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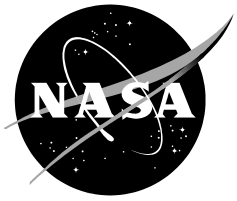

Tests of Full-Scale Helicopter Rotors at High Advancing Tip Mach Numbers and Advance Ratios

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May 2015

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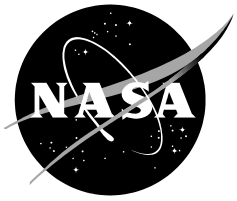

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INTRODUCTION

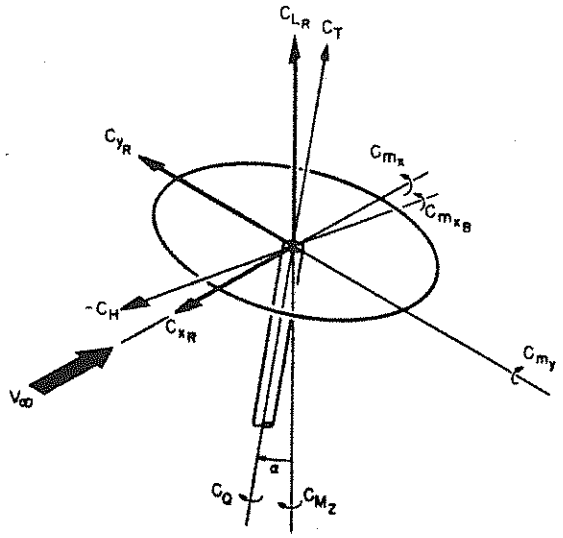
As a continuation of the studies of reference 1, three full-scale helicopter rotors have been tested in the Ames Research Center 40- by 80-foot wind tunnel. All three of them were two-bladed, teetering rotors.

One of the rotors incorporated the NACA 0012 airfoil section over the entire length of the blade. This rotor was tested at advance ratios up to 1.05. Both of the other rotors were tapered in thickness and incorporated leading-edge camber over the outer 20 percent of the blade radius. The larger of these rotors was tested at advancing tip Mach numbers up to 1.02.

Data were obtained for a wide range of lift and propulsive force, and are presented without discussion.

NOTATION

Positive direction of forces and moments are shown in the following sketch.



A_{1_s}, B_{1_s} — coefficients in the representation of rotor blade cyclic pitch, that is, $\theta_c = -A_{1_s} \cos\psi - B_{1_s} \sin\psi$, deg

a_{1_s}, b_{1_s} — first harmonic flapping coefficients relative to shaft normal plane, deg

ALPHA CONTROL	angle of attack of control axis (swash plate) relative to tunnel centerline; positive tilted aft, ALPHA CONTROL = ALPHA SHAFT $-B_{1_s}$, deg
ALPHA SHAFT	angle of rotor shaft from vertical, positive is shaft tilted aft, deg
$C_{D_{tare}}$	$\frac{(\text{Drag})_{tare}}{qS}$
$C_{L_{tare}}$	$\frac{(\text{Lift})_{tare}}{qS}$
CH	rotor propulsive force coefficient in shaft axes system, $\frac{C_H}{\sigma}$
CLR	rotor lift coefficient in wind axes system, $\frac{\text{LIFT}}{\rho S\ (\Omega R)^2}$
$C_{l_{tare}}$	$\frac{(\text{Rolling moment}_{tare})}{q \quad S \quad R}$
$C_{m_{tare}}$	$\frac{(\text{Pitching moment}_{tare})}{q \quad S \quad R}$
CMX	resultant rolling moment coefficient about rotor center in wind axes system, $\frac{\text{rolling moment}}{\rho S(\Omega R)^2 R}$, $\frac{C_{m_x}}{\sigma}$
CMXB	rolling moment coefficient about rotor center in shaft axes system
CMY	resultant pitching moment coefficient about rotor center, $\frac{\text{pitching moment}}{\rho S(\Omega R)^2 R}$, $\frac{C_{m_y}}{\sigma}$

CMZ	resultant yawing moment coefficient about rotor center in wind axes system, $\frac{\text{yawing moment}}{\rho S(\Omega R)^2 R}$, $\frac{C_{m_z}}{\sigma}$
$C_{n_{tare}}$	$\frac{(\text{Yawing moment}_{tare})}{q \quad S \quad R}$
CP	rotor power coefficient, $\frac{\text{power}}{\rho S(\Omega R)^3}$
CPO	profile power coefficient, $CPO = CP - (CLR)^2 \frac{\sigma}{2(V/OR)} - CXR\ (V/OR)$
CQ	rotor torque coefficient (shaft axes yawing moment coefficient)
CT	rotor thrust coefficient (shaft axes lift coefficient)
CXR	rotor propulsive force coefficient in wind axes system, $-\frac{\text{Drag}}{\rho S(\Omega R)^2}$
$C_{y_{tare}}$	$\frac{(\text{Side force}_{tare})}{qS}$
CYR	rotor side force coefficient, $\frac{\text{side force}}{\rho\ S\ (\Omega R)^2}$, $\frac{C_{Y_R}}{\sigma}$ (same in both wind axes and shaft axes systems)
M(1)(90), M,AT	rotor blade tip Mach no. at 90° azimuth position
q	free stream dynamic pressure, $1/2\ \rho V^2$, lb/ft^2
R	rotor radius, ft
S	reference area, (no. of blades)x(blade chord)x(rotor radius)ft^2

T	free stream temperature, deg R
THETA	collective pitch at .75R, deg*
V	free stream velocity, ft/sec
V/OR	advance ratio, $V/\Omega R$
ρ	air density, $slug/ft^3$
Ω	rotor rotational speed, radians/sec
σ	rotor solidity, $\frac{S}{\pi R^2}$
Θ_c	cyclic pitch, deg*
Θ_1	blade twist,deg*, from center of shaft to blade tip
Θ_{grip}	collective pitch at 2.33 ft radial distance from hub center, deg

*Pitch angles are measured from a plane perpendicular to the rotor shaft to the line of zero lift of the airfoil section.

MODEL DESCRIPTION

General

Figure 1 is a general view of the rotor system installed in the wind tunnel test section. Rotor shaft angle-of-attack was remotely controlled using an extendable tail strut. Rotor power was provided by a 1500 HP variable frequency electric motor inside the faired body. Collective and cyclic pitch were remotely controlled and monitored from the control

room. First harmonic rotor flapping coefficients relative to the shaft were obtained from electronic flapping resolvers.

Rotors

Three sets of blades were used for these investigations. The 34 ft blades had NACA 0012 airfoil sections. The 44 ft and the 48 ft blades were tapered linearly in thickness from .8R to the tip, which was approximately the NACA 21006 airfoil. The tip airfoil is described in detail in figure 2. The dimensional information related to the rotors is given below.

Parameter	Rotor No. 1	No. 2	No. 3
Rotor radius, ft	24.0	22.0	17.0
Blade chord, ft	1.75	1.75	1.75
Cutout radius, ft	2.04	2.04	2.04
Rotor solidity	.0464	.0506	.0656
Reference area, ft^2	84.0	77.0	59.5
Blade twist, linear, deg	-10.9	-1.83	-1.42
Blade taper ratio	1.0	1.0	1.0
Hub precone angle, deg	2.75	2.75	2.75
Moment of inertia about flapping hinge, ft-lb-sec^2, per rotor	2289	1995.2	1361.6
Number of blades	2	2	2
Airfoil	NACA 0012*	NACA 0012*	NACA 0012

A standard UH-1D transmission and rotor shaft were used in conjunction with a speed increasing transmission to match the motor speed

to the UH-1D transmission. The rotor was controlled by a modified UH-1B control system.

*These thin tip blades were NACA 0012 from the root to .8R, and linearly tapered in thickness from .8R to the 6% thick tip. The zero lift line of the cambered tip sections was varied such that the linear twist distribution was maintained. (See figure 2.)

OPERATING PROCEDURES

Tunnel speed and rotor rotational speed were adjusted to obtain the desired advance ratio and advancing tip Mach number. At each combination of shaft angle and collective pitch, the cyclic pitch was adjusted to minimize first harmonic blade flapping, and data were then recorded. Collective pitch or shaft angle was then changed and the above procedure repeated until a limit was reached in motor power, control position, or structural loading.

Data Reduction

Six-component forces and moments were measured by the wind tunnel balance system. Tare corrections were applied to the balance data to account for forces and moments produced by the exposed model support struts, the faired body and the rotating hub. All rotating hardware inboard of the 2.66 ft radius station were included in the tares. The tares were applied based on wind tunnel dynamic pressure and shaft angle.

Rotor downwash effects on the tares were neglected because of a lack of confidence in any known technique for assessing their magnitude. The tares used are listed below in equation form.

For Rotor No. 1:

$$C_{L_{tare}} = -0.8898 + 1.0521 \cos \alpha_s + 0.3913 \sin \alpha_s$$

$$C_{D_{tare}} = 0.9456 - 0.7869 \cos \alpha_s + 0.1288 \sin \alpha_s$$

$$C_{m_{tare}} = 0.4623 - 0.4933 \cos \alpha_s + 0.1732 \sin \alpha_s$$

$$C_{y_{tare}} = 0.0178 - 0.0215 \cos \alpha_s + 0.0257 \sin \alpha_s$$

$$C_{n_{tare}} = 0.$$

$$C_{l_{tare}} = 0.00246 - 0.000446 \cos \alpha_s - 0.01813 \sin \alpha_s$$

For Rotors No. 2 & 3:

$$C_{L_{tare}} = \frac{1}{s}(-29.740 + 39.39 \cos \alpha_s + 29.33 \sin \alpha_s + .0311q + 240.54 \alpha_{s_{radians}}^{3} - 90.96 \alpha_{s_{radians}}^{4} - 1046.3 \alpha_{s_{radians}}^{5} + 193.68 \alpha_{s_{radians}}^{6})$$

$$C_{D_{tare}} = \frac{1}{s}(59.895 - 49.767 \cos \alpha_s + 6.456 \sin \alpha_s + .0466q + 38.975 \alpha_{s_{radians}}^{3} + 336.69 \alpha_{s_{radians}}^{4} + 102.92 \alpha_{s_{radians}}^{5} - 754.89 \alpha_{s_{radians}}^{6})$$

$$C_{m_{tare}} = \frac{1}{s}(-419.97 + 470.78 \cos \alpha_s + 292.20 \sin \alpha_s - 2.312q - 2072.3 \alpha_{s_{radians}}^{3} + 4381.0 \alpha_{s_{radians}}^{4} + 10514.9 \alpha_{s_{radians}}^{5} - 9448.1 \alpha_{s_{radians}}^{6})$$

$$C_{y_{tare}} = \frac{1}{s}(2.989 - 3.983 \cos \alpha_s - 2.191 \sin \alpha_s + .009q + 126.06 \alpha_{s_{radians}}^{3} + 160.65 \alpha_{s_{radians}}^{4} - 1301.7 \alpha_{s_{radians}}^{5} - 2634.1 \alpha_{s_{radians}}^{6})$$

$$C_{n_{tare}} = \frac{1}{s}(-72.312 + 79.817 \cos \alpha_s + 15.230 \sin \alpha_s - .1695q - 642.46 \alpha_{s_{radians}}^{3} - 1237.31 \alpha_{s_{radians}}^{4} + 1215.98 \alpha_{s_{radians}}^{5} + 4080.31 \alpha_{s_{radians}}^{6})$$

$$C_{l_{tare}} = \frac{1}{s}((-27.709 + 41.964 \cos \alpha_s - 4.227 \sin \alpha_s - .210q - 351.91 \alpha_{s_{radians}}^{3} - 812.0 \alpha_{s_{radians}}^{4} + 637.27 \alpha_{s_{radians}}^{5} + 1063.68 \alpha_{s_{radians}}^{6})$$

The control axis angle of attack (ALPHA CONTROL) was determined by the equation

$$\text{ALPHA CONTROL} = \text{ALPHA SHAFT} - B_{l_S}$$

where longitudinal cyclic, B_{1_S}, was obtained from model instrumentation. The total torque coefficient, $\frac{C_Q}{\sigma}$, was derived from tunnel balance moment data. The term $\frac{C_{P_o}}{\sigma}$ was computed by the equation

$$CPO = CP - \frac{\sigma(CLR)^2}{2(V/OR)} - CXR(V/OR)$$

This equation is based on the assumption of uniform downwash distribution over the rotor disk.

Tabulated data are presented in both the wind and shaft axes systems. All data are referenced to the rotor hub center.

Data Presentation

Test conditions for the rotors are illustrated on the Rotor Velocity Diagrams shown in Figure 3. Numbers adjacent to the symbols on these diagrams refer to table numbers which present the data for that condition.

Tabulated data are presented in both the wind axes and shaft axes systems.

Although the technique used in these tests was directed toward obtaining data with $a_{1_s} = b_{1_s} = 0$, some data were recorded wherein flapping was not zero. Of those data, only those for which $|a_{1_s}|$ or $|b_{1_s}|$ was greater than .2° are so noted and listed in the tabulated data.

References

1. McCloud, John L. III, Biggers, James C., and Stroub, Robert H.: An Investigation of Full-Scale Helicopter Rotors at High Advance Ratios and Advancing Tip Mach Numbers. NASA TN D-4632, July, 1968.

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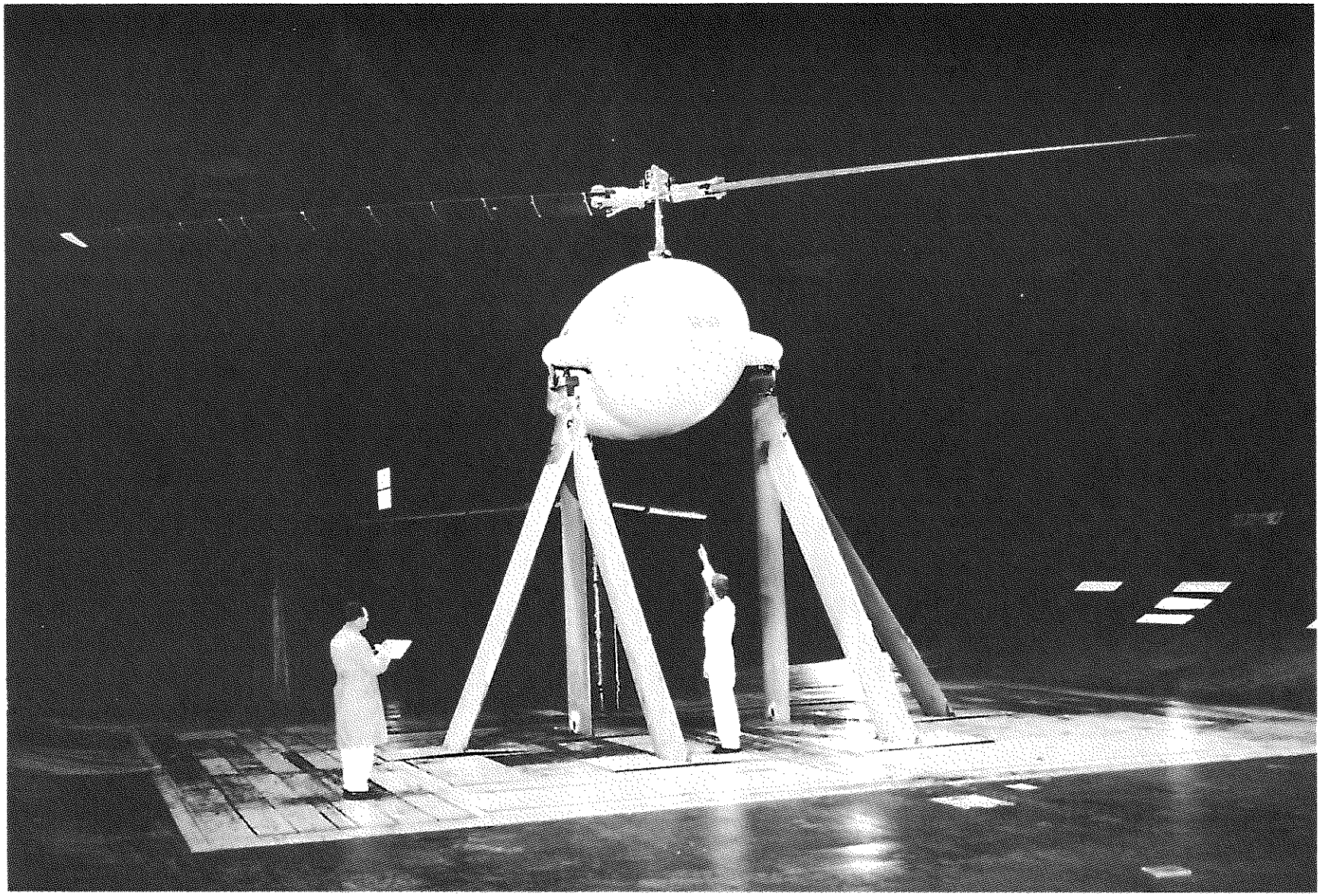
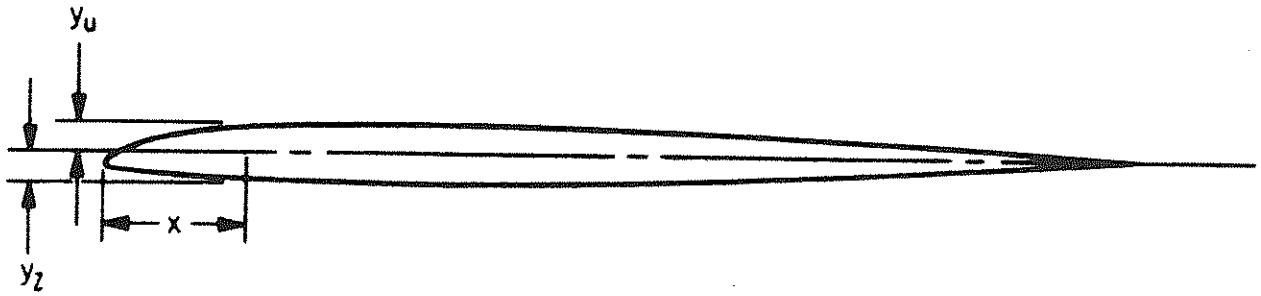


Figure 1.- GENERAL VIEW OF ROTOR SYSTEM.

Figure 2.- UPPER AND LOWER SURFACE COORDINATES OF BLADE TIP AIRFOIL SECTION FOR ROTORS NO. 1 AND 2

All dimensions are in inches



x	y_{upper}	y_{lower}
0	-0.25	-0.25
.105	-.082	-.343
.210	-.002	-.373
.420	.110	-.398
.630	.193	-.417
.840	.260	-.435
1.050	.318	-.451
1.575	.415	-.490
2.100	.485	-.520
2.625	.532	-.545
3.150	.562	-.562
4.200	.603	-.603
5.250	.623	-.623
6.300	.630	-.630
7.350	.625	-.625
8.400	.609	-.609
10.500	.556	-.556
12.600	.479	-.479
14.700	.385	-.385
18.900	.152	-.152
19.950	.085	-.085
21.000	.020	-.020

Leading-edge radius = 0.062 at y = -0.250.

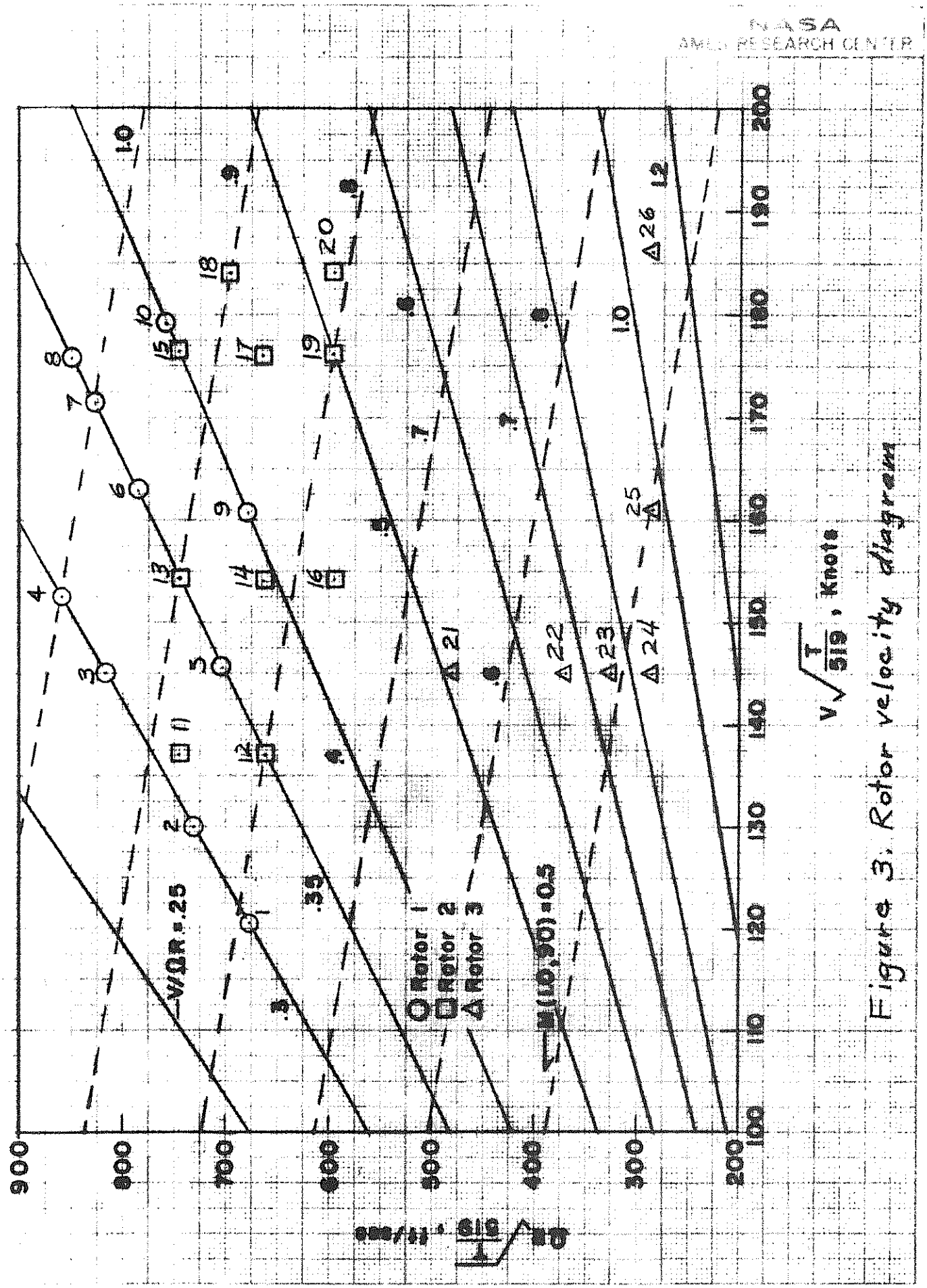


Figure 3. Rotor velocity diagram

Table I - 1. Rotor No. 1, V/OR = .30, M(1.0, 90) = .79

TEST 288.0 RUN 7

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_S}	θ_{gnp}
14.	-5.0	-8.4	0.051042	0.002568	-0.001276	0.000074	-0.001055	0.002799	0.0026220	0.0016538	0.298	0.790	.6	14.
15.	-5.0	-10.0	0.069612	0.004637	-0.001616	-0.000009	-0.001229	0.003850	0.0035134	0.0017465	0.300	0.788	.2	16.
16.	-5.0	-11.7	0.083975	0.006965	-0.002005	-0.000068	0.000475	0.005119	0.0048717	0.0022472	0.298	0.790	- .1	18.
17.	-10.0	-14.1	0.041437	0.005676	-0.000734	-0.000403	-0.001072	0.003689	0.0034549	0.0016240	0.299	0.787	.8	16.
18.	-10.0	-15.4	0.060330	0.009626	-0.000829	-0.000664	-0.001308	0.005212	0.0049584	0.0017851	0.300	0.786	.6	18.
19.	-10.0	-12.5	0.024051	0.002354	-0.000851	-0.000148	-0.000851	0.002502	0.0022614	0.0015147	0.298	0.786	.8	14.
20.	-10.0	-11.0	0.005556	-0.000825	-0.000783	-0.000087	-0.000559	0.001460	0.0012243	0.0014666	0.297	0.789	.8	12.
21.	-15.0	-18.2	0.017512	0.002733	-0.000712	-0.000497	-0.000837	0.002596	0.0023464	0.0015057	0.299	0.788	.7	16.
22.	-15.0	-19.3	0.034167	0.007581	-0.000511	-0.000848	-0.001018	0.004228	0.0040008	0.0016396	0.300	0.788	.9	18.
23.	-15.0	-20.9	0.050058	0.012464	-0.000577	-0.001292	-0.001320	0.005888	0.0056643	0.0017362	0.300	0.786	.6	20.
24.	-5.0	-6.9	0.030671	0.000862	-0.000943	0.000094	-0.000838	0.002030	0.0018685	0.0015376	0.299	0.788	.7	12.
25.	-5.0	-5.6	0.012428	-0.000611	-0.000849	0.000075	-0.000655	0.001498	0.0013534	0.0015223	0.296	0.790	.8	10.
26.	0.0	-1.5	0.040323	-0.001729	-0.001402	0.000250	-0.000789	0.001265	0.0011344	0.0015245	0.299	0.788	.8	10.
27.	0.0	-2.8	0.059234	-0.001814	-0.001919	0.000384	-0.001146	0.001558	0.0013702	0.0016352	0.297	0.791	.7	12.
28.	0.0	-4.5	0.078254	-0.001343	-0.002413	0.000440	-0.001197	0.002139	0.0019386	0.0018645	0.299	0.789	0.0	14.
29.	0.0	-6.4	0.094102	-0.000070	-0.002997	0.000428	-0.001402	0.003168	0.0029558	0.0022886	0.299	0.789	- .3	16.
30.	0.0	-0.3	0.019694	-0.001579	-0.001315	0.000192	-0.000589	0.001205	0.0010828	0.0015209	0.297	0.792	.7	8.
31.	4.0	3.4	0.042841	-0.004535	-0.002352	0.000482	-0.000721	0.000380	0.0003431	0.0015473	0.297	0.791	.2	8.
32.	4.0	1.8	0.061487	-0.005792	-0.002753	0.000535	-0.000950	0.000286	0.0002490	0.0016790	0.298	0.789	.1	10.
33.	4.0	0.2	0.080812	-0.006906	-0.003299	0.000555	-0.001244	0.000494	0.0004407	0.0019920	0.298	0.789	- .2	12.
34.	4.0	-1.6	0.096365	-0.006799	-0.003751	0.000715	-0.001163	0.001163	0.0010647	[illegible]855	0.300	0.786	- .5	14.

