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USAAVLABS TECHNICAL REPORT 68-13B

TWO-DIMENSIONAL TESTS OF AIRFOILS OSCILLATING NEAR STALL

VOLUME 11

DATA REPORT

By

Lewis Gray

Jaan Liiva

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April 1968

U. S. ARMY AVIATION MATERIEL LABORATORIES
FORT EUSTIS, VIRGINIA

CONTRACT DA 44-177-AMC-438(T)

THE BOEING COMPANY
VERTOL DIVISION
PHILADELPHIA, PENNSYLVANIA

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TWO-DIMESIONAL TESTS OF AIRFOILS OSCILLATING NEAR STALL. VOLUME II: DATA REPORT

Lewis Gray, et al

Boeing Company
Philadelphia, Pennsylvania

April 1968

DEPARTMENT OF THE ARMY
U. S. ARMY AVIATION MATERIEL LABORATORIES
FORT EUSTIS, VIRGINIA 23604

This report was prepared by Vertol Division, The Boeing Company, under the terms of Contract DA 44-177-AMC-438(T). It consists of results obtained from wind tunnel tests of airfoils oscillating near the stall angle of attack. The data were obtained at conditions comparable to those existing in present-day helicopters.

The object of this contractual effort was to obtain data on airfoils undergoing harmonic motion to serve as a basis for improvement of rotor theories. The unsteady aerodynamics data can provide a more realistic stall boundary and dynamic airloads if they are incorporated into present rotor theories.

The conclusions contained herein are concurred in by this command. The recommendations are sound. The report is published for the exchange of information and the stimulation of ideas.

Task 1F125901A14231
Contract DA 44-177-AMC-438(T)
USAAVLABS Technical Report 68-13B
April 1968

TWO-DIMENSIONAL TESTS OF AIRFOILS OSCILLATING NEAR STALL

VOLUME II

DATA REPORT

D8-0678-2

By

Lewis Gray
and
Jaan Liiva

Prepared by

The Boeing Company
Vertol Division
Philadelphia, Pennsylvania

for

U. S. ARMY AVIATION MATERIEL LABORATORIES
FORT EUSTIS, VIRGINIA

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SUMMARY

This report presents a detailed discussion of the test facilities, models, and data gathering and reduction system that were used in the tests of the oscillating airfoils.

The computer listings of the final data, with a comprehensive index of the test conditions, are also presented.

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LIST OF SYMBOLS

a	speed of sound, feet per second
AIRFOIL CPS	computer symbol for f, airfoil drive frequency for forced pitching or translation, Hertz
ALPHA.O	computer symbol for α_o, mean angle of attack, degrees
ALPHA (STALL)	computer symbol for angle of attack at CN(MAX), degrees
A_n	nth harmonic Fourier series cosine term of C_N
B_n	nth harmonic Fourier series sine term of C_N
c,C	airfoil chord, feet
CM	computer symbol for M/Qc^2, pitching moment coefficient per foot of span, positive for nose-up
C_M	airfoil pitching moment coefficient, positive nose-up
C_n	nth harmonic Fourier series cosine term of h
CN	computer symbol for N/Qc, normal force coefficient per foot of span, positive up
C_N	airfoil normal force coefficient, positive up
CN(MAX)	computer symbol for maximum normal force coefficient attained during oscillation
CPS	computer symbol for cycles per second or Hertz
$d\alpha$	the differential of α
D.ALPHA	computer symbol for $\Delta\alpha$, magnitude of oscillatory angle of attack, degrees
DAMPING	computer symbol for $(2\pi^2 f\Delta\alpha^2)^{-1} \oint CMd\alpha$, work-per-cycle coefficient for pitch oscillation
	computer symbol for $(2\pi^2 f\Delta h^2)^{-1} \oint CNdh$, work-per-cycle coefficient for vertical translation

DEL. H	computer symbol for Δh, magnitude of translation, based on first harmonic resultant of h, measured in semichords
D_n	nth harmonic Fourier series sine term of h
E_n	nth harmonic Fourier series cosine term of C_M
EXT.DAMPING	computer symbol for damping ratio of friction and eddy-current damping, fraction of critical damping (does not include aerodynamic damping)
f	drive frequency of airfoil motion in pitch or translation oscillation, Hertz
F_n	nth harmonic Fourier series sine term of C_N
G_n	nth harmonic Fourier series cosine term of α
h	translation position in semichords, positive up
H_n	nth harmonic Fourier series sine term of α
K	computer symbol for $\pi fC/V$, reduced frequency parameter
M	computer symbol for pitching moment, foot-pounds, positive nose-up
M*	total number of pressure-measuring stations
MACH NO	computer symbol for V/a, Mach number
n	number of harmonic based on f, see RES
n PHI	computer symbol for phase lead of response with respect to forcing motion for the nth harmonic, degrees
N	computer symbol for normal force, pounds, positive up
N*	total number of harmonics of data
Q	computer symbol for $(\rho V^2)/2$, dynamic pressure, pounds per square foot
RN	computer symbol for $(\rho VC)/\mu$, Reynolds number

RES n	computer symbol for magnitude of resultant for the nth harmonic
TUNED CPS	computer symbol for nominal value of airfoil system resonant frequency, Hertz
V	computer symbol for tunnel velocity, feet per second
W	work function, foot-pounds
x	airfoil chordwise location, measured from leading edge, feet
X	computer symbol for chordwise position, feet, measured from leading edge, positive toward trailing edge
X/C	computer symbol for chordwise position measured from the leading edge as a fraction of the chord
α	instantaneous angle of attack, degrees
α_o	mean angle of attack, degrees, positive for nose-up
δW_α	instantaneous work-per-cycle coefficient for pitching oscillation
δW_h	instantaneous work-per-cycle coefficient for translation
$\Delta\alpha$	magnitude of oscillatory angle of attack, degrees, based on first harmonic resultant of α
ΔC_p	differential pressure coefficient
Δh	magnitude of translation, based on first harmonic resultant of h, measured in semichords
ΔW_α	$(1/2\pi^2 f\Delta\alpha^2) \oint C_M d\alpha$, work-per-cycle coefficient for pitching oscillation
ΔW_h	$(1/2\ \pi^2 f\Delta h^2) \oint C_N dh$, work-per-cycle coefficient for translation
Θ	pitch and translation motion reference angle, degrees
μ	viscosity of air, slugs per foot per second

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INTRODUCTION

This volume contains the detailed description of the test facilities and apparatus and the computer data listings from the oscillating airfoil tests. The test results are presented and discussed in Volume I.

These computer data show differential pressures and integrated normal force and pitching moment data in harmonic form up to the ninth harmonic. For the tuned system tests, 18 harmonics are tabulated to show responses in the higher frequency range.

DESCRIPTION OF TEST FACILITIES AND APPARATUS

This section of the report describes the wind tunnel, test equipment, models, data-gathering system, and test procedures.

BOEING TWO-DIMENSIONAL, VARIABLE-DENSITY WIND TUNNEL

To accommodate tests such as (1) low-speed, high-lift blowing flaps, (2) high-speed airfoil drag reduction programs, and (3) high-speed transient and damping derivative measurements, a two-dimensional, variable-density subsonic test section was designed and built for the Boeing 4-by-4-foot supersonic wind tunnel in 1965 (see Figure 1).

Compressed air is stored in two 38-foot-diameter spheres with a total capacity of 55,000 cubic feet. Airflow through the tunnel is controlled automatically by an electrohydraulic servo valve that maintains tunnel operating pressures within 1.0 percent of the selected pressure and within 0.5 percent of the mean value during the run. Density is varied by controlling the total pressure. Temperature stabilization, achieved by radiation from a heat sink inside the storage spheres, results in a Reynolds number variation of less than 5 percent during a run.

The subsonic two-dimensional test facility fits within the basic 4-by-4-foot supersonic tunnel working section. It provides a 1-by-3-foot test section. A perforated floor and ceiling may be used for transonic testing.

Blowing boundary layer control (BLC) slots are provided in the tunnel side walls. They are used to prevent formation of vortexes or other three-dimensional disturbances due to separation of the wall boundary layers in the presence of the pressure field created by the airfoil.

Oil flow studies (see Figure 2) indicated wall boundary layer separation only when the translating mechanism was installed. This mechanism required end plates, which could not be flush with the wall, to cover holes through which the airfoil was moved. The disturbances created by the end plates were suppressed by the BLC, as is evident from the figure.

Pitch Oscillating Mechanism

The pitch oscillating mechanism is shown in Figure 3. A flywheel with an eccentrically mounted interchangeable cam drives a crank which is connected to the airfoil by a torsion spring for the tuned system (Figure 4) or by an adapter for direct drive.

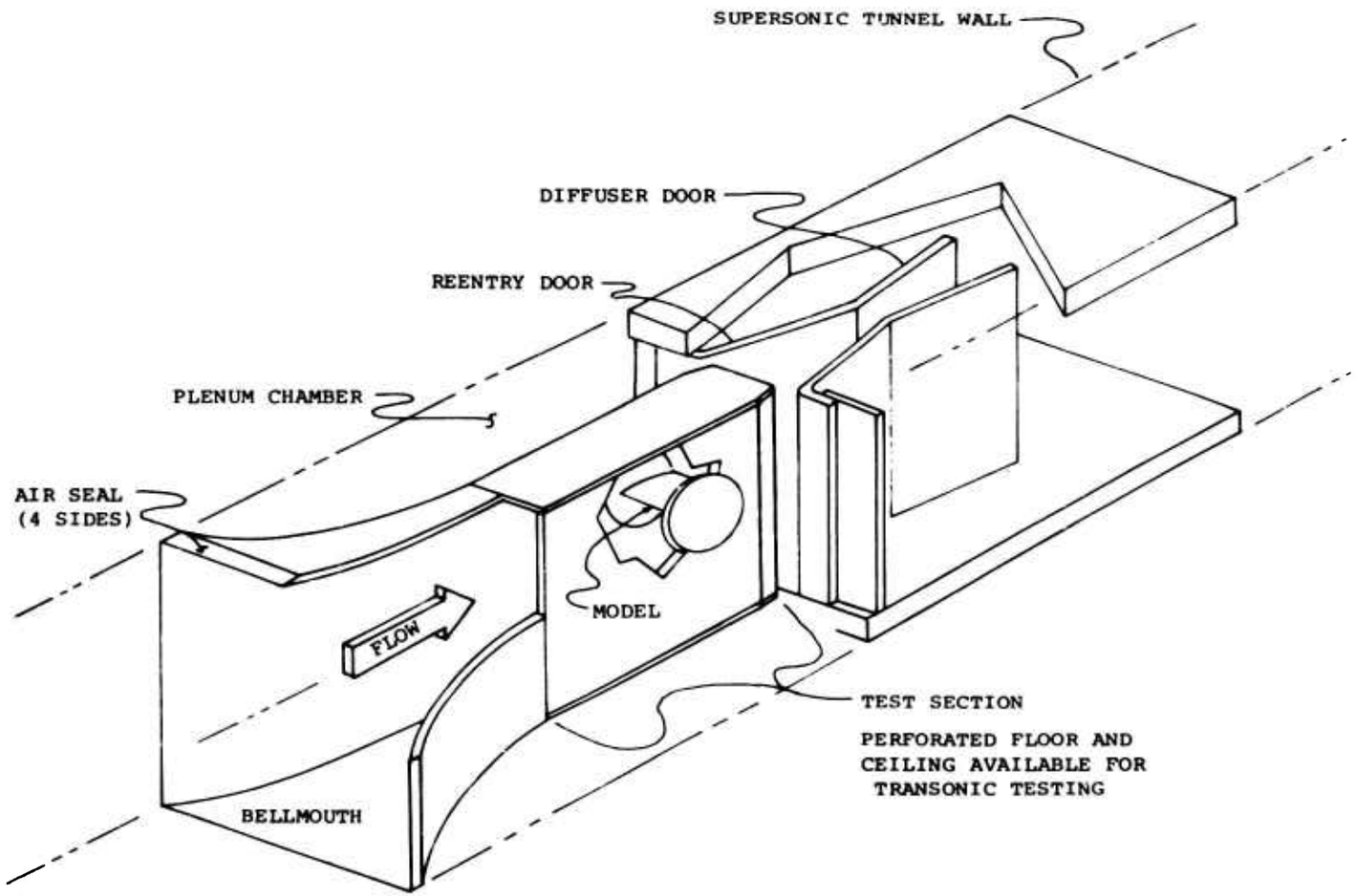
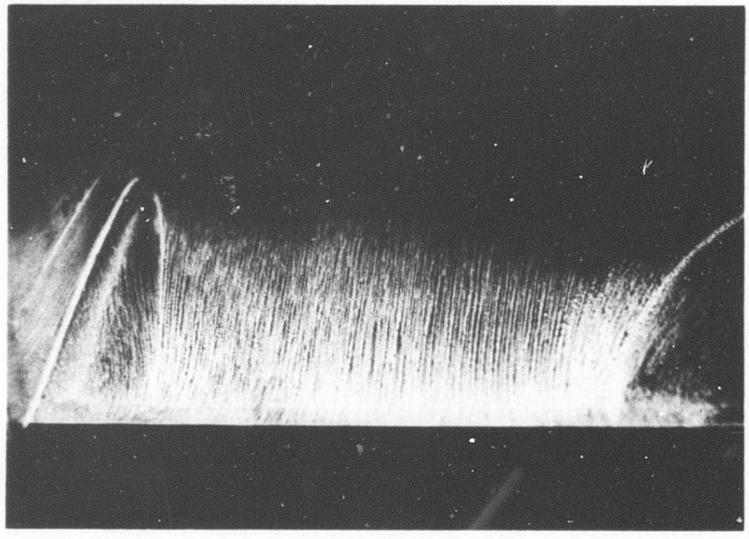
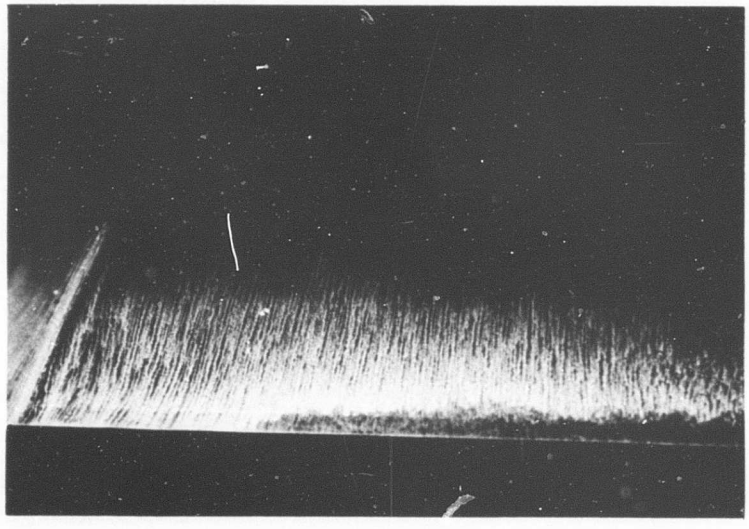


Figure 1. Schematic Drawing of the Variable-Density Test Section Installed in the 4-Foot-Square Boeing Supersonic Wind Tunnel.

NOTES: 1. $M = 0.4$ 3. $P_T = 50$ PSI
2. $\alpha = 12.5°$



A) NO BLOWING



B) BLOWING

Figure 2. Effect of Wall Blowing on Flow Separation at Tunnel Wall.

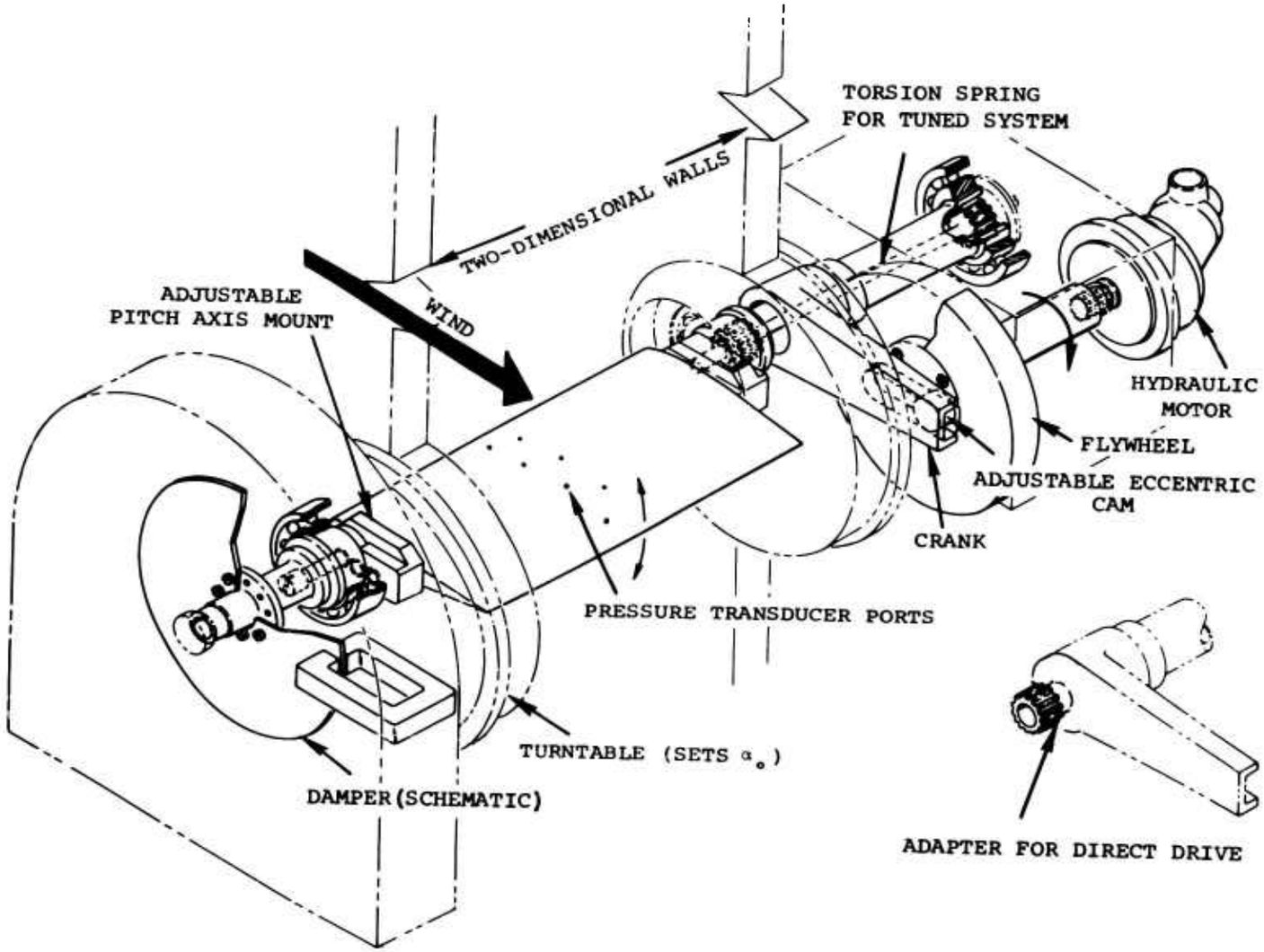


Figure 3. Pitch Oscillating Mechanism.

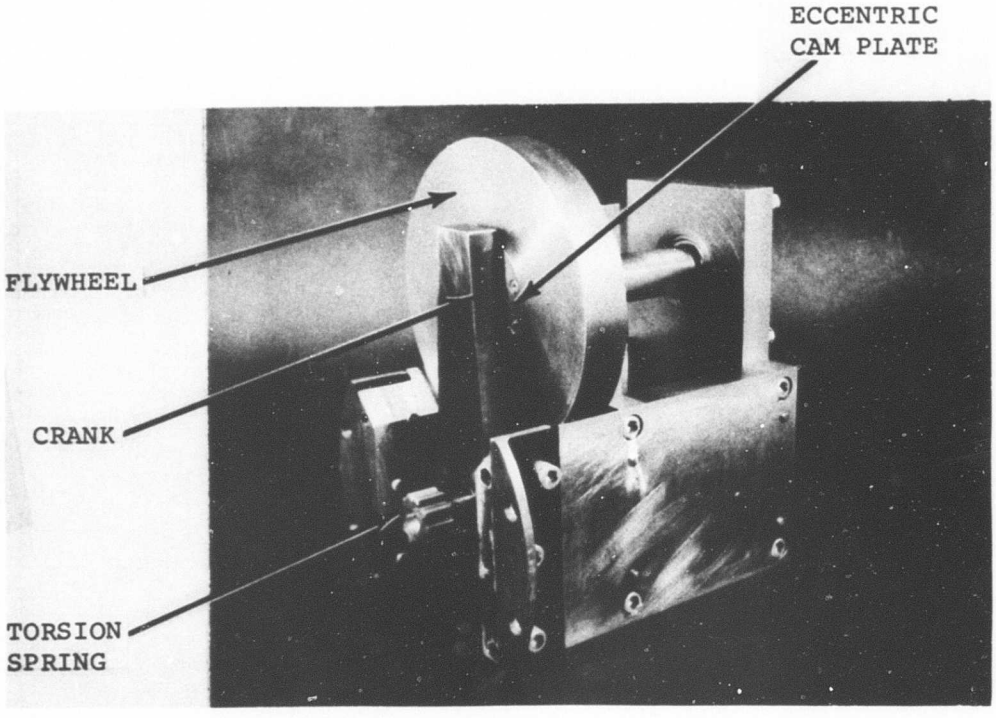


Figure 4. Detail of Flywheel and Crank for Pitch Oscillating Mechanism.

A hydraulic motor supplies drive power to the mechanism. The whole drive system is attached to a turntable, which rotates to provide the desired airfoil mean angle of attack. An eddy-current damper was attached to the airfoil as a safety control during the tuned airfoil tests. The damper was built specifically for this test and provided a maximum of 10 inch-pounds per radian per second damping at the test frequencies (see Figure 5 for damper characteristics). The dc power to the damper was supplied from storage batteries through a liquid rheostat. Full current could be applied very rapidly to the damper to give maximum damping force, if the elastic response exceeded preset limits. Simultaneously, the tunnel and the driving power to the oscillating mechanism would be shut off.

The kinematics of the drive system resulted in small deviations from a sinusoidal variation of pitch angle with flywheel rotation angle. At $\Delta\alpha$ values of 5 degrees or less, the amount of second harmonic motion so introduced was less than 5 percent of the fundamental amplitude. The waveform error is shown in Figure 6.

The mechanical amplification in the direct drive pitch system, caused by elastic deflections and inertial forces, is shown in the same figure. Since actual α values were measured deviations from the kinematic nominal can be accounted for.

Vertical Translating Mechanism

A drawing of the vertical translating mechanism is shown in Figure 7. The eccentrically mounted cams on each flywheel impart sinusoidal motion to the carriages supporting the airfoil. Rails restrict the carriages to vertical motion. By driving the airfoil from both sides, the bending deflections due to inertial forces are minimized. The flywheels are driven by toothed belts from a shaft connected to a hydraulic motor. The drive system is attached to the tunnel turntable, which is rotated to set the mean angle of attack. Airfoil end plates were required with the translating mechanism to cover the vertical slot in the test section walls. The end plates were covered with a Teflon sheet to provide a sliding fit and to seal the slot.

Airfoil Oscillation Frequency Control

The supply line to the hydraulic motor was provided with a coarse and a vernier flow control. By comparing the desired frequency with the airfoil output frequency in the form of a Lissajous figure on an oscilloscope, the vernier control could be adjusted to provide the required airfoil oscillation frequency.

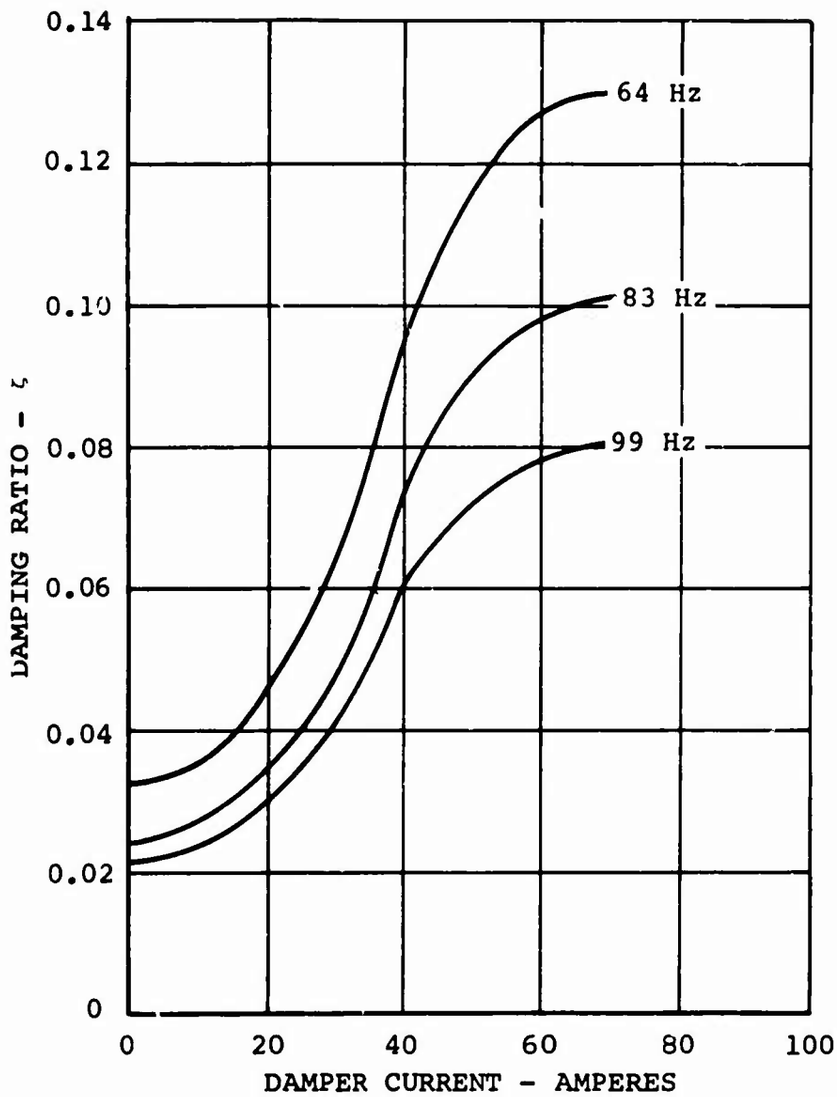
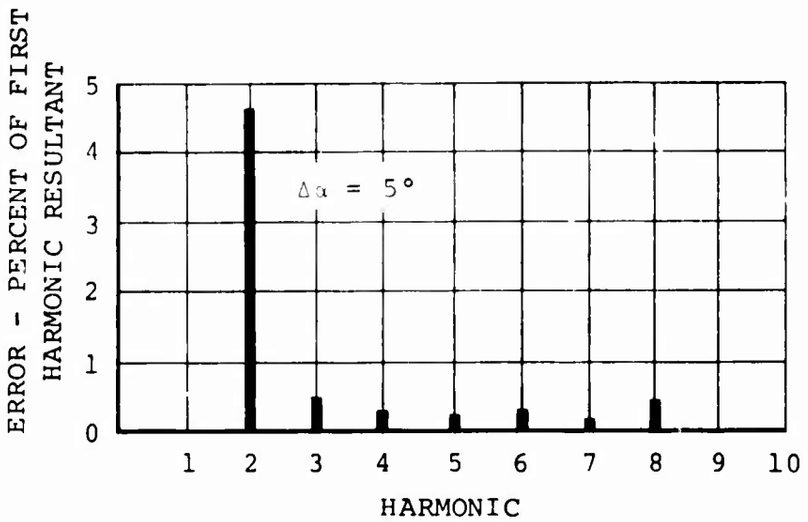
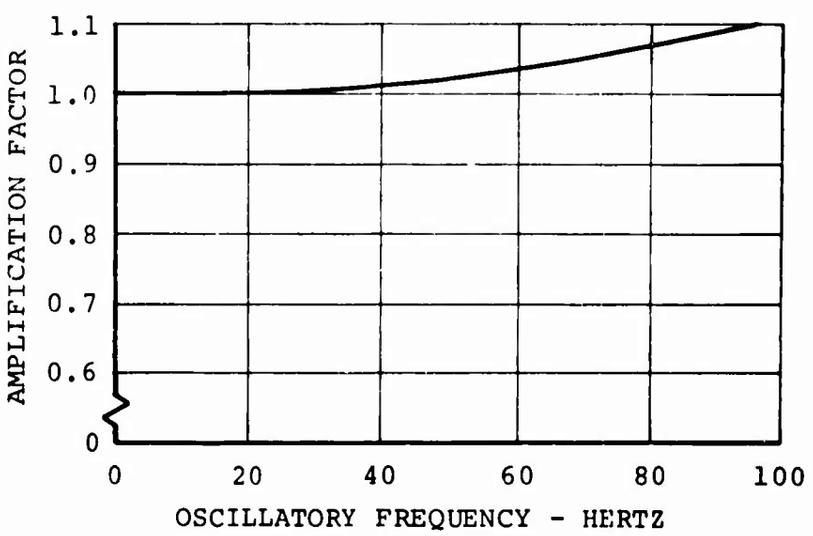


Figure 5. Characteristics of External Damper.



A) KINEMATIC ERROR



B) MECHANICAL AMPLIFICATION

Figure 6. Kinematic Error and Mechanical Amplification of Pitch Oscillating Mechanism.

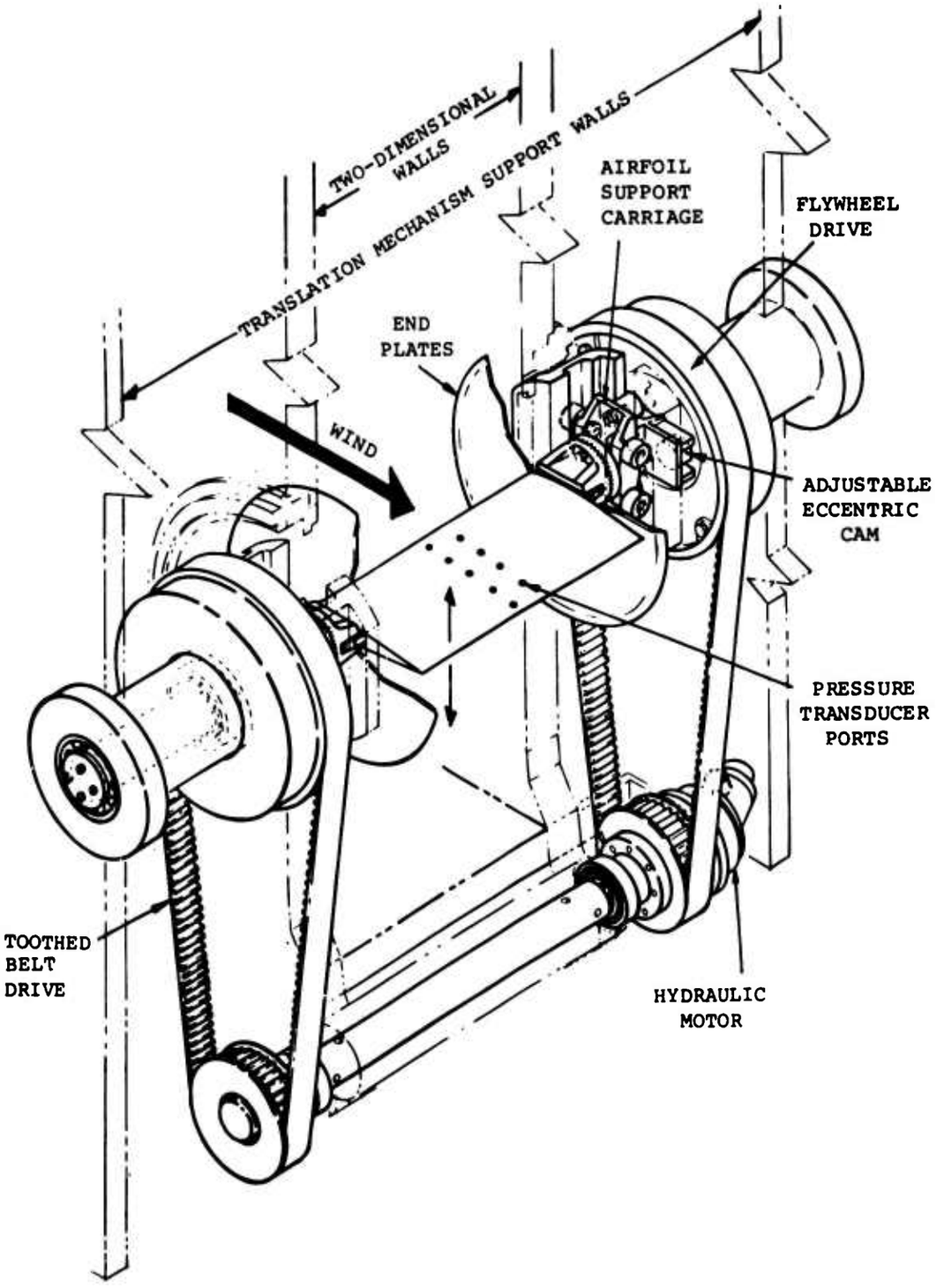


Figure 7. Vertical Translating Mechanism.

MODELS AND INSTRUMENTATION

Test Airfoil Sections

The symmetrical and the cambered airfoil contours and section ordinates are specified in Volume I. The airfoils were constructed of a steel center spar with sheet metal leading and trailing edges. The trailing edge of each airfoil ended in a flat, cusp-like piece of sheet metal.

Figure 8 shows details of the internal construction and the leading-edge transducer mounting ribs. The span of each test airfoil was nominally 12 inches, and the chord was 6.38 inches.

Transducer Installation Details

Fourteen pressure transducers were installed in 16 available pressure ports located at x/c values of 0.010, 0.025, 0.050, 0.100, 0.150, 0.200, 0.250, 0.300, 0.400, 0.500, 0.600, 0.695, 0.800, 0.831, 0.878, and 0.953. The two unused pressure-sensing locations were plugged to prevent leakage from the bottom surface to the top surface. The pressure ports were located within 3 inches of the airfoil centerline.

Surface pressures were transmitted to the transducers through 0.022-inch-i.d. Strip-A-Tubing connected between the transducer and 0.020-inch-i.d. metal tubes mounted flush to the model surface. Transducers were located in three areas: leading edge, body, and trailing edge. A typical installation for leading- and trailing-edge-mounted transducers is shown in Figure 9.

An improved method of mounting the leading- and trailing-edge transducers was adopted for the second phase of the test. This resulted in more efficient installation and removal of the transducers. A typical installation, shown in Figure 9 employed aluminum ribs with a screw-cap location for the transducer, instead of the foam ribs with adhesive location.

Transducer Static Characteristics

The pressure transducers in the airfoil were manufactured by Schaevitz-Bytrex and Scientific Advances. Each unit was temperature compensated.

Static Calibration

Each transducer was statically calibrated for linearity and hysteresis before installation. A typical calibration curve is shown in Figure 10, and the results are summarized in Figures 11 and 12.

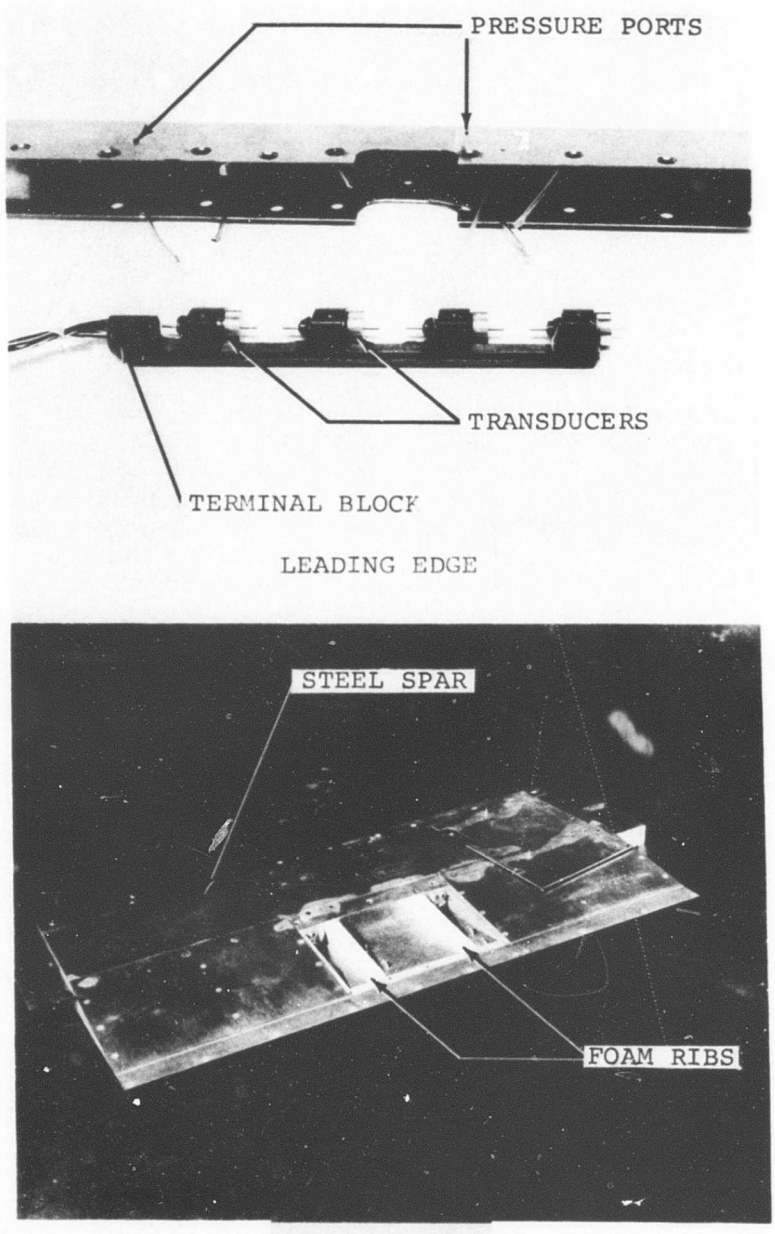
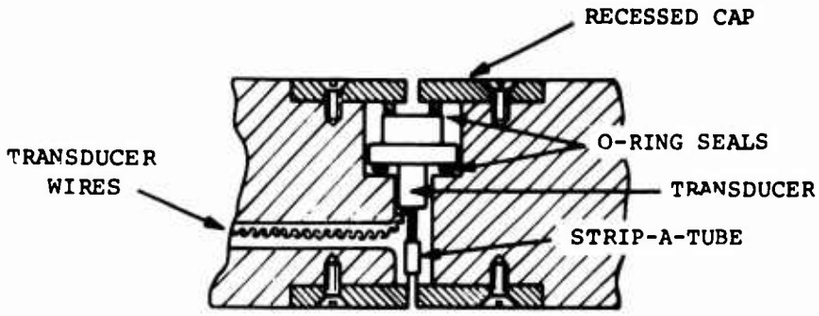
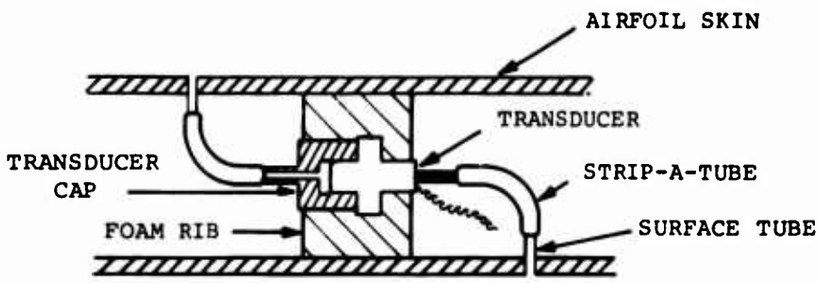


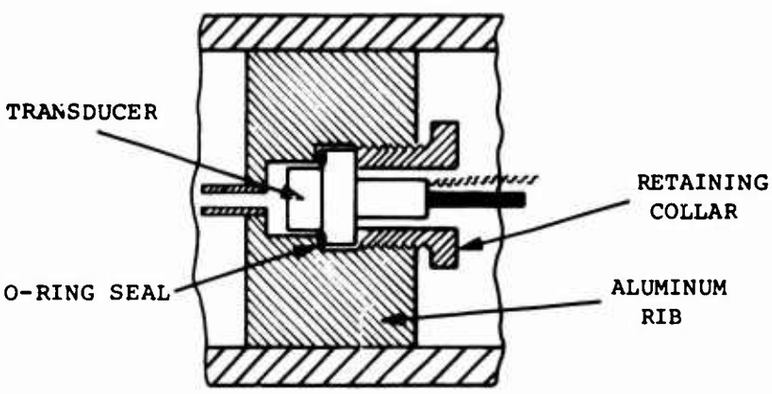
Figure 8. Details of Leading- and Trailing-Edge Construction of Test Airfoil.



A) BODY-MOUNTED TRANSDUCER INSTALLATION

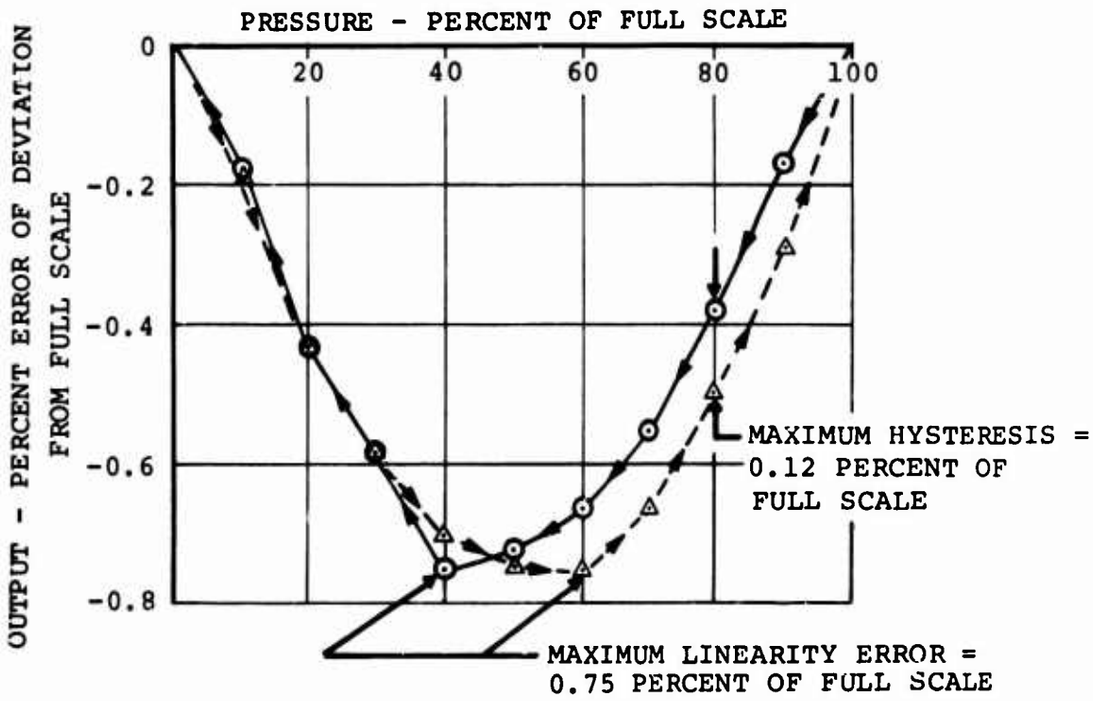


B) LEADING- AND TRAILING-EDGE TRANSDUCER INSTALLATION



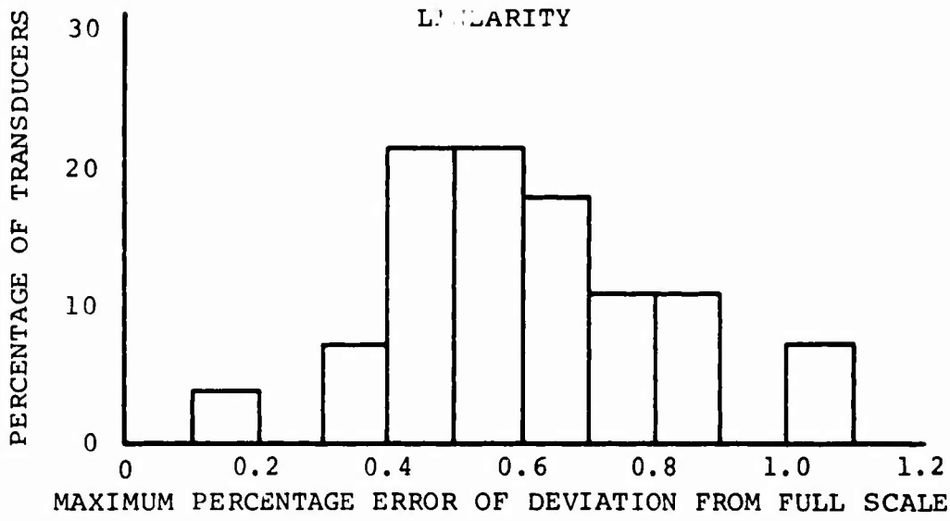
C) IMPROVED LEADING- AND TRAILING-EDGE TRANSDUCER INSTALLATION

Figure 9. Details of Pressure Transducer Installation.



NOTES: 1. SCHAEVITZ-BYTREX HFD-25 NO. 12306
2. CALIBRATION ON FRONT SIDE
3. EXCITATION VOLTS = 25

Figure 10. Typical Transducer Calibration Curve.



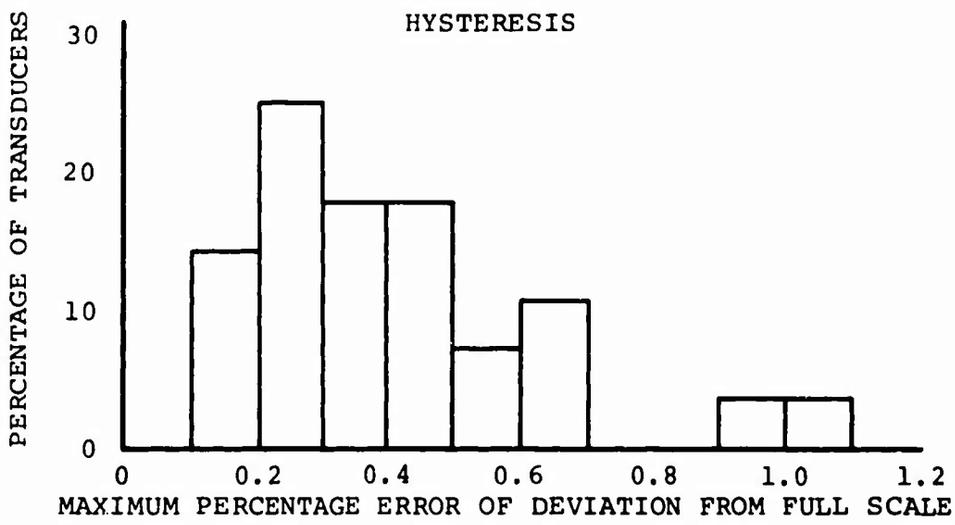
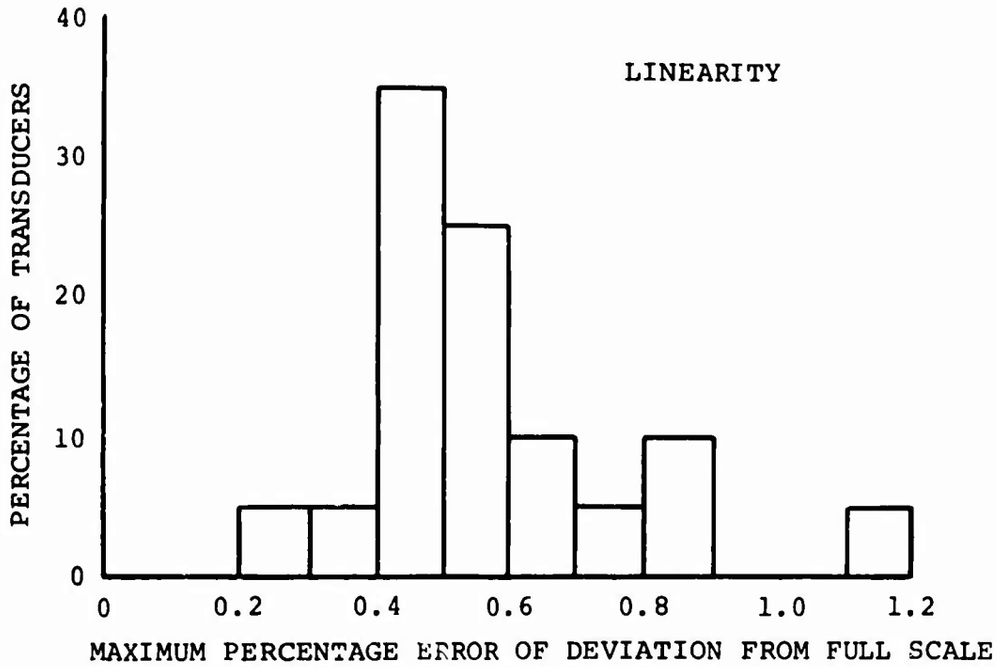


Figure 11. Summary of Transducer Calibration Data - Pressure Side.



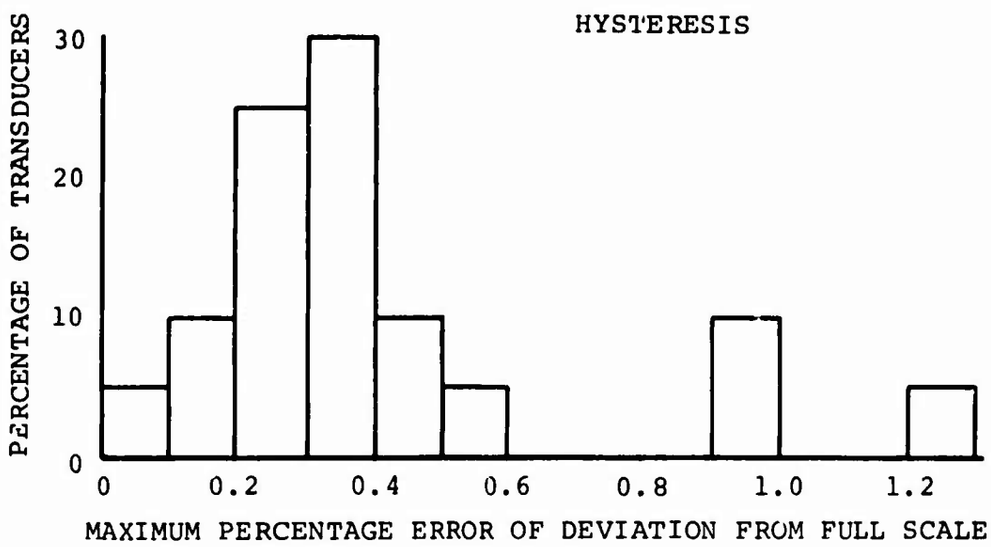


Figure 12. Summary of Transducer Calibration Data - Reference Side.

Transducer Dynamic Characteristics

The dynamic response of typical transducer installations was evaluated before the transducers were installed in the airfoil.

The following factors were investigated for their effects on the transducer installation:

1. Different lengths of Strip-A-Tubing between the pressure port and the transducer

2. Right-angle bends in the metal tubes leading from the pressure ports

A pressure step function input was applied to the transducer to evaluate its frequency response. Typical response curves are shown in Figure 13. For all transducer installations, the frequency response was at least 1030 Hertz with a damping ratio of approximately 0.45.

The frequency response of the transducer diaphragm is far too high to be measured by this technique. It is the pressure tubing and its terminating volume that limit the frequency response of the total system.

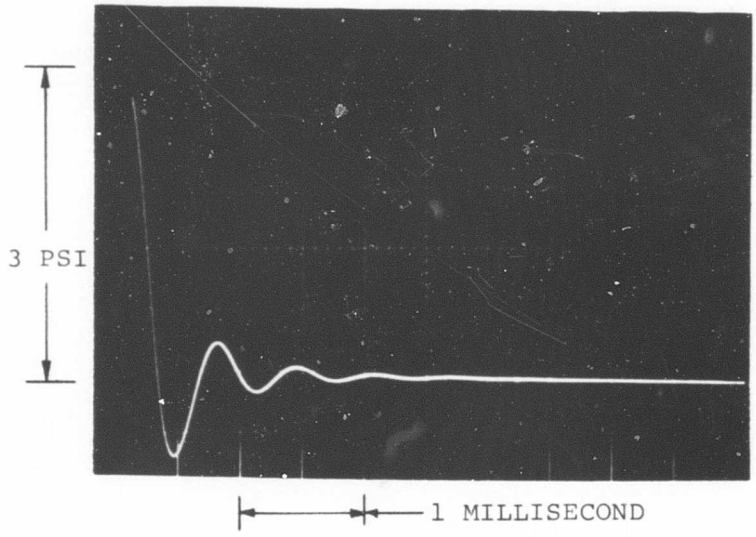
DATA RECORDING SYSTEM

The data recording system is shown in Figure 14. Data recording was controlled automatically during test runs through the tunnel operating console. The sequence of events during a typical test run is shown in Figure 15. The data recording system equipment consisted of the following:

1. Amplifiers - Each channel of information was fed to Preston Model 8300 amplifiers with 2-pole critically damped filters set to 1000-Hertz cutoff frequency.

2. Tape recorders - An Ampex Model FR200 and a Sangamo Model 4784 14-channel, wideband, FM tape recorder were used to record the data. A time code was generated on one channel of each recorder to provide tape synchronization during data reduction. Tape playback was available on the Sangamo model to allow checks to be made on the recorded data quality of each tape immediately after each run.

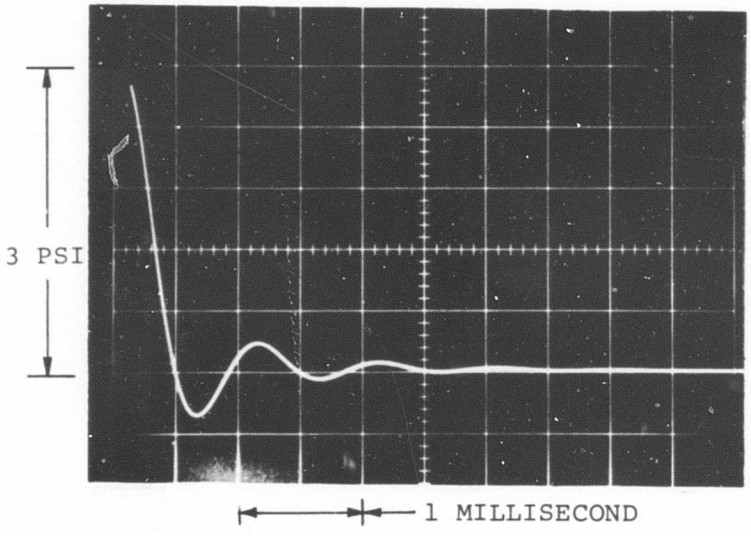
3. Oscillographs - In addition to the data stored on tape, simultaneous oscillograph records of all parameters were provided for on-line data monitoring.



DAMPING FACTOR
= 0.45

NATURAL FREQUENCY
= 1.6 kHz

PRESSURE STATION NO. 1, LOWER WING SURFACE



DAMPING FACTOR
= 0.45

NATURAL FREQUENCY
= 1.03 kHz

PRESSURE STATION NO. 1, UPPER WING SURFACE

PRESSURE CONNECTED THROUGH
A 0.75-INCH LENGTH OF
0.022-INCH PLASTIC TUBE

Figure 13. Dynamic Response of Installed Pressure Transducer.

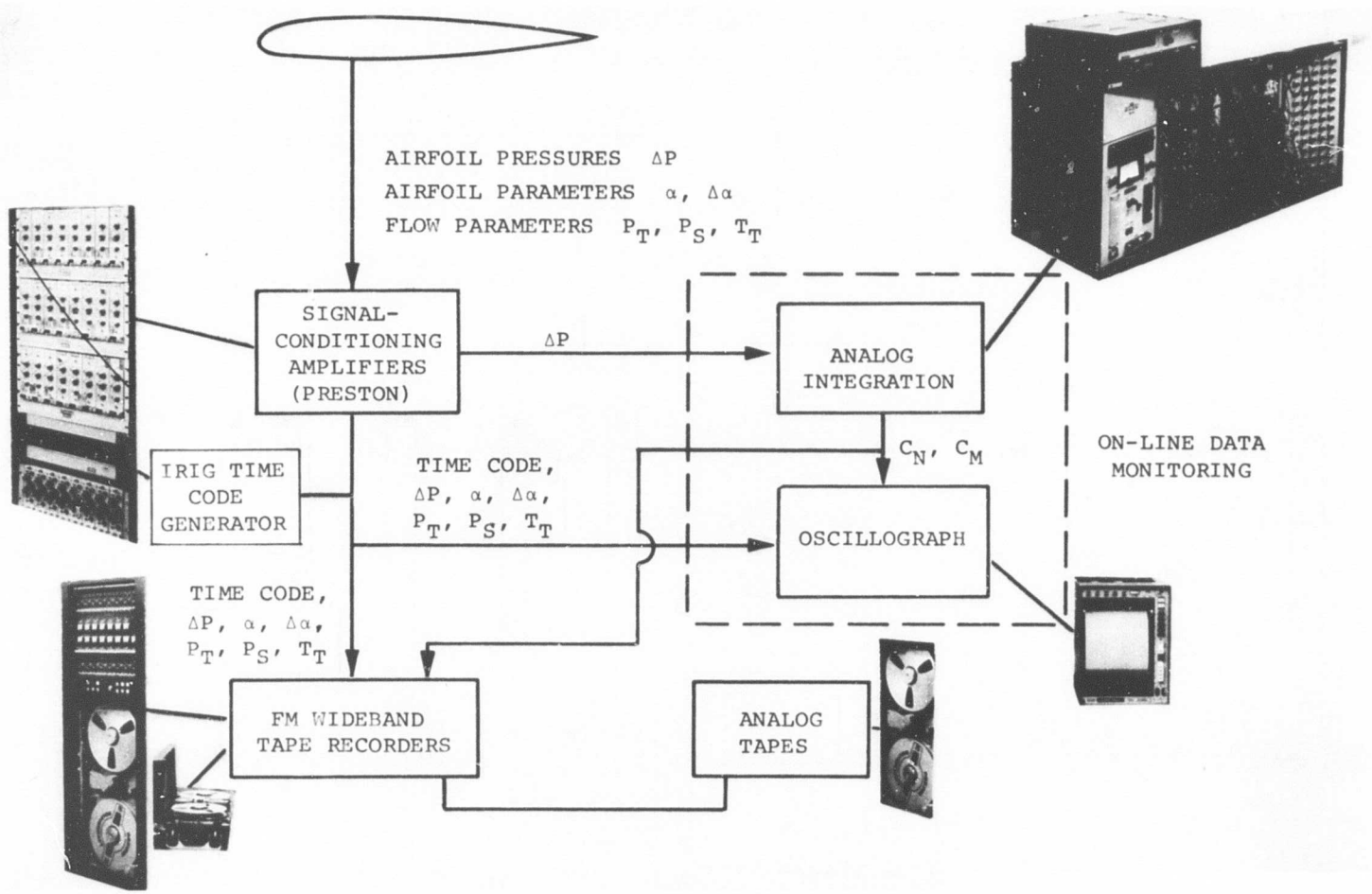


Figure 14. Data Recording System.

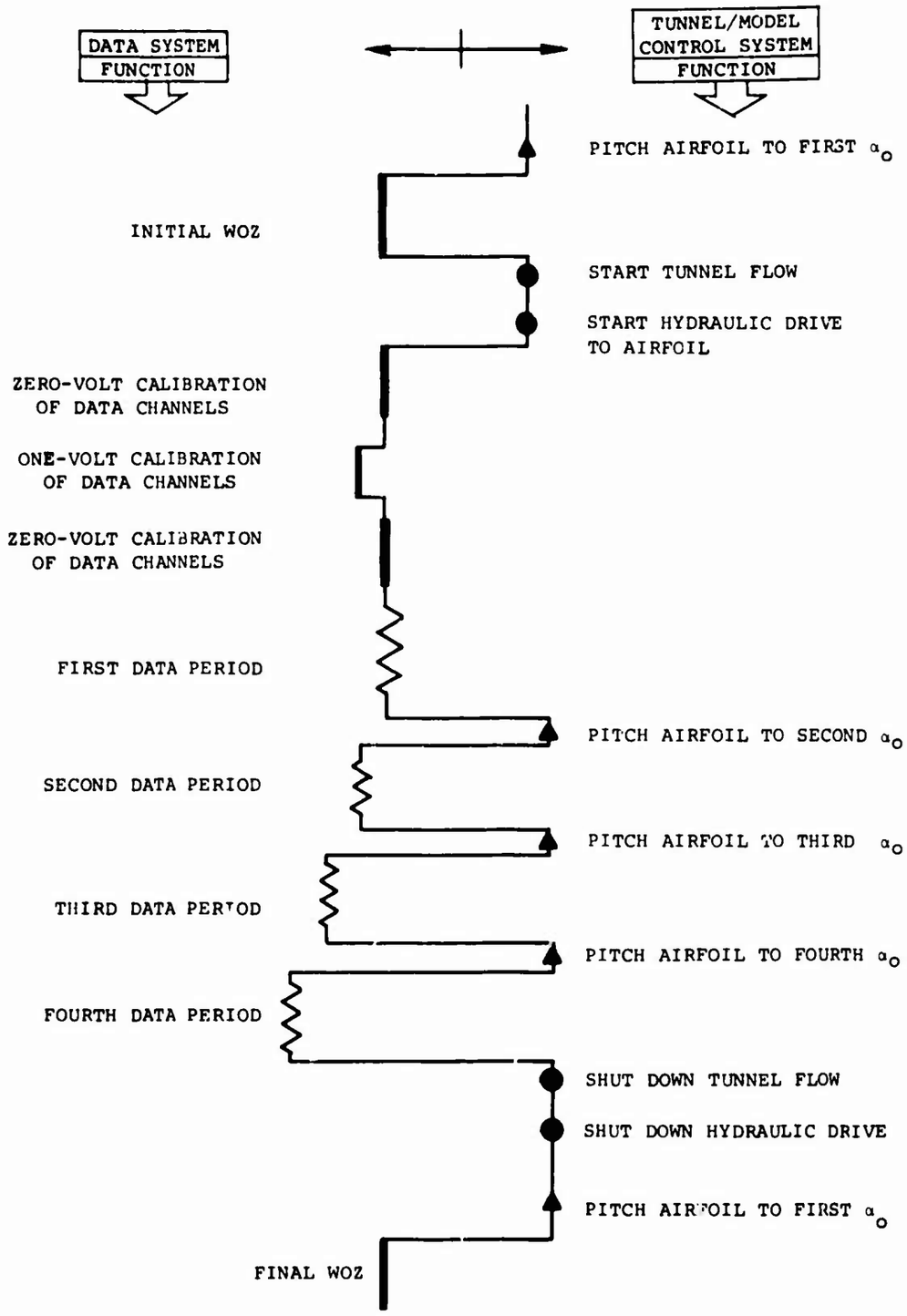


Figure 15. Data Recording Sequence.

4. Analog computer - A Pace analog computer was used on line to provide instantaneous integration of airfoil differential pressures to obtain C_N and C_M. These outputs were recorded on both magnetic tape and oscillograph records. Comparisons of analog integrated data and digital data will be discussed later.

Table I shows the parameters recorded on both magnetic tape and oscillograph paper.

TABLE I. MAGNETIC TAPE AND OSCILLOGRAPH RECORDINGS

Tape Recorder 1 Oscillograph 1		Tape Recorder 2 Oscillograph 2	
Channel	Component	Channel	Component
1	IRIG B time code	1	IRIG B time code
2	1/rev signal	2	1/rev signal
3	ΔP_1	3	ΔP_2
4	ΔP_3	4	ΔP_4
5	ΔP_5	5	ΔP_6
6	ΔP_7	6	ΔP_8
7	ΔP_9	7	ΔP_{10}
8	ΔP_{11}	8	ΔP_{12}
9	ΔP_{13}	9	ΔP_{14}
10	α_o	10	T_T
11	$\Delta\alpha / \Delta h$	11	P_T
12	C_N	12	P_S
13	C_M	13	-
14	-	14	-

DATA REDUCTION AND PLOTTING SYSTEM

Final data reduction and automatic plotting were conducted at the contractor's Vertol Division. A selection of the standard computer programs used by the flight test department for reducing data for flight programs such as that conducted by Pruyn* was adapted for use with the wind tunnel data. The computational details of these programs are adequately documented in the foregoing reference and will be omitted here except for specific changes. A new digital analysis program (M-56) was written to compute and list the aerodynamic output data in the format used in Volume II of this report. This program also produces a final digital data tape, from which data can be selected for automatic plotting.

The off-line system processing sequence is shown in Figure 16. The data were processed in two distinct phases:

1. Analog-to-digital conversion

2. Digital data processing

DIGITIZING

The analog tapes which contained chordwise pressure data and wind tunnel operating condition information were digitized at the contractor's flight test facility ground station, shown in Figure 17. The tapes were played back into the digitizing system by using an Ampex FR-100C tape drive at a tape playback speed of one-eighth of the recording speed of 60 inches per second. This enabled the system to read at least 36 data points for each airfoil oscillation cycle.

The digitizing system consists of a CDC 3100 computer and an analog-to-digital converter operating under the control of program F-02 through punched card inputs. The cards supply wind tunnel test condition and instrumentation information. Suitable areas for digitizing were selected by scanning and editing from the oscillograph records, which were obtained simultaneously with the magnetic tapes. Each set of digital

*Pruyn, Richard R., IN-FLIGHT MEASUREMENT OF ROTOR BLADE AIRLOADS, BENDING MOMENTS, AND MOTIONS, TOGETHER WITH ROTOR SHAFT LOADS AND FUSELAGE VIBRATION, ON A TANDEM ROTOR HELICOPTER, VOLUME III, DATA PROCESSING AND ANALYSIS SYSTEM, The Boeing Company, USAAVLABS Technical Report 67-9C, U.S. Army Aviation Materiel Laboratories, Fort Eustis, Virginia, November 1967.

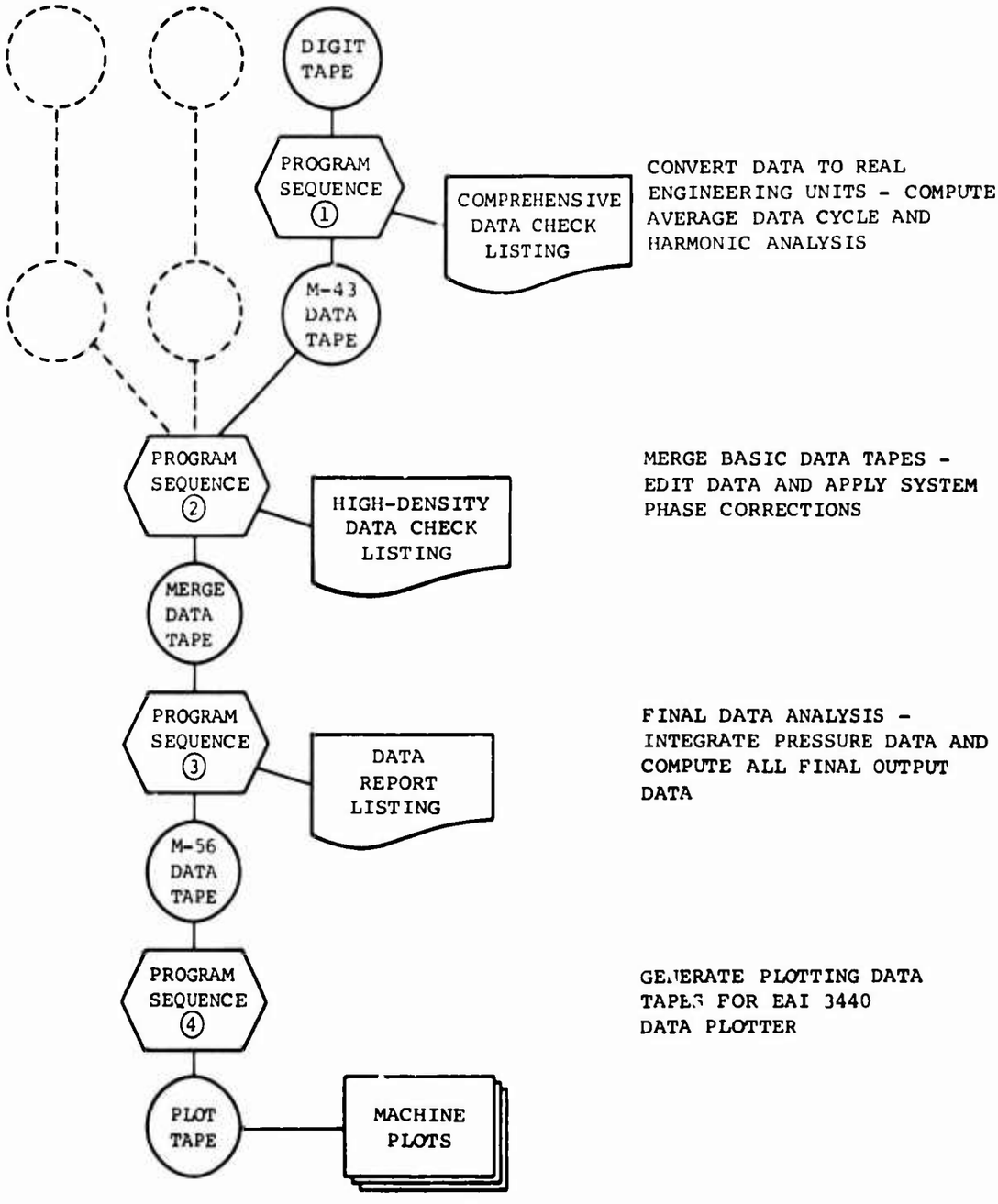


Figure 16. Digital Data Processing Flow Path.

Figure 17. Vertol Flight Test Ground Station Analog-to-Digital Converter System.

data on the output tapes contained information fed from the card input, followed by calibrations and test data. To correct for zero drift, a final wind-off zero data point was taken immediately after each tunnel run. For the oscillatory data, five to ten consecutive cycles of data were digitized for each test condition. The calibration data were an average of five samples.

DATA REDUCTION

All data reduction programs used a standard format for storing data on the input and output tapes. This format consisted of a header with run and instrumentation identification information followed by data; thus, each set of data was complete in itself. This allowed the combination of several programs in order to operate on the data in sequence or separately, as necessary, which simplified editing and checking. Because of the large quantity of data (over 750 data points in all), the data were processed in four stages with a check on data validity and quality at the end of each stage. In each stage of data reduction, up to four programs were used sequentially. A summary of the operations in each program of a sequence is presented in the following paragraphs.

Stage 1 Data Reduction: Calibration, Averaging, and Harmonic Analysis

Figure 18 shows the sequencing of programs during this stage of data reduction. Program M-40, the Primary Loads Calibration Program, converts the data from digitized analog voltage values to engineering units by using the card input information. The data are referenced to the zero level at the beginning of a data run. Since this zero does not include the drift due to temperature change, a correction was applied later. Each group of data cycles was then averaged by using Program M-31, the Data Averaging Program. This average cycle was the arithmetic mean of the cycles processed.

The averaged ordinates of every parameter were harmonically analyzed in Program M-43, the Harmonic Analysis Program. The sine and cosine coefficients, as well as the resultant and the phase lead terms, were obtained by a truncated Fourier series analysis, up to the ninth harmonic in most cases.

The data at this stage were in harmonic coefficient form in real engineering units. An output tape was saved for Stage 2 data processing, and a check listing was produced by using Program M-44, the Generalized Listing Program.

The data were checked for digitized calibration values, analog-to-digital converter band-edge limits, and sampling consistency; in addition, all input card data were checked for errors.

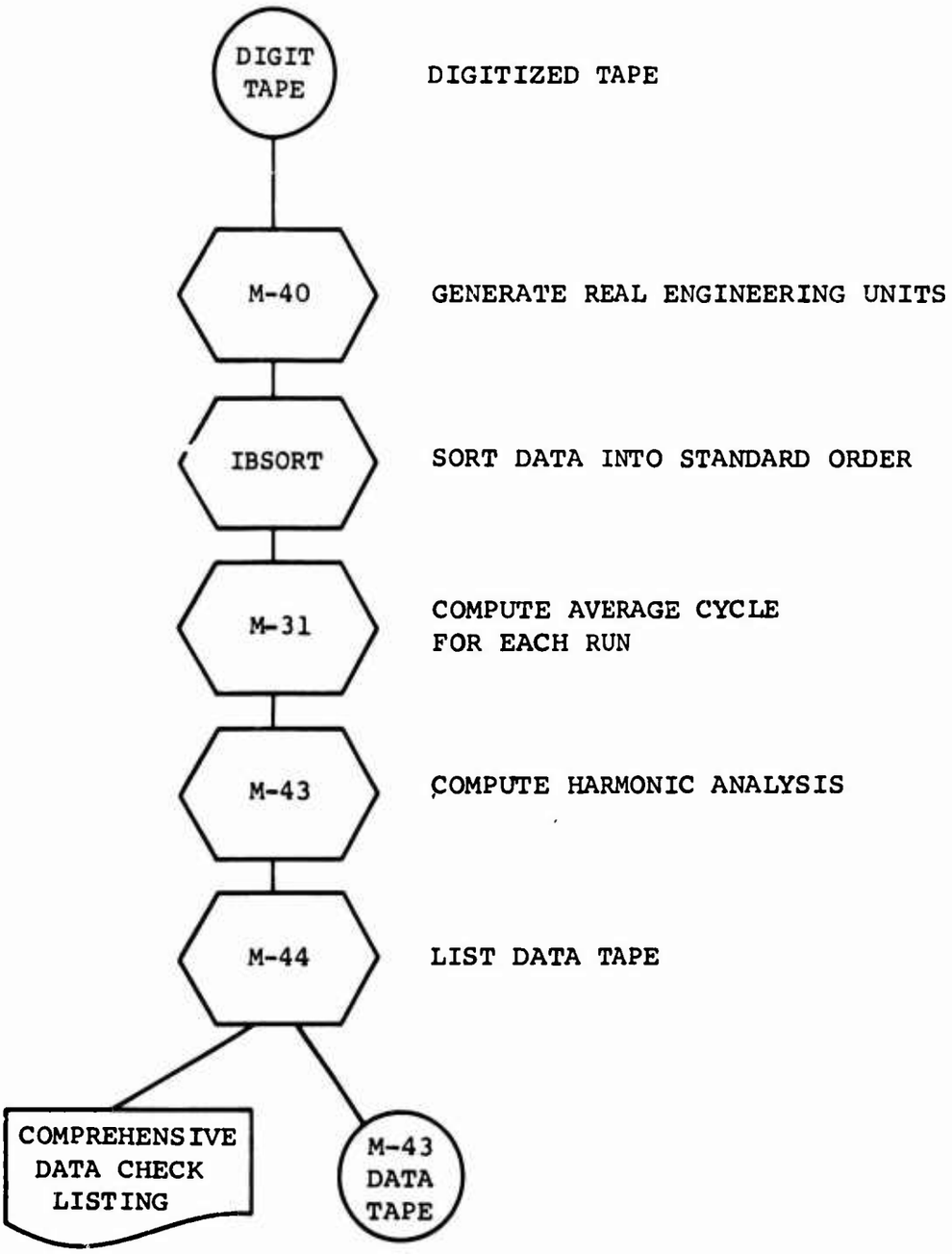


Figure 18. Stage 1 Data Reduction Sequence.

Stage 2 Data Reduction: Merging and Data Corrections

The Stage 2 data reduction program run sequence is shown in Figure 19. The complementary data from each of the two tapes were merged into a complete set at this point by using IBSORT, the IBM sort program. The data from as many as eight digital tapes were combined at one time. In addition, the merged data were further combined by the same process to produce large blocks of data. This simplified the final data integration in Stage 3 and greatly reduced the number of individual jobs on the computer.

Program M-05, the Select and Edit Program, was used next to eliminate defective pressure gage data and to correct input errors found from Stage 1 listings. In addition, the data were corrected for the phase deviation between the 1/rev signal and the $\alpha = \alpha_o$ reference point.

The outputs from Stage 2 data reduction consisted of a digital tape containing merged and corrected data and a high-density listing from Program M-44 which contained data information sufficient for a final check before integration.

Stage 3 Data Reduction: Integration and Final Data Analysis

All final integrations for C_N, C_M, and ΔW, as well as calculation of the test parameter values such as the dynamic pressure, Reynolds number, frequency, etc. (see typical listing in Volume II), were performed in the M-56 Oscillating Airfoil Data Reduction Program. The Stage 3 data reduction sequence is shown in Figure 20. The following formulas were used to integrate C_N, C_M, and damping parameters. In the case of the ΔW parameter (called damping in the data listings in this report), a different equation is given for the pitching and translating equations.

$$C_N(\theta) = \sum_{m=o}^{M^*} \left\{ \frac{[\Delta C_p(\theta)]_{m+1} + [\Delta C_p(\theta)]_m}{2} \left[\left(\frac{x}{c}\right)_{m+1} - \left(\frac{x}{c}\right)_m \right] \right\} \qquad (1)$$

where m = 1, 2, 3.....M*.

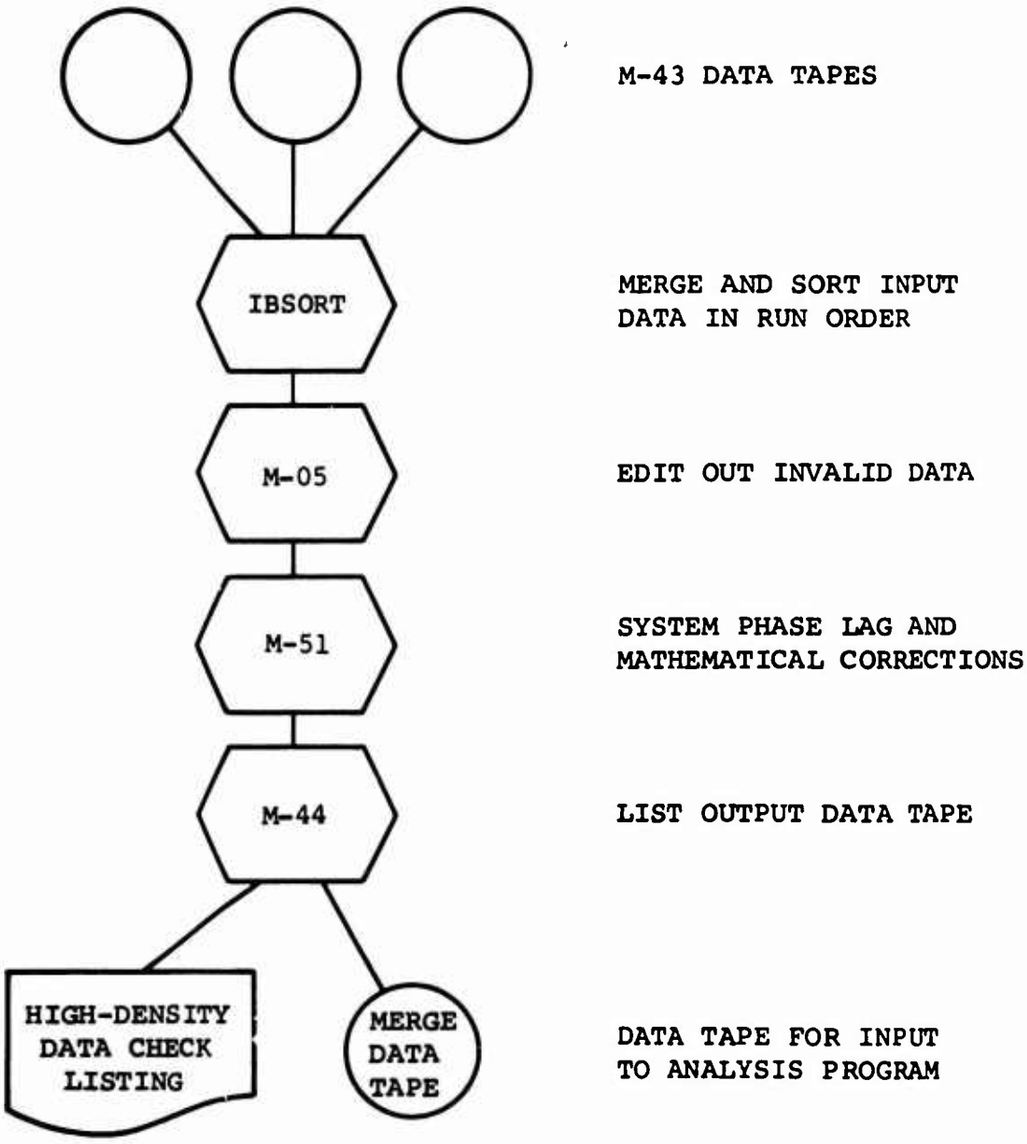


Figure 19. Stage 2 Data Reduction Sequence.

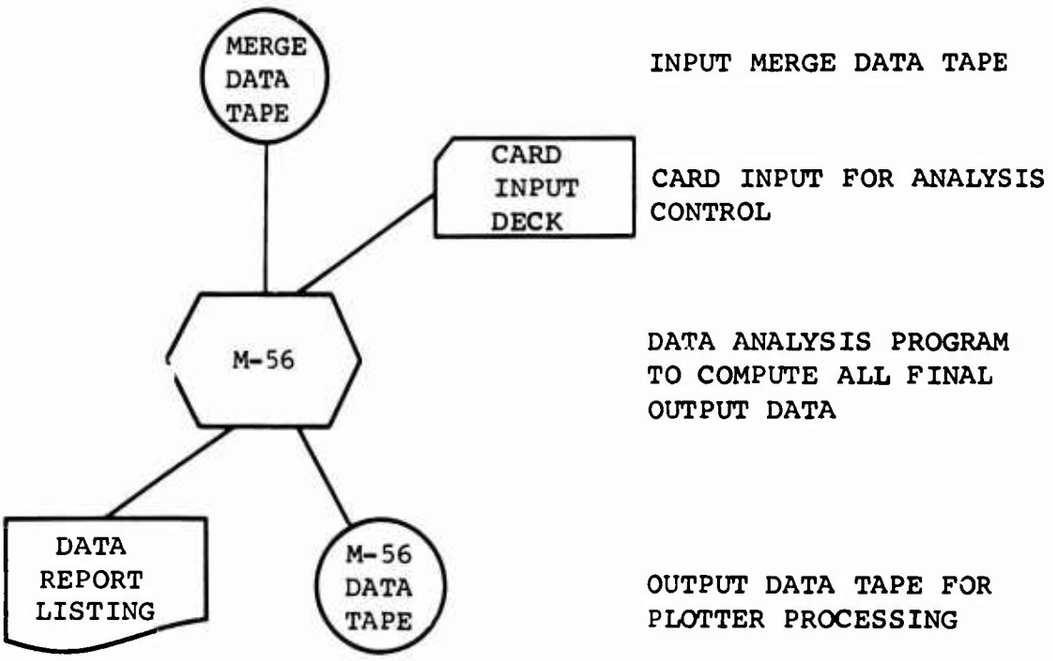


Figure 20. Stage 3 Data Reduction Sequence.

$$C_M(\Theta) = \sum_{m=1}^{M^*} \left\{ \frac{[\Delta C_p(\Theta)]_{\overline{m+1}} \left[\left(\frac{x_o}{c}\right) - \left(\frac{x}{c}\right)_{\overline{m+1}}\right]}{2} + \frac{[\Delta C_p(\Theta)]_m \left[\left(\frac{x_o}{c}\right) - \left(\frac{x}{c}\right)_m\right]}{2} \right\} \left[\left(\frac{x}{c}\right)_{\overline{m+1}} - \left(\frac{x}{c}\right)_m\right] \quad (2)$$

where

$$\left.\begin{aligned} \left(\frac{x}{c}\right)_o &= 0.0 \\ [\Delta C_p(\Theta)]_o &= 0.0 \end{aligned}\right\} \text{ leading-edge boundary condition}$$

$$\left.\begin{aligned} \left(\frac{x}{c}\right)_{\overline{M+1}} &= 1.0 \\ [\Delta C_p(\Theta)]_{\overline{M+1}} &= 0.0 \end{aligned}\right\} \text{ trailing-edge boundary condition}$$

$$\Delta W_\alpha = \frac{180}{2\pi^3 f(\Delta\alpha)^2} \oint C_M d\alpha \quad (3)$$

Using the harmonic sine and cosine coefficients of C_M and α, an exact integral technique has been used to derive the expression

$$\Delta W_\alpha = \frac{180}{2\pi^2 f(\Delta\alpha)^2} \sum_{n=1}^{N^*} [n(E_n H_n - F_n G_n)] \quad (4)$$

$$\Delta W_h = \frac{1}{2\pi^2 f(\Delta h)^2} \oint C_N dh \quad (5)$$

$$\Delta W_h = \frac{1}{2\pi^2 f(\Delta h)^2} \sum_{n=1}^{N^*} [n(A_n D_n - B_n C_n)] \quad (6)$$

where n = 1, 2, 3.....N*.

In addition to the average cycle work function, the instantaneous work function is used in Appendix IV of Volume I. This function is defined as follows:

1. For pitching,

$$\delta W_\alpha(\Theta) = \frac{1}{2\pi^2 f(\Delta\alpha)^2} C_M(\Theta) \frac{d\alpha}{dt}(\Theta) \tag{7}$$

or

$$\delta W_\alpha(\Theta) = \frac{C_M(\Theta)\,180}{\pi^2(\Delta\alpha)^2} \sum_{n=1}^{N^*} [n(H_n \cos n\Theta - G_n \sin n\Theta)] \tag{8}$$

2. For translation,

$$\delta W_h(\Theta) = \frac{C_N(\Theta)}{\pi(\Delta h)^2} \sum_{n=1}^{N^*} [n(D_n \cos n\Theta - C_n \sin n\Theta)] \tag{9}$$

The drift corrections from the Stage 1 listing are input data to the M-56 Program and are incorporated internally. The output from this program consisted of data listings of the sort given in this report, together with a digital data tape which could be used by the automatic plotting programs.

Stage 4 Data Reduction: Automatic Plotting

The two alternate program sequence paths for automatic data plotting are shown in Figure 21. The parameters and test points to be plotted were selected using the M-05 Program. A plotter tape was then produced with either the M-59 or the M-46 Plotting Program. The former operated on the data to produce plots of two harmonically reconstituted data, such as C_N or C_M against α or h, while the latter produced plotter tapes for time history and chordwise pressure distribution plots.

An EAI 3440 data plotter was used to plot both line and data point plots. The scales and the test parameter values were printed on prepared graph paper.

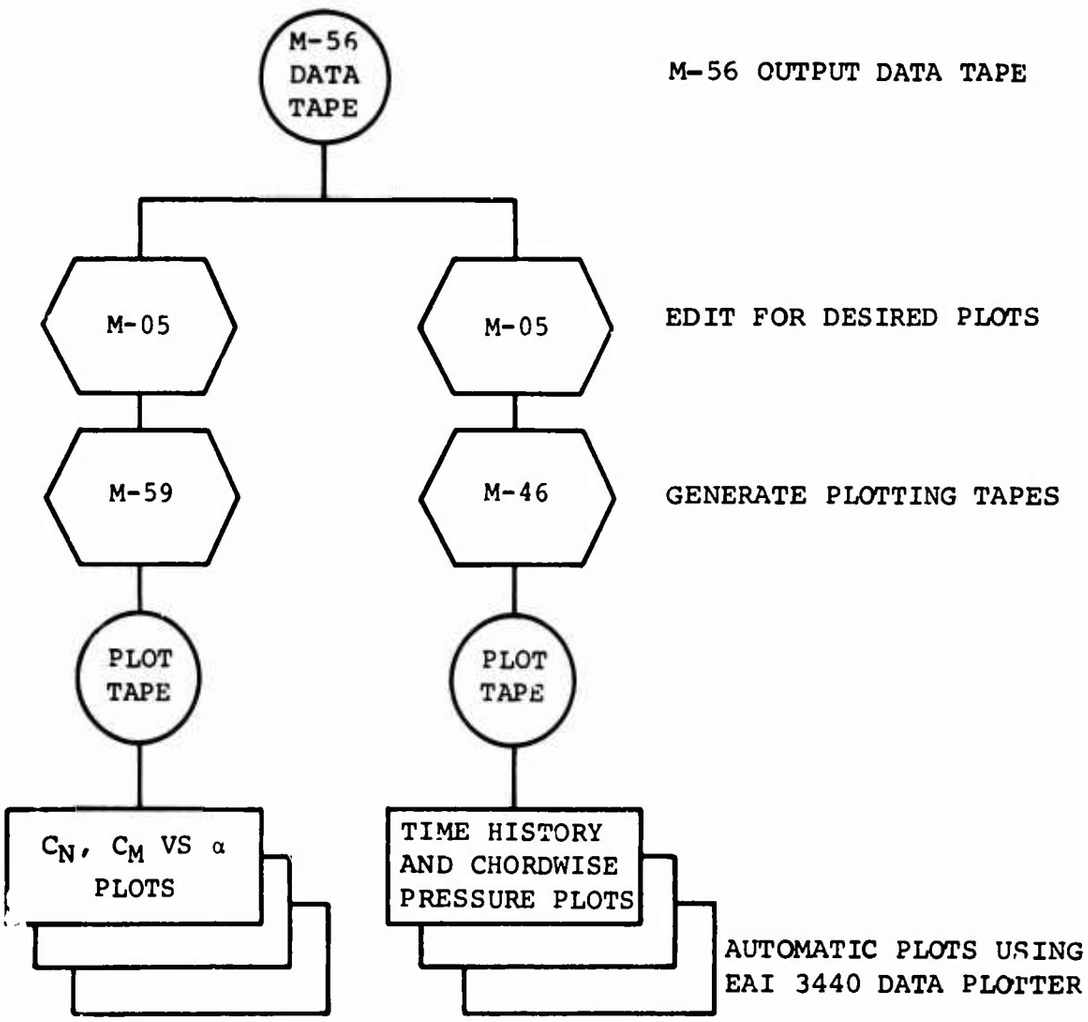


Figure 21. Stage 4 Data Reduction Sequence.

INDEX TO COMPUTER DATA

The test conditions and airfoil type are identified at the head of each set of data. Tables II through X refer these factors to the page on which the data appear. Numbers of pages containing two sets of data are followed by the letter L or R, indicating whether the data are on the left or right side of the page.

The values defining the test conditions in the tables are nominal; exact values are given in the data listings.

TABLE II. STATIC AIRFOIL DATA

Airfoil	Mach No.	R X 10^{-6}	Page
NACA 0012 (Modified) Airfoil	0.2	2.6	45
	0.4	4.8	45
	0.6	6.2	46
Vertol 23010-1.58 Airfoil	0.2	2.6	47
	0.4	4.8	47
	0.6	6.2	48
Vertol 23010-1.58 Airfoil (Reflex trailing edge)	0.4	4.8	49

TABLE III. FORCED PITCH OSCILLATION FOR THE NACA 0012 (MODIFIED) AIRFOIL

$\Delta\alpha$ (deg)	f (Hz)	Mach No.	α (degrees) 0	5	7.5	10	12.5	15	17.5	20	25	K	$R \times 10^{-6}$
			Page Number and Location of Computer Data										
2.5	16	0.2	-	-	-	50L	50R	51L	-	-	-	0.12	2.6
		0.4	-	-	-	51R	52L	52R	-	-	-	0.06	4.8
		0.6	-	53L	53R	54	-	-	-	-	-	0.04	6.2
	32	0.2	-	-	-	55L	55R	56L	-	-	-	0.24	2.6
		0.4	-	-	-	56R	57L	57R	-	-	-	0.12	4.8
		0.6	-	58L	58R	59	-	-	-	-	-	0.08	6.2
	48	0.4	-	-	-	60L	60R	61L	-	-	-	0.18	4.8
		0.6	-	61R	62L	62R	-	-	-	-	-	0.12	6.2
	64	0.4	-	-	-	63L	63R	63L	-	-	-	0.24	4.8
		0.6	-	64R	65L	65R	-	-	-	-	-	0.16	6.2
	80	0.4	-	-	-	66L	66R	67L	-	-	-	0.30	4.8
		0.6	-	67R	-	68	-	-	-	-	-	0.20	6.2
	96	0.2	-	-	-	69L	[illegible]R	70L	-	-	-	0.72	2.6
		0.4	-	-	-	70R	[illegible]	71R	-	-	-	0.36	4.8
		0.6	-	72L	72R	73	-	-	-	-	-	0.24	6.2
5	16	0.2	-	74L	74R	75L	75R	76L	76R	-	77L	0.12	2.6
		0.4	-	-	-	77R	78L	78R	79L	-	79R	0.06	4.8
		0.6	-	80L	80R	81L	-	81R	82L	-	82R	0.04	6.2
	32	0.2	-	83L	83R	84L	84R	85L	85R	-	86L	0.24	2.6
		0.4	-	-	-	86R	87L	87R	88L	-	88R	0.12	4.8
		0.6	-	89L	89R	90L	-	90R	91L	-	91R	0.08	6.2
	48	0.2	-	-	-	-	-	92L	92R	-	93	0.36	2.6
		0.4	-	-	-	94L	94R	95L	95R	-	96L	0.18	4.8
		0.6	-	96R	97L	97R	-	-	-	-	-	0.12	6.2
	64	0.2	-	-	-	-	-	98L	98R	-	99	0.48	2.6
		0.4	100L	-	100R	101L	101R	102L	102R	-	103L	0.24	4.8
		0.6	103R	104L	104R	105	-	-	-	-	-	0.16	6.2

TABLE III - Continued

$\Delta\alpha$ (deg)	f (Hz)	Mach No.	α_o (degrees) 0	5	7.5	10	12.5	15	17.5	20	25	K	$R \times 10^{-6}$
			Page Number and Location of Computer Data										
5	80	0.2	-	-	-	-	-	106L	106R	-	107	0.60	2.6
		0.4	108L	-	108R	109L	109R	110L	110R	-	111L	0.30	4.8
		0.6	111R	-	112L	112R	113	-	-	-	-	0.20	6.2
	96	0.2	114L	-	114R	115L	115R	116L	116R	-	117L	0.72	2.6
		0.4	117R	-	118L	118R	119L	119R	120L	-	120R	0.36	4.8
		0.6	121L	121R	122L	122R	-	123L	123R	-	124	0.24	6.2
7.5	16	0.2	-	125L	-	125R	-	-	-	-	-	0.12	2.6
		0.4	-	126L	-	126R	-	-	-	-	-	0.06	4.8
		0.6	-	127L	-	127R	-	-	-	-	-	0.04	6.2
	32	0.2	-	128L	-	128R	-	-	-	-	-	0.24	2.6
		0.4	-	129L	-	129R	-	-	-	-	-	0.12	4.8
		0.6	-	130L	-	130R	-	-	-	-	-	0.08	6.2

TABLE IV. FORCED PITCH OSCILLATION FOR THE VERTOL 23010-1.58 AIRFOIL

$\Delta\alpha$ (deg)	f (Hz)	Mach No.	α_o (degrees) 0	5	7.5	10	12.5	15	17.5	20	25	K	$R \times 10^{-6}$
			Page Number and Location of Computer Data										
2.5	16	0.2	-	-	-	131L	131R	132L	-	-	-	0.12	2.6
		0.4	-	-	-	132R	133L	133R	-	-	-	0.06	4.8
		0.6	-	-	-	134L	134R	135	-	-	-	0.04	6.2
	32	0.2	-	-	-	136L	136R	137L	-	-	-	0.24	2.6
		0.4	-	-	-	137R	138L	138R	-	-	-	0.12	4.8
		0.6	-	-	-	139L	139R	140	-	-	-	0.08	6.2
	48	0.4	-	-	-	141L	141R	142L	-	-	-	0.18	4.8
		0.6	-	-	-	142R	143L	143R	-	-	-	0.12	6.2
	64	0.4	-	-	-	144L	144R	145L	-	-	-	0.24	4.8
		0.6	-	-	-	145R	146L	146R	-	-	-	0.16	6.2
	80	0.4	-	-	-	147L	147R	148L	-	-	-	0.30	4.8
		0.6	-	-	-	148R	149L	149R	-	-	-	0.20	6.2
	96	0.2	-	-	-	150L	150R	151L	-	-	-	0.72	2.6
		0.4	-	-	-	151R	152L	152R	-	-	-	0.36	4.8
		0.6	-	-	-	153L	153R	154	-	-	-	0.24	6.2
5	16	0.2	155L	-	155R	156L	156R	157L	157R	158L	-	0.12	2.6
		0.4	158R	-	159L	159R	160L	160R	161L	-	161R	0.06	4.8
		0.6	162L	-	162R	163L	163R	164L	164R	-	165	0.04	6.2
	32	0.2	166L	-	166R	167L	167R	168L	168R	-	169L	0.24	2.6
		0.4	169R	-	170L	170R	171L	171R	172L	-	172R	0.12	4.8
		0.6	173L	-	173R	174L	174R	175L	175R	-	176	0.08	6.2
	48	0.4	177L	-	177R	178L	178R	179L	179R	-	180L	0.18	4.8
		0.6	180R	-	181L	181R	182L	182R	183L	-	183R	0.12	6.2
	64	0.4	184L	-	184R	185L	185R	186L	186R	-	187L	0.24	4.8
		0.6	187R	-	188L	188R	189L	189R	190L	-	190R	0.16	6.2

TABLE IV - Continued

$\Delta\alpha$ (deg)	f (Hz)	Mach No.	α_o (degrees) 0	5	7.5	10	12.5	15	17.5	20	25	K	R x 10^{-6}
			Page Number and Location of Computer Data										
5	80	0.4	191L	-	191R	192L	192R	193L	193R	-	194L	0.30	4.8
		0.6	194R	-	195L	195R	196L	196R	197L	-	197R	0.20	6.2
	96	0.2	198L	-	198R	199L	199R	200L	200R	-	201L	0.72	2.6
		0.4	201R	-	202L	202R	203L	203R	204L	-	204R	0.36	4.8
		0.6	205L	-	205R	206L	206R	207L	207R	-	208	0.24	6.2
7.5	16	0.2	-	209L	209R	210L	210R	-	-	-	-	0.12	2.6
		0.4	-	211L	211R	212L	-	-	-	-	-	0.06	4.8
		0.6	-	212R	-	213L	213R	-	-	-	-	0.04	6.2
	32	0.2	-	214L	214R	215L	215R	-	-	-	-	2.24	2.6
		0.4	-	216L	216R	217L	217R	-	-	-	-	0.12	4.8
		0.6	-	218L	218R	219L	219R	-	-	-	-	0.08	6.2

TABLE V. FORCED PITCH OSCILLATION FOR THE VERTOL 23010-1.58 AIRFOIL AT REDUCED REYNOLDS NUMBER

$\Delta\alpha$ (deg)	f (Hz)	Mach No.	α_o (degrees) 0	5	7.5	10	12.5	15	17.5	20	25	K	R $\times 10^{-6}$
			Page Number and Location of Computer Data										
2.5	16	0.2	-	-	-	220L	220R	221L	-	-	-	0.12	1.6
		0.4	-	-	-	221R	222L	222R	-	-	-	0.06	2.4
		0.6	-	-	-	223L	223R	224	-	-	-	0.04	3.1
	96	0.2	-	-	-	225L	225R	226L	-	-	-	0.72	1.6
		0.4	-	-	-	226R	227L	227R	-	-	-	0.36	2.4
		0.6	-	-	-	228L	228R	229	-	-	-	0.24	3.1
5	16	0.2	230L	-	230R	231L	231R	232L	232R	-	233L	0.12	1.6
		0.4	233R	-	234L	234R	235L	235R	236L	-	236R	0.06	2.4
		0.6	237L	-	237R	238L	238R	239L	239R	-	240	0.04	3.1
	96	0.2	-	241L	241R	242L	242R	243L	243R	244L	244R	0.72	1.6
		0.4	-	-	245L	245R	246L	246R	-	-	-	0.36	2.4
		0.6	-	247L	247R	248L	248R	249L	249R	-	250	0.24	3.1

TABLE VI. FORCED PITCH OSCILLATION FOR THE VERTOL 23010-1.58 AIRFOIL (REFLEX TRAILING EDGE)

$\Delta\alpha$ (deg)	f (Hz)	Mach No.	α_o (degrees) 0	5	7.5	10	12.5	15	17.5	20	25	K	$R \times 10^{-6}$
			Page Number and Location of Computer Data										
2.5	96	0.4	-	-	-	251L	251R	252	-	-	-	0.36	4.8
5	16		253L	253R	254L	254R	255L	255R	256L	-	256R	0.06	4.8
	96		257L	257R	258L	258R	259L	259R	260L	-	260R	0.36	4.8

TABLE VII. FORCED VERTICAL TRANSLATION FOR THE NACA 0012 (MODIFIED) AIRFOIL

Δh	f (Hz)	Mach No.	α_o (degrees) 0	2.5	5	7.5	10	12.5	15	17.5	20	K	$R \times 10^{-6}$
			Page Number and Location of Computer Data										
0.31	16	0.2	-	-	-	-	261L	261R	262L	-	-	0.12	2.6
		0.4	-	-	-	-	262R	263L	263R	-	-	0.06	4.8
		0.6	-	-	-	-	264L	264R	265	-	-	0.04	6.2
	32	0.2	-	-	-	-	266L	266R	267L	-	-	0.24	2.6
		0.4	-	-	-	-	267R	268L	268R	-	-	0.12	4.8
		0.6	-	-	-	-	269L	269R	270	-	-	0.08	6.2
0.47	32	0.2	271L	-	-	271R	272L	272R	-	-	-	0.24	2.6
		0.4	273L	-	-	273R	274L	274R	-	-	275L	0.12	4.8
		0.6	275R	-	276L	276R	-	-	-	-	277	0.08	6.2
0.62	16	0.2	278L	-	-	-	278R	279L	-	-	279R	0.12	2.6
		0.4	280L	-	-	-	280R	281L	-	-	281R	0.06	4.8
		0.6	282L	-	282R	283L	-	-	-	-	283R	0.04	6.2

TABLE VIII. FORCED VERTICAL TRANSLATION FOR THE VERTOL 23010-1.58 AIRFOIL

Δh	f (Hz)	Mach No.	α_o (degrees) 0	2.5	5	7.5	10	12.5	15	17.5	20	K	$R_x 10^{-6}$
			Page Number and Location of Computer Data										
0.31	16	0.2	-	-	284L	-	284R	285L	285R	-	-	0.12	2.6
		0.4	-	-	286L	-	286R	287L	287R	-	-	0.06	4.8
		0.6	-	-	288L	-	288R	289L	289R	-	-	0.04	6.2
	32	0.2	-	-	290L	-	290R	291L	291R	-	-	0.24	2.6
		0.4	-	-	292L	-	292R	293L	293R	-	-	0.12	4.8
		0.6	-	-	294L	-	294R	295L	295R	-	-	0.08	6.2
0.47	32	0.2	296L	-	-	296R	297L	297R	-	-	-	0.24	2.6
		0.4	298L	-	298R	299L	299R	300L	300R	-	301L	0.12	4.8
		0.6	-	301R	-	302L	302R	303L	303R	-	304	0.08	6.2
0.62	16	0.2	305L	-	-	-	305R	306L	-	-	306R	0.12	2.6
		0.4	307L	-	-	-	307R	308L	-	-	308R	0.06	4.8
		0.6	309L	-	-	-	309R	310L	-	-	310R	0.04	6.2

TABLE IX. TUNED PITCH OSCILLATION FOR THE VERTOL 23010-1.58 AIRFOIL AT f_{DRIVE} = 16 HERTZ

$\Delta\alpha$ (deg)	f_T (Hz)	Mach No.	ζ	α_o (degrees) 0	7.5	10	12.5	15	17.5	20	22.5	25	K	R X 10^{-6}
				Page Number and Location of Computer Data										
5	64	0.4	max	-	-	311	314	317	-	-	-	-	0.06	4.8
			int	-	-	312	315	318	-	-	-	-	-	-
			min	-	-	313	316	319	-	-	-	-	-	-
		0.6	max	-	-	320	-	-	-	-	-	-	0.04	6.2
			int	-	-	321	-	-	-	-	-	-	-	-
			min	-	-	322	-	-	-	-	-	-	-	-
	80	0.4	max	-	324	-	328	331	334	-	-	337	0.06	4.8
			int	-	325	-	329	332	335	-	-	-	-	-
			min	323	326	327	330	333	336	-	-	338	-	-
		0.6	max	339	341	344	347	350	353	-	-	356	0.04	6.2
			int	-	342	345	348	351	354	-	-	357	-	-
			min	340	343	346	349	352	355	-	-	358	-	-
	96	0.4	max	-	360	363	366	369	372	-	-	375	0.06	4.8
			int	-	361	364	367	370	373	-	-	376	-	-
			min	359	362	365	368	371	374	-	-	377	-	-
		0.6	max	378	381	384	387	-	-	-	-	-	0.04	6.2
			int	379	382	385	388	-	-	-	-	-	-	-
			min	380	383	386	389	390	391	-	-	392	-	-

Table IX - Continued

$\Delta\alpha$ (deg)	f_T (Hz)	Mach No.	ζ	α_o (degrees) 0	7.5	10	12.5	15	17.5	20	22.5	25	K	$R \times 10^{-6}$
				Page Number and Location of Computer Data										
7.5	80	0.4	max	393	396	399	402	405	-	-	-	-	0.06	4.8
			int	394	397	400	403	406	-	-	-	-	-	-
			min	395	398	401	404	407	-	-	-	-	-	-
		0.6	max	408	411	-	-	414	-	-	-	-	0.04	6.2
			int	409	412	-	-	415	-	-	-	-	-	-
			min	410	413	-	-	416	-	-	-	-	-	-
	96	0.4	max	417	420	423	426	429	-	-	-	-	0.06	4.8
			int	418	421	424	427	430	-	-	-	-	-	-
			min	419	422	425	428	431	-	-	-	-	-	-
		0.6	max	432	435	438	441	444	-	-	-	-	0.04	6.2
			int	433	436	439	442	445	-	-	-	-	-	-
			min	434	437	440	443	446	-	-	-	-	-	-

Notes:
1. Max indicates maximum external damping.
2. Int indicates intermediate external damping.
3. Min indicates minimum external damping.

TABLE X. TUNED PITCH OSCILLATION FOR THE VERTOL 23010-1.58 AIRFOIL AT f_{DRIVE} = 16 HERTZ AND REDUCED REYNOLDS NUMBER

$\Delta\alpha$ (deg)	f_T (Hz)	Mach No.	ζ	α_o (degrees) 0	7.5	10	12.5	15	17.5	20	22.5	25	K	R X 10^{-6}
				Page Number and Location of Computer Data										
5	64	0.4	max	-	-	447	-	-	-	-	-	-	0.06	4.8
			int	-	-	448	-	-	-	-	-	-	-	-
			min	-	-	449	-	-	-	-	-	-	-	-
		0.6	max	-	450	-	-	-	-	-	-	-	0.04	6.2
			int	-	451	-	-	-	-	-	-	-	-	-
			min	-	452	-	-	-	-	-	-	-	-	-
	80	0.4	min	-	-	-	453	-	-	-	-	-	0.06	4.8
		0.6	max	-	-	454	-	-	-	-	-	-	0.04	6.2
			int	-	-	455	-	-	-	-	-	-	-	-
			min	-	-	456	-	-	-	-	-	-	-	-
	96	0.4	min	457	-	-	458	459	460	461	-	462	0.06	4.8
		0.6	min	-	-	-	463	-	-	-	-	-	0.04	6.2
7.5	80	0.4	max	-	-	-	464	-	-	-	-	-	0.06	4.8
			int	-	-	-	465	-	-	-	-	-	-	-
			min	-	-	-	466	-	-	-	-	-	-	-
		0.6	max	-	467	-	-	-	-	-	-	-	0.04	6.2
			int	-	468	-	-	-	-	-	-	-	-	-
			min	-	469	-	-	-	-	-	-	-	-	-
	97	0.4	max	-	-	-	470	-	-	-	-	-	0.06	4.8
			int	-	-	-	471	-	-	-	-	-	-	-
			min	-	-		472	-	-	-	-	-	-	-
		0.6	max	-	-	473	-	-	-	-	-	-	0.04	6.2
			int	-	-	474	-	-	-	-	-	-	-	-
			min	-	-	475	-	-	-	-	-	-	-	-

STEADY FORCES AND MOMENTS — NACA 0012 AIRFOIL (MODIFIED)

MACH NO 0.200 — RN 0.26E 07 — V 220.0 — Q 198.4

DATA TYPE	X/C	TEST POINT 3130.1	3130.2	3130.3	3130.4	3131.1	3131.2	3131.3	3131.4	3132.1	3132.2	3132.3	3132.4
ALPHA.0		-3.06	-0.22	2.86	5.78	8.84	11.90	12.90	13.90	15.00	15.90	17.90	20.90
CN		-0.334	0.001	0.297	0.628	0.904	1.183	1.238	0.972	0.873	0.823	0.991	0.901
CM		0.007	-0.012	-0.010	-0.023	0.009	-0.001	-0.007	-0.150	-0.100	-0.095	-0.153	-0.132
DCP 1	.010	-2.402	-0.694	1.113	2.818	4.795	6.267	6.691	3.885	3.579	3.441	2.687	1.328
DCP 2	.050	-0.837	0.244	1.348	2.386	3.630	4.582	4.855	2.266	2.442	2.107	2.236	2.175
DCP 3	.100	-0.765	-0.040	0.732	1.441	2.115	2.693	2.843	1.187	1.385	1.076	1.198	1.095
DCP 4	.150	-0.628	-0.061	0.224	0.664	1.370	1.677	1.746	0.884	1.020	0.954	0.970	0.988
DCP 5	.200	-0.344	-0.044	0.411	0.844	1.413	1.715	1.749	0.866	1.162	0.910	1.033	1.032
DCP 6	.250	-0.372	-0.013	0.311	0.671	1.168	1.426	1.477	1.030	1.114	0.996	1.036	1.032
DCP 7	.300	-0.357	-0.092	0.306	0.571	1.046	1.284	1.252	0.937	1.216	0.987	1.092	1.102
DCP 8	.400	-0.277	-0.041	0.175	0.424	0.828	0.990	1.021	1.021	1.080	1.004	1.054	1.048
DCP 9	.500	-0.135	0.086	0.303	0.521	0.692	0.886	0.911	1.027	0.930	0.903	1.010	0.968
DCP 10	.695	-0.131	0.001	0.099	0.177	0.213	0.293	0.312	0.660	0.607	0.614	0.772	0.618
DCP 11	.800	-0.117	-0.007	0.076	0.199	0.164	0.278	0.280	0.634	0.511	0.538	0.582	0.532
DCP 12	.878	-0.125	0.017	0.111	0.222	0.129	0.249	0.290	0.660	0.377	0.398	0.498	0.545
DCP 13	.953	0.025	0.086	0.154	0.197	0.201	0.289	0.325	0.557	0.477	0.486	0.590	0.605

STEADY FORCES AND MOMENTS — NACA 0012 AIRFOIL (MODIFIED)

MACH NO 0.400 — RN 0.47E 07 — V 436.0 — Q 725.8

DATA TYPE	X/C	TEST POINT 3150.1	3150.2	3150.3	3150.4	3151.1	3151.3	3151.4	3152.1	3152.2	3152.3	3152.4
ALPHA.0		-0.17	1.74	3.65	5.55	7.56	9.48	11.37	13.35	15.15	19.08	23.94
CN		-0.037	0.196	0.414	0.657	0.891	1.081	0.957	0.853	0.812	0.951	1.057
CM		-0.014	-0.018	-0.013	-0.016	-0.001	-0.002	-0.096	-0.126	-0.127	-0.152	-0.182
DCP 1	.010	-0.489	0.779	2.039	3.430	5.209	6.575	5.335	3.645	2.917	1.786	1.662
DCP 2	.050	0.034	0.788	1.547	2.341	3.101	3.674	2.546	1.543	1.575	1.687	1.883
DCP 3	.10	-0.090	0.484	1.017	1.578	2.140	2.575	1.903	1.154	1.234	1.750	1.580
DCP 4	.150	-0.150	0.226	0.632	1.020	1.473	1.782	1.428	1.017	0.966	1.096	1.339
DCP 5	.200	-0.055	0.281	0.636	0.978	1.333	1.589	1.338	0.913	0.956	1.269	1.305
DCP 6	.250	-0.086	0.206	0.501	0.787	1.108	1.327	1.230	0.937	0.872	1.013	1.239
DCP 7	.300	-0.219	0.056	0.320	0.569	0.884	1.066	1.003	0.736	0.736	0.884	1.054
DCP 8	.400	-0.192	-0.011	0.187	0.379	0.598	0.748	0.764	0.707	0.597	0.717	0.900
DCP 9	.500	-0.021	0.133	0.291	0.448	0.567	0.686	0.813	0.803	0.790	0.890	1.006
DCP 10	.695	0.192	0.276	0.355	0.436	0.464	0.518	0.698	0.847	0.883	0.902	0.958
DCP 11	.800	-0.024	0.041	0.104	0.174	0.189	0.242	0.456	0.660	0.652	0.653	0.767
DCP 12	.878	0.035	0.075	0.117	0.156	0.100	0.172	0.382	0.558	0.571	0.587	0.686
DCP 13	.953	0.083	0.106	0.141	0.167	0.186	0.247	0.439	0.578	0.651	0.728	0.755

STEADY FORCES AND MOMENTS — NACA 0012 AIRFOIL (MODIFIED)

MACH NO	RN	V	Q
0.600	0.62E 07	638.0	1415.7

DATA TYPE	X/C	TEST POINT 3153.1	3153.2	3153.3	3153.4	3154.1	3154.2	3154.3	3154.4	3155.1	3155.2	3155.3
ALPHA.0		-0.26	1.65	3.54	4.51	5.60	7.44	9.34	11.26	14.96	18.12	18.86
CN		-0.034	0.256	0.536	0.679	0.768	0.889	0.921	0.939	1.071	1.025	1.042
CM		-0.001	0.000	-0.001	0.006	0.008	-0.013	-0.053	-0.058	-0.123	-0.127	-0.134
DCP 1	.010	-0.201	1.049	2.228	2.618	2.932	3.260	3.328	3.522	3.325	3.234	3.158
DCP 2	.050	-0.024	0.891	1.868	2.468	2.889	3.223	3.083	2.689	2.534	2.397	2.316
DCP 3	.100	-0.073	0.830	1.585	2.850	2.708	2.174	2.172	2.211	2.051	1.895	1.891
DCP 4	.150	-0.078	0.571	1.074	1.063	1.648	1.802	1.548	1.703	1.577	1.625	1.619
DCP 5	.200	-0.037	0.368	0.785	0.920	1.119	1.542	1.405	1.363	1.165	1.419	1.399
DCP 6	.250	-0.043	0.312	0.655	0.755	0.845	1.215	1.149	1.154	1.234	1.114	1.116
DCP 7	.300	-0.119	0.203	0.514	0.634	0.707	1.063	0.997	0.968	0.978	1.137	1.121
DCP 8	.400	-0.046	0.184	0.476	0.476	0.474	0.549	0.611	0.569	0.852	0.811	0.766
DCP 9	.500	-0.037	0.147	0.320	0.393	0.448	0.558	0.614	0.640	1.000	0.888	0.878
DCP 10	.695	0.049	0.145	0.242	0.274	0.322	0.360	0.476	0.533	0.825	0.796	0.810
DCP 11	.800	-0.037	0.037	0.100	0.137	0.156	0.222	0.390	0.437	0.591	0.713	0.734
DCP 12	.878	-0.032	0.024	0.079	0.105	0.092	0.191	0.352	0.410	0.546	0.698	0.715
DCP 13	.953	0.024	0.061	0.110	0.146	0.145	0.281	0.386	0.466	0.647	0.706	0.723

STEADY FORCES AND MOMENTS — VERTOL 23010-1.58 AIRFOIL

MACH NO 0.200 — RN 0.26E 07 — V 219.6 — Q 200.9

DATA TYPE	X/C	TEST POINT 4010.1	4010.2	4010.3	4010.4	4011.1	4011.2	4011.3	4011.4	4012.1	4012.2
ALPHA.0		-0.15	2.79	5.72	8.60	11.58	14.48	17.43	20.40	23.30	26.20
CN		-0.108	0.188	0.468	0.805	1.148	1.316	0.879	0.899	1.011	1.139
CM		0.002	0.014	0.022	0.009	-0.002	0.024	-0.074	-0.075	-0.120	-0.153
DCP 1	.010	-2.345	-0.303	1.541	3.281	4.923	6.567	4.091	4.249	3.621	3.341
DCP 2	.025	-0.921	0.450	1.897	3.365	4.678	5.874	3.588	3.600	3.514	3.241
DCP 3	.050	-0.118	1.010	2.167	3.297	4.374	5.347	3.327	2.976	2.325	2.158
DCP 4	.100	-0.040	0.639	1.429	2.040	2.742	3.329	1.302	1.075	1.376	1.563
DCP 5	.150	-0.079	0.518	0.851	1.384	2.095	2.484	1.000	1.190	1.273	1.485
DCP 6	.200	-0.001	0.462	0.750	1.221	1.788	2.010	0.929	1.093	1.251	1.442
DCP 7	.250	-0.051	0.343	0.732	1.104	1.512	1.773	0.894	1.002	1.192	1.416
DCP 8	.300	-0.142	0.279	0.612	0.983	1.275	1.514	0.816	0.954	1.055	1.319
DCP 9	.400	-0.060	0.231	0.502	0.738	1.028	1.188	0.765	0.838	1.014	1.268
DCP 10	.501	-0.130	0.047	0.253	0.448	0.668	0.766	0.581	0.663	0.827	1.017
DCP 11	.600	-0.087	0.026	0.172	0.383	0.509	0.545	0.558	0.583	0.805	0.974
DCP 12	.831	0.061	0.071	0.107	0.146	0.355	0.319	0.589	0.606	0.836	0.898
DCP 13	.878	-0.082	-0.031	0.016	0.076	0.106	0.113	0.431	0.426	0.532	0.613
DCP 14	.950	-0.203	-0.180	-0.122	-0.045	0.050	0.064	0.351	0.380	0.443	0.499

STEADY FORCES AND MOMENTS — VERTOL 23010-1.58 AIRFOIL

MACH NO 0.400 — RN 0.48E 07 — V 429.5 — Q 733.6

DATA TYPE	X/C	TEST POINT 4009.1	4009.2	4009.3	4009.4	4005.1	4005.2	4005.3	4005.4	4013.1	4013.2	4013.3	4013.4
ALPHA.0		-0.00	1.95	3.92	5.81	7.97	9.91	11.91	13.83	15.82	17.77	19.75	24.63
CN		-0.088	0.150	0.369	0.624	0.855	1.098	1.304	1.211	0.964	0.887	0.910	1.018
CM		-0.005	-0.005	0.002	-0.001	0.002	0.006	0.012	0.009	-0.093	-0.086	-0.088	-0.131
DCP 1	.010	-2.385	-0.789	0.610	1.941	3.133	4.492	6.354	6.284	4.414	4.322	4.535	4.165
DCP 2	.025	-1.156	-0.179	0.962	2.070	3.299	4.533	6.107	6.142	3.778	3.578	3.563	3.199
DCP 3	.050	-0.267	0.600	1.442	2.351	3.363	4.383	4.887	5.018	3.247	2.921	2.709	2.052
DCP 4	.100	-0.009	0.552	1.126	1.690	2.328	2.875	3.355	3.157	1.642	1.299	1.288	1.467
DCP 5	.150	0.008	0.433	0.870	1.282	1.623	2.036	2.381	2.161	1.054	1.003	1.069	1.269
DCP 6	.200	0.075	0.263	0.609	0.964	1.220	1.575	1.861	1.678	0.915	0.898	0.944	1.158
DCP 7	.250	-0.047	0.260	0.573	0.882	1.090	1.373	1.617	1.455	0.912	0.875	0.935	1.149
DCP 8	.300	-0.051	0.206	0.479	0.735	1.036	1.286	1.497	1.353	0.985	0.898	0.913	1.113
DCP 9	.400	-0.056	0.157	0.359	0.560	0.734	0.920	1.073	0.985	0.857	0.798	0.841	1.036
DCP 10	.501	-0.105	0.049	0.203	0.356	0.466	0.607	0.726	0.678	0.716	0.644	0.625	0.799
DCP 11	.600	-0.043	0.074	0.193	0.326	0.408	0.524	0.603	0.632	0.746	0.634	0.652	0.793
DCP 12	.831	-0.010	0.038	0.046	0.137	0.227	0.259	0.296	0.407	0.692	0.658	0.632	0.719
DCP 13	.878	0.020	0.061	0.104	0.151	0.147	0.188	0.227	0.342	0.561	0.527	0.546	0.626
DCP 14	.950	-0.138	-0.104	-0.049	-0.004	0.013	0.063	0.118	0.266	0.444	0.470	0.469	0.536

STEADY FORCES AND MOMENTS VERTOL 23010-1.58 AIRFOIL

MACH NO	RN	V	Q
0.600	0.63E 07	628.2	1436.4

DATA TYPE	X/C	TEST POINT 4008.1	4008.2	4008.3	4008.4	4007.1	4007.2	4007.3	4007.4	4014.1	4014.2	4014.3	4014.4
ALPHA.0		0.18	2.13	4.05	6.00	7.98	9.96	11.93	13.83	15.72	17.60	19.54	24.36
CN		-0.070	0.226	0.507	0.761	0.909	0.935	0.997	1.031	1.058	1.099	1.032	1.048
CM		-0.011	-0.008	-0.006	0.000	-0.005	-0.026	-0.066	-0.082	-0.086	-0.134	-0.146	-0.159
DCP 1	.010	-2.948	-0.859	0.501	1.470	2.063	2.439	2.847	3.152	3.361	3.349	3.112	2.408
DCP 2	.025	-1.360	-0.168	0.990	1.821	2.304	2.581	2.940	3.265	3.295	3.124	2.723	2.559
DCP 3	.050	-0.369	0.650	1.650	2.464	2.913	3.118	3.019	2.877	2.949	2.535	2.374	2.260
DCP 4	.100	0.185	0.921	1.855	2.432	2.815	2.792	2.425	2.179	1.984	1.887	1.698	1.672
DCP 5	.150	0.157	0.708	1.101			1.924	1.597	1.495	1.505	1.512	1.408	1.414
DCP 6	.200	0.026	0.475	0.858	1.644	1.655	1.419	1.309	1.305	1.255	1.308	1.188	1.310
DCP 7	.250	0.020	0.401	0.748	1.077	1.473	1.358	1.197	1.227	1.253	1.256	1.169	1.259
DCP 8	.300	0.005	0.332	0.630	0.765	1.246	1.240	1.240	1.285	1.232	1.259	1.197	1.261
DCP 9	.400	-0.017	0.226	0.451	0.586	0.733	0.821	0.973	1.003	1.011	1.075	1.023	1.095
DCP10	.501	-0.052	0.126	0.256	0.399	0.401	0.516	0.635	0.704	0.757	0.767	0.820	0.892
DCP11	.600	-0.026	0.117	0.253	0.342	0.372	0.490	0.637	0.659	0.729	0.779	0.814	0.882
DCP12	.831	0.031	0.077	0.128	0.172	0.233	0.349	0.482	0.562	0.616	0.646	0.755	0.792
DCP13	.878	0.015	0.066	0.113	0.152	0.204	0.316	0.424	0.556	0.582	0.619	0.712	0.721
DCP14	.950	-0.097	-0.042	0.014	0.051	0.141	0.259	0.334	0.403	0.452	0.498	0.589	0.676

STEADY FORCES AND MOMENTS VERTOL 23010-1.58 AIRFOIL (REFLEX TE)

MACH NO 0.400 RN 0.48E 07 V 429.4 Q 731.3

DATA TYPE	X/C	TEST POINT 4042.1	4042.2	4042.3	4042.4	4045.1	4045.2	4045.3	5008.1	5008.2	5008.3	5008.4
ALPHA.0		-0.11	1.83	3.79	5.75	7.79	9.73	11.73	13.79	14.69	17.62	24.42
CN		-0.126	0.108	0.326	0.576	0.850	1.053	1.290	1.303	1.323	0.959	1.012
CM		-0.003	-0.001	0.000	-0.002	-0.003	0.007	0.016	0.002	-0.031	-0.109	-0.136
DCP 1	.010	-2.465	-0.917	0.465	1.755	3.038	4.350	6.281	6.398	6.278	4.516	3.464
DCP 2	.025	-1.176	-0.199	0.929	2.049	3.242	4.479	5.878	6.188	5.937	3.351	2.954
DCP 3	.050	-0.272	0.403	0.967	1.813	2.868	3.596	5.078	4.835	4.718	3.346	1.980
DCP 4	.100	0.035	0.625	1.215	1.781	2.323	2.845	3.308	3.372	2.936	1.246	1.495
DCP 5	.150	-0.113	0.309	0.742	1.173	1.663	2.044	2.404	2.303	2.042	1.076	1.291
DCP 6	.200	-0.232	0.118	0.476	0.834	1.329	1.663	1.956	1.874	1.625	0.917	1.168
DCP 7	.250	-0.121	0.189	0.502	0.803	1.155	1.414	1.656	1.678	1.538	0.991	1.223
DCP 8	.300	-0.064	0.208	0.487	0.730	0.961	1.200	1.413	1.415	1.309	0.933	1.128
DCP 9	.400	-0.064	0.146	0.347	0.547	0.745	0.924	1.086	0.845	0.856	0.763	0.894
DCP 10	.501	-0.154	0.003	0.157	0.313	0.539	0.655	0.759	0.595	0.640	0.717	0.788
DCP 11	.600	-0.068	0.051	0.173	0.289	0.398	0.496	0.584	0.477	0.566	0.698	0.702
DCP 12	.831	0.021	0.062	0.113	0.170	0.228	0.257	0.288	0.358	0.470	0.656	0.714
DCP 13	.878	-0.041	0.002	0.044	0.086	0.099	0.134	0.160	0.251	0.324	0.594	0.635
DCP 14	.950	-0.164	-0.118	-0.070	-0.026	0.004	0.032	0.080	0.159	0.265	0.453	0.470

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.78	0.200	9.93	2.50		3133.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.127	220.5	200.9	0.26E 07	-0.00178	1.170	12.42

HARMONIC ANALYSIS

CATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.971	0.193	352	0.006	190	0.002	243	0.006	197	0.001	232	0.005	151	0.010	112	0.006	215	0.002	282
CM		-0.001	0.009	279	0.000	263	0.001	171	0.001	4	0.001	145	0.001	317	0.003	297	0.001	97	0.001	114
DCP 1	.010	5.251	1.267	346	0.052	177	0.019	151	0.043	193	0.011	160	0.015	194	0.004	200	0.020	230	0.003	340
DCP 2	.050	3.725	0.629	345	0.025	163	0.011	226	0.015	201	0.007	222	0.009	204	0.015	135	0.020	195	0.008	292
DCP 3	.100	2.232	0.466	342	0.006	271	0.008	292	0.004	158	0.003	79	0.010	97	0.018	100	0.006	170	0.008	81
DCP 4	.150	1.304	0.345	350	0.015	181	0.011	145	0.018	213	0.011	234	0.008	198	0.004	206	0.012	188	0.016	197
DCP 5	.200	1.385	0.292	346	0.009	204	0.009	296	0.006	15	0.010	99	0.009	71	0.013	93	0.006	217	0.004	65
DCP 6	.250	1.192	0.250	353	0.009	202	0.011	144	0.018	211	0.007	256	0.011	196	0.005	311	0.015	195	0.007	142
DCP 7	.300	0.996	0.211	352	0.005	245	0.013	263	0.005	347	0.009	137	0.004	95	0.014	83	0.007	190	0.004	233
DCP 8	.400	0.831	0.156	356	0.011	265	0.009	173	0.015	198	0.008	231	0.010	179	0.003	104	0.014	197	0.008	193
DCP 9	.500	0.719	0.118	256	0.005	211	0.010	303	0.004	62	0.005	69	0.007	116	0.007	91	0.003	267	0.005	14
DCP 10	.695	0.516	0.075	21	0.002	2	0.003	62	0.008	169	0.004	48	0.007	179	0.014	106	0.003	257	0.007	272
DCP 11	.800	0.159	0.036	42	0.016	115	0.004	57	0.007	248	0.016	318	0.005	84	0.022	141	0.006	291	0.013	358
DCP 12	.878	0.041	0.043	24	0.003	220	0.004	314	0.014	192	0.006	211	0.006	179	0.012	118	0.006	255	0.009	222
DCP 13	.953	0.120	0.042	7	0.004	224	0.002	177	0.007	25	0.003	302	0.008	95	0.017	111	0.003	243	0.001	228

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.81	0.200	12.27	2.53		3133.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.127	220.4	199.8	0.26E 07	0.00391	1.349	14.90

HARMONIC ANALYSIS

CATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.105	0.243	16	0.042	196	0.012	10	0.004	32	0.007	60	0.002	189	0.001	238	0.002	69	0.002	41
CM		-0.018	0.018	96	0.018	285	0.007	101	0.002	269	0.003	232	0.000	79	0.001	25	0.001	275	0.001	211
DCP 1	.010	5.748	1.453	35	0.485	297	0.257	163	0.142	24	0.070	284	0.064	149	0.040	30	0.017	273	0.030	59
DCP 2	.050	4.022	0.771	36	0.306	273	0.160	121	0.088	316	0.031	146	0.011	175	0.007	54	0.022	225	0.015	4
DCP 3	.100	2.484	0.590	26	0.168	241	0.095	59	0.030	253	0.017	71	0.003	262	0.016	245	0.009	20	0.016	192
DCP 4	.150	1.485	0.498	16	0.165	216	0.092	39	0.040	226	0.007	20	0.019	89	0.017	282	0.012	171	0.009	224
DCP 5	.200	1.489	0.366	18	0.099	197	0.074	5	0.029	162	0.015	35	0.015	265	0.006	136	0.002	13	0.010	138
DCP 6	.250	1.351	0.373	8	0.139	185	0.077	3	0.034	180	0.005	26	0.006	90	0.011	258	0.010	87	0.016	297
DCP 7	.300	1.118	0.279	14	0.079	171	0.058	350	0.021	122	0.006	70	0.009	286	0.015	112	0.004	330	0.002	268
DCP 8	.400	0.953	0.238	3	0.100	160	0.055	326	0.015	94	0.016	172	0.009	359	0.006	199	0.011	62	0.007	279
DCP 9	.500	0.838	0.164	3	0.070	129	0.037	293	0.018	71	0.010	55	0.012	227	0.003	313	0.005	351	0.008	179
DCP 10	.695	0.576	0.081	353	0.050	105	0.025	249	0.017	349	0.007	109	0.005	341	0.007	242	0.008	310	0.010	68
DCP 11	.800	0.269	0.069	320	0.050	106	0.011	230	0.008	126	0.036	27	0.008	163	0.008	118	0.015	79	0.013	21
DCP 12	.878	0.162	0.056	313	0.035	95	0.009	203	0.001	100	0.008	75	0.002	33	0.008	326	0.015	136	0.010	344
DCP 13	.953	0.222	0.048	315	0.015	64	0.003	173	0.005	59	0.016	49	0.009	151	0.006	176	0.009	170	0.008	94

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.84	0.200	14.65	2.49		3133.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.128	219.9	200.1	0.26E 07	0.00721	1.612	17.10

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.135	0.336	55	0.110	315	0.071	203	0.035	103	0.026	3	0.020	288	0.013	181	0.006	66	0.009	67
CM		-0.060	0.066	149	0.038	62	0.026	335	0.014	254	0.013	171	0.008	99	0.005	357	0.002	276	0.002	223
CCP 1	.010	4.990	2.212	115	1.078	58	0.523	6	0.402	316	0.320	258	0.249	197	0.184	144	0.124	89	0.077	41
CCP 2	.050	3.741	1.160	102	0.498	18	0.146	295	0.070	278	0.074	220	0.048	157	0.052	111	0.036	20	0.022	123
CCP 3	.100	2.397	0.861	80	0.343	349	0.164	257	0.107	181	0.054	116	0.036	51	0.033	353	0.033	309	0.028	233
CCP 4	.150	1.401	0.762	68	0.254	334	0.156	260	0.105	184	0.068	128	0.052	51	0.030	11	0.033	312	0.022	233
CCP 5	.200	1.440	0.591	61	0.215	315	0.142	231	0.095	139	0.051	61	0.043	346	0.026	261	0.014	233	0.014	112
CCP 6	.250	1.330	0.589	53	0.201	316	0.173	233	0.099	154	0.068	93	0.043	14	0.040	335	0.029	252	0.019	152
CCP 7	.300	1.147	0.479	46	0.180	295	0.146	211	0.094	108	0.055	38	0.043	333	0.027	252	0.019	172	0.019	87
CCP 8	.400	1.030	0.410	34	0.166	295	0.152	202	0.092	125	0.073	54	0.062	330	0.048	272	0.043	181	0.030	89
CCP 9	.500	0.934	0.329	19	0.117	267	0.129	180	0.071	81	0.059	5	0.045	285	0.035	192	0.020	99	0.013	22
CCP10	.695	0.660	0.239	354	0.118	252	0.108	153	0.064	56	0.058	336	0.037	260	0.034	136	0.029	49	0.015	61
CCP11	.800	0.422	0.165	347	0.123	260	0.084	148	0.035	79	0.058	333	0.029	257	0.019	200	0.002	113	0.029	31
CCP12	.878	0.341	0.146	336	0.110	246	0.061	136	0.042	63	0.042	348	0.024	246	0.036	140	0.028	26	0.001	214
CCP13	.953	0.373	0.128	320	0.064	243	0.042	130	0.027	17	0.033	283	0.014	241	0.001	163	0.013	326	0.009	232

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.50	0.400	9.94	2.49		3135.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.064	431.8	728.7	0.47E 07	0.00031	1.191	12.21

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.980	0.157	18	0.038	9	0.010	208	0.008	224	0.009	113	0.005	346	0.003	298	0.003	252	0.003	157
CM		-0.004	0.015	172	0.013	50	0.007	311	0.003	246	0.002	215	0.003	141	0.001	58	0.001	9	0.002	311
CCP 1	.010	6.131	1.105	7	0.311	30	0.017	328	0.129	272	0.027	293	0.077	247	0.033	277	0.005	297	0.048	346
CCP 2	.050	3.223	0.273	29	0.226	43	0.071	325	0.072	268	0.055	211	0.052	153	0.044	95	0.032	36	0.021	360
CCP 3	.100	2.257	0.215	46	0.217	38	0.088	292	0.054	233	0.054	171	0.042	109	0.030	43	0.016	361	0.018	238
CCP 4	.150	1.653	0.224	25	0.112	19	0.040	272	0.035	204	0.027	121	0.017	38	0.012	335	0.010	259	0.019	172
CCP 5	.200	1.393	0.199	36	0.113	10	0.061	242	0.031	188	0.035	127	0.027	37	0.016	325	0.013	250	0.016	210
CCP 6	.250	1.228	0.173	28	0.075	13	0.025	252	0.020	187	0.016	95	0.012	12	0.008	301	0.006	252	0.009	194
CCP 7	.300	0.987	0.185	26	0.061	347	0.043	208	0.020	153	0.027	91	0.022	351	0.006	288	0.012	280	0.020	182
CCP 8	.400	0.643	0.122	26	0.036	9	0.009	221	0.012	178	0.013	93	0.015	350	0.009	251	0.003	237	0.007	141
CCP 9	.500	0.660	0.140	13	0.032	264	0.033	146	0.008	69	0.015	62	0.016	320	0.007	243	0.010	131	0.012	118
CCP10	.695	0.508	0.102	2	0.038	229	0.027	122	0.010	67	0.013	26	0.010	291	0.003	276	0.006	238	0.008	136
CCP11	.800	0.228	0.076	8	0.024	243	0.017	121	0.005	338	0.006	122	0.005	355	0.007	302	0.006	188	0.004	124
CCP12	.878	0.131	0.090	355	0.027	244	0.017	145	0.007	64	0.003	52	0.007	324	0.005	193	0.002	47	0.002	275
CCP13	.953	0.210	0.105	350	0.041	228	0.018	120	0.010	20	0.008	300	0.005	243	0.006	200	0.007	117	0.002	158

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.47	0.400	12.29	2.45		3135.2	10

K	V	Q	RN	DAMPING	CY(MAX)	ALPHA(STALL)
0.064	432.0	727.7	0.47E 07	0.00525	1.221	12.48

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.988	0.183	90	0.017	43	0.009	72	0.018	69	0.010	38	0.007	327	0.002	262	0.004	122	0.003	48
CM		-0.056	0.065	158	0.007	166	0.010	103	0.007	139	0.003	149	0.005	83	0.002	106	0.001	325	0.001	170
DCP 1	.010	5.083	2.006	142	0.397	117	0.297	126	0.174	121	0.082	115	0.069	91	0.079	135	0.070	88	0.061	62
DCP 2	.050	2.690	1.027	132	0.026	48	0.157	112	0.076	130	0.051	13[illegible]	0.017	148	0.054	184	0.023	188	0.015	130
DCP 3	.100	1.982	0.666	126	0.067	182	0.119	106	0.092	118	0.039	94	0.032	95	0.025	116	0.010	126	0.020	123
DCP 4	.150	1.510	0.510	104	0.042	357	0.067	46	0.049	90	0.033	10	0.037	28	0.017	356	0.014	335	0.010	357
DCP 5	.200	1.300	0.362	103	0.036	107	0.059	72	0.076	77	0.036	21	0.026	26	0.018	30	0.010	336	0.004	97
DCP 6	.250	1.201	0.323	89	0.043	333	0.033	335	0.029	109	0.018	9	0.016	347	0.012	313	0.003	272	0.009	259
DCP 7	.300	1.005	0.262	80	0.036	63	0.049	24	0.052	45	0.024	359	0.032	11	0.026	349	0.021	317	0.008	273
DCP 8	.400	0.706	0.179	58	0.032	335	0.039	286	0.010	88	0.010	66	0.015	333	0.010	333	0.006	313	0.008	230
DCP 9	.500	0.774	0.194	29	0.036	348	0.034	302	0.028	348	0.010	325	0.017	289	0.015	280	0.014	139	0.004	19
DCP10	.695	0.653	0.190	355	0.025	337	0.034	278	0.024	325	0.010	1	0.022	261	0.010	231	0.011	113	0.005	12
DCP11	.800	0.391	0.165	341	0.015	55	0.016	281	0.019	327	0.009	359	0.022	262	0.005	170	0.010	157	0.012	57
DCP12	.878	0.303	0.154	333	0.022	44	0.013	224	0.015	325	0.007	348	0.012	212	0.004	301	0.004	152	0.005	326
DCP13	.953	0.373	0.154	340	0.020	29	0.011	215	0.010	296	0.002	280	0.006	227	0.005	289	0.003	153	0.003	11

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.45	0.400	14.61	2.50		3135.3	10

K.	V	Q	RN	DAMPING	CY(MAX)	ALPHA(STALL)
0.064	431.4	724.3	0.47E 07	-0.00431	1.028	12.97

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.970	0.129	120	0.049	217	0.003	49	0.010	105	0.010	245	0.004	310	0.002	189	0.005	131	0.001	315
CM		-0.113	0.024	234	0.006	305	0.005	327	0.001	304	0.002	53	0.002	191	0.001	11	0.001	296	0.001	149
DCP 1	.010	3.427	1.060	179	0.325	262	0.144	338	0.038	70	0.030	5	0.028	94	0.022	166	0.024	297	0.028	62
DCP 2	.050	1.742	0.268	153	0.129	240	0.038	25	0.012	133	0.018	349	0.016	98	0.009	244	0.005	341	0.009	337
DCP 3	.100	1.356	0.165	136	0.106	234	0.026	321	0.022	90	0.012	208	0.004	276	0.002	298	0.011	218	0.013	239
DCP 4	.150	1.104	0.206	119	0.102	205	0.021	353	0.022	111	0.011	217	0.019	349	0.009	13	0.005	110	0.003	197
DCP 5	.200	0.988	0.151	130	0.078	229	0.021	279	0.008	94	0.019	246	0.008	0	0.006	41	0.013	158	0.010	225
DCP 6	.250	0.981	0.192	116	0.076	203	0.015	34	0.025	109	0.016	239	0.015	314	0.014	359	0.009	196	0.004	199
DCP 7	.300	0.841	0.155	119	0.065	230	0.020	274	0.007	186	0.027	251	0.008	357	0.015	90	0.017	145	0.007	213
DCP 8	.400	0.670	0.178	121	0.066	207	0.012	4	0.020	93	0.027	218	0.011	259	0.010	336	0.003	127	0.002	334
DCP 9	.500	0.796	0.154	101	0.055	197	0.021	152	0.021	124	0.013	217	0.005	204	0.009	175	0.014	122	0.011	90
DCP10	.695	0.795	0.118	77	0.030	158	0.024	121	0.009	44	0.015	281	0.013	337	0.008	230	0.009	85	0.009	350
DCP11	.800	0.554	0.067	83	0.008	184	0.013	175	0.004	320	0.011	156	0.017	210	0.011	201	0.006	210	0.011	313
DCP12	.878	0.454	0.058	52	0.015	64	0.015	150	0.014	178	0.006	223	0.010	280	0.003	129	0.001	139	0.006	237
DCP13	.953	0.523	0.074	24	0.014	118	0.012	137	0.006	324	0.016	349	0.011	343	0.008	141	0.004	98	0.005	253

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.75	0.600	5.01	2.49		3138.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.044	639.6	1442.1	0.63E 07	-0.00115	0.858	7.50

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.602	0.263	352	0.015	124	0.017	226	0.013	187	0.004	177	0.001	238	0.003	224	0.002	260	0.004	216
CM		-0.000	0.006	287	0.002	64	0.003	315	0.002	203	0.001	109	0.000	155	0.000	66	0.000	296	0.001	222
DCP 1	.010	2.451	0.921	349	0.158	95	0.068	193	0.022	194	0.019	207	0.01[illegible]	192	0.009	213	0.007	180	0.005	196
DCP 2	.050	2.235	0.898	346	0.120	95	0.055	232	0.020	159	0.027	208	0.010	217	0.017	197	0.010	210	0.011	192
DCP 3	.100	1.783	0.841	348	0.191	74	0.272	307	0.127	202	0.030	256	0.019	127	0.033	255	0.021	298	0.065	217
DCP 4	.150	1.145	0.658	348	0.112	228	0.031	224	0.108	204	0.061	110	0.020	177	0.039	70	0.011	314	0.016	27
DCP 5	.200	0.998	0.506	351	0.100	237	0.064	167	0.041	200	0.058	114	0.031	9	0.006	352	0.023	316	0.019	229
DCP 6	.250	0.762	0.323	354	0.029	221	0.060	165	0.019	84	0.005	82	0.014	330	0.016	247	0.011	135	0.004	179
DCP 7	.300	0.587	0.287	354	0.029	222	0.058	159	0.028	53	0.014	290	0.010	269	0.012	229	0.010	157	0.002	83
DCP 8	.400	0.373	0.179	357	0.017	88	0.019	195	0.006	107	0.006	273	0.007	234	0.006	186	0.001	279	0.002	269
DCP 9	.500	0.380	0.137	0	0.018	86	0.012	204	0.003	148	0.006	241	0.005	201	0.002	169	0.001	157	0.001	348
DCP 10	.695	0.266	0.071	7	0.011	71	0.007	228	0.002	153	0.003	255	0.001	6	0.002	255	0.001	293	0.000	175
DCP 11	.800	0.138	0.061	7	0.006	121	0.006	176	0.002	4	0.003	259	0.002	340	0.004	234	0.003	110	0.004	32
DCP 12	.878	0.077	0.057	359	0.011	223	0.008	140	0.003	14	0.002	234	0.003	74	0.001	257	0.001	194	0.001	174
DCP 13	.953	0.154	0.071	353	0.022	209	0.013	122	0.005	6	0.001	240	0.002	10	0.001	322	0.001	91	0.002	114

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.05	0.600	7.43	2.41		3138.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.042	638.9	1443.3	0.63E 07	-0.00126	0.930	8.57

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.809	0.125	12	0.044	69	0.006	124	0.004	102	0.000	317	0.006	219	0.002	194	0.002	162	0.002	280
CM		-0.013	0.025	187	0.010	93	0.004	103	0.002	352	0.001	189	0.001	172	0.001	77	0.001	185	0.001	41
DCP 1	.010	3.112	0.338	356	0.103	80	0.008	132	0.012	181	0.005	305	0.004	163	0.003	184	0.002	53	0.001	79
DCP 2	.050	2.901	0.158	349	0.190	90	0.049	63	0.030	4	0.035	289	0.019	209	0.010	177	0.012	139	0.011	344
DCP 3	.100	2.292	0.235	163	0.085	83	0.167	147	0.041	234	0.052	126	0.044	225	0.027	111	0.024	183	0.0 5	8
DCP 4	.150	1.495	0.245	9	0.314	78	0.098	157	0.012	62	0.024	153	0.030	244	0.008	342	0.009	56	0.014	326
DCP 5	.200	1.295	0.256	11	0.222	78	0.023	71	0.079	70	0.037	150	0.016	213	0.020	140	0.020	229	0.012	309
DCP 6	.250	1.015	0.218	17	0.039	68	0.047	5	0.031	73	0.010	9	0.015	81	0.003	202	0.008	136	0.003	222
DCP 7	.300	0.832	0.214	14	0.076	58	0.063	350	0.022	41	0.035	315	0.007	159	0.004	249	0.007	151	0.006	174
DCP 8	.400	0.519	0.134	20	0.020	11	0.013	356	0.008	295	0.010	302	0.004	171	0.004	305	0.001	2	0.001	136
DCP 9	.500	0.523	0.116	18	0.018	338	0.011	323	0.012	265	0.008	269	0.002	212	0.007	292	0.005	226	0.003	235
DCP 10	.695	0.361	0.095	14	0.030	272	0.010	214	0.012	195	0.005	120	0.003	91	0.003	270	0.003	32	0.004	276
DCP 11	.800	0.231	0.101	8	0.030	271	0.013	220	0.018	158	0.012	43	0.010	293	0.004	197	0.003	347	0.007	221
DCP 12	.878	0.183	0.109	0	0.018	275	0.013	260	0.015	138	0.009	18	0.004	255	0.002	17[illegible]	0.006	20	0.007	290
DCP 13	.953	0.256	0.118	350	0.010	251	0.011	264	0.006	115	0.002	252	0.003	269	0.005	185	0.003	125	0.003	51

FORCED PITCHING OSCILLATION NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	15.97	0.600	9.03	2.41		3138.3	10

K	V	Q	RN	DAMPING	CY(MAX)	ALPHA(STALL)
0.042	638.1	1438.2	0.63E 07	-0.00121	0.957	10.74

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.885	0.068	35	0.008	114	0.007	184	0.006	199	0.005	166	0.002	242	0.001	188	0.003	146	0.006	331
CM		-0.028	0.031	191	0.007	249	0.002	239	0.002	258	0.001	238	0.001	177	0.001	147	0.002	195	0.002	113
DCP 1	.010	3.311	0.195	1	0.025	129	0.046	153	0.009	74	0.004	61	0.005	304	0.004	96	0.007	11	0.009	279
DCP 2	.050	2.927	0.167	168	0.067	43	0.089	232	0.057	233	0.072	234	0.075	180	0.004	45	0.038	179	0.019	47
DCP 3	.100	2.277	0.177	171	0.243	256	0.135	320	0.022	138	0.015	198	0.007	17	0.038	141	0.038	194	0.013	295
DCP 4	.150	1.703	0.077	152	0.092	234	0.034	140	0.032	251	0.012	125	0.008	291	0.009	194	0.018	127	0.004	349
DCP 5	.200	1.448	0.113	141	0.025	247	0.040	194	0.020	240	0.005	178	0.015	354	0.010	249	0.004	187	0.007	17
DCP 6	.250	1.135	0.092	40	0.059	127	0.045	172	0.034	248	0.005	106	0.017	311	0.007	176	0.010	121	0.008	7
DCP 7	.300	0.934	0.111	45	0.084	93	0.067	165	0.015	226	0.012	148	0.006	352	0.010	322	0.006	75	0.009	359
DCP 8	.400	0.555	0.105	32	0.035	92	0.013	130	0.009	139	0.011	141	0.008	354	0.004	324	0.003	93	0.010	15
DCP 9	.500	0.587	0.116	31	0.032	91	0.021	95	0.009	93	0.011	129	0.006	211	0.004	176	0.002	293	0.005	304
DCP 10	.69[illegible]	0.412	0.113	17	0.007	75	0.014	38	0.011	67	0.010	26	0.003	304	0.008	30	0.000	42	0.001	180
DCP 11	.800	0.302	0.110	12	0.024	50	0.015	324	0.007	147	0.004	55	0.001	80	0.004	299	0.011	21	0.016	310
DCP 12	.878	0.261	0.115	3	0.020	48	0.008	249	0.001	63	0.006	235	0.003	171	0.004	311	0.007	42	0.014	282
DCP 13	.953	0.346	0.111	0	0.018	49	0.009	53	0.003	82	0.003	16	0.003	83	0.006	260	0.003	12	0.002	195

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.90	0.200	9.96	2.69		3134.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.257	220.2	199.8	0.26E 07	-0.00181	1.181	12.74

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.997	0.179	6	0.006	175	0.000	184	0.001	254	0.005	313	0.001	275	0.004	172	0.001	259	0.001	326
CM		0.007	0.018	274	0.001	103	0.001	214	0.001	96	0.001	154	0.000	53	0.001	40	0.001	87	0.000	345
DCP 1	.010	4.997	1.148	345	0.051	135	0.020	157	0.024	110	0.003	104	0.003	54	0.008	40	0.014	93	0.025	296
DCP 2	.050	3.968	0.610	346	0.034	149	0.013	207	0.013	35	0.011	291	0.003	162	0.006	98	0.003	93	0.004	351
DCP 3	.100	2.195	0.432	350	0.009	215	0.011	291	0.011	272	0.007	295	0.011	9	0.010	143	0.002	251	0.005	174
DCP 4	.150	1.544	0.314	355	0.012	144	0.007	185	0.005	191	0.006	186	0.003	275	0.004	55	0.003	213	0.006	340
DCP 5	.200	1.490	0.269	358	0.010	199	0.002	244	0.001	38	0.006	325	0.004	18	0.007	161	0.001	308	0.002	337
DCP 6	.250	1.267	0.226	5	0.012	144	0.003	161	0.006	247	0.007	212	0.003	180	0.005	50	0.001	172	0.007	343
DCP 7	.300	1.196	0.199	8	0.005	227	0.002	287	0.001	228	0.010	334	0.005	281	0.009	154	0.000	306	0.003	32
DCP 8	.400	0.904	0.148	21	0.006	153	0.002	175	0.006	149	0.007	249	0.004	215	0.005	101	0.001	218	0.006	14
DCP 9	.500	0.684	0.125	25	0.005	237	0.002	44	0.002	249	0.008	335	0.003	99	0.008	182	0.002	258	0.003	164
DCP 10	.695	0.408	0.086	53	0.004	216	0.003	30	0.002	12	0.006	346	0.001	258	0.004	271	0.004	312	0.002	284
DCP 11	.800	0.190	0.071	53	0.010	277	0.004	317	0.012	269	0.006	318	0.007	263	0.012	195	0.005	212	0.006	198
DCP 12	.878	0.003	0.064	57	0.004	121	0.005	109	0.007	62	0.006	359	0.001	45	0.006	277	0.003	338	0.003	355
DCP 13	.953	0.144	0.054	32	0.002	65	0.004	30	0.006	253	0.003	262	0.002	106	0.004	207	0.005	274	0.003	138

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.78	0.200	12.30	2.69		3134.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.257	219.9	198.4	0.26E 07	-0.00092	1.337	15.07

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.147	0.195	0	0.005	159	0.003	302	0.007	211	0.004	273	0.001	1	0.003	125	0.003	139	0.001	176
CM		0.000	0.010	296	0.003	162	0.000	212	0.001	35	0.002	103	0.000	56	0.001	345	0.001	316	0.001	327
DCP 1	.010	5.943	1.311	352	0.099	202	0.037	56	0.032	220	0.026	145	0.012	300	0.011	169	0.008	131	0.038	293
DCP 2	.050	4.482	0.650	351	0.045	179	0.021	349	0.018	159	0.008	253	0.006	36	0.002	326	0.006	130	0.003	13
DCP 3	.100	2.548	0.461	351	0.021	156	0.011	277	0.007	201	0.007	246	0.012	58	0.010	115	0.006	161	0.005	186
DCP 4	.150	1.741	0.375	353	0.042	163	0.015	288	0.011	172	0.006	303	0.001	231	0.005	110	0.002	130	0.002	4
DCP 5	.200	1.652	0.298	356	0.012	103	0.011	234	0.009	255	0.009	294	0.009	55	0.007	138	0.007	130	0.004	196
DCP 6	.250	1.419	0.264	355	0.028	128	0.016	260	0.008	114	0.007	258	0.009	306	0.007	82	0.004	134	0.005	358
DCP 7	.300	1.277	0.220	1	0.013	56	0.007	179	0.013	239	0.008	291	0.004	6	0.006	103	0.003	241	0.004	195
DCP 8	.400	0.998	0.158	3	0.016	88	0.014	241	0.005	239	0.003	269	0.008	260	0.005	51	0.005	136	0.004	358
DCP 9	.500	0.814	0.121	17	0.013	348	0.006	6	0.009	247	0.009	293	0.006	99	0.004	125	0.002	190	0.004	148
DCP 10	.695	0.451	0.067	38	0.010	286	0.001	352	0.007	205	0.006	243	0.004	307	0.002	158	0.002	162	0.016	121
DCP 11	.800	0.243	0.040	24	0.010	8	0.003	11	0.007	211	0.009	282	0.003	321	0.003	172	0.009	133	0.008	171
DCP 12	.878	0.124	0.023	28	0.007	270	0.006	147	0.002	218	0.005	320	0.003	197	0.004	219	0.006	137	0.003	249
DCP 13	.953	0.220	0.036	26	0.004	221	0.011	11	0.007	153	0.007	267	0.003	126	0.004	155	0.002	296	0.006	129

FORCED PITCHING OSCILLATION NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.90	0.200	14.66	2.68		3134.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.258	219.4	198.5	0.26E 07	0.00613	1.485	16.98

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.179	0.357	355	0.092	129	0.045	296	0.019	111	0.018	282	0.017	111	0.002	280	0.006	123	0.006	3
CM		-0.057	0.058	82	0.041	263	0.022	90	0.010	285	0.007	117	0.006	293	0.002	108	0.003	339	0.002	188
DCP 1	.010	4.832	2.344	55	0.905	307	0.381	183	0.215	87	0.148	337	0.088	216	0.078	110	0.061	12	0.063	241
DCP 2	.050	3.957	1.274	36	0.322	244	0.077	88	0.052	50	0.070	248	0.044	89	0.015	31	0.015	272	0.028	115
DCP 3	.100	2.397	0.968	16	0.278	198	0.098	72	0.085	331	0.065	202	0.036	101	0.043	294	0.015	161	0.009	43
DCP 4	.150	1.675	0.875	4	0.285	190	0.107	76	0.099	328	0.054	197	0.045	92	0.031	342	0.016	189	0.020	61
DCP 5	.200	1.531	0.657	353	0.216	157	0.092	354	0.045	246	0.022	148	0.023	355	0.031	187	0.023	49	0.017	347
DCP 6	.250	1.434	0.675	347	0.258	162	0.135	38	0.085	271	0.037	154	0.048	50	0.020	266	0.026	156	0.028	17
DCP 7	.300	1.317	0.506	341	0.217	127	0.132	319	0.054	192	0.011	53	0.028	282	0.037	112	0.013	4	0.013	287
DCP 8	.400	1.136	0.464	325	0.232	130	0.147	350	0.084	193	0.028	56	0.030	325	0.028	168	0.036	60	0.016	278
DCP 9	.500	0.918	0.299	317	0.184	98	0.123	277	0.059	137	0.030	325	0.038	163	0.006	337	0.007	158	0.008	120
DCP 10	.695	0.613	0.197	289	0.168	77	0.108	260	0.064	85	0.046	296	0.038	125	0.022	353	0.017	205	0.009	0
DCP 11	.800	0.436	0.129	288	0.116	78	0.087	265	0.061	102	0.044	298	0.047	111	0.028	261	0.016	152	0.025	15
DCP 12	.878	0.332	0.112	277	0.104	71	0.083	248	0.053	64	0.050	269	0.036	99	0.015	309	0.021	149	0.036	350
DCP 13	.953	0.388	0.033	255	0.049	40	0.037	185	0.018	359	0.013	172	0.019	348	0.018	154	0.004	355	0.003	23

FORCED PITCHING OSCILLATION NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.56	0.400	9.81	2.65		3136.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.130	432.7	733.2	0.48E 07	0.00112	1.229	12.48

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.953	0.222	25	0.047	299	0.018	193	0.011	105	0.006	297	0.006	162	0.002	39	0.000	47	0.002	258
CM		-0.014	0.024	154	0.019	12	0.007	259	0.005	202	0.004	104	0.002	337	0.000	320	0.002	264	0.001	114
DCP 1	.010	5.374	0.915	49	0.738	21	0.329	282	0.170	228	0.161	169	0.044	87	0.042	287	0.059	253	0.067	201
DCP 2	.050	3.239	0.486	43	0.289	353	0.154	246	0.079	169	0.050	122	0.031	82	0.025	21	0.015	347	0.019	317
DCP 3	.100	2.223	0.406	46	0.199	346	0.107	235	0.062	148	0.026	69	0.006	109	0.014	44	0.010	351	0.010	287
DCP 4	.150	1.560	0.401	28	0.165	296	0.087	169	0.025	77	0.020	49	0.018	291	0.006	207	0.002	228	0.005	118
DCP 5	.200	1.345	0.342	36	0.141	302	0.080	187	0.046	107	0.029	9	0.011	259	0.007	190	0.006	82	0.003	298
DCP 6	.250	1.193	0.321	23	0.107	269	0.050	126	0.006	58	0.020	7	0.022	237	0.007	89	0.002	234	0.005	74
DCP 7	.300	0.940	0.298	28	0.114	275	0.065	157	0.045	80	0.036	331	0.015	213	0.006	119	0.002	225	0.012	107
DCP 8	.400	0.561	0.218	22	0.057	242	0.020	63	0.013	140	0.023	335	0.020	196	0.011	35	0.006	246	0.005	102
DCP 9	.500	0.677	0.198	18	0.078	233	0.039	108	0.023	32	0.023	277	0.010	146	0.003	72	0.006	159	0.008	5
DCP 10	.695	0.530	0.127	6	0.049	196	0.016	65	0.015	30	0.015	270	0.006	159	0.001	248	0.008	79	0.005	263
DCP 11	.800	0.258	0.101	353	0.044	183	0.010	51	0.011	45	0.012	270	0.005	120	0.004	130	0.007	50	0.007	244
DCP 12	.878	0.142	0.101	340	0.033	168	0.003	37	0.011	23	0.011	246	0.008	99	0.004	289	0.005	88	0.003	202
DCP 13	.953	0.270	0.109	330	0.030	176	0.006	131	0.010	341	0.007	215	0.005	115	0.003	152	0.006	52	0.007	292

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.56	0.400	12.10	2.56		3136.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.130	432.7	732.8	0.48E 07	0.00195	1.309	13.62

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.978	0.246	62	0.057	69	0.051	328	0.026	237	0.012	133	0.001	162	0.002	84	0.003	113	0.004	320
CM		-0.054	0.063	161	0.015	136	0.020	73	0.012	31	0.005	327	0.004	287	0.001	262	0.001	226	0.002	192
DCP 1	.010	4.711	1.842	137	0.830	113	0.507	78	0.153	71	0.069	46	0.065	298	0.045	283	0.018	33	0.030	30
DCP 2	.050	2.854	0.935	116	0.212	82	0.193	62	0.053	32	0.059	52	0.012	339	0.018	130	0.026	155	0.030	146
DCP 3	.100	2.084	0.642	93	0.136	75	0.164	21	0.013	311	0.036	4	0.015	341	0.013	33	0.014	56	0.012	33
DCP 4	.150	1.507	0.561	78	0.098	64	0.164	0	0.029	293	0.019	334	0.019	327	0.009	353	0.009	316	0.009	37
DCP 5	.200	1.290	0.431	69	0.098	71	0.148	345	0.036	284	0.024	259	0.022	284	0.010	187	0.007	202	0.005	338
DCP 6	.250	1.217	0.431	59	0.053	67	0.131	332	0.045	265	0.023	185	0.010	288	0.012	40	0.014	270	0.004	0
DCP 7	.300	0.984	0.372	51	0.071	63	0.125	319	0.036	277	0.031	220	0.018	247	0.008	182	0.012	175	0.009	7
DCP 8	.400	0.645	0.312	37	0.027	91	0.091	298	0.047	252	0.032	147	0.018	207	0.009	34	0.011	158	0.006	61
DCP 9	.500	0.754	0.258	24	0.046	63	0.083	290	0.060	249	0.029	157	0.014	174	0.009	151	0.003	103	0.014	254
DCP 10	.695	0.633	0.207	7	0.031	356	0.066	255	0.045	232	0.024	148	0.020	139	0.004	117	0.004	73	0.013	15
DCP 11	.800	0.386	0.178	351	0.052	334	0.062	247	0.054	184	0.016	111	0.018	70	0.002	42	0.007	33	0.021	271
DCP 12	.878	0.298	0.164	345	0.059	325	0.051	236	0.051	182	0.016	82	0.020	91	0.009	331	0.006	47	0.012	258
DCP 13	.953	0.403	0.134	331	0.050	324	0.023	237	0.024	163	0.013	126	0.007	13	0.003	77	0.005	357	0.007	234

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.56	0.400	14.45	2.56		3136.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.130	432.6	731.2	0.48E 07	-0.00166	1.250	14.53

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.952	0.218	82	0.055	110	0.028	97	0.018	29	0.013	253	0.001	141	0.002	119	0.003	190	0.005	114
CM		-0.101	0.053	200	0.024	214	0.015	219	0.009	197	0.002	184	0.004	223	0.002	289	0.002	287	0.002	241
DCP 1	.010	3.711	1.426	164	0.636	201	0.363	231	0.170	239	0.148	274	0.090	319	0.097	351	0.042	339	0.010	99
DCP 2	.050	2.268	0.565	136	0.251	213	0.072	198	0.040	238	0.067	231	0.050	255	0.026	293	0.020	304	0.016	49
DCP 3	.100	1.759	0.453	114	0.177	168	0.065	191	0.010	146	0.033	205	0.036	220	0.015	259	0.017	260	0.008	336
DCP 4	.150	1.295	0.379	90	0.162	146	0.043	163	0.010	91	0.032	230	0.037	209	0.014	229	0.016	240	0.007	238
DCP 5	.200	1.143	0.340	102	0.128	114	0.087	133	0.039	102	0.019	168	0.027	159	0.006	332	0.023	197	0.019	190
DCP 6	.250	1.116	0.343	79	0.137	123	0.044	125	0.018	61	0.013	218	0.036	182	0.020	181	0.015	234	0.015	208
DCP 7	.300	0.956	0.320	84	0.124	88	0.092	115	0.049	92	0.011	274	0.016	159	0.021	189	0.022	162	0.013	160
DCP 8	.400	0.684	0.293	68	0.116	89	0.064	82	0.033	47	0.004	51	0.024	127	0.006	137	0.010	208	0.019	179
DCP 9	.500	0.837	0.275	54	0.102	58	0.074	76	0.046	29	0.013	267	0.021	47	0.017	117	0.006	52	0.014	140
DCP 10	.695	0.761	0.217	31	0.062	42	0.049	51	0.034	20	0.008	277	0.015	45	0.016	76	0.008	165	0.021	66
DCP 11	.800	0.520	0.156	39	0.074	32	0.055	17	0.034	353	0.010	2	0.015	10	0.006	169	0.014	83	0.010	35
DCP 12	.878	0.434	0.131	34	0.059	25	0.042	7	0.026	354	0.010	325	0.013	339	0.004	7	0.004	45	0.005	12
DCP 13	.953	0.541	0.117	2	0.032	25	0.027	358	0.016	335	0.006	228	0.007	4	0.003	357	0.009	88	0.013	340

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.33	0.600	5.05	2.72		3139.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.087	639.1	1436.0	0.63E 07	-0.00094	0.889	7.81

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.613	0.264	349	0.012	340	0.011	206	0.005	86	0.001	356	0.002	327	0.001	312	0.001	266	0.003	130
CM		0.003	0.010	267	0.003	53	0.004	288	0.003	169	0.001	35	0.000	281	0.000	270	0.001	274	0.001	123
CCP 1	.010	2.497	0.919	340	0.128	50	0.028	159	0.006	8	0.003	147	0.003	220	0.003	180	0.008	52	0.015	70
CCP 2	.050	2.366	0.905	338	0.103	47	0.032	244	0.022	354	0.005	205	0.010	297	0.001	79	0.003	273	0.004	36
CCP 3	.100	1.787	0.818	343	0.215	40	0.282	287	0.082	155	0.055	264	0.022	47	0.030	255	0.040	270	0.055	150
CCP 4	.150	1.170	0.640	345	0.111	245	0.023	215	0.093	181	0.059	70	0.019	156	0.037	32	0.005	259	0.014	8
CCP 5	.200	1.003	0.507	347	0.111	248	0.065	146	0.033	155	0.064	69	0.038	325	0.006	329	0.022	277	0.019	174
CCP 6	.250	0.798	0.340	351	0.049	257	0.066	139	0.035	38	0.014	356	0.018	294	0.013	212	0.011	125	0.007	52
CCP 7	.300	0.633	0.298	351	0.040	254	0.060	133	0.040	23	0.016	294	0.009	266	0.011	190	0.012	100	0.006	71
CCP 8	.400	0.383	0.184	357	0.015	354	0.016	152	0.015	20	0.008	259	0.003	190	0.003	96	0.004	51	0.003	317
CCP 9	.500	0.376	0.141	1	0.017	4	0.010	158	0.010	9	0.006	236	0.003	125	0.003	22	0.001	274	0.001	248
CCP 10	.695	0.267	0.081	15	0.010	357	0.006	172	0.007	359	0.004	206	0.003	64	0.002	347	0.001	117	0.000	223
CCP 11	.800	0.132	0.066	13	0.005	299	0.007	130	0.005	347	0.003	193	0.002	58	0.000	334	0.002	131	0.000	345
CCP 12	.878	0.064	0.061	5	0.014	214	0.008	100	0.007	336	0.003	212	0.001	314	0.002	130	0.002	37	0.002	235
CCP 13	.953	0.132	0.073	349	0.022	194	0.012	61	0.006	288	0.002	112	0.003	280	0.001	142	0.000	279	0.001	79

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.22	0.600	7.47	2.58		3139.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.087	638.5	1434.6	0.63E 07	-0.00070	1.016	9.26

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.812	0.156	17	0.041	29	0.013	1	0.008	302	0.002	266	0.006	168	0.003	54	0.003	112	0.004	21
CM		-0.010	0.027	193	0.010	88	0.006	102	0.005	41	0.003	11	0.002	307	0.001	269	0.001	211	0.000	151
CCP 1	.010	3.126	0.361	352	0.088	57	0.019	28	0.006	214	0.014	293	0.001	153	0.002	74	0.006	180	0.010	161
CCP 2	.050	2.961	0.187	347	0.138	73	0.053	92	0.060	34	0.047	297	0.010	124	0.026	312	0.023	204	0.009	77
CCP 3	.100	2.325	0.197	139	0.118	54	0.182	120	0.027	76	0.072	66	0.001	321	0.046	46	0.005	114	0.030	16
CCP 4	.150	1.493	0.330	10	0.276	61	0.062	106	0.049	39	0.045	92	0.026	227	0.006	252	0.016	173	0.010	303
CCP 5	.200	1.266	0.316	13	0.168	54	0.073	1	0.089	24	0.026	22	0.021	356	0.021	67	0.010	131	0.018	50
CCP 6	.250	1.038	0.270	22	0.086	29	0.086	347	0.037	331	0.037	321	0.020	294	0.007	273	0.006	328	0.003	357
CCP 7	.300	0.860	0.254	20	0.068	14	0.085	339	0.043	297	0.044	287	0.018	246	0.021	258	0.011	183	0.002	301
CCP 8	.400	0.518	0.172	31	0.052	342	0.032	324	0.034	269	0.020	241	0.021	198	0.013	148	0.007	84	0.000	231
CCP 9	.500	0.514	0.148	27	0.038	326	0.028	306	0.034	235	0.017	197	0.019	153	0.011	121	0.012	74	0.004	40
CCP 10	.695	0.361	0.109	23	0.027	281	0.013	277	0.017	211	0.010	170	0.013	114	0.005	41	0.006	24	0.002	283
CCP 11	.800	0.227	0.118	11	0.036	266	0.008	235	0.011	205	0.006	189	0.012	131	0.008	49	0.003	12	0.005	33
CCP 12	.878	0.173	0.123	359	0.029	255	0.015	267	0.012	193	0.008	174	0.009	104	0.005	32	0.004	9	0.004	299
CCP 13	.953	0.236	0.123	346	0.018	253	0.019	238	0.006	159	0.008	126	0.006	16	0.004	346	0.004	235	0.003	114

FORCED PITCHING OSCILLATION NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.22	0.600	9.63	2.54		3139.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.087	637.8	1429.5	0.63E 07	-0.00119	0.995	9.25

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.894	0.098	53	0.014	117	0.006	212	0.012	123	0.002	170	0.003	226	0.004	182	0.002	119	0.002	248
CM		-0.030	0.034	200	0.007	252	0.002	253	0.004	249	0.001	229	0.001	273	0.002	262	0.001	153	0.000	43
CCP 1	.010	3.407	0.241	2	0.029	260	0.043	174	0.005	343	0.007	194	0.008	294	0.001	28	0.011	278	0.014	178
CCP 2	.050	2.952	0.251	179	0.033	70	0.104	212	0.025	193	0.029	232	0.011	243	0.031	246	0.018	153	0.035	251
CCP 3	.100	2.232	0.102	145	0.120	268	0.116	323	0.039	77	0.034	136	0.032	229	0.011	235	0.017	148	0.039	97
CCP 4	.150	1.710	0.130	118	0.060	230	0.026	296	0.044	214	0.010	11	0.014	245	0.015	206	0.008	161	0.034	241
CCP 5	.200	1.423	0.179	116	0.034	235	0.015	221	0.020	207	0.006	347	0.005	327	0.007	231	0.012	129	0.012	286
CCP 6	.250	1.161	0.155	77	0.057	139	0.025	210	0.030	179	0.012	320	0.007	229	0.016	199	0.012	179	0.039	171
CCP 7	.300	0.968	0.165	71	0.070	131	0.048	170	0.034	196	0.012	212	0.015	300	0.015	213	0.007	68	0.012	306
CCP 8	.400	0.562	0.156	54	0.036	110	0.018	142	0.025	120	0.004	245	0.004	198	0.007	184	0.005	152	0.003	175
CCP 9	.500	0.583	0.144	44	0.041	100	0.015	95	0.026	116	0.011	134	0.006	144	0.010	154	0.006	347	0.039	264
CCP10	.695	0.431	0.139	27	0.017	62	0.012	55	0.026	61	0.006	12	0.005	77	0.005	37	0.003	358	0.012	43
CCP11	.800	0.309	0.125	18	0.024	55	0.003	267	0.014	70	0.004	152	0.005	134	0.013	93	0.005	9	0.016	195
CCP12	.878	0.275	0.127	10	0.022	42	0.001	182	0.012	46	0.002	96	0.002	83	0.011	64	0.008	338	0.000	127
CCP13	.953	0.344	0.112	359	0.018	48	0.010	340	0.008	17	0.005	321	0.004	297	0.003	55	0.003	251	0.002	219

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	49.50	0.400	9.79	2.72		3137.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.190	434.5	735.4	0.48E 07	0.00068	1.263	12.56

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.971	0.271	14	0.051	230	0.019	104	0.005	301	0.016	153	0.007	4	0.003	352	0.003	241	0.005	94
CM		-0.016	0.020	149	0.020	341	0.010	209	0.007	102	0.004	320	0.002	124	0.002	244	0.001	107	0.001	253
DCP 1	.010	5.313	1.187	32	0.494	359	0.252	245	0.131	182	0.149	145	0.047	58	0.028	277	0.047	177	0.017	80
DCP 2	.050	3.300	0.637	33	0.257	320	0.181	197	0.095	102	0.025	75	0.024	37	0.029	328	0.018	240	0.011	177
DCP 3	.100	2.219	0.552	25	0.189	288	0.119	166	0.054	75	0.009	90	0.021	8	0.020	255	0.008	136	0.007	160
DCP 4	.150	1.590	0.469	16	0.143	249	0.073	125	0.022	73	0.012	355	0.009	216	0.002	257	0.012	146	0.010	45
DCP 5	.200	1.419	0.430	17	0.154	241	0.084	106	0.021	2	0.005	250	0.002	220	0.003	301	0.005	86	0.002	347
DCP 6	.250	1.210	0.366	15	0.111	225	0.046	88	0.008	73	0.012	270	0.008	146	0.002	115	0.006	68	0.004	0
DCP 7	.300	0.953	0.362	14	0.136	220	0.072	82	0.022	335	0.019	213	0.010	21	0.009	175	0.012	21	0.005	229
DCP 8	.400	0.648	0.259	18	0.083	206	0.030	47	0.009	11	0.024	213	0.015	50	0.002	183	0.006	338	0.005	132
DCP 9	.500	0.690	0.230	10	0.098	188	0.047	45	0.024	303	0.027	182	0.010	39	0.010	24	0.012	249	0.014	90
DCP10	.695	0.500	0.137	7	0.061	168	0.026	29	0.028	288	0.026	145	0.015	328	0.004	55	0.008	266	0.011	70
DCP11	.800	0.273	0.098	356	0.049	155	0.020	30	0.027	273	0.026	120	0.017	271	0.011	61	0.002	258	0.004	94
DCP12	.878	0.158	0.097	338	0.042	151	0.018	30	0.023	261	0.017	103	0.009	311	0.001	345	0.004	323	0.005	194
DCP13	.953	0.288	0.094	319	0.037	132	0.017	12	0.019	232	0.014	85	0.007	297	0.003	27	0.002	214	0.005	289

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	49.50	0.400	12.10	2.62		3137.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.190	434.4	733.7	0.48E 07	0.00130	1.421	14.46

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.014	0.310	55	0.080	342	0.047	235	0.017	131	0.009	60	0.010	34	0.007	195	0.009	19	0.003	208
CM		-0.055	0.072	167	0.033	83	0.027	11	0.011	278	0.004	231	0.004	170	0.004	28	0.002	233	0.003	8
DCP 1	.010	4.650	1.873	134	0.948	82	0.405	49	0.067	56	0.099	70	0.030	34	0.042	135	0.050	337	0.043	290
DCP 2	.050	3.063	0.952	108	0.366	37	0.140	34	0.094	342	0.058	339	0.018	355	0.014	347	0.017	62	0.021	21
DCP 3	.100	2.136	0.694	86	0.242	20	0.107	348	0.049	272	0.028	328	0.016	355	0.014	288	0.010	330	0.013	151
DCP 4	.150	1.561	0.610	67	0.181	356	0.132	321	0.072	243	0.028	260	0.015	207	0.022	176	0.011	68	0.008	309
DCP 5	.200	1.423	0.507	62	0.166	359	0.126	295	0.053	218	0.017	217	0.009	120	0.007	134	0.010	221	0.027	105
DCP 6	.250	1.255	0.492	52	0.114	345	0.135	289	0.056	203	0.014	220	0.028	194	0.035	113	0.015	14	0.005	197
DCP 7	.300	0.986	0.446	51	0.138	344	0.123	272	0.043	212	0.040	191	0.036	111	0.015	39	0.009	199	0.026	67
DCP 8	.400	0.742	0.398	36	0.101	314	0.139	241	0.045	136	0.017	124	0.028	114	0.023	24	0.014	309	0.006	232
DCP 9	.500	0.792	0.346	31	0.110	312	0.127	228	0.039	154	0.031	112	0.030	72	0.011	292	0.026	76	0.032	309
DCP10	.695	0.605	0.274	14	0.110	278	0.121	189	0.044	100	0.027	74	0.043	5	0.036	218	0.023	15	0.031	196
DCP11	.800	0.423	0.241	354	0.112	262	0.101	169	0.056	84	0.035	13	0.025	318	0.023	179	0.016	340	0.017	177
DCP12	.878	0.305	0.209	345	0.098	254	0.079	155	0.054	71	0.030	337	0.017	304	0.024	208	0.011	60	0.005	122
DCP13	.953	0.408	0.150	335	0.065	260	0.045	151	0.025	58	0.019	39	0.026	287	0.010	136	0.012	252	0.018	102

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	49.26	0.400	14.46	2.66		3137.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.190	434.0	733.4	0.48E 07	-0.00095	1.445	16.06

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.017	0.305	65	0.087	30	0.008	319	0.023	325	0.021	206	0.007	205	0.008	109	0.007	240	0.008	17
CM		-0.098	0.070	191	0.039	151	0.012	97	0.013	93	0.008	359	0.003	8	0.004	277	0.002	25	0.006	197
DCP 1	.010	3.894	1.728	147	0.762	149	0.374	173	0.237	164	0.091	218	0.162	220	0.047	236	0.042	246	0.037	326
DCP 2	.050	2.607	0.791	116	0.203	141	0.111	99	0.081	110	0.038	164	0.023	129	0.024	145	0.026	235	0.012	264
DCP 3	.100	1.931	0.549	100	0.216	114	0.061	61	0.111	87	0.021	157	0.019	84	0.018	143	0.008	128	0.029	241
DCP 4	.150	1.419	0.526	69	0.185	79	0.047	41	0.066	33	0.016	16	0.014	76	0.023	49	0.010	42	0.014	290
DCP 5	.200	1.324	0.428	80	0.210	70	0.046	57	0.082	24	0.009	203	0.030	66	0.005	352	0.017	35	0.011	166
DCP 6	.250	1.195	0.457	57	0.185	48	0.058	16	0.060	7	0.031	344	0.016	9	0.022	356	0.016	333	0.016	222
DCP 7	.300	0.980	0.404	63	0.191	45	0.035	56	0.091	352	0.011	310	0.038	39	0.009	325	0.029	332	0.006	131
DCP 8	.400	0.766	0.381	48	0.190	15	0.061	347	0.074	330	0.042	282	0.020	276	0.019	262	0.017	242	0.025	159
DCP 9	.500	0.871	0.361	45	0.183	10	0.043	341	0.076	329	0.044	264	0.028	301	0.009	170	0.023	245	0.021	91
DCP10	.695	0.743	0.302	27	0.155	333	0.042	285	0.072	275	0.054	190	0.038	229	0.041	111	0.023	150	0.027	33
DCP11	.800	0.571	0.243	26	0.132	319	0.070	244	0.049	241	0.064	170	0.042	153	0.020	112	0.008	241	0.045	11
DCP12	.878	0.449	0.195	19	0.101	312	0.063	230	0.043	199	0.045	131	0.019	128	0.015	74	0.014	4	0.040	340
DCP13	.953	0.531	0.128	10	0.059	298	0.023	260	0.041	221	0.020	128	0.020	125	0.018	37	0.007	186	0.015	314

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	50.51	0.600	4.99	2.76		3140.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.132	640.2	1434.1	0.63E 07	-0.00094	0.889	7.70

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.613	0.256	347	0.013	264	0.008	162	0.003	82	0.003	189	0.001	267	0.002	158	0.001	202	0.002	98
CM		0.002	0.014	267	0.003	34	0.004	248	0.003	100	0.002	346	0.000	201	0.000	275	0.000	39	0.000	264
DCP 1	.010	2.468	0.907	332	0.111	37	0.012	154	0.012	345	0.010	106	0.015	239	0.003	198	0.002	42	0.003	90
DCP 2	.050	2.372	0.883	331	0.088	34	0.036	248	0.023	335	0.008	158	0.011	248	0.003	279	0.005	292	0.001	229
DCP 3	.100	1.797	0.833	340	0.131	21	0.258	261	0.120	120	0.059	253	0.013	58	0.052	195	0.013	126	0.037	93
DCP 4	.150	1.148	0.629	341	0.139	234	0.031	154	0.077	148	0.055	40	0.016	103	0.040	341	0.009	235	0.015	273
DCP 5	.200	1.025	0.500	345	0.134	226	0.083	118	0.021	97	0.046	36	0.036	276	0.007	165	0.013	210	0.014	103
DCP 6	.250	0.786	0.338	346	0.060	235	0.067	107	0.039	356	0.013	276	0.017	225	0.014	118	0.009	36	0.003	337
DCP 7	.300	0.613	0.285	352	0.049	220	0.061	102	0.039	346	0.022	231	0.009	173	0.014	102	0.010	6	0.006	281
DCP 8	.400	0.392	0.181	359	0.014	308	0.014	103	0.015	326	0.012	182	0.003	66	0.003	47	0.003	297	0.004	162
DCP 9	.500	0.383	0.140	9	0.009	310	0.008	108	0.007	281	0.010	171	0.005	45	0.001	26	0.001	217	0.002	117
DCP10	.695	0.256	0.088	22	0.010	312	0.006	85	0.006	269	0.007	150	0.004	326	0.003	159	0.002	174	0.001	81
DCP11	.800	0.143	0.068	24	0.008	243	0.007	83	0.008	273	0.008	186	0.002	17	0.002	193	0.003	173	0.004	78
DCP12	.878	0.069	0.057	9	0.011	188	0.010	39	0.007	239	0.004	124	0.001	287	0.001	127	0.002	275	0.003	86
DCP13	.953	0.147	0.061	350	0.021	164	0.011	5	0.007	204	0.001	258	0.002	133	0.000	312	0.001	107	0.001	343

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	49.75	0.600	7.46	2.60		3140.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.130	639.7	1433.7	0.63E 07	-0.00063	1.063	9.68

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.812	0.198	21	0.042	336	0.003	11	0.012	285	0.010	107	0.001	232	0.003	21	0.002	277	0.000	92
CM		-0.012	0.031	195	0.017	70	0.004	39	0.006	351	0.003	277	0.001	288	0.003	183	0.001	96	0.001	44
DCP 1	.010	3.090	0.417	351	0.062	35	0.013	102	0.010	208	0.021	348	0.010	166	0.007	190	0.002	304	0.008	76
DCP 2	.050	2.949	0.208	355	0.177	54	0.051	353	0.028	267	0.008	274	0.006	43	0.020	241	0.022	147	0.015	56
DCP 3	.100	2.364	0.153	112	0.173	42	0.164	116	0.085	5	0.048	34	0.047	334	0.018	351	0.028	259	0.036	349
DCP 4	.150	1.454	0.431	14	0.224	37	0.038	90	0.084	9	0.043	102	0.008	198	0.011	173	0.014	119	0.013	118
DCP 5	.200	1.283	0.405	20	0.132	19	0.078	348	0.094	0	0.024	319	0.031	324	0.011	124	0.017	17	0.007	56
DCP 6	.250	1.019	0.336	26	0.102	337	0.064	331	0.063	294	0.021	245	0.025	269	0.018	219	0.005	269	0.013	137
DCP 7	.300	0.825	0.313	26	0.098	325	0.063	321	0.069	274	0.037	226	0.035	208	0.024	160	0.007	108	0.006	171
DCP 8	.400	0.531	0.219	32	0.075	305	0.013	281	0.039	250	0.025	153	0.014	186	0.017	114	0.012	49	0.008	31
DCP 9	.500	0.525	0.199	30	0.073	290	0.017	233	0.036	217	0.037	129	0.020	97	0.020	31	0.009	330	0.008	313
DCP 10	.695	0.349	0.139	25	0.055	255	0.012	152	0.019	169	0.022	81	0.009	29	0.017	331	0.009	232	0.003	133
DCP 11	.800	0.240	0.136	13	0.053	250	0.012	184	0.021	148	0.014	65	0.004	137	0.015	7	0.012	276	0.008	219
DCP 12	.878	0.181	0.130	357	0.044	236	0.017	209	0.023	128	0.009	28	0.005	171	0.011	338	0.005	268	0.005	235
DCP 13	.953	0.248	0.126	343	0.034	219	0.015	195	0.017	106	0.009	23	0.003	242	0.002	345	0.003	186	0.001	27

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	49.50	0.600	9.72	2.58		3140.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.129	638.9	1431.5	0.63E 07	-0.00112	1.088	10.64

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.905	0.156	52	0.027	87	0.009	299	0.005	112	0.003	292	0.004	330	0.001	205	0.003	232	0.003	226
CM		-0.031	0.042	202	0.007	214	0.003	166	0.003	230	0.002	224	0.001	120	0.001	356	0.002	38	0.001	324
DCP 1	.010	3.387	0.301	5	0.015	319	0.039	187	0.009	245	0.014	203	0.014	76	0.003	315	0.004	308	0.001	246
DCP 2	.050	3.019	0.182	166	0.093	74	0.069	201	0.003	173	0.032	232	0.008	120	0.010	340	0.005	41	0.017	3
DCP 3	.100	2.322	0.231	128	0.119	239	0.143	316	0.066	356	0.025	351	0.030	3	0.030	20	0.014	113	0.017	267
DCP 4	.150	1.712	0.184	96	0.055	180	0.019	329	0.031	221	0.018	313	0.009	279	0.012	332	0.008	173	0.011	298
DCP 5	.200	1.448	0.259	95	0.043	132	0.023	213	0.041	237	0.018	281	0.010	303	0.003	271	0.007	316	0.011	223
DCP 6	.250	1.153	0.255	62	0.107	112	0.034	166	0.047	187	0.010	256	0.011	290	0.002	137	0.017	31	0.014	255
DCP 7	.300	0.936	0.261	62	0.106	96	0.047	157	0.046	188	0.034	217	0.008	256	0.014	224	0.013	326	0.011	222
DCP 8	.400	0.573	0.219	56	0.052	87	0.013	77	0.032	110	0.006	166	0.009	65	0.006	238	0.009	292	0.005	286
DCP 9	.500	0.605	0.206	45	0.050	78	0.023	4	0.028	101	0.012	72	0.004	142	0.011	142	0.014	212	0.005	158
DCP 10	.695	0.423	0.167	30	0.021	36	0.024	325	0.017	23	0.005	35	0.010	334	0.008	133	0.003	214	0.002	195
DCP 11	.800	0.327	0.172	24	0.026	8	0.016	312	0.016	20	0.014	23	0.010	313	0.009	302	0.011	276	0.009	148
DCP 12	.878	0.275	0.155	12	0.024	2	0.007	319	0.013	358	0.007	347	0.009	255	0.004	190	0.011	197	0.009	116
DCP 13	.953	0.360	0.137	357	0.026	350	0.010	286	0.007	330	0.001	210	0.002	329	0.002	2	0.002	150	0.001	127

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	62.50	0.400	9.93	2.87		3167.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.239	436.2	726.1	0.47E 07	0.00053	1.268	12.75

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.970	0.292	13	0.041	216	0.009	53	0.009	220	0.006	111	0.001	349	0.001	292	0.001	155	0.001	298
CM		-0.017	0.016	139	0.017	322	0.008	191	0.006	62	0.002	272	0.001	109	0.000	272	0.000	183	0.001	149
DCP 1	.010	5.198	1.227	33	0.697	0	0.415	247	0.185	139	0.011	115	0.052	116	0.014	219	0.046	137	0.020	57
DCP 2	.050	3.182	0.694	32	0.258	310	0.126	186	0.047	128	0.043	68	0.015	49	0.034	343	0.023	244	0.015	215
DCP 3	.100	2.216	0.668	15	0.220	259	0.100	131	0.028	92	0.036	5	0.027	280	0.022	200	0.014	106	0.012	141
DCP 4	.150	1.632	0.547	12	0.166	230	0.070	69	0.012	52	0.020	297	0.002	130	0.015	213	0.0[illegible]	66	0.006	314
DCP 5	.200	1.434	0.495	7	0.162	216	0.061	75	0.020	21	0.023	264	0.015	167	0.014	72	0.012	303	0.006	184
DCP 6	.250	1.221	0.415	12	0.123	210	0.043	64	0.022	11	0.026	232	0.007	88	0.007	137	0.005	346	0.004	312
DCP 7	.300	0.955	0.402	8	0.131	199	0.045	54	0.024	339	0.025	215	0.010	128	0.013	31	0.010	253	0.010	144
DCP 8	.400	0.694	0.284	14	0.086	190	0.029	45	0.031	320	0.027	175	0.008	52	0.007	291	0.005	50	0.006	239
DCP 9	.500	0.702	0.248	6	0.089	163	0.038	14	0.036	257	0.026	121	0.011	341	0.003	206	0.002	189	0.006	338
DCP10	.695	0.499	0.131	8	0.053	143	0.028	10	0.033	240	0.016	84	0.005	257	0.001	314	0.002	106	0.007	279
DCP11	.800	0.265	0.089	353	0.036	120	0.019	343	0.030	204	0.013	43	0.007	281	0.002	64	0.002	151	0.006	48
DCP12	.878	0.146	0.071	331	0.026	112	0.014	3	0.022	204	0.013	38	0.006	233	0.001	349	0.003	155	0.005	321
DCP13	.953	0.277	0.075	303	0.023	86	0.016	302	0.018	140	0.007	331	0.001	296	0.002	137	0.005	317	0.007	170

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	62.50	0.400	12.37	2.73		3167.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.240	435.6	727.4	0.47E 07	0.00198	1.458	15.06

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.038	0.373	37	0.077	294	0.030	168	0.022	32	0.011	15	0.014	237	0.010	62	0.006	287	0.006	259
CM		-0.063	0.076	152	0.042	53	0.031	294	0.018	195	0.007	166	0.010	52	0.006	283	0.002	158	0.001	78
DCP 1	.010	4.547	1.904	120	1.016	68	0.295	357	0.183	23	0.126	6	0.025	172	0.033	35	0.019	329	0.035	239
DCP 2	.050	2.903	1.080	89	0.314	15	0.206	347	0.088	301	0.060	311	0.034	211	0.031	350	0.013	288	0.018	257
DCP 3	.100	2.140	0.907	62	0.223	343	0.195	298	0.026	283	0.066	226	0.009	191	0.005	52	0.024	225	0.007	155
DCP 4	.150	1.605	0.704	53	0.170	342	0.202	282	0.037	167	0.055	215	0.045	139	0.032	57	0.013	336	0.002	292
DCP 5	.200	1.453	0.632	38	0.141	316	0.153	247	0.009	206	0.070	152	0.047	95	0.042	351	0.006	293	0.015	277
DCP 6	.250	1.291	0.604	38	0.141	324	0.182	251	0.036	131	0.059	172	0.051	101	0.037	25	0.018	318	0.011	336
DCP 7	.300	1.040	0.562	27	0.145	304	0.158	216	0.016	119	0.066	120	0.048	48	0.037	326	0.021	257	0.010	290
DCP 8	.400	0.801	0.493	23	0.139	290	0.148	199	0.051	95	0.050	110	0.069	11	0.032	277	0.021	221	0.012	194
DCP 9	.500	0.858	0.431	8	0.144	269	0.139	154	0.048	93	0.073	26	0.059	247	0.024	198	0.021	149	0.010	3
DCP10	.695	0.646	0.309	356	0.155	245	0.149	115	0.044	43	0.069	6	0.088	252	0.051	143	0.020	49	0.015	336
DCP11	.800	0.426	0.256	342	0.160	220	0.151	85	0.077	343	0.042	280	0.063	194	0.050	67	0.024	321	0.021	237
DCP12	.878	0.310	0.183	333	0.130	221	0.120	85	0.070	347	0.038	270	0.055	189	0.049	65	0.029	317	0.011	198
DCP13	.953	0.407	0.105	316	0.075	206	0.063	41	0.022	281	0.026	270	0.029	134	0.018	4	0.007	279	0.011	291

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	62.50	0.400	14.66	2.66		3167.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.240	435.5	724.8	0.47E 07	0.00031	1.511	16.79

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.038	0.401	52	0.064	326	0.014	339	0.019	173	0.009	85	0.003	101	0.007	8	0.005	274	0.003	256
CM		-0.100	0.094	174	0.043	99	0.013	48	0.012	344	0.005	244	0.001	299	0.003	204	0.002	132	0.003	123
DCP 1	.010	3.868	2.247	147	0.602	139	0.399	163	0.156	159	0.148	191	0.101	189	0.071	198	0.040	190	0.047	165
DCP 2	.050	2.561	1.010	110	0.176	121	0.129	76	0.072	121	0.037	101	0.038	120	0.011	107	0.022	155	0.020	160
DCP 3	.100	1.908	0.847	83	0.206	76	0.120	30	0.050	89	0.034	94	0.024	62	0.014	77	0.019	118	0.012	105
DCP 4	.150	1.472	0.732	71	0.188	64	0.111	24	0.069	17	0.031	36	0.045	27	0.022	355	0.006	314	0.002	240
DCP 5	.200	1.380	0.684	59	0.197	34	0.129	8	0.038	330	0.035	21	0.021	10	0.027	324	0.011	315	0.008	302
DCP 6	.250	1.239	0.662	56	0.197	31	0.111	13	0.062	343	0.028	336	0.038	356	0.027	312	0.015	257	0.006	286
DCP 7	.300	1.027	0.651	48	0.199	6	0.116	359	0.066	308	0.029	326	0.021	314	0.015	289	0.021	292	0.017	271
DCP 8	.400	0.832	0.574	40	0.202	350	0.085	338	0.060	285	0.016	230	0.036	298	0.022	233	0.020	212	0.012	193
DCP 9	.500	0.935	0.518	24	0.180	302	0.056	295	0.046	237	0.029	234	0.023	189	0.016	54	0.010	310	0.016	66
DCP10	.695	0.753	0.368	9	0.180	280	0.079	230	0.086	175	0.042	137	0.036	142	0.024	84	0.014	6	0.020	342
DCP11	.800	0.543	0.311	2	0.186	262	0.080	191	0.082	139	0.054	52	0.009	15	0.029	357	0.010	311	0.021	271
DCP12	.878	0.440	0.225	358	0.134	254	0.064	189	0.070	132	0.049	43	0.013	24	0.013	22	0.010	273	0.015	259
DCP13	.953	0.516	0.139	345	0.085	236	0.030	149	0.033	110	0.024	34	0.014	50	0.017	313	0.008	221	0.008	241

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	64.10	0.600	5.00	2.77		3163.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.166	643.3	1434.6	0.63E 07	-0.00092	0.885	7.75

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.618	0.246	348	0.020	193	0.012	131	0.003	118	0.008	129	0.003	106	0.004	103	0.002	64	0.003	45
CM		-0.004	0.018	264	0.003	21	0.004	199	0.002	57	0.001	292	0.001	66	0.000	170	0.000	19	0.000	75
DCP 1	.010	2.422	0.876	331	0.110	70	0.053	148	0.009	130	0.019	89	0.016	90	0.012	81	0.009	85	0.007	62
DCP 2	.050	2.410	0.838	330	0.086	76	0.045	192	0.003	67	0.023	112	0.011	101	0.013	85	0.006	75	0.010	31
DCP 3	.100	1.785	0.798	336	0.113	359	0.232	225	0.118	80	0.061	208	0.034	43	0.054	143	0.032	21	0.030	41
DCP 4	.150	1.121	0.611	340	0.154	210	0.054	129	0.068	130	0.050	28	0.011	82	0.029	313	0.015	193	0.008	199
DCP 5	.200	0.987	0.485	339	0.150	203	0.090	94	0.015	32	0.028	350	0.030	208	0.015	115	0.013	103	0.010	24
DCP 6	.250	0.756	0.324	351	0.072	203	0.074	92	0.039	324	0.018	190	0.013	155	0.013	88	0.008	6	0.003	276
DCP 7	.300	0.587	0.282	348	0.070	188	0.062	68	0.043	284	0.033	154	0.014	94	0.011	49	0.005	286	0.007	134
DCP 8	.400	0.400	0.178	7	0.010	214	0.016	82	0.012	282	0.016	143	0.005	35	0.001	40	0.001	32	0.002	111
DCP 9	.500	0.385	0.144	11	0.010	226	0.006	60	0.010	217	0.014	111	0.002	274	0.004	132	0.004	103	0.002	24
DCP10	.695	0.296	0.098	33	0.006	256	0.008	33	0.005	221	0.004	85	0.004	254	0.001	85	0.001	228	0.002	312
DCP11	.800	0.153	0.074	31	0.012	202	0.009	19	0.007	197	0.004	129	0.002	207	0.002	58	0.001	163	0.001	343
DCP12	.878	0.107	0.059	24	0.012	171	0.010	12	0.005	214	0.002	51	0.002	275	0.001	355	0.001	227	0.002	298
DCP13	.953	0.156	0.053	348	0.022	135	0.014	299	0.009	149	0.002	226	0.004	133	0.000	115	0.002	151	0.002	115

FORCED PITCHING OSCILLATION NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	64.10	0.600	9.07	2.59		3163.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.167	642.4	1431.6	0.62E 07	-0.00099	1.158	10.86

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.889	0.241	45	0.022	321	0.003	167	0.013	135	0.006	208	0.008	97	0.002	130	0.002	55	0.001	76
CM		-0.032	0.049	197	0.013	95	0.005	88	0.001	14	0.004	1	0.003	278	0.003	276	0.001	215	0.001	235
DCP 1	.010	3.296	0.416	1	0.031	218	0.045	169	0.025	118	0.014	132	0.009	45	0.007	233	0.007	86	0.006	306
DCP 2	.050	3.023	0.177	114	0.177	61	0.036	179	0.070	58	0.026	296	0.019	18	0.038	276	0.015	193	0.022	276
DCP 3	.100	2.375	0.331	126	0.115	264	0.031	196	0.075	210	0.047	287	0.011	209	0.026	283	0.020	0	0.003	307
DCP 4	.150	1.589	0.362	69	0.039	163	0.024	148	0.036	181	0.009	66	0.011	311	0.011	210	0.003	281	0.008	275
DCP 5	.200	1.338	0.445	56	0.127	87	0.066	142	0.037	149	0.001	74	0.005	342	0.020	340	0.011	279	0.009	238
DCP 6	.250	1.067	0.416	53	0.070	70	0.071	93	0.048	131	0.025	130	0.011	171	0.012	244	0.012	249	0.011	216
DCP 7	.300	0.890	0.423	50	0.098	43	0.064	53	0.053	90	0.017	89	0.018	115	0.008	201	0.015	212	0.016	206
DCP 8	.400	0.596	0.331	52	0.050	353	0.047	34	0.024	62	0.019	0	0.012	103	0.007	112	0.010	112	0.016	138
DCP 9	.500	0.599	0.294	40	0.068	303	0.030	312	0.006	245	0.015	229	0.010	127	0.018	121	0.016	94	0.021	68
DCP10	.695	0.447	0.216	28	0.069	268	0.028	254	0.010	158	0.015	204	0.014	72	0.007	106	0.010	50	0.015	14
DCP11	.800	0.315	0.189	17	0.054	269	0.029	252	0.008	217	0.024	195	0.013	122	0.017	87	0.012	337	0.007	240
DCP12	.878	0.283	0.175	6	0.045	267	0.029	238	0.009	184	0.017	168	0.010	82	0.011	79	0.008	340	0.003	236
DCP13	.953	0.325	0.149	343	0.031	242	0.022	187	0.008	202	0.014	136	0.009	75	0.003	23	0.001	324	0.001	173

FORCED PITCHING OSCILLATION NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	64.10	0.600	9.80	2.59		3163.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.167	642.2	1436.7	0.63E 07	-0.00106	1.171	11.17

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.924	0.219	53	0.023	65	0.004	292	0.005	140	0.007	191	0.004	163	0.003	116	0.006	113	0.003	69
CM		-0.044	0.056	201	0.005	162	0.003	167	0.002	239	0.001	248	0.002	214	0.002	272	0.002	277	0.002	259
DCP 1	.010	3.362	0.350	11	0.015	335	0.030	193	0.023	206	0.026	157	0.011	45	0.004	92	0.013	99	0.014	29
DCP 2	.050	3.005	0.247	151	0.092	60	0.078	191	0.026	270	0.063	207	0.002	321	0.039	246	0.014	223	0.030	253
DCP 3	.100	2.315	0.354	125	0.082	249	0.123	297	0.028	6	0.016	354	0.032	357	0.033	23	0.033	89	0.014	101
DCP 4	.150	1.624	0.288	101	0.049	116	0.042	324	0.035	235	0.012	250	0.016	300	0.012	318	0.007	229	0.005	278
DCP 5	.200	1.408	0.335	85	0.051	110	0.047	205	0.035	197	0.016	198	0.002	204	0.004	325	0.012	319	0.006	358
DCP 6	.250	1.058	0.350	67	0.125	105	0.035	135	0.040	208	0.029	251	0.023	268	0.011	294	0.013	276	0.005	99
DCP 7	.300	0.916	0.368	57	0.110	84	0.057	132	0.033	147	0.028	205	0.021	213	0.010	264	0.012	267	0.010	334
DCP 8	.400	0.619	0.310	57	0.045	82	0.035	86	0.034	112	0.014	167	0.020	189	0.027	186	0.011	157	0.008	257
DCP 9	.500	0.653	0.298	41	0.031	43	0.033	26	0.016	46	0.013	122	0.016	124	0.019	131	0.023	111	0.009	107
DCP10	.695	0.486	0.239	30	0.022	327	0.025	311	0.006	46	0.003	19	0.011	138	0.013	85	0.012	97	0.010	71
DCP11	.800	0.369	0.219	21	0.027	328	0.015	297	0.010	28	0.008	59	0.010	85	0.017	32	0.002	28	0.015	63
DCP12	.878	0.342	0.193	14	0.034	341	0.015	291	0.011	358	0.006	344	0.003	349	0.006	20	0.000	83	0.005	110
DCP13	.953	0.366	0.146	351	0.023	281	0.013	220	0.008	188	0.007	149	0.001	106	0.008	117	0.006	51	0.007	85

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	81.97	0.400	10.01	2.98		3169.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.315	435.0	724.1	0.47E 07	0.00009	1.292	13.08

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.007	0.291	9	0.039	148	0.026	296	0.013	133	0.007	48	0.002	290	0.003	100	0.003	252	0.002	107
CM		-0.019	0.007	151	0.016	304	0.009	144	0.004	341	0.001	218	0.001	76	0.000	264	0.000	125	0.001	341
DCP 1	.010	5.341	1.196	15	0.534	14	0.338	248	0.137	166	0.080	76	0.019	254	0.038	114	0.018	288	0.018	219
DCP 2	.050	3.457	0.790	21	0.240	343	0.147	212	0.049	135	0.052	64	0.031	338	0.022	227	0.006	229	0.015	214
DCP 3	.100	2.283	0.673	8	0.183	229	0.066	109	0.043	77	0.057	325	0.025	191	0.008	140	0.009	171	0.016	43
DCP 4	.150	1.644	0.548	7	0.146	208	0.038	82	0.033	58	0.028	308	0.015	190	0.013	76	0.013	269	0.013	58
DCP 5	.200	1.484	0.493	359	0.148	181	0.034	18	0.026	39	0.028	250	0.022	90	0.011	352	0.010	225	0.010	51
DCP 6	.250	1.228	0.420	5	0.123	187	0.029	24	0.029	21	0.020	218	0.008	95	0.006	357	0.006	163	0.010	351
DCP 7	.300	0.983	0.389	2	0.128	165	0.038	346	0.013	359	0.016	174	0.012	65	0.009	323	0.008	127	0.007	342
DCP 8	.400	0.710	0.286	16	0.090	167	0.031	346	0.022	312	0.027	137	0.006	9	0.010	334	0.004	193	0.003	197
DCP 9	.500	0.713	0.231	6	0.094	129	0.051	305	0.014	169	0.015	83	0.014	326	0.015	136	0.011	309	0.008	93
DCP10	.695	0.515	0.130	15	0.065	120	0.046	318	0.032	180	0.019	52	0.013	267	0.011	85	0.010	244	0.005	160
DCP11	.800	0.277	0.074	4	0.047	92	0.037	300	0.030	147	0.015	357	0.003	159	0.007	251	0.012	27	0.011	172
DCP12	.878	0.195	0.043	339	0.031	84	0.024	308	0.022	144	0.010	357	0.006	191	0.003	287	0.004	156	0.005	284
DCP13	.953	0.296	0.039	285	0.023	58	0.029	272	0.022	83	0.011	288	0.007	138	0.002	310	0.003	169	0.004	350

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	81.97	0.400	12.44	2.96		3168.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.315	434.8	728.0	0.47E 07	0.00264	1.393	15.09

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.043	0.409	19	0.080	171	0.031	24	0.005	0	0.016	161	0.013	342	0.002	50	0.003	26	0.003	316
CM		-0.071	0.085	126	0.050	342	0.017	189	0.003	125	0.009	349	0.004	146	0.001	287	0.001	167	0.000	97
DCP 1	.010	4.243	2.115	93	0.962	30	0.174	6	0.167	316	0.067	183	0.048	36	0.023	131	0.050	47	0.016	79
DCP 2	.050	2.986	1.345	86	0.503	23	0.113	1	0.087	302	0.029	195	0.025	23	0.008	196	0.023	38	0.005	65
DCP 3	.100	2.121	1.030	40	0.169	282	0.088	263	0.045	169	0.053	110	0.013	346	0.028	22	0.016	247	0.014	311
DCP 4	.150	1.589	0.847	35	0.155	268	0.091	231	0.049	154	0.058	105	0.032	336	0.014	23	0.022	273	0.001	175
DCP 5	.200	1.444	0.767	19	0.159	230	0.072	186	0.064	138	0.065	36	0.006	37	0.031	305	0.017	148	0.022	291
DCP 6	.250	1.272	0.724	22	0.163	234	0.090	179	0.025	141	0.061	66	0.025	292	0.018	353	0.017	224	0.018	18
DCP 7	.300	1.018	0.666	9	0.170	216	0.072	147	0.064	112	0.054	344	0.009	66	0.037	240	0.023	75	0.008	239
DCP 8	.400	0.826	0.567	4	0.188	206	0.101	110	0.025	105	0.057	333	0.022	187	0.017	286	0.022	102	0.012	377
DCP 9	.500	0.867	0.498	345	0.205	176	0.080	59	0.060	23	0.066	228	0.007	10	0.033	103	0.015	290	0.006	262
DCP10	.695	0.662	0.328	330	0.205	161	0.099	23	0.050	341	0.076	194	0.026	0	0.014	53	0.006	229	0.005	173
DCP11	.800	0.446	0.246	309	0.202	141	0.114	342	0.040	231	0.061	124	0.030	321	0.002	268	0.012	359	0.005	73
DCP12	.878	0.366	0.186	304	0.160	141	0.107	342	0.036	230	0.051	139	0.036	322	0.010	168	0.013	30	0.005	352
DCP13	.953	0.429	0.103	278	0.080	114	0.040	295	0.022	234	0.036	90	0.007	295	0.004	267	0.004	15	0.001	298

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	81.97	0.400	14.72	2.88		3168.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.315	434.6	727.7	0.47E 07	0.00157	1.530	17.75

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.078	0.392	31	0.086	237	0.031	151	0.024	66	0.003	278	0.006	277	0.003	94	0.005	264	0.004	153
CM		-0.116	0.097	155	0.048	37	0.010	245	0.012	218	0.008	110	0.006	69	0.003	3	0.004	355	0.005	310
DCP 1	.010	3.799	2.164	125	0.538	106	0.505	149	0.117	127	0.193	150	0.054	123	0.040	99	0.058	311	0.058	305
DCP 2	.050	2.574	1.210	115	0.258	108	0.208	145	0.078	98	0.093	133	0.051	80	0.043	58	0.040	338	0.040	319
DCP 3	.100	1.923	0.964	56	0.130	48	0.003	176	0.055	337	0.037	66	0.039	53	0.033	33	0.045	351	0.034	328
DCP 4	.150	1.499	0.776	49	0.169	18	0.029	299	0.062	335	0.023	32	0.031	339	0.019	12	0.029	310	0.012	293
DCP 5	.200	1.373	0.736	31	0.177	334	0.037	300	0.038	273	0.030	272	0.008	222	0.008	190	0.018	357	0.010	259
DCP 6	.250	1.271	0.708	35	0.220	338	0.069	296	0.059	271	0.011	320	0.026	253	0.017	41	0.011	257	0.007	3
DCP 7	.300	1.032	0.641	21	0.218	303	0.079	281	0.037	21	0.021	224	0.014	176	0.011	212	0.016	352	0.010	179
DCP 8	.400	0.894	0.582	15	0.246	282	0.076	237	0.092	182	0.034	80	0.019	78	0.025	327	0.011	354	0.025	243
DCP 9	.500	0.988	0.498	357	0.264	241	0.084	201	0.085	116	0.034	49	0.031	356	0.012	287	0.034	224	0.023	133
DCP10	.695	0.827	0.360	351	0.242	220	0.090	129	0.110	64	0.051	318	0.057	273	0.030	182	0.036	140	0.026	83
DCP11	.800	0.598	0.312	344	0.218	186	0.111	59	0.099	1	0.068	251	0.030	206	0.011	145	0.019	152	0.016	150
DCP12	.878	0.508	0.241	345	0.172	186	0.099	58	0.078	359	0.050	257	0.025	224	0.012	148	0.017	207	0.020	154
DCP13	.953	0.561	0.110	325	0.090	146	0.046	0	0.026	313	0.007	153	0.027	148	0.018	59	0.027	310	0.017	141

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	80.65	0.600	5.03	2.84		3164.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.211	638.1	1423.8	0.62E 07	-0.00094	0.915	8.14

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.639	0.244	350	0.016	213	0.013	189	0.001	313	0.003	344	0.001	213	0.003	69	0.001	13	0.002	291
CM		-0.005	0.023	262	0.003	18	0.006	146	0.003	46	0.003	220	0.001	33	0.000	154	0.000	280	0.000	115
DCP 1	.010	2.407	0.849	327	0.111	45	0.073	139	0.012	167	0.007	197	0.006	35	0.006	74	0.004	4	0.004	240
DCP 2	.050	2.551	0.827	326	0.087	51	0.064	175	0.011	256	0.006	160	0.005	218	0.008	9	0.003	86	0.005	276
DCP 3	.100	1.802	0.794	334	0.141	358	0.264	214	0.111	51	0.068	204	0.033	290	0.061	106	0.017	290	0.017	341
DCP 4	.150	1.161	0.610	340	0.142	214	0.053	160	0.083	117	0.050	345	0.023	46	0.033	283	0.009	185	0.009	177
DCP 5	.200	1.024	0.491	341	0.149	206	0.081	100	0.022	38	0.047	316	0.026	196	0.005	102	0.012	79	0.010	338
DCP 6	.250	0.777	0.334	354	0.078	213	0.069	100	0.047	324	0.026	250	0.020	139	0.017	62	0.013	335	0.008	226
DCP 7	.300	0.621	0.285	353	0.069	193	0.053	66	0.052	285	0.025	174	0.018	67	0.011	347	0.004	283	0.004	187
DCP 8	.400	0.423	0.188	13	0.014	234	0.001	41	0.020	265	0.009	103	0.007	31	0.009	238	0.004	110	0.003	76
DCP 9	.500	0.391	0.155	20	0.010	241	0.015	284	0.014	213	0.014	34	0.006	258	0.005	104	0.004	25	0.002	237
DCP10	.695	0.312	0.113	40	0.012	247	0.017	308	0.010	209	0.013	30	0.006	207	0.002	43	0.002	141	0.003	310
DCP11	.800	0.150	0.082	39	0.009	204	0.020	305	0.006	208	0.010	38	0.006	231	0.001	349	0.001	142	0.005	306
DCP12	.878	0.131	0.064	31	0.012	169	0.019	318	0.009	195	0.007	37	0.002	234	0.000	206	0.002	138	0.001	293
DCP13	.953	0.152	0.048	356	0.020	100	0.026	265	0.007	93	0.002	303	0.001	34	0.002	118	0.002	329	0.001	299

FORCED PITCHING OSCILLATION NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	80.65	0.600	9.83	2.78		3164.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.211	637.1	1420.6	0.62E 07	-0.00061	1.257	11.73

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.923	0.295	45	0.016	11	0.028	269	0.009	49	0.003	164	0.005	195	0.002	182	0.002	125	0.002	38
CM		-0.048	0.064	192	0.015	98	0.006	95	0.004	195	0.001	133	0.003	35	0.001	55	0.001	326	0.001	283
CCP 1	.010	3.295	0.418	3	0.037	50	0.048	231	0.020	259	0.011	213	0.008	195	0.010	122	0.007	23	0.003	278
CCP 2	.050	3.019	0.374	132	0.213	54	0.049	154	0.035	296	0.053	143	0.024	94	0.026	105	0.026	74	0.020	27
CCP 3	.100	2.250	0.486	115	0.029	241	0.104	275	0.027	250	0.074	250	0.037	290	0.017	277	0.013	235	0.019	347
CCP 4	.150	1.520	0.485	72	0.134	114	0.107	246	0.034	249	0.018	47	0.023	102	0.014	155	0.005	111	0.005	320
CCP 5	.200	1.359	0.503	60	0.141	88	0.090	199	0.043	183	0.016	193	0.009	26	0.014	67	0.012	67	0.005	198
CCP 6	.250	1.126	0.490	55	0.090	89	0.017	67	0.070	139	0.026	132	0.013	206	0.013	246	0.012	326	0.004	294
CCP 7	.300	0.958	0.498	49	0.095	49	0.025	36	0.067	90	0.038	114	0.032	145	0.020	126	0.005	203	0.007	135
CCP 8	.400	0.635	0.405	45	0.013	355	0.053	358	0.052	71	0.027	75	0.022	50	0.011	86	0.005	346	0.011	158
CCP 9	.500	0.655	0.389	33	0.056	298	0.059	307	0.034	11	0.016	344	0.013	309	0.018	312	0.009	271	0.009	288
CCP10	.695	0.506	0.274	24	0.057	270	0.040	267	0.021	13	0.012	266	0.015	216	0.010	279	0.008	153	0.008	136
CCP11	.800	0.365	0.243	17	0.060	288	0.038	248	0.020	316	0.009	241	0.024	219	0.012	188	0.012	144	0.005	36
CCP12	.878	0.371	0.208	4	0.055	288	0.025	230	0.012	304	0.011	253	0.025	201	0.016	152	0.012	88	0.004	36
CCP13	.953	0.365	0.161	341	0.033	267	0.023	194	0.004	199	0.009	106	0.004	87	0.001	211	0.005	122	0.007	42

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	96.15	0.200	10.05	3.14		3170.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.727	221.0	198.0	0.25E 07	-0.00154	1.291	12.25

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.052	0.229	52	0.012	214	0.029	300	0.010	133	0.004	74	0.003	8	0.006	335	0.014	84	0.003	222
CM		-0.002	0.053	290	0.005	88	0.007	149	0.002	317	0.000	244	0.001	225	0.002	213	0.004	278	0.004	48
CCP 1	.010	4.859	1.176	350	0.121	115	0.072	207	0.028	121	0.022	314	0.018	266	0.008	14	0.021	3	0.028	284
CCP 2	.050	4.445	0.624	1	0.030	135	0.046	215	0.020	107	0.007	112	0.007	262	0.013	291	0.019	35	0.032	242
CCP 3	.100	2.116	0.430	17	0.021	155	0.023	247	0.009	50	0.014	31	0.004	326	0.014	270	0.012	97	0.008	121
CCP 4	.150	1.750	0.363	24	0.024	166	0.039	275	0.013	108	0.008	116	0.005	298	0.005	309	0.012	41	0.015	4
CCP 5	.200	1.592	0.325	33	0.027	185	0.038	289	0.008	192	0.012	42	0.002	220	0.019	285	0.017	132	0.013	70
CCP 6	.250	1.327	0.307	46	0.018	215	0.040	296	0.013	124	0.010	104	0.004	58	0.008	306	0.014	85	0.014	34
CCP 7	.300	1.123	0.284	56	0.018	224	0.040	305	0.011	175	0.009	81	0.007	28	0.011	290	0.019	110	0.021	74
CCP 8	.400	0.852	0.268	68	0.019	246	0.044	302	0.013	118	0.010	138	0.003	210	0.003	351	0.012	40	0.014	24
CCP 9	.500	0.786	0.270	83	0.020	259	0.048	319	0.012	183	0.012	65	0.008	352	0.012	307	0.018	98	0.009	76
CCP10	.695	0.452	0.236	90	0.016	248	0.026	313	0.014	134	0.006	169	0.003	34	0.014	5	0.024	72	0.028	177
CCP11	.800	0.144	0.192	103	0.017	254	0.032	344	0.008	102	0.008	16	0.013	51	0.018	69	0.015	145	0.045	265
CCP12	.878	0.160	0.148	100	0.016	284	0.025	317	0.014	116	0.009	228	0.003	168	0.009	68	0.011	71	0.019	260
CCP13	.953	0.212	0.105	86	0.006	209	0.008	297	0.001	211	0.012	347	0.009	33	0.004	297	0.013	122	0.017	215

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	96.15	0.200	12.52	3.14		3170.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.727	220.9	198.3	0.26E 07	-0.00143	1.506	14.50

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.240	0.212	51	0.003	271	0.030	297	0.014	161	0.011	190	0.001	232	0.001	191	0.012	92	0.009	44
CM		-0.011	0.049	290	0.003	118	0.008	147	0.003	355	0.003	25	0.000	131	0.001	228	0.003	293	0.003	26
CCP 1	.010	6.045	1.126	349	0.052	82	0.077	203	0.036	79	0.014	339	0.003	272	0.016	258	0.016	152	0.041	299
CCP 2	.050	4.982	0.549	359	0.016	72	0.030	229	0.014	118	0.009	190	0.016	231	0.001	252	0.011	39	0.018	8
CCP 3	.100	2.628	0.438	17	0.018	122	0.039	224	0.003	134	0.012	248	0.010	27	0.021	160	0.011	104	0.029	59
CCP 4	.150	1.974	0.342	21	0.018	185	0.035	272	0.014	167	0.013	159	0.006	135	0.005	232	0.014	53	0.032	23
CCP 5	.200	1.814	0.320	32	0.012	192	0.036	281	0.012	158	0.011	220	0.004	65	0.012	204	0.007	71	0.041	50
CCP 6	.250	1.498	0.281	44	0.014	206	0.041	290	0.022	165	0.019	136	0.002	166	0.003	10	0.021	58	0.035	32
CCP 7	.300	1.278	0.281	55	0.001	184	0.045	303	0.017	167	0.013	185	0.007	355	0.003	195	0.016	90	0.031	43
CCP 8	.400	0.991	0.243	70	0.011	236	0.044	295	0.024	169	0.023	147	0.008	157	0.003	15	0.019	75	0.030	34
CCP 9	.500	0.902	0.260	83	0.014	304	0.047	308	0.016	165	0.007	183	0.006	292	0.010	228	0.011	78	0.019	71
CCP10	.695	0.549	0.203	90	0.007	307	0.032	323	0.010	174	0.012	175	0.009	255	0.009	343	0.019	110	0.021	153
CCP11	.800	0.211	0.178	100	0.012	287	0.039	334	0.018	155	0.025	222	0.002	63	0.013	103	0.015	132	0.036	240
CCP12	.878	0.284	0.130	106	0.011	311	0.021	331	0.017	182	0.013	186	0.006	132	0.010	62	0.008	142	0.018	256
CCP13	.953	0.292	0.109	83	0.008	330	0.014	301	0.008	173	0.020	258	0.008	34	0.003	213	0.002	58	0.004	221

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.200	14.79	3.13		3170.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.735	220.6	197.8	0.25E 07	-0.00081	1.401	17.24

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.228	0.155	29	0.017	247	0.031	317	0.007	114	0.008	329	0.003	313	0.003	32	0.007	70	0.004	235
CM		-0.087	0.043	323	0.014	60	0.009	168	0.001	344	0.002	137	0.001	353	0.002	232	0.002	332	0.005	49
DCP 1	.010	4.293	1.188	52	0.186	0	0.096	245	0.047	136	0.040	8	0.038	323	0.025	251	0.025	32	0.008	242
DCP 2	.050	4.037	0.727	28	0.097	144	0.065	226	0.016	7	0.020	347	0.017	278	0.012	251	0.017	11	0.013	59
DCP 3	.100	1.986	0.664	352	0.125	144	0.033	272	0.038	39	0.012	275	0.032	192	0.016	17	0.023	136	0.031	29
DCP 4	.150	1.753	0.602	351	0.033	242	0.029	243	0.012	297	0.014	92	0.014	317	0.003	134	0.027	2	0.011	126
DCP 5	.200	1.689	0.448	337	0.030	103	0.086	244	0.012	113	0.006	222	0.038	44	0.011	204	0.022	325	0.018	93
DCP 6	.250	1.553	0.369	342	0.033	100	0.025	249	0.018	234	0.009	159	0.027	336	0.002	320	0.011	121	0.023	24
DCP 7	.300	1.348	0.195	334	0.060	45	0.010	306	0.019	132	0.019	294	0.034	333	0.014	204	0.015	30	0.020	10
DCP 8	.400	1.170	0.114	339	0.053	29	0.075	3	0.018	135	0.012	347	0.003	145	0.005	24	0.016	111	0.009	70
DCP 9	.500	1.057	0.116	109	0.109	313	0.098	354	0.018	116	0.028	333	0.011	110	0.010	17	0.012	30	0.008	89
DCP 10	.695	0.725	0.166	117	0.100	236	0.071	295	0.007	56	0.021	161	0.009	233	0.001	289	0.011	98	0.026	240
DCP 11	.800	0.389	0.171	131	0.070	213	0.019	81	0.005	154	0.014	348	0.010	264	0.013	124	0.015	162	0.040	229
DCP 12	.878	0.552	0.174	124	0.064	199	0.018	43	0.011	301	0.021	0	0.009	224	0.024	42	0.007	166	0.031	263
DCP 13	.953	0.479	0.139	96	0.029	173	0.014	333	0.012	210	0.023	281	0.020	134	0.010	7	0.005	59	0.026	169

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.400	9.88	3.14		3169.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.374	433.4	723.7	0.47E 07	-0.00001	1.338	12.90

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.038	0.293	8	0.018	153	0.024	283	0.019	103	0.001	76	0.003	68	0.004	358	0.004	41	0.002	225
CM		-0.021	0.004	188	0.014	281	0.009	131	0.006	292	0.002	82	0.001	347	0.001	207	0.001	240	0.002	56
DCP 1	.010	5.131	1.161	19	0.621	344	0.390	220	0.089	115	0.065	95	0.047	28	0.007	105	0.014	198	0.033	30
DCP 2	.050	3.717	0.769	18	0.310	329	0.194	204	0.052	95	0.045	72	0.027	4	0.007	293	0.016	228	0.011	134
DCP 3	.100	2.309	0.693	2	0.202	231	0.079	100	0.027	45	0.035	341	0.012	244	0.020	224	0.019	77	0.012	23
DCP 4	.150	1.742	0.575	1	0.165	205	0.058	64	0.031	20	0.022	260	0.017	118	0.005	331	0.009	42	0.005	353
DCP 5	.200	1.526	0.507	356	0.157	181	0.060	11	0.015	342	0.015	202	0.014	61	0.006	290	0.012	332	0.002	174
DCP 6	.250	1.277	0.439	5	0.124	182	0.047	19	0.020	353	0.023	186	0.013	73	0.011	356	0.007	19	0.007	202
DCP 7	.300	1.013	0.407	0	0.134	165	0.060	355	0.016	292	0.023	148	0.014	35	0.006	311	0.014	343	0.008	143
DCP 8	.400	0.773	0.300	10	0.092	147	0.051	335	0.018	210	0.022	91	0.006	287	0.003	47	0.015	33	0.010	236
DCP 9	.500	0.711	0.239	5	0.083	114	0.054	299	0.030	140	0.015	359	0.007	191	0.015	15	0.006	287	0.006	133
DCP 10	.695	0.556	0.126	22	0.059	83	0.047	287	0.046	117	0.015	290	0.007	130	0.009	23	0.014	152	0.010	303
DCP 11	.800	0.255	0.063	16	0.041	40	0.026	278	0.030	92	0.011	220	0.004	208	0.004	72	0.010	57	0.017	250
DCP 12	.878	0.229	0.021	359	0.032	39	0.026	282	0.032	97	0.012	269	0.006	126	0.001	290	0.011	96	0.009	276
DCP 13	.953	0.291	0.005	260	0.019	355	0.016	217	0.016	29	0.011	207	0.004	21	0.004	226	0.021	354	0.012	178

FORCED PITCHING OSCILLATION NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.400	12.36	3.11		3169.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.374	433.1	722.5	0.47E 07	0.00246	1.445	15.59

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.111	0.364	4	0.053	156	0.023	352	0.011	236	0.016	19	0.006	260	0.003	185	0.004	244	0.006	309
CM		-0.080	0.079	101	0.040	298	0.014	138	0.010	32	0.008	220	0.003	27	0.002	327	0.001	331	0.002	171
DCP 1	.010	4.274	2.104	86	0.735	1	0.147	351	0.082	301	0.019	17	0.096	337	0.057	314	0.082	293	0.033	247
DCP 2	.050	3.206	1.312	75	0.385	347	0.120	329	0.043	246	0.022	291	0.026	326	0.024	290	0.030	283	0.020	236
DCP 3	.100	2.198	1.040	23	0.209	253	0.130	224	0.064	111	0.013	95	0.026	49	0.017	309	0.019	303	0.012	194
DCP 4	.150	1.723	0.879	23	0.187	255	0.100	202	0.056	106	0.045	23	0.017	229	0.008	331	0.018	151	0.005	331
DCP 5	.200	1.534	0.789	2	0.176	224	0.093	140	0.069	66	0.043	305	0.029	259	0.015	104	0.007	228	0.007	329
DCP 6	.250	1.355	0.746	11	0.199	227	0.109	140	0.060	87	0.070	340	0.018	243	0.014	214	0.012	115	0.035	124
DCP 7	.300	1.083	0.680	354	0.188	209	0.092	98	0.084	38	0.054	258	0.034	220	0.025	59	0.012	134	0.009	308
DCP 8	.400	0.905	0.560	350	0.190	193	0.122	82	0.074	8	0.053	251	0.026	174	0.023	88	0.006	294	0.011	335
DCP 9	.500	0.906	0.467	324	0.190	155	0.112	24	0.112	275	0.040	131	0.036	54	0.031	239	0.003	152	0.010	2
DCP 10	.695	0.749	0.268	300	0.184	126	0.108	343	0.101	238	0.089	79	0.044	314	0.047	161	0.004	333	0.023	313
DCP 11	.800	0.466	0.231	273	0.203	82	0.127	275	0.080	150	0.066	352	0.043	185	0.026	12	0.007	138	0.036	120
DCP 12	.878	0.422	0.162	267	0.169	85	0.110	276	0.057	167	0.066	19	0.037	206	0.017	16	0.014	217	0.015	119
DCP 13	.953	0.440	0.059	238	0.076	37	0.032	217	0.040	123	0.034	293	0.015	151	0.012	292	0.007	162	0.014	331

FORCED PITCHING OSCILLATION NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	96.15	0.400	14.66	3.07		3169.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.371	432.9	723.2	0.47E 07	0.00223	1.546	17.80

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.163	0.384	22	0.060	227	0.020	70	0.018	352	0.016	166	0.007	119	0.001	124	0.005	71	0.003	45
CM		-0.118	0.107	135	0.050	0	0.008	206	0.010	166	0.008	24	0.003	271	0.001	110	0.002	254	0.002	244
DCP 1	.010	3.940	2.100	123	0.565	69	0.352	96	0.108	41	0.138	106	0.060	105	0.066	111	0.026	112	0.014	44
DCP 2	.050	2.927	1.229	109	0.297	61	0.178	84	0.079	17	0.063	85	0.026	72	0.020	75	0.007	58	0.007	34
DCP 3	.100	2.067	0.975	58	0.280	349	0.105	5	0.117	300	0.037	318	0.032	254	0.003	320	0.020	288	0.007	266
DCP 4	.150	1.697	0.783	44	0.260	350	0.063	320	0.102	282	0.028	242	0.027	224	0.007	220	0.011	193	0.014	336
DCP 5	.200	1.537	0.739	33	0.274	304	0.051	304	0.098	213	0.011	216	0.033	144	0.019	211	0.010	69	0.011	166
DCP 6	.250	1.399	0.703	30	0.258	315	0.062	276	0.089	244	0.038	201	0.030	178	0.020	177	0.016	174	0.004	264
DCP 7	.300	1.160	0.700	20	0.249	281	0.081	259	0.099	170	0.046	151	0.036	74	0.013	37	0.008	333	0.007	53
DCP 8	.400	0.984	0.627	7	0.279	267	0.078	202	0.106	153	0.061	105	0.034	23	0.018	354	0.015	349	0.007	217
DCP 9	.500	1.021	0.585	349	0.232	219	0.115	174	0.142	69	0.042	5	0.040	275	0.017	257	0.017	126	0.006	337
DCP 10	.695	0.887	0.406	331	0.240	183	0.092	87	0.127	4	0.051	246	0.046	175	0.024	77	0.017	30	0.003	224
DCP 11	.800	0.599	0.326	317	0.259	153	0.131	17	0.107	296	0.066	173	0.037	59	0.009	256	0.006	15	0.020	81
DCP 12	.878	0.553	0.240	316	0.201	148	0.120	9	0.071	284	0.053	185	0.037	74	0.017	278	0.015	135	0.013	71
DCP 13	.953	0.545	0.126	293	0.112	100	0.046	299	0.036	237	0.023	196	0.018	29	0.011	247	0.009	113	0.013	36

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.600	5.05	2.97		3166.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.252	644.7	1444.1	0.63E 07	-0.00086	0.889	8.08

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.624	0.237	344	0.026	171	0.017	123	0.008	69	0.008	71	0.004	45	0.006	348	0.000	286	0.003	303
CM		-0.002	0.027	257	0.001	34	0.004	114	0.003	315	0.001	141	0.001	334	0.000	130	0.000	12	0.000	231
CCP 1	.010	2.497	0.841	320	0.107	67	0.095	127	0.030	107	0.035	81	0.023	72	0.020	50	0.016	14	0.013	5
CCP 2	.050	2.437	0.797	320	0.098	82	0.082	152	0.019	83	0.038	79	0.018	71	0.021	25	0.017	24	0.016	344
CCP 3	.100	1.782	0.814	320	0.081	315	0.210	161	0.129	354	0.082	119	0.032	320	0.052	347	0.024	214	0.031	271
CCP 4	.150	1.162	0.617	336	0.178	195	0.089	120	0.081	70	0.044	317	0.002	227	0.017	192	0.013	63	0.006	98
CCP 5	.200	0.992	0.486	328	0.162	172	0.100	41	0.022	288	0.016	242	0.022	93	0.012	336	0.008	295	0.009	233
CCP 6	.250	0.766	0.316	354	0.083	178	0.069	66	0.032	275	0.028	135	0.019	57	0.013	348	0.005	259	0.004	99
CCP 7	.300	0.567	0.279	343	0.066	153	0.058	7	0.044	203	0.037	55	0.019	301	0.008	211	0.001	155	0.003	295
CCP 8	.400	0.401	0.190	17	0.019	187	0.009	102	0.011	158	0.015	85	0.006	19	0.004	39	0.005	24	0.003	320
CCP 9	.500	0.410	0.168	12	0.010	196	0.007	240	0.017	95	0.010	334	0.004	107	0.007	308	0.004	223	0.002	315
CCP 10	.695	0.293	0.124	44	0.016	221	0.007	252	0.016	125	0.005	17	0.007	108	0.007	10	0.001	59	0.004	323
CCP 11	.800	0.143	0.095	36	0.004	168	0.014	265	0.009	85	0.005	288	0.002	68	0.002	297	0.003	156	0.000	174
CCP 12	.878	0.091	0.066	41	0.008	145	0.012	286	0.010	125	0.004	354	0.003	131	0.002	18	0.002	259	0.001	80
CCP 13	.953	0.155	0.044	357	0.017	43	0.019	196	0.011	12	0.005	137	0.002	327	0.002	292	0.001	143	0.001	263

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	96.15	0.600	7.44	2.88		3166.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.249	644.1	1438.2	0.63E 07	-0.00007	1.148	10.51

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.820	0.299	5	0.043	196	0.017	132	0.006	86	0.004	170	0.008	78	0.004	330	0.001	304	0.002	52
CM		-0.022	0.026	188	0.024	345	0.008	186	0.004	157	0.003	18	0.000	233	0.002	137	0.002	356	0.001	160
CCP 1	.010	3.075	0.583	333	0.077	68	0.076	112	0.009	131	0.017	166	0.024	96	0.013	78	0.008	63	0.011	63
CCP 2	.050	2.932	0.348	353	0.199	3	0.138	174	0.062	98	0.020	108	0.019	18	0.015	155	0.018	53	0.011	50
CCP 3	.100	2.180	0.582	15	0.216	18	0.154	127	0.081	222	0.022	22	0.083	120	0.016	19	0.044	339	0.016	114
CCP 4	.150	1.443	0.689	3	0.151	322	0.091	289	0.058	278	0.027	257	0.011	154	0.019	327	0.025	314	0.017	238
CCP 5	.200	1.257	0.571	2	0.108	247	0.067	216	0.061	133	0.027	96	0.040	70	0.033	35	0.022	349	0.015	16
CCP 6	.250	1.015	0.479	11	0.146	245	0.073	189	0.068	136	0.039	66	0.025	17	0.018	310	0.010	262	0.007	226
CCP 7	.300	0.803	0.452	4	0.150	224	0.079	164	0.066	95	0.030	30	0.028	340	0.021	253	0.024	213	0.019	114
CCP 8	.400	0.564	0.341	16	0.130	215	0.051	122	0.038	67	0.026	328	0.015	255	0.020	192	0.017	88	0.030	135
CCP 9	.500	0.581	0.275	11	0.119	182	0.040	64	0.023	354	0.019	223	0.006	147	0.009	115	0.003	57	0.006	312
CCP 10	.695	0.394	0.177	15	0.096	162	0.037	8	0.020	313	0.023	177	0.005	339	0.006	352	0.005	241	0.003	242
CCP 11	.800	0.255	0.131	1	0.085	153	0.028	355	0.013	319	0.017	190	0.010	98	0.015	350	0.008	196	0.007	16
CCP 12	.878	0.208	0.100	345	0.070	139	0.023	352	0.015	323	0.017	193	0.012	67	0.020	319	0.017	188	0.009	61
CCP 13	.953	0.263	0.082	312	0.050	106	0.017	329	0.008	239	0.001	178	0.007	102	0.007	262	0.008	114	0.006	285

FORCED PITCHING OSCILLATION NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	96.15	0.600	9.87	2.99		3166.3	10
	K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
	0.250	643.7	1445.2	0.63E 07	-0.00002	1.295	12.54

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.906	0.352	31	0.018	316	0.025	204	0.002	47	0.010	70	0.002	181	0.004	73	0.004	341	0.003	353
CM		-0.045	0.064	178	0.022	50	0.009	16	0.003	58	0.003	262	0.001	287	0.000	263	0.002	155	0.001	156
DCP 1	.010	3.356	0.440	356	0.102	27	0.060	215	0.038	164	0.018	92	0.002	196	0.009	113	0.003	215	0.006	37
DCP 2	.050	2.931	0.347	101	0.227	25	0.060	96	0.022	329	0.065	8	0.054	253	0.003	19	0.026	201	0.013	102
DCP 3	.100	2.284	0.559	80	0.039	10	0.044	208	0.059	125	0.034	154	0.034	122	0.033	71	0.023	84	0.010	346
DCP 4	.150	1.481	0.636	52	0.209	72	0.063	146	0.069	144	0.050	202	0.020	140	0.002	244	0.004	222	0.009	12
DCP 5	.200	1.333	0.617	38	0.161	33	0.032	114	0.055	59	0.039	81	0.017	95	0.014	119	0.002	90	0.003	170
DCP 6	.250	1.072	0.575	43	0.082	43	0.056	21	0.063	28	0.026	51	0.030	36	0.014	91	0.017	54	0.008	15
DCP 7	.300	0.881	0.579	34	0.104	359	0.044	320	0.065	356	0.041	356	0.028	336	0.026	350	0.018	317	0.007	344
DCP 8	.400	0.636	0.483	34	0.049	307	0.067	276	0.034	346	0.022	300	0.026	266	0.008	262	0.017	292	0.016	234
DCP 9	.500	0.673	0.435	20	0.083	245	0.058	226	0.027	242	0.019	140	0.011	175	0.013	141	0.001	124	0.003	59
DCP 10	.695	0.480	0.294	12	0.078	220	0.054	204	0.014	196	0.018	72	0.011	167	0.006	78	0.007	12	0.004	352
DCP 11	.800	0.364	0.253	358	0.083	234	0.053	170	0.016	224	0.023	85	0.011	88	0.006	26	0.011	353	0.011	15
DCP 12	.878	0.331	0.202	349	0.075	240	0.045	160	0.017	194	0.020	66	0.008	60	0.004	7	0.012	341	0.004	351
DCP 13	.953	0.366	0.152	324	0.054	211	0.020	112	0.007	92	0.004	113	0.006	358	0.005	209	0.007	346	0.007	204

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.86	0.200	5.21	5.07		3183.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.127	221.6	198.6	0.26E 07	-0.00152	0.985	10.35

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.538	0.422	355	0.030	172	0.010	190	0.006	131	0.008	180	0.008	167	0.009	129	0.001	282	0.003	253
CM		-0.009	0.014	269	0.001	128	0.001	63	0.000	322	0.001	13	0.001	36	0.002	308	0.001	95	0.001	33
DCP 1	.010	2.619	2.614	348	0.189	164	0.053	153	0.034	115	0.035	148	0.022	127	0.033	86	0.036	89	0.018	50
DCP 2	.050	1.969	1.381	348	0.145	167	0.045	153	0.025	116	0.017	167	0.017	141	0.024	105	0.016	59	0.009	342
DCP 3	.100	1.071	0.980	349	0.069	166	0.022	181	0.027	186	0.014	174	0.025	161	0.021	179	0.012	115	0.005	57
DCP 4	.150	0.725	0.759	352	0.049	162	0.012	189	0.013	93	0.007	217	0.008	153	0.010	93	0.002	77	0.001	312
DCP 5	.200	0.799	0.597	353	0.039	184	0.007	282	0.007	186	0.011	187	0.013	156	0.017	171	0.002	157	0.005	238
DCP 6	.250	0.695	0.546	355	0.030	171	0.014	217	0.007	59	0.005	217	0.008	204	0.002	80	0.005	264	0.005	294
DCP 7	.300	0.543	0.449	356	0.032	164	0.010	183	0.002	122	0.013	135	0.009	169	0.006	153	0.003	330	0.006	250
DCP 8	.400	0.433	0.344	359	0.021	186	0.009	175	0.009	76	0.007	238	0.009	159	0.007	77	0.006	308	0.005	315
DCP 9	.500	0.523	0.278	2	0.018	189	0.007	232	0.002	194	0.010	193	0.008	152	0.010	167	0.008	251	0.006	274
DCP 10	.695	0.312	0.157	10	0.012	216	0.012	222	0.010	125	0.008	187	0.007	218	0.007	90	0.003	227	0.012	254
DCP 11	.800	0.092	0.119	12	0.016	138	0.007	248	0.010	229	0.011	160	0.006	218	0.015	147	0.013	276	0.017	147
DCP 12	.878	0.003	0.087	23	0.004	233	0.012	189	0.011	86	0.004	235	0.003	206	0.010	102	0.002	32	0.005	198
DCP 13	.953	0.053	0.077	19	0.002	77	0.007	57	0.002	243	0.005	181	0.004	70	0.013	126	0.004	51	0.005	13

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	17.61	0.200	7.73	5.08		3183.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.133	221.2	198.9	0.26E 07	-0.00171	1.192	12.86

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.787	0.396	357	0.022	180	0.010	188	0.003	182	0.012	132	0.001	309	0.010	192	0.004	197	0.008	160
CM		-0.015	0.017	278	0.003	130	0.001	336	0.001	324	0.002	268	0.001	166	0.002	11	0.000	242	0.001	341
DCP 1	.010	4.053	2.530	348	0.173	164	0.064	175	0.018	228	0.048	161	0.010	288	0.032	182	0.028	187	0.019	248
DCP 2	.050	2.704	1.265	350	0.099	163	0.030	196	0.007	311	0.027	152	0.009	249	0.018	174	0.017	152	0.003	317
DCP 3	.100	1.665	0.941	350	0.056	171	0.013	215	0.012	139	0.015	168	0.010	248	0.019	175	0.013	220	0.003	174
DCP 4	.150	1.091	0.713	353	0.045	163	0.018	174	0.004	271	0.023	145	0.007	99	0.011	206	0.006	212	0.008	123
DCP 5	.200	1.151	0.580	355	0.030	165	0.010	203	0.010	172	0.007	140	0.003	53	0.012	184	0.001	213	0.008	174
DCP 6	.250	0.970	0.509	357	0.032	179	0.008	218	0.001	28	0.023	161	0.005	71	0.008	267	0.005	176	0.010	79
DCP 7	.300	0.759	0.435	358	0.025	199	0.009	233	0.009	239	0.004	170	0.013	203	0.013	203	0.008	208	0.017	156
DCP 8	.400	0.657	0.319	359	0.022	196	0.014	217	0.005	19	0.026	137	0.005	101	0.012	245	0.006	210	0.016	139
DCP 9	.500	0.722	0.256	6	0.013	201	0.009	178	0.010	174	0.011	81	0.002	47	0.010	176	0.002	348	0.007	169
DCP 10	.695	0.403	0.144	23	0.004	198	0.003	140	0.003	23	0.015	87	0.007	4	0.008	132	0.003	216	0.004	4
DCP 11	.800	0.179	0.104	25	0.015	306	0.012	182	0.010	163	0.002	279	0.008	244	0.015	209	0.005	120	0.018	164
DCP 12	.878	0.102	0.080	30	0.007	234	0.008	128	0.007	16	0.014	104	0.008	9	0.003	144	0.003	351	0.004	137
DCP 13	.953	0.112	0.073	18	0.010	296	0.005	173	0.008	203	0.007	197	0.005	265	0.013	206	0.005	152	0.009	229

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	17.27	0.200	10.14	5.12		3183.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.130	221.3	199.9	0.26E 07	-0.00037	1.422	15.31

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.989	0.406	5	0.025	234	0.011	68	0.006	182	0.006	330	0.001	74	0.002	164	0.006	85	0.004	85
CM		-0.024	0.005	236	0.007	298	0.008	148	0.006	336	0.004	163	0.001	130	0.000	240	0.001	249	0.001	256
DCP 1	.010	4.992	2.295	3	0.294	312	0.282	180	0.207	49	0.131	259	0.116	130	0.044	343	0.030	217	0.042	97
DCP 2	.050	3.398	1.213	3	0.144	288	0.142	152	0.119	2	0.077	219	0.051	79	0.034	261	0.023	117	0.019	14
DCP 3	.100	2.073	0.941	2	0.093	265	0.068	118	0.038	298	0.025	152	0.025	333	0.020	168	0.011	345	0.025	166
DCP 4	.150	1.413	0.733	2	0.087	231	0.073	83	0.051	280	0.044	122	0.030	330	0.033	172	0.009	96	0.007	62
DCP 5	.200	1.416	0.605	4	0.059	226	0.040	62	0.038	223	0.024	29	0.019	252	0.016	72	0.005	215	0.005	93
DCP 6	.250	1.226	0.549	2	0.079	198	0.065	42	0.054	242	0.041	91	0.025	288	0.026	151	0.010	73	0.004	288
DCP 7	.300	0.925	0.462	6	0.047	207	0.034	34	0.037	210	0.027	32	0.012	295	0.013	44	0.005	143	0.006	34
DCP 8	.400	0.839	0.346	4	0.052	194	0.043	17	0.033	202	0.023	38	0.009	252	0.012	133	0.010	58	0.004	242
DCP 9	.500	0.685	0.272	10	0.019	176	0.029	352	0.035	171	0.026	334	0.010	128	0.009	312	0.014	83	0.004	292
DCP 10	.695	0.468	0.152	17	0.018	157	0.021	312	0.022	128	0.011	296	0.003	90	0.003	168	0.003	12	0.013	23
DCP 11	.800	0.263	0.103	11	0.025	61	0.027	332	0.017	108	0.019	321	0.009	43	0.008	3	0.013	65	0.021	101
DCP 12	.878	0.208	0.097	3	0.020	129	0.020	311	0.015	122	0.009	345	0.009	272	0.013	175	0.003	132	0.004	132
DCP 13	.953	0.183	0.083	352	0.019	59	0.022	208	0.007	85	0.013	268	0.011	351	0.007	343	0.005	112	0.012	231

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.86	0.200	12.24	4.84		3148.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.128	219.9	196.8	0.25E 07	0.00209	1.732	16.97

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.100	0.446	28	0.149	272	0.093	131	0.056	6	0.033	245	0.022	176	0.014	346	0.008	251	0.011	128
CM		-0.017	0.052	157	0.052	18	0.034	252	0.022	139	0.016	30	0.012	277	0.009	160	0.006	59	0.005	331
DCP 1	.010	4.932	1.783	67	1.338	13	0.727	271	0.378	178	0.245	99	0.182	32	0.178	301	0.133	213	0.127	118
DCP 2	.050	3.865	0.914	51	0.518	345	0.267	212	0.111	80	0.009	337	0.025	9	0.050	247	0.029	135	0.036	74
DCP 3	.100	2.312	0.952	41	0.476	314	0.303	189	0.160	80	0.093	4	0.103	283	0.103	185	0.076	89	0.057	5
DCP 4	.150	1.953	0.777	38	0.367	303	0.231	177	0.116	73	0.081	1	0.075	267	0.059	167	0.035	53	0.020	12
DCP 5	.200	1.684	0.708	30	0.318	283	0.219	154	0.129	40	0.078	299	0.066	297	0.055	109	0.040	12	0.033	283
DCP 6	.250	1.412	0.636	31	0.298	277	0.204	150	0.116	47	0.089	325	0.075	219	0.041	122	0.037	34	0.033	302
DCP 7	.300	1.319	0.577	26	0.259	264	0.187	131	0.118	15	0.088	272	0.072	169	0.051	62	0.040	328	0.036	242
DCP 8	.400	0.946	0.489	22	0.245	247	0.169	119	0.106	17	0.086	286	0.064	174	0.035	75	0.045	5	0.042	238
DCP 9	.500	0.750	0.403	17	0.221	230	0.169	93	0.107	334	0.083	224	0.067	120	0.053	8	0.043	271	0.041	157
DCP 10	.695	0.531	0.262	5	0.178	207	0.133	73	0.090	314	0.066	206	0.061	37	0.051	326	0.037	224	0.037	139
DCP 11	.800	0.322	0.231	353	0.154	202	0.103	72	0.084	317	0.085	199	0.061	75	0.046	320	0.042	276	0.028	94
DCP 12	.878	0.121	0.195	345	0.112	195	0.074	75	0.062	327	0.041	193	0.035	79	0.039	320	0.028	192	0.025	100
DCP 13	.953	0.203	0.158	340	0.085	183	0.046	45	0.038	280	0.035	154	0.020	13	0.016	253	0.012	146	0.016	39

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.81	0.200	14.85	4.75		3172.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.126	222.0	200.8	0.26E 07	0.00047	1.970	19.15

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.227	0.448	60	0.152	326	0.088	229	0.035	189	0.045	136	0.051	31	0.032	290	0.023	194	0.016	118
CM		-0.080	0.087	170	0.057	76	0.035	359	0.019	295	0.018	245	0.021	165	0.016	75	0.012	356	0.008	293
CCP 1	.010	4.836	2.525	123	1.598	63	0.545	357	0.395	330	0.423	280	0.247	212	0.134	161	0.115	134	0.113	86
CCP 2	.050	3.729	1.205	103	0.553	37	0.145	331	0.190	301	0.158	219	0.081	138	0.043	85	0.033	56	0.037	13
CCP 3	.100	2.367	1.018	82	0.414	8	0.151	294	0.164	265	0.139	187	0.087	138	0.078	78	0.066	41	0.074	1
CCP 4	.150	1.625	0.816	75	0.320	357	0.179	294	0.164	243	0.145	184	0.118	111	0.077	50	0.042	348	0.034	329
CCP 5	.200	1.626	0.753	66	0.291	335	0.170	262	0.129	218	0.125	158	0.104	79	0.063	3	0.026	295	0.022	282
CCP 6	.250	1.464	0.655	63	0.248	331	0.162	264	0.125	206	0.123	163	0.124	79	0.078	15	0.052	312	0.035	270
CCP 7	.300	1.212	0.621	55	0.265	317	0.188	243	0.112	193	0.121	138	0.130	52	0.089	331	0.053	255	0.051	211
CCP 8	.400	1.120	0.530	48	0.229	306	0.156	236	0.101	168	0.111	131	0.136	46	0.084	333	0.062	264	0.041	208
CCP 9	.500	1.147	0.457	35	0.222	286	0.162	206	0.089	141	0.096	96	0.116	14	0.101	278	0.059	205	0.063	155
CCP 10	.695	0.823	0.359	14	0.221	265	0.163	181	0.086	102	0.075	53	0.096	327	0.075	233	0.067	171	0.055	96
CCP 11	.800	0.453	0.294	3	0.172	263	0.116	177	0.047	119	0.061	56	0.090	343	0.080	258	0.059	164	0.041	90
CCP 12	.878	0.315	0.232	356	0.121	253	0.089	166	0.031	93	0.031	66	0.049	336	0.044	238	0.048	157	0.024	91
CCP 13	.953	0.378	0.199	348	0.083	243	0.073	144	0.035	49	0.029	337	0.032	270	0.031	171	0.031	93	0.029	27

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	17.36	0.200	17.36	4.88		3172.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.131	221.8	201.0	0.26E 07	-0.00228	2.048	19.96

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.238	0.509	75	0.086	14	0.056	356	0.061	291	0.045	265	0.052	202	0.042	141	0.028	93	0.015	22
CM		-0.108	0.109	185	0.047	126	0.031	98	0.028	62	0.020	25	0.021	340	0.018	289	0.012	238	0.007	183
CCP 1	.010	4.283	3.152	144	1.046	119	0.713	133	0.445	94	0.194	80	0.189	61	0.067	41	0.088	43	0.050	1
CCP 2	.050	3.527	1.461	121	0.291	118	0.332	89	0.105	42	0.145	14	0.054	337	0.054	313	0.017	323	0.032	297
CCP 3	.100	2.283	1.212	101	0.292	76	0.303	53	0.152	19	0.157	352	0.087	295	0.040	289	0.036	332	0.047	289
CCP 4	.150	1.537	0.949	92	0.263	70	0.245	45	0.157	13	0.142	340	0.092	302	0.045	260	0.025	255	0.022	221
CCP 5	.200	1.574	0.826	83	0.177	46	0.175	17	0.131	333	0.114	298	0.113	258	0.081	202	0.042	194	0.031	153
CCP 6	.250	1.449	0.745	78	0.188	43	0.173	14	0.150	340	0.131	304	0.116	265	0.071	226	0.049	190	0.030	169
CCP 7	.300	1.197	0.694	69	0.164	19	0.157	345	0.155	310	0.117	273	0.130	243	0.101	188	0.049	166	0.048	126
CCP 8	.400	1.169	0.587	60	0.158	5	0.143	336	0.140	306	0.127	268	0.122	230	0.090	179	0.066	142	0.044	118
CCP 9	.500	1.201	0.540	47	0.171	330	0.122	302	0.150	261	0.082	230	0.131	190	0.098	139	0.074	99	0.057	47
CCP 10	.695	0.901	0.464	29	0.154	313	0.118	272	0.118	238	0.084	194	0.111	151	0.098	93	0.080	58	0.053	1
CCP 11	.800	0.522	0.343	16	0.151	298	0.096	273	0.116	239	0.092	208	0.084	148	0.072	107	0.051	38	0.034	333
CCP 12	.878	0.453	0.267	13	0.108	310	0.053	268	0.053	229	0.051	197	0.055	134	0.070	89	0.059	27	0.045	334
CCP 13	.953	0.466	0.229	2	0.096	279	0.049	228	0.058	187	0.035	115	0.041	89	0.014	27	0.023	345	0.023	246

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	17.27	0.200	24.78	4.92		3172.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.130	221.4	199.4	0.26E 07	-0.00366	1.346	29.20

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.161	0.191	51	0.045	171	0.031	288	0.024	44	0.021	75	0.015	120	0.016	0	0.009	252	0.015	146
CM		-0.203	0.046	231	0.012	321	0.007	62	0.004	166	0.005	214	0.005	273	0.002	165	0.004	47	0.003	286
DCP 1	.010	1.722	0.631	156	0.288	237	0.237	333	0.173	78	0.135	158	0.079	271	0.063	354	0.027	100	0.014	220
DCP 2	.050	2.324	0.167	35	0.035	205	0.024	333	0.027	70	0.027	105	0.009	126	0.012	358	0.008	355	0.012	194
DCP 3	.100	1.538	0.235	28	0.044	142	0.024	310	0.026	90	0.008	106	0.009	217	0.031	24	0.004	140	0.019	190
DCP 4	.150	1.117	0.210	41	0.044	195	0.037	317	0.035	68	0.024	110	0.017	166	0.015	358	0.008	341	0.027	168
DCP 5	.200	1.283	0.241	39	0.021	159	0.032	300	0.025	70	0.023	74	0.017	138	0.025	353	0.005	299	0.024	177
DCP 6	.250	1.302	0.230	42	0.052	190	0.037	314	0.038	66	0.024	99	0.021	148	0.019	33	0.010	6	0.027	171
DCP 7	.300	1.087	0.250	39	0.032	160	0.036	306	0.027	50	0.036	78	0.022	127	0.028	18	0.006	290	0.027	163
DCP 8	.400	1.295	0.216	49	0.065	175	0.031	285	0.039	50	0.036	73	0.031	118	0.018	0	0.022	350	0.021	148
DCP 9	.500	1.342	0.229	48	0.054	160	0.038	273	0.029	21	0.029	53	0.024	140	0.015	355	0.025	259	0.021	136
DCP 10	.695	1.120	0.214	53	0.060	163	0.041	242	0.022	345	0.029	28	0.035	134	0.003	267	0.019	251	0.016	124
DCP 11	.800	0.797	0.200	61	0.060	143	0.032	218	0.024	350	0.013	97	0.016	61	0.024	350	0.034	212	0.014	93
DCP 12	.878	0.761	0.163	60	0.039	146	0.019	249	0.008	60	0.019	44	0.017	60	0.008	311	0.011	209	0.017	83
DCP 13	.953	0.705	0.120	44	0.031	107	0.010	212	0.012	356	0.005	350	0.007	6	0.018	8	0.019	159	0.000	326