Table I - 2. Rotor No. 1, V/OR = .30, M(1.0, 90) = .85

TEST 288.0 RUN 3

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}	θ_{grip}
1.	-5.0	-7.3	0.029615	0.001078	-0.001282	0.000380	-0.000334	0.002062	0.0019000	0.0015069	0.302	0.848	1.0	12.
2.	-5.0	-8.7	0.048920	0.002887	-0.001518	0.000359	-0.000430	0.002843	0.0026723	0.0016161	0.302	0.848	.7	14.
3.	-5.0	-10.3	0.067184	0.005046	-0.001743	0.000265	-0.000415	0.003836	0.0036739	0.0018091	0.301	0.852	.6	16.
4.	-5.0	-12.0	0.084405	0.007658	-0.001996	0.000063	-0.000319	0.005237	0.0050028	0.0021308	0.304	0.844	.3	18.
5.	-7.0	-13.6	0.073726	0.008862	-0.001443	-0.000263	-0.000327	0.005302	0.0050733	0.0019787	0.302	0.848	.5	18.
6.	-12.0	-17.2	0.048236	0.009409	-0.000319	-0.000807	-0.000379	0.004811	0.0046283	0.0016049	0.302	0.848	1.0	18.
7.	-10.0	-15.6	0.057903	0.009732	-0.000621	-0.000571	-0.000347	0.005053	0.0049216	0.0017150	0.303	0.846	.8	18.
8.	-10.0	-16.6	0.066472	0.011672	-0.000599	-0.000731	-0.000328	0.005890	0.0056886	0.0018204	0.302	0.848	.8	19.
9.	-8.0	-15.0	0.074956	0.011075	-0.000899	-0.000574	-0.000233	0.005943	0.0057666	0.0019840	0.303	0.847	.6	19.
10.	-6.0	-13.5	0.085678	0.009954	-0.001652	-0.000285	-0.000276	0.005923	0.0057435	0.0021661	0.303	0.846	.3	19.
11.	-7.0	-14.4	0.081135	0.010534	-0.001227	-0.000488	-0.000404	0.005948	0.0057604	0.0020651	0.303	0.846	.5	19.
12.	-7.0	-10.1	0.037511	0.003332	-0.000888	0.000059	-0.000419	0.002708	0.0025894	0.0014714	0.303	0.846	.9	14.
13.	-7.0	-8.5	0.019135	0.000972	-0.000895	0.000170	-0.000288	0.001883	0.0017432	0.0014205	0.303	0.846	1.1	12.
14.	-7.0	-7.2	0.001754	-0.001026	-0.000771	0.000057	-0.000508	0.001245	0.0010493	0.0013602	0.303	0.846	.9	10.
15.	-7.0	-7.2	0.002315	-0.001203	-0.000864	0.000176	-0.000566	0.001261	0.0010714	0.0014367	0.304	0.844	1.0	10.
16.	-3.0	-2.8	0.003543	-0.000988	-0.001381	0.000329	-0.000468	0.001328	0.0012148	0.0015131	0.303	0.847	1.0	8.
17.	-3.0	-1.4	-0.015453	-0.001743	-0.001444	0.000309	-0.000434	0.001247	0.0010429	0.0015516	0.302	0.848	.8	6.
18.	-3.0	-8.8	0.077304	0.003725	-0.002054	0.000280	-0.000355	0.003690	0.0034991	0.0019128	0.303	0.846	.5	16.
19.	-3.0	-10.6	0.092614	0.005961	-0.002367	0.000178	-0.000330	0.005048	0.0048308	0.0023621	0.305	0.843	.1	18.
20.	0.0	-6.5	0.091997	0.000460	-0.003254	0.000647	-0.000524	0.003244	0.0030821	0.0022953	0.303	0.846	.1	16.
21.	0.0	-7.7	0.096586	0.001739	-0.003494	0.000568	-0.000490	0.004078	0.0038343	0.0025935	0.304	0.845	- .2	17.
22.	0.0	-2.9	0.056426	-0.001257	-0.002227	0.000668	-0.000322	0.001600	0.0014321	0.0015721	0.304	0.843	.8	12.
23.	3.0	-0.7	0.073508	-0.004801	-0.003199	0.000902	-0.000413	0.000870	0.0007465	0.0017912	0.304	0.845	.3	12.
24.	3.0	0.8	0.053559	-0.004026	-0.002717	0.000829	-0.000404	0.000695	0.0006247	0.0016243	0.303	0.847	.7	10.
25.	3.0	2.2	0.034665	-0.003034	-0.002469	0.000807	-0.000321	0.000770	0.0006969	0.0015270	0.304	0.844	.8	8.
26.	3.0	3.6	0.016667	-0.001996	-0.002354	0.000791	-0.000312	0.001041	0.0009736	0.0015603	0.305	0.843	.8	6.
27.	3.0	-2.4	0.089094	-0.004410	-0.003860	0.000977	-0.000439	0.001500	0.0013870	0.0021163	0.303	0.846	- .1	14.
28.	3.0	-4.5	0.099900	-0.002802	-0.004146	0.000897	-0.000413	0.003114	0.0029625	0.0030441	0.302	0.848	- .2	15.

Table I - 3. Rotor No. 1, V/OR = .30, M(1.0, 90) = .95

TEST 288.0 RUN 8

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}	θ_{grip}
1.	-5.0	-7.8	0.049643	0.002083	-0.001365	0.000120	-0.000400	0.003044	0.0028280	0.0020170	0.297	0.952	.5	14.
2.	-5.0	-6.5	0.031727	0.000432	-0.001188	0.000260	-0.000411	0.002413	0.0021827	0.0019755	0.300	0.953	.7	12.
3.	-5.0	-9.2	0.067771	0.003868	-0.001843	0.000083	-0.000422	0.004109	0.0038730	0.0023585	0.300	0.953	.3	16.
4.	-5.0	-10.2	0.075513	0.005012	-0.002260	0.000101	-0.000431	0.004774	0.0045508	0.0026049	0.300	0.951	.1	17.
5.	-5.0	-10.8	0.083909	0.006477	-0.002516	0.000161	-0.000503	0.005633	0.0053803	0.0028925	0.300	0.950	0.0	18.
6.	-10.0	-13.3	0.040517	0.004937	-0.000655	-0.000317	-0.000534	0.003784	0.0034776	0.0018744	0.299	0.952	.9	16.
7.	-10.0	-14.8	0.056865	0.008451	-0.000808	-0.000598	-0.000608	0.005304	0.0050772	0.0022950	0.300	0.952	.6	18.
8.	-10.0	-14.1	0.049363	0.006779	-0.000641	-0.000469	-0.000533	0.004574	0.0043715	0.0021451	0.301	0.948	.8	17.
9.	-15.0	-17.6	0.017051	0.002301	-0.000505	-0.000399	-0.000407	0.002769	0.0025684	0.0018567	0.299	0.948	1.1	16.
10.	-15.0	-18.8	0.033473	0.006913	-0.000349	-0.000868	-0.000436	0.004328	0.0041427	0.0019783	0.301	0.948	1.0	18.
11.	-15.0	-19.4	0.041103	0.009203	-0.000262	-0.001092	-0.000455	0.005129	0.0048732	0.0019820	0.300	0.951	1.0	19.
12.	-17.0	-20.5	0.022761	0.004843	-0.000102	-0.000825	-0.000250	0.003521	0.0034500	0.0019624	0.299	0.950	1.2	18.
13.	-17.0	-21.1	0.028974	0.006998	0.000119	-0.001116	-0.000374	0.004181	0.0041537	0.0019900	0.300	0.950	1.1	19.
14.	-17.0	-21.5	0.037228	0.009667	0.000123	-0.001422	-0.000489	0.005098	0.0050920	0.0020825	0.300	0.950	1.0	20.
15.	-17.0	-20.0	0.015199	0.002473	-0.000301	-0.000637	-0.000268	0.002751	0.0026388	0.0018826	0.298	0.949	1.2	17.
16.	-17.0	-19.3	0.007663	0.000048	-0.000529	-0.000230	-0.000280	0.002109	0.0019419	0.0019230	0.298	0.948	1.1	16.

TEST 288.0 RUN 9

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}	θ_{grip}
1.	-3.0	-4.1	0.029093	-0.001945	-0.001531	0.000369	0.000361	0.002054	0.0018774	0.0023919	0.298	0.955	.8	11.
2.	-3.0	-3.5	0.024576	-0.000904	-0.001385	0.000323	-0.000543	0.001823	0.0016829	0.0019072	0.300	0.950	.7	10.
3.	-3.0	-6.9	0.070846	0.001570	-0.002267	0.000372	-0.000610	0.003386	0.0031878	0.0023283	0.301	0.949	.3	15.
4.	-3.0	-7.7	0.077569	0.002401	-0.002366	0.000302	-0.000713	0.003975	0.0037550	0.0025696	0.300	0.951	.2	16.
5.	-3.0	-8.5	0.085398	0.003338	-0.002623	0.000400	-0.000952	0.004721	0.0045009	0.0029370	0.299	0.953	.2	17.
6.	-3.0	-9.2	0.090634	0.004667	-0.003090	0.000306	-0.000660	0.005621	0.0053979	0.0033668	0.298	0.955	-.1	18.
7.	-5.0	-9.8	0.077246	0.004883	-0.002283	0.000084	-0.000789	0.004824	0.0045965	0.0026670	0.301	0.952	.1	17.
8.	-5.0	-10.5	0.085093	0.006108	-0.002491	-0.000161	-0.000731	0.005638	0.0053857	0.0029917	0.300	0.953	0.0	18.
9.	2.0	1.0	0.051233	-0.004198	-0.002344	0.000578	-0.000531	0.001124	0.0010242	0.0020710	0.298	0.950	.5	10.
10.	2.0	1.5	0.043925	-0.004130	-0.002307	0.000631	-0.000526	0.001064	0.0009865	0.0020823	0.301	0.951	.6	9.
11.	0.0	-4.3	0.086392	-0.001878	-0.003119	0.000563	-0.000286	0.003007	0.0028442	0.0028381	0.302	0.951	.1	15.
12.	0.0	-5.2	0.091684	-0.000793	-0.003345	0.000715	-0.000118	0.003839	0.0036533	0.0032455	0.301	0.954	0.0	16.
13.	0.0	-5.9	0.097128	-0.000299	-0.003257	0.000532	-0.000233	0.004874	0.0046408	0.0040022	0.300	0.953	-.2	17.
14.	5.0	4.1	0.060445	-0.008006	-0.003105	0.000746	-0.000933	0.000158	0.0001551	0.0022705	0.300	0.947	.3	9.
15.	5.0	3.4	0.070897	-0.008840	-0.003332	0.000794	-0.000441	0.000233	0.0002345	0.0024855	0.299	0.950	.3	10.
16.	5.0	1.7	0.085032	-0.009209	-0.003742	0.000950	-0.000579	0.000730	0.0007587	0.0029783	0.301	0.951	.1	12.

Table I - 4. Rotor No. 1, V/OR = .31, M(1.0, 90) = 1.0

TEST 288.0 RUN 11

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	θ_{grip}	A_{1_s}
1.	-5.0	-6.1	0.032471	-0.000348	-0.001252	0.000168	-0.000477	0.002870	0.0027214	0.0027498	0.309	0.990	12.	.9
2.	-6.0	-6.9	0.026653	-0.000282	-0.001064	0.000165	-0.000500	0.002857	0.0026933	0.0027274	0.309	0.989	12.	.9
3.	-6.0	-7.2	0.035456	0.000491	-0.001079	0.000057	-0.000547	0.003216	0.0030847	0.0028387	0.308	0.992	13.	.7
4.	-6.0	-7.9	0.045178	0.001292	-0.001303	0.000067	-0.000820	0.003626	0.0034651	0.0029119	0.310	0.989	14.	.6
5.	-6.0	-8.6	0.053029	0.002146	-0.001232	-0.000075	-0.000894	0.004182	0.0039924	0.0031173	0.310	0.991	15.	.6
6.	-6.0	-9.5	0.060671	0.003230	-0.001512	-0.000079	-0.000802	0.004711	0.0044980	0.0032202	0.310	0.989	16.	.5
7.	-9.0	-10.6	0.029126	0.001277	-0.000692	-0.000161	-0.000669	0.003415	0.0032531	0.0027946	0.309	0.990	14.	.9
8.	-9.0	-11.2	0.037116	0.002580	-0.000648	-0.000282	-0.000707	0.003940	0.0037705	0.0028688	0.310	0.990	15.	.9
9.	-9.0	-11.8	0.046723	0.003991	-0.000773	-0.000374	-0.000844	0.004601	0.0044456	0.0030483	0.309	0.992	16.	.8
10.	-9.0	-12.5	0.055362	0.005366	-0.000870	-0.000416	-0.001114	0.005302	0.0050958	0.0032046	0.310	0.991	17.	.7
11.	-12.0	-13.8	0.022260	0.001529	-0.000591	-0.000376	-0.000627	0.003402	0.0032316	0.0027240	0.308	0.992	15.	1.0
12.	-12.0	-14.3	0.030262	0.003301	-0.000534	-0.000493	-0.000696	0.003974	0.0038187	0.0027296	0.309	0.990	16.	1.0
13.	-12.0	-15.0	0.039006	0.005051	-0.000547	-0.000672	-0.000811	0.004819	0.0045337	0.0028584	0.309	0.993	17.	.9
14.	-12.0	-13.2	0.013491	-0.000154	-0.000576	-0.000282	-0.000418	0.002845	0.0026525	0.0026861	0.308	0.990	14.	1.1
15.	-9.0	-9.9	0.020624	0.000150	-0.000567	-0.000169	-0.000632	0.002926	0.0028093	0.0027311	0.307	0.991	13.	1.1
16.	-3.0	-6.7	0.052676	-0.000639	-0.001710	0.000281	-0.000713	0.003062	0.0029527	0.0029403	0.308	0.991	13.	.6
17.	-3.0	-4.7	0.054202	-0.000924	-0.001690	0.000312	-0.000808	0.003355	0.0032226	0.0032787	0.304	1.002	13.	.6
18.	-6.0	-7.2	0.038219	0.000291	-0.000987	0.000024	-0.000698	0.003461	0.0033327	0.0031327	0.304	1.002	13.	.7
19.	-6.0	-7.7	0.046604	0.001107	-0.001026	-0.000067	-0.000767	0.003866	0.0037212	0.0032181	0.305	1.000	14.	.6
20.	-6.0	-8.5	0.054744	0.001993	-0.001240	-0.000066	-0.000832	0.004425	0.0042687	0.0034332	0.305	1.002	15.	.3
21.	-6.0	-9.2	0.062730	0.003023	-0.001423	0.000065	-0.000491	0.004965	0.0046917	0.0034693	0.305	1.000	16.	.2
22.	-9.0	-11.8	0.047482	0.003988	-0.000623	-0.000445	-0.000664	0.004803	0.0046979	0.0033135	0.304	1.002	16.	.6
23.	-9.0	-11.1	0.039178	0.002597	-0.000481	-0.000368	-0.000699	0.004174	0.0040509	0.0031449	0.304	1.002	15.	.9
24.	-9.0	-10.4	0.029298	0.001196	-0.000414	-0.000316	-0.000542	0.003519	0.0034077	0.0029777	0.305	0.999	14.	.9
25.	-9.0	-9.8	0.022933	0.000131	-0.000338	-0.000301	-0.000567	0.003134	0.0030505	0.0029707	0.304	1.000	13.	.9
26.	-6.0	-7.1	0.038329	0.000282	-0.000872	-0.000048	-0.000687	0.003516	0.0033902	0.0031924	0.303	1.004	13.	.7

Table I - 5. Rotor No. 1, V/OR = .35, M(1.0, 90) = .85

TEST 288.0 RUN 4

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}	θ_{grip}
1.	-5.0	-7.6	0.023610	0.000516	-0.000707	0.000124	-0.000444	0.001898	0.0018362	0.0016202	0.347	0.849	.7	12.
2.	-5.0	-6.1	0.007668	-0.000897	-0.000589	0.000122	-0.000394	0.001369	0.0013124	0.0016195	0.346	0.849	1.1	10.
3.	-5.0	-11.0	0.056771	0.004128	-0.000982	0.000024	-0.000586	0.003675	0.0035842	0.0019385	0.346	0.848	.9	16.
4.	-5.0	-13.0	0.071727	0.006495	-0.001353	-0.000147	-0.000661	0.004958	0.0048405	0.0022280	0.350	0.844	.5	18.
5.	-5.0	-14.5	0.082621	0.008897	-0.001686	-0.000320	-0.000170	0.006433	0.0062898	0.0027458	0.347	0.848	.3	20.
6.	-10.0	-14.7	0.030283	0.003654	-0.000058	-0.000373	-0.000540	0.003073	0.0029696	0.0016416	0.347	0.849	1.1	16.
7.	-10.0	-16.2	0.045940	0.007054	0.000137	-0.000611	-0.000737	0.004490	0.0044772	0.0018932	0.346	0.851	1.0	18.
8.	-10.0	-17.8	0.060293	0.010363	-0.000107	-0.000924	-0.000751	0.006030	0.0059742	0.0021438	0.346	0.850	.8	20.
9.	-12.0	-16.2	0.020177	0.002349	0.000071	-0.000388	-0.000468	0.002571	0.0025652	0.0017222	0.347	0.848	1.1	16.
10.	-12.0	-17.7	0.035338	0.006238	0.000111	-0.000730	-0.000591	0.004027	0.0040242	0.0017763	0.347	0.848	1.1	18.
11.	-12.0	-19.2	0.048421	0.009760	-0.000172	-0.000991	-0.000652	0.005553	0.0055407	0.0020063	0.346	0.850	.9	20.
12.	-15.0	-19.9	0.020873	0.003682	0.000031	-0.000651	-0.000376	0.003124	0.0031337	0.0018318	0.346	0.850	1.1	18.
13.	-15.0	-21.4	0.033549	0.007583	-0.000072	-0.000957	-0.000471	0.004705	0.0046752	0.0019655	0.347	0.846	1.0	20.
14.	-15.0	-18.4	0.005736	-0.000667	-0.000049	-0.000327	-0.000236	0.001562	0.0015097	0.0017384	0.346	0.849	1.1	16.
15.	-12.0	-14.5	0.003187	-0.001340	0.000293	-0.000230	-0.000552	0.001207	0.0011524	0.0016164	0.347	0.849	1.2	14.
16.	0.0	-5.4	0.067680	-0.000392	-0.002576	0.000702	-0.000641	0.002186	0.0021002	0.0019293	0.346	0.850	.6	14.
17.	0.0	-7.5	0.082532	0.000561	-0.003145	0.000557	-0.000761	0.003168	0.0028951	0.0022445	0.346	0.849	.2	16.
18.	0.0	-9.5	0.091155	0.002701	-0.003595	0.000576	-0.000125	0.004880	0.0046932	0.0032014	0.346	0.849	.1	18.
19.	0.0	-3.9	0.050050	-0.000953	-0.002197	0.000643	-0.000781	0.001630	0.0015132	0.0016755	0.346	0.848	.7	12.
20.	2.0	-2.1	0.061886	-0.002824	-0.003126	0.000876	-0.000813	0.001216	0.0011312	0.0018499	0.346	0.849	.5	12.
21.	2.0	-3.0	0.068944	-0.002808	-0.003491	0.000829	-0.000844	0.001396	0.0013174	0.0019719	0.346	0.847	.3	14.
22.	2.0	-6.1	0.089849	-0.001365	-0.004242	0.000854	-0.000225	0.003067	0.0029179	0.0028476	0.346	0.850	0.0	16.
23.	2.0	-0.8	0.044836	-0.002526	-0.002663	0.000712	-0.000696	0.001040	0.0009221	0.0016651	0.347	0.847	.7	10.
24.	-5.0	-7.8	**********	**********	233.518621	**********	**********	-26.993653	0.0000000	**********	277.075	0.219		

Table I - 6. Rotor No. 1, V/OR = .35, M(1.0, 90) = .95

TEST 288.0 RUN 10

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}	θ_{grip}
1.	-10.0	-10.3	-0.000000	-0.000000	0.000000	-0.000000	-0.000000	0.000000	0.0011350	0.0011350	0.000	0.713	.5	6.
2.	-10.0	-10.3	0.000000	0.000000	0.000000	-0.000000	-0.000000	0.000000	0.0010218	0.0010218	0.000	0.714	.5	8.
3.	-10.0	-10.3	0.000000	0.000000	0.000000	-0.000000	-0.000000	0.000000	0.0011444	0.0011444	0.000	0.714	.5	10.
4.	-10.0	-10.2	0.000000	0.000000	0.000000	-0.000000	-0.000000	0.000000	0.0017257	0.0017257	0.000	0.715	.3	12.
5.	-10.0	-10.3	0.000000	0.000000	0.000000	-0.000000	-0.000000	0.000000	0.0025385	0.0025385	0.000	0.717	0.0	14.
6.	-10.0	-10.4	0.000000	0.000000	0.000000	-0.000000	-0.000000	0.000000	0.0038112	0.0038112	0.000	0.716	0.0	16.
7.	-12.0	-15.2	0.023934	0.001967	-0.000972	-0.000167	-0.000568	0.003405	0.0030851	0.0023583	0.350	0.948	1.2	16.
8.	-12.0	-16.5	0.040197	0.005603	-0.000893	-0.000541	-0.000704	0.004901	0.0045926	0.0025190	0.351	0.948	1.1	18.
9.	-12.0	-17.2	0.046198	0.007090	-0.000688	-0.000660	-0.000766	0.005523	0.0052292	0.0025921	0.352	0.946	1.2	19.
10.	-15.0	-17.5	0.008784	-0.000722	-0.001054	-0.000109	-0.000384	0.002349	0.0020440	0.0022918	0.350	0.948	1.4	16.
11.	-15.0	-19.1	0.024610	0.003490	-0.001042	-0.000554	-0.000562	0.004067	0.0036510	0.0023864	0.351	0.948	1.4	18.
12.	-15.0	-19.7	0.030797	0.005285	-0.000819	-0.000663	-0.000542	0.004718	0.0043856	0.0024607	0.352	0.946	1.4	19.
13.	-15.0	-20.2	0.037121	0.007096	-0.000720	-0.001002	-0.000621	0.005476	0.0051423	0.0025442	0.353	0.942	1.4	20.
14.	-12.0	-13.7	0.007753	-0.001318	-0.001049	0.000083	-0.000501	0.002138	0.0018648	0.0023229	0.351	0.949	1.4	14.
15.	-10.0	-12.0	0.017538	0.000217	-0.000848	-0.000012	-0.000439	0.002618	0.0023659	0.0022693	0.352	0.944	1.2	14.
16.	-5.0	-9.7	0.062710	0.002421	-0.001729	0.000130	-0.000877	0.004213	0.0038612	0.0027506	0.352	0.948	.8	16.
17.	-5.0	-11.5	0.076562	0.004513	-0.002254	-0.000013	-0.000830	0.005617	0.0053103	0.0033419	0.350	0.949	.5	18.
18.	-2.0	-5.9	0.062374	-0.000711	-0.002381	0.000568	-0.000803	0.002948	0.0027114	0.0027041	0.351	0.947	.6	14.
19.	-2.0	-7.5	0.079165	0.000283	-0.003070	0.000578	-0.000705	0.004019	0.0037632	0.0032504	0.352	0.945	.3	16.
20.	-2.0	-4.4	0.045218	-0.001351	-0.002061	0.000592	-0.000553	0.002353	0.0021384	0.0024768	0.351	0.947	.9	12.
21.	0.0	-2.6	0.058889	-0.003087	-0.002742	0.000706	-0.000630	0.002012	0.0018369	0.0026923	0.351	0.945	.6	12.
22.	0.0	-4.6	0.073448	-0.002651	-0.003250	0.000789	-0.000838	0.002670	0.0024273	0.0030013	0.351	0.948	.5	14.
23.	0.0	-6.2	0.088303	-0.001686	-0.003768	0.000776	-0.000327	0.003905	0.0036678	0.0037513	0.353	0.943	.2	16.

TEST 288.0 RUN 9

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}	θ_{grip}
17.	-5.0	-6.7	0.031134	-0.000297	-0.001281	0.000228	-0.000600	0.002520	0.0023505	0.0023903	0.350	0.952	1.0	12.
18.	-5.0	-7.3	0.039128	0.000390	-0.001436	0.000259	-0.000629	0.002841	0.0026562	0.0024181	0.350	0.952	.9	13.
19.	-5.0	-8.0	0.047723	0.000977	-0.001703	0.000260	-0.000724	0.003201	0.0030121	0.0025194	0.350	0.953	.7	14.
20.	-5.0	-8.8	0.054762	0.001740	-0.001519	0.000139	-0.000879	0.003638	0.0034247	0.0026168	0.350	0.952	1.0	15.
21.	-7.0	-9.5	0.035794	0.001404	-0.001157	0.000140	-0.000782	0.003157	0.0029789	0.0024025	0.350	0.951	1.0	14.
22.	-7.0	-11.0	0.052213	0.003468	-0.001222	-0.000087	-0.000798	0.004248	0.0040282	0.0026320	0.351	0.952	.8	16.
23.	-7.0	-12.7	0.067350	0.005770	-0.001482	-0.000247	-0.000935	0.005531	0.0053056	0.0029793	0.351	0.951	.7	18.
24.	-7.0	-8.3	0.018210	-0.000447	-0.000932	0.000119	-0.000618	0.002282	0.0021117	0.0022457	0.349	0.949	1.0	12.
25.	-7.0	-7.5	0.009631	-0.001367	-0.000894	0.000129	-0.000481	0.001992	0.0018379	0.0023117	0.351	0.949	1.1	11.
26.	-10.0	-13.5	0.034463	0.003144	-0.000529	-0.000209	-0.000585	0.003847	0.0036614	0.0024824	0.350	0.955	.9	16.
27.	-10.0	-14.1	0.041936	0.004585	-0.000576	-0.000395	-0.000670	0.004478	0.0042771	0.0025484	0.352	0.952	.9	17.
28.	-10.0	-15.0	0.049159	0.006084	-0.000493	-0.000620	-0.000690	0.005135	0.0049765	0.0026772	0.352	0.952	1.0	18.
29.	-10.0	-15.6	0.058559	0.007722	-0.000939	-0.000748	-0.000684	0.006082	0.0058661	0.0029206	0.352	0.953	.8	19.

Table I - 7. Rotor No. 1, V/OR = .35, M(1.0, 90) = 1.00

TEST 288.0 RUN 12

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M.AT	A_{1_s}	θ_{grip}
1.	-9.0	-11.8	0.033323	0.000827	-0.000727	-0.000219	-0.001077	0.004215	0.0039455	0.0035807	0.353	0.996	1.1	15.
2.	-9.0	-11.0	0.025396	-0.000811	-0.000785	0.000069	-0.001559	0.003927	0.0034541	0.0036952	0.350	1.003	1.1	14.
3.	-9.0	-12.2	0.042084	0.001623	-0.000843	-0.000028	-0.001649	0.005144	0.0046901	0.0040024	0.352	0.998	.9	16.
4.	-9.0	-13.0	0.049369	0.002692	-0.001037	-0.000157	-0.001827	0.005831	0.0052669	0.0041622	0.350	1.002	.7	17.
5.	-9.0	-10.0	0.017947	-0.001739	-0.000718	0.000038	-0.001351	0.003414	0.0030550	0.0036407	0.349	1.003	1.2	13.
6.	-9.0	-9.9	0.009032	-0.002730	-0.000649	-0.000013	-0.000928	0.002947	0.0026392	0.0035910	0.351	1.003	1.2	12.
7.	-12.0	-14.6	0.025147	0.000798	-0.000556	-0.000371	-0.001070	0.004279	0.0039233	0.0036021	0.350	1.002	1.2	16.
8.	-12.0	-15.3	0.032855	0.002395	-0.000609	-0.000435	-0.001171	0.005009	0.0046374	0.0037264	0.351	1.003	1.0	17.
9.	-12.0	-14.0	0.017319	-0.000546	-0.000522	-0.000345	-0.000835	0.003585	0.0033202	0.0034907	0.349	1.002	1.0	15.
10.	-12.0	-13.2	0.010439	-0.001898	-0.000706	-0.000117	-0.000667	0.002998	0.0027449	0.0034045	0.351	1.001	1.4	14.
11.	-12.0	-12.5	0.002874	-0.003202	-0.000578	-0.000086	-0.000557	0.002472	0.0022915	0.0034094	0.349	1.003	1.2	13.
12.	-15.0	-17.1	0.010694	-0.001387	-0.000536	-0.000467	-0.000468	0.003271	0.0030216	0.0035011	0.351	1.002	1.2	16.
13.	-15.0	-17.7	0.018403	0.000538	-0.000664	-0.000597	-0.000643	0.004085	0.0037167	0.0035061	0.350	1.005	1.1	17.
14.	-15.0	-18.4	0.026390	0.002529	-0.000558	-0.000729	-0.000816	0.004939	0.0046215	0.0036841	0.353	0.999	1.1	18.
15.	-15.0	-16.4	0.003068	-0.003257	-0.000691	-0.000311	-0.000352	0.002608	0.0024016	0.0035458	0.351	1.001	1.4	15.
16.	-12.0	-16.0	0.038999	0.003802	-0.000569	-0.000645	-0.001069	0.005695	0.0054239	0.0039863	0.352	1.002	1.0	17.7
17.	-13.0	-16.8	0.038004	0.003998	-0.000693	-0.000687	-0.001030	0.005746	0.0054200	0.0039164	0.352	1.000	1.0	18.
18.	-14.0	-17.8	0.030445	0.003164	-0.000471	-0.000834	-0.000891	0.005150	0.0048459	0.0036754	0.351	1.003	1.0	18.
19.	-6.0	-8.1	0.041862	-0.000306	-0.001239	0.000229	-0.001047	0.004123	0.0038953	0.0038879	0.352	0.999	.9	14.
20.	-6.0	-8.9	0.051300	0.000467	-0.001388	0.000118	-0.001171	0.004731	0.0044717	0.0041339	0.352	1.000	.8	15.
21.	-6.0	-9.7	0.059704	0.001236	-0.001691	0.000101	-0.001216	0.005413	0.0050797	0.0044094	0.353	1.000	.6	16.
22.	-6.0	-7.4	0.035716	-0.000961	-0.001114	0.000122	-0.000943	0.003733	0.0035176	0.0037708	0.351	1.001	.9	13.
23.	-6.0	-6.7	0.026919	-0.001558	-0.001070	0.000143	-0.000898	0.003338	0.0031455	0.0036451	0.351	0.999	1.0	12.
24.	-6.0	-6.2	0.018195	-0.002151	-0.000954	0.000157	-0.000889	0.003034	0.0028604	0.0035936	0.351	1.002	1.0	11.
25.	-3.0	-6.0	0.059447	-0.001873	-0.002166	0.000539	-0.001310	0.004080	0.0037743	0.0041984	0.351	1.002	.7	14.
26.	-3.0	-6.5	0.067565	-0.001496	-0.002150	0.000481	-0.001221	0.004678	0.0043512	0.0045747	0.351	1.001	.5	15.
27.	-3.0	-5.1	0.050920	-0.002331	-0.002049	0.000610	-0.001306	0.003675	0.0034094	0.0040569	0.351	1.001	.6	13.
28.	-3.0	-4.3	0.043578	-0.002687	-0.001780	0.000532	-0.001225	0.003412	0.0031367	0.0039571	0.352	1.001	.7	12.
29.	-3.0	-3.7	0.034536	-0.002878	-0.001442	0.000469	-0.001178	0.003158	0.0028711	0.0038061	0.352	1.001	.8	11.

Table I - 8. Rotor No. 1, V/OR = .35, M(1.0, 90) = 1.02

TEST 288.0 RUN 15

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}	θ_{grip}
1.	-12.0	-15.4	0.033266	0.002486	-0.000149	-0.000682	-0.000636	0.005051	0.0048940	0.0039453	0.352	1.017	1.1	17.
2.	-12.0	-15.2	0.033456	0.002440	-0.000254	-0.000711	-0.000565	0.005221	0.0050280	0.0041001	0.350	1.024	1.0	17.
3.	-12.0	-14.4	0.027293	0.001019	-0.000078	-0.000628	-0.000575	0.004575	0.0044401	0.0040337	0.351	1.022	1.1	16.
4.	-12.0	-13.5	0.019153	-0.000654	-0.000094	-0.000480	-0.000619	0.003890	0.0037679	0.0039728	0.350	1.020	1.2	15.
5.	-12.0	-12.8	0.012027	-0.002102	-0.000037	-0.000441	-0.000679	0.003352	0.0032532	0.0039835	0.352	1.020	1.2	14.
6.	-9.0	-10.2	0.027565	-0.000529	-0.000209	-0.000366	-0.000641	0.004066	0.0039589	0.0040952	0.352	1.022	1.1	14.
7.	-9.0	-9.6	0.019757	-0.001608	-0.000113	-0.000287	-0.000752	0.003633	0.0035342	0.0040719	0.351	1.023	1.0	13.
8.	-9.0	-11.2	0.034926	0.000655	-0.000228	-0.000387	-0.000508	0.004618	0.0044838	0.0041728	0.352	1.020	.9	15.
9.	-9.0	-12.1	0.043378	0.001949	-0.000182	-0.000581	-0.000592	0.005289	0.0051267	0.0043174	0.352	1.022	.8	16.
10.	-15.0	-16.7	0.011735	-0.001590	0.000151	-0.000711	-0.000492	0.003573	0.0034880	0.0040354	0.350	1.024	1.4	16.
11.	-15.0	-17.3	0.019647	0.000485	0.000070	-0.000818	-0.000460	0.004332	0.0042214	0.0040258	0.350	1.024	1.2	17.
12.	-15.0	-18.1	0.026347	0.002357	0.000275	-0.001081	-0.000405	0.004974	0.0048822	0.0040085	0.351	1.022	1.1	18.
13.	-13.0	-16.8	0.031172	0.003843	0.000278	-0.001248	-0.000586	0.005724	0.0056354	0.0042210	0.351	1.024	1.0	18.8
14.	-13.0	-15.9	0.029001	0.001986	-0.000060	-0.000803	-0.000390	0.005001	0.0048362	0.0040849	0.350	1.023	1.1	17.

Table I - 9. Rotor No. 1, V/OR = .40, M(1.0, 90) = .85

TEST 288.0 RUN 7

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}	θ_{grip}
1.	-4.0	-12.2	0.076035	0.002944	-0.002899	0.000536	-0.001161	0.004894	0.0046721	0.0031566	0.401	0.845	.7	18.
2.	-4.0	-13.1	0.081044	0.004087	-0.002909	0.000369	-0.001344	0.005704	0.0054607	0.0034570	0.396	0.853	.6	19.
3.	-4.0	-14.0	0.085398	0.005007	-0.003104	0.000360	-0.001309	0.006660	0.0063572	0.0039386	0.398	0.850	-1.2	20.
4.	-4.0	-3.3	-0.001140	-0.002049	-0.001617	0.000459	-0.001158	0.001326	0.0012329	0.0020498	0.399	0.849	1.1	8.
5.	-2.0	-5.0	0.043550	-0.001147	-0.002479	0.000723	-0.000340	0.001950	0.0018345	0.0021776	0.396	0.853	.8	12.
6.	-2.0	-3.5	0.027193	-0.001475	-0.002198	0.000757	-0.000144	0.001537	0.0014878	0.0020319	0.398	0.848	1.0	10.
7.	-2.0	-2.0	0.010925	-0.001746	-0.001868	0.000520	-0.000159	0.001451	0.0012590	0.0019500	0.400	0.847	1.1	8.
8.	-2.0	-9.9	0.080477	0.001158	-0.003413	0.000652	-0.000710	0.004190	0.0039995	0.0031609	0.398	0.850	.6	17.
9.	-2.0	-11.0	0.084170	0.002159	-0.003762	0.000639	-0.000697	0.005017	0.0047251	0.0034531	0.398	0.851	.3	18.
10.	0.0	-7.6	0.083656	-0.001384	-0.004335	0.000830	-0.000698	0.003334	0.0031181	0.0032624	0.399	0.848	.3	16.
11.	0.0	-8.8	0.087839	-0.000399	-0.004628	0.000848	-0.000786	0.004182	0.0039876	0.0036971	0.398	0.849	.2	17.
12.	0.0	-9.7	0.092076	0.000599	-0.004998	0.001015	-0.000711	0.005188	0.0049452	0.0042128	0.398	0.849	0.0	18.
13.	0.0	-9.7	0.071532	-0.002381	-0.004007	0.000971	-0.000722	0.002217	0.0020522	0.0027009	0.398	0.849	.5	14.

TEST 288.0 RUN 5

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}	θ_{grip}
1.	-4.0	-8.7	0.039962	0.000916	-0.001126	0.000163	-0.000660	0.002682	0.0025519	0.0020923	0.401	0.852	.9	14.
2.	-4.0	-10.6	0.054461	0.002205	-0.001486	0.000197	-0.000724	0.003519	0.0034048	0.0023582	0.396	0.859	.9	16.
3.	-4.0	-12.5	0.069525	0.003919	-0.001811	0.000052	-0.000767	0.004812	0.0046558	0.0028052	0.401	0.850	.8	18.
4.	-8.0	-15.2	0.047449	0.004913	-0.000205	-0.000535	-0.000592	0.004555	0.0045079	0.0024145	0.399	0.852	1.1	18.
5.	-8.0	-16.8	0.058799	0.007126	-0.000214	-0.000687	-0.000841	0.005803	0.0057593	0.0027279	0.397	0.857	1.0	20.
6.	-12.0	-17.8	0.025729	0.002908	0.000153	-0.000588	-0.000624	0.003415	0.0034310	0.0022373	0.397	0.856	1.4	18.
7.	-12.0	-19.4	0.038319	0.005997	0.000133	-0.000789	-0.000652	0.005017	0.0049311	0.0024533	0.399	0.853	1.4	20.

Table I - 10. Rotor No. 1, V/OR = .40, M(1.0, 90) = .95

TEST 288.0 RUN 13

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M.AT	A_{1_S}	θ_{grip}
1.	-9.0	-12.4	0.026799	0.000248	-0.000476	0.000015	-0.000510	0.003153	0.0029692	0.0028278	0.404	0.947	1.4	15.
2.	-9.0	-13.1	0.034482	0.001380	-0.000664	0.000062	-0.000378	0.003801	0.0035756	0.0029505	0.404	0.948	1.2	16.
3.	-9.0	-11.6	0.019715	-0.000792	-0.000632	0.000142	-0.000491	0.002677	0.0024827	0.0027799	0.403	0.948	1.4	14.
4.	-9.0	-10.9	0.012847	-0.001753	-0.000612	0.000167	-0.000265	0.002235	0.0020720	0.0027713	0.404	0.948	1.4	13.
5.	-12.0	-14.6	0.011369	-0.001578	-0.000292	-0.000029	-0.000289	0.002349	0.0022478	0.0028776	0.404	0.947	1.4	15.
6.	-12.0	-15.2	0.018260	-0.000168	-0.000298	-0.000088	-0.000302	0.002997	0.0028871	0.0029358	0.404	0.948	1.4	16.
7.	-12.0	-16.1	0.025255	0.001360	-0.000231	-0.000294	-0.000323	0.003587	0.0034642	0.0028801	0.402	0.949	1.2	17.
8.	-12.0	-16.8	0.031335	0.002680	-0.000377	-0.000302	-0.000301	0.004371	0.0041741	0.0030321	0.405	0.947	1.4	18.
9.	-12.0	-17.7	0.038236	0.003964	-0.000419	-0.000564	-0.000720	0.005229	0.0049655	0.0032789	0.404	0.947	1.2	19.
10.	-12.0	-13.9	0.003491	-0.003199	-0.000383	0.000065	-0.000448	0.001716	0.0016124	0.0029049	0.404	0.946	1.4	14.
11.	-15.0	-18.3	0.009813	-0.001550	-0.000400	-0.000282	-0.000137	0.002576	0.0023729	0.0029920	0.403	0.948	1.5	17.
12.	-15.0	-19.0	0.015745	0.000067	-0.000369	-0.000449	-0.000137	0.003244	0.0030826	0.0030413	0.402	0.951	1.5	18.
13.	-15.0	-19.7	0.022658	0.001875	-0.000356	-0.000616	-0.000160	0.003992	0.0038494	0.0030683	0.401	0.952	1.4	19.
14.	-15.0	-17.8	0.001979	-0.003535	-0.000298	-0.000125	-0.000077	0.001663	0.0015594	0.0029771	0.401	0.950	1.4	16.
15.	-7.0	-9.8	0.031850	-0.000098	-0.000798	0.000127	-0.000559	0.003122	0.0028643	0.0028453	0.403	0.949	1.2	14.
16.	-7.0	-10.8	0.038698	0.000707	-0.000805	0.000029	-0.000632	0.003640	0.0034714	0.0031002	0.403	0.946	1.1	15.
17.	-8.0	-13.1	0.068878	0.008818	-0.000989	-0.000472	-0.000410	0.004788	0.0045908	0.0017941	0.271	0.899	.1	17.5
18.	-8.0	-13.1	0.076147	0.009367	-0.001240	-0.000553	-0.000322	0.005175	0.0049512	0.0019266	0.270	0.903	.1	18.
19.	-9.0	-14.1	0.070359	0.010038	-0.001078	-0.000646	-0.000306	0.005169	0.0049530	0.0018057	0.271	0.900	0	18.
20.	-9.0	-14.1	0.078458	0.010825	-0.001114	-0.000747	-0.000350	0.005673	0.0054274	0.0019662	0.271	0.902	0	18.5
21.	-9.0	-14.1	0.060621	0.008900	-0.001040	-0.000561	-0.000274	0.004643	0.0044128	0.0016777	0.272	0.900	0	17.4
22.	-8.0	-13.1	0.061572	0.008165	-0.001137	-0.000495	-0.000215	0.004414	0.0042123	0.0016780	0.271	0.899	0	17.
23.	-7.0	-12.1	0.068607	0.007654	-0.001374	-0.000317	-0.000242	0.004458	0.0042473	0.0017745	0.270	0.900	0	17.
24.	-7.0	-12.1	0.060242	0.007002	-0.001329	-0.000281	-0.000224	0.004072	0.0038749	0.0016750	0.270	0.901	0	16.5
25.	-7.0	-12.1	0.078066	0.008292	-0.001473	-0.000359	-0.000386	0.004914	0.0046655	0.0018986	0.271	0.898	0	17.5
26.	-8.0	-14.1	0.058392	0.009050	-0.001354	-0.000501	-0.000145	0.004618	0.0044192	0.0016665	0.272	0.901	- .2	17.5
27.	-8.0	-15.1	0.053097	0.008906	-0.001399	-0.000495	-0.000140	0.004452	0.0042676	0.0016138	0.271	0.904	- .3	17.5
28.	-9.0	-16.1	0.048024	0.008864	-0.001313	-0.000533	-0.000216	0.004359	0.0041729	0.0015741	0.271	0.902	- .3	17.5
29.	-9.0	-13.8	0.063446	0.009130	-0.000433	-0.000601	-0.000402	0.004719	0.0045097	0.0016916	0.271	0.901	.7	17.5
30.	-9.0	-12.8	0.072598	0.008736	-0.000308	-0.000619	-0.000508	0.004857	0.0046241	0.0018186	0.269	0.904	.6	17.5
31.	-9.0	-11.8	0.082280	0.008238	-0.000331	-0.000585	-0.000569	0.005049	0.0048281	0.0020242	0.270	0.902	.6	17.5
32.	-8.0	-10.8	0.088077	0.007250	-0.000288	-0.000474	-0.000577	0.005038	0.0048064	0.0021886	0.269	0.904	.6	17.5
33.	-8.0	-12.8	0.069151	0.008831	-0.000780	-0.000531	-0.000255	0.004823	0.0045954	0.0017889	0.272	0.902	.2	17.5

Table I - 11. Rotor No. 2.

TEST 310. RUN 3

44 FT. TAPERED TIP ROTOR V/OR = .31 M(1.0)(90) = .87

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/CR	M(1.0)(90)	A_{1_s}
1.	8.	-1 .	-14.8	[illegible]	0. 5 54	0.000115	-0.000744	-0.001566	0.003618	0.0037269	0.0020327	0.315	0.871	.2
2.	6.	-1 .	-13.1	0.017023	0. 01594	0.000171	-0.000349	-0.000530	0.002133	0.0022866	0.0017574	0.318	0.873	.3
3.	1 .	-1 .	-16.2	0.05 949	0. 8489	-0.00 285	-0.0 1751	-0. 784	0.005510	0.0052081	0.0023282	0.315	0.878	
4.	12.	-1 .	-17.8	0.065884	0. 12123	-0.000311	-0.001553	-0.000639	0.006724	0.0069399	0.0027607	0.316	0.874	
5.	13.	-1 .	-16.5	0.072497	0.013746	-0.000598	-0.001848	-0.000791	0.007807	0.0079959	0.0032097	0.318	0.874	.2
6.	10.	-15.0	-20.1	0.027827	0.006362	0.000675	-0.001284	-0.000678	0.003826	0.0040787	0.0019922	0.318	0.871	.5
7.	8.	-15.	-18.8	0.011847	0. 1735	0.000718	-0.000886	-0.000617	0.002324	0.0024187	0.0018551	0.318	0.872	.5
8.	12.	-15.0	-21.5	0.04313	0.011132	0.000265	-0.001758	-0.000687	0.005655	0.0059767	0.0022824	0.319	0.872	.3
9.	13.7	-15.0	-22.9	0.057129	0.015756	0.000028	-0.002284	-0.000808	0.007670	0.0079627	0.0026766	0.319	0.872	.2
10.	10.0	-5.0	-12.5	0. 77466	0.006873	-0.001661	-0.000633	-0.000771	0.005491	0.0055846	0.0029232	0.318	0.873	.0
11.	1 .	-5.	-12.5	0.06679	0.0 411	-0.001837	-0.000646	0.003699	0.005610	0.0056548	0.0039951	0.317	0.870	

TEST 310. RUN 4

44 FT. TAPERED TIP ROTOR V/CR = M(1.0)(90) =

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/CR	M(1.0)(90)	A_{1_s}
1.	1 .	-5.	-12.5	0.078224	0.006735	-0.001812	-0.000741	-0.000652	0.005757	0.0057858	0.0031134	0.326	0.882	
2.	12.	-5.	-14.4	0.064345	0. 89 4	-0.002134	-0.000963	-0.000498	0.007364	0.0072771	0.0038450	0.323	0.882	
3.	8.	-5.	-1 .	0.036134	0.004494	-0.001314	-0.000509	-0.000552	0.004041	0.0045263	0.0022803	0.323	0.881	
4.	6.	-5.	-3.7	0.044557	0. 242	-0.000748	-0.000361	-0.000468	0.002819	0.0028483	0.0019121	0.322	0.881	.1
5.	4.	-5.	-7.5	0.029168	0. 734	-0.00 397	-0.000288	-0.000317	0.001922	0.0019223	0.0016364	0.322	0.880	.3
6.	2.	-5.	-5.9	0.0 278	-0. 763	-0. 212	-0.000179	-0.000228	0.001314	0.0013265	0.0015470	0.322	0.883	.0
7.	6.	.	-5.3	0.073473	-0.006471	-0.002323	-0. 38	-0.000783	0.002296	0.0023414	0.0040285	0.326	0.880	-.4
8.	6.	.	-7.5	0.094615	-0. 5439	-0.001343	-0.000 30	-0.001195	0.003916	0.0039516	0.0055300	0.327	0.878	.6
9.	1 .	.	-9.4	0.09 981	0. 217	-0. 383	-0. 54	-0. 926	0.005768	0.0057726	0.0044232	0.324	0.881	
10.	4.	.	-3.5	0.054761	-0. 1819	-0. 1516	-0.000052	-0.000530	0.001475	0.0014459	0.0017978	0.325	0.881	
11.	2.	.	-1.7	0.036 45	-0. 1872	-0.000951	-0.000 14	-0.000431	0.001084	0.0010775	0.0015840	0.325	0.880	
12.	.	.	- .4	0.019507	-0. 13 2	-0.00 552	-0.000122	-0.000299	0.000968	0.0009577	0.0015167	0.327	0.880	.1
13.	-1.	.	.	0.011728	-0. 1655	-0. 445	-0.000123	-0. 281	0.000598	0.0009591	0.0014866	0.325	0.878	
14.	-2.	.	.7	0. 325	-0. 1451	-0. 334	-0.000114	-0.000161	0.001082	0.0010815	0.0015564	0.325	0.878	
15.	2.	4.	3.	0.067227	-0. 8721	-0.002475	0.000 3	-0.000933	-0.000392	-0.0002663	0.0020872	0.324	0.879	
16.	4.	5.	.1	0. 83424	-0. 93 1	-0.002799	0.000140	-0.000951	0.000266	0.0003056	0.0027927	0.326	0.879	-.3
17.	.	5.	3.	0.04 27	- . 7 4	- . 1913	. 28	- . 81	-0.000350	-0.0003061	0.0017859	0.325	0.878	.0
18.	-2.	5.	5.	0.03 293	- . 5321	- . 127	0.000 23	-0.000325	-0.000057	-0.0000203	0.0016483	0.327	0.881	

Table I - 12. Rotor No. 2.

TEST 312. RUN 5

44 FT. TAPERED TIP ROTOR V/OR = .36 M(1.0)(90) = .80

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	4.[illegible]	-1[illegible]	-11.6	[illegible]2547	-[illegible]1193	[illegible]336	-[illegible]3391	-[illegible]1364	[illegible]1209	[illegible]2286	0.0015727	0.315	0.877	.4
2.	8.[illegible]	-1[illegible]	-14.5	[illegible]33185	[illegible]4273	[illegible]181	-[illegible]0761	-[illegible]1512	[illegible]3411	[illegible]3463[illegible]	0.0018952	0.340	0.832	.4
3.	8.[illegible]	-1[illegible]	-14.5	[illegible]29159	[illegible]3464	[illegible]0164	-[illegible]6666	-[illegible]0544	[illegible]3228	[illegible]3354	0.0020004	0.360	0.797	.4
4.	10.[illegible]	-1[illegible]	-16.1	[illegible]44578	[illegible]6635	[illegible]0114	-[illegible]1381	-[illegible]762[illegible]	[illegible]4784	0.0048156	0.0022669	0.360	0.798	.2
5.	12.[illegible]	-1[illegible]	-17.5	[illegible]5[illegible]819	[illegible]9745	-[illegible]0162	-[illegible]1384	-[illegible]0767	[illegible]6341	[illegible]3762	0.0026317	0.359	0.797	.2
6.	13.7	-1[illegible]	-19.7	[illegible]6[illegible]765	[illegible]3185	-[illegible]0314	-[illegible]1876	-[illegible]0768	[illegible]8229	[illegible]0[illegible]951	0.0030287	0.359	0.800	.1
7.	13.7	-15.[illegible]	-22.8	[illegible]4[illegible]358	[illegible]2167	[illegible]0425	-[illegible]2136	-[illegible]3839	[illegible]6869	[illegible]3[illegible]876	0.0024439	0.360	0.796	.5
8.	12.[illegible]	-15.[illegible]	-21.3	[illegible]3885[illegible]	[illegible]7618	[illegible]687	-[illegible]1631	-[illegible]794	[illegible]4826	[illegible]3[illegible]413	0.0022428	0.357	0.798	.7
9.	1[illegible]	-15.[illegible]	-2[illegible].1	[illegible]9238	[illegible]3311	[illegible]757	-[illegible]1116	-[illegible]0886	[illegible]3176	[illegible]3[illegible]915	0.0020677	0.362	0.794	.7
10.	8.[illegible]	-15.[illegible]	-18.8	[illegible]3249	-[illegible]1286	[illegible]0676	-[illegible]1485	-[illegible]0644	[illegible]1359	[illegible]3[illegible]92[illegible]	0.0019559	0.361	0.796	.7
11.	6.[illegible]	-15.[illegible]	-17.1	-[illegible]2246	-[illegible]5843	[illegible]0836	-[illegible]0141	-[illegible]1[illegible]31	-[illegible]0170	-[illegible]3[illegible]790	0.0020237	0.362	0.794	.6
12.	6.[illegible]	-1[illegible]	-13.[illegible]	[illegible]1153	[illegible]5215	[illegible]0352	-[illegible]0422	-[illegible]0446	[illegible]1886	[illegible]3[illegible]225	0.0018355	0.363	0.795	.5
13.	4.	-1[illegible]	-11.6	-[illegible]1[illegible]55	-[illegible].2724	[illegible]0398	-[illegible]0375	-[illegible]1431	[illegible]0771	[illegible]3[illegible]077	0.0017858	0.360	0.797	.5
14.	4.[illegible]	-5.[illegible]	-7.2	[illegible]22682	[illegible]1262	-[illegible]0367	-[illegible]0122	-[illegible]0[illegible]327	[illegible]1846	[illegible]3[illegible]017	0.0017715	0.359	0.797	.3
15.	2.[illegible]	-5.[illegible]	-6.[illegible]	[illegible]3834	-[illegible]1322	-[illegible]0169	-[illegible]0079	-[illegible]0173	[illegible]1213	[illegible]3[illegible]936	0.0016713	0.362	0.791	.4
16.	6.[illegible]	-5.[illegible]	-9.[illegible]	[illegible]4163[illegible]	[illegible]1943	-[illegible]0[illegible]764	-[illegible]0[illegible]2 3	-[illegible]0[illegible]515	[illegible]2785	[illegible]3[illegible]8382	0.0020129	0.362	0.792	.1
17.	6.[illegible]	-5.[illegible]	-1[illegible].8	[illegible]59[illegible]28	[illegible]3714	-[illegible]1[illegible]75	-[illegible]0[illegible]429	-[illegible]0[illegible]494	[illegible]3863	[illegible]3[illegible]872	0.0023132	0.357	0.801	.1
18.	12.[illegible]	-5.[illegible]	-12.5	[illegible]74771	[illegible]5883	-[illegible]1619	-[illegible]0[illegible]603	-[illegible]0[illegible]611	[illegible]5471	[illegible]4037	0.0028822	0.362	0.793	
19.	12.[illegible]	-5.[illegible]	-14.5	[illegible]4792	[illegible]8389	-[illegible]1[illegible]2[illegible]3	-[illegible]0786	-[illegible]0[illegible]923	[illegible]7329	[illegible]1613	0.0036164	0.363	0.793	
20.	8.[illegible]	[illegible]	-7.5	[illegible]6[illegible]325	-[illegible]1[illegible]38	-[illegible]2836	-[illegible]0[illegible]12	-[illegible]0[illegible]434	[illegible]3497	[illegible]3488[illegible]	0.0031338	0.358	0.799	
21.	1[illegible]	[illegible]	-9.3	[illegible]91238	[illegible]1275	-[illegible]3661	-[illegible]0[illegible]785	-[illegible]0[illegible]953	[illegible]5367	[illegible]2969	0.0042523	0.358	0.799	
22.	6.[illegible]	[illegible]	-5.5	[illegible]6[illegible]9596	-[illegible]1377	-[illegible]0217[illegible]	[illegible]0[illegible]42	-[illegible]0[illegible]602	[illegible]3287	[illegible]0965	0.0023175	0.358	0.798	
23.	4.[illegible]	[illegible]	-3.6	[illegible]3[illegible]281	-[illegible]1377	-[illegible]0[illegible]133[illegible]	-[illegible]0[illegible]26	-[illegible]0[illegible]458	[illegible]1329	[illegible]4235	0.0019371	0.358	0.798	.1
24.	2.[illegible]	[illegible]	-2.[illegible]	[illegible]3[illegible]659	-[illegible]1927	-[illegible]0[illegible]812	-[illegible]0[illegible]38	-[illegible]0[illegible]427	[illegible]0[illegible]18	[illegible]1152	0.0017313	0.359	0.798	
25.	[illegible]	[illegible]	-[illegible].5	[illegible]17333	-[illegible]1928	-[illegible]0[illegible]495	[illegible]0[illegible]21	-[illegible]0[illegible]191	[illegible]0[illegible]955	[illegible]0[illegible]9885	0.0016659	0.362	0.789	.2
26.	[illegible]	5.	3.7	[illegible]47161	-[illegible].6957	-[illegible]0[illegible]825	[illegible]0[illegible]033	-[illegible]0[illegible]452	-[illegible]0[illegible]532	-[illegible]0[illegible]0[illegible]4409	0.0018985	0.359	0.798	-.2
27.	2.[illegible]	5.	2.[illegible]	[illegible]64779	-[illegible]. 8559	-[illegible]0[illegible]2587	[illegible]0[illegible]084	-[illegible]0[illegible]631	-[illegible]0[illegible]593	-[illegible]0[illegible]0[illegible]4898	0.0022740	0.358	0.800	
28.	3.[illegible]	5.	.9	[illegible]73148	-[illegible]. 8973	-[illegible]0[illegible]2836	[illegible]0[illegible]111	-[illegible]0[illegible]717	-[illegible]0[illegible]463	-[illegible]0[illegible]0[illegible]3371	0.0024995	0.358	0.798	
29.	4.	5.	- .1	[illegible]81389	-[illegible].9195	-[illegible].3777	[illegible]0[illegible]205	-[illegible]0[illegible]653	-[illegible]0[illegible]170	0.0[illegible]0773	0.0028920	0.357	0.800	
30.	6.[illegible]	5.	-2.3	[illegible]92988	-[illegible].8433	-[illegible]0[illegible]4618	[illegible]0[illegible]363	-[illegible]0[illegible]448	[illegible]1457	[illegible]5848	0.0040187	0.359	0.798	