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.58	0.400	9.93	4.68		3145.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.064	433.9	726.3	0.47E 07	0.00075	1.302	13.15

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.877	0.275	29	0.093	27	0.005	45	0.038	290	0.038	192	0.018	123	0.008	45	0.002	216	0.003	179
CM		-0.029	0.055	168	0.030	57	0.002	9	0.012	12	0.010	290	0.008	232	0.006	154	0.002	74	0.002	111
DCP 1	.010	4.323	0.683	70	1.328	69	0.323	39	0.424	359	0.333	283	0.242	235	0.162	197	0.113	173	0.074	154
DCP 2	.050	2.708	0.483	78	0.636	49	0.073	323	0.136	340	0.135	251	0.077	197	0.045	162	0.032	157	0.042	128
DCP 3	.100	1.875	0.445	61	0.407	35	0.021	321	0.135	323	0.130	224	0.051	172	0.048	147	0.027	90	0.021	137
DCP 4	.150	1.455	0.439	46	0.264	18	0.039	231	0.074	303	0.089	200	0.039	140	0.035	110	0.020	46	0.036	41
DCP 5	.200	1.286	0.334	42	0.202	14	0.006	260	0.093	298	0.094	199	0.051	139	0.045	87	0.023	10	0.005	68
DCP 6	.250	1.132	0.391	37	0.157	359	0.035	190	0.054	288	0.064	179	0.028	119	0.030	75	0.016	335	0.001	275
DCP 7	.300	0.940	0.350	33	0.125	1	0.002	173	0.076	281	0.078	185	0.048	121	0.042	55	0.020	337	0.008	304
DCP 8	.400	0.646	0.315	26	0.080	322	0.032	159	0.035	261	0.044	162	0.029	104	0.032	28	0.021	297	0.015	231
DCP 9	.500	0.656	0.303	17	0.064	293	0.015	136	0.045	243	0.044	145	0.027	81	0.025	9	0.005	325	0.015	299
DCP 10	.695	0.471	0.233	2	0.062	229	0.020	70	0.035	225	0.033	126	0.025	65	0.023	341	0.010	213	0.006	30
DCP 11	.800	0.307	0.214	356	0.054	230	0.005	328	0.043	200	0.034	119	0.031	48	0.025	306	0.009	215	0.009	239
DCP 12	.878	0.154	0.202	35[illegible]	0.053	230	0.013	260	0.029	175	0.017	122	0.018	52	0.016	306	0.006	165	0.001	15
DCP 13	.953	0.285	0.199	344	0.044	210	0.021	280	0.032	163	0.015	91	0.019	26	0.019	277	0.007	190	0.010	162

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.84	0.400	12.29	4.72		3145.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.065	433.6	723.8	0.47E 07	-0.00034	1.331	13.77

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.963	0.226	71	0.061	51	0.049	90	0.013	32	0.023	14	0.016	310	0.004	249	0.005	262	0.006	165
CM		-0.051	0.074	181	0.014	114	0.017	142	0.007	107	0.009	112	0.009	98	0.005	42	0.005	47	0.002	327
DCP 1	.010	4.380	1.628	153	0.727	104	0.633	139	0.251	124	0.257	113	0.161	107	0.124	101	0.104	111	0.070	103
DCP 2	.050	2.746	0.813	152	0.312	70	0.276	127	0.122	69	0.089	93	0.069	62	0.045	83	0.050	55	0.022	79
DCP 3	.100	2.029	0.527	113	0.192	62	0.192	113	0.070	53	0.078	73	0.050	15	0.028	37	0.028	7	0.007	89
DCP 4	.150	1.538	0.454	93	0.135	43	0.148	84	0.040	15	0.074	31	0.032	333	0.034	356	0.017	321	0.015	335
DCP 5	.200	1.346	0.342	92	0.131	70	0.136	80	0.049	44	0.079	36	0.047	353	0.032	347	0.021	351	0.018	336
DCP 6	.250	1.215	0.372	74	0.083	18	0.089	67	0.016	331	0.052	5	0.021	301	0.022	300	0.007	339	0.015	251
DCP 7	.300	1.040	0.306	72	0.089	55	0.101	59	0.038	18	0.061	0	0.033	323	0.025	303	0.010	333	0.012	318
DCP 8	.400	0.727	0.284	55	0.046	344	0.047	35	0.005	234	0.033	325	0.006	347	0.021	284	0.014	293	0.02.	207
DCP 9	.500	0.739	0.281	41	0.047	345	0.055	3	0.016	267	0.038	327	0.029	291	0.025	238	0.015	263	0.015	194
DCP 10	.695	0.567	0.265	18	0.040	305	0.048	332	0.021	272	0.029	303	0.036	266	0.019	192	0.019	238	0.014	142
DCP 11	.800	0.384	0.217	8	0.024	328	0.035	323	0.021	325	0.023	290	0.032	283	0.020	203	0.020	215	0.015	195
DCP 12	.878	0.260	0.216	3	0.025	338	0.034	319	0.026	311	0.017	260	0.028	273	0.016	200	0.025	198	0.014	106
DCP 13	.953	0.383	0.223	354	0.011	8	0.028	307	0.012	321	0.010	294	0.022	252	0.002	165	0.016	206	0.005	129

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.81	0.400	14.89	4.87		3176.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.064	437.2	742.2	0.4PE 07	-0.00148	1.196	13.53

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.905	0.201	91	0.025	154	0.015	209	0.026	191	0.024	215	0.009	212	0.013	216	0.004	165	0.006	210
CM		-0.104	0.057	196	0.022	234	0.002	223	0.008	276	0.006	306	0.005	335	0.004	344	0.003	296	0.001	55
DCP 1	.050	2.601	0.963	151	0.332	230	0.097	222	0.173	250	0.126	290	0.063	307	0.039	332	0.035	66	0.027	122
DCP 2	.100	1.885	0.605	134	0.253	226	0.075	218	0.114	229	0.085	261	0.039	312	0.033	291	0.024	333	0.023	114
DCP 3	.150	1.434	0.479	120	0.140	188	0.028	186	0.075	199	0.064	243	0.046	277	0.039	248	0.027	287	0.004	324
DCP 4	.200	1.305	0.355	122	0.128	201	0.066	180	0.068	210	0.061	214	0.025	255	0.029	221	0.028	290	0.019	226
DCP 5	.250	1.213	0.342	103	0.064	157	0.013	214	0.040	176	0.049	209	0.034	243	0.033	202	0.026	219	0.010	270
DCP 6	.300	0.945	0.277	100	0.066	170	0.029	191	0.044	200	0.065	215	0.034	222	0.034	221	0.037	260	0.027	227
DCP 7	.400	0.813	0.245	79	0.047	104	0.005	352	0.023	140	0.026	192	0.024	195	0.018	199	0.019	179	0.006	221
DCP 8	.500	0.882	0.239	62	0.067	68	0.013	266	0.022	144	0.031	184	0.029	179	0.017	204	0.011	203	0.012	260
DCP 9	.695	0.673	0.212	31	0.075	55	0.012	356	0.026	111	0.023	130	0.022	106	0.004	182	0.022	91	0.004	292
DCP 10	.800	0.465	0.193	20	0.060	46	0.002	237	0.022	98	0.018	126	0.013	91	0.016	138	0.011	128	0.007	204
DCP 11	.878	0.354	0.186	18	0.073	51	0.013	129	0.026	105	0.012	103	0.018	113	0.021	179	0.023	95	0.010	143
DCP 12	.953	0.488	0.171	7	0.055	60	0.014	117	0.010	115	0.013	101	0.012	97	0.011	150	0.010	106	0.004	260

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.69	0.400	17.47	4.93		3176.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.064	436.7	739.2	0.48E 07	-0.00355	1.155	14.01

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.936	0.154	110	0.041	224	0.030	245	0.016	352	0.008	214	0.007	352	0.009	6	0.010	127	0.006	262
CM		-0.125	0.037	243	0.010	285	0.007	12	0.002	114	0.003	63	0.003	165	0.002	196	0.002	292	0.001	23
DCP 1	.010	2.696	1.271	181	0.177	345	0.063	193	0.117	30	0.046	186	0.023	290	0.060	358	0.068	115	0.055	254
DCP 2	.050	1.922	0.314	148	0.184	249	0.065	311	0.055	337	0.029	45	0.009	151	0.014	243	0.014	150	0.022	284
DCP 3	.100	1.612	0.108	91	0.251	259	0.053	305	0.014	54	0.038	95	0.011	150	0.012	325	0.025	247	0.021	3
DCP 4	.150	1.149	0.203	116	0.108	218	0.059	268	0.034	333	0.003	106	0.014	327	0.009	60	0.005	138	0.009	242
DCP 5	.200	1.227	0.109	104	0.128	240	0.060	307	0.008	17	0.013	121	0.009	153	0.015	31	0.008	153	0.015	295
DCP 6	.250	1.066	0.206	113	0.092	213	0.048	252	0.026	325	0.003	223	0.012	351	0.013	35	0.009	100	0.004	289
DCP 7	.300	0.919	0.162	110	0.079	230	0.062	296	0.019	17	0.022	226	0.015	45	0.015	13	0.020	122	0.008	277
DCP 8	.400	0.792	0.156	106	0.068	200	0.034	220	0.014	287	0.015	227	0.012	321	0.005	336	0.009	51	0.010	139
DCP 9	.500	0.543	0.189	100	0.036	174	0.060	245	0.031	24	0.020	239	0.012	60	0.006	241	0.012	153	0.010	258
DCP 10	.655	0.783	0.176	74	0.041	103	0.049	180	0.010	315	0.018	202	0.020	319	0.015	22	0.014	110	0.009	196
DCP 11	.800	0.575	0.136	83	0.022	104	0.025	206	0.009	310	0.014	287	0.008	13	0.012	32	0.020	167	0.010	331
DCP 12	.878	0.472	0.106	65	0.018	69	0.013	151	0.004	284	0.002	311	0.006	30	0.009	20	0.014	63	0.011	247
DCP 13	.953	0.592	0.100	54	0.023	92	0.017	180	0.011	260	0.015	247	0.018	316	0.010	327	0.008	69	0.007	102

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.75	0.400	24.91	4.92		3176.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.064	436.1	734.8	0.48E 07	-0.00109	1.203	29.74

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.036	0.160	17	0.050	171	0.005	335	0.006	53	0.003	249	0.007	87	0.008	11	0.003	144	0.005	232
CM		-0.168	0.033	197	0.011	358	0.001	111	0.001	166	0.002	78	0.001	245	0.002	173	0.002	310	0.001	13
DCP 1	.010	1.749	0.205	166	0.099	238	0.084	320	0.038	45	0.018	128	0.011	271	0.007	37	0.004	135	0.010	249
DCP 2	.050	1.947	0.135	24	0.045	184	0.015	323	0.008	40	0.010	12	0.015	113	0.006	130	0.007	271	0.005	283
DCP 3	.100	1.575	0.244	24	0.097	120	0.046	112	0.033	116	0.019	124	0.020	123	0.013	4	0.007	311	0.013	284
DCP 4	.150	1.347	0.179	13	0.068	192	0.023	304	0.010	357	0.008	350	0.019	72	0.009	102	0.007	231	0.009	319
DCP 5	.200	1.320	0.238	17	0.074	131	0.027	108	0.022	11	0.005	156	0.013	104	0.009	5	0.004	341	0.008	253
DCP 6	.250	1.243	0.212	8	0.054	184	0.017	332	0.005	30	0.004	269	0.012	75	0.006	55	0.002	135	0.004	253
DCP 7	.300	1.041	0.233	13	0.061	151	0.009	115	0.009	99	0.004	191	0.007	102	0.013	5	0.004	85	0.004	221
DCP 8	.400	0.962	0.199	9	0.053	184	0.016	354	0.005	89	0.013	237	0.007	40	0.009	39	0.007	158	0.008	243
DCP 9	.500	1.076	0.198	16	0.058	168	0.004	178	0.003	347	0.010	284	0.007	64	0.013	5	0.002	130	0.003	223
DCP 10	.695	0.910	0.157	21	0.058	173	0.010	265	0.007	327	0.009	296	0.009	88	0.005	358	0.005	132	0.008	212
DCP 11	.800	0.749	0.124	19	0.045	190	0.017	321	0.009	43	0.005	198	0.005	41	0.015	7	0.013	141	0.007	234
DCP 12	.878	0.641	0.104	17	0.038	191	0.012	327	0.014	0	0.005	227	0.006	112	0.008	353	0.009	122	0.006	163
DCP 13	.953	0.709	0.093	23	0.029	167	0.006	156	0.001	159	0.005	181	0.001	32	0.007	286	0.001	85	0.004	222

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.84	0.600	4.89	5.02		3187.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.044	638.9	1434.1	0.63E 07	-0.00093	0.970	8.82

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.524	0.474	356	0.079	58	0.028	300	0.008	270	0.013	218	0.010	133	0.005	52	0.001	342	0.002	227
CM		-0.008	0.017	206	0.013	88	0.007	352	0.002	337	0.004	309	0.004	233	0.002	187	0.002	124	0.001	54
DCP 1	.010	2.024	1.866	352	0.493	74	0.037	278	0.029	50	0.021	188	0.007	110	0.010	149	0.002	107	0.009	112
DCP 2	.050	1.985	1.495	350	0.391	78	0.147	330	0.030	339	0.039	255	0.008	127	0.021	190	0.024	54	0.039	347
DCP 3	.100	1.367	1.092	350	0.406	71	0.205	329	0.074	32	0.172	302	0.032	200	0.097	279	0.058	169	0.042	267
DCP 4	.150	0.942	0.921	355	0.179	65	0.135	332	0.085	255	0.028	271	0.081	217	0.039	131	0.031	197	0.037	115
DCP 5	.200	0.849	0.770	355	0.119	46	0.069	314	0.063	254	0.034	201	0.055	191	0.053	109	0.007	138	0.040	90
DCP 6	.250	0.665	0.622	359	0.094	44	0.037	281	0.033	262	0.042	189	0.030	149	0.036	105	0.024	38	0.009	53
DCP 7	.300	0.514	0.558	357	0.075	33	0.030	272	0.035	251	0.042	173	0.029	116	0.031	78	0.026	15	0.010	324
DCP 8	.400	0.353	0.379	2	0.066	42	0.029	244	0.004	151	0.017	185	0.018	139	0.014	44	0.011	342	0.008	267
DCP 9	.500	0.367	0.321	1	0.041	23	0.020	225	0.006	216	0.018	156	0.018	68	0.013	15	0.011	325	0.012	245
DCP 10	.695	0.235	0.194	5	0.014	355	0.015	196	0.004	84	0.011	161	0.013	65	0.008	11	0.006	312	0.008	227
DCP 11	.800	0.135	0.161	3	0.018	278	0.018	168	0.003	343	0.011	146	0.015	50	0.010	316	0.006	232	0.002	53
DCP 12	.878	0.100	0.153	2	0.038	263	0.019	183	0.008	143	0.011	112	0.010	38	0.004	325	0.003	252	0.011	268
DCP 13	.953	0.168	0.148	355	0.037	246	0.014	176	0.009	151	0.010	88	0.008	42	0.011	339	0.008	257	0.007	196

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	17.01	0.600	7.39	4.94		3187.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.045	638.3	1431.6	0.63E 07	-0.00113	0.997	9.05

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.728	0.299	8	0.105	67	0.010	96	0.011	41	0.011	76	0.009	345	0.002	269	0.002	232	0.002	6
CM		-0.021	0.033	194	0.015	88	0.003	172	0.005	90	0.003	122	0.004	57	0.002	54	0.001	34	0.001	26
DCP 1	.010	2.842	1.026	356	0.346	78	0.131	165	0.016	81	0.027	57	0.010	327	0.005	273	0.011	129	0.014	4
DCP 2	.050	2.549	0.602	358	0.576	75	0.041	234	0.032	130	0.040	121	0.018	124	0.034	16	0.016	257	0.022	356
DCP 3	.100	1.851	0.511	0	0.472	75	0.159	163	0.094	74	0.191	142	0.014	42	0.094	128	0.046	211	0.045	68
DCP 4	.150	1.294	0.525	6	0.297	78	0.033	57	0.107	84	0.044	88	0.107	59	0.008	203	0.040	73	0.027	137
DCP 5	.200	1.139	0.456	10	0.223	68	0.071	17	0.044	61	0.047	20	0.052	44	0.024	337	0.039	61	0.021	37
DCP 6	.250	0.899	0.373	15	0.143	68	0.045	56	0.034	33	0.049	25	0.037	4	0.034	346	0.022	356	0.019	323
DCP 7	.300	0.729	0.354	13	0.130	59	0.048	18	0.023	349	0.040	8	0.029	337	0.033	320	0.011	321	0.027	326
DCP 8	.400	0.497	0.245	18	0.070	54	0.019	99	0.020	5	0.025	6	0.036	303	0.022	250	0.008	222	0.005	233
DCP 9	.500	0.504	0.227	15	0.046	37	0.009	83	0.014	324	0.011	349	0.018	286	0.012	263	0.010	253	0.011	255
DCP 10	.695	0.336	0.180	13	0.018	274	0.014	119	0.013	293	0.004	257	0.010	265	0.004	218	0.006	217	0.007	197
DCP 11	.800	0.247	0.194	9	0.027	290	0.015	328	0.027	250	0.005	181	0.019	216	0.013	152	0.006	133	0.004	56
DCP 12	.878	0.201	0.185	4	0.026	278	0.020	325	0.020	251	0.010	254	0.011	194	0.002	333	0.007	239	0.007	167
DCP 13	.953	0.263	0.193	357	0.026	264	0.015	306	0.008	229	0.006	275	0.011	225	0.008	190	0.005	154	0.007	127

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	17.12	0.600	9.76	4.93		3187.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.045	637.8	1430.5	0.63E 07	-0.00134	1.015	11.96

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.866	0.160	30	0.055	95	0.032	150	0.008	189	0.008	233	0.006	244	0.009	256	0.006	149	0.001	105
CM		-0.041	0.053	193	0.005	56	0.006	236	0.005	291	0.003	310	0.003	285	0.002	12	0.002	345	0.002	326
DCP 1	.010	3.286	0.464	3	0.162	82	0.004	350	0.058	246	0.017	201	0.024	231	0.023	171	0.004	35	0.010	170
DCP 2	.050	2.804	0.207	163	0.259	76	0.122	176	0.032	26	0.037	265	0.026	299	0.035	219	0.016	52	0.024	350
DCP 3	.100	2.117	0.347	164	0.075	39	0.053	215	0.120	296	0.109	346	0.012	359	0.071	7	0.040	103	0.015	32
DCP 4	.150	1.473	0.167	50	0.258	87	0.160	179	0.106	262	0.049	295	0.045	265	0.041	332	0.016	81	0.009	199
DCP 5	.200	1.272	0.206	54	0.202	100	0.100	183	0.008	185	0.061	245	0.057	303	0.047	334	0.004	68	0.040	49
DCP 6	.250	1.037	0.220	39	0.115	98	0.046	139	0.043	150	0.045	192	0.026	204	0.031	244	0.026	257	0.025	280
DCP 7	.300	0.872	0.221	40	0.105	107	0.058	155	0.040	136	0.050	214	0.019	251	0.042	255	0.020	284	0.017	349
DCP 8	.400	0.607	0.193	32	0.016	127	0.039	124	0.022	137	0.010	143	0.017	186	0.026	189	0.011	159	0.018	235
DCP 9	.500	0.644	0.215	24	0.029	182	0.039	129	0.029	152	0.017	132	0.014	215	0.023	208	0.013	187	0.011	202
DCP10	.695	0.446	0.208	13	0.019	240	0.019	66	0.006	93	0.008	142	0.018	79	0.006	127	0.013	96	0.006	87
DCP11	.800	0.333	0.194	16	0.014	169	0.023	48	0.014	160	0.003	143	0.007	161	0.010	243	0.021	184	0.019	157
DCP12	.878	0.293	0.205	11	0.010	60	0.031	45	0.019	38	0.008	76	0.015	52	0.004	7	0.002	158	0.009	35
DCP13	.953	0.359	0.198	8	0.023	61	0.004	88	0.021	93	0.010	122	0.008	112	0.003	139	0.015	140	0.007	85

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.95	0.600	14.50	4.62		3175.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.044	638.6	1427.2	0.62E 07	-0.00151	1.068	16.31

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.979	0.088	57	0.009	236	0.018	257	0.006	6	0.006	304	0.001	246	0.006	253	0.006	37	0.003	238
CM		-0.096	0.046	195	0.006	1	0.004	108	0.000	344	0.001	89	0.001	69	0.003	49	0.001	180	0.001	22
DCP 1	.010	3.224	0.378	163	0.201	72	0.084	225	0.054	358	0.075	287	0.065	301	0.033	317	0.057	319	0.061	327
DCP 2	.050	2.397	0.393	168	0.103	288	0.064	270	0.011	203	0.038	255	0.026	149	0.044	158	0.039	138	0.054	159
DCP 3	.100	1.992	0.162	145	0.021	316	0.029	222	0.033	338	0.033	19	0.020	70	0.025	24	0.002	20	0.019	5
DCP 4	.150	1.488	0.113	143	0.047	245	0.061	196	0.024	267	0.021	120	0.019	209	0.000	157	0.026	132	0.013	157
DCP 5	.200	1.336	0.127	137	0.055	288	0.014	189	0.015	354	0.024	30	0.023	64	0.008	334	0.007	10	0.005	270
DCP 6	.250	1.175	0.097	74	0.016	251	0.018	208	0.003	123	0.010	122	0.010	181	0.013	298	0.012	77	0.005	5
DCP 7	.300	1.011	0.108	93	0.042	273	0.008	276	0.013	39	0.009	86	0.021	74	0.006	3	0.013	23	0.014	264
DCP 8	.400	0.773	0.168	42	0.019	44	0.013	315	0.021	47	0.005	359	0.011	44	0.018	315	0.021	26	0.007	2[illegible]
DCP 9	.500	0.803	0.161	34	0.016	151	0.024	323	0.015	66	0.008	287	0.009	268	0.007	270	0.012	41	0.012	2[illegible]
DCP10	.695	0.670	0.174	17	0.019	171	0.018	255	0.006	36	0.007	324	0.010	286	0.010	209	0.013	314	0.002	13[illegible]
DCP11	.800	0.526	0.160	16	0.024	209	0.031	271	0.011	261	0.014	246	0.009	246	0.024	233	0.007	109	0.013	17[illegible]
DCP12	.878	0.484	0.136	21	0.022	194	0.029	265	0.012	255	0.019	264	0.009	161	0.018	216	0.006	178	0.004	224
DCP13	.953	0.552	0.131	14	0.028	180	0.001	197	0.010	180	0.002	17	0.008	235	0.004	139	0.006	350	0.009	65

FORCED PITCHING OSCILLATION NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.72	0.600	17.03	4.83		3175.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.044	638.1	1425.3	0.62E 07	-0.00203	1.098	17.14

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		0.966	0.106 85	0.020 10	0.013 118	0.004 339	0.002 186	0.003 40	0.007 125	0.005 41	0.001 171
CM		-0.121	0.042 206	0.007 235	0.003 297	0.002 156	0.001 284	0.001 287	0.001 234	0.002 289	0.001 355
DCP 1	.010	2.947	1.002 176	0.194 88	0.141 190	0.051 73	0.021 211	0.008 324	0.046 209	0.010 291	0.017 247
DCP 2	.050	2.051	0.377 158	0.054 341	0.038 141	0.027 296	0.005 17	0.026 347	0.018 130	0.036 342	0.009 12
DCP 3	.100	1.769	0.231 144	0.112 295	0.051 349	0.010 166	0.018 249	0.008 53	0.019 144	0.008 29	0.006 109
DCP 4	.150	1.382	0.186 141	0.041 288	0.006 88	0.004 53	0.014 198	0.013 342	0.024 110	0.004 65	0.012 99
DCP 5	.200	1.240	0.161 104	0.051 284	0.030 8	0.008 156	0.013 268	0.007 87	0.019 142	0.012 96	0.005 154
DCP 6	.250	1.129	0.139 95	0.024 290	0.007 116	0.005 338	0.010 206	0.004 17	0.017 141	0.008 328	0.011 27
DCP 7	.300	0.974	0.156 76	0.024 279	0.011 79	0.005 218	0.004 245	0.006 42	0.017 122	0.008 59	0.002 77
DCP 8	.400	0.775	0.127 63	0.019 0	0.017 103	0.009 336	0.008 78	0.004 207	0.004 295	0.005 315	0.010 3
DCP 9	.500	0.851	0.154 58	0.035 33	0.032 103	0.006 232	0.003 241	0.007 185	0.004 272	0.010 26	0.002 241
DCP10	.695	0.738	0.147 39	0.039 44	0.021 132	0.012 338	0.011 69	0.006 73	0.003 71	0.006 87	0.005 171
DCP11	.800	0.620	0.139 35	0.030 66	0.012 138	0.008 11	0.005 132	0.005 78	0.012 55	0.013 132	0.009 194
DCP12	.878	0.565	0.122 32	0.024 71	0.006 125	0.005 47	0.007 171	0.007 90	0.011 85	0.009 105	0.005 154
DCP13	.953	0.621	0.110 24	0.014 45	0.007 206	0.008 322	0.005 196	0.008 319	0.008 114	0.004 249	0.003 48

FORCED PITCHING OSCILLATION NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	17.18	0.600	24.33	4.82		3175.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.045	637.1	1421.3	0.62E 07	0.00030	1.351	29.06

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		1.138	0.177 359	0.052 184	0.012 235	0.008 325	0.004 347	0.004 90	0.004 98	0.004 354	0.002 162
CM		-0.193	0.044 176	0.009 348	0.004 350	0.001 120	0.001 110	0.001 334	0.001 345	0.001 123	0.001 26
DCP 1	.010	2.000	0.298 157	0.197 219	0.120 284	0.062 356	0.022 85	0.008 321	0.021 56	0.009 78	0.005 120
DCP 2	.050	1.879	0.100 14	0.073 209	0.032 296	0.024 9	0.015 40	0.014 79	0.007 139	0.008 23	0.009 110
DCP 3	.100	1.729	0.165 7	0.091 193	0.034 262	0.018 295	0.018 313	0.020 15	0.019 43	0.008 35	0.005 137
DCP 4	.150	1.505	0.194 1	0.070 192	0.021 277	0.011 342	0.005 22	0.011 56	0.006 74	0.008 47	0.006 102
DCP 5	.200	1.428	0.242 356	0.050 171	0.003 225	0.005 263	0.008 311	0.010 35	0.007 59	0.004 357	0.001 291
DCP 6	.250	1.350	0.236 358	0.058 180	0.014 242	0.010 292	0.007 327	0.009 49	0.007 66	0.008 83	0.005 159
DCP 7	.300	1.221	0.260 356	0.048 168	0.006 197	0.004 292	0.005 16	0.006 74	0.005 68	0.006 3	0.000 62
DCP 8	.400	1.069	0.230 356	0.052 177	0.011 226	0.005 299	0.002 59	0.004 119	0.000 354	0.006 9	0.003 111
DCP 9	.500	1.114	0.232 354	0.044 166	0.011 184	0.008 307	0.005 55	0.005 136	0.004 90	0.003 331	0.003 213
DCP10	.695	0.994	0.197 356	0.046 176	0.014 197	0.007 334	0.005 337	0.006 147	0.005 178	0.001 255	0.005 197
DCP11	.800	0.875	0.168 359	0.051 185	0.015 197	0.002 325	0.005 266	0.006 151	0.005 144	0.007 303	0.003 255
DCP12	.878	0.804	0.131 0	0.048 185	0.015 198	0.005 322	0.004 280	0.006 164	0.009 188	0.010 325	0.003 158
DCP13	.953	0.816	0.110 2	0.031 166	0.011 161	0.007 316	0.009 291	0.004 82	0.008 98	0.007 292	0.005 175

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.67	0.200	5.23	5.23		3184.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.253	221.9	200.3	0.26E 07	-0.00155	0.897	10.41

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.519	0.364	4	0.017	207	0.006	159	0.005	117	0.005	68	0.007	99	0.006	203	0.006	337	0.004	102
CM		-0.004	0.030	275	0.004	122	0.002	294	0.001	196	0.002	222	0.001	334	0.002	52	0.001	155	0.000	315
DCP 1	.010	2.193	2.333	345	0.136	170	0.033	180	0.030	120	0.018	123	0.034	38	0.023	79	0.003	280	0.034	0
DCP 2	.050	2.116	1.218	349	0.069	162	0.015	180	0.025	148	0.009	134	0.013	65	0.005	77	0.007	13	0.013	63
DCP 3	.100	1.007	0.859	352	0.039	175	0.009	331	0.019	78	0.010	53	0.015	122	0.009	195	0.017	344	0.005	55
DCP 4	.150	0.775	0.653	353	0.038	180	0.004	231	0.017	144	0.006	168	0.010	71	0.011	150	0.009	312	0.009	139
DCP 5	.200	0.834	0.544	359	0.035	195	0.006	258	0.005	117	0.002	251	0.007	174	0.014	187	0.005	347	0.008	131
DCP 6	.250	0.685	0.467	1	0.028	204	0.009	217	0.013	173	0.007	118	0.008	75	0.016	194	0.006	232	0.012	145
DCP 7	.300	0.533	0.409	7	0.020	218	0.014	205	0.005	200	0.004	203	0.008	127	0.012	203	0.002	280	0.014	131
DCP 8	.400	0.476	0.292	12	0.020	242	0.009	180	0.009	191	0.004	112	0.006	95	0.010	206	0.009	313	0.006	123
DCP 9	.500	0.494	0.249	25	0.015	250	0.010	128	0.005	8	0.006	14	0.010	121	0.007	227	0.007	358	0.008	115
DCP 10	.695	0.161	0.161	40	0.008	282	0.010	99	0.002	313	0.010	38	0.007	85	0.005	280	0.006	25	0.004	1
DCP 11	.800	0.117	0.124	47	0.013	297	0.012	110	0.015	55	0.015	70	0.009	152	0.010	218	0.009	324	0.002	219
DCP 12	.878	0.062	0.098	48	0.015	285	0.006	224	0.005	162	0.003	47	0.005	93	0.006	261	0.003	251	0.001	53
DCP 13	.953	0.060	0.091	39	0.008	246	0.001	59	0.007	33	0.005	23	0.004	93	0.009	170	0.009	356	0.002	145

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.44	0.200	7.76	5.24		3184.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.252	221.6	199.7	0.26E 07	-0.00161	1.129	13.01

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.771	0.353	7	0.017	187	0.004	67	0.006	157	0.003	74	0.004	90	0.005	168	0.006	45	0.002	262
CM		-0.008	0.031	278	0.003	119	0.002	223	0.001	29	0.001	212	0.000	219	0.002	43	0.001	233	0.001	70
DCP 1	.010	3.624	2.297	346	0.132	158	0.008	193	0.014	139	0.016	185	0.019	51	0.021	94	0.018	43	0.069	5
DCP 2	.050	2.979	1.190	350	0.070	157	0.001	179	0.010	150	0.003	137	0.005	94	0.009	86	0.011	76	0.026	31
DCP 3	.100	1.593	0.821	355	0.047	178	0.005	277	0.014	97	0.016	160	0.007	189	0.014	115	0.005	157	0.007	144
DCP 4	.150	1.159	0.651	356	0.035	162	0.009	113	0.013	152	0.005	75	0.011	77	0.005	54	0.013	35	0.006	159
DCP 5	.200	1.166	0.521	3	0.036	187	0.006	326	0.007	100	0.004	167	0.010	169	0.013	144	0.004	71	0.005	222
DCP 6	.250	1.004	0.461	4	0.026	180	0.007	92	0.013	151	0.007	56	0.016	82	0.006	196	0.014	45	0.008	164
DCP 7	.300	0.772	0.382	12	0.022	196	0.008	107	0.006	147	0.007	57	0.010	120	0.009	139	0.005	57	0.008	220
DCP 8	.400	0.672	0.291	16	0.011	209	0.005	71	0.011	156	0.004	28	0.011	76	0.007	193	0.014	37	0.007	137
DCP 9	.500	0.675	0.234	29	0.011	247	0.006	117	0.003	189	0.004	48	0.002	219	0.010	186	0.002	131	0.005	228
DCP 10	.695	0.263	0.163	44	0.005	250	0.006	60	0.003	281	0.007	37	0.005	50	0.006	223	0.008	67	0.007	258
DCP 11	.800	0.185	0.126	55	0.010	294	0.014	65	0.009	198	0.001	79	0.001	34	0.002	226	0.010	324	0.009	343
DCP 12	.878	0.167	0.104	50	0.008	245	0.007	356	0.005	216	0.004	46	0.004	38	0.010	243	0.008	57	0.003	233
DCP 13	.953	0.111	0.085	46	0.006	243	0.011	352	0.007	123	0.001	184	0.004	239	0.004	143	0.003	221	0.002	217

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.44	0.200	10.15	5.24		3184.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.252	221.4	199.3	0.26E 07	-0.00159	1.350	15.41

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.990	0.351	9	0.017	194	0.003	79	0.001	51	0.005	48	0.004	138	0.002	254	0.006	25	0.006	49
CM		-0.012	0.030	277	0.003	100	0.001	235	0.001	153	0.001	222	0.001	51	0.001	74	0.002	225	0.002	266
DCP 1	.010	4.866	2.289	348	0.126	157	0.016	143	0.024	127	0.016	139	0.029	138	0.009	139	0.013	267	0.075	272
DCP 2	.050	3.692	1.139	351	0.066	149	0.009	190	0.008	136	0.007	81	0.014	137	0.005	156	0.007	308	0.014	54
DCP 3	.100	2.122	0.829	356	0.056	166	0.008	57	0.018	111	0.011	353	0.011	57	0.002	297	0.014	326	0.008	350
DCP 4	.150	1.501	0.635	358	0.034	190	0.003	190	0.005	317	0.008	64	0.011	86	0.002	83	0.003	335	0.010	356
DCP 5	.200	1.470	0.515	3	0.035	191	0.005	7	0.007	109	0.005	54	0.009	114	0.005	316	0.006	317	0.004	37
DCP 6	.250	1.240	0.453	8	0.023	203	0.002	78	0.005	264	0.006	61	0.006	79	0.007	71	0.007	59	0.009	41
DCP 7	.300	1.019	0.389	12	0.023	209	0.007	18	0.002	1	0.012	31	0.010	105	0.007	295	0.007	71	0.009	18
DCP 8	.400	0.863	0.292	22	0.008	247	0.006	192	0.008	239	0.011	72	0.002	96	0.002	109	0.008	28	0.014	56
DCP 9	.500	0.810	0.236	30	0.013	246	0.005	73	0.004	244	0.007	10	0.004	174	0.009	258	0.008	63	0.012	66
DCP10	.695	0.338	0.167	47	0.012	269	0.009	75	0.003	358	0.005	48	0.006	181	0.002	216	0.005	50	0.009	95
DCP11	.800	0.254	0.120	50	0.013	236	0.005	125	0.002	5	0.005	78	0.008	245	0.002	274	0.014	20	0.008	47
DCP12	.878	0.258	0.109	51	0.008	206	0.006	359	0.003	353	0.001	72	0.005	229	0.004	211	0.006	55	0.008	117
DCP13	.953	0.165	0.087	36	0.008	182	0.004	5	0.004	91	0.001	304	0.005	327	0.005	280	0.007	48	0.003	137

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.11	0.200	12.47	5.13		3149.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.253	219.0	191.6	0.25E 07	0.00133	1.515	17.03

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.066	0.472	2	0.089	151	0.034	320	0.014	91	0.019	236	0.005	77	0.012	306	0.011	137	0.003	314
CM		-0.024	0.021	83	0.035	258	0.021	77	0.013	260	0.007	88	0.001	326	0.003	142	0.003	314	0.003	133
DCP 1	.010	4.426	2.518	25	0.842	287	0.516	136	0.265	347	0.146	215	0.078	121	0.078	359	0.061	209	0.069	123
DCP 2	.050	3.658	1.380	21	0.353	254	0.208	85	0.095	273	0.027	166	0.046	115	0.057	309	0.045	147	0.014	355
DCP 3	.100	2.513	1.199	5	0.379	214	0.236	60	0.115	292	0.096	195	0.094	65	0.077	283	0.034	148	0.019	43
DCP 4	.150	1.830	0.977	2	0.337	194	0.174	34	0.057	261	0.058	182	0.059	36	0.049	246	0.031	95	0.014	314
DCP 5	.200	1.559	0.829	353	0.297	166	0.167	354	0.068	189	0.029	94	0.037	321	0.032	198	0.035	65	0.026	271
DCP 6	.250	1.267	0.701	358	0.268	161	0.154	348	0.054	198	0.034	119	0.048	323	0.035	182	0.034	35	0.025	230
DCP 7	.300	1.234	0.620	349	0.273	139	0.186	319	0.094	153	0.034	20	0.043	272	0.030	139	0.032	358	0.032	191
DCP 8	.400	0.977	0.445	353	0.218	130	0.129	313	0.057	164	0.039	34	0.047	250	0.034	97	0.027	317	0.026	170
DCP 9	.500	0.730	0.315	350	0.178	98	0.126	266	0.076	87	0.046	297	0.031	175	0.034	21	0.039	299	0.038	38
DCP10	.695	0.507	0.141	355	0.119	76	0.074	235	0.052	60	0.052	243	0.019	72	0.023	313	0.029	147	0.025	310
DCP11	.800	0.292	0.097	335	0.082	66	0.044	241	0.048	74	0.037	260	0.016	119	0.037	307	0.033	118	0.014	283
DCP12	.878	0.182	0.068	322	0.065	60	0.041	245	0.043	63	0.037	240	0.024	78	0.025	280	0.019	99	0.013	283
DCP13	.953	0.283	0.050	327	0.048	15	0.038	179	0.036	352	0.019	153	0.013	339	0.010	225	0.009	47	0.002	163

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.33	0.200	14.94	5.14		3179.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.252	221.3	201.3	0.26E 07	0.00378	1.906	19.49

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.253	0.608	23	0.170	224	0.090	70	0.043	256	0.036	130	0.019	23	0.017	240	0.013	147	0.006	17
CM		-0.082	0.095	136	0.077	345	0.047	210	0.024	74	0.013	321	0.008	194	0.007	55	0.005	295	0.003	183
DCP 1	.010	4.397	2.634	84	1.398	8	0.350	282	0.285	254	0.332	159	0.161	76	0.092	54	0.086	315	0.100	268
DCP 2	.050	3.658	1.519	64	0.569	327	0.128	201	0.133	198	0.133	103	0.068	6	0.040	307	0.059	222	0.046	136
DCP 3	.100	2.301	1.381	47	0.525	301	0.155	210	0.187	171	0.165	83	0.092	14	0.081	297	0.053	229	0.055	188
DCP 4	.150	1.823	1.210	35	0.524	279	0.215	178	0.142	123	0.100	45	0.074	329	0.057	229	0.036	170	0.034	97
DCP 5	.200	1.764	1.064	29	0.406	256	0.161	151	0.103	101	0.083	34	0.082	306	0.074	202	0.050	143	0.061	50
DCP 6	.250	1.659	0.981	24	0.440	249	0.226	142	0.141	63	0.091	343	0.088	262	0.066	177	0.062	142	[illegible]	46
DCP 7	.300	1.426	0.939	17	0.424	231	0.209	125	0.130	46	0.097	332	0.115	239	0.077	149	0.070	96	[illegible]	355
DCP 8	.400	1.247	0.713	10	0.348	217	0.221	102	0.145	356	0.103	263	0.100	163	0.036	64	0.034	24	[illegible]	266
DCP 9	.500	1.104	0.644	358	0.387	189	0.253	66	0.163	309	0.123	217	0.141	111	0.074	347	0.045	286	.058	189
DCP 10	.695	0.767	0.411	339	0.311	161	0.251	23	0.179	242	0.119	130	0.094	5	0.056	230	0.022	158	0.031	57
DCP 11	.800	0.473	0.304	334	0.229	161	0.190	23	0.138	245	0.117	127	0.095	356	0.063	231	0.050	139	0.026	344
DCP 12	.878	0.315	0.211	325	0.151	148	0.126	3	0.098	218	0.077	105	0.056	332	0.042	215	0.040	177	0.024	340
DCP 13	.953	0.389	0.177	311	0.125	133	0.122	335	0.094	178	0.054	39	0.031	245	0.008	87	0.018	193	0.011	17

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.33	0.200	17.50	5.12		3179.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.252	221.1	201.5	0.26E 07	0.00294	2.113	22.64

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.291	0.631	34	0.171	275	0.104	164	0.065	25	0.050	249	0.029	153	0.013	36	0.011	352	0.009	205
CM		-0.115	0.121	151	0.080	35	0.045	290	0.027	186	0.014	75	0.006	352	0.005	223	0.005	152	0.007	23
DCP 1	.010	4.071	2.867	111	1.276	52	0.345	42	0.442	353	0.220	283	0.142	264	0.188	216	0.071	142	0.018	328
DCP 2	.050	3.440	1.595	82	0.397	18	0.158	322	0.076	287	0.112	230	0.075	151	0.042	139	0.022	97	0.034	81
DCP 3	.100	2.223	1.409	65	0.424	0	0.269	300	0.141	279	0.196	224	0.178	174	0.104	104	0.079	83	0.071	13
DCP 4	.150	1.793	1.240	51	0.448	339	0.305	260	0.107	227	0.135	193	0.120	136	0.063	64	0.052	32	0.033	349
DCP 5	.200	1.748	1.138	43	0.401	321	0.300	233	0.098	185	0.089	156	0.115	109	0.090	27	0.068	349	0.052	282
DCP 6	.250	1.697	1.059	34	0.411	310	0.333	223	0.147	173	0.121	129	0.131	77	0.101	4	0.084	320	0.066	254
DCP 7	.300	1.466	1.034	25	0.439	299	0.372	210	0.218	142	0.113	76	0.100	47	0.116	337	0.078	290	0.078	216
DCP 8	.400	1.284	0.782	18	0.396	275	0.350	174	0.199	83	0.102	10	0.082	322	0.071	267	0.085	209	0.080	128
DCP 9	.500	1.146	0.733	4	0.397	245	0.301	147	0.249	52	0.154	308	0.074	262	0.087	191	0.060	97	0.047	46
DCP 10	.695	0.903	0.490	347	0.352	216	0.252	104	0.225	356	0.155	240	0.075	154	0.049	54	0.012	318	0.024	289
DCP 11	.800	0.547	0.342	352	0.233	214	0.173	101	0.149	357	0.127	252	0.108	151	0.084	24	0.030	313	0.040	193
DCP 12	.878	0.451	0.247	345	0.175	193	0.115	65	0.088	315	0.056	209	0.045	147	0.038	41	0.053	318	0.061	181
DCP 13	.953	0.556	0.280	325	0.218	167	0.174	25	0.141	253	0.096	111	0.057	315	0.043	162	0.058	20	0.066	242

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.67	0.200	24.97	5.15		3179.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.255	220.8	200.6	0.26E 07	-0.00307	1.495	24.13

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.144	0.344	56	0.094	153	0.052	186	0.009	141	0.014	19	0.004	144	0.004	209	0.005	176	0.003	274
CM		-0.190	0.086	225	0.023	281	0.017	333	0.003	342	0.004	173	0.001	4	0.002	52	0.001	70	0.000	240
DCP 1	.010	1.543	0.772	151	0.399	225	0.185	322	0.096	82	0.047	159	0.021	161	0.034	164	0.008	150	0.020	262
DCP 2	.050	2.356	0.248	59	0.127	190	0.030	252	0.015	62	0.019	17	0.014	52	0.015	128	0.012	239	0.009	322
DCP 3	.100	1.539	0.298	60	0.145	183	0.052	232	0.026	110	0.033	85	0.023	109	0.008	93	0.017	129	0.012	168
DCP 4	.150	1.280	0.349	56	0.137	184	0.041	235	0.013	74	0.005	1	0.012	110	0.013	115	0.012	233	0.022	311
DCP 5	.200	1.335	0.350	56	0.140	179	0.075	221	0.012	253	0.024	29	0.009	69	0.009	7	0.014	115	0.004	333
DCP 6	.250	1.396	0.393	56	0.137	175	0.061	222	0.005	43	0.004	37	0.007	280	0.018	67	0.012	141	0.022	286
DCP 7	.300	1.233	0.381	57	0.141	170	0.094	206	0.024	234	0.020	37	0.011	180	0.011	353	0.011	94	0.019	282
DCP 8	.400	1.256	0.432	56	0.134	159	0.084	199	0.011	259	0.013	65	0.014	211	0.008	287	0.005	49	0.014	251
DCP 9	.500	1.200	0.446	54	0.114	140	0.092	179	0.018	191	0.028	4	0.007	154	0.015	236	0.012	199	0.009	153
DCP10	.695	1.059	0.424	50	0.119	105	0.082	143	0.019	114	0.025	343	0.008	322	0.010	220	0.004	176	0.012	94
DCP11	.800	0.798	0.356	49	0.108	106	0.059	151	0.019	114	0.026	5	0.010	159	0.016	246	0.012	250	0.019	359
DCP12	.878	0.714	0.292	44	0.065	98	0.045	152	0.019	155	0.017	16	0.003	104	0.017	173	0.010	257	0.032	356
DCP13	.953	0.665	0.180	34	0.024	80	0.028	135	0.009	207	0.016	194	0.008	98	0.005	100	0.006	36	0.013	284

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.00	0.400	9.89	4.89		3146.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.127	433.4	723.8	0.47E 07	0.00005	1.434	14.44

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.866	0.375	31	0.110	345	0.057	249	0.044	156	0.025	34	0.009	308	0.002	222	0.005	171	0.005	89
CM		-0.031	0.058	177	0.040	62	0.020	351	0.019	280	0.015	185	0.006	130	0.004	41	0.003	337	0.003	244
DCP 1	.010	4.095	0.846	66	1.434	58	0.612	344	0.247	299	0.184	253	0.080	208	0.029	164	0.032	181	0.030	180
DCP 2	.050	2.661	0.645	61	0.625	33	0.224	302	0.082	268	0.104	232	0.064	156	0.039	112	0.026	35	0.019	69
DCP 3	.100	1.880	0.645	51	0.399	17	0.155	283	0.103	241	0.085	177	0.046	104	0.032	78	0.023	42	0.012	7
DCP 4	.150	1.454	0.592	39	0.286	353	0.120	266	0.095	216	0.071	137	0.026	54	0.029	74	0.032	1	0.020	335
DCP 5	.200	1.268	0.544	40	0.238	348	0.117	257	0.092	200	0.062	122	0.038	59	0.026	26	0.015	327	0.009	244
DCP 6	.250	1.138	0.571	33	0.193	330	0.085	255	0.103	192	0.078	91	0.034	2	0.012	25	0.018	334	0.021	271
DCP 7	.300	0.946	0.506	34	0.187	326	0.107	241	0.101	175	0.069	80	0.031	26	0.023	359	0.019	275	0.010	185
DCP 8	.400	0.629	0.425	28	0.134	299	0.057	234	0.095	162	0.076	50	0.030	333	0.020	302	0.015	240	0.015	185
DCP 9	.500	0.627	0.375	27	0.125	291	0.072	216	0.087	144	0.069	42	0.032	341	0.027	283	0.026	205	0.019	128
DCP10	.695	0.487	0.283	14	0.106	257	0.062	192	0.086	109	0.070	2	0.031	280	0.021	225	0.023	155	0.023	69
DCP11	.800	0.300	0.253	6	0.114	248	0.077	172	0.078	84	0.061	338	0.029	249	0.021	189	0.017	128	0.015	56
DCP12	.878	0.169	0.224	355	0.094	240	0.068	166	0.072	68	0.053	321	0.028	231	0.021	161	0.019	97	0.017	348
DCP13	.953	0.278	0.190	348	0.056	221	0.038	165	0.032	61	0.023	337	0.020	242	0.014	131	0.007	37	0.008	50

FORCED PITCHING OSCILLATION NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	32.79	0.400	12.25	4.80		3145.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.126	433.4	724.3	0.47E 07	-0.00055	1.501	15.33

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.942	0.352	55	0.098	28	0.059	329	0.028	238	0.015	182	0.010	178	0.017	99	0.010	39	0.003	22
CM		-0.055	0.082	184	0.031	115	0.031	83	0.017	15	0.011	353	0.009	330	0.008	249	0.004	180	0.002	143
CCP 1	.010	4.155	1.496	135	1.111	101	0.518	100	0.240	70	0.212	77	0.093	19	0.030	33	0.030	100	0.023	160
CCP 2	.050	2.639	0.914	113	0.456	67	0.262	77	0.174	11	0.082	50	0.092	348	0.039	353	0.037	333	0.033	339
CCP 3	.100	1.954	0.687	91	0.280	52	0.187	43	0.093	338	0.055	7	0.048	297	0.018	329	0.019	333	0.008	258
CCP 4	.150	1.538	0.578	75	0.202	46	0.177	23	0.093	303	0.038	341	0.056	276	0.019	254	0.011	221	0.013	277
CCP 5	.200	1.328	0.540	70	0.176	32	0.141	6	0.060	308	0.064	300	0.055	243	0.028	219	0.023	171	0.010	171
CCP 6	.250	1.214	0.510	63	0.146	32	0.159	351	0.071	265	0.045	296	0.054	243	0.035	203	0.026	159	0.009	146
CCP 7	.300	1.033	0.492	58	0.143	19	0.144	339	0.068	267	0.050	260	0.048	231	0.043	182	0.029	126	0.006	95
CCP 8	.400	0.728	0.430	47	0.097	8	0.149	319	0.072	229	0.049	240	0.042	197	0.045	159	0.038	133	0.015	62
CCP 9	.500	0.719	0.399	41	0.103	342	0.123	300	0.065	226	0.058	205	0.043	179	0.057	121	0.029	54	0.015	80
CCP10	.695	0.582	0.335	24	0.101	313	0.115	268	0.066	201	0.058	176	0.045	130	0.049	77	0.023	25	0.023	9
CCP11	.800	0.396	0.302	13	0.103	303	0.113	250	0.069	177	0.059	138	0.048	84	0.045	34	0.035	339	0.016	263
CCP12	.878	0.284	0.263	4	0.086	305	0.095	242	0.061	177	0.049	128	0.047	72	0.033	16	0.026	335	0.013	272
LCP12	.953	0.359	0.210	352	0.052	290	0.049	213	0.023	147	0.017	100	0.019	81	0.025	11	0.017	293	0.035	242

FORCED PITCHING OSCILLATION NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.56	0.400	14.88	5.00		3178.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.129	435.4	736.0	0.48E 07	-0.00194	1.457	15.64

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.900	0.357	75	0.091	75	0.036	98	0.050	52	0.012	13	0.011	45	0.010	327	0.001	162	0.006	288
CM		-0.099	0.080	210	0.033	206	0.013	188	0.021	188	0.009	172	0.008	186	0.005	150	0.002	227	0.003	136
CCP 1	.050	2.594	1.043	137	0.238	170	0.185	155	0.122	196	0.053	244	0.069	238	0.054	271	0.029	290	0.018	337
CCP 2	.100	1.878	0.749	121	0.204	155	0.155	144	0.100	164	0.033	225	0.023	187	0.029	269	0.031	319	0.031	278
CCP 3	.150	1.453	0.631	103	0.178	128	0.080	106	0.111	124	0.016	177	0.036	141	0.029	196	0.027	223	0.025	231
CCP 4	.200	1.381	0.516	100	0.168	123	0.100	132	0.101	113	0.040	159	0.036	128	0.016	197	0.022	250	0.024	240
CCP 5	.250	1.197	0.542	89	0.163	110	0.055	78	0.109	93	0.017	101	0.031	105	0.019	110	0.027	230	0.015	142
CCP 6	.300	0.989	0.471	87	0.145	101	0.078	120	0.094	89	0.042	126	0.029	123	0.018	118	0.026	230	0.017	216
CCP 7	.400	0.824	0.452	71	0.148	83	0.041	41	0.110	55	0.035	47	0.031	72	0.034	33	0.024	128	0.019	77
CCP 8	.500	0.856	0.419	65	0.125	64	0.053	70	0.099	43	0.042	66	0.029	44	0.023	57	0.029	135	0.012	118
CCP 9	.695	0.627	0.353	44	0.134	31	0.046	17	0.101	5	0.044	4	0.040	9	0.034	342	0.027	13	0.026	332
CCP10	.800	0.486	0.316	37	0.143	27	0.058	7	0.091	4	0.058	335	0.038	349	0.035	305	0.007	341	0.021	311
CCP11	.878	0.345	0.253	26	0.127	13	0.049	357	0.066	340	0.047	300	0.034	325	0.027	263	0.006	275	0.018	272
CCP12	.953	0.453	0.199	15	0.074	4	0.019	12	0.029	332	0.022	309	0.016	335	0.020	282	0.008	288	0.009	265

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.56	0.400	17.41	5.03		3178.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.129	435.1	736.4	0.48E 07	-0.00304	1.434	16.74

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.978	0.319	86	0.049	148	0.058	145	0.025	179	0.027	119	0.008	136	0.007	155	0.001	235	0.003	272
CM		-0.119	0.077	229	0.015	239	0.020	279	0.009	300	0.013	271	0.004	276	0.003	279	0.001	44	0.002	132
DCP 1	.010	2.837	1.445	177	0.250	296	0.108	235	0.097	20	0.101	194	0.062	181	0.067	240	0.013	39	0.051	346
DCP 2	.050	2.236	0.582	133	0.226	219	0.072	220	0.074	255	0.051	316	0.032	26	0.011	28	0.007	316	0.029	270
DCP 3	.100	1.652	0.436	107	0.214	191	0.088	213	0.080	232	0.018	243	0.011	269	0.009	40	0.015	131	0.024	130
DCP 4	.150	1.327	0.428	96	0.163	164	0.087	221	0.032	248	0.024	251	0.009	357	0.013	319	0.021	22	0.036	214
DCP 5	.200	1.289	0.376	89	0.142	164	0.093	187	0.076	216	0.018	216	0.014	234	0.017	288	0.014	1	0.017	80
DCP 6	.250	1.160	0.418	87	0.128	150	0.090	191	0.035	242	0.021	209	0.004	331	0.008	197	0.005	18	0.011	146
DCP 7	.300	0.963	0.391	84	0.105	155	0.093	164	0.062	204	0.031	174	0.024	206	0.023	221	0.008	259	0.002	190
DCP 8	.400	0.864	0.385	79	0.098	127	0.103	153	0.046	183	0.047	163	0.006	203	0.019	153	0.007	192	0.002	143
DCP 9	.500	0.947	0.404	72	0.062	115	0.092	130	0.042	162	0.057	124	0.030	164	0.035	167	0.019	216	0.009	157
DCP 10	.695	0.737	0.349	61	0.047	50	0.082	105	0.032	128	0.064	89	0.022	140	0.008	98	0.012	193	0.021	285
DCP 11	.800	0.603	0.293	59	0.058	53	0.082	98	0.043	108	0.063	90	0.026	56	0.019	70	0.012	355	0.011	356
DCP 12	.878	0.471	0.248	55	0.054	44	0.071	86	0.039	99	0.050	85	0.016	56	0.014	39	0.007	10	0.008	255
DCP 13	.953	0.567	0.166	42	0.020	36	0.043	69	0.017	90	0.029	38	0.025	46	0.012	42	0.004	24	0.010	281

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	32.89	0.400	24.88	5.06		3178.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.126	434.6	735.6	0.48E 07	-0.00158	1.186	29.27

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.007	0.140	36	0.030	186	0.008	273	0.009	351	0.008	64	0.003	107	0.003	334	0.003	1	0.005	210
CM		-0.160	0.043	222	0.007	356	0.003	61	0.003	146	0.003	212	0.002	254	0.000	88	0.001	52	0.001	21
DCP 1	.010	1.689	0.167	161	0.062	234	0.035	316	0.022	68	0.011	189	0.018	303	0.026	35	0.010	88	0.004	236
DCP 2	.050	1.914	0.152	37	0.053	185	0.013	261	0.013	65	0.012	135	0.013	249	0.010	349	0.013	32	0.001	130
DCP 3	.100	1.529	0.251	22	0.006	64	0.015	335	0.012	314	0.002	169	0.011	183	0.005	256	0.013	38	0.007	271
DCP 4	.150	1.311	0.209	27	0.050	193	0.008	257	0.006	84	0.011	120	0.006	198	0.004	331	0.009	29	0.004	185
DCP 5	.200	1.305	0.257	23	0.013	177	0.012	345	0.010	347	0.004	85	0.006	151	0.003	263	0.008	15	0.007	212
DCP 6	.250	1.221	0.226	28	0.045	196	0.006	281	0.009	41	0.013	107	0.005	165	0.006	319	0.010	31	0.004	224
DCP 7	.300	1.026	0.259	27	0.023	191	0.006	343	0.009	16	0.008	107	0.005	127	0.003	274	0.006	6	0.006	204
DCP 8	.400	0.959	0.220	31	0.041	195	0.007	254	0.010	15	0.012	85	0.005	150	0.006	310	0.007	16	0.007	209
DCP 9	.500	1.053	0.241	35	0.028	180	0.005	297	0.013	352	0.011	52	0.008	79	0.002	319	0.005	334	0.006	217
DCP 10	.695	0.858	0.208	43	0.031	168	0.008	259	0.012	325	0.013	42	0.008	58	0.007	22	0.002	259	0.007	215
DCP 11	.800	0.731	0.167	49	0.045	187	0.020	241	0.018	334	0.010	34	0.006	82	0.004	178	0.005	234	0.008	205
DCP 12	.878	0.591	0.137	49	0.034	186	0.017	245	0.016	330	0.017	23	0.006	56	0.004	273	0.006	237	0.007	185
DCP 13	.953	0.682	0.118	39	0.015	151	0.006	243	0.007	276	0.005	351	0.003	107	0.002	184	0.004	178	0.004	56

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.56	0.600	4.92	5.19		3186.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.088	640.4	1432.6	0.63E 07	-0.00079	1.015	9.87

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.497	0.464	357	0.059	13	0.037	242	0.014	133	0.006	138	0.007	64	0.003	244	0.002	148	0.002	22
CM		-0.004	0.024	216	0.018	72	0.013	329	0.007	246	0.004	195	0.003	125	0.003	46	0.001	331	0.002	277
DCP 1	.010	2.128	1.834	345	0.393	55	0.038	258	0.042	33	0.019	148	0.024	356	0.016	137	0.003	152	0.013	29
DCP 2	.050	1.901	1.361	345	0.395	61	0.215	308	0.055	232	0.047	165	0.033	24	0.018	162	0.025	345	0.029	256
DCP 3	.100	1.351	1.094	350	0.340	56	0.258	304	0.034	180	0.134	270	0.099	154	0.033	237	0.071	125	0.024	333
DCP 4	.150	0.887	0.886	355	0.156	15	0.120	292	0.093	225	0.042	162	0.051	164	0.048	88	0.014	127	0.040	49
DCP 5	.200	0.776	0.744	357	0.109	353	0.070	246	0.062	210	0.074	139	0.040	88	0.043	37	0.040	345	0.019	296
DCP 6	.250	0.630	0.604	1	0.116	355	0.077	234	0.032	174	0.048	137	0.046	68	0.029	9	0.023	313	0.016	289
DCP 7	.300	0.446	0.550	1	0.084	339	0.073	218	0.041	157	0.048	117	0.046	46	0.028	339	0.028	285	0.023	221
DCP 8	.400	0.318	0.390	6	0.079	344	0.063	216	0.032	113	0.016	100	0.027	42	0.026	314	0.017	238	0.007	174
DCP 9	.500	0.356	0.326	7	0.055	315	0.060	188	0.039	87	0.017	20	0.016	325	0.019	237	0.014	159	0.012	88
DCP 10	.695	0.184	0.211	12	0.041	284	0.040	163	0.027	55	0.012	336	0.008	290	0.012	214	0.007	128	0.006	69
DCP 11	.800	0.149	0.171	9	0.044	255	0.037	150	0.020	59	0.010	6	0.010	296	0.014	208	0.009	117	0.005	65
DCP 12	.878	0.112	0.157	4	0.053	240	0.032	138	0.015	62	0.014	15	0.016	292	0.013	195	0.006	89	0.004	100
DCP 13	.953	0.132	0.149	353	0.052	216	0.023	114	0.010	57	0.011	339	0.011	237	0.007	154	0.003	127	0.003	48

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.56	0.600	7.40	5.13		3186.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.088	640.3	1438.8	0.63E 07	-0.00089	1.104	10.81

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.693	0.329	15	0.090	40	0.030	347	0.024	262	0.007	153	0.005	255	0.007	105	0.005	233	0.004	73
CM		-0.018	0.041	202	0.021	91	0.007	92	0.011	36	0.003	317	0.003	348	0.002	298	0.002	315	0.002	223
DCP 1	.010	2.935	1.087	354	0.288	56	0.060	166	0.030	181	0.015	124	0.006	352	0.025	4	0.003	252	0.007	60
DCP 2	.050	2.392	0.485	355	0.575	67	0.037	34	0.089	30	0.042	287	0.022	184	0.027	7	0.018	226	0.028	235
DCP 3	.100	1.792	0.566	11	0.481	71	0.061	99	0.138	44	0.109	148	0.066	22	0.096	117	0.042	317	0.034	74
DCP 4	.150	1.198	0.558	15	0.247	58	0.154	13	0.044	339	0.040	3	0.055	27	0.038	357	0.045	10	0.015	323
DCP 5	.200	1.051	0.498	19	0.189	50	0.133	7	0.062	295	0.039	346	0.027	313	0.031	342	0.024	310	0.026	298
DCP 6	.250	0.871	0.431	20	0.129	35	0.082	5	0.068	286	0.020	334	0.049	293	0.025	260	0.028	255	0.027	233
DCP 7	.300	0.650	0.395	22	0.119	31	0.084	346	0.080	274	0.026	269	0.049	252	0.025	213	0.035	219	0.026	185
DCP 8	.400	0.479	0.322	24	0.077	3	0.033	351	0.050	270	0.007	224	0.028	257	0.018	196	0.028	200	0.024	128
DCP 9	.500	0.500	0.290	25	0.065	340	0.026	298	0.052	239	0.020	161	0.017	201	0.017	142	0.019	155	0.024	70
DCP 10	.695	0.293	0.222	21	0.050	297	0.016	280	0.039	216	0.014	127	0.016	156	0.016	79	0.003	95	0.011	18
DCP 11	.800	0.248	0.205	16	0.054	286	0.025	265	0.039	209	0.018	133	0.013	143	0.010	84	0.004	36	0.008	13
DCP 12	.878	0.209	0.192	8	0.047	275	0.031	271	0.035	196	0.011	131	0.013	133	0.007	69	0.006	73	0.008	0
DCP 13	.953	0.223	0.193	356	0.042	247	0.023	257	0.024	177	0.009	129	0.010	89	0.001	98	0.004	59	0.005	6

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.67	0.600	9.75	5.01		3186.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.088	63[illegible].9	1431.7	0.63E 07	-0.00109	1.138	10.83

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.837	0.232	38	0.064	81	0.041	74	0.016	29	0.007	308	0.005	132	0.005	345	0.002	31	0.001	33
CM		-0.035	0.060	199	0.008	109	0.012	191	0.006	185	0.003	147	0.004	233	0.004	186	0.001	225	0.002	215
DCP 1	.010	3.329	0.45[illegible]	7	0.225	82	0.045	18	0.035	286	0.021	296	0.029	238	0.011	184	0.010	121	0.020	112
DCP 2	.050	2.734	0.201	153	0.287	85	0.140	153	0.045	57	0.024	154	0.013	331	0.042	187	0.011	11	0.030	192
DCP 3	.100	2.122	0.264	135	0.109	78	0.132	155	0.111	256	0.066	317	0.056	221	0.046	275	0.022	338	0.041	290
DCP 4	.150	1.407	0.344	48	0.2[illegible]8	94	0.110	147	0.025	163	0.040	229	0.067	257	0.041	329	0.005	335	0.017	19
DCP 5	.200	1.194	0.335	52	0.210	87	0.072	93	0.076	100	0.044	190	0.036	206	0.024	209	0.030	253	0.021	265
DCP 6	.250	1.041	0.356	45	0.101	87	0.085	81	0.047	95	0.020	135	0.038	165	0.022	176	0.031	195	0.014	191
DCP 7	.300	0.802	0.313	45	0.126	84	0.095	69	0.067	68	0.021	84	0.035	121	0.029	172	0.017	149	0.026	151
DCP 8	.400	0.596	0.299	40	0.017	71	0.068	70	0.023	58	0.018	54	0.025	125	0.021	71	0.017	121	0.011	130
DCP 9	.500	0.627	0.281	34	0.025	78	0.079	45	0.038	8	0.019	348	0.024	66	0.026	12	0.013	73	0.021	27
DCP 10	.695	0.388	0.248	27	0.012	29[illegible]	0.052	21	0.024	346	0.017	320	0.016	42	0.022	344	0.006	351	0.019	[illegible]
DCP 11	.800	0.337	0.232	21	0.024	316	0.034	8	0.019	352	0.015	300	0.012	32	0.009	334	0.004	325	0.005	112
DCP 12	.878	0.300	0.221	14	0.022	317	0.024	345	0.019	9	0.013	281	0.013	47	0.008	345	0.003	8	0.004	87
DCP 13	.953	0.309	0.213	2	0.021	336	0.025	321	0.016	328	0.004	268	0.008	[illegible]6	0.004	341	0.004	1	0.009	327

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.90	0.600	14.82	4.95		3177.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.088	642.4	1452.8	0.63E 07	-0.00138	1.053	18.59

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.897	0.162	69	0.033	247	0.024	203	0.016	234	0.004	203	0.005	126	0.004	154	0.004	154	0.004	181
CM		-0.111	0.059	205	0.002	288	0.004	345	0.003	357	0.003	289	0.003	288	0.002	287	0.001	5	0.001	31
DCP 1	.050	2.536	0.526	159	0.161	256	0.077	274	0.016	168	0.073	257	0.017	354	0.021	195	0.028	50	0.035	133
DCP 2	.100	1.900	0.321	142	0.050	246	0.081	206	0.055	247	0.011	254	0.021	247	0.008	203	0.018	158	0.039	140
DCP 3	.150	1.441	0.243	120	0.076	245	0.064	190	0.033	273	0.009	203	0.015	272	0.003	287	0.004	95	0.008	185
DCP 4	.200	1.313	0.235	113	0.071	250	0.028	168	0.045	244	0.015	348	0.005	128	0.012	312	0.009	356	0.018	20
DCP 5	.250	1.135	0.228	90	0.059	255	0.039	195	0.030	286	0.003	158	0.011	196	0.007	293	0.017	165	0.009	211
DCP 6	.300	0.972	0.216	65	0.078	253	0.018	211	0.030	246	0.016	282	0.012	191	0.013	169	0.006	212	0.011	315
DCP 7	.400	0.761	0.231	55	0.024	239	0.019	240	0.021	273	0.006	303	0.010	135	0.007	158	0.011	177	0.005	53
DCP 8	.500	0.788	0.242	48	0.035	235	0.019	211	0.015	233	0.014	193	0.009	145	0.002	166	0.007	196	0.010	247
DCP 9	.695	0.638	0.230	33	0.009	237	0.020	190	0.012	188	0.016	115	0.016	120	0.008	146	0.007	176	0.009	182
DCP 10	.800	0.535	0.216	30	0.007	114	0.028	175	0.020	191	0.013	117	0.007	106	0.009	79	0.004	345	0.006	176
DCP 11	.878	0.493	0.192	25	0.011	88	0.018	160	0.017	163	0.012	111	0.007	50	0.010	69	0.003	41	0.006	200
DCP 12	.953	0.548	0.159	19	0.009	56	0.017	140	0.012	118	0.010	72	0.007	50	0.009	134	0.006	114	0.003	147

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	34.13	0.600	17.33	4.97		3177.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.089	641.5	1445.4	0.63E 07	-0.00182	1.097	20.77

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		0.908	0.182 66	0.039 278	0.011 60	0.013 237	0.007 119	0.005 224	0.001 98	0.003 25	0.000 337
CM		-0.133	0.057 215	0.002 89	0.002 317	0.004 30	0.002 245	0.001 353	0.000 162	0.001 210	0.000 98
DCP 1	.050	2.271	0.377 157	0.127 317	0.053 103	0.044 316	0.042 159	0.034 272	0.019 143	0.020 279	0.034 322
DCP 2	.100	1.727	0.285 133	0.154 278	0.059 345	0.020 264	0.009 205	0.004 167	0.006 98	0.014 44	0.036 14
DCP 3	.150	1.403	0.219 116	0.107 279	0.030 26	0.015 278	0.009 154	0.025 188	0.005 213	0.012 116	0.033 166
DCP 4	.200	1.244	0.221 92	0.079 283	0.029 39	0.009 151	0.006 110	0.005 330	0.002 51	0.008 42	0.033 18
DCP 5	.250	1.134	0.234 78	0.062 256	0.017 24	0.011 213	0.006 172	0.002 327	0.007 114	0.006 154	0.035 189
DCP 6	.300	0.957	0.239 72	0.051 253	0.026 59	0.017 209	0.006 302	0.005 269	0.003 24	0.011 113	0.007 175
DCP 7	.400	0.792	0.247 57	0.024 254	0.009 62	0.009 267	0.012 122	0.006 258	0.003 106	0.008 264	0.036 356
DCP 8	.500	0.841	0.252 52	0.022 252	0.007 106	0.020 232	0.005 155	0.007 238	0.003 302	0.007 354	0.032 143
DCP 9	.695	0.716	0.230 42	0.018 317	0.012 106	0.022 239	0.013 86	0.004 204	0.004 17	0.008 346	0.036 339
DCP10	.800	0.601	0.219 38	0.024 293	0.005 107	0.017 209	0.011 59	0.011 172	0.001 331	0.008 63	0.034 182
DCP11	.878	0.567	0.196 37	0.016 279	0.005 156	0.013 193	0.006 72	0.005 154	0.004 328	0.008 71	0.035 169
DCP12	.953	0.619	0.159 31	0.007 279	0.004 174	0.015 180	0.008 53	0.003 171	0.007 161	0.002 61	0.003 344

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.78	0.600	24.77	4.96		3177.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.088	641.0	1450.0	0.63E 07	-0.00036	1.295	29.69

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		1.118	0.172 9	0.026 166	0.008 169	0.003 229	0.006 40	0.001 98	0.003 254	0.001 168	0.002 93
CM		-0.189	0.040 190	0.004 310	0.004 316	0.001 21	0.001 165	0.001 236	0.000 43	0.001 286	0.030 238
DCP 1	.010	1.887	0.196 159	0.113 227	0.078 300	0.043 9	0.028 68	0.014 175	0.018 229	0.017 270	0.005 8
DCP 2	.050	1.997	0.102 27	0.058 193	0.022 271	0.015 359	0.022 67	0.013 178	0.014 238	0.011 258	0.034 356
DCP 3	.100	1.656	0.198 4	0.043 179	0.015 213	0.015 238	0.013 353	0.009 345	0.007 50	0.002 150	0.007 131
DCP 4	.150	1.441	0.190 8	0.042 178	0.012 248	0.007 319	0.013 50	0.003 218	0.001 275	0.005 226	0.004 180
DCP 5	.200	1.391	0.236 1	0.025 158	0.010 142	0.009 166	0.003 85	0.004 260	0.004 290	0.003 294	0.005 84
DCP 6	.250	1.316	0.222 6	0.033 162	0.009 195	0.003 266	0.008 46	0.003 264	0.001 327	0.005 199	0.035 178
DCP 7	.300	1.166	0.246 3	0.036 151	0.012 143	0.007 164	0.005 90	0.003 267	0.004 312	0.003 276	0.006 76
DCP 8	.400	1.057	0.219 7	0.032 154	0.012 167	0.004 230	0.007 39	0.003 180	0.005 280	0.002 120	0.005 125
DCP 9	.500	1.115	0.222 6	0.027 150	0.016 144	0.005 182	0.005 61	0.001 119	0.003 296	0.003 79	0.004 81
DCP10	.695	0.967	0.181 10	0.021 152	0.016 154	0.006 207	0.001 64	0.004 74	0.003 207	0.006 124	0.003 84
DCP11	.800	0.864	0.153 16	0.018 143	0.010 125	0.002 283	0.010 350	0.009 51	0.004 222	0.002 284	0.005 309
DCP12	.878	0.791	0.123 18	0.016 146	0.011 127	0.003 221	0.010 346	0.004 37	0.003 271	0.003 132	0.002 262
DCP13	.953	0.802	0.107 8	0.006 141	0.010 146	0.008 207	0.001 144	0.003 94	0.005 166	0.006 111	0.004 85

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	49.50	0.200	15.02	5.08		3180.1	10
	K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
	0.371	222.7	201.2	0.26E 07	0.00210	1.740	20.02

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.289	0.480	2	0.085	118	0.053	249	0.018	68	0.027	260	0.017	142	0.002	267	0.008	37	0.004	202
CM		-0.086	0.056	78	0.047	252	0.026	49	0.009	223	0.011	91	0.006	284	0.001	105	0.004	210	0.003	45
DCP 1	.010	4.434	2.472	58	0.895	335	0.308	235	0.315	153	0.170	60	0.104	292	0.050	291	0.030	146	0.045	53
DCP 2	.050	3.886	1.518	36	0.282	267	0.042	172	0.118	94	0.080	273	0.044	179	0.029	138	0.004	33	0.039	63
DCP 3	.100	2.366	1.377	22	0.350	243	0.165	157	0.198	58	0.107	296	0.091	219	0.049	120	0.020	29	0.023	233
DCP 4	.150	1.884	1.240	6	0.343	213	0.125	125	0.110	7	0.079	245	0.050	163	0.005	99	0.009	332	0.017	320
DCP 5	.200	1.852	1.016	1	0.294	181	0.106	72	0.129	335	0.128	217	0.065	106	0.038	31	0.054	248	0.028	176
DCP 6	.250	1.653	0.976	355	0.348	173	0.175	41	0.158	290	0.130	194	0.081	75	0.054	308	0.028	197	0.036	236
DCP 7	.300	1.412	0.820	348	0.330	152	0.174	18	0.141	275	0.134	163	0.072	21	0.037	289	0.062	152	0.029	39
DCP 8	.400	1.264	0.595	339	0.292	131	0.215	334	0.146	217	0.106	104	0.037	300	0.046	202	0.063	55	0.026	277
DCP 9	.500	1.101	0.400	322	0.292	92	0.236	281	0.134	143	0.132	6	0.096	198	0.036	81	0.058	334	0.041	158
DCP 10	.695	0.820	0.186	281	0.223	57	0.195	220	0.081	59	0.107	289	0.072	104	0.013	272	0.020	146	0.021	324
DCP 11	.800	0.487	0.077	271	0.153	46	0.148	201	0.095	32	0.086	254	0.034	75	0.027	305	0.024	52	0.037	240
DCP 12	.878	0.383	0.032	263	0.104	37	0.122	190	0.071	20	0.067	224	0.021	56	0.011	199	0.025	3	0.039	154
DCP 13	.953	0.389	0.014	102	0.060	15	0.075	148	0.043	343	0.054	206	0.022	310	0.010	67	0.009	19	0.012	160

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	49.75	0.200	17.55	5.41		3183.2	10
	K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
	0.374	222.3	199.5	0.26E 07	0.00463	1.968	22.35

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.397	0.639	10	0.181	167	0.065	330	0.028	193	0.020	57	0.005	279	0.004	56	0.012	215	0.008	56
CM		-0.147	0.131	105	0.084	298	0.024	129	0.005	19	0.005	212	0.006	91	0.005	270	0.005	59	0.003	231
DCP 1	.010	3.948	3.265	85	0.849	25	0.364	345	0.365	259	0.145	214	0.235	150	0.040	38	0.061	132	0.040	341
DCP 2	.050	3.701	1.888	58	0.255	315	0.251	286	0.152	173	0.097	134	0.102	55	0.065	351	0.037	286	0.019	227
DCP 3	.100	2.291	1.664	45	0.287	298	0.307	272	0.194	176	0.157	127	0.113	51	0.095	342	0.075	262	0.041	181
DCP 4	.150	1.820	1.535	30	0.412	272	0.265	231	0.204	151	0.159	70	0.102	6	0.073	273	0.030	235	0.033	168
DCP 5	.200	1.872	1.375	19	0.436	239	0.187	182	0.183	106	0.155	14	0.107	294	0.078	218	0.067	173	0.075	77
DCP 6	.250	1.695	1.290	14	0.517	237	0.273	155	0.232	80	0.196	350	0.138	278	0.135	195	0.101	115	0.063	23
DCP 7	.300	1.520	1.207	5	0.580	220	0.324	120	0.220	33	0.146	305	0.124	241	0.096	142	0.065	94	0.063	341
DCP 8	.400	1.363	0.924	349	0.553	190	0.336	64	0.215	324	0.111	223	0.100	146	0.062	49	0.057	331	0.355	214
DCP 9	.500	1.312	0.760	333	0.584	163	0.351	20	0.220	267	0.134	138	0.050	61	0.054	319	0.038	218	0.039	139
DCP 10	.695	1.041	0.479	301	0.473	116	0.303	310	0.180	174	0.102	11	0.006	226	0.024	144	0.004	218	0.010	297
DCP 11	.800	0.662	0.278	292	0.302	104	0.176	298	0.137	165	0.107	352	0.029	187	0.020	355	0.028	165	0.011	339
DCP 12	.878	0.627	0.236	271	0.279	65	0.158	236	0.024	72	0.030	72	0.050	259	0.043	45	0.043	217	0.044	19
DCP 13	.953	0.642	0.288	259	0.335	49	0.243	213	0.162	24	0.119	169	0.104	318	0.076	121	0.063	288	0.046	92

FORCED PITCHING OSCILLATION NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	49.50	0.200	25.00	5.34		3180.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.372	222.3	199.5	0.26E 07	-0.00245	1.836	26.42

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.297	0.439	60	0.110	52	0.015	292	0.006	233	0.003	60	0.011	90	0.008	338	0.001	104	0.001	32
CM		-0.231	0.106	222	0.034	191	0.004	204	0.002	49	0.001	302	0.006	292	0.004	156	0.002	298	0.002	240
DCP 1	.010	1.540	0.818	148	0.320	195	0.179	295	0.088	328	0.055	18	0.054	341	0.031	222	0.019	252	0.008	345
DCP 2	.050	2.659	0.346	81	0.114	108	0.056	316	0.011	310	0.008	44	0.012	89	0.019	173	0.006	328	0.011	243
DCP 3	.100	1.582	0.425	75	0.135	96	0.038	285	0.021	113	0.013	212	0.012	57	0.013	94	0.007	191	0.009	179
DCP 4	.150	1.308	0.46[illegible]	72	0.131	106	0.053	286	0.014	323	0.026	305	0.015	3	0.016	85	0.005	97	0.005	162
DCP 5	.200	1.483	0.[illegible]78	68	0.146	87	0.033	254	0.008	335	0.013	340	0.024	0	0.019	356	0.003	228	0.009	220
DCP 6	.250	1.427	0.511	69	0.148	90	0.037	258	0.008	225	0.029	267	0.021	319	0.016	24	0.004	1	0.007	134
DCP 7	.300	1.315	0.529	67	0.190	83	0.043	204	0.019	230	0.002	322	0.025	296	0.030	342	0.013	330	0.014	257
DCP 8	.400	1.457	0.555	62	0.196	66	0.035	167	0.021	157	0.018	159	0.020	214	0.014	279	0.003	278	0.010	250
DCP 9	.500	1.467	0.580	58	0.202	46	0.039	119	0.015	183	0.041	89	0.026	117	0.015	303	0.002	298	0.005	355
DCP10	.695	1.278	0.533	49	0.191	5	0.043	319	0.014	144	0.008	323	0.036	78	0.011	92	0.011	94	0.010	22
DCP11	.800	0.919	0.447	45	0.164	7	0.035	324	0.020	238	0.029	15	0.032	131	0.016	347	0.004	135	0.015	27
DCP12	.878	0.882	0.324	38	0.098	356	0.022	340	0.008	284	0.019	258	0.016	191	0.021	300	0.019	92	0.006	159
DCP13	.953	0.740	0.230	19	0.043	230	0.045	55	0.041	315	0.038	173	0.024	115	0.030	344	0.016	200	0.026	193

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	50.00	0.400	9.84	5.02		3147.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.193	433.0	724.3	0.47E 07	0.00063	1.459	14.88

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.866	0.498	22	0.106	267	0.055	139	0.015	33	0.016	222	0.007	86	0.007	77	0.005	317	0.006	121
CM		-0.040	0.062	161	0.051	22	0.029	271	0.018	150	0.008	43	0.002	317	0.004	255	0.005	124	0.004	347
DCP 1	.010	3.778	1.402	56	1.296	35	0.523	302	0.109	216	0.149	224	0.163	166	0.115	86	0.039	71	0.067	52
DCP 2	.050	2.545	1.005	49	0.529	359	0.173	246	0.081	210	0.132	160	0.075	71	0.050	36	0.030	322	0.036	9
DCP 3	.100	1.838	0.927	37	0.351	325	0.124	208	0.096	173	0.081	102	0.030	24	0.036	5	0.023	271	0.008	250
DCP 4	.150	1.445	0.816	30	0.276	303	0.122	196	0.108	148	0.059	60	0.027	33	0.053	332	0.051	214	0.023	130
DCP 5	.200	1.270	0.758	26	0.248	284	0.106	185	0.109	128	0.049	20	0.029	21	0.052	282	0.034	158	0.019	82
DCP 6	.250	1.135	0.719	26	0.237	275	0.109	177	0.102	121	0.049	0	0.028	40	0.059	287	0.052	170	0.026	69
DCP 7	.300	0.954	0.682	23	0.234	265	0.110	171	0.103	102	0.045	339	0.037	8	0.060	247	0.039	130	0.015	72
DCP 8	.400	0.648	0.570	18	0.223	245	0.112	144	0.086	67	0.053	299	0.025	320	0.059	192	0.047	79	0.025	339
DCP 9	.500	0.652	0.497	14	0.207	232	0.122	128	0.086	26	0.039	269	0.042	265	0.066	136	0.041	13	0.012	300
DCP10	.695	0.520	0.342	5	0.181	210	0.119	99	0.088	335	0.037	237	0.043	193	0.056	73	0.040	318	0.026	209
DCP11	.800	0.319	0.273	352	0.170	193	0.119	73	0.103	307	0.068	193	0.050	93	0.033	1	0.033	277	0.041	167
DCP12	.878	0.192	0.224	342	0.134	186	0.098	66	0.089	293	0.056	180	0.042	75	0.026	351	0.030	252	0.027	122
DCP13	.953	0.300	0.158	328	0.054	164	0.041	60	0.037	265	0.016	163	0.015	89	0.018	358	0.018	238	0.010	118

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	50.00	0.400	12.23	4.94		3147.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.193	433.0	722.9	0.47E 07	0.00047	1.599	16.71

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.985	0.504	38	0.056	310	0.034	266	0.026	187	0.032	64	0.014	332	0.004	69	0.005	229	0.010	47
CM		-0.072	0.105	171	0.052	60	0.027	8	0.019	287	0.015	212	0.006	132	0.001	123	0.006	25	0.005	249
DCP 1	.010	3.915	1.551	111	1.215	75	0.361	69	0.276	22	0.115	349	0.080	6	0.057	350	0.051	35	0.069	339
DCP 2	.050	2.595	1.026	89	0.487	47	0.210	35	0.175	317	0.061	4	0.103	299	0.030	253	0.027	273	0.014	283
DCP 3	.100	1.921	0.898	71	0.307	29	0.209	358	0.156	269	0.031	312	0.040	235	0.038	244	0.034	151	0.032	253
DCP 4	.150	1.554	0.784	54	0.204	10	0.184	331	0.145	249	0.034	226	0.049	196	0.043	173	0.069	111	0.020	51
DCP 5	.200	1.359	0.742	49	0.162	353	0.170	314	0.124	233	0.056	188	0.024	153	0.051	144	0.032	55	0.021	42
DCP 6	.250	1.246	0.743	45	0.155	334	0.159	306	0.123	228	0.067	172	0.027	103	0.043	160	0.053	69	0.018	352
DCP 7	.300	1.066	0.695	39	0.118	320	0.149	298	0.105	227	0.089	168	0.026	109	0.060	110	0.035	20	0.024	28
DCP 8	.400	0.772	0.651	31	0.152	287	0.138	268	0.114	191	0.102	121	0.045	44	0.039	64	0.045	364	0.021	245
DCP 9	.500	0.820	0.625	19	0.175	260	0.107	234	0.075	176	0.097	106	0.035	51	0.075	18	0.059	285	0.025	217
DCP10	.695	0.664	0.469	7	0.175	241	0.118	192	0.099	112	0.112	37	0.045	304	0.038	298	0.050	214	0.034	138
DCP11	.800	0.437	0.386	359	0.173	237	0.126	171	0.138	88	0.115	9	0.077	270	0.038	204	0.042	163	0.049	52
DCP12	.878	0.317	0.312	351	0.137	231	0.103	154	0.088	66	0.079	346	0.053	257	0.032	176	0.027	142	0.041	32
DCP13	.953	0.400	0.218	338	0.084	223	0.077	119	0.048	23	0.059	288	0.013	175	0.008	250	0.024	145	0.015	24

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	47.39	0.400	14.86	5.20		3181.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.181	437.9	734.6	0.47E 07	-0.00071	1.635	17.79

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.996	0.501	46	0.031	74	0.088	14	0.043	288	0.020	173	0.009	130	0.008	76	0.008	197	0.011	23
CM		-0.120	0.117	188	0.034	129	0.030	105	0.031	44	0.012	328	0.004	358	0.004	307	0.007	294	0.008	195
DCP 1	.050	2.696	1.040	113	0.371	135	0.309	87	0.058	85	0.049	131	0.076	147	0.034	136	0.019	159	0.030	247
DCP 2	.100	1.913	0.840	96	0.341	129	0.313	73	0.125	61	0.012	15	0.070	125	0.048	113	0.026	75	0.015	163
DCP 3	.150	1.547	0.746	74	0.248	109	0.256	47	0.146	28	0.023	333	0.059	62	0.036	47	0.036	33	0.015	352
DCP 4	.200	1.451	0.711	67	0.215	107	0.240	49	0.167	21	0.033	11	0.051	23	0.054	32	0.027	352	0.021	10
DCP 5	.250	1.331	0.721	58	0.169	95	0.213	33	0.163	10	0.042	295	0.047	27	0.036	15	0.041	355	0.012	292
DCP 6	.300	1.093	0.714	53	0.124	89	0.194	39	0.162	4	0.044	3	0.056	350	0.059	356	0.037	312	0.010	342
DCP 7	.400	0.978	0.689	38	0.056	65	0.170	12	0.176	328	0.079	247	0.016	291	0.027	318	0.050	279	0.031	182
DCP 8	.500	1.021	0.696	32	0.093	342	0.140	350	0.158	291	0.052	253	0.045	248	0.055	260	0.068	235	0.035	144
DCP 9	.695	0.732	0.538	17	0.121	311	0.152	296	0.186	227	0.088	167	0.045	163	0.047	145	0.065	113	0.058	42
DCP10	.800	0.541	0.433	12	0.130	310	0.142	272	0.172	210	0.101	136	0.033	135	0.055	99	0.050	78	0.060	357
DCP11	.878	0.396	0.332	4	0.122	299	0.101	257	0.135	187	0.080	110	0.020	94	0.036	67	0.040	52	0.054	327
DCP12	.953	0.482	0.234	354	0.096	279	0.052	223	0.081	150	0.039	56	0.002	44	0.012	156	0.019	52	0.018	0

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	49.50	0.400	17.39	5.21		3181.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.189	437.5	733.8	0.47E 07	-0.00168	1.672	18.51

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.035	0.493	54	0.088	142	0.117	68	0.037	38	0.030	313	0.009	160	0.009	329	0.007	288	0.004	212
CM		-0.141	0.121	204	0.026	194	0.041	196	0.024	145	0.013	112	0.006	252	0.009	160	0.005	112	0.001	41
DCP 1	.050	2.647	0.918	125	0.512	187	0.184	153	0.095	167	0.072	284	0.063	285	0.048	300	0.027	4	0.016	113
DCP 2	.100	1.932	0.678	104	0.448	178	0.208	147	0.148	148	0.028	257	0.072	258	0.042	262	0.016	195	0.035	328
DCP 3	.150	1.527	0.641	81	0.335	155	0.197	120	0.118	105	0.014	172	0.058	231	0.049	217	0.033	258	0.022	215
DCP 4	.200	1.449	0.620	73	0.268	157	0.198	121	0.119	117	0.034	122	0.058	202	0.036	206	0.025	204	0.023	277
DCP 5	.250	1.325	0.631	65	0.238	143	0.211	109	0.119	89	0.031	69	0.043	204	0.053	177	0.039	218	0.015	195
DCP 6	.300	1.088	0.663	60	0.178	147	0.194	108	0.112	105	0.042	69	0.069	177	0.046	176	0.038	148	0.024	245
DCP 7	.400	0.995	0.654	45	0.126	113	0.214	84	0.134	62	0.083	22	0.014	181	0.055	108	0.033	139	0.009	51
DCP 8	.500	1.072	0.699	42	0.086	83	0.210	61	0.103	42	0.053	350	0.074	96	0.056	74	0.043	53	0.023	84
DCP 9	.695	0.806	0.577	32	0.099	25	0.220	22	0.138	338	0.085	293	0.043	33	0.074	351	0.057	310	0.013	333
DCP10	.800	0.637	0.442	29	0.081	12	0.181	14	0.140	316	0.092	295	0.016	281	0.067	303	0.041	261	0.029	204
DCP11	.878	0.496	0.350	22	0.065	346	0.139	350	0.113	285	0.067	259	0.004	249	0.056	277	0.033	229	0.019	160
DCP12	.953	0.574	0.256	14	0.069	335	0.098	310	0.080	247	0.045	193	0.017	105	0.019	337	0.011	295	0.018	336

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	49.26	0.400	24.86	5.30		3181.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.188	437.2	731.5	0.47E 07	-0.00152	1.266	29.24

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.038	0.253	44	0.048	182	0.023	245	0.018	308	0.007	45	0.006	106	0.002	295	0.003	318	0.001	9
CM		-0.167	0.060	227	0.011	336	0.008	23	0.007	92	0.002	187	0.002	265	0.001	49	0.001	117	0.001	59
CCP 1	.010	1.773	0.275	141	0.113	230	0.095	331	0.058	41	0.022	140	0.010	255	0.018	359	0.013	38	0.015	97
CCP 2	.050	2.046	0.246	44	0.044	179	0.030	342	0.029	19	0.009	37	0.003	177	0.009	318	0.009	337	0.012	19
CCP 3	.100	1.512	0.251	26	0.043	211	0.017	301	0.008	327	0.004	357	0.008	112	0.003	301	0.005	336	0.001	85
CCP 4	.150	1.382	0.282	38	0.078	190	0.028	287	0.022	9	0.007	102	0.005	259	0.007	22	0.002	251	0.006	294
CCP 5	.200	1.302	0.273	29	0.052	206	0.025	273	0.018	322	0.005	36	0.003	84	0.001	302	0.003	252	0.002	299
CCP 6	.250	1.259	0.298	37	0.068	193	0.030	291	0.027	0	0.014	95	0.006	185	0.006	317	0.004	326	0.005	32
CCP 7	.300	1.015	0.291	35	0.058	204	0.029	265	0.021	323	0.010	58	0.005	126	0.002	101	0.002	243	0.003	155
CCP 8	.400	0.991	0.296	41	0.061	185	0.033	261	0.025	338	0.015	92	0.012	167	0.005	294	0.007	331	0.005	357
CCP 9	.500	1.064	0.297	42	0.050	188	0.033	237	0.024	297	0.009	59	0.008	106	0.004	252	0.000	212	0.002	43
CCP10	.695	0.894	0.287	48	0.050	159	0.033	207	0.028	266	0.006	9	0.009	91	0.005	301	0.005	360	0.003	285
CCP11	.800	0.778	0.269	55	0.060	162	0.039	213	0.034	286	0.017	11	0.013	83	0.008	189	0.002	331	0.000	359
CCP12	.878	0.641	0.228	50	0.043	146	0.034	195	0.031	274	0.019	335	0.009	58	0.002	99	0.005	278	0.002	143
CCP13	.953	0.696	0.149	42	0.019	134	0.019	169	0.010	224	0.003	57	0.005	52	0.003	263	0.004	251	0.002	186

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	49.50	0.600	5.13	5.34		3185.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.129	643.2	1439.5	0.63E 07	-0.00051	0.996	10.50

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.485	0.448	0	0.050	295	0.024	154	0.001	75	0.005	157	0.004	338	0.006	110	0.003	273	0.001	146
CM		-0.023	0.032	205	0.019	48	0.016	287	0.008	164	0.002	96	0.002	54	0.004	310	0.002	157	0.001	39
CCP 1	.050	1.538	1.409	344	0.254	48	0.190	292	0.088	153	0.008	130	0.015	351	0.019	274	0.021	177	0.024	131
CCP 2	.100	1.346	1.137	355	0.211	18	0.174	303	0.067	209	0.074	255	0.086	155	0.027	46	0.047	132	0.043	342
CCP 3	.150	0.896	0.913	356	0.154	322	0.069	239	0.071	202	0.072	136	0.033	77	0.046	47	0.017	337	0.019	347
CCP 4	.200	0.833	0.794	358	0.131	305	0.060	200	0.052	189	0.071	123	0.048	40	0.038	12	0.035	286	0.017	210
CCP 5	.250	0.668	0.657	2	0.172	301	0.084	179	0.038	119	0.038	91	0.047	0	0.016	298	0.020	257	0.021	220
CCP 6	.300	0.503	0.588	3	0.112	289	0.082	170	0.036	114	0.040	77	0.050	350	0.026	268	0.027	217	0.024	145
CCP 7	.400	0.352	0.423	7	0.090	286	0.073	152	0.027	52	0.012	29	0.031	317	0.022	195	0.008	155	0.012	97
CCP 8	.500	0.348	0.348	10	0.076	269	0.072	133	0.033	17	0.015	304	0.017	266	0.024	146	0.008	58	0.008	11
CCP 9	.695	0.279	0.224	15	0.060	242	0.058	104	0.035	330	0.014	236	0.008	199	0.017	108	0.011	329	0.004	239
CCP10	.800	0.152	0.180	13	0.063	230	0.054	103	0.027	336	0.007	273	0.013	217	0.021	126	0.016	349	0.007	224
CCP11	.878	0.096	0.150	2	0.061	208	0.042	81	0.021	319	0.012	263	0.012	167	0.012	85	0.009	305	0.000	215
CCP12	.953	0.173	0.143	352	0.058	190	0.034	64	0.015	310	0.011	237	0.008	134	0.005	91	0.003	340	0.003	247

FORCED PITCHING OSCILLATION NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	49.50	0.600	7.62	5.28		3185.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.129	642.7	1436.0	0.63E 07	-0.00071	1.153	12.09

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.662	0.363	20	0.088	352	0.023	246	0.011	228	0.012	129	0.002	6	0.004	35	0.005	285	0.003	191
CM		-0.042	0.052	199	0.029	77	0.010	5	0.008	340	0.004	264	0.001	237	0.003	183	0.001	123	0.002	83
DCP 1	.050	2.409	0.553	1	0.578	53	0.078	300	0.038	352	0.026	269	0.042	150	0.006	301	0.036	147	0.018	36
DCP 2	.100	1.793	0.651	17	0.480	50	0.042	294	0.130	38	0.074	147	0.101	21	0.041	118	0.049	320	0.023	88
DCP 3	.150	1.184	0.644	23	0.240	22	0.110	354	0.062	300	0.039	343	0.027	322	0.024	324	0.039	327	0.021	266
DCP 4	.200	1.091	0.595	24	0.214	5	0.078	318	0.056	278	0.027	316	0.037	269	0.027	274	0.031	251	0.024	215
DCP 5	.250	0.910	0.547	23	0.152	344	0.032	299	0.075	275	0.033	204	0.034	238	0.027	180	0.010	230	0.032	175
DCP 6	.300	0.710	0.497	27	0.165	344	0.062	278	0.061	258	0.032	219	0.044	214	0.027	162	0.019	172	0.025	139
DCP 7	.400	0.530	0.417	24	0.124	310	0.032	207	0.045	243	0.042	149	0.006	180	0.015	121	0.008	108	0.017	86
DCP 8	.500	0.519	0.352	28	0.111	306	0.047	217	0.039	197	0.034	128	0.014	102	0.018	37	0.006	351	0.010	368
DCP 9	.695	0.376	0.255	25	0.089	272	0.038	179	0.028	156	0.027	77	0.012	7	0.013	343	0.007	251	0.006	243
DCP 10	.800	0.247	0.234	18	0.090	264	0.039	192	0.033	147	0.015	78	0.010	72	0.020	7	0.008	320	0.015	270
DCP 11	.878	0.196	0.207	6	0.078	249	0.036	187	0.034	124	0.016	32	0.005	49	0.013	347	0.004	296	0.011	249
DCP 12	.953	0.262	0.195	354	0.060	231	0.025	184	0.027	110	0.009	22	0.006	349	0.004	299	0.003	361	0.004	252

FORCED PITCHING OSCILLATION NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	49.50	0.600	9.97	5.20		3185.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.129	642.2	1435.2	0.63E 07	-0.00096	1.182	12.67

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.791	0.305	41	0.076	44	0.023	301	0.006	116	0.012	320	0.003	118	0.004	223	0.003	198	0.001	206
CM		-0.064	0.072	200	0.021	115	0.015	115	0.001	159	0.004	98	0.002	129	0.002	49	0.002	12	0.001	180
DCP 1	.050	2.710	0.202	118	0.393	70	0.104	149	0.018	41	0.021	132	0.031	40	0.028	97	0.025	359	0.010	176
DCP 2	.100	2.038	0.344	77	0.348	80	0.170	169	0.155	244	0.097	344	0.041	184	0.054	289	0.031	21	0.037	228
DCP 3	.150	1.375	0.456	55	0.284	85	0.020	108	0.080	140	0.047	204	0.045	208	0.018	274	0.025	255	0.007	353
DCP 4	.200	1.256	0.446	52	0.235	69	0.030	31	0.082	97	0.026	177	0.034	144	0.060	166	0.023	222	0.015	231
DCP 5	.250	1.047	0.445	50	0.138	58	0.064	22	0.053	97	0.032	51	0.043	111	0.015	112	0.031	164	0.013	147
DCP 6	.300	0.849	0.426	47	0.135	49	0.057	9	0.057	64	0.035	27	0.023	72	0.027	111	0.018	128	0.021	115
DCP 7	.400	0.536	0.397	42	0.057	7	0.054	352	0.018	67	0.036	8	0.025	50	0.015	4	0.012	33	0.012	45
DCP 8	.500	0.633	0.374	38	0.066	343	0.066	324	0.019	325	0.032	305	0.006	291	0.009	316	0.006	237	0.014	334
DCP 9	.695	0.478	0.302	29	0.069	305	0.065	283	0.008	191	0.017	264	0.003	298	0.013	228	0.007	183	0.002	299
DCP 10	.800	0.357	0.290	23	0.066	308	0.059	292	0.007	325	0.021	286	0.022	295	0.018	227	0.015	237	0.001	219
DCP 11	.878	0.307	0.254	12	0.060	306	0.054	270	0.008	298	0.016	234	0.013	280	0.017	194	0.008	154	0.002	45
DCP 12	.953	0.359	0.224	358	0.049	301	0.041	244	0.010	221	0.006	186	0.004	113	0.006	322	0.005	253	0.003	232

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	62.89	0.200	14.82	5.58		3173.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.474	221.6	199.3	0.26E 07	0.00025	1.671	20.34

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.289	0.367	4	0.061	64	0.087	124	0.019	316	0.004	81	0.008	251	0.011	63	0.008	273	0.007	72
CM		-0.072	0.049	7	0.045	197	0.033	324	0.009	113	0.007	254	0.003	80	0.001	223	0.001	76	0.003	227
ECP 1	.010	5.009	2.460	49	0.984	311	0.249	148	0.152	106	0.142	10	0.068	235	0.033	148	0.065	74	0.060	271
ECP 2	.050	3.970	1.534	25	0.304	225	0.152	80	0.140	20	0.121	225	0.052	118	0.042	39	0.035	256	0.026	136
ECP 3	.100	2.518	1.507	9	0.408	207	0.247	101	0.154	359	0.105	246	0.062	123	0.064	50	0.061	253	0.044	89
ECP 4	.150	1.962	1.220	354	0.387	180	0.218	74	0.085	302	0.040	193	0.003	1	0.032	76	0.049	296	0.032	161
ECP 5	.200	1.795	0.981	347	0.308	155	0.206	50	0.101	271	0.111	151	0.057	345	0.035	296	0.051	126	0.039	345
ECP 6	.250	1.591	0.788	341	0.337	137	0.197	25	0.128	227	0.088	98	0.062	303	0.012	156	0.015	184	0.034	17
ECP 7	.300	1.354	0.640	331	0.344	117	0.167	343	0.112	207	0.149	64	0.098	259	0.021	160	0.054	32	0.031	264
ECP 8	.400	1.168	0.349	314	0.310	90	0.151	271	0.120	125	0.104	337	0.057	174	0.024	57	0.038	275	0.020	81
ECP 9	.500	1.119	0.137	275	0.310	46	0.221	194	0.077	62	0.141	269	0.076	54	0.010	279	0.005	135	0.018	71
ECP10	.695	0.839	0.125	139	0.238	1	0.240	137	0.069	312	0.079	139	0.042	271	0.032	114	0.032	259	0.015	171
ECP11	.800	0.398	0.130	125	0.177	351	0.191	132	0.092	312	0.092	94	0.040	241	0.022	35	0.007	172	0.023	48
ECP12	.878	0.308	0.138	122	0.149	332	0.168	107	0.069	276	0.072	47	0.009	186	0.019	337	0.010	72	0.020	327
ECP13	.953	0.373	0.119	86	0.094	290	0.074	78	0.040	252	0.037	7	0.012	137	0.016	293	0.005	32	0.001	0

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	63.29	0.200	17.36	5.56		3173.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.478	221.3	199.0	0.26E 07	0.00212	1.836	22.86

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.371	0.471	3	0.085	91	0.046	166	0.021	99	0.014	273	0.015	334	0.008	180	0.009	37	0.007	155
CM		-0.146	0.081	65	0.055	232	0.017	11	0.008	252	0.005	66	0.005	187	0.003	41	0.003	193	0.003	0
ECP 1	.010	4.062	2.720	71	0.814	28	0.340	329	0.118	221	0.034	208	0.060	173	0.082	113	0.025	35	0.027	55
ECP 2	.050	3.522	1.667	45	0.160	321	0.172	221	0.105	114	0.065	98	0.063	355	0.031	239	0.027	158	0.030	137
ECP 3	.100	2.321	1.599	29	0.294	292	0.245	205	0.152	133	0.082	40	0.001	303	0.026	180	0.028	246	0.040	112
ECP 4	.150	1.709	1.470	13	0.339	260	0.244	168	0.085	83	0.015	3	0.027	328	0.024	358	0.026	195	0.013	24
ECP 5	.200	1.720	1.217	3	0.354	226	0.230	138	0.147	49	0.084	313	0.099	226	0.071	145	0.097	56	0.045	336
ECP 6	.250	1.595	1.152	358	0.448	208	0.279	115	0.184	17	0.113	288	0.058	185	0.015	82	0.041	24	0.022	247
ECP 7	.300	1.443	0.973	347	0.457	186	0.251	83	0.180	316	0.069	218	0.076	133	0.039	29	0.040	319	0.027	198
ECP 8	.400	1.309	0.728	333	0.526	150	0.272	26	0.199	249	0.050	144	0.087	22	0.040	275	0.027	142	0.022	81
ECP 9	.500	1.391	0.444	301	0.458	99	0.135	307	0.171	179	0.066	342	0.058	303	0.035	135	0.016	54	0.007	229
ECP10	.695	1.116	0.220	243	0.384	38	0.128	213	0.136	83	0.055	227	0.019	8	0.025	286	0.006	17	0.015	196
ECP11	.800	0.616	0.108	241	0.281	36	0.202	212	0.115	45	0.044	184	0.026	336	0.016	192	0.013	51	0.019	191
ECP12	.878	0.522	0.072	220	0.206	10	0.151	185	0.098	23	0.019	189	0.035	357	0.013	134	0.012	319	0.010	243
ECP13	.953	0.584	0.181	182	0.264	325	0.165	113	0.058	232	0.058	343	0.039	124	0.042	210	0.029	356	0.034	125

FORCED PITCHING OSCILLATION NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	63.69	0.200	24.79	5.45		3173.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.481	221.2	201.7	0.26E 07	-0.00137	1.930	28.23

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.355	0.526	52	0.065	315	0.012	65	0.020	177	0.011	276	0.006	84	0.005	342	0.006	86	0.006	90
CM		-0.244	0.114	206	0.023	141	0.003	248	0.007	335	0.003	162	0.004	278	0.004	153	0.001	337	0.002	289
CCP 1	.010	1.746	0.734	139	0.316	233	0.115	330	0.058	51	0.057	254	0.070	339	0.024	108	0.015	319	0.032	51
CCP 2	.050	2.454	0.469	78	0.029	266	0.029	352	0.013	105	0.010	175	0.021	300	0.016	329	0.010	18	0.015	9
CCP 3	.100	1.674	0.541	79	0.048	273	0.029	340	0.014	155	0.048	183	0.017	227	0.012	265	0.018	128	0.010	93
CCP 4	.150	1.394	0.629	67	0.040	222	0.043	335	0.023	23	0.005	118	0.015	232	0.005	301	0.007	88	0.022	273
CCP 5	.200	1.486	0.636	71	0.016	295	0.015	256	0.013	220	0.006	188	0.019	154	0.015	183	0.011	119	0.012	134
CCP 6	.250	1.526	0.724	65	0.017	243	0.031	261	0.037	316	0.031	25	0.019	159	0.022	228	0.011	32	0.013	153
CCP 7	.300	1.372	0.745	68	0.040	45	0.036	157	0.041	227	0.020	289	0.016	156	0.008	148	0.011	72	0.010	71
CCP 8	.400	1.513	0.763	53	0.073	25	0.076	140	0.088	221	0.059	283	0.021	9	0.026	82	0.021	69	0.012	57
CCP 9	.500	1.631	0.747	50	0.152	348	0.067	88	0.068	172	0.040	232	0.013	29	0.003	77	0.010	160	0.009	163
CCP10	.695	1.391	0.641	30	0.165	306	0.044	25	0.020	85	0.013	91	0.027	98	0.015	274	0.015	55	0.012	80
CCP11	.800	0.896	0.453	24	0.150	299	0.032	150	0.009	64	0.017	36	0.017	53	0.023	344	0.009	159	0.012	134
CCP12	.878	0.826	0.287	15	0.089	297	0.020	193	0.020	112	0.016	346	0.011	135	0.015	328	0.010	78	0.019	185
CCP13	.953	0.797	0.164	336	0.094	125	0.094	319	0.060	151	0.048	348	0.021	151	0.039	1	0.029	265	0.025	53

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.M	TEST POINT	CYCLES ANALYZED
	62.50	0.400	0.38	5.46		3171.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.238	438.2	736.0	0.48E 07	-0.00094	0.389	5.87

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		-0.036	0.407	357	0.030	181	0.009	90	0.010	124	0.004	245	0.005	62	0.005	86	0.002	46	0.003	42
CM		-0.008	0.035	268	0.003	87	0.001	249	0.001	5	0.002	121	0.001	229	0.001	333	0.000	250	0.000	279
DCP 1	.010	-0.388	2.503	333	0.118	198	0.069	105	0.050	108	0.040	132	0.030	94	0.018	59	0.011	41	0.012	48
DCP 2	.050	0.190	1.363	342	0.107	152	0.018	101	0.02[illegible]	103	0.020	145	0.008	64	0.014	51	0.004	37	0.007	11
DCP 3	.100	-0.112	0.999	346	0.078	158	0.00[illegible]	132	0.023	111	0.015	188	0.010	70	0.012	45	0.007	32	0.009	34
DCP 4	.150	-0.214	0.744	348	0.067	163	0.011	88	0.015	102	0.008	177	0.005	51	0.009	57	0.002	56	0.003	2
DCP 5	.200	-0.054	0.619	352	0.052	165	0.009	108	0.014	122	0.008	207	0.006	89	0.008	74	0.005	88	0.005	51
DCP 6	.250	-0.095	0.535	358	0.046	174	0.009	72	0.011	104	0.008	252	0.006	31	0.006	82	0.004	334	0.003	337
DCP 7	.300	-0.222	0.464	1	0.039	178	0.010	75	0.010	119	0.007	254	0.005	57	0.008	75	0.004	38	0.005	36
DCP 8	.400	-0.150	0.342	8	0.028	188	0.008	77	0.009	127	0.009	280	0.005	34	0.007	96	0.002	349	0.001	280
DCP 9	.500	0.019	0.280	15	0.022	207	0.009	71	0.007	143	0.009	280	0.004	50	0.004	85	0.002	38	0.003	31
DCP10	.695	0.146	0.182	34	0.017	224	0.006	89	0.006	161	0.007	288	0.003	36	0.005	141	0.002	59	0.000	98
DCP11	.800	-0.038	0.138	41	0.010	247	0.005	83	0.006	157	0.007	308	0.005	77	0.004	159	0.003	44	0.005	88
DCP12	.878	-0.070	0.110	49	0.009	249	0.006	101	0.005	157	0.005	312	0.003	36	0.003	146	0.001	111	0.000	47
DCP13	.953	0.074	0.090	37	0.008	231	0.002	69	0.005	166	0.003	261	0.004	119	0.004	139	0.004	111	0.004	89

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.M	TEST POINT	CYCLES ANALYZED
	63.29	0.400	7.70	5.51		3171.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.241	437.9	738.9	0.48E 07	-0.00058	1.241	13.22

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.773	0.433	5	0.048	209	0.017	64	0.009	145	0.004	5	0.004	246	0.006	95	0.002	109	0.003	44
CM		-0.018	0.023	262	0.010	342	0.009	170	0.007	7	0.003	195	0.002	73	0.002	280	0.001	76	0.000	338
DCP 1	.010	4.089	2.530	351	0.270	357	0.370	230	0.299	104	0.102	0	0.008	212	0.039	292	0.052	150	0.047	32
DCP 2	.050	2.706	1.218	356	0.107	297	0.142	164	0.117	39	0.048	260	0.013	170	0.015	153	0.028	58	0.016	348
DCP 3	.100	1.795	1.011	358	0.147	242	0.145	120	0.095	0	0.049	214	0.016	121	0.019	75	0.009	347	0.002	101
DCP 4	.150	1.211	0.769	356	0.104	213	0.078	88	0.038	318	0.026	178	0.006	121	0.017	60	0.006	313	0.007	142
DCP 5	.200	1.114	0.660	0	0.125	210	0.089	71	0.042	281	0.024	139	0.003	272	0.013	75	0.004	272	0.003	153
DCP 6	.250	0.910	0.563	4	0.091	206	0.057	62	0.020	257	0.008	162	0.004	119	0.011	27	0.004	189	0.004	72
DCP 7	.300	0.683	0.516	6	0.110	200	0.075	48	0.039	243	0.017	104	0.005	2	0.003	350	0.010	144	0.007	11
DCP 8	.400	0.484	0.371	14	0.071	204	0.045	34	0.027	206	0.007	60	0.004	352	0.004	228	0.011	93	0.003	357
DCP 9	.500	0.570	0.307	20	0.061	192	0.042	9	0.035	186	0.015	42	0.013	300	0.016	141	0.007	2	0.006	169
DCP10	.695	0.470	0.194	31	0.038	173	0.032	338	0.031	158	0.018	356	0.012	245	0.013	88	0.006	264	0.007	39
DCP11	.800	0.202	0.140	37	0.030	173	0.020	335	0.020	165	0.010	13	0.009	272	0.010	121	0.002	249	0.001	124
DCP12	.878	0.141	0.097	22	0.024	142	0.016	302	0.014	138	0.011	347	0.010	214	0.010	65	0.006	222	0.004	73
DCP13	.953	0.234	0.076	8	0.019	116	0.007	284	0.008	127	0.012	340	0.010	169	0.005	359	0.004	108	0.006	264

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	63.69	0.400	10.05	5.36		3171.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.243	437.8	739.0	0.48E 07	0.00059	1.458	15.52

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.893	0.519	21	0.109	240	0.040	104	0.011	312	0.010	174	0.011	113	0.011	325	0.006	100	0.005	340
CM		-0.060	0.062	157	0.058	4	0.031	226	0.013	101	0.004	15	0.005	285	0.007	132	0.003	318	0.001	95
DCP 1	.010	3.657	1.508	57	1.298	31	0.476	284	0.131	266	0.193	201	0.152	130	0.069	91	0.065	96	0.088	36
DCP 2	.050	2.711	1.045	45	0.483	350	0.215	223	0.046	213	0.120	139	0.062	42	0.014	78	0.038	9	0.023	316
DCP 3	.100	1.846	0.994	36	0.354	318	0.178	202	0.053	171	0.086	111	0.048	29	0.023	343	0.022	314	0.019	264
DCP 4	.150	1.312	0.872	27	0.270	287	0.136	185	0.082	133	0.070	59	0.034	348	0.038	283	0.020	176	0.005	290
DCP 5	.200	1.215	0.808	26	0.281	275	0.143	168	0.065	101	0.048	46	0.040	333	0.034	246	0.008	151	0.014	133
DCP 6	.250	1.068	0.770	23	0.267	259	0.124	162	0.092	96	0.056	4	0.032	316	0.053	235	0.032	111	0.002	95
DCP 7	.300	0.821	0.717	23	0.270	256	0.133	151	0.081	75	0.049	355	0.042	283	0.032	190	0.011	54	0.021	92
DCP 8	.400	0.639	0.607	16	0.272	228	0.123	112	0.075	34	0.050	293	0.044	231	0.046	129	0.029	6	0.039	354
DCP 9	.500	0.760	0.533	10	0.262	215	0.124	91	0.072	13	0.069	284	0.080	186	0.065	55	0.023	302	0.018	338
DCP10	.695	0.622	0.343	359	0.226	184	0.139	45	0.082	290	0.056	195	0.064	135	0.069	332	0.032	190	0.009	130
DCP11	.800	0.366	0.258	349	0.192	172	0.133	30	0.100	263	0.060	142	0.039	50	0.048	293	0.033	129	0.011	317
DCP12	.878	0.296	0.204	337	0.149	159	0.111	15	0.087	238	0.048	108	0.033	19	0.043	255	0.031	93	0.015	282
DCP13	.953	0.342	0.138	331	0.070	143	0.051	358	0.035	211	0.008	114	0.025	41	0.029	253	0.017	74	0.034	245

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	63.29	0.400	12.53	5.39		3171.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.24[illegible]	437.2	731.3	0.47E 07	0.00066	1.606	17.72

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.049	0.509	30	0.056	291	0.025	224	0.021	94	0.013	291	0.002	341	0.012	188	0.014	18	0.010	286
CM		-0.096	0.110	163	0.064	43	0.033	308	0.012	223	0.008	134	0.004	112	0.006	8	0.007	235	0.004	87
DCP 1	.010	3.964	1.434	111	1.360	73	0.354	31	0.303	22	0.131	351	0.081	335	0.049	332	0.009	57	0.026	9
DCP 2	.050	2.803	1.066	84	0.591	33	0.167	351	0.078	324	0.090	327	0.079	250	0.018	279	0.025	227	0.019	270
DCP 3	.100	1.946	0.965	68	0.401	19	0.249	319	0.073	243	0.081	269	0.050	201	0.040	186	0.006	98	0.024	169
DCP 4	.150	1.457	0.802	49	0.263	2	0.233	289	0.072	186	0.088	235	0.064	154	0.055	133	0.033	51	0.024	56
DCP 5	.200	1.347	0.770	46	0.231	349	0.210	283	0.072	199	0.087	204	0.051	148	0.064	103	0.015	11	0.024	24
DCP 6	.250	1.227	0.746	38	0.195	340	0.238	272	0.103	173	0.079	186	0.050	119	0.061	91	0.035	7	0.032	3
DCP 7	.300	1.005	0.727	33	0.170	320	0.168	267	0.089	159	0.089	164	0.053	118	0.068	59	0.031	338	0.024	328
DCP 8	.400	0.799	0.664	22	0.155	281	0.171	235	0.111	145	0.081	101	0.055	34	0.052	327	0.028	284	0.034	259
DCP 9	.500	0.975	0.666	12	0.229	251	0.118	188	0.082	142	0.083	75	0.078	24	0.098	291	0.040	230	0.024	219
DCP10	.695	0.801	0.512	356	0.254	222	0.173	13[illegible]	0.110	52	0.092	325	0.053	295	0.101	196	0.052	64	0.018	28
DCP11	.800	0.497	0.387	353	0.226	217	0.179	114	0.111	21	0.099	298	0.058	220	0.057	145	0.060	23	0.026	255
DCP12	.878	0.406	0.289	342	0.172	205	0.142	91	0.084	350	0.071	264	0.044	186	0.047	101	0.053	341	0.028	225
DCP13	.953	0.471	0.217	323	0.109	180	0.094	53	0.047	294	0.023	184	0.017	305	0.032	165	0.028	29	0.023	305

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	63.69	0.400	14.91	5.18		3182.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.243	438.1	741.3	0.48E 07	0.00014	1.671	19.07

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.068	0.519	34	0.046	65	0.076	297	0.047	140	0.010	345	0.025	74	0.012	313	0.010	121	0.006	151
CM		-0.132	0.121	173	0.041	80	0.041	25	0.024	280	0.003	90	0.012	241	0.010	128	0.003	17	0.003	2
CCP 1	.050	2.962	1.120	104	0.441	92	0.267	38	0.077	166	0.064	77	0.038	66	0.025	242	0.027	172	0.028	211
CCP 2	.100	2.051	0.997	83	0.422	85	0.325	21	0.028	119	0.059	48	0.062	29	0.012	209	0.018	133	0.020	115
CCP 3	.150	1.620	0.846	65	0.367	71	0.306	355	0.025	315	0.049	19	0.065	351	0.015	294	0.015	126	0.023	58
CCP 4	.200	1.506	0.811	57	0.282	70	0.265	349	0.033	326	0.056	355	0.048	301	0.011	224	0.026	105	0.009	325
CCP 5	.250	1.395	0.777	49	0.276	68	0.307	341	0.094	270	0.021	354	0.040	296	0.020	234	0.031	108	0.007	95
CCP 6	.300	1.119	0.762	42	0.176	65	0.230	334	0.060	273	0.052	328	0.058	251	0.042	183	0.040	87	0.008	115
CCP 7	.400	0.988	0.674	24	0.103	56	0.269	300	0.173	213	0.019	173	0.080	175	0.062	119	0.039	54	0.023	106
CCP 8	.500	1.110	0.731	14	0.066	293	0.205	271	0.129	183	0.060	243	0.123	144	0.086	76	0.037	19	0.014	33
CCP 9	.695	0.850	0.571	2	0.162	263	0.224	212	0.184	113	0.010	92	0.106	57	0.100	322	0.036	229	0.026	235
CCP10	.800	0.561	0.423	1	0.177	265	0.205	187	0.160	94	0.043	15	0.085	31	0.100	292	0.051	189	0.024	150
CCP11	.878	0.453	0.319	352	0.148	248	0.159	163	0.131	57	0.020	337	0.068	4	0.068	246	0.032	128	0.005	175
CCP12	.953	0.518	0.235	343	0.121	231	0.112	131	0.099	16	0.027	209	0.027	17	0.006	267	0.015	286	0.021	158

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	63.29	0.400	17.46	5.24		3182.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.242	437.8	741.1	0.48E 07	-0.00069	1.697	20.55

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.066	0.508	45	0.085	93	0.093	356	0.031	196	0.009	131	0.016	137	0.019	99	0.008	358	0.007	345
CM		-0.159	0.121	189	0.031	136	0.039	103	0.016	353	0.002	9	0.007	345	0.011	274	0.006	233	0.004	185
CCP 1	.050	2.711	0.937	116	0.473	157	0.122	100	0.114	218	0.09[illegible]	217	0.054	232	0.052	258	0.044	263	0.017	325
CCP 2	.100	1.895	0.812	96	0.463	137	0.188	83	0.048	223	0.068	198	0.066	205	0.043	257	0.045	250	0.034	276
CCP 3	.150	1.530	0.725	70	0.353	113	0.196	65	0.017	83	0.071	135	0.052	137	0.076	164	0.041	184	0.021	227
CCP 4	.200	1.406	0.659	68	0.320	111	0.219	64	0.041	160	0.065	120	0.089	125	0.032	137	0.030	165	0.031	169
CCP 5	.250	1.374	0.760	56	0.301	91	0.245	52	0.044	15	0.081	95	0.070	87	0.038	78	0.029	139	0.012	147
CCP 6	.300	1.093	0.684	53	0.249	94	0.258	49	0.023	86	0.057	74	0.090	90	0.029	80	0.027	112	0.029	132
CCP 7	.400	1.054	0.755	9	0.230	61	0.289	16	0.090	322	0.084	18	0.075	4	0.026	341	0.035	18	0.027	357
CCP 8	.500	1.183	0.741	32	0.188	41	0.291	355	0.052	335	0.092	345	0.086	338	0.026	303	0.047	327	0.024	331
CCP 9	.695	0.897	0.541	14	0.123	313	0.267	285	0.132	199	0.067	200	0.075	195	0.075	115	0.009	30	0.009	76
CCP10	.800	0.680	0.452	10	0.154	293	0.202	259	0.139	182	0.062	170	0.081	158	0.073	99	0.035	25	0.018	15
CCP11	.878	0.591	0.354	5	0.135	274	0.157	231	0.108	144	0.025	144	0.052	130	0.053	61	0.027	321	0.012	290
CCP12	.953	0.591	0.208	2	0.098	254	0.113	207	0.062	93	0.006	228	0.034	176	0.030	125	0.039	76	0.028	0

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	62.89	0.400	24.94	5.53		3182.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.240	437.4	740.2	0.48E 07	-0.00150	1.307	24.61

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.070	0.296	52	0.069	171	0.022	219	0.006	282	[illegible]	27	0.004	110	0.005	138	0.005	151	0.001	256
CM		-0.178	0.076	230	0.016	320	0.011	357	0.006	80	[illegible]	184	0.004	273	0.002	345	0.002	29	0.001	136
DCP 1	.010	1.857	0.493	151	0.183	240	0.152	347	0.070	87	0.046	216	0.035	319	0.034	94	0.016	295	0.012	336
DCP 2	.050	2.079	0.195	47	0.067	193	0.026	313	0.017	88	0.009	180	0.010	307	0.013	115	0.003	127	0.003	14
DCP 3	.100	1.539	0.261	37	0.062	193	0.024	275	0.004	143	0.009	216	0.007	74	0.014	107	0.011	136	0.003	121
DCP 4	.150	1.349	0.283	45	0.089	186	0.037	299	0.019	58	0.008	152	0.013	290	0.013	66	0.011	116	0.005	278
DCP 5	.200	1.303	0.307	40	0.081	186	0.032	251	0.004	189	0.007	154	0.006	183	0.005	33	0.012	70	0.009	115
DCP 6	.250	1.257	0.320	47	0.091	189	0.034	297	0.021	49	0.013	140	0.015	276	0.015	61	0.022	131	0.015	241
DCP 7	.300	1.022	0.336	45	0.086	188	0.036	245	0.004	273	0.007	110	0.008	174	0.003	342	0.012	55	0.010	77
DCP 8	.400	1.001	0.350	52	0.097	176	0.031	263	0.025	3	0.024	89	0.022	223	0.019	305	0.019	59	0.010	153
DCP 9	.500	1.108	0.376	50	0.077	168	0.041	206	0.012	284	0.020	51	0.014	129	0.012	225	0.005	255	0.005	5
DCP 10	.695	0.973	0.367	52	0.077	144	0.050	164	0.020	238	0.021	16	0.014	94	0.012	154	0.011	237	0.004	303
DCP 11	.800	0.795	0.323	56	0.081	143	0.047	191	0.035	284	0.037	354	0.030	90	0.020	163	0.021	233	0.009	324
DCP 12	.878	0.705	0.263	52	0.068	138	0.038	170	0.029	256	0.035	336	0.017	52	0.020	116	0.016	182	0.009	250
DCP 13	.953	0.729	0.182	43	0.018	115	0.027	163	0.021	198	0.007	316	0.006	33	0.006	137	0.007	155	0.003	197

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	63.29	0.600	0.20	5.49		3174.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.165	640.8	1440.8	0.63E 07	-0.00085	0.461	5.50

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		-0.048	0.493	342	0.029	171	0.001	257	0.006	112	0.006	183	0.002	74	0.003	58	0.003	36	0.001	46
CM		-0.001	0.033	258	0.002	63	0.000	111	0.000	355	0.002	79	0.000	234	0.000	291	0.000	90	0.001	114
DCP 1	.010	-0.262	2.324	318	0.243	209	0.021	329	0.023	121	0.024	64	0.012	49	0.015	68	0.008	53	0.008	64
DCP 2	.050	0.168	1.876	331	0.091	100	0.063	69	0.028	132	0.037	111	0.008	132	0.010	134	0.003	134	0.005	340
DCP 3	.100	-0.153	1.290	335	0.071	149	0.028	239	0.020	84	0.023	151	0.020	247	0.030	345	0.035	33	0.031	103
DCP 4	.150	-0.200	0.954	336	0.061	150	0.017	234	0.008	45	0.011	115	0.006	98	0.008	74	0.001	81	0.001	191
DCP 5	.200	-0.071	0.781	339	0.055	156	0.010	219	0.010	88	0.011	142	0.004	127	0.003	72	0.003	93	0.002	171
DCP 6	.250	-0.107	0.670	344	0.045	162	0.008	247	0.008	94	0.011	179	0.004	64	0.005	80	0.002	358	0.002	327
DCP 7	.300	-0.181	0.573	346	0.039	169	0.005	252	0.007	110	0.009	195	0.002	48	0.004	65	0.002	26	0.002	261
DCP 8	.400	-0.104	0.415	351	0.029	175	0.003	240	0.006	105	0.010	207	0.003	52	0.004	92	0.002	324	0.001	322
DCP 9	.500	-0.006	0.323	358	0.023	187	0.002	268	0.004	123	0.008	221	0.002	66	0.003	72	0.001	20	0.002	272
DCP 10	.695	0.040	0.189	13	0.015	203	0.001	67	0.003	144	0.008	250	0.003	46	0.002	80	0.001	19	0.002	293
DCP 11	.800	-0.028	0.136	24	0.011	222	0.001	49	0.004	169	0.007	265	0.001	66	0.002	90	0.002	56	0.003	318
DCP 12	.878	-0.046	0.104	28	0.009	226	0.001	41	0.002	126	0.005	261	0.002	68	0.002	106	0.001	49	0.002	357
DCP 13	.953	0.037	0.092	23	0.006	225	0.003	23	0.001	122	0.003	260	0.001	117	0.001	68	0.001	21	0.001	288

FORCED PITCHING OSCILLATION NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	63.69	0.600	4.85	5.45		3174.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.166	640.2	1439.2	0.63E 07	-0.00056	1.063	10.22

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.524	0.488	355	0.043	241	0.016	136	0.006	23	0.010	112	0.006	130	0.004	76	0.003	224	0.002	78
CM		-0.015	0.027	225	0.020	25	0.016	237	0.007	125	0.005	32	0.004	325	0.003	173	0.002	65	0.001	272
CCP 1	.010	1.922	1.794	335	0.261	56	0.081	233	0.031	18	0.025	92	0.023	18	0.019	55	0.006	329	0.009	89
CCP 2	.050	1.973	1.392	339	0.217	56	0.211	252	0.084	112	0.041	47	0.019	317	0.038	148	0.025	54	0.017	0
CCP 3	.100	1.360	1.193	349	0.133	5	0.176	264	0.065	178	0.045	167	0.090	86	0.027	308	0.026	65	0.033	240
CCP 4	.150	0.876	0.948	353	0.135	288	0.098	210	0.064	173	0.097	94	0.047	34	0.036	347	0.024	259	0.012	232
CCP 5	.200	0.822	0.820	353	0.126	266	0.081	183	0.047	128	0.081	62	0.039	323	0.013	241	0.015	221	0.011	144
CCP 6	.250	0.631	0.669	359	0.110	266	0.078	168	0.042	81	0.052	54	0.043	302	0.031	206	0.018	159	0.021	91
CCP 7	.300	0.499	0.626	359	0.132	250	0.087	146	0.055	58	0.042	14	0.043	261	0.034	170	0.016	116	0.020	61
CCP 8	.400	0.338	0.442	5	0.101	247	0.073	120	0.048	17	0.016	298	0.038	213	0.032	116	0.016	19	0.012	335
CCP 9	.500	0.380	0.355	8	0.087	228	0.064	83	0.04[illegible]	335	0.026	220	0.031	151	0.021	39	0.013	284	0.002	212
CCP10	.695	0.265	0.220	17	0.063	210	0.058	52	0.0[illegible]	283	0.020	178	0.015	127	0.016	346	0.012	217	0.034	68
CCP11	.800	0.160	0.175	12	0.070	200	0.058	50	0.0[illegible]	248	0.022	208	0.020	118	0.019	342	0.012	227	0.014	140
CCP12	.878	0.126	0.137	1	0.065	178	0.049	31	0.0[illegible]	255	0.016	188	0.015	93	0.016	325	0.011	279	0.009	135
CCP13	.953	0.180	0.119	349	0.053	155	0.032	358	0.007	237	0.011	176	0.008	63	0.006	278	0.002	158	0.001	198

FORCED PITCHING OSCILLATION NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	63.29	0.600	7.48	5.35		3174.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.165	639.2	1438.9	0.63E 07	-0.00050	1.284	12.45

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.712	0.447	17	0.077	304	0.015	225	0.023	138	0.009	11	0.001	136	0.004	298	0.005	129	0.004	197
CM		-0.032	0.049	196	0.035	54	0.014	307	0.007	286	0.005	169	0.002	159	0.003	58	0.002	320	0.001	339
CCP 1	.010	2.644	1.153	348	0.237	57	0.090	252	0.040	128	0.059	83	0.024	317	0.023	260	0.010	139	0.003	349
CCP 2	.050	2.399	0.684	5	0.460	42	0.173	276	0.032	15	0.069	171	0.030	86	0.026	62	0.022	17	0.016	316
CCP 3	.100	1.694	0.841	22	0.294	28	0.096	338	0.073	49	0.052	337	0.012	348	0.017	237	0.010	54	0.030	135
CCP 4	.150	1.185	0.774	21	0.223	357	0.123	326	0.042	271	0.046	326	0.046	246	0.018	335	0.023	259	0.013	221
CCP 5	.200	1.073	0.693	20	0.197	333	0.098	287	0.053	220	0.028	242	0.038	186	0.009	244	0.032	152	0.009	80
CCP 6	.250	0.868	0.625	23	0.169	314	0.05[illegible]	268	0.056	217	0.026	189	0.039	189	0.031	116	0.022	139	0.021	71
CCP 7	.300	0.697	0.594	24	0.187	312	0.08[illegible]	[illegible]5	0.083	191	0.036	147	0.043	135	0.032	59	0.017	90	0.019	29
CCP 8	.400	0.522	0.490	23	0.160	279	0.03[illegible]	77	0.053	172	0.029	96	0.019	91	0.026	25	0.007	349	0.009	315
CCP 9	.500	0.522	0.412	24	0.143	268	0.049	[illegible]2	0.058	132	0.032	35	0.018	29	0.027	311	0.016	208	0.013	145
CCP10	.695	0.381	0.292	20	0.123	240	0.05[illegible]	117	0.031	103	0.026	349	0.013	330	0.019	225	0.010	115	0.016	150
CCP11	.800	0.26[illegible]	0.253	11	0.117	234	0.050	127	0.037	94	0.031	339	0.010	304	0.018	224	0.008	119	0.004	143
CCP12	.878	0.231	0.216	0	0.098	224	0.046	130	0.035	67	0.022	316	0.007	306	0.012	213	0.005	157	0.007	103
CCP13	.953	0.270	0.183	344	0.068	193	0.029	106	0.022	29	0.010	290	0.008	275	0.008	182	0.008	35	0.0[illegible]	317

FORCED PITCHING OSCILLATION NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.O	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	63.29	0.600	9.84	5.30		3174.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.166	638.7	1437.1	0.63E 07	-0.00069	1.353	13.56

HARMONIC ANALYSIS

DATA TYPE	X/C	RES C	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.841	0.401	42	0.071	0	0.016	2	0.009	259	0.014	188	0.009	75	0.005	99	0.005	50	0.004	88
CM		-0.052	0.075	195	0.032	84	0.010	69	0.005	16	0.007	15	0.003	244	0.002	276	0.001	158	0.337	228
DCP 1	.010	2.939	0.392	18	0.421	62	0.203	325	0.122	237	0.059	161	0.027	137	0.008	141	0.004	91	0.003	131
DCP 2	.050	2.642	0.390	98	0.415	47	0.067	127	0.090	8	0.011	79	0.042	326	0.009	258	0.076	290	0.015	190
DCP 3	.100	1.994	0.616	73	0.324	56	0.157	151	0.065	265	0.021	78	0.032	175	0.017	269	0.038	116	0.027	151
DCP 4	.150	1.305	0.658	58	0.257	58	0.128	59	0.051	93	0.053	156	0.040	166	0.029	193	0.033	178	0.037	133
DCP 5	.200	1.233	0.630	50	0.169	33	0.113	45	0.045	46	0.034	96	0.026	80	0.023	132	0.022	108	0.020	152
DCP 6	.250	1.001	0.575	51	0.128	26	0.119	34	0.037	24	0.043	31	0.020	45	0.024	59	0.033	79	0.021	47
DCP 7	.300	0.844	0.599	48	0.139	6	0.109	22	0.046	348	0.034	7	0.032	17	0.029	12	0.025	33	0.012	48
DCP 8	.400	0.629	0.511	42	0.100	321	0.064	354	0.019	290	0.037	299	0.003	330	0.015	334	0.022	357	0.023	301
DCP 9	.500	0.633	0.454	38	0.108	298	0.046	313	0.037	241	0.043	231	0.010	139	0.007	191	0.005	357	0.006	174
DCP 10	.695	0.470	0.340	28	0.106	271	0.043	239	0.022	185	0.042	197	0.017	74	0.016	126	0.005	29	0.010	35
DCP 11	.800	0.369	0.322	17	0.104	269	0.049	243	0.029	195	0.039	181	0.017	61	0.016	117	0.006	319	0.014	176
DCP 12	.878	0.333	0.273	6	0.081	265	0.050	228	0.023	189	0.034	156	0.013	55	0.015	80	0.006	273	0.012	66
DCP 13	.953	0.365	0.227	353	0.057	256	0.043	199	0.011	175	0.018	122	0.005	51	0.008	6	0.005	139	0.006	17

FORCED PITCHING OSCILLATION NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	80.65	0.200	14.24	5.80		3193.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.604	223.0	199.8	0.26E 07	-0.00085	1.662	18.33

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.326	0.327	17	0.052	330	0.090	57	0.021	206	0.010	257	0.019	48	0.005	86	0.005	141	0.003	7
CM		-0.057	0.069	328	0.048	145	0.036	246	0.014	39	0.008	117	0.007	247	0.003	14	0.001	156	0.002	4
CCP 1	.010	5.318	2.464	35	0.727	302	0.224	217	0.174	88	0.081	8	0.035	350	0.023	264	0.052	15	0.028	10
CCP 2	.050	4.123	1.468	21	0.308	220	0.040	345	0.107	40	0.054	182	0.005	27	0.050	51	0.016	81	0.013	339
CCP 3	.100	2.320	1.461	5	0.431	197	0.158	74	0.135	353	0.066	175	0.023	323	0.046	23	0.074	189	0.072	4
CCP 4	.150	2.243	1.173	350	0.357	174	0.180	54	0.048	296	0.029	194	0.034	115	0.066	26	0.034	209	0.030	64
CCP 5	.200	2.019	0.877	342	0.281	141	0.199	12	0.088	218	0.081	98	0.032	326	0.022	263	0.038	99	0.032	243
CCP 6	.250	1.801	0.737	332	0.327	120	0.220	353	0.080	211	0.102	114	0.043	336	0.033	202	0.059	57	0.022	231
CCP 7	.300	1.475	0.514	322	0.334	99	0.193	326	0.132	171	0.080	18	0.019	194	0.045	139	0.038	313	0.018	97
CCP 8	.400	1.341	0.179	307	0.295	54	0.123	236	0.089	100	0.111	274	0.063	76	0.018	44	0.036	154	0.025	25
CCP 9	.500	1.090	0.134	135	0.316	7	0.203	131	0.032	344	0.091	190	0.047	332	0.017	127	0.013	230	0.017	205
CCP10	.695	0.711	0.283	102	0.301	313	0.234	63	0.069	260	0.060	15	0.046	106	0.013	323	0.009	116	0.010	337
CCP11	.800	0.428	0.275	121	0.268	305	0.226	61	0.097	225	0.072	315	0.044	70	0.024	241	0.024	24	0.026	188
CCP12	.878	0.194	0.233	110	0.215	280	0.143	43	0.085	190	0.040	258	0.032	54	0.027	155	0.014	344	0.022	76
CCP13	.953	0.368	0.217	90	0.104	231	0.084	26	0.036	183	0.022	248	0.015	13	0.004	165	0.021	244	0.014	265

FORCED PITCHING OSCILLATION NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	81.30	0.200	16.71	5.82		3193.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.610	222.5	200.2	0.26E 07	0.00025	1.788	22.17

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.408	0.393	2	0.072	357	0.054	83	0.016	345	0.012	106	0.013	169	0.007	296	0.004	177	0.004	145
CM		-0.137	0.073	8	0.047	173	0.021	268	0.011	124	0.006	131	0.008	49	0.008	81	0.006	36	0.007	1
CCP 1	.010	4.162	2.365	55	0.404	336	0.236	275	0.235	177	0.349	137	0.299	88	0.260	64	0.225	35	0.231	359
CCP 2	.050	3.010	1.561	27	0.248	273	0.200	208	0.127	121	0.129	95	0.040	120	0.090	75	0.084	54	0.073	14
CCP 3	.100	2.110	1.584	11	0.321	268	0.198	181	0.170	62	0.071	3	0.085	239	0.034	126	0.039	85	0.021	12
CCP 4	.150	2.019	1.498	3	0.363	235	0.167	135	0.114	56	0.032	15	0.019	169	0.009	347	0.020	58	0.022	343
CCP 5	.200	2.055	1.153	350	0.293	190	0.153	76	0.148	339	0.056	200	0.075	114	0.049	359	0.047	257	0.047	152
CCP 6	.250	1.830	1.143	350	0.379	173	0.303	57	0.168	294	0.019	178	0.041	45	0.020	229	0.046	224	0.015	120
CCP 7	.300	1.733	0.895	330	0.391	132	0.212	45	0.146	247	0.061	140	0.059	33	0.032	276	0.026	152	0.014	67
CCP 8	.400	1.570	0.608	324	0.399	87	0.219	354	0.089	159	0.018	83	0.042	254	0.046	237	0.022	259	0.035	198
CCP 9	.500	1.501	0.270	266	0.398	30	0.069	303	0.140	62	0.016	241	0.017	151	0.010	308	0.004	229	0.023	156
CCP10	.695	0.983	0.209	173	0.351	344	0.115	147	0.103	304	0.028	13	0.046	235	0.027	237	0.030	195	0.020	220
CCP11	.800	0.581	0.239	147	0.248	321	0.175	120	0.075	262	0.024	303	0.023	193	0.008	308	0.021	223	0.013	153
CCP12	.878	0.353	0.247	134	0.167	313	0.151	102	0.073	273	0.050	317	0.009	207	0.032	281	0.024	208	0.028	168
CCP13	.953	0.528	0.295	126	0.176	253	0.114	29	0.049	69	0.024	159	0.046	203	0.039	278	0.014	29	0.012	142

FORCED PITCHING OSCILLATION NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	81.30	0.200	24.00	5.80		3193.3	10
	K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
	0.612	221.8	199.0	0.26E 07	0.00169	2.322	27.19

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.769	0.573	30	0.016	187	0.068	52	0.020	216	0.005	311	0.004	205	0.001	302	0.009	133	0.001	204
CM		-0.305	0.101	111	0.027	122	0.033	262	0.013	42	0.001	286	0.004	349	0.003	244	0.005	277	0.002	276
CCP 1	.010	2.133	1.460	124	0.467	175	0.185	285	0.170	327	0.069	295	0.072	285	0.007	303	0.052	218	0.045	179
CCP 2	.050	2.717	1.128	72	0.244	119	0.101	314	0.047	335	0.044	322	0.036	259	0.057	254	0.025	226	0.051	189
CCP 3	.100	2.258	1.330	63	0.317	111	0.048	352	0.014	129	0.039	357	0.009	345	0.020	245	0.021	288	0.014	237
CCP 4	.150	2.057	1.309	60	0.310	110	0.107	347	0.068	322	0.052	342	0.043	293	0.061	255	0.051	253	0.024	200
CCP 5	.200	2.229	1.377	48	0.241	80	0.066	11	0.019	153	0.020	334	0.035	300	0.049	244	0.045	293	0.060	223
CCP 6	.250	2.158	1.375	50	0.270	79	0.043	9	0.028	267	0.049	272	0.038	316	0.030	256	0.053	201	0.050	212
CCP 7	.300	2.078	1.421	38	0.227	7	0.066	346	0.036	121	0.018	66	0.017	290	0.007	219	0.014	94	0.010	225
CCP 8	.400	2.043	1.209	23	0.203	306	0.100	51	0.047	139	0.076	129	0.057	91	0.057	61	0.026	50	0.046	5
CCP 9	.500	2.129	1.053	1	0.377	239	0.064	96	0.049	151	0.025	187	0.041	122	0.024	76	0.033	61	0.038	29
CCP10	.695	1.571	0.547	322	0.244	191	0.096	34	0.044	122	0.032	239	0.010	328	0.016	66	0.028	121	0.009	9
CCP11	.800	1.109	0.344	257	0.058	128	0.159	37	0.074	192	0.049	285	0.023	148	0.011	191	0.022	107	0.014	128
CCP12	.878	1.020	0.505	226	0.237	6	0.204	95	0.152	246	0.062	353	0.034	161	0.027	261	0.029	50	0.041	164
CCP13	.953	1.132	0.644	213	0.472	353	0.250	118	0.149	292	0.086	90	0.078	247	0.027	42	0.039	212	0.034	315

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	80.65	0.400	0.07	5.68		3188.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.309	436.6	734.9	0.48E 07	-0.00094	0.361	6.06

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		-0.039	0.397	0	0.033	184	0.015	301	0.012	81	0.008	86	0.001	10	0.005	13	0.001	354	0.002	271
CM		0.000	0.045	266	0.006	78	0.006	151	0.002	321	0.002	317	0.000	118	0.001	249	0.000	275	0.000	57
DCP 1	.010	-0.354	2.390	325	0.109	192	0.075	113	0.053	59	0.015	359	0.013	8	0.017	342	0.009	302	0.003	331
DCP 2	.050	0.132	1.350	342	0.119	141	0.035	212	0.028	40	0.023	38	0.010	53	0.010	342	0.007	329	0.004	317
DCP 3	.100	-0.121	0.959	342	0.084	140	0.038	220	0.018	37	0.010	42	0.005	42	0.009	342	0.003	354	0.006	274
DCP 4	.150	-0.144	0.737	351	0.071	159	0.019	266	0.023	61	0.016	59	0.002	324	0.008	350	0.004	298	0.001	320
DCP 5	.200	-0.007	0.605	350	0.058	157	0.021	244	0.020	56	0.013	46	0.003	101	0.006	335	0.002	58	0.004	268
DCP 6	.250	-0.067	0.534	2	0.052	177	0.024	294	0.019	76	0.012	70	0.003	308	0.005	5	0.005	299	0.004	233
DCP 7	.300	-0.165	0.454	2	0.044	179	0.021	284	0.015	72	0.012	77	0.003	116	0.006	16	0.003	55	0.004	274
DCP 8	.400	-0.085	0.351	16	0.034	200	0.027	318	0.014	88	0.009	109	0.004	281	0.005	14	0.005	259	0.003	297
DCP 9	.500	0.014	0.290	22	0.032	212	0.025	306	0.014	93	0.011	92	0.004	139	0.005	13	0.003	58	0.003	286
DCP 10	.695	0.068	0.214	44	0.025	238	0.027	334	0.009	126	0.007	143	0.004	310	0.003	62	0.001	146	0.004	197
DCP 11	.800	-0.037	0.161	52	0.023	247	0.018	327	0.010	135	0.010	139	0.000	27	0.004	50	0.002	33	0.001	292
DCP 12	.878	-0.127	0.133	58	0.015	257	0.023	349	0.006	153	0.006	133	0.003	335	0.005	79	0.001	146	0.002	264
DCP 13	.953	0.046	0.106	43	0.014	222	0.009	279	0.006	123	0.006	108	0.002	43	0.003	53	0.003	87	0.001	304

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	80.65	0.400	7.45	5.71		3189.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.309	435.9	733.3	0.48E 07	-0.00076	1.238	13.15

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.811	0.429	5	0.053	179	0.021	338	0.013	62	0.005	93	0.002	339	0.001	2	0.005	350	0.005	255
CM		-0.007	0.036	268	0.004	354	0.010	159	0.003	285	0.003	352	0.000	223	0.000	191	0.001	232	0.001	85
DCP 1	.010	4.353	2.700	343	0.112	85	0.312	218	0.197	83	0.104	357	0.053	332	0.039	225	0.016	73	0.006	65
DCP 2	.050	2.908	1.278	351	0.066	221	0.132	160	0.115	15	0.021	280	0.009	274	0.023	129	0.033	8	0.015	265
DCP 3	.100	1.813	0.979	350	0.128	191	0.069	85	0.045	324	0.014	354	0.033	189	0.031	40	0.024	283	0.016	216
DCP 4	.150	1.380	0.783	354	0.134	175	0.061	32	0.034	275	0.033	89	0.006	285	0.014	28	0.012	283	0.037	230
DCP 5	.200	1.226	0.645	355	0.114	174	0.050	7	0.012	225	0.011	34	0.013	113	0.018	310	0.006	137	0.006	289
DCP 6	.250	1.002	0.562	5	0.097	180	0.056	2	0.014	205	0.022	74	0.001	102	0.014	349	0.006	258	0.007	291
DCP 7	.300	0.773	0.494	5	0.092	175	0.054	348	0.012	149	0.007	87	0.013	46	0.014	249	0.010	68	0.039	260
DCP 8	.400	0.577	0.376	21	0.062	194	0.049	348	0.014	136	0.011	109	0.009	25	0.005	282	0.003	362	0.036	259
DCP 9	.500	0.573	0.319	24	0.056	179	0.047	331	0.015	99	0.012	116	0.008	304	0.004	129	0.006	330	0.004	213
DCP 10	.695	0.401	0.218	43	0.027	179	0.038	318	0.022	82	0.010	168	0.004	233	0.004	79	0.002	10	0.015	346
DCP 11	.800	0.209	0.161	47	0.018	178	0.030	349	0.015	62	0.010	191	0.003	139	0.001	338	0.005	19	0.005	226
DCP 12	.878	0.085	0.114	44	0.014	150	0.019	321	0.013	71	0.008	219	0.005	63	0.001	305	0.007	29	0.006	232
DCP 13	.953	0.217	0.072	22	0.010	69	0.006	12	0.007	11	0.007	178	0.003	138	0.001	284	0.001	320	0.002	272

FORCED PITCHING OSCILLATION NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	81.30	0.400	9.83	5.78		3188.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.312	435.7	732.8	0.47E 07	0.00066	1.427	15.64

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.915	0.549	15	0.096	189	0.030	8	0.017	209	0.018	113	0.007	303	0.005	131	0.007	3	0.004	321
CM		-0.056	0.049	138	0.053	328	0.023	185	0.010	59	0.007	297	0.007	128	0.004	350	0.002	178	0.003	71
DCP 1	.010	2.643	1.750	46	1.216	16	0.413	273	0.174	253	0.130	178	0.070	121	0.057	125	0.059	57	0.024	339
DCP 2	.050	2.718	1.264	36	0.391	329	0.104	233	0.123	203	0.093	91	0.036	117	0.054	19	0.016	316	0.032	299
DCP 3	.100	1.824	1.173	30	0.256	281	0.086	200	0.107	167	0.088	85	0.044	51	0.042	334	0.017	319	0.020	251
DCP 4	.150	1.438	1.012	18	0.237	255	0.076	182	0.103	116	0.068	20	0.031	310	0.029	232	0.006	292	0.022	151
DCP 5	.200	1.324	0.924	22	0.263	238	0.072	153	0.087	107	0.047	25	0.035	300	0.018	192	0.013	157	0.026	32
DCP 6	.250	1.141	0.870	14	0.262	222	0.065	130	0.080	70	0.050	344	0.056	249	0.028	146	0.011	93	0.010	8
DCP 7	.300	0.904	0.805	19	0.283	222	0.080	127	0.080	78	0.051	341	0.050	240	0.024	101	0.016	143	0.034	22
DCP 8	.400	0.741	0.639	6	0.267	189	0.094	61	0.067	350	0.054	248	0.052	156	0.026	33	0.014	307	0.006	256
DCP 9	.500	0.779	0.526	6	0.260	180	0.093	57	0.077	342	0.082	225	0.055	103	0.014	0	0.026	337	0.017	292
DCP 10	.695	0.565	0.311	345	0.224	138	0.121	0	0.089	246	0.091	129	0.070	337	0.032	203	0.009	89	0.016	352
DCP 11	.800	0.373	0.191	341	0.188	135	0.120	350	0.092	215	0.059	93	0.047	315	0.019	182	0.013	76	0.010	339
DCP 12	.878	0.247	0.145	319	0.144	113	0.105	319	0.073	174	0.049	42	0.041	255	0.019	119	0.022	331	0.014	171
DCP 13	.953	0.338	0.073	307	0.056	98	0.044	318	0.037	194	0.045	64	0.036	273	0.019	132	0.016	346	0.009	296

FORCED PITCHING OSCILLATION NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	81.30	0.400	12.33	5.74		3188.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.312	435.4	732.1	0.47E 07	0.00132	1.635	17.89

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.073	0.556	20	0.074	210	0.012	353	0.002	125	0.011	282	0.024	68	0.013	309	0.002	141	0.002	139
CM		-0.097	0.108	141	0.064	356	0.024	220	0.003	148	0.009	79	0.014	274	0.006	121	0.002	336	0.001	287
DCP 1	.010	2.715	1.716	96	1.163	52	0.222	63	0.306	350	0.064	329	0.146	317	0.074	287	0.085	235	0.062	232
DCP 2	.050	2.826	1.243	68	0.437	5	0.075	333	0.145	286	0.062	254	0.042	231	0.034	250	0.026	179	0.019	275
DCP 3	.100	1.932	1.148	53	0.281	339	0.152	291	0.080	239	0.074	208	0.036	68	0.031	174	0.030	52	0.014	81
DCP 4	.150	1.550	1.019	40	0.267	318	0.168	261	0.085	217	0.092	177	0.047	76	0.030	93	0.020	71	0.020	68
DCP 5	.200	1.458	0.944	35	0.217	291	0.161	244	0.081	173	0.091	121	0.046	16	0.044	57	0.017	321	0.016	328
DCP 6	.250	1.283	0.923	30	0.240	287	0.184	235	0.080	165	0.088	125	0.075	43	0.055	0	0.017	258	0.024	305
DCP 7	.300	1.076	0.880	25	0.226	260	0.144	228	0.114	150	0.114	74	0.048	354	0.038	355	0.019	235	0.011	241
DCP 8	.400	0.887	0.756	14	0.241	242	0.144	186	0.096	98	0.090	29	0.056	324	0.033	250	0.015	175	0.017	147
DCP 9	.500	1.024	0.711	357	0.278	204	0.084	145	0.126	87	0.151	341	0.062	230	0.038	144	0.016	39	0.027	43
DCP 10	.695	0.777	0.508	333	0.285	167	0.151	50	0.080	342	0.117	250	0.102	112	0.035	351	0.020	329	0.031	291
DCP 11	.800	0.526	0.352	331	0.253	167	0.201	38	0.111	283	0.076	195	0.097	84	0.068	303	0.025	157	0.015	122
DCP 12	.878	0.377	0.256	317	0.186	151	0.159	14	0.076	252	0.048	171	0.069	56	0.046	264	0.024	112	0.018	20
DCP 13	.953	0.449	0.167	296	0.120	117	0.095	319	0.024	159	0.018	234	0.039	72	0.018	294	0.008	149	0.010	20

FORCED PITCHING OSCILLATION NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	80.65	0.400	14.04	5.58		3194.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.308	438.0	730.9	0.47E 07	0.00089	1.698	19.80

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.071	0.562	28	0.092	271	0.018	220	0.019	36	0.023	37	0.026	192	0.013	38	0.001	283	0.005	258
CM		-0.134	0.129	158	0.063	38	0.022	283	0.005	264	0.011	199	0.015	31	0.005	233	0.001	290	0.004	89
CCP 1	.050	2.862	1.286	93	0.314	48	0.082	46	0.088	58	0.079	9	0.072	84	0.010	81	0.027	55	0.033	131
CCP 2	.100	1.994	1.132	75	0.300	32	0.124	336	0.124	35	0.059	330	0.040	38	0.012	31	0.013	286	0.021	66
CCP 3	.150	1.658	1.004	55	0.285	11	0.151	298	0.116	358	0.044	301	0.031	281	0.019	336	0.026	248	0.012	303
CCP 4	.200	1.534	0.965	52	0.347	358	0.159	290	0.098	328	0.031	242	0.030	178	0.030	322	0.020	196	0.009	262
CCP 5	.250	1.417	0.912	44	0.252	347	0.192	273	0.079	318	0.042	227	0.057	190	0.017	263	0.023	136	0.009	236
CCP 6	.300	1.127	0.876	40	0.216	339	0.154	279	0.105	286	0.059	202	0.068	154	0.015	309	0.007	131	0.018	233
CCP 7	.400	1.011	0.785	23	0.240	298	0.212	229	0.068	177	0.079	130	0.062	90	0.006	101	0.036	7	0.032	163
CCP 8	.500	1.129	0.771	6	0.232	266	0.141	213	0.101	164	0.134	107	0.054	359	0.025	71	0.040	291	0.012	70
CCP 9	.695	0.859	0.618	346	0.330	223	0.166	118	0.095	69	0.116	3	0.094	227	0.002	90	0.047	145	0.026	349
CCP10	.800	0.585	0.463	341	0.290	213	0.191	93	0.084	18	0.071	338	0.115	237	0.056	50	0.009	153	0.027	295
CCP11	.878	0.420	0.342	329	0.225	191	0.151	58	0.057	319	0.044	323	0.079	192	0.044	21	0.009	359	0.051	230
CCP12	.953	0.510	0.211	321	0.161	167	0.120	12	0.034	189	0.033	353	0.031	212	0.017	149	0.031	2	0.039	196

FORCED PITCHING OSCILLATION NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	80.00	0.400	16.46	5.56		3194.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.306	437.1	731.5	0.47E 07	0.00027	1.775	21.10

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.133	0.526	36	0.089	338	0.041	239	0.029	69	0.026	83	0.028	240	0.018	61	0.010	353	0.010	279
CM		-0.163	0.129	170	0.056	80	0.022	346	0.003	348	0.017	256	0.015	86	0.007	243	0.003	193	0.004	111
CCP 1	.050	2.746	1.160	110	0.310	119	0.034	249	0.111	140	0.057	211	0.098	194	0.054	204	0.024	296	0.022	213
CCP 2	.100	1.929	0.987	88	0.351	83	0.043	330	0.095	89	0.031	108	0.083	176	0.027	177	0.029	150	0.031	179
CCP 3	.150	1.629	0.837	70	0.331	60	0.050	349	0.094	68	0.049	67	0.061	136	0.021	78	0.031	107	0.017	139
CCP 4	.200	1.534	0.829	62	0.357	44	0.100	343	0.091	50	0.058	341	0.030	106	0.023	55	0.016	331	0.010	112
CCP 5	.250	1.453	0.813	52	0.347	38	0.118	342	0.100	45	0.060	4	0.034	77	0.042	4	0.035	33	0.012	54
CCP 6	.300	1.170	0.794	48	0.357	29	0.143	332	0.111	36	0.061	315	0.016	344	0.036	31	0.031	4	0.023	353
CCP 7	.400	1.167	0.800	30	0.350	355	0.199	294	0.080	349	0.090	246	0.044	325	0.039	240	0.033	339	0.016	244
CCP 8	.500	1.220	0.772	17	0.314	320	0.198	253	0.039	295	0.096	171	0.014	203	0.043	67	0.042	348	0.039	314
CCP 9	.695	0.924	0.574	1	0.325	270	0.237	190	0.073	129	0.105	84	0.044	243	0.074	28	0.036	251	0.015	221
CCP10	.800	0.709	0.478	348	0.292	235	0.182	135	0.053	109	0.122	53	0.111	259	0.040	98	0.008	74	0.009	177
CCP11	.878	0.579	0.362	341	0.236	213	0.157	95	0.018	252	0.094	50	0.094	253	0.027	115	0.035	95	0.018	318
CCP12	.953	0.587	0.220	334	0.152	181	0.102	53	0.048	230	0.058	81	0.045	298	0.028	183	0.045	58	0.040	293

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	80.65	0.400	23.78	5.67		3194.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.308	436.7	729.2	0.47E 07	-0.00126	1.579	24.99

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.135	0.4[illegible]0	46	0.127	108	0.017	89	0.014	154	0.005	249	0.008	241	0.002	182	0.003	99	0.003	4
CM		-0.186	0.108	220	0.037	251	0.015	267	0.008	340	0.005	76	0.003	93	0.001	1	0.001	238	0.001	129
CCP 1	.010	1.882	0.596	151	0.260	228	0.203	331	0.095	64	0.074	156	0.028	184	0.033	74	0.036	74	0.019	24
CCP 2	.050	2.059	0.233	67	0.155	153	0.033	310	0.009	39	0.015	164	0.014	242	0.006	270	0.011	173	0.005	156
CCP 3	.100	1.619	0.311	42	0.148	134	0.028	254	0.013	45	0.012	71	0.008	78	0.010	339	0.004	16	0.009	47
CCP 4	.150	1.427	0.359	52	0.170	149	0.033	274	0.015	62	0.027	142	0.027	233	0.011	294	0.007	123	0.006	213
CCP 5	.200	1.436	0.413	37	0.156	131	0.035	239	0.023	284	0.023	9	0.002	57	0.014	199	0.008	257	0.014	352
CCP 6	.250	1.349	0.420	52	0.183	149	0.033	276	0.022	30	0.033	113	0.027	206	0.013	293	0.011	41	0.036	193
CCP 7	.300	1.150	0.493	41	0.172	127	0.036	198	0.029	267	0.033	331	0.007	332	0.011	146	0.006	185	0.006	342
CCP 8	.400	1.134	0.487	52	0.183	136	0.045	217	0.024	305	0.037	41	0.031	120	0.017	163	0.011	332	0.009	30
CCP 9	.500	1.220	0.563	42	0.184	93	0.059	123	0.041	169	0.034	264	0.016	263	0.003	24	0.008	112	0.004	42
CCP 10	.695	1.040	0.554	46	0.188	81	0.073	78	0.034	160	0.021	250	0.016	268	0.002	93	0.007	172	0.002	178
CCP 11	.800	0.806	0.427	41	0.169	65	0.080	75	0.041	147	0.026	223	0.019	295	0.006	285	0.008	56	0.010	338
CCP 12	.878	0.677	0.350	44	0.137	65	0.064	77	0.042	154	0.024	248	0.020	259	0.009	193	0.010	131	0.005	332
CCP 13	.953	0.695	0.226	22	0.054	16	0.026	16	0.021	114	0.008	122	0.002	116	0.004	80	0.010	317	0.005	229

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	80.65	0.600	0.04	5.68		3189.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.210	640.4	1437.8	0.63E 07	-0.00082	0.428	5.70

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		-0.042	0.459	342	0.030	175	0.011	262	0.011	61	0.012	33	0.004	26	0.003	357	0.001	336	0.003	282
CM		0.000	0.041	255	0.003	89	0.003	135	0.002	288	0.002	270	0.000	164	0.000	188	0.000	345	0.000	53
CCP 1	.010	-0.254	2.127	311	0.280	193	0.016	27	0.030	59	0.020	5	0.017	23	0.011	5	0.009	354	0.011	331
CCP 2	.050	0.215	1.773	327	0.081	113	0.045	99	0.023	97	0.012	357	0.011	355	0.010	344	0.011	324	0.011	236
CCP 3	.100	-0.158	1.208	330	0.071	156	0.064	217	0.032	352	0.041	3	0.020	59	0.010	108	0.005	255	0.010	271
CCP 4	.150	-0.196	0.915	335	0.059	151	0.028	223	0.020	35	0.023	10	0.006	43	0.006	327	0.006	342	0.004	332
CCP 5	.200	-0.040	0.743	335	0.052	154	0.026	212	0.017	39	0.017	0	0.005	51	0.003	352	0.005	2	0.003	274
CCP 6	.250	-0.100	0.647	345	0.042	166	0.022	255	0.018	50	0.019	33	0.004	347	0.007	341	0.002	29	0.004	275
CCP 7	.300	-0.162	0.544	345	0.033	168	0.021	248	0.015	51	0.016	24	0.003	24	0.002	343	0.003	13	0.002	336
CCP 8	.400	-0.105	0.398	356	0.027	181	0.018	283	0.014	69	0.015	43	0.003	353	0.005	340	0.001	136	0.003	265
CCP 9	.500	0.009	0.314	1	0.021	195	0.016	274	0.011	71	0.012	40	0.002	15	0.002	324	0.002	32	0.002	338
CCP 10	.695	0.030	0.198	24	0.015	219	0.017	323	0.008	96	0.011	75	0.002	324	0.001	347	0.003	175	0.002	230
CCP 11	.800	-0.013	0.145	32	0.013	241	0.010	325	0.006	118	0.007	108	0.004	29	0.002	69	0.002	158	0.001	276
CCP 12	.878	-0.076	0.117	40	0.009	239	0.010	336	0.005	116	0.006	96	0.002	14	0.002	50	0.003	233	0.002	253
CCP 13	.953	0.052	0.102	28	0.008	231	0.006	284	0.004	85	0.005	66	0.003	40	0.001	340	0.001	142	0.002	239

FORCED PITCHING OSCILLATION NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	80.65	0.600	7.35	5.61		3189.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.211	639.6	1433.5	0.63E 07	-0.00033	1.350	13.13

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.742	0.509	10	0.051	268	0.033	194	0.028	44	0.004	262	0.002	321	0.007	98	0.005	346	0.004	312
CM		-0.031	0.046	197	0.036	24	0.011	250	0.010	206	0.004	80	0.005	53	0.005	284	0.002	135	0.001	122
DCP 1	.010	2.712	1.382	341	0.294	51	0.177	161	0.032	359	0.035	356	0.006	257	0.015	278	0.003	68	0.002	165
DCP 2	.050	2.523	0.932	357	0.446	27	0.219	207	0.060	350	0.063	96	0.040	341	0.021	332	0.013	279	0.013	132
DCP 3	.100	1.673	1.000	13	0.314	8	0.091	270	0.024	349	0.033	282	0.031	60	0.015	348	0.012	268	0.016	26
DCP 4	.200	1.144	0.824	9	0.174	309	0.121	230	0.029	164	0.028	204	0.035	90	0.011	200	0.023	62	0.003	336
DCP 5	.250	0.901	0.738	18	0.140	291	0.091	238	0.046	177	0.023	135	0.041	120	0.018	37	0.019	65	0.016	329
DCP 6	.300	0.733	0.700	14	0.169	271	0.102	208	0.057	135	0.046	100	0.046	41	0.011	333	0.022	344	0.014	263
DCP 7	.400	0.529	0.540	21	0.140	248	0.042	195	0.048	100	0.021	64	0.027	19	0.020	274	0.007	279	0.012	271
DCP 8	.500	0.548	0.470	15	0.150	223	0.037	140	0.062	53	0.030	335	0.034	265	0.026	146	0.008	97	0.019	19
DCP 9	.695	0.380	0.305	18	0.124	206	0.036	75	0.063	26	0.031	250	0.017	233	0.024	113	0.012	334	0.010	268
DCP10	.800	0.262	0.244	9	0.117	201	0.047	70	0.049	12	0.018	252	0.030	232	0.030	84	0.010	286	0.019	335
DCP11	.878	0.202	0.200	357	0.096	194	0.040	79	0.040	9	0.016	260	0.023	218	0.021	88	0.008	322	0.014	310
DCP12	.953	0.295	0.160	332	0.063	152	0.030	51	0.031	316	0.013	189	0.007	158	0.009	37	0.009	238	0.006	72

FORCED PITCHING OSCILLATION NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	80.65	0.600	9.70	5.59		3189.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.211	638.7	1431.5	0.63E 07	-0.00027	1.475	14.76

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.854	0.522	29	0.043	308	0.032	294	0.018	124	0.011	73	0.007	348	0.008	340	0.005	289	0.006	279
CM		-0.054	0.076	186	0.041	51	0.008	355	0.012	279	0.003	246	0.001	182	0.003	147	0.001	33	0.002	39
DCP 1	.010	3.019	0.852	355	0.359	56	0.148	255	0.088	215	0.075	89	0.025	355	0.003	221	0.009	38	0.009	279
DCP 2	.050	2.610	0.651	53	0.465	35	0.060	207	0.113	295	0.066	127	0.035	249	0.011	61	0.013	98	0.013	336
DCP 3	.100	1.812	0.931	51	0.299	45	0.067	21	0.015	145	0.010	105	0.010	313	0.010	241	0.009	258	0.013	349
DCP 4	.200	1.245	0.827	37	0.177	358	0.125	329	0.017	4	0.045	353	0.024	10	0.021	12	0.024	350	0.013	339
DCP 5	.250	1.019	0.764	39	0.105	352	0.141	342	0.018	289	0.035	343	0.017	29	0.022	346	0.029	351	0.024	321
DCP 6	.300	0.834	0.763	35	0.129	327	0.146	317	0.031	245	0.033	291	0.019	286	0.015	253	0.024	281	0.012	258
DCP 7	.400	0.649	0.598	33	0.077	275	0.106	313	0.039	180	0.012	247	0.008	261	0.017	183	0.006	284	0.005	187
DCP 8	.500	0.666	0.560	24	0.135	245	0.070	262	0.058	136	0.035	138	0.027	80	0.029	38	0.016	297	0.013	318
DCP 9	.695	0.483	0.394	18	0.147	231	0.046	182	0.060	97	0.025	75	0.011	351	0.023	321	0.013	189	0.015	226
DCP10	.800	0.385	0.344	9	0.141	236	0.058	162	0.050	94	0.030	56	0.017	311	0.014	290	0.011	171	0.007	195
DCP11	.878	0.315	0.282	0	0.119	234	0.064	157	0.039	87	0.022	55	0.010	309	0.011	308	0.003	188	0.012	227
DCP12	.953	0.385	0.218	338	0.073	201	0.044	102	0.021	37	0.008	316	0.002	191	0.001	196	0.001	358	0.005	149

FORCED PITCHING OSCILLATION NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	80.65	0.600	12.23	5.52		3189.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.211	638.1	1429.1	0.63E 07	-0.00057	1.500	16.02

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.915	0.530	48	0.011	25	0.045	351	0.015	232	0.011	116	0.003	135	0.002	354	0.004	27	0.005	298
CM		-0.079	0.107	193	0.027	91	0.013	114	0.006	20	0.002	301	0.000	15	0.001	160	0.002	250	0.003	131
DCP 1	.010	2.882	0.521	98	0.578	48	0.135	285	0.086	346	0.068	241	0.036	95	0.015	318	0.012	75	0.025	7
DCP 2	.050	2.642	0.748	108	0.179	57	0.156	95	0.061	283	0.051	79	0.027	134	0.017	50	0.019	74	0.033	62
DCP 3	.100	1.888	0.897	82	0.220	137	0.016	79	0.069	287	0.036	69	0.012	166	0.006	269	0.025	298	0.038	17
DCP 4	.150	1.401	0.834	71	0.187	117	0.045	88	0.075	230	0.036	268	0.027	325	0.014	34	0.014	9	0.034	131
DCP 5	.200	1.318	0.810	58	0.134	92	0.105	41	0.052	164	0.026	163	0.017	203	0.015	270	0.018	297	0.012	20
DCP 6	.250	1.068	0.766	58	0.076	96	0.110	44	0.060	117	0.041	147	0.021	143	0.017	204	0.014	297	0.011	332
DCP 7	.300	0.907	0.791	51	0.067	57	0.146	18	0.034	79	0.038	93	0.021	102	0.020	142	0.008	218	0.007	158
DCP 8	.400	0.721	0.687	47	0.015	8	0.116	5	0.033	39	0.026	94	0.020	19	0.015	76	0.001	97	0.008	133
DCP 9	.500	0.743	0.650	36	0.060	293	0.108	323	0.028	291	0.008	334	0.016	282	0.011	290	0.003	336	0.005	295
DCP10	.695	0.562	0.496	27	0.100	272	0.062	294	0.036	231	0.010	186	0.016	267	0.009	173	0.017	86	0.019	339
DCP11	.800	0.491	0.421	14	0.098	272	0.053	262	0.047	203	0.021	117	0.011	123	0.017	359	0.013	60	0.028	287
DCP12	.878	0.417	0.340	5	0.088	282	0.041	264	0.037	198	0.013	117	0.007	61	0.017	348	0.000	101	0.022	283
DCP13	.953	0.473	0.250	350	0.078	263	0.026	178	0.021	159	0.008	107	0.012	56	0.007	317	0.008	359	0.008	245

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNEC CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.200	-0.23	6.05		3190.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.730	222.3	200.1	0.26E 07	-0.00159	0.556	3.84

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.087	0.441	49	0.048	231	0.042	313	0.019	156	0.014	198	0.009	346	0.005	79	0.007	89	0.002	69
CM		-0.013	0.104	287	0.017	91	0.012	150	0.004	356	0.005	34	0.001	226	0.001	274	0.003	278	0.001	6
DCP 1	.010	-0.480	2.311	343	0.126	68	0.060	168	0.050	113	0.022	353	0.004	233	0.018	207	0.016	14	0.019	30
DCP 2	.050	1.121	1.251	357	0.108	140	0.043	226	0.018	113	0.006	60	0.006	281	0.008	235	0.009	54	0.009	40
DCP 3	.100	-0.279	0.899	15	0.140	170	0.066	271	0.052	115	0.023	202	0.026	359	0.014	45	0.006	99	0.011	78
DCP 4	.150	-0.098	0.693	20	0.071	181	0.040	277	0.015	175	0.018	120	0.016	298	0.008	111	0.005	242	0.010	66
DCP 5	.200	0.124	0.638	36	0.079	200	0.039	305	0.016	125	0.009	155	0.023	332	0.007	7	0.008	338	0.011	346
DCP 6	.250	0.072	0.600	41	0.069	207	0.058	302	0.020	184	0.015	159	0.012	332	0.008	89	0.008	132	0.015	80
DCP 7	.300	-0.024	0.562	55	0.066	223	0.055	331	0.020	163	0.017	177	0.018	353	0.011	353	0.003	52	0.010	343
DCP 8	.400	0.100	0.508	65	0.068	235	0.064	310	0.013	182	0.016	178	0.014	297	0.011	114	0.008	210	0.012	58
DCP 9	.500	0.214	0.517	82	0.081	265	0.069	333	0.030	173	0.023	207	0.020	5	0.010	51	0.010	52	0.012	293
DCP10	.695	0.110	0.445	85	0.056	253	0.045	316	0.010	151	0.020	212	0.014	301	0.006	342	0.018	47	0.006	297
DCP11	.800	-0.004	0.360	101	0.082	277	0.045	330	0.036	171	0.026	210	0.027	112	0.023	146	0.036	130	0.029	142
DCP12	.878	0.010	0.300	97	0.039	278	0.039	329	0.007	148	0.013	228	0.004	90	0.007	50	0.010	59	0.009	49
DCP13	.953	0.016	0.217	86	0.042	260	0.022	315	0.010	156	0.013	231	0.004	36	0.004	78	0.007	135	0.006	245

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNEC CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.200	7.03	6.03		3190.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.731	221.8	199.1	0.26E 07	-0.00155	1.291	11.01

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.837	0.439	48	0.037	210	0.045	308	0.017	145	0.004	95	0.014	356	0.003	202	0.011	27	0.012	28
CM		-0.023	0.100	286	0.014	85	0.013	149	0.003	350	0.001	51	0.003	202	0.001	42	0.003	202	0.002	240
DCP 1	.010	3.686	2.333	349	0.224	104	0.095	195	0.031	88	0.025	12	0.017	274	0.012	101	0.018	68	0.026	26
DCP 2	.050	3.176	1.192	358	0.108	136	0.049	220	0.020	89	0.022	74	0.008	1	0.008	135	0.006	0	0.024	34
DCP 3	.100	1.597	0.845	9	0.076	158	0.022	251	0.009	109	0.015	50	0.013	344	0.002	32	0.014	43	0.010	7
DCP 4	.150	1.235	0.715	20	0.062	160	0.047	275	0.025	135	0.020	79	0.012	312	0.006	41	0.004	76	0.013	15
DCP 5	.200	1.245	0.634	28	0.069	176	0.041	290	0.028	151	0.007	75	0.021	332	0.004	184	0.019	32	0.024	358
DCP 6	.250	1.001	0.596	42	0.068	199	0.061	296	0.024	143	0.013	95	0.019	336	0.004	324	0.002	52	0.011	49
DCP 7	.300	0.844	0.537	51	0.044	195	0.062	311	0.027	145	0.008	138	0.025	337	0.002	152	0.012	32	0.020	356
DCP 8	.400	0.684	0.503	66	0.056	230	0.067	307	0.023	137	0.012	74	0.015	6	0.008	275	0.019	28	0.016	70
DCP 9	.500	0.687	0.511	79	0.059	245	0.078	323	0.023	145	0.010	177	0.024	352	0.007	169	0.011	7	0.020	0
DCP10	.695	0.422	0.435	85	0.051	244	0.054	320	0.015	163	0.006	177	0.016	341	0.013	190	0.022	12	0.010	37
DCP11	.800	0.207	0.360	99	0.056	276	0.055	334	0.018	194	0.008	297	0.024	60	0.007	247	0.008	57	0.009	94
DCP12	.878	0.244	0.294	95	0.035	271	0.040	325	0.012	160	0.005	138	0.012	45	0.004	319	0.009	55	0.010	128
DCP13	.953	0.155	0.201	82	0.026	248	0.019	319	0.003	143	0.013	309	0.005	18	0.005	254	0.005	358	0.006	35

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.200	9.36	6.01		3190.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.732	221.6	199.6	0.26E 07	-0.00154	1.546	13.66

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.085	0.433	49	0.036	234	0.044	300	0.014	155	0.016	94	0.008	355	0.005	177	0.005	57	0.010	357
CM		-0.033	0.099	287	0.015	101	0.014	145	0.003	354	0.003	299	0.002	211	0.002	5	0.001	174	0.001	194
DCP 1	.010	5.209	2.295	350	0.225	113	0.123	185	0.033	84	0.055	23	0.005	246	0.011	100	0.024	91	0.013	283
DCP 2	.050	4.032	1.152	0	0.103	138	0.059	209	0.021	73	0.018	48	0.010	288	0.008	97	0.012	32	0.007	312
DCP 3	.100	2.116	0.812	13	0.059	170	0.042	236	0.014	114	0.032	93	0.002	282	0.005	76	0.013	115	0.015	23
DCP 4	.150	1.581	0.698	21	0.067	184	0.043	265	0.007	147	0.011	110	0.019	318	0.006	159	0.009	87	0.019	347
DCP 5	.200	1.517	0.616	31	0.068	203	0.046	279	0.018	172	0.033	76	0.004	297	0.003	79	0.010	45	0.015	334
DCP 6	.250	1.288	0.580	42	0.066	210	0.056	289	0.017	143	0.019	116	0.018	326	0.005	250	0.006	90	0.015	4
DCP 7	.300	0.982	0.527	52	0.051	224	0.062	306	0.027	188	0.024	94	0.010	356	0.004	218	0.001	74	0.016	351
DCP 8	.400	0.911	0.506	67	0.053	242	0.062	302	0.016	139	0.016	113	0.013	346	0.005	240	0.012	66	0.017	351
DCP 9	.500	0.921	0.501	82	0.067	270	0.076	317	0.027	165	0.023	96	0.012	30	0.004	215	0.003	67	0.012	354
DCP10	.695	0.527	0.431	84	0.050	265	0.052	310	0.010	124	0.010	137	0.015	330	0.008	164	0.009	290	0.014	30
DCP11	.800	0.300	0.362	101	0.055	291	0.060	334	0.019	194	0.013	84	0.012	80	0.016	180	0.012	68	0.012	180
DCP12	.878	0.358	0.292	95	0.044	283	0.041	322	0.010	189	0.008	155	0.008	48	0.010	190	0.005	330	0.014	14
DCP13	.953	0.225	0.199	87	0.029	265	0.022	313	0.008	145	0.013	83	0.006	93	0.009	164	0.003	90	0.009	281

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.200	11.88	6.04		3190.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.732	221.7	200.3	0.26E 07	-0.00140	1.678	16.28

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.280	0.390	49	0.024	208	0.039	300	0.016	146	0.004	235	0.007	313	0.003	159	0.005	338	0.003	174
CM		-0.037	0.093	289	0.012	90	0.010	142	0.003	339	0.002	69	0.002	181	0.002	350	0.003	186	0.001	30
DCP 1	.010	6.283	2.068	351	0.174	80	0.099	200	0.050	110	0.024	75	0.024	290	0.029	44	0.009	121	0.022	27
DCP 2	.050	4.706	1.001	6	0.020	77	0.054	188	0.012	82	0.014	123	0.021	279	0.009	7	0.010	174	0.002	114
DCP 3	.100	2.631	0.835	4	0.140	140	0.085	284	0.036	111	0.032	275	0.007	81	0.008	337	0.012	231	0.012	236
DCP 4	.150	1.894	0.669	13	0.124	160	0.053	310	0.033	143	0.004	266	0.014	300	0.012	262	0.009	77	0.010	197
DCP 5	.200	1.828	0.582	23	0.076	154	0.033	290	0.016	206	0.014	36	0.018	241	0.007	162	0.015	270	0.007	225
DCP 6	.250	1.504	0.508	40	0.055	169	0.050	285	0.012	114	0.017	183	0.016	300	0.004	217	0.002	255	0.015	116
DCP 7	.300	1.184	0.486	49	0.024	177	0.043	302	0.029	167	0.009	353	0.005	216	0.008	97	0.013	288	0.010	229
DCP 8	.400	1.022	0.442	71	0.038	248	0.038	295	0.016	194	0.009	167	0.008	296	0.006	280	0.005	137	0.014	105
DCP 9	.500	1.035	0.468	80	0.049	271	0.064	314	0.023	148	0.007	194	0.007	321	0.011	143	0.012	332	0.005	87
DCP10	.695	0.573	0.386	91	0.040	262	0.045	325	0.013	129	0.007	215	0.016	0	0.004	108	0.008	327	0.010	293
DCP11	.800	0.364	0.347	95	0.051	267	0.044	311	0.013	143	0.015	273	0.005	17	0.013	210	0.025	28	0.012	195
DCP12	.878	0.479	0.263	103	0.036	262	0.031	311	0.015	167	0.004	280	0.002	222	0.012	180	0.014	30	0.003	255
DCP13	.953	0.305	0.201	83	0.023	254	0.014	304	0.002	151	0.005	302	0.004	334	0.008	115	0.008	4	0.012	190

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.200	14.10	5.99		3195.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.727	223.0	199.9	0.26E 07	-0.00130	1.784	19.31

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.420	0.310	34	0.088	230	0.056	337	0.037	96	0.010	175	0.016	343	0.006	214	0.011	225	0.024	198
CM		-0.078	0.091	307	0.049	79	0.022	169	0.013	287	0.005	17	0.005	153	0.001	48	0.004	15	0.006	35
DCP 1	.010	5.451	2.488	32	0.535	283	0.339	157	0.166	30	0.045	330	0.003	103	0.030	111	0.043	308	0.031	115
DCP 2	.050	4.629	1.441	13	0.342	171	0.049	310	0.079	358	0.051	149	0.030	306	0.005	88	0.036	305	0.042	159
DCP 3	.100	2.502	1.347	352	0.551	158	0.164	11	0.110	253	0.094	83	0.017	263	0.022	99	0.021	339	0.035	184
DCP 4	.150	2.340	1.073	345	0.419	149	0.129	6	0.058	246	0.046	104	0.048	351	0.020	221	0.011	138	0.026	202
DCP 5	.200	2.066	0.686	334	0.285	105	0.173	288	0.115	116	0.053	333	0.039	136	0.036	300	0.013	186	0.018	126
DCP 6	.250	1.752	0.522	331	0.291	98	0.200	297	0.124	136	0.089	352	0.033	211	0.029	78	0.047	254	0.017	143
DCP 7	.300	1.481	0.184	318	0.195	47	0.177	240	0.113	63	0.074	244	0.072	46	0.047	211	0.016	86	0.034	209
DCP 8	.400	1.314	0.077	105	0.203	355	0.099	174	0.080	38	0.097	197	0.061	335	0.019	158	0.014	275	0.021	188
DCP 9	.500	1.071	0.379	119	0.296	298	0.130	46	0.025	200	0.041	64	0.019	203	0.033	287	0.025	157	0.032	213
DCP10	.695	0.997	0.410	94	0.316	254	0.143	350	0.075	133	0.024	224	0.031	4	0.011	158	0.036	241	0.031	226
DCP11	.800	0.439	0.346	104	0.282	238	0.105	338	0.100	114	0.038	175	0.032	336	0.012	68	0.021	189	0.027	209
DCP12	.878	0.333	0.276	100	0.204	218	0.100	342	0.077	71	0.002	138	0.027	311	0.001	96	0.023	135	0.030	201
DCP13	.953	0.444	0.249	80	0.111	175	0.053	311	0.031	349	0.015	205	0.015	278	0.010	223	0.010	317	0.015	174

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.200	16.62	6.00		3195.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.729	222.3	200.2	0.26E 07	-0.00021	1.860	22.57

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.503	0.284	4	0.069	264	0.028	43	0.026	172	0.008	319	0.012	82	0.018	162	0.007	129	0.006	29
CM		-0.152	0.094	355	0.041	111	0.017	235	0.009	12	0.005	122	0.005	278	0.005	321	0.003	0	0.001	290
DCP 1	.010	4.123	1.876	62	0.327	64	0.113	330	0.028	105	0.048	185	0.091	50	0.057	242	0.013	35	0.047	74
DCP 2	.050	3.773	1.246	27	0.189	170	0.117	224	0.024	85	0.048	71	0.023	294	0.039	239	0.035	68	0.020	62
DCP 3	.100	2.133	1.452	9	0.130	251	0.054	210	0.063	80	0.077	18	0.077	282	0.065	167	0.028	70	0.023	43
DCP 4	.150	2.188	1.429	358	0.244	229	0.049	174	0.019	34	0.034	210	0.033	126	0.010	16	0.014	197	0.014	12
DCP 5	.200	1.987	1.173	357	0.189	213	0.017	136	0.043	238	0.020	189	0.044	121	0.035	123	0.017	8	0.031	345
DCP 6	.250	2.065	1.044	342	0.249	180	0.122	115	0.027	198	0.041	272	0.042	47	0.008	144	0.013	173	0.018	26
DCP 7	.300	1.715	0.837	343	0.243	158	0.135	61	0.118	174	0.058	106	0.037	343	0.021	203	0.017	116	0.025	209
DCP 8	.400	1.645	0.514	309	0.134	80	0.192	349	0.030	99	0.034	11	0.028	13	0.019	180	0.016	209	0.019	101
DCP 9	.500	1.415	0.368	255	0.151	2	0.148	267	0.014	223	0.044	244	0.053	140	0.024	102	0.006	41	0.016	318
DCP10	.695	1.216	0.412	168	0.275	296	0.125	123	0.019	164	0.025	354	0.008	180	0.013	192	0.011	232	0.012	320
DCP11	.800	0.618	0.388	145	0.223	292	0.176	73	0.064	196	0.024	310	0.034	113	0.038	148	0.037	151	0.017	145
DCP12	.878	0.514	0.380	135	0.188	271	0.156	36	0.066	186	0.036	299	0.053	70	0.029	144	0.011	42	0.034	45
DCP13	.953	0.515	0.370	114	0.164	229	0.060	326	0.014	205	0.004	157	0.030	325	0.012	155	0.016	192	0.009	219

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.200	23.92	5.91		3195.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.731	222.0	199.5	0.26E 07	0.00136	2.715	29.72

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		2.166	0.461	13	0.075	228	0.019	269	0.047	147	0.028	52	0.022	93	0.018	94	0.016	91	0.009	275
CM		-0.391	0.094	73	0.028	127	0.013	172	0.009	348	0.010	197	0.002	275	0.002	53	0.003	16	0.004	65
ECP 1	.010	2.000	0.926	107	0.235	197	0.279	233	0.036	168	0.053	76	0.100	89	0.099	92	0.073	86	0.040	53
ECP 2	.050	3.827	0.907	54	0.226	174	0.153	189	0.074	108	0.055	113	0.076	107	0.065	89	0.071	55	0.050	27
ECP 3	.100	2.787	1.117	45	0.214	169	0.106	204	0.061	160	0.017	213	0.015	65	0.028	93	0.031	113	0.016	220
ECP 4	.150	2.374	1.228	42	0.123	163	0.139	198	0.081	162	0.053	162	0.060	118	0.081	96	0.071	89	0.013	223
ECP 5	.200	2.559	1.182	34	0.121	129	0.104	137	0.096	123	0.065	118	0.034	107	0.020	68	0.026	91	0.027	345
ECP 6	.250	2.503	1.357	33	0.014	84	0.100	155	0.120	139	0.075	107	0.047	129	0.073	85	0.081	52	0.015	26
ECP 7	.300	2.434	1.261	25	0.074	349	0.082	16	0.040	85	0.043	55	0.036	92	0.006	160	0.039	147	0.013	278
ECP 8	.400	2.390	1.115	0	0.261	254	0.091	352	0.058	151	0.083	31	0.036	345	0.035	323	0.019	287	0.017	245
ECP 9	.500	2.463	0.973	347	0.336	222	0.040	341	0.059	168	0.003	45	0.025	100	0.034	94	0.037	14	0.022	298
ECP10	.695	2.279	0.568	288	0.237	134	0.091	275	0.010	1	0.056	2	0.030	332	0.010	178	0.026	139	0.029	206
ECP11	.800	1.345	0.364	217	0.097	33	0.119	298	0.064	123	0.006	44	0.034	119	0.036	158	0.041	217	0.010	299
ECP12	.878	1.268	0.519	191	0.247	315	0.081	336	0.085	134	0.014	2	0.055	88	0.022	190	0.012	356	0.009	47
ECP13	.953	1.408	0.937	195	0.583	322	0.231	98	0.115	229	0.096	40	0.048	206	0.053	333	0.040	152	0.040	257

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.400	-0.21	5.89		3191.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.370	438.3	735.0	0.47E 07	-0.00095	0.390	5.40

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		-0.041	0.393	7	0.041	201	0.001	115	0.013	97	0.009	69	0.003	339	0.003	36	0.002	198	0.003	355
CM		-0.005	0.058	268	0.007	98	0.003	124	0.002	320	0.001	275	0.001	131	0.000	76	0.001	47	0.000	338
ECP 1	.010	-0.385	2.335	325	0.224	194	0.123	89	0.059	80	0.030	63	0.028	56	0.025	33	0.008	4	0.019	321
ECP 2	.050	0.110	1.332	341	0.136	154	0.036	136	0.028	70	0.022	42	0.009	31	0.009	22	0.000	27	0.017	323
ECP 3	.100	-0.168	0.952	348	0.092	161	0.020	165	0.023	87	0.014	78	0.006	15	0.006	50	0.005	29	0.018	342
ECP 4	.150	-0.181	0.729	353	0.085	170	0.014	156	0.018	75	0.014	63	0.006	53	0.009	62	0.006	93	0.015	336
ECP 5	.200	-0.040	0.609	358	0.066	175	0.007	164	0.017	83	0.014	56	0.002	36	0.002	19	0.005	104	0.004	343
ECP 6	.250	-0.080	0.537	7	0.062	189	0.007	198	0.014	103	0.012	87	0.003	65	0.008	69	0.005	126	0.007	25
ECP 7	.300	-0.201	0.467	13	0.046	197	0.006	319	0.015	87	0.011	66	0.004	318	0.004	332	0.003	174	0.004	31
ECP 8	.400	-0.095	0.367	25	0.045	215	0.006	257	0.011	110	0.009	81	0.002	11	0.005	92	0.005	171	0.005	7
ECP 9	.500	0.029	0.323	36	0.036	233	0.008	315	0.014	98	0.010	82	0.004	290	0.003	342	0.003	155	0.004	352
ECP10	.695	0.081	0.252	53	0.033	249	0.006	306	0.016	113	0.003	42	0.007	234	0.002	280	0.010	227	0.002	142
ECP11	.800	-0.031	0.194	65	0.028	272	0.011	322	0.011	135	0.005	83	0.004	302	0.001	7	0.004	286	0.004	144
ECP12	.878	-0.068	0.163	66	0.023	268	0.006	316	0.007	144	0.002	263	0.004	282	0.003	134	0.004	254	0.002	116
ECP13	.953	0.056	0.127	55	0.018	245	0.004	298	0.008	121	0.007	98	0.002	298	0.003	30	0.002	173	0.003	346

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.400	7.03	5.99		3191.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.370	437.9	735.2	0.48E 07	-0.00069	1.092	13.13

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.706	0.381	17	0.048	203	0.007	37	0.006	100	0.003	284	0.000	193	0.003	61	0.003	32	0.002	248
CM		-0.034	0.045	255	0.003	350	0.008	117	0.005	317	0.003	131	0.002	295	0.001	141	0.001	328	0.001	22
CCP 1	.050	2.778	1.281	350	0.089	272	0.145	157	0.103	28	0.042	274	0.025	223	0.028	135	0.038	39	0.027	284
CCP 2	.100	1.816	0.996	0	0.149	211	0.127	114	0.065	352	0.026	168	0.016	317	0.029	116	0.033	352	0.011	249
CCP 3	.150	1.345	0.790	356	0.104	196	0.060	71	0.036	295	0.022	157	0.005	119	0.016	23	0.010	247	0.009	82
CCP 4	.200	1.221	0.658	7	0.122	192	0.060	63	0.023	257	0.020	105	0.004	10	0.012	17	0.005	248	0.004	52
CCP 5	.250	0.968	0.568	9	0.077	196	0.034	34	0.018	243	0.012	153	0.006	50	0.009	320	0.011	146	0.011	12
CCP 6	.300	0.757	0.510	20	0.087	196	0.042	34	0.019	212	0.012	82	0.009	4	0.006	354	0.003	334	0.003	259
CCP 7	.400	0.564	0.394	25	0.056	195	0.032	334	0.024	172	0.006	51	0.012	295	0.012	138	0.008	19	0.004	148
CCP 8	.500	0.570	0.348	41	0.053	201	0.033	333	0.027	151	0.009	8	0.004	294	0.006	110	0.002	31	0.003	4
CCP 9	.695	0.394	0.249	50	0.021	188	0.033	278	0.025	105	0.015	281	0.007	144	0.007	336	0.004	84	0.007	220
CCP10	.800	0.218	0.186	64	0.011	216	0.027	294	0.017	123	0.015	335	0.011	157	0.010	359	0.007	178	0.005	283
CCP11	.878	0.136	0.128	56	0.005	151	0.019	265	0.013	105	0.016	274	0.012	104	0.008	291	0.005	111	0.000	165
CCP12	.953	0.220	0.090	48	0.010	38	0.011	225	0.006	41	0.007	290	0.009	69	0.006	280	0.002	52	0.005	178

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.400	9.28	6.00		3191.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.371	437.7	735.3	0.48E 07	0.00055	1.371	15.42

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.874	0.485	6	0.081	183	0.019	359	0.031	132	0.015	331	0.010	184	0.014	3	0.009	161	0.001	6
CM		-0.083	0.037	126	0.041	280	0.021	130	0.013	335	0.007	152	0.006	7	0.005	195	0.004	345	0.002	198
CCP 1	.050	2.759	1.297	31	0.421	302	0.096	205	0.122	154	0.082	69	0.045	41	0.054	322	0.026	301	0.042	218
CCP 2	.100	1.855	1.194	23	0.356	267	0.084	170	0.124	120	0.047	27	0.046	4	0.034	271	0.011	228	0.021	159
CCP 3	.150	1.487	1.037	13	0.304	241	0.103	147	0.127	76	0.046	327	0.045	290	0.035	168	0.007	63	0.013	79
CCP 4	.200	1.367	0.957	11	0.282	225	0.086	132	0.111	57	0.049	298	0.043	238	0.025	100	0.018	81	0.015	318
CCP 5	.250	1.188	0.875	10	0.283	218	0.117	117	0.107	31	0.046	274	0.051	225	0.047	88	0.002	156	0.019	5
CCP 6	.300	0.937	0.800	7	0.252	205	0.092	105	0.095	22	0.060	267	0.047	195	0.041	69	0.012	13	0.015	277
CCP 7	.400	0.772	0.609	1	0.248	180	0.145	52	0.082	276	0.029	228	0.077	116	0.060	321	0.022	140	0.009	175
CCP 8	.500	0.833	0.492	350	0.218	150	0.126	31	0.100	258	0.054	159	0.057	46	0.040	285	0.028	155	0.021	46
CCP 9	.695	0.597	0.227	334	0.194	99	0.133	313	0.113	164	0.051	40	0.070	265	0.051	84	0.008	254	0.019	221
CCP10	.800	0.397	0.111	316	0.172	80	0.136	289	0.118	137	0.077	342	0.056	192	0.033	32	0.021	232	0.019	56
CCP11	.878	0.322	0.075	285	0.134	60	0.115	262	0.099	105	0.062	305	0.051	149	0.042	327	0.024	135	0.016	35
CCP12	.953	0.332	0.033	248	0.074	30	0.057	230	0.037	87	0.033	304	0.024	129	0.018	319	0.021	144	0.023	331

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.400	11.80	5.98		3191.4	10
	K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
	0.371	437.4	733.5	0.47E 07	0.00137	1.631	17.69

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.040	0.542	7	0.066	192	0.014	236	0.008	54	0.029	86	0.015	313	0.011	145	0.002	281	0.003	316
CM		-0.130	0.096	123	0.059	305	0.012	172	0.009	110	0.015	284	0.009	125	0.005	320	0.002	121	0.001	154
DCP 1	.050	2.873	1.361	60	0.433	334	0.120	351	0.125	253	0.040	292	0.050	180	0.019	195	0.027	125	0.020	155
DCP 2	.100	1.949	1.270	45	0.390	309	0.126	278	0.110	194	0.013	142	0.030	136	0.028	106	0.017	97	0.023	22
DCP 3	.150	1.593	1.109	33	0.322	288	0.127	239	0.114	158	0.056	94	0.043	76	0.038	22	0.011	316	0.023	306
DCP 4	.200	1.474	1.059	26	0.296	271	0.137	216	0.120	132	0.081	47	0.024	37	0.046	322	0.010	183	0.024	236
DCP 5	.250	1.314	1.011	24	0.311	263	0.137	199	0.119	127	0.095	54	0.036	17	0.038	314	0.016	242	0.021	204
DCP 6	.300	1.076	0.964	17	0.265	247	0.149	197	0.162	107	0.110	20	0.036	346	0.050	268	0.024	190	0.023	151
DCP 7	.400	0.943	0.806	4	0.295	216	0.160	136	0.134	46	0.067	330	0.043	266	0.044	167	0.017	114	0.024	26
DCP 8	.500	1.139	0.736	338	0.255	160	0.116	145	0.226	21	0.132	240	0.008	99	0.063	121	0.040	340	0.013	236
DCP 9	.695	0.814	0.457	313	0.297	123	0.123	14	0.149	278	0.158	121	0.044	330	0.022	308	0.034	164	0.023	344
DCP10	.800	0.563	0.288	309	0.255	120	0.174	343	0.134	220	0.124	79	0.051	285	0.031	150	0.017	331	0.013	28
DCP11	.878	0.457	0.197	293	0.189	99	0.120	313	0.080	197	0.088	61	0.042	262	0.032	111	0.025	302	0.001	42
DCP12	.953	0.468	0.168	260	0.155	52	0.075	238	0.014	109	0.018	100	0.038	340	0.035	154	0.023	319	0.021	202

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.400	15.00	5.98		3196.1	10
	K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
	0.369	439.1	740.4	0.48E 07	0.00163	1.836	20.58

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.233	0.555	18	0.025	272	0.026	242	0.035	48	0.037	170	0.020	336	0.010	189	0.005	359	0.002	230
CM		-0.137	0.145	134	0.050	342	0.008	33	0.021	212	0.019	12	0.007	166	0.004	17	0.001	128	0.000	37
DCP 1	.010	3.880	1.909	120	0.674	76	0.444	78	0.112	52	0.202	78	0.069	27	0.056	104	0.079	56	0.031	81
DCP 2	.050	2.906	1.387	85	0.356	14	0.201	37	0.092	9	0.060	15	0.049	341	0.027	354	0.025	339	0.025	23
DCP 3	.100	2.039	1.223	63	0.376	355	0.160	344	0.113	315	0.022	294	0.068	274	0.025	312	0.037	237	0.026	272
DCP 4	.150	1.618	1.120	53	0.369	344	0.137	304	0.108	296	0.038	224	0.070	238	0.017	217	0.032	175	0.010	293
DCP 5	.200	1.586	1.036	39	0.295	326	0.152	294	0.160	234	0.052	132	0.050	168	0.012	216	0.029	135	0.007	231
DCP 6	.250	1.444	1.043	40	0.364	321	0.142	263	0.134	236	0.064	174	0.068	168	0.028	149	0.048	82	0.006	270
DCP 7	.300	1.204	0.985	25	0.237	303	0.165	270	0.189	195	0.080	122	0.050	98	0.020	109	0.034	32	0.004	277
DCP 8	.400	1.108	0.937	17	0.373	275	0.196	195	0.168	144	0.068	89	0.060	30	0.021	37	0.041	308	0.008	279
DCP 9	.500	1.353	0.925	346	0.236	217	0.193	191	0.260	81	0.024	313	0.103	333	0.066	220	0.005	198	0.029	172
DCP10	.695	0.891	0.630	323	0.290	164	0.092	83	0.158	12	0.092	232	0.039	193	0.027	77	0.019	334	0.007	216
DCP11	.800	0.720	0.459	309	0.278	136	0.074	0	0.132	341	0.166	173	0.079	341	0.034	163	0.022	295	0.022	99
DCP12	.878	0.510	0.316	299	0.215	121	0.073	326	0.072	335	0.103	169	0.034	329	0.004	279	0.027	175	0.031	356
DCP13	.953	0.523	0.191	278	0.167	78	0.087	256	0.031	42	0.040	203	0.035	88	0.041	257	0.024	63	0.020	282

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.400	17.49	5.94		3196.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.370	438.3	739.0	0.48E 07	0.00095	1.851	22.68

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.240	0.552	30	0.060	301	0.023	191	0.021	65	0.027	253	0.022	91	0.012	265	0.004	200	0.005	135
CM		-0.160	0.143	154	0.052	36	0.009	20	0.016	259	0.014	104	0.007	276	0.005	97	0.003	78	0.002	282
CCP 1	.010	3.559	2.134	135	0.571	121	0.486	145	0.181	158	0.178	169	0.102	177	0.048	188	0.044	22[illegible]	0.045	241
CCP 2	.050	2.770	1.269	95	0.327	82	0.130	109	0.110	70	0.086	129	0.041	124	0.046	108	0.037	144	0.015	187
CCP 3	.100	1.944	1.092	74	0.376	49	0.111	68	0.134	10	0.055	70	0.049	53	0.019	17	0.016	92	0.014	118
CCP 4	.150	1.553	0.998	62	0.400	28	0.088	47	0.115	351	0.073	353	0.036	75	0.033	352	0.019	24	0.014	343
CCP 5	.200	1.531	0.931	48	0.343	9	0.135	3	0.124	309	0.057	277	0.033	323	0.022	259	0.016	235	0.004	296
CCP 6	.250	1.440	0.962	46	0.400	3	0.119	350	0.117	318	0.086	295	0.042	315	0.048	276	0.020	329	0.023	291
CCP 7	.300	1.151	0.909	35	0.347	348	0.164	320	0.134	266	0.097	241	0.078	226	0.076	222	0.013	153	0.016	174
CCP 8	.400	1.130	0.894	23	0.426	314	0.193	257	0.122	219	0.085	197	0.036	163	0.048	147	0.030	155	0.024	74
CCP 9	.500	1.332	0.860	3	0.374	269	0.182	222	0.145	159	0.069	125	0.092	81	0.032	336	0.018	45	0.018	311
CCP10	.695	0.929	0.644	345	0.339	215	0.159	141	0.119	66	0.048	327	0.036	7	0.042	254	0.005	10	0.012	117
CCP11	.800	0.821	0.439	331	0.260	182	0.085	102	0.133	40	0.116	279	0.042	105	0.031	269	0.016	305	0.013	132
CCP12	.878	0.670	0.328	320	0.215	151	0.050	21	0.085	46	0.089	271	0.029	125	0.014	183	0.047	263	0.033	138
CCP13	.953	0.627	0.165	312	0.151	120	0.087	306	0.053	119	0.064	305	0.049	164	0.035	356	0.033	188	0.017	9

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.400	25.01	5.94		3196.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.370	437.8	737.8	0.48E 07	-0.00122	1.642	26.29

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.178	0.468	53	0.070	132	0.019	99	0.013	101	0.004	207	0.003	213	0.003	175	0.002	130	0.005	258
CM		-0.196	0.122	221	0.022	229	0.014	273	0.007	322	0.003	62	0.001	34	0.002	291	0.001	120	0.002	98
CCP 1	.010	2.041	0.775	157	0.297	236	0.216	334	0.121	76	0.059	153	0.015	106	0.017	142	0.002	2	0.023	28
CCP 2	.050	2.163	0.291	69	0.143	169	0.023	285	0.028	48	0.014	121	0.003	138	0.006	182	0.011	152	0.008	174
CCP 3	.100	1.667	0.383	62	0.154	179	0.013	270	0.027	77	0.034	159	0.012	224	0.003	345	0.012	142	0.013	237
CCP 4	.150	1.421	0.439	58	0.168	165	0.016	266	0.033	38	0.018	111	0.011	228	0.003	232	0.013	110	0.005	197
CCP 5	.200	1.426	0.477	57	0.150	168	0.007	305	0.032	38	0.019	116	0.009	214	0.006	263	0.004	178	0.005	146
CCP 6	.250	1.395	0.501	57	0.186	166	0.028	236	0.037	22	0.031	79	0.014	179	0.014	245	0.006	95	0.011	325
CCP 7	.300	1.168	0.556	60	0.158	162	0.018	249	0.033	359	0.020	63	0.009	190	0.018	267	0.005	273	0.005	179
CCP 8	.400	1.150	0.553	52	0.148	148	0.062	192	0.036	285	0.038	342	0.015	53	0.030	291	0.005	191	0.003	186
CCP 9	.500	1.318	0.664	55	0.133	116	0.049	145	0.044	243	0.040	305	0.021	324	0.007	245	0.010	217	0.017	223
CCP10	.695	0.996	0.619	42	0.135	44	0.076	74	0.057	121	0.028	187	0.015	187	0.010	144	0.007	148	0.009	302
CCP11	.800	0.934	0.486	46	0.089	53	0.069	101	0.057	152	0.026	190	0.005	147	0.021	82	0.018	356	0.012	356
CCP12	.878	0.758	0.368	35	0.083	18	0.060	60	0.041	93	0.015	213	0.012	191	0.009	162	0.003	330	0.015	268
CCP13	.953	0.727	0.251	32	0.047	336	0.035	60	0.027	92	0.008	273	0.006	334	0.004	167	0.005	268	0.005	224

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.600	-0.35	5.97		3192.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.252	643.7	1438.4	0.63E 07	-0.00077	0.404	5.58

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		-0.066	0.449	344	0.030	193	0.007	213	0.003	113	0.001	97	0.002	350	0.003	24	0.001	17	0.001	28
CM		0.001	0.050	254	0.004	92	0.002	76	0.000	282	0.001	12	0.000	237	0.000	291	0.000	98	0.000	217
DCP 1	.010	-0.338	2.010	306	0.309	186	0.044	348	0.008	121	0.017	15	0.007	275	0.010	20	0.003	75	0.003	318
DCP 2	.050	0.242	1.775	324	0.034	119	0.063	56	0.022	98	0.021	70	0.003	68	0.011	77	0.004	143	0.004	221
DCP 3	.100	-0.217	1.223	331	0.058	150	0.049	169	0.018	192	0.018	257	0.020	298	0.026	323	0.022	24	0.021	54
DCP 4	.150	-0.257	0.898	334	0.060	168	0.025	193	0.005	309	0.009	8	0.004	46	0.003	38	0.002	118	0.001	155
DCP 5	.200	-0.098	0.737	338	0.051	171	0.018	186	0.003	43	0.003	9	0.004	61	0.003	41	0.002	139	0.002	191
DCP 6	.250	-0.148	0.636	346	0.045	187	0.018	206	0.003	75	0.004	88	0.003	28	0.004	63	0.001	91	0.002	347
DCP 7	.300	-0.228	0.538	350	0.035	192	0.015	214	0.004	95	0.004	117	0.003	54	0.003	1	0.003	296	0.003	262
DCP 8	.400	-0.121	0.400	0	0.031	204	0.014	221	0.004	86	0.003	118	0.003	348	0.004	52	0.001	101	0.002	315
DCP 9	.500	-0.024	0.326	9	0.025	219	0.011	237	0.003	108	0.002	149	0.002	81	0.003	25	0.002	321	0.003	279
DCP10	.695	0.027	0.217	30	0.020	236	0.009	255	0.003	114	0.003	158	0.001	290	0.003	29	0.001	317	0.003	57
DCP11	.800	-0.033	0.164	42	0.016	257	0.008	270	0.004	108	0.004	229	0.002	359	0.003	162	0.002	307	0.002	94
DCP12	.878	-0.037	0.130	45	0.014	250	0.006	280	0.002	131	0.000	296	0.002	347	0.002	111	0.001	231	0.001	75
DCP13	.953	0.027	0.116	34	0.012	243	0.005	263	0.002	115	0.002	218	0.001	328	0.001	112	0.001	24	0.002	243

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.600	4.39	5.96		3192.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.252	642.8	1435.6	0.63E 07	-0.00044	1.023	10.40

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.516	0.455	355	0.047	217	0.013	53	0.015	108	0.005	36	0.001	22	0.004	176	0.005	33	0.001	295
CM		-0.020	0.038	228	0.013	334	0.013	170	0.008	2	0.003	246	0.002	93	0.002	326	0.001	172	0.001	46
DCP 1	.050	2.158	1.412	328	0.119	31	0.137	198	0.108	27	0.033	196	0.031	57	0.025	0	0.016	213	0.019	14
DCP 2	.100	1.347	1.189	343	0.142	310	0.139	222	0.103	99	0.007	336	0.047	29	0.039	206	0.037	24	0.012	162
DCP 3	.200	0.885	0.863	348	0.174	239	0.092	122	0.054	59	0.047	347	0.021	234	0.012	207	0.015	110	0.007	13
DCP 4	.250	0.676	0.726	355	0.158	235	0.104	106	0.052	24	0.032	324	0.035	204	0.022	103	0.015	31	0.013	326
DCP 5	.300	0.528	0.662	357	0.164	223	0.116	91	0.059	358	0.029	265	0.031	171	0.014	91	0.015	48	0.016	303
DCP 6	.400	0.381	0.465	6	0.102	211	0.081	53	0.025	281	0.016	183	0.029	111	0.022	345	0.009	263	0.007	150
DCP 7	.500	0.384	0.371	13	0.071	192	0.068	18	0.037	213	0.025	106	0.014	8	0.013	243	0.006	176	0.003	154
DCP 8	.695	0.254	0.237	27	0.039	160	0.049	332	0.044	157	0.015	42	0.008	281	0.010	147	0.005	321	0.004	133
DCP 9	.800	0.167	0.164	26	0.047	144	0.052	336	0.039	179	0.018	81	0.019	304	0.014	164	0.009	15	0.006	257
DCP10	.878	0.126	0.116	15	0.049	116	0.043	309	0.032	156	0.016	50	0.016	271	0.015	120	0.008	359	0.003	297
DCP11	.953	0.162	0.092	5	0.039	84	0.030	273	0.023	130	0.010	1	0.005	222	0.001	236	0.002	97	0.004	286

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	98.04	0.600	6.91	5.90		3192.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.255	642.5	1434.3	0.63E 07	-0.00019	1.286	12.96

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.697	0.521	7	0.078	243	0.029	101	0.010	348	0.008	149	0.003	346	0.004	340	0.003	314	0.002	315
CM		-0.042	0.055	192	0.039	359	0.018	226	0.008	115	0.005	5	0.002	328	0.004	187	0.002	22	0.001	265
DCP 1	.050	2.608	0.968	340	0.415	353	0.202	179	0.094	353	0.036	66	0.026	269	0.022	221	0.034	84	0.034	291
DCP 2	.100	1.691	1.086	7	0.300	334	0.097	252	0.037	117	0.008	6	0.040	345	0.023	219	0.017	276	0.031	338
DCP 3	.250	0.901	0.816	12	0.194	269	0.065	165	0.042	151	0.032	105	0.024	68	0.014	7	0.028	352	0.021	279
DCP 4	.300	0.727	0.782	11	0.210	258	0.079	163	0.055	124	0.041	69	0.027	354	0.003	294	0.021	311	0.031	230
DCP 5	.400	0.548	0.594	15	0.168	227	0.063	102	0.033	78	0.019	332	0.013	329	0.023	244	0.009	119	0.012	80
DCP 6	.500	0.556	0.531	13	0.189	210	0.093	82	0.046	2	0.027	266	0.028	216	0.024	106	0.018	352	0.007	286
DCP 7	.695	0.369	0.330	15	0.145	180	0.070	40	0.040	312	0.033	200	0.018	128	0.027	1	0.014	239	0.013	136
DCP 8	.800	0.290	0.248	6	0.132	175	0.072	42	0.053	294	0.036	162	0.005	339	0.016	0	0.014	162	0.007	73
DCP 9	.878	0.247	0.194	352	0.113	164	0.068	38	0.054	276	0.031	143	0.003	51	0.017	350	0.014	183	0.009	59
DCP 10	.953	0.251	0.132	335	0.067	121	0.032	353	0.023	223	0.004	121	0.007	88	0.010	298	0.011	127	0.011	340

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.600	9.22	5.82		3192.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.253	642.0	1433.5	0.63E 07	-0.00018	1.344	14.74

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.715	0.563	24	0.071	256	0.018	183	0.010	95	0.010	324	0.004	107	0.002	266	0.003	268	0.001	296
CM		-0.088	0.086	184	0.044	30	0.013	321	0.008	228	0.006	160	0.002	357	0.002	100	0.001	213	0.001	164
DCP 1	.100	1.811	1.037	38	0.314	14	0.057	25	0.006	307	0.031	205	0.027	96	0.016	127	0.016	125	0.005	56
DCP 2	.250	1.021	0.877	29	0.144	317	0.084	288	0.043	215	0.028	303	0.021	315	0.017	242	0.024	274	0.021	220
DCP 3	.300	0.836	0.868	28	0.163	304	0.080	278	0.060	251	0.042	221	0.007	229	0.022	145	0.019	291	0.015	246
DCP 4	.400	0.659	0.686	25	0.133	250	0.081	231	0.044	146	0.015	146	0.019	77	0.022	55	0.017	265	0.015	54
DCP 5	.500	0.686	0.658	20	0.182	237	0.079	202	0.062	136	0.055	57	0.020	16	0.032	340	0.033	249	0.013	163
DCP 6	.695	0.486	0.428	12	0.185	204	0.066	128	0.049	32	0.037	337	0.006	221	0.027	227	0.020	74	0.012	21
DCP 7	.800	0.398	0.359	7	0.170	217	0.081	137	0.053	51	0.044	333	0.029	189	0.005	288	0.012	86	0.010	347
DCP 8	.878	0.342	0.275	352	0.143	201	0.077	108	0.049	11	0.038	288	0.028	160	0.004	38	0.016	46	0.013	274
DCP 9	.953	0.346	0.187	335	0.085	172	0.040	59	0.016	334	0.013	242	0.005	87	0.002	192	0.010	357	0.035	340

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	98.04	0.600	14.83	5.75		3197.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.255	643.3	1444.9	0.63E 07	-0.00058	1.576	17.99

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.956	0.600	45	0.018	138	0.027	345	0.006	320	0.006	327	0.002	212	0.001	91	0.004	11	0.001	30
CM		-0.093	0.135	193	0.025	104	0.016	132	0.001	49	0.005	135	0.001	48	0.001	30	0.001	152	0.000	392
DCP 1	.010	2.785	0.753	128	0.493	50	0.113	111	0.197	349	0.035	231	0.032	351	0.026	198	0.040	30	0.007	300
DCP 2	.050	2.593	0.825	111	0.035	150	0.157	95	0.042	190	0.020	93	0.026	138	0.019	121	0.010	192	0.014	117
DCP 3	.100	1.864	0.919	80	0.228	160	0.067	225	0.059	285	0.043	5	0.032	104	0.009	14	0.008	2	0.019	53
DCP 4	.150	1.453	0.837	67	0.217	133	0.044	183	0.050	251	0.035	261	0.023	32	0.047	72	0.027	90	0.006	78
DCP 5	.200	1.341	0.872	55	0.165	119	0.029	118	0.036	144	0.031	207	0.017	292	0.031	327	0.015	352	0.017	17
DCP 6	.250	1.139	0.848	56	0.143	133	0.023	69	0.030	152	0.055	186	0.026	246	0.017	337	0.011	321	0.014	27
DCP 7	.300	0.955	0.874	49	0.135	101	0.061	44	0.049	93	0.052	127	0.018	167	0.013	310	0.015	261	0.025	285
DCP 8	.400	0.800	0.798	43	0.063	110	0.066	8	0.031	48	0.043	91	0.015	141	0.008	147	0.012	123	0.007	299
DCP 9	.500	0.813	0.772	31	0.021	345	0.080	341	0.037	359	0.049	353	0.025	333	0.004	290	0.006	39	0.007	176
DCP10	.695	0.618	0.618	22	0.091	279	0.064	320	0.018	266	0.032	298	0.015	278	0.013	216	0.007	208	0.009	143
DCP11	.800	0.537	0.530	16	0.118	291	0.058	299	0.017	239	0.020	304	0.015	166	0.006	234	0.014	350	0.008	40
DCP12	.878	0.466	0.424	12	0.122	290	0.055	295	0.022	213	0.018	293	0.012	166	0.006	162	0.017	333	0.009	337
DCP13	.953	0.507	0.263	358	0.091	262	0.035	262	0.011	173	0.011	225	0.007	143	0.011	107	0.005	77	0.003	317

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.600	17.36	5.68		3197.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.252	642.5	1443.0	0.63E 07	-0.00092	1.479	18.50

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.000	0.516	53	0.063	161	0.009	72	0.009	86	0.011	172	0.006	111	0.004	141	0.006	337	0.009	396
CM		-0.117	0.133	205	0.011	179	0.010	197	0.005	258	0.004	51	0.001	173	0.003	13	0.003	130	0.001	180
DCP 1	.010	2.716	0.989	146	0.172	70	0.264	136	0.027	292	0.097	145	0.026	191	0.056	132	0.004	357	0.009	189
DCP 2	.050	2.445	0.756	127	0.274	213	0.016	137	0.017	188	0.053	102	0.029	90	0.057	46	0.011	41	0.019	327
DCP 3	.100	1.810	0.654	87	0.227	188	0.030	290	0.039	87	0.041	136	0.029	163	0.007	61	0.018	125	0.004	152
DCP 4	.150	1.434	0.639	81	0.254	170	0.057	220	0.034	319	0.047	78	0.039	138	0.011	326	0.023	346	0.022	343
DCP 5	.200	1.365	0.675	62	0.178	158	0.031	236	0.015	324	0.002	122	0.009	174	0.007	228	0.008	149	0.009	29
DCP 6	.250	1.161	0.646	63	0.203	163	0.045	209	0.023	286	0.030	31	0.037	98	0.010	79	0.006	313	0.018	322
DCP 7	.300	1.013	0.715	55	0.153	151	0.023	207	0.007	233	0.003	211	0.008	95	0.004	81	0.012	61	0.002	331
DCP 8	.400	0.844	0.650	49	0.119	140	0.028	125	0.028	171	0.022	255	0.012	41	0.006	341	0.005	125	0.005	321
DCP 9	.500	0.902	0.679	40	0.073	120	0.019	76	0.020	114	0.023	217	0.011	317	0.007	272	0.009	340	0.010	318
DCP10	.695	0.680	0.602	33	0.020	355	0.027	29	0.024	76	0.021	198	0.011	228	0.014	205	0.012	325	0.009	9
DCP11	.800	0.629	0.512	30	0.064	347	0.068	23	0.024	71	0.016	221	0.010	77	0.019	176	0.020	312	0.005	103
DCP12	.878	0.567	0.417	28	0.068	335	0.058	18	0.019	69	0.016	228	0.012	76	0.018	153	0.020	315	0.019	317
DCP13	.953	0.605	0.299	17	0.058	308	0.030	342	0.019	29	0.008	119	0.010	345	0.005	97	0.008	229	0.004	347

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.600	24.81	5.86		3197.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.253	641.8	1437.7	0.63E 07	-0.00072	1.352	30.32

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.075	0.316	35	0.046	167	0.016	208	0.008	347	0.008	325	0.003	328	0.001	274	0.001	170	0.003	169
CM		-0.174	0.083	213	0.005	296	0.004	323	0.001	79	0.004	161	0.003	201	0.000	223	0.001	33	0.001	18
DCP 1	.010	2.010	0.435	135	0.138	237	0.129	313	0.066	351	0.059	267	0.064	288	0.022	12	0.022	127	0.017	159
DCP 2	.050	2.017	0.185	59	0.118	194	0.057	241	0.011	277	0.020	228	0.022	246	0.003	292	0.006	98	0.001	102
DCP 3	.100	1.575	0.259	28	0.089	166	0.036	184	0.014	117	0.015	171	0.013	157	0.008	145	0.014	87	0.012	116
DCP 4	.150	1.438	0.313	35	0.098	178	0.046	228	0.013	338	0.004	227	0.016	227	0.008	258	0.000	309	0.001	155
DCP 5	.200	1.342	0.316	21	0.076	164	0.030	194	0.009	19	0.004	344	0.002	74	0.003	9	0.005	356	0.007	41
DCP 6	.250	1.282	0.366	33	0.075	172	0.027	222	0.014	30	0.005	127	0.014	219	0.010	255	0.003	339	0.003	158
DCP 7	.300	1.090	0.361	25	0.069	162	0.027	193	0.011	21	0.006	343	0.002	82	0.002	228	0.003	323	0.006	32
DCP 8	.400	1.043	0.383	34	0.054	165	0.020	231	0.023	10	0.017	47	0.010	156	0.009	223	0.006	297	0.002	169
DCP 9	.500	1.068	0.388	28	0.044	149	0.014	187	0.014	342	0.011	340	0.005	38	0.002	175	0.004	229	0.004	217
DCP10	.695	0.873	0.386	36	0.023	148	0.006	164	0.012	317	0.020	340	0.008	25	0.002	200	0.004	160	0.006	192
DCP11	.800	0.824	0.350	38	0.032	128	0.022	150	0.008	207	0.018	321	0.018	12	0.010	40	0.004	192	0.009	227
DCP12	.878	0.746	0.299	41	0.022	116	0.023	144	0.015	203	0.016	324	0.014	2	0.007	44	0.008	158	0.008	169
DCP13	.953	0.[illegible]34	0.222	32	0.008	305	0.002	191	0.004	149	0.005	264	0.009	327	0.003	305	0.005	294	0.005	113

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.18	0.200	4.65	7.49		3157.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.123	220.6	196.9	0.25E 07	-0.00145	1.156	12.24

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.521	0.637	354	0.058	160	0.012	189	0.012	185	0.003	256	0.000	253	0.005	207	0.002	179	0.008	151
CM		-0.012	0.019	269	0.002	32	0.002	40	0.002	39	0.002	133	0.001	127	0.001	42	0.000	47	0.002	2
DCP 1	.010	1.681	3.979	348	0.338	155	0.049	186	0.060	165	0.023	124	0.042	129	0.008	47	0.021	105	0.014	151
DCP 2	.050	2.353	2.021	350	0.200	147	0.041	179	0.018	150	0.020	91	0.026	106	0.002	213	0.016	83	0.012	84
DCP 3	.100	1.034	1.513	348	0.119	159	0.017	159	0.033	198	0.025	188	0.026	242	0.007	181	0.025	237	0.021	113
DCP 4	.150	0.858	1.121	352	0.102	159	0.021	175	0.014	179	0.011	301	0.012	76	0.007	240	0.004	52	0.008	127
DCP 5	.200	0.870	0.912	351	0.079	172	0.006	171	0.015	166	0.008	195	0.007	263	0.010	147	0.005	219	0.011	115
DCP 6	.250	0.647	0.810	354	0.077	156	0.016	181	0.011	170	0.004	181	0.010	69	0.009	246	0.005	33	0.010	124
DCP 7	.300	0.433	0.702	354	0.058	163	0.002	51	0.011	156	0.015	195	0.006	271	0.009	167	0.007	203	0.008	121
DCP 8	.400	0.469	0.524	337	0.047	156	0.019	182	0.017	204	0.005	296	0.008	354	0.013	243	0.008	56	0.012	180
DCP 9	.500	0.396	0.410	359	0.038	174	0.005	235	0.012	195	0.009	221	0.008	273	0.013	198	0.009	220	0.009	169
DCP 10	.695	0.223	0.246	13	0.024	143	0.012	171	0.006	113	0.014	0	0.009	50	0.005	11	0.008	58	0.002	157
DCP 11	.800	0.163	0.167	7	0.021	212	0.016	233	0.020	217	0.021	279	0.010	214	0.014	179	0.020	227	0.026	172
DCP 12	.878	0.098	0.131	21	0.025	159	0.016	224	0.007	221	0.010	5	0.003	306	0.009	329	0.006	23	0.002	310
DCP 13	.953	0.153	0.110	14	0.018	170	0.003	182	0.005	244	0.003	199	0.005	293	0.001	17	0.003	117	0.007	179

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.26	0.200	9.44	7.53		3157.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.123	220.2	195.9	0.25E 07	0.00081	1.700	16.84

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.891	0.638	14	0.127	263	0.098	126	0.067	343	0.036	207	0.028	83	0.015	290	0.010	164	0.008	80
CM		-0.047	0.041	161	0.048	11	0.037	237	0.028	113	0.019	345	0.014	224	0.011	99	0.008	335	0.005	221
DCP 1	.010	2.973	2.675	27	1.236	5	0.888	246	0.546	135	0.328	31	0.164	291	0.085	212	0.094	156	0.106	84
DCP 2	.050	3.407	1.489	24	0.485	345	0.372	215	0.215	89	0.112	331	0.041	233	0.046	170	0.050	79	0.040	319
DCP 3	.100	1.757	1.331	16	0.391	310	0.341	174	0.192	45	0.108	300	0.076	194	0.085	142	0.068	22	0.034	272
DCP 4	.150	1.343	1.091	18	0.301	294	0.266	167	0.164	41	0.084	296	0.044	210	0.053	128	0.055	20	0.047	261
DCP 5	.200	1.317	0.980	14	0.284	269	0.242	138	0.150	3	0.082	251	0.064	153	0.055	65	0.056	305	0.038	178
DCP 6	.250	1.056	0.867	15	0.254	267	0.224	139	0.150	11	0.083	265	0.063	169	0.057	73	0.050	322	0.036	212
DCP 7	.300	0.802	0.807	12	0.254	250	0.215	114	0.143	341	0.092	223	0.087	120	0.061	14	0.050	259	0.036	148
DCP 8	.400	0.821	0.610	13	0.211	241	0.186	109	0.133	343	0.078	229	0.073	127	0.059	11	0.045	268	0.041	172
DCP 9	.500	0.704	0.516	9	0.193	223	0.173	82	0.132	306	0.096	182	0.091	69	0.072	300	0.053	178	0.042	74
DCP 10	.695	0.431	0.327	7	0.165	202	0.139	64	0.116	296	0.086	167	0.070	35	0.062	271	0.041	131	0.025	26
DCP 11	.800	0.365	0.269	356	0.121	188	0.101	52	0.079	290	0.065	149	0.053	34	0.044	243	0.040	154	0.033	30
DCP 12	.878	0.345	0.202	355	0.140	193	0.082	46	0.070	287	0.051	153	0.053	17	0.041	251	0.035	110	0.017	19
DCP 13	.953	0.317	0.169	347	0.077	162	0.042	17	0.036	252	0.033	111	0.025	320	0.014	188	0.011	119	0.015	331

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.92	0.400	4.91	7.48		3159.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.065	434.1	723.0	0.47E 07	-0.00052	1.245	12.42

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.453	0.713	358	0.015	85	0.051	221	0.031	119	0.008	330	0.011	207	0.014	159	0.006	75	0.004	221
CM		-0.003	0.016	198	0.016	40	0.014	285	0.010	173	0.007	67	0.004	327	0.003	268	0.003	170	0.003	53
DCP 1	.010	2.912	4.273	354	0.255	66	0.401	272	0.380	182	0.203	101	0.076	359	0.068	251	0.083	189	0.070	127
DCP 2	.050	1.530	2.015	356	0.256	64	0.248	265	0.186	164	0.093	72	0.056	315	0.058	216	0.046	154	0.030	108
DCP 3	.100	1.082	1.536	356	0.176	50	0.208	249	0.162	143	0.091	40	0.059	287	0.062	195	0.047	117	0.027	42
DCP 4	.150	0.722	1.209	357	0.054	43	0.127	229	0.088	120	0.049	349	0.039	233	0.036	152	0.018	67	0.005	292
DCP 5	.200	0.677	0.994	358	0.060	29	0.119	224	0.093	107	0.046	344	0.033	220	0.030	150	0.019	83	0.014	5
DCP 6	.250	0.585	0.888	359	0.025	36	0.090	216	0.060	99	0.035	313	0.036	206	0.023	134	0.007	36	0.012	264
DCP 7	.300	0.392	0.790	359	0.022	347	0.088	204	0.063	83	0.042	308	0.034	191	0.021	123	0.017	51	0.012	285
DCP 8	.400	0.219	0.587	1	0.010	358	0.055	204	0.030	76	0.024	272	0.019	176	0.007	131	0.004	56	0.010	269
DCP 9	.500	0.377	0.509	0	0.034	218	0.047	156	0.035	33	0.028	260	0.022	157	0.012	113	0.014	18	0.013	258
DCP10	.695	0.082	0.312	1	0.048	210	0.037	122	0.028	349	0.028	231	0.015	143	0.008	122	0.009	359	0.015	227
DCP11	.800	0.175	0.227	2	0.037	210	0.030	109	0.019	3	0.009	246	0.010	110	0.009	114	0.006	11	0.002	128
DCP12	.878	0.160	0.182	359	0.052	214	0.027	113	0.014	350	0.008	243	0.008	207	0.010	113	0.009	355	0.012	213
DCP13	.953	0.169	0.171	354	0.061	202	0.035	86	0.014	311	0.005	216	0.005	164	0.007	128	0.008	335	0.009	157

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.81	0.400	9.73	7.51		3159.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.065	433.8	722.4	0.47E 07	-0.00077	1.374	14.09

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.731	0.407	27	0.159	44	0.019	27	0.047	331	0.029	261	0.026	218	0.022	143	0.013	95	0.011	30
CM		-0.043	0.070	185	0.033	89	0.011	92	0.018	44	0.010	353	0.010	331	0.009	275	0.008	232	0.006	180
DCP 1	.010	3.528	0.827	46	1.704	81	0.449	76	0.586	41	0.307	357	0.234	337	0.175	297	0.122	267	0.099	245
DCP 2	.050	2.053	0.602	50	0.781	64	0.076	84	0.240	31	0.139	319	0.063	302	0.077	272	0.060	224	0.039	197
DCP 3	.100	1.585	0.589	40	0.540	56	0.053	58	0.170	6	0.098	292	0.060	278	0.056	223	0.035	182	0.026	179
DCP 4	.150	1.086	0.587	41	0.379	43	0.040	58	0.144	344	0.075	267	0.060	260	0.067	191	0.028	138	0.029	131
DCP 5	.200	1.023	0.500	34	0.294	48	0.065	30	0.125	334	0.081	268	0.068	235	0.057	173	0.033	152	0.039	114
DCP 6	.250	0.905	0.531	37	0.232	29	0.018	69	0.096	324	0.044	247	0.053	244	0.052	163	0.021	133	0.034	95
DCP 7	.300	0.722	0.499	30	0.191	33	0.050	13	0.106	310	0.069	245	0.066	213	0.061	139	0.028	103	0.025	63
DCP 8	.400	0.485	0.447	31	0.128	9	0.014	32	0.069	301	0.040	244	0.054	210	0.042	139	0.032	110	0.033	45
DCP 9	.500	0.630	0.427	22	0.090	342	0.015	320	0.060	267	0.029	197	0.038	187	0.042	106	0.023	74	0.028	17
DCP10	.695	0.279	0.340	17	0.070	302	0.024	287	0.050	236	0.024	184	0.039	174	0.033	107	0.032	75	0.034	9
DCP11	.800	0.382	0.307	9	0.065	286	0.043	269	0.052	220	0.030	173	0.035	130	0.034	77	0.030	28	0.021	320
DCP12	.878	0.357	0.273	2	0.053	274	0.041	275	0.042	204	0.026	181	0.030	122	0.019	84	0.026	27	0.018	322
DCP13	.953	0.335	0.255	355	0.045	249	0.031	276	0.026	200	0.016	180	0.019	111	0.014	76	0.017	23	0.013	317

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.56	0.600	4.89	7.49		3161.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.043	639.9	1426.4	0.62E 07	-0.00094	1.046	10.12

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.423	0.676	357	0.140	62	0.039	299	0.014	314	0.019	232	0.008	176	0.012	171	0.009	93	0.001	52
CM		-0.017	0.031	199	0.018	85	0.005	1	0.005	57	0.007	328	0.003	276	0.003	276	0.003	234	0.002	166
DCP 1	.010	1.619	2.795	352	0.751	73	0.026	244	0.113	62	0.034	260	0.016	71	0.018	152	0.004	69	0.022	151
DCP 2	.050	1.443	1.900	353	0.714	76	0.206	317	0.054	53	0.099	302	0.042	216	0.019	150	0.005	331	0.026	153
DCP 3	.100	1.107	1.567	352	0.563	68	0.175	316	0.095	36	0.129	298	0.021	16	0.138	268	0.029	149	0.074	250
DCP 4	.150	0.756	1.289	356	0.280	69	0.100	333	0.060	310	0.056	288	0.053	242	0.030	233	0.055	191	0.023	176
DCP 5	.200	0.664	1.024	356	0.252	54	0.106	311	0.053	272	0.026	229	0.041	226	0.041	165	0.031	152	0.028	93
DCP 6	.250	0.539	0.875	0	0.190	62	0.051	310	0.048	300	0.045	215	0.023	203	0.039	164	0.028	139	0.016	83
DCP 7	.300	0.393	0.769	358	0.173	50	0.062	296	0.040	273	0.033	203	0.026	202	0.044	150	0.028	91	0.023	68
DCP 8	.400	0.227	0.566	3	0.133	54	0.029	272	0.018	325	0.027	211	0.008	145	0.015	172	0.013	99	0.006	136
DCP 9	.500	0.280	0.461	1	0.076	41	0.021	261	0.020	291	0.031	183	0.014	101	0.011	133	0.013	54	0.007	343
DCP10	.695	0.246	0.317	6	0.018	338	0.015	201	0.015	283	0.026	175	0.012	95	0.009	93	0.010	34	0.008	2
DCP11	.800	0.145	0.263	3	0.032	280	0.017	202	0.011	214	0.016	140	0.005	119	0.014	102	0.016	2	0.007	287
DCP12	.878	0.126	0.230	3	0.041	271	0.018	241	0.023	216	0.020	140	0.006	92	0.011	107	0.015	41	0.014	341
DCP13	.953	0.186	0.225	353	0.049	236	0.008	184	0.015	190	0.010	106	0.006	112	0.007	53	0.008	330	0.007	285

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.64	0.600	8.96	7.40		3161.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.043	638.9	1421.6	0.62E 07	-0.00190	1.089	9.97

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.737	0.370	13	0.151	79	0.038	134	0.022	93	0.019	82	0.008	102	0.012	46	0.003	249	0.003	275
CM		-0.048	0.065	189	0.018	77	0.011	204	0.003	107	0.007	206	0.004	190	0.005	187	0.003	154	0.002	159
DCP 1	.010	2.794	1.178	355	0.653	83	0.118	158	0.059	282	0.016	313	0.064	234	0.030	144	0.011	62	0.029	216
DCP 2	.050	2.144	0.389	9	0.781	77	0.208	187	0.104	87	0.032	171	0.025	155	0.003	327	0.009	188	0.028	226
DCP 3	.100	1.670	0.388	18	0.595	79	0.272	175	0.064	86	0.131	171	0.069	242	0.012	178	0.106	238	0.030	331
DCP 4	.150	1.217	0.504	19	0.416	80	0.092	158	0.122	112	0.044	161	0.063	146	0.059	180	0.043	235	0.056	194
DCP 5	.200	1.048	0.437	22	0.317	77	0.064	132	0.081	93	0.025	105	0.057	102	0.014	180	0.038	160	0.031	170
DCP 6	.250	0.915	0.455	20	0.197	75	0.060	132	0.055	104	0.045	74	0.043	98	0.029	68	0.029	104	0.011	122
DCP 7	.300	0.755	0.427	22	0.195	75	0.055	101	0.046	90	0.044	76	0.045	93	0.029	58	0.034	108	0.016	75
DCP 8	.400	0.516	0.382	18	0.085	73	0.047	108	0.013	86	0.035	66	0.013	95	0.037	63	0.016	30	0.013	54
DCP 9	.500	0.552	0.367	15	0.049	84	0.043	80	0.016	110	0.043	57	0.017	31	0.033	33	0.016	352	0.011	9
DCP10	.695	0.443	0.311	10	0.015	216	0.033	51	0.013	279	0.020	26	0.016	334	0.018	9	0.013	331	0.017	298
DCP11	.800	0.328	0.304	5	0.021	256	0.028	32	0.006	292	0.025	31	0.014	345	0.017	0	0.015	315	0.019	323
DCP12	.878	0.293	0.283	5	0.026	255	0.026	15	0.003	305	0.023	23	0.016	349	0.016	334	0.009	296	0.017	356
DCP13	.953	0.327	0.269	0	0.013	260	0.028	347	0.011	340	0.012	298	0.007	11	0.013	319	0.008	259	0.006	241

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	32.68	0.200	4.96	7.81		3158.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.247	220.7	197.1	0.25E 07	-0.00160	1.097	12.82

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.529	0.553	2	0.034	203	0.004	24	0.003	114	0.004	263	0.004	177	0.005	283	0.005	71	0.004	180
CM		-0.014	0.044	276	0.006	100	0.001	248	0.000	98	0.001	127	0.001	14	0.002	124	0.002	258	0.001	0
DCP 1	.010	2.300	3.614	345	0.222	156	0.014	359	0.017	164	0.012	249	0.034	108	0.014	68	0.004	27	0.010	37
DCP 2	.050	2.026	1.826	348	0.116	163	0.004	124	0.005	32	0.003	42	0.010	79	0.003	45	0.015	36	0.003	137
DCP 3	.100	1.067	1.347	345	0.089	166	0.023	292	0.020	110	0.024	210	0.002	352	0.014	124	0.016	193	0.004	122
DCP 4	.150	0.810	0.986	354	0.065	191	0.008	10	0.005	296	0.004	306	0.001	127	0.012	208	0.009	4	0.001	184
DCP 5	.200	0.770	0.814	356	0.056	200	0.016	331	0.023	124	0.013	215	0.006	200	0.006	270	0.003	79	0.007	169
DCP 6	.250	0.640	0.713	0	0.044	207	0.006	10	0.013	338	0.005	19	0.005	284	0.010	237	0.009	28	0.007	290
DCP 7	.300	0.554	0.611	4	0.041	213	0.004	329	0.020	121	0.011	234	0.013	185	0.006	272	0.002	78	0.010	233
DCP 8	.400	0.421	0.454	11	0.029	237	0.010	104	0.016	329	0.010	17	0.009	258	0.009	253	0.013	44	0.005	225
DCP 9	.500	0.404	0.362	20	0.033	238	0.002	79	0.015	141	0.004	234	0.010	186	0.004	288	0.004	55	0.009	170
DCP 10	.695	0.308	0.244	39	0.026	269	0.009	72	0.006	295	0.009	284	0.001	106	0.009	265	0.009	54	0.002	257
DCP 11	.800	0.149	0.190	49	0.021	229	0.005	299	0.004	335	0.001	29	0.012	143	0.025	342	0.012	114	0.008	170
DCP 12	.878	0.082	0.142	48	0.017	266	0.010	78	0.007	279	0.007	301	0.002	251	0.007	238	0.005	76	0.003	28
DCP 13	.953	0.106	0.132	38	0.013	217	0.006	342	0.010	125	0.000	126	0.005	230	0.006	335	0.001	32	0.007	162

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	32.79	0.200	9.83	7.81		3158.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.248	220.7	196.3	0.25E 07	-0.00062	1.521	17.70

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.958	0.593	5	0.077	168	0.027	336	0.013	125	0.004	245	0.005	121	0.007	232	0.006	134	0.002	221
CM		-0.029	0.021	284	0.015	258	0.014	74	0.010	245	0.006	78	0.001	247	0.002	74	0.001	253	0.001	20
DCP 1	.010	4.418	3.421	359	0.281	278	0.297	154	0.206	0	0.179	194	0.131	65	0.086	256	0.061	108	0.030	320
DCP 2	.050	3.352	1.744	5	0.221	255	0.167	108	0.122	285	0.102	122	0.043	329	0.035	190	0.027	111	0.049	360
DCP 3	.100	2.035	1.485	359	0.345	208	0.246	56	0.156	260	0.089	117	0.032	6	0.031	247	0.034	126	0.018	331
DCP 4	.150	1.520	1.162	356	0.268	188	0.163	36	0.098	231	0.051	90	0.008	272	0.026	177	0.023	57	0.034	278
DCP 5	.200	1.360	0.969	357	0.251	171	0.171	1	0.113	185	0.074	21	0.044	227	0.018	104	0.026	345	0.018	177
DCP 6	.250	1.180	0.800	0	0.197	165	0.126	350	0.097	176	0.049	20	0.032	211	0.033	119	0.023	329	0.042	175
DCP 7	.300	1.023	0.706	0	0.190	147	0.154	324	0.116	146	0.077	343	0.058	195	0.030	55	0.029	278	0.027	116
DCP 8	.400	0.774	0.489	5	0.132	138	0.098	306	0.076	126	0.039	316	0.034	175	0.026	53	0.029	223	0.013	115
DCP 9	.500	0.701	0.369	15	0.074	114	0.075	272	0.074	76	0.046	265	0.029	113	0.023	291	0.021	134	0.007	1
DCP 10	.695	0.477	0.225	33	0.043	82	0.057	238	0.047	39	0.035	217	0.023	44	0.029	235	0.014	49	0.030	141
DCP 11	.800	0.296	0.150	32	0.039	84	0.034	221	0.024	28	0.015	237	0.011	34	0.012	283	0.018	98	0.010	265
DCP 12	.878	0.293	0.111	30	0.030	70	0.031	219	0.019	19	0.011	210	0.009	359	0.015	234	0.013	50	0.010	235
DCP 13	.953	0.218	0.093	26	0.019	342	0.021	146	0.023	351	0.018	153	0.018	316	0.015	142	0.006	250	0.003	345

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	32.89	0.400	4.93	7.75		3160.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.127	434.0	724.5	0.47E 07	-0.00065	1.153	12.76

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.401	0.693	357	0.040	236	0.030	148	0.012	19	0.012	183	0.007	101	0.001	204	0.004	114	0.005	71
CM		0.011	0.020	241	0.012	17	0.011	231	0.009	97	0.006	332	0.003	196	0.002	77	0.001	311	0.000	214
DCP 1	.010	2.537	4.062	349	0.191	347	0.345	242	0.355	138	0.238	30	0.120	264	0.085	140	0.025	56	0.037	98
DCP 2	.050	1.574	2.005	353	0.114	2	0.203	216	0.160	95	0.090	329	0.069	193	0.039	100	0.012	83	0.028	39
DCP 3	.100	1.085	1.572	352	0.053	295	0.120	185	0.103	66	0.049	286	0.054	167	0.027	82	0.011	333	0.007	334
DCP 4	.150	0.815	1.228	353	0.085	235	0.086	149	0.066	17	0.052	235	0.039	115	0.012	13	0.006	39	0.001	23
DCP 5	.200	0.709	1.020	354	0.081	240	0.083	142	0.065	9	0.051	220	0.037	100	0.014	341	0.004	162	0.007	64
DCP 6	.250	0.489	0.902	357	0.073	225	0.064	123	0.048	344	0.043	194	0.027	82	0.010	298	0.005	114	0.004	131
DCP 7	.300	0.400	0.789	357	0.079	233	0.070	124	0.053	341	0.050	196	0.032	76	0.015	304	0.007	154	0.007	97
DCP 8	.400	0.248	0.587	2	0.053	232	0.045	113	0.035	325	0.033	174	0.017	61	0.006	289	0.002	198	0.010	125
DCP 9	.500	0.126	0.473	3	0.061	227	0.046	95	0.038	301	0.037	162	0.019	37	0.009	266	0.007	155	0.009	92
DCP 10	.695	0.068	0.283	12	0.039	217	0.029	70	0.025	275	0.022	143	0.010	8	0.008	247	0.008	128	0.004	26
DCP 11	.800	0.105	0.203	10	0.034	199	0.021	36	0.018	242	0.012	123	0.005	321	0.006	212	0.007	120	0.003	3
DCP 12	.878	0.125	0.160	9	0.041	188	0.026	29	0.016	238	0.009	97	0.005	277	0.003	198	0.005	133	0.001	335
DCP 13	.953	0.156	0.146	358	0.045	173	0.022	12	0.012	210	0.007	110	0.004	321	0.007	198	0.006	54	0.003	268

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	32.89	0.400	9.77	7.62		3160.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.127	433.6	724.9	0.47E 07	-0.00052	1.508	16.23

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.708	0.551	28	0.132	351	0.054	249	0.031	191	0.025	121	0.022	67	0.017	299	0.008	162	0.010	144
CM		-0.036	0.081	185	0.054	75	0.027	8	0.022	306	0.015	240	0.012	176	0.011	97	0.006	353	0.002	339
DCP 1	.010	3.185	1.214	44	1.663	69	0.609	6	0.308	341	0.247	304	0.147	247	0.142	196	0.021	179	0.089	159
DCP 2	.050	2.137	0.894	48	0.736	46	0.168	328	0.159	324	0.139	244	0.060	163	0.074	195	0.065	118	0.044	108
DCP 3	.100	1.569	0.877	41	0.496	29	0.137	310	0.140	286	0.113	206	0.065	151	0.051	130	0.022	65	0.045	130
DCP 4	.150	1.224	0.816	35	0.329	15	0.117	299	0.133	258	0.094	177	0.058	143	0.058	105	0.039	32	0.025	80
DCP 5	.200	1.060	0.739	34	0.272	3	0.107	283	0.104	240	0.078	171	0.091	126	0.053	44	0.006	8	0.031	44
DCP 6	.250	0.839	0.730	34	0.231	350	0.096	279	0.119	230	0.082	147	0.060	126	0.066	54	0.034	332	0.007	70
DCP 7	.300	0.757	0.689	31	0.214	339	0.095	260	0.089	214	0.067	152	0.079	111	0.062	17	0.010	338	0.021	342
DCP 8	.400	0.545	0.625	29	0.192	314	0.094	243	0.103	191	0.065	112	0.060	96	0.075	6	0.036	285	0.021	231
DCP 9	.500	0.421	0.566	24	0.185	294	0.095	216	0.075	164	0.059	111	0.070	58	0.060	321	0.009	290	0.031	246
DCP 10	.695	0.307	0.434	18	0.175	272	0.103	195	0.082	131	0.065	73	0.074	6	0.067	273	0.024	194	0.038	185
DCP 11	.800	0.343	0.377	7	0.158	255	0.095	184	0.093	112	0.071	34	0.064	328	0.067	249	0.055	150	0.035	85
DCP 12	.878	0.352	0.314	1	0.129	248	0.082	181	0.075	101	0.053	24	0.051	312	0.048	233	0.044	151	0.027	72
DCP 13	.953	0.323	0.246	354	0.075	234	0.053	175	0.046	77	0.026	6	0.030	284	0.026	190	0.017	108	0.007	54

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.00	0.600	4.91	7.62		3162.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.086	640.1	1423.2	0.62E 07	-0.00089	1.195	11.64

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		0.430	0.667 359	0.092 22	0.056 250	0.027 166	0.019 130	0.010 60	0.003 4	0.001 193	0.008 121
CM		-0.018	0.041 209	0.029 77	0.016 343	0.007 285	0.008 234	0.006 145	0.003 93	0.003 46	0.003 322
DCP 1	.010	1.605	2.667 346	0.566 56	0.060 288	0.087 79	0.033 183	0.027 62	0.011 141	0.009 108	0.033 107
DCP 2	.050	1.491	1.764 348	0.637 67	0.285 308	0.061 198	0.057 235	0.053 153	0.037 113	0.020 22	0.027 124
DCP 3	.100	1.095	1.517 351	0.481 50	0.276 298	0.053 206	0.094 241	0.069 123	0.052 246	0.071 110	0.020 254
DCP 4	.150	0.700	1.184 356	0.239 40	0.136 294	0.091 236	0.065 186	0.053 160	0.039 100	0.026 103	0.038 54
DCP 5	.200	0.674	1.007 357	0.194 20	0.122 273	0.079 213	0.066 151	0.041 127	0.046 70	0.013 13	0.028 43
DCP 6	.250	0.533	0.860 3	0.156 20	0.085 260	0.050 220	0.068 161	0.041 104	0.035 74	0.034 22	0.022 337
DCP 7	.300	0.408	0.780 2	0.133 4	0.089 246	0.057 195	0.064 138	0.039 81	0.037 35	0.028 324	0.016 287
DCP 8	.400	0.253	0.600 7	0.103 346	0.078 224	0.033 158	0.038 127	0.030 53	0.018 5	0.018 317	0.013 227
DCP 9	.500	0.305	0.502 6	0.087 318	0.074 203	0.038 134	0.041 85	0.032 359	0.023 297	0.021 227	0.020 144
DCP 10	.695	0.248	0.335 12	0.071 281	0.057 177	0.028 100	0.025 56	0.025 326	0.013 249	0.012 202	0.014 122
DCP 11	.800	0.152	0.280 8	0.078 262	0.052 171	0.029 109	0.031 45	0.026 309	0.010 239	0.012 221	0.018 143
DCP 12	.878	0.116	0.240 5	0.080 248	0.043 163	0.026 110	0.027 41	0.023 311	0.011 240	0.010 196	0.010 136
DCP 13	.953	0.187	0.221 354	0.071 223	0.025 143	0.022 97	0.020 1	0.011 268	0.006 240	0.009 155	0.006 94

FORCED PITCHING OSCILLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.00	0.600	9.71	7.52		3162.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.086	639.4	1422.6	0.62E 07	-0.00093	1.262	12.60

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		0.768	0.392 26	0.121 62	0.047 57	0.026 347	0.006 316	0.004 76	0.008 271	0.007 139	0.006 216
CM		-0.055	0.079 194	0.024 93	0.015 154	0.010 86	0.007 87	0.003 40	0.004 50	0.001 310	0.003 24
DCP 1	.010	2.829	0.913 0	0.578 80	0.056 97	0.060 300	0.040 310	0.029 235	0.021 219	0.013 201	0.023 163
DCP 2	.050	2.219	0.220 45	0.682 76	0.219 148	0.141 45	0.038 122	0.048 28	0.012 299	0.025 355	0.013 234
DCP 3	.100	1.667	0.420 45	0.547 74	0.193 132	0.092 51	0.091 160	0.040 217	0.021 165	0.080 213	0.010 335
DCP 4	.150	1.192	0.509 41	0.337 80	0.162 85	0.090 71	0.038 83	0.063 106	0.018 171	0.039 150	0.033 145
DCP 5	.200	1.094	0.497 40	0.285 63	0.125 63	0.084 37	0.040 31	0.050 62	0.012 62	0.035 82	0.017 116
DCP 6	.250	0.934	0.487 39	0.185 67	0.113 65	0.048 24	0.046 43	0.037 74	0.031 38	0.034 92	0.020 49
DCP 7	.300	0.798	0.504 36	0.182 53	0.116 51	0.076 12	0.050 13	0.048 32	0.042 1	0.035 23	0.022 355
DCP 8	.400	0.560	0.452 35	0.089 37	0.074 39	0.028 323	0.035 17	0.014 19	0.028 346	0.016 54	0.023 333
DCP 9	.500	0.594	0.444 25	0.043 352	0.069 22	0.048 295	0.025 303	0.012 314	0.037 278	0.014 184	0.013 244
DCP 10	.695	0.473	0.357 20	0.040 285	0.055 354	0.050 264	0.021 264	0.018 234	0.021 235	0.013 193	0.020 201
DCP 11	.800	0.356	0.345 13	0.063 284	0.040 320	0.033 272	0.036 246	0.016 188	0.023 199	0.004 94	0.020 147
DCP 12	.878	0.316	0.318 9	0.054 282	0.040 314	0.029 283	0.039 249	0.016 194	0.018 201	0.005 111	0.013 197
DCP 13	.953	0.351	0.280 357	0.025 274	0.045 287	0.015 238	0.020 228	0.018 230	0.018 141	0.003 115	0.016 114

FORCED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.56	0.200	9.99	2.42		1360.1	5

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.123	224.6	203.6	0.26E 07	-0.00177	1.356	11.95

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.973	0.197	353	0.013	111	0.006	59	0.006	233	0.005	214	0.005	297	0.003	280	0.006	54	0.002	83
CM		-0.025	0.008	288	0.002	292	0.001	211	0.002	92	0.002	76	0.001	130	0.000	142	0.001	233	0.001	199
CCP 1	.010	3.415	1.163	345	0.052	117	0.020	108	0.033	174	0.028	114	0.014	258	0.027	304	0.017	93	0.014	159
CCP 2	.050	2.867	0.712	347	0.043	100	0.029	72	0.011	161	0.024	145	0.008	13	0.002	132	0.006	87	0.018	131
CCP 3	.100	2.370	0.478	349	0.009	165	0.008	104	0.024	193	0.017	243	0.018	192	0.015	219	0.015	112	0.006	50
CCP 4	.150	1.937	0.381	349	0.021	94	0.005	178	0.003	319	0.010	149	0.009	301	0.005	315	0.010	12	0.007	189
CCP 5	.200	1.608	0.292	352	0.008	110	0.006	6	0.001	262	0.009	268	0.005	315	0.006	243	0.004	90	0.002	322
CCP 6	.250	1.252	0.238	353	0.017	105	0.008	351	0.002	12	0.009	148	0.004	29	0.004	7	0.008	18	0.007	204
CCP 7	.300	1.152	0.212	354	0.005	144	0.002	117	0.005	139	0.007	284	0.006	290	0.004	274	0.010	91	0.003	76
CCP 8	.500	0.716	0.123	0	0.014	110	0.006	60	0.009	243	0.007	134	0.007	324	0.006	312	0.008	30	0.004	70
CCP 9	.600	0.591	0.092	7	0.015	126	0.007	6	0.002	202	0.009	268	0.008	265	0.007	175	0.003	263	0.003	291
CCP10	.695	0.367	0.066	12	0.010	86	0.008	38	0.000	260	0.007	100	0.004	29	0.004	334	0.010	16	0.003	120
CCP11	.800	0.318	0.043	29	0.011	102	0.018	106	0.038	282	0.021	281	0.011	280	0.007	264	0.000	113	0.009	17
CCP12	.878	0.278	0.030	38	0.008	158	0.005	309	0.004	234	0.021	231	0.011	313	0.009	242	0.004	116	0.007	39
CCP13	.953	0.070	0.042	21	0.015	98	0.015	358	0.010	194	0.008	108	0.002	29	0.016	50	0.017	29	0.001	340

FORCED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.56	0.200	12.45	2.41		1360.2	5

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.123	224.6	202.9	0.26E 07	-0.00147	1.352	14.66