Table I-12. (Concluded)

TEST 310.0 RUN 13

44 FT. TAPERED TIP ROTOR V/OR = M(1.0)(90) =

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	0.0	0.0	-1.0	0.010839	-0.001700	-0.000294	-0.000017	-0.000156	0.000977	0.0009120	0.0015105	0.357	0.801	.2
2.	0.0	2.0	1.0	0.025145	-0.003071	-0.000796	0.000113	-0.000605	0.000652	0.0005910	0.0016373	0.355	0.804	.2
3.	0.0	4.0	3.0	0.039969	-0.005558	-0.001162	0.000014	-0.000450	-0.000006	-0.0000360	0.0018180	0.354	0.804	.2
4.	0.0	6.0	5.0	0.056740	-0.010104	-0.001785	-0.000095	-0.000703	-0.001192	-0.0010753	0.0022838	0.355	0.803	.2
5.	-2.0	6.0	5.0	0.028082	-0.005137	-0.001210	0.000052	-0.000388	0.000020	-0.0000121	0.0017575	0.355	0.803	.2
6.	-2.0	4.0	3.0	0.015648	-0.003010	-0.000822	0.000177	-0.000286	0.000635	0.0005438	0.0015986	0.356	0.803	.2
7.	2.0	4.0	3.0	0.077471	-0.012480	-0.002996	0.000046	-0.000873	-0.001225	-0.0010776	0.0029511	0.357	0.803	.5
8.	2.0	6.0	5.0	0.091362	-0.018321	-0.003691	-0.000060	-0.001063	-0.001959	-0.0017555	0.0041860	0.357	0.803	.5
9.	2.0	2.0	1.0	0.059997	-0.007083	-0.002311	0.000129	-0.000903	-0.000138	-0.0000849	0.0021819	0.356	0.802	.5
10.	2.0	0.0	-1.0	0.043201	-0.003374	-0.001509	-0.000007	-0.000478	0.000722	0.0006671	0.0017378	0.357	0.802	.5
11.	4.0	0.0	-1.0	0.076896	-0.007397	-0.002507	0.000085	-0.000818	0.000446	0.0003979	0.0026024	0.355	0.803	.5
12.	4.0	2.0	1.0	0.091649	-0.012877	-0.003290	0.000221	-0.001318	-0.000005	0.0000362	0.0040152	0.355	0.804	.5

For the following data points
a_{1_s} and/or $b_{1_s} \neq 0^\circ \pm .2^\circ$

PT.	THETA	ALPHA SHAFT	a_{1_s}	b_{1_s}
1	0	0	- .8	0
2	0	2	- .5	0
3	0	4	0	0
4	0	6	.8	0
5	-2	6	-1.0	0
6	-2	4	-1.4	0
7	2	4	2.4	0
8	2	6	3.6	0
9	2	2	1.8	0
10	2	0	1.2	0
11	4	0	3.4	0
12	4	2	4.3	0

Table I - 13. Rotor No. 2.

TEST 312. RUN 6

44 FT. TAPERED TIP ROTOR V/OR = .36 M(1.0)(90) = .90

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	0.	-5.	-5.2	.[illegible]	[illegible]1854	-.[illegible]444	-[illegible]466	-[illegible]231	[illegible]2853	[illegible]28525	[illegible]20750	0.358	0.903	.2
2.	0.	-5.	-11.	.[illegible]6222	[illegible].3478	-[illegible]953	-[illegible]575	-[illegible]329	[illegible]3994	[illegible]39511	[illegible]24877	0.356	0.907	.1
3.	1.	-5.	-12.9	.[illegible]69294	[illegible].5613	-[illegible]1424	-[illegible]614	-[illegible]217	[illegible]5591	[illegible]54739	[illegible]31286	0.357	0.905	.1
4.	4.	-5.	-7.5	.[illegible]23187	[illegible].3275	-[illegible]285	-[illegible]192	-[illegible]051	0.001914	0.0019744	0.0018377	0.359	0.900	.3
5.	2.	-5.	-6.	.[illegible]2437	-[illegible].1229	-[illegible]165	-[illegible]193	[illegible]102576	0.001379	[illegible]0013427	0.0017E83	0.363	0.893	.4
6.	2.	[illegible]	-1.9	.[illegible]35448	-[illegible].2184	-[illegible]928	[illegible]141	-[illegible]266	[illegible]01980	0.0010856	0.0017731	0.356	0.908	.1
7.	3.	[illegible]	-.6	.[illegible]18462	-[illegible].1963	-[illegible]959	[illegible]721	-[illegible]312	[illegible]03604	[illegible]0110092	0.0016831	0.357	0.907	.1
8.	4.	[illegible]	-3.6	.[illegible]03813	-[illegible].2156	-[illegible]1465	-[illegible]3221	-[illegible]192	0.001453	0.0014933	0.0020562	0.356	0.907	.1
9.	6.	[illegible]	-5.7	.[illegible]07 [illegible]68	-[illegible].1585	-[illegible]2415	[illegible]1742	-[illegible]424	[illegible]2315	0.0024211	0.0026348	0.355	0.906	
10.	8.	[illegible]	-7.7	.[illegible]28 655	-[illegible].2321	-[illegible]03212	[illegible]1736	-[illegible]479	[illegible]3806	[illegible]0037816	0.0034366	0.358	0.904	
11.	4.	5.	- .5	.[illegible]08 656	-[illegible].9178	-0.[illegible]4[illegible]	[illegible]1371	-[illegible]517	0.001444	[illegible]0024073	0.0032226	0.357	0.903	
12.	6.	5.	-2.6	.[illegible]84993	-[illegible].7871	-[illegible]4628	[illegible]0384	-[illegible]636	0.002146	[illegible]0021403	0.0043830	0.356	0.906	
13.	2.	5.	1.5	1.[illegible]67758	-[illegible].1926	-[illegible]29[illegible]	[illegible]0133	-[illegible]581	-[illegible]497	-[illegible]0000818	0.0028936	0.358	0.902	
14.	[illegible]	5.	3.3	.[illegible]31862	-[illegible].7964	-[illegible]1227	[illegible]0159	-[illegible]411	-[illegible]459	-[illegible]0004889	0.0021703	0.358	0.903	
15.	-2.	6.	5.	.[illegible]34353	-[illegible].628[illegible]	-[illegible].154	[illegible]0184	-[illegible]731	-[illegible]252	-[illegible]2026	0.0019528	0.357	0.905	
16.	-2.	7.	6.4	.[illegible]46914	-[illegible].9233	-[illegible]2117	[illegible]114	-[illegible]826	-[illegible]969	-[illegible]0013133	0.0021338	0.357	0.905	-.2
17.	[illegible]	7.	4.6	.[illegible]63938	-[illegible].11611	-[illegible]3326	[illegible]0143	-[illegible]572	-[illegible]392	-[illegible]0014262	0.0024432	0.358	0.903	
18.	2.	7.	2.8	.[illegible]76887	-[illegible].12933	-[illegible]4211	[illegible]0151	-[illegible]939	-[illegible]042	-[illegible]0019731	0.0032122	0.357	0.905	-.5
19.	4.	7.	[illegible].8	.[illegible]88[illegible]14	-[illegible].12375	-[illegible]4916	[illegible]0171	-[illegible]1586	0.0020359	[illegible]0037253	[illegible]0042195	0.359	0.905	
20.	6.	-1[illegible]	-13.[illegible]	.[illegible]13294	[illegible].922[illegible]	.[illegible]321	-[illegible]554	-[illegible]298	0.002165	0.0022513	0.0019464	0.356	0.908	.5
21.	8.	-1[illegible]	-14.4	.[illegible]3 952	[illegible].3882	[illegible]241	-[illegible]839	-[illegible]312	[illegible]3520	[illegible]0034992	[illegible]0020440	0.357	0.903	.5
22.	1[illegible]	-1[illegible]	-16.1	.[illegible]44177	[illegible].5851	.[illegible]1316	-[illegible]3155	-[illegible]2185	[illegible]4399	[illegible]0048323	[illegible]0026110	0.356	0.907	.4
23.	11.	-1[illegible]	-17.[illegible]	.[illegible]52661	.[illegible]8413	-[illegible]245	-[illegible]1152	-[illegible]717	[illegible]5762	[illegible]0056255	[illegible]0024181	0.358	0.903	.4
24.	11.	-15.[illegible]	-2[illegible].6	.[illegible]26465	[illegible].5456	.[illegible]66	-[illegible]1811	-[illegible]1632	[illegible]4178	[illegible]0041990	[illegible]0021842	0.358	0.903	.6
25.	12.	-15.	-21.3	.[illegible]33747	[illegible].7839	[illegible]44[illegible]	-[illegible]1545	-[illegible]1546	[illegible]5146	[illegible]0051325	[illegible]0022590	0.356	0.906	.6
26.	1[illegible]	-15.[illegible]	-2[illegible].	.[illegible]2 279	[illegible].3771	[illegible]71[illegible]	-[illegible]1228	-[illegible]515	[illegible]3437	[illegible]0034827	[illegible]0021347	0.358	0.906	.7
27.	8.	-15.	-18.[illegible]	.[illegible]6811	-[illegible].[illegible]441	[illegible]552	-[illegible]1567	-[illegible]527	[illegible]1716	[illegible]18218	[illegible]0019765	0.356	0.905	.6

Table I - 14. Rotor No. 2.

TEST 310.0 RUN 16

44 FT. TAPERED TIP ROTOR V/OR = .40 M(1.0)(90) = .83

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	6.0	-5.0	-9.6	0.033264	0.000880	-0.000562	-0.000270	-0.000112	0.002611	0.0023882	0.0019644	0.403	0.828	.1
2.	6.0	5.0	-3.4	0.085627	-0.007955	-0.004783	0.000416	-0.000415	0.001639	0.0014509	0.0041671	0.400	0.828	
3.	4.0	5.0	-1.1	0.077941	-0.009243	-0.004298	0.000289	-0.000651	0.000181	0.0001584	0.0034826	0.401	0.829	
4.	2.0	5.0	0.9	0.065253	-0.008990	-0.003287	0.000101	-0.000716	-0.000538	-0.0005005	0.0028421	0.402	0.829	
5.	0.0	5.0	2.9	0.050752	-0.007822	-0.002481	0.000152	-0.000432	-0.000617	-0.0005503	0.0024275	0.401	0.828	-.4
6.	-2.0	5.0	4.4	0.034677	-0.006290	-0.001983	0.000112	-0.000537	-0.000302	-0.0003045	0.0021379	0.400	0.829	-.5
7.	-2.0	7.0	5.9	0.048515	-0.009527	-0.002722	0.000051	-0.000433	-0.001271	-0.0011591	0.0025112	0.401	0.828	-.6
8.	0.0	7.0	4.2	0.063026	-0.011335	-0.003502	-0.000030	-0.000528	-0.001575	-0.0014301	0.0028616	0.401	0.828	-.7
9.	2.0	0.0	-2.5	0.035811	-0.002685	-0.001246	0.000114	-0.000282	0.001021	0.0009319	0.0019232	0.399	0.831	
10.	4.0	0.0	-4.1	0.051287	-0.002630	-0.001867	0.000065	-0.000674	0.001428	0.0012754	0.0021603	0.400	0.830	
11.	6.0	0.0	-6.3	0.064734	-0.002315	-0.002533	0.000083	-0.000674	0.002136	0.0019315	0.0025932	0.400	0.830	-.2
12.	8.0	0.0	-8.4	0.075657	-0.001243	-0.003039	0.000081	-0.000558	0.003502	0.0031032	0.0032394	0.400	0.829	.0
13.	8.0	-5.0	-11.5	0.049971	0.002350	-0.000919	-0.000482	-0.000294	0.003661	0.0032982	0.0021984	0.401	0.830	.1
14.	10.0	-5.0	-13.2	0.062628	0.003936	-0.001376	-0.000705	-0.000621	0.005033	0.0044486	0.0026255	0.400	0.831	.1
15.	10.0	-15.0	-20.2	0.008687	-0.000341	0.000168	-0.000655	-0.000713	0.002348	0.0021498	0.0022819	0.401	0.831	.6
16.	12.0	-15.0	-21.6	0.021605	0.003585	0.000024	-0.001091	-0.000382	0.004031	0.0036863	0.0022194	0.401	0.830	.7
17.	13.7	-15.0	-23.3	0.036263	0.007933	-0.000192	-0.001663	-0.000492	0.006273	0.0055607	0.0022912	0.402	0.830	.6
18.	12.0	-10.0	-18.3	0.048055	0.007067	-0.000307	-0.001163	-0.000443	0.005929	0.0052535	0.0022694	0.402	0.829	.4
19.	10.0	-10.0	-16.6	0.035311	0.004415	-0.000027	-0.000822	-0.000218	0.004347	0.0038960	0.0020523	0.400	0.830	.5
20.	8.0	-10.0	-15.0	0.022223	0.001870	0.000061	-0.000587	-0.000225	0.003032	0.0027113	0.0019328	0.400	0.829	.6
21.	4.0	-5.0	-7.7	0.018561	-0.000366	-0.000299	-0.000149	-0.000012	0.001837	0.0016420	0.0017676	0.402	0.830	.3

Table I - 15. Rotor No. 2.

TEST 31[illegible] RUN 8

44 FT. TAPERED TIP ROTOR V/CR = .41 M(1.0)(90) = .91

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/CR	M(1.0)(90)	A_{1_s}
1.	8.	-3.2	-11.4	.[illegible]	[illegible]	[illegible]	[illegible]	-0.001659	0.004168	0.0041631	0.0033364	0.417	0.928	.3
2.	1[illegible]	-5.[illegible]	-13.1	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0055777	0.0039782	0.408	0.939	.2
3.	12.[illegible]	-5.[illegible]	-14.7	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0047169	0.408	0.938	.0
4.	6.[illegible]	-5.	-9.4	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0028259	0.407	0.937	.4
5.	4.	-5.	-7.4	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.412	0.938	.3
6.	4.[illegible]	[illegible]	-4.[illegible]	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.411	0.938	.0
7.	6.[illegible]	[illegible]	-6.[illegible]	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.414	0.934	.1
8.	8.	[illegible]	-8.1	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
9.	1[illegible]	[illegible]	-1[illegible]	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.410	0.939	
10.	2.[illegible]	[illegible]	-2.2	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
11.	[illegible]	[illegible]	-[illegible].5	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.407	0.945	.1
12.	[illegible]	5.	3.[illegible]	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.408	0.946	-.2
13.	2.	5.[illegible]	1.1	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.409	0.944	-.4
14.	4.	5.[illegible]	-1.[illegible]	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.407	0.946	
15.	6.[illegible]	5.[illegible]	-3.3	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.407	0.948	
16.	8.[illegible]	5.[illegible]	-5.2	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.400	0.947	
17.	2.	7.	2.2	.[illegible]	[illegible]	[illegible]	[illegible]	-0.001909	-0.000919	-0.0007020	0.0052983	0.417	0.930	-.5

TEST 31[illegible] RUN 9

44 FT. TAPERED TIP ROTOR V/CR = M(1.[illegible])(9[illegible]) =

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/CR	M(1.0)(90)	A_{1_s}
1.	[illegible]	7.[illegible]	4.2	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.413	0.938	
2.	-2.[illegible]	7.	[illegible]	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.411	0.939	
3.	2.	7.	2.[illegible]	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.410	0.941	
4.	4.	7.	[illegible]	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.411	0.941	
5.	[illegible]	-1[illegible]	-14.[illegible]	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.410	0.941	.6
6.	1[illegible]	-1[illegible]	-16.1	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.411	0.940	.8
7.	12.	-1[illegible]	-17.[illegible]	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.411	0.940	.5
8.	13.7	-1[illegible]	-19.[illegible]	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.412	0.938	.5
9.	13.7	-1[illegible]	-22.[illegible]	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.413	0.937	.8
10.	12.	-1[illegible]	-21.[illegible]	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.413	0.936	.9
11.	1[illegible]	-1[illegible]	-19.[illegible]	.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.413	0.936	1.0

Table I - 16. Rotor No. 2.

TEST 319.3 RUN 7

44 FT. TAPERED TIP ROTOR V/CR = .45 M(1.0)(90) = .77

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/CR	M(1.0)(90)	A_{1_B}
1.	8.	-5.	-11.4	.042977	.001221	-.001187	-.000255	-.000189	0.003451	0.0035201	0.0028684	0.448	0.769	.1
2.	6.	-5.	-9.5	.028078	.000802	-.000731	-.000125	-.000001	0.002429	0.0025258	0.0024721	0.445	0.772	.3
3.	4.	-5.	-7.7	.013605	-.000148	-.000437	-.000138	0.000015	0.001654	0.0017110	0.0021660	0.444	0.771	.2
4.	10.	-5.	-13.4	.055426	0.002568	-.001658	-0.000347	-0.000231	0.004702	0.0047417	0.0034208	0.447	0.773	.1
5.	12.	-5.	-15.1	.064586	.003972	-.002219	-.000666	-.000488	0.006305	0.0062827	0.0042697	0.447	0.772	.0
6.	13.7	-5.	-16.7	.073549	.005947	-.002296	-.001626	-.001323	0.008286	0.0081782	0.0052135	0.447	0.772	.0
7.	12.	-1.	-18.2	.039236	0.004407	-.001313	-0.000946	-0.000310	0.005281	0.0052070	0.0031542	0.446	0.771	.3
8.	10.	-1.	-16.6	.028748	0.002515	-.000983	-0.000793	-0.000172	0.003936	0.0039253	0.0027639	0.445	0.771	.6
9.	8.	-1.	-15.	.014700	-0.000150	-.000649	-0.000346	-0.000165	0.002510	0.0024687	0.0024787	0.444	0.771	.6
10.	13.7	-1.	-2.	.052335	0.007295	-.002713	-0.001450	-0.000838	0.007213	0.0071807	0.0037747	0.446	0.770	.2
11.	14.	-15.	-23.2	.025387	.003815	-.000584	-0.002561	-0.000431	0.004761	0.0059871	0.0033365	0.449	0.772	.7
12.	13.7	-15.	-21.7	.014591	0.000863	-.000697	-0.000961	-0.000394	0.003127	0.0032820	0.0028876	0.443	0.771	.8
13.	10.	-15.	-20.	.002191	-0.002842	-.000713	-0.000596	-0.000844	0.001436	0.0015904	0.0028616	0.447	0.771	.8
14.	6.	-1.	-6.3	.057434	-0.002602	-.000237	-0.000146	-0.000322	0.001861	0.0019756	0.0029533	0.448	0.770	
15.	8.	-1.	-8.4	.068457	-0.002335	-.000745	-0.000145	-0.001264	0.003227	0.0031285	0.0039098	0.448	0.770	
16.	10.	-1.	-10.3	.078456	-0.000627	-.000958	0.000119	-0.001461	0.005063	0.0051379	0.0050691	0.447	0.772	
17.	4.	-1.	-4.3	.043844	-0.002716	-.001715	-0.000167	-0.000104	0.001256	0.0014003	0.0025030	0.446	0.770	.1
18.	2.	-1.	-2.2	.028589	-0.002693	-.001189	0.000375	-0.000268	0.000914	0.0010839	0.0022387	0.446	0.769	
19.	11.	-1.	-11.2	.082471	0.000197	-.001463	0.000223	-0.001780	0.006058	0.0060661	0.0055945	0.444	0.768	
20.	2.	5.	1.	.006142	-0.009159	-.003272	0.000211	-0.000885	-0.000685	-0.0006993	0.0031625	0.445	0.770	
21.	-2.	5.	2.8	.047992	-0.008195	-.002523	0.000215	-0.000635	-0.000791	-0.0006384	0.0029101	0.449	0.770	
22.	-2.	5.	4.	.033195	-0.006723	-.001903	0.000155	-0.000436	-0.000409	-0.0002553	0.0026981	0.449	0.770	-.4
23.	4.	5.	-1.	.073613	-0.009448	-.004124	0.000261	-0.000806	-0.000490	0.0000638	0.0039916	0.448	0.770	-.5
24.	6.	5.	-3.	.088196	-0.008971	-.004875	0.000359	-0.001497	0.001462	0.0015349	0.0051759	0.449	0.770	.0
25.	8.	5.	-5.	.091197	-0.007339	-.005514	0.000514	-0.001247	0.003479	0.0036047	0.0064158	0.447	0.773	-.8
26.	10.	5.	-7.	.101347	-0.006524	-.005351	0.000621	-0.001389	0.005673	0.0056914	0.0080356	0.447	0.773	.4
27.	-2.	7.	4.	.062952	-0.012275	-0.008357	-0.000203	-0.001096	-0.000837	-0.0007735	0.0034745	0.446	0.772	-.5
28.	-2.	7.	6.	.047245	-0.011323	-0.007706	-0.000151	-0.000777	-0.000480	-0.0013959	0.0030814	0.446	0.771	.0
29.	2.	7.	2.	.076143	-0.013271	-0.009339	-0.000113	-0.001167	-0.001566	-0.0014593	0.0041732	0.446	0.771	-.7

Table I - 17. Rotor No. 2.

TEST 310.0 RUN 12

44 FT. TAPERED TIP ROTOR V/OR = .46 M(1.0)(90) = .86

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	8.0	-5.0	-12.0	0.042112	0.000632	-0.000775	-0.000409	-0.000512	0.003547	0.0035693	0.0031800	0.462	0.865	.4
2.	10.0	-5.0	-14.0	0.055047	0.001821	-0.001248	-0.000510	-0.001084	0.004943	0.0049690	0.0039595	0.464	0.862	.4
3.	12.0	-5.0	-15.6	0.064233	0.003308	-0.001719	-0.000655	-0.001216	0.006596	0.0066279	0.0048700	0.463	0.864	.3
4.	6.0	-5.0	-10.0	0.030752	-0.000370	-0.000552	-0.000325	-0.000427	0.002606	0.0026246	0.0027439	0.462	0.865	.4
5.	4.0	-5.0	-7.7	0.017345	-0.001358	-0.000264	-0.000241	-0.000429	0.001827	0.0018407	0.0024554	0.465	0.863	.4
6.	2.0	-5.0	-6.2	0.001750	-0.002306	-0.000004	-0.000168	-0.000092	0.001216	0.0012260	0.0022907	0.462	0.866	.2
7.	4.0	0.0	-4.5	0.048240	-0.003354	-0.001811	-0.000018	-0.000487	0.001433	0.0014333	0.0028566	0.462	0.865	
8.	6.0	0.0	-6.8	0.060819	-0.003221	-0.002618	0.000078	-0.000973	0.002186	0.0021862	0.0034834	0.465	0.861	
9.	8.0	0.0	-8.9	0.071453	-0.002525	-0.003268	0.000078	-0.000856	0.003611	0.0036113	0.0045046	0.464	0.862	
10.	10.0	0.0	-10.9	0.078060	-0.001221	-0.003679	0.000024	-0.001342	0.005454	0.0054543	0.0056902	0.465	0.864	
11.	2.0	0.0	-2.6	0.033921	-0.003243	-0.001368	0.000040	-0.000737	0.001049	0.0010490	0.0024960	0.466	0.864	
12.	0.0	0.0	-0.8	0.020528	-0.003110	-0.000742	-0.000055	-0.000643	0.000901	0.0009013	0.0023275	0.466	0.863	
13.	-2.0	0.0	0.5	0.006242	-0.002703	-0.000535	0.000070	-0.000366	0.001048	0.0010477	0.0023029	0.465	0.862	
14.	0.0	2.0	0.5	0.034769	-0.004748	-0.001552	0.000054	-0.000597	0.000400	0.0004019	0.0025496	0.466	0.861	
15.	-2.0	2.0	2.0	0.019580	-0.003850	-0.000923	0.000125	-0.000586	0.000637	0.0006415	0.0024077	0.464	0.864	
16.	2.0	2.0	-1.5	0.048690	-0.005373	-0.002278	0.000144	-0.000717	0.000470	0.0004749	0.0028610	0.468	0.858	
17.	4.0	2.0	-3.7	0.061234	-0.005628	-0.002973	0.000234	-0.000992	0.000918	0.0009259	0.0033336	0.464	0.864	
18.	4.0	5.0	-1.8	0.079080	-0.009620	-0.004812	0.000315	-0.000831	0.000423	0.0004489	0.0046117	0.468	0.857	
19.	6.0	5.0	-4.0	0.086294	-0.008614	-0.005320	0.000550	-0.000985	0.002002	0.0020426	0.0056678	0.468	0.857	
20.	2.0	5.0	0.3	0.066916	-0.009601	-0.003912	0.000179	-0.000900	-0.000588	-0.0005697	0.0036768	0.468	0.856	
21.	0.0	5.0	2.1	0.054723	-0.008751	-0.003071	0.000083	-0.000622	-0.000806	-0.0007952	0.0031401	0.468	0.856	
22.	-2.0	5.0	4.0	0.039578	-0.007233	-0.002374	0.000106	-0.000559	-0.000519	-0.0005083	0.0027835	0.467	0.862	
23.	10.0	-10.0	-16.8	0.027762	0.001798	-0.000005	-0.000738	-0.000466	0.004120	0.0041852	0.0033086	0.464	0.864	.8
24.	8.0	-10.0	-15.3	0.014579	-0.000450	0.000120	-0.000599	-0.000362	0.002723	0.0027858	0.0029826	0.463	0.863	.7
25.	6.0	-10.0	-12.9	0.002109	-0.002465	0.000143	-0.000310	-0.000239	0.001524	0.0015549	0.0026931	0.462	0.864	.7
26.	12.0	-10.0	-18.3	0.039514	0.003995	-0.000296	-0.000731	-0.000583	0.005620	0.0056620	0.0037220	0.464	0.863	.8
27.	13.7	-10.0	-20.3	0.050493	0.006411	-0.000692	-0.001307	-0.000705	0.007347	0.0074625	0.0043477	0.464	0.863	.7
28.	13.7	-12.0	-21.5	0.039784	0.005450	-0.000384	-0.001353	-0.000580	0.006617	0.0067538	0.0041380	0.464	0.863	.9
29.	12.0	-12.0	-20.0	0.028883	0.002723	-0.000203	-0.000900	-0.000897	0.004998	0.0050761	0.0037710	0.463	0.864	.9
30.	10.0	-12.0	-18.3	0.016342	0.000193	-0.000020	-0.000687	-0.000260	0.003369	0.0034378	0.0033340	0.463	0.863	.9
31.	13.7	-15.0	-23.3	0.024399	0.002945	0.000090	-0.001421	-0.000722	0.005133	0.0053257	0.0039278	0.464	0.864	.9
32.	12.0	-15.0	-21.9	0.012386	-0.000433	0.000139	-0.000870	-0.000472	0.003232	0.0033469	0.0035397	0.464	0.862	1.1
33.	10.0	-15.0	-20.4	0.000799	-0.003389	-0.000034	-0.000384	-0.000530	0.001681	0.0017230	0.0032886	0.462	0.868	1.0

Table I - 18. Rotor No. 2.

TEST 310.0 RUN 11

44 FT. TAPERED TIP ROTOR V/OR = .45 M(1.0)(90) = .90

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	6.0	-5.0	-9.9	0.030915	-0.000277	-0.000785	-0.000140	-0.000622	0.002660	0.0026625	0.0027315	0.445	0.900	.3
2.	8.0	-5.0	-11.9	0.045028	0.000870	-0.001154	-0.000266	-0.000894	0.003698	0.0037076	0.0032047	0.445	0.901	.4
3.	10.0	-5.0	-13.9	0.057773	0.002382	-0.001619	-0.000533	-0.000992	0.005229	0.0052551	0.0040013	0.447	0.897	.2
4.	12.0	-5.0	-15.5	0.066193	0.003740	-0.002060	-0.000575	-0.001229	0.006724	0.0067484	0.0048325	0.446	0.899	.3
5.	13.0	-5.0	-16.4	0.068578	0.005170	-0.002315	-0.000673	-0.001003	0.007508	0.0075383	0.0049439	0.451	0.906	.1
6.	13.0	-5.0	-16.4	0.068780	0.004408	-0.002277	-0.000691	-0.001153	0.007515	0.0075462	0.0053269	0.442	0.900	.1
7.	4.0	-5.0	-7.9	0.017890	-0.001385	-0.000538	-0.000222	-0.000512	0.001837	0.0018497	0.0024400	0.439	0.900	.3
8.	2.0	-5.0	-6.0	0.003947	-0.002349	-0.000392	-0.000041	-0.000435	0.001251	0.0012496	0.0022807	0.439	0.898	.2
9.	2.0	0.0	-2.6	0.033034	-0.003844	-0.001544	0.000090	-0.001046	0.001098	0.0010981	0.0027372	0.443	0.898	.1
10.	4.0	0.0	-4.6	0.048232	-0.003731	-0.002289	0.000234	-0.000822	0.001493	0.0014929	0.0030181	0.444	0.900	
11.	6.0	0.0	-6.6	0.061392	-0.003614	-0.002827	0.000073	-0.000961	0.002386	0.0023863	0.0037850	0.446	0.898	
12.	8.0	0.0	-8.8	0.070868	-0.002786	-0.003527	0.000142	-0.001227	0.003811	0.0038110	0.0047665	0.445	0.897	
13.	10.0	0.0	-10.8	0.078276	-0.001353	-0.003850	0.000028	-0.002037	0.005775	0.0057746	0.0060310	0.446	0.896	
14.	0.0	0.0	-0.9	0.019831	-0.003758	-0.001036	0.000120	-0.000854	0.000970	0.0009703	0.0026184	0.445	0.899	.1
15.	-2.0	0.0	0.6	0.005797	-0.003457	-0.000656	0.092029	-0.000729	0.001080	0.0010803	0.0026221	0.447	0.895	.1
16.	2.0	2.0	-1.4	0.049390	-0.006664	-0.002192	0.000121	-0.001323	0.000478	0.0004817	0.0033093	0.445	0.895	
17.	4.0	2.0	-3.6	0.062949	-0.006718	-0.003137	0.000224	-0.001308	0.001028	0.0010352	0.0037998	0.445	0.896	
18.	0.0	2.0	0.5	0.034283	-0.005984	-0.001636	0.000042	-0.001262	0.000485	0.0004865	0.0030953	0.447	0.894	
19.	-2.0	2.0	2.1	0.015937	-0.005252	-0.001216	-0.000710	-0.004135	0.000634	0.0006085	0.0029382	0.446	0.895	
20.	-2.0	5.0	4.1	0.042758	-0.009036	-0.002332	0.000146	-0.001570	-0.000595	-0.0005797	0.0033647	0.448	0.895	
21.	0.0	5.0	2.4	0.047327	-0.010316	-0.003152	0.000071	-0.003754	-0.000770	-0.0007607	0.0037393	0.448	0.894	
22.	2.0	5.0	0.5	0.069948	-0.011536	-0.003867	0.000096	-0.001839	-0.000577	-0.0005667	0.0043149	0.447	0.893	
23.	4.0	5.0	-1.7	0.081038	-0.011081	-0.004826	0.000378	-0.001671	0.000510	0.0005406	0.0051259	0.447	0.894	
24.	8.0	-10.0	-15.1	0.017404	0.000041	0.000140	-0.000506	-0.000259	0.002874	0.0029178	0.0028822	0.450	0.893	.6
25.	6.0	-10.0	-13.2	0.004177	-0.002296	0.000035	-0.000257	-0.000510	0.001631	0.0016512	0.0026805	0.449	0.892	.6
26.	10.0	-10.0	-16.8	0.031380	0.002419	-0.000009	-0.000837	-0.000594	0.004374	0.0044527	0.0033154	0.447	0.895	
27.	12.0	-10.0	-18.5	0.043406	0.004764	-0.000195	-0.001011	-0.000768	0.005873	0.0059597	0.0037296	0.446	0.899	.8
28.	13.7	-10.0	-20.3	0.047177	0.007281	-0.000478	-0.002452	-0.002625	0.007614	0.0079245	0.0045279	0.449	0.896	.5
29.	13.7	-12.0	-21.4	0.040569	0.005532	-0.000340	-0.001357	0.000287	0.007029	0.0071578	0.0046045	0.445	0.897	.8
30.	12.0	-12.0	-19.8	0.032481	0.003865	-0.000079	-0.001247	-0.000466	0.005262	0.0054065	0.0036095	0.450	0.887	.7
31.	10.0	-12.0	-18.0	0.021134	0.001315	0.000222	-0.000802	-0.000745	0.003684	0.0037706	0.0031525	0.451	0.888	.9
32.	13.7	-15.0	-23.2	0.029179	0.004589	0.000588	-0.001734	-0.001043	0.005508	0.0057694	0.0036791	0.445	0.897	1.0
33.	12.0	-15.0	-21.7	0.017472	0.001315	0.000666	-0.001386	-0.000756	0.003760	0.0039904	0.0033791	0.452	0.887	1.0
34.	10.0	-15.0	-20.1	0.004897	-0.002100	0.000561	-0.001582	-0.000729	0.002008	0.0023486	0.0032939	0.451	0.886	.9

Table I - 19. Rotor No. 2.

TEST 31J.J RUN 1

44 FT. TAPERED TIP ROTOR V/CR = .51 M(1.0)(90) = .81

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/CR	M(1.0)(90)	A_{1_s}
1.	6.J	-5.[illegible]	-9.6	[illegible]22667	-[illegible]	-[illegible]	-[illegible]	-[illegible]	0.002409	0.0024008	0.0034135	0.514	0.805	.4
2.	6.4	[illegible]	-6.8	[illegible]052423	-[illegible]	-[illegible]	[illegible]	-[illegible]	0.002079	0.0020787	0.0043092	0.518	0.802	.1
3.	8.J	[illegible]	-9.[illegible]	[illegible]062578	-[illegible]	-[illegible]	[illegible]	-[illegible]	0.003304	0.0033042	0.0052291	0.519	0.802	.0
4.	4.J	[illegible]	-4.9	0.038421	-[illegible]	-[illegible]	-[illegible]	-[illegible]	0.001393	0.0013932	0.0034628	0.511	0.809	.2
5.	2.[illegible]	[illegible]	-2.8	[illegible]225717	-[illegible]	-[illegible]	[illegible]	-[illegible]	0.000698	0.0006978	0.0027096	0.512	0.808	.1
6.	2.[illegible]	5.[illegible]	[illegible].2	[illegible].63394	-[illegible]	-[illegible]	[illegible]	-[illegible]	-0.000572	-0.0005522	0.0048861	0.521	0.799	
7.	[illegible].[illegible]	5.[illegible]	2.1	[illegible].051865	-0.[illegible]	-[illegible]	-[illegible]	-[illegible]	-0.000868	-0.0009431	0.0040640	0.521	0.799	
8.	-2.[illegible]	5.[illegible]	4.1	[illegible].039291	-[illegible]	-[illegible]	-[illegible]	-[illegible]	-0.000721	-0.0007247	0.0037819	0.512	0.809	
9.	8.[illegible]	-5.[illegible]	-11.8	[illegible].034465	-[illegible]	-[illegible]	-[illegible]	-[illegible]	0.001366	0.0033326	0.0039870	0.512	0.808	.6
10.	1[illegible].[illegible]	-5.[illegible]	-13.7	[illegible].045155	-[illegible]	-[illegible]	-[illegible]	-[illegible]	0.004409	0.0044203	0.0045834	0.508	0.811	.5
11.	1[illegible].[illegible]	-1[illegible].[illegible]	-16.8	[illegible].018796	-[illegible]	-[illegible]	-[illegible]	-[illegible]	0.003547	0.0035537	0.0040631	0.509	0.810	.8
12.	12.[illegible]	-1[illegible].[illegible]	-18.5	[illegible].02977[illegible]	[illegible]	-[illegible]	-[illegible]	-[illegible]	0.004935	0.0050413	0.0045432	0.509	0.812	.9
13.	13.7	-1[illegible].[illegible]	-2[illegible].4	[illegible].039634	[illegible]	-[illegible]	-[illegible]	-[illegible]	0.006449	0.0064716	0.0051189	0.510	0.809	.7
14.	13.7	-12.[illegible]	-21.5	[illegible].029564	[illegible]	-[illegible]	-[illegible]	-[illegible]	0.005536	0.0056983	0.0048936	0.512	0.810	.9
15.	12.[illegible]	-8.[illegible]	-17.4	[illegible].04[illegible].251	[illegible]	-[illegible]	-[illegible]	-[illegible]	0.005371	0.0054686	0.0047075	0.512	0.809	.8
16.	1[illegible].[illegible]	-8.[illegible]	-15.7	[illegible].03[illegible]722	-[illegible]	-[illegible]	-[illegible]	-[illegible]	0.004061	0.0040563	0.0040254	0.510	0.808	.8
17.	8.[illegible]	-8.[illegible]	-13.[illegible]	[illegible].[illegible]17[illegible].3	-[illegible]	-[illegible]	[illegible]	-[illegible]	0.002808	0.0027892	0.0036351	0.510	0.808	.8
18.	8.[illegible]	-3.[illegible]	-1[illegible].8	[illegible].045488	-[illegible]	-[illegible]	-[illegible]	-[illegible]	0.003418	0.0034198	0.0044805	0.512	0.809	.6
19.	6.[illegible]	-3.[illegible]	-8.8	[illegible].033[illegible]09	-[illegible]	-[illegible]	[illegible]	-[illegible]	0.002457	0.0024422	0.0036042	0.510	0.810	.5
20.	4.[illegible]	-3.[illegible]	-6.0	[illegible].[illegible]22859	-[illegible]	-[illegible]	-[illegible]	-[illegible]	0.001865	0.0018396	0.0032283	0.510	0.810	.4
21.	4.[illegible]	2.[illegible]	-3.7	[illegible].053653	-[illegible]	-[illegible]	-[illegible]	-[illegible]	0.002153	0.0022807	0.0032496	0.516	0.811	
22.	2.[illegible]	2.[illegible]	-1.6	[illegible].043028	-[illegible]	-[illegible]	[illegible]	-[illegible]	0.001549	0.0015495	0.0036067	0.512	0.808	
23.	6.[illegible]	[illegible]	-5.8	[illegible].069472	-[illegible]	-[illegible]	[illegible]	-[illegible]	0.001848	0.0018577	0.0050986	0.511	0.810	

Table I - 19. Rotor No. 2.

TEST 310.0 RUN 1

44 FT. TAPERED TIP ROTOR V/CR = .51 M(1.0)(90) = .81

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/CR	M(1.0)(90)	A_{1_s}
1.	6.0	-5.1	-9.6	0.022667	-0.002019	-0.001046	-0.000015	-0.000537	0.002409	0.0024008	0.0034135	0.514	0.805	.4
2.	6.0	1.1	-6.8	0.052429	-0.004565	-0.002712	0.000218	-0.001374	0.002879	0.0020787	0.0043092	0.518	0.802	.1
3.	8.0	3.0	-9.0	0.062578	-0.004479	-0.003698	0.000253	-0.001068	0.003304	0.0033042	0.0052291	0.519	0.802	.0
4.	4.0	0.1	-4.9	0.038421	-0.004191	-0.001809	-0.000078	-0.001078	0.001393	0.0013932	0.0034628	0.511	0.809	.2
5.	2.0	0.1	-2.8	0.025717	-0.003992	-0.002232	0.001218	-0.001540	0.000698	0.0006978	0.0027096	0.512	0.808	.1
6.	2.0	5.0	0.2	0.063394	-0.010822	-0.003824	0.000203	-0.002681	-0.000572	-0.0005522	0.0048861	0.521	0.799	
7.	4.0	5.0	2.1	0.051865	-0.009857	-0.002415	-0.000091	-0.001806	-0.000868	-0.0009431	0.0040640	0.521	0.799	
8.	-2.0	5.0	4.1	0.039291	-0.008956	-0.001981	-0.000074	-0.002073	-0.000721	-0.0007247	0.0037819	0.512	0.809	
9.	8.0	-5.0	-11.8	0.084465	-0.011424	-0.001367	-0.000033	-0.001366	0.003326	0.0033167	0.0039870	0.512	0.808	.6
10.	10.0	-5.0	-13.7	0.045155	-0.008521	-0.001683	-0.000322	-0.001601	0.004409	0.0044203	0.0045834	0.508	0.811	.5
11.	10.0	-10.0	-16.8	0.018796	-0.011134	-0.000526	-0.000347	-0.000688	0.003547	0.0035537	0.0040631	0.509	0.810	.8
12.	12.0	-10.0	-18.5	0.029770	-0.010892	-0.000625	-0.000344	-0.000756	0.004935	0.0050413	0.0045432	0.509	0.812	.9
13.	13.7	-10.0	-21.4	0.039634	-0.012499	-0.000828	-0.000695	-0.001959	0.006449	0.0064716	0.0051189	0.510	0.809	.7
14.	13.7	-12.0	-21.5	0.029564	-0.011489	-0.000238	-0.001361	-0.001734	0.005536	0.0056983	0.0048936	0.512	0.810	.9
15.	12.0	-8.0	-17.4	0.024251	-0.011331	-0.001175	-0.001178	-0.001123	0.005371	0.0054686	0.0047075	0.512	0.809	.8
16.	10.0	-8.0	-15.7	0.033722	-0.012031	-0.001931	-0.001248	-0.000745	0.004061	0.0040563	0.0040254	0.510	0.808	.8
17.	8.0	-8.0	-13.0	0.017203	-0.011686	-0.001722	-0.000956	-0.000711	0.002808	0.0027897	0.0036351	0.510	0.808	.8
18.	8.0	-3.0	-10.8	0.045488	-0.012271	-0.002262	-0.000130	-0.001549	0.003418	0.0034198	0.0044805	0.512	0.809	.6
19.	6.0	-3.0	-8.8	0.033019	-0.012384	-0.001793	0.000227	-0.001625	0.002457	0.0024422	0.0036042	0.510	0.810	.5
20.	4.0	-3.0	-6.6	0.022859	-0.012774	-0.001762	0.000433	-0.000729	0.001865	0.0018396	0.0032283	0.510	0.810	.4
21.	4.0	2.0	-3.7	0.053653	-0.016409	-0.001368	-0.001943	-0.001497	0.002152	0.0022837	0.0052496	0.516	0.811	
22.	2.0	2.0	-1.6	0.043028	-0.016145	-0.001217	0.000027	-0.001097	0.001549	0.0005495	0.0036067	0.512	0.808	
23.	6.0	2.0	-5.8	0.069472	-0.016759	-0.003538	0.000395	-0.001869	0.001848	0.0018577	0.0050986	0.511	0.810	

Table I-19. (Concluded)

TEST 310.0 RUN 14

44 FT. TAPERED TIP ROTOR V/OR = .51 M(1.0)(90) = .81

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	2.0	-2.0	-4.0	0.015670	-0.002709	-0.000687	-0.000078	-0.000283	0.001275	0.0012825	0.0026617	0.514	0.805	.3
2.	2.0	-2.0	-3.0	0.026319	-0.003368	-0.000901	-0.000069	-0.000609	0.001129	0.0011118	0.0028208	0.517	0.803	.2
3.	2.0	0.0	-1.0	0.048181	-0.006329	-0.001738	-0.000017	-0.001039	0.000157	0.0002447	0.0033858	0.514	0.805	.2
4.	2.0	2.0	1.0	0.076086	-0.012457	-0.002878	0.000059	-0.001250	-0.001070	-0.0009358	0.0052405	0.518	0.799	.2
5.	0.0	0.0	-1.0	0.016944	-0.003288	-0.000729	-0.000041	-0.000148	0.000999	0.0009423	0.0026076	0.511	0.806	.2
6.	0.0	2.0	1.0	0.038727	-0.006067	-0.001637	-0.000120	-0.000629	0.000078	0.0001221	0.0031617	0.513	0.805	.2
7.	0.0	4.0	3.0	0.062579	-0.011672	-0.002527	-0.000223	-0.001235	-0.001653	-0.0014673	0.0043300	0.513	0.805	.2
8.	0.0	6.0	5.0	0.085738	-0.018666	-0.003391	-0.000281	-0.001471	-0.003029	-0.0026958	0.0066611	0.515	0.805	.2
9.	-2.0	6.0	5.0	0.050839	-0.010246	-0.002825	-0.000192	-0.000564	-0.001529	-0.0013806	0.0037603	0.514	0.804	.1
10.	-2.0	4.0	3.0	0.028585	-0.005644	-0.001678	-0.000077	-0.000571	0.000122	0.0001206	0.0029580	0.510	0.809	.1
11.	4.0	0.0	-1.0	0.087023	-0.012557	-0.003416	0.000492	-0.001488	0.000251	0.0003019	0.0063242	0.510	0.808	.1
12.	4.0	-2.0	-3.0	0.066455	-0.007678	-0.002664	0.000053	-0.001630	0.000649	0.0006424	0.0043658	0.513	0.804	.1
13.	4.0	-4.0	-5.0	0.041972	-0.003379	-0.001503	-0.000091	-0.000751	0.001491	0.0013890	0.0030255	0.510	0.808	.1

For the following data points a_{1_s} and/or $b_{1_s} \neq 0^\circ \pm .2^\circ$

PT.	THETA	ALPHA SHAFT	a_{1_s}	b_{1_s}
1	2	-2	0	0
2	2	-2	1.4	0
3	2	0	2.9	0
4	2	2	4.8	0
5	0	0	0	0
6	0	2	1.4	0
7	0	4	2.9	0
8	0	6	4.3	0
9	-2	6	.8	0
10	-2	4	- .7	0
11	4	0	6.7	0
12	4	-2	5.3	0
13	4	-4	3.4	0

Table I - 20. Rotor No. 2.

TEST 310.0 RUN 15

44 FT. TAPERED TIP ROTOR V/OR = .52 M(1.0)(90) = .81

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	6.0	-5.0	-10.1	0.023890	-0.001968	-0.000595	-0.000408	-0.000715	0.002443	0.0022069	0.0032143	0.526	0.811	-5
2.	8.0	-5.0	-12.0	0.036611	-0.001253	-0.001154	-0.000312	-0.001052	0.003290	0.0029701	0.0035596	0.522	0.814	.5
3.	10.0	-5.0	-14.1	0.047761	-0.000502	-0.001646	-0.000465	-0.001049	0.004600	0.0040518	0.0042038	0.523	0.812	.4
4.	12.0	-5.0	-15.8	0.055655	0.000587	-0.002035	-0.000669	-0.001370	0.005998	0.0053004	0.0048435	0.522	0.812	.4
5.	12.0	-7.0	-17.0	0.046380	0.000987	-0.001258	-0.000707	-0.000993	0.005675	0.0049301	0.0043093	0.524	0.810	.7
6.	12.0	-10.0	-18.6	0.030306	0.000467	-0.000419	-0.000933	-0.000729	0.004777	0.0041751	0.0038868	0.522	0.811	1.0
7.	10.0	-7.0	-15.3	0.037174	0.000003	-0.000904	-0.000544	-0.000655	0.004331	0.0037786	0.0037098	0.521	0.811	.9
8.	8.0	-7.0	-13.3	0.026670	-0.001163	-0.000735	-0.000757	-0.000810	0.003183	0.0028128	0.0033849	0.521	0.810	.8
9.	8.0	0.0	-9.3	0.064825	-0.003386	-0.003196	-0.000070	-0.001430	0.003407	0.0030012	0.0045620	0.521	0.809	.2
10.	6.0	0.0	-7.1	0.055322	-0.004117	-0.002799	-0.000056	-0.001243	0.002016	0.0018455	0.0038420	0.521	0.814	.3
11.	4.0	0.0	-4.9	0.044657	-0.004084	-0.002104	-0.000051	-0.000709	0.001354	0.0012606	0.0033063	0.524	0.809	.2
12.	2.0	0.0	-2.9	0.032504	-0.003744	-0.001441	-0.000026	-0.000600	0.001047	0.0009530	0.0028641	0.524	0.809	.2
13.	2.0	2.0	-1.6	0.046001	-0.005610	-0.002286	0.000028	-0.000686	0.000484	0.0004264	0.0032517	0.522	0.812	.1
14.	0.0	2.0	0.2	0.033584	-0.005049	-0.001713	0.000075	-0.000594	0.000430	0.0003959	0.0029725	0.521	0.811	.1
15.	0.0	5.0	2.0	0.053466	-0.008962	-0.003315	-0.000010	-0.000626	-0.000948	-0.0007831	0.0037155	0.518	0.814	
16.	0.0	7.0	3.2	0.067547	-0.012421	-0.004557	-0.000104	-0.000851	-0.001932	-0.0016774	0.0045585	0.520	0.810	
17.	2.0	5.0	0.2	0.063885	-0.009539	-0.004078	-0.000032	-0.000820	-0.000716	-0.0005722	0.0041648	0.518	0.814	
18.	4.0	5.0	-2.1	0.075076	-0.009704	-0.005293	0.000311	-0.001029	0.000316	0.0002781	0.0050921	0.524	0.807	
19.	4.0	2.0	-3.7	0.055160	-0.005478	-0.003134	-0.000091	-0.000802	0.001007	0.0009034	0.0036444	0.527	0.805	
20.	6.0	2.0	-5.9	0.065907	-0.005580	-0.003932	0.000256	-0.001247	0.001926	0.0017418	0.0044419	0.522	0.810	
21.	6.0	-3.0	-8.8	0.038569	-0.002215	-0.001499	-0.000058	-0.000776	0.002470	0.0021692	0.0032504	0.521	0.809	.4
22.	4.0	-3.0	-6.8	0.025216	-0.004019	-0.134523	0.189577	-0.002960	0.051591	0.0016847	0.0037697	0.526	0.804	.5
23.	8.0	-3.0	-10.9	0.049530	-0.001816	-0.002005	-0.000143	-0.001167	0.003293	0.0029619	0.0037843	0.519	0.813	.5
24.	10.0	-3.0	-12.8	0.056892	-0.001078	-0.002600	-0.000176	-0.001599	0.004672	0.0040871	0.0044885	0.519	0.812	.4

Table I - 21. Rotor No. 3.