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.153	0.193	355	0.010	200	0.002	224	0.002	299	0.003	155	0.004	95	0.001	183	0.002	160	0.005	136
CM		-0.023	0.006	283	0.002	42	0.001	159	0.001	5	0.001	347	0.001	276	0.000	123	0.001	351	0.001	335
CCP 1	.010	4.681	1.171	347	0.053	178	0.013	188	0.037	302	0.022	156	0.007	78	0.005	206	0.001	111	0.016	182
CCP 2	.050	3.603	0.693	348	0.021	164	0.011	199	0.018	334	0.006	72	0.018	134	0.009	187	0.009	328	0.004	93
CCP 3	.100	2.871	0.492	351	0.027	207	0.010	257	0.010	18	0.008	305	0.017	35	0.002	268	0.013	117	0.016	118
CCP 4	.150	2.224	0.343	350	0.007	127	0.003	172	0.007	312	0.009	134	0.003	126	0.004	50	0.001	17	0.010	201
CCP 5	.200	1.805	0.265	352	0.012	207	0.008	14	0.008	114	0.005	306	0.003	70	0.008	125	0.005	58	0.007	68
CCP 6	.250	1.431	0.227	354	0.006	109	0.006	167	0.004	247	0.011	127	0.005	143	0.003	197	0.005	328	0.011	155
CCP 7	.300	1.279	0.198	357	0.012	216	0.008	190	0.008	3	0.003	316	0.005	70	0.002	49	0.005	145	0.010	110
CCP 8	.500	0.796	0.120	0	0.004	43	0.006	151	0.007	257	0.011	136	0.003	189	0.003	226	0.005	240	0.009	187
CCP 9	.600	0.740	0.090	12	0.019	220	0.004	273	0.006	95	0.006	298	0.009	98	0.005	83	0.004	147	0.006	101
CCP10	.695	0.406	0.066	17	0.005	47	0.004	85	0.003	312	0.010	153	0.002	213	0.003	174	0.004	279	0.004	195
CCP11	.800	0.329	0.045	25	0.019	233	0.012	312	0.015	198	0.009	252	0.002	59	0.010	275	0.008	233	0.008	112
CCP12	.878	0.362	0.041	18	0.024	214	0.014	333	0.007	73	0.006	114	0.007	68	0.002	54	0.013	75	0.011	81
CCP13	.953	0.120	0.050	346	0.011	116	0.008	133	0.008	236	0.010	154	0.007	135	0.003	39	0.012	162	0.010	279

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.61	0.200	14.67	2.40		1360.3	5

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.124	224.6	201.7	0.26E 07	-0.00189	1.514	16.90

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.327	0.176	1	0.005	287	0.003	194	0.004	218	0.005	149	0.006	11	0.004	81	0.003	300	0.003	227
CM		-0.020	0.009	289	0.002	100	0.002	347	0.001	258	0.001	323	0.002	182	0.001	232	0.001	145	0.001	141
DCP 1	.010	5.789	1.117	351	0.065	97	0.089	318	0.070	212	0.020	128	0.009	291	0.035	158	0.008	276	0.012	202
DCP 2	.050	4.265	0.679	351	0.011	157	0.020	152	0.032	237	0.011	35	0.017	46	0.018	99	0.017	39	0.018	194
DCP 3	.100	3.348	0.447	355	0.027	306	0.005	266	0.004	325	0.020	183	0.002	335	0.006	322	0.025	263	0.013	237
DCP 4	.150	2.493	0.313	354	0.009	196	0.011	187	0.007	219	0.001	353	0.005	95	0.003	120	0.005	98	0.009	243
DCP 5	.200	2.037	0.234	2	0.008	302	0.003	126	0.003	222	0.007	188	0.005	252	0.008	331	0.006	238	0.005	309
DCP 6	.250	1.633	0.213	359	0.011	227	0.004	39	0.009	195	0.008	115	0.008	14	0.007	147	0.005	111	0.007	219
DCP 7	.300	1.439	0.180	5	0.016	315	0.005	224	0.004	354	0.010	177	0.003	32	0.006	75	0.009	253	0.004	263
DCP 8	.500	0.880	0.100	13	0.007	197	0.006	148	0.009	233	0.003	98	0.007	24	0.002	125	0.003	54	0.006	147
DCP 9	.600	0.858	0.077	34	0.022	328	0.007	51	0.004	145	0.008	148	0.007	331	0.010	36	0.004	224	0.004	63
DCP10	.695	0.436	0.062	24	0.006	257	0.007	106	0.005	237	0.002	156	0.005	47	0.007	137	0.006	77	0.006	176
DCP11	.800	0.369	0.049	39	0.007	318	0.011	156	0.029	26	0.007	134	0.012	36	0.015	45	0.009	317	0.006	84
DCP12	.878	0.431	0.036	37	0.018	266	0.012	201	0.001	149	0.003	199	0.017	335	0.008	11	0.008	12	0.010	260
DCP13	.953	0.146	0.060	354	0.010	137	0.013	259	0.028	166	0.010	131	0.010	357	0.008	173	0.011	237	0.018	314

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.95	0.400	9.83	2.43		1058.1	5

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.064	444.1	752.9	0.48E 07	-0.00134	1.290	12.17

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.040	0.249	352	0.009	160	0.002	192	0.003	225	0.000	16	0.000	19	0.003	14	0.002	286	0.001	171
CM		-0.005	0.009	316	0.001	243	0.001	42	0.001	125	0.000	82	0.000	342	0.001	205	0.001	145	0.000	14
DCP 1	.010	4.507	1.829	348	0.200	226	0.069	132	0.012	205	0.031	119	0.015	349	0.017	236	0.009	172	0.009	100
DCP 2	.050	3.584	0.964	348	0.039	127	0.011	308	0.012	183	0.008	133	0.005	332	0.004	231	0.005	181	0.003	65
DCP 3	.100	2.638	0.602	351	0.019	189	0.014	287	0.019	231	0.016	320	0.005	1	0.015	358	0.005	357	0.005	159
DCP 4	.150	2.095	0.408	350	0.017	119	0.001	31	0.008	196	0.002	24	0.001	89	0.003	339	0.002	281	0.002	338
DCP 5	.200	1.715	0.331	351	0.015	106	0.005	209	0.001	142	0.002	279	0.003	144	0.004	40	0.003	218	0.005	219
DCP 6	.250	1.259	0.276	351	0.010	134	0.001	196	0.004	227	0.002	267	0.002	162	0.001	252	0.002	242	0.001	255
DCP 7	.300	1.074	0.247	353	0.012	106	0.003	205	0.002	220	0.001	206	0.002	217	0.004	61	0.003	178	0.003	179
DCP 8	.500	0.661	0.143	357	0.006	136	0.002	61	0.005	204	0.001	341	0.001	164	0.001	215	0.002	282	0.002	127
DCP 9	.600	0.536	0.104	0	0.008	110	0.002	237	0.001	23	0.003	335	0.004	23	0.007	47	0.004	285	0.001	275
DCP10	.695	0.481	0.079	4	0.004	146	0.001	94	0.003	170	0.004	209	0.003	155	0.001	14	0.002	334	0.001	170
DCP11	.800	0.271	0.048	11	0.007	106	0.008	199	0.011	311	0.004	346	0.002	301	0.013	10	0.008	307	0.003	263
DCP12	.878	0.202	0.041	13	0.002	163	0.006	230	0.003	291	0.001	174	0.002	96	0.010	27	0.003	11	0.003	187
DCP13	.953	0.105	0.042	5	0.004	282	0.004	210	0.003	176	0.005	129	0.004	199	0.002	331	0.003	41	0.004	138

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	17.32	0.400	12.36	2.41		1058.2	4

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.065	444.1	751.1	0.48E 07	0.00001	1.429	13.93

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.223	0.165	17	0.043	2	0.012	222	0.004	193	0.001	185	0.008	200	0.005	169	0.003	164	0.007	103
CM		0.000	0.001	5	0.006	19	0.003	262	0.001	191	0.001	84	0.001	250	0.003	30	0.002	355	0.001	213
DCP 1	.010	5.967	1.382	0	0.200	65	0.083	24	0.012	114	0.030	53	0.013	141	0.010	30	0.009	142	0.018	118
DCP 2	.050	4.441	0.838	16	0.369	339	0.230	244	0.100	192	0.050	201	0.090	182	0.091	119	0.053	71	0.039	75
DCP 3	.100	3.070	0.292	14	0.109	24	0.019	169	0.006	356	0.014	73	0.019	294	0.021	195	0.005	351	0.016	143
DCP 4	.150	2.376	0.218	18	0.054	29	0.006	214	0.010	249	0.011	98	0.011	271	0.009	123	0.008	277	0.010	154
DCP 5	.200	1.915	0.165	35	0.098	0	0.034	203	0.001	42	0.012	84	0.022	271	0.023	[illegible]	0.020	343	0.015	174
DCP 6	.250	1.452	0.149	26	0.050	22	0.005	219	0.009	248	0.008	104	0.014	263	0.008	109	.009	281	0.012	149
DCP 7	.300	1.211	0.138	37	0.075	355	0.028	204	0.005	107	0.004	34	0.013	218	0.007	147	0.008	259	0.008	104
DCP 8	.500	0.736	0.082	40	0.027	20	0.001	129	0.004	23	0.010	290	0.015	179	0.015	14	0.015	224	0.013	92
DCP 9	.600	0.590	0.064	52	0.022	23	0.003	240	0.006	219	0.002	349	0.006	106	0.016	255	0.003	138	0.005	5
DCP10	.695	0.538	0.056	16	0.007	198	0.014	73	0.004	340	0.004	274	0.005	162	0.013	318	0.018	185	0.007	74
DCP11	.800	0.320	0.055	13	0.005	233	0.006	25	0.004	154	0.008	184	0.009	62	0.024	274	0.015	104	0.003	65
DCP12	.878	0.276	0.073	355	0.026	232	0.012	158	0.010	11	0.006	235	0.006	358	0.019	209	0.008	81	0.007	237
DCP13	.953	0.160	0.120	335	0.047	208	0.013	85	0.003	184	0.002	236	0.003	108	0.009	325	0.005	261	0.005	110

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	17.29	0.400	14.59	2.38		1058.3	6

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.065	444.1	750.6	0.48E 07	0.00734	1.449	14.77

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.073	0.298	87	0.084	75	0.026	347	0.012	322	0.014	218	0.007	93	0.013	125	0.001	3	0.003	307
CM		-0.066	0.052	132	0.029	136	0.014	66	0.012	45	0.007	8	0.005	240	0.004	289	0.001	158	0.001	252
DCP 1	.010	5.125	1.478	90	0.557	95	0.083	9	0.061	321	0.077	238	0.044	138	0.045	98	0.052	52	0.041	349
DCP 2	.050	3.318	1.391	109	0.623	101	0.301	71	0.215	76	0.072	80	0.047	127	0.022	145	0.023	115	0.023	294
DCP 3	.100	2.114	1.168	109	0.328	104	0.177	37	0.095	24	0.088	329	0.049	296	0.030	318	0.010	246	0.021	297
DCP 4	.150	1.636	0.826	104	0.231	116	0.110	23	0.086	29	0.023	276	0.030	279	0.016	273	0.006	153	0.007	269
DCP 5	.200	1.411	0.633	94	0.180	104	0.088	10	0.063	1	0.025	271	0.037	251	0.011	247	0.013	208	0.012	193
DCP 6	.250	1.095	0.497	90	0.138	90	0.070	337	0.061	349	0.018	235	0.031	206	0.022	218	0.003	51	0.013	153
DCP 7	.300	1.002	0.387	81	0.090	88	0.047	330	0.046	321	0.010	249	0.011	168	0.014	155	0.014	274	0.019	192
DCP 8	.500	0.756	0.168	49	0.050	15	0.057	257	0.041	267	0.025	205	0.026	93	0.029	123	0.002	58	0.007	12
DCP 9	.600	0.696	0.116	26	0.083	357	0.065	264	0.040	238	0.021	209	0.027	103	0.035	125	0.003	256	0.024	331
DCP10	.695	0.700	0.104	345	0.074	319	0.036	263	0.044	222	0.027	211	0.025	41	0.019	119	0.007	51	0.003	64
DCP11	.800	0.543	0.129	328	0.102	333	0.026	255	0.050	206	0.034	194	0.019	16	0.018	98	0.005	267	0.010	174
DCP12	.878	0.493	0.140	315	0.089	331	0.023	228	0.035	199	0.027	152	0.014	31	0.022	89	0.012	303	0.013	72
DCP13	.953	0.313	0.114	315	0.078	323	0.028	223	0.009	212	0.026	184	0.018	84	0.012	322	0.016	55	0.008	228

FORCED PITCHING OSCILLATION — VERTOL 23013-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	17.14	0.600	9.92	2.34		1055.1	6

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.044	653.3	1479.8	0.64E 07	-0.00082	1.000	12.33

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.902	0.097	19	0.014	94	0.007	140	0.001	83	0.001	232	0.003	234	0.004	217	0.007	105	0.003	346
CM		-0.032	0.033	186	0.001	263	0.002	191	0.002	229	0.000	327	0.002	317	0.001	239	0.001	216	0.001	90
DCP 1	.010	2.364	0.522	359	0.025	52	0.015	153	0.006	275	0.010	145	0.006	304	0.008	168	0.006	94	0.003	132
DCP 2	.050	2.693	0.307	358	0.012	61	0.017	158	0.004	250	0.007	160	0.004	268	0.008	171	0.007	96	0.004	55
DCP 3	.100	2.434	0.238	161	0.173	77	0.049	134	0.033	59	0.011	27	0.017	274	0.019	214	0.020	147	0.019	109
DCP 4	.200	1.567	0.155	146	0.102	243	0.007	128	0.041	258	0.040	283	0.015	310	0.022	287	0.008	103	0.025	6
DCP 5	.250	1.190	0.090	124	0.071	231	0.032	214	0.021	197	0.019	4	0.004	323	0.006	200	0.023	142	0.018	70
DCP 6	.300	0.935	0.109	23	0.034	92	0.040	159	0.016	241	0.009	165	0.016	241	0.019	241	0.019	109	0.020	314
DCP 7	.500	0.562	0.141	13	0.028	88	0.007	292	0.020	128	0.012	105	0.007	298	0.020	177	0.010	82	0.008	256
DCP 8	.600	0.526	0.173	7	0.010	287	0.011	316	0.004	70	0.003	195	0.008	34	0.013	349	0.011	275	0.011	197
DCP 9	.695	0.431	0.138	13	0.011	347	0.011	320	0.005	64	0.011	181	0.011	89	0.005	169	0.013	81	0.004	23
DCP 10	.800	0.327	0.139	7	0.004	100	0.020	35	0.018	333	0.007	216	0.018	156	0.022	65	0.015	336	0.007	222
DCP 11	.878	0.392	0.137	2	0.003	101	0.013	104	0.028	37	0.012	325	0.009	187	0.014	7	0.007	196	0.014	32
DCP 12	.953	0.102	0.113	358	0.030	91	0.019	41	0.007	117	0.010	59	0.017	137	0.003	163	0.011	77	0.005	242

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	17.24	0.600	12.37	2.37		1356.2	4

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.044	653.2	1477.4	0.64E 07	-0.00108	1.023	14.65

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.956	0.058	35	0.011	120	0.016	85	0.006	293	0.008	213	0.009	153	0.003	22	0.002	202	0.005	211
CM		-0.063	0.023	192	0.005	270	0.001	332	0.004	254	0.002	150	0.001	339	0.002	126	0.003	257	0.001	295
DCP 1	.010	2.822	0.428	357	0.031	92	0.012	127	0.011	327	0.007	124	0.003	296	0.005	11	0.008	120	0.001	295
DCP 2	.050	2.924	0.211	357	0.068	88	0.062	7	0.055	280	0.043	184	0.032	132	0.029	9	0.022	252	0.015	150
DCP 3	.100	2.157	0.450	151	0.098	243	0.124	87	0.061	258	0.039	203	0.040	130	0.037	57	0.026	304	0.064	241
DCP 4	.150	1.614	0.187	165	0.057	247	0.072	129	0.026	206	0.036	181	0.039	176	0.005	358	0.022	294	0.007	238
DCP 5	.200	1.421	0.036	210	0.035	291	0.030	320	0.062	296	0.013	151	0.020	158	0.005	215	0.051	272	0.026	227
DCP 6	.250	1.137	0.061	60	0.007	201	0.024	62	0.031	286	0.028	116	0.019	86	0.031	78	0.038	184	0.014	132
DCP 7	.300	0.987	0.032	37	0.013	130	0.015	24	0.018	271	0.017	224	0.011	243	0.019	176	0.012	280	0.012	336
DCP 8	.500	0.696	0.110	26	0.043	96	0.022	129	0.030	101	0.007	215	0.001	96	0.024	127	0.031	94	0.008	76
DCP 9	.600	0.648	0.103	15	0.018	72	0.009	77	0.016	88	0.030	308	0.014	278	0.021	356	0.024	326	0.014	154
DCP 10	.695	0.570	0.133	16	0.017	149	0.033	124	0.015	359	0.004	287	0.012	228	0.033	284	0.020	208	0.008	57
DCP 11	.800	0.438	0.077	13	0.014	78	0.019	332	0.006	278	0.006	339	0.018	155	0.012	278	0.016	68	0.003	299
DCP 12	.878	0.509	0.075	9	0.014	105	0.005	118	0.020	46	0.012	273	0.031	125	0.020	343	0.033	90	0.022	232
DCP 13	.953	0.181	0.054	12	0.029	76	0.006	203	0.013	106	0.016	66	0.009	57	0.009	1	0.007	257	0.007	40

FORCED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	17.34	0.600	14.59	2.39		1356.3	6

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.044	653.5	1474.1	0.64E 07	-0.00055	1.078	15.35

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.986	0.044	64	0.029	76	0.004	232	0.014	20	0.006	206	0.008	4	0.010	296	0.003	199	0.002	236
CM		-0.082	0.023	187	0.001	5	0.003	298	0.004	132	0.002	40	0.002	15	0.001	130	0.002	2	0.000	350
DCP 1	.010	3.140	0.304	358	0.036	79	0.010	222	0.017	354	0.012	219	0.004	358	0.010	288	0.003	9	0.007	69
DCP 2	.050	2.828	0.327	161	0.275	65	0.061	239	0.096	94	0.057	30	0.033	348	0.021	342	0.036	330	0.021	190
DCP 3	.100	1.912	0.303	147	0.090	[illegible]	0.051	280	0.043	79	0.034	138	0.048	317	0.017	247	0.032	56	0.019	244
DCP 4	.150	1.454	0.046	169	0.032	[illegible]	0.048	336	0.019	348	0.052	263	0.036	359	0.002	10	0.020	177	0.029	279
DCP 5	.200	1.458	0.112	127	0.047	[illegible]	0.018	240	0.016	117	0.037	149	0.048	48	0.042	289	0.018	51	0.012	163
DCP 6	.250	1.156	0.050	104	0.024	66	0.022	306	0.016	357	0.003	216	0.006	310	0.025	289	0.009	151	0.006	25
DCP 7	.300	1.040	0.052	66	0.020	129	0.013	111	0.020	6	0.010	202	0.038	26	0.021	277	0.008	274	0.008	6
DCP 8	.500	0.744	0.072	31	0.020	156	0.00[illegible]	77	0.041	4	0.007	241	0.013	161	0.003	186	0.015	214	0.007	9
DCP 9	.600	0.697	0.071	31	0.022	95	0.019	161	0.012	349	0.004	87	0.002	147	0.008	327	0.001	39	0.008	129
DCP 10	.695	0.638	0.078	1	0.020	47	0.024	286	0.005	97	0.002	336	0.020	209	0.017	23	0.012	324	0.013	137
DCP 11	.800	0.530	0.094	20	0.022	94	0.020	127	0.018	320	0.019	227	0.007	290	0.013	330	0.019	175	0.005	195
DCP 12	.878	0.603	0.091	7	0.015	61	0.024	116	0.017	285	0.013	247	0.002	337	0.019	255	0.012	196	0.011	279
DCP 13	.953	0.214	0.058	5	0.011	299	0.016	108	0.012	237	0.012	148	0.005	309	0.004	242	0.016	114	0.013	237

FORCED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.33	0.200	9.93	2.52		1063.1	5

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.248	224.6	205.6	0.26E 07	-0.00172	1.230	12.57

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.041	0.173	6	0.006	213	0.008	139	0.002	98	0.002	188	0.004	42	0.003	239	0.003	325	0.011	5
CM		-0.051	0.016	276	0.001	92	0.001	265	0.001	255	0.000	246	0.001	210	0.001	49	0.002	127	0.005	189
DCP 1	.010	3.441	1.031	346	0.028	210	0.031	174	0.015	58	0.002	48	0.015	118	0.010	289	0.014	161	0.013	79
DCP 2	.050	2.943	0.600	346	0.020	153	0.022	159	0.012	158	0.011	39	0.004	338	0.010	8	0.012	229	0.009	257
DCP 3	.100	2.477	0.429	355	0.033	182	0.026	150	0.009	259	0.016	191	0.021	91	0.006	155	0.005	85	0.005	225
DCP 4	.150	1.772	0.337	353	0.002	289	0.006	139	0.005	182	0.009	221	0.003	5	0.003	293	0.011	72	0.004	66
DCP 5	.200	1.636	0.251	3	0.011	183	0.017	168	0.013	53	0.013	207	0.008	37	0.007	225	0.008	321	0.011	252
DCP 6	.250	1.280	0.224	359	0.003	336	0.008	158	0.004	193	0.010	216	0.008	44	0.003	249	0.003	16	0.003	40
DCP 7	.300	1.252	0.188	10	0.008	157	0.002	188	0.009	59	0.004	182	0.009	13	0.006	152	0.005	7	0.010	293
DCP 8	.500	0.729	0.113	28	0.010	289	0.005	154	0.005	172	0.005	7	0.004	36	0.004	283	0.004	66	0.019	52
DCP 9	.600	0.624	0.099	37	0.008	260	0.014	88	0.006	277	0.007	186	0.008	222	0.016	236	0.012	310	0.016	316
DCP 10	.695	0.609	0.075	44	0.010	21	0.010	133	0.007	182	0.006	61	0.009	340	0.009	348	0.012	312	0.004	31
DCP 11	.800	0.444	0.071	53	0.018	232	0.007	174	0.009	357	0.003	338	0.007	248	0.004	103	0.008	332	0.082	19
DCP 12	.878	0.382	0.058	56	0.012	142	0.013	60	0.012	66	0.001	163	0.012	64	0.003	207	0.004	210	0.013	321
DCP 13	.953	0.118	0.035	33	0.013	271	0.004	88	0.009	108	0.003	194	0.018	66	0.014	208	0.012	274	0.016	217

FORCED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.33	0.200	12.41	2.51		1363.2	5

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.248	224.6	205.1	0.26E 07	-0.00166	1.449	14.75

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.265	0.174	5	0.007	227	0.001	61	0.003	184	0.003	80	0.003	132	0.004	85	0.005	227	0.010	213
CM		-0.052	0.016	281	0.002	113	0.001	15	0.001	7	0.001	196	0.001	342	0.001	289	0.002	16	0.003	44
DCP 1	.010	4.721	1.082	347	0.041	197	0.030	90	0.030	100	0.030	136	0.016	58	0.017	42	0.020	243	0.021	266
DCP 2	.050	3.685	0.616	350	0.029	204	0.022	62	0.002	183	0.016	110	0.002	89	0.011	193	0.015	20	0.012	179
DCP 3	.100	3.022	0.469	351	0.014	212	0.016	276	0.012	214	0.006	163	0.002	356	0.007	356	0.006	285	0.018	154
DCP 4	.150	2.157	0.305	357	0.014	140	0.008	75	0.001	184	0.004	16	0.008	151	0.007	106	0.004	278	0.004	111
DCP 5	.200	1.959	0.258	359	0.008	254	0.014	313	0.006	210	0.006	2	0.004	147	0.011	80	0.012	258	0.009	148
DCP 6	.250	1.528	0.203	4	0.007	151	0.002	322	0.004	294	0.002	131	0.006	153	0.007	2	0.005	286	0.010	176
DCP 7	.300	1.472	0.191	6	0.010	211	0.012	332	0.003	224	0.007	30	0.001	71	0.011	79	0.003	253	0.002	182
DCP 8	.500	0.851	0.118	33	0.006	233	0.007	88	0.006	187	0.008	89	0.004	89	0.002	25	0.007	287	0.021	240
DCP 9	.600	0.844	0.083	33	0.007	352	0.014	223	0.003	202	0.004	203	0.011	165	0.011	116	0.012	142	0.008	36
DCP 10	.695	0.667	0.067	62	0.014	252	0.021	97	0.006	55	0.009	98	0.006	352	0.005	325	0.004	151	0.008	111
DCP 11	.800	0.481	0.063	45	0.010	281	0.011	262	0.006	211	0.010	297	0.010	182	0.011	178	0.019	202	0.073	229
DCP 12	.878	0.464	0.066	35	0.006	271	0.007	248	0.007	188	0.002	162	0.004	40	0.006	98	0.014	225	0.007	124
DCP 13	.953	0.126	0.038	52	0.002	320	0.011	187	0.004	141	0.013	29	0.002	184	0.009	47	0.004	168	0.013	51

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALY D
	33.33	0.200	14.63	2.51		1063.3	5

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.248	224.6	204.9	0.26E 07	-0.00150	1.608	17.16

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.440	0.157	6	0.005	200	0.003	346	0.004	196	0.005	349	0.008	205	0.004	227	0.002	330	0.013	132
CM		-0.046	0.014	290	0.001	77	0.000	279	0.001	316	0.001	194	0.002	21	0.000	120	0.001	228	0.005	278
DCP 1	.010	5.875	1.105	347	0.068	99	0.066	319	0.054	237	0.029	74	0.041	196	0.017	254	0.018	318	0.024	193
DCP 2	.050	4.318	0.610	348	0.031	182	0.007	193	0.015	315	0.014	356	0.008	225	0.017	221	0.023	208	0.009	95
DCP 3	.100	3.498	0.409	351	0.007	302	0.003	310	0.010	219	0.016	282	0.018	263	0.020	238	0.021	304	0.007	70
DCP 4	.150	2.465	0.263	2	0.012	162	0.003	183	0.003	49	0.005	323	0.003	202	0.008	158	0.005	58	0.008	180
DCP 5	.200	2.195	0.221	357	0.005	211	0.012	356	0.009	150	0.007	277	0.005	140	0.008	184	0.010	246	0.009	89
DCP 6	.250	1.754	0.181	10	0.012	186	0.002	161	0.001	18	0.002	358	0.005	198	0.007	145	0.006	95	0.006	112
DCP 7	.300	1.653	0.170	8	0.011	247	0.007	15	0.011	161	0.011	280	0.003	182	0.001	205	0.005	302	0.006	30
DCP 8	.500	0.948	0.103	37	0.008	195	0.004	119	0.002	359	0.010	30	0.010	189	0.003	204	0.006	329	0.023	121
DCP 9	.600	0.952	0.086	55	0.010	243	0.015	333	0.013	172	0.008	345	0.014	207	0.011	276	0.002	242	0.011	343
DCP 10	.695	0.679	0.078	62	0.011	309	0.002	177	0.003	310	0.007	61	0.005	240	0.010	310	0.009	35	0.010	154
DCP 11	.800	0.483	0.050	36	0.002	322	0.009	47	0.002	199	0.006	302	0.007	173	0.006	87	0.007	96	0.087	97
DCP 12	.878	0.526	0.042	35	0.007	212	0.003	309	0.007	131	0.005	241	0.012	201	0.006	113	0.004	132	0.009	54
DCP 13	.953	0.148	0.015	345	0.010	124	0.012	181	0.002	282	0.021	33	0.005	251	0.009	218	0.012	16	0.004	245

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.22	0.400	9.89	2.52		1062.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.125	443.9	754.9	0.48E 07	-0.00111	1.293	12.48

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.064	0.225	349	0.006	185	0.001	180	0.000	190	0.001	198	0.001	263	0.001	217	0.001	205	0.002	255
CM		-0.009	0.012	299	0.001	201	0.000	98	0.000	197	0.000	65	0.000	321	0.000	87	0.000	58	0.001	73
DCP 1	.010	4.390	1.724	342	0.193	214	0.070	116	0.006	15	0.016	84	0.017	303	0.013	195	0.011	116	0.005	266
DCP 2	.050	3.424	0.872	343	0.027	111	0.010	292	0.007	180	0.005	158	0.006	244	0.004	203	0.004	117	0.004	126
DCP 3	.100	2.831	0.546	343	0.029	205	0.018	293	0.011	213	0.019	252	0.011	312	0.003	204	0.006	298	0.007	337
DCP 4	.150	2.019	0.377	348	0.009	103	0.003	177	0.003	149	0.002	126	0.002	144	0.001	265	0.000	96	0.002	207
DCP 5	.200	1.808	0.303	347	0.007	109	0.002	328	0.001	231	0.003	134	0.001	215	0.001	243	0.001	175	0.002	136
DCP 6	.250	1.357	0.248	351	0.005	107	0.001	146	0.001	96	0.001	122	0.001	134	0.000	106	0.000	158	0.001	213
DCP 7	.300	1.163	0.217	351	0.004	131	0.000	273	0.001	12	0.001	128	0.001	138	0.001	222	0.001	166	0.002	97
DCP 8	.500	0.686	0.127	2	0.001	46	0.003	198	0.001	316	0.000	183	0.001	149	0.001	183	0.001	249	0.005	273
DCP 9	.600	0.574	0.094	5	0.004	69	0.002	357	0.002	50	0.002	222	0.001	6	0.001	337	0.003	149	0.001	238
DCP 10	.695	0.458	0.069	14	0.002	255	0.004	203	0.002	29	0.002	136	0.002	301	0.001	328	0.003	359	0.009	62
DCP 11	.800	0.276	0.051	20	0.002	190	0.000	123	0.001	276	0.005	262	0.002	118	0.003	242	0.003	214	0.020	252
DCP 12	.878	0.244	0.041	21	0.000	126	0.003	6	0.003	117	0.001	205	0.001	346	0.001	338	0.003	241	0.030	216
DCP 13	.953	0.082	0.036	13	0.003	223	0.001	247	0.002	309	0.003	58	0.004	188	0.003	149	0.003	262	0.001	82

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.22	0.400	12.37	2.50		1062.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.125	443.9	753.3	0.48E 07	-0.00044	1.484	14.60

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.229	0.219	15	0.026	283	0.005	258	0.009	136	0.004	249	0.008	113	0.003	24	0.002	53	0.004	290
CM		-0.007	0.004	277	0.007	8	0.004	228	0.002	135	0.002	17	0.002	174	0.001	19	0.001	112	0.002	40
DCP 1	.010	5.725	1.554	358	0.132	101	0.140	347	0.044	120	0.051	354	0.017	157	0.017	339	0.016	157	0.007	347
DCP 2	.050	4.185	0.911	11	0.259	311	0.200	233	0.106	178	0.102	162	0.120	103	0.066	31	0.028	45	0.048	355
DCP 3	.100	3.205	0.444	17	0.055	320	0.036	193	0.061	103	0.062	357	0.043	244	0.022	150	0.010	75	0.005	353
DCP 4	.150	2.256	0.287	20	0.033	3	0.021	264	0.021	135	0.008	18	0.004	275	0.004	205	0.003	104	0.001	6
DCP 5	.200	1.976	0.245	31	0.062	302	0.019	164	0.018	89	0.027	327	0.025	184	0.015	41	0.006	246	0.004	24
DCP 6	.250	1.519	0.211	30	0.038	341	0.020	243	0.020	121	0.008	332	0.005	209	0.001	223	0.003	122	0.003	275
DCP 7	.300	1.289	0.228	33	0.060	279	0.022	110	0.005	67	0.017	293	0.019	148	0.014	350	0.006	168	0.004	329
DCP 8	.500	0.747	0.151	42	0.027	253	0.013	9	0.010	133	0.017	257	0.017	92	0.010	271	0.006	73	0.009	252
DCP 9	.600	0.636	0.115	42	0.026	272	0.008	92	0.010	336	0.012	212	0.008	43	0.004	196	0.004	342	0.005	195
DCP10	.695	0.504	0.090	27	0.025	187	0.012	3	0.006	354	0.018	199	0.016	17	0.009	165	0.006	342	0.004	175
DCP11	.800	0.328	0.078	15	0.034	198	0.019	38	0.008	270	0.006	138	0.006	313	0.004	90	0.009	275	0.019	245
DCP12	.878	0.319	0.080	356	0.035	195	0.017	28	0.007	234	0.007	101	0.005	319	0.003	34	0.004	235	0.001	48
DCP13	.953	0.161	0.085	314	0.023	111	0.015	222	0.005	310	0.011	133	0.005	326	0.003	125	0.002	38	0.001	112

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.24	0.400	14.59	2.46		1062.3	12

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.125	443.9	752.2	0.48E 07	0.00279	1.515	16.18

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.123	0.355	73	0.082	355	0.019	266	0.010	178	0.007	92	0.008	54	0.003	28	0.002	258	0.002	152
CM		-0.057	0.050	146	0.033	90	0.015	13	0.009	320	0.004	281	0.004	212	0.001	145	0.002	95	0.000	137
DCP 1	.010	5.061	1.424	80	0.333	71	0.120	128	0.118	83	0.129	12	0.107	304	0.078	246	0.045	192	0.019	124
DCP 2	.050	3.348	1.304	104	0.602	65	0.290	33	0.154	18	0.098	27	0.059	48	0.069	54	0.040	35	0.017	93
DCP 3	.100	2.450	1.195	103	0.358	41	0.153	340	0.115	300	0.071	265	0.037	226	0.022	235	0.031	227	0.027	197
DCP 4	.150	1.738	0.839	96	0.205	29	0.094	333	0.077	276	0.032	212	0.024	183	0.012	119	0.007	155	0.001	212
DCP 5	.200	1.601	0.717	81	0.148	13	0.079	306	0.060	254	0.036	219	0.025	175	0.022	113	0.016	134	0.007	81
DCP 6	.250	1.271	0.574	77	0.139	7	0.077	300	0.066	240	0.028	199	0.027	146	0.011	117	0.010	122	0.006	129
DCP 7	.300	1.151	0.491	66	0.124	342	0.074	269	0.045	210	0.024	175	0.019	118	0.009	59	0.011	76	0.002	105
DCP 8	.500	0.774	0.281	45	0.109	303	0.059	230	0.046	164	0.027	117	0.017	76	0.010	29	0.013	348	0.011	322
DCP 9	.600	0.730	0.200	28	0.106	291	0.062	199	0.037	132	0.024	91	0.012	47	0.014	309	0.003	257	0.005	202
DCP10	.695	0.629	0.160	9	0.106	282	0.054	186	0.035	135	0.026	99	0.023	33	0.010	359	0.014	257	0.007	236
DCP11	.800	0.489	0.144	345	0.110	274	0.056	175	0.032	115	0.015	35	0.023	18	0.006	230	0.014	276	0.008	24
DCP12	.878	0.503	0.140	330	0.090	274	0.040	160	0.026	105	0.012	24	0.020	3	0.004	265	0.007	252	0.013	145
DCP13	.953	0.258	0.108	318	0.064	272	0.016	166	0.014	100	0.008	42	0.011	329	0.004	320	0.008	293	0.002	281

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.33	0.600	9.98	2.37		1061.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.085	653.3	1491.2	0.64E 07	-0.00086	1.026	10.34

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.907	0.125	32	0.019	78	0.007	127	0.011	78	0.003	13	0.003	293	0.004	130	0.002	90	0.004	29
CM		-0.027	0.035	192	0.003	140	0.002	185	0.004	212	0.002	143	0.001	77	0.001	270	0.001	323	0.002	196
DCP 1	.010	2.376	0.571	0	0.033	106	0.014	79	0.007	55	0.005	22	0.001	172	0.003	45	0.003	49	0.002	227
DCP 2	.050	2.602	0.329	359	0.017	104	0.010	121	0.004	45	0.002	22	0.001	263	0.002	106	0.002	58	0.001	339
DCP 3	.100	2.552	0.239	147	0.178	68	0.035	146	0.018	70	0.025	119	0.010	73	0.016	96	0.013	47	0.005	39
DCP 4	.200	1.592	0.174	128	0.057	216	0.033	202	0.041	172	0.013	313	0.018	315	0.026	216	0.004	34	0.007	165
DCP 5	.250	1.257	0.151	99	0.061	185	0.031	205	0.037	186	0.008	144	0.018	51	0.003	58	0.007	53	0.006	214
DCP 6	.300	0.968	0.169	42	0.055	86	0.034	136	0.023	102	0.010	112	0.006	238	0.008	158	0.004	146	0.004	43
DCP 7	.500	0.564	0.186	23	0.006	70	0.017	58	0.015	57	0.006	54	0.005	268	0.010	110	0.000	167	0.003	41
DCP 8	.600	0.494	0.171	23	0.017	14	0.016	352	0.034	55	0.021	333	0.006	323	0.001	25	0.002	215	0.013	31
DCP 9	.695	0.383	0.148	19	0.011	298	0.007	35	0.013	56	0.005	324	0.003	169	0.010	65	0.003	317	0.003	320
DCP10	.800	0.312	0.139	12	0.014	355	0.009	355	0.022	11	0.011	311	0.013	274	0.008	146	0.008	94	0.014	39
DCP11	.878	0.397	0.131	2	0.011	1	0.005	300	0.011	359	0.005	284	0.006	226	0.002	22	0.008	156	0.006	331
DCP12	.953	0.092	0.137	357	0.012	8	0.006	358	0.007	8	0.005	330	0.001	128	0.004	318	0.002	118	0.005	342

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.22	0.600	12.45	2.39		1361.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.085	653.2	1489.1	0.64E 07	-0.00131	1.057	13.50

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.959	0.098	41	0.012	160	0.004	1	0.001	226	0.003	315	0.002	157	0.007	230	0.005	328	0.005	220
CM		-0.056	0.030	202	0.003	268	0.002	347	0.000	230	0.000	35	0.000	164	0.002	4	0.001	72	0.001	20
DCP 1	.010	2.832	0.454	2	0.055	120	0.010	316	0.011	315	0.008	253	0.008	64	0.003	109	0.002	281	0.002	116
DCP 2	.050	2.856	0.280	4	0.029	109	0.021	327	0.009	251	0.001	2	0.007	39	0.003	238	0.002	252	0.005	119
DCP 3	.100	2.300	0.438	162	0.037	292	0.051	310	0.053	237	0.016	266	0.024	228	0.014	271	0.011	299	0.022	232
DCP 4	.150	1.585	0.171	144	0.068	227	0.040	90	0.005	87	0.019	162	0.038	195	0.025	305	0.026	19	0.003	99
DCP 5	.200	1.484	0.030	77	0.022	251	0.049	356	0.025	149	0.043	54	0.026	98	0.002	288	0.018	53	0.016	230
DCP 6	.250	1.222	0.108	77	0.037	153	0.027	351	0.026	49	0.027	290	0.006	254	0.020	280	0.007	334	0.006	355
DCP 7	.300	1.054	0.100	43	0.046	206	0.016	8	0.002	291	0.018	8	0.017	97	0.013	250	0.017	9	0.015	233
DCP 8	.500	0.685	0.159	41	0.032	115	0.011	169	0.006	327	0.022	266	0.009	278	0.015	194	0.007	237	0.003	82
DCP 9	.600	0.591	0.149	34	0.014	63	0.005	273	0.010	60	0.014	40	0.009	30	0.011	155	0.015	341	0.005	241
DCP10	.695	0.506	0.140	27	0.020	141	0.021	141	0.007	103	0.013	138	0.006	277	0.004	225	0.010	236	0.011	329
DCP11	.800	0.421	0.117	16	0.002	269	0.015	205	0.012	218	0.013	212	0.003	147	0.017	194	0.010	230	0.017	186
DCP12	.878	0.517	0.113	9	0.017	54	0.003	162	0.002	261	0.008	347	0.007	46	0.003	263	0.006	271	0.012	190
DCP13	.953	0.152	0.089	16	0.020	54	0.002	40	0.005	357	0.008	142	0.007	201	0.007	29	0.005	111	0.003	161

FORCED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.18	0.600	14.62	2.38		1061.3	7

K	V	Q	RN	DAMPING	CM(MAX)	ALPHA(STALL)
0.085	553.2	1485.5	0.64E 07	-0.00060	1.103	16.34

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.002	0.077	39	0.022	59	0.008	228	0.004	331	0.004	160	0.003	227	0.004	116	0.007	27	0.001	154
CM		-0.076	0.026	191	0.001	345	0.001	341	0.001	79	0.001	86	0.003	350	0.002	247	0.001	159	0.001	189
DCP 1	.010	3.134	0.289	358	0.055	92	0.010	188	0.006	191	0.014	231	0.006	156	0.001	241	0.006	291	0.019	223
DCP 2	.050	2.868	0.098	149	0.192	77	0.023	350	0.017	90	0.010	52	0.020	356	0.016	274	0.010	177	0.003	195
DCP 3	.100	2.083	0.216	142	0.079	350	0.018	163	0.027	37	0.028	124	0.021	5	0.010	193	0.044	49	0.020	212
DCP 4	.150	1.506	0.045	59	0.051	343	0.036	298	0.010	130	0.023	181	0.015	310	0.014	265	0.007	355	0.005	142
DCP 5	.200	1.474	0.107	112	0.037	31	0.018	265	0.017	11	0.018	177	0.028	294	0.016	168	0.002	203	0.014	137
DCP 6	.250	1.256	0.076	85	0.022	63	0.024	221	0.021	321	0.014	87	0.013	207	0.017	234	0.013	112	0.007	144
DCP 7	.300	1.093	0.101	55	0.015	107	0.027	247	0.012	275	0.000	20	0.011	313	0.016	113	0.021	4	0.006	108
DCP 8	.500	0.765	0.139	32	0.022	74	0.015	180	0.010	316	0.006	124	0.011	148	0.019	137	0.020	54	0.005	28
DCP 9	.600	0.647	0.096	21	0.032	84	0.004	169	0.011	49	0.013	196	0.010	135	0.022	14	0.007	317	0.009	169
DCP10	.695	0.594	0.122	16	0.006	274	0.008	162	0.007	266	0.004	335	0.015	216	0.017	117	0.008	333	0.011	217
DCP11	.800	0.514	0.092	9	0.011	109	0.005	66	0.009	219	0.012	269	0.008	184	0.015	336	0.003	293	0.020	344
DCP12	.878	0.581	0.092	357	0.008	81	0.004	347	0.004	93	0.006	95	0.011	120	0.002	247	0.005	193	0.013	31
DCP13	.953	0.220	0.079	8	0.011	289	0.008	172	0.011	242	0.003	324	0.009	197	0.013	74	0.004	283	0.005	153

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	47.39	0.400	9.93	2.61		1366.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.178	443.9	753.4	0.48E 07	-0.00104	1.272	12.62

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.063	0.208	352	0.009	186	0.001	137	0.001	255	0.003	94	0.003	12	0.002	195	0.002	145	0.003	115
CM		-0.012	0.015	292	0.001	178	0.000	65	0.000	211	0.001	297	0.001	203	0.001	50	0.000	43	0.000	304
DCP 1	.010	4.356	1.629	339	0.188	202	0.063	104	0.018	249	0.029	64	0.015	297	0.011	152	0.013	102	0.012	187
DCP 2	.050	3.413	0.817	341	0.026	120	0.005	243	0.006	233	0.008	92	0.001	66	0.007	149	0.007	93	0.010	123
DCP 3	.100	2.716	0.514	342	0.031	204	0.018	289	0.006	225	0.002	246	0.012	333	0.002	239	0.003	180	0.007	59
DCP 4	.150	2.079	0.356	349	0.012	129	0.005	165	0.001	218	0.004	85	0.004	92	0.001	103	0.003	195	0.004	104
DCP 5	.200	1.802	0.281	349	0.007	138	0.001	111	0.002	236	0.003	97	0.002	31	0.002	191	0.004	122	0.005	100
DCP 6	.250	1.357	0.233	355	0.004	144	0.003	152	0.001	314	0.004	93	0.004	62	0.002	117	0.002	171	0.004	82
DCP 7	.300	1.166	0.203	355	0.006	167	0.002	61	0.000	236	0.002	109	0.001	121	0.002	230	0.002	138	0.003	99
DCP 8	.500	0.700	0.116	12	0.001	170	0.002	169	0.001	327	0.003	143	0.005	39	0.001	84	0.002	189	0.002	155
DCP 9	.600	0.559	0.092	15	0.003	219	0.002	149	0.001	19	0.006	88	0.002	67	0.003	220	0.002	158	0.005	84
DCP10	.695	0.445	0.071	32	0.002	123	0.002	178	0.001	109	0.003	123	0.003	39	0.003	169	0.002	223	0.003	156
DCP11	.800	0.278	0.052	31	0.003	197	0.001	171	0.004	357	0.004	52	0.015	347	0.006	217	0.001	185	0.003	108
DCP12	.878	0.294	0.043	36	0.005	255	0.003	6	0.002	199	0.003	83	0.002	82	0.006	254	0.001	83	0.001	145
DCP13	.953	0.081	0.035	27	0.002	217	0.001	234	0.001	248	0.002	146	0.002	69	0.001	103	0.001	279	0.003	126

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	47.39	0.400	12.36	2.58		1066.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.178	443.9	751.7	0.48E 07	-0.00007	1.493	14.67

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.239	0.237	14	0.015	250	0.007	216	0.006	114	0.005	159	0.007	110	0.002	58	0.004	31	0.002	279
CM		-0.014	0.001	267	0.011	326	0.006	176	0.002	37	0.001	252	0.000	81	0.001	21	0.001	30	0.001	311
DCP 1	.010	5.682	1.493	352	0.244	70	0.161	303	0.073	109	0.053	0	0.024	287	0.020	179	0.033	46	0.011	323
DCP 2	.050	4.131	0.899	11	0.314	318	0.262	224	0.135	156	0.100	127	0.078	78	0.055	41	0.060	5	0.049	299
DCP 3	.100	3.054	0.498	24	0.144	305	0.152	162	0.123	42	0.068	294	0.042	198	0.021	130	0.022	52	0.018	323
DCP 4	.150	2.301	0.329	23	0.057	313	0.053	165	0.035	39	0.019	272	0.016	161	0.011	39	0.003	256	0.008	139
DCP 5	.200	1.980	0.352	24	0.106	247	0.083	100	0.055	336	0.038	211	0.026	108	0.017	347	0.001	108	0.010	227
DCP 6	.250	1.526	0.264	26	0.051	271	0.038	132	0.024	356	0.017	229	0.015	113	0.009	352	0.004	194	0.001	173
DCP 7	.300	1.330	0.274	15	0.074	204	0.045	48	0.023	280	0.022	166	0.014	71	0.011	301	0.005	143	0.010	140
DCP 8	.500	0.791	0.162	23	0.039	164	0.027	333	0.017	195	0.008	91	0.001	271	0.002	177	0.006	159	0.003	335
DCP 9	.600	0.647	0.129	26	0.032	167	0.024	4	0.017	217	0.015	95	0.009	322	0.011	164	0.006	25	0.004	333
DCP10	.695	0.508	0.084	16	0.032	122	0.023	312	0.016	171	0.004	358	0.005	158	0.003	136	0.004	281	0.006	119
DCP11	.800	0.336	0.067	13	0.029	139	0.017	309	0.011	150	0.006	123	0.012	114	0.004	144	0.005	314	0.007	175
DCP12	.878	0.379	0.064	347	0.027	128	0.012	286	0.007	103	0.002	62	0.002	240	0.007	284	0.006	119	0.005	311
DCP13	.953	0.153	0.058	308	0.011	70	0.008	186	0.001	153	0.008	348	0.001	231	0.007	160	0.004	329	0.003	81

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	47.39	0.400	14.57	2.51		1066.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.171	443.9	750.4	0.48E 07	0.00283	1.550	16.18

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.113	0.440	47	0.064	288	0.016	199	0.012	73	0.010	343	0.012	267	0.005	173	0.004	171	0.002	29
CM		-0.057	0.061	143	0.038	41	0.014	313	0.011	235	0.005	158	0.004	88	0.002	340	0.001	281	0.001	266
DCP 1	.010	4.820	1.498	57	0.407	83	0.321	57	0.194	339	0.142	236	0.099	160	0.021	58	0.020	206	0.028	171
DCP 2	.050	3.230	1.383	84	0.594	31	0.262	330	0.113	309	0.090	320	0.096	299	0.089	276	0.050	234	0.013	264
DCP 3	.100	2.391	1.271	80	0.352	353	0.159	283	0.109	234	0.066	179	0.041	172	0.051	141	0.053	89	0.035	36
DCP 4	.150	1.835	0.919	72	0.207	331	0.094	269	0.074	203	0.037	120	0.006	129	0.017	114	0.023	89	0.025	19
DCP 5	.200	1.645	0.820	59	0.149	308	0.110	249	0.060	180	0.034	120	0.015	112	0.026	62	0.019	10	0.019	302
DCP 6	.250	1.308	0.711	51	0.132	299	0.096	230	0.049	173	0.021	93	0.016	103	0.021	95	0.024	26	0.020	329
DCP 7	.300	1.165	0.623	42	0.125	284	0.090	208	0.056	146	0.031	63	0.012	5	0.013	355	0.009	303	0.009	217
DCP 8	.500	0.780	0.394	23	0.112	251	0.054	149	0.049	98	0.033	24	0.024	321	0.012	229	0.004	154	0.011	205
DCP 9	.600	0.693	0.322	10	0.146	234	0.046	137	0.068	64	0.024	335	0.027	273	0.012	191	0.012	143	0.008	168
DCP10	.695	0.589	0.247	358	0.128	233	0.063	119	0.053	53	0.039	330	0.025	274	0.018	183	0.008	139	0.014	65
DCP11	.800	0.470	0.212	342	0.134	215	0.043	110	0.054	20	0.022	300	0.028	271	0.012	164	0.010	33	0.009	52
DCP12	.878	0.528	0.177	329	0.108	210	0.039	112	0.036	8	0.021	276	0.025	211	0.005	150	0.003	191	0.013	27
DCP13	.953	0.260	0.113	311	0.066	209	0.024	108	0.020	334	0.010	301	0.012	194	0.014	87	0.005	148	0.005	156

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	47.39	0.600	9.85	2.50		1064.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.121	653.2	1476.7	0.64E 07	-0.00056	1.105	11.27

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.933	0.167	32	0.022	61	0.002	147	0.005	88	0.002	273	0.001	189	0.002	86	0.001	194	0.001	119
CM		-0.026	0.038	189	0.004	98	0.005	121	0.002	92	0.002	31	0.002	36	0.002	280	0.001	2	0.001	273
DCP 1	.010	2.423	0.614	0	0.038	83	0.005	15	0.003	158	0.009	276	0.010	129	0.002	95	0.001	26	0.004	88
DCP 2	.050	2.625	0.352	359	0.020	68	0.012	147	0.003	150	0.002	229	0.004	101	0.001	27	0.001	80	0.002	64
DCP 3	.100	2.575	0.323	132	0.201	52	0.069	133	0.060	68	0.049	15	0.015	16	0.032	327	0.008	252	0.015	299
DCP 4	.150	1.754	0.183	78	0.020	138	0.022	157	0.010	140	0.014	223	0.008	244	0.012	294	0.006	133	0.014	222
DCP 5	.250	1.296	0.237	88	0.086	129	0.016	116	0.023	144	0.018	287	0.011	38	0.016	316	0.004	359	0.007	281
DCP 6	.300	1.039	0.281	31	0.057	87	0.026	107	0.011	172	0.014	145	0.006	84	0.012	141	0.004	11	0.010	117
DCP 7	.500	0.557	0.191	34	0.007	325	0.013	1	0.013	58	0.006	313	0.001	5	0.006	126	0.002	344	0.003	114
DCP 8	.600	0.474	0.220	18	0.023	312	0.029	304	0.012	325	0.020	248	0.012	186	0.014	116	0.001	191	0.009	92
DCP 9	.695	0.401	0.153	22	0.012	251	0.018	319	0.001	253	0.007	190	0.002	108	0.005	71	0.003	201	0.004	97
DCP10	.800	0.329	0.167	6	0.016	314	0.020	272	0.009	269	0.002	167	0.011	234	0.011	78	0.003	11[illegible]	0.004	331
DCP11	.878	0.364	0.155	357	0.015	324	0.018	278	0.012	251	0.003	146	0.010	229	0.001	56	0.012	[illegible]	0.009	74
DCP12	.953	0.110	0.126	350	0.009	333	0.016	286	0.005	249	0.005	210	0.002	211	0.003	10	0.005	19[illegible]	0.005	211

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	47.39	0.600	12.35	2.49		1064.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.121	653.2	1475.4	0.64E 07	-0.00116	1.104	13.88

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.984	0.128	45	0.013	163	0.003	17	0.004	84	0.006	304	0.004	194	0.003	114	0.002	332	0.002	322
CM		-0.055	0.036	206	0.006	271	0.002	239	0.003	245	0.001	29	0.000	347	0.001	208	0.002	139	0.001	159
DCP 1	.010	2.881	0.470	1	0.066	114	0.010	302	0.010	247	0.006	156	0.012	259	0.004	173	0.007	140	0.009	90
DCP 2	.050	2.894	0.285	2	0.032	96	0.021	308	0.009	188	0.002	66	0.007	236	0.004	78	0.003	59	0.001	51
DCP 3	.100	2.313	0.339	141	0.115	252	0.030	38	0.019	207	0.039	332	0.024	220	0.020	138	0.017	94	0.017	326
DCP 4	.150	1.632	0.175	156	0.088	246	0.026	249	0.033	263	0.040	324	0.033	128	0.013	237	0.019	193	0.026	166
DCP 5	.200	1.617	0.156	98	0.042	262	0.018	26	0.005	52	0.019	306	0.009	177	0.019	173	0.009	171	0.006	247
DCP 6	.250	1.280	0.132	74	0.034	180	0.009	255	0.018	222	0.008	275	0.010	358	0.008	131	0.011	149	0.003	119
DCP 7	.300	1.140	0.145	64	0.019	170	0.018	194	0.017	65	0.007	245	0.005	228	0.008	135	0.002	234	0.005	249
DCP 8	.500	0.673	0.172	36	0.031	119	0.002	254	0.003	104	0.001	143	0.003	339	0.005	82	0.011	49	0.018	67
DCP 9	.600	0.582	0.196	38	0.021	134	0.013	50	0.029	80	0.003	150	0.003	261	0.004	176	0.013	319	0.012	279
DCP10	.695	0.507	0.158	27	0.031	91	0.013	54	0.015	74	0.003	167	0.012	190	0.014	48	0.005	34	0.005	32
DCP11	.800	0.446	0.149	25	0.013	95	0.012	34	0.005	35	0.011	288	0.005	359	0.011	13	0.020	330	0.011	339
DCP12	.878	0.484	0.139	19	0.018	91	0.012	49	0.004	48	0.004	302	0.006	158	0.004	332	0.016	330	0.007	293
DCP13	.953	0.178	0.106	8	0.015	42	0.008	229	0.003	347	0.004	149	0.002	110	0.004	211	0.001	141	0.004	29

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	47.39	0.600	14.58	2.50		1064.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.121	653.1	1471.0	0.64E 07	-0.00107	1.150	16.36

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.016	0.116	57	0.011	87	0.000	220	0.007	246	0.005	165	0.005	208	0.008	56	0.005	44	0.003	136
CM		-0.075	0.033	205	0.000	9	0.001	10	0.003	27	0.004	264	0.001	5	0.003	228	0.002	293	0.001	223
DCP 1	.010	3.164	0.302	7	0.068	86	0.007	190	0.006	158	0.004	207	0.011	78	0.020	19	0.010	271	0.010	157
DCP 2	.050	2.871	0.149	131	0.182	67	0.003	137	0.045	34	0.032	274	0.007	122	0.002	227	0.008	38	0.016	263
DCP 3	.100	2.104	0.310	141	0.059	56	0.076	194	0.015	356	0.027	234	0.002	13	0.009	347	0.017	136	0.016	151
DCP 4	.150	1.583	0.072	72	0.031	252	0.012	318	0.007	237	0.024	253	0.020	257	0.014	272	0.002	229	0.007	95
DCP 5	.200	1.513	0.195	103	0.012	325	0.014	354	0.021	320	0.022	206	0.015	170	0.003	8	0.011	151	0.005	304
DCP 6	.250	1.298	0.129	79	0.015	182	0.012	115	0.025	266	0.013	212	0.015	206	0.020	211	0.008	221	0.020	172
DCP 7	.300	1.138	0.175	75	0.034	243	0.022	292	0.020	258	0.020	198	0.014	323	0.019	93	0.011	38	0.016	191
DCP 8	.500	0.749	0.165	38	0.030	168	0.018	246	0.019	220	0.007	108	0.018	202	0.001	207	0.012	26	0.003	57
DCP 9	.600	0.636	0.152	42	0.007	114	0.008	194	0.011	221	0.013	84	0.004	268	0.002	83	0.007	75	0.012	69
DCP 10	.695	0.603	0.146	15	0.026	84	0.010	166	0.005	240	0.024	107	0.012	167	0.014	56	0.009	27	0.005	167
DCP 11	.800	0.533	0.129	33	0.018	9	0.010	177	0.015	204	0.013	59	0.011	218	0.021	21	0.010	27	0.011	63
DCP12	.878	0.560	0.111	28	0.015	18	0.005	173	0.009	170	0.013	51	0.004	120	0.014	40	0.004	251	0.013	342
DCP13	.953	0.241	0.080	12	0.006	101	0.007	113	0.004	90	0.006	106	0.010	80	0.012	353	0.003	15	0.004	31

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	64.00	0.400	9.86	2.56		1069.1	16

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.241	444.0	752.6	0.48E 07	-0.00107	1.272	12.56

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.071	0.191	356	0.019	185	0.011	180	0.003	168	0.007	167	0.003	147	0.003	157	0.002	150	0.002	147
CM		-0.011	0.019	285	0.002	141	0.001	103	0.000	49	0.001	18	0.000	289	0.000	91	0.000	44	0.000	329
DCP 1	.010	4.345	1.517	336	0.254	186	0.107	129	0.001	358	0.033	141	0.012	169	0.026	169	0.013	116	0.009	175
DCP 2	.050	3.399	0.758	339	0.062	150	0.044	175	0.014	157	0.021	141	0.011	141	0.009	139	0.005	188	0.004	128
DCP 3	.100	2.802	0.471	342	0.062	192	0.032	215	0.014	180	0.019	188	0.004	208	0.011	134	0.012	151	0.005	118
DCP 4	.150	2.092	0.329	351	0.026	162	0.021	169	0.004	161	0.008	156	0.004	157	0.005	139	0.004	112	0.002	112
DCP 5	.200	1.807	0.258	353	0.020	163	0.015	173	0.005	174	0.009	160	0.004	162	0.003	164	0.001	149	0.001	118
DCP 6	.250	1.392	0.219	1	0.016	174	0.014	171	0.005	162	0.005	171	0.002	116	0.003	117	0.002	132	0.001	138
DCP 7	.300	1.168	0.139	2	0.015	182	0.011	191	0.003	175	0.007	176	0.005	167	0.004	165	0.003	132	0.003	155
DCP 8	.500	0.705	0.117	24	0.007	209	0.006	194	0.002	111	0.003	174	0.002	92	0.001	140	0.000	70	0.002	226
DCP 9	.600	0.594	0.097	30	0.005	216	0.004	202	0.001	167	0.005	171	0.001	96	0.001	307	0.002	314	0.002	36
DCP10	.695	0.464	0.080	45	0.004	246	0.003	211	0.002	129	0.002	188	0.002	91	0.001	240	0.001	231	0.001	319
DCP11	.800	0.281	0.058	49	0.011	242	0.009	236	0.005	212	0.009	185	0.007	173	0.006	164	0.006	150	0.006	137
DCP12	.878	0.235	0.051	52	0.003	241	0.002	257	0.002	359	0.001	212	0.002	52	0.002	275	0.002	334	0.002	163
DCP13	.953	0.084	0.040	39	0.006	230	0.001	153	0.001	143	0.003	129	0.004	101	0.001	344	0.002	149	0.003	334

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	64.00	0.400	12.35	2.62		1068.2	16

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.241	443.9	751.1	0.48E 07	-0.00032	1.500	15.05

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.251	0.233	12	0.026	202	0.010	184	0.008	126	0.005	130	0.002	62	0.001	19	0.001	257	0.003	206
CM		-0.011	0.007	282	0.009	301	0.004	135	0.001	309	0.002	161	0.001	70	0.001	192	0.001	332	0.001	153
DCP 1	.010	5.705	1.432	348	0.209	78	0.149	261	0.113	106	0.042	272	0.068	166	0.033	155	0.020	155	0.042	156
DCP 2	.050	4.142	0.882	6	0.279	291	0.272	194	0.138	124	0.089	101	0.079	34	0.050	319	0.039	279	0.040	216
DCP 3	.100	3.174	0.502	16	0.139	262	0.169	125	0.116	349	0.084	215	0.031	101	0.013	198	0.012	31	0.020	230
DCP 4	.150	2.359	0.348	20	0.065	253	0.058	129	0.024	338	0.028	181	0.008	94	0.006	176	0.006	75	0.005	175
DCP 5	.200	1.981	0.338	15	0.113	210	0.086	59	0.063	258	0.043	120	0.016	315	0.011	158	0.001	286	0.011	134
DCP 6	.250	1.586	0.283	22	0.072	222	0.038	84	0.021	273	0.020	153	0.002	8	0.005	109	0.002	253	0.009	115
DCP 7	.300	1.329	0.261	9	0.088	175	0.051	4	0.040	197	0.022	61	0.014	250	0.010	100	0.005	319	0.009	122
DCP 8	.500	0.793	0.162	27	0.039	150	0.028	291	0.018	121	0.004	341	0.002	240	0.005	30	0.004	213	0.006	29
DCP 9	.600	0.679	0.133	27	0.036	140	0.020	294	0.012	126	0.009	355	0.001	16	0.001	349	0.002	74	0.004	243
DCP10	.695	0.498	0.097	33	0.026	120	0.023	261	0.013	100	0.004	323	0.004	273	0.006	17	0.008	150	0.012	314
DCP11	.800	0.351	0.066	25	0.026	101	0.012	242	0.010	67	0.008	328	0.002	11	0.006	319	0.003	56	0.006	314
DCP12	.878	0.329	0.044	351	0.017	93	0.008	226	0.003	65	0.006	319	0.002	140	0.004	261	0.003	131	0.009	271
DCP13	.953	0.141	0.037	317	0.003	103	0.010	149	0.004	338	0.001	3	0.008	219	0.003	37	0.004	321	0.003	128

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	64.00	0.400	14.56	2.57		1068.3	16

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.241	443.9	749.8	0.48E 07	0.00315	1.575	17.14

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.142	0.430	23	0.069	217	0.019	135	0.004	255	0.019	171	0.014	109	0.003	62	0.004	146	0.007	117
CM		-0.057	0.060	117	0.032	344	0.013	240	0.007	137	0.004	24	0.003	270	0.003	169	0.002	57	0.001	327
DCP 1	.010	4.879	1.538	38	0.388	64	0.263	349	0.181	231	0.161	127	0.047	65	0.053	146	0.053	77	0.028	1
DCP 2	.050	3.298	1.347	59	0.426	341	0.217	259	0.128	220	0.091	189	0.090	165	0.075	124	0.049	77	0.030	53
DCP 3	.100	2.560	1.248	58	0.342	295	0.132	205	0.103	151	0.055	101	0.059	64	0.044	333	0.022	246	0.011	176
DCP 4	.150	1.943	0.938	48	0.227	268	0.096	200	0.072	119	0.020	88	0.027	48	0.016	299	0.013	239	0.020	164
DCP 5	.200	1.645	0.800	35	0.178	238	0.084	184	0.062	87	0.015	58	0.014	340	0.014	250	0.017	160	0.015	115
DCP 6	.250	1.385	0.708	28	0.165	237	0.099	172	0.050	81	0.010	98	0.010	15	0.013	273	0.018	192	0.024	134
DCP 7	.300	1.176	0.625	15	0.156	214	0.083	144	0.039	53	0.009	337	0.012	269	0.015	201	0.020	114	0.009	87
DCP 8	.500	0.794	0.405	352	0.130	193	0.063	115	0.034	358	0.033	240	0.029	167	0.022	110	0.009	71	0.003	94
DCP 9	.600	0.719	0.321	342	0.123	176	0.057	72	0.034	322	0.039	200	0.028	140	0.015	36	0.007	305	0.014	144
DCP10	.695	0.579	0.243	330	0.113	174	0.051	65	0.042	303	0.036	195	0.030	119	0.022	35	0.00[illegible]	250	0.010	14[illegible]
DCP11	.800	0.502	0.191	315	0.113	155	0.058	24	0.036	266	0.025	158	0.025	79	0.010	331	0.014	250	0.009	102
DCP12	.878	0.499	0.137	304	0.090	144	0.049	17	0.028	257	0.016	122	0.029	39	0.017	303	0.016	232	0.005	297
DCP13	.953	0.281	0.077	288	0.050	134	0.026	21	0.007	253	0.010	129	0.017	1	0.019	302	0.001	272	0.003	175

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	64.00	0.600	9.92	2.57		1067.1	16

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.164	653.3	1478.0	0.64E 07	-0.00043	1.154	11.47

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.938	0.204	34	0.022	37	0.003	70	0.004	29	0.002	168	0.001	112	0.002	62	0.000	198	0.002	142
CM		-0.029	0.040	189	0.007	80	0.005	69	0.000	257	0.001	328	0.000	262	0.001	167	0.000	96	0.000	261
DCP 1	.010	2.417	0.674	358	0.023	91	0.010	75	0.006	127	0.005	138	0.005	158	0.008	90	0.004	71	0.001	228
DCP 2	.050	2.595	0.387	357	0.005	61	0.013	146	0.005	117	0.006	126	0.003	118	0.005	111	0.003	100	0.001	169
DCP 3	.100	2.553	0.377	112	0.214	33	0.063	61	0.048	329	0.019	295	0.009	219	0.009	229	0.010	168	0.008	125
DCP 4	.200	1.750	0.268	75	0.027	92	0.021	93	0.020	127	0.010	156	0.014	359	0.013	164	0.006	7	0.005	280
DCP 5	.250	1.311	0.329	76	0.074	119	0.036	85	0.010	193	0.014	235	0.006	200	0.005	150	0.006	212	0.006	244
DCP 6	.300	1.046	0.308	35	0.088	73	0.027	85	0.013	94	0.016	103	0.007	183	0.016	93	0.005	136	0.004	187
DCP 7	.500	0.578	0.234	34	0.018	323	0.015	337	0.013	28	0.008	293	0.009	93	0.012	358	0.004	309	0.003	124
DCP 8	.600	0.507	0.254	19	0.032	291	0.031	272	0.006	64	0.005	161	0.009	14	0.006	332	0.010	294	0.006	143
DCP 9	.695	0.406	0.169	24	0.022	261	0.013	273	0.004	341	0.002	164	0.001	242	0.001	41	0.004	17	0.002	233
DCP10	.800	0.333	0.178	5	0.031	257	0.019	226	0.002	269	0.004	80	0.003	247	0.003	5	0.003	184	0.007	26
DCP11	.878	0.369	0.163	354	0.025	276	0.021	205	0.004	252	0.006	108	0.001	353	0.003	274	0.004	128	0.002	82
DCP12	.953	0.104	0.128	346	0.015	278	0.018	237	0.005	197	0.008	220	0.007	135	0.002	213	0.003	175	0.002	97

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	64.00	0.600	12.36	2.54		1367.2	16

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.164	653.2	1472.3	0.64E 07	-0.00089	1.155	13.81

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.995	0.163	46	0.023	125	0.006	243	0.008	192	0.005	190	0.005	138	0.001	83	0.003	188	0.004	148
CM		-0.057	0.041	204	0.008	223	0.002	301	0.003	299	0.003	323	0.003	295	0.000	14	0.002	15	0.002	317
DCP 1	.010	2.866	0.499	0	0.097	95	0.003	257	0.011	200	0.016	156	0.007	69	0.005	14	0.005	303	0.005	180
DCP 2	.050	2.855	0.294	1	0.058	85	0.020	316	0.015	208	0.009	160	0.008	112	0.009	58	0.007	352	0.004	133
DCP 3	.100	2.324	0.407	132	0.128	216	0.048	281	0.040	236	0.035	256	0.021	229	0.030	177	0.004	109	0.018	219
DCP 4	.150	1.649	0.235	141	0.151	209	0.053	269	0.041	258	0.008	347	0.018	348	0.020	39	0.011	159	0.016	34
DCP 5	.200	1.679	0.227	77	0.040	177	0.030	293	0.007	214	0.022	293	0.004	316	0.007	194	0.004	226	0.009	261
DCP 6	.250	1.278	0.160	75	0.092	174	0.038	236	0.020	230	0.023	275	0.015	210	0.003	186	0.016	131	0.014	58
DCP 7	.300	1.171	0.221	60	0.053	121	0.004	209	0.005	294	0.010	310	0.012	330	0.019	358	0.012	10	0.008	313
DCP 8	.500	0.678	0.218	39	0.039	95	0.019	153	0.011	162	0.010	134	0.017	191	0.003	209	0.004	158	0.005	118
DCP 9	.600	0.606	0.233	34	0.052	71	0.016	102	0.018	155	0.021	149	0.026	127	0.007	187	0.014	214	0.025	173
DCP 10	.695	0.508	0.178	27	0.020	53	0.006	139	0.009	138	0.001	206	0.013	159	0.003	316	0.009	286	0.002	311
DCP 11	.800	0.457	0.182	21	0.041	34	0.006	335	0.012	110	0.017	158	0.017	86	0.003	211	0.010	183	0.015	139
DCP 12	.878	0.492	0.147	16	0.028	18	0.003	191	0.009	98	0.013	149	0.014	59	0.009	145	0.009	157	0.012	97
DCP 13	.953	0.171	0.099	6	0.017	4	0.002	89	0.009	128	0.009	132	0.011	86	0.003	35	0.004	180	0.010	142

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	64.00	0.600	14.57	2.58		1367.3	16

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.164	653.1	1469.3	0.64E 07	-0.00101	1.174	15.83

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.021	0.139	62	0.011	31	0.006	226	0.003	333	0.005	223	0.002	279	0.004	168	0.003	336	0.001	205
CM		-0.079	0.037	209	0.002	322	0.001	358	0.002	60	0.002	68	0.001	94	0.001	262	0.002	95	0.000	253
DCP 1	.010	3.096	0.232	5	0.131	95	0.021	358	0.005	10	0.002	122	0.009	280	0.013	201	0.008	351	0.021	235
DCP 2	.050	2.774	0.226	130	0.186	55	0.027	238	0.020	60	0.012	210	0.014	103	0.013	221	0.015	113	0.009	289
DCP 3	.100	2.163	0.236	137	0.087	298	0.011	138	0.009	108	0.018	167	0.021	24	0.013	264	0.024	104	0.009	315
DCP 4	.150	1.526	0.150	113	0.076	310	0.033	311	0.018	13	0.009	150	0.007	96	0.023	208	0.010	110	0.004	258
DCP 5	.200	1.591	0.235	91	0.014	312	0.017	219	0.005	8	0.009	323	0.009	286	0.007	257	0.016	14	0.009	183
DCP 6	.250	1.277	0.178	84	0.041	282	0.004	236	0.011	354	0.008	141	0.006	231	0.018	128	0.009	36	0.015	145
DCP 7	.300	1.154	0.202	77	0.008	4	0.009	213	0.005	8	0.007	150	0.007	200	0.012	182	0.011	2	0.005	97
DCP 8	.500	0.750	0.176	48	0.010	165	0.010	205	0.011	342	0.007	316	0.008	114	0.011	107	0.008	304	0.004	315
DCP 9	.600	0.678	0.191	39	0.025	140	0.014	194	0.005	308	0.006	274	0.005	219	0.010	289	0.024	282	0.007	279
DCP 10	.695	0.602	0.143	38	0.005	70	0.004	150	0.010	234	0.011	243	0.012	319	0.007	98	0.005	316	0.017	126
DCP 11	.800	0.537	0.155	32	0.020	56	0.005	352	0.013	236	0.015	232	0.013	278	0.002	82	0.007	213	0.007	310
DCP 12	.878	0.577	0.131	23	0.015	40	0.003	297	0.008	215	0.010	239	0.009	300	0.004	172	0.005	150	0.006	219
DCP 13	.953	0.230	0.093	22	0.004	11	0.009	160	0.008	132	0.006	115	0.004	181	0.013	67	0.002	42	0.011	29

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	80.65	0.400	9.90	2.85		1071.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.303	444.0	755.7	0.48E 07	-0.00095	1.255	12.72

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.063	0.194	3	0.015	188	0.004	19	0.005	191	0.001	129	0.001	357	0.003	113	0.001	71	0.003	121
CM		-0.009	0.025	287	0.002	131	0.000	225	0.001	69	0.001	50	0.001	188	0.000	343	0.000	251	0.001	316
CCP 1	.010	4.460	1.621	335	0.239	182	0.054	57	0.026	163	0.029	61	0.010	211	0.012	117	0.006	255	0.009	127
CCP 2	.050	3.356	0.763	340	0.041	122	0.012	277	0.016	148	0.005	92	0.005	176	0.007	149	0.003	149	0.002	211
CCP 3	.100	2.819	0.483	348	0.043	195	0.031	308	0.003	183	0.003	217	0.007	326	0.010	48	0.004	21	0.003	86
CCP 4	.150	2.077	0.345	354	0.020	160	0.004	84	0.010	161	0.005	89	0.003	214	0.003	122	0.002	56	0.002	83
CCP 5	.200	1.829	0.266	0	0.012	168	0.005	40	0.007	180	0.003	105	0.003	110	0.004	92	0.002	358	0.002	121
CCP 6	.250	1.286	0.229	6	0.012	183	0.006	96	0.007	182	0.002	111	0.001	189	0.004	110	0.003	91	0.001	55
CCP 7	.300	1.192	0.197	12	0.012	191	0.005	37	0.008	193	0.003	108	0.002	37	0.004	112	0.001	56	0.001	87
CCP 8	.500	0.662	0.131	34	0.008	218	0.003	118	0.004	194	0.002	122	0.001	283	0.003	141	0.002	57	0.003	40
CCP 9	.600	0.567	0.115	43	0.007	237	0.008	36	0.006	222	0.003	211	0.003	6	0.002	70	0.003	8	0.005	146
CCP10	.695	0.446	0.092	53	0.010	257	0.003	124	0.002	229	0.002	206	0.001	344	0.001	4	0.003	133	0.005	75
CCP11	.800	0.281	0.082	69	0.003	261	0.004	5	0.006	237	0.004	225	0.004	14	0.002	137	0.002	94	0.007	149
CCP12	.878	0.265	0.063	64	0.006	245	0.005	343	0.004	240	0.003	258	0.003	3	0.003	174	0.001	310	0.008	157

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	80.65	0.400	12.40	2.84		1071.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.303	444.0	755.2	0.48E 07	-0.00037	1.482	15.15

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.232	0.242	12	0.018	200	0.007	164	0.005	176	0.005	115	0.003	50	0.001	66	0.003	354	0.001	181
CM		-0.009	0.010	287	0.008	279	0.003	87	0.001	348	0.002	121	0.001	11	0.001	34	0.001	240	0.000	345
CCP 1	.010	5.691	1.415	344	0.252	55	0.146	263	0.113	77	0.061	288	0.021	119	0.005	104	0.011	46	0.012	116
CCP 2	.050	4.016	0.890	6	0.297	291	0.216	189	0.093	135	0.104	107	0.098	33	0.051	327	0.031	276	0.023	276
CCP 3	.100	3.152	0.553	17	0.179	254	0.183	106	0.114	328	0.055	187	0.013	337	0.029	150	0.028	24	0.012	249
CCP 4	.150	2.295	0.385	17	0.082	239	0.068	94	0.033	301	0.021	154	0.008	31	0.009	115	0.006	0	0.004	235
CCP 5	.200	2.042	0.368	12	0.128	195	0.100	34	0.068	233	0.035	92	0.013	281	0.011	87	0.010	267	0.010	86
CCP 6	.250	1.462	0.307	18	0.076	202	0.045	47	0.024	241	0.014	117	0.003	12	0.009	98	0.006	309	0.003	131
CCP 7	.300	1.372	0.279	9	0.094	158	0.059	339	0.042	171	0.020	19	0.015	208	0.014	58	0.005	222	0.011	33
CCP 8	.500	0.747	0.165	24	0.037	104	0.029	235	0.008	90	0.003	288	0.007	117	0.004	267	0.007	72	0.004	252
CCP 9	.600	0.641	0.147	28	0.030	122	0.019	263	0.008	119	0.001	319	0.003	213	0.001	344	0.003	356	0.001	281
CCP10	.695	0.498	0.098	34	0.021	68	0.021	193	0.004	255	0.003	337	0.002	83	0.002	245	0.002	232	0.006	153
CCP11	.800	0.333	0.067	41	0.017	63	0.016	212	0.004	106	0.005	244	0.004	164	0.005	231	0.006	52	0.003	136
CCP12	.878	0.347	0.032	12	0.011	48	0.007	187	0.002	124	0.006	270	0.000	351	0.006	200	0.007	16	0.003	239

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	80.65	0.400	14.60	2.85		1371.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.303	444.0	754.3	0.48E 07	0.00236	1.495	17.55

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.128	0.388	5	0.055	174	0.006	59	0.016	214	0.014	87	0.005	317	0.004	75	0.003	39	0.003	157
CM		-0.056	0.057	96	0.026	313	0.008	178	0.008	62	0.003	273	0.003	125	0.002	2	0.001	316	0.002	15
DCP 1	.010	4.968	1.499	20	0.346	51	0.245	333	0.126	194	0.071	83	0.038	88	0.050	30	0.027	351	0.016	317
DCP 2	.050	3.015	1.119	46	0.300	323	0.127	247	0.117	184	0.059	138	0.056	112	0.053	57	0.032	14	0.025	346
DCP 3	.100	2.563	1.096	42	0.266	260	0.084	165	0.101	126	0.064	52	0.044	350	0.012	289	0.035	290	0.042	175
DCP 4	.150	1.832	0.890	33	0.186	232	0.079	162	0.048	69	0.028	50	0.024	307	0.008	260	0.012	138	0.014	66
DCP 5	.200	1.735	0.753	18	0.147	207	0.075	159	0.041	47	0.026	8	0.024	258	0.021	166	0.021	75	0.010	44
DCP 6	.250	1.250	0.681	10	0.126	208	0.092	133	0.034	12	0.016	326	0.011	234	0.010	101	0.003	30	0.012	133
DCP 7	.300	1.249	0.591	358	0.093	180	0.069	121	0.026	357	0.023	286	0.029	212	0.026	88	0.015	338	0.013	140
DCP 8	.500	0.765	0.384	330	0.100	161	0.039	38	0.035	304	0.021	166	0.022	59	0.025	339	0.015	183	0.014	26
DCP 9	.600	0.716	0.318	320	0.128	148	0.045	13	0.061	257	0.035	140	0.012	21	0.015	253	0.019	105	0.008	227
DCP10	.695	0.620	0.204	304	0.093	139	0.034	2	0.034	236	0.022	111	0.011	322	0.009	238	0.017	82	0.018	261
DCP11	.800	0.484	0.175	289	0.104	118	0.048	322	0.056	208	0.031	66	0.027	307	0.022	172	0.004	319	0.019	176
DCP12	.878	0.520	0.117	277	0.086	110	0.042	318	0.042	186	0.028	44	0.027	281	0.023	121	0.008	257	0.011	161

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	80.00	0.600	9.90	2.74		1379.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.205	652.8	1477.4	0.64E 07	-0.00040	1.228	11.84

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.946	0.254	32	0.014	24	0.003	330	0.007	280	0.008	161	0.003	175	0.001	34	0.001	184	0.002	335
CM		-0.032	0.042	191	0.010	60	0.005	59	0.002	68	0.002	337	0.000	312	0.000	324	0.001	173	0.001	96
DCP 1	.010	2.422	0.761	352	0.051	111	0.008	320	0.016	168	0.010	65	0.007	140	0.002	159	0.002	72	0.004	146
DCP 2	.050	2.538	0.436	352	0.022	115	0.011	151	0.007	171	0.006	83	0.003	143	0.003	154	0.003	70	0.002	164
DCP 3	.100	2.694	0.401	97	0.246	19	0.040	46	0.066	277	0.006	170	0.023	181	0.009	62	0.006	154	0.005	299
DCP 4	.200	1.731	0.354	65	0.051	131	0.023	98	0.035	72	0.004	75	0.006	57	0.014	332	0.010	220	0.000	136
DCP 5	.250	1.195	0.445	64	0.095	100	0.037	82	0.005	186	0.001	284	0.020	185	0.022	114	0.014	45	0.010	308
DCP 6	.300	1.042	0.406	36	0.086	62	0.040	35	0.013	16	0.009	158	0.007	320	0.009	261	0.014	210	0.006	82
DCP 7	.500	0.584	0.295	32	0.037	273	0.026	320	0.011	302	0.012	234	0.010	190	0.002	98	0.003	145	0.008	37
DCP 8	.600	0.532	0.291	18	0.053	257	0.043	251	0.005	235	0.023	163	0.009	54	0.009	280	0.007	145	0.012	8
DCP 9	.695	0.429	0.199	22	0.039	235	0.018	267	0.010	283	0.020	178	0.004	34	0.003	122	0.000	181	0.007	23
DCP10	.800	0.333	0.189	3	0.036	241	0.029	210	0.013	235	0.014	109	0.005	215	0.002	41	0.006	31	0.015	251
DCP11	.878	0.371	0.174	350	0.031	245	0.023	196	0.013	227	0.008	100	0.003	160	0.005	110	0.011	331	0.011	216

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	80.32	0.600	12.40	2.72		1070.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.205	653.0	1472.4	0.64E 07	-0.00083	1.196	13.93

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.002	0.197	47	0.007	153	0.002	314	0.002	77	0.002	48	0.002	274	0.006	117	0.003	278	0.001	57
CM		-0.056	0.047	205	0.004	209	0.001	204	0.000	185	0.003	226	0.001	155	0.001	301	0.001	112	0.001	262
DCP 1	.010	2.881	0.543	358	0.093	102	0.009	332	0.004	109	0.007	299	0.010	202	0.010	121	0.006	57	0.001	259
DCP 2	.050	2.762	0.255	10	0.077	50	0.041	276	0.015	141	0.009	295	0.013	170	0.011	81	0.007	31	0.005	295
DCP 3	.100	2.507	0.368	120	0.047	286	0.025	65	0.015	287	0.039	272	0.047	198	0.018	203	0.006	38	0.018	235
DCP 4	.150	1.666	0.280	137	0.162	229	0.026	274	0.033	59	0.023	177	0.022	23	0.036	108	0.011	272	0.016	33
DCP 5	.200	1.698	0.251	79	0.039	231	0.007	179	0.009	226	0.017	211	0.002	73	0.005	137	0.010	235	0.014	191
DCP 6	.250	1.208	0.253	75	0.049	165	0.032	210	0.019	240	0.005	247	0.016	247	0.004	56	0.003	11	0.006	278
DCP 7	.300	1.181	0.270	65	0.051	171	0.010	180	0.016	102	0.007	98	0.009	317	0.007	36	0.018	217	0.007	45
DCP 8	.500	0.679	0.268	42	0.025	104	0.005	31	0.009	329	0.003	140	0.007	100	0.006	243	0.011	56	0.010	320
DCP 9	.600	0.634	0.293	33	0.037	37	0.018	35	0.009	134	0.020	73	0.012	36	0.012	97	0.010	305	0.005	24
DCP 10	.695	0.521	0.210	29	0.013	60	0.005	76	0.013	242	0.019	55	0.012	286	0.013	143	0.001	334	0.008	111
DCP 11	.800	0.445	0.215	20	0.023	354	0.009	339	0.007	30	0.006	6	0.005	352	0.005	124	0.010	264	0.013	138
DCP 12	.878	0.477	0.178	12	0.020	349	0.007	325	0.008	44	0.013	359	0.009	270	0.010	105	0.006	293	0.009	55

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	80.32	0.600	14.50	2.74		1070.3	20

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.205	653.0	1467.7	0.63E 07	-0.00108	1.218	15.14

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.017	0.178	67	0.012	22	0.012	18	0.007	257	0.007	110	0.009	65	0.003	352	0.005	25	0.002	254
CM		-0.082	0.044	216	0.002	24	0.002	170	0.003	10	0.004	255	0.006	233	0.002	226	0.003	224	0.001	159
DCP 1	.010	2.994	0.061	17	0.263	96	0.077	17	0.015	43	0.030	340	0.019	260	0.014	210	0.005	154	0.012	374
DCP 2	.050	2.681	0.278	126	0.197	56	0.003	261	0.051	37	0.025	269	0.009	13	0.010	272	0.017	243	0.015	221
DCP 3	.100	2.202	0.226	117	0.092	298	0.022	141	0.050	266	0.025	220	0.026	247	0.004	229	0.015	224	0.015	237
DCP 4	.150	1.480	0.209	115	0.085	327	0.033	44	0.013	5	0.017	212	0.018	287	0.011	348	0.012	17	0.027	218
DCP 5	.200	1.598	0.273	91	0.050	317	0.019	80	0.029	284	0.027	179	0.016	260	0.008	270	0.013	329	0.016	183
DCP 6	.250	1.161	0.232	86	0.043	292	0.029	338	0.031	302	0.026	229	0.026	216	0.022	221	0.005	250	0.018	179
DCP 7	.300	1.172	0.262	76	0.034	277	0.023	4	0.016	264	0.015	134	0.009	140	0.012	273	0.005	349	0.004	41
DCP 8	.500	0.754	0.225	52	0.026	146	0.014	9	0.003	154	0.020	74	0.025	112	0.002	96	0.005	256	0.013	58
DCP 9	.600	0.701	0.235	48	0.016	91	0.010	84	0.012	203	0.023	100	0.028	90	0.012	10	0.009	131	0.020	56
DCP 10	.695	0.634	0.191	44	0.013	69	0.012	348	0.016	172	0.013	62	0.032	66	0.021	68	0.005	74	0.011	7
DCP 11	.800	0.546	0.189	36	0.005	22	0.008	7	0.016	215	0.018	70	0.027	38	0.006	57	0.028	51	0.013	289
DCP 12	.878	0.579	0.165	34	0.004	330	0.008	327	0.008	180	0.011	58	0.035	10	0.009	17	0.030	27	0.012	253

FORCED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.56	0.200	9.90	3.01		1374.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.725	224.7	204.5	0.26E 07	-0.00139	1.152	12.37

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.931	0.215	49	0.007	207	0.017	304	0.003	326	0.007	116	0.003	333	0.003	73	0.009	312	0.006	115
CM		-0.028	0.047	292	0.004	112	0.006	146	0.000	278	0.002	331	0.001	156	0.001	290	0.003	123	0.001	285
DCP 1	.010	3.204	1.097	351	0.069	119	0.039	206	0.022	315	0.016	354	0.007	36	0.011	52	0.005	322	0.000	100
DCP 2	.050	2.588	0.601	1	0.058	110	0.028	196	0.011	303	0.009	60	0.010	159	0.009	74	0.019	17	0.004	303
DCP 3	.100	2.161	0.414	15	0.035	171	0.004	165	0.013	165	0.020	76	0.002	282	0.008	117	0.019	2	0.010	108
DCP 4	.150	1.956	0.418	19	0.029	161	0.023	232	0.007	324	0.004	27	0.003	230	0.003	357	0.006	203	0.006	87
DCP 5	.200	1.637	0.309	34	0.016	201	0.021	308	0.008	285	0.015	92	0.008	286	0.002	34	0.004	277	0.016	145
DCP 6	.250	1.261	0.297	43	0.014	181	0.025	292	0.009	330	0.009	119	0.005	328	0.005	14	0.001	233	0.005	98
DCP 7	.300	1.043	0.261	55	0.014	222	0.022	321	0.005	347	0.013	114	0.007	337	0.002	91	0.007	318	0.011	128
DCP 8	.500	0.768	0.244	79	0.009	293	0.024	301	0.007	348	0.005	142	0.005	327	0.004	73	0.009	256	0.005	118
DCP 9	.600	0.459	0.233	83	0.016	250	0.028	323	0.002	21	0.013	124	0.008	334	0.007	330	0.015	304	0.009	134
DCP 10	.695	0.353	0.204	88	0.005	341	0.021	332	0.002	29	0.008	192	0.003	22	0.005	17	0.014	321	0.005	72
DCP 11	.800	0.281	0.177	105	0.031	291	0.024	294	0.005	126	0.008	144	0.004	90	0.015	129	0.016	310	0.006	110
DCP 12	.878	0.322	0.146	102	0.008	285	0.024	341	0.004	199	0.010	129	0.005	320	0.002	188	0.021	313	0.007	90

FORCED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.56	0.200	12.40	3.02		1374.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.725	224.7	204.4	0.26E 07	-0.00140	1.364	13.20

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.147	0.218	49	0.015	213	0.018	292	0.003	107	0.006	80	0.003	81	0.003	115	0.009	197	0.004	201
CM		-0.035	0.047	290	0.003	99	0.006	130	0.001	308	0.002	313	0.001	275	0.001	298	0.002	45	0.001	81
DCP 1	.010	4.462	1.116	351	0.079	172	0.032	198	0.011	340	0.030	359	0.005	217	0.015	260	0.020	158	0.025	248
DCP 2	.050	3.322	0.605	1	0.050	166	0.016	224	0.013	102	0.018	27	0.008	332	0.004	353	0.006	236	0.007	265
DCP 3	.100	2.636	0.447	13	0.028	152	0.015	241	0.013	162	0.015	35	0.006	163	0.008	180	0.005	62	0.012	44
DCP 4	.150	2.324	0.395	23	0.036	182	0.026	231	0.009	35	0.009	57	0.004	338	0.003	339	0.015	157	0.003	188
DCP 5	.200	1.907	0.315	35	0.017	206	0.019	282	0.005	301	0.012	49	0.006	101	0.001	199	0.012	165	0.010	109
DCP 6	.250	1.503	0.288	45	0.022	215	0.016	288	0.007	331	0.010	87	0.007	353	0.004	57	0.014	186	0.008	136
DCP 7	.300	1.228	0.264	54	0.014	229	0.021	308	0.002	327	0.010	102	0.003	30	0.005	79	0.011	181	0.012	151
DCP 8	.500	0.893	0.248	83	0.018	234	0.027	301	0.003	36	0.002	130	0.002	96	0.003	67	0.01	271	0.014	188
DCP 9	.600	0.616	0.237	80	0.015	252	0.023	305	0.002	170	0.006	109	0.011	120	0.008	149	0.014	185	0.004	172
DCP 10	.695	0.396	0.208	90	0.013	266	0.023	319	0.007	128	0.005	157	0.006	80	0.001	42	0.008	253	0.014	231
DCP 11	.800	0.340	0.171	93	0.019	243	0.036	285	0.011	109	0.010	108	0.003	8	0.006	98	0.011	242	0.009	321
DCP 12	.878	0.488	0.144	98	0.007	308	0.016	325	0.007	148	0.009	108	0.006	108	0.010	131	0.004	225	0.010	335

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.56	0.200	14.60	3.00		1374.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.725	224.7	204.1	0.26E 07	-0.00132	1.542	16.88

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.317	0.212	50	0.008	237	0.012	307	0.002	187	0.011	110	0.001	193	0.005	102	0.002	194	0.002	358
CM		-0.034	0.045	292	0.004	108	0.002	180	0.001	294	0.002	309	0.030	93	0.001	315	0.001	91	0.001	146
DCP 1	.010	5.525	1.136	353	0.092	87	0.100	305	0.048	211	0.021	74	0.017	123	0.013	122	0.011	106	0.006	243
DCP 2	.050	3.906	0.593	1	0.026	155	0.022	228	0.015	160	0.012	74	0.003	88	0.011	101	0.010	343	0.009	12
DCP 3	.100	3.066	0.420	15	0.024	169	0.012	231	0.002	281	0.018	83	0.007	131	0.001	81	0.008	112	0.011	343
DCP 4	.150	2.614	0.393	24	0.028	196	0.025	233	0.003	34	0.009	79	0.001	131	0.010	43	0.007	149	0.003	130
DCP 5	.200	2.155	0.298	38	0.016	218	0.016	280	0.006	299	0.018	93	0.006	228	0.001	340	0.012	157	0.009	84
DCP 6	.250	1.694	0.285	46	0.015	238	0.013	288	0.004	8	0.003	63	0.002	235	0.004	40	0.00[illegible]	129	0.004	90
DCP 7	.300	1.416	0.260	56	0.014	205	0.018	312	0.006	328	0.017	119	0.001	243	0.008	11	0.006	195	0.008	146
DCP 8	.500	0.975	0.244	81	0.020	276	0.014	327	0.002	311	0.005	149	0.002	290	0.012	87	0.005	221	0.008	147
DCP 9	.600	0.732	0.222	83	0.012	294	0.020	322	0.003	176	0.017	117	0.004	197	0.010	168	0.003	149	0.007	328
DCP10	.695	0.402	0.195	91	0.022	318	0.018	346	0.011	122	0.005	144	0.002	85	0.009	159	0.005	318	0.003	195
DCP11	.800	0.363	0.167	97	0.021	228	0.012	148	0.003	210	0.014	126	0.006	273	0.005	103	0.005	296	0.013	330
DCP12	.878	0.590	0.136	100	0.008	330	0.017	350	0.003	151	0.017	113	0.001	91	0.005	142	0.003	271	0.018	332

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	96.62	0.400	9.90	3.00		1073.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.363	444.0	750.2	0.48E 07	-0.00094	1.270	12.91

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.061	0.197	11	0.013	233	0.002	268	0.002	148	0.003	40	0.001	28	0.003	64	0.001	132	0.004	303
CM		-0.016	0.031	284	0.003	139	0.001	180	0.000	285	0.001	243	0.000	240	0.001	243	0.001	47	0.002	139
DCP 1	.010	4.316	1.624	335	0.231	193	0.056	116	0.008	196	0.013	22	0.005	18	0.011	171	0.015	38	0.005	212
DCP 2	.050	3.087	0.717	342	0.020	142	0.024	215	0.010	163	0.002	291	0.004	94	0.004	131	0.007	52	0.003	37
DCP 3	.100	2.836	0.482	352	0.045	215	0.024	250	0.009	148	0.006	279	0.008	311	0.007	52	0.006	56	0.004	336
DCP 4	.150	2.041	0.352	359	0.013	208	0.011	215	0.002	134	0.004	13	0.003	66	0.000	50	0.007	94	0.003	118
DCP 5	.200	1.852	0.279	7	0.009	236	0.004	284	0.001	351	0.006	51	0.002	334	0.002	52	0.002	128	0.004	238
DCP 6	.250	1.300	0.241	14	0.010	255	0.005	261	0.002	4	0.005	33	0.001	40	0.002	53	0.005	128	0.001	263
DCP 7	.300	1.206	0.212	22	0.009	262	0.005	298	0.001	155	0.004	53	0.001	302	0.004	19	0.004	166	0.005	255
DCP 8	.500	0.713	0.151	44	0.014	272	0.004	313	0.000	104	0.003	24	0.002	132	0.003	76	0.003	178	0.004	239
DCP 9	.600	0.575	0.143	54	0.013	281	0.005	325	0.002	151	0.006	79	0.004	9	0.004	23	0.002	193	0.006	275
DCP10	.695	0.462	0.119	64	0.012	297	0.001	329	0.001	315	0.005	56	0.002	129	0.005	51	0.002	286	0.008	319
DCP11	.800	0.291	0.105	76	0.012	271	0.009	33	0.004	134	0.002	47	0.003	52	0.003	84	0.001	266	0.012	345
DCP12	.878	0.265	0.083	73	0.008	298	0.005	356	0.002	121	0.002	45	0.002	35	0.003	103	0.002	236	0.012	325

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.56	0.400	12.40	2.98		1073.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.367	444.0	750.0	0.48E 07	-0.00047	1.495	15.30

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.241	0.240	14	0.010	219	0.008	201	0.005	81	0.003	78	0.003	87	0.002	59	0.003	241	0.002	267
CM		-0.014	0.015	279	0.008	271	0.003	130	0.002	315	0.002	126	0.002	328	0.001	245	0.002	47	0.001	179
DCP 1	.010	5.598	1.408	339	0.250	46	0.190	253	0.093	72	0.051	298	0.005	197	0.021	142	0.021	354	0.010	124
DCP 2	.050	3.758	0.805	6	0.304	299	0.233	196	0.102	124	0.086	87	0.071	10	0.035	289	0.013	295	0.014	212
DCP 3	.100	3.221	0.566	15	0.184	258	0.182	116	0.117	345	0.040	216	0.006	229	0.032	145	0.039	25	0.016	268
DCP 4	.150	2.317	0.398	16	0.084	242	0.058	100	0.037	321	0.015	178	0.006	121	0.010	35	0.003	213	0.004	172
DCP 5	.200	2.067	0.374	15	0.118	200	0.093	36	0.058	247	0.034	98	0.014	324	0.002	157	0.009	151	0.004	225
DCP 6	.250	1.503	0.317	18	0.074	204	0.044	43	0.023	273	0.016	147	0.008	88	0.011	347	0.014	177	0.004	55
DCP 7	.300	1.399	0.273	12	0.078	154	0.054	334	0.022	165	0.010	42	0.003	256	0.008	46	0.010	222	0.004	130
DCP 8	.500	0.810	0.176	30	0.038	99	0.030	262	0.012	91	0.006	9	0.008	140	0.008	354	0.009	179	0.003	297
DCP 9	.600	0.655	0.159	37	0.031	105	0.022	263	0.012	102	0.006	334	0.012	114	0.004	236	0.011	59	0.013	232
DCP 10	.695	0.506	0.113	44	0.026	58	0.014	226	0.008	117	0.005	308	0.008	127	0.006	170	0.009	274	0.003	11
DCP 11	.800	0.341	0.078	46	0.023	55	0.007	242	0.009	114	0.009	299	0.009	138	0.005	93	0.009	278	0.005	95
DCP 12	.878	0.343	0.037	50	0.017	14	0.007	133	0.004	67	0.005	268	0.005	161	0.011	65	0.014	224	0.015	357

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	95.69	0.400	14.60	2.97		1073.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.360	444.0	748.3	0.48E 07	0.00122	1.485	17.66

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.163	0.310	2	0.024	168	0.009	78	0.020	170	0.018	345	0.007	9	0.004	356	0.004	328	0.006	358
CM		-0.057	0.039	69	0.018	293	0.008	189	0.011	21	0.007	146	0.001	258	0.001	283	0.002	216	0.003	231
DCP 1	.010	4.978	1.136	16	0.598	26	0.419	266	0.278	120	0.111	341	0.074	180	0.083	39	0.037	274	0.044	139
DCP 2	.050	3.173	0.988	33	0.296	311	0.166	209	0.083	119	0.052	138	0.077	43	0.060	326	0.020	283	0.024	252
DCP 3	.100	2.688	1.105	35	0.314	261	0.110	145	0.080	99	0.048	28	0.066	325	0.041	233	0.017	112	0.005	252
DCP 4	.150	1.984	0.845	20	0.199	219	0.078	129	0.043	33	0.008	341	0.033	308	0.014	175	0.005	139	0.011	2
DCP 5	.200	1.718	0.703	10	0.110	201	0.076	118	0.034	17	0.017	317	0.017	292	0.007	183	0.002	190	0.013	343
DCP 6	.250	1.332	0.593	359	0.116	182	0.074	101	0.043	1	0.025	287	0.016	197	0.003	97	0.016	351	0.020	334
DCP 7	.300	1.240	0.486	348	0.099	175	0.087	78	0.058	334	0.017	243	0.011	64	0.012	35	0.019	314	0.013	286
DCP 8	.500	0.814	0.247	313	0.090	139	0.053	18	0.060	244	0.029	86	0.013	14	0.010	342	0.016	243	0.015	124
DCP 9	.600	0.734	0.193	307	0.076	116	0.036	4	0.076	213	0.044	31	0.014	131	0.006	170	0.017	192	0.024	17
DCP 10	.695	0.613	0.089	298	0.055	102	0.036	356	0.053	184	0.035	2	0.006	29	0.003	10	0.014	113	0.023	355
DCP 11	.800	0.512	0.079	258	0.057	86	0.030	302	0.066	168	0.069	315	0.011	339	0.004	212	0.023	49	0.008	118
DCP 12	.878	0.530	0.054	241	0.055	67	0.015	282	0.058	148	0.053	291	0.004	141	0.011	72	0.028	4	0.019	2

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.56	0.600	9.90	2.80		1372.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.249	653.4	1482.2	0.64E 07	-0.00030	1.283	12.65

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.923	0.295	24	0.024	337	0.025	223	0.011	147	0.006	54	0.002	96	0.000	299	0.001	344	0.006	142
CM		-0.032	0.045	190	0.015	45	0.009	29	0.004	260	0.001	171	0.001	306	0.001	253	0.001	161	0.002	20
DCP 1	.010	2.386	0.848	343	0.037	74	0.045	186	0.016	165	0.008	191	0.002	126	0.005	117	0.006	140	0.004	132
DCP 2	.050	2.366	0.438	343	0.016	59	0.031	166	0.007	173	0.003	112	0.001	320	0.004	108	0.003	90	0.002	189
DCP 3	.100	2.657	0.367	71	0.269	358	0.042	222	0.050	216	0.011	108	0.014	138	0.010	0	0.009	153	0.010	2
DCP 4	.200	1.618	0.398	63	0.137	55	0.021	21	0.056	184	0.040	28	0.042	356	0.052	281	0.024	199	0.058	124
DCP 5	.250	1.183	0.526	47	0.114	54	0.009	77	0.026	143	0.010	45	0.016	274	0.012	200	0.006	31	0.010	320
DCP 6	.300	1.041	0.503	30	0.072	17	0.043	333	0.011	19	0.013	58	0.005	264	0.014	148	0.003	39	0.012	102
DCP 7	.500	0.608	0.351	23	0.068	255	0.057	238	0.012	149	0.008	183	0.013	157	0.013	103	0.006	36	0.009	3
DCP 8	.600	0.514	0.315	15	0.068	231	0.042	222	0.015	216	0.021	85	0.007	176	0.003	65	0.012	3	0.001	225
DCP 9	.695	0.430	0.215	17	0.042	222	0.050	222	0.018	65	0.015	157	0.007	80	0.008	54	0.008	277	0.010	143
DCP10	.800	0.311	0.203	2	0.057	230	0.046	194	0.029	96	0.018	342	0.009	113	0.008	13	0.008	313	0.022	210
DCP11	.878	0.343	0.177	347	0.053	229	0.045	173	0.029	76	0.015	315	0.004	76	0.003	255	0.003	26	0.022	197

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.600	12.40	2.70		1072.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.248	653.3	1478.5	0.64E 07	-0.00087	1.325	12.81

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.036	0.291	49	0.013	120	0.007	225	0.002	294	0.005	138	0.009	336	0.002	228	0.008	281	0.002	287
CM		-0.054	0.061	202	0.005	107	0.003	0	0.001	255	0.003	358	0.003	138	0.002	327	0.005	136	0.001	18
DCP 1	.010	2.841	0.620	354	0.114	108	0.037	209	0.023	189	0.029	168	0.023	129	0.014	118	0.013	103	0.010	66
DCP 2	.050	2.536	0.224	15	0.100	42	0.069	255	0.044	179	0.028	127	0.015	74	0.007	228	0.018	116	0.015	16
DCP 3	.100	2.690	0.608	109	0.079	73	0.066	32	0.028	313	0.015	354	0.032	262	0.002	324	0.003	204	0.006	20
DCP 4	.200	1.667	0.338	88	0.091	221	0.038	256	0.012	280	0.017	136	0.032	105	0.020	6	0.010	76	0.010	342
DCP 5	.250	1.266	0.404	72	0.102	155	0.036	236	0.026	277	0.014	274	0.013	192	0.028	194	0.022	116	0.028	231
DCP 6	.300	1.203	0.463	63	0.070	131	0.010	125	0.024	339	0.042	17	0.044	3	0.040	324	0.024	295	0.024	333
DCP 7	.500	0.732	0.396	35	0.026	105	0.013	84	0.015	124	0.003	196	0.009	256	0.017	211	0.014	187	0.014	112
DCP 8	.600	0.644	0.396	34	0.035	339	0.027	242	0.014	117	0.012	157	0.026	1	0.016	255	0.005	286	0.004	293
DCP 9	.695	0.523	0.274	25	0.021	298	0.023	178	0.015	80	0.019	179	0.010	222	0.035	119	0.012	31	0.004	9
DCP10	.800	0.430	0.252	22	0.024	298	0.013	200	0.003	340	0.019	173	0.022	326	0.010	116	0.045	287	0.009	170
DCP11	.878	0.460	0.200	10	0.035	281	0.006	176	0.014	274	0.024	179	0.021	305	0.008	135	0.039	283	0.012	231

FORCED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.600	14.60	2.68		1072.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.248	653.3	1476.3	0.64E 07	-0.00103	1.287	16.13

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.017	0.245	60	0.014	250	0.017	190	0.010	224	0.008	223	0.013	177	0.010	144	0.009	136	0.008	108
CM		-0.077	0.053	210	0.005	41	0.004	344	0.005	33	0.006	57	0.004	336	0.004	359	0.003	320	0.003	299
CCP 1	.010	3.036	0.255	13	0.213	85	0.049	282	0.038	224	0.020	200	0.025	159	0.016	124	0.007	3	0.008	239
CCP 2	.050	2.555	0.275	97	0.187	26	0.045	223	0.020	272	0.020	172	0.015	195	0.018	130	0.003	159	0.004	86
CCP 3	.100	2.250	0.484	116	0.108	293	0.042	313	0.036	345	0.038	46	0.022	243	0.011	139	0.011	233	0.023	187
CCP 4	.150	1.565	0.230	102	0.121	259	0.026	258	0.024	89	0.026	98	0.020	271	0.030	18	0.015	93	0.023	72
CCP 5	.200	1.628	0.412	85	0.047	239	0.020	234	0.005	217	0.003	5	0.011	245	0.021	95	0.012	245	0.016	49
CCP 6	.250	1.235	0.333	75	0.057	201	0.021	104	0.023	13	0.018	26	0.014	175	0.005	163	0.006	293	0.013	327
CCP 7	.300	1.168	0.343	69	0.065	220	0.059	184	0.025	198	0.019	145	0.022	176	0.035	84	0.024	105	0.021	56
CCP 8	.500	0.793	0.343	45	0.016	80	0.019	96	0.009	355	0.020	314	0.010	227	0.027	250	0.015	205	0.026	215
CCP 9	.600	0.673	0.313	45	0.021	141	0.018	147	0.007	281	0.011	242	0.017	105	0.020	105	0.022	70	0.016	55
CCP 10	.695	0.609	0.230	35	0.023	242	0.026	163	0.025	176	0.019	237	0.026	117	0.022	198	0.009	94	0.008	63
CCP 11	.800	0.509	0.214	31	0.023	241	0.023	195	0.033	217	0.028	226	0.021	170	0.026	143	0.021	152	0.026	90
CCP 12	.878	0.547	0.181	22	0.029	258	0.023	214	0.041	223	0.044	225	0.027	189	0.028	181	0.025	155	0.028	139

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.39	0.200	0.07	4.95		1394.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.122	224.6	197.6	0.25E 07	-0.00169	0.384	5.14

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		-0.063	0.449	352	0.023	161	0.005	175	0.010	134	0.007	116	0.007	92	0.004	158	0.003	67	0.004	99
CM		-0.032	0.016	293	0.002	108	0.001	168	0.002	339	0.001	298	0.002	289	0.001	4	0.001	308	0.001	302
DCP 1	.010	-2.964	3.287	346	0.209	115	0.062	168	0.026	139	0.039	101	0.014	82	0.015	171	0.017	106	0.019	91
DCP 2	.050	-0.652	1.488	347	0.081	170	0.015	163	0.020	101	0.011	75	0.007	74	0.008	168	0.024	32	0.008	73
DCP 3	.100	-0.249	1.111	345	0.064	158	0.017	197	0.026	122	0.014	177	0.021	73	0.013	135	0.002	142	0.005	75
DCP 4	.150	0.260	0.755	350	0.045	178	0.009	142	0.011	122	0.012	100	0.007	62	0.006	130	0.004	47	0.003	63
DCP 5	.200	0.144	0.632	347	0.039	157	0.009	225	0.012	146	0.004	65	0.005	95	0.007	149	0.002	112	0.008	131
DCP 6	.250	-0.006	0.515	354	0.032	192	0.005	161	0.003	145	0.009	111	0.004	61	0.002	211	0.005	51	0.003	106
DCP 7	.300	-0.002	0.447	351	0.029	149	0.010	177	0.007	84	0.006	159	0.005	75	0.003	123	0.002	280	0.004	97
DCP 8	.500	0.189	0.272	2	0.015	200	0.006	106	0.010	105	0.010	99	0.005	137	0.001	121	0.005	2	.008	71
DCP 9	.600	0.026	0.217	359	0.013	143	0.008	221	0.009	97	0.001	272	0.008	99	0.005	138	0.004	271	0.008	168
DCP 10	.695	0.028	0.158	13	0.020	239	0.001	131	0.004	242	0.004	93	0.007	89	0.006	254	0.002	277	0.001	8
DCP 11	.800	0.030	0.111	11	0.006	87	0.007	320	0.040	164	0.009	154	0.016	122	0.008	137	0.007	137	0.008	100
DCP 12	.953	-0.048	0.060	15	0.008	287	0.003	71	0.006	2	0.009	90	0.005	62	0.007	210	0.008	94	0.003	232

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.49	0.200	7.37	4.93		1094.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.123	224.6	197.3	0.25E 07	-0.00147	1.128	12.42

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.700	0.422	352	0.025	164	0.005	211	0.010	160	0.003	157	0.005	190	0.006	132	0.003	97	0.003	173
CM		-0.027	0.013	286	0.003	57	0.001	126	0.003	8	0.001	26	0.001	37	0.001	345	0.001	332	0.001	350
DCP 1	.010	1.818	2.548	348	0.175	141	0.042	156	0.049	132	0.022	123	0.016	109	0.023	149	0.028	70	0.010	352
DCP 2	.050	1.757	1.442	348	0.088	146	0.015	234	0.029	152	0.016	149	0.014	143	0.014	104	0.013	7	0.010	119
DCP 3	.100	1.604	1.086	345	0.068	144	0.014	205	0.012	101	0.007	67	0.007	233	0.013	115	0.005	158	0.011	204
DCP 4	.150	1.583	0.760	350	0.055	176	0.011	180	0.015	152	0.008	124	0.010	154	0.009	146	0.004	73	0.004	34
DCP 5	.200	1.206	0.593	348	0.040	168	0.005	257	0.006	186	0.003	313	0.003	285	0.007	78	0.001	157	0.003	129
DCP 6	.250	0.955	0.515	354	0.035	170	0.010	178	0.007	151	0.003	215	0.005	124	0.005	165	0.007	80	0.003	296
DCP 7	.300	0.805	0.450	351	0.030	164	0.007	184	0.004	138	0.003	44	0.004	192	0.004	106	0.002	124	0.004	217
DCP 8	.500	0.682	0.266	1	0.017	177	0.002	207	0.008	124	0.004	109	0.004	174	0.005	98	0.005	72	0.002	341
DCP 9	.600	0.439	0.193	2	0.002	248	0.002	229	0.004	288	0.002	307	0.008	268	0.006	80	0.007	159	0.004	175
DCP 10	.695	0.297	0.146	14	0.012	202	0.002	237	0.003	79	0.006	245	0.005	193	0.005	189	0.007	44	0.004	218
DCP 11	.800	0.216	0.101	12	0.009	278	0.009	313	0.041	182	0.012	175	0.007	206	0.009	163	0.007	174	0.016	154
DCP 12	.953	0.043	0.064	4	0.011	210	0.003	239	0.002	216	0.006	211	0.006	195	0.008	175	0.000	264	0.004	191

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.50	0.200	9.69	4.99		1394.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.123	224.6	197.4	0.25E 07	-0.00165	1.318	14.57

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.920	0.411	354	0.012	131	0.005	60	0.005	139	0.003	211	0.001	185	0.004	344	0.002	179	0.004	52
CM		-0.025	0.015	282	0.002	159	0.002	220	0.002	356	0.001	28	0.000	18	0.000	147	0.001	311	0.001	240
DCP 1	.010	3.128	2.464	349	0.097	147	0.028	119	0.017	93	0.012	184	0.012	176	0.014	54	0.020	308	0.013	18
DCP 2	.050	2.475	1.402	349	0.056	136	0.012	148	0.017	66	0.011	295	0.013	28	0.014	322	0.013	253	0.006	256
DCP 3	.100	2.205	1.055	345	0.038	131	0.014	84	0.015	143	0.015	106	0.010	209	0.014	355	0.022	154	0.004	10
DCP 4	.150	1.959	0.753	352	0.030	152	0.008	316	0.005	94	0.005	241	0.006	56	0.002	46	0.002	333	0.009	50
DCP 5	.200	1.518	0.596	347	0.018	112	0.004	82	0.003	185	0.006	263	0.001	210	0.005	353	0.002	147	0.001	131
DCP 6	.250	1.236	0.500	356	0.020	149	0.002	153	0.004	108	0.006	330	0.002	39	0.006	343	0.001	185	0.007	63
DCP 7	.300	1.054	0.436	351	0.010	130	0.006	10	0.007	132	0.003	141	0.003	224	0.004	316	0.005	177	0.002	81
DCP 8	.500	0.808	0.256	6	0.005	102	0.002	129	0.002	145	0.004	231	0.004	195	0.005	356	0.004	273	0.005	31
DCP 9	.600	0.560	0.191	4	0.003	45	0.011	41	0.005	345	0.001	84	0.004	189	0.007	344	0.004	134	0.007	108
DCP10	.695	0.354	0.144	18	0.002	271	0.004	170	0.006	70	0.003	311	0.006	354	0.005	341	0.004	22	0.010	58
DCP11	.800	0.279	0.102	19	0.008	24	0.021	29	0.026	186	0.007	171	0.005	183	0.004	281	0.010	137	0.001	50
DCP12	.953	0.059	0.070	15	0.003	189	0.006	141	0.005	77	0.008	222	0.001	65	0.002	104	0.003	259	0.003	17

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.53	0.200	12.28	4.98		1094.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.123	224.6	197.1	0.25E 07	-0.00111	1.530	17.35

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.141	0.397	2	0.031	178	0.008	330	0.004	210	0.002	1	0.002	348	0.005	246	0.002	6	0.003	225
CM		-0.024	0.011	293	0.004	320	0.003	106	0.003	235	0.002	126	0.001	132	0.001	76	0.001	167	0.000	34
DCP 1	.010	4.421	2.411	354	0.141	201	0.034	343	0.087	226	0.072	125	0.045	27	0.012	279	0.004	334	0.024	282
DCP 2	.050	3.216	1.345	354	0.088	185	0.023	106	0.037	235	0.016	163	0.019	225	0.007	133	0.002	77	0.004	319
DCP 3	.100	2.768	1.020	358	0.059	188	0.019	356	0.011	235	0.016	346	0.006	18	0.024	245	0.008	75	0.011	144
DCP 4	.150	2.331	0.722	359	0.041	186	0.020	91	0.018	245	0.012	110	0.009	285	0.003	120	0.002	322	0.002	107
DCP 5	.200	1.844	0.561	1	0.030	174	0.011	10	0.005	198	0.003	333	0.002	319	0.010	253	0.004	93	0.001	313
DCP 6	.250	1.506	0.482	5	0.043	210	0.017	79	0.018	249	0.013	103	0.005	254	0.007	119	0.005	315	0.002	220
DCP 7	.300	1.288	0.423	6	0.024	183	0.010	351	0.003	199	0.007	16	0.003	185	0.008	248	0.003	119	0.007	201
DCP 8	.500	0.943	0.243	13	0.023	184	0.006	315	0.005	169	0.008	356	0.003	29	0.001	340	0.004	282	0.005	259
DCP 9	.600	0.660	0.184	11	0.028	146	0.038	327	0.021	141	0.015	319	0.004	88	0.012	259	0.006	71	0.002	219
DCP10	.695	0.426	0.137	23	0.019	160	0.009	271	0.007	125	0.004	199	0.004	101	0.005	163	0.006	1	0.005	230
DCP11	.800	0.339	0.087	10	0.028	134	0.025	270	0.025	28	0.020	304	0.006	317	0.014	284	0.006	325	0.002	218
DCP12	.953	0.103	0.077	4	0.022	176	0.005	118	0.004	309	0.009	138	0.008	349	0.005	144	0.005	0	0.002	85

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.37	0.200	14.97	4.98		1148.1	10

K	V	Q	RN	DAMPING	CY(MAX)	ALPHA(STALL)
0.122	224.5	200.2	0.26E 07	0.00164	1.892	19.30

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.441	0.451	18	0.108	214	0.058	46	0.026	251	0.024	104	0.011	351	0.005	148	0.007	133	0.003	89
CM		-0.050	0.017	130	0.025	328	0.017	164	0.008	14	0.007	262	0.003	128	0.002	315	0.000	10	0.001	201
DCP 1	.010	5.792	2.205	15	0.199	232	0.189	73	0.086	342	0.049	341	0.041	258	0.015	48	0.033	179	0.047	149
DCP 2	.050	4.156	1.410	15	0.286	249	0.132	109	0.073	328	0.041	145	0.034	47	0.014	33	0.036	149	0.017	131
DCP 3	.100	3.329	1.092	24	0.238	266	0.126	124	0.064	343	0.034	200	0.028	91	0.005	325	0.012	187	0.019	28
DCP 4	.150	2.706	0.770	32	0.220	268	0.120	114	0.067	316	0.046	165	0.029	34	0.017	268	0.016	132	0.007	109
DCP 5	.200	2.376	0.645	32	0.203	257	0.108	100	0.052	289	0.032	130	0.011	349	0.005	198	0.004	139	0.005	210
DCP 6	.250	1.821	0.578	29	0.167	243	0.093	67	0.056	260	0.035	96	0.014	0	0.002	188	0.009	32	0.005	172
DCP 7	.300	1.663	0.532	23	0.187	225	0.107	59	0.056	243	0.038	105	0.009	332	0.010	217	0.020	95	0.007	277
DCP 8	.500	0.800	0.330	14	0.141	185	0.105	10	0.046	205	0.025	79	0.026	12	0.013	138	0.008	19	0.008	137
DCP 9	.600	0.819	0.260	7	0.131	171	0.084	3	0.036	211	0.031	99	0.012	1	0.017	163	0.008	137	0.015	0
DCP10	.695	0.859	0.194	6	0.113	165	0.071	356	0.028	203	0.033	79	0.028	320	0.013	112	0.008	194	0.007	161
DCP11	.800	0.681	0.121	350	0.081	148	0.050	340	0.012	207	0.020	114	0.013	265	0.003	18	0.005	180	0.009	8
DCP12	.953	0.161	0.128	324	0.061	135	0.024	334	0.026	196	0.033	71	0.010	262	0.007	123	0.006	208	0.005	144

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.37	0.200	17.53	4.89		1148.2	10

K	V	Q	RN	DAMPING	CY(MAX)	ALPHA(STALL)
0.122	224.6	200.2	0.26E 07	0.00516	2.274	22.54

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.457	0.545	40	0.117	275	0.095	186	0.082	85	0.060	336	0.045	223	0.029	118	0.020	19	0.007	278
CM		-0.083	0.080	145	0.046	32	0.036	311	0.031	205	0.024	104	0.019	359	0.012	248	0.009	151	0.004	56
DCP 1	.010	5.681	1.995	60	0.655	34	0.503	282	0.533	182	0.350	96	0.163	5	0.085	245	0.068	156	0.068	125
DCP 2	.050	3.905	1.490	66	0.537	4	0.326	274	0.285	175	0.174	75	0.124	348	0.062	246	0.040	149	0.052	107
DCP 3	.100	3.055	1.398	74	0.455	344	0.191	246	0.128	164	0.088	56	0.049	290	0.020	135	0.018	3	0.038	196
DCP 4	.150	2.520	1.070	66	0.271	315	0.096	217	0.123	131	0.098	13	0.054	259	0.031	160	0.039	79	0.027	15
DCP 5	.200	2.270	0.896	56	0.258	286	0.105	206	0.129	112	0.098	0	0.074	265	0.059	176	0.027	83	0.015	344
DCP 6	.250	1.812	0.806	47	0.215	274	0.137	202	0.167	102	0.115	356	0.072	263	0.054	163	0.041	80	0.028	13
DCP 7	.300	1.662	0.755	39	0.239	265	0.151	198	0.163	91	0.107	345	0.087	256	0.058	167	0.026	64	0.018	321
DCP 8	.500	0.875	0.516	17	0.193	231	0.162	167	0.164	61	0.117	327	0.089	220	0.070	116	0.050	36	0.024	302
DCP 9	.600	0.947	0.417	6	0.164	223	0.148	157	0.130	40	0.099	309	0.095	206	0.058	106	0.046	5	0.035	287
DCP10	.695	0.946	0.339	356	0.143	218	0.135	140	0.117	39	0.078	299	0.070	183	0.062	74	0.049	0	0.029	259
DCP11	.800	0.824	0.268	343	0.125	223	0.117	135	0.091	14	0.093	272	0.082	166	0.045	49	0.048	304	0.028	218
DCP12	.953	0.242	0.239	325	0.096	210	0.101	109	0.059	0	0.059	249	0.048	136	0.039	10	0.029	266	0.024	131

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	15.11	0.200	19.78	4.80		5036.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.115	219.7	199.4	0.26E 07	-0.00461	1.515	21.10

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.977	0.403	67	0.071	55	0.034	36	0.021	22	0.017	15	0.008	49	0.004	313	0.018	130	0.006	274
CM		-0.075	0.071	211	0.023	169	0.012	177	0.007	188	0.003	210	0.004	291	0.002	134	0.003	343	0.003	60
DCP 1	.010	4.053	0.915	113	0.514	128	0.102	143	0.041	214	0.018	8	0.042	324	0.026	319	0.034	206	0.041	130
DCP 2	.025	3.925	0.932	113	0.288	118	0.122	128	0.069	107	0.046	7	0.021	223	0.018	218	0.076	126	0.019	33
DCP 3	.100	1.490	0.773	119	0.083	151	0.011	132	0.005	338	0.067	332	0.023	327	0.011	308	0.055	107	0.031	314
DCP 4	.150	1.099	0.565	77	0.156	126	0.012	157	0.051	336	0.031	30	0.016	60	0.011	347	0.026	156	0.020	116
DCP 5	.200	1.209	0.545	67	0.093	72	0.044	0	0.013	43	0.022	307	0.032	164	0.025	124	0.028	84	0.009	292
DCP 6	.250	1.136	0.547	58	0.135	77	0.058	83	0.039	336	0.024	337	0.016	345	0.020	295	0.021	217	0.019	139
DCP 7	.300	0.999	0.494	55	0.140	48	0.062	46	0.014	73	0.002	315	0.036	179	0.023	174	0.033	113	0.007	317
DCP 8	.400	1.010	0.556	53	0.142	54	0.062	53	0.041	18	0.019	32	0.012	66	0.003	332	0.002	187	0.007	281
DCP 9	.500	0.719	0.428	52	0.095	13	0.051	36	0.048	105	0.035	102	0.043	95	0.021	112	0.025	118	0.013	140
DCP 10	.600	0.692	0.449	50	0.103	22	0.052	18	0.034	356	0.017	85	0.027	51	0.027	349	0.009	0	0.040	331
DCP 11	.878	0.530	0.233	40	0.079	333	0.052	341	0.033	2	0.033	351	0.024	329	0.012	252	0.030	160	0.018	185

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.21	0.400	-0.00	4.84		1385.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.061	444.0	723.7	0.46E 07	-0.00106	0.459	4.98

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		-0.063	0.497	353	0.058	195	0.011	265	0.005	132	0.002	192	0.002	115	0.002	120	0.002	164	0.002	61
CM		-0.018	0.010	282	0.002	219	0.002	287	0.001	203	0.002	247	0.001	301	0.001	244	0.001	274	0.001	212
DCP 1	.010	-1.979	2.232	349	0.987	230	0.450	317	0.111	127	0.206	266	0.141	6	0.068	147	0.073	295	0.090	55
DCP 2	.050	-0.505	1.910	348	0.162	131	0.071	181	0.025	102	0.061	137	0.054	226	0.020	372	0.026	163	0.041	248
DCP 3	.100	0.053	1.399	352	0.137	142	0.066	192	0.017	265	0.019	119	0.027	202	0.012	311	0.017	119	0.009	204
DCP 4	.150	-0.070	0.941	350	0.086	149	0.053	178	0.021	231	0.008	64	0.013	161	0.003	267	0.010	195	0.012	156
DCP 5	.200	0.268	0.743	355	0.072	170	0.025	188	0.013	250	0.008	305	0.010	95	0.008	201	0.003	246	0.005	132
DCP 6	.250	-0.098	0.597	352	0.060	191	0.007	273	0.010	186	0.008	319	0.004	78	0.010	120	0.003	115	0.005	138
DCP 7	.300	-0.024	0.507	356	0.068	205	0.012	302	0.004	105	0.003	132	0.006	93	0.005	148	0.007	197	0.003	358
DCP 8	.500	-0.021	0.300	357	0.047	210	0.012	304	0.006	80	0.003	129	0.003	85	0.005	95	0.003	173	0.001	42
DCP 9	.600	-0.016	0.232	359	0.028	207	0.006	357	0.006	100	0.003	71	0.005	107	0.004	67	0.003	110	0.004	72
DCP 10	.695	0.078	0.173	3	0.022	192	0.002	248	0.001	43	0.004	49	0.004	111	0.006	103	0.001	145	0.002	32
DCP 11	.800	0.000	0.129	7	0.010	185	0.004	107	0.009	74	0.007	69	0.007	91	0.003	48	0.005	73	0.008	28
DCP 12	.878	0.014	0.103	5	0.007	119	0.006	149	0.002	281	0.002	104	0.002	176	0.001	282	0.002	151	0.002	27
DCP 13	.953	0.003	0.079	5	0.006	138	0.005	143	0.002	204	0.004	96	0.005	188	0.002	298	0.002	9	0.001	190

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.34	0.400	7.33	4.88		1385.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.061	444.0	721.3	0.46E 07	-0.00109	1.290	12.20

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.779	0.513	353	0.028	155	0.004	223	0.003	158	0.002	173	0.003	135	0.001	118	0.000	47	0.000	126
CM		-0.015	0.012	308	0.001	219	0.001	115	0.001	228	0.000	168	0.000	207	0.000	109	0.000	66	0.000	176
DCP 1	.010	2.643	3.297	349	0.286	199	0.152	140	0.055	40	0.023	252	0.026	156	0.014	257	0.016	197	0.016	60
DCP 2	.050	2.403	1.768	349	0.105	132	0.047	304	0.061	206	0.029	122	0.013	167	0.022	80	0.025	11	0.011	191
DCP 3	.100	2.217	1.323	351	0.064	161	0.012	283	0.012	174	0.012	176	0.010	106	0.004	167	0.008	200	0.002	77
DCP 4	.150	1.570	0.890	351	0.051	143	0.008	251	0.008	185	0.002	206	0.004	121	0.003	139	0.004	128	0.003	154
DCP 5	.200	1.381	0.735	352	0.042	136	0.006	203	0.003	172	0.005	170	0.001	30	0.005	200	0.003	131	0.003	94
DCP 6	.250	0.943	0.600	352	0.031	156	0.006	207	0.004	47	0.008	234	0.009	162	0.007	76	0.002	313	0.006	213
DCP 7	.300	0.827	0.533	354	0.028	142	0.003	267	0.004	132	0.002	197	0.003	110	0.003	167	0.001	78	0.001	209
DCP 8	.500	0.509	0.314	356	0.017	140	0.003	232	0.003	141	0.002	6	0.002	128	0.002	144	0.001	17	0.001	74
DCP 9	.600	0.412	0.234	358	0.012	135	0.005	271	0.004	224	0.002	193	0.002	244	0.003	310	0.001	227	0.003	261
DCP10	.695	0.361	0.168	2	0.010	141	0.003	227	0.003	83	0.002	332	0.001	304	0.001	55	0.001	148	0.001	39
DCP11	.800	0.224	0.117	5	0.005	105	0.004	278	0.006	60	0.003	105	0.001	128	0.002	309	0.001	85	0.002	46
DCP12	.878	0.192	0.087	8	0.002	164	0.001	338	0.002	10	0.001	288	0.002	74	0.002	290	0.001	37	0.001	317
DCP13	.953	0.136	0.073	7	0.011	172	0.002	234	0.001	91	0.003	339	0.005	84	0.007	121	0.005	259	0.005	10

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.50	0.400	9.63	4.91		1385.3	5

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.062	443.9	720.3	0.46E 07	-0.00089	1.449	14.32

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.983	0.439	0	0.033	18	0.021	223	0.005	107	0.003	178	0.003	23	0.002	255	0.005	235	0.003	176
CM		-0.010	0.012	315	0.001	353	0.002	274	0.001	131	0.001	3	0.002	243	0.001	101	0.001	343	0.001	133
DCP 1	.010	3.998	3.101	355	0.122	304	0.021	261	0.078	262	0.104	188	0.045	179	0.053	134	0.041	51	0.033	48
DCP 2	.050	3.223	1.662	356	0.166	333	0.200	207	0.148	100	0.102	9	0.055	319	0.031	342	0.076	251	0.073	199
DCP 3	.100	2.730	1.079	358	0.120	55	0.041	282	0.007	274	0.021	205	0.011	92	0.009	206	0.006	175	0.006	68
DCP 4	.150	1.932	0.716	358	0.077	44	0.035	250	0.004	141	0.003	87	0.006	267	0.006	178	0.004	171	0.003	119
DCP 5	.200	1.623	0.580	359	0.063	42	0.030	243	0.006	125	0.004	183	0.010	79	0.010	26	0.009	285	0.005	147
DCP 6	.250	1.207	0.479	2	0.064	28	0.027	241	0.007	101	0.004	28	0.010	292	0.003	203	0.008	305	0.008	235
DCP 7	.300	1.017	0.431	2	0.047	33	0.025	242	0.004	135	0.006	197	0.001	357	0.008	235	0.007	213	0.002	296
DCP 8	.500	0.619	0.241	9	0.042	23	0.018	244	0.004	163	0.008	159	0.002	22	0.003	268	0.003	185	0.002	76
DCP 9	.600	0.479	0.183	10	0.023	38	0.009	225	0.004	296	0.010	185	0.007	76	0.001	30	0.004	251	0.004	69
DCP10	.695	0.408	0.135	15	0.018	4	0.014	212	0.002	351	0.005	157	0.003	87	0.004	170	0.004	200	0.006	120
DCP11	.800	0.287	0.109	12	0.002	128	0.012	106	0.010	265	0.009	200	0.007	95	0.003	216	0.007	190	0.004	57
DCP12	.878	0.246	0.110	2	0.028	215	0.020	113	0.009	343	0.004	210	0.004	64	0.004	112	0.002	221	0.003	7
DCP13	.953	0.171	0.099	352	0.023	218	0.012	109	0.013	70	0.004	10	0.017	27	0.024	301	0.001	17	0.023	252

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.38	0.400	12.22	4.83		1385.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.062	443.9	721.2	0.46E 07	0.00078	1.536	15.63

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.059	0.283	50	0.151	22	0.036	284	0.028	238	0.019	150	0.007	100	0.006	338	0.005	199	0.004	248
CM		-0.039	0.044	166	0.029	63	0.010	18	0.012	332	0.008	257	0.006	210	0.006	133	0.001	68	0.003	55
DCP 1	.010	4.532	1.747	32	0.865	34	0.186	316	0.042	257	0.043	139	0.036	84	0.013	14	0.034	139	0.038	56
DCP 2	.050	3.240	0.678	66	0.691	50	0.191	0	0.203	325	0.163	276	0.151	241	0.136	207	0.095	180	0.071	158
DCP 3	.100	2.629	0.607	101	0.670	49	0.183	326	0.104	282	0.066	225	0.055	192	0.056	130	0.037	102	0.039	52
DCP 4	.150	1.867	0.487	95	0.434	34	0.093	298	0.074	285	0.074	203	0.053	145	0.039	74	0.012	39	0.026	346
DCP 5	.200	1.554	0.439	90	0.341	23	0.062	280	0.085	280	0.070	185	0.021	122	0.031	89	0.019	6	0.010	1
DCP 6	.250	1.247	0.371	72	0.250	16	0.055	275	0.066	255	0.066	162	0.035	110	0.035	60	0.020	350	0.018	298
DCP 7	.300	1.060	0.357	65	0.214	5	0.046	256	0.061	246	0.057	147	0.023	95	0.032	37	0.019	333	0.006	327
DCP 8	.500	0.728	0.260	40	0.092	326	0.033	226	0.047	192	0.040	96	0.021	65	0.032	341	0.013	252	0.017	255
DCP 9	.600	0.594	0.224	24	0.059	297	0.021	219	0.042	185	0.038	57	0.022	40	0.025	333	0.008	270	0.014	234
DCP10	.695	0.525	0.208	11	0.053	270	0.034	225	0.049	147	0.026	47	0.018	42	0.028	293	0.009	148	0.014	271
DCP11	.800	0.424	0.208	359	0.066	251	0.033	214	0.041	144	0.029	82	0.028	12	0.023	284	0.004	210	0.018	221
DCP12	.873	0.373	0.216	352	0.062	244	0.030	226	0.037	145	0.017	71	0.017	20	0.016	275	0.006	143	0.002	225
DCP13	.953	0.264	0.197	338	0.048	219	0.017	231	0.012	121	0.006	251	0.011	293	0.012	239	0.014	198	0.009	123

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.58	0.400	14.92	4.85		1147.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.062	443.8	737.8	0.47E 07	0.00021	1.562	16.34

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.090	0.294	94	0.104	60	0.063	63	0.033	0	0.011	331	0.014	284	0.008	210	0.008	189	0.005	165
CM		-0.051	0.060	175	0.019	131	0.019	109	0.012	92	0.009	38	0.007	31	0.004	339	0.003	327	0.001	275
DCP 1	.010	5.022	1.382	85	0.715	76	0.345	80	0.096	39	0.032	324	0.057	268	0.049	224	0.008	232	0.005	52
DCP 2	.050	3.162	1.034	133	0.534	102	0.410	106	0.241	85	0.204	72	0.129	65	0.108	83	0.085	91	0.069	136
DCP 3	.100	2.188	1.055	140	0.439	82	0.242	98	0.184	49	0.102	12	0.077	3	0.060	328	0.040	308	0.032	302
DCP 4	.150	1.856	0.793	125	0.170	74	0.227	83	0.077	24	0.070	15	0.051	346	0.034	286	0.027	306	0.016	232
DCP 5	.200	1.675	0.589	117	0.170	57	0.167	76	0.095	359	0.055	354	0.058	308	0.033	284	0.034	258	0.023	245
DCP 6	.250	1.184	0.512	105	0.100	61	0.154	54	0.051	0	0.061	330	0.036	311	0.036	257	0.025	259	0.014	199
DCP 7	.300	1.182	0.401	93	0.103	44	0.116	47	0.064	337	0.051	319	0.046	280	0.036	251	0.032	224	0.020	209
DCP 8	.500	0.732	0.259	61	0.053	11	0.055	356	0.029	305	0.031	263	0.025	252	0.020	202	0.020	197	0.012	136
DCP 9	.600	0.674	0.215	46	0.062	9	0.055	322	0.045	294	0.038	211	0.024	220	0.021	150	0.015	150	0.005	72
DCP10	.695	0.631	0.207	25	0.057	346	0.048	296	0.040	285	0.032	212	0.024	225	0.017	158	0.012	158	0.009	178
DCP11	.800	0.532	0.182	6	0.055	351	0.053	276	0.038	272	0.034	186	0.025	195	0.020	107	0.011	124	0.005	29
DCP12	.953	0.224	0.201	353	0.040	340	0.034	275	0.014	28[illegible]	0.018	225	0.015	179	0.009	171	0.020	104	0.007	47

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.63	0.400	17.51	4.83		1146.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.063	443.7	739.0	0.47E 07	-0.00111	1.547	16.24

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.104	0.320	110	0.086	177	0.035	143	0.026	179	0.008	127	0.008	149	0.004	60	0.004	143	0.005	195
CM		-0.070	0.062	192	0.025	209	0.015	238	0.008	249	0.009	239	0.006	276	0.003	249	0.002	282	0.001	348
DCP 1	.010	5.288	1.501	118	0.516	165	0.141	188	0.071	203	0.073	146	0.049	135	0.012	48	0.014	313	0.012	306
DCP 2	.050	3.021	1.254	151	0.472	190	0.273	222	0.236	249	0.196	290	0.148	329	0.091	14	0.058	73	0.049	119
DCP 3	.100	2.029	1.179	151	0.344	212	0.198	183	0.135	229	0.084	210	0.078	254	0.047	203	0.051	281	0.023	315
DCP 4	.150	1.754	0.757	134	0.311	200	0.084	176	0.081	186	0.053	187	0.037	226	0.012	248	0.016	243	0.013	266
DCP 5	.200	1.556	0.600	125	0.246	199	0.050	147	0.098	177	0.040	203	0.044	184	0.029	204	0.019	228	0.015	242
DCP 6	.250	1.182	0.487	112	0.195	180	0.047	139	0.060	144	0.041	146	0.022	151	0.012	181	0.010	242	0.006	243
DCP 7	.300	1.148	0.416	102	0.150	176	0.038	128	0.059	148	0.036	160	0.034	173	0.023	178	0.017	210	0.011	235
DCP 8	.500	0.764	0.271	72	0.053	132	0.035	98	0.027	95	0.031	90	0.026	137	0.012	118	0.018	131	0.011	196
DCP 9	.600	0.730	0.228	59	0.047	73	0.042	87	0.019	87	0.036	71	0.021	119	0.012	84	0.016	143	0.014	188
DCP10	.695	0.705	0.204	41	0.063	34	0.048	69	0.014	76	0.038	44	0.025	81	0.015	57	0.012	85	0.005	95
DCP11	.800	0.609	0.184	31	0.076	30	0.052	69	0.014	73	0.030	37	0.022	78	0.009	42	0.009	64	0.010	145
DCP12	.953	0.311	0.152	14	0.083	28	0.040	64	0.018	71	0.015	46	0.014	47	0.017	19	0.007	48	0.005	352

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.41	0.400	24.57	4.86		1146.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.062	443.8	738.7	0.47E 07	-0.00202	1.112	27.63

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.001	0.109	50	0.023	194	0.007	308	0.009	279	0.002	219	0.005	257	0.002	75	0.002	205	0.005	34
CM		-0.126	0.041	204	0.005	31	0.002	170	0.000	186	0.001	14	0.000	63	0.000	23	0.000	244	0.001	203
DCP 1	.010	3.432	1.519	167	0.281	90	0.279	234	0.095	237	0.038	272	0.070	249	0.048	90	0.044	292	0.010	91
DCP 2	.050	1.979	0.384	167	0.143	265	0.032	88	0.050	297	0.005	103	0.010	345	0.009	336	0.002	154	0.021	10
DCP 3	.100	1.367	0.178	24	0.030	186	0.030	29	0.013	276	0.004	32	0.012	279	0.004	7	0.003	161	0.007	72
DCP 4	.150	1.441	0.195	27	0.029	176	0.016	20	0.012	317	0.003	33	0.004	272	0.002	274	0.008	204	0.006	25
DCP 5	.200	1.330	0.190	22	0.028	195	0.009	13	0.010	297	0.002	189	0.006	232	0.002	51	0.008	157	0.008	65
DCP 6	.250	1.085	0.199	27	0.028	175	0.014	25	0.007	282	0.005	56	0.003	275	0.001	37	0.003	232	0.006	42
DCP 7	.300	1.094	0.197	21	0.034	195	0.010	352	0.008	271	0.005	213	0.008	223	0.001	195	0.012	177	0.003	84
DCP 8	.500	0.846	0.181	29	0.025	197	0.012	345	0.004	258	0.003	237	0.003	263	0.002	39	0.004	296	0.006	22
DCP 9	.600	0.835	0.168	34	0.026	194	0.012	359	0.008	353	0.006	70	0.005	55	0.007	48	0.006	80	0.009	24
DCP10	.695	0.832	0.143	38	0.022	187	0.005	338	0.002	293	0.007	217	0.003	306	0.002	114	0.003	85	0.006	10
DCP11	.800	0.730	0.117	43	0.021	205	0.009	291	0.006	296	0.005	222	0.003	209	0.005	147	0.006	182	0.003	26
DCP12	.953	0.423	0.088	43	0.017	236	0.006	269	0.005	236	0.005	188	0.007	260	0.005	255	0.008	344	0.002	77

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.93	0.600	-0.01	4.90		1383.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.043	653.2	1400.6	0.61E 07	-0.00096	0.537	4.92

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		-0.093	0.600	352	0.063	193	0.014	253	0.003	200	0.003	204	0.002	188	0.002	162	0.001	214	0.001	353
CM		-0.017	0.010	288	0.004	230	0.002	301	0.001	49	0.001	179	0.000	324	0.000	77	0.000	332	0.000	340
DCP 1	.010	-1.767	1.942	343	0.934	232	0.18[illegible]	282	0.186	208	0.048	277	0.047	133	0.010	161	0.023	104	0.010	47
DCP 2	.050	-0.731	2.235	347	0.173	198	0.179	313	0.085	42	0.034	272	0.038	16	0.020	212	0.028	316	0.011	24
DCP 3	.100	-0.213	2.00[illegible]	350	0.180	178	0.022	197	0.065	49	0.056	138	0.015	350	0.020	167	0.012	204	0.014	50
DCP 4	.150	-0.062	1.325	351	0.134	130	0.067	175	0.051	40	0.033	179	0.050	203	0.043	75	0.017	280	0.022	237
DCP 5	.200	0.203	0.972	355	0.116	134	0.046	213	0.018	231	0.027	133	0.017	267	0.006	33	0.008	145	0.001	320
DCP 6	.250	-0.115	0.789	352	0.069	131	0.045	165	0.026	228	0.003	188	0.016	216	0.010	300	0.004	81	0.004	323
DCP 7	.300	-0.011	0.594	355	0.065	186	0.016	209	0.027	225	0.006	301	0.002	213	0.004	285	0.003	130	0.002	283
DCP 8	.500	-0.044	0.330	354	0.048	217	0.006	298	0.009	209	0.003	315	0.003	123	0.003	247	0.001	138	0.001	10
DCP 9	.600	0.012	0.257	357	0.032	208	0.005	277	0.007	232	0.005	342	0.003	90	0.001	108	0.001	152	0.004	155
DCP10	.695	0.021	0.189	3	0.026	190	0.004	206	0.004	245	0.008	332	0.002	29	0.001	190	0.003	129	0.003	330
DCP11	.800	-0.023	0.150	358	0.005	164	0.001	99	0.006	206	0.002	60	0.004	131	0.005	194	0.003	248	0.001	86
DCP12	.878	0.003	0.129	358	0.009	90	0.002	158	0.003	130	0.001	151	0.003	186	0.001	206	0.001	176	0.001	111
DCP13	.953	-0.004	0.111	359	0.010	111	0.004	182	0.001	2	0.001	239	0.002	303	0.002	283	0.000	111	0.002	145

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.75	0.600	7.35	4.83		1083.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.043	653.1	1396.6	0.60E 07	-0.00098	1.017	11.23

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.703	0.383	0	0.[illegible]88	67	0.003	143	0.008	28	0.005	268	0.002	215	0.002	176	0.003	308	0.004	222
CM		-0.021	0.022	195	.017	78	0.001	293	0.004	83	0.002	45	0.001	352	0.000	355	0.000	172	0.001	46
DCP 1	.010	1.541	1.822	355	0.315	76	0.091	153	0.008	343	0.020	189	0.021	176	0.004	32	0.014	172	0.008	87
DCP 2	.050	1.926	1.069	355	0.286	75	0.043	184	0.004	169	0.026	52	0.012	199	0.016	119	0.007	345	0.013	72
DCP 3	.100	2.130	0.899	348	0.424	78	0.028	141	0.042	128	0.063	38	0.035	299	0.027	296	0.017	307	0.015	223
DCP 4	.150	1.731	0.501	4	0.561	77	0.049	193	0.167	67	0.077	172	0.020	47	0.042	131	0.036	279	0.023	293
DCP 5	.200	1.309	0.481	6	0.247	59	0.053	327	0.053	71	0.022	348	0.030	44	0.016	147	0.017	61	0.026	124
DCP 6	.250	0.935	0.518	7	0.119	68	0.050	28	0.034	44	0.035	356	0.019	68	0.019	356	0.018	70	0.018	349
DCP 7	.300	0.752	0.433	5	0.107	35	0.047	335	0.035	320	0.049	291	0.020	241	0.021	261	0.010	198	0.011	221
DCP 8	.500	0.437	0.271	7	0.008	340	0.016	137	0.018	304	0.016	231	0.012	171	0.007	79	0.006	299	0.004	221
DCP 9	.600	0.363	0.206	6	0.011	346	0.007	120	0.015	250	0.008	150	0.003	244	0.006	151	0.003	57	0.004	207
DCP10	.695	0.295	0.176	7	0.028	248	0.020	137	0.012	296	0.008	181	0.002	9	0.000	184	0.007	313	0.011	197
DCP11	.800	0.234	0.169	3	0.037	258	0.011	167	0.008	241	0.008	184	0.003	152	0.004	161	0.004	54	0.004	241
DCP12	.878	0.222	0.169	358	0.036	249	0.007	261	0.014	209	0.006	116	0.002	332	0.004	156	0.005	34	0.007	283
DCP13	.953	0.156	0.186	356	0.031	249	0.005	320	0.004	232	0.015	264	0.007	164	0.006	300	0.008	235	0.003	194

FORCED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.81	0.600	9.62	4.77		1383.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.043	653.0	1397.5	0.60E 07	-0.00075	1.040	12.98

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.848	0.221	13	0.076	77	0.017	164	0.011	121	0.006	119	0.006	222	0.006	122	0.001	20	0.001	315
CM		-0.032	0.043	186	0.012	71	0.004	213	0.001	209	0.001	231	0.001	205	0.000	43	0.001	274	0.001	89
CCP 1	.010	2.327	1.249	358	0.202	96	0.054	155	0.019	164	0.003	148	0.012	179	0.005	121	0.006	278	0.018	137
CCP 2	.050	2.289	0.484	3	0.297	80	0.037	285	0.032	196	0.014	9	0.029	227	0.024	128	0.010	349	0.016	70
CCP 3	.100	2.361	0.061	36	0.428	66	0.091	249	0.048	142	0.011	271	0.038	216	0.021	187	0.015	151	0.021	328
CCP 4	.150	1.982	0.294	154	0.153	70	0.179	176	0.045	270	0.021	159	0.032	247	0.020	42	0.008	255	0.015	352
CCP 5	.200	1.473	0.193	40	0.254	77	0.118	157	0.013	238	0.011	211	0.031	240	0.011	337	0.028	38	0.007	10
CCP 6	.250	1.094	0.277	30	0.200	87	0.039	184	0.057	126	0.033	184	0.021	275	0.008	94	0.024	324	0.008	92
CCP 7	.300	0.900	0.283	21	0.136	73	0.029	104	0.058	90	0.039	127	0.020	126	0.025	126	0.010	222	0.009	188
CCP 8	.500	0.545	0.236	16	0.006	256	0.008	102	0.017	119	0.017	34	0.005	195	0.007	92	0.002	145	0.007	123
CCP 9	.600	0.448	0.212	8	0.019	228	0.013	52	0.006	218	0.007	80	0.003	112	0.004	54	0.003	70	0.007	298
CCP10	.695	0.384	0.199	12	0.042	253	0.011	98	0.006	328	0.006	344	0.005	249	0.002	80	0.009	335	0.011	235
CCP11	.800	0.323	0.192	4	0.021	252	0.011	32	0.007	355	0.003	50	0.008	358	0.000	207	0.006	35	0.006	283
CCP12	.878	0.297	0.204	357	0.016	223	0.013	0	0.005	57	0.004	27	0.012	344	0.013	231	0.011	98	0.012	324
CCP13	.953	0.209	0.209	0	0.005	191	0.014	356	0.008	325	0.013	216	0.007	59	0.005	234	0.011	157	0.009	104

FORCED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.00	0.600	12.19	4.79		1384.1	5

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.041	653.1	1397.1	0.60E 07	-0.00092	1.090	12.19

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.954	0.102	46	0.048	102	0.009	30	0.004	285	0.000	356	0.007	167	0.008	95	0.002	218	0.007	104
CM		-0.052	0.061	186	0.010	46	0.000	326	0.003	351	0.001	226	0.003	56	0.002	294	0.002	223	0.002	145
CCP 1	.010	2.898	0.873	1	0.166	101	0.019	331	0.015	217	0.012	33	0.019	248	0.007	0	0.015	244	0.017	93
CCP 2	.050	2.308	0.262	161	0.365	85	-0.045	37	0.042	15	0.023	256	0.032	123	0.021	332	0.042	274	0.036	125
CCP 3	.100	2.471	0.646	165	0.362	69	0.051	181	0.083	28	0.040	191	0.066	107	0.049	94	0.016	109	0.025	79
CCP 4	.150	1.885	0.535	167	0.082	272	0.097	13	0.046	270	0.024	328	0.029	110	0.023	104	0.019	220	0.023	91
CCP 5	.200	1.608	0.238	141	0.091	79	0.015	39	0.005	324	0.034	174	0.025	130	0.015	67	0.016	250	0.029	116
CCP 6	.250	1.263	0.180	112	0.120	91	0.032	7	0.011	248	0.007	220	0.029	136	0.013	71	0.024	217	0.024	153
CCP 7	.300	1.058	0.136	72	0.056	132	0.002	54	0.038	266	0.022	34	0.013	309	0.003	269	0.014	232	0.019	137
CCP 8	.500	0.642	0.215	15	0.032	148	0.010	28	0.007	149	0.008	10	0.005	230	0.014	83	0.011	317	0.003	232
CCP 9	.600	0.553	0.247	12	0.037	228	0.007	177	0.008	163	0.002	13	0.026	269	0.017	202	0.012	2	0.018	251
CCP10	.695	0.525	0.218	6	0.024	190	0.008	32	0.006	140	0.010	191	0.016	255	0.019	171	0.010	346	0.004	233
CCP11	.800	0.433	0.225	10	0.026	223	0.006	237	0.004	124	0.010	311	0.012	195	0.011	33	0.011	87	0.030	16
CCP12	.878	0.307	0.225	5	0.020	195	0.002	61	0.020	181	0.014	82	0.016	195	0.015	94	0.015	53	0.014	349
CCP13	.953	0.293	0.188	7	0.026	138	0.008	107	0.005	83	0.004	187	0.017	118	0.016	59	0.018	137	0.016	105

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.58	0.600	14.83	4.81		1145.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.042	653.0	1448.2	0.63E 07	-0.00140	1.080	18.99

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.983	0.084	49	0.008	246	0.002	51	0.005	197	0.004	107	0.004	39	0.007	335	0.006	11	0.008	135
CM		-0.073	0.048	195	0.006	313	0.002	61	0.002	41	0.001	340	0.002	33	0.000	300	0.002	109	0.003	271
DCP 1	.010	3.305	0.599	3	0.139	90	0.027	278	0.018	211	0.016	137	0.004	350	0.013	183	0.013	9	0.009	304
DCP 2	.050	2.464	0.251	167	0.074	53	0.082	170	0.076	43	0.025	14	0.055	30	0.025	284	0.007	70	0.019	177
DCP 3	.100	2.105	0.527	181	0.241	289	0.090	27	0.040	245	0.042	30	0.014	98	0.045	348	0.049	110	0.024	204
DCP 4	.150	1.627	0.211	157	0.116	293	0.033	64	0.017	69	0.014	89	0.035	34	0.007	250	0.024	46	0.030	181
DCP 5	.200	1.457	0.147	148	0.037	263	0.051	31	0.012	146	0.017	222	0.016	35	0.012	44	0.020	5	0.022	143
DCP 6	.250	1.207	0.121	114	0.031	236	0.006	111	0.015	205	0.006	112	0.020	315	0.019	307	0.020	19	0.011	171
DCP 7	.300	1.087	0.112	90	0.025	184	0.016	51	0.014	139	0.007	123	0.010	352	0.019	336	0.020	6	0.011	150
DCP 8	.500	0.720	0.183	29	0.022	162	0.018	235	0.016	207	0.014	157	0.011	142	0.006	26	0.003	0	0.006	64
DCP 9	.600	0.670	0.188	19	0.020	134	0.024	231	0.006	261	0.017	212	0.008	143	0.009	304	0.003	271	0.005	70
DCP 10	.695	0.614	0.199	18	0.021	123	0.012	285	0.008	274	0.002	61	0.014	155	0.011	92	0.006	138	0.015	74
DCP 11	.800	0.577	0.176	12	0.008	128	0.004	108	0.014	247	0.006	19	0.012	264	0.009	319	0.018	268	0.017	74
DCP 12	.953	0.251	0.137	12	0.021	114	0.004	211	0.009	155	0.008	98	0.006	298	0.012	169	0.015	330	0.017	170

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.58	0.600	17.38	4.82		1145.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.042	653.0	1446.3	0.63E 07	-0.00138	1.117	20.50

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.009	0.081	66	0.007	6	0.018	251	0.009	189	0.006	227	0.006	237	0.001	69	0.002	125	0.004	39
CM		-0.097	0.039	198	0.006	250	0.004	111	0.001	357	0.001	17	0.001	136	0.001	268	0.001	110	0.001	170
DCP 1	.010	3.414	0.120	18	0.261	90	0.048	311	0.018	147	0.020	344	0.023	228	0.007	149	0.008	226	0.007	56
DCP 2	.050	2.334	0.400	176	0.093	267	0.110	196	0.042	224	0.016	92	0.031	210	0.017	270	0.013	114	0.021	266
DCP 3	.100	1.895	0.302	150	0.151	299	0.012	296	0.028	76	0.046	203	0.018	260	0.017	69	0.018	207	0.019	29
DCP 4	.150	1.509	0.179	152	0.055	248	0.025	184	0.028	201	0.007	351	0.019	203	0.024	253	0.023	79	0.005	130
DCP 5	.200	1.416	0.123	115	0.027	302	0.013	198	0.004	138	0.018	206	0.018	211	0.005	144	0.002	19	0.005	42
DCP 6	.250	1.201	0.127	110	0.038	235	0.018	274	0.005	107	0.009	298	0.003	308	0.016	294	0.011	336	0.022	67
DCP 7	.300	1.092	0.114	82	0.009	238	0.032	233	0.023	235	0.021	256	0.017	212	0.005	218	0.006	152	0.012	134
DCP 8	.500	0.795	0.143	41	0.015	90	0.019	297	0.017	157	0.007	236	0.010	70	0.019	34	0.014	83	0.009	38
DCP 9	.600	0.743	0.156	22	0.025	40	0.020	276	0.004	216	0.006	147	0.013	318	0.016	113	0.009	194	0.012	188
DCP 10	.695	0.703	0.156	22	0.048	65	0.009	305	0.007	114	0.008	264	0.011	347	0.006	159	0.006	343	0.007	354
DCP 11	.800	0.675	0.140	22	0.026	45	0.022	259	0.004	226	0.003	241	0.007	284	0.005	183	0.011	273	0.015	0
DCP 12	.953	0.324	0.103	15	0.010	137	0.016	288	0.011	186	0.009	121	0.013	213	0.006	312	0.002	292	0.006	238

FORCED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.58	0.600	24.43	4.83		1145.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.042	653.1	1445.4	0.62E 07	-0.00196	1.159	26.87

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.085	0.086	70	0.028	216	0.006	347	0.010	350	0.006	127	0.006	236	0.002	186	0.003	40	0.003	166
CM		-0.145	0.031	211	0.009	30	0.001	177	0.000	89	0.001	332	0.002	60	0.000	160	0.001	200	0.000	301
DCP 1	.010	2.990	0.832	171	0.080	305	0.085	140	0.075	324	0.014	263	0.031	279	0.025	196	0.011	248	0.006	271
DCP 2	.050	2.004	0.224	137	0.050	67	0.026	29	0.018	33	0.001	209	0.013	340	0.009	73	0.012	38	0.010	135
DCP 3	.100	1.767	0.085	129	0.015	69	0.046	295	0.061	13	0.024	107	0.008	247	0.003	96	0.011	95	0.018	151
DCP 4	.150	1.499	0.092	113	0.046	237	0.017	15	0.022	200	0.017	332	0.019	111	0.015	215	0.005	184	0.011	259
DCP 5	.200	1.439	0.102	68	0.021	193	0.018	313	0.027	2	0.012	109	0.012	233	0.006	134	0.011	148	0.010	190
DCP 6	.250	1.278	0.094	52	0.030	205	0.005	90	0.002	315	0.009	49	0.014	99	0.011	192	0.003	345	0.002	199
DCP 7	.300	1.184	0.117	44	0.037	221	0.007	330	0.018	3	0.020	122	0.007	225	0.007	146	0.003	27	0.006	162
DCP 8	.500	0.958	0.127	42	0.045	222	0.007	356	0.009	285	0.003	88	0.004	182	0.005	179	0.005	35	0.002	82
DCP 9	.600	0.883	0.126	43	0.045	211	0.008	333	0.007	43	0.015	180	0.023	246	0.015	308	0.010	18	0.005	163
DCP 10	.695	0.864	0.112	41	0.040	218	0.015	302	0.010	355	0.012	152	0.011	238	0.003	267	0.002	306	0.004	234
DCP 11	.800	0.834	0.110	43	0.030	200	0.001	323	0.002	319	0.004	185	0.006	240	0.005	72	0.004	75	0.005	136
DCP 12	.953	0.494	0.078	51	0.025	208	0.013	64	0.003	259	0.004	43	0.003	310	0.001	106	0.007	10	0.003	26

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	32.95	0.200	-0.00	5.02		1387.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.245	224.7	195.5	0.25E 07	-0.00170	0.174	5.12

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		-0.220	0.379	2	0.026	199	0.009	168	0.013	204	0.009	232	0.012	240	0.007	191	0.009	191	0.008	191
CM		-0.040	0.031	286	0.005	64	0.001	17	0.004	43	0.002	76	0.003	72	0.002	27	0.002	12	0.003	21
DCP 1	.010	-3.878	2.867	343	0.167	110	0.072	149	0.022	144	0.026	138	0.016	193	0.019	147	0.013	139	0.015	79
DCP 2	.050	-1.152	1.257	348	0.082	171	0.022	126	0.035	124	0.016	242	0.016	169	0.006	129	0.022	155	0.006	73
DCP 3	.100	-0.840	0.969	351	0.061	201	0.028	198	0.034	223	0.017	212	0.016	231	0.013	197	0.024	235	0.012	200
DCP 4	.150	-0.203	0.650	355	0.046	192	0.010	142	0.013	158	0.006	154	0.012	240	0.013	179	0.010	218	0.005	197
DCP 5	.200	0.006	0.566	359	0.023	198	0.005	228	0.010	216	0.005	187	0.013	237	0.007	204	0.007	204	0.005	114
DCP 6	.250	-0.235	0.435	4	0.031	193	0.011	148	0.017	147	0.007	143	0.010	232	0.005	170	0.013	195	0.008	205
DCP 7	.300	-0.089	0.394	6	0.032	227	0.010	203	0.011	256	0.011	237	0.016	255	0.005	222	0.008	209	0.010	203
DCP 8	.500	0.043	0.229	24	0.025	204	0.010	148	0.008	184	0.006	241	0.013	251	0.009	167	0.003	135	0.003	189
DCP 9	.600	-0.038	0.203	25	0.015	227	0.007	260	0.033	231	0.022	236	0.019	240	0.012	198	0.019	237	0.017	184
DCP10	.695	0.085	0.154	43	0.025	248	0.008	115	0.015	172	0.002	219	0.006	215	0.005	208	0.004	114	0.008	194
DCP11	.800	-0.049	0.115	41	0.042	205	0.014	207	0.027	225	0.019	264	0.015	241	0.011	207	0.016	209	0.020	184
DCP12	.878	-0.004	0.094	44	0.011	265	0.003	270	0.018	230	0.008	262	0.012	241	0.005	211	0.008	187	0.012	230
DCP13	.953	-0.043	0.070	56	0.013	230	0.009	121	0.003	140	0.007	237	0.011	284	0.004	225	0.004	124	0.005	236

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.00	0.200	7.39	5.00		1087.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.245	224.6	195.0	0.25E 07	-0.00166	0.934	12.47

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.550	0.370	3	0.026	180	0.005	136	0.005	79	0.002	134	0.004	182	0.001	7	0.009	154	0.007	56
CM		-0.035	0.030	280	0.004	61	0.002	237	0.001	140	0.000	206	0.000	246	0.001	197	0.002	292	0.001	206
DCP 1	.010	1.049	2.296	345	0.137	144	0.028	177	0.017	123	0.022	159	0.023	202	0.017	229	0.028	137	0.006	49
DCP 2	.050	1.338	1.274	346	0.083	136	0.024	234	0.050	104	0.004	138	0.019	177	0.010	43	0.033	225	0.010	28
DCP 3	.100	1.136	0.956	353	0.057	150	0.024	177	0.004	141	0.009	191	0.005	325	0.007	189	0.029	204	0.018	123
DCP 4	.150	1.068	0.684	355	0.057	185	0.010	123	0.010	96	0.006	101	0.008	178	0.004	166	0.014	83	0.009	56
DCP 5	.200	0.947	0.536	0	0.039	183	0.009	282	0.005	133	0.008	174	0.018	188	0.002	78	0.021	184	0.010	96
DCP 6	.250	0.746	0.458	2	0.028	175	0.010	115	0.012	31	0.006	77	0.003	201	0.005	292	0.012	93	0.005	95
DCP 7	.300	0.714	0.414	8	0.020	181	0.010	117	0.006	94	0.006	106	0.010	125	0.007	18	0.013	188	0.017	52
DCP 8	.500	0.518	0.235	20	0.020	209	0.006	162	0.008	29	0.005	288	0.007	229	0.002	67	0.016	109	0.004	159
DCP 9	.600	0.405	0.199	35	0.026	210	0.010	42	0.003	63	0.004	117	0.005	10	0.008	292	0.016	148	0.017	43
DCP10	.695	0.323	0.137	40	0.020	243	0.006	116	0.006	20	0.004	253	0.007	208	0.006	66	0.012	73	0.007	337
DCP11	.800	0.167	0.130	48	0.030	207	0.001	59	0.006	260	0.003	177	0.006	179	0.010	261	0.018	235	0.008	114
DCP12	.878	0.162	0.114	55	0.004	145	0.009	69	0.002	117	0.010	44	0.014	46	0.008	26	0.004	39	0.013	19
DCP13	.953	0.040	0.070	39	0.011	196	0.007	17	0.005	304	0.002	120	0.008	231	0.009	112	0.010	90	0.007	336

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.06	0.200	9.66	5.01		1387.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.246	224.6	195.2	0.25E 07	-0.00160	1.123	14.69

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.767	0.355	5	0.020	187	0.002	43	0.003	154	0.006	92	0.001	310	0.002	335	0.017	305	0.005	290
CM		-0.028	0.029	281	0.002	78	0.001	149	0.000	270	0.002	245	0.001	113	0.001	154	0.004	133	0.001	48
DCP 1	.010	2.442	2.207	347	0.133	172	0.031	135	0.023	205	0.013	165	0.013	145	0.012	178	0.008	270	0.010	132
DCP 2	.050	2.083	1.225	350	0.053	155	0.026	109	0.020	62	0.007	138	0.016	54	0.011	118	0.051	343	0.018	194
DCP 3	.100	1.792	0.898	353	0.055	157	0.015	126	0.013	144	0.018	122	0.004	120	0.009	13	0.026	342	0.003	290
DCP 4	.150	1.435	0.673	357	0.032	191	0.012	354	0.002	219	0.003	94	0.007	75	0.002	74	0.010	302	0.003	104
DCP 5	.200	1.226	0.511	358	0.027	185	0.013	266	0.013	197	0.003	151	0.011	255	0.008	211	0.017	291	0.011	193
DCP 6	.250	1.077	0.440	7	0.025	193	0.012	45	0.003	77	0.008	85	0.015	63	0.006	2	0.015	322	0.006	181
DCP 7	.300	0.937	0.379	8	0.028	195	0.001	260	0.009	184	0.005	88	0.006	223	0.005	318	0.019	317	0.011	188
DCP 8	.500	0.646	0.236	27	0.019	237	0.006	333	0.007	270	0.005	108	0.004	34	0.004	185	0.012	288	0.008	285
DCP 9	.600	0.486	0.189	30	0.007	176	0.008	335	0.011	64	0.009	32	0.013	247	0.007	324	0.030	281	0.010	161
DCP10	.695	0.393	0.160	47	0.022	239	0.003	122	0.004	204	0.008	71	0.010	4	0.005	3	0.014	332	0.007	194
DCP11	.800	0.201	0.108	48	0.013	115	0.005	235	0.003	215	0.006	124	0.015	256	0.004	276	0.022	281	0.007	258
DCP12	.878	0.171	0.094	53	0.004	170	0.001	302	0.010	88	0.008	62	0.004	121	0.009	353	0.013	279	0.003	148
DCP13	.953	0.051	0.081	45	0.011	210	0.012	19	0.001	99	0.007	62	0.009	32	0.008	354	0.012	294	0.002	7

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.06	0.200	12.28	5.06		1087.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.246	224.6	194.7	0.25E 07	-0.00152	1.357	17.37

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.011	0.343	5	0.011	223	0.002	328	0.001	80	0.003	85	0.005	89	0.003	224	0.006	30	0.003	172
CM		-0.020	0.028	283	0.003	127	0.001	358	0.001	213	0.000	28	0.001	271	0.000	145	0.002	134	0.001	68
DCP 1	.010	3.918	2.234	347	0.094	183	0.042	324	0.043	203	0.042	94	0.032	7	0.022	189	0.015	53	0.014	117
DCP 2	.050	2.888	1.188	348	0.054	199	0.008	168	0.016	202	0.009	101	0.009	119	0.014	228	0.009	99	0.005	233
DCP 3	.100	2.436	0.904	354	0.026	191	0.021	330	0.007	71	0.010	357	0.003	245	0.005	276	0.015	146	0.010	166
DCP 4	.150	1.958	0.629	357	0.019	154	0.004	324	0.003	129	0.004	285	0.007	68	0.009	227	0.007	2	0.004	193
DCP 5	.200	1.618	0.497	1	0.017	145	0.002	22	0.008	330	0.010	21	0.010	145	0.004	299	0.009	13	0.007	150
DCP 6	.250	1.409	0.399	6	0.012	190	0.004	117	0.002	95	0.006	20	0.006	134	0.002	20	0.011	36	0.006	170
DCP 7	.300	1.191	0.375	8	0.007	226	0.008	7	0.005	5	0.003	139	0.008	113	0.006	305	0.004	232	0.011	109
DCP 8	.500	0.796	0.212	28	0.016	273	0.003	170	0.008	88	0.003	77	0.005	57	0.006	161	0.007	48	0.004	166
DCP 9	.600	0.618	0.185	36	0.011	237	0.003	187	0.010	301	0.010	105	0.003	144	0.013	185	0.019	0	0.005	143
DCP10	.695	0.419	0.142	47	0.011	273	0.006	199	0.012	71	0.007	99	0.006	75	0.003	224	0.005	20	0.008	227
DCP11	.800	0.242	0.121	50	0.021	324	0.007	16	0.005	271	0.008	257	0.008	96	0.005	2	0.009	20	0.017	334
DCP12	.878	0.187	0.100	46	0.008	219	0.005	24	0.002	310	0.005	231	0.001	26	0.002	323	0.007	14	0.008	210
DCP13	.953	0.086	0.056	28	0.007	287	0.012	219	0.004	134	0.002	312	0.012	88	0.006	344	0.005	78	0.006	159

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	32.57	0.200	15.03	5.21		1157.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.242	224.5	202.8	0.26E 07	-0.00106	1.742	20.36

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.387	0.378	4	0.019	113	0.013	240	0.007	267	0.005	247	0.008	166	0.001	254	0.003	86	0.005	190
CM		-0.049	0.020	265	0.002	180	0.002	358	0.003	88	0.001	289	0.001	46	0.001	154	0.001	250	0.001	37
DCP 1	.010	5.481	1.950	349	0.260	79	0.088	288	0.061	35	0.127	259	0.047	175	0.038	213	0.052	142	0.017	146
DCP 2	.050	4.152	1.270	350	0.081	183	0.032	255	0.018	156	0.021	233	0.012	109	0.017	125	0.012	218	0.009	136
DCP 3	.100	2.857	0.960	354	0.044	126	0.027	247	0.017	229	0.007	23	0.012	164	0.014	220	0.005	224	0.005	58
DCP 4	.150	2.343	0.658	1	0.036	128	0.015	229	0.010	161	0.013	177	0.018	105	0.010	132	0.007	310	0.009	195
DCP 5	.200	2.401	0.535	5	0.017	121	0.026	274	0.014	245	0.006	321	0.016	155	0.004	333	0.006	28	0.007	108
DCP 6	.250	2.056	0.455	7	0.021	144	0.006	206	0.002	62	0.005	184	0.010	92	0.004	127	0.008	22	0.010	210
DCP 7	.300	1.587	0.431	9	0.031	165	0.010	288	0.010	271	0.006	300	0.017	142	0.004	318	0.005	57	0.006	164
DCP 8	.500	0.846	0.271	19	0.015	97	0.017	234	0.008	302	0.003	297	0.005	204	0.001	121	0.007	10	0.011	221
DCP 9	.600	0.880	0.216	20	0.016	94	0.015	231	0.028	298	0.015	108	0.013	215	0.008	259	0.009	72	0.006	298
DCP 10	.695	0.745	0.157	32	0.015	79	0.014	149	0.016	212	0.008	238	0.014	159	0.018	19	0.003	94	0.006	227
DCP 11	.800	0.660	0.121	32	0.007	58	0.007	212	0.010	249	0.004	245	0.011	229	0.009	261	0.006	129	0.004	135
DCP 12	.953	0.094	0.053	2	0.021	347	0.012	186	0.007	289	0.002	230	0.005	357	0.001	106	0.003	134	0.007	156

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	32.52	0.200	17.50	5.20		1157.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.242	224.5	201.9	0.26E 07	0.00275	1.985	20.33

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.457	0.543	359	0.152	145	0.075	332	0.040	164	0.028	356	0.010	153	0.009	47	0.006	197	0.004	110
CM		-0.081	0.046	99	0.044	278	0.027	113	0.015	316	0.013	150	0.008	338	0.004	204	0.004	23	0.002	242
DCP 1	.010	5.592	2.355	13	0.187	224	0.236	137	0.224	46	0.057	239	0.141	53	0.082	311	0.027	97	0.022	310
DCP 2	.050	4.185	1.565	13	0.205	233	0.073	101	0.037	28	0.027	209	0.045	77	0.019	279	0.019	180	0.015	356
DCP 3	.100	2.649	1.260	21	0.205	242	0.084	76	0.038	260	0.040	55	0.029	293	0.010	72	0.008	14	0.006	129
DCP 4	.150	2.204	0.976	23	0.218	208	0.117	27	0.079	209	0.033	41	0.008	203	0.006	67	0.010	146	0.008	131
DCP 5	.200	2.384	0.868	9	0.281	180	0.170	1	0.067	198	0.016	77	0.032	334	0.025	168	0.017	25	0.014	213
DCP 6	.250	2.151	0.809	4	0.322	173	0.158	5	0.064	218	0.024	100	0.009	340	0.010	99	0.016	174	0.006	148
DCP 7	.300	1.682	0.785	355	0.326	162	0.153	1	0.069	238	0.043	95	0.031	325	0.015	166	0.018	61	0.011	246
DCP 8	.500	0.972	0.461	344	0.264	128	0.129	328	0.096	190	0.060	25	0.030	228	0.038	118	0.019	304	0.028	166
DCP 9	.600	0.912	0.362	328	0.233	103	0.135	304	0.077	146	0.080	0	0.035	207	0.036	64	0.025	297	0.025	127
DCP 10	.695	0.883	0.247	326	0.176	103	0.113	293	0.085	145	0.073	326	0.055	164	0.034	17	0.037	239	0.020	86
DCP 11	.800	0.854	0.183	304	0.153	89	0.102	283	0.075	110	0.065	312	0.048	140	0.035	353	0.031	180	0.030	11
DCP 12	.953	0.161	0.072	292	0.070	81	0.057	257	0.044	73	0.036	280	0.035	97	0.019	303	0.015	126	0.009	343

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	32.47	0.200	24.61	5.13		1157.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.242	224.5	202.0	0.26E 07	-0.00234	1.371	29.82

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.120	0.287	48	0.049	193	0.052	123	0.020	346	0.017	252	0.006	176	0.006	340	0.007	334	0.001	353
CM		-0.173	0.087	210	0.007	310	0.014	264	0.004	162	0.002	13	0.000	170	0.004	159	0.001	142	0.000	222
DCP 1	.010	3.143	1.183	160	0.219	118	0.270	204	0.036	8	0.084	295	0.082	303	0.059	218	0.034	347	0.009	71
DCP 2	.050	2.075	0.555	149	0.221	244	0.102	185	0.102	271	0.050	255	0.056	208	0.017	151	0.009	42	0.018	13
DCP 3	.100	1.047	0.247	82	0.187	234	0.022	351	0.049	27	0.020	307	0.015	85	0.012	62	0.021	14	0.011	257
DCP 4	.150	1.121	0.331	39	0.063	194	0.063	149	0.008	45	0.030	248	0.023	148	0.009	143	0.005	297	0.002	348
DCP 5	.200	1.605	0.354	36	0.052	194	0.071	131	0.012	30	0.021	258	0.021	146	0.000	105	0.008	332	0.006	197
DCP 6	.250	1.539	0.349	36	0.066	202	0.070	146	0.009	7	0.023	237	0.024	143	0.005	169	0.007	250	0.006	241
DCP 7	.300	1.280	0.384	35	0.053	206	0.072	133	0.024	30	0.025	257	0.021	157	0.004	61	0.006	301	0.005	217
DCP 8	.500	0.979	0.422	35	0.062	189	0.082	117	0.027	4	0.022	251	0.007	128	0.017	5	0.006	281	0.001	4
DCP 9	.600	0.860	0.387	37	0.046	159	0.085	94	0.032	347	0.013	231	0.010	63	0.020	340	0.013	17	0.011	34
DCP10	.695	1.106	0.354	38	0.058	169	0.065	100	0.024	343	0.021	230	0.008	238	0.011	296	0.003	248	0.011	28
DCP11	.800	1.132	0.324	42	0.040	121	0.066	63	0.022	334	0.008	101	0.013	306	0.016	339	0.016	356	0.007	269
DCP12	.953	0.348	0.201	36	0.015	15	0.017	132	0.014	287	0.007	204	0.003	186	0.006	316	0.006	258	0.006	131

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.11	0.400	0.06	5.05		1088.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.125	444.1	725.6	0.47E 07	-0.00101	0.374	5.16

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		-0.102	0.465	351	0.038	186	0.011	247	0.004	216	0.003	195	0.003	240	0.002	287	0.004	100	0.003	222
CM		-0.021	0.019	276	0.002	151	0.001	251	0.000	75	0.000	231	0.000	201	0.001	198	0.002	249	0.001	346
DCP 1	.010	-2.037	2.204	344	0.801	210	0.390	277	0.043	50	0.158	208	0.135	274	0.050	342	0.029	196	0.046	267
DCP 2	.050	-0.795	1.803	342	0.124	88	0.054	135	0.014	314	0.043	68	0.053	140	0.039	221	0.004	155	0.016	182
DCP 3	.100	-0.280	1.330	345	0.082	111	0.041	138	0.040	214	0.013	9	0.016	114	0.021	201	0.004	172	0.010	74
DCP 4	.150	-0.096	0.884	347	0.041	108	0.043	126	0.036	204	0.019	290	0.008	37	0.010	174	0.011	263	0.010	332
DCP 5	.200	0.267	0.691	352	0.042	156	0.016	170	0.010	192	0.009	244	0.007	352	0.008	2	0.006	101	0.005	223
DCP 6	.250	-0.149	0.545	352	0.043	198	0.007	305	0.004	167	0.007	243	0.006	321	0.002	23	0.002	110	0.002	269
DCP 7	.300	0.004	0.471	355	0.052	200	0.019	279	0.003	41	0.005	106	0.005	238	0.003	337	0.010	104	0.004	269
DCP 8	.500	-0.042	0.281	3	0.035	195	0.010	257	0.003	282	0.001	218	0.003	287	0.002	331	0.003	32	0.003	163
DCP 9	.600	-0.018	0.219	4	0.026	194	0.010	260	0.002	332	0.005	168	0.002	188	0.004	338	0.014	87	0.005	239
DCP10	.695	0.050	0.168	12	0.014	196	0.005	259	0.003	204	0.001	352	0.001	326	0.002	308	0.003	93	0.001	185
DCP11	.800	-0.017	0.121	15	0.008	262	0.002	221	0.001	241	0.003	159	0.002	284	0.004	0	0.008	87	0.006	165
DCP12	.878	0.012	0.099	15	0.000	263	0.003	110	0.002	201	0.001	170	0.001	116	0.003	13	0.008	55	0.003	206
DCP13	.953	0.003	0.076	13	0.003	5	0.004	53	0.002	167	0.002	36	0.000	314	0.002	37	0.001	83	0.000	172

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.00	0.400	7.40	5.01		1088.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.124	444.0	721.9	0.46E 07	-0.00107	1.217	12.43

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.744	0.470	352	0.026	164	0.006	175	0.005	162	0.002	134	0.004	158	0.003	166	0.003	167	0.002	141
CM		-0.016	0.020	289	0.001	148	0.000	19	0.000	89	0.000	107	0.000	14	0.000	72	0.000	139	0.000	159
CCP 1	.010	2.626	3.084	343	0.204	190	0.138	118	0.033	4	0.033	205	0.031	121	0.012	111	0.015	139	0.012	79
CCP 2	.050	2.177	1.667	344	0.084	143	0.045	266	0.060	168	0.039	90	0.003	315	0.011	132	0.008	233	0.016	158
CCP 3	.100	1.920	1.230	346	0.075	160	0.009	222	0.012	186	0.005	124	0.008	123	0.007	157	0.007	176	0.008	137
CCP 4	.150	1.528	0.824	349	0.045	146	0.007	209	0.009	156	0.006	160	0.006	117	0.003	185	0.003	124	0.003	166
CCP 5	.200	1.381	0.667	350	0.035	144	0.014	199	0.008	174	0.002	207	0.010	185	0.009	170	0.007	174	0.011	140
CCP 6	.250	0.882	0.548	352	0.029	148	0.005	176	0.007	117	0.004	129	0.005	148	0.002	164	0.002	73	0.001	167
CCP 7	.300	0.864	0.480	353	0.027	154	0.006	183	0.007	140	0.001	11	0.004	183	0.008	215	0.009	170	0.007	135
CCP 8	.500	0.486	0.285	1	0.012	170	0.005	190	0.003	186	0.003	171	0.003	175	0.003	182	0.002	154	0.001	325
CCP 9	.600	0.400	0.215	7	0.009	156	0.004	166	0.002	139	0.001	5	0.001	175	0.006	78	0.002	53	0.002	6
CCP10	.695	0.348	0.154	11	0.005	161	0.003	185	0.003	118	0.001	209	0.004	221	0.001	260	0.001	54	0.001	280
CCP11	.800	0.203	0.115	19	0.012	185	0.003	155	0.003	206	0.002	261	0.006	173	0.002	175	0.004	236	0.002	32
CCP12	.878	0.187	0.091	24	0.005	195	0.003	148	0.002	234	0.000	312	0.001	89	0.000	334	0.000	254	0.001	144
CCP13	.953	0.122	0.075	15	0.007	225	0.001	169	0.001	257	0.002	100	0.003	111	0.001	252	0.003	329	0.002	330

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.11	0.400	9.70	5.05		1089.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.125	444.0	722.6	0.46E 07	-0.00111	1.444	14.79

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.962	0.443	359	0.012	271	0.011	185	0.007	10[illegible]	0.002	301	0.000	256	0.004	243	0.004	159	0.004	63
CM		-0.011	0.022	292	0.002	85	0.002	285	0.001	15	0.001	37	0.001	289	0.000	78	0.001	237	0.000	134
CCP 1	.010	4.106	3.118	348	0.176	212	0.081	326	0.146	209	0.084	108	0.009	256	0.045	92	0.036	328	0.009	196
CCP 2	.050	3.056	1.728	350	0.149	256	0.163	166	0.139	61	0.071	322	0.040	328	0.102	260	0.106	157	0.083	70
CCP 3	.100	2.466	1.082	354	0.066	63	0.035	299	0.016	181	0.002	97	0.006	192	0.009	131	0.011	343	0.010	244
CCP 4	.150	1.888	0.729	356	0.030	54	0.016	263	0.010	145	0.002	36	0.003	227	0.003	142	0.002	337	0.000	219
CCP 5	.200	1.671	0.586	358	0.026	46	0.014	257	0.010	119	0.003	38	0.000	113	0.003	126	0.001	307	0.005	211
CCP 6	.250	1.150	0.489	1	0.010	5	0.012	232	0.010	131	0.002	335	0.005	214	0.005	83	0.003	331	0.002	159
CCP 7	.300	1.071	0.437	3	0.011	351	0.015	185	0.008	121	0.005	324	0.006	197	0.005	109	0.003	35	0.006	353
CCP 8	.500	0.603	0.258	14	0.019	324	0.015	200	0.008	100	0.004	303	0.003	169	0.002	42	0.001	316	0.005	91
CCP 9	.600	0.469	0.196	21	0.017	323	0.009	202	0.007	86	0.008	257	0.006	124	0.002	312	0.005	176	0.003	23
CCP10	.695	0.406	0.155	25	0.018	283	0.012	154	0.006	41	0.007	189	0.003	51	0.006	275	0.003	154	0.002	14
CCP11	.800	0.262	0.119	29	0.021	259	0.011	129	0.005	339	0.008	218	0.006	71	0.006	251	0.005	121	0.007	60
CCP12	.878	0.234	0.100	20	0.023	216	0.015	86	0.008	310	0.005	181	0.002	355	0.006	228	0.004	132	0.002	319
CCP13	.953	0.164	0.096	1	0.030	194	0.013	60	0.003	282	0.001	255	0.002	215	0.003	149	0.003	49	0.003	254

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	32.89	0.400	12.29	4.94		1088.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.124	444.0	722.5	0.46E 07	0.00052	1.577	17.13

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.003	0.438	43	0.131	321	0.043	204	0.024	130	0.010	20	0.005	261	0.006	171	0.005	128	0.006	68
CM		-0.044	0.050	167	0.044	46	0.021	310	0.013	244	0.010	162	0.006	86	0.004	359	0.002	292	0.003	296
CCP 1	.010	4.195	2.063	33	0.611	15	0.161	326	0.114	320	0.158	252	0.129	159	0.119	71	0.099	338	0.079	253
CCP 2	.050	2.827	1.003	62	0.662	23	0.305	309	0.180	247	0.146	205	0.091	158	0.070	157	0.086	137	0.083	171
CCP 3	.100	2.255	0.899	77	0.601	15	0.275	271	0.121	185	0.074	141	0.069	86	0.051	0	0.034	306	0.015	330
CCP 4	.150	1.793	0.734	70	0.402	351	0.157	238	0.073	187	0.069	125	0.051	42	0.023	331	0.008	292	0.010	284
CCP 5	.200	1.583	0.640	64	0.326	337	0.120	220	0.049	161	0.064	122	0.030	353	0.011	291	0.002	258	0.004	192
CCP 6	.250	1.149	0.586	57	0.263	322	0.098	205	0.064	169	0.060	76	0.031	353	0.017	296	0.014	216	0.004	114
CCP 7	.300	1.100	0.547	49	0.229	306	0.096	186	0.057	144	0.062	63	0.028	341	0.011	305	0.011	209	0.010	140
CCP 8	.500	0.693	0.405	35	0.174	268	0.072	148	0.050	113	0.052	2	0.019	285	0.023	231	0.015	149	0.012	102
CCP 9	.600	0.558	0.327	28	0.146	255	0.065	147	0.054	83	0.040	347	0.028	275	0.025	193	0.015	117	0.014	66
CCP10	.695	0.519	0.288	15	0.143	236	0.064	135	0.051	74	0.042	331	0.029	269	0.029	175	0.014	85	0.015	53
CCP11	.800	0.412	0.247	2	0.129	230	0.063	129	0.052	50	0.038	310	0.027	238	0.018	138	0.006	77	0.019	10
CCP12	.878	0.368	0.231	350	0.112	220	0.061	129	0.046	36	0.029	304	0.024	208	0.017	96	0.008	51	0.015	348
CCP13	.953	0.261	0.178	335	0.054	202	0.032	136	0.024	25	0.010	290	0.008	234	0.008	108	0.005	40	0.006	345

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	32.36	0.400	15.07	4.99		1155.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.122	444.0	743.8	0.48E 07	-0.00041	1.657	18.33

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.072	0.426	69	0.093	17	0.056	349	0.031	258	0.018	192	0.010	147	0.015	77	0.007	3	0.003	346
CM		-0.053	0.069	182	0.034	95	0.022	75	0.017	11	0.010	324	0.007	274	0.005	220	0.003	151	0.002	116
CCP 1	.010	4.597	1.395	71	0.681	92	0.434	79	0.254	44	0.104	357	0.091	274	0.058	224	0.035	208	0.016	237
CCP 2	.050	3.104	1.104	106	0.671	78	0.361	52	0.218	14	0.089	11	0.059	15	0.081	56	0.083	50	0.090	52
CCP 3	.100	2.320	1.093	110	0.521	51	0.164	21	0.146	337	0.091	275	0.039	257	0.024	264	0.022	287	0.040	276
CCP 4	.150	1.765	0.835	100	0.269	28	0.141	28	0.128	302	0.042	251	0.044	239	0.021	168	0.016	248	0.021	193
CCP 5	.200	1.539	0.704	89	0.212	16	0.127	12	0.118	284	0.040	243	0.049	223	0.027	150	0.011	172	0.006	170
CCP 6	.250	1.325	0.628	80	0.159	0	0.123	0	0.097	262	0.038	244	0.044	192	0.019	138	0.009	154	0.008	189
CCP 7	.300	1.146	0.566	70	0.134	351	0.116	346	0.087	251	0.041	232	0.030	184	0.022	156	0.007	117	0.014	153
CCP 8	.500	0.711	0.424	52	0.092	312	0.095	309	0.063	218	0.053	190	0.029	128	0.034	97	0.013	31	0.014	30
CCP 9	.600	0.693	0.368	39	0.105	292	0.081	275	0.063	191	0.044	156	0.027	103	0.029	64	0.019	4	0.017	333
CCP10	.695	0.583	0.318	28	0.101	291	0.075	263	0.053	197	0.048	144	0.024	102	0.034	57	0.014	14	0.017	332
CCP11	.800	0.560	0.279	16	0.099	281	0.076	244	0.055	177	0.045	122	0.030	69	0.033	9	0.019	315	0.011	252
CCP12	.953	0.219	0.191	347	0.041	282	0.035	232	0.024	180	0.016	97	0.014	65	0.013	355	0.010	288	0.005	237

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	32.36	0.400	17.57	4.98		1156.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.122	444.0	739.2	0.47E 07	-0.00117	1.680	18.42

HARMONIC ANALYSIS

CATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.096	0.427	83	0.097	125	0.053	76	0.035	59	0.025	354	0.011	333	0.013	296	0.007	252	0.008	242
CM		-0.075	0.086	194	0.030	178	0.020	160	0.015	157	0.012	133	0.007	111	0.003	70	0.003	21	0.002	348
DCP 1	.010	4.607	1.036	114	0.924	170	0.527	172	0.305	168	0.116	139	0.069	83	0.024	55	0.033	27	0.070	279
DCP 2	.050	2.902	1.249	137	0.542	149	0.303	148	0.182	153	0.058	187	0.069	237	0.108	288	0.084	321	0.085	341
DCP 3	.100	2.191	1.246	128	0.321	140	0.280	122	0.107	110	0.076	105	0.024	142	0.017	200	0.042	229	0.046	234
DCP 4	.150	1.703	0.890	110	0.224	150	0.194	85	0.093	100	0.057	41	0.035	88	0.005	21	0.011	127	0.020	205
DCP 5	.200	1.494	0.743	100	0.194	142	0.145	71	0.099	95	0.040	43	0.039	82	0.011	86	0.010	147	0.021	182
DCP 6	.250	1.341	0.667	88	0.173	134	0.124	56	0.103	68	0.041	34	0.035	40	0.016	37	0.003	123	0.011	178
DCP 7	.300	1.165	0.595	80	0.159	122	0.106	53	0.102	60	0.043	40	0.035	38	0.027	30	0.003	99	0.010	198
DCP 8	.500	0.781	0.468	58	0.101	79	0.075	22	0.082	16	0.061	3	0.031	358	0.033	331	0.014	335	0.002	333
DCP 9	.600	0.747	0.425	44	0.076	44	0.057	355	0.066	350	0.065	325	0.033	310	0.023	275	0.020	232	0.008	228
DCP 10	.695	0.657	0.349	36	0.087	13	0.054	348	0.054	331	0.063	315	0.035	290	0.028	256	0.017	250	0.012	236
DCP 11	.800	0.647	0.306	25	0.093	353	0.059	330	0.044	311	0.049	284	0.033	267	0.021	240	0.024	137	0.010	165
DCP 12	.953	0.288	0.180	5	0.065	342	0.021	340	0.017	311	0.021	281	0.020	250	0.016	191	0.009	152	0.005	192

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	32.57	0.400	24.69	5.04		1156.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.123	444.0	741.2	0.48E 07	-0.00180	1.171	27.23

HARMONIC ANALYSIS

CATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.989	0.188	48	0.009	205	0.011	274	0.006	22	0.004	164	0.002	307	0.004	288	0.004	271	0.002	45
CM		-0.133	0.060	212	0.002	35	0.002	128	0.001	159	0.001	258	0.000	104	0.001	75	0.001	30	0.000	96
DCP 1	.010	3.068	1.539	173	0.319	94	0.285	206	0.087	90	0.083	192	0.020	192	0.043	106	0.013	346	0.053	88
DCP 2	.050	1.848	0.294	157	0.157	272	0.022	12	0.014	288	0.009	148	0.016	328	0.012	301	0.011	7	0.011	306
DCP 3	.100	1.438	0.261	34	0.026	242	0.033	0	0.014	67	0.011	167	0.009	279	0.008	327	0.011	327	0.004	67
DCP 4	.150	1.246	0.267	28	0.006	130	0.016	349	0.007	330	0.004	327	0.007	333	0.014	315	0.007	294	0.004	299
DCP 5	.200	1.254	0.280	30	0.022	222	0.012	335	0.007	354	0.004	159	0.002	58	0.007	290	0.007	321	0.004	97
DCP 6	.250	1.185	0.272	30	0.006	187	0.016	356	0.005	12	0.007	335	0.006	5	0.010	317	0.007	285	0.005	311
DCP 7	.300	1.124	0.286	31	0.018	216	0.013	307	0.006	349	0.003	156	0.001	115	0.007	288	0.008	279	0.002	93
DCP 8	.500	0.861	0.269	38	0.011	201	0.014	301	0.007	44	0.006	147	0.003	18	0.004	302	0.005	239	0.004	39
DCP 9	.600	0.817	0.267	38	0.009	175	0.013	293	0.009	331	0.001	237	0.002	244	0.008	275	0.008	239	0.004	155
DCP 10	.695	0.800	0.230	42	0.008	245	0.011	269	0.009	36	0.006	97	0.004	312	0.005	246	0.003	191	0.005	352
DCP 11	.800	0.786	0.213	44	0.005	180	0.009	250	0.007	317	0.002	154	0.004	288	0.004	237	0.006	202	0.005	227
DCP 12	.953	0.420	0.133	40	0.006	209	0.007	284	0.004	13	0.003	134	0.002	201	0.004	249	0.002	233	0.003	338

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.22	0.600	0.05	5.02		1389.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.085	653.7	1264.1	0.55E 07	-0.00116	0.546	5.06

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		-0.093	0.624	349	0.056	169	0.020	205	0.006	228	0.002	118	0.002	230	0.002	195	0.001	146	0.000	145
CM		-0.019	0.021	270	0.004	204	0.003	269	0.002	8	0.001	106	0.000	239	0.000	314	0.000	203	0.001	287
DCP 1	.010	-1.977	2.097	334	0.829	209	0.130	234	0.122	153	0.031	210	0.010	89	0.016	108	0.010	79	0.007	72
DCP 2	.050	-0.822	2.314	338	0.150	182	0.169	281	0.075	345	0.022	223	0.035	310	0.012	142	0.015	235	0.003	237
DCP 3	.100	-0.116	2.093	346	0.150	163	0.055	180	0.080	356	0.043	105	0.011	268	0.004	65	0.013	147	0.009	281
DCP 4	.150	-0.076	1.340	347	0.184	92	0.068	184	0.004	178	0.059	85	0.033	195	0.005	245	0.010	116	0.008	225
DCP 5	.200	0.258	1.040	353	0.116	119	0.060	180	0.023	249	0.022	99	0.020	202	0.011	262	0.003	236	0.006	290
DCP 6	.250	-0.083	0.810	349	0.070	117	0.047	153	0.033	211	0.008	356	0.015	138	0.012	228	0.004	323	0.002	13
DCP 7	.300	-0.008	0.642	356	0.060	162	0.031	173	0.034	218	0.014	294	0.000	140	0.005	250	0.004	336	0.001	53
DCP 8	.500	-0.048	0.347	358	0.048	194	0.007	225	0.011	177	0.006	268	0.003	6	0.001	92	0.002	79	0.003	112
DCP 9	.600	0.004	0.270	4	0.031	202	0.005	246	0.004	208	0.001	246	0.001	349	0.002	164	0.001	210	0.002	268
DCP10	.695	0.045	0.211	7	0.019	163	0.006	152	0.007	164	0.002	245	0.001	12	0.002	35	0.003	77	0.002	114
DCP11	.800	-0.019	0.156	8	0.010	138	0.007	115	0.004	196	0.001	102	0.001	63	0.003	140	0.001	217	0.008	98
DCP12	.878	-0.003	0.135	5	0.008	50	0.005	118	0.003	229	0.001	254	0.001	308	0.002	179	0.002	256	0.001	257
DCP13	.953	-0.000	0.123	1	0.013	44	0.007	107	0.003	162	0.002	242	0.001	231	0.001	67	0.001	96	0.001	219

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.11	0.600	7.39	4.96		1389.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.085	653.4	1411.8	0.61E 07	-0.00099	1.128	10.95

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.716	0.395	6	0.070	41	0.023	333	0.014	273	0.007	213	0.002	197	0.005	138	0.003	318	0.003	169
CM		-0.024	0.028	215	0.018	83	0.003	28	0.004	42	0.002	326	0.002	326	0.002	250	0.001	198	0.000	179
DCP 1	.010	1.527	1.796	351	0.225	47	0.020	125	0.027	194	0.012	175	0.008	168	0.003	102	0.001	51	0.002	9
DCP 2	.050	1.872	1.037	350	0.225	61	0.021	313	0.019	219	0.016	147	0.007	62	0.004	18	0.003	292	0.001	49
DCP 3	.100	2.260	0.890	350	0.402	78	0.090	1	0.054	270	0.007	282	0.022	237	0.018	270	0.011	266	0.027	168
DCP 4	.150	1.670	0.543	8	0.501	64	0.063	296	0.169	54	0.059	186	0.063	30	0.061	150	0.013	271	0.014	141
DCP 5	.200	1.356	0.561	13	0.182	52	0.114	355	0.034	350	0.045	327	0.021	53	0.011	8	0.020	357	0.012	141
DCP 6	.250	0.953	0.557	11	0.087	25	0.084	357	0.047	286	0.030	333	0.030	286	0.014	277	0.013	279	0.010	258
DCP 7	.300	0.777	0.462	15	0.095	11	0.070	340	0.065	278	0.032	273	0.035	240	0.021	215	0.012	198	0.007	199
DCP 8	.500	0.434	0.291	19	0.051	327	0.011	254	0.028	246	0.018	172	0.012	162	0.015	95	0.007	12	0.002	237
DCP 9	.600	0.371	0.233	20	0.038	309	0.009	243	0.020	242	0.011	165	0.007	161	0.011	98	0.007	359	0.006	54
DCP10	.695	0.319	0.195	19	0.045	273	0.019	154	0.009	236	0.015	126	0.009	49	0.005	354	0.002	290	0.001	4
DCP11	.800	0.253	0.173	16	0.041	274	0.012	219	0.014	200	0.005	117	0.007	150	0.007	90	0.006	29	0.004	101
DCP12	.878	0.236	0.174	7	0.042	262	0.014	248	0.017	196	0.006	164	0.012	128	0.009	51	0.005	3	0.004	296
DCP13	.953	0.160	0.187	354	0.044	236	0.008	239	0.013	177	0.002	109	0.004	111	0.001	337	0.001	85	0.001	138

FORCED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.22	0.600	9.68	4.91		1089.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.085	653.2	1409.2	0.61E 07	-0.00100	1.156	11.45

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.866	0.264	24	0.072	65	0.018	79	0.016	43	0.009	359	0.007	211	0.006	99	0.002	275	0.003	249
CM		-0.037	0.050	198	0.015	85	0.005	189	0.003	141	0.002	97	0.000	280	0.001	182	0.001	117	0.002	94
DCP 1	.010	2.310	1.299	358	0.154	73	0.032	72	0.021	276	0.007	54	0.004	208	0.003	116	0.001	136	0.005	224
DCP 2	.050	2.209	0.433	2	0.297	70	0.032	320	0.006	97	0.034	356	0.027	256	0.016	230	0.014	150	0.003	146
DCP 3	.100	2.505	0.095	47	0.448	73	0.039	239	0.086	82	0.053	338	0.032	186	0.017	135	0.014	105	0.014	178
DCP 4	.150	1.962	0.264	137	0.207	67	0.185	157	0.030	299	0.038	86	0.038	244	0.025	133	0.009	183	0.016	37
DCP 5	.200	1.500	0.318	50	0.271	81	0.089	145	0.040	86	0.009	204	0.037	242	0.016	20	0.009	4	0.002	327
DCP 6	.250	1.111	0.382	34	0.165	75	0.053	68	0.054	88	0.022	142	0.027	163	0.013	129	0.018	238	0.004	17
DCP 7	.300	0.924	0.367	36	0.128	65	0.072	57	0.063	64	0.035	62	0.019	112	0.031	92	0.004	337	0.012	187
DCP 8	.500	0.558	0.295	27	0.030	311	0.024	42	0.016	14	0.021	345	0.007	279	0.003	108	0.008	356	0.007	271
DCP 9	.600	0.461	0.250	25	0.026	281	0.026	45	0.022	348	0.015	302	0.003	286	0.004	256	0.005	88	0.010	332
DCP10	.695	0.424	0.233	19	0.044	263	0.017	11	0.012	284	0.017	297	0.011	213	0.004	[illegible]	0.013	233	0.008	154
DCP11	.800	0.345	0.221	16	0.038	265	0.018	19	0.018	311	0.011	272	0.001	107	0.007	347	0.011	304	0.016	277
DCP12	.878	0.318	0.224	8	0.035	273	0.017	343	0.017	29[illegible]	.009	236	0.003	185	0.006	65	0.010	329	0.011	268
DCP13	.953	0.204	0.208	359	0.018	302	0.020	296	0.005	356	.008	207	0.004	44	0.003	337	0.006	211	0.004	85

FORCED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.22	0.600	12.24	4.88		1089.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.085	653.2	1404.3	0.61E 07	-0.00095	1.156	12.25

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.963	0.176	49	0.035	111	0.011	169	0.012	111	0.002	96	0.006	49	0.001	191	0.006	102	0.001	167
CM		-0.055	0.062	195	0.002	55	0.002	148	0.002	284	0.002	331	0.001	96	0.001	356	0.001	289	0.001	255
DCP 1	.010	2.893	0.939	3	0.142	98	0.006	280	0.015	111	0.009	116	0.004	299	0.011	177	0.007	107	0.003	215
DCP 2	.050	2.301	0.138	139	0.238	91	0.056	144	0.067	111	0.059	58	0.012	67	0.021	12	0.017	103	0.017	321
DCP 3	.100	2.539	0.501	160	0.204	69	0.124	151	0.081	13	0.028	111	0.035	79	0.027	58	0.033	153	0.017	189
DCP 4	.150	1.934	0.470	150	0.160	260	0.027	41	0.053	188	0.033	332	0.026	71	0.007	232	0.004	10	0.003	226
DCP 5	.200	1.613	0.277	116	0.041	143	0.019	158	0.036	93	0.023	212	0.015	26	0.025	254	0.004	101	0.002	68
DCP 6	.250	1.260	0.265	80	0.075	110	0.022	176	0.017	31	0.017	331	0.026	54	0.006	257	0.009	34	0.014	218
DCP 7	.300	1.051	0.262	67	0.088	140	0.051	205	0.027	211	0.020	309	0.015	3	0.003	245	0.016	50	0.009	207
DCP 8	.500	0.639	0.266	32	0.026	127	0.006	352	0.020	142	0.011	180	0.003	194	0.007	204	0.001	154	0.004	185
DCP 9	.600	0.531	0.257	27	0.008	164	0.013	352	0.006	86	0.012	183	0.006	137	0.004	102	0.006	116	0.006	349
DCP10	.695	0.511	0.254	21	0.005	154	0.007	288	0.032	102	0.012	96	0.003	324	0.009	143	0.009	135	0.009	89
DCP11	.800	0.444	0.238	15	0.008	161	0.008	21	0.010	63	0.010	121	0.005	339	0.003	185	0.005	123	0.011	72
DCP12	.878	0.409	0.232	9	0.004	62	0.001	289	0.007	60	0.006	111	0.002	335	0.001	239	0.007	103	0.005	26
DCP13	.953	0.297	0.198	5	0.030	38	0.003	128	0.005	14	0.003	45	0.001	191	0.001	343	0.002	299	0.003	159

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.73	0.600	14.92	4.90		1155.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.086	653.1	1456.0	0.63E 07	-0.00089	1.121	18.29

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.981	0.145	52	0.011	171	0.011	204	0.008	324	0.010	166	0.001	111	0.002	77	0.002	211	0.000	82
CM		-0.080	0.056	197	0.004	291	0.005	306	0.002	66	0.002	265	0.001	143	0.001	191	0.001	329	0.000	63
DCP 1	.010	3.157	0.650	5	0.148	103	0.016	229	0.016	217	0.011	96	0.007	61	0.009	68	0.008	35	0.007	271
DCP 2	.050	2.330	0.284	161	0.095	49	0.084	214	0.016	323	0.040	237	0.012	177	0.015	182	0.003	70	0.004	251
DCP 3	.100	1.938	0.429	160	0.136	267	0.089	321	0.072	57	0.048	195	0.015	150	0.014	291	0.019	340	0.023	39
DCP 4	.150	1.664	0.241	140	0.120	275	0.058	300	0.021	348	0.024	183	0.012	108	0.021	171	0.012	222	0.009	195
DCP 5	.200	1.398	0.239	118	0.050	208	0.015	269	0.036	23	0.027	167	0.012	8	0.001	218	0.026	283	0.003	50
DCP 6	.250	1.247	0.185	91	0.040	210	0.045	250	0.013	302	0.021	199	0.005	139	0.009	45	0.005	320	0.005	93
DCP 7	.300	1.125	0.202	81	0.048	154	0.037	166	0.027	327	0.012	111	0.004	144	0.004	44	0.016	185	0.002	355
DCP 8	.500	0.749	0.235	34	0.028	149	0.020	186	0.023	264	0.006	255	0.003	152	0.009	106	0.003	102	0.006	257
DCP 9	.600	0.699	0.254	22	0.005	113	0.023	127	0.018	270	0.015	147	0.006	8	0.007	37	0.003	122	0.008	117
DCP 10	.695	0.629	0.254	19	0.018	103	0.005	130	0.009	161	0.023	119	0.004	200	0.004	22	0.005	137	0.005	172
DCP 11	.800	0.587	0.214	17	0.008	59	0.019	131	0.003	192	0.003	41	0.011	287	0.003	198	0.004	224	0.002	110
DCP 12	.953	0.253	0.148	12	0.021	94	0.012	107	0.003	313	0.008	64	0.009	20	0.011	332	0.003	97	0.007	323

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.78	0.600	17.42	4.96		1155.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.086	653.1	1455.0	0.63E 07	-0.00151	1.160	22.21

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.014	0.143	56	0.029	272	0.015	190	0.005	297	0.004	56	0.001	292	0.004	181	0.003	132	0.002	29
CM		-0.101	0.053	211	0.001	288	0.001	51	0.001	240	0.001	148	0.002	338	0.001	353	0.002	275	0.001	219
DCP 1	.010	3.292	0.277	30	0.208	73	0.063	294	0.022	127	0.019	324	0.009	242	0.002	225	0.004	234	0.007	325
DCP 2	.050	2.184	0.366	169	0.173	297	0.082	177	0.076	293	0.024	47	0.036	317	0.016	72	0.016	316	0.005	47
DCP 3	.100	1.826	0.131	176	0.101	284	0.044	172	0.035	357	0.030	140	0.014	257	0.010	302	0.017	249	0.017	25
DCP 4	.150	1.537	0.133	126	0.095	281	0.033	129	0.029	250	0.012	353	0.017	330	0.016	90	0.011	258	0.002	163
DCP 5	.200	1.407	0.117	112	0.086	255	0.022	175	0.011	156	0.025	107	0.010	34	0.011	208	0.014	199	0.014	274
DCP 6	.250	1.254	0.146	78	0.067	238	0.008	182	0.006	194	0.003	235	0.005	311	0.014	314	0.002	237	0.008	3
DCP 7	.300	1.162	0.165	75	0.078	239	0.027	188	0.001	191	0.016	70	0.013	10	0.008	246	0.001	179	0.010	198
DCP 8	.500	0.828	0.253	49	0.014	243	0.012	232	0.009	155	0.003	349	0.011	152	0.014	217	0.018	126	0.010	92
DCP 9	.600	0.750	0.231	37	0.009	303	0.006	263	0.007	329	0.006	281	0.007	186	0.016	127	0.012	124	0.007	342
DCP 10	.695	0.715	0.225	36	0.006	93	0.006	176	0.008	357	0.009	341	0.007	180	0.017	173	0.006	50	0.009	47
DCP 11	.800	0.682	0.195	28	0.014	11	0.011	200	0.005	307	0.006	158	0.007	153	0.005	88	0.005	58	0.006	241
DCP 12	.953	0.304	0.143	26	0.006	335	0.003	195	0.003	40	0.010	356	0.004	300	0.003	309	0.004	58	0.006	24

FORCED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.77	0.600	24.41	4.96		1155.3	9

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.086	653.3	1452.3	0.63E 07	-0.00162	1.246	26.24

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.095	0.171	58	0.037	176	0.003	266	0.005	6	0.003	235	0.003	314	0.002	129	0.001	152	0.002	229
CM		-0.150	0.049	216	0.007	15	0.002	225	0.002	358	0.000	281	0.001	347	0.001	180	0.001	278	0.001	41
DCP 1	.010	2.683	0.846	168	0.028	358	0.164	182	0.089	335	0.081	195	0.054	325	0.039	187	0.030	335	0.011	134
DCP 2	.050	1.883	0.173	87	0.105	137	0.062	274	0.044	61	0.035	227	0.025	350	0.019	111	0.008	194	0.013	6
DCP 3	.100	1.890	0.215	106	0.033	137	0.017	301	0.029	359	0.011	326	0.015	57	0.023	137	0.004	179	0.018	127
DCP 4	.150	1.503	0.191	59	0.076	164	0.024	283	0.009	26	0.008	318	0.014	307	0.001	129	0.012	252	0.011	317
DCP 5	.200	1.458	0.189	60	0.033	155	0.004	76	0.009	31	0.005	357	0.005	292	0.003	301	0.007	208	0.004	233
DCP 6	.250	1.354	0.197	48	0.052	183	0.012	329	0.012	0	0.014	3	0.003	353	0.001	192	0.009	250	0.009	295
DCP 7	.300	1.231	0.213	45	0.040	180	0.005	107	0.009	270	0.006	14	0.007	209	0.005	324	0.006	104	0.007	188
DCP 8	.500	0.973	0.223	45	0.049	200	0.014	337	0.006	359	0.002	176	0.005	271	0.002	356	0.000	75	0.005	297
DCP 9	.600	0.903	0.217	44	0.040	184	0.006	76	0.008	159	0.008	246	0.002	196	0.002	219	0.002	120	0.006	252
DCP10	.695	0.883	0.208	49	0.042	189	0.003	340	0.002	250	0.003	281	0.003	240	0.003	315	0.007	23	0.002	219
DCP11	.890	0.846	0.186	44	0.030	183	0.006	99	0.006	136	0.004	161	0.004	101	0.006	90	0.007	155	0.008	221
DCP12	.953	0.480	0.136	41	0.015	174	0.007	63	0.004	189	0.003	165	0.002	144	0.001	21	0.005	64	0.005	113

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	49.26	0.400	0.12	5.32		1391.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.185	443.9	725.4	0.47E 07	-0.00093	0.370	5.38

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		-0.079	0.432 350	0.031 177	0.006 183	0.003 178	0.002 253	0.002 168	0.001 183	0.001 236	0.002 277
CM		-0.027	0.026 270	0.002 117	0.001 212	0.000 203	0.001 182	0.001 314	0.000 36	0.000 177	0.001 173
CCP 1	.010	-2.101	2.041 339	0.726 194	0.332 245	0.050 325	0.074 161	0.075 218	0.024 248	0.030 178	0.040 229
CCP 2	.050	-0.840	1.691 339	0.116 71	0.067 111	0.024 253	0.036 10	0.042 90	0.034 166	0.014 276	0.009 350
CCP 3	.100	-0.249	1.241 336	0.067 65	0.057 92	0.040 156	0.027 244	0.023 347	0.021 48	0.013 137	0.012 197
CCP 4	.150	0.001	0.842 346	0.024 83	0.050 89	0.040 158	0.030 229	0.014 301	0.006 23	0.002 294	0.007 257
CCP 5	.200	0.303	0.648 345	0.030 144	0.011 88	0.012 139	0.015 204	0.010 255	0.006 340	0.007 348	0.003 104
CCP 6	.250	-0.081	0.511 354	0.048 198	0.009 290	0.000 196	0.006 230	0.004 276	0.004 325	0.002 337	0.001 354
CCP 7	.300	0.012	0.442 352	0.047 182	0.013 235	0.002 35	0.001 0	0.002 112	0.001 263	0.004 335	0.002 112
CCP 8	.500	-0.005	0.273 11	0.031 191	0.005 224	0.004 251	0.005 14	0.001 158	0.004 236	0.001 350	0.003 326
CCP 9	.600	0.002	0.218 9	0.020 178	0.004 167	0.002 185	0.003 313	0.006 134	0.003 176	0.002 215	0.004 323
CCP10	.695	0.055	0.166 24	0.011 216	0.002 51	0.003 137	0.004 47	0.002 178	0.002 207	0.001 227	0.004 333
CCP11	.800	-0.018	0.121 24	0.007 240	0.003 49	0.002 11	0.004 298	0.005 172	0.002 148	0.002 141	0.002 15
CCP12	.878	0.173	0.101 23	0.007 287	0.004 27	0.002 44	0.004 329	0.004 138	0.001 157	0.001 244	0.001 271
CCP13	.953	-0.093	0.078 25	0.010 267	0.005 42	0.002 320	0.004 40	0.003 47	0.002 218	0.002 24	0.002 281

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	49.38	0.400	7.49	5.31		1091.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.186	443.9	723.3	0.46E 07	-0.00095	1.216	12.80

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		0.778	0.435 351	0.016 170	0.002 6	0.002 140	0.002 356	0.002 31	0.000 98	0.000 334	0.001 256
CM		-0.025	0.028 281	0.002 112	0.000 188	0.000 176	0.000 139	0.001 313	0.000 24	0.000 155	0.000 138
CCP 1	.010	2.542	2.883 340	0.191 184	0.092 88	0.032 334	0.022 222	0.015 52	0.018 10	0.007 202	0.007 170
CCP 2	.050	2.173	1.588 341	0.058 143	0.042 284	0.048 156	0.039 46	0.029 310	0.009 153	0.004 94	0.005 185
CCP 3	.100	1.923	1.137 338	0.042 135	0.003 274	0.008 144	0.004 297	0.006 351	0.003 283	0.002 340	0.003 227
CCP 4	.150	1.672	0.780 349	0.030 150	0.007 316	0.002 180	0.004 281	0.005 7	0.001 26	0.001 55	0.003 260
CCP 5	.200	1.411	0.620 344	0.023 121	0.001 333	0.002 86	0.002 253	0.006 46	0.002 49	0.002 259	0.001 3
CCP 6	.250	0.963	0.519 355	0.019 157	0.003 349	0.001 159	0.002 351	0.001 87	0.003 101	0.002 357	0.002 297
CCP 7	.300	0.877	0.449 350	0.014 155	0.001 337	0.001 323	0.002 301	0.004 67	0.001 22	0.001 234	0.001 276
CCP 8	.500	0.539	0.265 9	0.009 205	0.003 346	0.000 355	0.002 39	0.002 198	0.002 119	0.001 31	0.001 247
CCP 9	.600	0.439	0.203 10	0.008 207	0.001 160	0.001 67	0.004 310	0.004 79	0.001 113	0.001 330	0.004 8
CCP10	.695	0.349	0.157 26	0.008 241	0.002 40	0.001 107	0.002 63	0.002 149	0.001 127	0.002 131	0.003 254
CCP11	.800	0.217	0.120 26	0.005 252	0.002 7	0.005 24	0.005 313	0.004 121	0.003 254	0.001 320	0.002 28
CCP12	.878	0.365	0.094 32	0.006 245	0.002 30	0.001 44	0.005 310	0.003 86	0.002 237	0.001 4	0.000 129
CCP13	.953	0.037	0.076 30	0.007 216	0.003 33	0.003 227	0.003 83	0.002 251	0.001 207	0.003 325	0.002 240

FORCED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	49.38	0.400	9.80	5.29		1091.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.186	443.8	723.2	0.46E 07	-0.00104	1.467	15.09

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.009	0.421	359	0.014	249	0.009	162	0.008	37	0.004	324	0.002	319	0.003	181	0.003	127	0.002	333
CM		-0.019	0.031	266	0.003	92	0.002	265	0.002	124	0.001	264	0.000	5	0.001	287	0.001	149	0.001	37
DCP 1	.010	4.086	3.010	342	0.165	179	0.115	315	0.141	177	0.068	51	0.010	233	0.052	37	0.036	262	0.008	130
DCP 2	.050	3.120	1.704	346	0.161	241	0.162	145	0.149	34	0.074	288	0.052	314	0.101	221	0.105	118	0.061	8
DCP 3	.100	2.481	1.009	349	0.071	58	0.044	286	0.019	148	0.005	354	0.007	116	0.012	24	0.008	256	0.004	169
DCP 4	.150	2.087	0.706	354	0.028	62	0.014	265	0.009	93	0.005	340	0.002	57	0.006	62	0.004	233	0.002	235
DCP 5	.200	1.693	0.555	357	0.015	43	0.012	230	0.006	94	0.006	302	0.003	113	0.006	58	0.002	252	0.001	282
DCP 6	.250	1.256	0.479	1	0.006	347	0.009	201	0.007	59	0.004	318	0.003	103	0.003	65	0.004	240	0.002	242
DCP 7	.300	1.101	0.415	3	0.008	296	0.012	163	0.007	39	0.004	271	0.005	95	0.002	82	0.001	182	0.001	289
DCP 8	.500	0.673	0.255	20	0.024	297	0.015	159	0.011	19	0.002	216	0.003	61	0.002	173	0.001	135	0.001	303
DCP 9	.600	0.518	0.203	28	0.022	287	0.012	151	0.012	351	0.001	288	0.002	39	0.003	168	0.004	12	0.003	238
DCP10	.695	0.386	0.162	37	0.025	276	0.013	124	0.009	338	0.004	125	0.003	312	0.005	160	0.003	14	0.004	251
DCP11	.800	0.282	0.124	42	0.020	256	0.009	100	0.010	305	0.004	61	0.008	234	0.006	133	0.004	357	0.005	241
DCP12	.878	0.412	0.099	33	0.018	203	0.011	43	0.007	261	0.005	35	0.003	202	0.004	92	0.002	299	0.001	86
DCP13	.953	0.089	0.067	10	0.025	178	0.013	25	0.003	257	0.006	340	0.002	246	0.001	128	0.001	258	0.002	165

FORCED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	49.02	0.400	12.40	5.19		1091.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.185	443.8	722.7	0.46E 07	0.00089	1.618	17.56

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.024	0.569	26	0.106	246	0.036	99	0.018	353	0.009	245	0.008	104	0.004	320	0.003	218	0.005	89
CM		-0.056	0.052	150	0.048	1	0.018	239	0.010	149	0.006	43	0.004	331	0.002	162	0.001	103	0.002	331
DCP 1	.010	3.973	2.441	22	0.383	20	0.258	344	0.225	268	0.135	158	0.145	42	0.122	309	0.072	226	0.013	195
DCP 2	.050	2.750	1.374	46	0.582	3	0.261	270	0.124	205	0.080	169	0.082	138	0.085	99	0.062	54	0.045	17
DCP 3	.100	2.203	1.193	47	0.484	321	0.216	181	0.066	80	0.055	53	0.057	341	0.037	279	0.045	222	0.045	129
DCP 4	.150	1.928	0.953	49	0.321	309	0.129	183	0.055	133	0.064	46	0.027	326	0.017	316	0.025	249	0.019	164
DCP 5	.200	1.588	0.862	36	0.305	267	0.127	127	0.048	81	0.067	346	0.017	230	0.020	254	0.025	128	0.014	23
DCP 6	.250	1.238	0.786	39	0.261	270	0.093	150	0.058	109	0.058	14	0.025	298	0.022	255	0.021	188	0.021	132
DCP 7	.300	1.110	0.721	24	0.256	236	0.091	105	0.057	59	0.048	307	0.007	230	0.019	190	0.015	99	0.024	11
DCP 8	.500	0.754	0.522	23	0.222	218	0.071	89	0.058	29	0.039	281	0.027	222	0.026	124	0.016	51	0.018	317
DCP 9	.600	0.601	0.407	7	0.189	189	0.070	59	0.061	329	0.040	201	0.034	104	0.025	353	0.023	278	0.019	144
DCP10	.695	0.500	0.326	6	0.170	192	0.067	74	0.065	341	0.036	229	0.036	152	0.021	39	0.021	345	0.024	219
DCP11	.800	0.426	0.273	346	0.160	165	0.072	35	0.057	287	0.029	168	0.024	75	0.013	282	0.014	266	0.020	112
DCP12	.878	0.550	0.219	332	0.120	159	0.061	35	0.042	274	0.027	167	0.031	58	0.028	288	0.021	178	0.016	70
DCP13	.953	0.196	0.165	319	0.062	166	0.040	53	0.025	286	0.015	202	0.015	101	0.016	349	0.013	232	0.017	156

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	49.02	0.400	15.00	5.12		1159.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.185	443.8	741.8	0.48E 07	0.00058	1.764	19.78

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.102	0.539	47	0.065	343	0.072	278	0.053	180	0.043	62	0.016	307	0.011	215	0.014	139	0.012	57
CM		-0.061	0.087	169	0.046	62	0.031	20	0.025	289	0.016	205	0.006	105	0.004	53	0.005	340	0.003	253
DCP 1	.010	4.249	1.235	71	1.337	88	0.750	20	0.314	290	0.011	136	0.074	278	0.121	199	0.107	131	0.041	72
DCP 2	.050	3.094	1.248	84	0.752	54	0.309	359	0.157	302	0.077	351	0.094	326	0.070	315	0.046	321	0.058	331
DCP 3	.100	2.283	1.279	83	0.524	18	0.197	318	0.217	260	0.095	180	0.042	222	0.070	164	0.054	138	0.052	107
DCP 4	.150	1.921	0.952	72	0.279	356	0.143	315	0.175	234	0.056	123	0.032	175	0.028	112	0.027	121	0.022	61
DCP 5	.200	1.680	0.878	64	0.199	334	0.155	305	0.155	210	0.053	122	0.033	137	0.016	127	0.032	76	0.019	17
DCP 6	.250	1.419	0.777	55	0.167	323	0.164	299	0.161	204	0.065	125	0.042	92	0.014	96	0.025	58	0.012	12
DCP 7	.300	1.167	0.744	48	0.145	305	0.150	281	0.117	187	0.068	123	0.033	58	0.023	87	0.015	31	0.017	2
DCP 8	.500	0.747	0.583	32	0.131	267	0.138	246	0.097	154	0.093	80	0.032	352	0.018	326	0.008	251	0.011	222
DCP 9	.600	0.720	0.491	19	0.134	249	0.131	226	0.111	130	0.108	46	0.042	308	0.030	288	0.038	211	0.031	121
DCP 10	.695	0.691	0.431	12	0.136	248	0.121	208	0.096	123	0.101	34	0.039	297	0.031	249	0.027	186	0.013	118
DCP 11	.800	0.572	0.331	359	0.114	234	0.113	191	0.102	90	0.077	356	0.039	267	0.038	213	0.041	141	0.028	54
DCP 12	.953	0.204	0.208	336	0.072	234	0.045	145	0.044	71	0.040	329	0.025	236	0.022	170	0.020	98	0.018	22

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	49.14	0.400	17.50	5.07		1159.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.185	443.8	742.1	0.48E 07	-0.00021	1.851	20.60

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.159	0.520	58	0.105	77	0.085	349	0.049	260	0.048	167	0.030	91	0.011	78	0.015	38	0.009	345
CM		-0.081	0.114	180	0.038	120	0.032	89	0.027	35	0.017	326	0.006	239	0.004	290	0.009	221	0.007	158
DCP 1	.010	4.234	1.178	127	1.384	122	0.378	99	0.172	98	0.014	245	0.110	173	0.072	77	0.055	297	0.056	186
DCP 2	.050	3.015	1.309	115	0.690	99	0.295	72	0.135	43	0.048	128	0.109	119	0.019	133	0.053	225	0.098	221
DCP 3	.100	2.304	1.341	102	0.435	83	0.321	53	0.141	354	0.038	98	0.069	88	0.057	51	0.020	95	0.042	106
DCP 4	.150	1.942	0.983	86	0.234	91	0.278	33	0.099	354	0.038	309	0.044	63	0.035	353	0.026	359	0.007	33
DCP 5	.200	1.710	0.869	77	0.199	83	0.226	13	0.084	344	0.033	262	0.045	54	0.032	339	0.020	339	0.008	58
DCP 6	.250	1.497	0.785	65	0.168	83	0.219	3	0.102	333	0.053	241	0.023	14	0.025	321	0.016	332	0.004	265
DCP 7	.300	1.234	0.747	57	0.149	68	0.184	350	0.110	319	0.060	229	0.007	113	0.015	310	0.005	285	0.012	81
DCP 8	.500	0.850	0.632	33	0.071	14	0.129	312	0.136	263	0.093	191	0.034	119	0.027	202	0.029	122	0.033	54
DCP 9	.600	0.799	0.569	24	0.068	333	0.139	295	0.153	237	0.106	163	0.045	110	0.034	133	0.050	74	0.045	10
DCP 10	.695	0.771	0.488	17	0.103	320	0.138	279	0.162	216	0.113	151	0.041	78	0.031	117	0.049	52	0.036	334
DCP 11	.800	0.656	0.390	10	0.107	309	0.116	264	0.131	198	0.105	127	0.052	61	0.045	55	0.054	358	0.043	287
DCP 12	.953	0.239	0.216	353	0.091	277	0.053	209	0.053	127	0.029	50	0.019	320	0.009	131	0.024	34	0.020	327

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	49.38	0.400	24.55	5.19		1159.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.186	443.8	740.0	0.48E 07	-0.00155	1.266	27.59

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.021	0.243	49	0.023	207	0.004	62	0.009	262	0.010	268	0.005	231	0.001	327	0.001	310	0.004	103
CM		-0.134	0.074	215	0.002	39	0.004	218	0.002	39	0.001	46	0.001	352	0.001	143	0.000	242	0.001	309
DCP 1	.010	3.101	1.571	172	0.199	125	0.370	200	0.035	233	0.139	214	0.031	235	0.051	185	0.032	203	0.023	105
DCP 2	.050	2.014	0.321	158	0.179	265	0.003	270	0.033	[illegible]	0.006	310	0.021	313	0.008	125	0.014	320	0.015	96
DCP 3	.100	1.449	0.310	39	0.037	224	0.047	18	0.006	67	0.027	307	0.011	273	0.005	349	0.003	222	0.013	38
DCP 4	.150	1.428	0.314	30	0.025	175	0.018	30	0.006	352	0.014	325	0.006	304	0.004	58	0.006	331	0.007	33
DCP 5	.200	1.337	0.335	34	0.037	179	0.023	24	0.014	279	0.017	313	0.008	238	0.002	50	0.003	239	0.003	63
DCP 6	.250	1.256	0.326	33	0.024	189	0.015	18	0.005	336	0.017	321	0.004	273	0.004	9	0.006	305	0.006	14
DCP 7	.300	1.100	0.346	36	0.030	183	0.020	27	0.010	284	0.016	318	0.007	205	0.004	309	0.002	179	0.003	344
DCP 8	.500	0.889	0.347	41	0.016	204	0.012	28	0.011	275	0.013	293	0.004	112	0.004	48	0.004	50	0.005	180
DCP 9	.600	0.814	0.322	40	0.020	212	0.006	34	0.017	258	0.010	243	0.011	227	0.001	292	0.001	48	0.009	231
DCP10	.695	0.882	0.308	43	0.017	209	0.008	45	0.008	252	0.011	236	0.003	267	0.005	32	0.006	38	0.012	139
DCP11	.800	0.750	0.258	46	0.017	187	0.010	73	0.015	231	0.009	151	0.010	191	0.007	310	0.001	166	0.009	126
DCP12	.953	0.447	0.182	41	0.016	277	0.013	53	0.012	126	0.006	233	0.002	86	0.006	249	0.003	218	0.011	29

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	49.26	0.600	0.11	5.29		1090.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.126	653.3	1431.0	0.62E 07	-0.00098	0.462	5.29

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		-0.065	0.516	345	0.037	150	0.012	142	0.006	186	0.001	349	0.002	100	0.001	191	0.002	333	0.000	144
CM		-0.019	0.026	264	0.002	152	0.001	214	0.002	306	0.001	96	0.000	257	0.000	324	0.001	132	0.000	238
DCP 1	.010	-1.846	1.751	325	0.595	188	0.066	190	0.057	131	0.036	157	0.010	65	0.013	6	0.012	85	0.002	156
DCP 2	.050	-0.725	1.904	332	0.103	166	0.102	256	0.061	303	0.008	178	0.027	279	0.013	327	0.004	240	0.005	230
DCP 3	.100	-0.136	1.747	335	0.065	128	0.067	103	0.053	305	0.017	50	0.006	67	0.008	278	0.007	53	0.009	274
DCP 4	.150	-0.021	1.163	343	0.162	69	0.064	139	0.014	192	0.040	41	0.021	143	0.002	223	0.003	45	0.010	171
DCP 5	.200	0.272	0.897	345	0.101	84	0.063	126	0.024	190	0.014	17	0.016	123	0.008	198	0.007	305	0.003	165
DCP 6	.250	-0.001	0.684	347	0.044	98	0.038	108	0.028	167	0.007	282	0.011	88	0.009	160	0.007	236	0.002	176
DCP 7	.300	0.030	0.526	352	0.047	155	0.017	129	0.023	163	0.012	256	0.004	54	0.004	149	0.004	299	0.002	47
DCP 8	.500	-0.000	0.294	3	0.042	179	0.004	190	0.010	146	0.004	227	0.001	65	0.001	59	0.001	321	0.001	20
DCP 9	.600	0.006	0.235	7	0.024	178	0.002	146	0.006	144	0.003	275	0.002	24	0.001	179	0.002	9	0.004	49
DCP10	.695	0.032	0.183	13	0.010	168	0.001	150	0.003	127	0.002	18	0.002	58	0.001	57	0.002	337	0.002	87
DCP11	.800	-0.021	0.130	14	0.003	254	0.005	48	0.004	109	0.003	298	0.000	103	0.001	159	0.004	313	0.002	37
DCP12	.878	0.110	0.112	11	0.007	357	0.005	47	0.002	145	0.003	289	0.001	126	0.002	152	0.001	313	0.001	217
DCP13	.953	-0.106	0.101	5	0.008	353	0.006	56	0.002	101	0.002	110	0.001	176	0.001	244	0.002	310	0.001	150

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	49.26	0.600	7.47	5.17		1090.2	10

K	V	ω	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.126	653.2	1429.6	0.62E 07	-0.00086	1.189	11.80

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.721	0.416	7	0.054	357	0.008	268	0.018	224	0.003	65	0.003	285	0.001	222	0.004	328	0.004	210
CM		-0.029	0.034	217	0.023	70	0.008	347	0.003	320	0.003	245	0.002	173	0.001	65	0.000	40	0.000	72
DCP 1	.010	1.414	1.774	346	0.152	37	0.103	95	0.013	143	0.011	61	0.020	321	0.014	307	0.004	266	0.005	205
DCP 2	.050	1.808	1.024	346	0.188	52	0.022	123	0.016	162	0.015	57	0.017	334	0.008	328	0.002	320	0.007	251
DCP 3	.100	2.066	0.793	351	0.432	60	0.105	327	0.070	234	0.010	250	0.042	189	0.015	65	0.020	338	0.015	211
DCP 4	.200	1.346	0.591	17	0.174	28	0.093	338	0.025	320	0.047	303	0.007	3	0.007	31	0.032	355	0.007	236
DCP 5	.250	1.007	0.598	16	0.135	351	0.056	316	0.046	267	0.017	305	0.025	283	0.014	235	0.008	288	0.011	238
DCP 6	.300	0.813	0.525	18	0.135	333	0.061	285	0.069	247	0.038	207	0.024	178	0.016	154	0.006	140	0.008	117
DCP 7	.500	0.498	0.340	19	0.084	281	0.042	169	0.019	190	0.028	97	0.019	7	0.007	286	0.006	243	0.005	158
DCP 8	.600	0.384	0.266	24	0.071	285	0.030	163	0.017	191	0.018	100	0.008	25	0.002	68	0.007	358	0.009	280
DCP 9	.695	0.330	0.217	20	0.069	249	0.038	139	0.009	119	0.021	38	0.009	305	0.003	353	0.010	253	0.010	117
DCP10	.800	0.237	0.192	18	0.066	260	0.029	172	0.017	141	0.016	49	0.007	324	0.004	257	0.002	121	0.008	302
DCP11	.878	0.348	0.179	8	0.061	244	0.021	167	0.015	126	0.012	31	0.002	311	0.001	232	0.004	352	0.006	234
DCP12	.953	0.049	0.172	350	0.055	209	0.013	139	0.013	113	0.007	15	0.005	357	0.006	230	0.005	96	0.002	278

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	49.26	0.600	7.81	5.11		1090.3	10

K	V	ω	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.126	653.1	1427.8	0.62E 07	-0.00095	1.241	12.31

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.859	0.319	27	0.082	51	0.022	339	0.013	72	0.012	348	0.005	297	0.004	247	0.001	158	0.003	244
CM		-0.042	0.055	205	0.021	89	0.004	121	0.002	93	0.002	122	0.001	101	0.002	50	0.000	329	0.001	42
DCP 1	.010	2.152	1.352	356	0.146	66	0.040	124	0.007	291	0.016	337	0.013	340	0.011	328	0.008	269	0.008	246
DCP 2	.050	2.166	0.532	0	0.287	58	0.062	292	0.044	209	0.009	50	0.009	326	0.003	260	0.004	201	0.004	118
DCP 3	.100	2.262	0.044	104	0.545	74	0.066	325	0.072	76	0.058	329	0.024	187	0.015	45	0.007	201	0.009	54
DCP 4	.200	1.450	0.415	49	0.264	74	0.026	145	0.046	95	0.033	160	0.018	312	0.017	307	0.013	339	0.014	299
DCP 5	.250	1.151	0.463	41	0.164	58	0.052	44	0.052	78	0.022	72	0.015	167	0.025	139	0.007	145	0.006	321
DCP 6	.300	0.955	0.476	39	0.129	35	0.062	23	0.056	57	0.045	41	0.031	34	0.008	54	0.011	50	0.007	248
DCP 7	.500	0.610	0.360	33	0.054	322	0.040	346	0.018	312	0.030	322	0.023	270	0.014	233	0.006	208	0.008	161
DCP 8	.600	0.470	0.291	33	0.046	301	0.026	327	0.008	256	0.017	333	0.005	320	0.015	283	0.005	236	0.010	246
DCP 9	.695	0.412	0.257	23	0.058	265	0.015	275	0.004	135	0.018	281	0.006	204	0.010	213	0.005	115	0.002	158
DCP10	.800	0.337	0.231	21	0.050	278	0.024	292	0.010	235	0.008	276	0.005	267	0.010	226	0.007	139	0.000	120
DCP11	.878	0.438	0.227	11	0.049	277	0.023	275	0.011	238	0.002	183	0.007	303	0.007	208	0.001	328	0.006	223
DCP12	.953	0.107	0.206	357	0.028	268	0.021	249	0.000	312	0.003	256	0.001	204	0.001	35	0.003	333	0.005	305

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	49.26	0.600	12.41	5.11		1390.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.126	653.1	1422.0	0.61E 07	-0.00050	1.228	13.51

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.952	0.252	44	0.055	87	0.008	73	0.005	40	0.002	198	0.002	130	0.002	77	0.001	25	0.002	26
CM		-0.063	0.070	190	0.005	25	0.008	172	0.002	223	0.002	286	0.002	258	0.001	223	0.001	304	0.001	246
CCP 1	.010	2.690	1.011	3	0.161	94	0.028	315	0.006	41	0.004	358	0.007	28	0.008	237	0.003	306	0.003	334
CCP 2	.050	2.176	0.265	116	0.359	64	0.007	342	0.082	36	0.055	322	0.012	277	0.020	285	0.021	182	0.007	7
CCP 3	.100	2.274	0.528	147	0.185	45	0.143	155	0.024	268	0.018	60	0.020	251	0.010	321	0.016	6	0.014	284
CCP 4	.200	1.570	0.383	92	0.049	133	0.014	190	0.006	16	0.016	220	0.013	92	0.005	131	0.013	346	0.004	313
CCP 5	.250	1.266	0.383	71	0.106	122	0.033	204	0.032	226	0.019	242	0.027	71	0.006	183	0.015	60	0.014	106
CCP 6	.300	1.059	0.426	51	0.099	97	0.029	123	0.025	186	0.029	212	0.025	240	0.018	167	0.002	313	0.006	333
CCP 7	.500	0.692	0.349	36	0.033	145	0.042	43	0.020	71	0.008	141	0.005	111	0.011	98	0.006	311	0.002	172
CCP 8	.600	0.576	0.309	18	0.032	156	0.034	2	0.014	14	0.007	352	0.005	184	0.010	340	0.012	180	0.008	122
CCP 9	.695	0.508	0.284	20	0.021	156	0.042	359	0.008	16	0.020	127	0.016	74	0.022	63	0.005	355	0.004	31
CCP10	.800	0.436	0.276	8	0.009	141	0.026	321	0.011	53	0.006	6	0.010	69	0.005	300	0.006	92	0.008	110
CCP11	.878	538	0.254	1	0.012	15	0.020	307	0.004	327	0.007	67	0.004	59	0.005	292	0.007	128	0.009	57
CCP12	.953	.176	0.212	2	0.031	37	0.014	341	0.009	2	0.013	40	0.005	37	0.007	349	0.001	97	0.013	331

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	48.19	0.600	14.94	4.97		1158.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.123	653.1	1460.7	0.63E 07	-0.00102	1.182	15.91

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.985	0.211	61	0.029	188	0.009	114	0.003	310	0.003	333	0.002	11	0.005	206	0.004	348	0.001	288
CM		-0.076	0.068	204	0.006	311	0.003	321	0.003	321	0.002	37	0.001	170	0.001	344	0.002	149	0.001	236
CCP 1	.010	3.188	0.706	9	0.185	107	0.038	285	0.035	169	0.010	110	0.011	53	0.007	96	0.005	186	0.004	152
CCP 2	.050	2.283	0.376	156	0.088	67	0.096	166	0.051	342	0.026	245	0.026	304	0.026	221	0.008	281	0.026	228
CCP 3	.100	2.076	0.533	160	0.222	270	0.090	24	0.055	10	0.039	79	0.018	147	0.019	7	0.022	234	0.027	336
CCP 4	.150	1.712	0.358	137	0.128	255	0.037	62	0.053	297	0.054	14	0.005	105	0.007	110	0.027	159	0.016	274
CCP 5	.200	1.482	0.349	105	0.080	228	0.025	30	0.024	352	0.017	14	0.010	208	0.021	295	0.019	62	0.025	237
CCP 6	.250	1.299	0.293	89	0.091	214	0.023	18	0.014	287	0.021	9	0.002	261	0.019	298	0.017	347	0.001	270
CCP 7	.300	1.082	0.329	79	0.069	172	0.010	[illegible]	0.022	259	0.008	310	0.008	131	0.011	220	0.018	41	0.012	141
CCP 8	.500	0.746	0.313	44	0.042	161	0.023	195	0.023	166	0.010	271	0.009	15	0.020	182	0.002	318	0.010	70
CCP 9	.600	0.689	0.325	35	0.027	134	0.020	77	0.008	114	0.007	18	0.012	22	0.004	359	0.014	347	0.021	346
CCP10	.695	0.620	0.299	29	0.038	147	0.014	151	0.017	104	0.018	232	0.004	329	0.016	158	0.009	304	0.002	134
CCP11	.800	0.573	0.256	21	0.019	126	0.011	157	0.006	94	0.009	201	0.001	14	0.005	68	0.008	332	0.006	62
CCP12	.953	0.241	0.174	16	0.015	74	0.015	91	0.004	173	0.008	147	0.006	271	0.005	241	0.004	231	0.006	293

FORCED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	48.31	0.600	17.45	5.04		1158.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.124	653.1	1457.6	0.63E 07	-0.00127	1.231	20.27

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.022	0.224	60	0.036	237	0.012	32	0.007	273	0.001	335	0.006	323	0.001	129	0.004	52	0.003	25
CM		-0.096	0.061	213	0.005	16	0.001	94	0.003	14	0.003	355	0.001	35	0.001	169	0.001	253	0.001	231
DCP 1	.010	3.289	0.271	42	0.283	87	0.079	308	0.021	52	0.032	316	0.025	237	0.012	167	0.003	89	0.006	219
DCP 2	.050	2.287	0.397	140	0.148	288	0.098	126	0.059	324	0.036	88	0.029	1	0.004	111	0.007	75	0.017	67
DCP 3	.100	1.966	0.172	129	0.082	297	0.038	72	0.045	339	0.037	3	0.024	333	0.011	142	0.034	3	0.029	329
DCP 4	.150	1.645	0.278	96	0.128	268	0.063	44	0.022	232	0.025	352	0.021	344	0.012	161	0.003	23	0.007	71
DCP 5	.200	1.440	0.246	86	0.096	236	0.039	39	0.026	277	0.018	340	0.013	293	0.012	160	0.010	265	0.003	232
DCP 6	.250	1.292	0.278	72	0.065	248	0.036	359	0.007	194	0.016	322	0.008	268	0.013	234	0.005	241	0.014	274
DCP 7	.300	1.108	0.292	71	0.094	222	0.033	341	0.007	266	0.010	277	0.012	332	0.006	191	0.007	295	0.003	216
DCP 8	.500	0.811	0.321	50	0.047	215	0.020	353	0.007	232	0.007	176	0.012	18	0.011	51	0.022	133	0.006	114
DCP 9	.600	0.738	0.279	42	0.024	191	0.011	131	0.007	142	0.007	188	0.004	322	0.005	235	0.012	9	0.004	140
DCP 10	.695	0.704	0.278	39	0.023	206	0.010	213	0.013	278	0.009	198	0.011	164	0.005	20	0.007	95	0.008	71
DCP 11	.800	0.664	0.235	34	0.008	185	0.005	74	0.006	195	0.011	145	0.009	235	0.011	1	0.007	13	0.010	354
DCP 12	.953	0.312	0.159	26	0.005	250	0.003	187	0.017	199	0.008	165	0.005	274	0.006	229	0.004	151	0.005	49

FORCED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	48.19	0.600	24.50	5.08		1158.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.123	653.1	1446.7	0.63E 07	-0.00130	1.272	27.75

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.085	0.210	46	0.038	179	0.013	265	0.008	348	0.008	143	0.005	215	0.005	182	0.002	81	0.003	56
CM		-0.146	0.061	214	0.008	5	0.001	35	0.002	96	0.001	288	0.001	71	0.001	232	0.001	252	0.001	211
DCP 1	.010	2.853	0.789	164	0.039	63	0.090	180	0.021	306	0.058	159	0.019	311	0.045	178	0.004	350	0.022	115
DCP 2	.050	1.876	0.119	62	0.028	131	0.049	258	0.038	68	0.018	174	0.017	327	0.015	211	0.019	152	0.028	193
DCP 3	.100	1.871	0.174	73	0.061	152	0.041	314	0.032	43	0.021	156	0.010	15	0.015	226	0.008	8	0.006	16
DCP 4	.150	1.524	0.184	41	0.044	186	0.035	286	0.015	34	0.004	239	0.015	337	0.012	243	0.007	55	0.004	118
DCP 5	.200	1.431	0.242	44	0.049	161	0.012	268	0.021	9	0.016	109	0.014	42	0.014	184	0.008	323	0.009	32
DCP 6	.250	1.350	0.222	43	0.060	201	0.022	284	0.010	327	0.002	279	0.011	314	0.008	280	0.014	71	0.008	84
DCP 7	.300	1.172	0.265	41	0.051	170	0.013	314	0.011	5	0.011	124	0.003	323	0.014	201	0.012	239	0.007	322
DCP 8	.500	0.971	0.281	41	0.058	191	0.022	271	0.012	323	0.008	142	0.008	331	0.010	98	0.003	86	0.008	56
DCP 9	.600	0.889	0.278	38	0.046	180	0.009	272	0.007	322	0.009	136	0.007	255	0.005	188	0.003	50	0.003	347
DCP 10	.695	0.869	0.261	40	0.038	175	0.014	211	0.015	282	0.005	148	0.008	264	0.008	66	0.004	47	0.010	17
DCP 11	.800	0.834	0.236	36	0.026	179	0.003	161	0.008	271	0.005	86	0.001	295	0.003	41	0.005	84	0.004	88
DCP 12	.953	0.474	0.165	37	0.013	166	0.005	112	0.003	254	0.004	154	0.006	238	0.003	356	0.002	84	0.003	195

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	63.62	0.400	0.06	5.42		1092.1	16

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.239	443.9	734.0	0.47E 07	-0.00099	0.310	5.50

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		-0.102	0.400	355	0.038	172	0.010	148	0.010	161	0.002	222	0.002	31	0.002	95	0.002	144	0.001	198
CM		-0.018	0.033	275	0.004	108	0.001	153	0.002	43	0.001	129	0.000	245	0.001	331	0.000	343	0.000	266
DCP 1	.010	-1.972	1.940	336	0.690	181	0.243	223	0.034	6	0.040	137	0.046	206	0.021	290	0.012	160	0.027	208
DCP 2	.050	-0.829	1.626	338	0.135	78	0.084	103	0.010	192	0.040	357	0.040	53	0.019	122	0.016	245	0.010	284
DCP 3	.100	-0.285	1.177	340	0.067	102	0.067	105	0.052	147	0.020	229	0.014	1	0.018	64	0.017	115	0.004	166
DCP 4	.150	-0.054	0.789	348	0.029	121	0.050	73	0.047	129	0.022	198	0.016	289	0.010	353	0.004	75	0.004	238
DCP 5	.200	0.283	0.601	352	0.045	166	0.011	114	0.015	136	0.014	179	0.003	270	0.009	58	0.010	69	0.006	124
DCP 6	.250	-0.115	0.481	359	0.055	184	0.004	261	0.009	130	0.002	188	0.004	313	0.003	305	0.002	307	0.001	277
DCP 7	.300	-0.019	0.413	2	0.058	184	0.013	201	0.009	165	0.002	182	0.002	140	0.002	163	0.003	60	0.003	54
DCP 8	.500	-0.032	0.270	20	0.028	189	0.004	165	0.007	184	0.003	312	0.003	23	0.002	115	0.001	203	0.001	315
DCP 9	.600	0.022	0.214	26	0.027	199	0.005	166	0.010	187	0.002	234	0.002	80	0.003	111	0.003	172	0.002	98
DCP10	.695	0.072	0.177	36	0.012	240	0.003	91	0.005	194	0.003	329	0.004	17	0.002	139	0.004	164	0.002	303
DCP11	.800	-0.011	0.093	38	0.014	249	0.004	219	0.009	213	0.001	262	0.003	107	0.004	134	0.003	151	0.003	128
DCP12	.953	-0.071	0.083	37	0.007	283	0.003	8	0.006	233	0.002	308	0.002	43	0.002	162	0.002	166	0.002	199

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	63.74	0.400	7.42	5.39		1092.2	16

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.240	443.9	734.0	0.47E 07	-0.00089	1.174	12.86

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.760	0.409	357	0.025	177	0.003	82	0.006	136	0.001	326	0.003	353	0.002	41	0.001	4	0.001	164
CM		-0.012	0.034	284	0.004	110	0.000	131	0.001	63	0.001	107	0.001	230	0.001	255	0.000	324	0.000	311
DCP 1	.010	2.743	2.787	338	0.243	167	0.111	76	0.035	25	0.017	175	0.015	14	0.022	314	0.011	297	0.005	246
DCP 2	.050	2.257	1.522	340	0.099	144	0.021	256	0.057	117	0.042	35	0.026	287	0.004	167	0.010	347	0.005	248
DCP 3	.100	1.972	1.098	347	0.071	166	0.012	174	0.021	141	0.010	156	0.002	137	0.002	74	0.005	43	0.007	126
DCP 4	.150	1.584	0.741	351	0.046	150	0.005	3	0.014	97	0.004	247	0.007	345	0.004	330	0.002	275	0.003	258
DCP 5	.200	1.396	0.584	356	0.033	163	0.006	189	0.011	153	0.005	189	0.001	59	0.006	51	0.001	104	0.002	129
DCP 6	.250	0.926	0.485	0	0.028	159	0.005	50	0.007	114	0.005	284	0.004	0	0.004	358	0.001	280	0.003	270
DCP 7	.300	0.853	0.423	5	0.025	187	0.003	175	0.008	158	0.002	206	0.002	24	0.004	74	0.002	89	0.004	129
DCP 8	.500	0.504	0.258	19	0.014	208	0.003	44	0.004	177	0.005	300	0.004	9	0.002	1	0.002	303	0.001	202
DCP 9	.600	0.458	0.210	29	0.014	230	0.003	57	0.004	171	0.001	279	0.004	29	0.004	63	0.005	87	0.002	138
DCP10	.695	0.367	0.165	39	0.010	245	0.002	95	0.005	189	0.004	319	0.003	41	0.004	73	0.000	62	0.000	91
DCP11	.800	0.212	0.095	42	0.011	252	0.002	286	0.002	244	0.003	289	0.002	4	0.002	77	0.001	100	0.002	167
DCP12	.953	0.050	0.083	41	0.009	235	0.002	38	0.003	244	0.002	307	0.001	31	0.000	158	0.002	258	0.001	88

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	63.49	0.400	9.73	5.39		1092.3	16

K	V	ω	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.239	444.0	729.0	0.47E 07	-0.00091	1.428	15.13

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.001	0.396	2	0.020	211	0.009	135	0.004	114	0.003	294	0.002	294	0.002	125	0.003	98	0.002	329
CM		-0.006	0.035	288	0.004	85	0.002	247	0.003	64	0.001	232	0.000	179	0.001	243	0.001	76	0.001	322
DCP 1	.010	4.364	2.948	340	0.251	162	0.103	306	0.145	148	0.062	42	0.017	134	0.056	355	0.024	249	0.011	329
DCP 2	.050	3.180	1.615	344	0.141	221	0.158	135	0.148	24	0.060	269	0.048	289	0.094	195	0.098	80	0.058	328
DCP 3	.100	2.594	0.963	352	0.061	82	0.040	262	0.029	141	0.006	195	0.015	145	0.009	29	0.004	222	0.007	150
DCP 4	.150	1.975	0.678	356	0.028	95	0.009	241	0.018	98	0.004	256	0.002	303	0.007	4	0.003	258	0.002	272
DCP 5	.200	1.722	0.522	2	0.009	157	0.013	220	0.013	148	0.005	249	0.004	191	0.004	58	0.004	134	0.002	92
DCP 6	.250	1.217	0.457	5	0.007	188	0.008	162	0.009	100	0.006	272	0.004	358	0.005	357	0.002	224	0.002	297
DCP 7	.300	1.093	0.395	11	0.019	233	0.010	157	0.004	156	0.007	250	0.002	171	0.004	62	0.003	161	0.002	93
DCP 8	.500	0.637	0.258	27	0.024	262	0.013	119	0.004	265	0.002	218	0.006	358	0.002	77	0.000	235	0.002	318
DCP 9	.600	0.540	0.212	38	0.029	259	0.014	105	0.009	248	0.003	48	0.005	308	0.005	137	0.003	107	0.003	223
DCP10	.695	0.433	0.176	44	0.025	256	0.014	87	0.009	245	0.001	1	0.004	292	0.006	90	0.003	259	0.003	158
DCP11	.800	0.275	0.094	57	0.023	241	0.012	98	0.014	239	0.007	33	0.004	240	0.008	75	0.002	303	0.001	111
DCP12	.953	0.096	0.082	20	0.017	168	0.010	346	0.006	197	0.003	291	0.004	57	0.003	342	0.002	196	0.002	52

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	63.37	0.400	12.32	5.31		1092.4	16

K	V	ω	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.238	444.1	729.0	0.47E 07	0.00077	1.619	17.45

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.023	0.577	21	0.090	226	0.025	117	0.010	317	0.016	184	0.018	38	0.010	237	0.004	19	0.002	153
CM		-0.042	0.047	145	0.045	347	0.018	229	0.012	120	0.009	19	0.007	223	0.005	67	0.001	255	0.001	295
DCP 1	.010	4.078	2.304	18	0.562	26	0.444	293	0.290	191	0.206	72	0.149	305	0.079	183	0.028	4	0.041	224
DCP 2	.050	2.815	1.409	35	0.479	348	0.233	239	0.088	174	0.099	145	0.093	103	0.103	57	0.083	356	0.065	319
DCP 3	.100	2.379	1.228	44	0.425	318	0.223	187	0.045	103	0.064	104	0.056	0	0.023	278	0.039	245	0.047	170
DCP 4	.150	1.800	1.033	38	0.312	276	0.129	146	0.048	102	0.043	17	0.013	325	0.035	281	0.023	179	0.012	105
DCP 5	.200	1.669	0.883	34	0.283	260	0.113	138	0.047	95	0.034	345	0.014	304	0.036	241	0.029	142	0.017	87
DCP 6	.250	1.219	0.828	28	0.265	239	0.081	127	0.076	73	0.052	307	0.011	283	0.022	201	0.010	117	0.017	43
DCP 7	.300	1.143	0.735	24	0.246	230	0.081	120	0.061	54	0.043	285	0.012	265	0.029	184	0.022	88	0.015	0
DCP 8	.500	0.728	0.522	12	0.212	189	0.056	83	0.068	352	0.048	233	0.032	140	0.021	40	0.022	317	0.012	196
DCP 9	.600	0.632	0.403	7	0.185	176	0.063	62	0.072	311	0.057	197	0.048	74	0.026	272	0.011	4	0.019	185
DCP10	.695	0.554	0.304	359	0.154	164	0.058	54	0.062	291	0.043	187	0.048	62	0.028	292	0.015	196	0.015	68
DCP11	.800	0.412	0.279	344	0.142	155	0.066	35	0.065	259	0.041	160	0.051	12	0.027	219	0.009	23	0.009	178
DCP12	.953	0.186	0.119	310	0.052	138	0.035	3	0.020	222	0.017	130	0.027	357	0.024	223	0.013	96	0.011	6

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	63.74	0.400	14.97	5.38		1161.1	16

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.240	444.0	740.5	0.48E 07	0.00074	1.762	20.18

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.123	0.566	35	0.084	318	0.055	204	0.054	64	0.032	287	0.023	213	0.022	103	0.009	334	0.007	281
CM		-0.073	0.087	157	0.050	38	0.039	313	0.020	211	0.010	104	0.005	50	0.007	286	0.004	168	0.002	109
DCP 1	.010	3.915	1.312	67	1.397	57	0.606	329	0.091	341	0.091	303	0.137	198	0.096	98	0.047	35	0.017	69
DCP 2	.050	2.839	1.268	72	0.771	29	0.268	309	0.103	350	0.117	297	0.097	235	0.034	256	0.046	234	0.050	237
DCP 3	.100	2.275	1.331	69	0.581	358	0.209	284	0.074	257	0.070	212	0.083	196	0.072	133	0.042	102	0.027	71
DCP 4	.150	1.913	1.008	58	0.320	334	0.155	273	0.094	172	0.034	174	0.060	134	0.041	57	0.024	31	0.020	327
DCP 5	.200	1.761	0.939	50	0.238	309	0.144	262	0.122	143	0.018	202	0.044	98	0.033	46	0.026	335	0.012	276
DCP 6	.250	1.484	0.840	43	0.206	305	0.161	249	0.122	131	0.021	176	0.044	82	0.043	25	0.030	333	0.021	272
DCP 7	.300	1.277	0.806	36	0.173	286	0.154	239	0.123	119	0.019	110	0.026	35	0.029	11	0.016	277	0.016	263
DCP 8	.500	0.830	0.632	16	0.160	245	0.168	180	0.123	79	0.072	352	0.039	284	0.033	212	0.013	148	0.006	89
DCP 9	.600	0.767	0.530	9	0.157	236	0.174	156	0.131	48	0.068	312	0.057	268	0.064	155	0.018	41	0.005	39
DCP10	.695	0.668	0.428	358	0.145	223	0.172	135	0.109	30	0.079	286	0.041	226	0.049	175	0.018	2	0.009	325
DCP11	.800	0.597	0.314	351	0.137	218	0.164	115	0.109	3	0.080	260	0.056	191	0.066	80	0.037	316	0.015	258
DCP12	.953	0.229	0.178	317	0.071	190	0.066	72	0.038	318	0.023	187	0.013	155	0.020	38	0.008	335	0.015	289

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	63.74	0.400	17.51	5.23		1161.2	16

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL
0.240	444.0	741.4	0.48E 07	0.00071	1.877	21.95