TEST 310.0 RUN 19

34 FT. 0012 ROTOR V/OR = .51 M(1.0)(90) = .63

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	8.0	-2.0	-9.6	0.046128	-0.002715	-0.002206	-0.000310	0.006463	0.003015	0.0028436	0.0040947	0.511	0.648	.0
2.	10.0	-2.0	-11.6	0.056642	-0.002633	-0.002827	-0.000117	0.006402	0.003963	0.0037217	0.0048651	0.512	0.647	.0
3.	6.0	-2.0	-7.8	0.037260	-0.002936	-0.002568	0.001134	0.006751	0.002707	0.0022558	0.0036767	0.514	0.644	.0
4.	4.0	-2.0	-5.8	0.023637	-0.002850	-0.001259	-0.000291	0.006514	0.001788	0.0017716	0.0031824	0.508	0.643	.0
5.	2.0	-2.0	-3.7	0.012665	-0.003122	-0.000668	0.000766	0.007035	0.001333	0.0013811	0.0029683	0.512	0.644	.4
6.	0.0	-2.0	-2.0	0.000790	-0.003366	-0.000252	-0.000120	0.006589	0.001133	0.0011443	0.0028651	0.511	0.644	.5
7.	0.0	2.0	0.7	0.029335	-0.004668	-0.002350	0.001438	0.006673	0.001103	0.0006763	0.0030295	0.512	0.641	
8.	2.0	2.0	-1.2	0.038099	-0.005268	-0.002182	-0.000029	0.006361	0.000790	0.0006718	0.0032641	0.508	0.642	
9.	4.0	2.0	-3.3	0.048393	-0.005751	-0.003036	0.000347	0.006589	0.001220	0.0010761	0.0038726	0.512	0.641	
10.	6.0	2.0	-5.5	0.058285	-0.006364	-0.003638	0.000243	0.005049	0.001762	0.0016368	0.0046639	0.511	0.640	
11.	8.0	2.0	-7.2	0.068211	-0.006441	-0.004321	0.000155	0.005222	0.002674	0.0024352	0.0056269	0.511	0.640	
12.	10.0	2.0	-9.8	0.078962	-0.006637	-0.005278	0.000468	0.004484	0.004177	0.0037198	0.0067122	0.511	0.639	
13.	10.0	0.0	-10.2	0.068045	-0.004457	-0.003828	-0.000121	0.005080	0.004008	0.0036887	0.0058594	0.509	0.641	
14.	12.0	-2.0	-15.7	0.068407	-0.002004	-0.003666	-0.000338	0.005353	0.005772	0.0051166	0.0058353	0.509	0.641	
15.	12.0	-4.0	-14.6	0.056992	-0.000886	-0.002757	-0.000394	0.005471	0.006433	0.0049261	0.0051658	0.507	0.643	
16.	10.0	-4.0	-12.7	0.044899	-0.001340	-0.002082	-0.000301	0.005905	0.006283	0.0038069	0.0043643	0.512	0.639	
17.	8.0	-4.0	-11.1	0.034428	-0.001771	-0.001515	-0.000294	0.005875	0.006276	0.0029804	0.0038068	0.510	0.641	
18.	6.0	-4.0	-9.1	0.025109	-0.002136	-0.001145	0.000013	0.006067	0.002545	0.0022832	0.0033298	0.509	0.638	
19.	4.0	-4.0	-7.2	0.012107	-0.002654	-0.000585	-0.000395	0.006091	0.001744	0.0017114	0.0030488	0.507	0.639	
20.	6.0	-6.0	-10.9	0.012714	-0.002425	-0.000451	-0.000327	0.005962	0.002109	0.0020298	0.0032499	0.507	0.639	
21.	8.0	-6.0	-12.1	0.025259	-0.001573	-0.000874	-0.000402	0.005629	0.003075	0.0028311	0.0035893	0.508	0.639	
22.	10.0	-6.0	-13.8	0.034121	-0.000681	-0.001108	-0.000448	0.005533	0.004087	0.0037397	0.0041153	0.511	0.638	
23.	12.0	-6.0	-15.8	0.047435	0.000117	-0.001865	-0.000652	0.005280	0.005581	0.0050262	0.0048217	0.510	0.637	
24.	14.0	-6.0	-17.8	0.061678	0.001358	-0.001935	-0.001060	0.005154	0.007227	0.0066486	0.0057088	0.511	0.637	
25.	8.0	0.0	-8.5	0.056982	-0.004081	-0.003142	0.000168	0.005772	0.002922	0.0026991	0.0045754	0.511	0.637	
26.	6.0	0.0	-6.7	0.046701	-0.003978	-0.002521	0.000051	0.006070	0.002210	0.0020543	0.0039432	0.510	0.637	
27.	4.0	0.0	-4.7	0.035182	-0.003859	-0.001962	-0.000196	0.005902	0.001623	0.0014904	0.0033797	0.510	0.637	
28.	2.0	0.0	-2.5	0.026141	-0.003805	-0.001369	-0.000088	0.006094	0.001162	0.0010876	0.0029890	0.510	0.637	
29.	0.0	0.0	-0.5	0.012107	-0.003608	-0.000774	-0.000070	0.006164	0.001023	0.0009986	0.0028209	0.508	0.638	
30.	0.0	4.0	2.0	0.036310	-0.007106	-0.002292	0.000098	0.005563	0.000024	0.0000400	0.0035655	0.508	0.638	
31.	0.0	6.0	3.1	0.046460	-0.009814	-0.003002	-0.000195	0.005651	-0.000824	-0.0006863	0.0042112	0.513	0.637	
32.	2.0	6.0	1.5	0.058647	-0.010736	-0.003858	0.000105	0.006239	-0.000800	-0.0006055	0.0046832	0.513	0.637	
33.	2.0	4.0	0.1	0.047105	-0.007965	-0.002766	-0.000107	0.005517	0.000187	0.0001201	0.0040490	0.511	0.639	
34.	4.0	4.0	-2.1	0.059128	-0.008394	-0.003687	-0.000014	0.006040	0.000628	0.0004412	0.0045126	0.512	0.639	.6
35.	4.0	6.0	-0.9	0.068953	-0.010935	-0.004547	0.000299	0.005817	0.000035	0.0000398	0.0053060	0.510	0.641	.0
36.	6.0	6.0	-2.9	0.080700	-0.011746	-0.005350	0.000193	0.005714	0.000999	0.0008493	0.0064657	0.514	0.637	
37.	6.0	4.0	-4.2	0.070018	-0.008894	-0.004576	0.000119	0.005874	0.001524	0.0013347	0.0055917	0.514	0.637	
38.	6.0	8.0	-1.7	0.092874	-0.015077	-0.006294	0.000569	0.005636	0.000548	0.0005257	0.0077084	0.513	0.637	
39.	4.0	8.0	0.2	0.083009	-0.014777	-0.005358	0.000177	0.005779	-0.000692	-0.0006075	0.0064895	0.510	0.635	
40.	4.0	10.0	1.5	0.095287	-0.018864	-0.006016	0.000059	0.005776	-0.001515	-0.0011745	0.0078669	0.510	0.635	.0

Table I-21. (Concluded)

TEST 310.0 RUN 24

34 FT. 0012 ROTOR V/OR = .51 M(1.0)(90) = .63

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
36.	2.0	-4.0	-5.2	0.002667	-0.003105	-0.000724	-0.000249	0.004948	0.001406	0.0012160	0.0027834	0.505	0.621	
37.	4.0	-6.0	-8.6	0.003011	-0.003077	-0.000607	-0.000283	0.004956	0.001504	0.0013768	0.0029309	0.505	0.623	.1
38.	6.0	10.0	-0.5	0.101994	-0.019034	-0.005766	0.000315	0.003558	0.000092	0.0002915	0.0091958	0.503	0.623	0
39.	8.0	8.0	-3.6	0.097067	-0.014866	-0.004902	0.000519	0.004210	0.002034	0.0017908	0.0086799	0.505	0.623	.1
40.	8.0	6.0	-4.8	0.087236	-0.011638	-0.004895	0.000543	0.004307	0.002198	0.0018743	0.0072623	0.505	0.623	0
41.	8.0	4.0	-6.1	0.080157	-0.009377	-0.004952	0.000186	0.004033	0.002365	0.0019577	0.0062838	0.506	0.624	0
42.	10.0	4.0	-7.5	0.087047	-0.008878	-0.004439	0.000536	0.004201	0.003950	0.0033742	0.0073812	0.507	0.624	.2
43.	12.0	0.0	-12.1	0.078739	-0.003302	-0.003746	0.000694	0.003920	0.005844	0.0051221	0.0063816	0.504	0.623	.5

For the following data points
a_{1_s} and/or $b_{1_s} \neq 0^\circ \pm .2^\circ$

PT.	THETA	ALPHA SHAFT	a_{1_s}	b_{1_s}
39	8	8	0	.7
40	8	6	0	.4
42	10	4	0	.6
43	12	0	0	.6

Table I - 22. Rotor No. 3.

TEST 310.0 RUN 23

34 FT. 0012 ROTOR V/OR = .65 M(1.0)(90) = .54

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CM^Z	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	0.0	0.0	-0.9	0.010147	-0.003985	-0.001162	-0.000035	0.009854	0.001320	0.0011998	0.0044359	0.650	0.540	-1.0
2.	0.0	2.0	-0.0	0.022483	-0.006042	-0.001985	-0.000114	0.010279	0.000875	0.0007986	0.0047150	0.652	0.541	- .7
3.	0.0	4.0	0.9	0.037469	-0.008408	-0.002577	-0.000581	0.010399	0.000067	0.0001331	0.0055556	0.653	0.542	
4.	0.0	6.0	2.0	0.047077	-0.010030	-0.003570	-0.000573	0.010700	-0.000684	-0.0006656	0.0057831	0.654	0.542	-1.4
5.	0.0	7.0	2.4	0.051923	-0.012493	-0.004197	-0.000875	0.007905	-0.001327	-0.0010646	0.0069161	0.650	0.540	-1.4
6.	0.0	8.0	3.0	0.060463	-0.014482	-0.004864	-0.000393	0.007609	-0.002008	-0.0015968	0.0076118	0.649	0.540	
7.	0.0	5.0	1.6	0.040322	-0.009311	-0.003115	-0.000567	0.008926	-0.000149	-0.0002661	0.0059073	0.650	0.541	-1.1
8.	2.0	5.0	-0.6	0.046860	-0.010144	-0.003810	-0.000834	0.008776	0.000049	-0.0001345	0.0063825	0.653	0.539	-1.0
9.	2.0	6.0	-0.2	0.050686	-0.010776	-0.004735	-0.000355	0.008947	-0.000387	-0.0003992	0.0069737	0.650	0.540	-1.0
10.	2.0	7.0	0.1	0.056556	-0.012295	-0.005338	-0.000522	0.008260	-0.000987	-0.0007984	0.0070266	0.650	0.540	-1.1
11.	2.0	8.0	0.6	0.065347	-0.014536	-0.005516	-0.000472	0.007830	-0.001868	-0.0013306	0.0078928	0.649	0.540	
12.	2.0	4.0	-1.4	0.042469	-0.009225	-0.003465	-0.000315	0.008659	0.000429	0.0002661	0.0061742	0.650	0.541	- .8
13.	2.0	2.0	-2.3	0.029816	-0.007067	-0.002813	0.000059	0.008281	0.001001	0.0009315	0.0054820	0.650	0.541	- .7
14.	2.0	0.0	-3.2	0.017574	-0.005761	-0.001695	-0.000500	0.008892	0.001383	0.0013308	0.0050657	0.651	0.541	- .6
15.	2.0	-2.0	-4.2	0.008193	-0.005309	-0.001097	-0.000141	0.008906	0.001407	0.0014637	0.0049089	0.649	0.540	- .5
16.	4.0	-2.0	-6.5	0.014088	-0.005532	-0.001745	-0.000140	0.008630	0.001794	0.0017299	0.0053186	0.650	0.541	- .4
17.	4.0	-4.0	-7.5	0.004067	-0.005402	-0.000847	-0.000604	0.008830	0.001679	0.0016142	0.0051498	0.655	0.539	- .3
18.	4.0	0.0	-5.7	0.024088	-0.006170	-0.002373	-0.000230	0.008981	0.001728	0.0016141	0.0056222	0.654	0.539	- .4
19.	4.0	2.0	-4.5	0.037528	-0.007674	-0.003885	0.000226	0.008861	0.001397	0.0010760	0.0060227	0.654	0.539	- .6
20.	4.0	3.0	-4.1	0.044141	-0.008722	-0.004132	0.000203	0.009377	0.001148	0.0008071	0.0064176	0.654	0.539	- .5
21.	4.0	4.0	-3.6	0.050881	-0.009872	-0.004709	0.000015	0.008952	0.000797	0.0005380	0.0068627	0.654	0.539	- .7
22.	4.0	5.0	-3.1	0.053976	-0.010619	-0.005235	0.000309	0.009715	0.000575	0.0004035	0.0071963	0.653	0.539	- .7
23.	4.0	6.0	-2.5	0.058981	-0.011881	-0.005619	-0.000188	0.009287	0.000207	-0.0001347	0.0074617	0.654	0.538	- .8
24.	4.0	7.0	-2.0	0.066281	-0.014205	-0.006063	-0.000246	0.008318	-0.000446	-0.0006737	0.0083967	0.654	0.538	- .9
25.	4.0	8.0	-1.5	0.071390	-0.015049	-0.006685	0.000326	0.007480	-0.000695	-0.0008084	0.0087688	0.653	0.538	-1.0
26.	6.0	7.0	-3.9	0.072951	-0.014447	-0.006615	-0.000036	0.008697	0.000567	0.0004042	0.0095789	0.654	0.538	- .6
27.	6.0	8.0	-3.5	0.077654	-0.015319	-0.006134	0.000156	0.009455	0.000344	0.0002695	0.0099827	0.654	0.538	
28.	6.0	6.0	-4.5	0.064735	-0.012742	-0.006552	0.000043	0.007916	0.000752	0.0004042	0.0085295	0.654	0.538	- .8
29.	6.0	4.0	-5.6	0.055625	-0.010494	-0.005583	0.000277	0.008272	0.001413	0.0009434	0.0076794	0.657	0.539	
30.	6.0	2.0	-6.6	0.042896	-0.008218	-0.004556	0.000773	0.008431	0.001929	0.0014821	0.0067624	0.654	0.538	
31.	6.0	0.0	-7.6	0.032187	-0.006727	-0.003426	0.000350	0.009060	0.001974	0.0018864	0.0062350	0.654	0.538	- .2
32.	6.0	-2.0	-8.7	0.021724	-0.006038	-0.002208	-0.000267	0.009245	0.002103	0.0018864	0.0058111	0.654	0.538	- .2
33.	6.0	-4.0	-9.5	0.008660	-0.005405	-0.001188	-0.000118	0.009395	0.001923	0.0018897	0.0054209	0.654	0.538	.0
34.	8.0	-4.0	-11.6	0.016060	-0.005794	-0.001297	-0.000852	0.009294	0.002450	0.0024297	0.0062082	0.654	0.538	.0
35.	8.0	-6.0	-12.6	0.007398	-0.006192	-0.001012	0.549288	0.009290	0.002172	0.0018898	0.0059403	0.655	0.538	.0

Table I-22. (Concluded)

TEST 310.0 RUN 23

34 FT. 0012 ROTOR V/OR = .65 M(1.0)(90) = .54

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
36.	8.0	-2.0	-10.7	0.027809	-0.006252	-0.002432	-0.000117	0.009607	0.002527	0.0024298	0.0064837	0.655	0.538	.1
37.	8.0	0.0	-9.7	0.037534	-0.006920	-0.003765	0.000290	0.009177	0.002524	0.0022947	0.0067517	0.654	0.538	-.1
38.	8.0	2.0	-8.7	0.049291	-0.008325	-0.004949	0.000818	0.008972	0.002420	0.0020248	0.0073516	0.655	0.538	-.1
39.	8.0	4.0	-7.5	0.061964	-0.010795	-0.005614	0.000437	0.008481	0.002046	0.0017547	0.0085816	0.654	0.538	.0
40.	8.0	6.0	-6.0	0.074285	-0.013998	-0.005741	0.000472	0.007690	0.001984	0.0017548	0.0106362	0.654	0.538	.4
41.	8.0	8.0	-4.0	0.099529	-0.021385	-0.006365	0.000627	0.005711	0.002073	0.0018898	0.0152902	0.655	0.538	.4
42.	10.0	6.0	-6.0	0.102562	-0.021474	-0.006245	0.001195	0.004153	0.004141	0.0036441	0.0171360	0.653	0.538	.0
43.	10.0	4.0	-8.0	0.080400	-0.014919	-0.006284	0.000475	0.005463	0.003596	0.0031164	0.0125999	0.657	0.538	.3
44.	10.0	2.0	-10.0	0.058472	-0.010149	-0.005109	0.000601	0.008090	0.003206	0.0028405	0.0093426	0.657	0.539	.5
45.	10.0	0.0	-11.5	0.044512	-0.008054	-0.004379	0.000749	0.008408	0.003279	0.0029750	0.0081488	0.655	0.538	.1
46.	10.0	-2.0	-12.5	0.035409	-0.007286	-0.003269	-0.000080	0.008604	0.003287	0.0029748	0.0076784	0.654	0.538	.2
47.	10.0	-4.0	-13.5	0.022676	-0.006194	-0.001849	-0.000369	0.009311	0.003040	0.0028399	0.0068734	0.655	0.538	.3
48.	10.0	-6.0	-14.5	0.013116	-0.006206	-0.001178	0.000687	0.009518	0.002735	0.0025695	0.0066298	0.656	0.538	.4
49.	10.0	-8.0	-15.4	0.003861	-0.007262	-0.000367	-0.000466	0.008758	0.002048	0.0018931	0.0066463	0.655	0.538	.4

For the following data points
a_{1_s} and/or $b_{1_s} \neq 0^{\circ} \pm .2^{\circ}$

PT.	THETA	ALPHA SHAFT	a_{1_s}	b_{1_s}
40	8	6	1.0	0
41	8	8	2.9	0
42	10	6	4.8	0
43	10	4	2.9	0
43	10	2	.5	0

Table I - 23. Rotor No. 3.

TEST 310.0 RUN 20

34 FT. 0012 ROTOR V/OR = .75 M(1.0)(90) = .50

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	8.0	0.0	-9.5	0.042433	-0.007378	-0.003689	0.000086	0.011269	0.002507	0.0023610	0.0072555	0.675	0.538	
2.	6.0	0.0	-7.6	0.034035	-0.006486	-0.003241	-0.000209	0.011667	0.002138	0.0018053	0.0061226	0.674	0.537	
3.	6.0	0.0	-7.8	0.025665	-0.007874	-0.003312	0.000025	0.012568	0.001803	0.0017341	0.0075900	0.747	0.502	
4.	8.0	0.0	-9.8	0.034513	-0.008471	-0.004429	0.000067	0.016331	0.002815	0.0021107	0.0084432	0.754	0.500	
5.	8.0	-2.0	-11.1	0.021555	-0.008527	-0.002841	0.000155	0.015036	0.001978	0.0021108	0.0085221	0.754	0.500	
6.	10.0	-2.0	-12.9	0.024571	-0.009255	-0.003354	-0.000160	0.016476	0.002424	0.0022908	0.0092434	0.754	0.500	
7.	6.0	-2.0	-9.1	0.013661	-0.007842	-0.001913	-0.000159	0.013371	0.001849	0.0017656	0.0078667	0.756	0.500	
8.	6.0	-4.0	-9.8	0.004121	-0.007621	-0.001079	-0.000449	0.013045	0.001538	0.0015891	0.0073510	0.756	0.500	
9.	8.0	-4.0	-11.9	0.006192	-0.008782	-0.001291	-0.000584	0.013948	0.001841	0.0017658	0.0084123	0.757	0.500	
10.	10.0	-4.0	-13.8	0.012380	-0.009237	-0.001868	-0.000401	0.015318	0.002232	0.0022955	0.0092801	0.757	0.500	
11.	10.0	-6.0	-8.0	-0.004284	-0.006792	-0.000497	-0.000283	0.013878	0.001260	0.0012361	0.0063788	0.757	0.500	
12.	4.0	-2.0	-6.6	0.007763	-0.006507	-0.001258	-0.000476	0.013830	0.001446	0.0015892	0.0065138	0.757	0.500	
13.	2.0	-2.0	-4.1	0.004178	-0.005738	-0.000898	-0.000254	0.014519	0.001277	0.0014126	0.0057555	0.757	0.500	
14.	2.0	0.0	-3.3	0.014783	-0.006337	-0.001688	0.000161	0.014335	0.001389	0.0014128	0.0062075	0.758	0.500	
15.	0.0	0.0	-1.1	0.006686	-0.005992	-0.001049	-0.000159	0.014338	0.001091	0.0012360	0.0057684	0.757	0.500	
16.	0.0	2.0	-0.1	0.022668	-0.006735	-0.002303	0.000005	0.014860	0.001890	0.0008846	0.0059683	0.758	0.500	-1.0
17.	0.0	4.0	0.7	0.029302	-0.008075	-0.003314	-0.000090	0.000545	0.000105	0.0003538	0.0064473	0.758	0.500	-1.3
18.	0.0	6.0	1.9	0.043995	-0.008164	-0.004136	-0.000266	0.017446	-0.000462	-0.0003538	0.0057500	0.758	0.500	-1.4
19.	0.0	8.0	2.4	0.069857	-0.013652	-0.005547	-0.000627	0.017723	-0.002218	-0.0017690	0.0083605	0.757	0.500	-1.4
20.	2.0	8.0	0.5	0.077460	-0.012668	-0.006270	-0.000714	0.020643	-0.002191	-0.0015921	0.0077414	0.757	0.500	-1.4
21.	2.0	6.0	-0.6	0.059174	-0.011942	-0.005508	-0.000033	0.015205	-0.000728	-0.0005307	0.0083648	0.758	0.500	-1.0
22.	2.0	4.0	-1.8	0.044084	-0.007786	-0.004394	-0.000014	0.017847	0.000470	0.0003538	0.0061730	0.758	0.500	-1.0
23.	4.0	4.0	-3.9	0.049453	-0.010625	-0.005402	0.000424	0.013595	0.000891	0.0005307	0.0084834	0.758	0.500	- .8
24.	4.0	2.0	-4.8	0.034527	-0.008925	-0.004611	0.000879	0.012571	0.001287	0.0012384	0.0079558	0.758	0.500	- .5
25.	4.0	0.0	-5.8	0.022084	-0.007645	-0.003065	0.000553	0.012943	0.001502	0.0014153	0.0071924	0.758	0.500	- .4
26.	6.0	2.0	-7.0	0.040999	-0.009735	-0.004883	0.000455	0.012802	0.001598	0.0012719	0.0086843	0.769	0.496	- .3
27.	2.0	2.0	-2.6	0.029932	-0.008096	-0.003177	-0.000174	0.012784	0.001264	0.0008862	0.0069888	0.759	0.500	- .8
28.	4.0	6.0	-3.0	0.061068	-0.012662	-0.006819	0.000566	0.012702	0.000019	0.0000000	0.0094442	0.759	0.500	- .9

Table I - 24. Rotor No. 3.

TEST 310.0 RUN 21

34 FT. 0012 ROTOR V/OR = .86 M(1.0)(90) = .47

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M(1.0)(90)	A_1
1.	0.0	0.0	-1.1	0.009157	-0.007066	-0.000928	-0.000609	0.019990	0.001227	0.0014035	0.0075418	0.869	0.462	-1.
2.	0.0	2.0	-0.4	0.025285	-0.007946	-0.002131	-0.001057	0.018328	0.000885	0.0011213	0.0078475	0.850	0.467	-1.
3.	0.0	4.0	0.3	0.044369	-0.010758	-0.003270	-0.000794	0.018133	0.000358	0.0004548	0.0095867	0.856	0.465	-1.
4.	0.0	6.0	1.3	0.054647	-0.013275	-0.004359	-0.000654	0.016965	-0.000846	-0.0006728	0.0104929	0.850	0.467	-1.
5.	0.0	8.0	2.0	0.077753	-0.015555	-0.006229	-0.000520	0.020133	-0.002354	-0.0017940	0.0111936	0.850	0.467	-1.
6.	2.0	6.0	-1.0	0.059741	-0.013436	-0.005632	-0.000740	0.018068	-0.000753	-0.0004548	0.0108952	0.855	0.465	-1.
7.	2.0	4.0	-2.1	0.045267	-0.012326	-0.004386	-0.000361	0.016314	0.000170	0.0004557	0.0109444	0.857	0.465	-1.
8.	2.0	2.0	-2.9	0.027029	-0.009406	-0.002906	-0.000627	0.016881	0.001093	0.0009113	0.0089407	0.857	0.465	-1.
9.	2.0	0.0	-3.4	0.013687	-0.007142	-0.001837	-0.000715	0.019224	0.001087	0.0013644	0.0074707	0.856	0.465	-1.
10.	2.0	-2.0	-4.2	-0.002154	-0.007212	-0.000710	-0.000968	0.018179	0.001157	0.0015919	0.0077696	0.857	0.466	- .
11.	4.0	-2.0	-6.6	0.002573	-0.008071	-0.002013	-0.000178	0.018512	0.001372	0.0015918	0.0085009	0.856	0.465	- .
12.	4.0	-4.0	-7.5	-0.013518	-0.008901	0.000086	-0.001055	0.017211	0.000723	0.0011371	0.0087550	0.857	0.466	- .
13.	4.0	0.0	-6.0	0.014054	-0.008878	-0.003038	-0.000111	0.017350	0.001504	0.0015919	0.0091897	0.857	0.466	- .
14.	4.0	2.0	-5.1	0.030507	-0.009361	-0.004190	-0.000304	0.019339	0.001139	0.0011371	0.0091239	0.857	0.466	- .
15.	4.0	4.0	-4.3	0.044482	-0.010418	-0.005873	0.000292	0.019743	0.000550	0.0006822	0.0095164	0.855	0.465	- .
16.	4.0	6.0	-3.4	0.059869	-0.013269	-0.007381	-0.000040	0.019467	-0.000016	0.0000000	0.0112302	0.857	0.466	-1.
17.	4.0	8.0	-2.4	0.087129	-0.016728	-0.008449	-0.000737	0.020044	-0.000731	-0.0006822	0.0133489	0.856	0.465	-1.
18.	6.0	6.0	-5.0	0.074493	-0.016773	-0.009339	0.000586	0.016632	0.000787	0.0009096	0.0150440	0.855	0.465	- .
19.	6.0	4.0	-6.6	0.049443	-0.014345	-0.006794	0.000166	0.015839	0.001338	0.0011370	0.0133230	0.856	0.465	- .
20.	6.0	2.0	-7.5	0.036642	-0.012173	-0.005773	0.000310	0.016996	0.001303	0.0011371	0.0115101	0.856	0.466	- .
21.	6.0	0.0	-8.4	0.016861	-0.010392	-0.003967	0.000220	0.017821	0.001262	0.0015919	0.0104820	0.857	0.466	- .
22.	6.0	-2.0	-9.2	0.001999	-0.010986	-0.002194	-0.000301	0.016006	0.001053	0.0015919	0.0110050	0.857	0.466	
23.	6.0	-4.0	-10.0	-0.012185	-0.011411	-0.000839	-0.000730	0.016735	0.000505	0.0009097	0.0106852	0.857	0.466	
24.	6.0	-6.0	-10.8	-0.042337	-0.012749	0.000001	-0.006094	0.003029	0.000095	0.0002274	0.0110705	0.856	0.465	
25.	8.0	-6.0	-12.7	-0.020121	-0.013683	-0.000182	-0.000842	0.017438	-0.000478	0.0000000	0.0117022	0.856	0.466	
26.	8.0	-4.0	-12.0	-0.010774	-0.012739	-0.000748	-0.000896	0.017636	0.000588	0.0009097	0.0118227	0.857	0.466	
27.	8.0	-2.0	-11.2	0.005842	-0.012090	-0.002571	-0.000297	0.017488	0.001092	0.0013644	0.0117105	0.856	0.465	
28.	8.0	0.0	-10.3	0.017837	-0.011751	-0.003784	-0.000809	0.018193	0.001039	0.0015919	0.0116404	0.856	0.465	
29.	8.0	2.0	-9.7	0.032029	-0.012296	-0.005867	0.000005	0.018325	0.001610	0.0015919	0.0120805	0.856	0.465	
30.	10.0	0.0	-12.1	0.032562	-0.013828	-0.006097	0.000271	0.018403	0.001969	0.0020468	0.0138570	0.857	0.466	.
31.	10.0	-2.0	-13.3	0.010328	-0.013647	-0.003584	-0.000254	0.018052	0.001573	0.0015920	0.0132835	0.857	0.466	.
32.	10.0	-4.0	-14.1	-0.003352	-0.014224	-0.002418	-0.000110	0.017204	0.001268	0.0011371	0.0133263	0.857	0.466	.
33.	10.0	-6.0	-15.0	-0.013660	-0.014925	-0.001386	0.000239	0.018022	-0.000007	0.0004548	0.0132331	0.857	0.466	.
34.	10.0	-8.0	-15.8	-0.024691	-0.016487	-0.000103	-0.000591	0.017118	-0.001364	-0.0008971	0.0131075	0.851	0.467	.

For the following data points a_{1_s} and/or $b_{1_s} \neq 0^\circ \pm .2^\circ$

PT.	THETA	ALPHA SHAFT	a_{1_s}	b_{1_s}
18	6	6	1.2	0
30	10	0	1.2	.6

Table I - 25. Rotor No. 3.

TEST 310.0 RUN 22

34 FT. 0012 ROTOR V/OR = .94 M(1.0)(90) = .49

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	0.0	0.0	-1.4	0.016292	-0.009670	-0.001045	0.004606	0.035292	0.001309	0.0015265	0.0106550	0.945	0.500	-1.4
2.	0.0	2.0	-0.6	0.032574	-0.010043	-0.002956	0.005006	0.036825	0.000949	0.0010966	0.0105714	0.947	0.499	
3.	0.0	4.0	0.2	0.048434	-0.010786	-0.003729	0.004376	0.039295	0.000276	0.0004394	0.0105729	0.947	0.499	-1.8
4.	0.0	6.0	1.1	0.065219	-0.014055	-0.005639	0.005099	0.034809	-0.001133	-0.0006599	0.0123810	0.938	0.496	
5.	2.0	4.0	-2.5	0.046688	-0.010841	-0.005357	0.005620	0.035258	0.000439	0.0006556	0.0107033	0.934	0.496	-1.5
6.	2.0	6.0	-1.4	0.061049	-0.012904	-0.006331	0.005703	0.035255	-0.000439	0.0000000	0.0119237	0.934	0.496	
7.	2.0	8.0	-0.7	0.090781	-0.017473	-0.007170	0.005149	0.035502	-0.002595	-0.0015297	0.0144739	0.933	0.496	-1.8
8.	2.0	2.0	-3.0	0.031664	-0.010052	-0.004002	0.005371	0.034674	0.001117	0.0010989	0.0104735	0.936	0.496	
9.	2.0	0.0	-3.9	0.011960	-0.008421	-0.002032	0.004230	0.035754	0.001351	0.0015657	0.0095133	0.944	0.493	-1.2
10.	2.0	5.0	-1.9	0.051355	-0.011579	-0.005627	0.005474	0.036380	0.000020	0.0004497	0.0112771	0.943	0.492	-1.4
11.	2.0	7.0	-1.2	0.076214	-0.016296	-0.007694	0.006277	0.035118	-0.000947	-0.0006761	0.0146094	0.950	0.493	
12.	4.0	7.0	-3.4	0.076074	-0.017715	-0.009071	0.005690	0.031610	-0.000283	-0.0002257	0.0162916	0.944	0.491	-1.1
13.	4.0	8.0	-3.0	0.086372	-0.017158	-0.007570	0.005631	0.037296	-0.000624	-0.0004516	0.0155919	0.950	0.492	
14.	4.0	6.0	-4.0	0.064593	-0.015600	-0.008583	0.005736	0.034049	-0.000275	0.0000000	0.0146797	0.950	0.492	
15.	4.0	5.0	-4.5	0.050625	-0.012742	-0.007456	0.005772	0.036362	0.000430	0.0004470	0.0123911	0.944	0.494	-1.1
16.	4.0	4.0	-5.0	0.046599	-0.013040	-0.006599	0.005947	0.033738	0.000999	0.0006805	0.0128913	0.942	0.489	-1.1
17.	4.0	2.0	-5.8	0.028182	-0.011534	-0.004876	0.005831	0.032874	0.001186	0.0011342	0.0119801	0.943	0.489	- .9
18.	4.0	0.0	-6.4	0.011544	-0.010247	-0.003813	0.005781	0.032772	0.001215	0.0013637	0.0110375	0.944	0.489	- .6
19.	6.0	0.0	-8.6	0.008460	-0.013235	-0.004009	0.005886	0.031466	0.000893	0.0011363	0.0136210	0.943	0.489	
20.	6.0	2.0	-7.9	0.030758	-0.014543	-0.006390	0.006517	0.031249	0.001047	0.0009107	0.0146009	0.944	0.489	
21.	6.0	4.0	-7.0	0.039885	-0.014295	-0.007371	0.006391	0.033900	0.001454	0.0009106	0.0143426	0.943	0.489	- .4
22.	6.0	5.0	-6.5	0.052430	-0.015486	-0.008258	0.006240	0.033543	0.001081	0.0006830	0.0152159	0.945	0.489	
23.	6.0	6.0	-6.0	0.060495	-0.016417	-0.008561	0.006366	0.033640	0.000989	0.0006830	0.0160568	0.944	0.489	.4
24.	8.0	2.0	-9.9	0.027558	-0.016400	-0.006503	0.006469	0.032069	0.001354	0.0011425	0.0166249	0.946	0.488	.2
25.	8.0	1.0	-10.4	0.017816	-0.016220	-0.005715	0.006583	0.031191	0.001334	0.0011425	0.0164700	0.946	0.488	
26.	8.0	0.0	-10.8	0.009641	-0.016465	-0.004516	0.005866	0.030658	0.000839	0.0011445	0.0167131	0.946	0.488	

Table I - 26. Rotor No. 3.

TEST 310.0 RUN 24

34 FT. 0012 ROTOR V/OR = 1.1 M(1.0)(90) = .52

WIND AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	0.0	0.0	-1.0	0.011358	-0.007943	-0.001043	-0.000773	0.032879	0.001505	0.0016873	0.0090945	0.933	0.489	-1.3
2.	0.0	0.0	-1.2	0.012140	-0.009380	-0.001286	-0.000491	0.046411	0.001561	0.0016927	0.0110084	0.994	0.505	-1.4
3.	0.0	0.0	-1.2	0.014520	-0.010062	-0.001343	-0.000403	0.057483	0.001564	0.0017077	0.0121070	1.034	0.514	-1.4
4.	0.0	0.0	-1.3	0.018777	-0.011240	-0.001123	-0.001098	0.076990	0.001568	0.0017319	0.0140077	1.093	0.526	-1.5
5.	0.0	0.0	-1.4	0.018883	-0.011155	-0.000991	-0.001193	0.076622	0.001378	0.0017483	0.0139616	1.096	0.524	-1.4
6.	0.0	2.0	-0.6	0.047906	-0.012696	-0.003014	-0.000209	0.075720	0.001512	0.0013017	0.0151879	1.099	0.521	-1.8
7.	0.0	4.0	-0.2	0.069374	-0.015749	-0.004502	-0.001548	0.079923	0.000512	0.0005861	0.0178105	1.103	0.525	-2.0
8.	0.0	6.0	0.5	0.087370	-0.019777	-0.006727	-0.001764	0.077742	-0.000835	-0.0005963	0.0211573	1.111	0.522	-2.3
9.	0.0	6.0	0.6	0.089867	-0.018441	-0.006787	-0.001161	0.074320	-0.001243	-0.0010755	0.0188888	1.096	0.517	-2.2
10.	2.0	6.0	-1.7	0.084591	-0.018434	-0.007993	-0.000847	0.070420	-0.000611	-0.0005982	0.0192796	1.090	0.516	-1.6
11.	2.0	7.0	-1.4	0.099758	-0.022567	-0.008670	-0.000755	0.069761	-0.001661	-0.0013166	0.0230994	1.095	0.517	-1.8
12.	2.0	5.0	-2.3	0.070154	-0.017612	-0.007001	-0.000438	0.070148	0.000462	0.0001197	0.0192018	1.092	0.516	-1.5
13.	2.0	4.0	-2.6	0.059979	-0.015556	-0.006349	0.000226	0.071808	0.000975	0.0006004	0.0175112	1.094	0.516	-1.4
14.	2.0	3.0	-3.1	0.047212	-0.012895	-0.005277	0.000343	0.072380	0.001444	0.0008405	0.0148672	1.093	0.515	-1.2
15.	2.0	2.0	-3.5	0.035843	-0.012671	-0.004838	-0.000072	0.070665	0.001605	0.0013254	0.0151535	1.094	0.515	-1.2
16.	2.0	1.0	-3.7	0.024251	-0.013024	-0.003789	-0.000270	0.068807	0.001760	0.0015691	0.0158153	1.095	0.515	-1.1
17.	2.0	0.0	-4.1	0.013370	-0.012627	-0.003006	-0.000077	0.068954	0.001739	0.0015688	0.0153719	1.094	0.514	-1.1
18.	2.0	-1.0	-4.3	0.004248	-0.012316	-0.002103	-0.001297	0.069510	0.001656	0.0015689	0.0150419	1.094	0.514	
19.	1.0	0.0	-3.0	0.013696	-0.011292	-0.002549	-0.000720	0.068814	0.001671	0.0018131	0.0141458	1.093	0.514	-1.2
20.	1.0	2.0	-2.0	0.042760	-0.012857	-0.004154	0.000015	0.070348	0.001572	0.0013294	0.0153056	1.091	0.513	-1.4
21.	1.0	4.0	-1.4	0.069081	-0.015253	-0.005233	-0.000571	0.071078	0.000756	0.0006043	0.0171052	1.091	0.513	-1.6
22.	1.0	6.0	-0.8	0.088362	-0.018668	-0.007899	-0.000615	0.070838	-0.000851	-0.0008489	0.0193109	1.092	0.513	-1.8
23.	3.0	6.0	-3.2	0.076078	-0.018667	-0.008400	-0.000724	0.069008	-0.000217	-0.0001213	0.0200896	1.092	0.512	-1.3
24.	3.0	7.0	-2.7	0.085803	-0.019579	-0.008884	-0.000912	0.069324	-0.000373	-0.0006074	0.0205761	1.093	0.512	-1.5
25.	4.0	7.0	-3.5	0.092317	-0.022889	-0.009389	-0.000479	0.067476	-0.000467	-0.0003651	0.0244342	1.095	0.512	- .6
26.	4.0	6.0	-4.3	0.069839	-0.018768	-0.008729	-0.000701	0.069936	0.000330	-0.0001219	0.0202955	1.096	0.512	- .7
27.	4.0	4.0	-5.1	0.050287	-0.016977	-0.007666	0.000291	0.069084	0.000791	0.0006095	0.0191405	1.096	0.512	-1.0
28.	4.0	2.0	-6.0	0.033820	-0.014827	-0.005848	-0.001510	0.069234	0.000743	0.0008546	0.0170388	1.094	0.511	- .7
29.	4.0	0.0	-6.7	0.009104	-0.015327	-0.004345	-0.000060	0.067295	0.000912	0.0010988	0.0178618	1.094	0.511	- .6
30.	5.0	0.0	-7.9	0.000770	-0.016904	-0.005155	-0.000346	0.067701	0.000565	0.0008545	0.0193303	1.093	0.511	- .5
31.	6.0	0.0	-8.9	0.001113	-0.018485	-0.005240	-0.000418	0.068165	0.000315	0.0003663	0.0205879	1.094	0.511	- .2
32.	6.0	2.0	-8.3	0.020529	-0.017801	-0.007167	-0.000402	0.066896	0.000746	0.0003669	0.0198306	1.094	0.511	- .5
33.	6.0	1.0	-8.8	0.007938	-0.017515	-0.005828	0.000100	0.067005	0.000648	0.0003674	0.0195144	1.093	0.510	
34.	7.0	0.0	-10.1	-0.000393	-0.019516	-0.005506	-0.000029	0.068122	0.000422	-0.0001225	0.0212060	1.093	0.510	
35.	3.0	0.0	-5.8	0.006914	-0.013469	-0.003994	0.000207	0.066448	0.001608	0.0013497	0.0160974	1.095	0.510	

For the following data point
a_{1_s} and/or $b_{1_s} \neq 0^\circ \pm .2^\circ$

PT.	THETA	ALPHA SHAFT	a_{1_s}	b_{1_s}
25	4	7	0	.7

Table II - 1. Rotor No. 1, V/OR = .30, M(1.0, 90) = .79

TEST 208.0 RUN 7

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M.AT	A_{1_s}	θ_{grip}
14.	-5.0	-8.4	0.0051072	-0.001891	-0.001276	0.000317	-0.0010155	0.002782	0.00263220	0.0016538	0.298	0.790	.6	14.
15.	-5.0	-10.0	0.0069751	-0.001947	-0.001618	0.000328	-0.0012229	0.003837	0.0035134	0.0017465	0.300	0.788	.2	16.
16.	-5.0	-11.7	0.0084252	-0.000381	-0.002005	0.000378	0.0000475	0.005105	0.0048717	0.0022472	0.298	0.790	- .1	18.
17.	-10.0	-14.1	0.0041793	-0.001606	-0.000734	0.000246	-0.0001072	0.003703	0.00034549	0.0016240	0.299	0.787	.8	16.
18.	-10.0	-15.4	0.0061085	-0.000997	-0.000829	0.000251	-0.001308	0.005248	0.0049584	0.0017851	0.300	0.786	.6	18.
19.	-10.0	-12.5	0.0024894	-0.001858	-0.000851	0.000289	-0.0000851	0.002489	0.0022614	0.0015147	0.298	0.786	.8	14.
20.	-10.0	-11.0	0.0005328	-0.001777	-0.000783	0.000168	-0.0000559	0.001453	0.00012243	0.0014666	0.297	0.789	.8	12.
21.	-15.0	-18.2	0.0017823	-0.001893	-0.000712	0.000192	-0.0000837	0.002637	0.00023464	0.0015057	0.299	0.788	.7	16.
22.	-15.0	-19.3	0.0034965	-0.001520	-0.000511	0.000275	-0.0001018	0.004303	0.0040008	0.0016396	0.300	0.788	.9	18.
23.	-15.0	-20.9	0.0051578	-0.000917	-0.000577	0.000278	-0.0001020	0.006022	0.0058643	0.0017362	0.300	0.786	.6	20.
24.	-5.0	-6.9	0.0030830	-0.001814	-0.000943	0.000271	-0.0000838	0.002014	0.0018685	0.0015376	0.299	0.788	.7	12.
25.	-5.0	-5.6	0.0012328	-0.001692	-0.000849	0.000205	-0.0000655	0.001486	0.0013534	0.0015223	0.296	0.790	.8	10.
26.	0.0	-1.6	0.0040923	-0.001729	-0.001402	0.000250	-0.0000789	0.001265	0.00111344	0.0015245	0.299	0.788	.8	10.
27.	0.0	-2.8	0.0069284	-0.001814	-0.001919	0.000384	-0.0001146	0.001658	0.0013702	0.0016352	0.297	0.791	.7	12.
28.	0.0	-4.5	0.0090254	-0.001343	-0.002413	0.000440	-0.0001197	0.002139	0.0019386	0.0018645	0.299	0.789	0.0	14.
29.	0.0	-6.4	0.0096102	-0.000070	-0.002997	0.000428	-0.0001402	0.003166	0.00295558	0.0022886	0.299	0.789	- .3	16.
30.	0.0	-0.8	0.0019694	-0.001579	-0.001315	0.000192	-0.0000589	0.001205	0.0010828	0.0015209	0.297	0.792	.7	8.
31.	4.0	3.4	0.0043053	-0.001536	-0.002352	0.000454	-0.0000721	0.000413	0.00039431	0.0015473	0.297	0.791	.2	8.
32.	4.0	1.8	0.0061741	-0.001489	-0.002753	0.000513	-0.0000950	0.000922	0.00082490	0.0016790	0.298	0.789	.1	10.
33.	4.0	0.2	0.0081097	-0.001252	-0.003299	0.000519	-0.0001244	0.000531	0.0004407	0.0019920	0.298	0.789	- .2	12.
34.	4.0	-1.6	0.0096605	-0.000060	-0.003751	0.000632	-0.0001163	0.001210	0.0010647	0.0023855	0.300	0.786	- .5	14.

Table II - 2. Rotor No. 1, V/OR = .30, M(1.0, 90) = .85

TEST 288.0 RUN 3

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1_s}	θ_{grip}
1.	-5.0	-7.3	0.0029696	-0.001507	-0.001282	0.000558	-0.000934	0.002021	0.0019000	0.0015069	0.302	0.848	1.0	12.
2.	-5.0	-8.7	0.0048985	-0.001387	-0.001518	0.000606	-0.000930	0.002801	0.0026723	0.0016161	0.302	0.848	.7	14.
3.	-5.0	-10.3	0.0057968	-0.000829	-0.001743	0.000598	-0.000915	0.003798	0.0036739	0.0018091	0.301	0.853	.6	16.
4.	-5.0	-12.0	0.0064751	0.000279	-0.001996	0.000519	-0.000919	0.005212	0.0050028	0.0021308	0.304	0.844	.3	18.
5.	-7.0	-13.6	0.0074257	-0.000189	-0.001943	0.000386	-0.000927	0.005294	0.0050733	0.0019787	0.302	0.848	.5	18.
6.	-12.0	-17.2	0.0049238	-0.000826	-0.000819	0.000211	-0.000879	0.004874	0.0046283	0.0018049	0.302	0.848	1.0	18.
7.	-10.0	-15.6	0.0058814	-0.000470	-0.000821	0.000316	-0.000947	0.005076	0.0048216	0.0017258	0.303	0.846	.8	18.
8.	-10.0	-14.6	0.0067489	-0.000049	-0.000599	0.000303	-0.000928	0.005928	0.0056886	0.0018294	0.302	0.848	.8	19.
9.	-8.0	-15.0	0.0075868	0.000536	-0.000899	0.000259	-0.000933	0.005965	0.0057668	0.0019840	0.303	0.847	.6	19.
10.	-6.0	-13.5	0.0066250	0.000948	-0.001652	0.000336	-0.000976	0.006921	0.0067435	0.0021661	0.303	0.846	.3	19.
11.	-7.0	-14.4	0.0071814	0.000568	-0.001227	0.000240	-0.000904	0.005963	0.0058604	0.0020651	0.303	0.846	.5	19.
12.	-7.0	-10.1	0.0037638	-0.001268	-0.000888	0.000389	-0.000519	0.002680	0.0025894	0.0014714	0.303	0.846	.9	14.
13.	-7.0	-8.5	0.0019211	-0.001368	-0.000895	0.000398	-0.000288	0.001848	0.0017432	0.0014205	0.303	0.848	1.1	12.
14.	-7.0	-7.2	0.0001618	-0.001232	-0.000771	0.000208	-0.000508	0.001229	0.0010493	0.0013602	0.303	0.848	.9	10.
15.	-7.0	-7.2	0.0002151	-0.001478	-0.000864	0.000328	-0.000566	0.001230	0.0010714	0.0014367	0.304	0.844	1.0	10.
16.	-3.0	-2.8	0.0003487	-0.001172	-0.001381	0.000398	-0.000568	0.001309	0.0012148	0.0015131	0.303	0.847	1.0	8.
17.	-3.0	-1.4	-0.0015523	-0.000932	-0.001444	0.000376	-0.000534	0.001229	0.0010429	0.0015516	0.302	0.848	.8	6.
18.	-3.0	-8.8	0.0077393	-0.000328	-0.002054	0.000472	-0.000855	0.003670	0.0034991	0.0019128	0.303	0.846	.5	16.
19.	-3.0	-10.6	0.0092799	0.001105	-0.002967	0.000442	-0.000930	0.005032	0.0048308	0.0023621	0.305	0.843	.1	18.
20.	0.0	-6.5	0.0091997	0.000468	-0.003254	0.000647	-0.000624	0.003244	0.0030821	0.0022953	0.303	0.846	.1	16.
21.	0.0	-7.7	0.0096586	0.001739	-0.003494	0.000568	-0.000590	0.004078	0.0038343	0.0025935	0.304	0.845	- .2	17.
22.	0.0	-2.9	0.0056426	-0.001258	-0.002227	0.000669	-0.000822	0.001600	0.0014321	0.0015721	0.304	0.843	.8	12.
23.	3.0	-0.7	0.0073658	-0.000948	-0.003199	0.000856	-0.000813	0.000916	0.0008465	0.0017912	0.304	0.845	.3	12.
24.	3.0	0.8	0.0053896	-0.001218	-0.002717	0.000792	-0.000804	0.000738	0.0006247	0.0016243	0.303	0.847	.7	10.
25.	3.0	2.2	0.0034776	-0.001215	-0.002469	0.000766	-0.000821	0.000811	0.0006969	0.0015270	0.304	0.844	.8	8.
26.	3.0	3.6	0.0016848	-0.001121	-0.002354	0.000735	-0.000812	0.001080	0.0009736	0.0015603	0.305	0.843	.8	6.
27.	3.0	-2.4	0.0089203	0.000259	-0.003860	0.000897	-0.000839	0.001549	0.0013870	0.0021163	0.303	0.846	- .1	14.
28.	3.0	-4.5	0.0099910	0.002430	-0.004146	0.000738	-0.000813	0.003157	0.0029625	0.0030461	0.302	0.848	- .2	15.

Table II - 3. Rotor No. 1, V/OR = .30, M(1.0, 90) = .95

TEST 288.0 RUN 8

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M.AT	A_{1_s}	θ_{grip}
1.	-5.0	-7.8	0.049835	-0.002251	-0.001365	0.000386	-0.000400	0.003022	0.0028280	0.0020170	0.297	0.952	.5	14.
2.	-5.0	-6.5	0.031644	-0.002335	-0.001188	0.000470	-0.000411	0.002382	0.0021827	0.0019758	0.300	0.953	.7	12.
3.	-5.0	-9.2	0.067850	-0.002053	-0.001843	0.000441	-0.000422	0.004086	0.0038730	0.0023585	0.300	0.953	.3	16.
4.	-5.0	-10.2	0.075863	-0.001588	-0.002260	0.000517	-0.000431	0.004747	0.0045508	0.0026049	0.300	0.951	.1	17.
5.	-5.0	-10.8	0.084154	-0.000860	-0.002516	0.000651	-0.000503	0.005597	0.0053803	0.0028925	0.300	0.950	0.0	18.
6.	-10.0	-13.3	0.040759	-0.002174	-0.000656	0.000345	-0.000534	0.003781	0.0034776	0.0018744	0.299	0.952	.9	16.
7.	-10.0	-14.8	0.057469	-0.001652	-0.000808	0.000332	-0.000608	0.005327	0.0050772	0.0022950	0.300	0.952	.6	18.
8.	-10.0	-14.1	0.049790	-0.001898	-0.000641	0.000338	-0.000533	0.004586	0.0043715	0.0021451	0.301	0.948	.8	17.
9.	-15.0	-17.6	0.017065	-0.002190	-0.000505	0.000331	-0.000407	0.002778	0.0025684	0.0018567	0.299	0.948	1.1	16.
10.	-15.0	-18.8	0.034121	-0.001986	-0.000349	0.000282	-0.000436	0.004605	0.0041427	0.0019783	0.301	0.948	1.0	18.
11.	-15.0	-19.4	0.042084	-0.001749	-0.000262	0.000273	-0.000455	0.005237	0.0048732	0.0019820	0.300	0.951	1.0	19.
12.	-17.0	-20.6	0.023182	-0.002023	-0.000102	0.000240	-0.000250	0.003608	0.0034500	0.0019624	0.299	0.950	1.2	18.
13.	-17.0	-21.1	0.029754	-0.001779	0.000119	0.000155	-0.000374	0.004324	0.0041537	0.0019900	0.300	0.950	1.1	19.
14.	-17.0	-21.5	0.038427	-0.001640	0.000123	0.000130	-0.000469	0.005291	0.0050920	0.0020825	0.300	0.950	1.0	20.
15.	-17.0	-20.0	0.015258	-0.002078	-0.000381	0.000195	-0.000268	0.002817	0.0026388	0.0018826	0.298	0.949	1.2	17.
16.	-17.0	-19.3	0.007942	-0.002194	-0.000529	0.000397	-0.000280	0.002084	0.0019419	0.0019230	0.298	0.948	1.1	16.

TEST 288.0 RUN 9

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M.AT	A_{1_s}	θ_{grip}
1.	-3.0	-4.1	0.028952	-0.003465	-0.001531	0.000476	0.000361	0.002032	0.0018774	0.0023919	0.298	0.955	.8	11.
2.	-3.0	-3.5	0.024595	-0.002189	-0.001385	0.000418	-0.000543	0.001804	0.0016829	0.0019072	0.300	0.950	.7	10.
3.	-3.0	-6.9	0.070831	-0.002140	-0.002247	0.000549	-0.000610	0.003362	0.0031878	0.0023283	0.301	0.949	.3	15.
4.	-3.0	-7.7	0.077588	-0.001662	-0.002368	0.000510	-0.000713	0.003953	0.0037550	0.0025696	0.300	0.951	.2	16.
5.	-3.0	-8.5	0.085456	-0.001136	-0.002623	0.000647	-0.000952	0.004694	0.0045009	0.0029370	0.299	0.953	.2	17.
6.	-3.0	-9.2	0.090754	-0.000083	-0.003090	0.000600	-0.000680	0.005698	0.0053979	0.0033668	0.298	0.955	- .1	18.
7.	-5.0	-9.8	0.077378	-0.001868	-0.002283	0.000504	-0.000789	0.004798	0.0045965	0.0026670	0.301	0.952	.1	17.
8.	-5.0	-10.5	0.085301	-0.001331	-0.002491	0.000331	-0.000731	0.005631	0.0053857	0.0029917	0.300	0.953	0.0	18.
9.	2.0	1.0	0.051348	-0.002408	-0.002344	0.000539	-0.000531	0.001143	0.0010242	0.0020710	0.298	0.950	.5	10.
10.	2.0	1.5	0.044042	-0.002594	-0.002307	0.000594	-0.000526	0.001086	0.0009865	0.0020823	0.301	0.951	.6	9.
11.	0.0	-4.3	0.086392	-0.001878	-0.003119	0.000569	-0.000286	0.003007	0.0028442	0.0028381	0.302	0.951	.1	15.
12.	0.0	-5.2	0.091484	-0.000793	-0.003345	0.000715	-0.000118	0.003839	0.0036533	0.0032455	0.301	0.954	0.0	16.
13.	0.0	-5.9	0.097128	-0.000299	-0.003267	0.000532	-0.000233	0.004674	0.0046408	0.0040022	0.300	0.953	- .2	17.
14.	5.0	4.1	0.060912	-0.002707	-0.003105	0.000729	-0.000933	0.000222	0.0001551	0.0022705	0.300	0.947	.3	9.
15.	5.0	3.4	0.071398	-0.002627	-0.003332	0.000771	-0.000941	0.000302	0.0002345	0.0024855	0.299	0.950	.3	10.
16.	5.0	1.7	0.085611	-0.001763	-0.003742	0.000883	-0.000579	0.000810	0.0007587	0.0029783	0.301	0.951	.1	12.

Table II - 4. Rotor No. 1, V/OR = .31, M(1.0, 90) = 1.0

TEST 288.0 RUN 11

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	MACH	A_{1_s}	θ_{grip}
1.	-5.0	-6.1	0.032818	-0.003176	-0.001252	0.000417	-0.000473	0.002844	0.0027214	0.0027498	0.309	0.990	.9	12.
2.	-6.0	-6.9	0.026477	-0.003067	-0.001064	0.000463	-0.000500	0.002824	0.0026983	0.0027274	0.309	0.989	.9	12.
3.	-6.0	-7.2	0.035813	-0.003218	-0.001079	0.000393	-0.000547	0.003193	0.0030847	0.0028387	0.308	0.992	.7	13.
4.	-6.0	-7.9	0.045065	-0.003437	-0.001303	0.000446	-0.000820	0.003599	0.0034651	0.0029119	0.310	0.989	.6	14.
5.	-6.0	-8.6	0.052963	-0.003409	-0.001232	0.000368	-0.000894	0.004167	0.0039924	0.0031178	0.310	0.991	.6	15.
6.	-6.0	-9.5	0.060676	-0.003129	-0.001512	0.000414	-0.000802	0.004693	0.0044980	0.0032202	0.310	0.989	.5	16.
7.	-9.0	-10.6	0.028967	-0.003295	-0.000692	0.000378	-0.000669	0.003398	0.0032531	0.0027946	0.309	0.990	.9	14.
8.	-9.0	-11.2	0.037063	-0.003258	-0.000648	0.000330	-0.000707	0.003935	0.0037705	0.0028888	0.310	0.990	.9	15.
9.	-9.0	-11.8	0.046772	-0.003867	-0.000773	0.000350	-0.000844	0.004603	0.0044458	0.0030483	0.309	0.992	.8	16.
10.	-9.0	-12.6	0.055619	-0.003860	-0.000870	0.000419	-0.001114	0.005301	0.0050986	0.0032046	0.310	0.991	.7	17.
11.	-12.0	-13.6	0.022092	-0.003133	-0.000591	0.000340	-0.000627	0.003406	0.0032316	0.0027248	0.308	0.992	1.0	15.
12.	-12.0	-14.3	0.030287	-0.003063	-0.000534	0.000346	-0.000696	0.003990	0.0038187	0.0027296	0.309	0.990	1.0	16.
13.	-12.0	-15.0	0.039203	-0.003169	-0.000547	0.000345	-0.000811	0.004853	0.0045337	0.0028584	0.309	0.993	.9	17.
14.	-12.0	-13.2	0.013165	-0.002955	-0.000576	0.000318	-0.000418	0.002841	0.0026525	0.0026861	0.308	0.990	1.1	14.
15.	-9.0	-9.9	0.020393	-0.003078	-0.000547	0.000291	-0.000632	0.002916	0.0028093	0.0027811	0.307	0.991	1.1	13.
16.	-3.0	-6.7	0.052671	-0.003895	-0.001710	0.000441	-0.000713	0.003043	0.0029527	0.0029403	0.308	0.991	.6	13.
17.	-3.0	-4.7	0.054079	-0.003759	-0.001690	0.000487	-0.000808	0.003334	0.0032226	0.0032787	0.304	1.002	.6	13.
18.	-6.0	-7.2	0.038040	-0.003705	-0.000987	0.000386	-0.000698	0.003439	0.0033327	0.0031827	0.304	1.002	.7	13.
19.	-6.0	-7.7	0.046465	-0.003770	-0.001026	0.000337	-0.000767	0.003852	0.0037212	0.0032181	0.305	1.000	.6	14.
20.	-6.0	-8.5	0.054652	-0.003740	-0.001240	0.000398	-0.000832	0.004407	0.0042687	0.0034832	0.305	1.002	.3	15.
21.	-6.0	-9.2	0.062702	-0.003650	-0.001423	0.000584	-0.000491	0.004931	0.0046917	0.0034693	0.305	1.000	.2	16.
22.	-9.0	-11.8	0.047521	-0.003489	-0.000823	0.000312	-0.000864	0.004814	0.0046979	0.0033135	0.304	1.002	.6	16.
23.	-9.0	-11.1	0.039102	-0.003564	-0.000481	0.000290	-0.000699	0.004180	0.0040509	0.0031449	0.304	1.002	.9	15.
24.	-9.0	-10.4	0.029124	-0.003402	-0.000414	0.000238	-0.000542	0.003526	0.0034077	0.0029777	0.305	0.999	.9	14.
25.	-9.0	-9.8	0.022671	-0.003458	-0.000338	0.000193	-0.000567	0.003142	0.0030505	0.0029707	0.304	1.000	.9	13.
26.	-6.0	-7.1	0.038148	-0.003726	-0.000872	0.000320	-0.000687	0.003502	0.0033902	0.0031924	0.303	1.004	.7	13.