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.226	0.469	41	0.151	34	0.093	281	0.061	135	0.018	41	0.023	18	0.023	303	0.004	311	0.004	204
CM		-0.095	0.123	168	0.055	100	0.049	15	0.020	276	0.002	18	0.009	235	0.011	127	0.005	35	0.005	333
DCP 1	.010	4.245	0.870	140	1.645	95	0.444	11	0.319	116	0.177	61	0.063	14	0.032	153	0.053	27	0.030	325
DCP 2	.050	2.867	1.181	111	0.751	69	0.282	13	0.103	91	0.122	57	0.094	32	0.056	89	0.080	54	0.051	72
DCP 3	.100	2.340	1.186	95	0.557	55	0.342	6	0.043	294	0.087	19	0.065	334	0.044	318	0.042	3	0.044	345
DCP 4	.150	1.953	0.920	74	0.337	53	0.332	341	0.037	219	0.057	317	0.060	315	0.041	254	0.037	331	0.026	265
DCP 5	.200	1.855	0.785	62	0.280	51	0.288	330	0.065	235	0.024	306	0.064	298	0.046	234	0.008	249	0.019	268
DCP 6	.250	1.576	0.756	50	0.292	46	0.295	315	0.089	238	0.009	287	0.062	273	0.039	229	0.017	251	0.037	214
DCP 7	.300	1.411	0.706	40	0.245	46	0.270	311	0.106	228	0.009	330	0.063	253	0.035	182	0.009	353	0.025	233
DCP 8	.500	0.974	0.648	15	0.173	354	0.234	254	0.151	163	0.015	200	0.071	126	0.055	34	0.016	342	0.037	18
DCP 9	.600	0.892	0.570	7	0.192	328	0.242	226	0.173	136	0.040	100	0.079	69	0.081	343	0.015	276	0.025	288
DCP10	.695	0.784	0.494	2	0.200	303	0.229	207	0.163	114	0.046	67	0.076	32	0.069	300	0.016	191	0.006	328
DCP11	.800	0.730	0.384	356	0.192	285	0.214	186	0.137	87	0.060	40	0.078	352	0.083	267	0.036	156	0.012	162
DCP12	.953	0.228	0.280	337	0.166	234	0.167	123	0.134	359	0.081	234	0.033	106	0.022	339	0.034	258	0.053	138

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	63.62	0.400	24.63	5.36		1161.3	16

K	V	ω	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.239	444.0	741.1	0.48E 07	-0.00137	1.303	27.79

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.031	0.264	50	0.025	224	0.009	100	0.009	257	0.006	278	0.004	202	0.001	66	0.001	313	0.002	335
CM		-0.147	0.085	216	0.003	115	0.004	233	0.003	35	0.002	183	0.001	307	0.001	317	0.001	289	0.001	94
DCP 1	.010	2.956	1.435	171	0.331	144	0.402	190	0.050	186	0.153	197	0.040	242	0.026	211	0.018	266	0.012	46
DCP 2	.050	1.757	0.355	153	0.215	266	0.025	309	0.048	295	0.013	4	0.019	297	0.018	59	0.019	308	0.017	41
DCP 3	.100	1.370	0.330	42	0.050	256	0.058	12	0.020	43	0.009	326	0.009	203	0.006	359	0.007	287	0.009	14
DCP 4	.150	1.362	0.338	32	0.038	194	0.019	46	0.011	17	0.007	316	0.006	327	0.008	5	0.007	346	0.007	336
DCP 5	.200	1.384	0.379	35	0.025	186	0.020	42	0.010	343	0.016	301	0.006	214	0.008	350	0.002	256	0.003	278
DCP 6	.250	1.252	0.357	35	0.030	205	0.017	57	0.012	353	0.012	287	0.005	307	0.006	329	0.004	313	0.005	310
DCP 7	.300	1.175	0.401	38	0.021	198	0.015	46	0.014	313	0.016	287	0.007	184	0.006	331	0.002	41	0.005	214
DCP 8	.500	0.936	0.408	43	0.017	252	0.014	85	0.016	249	0.009	261	0.003	161	0.001	194	0.002	344	0.001	205
DCP 9	.600	0.870	0.379	39	0.024	218	0.016	81	0.017	263	0.003	20	0.011	185	0.007	172	0.007	145	0.001	161
DCP10	.695	0.851	0.364	46	0.018	262	0.017	79	0.018	218	0.004	16	0.005	155	0.005	204	0.004	207	0.003	70
DCP11	.800	0.798	0.296	44	0.012	225	0.020	84	0.019	218	0.013	358	0.008	118	0.006	114	0.004	99	0.002	60
DCP12	.953	0.490	0.209	41	0.018	306	0.007	337	0.010	144	0.002	73	0.003	338	0.005	76	0.004	358	0.013	289

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	63.74	0.600	0.05	5.38		1093.1	16

K	V	ω	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.163	653.4	1439.8	0.62E 07	-0.00089	0.405	5.22

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		-0.083	0.480	344	0.039	142	0.019	111	0.011	146	0.003	94	0.003	26	0.001	195	0.001	332	0.001	246
CM		-0.011	0.033	261	0.003	111	0.002	168	0.001	337	0.001	37	0.001	157	0.000	70	0.000	49	0.000	42
DCP 1	.010	-1.753	1.587	318	0.542	170	0.059	140	0.053	107	0.026	87	0.010	47	0.011	11	0.010	13	0.007	341
DCP 2	.050	-0.737	1.801	326	0.106	144	0.050	210	0.022	323	0.019	32	0.014	291	0.012	333	0.014	280	0.010	276
DCP 3	.100	-0.132	1.640	330	0.064	142	0.066	100	0.019	265	0.020	69	0.012	79	0.004	140	0.015	49	0.001	29
DCP 4	.150	-0.043	1.109	340	0.153	66	0.075	112	0.023	129	0.036	37	0.013	116	0.006	255	0.011	4	0.005	149
DCP 5	.200	0.259	0.850	343	0.098	83	0.075	115	0.039	165	0.008	27	0.012	85	0.009	165	0.002	338	0.005	102
DCP 6	.250	-0.014	0.643	347	0.047	96	0.044	93	0.036	143	0.003	244	0.009	30	0.008	150	0.007	228	0.006	248
DCP 7	.300	0.020	0.506	353	0.046	148	0.025	107	0.033	142	0.013	183	0.003	358	0.007	138	0.003	217	0.001	12
DCP 8	.500	-0.032	0.289	8	0.039	167	0.005	95	0.009	126	0.003	174	0.003	313	0.002	252	0.000	173	0.002	220
DCP 9	.600	0.014	0.226	12	0.029	179	0.002	90	0.009	152	0.005	181	0.003	306	0.002	248	0.003	336	0.002	252
DCP10	.695	0.033	0.181	19	0.009	186	0.008	72	0.005	145	0.002	156	0.003	3	0.001	327	0.001	39	0.001	285
DCP11	.800	-0.017	0.120	16	0.008	242	0.003	5	0.003	189	0.004	244	0.002	25	0.002	280	0.002	299	0.001	245
DCP12	.953	-0.096	0.095	11	0.008	308	0.004	18	0.001	238	0.001	251	0.002	349	0.001	5	0.001	81	0.001	216

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	63.62	0.600	7.33	5.29		1093.2	16

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.163	653.3	1434.5	0.62E 07	-0.00061	1.226	12.39

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.694	0.436	9	0.048	309	0.011	239	0.019	167	0.013	42	0.003	353	0.001	303	0.002	181	0.004	116
CM		-0.021	0.034	215	0.025	54	0.009	303	0.004	302	0.005	190	0.001	71	0.001	5	0.000	55	0.001	314
DCP 1	.010	1.489	1.827	342	0.065	68	0.025	83	0.028	116	0.019	26	0.014	294	0.015	338	0.008	288	0.006	281
DCP 2	.050	1.771	1.065	343	0.128	60	0.035	231	0.029	84	0.012	5	0.013	304	0.008	326	0.002	198	0.006	342
DCP 3	.100	2.044	0.763	357	0.425	43	0.216	267	0.090	169	0.056	134	0.043	58	0.049	303	0.035	163	0.013	83
DCP 4	.150	1.603	0.782	20	0.245	31	0.085	348	0.076	34	0.014	301	0.044	28	0.024	138	0.014	64	0.023	81
DCP 5	.200	1.317	0.670	23	0.183	348	0.084	320	0.049	245	0.023	351	0.018	315	0.019	304	0.011	247	0.004	72
DCP 6	.250	0.972	0.645	18	0.149	319	0.051	300	0.054	244	0.003	288	0.020	255	0.009	185	0.005	247	0.010	245
DCP 7	.300	0.803	0.564	18	0.149	297	0.049	248	0.070	211	0.032	138	0.021	144	0.022	103	0.011	73	0.006	71
DCP 8	.500	0.464	0.373	21	0.113	260	0.038	139	0.031	156	0.035	43	0.006	319	0.010	353	0.008	247	0.003	198
DCP 9	.600	0.403	0.299	23	0.092	252	0.029	128	0.027	161	0.027	44	0.007	352	0.006	314	0.008	272	0.014	184
DCP10	.695	0.340	0.245	20	0.089	235	0.034	112	0.023	107	0.030	352	0.008	221	0.005	239	0.002	139	0.006	157
DCP11	.800	0.241	0.171	20	0.075	232	0.027	125	0.021	123	0.022	2	0.007	255	0.010	198	0.003	158	0.013	131
DCP12	.953	0.061	0.161	343	0.052	192	0.018	138	0.020	45	0.006	291	0.004	312	0.002	155	0.002	152	0.010	31

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	63.62	0.600	9.63	5.26		1093.3	16

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.163	653.3	1434.4	0.62E 07	-0.00071	1.295	13.08

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.831	0.370	30	0.073	5	0.014	308	0.007	197	0.003	229	0.006	93	0.001	237	0.005	88	0.002	271
CM		-0.032	0.060	201	0.026	73	0.003	54	0.004	5	0.001	38	0.001	217	0.002	30	0.002	271	0.001	128
DCP 1	.010	2.196	1.434	352	0.061	56	0.027	30	0.007	124	0.009	76	0.003	341	0.007	313	0.006	306	0.007	275
DCP 2	.050	2.055	0.493	4	0.327	42	0.151	281	0.031	168	0.032	75	0.004	180	0.018	50	0.026	326	0.022	234
DCP 3	.100	2.308	0.257	66	0.509	47	0.107	288	0.057	21	0.066	227	0.036	105	0.001	148	0.019	57	0.011	342
DCP 4	.150	1.902	0.425	81	0.317	39	0.152	160	0.076	249	0.040	50	0.035	133	0.019	14	0.011	145	0.008	214
DCP 5	.200	1.450	0.571	50	0.217	48	0.038	55	0.042	90	0.040	171	0.022	192	0.018	178	0.010	227	0.009	170
DCP 6	.250	1.103	0.566	44	0.162	26	0.070	24	0.042	56	0.018	29	0.023	86	0.009	17	0.018	151	0.008	60
DCP 7	.300	0.932	0.558	40	0.135	2	0.079	18	0.052	352	0.025	331	0.013	359	0.005	62	0.012	72	0.007	79
DCP 8	.500	0.574	0.410	33	0.092	288	0.027	349	0.034	241	0.009	261	0.003	259	0.009	275	0.001	174	0.009	264
DCP 9	.600	0.491	0.349	31	0.097	276	0.015	269	0.028	200	0.013	214	0.014	105	0.010	277	0.018	148	0.009	51
DCP10	.695	0.418	0.296	25	0.089	262	0.022	256	0.040	176	0.005	126	0.012	64	0.006	261	0.005	44	0.010	226
DCP11	.800	0.331	0.273	18	0.083	259	0.028	226	0.021	158	0.010	216	0.006	75	0.014	160	0.015	66	0.005	0
DCP12	.953	0.108	0.207	351	0.043	235	0.025	213	0.009	119	0.004	115	0.006	338	0.004	200	0.006	67	0.005	271

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	63.62	0.600	12.22	5.21		1393.4	16

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.163	653.3	1428.7	0.62E 07	-0.00055	1.299	13.97

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.936	0.313	43	0.050	53	0.017	54	0.011	73	0.009	15	0.004	36	0.004	328	0.001	77	0.003	332
CM		-0.050	0.075	195	0.007	88	0.004	130	0.003	183	0.001	177	0.002	176	0.002	100	0.001	218	0.002	130
DCP 1	.010	2.704	1.003	2	0.228	75	0.068	343	0.020	179	0.009	89	0.004	153	0.009	71	0.008	311	0.006	246
DCP 2	.050	2.220	0.185	83	0.360	59	0.039	321	0.058	40	0.049	305	0.017	215	0.005	3	0.006	252	0.006	282
DCP 3	.100	2.367	0.470	128	0.196	29	0.175	102	0.011	160	0.056	46	0.029	121	0.036	347	0.012	232	0.008	157
DCP 4	.150	1.950	0.598	128	0.049	297	0.029	73	0.034	211	0.048	289	0.014	342	0.013	139	0.015	291	0.009	21
DCP 5	.200	1.591	0.483	72	0.077	89	0.020	106	0.022	146	0.023	55	0.006	83	0.005	10	0.009	156	0.013	70
DCP 6	.250	1.212	0.491	69	0.131	100	0.062	148	0.026	178	0.014	269	0.016	311	0.008	263	0.007	289	0.009	180
DCP 7	.300	1.048	0.515	40	0.110	60	0.061	69	0.050	99	0.032	97	0.021	106	0.015	88	0.014	119	0.015	52
DCP 8	.500	0.672	0.422	39	0.019	72	0.028	25	0.038	67	0.016	29	0.011	5	0.005	258	0.005	115	0.008	16
DCP 9	.600	0.563	0.373	19	0.011	238	0.022	316	0.019	343	0.006	322	0.006	345	0.016	297	0.010	110	0.012	336
DCP10	.695	0.509	0.328	27	0.013	311	0.034	328	0.013	1	0.017	23	0.009	331	0.007	18	0.007	353	0.006	352
DCP11	.800	0.432	0.292	9	0.031	268	0.017	261	0.016	307	0.007	281	0.005	319	0.010	251	0.010	0	0.020	244
DCP12	.953	0.189	0.209	3	0.036	346	0.012	311	0.003	341	0.009	316	0.008	29	0.007	301	0.002	316	0.009	267

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	63.49	0.600	14.98	5.18		1160.1	16

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.162	653.3	1455.0	0.63E 07	-0.00092	1.249	14.82

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.990	0.260	61	0.039	159	0.012	148	0.007	186	0.012	157	0.004	85	0.002	145	0.001	61	0.001	353
CM		-0.080	0.074	207	0.007	278	0.005	288	0.003	358	0.003	282	0.001	217	0.001	273	0.000	236	0.001	144
DCP 1	.010	3.027	0.734	5	0.263	96	0.042	314	0.008	162	0.015	152	0.003	141	0.007	7	0.006	258	0.004	146
DCP 2	.050	2.136	0.358	151	0.108	61	0.127	179	0.010	307	0.057	187	0.008	112	0.021	172	0.008	13	0.008	137
DCP 3	.100	2.001	0.576	153	0.206	259	0.043	333	0.013	284	0.008	214	0.027	87	0.014	82	0.005	296	0.004	271
DCP 4	.150	1.771	0.385	115	0.126	224	0.007	95	0.044	207	0.038	265	0.008	330	0.003	232	0.004	293	0.022	163
DCP 5	.200	1.553	0.395	99	0.097	207	0.022	351	0.022	82	0.027	174	0.009	174	0.003	333	0.002	323	0.007	297
DCP 6	.250	1.395	0.384	85	0.115	198	0.031	281	0.013	72	0.018	158	0.018	217	0.003	175	0.007	54	0.004	134
DCP 7	.300	1.143	0.401	74	0.115	165	0.022	179	0.005	42	0.011	140	0.009	153	0.005	207	0.004	112	0.005	82
DCP 8	.500	0.748	0.389	45	0.059	137	0.016	156	0.016	232	0.016	183	0.009	26	0.006	252	0.007	151	0.008	52
DCP 9	.600	0.659	0.340	36	0.052	135	0.028	129	0.018	167	0.015	117	0.004	94	0.003	298	0.002	191	0.013	328
DCP10	.695	0.600	0.326	33	0.031	102	0.021	138	0.011	167	0.017	127	0.006	26	0.008	153	0.006	94	0.008	335
DCP11	.800	0.596	0.278	27	0.030	76	0.025	96	0.010	160	0.018	87	0.007	65	0.006	86	0.004	38	0.010	286
DCP12	.953	0.259	0.185	16	0.026	25	0.017	91	0.009	194	0.007	103	0.001	349	0.009	76	0.007	333	0.004	142

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	63.29	0.600	17.55	5.21		1160.2	10
	K	V	Q	RN	DAMPING	CY(MAX)	ALPHA(STALL)
	0.162	653.3	1453.9	0.63E 07	-0.00117	1.215	18.96

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.003	0.250	61	0.047	186	0.006	338	0.018	190	0.011	332	0.005	189	0.005	339	0.001	274	0.004	340
CM		-0.102	0.070	217	0.008	316	0.000	147	0.005	340	0.004	108	0.002	306	0.002	92	0.002	111	0.002	160
DCP 1	.010	3.103	0.304	36	0.293	81	0.064	266	0.029	147	0.008	163	0.019	285	0.006	144	0.013	43	0.006	280
DCP 2	.050	2.094	0.328	161	0.126	282	0.049	138	0.079	310	0.027	60	0.041	288	0.027	71	0.019	211	0.013	70
DCP 3	.100	1.741	0.225	131	0.127	240	0.017	72	0.025	245	0.037	102	0.051	243	0.073	309	0.011	180	0.012	276
DCP 4	.150	1.571	0.276	96	0.128	240	0.039	14	0.025	73	0.025	21	0.016	197	0.023	3	0.026	111	0.013	293
DCP 5	.200	1.446	0.289	85	0.128	204	0.029	28	0.042	197	0.016	14	0.009	189	0.009	295	0.004	102	0.005	232
DCP 6	.250	1.325	0.321	75	0.114	202	0.023	348	0.023	169	0.024	347	0.024	156	0.007	105	0.017	83	0.004	247
DCP 7	.300	1.148	0.332	76	0.125	193	0.021	299	0.030	202	0.027	354	0.020	53	0.013	70	0.005	186	0.004	183
DCP 8	.500	0.829	0.365	50	0.064	145	0.014	314	0.020	174	0.023	312	0.008	163	0.008	329	0.006	36	0.014	99
DCP 9	.600	0.714	0.328	46	0.061	155	0.006	254	0.034	172	0.016	271	0.006	158	0.011	346	0.010	327	0.008	286
DCP10	.695	0.688	0.320	41	0.027	126	0.002	247	0.019	186	0.019	269	0.014	139	0.005	298	0.021	308	0.022	359
DCP11	.800	0.693	0.274	38	0.028	131	0.001	220	0.022	150	0.014	278	0.005	165	0.011	236	0.015	286	0.010	16
DCP12	.953	0.314	0.166	29	0.006	4	0.010	86	0.002	120	0.009	329	0.003	149	0.010	274	0.012	173	0.019	292

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	63.29	0.600	24.57	5.21		1150.3	10
	K	V	Q	RN	DAMPING	CY(MAX)	ALPHA(STALL)
	0.162	653.3	1454.2	0.63E 07	-0.00107	1.291	28.02

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.085	0.233	53	0.025	167	0.018	227	0.003	71	0.007	102	0.006	184	0.001	37	0.003	142	0.002	189
CM		-0.151	0.066	215	0.005	350	0.001	340	0.002	92	0.004	194	0.002	298	0.001	127	0.001	254	0.001	134
DCP 1	.010	2.580	0.865	170	0.060	279	0.198	191	0.056	233	0.104	189	0.048	209	0.037	156	0.040	183	0.023	156
DCP 2	.050	1.780	0.179	92	0.067	134	0.068	230	0.040	95	0.043	185	0.019	245	0.022	59	0.013	139	0.014	230
DCP 3	.100	1.778	0.282	84	0.022	69	0.038	307	0.037	81	0.008	144	0.013	328	0.015	37	0.016	152	0.017	189
DCP 4	.150	1.516	0.211	59	0.035	171	0.019	239	0.006	114	0.014	121	0.016	201	0.010	25	0.007	113	0.005	242
DCP 5	.200	1.509	0.274	57	0.036	136	0.028	244	0.017	70	0.023	131	0.010	246	0.009	224	0.007	244	0.011	167
DCP 6	.250	1.413	0.237	52	0.043	198	0.017	273	0.016	69	0.017	114	0.015	185	0.008	284	0.002	326	0.006	131
DCP 7	.300	1.224	0.289	46	0.030	186	0.024	272	0.010	54	0.014	105	0.011	215	0.001	234	0.001	207	0.007	105
DCP 8	.500	0.978	0.321	41	0.037	159	0.019	232	0.006	17	0.014	63	0.011	132	0.003	55	0.006	310	0.011	343
DCP 9	.600	0.869	0.297	42	0.029	179	0.005	217	0.003	354	0.017	49	0.009	137	0.005	302	0.005	137	0.004	119
DCP10	.695	0.857	0.287	42	0.031	150	0.014	177	0.004	278	0.012	24	0.006	137	0.004	58	0.002	200	0.008	254
DCP11	.800	0.847	0.249	46	0.021	171	0.009	165	0.011	264	0.014	4	0.008	125	0.005	222	0.008	107	0.004	226
DCP12	.953	0.500	0.179	34	0.008	201	0.009	190	0.010	229	0.007	304	0.002	281	0.006	0	0.006	86	0.000	109

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	80.00	0.400	0.10	5.75		1098.1	10

K	V	ω	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.301	444.2	730.9	0.47E 07	-0.00096	0.330	5.62

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		-0.078	0.406	2	0.035	175	0.016	85	0.005	140	0.006	177	0.003	117	0.002	151	0.002	188	0.001	104
CM		-0.016	0.047	270	0.007	89	0.002	245	0.001	57	0.002	45	0.001	322	0.000	45	0.000	68	0.001	231
DCP 1	.010	-1.916	1.975	333	0.546	164	0.151	196	0.006	289	0.045	112	0.027	170	0.012	215	0.014	127	0.017	160
DCP 2	.050	-0.806	1.578	337	0.124	77	0.077	82	0.014	167	0.020	343	0.024	17	0.011	105	0.011	230	0.008	256
DCP 3	.100	-0.205	1.164	343	0.057	105	0.055	64	0.021	141	0.009	165	0.006	46	0.009	74	0.005	134	0.004	298
DCP 4	.150	0.013	0.829	350	0.042	108	0.061	64	0.033	124	0.015	191	0.008	337	0.006	85	0.008	154	0.005	210
DCP 5	.200	0.352	0.600	0	0.062	175	0.010	21	0.001	44	0.018	139	0.008	123	0.004	166	0.002	120	0.003	80
DCP 6	.250	-0.048	0.493	5	0.060	184	0.013	37	0.012	83	0.017	163	0.006	224	0.005	265	0.003	270	0.001	200
DCP 7	.300	0.024	0.429	12	0.055	186	0.007	76	0.004	154	0.012	154	0.007	124	0.003	151	0.005	159	0.002	91
DCP 8	.500	-0.025	0.302	28	0.034	203	0.013	91	0.004	142	0.007	193	0.001	108	0.002	151	0.002	230	0.001	87
DCP 9	.600	0.052	0.257	38	0.031	221	0.014	76	0.004	170	0.006	209	0.007	155	0.002	161	0.004	204	0.005	63
DCP10	.695	0.065	0.203	46	0.023	239	0.012	94	0.005	137	0.006	232	0.002	125	0.003	232	0.005	306	0.001	239
DCP11	.800	-0.019	0.169	55	0.023	255	0.014	72	0.008	259	0.007	235	0.006	138	0.002	200	0.002	172	0.004	43
DCP12	.953	-0.084	0.097	47	0.016	263	0.006	87	0.002	173	0.004	207	0.002	75	0.001	342	0.002	181	0.001	112

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	80.00	0.400	7.35	5.73		1098.2	10

K	V	ω	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.301	444.2	730.2	0.47E 07	-0.00094	1.166	12.89

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.771	0.400	3	0.031	179	0.014	60	0.003	125	0.003	181	0.002	333	0.001	242	0.001	178	0.000	300
CM		-0.015	0.047	281	0.007	88	0.003	294	0.001	27	0.001	46	0.000	86	0.000	27	0.000	322	0.000	319
DCP 1	.010	2.708	2.760	336	0.265	151	0.122	30	0.027	341	0.012	62	0.020	354	0.009	319	0.006	265	0.009	247
DCP 2	.050	2.155	1.473	340	0.122	129	0.037	339	0.022	63	0.018	45	0.013	10	0.007	310	0.004	1	0.009	269
DCP 3	.100	1.961	1.069	349	0.071	148	0.011	64	0.015	44	0.010	95	0.003	323	0.003	120	0.007	220	0.001	163
DCP 4	.150	1.602	0.728	353	0.066	161	0.028	351	0.011	101	0.003	197	0.006	313	0.002	293	0.004	225	0.003	318
DCP 5	.200	1.448	0.562	1	0.042	164	0.013	74	0.010	117	0.006	165	0.001	218	0.002	130	0.004	122	0.003	56
DCP 6	.250	0.951	0.494	4	0.038	165	0.019	35	0.008	117	0.005	141	0.004	339	0.002	9	0.001	143	0.000	164
DCP 7	.300	0.886	0.427	12	0.030	189	0.016	82	0.007	143	0.008	190	0.001	213	0.002	160	0.004	162	0.003	20
DCP 8	.500	0.523	0.276	29	0.026	215	0.016	67	0.006	149	0.002	153	0.002	319	0.001	332	0.002	132	0.001	19
DCP 9	.600	0.495	0.233	42	0.028	236	0.015	92	0.006	184	0.008	216	0.001	149	0.004	142	0.002	210	0.003	88
DCP10	.695	0.376	0.192	51	0.023	234	0.015	82	0.005	182	0.004	186	0.003	326	0.002	248	0.003	45	0.001	1
DCP11	.800	0.215	0.153	67	0.025	253	0.021	124	0.006	259	0.008	241	0.001	281	0.004	234	0.003	191	0.003	197
DCP12	.953	0.047	0.095	51	0.011	220	0.006	58	0.003	[illegible]	0.001	249	0.002	316	0.001	339	0.002	232	0.001	198

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	80.00	0.400	9.70	5.70		1098.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.301	444.2	727.4	0.47E 07	-0.00094	1.413	15.29

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.017	0.400	7	0.033	188	0.017	65	0.002	170	0.005	198	0.001	78	0.002	257	0.001	114	0.003	218
CM		-0.011	0.047	281	0.007	85	0.003	257	0.003	27	0.000	41	0.001	88	0.000	35	0.000	27	0.001	318
DCP 1	.010	4.322	2.938	338	0.317	142	0.146	304	0.131	132	0.071	7	0.022	89	0.047	325	0.023	210	0.013	276
DCP 2	.050	3.118	1.601	342	0.218	182	0.179	88	0.156	342	0.074	209	0.019	66	0.022	161	0.038	27	0.044	263
DCP 3	.100	2.574	0.945	354	0.062	93	0.037	279	0.032	146	0.009	139	0.010	133	0.010	256	0.006	148	0.006	194
DCP 4	.150	1.979	0.695	358	0.044	121	0.015	11	0.012	75	0.005	117	0.003	3	0.003	310	0.002	171	0.002	209
DCP 5	.200	1.773	0.536	6	0.025	168	0.004	49	0.011	132	0.007	185	0.002	103	0.003	15	0.004	111	0.003	106
DCP 6	.250	1.240	0.473	10	0.025	172	0.014	57	0.004	114	0.008	161	0.002	6	0.001	218	0.001	113	0.001	239
DCP 7	.300	1.129	0.409	17	0.032	209	0.015	77	0.005	149	0.010	180	0.001	145	0.001	293	0.003	110	0.002	103
DCP 8	.500	0.663	0.290	35	0.033	230	0.023	84	0.006	233	0.005	161	0.002	313	0.001	254	0.002	181	0.002	153
DCP 9	.600	0.613	0.241	47	0.037	264	0.026	70	0.010	214	0.004	204	0.001	74	0.002	221	0.001	181	0.006	115
DCP10	.695	0.447	0.205	54	0.032	234	0.022	81	0.012	209	0.001	188	0.002	25	0.002	295	0.002	187	0.003	115
DCP11	.800	0.283	0.154	61	0.032	244	0.013	57	0.008	220	0.005	272	0.005	221	0.002	245	0.005	228	0.005	232
DCP12	.953	0.088	0.092	39	0.015	151	0.004	12	0.007	171	0.003	213	0.002	359	0.004	209	0.003	44	0.003	184

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	80.32	0.400	12.28	5.63		1098.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.302	444.1	727.3	0.47E 07	0.00051	1.622	17.76

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.072	0.561	13	0.077	178	0.020	42	0.015	176	0.020	62	0.009	225	0.002	355	0.004	146	0.002	54
CM		-0.043	0.028	123	0.038	311	0.015	192	0.010	49	0.006	272	0.006	37	0.000	251	0.002	255	0.001	186
DCP 1	.010	4.259	2.318	4	0.554	33	0.464	285	0.243	150	0.200	356	0.080	210	0.079	23	0.093	245	0.061	133
DCP 2	.050	2.862	1.492	24	0.443	319	0.240	202	0.095	123	0.068	88	0.109	55	0.100	334	0.052	252	0.038	216
DCP 3	.100	2.457	1.356	32	0.407	281	0.201	147	0.064	108	0.094	32	0.055	321	0.045	253	0.051	156	0.033	84
DCP 4	.150	1.942	1.044	26	0.249	242	0.099	94	0.040	74	0.042	346	0.004	254	0.031	205	0.027	90	0.013	343
DCP 5	.200	1.760	0.903	22	0.239	219	0.071	84	0.044	65	0.012	282	0.007	316	0.027	177	0.020	100	0.022	22
DCP 6	.250	1.303	0.816	16	0.229	197	0.054	64	0.062	40	0.032	259	0.016	170	0.016	155	0.020	72	0.027	315
DCP 7	.300	1.223	0.744	12	0.230	191	0.055	87	0.054	21	0.018	237	0.028	204	0.025	123	0.022	32	0.011	298
DCP 8	.500	0.770	0.480	3	0.196	150	0.063	32	0.051	276	0.036	143	0.010	54	0.012	92	0.017	289	0.014	170
DCP 9	.600	0.733	0.356	0	0.166	137	0.063	26	0.065	241	0.055	111	0.021	286	0.010	76	0.006	255	0.004	95
DCP10	.695	0.543	0.258	352	0.142	126	0.066	2	0.053	211	0.038	88	0.021	238	0.015	355	0.031	187	0.025	35
DCP11	.800	0.406	0.154	338	0.123	116	0.061	354	0.065	195	0.052	62	0.042	226	0.007	320	0.017	128	0.015	15
DCP12	.953	0.176	0.061	278	0.044	88	0.020	294	0.023	148	0.027	349	0.024	158	0.011	270	0.032	41	0.020	209

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	80.65	0.400	15.04	5.70		1166.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.303	443.9	741.8	0.48E 07	0.00122	1.742	21.02

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		1.121	0.620 26	0.094 244	0.038 102	0.023 329	0.018 209	0.013 45	0.006 292	0.009 113	0.005 316
CM		-0.079	0.096 140	0.062 2	0.032 245	0.012 129	0.008 33	0.008 249	0.004 131	0.003 325	0.002 184
DCP 1	.010	3.949	1.721 59	1.193 37	0.448 299	0.108 241	0.023 185	0.049 155	0.061 14	0.014 287	0.022 27
DCP 2	.050	2.867	1.576 65	0.699 6	0.108 278	0.135 296	0.048 244	0.077 259	0.077 219	0.042 155	0.029 172
DCP 3	.100	2.415	1.494 61	0.531 327	0.106 248	0.091 247	0.072 166	0.052 184	0.035 134	0.053 112	0.052 30
DCP 4	.150	1.856	1.153 46	0.322 287	0.090 210	0.071 165	0.041 108	0.048 32	0.008 36	0.047 11	0.036 281
DCP 5	.200	1.606	1.028 41	0.294 276	0.107 220	0.102 135	0.045 96	0.063 15	0.006 304	0.024 344	0.023 272
DCP 6	.250	1.313	0.964 33	0.291 261	0.144 192	0.100 93	0.041 69	0.064 331	0.010 149	0.022 338	0.032 233
DCP 7	.300	1.210	0.885 27	0.259 251	0.134 194	0.115 88	0.035 35	0.051 332	0.011 247	0.002 317	0.017 227
DCP 8	.500	0.831	0.686 3	0.253 206	0.159 122	0.101 10	0.063 295	0.034 230	0.020 69	0.018 160	0.014 44
DCP 9	.600	0.816	0.583 357	0.257 199	0.194 91	0.108 334	0.083 247	0.057 111	0.014 11	0.011 6	0.007 164
DCP 10	.695	0.722	0.474 342	0.241 183	0.187 66	0.100 305	0.066 212	0.046 99	0.035 316	0.034 157	0.017 299
DCP 11	.800	0.685	0.316 337	0.188 176	0.180 44	0.106 279	0.091 172	0.084 43	0.037 255	0.019 135	0.021 299
DCP 12	.953	0.173	0.180 295	0.109 125	0.092 329	0.056 178	0.028 37	0.003 282	0.016 347	0.027 232	0.029 63

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	80.65	0.400	17.55	5.52		1166.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.303	443.9	742.1	0.48E 07	0.00102	1.905	23.08

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		1.255	0.564 40	0.136 284	0.077 157	0.046 23	0.025 356	0.016 136	0.014 325	0.005 230	0.010 227
CM		-0.096	0.139 156	0.079 40	0.031 276	0.004 161	0.012 184	0.012 19	0.003 192	0.003 92	0.004 210
DCP 1	.010	4.285	1.877 114	1.237 57	0.205 219	0.102 65	0.106 253	0.115 114	0.077 34	0.019 46	0.057 40
DCP 2	.050	3.105	1.505 102	0.603 28	0.123 171	0.116 30	0.040 87	0.142 84	0.088 104	0.085 92	0.036 93
DCP 3	.100	2.622	1.386 87	0.455 4	0.035 140	0.120 357	0.068 12	0.062 21	0.053 3	0.044 348	0.041 332
DCP 4	.150	2.041	1.089 70	0.361 339	0.101 255	0.043 1	0.039 314	0.031 36	0.042 298	0.019 262	0.014 267
DCP 5	.200	1.760	0.982 59	0.303 330	0.142 264	0.036 31	0.051 284	0.020 63	0.047 287	0.029 247	0.036 241
DCP 6	.250	1.475	0.897 52	0.312 322	0.182 236	0.057 37	0.038 235	0.035 44	0.050 262	0.011 193	0.035 252
DCP 7	.300	1.362	0.876 41	0.289 312	0.195 237	0.036 47	0.037 210	0.020 60	0.039 260	0.025 206	0.031 219
DCP 8	.500	0.956	0.721 12	0.321 256	0.218 163	0.062 56	0.080 71	0.042 350	0.031 288	0.025 233	0.012 192
DCP 9	.600	0.949	0.704 4	0.393 244	0.259 137	0.096 38	0.076 8	0.049 208	0.017 344	0.026 117	0.036 305
DCP 10	.695	0.847	0.576 352	0.342 230	0.232 115	0.099 9	0.051 334	0.062 191	0.019 348	0.012 159	0.009 301
DCP 11	.800	0.830	0.434 347	0.283 218	0.189 85	0.093 345	0.068 282	0.083 152	0.032 327	0.010 118	0.018 193
DCP 12	.953	0.156	0.289 313	0.204 154	0.182 358	0.129 202	0.092 28	0.066 222	0.060 96	0.059 304	0.040 151

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	80.32	0.400	24.70	5.61		1166.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.302	443.9	738.8	0.47E 07	-0.00145	1.550	27.99

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.112	0.403	56	0.008	91	0.028	0	0.022	196	0.007	219	0.001	172	0.008	165	0.003	337	0.002	141
CM		-0.161	0.117	217	0.013	181	0.013	181	0.013	342	0.003	97	0.002	313	0.002	12	0.001	210	0.000	288
DCP 1	.010	3.137	2.019	163	0.361	180	0.609	188	0.166	274	0.166	181	0.087	299	0.053	174	0.061	294	0.032	224
DCP 2	.050	2.012	0.550	148	0.208	247	0.054	323	0.068	293	0.027	66	0.018	4	0.014	91	0.022	353	0.006	138
DCP 3	.100	1.626	0.388	60	0.064	181	0.107	5	0.038	76	0.017	137	0.024	223	0.011	183	0.012	236	0.010	131
DCP 4	.150	1.463	0.415	47	0.074	115	0.048	35	0.008	351	0.022	97	0.002	96	0.008	128	0.006	351	0.004	73
DCP 5	.200	1.314	0.494	44	0.067	102	0.052	8	0.008	342	0.009	282	0.018	145	0.011	181	0.017	154	0.005	149
DCP 6	.250	1.231	0.449	47	0.063	106	0.045	44	0.010	327	0.025	76	0.005	252	0.014	86	0.010	258	0.004	90
DCP 7	.300	1.193	0.530	47	0.056	90	0.051	3	0.024	317	0.018	266	0.016	116	0.016	138	0.021	98	0.004	99
DCP 8	.500	1.033	0.581	45	0.027	57	0.024	1	0.035	213	0.005	11	0.016	353	0.005	19	0.007	298	0.006	195
DCP 9	.600	0.957	0.536	46	0.044	357	0.068	357	0.071	208	0.032	284	0.014	193	0.022	242	0.015	332	0.007	93
DCP10	.695	0.966	0.522	45	0.038	348	0.032	18	0.064	176	0.012	249	0.007	148	0.008	332	0.009	328	0.012	7
DCP11	.800	0.963	0.412	50	0.053	353	0.065	1	0.068	154	0.034	224	0.010	155	0.020	166	0.009	213	0.001	19
DCP12	.953	0.436	0.281	34	0.032	324	0.019	321	0.037	122	0.020	54	0.004	96	0.010	164	0.015	56	0.009	193

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	80.32	0.600	0.12	5.71		1097.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.205	653.6	1430.0	0.62E 07	-0.00091	0.395	5.44

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		-0.098	0.469	342	0.027	164	0.025	64	0.010	99	0.005	74	0.002	26	0.001	98	0.002	263	0.001	199
CM		-0.011	0.046	259	0.004	105	0.002	229	0.002	279	0.002	331	0.000	32	0.000	4	0.001	61	0.000	81
DCP 1	.010	-1.927	1.641	308	0.437	166	0.045	29	0.032	89	0.021	35	0.006	304	0.002	285	0.003	214	0.008	153
DCP 2	.050	-0.774	1.765	321	0.117	161	0.013	152	0.023	292	0.016	2	0.017	288	0.011	310	0.012	252	0.007	226
DCP 3	.100	-0.209	1.665	322	0.097	198	0.085	61	0.028	246	0.018	80	0.011	51	0.006	117	0.012	5	0.003	240
DCP 4	.150	-0.073	1.138	338	0.153	41	0.055	83	0.014	13	0.050	6	0.019	67	0.009	258	0.020	315	0.008	79
DCP 5	.200	0.262	0.834	340	0.054	64	0.067	74	0.027	118	0.010	10	0.010	77	0.009	96	0.004	133	0.003	20
DCP 6	.250	-0.016	0.633	348	0.020	94	0.057	63	0.035	104	0.003	109	0.009	18	0.009	101	0.006	196	0.001	189
DCP 7	.300	0.025	0.501	353	0.039	165	0.028	62	0.027	104	0.011	132	0.001	167	0.005	68	0.004	154	0.001	277
DCP 8	.500	-0.037	0.307	14	0.032	180	0.016	62	0.014	79	0.007	118	0.002	263	0.001	178	0.003	202	0.001	101
DCP 9	.600	0.006	0.246	18	0.021	197	0.019	52	0.013	89	0.008	127	0.001	200	0.000	85	0.002	281	0.002	287
DCP10	.695	0.016	0.192	28	0.013	236	0.013	59	0.006	90	0.003	136	0.003	328	0.000	255	0.003	277	0.001	144
DCP11	.800	-0.022	0.141	32	0.018	264	0.015	50	0.007	132	0.005	153	0.001	116	0.001	213	0.004	235	0.002	232
DCP12	.953	-0.100	0.095	20	0.014	274	0.005	37	0.003	102	0.004	110	0.001	28	0.001	236	0.004	273	0.001	287

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	80.32	0.600	7.35	5.58		1097.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.205	653.5	1431.6	0.62E 07	-0.00059	1.272	12.64

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.700	0.492	6	0.039	283	0.009	169	0.021	93	0.007	338	0.002	241	0.003	191	0.005	108	0.002	35
CM		-0.024	0.042	215	0.031	31	0.012	265	0.004	267	0.004	124	0.002	53	0.001	323	0.001	334	0.001	170
DCP 1	.010	1.432	1.935	335	0.139	41	0.025	61	0.022	35	0.027	34	0.008	319	0.012	309	0.011	263	0.006	256
DCP 2	.050	1.738	1.166	337	0.181	57	0.027	207	0.038	356	0.025	37	0.006	251	0.005	300	0.005	336	0.008	281
DCP 3	.100	1.927	0.778	358	0.522	18	0.257	220	0.065	54	0.064	137	0.044	45	0.029	293	0.018	137	0.002	56
DCP 4	.150	1.623	0.905	14	0.197	24	0.098	321	0.083	47	0.023	326	0.047	21	0.007	169	0.016	18	0.030	93
DCP 5	.200	1.340	0.730	15	0.130	346	0.060	304	0.015	135	0.018	331	0.013	26	0.024	294	0.003	279	0.005	282
DCP 6	.250	0.961	0.709	18	0.130	323	0.053	299	0.025	256	0.028	238	0.024	200	0.016	185	0.009	81	0.016	210
DCP 7	.300	0.865	0.689	12	0.151	276	0.046	242	0.061	178	0.019	143	0.029	153	0.019	97	0.022	63	0.002	7
DCP 8	.500	0.497	0.445	19	0.134	235	0.047	125	0.054	113	0.036	12	0.016	294	0.009	248	0.009	195	0.010	148
DCP 9	.600	0.409	0.343	23	0.104	226	0.035	89	0.034	103	0.016	337	0.010	288	0.012	216	0.017	144	0.009	24
DCP10	.695	0.341	0.279	21	0.113	214	0.050	88	0.034	84	0.032	314	0.016	229	0.016	142	0.004	358	0.008	39
DCP11	.800	0.245	0.212	19	0.103	207	0.046	80	0.020	50	0.019	274	0.007	250	0.011	156	0.005	93	0.012	1
DCP12	.953	0.048	0.152	341	0.060	165	0.030	84	0.024	344	0.011	222	0.007	168	0.011	16	0.008	199	0.011	287

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	80.32	0.600	9.65	5.52		1097.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.205	653.5	1428.8	0.62E 07	-0.00052	1.363	14.18

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.827	0.467	24	0.031	344	0.018	316	0.015	145	0.010	117	0.005	30	0.007	53	0.004	327	0.002	160
CM		-0.037	0.062	199	0.032	52	0.003	34	0.008	323	0.003	316	0.002	221	0.001	182	0.001	144	0.002	34
DCP 1	.010	2.104	1.623	346	0.167	76	0.026	343	0.011	123	0.024	354	0.005	342	0.007	282	0.003	182	0.005	210
DCP 2	.050	2.055	0.771	352	0.244	44	0.085	230	0.029	119	0.031	49	0.016	4	0.014	271	0.006	189	0.002	139
DCP 3	.100	2.151	0.431	58	0.470	30	0.035	174	0.119	316	0.020	114	0.049	267	0.045	127	0.010	327	0.023	114
DCP 4	.150	1.718	0.807	47	0.216	61	0.058	158	0.032	153	0.061	164	0.035	312	0.034	49	0.021	340	0.015	74
DCP 5	.200	1.438	0.631	45	0.168	46	0.103	5	0.033	96	0.024	67	0.036	153	0.035	86	0.019	228	0.016	146
DCP 6	.250	1.085	0.692	39	0.104	11	0.107	21	0.029	28	0.044	28	0.013	32	0.017	30	0.006	92	0.015	70
DCP 7	.300	0.990	0.672	32	0.106	359	0.114	344	0.012	11	0.031	345	0.013	33	0.019	359	0.012	356	0.006	313
DCP 8	.500	0.622	0.528	27	0.118	263	0.050	302	0.049	197	0.033	198	0.024	127	0.003	256	0.014	157	0.008	47
DCP 9	.600	0.496	0.405	25	0.103	231	0.023	295	0.043	143	0.020	152	0.009	52	0.019	113	0.022	6	0.007	300
DCP10	.695	0.437	0.350	22	0.118	240	0.028	228	0.049	159	0.036	133	0.030	40	0.009	313	0.010	16	0.022	254
DCP11	.800	0.334	0.280	13	0.106	225	0.034	177	0.032	112	0.016	116	0.006	0	0.020	27	0.021	275	0.011	198
DCP12	.953	0.099	0.200	344	0.060	211	0.035	157	0.021	103	0.015	50	0.016	314	0.014	212	0.005	40	0.014	148

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	80.32	0.600	12.21	5.45		1097.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.205	653.5	1424.2	0.62E 07	-0.00066	1.438	15.03

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.941	0.434	45	0.028	60	0.034	24	0.015	347	0.006	242	0.004	279	0.001	279	0.001	78	0.004	275
CM		-0.053	0.084	201	0.014	87	0.011	134	0.002	123	0.003	21	0.001	97	0.001	49	0.001	275	0.001	97
DCP 1	.010	2.644	1.196	358	0.235	83	0.070	297	0.024	147	0.027	18	0.007	5	0.005	69	0.008	322	0.011	236
DCP 2	.050	2.258	0.331	26	0.276	56	0.032	264	0.050	355	0.035	268	0.007	130	0.007	227	0.006	120	0.008	272
DCP 3	.100	2.242	0.731	114	0.293	36	0.215	105	0.099	328	0.053	55	0.029	242	0.020	63	0.010	136	0.024	324
DCP 4	.150	1.956	0.660	98	0.059	215	0.080	56	0.022	287	0.040	245	0.019	330	0.014	74	0.020	209	0.019	20
DCP 5	.200	1.538	0.663	72	0.069	122	0.030	100	0.017	328	0.020	46	0.014	83	0.041	214	0.018	104	0.019	224
DCP 6	.250	1.201	0.654	60	0.100	120	0.081	85	0.030	208	0.023	195	0.011	183	0.011	51	0.012	65	0.002	171
DCP 7	.300	1.097	0.700	53	0.108	99	0.111	60	0.044	95	0.014	332	0.007	211	0.016	2	0.027	316	0.019	184
DCP 8	.500	0.710	0.544	37	0.012	245	0.093	1	0.041	15	0.008	288	0.017	358	0.009	305	0.010	185	0.016	61
DCP 9	.600	0.593	0.455	34	0.027	257	0.060	336	0.028	5	0.020	249	0.002	222	0.006	355	0.008	45	0.017	315
DCP10	.695	0.531	0.400	28	0.038	294	0.059	316	0.032	319	0.017	223	0.016	273	0.008	239	0.009	5	0.013	244
DCP11	.800	0.416	0.349	22	0.071	275	0.042	276	0.020	266	0.018	172	0.010	259	0.015	209	0.013	102	0.012	272
DCP12	.953	0.179	0.222	357	0.038	313	0.026	267	0.020	223	0.015	179	0.008	129	0.006	108	0.005	159	0.002	252

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	80.32	0.600	14.82	5.36		1162.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.205	653.4	1463.9	0.63E 07	-0.00090	1.401	17.25

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.014	0.401	55	0.020	165	0.009	54	0.002	265	0.003	55	0.007	148	0.002	35	0.002	108	0.002	200
CM		-0.081	0.093	207	0.001	65	0.006	247	0.002	241	0.003	249	0.003	350	0.001	134	0.001	319	0.001	32
DCP 1	.010	2.903	0.681	10	0.332	81	0.096	292	0.008	57	0.027	226	0.025	90	0.031	326	0.022	196	0.014	26
DCP 2	.050	2.303	0.322	106	0.208	46	0.058	171	0.035	13	0.012	162	0.011	33	0.007	53	0.015	339	0.009	269
DCP 3	.100	2.124	0.793	123	0.186	302	0.049	47	0.100	274	0.061	291	0.027	98	0.006	98	0.025	50	0.008	116
DCP 4	.150	1.840	0.480	94	0.082	262	0.065	27	0.063	160	0.011	243	0.019	49	0.021	29	0.011	252	0.012	175
DCP 5	.200	1.512	0.462	88	0.185	214	0.064	293	0.018	284	0.019	269	0.008	166	0.031	163	0.014	119	0.011	144
DCP 6	.250	1.434	0.590	75	0.161	191	0.047	283	0.014	318	0.017	27	0.005	232	0.006	104	0.017	336	0.001	156
DCP 7	.300	1.152	0.577	64	0.141	171	0.030	211	0.026	238	0.005	286	0.006	321	0.016	145	0.009	49	0.005	255
DCP 8	.500	0.789	0.590	45	0.060	120	0.044	101	0.032	104	0.029	114	0.009	209	0.018	353	0.011	252	0.008	130
DCP 9	.600	0.669	0.472	36	0.013	188	0.006	81	0.011	48	0.006	33	0.020	187	0.007	218	0.006	142	0.004	275
DCP10	.695	0.633	0.447	33	0.020	21	0.024	54	0.010	330	0.013	99	0.021	175	0.008	247	0.017	150	0.007	285
DCP11	.800	0.585	0.344	27	0.025	327	0.017	58	0.004	331	0.007	45	0.016	141	0.002	319	0.009	125	0.003	204
DCP12	.953	0.265	0.217	12	0.027	348	0.029	38	0.010	34	0.018	29	0.007	55	0.007	0	0.007	20	0.004	187

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	80.65	0.600	17.40	5.37		1162.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.206	653.4	1463.2	0.63E 07	-0.00102	1.326	19.24

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.017	0.319	59	0.032	192	0.021	27	0.008	159	0.007	279	0.003	56	0.002	329	0.002	243	0.002	323
CM		-0.102	0.081	216	0.003	6	0.003	186	0.003	326	0.003	117	0.004	231	0.001	204	0.001	74	0.001	96
DCP 1	.010	3.071	0.303	44	0.338	70	0.079	275	0.023	29	0.013	211	0.015	115	0.008	248	0.008	82	0.010	293
DCP 2	.050	2.217	0.306	141	0.091	281	0.093	146	0.046	271	0.026	110	0.035	260	0.009	244	0.008	129	0.017	358
DCP 3	.100	1.824	0.416	116	0.053	211	0.099	72	0.023	275	0.005	203	0.040	263	0.013	155	0.048	151	0.012	329
DCP 4	.150	1.625	0.384	87	0.104	234	0.065	39	0.053	142	0.029	213	0.026	224	0.020	272	0.012	67	0.008	184
DCP 5	.200	1.432	0.337	82	0.104	217	0.048	359	0.029	203	0.009	292	0.010	18	0.019	0	0.019	340	0.014	260
DCP 6	.250	1.371	0.426	71	0.109	198	0.042	3	0.029	68	0.003	206	0.017	181	0.018	205	0.011	43	0.004	108
DCP 7	.300	1.142	0.405	68	0.083	194	0.045	8	0.008	135	0.006	260	0.003	326	0.009	352	0.015	311	0.011	132
DCP 8	.500	0.824	0.442	50	0.046	153	0.034	356	0.009	85	0.013	336	0.017	152	0.013	179	0.005	278	0.013	57
DCP 9	.600	0.718	0.408	43	0.034	186	0.009	316	0.018	189	0.005	296	0.032	58	0.008	337	0.017	287	0.007	343
DCP10	.695	0.706	0.381	41	0.021	133	0.011	10	0.010	90	0.015	307	0.025	68	0.014	39	0.004	149	0.006	323
DCP11	.800	0.680	0.324	38	0.008	246	0.005	51	0.023	168	0.013	261	0.017	18	0.006	58	0.019	197	0.014	282
DCP12	.953	0.333	0.187	28	0.014	318	0.017	71	0.003	151	0.019	292	0.011	356	0.010	335	0.007	8	0.009	202

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	80.97	0.600	24.47	5.39		1162.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.207	653.4	1458.1	0.63E 07	-0.00086	1.325	26.30

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.089	0.259	46	0.015	200	0.023	75	0.012	155	0.001	55	0.004	8	0.002	151	0.004	273	0.001	72
CM		-0.153	0.073	212	0.006	44	0.006	215	0.003	326	0.002	136	0.003	177	0.001	9	0.001	87	0.030	210
DCP 1	.010	2.784	0.850	156	0.053	333	0.126	162	0.015	182	0.030	132	0.018	198	0.029	186	0.023	192	0.028	142
DCP 2	.050	1.838	0.181	86	0.058	32	0.030	100	0.025	138	0.018	141	0.023	26	0.008	34	0.021	352	0.013	359
DCP 3	.100	1.636	0.204	61	0.028	97	0.028	120	0.015	118	0.035	171	0.012	144	0.021	71	0.005	53	0.008	202
DCP 4	.150	1.549	0.254	52	0.013	199	0.030	78	0.016	142	0.011	86	0.008	98	0.004	150	0.011	291	0.009	23
DCP 5	.200	1.459	0.262	46	0.024	133	0.034	88	0.008	203	0.003	121	0.011	223	0.005	139	0.017	151	0.012	158
DCP 6	.250	1.439	0.304	48	0.044	186	0.016	79	0.005	202	0.007	49	0.003	93	0.011	113	0.011	231	0.005	333
DCP 7	.300	1.215	0.301	42	0.034	186	0.025	84	0.009	207	0.006	79	0.009	245	0.011	14	0.002	151	0.007	48
DCP 8	.500	0.963	0.342	37	0.023	188	0.033	80	0.020	179	0.008	3	0.006	104	0.012	271	0.012	314	0.004	254
DCP 9	.600	0.898	0.355	35	0.023	189	0.037	57	0.020	138	0.010	319	0.013	11	0.008	243	0.005	273	0.001	211
DCP10	.695	0.859	0.314	40	0.025	233	0.028	50	0.020	143	0.005	340	0.012	19	0.006	215	0.011	281	0.003	192
DCP11	.800	0.873	0.294	40	0.018	249	0.031	25	0.011	114	0.011	305	0.015	346	0.006	139	0.006	258	0.008	91
DCP12	.953	0.498	0.188	33	0.028	239	0.008	13	0.006	161	0.005	251	0.012	344	0.011	130	0.005	158	0.007	347

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	96.62	0.200	0.13	5.89		1104.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.718	224.8	199.7	0.25E 07	-0.00162	0.406	3.99

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		-0.026	0.443	44	0.047	220	0.031	326	0.020	74	0.010	136	0.009	108	0.006	112	0.013	125	0.007	197
CM		-0.036	0.102	287	0.018	85	0.012	164	0.005	271	0.004	323	0.001	280	0.003	250	0.003	330	0.002	41
DCP 1	.010	-2.003	2.832	340	0.299	72	0.131	151	0.045	254	0.014	235	0.044	62	0.013	141	0.021	84	0.012	236
DCP 2	.050	-0.166	1.192	356	0.122	142	0.054	211	0.030	297	0.022	121	0.032	101	0.018	180	0.002	193	0.031	251
DCP 3	.100	0.064	0.906	10	0.107	142	0.033	212	0.016	6	0.014	39	0.044	104	0.045	163	0.003	153	0.023	66
DCP 4	.150	-0.296	0.797	20	0.122	184	0.045	270	0.028	49	0.011	127	0.007	149	0.013	220	0.024	85	0.011	128
DCP 5	.200	-0.128	0.639	31	0.063	199	0.041	293	0.046	58	0.001	99	0.012	173	0.008	37	0.018	114	0.014	169
DCP 6	.250	-0.182	0.584	42	0.084	210	0.047	319	0.033	71	0.005	210	0.002	127	0.017	288	0.010	121	0.012	168
DCP 7	.300	-0.000	0.531	53	0.067	215	0.047	331	0.038	68	0.006	68	0.007	212	0.006	38	0.017	131	0.016	143
DCP 8	.500	0.037	0.492	77	0.067	249	0.061	347	0.027	86	0.004	134	0.009	109	0.002	42	0.015	109	0.007	181
DCP 9	.600	0.007	0.478	79	0.079	240	0.051	324	0.034	87	0.011	164	0.006	110	0.005	349	0.025	165	0.018	319
DCP 10	.695	0.374	0.431	89	0.072	256	0.043	350	0.026	105	0.021	149	0.014	103	0.015	118	0.020	186	0.028	213
DCP 11	.953	-0.090	0.219	93	0.048	276	0.029	334	0.008	53	0.020	133	0.003	46	0.017	67	0.025	73	0.002	44

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.200	7.51	5.88		1104.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.721	224.8	200.4	0.26E 07	-0.00151	1.144	11.73

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.706	0.441	47	0.027	216	0.033	319	0.012	83	0.011	151	0.003	28	0.007	95	0.009	141	0.015	206
CM		-0.027	0.094	288	0.013	90	0.010	164	0.004	310	0.002	22	0.003	162	0.004	214	0.003	310	0.005	52
DCP 1	.010	2.645	2.283	349	0.244	99	0.077	187	0.033	341	0.022	41	0.023	75	0.042	152	0.045	337	0.036	104
DCP 2	.050	2.309	1.219	357	0.122	113	0.080	214	0.029	242	0.044	104	0.023	154	0.045	154	0.013	198	0.026	185
DCP 3	.100	1.787	0.900	10	0.056	114	0.033	257	0.041	310	0.042	161	0.037	161	0.070	176	0.006	358	0.010	4
DCP 4	.150	1.052	0.789	23	0.097	177	0.032	268	0.037	73	0.014	119	0.013	40	0.008	351	0.009	148	0.014	117
DCP 5	.200	0.829	0.623	32	0.056	195	0.052	302	0.041	45	0.009	162	0.009	318	0.006	317	0.020	155	0.016	203
DCP 6	.250	0.710	0.592	41	0.055	197	0.047	320	0.041	73	0.007	160	0.004	355	0.011	315	0.015	165	0.016	157
DCP 7	.300	0.757	0.526	51	0.045	216	0.045	328	0.022	74	0.014	170	0.005	208	0.010	153	0.016	147	0.018	209
DCP 8	.500	0.489	0.499	77	0.046	269	0.055	341	0.028	79	0.007	121	0.005	84	0.013	34	0.008	165	0.023	180
DCP 9	.600	0.454	0.458	81	0.051	252	0.049	327	0.006	54	0.026	167	0.021	345	0.009	320	0.009	118	0.018	217
DCP 10	.695	0.615	0.433	90	0.052	265	0.043	342	0.024	139	0.018	165	0.005	40	0.028	63	0.023	138	0.022	232
DCP 11	.953	-0.026	0.206	96	0.024	265	0.023	332	0.008	181	0.010	313	0.013	329	0.010	37	0.005	84	0.018	246

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.200	9.81	5.86		1104.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.721	224.8	199.7	0.25E 07	-0.00148	1.343	14.00

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.913	0.431	47	0.027	228	0.026	327	0.013	90	0.004	155	0.009	81	0.010	88	0.009	163	0.010	216
CM		-0.023	0.094	288	0.012	106	0.012	167	0.003	315	0.001	63	0.001	246	0.003	229	0.003	340	0.003	59
DCP 1	.010	3.908	2.243	349	0.176	118	0.093	189	0.024	353	0.023	117	0.036	58	0.030	115	0.011	31	0.021	142
DCP 2	.050	3.042	1.184	357	0.090	121	0.057	182	0.021	313	0.036	88	0.022	115	0.056	149	0.040	232	0.025	215
DCP 3	.100	2.276	0.889	11	0.076	138	0.024	147	0.020	53	0.022	85	0.038	97	0.042	106	0.030	1	0.032	341
DCP 4	.150	1.446	0.772	22	0.099	187	0.064	262	0.026	51	0.007	195	0.006	359	0.010	262	0.011	135	0.020	147
DCP 5	.200	1.104	0.606	32	0.035	188	0.015	290	0.033	96	0.009	255	0.005	19	0.007	333	0.019	130	0.013	148
DCP 6	.250	0.979	0.576	42	0.057	209	0.039	317	0.031	74	0.008	203	0.008	67	0.004	277	0.010	174	0.018	160
DCP 7	.300	0.966	0.515	52	0.052	223	0.032	336	0.021	80	0.004	206	0.009	136	0.006	345	0.015	142	0.014	194
DCP 8	.500	0.632	0.484	78	0.045	277	0.053	335	0.019	94	0.006	199	0.008	65	0.011	74	0.018	163	0.022	194
DCP 9	.600	0.602	0.463	82	0.056	259	0.037	346	0.019	113	0.006	254	0.010	69	0.017	42	0.005	148	0.011	291
DCP10	.695	0.642	0.414	90	0.053	272	0.037	341	0.018	138	0.012	136	0.010	60	0.028	94	0.011	196	0.011	258
DCP11	.953	0.002	0.205	94	0.020	316	0.039	349	0.004	264	0.009	288	0.006	86	0.007	341	0.014	149	0.015	237

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.56	0.200	12.41	5.89		1104.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.725	224.8	199.6	0.25E 07	-0.00139	1.576	16.61

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.140	0.417	48	0.020	231	0.030	322	0.015	97	0.011	150	0.004	58	0.013	55	0.003	189	0.003	201
CM		-0.014	0.090	288	0.011	109	0.011	167	0.005	279	0.001	350	0.002	161	0.005	202	0.001	32	0.001	282
DCP 1	.010	5.218	2.120	350	0.170	97	0.098	253	0.022	260	0.042	89	0.036	79	0.012	141	0.012	346	0.006	183
DCP 2	.050	3.866	1.127	358	0.091	142	0.043	194	0.027	187	0.046	131	0.046	113	0.043	127	0.024	189	0.037	270
DCP 3	.100	2.841	0.831	12	0.038	172	0.033	225	0.028	227	0.048	178	0.021	102	0.054	98	0.021	24	0.031	322
DCP 4	.150	2.050	0.760	22	0.067	171	0.039	265	0.019	36	0.008	181	0.001	287	0.010	321	0.001	136	0.005	152
DCP 5	.200	1.340	0.605	32	0.034	178	0.028	286	0.033	63	0.014	143	0.011	223	0.004	309	0.009	78	0.011	135
DCP 6	.250	1.372	0.560	43	0.044	208	0.043	313	0.025	69	0.007	169	0.004	355	0.007	19	0.009	184	0.012	166
DCP 7	.300	1.190	0.508	52	0.032	218	0.029	323	0.030	69	0.008	150	0.007	238	0.007	42	0.008	83	0.019	162
DCP 8	.500	0.815	0.468	80	0.033	272	0.052	343	0.016	86	0.005	181	0.006	105	0.014	38	0.005	159	0.007	210
DCP 9	.600	0.678	0.449	79	0.046	256	0.040	334	0.014	133	0.013	138	0.016	323	0.006	177	0.007	304	0.008	255
DCP10	.695	0.654	0.397	91	0.044	282	0.046	352	0.024	125	0.017	148	0.014	73	0.026	58	0.015	317	0.011	9
DCP11	.953	0.021	0.189	94	0.025	309	0.031	331	0.020	84	0.003	305	0.016	327	0.027	9	0.003	138	0.009	123

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	96.62	0.200	14.98	5.91		1165.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.719	224.6	200.3	0.26E 07	-0.00141	1.797	18.03

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.406	0.402	47	0.059	218	0.026	300	0.007	80	0.010	316	0.007	256	0.005	264	0.002	68	0.018	137
CM		-0.068	0.085	284	0.023	80	0.006	148	0.002	295	0.002	161	0.004	111	0.002	122	0.001	180	0.006	327
DCP 1	.010	5.557	1.759	354	0.388	80	0.137	267	0.052	2	0.090	246	0.015	99	0.028	173	0.007	203	0.022	10
DCP 2	.050	3.681	1.051	0	0.157	138	0.015	228	0.027	359	0.021	304	0.024	191	0.008	107	0.037	140	0.041	98
DCP 3	.100	3.042	0.825	9	0.122	149	0.037	166	0.029	46	0.040	291	0.051	133	0.011	70	0.015	173	0.009	261
DCP 4	.150	2.580	0.711	22	0.136	175	0.028	240	0.000	107	0.003	178	0.013	272	0.012	237	0.004	172	0.026	110
DCP 5	.200	2.299	0.568	32	0.074	198	0.039	293	0.012	175	0.019	26	0.006	300	0.012	234	0.016	359	0.013	127
DCP 6	.250	1.817	0.535	42	0.086	211	0.045	312	0.005	140	0.005	20	0.017	250	0.011	242	0.003	138	0.029	110
DCP 7	.300	1.578	0.475	48	0.079	213	0.042	309	0.011	128	0.0[illegible]	5	0.001	170	0.009	220	0.011	24	0.021	169
DCP 8	.500	0.967	0.434	77	0.101	251	0.035	309	0.012	122	0.006	93	0.011	258	0.007	327	0.008	114	0.021	177
DCP 9	.600	0.846	0.408	75	0.093	236	0.023	298	0.004	353	0.023	330	0.013	302	0.016	207	0.023	264	0.033	74
DCP 10	.695	0.726	0.382	89	0.098	260	0.027	343	0.013	113	0.003	358	0.027	271	0.021	334	0.008	98	0.037	165
DCP 11	.800	0.693	0.321	91	0.071	251	0.028	324	0.002	31	0.028	298	0.004	299	0.007	252	0.013	3	0.026	137
DCP 12	.953	0.276	0.192	87	0.053	261	0.012	296	0.014	86	0.006	83	0.015	299	0.010	323	0.005	65	0.019	146

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.200	17.48	5.96		1165.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.722	224.6	200.7	0.26E 07	-0.00122	1.805	22.00

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.482	0.327	47	0.059	230	0.027	303	0.006	95	0.001	238	0.003	14	0.002	25	0.011	67	0.013	160
CM		-0.096	0.078	295	0.030	87	0.011	140	0.003	333	0.001	338	0.001	274	0.001	214	0.003	246	0.004	359
DCP 1	.010	5.830	1.667	358	0.284	111	0.149	115	0.083	11	0.038	58	0.034	305	0.045	84	0.035	281	0.014	2
DCP 2	.050	3.795	1.096	5	0.146	149	0.040	145	0.026	342	0.023	322	0.013	207	0.010	287	0.015	51	0.033	39
DCP 3	.100	2.972	0.823	24	0.108	180	0.046	235	0.038	7	0.025	244	0.030	170	0.011	340	0.019	109	0.034	28
DCP 4	.150	2.397	0.734	24	0.143	167	0.039	237	0.019	348	0.009	346	0.009	334	0.007	238	0.006	14	0.023	136
DCP 5	.200	2.252	0.540	28	0.105	161	0.073	291	0.007	88	0.001	234	0.023	357	0.016	256	0.014	83	0.026	161
DCP 6	.250	1.845	0.448	22	0.083	148	0.041	283	0.011	77	0.008	55	0.018	324	0.006	297	0.009	14	0.015	177
DCP 7	.300	1.692	0.273	21	0.076	125	0.062	279	0.009	133	0.005	74	0.016	12	0.001	244	0.009	100	0.022	164
DCP 8	.500	1.036	0.239	94	0.146	300	0.031	6	0.021	156	0.005	266	0.009	147	0.003	157	0.024	37	0.018	140
DCP 9	.600	0.999	0.347	94	0.136	264	0.024	14	0.015	189	0.021	222	0.015	27	0.013	175	0.012	67	0.019	168
DCP 10	.695	0.784	0.353	99	0.167	256	0.054	325	0.027	149	0.004	249	0.020	313	0.027	33	0.022	80	0.022	212
DCP 11	.800	0.940	0.347	97	0.125	253	0.072	317	0.016	75	0.010	153	0.009	126	0.004	107	0.024	57	0.017	148
DCP 12	.953	0.286	0.213	82	0.059	230	0.023	252	0.007	291	0.013	56	0.012	141	0.012	349	0.015	251	0.013	235

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.56	0.200	24.57	6.03		1165.3	10

K	V	Q	RN	DAMPING	CY(MAX)	ALPHA(STALL)
0.725	224.6	200.7	0.26E 07	0.00025	2.366	30.70

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.818	0.377	5	0.100	228	0.033	221	0.030	57	0.022	23	0.015	253	0.007	155	0.004	36	0.018	238
CM		-0.297	0.106	12	0.026	100	0.015	64	0.010	217	0.005	262	0.002	12	0.001	16	0.002	120	0.011	72
DCP 1	.010	3.239	2.374	74	0.268	9	0.454	302	0.231	222	0.105	119	0.105	346	0.023	167	0.020	126	0.043	20
DCP 2	.050	2.263	1.250	41	0.261	146	0.030	330	0.102	35	0.046	319	0.010	276	0.018	265	0.031	129	0.013	334
DCP 3	.100	1.875	1.282	17	0.262	227	0.132	173	0.075	79	0.082	26	0.071	276	0.031	122	0.048	234	0.055	61
DCP 4	.150	2.498	1.401	1	0.366	209	0.063	115	0.030	141	0.088	31	0.053	232	0.012	166	0.025	51	0.021	164
DCP 5	.200	2.335	1.206	6	0.265	226	0.076	187	0.061	73	0.064	0	0.034	238	0.010	140	0.033	67	0.012	273
DCP 6	.250	2.362	1.366	1	0.363	210	0.162	107	0.026	320	0.018	312	0.048	211	0.026	118	0.037	306	0.021	177
DCP 7	.300	2.303	1.243	356	0.268	211	0.136	102	0.066	40	0.047	315	0.012	171	0.005	179	0.018	22	0.035	225
DCP 8	.500	2.041	0.770	303	0.071	123	0.136	311	0.023	80	0.008	53	0.027	260	0.014	154	0.033	84	0.018	150
DCP 9	.600	2.027	0.470	276	0.174	67	0.169	234	0.077	103	0.042	342	0.025	5	0.020	311	0.016	311	0.030	158
DCP10	.695	1.490	0.427	188	0.182	352	0.183	182	0.010	155	0.018	292	0.005	317	0.031	75	0.014	110	0.023	247
DCP11	.800	1.364	0.516	161	0.191	329	0.114	158	0.023	208	0.014	155	0.011	225	0.007	198	0.003	352	0.048	254
DCP12	.953	0.655	0.779	143	0.450	235	0.205	312	0.145	19	0.097	85	0.021	173	0.025	220	0.039	268	0.090	271

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.400	0.14	5.81		1102.1	10

K	V	Q	RN	DAMPING	CY(MAX)	ALPHA(STALL)
0.365	444.3	735.7	0.47E 07	-0.00095	0.310	6.29

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		-0.116	0.402	8	0.033	213	0.004	248	0.008	74	0.001	294	0.003	25	0.003	20	0.006	60	0.006	239
CM		-0.021	0.056	273	0.009	100	0.007	132	0.002	215	0.002	178	0.001	197	0.001	193	0.002	253	0.002	45
DCP 1	.010	-1.615	1.918	330	0.562	169	0.200	169	0.015	222	0.049	112	0.030	106	0.005	4	0.004	333	0.002	133
DCP 2	.050	-0.809	1.596	336	0.063	58	0.105	106	0.032	166	0.016	223	0.012	34	0.016	56	0.008	272	0.010	313
DCP 3	.100	-0.385	1.163	345	0.016	72	0.051	109	0.024	134	0.021	224	0.012	17	0.005	64	0.007	324	0.015	282
DCP 4	.150	-0.207	0.830	354	0.022	97	0.034	118	0.037	136	0.021	226	0.017	318	0.012	57	0.006	82	0.012	227
DCP 5	.200	0.047	0.605	6	0.054	203	0.023	259	0.020	24	0.006	187	0.001	125	0.004	245	0.009	30	0.006	241
DCP 6	.250	-0.067	0.496	12	0.069	208	0.026	266	0.022	47	0.007	123	0.006	208	0.004	282	0.012	8	0.003	188
DCP 7	.300	-0.058	0.447	21	0.054	214	0.021	269	0.016	37	0.002	277	0.001	45	0.004	257	0.010	54	0.003	216
DCP 8	.500	-0.085	0.323	39	0.038	237	0.019	291	0.010	23	0.006	346	0.003	334	0.002	356	0.008	54	0.007	191
DCP 9	.600	0.075	0.290	49	0.044	248	0.025	293	0.011	46	0.006	343	0.003	29	0.003	271	0.011	75	0.007	264
DCP10	.695	0.041	0.237	58	0.035	274	0.021	320	0.011	60	0.007	1	0.007	53	0.005	19	0.010	95	0.011	263
DCP11	.953	-0.019	0.111	60	0.022	270	0.013	324	0.002	156	0.005	2	0.002	347	0.006	35	0.006	79	0.008	204

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.400	7.51	5.81		1102.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.365	444.3	744.9	0.48E 07	-0.00090	1.168	13.51

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.746	0.404	8	0.032	213	0.012	257	0.007	55	0.002	26	0.004	35	0.003	353	0.004	19	0.003	199
CM		-0.015	0.055	279	0.007	107	0.005	125	0.002	259	0.001	212	0.000	226	0.001	121	0.001	244	0.002	14
DCP 1	.010	3.051	2.775	335	0.288	177	0.133	107	0.032	325	0.028	173	0.026	34	0.011	350	0.009	306	0.014	313
DCP 2	.050	2.222	1.471	340	0.110	158	0.044	179	0.007	62	0.003	29	0.012	54	0.018	60	0.012	306	0.003	280
DCP 3	.100	1.858	1.065	348	0.054	165	0.034	174	0.007	34	0.012	344	0.002	333	0.017	55	0.007	275	0.004	28
DCP 4	.150	1.426	0.725	357	0.069	193	0.037	231	0.008	40	0.001	273	0.007	2	0.002	354	0.008	325	0.005	3
DCP 5	.200	1.208	0.575	3	0.032	195	0.024	236	0.008	39	0.004	314	0.002	49	0.004	274	0.007	357	0.003	68
DCP 6	.250	0.955	0.505	10	0.040	209	0.023	251	0.010	37	0.005	65	0.003	28	0.002	330	0.007	7	0.002	63
DCP 7	.300	0.832	0.435	16	0.030	223	0.016	261	0.007	62	0.004	25	0.002	49	0.004	307	0.009	32	0.002	125
DCP 8	.500	0.464	0.303	40	0.036	250	0.021	286	0.009	57	0.005	32	0.002	14	0.005	343	0.004	34	0.005	162
DCP 9	.600	0.513	0.276	49	0.035	253	0.023	288	0.012	63	0.004	327	0.007	51	0.002	211	0.006	25	0.008	237
DCP10	.695	0.330	0.228	61	0.033	271	0.020	305	0.009	83	0.002	60	0.002	24	0.003	354	0.008	58	0.008	230
DCP11	.953	0.102	0.111	60	0.013	253	0.010	308	0.006	73	0.002	46	0.001	58	0.006	308	0.002	53	0.006	173

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.400	9.80	5.80		1102.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.365	444.4	744.6	0.48E 07	-0.00087	1.409	15.82

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.987	0.403	10	0.032	216	0.008	240	0.008	39	0.001	307	0.003	02	0.004	338	0.005	30	0.004	255
CM		-0.010	0.053	279	0.005	101	0.006	143	0.001	284	0.002	256	0.001	114	0.001	150	0.001	179	0.002	25
DCP 1	.010	4.597	2.908	336	0.300	155	0.080	252	0.137	151	0.053	16	0.028	110	0.044	353	0.020	233	0.017	343
DCP 2	.050	3.170	1.609	341	0.228	207	0.220	127	0.150	359	0.094	241	0.045	114	0.014	147	0.043	47	0.043	294
DCP 3	.100	2.440	0.944	352	0.037	74	0.055	224	0.030	138	0.005	205	0.033	86	0.006	313	0.007	219	0.012	55
DCP 4	.150	1.805	0.691	1	0.020	154	0.037	225	0.011	22	0.003	51	0.005	93	0.004	323	0.007	6	0.004	13
DCP 5	.200	1.529	0.538	7	0.018	218	0.024	230	0.013	30	0.003	313	0.001	20	0.002	295	0.007	31	0.001	26
DCP 6	.250	1.235	0.481	15	0.026	227	0.021	243	0.009	2	0.002	31	0.006	38	0.005	340	0.011	28	0.001	225
DCP 7	.300	1.069	0.425	20	0.032	231	0.012	260	0.010	6	0.002	355	0.005	351	0.002	312	0.008	53	0.001	38
DCP 8	.500	0.604	0.312	43	0.041	253	0.013	321	0.005	343	0.004	79	0.003	294	0.003	321	0.005	12	0.005	196
DCP 9	.600	0.625	0.284	50	0.043	246	0.020	313	0.006	64	0.009	42	0.005	247	0.007	332	0.004	28	0.006	212
DCP10	.695	0.409	0.233	60	0.034	257	0.023	337	0.003	125	0.006	54	0.001	208	0.008	350	0.005	52	0.007	240
DCP11	.953	0.139	0.093	51	0.008	149	0.015	294	0.008	75	0.005	115	0.005	331	0.002	180	0.004	320	0.007	213

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	94.34	0.400	12.45	5.65		1102.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.355	444.3	737.8	0.47E 07	0.00042	1.655	18.25

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.081	0.539	9	0.062	194	0.009	49	0.015	176	0.023	2	0.009	224	0.006	90	0.006	318	0.005	41
CM		-0.040	0.021	111	0.030	297	0.014	165	0.008	36	0.009	204	0.004	39	0.003	282	0.003	129	0.001	216
DCP 1	.010	4.613	2.079	2	0.510	13	0.442	266	0.337	147	0.102	348	0.082	179	0.064	30	0.047	223	0.064	91
DCP 2	.050	3.063	1.428	19	0.461	311	0.256	203	0.151	128	0.024	84	0.058	60	0.078	351	0.050	283	0.017	227
DCP 3	.100	2.440	1.305	24	0.430	270	0.208	139	0.082	67	0.053	332	0.047	298	0.037	234	0.054	135	0.040	54
DCP 4	.150	1.785	1.065	23	0.321	240	0.116	107	0.049	80	0.071	310	0.015	247	0.040	184	0.027	72	0.018	17
DCP 5	.200	1.606	0.913	16	0.267	220	0.094	108	0.071	29	0.061	277	0.019	204	0.026	131	0.017	39	0.018	334
DCP 6	.250	1.354	0.837	14	0.259	204	0.073	96	0.079	8	0.054	255	0.019	179	0.023	104	0.020	26	0.017	279
DCP 7	.300	1.226	0.738	7	0.223	187	0.075	91	0.091	341	0.048	229	0.023	116	0.017	38	0.009	309	0.009	304
DCP 8	.500	0.757	0.458	356	0.165	143	0.068	33	0.084	261	0.039	112	0.032	354	0.011	199	0.003	287	0.008	139
DCP 9	.600	0.770	0.350	351	0.149	121	0.072	355	0.091	214	0.073	43	0.037	251	0.006	121	0.002	350	0.006	129
DCP10	.695	0.543	0.204	344	0.110	104	0.092	334	0.076	187	0.089	36	0.048	233	0.020	144	0.026	341	0.004	54
DCP11	.953	0.203	0.015	237	0.031	52	0.037	256	0.036	97	0.043	309	0.023	129	0.022	43	0.016	251	0.008	20

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	88.50	0.400	14.93	5.94		1167.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.333	443.9	743.5	0.48E 07	0.00101	1.740	20.24

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.141	0.629	20	0.046	207	0.022	89	0.024	309	0.016	158	0.006	98	0.005	301	0.001	316	0.003	143
CM		-0.086	0.083	136	0.057	353	0.026	233	0.011	106	0.005	347	0.003	268	0.003	134	0.001	133	0.001	168
DCP 1	.010	3.823	1.713	45	1.323	35	0.393	288	0.017	198	0.080	304	0.079	131	0.063	343	0.040	177	0.056	28
DCP 2	.050	2.706	1.496	56	0.657	13	0.081	316	0.114	295	0.053	222	0.033	260	0.070	221	0.056	152	0.050	145
DCP 3	.100	2.318	1.514	51	0.456	329	0.122	261	0.136	232	0.064	153	0.063	142	0.051	111	0.049	76	0.019	33
DCP 4	.150	1.896	1.217	39	0.219	287	0.106	236	0.066	152	0.050	130	0.032	28	0.026	95	0.037	349	0.014	294
DCP 5	.200	1.710	1.052	31	0.191	261	0.111	215	0.064	103	0.058	114	0.048	4	0.020	304	0.013	276	0.023	230
DCP 6	.250	1.557	1.003	28	0.195	250	0.143	200	0.067	84	0.055	90	0.032	335	0.019	323	0.018	312	0.020	216
DCP 7	.300	1.274	0.894	19	0.187	232	0.141	181	0.079	61	0.055	57	0.052	303	0.022	224	0.011	273	0.029	158
DCP 8	.500	0.861	0.659	1	0.205	193	0.142	118	0.087	6	0.059	283	0.044	196	0.021	68	0.004	119	0.005	13
DCP 9	.600	0.811	0.588	352	0.237	180	0.166	77	0.114	320	0.067	202	0.054	116	0.037	339	0.005	219	0.003	328
DCP10	.695	0.709	0.407	343	0.200	177	0.164	56	0.090	300	0.061	196	0.052	130	0.028	314	0.011	304	0.006	122
DCP11	.800	0.696	0.301	329	0.192	158	0.156	23	0.107	249	0.055	121	0.033	25	0.016	210	0.016	356	0.017	248
DCP12	.953	0.215	0.130	287	0.102	114	0.083	316	0.052	169	0.019	46	0.008	285	0.013	296	0.011	175	0.029	28

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.400	17.47	5.94		1167.2	10
	K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
	0.365	443.9	743.0	0.48E 07	0.00140	1.926	23.69

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.263	0.605	30	0.129	267	0.061	108	0.027	340	0.029	205	0.009	332	0.010	182	0.012	99	0.011	268
CM		-0.127	0.141	141	0.073	8	0.017	242	0.007	216	0.014	46	0.004	228	0.001	73	0.007	335	0.005	89
DCP 1	.010	3.889	1.966	98	1.222	36	0.189	15	0.094	328	0.044	335	0.112	134	0.048	19	0.027	15	0.064	290
DCP 2	.050	2.002	1.592	93	0.571	8	0.191	80	0.092	4	0.057	57	0.063	9	0.041	18	0.051	18	0.066	359
DCP 3	.100	2.468	1.533	73	0.541	342	0.067	20	0.085	280	0.053	340	0.053	291	0.077	277	0.044	236	0.045	245
DCP 4	.150	2.001	1.256	59	0.384	318	0.041	266	0.063	302	0.059	237	0.042	233	0.036	176	0.008	176	0.014	198
DCP 5	.200	1.891	1.087	46	0.348	309	0.134	234	0.025	291	0.090	195	0.011	174	0.056	186	0.045	110	0.017	141
DCP 6	.250	1.708	1.049	44	0.378	307	0.171	215	0.042	275	0.086	166	0.018	236	0.041	136	0.018	133	0.338	95
DCP 7	.300	1.470	0.978	31	0.358	290	0.186	194	0.038	243	0.106	129	0.032	326	0.035	138	0.010	2	0.017	115
DCP 8	.500	1.087	0.828	2	0.393	242	0.242	132	0.045	77	0.079	19	0.049	260	0.020	208	0.026	67	0.025	240
DCP 9	.600	1.035	0.769	348	0.409	216	0.278	96	0.079	1	0.077	276	0.008	214	0.031	156	0.005	34	0.022	97
DCP 10	.695	0.947	0.578	339	0.358	202	0.222	74	0.086	340	0.093	236	0.023	57	0.035	160	0.028	311	0.022	150
DCP 11	.800	0.900	0.408	323	0.286	167	0.181	18	0.057	288	0.116	190	0.060	11	0.025	141	0.017	134	0.038	313
DCP 12	.953	0.141	0.267	288	0.231	103	0.182	283	0.094	95	0.066	246	0.055	113	0.081	324	0.084	131	0.082	270

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	95.24	0.400	24.59	5.81		1167.3	10
	K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
	0.358	443.9	743.2	0.48E 07	-0.00120	1.753	27.07

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.173	0.497	57	0.072	24	0.023	310	0.005	87	0.012	97	0.002	125	0.008	233	0.002	130	0.007	241
CM		-0.194	0.136	211	0.039	156	0.012	177	0.003	290	0.004	302	0.002	258	0.004	68	0.002	292	0.002	105
DCP 1	.010	2.934	2.036	153	0.464	177	0.658	194	0.333	263	0.076	222	0.141	290	0.010	87	0.043	300	0.001	214
DCP 2	.050	1.117	0.717	138	0.156	180	0.093	281	0.021	216	0.068	358	0.017	292	0.018	280	0.024	271	0.015	233
DCP 3	.100	1.697	0.645	84	0.178	137	0.075	331	0.061	80	0.043	143	0.052	180	0.017	175	0.015	250	0.015	321
DCP 4	.150	1.455	0.543	54	0.197	89	0.022	16	0.067	76	0.033	54	0.027	109	0.010	137	0.008	192	0.015	237
DCP 5	.200	1.481	0.598	56	0.179	83	0.034	26	0.049	66	0.016	92	0.027	99	0.019	187	0.016	141	0.017	215
DCP 6	.250	1.522	0.578	52	0.163	70	0.043	351	0.041	57	0.033	24	0.028	71	0.013	103	0.018	97	0.007	114
DCP 7	.300	1.326	0.631	56	0.157	67	0.048	358	0.040	32	0.011	56	0.033	47	0.014	108	0.017	66	0.021	142
DCP 8	.500	1.142	0.662	45	0.182	14	0.017	263	0.031	270	0.010	119	0.039	248	0.027	310	0.021	264	0.018	297
DCP 9	.600	1.158	0.683	41	0.167	355	0.043	314	0.036	195	0.035	184	0.024	221	0.026	218	0.010	347	0.026	243
DCP 10	.695	1.096	0.645	46	0.218	336	0.029	350	0.049	130	0.029	59	0.026	136	0.014	249	0.015	174	0.021	173
DCP 11	.800	1.130	0.508	39	0.148	333	0.058	328	0.037	132	0.045	91	0.016	77	0.017	181	0.028	72	0.015	256
DCP 12	.953	0.366	0.271	23	0.093	266	0.044	29	0.040	354	0.024	220	0.034	33	0.025	268	0.017	154	0.025	16

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	96.62	0.600	0.12	5.81		1100.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.247	653.8	1452.7	0.63E 07	-0.00086	0.375	5.85

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		-0.083	0.434	343	0.023	192	0.013	68	0.004	85	0.001	20	0.002	317	0.001	14	0.002	216	0.000	311
CM		-0.011	0.053	256	0.007	104	0.003	79	0.001	183	0.000	267	0.000	232	0.000	258	0.000	342	0.001	239
DCP 1	.010	-1.687	1.495	303	0.392	155	0.042	44	0.035	91	0.020	14	0.001	111	0.004	321	0.004	245	0.004	197
DCP 2	.050	-0.647	1.682	315	0.111	170	0.032	78	0.017	227	0.008	19	0.011	232	0.007	289	0.008	224	0.004	180
DCP 3	.100	-0.198	1.546	320	0.110	206	0.106	51	0.026	258	0.008	94	0.010	319	0.009	184	0.007	284	0.012	175
DCP 4	.150	-0.094	1.068	336	0.116	25	0.073	93	0.018	142	0.031	302	0.020	21	0.004	114	0.012	260	0.005	279
DCP 5	.200	0.121	0.778	341	0.034	46	0.059	80	0.028	129	0.009	264	0.005	298	0.004	24	0.002	161	0.002	238
DCP 6	.250	0.042	0.601	349	0.009	187	0.033	74	0.027	103	0.009	173	0.007	302	0.005	22	0.003	133	0.004	243
DCP 7	.300	0.027	0.485	357	0.035	186	0.010	98	0.014	86	0.007	13[illegible]	0.006	257	0.004	343	0.001	72	0.003	243
DCP 8	.500	-0.013	0.312	18	0.027	203	0.004	199	0.006	12	0.003	69	0.001	239	0.001	345	0.002	150	0.003	326
DCP 9	.600	0.003	0.260	25	0.025	225	0.007	247	0.007	5	0.002	75	0.001	336	0.003	89	0.003	158	0.004	347
DCP10	.695	0.049	0.201	35	0.021	265	0.007	288	0.006	2	0.001	37	0.001	29	0.000	24	0.004	202	0.004	36
DCP11	.800	-0.006	0.157	42	0.026	277	0.009	290	0.005	3	0.002	41	0.003	52	0.001	150	0.002	280	0.004	64
DCP12	.953	-0.112	0.097	28	0.020	269	0.007	280	0.002	331	0.002	38	0.001	337	0.000	86	0.001	157	0.002	71

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	98.04	0.600	7.45	5.78		1100.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.250	653.8	1444.4	0.62E 07	-0.00041	1.295	13.22

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.711	0.510	4	0.050	259	0.021	116	0.022	355	0.013	247	0.004	215	0.003	111	0.002	171	0.002	73
CM		-0.028	0.047	209	0.033	11	0.013	241	0.007	151	0.006	29	0.002	283	0.002	227	0.001	357	0.001	116
DCP 1	.010	1.606	1.869	326	0.062	17	0.076	50	0.018	9	0.032	345	0.011	240	0.014	230	0.012	164	0.008	143
DCP 2	.050	1.827	1.120	329	0.161	34	0.040	138	0.022	345	0.031	329	0.014	189	0.005	242	0.004	239	0.008	146
DCP 3	.100	1.853	0.753	355	0.518	3	0.236	198	0.042	55	0.061	56	0.040	279	0.030	189	0.005	331	0.035	123
DCP 4	.150	1.519	0.922	12	0.181	357	0.040	284	0.087	12	0.027	284	0.038	315	0.017	80	0.016	280	0.020	19
DCP 5	.200	1.183	0.811	18	0.196	323	0.037	284	0.029	301	0.040	282	0.035	240	0.019	228	0.026	199	0.007	108
DCP 6	.250	1.024	0.777	14	0.164	294	0.043	233	0.027	230	0.020	203	0.012	155	0.006	228	0.010	181	0.009	113
DCP 7	.300	0.896	0.746	12	0.169	273	0.049	221	0.034	176	0.012	195	0.021	132	0.004	304	0.015	104	0.007	9
DCP 8	.500	0.535	0.491	13	0.169	216	0.078	108	0.059	37	0.034	290	0.012	267	0.016	176	0.013	54	0.003	181
DCP 9	.600	0.436	0.367	18	0.133	204	0.051	78	0.034	10	0.023	255	0.007	226	0.016	112	0.009	50	0.010	330
DCP10	.695	0.388	0.304	15	0.140	194	0.069	68	0.054	340	0.040	217	0.014	135	0.029	50	0.020	264	0.007	110
DCP11	.800	0.270	0.224	15	0.111	184	0.053	50	0.039	327	0.032	203	0.014	106	0.020	39	0.015	250	0.005	178
DCP12	.953	0.018	0.127	333	0.063	134	0.035	30	0.036	270	0.020	129	0.009	16	0.012	276	0.017	123	0.016	303

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL-H	TEST POINT	CYCLES ANALYZED
	98.04	0.600	9.71	5.70		1100.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.251	653.7	1442.8	0.62E 07	-0.00037	1.430	15.17

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.828	0.521	19	0.043	307	0.024	212	0.017	71	0.010	5	0.006	297	0.003	273	0.002	131	0.003	298
CM		-0.042	0.068	195	0.037	34	0.008	346	0.009	240	0.004	163	0.002	60	0.001	100	0.001	325	0.001	53
DCP 1	.010	2.229	1.660	337	0.168	43	0.023	82	0.012	112	0.007	297	0.013	260	0.015	192	0.003	146	0.004	114
DCP 2	.050	2.112	0.788	343	0.271	22	0.091	189	0.028	111	0.022	9	0.012	315	0.021	206	0.012	109	0.012	357
DCP 3	.100	2.002	0.528	51	0.546	12	0.050	198	0.105	260	0.024	151	0.018	167	0.010	87	0.021	47	0.024	298
DCP 4	.150	1.606	0.849	38	0.210	41	0.065	153	0.055	95	0.047	131	0.022	257	0.011	307	0.008	265	0.014	305
DCP 5	.200	1.281	0.800	39	0.147	9	0.048	15	0.030	52	0.017	44	0.026	58	0.025	63	0.016	39	0.003	76
DCP 6	.250	1.150	0.805	32	0.145	343	0.066	322	0.029	343	0.029	327	0.022	345	0.009	321	0.008	0	0.003	330
DCP 7	.300	1.011	0.792	29	0.123	330	0.097	313	0.026	298	0.034	312	0.022	320	0.008	307	0.018	287	0.004	147
DCP 8	.500	0.646	0.601	21	0.138	244	0.079	239	0.050	147	0.024	104	0.010	27	0.000	268	0.013	183	0.011	76
DCP 9	.600	0.517	0.467	21	0.134	224	0.048	202	0.041	93	0.021	40	0.005	335	0.014	319	0.004	177	0.008	268
DCP 10	.695	0.479	0.386	14	0.148	218	0.070	174	0.067	71	0.038	16	0.025	281	0.020	240	0.019	133	0.010	329
DCP 11	.800	0.358	0.303	9	0.129	211	0.054	150	0.053	46	0.027	328	0.012	234	0.015	245	0.017	196	0.008	240
DCP 12	.953	0.078	0.172	333	0.066	183	0.049	96	0.031	353	0.020	261	0.016	164	0.017	68	0.010	303	0.008	214

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL-H	TEST POINT	CYCLES ANALYZED
	98.04	0.600	12.31	5.67		1100.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.251	653.7	1436.0	0.62E 07	-0.00048	1.524	16.29

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.931	0.532	36	0.022	31	0.031	324	0.019	239	0.004	110	0.003	173	0.002	209	0.003	258	0.004	255
CM		-0.060	0.097	196	0.021	69	0.015	101	0.004	25	0.000	351	0.001	80	0.002	20	0.002	25	0.001	22
DCP 1	.010	2.707	1.256	351	0.323	56	0.118	267	0.043	127	0.029	315	0.011	284	0.002	192	0.002	310	0.004	201
DCP 2	.050	2.286	0.442	22	0.299	26	0.046	203	0.075	299	0.047	193	0.004	84	0.015	125	0.011	357	0.004	242
DCP 3	.100	2.056	0.692	100	0.241	22	0.217	93	0.073	271	0.078	57	0.004	160	0.030	12	0.011	16	0.021	347
DCP 4	.150	1.731	0.817	71	0.100	148	0.015	163	0.079	256	0.015	22	0.022	127	0.008	103	0.019	251	0.016	299
DCP 5	.200	1.327	0.787	59	0.109	104	0.048	64	0.049	200	0.013	332	0.007	26	0.018	326	0.011	346	0.005	107
DCP 6	.250	1.242	0.813	50	0.095	91	0.087	44	0.039	150	0.023	139	0.016	137	0.017	263	0.012	295	0.009	232
DCP 7	.300	1.112	0.803	45	0.101	86	0.097	27	0.040	102	0.023	125	0.018	125	0.015	182	0.002	175	0.003	241
DCP 8	.500	0.753	0.679	30	0.016	315	0.124	320	0.050	312	0.021	282	0.018	280	0.008	350	0.006	353	0.013	271
DCP 9	.600	0.597	0.555	28	0.051	245	0.082	302	0.034	257	0.004	90	0.012	260	0.009	278	0.009	226	0.019	236
DCP 10	.695	0.575	0.495	22	0.069	273	0.098	277	0.052	237	0.025	191	0.024	154	0.010	154	0.005	182	0.004	207
DCP 11	.800	0.459	0.406	17	0.094	265	0.064	252	0.039	192	0.008	64	0.005	171	0.015	180	0.005	185	0.005	101
DCP 12	.953	0.154	0.224	345	0.068	243	0.033	183	0.027	120	0.010	57	0.017	346	0.003	255	0.012	214	0.005	129

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.600	14.93	5.75		1164.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.248	653.4	1459.3	0.63E 07	-0.00069	1.549	18.19

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.023	0.502	47	0.013	138	0.012	14	0.014	277	0.009	318	0.002	127	0.004	199	0.003	67	0.002	58
CM		-0.084	0.109	201	0.010	97	0.010	161	0.003	182	0.003	143	0.003	286	0.001	90	0.001	258	0.001	347
DCP 1	.010	2.799	0.859	4	0.387	62	0.124	269	0.029	126	0.020	326	0.008	204	0.004	43	0.003	210	0.004	79
DCP 2	.050	2.257	0.344	76	0.247	29	0.075	151	0.057	333	0.028	155	0.021	347	0.009	169	0.002	170	0.015	99
DCP 3	.100	2.148	0.767	109	0.113	302	0.102	105	0.114	252	0.038	244	0.025	231	0.022	217	0.007	42	0.021	279
DCP 4	.200	1.549	0.663	75	0.205	176	0.021	209	0.035	275	0.031	31	0.012	14	0.020	194	0.006	48	0.013	20
DCP 5	.250	1.433	0.752	62	0.162	156	0.040	180	0.051	217	0.022	311	0.008	352	0.020	95	0.007	47	0.016	5
DCP 6	.300	1.175	0.750	56	0.140	142	0.026	120	0.038	179	0.015	285	0.034	292	0.012	156	0.011	77	0.016	64
DCP 7	.500	0.800	0.702	35	0.027	77	0.053	1	0.026	31	0.019	75	0.029	152	0.017	54	0.011	269	0.007	191
DCP 8	.600	0.665	0.579	33	0.020	242	0.042	342	0.029	5	0.009	347	0.016	102	0.003	297	0.009	42	0.003	186
DCP 9	.695	0.650	0.519	26	0.033	308	0.044	358	0.025	338	0.027	358	0.021	41	0.016	308	0.013	153	0.016	46
DCP 10	.800	0.625	0.420	24	0.064	294	0.021	346	0.021	322	0.023	289	0.016	104	0.010	270	0.004	84	0.008	220
DCP 11	.953	0.252	0.231	3	0.061	300	0.041	316	0.017	211	0.017	278	0.003	201	0.018	205	0.007	35	0.007	187

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.600	17.50	5.74		1164.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.248	653.3	1456.5	0.63E 07	-0.00087	1.442	19.95

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.035	0.432	55	0.037	171	0.007	46	0.008	73	0.008	193	0.001	191	0.003	238	0.004	198	0.002	314
CM		-0.101	0.104	210	0.003	189	0.005	282	0.006	287	0.006	9	0.001	154	0.001	59	0.001	311	0.001	129
DCP 1	.010	2.913	0.328	47	0.514	64	0.089	267	0.007	290	0.023	310	0.019	210	0.024	106	0.018	15	0.012	312
DCP 2	.050	2.192	0.433	115	0.041	320	0.136	112	0.073	257	0.038	81	0.027	251	0.015	44	0.035	222	0.012	115
DCP 3	.100	1.992	0.572	114	0.180	225	0.133	17	0.056	35	0.064	89	0.015	142	0.017	142	0.035	276	0.012	199
DCP 4	.150	1.677	0.557	92	0.180	212	0.064	344	0.024	115	0.015	324	0.019	102	0.020	226	0.009	131	0.014	66
DCP 5	.200	1.516	0.510	73	0.145	202	0.076	304	0.024	2	0.001	260	0.009	135	0.011	34	0.008	266	0.009	37
DCP 6	.250	1.404	0.594	66	0.165	180	0.066	266	0.042	8	0.027	340	0.010	103	0.005	190	0.004	58	0.007	325
DCP 7	.300	1.194	0.589	63	0.125	178	0.063	265	0.030	315	0.020	331	0.007	126	0.006	30	0.020	170	0.008	295
DCP 8	.500	0.823	0.586	43	0.073	121	0.029	139	0.010	163	0.027	256	0.013	282	0.026	267	0.005	36	0.005	214
DCP 9	.600	0.708	0.535	41	0.025	157	0.036	126	0.021	131	0.033	213	0.005	333	0.007	284	0.014	9	0.010	343
DCP 10	.695	0.705	0.475	35	0.021	64	0.040	102	0.038	112	0.035	196	0.007	103	0.013	218	0.008	217	0.012	321
DCP 11	.800	0.716	0.409	35	0.044	349	0.024	79	0.036	105	0.036	175	0.001	57	0.006	95	0.006	192	0.013	264
DCP 12	.953	0.291	0.241	20	0.034	321	0.027	41	0.012	48	0.024	114	0.006	305	0.009	99	0.015	141	0.014	96

FORCED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.O	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.56	0.600	24.51	5.78		1164.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.249	653.3	1456.4	0.63E 07	-0.00084	1.410	28.17

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.096	0.324	47	0.028	222	0.011	237	0.010	257	0.006	325	0.003	274	0.001	21	0.004	136	0.004	173
CM		-0.158	0.090	215	0.006	26	0.001	316	0.003	20	0.004	124	0.001	173	0.000	173	0.002	338	0.002	42
DCP 1	.010	2.832	0.763	147	0.063	347	0.071	156	0.064	223	0.011	134	0.030	162	0.025	105	0.006	58	0.002	48
DCP 2	.050	1.773	0.155	105	0.043	305	0.019	302	0.030	101	0.032	197	0.023	3	0.012	103	0.008	0	0.004	201
DCP 3	.100	1.590	0.252	64	0.042	262	0.040	292	0.035	356	0.020	157	0.021	257	0.010	319	0.014	329	0.021	87
DCP 4	.150	1.474	0.297	51	0.054	231	0.034	283	0.027	341	0.011	128	0.011	247	0.013	47	0.011	102	0.015	175
DCP 5	.200	1.485	0.326	49	0.043	205	0.032	245	0.035	305	0.020	73	0.014	212	0.011	200	0.007	203	0.008	92
DCP 6	.250	1.416	0.350	45	0.056	225	0.025	274	0.008	330	0.019	142	0.017	230	0.002	326	0.007	184	0.010	120
DCP 7	.300	1.254	0.387	45	0.045	207	0.031	246	0.034	294	0.022	49	0.011	197	0.001	19	0.008	136	0.004	41
DCP 8	.500	0.982	0.437	41	0.032	191	0.021	182	0.027	240	0.025	336	0.002	208	0.008	305	0.008	87	0.008	184
DCP 9	.600	0.885	0.438	36	0.037	195	0.012	256	0.006	184	0.015	336	0.012	59	0.003	222	0.001	204	0.010	197
DCP10	.695	0.901	0.404	42	0.024	217	0.017	123	0.018	190	0.020	310	0.007	10	0.008	285	0.003	316	0.003	350
DCP11	.800	0.912	0.354	39	0.022	234	0.003	88	0.011	178	0.021	283	0.013	337	0.002	82	0.014	160	0.011	225
DCP12	.953	0.488	0.228	35	0.015	243	0.006	356	0.011	181	0.013	243	0.004	292	0.010	74	0.005	180	0.006	219

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	17.95	0.200	5.29	7.64		5031.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.136	221.0	199.5	0.26E 07	-0.00160	1.143	13.08

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.490	0.663	354	0.041	346	0.020	359	0.004	145	0.009	255	0.010	279	0.006	340	0.000	197	0.005	126
CM		-0.020	0.026	294	0.004	256	0.004	238	0.002	53	0.001	132	0.004	47	0.005	140	0.004	235	0.003	353
DCP 1	.010	0.846	4.086	345	0.308	349	0.094	0	0.056	138	0.063	248	0.052	326	0.027	130	0.016	219	0.049	19
DCP 2	.025	1.401	3.188	346	0.201	311	0.100	322	0.046	51	0.028	220	0.024	336	0.018	59	0.029	241	0.004	272
DCP 3	.100	1.190	1.666	349	0.093	338	0.035	354	0.011	60	0.018	260	0.004	315	0.018	111	0.014	237	0.006	232
DCP 4	.150	1.091	1.080	352	0.079	327	0.028	344	0.017	161	0.018	260	0.016	326	0.012	99	0.007	255	0.012	40
DCP 5	.200	0.873	0.942	351	0.048	342	0.019	336	0.014	57	0.010	227	0.011	328	0.002	207	0.007	286	0.008	153
DCP 6	.250	0.800	0.822	356	0.061	341	0.024	337	0.015	168	0.014	212	0.015	326	0.007	63	0.011	153	0.012	9
DCP 7	.300	0.574	0.689	354	0.043	25	0.022	354	0.004	99	0.006	306	0.006	301	0.007	158	0.014	211	0.004	136
DCP 8	.400	0.454	0.543	2	0.041	352	0.018	356	0.013	180	0.013	263	0.015	317	0.009	81	0.007	217	0.014	56
DCP 9	.500	0.353	0.401	0	0.029	26	0.011	344	0.008	54	0.011	277	0.009	3	0.003	313	0.013	265	0.003	56
DCP10	.600	0.243	0.310	10	0.017	345	0.009	17	0.013	191	0.011	230	0.014	268	0.015	277	0.008	249	0.018	69
DCP11	.878	0.172	0.128	22	0.021	41	0.028	46	0.008	263	0.006	339	0.026	219	0.033	332	0.035	57	0.030	194

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	17.76	0.200	7.72	7.64		5031.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.134	220.7	199.5	0.26E 07	-0.00147	1.292	15.30

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.647	0.635	357	0.047	342	0.017	25	0.006	199	0.009	326	0.007	108	0.010	169	0.013	335	0.006	308
CM		0.003	0.026	305	0.003	295	0.002	323	0.003	96	0.002	198	0.003	300	0.001	120	0.006	157	0.003	84
DCP 1	.010	2.239	3.848	349	0.297	330	0.061	14	0.071	93	0.021	249	0.030	355	0.048	114	0.036	145	0.027	22
DCP 2	.025	2.443	3.144	350	0.254	337	0.093	9	0.047	157	0.051	290	0.006	192	0.054	148	0.012	289	0.013	215
DCP 3	.100	1.725	1.620	353	0.125	331	0.047	357	0.023	146	0.007	52	0.012	58	0.023	154	0.013	349	0.007	251
DCP 4	.150	1.275	1.073	353	0.085	327	0.023	28	0.005	103	0.008	303	0.012	20	0.013	159	0.005	85	0.004	17
DCP 5	.200	1.067	0.908	355	0.065	338	0.026	5	0.008	153	0.009	330	0.009	178	0.017	180	0.011	284	0.010	22
DCP 6	.250	0.564	0.779	356	0.054	340	0.019	11	0.007	222	0.011	318	0.010	50	0.012	185	0.006	35	0.009	316
DCP 7	.300	0.655	0.658	359	0.056	346	0.031	12	0.006	115	0.011	348	0.006	135	0.014	159	0.009	277	0.005	282
DCP 8	.400	0.625	0.518	3	0.032	357	0.017	57	0.005	344	0.010	319	0.008	71	0.005	135	0.003	76	0.010	5
DCP 9	.500	0.398	0.380	6	0.035	6	0.017	20	0.010	259	0.005	328	0.009	136	0.010	188	0.010	325	0.010	41
DCP10	.600	0.240	0.284	11	0.020	20	0.019	92	0.014	220	0.017	314	0.013	137	0.022	188	0.012	350	0.027	26
DCP11	.878	0.119	0.106	24	0.006	332	0.004	211	0.011	283	0.010	55	0.014	109	0.014	342	0.041	335	0.036	240

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	17.67	0.200	10.20	7.59		5031.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.134	220.1	199.1	0.26E 07	-0.00164	1.529	17.85

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.815	0.634	1	0.047	350	0.019	50	0.013	87	0.005	272	0.013	275	0.003	86	0.018	291	0.018	17
CM		0.006	0.024	277	0.011	329	0.007	260	0.005	241	0.004	225	0.010	90	0.001	185	0.009	120	0.006	206
DCP 1	.010	3.496	3.524	352	0.349	353	0.152	10	0.092	229	0.118	198	0.060	86	0.021	100	0.005	318	0.043	30
DCP 2	.025	3.559	3.021	353	0.315	335	0.030	17	0.059	99	0.052	279	0.022	80	0.023	86	0.032	246	0.041	350
DCP 3	.100	2.277	1.559	357	0.157	336	0.028	350	0.021	108	0.029	288	0.005	29	0.021	77	0.023	268	0.024	20
DCP 4	.150	1.700	1.000	357	0.115	349	0.018	342	0.020	134	0.010	240	0.007	206	0.009	171	0.012	353	0.006	265
DCP 5	.200	1.304	0.857	359	0.105	358	0.010	52	0.016	142	0.035	295	0.003	32	0.004	88	0.007	279	0.025	71
DCP 6	.250	1.265	0.755	1	0.080	350	0.008	30	0.007	167	0.016	236	0.004	139	0.010	201	0.005	272	0.008	335
DCP 7	.300	1.115	0.621	5	0.063	351	0.012	12	0.019	111	0.015	256	0.007	323	0.003	53	0.015	250	0.013	56
DCP 8	.400	0.759	0.521	7	0.038	0	0.017	75	0.005	334	0.019	165	0.005	112	0.006	192	0.004	89	0.007	306
DCP 9	.500	0.507	0.365	11	0.046	1	0.013	32	0.001	214	0.003	344	0.005	93	0.002	212	0.006	106	0.011	27
DCP 10	.600	0.351	0.325	14	0.013	310	0.018	83	0.013	334	0.025	169	0.007	3	0.007	296	0.003	280	0.019	292
DCP 11	.878	0.174	0.174	25	0.058	144	0.041	72	0.042	78	0.037	18	0.076	268	0.009	64	0.072	298	0.056	34

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	17.64	0.200	12.60	7.49		5031.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.134	220.1	199.7	0.26E 07	0.00084	1.719	19.88

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.029	0.622	11	0.106	298	0.050	100	0.023	333	0.018	252	0.009	182	0.006	358	0.005	317	0.015	94
CM		-0.022	0.022	148	0.032	352	0.015	224	0.009	136	0.010	34	0.005	359	0.008	172	0.003	119	0.007	255
DCP 1	.010	4.045	2.850	7	0.710	351	0.081	287	0.096	175	0.121	26	0.083	309	0.078	220	0.021	144	0.042	186
DCP 2	.025	4.028	2.577	6	0.695	333	0.169	211	0.114	129	0.087	4	0.031	256	0.056	187	0.023	84	0.037	131
DCP 3	.100	2.404	1.293	19	0.505	333	0.162	199	0.069	86	0.043	332	0.029	285	0.027	174	0.019	17	0.021	63
DCP 4	.150	1.779	0.863	27	0.371	334	0.107	179	0.035	22	0.001	263	0.020	350	0.025	189	0.022	64	0.017	239
DCP 5	.200	1.436	0.841	19	0.271	314	0.136	136	0.065	345	0.042	235	0.011	76	0.011	112	0.016	260	0.023	292
DCP 6	.250	1.380	0.801	20	0.236	298	0.148	119	0.066	342	0.008	287	0.022	231	0.023	122	0.008	314	0.038	99
DCP 7	.300	1.299	0.715	17	0.184	273	0.144	98	0.082	321	0.030	227	0.022	127	0.030	36	0.030	274	0.018	134
DCP 8	.400	0.935	0.637	13	0.166	248	0.140	87	0.041	325	0.039	306	0.039	174	0.018	48	0.006	132	0.012	313
DCP 9	.500	0.631	0.461	12	0.103	217	0.106	51	0.046	284	0.022	205	0.027	72	0.018	295	0.012	166	0.010	137
DCP 10	.600	0.504	0.409	6	0.133	197	0.110	46	0.024	267	0.019	252	0.025	83	0.004	174	0.008	340	0.016	99
DCP 11	.878	0.338	0.175	336	0.060	144	0.009	295	0.040	343	0.056	211	0.043	214	0.050	349	0.019	335	0.051	74

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.47	0.400	4.94	6.88		5028.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.063	437.2	743.9	0.48E 07	-0.00103	1.237	11.92

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.518	0.702	354	0.071	0	0.024	193	0.018	357	0.006	195	0.007	6	0.008	182	0.004	277	0.004	137
CM		-0.010	0.021	323	0.004	351	0.000	357	0.002	189	0.002	107	0.002	236	0.000	285	0.004	26	0.001	171
DCP 1	.010	1.170	4.462	351	0.541	1	0.201	156	0.067	17	0.014	145	0.054	286	0.053	152	0.028	324	0.028	113
DCP 2	.025	1.744	3.502	352	0.324	343	0.127	197	0.076	2	0.032	198	0.019	349	0.051	201	0.047	2	0.020	169
DCP 3	.100	1.501	1.756	353	0.183	4	0.062	206	0.031	352	0.025	162	0.016	1	0.021	203	0.016	0	0.015	174
DCP 4	.150	0.997	1.120	352	0.130	1	0.027	208	0.019	338	0.015	120	0.014	321	0.009	125	0.007	266	0.011	113
DCP 5	.200	0.807	0.996	352	0.116	12	0.025	194	0.021	335	0.023	143	0.010	40	0.019	189	0.012	334	0.009	106
DCP 6	.250	0.728	0.851	354	0.099	4	0.022	212	0.015	340	0.008	120	0.012	325	0.004	124	0.005	306	0.008	99
DCP 7	.300	0.629	0.719	355	0.085	10	0.022	196	0.018	348	0.009	171	0.004	26	0.007	191	0.006	4	0.004	168
DCP 8	.400	0.477	0.564	356	0.063	6	0.014	196	0.013	349	0.003	167	0.007	302	0.003	146	0.002	285	0.006	136
DCP 9	.500	0.313	0.407	357	0.045	2	0.018	185	0.010	22	0.008	205	0.004	67	0.002	189	0.002	40	0.003	172
DCP 10	.600	0.275	0.318	1	0.031	8	0.007	160	0.012	0	0.002	354	0.003	310	0.001	138	0.004	356	0.004	156
DCP 11	.878	0.129	0.109	14	0.009	216	0.013	197	0.017	7	0.016	274	0.016	50	0.006	171	0.029	210	0.007	353

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.42	0.400	7.38	7.49		5028.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.063	436.4	740.6	0.48E 07	-0.00100	1.486	14.73

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.727	0.655	359	0.123	10	0.030	291	0.027	175	0.019	53	0.007	225	0.002	208	0.009	17	0.009	273
CM		-0.004	0.022	325	0.006	281	0.004	258	0.000	306	0.004	252	0.002	57	0.003	101	0.001	285	0.003	143
DCP 1	.010	2.609	4.345	354	0.650	347	0.101	248	0.124	172	0.038	294	0.076	142	0.052	99	0.063	5	0.014	226
DCP 2	.025	2.900	3.832	356	0.640	336	0.243	250	0.157	156	0.087	50	0.046	225	0.044	112	0.088	8	0.060	254
DCP 3	.100	1.986	1.691	357	0.304	19	0.097	317	0.057	211	0.024	70	0.009	35	0.013	304	0.010	251	0.023	183
DCP 4	.150	1.331	1.049	355	0.192	21	0.061	329	0.034	201	0.010	24	0.008	107	0.005	169	0.009	8	0.004	210
DCP 5	.200	1.082	0.913	357	0.192	25	0.063	313	0.053	172	0.026	49	0.017	300	0.011	192	0.013	59	0.010	1
DCP 6	.250	0.972	0.792	358	0.158	24	0.044	317	0.031	196	0.009	43	0.004	98	0.003	148	0.007	3	0.006	258
DCP 7	.300	0.826	0.667	0	0.151	20	0.047	291	0.036	168	0.025	40	0.014	278	0.009	170	0.010	55	0.005	270
DCP 8	.400	0.636	0.525	1	0.110	24	0.031	305	0.025	186	0.009	45	0.001	126	0.005	169	0.007	359	0.006	224
DCP 9	.500	0.413	0.389	3	0.079	20	0.021	280	0.012	142	0.012	343	0.016	208	0.016	102	0.012	341	0.007	261
DCP 10	.600	0.361	0.300	5	0.066	29	0.013	267	0.017	166	0.013	38	0.005	215	0.002	211	0.003	329	0.005	220
DCP 11	.878	0.179	0.144	14	0.025	7	0.018	77	0.007	173	0.036	77	0.012	237	0.023	284	0.011	80	0.025	320

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.47	0.400	9.75	7.32		5328.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.063	435.6	740.7	0.48E 07	-0.00021	1.610	16.38

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.846	0.463	7	0.248	21	0.079	295	0.031	222	0.020	185	0.019	103	0.005	57	0.011	20	0.007	251
CM		-0.021	0.023	197	0.026	62	0.016	354	0.012	292	0.007	233	0.008	178	0.005	69	0.003	79	0.005	348
DCP 1	.010	3.390	2.978	0	1.090	25	0.304	333	0.156	277	0.097	277	0.086	205	0.040	218	0.053	121	0.020	174
DCP 2	.025	3.288	2.271	356	1.187	27	0.506	326	0.295	270	0.217	227	0.183	172	0.129	120	0.139	67	0.096	4
DCP 3	.100	2.082	0.704	6	0.855	38	0.367	321	0.178	248	0.100	192	0.090	132	0.059	59	0.049	7	0.027	292
DCP 4	.150	1.417	0.488	13	0.514	43	0.189	326	0.069	253	0.037	236	0.051	163	0.028	86	0.033	43	0.027	314
DCP 5	.200	1.179	0.457	15	0.508	23	0.189	286	0.061	204	0.048	198	0.063	105	0.052	24	0.020	280	0.015	271
DCP 6	.250	1.073	0.475	19	0.372	29	0.115	296	0.031	226	0.033	232	0.049	139	0.024	52	0.028	30	0.035	315
DCP 7	.300	0.933	0.439	16	0.336	9	0.124	260	0.043	174	0.044	155	0.055	66	0.034	331	0.014	291	0.018	223
DCP 8	.400	0.775	0.431	16	0.207	9	0.060	250	0.012	190	0.026	174	0.036	76	0.017	339	0.013	7	0.024	269
DCP 9	.500	0.505	0.338	11	0.148	347	0.052	214	0.018	146	0.028	105	0.028	10	0.012	277	0.010	295	0.019	194
DCP 10	.600	0.476	0.321	13	0.094	346	0.043	212	0.018	170	0.032	104	0.029	30	0.014	311	0.010	269	0.014	218
DCP 11	.878	0.273	0.219	356	0.064	247	0.026	200	0.048	123	0.025	15	0.020	334	0.027	206	0.003	321	0.025	144

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.56	0.600	5.09	7.43		5032.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.043	640.2	1149.8	0.50E 07	-0.00114	1.299	12.67

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.518	0.036	356	0.110	14	0.034	4	0.037	316	0.005	269	0.018	17	0.009	39	0.033	170	0.030	340
CM		-0.025	0.021	238	0.024	104	0.006	15	0.007	71	0.006	346	0.006	263	0.006	222	0.004	19	0.006	164
DCP 1	.010	0.202	4.290	351	0.543	33	0.509	326	0.367	30	0.120	111	0.019	88	0.050	82	0.027	145	0.009	2
DCP 2	.025	0.834	3.186	351	0.296	30	0.142	118	0.100	10	0.115	74	0.046	340	0.016	305	0.066	144	0.074	325
DCP 3	.100	1.610	2.127	349	0.343	72	0.247	44	0.166	298	0.025	311	0.177	5	0.054	207	0.103	135	0.112	351
DCP 4	.150	1.335	1.357	353	0.646	49	0.326	325	0.062	97	0.245	314	0.108	200	0.115	349	0.107	219	0.048	291
DCP 5	.200	0.902	1.122	356	0.067	356	0.089	41	0.093	315	0.036	15	0.085	305	0.020	163	0.065	186	0.011	347
DCP 6	.250	0.903	1.197	358	0.232	22	0.154	349	0.091	303	0.059	227	0.040	263	0.050	171	0.025	135	0.017	179
DCP 7	.300	0.629	0.913	0	0.129	332	0.026	80	0.076	324	0.023	297	0.039	321	0.046	202	0.064	154	0.029	349
DCP 8	.400	0.554	0.798	359	0.130	4	0.036	322	0.027	325	0.048	210	0.029	108	0.020	65	0.005	121	0.006	6
DCP 9	.500	0.284	0.484	1	0.114	303	0.037	181	0.018	312	0.014	78	0.035	41	0.030	37	0.039	162	0.049	335
DCP 10	.600	0.301	0.440	3	0.074	6	0.021	279	0.008	9	0.014	191	0.014	65	0.007	11	0.011	157	0.012	22
DCP 11	.878	0.161	0.231	9	0.112	287	0.019	151	0.050	263	0.028	144	0.034	71	0.037	40	0.033	197	0.045	338

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.61	0.600	9.78	7.29		5032.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.043	639.9	1437.6	0.63E 07	-0.00102	1.239	16.19

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.649	0.392	6	0.168	52	0.035	75	0.023	96	0.003	85	0.029	79	0.011	16	0.011	65	0.008	0
CM		-0.043	0.044	200	0.014	101	0.006	141	0.003	122	0.003	140	0.001	328	0.003	170	0.002	159	0.004	81
DCP 1	.010	2.096	1.952	354	0.538	49	0.176	83	0.020	157	0.013	341	0.010	101	0.008	240	0.018	30	0.016	219
DCP 2	.025	2.286	1.567	354	0.557	55	0.151	53	0.091	218	0.047	135	0.057	33	0.031	287	0.018	231	0.010	118
DCP 3	.100	2.237	0.296	352	0.658	61	0.194	142	0.106	107	0.061	185	0.119	84	0.013	2	0.040	92	0.065	58
DCP 4	.200	1.243	0.402	13	0.321	67	0.064	87	0.106	81	0.028	130	0.039	93	0.056	119	0.027	139	0.042	53
DCP 5	.250	1.158	0.468	14	0.261	62	0.086	64	0.083	79	0.031	92	0.082	74	0.037	68	0.044	56	0.026	53
DCP 6	.300	1.034	0.474	14	0.197	58	0.080	52	0.062	89	0.048	44	0.049	69	0.029	39	0.039	68	0.021	14
DCP 7	.400	0.783	0.416	10	0.142	45	0.050	12	0.020	86	0.026	347	0.028	76	0.028	341	0.018	61	0.023	315
DCP 8	.500	0.536	0.336	10	0.064	32	0.034	51	0.006	347	0.019	10	0.009	313	0.003	342	0.011	21	0.013	269
DCP 9	.600	0.483	0.313	11	0.055	5	0.016	52	0.011	18	0.012	312	0.009	102	0.017	344	0.007	345	0.017	280
DCP 10	.878	0.362	0.259	10	0.043	332	0.024	308	0.015	251	0.011	263	0.014	108	0.014	350	0.006	320	0.016	248

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.47	0.600	12.21	7.22		5032.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.043	639.1	1436.9	0.63E 07	-0.00095	1.254	16.89

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.977	0.247	15	0.120	55	0.043	102	0.006	179	0.016	137	0.007	186	0.009	188	0.006	166	0.006	95
CM		-0.056	0.055	193	0.006	146	0.008	173	0.003	194	0.003	192	0.002	140	0.001	227	0.001	185	0.001	193
DCP 1	.010	2.655	1.256	355	0.428	63	0.130	63	0.045	168	0.039	43	0.021	20	0.030	291	0.012	230	0.022	171
DCP 2	.025	2.769	0.949	353	0.404	58	0.117	44	0.015	157	0.040	315	0.023	182	0.008	338	0.023	148	0.020	90
DCP 3	.100	2.393	0.312	168	0.231	51	0.254	147	0.043	244	0.103	162	0.046	201	0.060	178	0.036	152	0.097	174
DCP 4	.200	1.373	0.178	50	0.254	65	0.146	124	0.080	206	0.038	190	0.008	157	0.050	219	0.021	333	0.027	113
DCP 5	.250	1.330	0.263	23	0.229	74	0.120	137	0.038	154	0.066	140	0.056	182	0.038	254	0.030	153	0.021	242
DCP 6	.300	1.154	0.327	29	0.198	64	0.071	95	0.028	99	0.065	136	0.031	178	0.027	169	0.045	139	0.015	155
DCP 7	.400	0.909	0.340	19	0.129	61	0.046	52	0.031	57	0.020	112	0.021	51	0.012	154	0.013	127	0.012	64
DCP 8	.500	0.646	0.306	11	0.057	52	0.037	4	0.023	110	0.017	21	0.020	80	0.022	19	0.004	10	0.016	32
DCP 9	.600	0.574	0.281	20	0.068	29	0.027	9	0.009	298	0.012	99	0.009	340	0.010	60	0.010	256	0.013	82
DCP 10	.878	0.446	0.262	4	0.031	344	0.023	27	0.015	349	0.018	345	0.014	259	0.004	186	0.010	45	0.006	291

FORCED PITCHING OSCILLATION — VERTOL 23010-1.59 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	31.95	0.200	5.15	7.32		5030.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.241	221.3	198.9	0.26E 07	-0.00164	0.993	12.42

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.480	0.532	2	0.058	26	0.020	71	0.008	34	0.010	52	0.012	298	0.015	97	0.011	60	0.007	180
CM		-0.011	0.043	285	0.016	215	0.013	180	0.003	170	0.010	230	0.004	97	0.008	278	0.004	224	0.002	24
DCP 1	.010	0.972	3.485	346	0.249	12	0.047	118	0.025	153	0.051	228	0.000	203	0.043	38	0.021	79	0.012	161
DCP 2	.025	1.489	2.603	346	0.128	331	0.027	359	0.032	78	0.025	189	0.046	297	0.007	274	0.033	81	0.018	93
DCP 3	.100	1.194	1.283	351	0.080	352	0.020	69	0.023	68	0.028	193	0.019	322	0.015	110	0.019	58	0.008	167
DCP 4	.150	1.010	0.913	354	0.057	28	0.030	153	0.004	86	0.015	255	0.004	74	0.018	49	0.005	211	0.010	142
DCP 5	.200	0.856	0.723	357	0.036	17	0.014	49	0.022	69	0.004	86	0.021	306	0.012	142	0.014	70	0.006	241
DCP 6	.250	0.770	0.706	2	0.064	38	0.028	150	0.004	335	0.023	255	0.008	353	0.007	52	0.012	125	0.008	162
DCP 7	.300	0.621	0.537	7	0.039	55	0.009	130	0.013	49	0.012	237	0.009	326	0.012	131	0.009	71	0.011	174
DCP 8	.400	0.478	0.481	14	0.049	47	0.025	151	0.005	265	0.012	302	0.005	55	0.004	58	0.008	221	0.005	167
DCP 9	.500	0.318	0.291	21	0.036	79	0.017	48	0.014	72	0.003	32	0.015	323	0.008	175	0.004	90	0.005	237
DCP 10	.600	0.246	0.302	27	0.042	65	0.016	126	0.008	292	0.007	30	0.002	282	0.007	304	0.003	351	0.004	165
DCP 11	.878	0.106	0.149	60	0.120	19	0.114	356	0.021	7	0.071	54	0.033	277	0.065	97	0.036	49	0.016	[illegible]

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	32.05	0.200	7.61	7.88		5030.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.243	220.6	199.5	0.26E 07	-0.00149	1.316	15.62

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.686	0.610	1	0.044	352	0.015	298	0.015	2	0.000	276	0.022	189	0.013	237	0.011	124	0.001	28
CM		-0.005	0.043	284	0.001	56	0.002	70	0.006	200	0.003	276	0.007	8	0.006	91	0.004	309	0.004	172
DCP 1	.010	2.360	3.583	347	0.206	347	0.039	314	0.045	350	0.033	230	0.036	146	0.027	134	0.020	58	0.007	149
DCP 2	.025	2.559	3.066	345	0.217	349	0.067	281	0.016	313	0.037	284	0.041	185	0.038	116	0.037	114	0.008	252
DCP 3	.100	1.765	1.619	350	0.134	345	0.024	303	0.011	44	0.016	296	0.013	198	0.018	199	0.008	137	0.018	175
DCP 4	.150	1.287	0.958	356	0.050	345	0.022	330	0.011	274	0.017	234	0.012	181	0.017	167	0.007	65	0.011	151
DCP 5	.200	1.098	0.877	356	0.060	350	0.025	311	0.016	352	0.012	33	0.018	197	0.013	228	0.008	147	0.012	125
DCP 6	.250	1.005	0.706	4	0.035	9	0.023	309	0.012	314	0.006	276	0.015	192	0.007	214	0.007	304	0.009	123
DCP 7	.300	0.868	0.670	4	0.065	5	0.010	3	0.008	290	0.003	340	0.008	187	0.008	238	0.011	146	0.011	163
DCP 8	.400	0.661	0.483	17	0.027	18	0.016	333	0.012	315	0.008	231	0.009	211	0.017	210	0.005	350	0.015	145
DCP 9	.500	0.404	0.405	13	0.042	10	0.008	298	0.006	54	0.003	197	0.018	209	0.019	227	0.011	136	0.013	172
DCP 10	.600	0.307	0.289	36	0.022	31	0.015	329	0.019	352	0.005	75	0.017	190	0.015	230	0.001	311	0.008	208
DCP 11	.878	0.157	0.166	36	0.024	287	0.019	237	0.037	26	0.015	95	0.052	185	0.035	281	0.037	127	0.041	354

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	32.05	0.200	10.08	7.82		5030.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.243	220.5	199.5	0.26E 07	-0.00147	1.509	18.02

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.896	0.622	3	0.066	27	0.010	319	0.006	341	0.007	327	0.009	132	0.016	204	0.004	45	0.011	4
CM		0.005	0.039	272	0.011	247	0.004	313	0.005	188	0.003	66	0.006	318	0.006	4	0.006	188	0.005	155
DCP 1	.010	3.685	3.503	347	0.243	7	0.114	315	0.093	247	0.036	119	0.021	67	0.002	146	0.027	221	0.023	349
DCP 2	.025	3.673	2.943	347	0.226	355	0.044	294	0.019	123	0.018	273	0.028	37	0.026	231	0.025	121	0.014	355
DCP 3	.100	2.327	1.568	354	0.121	9	0.050	319	0.025	159	0.013	16	0.013	140	0.012	206	0.015	145	0.012	66
DCP 4	.150	1.645	0.979	356	0.091	16	0.027	311	0.025	299	0.022	355	0.012	229	0.011	171	0.011	182	0.012	52
DCP 5	.200	1.388	0.862	359	0.087	14	0.029	327	0.013	166	0.014	22	0.015	24	0.017	248	0.017	139	0.005	164
DCP 6	.250	1.269	0.732	3	0.072	30	0.020	337	0.028	292	0.022	350	0.012	228	0.008	237	0.007	231	0.013	24
DCP 7	.300	1.084	0.662	8	0.061	35	0.028	327	0.010	164	0.019	31	0.010	277	0.014	268	0.015	171	0.008	115
DCP 8	.400	0.839	0.509	14	0.058	32	0.009	311	0.016	317	0.019	359	0.007	262	0.014	229	0.016	192	0.009	44
DCP 9	.500	0.509	0.405	20	0.052	32	0.017	326	0.006	153	0.009	21	0.008	355	0.017	242	0.012	134	0.002	230
DCP10	.600	0.399	0.308	26	0.041	48	0.008	313	0.006	347	0.015	23	0.004	18	0.011	236	0.010	247	0.004	98
DCP11	.878	0.165	0.205	33	0.067	53	0.030	136	0.031	10	0.035	234	0.052	138	0.048	175	0.052	13	0.043	343

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	31.95	0.200	12.45	7.81		5030.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.242	220.5	199.6	0.26E 07	-0.00081	1.632	20.36

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.073	0.573	7	0.035	105	0.036	337	0.011	124	0.011	61	0.010	193	0.010	227	0.013	157	0.006	111
CM		0.001	0.023	301	0.023	304	0.014	119	0.005	271	0.004	233	0.002	21	0.001	272	0.003	348	0.000	317
DCP 1	.010	4.502	3.137	354	0.196	359	0.051	350	0.022	32	0.122	324	0.103	200	0.037	167	0.031	198	0.049	113
DCP 2	.025	4.533	2.809	354	0.165	339	0.045	49	0.020	84	0.028	135	0.024	126	0.037	177	0.033	117	0.023	82
DCP 3	.100	2.745	1.399	359	0.070	3	0.049	12	0.008	174	0.024	137	0.015	173	0.028	242	0.022	137	0.012	104
DCP 4	.150	1.869	0.947	9	0.084	303	0.048	108	0.026	317	0.007	261	0.006	139	0.020	237	0.010	185	0.013	57
DCP 5	.200	1.648	0.774	6	0.039	37	0.045	15	0.012	143	0.017	123	0.003	195	0.022	239	0.021	145	0.009	113
DCP 6	.250	1.450	0.758	17	0.058	251	0.053	63	0.026	237	0.011	66	0.012	232	0.016	231	0.007	192	0.006	84
DCP 7	.300	1.257	0.589	17	0.011	17	0.037	16	0.013	209	0.020	120	0.013	228	0.015	269	0.018	157	0.011	116
DCP 8	.400	0.589	0.551	18	0.078	154	0.063	2	0.033	173	0.024	6	0.009	206	0.013	235	0.006	160	0.005	186
DCP 9	.500	0.607	0.339	26	0.044	109	0.045	354	0.024	137	0.012	94	0.003	13	0.026	255	0.021	155	0.007	135
DCP10	.600	0.467	0.316	21	0.107	125	0.047	314	0.020	142	0.021	11	0.011	215	0.004	311	0.005	256	0.007	174
DCP11	.878	0.254	0.069	17	0.091	111	0.082	290	0.033	61	0.024	73	0.015	184	0.012	114	0.025	159	0.006	65

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	32.47	0.400	4.93	7.85		5029.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.124	436.3	740.8	0.48E 07	-0.00079	1.267	12.74

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.525	0.739	352	0.045	343	0.011	335	0.008	301	0.003	282	0.007	301	0.003	251	0.005	2	0.006	44
CM		-0.011	0.028	309	0.002	290	0.003	145	0.004	103	0.002	157	0.004	133	0.002	104	0.001	166	0.004	220
DCP 1	.010	1.137	4.655	345	0.304	343	0.120	124	0.057	65	0.045	276	0.034	201	0.027	130	0.022	343	0.002	331
DCP 2	.025	1.679	3.756	347	0.235	306	0.006	311	0.020	294	0.029	170	0.014	295	0.004	58	0.010	30	0.014	319
DCP 3	.100	1.520	1.899	349	0.115	340	0.026	313	0.008	312	0.008	161	0.003	233	0.006	172	0.004	342	0.005	167
DCP 4	.150	1.048	1.174	349	0.082	347	0.021	323	0.004	322	0.007	236	0.006	171	0.006	187	0.004	346	0.005	103
DCP 5	.200	0.832	1.046	351	0.069	355	0.019	349	0.003	345	0.008	234	0.007	311	0.007	354	0.010	18	0.006	190
DCP 6	.250	0.762	0.887	353	0.067	356	0.015	327	0.004	351	0.004	258	0.003	202	0.004	197	0.006	16	0.004	116
DCP 7	.300	0.611	0.759	356	0.058	5	0.013	326	0.004	350	0.002	293	0.001	331	0.003	175	0.003	347	0.001	214
DCP 8	.400	0.488	0.579	357	0.043	0	0.011	348	0.003	339	0.004	261	0.002	232	0.006	201	0.004	357	0.003	113
DCP 9	.500	0.344	0.422	1	0.030	19	0.008	19	0.005	345	0.003	266	0.001	325	0.001	299	0.002	50	0.001	103
DCP 10	.600	0.280	0.320	5	0.023	8	0.008	6	0.004	334	0.003	273	0.002	322	0.004	185	0.007	33	0.003	174
DCP 11	.878	0.130	0.127	11	0.009	272	0.021	314	0.029	280	0.015	338	0.031	310	0.015	293	0.009	330	0.032	35

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	32.36	0.400	7.36	7.80		5029.2	10

K	V	C	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.124	435.4	739.7	0.48E 07	-0.00092	1.504	15.14

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.748	0.715	358	0.068	337	0.008	185	0.008	71	0.004	290	0.003	156	0.002	165	0.003	299	0.003	138
CM		-0.002	0.032	309	0.005	279	0.002	261	0.001	162	0.001	149	0.001	350	0.001	4	0.001	91	0.001	308
DCP 1	.010	2.697	4.463	348	0.389	306	0.074	134	0.034	277	0.099	170	0.068	63	0.028	344	0.004	63	0.027	343
DCP 2	.025	2.998	4.009	351	0.460	293	0.119	179	0.055	66	0.044	170	0.059	79	0.074	344	0.056	261	0.039	159
DCP 3	.100	2.067	1.762	354	0.198	353	0.046	269	0.044	108	0.042	354	0.046	255	0.044	155	0.030	62	0.015	329
DCP 4	.150	1.358	1.067	354	0.122	357	0.027	313	0.004	205	0.002	253	0.004	258	0.006	192	0.002	82	0.003	31
DCP 5	.200	1.123	0.959	357	0.111	2	0.014	248	0.019	42	0.027	290	0.020	181	0.012	131	0.013	353	0.008	86
DCP 6	.250	1.002	0.813	359	0.098	357	0.011	298	0.003	104	0.002	296	0.002	189	0.005	157	0.001	205	0.002	355
DCP 7	.300	0.850	0.714	1	0.075	356	0.010	121	0.013	21	0.013	252	0.006	120	0.000	276	0.001	247	0.002	159
DCP 8	.400	0.658	0.541	3	0.063	352	0.003	185	0.006	84	0.006	287	0.001	288	0.005	201	0.004	96	0.002	70
DCP 9	.500	0.435	0.395	8	0.038	5	0.004	104	0.001	148	0.003	155	0.002	269	0.009	170	0.005	53	0.010	252
DCP 10	.600	0.359	0.311	13	0.036	0	0.002	153	0.002	120	0.006	326	0.001	234	0.005	169	0.002	138	0.001	231
DCP 11	.878	0.177	0.144	22	0.003	255	0.013	117	0.007	30	0.005	328	0.009	146	0.002	315	0.013	274	0.014	123

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	32.26	0.400	9.85	7.67		5029.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.124	434.6	738.9	0.48E 07	-0.00033	1.668	17.32

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.620	0.576	22	0.222	349	0.059	233	0.023	157	0.014	66	0.003	275	0.001	320	0.007	155	0.004	257
CM		-0.023	0.032	204	0.035	56	0.025	315	0.012	258	0.009	186	0.007	88	0.003	58	0.006	334	0.002	62
DCP 1	.010	3.084	2.971	4	0.865	9	0.217	314	0.166	301	0.205	250	0.193	174	0.135	99	0.088	12	0.054	277
DCP 2	.025	3.002	2.270	10	1.086	22	0.488	316	0.273	257	0.179	213	0.141	153	0.108	90	0.070	30	0.027	3
DCP 3	.100	2.035	1.010	31	0.826	18	0.370	284	0.163	196	0.069	131	0.052	98	0.046	33	0.030	319	0.012	269
DCP 4	.150	1.373	0.735	31	0.499	4	0.203	256	0.067	160	0.036	127	0.052	66	0.035	330	0.015	268	0.010	276
DCP 5	.200	1.171	0.717	31	0.436	356	0.174	243	0.058	164	0.054	116	0.058	40	0.031	315	0.018	265	0.018	229
DCP 6	.250	1.066	0.656	31	0.361	345	0.138	220	0.033	123	0.042	106	0.043	16	0.023	266	0.009	272	0.014	222
DCP 7	.300	0.938	0.645	30	0.307	339	0.120	209	0.035	137	0.049	94	0.044	357	0.024	276	0.011	234	0.015	171
DCP 8	.400	0.765	0.590	27	0.232	316	0.105	181	0.033	117	0.054	66	0.037	327	0.017	261	0.022	225	0.016	122
DCP 9	.500	0.519	0.457	26	0.169	305	0.086	167	0.036	90	0.048	34	0.036	297	0.021	235	0.017	168	0.009	72
DCP 10	.600	0.450	0.395	26	0.130	291	0.073	154	0.035	97	0.049	20	0.033	274	0.022	214	0.025	139	0.018	22
DCP 11	.878	0.270	0.238	7	0.077	236	0.068	128	0.039	80	0.030	318	0.029	211	0.010	54	0.027	144	0.026	241

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	32.36	0.400	12.24	7.66		5029.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.125	434.0	737.2	0.48E 07	-0.00021	1.802	19.20

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.922	0.496	36	0.241	358	0.050	305	0.043	253	0.032	178	0.021	118	0.013	43	0.006	313	0.005	238
CM		-0.040	0.058	192	0.041	76	0.021	14	0.020	322	0.012	255	0.008	190	0.006	137	0.004	79	0.004	37
DCP 1	.010	3.483	1.795	13	0.868	48	0.512	40	0.519	351	0.337	288	0.215	227	0.089	168	0.019	126	0.031	189
DCP 2	.025	3.245	1.246	25	1.185	41	0.568	5	0.449	319	0.283	267	0.199	209	0.101	161	0.070	136	0.055	84
DCP 3	.100	2.144	0.808	64	0.849	22	0.250	323	0.182	291	0.154	214	0.086	145	0.047	103	0.030	75	0.028	42
DCP 4	.150	1.490	0.628	61	0.531	18	0.115	312	0.118	302	0.119	215	0.067	149	0.044	131	0.051	83	0.026	19
DCP 5	.200	1.270	0.656	54	0.451	359	0.090	307	0.133	260	0.107	161	0.049	107	0.044	64	0.027	355	0.010	330
DCP 6	.250	1.186	0.656	51	0.400	359	0.078	293	0.119	265	0.110	178	0.057	127	0.050	38	0.043	16	0.018	325
DCP 7	.300	1.033	0.630	43	0.323	342	0.076	289	0.117	227	0.086	145	0.062	97	0.049	28	0.023	314	0.006	330
DCP 8	.400	0.872	0.592	40	0.281	334	0.075	261	0.104	219	0.082	139	0.057	99	0.053	38	0.035	329	0.031	277
DCP 9	.500	0.608	0.499	31	0.198	310	0.064	232	0.090	172	0.058	99	0.050	51	0.042	328	0.029	266	0.025	213
DCP 10	.600	0.539	0.436	32	0.170	309	0.054	224	0.076	180	0.045	106	0.042	69	0.036	355	0.032	297	0.033	233
DCP 11	.878	0.369	0.284	1	0.095	256	0.060	186	0.064	100	0.029	16	0.040	309	0.023	249	0.021	189	0.011	122

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	31.95	0.600	5.13	7.62		5333.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.083	642.0	1441.0	0.63E 07	-0.00087	1.296	12.39

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.463	0.741	351	0.148	10	0.058	290	0.024	224	0.019	149	0.007	79	0.010	62	0.011	332	0.006	241
CM		-0.026	0.026	260	0.016	83	0.009	356	0.005	308	0.003	241	0.002	155	0.001	122	0.001	75	0.002	57
DCP 1	.010	0.185	3.396	346	0.403	17	0.332	293	0.235	4	0.103	56	0.019	50	0.046	23	0.025	75	0.019	79
DCP 2	.025	0.617	3.068	342	0.566	20	0.085	289	0.071	15	0.056	44	0.046	119	0.034	224	0.017	293	0.021	147
DCP 3	.100	1.478	1.921	341	0.572	42	0.262	322	0.121	223	0.093	196	0.035	341	0.015	88	0.040	353	0.026	277
DCP 4	.200	0.872	1.048	351	0.237	7	0.139	305	0.099	243	0.039	175	0.046	170	0.041	75	0.003	139	0.020	59
DCP 5	.250	0.753	0.979	356	0.194	3	0.112	313	0.095	257	0.059	179	0.040	160	0.056	99	0.025	9	0.039	60
DCP 6	.300	0.592	0.785	357	0.201	355	0.092	278	0.061	234	0.058	159	0.041	104	0.041	58	0.031	353	0.018	336
DCP 7	.400	0.443	0.644	359	0.121	350	0.044	269	0.028	228	0.035	153	0.027	85	0.027	51	0.027	343	0.021	277
DCP 8	.500	0.306	0.431	0	0.096	343	0.045	233	0.011	151	0.011	113	0.016	58	0.015	351	0.012	277	0.039	219
DCP 9	.600	0.242	0.367	8	0.078	341	0.041	234	0.021	142	0.015	91	0.015	24	0.009	344	0.009	299	0.009	240
DCP 10	.878	0.181	0.195	4	0.046	282	0.024	173	0.021	120	0.015	42	0.018	301	0.009	219	0.006	222	0.006	218

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	31.95	0.600	7.48	7.57		5333.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.083	640.0	1436.5	0.63E 07	-0.00079	1.391	13.47

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.665	0.598	359	0.183	22	0.052	338	0.038	289	0.013	244	0.021	215	0.017	134	0.008	87	0.003	72
CM		-0.034	0.038	220	0.021	92	0.006	59	0.009	22	0.006	319	0.002	298	0.003	251	0.003	164	0.000	69
DCP 1	.010	1.078	2.977	347	0.731	31	0.112	80	0.036	198	0.009	240	0.011	318	0.030	83	0.012	340	0.014	348
DCP 2	.025	1.546	2.320	345	0.492	27	0.074	15	0.090	340	0.010	356	0.021	170	0.041	77	0.023	54	0.007	0
DCP 3	.100	1.867	1.111	345	0.759	47	0.147	334	0.136	1	0.083	308	0.066	236	0.023	170	0.052	138	0.019	45
DCP 4	.200	1.059	0.787	1	0.314	30	0.168	359	0.099	301	0.068	289	0.046	236	0.036	224	0.019	147	0.013	230
DCP 5	.250	0.957	0.750	6	0.267	30	0.140	1	0.095	310	0.068	301	0.073	250	0.044	196	0.021	176	0.010	181
DCP 6	.300	0.824	0.688	5	0.209	15	0.105	355	0.105	291	0.051	249	0.054	226	0.050	171	0.030	134	0.019	100
DCP 7	.400	0.631	0.587	8	0.166	3	0.072	329	0.081	262	0.039	190	0.030	209	0.046	143	0.020	88	0.021	81
DCP 8	.500	0.425	0.414	9	0.114	352	0.023	319	0.044	263	0.029	177	0.018	166	0.030	112	0.019	31	0.012	28
DCP 9	.600	0.371	0.382	14	0.100	342	0.031	287	0.040	236	0.029	152	0.014	154	0.028	100	0.019	356	0.003	150
DCP 10	.878	0.270	0.250	5	0.061	289	0.030	230	0.035	171	0.018	107	0.009	93	0.017	14	0.010	324	0.007	248

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	31.85	0.600	9.87	7.49		5033.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.083	640.2	1438.9	0.63E 07	-0.00102	1.424	14.07

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.837	0.426	11	0.170	43	0.068	34	0.047	338	0.013	206	0.012	346	0.013	266	0.010	274	0.005	216
CM		-0.049	0.061	209	0.023	113	0.012	125	0.010	78	0.005	46	0.005	32	0.003	345	0.003	324	0.002	271
DCP 1	.010	2.033	2.092	352	0.463	37	0.100	52	0.051	290	0.015	98	0.010	149	0.012	173	0.010	233	0.005	267
DCP 2	.025	2.058	1.426	347	0.554	65	0.257	44	0.123	309	0.005	173	0.015	333	0.032	273	0.033	258	0.032	214
DCP 3	.100	2.149	0.287	346	0.716	63	0.210	97	0.165	27	0.019	3	0.100	37	0.069	292	0.052	317	0.044	261
DCP 4	.200	1.228	0.446	20	0.334	62	0.152	46	0.119	29	0.040	29	0.072	12	0.017	344	0.032	290	0.011	120
DCP 5	.250	1.147	0.501	20	0.275	61	0.159	38	0.115	21	0.058	349	0.058	17	0.037	319	0.030	322	0.011	234
DCP 6	.300	0.989	0.511	21	0.199	47	0.133	37	0.085	7	0.064	356	0.049	346	0.042	320	0.033	302	0.011	311
DCP 7	.400	0.750	0.504	20	0.144	22	0.100	10	0.076	315	0.039	302	0.034	274	0.029	244	0.017	233	0.018	217
DCP 8	.500	0.579	0.428	20	0.106	353	0.044	5	0.051	307	0.029	283	0.036	235	0.021	190	0.007	198	0.006	220
DCP 9	.600	0.512	0.410	22	0.106	340	0.044	333	0.054	277	0.020	237	0.026	229	0.020	184	0.01[illegible]	179	0.010	120
DCP 10	.878	0.361	0.281	13	0.058	319	0.043	310	0.035	254	0.026	200	0.014	160	0.005	156	0.012	127	0.009	78

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	32.05	0.600	12.29	7.46		5033.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.084	638.4	1427.7	0.62E 07	-0.00087	1.424	14.43

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.964	0.307	28	0.147	44	0.043	67	0.041	48	0.018	59	0.005	57	0.015	57	0.010	303	0.005	47
CM		-0.058	0.065	201	0.011	151	0.011	146	0.005	195	0.007	133	0.002	146	0.004	153	0.004	59	0.002	233
DCP 1	.010	2.631	1.365	355	0.418	53	0.132	25	0.018	295	0.035	103	0.025	328	0.017	302	0.010	333	0.015	290
DCP 2	.025	2.653	0.911	349	0.430	60	0.144	27	0.042	47	0.061	3	0.037	265	0.007	37	0.022	332	0.029	272
DCP 3	.100	2.344	0.387	143	0.356	47	0.228	127	0.066	49	0.100	110	0.029	123	0.069	99	0.037	32	0.021	130
DCP 4	.200	1.325	0.317	52	0.278	59	0.138	114	0.058	78	0.072	110	0.048	130	0.019	109	0.042	333	0.016	239
DCP 5	.250	1.303	0.391	44	0.259	66	0.124	107	0.108	70	0.081	127	0.034	101	0.040	102	0.004	159	0.013	260
DCP 6	.300	1.146	0.460	38	0.216	49	0.085	69	0.101	61	0.060	78	0.038	59	0.042	71	0.005	42	0.039	25
DCP 7	.400	0.904	0.425	32	0.155	39	0.064	36	0.063	39	0.028	25	0.021	353	0.024	84	0.005	6	0.023	77
DCP 8	.500	0.662	0.382	24	0.080	19	0.049	8	0.037	24	0.020	329	0.017	14	0.025	5	0.025	288	0.013	7
DCP 9	.600	0.590	0.348	25	0.083	22	0.052	0	0.028	44	0.037	345	0.018	309	0.014	352	0.015	282	0.012	33
DCP 10	.878	0.438	0.286	9	0.054	353	0.037	312	0.020	355	0.024	296	0.003	218	0.020	326	0.023	227	0.005	86

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.95	0.200	9.90	2.41		1078.1	5

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.126	224.5	120.5	0.15E 07	-0.00132	1.311	12.35

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.065	0.209	356	0.010	167	0.007	302	0.006	86	0.018	21	0.008	140	0.022	251	0.011	98	0.005	86
CM		-0.046	0.006	290	0.001	3	0.003	148	0.003	246	0.005	188	0.001	358	0.007	83	0.003	303	0.002	304
DCP 1	.010	3.353	1.191	349	0.047	192	0.020	200	0.046	186	0.022	80	0.045	122	0.057	198	0.011	317	0.022	248
DCP 2	.050	2.766	0.774	348	0.019	209	0.032	271	0.018	187	0.011	324	0.014	107	0.020	155	0.021	327	0.039	299
DCP 3	.100	2.421	0.495	354	0.042	158	0.011	183	0.017	345	0.050	57	0.008	143	0.065	273	0.025	46	0.031	73
DCP 4	.150	2.260	0.403	351	0.019	85	0.003	332	0.008	96	0.017	35	0.030	147	0.018	176	0.005	72	0.006	212
DCP 5	.200	1.830	0.307	354	0.033	140	0.019	343	0.009	266	0.019	72	0.008	66	0.029	284	0.019	97	0.013	47
DCP 6	.250	1.359	0.261	355	0.005	37	0.008	92	0.012	138	0.012	352	0.020	141	0.020	158	0.008	352	0.011	133
DCP 7	.300	1.282	0.213	358	0.020	160	0.006	320	0.006	271	0.020	33	0.002	352	0.036	269	0.027	97	0.014	41
DCP 8	.500	0.761	0.134	7	0.010	304	0.011	218	0.018	84	0.020	332	0.015	154	0.014	158	0.007	69	0.003	13
DCP 9	.600	0.660	0.108	6	0.016	157	0.022	351	0.008	354	0.023	73	0.019	108	0.039	277	0.030	156	0.023	117
DCP10	.695	0.552	0.070	27	0.008	298	0.022	206	0.007	84	0.030	301	0.015	268	0.030	144	0.013	70	0.005	71
DCP11	.800	0.384	0.052	352	0.020	232	0.028	298	0.024	75	0.041	31	0.007	91	0.067	267	0.031	111	0.014	133
DCP12	.878	0.345	0.044	3	0.023	122	0.032	5	0.012	66	0.031	24	0.011	183	0.050	275	0.004	168	0.006	188

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.95	0.200	12.40	2.41		1078.2	5

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.126	224.6	120.3	0.15E 07	-0.00230	1.419	14.82

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.212	0.181	4	0.016	178	0.013	212	0.002	336	0.023	150	0.002	176	0.025	230	0.011	146	0.006	252
CM		-0.044	0.010	288	0.003	5	0.004	55	0.000	16	0.005	299	0.001	91	0.007	73	0.003	306	0.001	279
DCP 1	.010	4.494	1.131	351	0.023	207	0.022	205	0.043	358	0.085	181	0.010	294	0.049	155	0.036	216	0.008	312
DCP 2	.050	3.432	0.637	350	0.023	165	0.053	163	0.030	353	0.064	180	0.033	105	0.054	123	0.036	190	0.003	75
DCP 3	.100	2.810	0.502	358	0.037	149	0.018	198	0.012	266	0.014	76	0.012	201	0.091	263	0.009	140	0.023	273
DCP 4	.150	2.502	0.331	357	0.010	196	0.002	98	0.007	26	0.043	167	0.007	344	0.030	141	0.005	255	0.011	246
DCP 5	.200	1.947	0.252	1	0.033	189	0.013	50	0.017	167	0.008	113	0.010	279	0.058	244	0.011	103	0.011	274
DCP 6	.250	1.487	0.215	3	0.016	198	0.015	206	0.001	13	0.041	167	0.001	155	0.032	139	0.006	245	0.021	241
DCP 7	.300	1.356	0.180	10	0.021	148	0.005	170	0.012	140	0.005	98	0.010	159	0.054	242	0.010	153	0.027	251
DCP 8	.500	0.826	0.118	19	0.009	227	0.017	252	0.008	344	0.044	177	0.004	130	0.029	127	0.009	85	0.011	237
DCP 9	.600	0.734	0.086	33	0.016	161	0.019	154	0.027	247	0.028	102	0.001	264	0.061	264	0.024	124	0.012	16
DCP10	.695	0.589	0.081	43	0.028	209	0.015	241	0.014	290	0.028	189	0.010	2	0.023	91	0.008	139	0.004	205
DCP11	.800	0.421	0.052	44	0.010	258	0.060	246	0.050	71	0.048	96	0.009	167	0.051	259	0.020	153	0.014	107
DCP12	.878	0.452	0.046	0	0.029	151	0.013	164	0.019	242	0.018	103	0.014	275	0.057	251	0.017	138	0.007	66

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.95	0.200	14.60	2.41		1379.3	10
	K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
	0.126	224.5	120.1	0.15E 07	-0.00114	1.536	16.96

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.343	0.190	14	0.016	205	0.003	353	0.008	102	0.010	134	0.000	199	0.008	83	0.005	207	0.002	355
CM		-0.048	0.005	279	0.005	330	0.002	146	0.004	298	0.004	263	0.001	349	0.003	253	0.002	68	0.001	238
DCP 1	.010	5.493	1.297	358	0.114	234	0.017	181	0.007	109	0.073	207	0.012	155	0.019	105	0.010	152	0.012	107
DCP 2	.050	3.896	0.653	1	0.047	219	0.005	346	0.024	59	0.049	202	0.010	21	0.011	50	0.017	131	0.010	337
DCP 3	.100	3.151	0.452	9	0.014	169	0.006	158	0.026	346	0.042	62	0.007	293	0.018	73	0.006	256	0.014	218
DCP 4	.150	2.656	0.295	12	0.020	245	0.014	236	0.014	120	0.034	200	0.003	82	0.006	94	0.010	193	0.002	347
DCP 5	.200	2.110	0.239	20	0.011	312	0.010	103	0.008	356	0.019	68	0.007	247	0.006	36	0.004	18	0.002	345
DCP 6	.250	1.569	0.206	26	0.028	283	0.010	143	0.011	177	0.028	193	0.008	115	0.003	215	0.011	179	0.012	320
DCP 7	.300	1.452	0.200	31	0.015	312	0.015	80	0.011	5	0.014	58	0.010	314	0.007	142	0.004	241	0.005	243
DCP 8	.500	0.870	0.131	37	0.028	223	0.014	334	0.010	171	0.025	207	0.007	88	0.002	125	0.007	192	0.007	35
DCP 9	.600	0.809	0.118	35	0.035	193	0.018	53	0.011	211	0.015	16	0.017	284	0.007	74	0.010	354	0.004	240
DCP10	.695	0.628	0.065	21	0.029	166	0.023	338	0.015	199	0.016	210	0.005	101	0.002	230	0.011	147	0.002	52
DCP11	.800	0.478	0.060	4	0.028	155	0.040	280	0.076	99	0.043	83	0.019	132	0.033	108	0.016	170	0.012	8
DCP12	.878	0.591	0.070	343	0.026	110	0.020	127	0.006	4	0.034	81	0.008	233	0.028	35	0.023	264	0.007	56

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.95	0.400	9.90	2.43		1376.1	5
	K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
	0.064	443.8	370.3	0.24E 07	-0.00131	1.312	12.37

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.067	0.243	352	0.005	165	0.005	239	0.004	187	0.006	129	0.002	243	0.006	213	0.000	331	0.001	157
CM		-0.010	0.009	319	0.001	190	0.002	98	0.001	272	0.000	15	0.001	33	0.002	45	0.000	158	0.000	0
DCP 1	.010	4.275	1.680	348	0.127	221	0.043	140	0.009	65	0.005	138	0.013	50	0.007	132	0.004	206	0.008	216
DCP 2	.050	3.346	0.977	348	0.009	175	0.039	293	0.041	207	0.042	104	0.020	6	0.008	242	0.002	113	0.005	257
DCP 3	.100	2.830	0.570	350	0.022	112	0.050	145	0.015	241	0.046	127	0.011	238	0.017	151	0.005	357	0.016	63
DCP 4	.150	2.087	0.432	350	0.019	96	0.002	279	0.005	199	0.002	0	0.003	327	0.003	73	0.002	217	0.006	213
DCP 5	.200	1.857	0.331	350	0.013	119	0.007	270	0.002	174	0.009	174	0.004	219	0.011	235	0.001	126	0.001	174
DCP 6	.250	1.345	0.272	353	0.003	139	0.005	268	0.002	227	0.004	123	0.002	288	0.007	104	0.002	314	0.004	232
DCP 7	.300	1.197	0.243	353	0.010	146	0.004	210	0.004	250	0.004	170	0.004	224	0.011	234	0.002	55	0.003	164
DCP 8	.500	0.702	0.137	357	0.002	104	0.008	297	0.005	145	0.002	320	0.002	101	0.005	43	0.004	234	0.003	130
DCP 9	.600	0.552	0.104	3	0.003	117	0.006	304	0.003	141	0.005	184	0.007	216	0.017	228	0.005	83	0.004	126
DCP10	.695	0.464	0.077	6	0.002	57	0.004	256	0.003	179	0.008	54	0.004	212	0.003	93	0.005	199	0.002	289
DCP11	.800	0.261	0.050	4	0.004	263	0.014	255	0.011	77	0.006	135	0.003	246	0.015	225	0.005	356	0.002	300
DCP12	.878	0.249	0.047	6	0.003	250	0.003	220	0.003	200	0.010	169	0.004	231	0.016	221	0.003	358	0.001	221

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.89	0.400	12.40	2.42		1076.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.064	443.8	367.3	0.24E 07	0.00100	1.445	14.29

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.216	0.153	34	0.070	2	0.022	213	0.002	42	0.006	153	0.002	169	0.006	149	0.001	343	0.002	160
CM		-0.013	0.006	130	0.013	26	0.008	258	0.004	120	0.002	311	0.001	153	0.001	316	0.001	133	0.001	15
DCP 1	.010	5.520	1.260	12	0.319	1	0.065	199	0.058	40	0.038	333	0.023	224	0.018	161	0.007	315	0.003	149
DCP 2	.050	4.008	0.713	32	0.474	2	0.269	252	0.110	180	0.054	161	0.036	147	0.039	145	0.025	118	0.016	114
DCP 3	.100	3.110	0.293	39	0.217	28	0.070	230	0.040	93	0.003	185	0.014	217	0.003	134	0.004	13	0.009	149
DCP 4	.150	2.290	0.200	51	0.155	14	0.063	227	0.025	98	0.018	345	0.009	194	0.004	117	0.002	111	0.002	332
DCP 5	.200	1.952	0.182	79	0.178	14	0.079	235	0.033	97	0.012	272	0.013	129	0.008	347	0.007	237	0.009	114
DCP 6	.250	1.448	0.152	69	0.126	11	0.049	223	0.020	79	0.005	333	0.000	57	0.003	198	0.004	157	0.004	6
DCP 7	.300	1.277	0.146	68	0.111	4	0.041	213	0.016	34	0.015	194	0.007	73	0.005	225	0.001	34	0.003	211
DCP 8	.500	0.762	0.089	53	0.030	339	0.028	125	0.019	323	0.011	96	0.006	319	0.012	157	0.003	22	0.003	255
DCP 9	.600	0.652	0.070	32	0.012	269	0.029	89	0.019	301	0.015	164	0.005	9	0.006	184	0.006	334	0.002	216
DCP10	.695	0.524	0.077	9	0.030	219	0.028	86	0.010	290	0.012	48	0.008	248	0.011	111	0.004	258	0.006	195
DCP11	.800	0.339	0.086	353	0.039	219	0.020	77	0.014	293	0.012	157	0.001	34	0.005	151	0.005	351	0.002	215
DCP12	.878	0.364	0.112	347	0.047	217	0.019	68	0.013	258	0.009	160	0.003	95	0.006	114	0.008	297	0.007	129

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.89	0.400	14.60	2.41		1376.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.064	443.6	364.7	0.23E 07	0.00200	1.447	14.26

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.160	0.266	113	0.039	52	0.039	55	0.017	359	0.012	251	0.012	290	0.009	201	0.006	187	0.004	176
CM		-0.042	0.050	167	0.011	121	0.015	109	0.007	89	0.008	42	0.005	28	0.005	328	0.004	307	0.001	264
DCP 1	.010	5.420	1.153	115	0.235	97	0.165	104	0.074	78	0.059	68	0.072	32	0.047	354	0.040	335	0.026	297
DCP 2	.050	3.685	1.149	135	0.356	107	0.387	115	0.243	100	0.180	105	0.103	53	0.060	19	0.075	342	0.040	319
DCP 3	.100	2.724	0.953	144	0.187	75	0.144	86	0.102	41	0.075	7	0.087	344	0.050	310	0.040	287	0.043	257
DCP 4	.150	1.884	0.808	137	0.152	52	0.139	79	0.088	7	0.044	330	0.049	311	0.041	261	0.031	242	0.034	196
DCP 5	.200	1.677	0.640	129	0.087	38	0.134	60	0.067	343	0.056	317	0.048	287	0.036	243	0.031	211	0.023	183
DCP 6	.250	1.258	0.504	119	0.062	14	0.119	44	0.058	316	0.056	296	0.043	255	0.041	224	0.031	196	0.033	156
DCP 7	.300	1.155	0.393	110	0.035	354	0.101	33	0.042	317	0.053	284	0.032	266	0.036	202	0.021	197	0.018	141
DCP 8	.500	0.767	0.177	74	0.027	291	0.053	339	0.027	281	0.040	230	0.018	227	0.020	171	0.021	155	0.013	75
DCP 9	.600	0.727	0.132	43	0.029	318	0.058	300	0.023	273	0.039	219	0.013	237	0.020	157	0.023	133	0.007	38
DCP10	.695	0.600	0.129	13	0.029	317	0.037	284	0.025	282	0.025	189	0.019	198	0.015	124	0.022	136	0.009	46
DCP11	.800	0.447	0.163	357	0.030	337	0.043	282	0.011	238	0.021	208	0.010	220	0.013	140	0.005	189	0.004	168
DCP12	.878	0.502	0.169	348	0.032	1	0.038	252	0.011	308	0.019	201	0.009	185	0.015	122	0.011	59	0.006	249

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.89	0.600	9.90	2.40		1377.1	5

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.043	652.8	708.9	0.31E 07	-0.00026	1.035	11.60

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.947	0.079	25	0.005	133	0.004	343	0.006	236	0.007	136	0.002	354	0.004	163	0.004	137	0.003	9
CM		-0.042	0.037	182	0.005	319	0.003	223	0.002	18	0.000	242	0.001	75	0.001	68	0.002	253	0.002	145
DCP 1	.010	2.530	0.541	358	0.019	116	0.006	258	0.012	161	0.005	51	0.004	314	0.003	228	0.008	107	0.009	179
DCP 2	.050	2.526	0.090	26	0.098	67	0.006	210	0.011	343	0.019	172	0.014	60	0.003	20	0.003	38	0.008	135
DCP 3	.100	2.547	0.344	153	0.090	4	0.027	305	0.024	322	0.042	140	0.020	47	0.026	148	0.013	242	0.016	58
DCP 4	.150	1.967	0.421	170	0.146	262	0.060	322	0.017	32	0.015	144	0.013	353	0.015	134	0.036	241	0.017	256
DCP 5	.200	1.659	0.110	157	0.073	256	0.020	270	0.023	262	0.004	129	0.013	209	0.029	131	0.014	128	0.017	55
DCP 6	.250	1.225	0.061	84	0.014	350	0.034	225	0.025	237	0.001	284	0.006	177	0.006	17	0.013	175	0.019	171
DCP 7	.300	1.094	0.098	22	0.019	135	0.024	191	0.007	235	0.007	143	0.001	308	0.008	210	0.016	149	0.007	74
DCP 8	.500	0.588	0.165	20	0.022	116	0.022	87	0.010	221	0.018	131	0.010	10	0.012	347	0.007	240	0.004	36
DCP 9	.600	0.509	0.168	12	0.011	142	0.017	54	0.006	183	0.017	96	0.004	187	0.019	144	0.026	74	0.015	4
DCP10	.695	0.475	0.149	4	0.028	125	0.020	0	0.006	186	0.009	294	0.009	257	0.011	217	0.006	160	0.005	71
DCP11	.800	0.404	0.160	0	0.022	143	0.019	21	0.014	206	0.013	314	0.017	230	0.013	190	0.011	33	0.012	247
DCP12	.878	0.407	0.156	355	0.017	134	0.005	319	0.004	202	0.008	150	0.013	53	0.011	329	0.010	72	0.016	311

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.92	0.600	12.40	2.41		1377.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.043	653.1	707.9	0.31E 07	-0.00090	1.061	13.27

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.993	0.063	32	0.011	146	0.006	61	0.009	306	0.004	143	0.005	306	0.002	275	0.008	331	0.002	89
CM		-0.068	0.023	190	0.002	281	0.003	357	0.003	163	0.001	331	0.003	59	0.001	83	0.002	89	0.001	296
DCP 1	.010	2.965	0.392	357	0.073	97	0.019	10	0.016	276	0.011	237	0.003	95	0.006	124	0.004	217	0.011	31
DCP 2	.050	2.542	0.068	132	0.031	191	0.019	39	0.022	286	0.010	136	0.015	346	0.011	216	0.012	180	0.012	43
DCP 3	.100	2.355	0.236	154	0.057	201	0.021	33	0.011	274	0.004	108	0.017	10	0.016	63	0.047	321	0.009	147
DCP 4	.150	1.657	0.067	141	0.024	278	0.049	0	0.023	317	0.013	338	0.033	337	0.004	338	0.021	192	0.019	46
DCP 5	.200	1.533	0.054	126	0.026	211	0.022	86	0.014	220	0.022	101	0.016	56	0.005	278	0.023	27	0.005	200
DCP 6	.250	1.240	0.075	50	0.008	13	0.033	351	0.016	270	0.006	253	0.024	355	0.009	328	0.012	273	0.004	310
DCP 7	.300	1.135	0.073	39	0.006	71	0.024	50	0.015	276	0.007	36	0.006	109	0.008	245	0.007	27	0.014	296
DCP 8	.500	0.700	0.100	24	0.034	120	0.005	213	0.007	128	0.014	220	0.006	2	0.006	93	0.028	328	0.006	258
DCP 9	.600	0.643	0.103	15	0.032	159	0.026	161	0.008	228	0.011	86	0.013	190	0.008	346	0.007	124	0.013	134
DCP10	.695	0.599	0.101	10	0.015	104	0.017	156	0.014	14	0.012	179	0.005	296	0.002	306	0.013	334	0.034	185
DCP11	.800	0.496	0.093	8	0.006	197	0.017	185	0.024	339	0.007	120	0.021	229	0.006	218	0.017	215	0.014	134
DCP12	.878	0.500	0.097	12	0.015	9	0.009	345	0.028	327	0.007	120	0.030	274	0.012	257	0.018	250	0.013	77

FORCED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.92	0.600	14.60	2.41		1377.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.043	653.1	704.2	0.30E 07	0.00014	1.085	15.48

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.997	0.053	95	0.028	31	0.006	155	0.009	45	0.004	318	0.008	336	0.006	229	0.005	215	0.006	59
CM		-0.101	0.030	177	0.005	49	0.003	118	0.005	298	0.002	138	0.002	15	0.003	50	0.004	344	0.001	243
DCP 1	.010	3.220	0.188	341	0.086	124	0.017	98	0.007	251	0.006	227	0.008	294	0.006	194	0.008	252	0.008	240
DCP 2	.050	2.147	0.500	151	0.186	30	0.042	135	0.058	343	0.012	155	0.046	8	0.005	342	0.026	330	0.009	87
DCP 3	.100	1.994	0.330	151	0.133	21	0.080	133	0.043	321	0.018	175	0.030	323	0.015	126	0.024	292	0.010	45
DCP 4	.150	1.436	0.215	151	0.080	21	0.016	121	0.032	344	0.011	357	0.028	340	0.019	312	0.038	324	0.012	122
DCP 5	.200	1.396	0.188	139	0.076	32	0.024	139	0.022	348	0.011	173	0.029	346	0.002	39	0.018	260	0.010	265
DCP 6	.250	1.158	0.120	134	0.051	35	0.019	126	0.029	20	0.009	25	0.017	19	0.012	294	0.019	287	0.015	76
DCP 7	.300	1.089	0.111	117	0.052	45	0.009	275	0.003	58	0.004	278	0.016	333	0.002	80	0.006	192	0.007	38
DCP 8	.500	0.789	0.075	30	0.010	338	0.014	178	0.019	47	0.017	334	0.008	62	0.012	203	0.010	230	0.005	34
DCP 9	.600	0.747	0.096	18	0.028	166	0.005	14	0.031	111	0.022	22	0.007	350	0.022	161	0.030	116	0.017	33
DCP10	.695	0.721	0.117	1	0.011	222	0.008	275	0.018	139	0.015	239	0.017	208	0.016	304	0.010	166	0.010	58
DCP11	.800	0.634	0.119	359	0.015	250	0.014	332	0.023	134	0.013	330	0.006	197	0.013	234	0.012	169	0.017	83
DCP12	.878	0.633	0.110	354	0.016	307	0.020	289	0.011	86	0.007	211	0.012	215	0.022	239	0.021	200	0.012	226

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	94.34	0.200	10.00	2.97		1082.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.701	224.6	119.8	0.15E 07	-0.00153	1.210	11.91

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.962	0.222	50	0.009	279	0.009	334	0.001	54	0.006	190	0.001	32	0.007	80	0.012	88	0.012	266
CM		-0.035	0.048	288	0.005	147	0.002	171	0.002	31	0.003	7	0.001	212	0.003	293	0.004	270	0.005	97
DCP 1	.010	2.971	0.988	351	0.037	206	0.026	321	0.025	134	0.015	356	0.031	239	0.011	313	0.027	106	0.025	88
DCP 2	.050	2.657	0.588	4	0.010	177	0.004	23	0.004	299	0.031	277	0.027	157	0.033	84	0.021	86	0.022	104
DCP 3	.100	2.335	0.433	16	0.014	141	0.026	162	0.013	228	0.023	29	0.024	324	0.020	302	0.023	291	0.007	133
DCP 4	.150	2.081	0.435	20	0.024	218	0.015	261	0.025	18	0.009	27	0.002	144	0.012	75	0.031	113	0.005	192
DCP 5	.200	1.663	0.332	31	0.016	223	0.015	314	0.009	60	0.009	140	0.013	19	0.005	352	0.013	20	0.022	238
DCP 6	.250	1.277	0.290	49	0.027	276	0.009	347	0.025	39	0.014	251	0.007	215	0.011	353	0.018	110	0.012	252
DCP 7	.300	1.066	0.267	52	0.019	247	0.011	3	0.010	44	0.018	125	0.007	39	0.006	353	0.003	279	0.021	245
DCP 8	.500	0.773	0.261	87	0.013	125	0.038	327	0.009	315	0.017	201	0.019	165	0.023	84	[illegible]	[illegible]	0.020	316
DCP 9	.600	0.515	0.230	75	0.019	275	0.004	55	0.006	136	0.004	182	0.017	333	0.012	272	[illegible]	[illegible]	0.029	231
DCP10	.695	0.359	0.225	98	0.023	341	0.008	31	0.001	1	0.010	246	0.003	37	0.021	74	0.017	[illegible]	0.027	311
DCP11	.800	0.312	0.132	84	0.032	323	0.015	215	0.021	184	0.017	170	0.007	28	0.019	193	0.003	[illegible]	0.016	257
DCP12	.878	0.357	0.149	93	0.017	323	0.002	343	0.013	215	0.014	166	0.020	339	0.012	146	0.015	169	0.016	246
DCP13	.953	0.150	0.118	94	0.018	326	0.028	23	0.007	265	0.007	262	0.016	131	0.033	88	0.041	94	0.021	291

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	95.24	0.200	12.47	3.00		1082.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.708	224.6	120.2	0.15E 07	-0.00138	1.424	13.64

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.207	0.201	51	0.014	226	0.012	338	0.013	68	0.008	140	0.014	304	0.010	266	0.008	157	0.009	246
CM		-0.037	0.046	292	0.005	114	0.005	155	0.003	265	0.003	4	0.002	147	0.002	76	0.001	53	0.004	116
DCP 1	.010	4.352	1.042	347	0.084	180	0.038	178	0.043	99	0.044	11	0.075	297	0.072	236	0.056	116	0.055	116
DCP 2	.050	3.506	0.522	2	0.046	148	0.018	165	0.032	216	0.031	129	0.035	175	0.009	81	0.041	103	0.022	43
DCP 3	.100	2.868	0.430	13	0.015	172	0.006	271	0.012	27	0.019	124	0.016	284	0.024	298	0.005	347	0.010	48
DCP 4	.150	2.536	0.398	21	0.062	170	0.022	182	0.035	44	0.018	94	0.032	293	0.035	266	0.014	161	0.023	174
DCP 5	.200	2.011	0.322	38	0.013	255	0.026	331	0.031	24	0.005	243	0.028	299	0.008	293	0.028	194	0.032	191
DCP 6	.250	1.588	0.260	48	0.027	171	0.010	347	0.012	42	0.024	83	0.012	290	0.020	284	0.016	207	0.017	205
DCP 7	.300	1.299	0.268	57	0.017	255	0.020	335	0.020	47	0.002	135	0.013	308	0.010	265	0.014	184	0.034	218
DCP 8	.500	0.927	0.223	91	0.018	219	0.035	29	0.020	76	0.010	108	0.019	317	0.010	265	0.007	84	0.019	255
DCP 9	.600	0.619	0.232	81	0.025	262	0.016	327	0.019	90	0.003	204	0.026	0	0.010	3	0.031	177	0.010	256
DCP10	.695	0.475	0.180	101	0.004	61	0.024	342	0.012	20	0.014	167	0.016	254	0.005	176	0.011	12	0.019	353
DCP11	.800	0.359	0.146	83	0.062	297	0.036	278	0.023	121	0.024	180	0.017	26	0.006	341	0.006	265	0.022	312
DCP12	.878	0.451	0.139	100	0.012	265	0.007	10	0.006	141	0.007	171	0.014	270	0.021	254	0.016	171	0.016	306
DCP13	.953	0.205	0.087	101	0.009	100	0.015	329	0.006	358	0.018	199	0.011	266	0.021	230	0.015	339	0.007	265

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	94.34	0.200	14.73	2.93		1082.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.702	224.6	118.8	0.15E 07	-0.00144	1.572	17.20

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.365	0.212	50	0.026	259	0.007	311	0.012	64	0.009	73	0.002	167	0.006	206	0.006	321	0.003	323
CM		-0.033	0.047	293	0.006	132	0.004	178	0.002	265	0.002	8	0.001	333	0.001	20	0.002	45	0.001	339
DCP 1	.010	5.404	1.230	352	0.161	238	0.071	146	0.065	20	0.076	39	0.061	274	0.054	227	0.071	4	0.020	348
DCP 2	.050	3.954	0.599	1	0.030	147	0.033	218	0.031	28	0.055	41	0.014	243	0.032	207	0.021	10	0.047	324
DCP 3	.100	3.352	0.419	18	0.042	199	0.029	243	0.020	187	0.005	166	0.020	87	0.014	59	0.015	31	0.022	106
DCP 4	.150	2.790	0.402	25	0.054	216	0.016	210	0.032	62	0.036	47	0.013	320	0.015	252	0.021	351	0.007	16
DCP 5	.200	2.304	0.319	40	0.027	233	0.014	347	0.024	68	0.014	137	0.006	92	0.010	81	0.000	106	0.022	248
DCP 6	.250	1.764	0.276	48	0.043	265	0.009	335	0.019	54	0.026	44	0.001	82	0.016	202	0.006	276	0.013	348
DCP 7	.300	1.507	0.262	54	0.031	238	0.008	315	0.014	114	0.016	148	0.015	102	0.006	76	0.009	3	0.006	287
DCP 8	.500	1.000	0.228	67	0.040	275	0.025	288	0.026	40	0.023	32	0.007	226	0.015	241	0.015	294	0.013	353
DCP 9	.600	0.697	0.199	75	0.029	305	0.007	357	0.016	171	0.019	165	0.012	141	0.003	130	0.004	245	0.019	207
DCP10	.695	0.443	0.177	98	0.041	305	0.015	29	0.007	70	0.014	102	0.010	347	0.020	120	0.007	12	0.015	78
DCP11	.800	0.387	0.197	91	0.024	68	0.024	9	0.008	344	0.025	271	0.012	258	0.025	289	0.032	208	0.017	175
DCP12	.878	0.536	0.121	102	0.028	280	0.013	1	0.018	131	0.022	169	0.014	98	0.001	177	0.010	233	0.006	204
DCP13	.953	0.238	0.113	104	0.039	292	0.007	12	0.017	29	0.010	46	0.015	182	0.020	171	0.011	29	0.022	352

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	96.62	0.400	10.00	2.94		1080.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.363	444.0	365.6	0.23E 07	-0.00092	1.327	13.19

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.077	0.216	6	0.016	257	0.005	273	0.006	126	0.008	21	0.002	293	0.003	263	0.002	228	0.001	168
CM		-0.011	0.029	279	0.003	129	0.002	142	0.000	222	0.000	88	0.001	356	0.001	278	0.000	57	0.000	144
DCP 1	.010	4.292	1.615	335	0.184	210	0.063	152	0.026	133	0.029	36	0.022	325	0.044	275	0.014	185	0.026	156
DCP 2	.050	3.504	0.887	339	0.054	262	0.061	233	0.063	149	0.038	44	0.025	308	0.031	236	0.004	216	0.005	101
DCP 3	.100	2.933	0.470	350	0.011	157	0.044	93	0.016	87	0.051	7	0.009	359	0.018	305	0.010	304	0.009	250
DCP 4	.150	2.100	0.424	357	0.008	263	0.014	231	0.007	181	0.009	37	0.008	331	0.008	283	0.002	355	0.005	147
DCP 5	.200	1.808	0.295	3	0.008	234	0.008	270	0.004	4	0.009	9	0.003	57	0.004	292	0.003	147	0.004	187
DCP 6	.250	1.379	0.262	10	0.016	271	0.010	276	0.007	317	0.002	20	0.004	243	0.003	256	0.002	296	0.004	356
DCP 7	.300	1.192	0.217	18	0.009	268	0.008	308	0.001	0	0.005	31	0.002	329	0.003	38	0.003	139	0.002	136
DCP 8	.500	0.622	0.148	38	0.018	275	0.012	335	0.005	133	0.004	11	0.003	184	0.001	51	0.005	233	0.006	115
DCP 9	.600	0.524	0.149	48	0.013	254	0.007	275	0.004	52	0.010	33	0.002	179	0.004	160	0.005	216	0.011	209
DCP10	.695	0.480	0.106	54	0.012	293	0.011	332	0.006	103	0.003	219	0.003	251	0.005	209	0.003	226	0.007	57
DCP11	.800	0.348	0.100	62	0.027	291	0.010	279	0.001	120	0.005	342	0.003	151	0.006	84	0.003	35	0.006	312
DCP12	.878	0.256	0.083	66	0.010	288	0.005	319	0.004	130	0.004	4	0.001	215	0.004	93	0.003	294	0.004	315
DCP13	.953	0.128	0.055	29	0.006	303	0.003	286	0.003	101	0.001	15	0.003	224	0.002	294	0.003	200	0.003	309

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.56	0.400	12.46	2.96		1080.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.367	444.0	363.9	0.23E 07	0.00003	1.528	15.56

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.231	0.254	12	0.021	270	0.005	204	0.008	102	0.004	62	0.009	51	0.008	356	0.003	307	0.004	126
CM		-0.019	0.006	8	0.012	243	0.003	104	0.004	274	0.004	55	0.005	267	0.001	182	0.002	182	0.002	203
DCP 1	.010	5.142	1.188	355	0.303	344	0.263	233	0.125	109	0.097	354	0.032	293	0.037	310	0.035	205	0.036	156
DCP 2	.050	3.957	0.900	20	0.477	306	0.292	189	0.108	100	0.097	41	0.084	339	0.060	287	0.034	213	0.041	172
DCP 3	.100	3.198	0.605	22	0.266	258	0.186	100	0.166	328	0.055	161	0.010	119	0.023	82	0.024	346	0.014	180
DCP 4	.150	2.290	0.540	22	0.220	240	0.127	87	0.061	298	0.013	92	0.011	152	0.028	29	0.007	352	0.010	206
DCP 5	.200	2.028	0.429	11	0.167	190	0.134	20	0.070	221	0.041	68	0.007	264	0.009	31	0.006	290	0.014	177
DCP 6	.250	1.543	0.416	9	0.132	192	0.096	19	0.035	237	0.018	128	0.015	31	0.015	29	0.009	228	0.007	101
DCP 7	.300	1.392	0.325	3	0.138	152	0.096	338	0.037	161	0.015	100	0.011	341	0.008	81	0.008	237	0.002	79
DCP 8	.500	0.709	0.177	3	0.082	79	0.050	250	0.015	104	0.006	63	0.006	61	0.012	23	0.007	30	0.014	72
DCP 9	.600	0.638	0.123	13	0.072	52	0.032	223	0.030	115	0.023	304	0.029	123	0.017	322	0.013	95	0.016	264
DCP10	.695	0.523	0.063	13	0.058	17	0.014	197	0.023	139	0.023	312	0.025	125	0.011	332	0.008	34	0.003	170
DCP11	.800	0.414	0.027	32	0.063	355	0.020	183	0.030	64	0.036	229	0.032	51	0.015	138	0.020	293	0.012	54
DCP12	.878	0.363	0.024	116	0.033	316	0.007	82	0.025	42	0.033	198	0.026	25	0.009	118	0.014	250	0.020	2
DCP13	.953	0.172	0.010	84	0.017	303	0.006	191	0.012	333	0.008	97	0.012	114	0.028	306	0.029	27	0.011	92

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	95.24	0.400	14.71	2.99		1080.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.358	444.0	363.8	0.23E 07	0.00178	1.552	17.84

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.198	0.317	13	0.041	231	0.023	44	0.031	203	0.026	358	0.009	241	0.014	106	0.003	12	0.006	327
CM		-0.065	0.054	97	0.028	326	0.016	196	0.013	30	0.011	184	0.003	67	0.005	304	0.002	152	0.001	185
DCP 1	.010	4.595	0.840	54	0.755	29	0.491	298	0.189	173	0.069	324	0.115	196	0.102	79	0.051	1	0.039	307
DCP 2	.050	3.356	1.029	71	0.527	344	0.196	267	0.132	182	0.063	208	0.113	130	0.079	67	0.061	25	0.042	344
DCP 3	.100	2.871	1.021	47	0.407	286	0.152	156	0.070	119	0.028	38	0.055	353	0.045	272	0.032	182	0.022	150
DCP 4	.150	1.976	0.892	42	0.292	272	0.109	201	0.098	118	0.049	40	0.054	347	0.030	310	0.040	224	0.037	156
DCP 5	.200	1.845	0.760	23	0.238	224	0.085	123	0.061	39	0.032	321	0.043	278	0.029	163	0.010	117	0.008	1
DCP 6	.250	1.418	0.705	15	0.194	249	0.140	166	0.076	79	0.059	353	0.021	317	0.019	251	0.037	184	0.016	71
DCP 7	.300	1.304	0.589	2	0.158	195	0.128	101	0.067	325	0.031	300	0.030	232	0.020	120	0.019	71	0.034	307
DCP 8	.500	0.758	0.379	331	0.135	189	0.134	76	0.083	315	0.036	218	0.005	145	0.024	92	0.009	355	0.020	288
DCP 9	.600	0.730	0.253	305	0.108	136	0.104	12	0.114	227	0.062	62	0.018	327	0.011	204	0.016	169	0.008	75
DCP10	.695	0.665	0.187	302	0.113	162	0.134	22	0.128	235	0.070	75	0.015	305	0.006	199	0.017	302	0.028	138
DCP11	.800	0.566	0.114	273	0.076	98	0.088	318	0.100	173	0.099	357	0.029	221	0.025	111	0.012	34	0.015	10
DCP12	.878	0.553	0.085	248	0.066	87	0.065	285	0.082	149	0.084	335	0.031	189	0.031	74	0.015	359	0.007	8
DCP13	.953	0.298	0.044	210	0.045	102	0.053	298	0.067	143	0.054	327	0.006	9	0.043	139	0.020	316	0.018	328

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.600	9.90	2.95		1379.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.248	653.5	719.4	0.31E 07	-0.00035	1.244	12.64

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.921	0.282	29	0.015	357	0.014	244	0.007	146	0.006	111	0.005	98	0.001	340	0.001	210	0.001	311
CM		-0.040	0.051	190	0.013	79	0.010	56	0.004	3	0.003	317	0.004	282	0.002	156	0.001	0	0.001	149
DCP 1	.010	2.360	0.811	342	0.067	59	0.043	246	0.025	157	0.009	15	0.004	8	0.006	134	0.006	25	0.001	124
DCP 2	.050	2.351	0.280	354	0.095	31	0.027	131	0.017	330	0.000	118	0.010	252	0.003	124	0.008	259	0.008	134
DCP 3	.100	2.485	0.246	91	0.099	34	0.052	115	0.017	106	0.013	134	0.016	10	0.013	168	0.010	224	0.012	82
DCP 4	.150	2.002	0.520	108	0.113	105	0.101	49	0.055	92	0.037	24	0.024	9	0.016	340	0.005	184	0.013	12
DCP 5	.200	1.539	0.483	67	0.108	103	0.062	120	0.005	327	0.006	258	0.013	318	0.014	143	0.004	251	0.003	226
DCP 6	.250	1.296	0.444	39	0.125	48	0.033	341	0.027	89	0.013	39	0.002	93	0.011	214	0.009	24	0.010	275
DCP 7	.300	1.029	0.526	31	0.068	19	0.040	3	0.030	19	0.009	54	0.015	281	0.025	171	0.011	43	0.008	204
DCP 8	.500	0.658	0.366	20	0.039	273	0.052	270	0.013	266	0.011	238	0.020	172	0.009	357	0.008	180	0.006	53
DCP 9	.600	0.546	0.337	17	0.072	261	0.051	238	0.026	219	0.018	144	0.028	141	0.019	28	0.006	247	0.002	61
DCP10	.695	0.467	0.234	14	0.029	257	0.060	255	0.037	182	0.017	150	0.022	98	0.007	71	0.029	353	0.035	245
DCP11	.800	0.338	0.202	9	0.057	267	0.052	207	0.023	157	0.012	120	0.022	78	0.017	315	0.005	157	0.006	347
DCP12	.878	0.318	0.164	356	0.048	257	0.038	196	0.023	149	0.017	99	0.019	39	0.019	307	0.024	177	0.022	43

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.600	12.40	2.86		1079.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.248	653.5	717.8	0.31E 07	-0.00084	1.245	13.02

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.974	0.268	54	0.010	172	0.013	91	0.007	244	0.003	22	0.004	84	0.009	266	0.004	226	0.003	255
CM		-0.071	0.069	202	0.001	283	0.011	225	0.003	45	0.001	258	0.004	297	0.002	57	0.003	325	0.001	216
DCP 1	.010	2.816	0.632	356	0.137	99	0.007	26	0.011	109	0.003	155	0.006	344	0.005	299	0.004	306	0.003	226
DCP 2	.050	2.357	0.201	112	0.088	33	0.051	203	0.028	131	0.017	30	0.050	356	0.045	287	0.018	277	0.008	295
DCP 3	.100	2.176	0.503	135	0.102	322	0.020	183	0.024	358	0.046	334	0.034	340	0.026	286	0.035	312	0.020	269
DCP 4	.150	1.731	0.397	114	0.133	244	0.034	226	0.017	11	0.013	307	0.018	37	0.018	239	0.033	294	0.010	244
DCP 5	.200	1.446	0.414	99	0.101	226	0.055	208	0.017	257	0.017	188	0.020	255	0.018	89	0.014	200	0.010	11
DCP 6	.250	1.332	0.385	80	0.058	182	0.060	220	0.013	351	0.013	221	0.005	253	0.019	116	0.007	177	0.009	182
DCP 7	.300	1.075	0.422	67	0.059	165	0.044	190	0.027	271	0.003	203	0.008	289	0.013	352	0.005	244	0.011	259
DCP 8	.500	0.774	0.414	39	0.047	101	0.040	83	0.009	191	0.002	310	0.017	173	0.030	267	0.011	213	0.019	214
DCP 9	.600	0.660	0.366	31	0.014	105	0.062	72	0.026	246	0.023	107	0.031	161	0.016	82	0.017	4	0.012	188
DCP10	.695	0.581	0.315	29	0.006	1	0.044	71	0.014	138	0.012	66	0.020	96	0.015	173	0.012	113	0.020	90
DCP11	.800	0.471	0.264	18	0.009	251	0.060	25	0.026	222	0.008	66	0.015	102	0.012	234	0.029	190	0.015	56
DCP12	.878	0.469	0.233	13	0.018	336	0.051	13	0.006	324	0.012	311	0.024	45	0.025	262	0.018	118	0.025	336

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.600	14.60	2.87		1079.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.248	653.5	719.7	0.31E 07	-0.00120	1.273	15.23

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.992	0.271	64	0.015	288	0.007	92	0.006	191	0.009	34	0.005	282	0.003	39	0.006	278	0.007	242
CM		-0.092	0.067	212	0.009	34	0.007	255	0.004	11	0.005	206	0.003	319	0.002	227	0.001	128	0.001	61
DCP 1	.010	2.814	0.159	87	0.337	66	0.104	275	0.059	117	0.043	0	0.027	243	0.009	325	0.020	243	0.008	181
DCP 2	.050	2.275	0.395	134	0.192	27	0.049	259	0.050	50	0.022	315	0.026	347	0.018	253	0.028	320	0.041	242
DCP 3	.100	2.060	0.432	119	0.127	330	0.018	74	0.043	7	0.044	280	0.062	346	0.029	216	0.041	264	0.032	240
DCP 4	.150	1.524	0.352	101	0.058	311	0.025	6	0.036	28	0.017	257	0.038	312	0.015	273	0.016	271	0.008	271
DCP 5	.200	1.438	0.376	83	0.070	281	0.007	261	0.035	255	0.050	170	0.039	276	0.019	172	0.017	193	0.020	182
DCP 6	.250	1.320	0.390	76	0.043	275	0.019	215	0.017	353	0.012	73	0.012	341	0.014	332	0.016	307	0.015	331
DCP 7	.300	1.088	0.355	69	0.062	245	0.026	175	0.020	232	0.045	136	0.024	236	0.010	74	0.021	148	0.025	110
DCP 8	.500	0.811	0.355	51	0.042	204	0.011	228	0.033	214	0.027	36	0.014	183	0.016	47	0.017	2	0.029	315
DCP 9	.600	0.710	0.370	45	0.024	205	0.049	85	0.005	229	0.041	10	0.019	4	0.013	328	0.015	10	0.021	323
DCP 10	.695	0.664	0.288	39	0.046	220	0.021	142	0.032	167	0.019	344	0.027	177	0.017	192	0.017	197	0.034	194
DCP 11	.800	0.570	0.271	35	0.010	222	0.040	65	0.021	157	0.015	68	0.021	111	0.020	73	0.007	7	0.002	63
DCP 12	.878	0.571	0.243	28	0.007	331	0.043	41	0.003	169	0.022	358	0.006	34	0.016	12	0.020	263	0.015	203

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.60	0.200	0.01	4.93		1152.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.123	224.5	120.1	0.15E 07	-0.00188	0.457	4.99

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		-0.036	0.449	352	0.062	176	0.011	205	0.008	119	0.009	195	0.007	68	0.010	21	0.011	292	0.008	300
CM		-0.043	0.018	285	0.001	339	0.003	192	0.002	207	0.001	166	0.004	228	0.004	215	0.003	132	0.002	147
DCP 1	.010	-2.491	2.374	351	0.871	194	0.468	258	0.198	339	0.090	95	0.118	194	0.092	297	0.041	34	0.037	118
DCP 2	.050	-0.775	1.690	345	0.110	142	0.107	119	0.077	137	0.034	213	0.011	158	0.015	167	0.019	203	0.036	277
DCP 3	.100	-0.084	1.302	344	0.128	94	0.120	120	0.107	158	0.083	217	0.032	325	0.022	78	0.013	238	0.027	280
DCP 4	.150	0.118	0.841	342	0.052	206	0.020	109	0.038	142	0.028	180	0.012	218	0.005	7	0.019	226	0.007	232
DCP 5	.200	-0.002	0.661	350	0.085	155	0.025	167	0.020	161	0.016	191	0.012	46	0.009	18	0.016	310	0.010	331
DCP 6	.250	0.019	0.495	351	0.083	198	0.032	255	0.009	37	0.004	78	0.010	138	0.005	331	0.014	254	0.011	227
DCP 7	.300	0.081	0.449	353	0.070	181	0.015	230	0.007	174	0.010	255	0.020	48	0.006	36	0.019	290	0.011	341
DCP 8	.500	0.035	0.268	4	0.056	195	0.015	237	0.004	206	0.001	190	0.009	152	0.005	332	0.010	252	0.010	245
DCP 9	.600	0.096	0.731	4	0.039	140	0.012	176	0.016	66	0.008	167	0.026	64	0.022	51	0.028	330	0.020	339
DCP 10	.695	0.266	0.152	19	0.039	192	0.010	46	0.010	22	0.010	27	0.009	10	0.012	33	0.006	258	0.006	282
DCP 11	.800	0.052	0.113	19	0.022	104	0.016	0	0.005	12	0.012	212	0.023	48	0.025	30	0.017	331	0.014	330
DCP 12	.953	0.006	0.069	17	0.024	213	0.009	340	0.008	65	0.004	20	0.010	41	0.009	13	0.008	353	0.001	130

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.16	0.200	7.38	5.01		1152.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.120	224.6	120.5	0.15E 07	-0.00137	1.157	12.47

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.727	0.437	353	0.040	123	0.005	192	0.004	313	0.008	214	0.003	200	0.005	126	0.006	16	0.003	340
CM		-0.043	0.014	291	0.004	261	0.001	160	0.001	143	0.001	77	0.001	68	0.000	359	0.002	176	0.000	231
DCP 1	.010	1.836	2.650	347	0.224	122	0.037	177	0.014	106	0.018	197	0.023	134	0.039	118	0.017	72	0.011	195
DCP 2	.050	1.813	1.585	348	0.155	119	0.023	130	0.013	62	0.010	147	0.019	345	0.033	136	0.004	29	0.017	278
DCP 3	.100	1.911	1.130	348	0.071	158	0.031	212	0.019	302	0.042	237	0.027	158	0.009	282	0.022	91	0.024	11
DCP 4	.150	1.604	0.744	351	0.077	120	0.023	142	0.016	83	0.019	112	0.006	30	0.021	89	0.012	353	0.005	99
DCP 5	.200	0.988	0.617	350	0.057	195	0.008	237	0.026	238	0.024	235	0.011	192	0.014	231	0.003	17	0.001	4
DCP 6	.250	0.905	0.526	353	0.063	104	0.007	148	0.013	58	0.007	82	0.011	324	0.018	98	0.007	336	0.003	259
DCP 7	.300	0.820	0.461	354	0.029	198	0.011	239	0.018	257	0.017	193	0.011	172	0.010	338	0.004	219	0.004	48
DCP 8	.500	0.473	0.268	1	0.051	97	0.003	12	0.015	58	0.004	259	0.008	355	0.014	120	0.011	343	0.007	286
DCP 9	.600	0.521	0.193	2	0.027	211	0.001	17	0.024	282	0.013	230	0.019	192	0.016	243	0.009	73	0.007	282
DCP 10	.695	0.514	0.157	9	0.061	80	0.004	188	0.009	42	0.010	225	0.014	302	0.016	103	0.012	59	0.006	30
DCP 11	.800	0.323	0.095	16	0.011	204	0.010	263	0.018	274	0.006	172	0.012	179	0.008	323	0.008	350	0.007	45
DCP 12	.953	0.121	0.074	9	0.050	92	0.010	72	0.012	75	0.008	334	0.007	10	0.008	169	0.019	340	0.003	165

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.27	0.200	9.77	5.04		1152.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.121	224.6	120.1	0.15E 07	-0.00158	1.379	15.00

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.938	0.421	355	0.024	225	0.004	229	0.005	86	0.010	147	0.006	359	0.005	169	0.002	359	0.001	81
CM		-0.040	0.014	280	0.006	89	0.001	184	0.000	228	0.002	300	0.001	187	0.001	351	0.001	150	0.000	49
DCP 1	.010	3.203	2.512	349	0.117	182	0.045	181	0.020	117	0.038	213	0.018	309	0.014	252	0.026	102	0.013	80
DCP 2	.050	2.528	1.462	349	0.066	186	0.004	151	0.028	77	0.017	212	0.006	79	0.017	250	0.026	141	0.012	39
DCP 3	.100	2.543	1.081	349	0.030	149	0.014	179	0.007	23	0.037	119	0.014	344	0.025	88	0.018	352	0.006	357
DCP 4	.150	1.927	0.726	352	0.061	220	0.017	253	0.018	146	0.007	228	0.015	342	0.007	258	0.005	90	0.007	100
DCP 5	.200	1.250	0.607	352	0.016	139	0.009	262	0.008	116	0.018	149	0.001	84	0.008	93	0.010	334	0.002	260
DCP 6	.250	1.155	0.513	356	0.038	203	0.015	226	0.012	65	0.010	135	0.003	7	0.003	160	0.011	162	0.010	97
DCP 7	.300	1.052	0.443	355	0.010	195	0.009	321	0.002	202	0.008	133	0.005	60	0.005	117	0.009	331	0.002	334
DCP 8	.500	0.589	0.258	4	0.044	247	0.007	241	0.003	312	0.007	155	0.011	327	0.014	226	0.004	350	0.013	195
DCP 9	.600	0.557	0.197	9	0.021	308	0.009	158	0.011	97	0.024	156	0.013	15	0.019	142	0.003	330	0.011	18
DCP10	.695	0.573	0.148	13	0.033	243	0.003	301	0.009	16	0.008	110	0.003	37	0.010	163	0.009	252	0.004	156
DCP11	.800	0.425	0.103	20	0.004	328	0.008	57	0.002	231	0.002	129	0.006	32	0.006	104	0.009	17	0.010	322
DCP12	.953	0.144	0.086	3	0.046	248	0.004	303	0.008	91	0.010	105	0.006	343	0.006	266	0.001	51	0.005	128

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.21	0.200	12.32	4.99		1152.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.121	224.6	120.1	0.15E 07	-0.00149	1.591	17.53

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.152	0.387	3	0.040	275	0.014	137	0.002	148	0.009	77	0.002	3	0.012	76	0.003	92	0.003	81
CM		-0.038	0.015	279	0.007	87	0.003	226	0.001	53	0.002	222	0.001	229	0.003	256	0.002	103	0.001	145
DCP 1	.010	4.653	2.553	352	0.236	241	0.135	145	0.039	96	0.062	87	0.012	62	0.044	85	0.024	86	0.017	92
DCP 2	.050	3.281	1.339	354	0.061	269	0.052	160	0.022	124	0.024	103	0.014	155	0.038	90	0.012	102	0.025	102
DCP 3	.100	3.133	0.941	349	0.054	281	0.005	337	0.016	334	0.016	84	0.030	263	0.036	346	0.048	94	0.027	146
DCP 4	.150	2.195	0.667	0	0.072	307	0.041	180	0.018	139	0.015	136	0.005	72	0.009	56	0.009	99	0.002	194
DCP 5	.200	1.565	0.519	2	0.029	353	0.013	272	0.006	102	0.004	13	0.003	324	0.004	103	0.006	176	0.008	16
DCP 6	.250	1.403	0.430	7	0.052	303	0.035	183	0.011	177	0.001	316	0.003	157	0.011	42	0.010	97	0.001	206
DCP 7	.300	1.259	0.394	10	0.033	317	0.016	189	0.012	34	0.005	309	0.006	316	0.013	116	0.005	182	0.004	43
DCP 8	.500	0.707	0.244	19	0.061	286	0.031	125	0.009	337	0.019	107	0.010	23	0.014	93	0.013	354	0.006	82
DCP 9	.600	0.639	0.180	21	0.048	262	0.024	71	0.024	262	0.017	93	0.011	353	0.016	111	0.010	229	0.011	30
DCP10	.695	0.649	0.148	21	0.055	271	0.020	81	0.014	212	0.017	21	0.003	263	0.012	125	0.013	76	0.004	287
DCP11	.800	0.492	0.100	17	0.027	208	0.019	10	0.006	236	0.010	12	0.002	122	0.014	39	0.016	231	0.005	34
DCP12	.953	0.194	0.102	351	0.023	281	0.008	215	0.016	113	0.005	68	0.010	91	0.019	55	0.009	337	0.008	242

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.43	0.200	15.02	5.01		1151.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.122	224.5	119.0	0.15E 07	0.00417	1.893	19.83

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.324	0.478	30	0.130	254	0.066	109	0.036	345	0.037	221	0.034	96	0.018	321	0.019	195	0.007	42
CM		-0.078	0.059	144	0.054	5	0.031	240	0.020	133	0.016	18	0.012	249	0.008	125	0.007	22	0.002	234
DCP 1	.010	4.877	2.302	33	0.664	331	0.341	233	0.161	135	0.040	19	0.052	165	0.031	97	0.021	39	0.023	279
DCP 2	.050	3.265	1.246	54	0.564	348	0.398	231	0.262	123	0.156	15	0.099	264	0.072	148	0.056	40	0.034	324
DCP 3	.100	2.627	1.025	64	0.531	337	0.238	223	0.118	121	0.003	285	0.029	47	0.070	248	0.064	152	0.027	16
DCP 4	.150	2.475	0.811	63	0.318	327	0.124	185	0.028	31	0.035	151	0.017	77	0.010	30	0.007	205	0.021	135
DCP 5	.200	1.958	0.674	49	0.242	286	0.137	118	0.067	315	0.032	207	0.031	121	0.025	8	0.026	218	0.020	95
DCP 6	.250	1.631	0.637	45	0.235	273	0.145	120	0.057	11	0.032	294	0.047	144	0.036	47	0.011	170	0.016	49
DCP 7	.300	1.511	0.614	29	0.284	245	0.177	101	0.074	339	0.064	259	0.063	135	0.024	345	0.013	150	0.011	4
DCP 8	.500	1.099	0.494	10	0.313	217	0.178	89	0.093	353	0.089	242	0.057	115	0.028	29	0.031	271	0.022	208
DCP 9	.600	0.978	0.369	7	0.222	204	0.136	74	0.092	337	0.091	222	0.078	97	0.051	346	0.054	229	0.021	90
DCP 10	.695	0.816	0.308	353	0.214	191	0.125	61	0.082	316	0.088	194	0.069	64	0.044	311	0.052	204	0.016	51
DCP 11	.800	0.484	0.223	344	0.145	178	0.076	40	0.071	303	0.075	189	0.057	59	0.058	292	0.054	162	0.032	38
DCP 12	.953	0.275	0.169	322	0.066	148	0.032	22	0.040	257	0.039	106	0.032	356	0.029	224	0.005	25	0.011	266

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.42	0.200	17.60	4.96		1151.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.122	224.6	118.9	0.15E 07	0.00267	2.138	22.40

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.359	0.515	52	0.097	311	0.064	246	0.082	157	0.073	66	0.065	308	0.033	215	0.020	135	0.015	61
CM		-0.109	0.108	163	0.056	65	0.041	5	0.036	281	0.028	191	0.022	92	0.010	2	0.004	286	0.004	237
DCP 1	.010	4.542	2.078	92	1.266	62	0.767	352	0.454	259	0.340	149	0.160	37	0.040	301	0.016	0	0.034	252
DCP 2	.050	3.091	1.453	101	0.677	42	0.361	345	0.277	267	0.208	185	0.041	171	0.060	159	0.081	76	0.072	9
DCP 3	.100	2.592	1.266	96	0.421	32	0.138	353	0.147	267	0.064	142	0.076	310	0.084	209	0.088	128	0.060	52
DCP 4	.150	2.402	0.955	88	0.183	0	0.080	0	0.104	220	0.093	105	0.057	326	0.021	240	0.023	174	0.034	77
DCP 5	.200	1.925	0.800	73	0.169	322	0.064	293	0.143	193	0.124	83	0.081	339	0.038	273	0.022	172	0.005	71
DCP 6	.250	1.625	0.743	63	0.176	300	0.102	287	0.159	178	0.098	96	0.068	8	0.024	272	0.000	248	0.004	62
DCP 7	.300	1.531	0.732	49	0.198	298	0.146	271	0.180	177	0.119	96	0.085	3	0.025	299	0.015	254	0.021	237
DCP 8	.500	1.154	0.615	25	0.246	268	0.186	225	0.180	143	0.150	81	0.116	336	0.062	278	0.049	216	0.037	157
DCP 9	.600	1.116	0.537	14	0.213	258	0.195	212	0.165	125	0.154	38	0.124	302	0.064	235	0.060	150	0.028	94
DCP 10	.695	0.904	0.426	3	0.205	253	0.163	192	0.160	105	0.162	21	0.144	282	0.104	200	0.071	124	0.062	56
DCP 11	.800	0.634	0.341	353	0.126	239	0.120	171	0.118	92	0.136	0	0.104	259	0.059	165	0.034	114	0.050	40
DCP 12	.953	0.338	0.243	340	0.085	239	0.094	144	0.083	56	0.074	299	0.080	211	0.063	119	0.066	6	0.034	273

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.35	0.200	24.69	4.95		1151.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.122	224.6	119.3	0.15E 07	-0.00324	1.353	29.52

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.129	0.209	69	0.080	251	0.022	81	0.029	159	0.023	85	0.014	326	0.007	291	0.023	100	0.000	80
CM		-0.178	0.048	214	0.010	46	0.001	265	0.004	313	0.004	240	0.002	160	0.001	34	0.007	244	0.000	265
DCP 1	.010	2.761	1.971	134	0.173	263	0.302	79	0.121	210	0.047	56	0.093	175	0.025	3	0.016	101	0.042	316
DCP 2	.050	1.692	0.600	143	0.353	247	0.079	54	0.122	169	0.031	73	0.045	5	0.034	283	0.012	194	0.014	141
DCP 3	.100	1.440	0.184	53	0.170	285	0.038	37	0.082	133	0.043	158	0.057	335	0.025	18	0.053	137	0.017	99
DCP 4	.150	1.541	0.258	31	0.073	252	0.020	233	0.027	171	0.041	107	0.030	356	0.013	308	0.016	215	0.013	262
DCP 5	.200	1.427	0.243	35	0.053	276	0.026	161	0.012	180	0.033	104	0.016	315	0.020	282	0.036	140	0.012	43
DCP 6	.250	1.202	0.247	35	0.067	246	0.020	192	0.017	160	0.038	101	0.034	338	0.004	275	0.010	197	0.004	93
DCP 7	.300	1.268	0.247	41	0.053	267	0.023	123	0.017	175	0.028	103	0.017	289	0.008	285	0.043	120	0.012	10
DCP 8	.500	1.115	0.237	49	0.091	249	0.013	99	0.023	158	0.029	62	0.022	281	0.019	253	0.027	112	0.022	220
DCP 9	.600	1.089	0.226	51	0.063	255	0.030	69	0.019	130	0.018	79	0.018	23	0.009	17	0.046	89	0.006	171
DCP10	.695	1.068	0.223	55	0.080	232	0.026	58	0.036	150	0.016	36	0.029	293	0.012	262	0.034	48	0.001	254
DCP11	.800	0.893	0.196	61	0.046	236	0.023	53	0.022	139	0.017	57	0.010	30	0.003	189	0.037	65	0.015	88
DCP12	.953	0.490	0.129	52	0.043	217	0.012	197	0.016	153	0.022	81	0.011	71	0.007	85	0.010	9	0.013	337

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.69	0.400	-0.07	4.89		1153.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.063	443.9	364.4	0.23E 07	-0.00105	0.438	4.82

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		-0.112	0.521	352	0.067	179	0.018	201	0.008	181	0.009	175	0.005	173	0.007	191	0.002	270	0.005	133
CM		-0.017	0.010	291	0.002	197	0.002	302	0.001	63	0.000	64	0.001	228	0.000	11	0.001	145	0.001	334
DCP 1	.010	-1.652	1.946	347	1.001	227	0.211	314	0.202	179	0.173	268	0.037	82	0.102	220	0.072	334	0.050	126
DCP 2	.050	-0.532	1.850	348	0.210	182	0.070	300	0.103	64	0.072	151	0.005	283	0.047	108	0.046	175	0.036	133
DCP 3	.100	-0.312	1.652	351	0.195	122	0.053	187	0.069	58	0.102	137	0.063	216	0.017	108	0.046	170	0.022	[illegible]
DCP 4	.150	-0.200	1.144	348	0.164	118	0.115	173	0.032	247	0.031	135	0.041	220	0.024	312	0.008	30	0.008	21[illegible]
DCP 5	.200	0.045	0.898	355	0.154	120	0.088	182	0.044	240	0.022	95	0.026	204	0.020	282	0.021	15	0.016	134
DCP 6	.250	-0.134	0.655	350	0.068	145	0.060	161	0.040	231	0.015	306	0.011	113	0.011	240	0.006	15	0.013	125
DCP 7	.300	-0.118	0.536	356	0.081	171	0.041	188	0.029	250	0.016	344	0.018	103	0.018	183	0.005	303	0.009	113
DCP 8	.500	-0.047	0.287	356	0.055	211	0.005	269	0.010	171	0.008	232	0.004	56	0.006	173	0.005	256	0.006	132
DCP 9	.600	-0.027	0.231	359	0.034	201	0.001	15	0.006	154	0.009	187	0.001	15	0.008	178	0.008	336	0.002	69
DCP10	.695	0.060	0.165	0	0.026	203	0.002	160	0.007	142	0.007	198	0.005	27	0.002	214	0.003	229	0.006	153
DCP11	.800	0.070	0.120	7	0.016	181	0.001	167	0.001	130	0.007	178	0.003	132	0.004	151	0.005	342	0.004	89
DCP12	.953	-0.074	0.087	0	0.004	141	0.008	159	0.002	187	0.004	127	0.001	226	0.003	270	0.002	306	0.003	192

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.34	0.400	7.38	4.97		1153.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.061	443.9	362.9	0.23E 07	-0.00112	1.278	12.59

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.739	0.533	352	0.030	150	0.008	192	0.006	117	0.001	259	0.003	214	0.005	198	0.003	152	0.001	91
CM		-0.007	0.014	312	0.003	222	0.001	119	0.001	357	0.000	168	0.001	41	0.000	355	0.001	134	0.000	323
DCP 1	.010	2.790	3.349	348	0.239	186	0.133	139	0.040	41	0.014	210	0.005	157	0.010	189	0.025	138	0.016	22
DCP 2	.050	2.481	2.048	348	0.143	195	0.057	162	0.023	92	0.005	97	0.011	281	0.013	209	0.017	127	0.008	314
DCP 3	.100	2.063	1.374	350	0.095	120	0.018	251	0.027	68	0.021	276	0.007	204	0.028	234	0.022	157	0.004	87
DCP 4	.150	1.617	0.879	350	0.051	149	0.019	199	0.020	201	0.007	162	0.015	212	0.004	184	0.013	174	0.007	282
DCP 5	.200	1.191	0.724	351	0.043	148	0.013	286	0.008	144	0.002	296	0.009	63	0.008	160	0.001	10	0.005	118
DCP 6	.250	0.950	0.612	352	0.036	138	0.008	225	0.007	156	0.004	194	0.003	252	0.002	239	0.004	135	0.002	256
DCP 7	.300	0.683	0.548	353	0.035	133	0.007	227	0.009	119	0.002	136	0.006	177	0.007	176	0.001	139	0.004	87
DCP 8	.500	0.468	0.315	356	0.020	120	0.007	240	0.005	137	0.001	313	0.004	254	0.003	156	0.002	175	0.002	219
DCP 9	.600	0.368	0.240	358	0.020	109	0.005	252	0.011	126	0.002	31	0.005	157	0.007	201	0.007	349	0.003	134
DCP 10	.695	0.359	0.170	1	0.009	98	0.003	193	0.003	194	0.004	270	0.003	249	0.003	141	0.003	170	0.002	139
DCP 11	.800	0.256	0.111	5	0.007	108	0.003	246	0.003	131	0.001	287	0.004	220	0.004	185	0.001	287	0.003	113
DCP 12	.953	0.057	0.085	2	0.006	201	0.002	233	0.002	211	0.003	1	0.002	246	0.003	258	0.002	277	0.001	314

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.57	0.400	9.72	4.99		1153.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.062	443.9	364.1	0.23E 07	-0.00042	1.410	14.36

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.925	0.432	2	0.060	15	0.047	229	0.018	103	0.005	260	0.008	142	0.005	88	0.005	291	0.002	138
CM		-0.007	0.004	285	0.009	27	0.009	272	0.006	157	0.003	30	0.002	238	0.002	78	0.000	336	0.001	171
DCP 1	.010	4.037	2.899	356	0.202	354	0.214	232	0.048	133	0.045	219	0.068	151	0.049	72	0.013	330	0.013	173
DCP 2	.050	3.205	1.777	0	0.339	354	0.330	245	0.186	148	0.072	51	0.029	220	0.040	73	0.048	338	0.048	210
DCP 3	.100	2.551	0.997	359	0.213	45	0.097	235	0.036	114	0.020	139	0.013	164	0.035	112	0.001	205	0.032	100
DCP 4	.150	1.871	0.619	3	0.153	26	0.112	259	0.060	122	0.039	347	0.009	198	0.025	111	0.012	306	0.011	148
DCP 5	.200	1.399	0.528	3	0.139	33	0.087	244	0.044	124	0.022	335	0.016	192	0.007	84	0.007	276	0.004	122
DCP 6	.250	1.145	0.424	8	0.131	25	0.090	242	0.051	116	0.026	335	0.019	190	0.007	62	0.009	249	0.008	107
DCP 7	.300	0.857	0.399	7	0.097	23	0.068	237	0.036	107	0.019	309	0.013	154	0.005	20	0.007	233	0.007	35
DCP 8	.500	0.562	0.239	11	0.046	14	0.032	209	0.019	44	0.015	227	0.014	86	0.007	297	0.005	99	0.009	324
DCP 9	.600	0.451	0.202	10	0.018	338	0.028	148	0.029	4	0.027	213	0.011	96	0.008	265	0.005	199	0.003	37
DCP 10	.695	0.422	0.160	7	0.011	262	0.019	130	0.020	349	0.011	197	0.004	34	0.006	213	0.006	5	0.007	304
DCP 11	.800	0.341	0.135	0	0.036	216	0.030	99	0.023	321	0.014	184	0.005	59	0.005	190	0.007	320	0.002	217
DCP 12	.953	0.101	0.136	351	0.044	209	0.022	94	0.008	316	0.003	235	0.003	110	0.003	48	0.005	233	0.006	113

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.56	0.400	12.28	4.88		1153.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.062	443.9	364.6	0.23E 07	-0.00016	1.467	15.19

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		0.981	0.250 54	0.168 33	0.037 318	0.029 279	0.009 236	0.015 190	0.007 73	0.004 52	0.006 324
CM		-0.029	0.045 177	0.030 82	0.015 51	0.017 354	0.010 288	0.007 259	0.006 191	0.005 141	0.005 94
DCP 1	.010	4.427	1.272 28	0.836 56	0.194 27	0.186 13	0.163 341	0.124 298	0.104 257	0.097 207	0.082 165
DCP 2	.050	3.173	0.569 67	0.832 66	0.325 34	0.328 6	0.294 321	0.214 270	0.155 237	0.138 189	0.096 139
DCP 3	.100	2.504	0.495 116	0.640 62	0.190 8	0.181 314	0.116 278	0.107 223	0.055 170	0.093 110	0.076 61
DCP 4	.150	1.740	0.447 107	0.494 45	0.099 328	0.105 314	0.092 245	0.067 187	0.046 136	0.038 83	0.033 31
DCP 5	.200	1.368	0.417 97	0.387 32	0.080 306	0.099 297	0.092 217	0.060 168	0.055 118	0.050 59	0.041 11
DCP 6	.250	1.158	0.370 83	0.294 20	0.055 299	0.097 284	0.079 195	0.044 152	0.053 100	0.037 33	0.026 347
DCP 7	.300	0.902	0.345 71	0.245 13	0.058 289	0.089 267	0.075 180	0.046 148	0.057 89	0.042 23	0.037 339
DCP 8	.500	0.643	0.255 44	0.111 338	0.039 257	0.063 213	0.043 116	0.025 108	0.039 31	0.028 320	0.025 279
DCP 9	.600	0.526	0.229 31	0.068 317	0.041 251	0.056 184	0.039 80	0.011 99	0.023 357	0.006 23	0.018 292
DCP 10	.695	0.527	0.214 13	0.058 288	0.044 247	0.057 169	0.033 75	0.020 60	0.025 335	0.023 272	0.019 227
DCP 11	.800	0.451	0.203 5	0.057 269	0.045 247	0.052 166	0.026 90	0.022 69	0.021 337	0.009 313	0.018 259
DCP 12	.953	0.171	0.203 346	0.038 246	0.032 234	0.025 128	0.004 36	0.003 32	0.005 328	0.005 256	0.006 266

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.33	0.400	14.94	4.91		1150.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.061	443.7	363.9	0.23E 07	-0.00144	1.580	15.93

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		1.127	0.273 100	0.099 62	0.068 86	0.025 32	0.006 22	0.012 343	0.008 276	0.010 300	0.008 238
CM		-0.054	0.061 188	0.021 140	0.022 143	0.014 116	0.011 85	0.008 77	0.006 38	0.006 51	0.005 6
DCP 1	.010	5.028	0.801 88	0.502 98	0.415 136	0.212 132	0.178 137	0.130 117	0.100 107	0.088 94	0.070 50
DCP 2	.050	3.376	0.923 138	0.559 107	0.475 136	0.321 120	0.253 123	0.193 99	0.119 102	0.113 77	0.061 66
DCP 3	.100	2.397	0.995 149	0.425 88	0.231 123	0.184 85	0.087 68	0.087 45	0.089 18	0.070 14	0.056 351
DCP 4	.150	1.902	0.768 138	0.230 73	0.240 111	0.118 46	0.080 58	0.081 13	0.049 352	0.049 339	0.036 316
DCP 5	.200	1.577	0.598 128	0.171 61	0.186 96	0.100 22	0.068 32	0.070 350	0.052 327	0.053 317	0.045 283
DCP 6	.250	1.346	0.484 115	0.116 56	0.175 78	0.061 7	0.080 19	0.048 330	0.058 322	0.033 295	0.039 279
DCP 7	.300	1.117	0.409 102	0.105 41	0.138 65	0.062 350	0.064 357	0.045 315	0.049 297	0.040 295	0.037 254
DCP 8	.500	0.798	0.273 69	0.069 14	0.089 21	0.046 312	0.052 297	0.033 284	0.041 245	0.028 254	0.033 237
DCP 9	.600	0.710	0.235 53	0.060 342	0.075 355	0.040 306	0.054 274	0.031 254	0.037 220	0.019 240	0.030 185
DCP 10	.695	0.645	0.213 32	0.063 1	0.061 325	0.042 306	0.045 241	0.028 258	0.030 194	0.021 217	0.020 157
DCP 11	.800	0.522	0.203 17	0.056 346	0.057 309	0.032 300	0.035 236	0.024 258	0.026 188	0.015 220	0.013 157
DCP 12	.953	0.277	0.201 357	0.048 352	0.036 280	0.021 277	0.022 193	0.015 172	0.013 75	0.005 156	0.006 32

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.29	0.400	17.51	4.92		1150.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.061	443.9	362.5	0.23E 07	-0.00232	1.557	15.73

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.126	0.298	124	0.095	195	0.035	135	0.028	188	0.008	175	0.012	207	0.004	231	0.007	225	0.007	242
CM		-0.071	0.066	201	0.025	243	0.018	250	0.015	264	0.011	276	0.009	300	0.005	314	0.004	323	0.004	1
DCP 1	.010	5.335	0.983	134	0.455	212	0.122	253	0.157	276	0.096	329	0.076	329	0.078	5	0.058	21	0.044	36
DCP 2	.050	3.202	1.419	165	0.489	221	0.326	253	0.357	279	0.235	316	0.194	324	0.157	359	0.079	22	0.079	39
DCP 3	.100	2.177	1.211	164	0.339	233	0.201	197	0.163	253	0.099	247	0.106	282	0.060	295	0.064	312	0.043	355
DCP 4	.150	1.765	0.802	151	0.291	224	0.130	163	0.144	219	0.049	227	0.077	240	0.041	274	0.049	271	0.044	305
DCP 5	.200	1.459	0.622	139	0.256	211	0.090	143	0.129	193	0.055	215	0.058	215	0.047	251	0.040	254	0.037	287
DCP 6	.250	1.297	0.480	128	0.205	201	0.076	127	0.114	176	0.051	204	0.053	197	0.046	224	0.041	246	0.038	259
DCP 7	.300	1.094	0.413	115	0.183	184	0.075	121	0.111	153	0.066	186	0.050	179	0.053	201	0.038	221	0.031	233
DCP 8	.500	0.811	0.266	80	0.076	146	0.055	80	0.064	105	0.043	120	0.029	141	0.023	129	0.025	172	0.021	202
DCP 9	.600	0.757	0.238	63	0.076	118	0.064	75	0.059	87	0.047	105	0.028	117	0.019	113	0.018	146	0.016	166
DCP 10	.695	0.698	0.205	46	0.062	75	0.060	76	0.036	74	0.041	77	0.026	122	0.014	133	0.016	127	0.021	176
DCP 11	.800	0.602	0.190	32	0.072	67	0.045	73	0.028	59	0.028	79	0.018	125	0.010	131	0.012	163	0.013	178
DCP 12	.953	0.335	0.153	18	0.077	36	0.038	80	0.016	62	0.024	43	0.026	87	0.016	77	0.019	55	0.007	74

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.27	0.400	24.60	4.95		1150.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.061	443.9	363.7	0.23E 07	-0.00220	1.184	25.03

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.050	0.138	88	0.040	242	0.029	31	0.016	87	0.008	194	0.018	294	0.014	28	0.010	101	0.006	187
CM		-0.154	0.028	221	0.004	122	0.004	195	0.000	236	0.002	320	0.004	53	0.002	154	0.003	243	0.002	324
DCP 1	.010	3.061	1.948	155	0.316	219	0.238	115	0.056	66	0.120	84	0.080	342	0.123	48	0.011	107	0.058	348
DCP 2	.050	1.720	0.311	126	0.179	222	0.080	318	0.039	49	0.025	279	0.038	336	0.023	83	0.018	166	0.026	242
DCP 3	.100	1.532	0.184	63	0.038	225	0.051	37	0.034	100	0.024	256	0.043	327	0.022	28	0.019	113	0.011	193
DCP 4	.150	1.410	0.156	50	0.028	247	0.045	33	0.023	73	0.012	210	0.022	282	0.013	26	0.010	158	0.010	233
DCP 5	.200	1.273	0.160	49	0.027	241	0.039	32	0.028	104	0.021	234	0.025	312	0.015	29	0.013	98	0.014	167
DCP 6	.250	1.240	0.158	50	0.034	252	0.046	22	0.018	101	0.018	241	0.017	306	0.008	71	0.009	176	0.011	238
DCP 7	.300	1.105	0.158	51	0.036	252	0.040	27	0.030	109	0.025	219	0.024	303	0.014	59	0.013	126	0.007	171
DCP 8	.500	0.976	0.145	62	0.041	262	0.040	8	0.021	75	0.013	205	0.021	296	0.015	18	0.012	114	0.008	213
DCP 9	.600	0.946	0.132	67	0.043	265	0.032	28	0.016	131	0.009	182	0.019	280	0.014	359	0.009	77	0.007	172
DCP 10	.695	0.916	0.127	74	0.026	254	0.024	13	0.007	103	0.011	209	0.020	272	0.017	11	0.010	81	0.009	146
DCP 11	.800	0.833	0.106	79	0.026	275	0.023	40	0.007	147	0.009	92	0.009	227	0.012	358	0.019	72	0.011	143
DCP 12	.953	0.476	0.085	67	0.007	143	0.004	132	0.020	337	0.016	82	0.019	212	0.007	285	0.010	24	0.006	121

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.95	0.600	-0.03	4.83		1154.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.043	653.3	717.8	0.31E 07	-0.00087	0.563	5.01

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		-0.069	0.581	351	0.095	186	0.017	232	0.007	122	0.014	177	0.008	216	0.002	154	0.002	151	0.001	29
CM		-0.010	0.011	243	0.009	257	0.007	354	0.005	85	0.003	196	0.001	340	0.001	80	0.001	194	0.001	175
DCP 1	.010	-1.408	1.653	342	0.845	226	0.048	35	0.182	168	0.043	123	0.060	132	0.017	28	0.027	65	0.019	68
DCP 2	.050	-0.463	1.883	345	0.369	216	0.190	322	0.054	119	0.086	245	0.014	10	0.041	214	0.003	149	0.036	197
DCP 3	.100	-0.026	1.888	348	0.277	197	0.086	342	0.122	69	0.078	176	0.026	346	0.042	161	0.015	207	0.009	93
DCP 4	.150	0.030	1.357	348	0.199	185	0.041	138	0.118	58	0.094	190	0.031	209	0.031	84	0.040	239	0.013	80
DCP 5	.200	0.101	0.977	354	0.162	136	0.056	258	0.044	105	0.071	166	0.040	260	0.015	104	0.014	205	0.023	355
DCP 6	.250	-0.074	0.779	352	0.130	146	0.064	202	0.007	264	0.036	154	0.036	243	0.016	11	0.013	140	0.006	274
DCP 7	.300	-0.058	0.628	355	0.118	161	0.058	211	0.018	279	0.018	142	0.029	235	0.017	351	0.012	110	0.006	286
DCP 8	.500	-0.054	0.342	354	0.057	178	0.028	200	0.022	252	0.011	22	0.009	150	0.005	250	0.004	53	0.002	228
DCP 9	.600	-0.029	0.272	356	0.042	171	0.018	182	0.015	243	0.008	14	0.009	134	0.003	179	0.001	324	0.004	48
DCP 10	.695	0.030	0.198	359	0.030	157	0.019	175	0.013	239	0.008	7	0.006	92	0.004	148	0.002	0	0.003	10
DCP 11	.800	0.080	0.153	3	0.023	143	0.015	179	0.011	248	0.003	328	0.004	191	0.003	201	0.005	22	0.002	60
DCP 12	.953	-0.093	0.116	357	0.017	118	0.013	174	0.007	259	0.002	62	0.003	186	0.006	237	0.003	311	0.004	353

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.09	0.600	7.37	4.81		1154.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.041	653.3	714.9	0.31E 07	-0.00050	0.973	10.42

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.693	0.348	2	0.101	69	0.010	127	0.013	17	0.005	159	0.001	0	0.001	260	0.001	195	0.002	95
CM		-0.028	0.037	182	0.021	76	0.001	150	0.005	67	0.001	47	0.001	45	0.001	64	0.001	5	0.001	248
DCP 1	.010	1.584	1.719	353	0.339	74	0.093	150	0.018	265	0.024	140	0.010	213	0.005	140	0.007	168	0.008	169
DCP 2	.050	1.853	0.865	354	0.417	72	0.004	288	0.024	19	0.012	274	0.023	200	0.005	212	0.019	165	0.011	77
DCP 3	.100	1.963	0.395	4	0.579	73	0.076	161	0.057	41	0.010	80	0.009	307	0.005	43	0.019	31	0.013	177
DCP 4	.150	1.672	0.291	21	0.549	73	0.146	156	0.141	50	0.077	152	0.027	16	0.028	85	0.019	328	0.023	1
DCP 5	.200	1.200	0.389	11	0.290	75	0.042	55	0.125	60	0.042	137	0.054	64	0.039	137	0.006	22	0.026	154
DCP 6	.250	0.925	0.416	6	0.138	66	0.034	346	0.022	40	0.025	332	0.019	59	0.026	322	0.010	36	0.016	292
DCP 7	.300	0.711	0.438	5	0.100	56	0.046	350	0.017	330	0.019	336	0.009	12	0.021	317	0.002	237	0.001	253
DCP 8	.500	0.458	0.318	5	0.018	302	0.006	111	0.020	281	0.003	217	0.013	250	0.006	193	0.003	249	0.004	288
DCP 9	.600	0.403	0.271	3	0.033	265	0.017	104	0.023	278	0.006	162	0.010	248	0.004	164	0.005	244	0.006	122
DCP 10	.695	0.365	0.229	1	0.039	246	0.014	122	0.012	270	0.005	169	0.008	244	0.005	169	0.004	347	0.005	222
DCP 11	.800	0.295	0.174	1	0.035	264	0.006	201	0.015	230	0.008	161	0.006	80	0.010	287	0.013	166	0.011	42
DCP 12	.953	0.110	0.203	351	0.025	246	0.013	280	0.005	210	0.007	256	0.009	203	0.004	175	0.005	170	0.007	136

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.O	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.37	0.600	9.69	4.81		1154.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.042	653.3	715.2	0.31E 07	-0.00086	1.001	13.33

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.842	0.206	14	0.069	90	0.028	138	0.006	183	0.006	135	0.002	143	0.003	157	0.003	33	0.003	256
CM		-0.044	0.055	187	0.003	116	0.008	175	0.003	267	0.000	229	0.003	286	0.001	291	0.002	285	0.002	348
DCP 1	.010	2.312	1.173	357	0.194	89	0.037	144	0.032	197	0.012	108	0.004	173	0.007	213	0.012	159	0.006	72
DCP 2	.050	2.175	0.284	3	0.302	83	0.072	140	0.022	50	0.015	154	0.008	26	0.019	153	0.025	51	0.008	317
DCP 3	.100	2.206	0.224	157	0.180	92	0.100	150	0.018	320	0.022	119	0.032	272	0.002	118	0.021	357	0.025	325
DCP 4	.150	1.864	0.365	163	0.087	108	0.173	161	0.093	243	0.010	330	0.038	239	0.025	304	0.010	346	0.030	313
DCP 5	.200	1.353	0.105	70	0.146	103	0.165	172	0.134	264	0.044	339	0.032	338	0.022	332	0.027	340	0.016	307
DCP 6	.250	1.077	0.238	19	0.139	93	0.052	152	0.022	138	0.045	155	0.028	282	0.010	204	0.019	268	0.009	347
DCP 7	.300	0.864	0.291	14	0.129	91	0.028	129	0.027	128	0.042	166	0.007	289	0.014	229	0.020	281	0.012	288
DCP 8	.500	0.571	0.272	14	0.038	87	0.026	34	0.029	111	0.016	87	0.019	99	0.011	147	0.015	130	0.018	142
DCP 9	.600	0.519	0.270	12	0.004	153	0.027	35	0.006	71	0.005	333	0.018	144	0.020	81	0.009	15	0.015	206
DCP 10	.695	0.464	0.235	10	0.004	194	0.024	22	0.010	111	0.009	343	0.014	161	0.005	80	0.013	188	0.012	156
DCP 11	.800	0.410	0.218	8	0.007	356	0.025	355	0.005	63	0.002	301	0.015	88	0.007	139	0.022	59	0.004	331
DCP 12	.953	0.176	0.210	357	0.022	36	0.012	326	0.011	57	0.003	132	0.008	56	0.002	296	0.004	120	0.003	208

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.O	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.42	0.600	12.25	4.79		1154.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.042	653.3	714.0	0.31E 07	-0.00126	1.016	15.29

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.928	0.095	28	0.030	118	0.013	297	0.008	183	0.005	47	0.005	161	0.004	342	0.005	128	0.003	163
CM		-0.068	0.059	191	0.005	285	0.003	356	0.001	11	0.001	355	0.001	302	0.001	327	0.002	338	0.002	300
DCP 1	.010	2.662	0.498	6	0.351	82	0.112	322	0.022	213	0.010	226	0.010	120	0.009	200	0.015	100	0.013	27
DCP 2	.050	2.282	0.143	201	0.152	115	0.007	256	0.044	219	0.056	33	0.024	287	0.018	50	0.025	37	0.015	313
DCP 3	.100	2.166	0.423	185	0.101	235	0.051	342	0.035	207	0.012	35	0.024	243	0.037	301	0.014	118	0.024	259
DCP 4	.150	1.704	0.402	173	0.140	264	0.084	346	0.047	75	0.021	150	0.019	229	0.036	303	0.008	247	0.015	229
DCP 5	.200	1.395	0.178	161	0.039	246	0.051	336	0.020	119	0.010	57	0.021	179	0.010	350	0.001	74	0.009	266
DCP 6	.250	1.212	0.079	109	0.018	119	0.015	241	0.011	212	0.007	18	0.025	104	0.007	350	0.016	264	0.011	271
DCP 7	.300	0.997	0.100	64	0.065	98	0.025	260	0.002	133	0.018	27	0.025	125	0.019	49	0.008	39	0.013	63
DCP 8	.500	0.676	0.224	18	0.054	113	0.015	246	0.012	189	0.005	297	0.009	56	0.002	217	0.009	55	0.009	214
DCP 9	.600	0.602	0.234	11	0.034	116	0.019	254	0.012	197	0.005	301	0.010	237	0.005	209	0.018	173	0.027	158
DCP 10	.695	0.571	0.247	12	0.016	146	0.007	187	0.010	216	0.010	106	0.005	333	0.003	246	0.007	149	0.001	134
DCP 11	.800	0.520	0.217	8	0.014	119	0.012	164	0.002	303	0.010	183	0.009	162	0.002	241	0.018	187	0.014	121
DCP 12	.953	0.264	0.171	9	0.028	79	0.011	130	0.005	142	0.006	42	0.001	260	0.007	104	0.009	73	0.011	36

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.81	0.600	14.92	4.88		1149.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.043	653.5	711.6	0.31E 07	-0.00166	1.116	16.78

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.998	0.075	87	0.045	71	0.020	298	0.014	106	0.010	342	0.005	193	0.007	304	0.005	145	0.002	131
CM		-0.097	0.050	197	0.004	315	0.002	38	0.002	333	0.004	183	0.001	327	0.003	88	0.002	297	0.001	175
DCP 1	.010	2.890	0.162	139	0.436	82	0.008	145	0.041	51	0.017	126	0.024	30	0.020	200	0.036	58	0.012	307
DCP 2	.050	2.286	0.472	174	0.136	66	0.083	268	0.032	75	0.044	295	0.030	188	0.032	135	0.020	231	0.008	104
DCP 3	.100	1.939	0.473	171	0.063	38	0.123	340	0.068	75	0.057	305	0.015	302	0.019	47	0.052	192	0.033	128
DCP 4	.150	1.733	0.288	155	0.039	342	0.010	326	0.020	68	0.019	193	0.016	324	0.014	15	0.007	75	0.011	313
DCP 5	.200	1.421	0.159	162	0.061	55	0.055	346	0.045	110	0.018	78	0.024	196	0.030	35	0.011	344	0.020	104
DCP 6	.250	1.221	0.133	121	0.046	40	0.014	270	0.004	268	0.008	266	0.014	317	0.017	19	0.002	208	0.011	351
DCP 7	.300	1.039	0.086	112	0.039	49	0.038	304	0.025	137	0.010	110	0.022	191	0.015	26	0.004	318	0.014	138
DCP 8	.500	0.778	0.133	47	0.042	63	0.021	240	0.011	203	0.006	33	0.012	95	0.028	264	0.016	81	0.022	216
DCP 9	.600	0.755	0.165	35	0.037	83	0.006	309	0.017	147	0.023	21	0.028	192	0.010	262	0.012	172	0.016	283
DCP10	.695	0.734	0.177	19	0.034	93	0.028	265	0.003	110	0.015	298	0.017	351	0.014	256	0.013	281	0.010	53
DCP11	.800	0.625	0.188	22	0.023	116	0.004	269	0.014	56	0.031	344	0.004	253	0.020	289	0.017	152	0.022	40
DCP12	.953	0.325	0.143	12	0.026	145	0.006	126	0.015	134	0.008	34	0.009	126	0.004	172	0.011	75	0.006	212

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.86	0.600	17.46	4.88		1149.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.043	653.5	715.2	0.31E 07	-0.00197	1.110	15.99

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.982	0.098	121	0.021	21	0.035	146	0.016	2	0.010	136	0.009	275	0.006	238	0.006	243	0.003	26
CM		-0.114	0.040	206	0.002	231	0.003	198	0.002	190	0.002	233	0.000	331	0.000	35	0.002	21	0.002	196
DCP 1	.010	2.785	0.681	173	0.190	92	0.202	179	0.039	119	0.055	207	0.031	163	0.019	237	0.025	176	0.017	239
DCP 2	.050	2.065	0.539	175	0.073	10	0.136	170	0.074	3	0.045	163	0.037	349	0.032	169	0.021	320	0.018	162
DCP 3	.100	1.720	0.364	169	0.104	13	0.117	145	0.051	353	0.036	135	0.042	277	0.004	232	0.038	287	0.016	118
DCP 4	.150	1.589	0.245	163	0.048	290	0.065	152	0.011	287	0.023	209	0.018	315	0.016	207	0.016	299	0.010	332
DCP 5	.200	1.331	0.197	146	0.028	345	0.050	139	0.028	351	0.009	126	0.017	286	0.015	278	0.015	314	0.009	160
DCP 6	.250	1.183	0.163	148	0.027	305	0.052	147	0.016	306	0.008	190	0.021	296	0.006	323	0.005	206	0.012	305
DCP 7	.300	1.019	0.149	125	0.015	333	0.043	131	0.017	353	0.014	147	0.020	271	0.013	277	0.003	141	0.012	184
DCP 8	.500	0.804	0.114	79	0.021	18	0.027	109	0.019	27	0.016	97	0.021	200	0.015	279	0.012	168	0.011	334
DCP 9	.600	0.783	0.130	52	0.027	47	0.037	105	0.011	13	0.018	103	0.019	267	0.005	55	0.010	194	0.007	32
DCP10	.695	0.776	0.136	39	0.007	92	0.006	158	0.006	38	0.006	359	0.007	83	0.005	254	0.002	220	0.014	43
DCP11	.800	0.686	0.130	27	0.018	42	0.005	234	0.023	354	0.013	69	0.008	55	0.017	165	0.020	255	0.016	26
DCP12	.953	0.380	0.108	24	0.005	76	0.010	334	0.002	148	0.005	257	0.006	2	0.006	19	0.006	136	0.002	279

FORCED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.95	0.600	24.53	4.87		1149.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.043	653.5	715.7	0.31E 07	-0.00185	1.159	29.09

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.032	0.133	25	0.031	213	0.014	339	0.002	167	0.003	301	0.003	135	0.002	148	0.003	235	0.001	35
CM		-0.158	0.026	218	0.008	33	0.001	182	0.000	62	0.001	220	0.001	298	0.002	311	0.001	50	0.000	187
DCP 1	.010	2.139	0.122	143	0.066	326	0.047	333	0.011	222	0.030	245	0.010	251	0.012	333	0.007	125	0.021	240
DCP 2	.050	1.728	0.150	14	0.020	187	0.037	333	0.016	151	0.017	308	0.005	150	0.015	331	0.010	129	0.009	277
DCP 3	.100	1.576	0.194	15	0.028	196	0.023	345	0.006	77	0.009	283	0.007	270	0.005	293	0.008	310	0.004	116
DCP 4	.150	1.560	0.190	13	0.029	199	0.022	326	0.007	151	0.007	289	0.005	148	0.009	306	0.006	138	0.003	123
DCP 5	.200	1.354	0.178	15	0.031	208	0.016	347	0.004	112	0.008	263	0.001	348	0.001	303	0.003	309	0.002	103
DCP 6	.250	1.227	0.193	13	0.033	200	0.017	316	0.003	159	0.003	337	0.007	168	0.006	282	0.004	204	0.004	125
DCP 7	.300	1.091	0.189	16	0.035	206	0.012	324	0.003	1	0.004	239	0.003	51	0.001	132	0.004	327	0.004	103
DCP 8	.500	0.928	0.153	23	0.045	215	0.018	352	0.003	70	0.004	10	0.003	139	0.005	172	0.008	234	0.004	37
DCP 9	.600	0.899	0.144	27	0.038	215	0.008	318	0.005	228	0.005	211	0.009	152	0.014	155	0.011	275	0.007	356
DCP 10	.695	0.924	0.115	36	0.044	219	0.011	351	0.004	216	0.006	359	0.009	91	0.006	150	0.007	228	0.002	133
DCP 11	.800	0.823	0.100	40	0.031	220	0.005	310	0.004	261	0.003	149	0.006	147	0.009	110	0.002	263	0.003	5
DCP 12	.953	0.532	0.085	57	0.020	196	0.009	27	0.003	131	0.009	13	0.004	90	0.003	29	0.008	170	0.005	233

FORCED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	99.01	0.200	5.08	6.30		5144.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.745	222.0	118.7	0.15E 07	-0.00151	1.123	9.71

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.490	0.497	37	0.076	25	0.026	308	0.019	226	0.016	289	0.017	144	0.021	225	0.010	185	0.012	22
CM		-0.021	0.100	283	0.021	250	0.008	150	0.005	98	0.002	91	0.002	286	0.007	74	0.003	28	0.003	339
CCP 1	.010	0.800	2.672	348	0.289	321	0.117	135	0.058	275	0.067	299	0.055	160	0.051	346	0.021	159	0.029	334
CCP 2	.025	1.384	2.054	344	0.200	301	0.052	123	0.068	136	0.017	53	0.029	260	0.030	36	0.018	355	0.026	352
CCP 3	.100	1.148	1.110	4	0.157	323	0.092	279	0.086	147	0.053	295	0.041	110	0.029	161	0.023	99	0.043	298
CCP 4	.150	1.071	0.824	19	0.128	3	0.032	254	0.039	247	0.048	298	0.043	149	0.064	209	0.023	236	0.035	45
CCP 5	.200	0.931	0.652	24	0.066	2	0.046	312	0.047	172	0.032	317	0.007	302	0.038	177	0.028	133	0.017	227
CCP 6	.250	0.804	0.711	38	0.136	28	0.034	287	0.036	253	0.020	279	0.065	159	0.045	210	0.033	212	0.062	27
CCP 7	.300	0.604	0.613	45	0.086	23	0.039	279	0.019	178	0.018	300	0.020	191	0.016	204	0.007	137	0.019	336
CCP 8	.400	0.436	0.576	58	0.100	40	0.034	293	0.058	275	0.012	335	0.036	168	0.027	221	0.017	215	0.024	45
CCP 9	.500	0.325	0.485	70	0.088	54	0.030	307	0.019	205	0.003	91	0.008	326	0.019	161	0.019	139	0.033	318
CCP 10	.600	0.264	0.488	74	0.107	53	0.036	12	0.037	272	0.039	234	0.046	149	0.025	234	0.019	217	0.033	31
CCP 11	.878	0.173	0.329	87	0.071	63	0.041	315	0.006	244	0.016	348	0.016	9	0.041	265	0.010	210	0.027	143

FORCED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	99.01	0.200	7.55	6.30		5144.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.746	221.7	116.5	0.15E 07	-0.00149	1.388	11.73

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.814	0.472	40	0.082	46	0.060	283	0.009	145	0.031	256	0.027	50	0.037	239	0.007	37	0.019	242
CM		-0.026	0.097	288	0.024	266	0.013	118	0.003	1	0.008	81	0.005	236	0.012	79	0.004	159	0.008	32
CCP 1	.010	2.400	2.447	345	0.269	330	0.126	203	0.085	45	0.043	246	0.058	39	0.058	144	0.046	29	0.053	234
CCP 2	.025	2.790	2.081	346	0.185	310	0.088	210	0.060	56	0.038	168	0.058	21	0.017	5	0.024	13	0.013	343
CCP 3	.100	1.920	1.107	6	0.151	3	0.116	276	0.025	108	0.066	244	0.050	26	0.031	172	0.030	131	0.048	317
CCP 4	.150	1.519	0.719	21	0.131	8	0.078	273	0.013	129	0.025	308	0.015	79	0.050	216	0.012	94	0.032	334
CCP 5	.200	1.356	0.667	28	0.088	25	0.064	268	0.014	182	0.027	234	0.040	41	0.031	214	0.007	231	0.014	256
CCP 6	.250	1.153	0.645	40	0.128	39	0.074	278	0.016	126	0.035	280	0.029	94	0.058	205	0.024	178	0.029	241
CCP 7	.300	1.005	0.618	48	0.086	45	0.063	297	0.019	201	0.018	284	0.031	54	0.022	178	0.023	210	0.022	341
CCP 8	.400	0.665	0.537	68	0.114	53	0.064	306	0.005	308	0.026	258	0.024	39	0.043	228	0.012	133	0.006	320
CCP 9	.500	0.532	0.471	71	0.099	80	0.067	288	0.003	133	0.028	256	0.024	14	0.027	257	0.008	332	0.021	216
CCP 10	.600	0.485	0.486	79	0.106	67	0.060	305	0.027	210	0.045	257	0.039	118	0.072	243	0.012	130	0.035	223
CCP 11	.878	0.252	0.297	92	0.092	82	0.065	281	0.018	125	0.040	257	0.040	26	0.053	270	0.038	349	0.043	215

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	99.01	0.200	9.89	6.29		5144.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.746	221.8	119.3	0.15E 07	-0.00147	1.603	16.28

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.054	0.463	37	0.070	28	0.027	255	0.025	219	0.010	287	0.016	75	0.020	264	0.016	228	0.015	323
CM		-0.028	0.097	283	0.020	260	0.005	93	0.006	63	0.002	26	0.003	195	0.003	31	0.007	57	0.005	184
DCP 1	.010	3.829	2.443	345	0.225	296	0.102	175	0.064	125	0.009	262	0.026	134	0.023	170	0.018	74	0.054	264
DCP 2	.025	3.876	1.936	339	0.283	306	0.091	185	0.067	139	0.040	5	0.038	46	0.101	313	0.040	283	0.031	269
DCP 3	.100	2.489	1.112	3	0.159	319	0.034	259	0.018	162	0.023	340	0.064	90	0.041	274	0.038	161	0.068	246
DCP 4	.150	1.836	0.726	18	0.125	17	0.042	274	0.040	225	0.046	283	0.015	161	0.045	224	0.022	226	0.043	352
DCP 5	.200	1.818	0.636	21	0.090	347	0.059	244	0.051	193	0.029	316	0.041	56	0.007	31	0.009	24	0.031	220
DCP 6	.250	1.441	0.641	40	0.123	41	0.041	273	0.041	239	0.019	236	0.017	207	0.028	236	0.033	204	0.012	327
DCP 7	.300	1.164	0.645	44	0.111	17	0.020	268	0.022	215	0.032	325	0.044	104	0.013	258	0.013	116	0.004	273
DCP 8	.400	0.901	0.518	64	0.117	57	0.040	309	0.033	244	0.015	301	0.019	94	0.039	233	0.019	301	0.033	326
DCP 9	.500	0.641	0.476	66	0.068	54	0.031	259	0.034	215	0.009	288	0.017	38	0.006	110	0.017	199	0.006	32
DCP 10	.600	0.593	0.471	81	0.120	63	0.017	265	0.045	247	0.022	191	0.015	148	0.055	294	0.006	176	0.029	22
DCP 11	.878	0.341	0.305	84	0.049	77	0.031	253	0.014	213	0.004	255	0.027	9	0.024	160	0.050	[illegible]	0.024	336

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	96.15	0.200	12.46	6.14		5144.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.724	221.8	119.0	0.15E 07	-0.00150	1.851	17.12

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.292	0.435	49	0.100	47	0.026	339	0.029	224	0.021	18	0.014	222	0.013	8	0.029	220	0.047	25
CM		-0.023	0.096	290	0.026	279	0.013	198	0.009	33	0.006	178	0.006	49	0.007	163	0.007	49	0.012	238
DCP 1	.010	5.258	2.371	347	0.559	314	0.188	200	0.089	99	0.021	161	0.032	343	0.042	73	0.058	12	0.089	321
DCP 2	.025	4.893	1.686	352	0.358	335	0.117	168	0.037	253	0.048	66	0.052	243	0.064	57	0.041	186	0.053	30
DCP 3	.100	3.005	1.014	12	0.200	11	0.067	264	0.053	252	0.046	56	0.046	116	0.012	233	0.037	232	0.072	9
DCP 4	.150	2.281	0.600	27	0.180	13	0.062	295	0.013	189	0.029	319	0.011	309	0.025	141	0.052	213	0.056	28
DCP 5	.200	2.060	0.603	39	0.132	33	0.028	343	0.064	242	0.032	43	0.008	257	0.043	56	0.060	213	0.057	15
DCP 6	.250	1.762	0.601	46	0.117	42	0.039	291	0.017	177	0.015	45	0.013	46	0.028	202	0.034	175	0.025	33
DCP 7	.300	1.448	0.567	54	0.157	51	0.045	295	0.036	241	0.024	57	0.008	97	0.010	254	0.018	229	0.036	23
DCP 8	.400	1.091	0.487	73	0.154	68	0.064	333	0.016	320	0.023	261	0.005	280	0.005	275	0.027	242	0.035	30
DCP 9	.500	0.772	0.486	80	0.122	82	0.045	1	0.058	246	0.021	28	0.015	210	0.035	30	0.043	243	0.036	27
DCP 10	.600	0.843	0.435	83	0.117	86	0.046	354	0.030	149	0.029	7	0.025	224	0.009	326	0.013	225	0.047	43
DCP 11	.878	0.292	0.334	97	0.079	84	0.055	36	0.060	221	0.036	4	0.035	231	0.045	347	0.045	222	0.070	20

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	98.04	0.200	15.05	6.05		5145.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.736	222.5	119.7	0.15E 07	-0.00129	1.978	20.73

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.457	0.393	44	0.073	40	0.032	317	0.027	222	0.009	95	0.022	105	0.005	256	0.009	354	0.019	43
CM		-0.036	0.083	292	0.022	264	0.007	138	0.003	84	0.004	1	0.004	284	0.002	269	0.006	152	0.008	245
DCP 1	.010	6.019	1.934	345	0.238	335	0.197	333	0.218	219	0.020	55	0.072	98	0.069	178	0.075	141	0.029	343
DCP 2	.025	5.547	1.733	350	0.258	299	0.084	138	0.138	191	0.074	58	0.038	114	0.050	312	0.068	132	0.026	248
DCP 3	.100	3.189	0.954	13	0.204	347	0.030	295	0.078	234	0.063	63	0.023	181	0.050	294	0.050	128	0.044	275
DCP 4	.150	2.467	0.611	34	0.132	348	0.059	295	0.020	97	0.032	318	0.024	87	0.041	164	0.038	274	0.032	37
DCP 5	.200	2.354	0.628	36	0.071	34	0.037	303	0.054	201	0.008	124	0.016	103	0.012	219	0.020	175	0.033	346
DCP 6	.250	2.097	0.592	39	0.051	60	0.088	333	0.022	240	0.017	169	0.028	108	0.018	189	0.019	250	0.007	54
DCP 7	.300	1.619	0.581	44	0.070	78	0.039	348	0.053	265	0.041	60	0.020	175	0.028	307	0.007	170	0.039	316
DCP 8	.400	1.276	0.358	66	0.116	75	0.074	319	0.012	185	0.036	324	0.023	112	0.036	143	0.033	311	0.044	51
DCP 9	.500	0.905	0.373	72	0.138	72	0.023	246	0.060	243	0.025	75	0.026	151	0.022	315	0.033	109	0.012	304
DCP10	.600	0.856	0.347	96	0.128	44	0.040	321	0.036	69	0.038	199	0.058	62	0.013	272	0.067	348	0.064	83
DCP11	.878	0.427	0.310	90	0.062	95	0.025	323	0.042	240	0.018	142	0.022	174	0.015	87	0.008	312	0.027	45

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	98.04	0.200	17.39	5.84		5145.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.736	222.5	121.8	0.16E 07	-0.00096	1.891	20.29

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.513	0.275	38	0.081	16	0.007	169	0.027	328	0.026	84	0.042	290	0.014	356	0.024	203	0.026	332
CM		-0.107	0.079	314	0.011	283	0.007	168	0.008	238	0.004	98	0.008	178	0.006	67	0.003	163	0.010	339
DCP 1	.010	5.158	1.504	18	0.724	354	0.178	203	0.305	313	0.225	95	0.257	256	0.216	44	0.324	187	0.282	352
DCP 2	.025	4.792	1.370	29	0.589	328	0.274	195	0.058	298	0.219	96	0.216	258	0.131	50	0.192	181	0.219	333
DCP 3	.100	2.559	0.967	43	0.243	342	0.009	84	0.096	303	0.100	68	0.102	244	0.033	72	0.092	183	0.133	332
DCP 4	.150	1.925	0.809	11	0.129	17	0.068	147	0.051	302	0.082	85	0.090	247	0.091	15	0.090	194	0.107	349
DCP 5	.200	2.392	0.609	357	0.084	120	0.075	77	0.067	259	0.043	47	0.049	247	0.031	45	0.024	217	0.037	312
DCP 6	.250	2.061	0.833	344	0.059	192	0.033	121	0.053	34	0.049	79	0.029	245	0.065	320	0.040	193	0.101	321
DCP 7	.300	1.910	0.676	332	0.168	188	0.124	71	0.083	293	0.059	117	0.061	274	0.012	3	0.034	225	0.030	10
DCP 8	.400	1.691	0.360	316	0.140	90	0.032	8	0.074	319	0.024	200	0.038	252	0.024	214	0.041	0	0.038	310
DCP 9	.500	1.221	0.229	169	0.253	46	0.083	211	0.021	242	0.034	97	0.024	215	0.039	357	0.023	181	0.023	1
DCP10	.600	1.004	0.288	124	0.256	16	0.077	310	0.040	112	0.068	289	0.072	358	0.038	242	0.068	351	0.057	173
DCP11	.878	0.649	0.497	105	0.107	198	0.022	73	0.053	28	0.027	93	0.033	307	0.008	274	0.049	195	0.021	145

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	99.01	0.200	19.79	6.28		5145.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.743	222.5	121.9	0.16E 07	-0.00027	2.045	26.64

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.558	0.450	12	0.003	355	0.004	8	0.030	254	0.035	1	0.034	229	0.035	348	0.045	194	0.031	359
CM		-0.168	0.064	346	0.018	303	0.003	179	0.004	36	0.007	125	0.001	359	0.019	126	0.009	23	0.033	176
DCP 1	.010	4.523	1.955	44	0.849	357	0.147	192	0.062	44	0.119	31	0.159	349	0.092	216	0.083	262	0.028	223
DCP 2	.025	3.736	2.025	38	0.583	338	0.265	235	0.156	212	0.182	76	0.139	295	0.032	92	0.056	55	0.034	343
DCP 3	.100	1.887	1.397	14	0.032	281	0.039	19	0.019	84	0.048	333	0.050	194	0.056	55	0.096	173	0.047	296
DCP 4	.150	1.806	1.138	9	0.138	283	0.044	129	0.065	250	0.067	20	0.094	222	0.054	74	0.045	192	0.051	4
DCP 5	.200	2.245	1.080	350	0.215	236	0.101	111	0.035	309	0.045	11	0.091	203	0.087	18	0.082	202	0.039	341
DCP 6	.250	2.150	1.165	2	0.164	247	0.128	114	0.022	26	0.131	357	0.146	205	0.096	8	0.053	214	0.038	9
DCP 7	.300	2.160	1.069	349	0.302	234	0.232	84	0.100	32	0.081	13	0.121	211	0.090	1	0.091	148	0.053	356
DCP 8	.400	1.992	0.863	339	0.326	171	0.258	25	0.188	281	0.017	303	0.033	221	0.046	330	0.085	182	0.110	19
DCP 9	.500	1.506	0.342	290	0.189	93	0.155	315	0.149	186	0.039	47	0.036	253	0.076	352	0.055	207	0.043	359
DCP 10	.600	1.341	0.125	224	0.292	50	0.249	235	0.076	32	0.040	286	0.026	0	0.034	284	0.033	123	0.017	134
DCP 11	.878	0.699	0.519	121	0.094	222	0.101	69	0.055	204	0.034	332	0.016	192	0.035	302	0.060	220	0.021	339

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	99.01	0.200	24.84	6.38		5145.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.745	222.0	121.9	0.16E 07	-0.00025	2.415	31.23

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.746	0.609	359	0.042	166	0.014	210	0.019	200	0.053	251	0.028	301	0.030	77	0.015	278	0.034	320
CM		-0.265	0.090	353	0.040	282	0.015	30	0.015	73	0.013	88	0.013	111	0.013	194	0.006	3	0.008	126
DCP 1	.010	3.046	2.220	56	0.558	26	0.191	299	0.156	157	0.212	136	0.039	44	0.147	101	0.132	70	0.128	301
DCP 2	.025	3.040	1.908	39	0.399	0	0.205	332	0.036	315	0.242	248	0.140	159	0.186	92	0.241	330	0.081	187
DCP 3	.100	1.558	1.632	9	0.359	267	0.031	148	0.151	107	0.068	249	0.080	21	0.137	172	0.150	338	0.067	18
DCP 4	.150	1.766	1.510	1	0.280	260	0.101	170	0.079	99	0.051	201	0.024	272	0.046	70	0.076	207	0.065	333
DCP 5	.200	2.601	1.495	357	0.438	253	0.131	119	0.051	128	0.020	95	0.050	8	0.070	251	0.013	189	0.047	48
DCP 6	.250	2.384	1.913	357	0.471	245	0.249	128	0.047	9	0.046	140	0.039	343	0.014	232	0.075	208	0.052	339
DCP 7	.300	2.513	1.853	350	0.612	232	0.213	97	0.052	4	0.109	310	0.026	269	0.040	207	0.025	121	0.030	320
DCP 8	.400	2.218	1.599	336	0.508	169	0.218	354	0.061	259	0.050	216	0.045	271	0.084	93	0.049	214	0.089	324
DCP 9	.500	1.783	0.732	297	0.423	86	0.170	292	0.097	191	0.040	336	0.036	53	0.010	326	0.031	305	0.031	210
DCP 10	.600	1.463	0.376	257	0.476	55	0.112	241	0.065	125	0.098	224	0.068	298	0.063	81	0.031	160	0.069	318
DCP 11	.878	1.229	0.887	132	0.110	187	0.100	172	0.120	269	0.082	280	0.060	282	0.084	3	0.013	260	0.022	293

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	98.04	0.400	7.39	6.00		5143.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.373	439.4	368.5	0.24E 07	-0.00093	1.313	13.99

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.868	0.422	3	0.071	16	0.010	217	0.022	290	0.006	121	0.007	333	0.007	147	0.011	310	0.004	103
CM		-0.015	0.057	282	0.012	266	0.004	169	0.003	96	0.001	207	0.001	328	0.001	10	0.002	147	0.001	259
DCP 1	.010	2.936	2.744	335	0.293	328	0.193	158	0.063	341	0.048	172	0.055	319	0.068	124	0.030	320	0.017	163
DCP 2	.025	3.014	2.412	333	0.267	317	0.133	163	0.049	328	0.037	147	0.046	296	0.033	109	0.011	297	0.008	77
DCP 3	.100	2.270	1.139	347	0.208	352	0.024	182	0.055	271	0.013	79	0.013	328	0.009	206	0.009	243	0.004	312
DCP 4	.150	1.703	0.675	354	0.124	6	0.034	249	0.028	283	0.012	138	0.017	351	0.008	164	0.014	298	0.005	145
DCP 5	.200	1.419	0.588	356	0.105	9	0.024	247	0.032	278	0.002	120	0.010	335	0.011	134	0.012	275	0.009	78
DCP 6	.250	1.274	0.521	9	0.116	23	0.034	247	0.027	302	0.010	159	0.010	15	0.014	169	0.020	329	0.014	142
DCP 7	.300	0.916	0.460	14	0.086	21	0.019	256	0.027	276	0.003	105	0.006	8	0.004	317	0.012	260	0.004	35
DCP 8	.400	0.765	0.353	25	0.085	42	0.017	278	0.029	299	0.009	155	0.011	353	0.004	142	0.014	321	0.007	159
DCP 9	.500	0.579	0.281	33	0.055	38	0.007	285	0.018	273	0.005	85	0.008	348	0.006	71	0.008	273	0.005	113
DCP 10	.600	0.465	0.268	49	0.075	54	0.013	280	0.016	305	0.008	136	0.009	35	0.016	176	0.019	328	0.004	94
DCP 11	.878	0.216	0.159	65	0.029	72	0.014	32	0.017	273	0.009	16	0.008	220	0.002	36	0.007	328	0.004	58

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	98.04	0.400	9.92	6.00		5143.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.374	438.4	368.4	0.24E 07	-0.00085	1.581	16.62

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.111	0.453	4	0.058	357	0.013	149	0.017	321	0.010	169	0.007	324	0.001	42	0.009	306	0.003	54
CM		-0.012	0.048	281	0.020	275	0.007	137	0.001	52	0.001	248	0.001	74	0.002	236	0.004	132	0.002	310
DCP 1	.010	4.339	2.789	335	0.325	332	0.079	218	0.107	219	0.119	107	0.083	318	0.066	129	0.023	294	0.024	6
DCP 2	.025	4.341	2.554	334	0.435	306	0.193	175	0.021	205	0.076	116	0.057	327	0.030	306	0.034	195	0.012	41
DCP 3	.100	2.798	1.081	356	0.354	325	0.201	161	0.165	32	0.127	268	0.051	149	0.009	342	0.036	99	0.057	347
DCP 4	.150	2.046	0.675	1	0.144	348	0.032	186	0.033	353	0.016	257	0.019	246	0.016	135	0.012	314	0.006	254
DCP 5	.200	1.713	0.646	4	0.118	285	0.126	80	0.117	291	0.056	161	0.031	41	0.034	275	0.023	117	0.023	311
DCP 6	.250	1.547	0.582	14	0.071	349	0.031	94	0.047	324	0.020	196	0.004	45	0.005	293	0.011	310	0.002	185
DCP 7	.300	1.217	0.534	11	0.024	134	0.096	30	0.082	250	0.039	102	0.018	326	0.015	235	0.008	304	0.007	86
DCP 8	.400	0.943	0.402	23	0.039	65	0.042	17	0.033	296	0.019	148	0.018	25	0.005	157	0.019	278	0.013	142
DCP 9	.500	0.702	0.281	28	0.091	58	0.043	276	0.007	356	0.012	135	0.017	293	0.011	120	0.025	277	0.015	98
DCP 10	.600	0.581	0.283	41	0.068	77	0.017	308	0.010	38	0.009	146	0.021	322	0.007	137	0.038	329	0.019	159
DCP 11	.878	0.279	0.127	57	0.058	66	0.018	246	0.004	222	0.006	347	0.012	172	0.017	29	0.003	249	0.009	6

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.400	12.53	6.07		5143.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.370	437.9	363.9	0.24E 07	0.00023	1.815	19.31

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.149	0.574	19	0.072	308	0.018	54	0.021	201	0.019	350	0.011	51	0.004	240	0.016	22	0.026	186
CM		-0.057	0.030	148	0.039	322	0.024	223	0.010	85	0.006	218	0.004	136	0.005	334	0.004	226	0.007	21
DCP 1	.010	3.983	1.495	1	0.890	5	0.470	294	0.342	195	0.055	65	0.032	167	0.033	300	0.006	146	0.027	93
DCP 2	.025	3.755	1.452	21	1.054	351	0.464	276	0.247	184	0.073	231	0.135	109	0.027	344	0.081	9	0.037	238
DCP 3	.100	2.552	1.396	41	0.626	315	0.143	231	0.190	147	0.027	310	0.137	55	0.065	276	0.102	337	0.118	188
DCP 4	.150	1.933	1.052	32	0.380	291	0.050	194	0.101	152	0.061	37	0.052	17	0.050	296	0.021	262	0.043	171
DCP 5	.200	1.676	1.012	27	0.303	274	0.093	171	0.095	94	0.070	352	0.034	305	0.020	264	0.019	153	0.016	37
DCP 6	.250	1.553	0.979	24	0.232	254	0.061	140	0.071	81	0.072	351	0.028	300	0.041	224	0.049	88	0.017	101
DCP 7	.300	1.275	0.860	20.	0.170	245	0.116	146	0.098	53	0.093	334	0.042	231	0.031	183	0.039	84	0.023	86
DCP 8	.400	1.106	0.671	8	0.097	205	0.132	113	0.083	346	0.054	318	0.040	214	0.026	99	0.018	18	0.010	198
DCP 9	.500	0.845	0.473	1	0.075	158	0.150	107	0.152	325	0.057	200	0.022	154	0.057	42	0.016	257	0.017	261
DCP 10	.600	0.716	0.388	2	0.142	139	0.130	50	0.090	284	0.045	162	0.025	73	0.039	349	0.018	176	0.031	156
DCP 11	.878	0.433	0.080	350	0.086	102	0.114	349	0.098	185	0.068	23	0.035	335	0.061	177	0.046	25	0.052	239

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	98.04	0.400	15.00	6.16		5143.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.374	437.6	365.5	0.24E 07	0.00075	2.031	21.44

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.242	0.680	22	0.090	293	0.008	29	0.011	256	0.022	143	0.002	69	0.009	77	0.003	34	0.009	275
CM		-0.085	0.081	148	0.052	342	0.017	250	0.010	209	0.006	9	0.004	174	0.003	343	0.002	237	0.002	43
DCP 1	.010	3.963	1.069	40	0.902	18	0.430	348	0.314	286	0.170	232	0.053	128	0.013	104	0.008	232	0.020	219
DCP 2	.025	3.657	1.636	58	1.103	351	0.306	326	0.318	267	0.103	184	0.099	224	0.087	112	0.033	258	0.033	155
DCP 3	.100	2.574	1.579	54	0.645	327	0.192	284	0.205	221	0.135	123	0.054	106	0.077	23	0.023	231	0.045	340
DCP 4	.150	1.997	1.130	42	0.372	318	0.147	269	0.125	205	0.099	124	0.051	82	0.047	29	0.014	45	0.047	322
DCP 5	.200	1.714	1.210	32	0.297	291	0.173	240	0.101	153	0.086	95	0.034	44	0.036	350	0.033	325	0.033	289
DCP 6	.250	1.667	1.120	25	0.258	281	0.117	201	0.066	162	0.086	89	0.039	12	0.028	306	0.022	244	0.027	152
DCP 7	.300	1.436	1.038	19	0.215	272	0.135	190	0.102	128	0.105	38	0.022	23	0.041	251	0.020	312	0.025	154
DCP 8	.400	1.239	0.893	8	0.196	235	0.127	145	0.077	86	0.073	19	0.050	291	0.025	215	0.017	153	0.031	185
DCP 9	.500	1.004	0.761	355	0.203	196	0.122	116	0.126	44	0.089	296	0.070	186	0.029	62	0.014	150	0.037	5
DCP 10	.600	0.833	0.564	355	0.170	190	0.165	82	0.104	1	0.094	234	0.021	162	0.020	92	0.046	56	0.038	260
DCP 11	.878	0.544	0.186	341	0.159	126	0.096	341	0.043	239	0.076	134	0.046	3	0.020	166	0.016	236	0.034	122

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	101.01	0.600	4.98	6.41		5145.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.261	645.5	760.4	0.33E 07	-0.00055	1.086	11.38

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.538	0.536	347	0.043	328	0.010	68	0.002	226	0.004	239	0.004	165	0.003	16	0.005	131	0.009	15
CM		-0.027	0.040	248	0.016	328	0.011	194	0.007	44	0.001	230	0.001	260	0.001	72	0.002	273	0.003	182
DCP 1	.010	0.458	2.427	326	0.395	0	0.039	349	0.049	359	0.021	114	0.017	274	0.032	71	0.012	177	0.015	14
DCP 2	.025	0.910	2.087	321	0.380	1	0.014	74	0.024	43	0.031	142	0.026	251	0.017	103	0.016	205	0.013	327
DCP 3	.100	1.678	1.304	331	0.303	351	0.174	208	0.098	34	0.046	270	0.050	184	0.052	29	0.035	214	0.029	70
DCP 4	.150	1.321	1.012	346	0.203	326	0.126	254	0.071	158	0.025	160	0.024	67	0.013	8	0.010	190	0.015	63
DCP 5	.200	0.971	0.862	349	0.210	293	0.091	181	0.056	93	0.014	329	0.015	58	0.011	272	0.011	74	0.009	271
DCP 6	.250	0.863	0.835	355	0.147	279	0.063	150	0.032	102	0.013	3	0.012	2	0.021	295	0.010	155	0.008	332
DCP 7	.300	0.700	0.704	353	0.128	243	0.107	107	0.058	13	0.035	267	0.008	187	0.011	178	0.017	70	0.008	296
DCP 8	.400	0.503	0.498	0	0.043	228	0.061	77	0.024	346	0.025	280	0.024	205	0.019	101	0.017	7	0.008	271
DCP 9	.500	0.336	0.363	2	0.049	169	0.072	26	0.042	243	0.021	126	0.015	355	0.005	175	0.005	332	0.014	111
DCP10	.600	0.257	0.313	19	0.029	134	0.055	31	0.042	244	0.012	142	0.009	53	0.011	308	0.008	155	0.022	21
DCP11	.878	0.216	0.136	19	0.050	102	0.041	331	0.025	197	0.010	10	0.006	153	0.004	250	0.014	137	0.017	351

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	100.00	0.600	7.50	6.16		5146.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.259	645.5	759.9	0.33E 07	-0.00029	1.377	14.23

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.747	0.511	2	0.117	342	0.040	199	0.018	51	0.008	227	0.010	20	0.017	191	0.006	56	0.004	132
CM		-0.047	0.047	206	0.025	1	0.012	302	0.015	194	0.008	67	0.002	297	0.003	3	0.001	155	0.002	317
DCP 1	.010	1.435	1.968	330	0.423	357	0.092	81	0.010	257	0.020	109	0.017	330	0.023	152	0.009	322	0.003	202
DCP 2	.025	1.759	1.610	327	0.421	356	0.046	126	0.028	140	0.023	68	0.039	343	0.031	196	0.007	88	0.007	249
DCP 3	.100	1.973	0.702	351	0.691	1	0.143	232	0.070	204	0.056	109	0.082	29	0.059	243	0.026	137	0.014	328
DCP 4	.150	1.496	0.730	14	0.442	1	0.129	288	0.070	262	0.022	91	0.036	254	0.008	290	0.032	120	0.026	308
DCP 5	.200	1.199	0.796	12	0.329	340	0.124	271	0.059	222	0.048	171	0.006	13	0.030	171	0.009	95	0.019	141
DCP 6	.250	1.061	0.762	14	0.256	344	0.123	261	0.045	189	0.033	182	0.018	51	0.051	174	0.045	52	0.026	237
DCP 7	.300	0.920	0.738	13	0.202	318	0.116	231	0.080	160	0.044	91	0.018	24	0.018	112	0.019	8	0.015	108
DCP 8	.400	0.711	0.608	12	0.134	302	0.105	205	0.077	120	0.040	41	0.017	20	0.019	31	0.039	273	0.036	131
DCP 9	.500	0.502	0.469	8	0.062	236	0.062	161	0.071	61	0.036	312	0.017	286	0.024	188	0.013	90	0.036	87
DCP10	.600	0.423	0.421	15	0.071	220	0.079	142	0.097	42	0.057	287	0.012	250	0.039	186	0.023	131	0.014	29
DCP11	.878	0.345	0.184	356	0.070	140	0.049	89	0.075	335	0.051	207	0.025	93	0.007	220	0.011	313	0.012	183

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	*****	0.600	9.99	6.11		5146.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.259	645.4	767.8	0.33E 07	-0.00015	1.575	16.51

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.879	0.521	17	0.143	354	0.041	238	0.015	187	0.007	20	0.008	177	0.005	127	0.012	327	0.000	158
CM		-0.064	0.073	195	0.029	43	0.018	340	0.004	288	0.009	188	0.003	13	0.004	22	0.005	187	0.001	29
DCP 1	.010	1.995	1.596	333	0.406	13	0.021	48	0.044	192	0.056	111	0.005	278	0.010	356	0.008	271	0.013	359
DCP 2	.025	2.117	1.041	337	0.572	17	0.131	277	0.112	174	0.045	85	0.021	153	0.037	8	0.023	236	0.023	10
DCP 3	.100	2.142	0.467	42	0.622	16	0.135	322	0.045	206	0.080	236	0.048	157	0.035	121	0.031	352	0.019	65
DCP 4	.150	1.587	0.725	40	0.428	19	0.099	340	0.040	22	0.038	284	0.020	33	0.016	133	0.018	243	0.020	80
DCP 5	.200	1.366	0.796	34	0.386	16	0.138	320	0.052	356	0.048	301	0.020	321	0.028	8	0.028	299	0.018	284
DCP 6	.250	1.165	0.790	32	0.292	5	0.111	294	0.035	327	0.057	258	0.013	178	0.006	63	0.011	119	0.010	343
DCP 7	.300	1.062	0.786	29	0.250	353	0.142	284	0.057	246	0.038	234	0.032	219	0.014	98	0.032	267	0.013	216
DCP 8	.400	0.883	0.701	18	0.192	330	0.126	228	0.049	249	0.074	161	0.009	118	0.025	117	0.008	99	0.010	161
DCP 9	.500	0.645	0.590	16	0.107	289	0.104	213	0.038	176	0.061	116	0.022	44	0.022	42	0.024	301	0.009	91
DCP 10	.600	0.525	0.526	18	0.112	265	0.102	173	0.037	178	0.082	62	0.013	320	0.017	304	0.014	293	0.008	328
DCP 11	.878	0.438	0.257	0	0.077	201	0.064	128	0.038	76	0.076	325	0.031	182	0.034	191	0.035	21	0.005	193

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	100.00	0.600	12.44	6.13		5146.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.259	644.0	745.3	0.32E 07	0.00002	1.654	17.74

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.952	0.572	27	0.094	358	0.036	328	0.027	231	0.011	301	0.009	198	0.006	298	0.012	122	0.001	356
CM		-0.086	0.094	183	0.017	66	0.015	20	0.007	5	0.008	226	0.005	76	0.004	182	0.004	351	0.001	0
DCP 1	.010	2.402	1.233	337	0.338	42	0.067	0	0.056	279	0.037	259	0.059	195	0.023	100	0.020	73	0.027	322
DCP 2	.025	2.322	0.560	348	0.550	20	0.123	295	0.064	227	0.047	206	0.040	134	0.010	222	0.031	55	0.019	358
DCP 3	.100	2.049	0.888	76	0.208	354	0.264	13	0.021	283	0.120	278	0.036	135	0.052	260	0.030	114	0.025	178
DCP 4	.150	1.631	0.821	59	0.221	44	0.160	61	0.045	138	0.015	281	0.014	159	0.017	196	0.023	123	0.006	32
DCP 5	.200	1.291	0.944	46	0.226	34	0.170	21	0.049	41	0.012	322	0.053	69	0.018	169	0.036	99	0.029	314
DCP 6	.250	1.220	0.914	43	0.147	22	0.128	18	0.025	0	0.048	330	0.024	180	0.004	84	0.011	327	0.011	117
DCP 7	.300	1.120	0.913	34	0.177	8	0.143	334	0.080	311	0.050	275	0.012	318	0.049	262	0.031	136	0.021	339
DCP 8	.400	0.966	0.833	25	0.124	342	0.102	310	0.072	283	0.055	265	0.026	254	0.021	237	0.006	302	0.008	26
DCP 9	.500	0.697	0.666	17	0.092	328	0.093	258	0.098	228	0.047	149	0.005	178	0.034	134	0.017	7	0.019	70
DCP 10	.600	0.652	0.631	17	0.073	286	0.078	252	0.086	212	0.029	137	0.023	125	0.027	39	0.006	53	0.006	343
DCP 11	.878	0.545	0.316	348	0.056	239	0.085	160	0.040	104	0.065	22	0.044	260	0.031	335	0.040	168	0.016	192

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.600	15.09	5.37		1169.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.248	653.3	715.4	0.31E 07	-0.00098	1.507	16.50

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.986	0.494	59	0.003	321	0.013	41	0.009	314	0.015	14	0.005	25	0.001	67	0.003	75	0.004	307
CM		-0.081	0.114	207	0.017	96	0.014	176	0.004	320	0.012	186	0.003	270	0.002	148	0.001	317	0.001	118
DCP 1	.010	2.414	0.385	40	0.504	47	0.057	192	0.118	13	0.041	226	0.023	68	0.012	226	0.017	36	0.013	243
DCP 2	.100	2.275	0.768	132	0.063	6	0.127	174	0.090	323	0.052	240	0.041	15	0.024	175	0.023	44	0.020	265
DCP 3	.150	1.788	0.780	104	0.201	194	0.060	192	0.061	228	0.083	170	0.060	249	0.017	20	0.028	227	0.014	82
DCP 4	.200	1.555	0.789	91	0.153	201	0.060	231	0.071	315	0.040	167	0.036	333	0.022	118	0.023	330	0.009	164
DCP 5	.250	1.246	0.710	67	0.085	134	0.074	84	0.041	194	0.013	117	0.027	243	0.018	60	0.026	150	0.007	1
DCP 6	.300	1.115	0.804	70	0.085	149	0.069	134	0.044	248	0.024	177	0.029	308	0.018	129	0.019	308	0.007	320
DCP 7	.500	0.710	0.625	42	0.003	196	0.082	12	0.028	79	0.073	34	0.018	113	0.004	75	0.026	123	0.015	31
DCP 8	.600	0.657	0.668	45	0.035	280	0.056	33	0.016	140	0.065	56	0.024	145	0.014	6	0.007	177	0.007	99
DCP 9	.695	0.548	0.492	30	0.051	285	0.080	349	0.011	40	0.093	338	0.030	55	0.020	253	0.030	359	0.029	302
DCP10	.800	0.613	0.470	36	0.090	315	0.058	17	0.008	314	0.066	9	0.014	128	0.041	334	0.014	103	0.016	294
DCP11	.953	0.323	0.257	357	0.079	274	0.053	269	0.024	147	0.035	235	0.017	15	0.027	151	0.017	221	0.020	156

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	96.62	0.600	17.58	5.90		1169.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.247	653.3	716.4	0.31E 07	-0.00120	1.420	19.37

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.021	0.457	61	0.054	210	0.018	107	0.008	154	0.010	272	0.001	61	0.005	157	0.002	284	0.002	330
CM		-0.112	0.130	214	0.007	352	0.009	209	0.012	315	0.009	83	0.005	250	0.003	59	0.000	225	0.002	82
DCP 1	.010	2.474	0.427	125	0.413	66	0.255	167	0.043	355	0.058	140	0.020	8	0.033	113	0.042	348	0.012	249
DCP 2	.100	2.042	0.499	145	0.285	277	0.079	94	0.064	328	0.050	172	0.038	318	0.087	157	0.057	288	0.052	104
DCP 3	.150	1.523	0.518	99	0.257	233	0.021	357	0.024	316	0.035	85	0.054	250	0.035	35	0.024	175	0.019	327
DCP 4	.200	1.468	0.520	90	0.201	234	0.015	352	0.050	335	0.053	85	0.035	249	0.043	61	0.031	154	0.023	33
DCP 5	.250	1.265	0.603	74	0.180	206	0.034	259	0.036	295	0.045	35	0.046	196	0.030	318	0.013	104	0.017	288
DCP 6	.300	1.133	0.617	72	0.154	211	0.025	261	0.052	304	0.062	41	0.028	218	0.030	41	0.024	131	0.011	334
DCP 7	.500	0.837	0.684	47	0.100	170	0.018	155	0.045	199	0.065	294	0.024	72	0.018	277	0.010	305	0.009	23
DCP 8	.600	0.741	0.647	48	0.059	159	0.034	83	0.052	161	0.066	275	0.013	113	0.009	260	0.005	37	0.009	316
DCP 9	.695	0.673	0.585	39	0.048	147	0.054	77	0.078	135	0.054	233	0.007	38	0.037	232	0.009	246	0.027	239
DCP10	.800	0.711	0.480	42	0.020	24	0.045	50	0.067	126	0.026	238	0.034	71	0.024	227	0.008	329	0.015	220
DCP11	.953	0.429	0.310	16	0.031	312	0.037	355	0.031	70	0.016	191	0.014	5	0.025	101	0.006	66	0.012	50

FORCED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	97.09	0.600	24.67	5.98		1169.3	10

K	V	ω	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.248	653.3	723.0	0.31E 07	-0.00091	1.416	29.65

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.117	0.367	55	0.093	189	0.066	224	0.021	297	0.012	324	0.004	22	0.007	84	0.002	209	0.001	193
CM		-0.159	0.102	217	0.015	301	0.021	10	0.009	73	0.010	185	0.004	272	0.003	20	0.001	96	0.001	50
DCP 1	.010	2.270	0.696	148	0.265	244	0.048	331	0.036	212	0.076	262	0.060	12	0.055	104	0.005	232	0.011	93
DCP 2	.100	1.936	0.301	73	0.217	225	0.042	310	0.021	38	0.091	250	0.021	2	0.052	99	0.035	250	0.016	48
DCP 3	.150	1.466	0.367	61	0.192	194	0.113	251	0.045	10	0.044	168	0.044	271	0.043	7	0.027	98	0.016	209
DCP 4	.200	1.512	0.379	63	0.161	207	0.096	279	0.040	37	0.047	214	0.040	305	0.044	55	0.028	153	0.016	265
DCP 5	.250	1.339	0.397	56	0.159	164	0.107	247	0.058	6	0.050	136	0.050	233	0.048	327	0.035	45	0.024	128
DCP 6	.300	1.252	0.423	57	0.144	199	0.098	271	0.045	21	0.029	182	0.038	286	0.041	25	0.021	107	0.010	238
DCP 7	.500	0.988	0.480	42	0.112	155	0.113	206	0.052	290	0.038	39	0.026	130	0.024	234	0.018	306	0.011	1
DCP 8	.600	0.910	0.493	48	0.104	165	0.113	215	0.055	291	0.048	26	0.035	134	0.028	228	0.018	287	0.005	283
DCP 9	.695	0.852	0.451	43	0.082	137	0.101	187	0.058	255	0.056	350	0.038	74	0.026	153	0.013	198	0.004	144
DCP10	.800	0.906	0.403	51	0.053	136	0.080	196	0.044	245	0.053	359	0.032	90	0.024	185	0.013	218	0.011	168
DCP11	.953	0.564	0.284	27	0.021	9	0.047	145	0.030	164	0.031	294	0.031	325	0.022	54	0.013	52	0.005	299

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL (REFLEX TE)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	91.74	0.400	9.88	3.18		5022.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.349	438.9	744.4	0.48E 07	-0.00031	1.236	13.22

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.009	0.220	5	0.010	37	0.007	291	0.002	170	0.002	304	0.001	240	0.004	256	0.002	195	0.004	158
CM		0.007	0.030	285	0.003	234	0.002	137	0.001	39	0.000	218	0.001	115	0.002	96	0.000	29	0.001	349
DCP 1	.010	4.188	1.549	335	0.101	219	0.060	121	0.039	18	0.024	256	0.015	87	0.010	307	0.016	196	0.013	103
DCP 2	.025	4.231	1.315	336	0.033	206	0.015	201	0.017	86	0.018	260	0.014	112	0.011	60	0.013	275	0.010	220
DCP 3	.100	2.697	0.564	349	0.025	4	0.021	274	0.006	252	0.009	274	0.010	179	0.008	178	0.010	36	0.006	179
DCP 4	.150	1.907	0.344	357	0.029	20	0.011	256	0.002	136	0.002	334	0.003	202	0.004	203	0.003	188	0.005	73
DCP 5	.200	1.530	0.292	2	0.018	25	0.003	313	0.005	204	0.004	111	0.004	203	0.006	216	0.004	295	0.005	140
DCP 6	.250	1.367	0.271	10	0.024	35	0.010	293	0.007	110	0.007	31	0.002	233	0.010	228	0.010	140	0.007	67
DCP 7	.300	1.169	0.227	18	0.017	37	0.011	300	0.003	163	0.002	7	0.001	258	0.009	255	0.009	177	0.001	176
DCP 8	.400	0.883	0.191	25	0.019	33	0.012	301	0.005	154	0.002	287	0.004	267	0.006	219	0.003	154	0.001	228
DCP 9	.500	0.590	0.139	36	0.011	62	0.006	311	0.003	209	0.001	190	0.001	295	0.004	271	0.004	172	0.003	222
DCP10	.600	0.465	0.130	46	0.013	43	0.010	310	0.002	150	0.003	357	0.006	327	0.008	289	0.006	251	0.009	97
DCP11	.830	0.244	0.085	71	0.007	80	0.009	313	0.006	222	0.002	3	0.002	263	0.006	299	0.001	294	0.011	220
DCP12	.878	0.157	0.070	69	0.008	56	0.005	279	0.004	315	0.004	286	0.004	3	0.003	245	0.007	217	0.010	130
DCP13	.953	0.039	0.067	54	0.007	36	0.003	49	0.004	204	0.004	88	0.007	186	0.009	249	0.006	56	0.011	166

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL (REFLEX TE)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	91.74	0.400	12.33	3.33		5022.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.350	438.2	738.5	0.48E 07	-0.00097	1.461	15.67

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.198	0.245	7	0.013	347	0.003	236	0.005	213	0.007	64	0.005	218	0.005	15	0.007	156	0.001	259
CM		0.014	0.030	279	0.003	313	0.002	198	0.001	212	0.001	235	0.000	292	0.002	134	0.003	334	0.002	28
DCP 1	.010	5.498	1.689	333	0.071	41	0.085	276	0.014	261	0.035	187	0.015	277	0.021	104	0.017	267	0.011	86
DCP 2	.025	5.545	1.678	336	0.116	259	0.017	231	0.095	212	0.067	80	0.037	212	0.050	65	0.037	212	0.036	7
DCP 3	.100	3.110	0.475	357	0.089	13	0.029	206	0.013	82	0.019	327	0.011	217	0.013	83	0.008	15	0.008	290
DCP 4	.150	2.132	0.318	8	0.066	12	0.008	240	0.001	307	0.003	125	0.007	274	0.002	130	0.007	26	0.004	149
DCP 5	.200	1.743	0.285	11	0.036	1	0.016	200	0.004	111	0.009	10	0.014	205	0.006	88	0.006	103	0.007	357
DCP 6	.250	1.551	0.281	20	0.029	354	0.006	185	0.003	331	0.005	87	0.005	274	0.005	9	0.004	45	0.001	90
DCP 7	.300	1.343	0.246	23	0.023	347	0.009	168	0.002	297	0.007	38	0.007	165	0.009	347	0.007	147	0.005	13
DCP 8	.400	1.004	0.219	31	0.014	334	0.001	62	0.002	229	0.003	110	0.005	286	0.003	283	0.006	103	0.002	106
DCP 9	.500	0.664	0.169	40	0.011	328	0.006	94	0.006	219	0.009	80	0.002	126	0.008	256	0.008	142	0.002	263
DCP10	.600	0.540	0.168	43	0.005	282	0.007	52	0.019	249	0.010	73	0.004	250	0.008	334	0.014	136	0.008	195
DCP11	.830	0.272	0.096	58	0.010	159	0.011	6	0.006	142	0.005	34	0.008	211	0.012	33	0.013	175	0.003	240
DCP12	.878	0.216	0.075	42	0.013	123	0.007	328	0.003	233	0.004	55	0.004	249	0.008	14	0.007	185	0.006	176
DCP13	.953	0.112	0.048	11	0.024	175	0.011	260	0.016	30	0.004	222	0.015	75	0.024	278	0.019	162	0.019	226

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL (REFLEX TE)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	92.59	0.400	14.70	3.22		5322.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.353	438.0	737.9	0.48E 07	0.00125	1.609	18.07

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.216	0.339	3	0.015	233	0.017	148	0.008	163	0.022	113	0.009	290	0.004	107	0.009	165	0.016	356
CM		-0.037	0.038	69	0.016	293	0.019	239	0.003	61	0.007	279	0.006	92	0.003	275	0.002	324	0.008	144
DCP 1	.010	5.460	1.420	354	0.259	65	0.250	294	0.129	163	0.042	78	0.036	66	0.041	303	0.025	165	0.043	98
DCP 2	.025	4.854	1.285	30	0.570	338	0.286	240	0.145	202	0.137	150	0.087	61	0.029	307	0.009	354	0.021	137
DCP 3	.100	2.785	1.098	36	0.326	265	0.141	161	0.103	109	0.080	39	0.055	308	0.025	240	0.046	189	0.067	85
DCP 4	.150	1.970	0.792	24	0.204	216	0.062	158	0.065	72	0.029	10	0.036	245	0.016	157	0.015	133	0.022	27
DCP 5	.200	1.640	0.716	11	0.133	205	0.107	151	0.058	43	0.028	305	0.030	231	0.036	133	0.005	99	0.012	62
DCP 6	.250	1.520	0.663	4	0.134	180	0.093	131	0.031	20	0.022	274	0.017	182	0.013	90	0.007	114	0.021	2
DCP 7	.300	1.373	0.551	351	0.068	151	0.098	117	0.044	1	0.022	233	0.034	168	0.030	54	0.020	306	0.010	119
DCP 8	.400	1.087	0.413	335	0.061	120	0.041	61	0.018	345	0.034	176	0.026	92	0.010	309	0.003	238	0.005	354
DCP 9	.500	0.738	0.271	319	0.021	112	0.051	59	0.038	273	0.028	139	0.018	53	0.011	338	0.013	125	0.021	314
DCP10	.600	0.646	0.175	308	0.016	132	0.028	351	0.035	232	0.042	126	0.024	347	0.013	213	0.019	157	0.038	336
DCP11	.830	0.466	0.070	255	0.056	102	0.026	341	0.031	177	0.043	106	0.061	276	0.025	100	0.037	209	0.064	328
DCP12	.878	0.404	0.025	185	0.044	87	0.010	83	0.014	180	0.027	58	0.024	290	0.018	140	0.043	39	0.021	90
DCP13	.953	0.278	0.016	199	0.037	81	0.008	39	0.023	57	0.044	40	0.032	199	0.033	44	0.027	84	0.015	242

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL (REFLEX TE)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.03	0.400	0.21	4.94		5023.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.061	437.8	742.3	0.48E 07	-0.00077	0.435	5.04

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		-0.103	0.531	353	0.012	343	0.010	202	0.009	316	0.003	89	0.003	201	0.003	204	0.002	326	0.001	119
CM		-0.003	0.008	306	0.002	318	0.001	308	0.001	249	0.001	95	0.001	99	0.001	38	0.000	249	0.001	19
DCP 1	.010	-1.880	2.644	353	0.590	255	0.448	315	0.183	18	0.067	344	0.171	44	0.212	140	0.172	246	0.124	350
DCP 2	.025	-0.995	2.276	351	0.102	256	0.106	241	0.083	334	0.036	123	0.031	245	0.052	339	0.044	31	0.016	103
DCP 3	.100	-0.081	1.539	349	0.199	40	0.095	136	0.027	292	0.064	78	0.069	162	0.033	236	0.002	19	0.029	170
DCP 4	.150	0.007	0.952	351	0.079	30	0.067	135	0.046	212	0.024	265	0.015	321	0.008	93	0.001	154	0.004	343
DCP 5	.200	-0.033	0.815	351	0.063	48	0.053	143	0.035	225	0.020	273	0.008	36	0.005	172	0.016	225	0.006	1
DCP 6	.250	-0.039	0.651	352	0.034	295	0.037	281	0.005	7	0.007	167	0.008	245	0.001	19	0.005	27	0.004	99
DCP 7	.300	0.027	0.552	354	0.014	339	0.006	239	0.006	254	0.004	139	0.004	256	0.004	43	0.005	197	0.005	316
DCP 8	.400	0.002	0.414	357	0.022	255	0.012	262	0.013	331	0.004	127	0.005	204	0.003	224	0.003	354	0.002	67
DCP 9	.500	-0.075	0.291	356	0.007	211	0.015	258	0.009	309	0.002	117	0.002	306	0.002	28	0.003	75	0.003	125
DCP10	.600	-0.057	0.228	358	0.016	241	0.010	271	0.008	350	0.002	256	0.002	231	0.003	186	0.004	14	0.002	248
DCP11	.830	0.006	0.118	0	0.010	73	0.003	166	0.004	266	0.001	180	0.003	230	0.003	227	0.001	175	0.005	159
DCP12	.878	-0.039	0.096	1	0.005	227	0.002	244	0.003	353	0.002	76	0.004	175	0.003	238	0.005	348	0.003	229
DCP13	.953	-0.171	0.113	352	0.023	90	0.027	130	0.019	54	0.014	314	0.017	235	0.013	207	0.003	95	0.003	328

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL (REFLEX TE)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.08	0.400	5.05	4.35		5023.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.061	437.1	742.0	0.48E 07	-0.00033	0.936	9.36

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.653	0.525	353	0.044	338	0.005	190	0.004	314	0.003	165	0.004	304	0.004	88	0.001	142	0.002	138
CM		0.002	0.011	339	0.001	124	0.000	317	0.001	12	0.001	123	0.001	92	0.001	254	0.001	332	0.000	119
DCP 1	.010	1.061	3.022	351	0.254	2	0.057	156	0.021	325	0.016	165	0.014	7	0.017	120	0.016	351	0.016	156
DCP 2	.025	1.528	2.543	350	0.123	323	0.016	224	0.061	357	0.033	148	0.015	365	0.015	116	0.012	163	0.015	132
DCP 3	.100	1.422	1.315	351	0.105	337	0.015	197	0.012	339	0.005	143	0.008	333	0.003	103	0.005	369	0.007	154
DCP 4	.150	0.960	0.850	351	0.072	345	0.008	196	0.010	325	0.007	189	0.003	307	0.005	114	0.003	349	0.005	130
DCP 5	.200	0.714	0.759	351	0.065	357	0.008	225	0.014	224	0.004	120	0.011	298	0.007	13	0.007	76	0.010	101
DCP 6	.250	0.674	0.642	354	0.054	350	0.006	231	0.008	328	0.006	237	0.012	349	0.005	130	0.002	278	0.004	119
DCP 7	.300	0.606	0.550	352	0.046	350	0.005	231	0.003	318	0.006	122	0.003	317	0.006	77	0.002	53	0.003	95
DCP 8	.400	0.446	0.426	355	0.037	343	0.004	170	0.004	314	0.003	195	0.001	289	0.003	70	0.001	228	0.003	89
DCP 9	.500	0.245	0.307	355	0.026	339	0.004	152	0.001	239	0.002	133	0.004	249	0.004	35	0.002	108	0.002	51
DCP10	.600	0.200	0.238	359	0.022	332	0.002	179	0.005	247	0.002	270	0.004	237	0.003	111	0.005	211	0.002	35
DCP11	.830	0.122	0.113	3	0.015	324	0.001	225	0.000	110	0.005	59	0.005	259	0.004	97	0.006	138	0.003	193
DCP12	.878	0.052	0.091	7	0.015	299	0.001	181	0.002	229	0.002	293	0.003	150	0.002	105	0.002	242	0.001	298
DCP13	.953	-0.065	0.077	5	0.027	321	0.010	155	0.015	185	0.015	266	0.016	337	0.011	70	0.006	151	0.015	253

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL (REFLEX TE)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.08	0.470	7.47	4.91		5023.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.062	436.5	741.9	0.49E 07	-0.00092	1.223	12.45

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.718	0.500	354	0.046	357	0.007	191	0.004	303	0.002	112	0.001	277	0.002	70	0.004	227	0.002	36
CM		0.004	0.011	315	0.002	292	0.001	119	0.001	147	0.001	130	0.000	155	0.000	346	0.001	86	0.000	53
DCP 1	.010	2.598	2.897	352	0.308	343	0.118	183	0.030	96	0.042	48	0.024	263	0.005	43	0.012	232	0.016	58
DCP 2	.025	2.797	2.548	351	0.217	333	0.038	196	0.022	269	0.025	135	0.013	353	0.013	9	0.014	235	0.018	55
DCP 3	.100	2.063	1.250	352	0.106	348	0.014	184	0.012	312	0.011	133	0.006	195	0.005	77	0.009	240	0.006	51
DCP 4	.150	1.397	0.783	352	0.095	11	0.007	215	0.006	261	0.005	47	0.006	230	0.005	54	0.005	239	0.002	52
DCP 5	.200	1.081	0.701	352	0.063	2	0.010	147	0.015	323	0.005	217	0.002	215	0.002	117	0.006	176	0.005	343
DCP 6	.250	-0.998	0.584	355	0.074	18	0.007	174	0.003	249	0.004	74	0.003	217	0.006	84	0.002	244	0.001	22
DCP 7	.300	0.874	0.514	354	0.062	0	0.006	233	0.001	77	0.001	312	0.003	26	0.003	58	0.005	233	0.003	29
DCP 8	.400	0.650	0.393	357	0.053	16	0.006	152	0.015	230	0.002	33	0.003	218	0.003	69	0.002	234	0.002	335
DCP 9	.500	0.402	0.283	357	0.022	351	0.003	199	0.003	36	0.001	256	0.002	342	0.004	357	0.003	159	0.002	334
DCP10	.600	0.325	0.273	0	0.029	24	0.003	138	0.003	272	0.001	346	0.001	120	0.003	113	0.001	191	0.005	88
DCP11	.830	0.186	0.107	7	0.004	303	0.001	325	0.015	326	0.005	78	0.001	96	0.001	126	0.005	230	0.006	303
DCP12	.878	0.107	0.096	5	0.014	36	0.006	141	0.004	258	0.003	97	0.001	145	0.002	42	0.001	193	0.004	92
DCP13	.953	0.009	0.088	352	0.006	270	0.022	252	0.003	33	0.018	257	0.010	306	0.008	208	0.017	292	0.012	192

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL (REFLEX TE)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.08	0.400	9.90	4.84		5023.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.062	436.2	738.3	0.48E 07	-0.00093	1.425	14.54

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.957	0.440	1	0.080	6	0.011	252	0.015	115	0.010	286	0.005	173	0.006	46	0.003	22	0.004	283
CM		0.007	0.012	320	0.001	179	0.003	281	0.007	293	0.003	125	0.001	319	0.002	155	0.002	347	0.001	184
DCP 1	.010	4.025	2.805	357	0.424	341	0.087	220	0.042	315	0.078	221	0.051	160	0.027	82	0.008	56	0.012	163
DCP 2	.025	4.150	2.631	358	0.429	331	0.167	224	0.047	121	0.026	286	0.040	150	0.044	76	0.041	352	0.022	242
DCP 3	.100	2.591	1.004	358	0.188	27	0.045	334	0.016	298	0.014	264	0.007	271	0.008	116	0.008	9	0.005	16
DCP 4	.150	1.753	0.630	358	0.138	29	0.014	318	0.007	1	0.006	276	0.004	220	0.003	103	0.005	32	0.009	257
DCP 5	.200	1.405	0.546	359	0.118	26	0.031	294	0.011	166	0.002	2	0.011	322	0.001	121	0.008	63	0.011	277
DCP 6	.250	1.264	0.470	2	0.111	29	0.012	311	0.004	46	0.003	290	0.005	228	0.004	104	0.006	45	0.006	253
DCP 7	.300	1.102	0.400	3	0.094	18	0.020	286	0.008	146	0.005	328	0.010	283	0.007	103	0.009	357	0.008	267
DCP 8	.400	0.820	0.317	6	0.081	26	0.012	287	0.003	98	0.004	272	0.007	183	0.002	33	0.004	10	0.008	260
DCP 9	.500	0.526	0.230	7	0.054	11	0.010	281	0.003	108	0.010	298	0.005	182	0.009	32	0.007	299	0.007	214
DCP10	.600	0.420	0.183	10	0.050	27	0.008	301	0.001	131	0.005	266	0.007	169	0.006	46	0.005	1	0.006	256
DCP11	.830	0.258	0.106	10	0.025	309	0.024	125	0.091	118	0.030	294	0.021	129	0.016	345	0.023	154	0.014	359
DCP12	.878	0.160	0.100	9	0.018	358	0.006	189	0.006	92	0.003	313	0.003	247	0.001	260	0.001	175	0.002	274
DCP13	.953	0.072	0.120	8	0.048	290	0.017	139	0.012	0	0.009	5	0.022	319	0.004	285	0.008	294	0.015	56

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL (REFLEX TE)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	15.24	0.400	12.23	4.77		5326.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.059	437.1	736.1	0.48E 07	0.00069	1.539	16.22

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.114	0.277	21	0.154	30	0.065	292	0.036	147	0.005	185	0.001	125	0.002	195	0.004	144	0.002	351
CM		-0.019	0.034	176	0.030	54	0.013	360	0.022	311	0.002	269	0.003	245	0.002	157	0.002	55	0.001	61
DCP 1	.010	4.957	1.899	9	0.776	32	0.246	335	0.039	147	0.089	31	0.091	315	0.033	230	0.013	90	0.033	337
DCP 2	.025	4.697	1.393	16	1.020	35	0.423	314	0.119	242	0.028	41	0.171	296	0.070	234	0.048	210	0.037	161
DCP 3	.100	2.447	0.243	64	0.635	54	0.274	334	0.058	305	0.076	266	0.063	215	0.069	155	0.062	131	0.048	52
DCP 4	.150	1.877	0.185	61	0.366	55	0.135	326	0.021	283	0.017	233	0.035	231	0.018	175	0.012	87	0.010	338
DCP 5	.200	1.689	0.241	62	0.366	37	0.127	299	0.067	246	0.050	206	0.045	136	0.041	88	0.033	44	0.029	342
DCP 6	.250	1.424	0.240	42	0.224	39	0.059	289	0.071	283	0.022	198	0.019	124	0.009	66	0.011	27	0.013	295
DCP 7	.300	1.208	0.263	36	0.215	18	0.078	273	0.022	211	0.037	183	0.038	95	0.025	33	0.017	344	0.021	293
DCP 8	.400	0.981	0.272	23	0.192	4	0.050	219	0.022	130	0.035	138	0.013	92	0.008	0	0.006	330	0.010	252
DCP 9	.500	0.696	0.232	17	0.071	331	0.036	187	0.029	125	0.014	118	0.016	34	0.014	314	0.010	226	0.006	160
DCP10	.600	0.583	0.212	12	0.034	308	0.032	171	0.015	73	0.007	59	0.002	171	0.007	316	0.011	223	0.003	131
DCP11	.830	0.383	0.208	1	0.084	265	0.030	182	0.237	135	0.019	93	0.017	13	0.008	306	0.019	198	0.005	150
DCP12	.878	0.276	0.178	356	0.066	229	0.016	127	0.015	28	0.007	346	0.013	221	0.009	102	0.003	297	0.003	172
DCP13	.953	0.180	0.215	358	0.067	255	0.013	210	0.062	165	0.006	328	0.010	82	0.012	279	0.019	60	0.007	329

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL (REFLEX TE)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	15.53	0.400	14.65	4.79		5326.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.060	435.9	736.3	0.48E 07	0.00172	1.563	16.41

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.100	0.267	86	0.128	28	0.068	68	0.015	0	0.021	318	0.008	321	0.013	215	0.005	336	0.003	145
CM		-0.039	0.061	168	0.015	107	0.024	89	0.037	31	0.011	28	0.033	293	0.026	332	0.003	216	0.003	287
DCP 1	.010	5.016	1.172	59	0.745	36	0.320	65	0.087	14	0.061	350	0.026	205	0.034	156	0.001	12	0.016	170
DCP 2	.025	4.562	1.059	106	0.778	60	0.479	72	0.238	43	0.192	17	0.136	7	0.062	360	0.071	342	0.047	297
DCP 3	.100	2.410	1.025	136	0.426	54	0.253	87	0.130	28	0.111	2	0.071	331	0.057	303	0.042	295	0.032	284
DCP 4	.150	1.677	0.667	124	0.199	24	0.193	88	0.061	332	0.059	20	0.048	275	0.016	305	0.018	236	0.037	330
DCP 5	.200	1.423	0.571	113	0.196	27	0.164	53	0.065	323	0.066	343	0.053	262	0.038	254	0.038	198	0.014	173
DCP 6	.250	1.325	0.449	133	0.150	5	0.110	56	0.035	285	0.050	347	0.028	243	0.031	260	0.016	171	0.010	221
DCP 7	.300	1.174	0.381	91	0.117	13	0.110	36	0.028	289	0.045	322	0.029	234	0.038	239	0.024	159	0.012	188
DCP 8	.400	0.970	0.300	71	0.116	347	0.040	356	0.033	224	0.023	283	0.011	175	0.024	213	0.005	97	0.015	130
DCP 9	.500	0.693	0.232	52	0.067	348	0.053	335	0.022	194	0.046	258	0.016	110	0.031	192	0.012	86	0.010	87
DCP10	.600	0.624	0.211	34	0.082	346	0.052	281	0.016	182	0.039	217	0.005	45	0.040	159	0.018	349	0.028	114
DCP11	.830	0.456	0.212	356	0.031	345	0.079	255	0.039	174	0.043	278	0.021	90	0.016	117	0.010	38	0.014	343
DCP12	.878	0.383	0.211	356	0.053	344	0.062	260	0.037	181	0.021	151	0.006	352	0.005	76	0.010	290	0.011	175
DCP13	.953	0.260	0.208	338	0.060	11	0.058	263	0.025	302	0.009	212	0.013	322	0.010	153	0.030	25	0.010	146

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL (REFLEX TE)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	15.70	0.400	17.11	4.77		5324.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.060	435.1	733.0	0.48E 07	0.00031	1.592	17.15

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.125	0.348	98	0.054	109	0.027	83	0.016	54	0.012	92	0.004	83	0.011	133	0.006	351	0.009	96
CM		-0.061	0.063	176	0.030	185	0.011	158	0.012	157	0.010	154	0.007	174	0.002	121	0.008	129	0.003	142
DCP 1	.010	5.251	1.519	98	0.303	114	0.153	154	0.059	173	0.051	173	0.047	157	0.070	108	0.058	111	0.052	88
DCP 2	.025	4.556	1.571	129	0.562	160	0.286	154	0.233	170	0.199	181	0.166	153	0.156	164	0.116	153	0.137	131
DCP 3	.100	2.237	1.232	137	0.244	177	0.213	135	0.170	127	0.141	135	0.051	147	0.089	131	0.042	143	0.050	135
DCP 4	.150	1.591	0.772	116	0.182	173	0.061	36	0.087	95	0.030	152	0.024	352	0.028	80	0.004	218	0.008	63
DCP 5	.200	1.374	0.658	113	0.176	165	0.091	87	0.085	105	0.078	93	0.050	119	0.034	63	0.056	88	0.017	76
DCP 6	.250	1.306	0.545	99	0.171	143	0.046	15	0.068	55	0.036	92	0.014	337	0.031	36	0.015	27	0.011	52
DCP 7	.300	1.167	0.458	93	0.092	161	0.056	49	0.068	62	0.054	71	0.024	191	0.018	37	0.036	55	0.013	58
DCP 8	.400	1.006	0.359	76	0.065	70	0.033	0	0.050	1	0.034	64	0.038	27	0.016	319	0.037	3	0.009	96
DCP 9	.500	0.731	0.278	64	0.054	52	0.046	16	0.041	355	0.048	5	0.022	22	0.016	317	0.027	351	0.023	355
DCP10	.600	0.667	0.220	50	0.082	18	0.025	331	0.039	290	0.032	336	0.002	34	0.016	256	0.023	292	0.033	269
DCP11	.830	0.575	0.191	8	0.116	10	0.034	8	0.072	4	0.024	306	0.043	337	0.015	130	0.049	297	0.005	40
DCP12	.878	0.469	0.165	5	0.099	5	0.036	182	0.029	251	0.016	331	0.006	33	0.010	159	0.008	329	0.009	317
DCP13	.953	0.342	0.170	1	0.086	24	0.034	31	0.039	309	0.027	297	0.016	17	0.009	270	0.011	252	0.037	264

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL (REFLEX TE)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	15.82	0.400	24.45	4.79		5326.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.061	434.5	732.0	0.48E 07	-0.00207	1.142	26.77

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.017	0.111	48	0.030	191	0.011	339	0.014	138	0.009	336	0.003	259	0.003	178	0.003	254	0.003	329
CM		-0.127	0.041	294	0.001	157	0.032	127	0.035	329	0.002	139	0.001	187	0.000	341	0.002	330	0.002	152
DCP 1	.010	3.617	1.317	179	0.336	113	0.238	191	0.177	145	0.109	205	0.052	211	0.049	221	0.040	244	0.026	139
DCP 2	.025	2.817	0.849	167	0.258	112	0.039	337	0.133	120	0.076	343	0.020	197	0.031	329	0.022	290	0.011	225
DCP 3	.100	1.466	0.187	28	0.038	96	0.027	333	0.036	258	0.002	332	0.011	236	0.007	160	0.014	272	0.008	143
DCP 4	.150	1.261	0.188	26	0.020	41	0.020	349	0.016	44	0.009	337	0.004	7	0.005	145	0.007	328	0.004	8
DCP 5	.200	1.205	0.204	19	0.027	193	0.015	339	0.017	230	0.002	349	0.002	314	0.010	163	0.008	278	0.002	345
DCP 6	.250	1.202	0.204	25	0.018	32	0.022	341	0.014	7	0.005	356	0.003	333	0.005	194	0.008	22	0.004	342
DCP 7	.300	1.140	0.196	26	0.021	191	0.011	311	0.014	252	0.005	273	0.005	284	0.010	151	0.007	294	0.005	123
DCP 8	.400	1.036	0.200	27	0.012	35	0.019	355	0.013	322	0.005	298	0.009	329	0.007	134	0.006	51	0.004	183
DCP 9	.500	0.820	0.176	28	0.026	130	0.014	338	0.016	310	0.001	175	0.003	222	0.005	188	0.003	330	0.005	356
DCP10	.600	0.777	0.165	32	0.013	28	0.013	334	0.016	336	0.010	289	0.008	344	0.007	151	0.003	256	0.005	314
DCP11	.830	0.728	0.115	41	0.027	124	0.012	252	0.082	142	0.018	315	0.016	161	0.010	353	0.020	170	0.019	341
DCP12	.878	0.616	0.115	43	0.013	350	0.015	340	0.016	332	0.004	315	0.011	279	0.004	157	0.013	37	0.012	125
DCP13	.953	0.509	0.069	38	0.031	96	0.011	230	0.038	241	0.024	267	0.017	7	0.013	212	0.006	214	0.014	281

FORCED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL (REFLEX TE)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	90.09	0.430	0.17	5.13		5325.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.346	434.5	733.8	0.48E 07	-0.00081	0.340	6.24

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		-0.079	0.467	3	0.037	64	0.005	222	0.005	239	0.001	126	0.002	170	0.004	84	0.000	168	0.004	45
CM		-0.013	0.050	284	0.035	324	0.006	117	0.002	147	0.001	138	0.001	27	0.002	311	0.000	218	0.001	186
DCP 1	.010	-1.984	2.680	342	0.189	185	0.311	261	0.111	338	0.091	118	0.073	215	0.066	303	0.048	70	0.049	154
DCP 2	.025	-1.023	2.210	342	0.172	62	0.161	146	0.088	205	0.015	85	0.016	73	0.031	256	0.025	302	0.038	61
DCP 3	.100	-0.070	1.341	344	0.228	16	0.101	65	0.068	140	0.027	224	0.035	343	0.047	41	0.029	116	0.008	87
DCP 4	.150	0.074	0.736	352	0.062	38	0.006	17	0.005	128	0.013	134	0.007	125	0.003	346	0.004	252	0.004	69
DCP 5	.200	0.059	0.646	355	0.046	25	0.015	351	0.011	36	0.024	117	0.028	135	0.004	303	0.014	255	0.007	3
DCP 6	.250	-0.008	0.559	7	0.040	75	0.017	244	0.010	259	0.001	55	0.001	11	0.005	28	0.003	259	0.003	346
DCP 7	.300	0.014	0.466	12	0.022	106	0.028	255	0.011	288	0.006	21	0.005	127	0.008	104	0.007	232	0.005	350
DCP 8	.400	-0.004	0.381	21	0.044	91	0.015	256	0.011	272	0.002	347	0.006	176	0.004	108	0.003	196	0.001	273
DCP 9	.500	-0.043	0.289	30	0.035	92	0.010	241	0.010	287	0.003	327	0.007	137	0.003	154	0.005	273	0.002	283
DCP10	.600	-0.036	0.264	43	0.035	95	0.012	278	0.013	293	0.007	336	0.005	207	0.008	110	0.002	11	0.003	337
DCP11	.830	0.016	0.164	61	0.018	130	0.011	251	0.008	45	0.004	4	0.007	232	0.012	130	0.005	56	0.012	37
DCP12	.878	-0.034	0.135	65	0.019	127	0.012	303	0.014	290	0.004	258	0.004	218	0.005	140	0.003	43	0.003	96

FORCED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL (REFLEX TE)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	90.09	0.430	5.04	5.87		5325.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.347	433.5	732.4	0.48E 07	-0.00089	0.930	11.00

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.481	0.429	7	0.020	92	0.009	239	0.004	3	0.008	77	0.003	83	0.002	178	0.001	11	0.003	258
CM		-0.005	0.052	283	0.033	258	0.006	122	0.003	131	0.001	12	0.001	68	0.000	27	0.000	255	0.001	344
DCP 1	.010	1.125	2.654	338	0.098	107	0.119	128	0.062	91	0.027	42	0.022	47	0.018	1	0.011	21	0.007	267
DCP 2	.025	1.576	2.247	342	0.041	161	0.054	161	0.037	59	0.050	66	0.031	82	0.009	164	0.020	323	0.021	287
DCP 3	.100	1.419	1.105	352	0.025	73	0.029	187	0.013	108	0.020	72	0.010	40	0.002	108	0.006	15	0.015	263
DCP 4	.150	0.996	0.692	354	0.020	85	0.019	189	0.008	120	0.013	66	0.005	71	0.001	285	0.002	334	0.004	306
DCP 5	.200	0.753	0.617	2	0.037	82	0.012	204	0.002	52	0.007	32	0.007	104	0.002	298	0.011	155	0.010	13
DCP 6	.250	0.706	0.539	8	0.028	75	0.014	218	0.002	134	0.013	58	0.000	229	0.001	189	0.002	292	0.005	292
DCP 7	.300	0.617	0.462	17	0.025	77	0.015	244	0.002	169	0.008	80	0.006	128	0.002	112	0.000	131	0.010	325
DCP 8	.400	0.464	0.376	22	0.022	91	0.017	256	0.004	326	0.007	138	0.002	70	0.003	179	0.002	57	0.002	180
DCP 9	.500	0.289	0.290	36	0.022	76	0.017	284	0.006	310	0.006	93	0.003	127	0.002	165	0.001	10	0.004	328
DCP10	.600	0.226	0.271	44	0.020	87	0.017	275	0.007	332	0.005	111	0.001	244	0.005	161	0.002	91	0.004	190
DCP11	.830	0.136	0.181	69	0.014	96	0.018	313	0.017	319	0.002	66	0.004	239	0.005	302	0.003	341	0.006	175
DCP12	.878	0.082	0.155	64	0.011	133	0.010	296	0.007	336	0.005	199	0.002	347	0.004	176	0.002	196	0.008	176

FORCED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL (REFLEX TE)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	90.09	0.430	7.43	5.30		5325.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.348	432.9	731.2	0.48E 07	-0.00092	1.170	13.55

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.767	0.418	358	0.024	75	0.006	312	0.005	339	0.004	12	0.005	281	0.003	230	0.004	294	0.002	355
CM		-0.001	0.054	277	0.002	255	0.003	34	0.000	56	0.002	269	0.001	136	0.001	101	0.001	94	0.001	133
DCP 1	.010	2.742	2.673	336	0.122	136	0.093	88	0.069	3	0.031	307	0.020	249	0.009	191	0.018	162	0.010	125
DCP 2	.025	2.974	2.332	328	0.092	130	0.059	59	0.028	337	0.038	326	0.034	252	0.014	125	0.021	140	0.013	59
DCP 3	.100	2.105	1.108	339	0.043	39	0.009	60	0.012	345	0.015	328	0.037	265	0.009	208	0.007	158	0.007	119
DCP 4	.150	1.483	0.683	354	0.043	55	0.010	302	0.007	16	0.002	348	0.009	266	0.003	213	0.004	158	0.003	278
DCP 5	.200	1.150	0.595	350	0.043	37	0.007	136	0.006	251	0.008	198	0.016	281	0.010	225	0.008	94	0.006	82
DCP 6	.250	1.061	0.532	8	0.035	64	0.010	299	0.005	359	0.005	54	0.009	274	0.004	252	0.005	232	0.007	285
DCP 7	.300	0.931	0.455	5	0.032	64	0.007	252	0.007	333	0.003	0	0.003	342	0.001	135	0.001	195	0.005	357
DCP 8	.430	0.682	0.372	22	0.028	68	0.015	287	0.005	9	0.003	51	0.005	255	0.003	170	0.003	197	0.006	281
DCP 9	.500	0.453	0.280	24	0.024	55	0.007	252	0.006	214	0.005	53	0.005	335	0.002	213	0.002	230	0.002	83
DCP10	.600	0.365	0.266	43	0.023	73	0.014	286	0.006	357	0.002	10	0.008	271	0.004	247	0.005	214	0.001	306
DCP11	.830	0.211	0.164	55	0.013	120	0.009	285	0.005	266	0.013	78	0.008	40	0.004	290	0.009	270	0.011	339
DCP12	.878	0.118	0.150	62	0.012	130	0.007	285	0.004	49	0.002	46	0.003	301	0.003	279	0.005	247	0.007	172

FORCED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL (REFLEX TE)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	90.09	0.430	9.85	5.94		5325.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.348	432.3	731.7	0.48E 07	-0.00092	1.428	15.88

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.015	0.423	0	0.024	71	0.015	306	0.006	205	0.004	78	0.001	293	0.005	306	0.003	231	0.001	170
CM		0.006	0.055	285	0.005	277	0.006	154	0.002	114	0.001	12	0.001	256	0.002	121	0.001	156	0.001	83
DCP 1	.010	4.317	2.952	334	0.113	152	0.093	298	0.129	175	0.062	62	0.022	159	0.037	29	0.012	275	0.010	214
DCP 2	.025	4.485	2.814	331	0.201	200	0.030	104	0.042	143	0.072	34	0.049	265	0.011	39	0.049	212	0.060	80
DCP 3	.100	2.650	1.010	346	0.123	22	0.053	265	0.014	157	0.005	192	0.002	178	0.003	158	0.006	137	0.007	158
DCP 4	.150	1.858	0.635	357	0.081	35	0.024	281	0.011	207	0.006	109	0.001	347	0.003	222	0.002	93	0.004	256
DCP 5	.200	1.457	0.551	357	0.052	20	0.006	259	0.004	344	0.008	191	0.010	86	0.011	313	0.013	175	0.008	130
DCP 6	.250	1.332	0.504	10	0.059	45	0.020	285	0.008	236	0.006	80	0.003	322	0.004	236	0.001	215	0.005	228
DCP 7	.300	1.160	0.437	12	0.041	43	0.008	317	0.006	259	0.007	162	0.005	26	0.005	258	0.004	135	0.001	284
DCP 8	.430	0.853	0.363	24	0.041	59	0.016	292	0.009	246	0.002	112	0.005	356	0.004	213	0.005	339	0.009	227
DCP 9	.500	0.576	0.276	32	0.027	60	0.014	325	0.005	242	0.005	86	0.001	297	0.002	197	0.003	35	0.005	243
DCP10	.600	0.468	0.254	44	0.031	76	0.015	335	0.008	246	0.003	73	0.001	133	0.006	327	0.008	304	0.008	245
DCP11	.830	0.282	0.143	63	0.025	157	0.030	360	0.003	317	0.007	181	0.003	191	0.020	306	0.004	192	0.006	21
DCP12	.878	0.171	0.132	55	0.033	113	0.014	327	0.005	233	0.001	192	0.002	45	0.006	313	0.006	315	0.007	223

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL (REFLEX TE)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	86.96	0.400	12.36	5.87		5026.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.332	436.9	741.6	0.48E 07	0.00003	1.653	18.57

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.072	0.546	14	0.014	302	0.003	60	0.005	228	0.006	163	0.015	63	0.018	286	0.018	158	0.015	346
CM		-0.026	0.018	168	0.033	316	0.012	229	0.007	122	0.002	343	0.002	259	0.007	97	0.007	316	0.008	155
DCP 1	.010	4.344	2.262	350	0.309	10	0.404	316	0.313	201	0.135	96	0.062	300	0.031	97	0.028	15~	0.004	309
DCP 2	.025	4.136	1.765	6	0.758	357	0.348	273	0.197	204	0.140	152	0.108	77	0.077	14	0.037	329	0.056	273
DCP 3	.100	2.504	1.188	32	0.489	319	0.178	198	0.067	120	0.037	78	0.082	28	0.086	290	0.061	191	0.011	88
DCP 4	.150	1.847	0.882	24	0.272	285	0.113	141	0.043	93	0.044	15	0.021	280	0.020	233	0.029	163	0.021	88
DCP 5	.200	1.555	0.879	21	0.172	260	0.041	165	0.092	94	0.048	334	0.028	329	0.039	232	0.039	159	0.031	77
DCP 6	.250	1.385	0.824	19	0.184	239	0.071	103	0.049	79	0.048	319	0.016	254	0.037	199	0.022	119	0.023	38
DCP 7	.300	1.277	0.755	13	0.142	198	0.033	126	0.071	49	0.045	313	0.041	223	0.026	119	0.007	94	0.006	29
DCP 8	.400	0.570	0.614	12	0.144	177	0.045	68	0.045	1	0.039	245	0.033	146	0.016	69	0.008	339	0.010	276
DCP 9	.500	0.650	0.432	5	0.131	133	0.034	80	0.049	319	0.026	228	0.029	108	0.014	347	0.014	266	0.010	152
DCP10	.600	0.547	0.370	11	0.122	142	0.055	43	0.047	267	0.029	188	0.034	52	0.014	259	0.031	234	0.027	49
DCP11	.830	0.426	0.091	1	0.092	90	0.033	7	0.016	325	0.022	134	0.026	58	0.067	292	0.087	135	0.085	324
DCP12	.878	0.288	0.126	340	0.080	105	0.035	24	0.054	230	0.041	70	0.012	270	0.030	249	0.033	88	0.022	318

FORCED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL (REFLEX TE)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	86.21	0.420	14.71	5.79		5325.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.330	436.2	735.5	0.48E 07	0.00090	1.771	20.46

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.143	0.621	17	0.017	246	0.016	84	0.020	263	0.008	94	0.011	192	0.002	242	0.012	359	0.013	215
CM		-0.065	0.079	138	0.050	353	0.021	252	0.019	161	0.031	298	0.033	349	0.003	114	0.005	170	0.005	28
DCP 1	.010	3.910	1.255	40	1.175	37	0.537	319	0.060	271	0.236	280	0.234	157	0.155	29	0.094	244	0.076	89
DCP 2	.025	3.929	1.476	42	0.897	21	0.389	332	0.254	261	0.081	212	0.037	270	0.073	218	0.100	150	0.042	69
DCP 3	.100	2.427	1.419	50	0.450	333	0.170	236	0.148	221	0.073	169	0.094	121	0.060	49	0.041	9	0.028	287
DCP 4	.150	1.835	1.091	37	0.297	291	0.057	231	0.089	197	0.066	145	0.049	56	0.015	96	0.036	344	0.018	295
DCP 5	.200	1.547	1.052	30	0.149	274	0.111	228	0.078	136	0.069	97	0.050	349	0.009	281	0.016	351	0.037	272
DCP 6	.250	1.452	1.073	26	0.148	262	0.128	216	0.068	138	0.097	86	0.057	337	0.018	261	0.017	335	0.028	242
DCP 7	.300	1.348	0.926	19	0.128	250	0.156	138	0.085	107	0.087	43	0.052	304	0.029	196	0.036	322	0.041	190
DCP 8	.400	1.098	0.806	9	0.114	219	0.152	157	0.064	87	0.093	14	0.075	280	0.050	184	0.009	90	0.022	150
DCP 9	.500	0.812	0.629	356	0.149	183	0.133	115	0.057	11	0.039	286	0.043	231	0.023	118	0.010	1	0.036	324
DCP10	.600	0.687	0.523	356	0.132	182	0.126	172	0.065	346	0.033	293	0.074	193	0.027	31	0.025	36	0.019	243
DCP11	.830	0.594	0.291	314	0.185	149	0.110	14	0.064	275	0.035	163	0.043	88	0.028	291	0.026	326	0.040	198
DCP12	.878	0.440	0.253	322	0.169	163	0.122	38	0.034	264	0.045	141	0.033	63	0.031	285	0.016	346	0.011	221

FORCED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL (REFLEX TE)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	86.21	0.630	17.12	5.56		5326.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.330	436.1	739.7	0.68E 07	0.00096	1.920	22.99

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.252	0.606	37	0.097	305	0.051	162	0.014	57	0.030	339	0.013	232	0.002	300	0.007	339	0.006	245
CM		-0.086	0.112	150	0.054	52	0.028	312	0.037	290	0.013	145	0.008	9	0.001	228	0.002	37	0.006	286
DCP 1	.010	4.140	1.371	93	1.156	55	0.164	60	0.224	18	0.036	217	0.089	6	0.126	239	0.098	119	0.131	314
DCP 2	.025	3.076	1.645	97	1.063	52	0.226	45	0.233	32	0.115	359	0.118	15	0.076	329	0.060	39	0.099	333
DCP 3	.100	2.537	1.413	79	0.437	13	0.168	2	0.130	310	0.155	300	0.086	225	0.060	329	0.089	254	0.075	208
DCP 4	.150	1.946	1.050	55	0.230	336	0.125	317	0.073	275	0.072	239	0.055	284	0.085	200	0.039	138	0.010	285
DCP 5	.200	1.478	0.903	69	0.173	363	0.175	284	0.063	228	0.085	261	0.064	183	0.021	145	0.018	135	0.011	39
DCP 6	.250	1.603	0.988	39	0.276	317	0.181	265	0.037	248	0.091	183	0.028	34	0.036	158	0.070	54	0.038	258
DCP 7	.300	1.473	0.924	34	0.195	326	0.215	250	0.053	214	0.078	184	0.060	110	0.036	124	0.051	63	0.039	250
DCP 8	.400	1.243	0.811	21	0.223	331	0.237	138	0.065	198	0.084	113	0.065	347	0.064	82	0.050	313	0.074	167
DCP 9	.500	0.947	0.724	11	0.267	267	0.186	175	0.053	160	0.120	72	0.065	324	0.016	17	0.027	230	0.016	247
DCP10	.600	0.831	0.603	6	0.251	258	0.176	167	0.078	115	0.123	11	0.051	243	0.029	310	0.017	230	0.031	217
DCP11	.830	0.647	0.342	365	0.235	214	0.161	83	0.056	29	0.108	313	0.083	152	0.025	296	0.014	232	0.046	87
DCP12	.878	0.532	0.332	364	0.229	210	0.131	76	0.035	11	0.080	283	0.030	190	0.043	119	0.026	336	0.019	5

FORCED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL (REFLEX TE)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	85.67	0.630	24.51	5.52		5326.6	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.327	437.0	738.8	0.68E 07	-0.00109	1.577	28.82

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.137	0.416	59	0.117	322	0.034	262	0.020	254	0.004	123	0.010	35	0.004	6	0.010	88	0.015	194
CM		-0.155	0.081	220	0.035	114	0.035	58	0.016	18	0.003	210	0.002	232	0.002	97	0.001	318	0.005	333
DCP 1	.010	3.471	1.024	152	0.572	82	0.438	129	0.226	55	0.116	69	0.130	31	0.081	8	0.032	11	0.061	336
DCP 2	.025	2.832	0.904	161	0.157	28	0.132	172	0.088	33	0.060	164	0.061	74	0.036	64	0.061	132	0.066	132
DCP 3	.100	1.529	0.350	50	0.160	368	0.068	294	0.051	285	0.021	238	0.012	258	0.006	45	0.024	72	0.017	46
DCP 4	.150	1.375	0.374	43	0.126	350	0.077	307	0.067	276	0.029	245	0.015	256	0.018	146	0.033	135	0.025	67
DCP 5	.200	1.283	0.387	55	0.110	335	0.057	282	0.064	252	0.023	213	0.005	10	0.012	351	0.010	235	0.039	22
DCP 6	.250	1.374	0.432	66	0.133	363	0.057	232	0.050	280	0.022	229	0.007	28	0.016	126	0.028	78	0.020	39
DCP 7	.300	1.269	0.426	66	0.123	336	0.076	271	0.061	245	0.015	214	0.039	72	0.016	329	0.014	129	0.016	37
DCP 8	.400	1.104	0.450	66	0.161	328	0.060	256	0.053	267	0.018	154	0.007	30	0.013	66	0.014	3	0.003	294
DCP 9	.500	0.976	0.403	65	0.131	310	0.072	224	0.026	252	0.021	115	0.017	10	0.006	280	0.007	187	0.006	243
DCP10	.600	0.852	0.444	64	0.174	303	0.036	229	0.060	230	0.015	63	0.039	24	0.009	331	0.007	58	0.033	121
DCP11	.830	0.676	0.277	66	0.157	236	0.012	129	0.022	150	0.010	39	0.016	63	0.010	247	0.030	122	0.039	135
DCP12	.878	0.735	0.297	68	0.131	296	0.026	233	0.027	150	0.015	329	0.006	10	0.013	27	0.017	286	0.019	147

FORCED VERTICAL TRANSLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.34	0.200	9.90		0.305	3085.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.121	224.9	202.2	0.26E 07	-0.00522	0.996	9.90

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		0.819	0.168 262	0.005 16	0.011 288	0.003 296	0.007 203	0.005 191	0.002 103	0.001 149	0.005 58
CM		-0.013	0.001 232	0.003 290	0.003 311	0.002 218	0.002 221	0.001 191	0.002 116	0.002 79	0.001 44
DCP 1	.010	5.106	1.217 254	0.040 88	0.010 11	0.000 35	0.012 303	0.009 168	0.013 327	0.012 37	0.004 110
DCP 2	.025	3.128	0.938 250	0.024 151	0.007 296	0.005 41	0.011 102	0.013 271	0.017 72	0.009 204	0.013 357
DCP 3	.050	1.735	0.461 287	0.138 316	0.161 294	0.088 237	0.117 208	0.067 159	0.083 123	0.046 82	0.066 55
DCP 4	.150	1.575	0.313 256	0.016 63	0.007 285	0.016 32	0.004 243	0.005 62	0.007 354	0.006 85	0.009 34
DCP 5	.200	1.554	0.249 254	0.007 143	0.002 8	0.007 36	0.004 250	0.006 299	0.003 240	0.002 199	0.004 168
DCP 6	.250	1.316	0.211 258	0.011 55	0.004 255	0.012 33	0.003 179	0.002 36	0.007 357	0.006 119	0.007 3
DCP 7	.300	1.009	0.194 255	0.009 166	0.001 14	0.005 18	0.001 195	0.004 222	0.006 318	0.007 280	0.006 177
DCP 8	.500	0.573	0.107 261	0.010 161	0.003 288	0.004 20	0.002 358	0.005 270	0.003 283	0.003 193	0.004 216
DCP 9	.695	0.237	0.073 269	0.014 49	0.002 95	0.002 243	0.004 68	0.008 221	0.007 277	0.004 253	0.007 23
DCP 10	.800	0.230	0.032 280	0.020 124	0.011 173	0.009 31	0.011 131	0.003 223	0.006 357	0.012 242	0.011 217
DCP 11	.878	0.178	0.043 269	0.014 46	0.001 34	0.008 50	0.004 51	0.002 134	0.003 210	0.005 329	0.005 41
DCP 12	.953	0.210	0.008 22	0.001 12	0.008 193	0.007 273	0.009 278	0.003 288	0.007 309	0.008 198	0.007 190

FORCED VERTICAL TRANSLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.37	0.200	12.29		0.305	3085.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.121	225.1	201.8	0.26E 07	-0.00443	1.113	12.29

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		0.964	0.143 270	0.003 317	0.007 266	0.008 250	0.004 224	0.001 158	0.006 134	0.009 171	0.004 32
CM		-0.004	0.003 211	0.003 293	0.004 301	0.000 179	0.002 196	0.000 129	0.001 75	0.003 14	0.001 52
DCP 1	.010	6.398	1.124 256	0.040 149	0.011 100	0.019 298	0.008 338	0.006 42	0.004 111	0.009 260	0.003 208
DCP 2	.025	4.012	0.794 254	0.037 169	0.007 51	0.013 284	0.007 176	0.016 280	0.009 301	0.010 29	0.009 138
DCP 3	.050	2.578	0.405 294	0.150 308	0.146 291	0.094 223	0.098 208	0.047 145	0.065 120	0.031 95	0.055 34
DCP 4	.150	1.737	0.304 258	0.013 107	0.008 280	0.010 333	0.008 9	0.001 296	0.006 103	0.007 114	0.002 65
DCP 5	.200	1.712	0.217 261	0.012 103	0.005 244	0.003 345	0.011 182	0.008 313	0.007 125	0.006 155	0.006 96
DCP 6	.250	1.466	0.187 264	0.014 129	0.004 231	0.011 332	0.009 18	0.007 31	0.011 98	0.005 173	0.004 330
DCP 7	.300	1.120	0.161 263	0.005 129	0.004 207	0.004 333	0.005 200	0.006 303	0.003 229	0.011 182	0.002 3
DCP 8	.500	0.558	0.074 286	0.008 131	0.009 211	0.005 275	0.006 261	0.006 345	0.003 266	0.014 197	0.006 123
DCP 9	.695	0.284	0.051 290	0.012 168	0.011 145	0.005 20	0.015 49	0.008 161	0.011 115	0.015 237	0.011 311
DCP 10	.800	0.272	0.035 277	0.016 85	0.013 105	0.017 233	0.013 303	0.006 251	0.011 249	0.017 152	0.004 48
DCP 11	.878	0.224	0.047 260	0.004 358	0.013 106	0.005 317	0.008 42	0.004 86	0.001 244	0.002 232	0.005 246
DCP 12	.953	0.306	0.023 307	0.015 344	0.003 358	0.011 177	0.003 265	0.002 351	0.006 244	0.006 132	0.005 167

FORCED VERTICAL TRANSLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.37	0.200	14.62		0.305	3385.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.122	224.3	201.2	0.26E 07	-0.00576	1.293	14.62

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.889	0.306	322	0.112	123	0.077	250	0.045	31	0.039	193	0.023	16	0.025	143	0.017	309	0.003	72
CM		-0.073	0.067	47	0.039	219	0.031	13	0.028	180	0.016	353	0.012	156	0.009	338	0.007	125	0.004	357
DCP 1	.010	4.611	2.310	25	1.291	202	0.549	30	0.280	235	0.185	80	0.091	304	0.133	109	0.085	340	0.034	114
DCP 2	.025	2.556	1.757	6	0.709	188	0.244	15	0.152	226	0.178	61	0.091	244	0.061	61	0.052	238	0.019	151
DCP 3	.050	1.586	1.367	7	0.394	197	0.218	330	0.175	209	0.071	170	0.054	171	0.105	100	0.029	336	0.053	41
DCP 4	.150	1.638	0.649	336	0.322	151	0.188	323	0.142	147	0.084	331	0.054	154	0.044	26	0.026	189	0.038	49
DCP 5	.200	1.487	0.550	319	0.271	125	0.183	283	0.124	106	0.075	291	0.058	109	0.035	295	0.028	63	0.029	347
DCP 6	.250	1.332	0.449	324	0.212	139	0.160	295	0.125	114	0.067	289	0.053	113	0.036	330	0.022	148	0.036	7
DCP 7	.300	1.081	0.436	301	0.209	108	0.182	255	0.134	71	0.082	253	0.085	80	0.046	257	0.020	152	0.034	317
DCP 8	.500	0.639	0.297	277	0.147	67	0.156	209	0.130	14	0.095	191	0.087	6	0.066	165	0.035	315	0.030	196
DCP 9	.695	0.460	0.221	254	0.124	56	0.128	201	0.146	359	0.100	168	0.061	341	0.049	141	0.039	318	0.038	150
DCP10	.800	0.426	0.163	249	0.120	39	0.079	188	0.097	351	0.065	148	0.052	307	0.042	136	0.046	293	0.022	129
DCP11	.878	0.411	0.129	244	0.077	52	0.058	195	0.053	337	0.039	165	0.034	310	0.034	162	0.018	335	0.019	162
DCP12	.953	0.519	0.058	220	0.060	31	0.063	168	0.046	282	0.017	100	0.038	245	0.021	48	0.020	242	0.004	51

FORCED VERTICAL TRANSLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.34	0.400	10.00		0.306	3086.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.063	434.3	738.1	0.48E 07	-0.00164	1.158	10.00

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.086	0.058	295	0.024	206	0.009	334	0.005	71	0.004	240	0.001	251	0.002	123	0.001	184	0.001	16
CM		0.006	0.001	282	0.003	256	0.003	49	0.001	223	0.001	26	0.000	177	0.001	219	0.001	67	0.000	325
DCP 1	.010	6.654	0.835	274	0.157	173	0.126	51	0.120	46	0.024	60	0.010	115	0.046	209	0.044	214	0.018	189
DCP 2	.025	4.877	0.425	266	0.476	248	0.264	82	0.033	0	0.040	40	0.104	243	0.022	74	0.018	109	0.040	350
DCP 3	.050	4.018	0.167	316	0.045	212	0.083	323	0.041	221	0.012	237	0.008	192	0.017	153	0.007	123	0.006	71
DCP 4	.150	1.721	0.086	288	0.041	195	0.017	346	0.006	131	0.005	259	0.002	77	0.001	341	0.001	59	0.001	243
DCP 5	.200	1.533	0.074	293	0.037	179	0.021	311	0.015	103	0.011	279	0.008	50	0.001	200	0.003	324	0.002	61
DCP 6	.250	1.271	0.056	296	0.031	205	0.011	332	0.005	88	0.006	255	0.001	316	0.001	101	0.000	163	0.002	302
DCP 7	.300	1.096	0.054	295	0.026	176	0.018	290	0.018	85	0.012	254	0.014	68	0.006	234	0.006	53	0.005	237
DCP 8	.400	0.817	0.027	316	0.021	196	0.007	304	0.007	64	0.005	231	0.003	327	0.003	81	0.001	276	0.003	3
DCP 9	.500	0.647	0.021	327	0.017	186	0.009	284	0.008	66	0.006	234	0.004	81	0.002	124	0.002	16	0.001	180
DCP10	.695	0.542	0.019	320	0.006	165	0.013	243	0.007	76	0.006	224	0.003	356	0.003	356	0.004	208	0.002	150
DCP11	.800	0.209	0.019	296	0.006	131	0.008	253	0.006	8	0.005	197	0.008	234	0.003	132	0.003	203	0.002	198
DCP12	.878	0.159	0.029	272	0.008	66	0.005	199	0.002	24	0.002	172	0.003	292	0.004	51	0.004	245	0.003	28
DCP13	.953	0.205	0.037	262	0.009	74	0.005	185	0.008	359	0.004	88	0.003	249	0.006	66	0.003	257	0.002	59

FORCED VERTICAL TRANSLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.47	0.400	12.31		0.308	3086.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.063	434.1	736.0	0.48E 07	0.00174	1.132	12.31

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.996	0.116	29	0.013	259	0.009	175	0.015	216	0.005	75	0.006	136	0.006	158	0.003	164	0.005	320
CM		-0.075	0.044	73	0.007	27	0.004	219	0.002	294	0.003	202	0.003	37	0.000	173	0.001	315	0.003	127
DCP 1	.010	5.136	1.545	54	0.138	19	0.021	220	0.017	334	0.022	177	0.079	171	0.082	99	0.094	232	0.024	105
DCP 2	.025	2.760	1.039	84	0.095	82	0.168	232	0.089	213	0.074	165	0.025	340	0.051	146	0.026	150	0.047	96
DCP 3	.050	2.930	0.825	53	0.090	6	0.054	265	0.039	223	0.027	126	0.068	107	0.027	156	0.020	265	0.030	122
DCP 4	.150	1.338	0.309	39	0.010	351	0.036	176	0.031	239	0.003	0	0.023	74	0.001	197	0.010	120	0.003	157
DCP 5	.200	1.216	0.257	36	0.048	292	0.046	170	0.017	193	0.005	280	0.014	35	0.006	184	0.010	108	0.005	328
DCP 6	.250	1.113	0.187	25	0.024	245	0.031	160	0.038	236	0.008	254	0.018	38	0.012	239	0.016	50	0.004	336
DCP 7	.300	1.019	0.166	18	0.041	270	0.043	158	0.020	217	0.025	126	0.008	322	0.009	186	0.011	332	0.022	268
DCP 8	.400	0.795	0.086	344	0.043	253	0.021	121	0.016	213	0.005	48	0.002	190	0.013	280	0.008	54	0.015	25
DCP 9	.500	0.758	0.091	307	0.028	232	0.017	86	0.013	237	0.015	1	0.017	256	0.010	162	0.007	115	0.010	297
DCP10	.695	0.762	0.127	268	0.018	162	0.012	16	0.024	237	0.004	51	0.004	129	0.009	93	0.012	293	0.011	293
DCP11	.800	0.425	0.098	250	0.026	210	0.013	32	0.025	90	0.012	35	0.035	172	0.010	12	0.003	22	0.017	321
DCP12	.878	0.386	0.099	246	0.031	216	0.012	314	0.029	88	0.021	20	0.009	193	0.009	243	0.011	77	0.008	288
DCP13	.953	0.425	0.076	259	0.012	187	0.012	351	0.003	227	0.009	124	0.006	293	0.011	152	0.012	222	0.011	326

FORCED VERTICAL TRANSLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.53	0.400	14.62		0.308	3086.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.064	434.3	734.3	0.48E 07	0.00112	0.961	14.62

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.844	0.060	36	0.009	67	0.014	213	0.026	222	0.013	197	0.007	196	0.006	121	0.009	342	0.002	229
CM		-0.122	0.011	153	0.001	262	0.003	321	0.005	22	0.001	326	0.001	12	0.000	197	0.002	103	0.000	12
DCP 1	.010	3.262	0.455	93	0.096	148	0.040	224	0.032	305	0.065	43	0.033	10	0.028	139	0.039	65	0.017	175
DCP 2	.025	1.670	0.164	66	0.043	2	0.024	305	0.009	309	0.034	225	0.016	222	0.005	145	0.040	9	0.032	354
DCP 3	.050	1.913	0.134	42	0.016	344	0.052	258	0.050	225	0.050	206	0.020	173	0.023	125	0.020	13	0.008	346
DCP 4	.150	0.961	0.076	57	0.018	120	0.025	228	0.029	235	0.018	207	0.008	202	0.007	109	0.015	336	0.009	257
DCP 5	.200	0.880	0.064	52	0.022	36	0.018	224	0.029	232	0.021	229	0.014	132	0.013	145	0.010	26	0.006	215
DCP 6	.250	0.855	0.062	54	0.013	93	0.023	235	0.035	238	0.023	209	0.012	209	0.006	97	0.015	356	0.008	170
DCP 7	.300	0.800	0.076	50	0.023	60	0.027	227	0.040	239	0.033	202	0.015	196	0.010	153	0.008	3	0.009	171
DCP 8	.400	0.735	0.088	40	0.013	42	0.014	163	0.035	223	0.010	226	0.011	230	0.008	89	0.012	331	0.010	185
DCP 9	.500	0.739	0.067	34	0.010	59	0.017	164	0.031	219	0.016	189	0.006	214	0.011	149	0.013	8	0.001	325
DCP10	.695	0.846	0.054	354	0.010	99	0.012	179	0.027	187	0.008	144	0.008	180	0.003	49	0.005	359	0.006	284
DCP11	.800	0.555	0.057	344	0.012	139	0.005	90	0.019	228	0.002	200	0.003	89	0.004	78	0.013	298	0.002	104
DCP12	.878	0.525	0.042	329	0.009	314	0.015	157	0.017	206	0.012	164	0.002	53	0.004	338	0.020	245	0.005	121
DCP13	.953	0.508	0.015	306	0.005	301	0.005	71	0.009	183	0.006	90	0.003	251	0.005	326	0.014	290	0.005	346

FORCED VERTICAL TRANSLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.39	0.600	9.92		0.308	3089.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.044	628.8	1433.9	0.63E 07	-0.00017	0.963	9.92

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		0.929	0.018 342	0.004 301	0.001 135	0.001 348	0.008 153	0.005 149	0.002 28	0.007 204	0.000 348
CM		-0.031	0.008 124	0.003 78	0.002 44	0.001 256	0.002 261	0.002 219	0.001 116	0.002 358	0.001 341
DCP 1	.010	3.456	0.021 284	0.004 280	0.005 101	0.004 209	0.002 239	0.000 85	0.006 74	0.007 116	0.003 159
DCP 2	.025	3.884	0.070 250	0.003 78	0.017 53	0.014 261	0.033 189	0.028 156	0.022 94	0.009 354	0.005 55
DCP 3	.150	1.412	0.106 72	0.025 80	0.020 91	0.007 271	0.023 224	0.018 258	0.005 109	0.015 193	0.018 348
DCP 4	.200	1.241	0.018 95	0.015 61	0.013 32	0.017 313	0.015 229	0.022 183	0.012 101	0.010 271	0.007 285
DCP 5	.250	1.042	0.044 50	0.009 22	0.008 88	0.003 346	0.016 151	0.014 196	0.001 59	0.006 177	0.013 324
DCP 6	.300	0.939	0.035 47	0.011 321	0.009 40	0.007 286	0.013 221	0.011 163	0.010 60	0.014 238	0.002 291
DCP 7	.400	0.619	0.035 311	0.007 330	0.004 274	0.006 3	0.014 71	0.021 149	0.002 311	0.010 151	0.004 218
DCP 8	.500	0.619	0.031 14	0.014 297	0.017 279	0.013 96	0.015 120	0.011 142	0.005 271	0.018 230	0.009 129
DCP 9	.695	0.445	0.040 322	0.015 273	0.014 168	0.004 250	0.016 126	0.016 359	0.014 304	0.007 234	0.002 282
DCP10	.800	0.389	0.046 282	0.010 223	0.006 7	0.002 5	0.011 68	0.019 77	0.004 188	0.011 197	0.010 180
DCP11	.878	0.376	0.037 270	0.006 258	0.022 246	0.009 118	0.007 30	0.005 329	0.001 268	0.021 130	0.005 100
DCP12	.953	0.356	0.038 292	0.014 213	0.012 132	0.011 33	0.003 298	0.002 338	0.007 36	0.012 28	0.002 17

FORCED VERTICAL TRANSLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.50	0.600	12.31		0.308	3089.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.044	628.1	1430.7	0.63E 07	-0.00034	0.959	12.31

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		0.915	0.024 332	0.010 212	0.006 53	0.001 326	0.002 151	0.004 288	0.002 199	0.005 22	0.003 154
CM		-0.054	0.002 157	0.002 349	0.001 246	0.001 201	0.000 152	0.002 123	0.001 133	0.001 225	0.001 331
DCP 1	.010	3.579	0.153 271	0.010 162	0.021 65	0.003 245	0.006 0	0.003 198	0.010 156	0.008 326	0.009 89
DCP 2	.025	3.285	0.034 309	0.033 324	0.033 295	0.010 139	0.008 119	0.011 339	0.010 215	0.013 265	0.011 128
DCP 3	.150	1.417	0.063 287	0.038 249	0.026 108	0.008 320	0.012 147	0.016 152	0.016 169	0.015 62	0.012 50
DCP 4	.200	1.256	0.062 19	0.038 177	0.021 44	0.003 138	0.019 236	0.005 300	0.005 30	0.001 107	0.014 226
DCP 5	.250	1.020	0.035 10	0.017 246	0.022 118	0.010 298	0.008 71	0.015 151	0.010 119	0.010 53	0.004 68
DCP 6	.300	0.937	0.058 13	0.033 179	0.017 42	0.009 172	0.013 210	0.001 235	0.005 33	0.004 104	0.010 221
DCP 7	.400	0.615	0.032 25	0.008 250	0.015 103	0.016 311	0.012 6	0.015 236	0.006 311	0.017 343	0.011 269
DCP 8	.500	0.642	0.026 330	0.014 143	0.016 325	0.002 1	0.019 153	0.009 81	0.007 147	0.016 18	0.007 149
DCP 9	.695	0.483	0.019 304	0.006 212	0.002 153	0.006 235	0.007 23	0.023 326	0.008 251	0.004 141	0.002 80
DCP10	.800	0.476	0.014 322	0.011 219	0.008 87	0.010 92	0.001 209	0.014 258	0.010 17	0.006 331	0.008 228
DCP11	.878	0.462	0.014 2	0.008 152	0.013 32	0.012 28	0.006 34	0.015 309	0.007 260	0.014 99	0.014 72
DCP12	.953	0.405	0.020 227	0.005 182	0.006 161	0.001 5	0.017 279	0.007 160	0.003 26	0.010 246	0.011 162

FORCED VERTICAL TRANSLATION NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.37	0.600	14.63		0.306	3089.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.044	627.7	1427.2	0.63E 07	-0.00027	0.986	14.63

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.958	0.009	249	0.015	181	0.007	165	0.003	44	0.004	199	0.009	308	0.003	164	0.007	340	0.002	33
CM		-0.079	0.015	51	0.001	212	0.001	51	0.001	125	0.000	259	0.001	30	0.002	125	0.002	231	0.000	8
DCP 1	.010	3.757	0.043	49	0.030	242	0.013	99	0.032	336	0.052	220	0.020	346	0.025	293	0.026	22	0.012	311
DCP 2	.025	3.158	0.263	62	0.104	213	0.036	141	0.045	92	0.036	85	0.058	325	0.059	102	0.035	296	0.016	302
DCP 3	.150	1.374	0.044	351	0.038	128	0.023	192	0.024	261	0.022	254	0.011	287	0.016	227	0.015	301	0.010	57
DCP 4	.200	1.155	0.029	350	0.020	121	0.013	104	0.009	291	0.015	216	0.011	299	0.021	172	0.007	246	0.008	300
DCP 5	.250	1.075	0.034	329	0.038	156	0.009	99	0.011	315	0.016	199	0.009	268	0.015	169	0.006	204	0.015	88
DCP 6	.300	0.931	0.035	264	0.021	186	0.006	96	0.005	114	0.020	245	0.012	278	0.019	200	0.001	128	0.015	30
DCP 7	.400	0.682	0.025	243	0.024	164	0.006	254	0.011	61	0.009	241	0.008	301	0.007	164	0.010	307	0.014	117
DCP 8	.500	0.752	0.065	226	0.004	192	0.010	155	0.009	52	0.005	180	0.008	356	0.007	79	0.011	316	0.003	263
DCP 9	.695	0.597	0.064	220	0.011	257	0.011	252	0.000	131	0.006	138	0.010	338	0.016	303	0.019	48	0.007	135
DCP10	.800	0.535	0.041	234	0.002	113	0.008	143	0.004	304	0.013	42	0.009	195	0.018	356	0.015	18	0.008	278
DCP11	.878	0.532	0.028	246	0.016	36	0.002	155	0.009	345	0.006	330	0.007	260	0.005	309	0.011	94	0.010	336
DCP12	.953	0.486	0.010	225	0.011	164	0.003	133	0.011	200	0.007	156	0.008	214	0.013	221	0.004	237	0.003	294

FORCED VERTICAL TRANSLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	32.69	0.200	10.00		0.309	3090.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.243	226.5	202.6	0.26E 07	-0.00479	1.249	10.00

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.931	0.311	269	0.010	159	0.009	260	0.007	86	0.015	151	0.001	25	0.007	49	0.005	218	0.004	15
CM		0.005	0.019	186	0.001	259	0.002	242	0.003	233	0.002	15	0.001	157	0.001	224	0.001	68	0.000	332
DCP 1	.010	5.370	2.213	251	0.093	115	0.025	161	0.009	357	0.038	64	0.021	318	0.014	262	0.009	163	0.018	237
DCP 2	.025	3.615	1.612	254	0.057	122	0.022	36	0.023	43	0.048	50	0.004	149	0.005	230	0.012	59	0.010	131
DCP 3	.050	3.016	0.968	264	0.099	256	0.103	251	0.065	177	0.071	151	0.028	105	0.032	77	0.021	61	0.037	5
DCP 4	.150	2.047	0.577	258	0.035	114	0.014	242	0.008	3	0.019	124	0.011	282	0.001	249	0.011	186	0.005	46
DCP 5	.200	1.561	0.440	266	0.016	135	0.011	268	0.007	127	0.020	150	0.006	99	0.007	43	0.013	236	0.004	356
DCP 6	.250	1.255	0.393	267	0.028	136	0.012	250	0.009	11	0.015	140	0.011	262	0.001	59	0.016	196	0.006	29
DCP 7	.300	0.946	0.339	271	0.016	185	0.011	282	0.004	41	0.017	157	0.006	95	0.008	30	0.009	224	0.006	352
DCP 8	.400	0.663	0.242	279	0.020	120	0.008	292	0.013	31	0.016	149	0.012	281	0.005	21	0.016	204	0.005	51
DCP 9	.500	0.491	0.188	293	0.014	164	0.007	305	0.007	80	0.022	157	0.007	77	0.012	14	0.006	259	0.005	53
DCP10	.695	0.351	0.126	293	0.004	71	0.009	101	0.013	56	0.012	221	0.003	319	0.008	73	0.011	263	0.008	239
DCP11	.800	0.214	0.099	306	0.008	105	0.004	246	0.017	69	0.007	155	0.004	328	0.008	33	0.005	154	0.011	45
DCP12	.876	0.145	0.094	288	0.005	8	0.008	65	0.007	67	0.005	181	0.003	333	0.006	105	0.002	316	0.003	267
DCP13	.953	0.263	0.058	321	0.002	301	0.007	15	0.006	102	0.008	105	0.004	87	0.006	49	0.003	45	0.004	85

FORCED VERTICAL TRANSLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	32.47	0.200	12.36		0.306	3090.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.242	224.3	201.3	0.26E 07	-0.00690	1.357	12.36

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.954	0.447	264	0.071	290	0.036	343	0.028	85	0.021	143	0.001	196	0.011	18	0.005	163	0.004	218
CM		-0.028	0.040	347	0.030	63	0.018	152	0.013	230	0.007	345	0.003	94	0.003	212	0.003	11	0.002	65
DCP 1	.010	4.767	2.351	298	1.000	126	0.407	269	0.223	80	0.114	251	0.131	43	0.104	210	0.081	14	0.066	154
DCP 2	.025	3.369	1.767	292	0.494	128	0.113	246	0.062	130	0.061	290	0.079	31	0.013	296	0.030	17	0.048	130
DCP 3	.050	2.533	1.362	298	0.209	85	0.188	217	0.058	131	0.137	145	0.050	295	0.101	35	0.005	218	0.045	326
DCP 4	.150	2.098	1.053	262	0.321	5	0.125	128	0.048	309	0.090	84	0.051	202	0.033	334	0.029	124	.019	240
DCP 5	.200	1.645	0.859	259	0.307	342	0.100	88	0.037	301	0.063	78	0.051	177	0.036	347	0.037	140	.031	226
DCP 6	.250	1.323	0.778	254	0.276	323	0.109	77	0.073	231	0.095	24	0.078	135	0.051	275	0.051	51	.047	158
DCP 7	.300	1.022	0.634	252	0.285	309	0.149	46	0.056	186	0.043	352	0.046	121	0.031	281	0.031	44	.028	149
DCP 8	.400	0.734	0.477	245	0.229	282	0.094	14	0.084	161	0.055	285	0.055	66	0.063	171	0.045	296	0.049	64
DCP 9	.500	0.502	0.295	248	0.213	263	0.140	343	0.082	95	0.069	208	0.034	346	0.026	102	0.034	235	0.023	342
DCP10	.695	0.411	0.168	225	0.117	218	0.073	303	0.068	41	0.047	143	0.019	232	0.035	22	0.035	157	0.030	223
DCP11	.800	0.332	0.118	206	0.095	217	0.063	326	0.071	57	0.037	149	0.035	306	0.028	47	0.016	166	0.015	262
DCP12	.876	0.274	0.094	192	0.046	186	0.053	298	0.057	21	0.033	117	0.026	247	0.025	339	0.010	31	0.010	229
DCP13	.953	0.419	0.022	111	0.044	190	0.039	280	0.034	17	0.026	144	0.021	226	0.016	294	0.003	317	0.002	271

FORCED VERTICAL TRANSLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	31.75	0.200	14.67		0.307	3090.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.237	224.2	200.6	0.26E 07	-0.00813	1.531	14.67

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.995	0.532	285	0.114	19	0.074	104	0.035	170	0.008	25	0.017	80	0.016	274	0.015	116	0.010	251
CM		-0.074	0.103	29	0.070	146	0.041	261	0.006	8	0.009	248	0.006	297	0.004	79	0.001	343	0.002	68
DCP 1	.010	3.935	2.775	359	1.485	183	0.359	49	0.411	259	0.268	69	0.131	310	0.160	170	0.059	6	0.048	244
DCP 2	.025	2.894	1.811	332	0.464	147	0.366	46	0.386	202	0.267	324	0.057	130	0.019	258	0.019	157	0.010	15
DCP 3	.050	2.280	1.706	335	0.569	157	0.153	300	0.232	173	0.063	2	0.049	152	0.058	30	0.023	151	0.030	356
DCP 4	.150	1.878	1.132	309	0.493	111	0.237	291	0.192	124	0.122	319	0.110	128	0.045	304	0.059	150	0.029	317
DCP 5	.200	1.570	1.029	291	0.370	56	0.189	232	0.110	59	0.085	283	0.092	56	0.045	279	0.058	96	0.0[illegible]6	234
DCP 6	.250	1.258	0.914	295	0.359	81	0.210	248	0.142	87	0.143	267	0.126	76	0.087	278	0.111	135	0.0[illegible]3	254
DCP 7	.300	1.124	0.926	275	0.382	25	0.264	177	0.137	1	0.144	202	0.166	352	0.071	197	0.055	9	0.0[illegible]1	140
DCP 8	.400	0.814	0.769	266	0.391	28	0.252	176	0.092	359	0.162	184	0.111	341	0.059	195	0.078	16	0.033	153
DCP 9	.500	0.738	0.667	243	0.421	333	0.308	106	0.095	268	0.116	108	0.124	240	0.073	24	0.063	185	0.0[illegible]4	333
DCP 10	.695	0.617	0.427	225	0.324	330	0.294	85	0.120	202	0.118	32	0.072	134	0.051	300	0.013	137	0.0[illegible]6	259
DCP 11	.800	0.396	0.235	220	0.171	295	0.183	38	0.081	147	0.037	350	0.068	84	0.036	201	0.008	179	0.0[illegible]7	123
DCP 12	.878	0.338	0.150	225	0.110	297	0.111	46	0.058	166	0.047	7	0.079	102	0.045	200	0.010	283	0.0[illegible]7	108
DCP 13	.953	0.563	0.078	186	0.077	263	0.118	348	0.066	78	0.005	151	0.011	37	0.008	338	0.010	83	0.0[illegible]4	117

FORCED VERTICAL TRANSLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	32.79	0.400	9.92		0.309	3091.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.126	435.3	734.4	0.48E 07	-0.00262	1.189	9.92

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.929	0.198	301	0.066	131	0.016	275	0.008	91	0.013	205	0.008	48	0.004	213	0.001	348	0.002	229
CM		-0.013	0.032	58	0.022	200	0.009	5	0.006	214	0.004	19	0.002	143	0.002	300	0.001	88	0.000	172
DCP 1	.010	5.537	0.915	320	0.670	187	0.213	357	0.071	235	0.113	140	0.091	46	0.062	274	0.006	182	0.065	174
DCP 2	.025	3.705	0.798	9	0.936	206	0.436	35	0.100	254	0.092	181	0.083	58	0.039	318	0.037	206	0.015	199
DCP 3	.050	2.894	0.491	335	0.339	180	0.170	340	0.082	190	0.030	91	0.010	310	0.017	189	0.026	63	0.023	273
DCP 4	.150	1.533	0.363	311	0.202	134	0.078	279	0.022	144	0.026	350	0.026	143	0.013	291	0.005	133	0.008	245
DCP 5	.200	1.396	0.337	305	0.187	119	0.078	266	0.039	111	0.030	307	0.028	118	0.015	299	0.007	118	0.003	274
DCP 6	.250	1.158	0.283	305	0.128	110	0.052	222	0.002	251	0.016	305	0.016	98	0.007	240	0.001	17	0.005	193
DCP 7	.300	1.027	0.279	296	0.136	98	0.064	237	0.037	74	0.034	245	0.023	59	0.014	232	0.005	8	0.001	202
DCP 8	.400	0.780	0.196	298	0.078	81	0.035	175	0.007	176	0.021	252	0.009	36	0.004	229	0.006	7	0.008	150
DCP 9	.500	0.643	0.181	286	0.079	63	0.041	197	0.028	40	0.032	192	0.015	351	0.009	158	0.007	301	0.004	89
DCP 10	.695	0.413	0.134	269	0.058	37	0.023	181	0.016	58	0.019	205	0.005	357	0.002	118	0.006	340	0.003	146
DCP 11	.800	0.263	0.121	252	0.045	8	0.011	179	0.021	39	0.019	172	0.008	328	0.013	124	0.012	211	0.010	336
DCP 12	.878	0.160	0.124	243	0.034	4	0.009	218	0.016	19	0.010	184	0.003	358	0.005	126	0.004	224	0.005	319
DCP 13	.953	0.238	0.105	237	0.027	349	0.009	222	0.013	8	0.010	133	0.006	289	0.006	84	0.001	270	0.002	297

FORCED VERTICAL TRANSLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	34.01	0.400	12.34		0.309	3391.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.131	434.9	733.4	0.48E 07	-0.00160	1.353	12.34

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.944	0.255	334	0.085	227	0.064	56	0.039	224	0.010	56	0.014	24	0.011	181	0.004	14	0.005	80
CM		-0.057	0.070	72	0.021	322	0.026	174	0.016	25	0.006	230	0.004	152	0.005	333	0.002	111	0.001	256
DCP 1	.010	4.696	1.702	49	0.671	300	0.566	180	0.202	90	0.144	10	0.094	322	0.033	176	0.042	58	0.033	272
DCP 2	.025	3.279	1.542	47	0.606	288	0.452	178	0.096	163	0.155	31	0.018	37	0.049	277	0.008	292	0.040	128
DCP 3	.050	2.532	0.948	26	0.369	245	0.200	144	0.103	34	0.073	235	0.019	88	0.010	133	0.030	49	0.036	24
DCP 4	.150	1.447	0.567	350	0.110	229	0.169	93	0.034	295	0.028	235	0.023	116	0.013	344	0.005	346	0.003	229
DCP 5	.200	1.316	0.460	342	0.147	243	0.188	78	0.079	280	0.025	161	0.026	84	0.005	273	0.004	117	0.015	199
DCP 6	.250	1.141	0.446	334	0.068	231	0.136	67	0.041	279	0.018	129	0.024	92	0.011	310	0.006	222	0.009	74
DCP 7	.300	1.016	0.385	325	0.114	230	0.157	57	0.085	256	0.019	111	0.031	63	0.021	252	0.015	91	0.016	182
DCP 8	.400	0.799	0.319	317	0.067	232	0.114	42	0.067	259	0.028	84	0.026	7	0.005	268	0.008	95	0.005	20
DCP 9	.500	0.714	0.291	298	0.076	197	0.107	9	0.069	218	0.008	50	0.031	17	0.026	188	0.008	131	0.014	83
DCP 10	.695	0.539	0.238	275	0.083	181	0.094	0	0.074	209	0.017	77	0.030	6	0.037	183	0.012	14	0.010	112
DCP 11	.800	0.427	0.212	257	0.072	151	0.079	351	0.077	187	0.034	27	0.019	267	0.025	116	0.025	282	0.007	45
DCP 12	.878	0.324	0.191	251	0.074	156	0.062	353	0.062	187	0.030	37	0.012	243	0.021	135	0.020	286	0.007	80
DCP 13	.953	0.391	0.134	241	0.061	128	0.033	336	0.019	156	0.022	26	0.014	291	0.016	68	0.008	269	0.017	331

FORCED VERTICAL TRANSLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	34.48	0.400	14.64		0.309	3091.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.133	434.3	733.2	0.48E 07	-0.00096	1.275	14.64

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.895	0.247	343	0.079	247	0.045	134	0.025	319	0.009	158	0.003	64	0.006	269	0.004	4	0.006	237
CM		-0.099	0.050	107	0.023	6	0.015	262	0.012	109	0.004	19	0.002	333	0.002	22	0.001	257	0.002	357
DCP 1	.010	3.631	1.272	57	0.608	332	0.309	258	0.157	174	0.181	120	0.116	2	0.108	318	0.075	327	0.055	248
DCP 2	.025	2.338	1.133	50	0.288	346	0.152	241	0.013	8	0.067	44	0.052	40	0.015	301	0.014	142	0.030	58
DCP 3	.050	1.921	0.573	25	0.125	316	0.094	202	0.071	108	0.040	80	0.015	348	0.039	341	0.042	309	0.047	300
DCP 4	.150	1.265	0.405	348	0.168	284	0.071	185	0.040	38	0.015	44	0.011	329	0.010	302	0.009	31	0.002	297
DCP 5	.200	1.131	0.355	349	0.160	257	0.092	160	0.047	359	0.013	304	0.004	73	0.010	99	0.005	71	0.009	301
DCP 6	.250	1.064	0.349	343	0.137	270	0.074	163	0.043	26	0.006	94	0.009	97	0.003	352	0.005	25	0.009	35
DCP 7	.300	0.951	0.327	342	0.154	244	0.088	137	0.042	336	0.015	268	0.003	176	0.007	233	0.006	193	0.024	247
DCP 8	.400	0.826	0.300	337	0.116	249	0.082	135	0.051	8	0.008	224	0.007	138	0.008	193	0.007	105	0.013	37
DCP 9	.500	0.784	0.277	320	0.107	219	0.075	99	0.046	280	0.023	184	0.007	351	0.019	217	0.002	4	0.024	176
DCP 10	.695	0.657	0.227	310	0.094	212	0.066	106	0.067	318	0.034	216	0.017	169	0.017	309	0.005	37	0.021	223
DCP 11	.800	0.530	0.181	294	0.092	165	0.053	52	0.062	248	0.013	118	0.015	82	0.016	195	0.005	32	0.017	119
DCP 12	.878	0.435	0.145	301	0.079	189	0.043	85	0.049	298	0.007	185	0.013	170	0.004	285	0.009	0	0.016	266
DCP 13	.953	0.467	0.091	269	0.044	143	0.020	45	0.026	222	0.022	109	0.008	356	0.018	149	0.011	106	0.018	32

FORCED VERTICAL TRANSLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.44	0.600	9.82		0.312	3092.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.087	643.8	1433.8	0.62E 07	-0.00035	0.976	9.82

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		0.882	0.063 337	0.016 278	0.009 171	0.014 135	0.004 238	0.006 215	0.002 328	0.001 175	0.001 19
CM		-0.031	0.028 105	0.004 35	0.002 328	0.002 255	0.002 262	0.001 358	0.001 113	0.000 8	0.000 24
DCP 1	.010	3.302	0.085 278	0.021 277	0.009 259	0.018 128	0.001 171	0.002 200	0.002 201	0.003 15	0.003 180
DCP 2	.025	3.280	0.252 88	0.215 272	0.046 87	0.060 122	0.056 277	0.023 115	0.003 267	0.002 240	0.018 54
DCP 3	.150	1.545	0.157 45	0.090 71	0.026 239	0.028 206	0.007 209	0.018 319	0.011 17	0.005 237	0.002 204
DCP 4	.200	1.308	0.075 1	0.061 70	0.029 293	0.029 192	0.016 197	0.020 265	0.008 192	0.003 7	0.003 280
DCP 5	.250	1.080	0.128 9	0.038 38	0.018 219	0.027 188	0.010 219	0.016 273	0.007 172	0.006 129	0.008 12
DCP 6	.300	0.989	0.102 342	0.022 48	0.026 248	0.023 148	0.006 192	0.025 251	0.008 137	0.010 26	0.006 260
DCP 7	.400	0.607	0.110 323	0.027 319	0.023 163	0.020 136	0.009 227	0.015 213	0.006 354	0.004 112	0.013 338
DCP 8	.500	0.545	0.115 327	0.024 257	0.023 175	0.020 77	0.006 195	0.019 187	0.008 1	0.002 29	0.002 92
DCP 9	.695	0.422	0.105 296	0.037 238	0.015 132	0.010 102	0.009 113	0.005 39	0.008 287	0.012 198	0.002 99
DCP 10	.800	0.336	0.106 273	0.019 239	0.008 118	0.010 125	0.006 26	0.005 157	0.003 288	0.004 352	0.005 179
DCP 11	.878	0.328	0.098 268	0.019 226	0.005 109	0.008 103	0.010 42	0.007 193	0.005 147	0.002 319	0.004 172
DCP 12	.953	0.358	0.050 269	0.019 203	0.007 82	0.006 21	0.005 28	0.008 126	0.002 202	0.003 87	0.003 328

FORCED VERTICAL TRANSLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.22	0.600	12.39		0.312	3092.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.086	642.0	1427.6	0.62E 07	-0.00042	0.982	12.39

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		0.896	0.065 334	0.006 182	0.007 56	0.008 290	0.006 46	0.004 161	0.004 311	0.003 171	0.008 285
CM		-0.058	0.019 115	0.005 40	0.002 87	0.001 86	0.003 188	0.001 346	0.001 64	0.001 333	0.003 43
DCP 1	.010	3.478	0.193 277	0.028 176	0.062 73	0.017 288	0.007 223	0.004 96	0.009 282	0.006 156	0.001 81
DCP 2	.025	3.084	0.265 64	0.195 49	0.101 74	0.032 286	0.050 197	0.025 191	0.005 243	0.012 261	0.023 24
DCP 3	.150	1.415	0.089 317	0.062 212	0.023 18	0.008 214	0.018 84	0.009 75	0.016 12	0.002 19	0.027 339
DCP 4	.200	1.225	0.116 359	0.054 240	0.013 243	0.024 44	0.018 53	0.007 357	0.007 40	0.011 136	0.019 347
DCP 5	.250	1.023	0.065 331	0.024 184	0.003 51	0.021 248	0.022 81	0.008 25	0.015 1	0.005 255	0.013 291
DCP 6	.300	0.938	0.101 342	0.037 241	0.024 228	0.023 44	0.019 46	0.010 292	0.004 52	0.014 113	0.013 316
DCP 7	.400	0.632	0.067 332	0.015 159	0.008 120	0.017 285	0.010 64	0.006 122	0.006 319	0.013 205	0.017 284
DCP 8	.500	0.588	0.084 313	0.020 225	0.008 301	0.018 300	0.011 353	0.006 144	0.014 302	0.003 30	0.011 226
DCP 9	.695	0.519	0.075 302	0.005 254	0.007 329	0.011 244	0.009 25	0.012 137	0.005 284	0.006 161	0.009 212
DCP 10	.800	0.448	0.072 317	0.011 200	0.004 55	0.001 310	0.014 7	0.008 260	0.010 216	0.003 165	0.017 247
DCP 11	.878	0.454	0.068 306	0.010 215	0.004 28	0.006 231	0.013 1	0.007 167	0.005 172	0.005 173	0.014 202
DCP 12	.953	0.439	0.045 275	0.010 157	0.004 138	0.001 34	0.007 345	0.005 230	0.005 209	0.003 136	0.003 255

FORCED VERTICAL TRANSLATION NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.11	0.600	14.73		0.311	3092.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.086	639.8	1420.8	0.62E 07	-0.00043	0.983	14.73

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.916	0.041	316	0.018	214	0.003	143	0.008	38	0.000	167	0.003	330	0.007	33	0.006	169	0.005	338
CM		-0.084	0.026	83	0.003	297	0.000	328	0.003	195	0.002	294	0.002	104	0.001	129	0.002	257	0.002	114
DCP 1	.010	3.468	0.185	87	0.100	283	0.040	141	0.035	321	0.055	156	0.016	297	0.017	50	0.031	257	0.031	65
DCP 2	.025	2.641	0.406	65	0.094	234	0.047	231	0.050	1[illegible]1	0.048	299	0.011	100	0.035	61	0.041	192	0.024	31
DCP 3	.150	1.447	0.066	354	0.027	208	0.019	47	0.013	320	0.011	161	0.004	24	0.015	4	0.005	224	0.011	338
DCP 4	.200	1.181	0.071	354	0.026	225	0.014	51	0.003	127	0.005	292	0.009	109	0.012	144	0.009	252	0.011	213
DCP 5	.250	1.055	0.078	328	0.036	217	0.011	85	0.010	350	0.009	121	0.007	14	0.013	3	0.009	174	0.003	97
DCP 6	.300	0.953	0.080	298	0.037	220	0.015	57	0.004	43	0.013	319	0.018	61	0.012	105	0.005	259	0.010	174
DCP 7	.400	0.692	0.074	290	0.010	218	0.005	80	0.010	69	0.012	37	0.006	182	0.013	345	0.005	154	0.003	359
DCP 8	.500	0.680	0.090	272	0.002	144	0.008	144	0.020	25	0.009	164	0.014	308	0.013	61	0.005	186	0.005	36
DCP 9	.695	0.611	0.097	267	0.020	111	0.011	142	0.025	13	0.016	60	0.011	327	0.005	329	0.015	94	0.018	326
DCP10	.800	0.514	0.071	268	0.013	217	0.009	279	0.008	75	0.010	214	0.007	266	0.004	351	0.002	147	0.009	306
DCP11	.878	0.509	0.061	268	0.015	189	0.008	293	0.006	28	0.007	178	0.007	225	0.003	303	0.003	173	0.009	255
DCP12	.953	0.504	0.043	273	0.007	141	0.005	223	0.004	320	0.005	141	0.007	232	0.006	271	0.008	99	0.005	239

FORCED VERTICAL TRANSLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	28.01	0.200	0.0		0.464	3102.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.208	224.8	202.5	0.26E 07	-0.00495	0.232	0.0

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		-0.172	0.404 269	0.015 242	0.008 273	0.005 276	0.011 230	0.002 191	0.005 187	0.004 195	0.007 155
CM		0.059	0.016 185	0.001 115	0.000 322	0.001 213	0.001 63	0.000 53	0.000 86	0.001 42	0.001 14
DCP 1	.010	-1.818	2.933 257	0.113 182	0.057 213	0.022 175	0.037 179	0.006 352	0.007 88	0.012 53	0.012 66
DCP 2	.025	0.221	2.398 257	0.092 198	0.023 180	0.020 241	0.031 154	0.011 73	0.022 93	0.006 292	0.010 148
DCP 3	.050	0.409	0.865 268	0.037 298	0.058 302	0.035 265	0.039 247	0.012 224	0.028 194	0.013 155	0.027 125
DCP 4	.150	0.081	0.753 263	0.035 222	0.025 238	0.007 318	0.021 214	0.002 12	0.001 312	0.003 190	0.004 70
DCP 5	.200	-0.096	0.602 266	0.010 227	0.009 257	0.009 250	0.007 259	0.005 108	0.011 194	0.007 198	0.013 182
DCP 6	.250	-0.264	0.562 268	0.019 239	0.017 236	0.014 281	0.014 228	0.003 211	0.007 222	0.002 279	0.003 96
DCP 7	.300	-0.332	0.484 268	0.026 241	0.007 352	0.002 290	0.008 237	0.003 164	0.007 183	0.005 172	0.009 176
DCP 8	.500	-0.221	0.262 281	0.018 258	0.003 281	0.005 243	0.012 235	0.002 124	0.009 182	0.007 156	0.009 161
DCP 9	.800	-0.193	0.109 292	0.005 262	0.007 5	0.005 18	0.008 219	0.007 197	0.005 11	0.008 242	0.004 193
DCP 10	.878	-0.374	0.109 294	0.005 238	0.023 232	0.005 25	0.006 259	0.006 300	0.008 229	0.001 258	0.004 148
DCP 11	.953	-0.086	0.047 321	0.009 55	0.004 127	0.002 340	0.002 291	0.008 359	0.002 102	0.004 53	0.003 227

FORCED VERTICAL TRANSLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	28.25	0.200	7.22		0.461	3102.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.211	223.8	202.6	0.26E 07	-0.00475	0.965	7.22

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		0.561	0.395 264	0.018 194	0.007 265	0.005 324	0.010 219	0.001 212	0.006 149	0.003 358	0.002 52
CM		0.044	0.018 172	0.001 347	0.001 220	0.001 222	0.001 90	0.001 52	0.000 14	0.001 164	0.000 202
DCP 1	.010	2.785	2.508 251	0.097 174	0.018 202	0.028 300	0.040 126	0.020 162	0.024 60	0.008 47	0.012 343
DCP 2	.025	3.968	2.230 253	0.074 187	0.025 215	0.006 27	0.023 132	0.009 282	0.018 143	0.003 289	0.021 299
DCP 3	.050	2.107	0.868 259	0.024 215	0.046 271	0.019 238	0.047 193	0.008 112	0.018 131	0.011 86	0.009 81
DCP 4	.150	1.278	0.768 257	0.035 189	0.009 236	0.021 312	0.012 200	0.006 6	0.012 163	0.004 326	0.005 309
DCP 5	.200	1.028	0.591 262	0.022 199	0.010 214	0.002 20	0.011 237	0.003 308	0.009 126	0.002 63	0.006 62
DCP 6	.250	0.700	0.538 261	0.030 205	0.007 211	0.012 303	0.014 217	0.004 71	0.014 158	0.003 352	0.004 3
DCP 7	.300	0.510	0.452 265	0.022 212	0.009 260	0.005 306	0.013 239	0.001 15	0.008 135	0.001 255	0.007 104
DCP 8	.500	0.271	0.243 281	0.019 194	0.007 325	0.008 17	0.016 248	0.005 210	0.007 177	0.004 338	0.004 82
DCP 9	.800	0.048	0.113 290	0.008 164	0.006 294	0.000 49	0.004 257	0.003 212	0.002 279	0.005 338	0.003 79
DCP 10	.878	-0.165	0.120 280	0.001 281	0.011 118	0.006 330	0.007 149	0.002 90	0.007 100	0.004 344	0.012 289
DCP 11	.953	0.081	0.095 289	0.005 111	0.002 172	0.005 104	0.001 225	0.006 290	0.004 177	0.008 26	0.001 319

FORCED VERTICAL TRANSLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	28.49	0.200	9.69		0.461	3102.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.214	222.7	199.9	0.26E 07	-0.00454	1.164	9.69

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.770	0.382	266	0.014	162	0.005	258	0.005	273	0.010	204	0.001	55	0.012	132	0.006	208	0.005	80
CM		0.038	0.018	168	0.001	230	0.002	306	0.002	153	0.002	73	0.000	211	0.002	330	0.001	30	0.001	288
DCP 1	.010	4.145	2.863	251	0.101	154	0.006	338	0.010	193	0.026	142	0.013	57	0.024	111	0.013	136	0.009	317
DCP 2	.025	5.081	2.114	252	0.088	173	0.007	353	0.032	197	0.027	150	0.009	41	0.010	61	0.014	255	0.011	9
DCP 3	.050	2.566	0.800	261	0.028	251	0.053	294	0.026	218	0.035	180	0.010	146	0.035	116	0.017	114	0.016	41
DCP 4	.150	1.649	0.765	257	0.024	142	0.017	239	0.006	338	0.019	169	0.003	277	0.013	154	0.007	253	0.001	114
DCP 5	.200	1.315	0.568	263	0.028	143	0.011	251	0.009	265	0.012	209	0.004	337	0.011	125	0.008	224	0.001	67
DCP 6	.250	0.975	0.532	264	0.018	168	0.010	246	0.004	67	0.016	194	0.003	310	0.012	150	0.007	291	0.003	135
DCP 7	.300	0.730	0.432	266	0.027	172	0.006	202	0.007	301	0.006	220	0.002	82	0.010	125	0.008	209	0.003	36
DCP 8	.500	0.399	0.242	286	0.020	155	0.003	322	0.008	251	0.009	224	0.001	33	0.014	127	0.009	222	0.008	90
DCP 9	.800	0.122	0.118	291	0.007	51	0.007	137	0.010	330	0.007	228	0.006	55	0.008	140	0.005	202	0.006	131
DCP 10	.878	-0.064	0.135	274	0.012	343	0.003	292	0.001	113	0.014	256	0.007	248	0.006	178	0.005	207	0.005	72
DCP 11	.952	0.138	0.064	281	0.005	240	0.012	136	0.008	349	0.008	215	0.003	52	0.008	161	0.005	150	0.006	72

FORCED VERTICAL TRANSLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	27.86	0.200	12.15		0.463	3102.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.209	222.8	197.4	0.25E 07	-0.00654	1.508	12.15

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.890	0.548	279	0.134	26	0.085	131	0.029	228	0.011	246	0.006	300	0.008	99	0.004	170	0.006	295
CM		-0.009	0.058	36	0.054	142	0.034	258	0.017	13	0.008	137	0.004	3	0.003	125	0.003	281	0.002	86
DCP 1	.010	2.982	2.458	321	1.535	158	0.458	312	0.168	181	0.241	23	0.190	171	0.119	8	0.143	207	0.143	14
DCP 2	.025	4.649	1.787	314	0.837	172	0.225	345	0.139	193	0.135	345	0.121	117	0.115	243	0.063	17	0.030	194
DCP 3	.050	2.479	1.010	312	0.355	130	0.202	249	0.033	109	0.064	222	0.070	57	0.042	143	0.010	39	0.018	292
DCP 4	.150	1.753	1.150	286	0.481	75	0.255	211	0.121	39	0.128	203	0.087	14	0.063	169	0.036	330	0.012	175
DCP 5	.200	1.443	0.988	285	0.369	65	0.181	208	0.089	42	0.093	225	0.063	30	0.060	211	0.058	2	0.031	144
DCP 6	.250	1.062	0.879	282	0.343	44	0.220	170	0.098	339	0.109	154	0.079	312	0.095	109	0.073	255	0.034	49
DCP 7	.300	0.941	0.812	273	0.361	29	0.243	159	0.119	321	0.079	149	0.080	315	0.083	125	0.074	275	0.047	71
DCP 8	.500	0.645	0.506	259	0.333	344	0.244	104	0.134	236	0.061	26	0.073	227	0.088	8	0.088	136	0.059	272
DCP 9	.800	0.265	0.217	239	0.151	312	0.119	62	0.091	181	0.070	306	0.039	120	0.045	249	0.039	15	0.015	134
DCP 10	.878	0.069	0.173	230	0.082	276	0.070	19	0.077	123	0.045	225	0.026	38	0.036	155	0.029	247	0.020	8
DCP 11	.953	0.218	0.081	239	0.058	271	0.055	21	0.046	123	0.026	261	0.015	97	0.022	210	0.010	325	0.000	104

FORCED VERTICAL TRANSLATION NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	28.74	0.400	0.0		0.462	3106.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.112	429.4	719.3	0.47E 07	-0.00365	0.103	0.0

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		-0.212	0.308 260	0.012 182	0.003 232	0.002 278	0.004 195	0.002 344	0.003 145	0.002 6	0.002 195
CM		0.040	0.005 208	0.000 112	0.000 297	0.000 251	0.001 60	0.000 223	0.000 37	0.001 218	0.000 70
DCP 1	.010	-0.935	1.877 256	0.112 159	0.019 185	0.006 230	0.024 131	0.014 331	0.013 107	0.007 290	0.003 81
DCP 2	.025	-0.318	1.615 255	0.090 167	0.014 169	0.011 235	0.019 120	0.008 337	0.011 92	0.007 257	0.005 162
DCP 3	.050	-0.110	0.975 261	0.021 188	0.023 298	0.017 263	0.020 210	0.008 271	0.015 153	0.005 238	0.009 107
DCP 4	.150	-0.208	0.535 259	0.028 191	0.011 212	0.003 355	0.003 164	0.002 319	0.006 149	0.003 323	0.003 189
DCP 5	.200	-0.219	0.457 260	0.019 164	0.005 234	0.005 241	0.005 154	0.000 100	0.004 115	0.002 20	0.003 164
DCP 6	.250	-0.273	0.404 261	0.017 181	0.003 188	0.003 327	0.007 201	0.002 359	0.002 143	0.003 332	0.003 223
DCP 7	.300	-0.241	0.353 260	0.014 195	0.002 203	0.002 229	0.006 185	0.002 32	0.003 153	0.004 29	0.004 198
DCP 8	.400	-0.376	0.260 261	0.011 131	0.003 190	0.002 319	0.004 217	0.001 333	0.002 180	0.003 355	0.003 266
DCP 9	.500	-0.216	0.195 264	0.005 195	0.003 242	0.001 290	0.004 203	0.002 32	0.002 161	0.004 27	0.003 204
DCP 10	.600	-0.143	0.125 258	0.007 212	0.001 94	0.003 21	0.002 210	0.002 346	0.000 124	0.002 7	0.001 316
DCP 11	.800	-0.223	0.082 269	0.003 169	0.001 128	0.002 127	0.004 210	0.002 26	0.002 149	0.004 35	0.001 215
DCP 12	.878	-0.186	0.063 275	0.003 223	0.002 175	0.002 358	0.002 257	0.002 13	0.001 142	0.002 43	0.001 234
DCP 13	.953	-0.051	0.038 295	0.003 156	0.001 287	0.003 215	0.002 236	0.000 70	0.000 224	0.002 54	0.003 231

FORCED VERTICAL TRANSLATION NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	28.99	0.400	7.24		0.460	3106.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.113	426.9	716.6	0.47E 07	-0.00331	0.976	7.24

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		0.694	0.288 255	0.019 176	0.005 284	0.002 265	0.006 168	0.001 0	0.002 37	0.002 175	0.002 344
CM		0.044	0.005 205	0.000 86	0.001 92	0.000 81	0.000 155	0.000 313	0.000 250	0.001 118	0.000 336
DCP 1	.010	4.426	2.209 251	0.092 138	0.010 38	0.030 29	0.097 176	0.056 350	0.020 335	0.068 152	0.065 320
DCP 2	.025	4.144	1.656 251	0.130 109	0.115 224	0.060 36	0.068 174	0.023 339	0.036 342	0.038 157	0.033 329
DCP 3	.050	2.845	0.868 254	0.059 203	0.026 350	0.025 233	0.018 154	0.009 166	0.008 112	0.011 133	0.008 43
DCP 4	.150	1.370	0.497 253	0.037 177	0.005 352	0.007 239	0.007 137	0.002 305	0.002 316	0.003 205	0.002 335
DCP 5	.200	1.126	0.406 255	0.032 184	0.003 312	0.003 241	0.006 150	0.001 16	0.003 45	0.003 208	0.002 343
DCP 6	.250	0.890	0.358 256	0.029 179	0.004 291	0.003 234	0.005 155	0.003 251	0.001 23	0.002 256	0.000 313
DCP 7	.300	0.767	0.305 256	0.027 192	0.004 308	0.001 239	0.004 163	0.000 349	0.003 55	0.002 215	0.002 329
DCP 8	.400	0.362	0.224 257	0.020 181	0.005 293	0.002 218	0.003 189	0.001 296	0.001 5	0.001 248	0.002 52
DCP 9	.500	0.383	0.168 261	0.018 200	0.005 315	0.001 74	0.005 211	0.002 69	0.004 70	0.002 217	0.002 347
DCP 10	.600	0.200	0.108 255	0.013 180	0.005 292	0.002 217	0.001 152	0.001 135	0.000 332	0.002 274	0.001 130
DCP 11	.800	0.033	0.074 266	0.005 175	0.004 241	0.002 341	0.002 177	0.001 172	0.004 68	0.001 311	0.001 300
DCP 12	.878	0.004	0.080 263	0.006 69	0.004 276	0.002 219	0.001 266	0.002 89	0.001 88	0.001 232	0.000 106
DCP 13	.953	0.122	0.065 262	0.007 357	0.002 203	0.003 304	0.002 110	0.001 166	0.004 30	0.002 235	0.001 146

FORCED VERTICAL TRANSLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	29.85	0.400	9.74		0.458	3106.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.117	426.9	713.7	0.47E 07	-0.00229	1.196	9.74

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		0.825	0.227 298	0.114 158	0.030 318	0.025 171	0.013 287	0.011 69	0.011 246	0.008 24	0.002 90
CM		0.016	0.046 70	0.030 229	0.013 46	0.007 267	0.009 85	0.006 251	0.003 57	0.003 199	0.000 253
DCP 1	.010	4.688	0.576 338	1.065 223	0.408 73	0.213 293	0.239 146	0.161 349	0.119 226	0.047 132	0.033 37
DCP 2	.025	4.220	0.557 7	1.035 218	0.458 57	0.188 263	0.140 168	0.126 35	0.105 253	0.035 119	0.014 31
DCP 3	.050	3.067	0.464 343	0.560 200	0.240 12	0.125 201	0.049 109	0.048 311	0.031 161	0.012 78	0.034 334
DCP 4	.150	1.535	0.400 309	0.285 159	0.108 316	0.046 177	0.046 44	0.042 230	0.011 52	0.011 343	0.016 187
DCP 5	.200	1.257	0.357 310	0.256 154	0.093 318	0.046 187	0.057 14	0.036 196	0.007 2	0.015 346	0.017 170
DCP 6	.250	1.039	0.336 305	0.199 141	0.069 277	0.021 184	0.034 17	0.024 189	0.006 26	0.014 315	0.013 133
DCP 7	.300	0.904	0.321 301	0.196 138	0.074 294	0.054 169	0.052 343	0.034 162	0.018 340	0.004 318	0.018 123
DCP 8	.400	0.456	0.263 297	0.138 116	0.054 248	0.025 157	0.037 315	0.020 110	0.010 310	0.002 58	0.002 127
DCP 9	.500	0.507	0.237 289	0.110 104	0.041 249	0.037 148	0.049 291	0.033 96	0.023 279	0.018 44	0.019 135
DCP 10	.600	0.281	0.172 275	0.077 82	0.033 233	0.030 117	0.037 268	0.026 66	0.015 260	0.010 41	0.003 113
DCP 11	.800	0.187	0.188 259	0.067 54	0.030 227	0.022 83	0.036 235	0.026 46	0.019 220	0.016 2	0.005 51
DCP 12	.878	0.168	0.207 250	0.064 42	0.024 243	0.030 83	0.032 237	0.027 46	0.017 207	0.004 5	0.008 340
DCP 13	.953	0.242	0.133 247	0.023 45	0.017 251	0.007 27	0.013 223	0.017 42	0.013 201	0.009 9	0.006 306

FORCED VERTICAL TRANSLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	30.30	0.400	12.18		0.458	3107.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.118	427.4	719.0	0.47E 07	-0.00128	1.373	12.18

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		0.906	0.252 332	0.104 227	0.087 65	0.044 242	0.022 81	0.015 316	0.008 188	0.009 54	0.003 203
CM		-0.007	0.068 76	0.024 330	0.030 180	0.020 28	0.009 256	0.008 118	0.003 338	0.004 185	0.002 25
DCP 1	.010	-.359	1.612 56	0.949 297	0.692 171	0.246 43	0.225 344	0.127 217	0.039 112	0.047 116	0.042 17
DCP 2	.025	4.063	1.467 51	0.709 274	0.438 177	0.178 68	0.177 22	0.101 262	0.052 227	0.073 122	0.022 76
DCP 3	.050	3.392	0.929 24	0.329 249	0.255 144	0.072 5	0.074 308	0.056 175	0.043 74	0.021 40	0.012 290
DCP 4	.150	1.591	0.540 344	0.150 229	0.211 99	0.086 297	0.042 194	0.033 75	0.017 331	0.013 237	0.012 124
DCP 5	.200	1.266	0.445 346	0.185 240	0.212 83	0.070 301	0.059 172	0.030 69	0.019 314	0.015 163	0.009 223
DCP 6	.250	1.107	0.443 330	0.100 229	0.172 77	0.074 279	0.048 152	0.038 38	0.016 259	0.012 159	0.011 134
DCP 7	.300	0.966	0.387 326	0.136 227	0.193 61	0.078 265	0.056 130	0.034 35	0.022 258	0.019 121	0.002 281
DCP 8	.400	0.574	0.349 310	0.065 224	0.141 49	0.070 255	0.047 121	0.046 1	0.027 221	0.016 70	0.007 53
DCP 9	.500	0.464	0.314 295	0.083 202	0.148 27	0.081 231	0.044 84	0.029 7	0.029 222	0.016 59	0.009 3
DCP 10	.600	0.389	0.207 283	0.070 195	0.104 18	0.070 222	0.039 79	0.039 307	0.018 178	0.015 34	0.015 251
DCP 11	.800	0.318	0.217 265	0.105 166	0.095 356	0.088 203	0.041 50	0.044 274	0.019 115	0.022 359	0.013 182
DCP 12	.878	0.259	0.199 257	0.096 165	0.075 357	0.073 194	0.034 48	0.042 253	0.012 81	0.014 333	0.011 167
DCP 13	.953	0.346	0.125 252	0.070 165	0.038 352	0.038 186	0.014 39	0.015 302	0.015 135	0.011 8	0.006 240

FORCED VERTICAL TRANSLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	32.15	0.400	18.91		0.458	3107.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.126	426.0	718.[illegible]	0.47E 07	-0.00127	0.993	18.91

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.756	0.154	306	0.012	126	0.013	284	0.009	243	0.016	358	0.002	255	0.004	44	0.004	355	0.003	111
CM		-0.077	0.034	121	0.003	353	0.004	25	0.002	46	0.005	134	0.000	302	0.001	224	0.000	68	0.000	206
DCP 1	.010	2.141	0.735	73	0.115	78	0.077	297	0.025	302	0.048	102	0.004	214	0.009	45	0.022	73	0.040	175
DCP 2	.025	2.474	0.172	334	0.050	92	0.039	30	0.035	228	0.028	29	0.012	331	0.031	99	0.020	344	0.015	209
DCP 3	.050	2.283	0.185	309	0.004	138	0.046	320	0.008	260	0.030	71	0.001	358	0.012	354	0.015	39	0.008	199
DCP 4	.150	1.205	0.155	290	0.021	146	0.041	323	0.016	288	0.030	60	0.008	237	0.002	7	0.011	358	0.010	108
DCP 5	.200	1.025	0.184	298	0.028	74	0.006	319	0.020	222	0.026	328	0.011	277	0.008	99	0.010	328	0.006	225
DCP 6	.250	0.916	0.158	299	0.020	148	0.030	313	0.019	274	0.027	51	0.006	240	0.000	300	0.008	354	0.015	99
DCP 7	.300	0.879	0.164	300	0.026	68	0.003	318	0.011	207	0.032	320	0.009	276	0.007	59	0.010	9	0.005	113
DCP 8	.400	0.586	0.200	308	0.015	143	0.024	291	0.013	261	0.029	35	0.002	221	0.005	290	0.006	260	0.013	62
DCP 9	.500	0.557	0.204	306	0.014	67	0.008	172	0.011	132	0.024	311	0.001	101	0.010	21	0.006	6	0.001	347
DCP 10	.600	0.460	0.147	307	0.015	196	0.022	257	0.010	267	0.026	11	0.004	187	0.008	181	0.006	211	0.014	14
DCP 11	.800	0.529	0.155	298	0.017	147	0.022	195	0.017	209	0.028	276	0.004	52	0.019	27	0.004	10	0.018	163
DCP 12	.878	0.453	0.124	308	0.020	178	0.012	254	0.016	282	0.022	351	0.001	194	0.014	129	0.001	127	0.014	301
DCP 13	.953	0.527	0.074	306	0.002	15	0.007	133	0.008	81	0.010	298	0.005	301	0.010	342	0.001	343	0.003	262

FORCED VERTICAL TRANSLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	23.92	0.600	0.0		0.462	3108.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.063	633.7	1416.8	0.62E 07	-0.00314	-0.010	0.0

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		-0.231	0.224	257	0.010	176	0.001	120	0.001	265	0.001	244	0.001	284	0.001	219	0.001	138	0.001	92
CM		0.047	0.002	213	0.000	156	0.000	321	0.000	310	0.000	171	0.000	225	0.000	139	0.000	301	0.000	288
DCP 1	.010	-0.645	1.103	255	0.069	147	0.009	135	0.002	301	0.010	187	0.002	305	0.004	174	0.002	43	0.002	22
DCP 2	.025	-0.361	1.068	253	0.068	159	0.008	127	0.002	293	0.007	83	0.001	245	0.004	136	0.002	99	0.002	35
DCP 3	.050	-0.148	0.731	258	0.028	181	0.006	268	0.007	291	0.012	237	0.006	255	0.009	206	0.002	220	0.004	117
DCP 4	.150	-0.259	0.411	254	0.029	202	0.008	75	0.004	223	0.004	220	0.001	302	0.003	211	0.001	79	0.001	60
DCP 5	.200	-0.254	0.350	256	0.017	164	0.001	148	0.001	346	0.003	81	0.001	301	0.001	185	0.001	144	0.001	56
DCP 6	.250	-0.262	0.307	257	0.013	163	0.003	153	0.000	176	0.004	217	0.000	290	0.002	209	0.001	79	0.001	105
DCP 7	.300	-0.223	0.265	257	0.012	173	0.001	108	0.001	335	0.002	57	0.000	349	0.000	223	0.001	163	0.001	79
DCP 8	.400	-0.302	0.195	257	0.008	160	0.001	172	0.000	188	0.003	227	0.001	257	0.002	257	0.000	137	0.000	137
DCP 9	.500	-0.274	0.144	258	0.006	181	0.001	89	0.001	81	0.002	45	0.001	327	0.000	141	0.001	169	0.001	97
DCP 10	.600	-0.189	0.090	257	0.003	175	0.001	153	0.000	31	0.003	237	0.000	286	0.001	239	0.000	220	0.000	47
DCP 11	.800	-0.202	0.055	264	0.002	203	0.001	351	0.001	122	0.003	358	0.001	81	0.001	296	0.001	121	0.001	126
DCP 12	.878	-0.242	0.041	271	0.001	202	0.001	231	0.001	204	0.003	238	0.001	314	0.001	307	0.001	12	0.000	49
DCP 13	.953	-0.149	0.027	263	0.000	298	0.000	94	0.002	275	0.004	32	0.001	64	0.001	292	0.000	119	0.001	293

FORCED VERTICAL TRANSLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	23.47	0.600	4.63		0.458	3108.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.062	634.2	1419.8	0.62E 07	-0.00285	0.669	4.63

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.472	0.200	254	0.015	159	0.005	215	0.003	253	0.003	37	0.001	98	0.001	127	0.000	311	0.001	330
CM		0.057	0.005	233	0.001	63	0.000	278	0.001	200	0.001	15	0.000	289	0.000	178	0.000	206	0.000	256
DCP 1	.010	2.322	0.703	252	0.095	207	0.012	147	0.003	281	0.008	103	0.005	359	0.006	316	0.003	171	0.003	42
DCP 2	.025	2.927	0.934	250	0.182	216	0.015	164	0.026	2	0.017	9	0.003	18	0.003	88	0.004	120	0.003	56
DCP 3	.050	2.436	0.687	252	0.084	211	0.015	19	0.012	308	0.010	165	0.010	135	0.003	159	0.005	243	0.001	6
DCP 4	.150	1.121	0.642	255	0.176	71	0.015	215	0.082	210	0.052	22	0.015	326	0.027	160	0.008	17	0.013	330
DCP 5	.200	0.840	0.327	256	0.083	83	0.084	228	0.038	34	0.005	8	0.017	183	0.016	3	0.007	192	0.002	54
DCP 6	.250	0.601	0.169	256	0.044	214	0.007	192	0.008	19	0.003	179	0.002	58	0.001	357	0.001	217	0.000	262
DCP 7	.300	0.531	0.155	255	0.039	218	0.004	95	0.004	6	0.003	172	0.003	33	0.001	87	0.001	287	0.000	163
DCP 8	.400	0.240	0.132	255	0.024	206	0.001	152	0.003	9	0.002	159	0.001	67	0.001	342	0.000	335	0.000	66
DCP 9	.500	0.151	0.101	257	0.018	207	0.003	67	0.002	332	0.001	184	0.001	45	0.001	41	0.000	219	0.001	132
DCP 10	.600	0.076	0.066	253	0.010	202	0.000	173	0.001	5	0.001	138	0.001	104	0.001	335	0.000	13	0.000	79
DCP 11	.800	-0.036	0.046	263	0.006	200	0.000	126	0.001	0	0.000	24	0.001	61	0.001	79	0.001	67	0.000	20
DCP 12	.878	-0.111	0.044	261	0.003	173	0.002	232	0.002	348	0.001	186	0.001	125	0.001	28	0.000	8	0.000	315
DCP 13	.953	-0.023	0.043	262	0.003	38	0.003	157	0.006	349	0.002	151	0.003	150	0.002	337	0.001	323	0.003	44

FORCED VERTICAL TRANSLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	25.84	0.600	7.17		0.458	3108.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.067	643.4	1410.1	0.61E 07	-0.00138	0.891	7.17

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.722	0.107	281	0.047	221	0.021	118	0.013	310	0.005	179	0.004	80	0.004	333	0.004	181	0.003	38
CM		0.043	0.026	100	0.011	294	0.005	190	0.003	63	0.001	272	0.001	263	0.002	103	0.002	298	0.001	119
DCP 1	.010	3.083	0.318	264	0.066	207	0.021	109	0.013	271	0.002	268	0.003	72	0.003	36	0.004	152	0.003	27
DCP 2	.025	3.843	0.297	261	0.078	240	0.051	137	0.027	338	0.015	187	0.010	39	0.003	228	0.002	16	0.005	130
DCP 3	.050	3.196	0.094	242	0.146	273	0.085	141	0.051	353	0.050	221	0.029	66	0.009	207	0.004	252	0.017	106
DCP 4	.150	1.723	0.096	69	0.196	248	0.088	183	0.013	185	0.026	136	0.005	36	0.017	16	0.021	262	0.010	99
DCP 5	.200	1.204	0.156	272	0.246	245	0.087	184	0.035	34	0.030	12	0.022	330	0.007	27	0.011	227	0.019	109
DCP 6	.250	0.876	0.190	287	0.101	231	0.086	95	0.048	344	0.016	243	0.020	191	0.021	58	0.010	234	0.010	28
DCP 7	.300	0.758	0.198	288	0.079	227	0.072	97	0.042	359	0.017	246	0.016	193	0.011	80	0.003	183	0.009	6
DCP 8	.400	0.360	0.113	296	0.049	175	0.028	66	0.029	282	0.012	128	0.006	109	0.010	334	0.009	178	0.003	22
DCP 9	.500	0.279	0.126	294	0.048	150	0.024	57	0.027	272	0.011	148	0.010	75	0.011	311	0.012	172	0.010	352
DCP 10	.600	0.168	0.078	287	0.033	136	0.009	16	0.015	245	0.007	77	0.001	106	0.002	304	0.004	138	0.002	326
DCP 11	.800	0.095	0.115	278	0.036	118	0.012	14	0.011	229	0.001	236	0.007	73	0.011	275	0.010	119	0.006	292
DCP 12	.878	0.050	0.133	267	0.033	107	0.013	358	0.006	211	0.005	204	0.009	49	0.008	255	0.007	84	0.002	268
DCP 13	.953	0.128	0.115	265	0.012	166	0.010	24	0.007	300	0.003	144	0.001	208	0.002	306	0.004	61	0.003	233

FORCED VERTICAL TRANSLATION NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	30.67	0.600	19.97		0.456	3110.1	10
	K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
	0.082	622.4	1418.9	0.63E 07	-0.00057	0.976	19.97

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.850	0.106	329	0.021	236	0.001	87	0.006	53	0.003	41	0.004	348	0.003	354	0.002	174	0.004	337
CM		-0.100	0.025	122	0.003	356	0.001	224	0.001	94	0.001	161	0.001	175	0.000	299	0.001	259	0.000	247
DCP 1	.025	2.088	0.340	29	0.113	248	0.059	160	0.076	35	0.027	290	0.022	189	0.019	336	0.005	185	0.014	32
DCP 2	.050	2.149	0.216	45	0.072	276	0.011	269	0.029	76	0.026	117	0.015	2	0.024	25	0.017	240	0.015	311
DCP 3	.150	1.412	0.134	350	0.049	246	0.007	289	0.022	59	0.009	14	0.007	347	0.008	356	0.008	247	0.013	344
DCP 4	.200	1.082	0.149	306	0.025	191	0.008	9	0.010	45	0.004	231	0.005	339	0.007	239	0.003	154	0.006	290
DCP 5	.250	1.061	0.150	329	0.027	249	0.005	190	0.005	120	0.005	75	0.004	28	0.003	84	0.007	197	0.008	341
DCP 6	.300	0.936	0.148	305	0.016	200	0.005	330	0.002	115	0.002	132	0.007	11	0.005	255	0.003	180	0.005	278
DCP 7	.400	0.691	0.147	321	0.020	250	0.010	179	0.004	149	0.003	37	0.006	304	0.004	261	0.003	189	0.007	309
DCP 8	.500	0.658	0.136	313	0.003	239	0.012	337	0.002	6	0.007	46	0.012	350	0.008	260	0.002	150	0.004	5
DCP 9	.600	0.682	0.091	307	0.014	215	0.007	121	0.004	89	0.005	10	0.003	326	0.005	85	0.004	78	0.002	7
DCP10	.800	0.555	0.100	314	0.018	200	0.008	50	0.004	8	0.003	10	0.001	3	0.003	60	0.006	89	0.004	47
DCP11	.878	0.470	0.081	310	0.013	184	0.008	38	0.009	299	0.003	211	0.004	55	0.006	358	0.004	112	0.002	128
DCP12	.953	0.494	0.080	325	0.016	202	0.002	343	0.003	302	0.006	290	0.002	334	0.003	283	0.001	259	0.003	254

FORCED VERTICAL TRANSLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.26	0.200	0.0		0.611	3113.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.124	219.1	199.7	0.26E 07	-0.00602	0.178	0.0

HARMONIC ANALYSIS

CATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		-0.188	0.378	266	0.009	253	0.002	28	0.004	297	0.009	161	0.009	229	0.007	287	0.001	195	0.005	208
CM		0.038	0.008	211	0.001	68	0.000	143	0.000	254	0.002	301	0.001	59	0.002	140	0.001	59	0.001	64
DCP 1	.010	-1.112	2.521	261	0.038	202	0.037	122	0.006	195	0.048	159	0.016	190	0.013	223	0.007	27	0.011	239
DCP 2	.025	-0.161	2.105	261	0.058	187	0.010	33	0.008	345	0.011	173	0.018	121	0.011	259	0.010	196	0.004	74
DCP 3	.050	-0.135	1.138	266	0.028	303	0.030	356	0.037	278	0.033	233	0.031	231	0.030	211	0.009	130	0.025	169
DCP 4	.150	0.253	0.648	263	0.024	271	0.006	121	0.006	345	0.030	171	0.005	207	0.007	332	0.007	52	0.008	191
DCP 5	.200	-0.053	0.527	264	0.014	180	0.011	209	0.004	93	0.006	39	0.012	223	0.012	290	0.006	177	0.001	58
DCP 6	.250	-0.301	0.491	265	0.012	312	0.005	195	0.004	285	0.017	144	0.013	229	0.006	292	0.006	55	0.008	228
DCP 7	.300	-0.380	0.454	265	0.013	211	0.008	91	0.004	54	0.003	10	0.007	236	0.005	312	0.005	176	0.007	205
DCP 8	.400	-0.436	0.320	266	0.012	309	0.002	131	0.011	313	0.020	154	0.013	236	0.011	298	0.007	49	0.006	236
DCP 9	.500	-0.424	0.241	270	0.017	209	0.007	144	0.006	173	0.005	27	0.008	223	0.011	293	0.007	225	0.007	269
DCP 10	.600	-0.185	0.154	266	0.011	297	0.003	309	0.002	275	0.013	138	0.010	258	0.006	309	0.004	328	0.002	210
DCP 11	.800	-0.006	0.097	279	0.009	137	0.012	9	0.002	78	0.001	4	0.006	236	0.014	297	0.005	232	0.012	245
DCP 12	.878	-0.273	0.088	279	0.013	300	0.002	237	0.001	256	0.021	145	0.004	210	0.003	21	0.002	182	0.005	117
DCP 13	.953	0.009	0.041	332	0.016	239	0.007	243	0.005	341	0.002	220	0.007	199	0.006	336	0.010	239	0.006	104

FORCED VERTICAL TRANSLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.47	0.200	9.75		0.609	3113.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.126	218.3	199.3	0.26E 07	-0.00521	1.222	9.75

HARMONIC ANALYSIS

CATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.877	0.338	260	0.019	157	0.008	302	0.003	264	0.003	297	0.003	272	0.006	175	0.001	353	0.002	57
CM		0.038	0.009	208	0.001	326	0.002	60	0.000	243	0.001	145	0.001	95	0.001	58	0.001	51	0.001	20
DCP 1	.010	4.962	2.392	254	0.105	136	0.019	33	0.021	294	0.016	104	0.024	359	0.012	167	0.009	328	0.009	45
DCP 2	.025	4.763	1.818	256	0.082	132	0.025	47	0.012	166	0.008	97	0.014	224	0.014	95	0.014	3	0.023	322
DCP 3	.050	3.821	1.035	259	0.043	191	0.040	339	0.028	221	0.019	229	0.009	155	0.028	127	0.011	36	0.033	56
DCP 4	.150	1.886	0.643	256	0.029	137	0.011	351	0.009	287	0.007	138	0.002	284	0.012	174	0.004	100	0.006	26
DCP 5	.200	1.418	0.487	258	0.033	158	0.016	279	0.012	67	0.010	308	0.003	340	0.004	156	0.006	322	0.007	256
DCP 6	.250	0.988	0.440	259	0.023	160	0.012	336	0.020	302	0.004	73	0.003	255	0.014	169	0.002	64	0.007	24
DCP 7	.300	0.730	0.388	261	0.021	170	0.008	316	0.006	117	0.008	320	0.005	350	0.007	198	0.001	212	0.002	106
DCP 8	.400	0.445	0.258	263	0.019	140	0.011	310	0.017	300	0.005	114	0.003	291	0.013	202	0.005	35	0.003	32
DCP 9	.500	0.197	0.201	269	0.022	167	0.016	260	0.012	112	0.009	324	0.004	309	0.004	166	0.00	[illegible]	0.003	247
DCP 10	.600	0.267	0.116	262	0.022	174	0.003	351	0.015	282	0.004	225	0.006	232	0.004	211	0.002		0.002	52
DCP 11	.800	0.296	0.080	288	0.005	313	0.017	248	0.015	130	0.013	317	0.012	294	0.002	54	0.009	[illegible]	0.012	190
DCP 12	.878	0.034	0.109	263	0.008	86	0.008	121	0.015	331	0.003	156	0.005	176	0.010	216	0.002	31	0.002	335
DCP 13	.953	0.267	0.046	276	0.010	105	0.017	270	0.007	118	0.005	4	0.004	284	0.008	238	0.005	196	0.002	171

FORCED VERTICAL TRANSLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.31	0.200	12.10		0.612	3113.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.125	218.2	197.9	0.26E 07	-0.00583	1.508	12.10

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		0.932	0.405 293	0.133 90	0.071 211	0.059 350	0.039 140	0.019 266	0.008 94	0.003 337	0.006 63
CM		-0.000	0.054 41	0.043 177	0.028 321	0.021 118	0.016 262	0.009 49	0.005 210	0.004 25	0.005 185
DCP 1	.010	4.533	1.856 325	1.349 171	0.668 335	0.340 135	0.169 303	0.110 137	0.088 315	0.091 128	0.076 310
DCP 2	.025	4.236	1.575 336	1.175 171	0.475 327	0.171 134	0.103 348	0.101 162	0.085 337	0.055 112	0.036 279
DCP 3	.050	3.552	1.083 330	0.610 152	0.300 296	0.080 73	0.067 241	0.056 142	0.045 252	0.054 75	0.008 338
DCP 4	.150	1.981	0.803 299	0.396 103	0.210 244	0.120 46	0.096 222	0.060 29	0.047 192	0.034 29	0.033 213
DCP 5	.200	1.410	0.690 302	0.362 100	0.199 239	0.132 48	0.113 219	0.086 22	0.049 188	0.047 13	0.042 186
DCP 6	.250	1.086	0.634 293	0.291 79	0.174 217	0.132 19	0.120 184	0.078 335	0.055 158	0.048 346	0.053 161
DCP 7	.300	0.820	0.577 289	0.273 74	0.179 208	0.135 17	0.121 177	0.081 338	0.059 153	0.051 342	0.047 136
DCP 8	.400	0.523	0.445 281	0.217 45	0.140 181	0.127 342	0.111 138	0.072 284	0.046 101	0.040 290	0.041 111
DCP 9	.500	0.318	0.380 275	0.193 30	0.151 167	0.129 330	0.109 117	0.076 267	0.060 55	0.040 235	0.036 49
DCP 10	.600	0.342	0.257 259	0.144 13	0.095 147	0.093 314	0.076 95	0.051 235	0.029 54	0.027 223	0.039 25
DCP 11	.800	0.428	0.204 243	0.114 357	0.087 142	0.076 286	0.070 62	0.046 202	0.024 343	0.021 143	0.032 334
DCP 12	.878	0.207	0.208 237	0.069 349	0.056 129	0.058 276	0.041 33	0.036 181	0.019 314	0.017 126	0.017 294
DCP 13	.953	0.376	0.055 209	0.008 17	0.026 112	0.040 244	0.021 19	0.022 145	0.018 326	0.010 199	0.011 287

FORCED VERTICAL TRANSLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	17.73	0.200	19.47		0.612	3113.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.136	217.8	198.0	0.26E 07	-0.00105	1.244	19.47

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		0.922	0.270 343	0.025 41	0.051 167	0.036 161	0.009 273	0.021 287	0.007 36	0.010 74	0.008 188
CM		-0.111	0.062 138	0.005 69	0.014 315	0.008 291	0.003 82	0.008 85	0.004 111	0.003 180	0.004 344
DCP 1	.010	2.055	1.359 74	0.368 73	0.193 249	0.205 264	0.061 314	0.014 137	0.070 141	0.048 137	0.040 34
DCP 2	.025	2.498	0.437 47	0.286 76	0.019 301	0.088 237	0.078 334	0.034 357	0.034 54	0.043 230	0.051 181
DCP 3	.050	2.431	0.377 22	0.099 46	0.055 232	0.077 190	0.045 171	0.009 179	0.028 86	0.015 138	0.021 345
DCP 4	.150	1.590	0.288 342	0.053 30	0.059 212	0.055 193	0.005 95	0.011 337	0.026 100	0.012 115	0.036 328
DCP 5	.200	1.168	0.313 352	0.062 46	0.055 193	0.057 180	0.006 150	0.017 1	0.007 97	0.027 135	0.019 224
DCP 6	.250	0.963	0.331 341	0.044 18	0.069 196	0.058 186	0.011 39	0.020 339	0.030 82	0.014 97	0.010 336
DCP 7	.300	0.842	0.331 341	0.043 55	0.076 180	0.066 169	0.013 277	0.032 316	0.017 23	0.038 199	0.014 186
DCP 8	.400	0.760	0.358 339	0.032 330	0.074 174	0.049 154	0.021 13	0.038 322	0.027 73	0.023 43	0.016 270
DCP 9	.500	0.538	0.392 334	0.014 288	0.092 144	0.045 126	0.031 245	0.025 285	0.024 11	0.045 45	0.003 56
DCP 10	.600	0.538	0.279 326	0.030 262	0.060 146	0.037 113	0.028 316	0.041 298	0.005 334	0.010 36	0.019 209
DCP 11	.800	0.794	0.258 325	0.005 75	0.064 144	0.032 123	0.023 242	0.044 248	0.027 291	0.005 10	0.030 153
DCP 12	.878	0.575	0.207 314	0.016 184	0.045 135	0.028 119	0.013 205	0.024 247	0.016 258	0.017 266	0.025 133
DCP 13	.953	0.666	0.128 342	0.024 57	0.025 69	0.010 156	0.006 155	0.008 223	0.019 258	0.011 331	0.035 290

FORCED VERTICAL TRANSLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	14.95	0.400	0.0		0.607	3114.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.058	428.7	728.7	0.48E 07	-0.00394	0.012	0.0

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		-0.210	0.225	265	0.004	161	0.003	77	0.002	279	0.001	181	0.003	153	0.001	264	0.002	299	0.001	137
CM		0.031	0.002	248	0.000	356	0.000	87	0.000	17	0.000	77	0.000	12	0.000	125	0.001	107	0.000	230
DCP 1	.010	-0.758	1.361	264	0.044	147	0.017	94	0.011	329	0.008	126	0.013	137	0.007	173	0.003	127	0.003	100
DCP 2	.025	-1.052	1.178	264	0.033	167	0.011	106	0.009	182	0.008	136	0.002	132	0.003	265	0.006	295	0.004	88
DCP 3	.050	-0.272	0.704	267	0.007	90	0.013	32	0.016	324	0.002	13	0.007	136	0.002	219	0.002	83	0.005	149
DCP 4	.150	-0.123	0.385	263	0.015	216	0.010	92	0.004	332	0.004	167	0.008	134	0.001	249	0.001	185	0.003	175
DCP 5	.200	-0.214	0.333	265	0.007	153	0.001	135	0.004	163	0.003	192	0.002	170	0.001	343	0.002	258	0.001	110
DCP 6	.250	-0.238	0.296	265	0.008	137	0.004	101	0.005	315	0.002	146	0.005	160	0.001	286	0.002	7	0.003	186
DCP 7	.300	-0.205	0.262	265	0.006	175	0.002	86	0.004	166	0.000	223	0.000	163	0.002	296	0.002	311	0.001	301
DCP 8	.400	-0.331	0.199	265	0.006	127	0.003	107	0.004	314	0.003	137	0.006	160	0.002	269	0.003	0	0.001	186
DCP 9	.500	-0.293	0.147	266	0.001	195	0.002	47	0.006	202	0.000	35	0.001	265	0.003	288	0.005	307	0.003	70
DCP 10	.600	-0.035	0.096	264	0.002	117	0.002	108	0.005	304	0.002	187	0.003	150	0.001	223	0.002	42	0.001	210
DCP 11	.800	-0.208	0.058	267	0.003	201	0.002	302	0.005	157	0.004	296	0.002	314	0.001	52	0.007	264	0.001	116
DCP 12	.878	-0.134	0.047	274	0.000	8	0.002	126	0.006	296	0.004	187	0.006	157	0.000	169	0.002	27	0.002	303
DCP 13	.953	-0.133	0.009	284	0.002	128	0.003	28	0.005	135	0.001	358	0.000	259	0.000	282	0.006	281	0.003	58

FORCED VERTICAL TRANSLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.45	0.400	9.71		0.607	3114.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.064	428.1	728.0	0.48E 07	-0.00170	1.077	9.71

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.879	0.121	297	0.079	183	0.020	328	0.004	36	0.001	185	0.003	70	0.004	226	0.003	241	0.004	70
CM		0.018	0.032	65	0.022	219	0.010	15	0.003	206	0.001	85	0.001	186	0.001	316	0.002	64	0.001	193
DCP 1	.010	5.719	0.719	304	0.851	193	0.356	350	0.184	176	0.101	334	0.088	99	0.094	320	0.076	176	0.036	31
DCP 2	.025	3.740	0.521	35	0.935	230	0.414	70	0.195	313	0.176	191	0.116	53	0.067	303	0.047	172	0.014	121
DCP 3	.050	3.194	0.327	6	0.477	205	0.223	4	0.076	200	0.026	82	0.036	290	0.033	162	0.013	55	0.007	205
DCP 4	.150	1.711	0.184	318	0.196	186	0.072	334	0.016	110	0.007	65	0.004	216	0.004	243	0.005	18	0.007	137
DCP 5	.200	1.354	0.192	311	0.172	172	0.079	324	0.024	132	0.020	37	0.019	221	0.005	58	0.007	341	0.012	167
DCP 6	.250	1.129	0.154	304	0.112	172	0.040	294	0.019	56	0.004	311	0.012	111	0.015	253	0.009	17	0.006	121
DCP 7	.300	0.999	0.192	292	0.107	145	0.062	281	0.027	77	0.012	335	0.015	163	0.005	296	0.009	337	0.013	114
DCP 8	.400	0.551	0.133	288	0.059	130	0.047	235	0.031	17	0.006	180	0.011	93	0.017	245	0.009	14	0.003	138
DCP 9	.500	0.420	0.148	275	0.062	90	0.050	224	0.021	24	0.013	353	0.017	147	0.007	322	0.013	232	0.016	44
DCP 10	.600	0.425	0.087	266	0.028	68	0.030	193	0.014	340	0.002	187	0.006	53	0.011	189	0.005	302	0.002	35
DCP 11	.800	0.156	0.123	253	0.046	32	0.015	178	0.007	67	0.008	242	0.011	358	0.005	94	0.007	202	0.006	7
DCP 12	.878	0.191	0.135	252	0.040	38	0.016	183	0.007	14	0.007	180	0.005	296	0.008	94	0.011	217	0.007	340
DCP 13	.953	0.146	0.094	258	0.017	41	0.017	97	0.008	208	0.003	93	0.009	341	0.010	135	0.009	240	0.002	28

FORCED VERTICAL TRANSLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	18.28	0.400	12.06		0.609	3114.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.071	427.2	731.4	0.48E 07	0.00033	1.149	12.06

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.886	0.182	7	0.050	226	0.009	116	0.029	55	0.020	224	0.011	69	0.001	67	0.008	229	0.004	63
CM		-0.024	0.062	70	0.013	332	0.013	180	0.009	148	0.008	340	0.004	196	0.002	141	0.003	15	0.001	158
DCP 1	.010	4.926	1.729	53	0.519	268	0.358	192	0.205	152	0.131	351	0.030	286	0.024	171	0.012	102	0.013	160
DCP 2	.025	3.335	1.613	64	0.554	317	0.422	229	0.391	140	0.100	17	0.062	340	0.035	194	0.048	348	0.029	136
DCP 3	.050	2.854	1.078	46	0.195	262	0.201	172	0.093	88	0.115	309	0.031	210	0.043	156	0.030	25	0.028	70
DCP 4	.150	1.587	0.501	17	0.108	210	0.090	122	0.048	52	0.059	256	0.024	119	0.018	54	0.012	265	0.014	148
DCP 5	.200	1.268	0.361	13	0.054	252	0.074	132	0.093	59	0.067	251	0.051	140	0.020	32	0.033	261	0.010	97
DCP 6	.250	1.082	0.337	4	0.073	194	0.052	74	0.037	47	0.041	206	0.021	68	0.003	298	0.007	207	0.007	309
DCP 7	.300	0.984	0.243	349	0.052	220	0.044	87	0.070	42	0.050	229	0.055	111	0.009	16	0.035	245	0.012	151
DCP 8	.400	0.592	0.201	332	0.062	182	0.067	14	0.031	47	0.037	170	0.014	61	0.006	268	0.007	191	0.006	336
DCP 9	.500	0.481	0.185	303	0.048	180	0.056	11	0.046	19	0.048	185	0.043	50	0.005	172	0.022	190	0.001	242
DCP 10	.600	0.489	0.128	279	0.034	173	0.047	349	0.023	14	0.018	149	0.011	34	0.005	346	0.007	204	0.008	39
DCP 11	.800	0.303	0.173	254	0.033	177	0.014	353	0.032	321	0.020	161	0.011	344	0.013	340	0.012	182	0.012	15
DCP 12	.878	0.360	0.175	252	0.044	175	0.030	329	0.023	314	0.016	160	0.018	355	0.003	175	0.004	76	0.011	190
DCP 13	.953	0.311	0.102	246	0.049	195	0.009	1	0.013	314	0.024	184	0.012	326	0.009	236	0.014	238	0.006	304

FORCED VERTICAL TRANSLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	17.48	0.400	19.42		0.609	3114.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.069	425.2	728.5	0.48E 07	-0.00087	0.816	19.42

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.732	0.062	284	0.015	99	0.007	34	0.002	147	0.006	37	0.000	17	0.001	126	0.002	28	0.002	36
CM		-0.088	0.012	107	0.003	265	0.002	223	0.001	208	0.001	201	0.001	83	0.001	70	0.000	176	0.000	117
DCP 1	.010	2.162	0.401	74	0.049	7	0.053	217	0.020	278	0.030	335	0.017	70	0.024	102	0.011	245	0.001	108
DCP 2	.025	1.457	0.083	324	0.069	74	0.051	3	0.030	120	0.036	8	0.000	252	0.016	38	0.015	287	0.012	82
DCP 3	.050	1.702	0.086	297	0.009	166	0.012	294	0.014	220	0.010	143	0.008	88	0.013	92	0.007	110	0.005	358
DCP 4	.150	1.212	0.107	264	0.021	170	0.009	34	0.003	309	0.015	34	0.011	52	0.010	108	0.008	74	0.005	8
DCP 5	.200	0.984	0.083	273	0.036	86	0.015	27	0.010	113	0.006	36	0.006	252	0.006	258	0.008	299	0.005	107
DCP 6	.250	0.881	0.100	271	0.018	152	0.010	77	0.004	212	0.007	46	0.003	31	0.005	88	0.011	66	0.007	12
DCP 7	.300	0.849	0.050	269	0.033	93	0.014	40	0.015	110	0.007	45	0.005	198	0.008	345	0.005	322	0.010	55
DCP 8	.400	0.563	0.091	278	0.014	133	0.008	98	0.009	237	0.003	35	0.001	319	0.003	103	0.006	96	0.002	205
DCP 9	.500	0.521	0.071	282	0.027	79	0.013	38	0.010	100	0.005	38	0.004	158	0.004	206	0.006	233	0.003	119
DCP 10	.600	0.513	0.055	291	0.010	114	0.004	100	0.006	201	0.008	100	0.001	74	0.002	56	0.007	31	0.003	205
DCP 11	.800	0.482	0.057	286	0.011	70	0.007	7	0.006	65	0.005	15	0.005	282	0.007	219	0.004	2	0.007	12
DCP 12	.878	0.553	0.049	299	0.007	68	0.009	65	0.004	251	0.001	110	0.004	221	0.005	268	0.002	85	0.001	53
DCP 13	.953	0.440	0.021	322	0.020	88	0.021	18	0.015	352	0.016	342	0.005	292	0.009	266	0.007	254	0.008	233

FORCED VERTICAL TRANSLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	15.72	0.600	0.0		0.609	3115.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.042	623.8	1436.5	0.64E 07	-0.00334	-0.020	0.0

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		-0.223	0.203	260	0.005	151	0.003	88	0.001	40	0.002	106	0.000	323	0.000	354	0.001	277	0.000	190
CM		0.028	0.002	229	0.000	182	0.000	358	0.000	251	0.001	284	0.000	179	0.000	243	0.000	130	0.000	287
DCP 1	.010	-0.643	0.995	259	0.043	139	0.013	88	0.003	30	0.006	116	0.002	169	0.002	308	0.003	342	0.000	208
DCP 2	.025	-0.881	0.962	259	0.037	142	0.012	82	0.006	347	0.005	[illegible]	0.001	58	0.001	118	0.002	339	0.004	119
DCP 3	.050	-0.247	0.664	260	0.017	168	0.006	58	0.004	353	0.001	237	0.002	254	0.004	247	0.001	206	0.004	196
DCP 4	.150	-0.401	0.379	258	0.012	189	0.009	82	0.001	119	0.003	123	0.001	309	0.001	350	0.002	178	0.002	270
DCP 5	.200	-0.253	0.323	260	0.010	155	0.004	110	0.002	336	0.001	40	0.001	241	0.002	238	0.001	237	0.001	152
DCP 6	.250	-0.270	0.281	260	0.010	145	0.003	95	0.000	100	0.002	115	0.001	19	0.001	20	0.002	226	0.001	292
DCP 7	.300	-0.220	0.241	261	0.007	143	0.003	87	0.003	10	0.002	60	0.001	329	0.001	297	0.001	317	0.000	130
DCP 8	.400	-0.287	0.178	262	0.004	124	0.002	105	0.001	193	0.003	118	0.001	79	0.001	70	0.003	247	0.002	335
DCP 9	.500	-0.255	0.130	262	0.003	134	0.002	107	0.002	40	0.001	111	0.001	328	0.001	24	0.001	38	0.001	156
DCP10	.600	-0.085	0.079	261	0.002	114	0.002	103	0.001	50	0.004	124	0.001	[illegible]	0.001	91	0.002	311	0.001	58
DCP11	.800	-0.164	0.051	266	0.000	75	0.001	339	0.001	62	0.001	14	0.002	324	0.001	214	0.002	231	0.002	210
DCP12	.878	-0.152	0.035	270	0.000	104	0.002	122	0.002	112	0.003	117	0.001	132	0.001	36	0.001	338	0.001	15
DCP13	.953	-0.118	0.018	269	0.001	338	0.000	0	0.006	54	0.003	86	0.001	294	0.001	30	0.002	22	0.002	85

FORCED VERTICAL TRANSLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	15.36	0.600	4.63		0.610	3115.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.041	621.9	1434.2	0.64E 07	-0.00292	0.666	4.63

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.493	0.176	257	0.016	168	0.000	248	0.003	300	0.003	33	0.002	42	0.000	192	0.001	188	0.000	119
CM		0.037	0.004	244	0.001	60	0.000	76	0.001	210	0.000	356	0.000	233	0.000	196	0.000	12	0.000	358
DCP 1	.010	2.329	0.632	255	0.081	207	0.013	93	0.005	316	0.001	119	0.006	39	0.003	310	0.001	321	0.002	105
DCP 2	.025	2.465	0.852	254	0.160	218	0.018	125	0.028	19	0.018	356	0.005	327	0.003	150	0.005	128	0.003	102
DCP 3	.050	2.391	0.621	255	0.070	212	0.026	42	0.015	340	0.006	232	0.010	162	0.003	201	0.002	273	0.002	305
DCP 4	.150	1.040	0.544	259	0.138	84	0.004	213	0.060	231	0.032	45	0.020	20	0.020	203	0.005	130	0.011	348
DCP 5	.200	0.834	0.271	260	0.064	103	0.063	250	0.032	62	0.006	325	0.011	217	0.010	32	0.005	228	0.002	85
DCP 6	.250	0.608	0.137	257	0.045	229	0.006	115	0.008	28	0.003	248	0.004	75	0.003	350	0.001	140	0.001	171
DCP 7	.300	0.555	0.140	257	0.031	221	0.005	92	0.004	6	0.001	170	0.001	0	0.001	80	0.001	307	0.001	174
DCP 8	.400	0.265	0.120	258	0.020	216	0.004	64	0.003	358	0.002	53	0.002	45	0.003	54	0.001	293	0.003	161
DCP 9	.500	0.187	0.092	259	0.014	210	0.003	81	0.002	325	0.001	74	0.002	0	0.001	27	0.001	311	0.001	178
DCP10	.600	0.188	0.060	257	0.009	206	0.001	38	0.002	5	0.001	59	0.001	51	0.002	34	0.001	200	0.002	163
DCP11	.800	0.008	0.041	263	0.006	171	0.000	347	0.001	291	0.001	49	0.001	67	0.002	255	0.001	33	0.001	303
DCP12	.878	-0.018	0.040	263	0.003	180	0.002	259	0.002	344	0.000	297	0.002	54	0.002	20	0.001	220	0.002	145
DCP13	.953	0.001	0.032	254	0.005	130	0.001	241	0.004	12	0.001	280	0.001	156	0.001	57	0.002	117	0.001	254

FORCED VERTICAL TRANSLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	19.05	0.600	7.18		0.609	3115.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.051	619.5	1432.3	0.64E 07	-0.00145	0.862	7.18

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		0.731	0.107 272	0.042 224	0.016 106	0.011 26	0.014 237	0.008 27	0.003 150	0.002 354	0.000 289
CM		0.025	0.023 96	0.009 298	0.004 189	0.002 114	0.003 339	0.003 148	0.001 304	0.000 98	0.001 53
DCP 1	.010	3.020	0.302 262	0.058 205	0.024 111	0.012 355	0.011 198	0.008 357	0.003 76	0.002 282	0.001 213
DCP 2	.025	3.328	0.301 259	0.079 224	0.027 130	0.027 25	0.033 222	0.026 22	0.011 215	0.006 45	0.008 351
DCP 3	.050	3.116	0.115 250	0.134 258	0.065 112	0.014 329	0.028 275	0.036 119	0.040 317	0.031 142	0.018 341
DCP 4	.150	1.621	0.016 153	0.156 254	0.057 186	0.027 91	0.034 297	0.023 91	0.005 245	0.007 335	0.005 33
DCP 5	.200	1.206	0.150 263	0.209 247	0.079 184	0.045 75	0.041 309	0.022 15	0.012 221	0.013 330	0.011 95
DCP 6	.250	0.886	0.190 278	0.098 239	0.063 96	0.055 43	0.041 282	0.011 147	0.019 145	0.014 15	0.002 270
DCP 7	.300	0.795	0.170 275	0.068 238	0.059 87	0.041 35	0.042 253	0.009 115	0.017 132	0.014 345	0.004 227
DCP 8	.400	0.371	0.100 288	0.035 183	0.022 77	0.015 1	0.028 216	0.023 23	0.012 159	0.010 337	0.011 192
DCP 9	.500	0.305	0.114 285	0.032 139	0.015 64	0.011 302	0.021 186	0.021 346	0.015 119	0.011 282	0.006 141
DCP 10	.600	0.267	0.073 282	0.027 129	0.004 338	0.004 356	0.011 190	0.015 357	0.004 119	0.002 239	0.002 88
DCP 11	.800	0.129	0.102 274	0.027 129	0.015 31	0.010 269	0.014 145	0.010 317	0.000 114	0.005 137	0.002 298
DCP 12	.878	0.136	0.124 267	0.030 135	0.018 15	0.008 272	0.012 125	0.008 293	0.002 347	0.001 256	0.002 6
DCP 13	.953	0.163	0.108 258	0.022 175	0.017 354	0.008 10	0.010 184	0.001 39	0.005 292	0.009 106	0.011 274

FORCED VERTICAL TRANSLATION — NACA 0012 AIRFOIL (MODIFIED)

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	21.98	0.600	19.40		0.613	3115.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.060	616.8	1430.6	0.64E 07	-0.00031	0.990	19.40

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		0.884	0.055 343	0.009 198	0.003 136	0.001 237	0.002 39	0.004 309	0.002 263	0.001 358	0.001 71
CM		-0.095	0.019 130	0.002 299	0.001 45	0.001 319	0.000 141	0.001 181	0.000 78	0.001 27	0.001 268
DCP 1	.010	2.604	0.555 56	0.067 282	0.036 230	0.023 282	0.022 0	0.052 282	0.023 80	0.038 347	0.036 273
DCP 2	.025	1.511	0.218 25	0.089 228	0.013 136	0.015 107	0.008 26	0.016 280	0.009 172	0.016 267	0.021 253
DCP 3	.050	2.475	0.254 30	0.019 262	0.019 91	0.016 285	0.009 98	0.006 357	0.002 221	0.020 50	0.011 64
DCP 4	.150	1.415	0.185 359	0.023 211	0.014 97	0.013 272	0.003 152	0.018 295	0.010 268	0.010 13	0.004 48
DCP 5	.200	1.052	0.103 313	0.016 204	0.006 227	0.005 258	0.005 52	0.004 342	0.003 275	0.009 257	0.008 271
DCP 6	.250	1.105	0.153 330	0.028 201	0.011 157	0.003 117	0.005 43	0.007 227	0.009 282	0.012 47	0.013 116
DCP 7	.300	0.914	0.100 311	0.009 181	0.004 179	0.005 102	0.005 62	0.003 325	0.003 286	0.010 260	0.006 257
DCP 8	.400	0.662	0.103 315	0.014 122	0.011 86	0.014 76	0.001 344	0.005 261	0.004 199	0.011 59	0.008 67
DCP 9	.500	0.635	0.103 322	0.005 229	0.002 317	0.006 294	0.004 99	0.006 61	0.011 52	0.003 348	0.003 159
DCP 10	.600	0.566	0.075 315	0.003 123	0.001 87	0.003 72	0.004 356	0.001 82	0.001 111	0.002 180	0.005 291
DCP 11	.800	0.613	0.094 341	0.005 139	0.007 247	0.008 232	0.004 240	0.006 302	0.009 225	0.008 213	0.003 97
DCP 12	.878	0.607	0.082 316	0.009 122	0.009 179	0.009 128	0.009 10	0.006 316	0.011 307	0.007 280	0.005 131
DCP 13	.953	0.486	0.064 350	0.012 176	0.003 95	0.003 116	0.002 178	0.007 23	0.006 124	0.007 148	0.006 45

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.86	0.200	5.10		0.307	4026.1	70

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.130	217.0	199.1	0.26E 07	-0.00587	0.668	5.10

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.456	0.204	250	0.009	3	0.003	77	0.003	144	0.011	279	0.002	353	0.005	176	0.002	290	0.002	298
CM		0.014	0.006	219	0.002	188	0.001	264	0.001	349	0.001	58	0.001	184	0.002	6	0.000	4	0.000	172
DCP 1	.010	0.983	1.259	247	0.019	265	0.007	58	0.023	356	0.032	280	0.015	236	0.019	61	0.026	321	0.007	308
DCP 2	.025	1.421	1.014	247	0.034	317	0.005	192	0.006	11	0.019	175	0.014	351	0.008	230	0.006	184	0.013	304
DCP 3	.050	1.801	0.796	247	0.007	325	0.007	41	0.005	130	0.041	300	0.005	223	0.003	0	0.013	308	0.006	254
DCP 4	.150	1.463	0.321	248	0.019	26	0.002	77	0.006	122	0.022	293	0.003	41	0.004	138	0.004	293	0.007	293
DCP 5	.200	0.343	0.286	248	0.017	349	0.005	145	0.004	156	0.008	196	0.008	328	0.007	240	0.001	136	0.003	335
DCP 6	.250	0.641	0.239	249	0.004	33	0.011	341	0.002	152	0.022	308	0.005	293	0.007	114	0.001	227	0.007	237
DCP 7	.300	0.477	0.229	252	0.018	340	0.008	151	0.004	215	0.004	91	0.006	42	0.005	237	0.004	141	0.006	343
DCP 8	.400	0.442	0.176	256	0.007	82	0.003	347	0.001	107	0.022	288	0.001	130	0.007	155	0.005	323	0.003	262
DCP 9	.501	0.221	0.127	249	0.011	4	0.001	96	0.002	20	0.002	168	0.003	309	0.006	200	0.001	153	0.002	110
DCP 10	.600	0.190	0.078	248	0.007	69	0.011	84	0.008	136	0.019	266	0.005	42	0.010	136	0.003	302	0.000	15
DCP 11	.831	0.168	0.039	267	0.018	342	0.001	114	0.003	210	0.007	149	0.004	356	0.010	214	0.004	218	0.001	275
DCP 12	.878	-0.050	0.031	273	0.009	73	0.007	120	0.002	139	0.021	278	0.002	19	0.004	175	0.000	232	0.000	307
DCP 13	.950	-0.175	0.023	304	0.012	333	0.006	319	0.003	188	0.005	89	0.006	306	0.007	194	0.005	137	0.003	14

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.89	0.200	10.01		0.307	4026.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.130	216.6	198.7	0.26E 07	-0.00566	1.132	10.01

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.951	0.189	260	0.009	242	0.004	196	0.003	258	0.008	17	0.004	329	0.002	182	0.003	334	0.001	309
CM		0.031	0.008	216	0.001	1	0.001	17	0.000	73	0.001	235	0.001	158	0.000	15	0.001	153	0.000	109
DCP 1	.010	3.888	1.126	255	0.024	272	0.008	171	0.019	253	0.039	16	0.010	316	0.009	93	0.002	358	0.004	165
DCP 2	.025	3.838	0.937	257	0.067	239	0.017	33	0.021	202	0.009	84	0.007	53	0.006	200	0.016	304	0.002	163
DCP 3	.050	3.716	0.737	254	0.036	252	0.023	211	0.010	321	0.035	6	0.002	218	0.008	187	0.006	317	0.004	207
DCP 4	.150	2.265	0.325	256	0.013	236	0.009	57	0.006	271	0.019	1	0.006	312	0.001	140	0.003	84	0.006	21
DCP 5	.200	1.124	0.270	258	0.007	267	0.009	221	0.003	55	0.004	125	0.004	295	0.002	130	0.005	319	0.003	195
DCP 6	.250	1.269	0.225	259	0.008	265	0.006	11	0.009	258	0.013	0	0.005	311	0.003	240	0.006	33	0.006	284
DCP 7	.300	1.057	0.220	264	0.003	256	0.008	193	0.003	201	0.004	194	0.003	326	0.003	117	0.006	342	0.002	195
DCP 8	.400	0.873	0.162	267	0.008	261	0.006	66	0.008	239	0.017	14	0.007	327	0.004	175	0.001	247	0.002	305
DCP 9	.501	0.514	0.115	261	0.006	211	0.008	234	0.002	53	0.004	142	0.003	54	0.003	260	0.002	0	0.003	67
DCP 10	.600	0.385	0.069	271	0.005	261	0.001	201	0.004	254	0.009	13	0.008	324	0.003	166	0.004	331	0.008	358
DCP 11	.831	0.207	0.033	292	0.005	167	0.010	197	0.001	214	0.005	121	0.004	315	0.003	247	0.008	316	0.007	208
DCP 12	.878	0.013	0.039	295	0.009	264	0.006	101	0.004	241	0.018	357	0.007	330	0.007	150	0.001	18	0.004	333
DCP 13	.950	-0.119	0.017	301	0.012	195	0.009	224	0.003	342	0.004	121	0.006	35	0.000	45	0.003	89	0.001	272

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.34	0.200	12.42		0.306	4026.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.126	216.3	198.9	0.26E 07	-0.00556	1.371	12.42

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		1.185	0.181 261	0.005 313	0.004 116	0.002 336	0.003 241	0.003 337	0.003 251	0.002 136	0.004 224
CM		0.036	0.008 222	0.002 112	0.001 306	0.001 178	0.000 330	0.000 148	0.001 55	0.001 277	0.001 80
DCP 1	.010	5.259	1.226 256	0.029 48	0.009 316	0.018 197	0.027 219	0.014 254	0.018 267	0.007 238	0.011 60
DCP 2	.025	4.885	0.840 256	0.033 58	0.033 229	0.031 229	0.008 347	0.016 21	0.009 202	0.016 158	0.013 250
DCP 3	.050	4.586	0.752 255	0.008 20	0.023 69	0.016 48	0.006 292	0.006 20	0.008 268	0.006 216	0.010 167
DCP 4	.150	2.665	0.305 258	0.002 287	0.006 120	0.006 265	0.006 229	0.004 312	0.006 300	0.002 76	0.001 128
DCP 5	.200	1.486	0.252 257	0.010 312	0.005 144	0.008 4	0.004 44	0.004 17	0.007 198	0.003 130	0.006 234
DCP 6	.250	1.554	0.207 260	0.003 229	0.008 96	0.006 249	0.007 257	0.003 327	0.004 340	0.002 256	0.006 169
DCP 7	.300	1.340	0.199 263	0.008 262	0.003 177	0.006 286	0.006 312	0.007 323	0.009 202	0.001 117	0.008 237
DCP 8	.400	1.061	0.152 268	0.005 256	0.007 107	0.003 163	0.008 241	0.005 318	0.005 303	0.004 164	0.008 158
DCP 9	.501	0.641	0.104 263	0.006 294	0.002 229	0.005 9	0.002 30	0.001 285	0.006 221	0.002 337	0.006 224
DCP10	.600	0.488	0.054 271	0.004 354	0.003 191	0.002 0	0.012 229	0.002 322	0.003 21	0.001 50	0.008 228
DCP11	.831	0.225	0.039 286	0.011 282	0.005 101	0.005 340	0.007 76	0.004 36	0.009 228	0.006 119	0.007 291
DCP12	.878	0.047	0.036 281	0.006 345	0.008 98	0.002 282	0.008 209	0.002 269	0.005 342	0.003 65	0.002 243
DCP13	.950	-0.056	0.022 317	0.009 309	0.001 213	0.008 23	0.007 65	0.002 212	0.002 150	0.001 202	0.006 271

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.89	0.200	14.87		0.306	4026.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.131	216.1	198.0	0.26E 07	-0.00502	1.550	14.87

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		1.388	0.169 273	0.005 237	0.004 187	0.005 303	0.002 345	0.003 264	0.001 133	0.002 146	0.003 328
CM		0.039	0.008 216	0.001 213	0.001 351	0.002 103	0.001 94	0.001 125	0.000 345	0.001 276	0.001 130
DCP 1	.010	6.305	0.770 264	0.255 257	0.043 68	0.054 73	0.025 268	0.026 201	0.024 17	0.024 243	0.009 226
DCP 2	.025	5.847	0.943 266	0.005 215	0.019 230	0.004 24	0.002 66	0.016 281	0.007 83	0.002 341	0.006 52
DCP 3	.050	5.372	0.731 264	0.005 201	0.005 153	0.000 351	0.010 61	0.008 247	0.003 164	0.007 227	0.001 170
DCP 4	.150	3.031	0.273 268	0.004 208	0.005 206	0.006 285	0.007 6	0.001 232	0.003 175	0.006 214	0.008 332
DCP 5	.200	1.813	0.218 270	0.009 226	0.006 284	0.007 3	0.003 303	0.006 293	0.001 134	0.003 47	0.004 32
DCP 6	.250	1.812	0.194 274	0.002 201	0.006 218	0.008 247	0.007 80	0.002 230	0.001 88	0.010 221	0.004 359
DCP 7	.300	1.551	0.191 281	0.012 231	0.006 286	0.006 7	0.005 264	0.007 267	0.001 72	0.004 43	0.007 19
DCP 8	.400	1.211	0.143 283	0.008 151	0.008 212	0.004 289	0.012 29	0.002 244	0.002 20	0.004 232	0.001 196
DCP 9	.501	0.754	0.089 283	0.006 177	0.004 234	0.004 309	0.004 289	0.005 311	0.003 203	0.003 1	0.003 345
DCP10	.600	0.545	0.049 305	0.008 180	0.005 141	0.012 294	0.001 21	0.006 132	0.002 279	0.008 118	0.006 281
DCP11	.831	0.258	0.046 295	0.009 345	0.011 150	0.006 282	0.006 225	0.007 319	0.004 113	0.007 102	0.003 299
DCP12	.878	0.105	0.053 272	0.006 335	0.006 145	0.008 278	0.009 13	0.003 186	0.005 282	0.005 100	0.006 282
DCP13	.950	0.036	0.025 283	0.008 348	0.008 260	0.002 256	0.009 256	0.010 283	0.006 143	0.002 320	0.007 56

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	17.12	0.400	5.02		0.304	4025.1	10

K	V	ω	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.067	427.7	735.2	0.48E 07	-0.00385	0.658	5.02

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.524	0.133	251	0.005	262	0.002	85	0.003	256	0.003	102	0.001	86	0.003	2	0.001	315	0.003	71
CM		-0.000	0.003	238	0.001	79	0.001	264	0.001	109	0.001	285	0.000	254	0.001	190	0.000	148	0.001	249
DCP 1	.010	1.271	0.754	251	0.027	285	0.004	201	0.010	233	0.004	115	0.005	70	0.005	331	0.003	237	0.004	21
DCP 2	.025	1.615	0.636	251	0.025	284	0.007	174	0.009	217	0.007	98	0.004	225	0.006	43	0.003	242	0.005	12
DCP 3	.050	1.922	0.519	250	0.016	297	0.002	17	0.007	200	0.001	115	0.004	97	0.002	254	0.003	260	0.002	38
DCP 4	.150	1.125	0.220	249	0.006	296	0.002	70	0.003	246	0.002	104	0.002	66	0.002	330	0.001	6	0.001	228
DCP 5	.200	0.826	0.167	249	0.006	282	0.002	97	0.004	257	0.005	84	0.003	222	0.005	30	0.000	23	0.002	54
DCP 6	.250	0.744	0.155	250	0.003	278	0.002	76	0.003	240	0.001	75	0.002	77	0.001	293	0.000	308	0.002	122
DCP 7	.300	0.644	0.138	251	0.004	275	0.003	68	0.001	260	0.004	112	0.003	273	0.005	25	0.001	0	0.003	52
DCP 8	.400	0.488	0.107	253	0.002	260	0.001	90	0.002	276	0.002	72	0.003	74	0.002	296	0.000	354	0.003	138
DCP 9	.501	0.312	0.078	249	0.005	270	0.002	63	0.002	285	0.004	103	0.002	219	0.004	30	0.002	29	0.003	82
DCP10	.600	0.242	0.059	250	0.001	271	0.001	149	0.004	279	0.002	109	0.003	71	0.003	266	0.002	315	0.005	95
DCP11	.831	0.152	0.027	257	0.007	271	0.005	83	0.003	267	0.007	107	0.001	33	0.009	18	0.002	284	0.008	47
DCP12	.878	0.086	0.020	260	0.002	293	0.001	106	0.002	266	0.002	114	0.002	61	0.001	257	0.002	320	0.004	89
DCP13	.950	-0.032	0.016	260	0.003	284	0.004	74	0.002	289	0.005	96	0.002	194	0.007	23	0.001	17	0.003	62

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	17.04	0.400	9.82		0.304	4025.2	10

K	V	ω	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.067	427.0	733.4	0.48E 07	-0.00385	1.258	9.82

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.127	0.131	256	0.001	19	0.002	269	0.001	227	0.000	45	0.000	139	0.002	27	0.001	202	0.001	125
CM		0.013	0.007	247	0.001	9	0.000	129	0.001	78	0.000	209	0.000	90	0.001	210	0.000	58	0.000	274
DCP 1	.010	4.602	0.819	255	0.036	21	0.018	238	0.005	49	0.003	112	0.003	154	0.001	212	0.003	103	0.002	59
DCP 2	.025	4.565	0.705	257	0.013	300	0.004	74	0.003	123	0.006	318	0.006	353	0.004	98	0.001	51	0.004	97
DCP 3	.050	4.384	0.656	254	0.034	42	0.009	253	0.002	174	0.003	96	0.004	153	0.006	354	0.004	112	0.001	27
DCP 4	.150	2.103	0.193	255	0.006	284	0.005	262	0.002	113	0.002	64	0.004	92	0.001	48	0.000	247	0.003	207
DCP 5	.200	1.694	0.161	255	0.004	227	0.000	202	0.001	145	0.003	234	0.001	13	0.004	170	0.001	323	0.003	73
DCP 6	.250	1.437	0.132	256	0.004	300	0.002	290	0.002	160	0.001	125	0.003	102	0.002	46	0.001	198	0.003	186
DCP 7	.300	1.247	0.118	257	0.002	238	0.004	253	0.002	51	0.005	287	0.001	229	0.003	137	0.001	319	0.001	76
DCP 8	.400	0.952	0.089	258	0.002	236	0.000	23	0.002	163	0.003	97	0.002	112	0.003	0	0.003	219	0.002	201
DCP 9	.501	0.654	0.066	257	0.002	213	0.000	176	0.001	354	0.003	262	0.001	65	0.001	131	0.001	31	0.002	89
DCP10	.600	0.504	0.043	256	0.002	232	0.000	127	0.003	161	0.003	88	0.002	95	0.003	333	0.003	162	0.002	192
DCP11	.831	0.271	0.023	271	0.004	140	0.008	288	0.011	271	0.002	7	0.006	267	0.011	35	0.004	294	0.003	73
DCP12	.878	0.181	0.014	265	0.001	194	0.002	84	0.002	165	0.003	80	0.002	115	0.004	331	0.003	169	0.001	229
DCP13	.950	0.070	0.018	268	0.003	171	0.000	355	0.001	137	0.004	259	0.003	306	0.004	114	0.001	265	0.002	48

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	17.24	0.400	12.25		0.306	4025.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.068	426.1	731.5	0.48E 07	-0.00276	1.545	12.25

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.376	0.116	306	0.060	170	0.021	318	0.013	64	0.011	237	0.005	58	0.005	159	0.005	300	0.005	74
CM		0.020	0.009	330	0.010	184	0.006	358	0.004	123	0.003	292	0.002	95	0.001	311	0.002	66	0.002	253
DCP 1	.010	6.448	0.485	284	0.183	202	0.103	267	0.029	72	0.021	208	0.017	29	0.028	174	0.022	297	0.012	65
DCP 2	.025	6.249	0.753	294	0.303	194	0.112	290	0.078	67	0.021	209	0.024	31	0.026	151	0.013	335	0.021	94
DCP 3	.050	5.534	0.950	305	0.529	157	0.209	356	0.111	79	0.117	256	0.051	81	0.005	74	0.023	12	0.021	283
DCP 4	.150	2.425	0.037	316	0.059	191	0.026	314	0.012	103	0.008	264	0.009	84	0.005	213	0.004	329	0.002	108
DCP 5	.200	1.937	0.082	1	0.092	201	0.041	331	0.022	127	0.013	274	0.008	86	0.005	176	0.005	13	0.004	112
DCP 6	.250	1.666	0.065	327	0.051	192	0.023	315	0.013	104	0.008	268	0.009	77	0.006	211	0.003	338	0.003	111
DCP 7	.300	1.429	0.075	358	0.078	197	0.036	327	0.021	117	0.012	266	0.007	83	0.006	191	0.007	349	0.004	125
DCP 8	.400	1.099	0.054	337	0.038	184	0.020	299	0.014	82	0.009	250	0.008	36	0.008	195	0.005	318	0.002	114
DCP 9	.501	0.750	0.041	343	0.033	169	0.023	271	0.013	46	0.007	192	0.003	266	0.009	125	0.006	273	0.004	78
DCP10	.600	0.581	0.028	351	0.014	175	0.010	250	0.010	17	0.007	182	0.005	24	0.005	188	0.003	250	0.002	29
DCP11	.831	0.351	0.062	253	0.035	28	0.029	173	0.025	316	0.014	126	0.012	265	0.006	79	0.016	259	0.016	43
DCP12	.878	0.232	0.026	293	0.007	93	0.003	201	0.004	284	0.004	76	0.001	157	0.005	230	0.001	250	0.001	192
DCP13	.950	0.185	0.090	255	0.035	40	0.019	164	0.010	295	0.004	179	0.003	342	0.012	124	0.004	283	0.010	74

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	17.24	0.400	14.65		0.306	4025.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.068	425.6	730.6	0.48E 07	0.00311	1.573	14.65

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.250	0.225	27	0.065	15	0.057	307	0.014	37	0.008	94	0.006	81	0.009	252	0.010	47	0.007	243
CM		-0.040	0.056	63	0.014	25	0.006	48	0.001	182	0.005	233	0.003	30	0.001	343	0.002	211	0.001	29
DCP 1	.010	5.851	1.152	30	0.107	19	0.082	301	0.078	56	0.021	120	0.039	34	0.037	220	0.020	108	0.023	335
DCP 2	.025	5.452	1.535	40	0.298	6	0.127	297	0.153	67	0.141	247	0.189	70	0.156	271	0.133	99	0.080	259
DCP 3	.050	4.646	1.397	45	0.587	8	0.365	316	0.097	311	0.044	212	0.056	36	0.028	303	0.030	0	0.024	279
DCP 4	.150	1.791	0.682	41	0.096	19	0.018	321	0.039	103	0.009	127	0.018	13	0.017	197	0.009	69	0.002	345
DCP 5	.200	1.425	0.507	40	0.131	54	0.050	355	0.016	70	0.030	157	0.016	121	0.022	307	0.008	259	0.012	155
DCP 6	.250	1.286	0.375	31	0.111	21	0.049	318	0.035	75	0.021	94	0.006	63	0.012	227	0.003	93	0.007	296
DCP 7	.300	1.200	0.251	23	0.109	48	0.074	337	0.020	110	0.013	89	0.009	170	0.010	221	0.012	39	0.011	227
DCP 8	.400	1.000	0.164	356	0.050	32	0.052	315	0.013	47	0.025	74	0.006	214	0.008	200	0.004	227	0.004	43
DCP 9	.501	0.752	0.103	311	0.028	20	0.068	311	0.019	103	0.022	44	0.006	152	0.013	168	0.014	42	0.010	189
DCP10	.600	0.682	0.111	283	0.026	186	0.036	303	0.019	6	0.017	77	0.016	256	0.001	39	0.012	30	0.006	199
DCP11	.831	0.572	0.132	253	0.046	247	0.048	239	0.012	24	0.011	80	0.014	155	0.004	268	0.017	42	0.013	240
DCP12	.878	0.457	0.134	244	0.030	188	0.019	222	0.014	305	0.010	13	0.011	167	0.012	265	0.015	29	0.003	260
DCP13	.950	0.372	0.096	243	0.035	245	0.029	235	0.011	276	0.013	12	0.002	316	0.007	250	0.008	183	0.003	310

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.58	0.600	4.96		0.306	4024.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.044	632.4	1447.5	0.64E 07	-0.00250	0.713	4.96

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.629	0.086	248	0.003	284	0.002	218	0.003	190	0.001	141	0.001	189	0.001	64	0.001	275	0.001	203
CM		-0.000	0.003	240	0.000	244	0.000	205	0.000	157	0.000	190	0.000	101	0.000	230	0.000	126	0.000	94
DCP 1	.010	0.992	0.357	250	0.018	276	0.002	230	0.002	21	0.003	16	0.001	186	0.000	116	0.002	291	0.003	167
DCP 2	.025	1.413	0.298	249	0.018	256	0.001	359	0.001	346	0.003	21	0.001	113	0.003	352	0.001	329	0.004	150
DCP 3	.050	2.061	0.289	248	0.011	282	0.003	329	0.002	129	0.002	70	0.001	130	0.001	294	0.002	247	0.003	141
DCP 4	.150	2.018	0.273	247	0.067	234	0.042	210	0.029	188	0.017	172	0.011	156	0.006	158	0.005	172	0.007	144
DCP 5	.200	1.049	0.290	245	0.095	38	0.026	30	0.023	169	0.003	177	0.002	245	0.001	8	0.001	245	0.002	195
DCP 6	.250	0.808	0.051	252	0.011	31	0.012	201	0.004	313	0.000	30	0.002	89	0.001	0	0.001	334	0.001	297
DCP 7	.300	0.703	0.040	251	0.008	226	0.002	328	0.001	181	0.000	2	0.000	349	0.003	1	0.001	292	0.001	268
DCP 8	.400	0.529	0.047	253	0.004	245	0.000	341	0.001	277	0.001	13	0.001	294	0.001	26	0.001	286	0.001	327
DCP 9	.501	0.324	0.038	246	0.002	258	0.001	39	0.001	301	0.001	279	0.001	5	0.002	3	0.001	249	0.001	203
DCP 10	.600	0.287	0.029	251	0.002	262	0.000	22	0.001	273	0.002	55	0.001	281	0.001	116	0.002	322	0.002	256
DCP 11	.831	0.157	0.015	257	0.001	51	0.001	9	0.000	300	0.001	343	0.001	227	0.001	92	0.002	276	0.002	254
DCP 12	.878	0.130	0.012	265	0.001	28	0.001	229	0.000	244	0.001	115	0.001	297	0.001	154	0.001	327	0.001	325
DCP 13	.950	0.009	0.009	252	0.001	321	0.001	1	0.001	163	0.001	36	0.001	178	0.002	326	0.001	278	0.001	222

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	17.21	0.600	9.75		0.307	4024.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.046	631.7	1461.1	0.64E 07	-0.00045	0.977	9.75

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.948	0.018	297	0.006	39	0.004	209	0.004	286	0.003	10	0.005	95	0.007	248	0.001	62	0.001	204
CM		-0.036	0.008	99	0.002	181	0.000	205	0.001	93	0.001	183	0.000	85	0.001	30	0.001	47	0.000	71
DCP 1	.010	2.419	0.134	265	0.007	46	0.004	170	0.002	270	0.003	19	0.009	52	0.013	181	0.007	318	0.005	39
DCP 2	.025	2.541	0.099	267	0.005	300	0.004	140	0.003	299	0.001	289	0.006	52	0.009	212	0.003	309	0.002	340
DCP 3	.050	3.069	0.044	264	0.013	47	0.015	212	0.008	355	0.005	253	0.010	123	0.005	258	0.004	309	0.010	64
DCP 4	.150	1.855	0.027	78	0.006	30	0.011	210	0.012	245	0.006	190	0.008	289	0.015	231	0.011	43	0.018	191
DCP 5	.200	1.423	0.047	71	0.020	201	0.005	79	0.005	285	0.016	22	0.021	87	0.017	325	0.010	88	0.017	288
DCP 6	.250	1.362	0.067	66	0.028	81	0.007	171	0.002	339	0.008	19	0.024	144	0.016	260	0.016	346	0.008	136
DCP 7	.300	1.260	0.040	59	0.021	96	0.013	248	0.007	224	0.012	81	0.018	87	0.013	289	0.010	96	0.008	10
DCP 8	.400	0.864	0.028	344	0.005	147	0.006	181	0.016	347	0.007	14	0.023	92	0.013	242	0.004	133	0.008	64
DCP 9	.501	0.506	0.026	290	0.017	18	0.012	220	0.003	205	0.004	247	0.002	53	0.012	212	0.008	78	0.004	163
DCP 10	.600	0.476	0.037	274	0.005	268	0.002	179	0.008	262	0.005	320	0.010	23	0.007	264	0.010	213	0.004	340
DCP 11	.831	0.362	0.040	270	0.023	2	0.006	4	0.004	267	0.007	39	0.011	197	0.001	332	0.001	308	0.007	204
DCP 12	.878	0.328	0.030	281	0.004	142	0.006	118	0.002	155	0.008	331	0.010	285	0.009	115	0.008	327	0.008	260
DCP 13	.950	0.266	0.041	274	0.002	61	0.001	270	0.004	55	0.003	178	0.008	296	0.006	180	0.004	220	0.005	22

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	17.24	0.600	12.21		0.305	4024.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.046	631.3	1440.0	0.63E 07	-0.00016	1.028	12.21

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.007	0.006	295	0.002	55	0.008	1	0.010	237	0.002	268	0.004	97	0.001	123	0.005	268	0.002	40
CM		-0.068	0.006	100	0.002	141	0.002	124	0.001	40	0.001	322	0.001	135	0.000	16	0.002	61	0.001	152
DCP 1	.010	2.897	0.125	265	0.002	294	0.007	338	0.008	154	0.002	186	0.009	58	0.006	320	0.004	265	0.004	73
DCP 2	.025	2.978	0.135	265	0.004	252	0.005	338	0.007	193	0.001	2	0.008	47	0.004	153	0.002	222	0.007	71
DCP 3	.050	3.027	0.087	111	0.037	55	0.028	92	0.040	281	0.020	226	0.016	151	0.027	352	0.008	52	0.020	224
DCP 4	.150	1.592	0.066	86	0.050	117	0.067	60	0.025	265	0.006	278	0.025	114	0.019	284	0.015	307	0.023	175
DCP 5	.200	1.312	0.029	53	0.009	179	0.025	303	0.012	186	0.012	350	0.010	34	0.023	110	0.007	205	0.023	52
DCP 6	.250	1.221	0.035	112	0.016	92	0.020	33	0.018	235	0.005	310	0.013	36	0.015	244	0.011	335	0.013	93
DCP 7	.300	1.252	0.018	1	0.022	234	0.014	293	0.015	175	0.014	1	0.015	41	0.017	99	0.007	288	0.026	86
DCP 8	.400	0.987	0.017	313	0.016	243	0.028	294	0.017	162	0.015	46	0.005	236	0.018	160	0.009	313	0.016	15
DCP 9	.501	0.627	0.023	283	0.009	239	0.012	351	0.011	269	0.009	225	0.017	124	0.010	80	0.007	223	0.014	306
DCP10	.600	0.626	0.043	287	0.023	332	0.020	244	0.009	246	0.012	236	0.013	138	0.002	146	0.007	354	0.011	300
DCP11	.831	0.489	0.019	237	0.010	22	0.019	45	0.014	225	0.011	75	0.019	313	0.013	258	0.024	206	0.035	132
DCP12	.878	0.481	0.015	288	0.007	158	0.016	302	0.010	48	0.017	172	0.010	188	0.018	32	0.005	230	0.005	48
DCP13	.950	0.338	0.012	294	0.007	94	0.004	111	0.008	276	0.006	296	0.013	6	0.003	191	0.005	253	0.008	261

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	17.27	0.600	14.58		0.306	4024.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.046	630.1	1450.7	0.64E 07	-0.00036	1.070	14.58

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.047	0.014	297	0.005	0	0.003	261	0.005	319	0.004	205	0.004	117	0.004	212	0.004	191	0.004	117
CM		-0.089	0.008	105	0.001	348	0.001	176	0.002	99	0.003	270	0.001	278	0.000	111	0.001	6	0.001	299
DCP 1	.010	3.260	0.094	270	0.013	333	0.003	198	0.001	187	0.007	258	0.004	30	0.005	269	0.004	159	0.002	289
DCP 2	.025	3.308	0.060	280	0.007	253	0.003	135	0.005	274	0.004	273	0.006	186	0.005	233	0.009	77	0.008	194
DCP 3	.050	2.841	0.100	96	0.053	328	0.011	218	0.044	19	0.030	243	0.018	41	0.033	231	0.012	245	0.007	327
DCP 4	.150	1.528	0.029	69	0.028	13	0.037	205	0.020	4	0.017	220	0.004	202	0.013	164	0.008	315	0.012	124
DCP 5	.200	1.280	0.024	261	0.007	108	0.015	143	0.027	178	0.015	248	0.008	280	0.006	232	0.013	174	0.009	47
DCP 6	.250	1.213	0.016	9	0.014	78	0.011	249	0.005	260	0.006	203	0.016	125	0.028	130	0.003	16	0.009	155
DCP 7	.300	1.262	0.034	272	0.008	109	0.005	123	0.016	204	0.026	236	0.015	131	0.016	212	0.005	249	0.013	204
DCP 8	.400	1.029	0.037	286	0.008	345	0.023	330	0.007	140	0.011	127	0.012	205	0.012	102	0.010	70	0.004	205
DCP 9	.501	0.704	0.014	315	0.009	75	0.006	16	0.019	347	0.013	312	0.010	180	0.003	19	0.010	218	0.006	168
DCP10	.600	0.692	0.022	311	0.011	321	0.010	333	0.014	283	0.012	319	0.009	51	0.019	318	0.017	161	0.019	47
DCP11	.831	0.584	0.029	282	0.009	131	0.006	173	0.008	245	0.033	110	0.003	157	0.018	176	0.002	15	0.006	99
DCP12	.878	0.573	0.027	279	0.009	178	0.004	115	0.007	342	0.024	68	0.005	84	0.010	349	0.014	276	0.019	205
DCP13	.950	0.414	0.034	274	0.014	228	0.009	350	0.010	334	0.014	244	0.009	39	0.005	281	0.006	193	0.011	150

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	32.68	0.200	4.99		0.306	4029.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.248	219.8	200.4	0.26E 07	-0.00522	0.858	4.99

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		0.499	0.342 254	0.005 331	0.004 316	0.006 356	0.015 102	0.005 8	0.003 61	0.003 51	0.003 59
CM		-0.019	0.018 187	0.002 307	0.001 179	0.001 204	0.002 318	0.001 167	0.001 267	0.001 240	0.001 197
DCP 1	.010	0.993	2.152 246	0.091 277	0.028 243	0.015 349	0.056 65	0.017 20	0.016 328	0.012 179	0.016 133
DCP 2	.025	1.312	1.751 245	0.046 293	0.034 229	0.007 51	0.033 55	0.007 220	0.012 144	0.009 280	0.001 173
DCP 3	.050	1.763	1.329 243	0.049 334	0.010 293	0.025 333	0.033 54	0.009 325	0.006 9	0.009 73	0.011 135
DCP 4	.150	0.967	0.547 250	0.013 332	0.002 340	0.009 343	0.022 91	0.013 32	0.005 12	0.003 55	0.006 137
DCP 5	.200	0.788	0.474 252	0.013 345	0.012 300	0.007 23	0.020 120	0.005 78	0.011 79	0.004 270	0.006 338
DCP 6	.250	0.639	0.387 256	0.010 289	0.007 77	0.012 342	0.025 112	0.010 19	0.003 351	0.005 83	0.008 150
DCP 7	.300	0.481	0.376 258	0.005 20	0.009 302	0.012 7	0.025 121	0.007 84	0.007 135	0.004 180	0.004 343
DCP 8	.400	0.400	0.290 262	0.005 51	0.004 41	0.006 25	0.022 104	0.007 9	0.007 37	0.002 52	0.003 94
DCP 9	.501	0.349	0.197 262	0.002 53	0.010 323	0.003 155	0.016 133	0.005 237	0.005 110	0.001 206	0.004 319
DCP 10	.600	0.321	0.135 269	0.003 192	0.002 337	0.003 354	0.013 94	0.011 4	0.004 302	0.010 30	0.006 46
DCP 11	.831	0.271	0.091 287	0.006 94	0.005 333	0.007 0	0.010 147	0.003 239	0.007 103	0.003 87	0.005 10
DCP 12	.878	0.130	0.067 278	0.004 139	0.007 18	0.001 247	0.008 95	0.010 12	0.005 23	0.007 53	0.006 64
DCP 13	.950	-0.057	0.072 299	0.007 136	0.002 312	0.003 23	0.005 134	0.002 217	0.003 111	0.004 159	0.005 3

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	32.68	0.200	10.12		0.304	4029.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.249	219.2	200.5	0.26E 07	-0.00499	1.307	10.12

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		0.981	0.320 261	0.001 15	0.006 299	0.003 342	0.011 130	0.003 252	0.003 18	0.003 37	0.002 57
CM		-0.001	0.019 198	0.002 284	0.001 208	0.001 210	0.002 357	0.001 132	0.001 159	0.000 290	0.001 263
DCP 1	.010	3.966	2.006 251	0.064 320	0.030 261	0.015 260	0.043 57	0.025 170	0.028 13	0.008 238	0.007 276
DCP 2	.025	3.735	1.610 251	0.062 266	0.032 259	0.036 24	0.035 112	0.013 261	0.010 336	0.010 158	0.005 84
DCP 3	.050	3.696	1.289 250	0.036 279	0.023 251	0.003 354	0.030 39	0.017 151	0.011 61	0.007 279	0.005 292
DCP 4	.150	1.723	0.526 257	0.007 334	0.010 304	0.014 270	0.021 116	0.006 247	0.001 86	0.010 19	0.004 353
DCP 5	.200	1.477	0.452 259	0.007 46	0.017 284	0.008 74	0.020 118	0.008 322	0.007 33	0.008 22	0.004 42
DCP 6	.250	1.223	0.366 264	0.006 340	0.012 269	0.010 275	0.021 140	0.005 241	0.005 216	0.015 13	0.006 58
DCP 7	.300	1.051	0.363 266	0.017 134	0.008 283	0.000 261	0.010 163	0.013 300	0.003 102	0.006 28	0.006 87
DCP 8	.400	0.844	0.272 273	0.013 77	0.005 328	0.008 308	0.016 132	0.005 269	0.001 333	0.009 50	0.006 55
DCP 9	.501	0.618	0.176 271	0.007 85	0.004 332	0.008 64	0.015 164	0.004 183	0.005 350	0.006 67	0.003 95
DCP 10	.600	0.509	0.120 288	0.002 2	0.006 331	0.005 314	0.009 150	0.003 310	0.005 20	0.002 109	0.002 31
DCP 11	.831	0.298	0.079 294	0.008 111	0.005 37	0.005 70	0.010 173	0.002 320	0.001 234	0.003 212	0.003 113
DCP 12	.878	0.187	0.065 302	0.005 97	0.008 19	0.007 297	0.006 117	0.002 200	0.004 17	0.003 102	0.001 241
DCP 13	.950	-0.007	0.059 295	0.003 161	0.002 346	0.009 59	0.005 190	0.001 283	0.007 329	0.002 325	0.004 59

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	32.79	0.200	12.61		0.305	4029.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.250	219.2	199.9	0.26E 07	-0.00496	1.511	12.61

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		1.195	0.320 267	0.003 75	0.005 349	0.002 169	0.009 112	0.006 257	0.001 292	0.004 155	0.002 10
CM		0.007	0.020 194	0.002 309	0.001 222	0.000 251	0.001 344	0.001 96	0.001 186	0.001 347	0.001 239
DCP 1	.010	5.162	1.885 254	0.145 263	0.140 24	0.078 202	0.048 51	0.016 154	0.015 212	0.015 306	0.012 81
DCP 2	.025	4.822	1.587 254	0.045 6	0.069 228	0.018 212	0.051 54	0.010 320	0.018 162	0.017 119	0.018 262
DCP 3	.050	4.514	1.300 254	0.031 6	0.010 312	0.012 187	0.021 99	0.017 204	0.011 350	0.007 12	0.011 300
DCP 4	.150	2.093	0.518 262	0.007 306	0.005 326	0.004 90	0.013 88	0.004 205	0.003 306	0.003 153	0.005 274
DCP 5	.200	1.839	0.433 265	0.003 73	0.010 272	0.007 50	0.018 132	0.007 342	0.013 179	0.003 143	0.003 245
DCP 6	.250	1.492	0.370 270	0.003 351	0.004 338	0.003 27	0.013 109	0.004 268	0.003 208	0.006 135	0.003 356
DCP 7	.300	1.326	0.353 274	0.003 103	0.005 275	0.006 269	0.013 140	0.009 279	0.009 186	0.001 130	0.006 128
DCP 8	.400	1.013	0.281 277	0.016 89	0.008 350	0.002 70	0.010 120	0.008 258	0.002 224	0.007 171	0.003 336
DCP 9	.501	0.745	0.167 282	0.009 109	0.010 338	0.003 97	0.010 164	0.007 244	0.002 335	0.003 154	0.003 101
DCP 10	.600	0.565	0.133 292	0.014 124	0.004 34	0.001 149	0.006 136	0.006 275	0.004 357	0.007 159	0.007 21
DCP 11	.831	0.315	0.090 305	0.007 79	0.005 41	0.002 210	0.005 133	0.009 269	0.003 31	0.004 150	0.004 95
DCP 12	.878	0.197	0.083 289	0.002 129	0.010 66	0.004 134	0.004 34	0.005 286	0.004 18	0.007 152	0.003 295
DCP 13	.950	0.067	0.061 300	0.014 210	0.005 12	0.005 87	0.004 120	0.001 231	0.003 322	0.003 194	0.004 47

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	32.68	0.200	15.10		0.305	4029.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.249	219.1	199.4	0.26E 07	-0.00517	1.719	15.10

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		1.376	0.336 273	0.005 9	0.004 270	0.005 86	0.010 160	0.004 255	0.002 266	0.001 88	0.001 147
CM		0.008	0.015 188	0.001 222	0.001 287	0.001 325	0.002 35	0.001 172	0.001 70	0.001 11	0.001 294
DCP 1	.010	6.102	1.615 260	0.196 265	0.104 241	0.171 49	0.033 151	0.063 231	0.029 22	0.013 284	0.015 230
DCP 2	.025	5.765	1.673 260	0.058 40	0.028 45	0.039 130	0.023 119	0.033 210	0.025 208	0.014 27	0.004 253
DCP 3	.050	5.212	1.346 261	0.020 9	0.028 267	0.017 57	0.024 107	0.006 180	0.001 223	0.003 53	0.008 312
DCP 4	.150	2.368	0.511 269	0.008 268	0.011 311	0.008 140	0.023 144	0.013 273	0.004 29	0.004 226	0.003 235
DCP 5	.200	2.120	0.437 274	0.005 272	0.013 325	0.006 57	0.017 130	0.012 291	0.005 203	0.014 47	0.005 232
DCP 6	.250	1.703	0.375 278	0.005 93	0.012 265	0.005 292	0.016 134	0.011 232	0.004 20	0.002 157	0.005 98
DCP 7	.300	1.524	0.393 278	0.009 139	0.012 293	0.003 178	0.009 139	0.008 267	0.001 300	0.009 51	0.005 175
DCP 8	.400	1.158	0.299 286	0.022 77	0.004 182	0.003 155	0.014 165	0.001 354	0.004 266	0.001 136	0.004 89
DCP 9	.501	0.834	0.201 288	0.006 51	0.005 230	0.004 243	0.009 238	0.007 317	0.003 284	0.004 78	0.007 137
DCP 10	.600	0.612	0.157 298	0.014 3	0.003 82	0.007 101	0.011 194	0.002 86	0.004 320	0.003 137	0.001 3
DCP 11	.831	0.359	0.097 290	0.003 33	0.004 107	0.006 112	0.010 190	0.005 224	0.006 216	0.002 265	0.005 121
DCP 12	.878	0.254	0.088 272	0.010 340	0.000 192	0.006 81	0.008 172	0.007 35	0.003 59	0.004 198	0.004 335
DCP 13	.950	0.159	0.050 281	0.006 218	0.003 141	0.004 112	0.005 266	0.006 300	0.005 247	0.004 241	0.003 157

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.11	0.400	5.12		0.307	4028.1	10

K	V	Q	RN	DAMPING	CN'MAX)	ALPHA(STALL)
0.129	429.4	736.3	0.48E 07	-0.00316	0.746	5.12

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.528	0.222	245	0.008	316	0.002	249	0.004	145	0.001	51	0.002	163	0.001	234	0.001	359	0.000	285
CM		-0.002	0.006	219	0.001	297	0.000	144	0.000	10	0.000	353	0.000	24	0.000	105	0.000	230	0.000	202
DCP 1	.010	1.259	1.285	245	0.063	299	0.014	225	0.022	134	0.022	7	0.010	122	0.005	205	0.008	258	0.003	178
DCP 2	.025	1.583	1.100	244	0.056	307	0.016	210	0.013	93	0.013	18	0.009	138	0.005	160	0.005	357	0.002	241
DCP 3	.050	1.923	0.881	243	0.041	318	0.008	243	0.011	131	0.010	8	0.008	127	0.002	187	0.002	312	0.003	229
DCP 4	.150	1.126	0.359	244	0.013	314	0.004	262	0.005	137	0.001	94	0.003	148	0.001	240	0.002	267	0.001	341
DCP 5	.200	0.834	0.317	244	0.015	308	0.004	203	0.004	103	0.004	50	0.003	177	0.002	207	0.003	42	0.004	303
DCP 6	.250	0.759	0.255	246	0.009	308	0.004	284	0.004	167	0.004	122	0.002	149	0.001	199	0.002	272	0.001	57
DCP 7	.300	0.630	0.233	247	0.008	306	0.003	224	0.004	109	0.003	66	0.003	188	0.001	189	0.002	49	0.001	333
DCP 8	.400	0.485	0.176	248	0.004	340	0.003	275	0.004	159	0.001	125	0.002	178	0.002	255	0.001	329	0.000	209
DCP 9	.501	0.328	0.127	244	0.004	316	0.002	236	0.002	123	0.001	109	0.003	174	0.000	165	0.003	38	0.001	236
DCP10	.600	0.255	0.090	248	0.002	5	0.001	307	0.005	199	0.001	120	0.002	198	0.002	269	0.001	333	0.000	154
DCP11	.831	0.159	0.048	256	0.000	342	0.001	287	0.001	155	0.001	119	0.002	179	0.001	6	0.001	42	0.001	26
DCP12	.878	0.092	0.035	263	0.002	67	0.002	308	0.004	180	0.002	204	0.001	201	0.002	241	0.001	252	0.001	158
DCP13	.950	-0.041	0.033	259	0.001	276	0.001	177	0.003	99	0.000	3	0.002	176	0.001	244	0.001	50	0.001	308

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	31.06	0.400	10.01		0.306	4028.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.121	428.8	737.3	0.48E 07	-0.00336	1.346	10.01

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.138	0.213	252	0.009	280	0.004	325	0.004	153	0.005	114	0.002	293	0.003	95	0.001	95	0.001	308
CM		0.013	0.010	230	0.001	308	0.001	47	0.000	32	0.000	280	0.001	278	0.000	62	0.000	290	0.000	326
DCP 1	.010	4.787	1.580	248	0.165	14	0.023	201	0.051	165	0.042	343	0.025	148	0.014	88	0.007	255	0.005	66
DCP 2	.025	4.688	1.336	248	0.122	9	0.060	200	0.014	32	0.018	35	0.018	161	0.013	345	0.012	107	0.006	333
DCP 3	.050	4.357	0.899	249	0.103	239	0.068	6	0.016	129	0.044	136	0.046	299	0.029	87	0.003	115	0.010	299
DCP 4	.150	2.121	0.315	251	0.017	270	0.005	314	0.006	177	0.003	86	0.003	227	0.003	81	0.002	52	0.001	272
DCP 5	.200	1.721	0.270	250	0.013	283	0.003	263	0.003	154	0.004	65	0.002	146	0.002	99	0.003	104	0.001	11
DCP 6	.250	1.456	0.221	253	0.010	285	0.004	301	0.004	183	0.003	120	0.001	75	0.003	146	0.001	353	0.001	118
DCP 7	.300	1.241	0.202	254	0.009	303	0.003	257	0.003	143	0.003	64	0.001	109	0.002	119	0.000	269	0.001	337
DCP 8	.400	0.957	0.155	256	0.004	279	0.006	287	0.003	183	0.004	138	0.001	340	0.001	144	0.002	59	0.002	114
DCP 9	.501	0.673	0.106	252	0.004	286	0.002	242	0.002	157	0.002	98	0.001	43	0.002	136	0.001	129	0.000	221
DCP10	.600	0.514	0.076	258	0.004	241	0.005	313	0.003	169	0.004	136	0.001	15	0.001	178	0.002	78	0.001	156
DCP11	.831	0.273	0.038	271	0.000	336	0.001	217	0.001	76	0.002	85	0.001	141	0.001	222	0.001	216	0.001	310
DCP12	.878	0.191	0.034	275	0.003	230	0.004	302	0.003	188	0.003	119	0.001	359	0.001	335	0.002	113	0.001	185
DCP13	.950	0.056	0.035	260	0.005	313	0.001	179	0.001	101	0.001	83	0.001	114	0.001	159	0.001	73	0.000	351

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	30.96	0.400	12.46		0.306	4028.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.121	428.1	734.6	0.48E 07	-0.00363	1.587	12.46

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.279	0.275	305	0.074	94	0.028	156	0.020	282	0.011	142	0.003	20	0.003	315	0.003	36	0.003	199
CM		0.010	0.016	14	0.020	175	0.009	298	0.004	17	0.002	176	0.001	39	0.001	157	0.001	312	0.001	136
DCP 1	.010	5.717	1.514	294	0.192	69	0.237	166	0.065	305	0.084	45	0.040	192	0.038	299	0.023	94	0.023	175
DCP 2	.025	5.694	1.557	292	0.296	98	0.204	164	0.143	320	0.082	87	0.066	231	0.029	340	0.049	93	0.027	238
DCP 3	.050	5.080	1.333	311	0.555	143	0.131	340	0.092	320	0.162	181	0.101	38	0.026	198	0.062	335	0.049	159
DCP 4	.150	2.235	0.341	320	0.104	109	0.051	205	0.025	318	0.019	105	0.012	250	0.010	26	0.007	153	0.005	284
DCP 5	.200	1.804	0.296	327	0.111	121	0.051	229	0.021	348	0.018	121	0.007	261	0.003	14	0.002	128	0.002	72
DCP 6	.250	1.530	0.285	325	0.107	104	0.056	199	0.029	304	0.017	95	0.007	235	0.007	38	0.006	194	0.007	336
DCP 7	.300	1.326	0.254	324	0.101	110	0.051	216	0.022	311	0.014	78	0.002	177	0.002	237	0.002	22	0.000	44
DCP 8	.400	1.013	0.224	318	0.088	76	0.055	157	0.032	252	0.007	11	0.003	315	0.006	40	0.005	154	0.004	329
DCP 9	.501	0.714	0.153	309	0.073	59	0.053	154	0.029	257	0.007	29	0.002	86	0.003	325	0.004	97	0.002	231
DCP 10	.600	0.561	0.122	296	0.070	22	0.060	114	0.030	216	0.004	321	0.005	164	0.012	292	0.007	55	0.004	231
DCP 11	.831	0.357	0.113	256	0.071	11	0.034	120	0.012	219	0.004	145	0.002	272	0.002	13	0.002	123	0.004	334
DCP 12	.878	0.285	0.107	241	0.052	339	0.025	58	0.011	151	0.003	237	0.003	77	0.004	201	0.001	334	0.002	219
DCP 13	.950	0.173	0.125	242	0.042	7	0.005	112	0.004	319	0.011	112	0.007	279	0.005	52	0.005	133	0.006	271

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	32.89	0.400	14.88		0.306	4028.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.128	427.7	735.9	0.48E 07	-0.00028	1.616	14.88

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.244	0.333	357	0.054	242	0.021	76	0.025	253	0.021	127	0.005	14	0.004	24	0.003	254	0.004	274
CM		-0.032	0.065	80	0.022	319	0.017	202	0.007	88	0.003	301	0.002	188	0.003	94	0.002	325	0.001	117
DCP 1	.010	5.720	1.290	357	0.142	281	0.077	334	0.036	216	0.053	28	0.069	249	0.046	112	0.012	304	0.001	276
DCP 2	.025	5.062	1.247	30	0.474	319	0.344	262	0.244	157	0.161	35	0.103	263	0.026	180	0.063	158	0.071	47
DCP 3	.050	4.538	1.413	33	0.541	297	0.321	218	0.168	170	0.156	119	0.048	31	0.057	66	0.037	329	0.031	251
DCP 4	.150	1.889	0.738	28	0.131	246	0.109	132	0.041	358	0.028	252	0.009	181	0.018	117	0.015	310	0.009	258
DCP 5	.200	1.586	0.660	17	0.140	218	0.109	115	0.074	328	0.016	230	0.016	170	0.017	82	0.019	345	0.018	255
DCP 6	.250	1.413	0.551	5	0.083	220	0.122	99	0.057	320	0.035	197	0.008	89	0.008	33	0.008	311	0.014	212
DCP 7	.300	1.292	0.485	354	0.097	208	0.107	87	0.068	305	0.014	195	0.015	96	0.008	63	0.011	313	0.009	239
DCP 8	.400	1.042	0.385	338	0.050	194	0.091	67	0.050	300	0.034	176	0.014	46	0.018	336	0.010	223	0.009	81
DCP 9	.501	0.743	0.272	321	0.039	166	0.058	44	0.042	272	0.021	162	0.007	50	0.017	294	0.007	214	0.004	263
DCP 10	.600	0.634	0.221	307	0.039	173	0.067	19	0.040	264	0.023	118	0.006	6	0.013	296	0.010	204	0.008	34
DCP 11	.831	0.509	0.211	271	0.064	142	0.052	6	0.033	225	0.027	96	0.009	328	0.004	215	0.010	130	0.008	279
DCP 12	.878	0.433	0.193	266	0.076	150	0.046	332	0.023	219	0.014	79	0.005	9	0.007	228	0.011	124	0.006	293
DCP 13	.950	0.311	0.173	258	0.054	148	0.028	344	0.016	181	0.006	51	0.011	346	0.006	256	0.010	93	0.007	242

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	29.85	0.600	5.09		0.306	4027.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.079	631.2	1450.2	0.64E 07	-0.00261	0.793	5.09

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		0.628	0.168 243	0.009 247	0.005 200	0.000 348	0.004 303	0.003 273	0.001 189	0.002 3	0.002 353
CM		-0.001	0.006 225	0.001 239	0.000 261	0.001 54	0.000 296	0.000 284	0.000 5	0.001 86	0.000 316
DCP 1	.010	0.971	0.633 244	0.044 257	0.008 202	0.010 155	0.004 147	0.001 57	0.002 89	0.003 131	0.002 236
DCP 2	.025	1.397	0.534 242	0.047 247	0.009 210	0.005 176	0.002 120	0.001 91	0.003 94	0.004 342	0.004 255
DCP 3	.050	2.050	0.518 242	0.033 251	0.006 207	0.009 134	0.003 134	0.001 228	0.001 320	0.002 133	0.002 259
DCP 4	.150	1.862	0.628 240	0.166 216	0.037 194	0.042 332	0.065 306	0.039 278	0.000 326	0.024 42	0.022 5
DCP 5	.200	1.266	0.415 238	0.110 19	0.052 344	0.047 127	0.021 123	0.018 240	0.008 226	0.011 347	0.002 329
DCP 6	.250	0.897	0.258 241	0.095 18	0.046 169	0.006 130	0.016 269	0.008 35	0.003 63	0.006 156	0.005 304
DCP 7	.300	0.686	0.088 253	0.007 209	0.011 180	0.006 288	0.003 82	0.000 336	0.003 176	0.003 296	0.002 26
DCP 8	.400	0.514	0.086 249	0.008 196	0.003 216	0.001 197	0.001 303	0.001 32	0.002 202	0.001 190	0.001 47
DCP 9	.501	0.327	0.067 244	0.005 211	0.002 238	0.002 251	0.001 253	0.001 68	0.002 162	0.002 318	0.001 291
DCP10	.600	0.279	0.051 250	0.002 179	0.001 213	0.001 116	0.001 11	0.001 129	0.001 204	0.001 189	0.001 44
DCP11	.831	0.158	0.028 258	0.000 255	0.001 276	0.004 237	0.000 13	0.001 228	0.001 192	0.005 286	0.000 232
DCP12	.878	0.126	0.025 260	0.002 81	0.001 153	0.000 325	0.000 252	0.000 243	0.000 209	0.001 189	0.001 35
DCP13	.950	0.012	0.026 249	0.004 288	0.003 132	0.003 244	0.001 125	0.001 227	0.001 169	0.004 284	0.001 336

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	32.05	0.600	9.95		0.306	4027.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.085	630.5	1450.7	0.64E 07	-0.00082	1.029	9.95

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		0.957	0.063 305	0.010 355	0.005 239	0.006 197	0.009 24	0.001 40	0.004 318	0.005 153	0.004 48
CM		-0.037	0.023 95	0.002 191	0.002 21	0.001 310	0.001 104	0.001 203	0.001 62	0.000 143	0.002 324
DCP 1	.010	2.437	0.306 271	0.031 335	0.005 266	0.003 133	0.006 349	0.003 272	0.006 181	0.003 169	0.002 306
DCP 2	.025	2.568	0.236 269	0.022 353	0.015 240	0.005 110	0.005 354	0.005 244	0.003 186	0.004 118	0.003 12
DCP 3	.050	3.030	0.061 275	0.050 283	0.014 6	0.012 216	0.007 349	0.012 94	0.011 280	0.013 163	0.011 17
DCP 4	.150	1.935	0.205 50	0.015 162	0.009 240	0.040 244	0.074 63	0.022 176	0.027 357	0.026 145	0.051 21
DCP 5	.200	1.502	0.122 59	0.019 34	0.015 307	0.013 31	0.017 47	0.008 315	0.015 95	0.007 164	0.015 19
DCP 6	.250	1.323	0.100 27	0.031 91	0.014 28	0.006 120	0.015 348	0.017 8	0.016 144	0.012 144	0.013 299
DCP 7	.300	1.264	0.083 25	0.024 25	0.014 252	0.012 225	0.021 28	0.012 304	0.016 355	0.002 220	0.012 278
DCP 8	.400	0.844	0.108 292	0.014 24	0.011 284	0.008 165	0.007 308	0.005 322	0.007 12	0.005 190	0.011 194
DCP 9	.501	0.537	0.111 294	0.014 314	0.008 174	0.014 179	0.009 278	0.007 130	0.008 306	0.008 182	0.003 258
DCP10	.600	0.473	0.099 281	0.023 354	0.008 193	0.006 193	0.013 6	0.001 21	0.010 272	0.001 279	0.007 142
DCP11	.831	0.376	0.103 275	0.006 22	0.010 219	0.007 107	0.007 239	0.006 52	0.006 212	0.003 323	0.011 122
DCP12	.878	0.331	0.088 269	0.009 342	0.007 178	0.004 93	0.007 299	0.003 119	0.004 259	0.004 155	0.006 126
DCP13	.950	0.257	0.084 264	0.003 171	0.007 197	0.002 129	0.001 44	0.006 321	0.005 177	0.002 75	0.008 85

FORCED VERTICAL TRANSLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	32.36	0.600	12.34		0.306	4027.3	10
	K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
	0.086	630.0	1445.5	0.64E 07	-0.00045	1.071	12.34

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		1.016	0.048 324	0.010 282	0.006 271	0.010 213	0.006 34	0.006 241	0.005 354	0.003 126	0.004 193
CM		-0.067	0.018 95	0.002 121	0.001 163	0.002 351	0.002 167	0.001 87	0.001 108	0.001 202	0.002 337
DCP 1	.010	2.893	0.272 275	0.027 316	0.008 253	0.009 161	0.005 84	0.005 263	0.001 233	0.002 291	0.001 216
DCP 2	.025	2.986	0.286 273	0.030 289	0.004 189	0.011 163	0.007 49	0.005 226	0.002 4	0.002 49	0.004 267
DCP 3	.050	2.994	0.149 59	0.035 293	0.030 196	0.008 137	0.015 115	0.023 240	0.034 69	0.015 155	0.010 254
DCP 4	.150	1.635	0.158 49	0.002 176	0.038 217	0.022 256	0.010 64	0.011 276	0.010 286	0.014 132	0.011 346
DCP 5	.200	1.461	0.075 58	0.017 150	0.026 343	0.032 267	0.006 64	0.002 289	0.020 30	[illegible]	0.004 259
DCP 6	.250	1.243	0.119 21	0.007 275	0.011 238	0.016 234	0.016 117	0.024 157	0.010 283	[illegible]	0.016 300
DCP 7	.300	1.263	0.065 354	0.020 244	0.024 325	0.020 265	0.012 24	0.012 259	0.021 336	[illegible]	0.007 57
DCP 8	.400	0.969	0.084 322	0.010 246	0.008 297	0.010 220	0.008 77	0.005 131	0.008 273	[illegible]	0.009 299
DCP 9	.501	0.645	0.083 295	0.032 286	0.007 312	0.025 192	0.009 351	0.006 183	0.006 310	0.013 [illegible]	0.006 279
DCP 10	.600	0.610	0.064 278	0.008 315	0.002 39	0.011 176	0.010 345	0.009 353	0.007 15	0.011 33	0.021 170
DCP 11	.831	0.492	0.074 282	0.009 294	0.005 318	0.008 139	0.006 3	0.016 247	0.002 213	0.002 334	0.005 189
DCP 12	.878	0.471	0.067 261	0.003 261	0.007 342	0.007 197	0.009 358	0.014 296	0.006 6	0.006 352	0.009 91
DCP 13	.950	0.346	0.062 274	0.008 34	0.004 234	0.003 127	0.001 273	0.009 193	0.006 198	0.001 3	0.010 127

FORCED VERTICAL TRANSLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	32.57	0.600	14.77		0.305	4027.4	10
	K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
	0.087	628.6	1442.6	0.64E 07	-0.00048	1.104	14.77

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		1.048	0.041 308	0.016 29	0.005 41	0.004 232	0.013 151	0.000 300	0.006 106	0.005 15	0.004 250
CM		-0.090	0.019 109	0.004 213	0.001 116	0.001 245	0.002 315	0.002 167	0.000 335	0.004 158	0.003 16
DCP 1	.010	3.236	0.172 280	0.057 298	0.015 70	0.002 237	0.007 135	0.003 47	0.003 265	0.007 109	0.013 314
DCP 2	.025	3.235	0.067 317	0.072 268	0.027 66	0.332 239	0.030 52	0.027 189	0.031 1	0.033 159	0.034 319
DCP 3	.050	2.831	0.128 106	0.021 94	0.015 357	0.017 54	0.024 210	0.019 278	0.034 169	0.023 206	0.012 182
DCP 4	.150	1.475	0.039 51	0.013 337	0.035 90	0.024 247	0.020 135	0.023 153	0.010 157	0.032 131	0.017 354
DCP 5	.200	1.434	0.022 1	0.020 36	0.011 251	0.017 274	0.014 172	0.007 239	0.022 91	0.006 98	0.013 33
DCP 6	.250	1.202	0.042 356	0.025 49	0.025 84	0.036 215	0.012 171	0.018 110	0.009 72	0.027 135	0.018 321
DCP 7	.300	1.258	0.043 352	0.019 33	0.004 125	0.017 261	0.022 177	0.010 174	0.019 62	0.013 360	0.011 7
DCP 8	.400	1.016	0.077 306	0.040 39	0.016 55	0.022 166	0.021 149	0.033 191	0.017 62	0.006 336	0.007 298
DCP 9	.501	0.705	0.053 320	0.025 35	0.002 327	0.015 217	0.013 139	0.010 39	0.005 2	0.014 333	0.008 249
DCP 10	.600	0.699	0.072 299	0.023 38	0.010 304	0.017 13	0.018 140	0.005 14	0.006 33	0.015 10	0.013 209
DCP 11	.831	0.578	0.081 283	0.009 12	0.004 334	0.007 63	0.010 115	0.013 340	0.011 184	0.016 338	0.010 207
DCP 12	.878	0.584	0.065 285	0.008 313	0.011 283	0.008 205	0.006 154	0.005 302	0.006 186	0.020 357	0.017 179
DCP 13	.950	0.418	0.064 272	0.011 41	0.000 140	0.006 80	0.003 214	0.008 292	0.006 189	0.006 336	0.010 159

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	32.89	0.200	0.26		0.466	4037.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.249	220.3	202.3	0.26E 07	-0.00504	0.426	0.26

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		-0.110	0.516	250	0.016	330	0.016	244	0.005	110	0.018	93	0.005	346	0.005	316	0.001	54	0.001	289
CM		0.002	0.027	185	0.003	271	0.002	129	0.001	359	0.004	303	0.000	166	0.001	191	0.002	242	0.001	139
DCP 1	.010	-2.567	3.906	242	0.281	241	0.127	210	0.042	50	0.083	24	0.034	338	0.022	273	0.015	303	0.005	204
DCP 2	.025	-1.035	2.489	239	0.100	308	0.060	189	0.005	168	0.043	2	0.010	83	0.001	276	0.016	251	0.011	154
DCP 3	.050	-0.092	1.925	240	0.086	330	0.051	211	0.004	30	0.016	19	0.011	290	0.019	254	0.003	213	0.006	297
DCP 4	.150	0.044	0.821	247	0.042	324	0.024	228	0.017	72	0.025	81	0.009	343	0.009	313	0.005	248	0.005	74
DCP 5	.200	0.023	0.708	247	0.023	299	0.022	249	0.011	111	0.035	85	0.011	42	0.003	272	0.009	257	0.006	197
DCP 6	.250	-0.040	0.614	253	0.030	328	0.017	239	0.017	79	0.023	96	0.008	340	0.005	322	0.001	274	0.007	74
DCP 7	.300	-0.214	0.561	252	0.012	328	0.019	261	0.015	172	0.030	97	0.014	53	0.006	275	0.009	229	0.002	33
DCP 8	.400	-0.071	0.449	260	0.022	38	0.012	269	0.007	59	0.023	112	0.010	305	0.008	339	0.005	25	0.005	352
DCP 9	.501	-0.136	0.287	256	0.010	349	0.015	280	0.007	142	0.030	96	0.008	21	0.007	350	0.004	321	0.003	227
DCP 10	.600	-0.078	0.215	267	0.015	28	0.013	273	0.007	93	0.017	116	0.008	291	0.012	318	0.012	94	0.004	204
DCP 11	.831	0.158	0.122	282	0.005	80	0.010	281	0.008	208	0.015	121	0.003	107	0.005	76	0.005	55	0.006	320
DCP 12	.878	-0.076	0.118	282	0.007	78	0.008	293	0.001	132	0.012	128	0.007	283	0.006	333	0.007	32	0.006	313
DCP 13	.950	-0.365	0.089	291	0.009	181	0.005	231	0.004	183	0.010	89	0.006	65	0.002	107	0.004	28	0.004	174

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	32.89	0.200	7.54		0.465	4037.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.250	220.0	201.7	0.26E 07	-0.00509	1.161	7.54

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.632	0.501	260	0.010	6	0.010	262	0.007	114	0.020	133	0.003	31	0.007	65	0.005	42	0.006	54
CM		0.017	0.029	195	0.004	295	0.001	185	0.001	17	0.004	341	0.001	215	0.002	258	0.001	274	0.001	226
DCP 1	.010	2.257	3.079	249	0.097	296	0.112	219	0.044	50	0.058	68	0.015	53	0.004	142	0.042	322	0.003	351
DCP 2	.025	2.477	2.511	251	0.090	306	0.024	300	0.019	133	0.070	80	0.012	354	0.008	71	0.025	321	0.006	35
DCP 3	.050	2.659	2.002	247	0.059	317	0.054	228	0.032	56	0.024	103	0.011	17	0.011	319	0.011	5	0.008	270
DCP 4	.150	1.181	0.837	255	0.035	349	0.015	268	0.018	97	0.031	114	0.005	152	0.005	26	0.010	9	0.007	37
DCP 5	.200	1.019	0.682	259	0.023	21	0.015	303	0.009	106	0.025	129	0.001	52	0.012	95	0.008	81	0.011	60
DCP 6	.250	0.857	0.555	261	0.019	330	0.014	271	0.021	101	0.026	133	0.001	301	0.005	343	0.010	342	0.012	31
DCP 7	.300	0.673	0.536	265	0.016	34	0.012	312	0.007	223	0.023	160	0.005	181	0.014	72	0.013	82	0.017	88
DCP 8	.400	0.588	0.446	269	0.019	82	0.013	247	0.016	129	0.029	135	0.002	103	0.011	26	0.008	66	0.013	76
DCP 9	.501	0.322	0.271	269	0.012	53	0.010	312	0.007	189	0.026	155	0.005	344	0.013	87	0.004	100	0.005	62
DCP 10	.600	0.252	0.204	281	0.006	114	0.012	250	0.004	141	0.016	150	0.005	349	0.011	84	0.008	66	0.002	199
DCP 11	.831	0.270	0.115	296	0.014	108	0.011	10	0.005	213	0.014	153	0.009	47	0.006	81	0.004	22	0.008	37
DCP 12	.878	0.037	0.124	293	0.011	106	0.003	201	0.007	145	0.013	133	0.004	69	0.008	58	0.006	97	0.006	16
DCP 13	.950	-0.281	0.060	301	0.005	270	0.002	102	0.001	150	0.010	147	0.005	29	0.005	74	0.005	190	0.008	31

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.00	0.200	9.99		0.465	4037.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.251	219.5	201.4	0.26E 07	-0.00503	1.365	9.99

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.850	0.499	261	0.008	31	0.013	263	0.009	121	0.019	129	0.005	170	0.005	68	0.003	173	0.004	56
CM		0.026	0.028	193	0.003	312	0.002	155	0.002	353	0.004	349	0.001	38	0.002	279	0.001	348	0.001	233
DCP 1	.010	3.634	3.018	251	0.095	335	0.054	261	0.089	143	0.084	32	0.037	156	0.050	284	0.009	132	0.016	319
DCP 2	.025	3.642	2.497	249	0.076	305	0.057	224	0.053	23	0.054	59	0.013	139	0.040	314	0.005	350	0.013	116
DCP 3	.050	3.535	1.991	250	0.064	337	0.055	222	0.025	58	0.043	76	0.011	161	0.009	302	0.016	232	0.010	298
DCP 4	.150	1.515	0.812	258	0.021	3	0.017	274	0.007	101	0.029	122	0.011	128	0.008	90	0.002	347	0.012	70
DCP 5	.200	1.310	0.689	259	0.012	62	0.019	266	0.017	99	0.019	118	0.003	137	0.005	34	0.007	325	0.012	131
DCP 6	.250	1.124	0.565	264	0.014	330	0.014	275	0.013	157	0.033	137	0.009	116	0.008	75	0.011	142	0.009	61
DCP 7	.300	0.944	0.556	266	0.022	95	0.015	273	0.017	106	0.021	145	0.003	282	0.012	54	0.003	45	0.012	78
DCP 8	.400	0.794	0.422	271	0.025	94	0.011	282	0.012	131	0.031	133	0.008	147	0.010	81	0.007	120	0.003	33
DCP 9	.501	0.444	0.280	270	0.008	93	0.017	283	0.010	134	0.020	156	0.004	234	0.007	80	0.006	132	0.008	98
DCP 10	.600	0.315	0.199	283	0.004	115	0.004	287	0.013	173	0.023	142	0.009	239	0.005	96	0.004	175	0.009	320
DCP 11	.831	0.289	0.131	295	0.012	100	0.009	318	0.002	118	0.014	175	0.002	215	0.008	91	0.007	137	0.007	70
DCP 12	.878	0.047	0.110	289	0.011	120	0.001	306	0.007	158	0.016	154	0.011	129	0.007	115	0.004	155	0.003	45
DCP 13	.950	-0.237	0.099	292	0.013	244	0.007	285	0.002	135	0.006	152	0.002	180	0.004	99	0.005	189	0.009	85

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.11	0.200	12.45		0.468	4037.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.252	219.5	201.3	0.26E 07	-0.00488	1.570	12.45

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.073	0.487	267	0.012	32	0.013	265	0.005	151	0.017	154	0.006	273	0.005	54	0.008	111	0.005	47
CM		0.028	0.029	191	0.003	266	0.002	199	0.001	14	0.003	1	0.001	94	0.001	279	0.001	298	0.001	220
DCP 1	.010	4.771	2.632	255	0.239	261	0.030	9	0.053	17	0.113	175	0.074	4	0.021	340	0.048	160	0.045	336
DCP 2	.025	4.736	2.445	252	0.085	346	0.095	220	0.016	77	0.071	48	0.006	150	0.024	127	0.023	50	0.025	339
DCP 3	.050	4.379	1.965	254	0.048	345	0.064	240	0.005	179	0.025	82	0.018	210	0.023	357	0.015	95	0.011	169
DCP 4	.150	1.856	0.798	264	0.017	1	0.026	288	0.013	119	0.026	154	0.010	286	0.006	344	0.012	122	0.006	78
DCP 5	.200	1.679	0.642	265	0.011	101	0.027	262	0.015	70	0.030	130	0.005	235	0.011	85	0.007	59	0.008	66
DCP 6	.250	1.371	0.570	272	0.017	22	0.023	289	0.015	152	0.023	161	0.011	253	0.007	33	0.016	143	0.003	269
DCP 7	.300	1.221	0.526	270	0.028	63	0.014	255	0.012	151	0.027	148	0.009	293	0.009	87	0.008	130	0.017	97
DCP 8	.400	0.973	0.438	280	0.034	79	0.010	289	0.007	216	0.022	177	0.007	254	0.005	65	0.011	134	0.004	56
DCP 9	.501	0.560	0.271	281	0.020	71	0.012	276	0.001	205	0.021	149	0.003	299	0.007	112	0.006	135	0.010	37
DCP 10	.600	0.395	0.210	297	0.009	94	0.005	237	0.011	173	0.014	213	0.006	297	0.007	25	0.013	75	0.007	31
DCP 11	.831	0.337	0.138	299	0.012	60	0.009	23	0.005	177	0.018	153	0.009	276	0.004	91	0.005	192	0.008	31
DCP 12	.878	0.100	0.133	290	0.018	21	0.009	359	0.005	207	0.012	204	0.006	240	0.002	99	0.009	134	0.002	157
DCP 13	.950	-0.159	0.087	287	0.017	253	0.006	254	0.004	340	0.008	123	0.000	52	0.005	130	0.004	93	0.003	13

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	30.12	0.400	0.26		0.466	4038.1	10

K	V	ω	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.116	433.0	736.4	0.48E 07	-0.00336	0.246	0.26

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		-0.066	0.333 243	0.019 290	0.005 203	0.006 136	0.007 38	0.001 232	0.004 308	0.001 326	0.002 314
CM		-0.011	0.007 207	0.001 227	0.001 109	0.001 329	0.001 304	0.000 43	0.001 158	0.001 180	0.000 201
DCP 1	.010	-2.495	2.514 242	0.257 244	0.047 190	0.031 65	0.066 2	0.018 282	0.019 255	0.021 194	0.009 213
DCP 2	.025	-1.143	1.507 240	0.083 291	0.029 167	0.013 44	0.030 24	0.014 83	0.020 241	0.007 305	0.014 301
DCP 3	.050	-0.280	1.193 240	0.063 291	0.013 184	0.017 138	0.024 3	0.003 216	0.008 286	0.004 214	0.005 227
DCP 4	.150	0.043	0.531 242	0.033 293	0.006 189	0.006 147	0.011 46	0.000 48	0.002 327	0.002 213	0.002 264
DCP 5	.200	-0.062	0.467 242	0.027 308	0.008 202	0.006 119	0.010 54	0.001 193	0.003 284	0.005 344	0.003 284
DCP 6	.250	-0.018	0.396 243	0.024 291	0.007 205	0.007 168	0.008 60	0.001 8	0.005 336	0.001 212	0.002 320
DCP 7	.300	-0.017	0.350 244	0.019 311	0.007 190	0.007 130	0.007 54	0.001 238	0.005 323	0.004 349	0.003 317
DCP 8	.400	-0.034	0.274 244	0.013 293	0.006 205	0.006 165	0.006 47	0.002 275	0.005 327	0.002 184	0.002 9
DCP 9	.501	-0.067	0.195 241	0.013 314	0.003 255	0.008 139	0.005 78	0.002 227	0.004 319	0.005 348	0.002 313
DCP10	.600	-0.031	0.143 245	0.068 281	0.004 220	0.004 161	0.004 40	0.000 118	0.006 315	0.002 164	0.002 350
DCP11	.831	0.060	0.074 255	0.005 345	0.002 285	0.006 117	0.003 97	0.001 202	0.002 336	0.006 349	0.002 22
DCP12	.878	0.069	0.059 260	0.005 255	0.002 221	0.004 179	0.001 46	0.001 255	0.002 356	0.002 150	0.001 61
DCP13	.950	-0.131	0.051 259	0.005 325	0.002 265	0.006 119	0.002 99	0.002 222	0.002 289	0.007 356	0.001 324

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	30.30	0.400	5.09		0.467	4038.2	10

K	V	ω	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.117	432.4	733.4	0.48E 07	-0.00342	0.851	5.09

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		0.514	0.331 247	0.019 314	0.004 191	0.005 150	0.006 67	0.000 180	0.003 324	0.001 11	0.001 338
CM		-0.005	0.008 217	0.000 8	0.000 105	0.001 70	0.001 331	0.000 141	0.001 224	0.001 292	0.000 213
DCP 1	.010	1.192	1.897 246	0.111 297	0.039 199	0.029 122	0.035 38	0.001 251	0.018 293	0.013 320	0.006 290
DCP 2	.025	1.567	1.629 245	0.089 322	0.023 170	0.024 162	0.030 41	0.008 115	0.019 285	0.012 309	0.003 252
DCP 3	.050	1.863	1.304 244	0.082 326	0.013 153	0.025 112	0.021 29	0.003 154	0.015 279	0.010 302	0.003 229
DCP 4	.150	1.056	0.533 246	0.031 305	0.008 180	0.007 140	0.011 57	0.002 153	0.006 303	0.004 356	0.003 298
DCP 5	.200	0.809	0.467 246	0.024 313	0.007 206	0.007 190	0.008 82	0.001 110	0.004 330	0.002 5	0.002 11
DCP 6	.250	0.720	0.387 247	0.023 304	0.004 179	0.008 144	0.007 68	0.001 172	0.004 314	0.004 344	0.001 262
DCP 7	.300	0.629	0.348 249	0.017 321	0.005 186	0.007 187	0.007 97	0.002 150	0.003 338	0.002 353	0.003 41
DCP 8	.400	0.467	0.269 248	0.015 304	0.004 200	0.005 130	0.006 85	0.001 217	0.004 343	0.003 6	0.002 294
DCP 9	.501	0.302	0.187 246	0.009 324	0.002 214	0.005 205	0.005 98	0.002 56	0.004 15	0.001 12	0.001 7
DCP10	.600	0.252	0.144 248	0.011 303	0.003 257	0.005 99	0.002 83	0.002 269	0.002 355	0.003 77	0.001 336
DCP11	.831	0.183	0.068 260	0.002 351	0.001 245	0.006 248	0.003 131	0.002 352	0.003 27	0.004 114	0.002 40
DCP12	.878	0.101	0.056 260	0.008 286	0.002 194	0.003 115	0.003 104	0.001 285	0.002 38	0.001 81	0.002 64
DCP13	.950	-0.035	0.047 262	0.005 303	0.002 148	0.005 240	0.002 89	0.002 33	0.001 334	0.004 144	0.000 233

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	30.21	0.400	7.53		0.466	4038.3	10
	K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
	0.117	431.5	736.3	0.48E 07	-0.00344	1.146	7.53

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		0.813	0.328 245	0.014 319	0.006 201	0.005 140	0.005 80	0.003 212	0.003 316	0.004 325	0.002 264
CM		0.001	0.010 222	0.001 5	0.000 123	0.001 230	0.001 345	0.000 30	0.000 194	0.001 115	0.000 148
DCP 1	.010	2.826	1.860 248	0.094 332	0.045 190	0.025 161	0.033 66	0.009 240	0.019 293	0.013 4	0.010 226
DCP 2	.025	3.014	1.701 245	0.107 336	0.034 176	0.021 107	0.033 24	0.008 131	0.013 264	0.021 334	0.007 278
DCP 3	.050	3.022	1.393 246	0.081 343	0.031 183	0.017 150	0.020 46	0.008 209	0.013 273	0.011 348	0.007 230
DCP 4	.150	1.564	0.519 249	0.021 297	0.008 222	0.010 173	0.008 93	0.004 230	0.005 328	0.004 12	0.002 315
DCP 5	.200	1.246	0.444 247	0.020 307	0.009 211	0.007 81	0.007 63	0.002 168	0.003 321	0.006 336	0.004 241
DCP 6	.250	1.073	0.367 250	0.015 287	0.007 218	0.010 186	0.008 101	0.003 234	0.005 334	0.004 13	0.002 330
DCP 7	.300	0.946	0.334 250	0.013 306	0.005 222	0.006 100	0.003 121	0.001 225	0.003 329	0.004 334	0.001 218
DCP 8	.400	0.709	0.254 252	0.006 271	0.003 217	0.008 193	0.007 117	0.003 237	0.005 339	0.003 49	0.001 352
DCP 9	.501	0.476	0.179 247	0.008 321	0.005 226	0.006 68	0.003 93	0.002 168	0.003 354	0.004 299	0.003 275
DCP 10	.600	0.378	0.127 252	0.005 240	0.003 205	0.007 191	0.002 104	0.003 233	0.002 322	0.002 30	0.003 246
DCP 11	.831	0.242	0.069 262	0.002 328	0.002 227	0.006 51	0.002 137	0.003 189	0.002 343	0.008 292	0.002 7
DCP 12	.878	0.145	0.053 269	0.006 221	0.001 155	0.005 214	0.004 155	0.003 267	0.002 352	0.003 57	0.001 136
DCP 13	.950	0.016	0.052 263	0.008 329	0.003 217	0.009 47	0.003 33	0.003 161	0.002 343	0.009 296	0.002 291

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	30.03	0.400	9.92		0.467	4038.4	10
	K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
	0.116	431.1	734.9	0.48E 07	-0.00360	1.493	9.92

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		1.115	0.336 253	0.026 34	0.018 212	0.010 339	0.008 127	0.003 204	0.006 306	0.010 73	0.002 276
CM		0.011	0.019 233	0.004 14	0.003 177	0.002 68	0.000 35	0.000 97	0.001 275	0.001 242	0.001 244
DCP 1	.010	4.596	2.154 251	0.199 23	0.027 168	0.092 185	0.071 3	0.026 140	0.008 146	0.020 307	0.013 38
DCP 2	.025	4.662	2.041 248	0.251 23	0.112 196	0.016 219	0.052 15	0.048 140	0.034 284	0.024 18	0.016 83
DCP 3	.050	4.359	1.695 249	0.281 33	0.209 197	0.143 358	0.089 143	0.007 237	0.070 293	0.083 86	0.049 243
DCP 4	.150	2.017	0.461 255	0.007 282	0.006 256	0.004 132	0.008 107	0.004 217	0.003 4	0.004 36	0.001 21
DCP 5	.200	1.656	0.390 253	0.011 244	0.011 266	0.005 232	0.006 96	0.003 202	0.002 329	0.008 51	0.003 27
DCP 6	.250	1.399	0.325 256	0.003 298	0.006 253	0.002 152	0.005 133	0.002 154	0.003 11	0.002 30	0.001 162
DCP 7	.300	1.232	0.294 257	0.005 198	0.011 268	0.004 228	0.004 129	0.002 247	0.002 355	0.009 56	0.001 50
DCP 8	.400	0.925	0.226 259	0.008 88	0.005 255	0.004 45	0.006 128	0.004 245	0.002 14	0.003 79	0.001 136
DCP 9	.501	0.630	0.152 255	0.005 171	0.010 282	0.006 296	0.005 146	0.002 237	0.002 1	0.008 73	0.001 84
DCP 10	.600	0.498	0.113 262	0.006 110	0.006 265	0.005 356	0.005 170	0.003 247	0.002 41	0.001 119	0.002 64
DCP 11	.831	0.297	0.059 273	0.005 85	0.006 272	0.011 286	0.004 118	0.001 234	0.001 4	0.011 59	0.002 130
DCP 12	.878	0.197	0.052 276	0.013 64	0.003 171	0.006 351	0.003 124	0.003 245	0.002 17	0.002 135	0.001 138
DCP 13	.950	0.076	0.061 255	0.013 22	0.005 164	0.013 274	0.003 66	0.001 154	0.001 263	0.010 60	0.002 118

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	30.12	0.400	12.45		0.472	4041.1	10
	K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
	0.116	435.5	744.0	0.48E 07	-0.00268	1.602	12.45

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.179	0.341	314	0.125	130	0.039	248	0.013	348	0.019	162	0.002	331	0.01[illegible]	307	0.008	137	0.00[illegible]	322
CM		-0.015	0.037	46	0.034	204	0.015	5	0.005	211	0.005	80	0.003	227	0.003	28	0.001	216	0.003	26
DCP 1	.010	5.189	1.769	295	0.353	144	0.117	217	0.105	17	0.074	147	0.033	251	0.053	72	0.079	276	0.018	355
DCP 2	.025	4.899	1.291	306	0.475	193	0.222	72	0.237	287	0.269	125	0.184	303	0.164	109	0.163	291	0.099	117
DCP 3	.050	4.042	1.690	340	0.883	167	0.125	345	0.204	290	0.281	128	0.101	296	0.063	313	0.065	167	0.106	356
DCP 4	.150	2.060	0.450	340	0.264	170	0.132	321	0.068	147	0.035	351	0.045	182	0.043	0	0.028	158	0.017	340
DCP 5	.200	1.690	0.407	329	0.239	149	0.140	298	0.080	120	0.046	323	0.061	165	0.064	341	0.049	156	0.028	334
DCP 6	.250	1.484	0.382	323	0.205	133	0.123	275	0.052	94	0.032	286	0.037	127	0.034	304	0.028	134	0.013	286
DCP 7	.300	1.257	0.364	312	0.195	120	0.119	265	0.058	86	0.040	284	0.044	128	0.042	303	0.032	117	0.021	292
DCP 8	.400	1.004	0.320	305	0.166	94	0.098	230	0.029	43	0.032	254	0.030	74	0.024	249	0.020	73	0.009	267
DCP 9	.501	0.730	0.224	298	0.121	78	0.073	207	0.024	17	0.026	227	0.019	41	0.016	239	0.012	56	0.012	211
DCP 10	.600	0.597	0.188	292	0.105	59	0.063	187	0.013	331	0.024	227	0.020	15	0.010	195	0.010	16	0.005	239
DCP 11	.831	0.402	0.163	261	0.092	33	0.044	170	0.024	352	0.017	175	0.008	333	0.005	194	0.007	229	0.005	242
DCP 12	.878	0.295	0.161	253	0.089	21	0.036	171	0.019	339	0.018	150	0.010	286	0.006	217	0.010	21	0.008	180
DCP 13	.950	0.165	0.162	246	0.066	19	0.025	167	0.018	339	0.010	112	0.009	290	0.005	121	0.010	225	0.004	216

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	32.79	0.400	14.88		0.472	4041.2	10
	K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
	0.126	434.5	741.0	0.48E 07	-0.00036	1.653	14.88

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.153	0.443	355	0.087	183	0.033	104	0.023	231	0.023	80	0.016	270	0.006	304	0.009	169	0.006	60
CM		-0.041	0.074	82	0.030	284	0.020	189	0.011	47	0.004	261	0.001	257	0.002	22	0.002	252	0.000	268
DCP 1	.010	5.241	1.516	349	0.301	253	0.106	228	0.070	154	0.081	25	0.109	185	0.093	58	0.047	317	0.013	118
DCP 2	.025	4.629	1.201	26	0.618	293	0.425	206	0.234	105	0.179	29	0.087	278	0.048	167	0.045	55	0.061	328
DCP 3	.050	3.621	2.210	24	0.423	245	0.311	185	0.230	118	0.110	45	0.241	275	0.064	328	0.102	183	0.040	43
DCP 4	.150	1.871	0.808	24	0.249	215	0.109	143	0.117	343	0.028	194	0.042	147	0.016	5	0.015	303	0.009	150
DCP 5	.200	1.599	0.680	13	0.234	198	0.096	118	0.112	320	0.034	168	0.035	129	0.021	354	0.013	285	0.018	160
DCP 6	.250	1.402	0.609	3	0.178	185	0.109	108	0.095	295	0.025	167	0.022	83	0.010	7	0.016	214	0.007	125
DCP 7	.300	1.234	0.542	353	0.175	171	0.103	95	0.099	283	0.026	154	0.025	61	0.013	316	0.013	192	0.011	105
DCP 8	.400	0.996	0.475	339	0.137	147	0.094	70	0.079	245	0.034	126	0.019	336	0.008	279	0.012	126	0.004	86
DCP 9	.501	0.741	0.346	328	0.109	127	0.070	49	0.062	231	0.034	113	0.017	312	0.015	245	0.011	96	0.006	26
DCP 10	.600	0.624	0.300	317	0.088	117	0.074	36	0.055	210	0.025	81	0.008	297	0.007	204	0.008	159	0.006	51
DCP 11	.831	0.500	0.263	280	0.089	106	0.060	346	0.030	192	0.030	61	0.009	218	0.012	221	0.007	110	0.002	36
DCP 12	.878	0.387	0.241	275	0.077	112	0.058	337	0.037	183	0.023	20	0.005	259	0.007	132	0.004	156	0.005	27
DCP 13	.950	0.266	0.214	262	0.047	122	0.040	324	0.015	193	0.019	20	0.009	241	0.004	163	0.009	54	0.003	221

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.56	0.400	19.79		0.470	4041.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.129	434.1	740.9	0.48E 07	0.00014	1.460	19.79

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.037	0.317	2	0.086	349	0.032	290	0.018	221	0.018	163	0.005	286	0.004	348	0.002	132	0.001	128
CM		-0.111	0.058	135	0.022	121	0.015	70	0.006	6	0.005	285	0.003	298	0.001	167	0.002	327	0.002	197
DCP 1	.010	4.944	0.823	1	0.362	359	0.063	10	0.122	310	0.061	137	0.015	312	0.010	228	0.016	351	0.010	77
DCP 2	.025	3.827	0.625	63	0.298	24	0.115	346	0.069	292	0.053	204	0.044	154	0.038	125	0.026	58	0.023	32
DCP 3	.050	2.131	1.357	47	0.271	99	0.179	71	0.043	227	0.162	213	0.129	308	0.033	311	0.039	358	0.064	214
DCP 4	.150	1.303	0.299	7	0.131	25	0.036	10	0.019	57	0.017	79	0.004	266	0.001	118	0.006	197	0.005	133
DCP 5	.200	1.230	0.350	0	0.140	3	0.041	328	0.009	97	0.024	78	0.003	310	0.006	320	0.007	255	0.004	185
DCP 6	.250	1.122	0.311	351	0.120	355	0.052	310	0.016	281	0.002	109	0.013	249	0.005	35	0.004	163	0.009	67
DCP 7	.300	1.095	0.363	351	0.143	341	0.065	293	0.014	254	0.012	74	0.012	290	0.007	354	0.007	257	0.000	233
DCP 8	.400	0.978	0.352	346	0.136	339	0.071	292	0.028	249	0.015	165	0.014	195	0.007	82	0.008	192	0.011	93
DCP 9	.501	0.819	0.317	347	0.118	327	0.066	264	0.029	210	0.013	131	0.008	227	0.004	179	0.008	154	0.011	58
DCP 10	.600	0.763	0.304	344	0.125	328	0.068	271	0.031	230	0.019	146	0.013	126	0.010	18	0.003	237	0.008	47
DCP 11	.831	0.715	0.246	332	0.070	293	0.047	237	0.030	171	0.023	139	0.013	98	0.003	318	0.015	115	0.006	354
DCP 12	.878	0.577	0.207	330	0.057	306	0.037	252	0.023	187	0.022	114	0.008	68	0.007	334	0.005	237	0.007	288
DCP 13	.950	0.468	0.138	314	0.033	264	0.031	212	0.019	147	0.016	104	0.002	70	0.009	263	0.014	133	0.006	279

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	26.88	0.600	2.61		0.464	4039.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.071	633.1	1443.6	0.63E 07	-0.00259	0.452	2.61

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.220	0.233	241	0.015	290	0.009	212	0.008	195	0.006	124	0.009	165	0.009	147	0.008	119	0.009	107
CM		-0.011	0.005	212	0.000	223	0.000	348	0.000	49	0.000	252	0.000	225	0.000	153	0.000	227	0.000	101
DCP 1	.010	-0.767	0.996	241	0.163	0	0.034	226	0.089	176	0.059	199	0.058	184	0.048	139	0.038	113	0.046	111
DCP 2	.025	-0.156	1.001	239	0.074	283	0.060	319	0.046	187	0.062	137	0.048	168	0.047	158	0.035	121	0.036	85
DCP 3	.050	0.639	0.911	235	0.106	233	0.031	229	0.022	264	0.035	224	0.037	161	0.047	141	0.040	130	0.048	139
DCP 4	.150	0.631	0.444	239	0.034	279	0.016	167	0.009	132	0.001	58	0.002	48	0.001	269	0.002	239	0.001	168
DCP 5	.200	0.594	0.414	241	0.048	359	0.011	241	0.043	162	0.012	163	0.019	204	0.015	138	0.011	97	0.016	108
DCP 6	.250	0.439	0.333	243	0.050	15	0.038	197	0.015	190	0.009	255	0.019	142	0.013	145	0.010	133	0.016	135
DCP 7	.300	0.327	0.236	243	0.023	325	0.029	183	0.011	255	0.009	165	0.011	141	0.011	163	0.009	94	0.011	110
DCP 8	.400	0.243	0.169	245	0.015	265	0.008	215	0.008	201	0.008	167	0.008	167	0.008	145	0.008	122	0.008	110
DCP 9	.501	0.129	0.118	241	0.011	270	0.005	229	0.006	204	0.004	165	0.006	161	0.005	140	0.005	115	0.005	136
DCP 10	.600	0.117	0.088	246	0.007	277	0.003	235	0.004	192	0.002	190	0.004	171	0.004	147	0.005	139	0.004	113
DCP 11	.831	0.082	0.047	253	0.003	298	0.002	230	0.002	212	0.002	144	0.002	162	0.001	128	0.002	131	0.003	98
DCP 12	.878	0.079	0.043	253	0.002	293	0.001	201	0.001	194	0.001	138	0.002	189	0.001	163	0.002	123	0.001	120
DCP 13	.950	-0.062	0.047	245	0.004	277	0.004	174	0.002	210	0.002	167	0.002	152	0.002	150	0.002	94	0.002	94

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	29.50	0.600	7.48		0.466	4039.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.078	631.6	1434.6	0.63E 07	-0.00195	0.987	7.48

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.811	0.170	269	0.026	195	0.002	351	0.005	186	0.002	358	0.002	122	0.001	268	0.002	16	0.000	73
CM		-0.007	0.011	88	0.007	237	0.001	50	0.001	35	0.001	140	0.000	246	0.001	2	0.000	188	0.000	307
DCP 1	.010	1.8[illegible]	0.601	260	0.043	225	0.012	231	0.017	182	0.005	148	0.008	75	0.002	299	0.006	353	0.002	299
DCP 2	.025	2.102	0.495	256	0.040	223	0.006	213	0.013	177	0.003	178	0.005	76	0.003	326	0.004	326	0.001	289
DCP 3	.050	2.618	0.427	263	0.060	207	0.008	235	0.019	151	0.012	126	0.001	294	0.006	30	0.008	308	0.007	336
DCP 4	.200	1.586	0.195	277	0.153	218	0.026	13	0.017	229	0.023	151	0.009	132	0.014	334	0.006	84	0.003	140
DCP 5	.250	1.214	0.267	283	0.176	230	0.027	158	0.024	35	0.007	54	0.003	0	0.010	308	0.005	236	0.001	296
DCP 6	.300	0.994	0.292	275	0.055	192	0.026	72	0.016	50	0.039	337	0.015	185	0.021	172	0.020	32	0.007	268
DCP 7	.400	0.710	0.180	271	0.036	124	0.022	9	0.016	213	0.002	356	0.004	127	0.003	317	0.001	130	0.005	81
DCP 8	.501	0.420	0.108	270	0.035	87	0.015	259	0.003	152	0.002	283	0.005	70	0.005	247	0.005	30	0.002	127
DCP 9	.600	0.362	0.071	276	0.018	83	0.007	230	0.009	206	0.005	335	0.003	70	0.003	161	0.002	323	0.003	94
DCP 10	.831	0.224	0.074	265	0.025	53	0.007	210	0.002	220	0.003	321	0.001	72	0.002	174	0.002	290	0.000	112
DCP 11	.878	0.213	0.074	259	0.016	51	0.003	248	0.005	169	0.003	295	0.001	48	0.001	237	0.002	95	0.002	186
DCP 12	.950	0.096	0.111	251	0.024	30	0.003	140	0.004	191	0.003	307	0.002	307	0.002	65	0.001	177	0.001	177

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	32.36	0.600	9.85		0.465	4039.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.086	630.2	1422.7	0.63E 07	-0.00107	1.076	9.85

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.948	0.119	300	0.015	242	0.009	233	0.009	113	0.004	26	0.004	204	0.002	32	0.002	132	0.006	353
CM		-0.030	0.034	86	0.005	215	0.001	312	0.002	295	0.001	149	0.001	2	0.000	67	0.001	237	0.001	52
DCP 1	.010	2.441	0.509	272	0.036	330	0.025	200	0.006	93	0.010	54	0.014	190	0.003	70	0.007	90	0.006	298
DCP 2	.025	2.580	0.414	269	0.030	353	0.024	213	0.006	69	0.008	53	0.012	180	0.002	52	0.006	55	0.005	309
DCP 3	.050	2.925	0.172	311	0.151	231	0.051	16	0.020	141	0.006	126	0.002	273	0.017	77	0.016	223	0.028	15
DCP 4	.200	1.541	0.265	42	0.028	194	0.061	238	0.003	345	0.005	160	0.007	143	0.011	358	0.013	173	0.018	30
DCP 5	.250	1.350	0.188	31	0.029	258	0.038	232	0.005	37	0.015	83	0.011	170	0.007	322	0.007	122	0.010	42
DCP 6	.300	1.184	0.176	331	0.040	254	0.048	215	0.031	57	0.012	49	0.005	237	0.004	315	0.007	161	0.020	349
DCP 7	.400	0.880	0.168	296	0.007	201	0.027	232	0.007	150	0.009	19	0.006	294	0.010	215	0.011	0	0.004	115
DCP 8	.501	0.523	0.173	283	0.011	59	0.008	86	0.015	151	0.010	57	0.017	230	0.008	6	0.012	91	0.012	275
DCP 9	.600	0.462	0.145	278	0.018	55	0.002	128	0.016	130	0.007	334	0.005	254	0.007	104	0.004	235	0.005	331
DCP 10	.831	0.351	0.155	264	0.017	4	0.010	77	0.011	117	0.007	297	0.006	110	0.004	225	0.006	39	0.006	231
DCP 11	.878	0.335	0.133	267	0.015	51	0.002	172	0.004	89	0.002	60	0.005	238	0.005	327	0.009	109	0.010	258
DCP 12	.950	0.220	0.147	256	0.021	266	0.004	79	0.008	56	0.007	314	0.006	116	0.003	305	0.003	55	0.002	200

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNEC CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	32.68	0.600	12.38		0.468	4040.1	10

K	V	Q	RN	DAMPING	CY(MAX)	ALPHA(STALL)
0.086	636.9	1453.4	0.64E 07	-0.00057	1.119	12.38

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.015	0.090	321	0.005	308	0.003	45	0.007	0	0.004	126	0.008	235	0.001	357	0.009	40	0.008	244
CM		-0.066	0.027	94	0.003	145	0.001	131	0.001	226	0.000	123	0.002	298	0.000	114	0.002	177	0.004	19
DCP 1	.010	2.859	0.453	275	0.044	337	0.005	21	0.008	68	0.007	94	0.008	219	0.001	182	0.005	9	0.008	277
DCP 2	.025	2.940	0.376	273	0.038	280	0.025	49	0.010	171	0.006	23	0.008	208	0.009	103	0.007	320	0.001	198
DCP 3	.050	3.002	0.295	16	0.026	221	0.059	201	0.060	358	0.049	135	0.048	270	0.015	14	0.015	67	0.014	334
DCP 4	.150	1.728	0.195	48	0.015	179	0.011	231	0.017	285	0.006	37	0.013	258	0.005	174	0.021	102	0.009	26
DCP 5	.200	1.363	0.104	39	0.038	106	0.053	26	0.005	295	0.016	303	0.029	255	0.012	106	0.016	114	0.018	343
DCP 6	.250	1.300	0.153	20	0.018	92	0.030	99	0.012	178	0.004	90	0.025	285	0.006	230	0.015	69	0.016	309
DCP 7	.300	1.234	0.094	351	0.007	250	0.030	27	0.003	249	0.002	163	0.022	223	0.002	47	0.009	96	0.021	309
DCP 8	.400	0.969	0.121	320	0.018	5	0.033	30	0.019	31	0.007	166	0.019	231	0.007	291	0.009	10	0.014	269
DCP 9	.501	0.669	0.112	308	0.024	276	0.002	178	0.012	185	0.005	137	0.003	88	0.021	283	0.021	9	0.019	208
DCP10	.600	0.589	0.124	280	0.011	6	0.004	242	0.013	357	0.005	49	0.009	159	0.013	116	0.019	31	0.018	224
DCP11	.831	0.492	0.113	284	0.014	290	0.002	175	0.004	32	0.002	190	0.008	120	0.004	323	0.006	328	0.013	186
DCP12	.878	0.461	0.116	270	0.011	27	0.016	258	0.011	35	0.005	311	0.005	52	0.004	71	0.012	339	0.012	186
DCP13	.950	0.336	0.003	270	0.015	305	0.007	200	0.008	38	0.004	232	0.007	109	0.001	323	0.005	195	0.011	158

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNEC CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	33.00	0.600	14.80		0.473	4040.2	10

K	V	Q	RN	DAMPING	CY(MAX)	ALPHA(STALL)
0.087	636.1	1451.8	0.64E 07	-0.00034	1.118	14.80

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.045	0.068	329	0.017	358	0.006	341	0.009	148	0.006	173	0.009	308	0.009	218	0.002	190	0.006	279
CM		-0.091	0.026	106	0.003	203	0.001	18	0.002	297	0.002	236	0.003	92	0.002	332	0.001	189	0.002	59
DCP 1	.010	3.231	0.339	281	0.066	314	0.014	338	0.012	142	0.002	152	0.010	247	0.006	169	0.004	179	0.002	92
DCP 2	.025	3.137	0.067	282	0.165	292	0.026	116	0.032	318	0.026	165	0.010	23	0.014	215	0.008	43	0.028	232
DCP 3	.050	2.788	0.371	52	0.032	164	0.079	5	0.012	143	0.053	220	0.007	354	0.024	268	0.029	193	0.013	
DCP 4	.150	1.561	0.057	50	0.034	344	0.016	258	0.011	109	0.021	190	0.008	29	0.013	224	0.008	340	0.006	315
DCP 5	.200	1.304	0.037	27	0.023	4	0.017	307	0.033	161	0.007	146	0.017	320	0.019	270	0.011	80	0.015	333
DCP 6	.250	1.244	0.075	0	0.040	21	0.020	316	0.022	189	0.009	215	0.014	343	0.014	224	0.003	185	0.008	301
DCP 7	.300	1.232	0.050	358	0.040	30	0.002	192	0.013	181	0.004	207	0.003	359	0.016	246	0.011	184	0.006	243
DCP 8	.400	1.018	0.112	322	0.027	5	0.004	315	0.012	185	0.008	197	0.023	325	0.017	220	0.008	295	0.008	318
DCP 9	.501	0.743	0.086	310	0.033	0	0.011	163	0.009	103	0.014	98	0.011	8	0.016	224	0.010	183	0.004	146
DCP10	.600	0.689	0.111	301	0.009	60	0.004	53	0.016	155	0.004	85	0.013	281	0.011	206	0.005	154	0.022	279
DCP11	.831	0.584	0.101	289	0.014	332	0.002	292	0.005	54	0.012	55	0.012	280	0.011	127	0.005	10	0.005	212
DCP12	.878	0.564	0.093	288	0.008	112	0.005	16	0.017	96	0.005	142	0.022	240	0.009	123	0.011	24	0.014	217
DCP13	.950	0.416	0.074	280	0.007	346	0.010	260	0.002	1	0.004	325	0.009	245	0.007	109	0.004	269	0.005	187

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	34.01	0.600	19.70		0.471	4340.3	10
	K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
	0.089	554.9	1444.3	0.63E 07	0.00018	1.124	19.70

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.035	0.107	10	0.028	113	0.008	284	0.004	3	0.003	258	0.010	327	0.005	330	0.003	137	0.003	4
CM		-0.138	0.026	112	0.003	184	0.001	131	0.003	92	0.002	191	0.002	85	0.000	281	0.002	256	0.002	50
DCP 1	.010	3.068	0.498	87	0.138	261	0.041	271	0.043	58	0.040	297	0.031	127	0.027	37	0.017	206	0.008	222
DCP 2	.025	2.631	0.413	89	0.083	209	0.047	318	0.067	129	0.056	118	0.067	352	0.041	289	0.011	134	0.015	65
DCP 3	.050	2.010	0.570	44	0.243	130	0.062	261	0.057	57	0.055	215	0.041	336	0.036	353	0.029	225	0.036	8
DCP 4	.150	1.381	0.143	[illegible]	0.031	111	0.012	237	0.018	48	0.016	322	0.014	329	0.014	246	0.007	241	0.004	42
DCP 5	.200	1.257	0.131	[illegible]	0.032	107	0.014	76	0.015	348	0.013	313	0.008	331	0.008	331	0.005	137	0.011	44
DCP 6	.250	1.192	0.147	8	0.037	76	0.002	100	0.015	356	0.010	304	0.007	14	0.004	343	0.003	93	0.005	33
DCP 7	.300	1.233	0.12[illegible]	5	0.038	96	0.014	9	0.005	323	0.008	243	0.005	67	0.004	280	0.009	241	0.010	81
DCP 8	.400	1.044	0.133	353	0.[illegible]35	73	0.011	67	0.008	327	0.004	310	0.016	349	0.005	24	0.014	80	0.007	324
DCP 9	.501	0.828	0.112	340	0.011	42	0.013	315	0.006	258	0.013	139	0.009	333	0.003	168	0.016	124	0.011	39
DCP 10	.600	0.814	0.091	329	0.020	75	0.010	237	0.017	201	0.004	139	0.009	308	0.002	317	0.004	80	0.003	182
DCP 11	.831	0.730	0.084	304	0.008	148	0.007	320	0.019	323	0.012	354	0.008	260	0.007	41	0.006	57	0.011	262
DCP 12	.878	0.693	0.084	310	0.005	59	0.009	262	0.013	239	0.000	324	0.013	288	0.014	241	0.006	97	0.005	153
DCP 13	.950	0.575	0.068	284	0.006	243	0.006	263	0.013	313	0.012	329	0.009	249	0.006	31	0.003	276	0.018	229

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	15.50	0.200	-0.07		0.620	4033.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.117	220.7	199.5	0.26E 07	-0.00584	0.316	-0.07

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		-0.068	0.383 246	0.016 288	0.006 144	0.004 104	0.006 177	0.007 11	0.006 299	0.003 312	0.002 171
CM		-0.009	0.011 205	0.001 152	0.001 313	0.002 280	0.002 8	0.001 199	0.002 102	0.001 60	0.001 20
DCP 1	.010	-2.269	2.817 244	0.181 250	0.009 155	0.004 174	0.002 134	0.020 349	0.007 105	0.014 299	0.018 5
DCP 2	.025	-1.039	1.793 243	0.041 315	0.017 201	0.016 355	0.019 300	0.003 54	0.009 28	0.010 209	0.009 293
DCP 3	.050	-0.122	1.396 243	0.051 291	0.014 157	0.004 352	0.013 127	0.023 347	0.007 7	0.012 24	0.009 71
DCP 4	.150	0.178	0.621 243	0.024 299	0.004 105	0.009 157	0.012 184	0.007 11	0.007 350	0.004 24	0.001 347
DCP 5	.200	-0.039	0.531 244	0.012 291	0.006 153	0.006 71	0.003 256	0.005 308	0.004 275	0.009 5	0.003 197
DCP 6	.250	0.033	0.453 246	0.026 297	0.006 174	0.009 169	0.014 193	0.007 18	0.011 4	0.005 6	0.008 144
DCP 7	.300	-0.202	0.413 248	0.018 298	0.012 70	0.003 154	0.002 42	0.005 66	0.010 264	0.016 338	0.010 80
DCP 8	.400	-0.026	0.331 252	0.014 263	0.005 162	0.005 169	0.007 181	0.007 33	0.005 12	0.003 78	0.004 163
DCP 9	.501	-0.082	0.239 245	0.004 0	0.002 102	0.006 9	0.006 147	0.003 8	0.007 256	0.004 23	0.003 77
DCP10	.600	-0.023	0.151 248	0.012 264	0.012 182	0.004 62	0.005 125	0.009 30	0.006 249	0.014 267	0.010 249
DCP11	.831	0.140	0.079 275	0.007 304	0.008 33	0.006 134	0.011 210	0.001 166	0.015 306	0.006 164	0.013 185
DCP12	.878	-0.022	0.072 260	0.012 249	0.007 181	0.003 113	0.004 155	0.006 30	0.006 303	0.004 216	0.002 0
DCP13	.950	-0.213	0.054 273	0.020 1	0.020 137	0.029 94	0.011 195	0.020 351	0.015 267	0.005 288	0.010 31

FORCED VERTICAL TRANSLATION — VERTOL 23013-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	15.48	0.200	10.02		0.616	4033.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.118	219.7	198.6	0.26E 07	-0.00577	1.293	10.02

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		0.934	0.361 256	0.001 200	0.002 91	0.004 227	0.001 123	0.002 40	0.001 184	0.004 184	0.005 188
CM		0.012	0.013 224	0.001 345	0.001 284	0.002 42	0.000 357	0.001 285	0.001 26	0.001 64	0.002 15
DCP 1	.010	3.821	2.204 253	0.040 17	0.021 217	0.022 190	0.017 277	0.023 327	0.024 249	0.030 133	0.018 146
DCP 2	.025	3.790	1.734 252	0.025 265	0.025 53	0.033 19	0.021 167	0.025 324	0.008 43	0.014 131	0.015 321
DCP 3	.050	3.665	1.447 252	0.016 289	0.006 237	0.010 299	0.009 79	0.002 138	0.009 101	0.013 97	0.008 171
DCP 4	.150	1.734	0.626 254	0.001 165	0.006 301	0.004 146	0.002 40	0.006 326	0.004 248	0.006 130	0.001 123
DCP 5	.200	1.282	0.505 252	0.016 45	0.006 83	0.002 42	0.004 35	0.003 60	0.002 190	0.008 260	0.003 148
DCP 6	.250	1.265	0.430 256	0.007 263	0.006 271	0.003 130	0.003 136	0.004 155	0.002 103	0.005 115	0.002 161
DCP 7	.300	0.975	0.379 260	0.016 44	0.003 307	0.005 346	0.007 27	0.005 26	0.005 183	0.012 228	0.006 214
DCP 8	.400	0.844	0.302 261	0.015 175	0.003 285	0.005 186	0.004 357	0.004 326	0.003 217	0.006 155	0.003 117
DCP 9	.501	0.539	0.216 255	0.004 52	0.004 67	0.001 61	0.001 22	0.003 68	0.005 231	0.004 216	0.003 159
DCP10	.600	0.421	0.130 260	0.012 222	0.010 81	0.015 210	0.007 228	0.005 57	0.004 27	0.003 125	0.011 188
DCP11	.831	0.301	0.067 284	0.008 97	0.008 133	0.010 245	0.010 144	0.005 113	0.004 166	0.006 219	0.014 238
DCP12	.878	0.112	0.065 275	0.005 186	0.004 221	0.005 221	0.002 346	0.002 277	0.005 310	0.006 244	0.002 232
DCP13	.950	-0.092	0.031 287	0.006 273	0.005 59	0.001 249	0.006 347	0.006 125	0.002 127	0.011 277	0.004 188

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	15.53	0.200	12.60		0.620	4033.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.118	219.8	197.8	0.26E 07	-0.00548	1.492	12.60

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.144	0.342	263	0.003	313	0.002	137	0.005	116	0.003	351	0.006	21	0.005	318	0.005	55	0.006	96
CM		0.024	0.015	221	0.001	115	0.001	356	0.002	271	0.001	130	0.002	195	0.001	162	0.002	231	0.001	236
DCP 1	.010	5.138	2.104	258	0.055	284	0.129	52	0.082	233	0.069	42	0.004	109	0.028	235	0.011	337	0.029	118
DCP 2	.025	4.891	1.710	261	0.041	52	0.034	233	0.009	206	0.021	55	0.022	30	0.019	196	0.002	47	0.021	10
DCP 3	.050	4.550	1.391	257	0.022	38	0.006	175	0.019	181	0.005	129	0.017	1	0.018	294	0.010	54	0.024	120
DCP 4	.150	2.110	0.580	260	0.010	256	0.004	112	0.010	99	0.003	54	0.002	243	0.007	349	0.004	91	0.010	163
DCP 5	.200	1.599	0.477	260	0.006	24	0.008	26	0.003	45	0.005	306	0.009	52	0.003	318	0.008	51	0.008	73
DCP 6	.250	1.515	0.402	263	0.004	290	0.006	258	0.012	92	0.005	334	0.007	222	0.004	302	0.006	84	0.013	141
DCP 7	.300	1.241	0.367	268	0.004	171	0.004	122	0.011	133	0.007	315	0.007	27	0.007	324	0.001	121	0.005	53
DCP 8	.400	1.022	0.280	270	0.006	233	0.006	231	0.011	72	0.005	359	0.001	347	0.006	341	0.001	101	0.010	130
DCP 9	.501	0.649	0.202	267	0.002	99	0.002	257	0.001	333	0.001	291	0.004	70	0.004	333	0.004	32	0.005	37
DCP 10	.600	0.467	0.105	269	0.014	247	0.004	357	0.009	48	0.013	313	0.013	51	0.005	111	0.004	44	0.003	80
DCP 11	.831	0.301	0.076	300	0.010	75	0.011	158	0.001	269	0.008	223	0.014	349	0.016	324	0.011	69	0.011	50
DCP 12	.878	0.115	0.069	278	0.010	336	0.010	165	0.006	75	0.004	1	0.003	80	0.002	183	0.001	200	0.005	111
DCP 13	.950	-0.049	0.049	296	0.024	313	0.003	350	0.032	134	0.021	72	0.005	332	0.006	327	0.013	24	0.007	83

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	15.90	0.200	20.14		0.618	4033.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.121	219.5	198.5	0.26E 07	-0.00155	1.616	20.14

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.100	0.399	344	0.097	266	0.027	129	0.011	90	0.008	267	0.018	103	0.015	308	0.007	165	0.004	356
CM		-0.083	0.085	126	0.028	26	0.009	288	0.003	192	0.005	338	0.005	208	0.004	56	0.002	243	0.003	110
DCP 1	.010	4.240	0.814	44	0.564	330	0.051	343	0.086	225	0.084	297	0.144	164	0.081	33	0.009	302	0.008	75
DCP 2	.025	3.983	0.800	31	0.375	327	0.158	225	0.090	137	0.112	335	0.094	177	0.049	30	0.009	14	0.020	228
DCP 3	.050	3.301	1.008	58	0.339	324	0.049	325	0.025	225	0.067	294	0.098	162	0.060	19	0.025	231	0.011	63
DCP 4	.150	1.384	0.508	9	0.058	19	0.045	126	0.036	111	0.019	319	0.007	84	0.038	323	0.022	178	0.011	86
DCP 5	.200	1.318	0.592	347	0.116	297	0.052	111	0.036	50	0.007	321	0.034	86	0.014	292	0.011	113	0.008	10
DCP 6	.250	1.192	0.542	339	0.124	275	0.009	185	0.015	129	0.009	193	0.027	91	0.036	330	0.024	195	0.018	78
DCP 7	.300	1.097	0.630	333	0.192	262	0.068	142	0.026	64	0.011	271	0.040	100	0.028	303	0.005	133	0.010	194
DCP 8	.400	1.049	0.587	332	0.144	252	0.025	147	0.017	113	0.015	211	0.035	97	0.030	313	0.017	193	0.019	79
DCP 9	.501	0.846	0.539	323	0.176	242	0.068	127	0.020	65	0.003	352	0.028	39	0.030	237	0.019	122	0.020	14
DCP 10	.600	0.697	0.413	327	0.113	243	0.026	169	0.026	124	0.013	311	0.009	34	0.007	236	0.017	198	0.006	63
DCP 11	.831	0.692	0.302	313	0.103	203	0.048	107	0.037	355	0.034	158	0.023	36	0.030	250	0.018	54	0.024	291
DCP 12	.878	0.483	0.225	313	0.059	187	0.008	40	0.016	177	0.013	260	0.015	171	0.014	124	0.008	42	0.022	283
DCP 13	.950	0.315	0.136	314	0.064	191	0.050	53	0.025	296	0.027	146	0.021	35	0.011	9	0.019	347	0.021	235

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.31	0.400	-0.06		0.618	4032.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.063	435.0	733.6	0.48E 07	-0.00325	0.131	-0.06

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		-0.093	0.222 247	0.011 317	0.001 55	0.001 60	0.001 135	0.000 356	0.001 162	0.001 23	0.001 295
CM		-0.009	0.004 239	0.001 219	0.000 179	0.000 306	0.000 345	0.000 175	0.000 0	0.000 159	0.000 130
DCP 1	.010	-2.499	1.668 249	0.124 266	0.009 231	0.010 106	0.010 47	0.009 95	0.004 309	0.003 180	0.008 279
DCP 2	.025	-1.164	0.969 248	0.053 279	0.013 70	0.023 2	0.024 142	0.002 265	0.009 284	0.011 42	0.001 21
DCP 3	.050	-0.289	0.794 247	0.036 332	0.003 90	0.006 19	0.001 74	0.003 158	0.003 87	0.003 94	0.036 290
DCP 4	.150	0.073	0.360 245	0.016 316	0.002 68	0.000 48	0.002 38	0.001 285	0.003 156	0.001 173	0.002 282
DCP 5	.200	-0.069	0.319 246	0.014 320	0.005 83	0.003 97	0.002 69	0.001 2	0.001 108	0.003 318	0.001 46
DCP 6	.250	-0.009	0.266 246	0.011 323	0.002 58	0.002 80	0.001 262	0.001 159	0.004 118	0.004 123	0.000 345
DCP 7	.300	-0.023	0.237 248	0.014 324	0.005 45	0.002 135	0.001 150	0.003 6	0.001 329	0.004 0	0.002 283
DCP 8	.400	-0.026	0.183 248	0.008 328	0.001 36	0.001 64	0.003 163	0.002 196	0.002 84	0.001 136	0.001 7
DCP 9	.501	-0.066	0.136 245	0.007 337	0.000 111	0.002 141	0.001 180	0.001 24	0.001 184	0.002 350	0.001 237
DCP10	.600	-0.045	0.090 246	0.004 328	0.002 266	0.001 232	0.003 161	0.002 279	0.002 183	0.002 237	0.003 9
DCP11	.831	0.025	0.047 252	0.004 345	0.002 32	0.002 38	0.002 34	0.004 71	0.003 174	0.002 330	0.002 241
DCP12	.878	0.014	0.036 255	0.001 4	0.002 321	0.001 215	0.003 134	0.000 289	0.002 167	0.002 217	0.002 14
DCP13	.950	-0.120	0.028 262	0.006 346	0.004 85	0.005 73	0.002 260	0.004 293	0.001 264	0.007 44	0.004 269

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	13.37	0.400	10.00		0.618	4032.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.051	434.1	731.8	0.48E 07	-0.00393	1.338	10.00

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		1.132	0.210 259	0.002 203	0.006 20	0.002 143	0.001 58	0.003 347	0.002 174	0.002 285	0.001 4
CM		0.010	0.009 254	0.001 100	0.001 113	0.001 185	0.001 269	0.000 66	0.000 176	0.000 115	0.000 21
DCP 1	.010	4.661	1.447 259	0.147 183	0.039 237	0.008 95	0.016 31	0.014 218	0.007 342	0.007 156	0.009 27
DCP 2	.025	4.587	1.165 257	0.040 52	0.013 209	0.022 65	0.010 204	0.018 344	0.006 343	0.014 187	0.018 338
DCP 3	.050	4.348	0.953 259	0.032 201	0.007 32	0.036 181	0.008 303	0.029 7	0.029 174	0.011 318	0.008 27
DCP 4	.150	2.109	0.313 259	0.009 239	0.005 47	0.002 51	0.002 13	0.002 35	0.001 15	0.003 189	0.001 1
DCP 5	.200	1.705	0.264 257	0.007 248	0.003 30	0.003 97	0.004 45	0.005 5	0.002 115	0.001 246	0.003 284
DCP 6	.250	1.448	0.217 259	0.006 256	0.003 36	0.001 32	0.001 0	0.001 24	0.001 69	0.003 223	0.003 356
DCP 7	.300	1.241	0.199 260	0.004 238	0.004 18	0.001 150	0.002 67	0.000 347	0.001 123	0.003 156	0.003 173
DCP 8	.400	0.949	0.149 262	0.003 242	0.003 34	0.001 32	0.002 107	0.001 32	0.002 253	0.001 209	0.003 10
DCP 9	.501	0.656	0.110 256	0.002 214	0.004 2	0.001 70	0.001 40	0.002 7	0.001 95	0.002 246	0.002 255
DCP10	.600	0.509	0.076 259	0.001 273	0.001 57	0.004 328	0.002 172	0.005 286	0.002 211	0.003 305	0.003 74
DCP11	.831	0.280	0.035 266	0.001 267	0.004 340	0.001 39	0.003 77	0.002 334	0.001 14	0.003 251	0.004 212
DCP12	.878	0.210	0.031 272	0.002 344	0.002 303	0.001 340	0.001 124	0.001 314	0.003 225	0.002 323	0.002 36
DCP13	.950	0.078	0.030 256	0.001 103	0.010 333	0.005 106	0.008 67	0.002 121	0.005 35	0.002 31	0.005 355

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	15.13	0.400	12.53		0.616	4032.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.058	434.1	731.2	0.47E 07	-0.00155	1.563	12.53

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.315	0.137	318	0.104	196	0.042	9	0.027	159	0.022	290	0.014	98	0.004	281	0.005	74	0.005	241
CM		0.009	0.017	37	0.020	214	0.012	41	0.037	240	0.006	42	0.004	198	0.002	17	0.001	292	0.001	119
DCP 1	.010	5.959	0.823	291	0.506	217	0.167	353	0.174	134	0.111	322	0.069	93	0.050	261	0.033	104	0.028	248
DCP 2	.025	5.844	0.916	298	0.614	194	0.316	2	0.202	131	0.170	297	0.091	115	0.058	270	0.075	96	0.057	268
DCP 3	.050	5.174	0.833	333	0.748	199	0.396	47	0.245	243	0.056	55	0.056	212	0.075	55	0.048	339	0.036	154
DCP 4	.150	2.283	0.167	4	0.200	207	0.100	3	0.072	159	0.055	329	0.043	130	0.030	292	0.022	86	0.017	233
DCP 5	.200	1.865	0.134	1	0.166	204	0.082	354	0.060	154	0.049	312	0.036	112	0.024	278	0.013	75	0.011	213
DCP 6	.250	1.569	0.130	4	0.144	205	0.069	1	0.055	156	0.040	322	0.029	122	0.013	288	0.006	128	0.004	297
DCP 7	.300	1.359	0.106	350	0.115	202	0.056	354	0.044	153	0.033	309	0.027	113	0.014	280	0.009	135	0.001	271
DCP 8	.400	1.054	0.090	335	0.067	191	0.025	332	0.033	126	0.029	281	0.020	76	0.008	217	0.004	173	0.003	5
DCP 9	.501	0.731	0.057	312	0.029	175	0.019	281	0.021	103	0.026	260	0.016	59	0.003	202	0.007	145	0.009	292
DCP10	.600	0.597	0.063	285	0.020	99	0.028	259	0.036	83	0.035	244	0.021	42	0.013	193	0.003	58	0.006	273
DCP11	.831	0.356	0.082	260	0.035	48	0.024	213	0.009	97	0.016	224	0.009	22	0.001	328	0.008	88	0.007	238
DCP12	.878	0.305	0.104	256	0.044	49	0.020	227	0.020	72	0.028	220	0.012	11	0.009	205	0.007	43	0.003	199
DCP13	.950	0.173	0.121	259	0.040	50	0.018	221	0.013	340	0.008	174	0.008	320	0.003	36	0.003	262	0.006	336

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	16.31	0.400	20.07		0.618	4032.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.063	433.8	731.1	0.47E 07	-0.00015	1.010	20.07

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		0.980	0.037	349	0.024	52	0.008	52	0.004	44	0.001	322	0.002	36	0.002	141	0.001	189	0.002	83
CM		-0.009	0.015	153	0.004	220	0.002	217	0.001	137	0.000	99	0.000	72	0.000	52	0.000	330	0.000	350
DCP 1	.010	4.983	0.339	306	0.098	79	0.022	57	0.019	26	0.011	78	0.021	46	0.019	126	0.003	238	0.019	49
DCP 2	.025	3.492	0.107	65	0.042	67	0.017	9	0.009	116	0.005	189	0.013	6	0.013	150	0.008	244	0.007	117
DCP 3	.050	2.743	0.091	84	0.029	126	0.017	96	0.023	38	0.004	331	0.005	347	0.018	81	0.006	308	0.012	0
DCP 4	.150	1.097	0.002	312	0.025	46	0.008	89	0.007	44	0.004	6	0.005	23	0.004	193	0.002	187	0.004	113
DCP 5	.200	1.012	0.002	317	0.033	32	0.006	73	0.006	131	0.005	150	0.007	57	0.002	135	0.000	60	0.006	104
DCP 6	.250	0.957	0.003	315	0.024	56	0.007	58	0.008	62	0.005	5	0.004	42	0.003	138	0.001	353	0.003	29
DCP 7	.300	0.952	0.001	322	0.030	45	0.007	26	0.004	131	0.005	139	0.007	104	0.000	142	0.001	180	0.004	125
DCP 8	.400	0.839	0.090	325	0.030	49	0.008	39	0.007	76	0.004	346	0.002	62	0.004	102	0.002	299	0.003	114
DCP 9	.501	0.068	0.067	330	0.031	40	0.007	65	0.001	107	0.008	163	0.006	115	0.006	189	0.004	148	0.003	66
DCP10	.600	0.042	0.061	339	0.027	60	0.011	38	0.005	0	0.005	305	0.006	334	0.006	271	0.003	108	0.007	182
DCP11	.831	0.045	0.063	1	0.031	37	0.009	39	0.005	25	0.006	275	0.003	239	0.002	243	0.001	246	0.003	315
DCP12	.878	0.057	0.050	330	0.023	50	0.050	1	0.001	173	0.007	345	0.004	338	0.002	163	0.002	330	0.005	48
DCP13	.950	0.407	0.034	340	0.012	46	0.007	10[illegible]	0.012	292	0.009	118	0.004	130	0.010	92	0.005	183	0.003	24

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	12.20	0.600	0.02		0.616	4331.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.032	640.8	1439.0	0.63E 07	-0.00314	0.068	0.02

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		-0.097	0.162 246	0.011 325	0.002 50	0.001 86	0.001 75	0.001 338	0.000 352	0.000 155	0.001 250
CM		-0.014	0.005 242	0.001 229	0.000 353	0.000 229	0.000 326	0.000 237	0.000 203	0.000 29	0.000 55
DCP 1	.010	-2.576	0.600 242	0.309 37	0.016 114	0.080 181	0.019 219	0.017 291	0.009 328	0.003 262	0.007 231
DCP 2	.025	-1.505	0.904 244	0.069 12	0.129 17	0.013 123	0.065 143	0.008 260	0.036 274	0.018 13	0.007 36
DCP 3	.050	-0.519	0.732 247	0.120 248	0.029 209	0.020 8	0.023 347	0.006 345	0.007 119	0.004 125	0.003 234
DCP 4	.150	0.141	0.268 244	0.018 329	0.003 88	0.002 128	0.001 40	0.001 326	0.001 99	0.000 291	0.001 257
DCP 5	.200	0.046	0.213 245	0.022 350	0.004 38	0.002 80	0.001 64	0.000 114	0.002 77	0.001 26	0.002 324
DCP 6	.250	0.009	0.185 245	0.014 347	0.003 72	0.001 68	0.000 311	0.002 326	0.001 148	0.001 135	0.000 246
DCP 7	.300	0.011	0.161 247	0.014 340	0.004 82	0.002 87	0.000 58	0.001 305	0.000 308	0.001 242	0.001 243
DCP 8	.400	-0.018	0.122 246	0.010 348	0.002 68	0.001 137	0.000 305	0.001 314	0.001 62	0.001 278	0.000 216
DCP 9	.501	-0.063	0.086 243	0.007 345	0.001 54	0.002 72	0.001 94	0.000 108	0.001 23	0.000 38	0.000 290
DCP 10	.600	-0.037	0.063 246	0.008 356	0.001 162	0.002 117	0.001 202	0.000 189	0.001 117	0.002 185	0.000 165
DCP 11	.831	0.024	0.030 251	0.003 356	0.001 128	0.002 64	0.002 84	0.003 24	0.002 334	0.000 153	0.002 277
DCP 12	.878	0.017	0.028 248	0.002 306	0.002 161	0.001 223	0.001 185	0.001 113	0.001 54	0.001 214	0.000 224
DCP 13	.950	-0.114	0.034 247	0.002 329	0.003 338	0.002 335	0.000 267	0.000 30	0.004 354	0.001 324	0.003 232

FORCED VERTICAL TRANSLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	14.51	0.600	9.99		0.618	4331.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.038	639.7	1439.2	0.63E 07	-0.00057	0.994	9.99

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
CN		0.955	0.035 290	0.001 295	0.005 168	0.002 255	0.004 58	0.002 213	0.005 25	0.004 170	0.002 200
CM		-0.034	0.016 102	0.001 41	0.001 244	0.001 300	0.000 156	0.001 116	0.001 221	0.002 339	0.001 126
DCP 1	.010	2.432	0.231 265	0.002 321	0.005 123	0.001 94	0.004 7	0.006 137	0.006 276	0.008 118	0.006 47
DCP 2	.025	2.577	0.172 267	0.002 67	0.003 161	0.003 115	0.005 343	0.004 113	0.002 320	0.005 127	0.003 137
DCP 3	.050	3.064	0.068 252	0.025 287	0.011 114	0.005 242	0.009 352	0.007 136	0.005 1	0.003 291	0.010 163
DCP 4	.200	1.413	0.128 81	0.006 51	0.031 212	0.017 326	0.017 114	0.009 179	0.007 30	0.018 287	0.007 193
DCP 5	.250	1.228	0.085 86	0.021 82	0.005 107	0.007 353	0.010 57	0.020 153	0.013 359	0.017 235	0.001 230
DCP 6	.300	1.256	0.072 56	0.018 75	0.017 206	0.029 283	0.016 116	0.008 330	0.004 80	0.008 234	0.014 171
DCP 7	.400	0.839	0.060 290	0.002 206	0.013 92	0.010 224	0.012 20	0.003 298	0.003 287	0.004 155	0.001 26
DCP 8	.501	0.553	0.077 283	0.002 2	0.013 106	0.003 171	0.004 31	0.005 63	0.002 332	0.018 144	0.001 143
DCP 9	.600	0.480	0.065 288	0.001 91	0.015 243	0.015 142	0.005 54	0.003 145	0.005 40	0.006 120	0.004 239
DCP 10	.831	0.381	0.077 277	0.012 238	0.018 76	0.002 323	0.005 287	0.014 291	0.018 25	0.014 139	0.006 336
DCP 11	.878	0.349	0.064 271	0.003 298	0.013 255	0.008 77	0.006 112	0.005 266	0.004 103	0.007 336	0.007 357
DCP 12	.950	0.260	0.070 273	0.009 233	0.010 18	0.009 78	0.008 285	0.008 55	0.007 171	0.007 41	0.002 206

FORCED VERTICAL TRANSLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	14.75	0.600	12.51		0.619	4331.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.038	640.0	1437.2	0.63E 07	-0.00019	1.033	12.51

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.007	0.018	321	0.004	228	0.008	200	0.002	97	0.004	79	0.004	164	0.004	24	0.003	162	0.002	155
CM		-0.069	0.012	108	0.002	146	0.001	273	0.002	286	0.002	152	0.001	42	0.001	257	0.001	330	0.002	333
CCP 1	.010	2.887	0.204	270	0.016	246	0.008	196	0.005	16	0.005	74	0.008	123	0.006	269	0.005	131	0.002	250
CCP 2	.025	2.582	0.214	269	0.019	257	0.012	158	0.005	355	0.009	84	0.004	43	0.009	300	0.006	151	0.003	315
CCP 3	.050	2.032	0.105	83	0.020	96	0.046	270	0.009	359	0.013	157	0.007	205	0.007	29	0.013	227	0.006	136
CCP 4	.150	1.649	0.139	82	0.042	148	0.034	226	0.009	310	0.023	138	0.021	176	0.017	339	0.017	338	0.022	317
CCP 5	.200	1.391	0.015	108	0.011	182	0.027	108	0.008	264	0.025	82	0.006	90	0.011	326	0.013	256	0.014	191
CCP 6	.250	1.170	0.020	26	0.023	205	0.026	202	0.010	312	0.011	36	0.013	69	0.011	303	0.010	348	0.009	335
CCP 7	.300	1.252	0.013	373	0.011	222	0.016	134	0.009	220	0.021	88	0.007	209	0.011	316	0.011	225	0.006	260
CCP 8	.400	0.940	0.030	308	0.013	289	0.009	144	0.014	214	0.016	47	0.006	177	0.007	159	0.014	228	0.006	129
CCP 9	.501	0.662	0.029	344	0.017	275	0.027	236	0.009	71	0.009	186	0.011	223	0.007	254	0.024	135	0.010	9
CCP10	.600	0.603	0.051	287	0.025	297	0.006	149	0.018	98	0.006	225	0.018	274	0.021	64	0.017	93	0.019	158
CCP11	.831	0.504	0.035	292	0.018	60	0.009	61	0.003	88	0.017	334	0.007	108	0.010	83	0.002	189	0.011	107
CCP12	.878	0.496	0.060	285	0.006	14	0.007	251	0.009	348	0.005	21	0.008	314	0.011	288	0.007	210	0.009	249
CCP13	.950	0.347	0.047	279	0.008	240	0.012	329	0.008	148	0.005	10	0.012	343	0.002	172	0.003	2	0.008	212

FORCED VERTICAL TRANSLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
	15.17	0.600	20.00		0.616	4331.4	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)
0.040	638.8	1441.2	0.63E 07	0.00039	1.092	20.00

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
CN		1.047	0.033	49	0.006	149	0.008	118	0.001	264	0.000	270	0.005	214	0.005	303	0.004	250	0.006	283
CM		-0.137	0.013	97	0.002	351	0.001	354	0.002	17	0.001	26	0.000	6	0.001	38	0.002	35	0.002	36
CCP 1	.010	3.105	0.280	86	0.044	302	0.043	148	0.018	172	0.024	280	0.031	328	0.036	103	0.037	129	0.016	173
CCP 2	.025	2.611	0.228	83	0.038	48	0.084	17	0.034	32	0.039	139	0.046	147	0.044	304	0.028	289	0.032	4
CCP 3	.050	2.319	0.261	78	0.056	140	0.028	134	0.037	348	0.044	319	0.024	272	0.005	245	0.007	103	0.030	335
CCP 4	.150	1.320	0.054	47	0.030	325	0.015	57	0.015	227	0.005	108	0.021	158	0.008	119	0.008	269	0.007	317
CCP 5	.200	1.220	0.075	81	0.007	167	0.011	299	0.005	1	0.019	112	0.007	169	0.020	299	0.002	215	0.016	355
CCP 6	.250	1.155	0.061	50	0.018	346	0.012	67	0.008	130	0.004	34	0.010	236	0.014	292	0.006	254	0.008	0
CCP 7	.300	1.205	0.050	52	0.005	111	0.003	336	0.006	103	0.018	99	0.006	34	0.014	314	0.008	297	0.014	319
CCP 8	.400	1.044	0.049	38	0.014	100	0.025	106	0.011	14	0.012	30	0.015	260	0.016	305	0.016	20	0.016	349
CCP 9	.501	0.821	0.017	20	0.016	188	0.022	166	0.010	177	0.001	260	0.009	232	0.012	333	0.017	331	0.012	249
CCP10	.600	0.809	0.023	320	0.018	181	0.025	134	0.012	233	0.002	225	0.008	208	0.009	36	0.011	228	0.009	182
CCP11	.831	0.746	0.052	277	0.008	143	0.008	297	0.008	115	0.016	229	0.006	89	0.012	180	0.014	276	0.016	227
CCP12	.878	0.707	0.025	291	0.005	312	0.007	298	0.022	250	0.005	208	0.010	162	0.005	159	0.001	246	0.008	243
CCP13	.950	0.592	0.058	265	0.006	109	0.004	212	0.004	55	0.004	118	0.010	332	0.010	256	0.013	147	0.000	11

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
64.0	15.85	0.400	9.96	4.66		5135.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.060	438.0	739.2	0.48E 07	-0.00067	1.495	13.62	0.1300

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		9.956	4.658	0	0.307	36	0.065	338	0.058	246	0.064	238	0.068	71	0.039	322	0.017	195	0.010	44
CN		1.081	0.350	9	0.098	41	0.035	316	0.012	269	0.013	228	0.004	115	0.007	314	0.004	275	0.001	68
CM		0.017	0.008	309	0.006	59	0.005	352	0.003	267	0.001	249	0.001	186	0.002	119	0.001	26	0.001	312
DCP 1	.010	4.630	2.449	1	0.368	19	0.168	340	0.095	289	0.059	260	0.042	303	0.045	255	0.016	209	0.011	230
DCP 2	.025	4.688	2.219	3	0.436	28	0.205	321	0.111	280	0.097	239	0.018	243	0.054	229	0.051	145	0.029	71
DCP 3	.100	2.752	0.649	8	0.253	65	0.152	343	0.063	287	0.059	236	0.045	169	0.041	100	0.040	49	0.044	342
DCP 4	.150	2.079	0.430	7	0.182	52	0.060	346	0.021	299	0.025	256	0.011	180	0.009	79	0.011	356	0.009	281
DCP 5	.200	1.718	0.369	15	0.230	50	0.108	313	0.057	228	0.039	173	0.039	91	0.038	10	0.025	297	0.015	227
DCP 6	.250	1.519	0.341	13	0.135	44	0.045	328	0.014	259	0.012	231	0.007	99	0.013	357	0.008	271	0.006	195
DCP 7	.300	1.198	0.318	18	0.149	39	0.070	287	0.139	193	0.022	135	0.026	72	0.030	348	0.023	268	0.014	196
DCP 8	.400	0.919	0.256	16	0.078	29	0.022	294	0.006	214	0.002	207	0.008	25	0.014	306	0.012	229	0.007	160
DCP 9	.500	0.744	0.205	16	0.048	35	0.022	212	0.022	74	0.013	319	0.002	198	0.012	309	0.013	204	0.010	122
DCP10	.600	0.506	0.165	18	0.034	6	0.006	270	0.003	340	0.004	264	0.004	342	0.011	281	0.007	212	0.003	101
DCP11	.878	0.112	0.112	10	0.008	224	0.009	188	0.004	55	0.005	184	0.001	225	0.005	269	0.006	138	0.003	23

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.012	77	0.008	17	0.003	48	0.009	33	0.006	133	0.004	127	0.005	62	0.008	200	0.007	227
CN		0.002	16	0.001	117	0.002	61	0.001	105	0.001	5	0.001	140	0.002	114	0.001	136	0.002	107
CM		0.001	238	0.000	224	0.001	183	0.001	104	0.001	88	0.000	17	0.001	309	0.000	331	0.000	277
DCP 1	.010	0.010	226	0.011	118	0.009	150	0.012	110	0.003	353	0.007	96	0.005	75	0.003	80	0.007	73
DCP 2	.025	0.013	32	0.007	82	0.010	198	0.022	92	0.018	74	0.006	323	0.006	174	0.011	114	0.011	70
DCP 3	.100	0.032	288	0.023	212	0.011	146	0.008	123	0.012	141	0.016	114	0.013	49	0.008	347	0.008	300
DCP 4	.150	0.004	248	0.005	149	0.003	88	0.002	79	0.002	339	0.001	126	0.001	160	0.001	127	0.003	145
DCP 5	.200	0.008	162	0.008	116	0.005	78	0.003	107	0.005	19	0.002	184	0.003	21	0.008	277	0.008	195
DCP 6	.250	0.002	98	0.005	65	0.004	351	0.004	244	0.002	133	0.002	74	0.001	23	0.004	318	0.004	204
DCP 7	.300	0.012	110	0.008	62	0.005	345	0.001	285	0.002	99	0.002	103	0.002	308	0.005	192	0.006	149
DCP 8	.400	0.007	46	0.005	4	0.001	217	0.004	111	0.005	348	0.003	270	0.003	161	0.001	146	0.002	141
DCP 9	.500	0.008	48	0.003	324	0.001	328	0.001	277	0.002	356	0.001	252	0.007	176	0.005	114	0.005	38
DCP10	.600	0.007	26	0.001	173	0.002	41	0.003	300	0.002	225	0.000	96	0.003	144	0.004	149	0.004	86
DCP11	.878	0.001	245	0.003	84	0.004	18	0.002	275	0.003	281	0.003	171	0.003	85	0.000	355	0.001	117

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
64.0	15.88	0.600	0.95	4.73		5136.2	10

K	V	Q	CN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.060	436.4	798.8	0.48E 07	-0.00070	1.493	14.09	0.1130

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		9.947	4.734	359	0.329	82	0.050	318	0.059	222	0.052	334	0.014	41	0.013	310	0.006	60	0.013	319
CN		1.073	0.884	9	0.091	80	0.058	310	0.012	242	0.010	308	0.014	212	0.004	94	0.004	334	0.003	283
CM		0.005	0.009	313	0.009	66	0.004	240	0.001	235	0.001	292	0.001	286	0.001	149	0.001	87	0.001	13
DCP 1	.010	4.676	2.466	1	0.392	10	0.167	395	0.069	271	0.083	316	0.072	244	0.018	196	0.020	269	0.018	209
DCP 2	.025	4.673	2.246	3	0.458	16	0.207	336	0.066	252	0.091	300	0.094	235	0.051	178	0.025	109	0.018	94
DCP 3	.100	2.749	0.678	7	0.308	57	0.184	338	0.042	263	0.032	287	0.044	214	0.041	119	0.042	47	0.043	347
DCP 4	.150	1.948	0.439	7	0.177	52	0.054	361	0.012	249	0.020	327	0.026	220	0.016	120	0.011	21	0.009	301
DCP 5	.200	1.568	0.372	15	0.213	41	0.099	303	0.051	205	0.010	106	0.010	153	0.022	37	0.023	325	0.016	267
DCP 6	.250	1.433	0.337	13	0.137	46	0.048	327	0.014	238	0.012	319	0.019	194	0.013	74	0.011	318	0.008	256
DCP 7	.300	1.183	0.312	17	0.128	28	0.057	281	0.029	196	0.003	82	0.010	121	0.023	2	0.020	289	0.013	220
DCP 8	.400	0.907	0.250	16	0.080	30	0.022	300	0.006	215	0.005	322	0.011	173	0.008	3	0.011	263	0.005	212
DCP 9	.500	0.671	0.199	16	0.040	5	0.012	198	0.011	35	0.014	303	0.008	204	0.006	343	0.006	261	0.004	177
DCP10	.600	0.501	0.163	20	0.034	16	0.005	288	0.004	312	0.006	310	0.010	198	0.002	249	0.003	250	0.002	242
DCP11	.878	0.222	0.112	11	0.037	268	0.007	197	0.005	255	0.004	109	0.004	247	0.001	172	0.003	346	0.001	172

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.006	91	0.015	18	0.005	25	0.015	52	0.002	81	0.004	124	0.003	87	0.004	187	0.002	209
CN		0.002	84	0.001	178	0.004	98	0.001	98	0.002	355	0.002	223	0.002	185	0.002	84	0.000	285
CM		0.001	289	0.001	224	0.000	116	0.001	56	0.000	14	0.001	48	0.000	13	0.000	252	0.000	81
DCP 1	.010	0.004	127	0.010	175	0.017	93	0.012	140	0.003	6	0.009	118	0.004	84	0.002	205	0.006	143
DCP 2	.025	0.028	92	0.009	331	0.023	89	0.017	75	0.014	358	0.003	106	0.003	56	0.007	332	0.006	298
DCP 3	.100	0.034	296	0.032	237	0.027	156	0.025	99	0.015	29	0.008	302	0.008	208	0.008	135	0.005	.43
DCP 4	.150	0.001	207	0.003	181	0.006	164	0.005	103	0.005	10	0.003	259	0.001	211	0.001	56	0.001	170
DCP 5	.200	0.010	201	0.013	194	0.018	81	0.012	15	0.011	291	0.010	198	0.008	142	0.008	49	0.004	333
DCP 6	.250	0.004	194	0.004	139	0.007	94	0.002	12	0.002	320	0.002	240	0.003	243	0.003	179	0.003	61
DCP 7	.300	0.008	146	0.010	109	0.013	43	0.011	314	0.006	221	0.005	118	0.001	64	0.001	23	0.001	188
DCP 8	.400	0.005	124	0.006	95	0.005	13	0.005	249	0.002	126	0.001	231	0.002	189	0.003	153	0.001	316
DCP 9	.500	0.009	102	0.006	17	0.003	319	0.005	224	0.004	142	0.003	54	0.003	318	0.003	221	0.002	143
DCP10	.600	0.002	90	0.001	89	0.000	133	0.003	185	0.004	145	0.004	237	0.001	146	0.004	69	0.003	234
DCP11	.878	0.003	74	0.001	315	0.002	178	0.001	138	0.000	359	0.004	229	0.003	190	0.002	51	0.001	1

TUNED PITCHING OSCILLATION VERTOL 23010-1.59 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
64.0	15.75	0.400	9.97	4.79		5136.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.060	435.3	735.5	0.48E 07	-0.00068	1.503	13.85	0.0340

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		9.969	4.789	359	0.194	48	0.129	291	0.147	205	0.161	327	0.051	33	0.045	13	0.014	34	0.025	72
CN		1.076	0.351	8	0.093	24	0.040	286	0.039	197	0.018	295	0.034	126	0.007	9	0.001	85	0.003	46
CM		-0.007	0.007	302	0.010	63	0.006	330	0.002	223	0.001	285	0.001	250	0.001	108	0.001	335	0.000	184
DCP 1	.010	4.545	2.446	0	0.396	11	0.187	300	0.046	244	0.135	297	0.045	273	0.023	326	0.010	215	0.020	79
DCP 2	.025	4.615	2.214	1	0.449	15	0.254	296	0.074	216	0.112	291	0.049	210	0.029	97	0.021	32	0.022	64
DCP 3	.100	2.718	0.662	6	0.375	52	0.148	321	0.047	240	0.045	268	0.038	130	0.038	49	0.025	2	0.018	304
DCP 4	.150	1.903	0.428	7	0.179	46	0.059	318	0.013	256	0.031	291	0.003	323	0.009	22	0.004	19	0.002	42
DCP 5	.200	1.551	0.367	14	0.220	36	0.114	287	0.057	185	0.010	39	0.021	71	0.028	351	0.016	269	0.010	150
DCP 6	.250	1.290	0.334	13	0.141	37	0.047	293	0.011	178	0.024	308	0.004	314	0.008	358	0.003	178	0.003	109
DCP 7	.300	1.190	0.321	17	0.136	19	0.077	260	0.041	146	0.021	358	0.010	66	0.020	338	0.013	221	0.011	111
DCP 8	.400	0.887	0.255	16	0.089	18	0.030	260	0.007	104	0.018	303	0.006	350	0.008	324	0.006	150	0.002	35
DCP 9	.500	0.641	0.204	15	0.038	354	0.024	187	0.019	37	0.021	291	0.011	117	0.009	305	0.009	147	0.009	43
DCP10	.600	0.505	0.173	17	0.046	251	0.016	227	0.008	30	0.014	285	0.005	15	0.005	339	0.003	121	0.003	314
DCP11	.878	0.310	0.115	6	0.035	247	0.008	156	0.007	230	0.004	116	0.006	145	0.002	89	0.001	83	0.001	44

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.018	108	0.005	214	0.014	196	0.011	265	0.013	280	0.015	324	0.011	324	0.012	46	0.017	62
CN		0.001	83	0.002	142	0.000	88	0.002	228	0.002	134	0.000	320	0.002	348	0.001	24	0.001	347
CM		0.000	324	0.000	79	0.000	127	0.000	30	0.000	336	0.000	199	0.001	162	0.001	87	0.000	6
DCP 1	.010	0.014	310	0.018	166	0.008	89	0.003	236	0.001	122	0.002	98	0.005	69	0.013	43	0.007	335
DCP 2	.025	0.018	358	0.021	174	0.019	118	0.014	356	0.008	317	0.004	233	0.006	115	0.017	45	0.013	20
DCP 3	.100	0.011	191	0.018	95	0.012	6	0.015	272	0.010	187	0.006	153	0.004	122	0.011	97	0.011	16
DCP 4	.150	0.003	96	0.003	51	0.004	284	0.006	183	0.005	63	0.003	333	0.002	283	0.002	61	0.004	347
DCP 5	.200	0.013	77	0.005	19	0.007	277	0.008	196	0.007	120	0.006	42	0.006	339	0.002	157	0.001	296
DCP 6	.250	0.002	37	0.002	342	0.003	299	0.006	177	0.005	64	0.003	278	0.002	130	0.004	30	0.004	315
DCP 7	.300	0.010	46	0.006	296	0.008	225	0.006	131	0.005	69	0.003	352	0.007	322	0.002	266	0.003	158
DCP 8	.400	0.002	185	0.002	79	0.001	254	0.001	163	0.001	85	0.003	198	0.002	357	0.004	318	0.004	247
DCP 9	.500	0.003	310	0.007	196	0.005	138	0.002	35	0.001	345	0.003	272	0.001	56	0.002	337	0.001	192
DCP10	.600	0.004	151	0.002	61	0.002	58	0.002	197	0.003	155	0.001	305	0.003	293	0.003	250	0.003	228
DCP11	.878	0.001	108	0.003	220	0.001	342	0.003	246	0.003	170	0.002	56	0.005	3	0.001	328	0.002	73

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
64.0	15.82	0.400	12.42	4.26		5137.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.060	438.4	736.2	0.48E 07	0.00038	1.032	14.60	0.1300

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		12.417	4.263	0	0.235	48	0.088	105	0.130	349	0.051	249	0.099	253	0.021	229	0.023	45	0.028	19
CN		1.196	0.192	58	0.150	38	0.030	65	0.037	354	0.014	326	0.019	291	0.006	237	0.005	280	0.001	168
CM		-0.006	0.045	179	0.026	76	0.005	62	0.008	43	0.003	8	0.004	358	0.003	292	0.001	195	0.001	310
DCP 1	.010	5.165	1.247	27	0.834	47	0.115	27	0.115	3	0.036	44	0.030	317	0.019	153	0.034	53	0.021	32
DCP 2	.025	4.772	0.642	62	0.934	62	0.240	57	0.241	30	0.156	13	0.119	329	0.056	327	0.052	340	0.059	337
DCP 3	.100	2.639	0.585	145	0.623	73	0.141	78	0.187	37	0.106	350	0.090	325	0.076	301	0.053	270	0.031	280
DCP 4	.150	2.208	0.322	124	0.340	59	0.048	88	0.[illegible]2	22	0.032	329	0.030	320	0.031	267	0.015	226	0.010	200
DCP 5	.200	1.918	0.377	114	0.336	48	0.076	66	0.[illegible]	357	0.064	293	0.065	287	0.060	237	0.034	214	0.032	188
DCP 6	.250	1.670	0.260	84	0.214	39	0.031	89	[illegible]	340	0.027	248	0.015	287	0.021	219	0.010	169	0.012	132
DCP 7	.300	1.242	0.281	80	0.198	32	0.048	39	0.[illegible]	324	0.043	266	0.058	263	0.045	198	0.023	170	0.024	138
DCP 8	.400	1.050	0.261	43	0.114	6	0.008	27	0.055	289	0.026	193	0.011	297	0.015	140	0.005	80	0.009	110
DCP 9	.500	0.916	0.220	36	0.057	346	0.005	315	0.034	247	0.015	170	0.015	211	0.016	123	0.008	68	0.008	44
DCP10	.600	0.665	0.223	22	0.051	321	0.008	172	0.024	255	0.012	144	0.008	138	0.015	80	0.010	338	0.002	85
DCP11	.878	0.181	0.197	359	0.045	236	0.008	255	0.009	165	0.009	321	0.011	236	0.006	110	0.005	299	0.003	168

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.021	19	0.013	59	0.015	32	0.005	22	0.011	127	0.006	138	0.009	143	0.008	175	0.007	215
CN		0.002	293	0.002	115	0.005	174	0.002	17	0.002	94	0.001	271	0.001	95	0.002	52	0.001	272
CM		0.002	274	0.003	213	0.002	145	0.002	108	0.001	74	0.002	101	0.001	15	0.001	219	0.001	82
DCP 1	.010	0.010	63	0.016	66	0.024	63	0.004	29	0.012	130	0.011	118	0.006	50	0.003	116	0.003	203
DCP 2	.025	0.057	289	0.048	226	0.042	134	0.029	102	0.040	81	0.031	66	0.037	28	0.025	356	0.021	294
DCP 3	.100	0.055	262	0.057	221	0.048	175	0.030	153	0.025	142	0.023	145	0.020	106	0.014	113	0.019	109
DCP 4	.150	0.010	167	0.007	112	0.012	100	0.013	25	0.003	288	0.003	173	0.001	239	0.008	131	0.007	39
DCP 5	.200	0.028	160	0.020	132	0.025	107	0.019	65	0.017	44	0.011	10	0.011	20	0.010	353	0.004	332
DCP 6	.250	0.011	97	0.009	57	0.011	56	0.008	357	0.003	331	0.007	252	0.001	279	0.003	193	0.002	128
DCP 7	.300	0.022	117	0.021	87	0.021	62	0.017	14	0.009	351	0.010	316	0.007	285	0.006	274	0.004	257
DCP 8	.400	0.011	67	0.011	15	0.004	346	0.002	319	0.003	299	0.005	234	0.002	262	0.004	222	0.004	144
DCP 9	.500	0.002	85	0.009	51	0.011	12	0.016	325	0.011	276	0.010	249	0.008	205	0.010	130	0.006	46
DCP10	.600	0.002	83	0.008	76	0.[illegible]4	40	0.005	314	0.005	241	0.002	247	0.002	255	0.001	212	0.004	245
DCP11	.878	0.004	108	0.009	4	0.[illegible]5	281	0.006	245	0.005	112	0.006	304	0.006	155	0.008	24	0.005	272

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
64.0	15.87	0.400	12.42	4.34		5137.?	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.061	436.4	739.3	0.49E 07	0.00091	1.535	14.73	0.1190

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		12.415	4.343	0	0.316	50	0.073	131	0.149	340	0.090	3	0.131	228	0.021	149	0.033	16	0.019	354
CN		1.144	0.218	61	0.144	37	0.033	73	0.032	343	0.020	14	0.016	245	0.002	305	0.004	146	0.005	269
CM		-0.013	0.045	174	0.023	71	0.006	69	0.006	10	0.002	61	0.007	5	0.005	298	0.003	245	0.000	147
DCP 1	.010	5.056	1.320	33	0.790	36	0.104	49	0.195	359	0.102	41	0.028	351	0.010	319	0.034	109	0.025	42
DCP 2	.025	4.706	0.920	61	0.946	53	0.218	62	0.149	20	0.189	35	0.111	5	0.130	331	0.062	299	0.047	293
DCP 3	.100	2.593	0.632	137	0.611	66	0.149	75	0.144	16	0.084	12	0.054	335	0.088	311	0.059	259	0.052	252
DCP 4	.150	2.000	0.382	120	0.295	47	0.082	100	0.080	4	0.035	26	0.036	312	0.018	279	0.022	218	0.007	162
DCP 5	.200	1.607	0.423	111	0.313	40	0.097	75	0.134	342	0.042	310	0.066	272	0.048	233	0.036	195	0.029	180
DCP 6	.250	1.530	0.307	87	0.198	24	0.055	92	0.075	328	0.006	303	0.033	252	0.020	182	0.024	158	0.012	91
DCP 7	.300	1.224	0.311	80	0.187	24	0.058	56	0.097	309	0.016	268	0.061	237	0.033	178	0.032	152	0.019	112
DCP 8	.400	1.022	0.276	48	0.118	347	0.016	67	0.043	281	0.002	17	0.036	214	0.026	136	0.023	115	0.010	56
DCP 9	.500	0.840	0.231	36	0.057	343	0.008	2	0.040	236	0.012	104	0.034	187	0.018	113	0.027	83	0.011	352
DCP10	.600	0.668	0.226	23	0.070	308	0.009	181	0.014	190	0.011	25	0.021	182	0.017	100	0.016	64	0.011	310
DCP11	.878	0.228	0.200	354	0.023	216	0.016	256	0.015	109	0.012	322	0.016	190	0.008	82	0.009	354	0.006	233

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.009	312	0.007	32	0.014	31	0.005	359	0.005	106	0.005	92	0.003	123	0.008	100	0.006	168
CN		0.005	148	0.006	102	0.004	79	0.004	42	0.002	334	0.001	280	0.001	153	0.002	137	0.001	28
CM		0.001	243	0.001	235	0.002	165	0.002	114	0.002	46	0.000	303	0.001	107	0.001	26	0.001	317
DCP 1	.010	0.016	59	0.022	63	0.021	62	0.017	53	0.004	70	0.011	101	0.007	62	0.010	248	0.010	178
DCP 2	.025	0.036	249	0.030	184	0.037	177	0.045	80	0.030	32	0.008	330	0.015	74	0.017	21	0.016	317
DCP 3	.100	0.057	214	0.036	174	0.036	178	0.040	133	0.021	89	0.008	145	0.023	125	0.024	80	0.017	35
DCP 4	.150	0.007	149	0.010	91	0.007	134	0.010	51	0.006	336	0.001	4	0.002	106	0.004	115	0.001	310
DCP 5	.200	0.033	149	0.025	110	0.021	101	0.024	66	0.016	36	0.016	10	0.011	340	0.008	322	0.008	281
DCP 6	.250	0.016	89	0.017	18	0.006	92	0.013	7	0.008	299	0.005	280	0.008	222	0.005	142	0.002	95
DCP 7	.300	0.022	110	0.023	58	0.014	43	0.019	17	0.015	324	0.013	330	0.008	265	0.009	261	0.010	222
DCP 8	.400	0.019	50	0.011	341	0.008	2	0.008	308	0.006	314	0.009	251	0.008	198	0.006	159	0.004	98
DCP 9	.500	0.016	52	0.013	316	0.006	335	0.011	283	0.009	241	0.009	196	0.006	117	0.003	177	0.004	131
DCP10	.600	0.004	340	0.009	137	0.008	9	0.006	269	0.002	238	0.002	115	0.003	288	0.006	141	0.004	334
DCP11	.878	0.006	177	0.009	81	0.006	348	0.006	341	0.008	210	0.004	80	0.003	321	0.004	238	0.004	132

TUNED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
64.0	15.70	0.400	12.44	4.55		5137.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.060	435.0	724.2	0.48E 07	0.00324	1.680	17.42	0.0340

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		12.436	4.548	0	0.291	35	0.086	185	0.670	50	2.189	152	0.599	8	0.150	308	0.033	355	0.046	336
CN		1.201	0.209	38	0.139	44	0.011	99	0.093	359	0.228	165	0.081	49	0.022	348	0.008	356	0.019	343
CM		-0.016	0.031	171	0.021	57	0.001	131	0.022	20	0.015	299	0.024	178	0.012	78	0.001	53	0.007	78
DCP 1	.010	5.141	1.162	20	0.811	56	0.263	85	0.931	9	0.819	156	0.109	301	0.118	124	0.061	140	0.174	64
DCP 2	.025	4.988	0.853	39	1.033	53	0.240	80	0.980	7	0.784	170	0.236	153	0.264	78	0.028	226	0.231	65
DCP 3	.100	2.840	0.360	100	0.517	47	0.061	217	0.336	16	0.465	191	0.278	139	0.186	61	0.046	356	0.055	57
DCP 4	.150	2.104	0.238	74	0.251	46	0.029	243	0.164	10	0.343	181	0.158	100	0.095	14	0.026	312	0.024	326
DCP 5	.200	1.619	0.263	88	0.307	39	0.037	259	0.124	358	0.343	172	0.179	77	0.078	6	0.038	30	0.078	343
DCP 6	.250	1.575	0.234	54	0.157	39	0.024	247	0.076	1	0.313	159	0.157	59	0.066	326	0.014	34	0.043	317
DCP 7	.300	1.319	0.245	56	0.181	27	0.015	243	0.070	342	0.289	165	0.171	49	0.070	324	0.031	7	0.071	316
DCP 8	.400	1.034	0.225	32	0.052	32	0.002	342	0.026	306	0.252	157	0.160	29	0.064	284	0.015	29	0.041	287
DCP 9	.500	0.805	0.209	23	0.036	336	0.022	98	0.040	272	0.200	154	0.142	21	0.065	274	0.007	268	0.035	279
DCP10	.600	0.660	0.182	15	0.011	215	0.012	95	0.024	242	0.166	151	0.119	8	0.047	252	0.006	37	0.022	258
DCP11	.878	0.309	0.164	357	0.016	266	0.008	17	0.032	212	0.060	135	0.056	348	0.015	263	0.008	229	0.008	274

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.043	98	0.057	87	0.020	5	0.033	111	0.009	178	0.009	74	0.020	188	0.016	172	0.015	188
CN		0.017	215	0.013	63	0.002	48	0.005	243	0.007	102	0.000	252	0.001	79	0.002	279	0.003	282
CM		0.008	337	0.006	233	0.004	125	0.003	40	0.000	329	0.002	4	0.003	288	0.002	201	0.001	93
DCP 1	.010	0.109	6	0.182	288	0.155	185	0.099	143	0.054	100	0.067	80	0.108	319	0.085	223	0.041	187
DCP 2	.025	0.154	323	0.118	244	0.122	137	0.011	33	0.078	140	0.067	65	0.055	295	0.058	204	0.018	126
DCP 3	.100	0.031	320	0.040	83	0.040	64	0.034	31	0.040	63	0.039	13	0.054	23	0.051	305	0.017	342
DCP 4	.150	0.031	221	0.033	88	0.009	50	0.011	56	0.014	339	0.010	279	0.011	254	0.018	196	0.009	62
DCP 5	.200	0.044	258	0.018	23	0.006	23	0.024	340	0.021	342	0.030	297	0.029	271	0.024	195	0.015	280
DCP 6	.250	0.042	208	0.032	81	0.009	6	0.009	309	0.008	245	0.012	259	0.019	201	0.014	117	0.007	326
DCP 7	.300	0.049	238	0.006	166	0.003	41	0.019	280	0.007	252	0.021	266	0.030	212	0.014	138	0.011	227
DCP 8	.400	0.045	188	0.033	84	0.015	351	0.025	252	0.013	157	0.013	246	0.027	152	0.019	46	0.010	281
DCP 9	.500	0.046	193	0.037	90	0.020	345	0.017	210	0.012	61	0.011	247	0.017	150	0.005	51	0.002	164
DCP10	.600	0.033	158	0.029	58	0.014	304	0.015	212	0.003	56	0.015	184	0.017	71	0.013	356	0.005	339
DCP11	.878	0.016	136	0.018	18	0.010	271	0.006	203	0.006	136	0.010	108	0.008	62	0.005	334	0.004	234

TUNED PITCHING OSCILLATION VERTOL 23010-1.59 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
64.0	15.85	0.400	14.78	4.22		5138.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.061	436.6	734.7	0.48E 07	0.00099	1.601	15.48	0.1300

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		14.777	4.224	0	0.143	46	0.170	114	0.085	140	0.032	8	0.144	3	0.037	331	0.042	241	0.008	175
CN		1.163	0.287	96	0.068	49	0.042	92	0.031	119	0.008	104	0.021	13	0.006	8	0.000	274	0.001	14
CM		-0.021	0.057	175	0.011	149	0.014	108	0.006	152	0.001	65	0.006	124	0.002	139	0.003	59	0.001	90
DCP 1	.010	5.252	1.359	81	0.477	36	0.237	95	0.142	154	0.031	183	0.040	331	0.020	307	0.021	20	0.028	324
DCP 2	.025	4.767	1.254	171	0.462	89	0.374	120	0.255	144	0.152	161	0.120	134	0.098	138	0.103	117	0.064	95
DCP 3	.100	2.501	1.067	147	0.236	90	0.235	130	0.140	117	0.073	111	0.099	78	0.041	84	0.055	85	0.030	115
DCP 4	.150	1.926	0.698	123	0.039	8	0.106	89	0.064	146	0.048	26	0.037	44	0.022	321	0.016	24	0.007	279
DCP 5	.200	1.638	0.588	122	0.088	69	0.168	93	0.063	89	0.065	51	0.070	35	0.041	25	0.040	13	0.022	17
DCP 6	.250	1.504	0.496	101	0.059	358	0.111	57	0.046	127	0.050	348	0.051	4	0.030	291	0.028	302	0.014	253
DCP 7	.300	1.272	0.402	97	0.064	55	0.107	59	0.037	84	0.049	13	0.058	22	0.038	348	0.038	331	0.019	332
DCP 8	.400	1.029	0.333	71	0.076	359	0.061	2	0.015	99	0.023	294	0.050	337	0.016	279	0.028	264	0.011	257
DCP 9	.500	0.885	0.233	57	0.046	34	0.053	346	0.014	25	0.028	298	0.033	323	0.014	294	0.030	265	0.014	259
DCP10	.600	0.700	0.226	38	0.061	353	0.042	288	0.007	103	0.021	194	0.033	320	0.002	349	0.014	218	0.003	276
DCP11	.878	0.269	0.186	357	0.041	21	0.035	239	0.013	343	0.016	127	0.010	275	0.006	9	0.010	139	0.001	106

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.006	25	0.003	309	0.003	41	0.004	12	0.002	95	0.005	136	0.001	137	0.006	215	0.002	169
CN		0.004	100	0.004	73	0.005	28	0.001	35	0.001	130	0.002	334	0.001	349	0.001	153	0.001	157
CM		0.001	38	0.001	53	0.001	99	0.001	23	0.000	82	0.001	128	0.001	62	0.001	345	0.000	66
DCP 1	.010	0.020	301	0.009	161	0.007	335	0.008	346	0.010	227	0.016	186	0.006	141	0.005	40	0.004	121
DCP 2	.025	0.081	66	0.061	42	0.049	31	0.034	10	0.007	29	0.007	21	0.010	8	0.012	323	0.008	193
DCP 3	.100	0.047	102	0.047	103	0.041	83	0.023	88	0.024	110	0.021	108	0.022	96	0.015	118	0.021	106
DCP 4	.150	0.009	293	0.002	127	0.002	241	0.004	351	0.004	138	0.004	284	0.004	79	0.003	31	0.003	310
DCP 5	.200	0.025	5	0.022	32	0.025	6	0.016	1	0.013	0	0.017	0	0.017	354	0.009	352	0.011	324
DCP 6	.250	0.018	242	0.005	230	0.004	177	0.005	228	0.001	201	0.005	216	0.002	266	0.002	85	0.002	139
DCP 7	.300	0.020	303	0.015	339	0.017	315	0.014	294	0.008	295	0.010	306	0.011	309	0.010	288	0.012	255
DCP 8	.400	0.016	209	0.012	216	0.001	259	0.008	162	0.005	202	0.002	324	0.006	171	0.002	179	0.006	97
DCP 9	.500	0.016	212	0.009	250	0.008	219	0.009	193	0.007	222	0.003	271	0.007	230	0.007	208	0.001	147
DCP10	.600	0.008	153	0.004	183	0.000	234	0.004	97	0.002	86	0.006	317	0.001	61	0.002	150	0.003	99
DCP11	.878	0.005	50	0.002	90	0.007	21	0.002	262	0.002	298	0.002	327	0.003	249	0.003	125	0.004	245

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
64.0	15.77	0.400	14.79	4.25		5139.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.061	435.0	732.8	0.48E 07	0.00069	1.615	15.40	0.1170

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		14.790	4.247	0	0.070	112	0.159	136	0.120	142	0.048	108	0.221	343	0.077	290	0.020	256	0.009	4
CN		1.148	0.297	102	0.061	53	0.043	87	0.033	106	0.016	109	0.028	33	0.012	346	0.008	309	0.003	0
CM		-0.042	0.056	175	0.016	151	0.015	102	0.008	136	0.002	33	0.006	124	0.003	79	0.003	60	0.001	33
DCP 1	.010	5.190	1.304	87	0.443	53	0.232	92	0.116	124	0.035	151	0.058	350	0.071	304	0.033	278	0.005	113
DCP 2	.025	4.447	1.315	124	0.480	93	0.403	110	0.293	122	0.150	136	0.129	107	0.050	90	0.040	84	0.016	86
DCP 3	.100	2.396	1.147	147	0.198	108	0.241	123	0.173	117	0.077	107	0.127	86	0.057	56	0.061	78	0.040	69
DCP 4	.150	1.796	0.712	126	0.017	76	0.157	89	0.172	135	0.037	51	0.053	63	0.023	354	0.029	1	0.007	22
DCP 5	.200	1.447	0.627	123	0.062	97	0.175	86	0.073	96	0.069	56	0.080	39	0.041	9	0.040	6	0.025	14
DCP 6	.250	1.407	0.500	107	0.048	25	0.106	57	0.044	110	0.029	8	0.052	28	0.029	333	0.035	317	0.014	321
DCP 7	.300	1.231	0.414	102	0.055	65	0.112	57	0.049	70	0.042	21	0.070	16	0.039	342	0.042	321	0.025	323
DCP 8	.400	0.999	0.320	78	0.078	11	0.056	0	0.022	64	0.014	292	0.040	357	0.020	316	0.032	278	0.010	298
DCP 9	.500	0.818	0.223	63	0.049	22	0.044	341	0.020	8	0.011	253	0.040	340	0.020	296	0.025	257	0.020	275
DCP10	.600	0.712	0.212	43	0.083	359	0.050	283	0.009	339	0.024	183	0.021	328	0.009	274	0.020	236	0.008	184
DCP11	.878	0.416	0.186	359	0.047	352	0.038	243	0.017	287	0.016	120	0.010	297	0.006	230	0.005	166	0.006	118

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.018	337	0.007	48	0.019	53	0.011	59	0.011	107	0.010	110	0.005	107	0.006	173	0.005	179
CN		0.003	62	0.007	52	0.003	72	0.006	45	0.001	110	0.004	36	0.001	50	0.001	336	0.001	253
CM		0.001	59	0.001	76	0.002	33	0.000	140	0.001	348	0.000	280	0.001	159	0.001	110	0.001	72
DCP 1	.010	0.023	52	0.021	60	0.015	87	0.015	121	0.004	21	0.008	138	0.011	203	0.007	199	0.003	290
DCP 2	.025	0.036	77	0.049	53	0.047	60	0.041	63	0.027	59	0.034	68	0.022	68	0.023	36	0.018	349
DCP 3	.100	0.038	85	0.047	84	0.040	70	0.035	72	0.016	56	0.024	91	0.017	92	0.019	90	0.018	85
DCP 4	.150	0.015	357	0.010	57	0.005	340	0.007	50	0.003	310	0.002	272	0.005	216	0.005	265	0.006	202
DCP 5	.200	0.021	1	0.028	32	0.024	2	0.025	4	0.017	334	0.016	342	0.013	323	0.011	305	0.011	298
DCP 6	.250	0.011	293	0.009	334	0.008	260	0.008	253	0.007	238	0.011	197	0.008	199	0.008	179	0.003	177
DCP 7	.300	0.021	279	0.017	347	0.012	286	0.018	320	0.011	279	0.012	278	0.010	272	0.014	261	0.014	250
DCP 8	.400	0.008	219	0.004	261	0.004	195	0.006	197	0.007	211	0.011	151	0.008	174	0.004	128	0.005	181
DCP 9	.500	0.018	197	0.007	243	0.010	175	0.006	257	0.006	156	0.006	177	0.001	192	0.006	196	0.006	155
DCP10	.600	0.009	90	0.005	98	0.005	274	0.008	73	0.006	219	0.007	117	0.001	212	0.000	287	0.001	253
DCP11	.878	0.004	348	0.002	336	0.007	170	0.004	32	0.007	102	0.006	41	0.007	10	0.005	333	0.004	305

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
64.0	15.97	0.400	14.82	4.20		5138.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.062	433.8	726.8	0.47E 07	0.00039	1.639	15.99	0.0340

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		14.825	4.200	0	0.177	208	0.331	296	0.360	305	0.575	14	0.314	256	0.144	252	0.050	274	0.026	279
CN		1.210	0.278	190	0.073	18	0.048	120	0.034	294	0.069	31	0.037	308	0.022	294	0.012	273	0.006	279
CM		-0.051	0.059	176	0.017	91	0.016	118	0.004	347	0.004	131	0.008	77	0.005	23	0.004	5	0.003	333
DCP 1	.010	5.351	1.139	91	0.394	35	0.423	153	0.220	272	0.303	29	0.045	281	0.036	341	0.029	38	0.033	327
DCP 2	.025	4.871	1.274	126	0.486	72	0.494	131	0.135	263	0.298	51	0.148	39	0.137	353	0.081	356	0.066	351
DCP 3	.100	2.572	1.120	144	0.310	53	0.273	123	0.130	350	0.156	52	0.119	10	0.075	330	0.055	328	0.050	306
DCP 4	.150	1.892	0.667	128	0.167	20	0.152	116	0.121	325	0.116	40	0.079	313	0.037	315	0.042	276	0.010	303
DCP 5	.200	1.526	0.570	126	0.146	33	0.146	99	0.096	326	0.112	32	0.080	313	0.034	307	0.044	297	0.027	279
DCP 6	.250	1.448	0.447	108	0.121	353	0.074	33	0.075	330	0.102	29	0.067	293	0.042	299	0.033	343	0.010	264
DCP 7	.300	1.286	0.363	101	0.100	6	0.077	67	0.074	300	0.033	21	0.070	330	0.034	285	0.042	266	0.022	252
DCP 8	.400	1.015	0.292	74	0.030	332	0.025	5	0.046	271	0.057	14	0.047	240	0.033	276	0.019	218	0.007	223
DCP 9	.500	0.812	0.219	57	0.046	324	0.045	334	0.044	251	0.044	1	0.044	252	0.033	229	0.012	210	0.011	203
DCP10	.600	0.717	0.215	41	0.053	299	0.033	290	0.024	298	0.040	15	0.033	240	0.022	242	0.009	178	0.005	140
DCP11	.878	0.524	0.203	1	0.035	284	0.035	257	0.013	121	0.016	11	0.028	276	0.015	139	0.012	199	0.010	144

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.025	349	0.043	13	0.045	64	0.028	69	0.020	83	0.022	135	0.017	183	0.017	185	0.013	213
CN		0.004	299	0.002	23	0.004	353	0.004	5	0.002	228	0.003	76	0.001	64	0.002	335	0.001	273
CM		0.002	339	0.003	295	0.001	273	0.002	249	0.001	154	0.000	176	0.001	23	0.001	356	0.002	290
DCP 1	.010	0.061	6	0.048	359	0.054	320	0.022	260	0.033	208	0.029	132	0.023	154	0.006	34	0.012	269
DCP 2	.025	0.094	355	0.033	330	0.081	311	0.033	286	0.030	174	0.024	95	0.022	61	0.021	336	0.023	292
DCP 3	.100	0.022	298	0.028	301	0.016	329	0.035	305	0.021	259	0.010	266	0.010	280	0.015	285	0.022	270
DCP 4	.150	0.019	265	0.008	154	0.008	125	0.018	100	0.010	80	0.014	43	0.006	358	0.005	345	0.001	277
DCP 5	.200	0.026	276	0.016	230	0.005	260	0.008	244	0.008	239	0.010	181	0.004	157	0.003	163	0.001	269
DCP 6	.250	0.014	222	0.007	143	0.011	136	0.012	78	0.011	66	0.007	28	0.005	30	0.003	37	0.006	25
DCP 7	.300	0.019	228	0.011	185	0.008	142	0.004	85	0.007	144	0.010	111	0.008	71	0.001	329	0.003	199
DCP 8	.400	0.007	133	0.010	113	0.011	91	0.011	69	0.006	4	0.004	54	0.002	22	0.005	26	0.004	343
DCP 9	.500	0.010	154	0.008	124	0.010	81	0.006	58	0.006	51	0.011	77	0.010	29	0.007	347	0.002	35
DCP10	.600	0.005	70	0.008	85	0.007	33	0.006	28	0.005	323	0.003	343	0.003	294	0.002	314	0.001	229
DCP11	.878	0.006	176	0.010	93	0.002	349	0.005	29	0.004	229	0.001	321	0.003	187	0.009	182	0.010	113

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
64.0	15.53	0.600	9.90	4.30		5141.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.040	642.8	713.3	0.31E 07	-0.00059	1.140	11.78	0.1300

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		9.901	4.301	0	0.193	356	0.082	176	0.076	241	0.037	264	0.021	264	0.013	198	0.019	238	0.022	298
CN		0.998	0.155	15	0.056	76	0.035	153	0.005	209	0.008	219	0.008	285	0.007	272	0.004	260	0.002	257
CM		-0.047	0.047	185	0.000	149	0.006	153	0.002	273	0.001	240	0.001	244	0.001	264	0.000	185	0.001	88
DCP 1	.010	2.636	0.919	359	0.148	78	0.034	65	0.042	249	0.024	230	0.005	250	0.012	114	0.009	7	0.011	280
DCP 2	.025	2.700	0.752	356	0.096	66	0.035	97	0.029	236	0.014	217	0.012	310	0.005	190	0.002	102	0.005	186
DCP 3	.100	2.344	0.469	170	0.108	61	0.198	163	0.031	261	0.042	226	0.041	271	0.030	259	0.022	266	0.015	248
DCP 4	.250	1.439	0.172	37	0.152	91	0.111	154	0.033	249	0.005	178	0.026	295	0.016	298	0.005	177	0.006	105
DCP 5	.300	1.183	0.207	17	0.156	88	0.104	142	0.018	158	0.019	212	0.017	247	0.036	297	0.011	255	0.001	327
DCP 6	.400	0.900	0.261	13	0.059	73	0.014	11	0.014	77	0.008	302	0.010	278	0.009	230	0.006	255	0.007	4
DCP 7	.500	0.715	0.248	12	0.047	80	0.017	44	0.023	104	0.011	114	0.011	85	0.002	221	0.010	176	0.005	101
DCP 8	.600	0.586	0.205	11	0.009	22	0.013	308	0.003	126	0.007	243	0.003	90	0.002	89	0.002	288	0.003	327
DCP 9	.878	0.376	0.200	359	0.004	359	0.016	318	0.004	106	0.004	74	0.005	2	0.003	93	0.005	355	0.008	245

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.020	269	0.011	248	0.015	281	0.012	304	0.014	259	0.005	303	0.006	294	0.008	273	0.009	237
CN		0.003	294	0.001	196	0.000	295	0.002	41	0.001	218	0.005	98	0.006	13	0.004	316	0.003	248
CM		0.001	46	0.001	347	0.001	282	0.000	201	0.001	331	0.002	250	0.001	178	0.001	107	0.001	23
DCP 1	.010	0.010	217	0.004	114	0.002	308	0.002	319	0.003	290	0.002	30	0.006	339	0.006	304	0.001	112
DCP 2	.025	0.002	32	0.003	308	0.003	172	0.005	50	0.003	291	0.003	151	0.002	350	0.003	337	0.003	243
DCP 3	.100	0.007	322	0.018	332	0.013	285	0.006	325	0.003	331	0.004	289	0.008	29	0.013	318	0.010	302
DCP 4	.250	0.008	27	0.005	98	0.007	271	0.011	99	0.007	299	0.008	165	0.008	73	0.006	16	0.003	21
DCP 5	.300	0.008	65	0.005	65	0.003	284	0.014	183	0.002	189	0.013	160	0.008	330	0.004	181	0.008	251
DCP 6	.400	0.015	289	0.004	221	0.002	59	0.010	355	0.007	234	0.010	102	0.006	25	0.002	38	0.003	179
DCP 7	.500	0.007	317	0.006	186	0.005	83	0.008	82	0.002	357	0.012	105	0.005	47	0.007	43	0.004	248
DCP 8	.600	0.005	237	0.008	177	0.008	98	0.004	358	0.004	144	0.008	48	0.010	352	0.005	257	0.001	100
DCP 9	.878	0.004	193	0.002	151	0.001	175	0.001	318	0.004	147	0.006	61	0.005	359	0.007	296	0.007	217

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL C.S	MACH NO	ALPHA.0	D.ALPHA	OCL.H	TEST POINT	CYCLES ANALYZED
64.0	15.59	0.600	9.89	4.37		5141.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.041	640.6	719.4	0.31E 07	-0.00074	1.178	12.18	0.1150

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		9.892	4.373	359	0.161	354	0.101	180	0.052	233	0.025	297	0.029	259	0.027	195	0.013	245	0.010	209
CN		1.001	0.173	14	0.061	75	0.021	155	0.019	244	0.009	159	0.012	282	0.011	262	0.007	271	0.007	231
CM		-0.044	0.043	187	0.001	132	0.005	160	0.002	231	0.000	323	0.001	246	0.000	346	0.001	38	0.002	325
DCP 1	.010	2.653	0.978	359	0.150	73	0.015	111	0.049	252	0.008	224	0.022	226	0.016	163	0.004	6	0.002	223
DCP 2	.025	2.696	0.761	357	0.117	65	0.017	42	0.058	239	0.013	135	0.008	246	0.009	184	0.006	176	0.008	119
DCP 3	.100	2.429	0.348	169	0.107	71	0.136	162	0.077	247	0.029	187	0.041	293	0.045	265	0.029	296	0.034	281
DCP 4	.250	1.417	0.207	30	0.174	87	0.093	159	0.056	245	0.009	108	0.045	274	0.024	306	0.001	183	0.011	244
DCP 5	.300	1.186	0.228	19	0.172	85	0.061	137	0.039	220	0.041	151	0.035	273	0.027	274	0.019	295	0.007	276
DCP 6	.400	0.897	0.262	14	0.068	69	0.025	349	0.033	32	0.004	171	0.006	258	0.008	234	0.013	292	0.020	228
DCP 7	.500	0.673	0.249	12	0.041	77	0.024	53	0.016	71	0.015	88	0.004	278	0.010	196	0.014	193	0.008	190
DCP 8	.600	0.588	0.210	12	0.015	35	0.015	309	0.004	247	0.003	233	0.003	92	0.001	214	0.006	285	0.009	167
DCP 9	.878	0.372	0.187	1	0.009	303	0.010	335	0.005	336	0.005	179	0.005	21	0.003	236	0.005	212	0.006	121

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.009	223	0.006	192	0.011	308	0.001	187	0.006	190	0.002	118	0.004	63	0.002	199	0.002	46
CN		0.003	234	0.003	106	0.002	325	0.001	326	0.002	22	0.001	328	0.002	305	0.001	85	0.004	307
CM		0.000	279	0.002	315	0.001	251	0.000	288	0.000	97	0.001	315	0.000	211	0.001	260	0.001	136
DCP 1	.010	0.009	249	0.010	125	0.007	119	0.006	19	0.003	313	0.004	217	0.001	218	0.003	23	0.003	290
DCP 2	.025	0.005	249	0.003	122	0.004	70	0.002	81	0.002	8	0.004	240	0.006	188	0.003	100	0.004	24
DCP 3	.100	0.024	266	0.016	310	0.012	299	0.019	302	0.005	101	0.027	340	0.021	268	0.008	245	0.011	289
DCP 4	.250	0.004	176	0.010	63	0.009	289	0.000	64	0.016	38	0.011	280	0.003	78	0.007	55	0.012	324
DCP 5	.300	0.003	99	0.008	58	0.003	167	0.009	187	0.006	143	0.007	218	0.007	199	0.007	161	0.001	313
DCP 6	.400	0.007	167	0.004	181	0.004	180	0.003	72	0.007	343	0.004	145	0.010	23	0.007	314	0.007	247
DCP 7	.500	0.007	165	0.003	52	0.006	282	0.008	141	0.002	329	0.011	156	0.008	99	0.009	75	0.001	198
DCP 8	.600	0.001	105	0.013	133	0.006	66	0.008	21	0.007	304	0.009	116	0.010	358	0.002	162	0.005	343
DCP 9	.878	0.002	303	0.004	148	0.002	55	0.003	207	0.003	145	0.001	352	0.005	217	0.005	78	0.004	305

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
64.0	15.72	0.600	9.99	4.53		5141.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.041	639.9	713.8	0.315 07	-0.00020	1.141	12.78	0.0340

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		9.899	4.533	0	0.239	10	0.122	198	0.051	189	0.143	248	0.016	251	0.048	209	0.025	213	0.024	246
CN		0.992	0.167	16	0.070	69	0.023	155	0.037	255	0.018	242	0.038	248	0.009	296	0.008	334	0.009	286
CM		-0.051	0.049	182	0.005	43	0.004	183	0.002	204	0.001	42	0.001	180	0.002	38	0.001	36	0.002	24
DCP 1	.010	2.628	0.989	357	0.114	62	0.028	99	0.023	236	0.042	236	0.026	278	0.020	202	0.002	0	0.013	188
DCP 2	.025	2.705	0.791	357	0.128	56	0.018	131	0.041	234	0.042	212	0.009	176	0.017	154	0.009	80	0.032	296
DCP 3	.100	2.333	0.506	154	0.239	57	0.133	171	0.030	273	0.042	267	0.028	236	0.036	354	0.033	338	0.035	326
DCP 4	.250	1.355	0.203	37	0.163	76	0.086	166	0.041	211	0.026	239	0.032	252	0.023	297	0.018	22	0.020	307
DCP 5	.300	1.178	0.222	26	0.202	79	0.055	153	0.020	192	0.060	234	0.034	204	0.030	325	0.018	328	0.014	341
DCP 6	.400	0.891	0.266	11	0.045	59	0.014	15	0.019	41	0.017	255	0.012	9	0.013	264	0.014	313	0.015	258
DCP 7	.500	0.675	0.266	10	0.052	81	0.018	23	0.005	70	0.022	290	0.015	136	0.017	207	0.007	185	0.011	251
DCP 8	.600	0.597	0.223	8	0.018	271	0.011	16	0.010	309	0.010	266	0.016	334	0.017	265	0.009	285	0.014	222
DCP 9	.878	0.407	0.208	357	0.010	171	0.008	18	0.006	6	0.004	224	0.003	220	0.009	180	0.002	137	0.002	154

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.022	218	0.008	195	0.012	247	0.018	194	0.012	189	0.002	169	0.009	234	0.007	191	0.005	186
CN		0.004	327	0.003	278	0.001	234	0.002	11	0.002	224	0.003	342	0.002	185	0.002	287	0.002	163
CM		0.000	41	0.001	30	0.000	302	0.001	50	0.000	224	0.001	58	0.001	288	0.001	123	0.000	6
DCP 1	.010	0.005	297	0.006	205	0.004	59	0.007	288	0.005	183	0.005	260	0.006	128	0.003	192	0.004	287
DCP 2	.025	0.003	31	0.003	134	0.007	70	0.003	9	0.003	347	0.004	346	0.000	92	0.001	275	0.002	13
DCP 3	.100	0.011	349	0.025	15	0.009	310	0.020	54	0.009	297	0.017	48	0.016	275	0.007	119	0.009	282
DCP 4	.250	0.013	333	0.011	199	0.011	262	0.008	8	0.024	228	0.010	52	0.009	227	0.003	235	0.006	144
DCP 5	.300	0.021	55	0.013	337	0.019	131	0.010	26	0.007	102	0.016	330	0.004	203	0.006	302	0.007	130
DCP 6	.400	0.010	296	0.011	292	0.010	248	0.012	270	0.014	163	0.011	343	0.008	176	0.005	292	0.011	155
DCP 7	.500	0.012	268	0.014	227	0.005	233	0.005	222	0.008	2	0.011	263	0.006	125	0.002	279	0.007	86
DCP 8	.600	0.002	178	0.009	224	0.004	158	0.006	201	0.007	97	0.009	266	0.009	114	0.003	276	0.005	69
DCP 9	.878	0.001	69	0.003	136	0.003	29	0.002	21	0.005	295	0.004	147	0.001	48	0.003	319	0.007	245

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED FRQ	AIRFOIL FRQ	MACH NO	ALPHA,O	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	16.00	0.420	0.37	4.26		5363.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.060	441.0	743.5	0.485 07	-0.00095	0.647	5.26	0.0220

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		0.363	4.957	0	0.158	24	0.104	224	0.063	232	0.027	216	0.027	186	0.024	198	0.027	218	0.011	245
CN		0.072	0.562	354	0.014	210	0.015	275	0.010	35	0.007	135	0.005	170	0.002	180	0.004	171	0.006	172
CM		-0.022	0.016	331	0.003	282	0.003	283	0.003	1	0.002	99	0.001	174	0.000	312	0.001	73	0.001	169
PCP 1	.010	-1.191	3.161	352	0.257	220	0.350	233	0.202	14	0.207	93	0.123	170	0.038	256	0.046	80	0.090	143
PCP 2	.100	0.454	1.427	352	0.072	58	0.073	132	0.072	181	0.052	259	0.033	338	0.021	58	0.014	134	0.018	230
PCP 3	.150	0.347	0.897	351	0.027	308	0.012	155	0.011	187	0.007	232	0.004	316	0.003	137	0.005	149	0.006	206
PCP 4	.200	0.227	0.770	354	0.016	180	0.015	260	0.013	174	0.003	236	0.005	166	0.003	172	0.004	170	0.004	211
PCP 5	.250	0.237	0.684	352	0.028	270	0.030	265	0.012	260	0.001	140	0.002	104	0.004	170	0.004	172	0.003	196
PCP 6	.300	0.196	0.573	356	0.016	137	0.018	251	0.015	133	0.003	175	0.005	141	0.002	215	0.000	354	0.001	156
PCP 7	.400	0.160	0.450	355	0.023	273	0.016	278	0.001	317	0.002	60	0.002	101	0.004	171	0.003	167	0.002	182
PCP 8	.500	0.074	0.323	357	0.018	130	0.016	257	0.015	118	0.001	6	0.003	110	0.002	221	0.001	251	0.001	272
PCP 9	.600	0.066	0.247	359	0.021	263	0.016	256	0.002	331	0.002	133	0.001	54	0.005	150	0.006	130	0.002	92
PCP10	.878	0.046	0.026	6	0.021	126	0.023	110	0.028	135	0.001	13	0.001	242	0.001	5	0.001	226	0.002	191

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.018	223	0.010	287	0.011	212	0.006	245	0.014	239	0.010	243	0.012	233	0.011	248	0.008	227
CN		0.006	216	0.006	261	0.002	13	0.002	161	0.002	251	0.002	228	0.003	98	0.002	173	0.002	190
CM		0.001	243	0.001	327	0.000	350	0.000	338	0.000	286	0.001	16	0.000	293	0.000	136	0.001	74
PCP 1	.010		0.103	228	0.078	282	0.056	3	0.021	88	0.014	227	0.012	77	0.028	101	0.037	176	0.031	238
PCP 2	.100		0.020	182	0.037	123	0.010	182	0.012	240	0.006	236	0.006	210	0.003	82	0.003	27	0.006	123
PCP 3	.150		0.004	215	0.002	105	0.001	121	0.003	215	0.004	257	0.000	258	0.003	28	0.003	204	0.000	99
PCP 4	.200		0.005	262	0.003	265	0.001	60	0.001	127	0.003	230	0.006	233	0.005	278	0.003	231	0.008	93
PCP 5	.250		0.003	177	0.002	151	0.001	187	0.001	223	0.001	275	0.001	154	0.002	108	0.001	135	0.002	145
PCP 6	.300		0.001	232	0.002	171	0.001	217	0.001	261	0.001	304	0.003	223	0.002	146	0.002	131	0.001	117
PCP 7	.400		0.002	165	0.004	137	0.001	158	0.003	187	0.000	289	0.001	145	0.002	80	0.000	187	0.002	93
PCP 8	.500		0.001	144	0.002	170	0.000	88	0.001	82	0.001	241	0.004	233	0.001	178	0.000	335	0.001	50
PCP 9	.600		0.004	128	0.002	174	0.001	128	0.002	176	0.001	3	0.001	15	0.003	81	0.001	235	0.002	186
PCP10	.878		0.002	197	0.004	215	0.001	12	0.003	132	0.002	233	0.006	121	0.003	113	0.002	71	0.001	208

TUNED PITCHING OSCILLATION VERTOL 23010-1-58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	15.22	0.430	7.55	4.70		5364.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.057	444.2	755.4	0.485 07	-0.00098	1.416	12.11	0.0800

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		7.553	4.695	359	0.170	1	0.079	193	0.053	235	0.033	246	0.021	197	0.011	278	0.020	222	0.019	292
CN		0.938	0.469	358	0.042	16	0.012	238	0.012	184	0.003	158	0.002	291	0.001	278	0.003	248	0.004	276
CM		-0.005	0.016	335	0.003	311	0.001	225	0.001	288	0.001	215	0.001	117	0.000	61	0.001	5	0.000	189
DCP 1	.010	3.561	2.930	356	0.284	331	0.145	211	0.062	173	0.026	165	0.030	120	0.015	37	0.019	307	0.021	264
DCP 2	.100	2.490	1.138	356	0.038	33	0.019	288	0.034	208	0.017	274	0.018	215	0.004	248	0.009	215	0.012	265
DCP 3	.150	1.869	0.702	356	0.093	33	0.017	288	0.013	208	0.004	160	0.000	141	0.004	271	0.002	264	0.004	297
DCP 4	.200	1.542	0.636	356	0.051	33	0.014	276	0.017	197	0.004	278	0.006	256	0.002	197	0.004	278	0.002	230
DCP 5	.250	1.365	0.529	359	0.075	34	0.014	281	0.014	202	0.003	136	0.002	70	0.002	232	0.003	276	0.004	279
DCP 6	.300	1.019	0.461	358	0.043	32	0.009	252	0.012	191	0.004	223	0.006	239	0.001	243	0.004	248	0.005	255
DCP 7	.400	0.797	0.350	2	0.051	33	0.011	274	0.011	191	0.006	131	0.001	14	0.003	215	0.001	249	0.001	306
DCP 8	.500	0.642	0.256	1	0.024	35	0.006	268	0.009	175	0.002	232	0.005	256	0.001	286	0.003	245	0.002	293
DCP 9	.600	0.448	0.202	6	0.029	34	0.007	241	0.008	177	0.005	79	0.003	43	0.003	259	0.001	241	0.003	294
DCP10	.878	0.190	0.086	9	0.005	218	0.005	142	0.006	175	0.001	344	0.003	246	0.001	44	0.003	272	0.001	289

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.011	253	0.006	253	0.005	258	0.006	324	0.005	283	0.011	320	0.005	352	0.004	293	0.002	37
CN		0.003	251	0.002	318	0.001	282	0.001	271	0.001	1	0.001	292	0.001	134	0.002	139	0.000	293
CM		0.000	140	0.001	198	0.000	309	0.000	138	0.000	329	0.000	315	0.000	340	0.000	321	0.000	10
DCP 1	.010	0.012	229	0.007	251	0.006	231	0.003	233	0.008	353	0.009	289	0.004	359	0.002	57	0.004	279
DCP 2	.100	0.007	237	0.005	249	0.002	353	0.005	270	0.003	335	0.002	308	0.002	226	0.004	65	0.001	99
DCP 3	.150	0.002	259	0.001	282	0.003	297	0.002	273	0.003	322	0.001	328	0.003	21	0.001	99	0.002	292
DCP 4	.200	0.002	310	0.006	334	0.008	277	0.002	183	0.002	358	0.003	298	0.003	150	0.006	94	0.005	52
DCP 5	.250	0.003	260	0.001	309	0.002	295	0.002	311	0.001	285	0.001	293	0.002	22	0.002	132	0.001	303
DCP 6	.300	0.003	260	0.001	252	0.002	361	0.001	333	0.001	338	0.001	54	0.000	102	0.002	76	0.001	22
DCP 7	.400	0.002	260	0.001	277	0.001	10	0.001	281	0.001	268	0.001	328	0.001	16	0.001	117	0.001	332
DCP 8	.500	0.002	270	0.002	10	0.000	335	0.001	85	0.001	78	0.001	7	0.001	142	0.003	133	0.001	97
DCP 9	.600	0.003	270	0.002	334	0.001	16	0.001	282	0.001	90	0.002	127	0.001	148	0.002	156	0.001	281
DCP10	.878	0.000	318	0.003	19	0.002	158	0.001	272	0.002	151	0.001	220	0.003	161	0.002	126	0.002	186

TUNED PITCHING OSCILLATION VERTOL 23010-1.59 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	15.29	0.400	7.55	4.80		5064.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.058	441.3	746.9	0.48E 07	-0.00090	1.397	12.20	0.0590

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		7.554	4.801	359	0.213	15	0.049	195	0.038	242	0.028	216	0.040	138	0.019	223	0.024	223	0.008	297
CN		0.915	0.478	358	0.045	5	0.009	264	0.004	230	0.002	209	0.008	99	0.002	344	0.002	253	0.001	312
CM		-0.008	0.017	334	0.002	334	0.001	207	0.000	185	0.001	184	0.001	152	0.000	37	0.000	41	0.000	193
DCP 1	.010	3.553	2.991	355	0.309	326	0.118	212	0.031	164	0.033	189	0.070	109	0.027	22	0.012	284	0.004	308
DCP 2	.100	2.484	1.163	356	0.117	28	0.032	337	0.024	264	0.011	217	0.014	116	0.033	339	0.004	227	0.003	258
DCP 3	.150	1.723	0.709	356	0.089	25	0.017	307	0.006	246	0.003	253	0.010	112	0.002	266	0.001	184	0.001	303
DCP 4	.200	1.376	0.653	356	0.070	29	0.013	327	0.010	250	0.003	224	0.008	81	0.001	329	0.004	236	0.001	191
DCP 5	.250	1.265	0.538	358	0.069	24	0.013	296	0.005	233	0.002	235	0.009	110	0.001	259	0.001	206	0.002	317
DCP 6	.300	1.022	0.474	359	0.050	28	0.011	315	0.005	243	0.003	166	0.008	80	0.003	325	0.001	285	0.002	229
DCP 7	.400	0.796	0.356	0	0.047	18	0.010	287	0.004	215	0.001	35	0.007	113	0.002	302	0.000	322	0.000	320
DCP 8	.500	0.576	0.262	1	0.027	28	0.007	312	0.004	268	0.002	202	0.004	70	0.002	301	0.001	331	0.001	207
DCP 9	.600	0.463	0.202	4	0.025	9	0.007	270	0.004	184	0.004	352	0.005	95	0.002	279	0.000	128	0.001	301
DCP10	.878	0.224	0.090	10	0.010	257	0.004	176	0.003	0	0.000	263	0.003	5	0.001	184	0.003	240	0.003	8

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.004	211	0.005	343	0.004	294	0.003	227	0.006	228	0.006	308	0.004	333	0.001	289	0.004	286
CN		0.002	195	0.001	233	0.000	181	0.000	122	0.001	73	0.001	283	0.001	171	0.001	82	0.001	178
CM		0.000	323	0.000	176	0.000	241	0.000	315	0.000	174	0.000	151	0.001	334	0.000	276	0.000	323
DCP 1	.010	0.010	255	0.011	234	0.007	169	0.003	65	0.005	134	0.004	217	0.006	349	0.005	359	0.004	222
DCP 2	.100	0.003	182	0.004	250	0.002	50	0.003	264	0.002	10	0.002	277	0.002	293	0.002	72	0.001	205
DCP 3	.150	0.003	231	0.001	344	0.002	282	0.002	78	0.002	165	0.003	256	0.002	179	0.000	190	0.001	180
DCP 4	.200	0.003	111	0.001	291	0.002	243	0.005	310	0.003	21	0.002	196	0.003	213	0.001	310	0.002	12
DCP 5	.250	0.002	210	0.001	335	0.001	289	0.001	347	0.002	139	0.003	257	0.001	154	0.002	112	0.001	230
DCP 6	.300	0.001	189	0.001	180	0.002	279	0.000	160	0.002	70	0.001	273	0.001	142	0.002	136	0.000	249
DCP 7	.400	0.002	209	0.001	119	0.001	110	0.001	38	0.001	120	0.003	286	0.000	118	0.002	74	0.001	215
DCP 8	.500	0.001	259	0.001	127	0.002	268	0.001	108	0.001	44	0.000	313	0.001	234	0.001	191	0.001	321
DCP 9	.600	0.003	180	0.002	143	0.001	326	0.001	207	0.002	191	0.004	324	0.002	171	0.001	151	0.002	140
DCP10	.878	0.002	130	0.002	293	0.002	107	0.003	132	0.003	2	0.000	212	0.002	144	0.002	53	0.001	160

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
90.0	15.38	0.400	7.53	4.91		5364.3	19

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.058	440.6	743.6	0.48E 07	-0.00093	1.405	12.28	0.0220

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		7.527	4.906	0	0.214	12	0.048	200	0.047	278	0.038	196	0.029	4	0.012	194	0.012	208	0.008	293
CN		0.911	0.482	359	0.058	9	0.007	246	0.005	227	0.008	179	0.003	35	0.000	194	0.001	121	0.002	261
CM		-0.008	0.017	333	0.003	267	0.000	239	0.001	275	0.001	190	0.000	117	0.001	346	0.000	296	0.000	56
DCP 1	.010	3.534	3.009	355	0.350	328	0.107	211	0.032	199	0.068	167	0.034	56	0.017	23	0.010	342	0.009	312
DCP 2	.100	2.484	1.171	359	0.138	34	0.019	337	0.025	259	0.023	199	0.007	204	0.003	196	0.003	178	0.005	264
DCP 3	.150	1.697	0.717	355	0.104	19	0.017	320	0.011	260	0.013	191	0.006	26	0.001	297	0.001	1	0.001	281
DCP 4	.200	1.384	0.650	359	0.080	34	0.006	338	0.015	256	0.011	206	0.004	301	0.006	208	0.004	145	0.003	217
DCP 5	.250	1.246	0.543	358	0.085	19	0.011	307	0.018	254	0.011	186	0.006	20	0.002	262	0.000	20	0.001	177
DCP 6	.300	1.026	0.472	2	0.062	33	0.007	272	0.014	227	0.006	185	0.001	63	0.003	247	0.003	198	0.002	226
DCP 7	.400	0.782	0.362	1	0.060	13	0.008	293	0.016	248	0.007	187	0.006	15	0.002	255	0.002	102	0.003	259
DCP 8	.500	0.565	0.263	4	0.041	34	0.003	272	0.014	214	0.005	170	0.002	98	0.001	227	0.002	175	0.001	287
DCP 9	.600	0.455	0.207	4	0.037	5	0.004	269	0.003	290	0.002	163	0.004	21	0.001	229	0.002	118	0.003	235
DCP10	.878	0.231	0.090	11	0.010	18	0.005	178	0.003	112	0.002	61	0.001	278	0.003	138	0.002	70	0.001	283

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.004	165	0.008	348	0.002	231	0.006	131	0.002	306	0.008	293	0.004	348	0.005	275	0.004	284
CN		0.002	223	0.001	164	0.000	283	0.001	229	0.001	233	0.001	278	0.000	298	0.000	325	0.001	193
CM		0.000	326	0.000	285	0.000	331	0.000	331	0.000	260	0.000	109	0.000	2	0.000	218	0.000	17
DCP 1	.010	0.014	257	0.011	199	0.005	111	0.005	344	0.007	241	0.005	60	0.005	317	0.005	234	0.006	109
DCP 2	.100	0.006	202	0.001	219	0.001	337	0.003	255	0.003	250	0.002	263	0.001	81	0.002	238	0.004	260
DCP 3	.150	0.003	260	0.001	15	0.001	341	0.001	157	0.002	256	0.001	130	0.001	117	0.001	286	0.002	172
DCP 4	.200	0.003	155	0.001	98	0.002	335	0.003	207	0.002	167	0.001	284	0.002	86	0.002	148	0.005	254
DCP 5	.250	0.003	249	0.001	61	0.001	344	0.001	182	0.003	280	0.001	210	0.001	101	0.002	285	0.002	158
DCP 6	.300	0.002	169	0.001	180	0.001	240	0.003	221	0.001	211	0.002	258	0.002	278	0.001	92	0.000	211
DCP 7	.400	0.003	227	0.001	349	0.001	293	0.001	254	0.001	263	0.001	204	0.001	130	0.002	305	0.002	125
DCP 8	.500	0.001	205	0.001	144	0.001	250	0.001	196	0.001	113	0.001	203	0.000	151	0.000	356	0.001	185
DCP 9	.600	0.002	181	0.001	96	0.002	255	0.001	225	0.000	83	0.002	277	0.002	315	0.003	32	0.001	208
DCP10	.878	0.001	282	0.001	159	0.002	94	0.001	94	0.000	120	0.002	322	0.001	165	0.000	133	0.002	197

TUNED PITCHING OSCILLATION VERTOL 23010-1.59 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	16.16	0.400	9.91	4.69		5365.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.061	438.9	739.9	0.48E 07	-0.00039	1.540	14.09	0.0229

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		9.915	4.686	0	0.174	51	0.079	234	0.089	221	0.244	274	0.128	75	0.050	233	0.059	220	0.023	225
CN		1.079	0.342	12	0.116	29	0.029	276	0.035	195	0.020	235	0.017	74	0.003	298	0.002	246	0.006	222
CM		-0.008	0.004	269	0.010	67	0.006	315	0.001	269	0.004	275	0.003	218	0.002	101	0.001	347	0.001	306
DCP 1	.010	4.670	2.370	3	0.474	11	0.133	286	0.039	275	0.163	257	0.022	8	0.051	223	0.032	219	0.048	203
DCP 2	.100	2.768	0.595	15	0.439	41	0.164	336	0.036	206	0.071	239	0.054	125	0.057	75	0.041	6	0.033	302
DCP 3	.150	1.915	0.389	16	0.230	42	0.061	301	0.014	181	0.039	261	0.021	139	0.012	90	0.009	333	0.011	243
DCP 4	.200	1.578	0.352	22	0.265	29	0.107	280	0.037	178	0.027	215	0.060	86	0.023	3	0.014	299	0.013	257
DCP 5	.250	1.418	0.327	20	0.168	33	0.038	284	0.036	152	0.029	252	0.024	109	0.006	41	0.002	291	0.008	237
DCP 6	.300	1.192	0.319	22	0.162	14	0.056	269	0.020	136	0.018	222	0.038	71	0.020	330	0.013	226	0.006	174
DCP 7	.400	0.912	0.264	19	0.090	15	0.017	225	0.004	57	0.016	222	0.021	64	0.013	277	0.005	162	0.005	227
DCP 8	.500	0.664	0.224	17	0.060	345	0.028	141	0.018	26	0.009	227	0.019	40	0.015	255	0.009	154	0.004	126
DCP 9	.600	0.531	0.178	17	0.038	353	0.009	153	0.004	318	0.012	162	0.019	41	0.014	259	0.006	158	0.006	185
DCP10	.878	0.295	0.125	5	0.031	282	0.007	159	0.008	186	0.010	97	0.007	57	0.002	22	0.002	253	0.004	150

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.020	201	0.008	215	0.022	228	0.013	225	0.014	239	0.013	255	0.009	240	0.009	256	0.006	253
CN		0.006	193	0.002	141	0.003	189	0.004	130	0.002	81	0.002	219	0.003	81	0.000	99	0.001	74
CM		0.001	280	0.001	220	0.000	116	0.000	230	0.000	58	0.001	6	0.001	282	0.000	14	0.001	259
DCP 1	.010	0.027	174	0.011	216	0.010	182	0.015	172	0.008	111	0.005	279	0.003	330	0.006	68	0.002	265
DCP 2	.100	0.031	254	0.022	218	0.018	194	0.025	142	0.019	83	0.009	50	0.012	22	0.013	341	0.015	272
DCP 3	.150	0.010	225	0.008	193	0.007	158	0.001	102	0.002	72	0.005	291	0.003	264	0.007	193	0.006	102
DCP 4	.200	0.022	205	0.017	142	0.008	84	0.005	101	0.005	55	0.003	254	0.006	77	0.004	32	0.003	156
DCP 5	.250	0.009	204	0.004	139	0.006	129	0.003	73	0.004	356	0.004	267	0.003	155	0.005	134	0.002	69
DCP 6	.300	0.006	198	0.009	154	0.009	97	0.005	35	0.002	332	0.005	253	0.005	139	0.003	112	0.003	140
DCP 7	.400	0.006	189	0.003	36	0.005	308	0.001	120	0.002	35	0.004	235	0.004	123	0.003	14	0.002	78
DCP 8	.500	0.006	115	0.004	14	0.003	216	0.005	130	0.001	72	0.003	200	0.002	82	0.004	148	0.005	60
DCP 9	.600	0.007	117	0.008	21	0.009	258	0.004	120	0.001	170	0.003	142	0.004	89	0.003	207	0.006	66
DCP10	.878	0.002	165	0.003	78	0.002	95	0.001	76	0.001	176	0.004	193	0.003	84	0.000	276	0.001	120

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	16.64	0.400	12.29	4.37		5066.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.063	440.1	739.1	0.48E 07	0.00098	1.634	14.75	0.0800

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		12.198	4.366	0	0.289	35	0.091	141	0.070	7	0.030	56	0.093	268	0.049	191	0.025	124	0.021	355
CN		1.199	0.228	60	0.143	32	0.028	73	0.024	345	0.013	356	0.016	263	0.012	211	0.010	134	0.003	115
CM		-0.028	0.042	171	0.021	67	0.006	91	0.007	20	0.002	19	0.003	316	0.000	261	0.002	248	0.001	225
DCP 1	.010	5.182	1.261	39	0.819	36	0.125	92	0.131	39	0.097	42	0.035	294	0.032	170	0.035	112	0.012	60
DCP 2	.100	2.687	0.688	135	0.627	59	0.147	63	0.157	11	0.082	335	0.082	300	0.069	255	0.031	214	0.023	231
DCP 3	.150	2.035	0.436	120	0.330	43	0.076	105	0.100	8	0.033	316	0.039	292	0.042	219	0.022	151	0.011	153
DCP 4	.200	1.756	0.401	111	0.293	39	0.085	75	0.096	344	0.027	312	0.056	274	0.036	209	0.020	180	0.016	157
DCP 5	.250	1.574	0.333	92	0.205	25	0.063	94	0.070	327	0.005	357	0.042	264	0.030	172	0.018	155	0.018	99
DCP 6	.300	1.224	0.300	79	0.174	19	0.051	60	0.064	309	0.008	298	0.039	251	0.021	189	0.020	155	0.011	99
DCP 7	.400	1.025	0.265	54	0.107	355	0.024	76	0.035	271	0.009	47	0.025	219	0.012	130	0.015	131	0.009	51
DCP 8	.500	0.870	0.223	37	0.065	333	0.009	16	0.035	222	0.009	68	0.020	194	0.009	96	0.013	92	0.010	31
DCP 9	.600	0.679	0.219	25	0.047	311	0.003	14	0.022	201	0.011	28	0.009	134	0.004	297	0.006	108	0.006	193
DCP10	.878	0.370	0.209	354	0.030	257	0.027	272	0.011	147	0.010	233	0.004	97	0.006	217	0.010	65	0.004	36

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.006	258	0.004	324	0.005	308	0.003	254	0.003	308	0.007	326	0.005	335	0.007	188	0.004	286
CN		0.003	343	0.003	197	0.001	269	0.003	164	0.001	35	0.002	173	0.001	66	0.000	23	0.002	166
CM		0.001	154	0.001	234	0.001	126	0.001	304	0.001	176	0.000	121	0.001	122	0.000	336	0.000	328
DCP 1	.010	0.018	268	0.023	174	0.015	157	0.014	129	0.006	100	0.006	133	0.008	31	0.014	304	0.014	246
DCP 2	.100	0.018	231	0.025	229	0.024	197	0.023	191	0.022	152	0.010	151	0.021	139	0.016	88	0.010	136
DCP 3	.150	0.015	82	0.007	358	0.002	358	0.009	302	0.008	203	0.007	164	0.004	106	0.002	43	0.004	73
DCP 4	.200	0.011	150	0.003	153	0.006	140	0.004	95	0.007	81	0.007	14	0.005	82	0.006	351	0.003	204
DCP 5	.250	0.015	29	0.009	350	0.006	307	0.008	283	0.007	218	0.008	143	0.004	94	0.003	47	0.004	343
DCP 6	.300	0.008	76	0.003	101	0.006	58	0.003	22	0.008	11	0.005	315	0.003	320	0.005	225	0.003	116
DCP 7	.400	0.011	12	0.008	251	0.003	58	0.004	246	0.002	351	0.006	170	0.005	40	0.004	298	0.003	229
DCP 8	.500	0.010	320	0.005	201	0.003	323	0.006	115	0.011	334	0.004	209	0.003	350	0.005	236	0.004	142
DCP 9	.600	0.008	40	0.006	129	0.009	2	0.003	190	0.006	323	0.005	295	0.001	350	0.003	251	0.004	133
DCP10	.878	0.007	262	0.003	30	0.009	252	0.007	127	0.004	59	0.004	358	0.005	290	0.005	113	0.001	248

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	16.50	0.400	12.26	4.45		5066.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.063	438.1	736.7	0.48E 07	0.00066	1.611	14.84	0.0610

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		12.264	4.446	0	0.288	34	0.065	144	0.084	15	0.003	80	0.070	237	0.014	231	0.013	160	0.008	331
CN		1.187	0.233	54	0.143	29	0.013	83	0.017	327	0.006	13	0.014	260	0.004	280	0.010	293	0.003	119
CM		-0.029	0.040	174	0.024	69	0.004	61	0.009	16	0.002	272	0.001	8	0.001	210	0.001	46	0.002	173
DCP 1	.010	5.299	1.371	30	0.811	35	0.039	50	0.095	45	0.060	56	0.014	72	0.015	358	0.013	164	0.027	138
DCP 2	.100	2.700	0.676	133	0.652	59	0.199	52	0.152	4	0.085	313	0.076	277	0.059	259	0.047	210	0.013	182
DCP 3	.150	1.923	0.376	117	0.334	45	0.038	135	0.077	5	0.025	274	0.021	291	0.021	228	0.008	139	0.007	197
DCP 4	.200	1.556	0.407	110	0.306	36	0.056	83	0.117	339	0.032	275	0.055	271	0.028	205	0.023	226	0.027	162
DCP 5	.250	1.498	0.294	87	0.207	26	0.040	119	0.053	332	0.011	178	0.023	278	0.011	177	0.004	185	0.010	115
DCP 6	.300	1.247	0.310	78	0.181	17	0.026	70	0.059	339	0.023	228	0.040	240	0.017	146	0.013	196	0.014	127
DCP 7	.400	1.029	0.264	47	0.107	347	0.021	148	0.028	244	0.025	105	0.008	276	0.012	28	0.011	249	0.006	123
DCP 8	.500	0.790	0.232	39	0.080	329	0.006	267	0.045	229	0.018	121	0.017	175	0.016	46	0.007	118	0.011	341
DCP 9	.600	0.697	0.230	23	0.058	306	0.012	195	0.032	189	0.023	68	0.003	216	0.013	354	0.010	181	0.005	43
DCP10	.878	0.388	0.210	357	0.043	253	0.016	268	0.022	175	0.007	332	0.005	259	0.003	248	0.006	252	0.007	344

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.006	327	0.005	333	0.004	327	0.004	244	0.004	303	0.002	193	0.001	155	0.002	205	0.000	349
CN		0.002	129	0.001	131	0.003	35	0.001	334	0.002	262	0.001	147	0.001	108	0.002	58	0.001	355
CM		0.000	35	0.000	215	0.001	198	0.001	176	0.002	106	0.000	97	0.000	53	0.000	0	0.000	192
DCP 1	.010	0.021	90	0.001	196	0.013	40	0.009	318	0.006	149	0.007	148	0.011	79	0.003	33	0.003	281
DCP 2	.100	0.018	245	0.021	222	0.030	198	0.027	165	0.026	150	0.027	110	0.018	85	0.016	45	0.008	37
DCP 3	.150	0.008	107	0.002	9	0.005	29	0.005	293	0.004	135	0.003	300	0.003	134	0.006	57	0.002	29
DCP 4	.200	0.012	117	0.012	90	0.008	51	0.014	62	0.007	47	0.009	356	0.002	336	0.009	343	0.005	311
DCP 5	.250	0.008	44	0.003	296	0.004	10	0.004	283	0.004	122	0.001	270	0.006	122	0.008	4	0.001	352
DCP 6	.300	0.009	131	0.011	66	0.009	35	0.005	357	0.008	17	0.012	326	0.007	277	0.009	257	0.006	205
DCP 7	.400	0.002	89	0.004	142	0.009	33	0.005	353	0.007	334	0.007	233	0.002	24	0.006	178	0.004	54
DCP 8	.500	0.003	116	0.004	311	0.007	77	0.008	339	0.007	305	0.008	243	0.006	189	0.002	162	0.003	140
DCP 9	.600	0.002	212	0.006	81	0.006	330	0.003	338	0.008	263	0.003	142	0.006	260	0.009	93	0.006	293
DCP10	.878	0.000	171	0.003	262	0.005	35	0.001	64	0.008	275	0.002	25	0.004	87	0.003	263	0.004	45

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	15.29	0.400	12.22	4.43		5066.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.042	437.1	734.4	0.48E 07	0.00083	1.575	14.18	0.0220

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		12.215	4.434	0	0.152	82	0.127	161	0.026	334	0.052	340	0.073	115	0.101	288	0.025	229	0.035	319
CN		1.153	0.246	64	0.147	31	0.014	44	0.012	315	0.011	341	0.014	175	0.008	297	0.007	192	0.011	20
CM		-0.037	0.043	169	0.021	64	0.008	86	0.008	354	0.002	28	0.004	313	0.001	151	0.003	283	0.001	170
DCP 1	.010	5.069	1.280	41	0.863	38	0.045	29	0.058	28	0.057	339	0.060	101	0.028	321	0.016	261	0.017	87
DCP 2	.100	2.560	0.814	133	0.609	58	0.157	75	0.141	5	0.082	14	0.070	294	0.046	269	0.043	260	0.032	228
DCP 3	.150	1.875	0.480	116	0.347	38	0.036	92	0.063	343	0.028	296	0.015	217	0.009	240	0.015	221	0.010	129
DCP 4	.200	1.469	0.466	109	0.294	35	0.087	73	0.090	335	0.030	347	0.052	242	0.008	234	0.027	224	0.012	176
DCP 5	.250	1.431	0.370	91	0.222	19	0.031	104	0.052	305	0.009	237	0.016	182	0.006	259	0.012	178	0.004	124
DCP 6	.300	1.213	0.333	83	0.182	22	0.051	44	0.062	301	0.015	318	0.055	219	0.011	154	0.020	176	0.011	95
DCP 7	.400	0.984	0.277	57	0.124	354	0.006	278	0.034	238	0.003	180	0.029	146	0.008	356	0.009	142	0.005	24
DCP 8	.500	0.758	0.227	44	0.064	350	0.030	327	0.045	217	0.003	16	0.042	181	0.013	74	0.015	122	0.013	44
DCP 9	.600	0.492	0.219	24	0.053	312	0.015	252	0.033	177	0.004	76	0.027	110	0.016	325	0.009	122	0.010	333
DCP10	.878	0.427	0.214	353	0.030	235	0.036	269	0.024	132	0.011	260	0.009	116	0.007	269	0.008	98	0.003	319

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.022	308	0.024	287	0.014	321	0.005	337	0.003	357	0.007	319	0.004	123	0.003	322	0.005	255
CN		0.003	205	0.001	31	0.001	303	0.001	297	0.003	211	0.003	133	0.001	246	0.002	170	0.002	88
CM		0.001	344	0.001	162	0.000	204	0.001	111	0.001	12	0.000	244	0.000	114	0.001	82	0.000	286
DCP 1	.010	0.020	331	0.006	28	0.013	360	0.012	9	0.010	260	0.023	142	0.009	107	0.011	122	0.009	129
DCP 2	.100	0.029	206	0.017	153	0.012	278	0.011	151	0.005	148	0.002	56	0.015	227	0.017	152	0.006	96
DCP 3	.150	0.001	186	0.004	352	0.003	261	0.003	133	0.003	171	0.006	122	0.001	128	0.006	36	0.002	46
DCP 4	.200	0.021	177	0.013	109	0.006	172	0.006	69	0.003	290	0.006	182	0.005	140	0.007	115	0.006	18
DCP 5	.250	0.007	76	0.008	318	0.003	19	0.005	256	0.004	76	0.005	215	0.004	83	0.002	284	0.003	75
DCP 6	.300	0.009	127	0.008	58	0.004	337	0.003	7	0.003	295	0.004	186	0.003	95	0.002	225	0.003	73
DCP 7	.400	0.005	300	0.003	287	0.007	309	0.003	161	0.005	292	0.006	151	0.006	329	0.001	190	0.003	293
DCP 8	.500	0.008	26	0.006	325	0.004	334	0.006	286	0.005	244	0.006	186	0.001	170	0.005	180	0.003	39
DCP 9	.600	0.010	238	0.002	179	0.003	297	0.002	119	0.003	83	0.007	9	0.009	281	0.004	209	0.000	158
DCP10	.878	0.005	137	0.005	357	0.002	44	0.009	297	0.010	195	0.005	115	0.003	121	0.003	278	0.005	113

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	16.72	0.400	14.87	4.27		5067.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.063	442.4	739.7	0.48E 07	0.00076	1.638	15.71	0.0800

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		14.872	4.271	0	0.083	53	0.167	146	0.119	169	0.005	357	0.120	60	0.046	320	0.077	246	0.030	212
CN		1.192	0.316	95	0.051	41	0.048	74	0.016	93	0.006	349	0.025	27	0.012	346	0.013	278	0.006	232
CM		-0.039	0.052	173	0.012	153	0.014	103	0.005	142	0.003	34	0.003	106	0.002	80	0.004	41	0.001	1
DCP 1	.010	5.269	1.318	91	0.279	58	0.258	111	0.112	179	0.029	228	0.033	53	0.035	31	0.004	276	0.002	185
DCP 2	.100	2.477	1.192	142	0.207	91	0.273	137	0.137	96	0.070	78	0.105	61	0.041	53	0.030	38	0.014	169
DCP 3	.150	1.912	0.741	126	0.020	42	0.183	90	0.035	147	0.065	35	0.040	63	0.044	353	0.023	331	0.028	284
DCP 4	.200	1.728	0.631	118	0.058	90	0.187	73	0.058	82	0.057	27	0.068	31	0.036	353	0.032	335	0.010	308
DCP 5	.250	1.503	0.521	107	0.020	16	0.124	58	0.031	122	0.056	342	0.044	42	0.030	304	0.034	315	0.018	253
DCP 6	.300	1.219	0.427	97	0.049	71	0.123	45	0.046	61	0.041	341	0.059	14	0.026	328	0.038	333	0.010	268
DCP 7	.400	1.004	0.337	79	0.038	359	0.064	11	0.017	76	0.031	289	0.033	11	0.008	295	0.031	280	0.006	273
DCP 8	.500	0.902	0.239	59	0.038	21	0.052	336	0.023	11	0.026	238	0.031	330	0.009	307	0.031	248	0.013	219
DCP 9	.600	0.686	0.225	46	0.047	349	0.045	302	0.010	330	0.027	219	0.012	348	0.002	33	0.021	233	0.006	267
DCP10	.878	0.433	0.192	357	0.061	0	0.037	232	0.014	304	0.012	110	0.007	244	0.010	279	0.010	172	0.011	155

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.011	192	0.014	215	0.017	253	0.013	227	0.011	216	0.011	226	0.001	323	0.008	279	0.009	192
CN		0.001	120	0.002	23[illegible]	0.002	110	0.002	330	0.001	246	0.001	248	0.001	349	0.002	296	0.002	290
CM		0.000	208	0.000	343	0.001	112	0.000	54	0.001	17	0.001	297	0.000	250	0.000	38	0.000	292
DCP 1	.010	0.019	82	0.011	337	0.006	111	0.018	22	0.012	359	0.017	341	0.018	330	0.018	309	0.021	275
DCP 2	.100	0.022	110	0.021	138	0.031	179	0.011	91	0.009	198	0.007	212	0.004	153	0.005	173	0.004	7
DCP 3	.150	0.009	263	0.010	239	0.003	271	0.005	313	0.010	245	0.007	225	0.008	194	0.004	128	0.008	120
DCP 4	.200	0.016	342	0.011	347	0.006	1	0.011	304	0.008	1	0.004	303	0.008	322	0.002	338	0.015	316
DCP 5	.250	0.017	262	0.005	293	0.011	223	0.009	314	0.008	203	0.004	260	0.003	146	0.002	348	0.001	320
DCP 6	.300	0.011	286	0.012	309	0.015	291	0.004	295	0.008	287	0.007	295	0.010	278	0.003	270	0.007	276
DCP 7	.400	0.012	206	0.008	315	0.003	172	0.003	329	0.004	316	0.003	220	0.003	87	0.005	349	0.002	352
DCP 8	.500	0.007	173	0.009	201	0.003	144	0.002	132	0.005	204	0.001	150	0.004	161	0.001	297	0.005	172
DCP 9	.600	0.007	110	0.006	231	0.006	3	0.005	178	0.002	251	0.005	136	0.006	56	0.006	334	0.002	270
DCP10	.878	0.006	13	0.006	98	0.003	229	0.003	317	0.003	169	0.002	53	0.001	301	0.006	198	0.002	85

TUNED PITCHING OSCILLATION VERTOL 23010-1.59 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DFL.H	TEST POINT	CYCLES ANALYZED
80.0	16.37	0.400	14.86	4.35		3967.7	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.067	440.2	737.1	0.48E 07	0.00104	1.641	15.88	0.0620

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		14.857	4.354	0	0.109	22	0.146	131	0.128	146	0.053	294	0.280	41	0.073	317	0.066	238	0.023	221
CN		1.167	0.307	93	0.058	41	0.035	75	0.325	97	0.002	300	0.042	37	0.021	0	0.012	296	0.038	327
CM		-0.042	0.051	172	0.012	171	0.014	97	0.038	158	0.003	8	0.004	146	0.003	113	0.00[illegible]	66	0.002	61
DCP 1	.010	5.193	1.286	88	0.273	62	0.258	100	0.156	144	0.089	240	0.077	66	0.041	57	0.017	86	0.023	55
DCP 2	.100	2.467	1.177	141	0.195	85	0.251	112	0.153	104	0.087	70	0.131	59	0.087	25	0.029	34	0.042	12
DCP 3	.150	1.759	0.729	123	0.012	309	0.145	86	0.073	153	0.061	27	0.068	73	0.045	4	0.024	11	0.017	320
DCP 4	.200	1.587	0.611	119	0.050	74	0.160	83	0.062	89	0.063	36	0.084	40	0.054	4	0.031	346	0.029	331
DCP 5	.250	1.414	0.501	104	0.024	342	0.095	50	0.057	132	0.038	325	0.075	52	0.020	327	0.033	327	0.001	257
DCP 6	.300	1.234	0.410	96	0.045	57	0.095	50	0.052	79	0.037	350	0.075	30	0.040	338	0.036	323	0.022	307
DCP 7	.400	1.002	0.322	75	0.055	9	0.062	341	0.025	82	0.035	260	0.050	28	0.003	28	0.028	275	0.008	51
DCP 8	.500	0.831	0.236	58	0.043	21	0.048	326	0.026	26	0.026	240	0.039	0	0.017	301	0.026	250	0.017	253
DCP 9	.600	0.688	0.222	43	0.058	14	0.055	230	0.021	15	0.032	209	0.029	12	0.014	33	0.019	255	0.006	336
DCP10	.878	0.453	0.185	358	0.062	12	0.037	229	0.027	329	0.016	112	0.012	324	0.018	307	0.010	224	0.009	238

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.008	207	0.003	233	0.016	215	0.019	218	0.010	191	0.004	181	0.002	162	0.003	217	0.008	139
CN		0.002	318	0.003	288	0.003	165	0.031	27	0.002	243	0.000	124	0.002	283	0.002	218	0.002	180
CM		0.001	349	0.001	40	0.001	360	0.031	73	0.001	34	0.001	31	0.001	73	0.001	17	0.001	325
DCP 1	.010	0.012	55	0.006	72	0.018	121	0.023	70	0.019	354	0.010	323	0.005	56	0.004	51	0.011	17
DCP 2	.100	0.006	36	0.017	27	0.017	146	0.018	74	0.013	145	0.015	95	0.006	144	0.011	179	0.010	190
DCP 3	.150	0.015	331	0.005	303	0.008	279	0.009	248	0.005	238	0.005	146	0.004	45	0.002	334	0.003	344
DCP 4	.200	0.016	336	0.013	319	0.005	24	0.009	355	0.009	353	0.011	11	0.012	335	0.009	327	0.009	2[illegible]8
DCP 5	.250	0.017	280	0.009	353	0.010	212	0.005	286	0.004	209	0.005	207	0.005	75	0.004	303	0.001	239
DCP 6	.300	0.015	303	0.012	281	0.005	336	0.010	317	0.009	285	0.010	295	0.004	287	0.011	279	0.005	250
DCP 7	.400	0.006	235	0.013	298	0.004	220	0.005	227	0.006	249	0.005	106	0.001	214	0.003	319	0.003	234
DCP 8	.500	0.006	172	0.011	290	0.000	6	0.004	193	0.005	215	0.004	194	0.002	199	0.002	150	0.000	206
DCP 9	.600	0.005	85	0.002	221	0.006	236	0.003	149	0.005	201	0.004	50	0.006	308	0.008	228	0.009	169
DCP10	.878	0.003	177	0.005	212	0.008	122	0.004	296	0.000	251	0.005	226	0.005	229	0.007	168	0.004	97

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	16.58	0.400	14.79	4.39		5067.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.063	439.5	736.9	0.48E 07	0.00091	1.636	16.22	0.0220

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		14.794	4.389	0	0.075	53	0.174	151	0.153	167	0.086	239	0.406	351	0.103	289	0.077	231	0.011	194
CN		1.176	0.278	94	0.064	47	0.042	83	0.024	84	0.006	241	0.040	6	0.015	326	0.016	257	0.004	244
CM		-0.045	0.051	172	0.011	150	0.014	202	0.007	129	0.002	16	0.004	124	0.002	74	0.005	41	0.002	7
DCP 1	.010	5.264	1.094	88	0.349	68	0.280	119	0.176	139	0.136	192	0.121	17	0.066	13	0.025	8	0.033	31
DCP 2	.100	2.446	1.154	142	0.220	85	0.270	135	0.158	89	0.049	36	0.085	46	0.028	4	0.035	48	0.005	313
DCP 3	.150	1.787	0.689	127	0.059	60	0.157	88	0.051	116	0.037	12	0.075	38	0.051	333	0.033	331	0.025	277
DCP 4	.200	1.575	0.600	119	0.074	75	0.173	74	0.059	74	0.056	14	0.064	4	0.034	337	0.026	311	0.020	296
DCP 5	.250	1.424	0.462	108	0.041	39	0.101	60	0.033	100	0.035	319	0.073	24	0.035	304	0.042	302	0.017	231
DCP 6	.300	1.241	0.380	97	0.070	55	0.096	49	0.044	61	0.029	332	0.057	357	0.016	311	0.026	291	0.007	254
DCP 7	.400	1.006	0.284	76	0.049	18	0.046	4	0.020	47	0.030	269	0.056	2	0.020	293	0.043	266	0.009	226
DCP 8	.500	0.816	0.204	55	0.048	28	0.038	324	0.022	7	0.025	245	0.037	322	0.008	226	0.029	240	0.010	195
DCP 9	.600	0.690	0.201	40	0.046	355	0.036	287	0.017	340	0.025	196	0.036	351	0.010	319	0.034	239	0.006	227
DCP10	.878	0.483	0.195	359	0.056	1	0.037	249	0.019	295	0.011	128	0.012	297	0.009	286	0.013	177	0.006	160

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.000	281	0.007	30	0.004	45	0.007	93	0.010	102	0.002	61	0.002	190	0.004	184	0.009	165
CN		0.005	75	0.002	274	0.000	142	0.002	237	0.001	37	0.002	171	0.001	356	0.001	287	0.002	250
CM		0.001	304	0.001	43	0.001	315	0.001	295	0.001	230	0.000	301	0.000	114	0.000	345	0.001	114
DCP 1	.010	0.048	47	0.043	25	0.027	329	0.036	300	0.031	280	0.023	237	0.005	296	0.012	292	0.005	196
DCP 2	.100	0.022	37	0.008	152	0.004	79	0.012	191	0.014	138	0.014	133	0.011	125	0.007	98	0.011	179
DCP 3	.150	0.010	305	0.009	246	0.009	228	0.005	251	0.005	161	0.006	321	0.002	193	0.008	288	0.007	184
DCP 4	.200	0.018	322	0.013	302	0.009	271	0.008	285	0.003	316	0.002	195	0.004	52	0.006	339	0.005	329
DCP 5	.250	0.017	235	0.005	151	0.011	179	0.004	186	0.008	103	0.002	120	0.007	49	0.004	25	0.002	261
DCP 6	.300	0.008	338	0.008	301	0.004	320	0.009	282	0.003	335	0.005	246	0.007	9	0.005	296	0.009	289
DCP 7	.400	0.017	184	0.004	251	0.009	136	0.005	170	0.007	78	0.004	96	0.006	13	0.002	317	0.002	47
DCP 8	.500	0.006	128	0.005	215	0.002	189	0.003	162	0.001	20	0.005	302	0.008	218	0.005	240	0.004	142
DCP 9	.600	0.018	132	0.006	216	0.007	59	0.005	116	0.003	9	0.008	99	0.005	339	0.003	120	0.006	286
DCP10	.878	0.009	30	0.002	250	0.003	191	0.001	105	0.002	48	0.004	221	0.002	227	0.001	228	0.002	269

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	16.29	0.400	17.22	4.30		5069.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.061	444.5	741.7	0.48E 07	0.00027	1.616	16.63	0.0800

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		17.225	4.304	0	0.023	240	0.165	201	0.050	198	0.056	179	0.054	216	0.051	231	0.029	211	0.026	171
CN		1.192	0.335	98	0.065	160	0.023	59	0.008	140	0.006	174	0.011	147	0.003	197	0.007	147	0.003	221
CM		-0.054	0.045	177	0.023	180	0.008	195	0.002	111	0.001	92	0.001	326	0.002	327	0.001	292	0.000	69
DCP 1	.010	5.359	1.402	112	0.393	176	0.035	230	0.028	294	0.056	161	0.029	140	0.007	56	0.025	66	0.037	8
DCP 2	.100	2.182	1.177	129.	0.388	180	0.139	115	0.124	155	0.032	184	0.055	151	0.060	216	0.026	138	0.037	236
DCP 3	.150	1.752	0.666	125	0.245	198	0.052	283	0.021	322	0.016	248	0.033	274	0.037	311	0.010	301	0.015	283
DCP 4	.200	1.625	0.598	104	0.246	156	0.062	122	0.084	106	0.045	123	0.042	103	0.034	137	0.033	135	0.019	128
DCP 5	.250	1.448	0.487	106	0.154	171	0.019	276	0.019	352	0.004	174	0.019	235	0.030	273	0.015	265	0.011	258
DCP 6	.300	1.171	0.411	86	0.139	129	0.052	100	0.046	89	0.026	92	0.032	81	0.030	108	0.027	114	0.018	100
DCP 7	.400	1.022	0.336	95	0.075	118	0.026	83	0.013	308	0.010	11	0.021	185	0.024	241	0.015	231	0.012	231
DCP 8	.500	0.920	0.241	56	0.050	43	0.047	28	0.013	11	0.013	312	0.009	14	0.011	73	0.016	85	0.006	26
DCP 9	.600	0.735	0.211	61	0.058	48	0.040	70	0.016	259	0.014	327	0.015	172	0.017	207	0.014	212	0.010	224
DCP10	.878	0.498	0.141	10	0.085	333	0.040	352	0.006	184	0.018	195	0.006	123	0.010	125	0.012	77	0.004	17

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.017	174	0.014	121	0.005	157	0.008	130	0.010	115	0.010	93	0.005	116	0.004	74	0.005	106
CN		0.002	186	0.003	171	0.003	154	0.002	148	0.001	119	0.003	113	0.003	130	0.000	51	0.001	13
CM		0.000	129	0.001	27	0.002	352	0.001	326	0.001	270	0.001	266	0.001	230	0.001	165	0.001	163
DCP 1	.010	0.024	31	0.025	50	0.023	22	0.023	357	0.011	336	0.002	248	0.005	176	0.013	153	0.011	156
DCP 2	.100	0.019	253	0.011	240	0.013	314	0.008	347	0.014	323	0.011	346	0.003	174	0.008	333	0.004	173
DCP 3	.150	0.010	230	0.012	207	0.017	151	0.018	169	0.015	152	0.019	145	0.016	143	0.011	125	0.012	114
DCP 4	.200	0.016	155	0.010	199	0.007	186	0.009	189	0.009	226	0.006	206	0.007	197	0.007	246	0.004	302
DCP 5	.250	0.015	210	0.012	195	0.011	156	0.014	167	0.008	178	0.013	137	0.010	146	0.006	103	0.006	81
DCP 6	.300	0.015	197	0.010	126	0.007	141	0.007	160	0.006	180	0.008	182	0.010	157	0.006	153	0.000	121
DCP 7	.400	0.010	190	0.007	137	0.007	117	0.005	155	0.003	158	0.004	149	0.002	136	0.003	115	0.002	101
DCP 8	.500	0.013	40	0.005	70	0.002	189	0.330	143	0.006	117	0.002	127	0.004	91	0.006	58	0.003	3
DCP 9	.600	0.005	214	0.005	291	0.002	226	0.002	346	0.001	176	0.004	49	0.003	42	0.003	328	0.004	292
DCP10	.878	0.004	333	0.003	244	0.009	167	0.005	137	0.008	69	0.008	86	0.003	58	0.004	310	0.007	355

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	16.39	0.400	17.25	4.28		5063.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.062	441.4	739.5	0.48E 07	0.00041	1.609	16.76	0.0600

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		17.247	4.281	0	0.193	199	0.214	295	0.118	184	0.178	198	0.161	214	0.028	192	0.012	199	0.003	202
CN		1.171	0.332	95	0.057	157	0.012	143	0.035	89	0.022	116	0.017	152	0.002	71	0.008	234	0.005	269
CM		-0.057	0.046	175	0.026	185	0.007	230	0.002	100	0.003	162	0.002	283	0.001	276	0.001	133	0.001	155
DCP 1	.010	5.375	1.357	111	0.362	187	0.101	272	0.067	11	0.070	107	0.043	328	0.075	337	0.057	333	0.003	319
DCP 2	.100	2.178	1.166	129	0.419	174	0.146	153	0.132	153	0.127	136	0.139	157	0.042	143	0.033	178	0.022	229
DCP 3	.150	1.639	0.677	125	0.258	205	0.078	278	0.014	162	0.075	222	0.069	274	0.029	271	0.037	273	0.031	283
DCP 4	.200	1.470	0.589	104	0.245	159	0.056	158	0.053	105	0.078	106	0.075	125	0.032	113	0.013	59	0.010	109
DCP 5	.250	1.394	0.501	106	0.144	173	0.044	254	0.025	42	0.053	172	0.056	246	0.029	273	0.018	277	0.023	249
DCP 6	.300	1.194	0.414	85	0.135	129	0.037	139	0.014	67	0.052	76	0.055	107	0.030	83	0.008	68	0.008	25
DCP 7	.400	1.045	0.353	83	0.077	100	0.016	148	0.022	2	0.034	109	0.031	200	0.019	246	0.012	278	0.009	206
DCP 8	.500	0.850	0.241	53	0.061	45	0.030	59	0.016	266	0.030	359	0.035	72	0.025	32	0.018	354	0.008	306
DCP 9	.600	0.743	0.220	59	0.082	42	0.027	115	0.019	308	0.022	71	0.024	166	0.018	185	0.015	215	0.008	179
DCP10	.878	0.524	0.142	4	0.096	337	0.032	26	0.011	153	0.009	264	0.010	67	0.011	33	0.013	337	0.013	337

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.010	21	0.003	27	0.005	356	0.005	112	0.010	135	0.012	117	0.014	106	0.015	122	0.013	105
CN		0.006	219	0.004	298	0.001	238	0.002	224	0.002	181	0.003	253	0.004	246	0.001	227	0.001	181
CM		0.001	13	0.001	327	0.000	161	0.000	92	0.001	350	0.001	49	0.001	351	0.000	66	0.001	228
DCP 1	.010	0.004	318	0.015	172	0.021	109	0.019	91	0.012	40	0.020	0	0.035	305	0.019	276	0.019	268
DCP 2	.100	0.028	223	0.023	259	0.014	221	0.016	230	0.006	2	0.004	241	0.007	330	0.010	58	0.004	250
DCP 3	.150	0.017	311	0.011	281	0.013	330	0.004	311	0.007	285	0.001	179	0.005	173	0.006	217	0.006	193
DCP 4	.200	0.025	176	0.017	195	0.007	165	0.015	185	0.008	205	0.005	190	0.009	244	0.001	71	0.006	152
DCP 5	.250	0.021	301	0.011	344	0.008	346	0.010	338	0.009	323	0.004	9	0.004	286	0.003	220	0.003	224
DCP 6	.300	0.011	134	0.015	162	0.004	149	0.008	157	0.008	165	0.007	203	0.007	196	0.005	144	0.007	163
DCP 7	.400	0.007	244	0.006	298	0.008	316	0.009	312	0.009	224	0.011	259	0.007	242	0.004	122	0.004	188
DCP 8	.500	0.004	287	0.007	121	0.007	116	0.005	75	0.005	89	0.002	116	0.004	97	0.007	119	0.005	75
DCP 9	.600	0.003	119	0.005	176	0.010	248	0.005	245	0.006	175	0.006	210	0.008	210	0.004	265	0.006	77
DCP10	.878	0.012	205	0.003	177	0.005	45	0.001	200	0.002	149	0.003	287	0.001	171	0.004	273	0.004	325

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	16.39	0.400	17.28	4.37		5068.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.062	440.5	737.6	0.48E 07	-0.00010	1.653	16.94	0.0220

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		17.281	4.369	0	0.155	200	0.227	191	0.120	170	0.158	164	0.269	105	0.100	325	0.070	299	0.037	287
CN		1.153	0.329	102	0.062	163	0.018	137	0.014	170	0.012	116	0.037	145	0.007	203	0.003	20	0.005	285
CM		-0.058	0.045	182	0.025	197	0.010	227	0.001	347	0.003	195	0.008	267	0.003	240	0.003	184	0.001	181
DCP 1	.010	5.294	1.320	114	0.376	191	0.060	266	0.072	295	0.114	292	0.097	226	0.102	234	0.026	217	0.018	250
DCP 2	.100	2.154	1.159	137	0.388	188	0.153	166	0.095	186	0.121	143	0.135	180	0.032	176	0.043	167	0.015	259
DCP 3	.150	1.604	0.689	124	0.242	202	0.047	283	0.037	176	0.051	218	0.038	224	0.032	281	0.021	295	0.029	293
DCP 4	.200	1.456	0.594	112	0.261	167	0.066	158	0.070	131	0.080	120	0.097	143	0.034	181	0.022	123	0.019	175
DCP 5	.250	1.347	0.491	106	0.141	178	0.023	289	0.026	103	0.033	175	0.025	198	0.019	289	0.020	292	0.027	294
DCP 6	.300	1.194	0.418	94	0.150	142	0.048	119	0.042	107	0.058	92	0.085	173	0.029	143	0.025	85	0.015	112
DCP 7	.400	1.012	0.335	84	0.063	114	0.017	53	0.013	49	0.028	107	0.033	159	0.014	291	0.010	303	0.019	269
DCP 8	.500	0.819	0.236	64	0.062	67	0.053	57	0.007	130	0.036	29	0.066	95	0.020	104	0.022	39	0.013	38
DCP 9	.600	0.713	0.216	60	0.065	48	0.026	74	0.011	280	0.019	55	0.038	133	0.007	288	0.010	0	0.003	288
DCP10	.878	0.547	0.139	14	0.089	359	0.040	42	0.019	184	0.015	287	0.026	83	0.015	74	0.010	349	0.006	340

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.029	264	0.024	271	0.013	261	0.010	296	0.018	224	0.016	243	0.010	245	0.008	223	0.005	215
CN		0.011	272	0.012	245	0.007	239	0.009	240	0.006	214	0.008	238	0.006	228	0.008	239	0.006	228
CM		0.001	58	0.001	17	0.001	55	0.001	9	0.001	359	0.002	47	0.001	351	0.000	48	0.001	314
DCP 1	.010	0.041	276	0.042	225	0.051	193	0.032	193	0.026	139	0.016	93	0.013	311	0.019	277	0.014	244
DCP 2	.100	0.002	319	0.016	289	0.011	349	0.018	289	0.009	325	0.006	283	0.015	250	0.004	238	0.015	261
DCP 3	.150	0.033	308	0.024	287	0.027	282	0.024	271	0.024	257	0.027	253	0.029	254	0.031	245	0.031	245
DCP 4	.200	0.011	261	0.012	253	0.010	270	0.016	298	0.007	310	0.010	286	0.008	282	0.005	270	0.004	299
DCP 5	.250	0.027	295	0.028	272	0.021	266	0.019	260	0.018	247	0.023	242	0.027	248	0.024	239	0.023	237
DCP 6	.300	0.004	133	0.007	226	0.002	290	0.008	295	0.006	248	0.007	290	0.005	255	0.002	255	0.003	322
DCP 7	.400	0.026	269	0.023	260	0.012	250	0.020	235	0.014	250	0.013	219	0.019	213	0.016	235	0.011	223
DCP 8	.500	0.008	358	0.009	152	0.008	185	0.036	264	0.009	156	0.010	202	0.009	164	0.006	178	0.001	127
DCP 9	.600	0.015	230	0.019	244	0.005	233	0.015	195	0.016	202	0.009	246	0.010	172	0.014	227	0.010	175
DCP10	.878	0.006	260	0.005	146	0.003	222	0.001	72	0.005	74	0.006	219	0.002	261	0.006	348	0.001	61

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	16.16	0.400	24.87	4.58		5069.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.061	441.5	745.1	0.48E 07	-0.00195	1.151	25.61	0.0610

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		24.870	4.576	0	0.123	19	0.106	171	0.059	163	0.028	117	0.020	157	0.020	132	0.021	96	0.015	129
CN		1.040	0.088	57	0.035	93	0.013	187	0.033	230	0.007	232	0.005	270	0.001	327	0.004	29	0.005	359
CM		-0.110	0.045	200	0.003	242	0.004	197	0.002	244	0.001	168	0.000	257	0.001	171	0.001	246	0.000	214
DCP 1	.010	3.457	1.550	176	0.226	112	0.315	188	0.086	253	0.107	213	0.073	280	0.023	243	0.045	286	0.023	328
DCP 2	.100	1.459	0.150	26	0.050	134	0.012	338	0.011	176	0.008	280	0.007	167	0.001	112	0.005	74	0.007	353
DCP 3	.150	1.326	0.184	25	0.035	83	0.009	34	0.007	86	0.005	29	0.003	345	0.005	124	0.002	77	0.006	19
DCP 4	.200	1.305	0.191	18	0.023	78	0.007	301	0.009	177	0.005	87	0.010	229	0.002	36	0.007	68	0.007	10
DCP 5	.250	1.284	0.210	24	0.031	80	0.010	35	0.004	96	0.003	355	0.003	357	0.006	127	0.005	46	0.006	10
DCP 6	.300	1.215	0.189	22	0.023	70	0.006	311	0.007	187	0.002	263	0.006	203	0.002	50	0.008	58	0.004	342
DCP 7	.400	1.067	0.202	27	0.031	79	0.007	39	0.005	58	0.002	295	0.003	11	0.004	77	0.006	58	0.006	34
DCP 8	.500	0.897	0.165	27	0.022	74	0.000	347	0.001	42	0.002	338	0.003	187	0.003	29	0.009	48	0.002	356
DCP 9	.600	0.814	0.164	33	0.029	78	0.003	32	0.004	353	0.005	260	0.004	232	0.002	348	0.002	92	0.003	25
DCP10	.878	0.637	0.110	39	0.026	95	0.003	93	0.004	89	0.004	251	0.004	319	0.005	320	0.006	39	0.003	1

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.008	129	0.019	130	0.012	79	0.004	86	0.006	86	0.008	40	0.005	62	0.006	103	0.003	119
CN		0.004	328	0.003	267	0.002	19	0.005	100	0.003	276	0.001	343	0.002	12	0.002	348	0.003	272
CM		0.000	88	0.001	20	0.000	298	0.001	254	0.001	23	0.000	5	0.000	299	0.000	84	0.001	30
DCP 1	.010	0.030	349	0.031	318	0.027	343	0.017	219	0.010	321	0.007	337	0.022	358	0.001	303	0.016	348
DCP 2	.100	0.003	359	0.001	334	0.009	94	0.008	112	0.008	292	0.008	41	0.003	327	0.002	73	0.006	3
DCP 3	.150	0.004	342	0.004	235	0.004	117	0.005	92	0.004	291	0.004	345	0.001	202	0.003	358	0.007	260
DCP 4	.200	0.006	327	0.001	319	0.003	336	0.008	140	0.002	328	0.003	275	0.004	46	0.004	22	0.002	259
DCP 5	.250	0.004	318	0.002	272	0.003	108	0.005	99	0.005	297	0.005	357	0.003	182	0.004	359	0.008	266
DCP 6	.300	0.004	12	0.004	282	0.002	11	0.008	127	0.002	275	0.001	233	0.004	43	0.004	5	0.005	265
DCP 7	.400	0.005	308	0.001	235	0.002	20	0.006	87	0.003	291	0.003	344	0.003	290	0.006	342	0.006	258
DCP 8	.500	0.008	320	0.004	294	0.002	342	0.004	91	0.004	246	0.003	307	0.001	296	0.004	334	0.004	214
DCP 9	.600	0.004	275	0.004	210	0.001	139	0.007	97	0.004	290	0.002	165	0.002	94	0.002	346	0.003	203
DCP10	.878	0.001	341	0.005	215	0.002	16	0.005	64	0.004	182	0.001	172	0.002	51	0.002	193	0.002	247

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	15.26	0.400	24.82	4.56		5069.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.062	440.8	746.8	0.48E 07	-0.00191	1.164	25.50	0.0220

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		24.820	4.665	0	0.080	43	0.134	174	0.056	167	0.028	153	0.054	118	0.030	118	0.028	145	0.014	105
CN		1.034	0.092	53	0.023	93	0.010	129	0.006	220	0.002	195	0.003	270	0.005	13	0.002	342	0.004	357
CM		-0.112	0.043	202	0.002	234	0.005	204	0.002	257	0.001	199	0.002	250	0.002	191	0.002	243	0.001	253
DCP 1	.010	3.490	1.495	174	0.167	116	0.259	180	0.142	242	0.070	199	0.093	271	0.022	248	0.064	295	0.039	304
DCP 2	.100	1.434	0.143	35	0.015	160	0.013	37	0.011	75	0.005	322	0.008	185	0.009	70	0.015	151	0.006	348
DCP 3	.150	1.304	0.176	28	0.034	65	0.017	41	0.009	104	0.002	322	0.004	133	0.005	355	0.002	199	0.002	37
DCP 4	.200	1.280	0.176	21	0.010	168	0.017	43	0.012	125	0.003	55	0.004	211	0.005	77	0.006	109	0.001	115
DCP 5	.250	1.273	0.203	27	0.031	61	0.016	43	0.013	131	0.001	301	0.003	125	0.003	1	0.004	247	0.003	90
DCP 6	.300	1.187	0.179	25	0.013	115	0.014	57	0.014	71	0.001	93	0.002	135	0.007	68	0.005	98	0.005	35
DCP 7	.400	1.059	0.195	29	0.032	58	0.013	41	0.017	113	0.002	66	0.002	104	0.005	12	0.002	296	0.003	27
DCP 8	.500	0.868	0.157	29	0.013	133	0.007	64	0.014	221	0.002	149	0.001	199	0.007	37	0.005	85	0.003	49
DCP 9	.600	0.809	0.163	36	0.035	59	0.018	48	0.014	112	0.004	69	0.003	46	0.006	8	0.002	351	0.006	16
DCP10	.878	0.660	0.107	45	0.012	124	0.012	59	0.012	110	0.004	347	0.005	47	0.009	1	0.009	46	0.002	65

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.009	100	0.022	143	0.006	105	0.012	107	0.013	102	0.010	80	0.011	68	0.010	92	0.001	52
CN		0.005	57	0.005	285	0.004	292	0.004	244	0.002	262	0.004	8	0.001	272	0.004	315	0.001	76
CM		0.001	202	0.001	74	0.000	69	0.001	38	0.000	264	0.001	169	0.000	115	0.001	65	0.000	169
DCP 1	.010	0.018	307	0.030	307	0.037	306	0.016	310	0.039	289	0.016	352	0.024	268	0.026	5	0.007	13
DCP 2	.100	0.012	38	0.004	283	0.005	286	0.009	250	0.005	292	0.008	97	0.002	312	0.006	341	0.006	208
DCP 3	.150	0.007	116	0.007	285	0.001	157	0.006	227	0.002	199	0.002	354	0.003	122	0.004	3	0.004	111
DCP 4	.200	0.012	78	0.005	283	0.002	272	0.007	244	0.005	156	0.002	349	0.003	95	0.008	328	0.003	165
DCP 5	.250	0.005	133	0.008	274	0.002	142	0.006	234	0.004	156	0.003	14	0.002	143	0.005	36	0.006	79
DCP 6	.300	0.013	83	0.004	301	0.003	299	0.007	236	0.002	215	0.002	297	0.003	81	0.005	334	0.003	198
DCP 7	.400	0.007	90	0.004	268	0.001	297	0.005	210	0.001	224	0.003	23	0.001	131	0.004	313	0.004	73
DCP 8	.500	0.006	61	0.004	269	0.002	228	0.006	213	0.004	140	0.005	55	0.003	34	0.004	302	0.001	293
DCP 9	.600	0.005	48	0.005	279	0.002	306	0.004	226	0.003	274	0.003	24	0.003	253	0.007	290	0.002	73
DCP10	.878	0.006	352	0.003	279	0.005	275	0.003	263	0.002	20	0.008	340	0.002	279	0.005	234	0.002	314

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	15.60	0.600	0.38	4.74		5371.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.040	652.2	1465.8	0.63E 07	-0.00092	0.784	5.11	0.1010

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		0.384	4.738	0	0.248	5	0.055	248	0.033	299	0.038	25	0.029	16	0.033	310	0.025	328	0.043	0
CN		0.171	0.626	355	0.015	22	0.020	305	0.034	265	0.003	70	0.007	246	0.004	170	0.001	6	0.000	192
CM		-0.019	0.017	336	0.002	254	0.001	336	0.001	108	0.001	136	0.000	220	0.001	141	0.000	36	0.000	132
DCP 1	.010	-1.002	2.505	353	0.376	267	0.316	329	0.034	259	0.109	306	0.041	335	0.055	309	0.042	350	0.034	319
DCP 2	.025	-0.515	2.551	354	0.063	291	0.211	330	0.081	65	0.029	169	0.038	35	0.050	130	0.011	12	0.047	120
DCP 3	.100	0.714	2.069	354	0.114	64	0.034	188	0.060	254	0.070	129	0.062	220	0.013	183	0.004	137	0.021	266
DCP 4	.200	0.536	0.914	356	0.031	9	0.059	203	0.031	117	0.060	350	0.036	255	0.024	183	0.003	59	0.009	115
DCP 5	.250	0.395	0.728	354	0.043	27	0.031	319	0.020	256	0.013	324	0.008	324	0.001	220	0.004	355	0.009	359
DCP 6	.300	0.232	0.605	357	0.030	44	0.027	315	0.013	255	0.000	34	0.003	195	0.003	174	0.001	226	0.002	198
DCP 7	.400	0.188	0.461	356	0.014	316	0.027	311	0.009	301	0.002	338	0.003	290	0.002	332	0.003	331	0.003	10
DCP 8	.500	0.181	0.329	358	0.005	50	0.016	310	0.003	295	0.001	178	0.001	234	0.001	194	0.000	255	0.001	266
DCP 9	.600	0.093	0.248	359	0.013	294	0.012	310	0.005	295	0.002	302	0.003	265	0.001	329	0.001	323	0.001	20
DCP10	.878	0.060	0.115	3	0.019	70	0.002	151	0.002	291	0.001	113	0.001	244	0.001	223	0.000	205	0.002	261

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.032	1	0.023	7	0.026	22	0.025	26	0.023	36	0.024	29	0.021	49	0.022	55	0.021	81
CN		0.004	15	0.001	50	0.001	257	0.001	335	0.001	130	0.000	108	0.001	107	0.001	52	0.001	251
CM		0.000	43	0.000	49	0.000	222	0.000	109	0.000	198	0.000	294	0.000	268	0.000	287	0.000	82
DCP 1	.010	0.051	348	0.046	37	0.009	65	0.014	353	0.017	24	0.002	45	0.019	7	0.025	56	0.015	112
DCP 2	.025	0.013	193	0.037	108	0.027	193	0.005	5	0.018	167	0.006	290	0.012	146	0.012	225	0.005	268
DCP 3	.100	0.022	11	0.004	267	0.010	333	0.005	23	0.004	136	0.002	288	0.005	185	0.004	335	0.004	147
DCP 4	.200	0.015	63	0.011	329	0.006	246	0.010	245	0.006	181	0.006	107	0.006	42	0.003	354	0.007	308
DCP 5	.250	0.005	6	0.003	64	0.005	356	0.005	7	0.005	54	0.001	55	0.003	42	0.003	55	0.003	76
DCP 6	.300	0.002	255	0.001	304	0.002	31	0.002	214	0.001	244	0.001	252	0.001	232	0.001	252	0.002	336
DCP 7	.400	0.003	349	0.003	17	0.003	13	0.003	28	0.002	28	0.002	103	0.003	66	0.001	120	0.001	113
DCP 8	.500	0.001	205	0.001	253	0.000	149	0.001	229	0.001	192	0.000	76	0.000	216	0.000	12	0.001	335
DCP 9	.600	0.002	11	0.001	111	0.001	353	0.001	50	0.001	25	0.001	233	0.002	77	0.003	76	0.002	207
DCP10	.878	0.001	352	0.001	153	0.002	202	0.001	300	0.002	67	0.001	93	0.001	151	0.001	177	0.001	282

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	15.55	0.600	0.44	4.90		5071.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.041	648.1	1446.7	0.63E 07	-0.00092	0.785	5.37	0.0250

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		0.437	4.899	0	0.218	334	0.103	245	0.065	267	0.027	339	0.060	273	0.062	282	0.045	301	0.047	306
CN		0.150	0.086	270	0.013	314	0.017	275	0.002	218	0.003	347	0.005	276	0.001	302	0.004	298	0.001	134
CM		-0.020	0.008	270	0.003	264	0.001	284	0.000	84	0.000	64	0.001	110	0.001	91	0.001	118	0.000	74
DCP 1	.010	-1.044	2.525	351	0.410	262	0.336	317	0.070	270	0.117	304	0.057	286	0.095	292	0.066	324	0.045	306
DCP 2	.025	-0.517	2.547	349	0.103	256	0.226	314	0.078	47	0.010	144	0.062	13	0.058	100	0.013	343	0.048	91
DCP 3	.100	0.689	2.106	349	0.088	60	0.032	180	0.056	226	0.072	105	0.062	197	0.013	130	0.004	99	0.019	221
DCP 4	.150	0.636	1.432	351	0.145	288	0.179	166	0.018	104	0.020	274	0.024	51	0.050	322	0.026	256	0.005	261
DCP 5	.200	0.387	0.951	351	0.022	350	0.065	186	0.038	110	0.065	328	0.042	245	0.025	149	0.005	85	0.013	78
DCP 6	.250	0.277	0.738	352	0.046	26	0.030	304	0.024	243	0.016	304	0.013	300	0.007	264	0.008	300	0.009	307
DCP 7	.300	0.234	0.614	353	0.020	67	0.029	301	0.013	219	0.002	140	0.001	217	0.003	138	0.002	273	0.001	72
DCP 8	.400	0.166	0.463	354	0.012	338	0.029	300	0.012	280	0.006	299	0.005	313	0.004	273	0.007	286	0.005	288
DCP 9	.500	0.117	0.333	354	0.008	214	0.017	295	0.001	155	0.002	142	0.003	311	0.000	328	0.002	270	0.001	198
DCP 10	.600	0.086	0.252	358	0.007	334	0.013	303	0.005	272	0.004	293	0.004	318	0.004	291	0.004	280	0.003	277
DCP 11	.878	0.083	0.117	357	0.009	85	0.002	114	0.002	73	0.002	130	0.003	274	0.003	270	0.004	328	0.002	121

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.048	299	0.044	313	0.035	304	0.030	303	0.026	320	0.023	308	0.018	325	0.017	318	0.013	313
CN		0.003	299	0.002	264	0.002	240	0.002	291	0.000	212	0.000	283	0.002	309	0.001	270	0.000	200
CM		0.000	331	0.001	53	0.000	144	0.000	182	0.000	171	0.000	197	0.000	62	0.000	166	0.000	40
DCP 1	.010	0.043	345	0.004	95	0.027	233	0.038	258	0.036	285	0.028	295	0.029	290	0.024	305	0.018	308
DCP 2	.025	0.022	190	0.021	45	0.024	131	0.003	11	0.026	120	0.014	188	0.010	136	0.014	195	0.004	153
DCP 3	.100	0.020	306	0.008	217	0.011	267	0.008	278	0.002	321	0.002	314	0.005	52	0.001	335	0.008	82
DCP 4	.150	0.015	295	0.006	256	0.004	340	0.008	318	0.004	230	0.006	30	0.015	329	0.004	298	0.001	7
DCP 5	.200	0.013	13	0.006	275	0.007	210	0.005	197	0.005	158	0.005	110	0.007	313	0.007	274	0.001	17
DCP 6	.250	0.007	303	0.005	310	0.005	314	0.004	290	0.005	287	0.004	302	0.005	329	0.004	340	0.001	308
DCP 7	.300	0.000	108	0.002	212	0.002	237	0.003	305	0.000	92	0.003	155	0.002	199	0.001	223	0.001	290
DCP 8	.400	0.003	302	0.004	287	0.003	290	0.004	306	0.004	302	0.001	334	0.003	287	0.002	314	0.001	273
DCP 9	.500	0.002	313	0.001	209	0.001	216	0.001	341	0.000	2	0.001	178	0.001	175	0.000	108	0.000	325
DCP 10	.600	0.003	313	0.001	291	0.001	296	0.001	239	0.002	273	0.001	306	0.001	290	0.001	297	0.002	178
DCP 11	.878	0.002	175	0.003	221	0.001	300	0.002	330	0.002	53	0.001	30	0.000	253	0.001	239	0.002	228

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	15.80	0.600	7.50	4.24		5072.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.040	652.5	1458.8	0.63E 07	-0.00115	1.096	10.24	0.1010

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		7.495	4.238	359	0.141	39	0.138	177	0.056	187	0.039	177	0.062	146	0.036	146	0.040	45	0.058	329
CN		0.863	0.068	90	0.079	85	0.013	106	0.018	143	0.004	89	0.004	122	0.005	208	0.007	143	0.005	53
CM		-0.020	0.005	270	0.012	113	0.001	186	0.002	140	0.000	200	0.000	167	0.001	299	0.002	268	0.002	185
DCP 1	.010	1.566	1.263	357	0.251	62	0.082	132	0.030	171	0.005	153	0.014	62	0.006	101	0.018	12	0.022	291
DCP 2	.025	2.230	1.062	9	0.196	82	0.086	178	0.026	196	0.009	192	0.015	165	0.010	182	0.022	119	0.016	29
DCP 3	.100	2.558	0.241	12	0.402	98	0.032	121	0.060	147	0.036	50	0.007	91	0.012	259	0.029	212	0.030	151
DCP 4	.200	1.435	0.321	25	0.252	108	0.047	157	0.111	144	0.065	208	0.031	220	0.058	238	0.033	264	0.008	112
DCP 5	.250	1.324	0.423	11	0.198	76	0.067	31	0.070	93	0.020	83	0.053	80	0.019	154	0.032	107	0.012	98
DCP 6	.300	1.038	0.377	22	0.112	90	0.061	49	0.043	129	0.036	68	0.032	147	0.015	143	0.045	163	0.029	114
DCP 7	.400	0.770	0.311	5	0.043	32	0.022	15	0.010	250	0.015	8	0.011	16	0.009	11	0.019	39	0.028	335
DCP 8	.500	0.597	0.241	23	0.027	13	0.014	76	0.012	339	0.007	69	0.009	23	0.002	312	0.013	128	0.014	60
DCP 9	.600	0.416	0.179	11	0.017	347	0.014	154	0.006	221	0.002	213	0.002	144	0.007	98	0.009	33	0.012	329
DCP 10	.878	0.235	0.146	18	0.031	301	0.002	242	0.002	326	0.001	42	0.002	280	0.005	196	0.008	132	0.006	48

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.031	272	0.007	268	0.011	323	0.007	291	0.007	273	0.009	303	0.010	7	0.005	354	0.006	18
CN		0.002	335	0.001	142	0.002	106	0.003	344	0.002	250	0.000	194	0.001	9	0.003	224	0.003	125
CM		0.001	98	0.000	343	0.000	202	0.001	150	0.000	131	0.000	150	0.000	110	0.001	60	0.001	329
DCP 1	.010	0.004	260	0.009	307	0.002	311	0.004	280	0.002	27	0.005	319	0.002	346	0.004	339	0.002	14
DCP 2	.025	0.002	6	0.003	25	0.005	322	0.003	330	0.000	29	0.005	83	0.005	147	0.002	170	0.003	313
DCP 3	.100	0.013	69	0.004	183	0.010	113	0.010	17	0.007	233	0.013	143	0.009	63	0.008	210	0.009	117
DCP 4	.200	0.014	353	0.008	130	0.013	129	0.003	242	0.008	214	0.005	254	0.008	343	0.003	264	0.006	52
DCP 5	.250	0.003	187	0.005	217	0.009	216	0.004	285	0.004	283	0.010	328	0.006	278	0.003	7	0.003	327
DCP 6	.300	0.013	141	0.006	134	0.008	154	0.002	151	0.009	194	0.009	152	0.005	157	0.010	173	0.005	153
DCP 7	.400	0.008	292	0.009	337	0.005	310	0.007	331	0.006	325	0.007	300	0.002	327	0.009	285	0.008	194
DCP 8	.500	0.004	56	0.009	62	0.004	15	0.006	50	0.003	296	0.006	125	0.003	82	0.006	106	0.005	40
DCP 9	.600	0.006	287	0.003	251	0.001	76	0.002	310	0.003	30	0.005	306	0.002	235	0.004	219	0.007	115
DCP 10	.878	0.003	282	0.005	163	0.003	43	0.003	323	0.002	230	0.002	41	0.002	327	0.004	251	0.003	185

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	15.90	0.600	7.51	4.32		5072.2	10

K	V	Q	RN	DAMPING	CY(MAX)	ALPHA(STALL)	EXT DAMPING
0.041	647.7	1449.3	0.63E 07	-0.00083	1.102	11.55	0.0680

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		7.511	4.320	0	0.247	17	0.083	201	0.022	250	0.018	253	0.022	288	0.071	40	0.075	332	0.032	310
CN		0.855	0.281	6	0.084	71	0.017	69	0.017	96	0.017	81	0.010	57	0.009	67	0.008	. 6	0.004	286
CM		-0.026	0.024	108	0.012	86	0.001	132	0.002	82	0.001	282	0.001	177	0.001	222	0.002	156	0.001	57
DCP 1	.010	1.958	1.303	356	0.243	50	0.059	128	0.005	109	0.007	80	0.009	313	0.033	18	0.025	325	0.012	27
DCP 2	.025	2.229	1.099	357	0.213	54	0.087	135	0.329	137	0.013	153	0.021	103	0.027	48	0.021	341	0.014	239
DCP 3	.100	2.544	0.257	354	0.434	80	0.055	69	0.056	102	0.027	22	0.027	22	0.001	54	0.014	69	0.003	58
DCP 4	.200	1.357	0.329	13	0.261	84	0.057	111	0.121	91	0.079	143	0.051	99	0.051	132	0.024	178	0.007	207
DCP 5	.250	1.245	0.421	9	0.176	74	0.064	21	0.062	71	0.024	12	0.020	48	0.025	94	0.035	32	0.014	0
DCP 6	.300	1.029	0.384	10	0.102	68	0.063	21	0.038	65	0.037	355	0.030	70	0.029	33	0.031	37	0.021	343
DCP 7	.400	0.755	0.313	9	0.041	25	0.021	349	0.010	230	0.015	20	0.011	329	0.015	15	0.018	341	0.012	296
DCP 8	.500	0.539	0.242	12	0.021	20	0.020	41	0.014	296	0.005	284	0.001	126	0.008	35	0.008	353	0.011	337
DCP 9	.600	0.415	0.185	13	0.020	337	0.010	186	0.019	226	0.012	120	0.010	1	0.005	12	0.008	324	0.009	201
DCP10	.878	0.297	0.151	5	0.028	254	0.003	76	0.004	216	0.002	114	0.003	86	0.006	82	0.007	342	0.004	221

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.030	355	0.046	9	0.032	356	0.020	26	0.020	48	0.029	34	0.019	41	0.016	36	0.019	63
CN		0.001	316	0.004	353	0.003	5	0.003	354	0.002	0	0.002	342	0.001	265	0.000	135	0.001	251
CM		0.001	189	0.001	137	0.001	39	0.000	294	0.000	289	0.001	320	0.001	213	0.001	143	0.001	116
DCP 1	.010	0.003	311	0.014	325	0.011	6	0.015	26	0.009	29	0.007	59	0.008	32	0.006	71	0.003	84
DCP 2	.025	0.001	197	0.003	260	0.003	157	0.005	106	0.003	307	0.004	202	0.003	280	0.002	246	0.001	354
DCP 3	.100	0.007	102	0.012	36	0.010	2	0.011	288	0.004	341	0.016	307	0.020	232	0.007	154	0.009	180
DCP 4	.200	0.024	197	0.004	324	0.013	42	0.012	359	0.013	43	0.017	351	0.012	219	0.013	142	0.015	125
DCP 5	.250	0.010	310	0.008	21	0.008	47	0.010	64	0.011	78	0.015	97	0.012	62	0.016	83	0.009	11
DCP 6	.300	0.009	34	0.010	28	0.015	16	0.012	333	0.011	324	0.012	285	0.012	244	0.009	204	0.007	116
DCP 7	.400	0.011	260	0.002	63	0.003	18	0.009	32	0.007	329	0.002	108	0.005	54	0.012	358	0.007	269
DCP 8	.500	0.011	305	0.006	270	0.006	244	0.007	245	0.003	228	0.004	232	0.005	192	0.003	134	0.008	14
DCP 9	.600	0.005	77	0.008	345	0.002	262	0.005	4	0.005	205	0.007	72	0.006	359	0.007	276	0.004	190
DCP10	.878	0.005	18	0.002	296	0.004	193	0.004	152	0.004	42	0.003	197	0.004	41	0.003	357	0.010	296

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	15.58	0.600	7.49	4.37		5072.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.040	646.4	1447.3	0.63E 07	-0.00079	1.110	11.40	0.0259

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		7.486	4.369	359	0.271	48	0.115	180	0.050	161	0.011	17	0.151	117	0.047	32	0.052	338	0.038	282
CN		0.857	0.284	5	0.082	59	0.019	73	0.018	88	0.005	350	0.015	112	0.008	85	0.009	39	0.007	300
CM		-0.027	0.023	195	0.012	81	0.001	136	0.002	99	0.001	28	0.001	323	0.001	204	0.002	183	0.002	124
DCP 1	.010	1.962	1.311	355	0.240	58	0.082	128	0.024	152	0.004	306	0.040	97	0.010	347	0.018	303	0.013	238
DCP 2	.025	2.230	1.105	356	0.212	61	0.090	136	0.032	143	0.036	157	0.042	102	0.023	32	0.019	332	0.014	246
DCP 3	.100	2.548	0.277	355	0.436	78	0.059	59	0.044	94	0.039	342	0.034	74	0.020	160	0.019	79	0.005	68
DCP 4	.200	1.351	0.331	14	0.252	82	0.063	108	0.127	86	0.049	134	0.050	129	0.061	138	0.028	151	0.015	183
DCP 5	.250	1.250	0.435	11	0.182	72	0.062	25	0.081	80	0.020	344	0.059	96	0.015	109	0.036	79	0.006	55
DCP 6	.300	1.027	0.383	9	0.102	65	0.051	15	0.044	72	0.045	343	0.027	89	0.025	27	0.031	39	0.021	338
DCP 7	.400	0.761	0.324	8	0.036	12	0.019	27	0.010	316	0.015	319	0.008	100	0.012	359	0.018	9	0.020	311
DCP 8	.500	0.533	0.247	10	0.021	11	0.013	36	0.007	268	0.007	326	0.008	174	0.010	55	0.012	8	0.012	311
DCP 9	.600	0.412	0.181	10	0.017	295	0.016	127	0.010	267	0.009	162	0.009	175	0.006	50	0.009	357	0.012	288
DCP10	.878	0.306	0.145	3	0.023	254	0.004	317	0.005	217	0.002	232	0.005	123	0.005	38	0.005	11	0.006	300

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.020	219	0.003	333	0.009	291	0.004	215	0.005	317	0.011	289	0.004	139	0.005	76	0.006	336
CN		0.001	252	0.002	255	0.005	351	0.003	290	0.001	92	0.005	329	0.004	265	0.002	199	0.001	7
CM		0.001	77	0.000	102	0.000	124	0.001	322	0.001	204	0.001	128	0.001	40	0.001	311	0.001	203
DCP 1	.010	0.003	295	0.006	213	0.007	322	0.002	270	0.004	100	0.005	247	0.001	164	0.001	151	0.001	173
DCP 2	.025	0.002	123	0.006	189	0.006	336	0.002	327	0.002	87	0.006	279	0.004	231	0.001	194	0.002	259
DCP 3	.100	0.008	93	0.010	49	0.013	1	0.014	302	0.013	207	0.008	100	0.008	343	0.004	345	0.006	287
DCP 4	.200	0.011	190	0.009	240	0.008	22	0.016	341	0.002	135	0.017	28	0.010	19	0.001	337	0.005	95
DCP 5	.250	0.002	6	0.015	189	0.002	122	0.003	224	0.005	195	0.009	321	0.011	270	0.011	258	0.007	238
DCP 6	.300	0.000	4	0.003	276	0.014	30	0.010	318	0.003	303	0.011	315	0.010	255	0.004	264	0.005	269
DCP 7	.400	0.008	314	0.009	277	0.009	353	0.009	246	0.005	99	0.007	313	0.005	259	0.004	217	0.004	170
DCP 8	.500	0.004	342	0.011	321	0.011	281	0.007	222	0.001	190	0.005	234	0.007	263	0.010	225	0.006	151
DCP 9	.600	0.008	216	0.004	150	0.002	15	0.003	170	0.005	51	0.006	309	0.006	233	0.007	148	0.007	47
DCP10	.878	0.002	260	0.000	316	0.001	336	0.003	88	0.004	1	0.004	315	0.003	195	0.004	55	0.004	339

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	16.00	0.600	9.99	4.13		5373.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.041	649.4	1451.9	0.63E 07	-0.00154	1.134	12.12	0.1010

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		9.895	4.130	359	0.187	4	0.097	187	0.054	242	0.018	331	0.017	281	0.054	218	0.015	275	0.015	122
CN		0.980	0.156	26	0.056	91	0.018	193	0.010	265	0.004	224	0.005	345	0.008	289	0.003	1	0.001	299
CM		-0.031	0.039	197	0.004	124	0.005	191	0.000	226	0.001	162	0.001	104	0.001	34	0.000	317	0.001	4
DCP 1	.010	2.592	0.924	358	0.118	69	0.024	141	0.027	242	0.013	257	0.012	256	0.015	191	0.009	285	0.003	153
DCP 2	.025	2.738	0.750	12	0.090	95	0.026	172	0.054	308	0.016	274	0.005	27	0.016	316	0.012	352	0.009	236
DCP 3	.100	2.603	0.354	174	0.225	93	0.150	209	0.030	207	0.039	208	0.014	84	0.026	323	0.007	289	0.011	34
DCP 4	.200	1.598	0.133	135	0.056	130	0.092	214	0.063	299	0.021	59	0.024	69	0.022	327	0.013	77	0.005	219
DCP 5	.250	1.456	0.189	43	0.196	81	0.110	158	0.055	230	0.015	314	0.027	324	0.026	271	0.018	20	0.008	113
DCP 6	.300	1.171	0.239	34	0.162	112	0.053	167	0.024	239	0.034	214	0.038	325	0.027	325	0.012	6	0.013	343
DCP 7	.400	0.889	0.249	16	0.076	72	0.012	24	0.027	86	0.015	98	0.012	324	0.015	198	0.010	298	0.010	217
DCP 8	.500	0.695	0.214	25	0.031	108	0.025	52	0.010	152	0.002	97	0.008	204	0.008	259	0.004	173	0.007	289
DCP 9	.600	0.519	0.190	13	0.007	340	0.017	340	0.009	262	0.006	312	0.005	291	0.007	218	0.002	322	0.006	151
DCP10	.878	0.300	0.179	18	0.020	321	0.013	0	0.005	317	0.004	277	0.001	29	0.003	280	0.003	118	0.003	181

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.007	274	0.009	255	0.002	351	0.009	32	0.008	254	0.004	320	0.003	347	0.001	288	0.004	56
CN		0.001	267	0.000	226	0.001	325	0.001	232	0.002	33	0.004	285	0.002	313	0.002	289	0.001	144
CM		0.001	246	0.000	317	0.001	278	0.000	309	0.000	234	0.001	78	0.000	90	0.001	10	0.000	307
DCP 1	.010	0.003	294	0.000	328	0.002	223	0.004	40	0.001	151	0.002	283	0.001	354	0.002	243	0.001	351
DCP 2	.025	0.001	96	0.005	281	0.008	296	0.006	236	0.000	133	0.003	274	0.005	267	0.003	213	0.004	139
DCP 3	.100	0.013	283	0.010	92	0.014	334	0.003	270	0.012	353	0.011	283	0.008	20	0.0[illegible]	327	0.006	226
DCP 4	.200	0.010	232	0.010	268	0.004	287	0.009	284	0.002	14	0.009	345	0.009	334	0.010	341	0.001	92
DCP 5	.250	0.003	218	0.002	358	0.011	228	0.009	92	0.003	357	0.003	292	0.004	146	0.007	32	0.005	269
DCP 6	.300	0.009	127	0.004	219	0.005	153	0.021	251	0.014	184	0.010	276	0.007	271	0.005	276	0.004	35
DCP 7	.400	0.003	259	0.006	300	0.007	188	0.009	90	0.008	56	0.006	319	0.007	105	0.005	358	0.003	58
DCP 8	.500	0.002	210	0.003	148	0.004	57	0.007	182	0.006	124	0.008	192	0.005	217	0.014	192	0.008	130
DCP 9	.600	0.005	22	0.002	278	0.004	92	0.005	23	0.004	340	0.003	331	0.002	305	0.000	347	0.001	313
DCP10	.878	0.003	75	0.004	114	0.002	22	0.003	192	0.002	42	0.004	257	0.003	303	0.004	207	0.003	150

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	16.08	0.600	9.92	4.18		5073.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EX DAMPING
0.042	646.6	1447.3	0.63E 07	-0.00149	1.155	13.31	0.0720

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		9.924	4.177	0	0.189	5	0.105	195	0.077	241	0.033	335	0.050	169	0.072	236	0.020	206	0.007	160
CN		0.985	0.169	24	0.060	92	0.023	293	0.012	256	0.006	258	0.004	195	0.010	306	0.003	34	0.005	296
CM		-0.037	0.039	196	0.004	122	0.004	190	0.001	305	0.001	157	0.000	102	0.001	91	0.000	359	0.002	106
DCP 1	.010	2.587	0.933	358	0.119	71	0.027	140	0.035	234	0.011	272	0.022	164	0.020	197	0.004	63	0.006	202
DCP 2	.025	2.737	0.761	12	0.114	35	0.012	155	0.054	289	0.014	265	0.007	234	0.028	299	0.010	290	0.016	263
DCP 3	.100	2.636	0.293	176	0.249	96	0.146	212	0.025	227	0.038	223	0.013	132	0.018	343	0.020	0	0.008	317
DCP 4	.200	1.554	0.119	125	0.074	171	0.096	227	0.086	297	0.024	66	0.019	122	0.029	14	0.013	69	0.005	97
DCP 5	.250	1.423	0.186	37	0.198	82	0.125	155	0.054	233	0.008	253	0.019	198	0.020	288	0.012	45	0.012	54
DCP 6	.300	1.166	0.260	36	0.149	107	0.066	191	0.026	190	0.039	242	0.022	297	0.025	351	0.020	16	0.017	30
DCP 7	.400	0.892	0.279	16	0.057	68	0.027	38	0.017	59	0.007	76	0.001	155	0.022	246	0.016	152	0.012	255
DCP 8	.500	0.648	0.219	26	0.032	104	0.012	59	0.014	198	0.012	233	0.016	196	0.015	300	0.010	246	0.013	320
DCP 9	.600	0.526	0.196	12	0.009	280	0.006	324	0.035	159	0.010	344	0.007	229	0.009	229	0.005	162	0.008	203
DCP10	.878	0.354	0.178	16	0.013	0	0.011	325	0.014	277	0.006	314	0.004	20	0.008	316	0.003	357	0.011	300

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.006	260	0.005	328	0.006	301	0.002	309	0.003	146	0.003	243	0.004	16	0.004	297	0.004	28
CN		0.002	209	0.003	164	0.003	126	0.003	152	0.003	147	0.002	93	0.001	340	0.002	26	0.003	342
CM		0.001	35	0.000	335	0.001	315	0.001	258	0.000	191	0.000	187	0.001	110	0.001	198	0.001	107
DCP 1	.010	0.002	208	0.005	100	0.001	93	0.004	210	0.004	277	0.002	86	0.003	118	0.002	211	0.002	281
DCP 2	.025	0.006	189	0.006	132	0.011	30	0.010	350	0.003	218	0.004	112	0.005	10	0.002	46	0.004	15
DCP 3	.100	0.007	346	0.010	166	0.010	106	0.008	150	0.017	134	0.015	107	0.015	54	0.009	27	0.014	39
DCP 4	.200	0.001	268	0.003	215	0.008	274	0.007	196	0.008	173	0.008	110	0.004	26	0.008	50	0.007	316
DCP 5	.250	0.006	194	0.006	334	0.011	154	0.007	253	0.010	204	0.001	220	0.004	249	0.016	237	0.010	144
DCP 6	.300	0.010	40	0.008	156	0.008	169	0.015	183	0.013	194	0.005	233	0.007	236	0.006	343	0.006	348
DCP 7	.400	0.005	140	0.008	201	0.002	57	0.007	201	0.005	98	0.001	334	0.005	254	0.008	180	0.001	12
DCP 8	.500	0.009	271	0.003	179	0.005	116	0.012	121	0.012	70	0.004	30	0.004	275	0.004	168	0.004	1
DCP 9	.600	0.007	119	0.004	119	0.002	225	0.003	99	0.003	306	0.001	266	0.002	196	0.004	51	0.005	334
DCP10	.878	0.009	235	0.001	191	0.004	112	0.004	24	0.001	173	0.004	57	0.004	346	0.008	9	0.006	273

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	15.90	0.600	9.96	4.24		5073.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.041	645.7	1444.1	0.63E 07	-0.00158	1.138	12.03	0.0250

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		9.956	4.239	0	0.196	23	0.096	197	0.050	263	0.007	190	0.139	259	0.081	211	0.044	213	0.014	146
CN		0.989	0.167	24	0.054	98	0.024	210	0.015	187	0.008	259	0.004	318	0.007	301	0.001	333	0.002	88
CM		-0.038	0.037	199	0.005	125	0.003	198	0.001	330	0.001	71	0.000	78	0.002	52	0.000	287	0.001	157
DCP 1	.010	2.584	0.947	357	0.105	70	0.024	148	0.027	245	0.014	201	0.027	223	0.015	191	0.012	196	0.005	208
DCP 2	.025	2.751	0.788	14	0.076	97	0.021	191	0.037	310	0.028	272	0.023	299	0.011	299	0.014	346	0.010	304
DCP 3	.100	2.644	0.293	181	0.262	105	0.129	216	0.038	157	0.020	240	0.008	83	0.027	352	0.013	256	0.016	135
DCP 4	.200	1.561	0.195	124	0.073	146	0.093	231	0.046	313	0.029	44	0.019	37	0.016	352	0.013	141	0.007	141
DCP 5	.250	1.425	0.218	32	0.196	85	0.191	157	0.028	272	0.011	250	0.026	259	0.030	301	0.009	275	0.008	110
DCP 6	.300	1.176	0.259	35	0.141	113	0.069	198	0.027	163	0.034	252	0.034	345	0.024	359	0.022	17	0.012	52
DCP 7	.400	0.884	0.263	15	0.064	73	0.013	21	0.032	92	0.007	163	0.004	157	0.017	206	0.011	209	0.004	255
DCP 8	.500	0.635	0.219	31	0.025	60	0.007	85	0.010	138	0.008	266	0.004	[illegible]	0.008	325	0.013	4	0.010	351
DCP 9	.600	0.523	0.193	13	0.018	275	0.008	319	0.005	252	0.010	262	0.005	[illegible]	0.012	200	0.006	185	0.007	133
DCP10	.878	0.370	0.168	19	0.013	336	0.007	355	0.004	210	0.005	250	0.001	355	0.007	284	0.003	82	0.005	317

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.022	262	0.017	287	0.010	241	0.006	51	0.007	279	0.003	258	0.003	342	0.008	3	0.005	245
CN		0.002	221	0.002	205	0.005	180	0.002	43	0.003	227	0.002	97	0.001	70	0.001	59	0.002	63
CM		0.001	83	0.000	326	0.000	15	0.001	189	0.001	86	0.001	176	0.001	61	0.001	254	0.000	139
DCP 1	.010	0.001	189	0.002	119	0.003	324	0.003	155	0.002	184	0.002	65	0.001	105	0.001	138	0.001	98
DCP 2	.025	0.005	238	0.001	65	0.003	114	0.003	345	0.001	281	0.002	297	0.000	167	0.002	220	0.000	184
DCP 3	.100	0.013	115	0.004	154	0.018	167	0.010	95	0.008	270	0.017	158	0.011	62	0.007	203	0.017	88
DCP 4	.200	0.011	193	0.011	245	0.013	172	0.006	14	0.011	188	0.017	114	0.016	54	0.006	252	0.009	82
DCP 5	.250	0.003	327	0.007	80	0.006	351	0.005	180	0.003	159	0.005	326	0.009	239	0.008	172	0.003	232
DCP 6	.300	0.008	149	0.009	181	0.013	168	0.005	272	0.007	152	0.012	66	0.022	27	0.011	330	0.003	301
DCP 7	.400	0.017	294	0.013	267	0.011	269	0.006	247	0.007	237	0.003	297	0.012	190	0.010	78	0.002	19
DCP 8	.500	0.007	355	0.003	136	0.004	137	0.008	119	0.005	25	0.002	129	0.006	359	0.007	279	0.003	222
DCP 9	.600	0.004	192	0.005	30	0.007	194	0.003	15	0.007	198	0.001	77	0.009	160	0.010	51	0.003	322
DCP10	.878	0.004	245	0.004	165	0.002	97	0.006	10	0.005	303	0.005	352	0.008	275	0.004	149	0.002	40

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	15.10	0.600	12.32	4.15		5076.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.041	650.1	1452.3	0.63E 07	-0.00237	1.173	14.83	0.1010

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		12.317	4.150	359	0.175	357	0.040	193	0.010	237	0.023	290	0.035	99	0.025	156	0.018	43	0.019	103
CN		1.053	0.102	41	0.031	89	0.016	180	0.035	327	0.002	166	0.032	210	0.002	249	0.005	176	0.001	61
CM		-0.051	0.041	293	0.006	262	0.000	127	0.001	358	0.001	20	0.001	334	0.001	45	0.001	286	0.000	283
DCP 1	.010	2.912	0.664	359	0.159	76	0.039	4	0.036	241	0.011	40	0.025	16	0.009	313	0.010	216	0.006	134
DCP 2	.025	3.009	0.513	20	0.165	122	0.055	78	0.038	82	0.012	44	0.015	224	0.009	243	0.008	29	0.010	296
DCP 3	.100	2.534	0.534	188	0.044	355	0.036	196	0.071	339	0.020	131	0.010	52	0.021	49	0.005	343	0.007	113
DCP 4	.150	1.906	0.177	155	0.019	54	0.033	196	0.014	199	0.013	190	0.011	182	0.002	128	0.015	127	0.012	315
DCP 5	.200	1.622	0.136	170	0.017	289	0.024	40	0.005	355	0.009	79	0.010	291	0.014	351	0.013	171	0.015	13
DCP 6	.250	1.573	0.144	125	0.015	46	0.029	190	0.008	83	0.012	302	0.008	153	0.013	152	0.012	45	0.003	239
DCP 7	.300	1.300	0.094	103	0.033	151	0.020	238	0.015	319	0.016	40	0.017	248	0.019	299	0.012	134	0.007	29
DCP 8	.400	0.998	0.189	25	0.057	70	0.018	170	0.004	303	0.008	337	0.011	347	0.010	131	0.007	358	0.009	146
DCP 9	.500	0.814	0.185	43	0.061	198	0.025	215	0.008	209	0.009	179	0.008	146	0.013	246	0.015	167	0.013	185
DCP10	.600	0.595	0.205	14	0.024	57	0.012	345	0.005	309	0.003	234	0.005	248	0.005	204	0.007	61	0.002	27
DCP11	.878	0.385	0.177	27	0.031	90	0.006	83	0.003	120	0.008	180	0.006	135	0.003	247	0.006	178	0.003	18

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.008	230	0.006	261	0.003	122	0.009	67	0.001	251	0.008	147	0.006	126	0.002	214	0.005	184
CN		0.003	214	0.001	245	0.003	327	0.003	5	0.004	259	0.001	77	0.002	207	0.002	283	0.000	218
CM		0.001	215	0.001	74	0.000	112	0.001	117	0.001	30	0.000	160	0.001	42	0.001	66	0.000	122
DCP 1	.010	0.002	76	0.010	199	0.005	93	0.012	15	0.002	295	0.002	337	0.005	203	0.005	214	0.005	153
DCP 2	.025	0.007	190	0.006	85	0.002	34	0.001	232	0.005	164	0.004	134	0.006	116	0.005	51	0.005	108
DCP 3	.100	0.003	230	0.019	143	0.018	356	0.015	34	0.018	328	0.004	156	0.007	280	0.003	335	0.004	147
DCP 4	.150	0.011	144	0.019	347	0.003	86	0.006	345	0.009	357	0.009	309	0.005	236	0.012	59	0.014	296
DCP 5	.200	0.014	232	0.011	64	0.017	352	0.007	0	0.011	333	0.013	72	0.004	334	0.008	133	0.002	2
DCP 6	.250	0.006	234	0.003	349	0.008	342	0.006	135	0.007	37	0.003	332	0.008	151	0.005	8	0.007	205
DCP 7	.300	0.006	227	0.013	67	0.008	341	0.008	359	0.015	247	0.007	149	0.005	1	0.002	170	0.002	346
DCP 8	.400	0.003	167	0.012	251	0.012	250	0.016	105	0.007	279	0.002	76	0.003	69	0.009	331	0.008	73
DCP 9	.500	0.010	144	0.009	227	0.005	174	0.007	295	0.014	200	0.003	122	0.003	217	0.007	297	0.004	333
DCP10	.600	0.006	331	0.008	270	0.004	185	0.005	6	0.007	217	0.001	90	0.008	159	0.003	260	0.007	183
DCP11	.878	0.006	40	0.001	156	0.006	353	0.007	285	0.000	340	0.003	318	0.006	260	0.004	213	0.003	339

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	16.05	0.600	12.27	4.21		5374.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.041	646.8	1445.9	0.63E 07	-0.00190	1.161	15.50	0.0690

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		12.275	4.205	359	0.195	11	0.057	210	0.027	196	0.011	90	0.018	13	0.070	135	0.035	91	0.016	254
CN		1.041	0.194	39	0.018	83	0.006	216	0.005	344	0.002	374	0.002	177	0.005	159	0.003	54	0.002	275
CM		-0.055	0.042	198	0.003	245	0.001	293	0.001	321	0.001	50	0.000	34	0.000	245	0.000	205	0.001	116
DCP 1	.010	2.929	0.704	359	0.129	79	0.040	17	0.009	340	0.014	291	0.007	87	0.020	93	0.006	28	0.007	190
DCP 2	.025	3.015	0.522	20	0.152	113	0.047	49	0.012	196	0.012	95	0.014	237	0.020	206	0.008	25	0.016	338
DCP 3	.100	2.526	0.556	188	0.070	316	0.077	236	0.077	350	0.026	20	0.015	51	0.015	134	0.003	322	0.009	241
DCP 4	.150	1.827	0.167	146	0.019	173	0.023	236	0.037	199	0.008	167	0.007	163	0.019	174	0.012	237	0.012	195
DCP 5	.200	1.521	0.156	161	0.032	291	0.018	10	0.010	27	0.007	39	0.012	243	0.011	238	0.008	342	0.008	254
DCP 6	.250	1.491	0.154	125	0.027	137	0.017	205	0.019	211	0.006	253	0.008	28	0.027	150	0.010	112	0.034	314
DCP 7	.300	1.302	0.119	98	0.023	133	0.022	272	0.022	335	0.009	349	0.021	177	0.009	266	0.011	7	0.009	110
DCP 8	.400	0.983	0.186	20	0.051	67	0.043	156	0.038	175	0.006	214	0.001	98	0.016	117	0.021	125	0.006	99
DCP 9	.500	0.736	0.207	36	0.026	96	0.023	229	0.035	167	0.016	313	0.004	273	0.010	349	0.006	340	0.010	44
DCP10	.600	0.602	0.204	9	0.012	52	0.009	38	0.011	353	0.006	233	0.005	103	0.010	139	0.014	72	0.007	282
DCP11	.878	0.426	0.180	22	0.014	78	0.003	36	0.007	143	0.004	180	0.003	250	0.004	270	0.007	285	0.005	268

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.020	272	0.011	201	0.009	267	0.009	297	0.008	244	0.003	329	0.009	276	0.009	323	0.005	301
CN		0.003	6	0.002	346	0.003	18	0.004	14	0.002	59	0.004	72	0.002	63	0.003	44	0.001	55
CM		0.001	206	0.001	133	0.001	192	0.001	144	0.001	268	0.002	217	0.001	201	0.001	248	0.002	236
DCP 1	.010	0.002	251	0.003	67	0.006	184	0.006	37	0.004	304	0.005	199	0.002	121	0.002	322	0.005	154
DCP 2	.025	0.005	142	0.014	30	0.005	4	0.006	55	0.010	59	0.006	55	0.004	97	0.008	48	0.004	287
DCP 3	.100	0.014	251	0.010	129	0.011	51	0.024	42	0.016	320	0.018	164	0.010	125	0.004	335	0.024	253
DCP 4	.150	0.012	150	0.014	192	0.007	0	0.010	244	0.002	128	0.011	191	0.005	153	0.005	79	0.005	317
DCP 5	.200	0.017	301	0.003	1	0.003	250	0.009	26	0.006	308	0.004	155	0.005	249	0.004	145	0.009	226
DCP 6	.250	0.009	81	0.014	90	0.009	83	0.009	72	0.001	191	0.005	141	0.001	37	0.004	57	0.003	183
DCP 7	.300	0.011	282	0.011	277	0.004	300	0.005	3	0.002	143	0.005	13	0.004	290	0.011	13	0.003	81
DCP 8	.400	0.008	55	0.009	8	0.004	93	0.009	55	0.002	6	0.004	88	0.003	142	0.004	5	0.004	207
DCP 9	.500	0.015	64	0.012	29	0.005	1	0.004	337	0.008	152	0.007	63	0.006	52	0.004	21	0.012	62
DCP10	.600	0.006	327	0.006	227	0.005	232	0.004	183	0.008	126	0.009	35	0.005	125	0.001	78	0.006	113
DCP11	.878	0.004	32	0.007	317	0.007	35	0.011	335	0.006	26	0.008	43	0.010	8	0.005	76	0.008	28

TUNED PITCHING OSCILLATION VERTOL 23010-1.59 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	15.72	0.600	12.33	4.24		5074.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.041	645.9	1442.2	0.63E 07	-0.00215	1.164	11.90	0.0250

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		12.327	4.242	359	0.195	16	0.060	198	0.027	213	0.018	14	0.062	326	0.081	171	0.014	251	0.010	206
CN		1.055	0.109	39	0.025	104	0.005	144	0.003	20	0.004	37	0.004	162	0.005	172	0.004	71	0.002	108
CM		-0.059	0.042	201	0.004	281	0.001	208	0.001	43	0.002	67	0.001	59	0.001	40	0.001	175	0.001	358
DCP 1	.010	2.943	0.714	358	0.121	71	0.029	1	0.012	150	0.007	4	0.012	24	0.017	149	0.005	347	0.008	229
DCP 2	.025	3.024	0.517	17	0.170	127	0.037	87	0.031	142	0.030	64	0.014	260	0.009	257	0.026	16	0.030	330
DCP 3	.100	2.565	0.536	182	0.054	353	0.075	206	0.068	357	0.016	111	0.028	151	0.052	130	0.023	95	0.017	109
DCP 4	.150	1.367	0.143	138	0.014	201	0.017	138	0.013	143	0.016	52	0.034	172	0.010	197	0.012	161	0.014	245
DCP 5	.200	1.524	0.162	169	0.005	17	0.044	24	0.034	39	0.017	42	0.015	124	0.022	39	0.009	144	0.011	86
DCP 6	.250	1.529	0.154	112	0.022	138	0.011	108	0.016	213	0.013	322	0.017	83	0.020	213	0.003	94	0.006	146
DCP 7	.300	1.311	0.080	98	0.039	152	0.009	291	0.021	4	0.031	43	0.013	173	0.022	336	0.009	69	0.016	58
DCP 8	.400	0.990	0.194	23	0.056	63	0.020	132	0.015	205	0.009	287	0.019	356	0.012	179	0.008	120	0.001	145
DCP 9	.500	0.740	0.204	39	0.060	133	0.030	180	0.015	183	0.012	32	0.016	298	0.016	272	0.004	143	0.009	146
DCP10	.600	0.600	0.207	12	0.011	52	0.008	12	0.004	39	0.005	208	0.006	151	0.011	138	0.005	357	0.003	165
DCP11	.878	0.457	0.177	25	0.023	107	0.005	20	0.005	245	0.009	239	0.007	192	0.006	218	0.004	12	0.002	267

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.014	277	0.020	256	0.011	323	0.012	304	0.003	337	0.005	330	0.009	340	0.005	317	0.004	289
CN		0.001	258	0.004	291	0.001	114	0.003	188	0.001	103	0.001	58	0.002	180	0.002	7	0.004	235
CM		0.001	132	0.001	30	0.001	147	0.001	82	0.000	149	0.002	178	0.001	129	0.002	156	0.000	68
DCP 1	.010	0.011	232	0.006	124	0.005	55	0.006	326	0.003	244	0.005	33	0.006	322	0.003	304	0.003	156
DCP 2	.025	0.013	330	0.009	308	0.005	329	0.004	320	0.002	50	0.003	71	0.001	123	0.006	86	0.005	81
DCP 3	.100	0.019	158	0.023	172	0.025	165	0.029	177	0.006	134	0.030	234	0.020	215	0.019	238	0.022	246
DCP 4	.150	0.007	229	0.002	25	0.005	252	0.001	46	0.012	153	0.002	47	0.008	330	0.002	71	0.003	26
DCP 5	.200	0.005	206	0.015	178	0.018	119	0.014	132	0.016	108	0.018	150	0.013	137	0.010	142	0.018	241
DCP 6	.250	0.006	189	0.012	47	0.007	289	0.004	278	0.004	120	0.012	117	0.006	182	0.009	108	0.006	190
DCP 7	.300	0.003	233	0.014	201	0.018	96	0.011	95	0.010	45	0.012	92	0.006	122	0.017	121	0.011	222
DCP 8	.400	0.014	85	0.007	345	0.005	9	0.004	105	0.011	332	0.008	91	0.014	111	0.009	75	0.003	347
DCP 9	.500	0.001	63	0.009	196	0.007	290	0.009	252	0.009	246	0.007	339	0.015	268	0.005	323	0.007	201
DCP10	.600	0.010	359	0.007	274	0.004	149	0.007	41	0.005	254	0.002	127	0.011	97	0.005	340	0.001	112
DCP11	.878	0.008	256	0.005	160	0.009	324	0.011	242	0.005	85	0.011	343	0.010	290	0.010	324	0.003	265

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	15.92	0.600	14.77	4.21		5375.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.041	650.7	1451.9	0.63E 07	-0.00207	1.181	15.25	0.1010

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		14.772	4.213	0	0.201	0	0.068	240	0.070	282	0.028	251	0.096	293	0.039	66	0.043	13	0.081	290
CN		1.078	0.067	61	0.022	89	0.038	172	0.037	168	0.034	10	0.034	252	0.006	58	0.002	5	0.007	310
CM		-0.074	0.035	205	0.003	236	0.002	359	0.030	332	0.000	278	0.001	206	0.001	108	0.001	143	0.002	97
DCP 1	.010	3.147	0.403	358	0.184	93	0.022	30	0.004	202	0.006	204	0.022	276	0.007	279	0.026	167	0.031	136
DCP 2	.025	3.098	0.161	19	0.247	113	0.033	336	0.036	147	0.021	340	0.032	298	0.038	108	0.022	17	0.017	323
DCP 3	.100	2.324	0.490	181	0.095	316	0.072	69	0.027	229	0.046	29	0.028	240	0.031	18	0.027	328	0.017	10
DCP 4	.150	1.799	0.137	139	0.042	230	0.025	157	0.035	25	0.023	207	0.024	161	0.050	105	0.028	139	0.010	76
DCP 5	.200	1.448	0.136	164	0.031	72	0.008	31	0.022	173	0.014	338	0.016	299	0.019	45	0.003	63	0.011	77
DCP 6	.250	1.494	0.120	121	0.039	196	0.019	133	0.013	134	0.008	148	0.020	146	0.035	123	0.029	127	0.015	232
DCP 7	.300	1.307	0.082	126	0.026	93	0.012	353	0.036	159	0.016	308	0.011	233	0.016	86	0.006	225	0.011	36
DCP 8	.400	1.073	0.107	39	0.030	52	0.004	156	0.018	161	0.003	192	0.006	152	0.013	44	0.011	123	0.022	313
DCP 9	.500	0.851	0.128	48	0.017	120	0.015	69	0.015	341	0.007	243	0.015	304	0.016	305	0.017	289	0.010	334
DCP10	.600	0.679	0.154	23	0.026	67	0.009	197	0.010	142	0.010	63	0.007	9	0.002	326	0.008	4	0.019	258
DCP11	.878	0.491	0.146	27	0.021	73	0.009	151	0.004	197	0.002	35	0.012	21	0.004	283	0.005	324	0.004	304

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.035	328	0.035	17	0.043	349	0.039	357	0.033	21	0.030	30	0.026	10	0.027	21	0.023	36
CN		0.002	164	0.005	353	0.002	125	0.001	10	0.000	38	0.003	63	0.003	294	0.002	123	0.002	37
CM		0.001	311	0.001	104	0.001	36	0.000	198	0.000	141	0.001	270	0.001	113	0.001	263	0.001	203
DCP 1	.010	0.030	28	0.013	271	0.019	90	0.014	353	0.007	18	0.008	38	0.004	315	0.006	121	0.011	79
DCP 2	.025	0.005	273	0.012	27	0.019	336	0.018	277	0.014	192	0.007	335	0.008	39	0.010	39	0.016	344
DCP 3	.100	0.014	270	0.039	15	0.004	125	0.001	170	0.008	15	0.020	17	0.006	312	0.013	288	0.009	211
DCP 4	.150	0.008	181	0.008	141	0.027	125	0.015	148	0.014	190	0.018	238	0.013	152	0.025	176	0.016	240
DCP 5	.200	0.006	198	0.017	64	0.018	156	0.007	61	0.009	332	0.011	126	0.011	173	0.015	241	0.011	180
DCP 6	.250	0.012	146	0.004	159	0.011	135	0.019	39	0.008	226	0.011	301	0.007	0	0.010	159	0.012	142
DCP 7	.300	0.013	192	0.012	47	0.007	133	0.006	87	0.006	239	0.006	205	0.008	140	0.020	249	0.004	100
DCP 8	.400	0.005	157	0.007	150	0.006	21	0.016	315	0.013	137	0.006	271	0.005	308	0.007	17	0.014	101
DCP 9	.500	0.006	257	0.002	298	0.006	48	0.005	78	0.007	227	0.001	277	0.008	354	0.011	125	0.010	27
DCP10	.600	0.010	68	0.019	309	0.010	292	0.009	185	0.006	27	0.018	80	0.015	284	0.013	42	0.010	354
DCP11	.878	0.005	183	0.003	282	0.008	170	0.005	2	0.004	311	0.002	38	0.002	298	0.005	126	0.002	20

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	15.87	0.600	14.79	4.26		5375.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.041	647.9	1447.1	0.63E 07	-0.00147	1.199	16.01	0.0720

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		14.789	4.261	0	0.115	359	0.100	246	0.108	274	0.059	300	0.102	309	0.028	332	0.116	284	0.057	292
CN		1.073	0.070	65	0.031	77	0.008	67	0.010	123	0.003	246	0.008	209	0.004	359	0.017	337	0.003	189
CM		-0.080	0.038	199	0.002	196	0.003	356	0.002	334	0.002	16	0.002	27	0.001	221	0.004	99	0.001	81
DCP 1	.010	3.166	0.450	355	0.158	92	0.038	92	0.022	54	0.008	329	0.010	218	0.020	6	0.033	272	0.018	242
DCP 2	.025	3.074	0.124	51	0.321	172	0.038	59	0.030	69	0.044	270	0.044	190	0.035	123	0.022	39	0.024	17
DCP 3	.100	2.297	0.549	179	0.080	304	0.060	49	0.023	253	0.005	266	0.033	235	0.029	343	0.022	0	0.027	123
DCP 4	.150	1.735	0.184	140	0.025	54	0.052	319	0.017	59	0.026	32	0.028	34	0.025	320	0.013	6	0.016	197
DCP 5	.200	1.419	0.143	160	0.034	56	0.012	4	0.011	139	0.007	7	0.006	247	0.017	342	0.016	10	0.014	127
DCP 6	.250	1.433	0.164	127	0.009	53	0.023	302	0.029	98	0.018	357	0.020	331	0.014	287	0.033	337	0.015	266
DCP 7	.300	1.299	0.105	108	0.041	92	0.012	16	0.025	123	0.007	120	0.002	123	0.014	293	0.018	352	0.018	96
DCP 8	.400	1.067	0.108	49	0.042	52	0.025	113	0.025	156	0.004	109	0.019	231	0.004	223	0.042	390	0.014	228
DCP 9	.500	0.810	0.138	43	0.027	94	0.005	24	0.012	148	0.013	149	0.007	102	0.013	209	0.014	311	0.017	19
DCP10	.600	0.685	0.162	13	0.032	65	0.021	130	0.017	96	0.009	241	0.020	165	0.019	69	0.028	278	0.023	213
DCP11	.878	0.539	0.155	22	0.005	54	0.008	213	0.008	214	0.008	216	0.011	251	0.005	318	0.012	279	0.006	356

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.039	316	0.050	337	0.045	345	0.048	357	0.040	9	0.024	14	0.026	356	0.021	2	0.025	22
CN		0.004	321	0.003	323	0.006	223	0.003	136	0.003	209	0.002	233	0.006	301	0.001	6	0.004	284
CM		0.001	73	0.002	99	0.002	15	0.001	351	0.001	22	0.001	60	0.003	82	0.001	229	0.001	44
DCP 1	.010	0.011	187	0.011	69	0.014	39	0.018	19	0.007	305	0.006	136	0.016	45	0.022	3	0.020	306
DCP 2	.025	0.013	28	0.019	5	0.010	292	0.033	335	0.007	298	0.012	221	0.002	78	0.004	353	0.004	346
DCP 3	.100	0.025	350	0.011	331	0.034	262	0.006	193	0.006	289	0.012	320	0.013	22	0.005	208	0.012	312
DCP 4	.150	0.007	84	0.019	111	0.009	326	0.014	3	0.007	65	0.014	310	0.012	85	0.005	47	0.011	21
DCP 5	.200	0.014	317	0.001	263	0.009	219	0.015	273	0.006	323	0.006	276	0.013	32	0.011	257	0.015	295
DCP 6	.250	0.013	296	0.011	113	0.035	245	0.012	44	0.007	238	0.019	243	0.019	0	0.005	302	0.012	357
DCP 7	.300	0.009	5	0.005	285	0.016	149	0.010	97	0.006	66	0.003	91	0.006	80	0.002	122	0.005	26
DCP 8	.400	0.014	250	0.010	107	0.008	237	0.007	125	0.020	206	0.017	153	0.014	341	0.008	271	0.007	278
DCP 9	.500	0.003	301	0.003	249	0.011	58	0.003	274	0.003	163	0.007	21	0.006	253	0.016	24	0.004	313
DCP10	.600	0.010	90	0.014	318	0.014	196	0.015	133	0.006	134	0.011	120	0.016	263	0.008	147	0.007	192
DCP11	.878	0.011	272	0.008	264	0.009	224	0.005	252	0.007	235	0.012	277	0.013	260	0.005	9	0.008	244

TUNED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	16.00	0.600	14.83	4.37		5975.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.041	646.9	1444.1	0.63E 07	-0.00189	1.196	16.23	0.0250

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1 PHI	RES 2 PHI	RES 3 PHI	RES 4 PHI	RES 5 PHI	RES 6 PHI	RES 7 PHI	RES 8 PHI	RES 9 PHI
ALPHA		14.805	4.367 0	0.359 9	0.070 0	0.094 328	0.064 328	0.009 132	0.075 1	0.080 4	0.031 328
CN		1.082	0.067 53	0.036 83	0.011 31	0.039 189	0.003 87	0.006 161	0.001 159	0.008 24	0.004 285
CM		-0.082	0.039 201	0.005 216	0.001 3	0.002 49	0.001 99	0.003 314	0.001 288	0.002 214	0.001 92
DCP 1	.010	3.121	0.414 342	0.184 95	0.064 80	0.015 40	0.017 109	0.020 117	0.008 317	0.013 358	0.010 236
DCP 2	.025	3.147	0.293 5	0.246 119	0.052 144	0.061 117	0.018 28	0.024 298	0.029 249	0.017 219	0.016 178
DCP 3	.100	2.274	0.573 176	0.046 318	0.080 30	0.035 200	0.025 70	0.015 275	0.007 91	0.012 302	0.003 282
DCP 4	.150	1.757	0.126 171	0.065 139	0.044 3	0.039 20	0.015 122	0.010 304	0.031 79	0.028 75	0.000 214
DCP 5	.200	1.424	0.149 161	0.051 64	0.025 339	0.020 160	0.021 130	0.039 253	0.009 221	0.014 1	0.010 334
DCP 6	.250	1.477	0.133 130	0.041 114	0.019 355	0.012 1	0.016 94	0.003 156	0.007 86	0.012 71	0.002 232
DCP 7	.300	1.290	0.079 126	0.034 87	0.019 308	0.019 204	0.016 210	0.011 243	0.020 256	0.015 306	0.018 331
DCP 8	.400	1.067	0.136 39	0.061 64	0.028 38	0.028 229	0.009 105	0.018 119	0.009 325	0.008 40	0.007 279
DCP 9	.500	0.819	0.137 42	0.030 79	0.015 329	0.018 289	0.014 260	0.005 158	0.006 134	0.009 19	0.013 312
DCP10	.600	0.677	0.182 15	0.035 30	0.004 81	0.017 160	0.012 15	0.021 145	0.001 18	0.011 27	0.003 258
DCP11	.878	0.562	0.156 22	0.025 79	0.010 157	0.033 216	0.004 225	0.037 127	0.006 119	0.011 38	0.004 228

DATA TYPE	X/C	RES 10 PHI	RES 11 PHI	RES 12 PHI	RES 13 PHI	RES 14 PHI	RES 15 PHI	RES 16 PHI	RES 17 PHI	RES 18 PHI
ALPHA		0.039 328	0.050 340	0.027 338	0.027 312	0.029 316	0.021 321	0.026 316	0.025 333	0.021 298
CN		0.002 356	0.005 334	0.001 32	0.003 111	0.003 351	0.006 89	0.004 299	0.004 335	0.003 230
CM		0.001 174	0.001 100	0.000 40	0.000 116	0.001 159	0.002 208	0.001 131	0.002 102	0.001 347
DCP 1	.010	0.016 173	0.002 65	0.020 153	0.016 104	0.008 92	0.018 76	0.013 353	0.004 25	0.011 14
DCP 2	.025	0.019 102	0.014 39	0.013 28	0.007 20	0.009 225	0.009 100	0.003 347	0.003 199	0.014 7
DCP 3	.100	0.017 291	0.015 3	0.024 78	0.009 155	0.007 112	0.025 123	0.013 261	0.011 35	0.012 295
DCP 4	.150	0.005 76	0.024 92	0.014 223	0.032 66	0.011 183	0.008 15	0.011 74	0.008 54	0.016 240
DCP 5	.200	0.013 246	0.023 336	0.018 355	0.015 207	0.008 69	0.023 176	0.015 234	0.005 137	0.005 323
DCP 6	.250	0.014 66	0.006 239	0.006 212	0.010 112	0.007 56	0.004 174	0.007 53	0.006 155	0.017 227
DCP 7	.300	0.012 195	0.015 301	0.018 321	0.015 194	0.007 22	0.015 154	0.011 211	0.006 280	0.009 296
DCP 8	.400	0.003 87	0.007 65	0.011 180	0.004 127	0.008 347	0.018 145	0.009 316	0.004 294	0.011 151
DCP 9	.500	0.004 27	0.009 264	0.012 316	0.009 79	0.016 335	0.021 13	0.006 62	0.009 331	0.007 287
DCP10	.600	0.009 332	0.016 310	0.012 86	0.006 329	0.013 335	0.011 47	0.008 317	0.011 303	0.004 111
DCP11	.878	0.003 24	0.003 143	0.005 240	0.002 159	0.005 157	0.005 26	0.005 289	0.007 259	0.007 180

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	15.87	0.600	17.08	4.30		5076.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.041	647.1	1444.8	0.63E 07	-0.00211	1.175	14.64	0.0960

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		17.083	4.302	0	0.122	18	0.071	190	0.024	239	0.003	164	0.056	323	0.045	192	0.034	313	0.035	132
CN		1.076	0.056	90	0.022	83	0.014	234	0.005	168	0.005	259	0.001	252	0.003	79	0.005	307	0.004	105
CM		-0.101	0.016	270	0.003	260	0.001	151	0.001	10	0.000	165	0.002	85	0.001	334	0.003	95	0.002	13
DCP 1	.010	3.405	0.191	355	0.167	91	0.027	88	0.012	54	0.012	293	0.015	172	0.014	87	0.027	331	0.008	30
DCP 2	.025	2.878	0.566	191	0.206	107	0.115	252	0.023	230	0.021	358	0.021	84	0.047	43	0.022	55	0.011	47
DCP 3	.100	1.585	0.457	175	0.088	271	0.033	244	0.003	17	0.023	272	0.015	50	0.009	353	0.005	128	0.041	34
DCP 4	.150	1.610	0.236	158	0.049	32	0.032	155	0.031	157	0.017	200	0.013	140	0.010	200	0.014	40	0.014	171
DCP 5	.200	1.386	0.186	164	0.017	10	0.026	189	0.011	108	0.009	223	0.009	34	0.008	8	0.008	52	0.021	40
DCP 6	.250	1.367	0.179	135	0.007	73	0.028	151	0.020	170	0.027	196	0.012	226	0.008	227	0.014	8	0.019	188
DCP 7	.300	1.264	0.115	148	0.025	82	0.023	226	0.016	95	0.011	290	0.008	103	0.012	353	0.008	151	0.019	349
DCP 8	.400	1.091	0.097	86	0.023	71	0.021	193	0.009	314	0.015	178	0.013	256	0.008	125	0.015	318	0.025	143
DCP 9	.500	0.892	0.093	65	0.026	83	0.015	294	0.009	5	0.010	304	0.009	305	0.006	1	0.004	38	0.016	290
DCP 10	.600	0.791	0.132	24	0.025	58	0.006	286	0.002	141	0.009	304	0.004	125	0.018	154	0.024	264	0.023	121
DCP 11	.878	0.555	0.139	27	0.023	107	0.008	293	0.015	192	0.003	68	0.010	269	0.004	15	0.006	302	0.009	255

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.004	248	0.006	74	0.016	341	0.004	308	0.003	197	0.010	349	0.004	3	0.005	349	0.004	84
CN		0.001	311	0.003	105	0.002	253	0.002	126	0.003	250	0.004	131	0.003	182	0.002	349	0.003	47
CM		0.001	126	0.000	241	0.001	22	0.001	67	0.001	140	0.001	1	0.000	78	0.000	64	0.001	131
DCP 1	.010	0.009	78	0.013	304	0.005	223	0.011	61	0.007	264	0.001	135	0.003	44	0.002	308	0.004	43
DCP 2	.025	0.005	61	0.024	63	0.010	255	0.012	72	0.018	226	0.022	144	0.019	130	0.022	73	0.016	93
DCP 3	.100	0.027	154	0.014	182	0.007	285	0.010	155	0.006	220	0.004	135	0.007	222	0.015	339	0.007	51
DCP 4	.150	0.012	340	0.014	236	0.013	67	0.005	62	0.016	315	0.010	58	0.005	91	0.011	112	0.013	156
DCP 5	.200	0.020	128	0.006	117	0.003	340	0.011	95	0.009	118	0.012	72	0.017	133	0.008	290	0.015	93
DCP 6	.250	0.021	320	0.006	44	0.012	101	0.003	199	0.015	273	0.012	145	0.001	219	0.006	45	0.011	64
DCP 7	.300	0.010	151	0.001	351	0.011	301	0.006	51	0.007	144	0.005	359	0.017	152	0.014	254	0.012	86
DCP 8	.400	0.017	292	0.008	84	0.006	89	0.008	121	0.008	211	0.005	144	0.010	313	0.004	14	0.010	345
DCP 9	.500	0.008	7	0.004	96	0.017	238	0.005	328	0.002	253	0.007	267	0.005	191	0.008	246	0.007	22
DCP 10	.600	0.005	333	0.013	116	0.006	355	0.001	133	0.003	159	0.006	99	0.011	251	0.015	4	0.009	305
DCP 11	.878	0.002	215	0.006	305	0.007	183	0.007	242	0.008	320	0.006	181	0.004	86	0.007	177	0.002	143

TUNED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	15.97	0.600	17.13	4.37		5076.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.041	646.2	1443.6	0.63E 07	-0.00165	1.176	16.75	0.0570

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		17.129	4.373	359	0.248	14	0.059	150	0.023	205	0.050	67	0.007	302	0.059	311	0.010	48	0.003	346
CN		1.084	0.067	90	0.028	69	0.014	252	0.003	226	0.009	180	0.005	345	0.005	74	0.004	95	0.003	117
CM		-0.100	0.012	270	0.005	240	0.001	155	0.002	257	0.001	94	0.001	307	0.001	161	0.001	290	0.000	69
DCP 1	.010	3.255	0.025	207	0.260	93	0.030	68	0.016	106	0.016	155	0.016	46	0.014	284	0.011	90	0.013	75
DCP 2	.025	3.001	0.428	177	0.223	101	0.040	242	0.100	249	0.044	146	0.058	291	0.034	128	0.013	354	0.019	100
DCP 3	.100	2.063	0.415	172	0.120	276	0.055	279	0.029	273	0.047	181	0.026	37	0.029	123	0.009	244	0.014	117
DCP 4	.150	1.609	0.211	137	0.046	83	0.025	250	0.024	130	0.028	116	0.016	249	0.022	48	0.006	61	0.004	70
DCP 5	.200	1.369	0.147	154	0.043	341	0.039	223	0.018	259	0.016	164	0.013	32	0.021	112	0.009	190	0.012	127
DCP 6	.250	1.390	0.180	126	0.008	83	0.032	222	0.006	197	0.016	118	0.012	274	0.012	17	0.008	37	0.004	98
DCP 7	.300	1.261	0.117	123	0.027	13	0.033	212	0.017	267	0.008	181	0.016	31	0.014	96	0.003	138	0.002	123
DCP 8	.400	1.092	0.097	77	0.027	61	0.016	276	0.015	91	0.015	242	0.010	9	0.005	310	0.008	88	0.003	236
DCP 9	.500	0.878	0.113	67	0.038	86	0.005	311	0.013	103	0.008	301	0.005	330	0.013	30	0.009	91	0.006	36
DCP 10	.600	0.775	0.124	21	0.045	62	0.009	287	0.014	61	0.014	232	0.007	44	0.009	275	0.006	95	0.005	193
DCP 11	.878	0.612	0.134	22	0.024	75	0.002	291	0.003	211	0.005	120	0.005	204	0.007	44	0.003	131	0.000	153

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.002	316	0.012	326	0.005	115	0.003	312	0.007	349	0.004	180	0.005	139	0.008	193	0.006	12
CN		0.002	99	0.001	127	0.002	226	0.003	87	0.002	76	0.002	264	0.001	318	0.001	106	0.001	222
CM		0.001	266	0.001	154	0.001	267	0.001	124	0.001	305	0.001	118	0.000	139	0.001	124	0.001	85
DCP 1	.010	0.011	51	0.011	45	0.004	317	0.007	95	0.011	299	0.006	114	0.006	351	0.003	303	0.007	238
DCP 2	.025	0.027	313	0.008	177	0.030	266	0.029	128	0.029	330	0.023	218	0.006	192	0.011	161	0.010	99
DCP 3	.100	0.005	302	0.020	136	0.015	276	0.027	117	0.013	316	0.009	145	0.006	107	0.013	120	0.014	152
DCP 4	.150	0.007	85	0.004	173	0.011	166	0.014	20	0.010	135	0.011	31	0.009	8	0.006	323	0.005	335
DCP 5	.200	0.014	167	0.013	169	0.012	253	0.011	99	0.010	198	0.006	113	0.008	292	0.011	62	0.008	214
DCP 6	.250	0.002	139	0.009	39	0.015	163	0.015	343	0.017	88	0.002	301	0.010	321	0.005	277	0.006	345
DCP 7	.300	0.011	175	0.003	207	0.001	263	0.017	111	0.014	201	0.006	56	0.003	163	0.011	85	0.006	170
DCP 8	.400	0.002	14	0.002	70	0.012	131	0.010	299	0.010	68	0.004	41	0.005	298	0.000	329	0.003	35
DCP 9	.500	0.003	117	0.006	345	0.013	349	0.011	77	0.003	160	0.001	26	0.002	145	0.012	321	0.005	325
DCP 10	.600	0.005	152	0.002	250	0.004	163	0.007	261	0.009	32	0.008	254	0.003	138	0.010	188	0.004	263
DCP 11	.878	0.008	51	0.002	353	0.001	81	0.002	5	0.006	167	0.008	302	0.005	323	0.005	354	0.003	221

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	15.92	0.600	17.05	4.38		5076.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.041	645.6	1440.3	0.63E 07	-0.00134	1.218	15.83	0.0250

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		17.055	4.378	359	0.184	6	0.071	190	0.021	300	0.058	260	0.056	346	0.025	76	0.030	185	0.004	102
CN		1.099	0.065	90	0.028	69	0.015	186	0.008	143	0.007	132	0.006	336	0.007	142	0.008	219	0.003	109
CM		-0.103	0.010	270	0.005	262	0.001	87	0.002	346	0.002	344	0.000	48	0.003	303	0.000	104	0.003	311
DCP 1	.010	3.283	0.051	299	0.216	100	0.033	153	0.043	125	0.015	94	0.022	309	0.016	123	0.013	191	0.022	147
DCP 2	.025	3.048	0.351	171	0.200	73	0.103	211	0.014	104	0.023	307	0.028	348	0.030	278	0.033	167	0.036	334
DCP 3	.100	2.108	0.426	164	0.075	302	0.022	110	0.012	295	0.026	75	0.005	336	0.022	276	0.015	250	0.018	318
DCP 4	.150	1.627	0.209	152	0.024	9	0.028	188	0.030	90	0.006	237	0.031	344	0.013	108	0.023	225	0.009	168
DCP 5	.200	1.388	0.155	153	0.023	353	0.030	167	0.009	293	0.008	118	0.004	278	0.009	247	0.018	252	0.006	14
DCP 6	.250	1.358	0.173	128	0.026	250	0.022	125	0.023	127	0.020	114	0.012	339	0.017	91	0.020	206	0.003	199
DCP 7	.300	1.285	0.117	131	0.021	73	0.027	175	0.003	185	0.005	134	0.007	1	0.006	233	0.016	241	0.005	18
DCP 8	.400	1.091	0.110	80	0.031	109	0.022	164	0.016	115	0.030	125	0.004	46	0.025	108	0.005	155	0.009	71
DCP 9	.500	0.874	0.050	57	0.039	96	0.004	237	0.015	197	0.013	197	0.010	278	0.014	159	0.018	231	0.005	253
DCP 10	.600	0.786	0.131	20	0.038	66	0.012	204	0.014	158	0.007	118	0.002	348	0.016	147	0.002	206	0.014	135
DCP 11	.878	0.634	0.139	16	0.028	73	0.007	263	0.005	154	0.006	192	0.001	339	0.007	100	0.000	354	0.013	125

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.016	347	0.011	346	0.008	28	0.016	319	0.002	61	0.005	333	0.008	43	0.006	146	0.003	310
CN		0.004	334	0.002	177	0.003	209	0.004	301	0.003	212	0.003	221	0.003	69	0.002	324	0.002	67
CM		0.002	161	0.002	332	0.001	267	0.001	116	0.001	11	0.002	341	0.001	327	0.001	93	0.000	140
DCP 1	.010	0.008	69	0.007	153	0.010	127	0.009	106	0.013	61	0.001	181	0.012	129	0.009	91	0.014	72
DCP 2	.025	0.012	227	0.030	322	0.031	249	0.007	216	0.009	198	0.003	137	0.013	94	0.008	46	0.012	77
DCP 3	.100	0.016	155	0.031	299	0.025	259	0.017	264	0.016	327	0.010	253	0.019	357	0.006	29	0.007	289
DCP 4	.150	0.012	1	0.002	40	0.009	6	0.002	187	0.004	168	0.019	322	0.003	55	0.014	297	0.006	139
DCP 5	.200	0.011	137	0.006	250	0.007	278	0.005	244	0.012	243	0.012	249	0.014	351	0.011	68	0.002	80
DCP 6	.250	0.013	47	0.007	155	0.001	193	0.017	29	0.005	164	0.011	332	0.003	135	0.012	269	0.006	125
DCP 7	.300	0.001	213	0.006	229	0.007	254	0.004	285	0.009	239	0.008	294	0.006	356	0.012	47	0.012	89
DCP 8	.400	0.017	27	0.011	116	0.011	153	0.008	32	0.009	73	0.002	199	0.010	66	0.003	151	0.010	86
DCP 9	.500	0.004	216	0.005	69	0.013	161	0.003	236	0.002	3	0.003	157	0.003	340	0.008	341	0.004	77
DCP 10	.600	0.012	316	0.016	132	0.004	158	0.013	325	0.004	202	0.007	183	0.005	97	0.008	243	0.010	307
DCP 11	.878	0.009	344	0.008	203	0.007	42	0.005	213	0.008	198	0.008	157	0.008	157	0.003	325	0.003	137

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	16.16	0.600	24.35	4.45		5077.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.042	649.0	1451.2	0.63E 07	-0.00238	1.251	22.07	0.1010

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		24.346	4.451	0	0.178	54	0.081	248	0.054	260	0.079	312	0.074	320	0.084	345	0.060	344	0.051	358
CN		1.126	0.079	90	0.023	176	0.016	268	0.002	35	0.012	281	0.002	20	0.004	344	0.004	34	0.003	88
CM		-0.137	0.020	270	0.005	73	0.002	344	0.001	85	0.002	14	0.002	77	0.002	125	0.002	203	0.001	300
DCP 1	.010	2.672	0.862	168	0.042	320	0.016	19	0.024	54	0.022	240	0.015	167	0.013	253	0.027	256	0.033	284
DCP 2	.025	2.486	0.153	183	0.149	154	0.121	306	0.045	90	0.055	348	0.012	54	0.020	34	0.023	144	0.009	243
DCP 3	.100	1.890	0.070	30	0.055	122	0.054	324	0.035	94	0.047	317	0.031	77	0.015	79	0.013	135	0.006	327
DCP 4	.150	1.590	0.099	90	0.069	170	0.057	251	0.010	347	0.027	281	0.019	60	0.005	209	0.007	26	0.007	9
DCP 5	.200	1.485	0.103	52	0.029	108	0.020	292	0.011	62	0.019	277	0.010	41	0.008	56	0.008	318	0.008	95
DCP 6	.250	1.436	0.119	51	0.036	139	0.042	228	0.023	289	0.027	287	0.012	18	0.004	273	0.007	336	0.008	43
DCP 7	.300	1.255	0.117	55	0.020	147	0.019	246	0.006	94	0.014	281	0.008	103	0.002	261	0.006	26	0.006	83
DCP 8	.400	1.185	0.118	59	0.029	188	0.031	225	0.022	292	0.014	259	0.009	288	0.005	341	0.007	271	0.007	357
DCP 9	.500	1.032	0.114	63	0.022	221	0.007	237	0.003	344	0.008	266	0.010	36	0.004	147	0.010	35	0.010	142
DCP 10	.600	0.933	0.103	64	0.024	232	0.005	204	0.005	248	0.011	220	0.012	259	0.011	328	0.007	32	0.006	83
DCP 11	.878	0.708	0.085	78	0.017	230	0.003	217	0.001	182	0.006	200	0.006	241	0.006	305	0.011	31	0.005	144

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.053	0	0.042	30	0.029	16	0.038	19	0.025	52	0.017	44	0.019	43	0.019	34	0.028	28
CN		0.003	56	0.005	108	0.003	187	0.002	78	0.003	208	0.004	230	0.004	280	0.003	320	0.004	1
CM		0.001	119	0.001	233	0.000	318	0.000	260	0.001	16	0.002	49	0.001	94	0.001	115	0.001	151
DCP 1	.010	0.032	268	0.028	308	0.021	297	0.026	28	0.017	290	0.017	48	0.011	261	0.016	111	0.008	144
DCP 2	.025	0.045	100	0.027	149	0.022	210	0.017	164	0.011	155	0.010	248	0.005	37	0.007	225	0.010	115
DCP 3	.100	0.014	25	0.018	138	0.008	103	0.005	150	0.005	260	0.008	155	0.006	286	0.003	70	0.002	166
DCP 4	.150	0.017	92	0.005	159	0.007	230	0.011	332	0.002	44	0.007	3	0.005	98	0.003	26	0.006	164
DCP 5	.200	0.008	301	0.007	110	0.003	100	0.009	110	0.002	355	0.008	136	0.001	176	0.004	347	0.007	6
DCP 6	.250	0.003	96	0.010	10	0.004	263	0.011	17	0.003	211	0.007	343	0.007	15	0.013	39	0.011	75
DCP 7	.300	0.002	218	0.008	109	0.004	174	0.007	90	0.001	147	0.005	201	0.004	287	0.004	274	0.009	335
DCP 8	.400	0.003	37	0.006	45	0.003	203	0.005	327	0.001	349	0.004	271	0.003	303	0.005	16	0.009	60
DCP 9	.500	0.006	284	0.005	59	0.005	122	0.004	210	0.007	317	0.002	213	0.003	289	0.001	260	0.003	303
DCP 10	.600	0.006	100	0.010	120	0.009	202	0.001	320	0.010	194	0.009	249	0.013	251	0.011	318	0.016	347
DCP 11	.878	0.006	310	0.002	5	0.003	57	0.006	96	0.004	183	0.008	213	0.004	317	0.004	256	0.003	272

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	16.13	0.600	24.37	4.55		5077.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.042	645.6	1436.0	0.62E 07	-0.00210	1.237	24.30	0.0680

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		24.368	4.551	0	0.282	27	0.070	276	0.035	231	0.071	316	0.082	18	0.094	332	0.101	339	0.049	333
CN		1.133	0.096	90	0.026	178	0.009	343	0.012	82	0.003	220	0.002	4	0.007	319	0.007	38	0.004	147
CM		-0.142	0.018	270	0.006	63	0.002	353	0.001	97	0.002	349	0.001	76	0.002	131	0.003	196	0.001	282
DCP 1	.010	2.723	0.887	169	0.135	83	0.061	130	0.090	79	0.018	157	0.069	128	0.053	169	0.043	149	0.022	154
DCP 2	.025	2.575	0.307	139	0.202	143	0.123	354	0.099	100	0.048	9	0.027	82	0.039	13	0.033	151	0.009	247
DCP 3	.100	1.891	0.100	52	0.026	198	0.052	356	0.028	131	0.016	287	0.008	171	0.018	253	0.006	296	0.022	219
DCP 4	.150	1.556	0.136	77	0.057	146	0.029	308	0.043	40	0.003	160	0.026	9	0.014	14	0.014	83	0.006	107
DCP 5	.200	1.410	0.115	52	0.004	187	0.006	1	0.015	127	0.007	263	0.007	57	0.006	227	0.006	354	0.006	234
DCP 6	.250	1.407	0.133	53	0.030	139	0.013	290	0.033	31	0.010	188	0.020	7	0.012	54	0.013	97	0.009	153
DCP 7	.300	1.306	0.130	53	0.020	198	0.005	192	0.005	128	0.006	256	0.005	56	0.007	250	0.009	32	0.002	137
DCP 8	.400	1.174	0.123	52	0.025	187	0.010	275	0.013	25	0.012	224	0.008	315	0.017	306	0.015	13	0.005	151
DCP 9	.500	1.009	0.114	60	0.021	217	0.009	161	0.011	228	0.004	272	0.003	221	0.011	275	0.012	0	0.007	83
DCP 10	.600	0.548	0.109	67	0.028	207	0.007	343	0.012	60	0.016	187	0.014	281	0.014	344	0.015	12	0.009	107
DCP 11	.878	0.754	0.087	78	0.026	226	0.005	148	0.003	200	0.005	83	0.005	142	0.007	300	0.008	46	0.005	126

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.046	331	0.064	341	0.042	7	0.041	359	0.044	1	0.045	16	0.037	20	0.038	24	0.031	38
CN		0.004	224	0.000	55	0.004	205	0.001	71	0.001	196	0.002	21	0.001	234	0.001	134	0.003	25
CM		0.001	6	0.001	187	0.001	355	0.001	66	0.002	138	0.001	161	0.001	205	0.000	29	0.001	58
DCP 1	.010	0.008	31	0.010	276	0.005	190	0.010	232	0.037	172	0.005	173	0.016	166	0.015	98	0.003	144
DCP 2	.025	0.018	233	0.012	172	0.008	132	0.016	137	0.015	171	0.007	83	0.017	251	0.012	120	0.023	38
DCP 3	.100	0.007	170	0.008	171	0.002	38	0.013	75	0.010	175	0.002	1	0.010	271	0.010	307	0.012	336
DCP 4	.150	0.016	322	0.013	4	0.006	319	0.002	344	0.003	171	0.003	181	0.007	146	0.017	156	0.011	141
DCP 5	.200	0.002	194	0.004	166	0.006	288	0.014	50	0.007	138	0.004	151	0.007	206	0.005	346	0.007	26
DCP 6	.250	0.006	288	0.007	64	0.010	215	0.011	22	0.017	103	0.012	130	0.011	153	0.009	145	0.012	121
DCP 7	.300	0.008	214	0.007	284	0.006	263	0.007	40	0.004	155	0.004	70	0.004	234	0.002	34	0.005	21
DCP 8	.400	0.006	254	0.006	221	0.013	274	0.006	357	0.007	60	0.007	72	0.007	43	0.009	70	0.011	39
DCP 9	.500	0.006	155	0.004	295	0.004	252	0.006	26	0.004	53	0.004	16	0.003	145	0.004	278	0.005	349
DCP 10	.600	0.006	204	0.008	79	0.015	179	0.013	219	0.010	239	0.007	265	0.007	294	0.006	295	0.005	328
DCP 11	.878	0.001	200	0.004	321	0.005	131	0.002	258	0.010	330	0.009	358	0.006	49	0.005	150	0.005	201

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	15.87	0.600	24.35	4.57		5077.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.041	644.7	1429.7	0.62E 07	-0.00207	1.238	24.08	0.0250

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		24.351	4.567	0	0.238	33	0.113	250	0.097	283	0.071	289	0.149	342	0.156	335	0.109	1	0.058	10
CN		1.129	0.096	90	0.028	166	0.010	323	0.003	110	0.010	305	0.003	31	0.004	354	0.011	60	0.006	139
CM		-0.144	0.015	270	0.002	59	0.003	353	0.003	94	0.000	149	0.001	133	0.002	180	0.003	194	0.001	272
DCP 1	.010	2.767	0.995	171	0.048	136	0.058	117	0.061	125	0.041	324	0.037	149	0.029	208	0.059	175	0.028	195
DCP 2	.025	2.574	0.298	118	0.186	141	0.114	346	0.088	56	0.048	312	0.030	87	0.034	182	0.058	116	0.035	170
DCP 3	.100	1.837	0.078	37	0.057	173	0.066	337	0.054	133	0.028	318	0.025	107	0.003	319	0.002	25	0.001	271
DCP 4	.150	1.565	0.152	84	0.070	166	0.025	274	0.010	241	0.023	262	0.018	323	0.021	28	0.040	89	0.013	156
DCP 5	.200	1.375	0.115	46	0.013	126	0.018	346	0.025	104	0.010	278	0.007	37	0.006	261	0.009	326	0.001	51
DCP 6	.250	1.395	0.137	54	0.032	172	0.017	307	0.005	357	0.008	277	0.007	296	0.005	315	0.014	45	0.004	296
DCP 7	.300	1.202	0.124	50	0.009	156	0.001	86	0.015	110	0.007	229	0.009	47	0.001	226	0.005	356	0.003	111
DCP 8	.400	1.168	0.136	51	0.023	187	0.001	267	0.011	257	0.005	342	0.002	249	0.005	345	0.015	50	0.005	150
DCP 9	.500	0.995	0.115	57	0.015	182	0.005	189	0.001	151	0.005	238	0.007	6	0.011	34	0.010	61	0.006	166
DCP 10	.600	0.943	0.119	60	0.030	197	0.014	252	0.018	274	0.017	326	0.010	323	0.014	348	0.022	42	0.014	122
DCP 11	.878	0.776	0.083	65	0.007	149	0.007	123	0.006	288	0.001	276	0.001	75	0.003	6	0.007	3	0.005	70

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.065	341	0.042	349	0.037	342	0.034	5	0.024	18	0.011	343	0.009	340	0.010	321	0.007	330
CN		0.002	70	0.001	251	0.002	124	0.000	146	0.003	136	0.001	202	0.001	257	0.002	238	0.001	335
CM		0.001	275	0.001	336	0.000	217	0.000	308	0.000	186	0.000	24	0.000	187	0.001	356	0.000	124
DCP 1	.010	0.049	144	0.011	196	0.028	122	0.011	227	0.012	13	0.026	319	0.017	288	0.014	326	0.018	242
DCP 2	.025	0.010	124	0.008	100	0.007	137	0.016	83	0.030	156	0.014	154	0.012	272	0.007	358	0.010	285
DCP 3	.100	0.008	305	0.007	318	0.011	61	0.013	335	0.019	118	0.004	260	0.003	187	0.002	295	0.009	152
DCP 4	.150	0.002	257	0.019	299	0.013	232	0.005	205	0.006	264	0.009	5	0.003	67	0.004	349	0.008	35
DCP 5	.200	0.006	342	0.001	40	0.003	129	0.009	298	0.005	43	0.006	105	0.006	177	0.004	235	0.002	228
DCP 6	.250	0.011	39	0.007	271	0.009	241	0.006	200	0.007	267	0.009	293	0.010	339	0.001	0	0.006	355
DCP 7	.300	0.004	87	0.002	110	0.004	155	0.009	314	0.005	69	0.005	108	0.005	171	0.004	300	0.005	114
DCP 8	.400	0.009	13	0.003	24	0.006	131	0.007	138	0.003	228	0.005	329	0.005	332	0.005	23	0.008	44
DCP 9	.500	0.006	8	0.005	93	0.005	106	0.005	219	0.005	26	0.004	74	0.003	125	0.006	253	0.007	355
DCP 10	.600	0.003	162	0.009	244	0.001	181	0.004	147	0.005	180	0.006	187	0.009	211	0.011	209	0.005	266
DCP 11	.878	0.005	113	0.005	118	0.003	31	0.003	60	0.002	77	0.001	264	0.005	12	0.004	101	0.001	200

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	0.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
26.0	15.42	0.420	0.22	5.26		5343.1	10

K	V	O	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.263	436.7	733.6	0.475 07	-0.00026	0.559	5.26	0.0220

HARMONIC ANALYSIS

DATA TYPE	Y/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		0.222	5.061	0	0.428	357	0.106	327	0.284	329	0.063	343	0.059	334	0.048	320	0.030	302	0.044	324
CN		0.123	0.445	354	0.043	356	0.022	356	0.015	350	0.014	318	0.016	339	0.008	312	0.002	255	0.011	334
CM		-0.028	0.013	191	0.003	204	0.002	183	0.002	92	0.000	352	0.002	140	0.002	91	0.001	27	0.001	357
DCP 1	.010	-1.148	0.867	355	0.061	33	0.135	7	0.130	17	0.119	313	0.050	206	0.033	329	0.038	186	0.117	311
DCP 2	.100	0.654	1.372	352	0.130	335	0.335	339	0.316	339	0.014	337	0.014	324	0.015	342	0.007	356	0.019	314
DCP 3	.150	0.487	0.917	350	0.084	352	0.027	345	0.017	337	0.019	330	0.010	335	0.010	329	0.010	319	0.010	301
DCP 4	.200	0.293	0.891	352	0.066	344	0.026	328	0.018	312	0.012	322	0.006	321	0.005	322	0.013	353	0.003	0
DCP 5	.250	0.343	0.708	353	0.069	358	0.022	349	0.015	339	0.017	334	0.007	335	0.007	342	0.009	313	0.007	301
DCP 6	.300	0.203	0.582	354	0.059	346	0.023	335	0.013	343	0.009	352	0.006	306	0.006	322	0.005	319	0.005	296
DCP 7	.400	0.183	0.463	354	0.048	4	0.015	350	0.011	336	0.013	329	0.003	327	0.005	338	0.007	328	0.006	292
DCP 8	.500	0.140	0.325	356	0.036	342	0.012	330	0.007	358	0.006	324	0.005	311	0.005	336	0.006	9	0.004	274
DCP 9	.600	0.105	0.257	358	0.031	9	0.011	356	0.008	331	0.010	324	0.005	309	0.003	340	0.002	289	0.004	331
DCP10	.878	0.085	0.075	4	0.017	31	0.010	9	0.012	318	0.004	262	0.011	330	0.017	275	0.010	193	0.006	285

DATA TYPE	Y/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.033	302	0.033	312	0.027	321	0.032	313	0.025	296	0.025	285	0.028	303	0.018	334	0.017	281
CN		0.005	259	0.003	275	0.005	316	0.003	113	0.002	88	0.004	330	0.001	197	0.008	234	0.007	284
CM		0.002	24	0.002	291	0.001	357	0.001	325	0.001	98	0.001	334	0.001	159	0.002	328	0.001	256
DCP 1	.010	0.028	276	0.061	265	0.086	336	0.030	97	0.089	93	0.052	346	0.062	139	0.143	310	0.097	280
DCP 2	.100	0.005	280	0.006	301	0.006	296	0.006	4	0.007	278	0.006	255	0.012	279	0.005	286	0.003	313
DCP 3	.150	0.009	332	0.009	313	0.004	313	0.005	320	0.005	280	0.007	300	0.002	256	0.003	255	0.006	248
DCP 4	.200	0.003	298	0.008	327	0.003	52	0.003	225	0.006	237	0.005	6	0.005	280	0.008	255	0.009	273
DCP 5	.250	0.006	327	0.005	319	0.003	295	0.003	301	0.005	278	0.007	299	0.003	225	0.003	330	0.005	247
DCP 6	.300	0.003	277	0.003	303	0.002	235	0.001	358	0.006	275	0.006	285	0.006	288	0.002	217	0.003	277
DCP 7	.400	0.005	311	0.004	319	0.003	262	0.001	279	0.002	259	0.003	315	0.003	267	0.001	301	0.003	279
DCP 8	.500	0.001	313	0.002	305	0.001	301	0.003	56	0.003	302	0.001	289	0.003	296	0.004	248	0.002	260
DCP 9	.600	0.003	296	0.000	17	0.003	242	0.002	61	0.002	281	0.001	14	0.002	286	0.001	150	0.005	283
DCP10	.878	0.014	208	0.008	130	0.003	226	0.008	136	0.000	31	0.002	143	0.005	17	0.006	191	0.006	50

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
56.0	15.70	0.400	7.62	4.83		5048.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.059	441.7	741.0	0.48E 07	-0.00067	1.355	11.89	0.0800

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		7.623	4.832	0	0.334	354	0.055	0	0.061	327	0.044	324	0.029	290	0.020	6	0.050	300	0.040	310
CN		0.999	0.006	90	0.061	31	0.015	343	0.003	312	0.009	332	0.005	244	0.006	61	0.006	318	0.001	258
CM		-0.008	0.005	270	0.003	238	0.001	29	0.001	195	0.001	248	0.001	235	0.001	61	0.000	164	0.001	60
DCP 1	.010	3.637	0.666	358	0.132	20	0.050	355	0.042	168	0.089	304	0.115	228	0.077	76	0.037	293	0.024	98
DCP 2	.100	2.524	1.132	358	0.176	33	0.056	359	0.022	310	0.011	334	0.004	307	0.010	36	0.016	338	0.012	302
DCP 3	.150	2.128	0.717	357	0.117	27	0.029	336	0.013	323	0.009	356	0.006	331	0.005	348	0.008	310	0.003	308
DCP 4	.200	1.806	0.639	358	0.104	28	0.029	346	0.006	347	0.006	3	0.005	86	0.006	10	0.010	5	0.004	313
DCP 5	.250	1.532	0.538	0	0.092	29	0.019	333	0.011	322	0.007	345	0.007	339	0.003	25	0.008	323	0.004	278
DCP 6	.300	1.030	0.465	1	0.075	31	0.019	345	0.006	318	0.007	27	0.004	325	0.004	32	0.006	332	0.003	288
DCP 7	.400	0.825	0.357	2	0.061	29	0.012	318	0.008	307	0.006	354	0.005	339	0.002	1	0.006	322	0.003	232
DCP 8	.500	0.732	0.256	4	0.053	37	0.012	333	0.001	339	0.003	10	0.002	62	0.002	68	0.005	333	0.004	241
DCP 9	.600	0.490	0.203	5	0.034	37	0.007	317	0.002	327	0.007	5	0.005	336	0.002	330	0.002	281	0.003	152
DCP 10	.878	0.209	0.084	12	0.018	49	0.001	154	0.004	45	0.004	339	0.004	149	0.004	103	0.003	320	0.002	277

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.022	326	0.037	320	0.022	293	0.031	307	0.021	321	0.025	309	0.021	312	0.017	310	0.022	307
CN		0.006	13	0.002	279	0.002	268	0.005	49	0.003	333	0.005	350	0.008	332	0.003	145	0.006	269
CM		0.001	324	0.001	170	0.000	240	0.000	49	0.000	221	0.000	31	0.001	307	0.001	165	0.001	252
DCP 1	.010	0.075	351	0.045	181	0.034	214	0.053	75	0.016	310	0.059	357	0.127	321	0.075	156	0.097	262
DCP 2	.100	0.011	19	0.010	317	0.008	341	0.010	355	0.010	336	0.007	16	0.008	349	0.005	47	0.004	336
DCP 3	.150	0.006	354	0.007	290	0.007	321	0.005	339	0.005	346	0.004	332	0.003	342	0.005	313	0.002	298
DCP 4	.200	0.004	77	0.005	316	0.003	325	0.004	48	0.003	352	0.002	87	0.004	13	0.008	6	0.003	179
DCP 5	.250	0.004	22	0.005	292	0.004	333	0.004	340	0.004	342	0.007	318	0.002	346	0.003	297	0.002	310
DCP 6	.300	0.002	32	0.005	322	0.004	349	0.005	0	0.003	304	0.002	342	0.003	11	0.003	15	0.002	294
DCP 7	.400	0.003	50	0.004	321	0.003	308	0.001	353	0.002	298	0.004	317	0.003	329	0.004	296	0.002	299
DCP 8	.500	0.002	68	0.003	322	0.002	66	0.004	62	0.001	329	0.001	323	0.003	0	0.003	91	0.003	262
DCP 9	.600	0.002	58	0.002	298	0.001	291	0.002	6	0.002	339	0.003	340	0.001	65	0.001	329	0.003	260
DCP 10	.878	0.003	54	0.003	348	0.002	204	0.003	91	0.003	17	0.002	343	0.003	27	0.003	138	0.002	22

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	15.55	0.400	7.60	4.89		5368.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.059	438.3	734.4	0.47E 07	-0.00035	1.322	12.35	0.0620

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		7.597	4.894	0	0.402	7	0.107	4	0.075	333	0.067	354	0.050	355	0.055	338	0.026	348	0.039	350
CN		0.066	0.354	2	0.074	12	0.020	331	0.015	19	0.014	313	0.016	16	0.017	338	0.006	325	0.015	31
CM		-0.012	0.014	192	0.004	170	0.002	6	0.010	193	0.002	257	0.000	285	0.001	18	0.000	169	0.000	49
DCP 1	.010	3.539	0.623	15	0.184	5	0.105	325	0.065	88	0.087	263	0.026	359	0.053	341	0.021	304	0.035	67
DCP 2	.100	2.532	1.135	358	0.217	21	0.066	357	0.028	317	0.013	336	0.012	352	0.015	345	0.011	347	0.014	347
DCP 3	.150	1.823	0.705	357	0.130	15	0.038	333	0.010	350	0.008	29	0.010	34	0.008	336	0.007	324	0.005	22
DCP 4	.200	1.439	0.632	358	0.117	21	0.025	345	0.013	349	0.007	349	0.007	25	0.011	346	0.007	9	0.013	22
DCP 5	.250	1.351	0.533	0	0.103	13	0.031	329	0.006	9	0.007	41	0.008	39	0.007	339	0.004	327	0.005	354
DCP 6	.300	1.041	0.457	1	0.083	21	0.025	335	0.007	349	0.001	48	0.007	5	0.008	0	0.004	308	0.005	33
DCP 7	.400	0.821	0.354	2	0.072	8	0.021	318	0.002	43	0.005	58	0.007	43	0.003	316	0.002	277	0.002	329
DCP 8	.500	0.619	0.257	3	0.063	20	0.012	332	0.004	307	0.003	49	0.004	3	0.005	351	0.003	314	0.003	18
DCP 9	.600	0.488	0.204	6	0.063	357	0.011	298	0.006	64	0.004	65	0.006	43	0.002	310	0.002	326	0.003	15
DCP10	.878	0.234	0.089	10	0.026	358	0.004	178	0.003	16	0.002	30	0.002	265	0.002	279	0.003	341	0.002	88

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.032	354	0.029	351	0.024	368	0.028	5	0.017	343	0.024	350	0.031	354	0.022	358	0.021	346
CN		0.005	333	0.008	19	0.002	137	0.002	259	0.004	80	0.002	174	0.005	336	0.005	87	0.001	263
CM		0.001	271	0.001	15	0.000	90	0.002	160	0.002	147	0.000	257	0.000	274	0.000	69	0.001	342
DCP 1	.010	0.083	276	0.105	26	0.042	158	0.071	194	0.106	118	0.035	190	0.052	311	0.098	191	0.030	280
DCP 2	.100	0.028	350	0.027	336	0.016	343	0.010	357	0.005	334	0.006	328	0.009	355	0.006	1	0.004	331
DCP 3	.150	0.007	332	0.005	347	0.005	321	0.004	345	0.007	354	0.003	352	0.004	339	0.007	329	0.001	11
DCP 4	.200	0.004	0	0.003	322	0.010	330	0.003	45	0.003	8	0.005	131	0.006	327	0.005	334	0.007	12
DCP 5	.250	0.005	353	0.005	352	0.003	358	0.004	354	0.005	347	0.002	322	0.003	8	0.006	333	0.001	11
DCP 6	.300	0.004	20	0.003	24	0.001	9	0.004	346	0.003	298	0.002	41	0.004	32	0.003	323	0.002	37
DCP 7	.400	0.002	331	0.003	6	0.003	252	0.002	344	0.003	22	0.002	322	0.002	60	0.003	311	0.002	107
DCP 8	.500	0.003	41	0.003	9	0.001	19	0.002	359	0.005	272	0.001	67	0.004	15	0.001	1	0.000	50
DCP 9	.600	0.001	355	0.002	330	0.001	150	0.003	8	0.002	20	0.001	79	0.001	359	0.002	7	0.002	157
DCP10	.878	0.000	62	0.003	63	0.003	213	0.008	337	0.007	12	0.003	141	0.006	341	0.007	171	0.007	187

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	15.53	0.600	7.61	4.39		5348.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.059	437.6	733.6	0.47E 07	-0.03059	1.290	12.37	0.0220

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		7.613	4.979	0	0.364	8	0.068	334	0.053	339	0.048	336	0.015	14	0.059	330	0.024	291	0.032	298
CN		0.026	0.354	359	0.051	25	0.021	339	0.011	274	0.031	4	0.034	12	0.006	351	0.004	238	0.007	290
CM		-0.011	0.015	199	0.003	189	0.002	28	0.001	255	0.001	32	0.002	319	0.002	203	0.002	193	0.002	347
DCP 1	.010	3.369	0.542	359	0.124	50	0.138	357	0.119	247	0.046	78	0.060	356	0.007	175	0.021	74	0.102	306
DCP 2	.100	2.525	1.148	356	0.177	32	0.058	352	0.033	335	0.016	298	0.032	247	0.014	315	0.006	325	0.012	288
DCP 3	.150	1.797	0.709	355	0.117	15	0.038	335	0.013	326	0.008	325	0.007	340	0.009	333	0.006	313	0.005	326
DCP 4	.200	1.445	0.645	355	0.105	30	0.031	327	0.012	287	0.008	20	0.006	8	0.007	344	0.012	270	0.002	218
DCP 5	.250	1.327	0.535	358	0.092	14	0.027	332	0.008	320	0.005	352	0.007	346	0.008	343	0.005	280	0.002	336
DCP 6	.300	1.037	0.466	359	0.081	30	0.017	343	0.010	337	0.004	326	0.005	342	0.005	312	0.002	331	0.002	295
DCP 7	.400	0.813	0.357	1	0.064	0	0.018	325	0.012	353	0.005	332	0.006	336	0.006	341	0.003	280	0.003	341
DCP 8	.500	0.599	0.259	1	0.051	38	0.012	332	0.006	335	0.001	238	0.000	136	0.004	341	0.002	237	0.003	242
DCP 9	.600	0.469	0.205	6	0.039	355	0.008	331	0.003	61	0.002	309	0.005	341	0.006	335	0.003	256	0.002	287
DCP10	.878	0.225	0.089	10	0.019	41	0.005	263	0.007	250	0.008	190	0.013	129	0.013	32	0.010	295	0.008	214

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.023	318	0.029	321	0.016	304	0.015	298	0.019	279	0.023	291	0.014	312	0.011	297	0.015	254
CN		0.001	131	0.003	251	0.003	283	0.005	322	0.004	254	0.002	276	0.001	182	0.004	330	0.006	276
CM		0.000	293	0.001	149	0.000	272	0.000	89	0.001	41	0.001	251	0.001	122	0.001	3	0.001	326
DCP 1	.010	0.017	193	0.038	204	0.027	271	0.060	326	0.027	302	0.060	220	0.046	139	0.074	358	0.082	295
DCP 2	.100	0.005	331	0.007	289	0.003	312	0.005	312	0.006	291	0.004	319	0.007	263	0.006	274	0.004	217
DCP 3	.150	0.002	354	0.004	335	0.006	306	0.006	332	0.002	175	0.002	341	0.003	328	0.005	274	0.003	250
DCP 4	.200	0.004	72	0.002	283	0.004	326	0.009	301	0.004	163	0.003	276	0.003	215	0.003	298	0.005	260
DCP 5	.250	0.002	2	0.002	347	0.004	281	0.004	344	0.000	252	0.002	257	0.002	41	0.003	297	0.003	279
DCP 6	.300	0.002	25	0.004	306	0.002	210	0.002	331	0.003	275	0.001	233	0.001	349	0.004	290	0.003	245
DCP 7	.400	0.002	108	0.003	358	0.004	292	0.004	357	0.001	219	0.001	26	0.002	41	0.003	310	0.002	228
DCP 8	.500	0.002	156	0.002	334	0.001	261	0.002	316	0.002	292	0.001	210	0.002	266	0.002	253	0.002	223
DCP 9	.600	0.003	60	0.003	5	0.003	274	0.002	305	0.003	235	0.003	41	0.002	37	0.003	337	0.002	217
DCP10	.878	0.003	154	0.004	267	0.003	89	0.004	309	0.007	238	0.006	102	0.005	269	0.004	171	0.003	255

TUNED PITCHING OSCILLATION VERTOL 23010-1.59 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	15.55	0.400	10.00	4.54		5353.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.058	446.1	735.0	0.47E 07	-0.00036	1.536	13.21	0.0807

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		10.001	4.644	0	0.375	16	0.038	337	0.032	308	0.075	333	0.055	277	0.042	27	0.043	286	0.043	295
CN		1.204	0.219	17	0.115	36	0.036	333	0.035	304	0.016	319	0.019	213	0.005	352	0.011	339	0.013	362
CM		-0.011	0.025	191	0.009	93	0.005	353	0.002	161	0.003	15	0.003	255	0.002	173	0.002	68	0.002	16
DCP 1	.010	4.788	0.430	14	0.203	21	0.071	106	0.133	17	0.142	338	0.058	257	0.109	267	0.062	322	0.152	7
DCP 2	.100	2.875	0.473	16	0.498	57	0.235	327	0.166	235	0.048	345	0.375	253	0.055	157	0.041	85	0.062	14
DCP 3	.150	2.484	0.320	17	0.276	69	0.115	315	0.023	199	0.032	359	0.031	247	0.015	92	0.018	319	0.036	260
DCP 4	.200	2.250	0.280	26	0.322	65	0.161	310	0.061	221	0.019	297	0.038	187	0.052	72	0.054	351	0.036	287
DCP 5	.250	1.756	0.273	23	0.196	63	0.080	305	0.010	172	0.023	334	0.023	204	0.026	54	0.027	337	0.010	248
DCP 6	.300	1.152	0.267	25	0.204	36	0.033	231	0.038	234	0.009	229	0.028	135	0.040	44	0.038	325	0.025	258
DCP 7	.400	0.947	0.235	21	0.097	24	0.035	269	0.039	55	0.012	338	0.013	152	0.020	7	0.021	276	0.009	218
DCP 8	.500	0.901	0.201	18	0.077	11	0.027	224	0.013	61	0.014	275	0.016	73	0.026	335	0.025	252	0.007	147
DCP 9	.600	0.576	0.170	18	0.031	360	0.013	198	0.010	14	0.010	274	0.014	121	0.013	300	0.013	212	0.004	72
DCP10	.878	0.296	0.132	5	0.029	282	0.013	137	0.013	303	0.008	294	0.006	49	0.002	295	0.003	336	0.005	299

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.029	287	0.026	312	0.031	291	0.030	307	0.028	301	0.031	297	0.027	290	0.018	298	0.023	272
CN		0.007	18	0.003	10	0.005	315	0.031	215	0.004	3	0.005	332	0.006	293	0.006	271	0.003	233
CM		0.003	31	0.001	280	0.000	169	0.000	142	0.000	143	0.001	65	0.001	331	0.002	268	0.002	183
DCP 1	.010	0.147	59	0.056	56	0.048	1	0.027	141	0.048	23	0.056	344	0.090	306	0.093	272	0.095	195
DCP 2	.100	0.047	345	0.049	337	0.041	257	0.024	221	0.011	189	0.011	127	0.012	57	0.014	352	0.015	331
DCP 3	.150	0.011	346	0.016	269	0.011	191	0.008	7	0.011	306	0.006	253	0.004	339	0.008	331	0.010	286
DCP 4	.200	0.022	263	0.014	228	0.006	211	0.002	73	0.003	164	0.010	54	0.018	309	0.020	237	0.013	215
DCP 5	.250	0.006	284	0.005	197	0.006	76	0.010	343	0.006	299	0.007	318	0.007	282	0.004	194	0.003	345
DCP 6	.300	0.019	244	0.018	175	0.012	31	0.012	19	0.011	353	0.011	326	0.016	267	0.009	211	0.008	149
DCP 7	.400	0.009	167	0.008	92	0.010	5	0.007	290	0.002	276	0.001	78	0.003	300	0.005	219	0.002	11
DCP 8	.500	0.002	349	0.002	8	0.006	322	0.005	9	0.006	321	0.004	281	0.002	250	0.000	317	0.004	63
DCP 9	.600	0.003	162	0.002	55	0.002	332	0.002	194	0.006	50	0.002	300	0.008	205	0.003	195	0.006	338
DCP10	.878	0.002	228	0.003	28	0.003	323	0.001	35	0.003	323	0.001	315	0.002	102	0.003	23	0.005	332

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	15.97	0.400	10.02	4.73		5350.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.061	435.3	732.5	0.47E 07	-0.00010	1.467	13.57	0.0540

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		10.017	4.727	0	0.437	3	0.117	343	0.075	329	0.064	320	0.072	348	0.032	301	0.029	320	0.047	311
CN		1.105	0.230	21	0.134	27	0.021	320	0.016	331	0.015	274	0.006	71	0.005	46	0.009	53	0.010	306
CM		-0.017	0.029	187	0.012	91	0.005	10	0.002	316	0.002	298	0.002	114	0.003	142	0.002	73	0.001	31
DCP 1	.010	4.731	0.470	15	0.304	35	0.171	70	0.127	310	0.112	339	0.137	62	0.018	63	0.079	117	0.039	267
DCP 2	.100	2.796	0.431	28	0.560	49	0.199	338	0.173	332	0.051	250	0.052	229	0.057	157	0.075	85	0.058	18
DCP 3	.150	1.973	0.329	20	0.287	45	0.083	329	0.021	305	0.016	338	0.023	255	0.018	149	0.025	42	0.020	317
DCP 4	.200	1.457	0.291	44	0.355	30	0.125	297	0.038	253	0.051	209	0.040	122	0.038	63	0.048	15	0.040	298
DCP 5	.250	1.439	0.293	28	0.223	33	0.053	296	0.038	332	0.010	245	0.012	162	0.015	54	0.020	356	0.017	284
DCP 6	.300	1.174	0.307	32	0.227	14	0.080	270	0.035	220	0.042	164	0.031	79	0.032	26	0.038	335	0.036	262
DCP 7	.400	0.950	0.270	22	0.113	13	0.020	227	0.015	359	0.008	186	0.013	92	0.019	357	0.014	285	0.005	217
DCP 8	.500	0.709	0.227	19	0.087	344	0.034	171	0.017	51	0.007	20	0.013	325	0.005	299	0.005	281	0.006	240
DCP 9	.600	0.581	0.192	15	0.037	356	0.017	148	0.013	7	0.005	55	0.004	349	0.009	297	0.007	160	0.010	356
DCP10	.878	0.329	0.137	2	0.033	296	0.004	251	0.012	223	0.005	97	0.007	307	0.010	327	0.005	133	0.004	229

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.038	300	0.021	333	0.027	329	0.030	303	0.024	292	0.019	279	0.020	309	0.020	338	0.025	291
CN		0.008	213	0.004	13	0.002	217	0.007	2	0.002	270	0.005	290	0.001	65	0.003	4	0.005	112
CM		0.002	78	0.002	294	0.002	269	0.002	108	0.002	58	0.001	178	0.002	81	0.002	43	0.001	85
DCP 1	.010	0.100	146	0.063	16	0.047	215	0.113	23	0.036	29	0.054	234	0.087	75	0.082	25	0.111	114
DCP 2	.100	0.054	343	0.061	330	0.051	265	0.038	188	0.029	128	0.018	37	0.036	334	0.007	326	0.010	376
DCP 3	.150	0.004	245	0.013	297	0.011	232	0.006	94	0.006	350	0.008	314	0.004	236	0.002	323	0.005	237
DCP 4	.200	0.024	250	0.021	233	0.020	150	0.016	98	0.011	19	0.020	329	0.012	281	0.008	250	0.012	244
DCP 5	.250	0.010	231	0.007	208	0.007	70	0.010	347	0.004	290	0.008	326	0.011	237	0.006	112	0.006	337
DCP 6	.300	0.026	201	0.016	133	0.017	55	0.014	1	0.012	298	0.010	254	0.007	199	0.002	41	0.005	332
DCP 7	.400	0.008	215	0.011	131	0.015	30	0.011	322	0.007	264	0.005	239	0.005	189	0.004	90	0.005	14
DCP 8	.500	0.013	192	0.013	92	0.009	354	0.007	347	0.011	249	0.004	173	0.003	350	0.004	235	0.003	101
DCP 9	.600	0.011	225	0.012	97	0.007	358	0.005	311	0.009	275	0.007	215	0.002	185	0.002	58	0.005	78
DCP10	.878	0.006	283	0.004	0	0.010	150	0.008	320	0.008	294	0.009	353	0.006	285	0.009	249	0.005	190

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	15.82	0.400	9.99	4.77		5357.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.061	434.9	728.7	0.47E 07	-0.00028	1.497	14.02	0.0220

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		9.992	4.770	0	0.310	15	0.068	339	0.087	303	0.068	271	0.116	71	0.088	242	0.022	252	0.035	306
CN		1.117	0.239	18	0.111	16	0.029	310	0.014	254	0.037	156	0.038	325	0.010	265	0.008	41	0.023	358
CM		-0.014	0.027	186	0.009	98	0.004	326	0.003	293	0.002	200	0.002	80	0.004	71	0.002	158	0.000	332
DCP 1	.010	4.846	0.462	14	0.175	326	0.094	282	0.093	247	0.025	141	0.151	312	0.037	283	0.09[illegible]	98	0.018	11
DCP 2	.100	2.839	0.487	21	0.483	64	0.182	339	0.287	303	0.087	236	0.077	147	0.049	88	0.03[illegible]	[illegible]	0.030	18
DCP 3	.150	1.995	0.342	16	0.254	42	0.085	338	0.136	278	0.019	191	0.012	57	0.013	240	0.009	[illegible]	0.014	356
DCP 4	.200	1.484	0.317	35	0.315	26	0.109	296	0.142	237	0.045	181	0.041	93	0.020	29	0.034	[illegible]	0.026	277
DCP 5	.250	1.453	0.301	23	0.194	30	0.056	316	0.120	254	0.016	151	0.011	50	0.008	273	0.012	[illegible]	0.011	276
DCP 6	.300	1.189	0.314	26	0.195	9	0.058	271	0.126	217	0.036	137	0.038	46	0.028	313	0.019	275	0.013	237
DCP 7	.400	0.947	0.263	20	0.109	10	0.019	289	0.098	203	0.021	89	0.018	344	0.017	253	0.002	220	0.007	134
DCP 8	.500	0.703	0.231	15	0.070	340	0.017	155	0.093	86	0.020	78	0.025	338	0.029	256	0.015	151	0.038	56
DCP 9	.600	0.583	0.183	16	0.055	350	0.014	132	0.076	82	0.014	45	0.018	287	0.014	227	0.006	98	0.035	92
DCP10	.878	0.326	0.140	2	0.038	279	0.006	127	0.019	151	0.012	297	0.014	233	0.015	261	0.019	3	0.002	310

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.030	278	0.019	269	0.021	280	0.017	289	0.015	257	0.019	265	0.011	262	0.017	219	0.011	264
CN		0.010	317	0.002	297	0.009	191	0.006	291	0.001	133	0.008	245	0.006	279	0.002	285	0.005	283
CM		0.002	268	0.002	295	0.001	60	0.003	223	0.001	40	0.001	125	0.001	251	0.002	301	0.002	281
DCP 1	.010	0.107	324	0.053	151	0.072	158	0.128	255	0.063	92	0.054	231	0.116	286	0.075	300	0.103	287
DCP 2	.100	0.050	321	0.057	250	0.045	199	0.024	114	0.014	15	0.017	246	0.013	132	0.013	359	0.015	252
DCP 3	.150	0.017	256	0.005	171	0.002	248	0.000	357	0.007	319	0.008	223	0.002	122	0.004	268	0.002	182
DCP 4	.200	0.022	234	0.017	177	0.010	89	0.008	70	0.011	345	0.021	270	0.009	174	0.004	293	0.002	158
DCP 5	.250	0.011	184	0.007	50	0.006	277	0.001	41	0.007	297	0.006	233	0.002	175	0.003	219	0.001	325
DCP 6	.300	0.020	205	0.018	118	0.013	21	0.010	339	0.012	275	0.014	232	0.009	169	0.004	153	0.004	125
DCP 7	.400	0.005	55	0.009	332	0.005	227	0.002	344	0.004	195	0.006	80	0.006	298	0.004	216	0.002	76
DCP 8	.500	0.005	219	0.004	25	0.004	299	0.004	310	0.008	292	0.001	318	0.002	319	0.007	205	0.005	55
DCP 9	.600	0.006	7	0.006	317	0.001	127	0.003	20	0.002	288	0.001	203	0.004	214	0.002	137	0.001	56
DCP10	.878	0.011	23	0.006	67	0.016	293	0.011	28	0.006	170	0.011	268	0.007	11	0.000	131	0.002	132

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	15.90	0.400	12.39	4.53		5951.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.060	441.3	736.8	0.47E 07	-0.00008	1.549	15.15	0.0809

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		12.393	4.532	0	0.348	17	0.038	37	0.064	336	0.050	0	0.079	283	0.054	335	0.010	69	0.044	291
CN		1.222	0.184	50	0.081	32	0.041	39	0.039	301	0.019	338	0.014	219	0.007	300	0.009	39	0.038	289
CM		-0.034	0.047	184	0.016	80	0.007	79	0.014	23	0.003	46	0.003	287	0.002	164	0.001	153	0.003	70
DCP 1	.010	5.218	0.522	44	0.161	350	0.189	20	0.198	198	0.030	94	0.048	168	0.034	196	0.115	82	0.041	26
DCP 2	.100	2.701	0.542	142	0.521	76	0.296	54	0.339	32	0.173	14	0.376	300	0.037	326	0.024	239	0.018	332
DCP 3	.150	2.085	0.369	120	0.272	54	0.072	66	0.367	8	0.047	358	0.046	254	0.014	98	0.011	338	0.006	196
DCP 4	.200	1.735	0.383	111	0.275	44	0.099	57	0.004	1	0.084	332	0.059	259	0.022	282	0.042	221	0.011	167
DCP 5	.250	1.609	0.276	86	0.158	36	0.055	51	0.363	322	0.028	321	0.038	225	0.006	185	0.022	130	0.014	344
DCP 6	.300	1.231	0.300	78	0.166	22	0.059	35	0.354	326	0.041	310	0.062	233	0.017	252	0.034	179	0.011	274
DCP 7	.400	1.058	0.254	46	0.073	355	0.033	15	0.331	259	0.014	339	0.027	189	0.006	298	0.021	120	0.012	317
DCP 8	.500	0.884	0.216	37	0.060	333	0.029	339	0.329	237	0.024	244	0.035	148	0.004	68	0.032	78	0.022	304
DCP 9	.600	0.697	0.214	25	0.047	299	0.016	303	0.022	189	0.006	337	0.018	121	0.014	312	0.009	82	0.015	255
DCP10	.878	0.410	0.202	1	0.049	249	0.024	277	0.312	175	0.005	272	0.009	55	0.007	356	0.011	321	0.009	240

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.027	276	0.019	320	0.027	311	0.021	289	0.019	280	0.014	296	0.024	287	0.024	289	0.011	287
CN		0.002	44	0.005	281	0.002	139	0.012	295	0.011	243	0.034	341	0.002	345	0.001	34	0.003	332
CM		0.002	14	0.002	314	0.002	250	0.001	191	0.002	15	0.001	291	0.001	15	0.001	173	0.000	27
DCP 1	.010	0.084	35	0.088	302	0.036	188	0.098	305	0.095	7	0.045	308	0.066	12	0.016	347	0.038	314
DCP 2	.100	0.040	331	0.032	270	0.025	249	0.036	223	0.017	187	0.011	250	0.024	199	0.022	153	0.039	139
DCP 3	.150	0.010	300	0.007	202	0.003	311	0.038	281	0.006	261	0.004	253	0.005	197	0.009	137	0.002	61
DCP 4	.200	0.019	182	0.013	57	0.004	237	0.006	347	0.006	217	0.007	43	0.004	66	0.009	60	0.010	18
DCP 5	.250	0.002	105	0.012	298	0.008	185	0.005	282	0.007	184	0.007	108	0.005	40	0.002	345	0.006	328
DCP 6	.300	0.033	137	0.017	65	0.015	77	0.013	336	0.004	152	0.008	20	0.005	3	0.004	320	0.007	330
DCP 7	.400	0.002	110	0.007	225	0.006	81	0.009	330	0.002	206	0.002	95	0.006	349	0.007	265	0.007	237
DCP 8	.500	0.006	66	0.005	312	0.005	20	0.011	257	0.009	188	0.007	25	0.004	294	0.001	75	0.003	330
DCP 9	.600	0.004	89	0.005	214	0.003	8	0.009	292	0.010	200	0.006	79	0.005	262	0.002	249	0.005	232
DCP10	.878	0.007	237	0.008	140	0.010	130	0.008	352	0.002	222	0.009	323	0.004	154	0.007	19	0.002	9

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	16.10	0.430	12.37	4.57		5351.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.061	438.6	730.5	0.675 07	0.00015	1.573	15.19	0.0610

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		12.373	4.574	0	0.336	22	0.056	32	0.085	343	0.063	12	0.028	266	0.152	326	0.034	235	0.009	28
CN		1.189	0.213	64	0.173	20	0.025	29	0.036	1	0.014	351	0.014	94	0.020	332	0.015	251	0.014	162
CM		-0.036	0.048	181	0.014	100	0.006	83	0.004	6	0.003	98	0.001	101	0.002	40	0.003	329	0.001	114
DCP 1	.010	5.262	0.674	39	0.363	359	0.188	332	0.282	164	0.040	126	0.157	101	0.078	356	0.162	303	0.157	141
DCP 2	.100	2.600	0.695	140	0.559	54	0.175	80	0.134	36	0.088	21	0.054	354	0.088	350	0.073	292	0.028	236
DCP 3	.150	1.936	0.633	119	0.281	41	0.075	93	0.055	20	0.034	28	0.025	338	0.030	336	0.031	256	0.018	167
DCP 4	.200	1.599	0.449	110	0.221	37	0.110	72	0.110	353	0.049	329	0.046	283	0.033	297	0.045	220	0.018	187
DCP 5	.250	1.504	0.369	89	0.195	15	0.057	77	0.069	322	0.010	338	0.026	240	0.016	350	0.021	213	0.008	144
DCP 6	.300	1.224	0.336	79	0.188	19	0.045	46	0.045	318	0.032	318	0.031	255	0.027	314	0.029	216	0.010	224
DCP 7	.400	1.036	0.295	53	0.130	344	0.025	9	0.036	239	0.006	11	0.019	185	0.015	326	0.019	170	0.008	151
DCP 8	.500	0.817	0.239	41	0.086	348	0.034	342	0.044	232	0.012	241	0.025	156	0.005	3	0.015	111	0.003	232
DCP 9	.600	0.685	0.234	26	0.078	315	0.023	272	0.035	161	0.014	350	0.016	120	0.023	332	0.011	194	0.009	148
DCP10	.878	0.430	0.211	357	0.027	315	0.028	274	0.012	131	0.013	281	0.015	350	0.014	218	0.002	348	0.006	172

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.023	9	0.033	321	0.025	309	0.015	304	0.014	338	0.019	321	0.015	288	0.014	337	0.012	309
CN		0.004	267	0.004	47	0.011	322	0.003	141	0.002	365	0.006	247	0.001	322	0.003	320	0.004	179
CM		0.002	254	0.002	302	0.001	222	0.001	39	0.002	242	0.001	243	0.001	248	0.001	214	0.002	132
DCP 1	.010	0.131	264	0.028	356	0.109	308	0.375	94	0.034	294	0.101	240	0.023	2	0.014	292	0.071	144
DCP 2	.100	0.016	319	0.016	293	0.019	331	0.020	240	0.016	235	0.034	255	0.018	221	0.025	251	0.030	193
DCP 3	.150	0.003	110	0.011	19	0.007	306	0.009	310	0.011	223	0.002	132	0.005	206	0.000	8	0.004	106
DCP 4	.200	0.024	196	0.016	82	0.009	248	0.003	138	0.005	241	0.007	161	0.003	310	0.003	158	0.005	92
DCP 5	.250	0.009	72	0.011	344	0.003	29	0.011	309	0.004	102	0.009	298	0.005	202	0.002	294	0.004	103
DCP 6	.300	0.020	169	0.004	109	0.009	180	0.009	142	0.007	99	0.008	99	0.005	31	0.008	53	0.010	357
DCP 7	.400	0.013	56	0.002	341	0.010	41	0.004	236	0.009	33	0.006	314	0.006	301	0.002	259	0.001	302
DCP 8	.500	0.010	87	0.005	96	0.012	351	0.001	188	0.006	258	0.015	82	0.009	332	0.012	358	0.014	265
DCP 9	.600	0.009	15	0.006	47	0.010	312	0.008	187	0.006	113	0.006	349	0.005	194	0.001	299	0.008	359
DCP10	.878	0.001	232	0.010	129	0.009	6	0.002	114	0.009	26	0.005	211	0.007	63	0.005	28	0.005	222

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	16.03	0.400	12.39	4.64		5351.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.061	437.6	732.6	0.47E 07	-0.00004	1.610	15.22	0.0220

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		12.394	4.640	0	0.352	22	0.042	32	0.083	352	0.060	17	0.169	8	0.113	242	0.015	187	0.022	328
CN		1.185	0.193	62	0.114	26	0.036	50	0.326	336	0.012	12	0.339	317	0.013	240	0.004	87	0.010	247
CM		-0.029	0.049	183	0.013	102	0.004	126	0.035	19	0.002	55	0.002	10	0.001	58	0.001	128	0.001	255
DCP 1	.010	5.379	0.473	44	0.153	347	0.110	4	0.081	306	0.085	57	0.035	172	0.028	110	0.113	95	0.077	252
DCP 2	.100	2.633	0.621	138	0.594	54	0.157	91	0.163	32	0.069	13	0.098	14	0.068	310	0.039	331	0.032	277
DCP 3	.150	1.921	0.402	119	0.310	42	0.079	92	0.090	6	0.006	277	0.045	5	0.038	254	0.016	247	0.014	203
DCP 4	.200	1.624	0.384	108	0.293	39	0.098	78	0.115	358	0.037	330	0.067	314	0.065	237	0.022	270	0.024	230
DCP 5	.250	1.484	0.308	89	0.207	22	0.054	82	0.053	331	0.002	216	0.020	307	0.024	206	0.007	186	0.008	152
DCP 6	.300	1.223	0.305	76	0.195	23	0.073	53	0.079	322	0.025	333	0.052	289	0.042	219	0.014	167	0.016	210
DCP 7	.400	1.022	0.271	51	0.124	352	0.032	43	0.045	272	0.006	93	0.017	231	0.020	154	0.010	94	0.003	356
DCP 8	.500	0.800	0.228	37	0.074	359	0.034	7	0.037	258	0.010	295	0.022	200	0.015	158	0.013	62	0.006	203
DCP 9	.600	0.654	0.227	28	0.076	318	0.010	351	0.028	212	0.014	60	0.015	165	0.003	178	0.009	70	0.014	394
DCP10	.878	0.412	0.208	357	0.021	286	0.022	323	0.011	102	0.011	252	0.004	18	0.015	283	0.010	296	0.005	141

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.020	301	0.027	309	0.021	291	0.019	273	0.012	320	0.022	276	0.014	266	0.012	248	0.009	264
CN		0.010	158	0.006	114	0.008	70	0.002	282	0.008	30	0.008	0	0.004	279	0.005	239	0.003	301
CM		0.003	208	0.003	218	0.003	122	0.002	349	0.002	354	0.002	5	0.003	327	0.001	293	0.001	66
DCP 1	.010	0.185	172	0.103	130	0.135	86	0.050	14	0.147	10	0.106	15	0.092	331	0.086	271	0.043	315
DCP 2	.100	0.020	275	0.025	256	0.031	257	0.032	265	0.015	180	0.021	314	0.034	234	0.022	184	0.019	174
DCP 3	.150	0.003	161	0.004	174	0.001	22	0.008	205	0.006	80	0.003	333	0.001	220	0.002	333	0.004	212
DCP 4	.200	0.007	186	0.013	236	0.019	130	0.016	78	0.014	96	0.011	44	0.008	42	0.005	36	0.015	24
DCP 5	.250	0.010	48	0.010	290	0.009	147	0.006	337	0.004	20	0.011	318	0.010	204	0.002	150	0.008	142
DCP 6	.300	0.016	159	0.007	123	0.007	121	0.005	164	0.013	84	0.016	42	0.010	65	0.009	17	0.011	5
DCP 7	.400	0.010	35	0.012	259	0.012	125	0.004	356	0.009	2	0.004	285	0.004	336	0.008	221	0.007	26
DCP 8	.500	0.007	103	0.012	90	0.014	343	0.005	206	0.004	40	0.003	29	0.005	322	0.006	243	0.002	32
DCP 9	.600	0.004	153	0.004	66	0.010	353	0.008	299	0.004	315	0.006	316	0.009	243	0.006	97	0.006	294
DCP10	.878	0.009	68	0.018	60	0.006	317	0.011	154	0.007	137	0.006	150	0.015	138	0.005	175	0.008	238

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.)	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	16.26	0.400	14.98	4.44		5052.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.061	442.6	749.5	0.48E 07	-0.00025	1.698	14.86	0.0800

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		14.981	4.436	0	0.056	20	0.139	164	0.088	185	0.028	223	0.068	137	0.050	180	0.051	287	0.034	285
CN		1.199	0.304	96	0.042	39	0.051	66	0.019	68	0.007	239	0.015	359	0.011	111	0.006	269	0.006	136
CM		-0.039	0.046	180	0.010	172	0.011	92	0.007	152	0.004	11	0.004	89	0.001	80	0.002	68	0.002	99
DCP 1	.010	5.408	0.855	78	0.175	31	0.197	58	0.044	126	0.124	308	0.013	319	0.100	107	0.060	186	0.125	115
DCP 2	.100	2.454	1.261	160	0.176	95	0.379	138	0.127	130	0.078	88	0.090	82	0.037	99	0.046	130	0.018	104
DCP 3	.150	1.921	0.765	125	0.014	157	0.174	82	0.046	160	0.038	10	0.035	105	0.006	350	0.022	15	0.006	271
DCP 4	.200	1.725	0.660	119	0.047	95	0.189	76	0.059	97	0.064	32	0.054	49	0.021	13	0.029	10	0.012	357
DCP 5	.250	1.490	0.528	106	0.005	127	0.117	49	0.036	135	0.041	304	0.027	67	0.015	194	0.023	338	0.006	122
DCP 6	.300	1.217	0.441	100	0.032	73	0.107	51	0.043	87	0.029	349	0.063	28	0.006	10	0.024	340	0.015	340
DCP 7	.400	1.031	0.337	80	0.030	24	0.063	5	0.017	51	0.035	254	0.022	346	0.017	156	0.020	285	0.005	15
DCP 8	.500	0.854	0.235	64	0.032	1	0.041	336	0.020	24	0.029	242	0.020	328	0.007	176	0.014	258	0.007	284
DCP 9	.600	0.694	0.213	49	0.040	17	0.034	297	0.029	359	0.030	210	0.025	295	0.014	126	0.013	223	0.002	47
DCP10	.878	0.446	0.177	2	0.055	4	0.028	229	0.030	327	0.011	120	0.018	258	0.004	345	0.009	293	0.006	210

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.021	234	0.015	214	0.021	266	0.011	270	0.015	258	0.013	276	0.011	272	0.008	258	0.010	288
CN		0.012	143	0.008	315	0.008	126	0.013	161	0.004	129	0.004	294	0.005	71	0.008	294	0.006	156
CM		0.002	111	0.003	338	0.001	97	0.003	173	0.001	91	0.001	286	0.002	66	0.002	317	0.000	192
DCP 1	.010	0.171	134	0.206	329	0.098	102	0.237	165	0.054	99	0.097	306	0.138	56	0.160	309	0.071	181
DCP 2	.100	0.035	132	0.016	145	0.029	146	0.010	160	0.011	174	0.013	224	0.013	187	0.020	232	0.011	162
DCP 3	.150	0.009	316	0.002	178	0.008	233	0.001	118	0.007	200	0.006	182	0.009	177	0.003	147	0.005	119
DCP 4	.200	0.011	339	0.002	48	0.002	168	0.005	79	0.008	161	0.007	112	0.010	110	0.004	104	0.009	87
DCP 5	.250	0.012	244	0.006	38	0.010	172	0.002	310	0.006	131	0.007	182	0.005	135	0.004	127	0.002	92
DCP 6	.300	0.008	337	0.011	297	0.004	232	0.007	251	0.001	251	0.007	161	0.002	145	0.006	133	0.006	106
DCP 7	.400	0.010	187	0.009	260	0.007	116	0.006	178	0.004	71	0.006	192	0.002	257	0.001	295	0.003	100
DCP 8	.500	0.002	187	0.009	216	0.002	216	0.003	155	0.004	270	0.002	193	0.006	218	0.004	127	0.002	197
DCP 9	.600	0.008	134	0.006	150	0.000	134	0.007	56	0.003	152	0.005	336	0.002	309	0.005	280	0.004	256
DCP10	.878	0.004	192	0.006	155	0.004	131	0.001	168	0.001	142	0.002	88	0.002	253	0.003	150	0.005	147

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	16.26	0.420	14.99	4.51		5352.2	13

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.062	660.7	739.8	0.48E 07	-0.00053	1.586	16.49	0.0620

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		14.096	4.506	359	0.116	36	0.126	159	0.090	185	0.025	127	0.068	130	0.038	114	0.083	269	0.032	246
CN		1.189	0.291	95	0.052	21	0.045	71	0.011	49	0.010	65	0.009	22	0.010	72	0.023	311	0.009	235
CM		-0.038	0.047	186	0.010	177	0.011	100	0.003	148	0.005	60	0.004	89	0.002	32	0.003	16	0.009	119
DCP 1	.010	5.440	0.692	70	0.165	348	0.112	67	0.110	13	0.142	72	0.036	48	0.132	38	0.279	301	0.129	197
DCP 2	.100	2.643	1.242	143	0.196	87	0.371	113	0.117	31	0.097	91	0.087	75	0.053	99	0.050	75	0.018	77
DCP 3	.150	1.957	0.754	126	0.037	14	0.180	85	0.032	183	0.065	25	0.023	128	0.003	22	0.011	34	0.006	309
DCP 4	.200	1.454	0.653	119	0.061	46	0.187	80	0.164	94	0.059	37	0.141	47	0.021	25	0.029	5	0.004	325
DCP 5	.250	1.441	0.519	106	0.037	353	0.116	52	0.026	150	0.063	326	0.018	73	0.017	225	0.020	323	0.011	189
DCP 6	.300	1.228	0.433	99	0.050	45	0.136	56	0.031	79	0.038	355	0.034	24	0.004	350	0.036	336	0.012	293
DCP 7	.400	1.028	0.360	79	0.054	353	0.054	6	0.039	56	0.035	275	0.016	335	0.017	176	0.024	278	0.005	274
DCP 8	.500	0.811	0.244	64	0.069	10	0.063	337	0.019	5	0.030	257	0.020	228	0.012	145	0.022	279	0.010	303
DCP 9	.600	0.688	0.223	48	0.053	351	0.040	301	0.017	356	0.023	224	0.018	295	0.006	120	0.020	256	0.010	231
DCP10	.878	0.453	0.187	2	0.057	13	0.032	235	0.010	349	0.039	110	0.013	247	0.003	6	0.010	226	0.008	143

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.016	199	0.024	266	0.015	270	0.028	183	0.010	216	0.004	272	0.005	310	0.007	211	0.005	240
CN		0.005	77	0.007	156	0.005	88	0.007	218	0.001	122	0.008	78	0.007	120	0.005	122	0.007	273
CM		0.003	21	0.002	189	0.001	79	0.002	197	0.001	34	0.002	26	0.002	178	0.001	195	0.001	276
DCP 1	.010	0.137	29	0.142	185	0.066	74	0.140	227	0.054	19	0.125	58	0.105	142	0.092	117	0.140	274
DCP 2	.100	0.031	106	0.016	96	0.019	136	0.017	216	0.032	176	0.013	163	0.021	165	0.014	155	0.007	132
DCP 3	.150	0.009	28	0.005	17	0.005	200	0.004	336	0.009	217	0.007	156	0.011	136	0.006	99	0.010	88
DCP 4	.200	0.003	27	0.010	88	0.012	61	0.018	42	0.010	62	0.012	34	0.010	35	0.008	335	0.004	331
DCP 5	.250	0.005	229	0.008	56	0.005	157	0.007	360	0.005	153	0.004	154	0.006	82	0.003	95	0.003	56
DCP 6	.300	0.013	260	0.002	85	0.004	113	0.006	354	0.002	86	0.003	41	0.006	21	0.005	0	0.006	320
DCP 7	.400	0.015	158	0.003	28	0.008	31	0.003	20	0.007	25	0.004	36	0.003	318	0.004	335	0.003	257
DCP 8	.500	0.012	204	0.004	284	0.003	353	0.008	260	0.005	224	0.004	154	0.001	12	0.002	25	0.004	247
DCP 9	.600	0.010	145	0.010	164	0.003	313	0.003	111	0.001	135	0.003	58	0.002	66	0.003	220	0.001	228
DCP10	.878	0.002	214	0.006	33	0.002	178	0.004	322	0.005	214	0.007	154	0.008	46	0.002	238	0.001	281

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	16.29	0.400	15.02	4.55		5352.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.062	439.8	739.4	0.485 07	-0.00076	1.578	15.94	0.0220

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		15.022	4.551	0	0.104	27	0.142	161	0.065	172	0.014	146	0.050	107	0.175	65	0.075	291	0.049	264
CN		1.175	0.276	91	0.057	25	0.050	52	0.017	31	0.033	259	0.016	25	0.024	64	0.018	354	0.033	261
CM		-0.040	0.050	185	0.012	168	0.011	90	0.036	110	0.003	317	0.003	58	0.002	275	0.004	130	0.004	105
DCP 1	.010	5.243	0.578	68	0.184	4	0.360	27	0.113	79	0.290	257	0.099	8	0.127	27	0.088	37	0.136	143
DCP 2	.100	2.467	1.176	143	0.212	44	0.278	118	0.137	172	0.092	130	0.036	71	0.075	91	0.067	55	0.017	97
DCP 3	.150	1.844	0.734	123	0.043	60	0.160	88	0.046	147	0.048	42	0.029	66	0.028	44	0.030	19	0.027	328
DCP 4	.200	1.642	0.615	119	0.051	80	0.172	80	0.147	174	0.059	37	0.048	51	0.037	53	0.037	359	0.012	352
DCP 5	.250	1.437	0.521	103	0.044	24	0.104	51	0.031	139	0.031	341	0.029	38	0.006	78	0.032	346	0.017	298
DCP 6	.300	1.226	0.423	97	0.048	59	0.114	69	0.037	86	0.038	355	0.033	24	0.024	54	0.036	336	0.015	337
DCP 7	.400	1.031	0.349	75	0.062	11	0.062	1	0.034	76	0.019	269	0.024	336	0.016	106	0.028	332	0.012	304
DCP 8	.500	0.793	0.240	60	0.050	11	0.051	337	0.012	1	0.017	260	0.020	300	0.018	86	0.023	290	0.015	331
DCP 9	.600	0.675	0.235	44	0.060	356	0.060	334	0.017	295	0.020	201	0.018	265	0.020	94	0.012	253	0.019	296
DCP10	.878	0.460	0.194	0	0.062	359	0.026	247	0.016	299	0.017	122	0.006	127	0.017	49	0.014	344	0.013	239

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.023	213	0.013	196	0.013	238	0.014	211	0.013	236	0.008	242	0.006	237	0.003	294	0.008	197
CN		0.015	294	0.012	80	0.039	353	0.010	118	0.006	207	0.038	47	0.006	231	0.009	188	0.006	174
CM		0.002	192	0.002	37	0.001	74	0.002	130	0.002	82	0.002	39	0.001	249	0.002	272	0.001	197
DCP 1	.010	0.240	127	0.200	65	0.197	3	0.174	121	0.045	139	0.156	42	0.106	235	0.152	185	0.102	184
DCP 2	.100	0.026	56	0.026	130	0.014	55	0.021	148	0.009	127	0.013	167	0.010	160	0.009	195	0.015	155
DCP 3	.150	0.011	295	0.007	271	0.002	334	0.003	276	0.003	145	0.003	121	0.004	56	0.001	277	0.005	67
DCP 4	.200	0.012	326	0.011	50	0.005	302	0.010	39	0.001	139	0.010	14	0.005	15	0.008	335	0.005	316
DCP 5	.250	0.015	260	0.005	188	0.001	160	0.002	346	0.001	19	0.002	191	0.004	16	0.003	234	0.000	166
DCP 6	.300	0.015	276	0.010	354	0.006	285	0.006	321	0.005	270	0.003	310	0.001	327	0.006	291	0.006	274
DCP 7	.400	0.015	224	0.003	253	0.002	4	0.004	210	0.006	365	0.002	73	0.008	290	0.003	211	0.001	188
DCP 8	.500	0.012	214	0.006	272	0.002	296	0.003	308	0.006	222	0.000	8	0.003	356	0.006	237	0.001	162
DCP 9	.600	0.009	170	0.007	131	0.010	348	0.008	78	0.012	269	0.003	321	0.005	212	0.006	179	0.005	130
DCP10	.878	0.002	358	0.003	120	0.007	303	0.002	157	0.006	272	0.004	112	0.003	136	0.005	175	0.002	38

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	15.92	0.400	17.35	4.47		5953.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.059	445.4	746.0	0.48E 07	-0.00179	1.558	15.98	0.0800

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		17.346	4.670	0	0.052	38	0.099	211	0.041	221	0.034	156	0.056	275	0.032	285	0.015	245	0.006	263
CN		1.187	0.284	102	0.058	154	0.012	133	0.012	270	0.005	65	0.014	188	0.012	256	0.004	331	0.038	3
CM		-0.055	0.038	202	0.021	211	0.011	258	0.002	108	0.003	174	0.003	329	0.002	305	0.001	64	0.001	56
DCP 1	.010	5.351	0.603	81	0.127	117	0.125	360	0.087	72	0.110	77	0.121	115	0.136	229	0.044	110	0.067	39
DCP 2	.100	2.211	1.141	149	0.434	213	0.120	238	0.129	255	0.035	283	0.080	297	0.051	10	0.030	27	0.051	52
DCP 3	.150	1.769	0.673	175	0.294	199	0.074	273	0.019	75	0.044	219	0.038	280	0.013	336	0.015	271	0.015	324
DCP 4	.200	1.656	0.566	173	0.269	190	0.073	216	0.065	217	0.068	230	0.054	249	0.044	286	0.033	305	0.029	323
DCP 5	.250	1.436	0.473	197	0.174	174	0.069	230	0.025	8	0.022	145	0.060	215	0.027	281	0.012	287	0.009	279
DCP 6	.300	1.175	0.407	193	0.176	162	0.061	185	0.033	214	0.033	190	0.054	229	0.060	267	0.030	280	0.026	295
DCP 7	.400	1.026	0.332	86	0.085	122	0.038	135	0.014	354	0.018	59	0.034	164	0.019	235	0.014	263	0.010	290
DCP 8	.500	0.919	0.240	72	0.075	89	0.043	96	0.016	309	0.028	43	0.020	150	0.009	218	0.012	256	0.008	279
DCP 9	.600	0.725	0.208	61	0.073	43	0.047	90	0.016	335	0.027	22	0.027	116	0.011	145	0.000	181	0.006	26
DCP10	.878	0.511	0.129	27	0.079	17	0.045	56	0.015	248	0.009	304	0.008	183	0.002	162	0.005	91	0.000	211

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.028	245	0.008	194	0.003	224	0.009	155	0.007	137	0.007	155	0.011	136	0.006	153	0.008	135
CN		0.007	24	0.002	266	0.005	269	0.010	280	0.004	11	0.005	45	0.015	290	0.012	56	0.031	59
CM		0.004	83	0.001	111	0.002	230	0.001	217	0.002	113	0.003	78	0.003	295	0.003	70	0.001	193
DCP 1	.010	0.183	70	0.038	265	0.112	233	0.145	256	0.071	89	0.157	77	0.272	292	0.247	62	0.011	201
DCP 2	.100	0.037	107	0.032	115	0.024	150	0.036	233	0.011	342	0.025	316	0.013	358	0.013	27	0.021	54
DCP 3	.150	0.013	324	0.004	187	0.006	317	0.006	303	0.008	286	0.013	264	0.008	260	0.005	276	0.004	170
DCP 4	.200	0.030	340	0.014	30	0.010	70	0.033	59	0.003	106	0.006	241	0.006	239	0.005	256	0.006	330
DCP 5	.250	0.022	283	0.003	239	0.003	314	0.007	327	0.005	309	0.008	267	0.007	247	0.004	227	0.005	297
DCP 6	.300	0.027	312	0.015	341	0.014	17	0.011	41	0.008	29	0.006	86	0.009	167	0.007	274	0.006	216
DCP 7	.400	0.013	276	0.008	27[illegible]	0.007	348	0.013	336	0.009	343	0.004	334	0.003	255	0.005	54	0.004	101
DCP 8	.500	0.014	249	0.013	35	0.008	293	0.005	317	0.009	294	0.006	296	0.002	332	0.003	259	0.004	234
DCP 9	.600	0.007	296	0.002	133	0.002	48	0.008	349	0.004	346	0.002	324	0.002	75	0.003	60	0.006	49
DCP10	.878	0.005	276	0.005	299	0.003	310	0.006	251	0.006	299	0.005	258	0.002	232	0.004	304	0.003	0

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	15.90	0.400	17.34	4.50		5353.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.060	439.9	737.0	0.48E 07	-0.00134	1.549	15.78	0.0580

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		17.339	4.502	0	0.054	61	0.120	206	0.077	194	0.066	178	0.084	260	0.067	280	0.064	291	0.045	157
CN		1.162	0.299	95	0.044	175	0.009	136	0.038	347	0.004	297	0.020	234	0.013	271	0.024	229	0.016	271
CM		-0.060	0.040	198	0.019	199	0.010	256	0.002	140	0.004	297	0.006	286	0.004	347	0.002	294	0.004	317
DCP 1	.010	5.173	0.644	77	0.169	35	0.040	256	0.055	87	0.033	246	0.072	227	0.127	15	0.156	218	0.205	299
DCP 2	.100	2.159	1.127	142	0.177	214	0.092	235	0.089	251	0.094	254	0.135	280	0.086	295	0.068	298	0.030	337
DCP 3	.150	1.660	0.665	120	0.295	201	0.109	286	0.039	26	0.057	223	0.069	275	0.033	307	0.036	260	0.026	267
DCP 4	.200	1.503	0.590	115	0.278	184	0.051	213	0.030	151	0.065	192	0.064	229	0.049	259	0.048	249	0.039	271
DCP 5	.250	1.380	0.497	102	0.168	175	0.064	255	0.040	18	0.032	162	0.056	223	0.042	273	0.032	236	0.028	232
DCP 6	.300	1.189	0.437	97	0.167	158	0.044	165	0.021	87	0.045	144	0.052	193	0.039	231	0.035	222	0.025	232
DCP 7	.400	1.044	0.368	82	0.083	116	0.039	120	0.023	24	0.036	90	0.047	167	0.031	224	0.033	216	0.021	208
DCP 8	.500	0.842	0.249	67	0.053	82	0.040	92	0.022	2	0.029	51	0.030	123	0.017	157	0.020	185	0.007	158
DCP 9	.600	0.747	0.233	57	0.068	39	0.039	86	0.022	337	0.032	33	0.031	120	0.016	191	0.013	199	0.012	147
DCP10	.878	0.531	0.140	19	0.089	352	0.038	62	0.011	232	0.017	297	0.019	81	0.006	108	0.004	124	0.002	256

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.027	144	0.010	127	0.014	149	0.019	135	0.012	127	0.015	127	0.013	143	0.007	135	0.009	112
CN		0.011	276	0.006	295	0.007	152	0.008	274	0.010	155	0.003	250	0.007	194	0.007	177	0.007	170
CM		0.004	338	0.001	296	0.001	255	0.002	297	0.002	182	0.001	289	0.003	229	0.001	269	0.002	244
DCP 1	.010	0.169	311	0.120	307	0.098	181	0.188	286	0.137	160	0.090	311	0.124	219	0.052	210	0.078	194
DCP 2	.100	0.016	358	0.019	96	0.022	136	0.025	158	0.039	180	0.035	207	0.030	229	0.029	238	0.030	252
DCP 3	.150	0.007	265	0.012	194	0.009	232	0.009	193	0.015	210	0.017	218	0.015	193	0.015	222	0.009	224
DCP 4	.200	0.028	300	0.014	324	0.013	1	0.015	39	0.013	87	0.014	122	0.010	132	0.017	161	0.015	178
DCP 5	.250	0.022	250	0.007	245	0.002	321	0.004	205	0.005	170	0.008	176	0.008	144	0.009	159	0.009	171
DCP 6	.300	0.020	257	0.011	289	0.014	354	0.014	5	0.017	14	0.011	50	0.011	38	0.012	74	0.011	78
DCP 7	.400	0.019	206	0.014	222	0.002	299	0.002	106	0.003	146	0.007	126	0.012	112	0.009	178	0.013	108
DCP 8	.500	0.011	174	0.006	202	0.000	222	0.004	231	0.006	327	0.004	341	0.004	322	0.004	3	0.004	40
DCP 9	.600	0.010	168	0.003	132	0.008	132	0.004	145	0.006	115	0.005	143	0.009	96	0.013	136	0.010	125
DCP10	.878	0.005	201	0.006	30	0.008	149	0.004	219	0.003	131	0.001	55	0.003	24	0.001	203	0.003	72

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
94.0	15.87	0.400	17.31	6.54		5353.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.060	439.0	735.4	0.475 07	-0.00158	1.533	16.33	0.0223

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		17.306	4.543	0	0.081	312	0.134	228	0.222	214	0.074	173	0.095	230	0.071	238	0.053	187	0.021	175
CN		1.150	0.295	96	0.052	159	0.010	142	0.224	297	0.010	57	0.015	211	0.015	234	0.013	242	0.015	135
CM		-0.060	0.036	199	0.020	212	0.008	249	0.037	46	0.024	162	0.025	251	0.000	52	0.001	166	0.002	98
DCP 1	.010	5.069	0.658	66	0.073	336	0.134	88	0.242	18	0.124	78	0.147	213	0.157	178	0.184	211	0.102	156
DCP 2	.100	2.191	1.138	144	0.430	211	0.139	213	0.123	258	0.046	240	0.132	275	0.072	323	0.041	335	0.030	352
DCP 3	.150	1.650	0.703	117	0.203	182	0.087	273	0.020	21	0.045	192	0.053	255	0.023	279	0.017	210	0.017	239
DCP 4	.200	1.504	0.580	119	0.266	188	0.063	224	0.035	231	0.031	182	0.044	237	0.038	282	0.016	313	0.005	238
DCP 5	.250	1.362	0.519	120	0.106	153	0.037	233	0.031	358	0.042	109	0.040	135	0.024	255	0.008	161	0.018	185
DCP 6	.300	1.177	0.424	99	0.150	162	0.044	204	0.025	284	0.021	138	0.034	219	0.024	271	0.016	337	0.003	244
DCP 7	.400	1.022	0.364	80	0.124	138	0.035	122	0.020	317	0.043	54	0.035	130	0.016	215	0.003	116	0.007	178
DCP 8	.500	0.824	0.253	71	0.060	91	0.034	135	0.029	281	0.022	34	0.025	135	0.023	207	0.017	259	0.004	244
DCP 9	.600	0.727	0.216	57	0.083	52	0.037	89	0.025	259	0.033	7	0.025	81	0.009	196	0.007	241	0.003	251
DCP10	.878	0.537	0.125	21	0.079	0	0.034	65	0.028	232	0.012	292	0.009	26	0.010	173	0.007	251	0.009	244

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.010	156	0.013	168	0.007	210	0.010	167	0.008	165	0.007	138	0.010	192	0.005	188	0.004	203
CN		0.010	225	0.003	46	0.005	131	0.008	230	0.002	153	0.009	264	0.005	267	0.006	310	0.006	118
CM		0.003	319	0.004	41	0.003	41	0.003	6	0.001	58	0.002	339	0.003	350	0.002	10	0.003	37
DCP 1	.010	0.132	260	0.113	45	0.162	45	0.060	275	0.049	127	0.114	264	0.105	310	0.109	328	0.118	80
DCP 2	.100	0.017	339	0.018	30	0.030	315	0.017	349	0.020	47	0.014	28	0.017	51	0.013	59	0.032	138
DCP 3	.150	0.003	211	0.001	349	0.006	286	0.008	295	0.005	272	0.005	232	0.003	127	0.002	293	0.006	32
DCP 4	.200	0.002	272	0.010	68	0.004	123	0.010	276	0.005	349	0.005	235	0.005	312	0.005	347	0.004	294
DCP 5	.250	0.012	198	0.001	130	0.005	219	0.007	274	0.004	281	0.007	271	0.004	294	0.003	259	0.001	356
DCP 6	.300	0.010	228	0.005	332	0.003	175	0.003	251	0.003	287	0.005	253	0.006	264	0.006	333	0.003	282
DCP 7	.400	0.010	153	0.005	100	0.005	228	0.008	211	0.005	272	0.006	211	0.005	245	0.006	279	0.003	215
DCP 8	.500	0.017	187	0.011	228	0.006	221	0.007	234	0.005	250	0.005	227	0.011	213	0.004	232	0.006	189
DCP 9	.600	0.009	163	0.007	214	0.012	198	0.013	233	0.003	178	0.010	179	0.008	234	0.006	237	0.009	213
DCP10	.878	0.009	177	0.010	220	0.007	196	0.010	139	0.006	210	0.002	213	0.010	174	0.004	223	0.009	165

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	16.23	0.400	24.58	4.59		5354.1	10

K	V	O	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.063	432.2	743.0	0.485 07	-0.00102	1.296	27.74	0.0803

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		24.678	4.592	0	0.185	35	0.041	172	0.021	178	0.017	189	0.010	190	0.021	169	0.024	313	0.015	118
CN		1.198	0.151	29	0.030	21	0.033	76	0.036	338	0.009	23	0.037	173	0.003	83	0.002	259	0.035	345
CM		-0.113	0.028	213	0.002	238	0.002	125	0.002	17	0.001	336	0.000	283	0.002	163	0.002	139	0.003	312
DCP 1	.010	3.709	0.078	26	0.239	0	0.113	146	0.147	6	0.132	4	0.076	165	0.066	143	0.088	144	0.181	328
DCP 2	.100	1.576	0.191	33	0.037	16	0.025	40	0.016	275	0.011	165	0.039	312	0.006	196	0.004	295	0.010	178
DCP 3	.150	1.466	0.185	26	0.020	65	0.017	22	0.009	184	0.010	17	0.009	200	0.007	71	0.007	278	0.007	143
DCP 4	.200	1.471	0.194	23	0.029	68	0.013	352	0.016	217	0.003	172	0.032	133	0.004	38	0.011	328	0.007	158
DCP 5	.250	1.382	0.207	25	0.017	60	0.017	7	0.016	213	0.010	6	0.010	212	0.004	56	0.006	285	0.005	140
DCP 6	.300	1.215	0.194	27	0.028	60	0.009	337	0.033	242	0.006	111	0.031	316	0.003	345	0.012	315	0.038	153
DCP 7	.400	1.109	0.202	26	0.016	45	0.012	354	0.037	192	0.007	10	0.009	196	0.007	24	0.005	301	0.006	39
DCP 8	.500	1.012	0.169	28	0.025	39	0.008	332	0.032	251	0.004	142	0.031	140	0.004	45	0.009	311	0.010	127
DCP 9	.600	0.869	0.166	31	0.015	24	0.033	284	0.033	221	0.005	55	0.034	180	0.004	14	0.005	327	0.005	89
DCP10	.878	0.643	0.106	37	0.025	21	0.002	184	0.033	297	0.003	77	0.036	134	0.006	343	0.005	338	0.002	62

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.026	226	0.006	114	0.006	175	0.038	198	0.003	156	0.002	174	0.004	170	0.002	118	0.005	137
CN		0.001	347	0.011	72	0.008	259	0.039	337	0.021	6	0.033	93	0.009	337	0.008	138	0.014	82
CM		0.005	60	0.001	92	0.001	57	0.034	335	0.003	45	0.001	356	0.001	28	0.002	86	0.003	96
DCP 1	.010	0.194	67	0.164	67	0.042	261	0.242	332	0.290	20	0.052	32	0.137	360	0.161	111	0.230	83
DCP 2	.100	0.011	288	0.008	116	0.010	236	0.011	193	0.011	357	0.036	116	0.003	247	0.002	250	0.038	81
DCP 3	.150	0.012	258	0.008	133	0.007	286	0.009	201	0.008	358	0.031	336	0.001	115	0.008	288	0.036	156
DCP 4	.200	0.008	289	0.006	147	0.004	226	0.038	196	0.011	364	0.031	96	0.002	32	0.005	261	0.005	99
DCP 5	.250	0.013	258	0.006	122	0.009	280	0.009	293	0.011	5	0.033	276	0.004	108	0.009	280	0.009	152
DCP 6	.300	0.009	246	0.006	145	0.004	234	0.037	293	0.011	352	0.031	246	0.001	313	0.008	242	0.006	125
DCP 7	.400	0.014	258	0.005	113	0.010	280	0.010	187	0.014	351	0.036	174	0.007	25	0.008	240	0.006	99
DCP 8	.500	0.014	265	0.005	59	0.006	272	0.038	179	0.012	323	0.003	161	0.004	327	0.007	177	0.002	135
DCP 9	.600	0.013	242	0.007	52	0.007	272	0.035	158	0.008	336	0.034	147	0.007	344	0.006	134	0.005	23
DCP10	.878	0.009	222	0.003	359	0.006	219	0.034	162	0.006	279	0.034	176	0.006	283	0.004	135	0.003	332

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	16.42	0.400	24.65	4.66		5356.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.062	440.7	735.9	0.47E 07	-0.00162	1.276	25.40	0.0530

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		24.651	4.663	0	0.171	25	0.072	176	0.034	174	0.015	186	0.024	185	0.038	171	0.014	238	0.007	113
CN		1.073	0.155	26	0.023	70	0.007	171	0.036	17	0.011	64	0.010	36	0.006	3	0.011	17	0.007	255
CM		-0.117	0.023	216	0.007	235	0.002	347	0.002	30	0.001	25	0.002	4	0.002	335	0.003	74	0.003	233
DCP 1	.010	3.377	0.367	16	0.105	186	0.058	19	0.141	20	0.116	49	0.147	24	0.156	345	0.202	51	0.195	249
DCP 2	.100	1.560	0.183	30	0.035	67	0.018	115	0.036	272	0.012	99	0.010	71	0.037	178	0.010	319	0.033	114
DCP 3	.150	1.387	0.175	23	0.035	63	0.017	63	0.011	158	0.009	69	0.001	19	0.006	128	0.009	321	0.007	131
DCP 4	.200	1.343	0.185	19	0.026	52	0.008	136	0.034	280	0.012	66	0.036	115	0.006	166	0.009	323	0.002	117
DCP 5	.250	1.324	0.197	23	0.031	59	0.015	65	0.038	144	0.007	57	0.034	43	0.005	123	0.008	333	0.007	132
DCP 6	.300	1.218	0.183	23	0.032	61	0.008	119	0.034	303	0.011	73	0.032	52	0.004	134	0.008	325	0.006	72
DCP 7	.400	1.104	0.190	24	0.031	58	0.009	136	0.034	127	0.005	77	0.005	10	0.037	124	0.010	314	0.005	99
DCP 8	.500	0.955	0.157	25	0.028	56	0.006	157	0.034	313	0.014	78	0.003	179	0.006	83	0.007	292	0.006	13
DCP 9	.600	0.874	0.154	31	0.027	60	0.006	154	0.032	137	0.004	64	0.004	65	0.004	131	0.005	302	0.007	39
DCP10	.878	0.651	0.099	37	0.027	67	0.010	152	0.033	288	0.003	167	0.004	87	0.001	336	0.005	318	0.003	336

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.001	301	0.015	152	0.011	172	0.005	193	0.002	102	0.009	111	0.005	137	0.006	133	0.006	98
CN		0.011	2	0.035	271	0.011	284	0.037	25	0.015	1	0.010	311	0.018	346	0.004	79	0.036	114
CM		0.000	346	0.001	299	0.001	338	0.033	37	0.003	21	0.003	320	0.003	331	0.001	67	0.001	119
DCP 1	.010	0.117	352	0.139	277	0.138	282	0.169	32	0.265	6	0.192	315	0.306	338	0.092	85	0.102	114
DCP 2	.100	0.014	23	0.031	10	0.039	332	0.032	222	0.001	135	0.033	2	0.005	23	0.008	325	0.003	222
DCP 3	.150	0.006	53	0.003	170	0.009	323	0.003	245	0.001	90	0.003	276	0.006	46	0.006	18	0.002	315
DCP 4	.200	0.008	2	0.007	89	0.038	284	0.035	64	0.005	255	0.031	147	0.004	347	0.002	33	0.032	179
DCP 5	.250	0.007	53	0.001	343	0.007	313	0.032	291	0.001	1	0.001	3	0.004	33	0.005	31	0.001	287
DCP 6	.300	0.009	359	0.005	42	0.006	273	0.035	53	0.005	252	0.002	341	0.004	60	0.006	313	0.002	154
DCP 7	.400	0.004	7	0.000	291	0.005	291	0.031	294	0.002	68	0.003	278	0.003	48	0.004	310	0.004	136
DCP 8	.500	0.005	5	0.001	324	0.003	216	0.035	335	0.003	48	0.034	298	0.005	25	0.006	252	0.003	28
DCP 9	.600	0.004	45	0.003	50	0.005	270	0.034	251	0.004	10	0.002	211	0.006	8	0.004	250	0.003	54
DCP10	.878	0.006	343	0.006	194	0.005	272	0.035	210	0.006	290	0.035	137	0.003	358	0.007	123	0.004	139

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	16.31	0.430	24.69	4.72		5354.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.062	439.3	734.9	0.47E 07	-0.00178	1.227	27.43	0.0220

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		24.689	4.721	0	0.127	23	0.100	173	0.054	165	0.007	147	0.019	185	0.058	168	0.014	193	0.077	127
CN		1.038	0.147	30	0.015	95	0.005	37	0.035	283	0.039	352	0.035	352	0.005	117	0.002	232	0.010	172
CM		-0.119	0.026	215	0.005	200	0.001	84	0.001	210	0.002	317	0.002	349	0.001	72	0.001	152	0.003	233
DCP 1	.010	3.090	0.131	38	0.214	155	0.055	95	0.077	246	0.184	325	0.131	346	0.084	80	0.071	186	0.183	202
DCP 2	.100	1.525	0.179	31	0.050	252	0.019	32	0.012	332	0.012	92	0.032	354	0.012	196	0.009	355	0.008	135
DCP 3	.150	1.349	0.177	25	0.061	64	0.012	29	0.035	120	0.010	37	0.003	126	0.001	209	0.003	56	0.005	128
DCP 4	.200	1.305	0.189	22	0.004	285	0.006	2	0.035	40	0.006	74	0.005	111	0.008	198	0.006	22	0.003	175
DCP 5	.250	1.281	0.201	25	0.037	53	0.010	44	0.032	88	0.007	41	0.003	111	0.003	202	0.003	50	0.006	160
DCP 6	.300	1.196	0.195	24	0.005	11	0.010	368	0.035	333	0.006	89	0.002	319	0.009	162	0.006	348	0.008	126
DCP 7	.400	1.078	0.195	27	0.035	53	0.006	13	0.001	305	0.004	53	0.003	124	0.003	140	0.004	293	0.006	122
DCP 8	.500	0.918	0.166	28	0.001	298	0.010	329	0.035	339	0.007	84	0.001	119	0.006	163	0.004	337	0.036	97
DCP 9	.600	0.846	0.158	32	0.031	52	0.002	306	0.032	307	0.004	87	0.004	120	0.002	121	0.005	273	0.004	139
DCP10	.878	0.655	0.100	41	0.005	61	0.003	298	0.033	335	0.001	346	0.003	216	0.001	294	0.001	257	0.008	98

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.011	294	0.014	142	0.007	293	0.009	162	0.007	132	0.010	123	0.006	97	0.010	74	0.006	144
CN		0.025	19	0.004	1	0.021	31	0.004	46	0.004	340	0.036	339	0.007	140	0.007	214	0.008	3
CM		0.003	35	0.001	1	0.003	33	0.002	59	0.001	56	0.000	285	0.002	73	0.002	252	0.002	25
DCP 1	.010	0.330	19	0.102	8	0.317	27	0.135	58	0.054	346	0.068	319	0.121	112	0.137	235	0.148	19
DCP 2	.100	0.012	36	0.005	219	0.007	83	0.004	281	0.005	61	0.004	316	0.004	206	0.005	230	0.007	353
DCP 3	.150	0.009	47	0.003	328	0.008	76	0.004	302	0.001	208	0.006	20	0.001	220	0.003	203	0.005	317
DCP 4	.200	0.013	44	0.005	249	0.007	85	0.006	244	0.005	82	0.004	339	0.003	313	0.004	185	0.002	252
DCP 5	.250	0.011	46	0.003	290	0.012	60	0.004	281	0.002	3	0.005	9	0.002	252	0.003	151	0.007	308
DCP 6	.300	0.011	22	0.001	159	0.007	64	0.006	252	0.004	85	0.003	333	0.004	195	0.002	157	0.003	258
DCP 7	.400	0.013	25	0.001	268	0.012	66	0.004	278	0.004	351	0.003	350	0.003	223	0.004	158	0.006	332
DCP 8	.500	0.012	358	0.003	182	0.006	36	0.004	230	0.005	13	0.001	236	0.003	221	0.005	106	0.003	220
DCP 9	.600	0.011	12	0.001	341	0.009	29	0.003	231	0.005	299	0.002	347	0.004	214	0.004	139	0.004	289
DCP10	.878	0.005	333	0.002	155	0.003	280	0.001	7	0.004	257	0.004	346	0.006	181	0.003	116	0.003	182

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	14.58	0.600	0.43	4.74		5355.1	13

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.037	654.0	1469.7	0.635 07	-0.00058	0.741	5.22	0.0800

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		0.402	4.743	0	0.139	354	0.107	291	0.068	215	0.029	207	0.032	216	0.041	240	0.021	243	0.022	288
CN		0.186	0.542	355	0.007	91	0.014	245	0.010	229	0.004	149	0.013	214	0.003	221	0.006	6	0.002	319
CM		-0.023	0.005	236	0.000	39	0.001	135	0.001	340	0.001	110	0.002	192	0.001	330	0.002	17	0.000	36
DCP 1	.010	-0.776	1.089	354	0.038	352	0.045	7	0.049	28	0.060	128	0.110	150	0.064	318	0.121	11	0.032	68
DCP 2	.100	0.744	2.017	353	0.073	110	0.074	226	0.086	241	0.058	141	0.054	229	0.035	191	0.004	9	0.023	270
DCP 3	.200	0.567	0.898	355	0.011	314	0.071	230	0.027	127	0.063	331	0.063	255	0.024	179	0.002	181	0.009	75
DCP 4	.250	0.400	0.722	353	0.026	46	0.028	238	0.010	219	0.008	286	0.038	252	0.010	181	0.002	130	0.006	325
DCP 5	.300	0.233	0.597	354	0.018	95	0.027	292	0.020	231	0.007	229	0.033	231	0.004	182	0.004	236	0.006	252
DCP 6	.400	0.185	0.460	356	0.006	247	0.025	226	0.017	242	0.006	175	0.032	228	0.003	214	0.002	229	0.002	258
DCP 7	.500	0.196	0.321	357	0.010	221	0.017	232	0.015	215	0.004	211	0.033	256	0.002	252	0.002	253	0.001	330
DCP 8	.600	0.096	0.249	359	0.009	252	0.011	230	0.006	204	0.002	242	0.001	234	0.002	206	0.001	192	0.001	277
DCP 9	.878	0.088	0.113	2	0.011	80	0.004	155	0.003	295	0.002	223	0.002	240	0.001	153	0.001	251	0.001	16

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.008	211	0.013	319	0.017	292	0.010	316	0.013	319	0.012	329	0.007	337	0.003	322	0.003	352
CN		0.009	309	0.008	215	0.003	12	0.001	354	0.003	255	0.001	357	0.002	120	0.002	13	0.004	174
CM		0.001	293	0.001	291	0.001	30	0.000	99	0.001	254	0.000	349	0.001	96	0.000	26	0.001	113
DCP 1	.010	0.119	286	0.124	199	0.071	33	0.013	75	0.070	260	0.013	50	0.039	117	0.028	33	0.071	105
DCP 2	.100	0.023	354	0.006	253	0.008	323	0.004	340	0.002	172	0.006	333	0.001	73	0.001	331	0.003	150
DCP 3	.200	0.015	1	0.014	272	0.007	257	0.004	310	0.002	22	0.005	351	0.001	357	0.006	331	0.001	258
DCP 4	.250	0.006	280	0.003	214	0.002	108	0.003	368	0.002	299	0.002	279	0.001	295	0.002	0	0.001	342
DCP 5	.300	0.002	271	0.002	272	0.002	239	0.001	333	0.001	319	0.001	330	0.001	298	0.001	320	0.001	329
DCP 6	.400	0.002	305	0.002	263	0.001	198	0.001	276	0.001	357	0.001	317	0.001	210	0.001	347	0.001	312
DCP 7	.500	0.002	275	0.001	291	0.001	309	0.001	334	0.000	6	0.001	25	0.001	294	0.001	333	0.001	349
DCP 8	.600	0.001	343	0.001	292	0.002	237	0.001	253	0.001	41	0.001	49	0.000	112	0.000	26	0.001	38
DCP 9	.878	0.001	341	0.001	165	0.000	291	0.001	28	0.001	56	0.000	57	0.002	241	0.001	147	0.001	109

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	14.58	0.600	0.33	4.84		5355.2	13

K	V	D	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.037	650.0	1455.0	0.63E 07	-0.00059	0.721	5.26	0.0573

HARMONIC ANALYSIS

DATA TYPE	Y/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		0.300	4.836	350	0.187	8	0.057	196	0.037	196	0.012	179	0.017	244	0.018	208	0.016	189	0.007	304
CN		0.155	0.566	355	0.016	9	0.036	333	0.015	213	0.006	176	0.012	241	0.006	204	0.003	171	0.003	137
CM		-0.026	0.006	234	0.002	151	0.002	94	0.003	36	0.002	146	0.002	253	0.001	242	0.000	158	0.001	199
DCP 1	.010	-1.068	1.104	352	0.013	327	0.154	51	0.072	52	0.114	176	0.084	277	0.056	262	0.050	179	0.093	102
DCP 2	.100	0.758	2.024	353	0.062	54	0.043	193	0.174	238	0.053	133	0.150	213	0.016	182	0.005	322	0.013	256
DCP 3	.200	0.427	0.904	355	0.034	337	0.058	196	0.038	117	0.059	333	0.041	253	0.028	167	0.012	195	0.007	66
DCP 4	.250	0.320	0.730	353	0.040	26	0.027	338	0.013	226	0.011	310	0.036	281	0.010	160	0.005	86	0.006	335
DCP 5	.300	0.245	0.603	355	0.023	35	0.028	338	0.016	231	0.006	250	0.033	182	0.006	170	0.003	291	0.002	189
DCP 6	.400	0.184	0.464	355	0.014	337	0.025	336	0.005	272	0.002	195	0.001	141	0.002	169	0.001	240	0.002	277
DCP 7	.500	0.143	0.325	357	0.013	301	0.016	331	0.002	215	0.003	215	0.001	228	0.001	205	0.001	183	0.001	191
DCP 8	.600	0.094	0.253	359	0.013	335	0.01[illegible]	333	0.002	316	0.002	242	0.001	192	0.001	212	0.001	333	0.001	253
DCP 9	.878	0.094	0.114	2	0.015	18	0.034	140	0.002	179	0.002	224	0.001	129	0.000	17	0.001	227	0.001	3

DATA TYPE	Y/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.004	41	0.002	14	0.001	337	0.003	340	0.006	179	0.004	289	0.005	357	0.006	143	0.003	271
CN		0.008	244	0.003	144	0.002	237	0.004	33	0.004	339	0.001	202	0.002	145	0.003	280	0.005	199
CM		0.001	233	0.001	108	0.000	301	0.001	43	0.001	306	0.001	213	0.001	122	0.000	285	0.001	193
DCP 1	.010	0.149	228	0.068	111	0.015	286	0.088	35	0.097	313	0.032	202	0.045	130	0.030	286	0.108	196
DCP 2	.100	0.016	350	0.007	233	0.010	347	0.004	37	0.005	151	0.003	236	0.003	183	0.007	253	0.001	32
DCP 3	.200	0.007	7	0.008	256	0.008	211	0.002	214	0.003	148	0.002	144	0.003	292	0.006	296	0.002	1
DCP 4	.250	0.006	247	0.005	170	0.001	72	0.002	269	0.002	278	0.001	325	0.001	55	0.000	210	0.001	232
DCP 5	.300	0.003	265	0.003	231	0.001	246	0.001	287	0.001	223	0.001	13	0.001	272	0.001	288	0.001	292
DCP 6	.400	0.003	266	0.002	189	0.001	232	0.001	228	0.001	232	0.001	269	0.001	323	0.001	250	0.000	244
DCP 7	.500	0.002	249	0.002	227	0.000	195	0.000	322	0.001	31	0.001	76	0.000	243	0.001	319	0.000	309
DCP 8	.600	0.001	216	0.001	127	0.001	302	0.002	285	0.001	242	0.001	343	0.001	244	0.001	190	0.001	263
DCP 9	.878	0.001	226	0.000	229	0.001	316	0.000	226	0.001	14	0.003	54	0.001	187	0.000	99	0.000	87

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	14.58	0.600	0.40	4.91		5356.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.038	668.7	1453.1	0.63E 07	-0.00065	0.793	5.45	0.0220

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		0.602	4.912	0	0.174	359	0.104	293	0.059	205	0.018	138	0.022	229	0.031	213	0.025	229	0.019	265
CN		0.166	0.550	353	0.012	319	0.010	215	0.336	168	0.033	218	0.038	167	0.034	256	0.002	225	0.031	295
CM		-0.027	0.008	216	0.001	297	0.002	112	0.331	84	0.001	125	0.002	149	0.001	290	0.000	168	0.001	337
DCP 1	.010	-1.249	0.377	349	0.104	309	0.091	19	0.115	79	0.027	224	0.119	131	0.042	266	0.015	222	0.037	336
DCP 2	.100	0.754	2.031	351	0.060	85	0.065	197	0.375	236	0.057	123	0.058	238	0.037	203	0.007	27	0.013	232
DCP 3	.150	0.693	1.419	355	0.143	269	0.234	142	0.025	113	0.020	226	0.049	57	0.062	309	0.035	216	0.034	116
DCP 4	.200	0.417	0.918	353	0.028	358	0.062	190	0.335	119	0.052	324	0.044	252	0.024	161	0.010	77	0.010	77
DCP 5	.250	0.309	0.729	352	0.031	45	0.027	296	0.019	210	0.008	291	0.037	245	0.039	170	0.002	95	0.003	365
DCP 6	.300	0.242	0.607	354	0.020	42	0.028	332	0.016	229	0.004	226	0.032	219	0.003	159	0.001	134	0.002	294
DCP 7	.400	0.178	0.465	354	0.002	255	0.026	239	0.016	240	0.002	198	0.032	188	0.003	189	0.002	222	0.002	229
DCP 8	.500	0.129	0.327	355	0.011	269	0.017	233	0.033	227	0.002	222	0.031	255	0.001	228	0.001	315	0.032	187
DCP 9	.600	0.091	0.254	357	0.006	237	0.012	288	0.013	214	0.003	258	0.001	205	0.001	203	0.002	333	0.031	183
DCP10	.878	0.093	0.115	1	0.007	24	0.004	147	0.332	230	0.001	227	0.001	94	0.001	176	0.001	297	0.000	181

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.014	225	0.011	230	0.008	187	0.038	212	0.016	217	0.006	255	0.002	329	0.007	220	0.008	241
CN		0.010	267	0.033	134	0.001	230	0.033	166	0.036	20	0.031	231	0.001	248	0.005	133	0.032	16
CM		0.002	245	0.001	121	0.000	354	0.001	173	0.001	30	0.030	123	0.000	235	0.001	99	0.000	30
DCP 1	.010	0.145	240	0.074	119	0.011	255	0.080	169	0.114	29	0.017	109	0.018	270	0.106	98	0.037	21
DCP 2	.100	0.019	323	0.005	258	0.035	330	0.031	32	0.031	238	0.034	259	0.036	108	0.006	215	0.032	146
DCP 3	.150	0.028	212	0.029	112	0.019	10	0.036	309	0.010	358	0.016	255	0.013	190	0.001	177	0.001	181
DCP 4	.200	0.007	2	0.016	269	0.039	290	0.035	63	0.001	147	0.035	192	0.005	306	0.007	293	0.031	62
DCP 5	.250	0.007	240	0.005	219	0.031	0	0.031	359	0.003	256	0.033	241	0.001	247	0.002	286	0.032	311
DCP 6	.300	0.002	230	0.002	273	0.032	241	0.030	43	0.001	239	0.032	259	0.000	245	0.002	171	0.032	222
DCP 7	.400	0.001	270	0.002	293	0.031	235	0.030	292	0.001	288	0.031	275	0.001	291	0.001	335	0.031	298
DCP 8	.500	0.001	240	0.002	300	0.001	240	0.030	155	0.000	179	0.001	263	0.001	301	0.001	214	0.001	333
DCP 9	.600	0.002	248	0.001	264	0.031	329	0.031	338	0.002	283	0.001	262	0.001	359	0.001	325	0.000	14
DCP10	.878	0.001	239	0.001	327	0.001	233	0.031	62	0.001	172	0.000	2	0.000	167	0.001	179	0.000	222

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	14.58	0.600	7.63	4.35		5957.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.037	653.0	1456.5	0.635 07	-0.00049	1.174	8.90	0.0809

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		7.599	4.349	0	0.071	56	0.176	192	0.067	202	0.058	223	0.051	187	0.027	178	0.056	11	0.050	303
CN		0.868	0.241	11	0.079	56	0.01[illegible]	33	0.317	84	0.034	319	0.038	42	0.032	38	0.009	2	0.039	231
CM		-0.030	0.031	186	0.011	82	0.001	64	0.034	62	0.002	284	0.000	69	0.001	118	0.001	91	0.001	29
DCP 1	.010	1.939	0.814	11	0.129	352	0.089	9	0.094	25	0.080	259	0.043	10	0.023	112	0.056	63	0.064	306
DCP 2	.100	2.459	0.102	11	0.473	76	0.031	157	0.382	191	0.058	351	0.039	16	0.016	18	0.021	329	0.011	337
DCP 3	.200	1.495	0.303	19	0.263	85	0.053	125	0.111	89	0.052	155	0.016	120	0.028	142	0.014	293	0.016	319
DCP 4	.250	1.359	0.391	18	0.217	72	0.027	29	0.092	86	0.007	229	0.069	87	0.010	168	0.020	33	0.016	250
DCP 5	.300	1.071	0.359	12	0.094	69	0.057	24	0.023	49	0.023	345	0.019	74	0.013	17	0.019	29	0.015	323
DCP 6	.400	0.793	0.312	10	0.061	34	0.026	358	0.016	330	0.013	330	0.018	353	0.016	294	0.017	343	0.019	265
DCP 7	.500	0.621	0.243	11	0.026	346	0.013	358	0.023	258	0.033	131	0.005	338	0.005	343	0.012	340	0.014	283
DCP 8	.600	0.634	0.188	10	0.016	289	0.010	162	0.015	229	0.008	127	0.033	344	0.001	221	0.004	359	0.006	253
DCP 9	.878	0.269	0.153	4	0.028	270	0.034	276	0.037	213	0.003	58	0.031	146	0.003	323	0.003	231	0.002	160

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.016	255	0.002	283	0.009	358	0.004	127	0.005	113	0.008	71	0.002	99	0.008	198	0.004	132
CN		0.006	259	0.007	338	0.032	58	0.034	317	0.007	159	0.036	45	0.036	256	0.000	226	0.034	23
CM		0.001	300	0.001	302	0.002	98	0.002	349	0.001	190	0.000	96	0.001	208	0.001	17	0.001	16
DCP 1	.010	0.063	252	0.025	39	0.05[illegible]	90	0.125	343	0.102	166	0.087	36	0.086	277	0.024	3	0.065	24
DCP 2	.100	0.017	330	0.01[illegible]	339	0.009	269	0.036	279	0.010	243	0.039	158	0.004	155	0.005	122	0.001	38
DCP 3	.200	0.015	287	0.016	13	0.011	1	0.008	310	0.005	173	0.014	135	0.004	55	0.002	293	0.007	3
DCP 4	.250	0.004	244	0.005	236	0.004	134	0.015	315	0.008	189	0.007	150	0.006	80	0.005	291	0.010	246
DCP 5	.300	0.009	307	0.003	175	0.010	357	0.010	253	0.005	158	0.008	109	0.008	32	0.002	116	0.007	27
DCP 6	.400	0.000	245	0.009	259	0.005	175	0.013	223	0.003	146	0.003	50	0.006	335	0.005	217	0.005	74
DCP 7	.500	0.008	246	0.006	224	0.005	176	0.014	160	0.005	97	0.006	1	0.006	252	0.006	130	0.005	0
DCP 8	.600	0.003	156	0.002	97	0.003	331	0.009	295	0.012	39	0.009	4	0.005	324	0.004	248	0.003	172
DCP 9	.878	0.002	149	0.005	58	0.034	299	0.002	23	0.005	294	0.002	97	0.004	308	0.003	175	0.001	14

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	14.58	0.620	7.61	4.46		5357.2	10

K	V	Q	RN	DAMPING	CY(MAX)	ALPHA(STALL)	EXT DAMPING
0.037	649.4	1451.3	0.635 07	-0.00053	1.131	8.78	0.0530

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		7.611	4.460	0	0.181	36	0.113	179	0.060	184	0.031	179	0.030	159	0.049	175	0.040	49	0.046	297
CN		0.859	0.250	10	0.093	51	0.017	58	0.017	53	0.011	353	0.007	26	0.006	94	0.010	3	0.011	333
CM		-0.034	0.032	187	0.011	79	0.002	152	0.003	56	0.003	334	0.001	337	0.002	16	0.002	263	0.001	70
DCP 1	.010	1.958	0.875	8	0.214	19	0.107	67	0.214	310	0.159	326	0.096	295	0.099	50	0.144	322	0.088	319
DCP 2	.100	2.442	0.100	6	0.486	72	0.021	157	0.113	93	0.054	0	0.034	69	0.026	345	0.007	332	0.019	353
DCP 3	.200	1.401	0.322	15	0.265	79	0.046	121	0.127	86	0.069	138	0.021	81	0.061	154	0.020	184	0.021	211
DCP 4	.250	1.276	0.388	14	0.222	74	0.044	64	0.111	81	0.008	45	0.058	83	0.029	162	0.024	190	0.015	163
DCP 5	.300	1.083	0.377	10	0.099	62	0.050	21	0.037	68	0.029	9	0.026	50	0.007	77	0.033	56	0.010	4
DCP 6	.400	0.785	0.322	12	0.061	27	0.028	8	0.017	345	0.023	324	0.008	343	0.011	316	0.013	1	0.015	297
DCP 7	.500	0.559	0.242	10	0.025	7	0.018	38	0.016	298	0.009	287	0.007	216	0.002	120	0.009	37	0.016	315
DCP 8	.600	0.433	0.195	12	0.016	336	0.007	96	0.012	269	0.006	164	0.002	244	0.006	165	0.009	33	0.011	278
DCP 9	.878	0.313	0.160	3	0.023	272	0.007	343	0.012	247	0.008	133	0.002	329	0.005	140	0.006	33	0.005	280

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.023	231	0.003	337	0.008	263	0.004	316	0.012	238	0.013	269	0.001	215	0.005	284	0.002	291
CN		0.010	259	0.004	198	0.006	306	0.004	8	0.003	15	0.005	231	0.002	295	0.007	20	0.001	262
CM		0.001	307	0.001	157	0.001	310	0.001	4	0.000	357	0.001	194	0.001	327	0.001	10	0.001	68
DCP 1	.010	0.110	289	0.057	176	0.068	309	0.099	13	0.048	16	0.091	271	0.026	320	0.127	20	0.022	106
DCP 2	.100	0.024	241	0.003	130	0.015	271	0.010	193	0.005	218	0.012	97	0.019	341	0.014	261	0.006	37
DCP 3	.200	0.013	210	0.013	270	0.012	359	0.013	327	0.003	359	0.009	15	0.004	300	0.002	71	0.006	317
DCP 4	.250	0.017	209	0.013	163	0.013	245	0.013	271	0.007	183	0.009	318	0.009	242	0.001	276	0.003	280
DCP 5	.300	0.012	33	0.004	115	0.010	29	0.003	117	0.009	48	0.008	348	0.007	246	0.004	47	0.012	257
DCP 6	.400	0.006	281	0.006	240	0.002	62	0.001	138	0.007	354	0.008	231	0.007	120	0.007	44	0.005	295
DCP 7	.500	0.009	245	0.004	255	0.005	216	0.003	140	0.001	341	0.004	236	0.007	139	0.006	38	0.004	279
DCP 8	.600	0.007	192	0.001	309	0.003	130	0.002	15	0.002	240	0.002	264	0.006	201	0.004	120	0.002	166
DCP 9	.878	0.001	194	0.001	313	0.004	294	0.002	177	0.002	76	0.001	226	0.002	67	0.004	330	0.004	237

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
56.0	14.58	0.600	7.61	4.50		5057.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.038	648.3	1450.7	0.63E 07	-0.00048	1.113	10.98	0.0220

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		7.607	4.502	0	0.184	38	0.126	183	0.066	167	0.037	185	0.053	96	0.140	130	0.083	352	0.058	292
CN		0.860	0.046	90	0.089	64	0.020	40	0.024	67	0.004	21	0.006	79	0.018	146	0.018	46	0.004	325
CM		-0.036	0.004	269	0.012	87	0.002	359	0.003	69	0.000	80	0.001	76	0.001	264	0.001	179	0.002	131
DCP 1	.010	1.575	0.883	9	0.133	28	0.168	358	0.083	353	0.036	151	0.071	151	0.063	163	0.133	30	0.055	165
DCP 2	.100	2.431	0.058	5	0.503	76	0.042	77	0.097	86	0.056	356	0.032	0	0.017	132	0.020	88	0.029	14
DCP 3	.200	1.391	0.323	15	0.259	80	0.053	111	0.129	84	0.058	151	0.023	84	0.079	163	0.028	149	0.011	171
DCP 4	.250	1.270	0.387	15	0.226	68	0.044	43	0.105	70	0.006	52	0.048	70	0.041	138	0.031	63	0.007	126
DCP 5	.300	1.072	0.369	10	0.101	63	0.045	25	0.042	71	0.027	2	0.024	48	0.023	144	0.044	63	0.010	43
DCP 6	.400	0.780	0.324	11	0.056	28	0.033	11	0.019	327	0.025	317	0.012	285	0.006	141	0.021	12	0.020	303
DCP 7	.500	0.548	0.242	11	0.027	5	0.013	54	0.007	281	0.008	15	0.006	293	0.010	124	0.012	17	0.009	347
DCP 8	.600	0.437	0.201	10	0.018	301	0.011	141	0.006	237	0.005	189	0.009	170	0.011	106	0.011	16	0.009	299
DCP 9	.878	0.332	0.163	3	0.027	279	0.003	331	0.006	262	0.001	140	0.000	145	0.006	143	0.008	37	0.008	310

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.030	222	0.007	250	0.014	260	0.010	240	0.012	226	0.005	259	0.006	253	0.005	185	0.004	28
CN		0.009	323	0.005	132	0.006	82	0.005	343	0.002	151	0.006	147	0.003	68	0.004	279	0.004	110
CM		0.001	22	0.001	98	0.002	87	0.001	8	0.001	130	0.001	143	0.001	122	0.001	33	0.001	43
DCP 1	.010	0.083	355	0.129	112	0.147	79	0.098	354	0.082	138	0.091	138	0.040	107	0.029	274	0.096	80
DCP 2	.100	0.027	302	0.010	249	0.011	202	0.010	132	0.012	337	0.013	217	0.015	97	0.017	15	0.013	300
DCP 3	.200	0.006	197	0.019	335	0.009	325	0.012	317	0.006	2	0.003	123	0.014	93	0.008	38	0.007	213
DCP 4	.250	0.012	246	0.014	181	0.014	192	0.002	302	0.010	268	0.008	263	0.004	300	0.012	306	0.006	239
DCP 5	.300	0.022	44	0.006	97	0.011	45	0.003	116	0.001	291	0.011	127	0.012	35	0.007	297	0.006	183
DCP 6	.400	0.011	299	0.007	245	0.001	270	0.008	273	0.009	208	0.005	114	0.003	303	0.009	233	0.008	164
DCP 7	.500	0.013	328	0.009	262	0.003	179	0.002	335	0.003	244	0.004	96	0.006	350	0.008	279	0.005	205
DCP 8	.600	0.006	251	0.005	159	0.002	304	0.005	183	0.002	50	0.004	358	0.007	266	0.009	181	0.002	99
DCP 9	.878	0.003	226	0.001	88	0.002	286	0.001	311	0.003	315	0.003	193	0.003	26	0.004	270	0.002	163

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	14.58	0.600	9.99	4.29		5359.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.037	652.6	1463.3	0.53E 07	-0.00063	1.127	10.67	0.0800

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		9.987	4.294	0	0.153	29	0.107	180	0.031	233	0.007	44	0.032	205	0.029	202	0.039	319	0.031	211
CN		0.984	0.141	23	0.061	77	0.030	154	0.008	198	0.033	110	0.032	181	0.003	194	0.010	315	0.038	211
CM		-0.039	0.045	185	0.005	82	0.006	148	0.031	338	0.001	333	0.001	131	0.001	48	0.001	45	0.002	20
DCP 1	.010	2.512	0.718	12	0.203	47	0.095	151	0.052	0	0.103	357	0.041	153	0.075	32	0.115	289	0.047	157
DCP 2	.100	2.546	0.450	172	0.237	80	0.174	157	0.33	50	0.053	170	0.023	132	0.023	170	0.018	49	0.016	329
DCP 3	.200	1.670	0.137	136	0.084	114	0.069	169	0.0[illegible]	42	0.012	295	0.037	62	0.022	218	0.024	14	0.004	248
DCP 4	.250	1.519	0.162	42	0.166	81	0.130	156	0.[illegible]	26	0.013	323	0.010	279	0.003	290	0.021	2	0.003	134
DCP 5	.300	1.156	0.240	17	0.137	90	0.039	143	0.027	172	0.028	154	0.024	265	0.022	211	0.015	13	0.018	255
DCP 6	.400	0.910	0.255	16	0.071	77	0.025	80	0.030	92	0.015	110	0.037	176	0.002	150	0.009	291	0.015	265
DCP 7	.500	0.732	0.233	13	0.028	74	0.018	26	0.012	98	0.009	83	0.008	328	0.012	196	0.009	277	0.016	199
DCP 8	.600	0.529	0.203	12	0.015	289	0.012	7	0.031	177	0.002	36	0.005	27	0.003	249	0.001	30	0.009	203
DCP 9	.878	0.323	0.185	4	0.008	312	0.014	327	0.035	254	0.002	258	0.004	261	0.003	247	0.011	258	0.012	181

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.017	196	0.010	131	0.005	26	0.003	165	0.004	153	0.005	233	0.007	137	0.007	149	0.002	156
CN		0.001	40	0.004	339	0.034	287	0.012	315	0.006	17	0.034	276	0.036	151	0.003	327	0.007	277
CM		0.002	306	0.000	326	0.002	331	0.001	242	0.001	94	0.002	59	0.001	85	0.000	294	0.001	3
DCP 1	.010	0.071	330	0.041	281	0.107	314	0.096	241	0.080	59	0.016	327	0.094	148	0.031	286	0.080	292
DCP 2	.100	0.006	247	0.011	359	0.005	258	0.015	28	0.009	287	0.039	61	0.008	28	0.015	355	0.009	303
DCP 3	.200	0.005	115	0.003	214	0.009	179	0.006	34	0.004	93	0.014	335	0.002	135	0.005	7	0.004	355
DCP 4	.250	0.014	177	0.013	336	0.014	197	0.010	14	0.009	357	0.008	285	0.002	128	0.005	248	0.007	114
DCP 5	.300	0.009	136	0.003	176	0.014	121	0.012	48	0.001	153	0.002	74	0.008	186	0.005	119	0.006	143
DCP 6	.400	0.006	210	0.006	10	0.004	264	0.010	70	0.014	351	0.008	265	0.001	191	0.002	53	0.005	310
DCP 7	.500	0.004	180	0.003	144	0.005	348	0.008	276	0.005	17	0.011	295	0.005	258	0.003	329	0.006	260
DCP 8	.600	0.010	192	0.003	347	0.005	97	0.014	26	0.008	351	0.010	249	0.004	80	0.006	323	0.006	250
DCP 9	.878	0.002	72	0.004	262	0.008	[illegible]	0.002	93	0.005	252	0.005	220	0.007	185	0.002	142	0.005	222

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	14.58	0.600	9.98	4.35		5358.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.038	648.1	1453.3	0.63E 07	-0.00037	1.134	11.42	0.0550

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		9.978	4.350	359	0.094	15	0.130	181	0.044	209	0.025	172	0.040	244	0.048	43	0.080	198	0.019	56
CN		0.965	0.145	27	0.047	62	0.038	147	0.036	96	0.005	158	0.014	246	0.010	30	0.012	219	0.016	136
CM		-0.044	0.045	183	0.003	71	0.007	163	0.002	92	0.000	103	0.003	295	0.001	54	0.002	336	0.002	199
DCP 1	.010	2.396	0.659	18	0.275	26	0.078	116	0.146	98	0.051	315	0.098	236	0.158	27	0.067	276	0.055	188
DCP 2	.100	2.547	0.436	165	0.223	70	0.224	158	0.036	42	0.055	159	0.335	289	0.039	180	0.010	237	0.026	128
DCP 3	.200	1.564	0.145	127	0.073	102	0.099	170	0.046	248	0.019	269	0.029	279	0.006	52	0.017	237	0.010	134
DCP 4	.250	1.422	0.186	45	0.194	81	0.141	158	0.046	251	0.008	99	0.045	280	0.029	356	0.007	190	0.020	92
DCP 5	.300	1.159	0.236	18	0.135	75	0.065	147	0.036	13	0.032	146	0.036	261	0.017	340	0.026	224	0.016	28
DCP 6	.400	0.898	0.263	19	0.074	65	0.027	83	0.018	91	0.020	108	0.014	214	0.003	298	0.029	196	0.005	357
DCP 7	.500	0.661	0.230	14	0.030	45	0.018	17	0.038	128	0.011	80	0.007	151	0.014	59	0.009	214	0.006	57
DCP 8	.600	0.527	0.201	12	0.011	346	0.016	357	0.037	221	0.005	343	0.018	152	0.010	25	0.009	233	0.006	42
DCP 9	.878	0.361	0.183	3	0.009	356	0.013	344	0.035	10	0.010	252	0.008	137	0.001	244	0.008	149	0.004	53

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.015	211	0.013	201	0.011	143	0.011	176	0.007	176	0.008	191	0.013	139	0.008	164	0.004	123
CN		0.010	275	0.005	177	0.004	292	0.005	294	0.005	116	0.005	81	0.007	283	0.005	186	0.002	49
CM		0.002	250	0.002	82	0.001	295	0.001	52	0.001	223	0.002	108	0.002	317	0.001	200	0.001	290
DCP 1	.010	0.139	255	0.067	114	0.043	290	0.038	118	0.074	110	0.104	92	0.139	303	0.075	185	0.058	348
DCP 2	.100	0.026	314	0.014	144	0.024	313	0.017	228	0.018	231	0.015	136	0.005	352	0.007	255	0.014	186
DCP 3	.200	0.018	277	0.010	178	0.007	242	0.011	266	0.005	266	0.006	3	0.009	226	0.005	118	0.004	314
DCP 4	.250	0.005	272	0.001	56	0.013	136	0.003	306	0.002	66	0.003	85	0.003	309	0.009	239	0.008	128
DCP 5	.300	0.003	23	0.008	125	0.008	56	0.006	103	0.002	107	0.006	13	0.005	232	0.007	79	0.007	347
DCP 6	.400	0.001	202	0.013	278	0.003	255	0.007	252	0.005	186	0.004	290	0.009	219	0.006	231	0.006	170
DCP 7	.500	0.001	188	0.004	259	0.004	45	0.009	276	0.006	105	0.008	347	0.002	329	0.002	278	0.007	72
DCP 8	.600	0.002	284	0.009	248	0.003	221	0.008	169	0.009	27	0.010	266	0.005	173	0.002	80	0.006	107
DCP 9	.878	0.004	16	0.007	224	0.004	97	0.005	222	0.006	118	0.003	58	0.003	146	0.001	71	0.004	66

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	14.53	0.620	10.91	4.35		5358.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.038	647.1	1445.3	0.53E 07	-0.00006	1.151	12.72	0.0220

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		10.910	4.354	0	0.079	85	0.169	182	0.059	293	0.057	180	0.046	201	0.032	241	0.020	332	0.011	181
CN		0.974	0.158	25	0.078	75	0.024	136	0.035	58	0.015	189	0.009	157	0.008	168	0.006	65	0.007	57
CM		-0.045	0.043	190	0.007	91	0.004	137	0.002	12	0.001	136	0.001	13	0.001	319	0.001	151	0.001	13
DCP 1	.010	2.481	0.813	17	0.288	76	0.105	62	0.132	56	0.065	201	0.061	169	0.032	128	0.070	113	0.105	34
DCP 2	.100	2.558	0.438	163	0.293	70	0.149	151	0.071	319	0.071	[illegible]	0.016	88	0.024	186	0.003	273	0.016	117
DCP 3	.200	1.542	0.142	112	0.112	88	0.034	159	0.054	255	0.018	275	0.016	106	0.013	247	0.027	353	0.003	101
DCP 4	.250	1.406	0.210	68	0.188	87	0.124	157	0.043	242	0.010	235	0.022	281	0.019	347	0.021	13	0.004	27
DCP 5	.300	1.155	0.250	71	0.148	81	0.069	131	0.014	132	0.068	175	0.025	211	0.016	183	0.015	327	0.008	295
DCP 6	.400	0.902	0.266	70	0.088	72	0.025	38	0.019	94	0.011	167	0.012	180	0.008	202	0.006	259	0.003	220
DCP 7	.500	0.651	0.221	0	0.033	84	0.023	35	0.014	87	0.007	77	0.006	102	0.003	83	0.007	218	0.006	69
DCP 8	.600	0.527	0.202	11	0.011	338	0.014	330	0.035	228	0.010	261	0.012	175	0.011	169	0.008	88	0.006	118
DCP 9	.878	0.387	0.184	0	0.015	311	0.028	279	0.036	128	0.004	208	0.005	177	0.003	128	0.004	8	0.003	51

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.030	250	0.009	214	0.004	87	0.011	211	0.007	154	0.005	179	0.002	214	0.006	168	0.003	140
CN		0.012	366	0.005	250	0.006	17	0.002	28	0.000	153	0.002	216	0.001	2	0.003	226	0.002	272
CM		0.002	33	0.001	310	0.002	29	0.002	56	0.001	55	0.001	290	0.001	224	0.001	223	0.002	218
DCP 1	.010	0.153	355	0.065	265	0.091	9	0.126	60	0.044	132	0.030	192	0.031	244	0.103	219	0.094	206
DCP 2	.100	0.021	25	0.008	329	0.010	34	0.012	1	0.012	346	0.007	257	0.011	95	0.015	19	0.009	357
DCP 3	.200	0.015	13	0.003	265	0.015	43	0.019	353	0.002	341	0.005	355	0.005	24	0.003	299	0.003	96
DCP 4	.250	0.004	52	0.010	324	0.009	250	0.011	305	0.009	315	0.013	292	0.009	281	0.009	35	0.003	326
DCP 5	.300	0.018	345	0.011	271	0.010	42	0.015	331	0.006	294	0.007	312	0.009	307	0.002	181	0.006	42
DCP 6	.400	0.004	283	0.004	53	0.001	78	0.010	18	0.003	6	0.005	324	0.001	35	0.006	6	0.001	232
DCP 7	.500	0.010	247	0.004	221	0.005	236	0.005	241	0.007	252	0.013	172	0.009	49	0.004	37	0.005	318
DCP 8	.600	0.003	276	0.008	149	0.005	56	0.002	356	0.003	54	0.002	257	0.003	104	0.002	134	0.006	51
DCP 9	.878	0.006	279	0.002	225	0.006	252	0.002	194	0.006	196	0.006	114	0.001	322	0.000	278	0.002	86

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	14.58	0.600	12.48	4.32		5359.1	13

K	V	O	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.037	653.6	1462.1	0.635 07	-0.00001	1.172	15.93	0.0800

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		12.481	4.325	0	0.137	34	0.062	169	0.020	173	0.013	128	0.016	141	0.016	136	0.014	267	0.046	72
CN		1.056	0.088	40	0.012	360	0.006	51	0.017	265	0.006	30	0.003	339	0.003	322	0.006	211	0.008	130
CM		-0.056	0.064	187	0.010	242	0.001	19	0.000	237	0.002	313	0.001	10	0.000	298	0.001	214	0.002	239
DCP 1	.010	3.017	0.316	14	0.025	28	0.110	70	0.078	154	0.051	43	0.062	352	0.072	318	0.080	221	0.015	308
DCP 2	.100	2.628	0.481	171	0.263	272	0.021	256	0.126	266	0.045	351	0.018	230	0.024	65	0.028	145	0.025	135
DCP 3	.150	1.945	0.190	143	0.020	29	0.013	99	0.015	293	0.005	213	0.008	295	0.006	324	0.013	322	0.017	165
DCP 4	.200	1.640	0.114	151	0.049	252	0.030	336	0.033	283	0.002	239	0.006	275	0.016	197	0.010	212	0.023	143
DCP 5	.250	1.584	0.164	119	0.020	224	0.021	338	0.017	247	0.016	334	0.005	347	0.020	162	0.009	251	0.026	97
DCP 6	.300	1.227	0.087	95	0.016	181	0.018	263	0.031	257	0.023	316	0.001	241	0.021	209	0.008	270	0.039	139
DCP 7	.400	1.005	0.170	25	0.036	60	0.004	142	0.018	258	0.003	119	0.003	82	0.012	55	0.011	181	0.012	66
DCP 8	.500	0.839	0.181	22	0.049	74	0.018	178	0.024	183	0.003	160	0.008	322	0.010	274	0.004	351	0.013	67
DCP 9	.600	0.602	0.198	12	0.025	51	0.004	14	0.015	275	0.011	122	0.003	29	0.003	19	0.002	277	0.006	87
DCP10	.878	0.406	0.172	6	0.036	39	0.006	97	0.033	191	0.008	83	0.007	205	0.003	349	0.003	70	0.007	53

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.020	292	0.018	193	0.007	158	0.008	137	0.003	178	0.007	96	0.003	163	0.002	296	0.005	31
CN		0.003	18	0.012	213	0.001	262	0.007	189	0.002	332	0.003	90	0.005	331	0.001	192	0.001	136
CM		0.001	153	0.000	180	0.001	177	0.001	87	0.001	322	0.001	218	0.002	162	0.001	324	0.002	135
DCP 1	.010	0.039	334	0.122	197	0.060	192	0.030	118	0.063	333	0.026	314	0.042	237	0.038	327	0.078	148
DCP 2	.100	0.026	135	0.011	258	0.005	274	0.031	266	0.008	270	0.017	188	0.009	62	0.010	165	0.001	130
DCP 3	.150	0.006	121	0.005	280	0.011	54	0.007	335	0.015	55	0.005	199	0.007	231	0.003	178	0.004	335
DCP 4	.200	0.008	95	0.010	240	0.002	359	0.022	247	0.005	42	0.015	139	0.010	44	0.007	125	0.011	337
DCP 5	.250	0.012	73	0.008	236	0.006	182	0.012	198	0.005	368	0.013	158	0.012	74	0.012	198	0.005	91
DCP 6	.300	0.005	181	0.016	227	0.006	21	0.017	224	0.009	272	0.010	136	0.015	341	0.007	189	0.000	124
DCP 7	.400	0.003	10	0.009	260	0.002	39	0.019	230	0.014	215	0.014	193	0.007	20	0.005	136	0.011	64
DCP 8	.500	0.006	321	0.014	183	0.007	271	0.019	184	0.006	186	0.010	54	0.002	335	0.009	12	0.007	299
DCP 9	.600	0.008	17	0.009	223	0.007	328	0.011	169	0.008	58	0.010	40	0.010	354	0.002	334	0.011	323
DCP10	.878	0.005	310	0.002	177	0.002	137	0.007	350	0.003	148	0.004	313	0.007	301	0.005	153	0.003	235

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	14.58	0.620	12.49	4.36		5253.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.038	648.7	1450.0	0.635 07	-0.00078	1.197	16.02	0.0580

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		12.485	4.364	0	0.146	30	0.053	164	0.042	209	0.015	161	0.023	171	0.038	266	0.071	6	0.024	301
CN		1.064	0.096	44	0.022	52	0.031	153	0.038	238	0.037	291	0.038	279	0.034	48	0.009	10	0.034	32
CM		-0.056	0.044	186	0.006	252	0.000	68	0.033	238	0.002	277	0.000	159	0.001	327	0.001	291	0.002	169
DCP 1	.010	3.378	0.456	26	0.170	34	0.049	134	0.095	138	0.137	261	0.063	279	0.030	309	0.032	304	0.069	141
DCP 2	.100	2.481	0.561	171	0.132	245	0.018	232	0.086	265	0.035	356	0.018	339	0.018	65	0.018	51	0.019	73
DCP 3	.150	1.835	0.188	160	0.033	355	0.028	2	0.053	270	0.016	122	0.026	177	0.025	26	0.010	327	0.025	334
DCP 4	.200	1.557	0.179	156	0.038	186	0.035	332	0.039	165	0.017	8	0.015	266	0.014	77	0.015	66	0.034	72
DCP 5	.250	1.510	0.172	123	0.009	128	0.026	12	0.064	221	0.004	303	0.039	148	0.011	101	0.010	28	0.009	346
DCP 6	.300	1.299	0.091	83	0.061	108	0.036	227	0.026	233	0.008	331	0.033	157	0.014	24	0.011	34	0.017	358
DCP 7	.400	1.013	0.173	28	0.040	79	0.033	169	0.013	181	0.035	268	0.017	314	0.006	94	0.016	17	0.036	44
DCP 8	.500	0.748	0.183	21	0.054	72	0.037	173	0.010	234	0.003	206	0.033	333	0.009	296	0.010	322	0.006	278
DCP 9	.600	0.606	0.206	10	0.022	12	0.037	195	0.024	74	0.006	30	0.008	297	0.007	117	0.011	14	0.037	353
DCP10	.878	0.456	0.178	8	0.030	65	0.032	31	0.036	56	0.004	155	0.033	242	0.002	151	0.005	22	0.003	352

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.024	211	0.016	205	0.009	154	0.035	161	0.007	160	0.007	150	0.010	160	0.002	166	0.008	121
CN		0.004	112	0.004	185	0.007	246	0.034	282	0.003	49	0.036	43	0.004	246	0.002	257	0.039	218
CM		0.001	157	0.002	135	0.001	282	0.001	344	0.001	355	0.001	48	0.002	258	0.001	229	0.003	260
DCP 1	.010	0.072	134	0.124	168	0.095	253	0.069	331	0.070	15	0.109	44	0.118	259	0.055	253	0.166	232
DCP 2	.100	0.013	52	0.020	42	0.037	253	0.014	59	0.014	130	0.037	35	0.013	113	0.011	217	0.011	310
DCP 3	.150	0.005	233	0.017	358	0.005	174	0.006	301	0.012	317	0.006	171	0.007	96	0.007	255	0.007	263
DCP 4	.200	0.003	120	0.008	132	0.010	321	0.036	15	0.011	165	0.032	131	0.007	142	0.008	235	0.002	237
DCP 5	.250	0.007	293	0.006	316	0.007	170	0.033	321	0.006	216	0.010	192	0.003	25	0.010	81	0.005	310
DCP 6	.300	0.009	25	0.004	129	0.006	242	0.015	308	0.006	278	0.032	17	0.007	73	0.008	147	0.002	147
DCP 7	.400	0.008	161	0.006	157	0.035	335	0.038	250	0.008	164	0.038	329	0.018	273	0.001	318	0.008	179
DCP 8	.500	0.013	223	0.004	331	0.035	191	0.037	209	0.002	212	0.006	109	0.004	36	0.005	53	0.037	149
DCP 9	.600	0.006	46	0.011	283	0.032	282	0.010	232	0.004	78	0.004	280	0.006	192	0.005	31	0.006	122
DCP10	.878	0.004	19	0.004	302	0.004	180	0.035	93	0.002	129	0.004	64	0.004	61	0.002	351	0.005	106

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	0,ALPHA	DEL,H	TEST POINT	CYCLES ANALYZED
96.0	14.58	0.600	12.51	4.38		5353.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.038	647.7	1645.1	0.635 07	-0.03094	1.156	15.30	0.0220

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		12.508	4.381	0	0.139	17	0.107	183	0.049	184	0.021	133	0.027	131	0.028	12	0.043	197	0.019	288
CN		1.044	0.093	39	0.012	89	0.037	228	0.036	238	0.011	293	0.038	334	0.037	227	0.005	327	0.014	35
CM		-0.067	0.048	186	0.007	246	0.031	83	0.031	323	0.002	339	0.001	70	0.001	5	0.003	354	0.003	75
DCP 1	.010	2.821	0.347	27	0.097	85	0.020	22	0.044	63	0.070	268	0.016	318	0.013	255	0.181	333	0.190	52
DCP 2	.130	2.459	0.529	177	0.188	251	0.060	177	0.351	269	0.383	339	0.343	345	0.034	335	0.023	57	0.015	57
DCP 3	.150	1.836	0.224	150	0.053	50	0.020	336	0.013	227	0.008	42	0.022	217	0.012	169	0.011	211	0.008	322
DCP 4	.200	1.569	0.154	154	0.047	231	0.035	279	0.011	246	0.022	337	0.033	356	0.004	247	0.008	189	0.022	81
DCP 5	.250	1.503	0.156	129	0.016	150	0.017	318	0.016	247	0.028	320	0.011	276	0.015	182	0.006	171	0.011	42
DCP 6	.300	1.297	0.095	85	0.038	99	0.026	226	0.026	228	0.032	284	0.013	310	0.015	104	0.021	180	0.016	357
DCP 7	.400	1.010	0.195	23	0.036	93	0.021	180	0.038	179	0.006	280	0.014	6	0.005	149	0.008	54	0.014	34
DCP 8	.500	0.751	0.195	20	0.045	81	0.006	87	0.036	158	0.015	239	0.019	231	0.008	203	0.009	132	0.007	296
DCP 9	.600	0.616	0.225	13	0.018	48	0.026	287	0.032	131	0.014	167	0.037	345	0.002	225	0.008	210	0.011	19
DCP10	.878	0.477	0.185	4	0.021	51	0.035	256	0.031	111	0.003	177	0.038	254	0.003	246	0.005	269	0.011	257

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.035	229	0.008	208	0.010	217	0.039	293	0.017	202	0.034	125	0.006	217	0.006	122	0.002	205
CN		0.032	20	0.006	9	0.033	279	0.031	155	0.033	256	0.012	245	0.036	322	0.004	251	0.032	28
CM		0.001	21	0.001	326	0.000	36	0.031	52	0.001	40	0.003	268	0.001	36	0.002	302	0.000	66
DCP 1	.010	0.029	334	0.094	343	0.059	286	0.010	5	0.013	78	0.235	252	0.089	347	0.074	285	0.037	46
DCP 2	.130	0.029	64	0.014	234	0.021	117	0.334	70	0.338	350	0.317	312	0.010	302	0.024	231	0.037	209
DCP 3	.150	0.012	291	0.006	154	0.009	342	0.317	81	0.010	32	0.003	347	0.008	164	0.008	151	0.006	36
DCP 4	.200	0.008	76	0.008	186	0.012	78	0.339	248	0.039	278	0.009	222	0.007	59	0.006	190	0.036	345
DCP 5	.250	0.004	129	0.007	95	0.002	258	0.038	66	0.011	352	0.010	258	0.002	185	0.006	151	0.007	286
DCP 6	.330	0.015	50	0.016	74	0.038	7	0.014	176	0.015	188	0.321	180	0.005	36	0.009	145	0.037	351
DCP 7	.400	0.004	222	0.006	69	0.010	199	0.036	189	0.016	290	0.337	254	0.007	285	0.000	76	0.035	86
DCP 8	.530	0.009	241	0.013	83	0.004	1	0.332	174	0.035	119	0.034	97	0.007	342	0.004	227	0.004	167
DCP 9	.600	0.002	258	0.010	14	0.038	257	0.034	330	0.010	253	0.034	155	0.007	256	0.003	186	0.001	251
DCP10	.878	0.003	172	0.004	251	0.001	233	0.033	221	0.005	179	0.032	124	0.004	259	0.006	128	0.002	344

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	16.21	0.600	14.98	6.40		5353.1	13

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.042	649.7	1669.9	0.645 07	-0.00047	1.174	17.44	0.0220

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		14.983	4.404	0	0.054	42	0.126	179	0.056	165	0.059	161	0.035	172	0.022	289	0.089	208	0.037	222
CN		1.055	0.074	56	0.033	71	0.016	281	0.015	128	0.003	331	0.003	131	0.001	237	0.012	157	0.006	308
CM		-0.091	0.038	186	0.006	221	0.001	233	0.002	1	0.001	92	0.001	353	0.001	162	0.002	270	0.001	198
DCP 1	.010	3.083	0.253	7	0.303	76	0.041	326	0.015	195	0.018	179	0.026	157	0.026	61	0.007	238	0.007	191
DCP 2	.100	2.125	0.437	161	0.134	220	0.133	286	0.037	58	0.019	86	0.024	50	0.018	156	0.043	179	0.024	281
DCP 3	.150	1.631	0.258	146	0.031	26	0.012	252	0.032	58	0.017	135	0.008	291	0.006	136	0.008	335	0.010	31
DCP 4	.200	1.307	0.151	144	0.019	118	0.021	264	0.022	56	0.018	8	0.017	9	0.006	291	0.029	173	0.002	271
DCP 5	.250	1.349	0.166	130	0.011	117	0.046	263	0.013	352	0.014	36	0.006	174	0.015	264	0.028	254	0.014	331
DCP 6	.300	1.280	0.096	107	0.023	58	0.026	217	0.031	69	0.018	322	0.037	250	0.010	240	0.046	158	0.011	188
DCP 7	.400	1.043	0.121	48	0.062	61	0.016	256	0.012	214	0.017	318	0.035	336	0.014	285	0.013	227	0.017	290
DCP 8	.500	0.795	0.124	21	0.036	40	0.013	235	0.016	233	0.015	251	0.015	158	0.013	179	0.034	120	0.005	178
DCP 9	.600	0.712	0.170	20	0.047	55	0.013	334	0.015	175	0.012	280	0.008	129	0.005	244	0.013	144	0.007	329
DCP10	.878	0.501	0.161	0	0.024	50	0.009	28	0.038	126	0.006	150	0.032	186	0.010	28	0.014	54	0.008	38

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.015	140	0.026	128	0.013	103	0.002	164	0.015	92	0.014	113	0.008	46	0.009	58	0.004	25
CN		0.002	59	0.004	25	0.003	138	0.001	284	0.004	356	0.003	349	0.002	226	0.003	315	0.004	253
CM		0.001	312	0.000	269	0.001	256	0.001	273	0.001	133	0.002	104	0.001	94	0.001	335	0.002	77
DCP 1	.010	0.017	352	0.016	305	0.018	229	0.011	136	0.004	120	0.010	89	0.006	18	0.008	30	0.007	295
DCP 2	.100	0.022	339	0.018	10	0.016	36	0.021	249	0.016	355	0.018	51	0.017	207	0.024	314	0.015	65
DCP 3	.150	0.012	36	0.006	35	0.006	26	0.006	100	0.008	231	0.008	133	0.007	265	0.003	362	0.011	345
DCP 4	.200	0.002	208	0.007	363	0.005	256	0.018	261	0.016	344	0.005	3	0.006	242	0.015	296	0.006	258
DCP 5	.250	0.007	78	0.008	363	0.006	330	0.005	05	0.010	144	0.003	174	0.006	76	0.006	131	0.009	301
DCP 6	.300	0.010	210	0.010	71	0.010	218	0.015	214	0.010	338	0.014	35	0.008	136	0.016	289	0.008	194
DCP 7	.400	0.009	130	0.002	93	0.010	167	0.013	356	0.014	97	0.005	85	0.006	346	0.005	75	0.003	286
DCP 8	.500	0.012	176	0.005	88	0.005	111	0.010	130	0.005	240	0.006	47	0.011	174	0.006	182	0.010	119
DCP 9	.600	0.011	81	0.005	54	0.012	67	0.016	306	0.010	26	0.011	283	0.009	256	0.006	363	0.009	227
DCP10	.878	0.003	300	0.001	322	0.002	80	0.011	76	0.006	273	0.010	283	0.002	303	0.006	125	0.011	284

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	15.50	0.620	17.27	4.50		5351.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.0 0	668.0	1452.7	0.635 07	-0.00102	1.223	17.77	0.0220

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		17.274	4.499	0	0.143	21	0.083	164	0.032	136	0.015	130	0.022	185	0.023	251	0.070	342	0.041	117
CN		1.067	0.079	90	0.064	62	0.021	155	0.037	51	0.035	31	0.038	19	0.036	125	0.009	259	0.035	52
CM		-0.107	0.033	194	0.004	189	0.001	79	0.001	60	0.002	70	0.000	34	0.000	32	0.001	61	0.002	146
DCP 1	.010	3.062	0.329	172	0.314	84	0.066	129	0.026	81	0.060	56	0.023	348	0.014	86	0.021	316	0.023	51
DCP 2	.100	1.053	0.357	145	0.058	73	0.032	173	0.051	46	0.024	7	0.060	37	0.032	138	0.023	273	0.027	111
DCP 3	.150	1.519	0.238	147	0.035	37	0.058	145	0.016	231	0.009	88	0.002	149	0.014	104	0.010	296	0.013	245
DCP 4	.200	1.377	0.154	144	0.025	21	0.043	158	0.014	55	0.015	28	0.022	32	0.018	153	0.026	257	0.036	76
DCP 5	.250	1.349	0.181	132	0.023	60	0.047	163	0.011	265	0.002	175	0.006	6	0.004	327	0.018	334	0.006	174
DCP 6	.300	1.258	0.116	116	0.026	31	0.036	150	0.011	127	0.018	12	0.018	9	0.005	133	0.016	255	0.004	19
DCP 7	.400	1.075	0.111	86	0.043	58	0.033	148	0.011	54	0.012	113	0.007	17	0.007	82	0.008	282	0.013	96
DCP 8	.500	0.861	0.102	35	0.029	62	0.016	137	0.017	94	0.007	86	0.007	341	0.009	28	0.013	181	0.017	26
DCP 9	.600	0.779	0.120	37	0.043	59	0.013	151	0.003	354	0.001	170	0.008	30	0.002	125	0.007	347	0.013	72
DCP10	.878	0.651	0.121	12	0.024	35	0.011	278	0.015	249	0.011	271	0.005	206	0.006	182	0.012	229	0.011	313

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.022	138	0.010	134	0.011	141	0.012	130	0.015	103	0.005	127	0.010	44	0.003	12	0.001	64
CN		0.003	15	0.037	137	0.034	55	0.032	53	0.034	72	0.036	261	0.005	335	0.004	355	0.034	247
CM		0.000	254	0.002	227	0.002	273	0.001	266	0.002	308	0.001	343	0.001	207	0.000	70	0.001	56
DCP 1	.010	0.006	341	0.019	86	0.022	31	0.024	352	0.017	311	0.016	320	0.015	253	0.011	30	0.017	273
DCP 2	.100	0.016	28	0.029	152	0.035	64	0.034	236	0.044	47	0.012	259	0.024	313	0.017	29	0.017	237
DCP 3	.150	0.010	243	0.037	148	0.008	183	0.013	264	0.012	255	0.015	319	0.011	102	0.008	354	0.008	21
DCP 4	.200	0.016	333	0.012	168	0.016	286	0.014	205	0.012	4	0.020	258	0.019	322	0.009	3	0.010	13
DCP 5	.250	0.012	272	0.037	223	0.038	212	0.010	277	0.010	213	0.017	335	0.002	164	0.002	149	0.006	303
DCP 6	.300	0.006	34	0.014	160	0.038	324	0.010	194	0.007	323	0.021	274	0.019	327	0.010	342	0.003	42
DCP 7	.400	0.008	167	0.006	68	0.037	56	0.033	51	0.008	118	0.002	257	0.003	17	0.009	42	0.009	255
DCP 8	.500	0.009	55	0.014	122	0.033	169	0.037	55	0.011	223	0.010	216	0.010	231	0.015	276	0.012	326
DCP 9	.600	0.004	59	0.038	52	0.005	50	0.032	96	0.013	99	0.004	208	0.010	82	0.004	262	0.010	194
DCP10	.878	0.002	324	0.009	48	0.013	93	0.018	71	0.005	175	0.036	147	0.008	342	0.003	78	0.007	264

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	15.52	0.600	24.75	4.65		5062.1	10

K	V	C	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.041	650.5	1468.6	0.64E 07	-0.00209	1.20E	25.76	0.0220

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		24.746	4.655	0	0.205	55	0.071	165	0.029	70	0.042	121	0.061	85	0.084	123	0.046	324	0.020	122
CN		1.103	0.065	90	0.006	70	0.012	303	0.009	65	0.003	64	0.005	7	0.004	33	0.006	351	0.003	106
CM		-0.151	0.017	270	0.002	264	0.002	340	0.002	55	0.001	169	0.001	129	0.001	277	0.001	177	0.001	269
DCP 1	.010	2.350	0.64E	178	0.080	268	0.070	278	0.067	55	0.025	191	0.008	221	0.020	257	0.018	226	0.013	249
DCP 2	.100	1.800	0.117	22	0.068	82	0.074	345	0.055	83	0.022	61	0.036	56	0.025	32	0.027	7	0.010	129
DCP 3	.150	1.447	0.066	44	0.007	332	0.028	303	0.023	49	0.005	113	0.005	27	0.004	29	0.010	40	0.010	131
DCP 4	.200	1.417	0.129	28	0.029	65	0.028	349	0.029	56	0.005	93	0.017	23	0.012	21	0.018	353	0.006	135
DCP 5	.250	1.366	0.105	37	0.002	264	0.018	285	0.010	28	0.005	54	0.003	12	0.005	16	0.008	352	0.007	70
DCP 6	.300	1.303	0.123	36	0.012	35	0.013	333	0.013	59	0.005	105	0.007	352	0.009	13	0.013	12	0.006	88
DCP 7	.400	1.163	0.121	41	0.008	137	0.017	255	0.011	329	0.013	38	0.004	29	0.005	121	0.010	313	0.008	47
DCP 8	.500	0.996	0.116	47	0.004	73	0.004	126	0.006	180	0.002	248	0.011	306	0.007	37	0.005	15	0.002	124
DCP 9	.600	0.924	0.114	47	0.008	98	0.008	210	0.006	228	0.005	345	0.005	309	0.002	40	0.006	334	0.003	30
DCP 10	.878	0.759	0.088	54	0.007	62	0.002	191	0.005	209	0.001	136	0.004	342	0.003	106	0.001	47	0.004	141

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.016	81	0.013	94	0.013	90	0.014	110	0.005	112	0.008	43	0.009	63	0.008	38	0.005	98
CN		0.004	13	0.004	130	0.004	246	0.001	170	0.006	291	0.002	91	0.003	247	0.003	17	0.002	276
CM		0.001	218	0.001	291	0.001	6	0.001	320	0.001	67	0.000	154	0.000	290	0.001	94	0.000	118
DCP 1	.010	0.019	253	0.004	214	0.041	248	0.022	290	0.027	296	0.003	293	0.028	287	0.026	9	0.006	282
DCP 2	.100	0.017	0	0.011	139	0.006	341	0.007	16	0.007	2	0.008	152	0.011	225	0.010	48	0.007	326
DCP 3	.150	0.001	1	0.003	33	0.005	35	0.009	162	0.008	299	0.010	83	0.004	146	0.005	96	0.005	250
DCP 4	.200	0.006	56	0.006	132	0.002	107	0.002	346	0.004	356	0.008	129	0.004	255	0.005	66	0.004	339
DCP 5	.250	0.005	62	0.004	118	0.004	350	0.005	180	0.008	287	0.008	70	0.003	188	0.009	45	0.003	162
DCP 6	.300	0.004	24	0.005	122	0.001	132	0.003	147	0.004	353	0.005	144	0.006	270	0.004	53	0.003	281
DCP 7	.400	0.004	68	0.006	164	0.011	285	0.004	17	0.008	305	0.007	53	0.002	92	0.004	28	0.005	177
DCP 8	.500	0.005	4	0.003	149	0.002	324	0.006	179	0.005	314	0.004	132	0.002	200	0.002	143	0.003	272
DCP 9	.600	0.008	18	0.006	116	0.006	215	0.001	186	0.006	266	0.002	41	0.001	175	0.001	310	0.003	137
DCP 10	.878	0.004	34	0.003	100	0.006	192	0.006	140	0.007	246	0.003	304	0.000	271	0.005	304	0.004	318

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	15.80	0.400	0.01	7.14		5379.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.059	443.7	728.7	0.475 07	-0.00044	0.856	7.16	0.1010

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		0.011	7.144	0	0.292	5	0.100	224	0.034	224	0.059	152	0.056	187	0.052	225	0.044	234	0.027	243
CN		0.070	0.762	357	0.023	243	0.026	239	0.011	285	0.004	139	0.005	139	0.006	181	0.005	214	0.005	244
CM		-0.012	0.005	267	0.012	237	0.008	302	0.005	21	0.003	91	0.001	157	0.001	222	0.000	125	0.000	83
DCP 1	.010	-0.862	2.858	356	1.214	252	0.431	325	0.163	216	0.247	304	0.074	64	0.129	260	0.098	358	0.028	202
DCP 2	.025	-0.615	3.100	355	0.436	250	0.224	234	0.081	19	0.051	117	0.038	179	0.055	173	0.026	219	0.012	151
DCP 3	.100	0.078	1.980	356	0.099	216	0.164	283	0.137	26	0.098	125	0.015	220	0.043	97	0.056	189	0.012	282
DCP 4	.150	0.528	1.464	354	0.092	88	0.089	298	0.050	330	0.054	106	0.040	190	0.015	270	0.016	156	0.021	238
DCP 5	.200	0.815	1.217	357	0.052	97	0.077	297	0.039	314	0.046	98	0.050	173	0.017	253	0.014	26	0.015	238
DCP 6	.250	0.306	1.068	355	0.060	73	0.078	178	0.055	251	0.017	344	0.014	117	0.016	225	0.005	305	0.001	43
DCP 7	.300	-0.073	0.890	357	0.059	70	0.057	179	0.040	250	0.013	357	0.020	145	0.021	221	0.011	284	0.004	261
DCP 8	.400	0.020	0.619	358	0.025	226	0.028	276	0.028	247	0.015	289	0.012	31	0.009	144	0.010	293	0.006	290
DCP 9	.500	0.171	0.467	0	0.016	68	0.027	159	0.030	211	0.021	270	0.009	344	0.002	60	0.002	213	0.004	179
DCP10	.600	0.001	0.349	1	0.015	259	0.014	179	0.018	224	0.012	257	0.005	357	0.005	138	0.002	143	0.002	304
DCP11	.878	0.036	0.172	359	0.037	62	0.020	103	0.012	172	0.006	243	0.001	303	0.002	36	0.004	274	0.005	235

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.022	238	0.023	259	0.023	239	0.018	292	0.022	272	0.018	262	0.010	263	0.013	312	0.010	280
CN		0.004	247	0.003	233	0.000	166	0.002	282	0.002	34	0.002	298	0.001	201	0.002	358	0.002	268
CM		0.000	333	0.000	201	0.001	313	0.000	120	0.000	252	0.000	204	0.000	354	0.001	156	0.000	304
DCP 1	.010	0.080	328	0.054	84	0.036	247	0.054	6	0.024	141	0.037	314	0.042	64	0.019	201	0.023	36
DCP 2	.025	0.039	257	0.013	253	0.002	351	0.013	314	0.031	40	0.018	268	0.006	233	0.023	97	0.043	272
DCP 3	.100	0.031	156	0.039	241	0.015	342	0.013	185	0.018	285	0.004	36	0.014	232	0.014	334	0.005	137
DCP 4	.150	0.007	316	0.006	181	0.005	238	0.002	328	0.001	128	0.003	261	0.002	80	0.001	173	0.005	157
DCP 5	.200	0.013	309	0.006	67	0.003	30	0.010	213	0.009	136	0.002	198	0.006	328	0.004	336	0.003	232
DCP 6	.250	0.003	169	0.003	182	0.005	155	0.004	259	0.004	10	0.000	92	0.002	78	0.001	279	0.004	135
DCP 7	.300	0.008	283	0.006	20	0.004	98	0.003	215	0.002	289	0.001	296	0.004	204	0.006	276	0.006	328
DCP 8	.400	0.002	21	0.004	165	0.003	194	0.003	303	0.002	24	0.001	223	0.001	185	0.004	317	0.002	12
DCP 9	.500	0.004	232	0.003	300	0.003	27	0.002	314	0.001	157	0.001	104	0.001	20	0.002	111	0.003	190
DCP10	.600	0.003	169	0.004	213	0.003	167	0.001	5	0.002	91	0.001	210	0.002	130	0.003	322	0.002	42
DCP11	.878	0.002	261	0.002	6	0.002	123	0.002	292	0.002	22	0.003	340	0.002	200	0.003	18	0.003	242

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	16.23	0.400	-0.02	7.29		5379.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.062	439.6	743.8	0.48E 07	-0.00058	0.779	7.31	0.0950

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		-0.019	7.293	359	0.397	1	0.036	231	0.024	334	0.039	110	0.024	148	0.026	220	0.025	250	0.009	239
CN		-0.011	0.780	357	0.017	316	0.017	260	0.333	314	0.007	155	0.003	173	0.005	244	0.004	263	0.002	167
CM		-0.020	0.008	301	0.010	232	0.006	301	0.002	18	0.001	113	0.000	61	0.001	119	0.002	155	0.001	234
DCP 1	.010	-0.856	2.909	358	1.198	251	0.511	320	0.137	226	0.304	304	0.133	39	0.104	260	0.133	7	0.062	138
DCP 2	.025	-0.732	3.283	356	0.357	243	0.202	310	0.066	60	0.064	154	0.029	47	0.047	175	0.043	214	0.012	139
DCP 3	.100	0.006	2.139	356	0.040	79	0.096	274	0.100	32	0.093	134	0.015	231	0.042	98	0.057	196	0.019	289
DCP 4	.150	0.110	1.493	353	0.127	57	0.062	196	0.044	346	0.062	99	0.051	183	0.023	270	0.007	127	0.018	212
DCP 5	.200	0.108	1.211	358	0.053	98	0.066	220	0.027	311	0.034	114	0.038	206	0.028	319	0.016	82	0.024	226
DCP 6	.250	0.019	1.068	356	0.082	38	0.048	162	0.037	232	0.010	308	0.039	148	0.014	241	0.010	302	0.001	1
DCP 7	.300	-0.019	0.879	358	0.042	56	0.042	181	0.033	242	0.007	320	0.008	178	0.013	268	0.011	13	0.010	141
DCP 8	.400	0.032	0.629	358	0.013	347	0.015	203	0.018	219	0.013	260	0.005	332	0.002	235	0.003	267	0.002	354
DCP 9	.500	0.003	0.457	1	0.003	18	0.012	176	0.017	206	0.013	262	0.004	306	0.005	243	0.004	308	0.004	74
DCP10	.600	0.018	0.347	1	0.017	338	0.004	195	0.010	192	0.008	237	0.001	336	0.002	230	0.005	279	0.003	355
DCP11	.878	0.076	0.169	3	0.038	33	0.014	93	0.005	72	0.002	66	0.003	121	0.007	288	0.003	330	0.006	77

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.008	171	0.007	246	0.011	232	0.005	319	0.006	286	0.004	272	0.008	176	0.007	285	0.007	275
CN		0.004	224	0.002	248	0.005	218	0.001	309	0.002	16	0.001	66	0.003	257	0.001	251	0.002	316
CM		0.002	295	0.000	331	0.001	80	0.001	221	0.000	180	0.001	232	0.001	2	0.000	88	0.000	163
DCP 1	.010	0.075	309	0.078	76	0.074	202	0.068	341	0.049	119	0.048	262	0.044	21	0.022	156	0.030	324
DCP 2	.025	0.060	245	0.016	283	0.020	178	0.026	251	0.030	53	0.021	240	0.043	303	0.012	120	0.020	331
DCP 3	.100	0.024	151	0.033	225	0.005	355	0.014	187	0.021	292	0.013	78	0.019	236	0.014	326	0.008	139
DCP 4	.150	0.012	292	0.007	317	0.001	261	0.007	78	0.008	182	0.004	272	0.004	318	0.002	27	0.002	4
DCP 5	.200	0.032	268	0.012	51	0.006	121	0.007	350	0.007	1	0.010	136	0.005	170	0.010	284	0.004	29
DCP 6	.250	0.001	220	0.002	355	0.005	150	0.002	133	0.003	231	0.002	86	0.002	144	0.002	215	0.003	318
DCP 7	.300	0.010	236	0.003	353	0.004	157	0.001	197	0.001	282	0.003	11	0.001	54	0.004	218	0.002	280
DCP 8	.400	0.002	143	0.001	255	0.005	201	0.001	302	0.001	279	0.002	63	0.002	148	0.001	202	0.001	255
DCP 9	.500	0.006	212	0.004	249	0.003	290	0.002	35	0.001	144	0.002	61	0.001	186	0.003	170	0.001	287
DCP10	.600	0.003	139	0.002	203	0.005	229	0.000	134	0.003	12	0.002	63	0.003	137	0.000	196	0.003	174
DCP11	.878	0.008	118	0.002	134	0.010	252	0.004	13	0.002	32	0.004	44	0.006	234	0.003	288	0.006	360

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	0,ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	15.82	0.400	-0.02	7.51		5379.3	10

K	V	O	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.060	438.2	743.4	0.49E 07	-0.00051	0.784	7.55	0.0250

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		-0.020	7.512	0	0.379	4	0.136	234	0.038	172	0.074	124	0.041	202	0.059	215	0.053	216	0.027	220
CN		-0.031	0.787	356	0.027	249	0.027	247	0.016	245	0.006	150	0.004	198	0.007	194	0.004	229	0.003	226
CM		-0.016	0.006	287	0.010	238	0.006	308	0.005	32	0.002	111	0.001	148	0.000	357	0.000	264	0.001	115
DCP 1	.010	-0.899	2.986	356	1.312	249	0.551	317	0.137	212	0.262	301	0.105	28	0.088	258	0.118	9	0.073	135
DCP 2	.025	-0.692	3.257	355	0.443	253	0.195	236	0.074	63	0.041	143	0.020	95	0.056	171	0.024	256	0.025	129
DCP 3	.100	0.020	2.108	355	0.041	214	0.122	281	0.109	44	0.111	137	0.076	251	0.053	96	0.069	186	0.024	270
DCP 4	.150	0.051	1.488	353	0.081	79	0.077	210	0.042	344	0.063	111	0.052	202	0.022	287	0.013	131	0.022	227
DCP 5	.200	0.029	1.255	356	0.074	96	0.088	203	0.037	295	0.041	98	0.050	182	0.036	261	0.007	359	0.010	202
DCP 6	.250	-0.037	1.092	353	0.051	48	0.058	173	0.041	240	0.009	353	0.013	145	0.020	220	0.012	292	0.001	332
DCP 7	.300	-0.034	0.916	357	0.055	77	0.065	181	0.047	241	0.015	338	0.014	147	0.017	227	0.012	303	0.006	31
DCP 8	.400	0.022	0.632	357	0.027	233	0.023	208	0.022	226	0.012	270	0.008	345	0.005	156	0.005	260	0.003	348
DCP 9	.500	-0.040	0.456	1	0.009	215	0.015	199	0.020	203	0.011	256	0.003	350	0.005	189	0.004	250	0.001	45
DCP10	.600	-0.001	0.351	1	0.024	246	0.011	237	0.012	232	0.008	253	0.005	328	0.003	249	0.005	329	0.002	71
DCP11	.878	0.059	0.180	359	0.034	38	0.011	115	0.015	190	0.003	291	0.002	298	0.005	147	0.005	154	0.008	261

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.021	227	0.027	233	0.019	214	0.014	245	0.015	247	0.021	246	0.019	238	0.016	277	0.013	222
CN		0.004	195	0.001	290	0.003	240	0.003	267	0.002	285	0.001	247	0.002	174	0.000	186	0.002	279
CM		0.000	33	0.001	202	0.001	208	0.000	272	0.001	136	0.000	144	0.001	332	0.000	245	0.000	163
DCP 1	.010	0.041	279	0.036	103	0.071	233	0.044	349	0.042	177	0.054	293	0.040	58	0.032	211	0.035	343
DCP 2	.025	0.026	196	0.012	277	0.019	214	0.033	279	0.011	40	0.024	209	0.021	317	0.013	134	0.023	259
DCP 3	.100	0.026	143	0.035	229	0.012	300	0.016	206	0.021	283	0.007	55	0.013	224	0.017	332	0.009	149
DCP 4	.150	0.014	309	0.006	61	0.010	223	0.008	311	0.001	63	0.004	136	0.005	186	0.004	230	0.001	313
DCP 5	.200	0.008	296	0.005	17	0.005	223	0.008	272	0.001	40	0.006	14	0.001	246	0.006	106	0.007	132
DCP 6	.250	0.002	265	0.006	27	0.006	152	0.003	256	0.001	193	0.004	154	0.004	206	0.004	270	0.002	4
DCP 7	.300	0.005	111	0.004	130	0.003	214	0.002	275	0.003	151	0.003	180	0.006	218	0.007	285	0.004	356
DCP 8	.400	0.002	110	0.003	57	0.004	185	0.002	191	0.003	245	0.002	61	0.004	113	0.003	182	0.002	284
DCP 9	.500	0.003	201	0.002	301	0.002	38	0.003	181	0.002	261	0.004	18	0.004	120	0.004	173	0.004	247
DCP10	.600	0.005	191	0.002	314	0.002	280	0.000	166	0.001	304	0.001	293	0.006	78	0.004	139	0.002	177
DCP11	.878	0.003	225	0.004	25	0.002	355	0.002	341	0.004	319	0.002	243	0.006	196	0.004	26	0.004	338

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	15.92	0.400	7.62	7.23		5381.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.060	445.3	750.7	0.48E 07	-0.00093	1.526	14.90	0.1010

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		7.623	7.225	0	0.408	18	0.079	199	0.161	217	0.132	166	0.049	332	0.088	216	0.030	200	0.027	224
CN		0.770	0.697	357	0.095	16	0.037	257	0.031	181	0.016	106	0.011	312	0.011	198	0.005	126	0.003	232
CM		-0.004	0.020	322	0.003	358	0.004	326	0.004	239	0.004	149	0.002	65	0.002	340	0.002	243	0.001	141
DCP 1	.010	2.519	4.338	355	0.514	4	0.177	236	0.173	194	0.096	155	0.005	275	0.046	157	0.014	61	0.025	270
DCP 2	.025	2.775	3.771	353	0.445	339	0.249	253	0.178	174	0.117	107	0.036	320	0.019	173	0.012	303	0.044	230
DCP 3	.100	1.913	1.683	354	0.253	30	0.103	301	0.084	209	0.061	131	0.033	353	0.026	243	0.030	196	0.031	137
DCP 4	.150	1.694	1.040	356	0.193	38	0.067	317	0.058	225	0.040	154	0.016	34	0.015	271	0.012	209	0.012	176
DCP 5	.200	1.517	0.942	354	0.171	30	0.064	293	0.055	188	0.040	93	0.033	326	0.023	213	0.022	143	0.012	81
DCP 6	.250	1.203	0.792	359	0.157	36	0.049	305	0.044	212	0.030	141	0.013	16	0.014	246	0.009	182	0.005	165
DCP 7	.300	0.775	0.689	357	0.115	25	0.044	271	0.039	175	0.024	78	0.025	305	0.024	207	0.017	114	0.008	343
DCP 8	.400	0.618	0.537	2	0.101	29	0.030	279	0.028	189	0.014	112	0.011	319	0.013	210	0.006	123	0.004	278
DCP 9	.500	0.557	0.384	0	0.061	27	0.022	264	0.014	155	0.005	29	0.008	247	0.012	137	0.008	30	0.009	249
DCP10	.600	0.333	0.310	5	0.052	19	0.021	241	0.019	153	0.010	42	0.013	287	0.014	194	0.008	98	0.006	320
DCP11	.878	0.174	0.144	6	0.018	259	0.021	173	0.016	74	0.012	330	0.007	242	0.007	145	0.006	52	0.003	284

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.028	211	0.023	215	0.028	207	0.021	241	0.018	240	0.012	237	0.022	237	0.013	235	0.009	265
CN		0.005	237	0.003	222	0.003	203	0.001	178	0.000	230	0.003	276	0.001	203	0.002	219	0.002	249
CM		0.001	69	0.001	351	0.000	226	0.001	176	0.001	106	0.001	58	0.001	275	0.000	200	0.000	135
DCP 1	.010	0.027	234	0.026	233	0.028	213	0.017	182	0.006	175	0.013	255	0.005	248	0.010	252	0.011	262
DCP 2	.025	0.040	218	0.020	163	0.014	94	0.035	258	0.007	203	0.004	272	0.012	266	0.018	226	0.013	206
DCP 3	.100	0.017	59	0.022	320	0.028	239	0.020	178	0.017	101	0.016	2	0.015	275	0.014	209	0.008	164
DCP 4	.150	0.004	108	0.007	294	0.009	227	0.007	189	0.003	181	0.000	216	0.004	262	0.007	219	0.003	132
DCP 5	.200	0.009	301	0.011	206	0.012	154	0.008	100	0.007	45	0.003	274	0.004	174	0.005	118	0.005	358
DCP 6	.250	0.003	207	0.004	259	0.004	227	0.003	196	0.001	156	0.003	298	0.003	235	0.004	200	0.000	51
DCP 7	.300	0.012	251	0.009	197	0.005	168	0.004	5	0.005	314	0.007	236	0.005	156	0.003	71	0.009	303
DCP 8	.400	0.008	228	0.004	228	0.001	247	0.001	314	0.001	266	0.003	267	0.000	302	0.002	237	0.003	264
DCP 9	.500	0.006	181	0.003	84	0.003	230	0.001	342	0.001	266	0.002	210	0.002	73	0.001	289	0.004	247
DCP10	.600	0.007	246	0.005	223	0.001	44	0.001	52	0.003	303	0.003	262	0.003	122	0.003	251	0.001	72
DCP11	.878	0.004	251	0.003	169	0.001	78	0.002	329	0.002	253	0.003	250	0.004	90	0.001	37	0.002	279

TUNED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	15.92	0.400	7.57	7.34		5081.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.060	440.8	742.9	0.48E 07	-0.00098	1.488	14.96	0.0970

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		7.571	7.343	0	0.534	13	0.040	203	0.126	220	0.096	152	0.053	310	0.042	190	0.018	217	0.019	220
CN		0.728	0.707	356	0.101	13	0.034	274	0.023	177	0.012	97	0.005	305	0.004	177	0.003	194	0.003	173
CM		-0.005	0.022	326	0.004	320	0.002	301	0.002	238	0.001	142	0.001	87	0.001	14	0.001	290	0.001	188
DCP 1	.010	2.543	4.436	355	0.553	1	0.150	234	0.115	189	0.050	161	0.032	187	0.053	104	0.024	24	0.020	296
DCP 2	.025	2.810	3.858	352	0.506	336	0.225	251	0.142	163	0.092	92	0.016	249	0.032	83	0.034	329	0.051	239
DCP 3	.100	1.929	1.720	353	0.270	23	0.104	306	0.063	209	0.047	123	0.024	5	0.019	295	0.041	213	0.042	136
DCP 4	.150	1.436	1.071	355	0.184	32	0.053	313	0.032	226	0.018	148	0.004	359	0.003	245	0.007	210	0.005	159
DCP 5	.200	1.155	0.955	353	0.172	21	0.062	284	0.042	170	0.029	77	0.024	324	0.018	217	0.016	159	0.009	77
DCP 6	.250	1.045	0.814	358	0.150	33	0.040	306	0.028	210	0.015	135	0.006	12	0.004	240	0.008	189	0.005	118
DCP 7	.300	0.799	0.705	356	0.123	18	0.042	267	0.035	153	0.020	51	0.023	282	0.019	182	0.013	106	0.007	10
DCP 8	.400	0.619	0.543	1	0.100	31	0.028	290	0.019	196	0.009	114	0.004	347	0.004	212	0.005	179	0.001	77
DCP 9	.500	0.464	0.387	359	0.067	21	0.020	274	0.012	153	0.002	35	0.005	218	0.006	120	0.002	1	0.003	240
DCP10	.600	0.334	0.306	5	0.055	33	0.015	286	0.011	184	0.004	107	0.002	333	0.003	215	0.003	215	0.001	13
DCP11	.878	0.184	0.136	6	0.013	292	0.013	181	0.010	101	0.006	9	0.004	274	0.003	167	0.003	101	0.001	291

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.017	181	0.013	180	0.018	191	0.010	228	0.007	240	0.006	233	0.013	220	0.007	225	0.008	221
CN		0.001	228	0.001	283	0.002	165	0.003	127	0.001	168	0.002	284	0.001	168	0.001	157	0.000	159
CM		0.001	49	0.001	304	0.001	212	0.001	115	0.001	31	0.000	344	0.001	281	0.000	168	0.000	319
DCP 1	.010	0.016	253	0.022	264	0.011	209	0.020	174	0.016	170	0.004	230	0.004	46	0.003	234	0.007	300
DCP 2	.025	0.032	189	0.006	84	0.012	90	0.011	104	0.006	125	0.009	329	0.013	256	0.016	190	0.006	246
DCP 3	.100	0.036	56	0.037	327	0.038	238	0.034	152	0.026	80	0.024	344	0.018	260	0.015	165	0.011	70
DCP 4	.150	0.003	87	0.006	295	0.005	188	0.005	130	0.001	136	0.005	277	0.003	112	0.000	67	0.002	229
DCP 5	.200	0.011	330	0.011	251	0.014	158	0.018	83	0.010	344	0.018	256	0.008	162	0.011	72	0.007	25
DCP 6	.250	0.002	322	0.005	279	0.005	174	0.005	114	0.001	325	0.004	271	0.004	146	0.002	147	0.001	301
DCP 7	.300	0.012	269	0.010	190	0.011	108	0.010	7	0.012	265	0.010	182	0.009	76	0.007	2	0.006	263
DCP 8	.400	0.004	286	0.004	209	0.005	107	0.003	24	0.004	244	0.003	228	0.005	124	0.001	339	0.003	217
DCP 9	.500	0.004	199	0.004	107	0.003	29	0.003	272	0.004	166	0.003	65	0.002	8	0.002	181	0.002	124
DCP10	.600	0.003	274	0.003	151	0.004	65	0.002	277	0.005	210	0.001	145	0.003	150	0.001	234	0.002	197
DCP11	.878	0.003	160	0.004	89	0.002	336	0.002	224	0.002	155	0.001	269	0.001	89	0.000	60	0.001	66

TUNED PITCHING OSCILLATION VERTOL 23010-1.59 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	15.92	0.400	7.65	7.58		5381.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.061	438.8	742.1	0.48E 07	-0.00096	1.482	15.18	0.0250

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		7.655	7.580	0	0.538	14	0.062	229	0.131	252	0.165	169	0.046	305	0.036	232	0.022	204	0.021	226
CN		0.704	0.721	357	0.107	13	0.030	277	0.023	207	0.020	148	0.005	0	0.005	272	0.006	197	0.004	194
CM		-0.004	0.022	325	0.002	252	0.001	304	0.002	250	0.002	173	0.002	123	0.001	45	0.001	295	0.001	189
DCP 1	.010	2.525	4.544	354	0.539	357	0.108	231	0.093	224	0.126	176	0.031	144	0.015	85	0.015	68	0.021	341
DCP 2	.025	2.791	3.939	353	0.465	334	0.196	245	0.125	195	0.128	147	0.025	121	0.019	39	0.023	283	0.052	240
DCP 3	.100	1.894	1.730	354	0.274	29	0.097	312	0.088	235	0.081	158	0.024	64	0.026	319	0.038	235	0.044	173
DCP 4	.150	1.347	1.085	354	0.190	30	0.058	324	0.032	248	0.032	175	0.006	89	0.006	336	0.006	246	0.006	215
DCP 5	.200	1.084	0.965	355	0.172	26	0.059	286	0.048	199	0.033	119	0.020	339	0.026	242	0.026	185	0.011	109
DCP 6	.250	0.981	0.829	357	0.155	29	0.043	310	0.027	228	0.024	160	0.009	32	0.008	299	0.009	205	0.004	146
DCP 7	.300	0.789	0.719	357	0.128	20	0.041	266	0.033	180	0.021	102	0.019	321	0.022	231	0.020	151	0.011	71
DCP 8	.400	0.607	0.556	0	0.105	25	0.029	294	0.017	200	0.013	148	0.008	354	0.008	267	0.006	176	0.004	70
DCP 9	.500	0.417	0.398	0	0.075	21	0.019	265	0.011	185	0.003	151	0.006	264	0.007	187	0.004	102	0.003	308
DCP10	.600	0.314	0.314	4	0.063	26	0.015	292	0.010	205	0.007	146	0.006	4	0.003	297	0.003	198	0.000	276
DCP11	.878	0.185	0.139	9	0.024	335	0.011	182	0.007	102	0.003	64	0.007	292	0.001	260	0.004	131	0.003	255

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.018	127	0.009	210	0.015	196	0.006	251	0.009	225	0.003	292	0.016	228	0.007	247	0.006	247
CN		0.003	252	0.001	196	0.003	214	0.003	194	0.002	134	0.001	203	0.003	254	0.002	247	0.001	229
CM		0.001	114	0.001	319	0.000	324	0.001	186	0.000	145	0.001	349	0.001	312	0.000	251	0.000	159
DCP 1	.010	0.033	271	0.016	251	0.014	219	0.022	198	0.010	155	0.003	173	0.002	37	0.004	287	0.009	268
DCP 2	.025	0.042	215	0.018	175	0.014	115	0.010	200	0.008	149	0.008	325	0.020	279	0.020	240	0.011	195
DCP 3	.100	0.033	103	0.032	10	0.032	283	0.037	209	0.029	140	0.016	57	0.020	322	0.016	254	0.013	189
DCP 4	.150	0.004	217	0.006	36	0.006	250	0.005	209	0.006	140	0.001	27	0.005	261	0.004	281	0.003	204
DCP 5	.200	0.013	6	0.010	273	0.013	205	0.009	147	0.008	52	0.009	292	0.014	235	0.002	133	0.005	34
DCP 6	.250	0.004	299	0.003	313	0.007	228	0.006	154	0.003	59	0.004	296	0.005	223	0.001	205	0.001	308
DCP 7	.300	0.012	317	0.013	230	0.014	158	0.008	72	0.005	330	0.008	241	0.007	171	0.003	82	0.002	343
DCP 8	.400	0.008	285	0.004	233	0.006	167	0.003	75	0.003	343	0.004	240	0.004	183	0.003	78	0.003	319
DCP 9	.500	0.007	250	0.006	180	0.004	109	0.005	343	0.004	265	0.004	188	0.002	96	0.003	354	0.001	240
DCP10	.600	0.008	259	0.002	171	0.001	27	0.002	355	0.002	229	0.004	188	0.001	244	0.001	141	0.001	223
DCP11	.878	0.000	12	0.005	106	0.002	235	0.001	261	0.004	113	0.004	125	0.001	158	0.001	224	0.001	306

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	16.05	0.400	9.94	7.04		5082.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.061	441.3	743.6	0.48E 07	-0.00008	1.648	16.32	0.1010

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		9.935	7.039	0	0.486	33	0.028	201	0.100	234	0.139	251	0.207	165	0.045	58	0.048	272	0.056	224
CN		0.885	0.487	7	0.218	31	0.069	296	0.031	237	0.033	210	0.029	138	0.009	67	0.006	340	0.008	256
CM		-0.024	0.024	191	0.031	68	0.018	339	0.006	273	0.005	259	0.005	194	0.004	143	0.004	83	0.003	11
DCP 1	.010	3.372	3.128	1	1.016	35	0.317	312	0.158	246	0.129	244	0.098	183	0.039	215	0.052	204	0.061	184
DCP 2	.025	3.189	2.354	359	1.122	40	0.499	324	0.241	265	0.217	237	0.176	181	0.129	157	0.107	102	0.062	45
DCP 3	.100	2.059	0.711	9	0.848	50	0.374	325	0.164	250	0.107	219	0.105	165	0.065	119	0.060	60	0.049	341
DCP 4	.150	1.655	0.519	14	0.501	50	0.190	324	0.073	247	0.054	233	0.066	172	0.046	106	0.030	36	0.028	319
DCP 5	.200	1.369	0.497	16	0.471	33	0.194	291	0.066	217	0.072	207	0.091	126	0.056	40	0.034	328	0.027	275
DCP 6	.250	1.251	0.508	17	0.335	35	0.106	288	0.027	218	0.049	229	0.060	144	0.036	49	0.022	328	0.020	270
DCP 7	.300	0.905	0.477	16	0.291	19	0.108	268	0.041	202	0.057	187	0.066	102	0.044	13	0.028	305	0.030	253
DCP 8	.400	0.777	0.457	15	0.171	12	0.060	237	0.011	163	0.030	205	0.034	112	0.023	13	0.020	307	0.022	246
DCP 9	.500	0.651	0.355	10	0.106	350	0.043	202	0.005	150	0.024	153	0.024	46	0.015	295	0.010	253	0.017	200
DCP10	.600	0.492	0.336	10	0.071	331	0.046	190	0.009	116	0.014	157	0.016	52	0.011	314	0.015	282	0.019	214
DCP11	.878	0.269	0.225	357	0.074	251	0.036	155	0.011	128	0.013	72	0.007	343	0.008	323	0.012	236	0.009	136

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.048	176	0.022	194	0.015	239	0.020	249	0.022	241	0.021	236	0.023	204	0.017	237	0.015	245
CN		0.004	243	0.003	208	0.007	188	0.002	153	0.000	187	0.001	345	0.003	250	0.003	249	0.003	204
CM		0.002	289	0.001	268	0.002	209	0.002	131	0.001	59	0.001	317	0.001	317	0.000	307	0.000	293
DCP 1	.010	0.041	128	0.037	57	0.028	274	0.032	231	0.018	215	0.007	215	0.006	204	0.004	0	0.011	313
DCP 2	.025	0.048	352	0.063	303	0.067	228	0.051	175	0.030	117	0.022	1	0.029	282	0.033	238	0.024	189
DCP 3	.100	0.048	289	0.044	250	0.051	199	0.040	147	0.019	102	0.017	56	0.017	355	0.018	317	0.016	286
DCP 4	.150	0.027	268	0.016	197	0.021	188	0.015	125	0.007	50	0.004	345	0.005	273	0.001	234	0.004	243
DCP 5	.200	0.027	224	0.023	170	0.019	128	0.016	70	0.009	10	0.010	316	0.009	265	0.007	268	0.011	200
DCP 6	.250	0.018	245	0.013	172	0.011	170	0.008	101	0.007	16	0.004	308	0.008	264	0.006	201	0.003	164
DCP 7	.300	0.027	198	0.021	136	0.014	98	0.012	39	0.013	330	0.012	266	0.010	209	0.006	166	0.006	139
DCP 8	.400	0.011	203	0.012	145	0.007	141	0.007	37	0.007	330	0.007	278	0.008	226	0.004	176	0.003	158
DCP 9	.500	0.010	121	0.004	92	0.005	73	0.008	320	0.006	251	0.005	201	0.006	150	0.004	29	0.002	223
DCP10	.600	0.010	101	0.004	26	0.002	84	0.009	328	0.009	250	0.006	202	0.006	160	0.003	55	0.001	233
DCP11	.878	0.004	44	0.002	63	0.004	311	0.008	251	0.006	164	0.008	76	0.003	352	0.004	232	0.002	140

TUNED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	16.05	0.400	9.99	7.20		5082.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.061	438.0	740.7	0.48E 07	-0.00011	1.611	16.29	0.0720

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		9.991	7.204	0	0.595	28	0.068	357	0.071	241	0.213	286	0.334	131	0.087	18	0.067	270	0.037	229
CN		0.847	0.491	7	0.238	33	0.073	332	0.016	247	0.037	247	0.045	133	0.017	49	0.010	337	0.008	251
CM		-0.023	0.023	196	0.029	69	0.018	339	0.004	276	0.006	280	0.006	206	0.006	136	0.004	87	0.003	23
DCP 1	.010	3.342	3.149	0	1.105	34	0.340	311	0.052	251	0.198	282	0.124	147	0.030	249	0.065	211	0.075	167
DCP 2	.025	3.161	2.362	359	1.224	41	0.531	327	0.159	282	0.283	264	0.188	171	0.132	149	0.101	100	0.068	53
DCP 3	.100	2.054	0.756	7	0.884	50	0.377	328	0.120	259	0.133	252	0.149	159	0.110	97	0.081	19	0.048	303
DCP 4	.150	1.465	0.525	13	0.528	48	0.203	319	0.045	235	0.066	271	0.092	157	0.057	79	0.033	355	0.019	283
DCP 5	.200	1.203	0.505	13	0.479	37	0.183	301	0.054	217	0.064	232	0.099	130	0.065	46	0.039	331	0.022	275
DCP 6	.250	1.131	0.512	16	0.358	35	0.119	290	0.020	187	0.052	258	0.086	137	0.049	41	0.022	323	0.018	287
DCP 7	.300	0.917	0.483	13	0.298	25	0.105	277	0.026	194	0.045	214	0.081	111	0.052	11	0.028	294	0.016	248
DCP 8	.400	0.760	0.458	14	0.182	13	0.060	239	0.013	83	0.033	236	0.057	115	0.031	9	0.014	399	0.018	266
DCP 9	.500	0.559	0.357	10	0.122	0	0.042	209	0.010	66	0.021	190	0.040	79	0.027	322	0.015	247	0.013	193
DCP10	.600	0.470	0.329	11	0.073	340	0.041	185	0.011	59	0.010	187	0.022	87	0.014	327	0.008	287	0.017	217
DCP11	.878	0.276	0.221	359	0.057	259	0.029	153	0.009	167	0.013	96	0.009	15	0.011	310	0.011	280	0.007	174

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.037	152	0.016	139	0.004	165	0.008	274	0.010	229	0.009	238	0.015	201	0.002	322	0.007	217
CN		0.002	288	0.003	230	0.003	191	0.001	26	0.003	230	0.000	54	0.000	193	0.001	231	0.001	288
CM		0.001	285	0.001	294	0.002	225	0.002	156	0.002	52	0.001	336	0.000	242	0.001	13	0.000	190
DCP 1	.010	0.054	95	0.040	27	0.033	292	0.019	238	0.021	181	0.019	154	0.024	95	0.022	19	0.023	322
DCP 2	.025	0.068	8	0.057	310	0.063	237	0.042	182	0.027	97	0.014	357	0.014	290	0.025	241	0.020	178
DCP 3	.100	0.019	275	0.022	260	0.034	218	0.030	171	0.021	121	0.016	52	0.008	37	0.010	7	0.015	340
DCP 4	.150	0.018	271	0.017	209	0.009	147	0.008	119	0.007	66	0.005	294	0.007	243	0.003	157	0.004	231
DCP 5	.200	0.021	240	0.019	201	0.015	142	0.013	96	0.008	43	0.010	323	0.004	247	0.001	91	0.002	357
DCP 6	.250	0.022	240	0.014	153	0.002	157	0.008	102	0.006	9	0.007	249	0.003	167	0.003	335	0.003	248
DCP 7	.300	0.013	213	0.012	157	0.008	113	0.008	55	0.008	338	0.006	294	0.006	225	0.005	204	0.006	128
DCP 8	.400	0.015	195	0.005	129	0.005	113	0.011	39	0.010	291	0.005	219	0.004	213	0.005	158	0.003	91
DCP 9	.500	0.010	111	0.002	54	0.003	72	0.007	340	0.008	263	0.005	193	0.004	138	0.002	145	0.003	106
DCP10	.600	0.006	106	0.002	208	0.010	72	0.015	334	0.012	225	0.006	149	0.005	105	0.008	40	0.009	287
DCP11	.878	0.007	6	0.003	92	0.005	347	0.015	292	0.007	192	0.003	39	0.004	345	0.008	221	0.003	88

TUNED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	O.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	15.87	0.400	9.99	7.29		5082.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.061	437.2	739.7	0.48E 07	-0.00021	1.584	16.62	0.0250

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		9.992	7.293	0	0.559	30	0.054	347	0.101	268	0.275	272	0.286	100	0.025	316	0.065	239	0.051	209
CN		0.631	0.490	7	0.235	32	0.075	298	0.026	240	0.038	228	0.034	109	0.008	47	0.006	323	0.005	229
CM		-0.021	0.021	197	0.026	67	0.016	337	0.006	292	0.007	263	0.006	207	0.006	130	0.004	68	0.003	332
DCP 1	.010	3.342	3.230	0	1.026	33	0.330	314	0.145	261	0.205	252	0.076	111	0.036	199	0.054	205	0.066	171
DCP 2	.025	3.158	2.428	358	1.153	39	0.492	323	0.193	279	0.303	252	0.137	179	0.155	147	0.102	89	0.054	48
DCP 3	.100	2.006	0.729	8	0.898	49	0.375	322	0.130	254	0.142	241	0.101	149	0.082	108	0.068	33	0.049	316
DCP 4	.150	1.446	0.539	11	0.496	48	0.185	321	0.057	250	0.068	248	0.059	146	0.041	97	0.026	14	0.022	293
DCP 5	.200	1.179	0.502	15	0.492	34	0.191	292	0.058	216	0.081	218	0.095	111	0.057	33	0.031	323	0.028	283
DCP 6	.250	1.104	0.512	15	0.343	36	0.115	295	0.034	234	0.059	226	0.071	115	0.035	31	0.019	312	0.016	270
DCP 7	.300	0.897	0.475	15	0.308	22	0.116	271	0.037	206	0.054	199	0.076	90	0.038	2	0.026	307	0.029	253
DCP 8	.400	0.750	0.453	14	0.175	16	0.057	254	0.014	207	0.035	195	0.055	86	0.031	347	0.020	264	0.014	218
DCP 9	.500	0.543	0.362	9	0.114	0	0.041	210	0.007	134	0.019	160	0.037	54	0.020	305	0.015	268	0.020	188
DCP10	.600	0.451	0.321	11	0.066	345	0.035	194	0.006	121	0.009	143	0.022	61	0.015	304	0.013	238	0.010	169
DCP11	.878	0.268	0.213	359	0.049	259	0.029	151	0.016	153	0.016	75	0.012	26	0.014	300	0.011	243	0.015	120

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.042	185	0.017	184	0.018	215	0.017	213	0.016	214	0.019	222	0.016	217	0.007	215	0.016	228
CN		0.004	217	0.003	205	0.004	186	0.003	168	0.003	299	0.002	210	0.002	322	0.001	256	0.000	33
CM		0.001	318	0.001	278	0.003	215	0.002	103	0.001	85	0.001	24	0.000	158	0.001	256	0.001	245
DCP 1	.010	0.051	196	0.024	20	0.031	245	0.019	197	0.016	177	0.022	108	0.019	10	0.017	292	0.015	248
DCP 2	.025	0.055	0	0.070	296	0.072	216	0.043	147	0.011	82	0.007	30	0.014	303	0.019	246	0.020	213
DCP 3	.100	0.033	263	0.027	252	0.041	211	0.033	148	0.009	94	0.009	100	0.011	42	0.011	352	0.020	312
DCP 4	.150	0.016	227	0.012	196	0.014	193	0.013	123	0.007	24	0.005	312	0.004	234	0.005	262	0.003	290
DCP 5	.200	0.031	230	0.024	147	0.015	148	0.012	99	0.014	357	0.006	300	0.005	286	0.009	245	0.008	210
DCP 6	.250	0.016	213	0.014	170	0.009	133	0.006	44	0.005	301	0.003	282	0.004	284	0.006	238	0.006	214
DCP 7	.300	0.023	190	0.014	132	0.008	90	0.007	13	0.009	302	0.006	255	0.004	253	0.007	224	0.004	168
DCP 8	.400	0.010	156	0.009	133	0.003	55	0.002	353	0.006	317	0.003	252	0.003	241	0.007	231	0.007	122
DCP 9	.500	0.011	95	0.006	87	0.010	20	0.011	287	0.007	224	0.004	217	0.003	109	0.001	32	0.001	121
DCP10	.600	0.003	95	0.004	161	0.005	71	0.003	332	0.008	290	0.007	213	0.004	144	0.004	138	0.008	36
DCP11	.878	0.002	271	0.003	25	0.006	22	0.009	235	0.004	241	0.004	172	0.006	334	0.006	50	0.003	77

TUNED PITCHING OSCILLATION VERTOL 23010-1.59 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	15.97	0.400	12.45	6.95		5083.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.060	445.6	744.9	0.48E 07	-0.00028	1.757	16.83	0.1010

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		12.449	6.951	0	0.574	30	0.113	99	0.123	46	0.071	350	0.174	319	0.142	216	0.099	164	0.035	101
CN		1.046	0.277	34	0.253	44	0.050	46	0.059	3	0.025	324	0.039	300	0.027	242	0.028	200	0.017	134
CM		-0.032	0.046	191	0.028	91	0.010	92	0.014	46	0.007	2	0.007	357	0.006	325	0.006	299	0.006	241
DCP 1	.010	4.071	1.859	10	1.185	51	0.202	56	0.245	41	0.124	21	0.149	349	0.070	326	0.028	293	0.036	3
DCP 2	.025	3.615	0.967	11	1.294	62	0.378	61	0.394	36	0.241	10	0.253	337	0.186	311	0.164	272	0.110	245
DCP 3	.100	2.163	0.335	118	0.884	62	0.184	63	0.274	34	0.163	336	0.132	314	0.108	277	0.096	233	0.061	194
DCP 4	.150	2.063	0.278	88	0.532	55	0.086	71	0.165	28	0.080	320	0.066	316	0.067	265	0.055	209	0.038	184
DCP 5	.200	2.036	0.312	76	0.466	43	0.101	60	0.171	358	0.071	286	0.082	296	0.081	228	0.055	187	0.046	157
DCP 6	.250	1.540	0.326	62	0.367	41	0.064	70	0.124	359	0.045	281	0.061	307	0.064	230	0.044	190	0.041	158
DCP 7	.300	0.973	0.320	54	0.304	34	0.071	44	0.113	334	0.043	263	0.067	279	0.063	204	0.044	180	0.048	132
DCP 8	.400	0.851	0.341	41	0.217	25	0.038	35	0.071	317	0.017	232	0.046	279	0.039	199	0.035	191	0.038	126
DCP 9	.500	0.832	0.279	31	0.131	11	0.031	3	0.050	276	0.013	184	0.033	241	0.027	156	0.031	158	0.036	74
DCP10	.600	0.566	0.288	25	0.098	0	0.016	331	0.035	261	0.008	151	0.020	247	0.013	168	0.025	166	0.028	80
DCP11	.878	0.336	0.247	1	0.048	284	0.037	285	0.033	200	0.010	211	0.016	156	0.009	175	0.019	110	0.014	28

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.019	323	0.023	319	0.009	294	0.010	353	0.011	20	0.009	51	0.007	136	0.011	148	0.012	183
CN		0.007	95	0.004	50	0.004	39	0.001	263	0.003	121	0.004	70	0.001	0	0.001	324	0.001	248
CM		0.003	204	0.004	182	0.003	131	0.002	94	0.001	41	0.001	344	0.001	346	0.000	300	0.000	3
DCP 1	.010	0.064	321	0.077	278	0.030	242	0.033	223	0.027	164	0.026	120	0.023	79	0.019	43	0.011	351
DCP 2	.025	0.076	224	0.077	216	0.054	171	0.045	147	0.044	119	0.034	70	0.019	7	0.015	310	0.011	230
DCP 3	.100	0.045	168	0.033	159	0.028	118	0.021	128	0.025	104	0.023	90	0.017	69	0.016	43	0.017	41
DCP 4	.150	0.031	148	0.019	117	0.019	93	0.014	47	0.009	29	0.007	9	0.006	332	0.002	194	0.003	277
DCP 5	.200	0.032	100	0.020	103	0.029	56	0.038	34	0.014	46	0.014	340	0.009	318	0.013	297	0.011	255
DCP 6	.250	0.029	106	0.019	78	0.024	56	0.015	2	0.009	359	0.010	328	0.007	263	0.001	221	0.003	223
DCP 7	.300	0.026	76	0.022	71	0.024	29	0.009	13	0.013	0	0.008	313	0.011	315	0.011	264	0.008	256
DCP 8	.400	0.018	76	0.018	70	0.015	27	0.010	341	0.009	318	0.005	301	0.005	266	0.005	203	0.002	128
DCP 9	.500	0.018	12	0.020	1	0.014	298	0.018	268	0.008	231	0.005	169	0.004	194	0.005	190	0.007	167
DCP10	.600	0.009	24	0.013	11	0.006	323	0.009	295	0.006	180	0.004	348	0.004	232	0.002	125	0.003	215
DCP11	.878	0.009	15	0.011	323	0.009	282	0.010	230	0.008	179	0.011	134	0.006	106	0.004	56	0.003	10

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	16.05	0.400	12.45	7.06		5083.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.061	436.5	739.1	0.48E 07	0.00014	1.679	16.85	0.0690

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		12.446	7.064	0	0.541	32	0.122	126	0.114	27	0.024	134	0.371	273	0.149	168	0.075	113	0.022	58
CN		0.957	0.342	34	0.247	36	0.029	32	0.046	341	0.008	307	0.051	275	0.027	196	0.017	175	0.010	104
CM		-0.038	0.045	184	0.028	86	0.012	80	0.015	16	0.004	286	0.005	358	0.007	286	0.003	257	0.005	206
DCP 1	.010	3.995	2.105	14	1.144	39	0.112	55	0.178	29	0.136	54	0.190	312	0.069	311	0.060	302	0.072	288
DCP 2	.025	3.559	1.264	21	1.264	55	0.317	52	0.337	12	0.134	355	0.244	302	0.175	278	0.154	241	0.115	214
DCP 3	.100	2.140	0.459	91	0.890	55	0.159	52	0.260	7	0.118	292	0.131	282	0.119	237	0.088	183	0.044	157
DCP 4	.150	1.570	0.373	77	0.530	44	0.061	67	0.160	4	0.061	269	0.079	288	0.079	219	0.045	158	0.029	148
DCP 5	.200	1.274	0.378	69	0.442	39	0.063	72	0.148	347	0.058	249	0.084	272	0.076	198	0.034	153	0.041	135
DCP 6	.250	1.233	0.394	56	0.356	32	0.040	69	0.106	338	0.031	217	0.078	285	0.069	185	0.019	137	0.032	125
DCP 7	.300	1.009	0.380	50	0.294	28	0.034	42	0.097	318	0.043	223	0.068	261	0.063	174	0.031	139	0.035	96
DCP 8	.400	0.848	0.384	37	0.206	14	0.015	355	0.054	288	0.020	143	0.059	268	0.045	150	0.012	146	0.032	83
DCP 9	.500	0.643	0.314	30	0.130	4	0.017	319	0.053	251	0.028	131	0.035	247	0.035	126	0.015	86	0.025	27
DCP10	.600	0.590	0.320	22	0.093	347	0.021	291	0.040	216	0.026	77	0.034	261	0.024	120	0.008	143	0.023	37
DCP11	.878	0.363	0.255	0	0.052	289	0.043	274	0.044	172	0.010	15	0.020	179	0.009	113	0.009	110	0.009	350

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.006	211	0.012	284	0.013	301	0.008	154	0.011	224	0.017	187	0.011	188	0.006	266	0.006	266
CN		0.002	237	0.001	139	0.001	169	0.001	292	0.001	206	0.005	285	0.002	157	0.001	275	0.003	284
CM		0.004	132	0.002	132	0.002	65	0.001	69	0.001	25	0.002	85	0.001	289	0.000	132	0.001	119
DCP 1	.010	0.071	249	0.071	212	0.043	177	0.038	140	0.036	90	0.031	25	0.024	330	0.021	275	0.023	244
DCP 2	.025	0.099	187	0.071	159	0.050	136	0.030	117	0.017	74	0.012	328	0.013	228	0.012	201	0.009	190
DCP 3	.100	0.044	141	0.024	103	0.019	80	0.010	50	0.005	35	0.009	4	0.007	0	0.015	5	0.024	324
DCP 4	.150	0.036	98	0.017	48	0.018	41	0.019	334	0.007	266	0.009	307	0.008	199	0.000	216	0.001	238
DCP 5	.200	0.024	73	0.010	86	0.019	28	0.006	320	0.011	339	0.009	273	0.004	291	0.008	255	0.005	273
DCP 6	.250	0.025	40	0.006	57	0.015	1	0.007	283	0.005	313	0.003	231	0.001	293	0.005	193	0.001	62
DCP 7	.300	0.016	25	0.010	35	0.013	340	0.008	317	0.013	268	0.004	226	0.007	223	0.003	188	0.007	236
DCP 8	.400	0.016	340	0.008	36	0.012	303	0.004	267	0.007	221	0.000	336	0.006	181	0.002	73	0.004	202
DCP 9	.500	0.017	290	0.008	289	0.007	229	0.007	271	0.009	203	0.003	211	0.006	138	0.002	167	0.006	62
DCP10	.600	0.014	299	0.004	305	0.005	212	0.004	300	0.007	148	0.002	240	0.008	148	0.001	294	0.002	157
DCP11	.878	0.010	275	0.008	282	0.010	219	0.004	182	0.002	4	0.014	279	0.006	72	0.002	310	0.009	299

TUNED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	16.13	0.400	12.48	7.19		5083.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.062	436.0	738.5	0.48E 07	-0.00007	1.661	17.39	0.0250

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		12.477	7.186	0	0.573	30	0.155	95	0.156	19	0.298	44	0.444	213	0.093	149	0.060	73	0.028	13
CN		0.941	0.336	33	0.246	40	0.047	19	0.034	333	0.033	10	0.054	240	0.019	200	0.022	171	0.011	98
CM		-0.036	0.042	187	0.026	87	0.016	66	0.015	358	0.004	350	0.007	343	0.005	266	0.005	268	0.005	190
DCP 1	.010	3.962	2.124	11	1.134	43	0.225	40	0.160	31	0.318	29	0.095	272	0.079	310	0.061	287	0.051	276
DCP 2	.025	3.549	1.290	17	1.261	59	0.446	42	0.298	7	0.316	12	0.205	285	0.196	272	0.158	234	0.120	202
DCP 3	.100	2.112	0.420	87	0.868	60	0.250	43	0.221	352	0.108	347	0.146	266	0.114	223	0.072	192	0.065	162
DCP 4	.150	1.581	0.345	72	0.508	47	0.096	47	0.124	355	0.056	346	0.086	258	0.055	210	0.035	182	0.040	138
DCP 5	.200	1.215	0.382	70	0.446	39	0.087	47	0.136	334	0.033	304	0.106	243	0.066	182	0.041	175	0.049	113
DCP 6	.250	1.208	0.394	55	0.351	33	0.056	44	0.088	326	0.014	21	0.079	247	0.042	171	0.026	176	0.037	102
DCP 7	.300	0.994	0.373	51	0.296	31	0.059	18	0.089	306	0.013	272	0.094	230	0.052	156	0.035	152	0.042	82
DCP 8	.400	0.830	0.382	37	0.210	17	0.035	340	0.046	267	0.016	55	0.069	226	0.029	129	0.026	153	0.034	55
DCP 9	.500	0.618	0.305	31	0.132	14	0.034	311	0.042	232	0.010	72	0.055	205	0.026	103	0.020	120	0.023	25
DCP10	.600	0.580	0.307	23	0.102	355	0.041	279	0.042	191	0.018	47	0.040	208	0.011	86	0.022	129	0.021	21
DCP11	.878	0.355	0.244	0	0.039	277	0.050	250	0.046	149	0.005	12	0.017	163	0.004	88	0.016	89	0.010	334

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.017	3	0.011	283	0.008	199	0.007	259	0.009	264	0.004	127	0.004	187	0.007	337	0.007	248
CN		0.003	71	0.003	303	0.003	302	0.002	281	0.002	240	0.002	230	0.002	198	0.002	153	0.001	271
CM		0.002	151	0.003	113	0.001	78	0.002	58	0.002	354	0.002	350	0.002	310	0.001	293	0.001	288
DCP 1	.010	0.059	258	0.067	206	0.047	169	0.044	99	0.037	42	0.035	349	0.034	312	0.024	266	0.018	246
DCP 2	.025	0.063	172	0.056	159	0.019	139	0.026	87	0.017	16	0.016	292	0.021	261	0.022	211	0.016	188
DCP 3	.100	0.038	116	0.030	124	0.021	49	0.028	67	0.015	53	0.014	13	0.014	1	0.017	339	0.023	327
DCP 4	.150	0.025	92	0.019	53	0.017	348	0.007	3	0.008	314	0.006	289	0.004	274	0.004	231	0.001	177
DCP 5	.200	0.018	39	0.015	68	0.018	332	0.009	4	0.017	308	0.004	257	0.012	280	0.007	233	0.008	239
DCP 6	.250	0.012	22	0.012	38	0.014	321	0.005	339	0.009	273	0.001	271	0.007	254	0.006	144	0.004	278
DCP 7	.300	0.018	30	0.021	359	0.015	293	0.011	328	0.015	249	0.003	231	0.009	229	0.005	173	0.004	215
DCP 8	.400	0.006	322	0.015	351	0.009	260	0.005	331	0.007	240	0.004	282	0.006	205	0.003	157	0.004	114
DCP 9	.500	0.008	11	0.019	306	0.006	262	0.012	269	0.010	198	0.008	185	0.009	130	0.005	101	0.003	49
DCP10	.600	0.004	328	0.018	293	0.003	210	0.009	278	0.005	215	0.007	188	0.007	135	0.009	84	0.005	0
DCP11	.878	0.004	309	0.010	241	0.001	277	0.012	202	0.007	125	0.004	156	0.005	123	0.004	174	0.005	157

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	15.92	0.400	14.91	6.86		5084.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.060	446.0	741.7	0.47E 07	-0.00085	1.783	17.26	0.1010

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		14.911	6.862	0	0.424	33	0.206	152	0.098	137	0.131	105	0.138	55	0.166	328	0.102	258	0.065	221
CN		1.110	0.230	80	0.188	57	0.110	99	0.051	51	0.041	42	0.026	37	0.037	349	0.021	314	0.022	285
CM		-0.038	0.053	194	0.015	130	0.018	137	0.009	107	0.010	102	0.005	90	0.008	83	0.007	55	0.007	36
DCP 1	.010	4.495	0.986	38	0.907	62	0.433	122	0.222	94	0.150	111	0.151	112	0.088	86	0.043	93	0.042	141
DCP 2	.025	3.930	0.423	98	0.983	75	0.594	115	0.342	91	0.263	87	0.230	87	0.204	60	0.146	46	0.124	28
DCP 3	.100	2.193	0.796	147	0.576	73	0.423	121	0.232	69	0.155	69	0.125	49	0.112	17	0.080	359	0.073	344
DCP 4	.150	2.118	0.519	129	0.316	62	0.268	119	0.114	51	0.096	76	0.069	27	0.066	20	0.063	340	0.040	328
DCP 5	.200	2.126	0.441	114	0.270	55	0.258	100	0.107	31	0.104	49	0.072	358	0.076	355	0.056	310	0.054	299
DCP 6	.250	1.603	0.393	102	0.216	54	0.198	100	0.066	33	0.090	50	0.037	359	0.072	3	0.047	309	0.044	305
DCP 7	.300	1.037	0.335	90	0.195	51	0.174	83	0.073	21	0.087	19	0.045	340	0.075	333	0.048	287	0.052	281
DCP 8	.400	0.895	0.307	72	0.146	43	0.108	75	0.035	22	0.063	15	0.018	352	0.060	333	0.034	292	0.044	279
DCP 9	.500	0.899	0.246	54	0.103	37	0.070	50	0.030	349	0.047	331	0.015	313	0.048	292	0.027	246	0.041	235
DCP10	.600	0.610	0.246	44	0.083	29	0.041	30	0.014	1	0.032	324	0.007	39	0.039	301	0.018	272	0.034	244
DCP11	.878	0.376	0.230	9	0.067	10	0.053	300	0.023	303	0.027	250	0.010	276	0.016	234	0.020	231	0.019	184

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.040	184	0.018	154	0.022	195	0.018	190	0.018	205	0.010	162	0.008	209	0.006	239	0.008	239
CN		0.016	242	0.009	177	0.002	224	0.002	130	0.002	286	0.002	167	0.001	211	0.003	276	0.002	209
CM		0.006	357	0.004	326	0.002	316	0.002	280	0.001	309	0.001	270	0.001	279	0.001	198	0.000	231
DCP 1	.010	0.048	141	0.071	118	0.052	83	0.046	57	0.048	33	0.037	3	0.036	341	0.037	310	0.025	294
DCP 2	.025	0.075	357	0.053	26	0.055	355	0.037	335	0.031	329	0.021	271	0.021	239	0.031	222	0.028	201
DCP 3	.100	0.054	310	0.025	317	0.031	315	0.022	303	0.023	318	0.015	294	0.016	322	0.018	300	0.014	324
DCP 4	.150	0.042	302	0.019	272	0.022	281	0.014	265	0.009	250	0.008	229	0.004	269	0.006	261	0.004	247
DCP 5	.200	0.047	257	0.017	235	0.018	233	0.012	245	0.007	266	0.013	214	0.008	242	0.010	248	0.009	240
DCP 6	.250	0.035	265	0.023	243	0.015	231	0.012	227	0.006	193	0.009	196	0.002	29	0.005	240	0.002	323
DCP 7	.300	0.045	239	0.028	213	0.021	211	0.017	193	0.009	205	0.012	182	0.010	170	0.010	177	0.008	153
DCP 8	.400	0.030	243	0.026	217	0.011	224	0.015	196	0.010	197	0.011	180	0.008	181	0.006	181	0.009	165
DCP 9	.500	0.031	194	0.029	154	0.013	135	0.017	114	0.007	85	0.009	103	0.007	83	0.006	51	0.003	19
DCP10	.600	0.021	207	0.023	176	0.012	158	0.012	117	0.010	139	0.009	86	0.006	89	0.004	25	0.006	99
DCP11	.878	0.019	155	0.018	97	0.008	75	0.010	42	0.004	13	0.004	40	0.001	309	0.007	333	0.004	313

TUNED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	16.08	0.400	14.92	6.97		5084.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.061	437.4	737.9	0.48E 07	-0.00072	1.690	17.42	0.0920

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		14.915	6.974	0	0.463	28	0.180	145	0.120	127	0.110	77	0.270	40	0.166	294	0.099	245	0.047	197
CN		1.021	0.256	72	0.190	52	0.088	91	0.050	45	0.027	33	0.043	34	0.030	322	0.019	311	0.018	250
CM		-0.042	0.053	193	0.018	126	0.018	121	0.010	100	0.009	66	0.004	102	0.008	59	0.005	53	0.007	4
DCP 1	.010	4.450	1.184	36	0.910	57	0.365	110	0.191	89	0.126	110	0.187	84	0.082	84	0.057	93	0.047	111
DCP 2	.025	3.874	0.532	76	1.010	72	0.522	173	0.352	79	0.205	70	0.247	64	0.168	46	0.134	35	0.102	13
DCP 3	.100	2.187	0.755	139	0.602	70	0.355	113	0.254	66	0.127	43	0.147	41	0.111	349	0.058	342	0.070	320
DCP 4	.150	1.651	0.506	121	0.324	60	0.235	109	0.105	51	0.089	56	0.076	26	0.070	355	0.047	312	0.040	305
DCP 5	.200	1.359	0.446	108	0.264	52	0.228	96	0.102	29	0.085	36	0.083	5	0.062	329	0.049	315	0.048	278
DCP 6	.250	1.304	0.401	95	0.212	49	0.170	93	0.046	31	0.071	41	0.043	26	0.064	338	0.029	302	0.044	285
DCP 7	.300	1.066	0.351	82	0.186	44	0.150	77	0.066	12	0.068	11	0.050	352	0.060	309	0.038	286	0.047	252
DCP 8	.400	0.896	0.323	65	0.149	37	0.077	61	0.024	9	0.035	352	0.029	37	0.049	301	0.021	300	0.043	241
DCP 9	.500	0.700	0.269	51	0.097	27	0.059	39	0.029	339	0.032	312	0.021	354	0.040	269	0.024	266	0.036	206
DCP10	.600	0.634	0.265	41	0.099	22	0.033	351	0.014	340	0.022	264	0.026	42	0.029	264	0.022	301	0.033	204
DCP11	.878	0.397	0.235	9	0.066	353	0.055	285	0.027	304	0.028	219	0.012	321	0.021	230	0.021	214	0.021	154

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.021	151	0.004	194	0.014	223	0.009	165	0.007	206	0.008	119	0.006	241	0.007	269	0.004	235
CN		0.009	207	0.003	119	0.001	206	0.003	214	0.001	242	0.003	153	0.001	276	0.001	286	0.002	256
CM		0.003	334	0.003	320	0.002	287	0.001	328	0.001	266	0.002	302	0.001	257	0.000	254	0.000	257
DCP 1	.010	0.066	113	0.072	64	0.051	53	0.045	9	0.040	332	0.037	295	0.024	266	0.022	266	0.016	245
DCP 2	.025	0.048	9	0.064	10	0.037	1	0.020	339	0.013	336	0.005	268	0.004	338	0.002	290	0.009	62
DCP 3	.100	0.027	273	0.037	317	0.023	277	0.022	291	0.020	277	0.009	271	0.017	297	0.018	296	0.023	277
DCP 4	.150	0.030	254	0.013	319	0.017	242	0.011	286	0.010	237	0.008	303	0.010	228	0.009	290	0.008	247
DCP 5	.200	0.024	249	0.024	260	0.013	243	0.021	229	0.014	219	0.016	183	0.009	195	0.009	180	0.006	175
DCP 6	.250	0.020	229	0.014	258	0.006	210	0.014	246	0.005	225	0.008	231	0.005	237	0.008	239	0.008	226
DCP 7	.300	0.025	215	0.018	201	0.011	199	0.015	191	0.008	185	0.014	148	0.005	147	0.005	134	0.002	165
DCP 8	.400	0.016	204	0.018	175	0.004	197	0.008	159	0.004	200	0.006	134	0.004	165	0.003	129	0.002	150
DCP 9	.500	0.023	185	0.022	129	0.010	147	0.012	97	0.005	128	0.011	95	0.005	75	0.007	29	0.001	303
DCP10	.600	0.009	217	0.018	123	0.005	215	0.010	111	0.003	129	0.004	84	0.003	121	0.002	39	0.003	44
DCP11	.878	0.016	121	0.006	109	0.013	70	0.035	239	0.008	53	0.006	147	0.003	30	0.002	248	0.001	247

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	16.23	0.400	15.00	7.57		5084.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.062	436.6	737.3	0.48E 07	-0.00101	1.693	17.90	0.0250

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		15.002	7.072	0	0.411	42	0.261	162	0.169	114	0.227	134	0.362	323	0.173	243	0.100	195	0.062	173
CN		1.025	0.276	69	0.207	42	0.082	91	0.045	18	0.022	92	0.044	350	0.028	295	0.019	274	0.017	229
CM		-0.039	0.056	194	0.023	113	0.019	122	0.013	67	0.007	55	0.003	90	0.008	36	0.004	13	0.005	328
DCP 1	.010	4.486	1.213	37	0.989	55	0.393	116	0.205	67	0.240	133	0.099	58	0.078	85	0.069	69	0.039	54
DCP 2	.025	3.917	0.579	76	1.096	66	0.555	105	0.360	60	0.256	94	0.188	43	0.180	26	0.127	3	0.099	339
DCP 3	.100	2.217	0.755	135	0.683	61	0.338	114	0.274	48	0.099	55	0.146	5	0.123	322	0.073	303	0.077	283
DCP 4	.150	1.686	0.498	117	0.384	54	0.203	112	0.134	32	0.044	77	0.135	354	0.061	311	0.048	330	0.047	257
DCP 5	.200	1.352	0.442	105	0.316	42	0.203	96	0.119	10	0.060	54	0.107	329	0.057	296	0.060	274	0.045	229
DCP 6	.250	1.308	0.420	90	0.253	39	0.151	93	0.076	354	0.042	63	0.078	328	0.049	311	0.052	266	0.035	237
DCP 7	.300	1.090	0.366	78	0.218	32	0.131	77	0.072	342	0.035	27	0.071	312	0.053	284	0.046	244	0.041	213
DCP 8	.400	0.896	0.364	64	0.168	22	0.075	59	0.049	306	0.012	18	0.040	319	0.042	288	0.030	239	0.034	222
DCP 9	.500	0.691	0.291	49	0.121	11	0.055	36	0.043	288	0.012	268	0.029	302	0.039	242	0.021	203	0.029	179
DCP10	.600	0.626	0.290	41	0.101	0	0.032	351	0.037	259	0.018	213	0.016	355	0.027	255	0.011	199	0.023	190
DCP11	.878	0.389	0.244	10	0.064	338	0.061	290	0.014	244	0.028	194	0.013	346	0.029	205	0.010	216	0.019	111

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.027	174	0.019	133	0.017	174	0.018	161	0.013	170	0.012	155	0.010	207	0.007	187	0.010	238
CN		0.010	173	0.005	170	0.007	196	0.005	132	0.001	307	0.003	159	0.001	38	0.001	303	0.004	245
CM		0.003	278	0.004	280	0.001	291	0.002	243	0.002	199	0.002	210	0.002	181	0.001	145	0.001	98
DCP 1	.010	0.030	59	0.037	342	0.034	288	0.028	260	0.034	261	0.033	225	0.020	175	0.003	62	0.011	274
DCP 2	.025	0.050	312	0.050	310	0.044	275	0.025	236	0.035	235	0.036	193	0.023	176	0.013	168	0.039	189
DCP 3	.100	0.043	245	0.034	265	0.034	230	0.015	235	0.027	246	0.026	224	0.027	222	0.024	202	0.026	195
DCP 4	.150	0.025	216	0.024	232	0.017	205	0.016	212	0.009	169	0.008	204	0.009	152	0.003	186	0.007	201
DCP 5	.200	0.028	218	0.025	204	0.018	183	0.016	156	0.006	187	0.012	169	0.008	132	0.007	126	0.006	99
DCP 6	.250	0.036	198	0.019	194	0.020	172	0.015	146	0.010	107	0.005	95	0.004	100	0.002	20	0.004	244
DCP 7	.300	0.029	171	0.015	158	0.014	145	0.013	134	0.006	122	0.010	124	0.007	91	0.007	66	0.002	63
DCP 8	.400	0.028	164	0.016	169	0.017	147	0.016	133	0.012	83	0.008	73	0.008	64	0.008	6	0.009	315
DCP 9	.500	0.016	137	0.017	114	0.010	69	0.011	72	0.002	11	0.007	55	0.005	10	0.007	1	0.007	302
DCP10	.600	0.020	119	0.008	116	0.006	98	0.010	104	0.010	34	0.006	58	0.012	12	0.011	328	0.012	282
DCP11	.878	0.011	43	0.014	79	0.006	238	0.009	31	0.009	334	0.003	329	0.007	331	0.004	228	0.005	183

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	15.87	0.600	-0.04	7.00		5086.1	10

I	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.041	652.7	1462.5	0.63E 07	-0.00059	0.926	7.26	0.1010

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		-0.043	7.004	0	0.361	336	0.127	298	0.025	180	0.056	158	0.122	322	0.047	351	0.033	145	0.021	182
CN		0.061	0.819	356	0.043	270	0.061	298	0.008	153	0.003	108	0.018	299	0.002	240	0.003	118	0.002	146
CM		-0.014	0.006	251	0.019	246	0.009	323	0.002	30	0.001	293	0.001	335	0.001	108	0.000	216	0.001	219
DCP 1	.010	-1.026	2.522	355	0.904	259	0.379	322	0.216	236	0.069	320	0.083	239	0.017	250	0.078	189	0.053	246
DCP 2	.025	-0.756	2.831	353	0.506	257	0.396	321	0.062	233	0.062	311	0.025	276	0.038	269	0.011	169	0.052	273
DCP 3	.100	0.359	2.469	354	0.217	248	0.280	313	0.037	38	0.023	184	0.080	345	0.053	107	0.042	22	0.038	103
DCP 4	.200	0.491	1.339	357	0.084	273	0.131	249	0.092	88	0.033	99	0.054	296	0.034	19	0.040	217	0.020	180
DCP 5	.250	0.222	1.160	356	0.039	323	0.099	238	0.066	104	0.042	62	0.073	283	0.015	243	0.028	148	0.004	136
DCP 6	.300	0.046	0.870	357	0.027	61	0.057	285	0.035	134	0.017	107	0.031	271	0.007	271	0.016	130	0.006	14
DCP 7	.400	0.027	0.644	356	0.025	40	0.029	302	0.021	219	0.014	179	0.014	260	0.012	304	0.005	54	0.003	49
DCP 8	.500	0.112	0.461	358	0.020	48	0.013	294	0.019	208	0.006	171	0.006	241	0.009	292	0.004	58	0.002	125
DCP 9	.600	0.012	0.357	0	0.017	53	0.011	262	0.014	225	0.003	181	0.003	258	0.006	304	0.004	23	0.003	102
DCP10	.878	0.047	0.216	357	0.050	53	0.013	149	0.003	197	0.004	31	0.002	77	0.002	213	0.000	231	0.002	335

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.010	219	0.004	238	0.013	205	0.009	202	0.014	183	0.007	197	0.014	193	0.008	209	0.006	184
CN		0.003	61	0.002	234	0.001	355	0.002	241	0.002	206	0.001	218	0.001	108	0.002	151	0.000	122
CM		0.000	49	0.000	334	0.000	338	0.000	267	0.000	108	0.000	269	0.000	198	0.000	137	0.000	143
DCP 1	.010	0.027	213	0.005	146	0.040	182	0.010	283	0.034	147	0.017	212	0.019	127	0.019	184	0.012	133
DCP 2	.025	0.021	44	0.044	236	0.027	331	0.025	232	0.019	304	0.018	227	0.013	331	0.025	183	0.019	293
DCP 3	.100	0.012	352	0.020	34	0.011	143	0.009	357	0.016	137	0.005	356	0.012	88	0.008	84	0.012	105
DCP 4	.200	0.025	105	0.000	64	0.021	24	0.010	240	0.017	257	0.002	214	0.012	164	0.008	93	0.003	35
DCP 5	.250	0.011	84	0.009	330	0.013	299	0.013	201	0.009	148	0.006	69	0.004	332	0.003	300	0.004	222
DCP 6	.300	0.005	2	0.010	231	0.003	275	0.005	126	0.002	231	0.003	342	0.001	209	0.003	222	0.004	178
DCP 7	.400	0.001	31	0.004	185	0.002	176	0.001	40	0.001	353	0.001	233	0.002	170	0.001	154	0.001	334
DCP 8	.500	0.002	302	0.001	172	0.001	201	0.002	353	0.001	70	0.002	154	0.002	213	0.001	243	0.002	274
DCP 9	.600	0.002	187	0.002	190	0.000	51	0.001	34	0.001	209	0.003	127	0.001	179	0.001	334	0.000	86
DCP10	.878	0.001	8	0.002	167	0.001	147	0.001	217	0.001	257	0.002	284	0.002	40	0.002	162	0.001	335

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	15.90	0.600	-0.05	7.22		5086.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.041	645.9	1447.7	0.63E 07	-0.00050	0.919	7.47	0.0300

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		-0.054	7.223	0	0.316	326	0.142	284	0.111	184	0.150	221	0.273	242	0.078	269	0.038	104	0.045	144
CN		0.031	0.825	357	0.062	253	0.056	290	0.025	178	0.016	230	0.029	249	0.006	261	0.005	100	0.008	152
CM		-0.015	0.006	249	0.018	247	0.009	326	0.001	89	0.002	281	0.002	61	0.002	113	0.001	186	0.001	224
DCP 1	.010	-1.040	2.576	353	0.951	255	0.358	311	0.277	225	0.088	273	0.180	215	0.023	319	0.105	151	0.043	202
DCP 2	.025	-0.770	2.815	354	0.603	254	0.376	315	0.154	230	0.119	295	0.070	199	0.056	249	0.024	139	0.044	244
DCP 3	.100	0.345	2.503	355	0.262	240	0.248	314	0.064	144	0.095	214	0.042	304	0.058	135	0.030	44	0.044	132
DCP 4	.200	0.255	1.345	358	0.113	258	0.126	243	0.108	110	0.028	178	0.071	267	0.026	15	0.037	232	0.031	172
DCP 5	.250	0.100	1.187	355	0.043	280	0.100	218	0.069	104	0.014	356	0.094	252	0.012	238	0.022	129	0.010	157
DCP 6	.300	0.067	0.858	359	0.017	173	0.060	282	0.015	172	0.020	189	0.054	254	0.008	297	0.021	115	0.004	127
DCP 7	.400	0.026	0.647	356	0.011	45	0.031	278	0.034	216	0.013	227	0.025	241	0.012	283	0.008	68	0.003	68
DCP 8	.500	0.034	0.459	0	0.001	330	0.018	279	0.022	209	0.011	197	0.022	240	0.015	296	0.007	55	0.005	106
DCP 9	.600	0.013	0.360	359	0.009	36	0.014	246	0.021	217	0.004	227	0.014	245	0.012	290	0.005	29	0.005	76
DCP10	.878	0.055	0.220	0	0.041	60	0.016	157	0.003	205	0.003	160	0.009	231	0.008	262	0.003	12	0.002	123

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.039	180	0.013	173	0.024	137	0.023	131	0.018	164	0.008	185	0.017	171	0.006	118	0.014	154
CN		0.003	96	0.002	172	0.004	164	0.002	226	0.003	162	0.003	206	0.003	168	0.002	181	0.002	248
CM		0.000	129	0.001	274	0.001	332	0.001	186	0.001	239	0.000	297	0.000	134	0.000	179	0.001	90
DCP 1	.010	0.042	157	0.013	194	0.035	125	0.018	153	0.022	132	0.006	101	0.022	97	0.007	201	0.007	28
DCP 2	.025	0.004	341	0.031	249	0.010	78	0.028	219	0.007	152	0.029	211	0.002	279	0.027	179	0.007	210
DCP 3	.100	0.005	18	0.012	136	0.018	201	0.005	217	0.023	194	0.004	253	0.017	180	0.007	261	0.002	153
DCP 4	.200	0.025	115	0.002	308	0.009	90	0.008	279	0.011	267	0.008	249	0.008	164	0.011	155	0.004	356
DCP 5	.250	0.017	65	0.014	310	0.015	258	0.013	130	0.010	96	0.001	211	0.005	107	0.002	118	0.008	220
DCP 6	.300	0.003	269	0.003	201	0.004	141	0.004	170	0.001	178	0.002	188	0.003	195	0.002	188	0.001	283
DCP 7	.400	0.001	37	0.006	137	0.003	137	0.002	331	0.002	163	0.003	182	0.002	109	0.002	79	0.001	256
DCP 8	.500	0.002	121	0.004	160	0.003	192	0.002	319	0.002	140	0.002	189	0.001	218	0.000	154	0.002	271
DCP 9	.600	0.003	94	0.004	140	0.003	170	0.001	337	0.003	89	0.003	170	0.002	126	0.002	91	0.003	231
DCP10	.878	0.002	291	0.004	86	0.004	144	0.002	331	0.003	79	0.001	158	0.002	276	0.002	292	0.003	280

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	15.92	0.600	-0.02	7.23		5086.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.041	645.3	1446.7	0.63E 07	-0.00047	0.894	7.38	0.0250

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		-0.016	7.232	0	0.393	334	0.183	294	0.128	170	0.141	210	0.346	233	0.086	268	0.039	65	0.031	126
CN		0.034	0.820	354	0.055	262	0.060	288	0.017	170	0.017	194	0.031	229	0.010	294	0.001	104	0.004	121
CM		-0.014	0.007	219	0.018	243	0.009	312	0.001	144	0.002	249	0.002	37	0.002	64	0.001	137	0.001	229
DCP 1	.010	-1.048	2.564	352	1.009	256	0.432	314	0.263	225	0.133	283	0.145	212	0.018	43	0.084	151	0.027	162
DCP 2	.025	-0.754	2.829	352	0.570	253	0.407	311	0.119	220	0.122	279	0.077	202	0.033	269	0.028	120	0.041	237
DCP 3	.100	0.353	2.518	353	0.232	241	0.268	306	0.036	122	0.076	204	0.045	267	0.048	109	0.034	6	0.040	91
DCP 4	.150	0.369	1.725	354	0.132	269	0.141	271	0.057	134	0.207	164	0.020	71	0.108	338	0.047	224	0.003	359
DCP 5	.200	0.259	1.349	356	0.105	268	0.145	242	0.099	100	0.025	121	0.074	242	0.026	357	0.028	240	0.023	170
DCP 6	.250	0.098	1.186	355	0.045	280	0.104	224	0.069	97	0.024	30	0.097	246	0.016	227	0.024	114	0.007	177
DCP 7	.300	0.067	0.863	355	0.004	80	0.063	285	0.010	116	0.017	158	0.065	232	0.013	263	0.015	88	0.003	16
DCP 8	.400	0.019	0.655	355	0.016	42	0.030	286	0.029	217	0.010	199	0.033	220	0.016	265	0.008	26	0.006	50
DCP 9	.500	0.025	0.465	357	0.012	2	0.017	292	0.018	190	0.010	177	0.027	217	0.016	261	0.005	334	0.002	12
DCP10	.600	0.010	0.368	359	0.010	30	0.011	260	0.018	214	0.006	213	0.022	232	0.013	285	0.007	14	0.005	91
DCP11	.878	0.057	0.225	356	0.045	48	0.015	134	0.004	346	0.002	88	0.009	201	0.008	225	0.005	248	0.002	86

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.043	169	0.005	176	0.029	93	0.022	81	0.011	116	0.001	181	0.009	160	0.009	46	0.003	357
CN		0.002	42	0.003	101	0.002	117	0.004	194	0.001	272	0.001	10	0.001	4	0.002	172	0.001	102
CM		0.000	335	0.000	240	0.000	317	0.000	316	0.001	91	0.001	155	0.000	271	0.000	141	0.000	183
DCP 1	.010	0.042	154	0.012	119	0.039	136	0.008	119	0.032	110	0.002	280	0.030	66	0.014	107	0.016	77
DCP 2	.025	0.021	353	0.019	211	0.013	262	0.031	212	0.015	336	0.030	172	0.020	275	0.010	133	0.003	105
DCP 3	.100	0.011	358	0.016	36	0.004	112	0.002	70	0.008	163	0.005	331	0.010	87	0.007	18	0.009	79
DCP 4	.150	0.026	260	0.023	141	0.012	64	0.015	213	0.012	101	0.026	38	0.025	337	0.029	218	0.018	208
DCP 5	.200	0.029	97	0.005	73	0.010	61	0.003	302	0.012	274	0.008	224	0.007	185	0.007	134	0.008	56
DCP 6	.250	0.011	66	0.012	346	0.011	262	0.013	163	0.007	57	0.005	19	0.006	140	0.004	95	0.002	227
DCP 7	.300	0.001	12	0.005	173	0.004	256	0.002	196	0.001	42	0.004	0	0.001	144	0.004	160	0.001	146
DCP 8	.400	0.001	46	0.005	133	0.002	171	0.000	240	0.001	235	0.001	137	0.002	70	0.001	41	0.002	60
DCP 9	.500	0.003	347	0.005	64	0.003	115	0.003	168	0.003	206	0.003	268	0.003	308	0.002	9	0.001	43
DCP10	.600	0.001	133	0.003	70	0.005	128	0.006	191	0.004	266	0.001	358	0.001	110	0.001	250	0.004	28
DCP11	.878	0.001	156	0.001	83	0.003	319	0.000	3	0.002	307	0.003	337	0.001	49	0.001	157	0.002	184

TUNED PITCHING OSCILLATION VERTOL 23010-1.59 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	15.87	0.600	7.04	6.84		5087.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.040	657.9	1466.3	0.63E 07	-0.00087	1.253	10.26	0.1010

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		7.044	6.835	0	0.622	40	0.133	124	0.059	93	0.031	51	0.090	55	0.087	343	0.094	271	0.058	215
CN		0.713	0.573	359	0.199	58	0.030	61	0.019	47	0.011	13	0.037	20	0.019	6	0.024	279	0.018	242
CM		-0.031	0.021	219	0.019	96	0.002	114	0.005	92	0.001	33	0.001	111	0.002	91	0.002	88	0.002	3
DCP 1	.010	1.093	2.820	353	0.851	55	0.220	115	0.037	110	0.004	280	0.073	15	0.030	310	0.036	255	0.019	149
DCP 2	.025	1.494	2.288	355	0.666	59	0.148	123	0.049	90	0.015	252	0.042	27	0.036	72	0.061	234	0.057	222
DCP 3	.100	1.891	1.089	352	0.802	73	0.070	61	0.143	73	0.048	56	0.019	78	0.061	42	0.047	293	0.029	270
DCP 4	.250	1.237	0.737	2	0.279	56	0.101	23	0.040	36	0.065	350	0.018	60	0.077	356	0.050	304	0.046	293
DCP 5	.300	0.786	0.647	4	0.190	54	0.064	39	0.030	331	0.022	0	0.012	326	0.039	2	0.051	300	0.038	267
DCP 6	.400	0.622	0.541	4	0.129	36	0.036	35	0.026	305	0.005	324	0.013	311	0.014	311	0.028	275	0.026	236
DCP 7	.500	0.605	0.401	7	0.095	31	0.013	56	0.018	329	0.006	289	0.008	303	0.010	311	0.023	272	0.025	210
DCP 8	.600	0.344	0.308	6	0.062	23	0.010	114	0.015	323	0.005	138	0.006	23	0.005	335	0.016	279	0.015	198
DCP 9	.878	0.245	0.204	8	0.031	323	0.003	242	0.008	259	0.002	182	0.003	307	0.006	287	0.010	236	0.009	176

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.032	179	0.015	142	0.012	194	0.012	174	0.005	211	0.012	110	0.005	175	0.003	248	0.006	225
CN		0.009	212	0.006	242	0.004	199	0.006	217	0.006	209	0.006	160	0.003	99	0.003	110	0.004	71
CM		0.001	319	0.001	1	0.001	327	0.001	273	0.001	287	0.001	264	0.001	232	0.000	205	0.001	205
DCP 1	.010	0.018	124	0.017	185	0.001	189	0.004	201	0.004	274	0.002	125	0.002	9	0.001	338	0.002	277
DCP 2	.025	0.023	325	0.009	70	0.020	100	0.016	173	0.013	186	0.006	321	0.013	229	0.009	84	0.003	142
DCP 3	.100	0.020	222	0.024	267	0.013	266	0.027	238	0.020	239	0.025	185	0.011	144	0.012	134	0.016	117
DCP 4	.250	0.023	236	0.015	311	0.017	290	0.018	270	0.010	264	0.012	232	0.007	29	0.014	283	0.002	272
DCP 5	.300	0.027	240	0.016	247	0.015	241	0.016	250	0.026	218	0.017	158	0.004	186	0.014	169	0.008	103
DCP 6	.400	0.022	202	0.012	195	0.017	187	0.014	146	0.009	150	0.012	126	0.007	98	0.012	97	0.010	32
DCP 7	.500	0.015	174	0.012	170	0.012	124	0.006	107	0.005	121	0.003	122	0.009	117	0.011	66	0.007	16
DCP 8	.600	0.006	110	0.005	242	0.006	149	0.001	202	0.004	172	0.005	120	0.004	62	0.002	78	0.004	58
DCP 9	.878	0.003	122	0.002	175	0.003	136	0.004	112	0.002	98	0.005	79	0.005	38	0.002	322	0.002	48

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	15.90	0.600	7.10	6.91		5387.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.041	646.9	1444.3	0.63E 07	-0.00091	1.197	10.73	0.0940

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		7.098	6.509	0	0.561	41	0.123	137	0.070	122	0.070	78	0.078	63	0.121	326	0.157	246	0.081	169
CN		0.654	0.573	358	0.194	53	0.035	50	0.016	31	0.016	19	0.005	0	0.023	359	0.027	253	0.017	202
CM		-0.031	0.022	218	0.018	91	0.002	59	0.004	94	0.002	36	0.000	35	0.002	119	0.004	53	0.004	331
DCP 1	.010	1.036	2.926	352	0.895	55	0.232	119	0.036	138	0.006	45	0.006	161	0.046	290	0.047	231	0.034	114
DCP 2	.025	1.456	2.354	352	0.673	52	0.142	112	0.039	72	0.022	312	0.050	25	0.042	27	0.068	188	0.037	189
DCP 3	.100	1.900	1.156	349	0.811	68	0.119	17	0.094	65	0.077	45	0.016	252	0.060	54	0.052	297	0.034	242
DCP 4	.200	1.047	0.700	359	0.336	62	0.108	49	0.082	61	0.082	23	0.049	49	0.084	4	0.057	334	0.038	292
DCP 5	.250	0.994	0.747	2	0.284	57	0.114	20	0.023	6	0.071	1	0.018	285	0.063	354	0.060	285	0.035	271
DCP 6	.300	0.779	0.636	2	0.188	45	0.055	35	0.019	321	0.025	22	0.015	324	0.043	345	0.062	271	0.028	217
DCP 7	.400	0.617	0.544	4	0.149	37	0.042	23	0.036	305	0.010	279	0.014	258	0.015	314	0.041	257	0.037	195
DCP 8	.500	0.447	0.401	4	0.091	25	0.018	52	0.020	330	0.010	308	0.008	284	0.019	306	0.038	240	0.025	171
DCP 9	.600	0.347	0.316	7	0.063	23	0.016	132	0.010	356	0.008	173	0.008	82	0.014	332	0.023	249	0.022	166
DCP10	.878	0.254	0.206	5	0.036	306	0.005	222	0.009	244	0.004	227	0.001	323	0.007	344	0.014	214	0.012	136

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.033	141	0.018	150	0.017	189	0.025	146	0.011	138	0.006	88	0.004	204	0.004	201	0.018	199
CN		0.003	225	0.008	210	0.004	166	0.004	155	0.002	152	0.004	93	0.003	29	0.001	322	0.002	328
CM		0.001	285	0.001	310	0.001	296	0.002	238	0.001	191	0.001	228	0.001	168	0.001	99	0.001	85
DCP 1	.010	0.012	148	0.015	167	0.007	244	0.004	84	0.003	131	0.003	120	0.008	167	0.008	217	0.004	230
DCP 2	.025	0.024	278	0.010	84	0.007	79	0.010	116	0.010	263	0.011	243	0.006	68	0.001	248	0.007	28
DCP 3	.100	0.008	236	0.042	244	0.024	174	0.020	209	0.028	176	0.021	109	0.005	40	0.006	60	0.007	6
DCP 4	.200	0.036	345	0.038	277	0.008	6	0.023	256	0.007	263	0.002	291	0.005	109	0.008	47	0.006	1
DCP 5	.250	0.027	236	0.007	269	0.018	270	0.018	240	0.009	196	0.009	270	0.008	196	0.007	264	0.006	174
DCP 6	.300	0.024	249	0.027	199	0.015	193	0.019	180	0.015	148	0.010	125	0.008	97	0.005	80	0.004	33
DCP 7	.400	0.020	162	0.012	143	0.015	188	0.024	129	0.011	83	0.013	97	0.011	42	0.002	15	0.008	46
DCP 8	.500	0.015	176	0.024	124	0.009	62	0.009	99	0.007	24	0.006	75	0.011	356	0.005	274	0.003	305
DCP 9	.600	0.011	86	0.003	153	0.006	117	0.008	65	0.003	358	0.004	61	0.005	348	0.005	299	0.005	282
DCP10	.878	0.004	43	0.003	192	0.001	161	0.007	26	0.004	349	0.004	33	0.002	327	0.002	262	0.005	258

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	16.10	0.600	7.07	7.06		5087.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.042	645.3	1442.1	0.63E 07	-0.00091	1.218	10.99	0.0250

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		7.072	7.061	0	0.587	44	0.102	152	0.101	101	0.044	171	0.329	11	0.205	263	0.146	198	0.065	157
CN		0.653	0.588	357	0.194	51	0.025	50	0.027	47	0.010	318	0.028	1	0.026	307	0.024	234	0.014	198
CM		-0.037	0.022	217	0.018	84	0.002	15	0.004	88	0.001	1	0.001	210	0.005	80	0.003	27	0.002	336
DCP 1	.010	1.007	2.967	352	0.871	55	0.198	117	0.056	89	0.048	183	0.066	339	0.072	238	0.035	221	0.034	69
DCP 2	.025	1.425	2.430	351	0.699	51	0.142	107	0.055	85	0.062	230	0.130	346	0.021	39	0.071	160	0.039	157
DCP 3	.100	1.877	1.187	349	0.816	64	0.085	351	0.146	64	0.035	20	0.034	357	0.061	24	0.068	268	0.023	213
DCP 4	.200	1.027	0.718	356	0.365	60	0.083	44	0.120	61	0.079	348	0.077	26	0.089	329	0.035	312	0.037	284
DCP 5	.250	0.969	0.766	2	0.288	53	0.098	4	0.030	24	0.052	332	0.041	10	0.083	314	0.047	248	0.034	273
DCP 6	.300	0.778	0.649	2	0.190	41	0.048	46	0.036	2	0.024	327	0.036	333	0.044	297	0.043	247	0.030	224
DCP 7	.400	0.609	0.565	4	0.133	30	0.025	22	0.026	312	0.012	253	0.023	339	0.035	273	0.039	228	0.034	186
DCP 8	.500	0.419	0.405	4	0.094	25	0.017	52	0.023	328	0.012	233	0.020	354	0.030	262	0.026	204	0.019	159
DCP 9	.600	0.348	0.323	6	0.051	23	0.015	138	0.007	30	0.005	166	0.020	25	0.022	283	0.019	222	0.017	182
DCP10	.878	0.298	0.211	3	0.032	298	0.008	166	0.004	233	0.004	184	0.008	358	0.015	266	0.014	199	0.009	125

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.041	143	0.027	132	0.020	171	0.014	129	0.019	133	0.021	120	0.002	346	0.016	182	0.012	139
CN		0.008	184	0.006	190	0.004	174	0.007	147	0.004	93	0.005	57	0.004	339	0.003	255	0.001	172
CM		0.002	294	0.002	260	0.001	238	0.001	247	0.001	208	0.001	186	0.001	147	0.001	51	0.001	285
DCP 1	.010	0.030	111	0.028	142	0.015	204	0.007	290	0.005	2	0.004	69	0.010	111	0.009	169	0.009	196
DCP 2	.025	0.021	207	0.002	87	0.007	344	0.002	11	0.001	231	0.003	81	0.002	173	0.008	178	0.006	307
DCP 3	.100	0.026	211	0.032	213	0.022	168	0.032	175	0.024	113	0.015	82	0.010	46	0.018	1	0.016	255
DCP 4	.200	0.030	320	0.035	272	0.031	264	0.017	195	0.005	8	0.008	73	0.021	282	0.005	288	0.003	249
DCP 5	.250	0.027	229	0.023	255	0.023	218	0.017	202	0.008	194	0.011	221	0.008	191	0.009	190	0.003	208
DCP 6	.300	0.025	210	0.025	199	0.025	168	0.021	137	0.013	109	0.011	82	0.009	25	0.004	225	0.007	120
DCP 7	.400	0.021	155	0.019	145	0.017	112	0.009	88	0.006	115	0.011	78	0.009	19	0.003	242	0.005	71
DCP 8	.500	0.012	148	0.016	124	0.015	68	0.009	26	0.004	347	0.005	34	0.008	338	0.006	261	0.003	207
DCP 9	.600	0.013	123	0.009	73	0.002	313	0.007	153	0.006	77	0.005	18	0.006	331	0.005	230	0.002	123
DCP10	.878	0.003	44	0.003	56	0.001	33	0.006	66	0.003	12	0.005	0	0.002	297	0.003	235	0.005	110

TUNED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	15.85	0.600	14.77	6.36		5390.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.041	646.8	1487.1	0.65E 07	-0.00070	1.300	17.52	0.1010

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		14.769	6.365	0	0.227	33	0.161	169	0.079	198	0.019	202	0.023	149	0.079	178	0.053	195	0.050	143
CN		1.086	0.130	39	0.088	75	0.013	118	0.012	254	0.018	312	0.012	280	0.004	168	0.006	286	0.004	197
CM		-0.065	0.060	187	0.004	223	0.001	153	0.002	237	0.003	331	0.002	34	0.001	313	0.002	35	0.001	331
DCP 1	.010	2.830	0.691	358	0.407	83	0.056	36	0.034	199	0.027	211	0.037	89	0.018	42	0.010	297	0.012	247
DCP 2	.025	2.769	0.334	6	0.435	80	0.044	26	0.042	94	0.044	317	0.002	268	0.018	118	0.022	345	0.033	238
DCP 3	.100	2.362	0.683	154	0.110	62	0.098	138	0.084	257	0.074	334	0.053	296	0.041	321	0.034	307	0.014	233
DCP 4	.200	1.926	0.191	126	0.059	92	0.044	348	0.086	312	0.077	322	0.025	285	0.053	139	0.029	89	0.030	44
DCP 5	.250	1.746	0.198	107	0.065	68	0.055	151	0.038	248	0.058	309	0.024	9	0.015	216	0.019	304	0.011	200
DCP 6	.300	1.175	0.151	55	0.161	83	0.066	154	0.033	242	0.034	311	0.019	345	0.014	307	0.013	349	0.010	201
DCP 7	.400	0.984	0.240	29	0.131	75	0.038	144	0.024	175	0.020	251	0.019	295	0.018	231	0.012	256	0.002	326
DCP 8	.500	0.940	0.243	17	0.070	79	0.006	109	0.008	202	0.017	249	0.021	238	0.012	248	0.017	250	0.008	160
DCP 9	.600	0.634	0.255	14	0.049	68	0.013	8	0.013	97	0.005	118	0.009	231	0.013	136	0.004	261	0.009	207
DCP10	.878	0.439	0.244	5	0.028	47	0.008	343	0.001	91	0.007	125	0.007	213	0.008	87	0.009	213	0.005	140

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.021	143	0.026	168	0.010	120	0.007	130	0.005	76	0.011	168	0.008	124	0.007	165	0.009	164
CN		0.002	37	0.006	283	0.007	127	0.009	330	0.004	209	0.003	322	0.003	65	0.002	294	0.004	116
CM		0.002	327	0.001	56	0.002	282	0.001	132	0.001	62	0.001	35	0.001	181	0.001	65	0.001	2
DCP 1	.010	0.021	175	0.012	42	0.005	311	0.005	288	0.017	224	0.023	123	0.025	15	0.022	284	0.014	199
DCP 2	.025	0.009	183	0.028	243	0.015	138	0.015	280	0.026	164	0.015	51	0.014	223	0.019	131	0.015	74
DCP 3	.100	0.017	18	0.016	274	0.012	142	0.016	42	0.014	151	0.020	33	0.014	135	0.012	2	0.005	231
DCP 4	.200	0.045	348	0.029	35	0.003	217	0.051	336	0.032	290	0.021	298	0.008	130	0.022	355	0.036	77
DCP 5	.250	0.015	296	0.008	345	0.010	224	0.012	26	0.004	202	0.008	309	0.014	154	0.002	35	0.005	95
DCP 6	.300	0.006	73	0.010	286	0.005	173	0.006	283	0.007	172	0.008	236	0.011	115	0.006	210	0.008	151
DCP 7	.400	0.009	141	0.018	284	0.015	134	0.007	318	0.008	56	0.010	298	0.013	44	0.005	351	0.004	6
DCP 8	.500	0.005	272	0.006	255	0.006	155	0.007	281	0.004	238	0.008	264	0.005	248	0.004	173	0.007	233
DCP 9	.600	0.007	115	0.008	224	0.014	90	0.009	297	0.005	113	0.003	358	0.010	344	0.006	228	0.003	106
DCP10	.878	0.008	149	0.001	270	0.004	123	0.007	343	0.009	238	0.004	154	0.005	22	0.007	261	0.007	173

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	15.95	0.600	14.78	6.61		5390.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.041	646.8	1450.9	0.63E 07	-0.00098	1.242	17.42	0.0450

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		14.783	6.606	0	0.435	14	0.095	172	0.039	259	0.027	42	0.073	19	0.046	242	0.030	222	0.008	88
CN		1.028	0.141	38	0.086	79	0.019	146	0.037	174	0.017	313	0.002	345	0.004	287	0.003	256	0.006	6
CM		-0.062	0.060	190	0.007	227	0.003	179	0.003	242	0.001	293	0.001	67	0.001	301	0.001	78	0.001	192
DCP 1	.010	2.856	0.754	354	0.386	83	0.064	69	0.034	131	0.026	11	0.031	28	0.006	350	0.006	223	0.014	83
DCP 2	.025	2.813	0.408	1	0.430	86	0.067	49	0.042	54	0.051	299	0.019	88	0.021	266	0.037	153	0.025	40
DCP 3	.100	2.400	0.624	162	0.071	79	0.152	163	0.081	218	0.058	308	0.016	230	0.034	310	0.006	347	0.017	3
DCP 4	.200	1.509	0.246	142	0.030	182	0.037	243	0.039	323	0.054	335	0.043	45	0.006	90	0.007	44	0.007	332
DCP 5	.250	1.434	0.182	105	0.108	95	0.070	162	0.063	221	0.063	305	0.034	30	0.017	149	0.005	256	0.006	328
DCP 6	.300	1.175	0.190	46	0.161	87	0.055	163	0.015	249	0.022	303	0.038	331	0.012	324	0.011	310	0.009	289
DCP 7	.400	0.979	0.256	29	0.144	74	0.037	138	0.024	154	0.016	213	0.021	220	0.013	268	0.014	288	0.012	350
DCP 8	.500	0.740	0.243	21	0.082	83	0.008	37	0.009	136	0.007	257	0.016	245	0.009	256	0.013	274	0.005	205
DCP 9	.600	0.636	0.267	15	0.056	54	0.021	1	0.017	52	0.011	3	0.005	295	0.003	129	0.005	228	0.007	39
DCP10	.878	0.454	0.242	8	0.038	59	0.008	30	0.014	65	0.004	103	0.002	98	0.004	95	0.004	121	0.007	15

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.011	197	0.008	174	0.002	15	0.005	121	0.009	110	0.007	111	0.006	84	0.006	202	0.006	195
CN		0.003	342	0.003	341	0.005	278	0.003	154	0.005	229	0.006	120	0.002	93	0.002	78	0.003	11
CM		0.001	33	0.000	12	0.001	78	0.001	292	0.000	66	0.001	303	0.001	269	0.001	326	0.001	253
DCP 1	.010	0.027	17	0.012	282	0.004	219	0.007	31	0.010	303	0.008	313	0.010	229	0.006	210	0.008	175
DCP 2	.025	0.007	36	0.013	18	0.025	330	0.024	231	0.018	200	0.017	161	0.013	95	0.013	12	0.007	325
DCP 3	.100	0.022	20	0.017	348	0.007	308	0.003	352	0.007	217	0.013	86	0.009	351	0.011	32	0.022	343
DCP 4	.200	0.002	306	0.003	294	0.011	273	0.003	166	0.007	230	0.012	130	0.006	350	0.000	214	0.005	278
DCP 5	.250	0.016	293	0.006	310	0.003	185	0.004	210	0.005	277	0.004	131	0.006	172	0.008	61	0.003	330
DCP 6	.300	0.007	263	0.006	302	0.010	237	0.005	164	0.006	233	0.002	132	0.005	252	0.004	109	0.006	283
DCP 7	.400	0.004	53	0.008	19	0.008	347	0.005	77	0.006	249	0.006	41	0.013	176	0.004	269	0.006	140
DCP 8	.500	0.003	296	0.008	229	0.010	209	0.009	179	0.006	179	0.004	174	0.001	143	0.002	337	0.003	176
DCP 9	.600	0.003	193	0.004	70	0.006	298	0.004	107	0.004	281	0.005	128	0.005	86	0.006	198	0.006	46
DCP10	.878	0.002	237	0.002	298	0.004	264	0.004	113	0.003	224	0.009	122	0.006	63	0.006	100	0.007	50

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	16.00	0.600	14.79	6.61		5390.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.041	646.1	1448.4	0.63E 07	-0.00110	1.265	17.87	0.0250

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		14.795	6.605	0	0.321	27	0.144	170	0.065	236	0.028	135	0.041	157	0.127	231	0.035	200	0.056	139
CN		1.032	0.148	37	0.086	76	0.016	153	0.016	192	0.013	336	0.006	194	0.020	281	0.009	248	0.007	203
CM		-0.064	0.061	192	0.007	206	0.002	138	0.006	265	0.002	298	0.001	178	0.003	53	0.002	37	0.003	344
DCP 1	.010	2.840	0.733	356	0.400	81	0.053	82	0.027	124	0.011	305	0.056	114	0.015	25	0.032	324	0.006	347
DCP 2	.025	2.845	0.455	357	0.443	84	0.097	17	0.026	240	0.020	245	0.052	108	0.008	340	0.015	315	0.014	185
DCP 3	.100	2.402	0.630	163	0.100	76	0.130	145	0.113	239	0.063	334	0.059	228	0.055	309	0.017	232	0.027	315
DCP 4	.200	1.500	0.243	140	0.054	157	0.037	263	0.021	222	0.067	333	0.007	72	0.039	271	0.003	188	0.003	302
DCP 5	.250	1.451	0.174	94	0.091	77	0.103	180	0.082	234	0.041	340	0.012	63	0.032	266	0.015	271	0.014	232
DCP 6	.300	1.176	0.186	42	0.161	87	0.055	169	0.036	184	0.023	338	0.021	212	0.[illegible]2	291	0.009	263	0.013	249
DCP 7	.400	0.985	0.273	30	0.138	71	0.041	143	0.030	141	0.014	213	0.013	213	0.037	269	0.018	291	0.015	189
DCP 8	.500	0.737	0.255	19	0.072	66	0.008	204	0.019	145	0.013	142	0.004	187	0.022	272	0.007	281	0.013	226
DCP 9	.600	0.635	0.270	18	0.050	51	0.011	344	0.024	93	0.006	52	0.005	254	0.014	239	0.015	227	0.013	169
DCP10	.878	0.467	0.248	9	0.036	43	0.012	344	0.016	77	0.005	78	0.006	47	0.[illegible]1	235	0.010	200	0.013	154

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.023	138	0.018	109	0.010	106	0.021	114	0.008	91	0.010	140	0.012	103	0.004	160	0.003	98
CN		0.003	92	0.007	158	0.005	74	0.003	112	0.003	74	0.001	212	0.002	138	0.001	219	0.004	53
CM		0.001	358	0.002	285	0.001	257	0.001	260	0.001	170	0.001	52	0.001	283	0.001	123	0.001	229
DCP 1	.010	0.024	295	0.025	199	0.013	169	0.005	159	0.009	142	0.010	71	0.006	294	0.007	198	0.004	103
DCP 2	.025	0.016	98	0.001	103	0.013	232	0.012	165	0.004	22	0.007	252	0.007	117	0.012	23	0.011	357
DCP 3	.100	0.025	48	0.016	274	0.022	57	0.002	357	0.012	50	0.007	61	0.009	295	0.011	144	0.007	51
DCP 4	.200	0.011	78	0.022	184	0.010	73	0.002	234	0.011	158	0.002	118	0.010	244	0.006	205	0.009	226
DCP 5	.250	0.004	356	0.021	191	0.008	343	0.005	156	0.002	134	0.008	79	0.008	143	0.004	153	0.004	89
DCP 6	.300	0.003	28	0.008	177	0.008	27	0.002	172	0.002	121	0.006	121	0.002	177	0.007	128	0.006	33
DCP 7	.400	0.007	271	0.014	153	0.009	127	0.005	137	0.008	113	0.002	328	0.005	139	0.002	300	0.008	101
DCP 8	.500	0.004	17	0.003	216	0.002	104	0.007	90	0.008	43	0.001	285	0.004	2	0.000	341	0.004	84
DCP 9	.600	0.008	198	0.008	127	0.005	127	0.002	109	0.006	118	0.004	245	0.006	117	0.005	233	0.009	54
DCP10	.878	0.008	136	0.012	94	0.007	52	0.006	74	0.008	326	0.008	226	0.003	96	0.006	331	0.002	342

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	16.42	0.400	0.48	7.22		5092.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.062	444.7	761.1	0.49E 07	-0.00042	0.832	7.75	0.0800

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		0.478	7.217	0	0.358	359	0.078	216	0.017	214	0.048	137	0.042	194	0.040	211	0.022	219	0.014	219
CN		0.122	0.755	356	0.009	252	0.026	241	0.010	285	0.001	342	0.002	171	0.005	166	0.002	220	0.002	147
CM		-0.010	0.005	275	0.012	236	0.007	300	0.005	19	0.002	79	0.001	134	0.001	126	0.000	155	0.000	135
DCP 1	.010	-0.839	2.863	357	1.135	250	0.507	319	0.087	212	0.057	302	0.118	44	0.098	245	0.129	357	0.065	117
DCP 2	.025	-0.548	3.122	355	0.391	250	0.202	286	0.083	21	0.026	107	0.021	136	0.051	146	0.005	199	0.040	123
DCP 3	.100	0.173	2.030	355	0.034	165	0.126	268	0.107	17	0.081	120	0.017	255	0.047	84	0.054	174	0.022	273
DCP 4	.150	0.728	1.421	353	0.110	70	0.073	200	0.036	323	0.042	92	0.037	180	0.020	256	0.003	142	0.007	221
DCP 5	.200	1.033	1.182	356	0.061	88	0.060	217	0.039	302	0.035	54	0.052	183	0.010	234	0.011	254	0.010	103
DCP 6	.250	0.448	1.027	355	0.066	65	0.065	182	0.049	250	0.025	329	0.011	70	0.009	196	0.003	240	0.001	182
DCP 7	.300	0.026	0.852	357	0.039	72	0.045	188	0.032	257	0.011	358	0.010	147	0.013	229	0.007	311	0.002	143
DCP 8	.400	0.046	0.614	359	0.011	132	0.030	204	0.026	235	0.019	287	0.009	5	0.004	140	0.004	226	0.001	318
DCP 9	.500	0.236	0.452	0	0.009	78	0.017	179	0.021	218	0.013	277	0.007	353	0.004	174	0.005	267	0.004	320
DCP10	.600	0.019	0.343	1	0.006	23	0.010	191	0.015	213	0.014	266	0.008	346	0.001	62	0.000	307	0.001	94
DCP11	.878	0.012	0.177	357	0.037	41	0.017	109	0.009	178	0.005	201	0.004	245	0.001	249	0.002	4	0.001	188

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.013	191	0.009	211	0.013	203	0.007	254	0.007	263	0.009	362	0.013	202	0.007	259	0.008	269
CN		0.004	222	0.003	261	0.001	232	0.002	192	0.002	280	0.000	257	0.001	295	0.001	113	0.002	213
CM		0.000	109	0.001	118	0.000	167	0.000	312	0.000	38	0.000	145	0.000	267	0.000	50	0.000	111
DCP 1	.010	0.060	290	0.074	54	0.052	178	0.039	326	0.042	104	0.037	223	0.020	17	0.029	160	0.027	275
DCP 2	.025	0.045	210	0.019	271	0.018	159	0.024	232	0.021	346	0.006	218	0.034	304	0.039	72	0.026	182
DCP 3	.100	0.022	130	0.034	224	0.014	336	0.018	157	0.024	268	0.013	11	0.013	174	0.011	291	0.003	49
DCP 4	.150	0.001	203	0.004	213	0.006	307	0.004	60	0.005	178	0.002	231	0.002	66	0.001	114	0.001	109
DCP 5	.200	0.027	289	0.016	60	0.008	210	0.013	151	0.002	59	0.005	128	0.008	101	0.008	110	0.003	245
DCP 6	.250	0.002	200	0.002	277	0.003	325	0.004	33	0.004	117	0.004	163	0.002	186	0.003	218	0.003	297
DCP 7	.300	0.003	267	0.001	144	0.002	149	0.002	254	0.001	357	0.002	159	0.002	252	0.001	264	0.001	167
DCP 8	.400	0.001	176	0.002	215	0.003	222	0.002	265	0.001	286	0.002	167	0.002	235	0.002	280	0.001	222
DCP 9	.500	0.002	342	0.001	347	0.002	98	0.003	208	0.002	297	0.001	27	0.001	265	0.000	276	0.001	160
DCP10	.600	0.004	184	0.005	278	0.001	272	0.001	355	0.002	260	0.000	197	0.002	90	0.004	208	0.003	272
DCP11	.878	0.003	240	0.004	291	0.002	353	0.003	171	0.002	232	0.003	313	0.001	12	0.001	98	0.001	166

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	16.58	0.400	0.48	7.33		5392.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.062	444.7	743.3	0.48E 07	-0.00046	0.807	7.85	0.0760

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		0.476	7.334	0	0.491	2	0.030	240	0.016	344	0.030	102	0.025	138	0.020	219	0.013	278	0.003	333
CN		0.018	0.773	358	0.013	296	0.019	252	0.033	299	0.005	140	0.032	171	0.004	199	0.005	253	0.002	196
CM		-0.013	0.006	297	0.010	238	0.006	302	0.004	18	0.001	69	0.001	119	0.001	159	0.000	30	0.000	169
DCP 1	.010	-0.912	2.911	358	1.193	251	0.515	321	0.127	216	0.301	305	0.145	43	0.106	245	0.143	357	0.073	126
DCP 2	.025	-0.472	3.216	357	0.381	258	0.198	300	0.089	39	0.057	116	0.042	94	0.062	169	0.023	268	0.019	107
DCP 3	.100	0.149	2.069	357	0.019	193	0.119	288	0.115	38	0.101	141	0.023	269	0.053	92	0.061	194	0.019	303
DCP 4	.150	0.190	1.492	353	0.132	60	0.064	193	0.038	335	0.058	95	0.048	186	0.023	271	0.006	148	0.019	237
DCP 5	.200	0.255	1.234	359	0.070	83	0.097	193	0.027	296	0.035	79	0.039	184	0.028	277	0.019	341	0.023	207
DCP 6	.250	0.096	1.071	354	0.087	44	0.056	155	0.044	227	0.020	311	0.006	63	0.009	200	0.009	251	0.004	306
DCP 7	.300	0.014	0.898	358	0.063	62	0.056	176	0.041	249	0.013	352	0.015	143	0.021	261	0.015	346	0.008	114
DCP 8	.400	0.064	0.623	359	0.002	341	0.016	208	0.018	220	0.012	277	0.009	340	0.003	85	0.005	219	0.001	322
DCP 9	.500	0.097	0.446	3	0.001	240	0.011	188	0.019	215	0.013	262	0.007	344	0.002	140	0.003	248	0.001	327
DCP10	.600	0.016	0.342	1	0.009	301	0.003	225	0.011	184	0.010	259	0.005	315	0.001	188	0.004	242	0.001	355
DCP11	.878	0.017	0.175	1	0.034	39	0.012	104	0.096	147	0.008	151	0.002	279	0.001	247	0.001	224	0.002	155

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.009	146	0.003	329	0.008	225	0.005	30	0.002	335	0.004	10	0.011	196	0.002	238	0.003	187
CN		0.001	218	0.002	56	0.001	94	0.001	300	0.001	231	0.002	247	0.001	257	0.002	38	0.002	329
CM		0.000	224	0.000	302	0.001	77	0.000	237	0.000	128	0.000	214	0.001	318	0.000	297	0.000	321
DCP 1	.010	0.080	290	0.069	47	0.047	226	0.078	338	0.044	94	0.044	279	0.061	26	0.028	132	0.028	318
DCP 2	.025	0.022	207	0.010	103	0.030	129	0.012	307	0.014	114	0.041	234	0.030	314	0.018	98	0.018	326
DCP 3	.100	0.032	134	0.034	236	0.014	7	0.022	193	0.027	290	0.010	59	0.019	242	0.023	351	0.013	90
DCP 4	.150	0.019	327	0.015	53	0.004	121	0.035	334	0.004	58	0.005	124	0.005	169	0.003	256	0.003	301
DCP 5	.200	0.001	342	0.018	41	0.014	38	0.034	227	0.022	191	0.007	243	0.004	158	0.010	331	0.019	310
DCP 6	.250	0.005	323	0.009	30	0.037	70	0.032	66	0.004	145	0.003	196	0.003	233	0.004	2	0.002	72
DCP 7	.300	0.005	241	0.004	352	0.036	52	0.033	119	0.001	237	0.003	91	0.006	165	0.008	239	0.010	302
DCP 8	.400	0.002	319	0.002	39	0.002	106	0.002	346	0.002	45	0.001	132	0.003	139	0.001	251	0.003	316
DCP 9	.500	0.002	77	0.002	149	0.001	248	0.002	340	0.001	355	0.001	62	0.003	140	0.002	120	0.003	273
DCP10	.600	0.001	154	0.002	131	0.003	249	0.002	358	0.001	296	0.004	320	0.002	9	0.003	117	0.001	164
DCP11	.878	0.000	64	0.001	84	0.002	215	0.000	277	0.001	290	0.001	221	0.001	197	0.002	63	0.002	99

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	16.61	0.400	0.46	7.47		5092.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.063	443.6	742.1	0.48E 07	-0.00052	0.809	8.01	0.0220

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		0.464	7.473	0	0.351	357	0.155	224	0.061	220	0.049	189	0.058	202	0.043	224	0.038	242	0.020	255
CN		0.010	0.781	355	0.016	261	0.023	244	0.037	265	0.006	174	0.005	203	0.005	214	0.002	268	0.003	241
CM		-0.016	0.007	294	0.011	237	0.006	300	0.004	17	0.002	95	0.001	161	0.000	7	0.000	277	0.001	98
DCP 1	.010	-0.944	2.939	356	1.265	247	0.517	312	0.161	222	0.307	2[illegible]	0.118	31	0.101	258	0.130	356	0.047	125
DCP 2	.025	-0.673	3.251	353	0.414	252	0.204	298	0.080	35	0.066	139	0.005	44	0.045	156	0.017	229	0.013	117
DCP 3	.100	0.112	2.153	353	0.028	70	0.098	267	0.092	22	0.094	127	0.027	232	0.034	65	0.049	170	0.023	274
DCP 4	.150	0.147	1.481	352	0.098	71	0.074	204	0.032	336	0.056	109	0.053	191	0.024	273	0.004	137	0.020	222
DCP 5	.200	0.193	1.230	354	0.066	90	0.077	186	0.048	277	0.008	66	0.041	175	0.014	249	0.023	353	0.011	212
DCP 6	.250	0.049	1.080	353	0.066	49	0.058	166	0.042	221	0.010	257	0.014	196	0.019	252	0.015	321	0.003	43
DCP 7	.300	0.036	0.880	355	0.037	58	0.042	184	0.035	241	0.004	333	0.014	171	0.016	241	0.012	324	0.005	46
DCP 8	.400	0.057	0.626	357	0.012	203	0.025	205	0.023	221	0.014	264	0.004	319	0.004	193	0.006	261	0.002	288
DCP 9	.500	0.065	0.451	359	0.004	192	0.013	203	0.017	215	0.014	258	0.003	317	0.004	231	0.003	299	0.001	0
DCP10	.600	0.015	0.348	0	0.007	240	0.009	223	0.012	207	0.009	260	0.005	324	0.003	211	0.005	254	0.002	297
DCP11	.878	0.037	0.176	357	0.037	35	0.015	98	0.006	169	0.004	235	0.002	354	0.003	142	0.005	104	0.005	246

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.019	234	0.015	254	0.015	221	0.009	290	0.009	298	0.010	289	0.009	280	0.006	301	0.006	246
CN		0.002	259	0.001	261	0.003	97	0.002	243	0.002	289	0.000	124	0.002	231	0.001	71	0.002	256
CM		0.001	61	0.001	102	0.001	274	0.000	4	0.001	52	0.001	154	0.001	245	0.001	313	0.001	77
DCP 1	.010	0.055	306	0.061	74	0.046	215	0.049	341	0.035	125	0.037	266	0.034	32	0.022	160	0.026	305
DCP 2	.025	0.009	312	0.018	11	0.031	134	0.024	236	0.026	26	0.024	147	0.035	261	0.018	49	0.012	126
DCP 3	.100	0.020	101	0.028	211	0.016	340	0.015	134	0.013	255	0.010	46	0.013	170	0.011	273	0.008	57
DCP 4	.150	0.013	289	0.002	330	0.005	319	0.007	4	0.006	96	0.007	155	0.006	212	0.005	292	0.000	318
DCP 5	.200	0.017	249	0.010	3	0.015	104	0.002	189	0.016	294	0.009	219	0.006	347	0.006	54	0.006	218
DCP 6	.250	0.004	161	0.004	206	0.003	257	0.005	328	0.002	53	0.005	160	0.003	228	0.005	342	0.005	52
DCP 7	.300	0.003	171	0.000	174	0.003	158	0.005	241	0.003	314	0.001	125	0.002	142	0.003	186	0.003	268
DCP 8	.400	0.000	58	0.003	195	0.001	114	0.002	271	0.003	254	0.001	237	0.002	213	0.002	308	0.001	311
DCP 9	.500	0.003	195	0.004	269	0.001	91	0.002	264	0.000	148	0.001	99	0.002	202	0.001	186	0.002	278
DCP10	.600	0.001	335	0.002	198	0.002	133	0.003	284	0.004	329	0.004	22	0.002	94	0.001	184	0.002	244
DCP11	.878	0.005	255	0.005	311	0.006	89	0.003	163	0.006	218	0.005	314	0.002	25	0.004	112	0.006	256

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	15.77	0.400	7.67	7.24		5093.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.059	444.5	809.8	0.52E 07	-0.00066	1.657	14.84	0.0800

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		7.665	7.244	0	0.446	16	0.047	218	0.115	224	0.089	175	0.050	127	0.037	279	0.063	217	0.019	166
CN		0.900	0.698	358	0.126	30	0.050	237	0.033	205	0.016	116	0.008	354	0.006	287	0.005	221	0.003	196
CM		-0.013	0.013	310	0.008	85	0.010	352	0.009	264	0.007	178	0.005	100	0.003	17	0.002	315	0.002	236
DCP 1	.010	2.791	4.337	354	0.510	15	0.151	280	0.159	221	0.097	166	0.032	98	0.024	222	0.037	138	0.018	34
DCP 2	.025	2.969	3.736	355	0.474	20	0.256	314	0.237	243	0.145	175	0.090	122	0.059	42	0.033	348	0.035	269
DCP 3	.100	2.051	1.540	356	0.436	54	0.239	339	0.168	251	0.114	173	0.072	95	0.053	12	0.044	299	0.040	233
DCP 4	.150	2.030	0.975	354	0.262	49	0.131	328	0.088	236	0.052	151	0.031	56	0.019	314	0.016	252	0.015	200
DCP 5	.200	2.157	0.917	357	0.245	37	0.122	303	0.093	208	0.067	116	0.052	21	0.040	306	0.025	235	0.024	199
DCP 6	.250	1.448	0.785	358	0.187	39	0.083	301	0.059	199	0.037	99	0.027	351	0.022	266	0.015	210	0.013	157
DCP 7	.300	0.828	0.718	0	0.166	25	0.081	276	0.073	175	0.054	83	0.038	350	0.031	277	0.026	209	0.018	144
DCP 8	.400	0.665	0.568	1	0.109	18	0.050	257	0.041	149	0.032	45	0.029	305	0.019	228	0.013	157	0.008	87
DCP 9	.500	0.759	0.498	2	0.085	19	0.035	246	0.031	138	0.026	23	0.025	285	0.014	204	0.010	140	0.006	51
DCP10	.600	0.362	0.332	4	0.051	9	0.028	228	0.023	109	0.022	8	0.019	277	0.012	177	0.008	113	0.006	41
DCP11	.878	0.243	0.165	5	0.027	300	0.029	166	0.017	76	0.012	335	0.011	266	0.003	194	0.001	171	0.002	28

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.012	206	0.010	232	0.019	204	0.011	197	0.008	236	0.011	236	0.017	218	0.006	209	0.010	205
CN		0.003	293	0.003	237	0.002	270	0.004	232	0.001	261	0.005	289	0.003	344	0.004	258	0.001	328
CM		0.002	155	0.001	72	0.001	32	0.000	158	0.001	193	0.001	140	0.001	337	0.000	161	0.000	166
DCP 1	.010	0.024	291	0.022	254	0.019	245	0.025	183	0.015	236	0.028	240	0.008	304	0.002	214	0.010	338
DCP 2	.025	0.038	241	0.022	197	0.010	54	0.022	250	0.019	206	0.019	262	0.028	354	0.028	289	0.012	272
DCP 3	.100	0.030	176	0.021	99	0.017	14	0.011	287	0.016	263	0.012	251	0.006	353	0.008	288	0.004	273
DCP 4	.150	0.008	138	0.006	25	0.012	291	0.011	213	0.005	146	0.006	327	0.006	306	0.006	226	0.004	347
DCP 5	.200	0.008	92	0.007	100	0.010	337	0.014	185	0.006	331	0.005	242	0.010	354	0.012	189	0.007	14
DCP 6	.250	0.010	52	0.011	316	0.013	238	0.009	177	0.003	37	0.007	290	0.002	222	0.004	238	0.000	264
DCP 7	.300	0.012	49	0.011	330	0.007	281	0.011	235	0.005	180	0.002	338	0.006	359	0.006	248	0.004	115
DCP 8	.400	0.009	340	0.011	254	0.006	175	0.001	238	0.002	292	0.003	286	0.003	342	0.005	254	0.002	4
DCP 9	.500	0.010	333	0.009	269	0.006	222	0.006	214	0.004	50	0.008	333	0.005	311	0.006	250	0.004	118
DCP10	.600	0.007	308	0.007	198	0.001	181	0.001	32	0.001	51	0.006	326	0.003	206	0.003	242	0.004	352
DCP11	.878	0.005	305	0.004	254	0.003	239	0.003	294	0.003	319	0.005	278	0.002	103	0.005	351	0.002	249

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	15.80	0.400	7.69	7.32		5093.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.059	444.5	743.4	0.48E 07	-0.00080	1.509	14.97	0.0760

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		7.691	7.322	0	0.526	11	0.013	237	0.068	244	0.042	159	0.026	3	0.036	211	0.009	225	0.008	286
CN		0.761	0.697	359	0.109	16	0.031	280	0.021	178	0.009	104	0.005	176	0.002	194	0.004	274	0.002	201
CM		-0.003	0.021	331	0.002	346	0.002	321	0.002	282	0.002	187	0.001	55	0.001	58	0.001	358	0.001	219
DCP 1	.010	2.629	4.381	355	0.617	358	0.134	235	0.064	177	0.036	195	0.056	149	0.044	100	0.030	13	0.010	326
DCP 2	.025	2.885	3.810	357	0.499	342	0.226	251	0.134	168	0.061	113	0.026	180	0.029	107	0.049	339	0.043	277
DCP 3	.100	2.059	1.693	358	0.268	32	0.086	317	0.053	226	0.030	151	0.012	125	0.007	309	0.027	244	0.031	171
DCP 4	.150	1.504	1.059	356	0.205	29	0.054	322	0.017	230	0.010	153	0.011	124	0.001	15	0.006	290	0.005	190
DCP 5	.200	1.197	0.931	358	0.178	34	0.053	308	0.036	198	0.016	115	0.010	321	0.011	249	0.017	207	0.014	133
DCP 6	.250	1.087	0.798	359	0.168	30	0.043	317	0.017	212	0.010	143	0.010	119	0.002	322	0.007	285	0.003	185
DCP 7	.300	0.837	0.679	1	0.131	28	0.045	287	0.032	183	0.016	76	0.008	275	0.010	224	0.007	172	0.003	96
DCP 8	.400	0.655	0.535	1	0.117	25	0.030	300	0.015	178	0.009	97	0.005	140	0.004	241	0.001	276	0.002	89
DCP 9	.500	0.508	0.382	3	0.068	28	0.018	280	0.012	169	0.003	329	0.011	198	0.005	121	0.003	333	0.005	272
DCP10	.600	0.366	0.307	6	0.066	20	0.016	281	0.013	152	0.007	68	0.004	167	0.003	218	0.001	181	0.003	86
DCP11	.878	0.162	0.134	11	0.020	287	0.014	190	0.013	128	0.007	23	0.004	229	0.004	232	0.003	238	0.003	0

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.011	172	0.005	202	0.007	196	0.004	103	0.002	284	0.002	358	0.011	209	0.005	343	0.004	210
CN		0.001	96	0.001	184	0.003	238	0.001	116	0.002	9	0.001	0	0.001	325	0.001	243	0.003	172
CM		0.001	143	0.001	18	0.000	252	0.001	199	0.001	143	0.000	31	0.000	232	0.000	138	0.000	112
DCP 1	.010	0.010	316	0.009	277	0.014	239	0.008	205	0.006	114	0.002	128	0.006	42	0.002	58	0.003	347
DCP 2	.025	0.029	195	0.020	173	0.024	195	0.023	128	0.021	14	0.011	330	0.006	48	0.014	251	0.027	166
DCP 3	.100	0.025	107	0.022	25	0.026	286	0.023	210	0.020	136	0.019	61	0.014	318	0.011	241	0.011	183
DCP 4	.150	0.002	66	0.002	42	0.002	277	0.002	299	0.001	69	0.001	346	0.001	334	0.002	214	0.003	181
DCP 5	.200	0.009	38	0.006	345	0.013	247	0.005	174	0.002	334	0.004	359	0.012	269	0.012	144	0.012	102
DCP 6	.250	0.003	46	0.001	8	0.001	284	0.001	341	0.001	355	0.001	342	0.002	96	0.001	219	0.002	199
DCP 7	.300	0.003	342	0.005	261	0.005	193	0.005	93	0.008	357	0.006	270	0.007	188	0.004	78	0.004	321
DCP 8	.400	0.004	321	0.003	196	0.003	106	0.004	7	0.004	291	0.003	213	0.003	99	0.002	359	0.001	243
DCP 9	.500	0.003	207	0.003	141	0.000	26	0.002	349	0.004	308	0.004	181	0.002	73	0.003	300	0.005	215
DCP10	.600	0.005	329	0.003	218	0.002	174	0.005	40	0.005	334	0.002	210	0.001	245	0.001	18	0.002	161
DCP11	.878	0.001	309	0.002	176	0.001	17	0.001	46	0.001	43	0.001	20	0.002	359	0.003	255	0.001	165

TUNED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	15.97	0.400	7.68	7.36		5393.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.060	442.8	746.2	0.48E 07	-0.00086	1.530	15.20	0.0220

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		7.683	7.363	0	0.222	16	0.231	206	0.202	218	0.134	189	0.015	116	0.180	221	0.047	232	0.046	262
CN		0.754	0.701	357	0.094	11	0.045	245	0.034	173	0.010	139	0.006	247	0.019	216	0.004	182	0.005	249
CM		-0.008	0.013	323	0.002	37	0.004	316	0.004	239	0.004	137	0.003	46	0.001	305	0.002	233	0.001	123
DCP 1	.010	2.602	4.367	354	0.417	356	0.257	218	0.172	192	0.110	182	0.043	151	0.057	189	0.016	319	0.041	274
DCP 2	.025	2.850	3.801	354	0.450	336	0.270	240	0.185	175	0.118	135	0.036	70	0.056	233	0.037	266	0.060	247
DCP 3	.100	2.040	1.681	355	0.263	30	0.113	285	0.104	206	0.067	142	0.033	23	0.059	250	0.054	207	0.042	138
DCP 4	.150	1.433	1.044	355	0.176	34	0.070	280	0.064	207	0.034	161	0.003	322	0.031	237	0.015	204	0.003	168
DCP 5	.200	1.146	0.936	356	0.164	28	0.073	263	0.052	176	0.030	82	0.025	298	0.060	208	0.023	145	0.012	30
DCP 6	.250	1.044	0.797	358	0.141	31	0.056	265	0.047	191	0.017	152	0.039	261	0.025	227	0.007	186	0.002	176
DCP 7	.300	0.848	0.692	359	0.119	20	0.058	246	0.046	159	0.019	53	0.025	277	0.036	207	0.017	122	0.012	344
DCP 8	.400	0.651	0.543	1	0.091	22	0.039	242	0.028	165	0.001	207	0.015	233	0.015	194	0.004	44	0.005	274
DCP 9	.500	0.476	0.388	1	0.068	18	0.028	241	0.018	142	0.007	298	0.013	208	0.008	180	0.003	327	0.008	255
DCP10	.600	0.365	0.315	5	0.049	16	0.023	222	0.019	140	0.006	298	0.015	222	0.008	182	0.008	37	0.006	276
DCP11	.878	0.196	0.143	7	0.026	289	0.020	168	0.017	76	0.009	312	0.009	226	0.004	186	0.004	79	0.006	278

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.033	238	0.036	245	0.027	254	0.021	275	0.019	274	0.015	282	0.011	254	0.011	288	0.006	272
CN		0.006	254	0.006	219	0.003	180	0.003	277	0.002	265	0.002	314	0.003	264	0.002	274	0.001	300
CM		0.001	48	0.001	321	0.001	224	0.001	171	0.001	356	0.000	102	0.000	335	0.001	223	0.000	193
DCP 1	.010	0.040	251	0.033	235	0.023	223	0.015	236	0.005	295	0.011	297	0.009	317	0.011	315	0.009	287
DCP 2	.025	0.044	209	0.034	128	0.012	134	0.024	247	0.023	289	0.013	20	0.016	272	0.029	218	0.009	223
DCP 3	.100	0.032	36	0.041	304	0.044	232	0.031	162	0.020	60	0.021	328	0.020	255	0.009	186	0.003	330
DCP 4	.150	0.010	298	0.015	255	0.008	202	0.003	309	0.007	300	0.007	247	0.002	337	0.003	319	0.004	276
DCP 5	.200	0.014	327	0.026	232	0.013	193	0.007	347	0.004	264	0.006	195	0.005	187	0.014	307	0.002	322
DCP 6	.250	0.009	289	0.012	246	0.006	164	0.005	332	0.008	287	0.004	238	0.003	39	0.004	322	0.001	276
DCP 7	.300	0.018	273	0.018	205	0.010	110	0.012	345	0.012	266	0.007	184	0.004	64	0.006	319	0.006	260
DCP 8	.400	0.006	247	0.005	209	0.004	102	0.006	323	0.003	260	0.000	104	0.002	343	0.002	315	0.001	75
DCP 9	.500	0.007	223	0.006	160	0.004	30	0.007	274	0.005	179	0.004	41	0.005	296	0.003	230	0.000	344
DCP10	.600	0.004	218	0.004	186	0.004	79	0.006	324	0.001	163	0.002	344	0.002	201	0.003	62	0.003	2
DCP11	.878	0.008	229	0.004	128	0.003	28	0.002	133	0.003	179	0.003	294	0.001	234	0.002	39	0.001	343

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	16.05	0.400	10.00	7.12		5094.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.060	448.0	726.0	0.46E 07	-0.00022	1.700	16.04	0.0800

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		10.004	7.118	0	0.480	24	0.022	94	0.046	273	0.068	275	0.106	210	0.119	143	0.063	6	0.052	265
CN		0.951	0.463	9	0.242	39	0.079	322	0.033	267	0.030	218	0.020	159	0.017	129	0.014	40	0.009	300
CM		-0.018	0.024	196	0.028	81	0.015	459	0.006	328	0.008	298	0.007	233	0.005	191	0.005	142	0.005	68
DCP 1	.010	3.369	2.992	1	1.125	39	0.373	323	0.147	263	0.095	245	0.061	222	0.059	185	0.027	220	0.053	186
DCP 2	.025	3.251	2.249	1	1.198	52	0.529	349	0.242	306	0.198	272	0.159	232	0.160	190	0.115	149	0.096	101
DCP 3	.100	2.138	0.671	9	0.873	61	0.387	350	0.164	287	0.101	249	0.095	209	0.101	161	0.083	97	0.058	36
DCP 4	.150	1.959	0.475	15	0.527	51	0.195	329	0.062	269	0.057	242	0.052	177	0.042	125	0.033	57	0.025	349
DCP 5	.200	1.929	0.474	17	0.498	45	0.201	317	0.067	249	0.057	241	0.066	171	0.065	105	0.044	33	0.036	337
DCP 6	.250	1.431	0.472	20	0.374	36	0.122	297	0.023	243	0.054	229	0.056	142	0.030	75	0.025	33	0.031	318
DCP 7	.300	0.935	0.448	20	0.316	31	0.114	293	0.039	227	0.053	213	0.059	136	0.042	75	0.035	15	0.035	317
DCP 8	.400	0.779	0.428	17	0.200	17	0.062	262	0.016	231	0.045	190	0.040	97	0.013	39	0.023	11	0.031	279
DCP 9	.500	0.765	0.341	15	0.132	7	0.041	238	0.006	166	0.026	175	0.026	83	0.013	37	0.025	343	0.028	257
DCP10	.600	0.480	0.315	12	0.074	350	0.022	214	0.010	238	0.028	157	0.018	57	0.003	74	0.016	359	0.019	250
DCP11	.878	0.238	0.224	1	0.059	271	0.020	181	0.021	185	0.025	110	0.011	41	0.010	26	0.015	304	0.010	214

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.023	188	0.015	179	0.008	198	0.007	218	0.007	256	0.006	304	0.019	212	0.010	221	0.004	148
CN		0.004	219	0.003	189	0.001	157	0.002	233	0.001	125	0.001	118	0.001	122	0.001	0	0.002	271
CM		0.003	6	0.002	336	0.002	285	0.002	244	0.002	197	0.001	143	0.002	76	0.001	4	0.001	336
DCP 1	.010	0.048	138	0.035	84	0.019	359	0.015	289	0.018	242	0.017	185	0.009	127	0.006	67	0.009	19
DCP 2	.025	0.072	62	0.066	19	0.054	326	0.060	275	0.050	219	0.040	147	0.039	89	0.028	5	0.026	310
DCP 3	.100	0.042	344	0.031	314	0.036	282	0.036	240	0.032	189	0.027	142	0.023	112	0.023	60	0.015	9
DCP 4	.150	0.022	283	0.018	244	0.014	199	0.011	155	0.007	90	0.005	38	0.005	344	0.006	286	0.004	256
DCP 5	.200	0.029	301	0.030	213	0.012	156	0.014	179	0.024	98	0.011	65	0.005	53	0.011	357	0.013	275
DCP 6	.250	0.025	236	0.012	188	0.009	184	0.013	124	0.010	33	0.003	291	0.004	333	0.004	276	0.003	224
DCP 7	.300	0.029	250	0.019	198	0.012	170	0.013	112	0.013	57	0.007	19	0.008	326	0.010	267	0.009	214
DCP 8	.400	0.022	194	0.007	154	0.008	133	0.007	64	0.003	15	0.003	342	0.005	293	0.003	246	0.005	236
DCP 9	.500	0.016	166	0.006	147	0.009	114	0.010	39	0.006	344	0.003	350	0.005	283	0.006	246	0.007	194
DCP10	.600	0.009	182	0.008	184	0.010	109	0.005	45	0.006	31	0.008	287	0.005	219	0.003	133	0.001	144
DCP11	.878	0.005	151	0.007	116	0.004	38	0.001	8	0.002	339	0.002	21	0.005	240	0.003	141	0.001	88

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	16.00	0.400	10.02	7.17		5094.2	10

X	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.060	443.7	744.1	0.48E 07	-0.00019	1.625	15.12	0.0760

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		10.024	7.170	0	0.509	19	0.004	143	0.057	262	0.036	255	0.070	212	0.102	152	0.050	346	0.041	256
CN		0.893	0.497	8	0.219	34	0.069	304	0.020	245	0.020	229	0.015	177	0.015	139	0.012	40	0.006	291
CM		-0.014	0.020	196	0.027	68	0.016	364	0.006	284	0.004	253	0.003	196	0.002	169	0.003	136	0.003	41
DCP 1	.010	3.503	3.237	0	0.993	32	0.292	309	0.070	242	0.079	287	0.106	243	0.101	176	0.022	142	0.034	173
DCP 2	.025	3.382	2.497	2	1.134	41	0.506	327	0.190	273	0.119	260	0.130	230	0.140	181	0.102	133	0.086	75
DCP 3	.100	2.176	0.768	11	0.830	53	0.357	335	0.149	271	0.100	231	0.083	178	0.067	135	0.060	70	0.050	3
DCP 4	.150	1.625	0.531	12	0.486	49	0.173	322	0.045	254	0.044	242	0.042	177	0.038	124	0.031	48	0.025	323
DCP 5	.200	1.309	0.508	18	0.468	36	0.182	303	0.058	234	0.065	212	0.058	140	0.044	76	0.046	17	0.033	307
DCP 6	.250	1.234	0.517	15	0.329	37	0.104	293	0.020	204	0.031	230	0.034	145	0.023	85	0.024	8	0.021	275
DCP 7	.300	0.973	0.483	16	0.288	24	0.107	278	0.032	210	0.041	203	0.043	122	0.027	63	0.033	1	0.030	284
DCP 8	.400	0.803	0.455	13	0.161	16	0.052	241	0.016	117	0.015	210	0.016	103	0.004	56	0.010	351	0.013	240
DCP 9	.500	0.637	0.357	11	0.102	358	0.037	212	0.019	97	0.008	130	0.012	8	0.006	211	0.014	348	0.018	234
DCP10	.600	0.494	0.324	10	0.058	346	0.035	191	0.017	97	0.004	94	0.007	350	0.008	201	0.004	28	0.007	206
DCP11	.878	0.210	0.210	2	0.061	260	0.028	169	0.011	150	0.009	59	0.006	286	0.004	89	0.009	327	0.008	210

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.026	193	0.019	171	0.008	151	0.013	257	0.010	216	0.002	231	0.012	196	0.009	232	0.009	196
CN		0.003	273	0.002	192	0.002	177	0.002	114	0.001	117	0.002	342	0.003	194	0.001	332	0.000	234
CM		0.001	328	0.001	302	0.001	211	0.001	107	0.001	347	0.001	217	0.000	183	0.001	142	0.001	63
DCP 1	.010	0.033	131	0.036	56	0.015	314	0.020	240	0.023	175	0.019	125	0.017	61	0.015	334	0.013	308
DCP 2	.025	0.059	13	0.033	323	0.030	226	0.024	120	0.025	27	0.036	305	0.024	236	0.023	214	0.021	135
DCP 3	.100	0.037	304	0.019	274	0.024	233	0.015	157	0.005	317	0.016	220	0.027	154	0.027	95	0.030	44
DCP 4	.150	0.021	247	0.008	193	0.012	182	0.010	97	0.007	347	0.008	248	0.006	154	0.003	2	0.002	269
DCP 5	.200	0.023	246	0.013	210	0.012	162	0.010	104	0.004	133	0.008	74	0.007	10	0.009	323	0.011	275
DCP 6	.250	0.011	215	0.005	192	0.009	160	0.004	56	0.002	205	0.002	32	0.003	327	0.005	274	0.005	205
DCP 7	.300	0.019	221	0.011	176	0.011	134	0.009	60	0.003	2	0.004	50	0.005	299	0.006	266	0.005	209
DCP 8	.400	0.005	176	0.005	143	0.005	68	0.005	296	0.006	185	0.003	52	0.002	262	0.001	310	0.003	278
DCP 9	.500	0.010	140	0.006	143	0.012	67	0.012	337	0.007	244	0.003	174	0.005	157	0.003	-1	0.002	331
DCP10	.600	0.002	37	0.004	208	0.003	81	0.003	272	0.002	129	0.005	8	0.004	234	0.002	347	0.003	231
DCP11	.878	0.001	82	0.007	93	0.005	324	0.004	173	0.003	125	0.006	18	0.002	86	0.002	293	0.002	225

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	15.95	0.400	10.04	7.24		5094.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.060	442.2	740.8	0.48E 07	-0.00009	1.628	16.18	0.0220

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		10.041	7.240	0	0.379	22	0.103	216	0.132	238	0.114	246	0.182	220	0.181	44	0.074	272	0.066	232
CN		0.875	0.490	9	0.221	33	0.067	292	0.022	248	0.033	219	0.024	178	0.017	67	0.006	330	0.006	290
CM		-0.020	0.022	191	0.028	69	0.016	339	0.006	277	0.006	283	0.006	198	0.002	134	0.003	111	0.002	39
DCP 1	.010	3.403	3.135	1	1.013	32	0.349	294	0.137	235	0.106	255	0.160	224	0.015	65	0.064	197	0.036	141
DCP 2	.025	3.281	2.385	2	1.127	44	0.473	327	0.216	282	0.232	257	0.245	212	0.108	150	0.117	114	0.069	42
DCP 3	.100	2.144	0.765	12	0.838	52	0.342	325	0.135	257	0.107	233	0.120	183	0.072	88	0.038	30	0.031	330
DCP 4	.150	1.542	0.519	15	0.505	45	0.188	304	0.056	229	0.049	235	0.060	182	0.051	68	0.022	342	0.020	302
DCP 5	.200	1.233	0.510	18	0.458	37	0.168	293	0.057	228	0.069	216	0.072	141	0.058	51	0.035	320	0.024	293
DCP 6	.250	1.169	0.505	18	0.340	32	0.118	274	0.021	196	0.048	223	0.044	147	0.047	38	0.022	301	0.015	274
DCP 7	.300	0.966	0.485	18	0.290	23	0.104	269	0.029	204	0.052	204	0.050	126	0.043	35	0.024	322	0.023	274
DCP 8	.400	0.782	0.449	14	0.165	11	0.067	229	0.003	80	0.034	198	0.019	96	0.022	18	0.017	286	0.012	248
DCP 9	.500	0.595	0.356	13	0.116	357	0.048	211	0.012	102	0.020	172	0.016	57	0.013	337	0.012	267	0.009	223
DCP10	.600	0.490	0.326	11	0.059	336	0.040	177	0.008	33	0.015	163	0.011	356	0.003	51	0.007	276	0.005	189
DCP11	.878	0.254	0.218	359	0.056	260	0.026	164	0.013	143	0.018	108	0.037	322	0.001	216	0.007	320	0.006	242

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.025	225	0.009	208	0.013	297	0.010	287	0.010	212	0.007	269	0.005	224	0.004	71	0.001	138
CN		0.006	270	0.003	230	0.002	250	0.000	225	0.002	257	0.002	219	0.003	11	0.003	318	0.001	196
CM		0.001	338	0.001	287	0.001	244	0.001	233	0.001	110	0.001	71	0.000	279	0.000	60	0.001	301
DCP 1	.010	0.014	100	0.023	29	0.017	285	0.010	230	0.008	145	0.007	135	0.012	6	0.016	332	0.016	289
DCP 2	.025	0.060	345	0.050	319	0.050	265	0.031	217	0.020	117	0.010	44	0.027	322	0.024	286	0.022	199
DCP 3	.100	0.028	312	0.031	276	0.028	235	0.017	201	0.017	178	0.016	145	0.020	75	0.024	29	0.022	350
DCP 4	.150	0.024	256	0.019	189	0.014	115	0.010	11	0.005	268	0.006	192	0.002	318	0.003	5	0.005	312
DCP 5	.200	0.017	251	0.014	204	0.010	194	0.005	9	0.005	253	0.003	84	0.005	328	0.007	300	0.007	277
DCP 6	.250	0.019	232	0.015	158	0.008	77	0.006	7	0.003	320	0.005	244	0.002	269	0.002	38	0.001	305
DCP 7	.300	0.014	227	0.011	186	0.007	130	0.006	71	0.005	36	0.007	327	0.006	306	0.003	236	0.002	203
DCP 8	.400	0.010	211	0.008	138	0.005	30	0.001	340	0.003	346	0.005	257	0.002	311	0.005	271	0.007	158
DCP 9	.500	0.006	207	0.009	136	0.009	36	0.006	327	0.004	300	0.008	254	0.002	164	0.003	149	0.004	77
DCP10	.600	0.002	232	0.003	105	0.004	9	0.001	9	0.003	275	0.005	174	0.005	9	0.004	285	0.007	158
DCP11	.878	0.003	113	0.004	341	0.003	204	0.004	95	0.008	277	0.005	266	0.003	100	0.002	338	0.002	2

TUNED PITCHING OSCILLATION — VERTOL 23010-1.5R AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	15.72	0.400	12.45	7.02		5395.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.059	443.2	740.2	0.48E 07	-0.00043	1.753	16.56	0.0220

HARMONIC ANALYSIS.

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		12.448	7.022	0	0.438	25	0.108	142	0.046	80	0.055	12	0.060	285	0.094	290	0.172	193	0.074	109
CN		1.040	0.271	39	0.263	50	0.056	30	0.049	357	0.033	315	0.025	271	0.018	273	0.033	210	0.019	148
CM		-0.028	0.042	192	0.024	99	0.014	97	0.014	49	0.009	21	0.009	339	0.004	320	0.007	314	0.006	248
DCP 1	.010	3.996	1.736	13	1.233	54	0.228	42	0.196	36	0.124	0	0.078	349	0.105	343	0.049	254	0.028	335
DCP 2	.025	3.700	1.030	17	1.317	66	0.390	53	0.351	36	0.261	3	0.182	331	0.174	321	0.152	276	0.129	246
DCP 3	.100	2.233	0.347	115	0.902	68	0.203	50	0.214	37	0.176	348	0.114	298	0.071	291	0.099	250	0.086	203
DCP 4	.150	2.007	0.311	93	0.539	55	0.097	62	0.149	17	0.083	312	0.065	297	0.056	258	0.063	214	0.047	169
DCP 5	.200	1.929	0.309	81	0.450	49	0.087	62	0.135	6	0.071	304	0.055	284	0.048	251	0.059	213	0.054	160
DCP 6	.250	1.489	0.331	68	0.367	44	0.076	62	0.112	348	0.042	283	0.057	289	0.040	229	0.049	211	0.044	153
DCP 7	.300	1.022	0.312	59	0.300	40	0.066	41	0.096	340	0.051	284	0.049	259	0.038	228	0.055	201	0.047	144
DCP 8	.400	0.460	0.319	46	0.213	31	0.049	20	0.067	306	0.026	254	0.040	251	0.020	187	0.044	192	0.038	116
DCP 9	.500	0.827	0.266	36	0.129	23	0.036	0	0.044	285	0.021	257	0.038	206	0.010	151	0.035	177	0.033	90
DCP10	.600	0.550	0.265	28	0.103	18	0.034	334	0.037	259	0.018	234	0.021	196	0.001	167	0.032	177	0.024	88
DCP11	.878	0.316	0.240	4	0.042	314	0.061	288	0.037	212	0.024	218	0.032	145	0.003	152	0.019	125	0.014	50

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.022	35	0.014	314	0.011	202	0.008	246	0.013	221	0.010	182	0.012	199	0.008	252	0.009	222
CN		0.015	95	0.008	355	0.002	195	0.004	357	0.006	237	0.002	102	0.002	242	0.001	171	0.002	167
CM		0.004	271	0.004	167	0.002	125	0.002	124	0.002	59	0.000	83	0.001	61	0.001	351	0.001	347
DCP 1	.010	0.050	328	0.082	281	0.065	233	0.046	211	0.048	177	0.030	119	0.017	79	0.016	38	0.014	342
DCP 2	.025	0.064	211	0.061	230	0.065	181	0.019	133	0.027	172	0.023	103	0.013	82	0.007	283	0.009	286
DCP 3	.100	0.049	151	0.028	188	0.043	147	0.023	96	0.012	156	0.025	98	0.016	83	0.021	70	0.023	40
DCP 4	.150	0.034	124	0.018	94	0.017	74	0.011	21	0.008	356	0.004	321	0.003	312	0.003	319	0.002	185
DCP 5	.200	0.040	106	0.021	83	0.019	76	0.014	45	0.005	13	0.005	27	0.001	346	0.005	339	0.003	344
DCP 6	.250	0.030	105	0.017	71	0.011	37	0.011	26	0.009	329	0.004	331	0.008	312	0.007	282	0.003	253
DCP 7	.300	0.033	101	0.023	69	0.017	43	0.015	11	0.011	338	0.009	302	0.005	282	0.008	285	0.007	224
DCP 8	.400	0.024	76	0.021	27	0.009	334	0.010	344	0.010	286	0.003	278	0.007	286	0.005	243	0.005	228
DCP 9	.500	0.018	50	0.018	8	0.013	320	0.009	307	0.010	266	0.007	225	0.005	215	0.006	194	0.007	162
DCP10	.600	0.017	66	0.020	2	0.009	302	0.010	329	0.012	257	0.005	262	0.011	230	0.006	168	0.009	170
DCP11	.878	0.015	34	0.020	309	0.009	240	0.006	268	0.010	192	0.005	90	0.002	243	0.003	126	0.003	135

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	15.85	0.400	12.49	7.07		5095.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.060	443.2	740.5	0.48E 07	-0.00053	1.678	16.71	0.0220

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		12.494	7.073	0	0.470	26	0.096	139	0.063	65	0.084	344	0.035	299	0.160	264	0.133	168	0.053	74
CN		0.974	0.297	37	0.264	43	0.040	31	0.057	356	0.025	289	0.018	309	0.026	265	0.025	185	0.014	122
CM		-0.026	0.044	194	0.030	97	0.010	77	0.014	51	0.010	351	0.005	330	0.004	309	0.006	294	0.005	233
DCP 1	.010	4.057	1.933	12	1.218	48	0.160	27	0.190	36	0.094	354	0.094	19	0.131	316	0.030	259	0.031	338
DCP 2	.025	3.698	1.114	18	1.332	62	0.348	48	0.379	33	0.252	353	0.182	345	0.199	308	0.130	272	0.103	248
DCP 3	.100	2.216	0.372	109	0.928	63	0.177	45	0.257	30	0.180	328	0.095	305	0.098	277	0.093	225	0.068	177
DCP 4	.150	1.695	0.286	82	0.550	53	0.062	38	0.136	22	0.094	298	0.031	268	0.061	264	0.061	188	0.034	135
DCP 5	.200	1.391	0.328	78	0.467	46	0.081	63	0.162	1	0.077	277	0.047	298	0.076	240	0.060	178	0.039	142
DCP 6	.250	1.302	0.336	60	0.376	40	0.038	52	0.105	354	0.061	258	0.022	290	0.050	240	0.041	169	0.031	132
DCP 7	.300	1.035	0.332	56	0.308	36	0.053	43	0.115	337	0.051	254	0.035	294	0.047	224	0.043	177	0.040	130
DCP 8	.400	0.872	0.341	41	0.221	23	0.019	13	0.065	311	0.040	213	0.016	254	0.024	205	0.031	155	0.030	96
DCP 9	.500	0.707	0.293	34	0.139	14	0.026	1	0.058	288	0.029	192	0.009	223	0.012	171	0.028	150	0.030	74
DCP10	.600	0.561	0.288	27	0.105	359	0.012	283	0.037	258	0.028	168	0.006	188	0.003	181	0.022	143	0.019	67
DCP11	.878	0.287	0.246	7	0.065	302	0.039	280	0.033	219	0.015	180	0.014	118	0.000	345	0.017	120	0.011	27

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.014	358	0.005	262	0.009	177	0.008	231	0.011	211	0.003	178	0.012	205	0.006	244	0.003	206
CN		0.006	63	0.006	304	0.004	163	0.002	13	0.001	196	0.002	303	0.001	231	0.001	239	0.002	109
CM		0.003	193	0.002	155	0.001	141	0.002	114	0.000	35	0.001	102	0.001	346	0.000	329	0.001	294
DCP 1	.010	0.068	308	0.084	254	0.054	202	0.030	165	0.025	133	0.015	69	0.013	352	0.008	338	0.009	347
DCP 2	.025	0.062	222	0.069	227	0.059	174	0.031	131	0.017	135	0.004	42	0.009	255	0.021	248	0.010	198
DCP 3	.100	0.034	143	0.021	165	0.027	128	0.016	98	0.010	132	0.016	109	0.017	72	0.016	54	0.019	52
DCP 4	.150	0.020	109	0.014	57	0.004	41	0.010	39	0.006	315	0.001	355	0.008	313	0.003	208	0.004	3
DCP 5	.200	0.028	107	0.014	67	0.014	85	0.014	15	0.007	303	0.003	283	0.005	279	0.003	227	0.003	260
DCP 6	.250	0.022	75	0.008	10	0.004	81	0.007	30	0.004	350	0.006	339	0.009	305	0.004	285	0.005	258
DCP 7	.300	0.024	78	0.014	48	0.013	44	0.013	4	0.009	320	0.007	318	0.006	288	0.006	286	0.004	258
DCP 8	.400	0.017	39	0.011	341	0.005	280	0.004	3	0.004	307	0.006	308	0.008	256	0.005	224	0.006	175
DCP 9	.500	0.016	15	0.016	353	0.011	312	0.010	283	0.008	241	0.006	221	0.004	181	0.004	161	0.002	145
DCP10	.600	0.009	12	0.014	322	0.008	231	0.003	284	0.004	180	0.001	270	0.003	152	0.002	272	0.004	112
DCP11	.878	0.007	358	0.008	280	0.003	102	0.004	287	0.002	135	0.006	293	0.004	149	0.002	116	0.003	86

TUNED PITCHING OSCILLATION VERTOL 23010-1.59 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	15.80	0.400	12.53	7.14		5395.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.060	442.3	739.8	0.48E 07	-0.00052	1.659	17.32	0.0220

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		12.529	7.142	0	0.398	30	0.123	158	0.066	103	0.056	295	0.072	170	0.486	255	0.144	123	0.063	73
CN		0.973	0.290	34	0.277	45	0.029	13	0.052	353	0.027	265	0.008	266	0.044	258	0.022	171	0.016	119
CM		-0.029	0.043	193	0.029	94	0.010	68	0.014	49	0.010	337	0.003	249	0.003	287	0.007	289	0.006	229
DCP 1	.010	4.002	1.848	10	1.217	50	0.108	44	0.219	35	0.072	331	0.112	38	0.210	277	0.051	297	0.052	271
DCP 2	.025	3.698	1.107	16	1.395	61	0.285	46	0.361	31	0.197	341	0.118	355	0.244	281	0.143	273	0.113	221
DCP 3	.100	2.240	0.341	103	0.990	62	0.150	24	0.226	30	0.181	314	0.059	260	0.134	267	0.096	221	0.071	160
DCP 4	.150	1.651	0.286	81	0.569	52	0.057	26	0.138	12	0.101	285	0.030	238	0.092	248	0.057	169	0.034	128
DCP 5	.200	1.361	0.292	73	0.498	48	0.051	33	0.132	8	0.086	272	0.013	238	0.083	255	0.046	164	0.022	123
DCP 6	.250	1.272	0.320	58	0.383	42	0.030	32	0.105	346	0.067	248	0.018	263	0.073	236	0.042	146	0.030	126
DCP 7	.300	1.050	0.309	52	0.326	39	0.034	15	0.095	337	0.068	240	0.016	235	0.063	238	0.040	148	0.028	115
DCP 8	.400	0.865	0.326	40	0.223	26	0.013	336	0.064	309	0.043	205	0.012	245	0.032	226	0.029	138	0.029	99
DCP 9	.500	0.676	0.274	33	0.146	19	0.012	359	0.056	294	0.043	188	0.008	232	0.024	218	0.024	127	0.022	85
DCP10	.600	0.560	0.283	26	0.103	2	0.018	276	0.040	259	0.031	164	0.007	197	0.006	262	0.022	131	0.020	64
DCP11	.878	0.317	0.248	5	0.057	305	0.040	263	0.037	212	0.018	145	0.011	157	0.006	299	0.020	122	0.017	44

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.011	306	0.022	306	0.012	228	0.014	235	0.012	211	0.004	207	0.003	190	0.006	246	0.002	217
CN		0.007	71	0.004	359	0.002	333	0.003	273	0.005	207	0.003	159	0.003	112	0.001	92	0.003	93
CM		0.003	182	0.003	153	0.002	111	0.001	86	0.002	38	0.001	12	0.001	279	0.000	89	0.001	295
DCP 1	.010	0.058	260	0.081	226	0.055	173	0.038	153	0.031	112	0.020	59	0.011	349	0.002	354	0.006	270
DCP 2	.025	0.061	196	0.040	198	0.031	158	0.020	156	0.024	166	0.022	121	0.016	128	0.014	87	0.004	53
DCP 3	.100	0.033	134	0.031	131	0.030	66	0.004	322	0.010	100	0.008	24	0.008	95	0.017	34	0.013	354
DCP 4	.150	0.027	101	0.017	52	0.008	55	0.010	18	0.004	319	0.005	358	0.008	290	0.004	207	0.001	300
DCP 5	.200	0.017	96	0.018	32	0.005	333	0.006	16	0.006	316	0.004	105	0.008	332	0.005	335	0.005	13
DCP 6	.250	0.026	79	0.013	24	0.009	32	0.010	329	0.003	290	0.003	297	0.007	257	0.005	207	0.006	168
DCP 7	.300	0.026	74	0.016	8	0.006	348	0.008	324	0.007	275	0.002	228	0.003	278	0.003	204	0.001	197
DCP 8	.400	0.017	32	0.009	18	0.010	324	0.006	287	0.009	254	0.009	184	0.004	180	0.007	142	0.004	94
DCP 9	.500	0.017	24	0.011	353	0.011	317	0.010	269	0.007	221	0.005	200	0.004	181	0.003	162	0.004	123
DCP10	.600	0.007	352	0.010	356	0.008	286	0.006	262	0.010	212	0.008	168	0.006	110	0.003	140	0.008	110
DCP11	.878	0.008	350	0.010	294	0.004	256	0.004	238	0.006	188	0.003	183	0.007	86	0.005	323	0.004	104

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	15.82	0.400	14.85	7.01		5096.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.060	443.3	740.4	0.48E 07	-0.00103	1.766	16.50	0.0800

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		14.848	7.006	0	0.448	19	0.143	158	0.057	137	0.088	117	0.078	71	0.083	40	0.107	329	0.081	266
CN		1.119	0.249	83	0.191	61	0.109	101	0.043	41	0.034	59	0.017	53	0.018	21	0.015	12	0.015	322
CM		-0.035	0.054	196	0.015	141	0.021	152	0.013	120	0.011	116	0.007	90	0.007	80	0.005	81	0.005	60
DCP 1	.010	4.570	1.007	40	0.863	61	0.414	120	0.151	94	0.163	128	0.140	136	0.153	121	0.121	101	0.075	106
DCP 2	.025	4.013	0.557	103	1.029	83	0.610	127	0.330	104	0.279	109	0.236	106	0.184	93	0.161	90	0.131	74
DCP 3	.100	2.316	0.850	146	0.594	77	0.427	133	0.231	76	0.141	94	0.156	70	0.089	36	0.090	43	0.079	6
DCP 4	.150	2.070	0.533	126	0.302	60	0.265	115	0.104	42	0.093	79	0.063	19	0.048	34	0.056	356	0.037	326
DCP 5	.200	2.038	0.468	116	0.276	61	0.252	110	0.098	34	0.107	74	0.068	25	0.067	29	0.054	349	0.045	338
DCP 6	.250	1.567	0.410	100	0.208	52	0.196	93	0.060	15	0.084	47	0.033	339	0.052	5	0.034	327	0.044	312
DCP 7	.300	1.088	0.350	93	0.186	56	0.172	95	0.059	17	0.077	50	0.037	358	0.050	4	0.038	324	0.044	319
DCP 8	.400	0.933	0.324	71	0.145	43	0.116	66	0.045	352	0.060	4	0.023	298	0.037	321	0.019	312	0.037	280
DCP 9	.500	0.901	0.253	59	0.099	41	0.072	61	0.033	331	0.036	1	0.011	307	0.026	310	0.014	301	0.027	280
DCP10	.600	0.615	0.249	45	0.090	32	0.055	23	0.033	328	0.036	313	0.021	251	0.018	265	0.006	274	0.018	252
DCP11	.878	0.360	0.229	14	0.068	25	0.058	324	0.036	315	0.030	273	0.011	271	0.018	231	0.012	257	0.011	207

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.051	209	0.021	151	0.008	157	0.002	282	0.012	219	0.006	96	0.009	248	0.005	223	0.001	336
CN		0.012	263	0.007	197	0.002	226	0.001	233	0.001	228	0.002	181	0.001	147	0.001	33	0.001	197
CM		0.005	35	0.004	355	0.003	327	0.001	302	0.002	321	0.001	282	0.001	275	0.001	270	0.001	332
DCP 1	.010	0.066	109	0.086	100	0.056	66	0.050	51	0.054	25	0.043	10	0.042	353	0.046	334	0.039	313
DCP 2	.025	0.074	59	0.048	67	0.027	8	0.036	349	0.028	355	0.019	252	0.011	275	0.018	289	0.005	238
DCP 3	.100	0.037	1	0.042	350	0.020	335	0.025	359	0.013	341	0.011	14	0.006	14	0.015	43	0.011	18
DCP 4	.150	0.037	311	0.018	271	0.023	302	0.015	260	0.011	285	0.011	217	0.004	241	0.003	225	0.003	278
DCP 5	.200	0.039	303	0.020	254	0.009	296	0.011	264	0.013	263	0.008	256	0.007	272	0.001	185	0.007	242
DCP 6	.250	0.033	272	0.021	253	0.015	261	0.012	245	0.011	242	0.009	187	0.008	219	0.002	180	0.005	228
DCP 7	.300	0.036	275	0.026	262	0.017	247	0.017	249	0.015	222	0.014	212	0.012	197	0.006	193	0.009	189
DCP 8	.400	0.026	254	0.021	209	0.009	231	0.009	188	0.007	207	0.008	164	0.004	191	0.001	180	0.005	177
DCP 9	.500	0.022	246	0.024	216	0.009	195	0.014	198	0.011	165	0.012	174	0.010	129	0.007	122	0.007	105
DCP10	.600	0.020	221	0.015	159	0.006	144	0.005	97	0.005	159	0.005	111	0.004	111	0.004	56	0.001	197
DCP11	.878	0.018	194	0.014	145	0.013	123	0.008	77	0.006	89	0.005	32	0.005	43	0.002	13	0.002	172

TUNED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	15.92	0.600	14.85	7.02		5096.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.060	443.3	739.9	0.48E 07	-0.00095	1.697	17.03	0.0760

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		14.851	7.016	0	0.386	27	0.183	162	0.074	151	0.085	122	0.061	67	0.091	32	0.137	292	0.102	222
CN		1.049	0.262	76	0.187	54	0.107	94	0.040	35	0.031	48	0.020	6	0.018	18	0.024	331	0.021	264
CM		-0.032	0.055	194	0.018	129	0.019	138	0.011	98	0.010	98	0.006	78	0.005	70	0.005	83	0.007	31
DCP 1	.010	4.579	1.172	40	0.841	56	0.455	112	0.160	80	0.187	112	0.105	109	0.160	97	0.076	52	0.017	107
DCP 2	.025	4.004	0.588	87	0.988	77	0.622	114	0.310	90	0.278	94	0.182	77	0.181	80	0.141	59	0.092	34
DCP 3	.100	2.319	0.807	141	0.622	72	0.390	121	0.230	66	0.128	68	0.126	39	0.092	19	0.075	4	0.068	338
DCP 4	.150	1.743	0.544	120	0.308	55	0.266	108	0.110	27	0.096	67	0.074	350	0.047	19	0.071	320	0.043	284
DCP 5	.200	1.486	0.448	114	0.278	57	0.232	103	0.097	29	0.078	59	0.073	357	0.041	9	0.051	331	0.035	287
DCP 6	.250	1.372	0.417	95	0.207	46	0.189	90	0.060	3	0.080	43	0.040	317	0.047	2	0.047	304	0.050	284
DCP 7	.300	1.094	0.351	87	0.200	49	0.162	83	0.067	0	0.061	30	0.049	323	0.031	348	0.038	305	0.035	275
DCP 8	.400	0.943	0.333	67	0.140	32	0.103	62	0.034	338	0.046	4	0.018	279	0.029	327	0.028	303	0.046	258
DCP 9	.500	0.766	0.264	55	0.103	34	0.074	51	0.035	319	0.034	328	0.021	288	0.019	280	0.016	290	0.031	240
DCP10	.600	0.620	0.268	42	0.083	15	0.047	18	0.017	303	0.026	307	0.009	220	0.014	272	0.019	305	0.034	225
DCP11	.878	0.333	0.237	12	0.066	8	0.052	308	0.025	292	0.030	255	0.014	293	0.010	210	0.017	275	0.027	193

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.058	162	0.023	128	0.008	245	0.019	217	0.018	189	0.010	149	0.013	212	0.005	200	0.007	210
CN		0.011	216	0.007	130	0.003	196	0.003	93	0.002	302	0.003	13	0.002	241	0.001	314	0.002	262
CM		0.004	353	0.004	313	0.001	311	0.001	274	0.001	229	0.001	250	0.001	308	0.001	237	0.000	268
DCP 1	.010	0.038	118	0.060	61	0.035	32	0.038	342	0.034	307	0.040	286	0.033	259	0.027	237	0.016	221
DCP 2	.025	0.043	28	0.051	39	0.010	50	0.015	30	0.013	290	0.011	318	0.013	246	0.023	193	0.015	177
DCP 3	.100	0.029	320	0.037	343	0.020	307	0.025	354	0.020	326	0.026	357	0.025	331	0.026	329	0.025	316
DCP 4	.150	0.041	263	0.015	231	0.019	235	0.009	227	0.008	238	0.007	253	0.006	224	0.006	238	0.005	250
DCP 5	.200	0.022	272	0.015	252	0.010	218	0.014	225	0.006	224	0.006	251	0.006	253	0.014	264	0.007	249
DCP 6	.250	0.037	228	0.016	221	0.018	193	0.010	192	0.007	154	0.002	250	0.002	226	0.004	220	0.004	242
DCP 7	.300	0.023	245	0.014	224	0.011	232	0.008	206	0.007	256	0.006	202	0.004	225	0.009	208	0.006	195
DCP 8	.400	0.028	209	0.021	183	0.015	173	0.012	144	0.008	141	0.006	95	0.004	123	0.005	82	0.002	120
DCP 9	.500	0.015	195	0.017	163	0.006	161	0.009	131	0.003	17	0.005	107	0.002	220	0.004	164	0.002	170
DCP10	.600	0.017	184	0.024	139	0.004	144	0.011	110	0.002	121	0.008	56	0.005	137	0.011	56	0.004	327
DCP11	.878	0.014	153	0.016	89	0.003	63	0.008	25	0.005	350	0.004	17	0.002	134	0.002	350	0.002	132

TUNED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	15.90	0.400	14.86	7.12		5396.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.060	441.1	736.6	0.47E 07	-0.00075	1.719	17.21	0.0220

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		14.860	7.121	359	0.414	23	0.193	163	0.074	146	0.118	118	0.033	286	0.419	357	0.1[illegible]7	239	0.127	202
CN		1.041	0.283	75	0.184	48	0.108	87	0.031	22	0.037	36	0.009	303	0.044	10	0.013	313	0.022	267
CM		-0.037	0.055	191	0.017	126	0.021	134	0.009	84	0.012	94	0.005	37	0.004	71	0.005	46	0.007	30
DCP 1	.010	4.549	1.185	40	0.839	56	0.447	103	0.111	93	0.202	102	0.125	136	0.194	47	0.096	48	0.032	48
DCP 2	.025	3.988	0.705	86	0.991	72	0.624	137	0.279	80	0.285	79	0.100	74	0.221	42	0.164	40	0.094	5
DCP 3	.100	2.291	0.860	135	0.575	64	0.427	116	0.201	51	0.159	70	0.096	6	0.121	18	0.094	350	0.058	318
DCP 4	.150	1.671	0.561	118	0.299	52	0.269	103	0.089	12	0.101	64	0.062	323	0.081	12	0.063	299	0.029	283
DCP 5	.200	1.424	0.485	109	0.270	48	0.244	98	0.084	18	0.104	50	0.063	321	0.084	12	0.055	303	0.039	302
DCP 6	.250	1.326	0.425	94	0.200	43	0.183	87	0.048	340	0.078	40	0.036	281	0.077	4	0.040	271	0.041	283
DCP 7	.300	1.102	0.376	85	0.199	40	0.155	78	0.052	356	0.074	20	0.042	290	0.067	357	0.035	276	0.043	280
DCP 8	.400	0.937	0.340	65	0.136	30	0.100	56	0.036	303	0.048	351	0.025	232	0.044	340	0.023	250	0.038	247
DCP 9	.500	0.736	0.276	53	0.106	23	0.068	40	0.023	298	0.042	325	0.022	226	0.028	336	0.013	242	0.034	243
DCP10	.600	0.614	0.274	41	0.076	15	0.055	12	0.024	268	0.035	307	0.017	192	0.020	325	0.015	252	0.030	219
DCP11	.878	0.373	0.242	11	0.070	3	0.060	307	0.018	285	0.036	257	0.008	223	0.001	186	0.011	251	0.019	207

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.052	169	0.023	136	0.016	173	0.024	161	0.018	189	0.014	221	0.011	197	0.004	126	0.009	220
CN		0.014	208	0.008	143	0.001	201	0.003	108	0.002	250	0.001	175	0.002	226	0.001	86	0.003	265
CM		0.005	340	0.004	312	0.002	283	0.002	274	0.001	229	0.001	262	0.001	219	0.001	187	0.000	114
DCP 1	.010	0.035	53	0.052	41	0.044	340	0.043	325	0.048	279	0.046	261	0.051	226	0.037	199	0.024	190
DCP 2	.025	0.054	350	0.031	12	0.017	345	0.011	0	0.013	261	0.014	243	0.016	210	0.019	155	0.009	163
DCP 3	.100	0.049	306	0.014	287	0.025	308	0.018	309	0.020	309	0.018	318	0.023	297	0.014	295	0.023	302
DCP 4	.150	0.042	244	0.010	184	0.023	232	0.006	165	0.014	215	0.004	152	0.011	207	0.006	164	0.007	195
DCP 5	.200	0.043	247	0.010	269	0.021	248	0.005	231	0.016	235	0.007	257	0.013	237	0.006	268	0.011	230
DCP 6	.250	0.035	208	0.013	222	0.015	179	0.009	226	0.009	157	0.009	208	0.008	142	0.007	168	0.004	123
DCP 7	.300	0.036	217	0.014	215	0.014	190	0.010	200	0.009	161	0.008	183	0.007	188	0.006	170	0.004	222
DCP 8	.400	0.023	176	0.019	167	0.007	124	0.013	144	0.003	95	0.008	119	0.003	141	0.007	81	0.001	231
DCP 9	.500	0.024	178	0.017	165	0.007	150	0.012	139	0.007	131	0.008	119	0.007	116	0.007	70	0.004	51
DCP10	.600	0.018	161	0.021	128	0.005	88	0.010	99	0.003	126	0.009	69	0.006	82	0.009	29	0.006	326
DCP11	.878	0.017	158	0.014	110	0.007	77	0.010	57	0.007	348	0.002	51	0.006	340	0.004	277	0.004	241

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	16.18	0.600	0.18	7.10		5398.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.041	651.7	1488.5	0.64E 07	-0.00042	0.912	7.46	0.0770

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		0.184	7.099	0	0.386	348	0.079	270	0.046	188	0.057	184	0.050	340	0.031	11	0.039	184	0.025	219
CN		0.046	0.831	358	0.043	269	0.061	310	0.009	162	0.005	152	0.009	295	0.002	198	0.006	131	0.004	174
CM		-0.006	0.004	265	0.020	248	0.011	330	0.001	26	0.002	282	0.002	10	0.001	110	0.000	331	0.001	348
DCP 1	.010	-1.035	2.520	355	0.898	257	0.379	317	0.217	238	0.072	310	0.095	229	0.058	302	0.042	169	0.031	242
DCP 2	.025	-0.707	2.759	356	0.524	264	0.381	333	0.063	214	0.079	302	0.014	318	0.046	310	0.018	150	0.053	299
DCP 3	.100	0.443	2.415	357	0.238	246	0.284	320	0.049	62	0.037	187	0.064	13	0.065	134	0.023	39	0.032	123
DCP 4	.250	0.211	1.123	356	0.027	357	0.091	251	0.044	114	0.039	95	0.043	279	0.012	306	0.026	181	0.010	198
DCP 5	.300	0.052	0.910	359	0.040	58	0.050	284	0.010	102	0.024	110	0.027	263	0.004	260	0.019	158	0.004	221
DCP 6	.400	0.042	0.651	356	0.023	31	0.021	287	0.022	201	0.006	193	0.012	245	0.005	264	0.009	111	0.001	145
DCP 7	.500	0.110	0.466	1	0.024	52	0.008	290	0.019	211	0.008	193	0.009	224	0.007	304	0.003	107	0.004	182
DCP 8	.600	0.013	0.359	0	0.017	53	0.007	248	0.015	211	0.006	163	0.008	199	0.006	280	0.002	34	0.004	155
DCP 9	.878	-0.007	0.222	359	0.047	57	0.013	145	0.003	47	0.006	73	0.004	168	0.002	229	0.003	139	0.002	197

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.016	239	0.013	272	0.012	220	0.007	232	0.009	235	0.016	262	0.015	229	0.008	285	0.008	293
CN		0.003	23	0.003	293	0.002	301	0.001	328	0.003	195	0.002	254	0.000	355	0.001	304	0.001	54
CM		0.001	72	0.000	139	0.000	18	0.000	234	0.001	258	0.000	30	0.000	102	0.001	212	0.000	303
DCP 1	.010	0.028	207	0.008	232	0.032	173	0.012	249	0.022	162	0.012	250	0.024	116	0.021	204	0.003	83
DCP 2	.025	0.030	25	0.034	276	0.037	5	0.018	273	0.024	340	0.012	277	0.023	356	0.015	237	0.021	339
DCP 3	.100	0.012	46	0.011	91	0.008	199	0.008	45	0.019	190	0.003	297	0.013	179	0.007	289	0.008	123
DCP 4	.250	0.016	79	0.002	318	0.009	298	0.007	207	0.012	222	0.004	254	0.008	46	0.005	21	0.002	297
DCP 5	.300	0.006	341	0.008	299	0.005	353	0.003	140	0.005	182	0.003	239	0.003	338	0.003	286	0.002	254
DCP 6	.400	0.004	271	0.005	238	0.003	213	0.002	47	0.001	16	0.002	228	0.002	230	0.001	219	0.001	2
DCP 7	.500	0.003	279	0.003	288	0.003	304	0.003	17	0.002	74	0.000	210	0.001	148	0.001	204	0.002	350
DCP 8	.600	0.003	241	0.003	327	0.002	188	0.002	257	0.002	26	0.001	175	0.001	302	0.002	75	0.002	129
DCP 9	.878	0.003	292	0.001	313	0.000	52	0.001	36	0.003	124	0.003	247	0.003	284	0.004	6	0.001	89

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	16.34	0.600	0.17	7.17		5098.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.042	650.3	1490.0	0.65E 07	-0.00049	0.903	7.52	0.0770

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		0.172	7.171	359	0.438	349	0.074	290	0.021	161	0.052	180	0.060	347	0.065	11	0.031	148	0.022	170
CN		0.044	0.829	357	0.046	272	0.064	311	0.037	184	0.003	186	0.011	321	0.002	1	0.008	88	0.005	129
CM		-0.008	0.005	293	0.019	248	0.010	334	0.002	54	0.001	260	0.002	6	0.001	117	0.000	241	0.001	276
DCP 1	.010	-1.041	2.575	354	0.877	259	0.389	325	0.196	224	0.073	278	0.100	236	0.061	308	0.060	178	0.063	254
DCP 2	.025	-0.683	2.746	357	0.546	261	0.403	330	0.073	226	0.107	3[illegible]	0.047	18	0.036	315	0.019	71	0.046	301
DCP 3	.100	0.429	2.457	356	0.221	255	0.278	323	0.057	56	0.046	177	0.068	6	0.053	121	0.037	43	0.041	113
DCP 4	.250	0.155	1.108	356	0.029	7	0.086	252	0.036	117	0.034	95	0.043	282	0.016	330	0.025	161	0.016	180
DCP 5	.300	0.067	0.893	359	0.035	62	0.051	281	0.003	287	0.014	98	0.026	270	0.004	358	0.022	139	0.003	222
DCP 6	.400	0.051	0.640	356	0.017	18	0.029	293	0.018	208	0.006	166	0.012	234	0.010	281	0.008	63	0.006	75
DCP 7	.500	0.081	0.451	2	0.010	48	0.016	285	0.020	226	0.006	229	0.006	249	0.009	331	0.006	80	0.005	142
DCP 8	.600	0.024	0.351	0	0.011	42	0.011	268	0.016	222	0.003	220	0.004	163	0.005	298	0.003	32	0.004	109
DCP 9	.878	0.006	0.219	0	0.047	54	0.013	156	0.003	268	0.004	33	0.001	66	0.001	296	0.002	54	0.004	91

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.014	214	0.009	267	0.011	196	0.004	250	0.009	238	0.013	265	0.014	228	0.006	299	0.005	341
CN		0.004	62	0.001	311	0.002	274	0.002	295	0.001	197	0.001	199	0.001	98	0.000	261	0.001	8
CM		0.001	6	0.001	42	0.001	104	0.000	232	0.000	349	0.000	106	0.000	149	0.000	234	0.000	317
DCP 1	.010	0.036	266	0.024	341	0.034	153	0.018	239	0.022	140	0.019	214	0.018	[illegible]	0.023	179	0.012	193
DCP 2	.025	0.039	33	0.023	289	0.035	9	0.017	288	0.032	5	0.009	230	0.021	331	0.011	266	0.029	353
DCP 3	.100	0.013	59	0.019	72	0.018	172	0.004	291	0.014	199	0.005	39	0.015	145	0.005	191	0.002	74
DCP 4	.250	0.014	75	0.006	323	0.014	292	0.008	263	0.003	226	0.008	119	0.005	100	0.004	326	0.005	292
DCP 5	.300	0.005	337	0.006	273	0.006	324	0.005	68	0.002	100	0.001	252	0.001	299	0.002	6	0.004	81
DCP 6	.400	0.001	261	0.005	232	0.002	198	0.002	80	0.001	255	0.002	271	0.001	30	0.001	51	0.000	214
DCP 7	.500	0.001	249	0.001	43	0.001	251	0.001	315	0.002	349	0.001	16	0.002	123	0.002	126	0.001	54
DCP 8	.600	0.002	140	0.002	213	0.001	271	0.001	318	0.002	129	0.002	195	0.002	291	0.003	352	0.001	129
DCP 9	.878	0.004	164	0.004	235	0.003	292	0.001	7	0.001	220	0.003	303	0.002	348	0.002	99	0.001	40

TUNED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	16.37	0.600	0.19	7.30		5098.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.042	646.9	1465.6	0.64E 07	-0.00047	0.928	7.88	0.0220

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		0.194	7.304	0	0.378	345	0.116	269	0.045	207	0.090	200	0.118	338	0.134	282	0.048	192	0.028	176
CN		0.041	0.838	356	0.049	271	0.061	335	0.010	183	0.008	179	0.012	298	0.014	257	0.003	94	0.005	127
CM		-0.010	0.005	272	0.019	245	0.010	328	0.001	12	0.002	273	0.003	354	0.002	116	0.000	115	0.001	244
DCP 1	.010	-1.038	2.590	353	0.906	257	0.379	318	0.232	233	0.080	295	0.090	233	0.071	273	0.069	155	0.047	219
DCP 2	.025	-0.710	2.796	354	0.549	263	0.400	329	0.075	224	0.097	296	0.035	1	0.074	255	0.008	66	0.037	262
DCP 3	.100	0.436	2.453	355	0.236	248	0.266	315	0.033	53	0.056	190	0.071	346	0.038	153	0.029	20	0.032	100
DCP 4	.250	0.119	1.119	355	0.032	349	0.087	248	0.038	117	0.034	100	0.043	278	0.032	283	0.023	180	0.016	144
DCP 5	.300	0.070	0.904	358	0.027	44	0.055	276	0.010	107	0.018	107	0.029	264	0.015	263	0.022	148	0.003	219
DCP 6	.400	0.044	0.650	355	0.023	1	0.025	291	0.020	187	0.010	166	0.013	235	0.018	256	0.004	128	0.003	0
DCP 7	.500	0.051	0.458	0	0.010	37	0.017	280	0.019	216	0.009	199	0.006	225	0.014	310	0.003	79	0.004	154
DCP 8	.600	0.019	0.361	359	0.017	35	0.007	247	0.018	212	0.007	199	0.005	186	0.013	288	0.003	348	0.003	79
DCP 9	.878	0.030	0.228	358	0.048	52	0.014	148	0.031	29	0.010	76	0.006	168	0.010	260	0.003	333	0.003	90

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.023	194	0.014	244	0.021	185	0.016	200	0.018	212	0.013	264	0.017	216	0.013	254	0.012	203
CN		0.003	6	0.002	234	0.002	242	0.001	261	0.001	182	0.001	230	0.001	30	0.001	198	0.002	239
CM		0.001	58	0.000	47	0.001	313	0.000	274	0.000	317	0.000	190	0.000	215	0.001	275	0.001	38
DCP 1	.010	0.038	189	0.030	232	0.019	166	0.016	229	0.010	113	0.014	204	0.009	103	0.011	199	0.010	0
DCP 2	.025	0.026	357	0.019	227	0.027	327	0.024	220	0.026	319	0.021	226	0.018	317	0.013	234	0.016	276
DCP 3	.100	0.012	48	0.012	74	0.011	187	0.008	351	0.015	180	0.006	304	0.005	137	0.001	267	0.006	91
DCP 4	.250	0.014	63	0.009	294	0.014	296	0.003	215	0.009	156	0.006	126	0.004	11	0.004	311	0.005	246
DCP 5	.300	0.011	323	0.008	256	0.004	225	0.003	13	0.004	40	0.003	135	0.004	199	0.004	266	0.002	274
DCP 6	.400	0.008	310	0.004	228	0.002	123	0.003	33	0.002	4	0.001	184	0.001	225	0.002	168	0.001	214
DCP 7	.500	0.002	286	0.002	207	0.003	202	0.002	287	0.003	350	0.001	45	0.002	130	0.002	209	0.002	239
DCP 8	.600	0.002	355	0.002	204	0.001	111	0.001	274	0.002	44	0.001	80	0.002	88	0.004	138	0.004	224
DCP 9	.878	0.003	217	0.003	221	0.003	141	0.003	127	0.003	194	0.003	302	0.004	11	0.002	74	0.001	225

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
26.0	15.75	0.600	7.38	6.91		5099.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.040	653.0	1475.4	0.64E 07	-0.00093	1.197	10.33	0.0800

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		7.379	6.912	0	0.511	30	0.106	155	0.052	149	0.025	153	0.037	95	0.017	208	0.123	340	0.118	252
CN		0.707	0.561	0	0.189	60	0.029	61	0.016	41	0.013	36	0.007	318	0.002	298	0.014	340	0.021	271
CM		-0.026	0.023	216	0.019	93	0.002	116	0.005	85	0.001	95	0.002	102	0.001	70	0.002	149	0.003	53
DCP 1	.010	1.111	2.792	353	0.808	56	0.225	122	0.033	152	0.013	229	0.007	19	0.016	214	0.045	30[illegible]	[illegible].036	187
DCP 2	.025	1.538	2.250	355	0.611	58	0.114	123	0.059	65	0.026	116	0.015	81	0.021	131	0.018	281	[illegible].050	237
DCP 3	.100	1.961	1.045	351	0.796	75	0.085	61	0.117	70	0.054	67	0.009	21	0.007	82	0.012	23	[illegible].038	321
DCP 4	.250	1.123	0.693	1	0.261	61	0.082	27	0.036	43	0.049	351	0.016	33	0.033	335	0.033	2	[illegible].046	296
DCP 5	.300	0.804	0.634	5	0.187	52	0.061	44	0.030	347	0.036	3	0.028	300	0.013	334	0.036	340	0.042	297
DCP 6	.400	0.636	0.522	4	0.114	39	0.030	42	0.019	290	0.009	23	0.019	274	0.008	177	0.022	333	0.029	252
DCP 7	.500	0.549	0.402	8	0.093	32	0.018	38	0.023	319	0.007	312	0.013	286	0.008	252	0.013	323	0.022	257
DCP 8	.600	0.360	0.314	7	0.051	21	0.006	119	0.007	245	0.010	107	0.007	335	0.004	199	0.012	331	0.019	234
DCP 9	.878	0.219	0.211	7	0.028	311	0.003	282	0.011	268	0.001	328	0.005	268	0.004	252	0.004	321	0.010	237

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.055	188	0.026	178	0.012	221	0.014	239	0.015	221	0.005	149	0.005	206	0.007	269	0.010	248
CN		0.009	245	0.008	231	0.002	217	0.005	243	0.003	237	0.003	187	0.002	139	0.001	232	0.002	199
CM		0.002	354	0.001	1	0.001	320	0.001	320	0.001	281	0.000	300	0.001	255	0.001	137	0.001	343
DCP 1	.010	0.011	145	0.018	197	0.005	239	0.002	202	0.006	234	0.004	255	0.003	301	0.005	242	0.002	252
DCP 2	.025	0.022	325	0.007	144	0.008	133	0.004	294	0.005	307	0.009	138	0.005	171	0.006	235	0.008	216
DCP 3	.100	0.030	265	0.017	241	0.010	313	0.015	282	0.021	271	0.008	205	0.009	251	0.012	167	0.004	40
DCP 4	.250	0.009	289	0.021	289	0.006	335	0.016	299	0.009	273	0.005	321	0.012	325	0.010	290	0.013	290
DCP 5	.300	0.028	276	0.029	260	0.017	253	0.022	248	0.015	221	0.013	215	0.013	181	0.009	150	0.001	167
DCP 6	.400	0.014	205	0.008	213	0.005	225	0.009	214	0.007	185	0.007	204	0.009	161	0.005	119	0.004	154
DCP 7	.500	0.014	216	0.013	197	0.008	190	0.012	172	0.009	114	0.006	155	0.013	103	0.007	29	0.002	151
DCP 8	.600	0.007	183	0.008	176	0.004	94	0.005	188	0.006	103	0.001	25	0.004	116	0.002	326	0.003	154
DCP 9	.878	0.006	181	0.004	181	0.006	135	0.004	84	0.002	326	0.003	122	0.005	34	0.005	281	0.004	170

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA:C	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	15.92	0.600	7.39	6.97		5099.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.041	649.2	1464.9	0.64E 07	-0.00084	1.175	10.84	0.0770

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		7.387	6.965	0	0.505	27	0.103	158	0.047	148	0.031	150	0.048	78	0.021	223	0.133	313	0.106	232
CN		0.685	0.568	359	0.184	59	0.028	57	0.015	39	0.014	47	0.014	314	0.002	210	0.018	309	0.019	247
CM		-0.023	0.022	215	0.019	87	0.001	121	0.005	96	0.002	82	0.002	80	0.001	32	0.002	141	0.003	30
DCP 1	.010	1.099	2.826	353	0.830	56	0.216	121	0.035	167	0.018	241	0.016	328	0.016	184	0.052	277	0.033	165
DCP 2	.025	1.533	2.280	355	0.604	57	0.102	119	0.063	65	0.028	126	0.015	26	0.023	114	0.039	248	0.042	208
DCP 3	.100	1.957	1.080	351	0.790	73	0.069	39	0.119	76	0.073	71	0.032	357	0.012	97	0.016	328	0.037	307
DCP 4	.250	1.010	0.699	1	0.247	58	0.084	27	0.016	16	0.053	14	0.032	323	0.023	324	0.035	322	0.035	282
DCP 5	.300	0.796	0.624	4	0.178	51	0.059	44	0.032	339	0.024	11	0.029	314	0.019	309	0.037	313	0.039	272
DCP 6	.400	0.625	0.519	3	0.116	39	0.029	47	0.020	303	0.011	20	0.028	288	0.013	210	0.025	299	0.028	216
DCP 7	.500	0.483	0.401	6	0.082	36	0.022	43	0.022	316	0.003	341	0.018	288	0.008	203	0.023	315	0.028	226
DCP 8	.600	0.356	0.316	6	0.047	20	0.013	135	0.006	318	0.003	198	0.005	280	0.007	168	0.016	329	0.021	223
DCP 9	.878	0.218	0.214	6	0.029	293	0.002	347	0.010	279	0.002	237	0.007	266	0.003	190	0.007	293	0.009	203

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.049	168	0.020	177	0.013	258	0.017	247	0.014	210	0.005	154	0.011	255	0.009	285	0.011	260
CN		0.008	226	0.007	224	0.002	209	0.005	228	0.002	223	0.002	213	0.001	325	0.001	258	0.001	192
CM		0.002	303	0.002	355	0.002	280	0.001	245	0.001	262	0.001	198	0.001	138	0.001	43	0.000	234
DCP 1	.010	0.009	188	0.017	197	0.005	256	0.004	281	0.007	231	0.005	262	0.009	283	0.008	274	0.001	219
DCP 2	.025	0.026	293	0.009	110	0.004	130	0.002	187	0.010	264	0.003	216	0.007	54	0.003	122	0.011	237
DCP 3	.100	0.031	227	0.015	323	0.030	281	0.028	223	0.012	272	0.019	216	0.010	163	0.007	59	0.006	194
DCP 4	.250	0.016	268	0.018	265	0.005	261	0.010	291	0.012	282	0.007	265	0.008	309	0.010	288	0.010	264
DCP 5	.300	0.028	252	0.025	235	0.017	218	0.017	222	0.016	203	0.014	187	0.011	164	0.012	133	0.010	91
DCP 6	.400	0.003	218	0.019	218	0.010	156	0.007	195	0.009	146	0.006	103	0.006	48	0.005	296	0.004	156
DCP 7	.500	0.009	177	0.016	196	0.013	127	0.006	173	0.010	120	0.007	63	0.005	24	0.003	335	0.001	57
DCP 8	.600	0.007	128	0.007	173	0.009	76	0.004	330	0.002	182	0.003	51	0.006	333	0.004	246	0.001	91
DCP 9	.878	0.005	141	0.004	127	0.003	87	0.003	105	0.005	30	0.004	313	0.003	260	0.002	160	0.001	18

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	16.00	0.600	7.39	7.04		5099.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.041	646.0	1463.7	0.64E 07	-0.00089	1.176	10.72	0.0220

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		7.388	7.043	0	0.357	41	0.206	182	0.077	187	0.061	187	0.032	328	0.104	50	0.260	262	0.153	198
CN		0.682	0.574	359	0.177	61	0.022	69	0.035	8	0.005	7	0.020	274	0.010	77	0.031	277	0.026	218
CM		-0.027	0.021	215	0.021	88	0.001	85	0.004	80	0.001	41	0.002	2	0.000	154	0.004	102	0.005	346
DCP 1	.010	1.079	2.856	352	0.819	58	0.227	133	0.061	199	0.046	232	0.047	272	0.029	31	0.075	230	0.035	155
DCP 2	.025	1.516	2.324	355	0.592	61	0.130	139	0.031	114	0.030	223	0.029	305	0.061	75	0.081	228	0.056	206
DCP 3	.100	1.946	1.087	352	0.786	76	0.075	45	0.092	68	0.043	61	0.054	285	0.034	98	0.036	298	0.065	277
DCP 4	.250	0.976	0.711	0	0.238	60	0.077	24	0.018	315	0.044	355	0.042	281	0.016	2	0.050	297	0.043	250
DCP 5	.300	0.798	0.638	4	0.163	52	0.048	46	0.033	316	0.023	337	0.044	284	0.005	262	0.049	285	0.046	232
DCP 6	.400	0.620	0.526	3	0.115	38	0.009	32	0.017	251	0.007	15	0.028	263	0.010	105	0.042	280	0.038	199
DCP 7	.500	0.452	0.403	6	0.076	31	0.009	19	0.020	275	0.006	231	0.016	258	0.006	127	0.033	274	0.036	190
DCP 8	.600	0.356	0.320	5	0.043	24	0.017	142	0.036	296	0.006	187	0.005	245	0.005	91	0.025	276	0.026	176
DCP 9	.878	0.246	0.211	6	0.034	284	0.002	216	0.013	244	0.007	212	0.007	182	0.006	38	0.016	270	0.015	174

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.030	157	0.013	202	0.031	282	0.031	260	0.012	273	0.013	284	0.013	274	0.011	292	0.017	300
CN		0.007	188	0.004	222	0.004	263	0.008	203	0.002	134	0.002	229	0.002	327	0.001	181	0.001	49
CM		0.002	262	0.002	327	0.002	218	0.000	54	0.001	252	0.001	165	0.000	135	0.000	185	0.001	173
DCP 1	.010	0.009	237	0.011	211	0.015	276	0.011	305	0.004	273	0.007	240	0.007	270	0.003	342	0.005	339
DCP 2	.025	0.029	307	0.013	85	0.006	103	0.014	223	0.012	223	0.011	292	0.009	339	0.008	223	0.002	341
DCP 3	.100	0.041	197	0.025	309	0.038	254	0.028	203	0.010	209	0.016	165	0.006	41	0.004	10	0.007	134
DCP 4	.250	0.012	221	0.019	284	0.020	250	0.010	208	0.010	273	0.011	249	0.012	258	0.014	204	0.005	165
DCP 5	.300	0.020	217	0.021	214	0.013	205	0.018	196	0.017	159	0.008	124	0.002	111	0.007	138	0.006	68
DCP 6	.400	0.009	172	0.018	177	0.011	111	0.005	122	0.005	101	0.002	58	0.003	87	0.007	66	0.005	17
DCP 7	.500	0.010	99	0.007	197	0.005	146	0.009	138	0.010	57	0.004	331	0.006	12	0.004	301	0.001	342
DCP 8	.600	0.007	96	0.008	139	0.011	27	0.005	236	0.006	83	0.005	314	0.001	244	0.003	39	0.004	349
DCP 9	.878	0.003	89	0.004	121	0.006	358	0.003	245	0.004	78	0.000	34	0.003	321	0.002	254	0.001	3

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	16.08	0.600	9.96	6.82		5100.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.041	655.2	1468.0	0.63E 07	-0.00096	1.210	15.06	0.0800

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		9.956	6.816	0	0.544	23	0.114	156	0.033	195	0.043	175	0.044	186	0.063	142	0.113	142	0.099	44
CN		0.861	0.381	5	0.155	67	0.045	92	0.014	117	0.018	121	0.015	77	0.006	107	0.021	143	0.024	67
CM		-0.037	0.041	197	0.014	95	0.007	156	0.001	96	0.003	169	0.001	52	0.001	261	0.002	287	0.004	209
DCP 1	.010	2.012	1.916	355	0.535	59	0.179	102	0.020	152	0.014	121	0.004	202	0.006	109	0.034	117	0.020	341
DCP 2	.025	2.132	1.514	357	0.467	66	0.143	133	0.035	222	0.038	153	0.021	30	0.026	287	0.043	184	0.015	75
DCP 3	.100	2.260	0.302	351	0.672	75	0.202	136	0.065	123	0.060	159	0.076	85	0.016	324	0.038	159	0.053	97
DCP 4	.200	1.447	0.364	10	0.310	78	0.120	103	0.041	85	0.130	136	0.033	53	0.063	133	0.053	175	0.055	101
DCP 5	.250	1.309	0.442	11	0.259	69	0.065	78	0.070	88	0.038	116	0.049	70	0.028	136	0.036	129	0.039	92
DCP 6	.300	0.996	0.457	12	0.186	75	0.089	56	0.025	106	0.034	80	0.035	71	0.011	117	0.042	125	0.040	83
DCP 7	.400	0.792	0.425	10	0.108	52	0.047	49	0.013	70	0.017	21	0.012	70	0.009	7	0.022	125	0.030	46
DCP 8	.500	0.696	0.345	12	0.059	47	0.031	62	0.009	102	0.017	34	0.005	83	0.012	48	0.013	107	0.026	31
DCP 9	.600	0.472	0.303	10	0.037	19	0.015	31	0.013	216	0.006	54	0.009	197	0.008	92	0.015	125	0.024	36
DCP10	.878	0.281	0.237	8	0.022	316	0.018	343	0.004	275	0.006	319	0.001	240	0.002	247	0.011	131	0.015	43

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.042	337	0.014	3	0.003	260	0.015	25	0.011	316	0.005	132	0.003	174	0.005	313	0.012	303
CN		0.003	55	0.005	59	0.001	346	0.001	109	0.003	348	0.002	277	0.001	250	0.005	73	0.006	332
CM		0.002	151	0.001	159	0.001	105	0.001	304	0.001	216	0.001	115	0.001	11	0.001	260	0.001	173
DCP 1	.010	0.011	83	0.009	338	0.003	274	0.007	252	0.005	237	0.002	243	0.002	224	0.004	63	0.003	323
DCP 2	.025	0.008	81	0.009	78	0.002	329	0.014	306	0.015	284	0.006	206	0.008	169	0.011	167	0.004	25
DCP 3	.100	0.029	85	0.016	94	0.017	69	0.008	69	0.008	20	0.008	2	0.006	10	0.005	69	0.009	340
DCP 4	.200	0.025	205	0.011	221	0.015	259	0.019	247	0.016	291	0.012	211	0.017	337	0.013	11	0.021	328
DCP 5	.250	0.007	199	0.018	153	0.012	162	0.007	197	0.002	268	0.015	265	0.009	252	0.010	289	0.014	273
DCP 6	.300	0.019	102	0.020	96	0.011	102	0.012	106	0.007	106	0.004	116	0.003	101	0.005	356	0.009	270
DCP 7	.400	0.003	37	0.016	72	0.010	15	0.003	29	0.004	153	0.006	86	0.002	177	0.008	132	0.007	131
DCP 8	.500	0.008	325	0.007	25	0.001	346	0.007	91	0.009	29	0.006	320	0.003	223	0.007	100	0.008	9
DCP 9	.600	0.006	355	0.011	337	0.015	278	0.006	43	0.007	323	0.005	274	0.004	208	0.011	73	0.011	321
DCP10	.878	0.009	338	0.006	305	0.003	281	0.005	189	0.004	55	0.003	293	0.002	166	0.004	79	0.005	17

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	16.16	0.600	10.01	6.95		5100.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.042	648.2	1454.4	0.63E 07	-0.00086	1.187	15.89	0.0750

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		10.005	6.855	0	0.487	31	0.143	163	0.053	185	0.071	176	0.064	169	0.076	142	0.128	111	0.084	15
CN		0.829	0.379	5	0.160	57	0.041	95	0.017	116	0.013	116	0.018	88	0.006	84	0.019	110	0.016	34
CM		-0.035	0.039	198	0.012	90	0.007	159	0.002	90	0.003	173	0.001	107	0.001	178	0.002	270	0.003	173
DCP 1	.010	2.027	1.941	355	0.531	57	0.172	108	0.029	175	0.017	143	0.010	162	0.004	313	0.030	82	0.020	295
DCP 2	.025	2.153	1.582	354	0.488	54	0.144	93	0.061	239	0.059	147	0.023	82	0.012	277	0.021	83	0.019	320
DCP 3	.100	2.241	0.304	352	0.667	63	0.214	143	0.099	110	0.048	153	0.079	99	0.015	32	0.032	85	0.041	61
DCP 4	.200	1.263	0.377	11	0.291	70	0.124	117	0.072	97	0.091	142	0.066	108	0.062	133	0.069	171	0.037	105
DCP 5	.250	1.180	0.438	14	0.260	65	0.055	72	0.072	98	0.028	101	0.049	83	0.017	120	0.031	115	0.016	98
DCP 6	.300	0.989	0.447	10	0.195	63	0.078	44	0.028	80	0.021	42	0.038	72	0.015	42	0.042	99	0.040	54
DCP 7	.400	0.782	0.413	11	0.116	48	0.043	40	0.004	127	0.012	27	0.013	97	0.005	42	0.031	102	0.024	23
DCP 8	.500	0.604	0.340	10	0.074	39	0.036	46	0.004	33	0.015	20	0.006	47	0.007	21	0.022	71	0.027	350
DCP 9	.600	0.464	0.288	10	0.038	19	0.014	53	0.011	225	0.006	64	0.004	146	0.005	32	0.012	121	0.018	22
DCP10	.878	0.282	0.232	6	0.025	331	0.020	345	0.005	233	0.009	352	0.005	323	0.002	305	0.008	80	0.011	337

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.030	300	0.006	275	0.004	197	0.003	344	0.010	243	0.006	156	0.010	231	0.004	209	0.004	238
CN		0.004	76	0.002	324	0.003	121	0.004	355	0.001	9	0.002	14	0.005	311	0.002	217	0.002	49
CM		0.001	137	0.002	132	0.001	140	0.001	101	0.000	137	0.001	92	0.000	263	0.000	124	0.000	156
DCP 1	.010	0.007	119	0.006	305	0.003	204	0.010	309	0.006	258	0.006	236	0.007	214	0.004	155	0.002	87
DCP 2	.025	0.010	51	0.012	260	0.006	195	0.010	355	0.006	170	0.004	80	0.016	303	0.013	164	0.014	77
DCP 3	.100	0.012	31	0.014	103	0.018	93	0.016	56	0.009	72	0.027	42	0.022	320	0.002	223	0.001	62
DCP 4	.200	0.049	155	0.024	192	0.028	160	0.013	247	0.007	315	0.003	177	0.012	295	0.007	230	0.002	302
DCP 5	.250	0.015	178	0.012	150	0.020	199	0.010	155	0.007	219	0.006	288	0.016	262	0.007	239	0.010	294
DCP 6	.300	0.029	49	0.019	32	0.014	67	0.019	38	0.008	3	0.003	80	0.002	295	0.011	159	0.011	100
DCP 7	.400	0.010	71	0.008	20	0.010	95	0.009	56	0.008	55	0.000	2	0.007	84	0.003	289	0.008	148
DCP 8	.500	0.008	8	0.016	333	0.005	341	0.010	330	0.003	273	0.003	350	0.003	311	0.001	124	0.005	10
DCP 9	.600	0.006	347	0.009	329	0.001	357	0.006	344	0.005	321	0.004	254	0.002	28	0.002	317	0.004	343
DCP10	.878	0.006	286	0.007	263	0.005	302	0.008	250	0.003	145	0.003	324	0.002	317	0.002	271	0.001	337

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	15.21	0.600	10.00	6.96		5100.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.042	645.7	1452.2	0.63E 07	-0.00088	1.20	15.57	0.0220

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		10.002	6.958	0	0.471	31	0.179	171	0.073	175	0.073	157	0.092	162	0.143	162	0.143	62	0.089	341
CN		0.831	0.386	7	0.154	61	0.044	112	0.019	112	0.013	139	0.017	90	0.013	176	0.025	90	0.014	8
CM		-0.038	0.039	198	0.013	92	0.007	162	0.002	103	0.003	166	0.001	72	0.001	254	0.004	243	0.004	156
DCP 1	.010	2.007	1.943	354	0.555	58	0.173	104	0.031	204	0.028	165	0.018	116	0.028	176	0.026	26	0.022	261
DCP 2	.025	2.149	1.531	356	0.466	63	0.137	110	0.046	226	0.044	162	0.007	24	0.036	213	0.020	86	0.011	284
DCP 3	.100	2.249	0.332	2	0.674	67	0.237	149	0.088	101	0.045	169	0.075	83	0.029	222	0.040	87	0.028	58
DCP 4	.200	1.247	0.399	17	0.284	77	0.160	126	0.097	113	0.104	148	0.050	117	0.081	160	0.064	151	0.031	126
DCP 5	.250	1.175	0.468	11	0.247	64	0.050	96	0.082	91	0.027	125	0.053	70	0.039	180	0.050	97	0.012	86
DCP 6	.300	0.998	0.460	11	0.177	67	0.061	72	0.038	94	0.022	85	0.051	74	0.002	183	0.054	95	0.032	39
DCP 7	.400	0.778	0.421	10	0.110	46	0.038	50	0.007	123	0.012	47	0.012	85	0.009	150	0.040	78	0.028	359
DCP 8	.500	0.580	0.344	11	0.073	47	0.031	49	0.006	17	0.014	347	0.005	73	0.007	334	0.020	66	0.029	345
DCP 9	.600	0.462	0.295	11	0.041	16	0.013	61	0.010	239	0.003	28	0.010	186	0.010	114	0.020	64	0.022	343
DCP10	.878	0.312	0.234	8	0.020	319	0.016	350	0.006	265	0.005	322	0.003	320	0.004	201	0.013	69	0.013	327

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.036	260	0.019	218	0.007	163	0.009	289	0.018	254	0.012	221	0.010	197	0.003	263	0.011	257
CN		0.001	91	0.003	313	0.003	130	0.004	310	0.005	225	0.002	103	0.004	316	0.002	191	0.002	3
CM		0.001	129	0.001	120	0.001	156	0.002	123	0.001	43	0.001	7	0.001	358	0.001	333	0.000	219
DCP 1	.010	0.012	21	0.011	286	0.009	186	0.003	192	0.003	200	0.009	249	0.007	217	0.003	128	0.003	19
DCP 2	.025	0.011	41	0.007	346	0.014	196	0.009	248	0.003	156	0.004	268	0.008	244	0.007	125	0.004	130
DCP 3	.100	0.010	97	0.016	80	0.013	97	0.009	46	0.007	253	0.018	79	0.024	350	0.009	256	0.005	9
DCP 4	.200	0.037	180	0.015	228	0.015	157	0.006	255	0.008	274	0.009	82	0.017	343	0.002	264	0.006	0
DCP 5	.250	0.010	171	0.014	165	0.023	180	0.010	150	0.015	174	0.005	32	0.011	292	0.017	268	0.014	219
DCP 6	.300	0.020	59	0.004	39	0.017	92	0.016	359	0.009	254	0.001	270	0.006	324	0.009	281	0.007	281
DCP 7	.400	0.006	49	0.008	36	0.008	52	0.006	13	0.001	10	0.003	152	0.004	70	0.003	69	0.004	8
DCP 8	.500	0.011	302	0.009	293	0.008	280	0.009	248	0.004	229	0.004	234	0.004	235	0.005	125	0.005	341
DCP 9	.600	0.007	316	0.009	301	0.003	342	0.010	288	0.006	186	0.004	332	0.007	243	0.009	134	0.006	37
DCP10	.878	0.002	290	0.005	300	0.000	27	0.006	320	0.009	236	0.007	158	0.003	116	0.004	205	0.001	104

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	15.95	0.600	12.36	6.70		5101.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.041	651.6	1460.4	0.63E 07	-0.00107	1.264	16.20	0.0800

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		12.364	6.701	0	0.444	19	0.094	161	0.049	248	0.005	271	0.040	256	0.063	284	0.036	315	0.059	218
CN		0.994	0.221	17	0.122	77	0.036	110	0.020	231	0.010	165	0.014	257	0.013	248	0.010	313	0.016	227
CM		-0.049	0.056	193	0.006	135	0.007	151	0.004	268	0.000	168	0.002	261	0.000	332	0.000	60	0.002	3
DCP 1	.010	2.589	1.192	357	0.410	73	0.095	84	0.024	197	0.021	324	0.024	224	0.008	183	0.027	325	0.015	195
DCP 2	.025	2.625	0.827	356	0.437	85	0.141	54	0.038	249	0.036	351	0.042	282	0.038	240	0.012	293	0.016	205
DCP 3	.100	2.394	0.380	169	0.304	83	0.189	135	0.096	253	0.078	156	0.049	261	0.035	239	0.029	290	0.042	267
DCP 4	.200	1.685	0.107	66	0.241	92	0.158	149	0.149	242	0.038	305	0.075	278	0.038	287	0.067	1	0.030	201
DCP 5	.250	1.460	0.239	34	0.241	74	0.103	139	0.024	224	0.034	147	0.047	239	0.041	292	0.012	12	0.026	263
DCP 6	.300	1.113	0.256	24	0.205	83	0.069	118	0.017	133	0.051	160	0.046	223	0.029	237	0.031	246	0.045	267
DCP 7	.400	0.909	0.326	19	0.120	67	0.031	41	0.011	85	0.023	167	0.010	90	0.012	187	0.013	299	0.026	216
DCP 8	.500	0.794	0.293	20	0.069	64	0.019	65	0.032	107	0.007	111	0.015	112	0.004	193	0.006	234	0.021	191
DCP 9	.600	0.573	0.283	14	0.040	37	0.030	349	0.011	244	0.008	272	0.002	69	0.007	229	0.004	290	0.014	188
DCP10	.878	0.364	0.254	8	0.017	12	0.018	349	0.009	100	0.005	46	0.005	22	0.002	213	0.003	353	0.004	201

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.017	136	0.010	48	0.001	276	0.008	59	0.010	242	0.010	140	0.002	95	0.002	115	0.004	233
CN		0.002	176	0.003	298	0.002	280	0.005	26	0.007	317	0.003	144	0.005	25	0.004	327	0.005	281
CM		0.001	230	0.001	133	0.001	96	0.000	186	0.001	83	0.001	316	0.000	222	0.000	183	0.001	16
DCP 1	.010	0.005	307	0.015	291	0.021	242	0.020	153	0.015	93	0.014	24	0.007	313	0.009	230	0.008	172
DCP 2	.025	0.015	214	0.018	143	0.009	75	0.009	55	0.004	69	0.009	55	0.004	210	0.005	131	0.008	8
DCP 3	.100	0.023	231	0.017	300	0.013	255	0.006	2	0.022	303	0.014	184	0.020	29	0.022	334	0.024	301
DCP 4	.200	0.018	173	0.009	240	0.006	144	0.008	8	0.025	349	0.006	127	0.022	23	0.023	282	0.015	313
DCP 5	.250	0.023	81	0.019	86	0.007	122	0.011	151	0.004	107	0.011	238	0.008	278	0.004	229	0.006	288
DCP 6	.300	0.015	280	0.014	323	0.018	315	0.019	46	0.015	338	0.004	157	0.006	55	0.003	223	0.008	199
DCP 7	.400	0.004	85	0.008	335	0.008	322	0.009	4	0.006	300	0.006	93	0.005	150	0.014	81	0.005	323
DCP 8	.500	0.006	101	0.005	219	0.005	47	0.010	347	0.010	292	0.003	341	0.006	264	0.004	104	0.002	69
DCP 9	.600	0.005	53	0.004	269	0.003	159	0.007	24	0.005	296	0.001	58	0.005	31	0.014	341	0.013	243
DCP10	.878	0.002	37	0.004	334	0.005	267	0.002	187	0.002	235	0.008	147	0.004	39	0.002	209	0.002	104

TUNED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	16.05	0.600	12.38	6.75		5101.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.042	645.0	1452.9	0.63E 07	-0.00102	1.215	15.68	0.0720

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		12.381	6.747	0	0.426	26	0.126	170	0.077	222	0.033	207	0.042	238	0.010	245	0.108	255	0.057	182
CN		0.063	0.229	18	0.121	73	0.027	171	0.017	188	0.011	155	0.011	256	0.007	253	0.014	269	0.006	211
CM		-0.047	0.054	194	0.005	119	0.005	162	0.004	256	0.001	128	0.003	284	0.001	195	0.002	53	0.002	345
DCP 1	.010	2.614	1.217	358	0.429	71	0.090	58	0.058	238	0.028	211	0.028	194	0.015	81	0.018	247	0.013	185
DCP 2	.025	2.652	0.873	357	0.455	79	0.136	34	0.065	228	0.037	62	0.052	308	0.033	236	0.025	185	0.014	14
DCP 3	.100	2.427	0.340	168	0.327	72	0.197	156	0.033	216	0.046	145	0.051	288	0.033	220	0.031	275	0.024	251
DCP 4	.200	1.439	0.149	61	0.234	88	0.143	159	0.133	219	0.047	281	0.061	260	0.057	296	0.057	359	0.024	23
DCP 5	.250	1.324	0.248	29	0.215	77	0.088	156	0.032	187	0.060	146	0.049	248	0.018	340	0.029	284	0.021	297
DCP 6	.300	1.120	0.300	25	0.195	78	0.034	86	0.033	116	0.037	160	0.035	207	0.029	167	0.024	258	0.026	250
DCP 7	.400	0.898	0.326	20	0.093	67	0.027	45	0.016	149	0.019	140	0.004	182	0.006	211	0.027	253	0.020	214
DCP 8	.500	0.703	0.294	18	0.075	66	0.031	47	0.021	77	0.007	119	0.013	113	0.012	78	0.015	262	0.015	174
DCP 9	.600	0.563	0.268	15	0.027	45	0.017	15	0.037	132	0.004	261	0.010	107	0.001	279	0.012	238	0.016	156
DCP10	.878	0.368	0.246	8	0.022	22	0.014	336	0.012	84	0.002	358	0.004	62	0.007	292	0.010	226	0.005	164

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.036	131	0.003	102	0.012	296	0.017	172	0.016	153	0.009	196	0.014	201	0.006	132	0.008	121
CN		0.005	232	0.004	80	0.003	358	0.005	290	0.001	196	0.004	27	0.002	243	0.002	199	0.004	72
CM		0.001	311	0.001	159	0.001	43	0.001	72	0.001	302	0.000	180	0.001	345	0.000	18	0.001	199
DCP 1	.010	0.011	187	0.010	24	0.006	159	0.003	137	0.006	256	0.00[illegible]	200	0.010	129	0.007	96	0.006	27
DCP 2	.025	0.025	261	0.013	156	0.001	73	0.016	168	0.024	93	0.03[illegible]	18	0.019	298	0.013	230	0.004	22
DCP 3	.100	0.029	251	0.027	1[illegible]	0.034	29	0.018	338	0.009	304	0.01[illegible]	29	0.009	310	0.003	174	0.012	136
DCP 4	.200	0.039	353	0.017	[illegible]3	0.011	37	0.009	349	0.002	5	0.00[illegible]	142	0.010	90	0.002	40	0.003	165
DCP 5	.250	0.013	60	0.01[illegible]	88	0.013	77	0.002	129	0.012	224	0.00[illegible]	74	0.016	265	0.005	183	0.007	128
DCP 6	.300	0.019	258	0.011	273	0.013	290	0.011	298	0.012	257	0.0[illegible]3	82	0.002	261	0.005	6	0.002	344
DCP 7	.400	0.008	320	0.008	336	0.007	276	0.007	334	0.004	258	0.004	38	0.004	228	0.006	157	0.012	98
DCP 8	.500	0.013	181	0.010	79	0.008	280	0.005	260	0.002	292	0.008	287	0.004	177	0.002	3	0.006	39
DCP 9	.600	0.003	109	0.002	3	0.005	197	0.007	301	0.007	241	0.005	218	0.002	216	0.009	196	0.014	56
DCP10	.878	0.003	158	0.001	349	0.001	190	0.009	231	0.012	97	0.00[illegible]	27	0.002	155	0.003	343	0.005	283

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	16.13	0.600	12.40	6.84		5101.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.042	644.0	1453.4	0.635 07	-0.00085	1.187	16.32	0.0220

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	HI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		12.325	6.842	0	0.372	26	0.168	175	0.078	225	0.066	222	0.061	262	0.080	328	0.201	204	0.069	140
CN		0.015	0.227	16	0.122	57	0.027	133	0.015	199	0.019	143	0.014	231	0.005	356	0.024	232	0.007	167
CM		-0.053	0.054	191	0.006	118	0.006	156	0.002	273	0.001	179	0.002	254	0.001	93	0.003	15	0.002	279
DCP 1	.010	2.608	1.243	356	0.411	76	0.118	76	0.037	266	0.048	239	0.049	202	0.025	40	0.013	168	0.017	273
DCP 2	.025	2.630	0.862	357	0.469	70	0.120	22	0.053	230	0.032	284	0.054	215	0.039	20	0.048	247	0.051	183
DCP 3	.100	2.388	0.393	160	0.369	64	0.171	144	0.073	235	0.097	139	0.071	250	0.036	107	0.058	273	0.037	192
DCP 4	.200	0.821	0.103	31	0.175	83	0.127	144	0.051	195	0.036	131	0.035	243	0.048	321	0.028	259	0.020	341
DCP 5	.250	1.302	0.253	34	0.238	75	0.091	144	0.011	167	0.051	155	0.045	255	0.026	4	0.031	257	0.025	7
DCP 6	.300	1.113	0.288	21	0.188	76	0.050	93	0.024	106	0.050	147	0.024	188	0.007	146	0.044	219	0.015	245
DCP 7	.400	0.809	0.325	19	0.107	71	0.033	49	0.016	151	0.026	142	0.002	94	0.010	251	0.037	214	0.010	177
DCP 8	.500	0.682	0.295	17	0.069	58	0.031	41	0.013	106	0.016	120	0.014	86	0.005	28	0.023	191	0.011	118
DCP 9	.600	0.566	0.278	14	0.032	30	0.025	346	0.016	211	0.002	311	0.005	263	0.008	251	0.020	209	0.007	144
DCP10	.878	0.398	0.245	6	0.029	5	0.015	342	0.007	87	0.005	354	0.006	108	0.005	345	0.012	223	0.011	112

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.022	117	0.017	169	0.016	190	0.024	166	0.016	144	0.013	134	0.011	179	0.007	134	0.017	180
CN		0.004	164	0.004	300	0.004	47	0.004	234	0.005	71	0.004	355	0.001	107	0.003	352	0.001	54
CM		0.001	66	0.002	39	0.000	14	0.002	354	0.001	182	0.001	27	0.002	328	0.001	189	0.000	338
DCP 1	.010	0.023	195	0.012	170	0.010	96	0.002	40	0.002	242	0.008	156	0.007	113	0.005	348	0.006	273
DCP 2	.025	0.036	100	0.021	1	0.010	333	0.021	234	0.023	145	0.027	50	0.014	306	0.009	212	0.002	188
DCP 3	.100	0.013	228	0.006	70	0.007	337	0.013	321	0.005	140	0.022	358	0.007	320	0.015	307	0.006	99
DCP 4	.200	0.036	92	0.037	15	0.040	58	0.028	9	0.031	66	0.025	25	0.021	37	0.008	120	0.020	34
DCP 5	.250	0.019	47	0.014	7	0.024	67	0.011	304	0.014	122	0.011	338	0.005	329	0.011	333	0.011	338
DCP 6	.300	0.017	221	0.018	279	0.012	278	0.013	247	0.001	78	0.002	4	0.006	280	0.010	52	0.010	314
DCP 7	.400	0.005	211	0.013	269	0.008	69	0.007	273	0.013	49	0.004	315	0.005	344	0.006	178	0.003	189
DCP 8	.500	0.005	139	0.010	217	0.004	102	0.007	204	0.004	18	0.006	242	0.006	194	0.005	27	0.006	225
DCP 9	.600	0.007	243	0.009	233	0.007	227	0.010	197	0.003	5	0.008	252	0.008	164	0.005	359	0.005	173
DCP10	.878	0.006	236	0.004	196	0.001	43	0.012	168	0.003	17	0.005	145	0.008	131	0.005	347	0.003	85

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	16.08	0.600	14.75	6.72		5102.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.042	644.6	1452.9	0.635 07	-0.00105	1.254	16.63	0.0760

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		14.754	6.723	0	0.414	18	0.074	154	0.051	229	0.025	155	0.017	149	0.037	106	0.045	145	0.029	206
CN		1.075	0.119	51	0.101	71	0.010	135	0.011	154	0.014	331	0.007	129	0.016	356	0.004	81	0.002	271
CM		-0.062	0.063	191	0.008	208	0.001	120	0.001	242	0.001	299	0.001	357	0.001	255	0.001	263	0.001	47
DCP 1	.010	2.834	0.572	352	0.478	89	0.083	44	0.052	137	0.034	56	0.024	10	0.005	67	0.024	64	0.006	167
DCP 2	.025	2.738	0.183	0	0.602	80	0.140	2	0.051	96	0.055	329	0.026	139	0.036	37	0.007	283	0.024	123
DCP 3	.100	2.369	0.735	164	0.083	68	0.126	143	0.079	230	0.049	329	0.004	156	0.072	331	0.006	36	0.028	320
DCP 4	.200	1.498	0.289	147	0.010	108	0.042	276	0.016	47	0.041	345	0.028	33	0.037	3	0.009	139	0.008	280
DCP 5	.250	1.447	0.190	172	0.111	75	0.029	134	0.043	178	0.031	309	0.027	87	0.008	58	0.010	275	0.011	284
DCP 6	.300	1.216	0.151	64	0.171	78	0.072	167	0.042	188	0.033	309	0.009	125	0.033	344	0.021	55	0.018	96
DCP 7	.400	0.971	0.244	34	0.130	68	0.018	147	0.016	142	0.007	261	0.013	147	0.007	14	0.013	129	0.006	208
DCP 8	.500	0.786	0.237	23	0.094	67	0.016	191	0.022	134	0.010	245	0.016	178	0.010	311	0.004	306	0.003	183
DCP 9	.600	0.650	0.254	17	0.066	59	0.012	340	0.017	75	0.006	60	0.007	151	0.009	42	0.007	172	0.007	265
DCP10	.878	0.424	0.244	9	0.046	42	0.008	32	0.010	38	0.006	60	0.005	183	0.006	32	0.004	45	0.003	226

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.009	166	0.010	91	0.013	165	0.010	177	0.008	177	0.014	158	0.009	208	0.007	157	0.006	211
CN		0.001	77	0.000	219	0.004	265	0.001	120	0.005	243	0.002	357	0.001	197	0.001	51	0.004	68
CM		0.001	262	0.000	76	0.001	329	0.001	180	0.000	340	0.001	114	0.001	232	0.001	118	0.001	167
DCP 1	.010	0.013	131	0.013	90	0.005	11	0.005	76	0.015	5	0.016	293	0.005	191	0.011	7	0.016	265
DCP 2	.025	0.009	12	0.009	149	0.009	16	0.008	278	0.006	78	0.011	328	0.010	236	0.009	136	0.004	68
DCP 3	.100	0.002	346	0.006	338	0.017	284	0.003	55	0.026	248	0.015	103	0.015	225	0.015	117	0.014	128
DCP 4	.200	0.008	319	0.003	273	0.012	313	0.001	59	0.012	244	0.004	57	0.006	191	0.004	79	0.009	74
DCP 5	.250	0.020	262	0.020	299	0.008	261	0.002	159	0.003	62	0.008	60	0.002	138	0.010	70	0.005	161
DCP 6	.300	0.012	95	0.010	130	0.009	189	0.014	185	0.013	228	0.003	136	0.005	104	0.005	298	0.014	77
DCP 7	.400	0.010	194	0.005	180	0.014	259	0.008	144	0.008	290	0.008	49	0.005	1	0.008	300	0.004	85
DCP 8	.500	0.004	359	0.004	43	0.006	208	0.005	162	0.005	113	0.004	254	0.005	53	0.004	253	0.008	39
DCP 9	.600	0.007	124	0.006	110	0.002	328	0.005	72	0.005	290	0.003	321	0.003	252	0.004	112	0.006	23
DCP10	.878	0.006	42	0.006	278	0.005	123	0.007	330	0.005	160	0.009	294	0.004	68	0.006	302	0.003	279

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	16.42	0.600	14.75	6.79		5102.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.043	643.7	1444.1	0.63E 07	-0.00086	1.262	15.74	0.0220

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		14.754	6.789	0	0.284	21	0.154	178	0.072	206	0.072	177	0.072	118	0.053	107	0.016	215	0.036	228
CN		1.022	0.138	52	0.104	67	0.008	189	0.011	188	0.012	357	0.003	47	0.009	21	0.007	72	0.009	331
CM		-0.063	0.062	189	0.007	229	0.001	100	0.003	278	0.003	268	0.001	29	0.002	251	0.001	172	0.002	154
DCP 1	.010	2.824	0.536	356	0.552	85	0.128	26	0.029	311	0.043	281	0.007	200	0.011	178	0.034	141	0.026	68
DCP 2	.025	2.735	0.204	17	0.591	74	0.119	355	0.016	84	0.023	331	0.028	30	0.011	45	0.025	41	0.016	334
DCP 3	.100	2.387	0.701	156	0.118	32	0.094	149	0.091	235	0.055	329	0.014	254	0.041	321	0.010	128	0.022	290
DCP 4	.200	1.475	0.282	138	0.015	148	0.056	256	0.036	66	0.039	1	0.031	51	0.019	39	0.024	116	0.004	322
DCP 5	.250	1.411	0.196	98	0.125	69	0.045	169	0.033	232	0.025	344	0.033	78	0.006	146	0.003	180	0.008	279
DCP 6	.300	1.210	0.188	58	0.158	75	0.073	178	0.043	193	0.018	302	0.035	34	0.023	338	0.019	59	0.018	8
DCP 7	.400	0.965	0.244	35	0.138	70	0.015	183	0.010	113	0.003	18	0.012	41	0.014	65	0.017	89	0.007	39
DCP 8	.500	0.765	0.234	22	0.095	70	0.016	187	0.018	141	0.013	160	0.006	205	0.004	268	0.005	24	0.011	298
DCP 9	.600	0.648	0.257	19	0.062	63	0.015	349	0.015	90	0.014	54	0.005	319	0.015	65	0.008	39	0.014	357
DCP10	.878	0.437	0.245	8	0.049	51	0.007	322	0.007	122	0.011	56	0.008	198	0.007	51	0.005	318	0.008	308

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.043	183	0.029	186	0.030	189	0.032	177	0.021	171	0.024	164	0.011	193	0.011	168	0.013	197
CN		0.001	117	0.002	300	0.002	174	0.002	90	0.003	14	0.003	219	0.006	80	0.002	27	0.001	340
CM		0.001	238	0.001	118	0.001	311	0.001	210	0.001	219	0.001	215	0.001	197	0.001	141	0.001	296
DCP 1	.010	0.022	324	0.009	183	0.013	333	0.025	254	0.019	184	0.004	138	0.008	191	0.008	131	0.003	275
DCP 2	.025	0.025	267	0.023	177	0.005	314	0.018	222	0.003	285	0.023	250	0.023	162	0.016	60	0.011	304
DCP 3	.100	0.018	148	0.009	51	0.009	305	0.005	81	0.007	269	0.007	202	0.017	136	0.013	132	0.005	36
DCP 4	.200	0.007	91	0.009	36	0.003	125	0.015	106	0.002	351	0.010	186	0.012	81	0.008	193	0.011	341
DCP 5	.250	0.016	261	0.004	289	0.012	199	0.002	126	0.001	110	0.006	265	0.012	126	0.003	1	0.003	240
DCP 6	.300	0.004	24	0.008	35	0.009	225	0.004	54	0.005	332	0.010	213	0.011	66	0.005	135	0.008	310
DCP 7	.400	0.007	117	0.012	244	0.011	158	0.002	205	0.008	70	0.003	158	0.011	61	0.009	34	0.007	320
DCP 8	.500	0.001	106	0.008	302	0.008	188	0.000	46	0.004	237	0.008	120	0.004	319	0.008	47	0.007	221
DCP 9	.600	0.004	43	0.003	274	0.005	82	0.002	88	0.014	15	0.005	314	0.016	24	0.012	308	0.003	117
DCP10	.878	0.003	63	0.005	309	0.002	125	0.006	20	0.003	93	0.002	38	0.003	164	0.001	333	0.005	97

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	16.21	0.600	14.75	6.81		5102.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.042	643.1	1443.9	0.63E 07	-0.00082	1.253	16.63	0.0220

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		14.745	6.806	0	0.318	21	0.157	177	0.074	192	0.035	164	0.027	140	0.017	81	0.121	359	0.065	243
CN		1.025	0.134	47	0.096	66	0.016	162	0.004	176	0.010	280	0.002	306	0.009	282	0.017	25	0.011	284
CM		-0.065	0.061	189	0.007	235	0.002	143	0.003	282	0.003	323	0.001	8	0.001	294	0.003	151	0.002	71
DCP 1	.010	2.827	0.563	354	0.500	83	0.071	33	0.032	157	0.011	112	0.012	16	0.021	224	0.018	53	0.021	31
DCP 2	.025	2.771	0.277	14	0.538	71	0.060	335	0.067	90	0.038	329	0.029	16	0.052	256	0.027	128	0.015	35
DCP 3	.100	2.374	0.695	159	0.093	30	0.114	141	0.076	270	0.063	308	0.017	306	0.034	286	0.048	56	0.020	321
DCP 4	.200	1.470	0.285	139	0.021	136	0.036	266	0.019	358	0.035	313	0.014	348	0.021	336	0.032	59	0.022	291
DCP 5	.250	1.418	0.175	92	0.098	51	0.079	170	0.032	225	0.025	293	0.018	93	0.016	242	0.025	19	0.011	268
DCP 6	.300	1.210	0.168	54	0.159	76	0.081	168	0.029	203	0.037	270	0.009	232	0.036	299	0.030	28	0.019	300
DCP 7	.400	0.960	0.246	32	0.117	66	0.034	166	0.014	122	0.019	233	0.005	222	0.007	327	0.025	7	0.012	276
DCP 8	.500	0.754	0.238	21	0.089	69	0.017	146	0.015	197	0.014	180	0.010	152	0.006	320	0.024	5	0.014	277
DCP 9	.600	0.648	0.255	16	0.058	64	0.017	341	0.005	90	0.010	196	0.008	220	0.007	123	0.019	356	0.013	258
DCP10	.878	0.458	0.244	8	0.054	56	0.009	336	0.011	99	0.014	109	0.003	11	0.004	176	0.007	312	0.008	252

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.030	190	0.026	145	0.017	123	0.016	166	0.012	148	0.020	132	0.003	189	0.010	173	0.011	196
CN		0.004	357	0.005	172	0.002	106	0.003	210	0.001	241	0.001	188	0.004	316	0.002	264	0.003	312
CM		0.001	87	0.001	296	0.001	250	0.000	289	0.000	120	0.001	41	0.001	160	0.001	34	0.002	90
DCP 1	.010	0.021	294	0.012	136	0.012	335	0.018	253	0.013	181	0.006	166	0.001	162	0.004	171	0.007	94
DCP 2	.025	0.011	344	0.011	347	0.010	256	0.006	295	0.014	253	0.014	193	0.006	164	0.013	207	0.027	113
DCP 3	.100	0.029	46	0.017	221	0.015	67	0.005	230	0.005	197	0.016	38	0.005	254	0.016	14	0.008	76
DCP 4	.200	0.009	99	0.016	195	0.008	164	0.008	222	0.003	90	0.005	39	0.007	214	0.007	9	0.009	7
DCP 5	.250	0.011	304	0.010	248	0.002	77	0.013	299	0.007	46	0.004	302	0.005	63	0.003	329	0.007	13
DCP 6	.300	0.001	107	0.012	112	0.013	233	0.007	136	0.010	189	0.002	38	0.005	272	0.005	348	0.007	278
DCP 7	.400	0.004	57	0.006	238	0.004	164	0.006	192	0.007	13	0.003	53	0.014	329	0.007	352	0.009	333
DCP 8	.500	0.006	301	0.006	98	0.002	239	0.002	203	0.001	256	0.012	201	0.005	21	0.008	223	0.007	293
DCP 9	.600	0.006	323	0.011	184	0.003	81	0.007	187	0.004	292	0.010	199	0.008	294	0.008	205	0.008	305
DCP10	.878	0.005	262	0.009	90	0.007	59	0.004	38	0.002	212	0.002	324	0.006	2	0.004	218	0.007	232

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
64.0	15.60	0.400	9.91	4.47		5135.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.050	439.1	371.4	0.24E 07	-0.00035	1.616	13.77	0.1300

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		9.906	4.669	0	0.200	29	0.083	284	0.076	241	0.080	294	0.005	252	0.040	347	0.029	346	0.012	2
CN		1.132	0.311	14	0.144	35	0.045	296	0.010	264	0.022	266	0.011	154	0.009	85	0.011	10	0.007	299
CM		-0.014	0.014	292	0.017	87	0.012	355	0.003	304	0.004	295	0.005	231	0.004	156	0.004	92	0.003	31
DCP 1	.010	4.643	2.131	4	0.527	31	0.236	318	0.082	295	0.131	280	0.068	216	0.032	135	0.036	18	0.027	321
DCP 2	.025	4.508	1.782	3	0.626	47	0.276	345	0.165	349	0.273	294	0.212	238	0.169	176	0.133	110	0.130	59
DCP 3	.100	2.755	0.397	17	0.563	65	0.223	347	0.105	286	0.106	266	0.078	195	0.085	131	0.093	60	0.080	7
DCP 4	.150	2.119	0.308	22	0.289	53	0.118	325	0.037	263	0.033	266	0.031	193	0.031	99	0.037	22	0.029	317
DCP 5	.200	1.655	0.266	37	0.301	46	0.187	305	0.092	219	0.046	188	0.058	125	0.064	59	0.059	350	0.051	290
DCP 6	.250	1.565	0.292	29	0.217	35	0.107	293	0.045	296	0.017	174	0.033	106	0.039	32	0.038	327	0.031	259
DCP 7	.300	1.184	0.291	31	0.243	28	0.130	275	0.062	185	0.023	171	0.049	96	0.053	23	0.046	316	0.040	256
DCP 8	.400	0.975	0.273	22	0.117	0	0.064	248	0.023	152	0.010	123	0.031	68	0.031	347	0.027	293	0.024	216
DCP 9	.500	0.735	0.230	20	0.092	2	0.057	209	0.024	98	0.001	237	0.028	46	0.026	314	0.016	249	0.017	202
DCP10	.600	0.606	0.197	17	0.060	313	0.037	186	0.018	41	0.007	269	0.010	55	0.005	325	0.008	273	0.009	184
DCP11	.878	0.290	0.158	2	0.024	290	0.020	153	0.006	255	0.005	170	0.004	75	0.002	122	0.003	354	0.003	304

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.022	94	0.016	59	0.008	111	0.009	84	0.010	115	0.003	216	0.011	217	0.011	207	0.011	274
CN		0.004	248	0.003	105	0.006	122	0.003	141	0.002	106	0.002	13	0.001	132	0.001	335	0.002	196
CM		0.002	317	0.002	255	0.002	220	0.002	134	0.002	71	0.001	25	0.001	322	0.001	251	0.000	235
DCP 1	.010	0.016	285	0.005	157	0.020	174	0.024	122	0.012	51	0.006	356	0.004	283	0.007	202	0.002	258
DCP 2	.025	0.088	0	0.071	304	0.062	221	0.076	162	0.062	105	0.050	48	0.043	3	0.034	297	0.032	232
DCP 3	.100	0.070	306	0.041	249	0.046	190	0.043	151	0.035	99	0.022	34	0.013	339	0.015	301	0.010	233
DCP 4	.150	0.022	249	0.016	159	0.018	111	0.016	80	0.009	6	0.008	286	0.007	218	0.007	194	0.010	150
DCP 5	.200	0.040	224	0.029	158	0.030	103	0.018	65	0.017	14	0.015	319	0.010	235	0.012	209	0.008	147
DCP 6	.250	0.025	187	0.023	113	0.018	74	0.009	24	0.012	319	0.009	267	0.009	208	0.007	142	0.011	59
DCP 7	.300	0.038	195	0.034	122	0.025	68	0.014	24	0.016	330	0.016	270	0.015	198	0.011	152	0.011	110
DCP 8	.400	0.020	143	0.020	77	0.012	26	0.011	293	0.010	227	0.008	178	0.007	117	0.006	30	0.008	301
DCP 9	.500	0.019	126	0.016	54	0.006	21	0.009	311	0.011	235	0.007	176	0.011	145	0.011	75	0.009	12
DCP10	.600	0.008	79	0.005	23	0.002	76	0.004	297	0.005	198	0.004	116	0.003	82	0.001	290	0.007	199
DCP11	.878	0.003	301	0.001	68	0.004	91	0.002	248	0.001	224	0.002	335	0.002	124	0.002	12	0.002	70

TUNED PITCHING OSCILLATION VERTOL 23010-1.59 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.N	TEST POINT	CYCLES ANALYZED
64.0	15.80	0.400	9.92	4.74		5135.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.060	437.8	367.1	0.24E 07	-0.00056	1.546	13.93	0.1170

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		9.923	4.744	359	0.222	21	0.079	285	0.128	272	0.065	245	0.022	343	0.046	352	0.022	314	0.018	46
CN		1.117	0.314	14	0.117	51	0.053	312	0.019	247	0.014	230	0.005	64	0.002	6	0.006	9	0.003	307
CM		-0.015	0.015	209	0.018	72	0.012	9	0.007	308	0.005	272	0.006	216	0.005	147	0.004	92	0.004	21
DCP 1	.010	4.590	2.100	4	0.502	43	0.300	331	0.154	269	0.087	263	0.019	252	0.020	168	0.036	56	0.020	343
DCP 2	.025	4.467	1.739	2	0.586	60	0.284	357	0.238	329	0.226	287	0.238	248	0.186	184	0.160	120	0.135	58
DCP 3	.100	2.760	0.433	14	0.520	74	0.237	353	0.122	293	0.107	249	0.074	200	0.080	129	0.085	60	0.083	2
DCP 4	.150	2.018	0.304	21	0.289	64	0.143	339	0.033	261	0.035	219	0.025	120	0.022	90	0.035	25	0.026	318
DCP 5	.200	1.565	0.272	32	0.336	54	0.178	313	0.095	231	0.063	175	0.042	109	0.047	49	0.043	346	0.037	290
DCP 6	.250	1.513	0.298	28	0.192	46	0.111	306	0.070	219	0.035	157	0.045	76	0.031	12	0.030	340	0.027	277
DCP 7	.300	1.201	0.304	28	0.198	35	0.123	282	0.061	195	0.041	154	0.044	79	0.049	14	0.044	334	0.032	244
DCP 8	.400	0.965	0.281	23	0.087	10	0.064	263	0.041	177	0.026	115	0.046	53	0.033	327	0.021	281	0.021	219
DCP 9	.500	0.706	0.228	19	0.067	13	0.048	220	0.028	113	0.010	93	0.025	10	0.027	309	0.025	246	0.020	177
DCP10	.600	0.604	0.207	19	0.042	304	0.032	223	0.018	130	0.009	52	0.028	43	0.019	310	0.010	277	0.013	192
DCP11	.878	0.301	0.155	4	0.060	220	0.021	175	0.008	116	0.004	126	0.009	331	0.003	287	0.004	274	0.007	188

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.029	76	0.017	81	0.016	108	0.012	91	0.008	190	0.012	205	0.008	225	0.008	253	0.012	280
CN		0.001	211	0.005	115	0.002	93	0.004	110	0.002	103	0.003	187	0.004	69	0.001	342	0.002	187
CM		0.003	306	0.003	247	0.002	184	0.001	148	0.001	70	0.002	10	0.002	293	0.001	243	0.000	9
DCP 1	.010	0.017	294	0.013	204	0.018	127	0.024	110	0.018	78	0.001	165	0.007	10	0.004	186	0.008	130
DCP 2	.025	0.135	357	0.066	292	0.069	215	0.068	157	0.056	109	0.036	68	0.047	351	0.037	333	0.032	232
DCP 3	.100	0.061	302	0.042	232	0.033	177	0.029	136	0.017	110	0.008	71	0.016	38	0.012	333	0.007	301
DCP 4	.150	0.021	249	0.018	176	0.017	114	0.017	72	0.013	26	0.006	284	0.006	232	0.010	174	0.009	107
DCP 5	.200	0.034	221	0.035	157	0.025	90	0.012	67	0.014	14	0.016	292	0.007	268	0.005	204	0.007	166
DCP 6	.250	0.024	200	0.022	138	0.017	70	0.012	15	0.009	343	0.010	270	0.006	189	0.009	145	0.008	106
DCP 7	.300	0.029	181	0.034	120	0.021	54	0.011	11	0.011	306	0.013	249	0.005	215	0.008	141	0.007	125
DCP 8	.400	0.017	150	0.017	70	0.011	3	0.005	317	0.002	323	0.006	201	0.008	137	0.005	69	0.002	133
DCP 9	.500	0.020	114	0.019	51	0.010	351	0.009	270	0.007	221	0.008	193	0.008	132	0.007	61	0.009	27
DCP10	.600	0.014	96	0.009	49	0.006	6	0.003	6	0.004	231	0.008	163	0.010	83	0.003	220	0.003	180
DCP11	.878	0.003	79	0.005	69	0.003	340	0.001	34	0.003	205	0.008	180	0.006	86	0.005	7	0.006	216

TUNED PITCHING OSCILLATION VERTOL 23010-1.59 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
64.0	15.87	0.400	9.96	4.91		5135.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.061	436.9	368.0	0.24E 07	-0.00035	1.590	13.99	0.0340

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		9.963	4.912	359	0.192	36	0.096	284	0.085	310	0.048	181	0.036	358	0.062	335	0.024	323	0.024	14
CN		1.092	0.302	15	0.157	36	0.052	239	0.027	298	0.022	203	0.006	118	0.006	56	0.015	7	0.005	309
CM		-0.018	0.019	194	0.020	75	0.012	357	0.004	303	0.005	278	0.004	210	0.003	150	0.003	123	0.002	12
DCP 1	.010	4.505	2.046	4	0.600	34	0.287	323	0.183	298	0.095	239	0.068	270	0.017	154	0.032	5	0.019	335
DCP 2	.025	4.379	1.647	2	0.759	49	0.292	347	0.267	326	0.171	269	0.162	229	0.144	173	0.111	99	0.084	44
DCP 3	.100	2.666	0.339	22	0.643	63	0.246	341	0.142	296	0.090	227	0.077	169	0.059	120	0.078	49	0.063	359
DCP 4	.150	1.945	0.266	28	0.329	52	0.132	327	0.062	287	0.050	221	0.014	166	0.026	65	0.031	4	0.022	303
DCP 5	.200	1.496	0.262	44	0.402	42	0.177	298	0.066	240	0.062	184	0.071	121	0.062	44	0.055	344	0.033	276
DCP 6	.250	1.457	0.278	33	0.235	32	0.106	289	0.032	235	0.031	184	0.021	61	0.030	17	0.029	323	0.016	244
DCP 7	.300	1.174	0.293	33	0.257	27	0.120	269	0.031	199	0.050	166	0.060	90	0.048	10	0.040	319	0.025	257
DCP 8	.400	0.944	0.279	25	0.135	356	0.069	242	0.013	151	0.020	146	0.032	14	0.027	334	0.019	286	0.014	218
DCP 9	.500	0.685	0.236	19	0.077	6	0.047	209	0.010	56	0.020	128	0.025	45	0.018	311	0.014	295	0.017	206
DCP10	.600	0.598	0.219	16	0.079	311	0.036	194	0.007	12	0.010	147	0.027	344	0.009	294	0.008	322	0.006	188
DCP11	.878	0.314	0.171	359	0.023	218	0.012	167	0.008	312	0.009	115	0.009	139	0.003	99	0.012	15	0.003	81

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.020	24	0.022	44	0.017	80	0.011	82	0.012	124	0.012	145	0.007	204	0.006	233	0.008	252
CN		0.002	291	0.001	223	0.003	126	0.005	79	0.003	51	0.001	354	0.001	194	0.001	155	0.001	345
CM		0.002	318	0.001	234	0.001	186	0.001	169	0.000	101	0.001	45	0.001	338	0.000	334	0.000	205
DCP 1	.010	0.012	46	0.012	272	0.011	161	0.017	117	0.013	110	0.011	36	0.003	276	0.013	32	0.003	188
DCP 2	.025	0.065	353	0.046	285	0.033	279	0.039	134	0.038	98	0.037	34	0.016	350	0.012	246	0.005	274
DCP 3	.100	0.052	305	0.038	253	0.035	187	0.031	118	0.019	65	0.015	25	0.003	328	0.004	330	0.013	288
DCP 4	.150	0.010	221	0.005	163	0.009	132	0.011	89	0.010	9	0.006	330	0.010	253	0.009	124	0.010	40
DCP 5	.200	0.023	219	0.019	174	0.022	104	0.020	51	0.011	342	0.009	295	0.007	227	0.008	196	0.003	135
DCP 6	.250	0.017	173	0.015	122	0.011	66	0.006	13	0.006	328	0.009	231	0.008	179	0.008	59	0.002	312
DCP 7	.300	0.028	190	0.022	124	0.017	74	0.015	37	0.013	334	0.007	286	0.008	223	0.008	183	0.003	115
DCP 8	.400	0.023	136	0.018	65	0.013	356	0.008	305	0.010	234	0.012	166	0.009	73	0.009	18	0.002	266
DCP 9	.500	0.012	135	0.010	74	0.012	36	0.012	313	0.008	216	0.002	242	0.006	148	0.005	88	0.006	0
DCP10	.600	0.008	81	0.005	352	0.002	234	0.001	220	0.003	103	0.003	140	0.002	287	0.004	224	0.005	148
DCP11	.878	0.002	268	0.003	303	0.001	234	0.007	77	0.004	44	0.004	304	0.004	165	0.003	157	0.005	353

TUNED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
64.0	16.13	0.600	7.50	4.41		5139.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.042	643.0	714.0	0.31E 07	-0.00081	1.092	11.72	0.1300

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		7.505	4.412	0	0.234	31	0.115	184	0.016	201	0.024	109	0.061	4	0.034	341	0.025	331	0.025	4
CN		0.853	0.767	6	0.086	67	0.020	118	0.010	114	0.007	97	0.008	77	0.012	20	0.003	29	0.005	23
CM		-0.034	0.032	193	0.014	94	0.004	164	0.003	103	0.001	160	0.001	210	0.001	137	0.000	207	0.001	145
DCP 1	.010	1.032	1.336	357	0.231	69	0.075	137	0.022	175	0.006	302	0.014	6	0.019	353	0.008	355	0.006	306
DCP 2	.025	2.213	1.394	352	0.215	56	0.075	147	0.039	158	0.007	330	0.019	3	0.023	357	0.011	340	0.006	40
DCP 3	.100	2.306	1.074	313	0.119	92	0.075	143	0.070	174	0.019	66	0.037	82	0.041	53	0.007	350	0.038	111
DCP 4	.150	1.995	0.159	15	0.421	76	0.232	154	0.018	176	0.083	140	0.088	214	0.041	14	0.013	229	0.009	77
DCP 5	.200	1.325	0.254	14	0.266	84	0.067	150	0.086	110	0.078	152	0.018	204	0.018	144	0.033	230	0.021	335
DCP 6	.250	1.272	0.362	13	0.174	76	0.047	38	0.076	84	0.019	20	0.058	81	0.018	55	0.029	75	0.012	139
DCP 7	.300	1.034	0.368	11	0.159	66	0.059	19	0.057	80	0.043	23	0.049	65	0.029	30	0.033	68	0.023	27
DCP 8	.400	0.769	0.313	8	0.074	33	0.023	27	0.017	266	0.006	335	0.008	23	0.010	352	0.008	30	0.009	327
DCP 9	.500	0.606	0.278	17	0.045	353	0.022	24	0.016	320	0.008	359	0.018	29	0.023	350	0.012	334	0.011	313
DCP10	.600	0.468	0.211	11	0.018	303	0.005	87	0.014	247	0.004	165	0.006	76	0.008	26	0.004	38	0.007	3
DCP11	.978	0.294	0.174	4	0.040	289	0.006	328	0.006	267	0.003	12	0.002	329	0.004	288	0.001	239	0.002	318

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.015	358	0.010	16	0.011	58	0.011	73	0.007	122	0.010	137	0.004	153	0.004	174	0.006	213
CN		0.007	72	0.006	37	0.003	57	0.001	52	0.002	74	0.003	181	0.001	294	0.003	234	0.001	212
CM		0.001	215	0.001	144	0.001	113	0.001	103	0.000	72	0.001	300	0.000	100	0.000	270	0.001	145
DCP 1	.010	0.003	69	0.006	32	0.004	82	0.003	140	0.002	190	0.006	184	0.003	92	0.004	209	0.005	144
DCP 2	.025	0.008	73	0.006	3	0.038	84	0.004	66	0.004	126	0.038	133	0.003	278	0.011	239	0.003	145
DCP 3	.100	0.033	56	0.021	55	0.023	47	0.012	20	0.008	12	0.005	121	0.013	5	0.013	265	0.010	152
DCP 4	.150	0.014	130	0.025	104	0.036	169	0.013	195	0.018	152	0.019	237	0.003	161	0.006	240	0.016	170
DCP 5	.200	0.008	227	0.011	44	0.015	30	0.010	160	0.011	106	0.007	201	0.007	202	0.004	298	0.009	237
DCP 6	.250	0.024	106	0.013	90	0.011	151	0.013	111	0.002	208	0.008	168	0.002	143	0.007	240	0.008	219
DCP 7	.330	0.003	84	0.017	94	0.014	79	0.015	107	0.020	65	0.002	29	0.005	125	0.001	14	0.005	195
DCP 8	.400	0.007	81	0.009	28	0.009	5	0.008	342	0.008	327	0.010	245	0.004	153	0.001	205	0.002	89
DCP 9	.500	0.008	39	0.013	326	0.002	165	0.008	25	0.008	334	0.001	206	0.009	313	0.013	217	0.005	69
DCP10	.630	0.004	38	0.002	315	0.004	42	0.007	307	0.004	219	0.001	111	0.005	275	0.004	185	0.005	345
DCP11	.978	0.003	54	0.008	335	0.007	278	0.003	204	0.002	133	0.006	120	0.000	8	0.004	41	0.005	296

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
64.0	16.19	0.600	7.52	4.52		5139.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.042	641.1	716.9	0.31E 07	-0.00093	1.085	11.70	0.1080

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		7.515	4.523	359	0.248	23	0.127	175	0.029	179	0.098	81	0.050	25	0.028	345	0.017	327	0.022	28
CN		0.947	0.279	5	0.098	69	0.029	117	0.010	86	0.016	111	0.009	84	0.010	60	0.007	39	0.006	7
CM		-0.035	0.031	196	0.011	100	0.005	165	0.002	99	0.002	207	0.002	175	0.002	180	0.001	159	0.002	[illegible]
DCP 1	.010	1.928	1.362	356	0.269	62	0.098	130	0.005	59	0.029	65	0.015	21	0.017	4	0.015	327	0.006	269
DCP 2	.025	2.217	1.142	357	0.252	58	0.092	143	0.037	168	0.021	75	0.021	27	0.018	355	0.013	319	0.010	310
DCP 3	.100	2.302	0.135	316	0.423	85	0.122	142	0.055	128	0.029	139	0.052	93	0.040	116	0.036	89	0.028	94
DCP 4	.150	1.854	0.174	11	0.442	73	0.240	150	0.018	73	0.116	134	0.089	216	0.012	29	0.012	191	0.007	264
DCP 5	.200	1.295	0.297	8	0.252	84	0.088	140	0.081	91	0.090	156	0.028	152	0.044	152	0.036	206	0.009	274
DCP 6	.250	1.244	0.383	11	0.173	77	0.049	62	0.071	78	0.027	101	0.066	78	0.029	93	0.043	64	0.018	113
DCP 7	.300	1.052	0.401	9	0.137	70	0.063	36	0.050	63	0.024	30	0.054	77	0.035	59	0.037	63	0.026	61
DCP 8	.400	0.757	0.327	7	0.030	54	0.026	43	0.013	283	0.009	57	0.002	40	0.018	39	0.014	342	0.010	1
DCP 9	.500	0.580	0.276	13	0.050	24	0.031	28	0.013	308	0.016	38	0.015	18	0.022	8	0.020	343	0.023	325
DCP10	.600	0.462	0.203	11	0.011	15	0.009	79	0.007	266	0.009	102	0.003	333	0.006	37	0.004	30	0.009	6
DCP11	.878	0.290	0.170	6	0.027	311	0.026	325	0.005	241	0.006	61	0.006	0	0.005	341	0.004	317	0.008	313

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.014	305	0.007	58	0.011	62	0.014	63	0.005	169	0.007	173	0.010	128	0.004	98	0.005	179
CN		0.007	5	0.002	53	0.005	45	0.004	341	0.001	100	0.001	338	0.001	143	0.002	91	0.001	49
CM		0.002	112	0.001	63	0.001	127	0.001	64	0.000	297	0.001	150	0.001	30	0.001	282	0.000	213
DCP 1	.010	0.006	303	0.006	278	0.003	98	0.004	283	0.003	118	0.003	57	0.002	15	0.001	192	0.001	175
DCP 2	.025	0.010	332	0.002	299	0.004	36	0.004	335	0.004	11	0.002	1	0.003	108	0.007	111	0.003	66
DCP 3	.100	0.038	79	0.044	72	0.041	49	0.032	14	0.022	342	0.004	344	0.018	41	0.018	354	0.011	327
DCP 4	.150	0.019	74	0.021	64	0.041	169	0.012	71	0.026	165	0.018	210	0.003	131	0.008	254	0.008	171
DCP 5	.200	0.007	325	0.011	329	0.025	19	0.014	353	0.005	21	0.003	90	0.010	124	0.003	210	0.007	157
DCP 6	.250	0.026	64	0.003	149	0.006	113	0.004	225	0.009	187	0.005	131	0.002	298	0.008	239	0.006	187
DCP 7	.300	0.028	42	0.013	71	0.018	57	0.008	62	0.009	78	0.007	61	0.003	143	0.007	138	0.006	152
DCP 8	.400	0.013	324	0.004	249	0.006	1	0.006	333	0.004	310	0.002	170	0.001	141	0.004	114	0.008	41
DCP 9	.500	0.017	302	0.010	282	0.006	281	0.005	288	0.001	216	0.005	1	0.003	298	0.001	321	0.003	202
DCP10	.600	0.010	313	0.004	245	0.004	358	0.006	258	0.003	190	0.001	8	0.005	199	0.004	103	0.004	334
DCP11	.878	0.006	277	0.003	215	0.003	320	0.003	250	0.004	81	0.006	318	0.003	195	0.004	85	0.002	63

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
64.0	16.29	0.600	7.52	4.67		5139.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.042	640.3	712.9	0.31E 07	-0.00074	1.111	11.94	0.0340

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		7.522	4.671	0	0.292	36	0.124	171	0.050	163	0.242	40	0.072	334	0.037	309	0.020	291	0.010	352
CN		0.941	0.283	4	0.100	58	0.026	110	0.037	139	0.026	81	0.012	13	0.007	48	0.005	3	0.002	310
CM		-0.037	0.032	193	0.014	94	0.005	164	0.002	86	0.002	217	0.003	148	0.002	137	0.001	84	0.000	51
DCP 1	.010	1.913	1.391	355	0.282	52	0.106	123	0.016	181	0.056	22	0.020	338	0.009	1	0.009	282	0.002	280
DCP 2	.025	2.206	1.170	356	0.259	52	0.094	139	0.022	160	0.050	30	0.030	330	0.011	317	0.010	317	0.004	262
DCP 3	.100	2.255	0.077	325	0.480	74	0.086	147	0.063	153	0.035	93	0.051	65	0.037	93	0.034	39	0.011	60
DCP 4	.150	1.841	0.182	4	0.426	68	0.263	143	0.022	49	0.125	121	0.071	205	0.002	228	0.015	120	0.014	316
DCP 5	.200	1.265	0.290	12	0.277	72	0.058	134	0.057	97	0.103	134	0.016	85	0.043	140	0.026	188	0.023	256
DCP 6	.250	1.221	0.378	11	0.182	69	0.058	44	0.059	79	0.043	61	0.058	58	0.026	83	0.042	48	0.002	227
DCP 7	.300	1.072	0.407	11	0.140	59	0.069	23	0.026	79	0.052	57	0.051	42	0.031	46	0.036	37	0.017	43
DCP 8	.400	0.761	0.326	7	0.042	24	0.027	23	0.024	252	0.021	67	0.016	351	0.010	12	0.011	318	0.004	295
DCP 9	.500	0.572	0.289	9	0.037	359	0.025	45	0.005	321	0.028	35	0.023	339	0.022	351	0.021	299	0.008	270
DCP10	.600	0.463	0.219	9	0.027	320	0.011	112	0.011	243	0.018	76	0.009	316	0.004	58	0.007	291	0.001	140
DCP11	.878	0.308	0.175	4	0.031	302	0.010	338	0.008	234	0.009	41	0.014	328	0.009	288	0.005	208	0.001	229

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.007	312	0.005	340	0.006	327	0.004	84	0.002	65	0.003	90	0.002	1	0.004	222	0.005	274
CN		0.003	34	0.001	57	0.004	65	0.005	28	0.002	27	0.001	201	0.001	107	0.002	286	0.001	159
CM		0.000	105	0.000	35	0.001	182	0.001	133	0.001	96	0.001	36	0.000	127	0.001	56	0.001	274
DCP 1	.010	0.001	284	0.004	181	0.003	355	0.002	346	0.003	181	0.004	98	0.000	113	0.002	303	0.003	178
DCP 2	.025	0.000	339	0.001	229	0.009	312	0.007	33	0.004	43	0.003	116	0.002	96	0.004	328	0.003	92
DCP 3	.100	0.019	55	0.004	115	0.020	96	0.025	39	0.014	55	0.014	36	0.007	303	0.006	48	0.007	330
DCP 4	.150	0.013	279	0.024	76	0.036	167	0.023	80	0.027	141	0.018	165	0.009	116	0.001	248	0.012	220
DCP 5	.200	0.014	214	0.015	242	0.004	13	0.009	75	0.017	43	0.007	352	0.009	138	0.004	135	0.007	233
DCP 6	.250	0.022	94	0.006	115	0.016	101	0.005	107	0.004	71	0.006	203	0.003	112	0.007	289	0.010	215
DCP 7	.300	0.023	43	0.008	26	0.017	60	0.011	60	0.012	60	0.004	344	0.011	144	0.012	62	0.003	140
DCP 8	.400	0.005	8	0.005	324	0.006	341	0.004	301	0.004	335	0.002	208	0.004	28	0.007	290	0.002	156
DCP 9	.500	0.004	321	0.008	318	0.008	297	0.008	342	0.009	307	0.005	247	0.005	351	0.014	286	0.007	217
DCP10	.600	0.002	356	0.001	185	0.006	31	0.004	344	0.005	314	0.007	237	0.003	151	0.002	178	0.005	79
DCP11	.878	0.002	232	0.003	143	0.002	23	0.005	330	0.004	237	0.003	124	0.003	299	0.003	209	0.003	83

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	16.23	0.400	12.52	4.71		5070.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.061	441.5	371.0	0.24E 07	0.00027	1.670	15.17	0.0250

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		12.516	4.707	0	0.211	12	0.040	194	0.039	310	0.087	9	0.078	255	0.049	235	0.012	277	0.035	316
CN		1.146	0.199	56	0.186	41	0.034	38	0.023	326	0.020	343	0.020	275	0.021	242	0.014	177	0.006	162
CM		-0.033	0.047	180	0.021	101	0.011	79	0.008	32	0.005	29	0.005	338	0.004	337	0.006	275	0.004	199
DCP 1	.010	4.982	0.958	27	0.764	53	0.144	59	0.102	45	0.137	34	0.090	349	0.078	324	0.082	305	0.062	285
DCP 2	.025	4.524	0.450	69	0.983	69	0.348	67	0.224	55	0.299	29	0.233	348	0.194	311	0.160	273	0.132	221
DCP 3	.100	2.652	0.648	140	0.697	64	0.167	53	0.124	10	0.100	343	0.092	288	0.078	261	0.064	227	0.059	190
DCP 4	.150	1.879	0.397	128	0.368	54	0.065	59	0.083	9	0.048	343	0.056	304	0.047	262	0.040	226	0.029	179
DCP 5	.200	1.500	0.448	109	0.349	34	0.070	45	0.116	319	0.056	274	0.075	241	0.061	189	0.045	158	0.043	125
DCP 6	.250	1.478	0.328	93	0.266	30	0.044	45	0.085	324	0.025	293	0.054	277	0.045	228	0.046	194	0.032	132
DCP 7	.300	1.223	0.341	80	0.242	19	0.051	16	0.095	288	0.036	243	0.058	215	0.044	156	0.039	124	0.027	78
DCP 8	.400	1.037	0.271	56	0.167	5	0.027	345	0.059	285	0.021	260	0.032	226	0.025	210	0.042	161	0.020	68
DCP 9	.500	0.716	0.224	43	0.097	359	0.018	326	0.046	278	0.012	210	0.041	159	0.018	93	0.027	75	0.018	357
DCP10	.600	0.658	0.220	27	0.089	342	0.028	285	0.029	217	0.004	262	0.009	226	0.026	218	0.030	121	0.019	21
DCP11	.878	0.400	0.204	354	0.018	352	0.024	256	0.016	154	0.005	260	0.007	95	0.007	197	0.009	51	0.006	285

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.046	305	0.037	292	0.036	308	0.029	293	0.025	305	0.033	319	0.029	318	0.023	302	0.025	336
CN		0.004	199	0.005	152	0.005	34	0.004	320	0.002	1	0.000	197	0.003	304	0.004	311	0.005	284
CM		0.003	178	0.002	128	0.002	124	0.001	58	0.001	69	0.001	35	0.001	50	0.001	322	0.001	204
DCP 1	.010	0.063	271	0.042	220	0.007	183	0.032	338	0.036	321	0.019	289	0.016	323	0.034	339	0.029	321
DCP 2	.025	0.102	183	0.095	158	0.061	111	0.024	104	0.035	93	0.045	71	0.038	23	0.038	339	0.037	261
DCP 3	.100	0.052	164	0.046	147	0.035	108	0.022	89	0.031	72	0.027	51	0.028	11	0.029	327	0.023	281
DCP 4	.150	0.009	67	0.003	208	0.005	2	0.008	336	0.006	332	0.002	272	0.005	35	0.012	334	0.007	317
DCP 5	.200	0.027	97	0.021	67	0.020	32	0.018	356	0.017	330	0.009	293	0.017	249	0.014	239	0.012	202
DCP 6	.250	0.014	58	0.008	71	0.005	5	0.013	348	0.007	300	0.003	282	0.000	304	0.004	8	0.004	326
DCP 7	.300	0.021	54	0.017	14	0.017	353	0.019	311	0.014	276	0.014	237	0.015	208	0.010	190	0.008	144
DCP 8	.400	0.016	45	0.009	318	0.012	21	0.021	331	0.010	303	0.012	273	0.010	272	0.004	255	0.003	298
DCP 9	.500	0.010	334	0.007	273	0.011	283	0.013	224	0.010	175	0.006	151	0.008	145	0.003	92	0.004	35
DCP10	.600	0.014	7	0.007	285	0.014	338	0.011	278	0.006	267	0.006	220	0.004	243	0.006	41	0.007	275
DCP11	.878	0.003	296	0.004	196	0.003	236	0.007	152	0.005	72	0.003	102	0.004	288	0.003	225	0.004	0

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	15.70	0.600	10.07	4.35		5078.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.040	654.8	723.4	0.31E 07	-0.00115	1.150	10.85	0.1010

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		10.071	4.349	0	0.156	347	0.067	198	0.049	262	0.021	324	0.065	286	0.025	6	0.043	299	0.016	327
CN		1.015	0.052	90	0.052	97	0.013	151	0.015	266	0.005	251	0.006	10	0.004	46	0.010	345	0.002	275
CM		-0.055	0.005	270	0.003	225	0.003	195	0.004	261	0.001	146	0.001	350	0.001	266	0.003	111	0.003	43
DCP 1	.010	2.612	0.934	358	0.164	78	0.039	45	0.046	274	0.011	283	0.017	221	0.002	210	0.013	86	0.013	10
DCP 2	.025	2.789	0.760	7	0.140	79	0.024	76	0.045	275	0.011	243	0.012	353	0.008	185	0.008	305	0.001	306
DCP 3	.100	2.347	0.490	183	0.108	99	0.125	189	0.096	279	0.025	257	0.038	3	0.032	356	0.023	38	0.031	34
DCP 4	.150	2.169	0.380	162	0.085	202	0.027	149	0.060	236	0.034	251	0.058	21	0.014	135	0.027	25	0.033	54
DCP 5	.200	1.633	0.189	161	0.043	171	0.011	253	0.056	274	0.008	105	0.036	74	0.006	162	0.015	65	0.017	25
DCP 6	.250	1.466	0.155	38	0.181	92	0.079	143	0.057	[illegible]	0.023	107	0.030	280	0.020	341	0.014	20	0.013	251
DCP 7	.300	1.172	0.186	33	0.179	104	0.064	186	0.052	[illegible]	0.028	211	0.022	344	0.015	46	0.024	51	0.018	49
DCP 8	.400	0.891	0.258	12	0.062	78	0.016	33	0.014	[illegible]	0.015	36	0.012	276	0.003	225	0.015	297	0.017	243
DCP 9	.500	0.767	0.254	20	0.068	90	0.020	77	0.010	[illegible]	0.024	199	0.009	166	0.011	168	0.012	320	0.003	301
DCP 10	.600	0.574	0.225	9	0.016	130	0.015	46	0.013	49	0.010	342	0.008	145	0.016	49	0.021	316	0.020	232
DCP 11	.878	0.421	0.213	9	0.019	15	0.006	327	0.006	73	0.007	305	0.002	119	0.002	207	0.008	272	0.006	197

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.018	357	0.034	5	0.019	352	0.023	33	0.018	28	0.016	24	0.012	71	0.014	54	0.011	60
CN		0.004	121	0.007	32	0.003	318	0.003	30	0.003	262	0.002	28	0.003	319	0.002	278	0.002	12
CM		0.001	339	0.001	171	0.002	76	0.001	307	0.000	210	0.002	165	0.001	114	0.001	160	0.001	136
DCP 1	.010	0.025	307	0.021	203	0.016	65	0.011	6	0.013	279	0.005	179	0.002	322	0.002	79	0.004	16
DCP 2	.025	0.004	273	0.003	355	0.004	25	0.006	337	0.003	248	0.001	241	0.001	325	0.001	328	0.000	292
DCP 3	.100	0.025	70	0.029	64	0.026	78	0.031	31	0.017	246	0.018	151	0.014	86	0.009	256	0.022	115
DCP 4	.150	0.018	142	0.007	45	0.021	49	0.021	254	0.008	260	0.006	91	0.015	317	0.008	196	0.013	53
DCP 5	.200	0.016	15	0.014	76	0.011	57	0.008	17	0.011	227	0.003	53	0.001	245	0.011	196	0.012	104
DCP 6	.250	0.007	319	0.017	86	0.022	320	0.004	323	0.009	252	0.006	44	0.015	313	0.013	283	0.013	275
DCP 7	.300	0.002	3	0.011	40	0.005	337	0.011	15	0.004	296	0.007	127	0.004	5	0.011	153	0.011	59
DCP 8	.400	0.013	149	0.022	12	0.029	279	0.020	204	0.010	130	0.014	352	0.012	234	0.001	7	0.006	198
DCP 9	.500	0.008	326	0.007	319	0.001	90	0.007	348	0.008	245	0.007	136	0.006	4	0.004	96	0.005	341
DCP 10	.600	0.016	143	0.003	11	0.011	176	0.015	83	0.011	343	0.002	273	0.005	22	0.009	329	0.012	293
DCP 11	.878	0.003	174	0.006	3	0.008	297	0.003	261	0.003	148	0.010	347	0.007	276	0.002	320	0.004	30

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	15.87	0.600	10.02	4.41		5378.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.041	549.6	716.8	0.315 07	-0.00104	1.175	13.34	0.0760

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		10.020	4.407	0	0.153	338	0.100	225	0.094	274	0.080	301	0.026	271	0.067	250	0.074	287	0.048	288
CN		1.009	0.151	20	0.055	80	0.014	156	0.019	239	0.007	226	0.008	255	0.006	213	0.009	20	0.005	251
CM		-0.055	0.048	189	0.004	216	0.005	168	0.001	263	0.001	339	0.000	351	0.001	11	0.000	194	0.001	4
DCP 1	.010	2.589	0.880	358	0.186	71	0.033	359	0.058	232	0.021	314	0.041	313	0.026	213	0.022	316	0.015	295
DCP 2	.025	2.779	0.718	0	0.170	85	0.023	54	0.038	263	0.007	243	0.032	221	0.009	187	0.003	178	0.002	214
DCP 3	.100	2.402	0.433	175	0.097	76	0.167	179	0.064	270	0.039	245	0.033	255	0.015	297	0.040	357	0.019	311
DCP 4	.150	2.087	0.436	163	0.045	200	0.053	160	0.058	222	0.042	346	0.026	341	0.003	196	0.034	80	0.011	302
DCP 5	.200	1.561	0.167	150	0.033	143	0.026	227	0.046	269	0.021	309	0.008	219	0.016	177	0.006	67	0.008	275
DCP 6	.250	1.439	0.189	35	0.163	83	0.090	158	0.054	225	0.020	180	0.003	96	0.018	246	0.013	48	0.012	234
DCP 7	.300	1.197	0.209	27	0.173	93	0.079	165	0.045	232	0.029	217	0.037	249	0.006	329	0.024	17	0.006	17
DCP 8	.400	0.906	0.267	14	0.070	65	0.029	358	0.016	221	0.019	200	0.006	89	0.014	199	0.014	21	0.010	270
DCP 9	.500	0.733	0.263	16	0.059	88	0.015	55	0.013	142	0.023	151	0.010	187	0.003	236	0.015	296	0.011	270
DCP10	.600	0.574	0.218	13	0.026	27	0.019	354	0.007	197	0.004	305	0.011	339	0.015	191	0.012	41	0.015	209
DCP11	.878	0.424	0.204	5	0.016	43	0.013	326	0.006	358	0.004	173	0.008	193	0.000	281	0.001	196	0.005	111

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.045	310	0.049	317	0.041	319	0.038	323	0.042	316	0.029	326	0.029	345	0.029	339	0.021	343
CN		0.003	319	0.003	294	0.002	250	0.001	179	0.002	192	0.001	271	0.003	229	0.002	97	0.002	30
CM		0.001	153	0.001	63	0.001	36	0.001	301	0.000	69	0.001	90	0.002	27	0.000	313	0.001	328
DCP 1	.010	0.024	249	0.012	88	0.025	340	0.019	297	0.003	204	0.012	346	0.006	267	0.007	356	0.015	336
DCP 2	.025	0.003	250	0.008	156	0.002	291	0.007	258	0.009	192	0.008	142	0.007	45	0.004	347	0.004	268
DCP 3	.100	0.027	8	0.004	291	0.023	52	0.015	352	0.002	188	0.015	125	0.019	53	0.005	65	0.012	27
DCP 4	.150	0.028	162	0.029	140	0.009	198	0.015	159	0.006	134	0.010	279	0.006	255	0.005	147	0.012	51
DCP 5	.200	0.003	48	0.004	201	0.009	42	0.013	345	0.004	160	0.011	89	0.004	6	0.006	116	0.014	32
DCP 6	.250	0.014	223	0.005	89	0.002	49	0.008	196	0.003	121	0.012	64	0.014	304	0.003	251	0.012	356
DCP 7	.300	0.003	27	0.006	115	0.002	54	0.008	294	0.008	188	0.009	90	0.010	8	0.009	56	0.007	2
DCP 8	.400	0.012	310	0.009	306	0.020	287	0.016	222	0.005	144	0.013	318	0.022	232	0.014	100	0.008	308
DCP 9	.500	0.016	297	0.010	263	0.013	278	0.009	212	0.001	231	0.006	290	0.013	255	0.011	226	0.009	218
DCP10	.600	0.006	171	0.008	223	0.014	182	0.011	102	0.003	288	0.008	238	0.014	175	0.006	58	0.005	136
DCP11	.878	0.006	342	0.003	200	0.000	138	0.002	44	0.003	221	0.003	268	0.001	214	0.001	240	0.004	136

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	15.77	0.600	10.00	4.49		5378.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.041	648.0	715.3	0.31E 07	-0.00056	1.172	13.45	0.0250

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		9.998	4.488	0	0.249	1	0.089	227	0.089	273	0.075	310	0.038	303	0.064	240	0.051	304	0.050	287
CN		0.998	0.153	18	0.051	66	0.012	158	0.017	222	0.011	218	0.004	99	0.006	257	0.002	353	0.004	289
CM		-0.055	0.049	185	0.002	180	0.004	148	0.003	262	0.001	179	0.001	354	0.002	307	0.001	114	0.001	78
DCP 1	.010	2.608	0.939	356	0.132	81	0.042	48	0.041	273	0.033	269	0.017	201	0.022	221	0.005	241	0.012	260
DCP 2	.025	2.784	0.757	358	0.173	58	0.020	1	0.055	234	0.018	187	0.009	316	0.011	192	0.005	189	0.006	77
DCP 3	.100	2.355	0.480	170	0.129	54	0.159	167	0.077	263	0.076	209	0.027	26	0.047	291	0.022	336	0.023	300
DCP 4	.150	2.081	0.406	157	0.081	211	0.058	117	0.099	230	0.037	288	0.015	85	0.025	323	0.009	147	0.040	52
DCP 5	.200	1.502	0.197	146	0.037	84	0.021	228	0.055	253	0.028	262	0.032	38	0.008	297	0.003	55	0.009	196
DCP 6	.250	1.385	0.193	38	0.176	78	0.064	149	0.040	226	0.036	172	0.037	139	0.034	289	0.038	132	0.001	46
DCP 7	.300	1.169	0.197	27	0.193	76	0.058	165	0.050	204	0.034	183	0.015	279	0.027	286	0.016	319	0.002	339
DCP 8	.400	0.897	0.263	12	0.056	57	0.020	335	0.023	82	0.014	244	0.015	128	0.014	205	0.012	46	0.009	258
DCP 9	.500	0.716	0.262	12	0.071	67	0.019	358	0.023	138	0.018	114	0.006	54	0.005	175	0.011	228	0.003	308
DCP10	.600	0.577	0.228	10	0.016	282	0.012	284	0.013	126	0.006	358	0.006	215	0.010	175	0.014	11	0.016	261
DCP11	.878	0.428	0.210	1	0.017	20	0.013	339	0.006	336	0.007	277	0.004	151	0.010	102	0.007	234	0.001	313

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.052	279	0.054	291	0.041	283	0.045	283	0.046	276	0.038	273	0.039	279	0.036	291	0.035	294
CN		0.003	330	0.003	10	0.004	317	0.003	285	0.001	230	0.001	3	0.001	79	0.001	291	0.001	215
CM		0.001	71	0.001	30	0.001	69	0.001	114	0.001	76	0.001	358	0.001	279	0.000	292	0.001	158
DCP 1	.010	0.006	276	0.006	17	0.021	330	0.023	269	0.016	206	0.005	5	0.011	325	0.017	278	0.014	213
DCP 2	.025	0.007	25	0.007	226	0.002	193	0.003	238	0.004	94	0.004	37	0.001	211	0.002	293	0.008	124
DCP 3	.100	0.030	2	0.017	354	0.031	345	0.019	273	0.015	96	0.020	348	0.005	247	0.011	314	0.021	181
DCP 4	.150	0.009	88	0.027	56	0.012	113	0.020	92	0.008	95	0.015	124	0.006	52	0.015	151	0.015	164
DCP 5	.200	0.014	47	0.013	324	0.011	337	0.017	279	0.012	109	0.014	5	0.004	265	0.011	286	0.013	177
DCP 6	.250	0.006	98	0.011	33	0.013	337	0.014	45	0.015	324	0.012	63	0.011	332	0.005	110	0.004	179
DCP 7	.300	0.014	42	0.008	31	0.005	201	0.009	167	0.007	96	0.005	5	0.004	225	0.007	344	0.006	175
DCP 8	.400	0.009	307	0.005	310	0.013	277	0.006	242	0.004	222	0.004	309	0.003	61	0.006	339	0.009	296
DCP 9	.500	0.009	244	0.007	284	0.006	233	0.002	222	0.007	340	0.009	233	0.004	116	0.007	198	0.008	65
DCP10	.600	0.012	221	0.006	106	0.009	11	0.014	312	0.013	248	0.007	235	0.004	86	0.002	25	0.009	330
DCP11	.878	0.005	322	0.004	242	0.005	227	0.002	215	0.002	214	0.006	112	0.003	104	0.002	137	0.001	220

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
95.0	15.67	0.400	0.11	5.22		5045.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.060	438.3	370.0	0.24E 07	-0.00042	0.566	5.06	0.0220

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		0.109	5.025	0	0.333	1	0.059	319	0.081	322	0.066	329	0.035	298	0.020	320	0.029	337	0.036	310
CN		0.089	0.456	354	0.055	25	0.034	267	0.012	274	0.038	332	0.018	299	0.010	280	0.006	31	0.039	26
CM		-0.032	0.015	195	0.003	277	0.030	127	0.033	260	0.001	272	0.012	325	0.003	353	0.003	286	0.033	152
DCP 1	.010	-1.342	0.682	346	0.277	18	0.123	258	0.147	292	0.065	2	0.239	291	0.124	304	0.061	5	0.086	104
DCP 2	.100	0.450	1.577	351	0.253	37	0.112	115	0.353	222	0.053	230	0.013	14	0.024	219	0.040	288	0.038	364
DCP 3	.150	0.419	0.971	350	0.111	5	0.021	36	0.023	181	0.017	230	0.029	312	0.024	325	0.008	25	0.004	97
DCP 4	.200	0.296	0.789	354	0.052	19	0.012	323	0.020	322	0.011	317	0.016	331	0.013	347	0.014	33	0.039	20
DCP 5	.250	0.291	0.711	353	0.056	347	0.028	311	0.013	316	0.008	16	0.010	355	0.009	296	0.003	284	0.034	317
DCP 6	.300	0.209	0.575	355	0.037	25	0.025	322	0.024	344	0.008	359	0.033	319	0.005	337	0.006	13	0.034	1
DCP 7	.400	0.174	0.463	355	0.048	359	0.020	331	0.036	275	0.002	37	0.012	346	0.006	304	0.001	281	0.032	245
DCP 8	.500	0.064	0.326	357	0.036	46	0.011	310	0.014	334	0.006	14	0.002	186	0.004	313	0.005	2	0.007	7
DCP 9	.600	0.074	0.259	358	0.043	2	0.008	298	0.007	225	0.001	278	0.009	0	0.007	313	0.006	142	0.003	248
DCP10	.878	0.105	0.090	1	0.038	73	0.009	162	0.009	80	0.006	24	0.015	241	0.021	193	0.022	87	0.021	5

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.024	296	0.022	320	0.017	331	0.018	295	0.021	256	0.015	279	0.022	296	0.016	268	0.020	270
CN		0.021	359	0.004	277	0.011	358	0.015	294	0.006	332	0.002	256	0.012	29	0.008	283	0.007	92
CM		0.007	23	0.003	291	0.001	106	0.003	64	0.004	281	0.002	70	0.005	31	0.002	297	0.002	51
DCP 1	.010	0.447	11	0.086	300	0.134	14	0.054	47	0.188	304	0.056	55	0.298	35	0.134	287	0.146	76
DCP 2	.100	0.012	20	0.012	223	0.014	318	0.011	31	0.018	127	0.018	235	0.015	302	0.003	235	0.013	193
DCP 3	.150	0.011	221	0.012	251	0.010	288	0.012	327	0.002	347	0.006	182	0.005	210	0.009	278	0.001	311
DCP 4	.200	0.009	298	0.009	235	0.008	30	0.011	275	0.006	35	0.004	302	0.001	287	0.005	253	0.004	57
DCP 5	.250	0.004	272	0.007	292	0.005	282	0.005	298	0.002	202	0.002	247	0.002	276	0.006	270	0.001	293
DCP 6	.300	0.005	251	0.006	274	0.002	231	0.005	281	0.003	70	0.003	215	0.006	290	0.003	345	0.003	58
DCP 7	.400	0.003	251	0.006	260	0.001	189	0.005	298	0.004	272	0.003	244	0.001	221	0.005	277	0.001	297
DCP 8	.500	0.002	318	0.007	274	0.002	8	0.007	332	0.004	83	0.005	219	0.002	254	0.003	324	0.002	158
DCP 9	.600	0.003	292	0.006	360	0.002	231	0.006	230	0.004	251	0.003	259	0.001	277	0.003	83	0.002	296
DCP10	.878	0.018	227	0.017	114	0.016	351	0.019	248	0.022	80	0.009	258	0.012	203	0.004	219	0.006	196

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	16.13	0.400	12.52	4.83		5041.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.061	440.2	364.6	0.24E 07	-0.00017	1.641	15.60	0.0220

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		12.516	4.835	0	0.428	13	0.075	355	0.082	349	0.076	346	0.181	350	0.051	252	0.021	266	0.030	321
CN		1.206	0.184	90	0.097	34	0.036	49	0.042	344	0.022	13	0.021	306	0.026	239	0.004	273	0.013	173
CM		-0.030	0.005	270	0.013	97	0.009	126	0.007	44	0.006	57	0.003	11	0.002	300	0.004	273	0.002	197
DCP 1	.010	6.076	0.815	34	0.164	12	0.182	356	0.298	302	0.187	72	0.056	207	0.192	199	0.074	312	0.189	153
DCP 2	.100	2.581	0.613	150	0.528	79	0.207	110	0.235	65	0.154	34	0.144	7	0.109	322	0.064	316	0.049	303
DCP 3	.150	1.836	0.413	130	0.299	52	0.097	116	0.151	40	0.068	346	0.059	350	0.070	283	0.031	236	0.023	250
DCP 4	.200	1.451	0.427	117	0.289	45	0.118	88	0.150	14	0.069	349	0.099	320	0.065	263	0.026	243	0.034	237
DCP 5	.250	1.436	0.329	95	0.193	25	0.074	87	0.105	1	0.034	324	0.059	309	0.051	249	0.024	242	0.029	223
DCP 6	.300	1.240	0.327	86	0.181	29	0.099	63	0.098	341	0.062	341	0.084	290	0.051	246	0.042	220	0.024	193
DCP 7	.400	1.018	0.298	57	0.131	349	0.049	32	0.075	308	0.017	278	0.036	251	0.035	209	0.018	177	0.022	156
DCP 8	.500	0.686	0.230	46	0.054	347	0.039	10	0.038	258	0.011	288	0.024	223	0.027	201	0.032	128	0.021	100
DCP 9	.600	0.647	0.244	33	0.080	310	0.027	344	0.041	266	0.015	198	0.020	188	0.015	187	0.013	87	0.009	104
DCP 10	.878	0.499	0.214	357	0.014	222	0.047	302	0.015	191	0.012	260	0.005	54	0.004	93	0.018	47	0.004	326

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.027	331	0.024	327	0.028	313	0.027	320	0.014	320	0.021	294	0.023	319	0.012	300	0.013	287
CN		0.005	222	0.015	285	0.004	79	0.005	60	0.006	235	0.008	325	0.005	218	0.009	216	0.013	253
CM		0.003	253	0.002	303	0.003	40	0.006	126	0.004	238	0.001	9	0.003	93	0.002	6	0.004	294
DCP 1	.010	0.095	272	0.227	301	0.153	31	0.196	111	0.180	238	0.143	334	0.061	163	0.064	239	0.274	265
DCP 2	.100	0.027	263	0.034	283	0.026	246	0.020	279	0.025	270	0.035	222	0.020	207	0.033	202	0.021	152
DCP 3	.150	0.025	208	0.017	215	0.026	174	0.011	106	0.003	123	0.010	123	0.008	83	0.009	35	0.013	346
DCP 4	.200	0.028	211	0.022	201	0.027	158	0.002	6	0.010	191	0.018	152	0.014	119	0.007	83	0.007	51
DCP 5	.250	0.025	196	0.022	173	0.022	133	0.009	82	0.009	108	0.009	95	0.014	68	0.012	13	0.011	353
DCP 6	.300	0.030	173	0.021	159	0.026	135	0.016	77	0.012	114	0.018	92	0.017	66	0.013	38	0.020	4
DCP 7	.400	0.017	113	0.009	112	0.018	72	0.010	348	0.003	36	0.008	340	0.006	345	0.008	284	0.001	75
DCP 8	.500	0.020	58	0.012	27	0.013	15	0.012	325	0.004	11	0.012	338	0.013	277	0.009	243	0.011	217
DCP 9	.600	0.012	35	0.012	299	0.035	349	0.007	228	0.004	72	0.008	3	0.014	294	0.013	208	0.010	134
DCP 10	.878	0.002	95	0.008	268	0.021	222	0.028	319	0.010	52	0.008	255	0.015	227	0.015	188	0.010	185

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,O	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
06.0	16.58	0.420	16.85	4.95		5342.1	10

K	V	O	RV	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.063	430.8	373.3	0.26E 07	-0.00105	1.674	16.40	0.0220

HARMONIC ANALYSIS

DATA TYPE	Y/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		14.364	4.859	0	0.441	4	0.048	351	0.051	321	0.064	324	0.121	61	0.071	25	0.051	328	0.052	322
CN		1.151	0.267	102	0.045	33	0.024	87	0.041	51	0.039	57	0.014	23	0.024	76	0.014	13	0.023	341
CM		-0.049	0.050	102	0.015	103	0.007	152	0.010	156	0.002	143	0.003	143	0.004	175	0.004	133	0.001	108
DCP 1	.010	4.089	0.601	92	0.139	95	0.124	290	0.239	52	0.095	334	0.178	295	0.081	134	0.088	332	0.279	307
DCP 2	.100	2.450	1.133	157	0.213	125	0.248	152	0.158	131	0.114	150	0.127	122	0.133	119	0.089	119	0.376	99
DCP 3	.150	1.762	0.729	132	0.054	132	0.153	108	0.170	154	0.048	99	0.056	116	0.044	81	0.038	98	0.030	46
DCP 4	.200	1.423	0.587	132	0.078	146	0.157	115	0.179	117	0.059	139	0.051	95	0.062	96	0.043	59	0.062	53
DCP 5	.250	1.409	0.517	109	0.050	153	0.114	50	0.176	108	0.029	14	0.061	55	0.036	56	0.038	25	0.061	24
DCP 6	.300	1.213	0.386	107	0.059	126	0.090	74	0.152	87	0.027	56	0.047	52	0.036	68	0.031	21	0.024	22
DCP 7	.400	1.045	0.358	81	0.042	47	0.058	16	0.175	47	0.019	338	0.045	8	0.033	37	0.027	327	0.036	359
DCP 8	.500	0.734	0.226	59	0.052	73	0.060	12	0.153	34	0.013	14	0.033	351	0.032	28	0.026	335	0.028	330
DCP 9	.600	0.695	0.235	51	0.059	38	0.035	326	0.104	2	0.027	313	0.027	310	0.016	16	0.015	323	0.019	296
DCP10	.878	0.488	0.179	7	0.072	15	0.017	276	0.034	325	0.009	6	0.038	259	0.010	26	0.011	319	0.009	298

DATA TYPE	Y/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.036	314	0.032	329	0.026	339	0.023	328	0.025	326	0.023	313	0.023	315	0.018	317	0.018	299
CN		0.005	20	0.010	7	0.009	8	0.009	8	0.005	1	0.014	295	0.008	226	0.010	53	0.011	279
CM		0.006	130	0.004	27	0.002	53	0.002	150	0.003	52	0.001	233	0.002	92	0.000	331	0.002	298
DCP 1	.010	0.150	96	0.198	354	0.093	10	0.227	360	0.092	25	0.139	295	0.106	201	0.120	29	0.267	274
DCP 2	.100	0.045	126	0.070	111	0.067	137	0.051	109	0.034	131	0.062	134	0.036	117	0.042	126	0.063	113
DCP 3	.150	0.016	61	0.010	18	0.013	50	0.006	8	0.008	85	0.007	236	0.006	47	0.005	162	0.012	61
DCP 4	.200	0.026	58	0.027	61	0.024	54	0.023	60	0.021	51	0.020	27	0.021	14	0.018	58	0.016	57
DCP 5	.250	0.029	326	0.023	358	0.015	327	0.019	349	0.009	347	0.015	322	0.008	317	0.002	336	0.008	29
DCP 6	.300	0.018	0	0.020	18	0.016	16	0.021	13	0.016	14	0.016	0	0.019	349	0.010	12	0.011	6
DCP 7	.400	0.027	311	0.015	295	0.022	330	0.021	319	0.013	285	0.021	306	0.016	274	0.009	297	0.008	289
DCP 8	.500	0.023	303	0.012	310	0.013	319	0.013	332	0.017	290	0.013	325	0.017	279	0.007	333	0.009	273
DCP 9	.600	0.019	292	0.007	233	0.011	274	0.007	336	0.010	230	0.007	299	0.011	237	0.004	110	0.005	158
DCP10	.878	0.011	249	0.011	199	0.005	130	0.007	21	0.007	247	0.006	296	0.009	205	0.012	57	0.007	295

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	16.45	0.600	17.35	4.83		5343.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.063	439.4	365.6	0.24E 07	-0.00215	1.554	15.86	0.0220

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		17.365	4.829	0	0.342	350	0.061	316	0.072	293	0.066	348	0.072	13	0.072	273	0.049	262	0.044	275
CN		1.210	0.265	99	0.052	137	0.036	167	0.036	172	0.021	169	0.019	165	0.021	236	0.016	314	0.013	299
CM		-0.061	0.065	199	0.023	222	0.013	224	0.011	242	0.003	235	0.006	233	0.003	267	0.004	365	0.003	27
DCP 1	.010	5.603	0.507	72	0.143	89	0.411	208	0.133	148	0.064	93	0.161	214	0.171	243	0.323	343	0.117	29
DCP 2	.100	2.273	1.145	152	0.357	229	0.151	186	0.164	217	0.063	242	0.089	256	0.077	291	0.075	311	0.081	326
DCP 3	.150	1.682	0.690	130	0.252	197	0.030	225	0.098	161	0.072	202	0.034	172	0.037	237	0.027	246	0.026	280
DCP 4	.200	1.417	0.601	119	0.248	187	0.078	163	0.121	146	0.066	173	0.062	177	0.061	230	0.034	230	0.048	259
DCP 5	.250	1.423	0.484	106	0.197	155	0.029	174	0.086	116	0.078	154	0.050	172	0.026	212	0.039	230	0.036	254
DCP 6	.300	1.255	0.406	98	0.156	156	0.059	159	0.032	126	0.074	167	0.059	159	0.067	192	0.032	210	0.035	261
DCP 7	.400	1.105	0.303	91	0.141	195	0.038	112	0.070	95	0.042	113	0.066	129	0.019	187	0.023	158	0.028	221
DCP 8	.500	0.799	0.222	61	0.059	87	0.029	125	0.051	94	0.035	82	0.061	104	0.022	133	0.024	146	0.011	197
DCP 9	.600	0.762	0.205	50	0.112	68	0.037	76	0.055	76	0.024	70	0.036	73	0.008	77	0.014	90	0.010	258
DCP10	.878	0.579	0.169	26	0.095	16	0.033	45	0.032	56	0.008	335	0.016	329	0.009	271	0.020	297	0.002	333

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.028	274	0.022	280	0.023	295	0.020	276	0.016	286	0.025	282	0.016	276	0.018	253	0.018	257
CN		0.020	236	0.019	130	0.013	369	0.013	261	0.018	136	0.013	146	0.038	299	0.009	328	0.003	171
CM		0.003	336	0.001	300	0.004	369	0.003	338	0.004	104	0.004	145	0.001	305	0.003	335	0.004	213
DCP 1	.010	0.102	260	0.259	124	0.198	359	0.065	273	0.317	119	0.269	136	0.156	320	0.224	341	0.102	229
DCP 2	.100	0.060	327	0.041	10	0.043	15	0.032	164	0.017	144	0.020	175	0.029	195	0.028	216	0.038	234
DCP 3	.150	0.066	254	0.008	239	0.011	331	0.023	292	0.005	258	0.003	304	0.008	262	0.003	50	0.008	117
DCP 4	.200	0.033	264	0.018	310	0.023	322	0.024	281	0.010	24	0.003	7	0.019	139	0.020	120	0.022	118
DCP 5	.250	0.053	236	0.025	231	0.014	282	0.027	272	0.013	253	0.011	312	0.011	272	0.007	317	0.011	83
DCP 6	.300	0.038	225	0.025	254	0.019	295	0.023	250	0.016	263	0.036	199	0.009	49	0.010	65	0.007	68
DCP 7	.400	0.036	205	0.030	177	0.018	256	0.028	230	0.016	195	0.015	229	0.005	285	0.009	244	0.002	72
DCP 8	.500	0.028	158	0.021	155	0.013	220	0.018	202	0.016	191	0.010	232	0.011	195	0.006	199	0.005	96
DCP 9	.600	0.014	184	0.021	117	0.017	198	0.010	227	0.010	91	0.014	179	0.006	263	0.013	254	0.011	63
DCP10	.878	0.006	195	0.015	31	0.006	114	0.012	135	0.005	228	0.015	13	0.005	29	0.009	80	0.014	11

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
56.0	15.87	0.400	19.86	4.87		5044.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.060	438.9	371.0	0.24E 07	-0.00259	1.221	22.65	0.0220

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		19.856	4.871	0	0.407	9	0.083	345	0.040	284	0.070	302	0.043	289	0.154	32	0.042	355	0.048	0
CN		1.088	0.115	90	0.014	268	0.029	280	0.023	44	0.007	192	0.009	293	0.003	314	0.002	182	0.007	352
CM		-0.109	0.021	270	0.008	245	0.007	78	0.002	204	0.003	7	0.004	94	0.003	243	0.004	7	0.004	347
DCP 1	.010	4.215	0.267	59	0.149	10	0.096	247	0.097	55	0.025	134	0.087	37	0.055	279	0.022	79	0.241	342
DCP 2	.100	1.690	0.191	154	0.100	299	0.104	32	0.050	104	0.026	19	0.026	154	0.052	238	0.044	348	0.006	192
DCP 3	.150	1.293	0.143	71	0.083	272	0.037	293	0.029	331	0.016	267	0.015	284	0.021	62	0.019	163	0.021	130
DCP 4	.200	1.127	0.167	57	0.017	112	0.035	322	0.032	71	0.008	235	0.012	330	0.013	208	0.018	312	0.014	253
DCP 5	.250	1.222	0.152	58	0.056	277	0.032	257	0.032	343	0.011	214	0.019	256	0.017	42	0.011	120	0.023	113
DCP 6	.300	1.132	0.159	60	0.028	112	0.034	307	0.036	61	0.014	269	0.020	320	0.014	192	0.008	295	0.023	261
DCP 7	.400	1.078	0.138	63	0.061	270	0.045	267	0.034	1	0.011	167	0.029	224	0.016	348	0.007	76	0.029	99
DCP 8	.500	0.851	0.134	71	0.030	131	0.035	289	0.031	73	0.023	226	0.034	327	0.015	118	0.010	312	0.023	242
DCP 9	.600	0.823	0.127	66	0.039	257	0.047	250	0.028	3	0.010	150	0.020	223	0.017	338	0.005	150	0.029	83
DCP 10	.878	0.719	0.102	80	0.047	139	0.026	268	0.012	80	0.014	183	0.018	311	0.015	85	0.024	186	0.016	241

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.041	320	0.037	322	0.023	308	0.026	315	0.023	287	0.028	294	0.025	293	0.026	269	0.022	279
CN		0.007	84	0.011	78	0.012	201	0.003	84	0.007	123	0.008	273	0.003	69	0.003	159	0.002	278
CM		0.001	297	0.001	70	0.004	216	0.000	329	0.004	333	0.002	144	0.002	113	0.001	199	0.002	164
DCP 1	.010	0.112	32	0.171	79	0.247	214	0.056	58	0.096	43	0.077	242	0.055	59	0.099	173	0.050	241
DCP 2	.100	0.020	177	0.022	269	0.022	99	0.022	199	0.008	191	0.014	152	0.013	182	0.014	294	0.004	170
DCP 3	.150	0.011	116	0.008	66	0.001	318	0.011	348	0.010	203	0.014	325	0.001	234	0.014	62	0.012	98
DCP 4	.200	0.025	202	0.010	240	0.015	83	0.014	146	0.011	218	0.006	297	0.006	173	0.006	181	0.003	224
DCP 5	.250	0.015	104	0.007	101	0.003	236	0.008	318	0.009	223	0.009	331	0.009	108	0.014	56	0.007	76
DCP 6	.300	0.017	198	0.003	241	0.005	120	0.011	165	0.010	202	0.007	223	0.000	293	0.003	201	0.008	14
DCP 7	.400	0.009	82	0.011	86	0.013	265	0.002	346	0.004	282	0.003	348	0.013	107	0.010	359	0.003	138
DCP 8	.500	0.009	176	0.010	155	0.008	62	0.004	168	0.018	143	0.002	7	0.006	268	0.006	172	0.001	138
DCP 9	.600	0.002	81	0.016	39	0.021	195	0.008	322	0.005	161	0.008	318	0.012	92	0.017	331	0.002	130
DCP 10	.878	0.014	72	0.004	148	0.016	33	0.007	103	0.021	131	0.012	285	0.015	298	0.011	131	0.013	319

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
94.0	16.08	0.430	24.74	6.31		5145.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.261	449.2	368.2	0.24E 07	-0.00160	1.356	27.52	0.0220

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		24.740	6.013	0	0.324	0	0.061	277	0.080	303	0.063	328	0.017	287	0.017	23	0.029	315	0.018	297
CN		1.159	0.142	30	0.018	56	0.026	10	0.026	92	0.035	216	0.032	353	0.013	93	0.003	221	0.016	188
CM		-0.135	0.019	224	0.005	141	0.009	214	0.006	262	0.003	354	0.001	136	0.002	1	0.003	333	0.001	208
DCP 1	.010	3.613	0.351	19	0.160	105	0.171	259	0.075	100	0.134	338	0.045	105	0.145	51	0.171	313	0.086	192
DCP 2	.100	1.676	0.191	30	0.072	32	0.039	44	0.025	66	0.016	139	0.035	248	0.015	140	0.014	135	0.010	132
DCP 3	.1[illegible]	1.435	0.156	20	0.024	17	0.023	58	0.035	123	0.020	159	0.005	309	0.016	142	0.022	157	0.006	316
DCP 4	.2[illegible]	1.327	0.199	22	0.038	87	0.011	15	0.016	77	0.012	187	0.006	250	0.011	155	0.011	150	0.006	176
DCP 5	.250	1.416	0.178	24	0.029	355	0.032	47	0.035	119	0.014	191	0.011	332	0.017	141	0.013	169	0.005	292
DCP 6	.300	1.301	0.185	24	0.035	92	0.027	27	0.027	68	0.009	179	0.002	222	0.013	141	0.010	113	0.007	111
DCP 7	.400	1.223	0.170	30	0.029	326	0.044	27	0.036	113	0.019	179	0.012	312	0.011	123	0.016	139	0.007	310
DCP 8	.500	0.971	0.150	33	0.027	83	0.036	19	0.032	63	0.010	39	0.007	77	0.010	125	0.008	123	0.006	27
DCP 9	.600	0.975	0.121	40	0.036	319	0.056	23	0.039	94	0.015	184	0.011	303	0.007	141	0.015	136	0.005	15
DCP10	.878	0.755	0.087	42	0.029	30	0.019	29	0.019	74	0.006	216	0.006	136	0.008	102	0.010	236	0.006	173

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.028	234	0.020	270	0.035	287	0.025	276	0.020	278	0.022	252	0.021	226	0.027	253	0.019	235
CN		0.013	157	0.010	155	0.025	359	0.018	85	0.007	132	0.005	239	0.013	306	0.005	156	0.009	238
CM		0.006	210	0.002	93	0.003	175	0.001	77	0.002	21[illegible]	0.002	309	0.002	132	0.001	265	0.003	186
DCP 1	.010	0.248	196	0.172	138	0.100	213	0.074	82	0.033	135	0.151	202	0.083	306	0.033	155	0.214	222
DCP 2	.100	0.012	179	0.038	325	0.036	62	0.016	142	0.013	134	0.015	141	0.018	209	0.010	250	0.007	111
DCP 3	.150	0.02[illegible]	97	0.012	189	0.019	74	0.016	112	0.005	95	0.016	82	0.004	192	0.004	254	0.014	68
DCP 4	.200	0.005	248	0.008	208	0.009	25	0.009	105	0.010	88	0.006	153	0.008	209	0.010	216	0.003	88
DCP 5	.250	0.020	94	0.004	150	0.017	81	0.013	112	0.012	102	0.015	75	0.003	113	0.007	258	0.011	61
DCP 6	.300	0.007	87	0.004	313	0.012	61	0.013	85	0.010	77	0.007	106	0.005	162	0.008	183	0.009	109
DCP 7	.400	0.018	105	0.004	175	0.015	47	0.016	82	0.010	105	0.010	47	0.010	63	0.013	185	0.005	316
DCP 8	.500	0.015	65	0.004	307	0.018	359	0.016	32	0.012	56	0.006	3	0.011	353	0.012	126	0.005	55
DCP 9	.600	0.017	35	0.004	277	0.018	7	0.017	53	0.009	193	0.005	328	0.015	344	0.008	118	0.006	313
DCP10	.878	0.005	331	0.010	179	0.010	239	0.009	188	0.003	341	0.009	196	0.021	286	0.005	59	0.012	316

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA,0	0.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	14.58	0.600	12.51	4.59		5355.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.038	668.9	731.6	0.325 07	-0.00027	1.133	14.69	0.2229

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		12.511	4.592	0	0.230	358	0.048	253	0.043	262	0.033	310	0.048	297	0.047	302	0.168	362	0.057	248
CN		1.029	0.084	50	0.021	52	0.012	29	0.319	347	0.338	258	0.336	176	0.006	2	0.019	69	0.321	232
CM		-0.080	0.047	182	0.010	238	0.002	73	0.331	42	0.002	350	0.001	58	0.031	93	0.007	131	0.003	112
DCP 1	.010	2.977	0.544	31	0.100	20	0.247	82	0.233	12	0.086	321	0.061	66	0.091	93	0.271	117	0.268	157
DCP 2	.100	2.135	0.620	172	0.155	258	0.051	310	0.341	298	0.333	123	0.329	129	0.018	323	0.036	56	0.028	257
DCP 3	.150	1.759	0.312	159	0.063	156	0.047	349	0.034	275	0.018	312	0.336	238	0.010	355	0.026	51	0.031	262
DCP 4	.200	1.330	0.192	150	0.036	217	0.065	337	0.320	342	0.034	224	0.333	331	0.019	326	0.032	31	0.327	251
DCP 5	.250	1.411	0.162	136	0.025	159	0.0	316	0.310	339	0.014	253	0.011	211	0.013	317	0.045	29	0.023	273
DCP 6	.300	1.275	0.097	128	0.066	100	0.037	235	0.323	336	0.013	262	0.331	196	0.022	305	0.033	10	0.017	255
DCP 7	.400	1.000	0.160	26	0.057	65	0.037	136	0.312	0	0.020	222	0.015	164	0.005	338	0.028	350	0.017	250
DCP 8	.500	0.746	0.159	26	0.067	57	0.038	33	0.317	320	0.010	239	0.003	176	0.014	220	0.025	350	0.011	214
DCP 9	.600	0.669	0.216	11	0.036	48	0.036	35	0.338	347	0.013	211	0.011	139	0.005	358	0.023	0	0.019	226
DCP10	.878	0.541	0.193	3	0.037	43	0.033	8	0.336	342	0.005	50	0.007	293	0.001	311	0.017	236	0.010	260

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.028	249	0.020	311	0.021	336	0.016	305	0.022	302	0.018	339	0.020	294	0.018	291	0.018	307
CN		0.013	177	0.005	233	0.033	131	0.034	24	0.004	17	0.012	59	0.007	255	0.008	335	0.007	57
CM		0.002	239	0.002	226	0.003	242	0.002	111	0.002	7	0.003	77	0.001	246	0.002	328	0.003	65
DCP 1	.010	0.175	175	0.121	245	0.084	223	0.096	99	0.077	43	0.214	68	0.118	232	0.183	330	0.156	71
DCP 2	.100	0.023	285	0.025	130	0.034	32	0.030	338	0.020	349	0.012	15	0.009	32	0.017	58	0.019	76
DCP 3	.150	0.006	296	0.005	186	0.013	268	0.013	219	0.003	332	0.011	179	0.010	57	0.006	267	0.003	76
DCP 4	.200	0.015	260	0.008	117	0.036	150	0.012	21	0.015	318	0.003	56	0.010	318	0.006	333	0.010	364
DCP 5	.250	0.006	215	0.006	86	0.005	164	0.035	237	0.002	331	0.009	135	0.013	317	0.009	121	0.008	321
DCP 6	.300	0.014	189	0.003	82	0.007	52	0.010	355	0.007	333	0.003	170	0.012	330	0.001	250	0.003	346
DCP 7	.400	0.008	209	0.005	92	0.006	65	0.036	23	0.012	314	0.007	141	0.005	359	0.006	251	0.003	320
DCP 8	.500	0.011	123	0.009	16	0.007	76	0.034	245	0.006	279	0.034	138	0.006	259	0.007	211	0.007	244
DCP 9	.600	0.010	125	0.007	45	0.011	67	0.010	335	0.006	150	0.006	23	0.006	249	0.005	113	0.006	287
DCP10	.878	0.006	139	0.002	279	0.008	76	0.034	280	0.005	134	0.034	237	0.034	137	0.004	25	0.007	205

TUNED PITCHING OSCILLATION — VERTOL 2301C-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	15.60	0.400	12.55	7.09		5085.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.058	446.4	379.2	0.24E 07	-0.00071	1.700	16.71	0.0

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		12.551	7.086	0	0.481	27	0.078	134	0.044	125	0.023	305	0.092	330	0.110	231	0.068	175	0.026	125
CN		1.017	0.280	27	0.239	52	0.053	42	0.053	354	0.017	305	0.033	332	0.039	255	0.032	197	0.017	142
CM		-0.038	0.054	195	0.032	96	0.010	88	0.016	59	0.008	3	0.007	17	0.010	333	0.008	290	0.006	248
DCP 1	.010	3.963	1.675	4	1.131	65	0.272	62	0.203	48	0.102	55	0.219	30	0.152	338	0.082	318	0.084	323
DCP 2	.025	3.366	0.698	356	1.389	78	0.485	57	0.347	37	0.237	29	0.351	358	0.291	308	0.192	268	0.127	253
DCP 3	.100	2.177	0.193	114	0.866	71	0.188	60	0.222	39	0.138	345	0.116	339	0.151	292	0.119	235	0.062	206
DCP 4	.150	1.968	0.244	77	0.546	58	0.078	53	0.174	32	0.101	315	0.040	323	0.081	276	0.077	213	0.037	169
DCP 5	.200	1.770	0.281	66	0.466	48	0.061	42	0.141	9	0.085	289	0.055	318	0.096	254	0.078	192	0.047	162
DCP 6	.250	1.508	0.336	51	0.362	43	0.055	50	0.126	357	0.077	271	0.030	316	0.078	243	0.061	184	0.043	156
DCP 7	.300	1.001	0.336	45	0.303	36	0.044	15	0.102	335	0.062	250	0.036	296	0.072	229	0.061	176	0.048	136
DCP 8	.400	0.872	0.373	34	0.206	21	0.033	27	0.085	316	0.040	236	0.030	287	0.057	211	0.040	176	0.049	137
DCP 9	.500	0.744	0.319	27	0.127	9	0.025	334	0.063	276	0.037	178	0.015	270	0.033	181	0.032	150	0.039	93
DCP10	.600	0.572	0.318	22	0.098	348	0.013	358	0.053	275	0.023	188	0.015	247	0.031	181	0.028	147	0.031	83
DCP11	.878	0.363	0.254	2	0.043	263	0.029	301	0.040	217	0.011	133	0.008	212	0.016	163	0.020	104	0.014	10

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.006	85	0.010	286	0.010	220	0.011	234	0.007	235	0.002	230	0.012	213	0.009	248	0.009	232
CN		0.007	118	0.009	66	0.003	56	0.003	100	0.004	1	0.002	231	0.002	115	0.005	5	0.004	265
CM		0.005	211	0.004	187	0.002	137	0.002	135	0.002	102	0.002	44	0.001	20	0.001	21	0.002	349
DCP 1	.010	0.103	290	0.094	267	0.082	224	0.083	194	0.062	158	0.045	141	0.045	107	0.057	52	0.048	2
DCP 2	.025	0.115	229	0.084	204	0.056	170	0.064	173	0.053	138	0.046	114	0.038	100	0.058	40	0.051	349
DCP 3	.100	0.058	194	0.048	151	0.037	124	0.042	117	0.032	87	0.030	75	0.033	65	0.039	20	0.029	353
DCP 4	.150	0.034	164	0.031	106	0.016	111	0.025	84	0.024	37	0.010	16	0.014	4	0.013	324	0.016	288
DCP 5	.200	0.047	132	0.034	90	0.033	79	0.036	51	0.027	4	0.019	349	0.016	322	0.013	306	0.015	262
DCP 6	.250	0.039	114	0.026	70	0.020	82	0.020	29	0.015	357	0.014	340	0.014	300	0.009	272	0.011	260
DCP 7	.300	0.040	99	0.030	66	0.028	43	0.022	11	0.022	336	0.017	299	0.017	275	0.012	244	0.012	213
DCP 8	.400	0.034	74	0.025	53	0.020	8	0.013	327	0.014	338	0.019	285	0.014	248	0.007	262	0.016	241
DCP 9	.500	0.027	38	0.025	13	0.021	330	0.012	286	0.013	280	0.018	230	0.015	184	0.003	135	0.009	183
DCP10	.600	0.016	21	0.019	16	0.017	295	0.007	223	0.004	302	0.012	258	0.008	195	0.003	330	0.017	190
DCP11	.878	0.007	346	0.008	321	0.003	197	0.002	17	0.008	252	0.012	144	0.008	68	0.003	121	0.005	64

TUNED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	15.87	0.400	12.57	7.19		5085.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.060	440.3	371.4	0.24E 07	-0.00081	1.666	16.83	0.0

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		12.565	7.194	0	0.499	27	0.091	125	0.034	111	0.052	23	0.167	296	0.083	207	0.061	163	0.029	98
CN		0.949	0.301	36	0.261	41	0.031	48	0.046	5	0.023	328	0.038	299	0.027	242	0.026	200	0.019	136
CM		-0.037	0.048	199	0.029	108	0.015	81	0.013	47	0.008	21	0.008	2	0.009	318	0.007	291	0.008	242
DCP 1	.010	3.930	1.824	8	1.032	56	0.185	84	0.221	68	0.160	51	0.167	19	0.162	354	0.121	317	0.089	299
DCP 2	.025	3.414	0.950	6	1.225	69	0.419	70	0.367	44	0.289	25	0.314	347	0.260	314	0.207	280	0.179	250
DCP 3	.100	2.112	0.303	108	0.909	64	0.181	62	0.226	37	0.159	350	0.142	317	0.129	280	0.104	241	0.081	198
DCP 4	.150	1.700	0.318	83	0.545	52	0.065	61	0.154	26	0.086	312	0.065	303	0.083	261	0.074	205	0.053	171
DCP 5	.200	1.314	0.342	74	0.489	41	0.064	70	0.147	3	0.076	292	0.083	296	0.092	233	0.067	188	0.062	153
DCP 6	.250	1.310	0.386	63	0.384	36	0.040	56	0.119	351	0.059	268	0.063	294	0.080	226	0.056	182	0.060	152
DCP 7	.300	0.966	0.366	54	0.335	29	0.037	41	0.130	332	0.036	262	0.070	279	0.067	203	0.049	178	0.063	126
DCP 8	.400	0.836	0.396	45	0.244	14	0.024	341	0.077	302	0.037	231	0.051	255	0.052	185	0.045	167	0.052	110
DCP 9	.500	0.626	0.320	35	0.171	7	0.019	296	0.045	255	0.012	166	0.033	230	0.028	137	0.026	144	0.041	68
DCP10	.600	0.560	0.300	30	0.120	349	0.025	281	0.040	253	0.013	198	0.029	221	0.024	160	0.031	144	0.032	66
DCP11	.878	0.368	0.246	4	0.045	329	0.047	263	0.026	182	0.011	234	0.013	157	0.015	133	0.013	88	0.014	43

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.002	242	0.005	244	0.010	182	0.006	208	0.010	209	0.006	159	0.009	175	0.005	225	0.005	222
CN		0.010	93	0.003	8	0.002	81	0.001	315	0.003	216	0.002	148	0.003	11	0.002	345	0.002	285
CM		0.006	194	0.004	156	0.002	103	0.003	79	0.002	49	0.002	22	0.001	344	0.001	295	0.001	318
DCP 1	.010	0.083	288	0.109	258	0.073	233	0.083	201	0.069	168	0.055	131	0.040	87	0.031	53	0.026	27
DCP 2	.025	0.139	216	0.114	195	0.077	166	0.063	131	0.044	111	0.025	83	0.028	39	0.032	9	0.028	330
DCP 3	.100	0.054	163	0.043	152	0.037	121	0.039	95	0.031	84	0.035	67	0.038	30	0.029	352	0.025	334
DCP 4	.150	0.050	135	0.024	89	0.021	79	0.017	36	0.013	358	0.011	5	0.015	334	0.010	288	0.007	301
DCP 5	.200	0.048	113	0.028	98	0.034	66	0.026	34	0.018	17	0.018	336	0.015	314	0.018	287	0.014	254
DCP 6	.250	0.049	95	0.024	55	0.028	36	0.016	348	0.011	339	0.012	306	0.010	298	0.012	273	0.008	237
DCP 7	.300	0.039	73	0.028	59	0.031	18	0.018	348	0.022	317	0.013	278	0.017	270	0.015	236	0.015	227
DCP 8	.400	0.033	60	0.028	28	0.021	351	0.019	328	0.021	271	0.009	257	0.012	248	0.010	208	0.009	192
DCP 9	.500	0.018	5	0.020	344	0.013	293	0.014	289	0.016	218	0.009	183	0.006	187	0.006	171	0.009	146
DCP10	.600	0.020	32	0.025	335	0.009	285	0.017	287	0.016	229	0.011	202	0.010	155	0.005	133	0.005	97
DCP11	.878	0.015	342	0.012	272	0.012	220	0.015	191	0.007	160	0.006	140	0.007	49	0.010	59	0.003	339

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	16.16	0.400	12.62	7.38		5085.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.062	438.3	372.5	0.24E 07	-0.00051	1.649	17.36	0.0

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		12.618	7.382	0	0.442	25	0.150	145	0.059	95	0.243	23	0.226	212	0.112	190	0.046	157	0.014	97
CN		0.935	0.326	32	0.232	37	0.045	31	0.040	335	0.035	345	0.041	261	0.028	230	0.027	188	0.011	128
CM		-0.035	0.044	194	0.029	100	0.015	87	0.012	44	0.006	48	0.010	3	0.007	298	0.008	272	0.007	200
DCP 1	.010	3.890	1.939	7	1.026	55	0.214	69	0.176	63	0.236	31	0.094	12	0.156	339	0.147	295	0.116	259
DCP 2	.025	3.457	1.158	6	1.085	63	0.372	58	0.240	44	0.358	30	0.298	347	0.307	299	0.263	260	0.205	224
DCP 3	.100	2.122	0.312	83	0.774	61	0.229	56	0.185	12	0.151	356	0.125	301	0.133	255	0.092	223	0.077	195
DCP 4	.150	1.633	0.351	76	0.528	48	0.074	64	0.135	13	0.079	320	0.078	279	0.084	235	0.058	190	0.051	161
DCP 5	.200	1.258	0.379	69	0.441	36	0.098	52	0.150	340	0.071	296	0.096	258	0.090	200	0.059	177	0.056	131
DCP 6	.250	1.268	0.410	58	0.373	33	0.056	57	0.112	338	0.049	288	0.088	262	0.078	202	0.054	171	0.058	124
DCP 7	.300	0.973	0.392	50	0.298	22	0.048	26	0.110	312	0.042	284	0.096	236	0.067	179	0.058	161	0.057	94
DCP 8	.400	0.820	0.394	41	0.226	16	0.037	3	0.074	291	0.027	258	0.077	236	0.050	173	0.048	155	0.048	90
DCP 9	.500	0.597	0.319	32	0.137	357	0.032	332	0.057	250	0.001	141	0.055	205	0.024	129	0.034	130	0.040	45
DCP10	.600	0.544	0.312	27	0.110	356	0.029	304	0.041	235	0.007	263	0.050	213	0.026	130	0.030	123	0.034	45
DCP11	.878	0.366	0.247	0	0.070	290	0.055	273	0.021	196	0.020	317	0.014	151	0.004	324	0.015	66	0.026	311

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.004	339	0.026	244	0.019	298	0.017	206	0.015	223	0.011	248	0.010	212	0.010	238	0.013	227
CN		0.002	60	0.004	300	0.003	313	0.005	316	0.001	280	0.010	231	0.002	267	0.002	339	0.002	288
CM		0.006	158	0.005	171	0.003	84	0.004	97	0.002	354	0.004	35	0.000	64	0.001	207	0.001	279
DCP 1	.010	0.090	235	0.078	215	0.052	206	0.060	171	0.047	138	0.029	78	0.018	330	0.021	217	0.011	105
DCP 2	.025	0.142	191	0.106	173	0.047	151	0.058	120	0.050	77	0.021	26	0.017	341	0.015	339	0.032	285
DCP 3	.100	0.050	150	0.037	146	0.032	110	0.033	76	0.032	58	0.017	15	0.026	4	0.023	340	0.028	309
DCP 4	.150	0.030	122	0.016	86	0.024	59	0.018	18	0.016	334	0.011	292	0.007	254	0.005	282	0.010	290
DCP 5	.200	0.032	79	0.023	74	0.030	16	0.021	341	0.024	310	0.020	264	0.015	268	0.016	254	0.016	236
DCP 6	.250	0.028	77	0.024	59	0.029	14	0.020	355	0.028	311	0.022	258	0.013	239	0.009	211	0.005	193
DCP 7	.300	0.027	58	0.032	30	0.028	345	0.028	326	0.027	270	0.021	240	0.013	222	0.010	200	0.011	198
DCP 8	.400	0.018	50	0.028	15	0.019	330	0.016	325	0.020	271	0.016	240	0.014	197	0.009	181	0.008	138
DCP 9	.500	0.027	4	0.031	317	0.016	283	0.019	261	0.017	223	0.023	199	0.016	136	0.012	107	0.011	55
DCP10	.600	0.018	345	0.024	308	0.012	269	0.009	251	0.010	228	0.011	179	0.006	134	0.003	98	0.004	29
DCP11	.878	0.024	305	0.022	254	0.012	232	0.012	276	0.017	105	0.018	229	0.011	327	0.014	356	0.004	120

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	16.18	0.600	7.65	6.99		5091.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.041	657.4	732.1	0.32E 07	-0.00092	1.165	10.6[illegible]	0.1010

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		7.647	6.990	0	0.521	24	0.092	160	0.064	131	0.010	170	0.078	26	0.069	279	0.062	231	0.038	201
CN		0.682	0.543	358	0.188	57	0.034	62	0.027	40	0.007	343	0.020	25	0.014	340	0.013	302	0.011	234
CM		-0.040	0.030	207	0.018	91	0.003	133	0.007	93	0.002	65	0.003	56	0.002	46	0.002	84	0.003	29
DCP 1	.010	1.123	2.754	353	0.767	55	0.163	104	0.038	53	0.030	181	0.016	359	0.025	242	0.019	261	0.017	158
DCP 2	.025	1.433	2.362	352	0.722	55	0.175	112	0.021	130	0.045	255	0.048	2	0.025	30	0.021	162	0.033	189
DCP 3	.100	1.737	0.864	346	0.790	71	0.064	89	0.173	72	0.055	81	0.074	54	0.056	24	0.014	345	0.036	342
DCP 4	.150	1.565	0.702	353	0.564	70	0.066	68	0.224	63	0.023	37	0.143	44	0.020	42	0.078	8	0.025	127
DCP 5	.200	1.231	0.649	358	0.364	66	0.083	43	0.094	71	0.048	10	0.085	51	0.061	353	0.035	20	0.021	324
DCP 6	.250	1.097	0.668	2	0.261	58	0.082	36	0.041	25	0.043	357	0.033	10	0.058	329	0.034	287	0.034	284
DCP 7	.300	0.793	0.636	2	0.203	54	0.082	33	0.039	7	0.045	352	0.032	347	0.053	330	0.043	287	0.032	272
DCP 8	.400	0.613	0.517	4	0.125	41	0.040	40	0.034	313	0.010	247	0.012	323	0.013	287	0.022	266	0.021	214
DCP 9	.500	0.541	0.428	6	0.090	24	0.030	32	0.032	320	0.013	294	0.020	299	0.017	268	0.021	256	0.023	213
DCP10	.600	0.369	0.329	7	0.054	23	0.012	74	0.018	310	0.010	209	0.003	4	0.004	256	0.007	286	0.015	219
DCP11	.878	0.277	0.235	5	0.036	300	0.008	281	0.015	253	0.005	243	0.006	215	0.003	158	0.007	277	0.009	193

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.021	168	0.008	203	0.016	201	0.012	189	0.009	172	0.007	162	0.014	199	0.006	229	0.005	204
CN		0.007	227	0.003	133	0.004	314	0.006	203	0.003	207	0.003	151	0.001	242	0.003	203	0.001	72
CM		0.002	336	0.001	309	0.001	346	0.001	324	0.001	264	0.001	264	0.001	222	0.000	255	0.000	204
DCP 1	.010	0.008	213	0.016	176	0.004	167	0.004	188	0.005	253	0.005	265	0.002	118	0.001	212	0.003	247
DCP 2	.025	0.022	252	0.009	28	0.014	36	0.030	159	0.003	139	0.008	288	0.012	202	0.019	275	0.020	350
DCP 3	.100	0.028	249	0.010	295	0.019	310	0.026	260	0.024	262	0.020	208	0.014	260	0.022	201	0.008	170
DCP 4	.150	0.040	342	0.025	116	0.013	290	0.017	83	0.017	244	0.009	159	0.014	165	0.007	213	0.009	183
DCP 5	.200	0.024	19	0.024	34	0.041	2	0.007	337	0.013	327	0.015	87	0.018	328	0.006	17	0.008	131
DCP 6	.250	0.019	243	0.015	293	0.016	278	0.022	261	0.015	197	0.003	298	0.008	242	0.007	229	0.002	228
DCP 7	.300	0.024	253	0.016	265	0.018	270	0.025	250	0.023	217	0.013	195	0.012	230	0.018	199	0.013	158
DCP 8	.400	0.012	196	0.012	162	0.001	256	0.013	186	0.010	111	0.003	76	0.003	61	0.003	256	0.004	141
DCP 9	.500	0.015	191	0.013	176	0.009	164	0.012	156	0.010	126	0.009	119	0.009	99	0.011	73	0.012	28
DCP10	.600	0.010	161	0.006	116	0.001	358	0.002	192	0.004	167	0.005	108	0.003	54	0.003	103	0.005	3
DCP11	.878	0.007	152	0.005	91	0.001	143	0.005	128	0.005	26	0.001	338	0.003	358	0.001	260	0.000	325

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
90.0	16.73	0.690	7.63	7.07		5091.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.042	649.4	728.9	0.32E 07	-0.00092	1.158	10.63	0.0900

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		7.628	7.074	0	0.518	28	0.117	171	0.067	134	0.022	167	0.125	8	0.090	265	0.074	212	0.037	192
CN		0.662	0.557	359	0.189	57	0.031	68	0.027	44	0.010	351	0.019	5	0.013	307	0.008	256	0.036	237
CM		-0.041	0.031	208	0.020	95	0.003	128	0.006	98	0.001	48	0.003	77	0.004	70	0.003	57	0.003	0
DCP 1	.010	1.098	2.810	353	0.762	54	0.163	110	0.035	54	0.032	183	0.013	293	0.033	242	0.020	243	0.014	153
DCP 2	.025	1.423	2.425	353	0.740	57	0.187	120	0.033	169	0.043	257	0.069	0	0.008	56	0.045	162	0.032	235
DCP 3	.100	1.723	0.869	347	0.814	74	0.072	92	0.178	74	0.044	70	0.047	64	0.049	49	0.016	37	0.042	358
DCP 4	.150	1.474	0.718	353	0.574	70	0.065	68	0.235	63	0.033	74	0.140	39	0.022	16	0.073	355	0.027	138
DCP 5	.200	1.059	0.683	0	0.369	70	0.093	50	0.094	65	0.052	5	0.063	60	0.051	7	0.037	49	0.037	10
DCP 6	.250	1.010	0.683	2	0.260	56	0.079	33	0.039	20	0.047	345	0.022	344	0.048	323	0.022	274	0.034	307
DCP 7	.300	0.808	0.657	4	0.211	54	0.079	27	0.036	0	0.046	349	0.029	330	0.046	327	0.034	277	0.026	301
DCP 8	.400	0.619	0.533	4	0.126	31	0.028	37	0.026	313	0.007	296	0.022	302	0.026	253	0.021	232	0.019	211
DCP 9	.500	0.488	0.439	7	0.096	27	0.029	28	0.029	320	0.011	332	0.030	316	0.031	273	0.029	245	0.023	212
DCP10	.600	0.382	0.341	7	0.056	5	0.012	112	0.012	326	0.002	208	0.012	316	0.018	242	0.009	205	0.011	192
DCP11	.878	0.280	0.235	6	0.037	305	0.007	285	0.014	272	0.006	205	0.007	233	0.008	251	0.006	246	0.010	154

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.017	203	0.019	214	0.018	189	0.016	197	0.010	189	0.010	167	0.015	222	0.008	253	0.006	260
CN		0.008	238	0.003	179	0.005	260	0.007	204	0.004	182	0.002	131	0.003	231	0.003	222	0.000	191
CM		0.002	338	0.001	30	0.001	334	0.002	312	0.001	266	0.001	240	0.001	180	0.000	240	0.001	226
DCP 1	.010	0.021	171	0.010	129	0.010	234	0.008	220	0.009	189	0.005	205	0.002	283	0.007	241	0.007	267
DCP 2	.025	0.027	257	0.029	59	0.004	185	0.018	212	0.005	112	0.013	184	0.019	207	0.019	302	0.012	334
DCP 3	.100	0.026	273	0.018	314	0.025	298	0.033	266	0.024	264	0.025	229	0.020	255	0.026	216	0.015	181
DCP 4	.150	0.036	328	0.027	108	0.033	280	0.014	154	0.028	207	0.011	149	0.016	182	0.016	204	0.008	155
DCP 5	.200	0.021	10	0.011	79	0.035	358	0.010	194	0.016	343	0.011	24	0.002	41	0.006	37	0.012	242
DCP 6	.250	0.025	250	0.021	291	0.023	243	0.017	255	0.015	218	0.008	261	0.010	225	0.006	230	0.008	258
DCP 7	.300	0.030	265	0.019	262	0.022	269	0.026	253	0.025	219	0.013	206	0.014	213	0.013	197	0.009	172
DCP 8	.400	0.018	185	0.014	150	0.006	143	0.004	174	0.008	154	0.005	113	0.005	106	0.006	43	0.004	306
DCP 9	.500	0.016	205	0.017	195	0.015	182	0.017	163	0.017	123	0.012	81	0.005	96	0.011	82	0.010	30
DCP10	.600	0.009	157	0.006	148	0.004	165	0.007	134	0.008	96	0.007	32	0.005	347	0.004	245	0.001	114
DCP11	.878	0.005	158	0.004	264	0.001	148	0.005	142	0.004	32	0.004	84	0.003	302	0.003	261	0.004	51

TUNED PITCHING OSCILLATION — VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
80.0	16.39	0.600	7.65	7.25		5091.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.042	647.2	727.9	0.32E 07	-0.00079	1.166	11.35	0.0250

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		7.651	7.253	0	0.530	29	0.128	175	0.044	100	0.091	121	0.183	294	0.094	237	0.055	196	0.039	188
CN		0.655	0.567	359	0.188	56	0.033	77	0.028	37	0.007	77	0.020	335	0.016	293	0.014	248	0.012	198
CM		-0.043	0.032	204	0.022	93	0.003	126	0.006	82	0.001	357	0.003	108	0.003	49	0.003	29	0.003	359
DCP 1	.010	1.061	2.873	352	0.802	52	0.161	104	0.050	22	0.079	133	0.054	228	0.042	244	0.024	245	0.018	164
DCP 2	.025	1.406	2.476	353	0.733	58	0.195	125	0.022	151	0.050	208	0.041	294	0.010	101	0.048	181	0.036	185
DCP 3	.100	1.705	0.870	348	0.822	75	0.083	109	0.198	73	0.066	75	0.026	32	0.053	2	0.038	262	0.015	305
DCP 4	.150	1.459	0.747	353	0.588	66	0.056	69	0.239	54	0.016	79	0.135	33	0.020	353	0.077	350	0.015	163
DCP 5	.200	1.023	0.648	1	0.383	71	0.100	54	0.099	56	0.033	10	0.050	53	0.057	349	0.036	28	0.012	23
DCP 6	.250	0.976	0.686	1	0.267	55	0.089	37	0.043	9	0.041	13	0.036	326	0.061	314	0.040	259	0.024	281
DCP 7	.300	0.792	0.644	4	0.209	57	0.090	34	0.053	337	0.027	331	0.035	310	0.050	312	0.045	263	0.020	267
DCP 8	.400	0.614	0.550	2	0.119	30	0.030	52	0.027	316	0.007	122	0.034	300	0.033	241	0.021	202	0.015	175
DCP 9	.500	0.478	0.453	7	0.091	17	0.016	25	0.028	302	0.004	205	0.030	307	0.030	258	0.026	232	0.023	202
DCP10	.600	0.382	0.355	5	0.057	2	0.012	119	0.010	313	0.010	115	0.021	312	0.018	239	0.011	235	0.018	194
DCP11	.878	0.293	0.244	5	0.043	294	0.003	215	0.016	246	0.005	175	0.009	282	0.006	207	0.012	196	0.016	166

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.020	153	0.011	221	0.015	197	0.007	207	0.011	213	0.004	169	0.008	224	0.007	271	0.011	220
CN		0.005	259	0.003	195	0.002	208	0.007	226	0.006	150	0.005	158	0.004	174	0.002	85	0.001	58
CM		0.002	292	0.002	275	0.001	274	0.001	19	0.001	274	0.001	261	0.000	270	0.002	213	0.001	100
DCP 1	.010	0.006	203	0.008	73	0.004	214	0.008	219	0.004	206	0.004	195	0.004	236	0.007	216	0.010	241
DCP 2	.025	0.017	257	0.004	36	0.014	232	0.018	258	0.018	52	0.018	154	0.019	212	0.014	296	0.004	138
DCP 3	.100	0.026	283	0.040	266	0.014	241	0.036	266	0.034	221	0.025	187	0.015	190	0.018	159	0.008	112
DCP 4	.150	0.034	314	0.016	116	0.009	292	0.011	260	0.021	180	0.019	218	0.019	135	0.028	216	0.020	134
DCP 5	.200	0.035	12	0.014	327	0.024	11	0.006	254	0.007	359	0.007	152	0.005	216	0.008	106	0.015	40
DCP 6	.250	0.030	250	0.013	255	0.018	[illegible]	0.011	243	0.015	221	0.005	210	0.010	235	0.010	197	0.003	233
DCP 7	.300	0.035	263	0.025	225	0.018	241	0.025	211	0.016	173	0.011	190	0.012	187	0.011	164	0.006	116
DCP 8	.400	0.008	202	0.007	167	0.008	194	0.013	155	0.012	119	0.008	66	0.002	86	0.007	75	0.008	359
DCP 9	.500	0.017	188	0.017	163	0.011	152	0.014	143	0.010	111	0.013	108	0.014	61	0.008	18	0.007	26
DCP10	.600	0.009	146	0.007	135	0.008	77	0.011	63	0.005	108	0.007	0	0.003	240	0.003	71	0.005	339
DCP11	.878	0.011	72	0.009	48	0.004	81	0.008	262	0.005	86	0.006	165	0.003	170	0.014	27	0.006	223

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	16.39	0.400	12.33	7.13		5097.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.061	445.5	363.2	0.23E 07	-0.00097	1.662	16.35	0.0800

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		12.329	7.131	359	0.414	20	0.099	163	0.033	167	0.011	253	0.016	333	0.126	263	0.093	180	0.019	127
CN		1.047	0.276	29	0.246	62	0.068	32	0.043	350	0.018	300	0.016	321	0.025	274	0.023	207	0.013	127
CM		-0.048	0.063	195	0.036	104	0.011	98	0.017	72	0.010	19	0.006	32	0.009	356	0.010	318	0.008	256
DCP 1	.010	3.869	1.337	3	1.363	72	0.391	32	0.140	31	0.071	37	0.160	45	0.188	342	0.133	307	0.105	282
DCP 2	.025	3.272	0.352	358	1.643	89	0.525	57	0.339	64	0.311	37	0.234	16	0.217	354	0.196	321	0.137	282
DCP 3	.100	2.288	0.229	123	0.897	81	0.190	64	0.212	63	0.169	2	0.062	339	0.126	338	0.110	284	0.073	244
DCP 4	.150	1.825	0.252	72	0.548	60	0.097	27	0.122	20	0.093	302	0.025	289	0.078	273	0.077	207	0.042	155
DCP 5	.250	1.595	0.348	49	0.364	45	0.072	19	0.111	342	0.083	263	0.024	279	0.078	243	0.068	183	0.051	137
DCP 6	.300	1.068	0.351	47	0.284	48	0.075	40	0.120	346	0.074	269	0.028	287	0.057	266	0.062	214	0.050	171
DCP 7	.400	0.955	0.384	31	0.193	24	0.052	8	0.092	304	0.057	224	0.022	241	0.040	209	0.047	164	0.047	112
DCP 8	.500	0.840	0.341	28	0.107	18	0.041	15	0.078	296	0.045	206	0.011	276	0.025	227	0.043	185	0.040	119
DCP 9	.600	0.606	0.329	19	0.079	350	0.029	358	0.059	268	0.030	189	0.013	264	0.032	204	0.037	133	0.036	64
DCP10	.878	0.388	0.273	9	0.044	298	0.044	303	0.043	279	0.012	186	0.018	211	0.017	152	0.021	137	0.021	52

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.003	161	0.011	270	0.019	243	0.019	252	0.016	236	0.002	259	0.011	218	0.010	269	0.008	276
CN		0.003	2	0.002	199	0.006	60	0.005	328	0.006	268	0.005	219	0.004	226	0.002	145	0.004	177
CM		0.003	203	0.003	242	0.004	197	0.004	150	0.003	109	0.003	68	0.001	25	0.001	354	0.001	5
DCP 1	.010	0.102	264	0.108	232	0.066	186	0.061	179	0.061	136	0.054	79	0.039	22	0.039	335	0.032	293
DCP 2	.025	0.076	277	0.113	274	0.103	223	0.064	195	0.039	196	0.031	171	0.022	176	0.029	136	0.027	117
DCP 3	.100	0.042	249	0.059	226	0.053	188	0.048	163	0.034	155	0.038	139	0.025	127	0.030	93	0.018	111
DCP 4	.150	0.029	154	0.032	111	0.031	67	0.019	29	0.016	352	0.010	331	0.015	315	0.012	300	0.012	246
DCP 5	.250	0.033	98	0.020	84	0.033	54	0.027	1	0.019	321	0.012	313	0.019	298	0.017	258	0.012	203
DCP 6	.300	0.030	138	0.026	136	0.032	105	0.030	59	0.018	33	0.012	20	0.016	3	0.011	326	0.008	302
DCP 7	.400	0.030	52	0.019	43	0.026	16	0.024	323	0.019	280	0.013	245	0.015	232	0.009	170	0.006	156
DCP 8	.500	0.019	73	0.018	91	0.026	47	0.027	349	0.015	291	0.002	305	0.009	314	0.007	283	0.013	252
DCP 9	.600	0.019	352	0.015	356	0.014	333	0.015	283	0.010	263	0.012	237	0.012	193	0.010	112	0.006	108
DCP10	.878	0.010	317	0.004	161	0.010	18	0.008	323	0.009	270	0.012	228	0.006	172	0.003	179	0.007	177

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	16.50	0.400	12.36	7.18		5397.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.062	445.2	380.4	0.74E 07	-0.00081	1.658	15.84	0.0800

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		12.357	7.177	359	0.446	17	0.088	159	0.023	134	0.020	337	0.039	341	0.147	238	0.068	172	0.011	95
CN		1.019	0.301	32	0.247	51	0.046	32	0.041	0	0.011	332	0.025	322	0.026	262	0.018	200	0.010	137
CM		-0.044	0.055	196	0.032	107	0.012	108	0.018	69	0.010	18	0.009	22	0.008	331	0.007	301	0.007	257
DCP 1	.010	4.027	1.747	5	1.066	59	0.170	76	0.231	57	0.162	48	0.217	21	0.155	328	0.100	315	0.104	298
DCP 2	.025	-3.438	0.740	11	1.372	79	0.375	59	0.389	70	0.332	47	0.336	17	0.263	339	0.205	311	0.148	280
DCP 3	.100	2.765	0.259	110	0.874	73	0.168	67	0.227	58	0.160	5	0.110	351	0.142	309	0.097	266	0.071	243
DCP 4	.150	1.645	0.293	80	0.551	55	0.064	46	0.155	24	0.099	306	0.047	299	0.089	260	0.078	195	0.041	157
DCP 5	.250	1.464	0.371	55	0.373	40	0.052	25	0.122	345	0.070	263	0.050	287	0.088	224	0.063	167	0.048	143
DCP 6	.300	1.068	0.361	49	0.304	39	0.066	32	0.112	342	0.054	262	0.050	308	0.077	241	0.049	193	0.045	173
DCP 7	.400	0.946	0.398	36	0.218	19	0.045	352	0.093	299	0.048	217	0.040	251	0.057	187	0.040	148	0.045	105
DCP 8	.500	0.756	0.324	32	0.138	16	0.043	3	0.071	286	0.038	189	0.024	258	0.031	188	0.029	165	0.038	103
DCP 9	.600	0.586	0.323	23	0.096	354	0.028	325	0.058	264	0.022	178	0.029	216	0.028	144	0.020	120	0.029	72
DCP10	.878	0.390	0.265	9	0.058	312	0.044	299	0.040	219	0.014	177	0.016	189	0.004	111	0.016	111	0.014	39

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.005	43	0.009	289	0.015	270	0.018	264	0.007	240	0.004	350	0.013	246	0.012	266	0.010	313
CN		0.005	87	0.003	2	0.002	292	0.002	265	0.003	262	0.003	178	0.002	183	0.002	75	0.001	115
CM		0.005	222	0.004	194	0.002	151	0.003	112	0.001	58	0.001	18	0.001	80	0.001	2	0.000	293
DCP 1	.010	0.117	266	0.117	230	0.075	201	0.057	172	0.044	156	0.057	109	0.057	47	0.043	349	0.026	297
DCP 2	.025	0.086	259	0.090	255	0.074	227	0.055	194	0.043	198	0.039	165	0.050	134	0.044	66	0.026	341
DCP 3	.100	0.054	217	0.049	195	0.038	177	0.051	141	0.020	106	0.025	139	0.034	119	0.026	85	0.027	96
DCP 4	.150	0.036	139	0.028	90	0.015	67	0.020	35	0.018	339	0.006	340	0.011	325	0.010	296	0.006	236
DCP 5	.250	0.042	91	0.022	55	0.024	45	0.024	348	0.017	314	0.013	293	0.011	269	0.010	271	0.008	199
DCP 6	.300	0.036	132	0.024	117	0.029	88	0.023	60	0.020	35	0.020	9	0.020	335	0.017	301	0.008	286
DCP 7	.400	0.028	44	0.018	29	0.021	355	0.018	318	0.017	288	0.011	268	0.013	242	0.008	182	0.008	171
DCP 8	.500	0.020	53	0.020	54	0.021	6	0.011	325	0.011	313	0.010	291	0.016	259	0.011	205	0.006	160
DCP 9	.600	0.015	18	0.019	344	0.014	285	0.011	267	0.007	225	0.005	192	0.009	176	0.007	96	0.005	121
DCP10	.878	0.010	27	0.010	345	0.007	257	0.010	254	0.008	183	0.009	145	0.002	47	0.002	91	0.004	16

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	16.89	0.400	12.32	7.74		5097.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.064	443.6	381.7	0.24E 07	-0.00090	1.636	16.30	0.0470

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		12.319	7.240	0	0.338	21	0.161	185	0.056	195	0.037	268	0.148	312	0.166	196	0.049	172	0.027	303
CN		0.992	0.316	37	0.231	46	0.031	41	0.051	351	0.023	283	0.025	302	0.025	222	0.015	182	0.005	95
CM		-0.039	0.050	198	0.032	104	0.011	93	0.014	64	0.008	21	0.009	8	0.009	324	0.007	287	0.006	238
DCP 1	.010	3.980	1.803	8	0.976	56	0.175	83	0.196	45	0.098	33	0.215	1	0.156	317	0.141	282	0.116	265
DCP 2	.025	3.507	0.960	14	1.189	77	0.354	73	0.319	49	0.226	38	0.323	8	0.236	328	0.197	300	0.165	275
DCP 3	.100	2.261	0.325	102	0.855	72	0.159	60	0.203	41	0.160	344	0.108	321	0.102	287	0.088	249	0.055	221
DCP 4	.150	1.556	0.339	80	0.536	51	0.046	32	0.140	14	0.107	287	0.053	275	0.077	231	0.068	177	0.029	124
DCP 5	.250	1.393	0.393	60	0.372	35	0.027	24	0.119	339	0.085	250	0.046	271	0.088	203	0.061	143	0.038	113
DCP 6	.300	1.047	0.377	55	0.303	36	0.035	35	0.115	343	0.069	264	0.045	287	0.077	223	0.047	173	0.042	151
DCP 7	.400	0.908	0.389	42	0.222	13	0.018	343	0.087	305	0.056	225	0.045	243	0.065	171	0.037	124	0.039	82
DCP 8	.500	0.706	0.329	39	0.146	7	0.018	330	0.068	291	0.033	206	0.027	255	0.040	175	0.026	147	0.034	94
DCP 9	.600	0.569	0.321	27	0.103	344	0.012	278	0.045	266	0.025	192	0.029	200	0.034	127	0.016	107	0.025	35
DCP10	.878	0.372	0.252	8	0.052	294	0.036	293	0.030	223	0.011	226	0.014	168	0.013	160	0.016	102	0.012	14

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.025	282	0.022	286	0.027	266	0.022	266	0.016	289	0.012	325	0.007	281	0.008	329	0.009	329
CN		0.004	313	0.003	270	0.005	260	0.003	282	0.006	227	0.003	130	0.002	20	0.001	35	0.002	342
CM		0.004	208	0.004	185	0.003	126	0.003	95	0.003	42	0.001	339	0.001	261	0.001	286	0.001	178
DCP 1	.010	0.111	241	0.093	203	0.066	188	0.049	134	0.041	79	0.035	15	0.026	333	0.018	274	0.006	262
DCP 2	.025	0.146	248	0.122	221	0.089	199	0.067	149	0.040	115	0.033	75	0.021	347	0.012	266	0.015	212
DCP 3	.100	0.035	221	0.051	192	0.030	159	0.031	123	0.021	125	0.027	94	0.025	77	0.027	44	0.029	22
DCP 4	.150	0.020	120	0.021	76	0.014	34	0.024	5	0.022	311	0.010	276	0.009	284	0.006	245	0.005	231
DCP 5	.250	0.036	59	0.018	11	0.017	14	0.022	324	0.015	285	0.014	261	0.007	224	0.004	235	0.008	186
DCP 6	.300	0.025	106	0.017	98	0.024	67	0.021	29	0.018	352	0.016	324	0.012	311	0.015	292	0.016	271
DCP 7	.400	0.029	14	0.015	357	0.023	322	0.018	308	0.022	262	0.016	202	0.008	166	0.007	119	0.004	142
DCP 8	.500	0.016	17	0.012	27	0.018	344	0.016	318	0.018	273	0.009	235	0.012	226	0.005	187	0.004	195
DCP 9	.600	0.014	344	0.018	330	0.020	253	0.013	233	0.016	182	0.008	116	0.006	90	0.004	120	0.009	98
DCP10	.878	0.004	350	0.006	353	0.008	276	0.013	255	0.009	202	0.007	119	0.007	30	0.003	44	0.012	337

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	16.34	0.600	10.05	7.04		5103.1	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.042	654.5	730.1	0.32E 07	-0.00128	1.219	10.29	0.0800

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		10.053	7.038	0	0.456	18	0.126	164	0.046	184	0.051	173	0.045	189	0.080	174	0.086	106	0.039	356
CN		0.901	0.358	4	0.158	67	0.049	96	0.014	134	0.023	140	0.025	86	0.008	11	0.021	156	0.010	73
CM		-0.084	0.053	159	0.015	122	0.010	150	0.000	82	0.004	173	0.004	201	0.002	97	0.006	272	0.006	173
DCP 1	.010	1.991	1.806	354	0.612	63	0.159	79	0.055	226	0.028	128	0.011	93	0.003	104	0.020	23	0.034	245
DCP 2	.025	2.113	1.410	355	0.609	68	0.165	61	0.077	280	0.070	181	0.030	93	0.041	16	0.045	196	0.030	188
DCP 3	.100	2.004	0.192	301	0.517	84	0.332	138	0.061	151	0.112	159	0.078	119	0.050	34	0.098	242	0.111	152
DCP 4	.200	1.392	0.275	1	0.318	84	0.160	129	0.061	115	0.140	152	0.058	114	0.007	59	0.113	210	0.018	108
DCP 5	.250	1.276	0.413	12	0.259	73	0.082	71	0.059	100	0.039	110	0.041	82	0.051	157	0.061	104	0.030	84
DCP 6	.300	0.961	0.392	9	0.233	79	0.072	66	0.068	103	0.038	110	0.078	81	0.020	350	0.064	163	0.049	101
DCP 7	.400	0.795	0.420	10	0.118	51	0.047	34	0.013	101	0.028	17	0.009	65	0.005	42	0.035	80	0.036	356
DCP 8	.500	0.656	0.365	16	0.109	39	0.038	26	0.017	47	0.019	337	0.012	67	0.005	77	0.041	104	0.040	20
DCP 9	.600	0.513	0.328	11	0.051	10	0.019	4	0.015	198	0.016	53	0.010	57	0.009	336	0.015	79	0.021	324
DCP10	.878	0.616	0.280	9	0.042	341	0.029	342	0.010	267	0.005	226	0.024	33	0.014	287	0.019	124	0.017	4

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.008	262	0.005	153	0.008	178	0.002	21	0.009	239	0.008	144	0.005	171	0.004	242	0.005	246
CN		0.008	130	0.004	109	0.007	98	0.005	149	0.002	58	0.002	59	0.002	92	0.005	75	0.001	310
CM		0.001	3	0.002	187	0.001	195	0.000	280	0.002	178	0.003	116	0.001	57	0.001	330	0.001	240
DCP 1	.010	0.012	146	0.014	81	0.017	37	0.021	296	0.020	217	0.018	132	0.009	27	0.011	287	0.009	191
DCP 2	.025	0.057	50	0.024	20	0.018	53	0.019	333	0.026	246	0.038	160	0.047	101	0.041	48	0.048	305
DCP 3	.100	0.034	108	0.031	151	0.023	153	0.050	168	0.039	123	0.012	123	0.028	122	0.015	56	0.010	227
DCP 4	.200	0.032	214	0.035	232	0.013	65	0.011	300	0.012	319	0.037	37	0.016	339	0.019	57	0.019	156
DCP 5	.250	0.008	206	0.029	149	0.015	154	0.009	116	0.005	246	0.006	265	0.008	250	0.010	279	0.006	229
DCP 6	.300	0.028	132	0.020	132	0.038	147	0.024	106	0.011	197	0.022	133	0.012	322	0.014	199	0.009	242
DCP 7	.400	0.009	274	0.006	110	0.010	57	0.037	358	0.003	271	0.004	118	0.001	289	0.005	167	0.006	81
DCP 8	.500	0.007	88	0.017	39	0.010	50	0.015	95	0.020	56	0.024	17	0.019	330	0.005	276	0.002	86
DCP 9	.600	0.009	166	0.007	66	0.010	19	0.009	293	0.002	195	0.003	115	0.001	56	0.007	75	0.010	5
DCP10	.878	0.004	111	0.011	345	0.001	205	0.008	150	0.015	352	0.019	278	0.010	169	0.006	122	0.003	81

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	16.39	0.600	10.03	7.08		5103.2	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.042	651.7	726.6	0.31E 07	-0.00095	1.222	15.16	0.0760

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		10.029	7.079	0	0.515	16	0.103	164	0.020	166	0.027	173	0.042	178	0.073	177	0.080	95	0.040	1
CN		0.896	0.363	6	0.156	66	0.049	100	0.013	116	0.014	136	0.015	93	0.011	189	0.021	138	0.008	39
CM		-0.084	0.050	196	0.014	102	0.009	170	0.002	159	0.004	178	0.001	183	0.002	202	0.004	228	0.004	149
DCP 1	.010	2.005	1.845	354	0.599	60	0.159	87	0.042	188	0.028	68	0.014	3	0.021	239	0.002	131	0.020	161
DCP 2	.025	2.116	1.433	356	0.601	67	0.140	73	0.073	254	0.027	177	0.011	128	0.015	187	0.006	59	0.004	181
DCP 3	.100	2.022	0.137	331	0.533	74	0.297	149	0.060	151	0.094	165	0.039	104	0.062	217	0.054	150	0.033	122
DCP 4	.200	1.327	0.304	10	0.323	81	0.123	131	0.070	112	0.091	158	0.034	189	0.065	181	0.064	182	0.006	53
DCP 5	.250	1.249	0.402	12	0.259	71	0.069	74	0.069	94	0.025	119	0.050	88	0.040	163	0.060	109	0.034	96
DCP 6	.300	0.981	0.414	13	0.232	77	0.078	72	0.070	97	0.034	106	0.064	92	0.027	148	0.061	119	0.041	101
DCP 7	.400	0.792	0.416	10	0.106	51	0.052	50	0.008	36	0.011	28	0.022	70	0.009	348	0.027	72	0.020	359
DCP 8	.500	0.646	0.363	16	0.100	48	0.048	39	0.017	67	0.022	40	0.032	67	0.016	12	0.032	80	0.029	26
DCP 9	.600	0.518	0.331	11	0.041	7	0.031	55	0.010	313	0.008	355	0.003	151	0.003	67	0.017	53	0.015	323
DCP10	.878	0.609	0.267	7	0.030	319	0.026	349	0.010	287	0.011	354	0.008	316	0.002	256	0.015	47	0.014	309

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.008	310	0.005	137	0.006	91	0.008	23	0.004	284	0.004	94	0.009	221	0.002	259	0.001	325
CN		0.005	121	0.001	74	0.002	164	0.003	182	0.003	102	0.003	31	0.001	277	0.003	172	0.004	151
CM		0.000	217	0.001	205	0.001	172	0.001	111	0.001	275	0.001	203	0.001	171	0.001	211	0.001	130
DCP 1	.010	0.021	34	0.010	280	0.016	115	0.014	3	0.018	304	0.015	238	0.009	148	0.008	77	0.005	289
DCP 2	.025	0.015	39	0.009	332	0.006	249	0.015	193	0.007	120	0.009	4	0.013	254	0.022	184	0.016	78
DCP 3	.100	0.034	169	0.022	149	0.032	163	0.017	142	0.014	181	0.011	139	0.006	196	0.020	214	0.035	167
DCP 4	.200	0.012	192	0.034	289	0.022	289	0.005	230	0.026	3	0.010	23	0.012	39	0.009	125	0.017	134
DCP 5	.250	0.012	120	0.021	126	0.015	147	0.003	148	0.011	209	0.011	250	0.014	207	0.005	195	0.004	95
DCP 6	.300	0.023	96	0.013	139	0.019	175	0.020	156	0.008	158	0.004	216	0.013	264	0.022	222	0.016	152
DCP 7	.400	0.007	21	0.004	62	0.011	33	0.007	281	0.005	110	0.004	129	0.009	86	0.008	64	0.006	2
DCP 8	.500	0.016	23	0.003	54	0.015	55	0.004	14	0.010	59	0.008	339	0.009	235	0.014	135	0.009	52
DCP 9	.600	0.004	144	0.005	16	0.003	291	0.004	181	0.008	103	0.011	34	0.004	342	0.007	15	0.006	271
DCP10	.878	0.003	194	0.004	18	0.005	319	0.003	287	0.001	224	0.003	29	0.003	357	0.002	358	0.005	293

TUNED PITCHING OSCILLATION VERTOL 23010-1.58 AIRFOIL

TUNED CPS	AIRFOIL CPS	MACH NO	ALPHA.0	D.ALPHA	DEL.H	TEST POINT	CYCLES ANALYZED
96.0	16.69	0.600	10.07	7.17		5103.3	10

K	V	Q	RN	DAMPING	CN(MAX)	ALPHA(STALL)	EXT DAMPING
0.043	647.4	725.4	0.31E 07	-0.00092	1.222	16.07	0.0220

HARMONIC ANALYSIS

DATA TYPE	X/C	RES 0	RES 1	PHI	RES 2	PHI	RES 3	PHI	RES 4	PHI	RES 5	PHI	RES 6	PHI	RES 7	PHI	RES 8	PHI	RES 9	PHI
ALPHA		10.070	7.174	0	0.373	22	0.224	183	0.094	201	0.088	175	0.075	206	0.112	84	0.042	325	0.064	249
CN		0.890	0.370	5	0.162	67	0.045	100	0.015	110	0.009	136	0.006	160	0.014	125	0.018	53	0.009	315
CM		-0.084	0.051	194	0.018	104	0.009	138	0.002	311	0.004	172	0.001	119	0.003	213	0.005	172	0.004	79
DCP 1	.010	2.003	1.883	354	0.583	62	0.133	94	0.066	215	0.024	139	0.037	268	0.015	255	0.007	205	0.005	117
DCP 2	.025	2.119	1.460	355	0.584	69	0.124	75	0.088	253	0.036	188	0.045	248	0.022	182	0.020	122	0.010	49
DCP 3	.100	2.024	0.134	333	0.615	78	0.297	138	0.052	97	0.066	167	0.045	141	0.038	156	0.070	99	0.053	45
DCP 4	.200	1.260	0.303	11	0.361	82	0.127	122	0.059	93	0.076	153	0.028	191	0.057	160	0.026	165	0.020	322
DCP 5	.250	1.220	0.425	12	0.264	74	0.082	72	0.059	84	0.022	110	0.023	82	0.053	137	0.045	69	0.012	64
DCP 6	.300	0.995	0.426	14	0.258	76	0.088	66	0.069	77	0.019	96	0.043	96	0.045	125	0.047	75	0.006	142
DCP 7	.400	0.791	0.423	9	0.111	54	0.048	29	0.004	233	0.012	2	0.002	78	0.014	65	0.029	19	0.023	299
DCP 8	.500	0.616	0.375	12	0.081	42	0.035	26	0.001	225	0.018	30	0.015	13	0.012	19	0.027	15	0.025	292
DCP 9	.600	0.521	0.340	9	0.038	358	0.008	1	0.012	173	0.011	4	0.005	214	0.012	58	0.019	354	0.019	274
DCP10	.878	0.615	0.268	6	0.046	312	0.025	305	0.011	132	0.010	330	0.010	256	0.006	42	0.017	1	0.009	241

DATA TYPE	X/C	RES 10	PHI	RES 11	PHI	RES 12	PHI	RES 13	PHI	RES 14	PHI	RES 15	PHI	RES 16	PHI	RES 17	PHI	RES 18	PHI
ALPHA		0.034	218	0.017	235	0.018	246	0.022	238	0.022	228	0.005	247	0.016	265	0.007	236	0.005	254
CN		0.006	212	0.004	320	0.002	291	0.003	297	0.004	301	0.000	315	0.004	296	0.001	348	0.003	332
CM		0.001	326	0.001	145	0.001	144	0.001	129	0.001	101	0.000	57	0.001	80	0.000	50	0.000	273
DCP 1	.010	0.019	291	0.027	226	0.007	175	0.008	279	0.012	268	0.012	242	0.007	242	0.012	245	0.005	188
DCP 2	.025	0.046	297	0.034	233	0.014	127	0.002	59	0.013	252	0.010	224	0.005	129	0.015	27	0.011	316
DCP 3	.100	0.013	242	0.010	83	0.013	166	0.009	90	0.008	166	0.022	81	0.008	348	0.011	97	0.017	38
DCP 4	.200	0.020	204	0.025	315	0.019	326	0.011	274	0.018	348	0.009	65	0.009	48	0.007	37	0.001	327
DCP 5	.250	0.009	195	0.009	97	0.012	264	0.011	216	0.002	291	0.011	262	0.003	48	0.013	317	0.006	287
DCP 6	.300	0.017	131	0.010	112	0.003	141	0.006	165	0.008	349	0.012	246	0.003	3	0.008	309	0.006	308
DCP 7	.400	0.009	207	0.004	45	0.011	307	0.012	228	0.008	99	0.008	344	0.010	271	0.006	229	0.004	249
DCP 8	.500	0.003	109	0.013	342	0.004	293	0.012	16	0.016	319	0.009	314	0.018	293	0.006	255	0.012	281
DCP 9	.600	0.007	164	0.006	10	0.004	321	0.007	339	0.007	303	0.005	244	0.002	272	0.002	308	0.006	275
DCP10	.878	0.002	231	0.009	278	0.001	85	0.006	291	0.007	245	0.005	122	0.004	230	0.003	104	0.008	82

UNCLASSIFIED

Security Classification

DOCUMENT CONTROL DATA - R&D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY *(Corporate author)* The Boeing Company Vertol Division Philadelphia, Pennsylvania	2a. REPORT SECURITY CLASSIFICATION Unclassified 2b. GROUP

3. REPORT TITLE

Two-Dimensional Tests of Airfoils Oscillating Near Stall
Volume II Data Report

4. DESCRIPTIVE NOTES *(Type of report and inclusive dates)*

Final Technical Report

5. AUTHOR(S) *(Last name, first name, initial)*

Gray, Lewis
Liiva, Jaan

6. REPORT DATE April 1968	7a. TOTAL NO. OF PAGES 488	7b. NO. OF REFS 1

8a. CONTRACT OR GRANT NO. DA 44-177-AMC-438(T) b. PROJECT NO. Task 1F125901A14231 c. d.	9a. ORIGINATOR'S REPORT NUMBER(S) USAAVLABS Technical Report 68-13B 9b. OTHER REPORT NO(S) *(Any other numbers that may be assigned this report)* Boeing Document D8-0678-2

10. AVAILABILITY/LIMITATION NOTICES

This document has been approved for public release and sale; its distribution is unlimited.

11. SUPPLEMENTARY NOTES Volume II of a 2-volume report	12. SPONSORING MILITARY ACTIVITY U.S. Army Aviation Materiel Laboratories, Fort Eustis, Virginia

13. ABSTRACT

This report presents a discussion of the test facility, models, and data gathering and reduction system used in the tests of oscillating airfoils. It also contains the actual computer data that resulted from the wind tunnel tests of the airfoils. A set of tables provides a quick cross-reference between the various test factors and the page on which the data appear.

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3893-66

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14. KEY WORDS	LINK A ROLE	LINK A WT	LINK B ROLE	LINK B WT	LINK C ROLE	LINK C WT
Airfoil						
Blade Stall						
Blade Damping						
Cambered Profile						
Symmetrical Profile						
Translatory Oscillation						
Computer Data						

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