Table II - 5. Rotor No. 1, V/OR = .35, M(1.0, 90) = .85

TEST 288.0 RUN 4

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M.AT	A_{1_s}	θ_{grip}
1.	-5.0	-7.6	0.023605	-0.001544	-0.000707	0.000289	-0.000644	0.001880	0.0018362	0.0016202	0.347	0.849	.7	12.
2.	-5.0	-6.1	0.007561	-0.001562	-0.000589	0.000241	-0.000394	0.001353	0.0013124	0.0016195	0.346	0.849	1.1	10.
3.	-5.0	-11.0	0.050915	-0.000838	-0.000982	0.000345	-0.000886	0.003659	0.0035842	0.0019385	0.346	0.848	.9	16.
4.	-5.0	-13.0	0.072020	0.000219	-0.001893	0.000285	-0.000861	0.004952	0.0048405	0.0022280	0.360	0.844	.5	18.
5.	-5.0	-14.5	0.083082	0.001563	-0.001686	0.000242	-0.000170	0.006436	0.0062898	0.0027458	0.347	0.848	.3	20.
6.	-10.0	-14.7	0.030557	-0.001668	-0.000050	0.000168	-0.000640	0.003091	0.0029696	0.0016416	0.347	0.849	1.1	16.
7.	-10.0	-16.2	0.046667	-0.001038	0.000137	0.000178	-0.000737	0.004528	0.0044772	0.0018932	0.346	0.851	1.0	18.
8.	-10.0	-17.8	0.061176	-0.000265	-0.000107	0.000138	-0.000751	0.006099	0.0059742	0.0021438	0.346	0.850	.8	20.
9.	-12.0	-16.2	0.020225	-0.001898	0.000071	0.000155	-0.000568	0.002596	0.0025852	0.0017222	0.347	0.848	1.1	16.
10.	-12.0	-17.7	0.035862	-0.001246	0.000111	0.000124	-0.000691	0.004090	0.0040242	0.0017763	0.347	0.848	1.1	18.
11.	-12.0	-19.2	0.049892	-0.000521	-0.000172	0.000185	-0.000852	0.005638	0.0055407	0.0020063	0.346	0.850	.9	20.
12.	-15.0	-19.9	0.021115	-0.001848	0.000031	0.000180	-0.000876	0.003186	0.0031337	0.0018318	0.346	0.850	1.1	18.
13.	-15.0	-21.4	0.034969	-0.001359	-0.000072	0.000298	-0.000871	0.004793	0.0046752	0.0019865	0.347	0.846	1.0	20.
14.	-15.0	-18.4	0.005968	-0.002129	-0.000049	0.000088	-0.000236	0.001593	0.0015097	0.0017384	0.346	0.849	1.1	16.
15.	-12.0	-14.5	0.002839	-0.001978	0.000293	0.000026	-0.000652	0.001229	0.0011524	0.0016164	0.347	0.849	1.2	14.
16.	0.0	-5.4	0.067580	-0.000392	-0.002576	0.000702	-0.000641	0.002186	0.0021002	0.0019293	0.346	0.850	.6	14.
17.	0.0	-7.5	0.082632	0.000581	-0.003145	0.000557	-0.000761	0.003168	0.0028951	0.0022445	0.346	0.849	.2	16.
18.	0.0	-9.5	0.091155	0.002701	-0.003695	0.000578	-0.000125	0.004880	0.0046932	0.0032014	0.346	0.849	.1	18.
19.	0.0	-3.9	0.050050	-0.000953	-0.002197	0.000643	-0.000781	0.001630	0.0015132	0.0016755	0.346	0.848	.7	12.
20.	2.0	-2.1	0.061946	-0.000668	-0.003126	0.000833	-0.000813	0.001246	0.0011312	0.0018499	0.346	0.849	.5	12.
21.	2.0	-3.0	0.069800	-0.000401	-0.003491	0.000780	-0.000844	0.001424	0.0013174	0.0019719	0.346	0.847	.3	14.
22.	2.0	-6.1	0.089842	0.001772	-0.004242	0.000748	-0.000225	0.003095	0.0029179	0.0028476	0.346	0.850	0.0	16.
23.	2.0	-0.8	0.044897	-0.000959	-0.002663	0.000675	-0.000896	0.001064	0.0009221	0.0016651	0.347	0.847	.7	10.
24.	-5.0	-7.8	**********	**********	233151862	**********	**********	-13.003391	0.0000000	**********	277.075	0.219		

Table II - 6. Rotor No. 1, V/OR = .35, M(1.0, 90) = .95

TEST 208.0 RUN 10

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1_s}	θ_{grip}
1.	-10.0	-10.3	-0.000000	-0.000000	0.000000	0.000000	-0.000000	0.000000	0.0011350	0.0011350	0.000	0.713	.5	6.
2.	-10.0	-10.3	0.000000	-0.000000	0.000000	0.000000	-0.000000	0.000000	0.0010218	0.0010218	0.000	0.714	.5	8.
3.	-10.0	-10.3	0.000000	-0.000000	0.000000	0.000000	-0.000000	0.000000	0.0011444	0.0011444	0.000	0.714	.5	10.
4.	-10.0	-10.2	0.000000	-0.000000	0.000000	0.000000	-0.000000	0.000000	0.0017257	0.0017257	0.000	0.715	.3	12.
5.	-10.0	-10.3	0.000000	0.000000	0.000000	0.000000	-0.000000	0.000000	0.0025385	0.0025385	0.000	0.717	0.0	14.
6.	-10.0	-10.4	0.000000	0.000000	0.000000	-0.000000	-0.000000	0.000000	0.0038112	0.0038112	0.000	0.716	0.0	16.
7.	-12.0	-15.2	0.023820	-0.003052	-0.000972	0.000545	-0.000568	0.003368	0.0030851	0.0023583	0.350	0.948	1.2	16.
8.	-12.0	-16.6	0.040484	-0.002877	-0.000893	0.000490	-0.000704	0.004907	0.0045926	0.0025190	0.351	0.948	1.1	18.
9.	-12.0	-17.2	0.046862	-0.002670	-0.000688	0.000503	-0.000766	0.005639	0.0052292	0.0025921	0.352	0.946	1.2	19.
10.	-15.0	-17.6	0.008298	-0.002971	-0.001054	0.000502	-0.000384	0.002298	0.0020440	0.0022918	0.350	0.948	1.4	16.
11.	-15.0	-19.1	0.024675	-0.002999	-0.001042	0.000518	-0.000562	0.004072	0.0036510	0.0023864	0.351	0.948	1.4	18.
12.	-15.0	-19.7	0.031115	-0.002866	-0.000819	0.000581	-0.000542	0.004729	0.0043856	0.0024607	0.352	0.946	1.4	19.
13.	-15.0	-20.2	0.037893	-0.002753	-0.000720	0.000449	-0.000621	0.005549	0.0051423	0.0025442	0.353	0.942	1.4	20.
14.	-12.0	-13.7	0.007309	-0.002901	-0.001049	0.000525	-0.000501	0.002074	0.0018648	0.0023229	0.351	0.949	1.4	14.
15.	-10.0	-12.0	0.017310	-0.002832	-0.000848	0.000443	-0.000439	0.002580	0.0023659	0.0022693	0.352	0.944	1.2	14.
16.	-5.0	-9.7	0.062682	-0.003054	-0.001729	0.000497	-0.000877	0.004186	0.0038612	0.0027506	0.352	0.948	.8	16.
17.	-5.0	-11.5	0.076664	-0.002177	-0.002254	0.000478	-0.000830	0.005597	0.0053103	0.0033419	0.350	0.949	.5	18.
18.	-2.0	-5.9	0.062811	-0.002888	-0.002381	0.000671	-0.000803	0.002926	0.0027114	0.0027041	0.351	0.947	.6	14.
19.	-2.0	-7.6	0.079127	-0.002480	-0.003070	0.000718	-0.000705	0.003997	0.0037632	0.0032504	0.352	0.945	.3	16.
20.	-2.0	-4.4	0.045144	-0.002928	-0.002081	0.000674	-0.000553	0.002331	0.0021384	0.0024768	0.351	0.947	.9	12.
21.	0.0	-2.6	0.058089	-0.003087	-0.002742	0.000706	-0.000630	0.002012	0.0018369	0.0026923	0.351	0.945	.6	12.
22.	0.0	-4.6	0.073648	-0.002651	-0.003250	0.000789	-0.000838	0.002670	0.0024273	0.0030013	0.351	0.948	.5	14.
23.	0.0	-6.2	0.088903	-0.001686	-0.003768	0.000776	-0.000827	0.003905	0.0036678	0.0037513	0.353	0.943	.2	16.

TEST 208.0 RUN 9

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1_s}	θ_{grip}
17.	-5.0	-6.7	0.030990	-0.003010	-0.001281	0.000447	-0.000600	0.002491	0.0023505	0.0023903	0.350	0.952	1.0	12.
18.	-5.0	-7.3	0.039013	-0.003021	-0.001436	0.000505	-0.000629	0.002808	0.0026562	0.0024181	0.350	0.952	.9	13.
19.	-5.0	-8.0	0.047627	-0.003187	-0.001703	0.000538	-0.000724	0.003166	0.0030121	0.0025194	0.350	0.953	.7	14.
20.	-5.0	-8.8	0.054705	-0.003040	-0.001519	0.000455	-0.000879	0.003612	0.0034247	0.0026168	0.350	0.952	1.0	15.
21.	-7.0	-9.5	0.035698	-0.002968	-0.001157	0.000529	-0.000782	0.003117	0.0029789	0.0024026	0.350	0.951	1.0	14.
22.	-7.0	-11.0	0.052246	-0.002921	-0.001222	0.000432	-0.000798	0.004227	0.0040282	0.0026320	0.351	0.952	.8	16.
23.	-7.0	-12.7	0.067651	-0.002480	-0.001482	0.000428	-0.000935	0.005520	0.0053056	0.0029793	0.351	0.951	.7	18.
24.	-7.0	-8.3	0.018020	-0.002663	-0.000932	0.000396	-0.000618	0.002250	0.0021117	0.0022657	0.349	0.949	1.0	12.
25.	-7.0	-7.5	0.009392	-0.002531	-0.000894	0.000370	-0.000481	0.001961	0.0018379	0.0023117	0.351	0.949	1.1	11.
26.	-10.0	-13.6	0.034486	-0.002888	-0.000529	0.000462	-0.000585	0.003825	0.0036614	0.0024824	0.350	0.955	.9	16.
27.	-10.0	-14.1	0.042095	-0.002767	-0.000576	0.000388	-0.000670	0.004479	0.0042771	0.0025484	0.352	0.952	.9	17.
28.	-10.0	-15.0	0.049468	-0.002544	-0.000493	0.000281	-0.000690	0.005164	0.0049765	0.0026772	0.352	0.952	1.0	18.
29.	-10.0	-15.6	0.059010	-0.002564	-0.000939	0.000319	-0.000684	0.006120	0.0058661	0.0029206	0.352	0.953	.8	19.

Table II - 7. Rotor No. 1, V/OR = .35, M(1.0, 90) = 1.00

TEST 288.0 RUN 12

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M.AT	A_{1_s}	θ_{grip}
1.	-9.0	-11.8	0.033042	-0.004396	-0.000727	0.000443	-0.001077	0.004197	0.0039485	0.0035807	0.353	0.996	1.1	15.
2.	-9.0	-11.0	0.024956	-0.004773	-0.000765	0.000682	-0.001559	0.003868	0.0034541	0.0036952	0.350	1.003	1.1	14.
3.	-9.0	-12.2	0.041020	-0.004980	-0.000843	0.000778	-0.001649	0.005088	0.0046901	0.0040024	0.352	0.998	.9	16.
4.	-9.0	-13.0	0.049182	-0.005064	-0.001037	0.000758	-0.001827	0.005784	0.0052669	0.0041622	0.350	1.002	.7	17.
5.	-9.0	-10.0	0.017454	-0.004525	-0.000718	0.000571	-0.001351	0.003366	0.0030550	0.0036407	0.349	1.003	1.2	13.
6.	-9.0	-9.9	0.008494	-0.004109	-0.000649	0.000448	-0.000928	0.002913	0.0026392	0.0035910	0.351	1.003	1.2	12.
7.	-12.0	-14.6	0.034764	-0.004448	-0.000656	0.000527	-0.001070	0.004263	0.0039283	0.0036021	0.350	1.002	1.2	16.
8.	-12.0	-13.3	0.032635	-0.004489	-0.000689	0.000616	-0.001171	0.004998	0.0046374	0.0037264	0.351	1.003	1.0	17.
9.	-12.0	-14.0	0.016827	-0.004135	-0.000522	0.000408	-0.000835	0.003578	0.0033202	0.0034907	0.349	1.002	1.0	15.
10.	-12.0	-11.2	0.009816	-0.004027	-0.000706	0.000509	-0.000867	0.002956	0.0027449	0.0034045	0.351	1.001	1.4	14.
11.	-12.0	-12.5	0.002145	-0.003730	-0.000578	0.000430	-0.000557	0.002436	0.0022915	0.0034094	0.349	1.003	1.2	13.
12.	-15.0	-17.1	0.009971	-0.004107	-0.000536	0.000398	-0.000468	0.003281	0.0030216	0.0035011	0.351	1.002	1.2	16.
13.	-15.0	-17.7	0.017915	-0.004243	-0.000664	0.000481	-0.000643	0.004100	0.0037167	0.0035061	0.350	1.005	1.1	17.
14.	-15.0	-18.4	0.026145	-0.004387	-0.000558	0.000574	-0.000816	0.004959	0.0046215	0.0036841	0.353	0.999	1.1	18.
15.	-15.0	-16.4	0.002120	-0.003941	-0.000691	0.000375	-0.000352	0.002600	0.0024016	0.0035458	0.351	1.001	1.4	15.
16.	-12.0	-16.0	0.038937	-0.004389	-0.000589	0.000553	-0.001069	0.005705	0.0054239	0.0039863	0.352	1.002	1.0	17.7
17.	-13.0	-16.8	0.037929	-0.004653	-0.000693	0.000623	-0.001030	0.005754	0.0054200	0.0039164	0.352	1.000	1.0	18.
18.	-14.0	-17.8	0.030306	-0.004296	-0.000471	0.000436	-0.000891	0.005199	0.0048459	0.0036754	0.351	1.003	1.0	18.
19.	-6.0	-8.1	0.041601	-0.004880	-0.001239	0.000659	-0.001047	0.004076	0.0038953	0.0038879	0.352	0.999	.9	14.
20.	-6.0	-8.9	0.051068	-0.004898	-0.001388	0.000612	-0.001171	0.004693	0.0044717	0.0041339	0.352	1.000	.8	15.
21.	-6.0	-9.7	0.059606	-0.005012	-0.001691	0.000668	-0.001216	0.005373	0.0050797	0.0044094	0.353	1.000	.6	16.
22.	-6.0	-7.4	0.035420	-0.004689	-0.001114	0.000511	-0.000943	0.003699	0.0035176	0.0037708	0.351	1.001	.9	13.
23.	-6.0	-6.7	0.026808	-0.004363	-0.001070	0.000491	-0.000898	0.003305	0.0031485	0.0036451	0.351	0.999	1.0	12.
24.	-6.0	-6.2	0.017871	-0.004042	-0.000954	0.000473	-0.000889	0.003001	0.0028604	0.0035936	0.351	1.002	1.0	11.
25.	-3.0	-6.0	0.059267	-0.004982	-0.002166	0.000752	-0.001310	0.004046	0.0037743	0.0041984	0.351	1.002	.7	14.
26.	-3.0	-6.5	0.067395	-0.005030	-0.002150	0.000725	-0.001221	0.004646	0.0043512	0.0045747	0.351	1.001	.5	15.
27.	-3.0	-5.1	0.050728	-0.004992	-0.002049	0.000801	-0.001306	0.003638	0.0034094	0.0040569	0.351	1.001	.6	13.
28.	-3.0	-4.3	0.043878	-0.004964	-0.001780	0.000710	-0.001225	0.003380	0.0031367	0.0039571	0.352	1.001	.7	12.
29.	-3.0	-3.7	0.034888	-0.004681	-0.001442	0.000634	-0.001178	0.003129	0.0028711	0.0038061	0.352	1.001	.8	11.

Table II - 8. Rotor No. 1, V/OR = .35, M(1.0, 90) = 1.02

TEST 208.0 RUN 15

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M.AT	A_{1_s}	θ_{grip}
1.	-12.0	-15.4	0.033056	-0.004485	-0.000149	0.000383	-0.000636	0.005083	0.0048940	0.0039453	0.352	1.017	1.1	17.
2.	-12.0	-15.2	0.033232	-0.004570	-0.000254	0.000390	-0.000565	0.005255	0.0050280	0.0041001	0.350	1.024	1.0	17.
3.	-12.0	-14.4	0.026908	-0.004678	-0.000078	0.000337	-0.000575	0.004606	0.0044401	0.0040337	0.351	1.022	1.1	16.
4.	-12.0	-13.6	0.018599	-0.004622	-0.000094	0.000339	-0.000619	0.003905	0.0037679	0.0039728	0.350	1.020	1.2	15.
5.	-12.0	-12.8	0.011827	-0.004557	-0.000037	0.000266	-0.000679	0.003371	0.0032532	0.0039835	0.352	1.020	1.2	14.
6.	-9.0	-10.2	0.027143	-0.004835	-0.000209	0.000275	-0.000641	0.004073	0.0039589	0.0040952	0.352	1.022	1.1	14.
7.	-9.0	-9.6	0.019262	-0.004679	-0.000113	0.000285	-0.000752	0.003633	0.0035342	0.0040719	0.351	1.023	1.0	13.
8.	-9.0	-11.2	0.036598	-0.004817	-0.000228	0.000340	-0.000508	0.004621	0.0044838	0.0041728	0.352	1.020	.9	15.
9.	-9.0	-12.1	0.043149	-0.004861	-0.000182	0.000254	-0.000592	0.005315	0.0051267	0.0043174	0.352	1.022	.8	16.
10.	-15.0	-16.7	0.010923	-0.004573	0.000151	0.000238	-0.000492	0.003636	0.0034880	0.0040354	0.350	1.024	1.4	16.
11.	-15.0	-17.3	0.019103	-0.004616	0.000070	0.000332	-0.000660	0.004398	0.0042214	0.0040258	0.350	1.024	1.2	17.
12.	-15.0	-18.1	0.026059	-0.004543	0.000275	0.000243	-0.000405	0.005085	0.0048822	0.0040085	0.351	1.022	1.1	18.
13.	-13.0	-16.8	0.031288	-0.003268	0.000278	0.000072	-0.000686	0.005858	0.0056354	0.0042210	0.351	1.024	1.0	18.8
14.	-13.0	-15.9	0.028705	-0.004589	-0.000060	0.000342	-0.000390	0.005053	0.0048362	0.0040849	0.350	1.023	1.1	17.

Table II - 9. Rotor No. 1, V/OR = .40, M(1.0, 90) = .85

TEST 208.0 RUN 7

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M.AT	A_{1_s}	θ_{grip}
1.	-4.0	-12.2	0.076055	-0.002867	-0.002899	0.000878	-0.001161	0.004846	0.0046721	0.0031566	0.401	0.845	.7	18.
2.	-4.0	-13.1	0.081132	-0.001576	-0.002909	0.000768	-0.001344	0.005864	0.0054607	0.0034570	0.396	0.853	.6	19.
3.	-4.0	-14.0	0.085539	-0.000962	-0.003104	0.000824	-0.001309	0.006619	0.0063572	0.0039386	0.398	0.850	-1.2	20.
4.	-4.0	-8.3	-0.001280	-0.001964	-0.001617	0.000550	-0.001158	0.001290	0.0012829	0.0020498	0.399	0.849	1.1	8.
5.	-2.0	-5.0	0.043683	-0.002668	-0.002479	0.000790	-0.000940	0.001924	0.0018345	0.0021776	0.396	0.853	.8	12.
6.	-2.0	-3.8	0.027125	-0.002428	-0.002198	0.000810	-0.000144	0.001609	0.0014878	0.0020319	0.398	0.848	1.0	10.
7.	-2.0	-2.0	0.010858	-0.002127	-0.001868	0.000570	-0.000159	0.001432	0.0012590	0.0019500	0.400	0.847	1.1	8.
8.	-2.0	-9.9	0.060468	-0.001851	-0.003413	0.000798	-0.000710	0.004164	0.0039995	0.0031609	0.398	0.850	.6	17.
9.	-2.0	-11.0	0.084194	-0.000780	-0.003762	0.000814	-0.000697	0.004991	0.0047251	0.0034531	0.398	0.851	.3	18.
10.	0.0	-7.6	0.033656	-0.001384	-0.004335	0.000830	-0.000698	0.003834	0.0031181	0.0032624	0.399	0.848	.3	16.
11.	0.0	-8.8	0.037839	-0.000399	-0.004628	0.000848	-0.000786	0.004182	0.0039876	0.0036971	0.398	0.849	.2	17.
12.	0.0	-9.7	0.092076	0.000599	-0.004998	0.001015	-0.000711	0.005188	0.0049452	0.0042128	0.398	0.849	0.0	18.
13.	0.0	-9.7	0.071582	-0.002381	-0.004007	0.000971	-0.000722	0.002217	0.0020522	0.0027009	0.398	0.849	.5	14.

TEST 208.0 RUN 5

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M.AT	A_{1_s}	θ_{grip}
1.	-4.0	-8.7	0.039928	-0.001875	-0.001126	0.000349	-0.000860	0.002664	0.0026519	0.0020923	0.401	0.852	.9	14.
2.	-4.0	-10.6	0.054582	-0.001600	-0.001486	0.000442	-0.000824	0.003497	0.0036048	0.0023682	0.396	0.859	.9	16.
3.	-4.0	-12.5	0.069829	-0.000948	-0.001811	0.000388	-0.000767	0.004796	0.0046558	0.0028052	0.401	0.850	.8	18.
4.	-8.0	-15.2	0.047871	-0.001738	-0.000205	0.000105	-0.000692	0.004585	0.0045879	0.0024145	0.399	0.852	1.1	18.
5.	-8.0	-16.8	0.059219	-0.001127	-0.000214	0.000128	-0.000841	0.005842	0.0057593	0.0027279	0.397	0.857	1.0	20.
6.	-12.0	-17.8	0.025871	-0.002504	0.000153	0.000136	-0.000824	0.003463	0.0034310	0.0022373	0.397	0.856	1.4	18.
7.	-12.0	-19.4	0.038729	-0.002101	0.000133	0.000271	-0.000852	0.005072	0.0049311	0.0024533	0.399	0.853	1.4	20.

Table II - 10. Rotor No. 1, V/OR = .40, M(1.0, 90) = .95

TEST 288.0 RUN 13

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M.AT	A_{1_s}	θ_{grip}
1.	-9.0	-12.4	0.026508	-0.003947	-0.000476	0.000508	-0.0000510	0.003112	0.0029692	0.0028278	0.404	0.947	1.4	15.
2.	-9.0	-13.1	0.034273	-0.004032	-0.000664	0.000656	-0.0000378	0.003745	0.0035758	0.0029505	0.404	0.948	1.2	16.
3.	-9.0	-11.6	0.019348	-0.003867	-0.000632	0.000659	-0.0000491	0.002822	0.0024827	0.0027799	0.403	0.948	1.4	14.
4.	-9.0	-10.9	0.012415	-0.003741	-0.000612	0.000516	-0.0000265	0.002181	0.0020720	0.0027713	0.404	0.948	1.4	13.
5.	-12.0	-14.6	0.010793	-0.003908	-0.000292	0.000460	-0.0000289	0.002903	0.0022478	0.0028776	0.404	0.947	1.4	15.
6.	-12.0	-15.2	0.017826	-0.003961	-0.000298	0.000537	-0.0000302	0.002949	0.0028871	0.0029358	0.404	0.948	1.4	16.
7.	-12.0	-16.1	0.024986	-0.003920	-0.000231	0.000459	-0.0000328	0.003569	0.0034642	0.0028801	0.402	0.949	1.2	17.
8.	-12.0	-16.8	0.031208	-0.003893	-0.000377	0.000613	-0.0000301	0.004338	0.0041741	0.0030321	0.405	0.947	1.4	18.
9.	-12.0	-17.7	0.038225	-0.004072	-0.000419	0.000536	-0.0000720	0.005232	0.0049655	0.0032789	0.404	0.947	1.2	19.
10.	-12.0	-13.9	0.002750	-0.003855	-0.000383	0.000420	-0.0000448	0.001665	0.0016124	0.0029049	0.404	0.946	1.4	14.
11.	-15.0	-18.3	0.009077	-0.004036	-0.000400	0.000396	-0.0000137	0.002561	0.0023729	0.0029920	0.403	0.948	1.5	17.
12.	-15.0	-19.0	0.015226	-0.004010	-0.000369	0.000408	-0.0000137	0.003250	0.0030826	0.0030413	0.402	0.951	1.5	18.
13.	-15.0	-19.7	0.022872	-0.004053	-0.000356	0.000438	-0.0000160	0.004018	0.0038494	0.0030683	0.401	0.952	1.4	19.
14.	-15.0	-17.8	0.000997	-0.003927	-0.000298	0.000310	-0.0000077	0.001639	0.0015594	0.0029771	0.401	0.950	1.4	16.
15.	-7.0	-9.8	0.031801	-0.003978	-0.000798	0.000508	-0.0000559	0.003083	0.0028643	0.0028453	0.403	0.949	1.2	14.
16.	-7.0	-10.8	0.038896	-0.004014	-0.000805	0.000473	-0.0000632	0.003810	0.0034714	0.0031002	0.403	0.946	1.1	15.
17.	-8.0	-13.1	0.069435	-0.000854	-0.000989	0.000199	-0.0000410	0.004808	0.0045908	0.0017941	0.271	0.899	.1	17.5
18.	-8.0	-13.1	0.036709	-0.001821	-0.001240	0.000173	-0.0000322	0.005202	0.0049512	0.0019266	0.270	0.903	.1	18.
19.	-9.0	-14.1	0.031063	-0.001092	-0.001078	0.000171	-0.0000306	0.005206	0.0049530	0.0018057	0.271	0.900	0	18.
20.	-9.0	-14.1	0.079185	-0.001582	-0.001114	0.000150	-0.0000350	0.005720	0.0054274	0.0019662	0.271	0.902	0	18.5
21.	-9.0	-14.1	0.061267	-0.000693	-0.001040	0.000172	-0.0000274	0.004674	0.0044128	0.0016777	0.272	0.900	0	17.4
22.	-8.0	-13.1	0.062109	-0.000483	-0.001137	0.000124	-0.0000215	0.004440	0.0042123	0.0016780	0.271	0.899	0	17.
23.	-7.0	-12.1	0.069029	-0.000764	-0.001374	0.000229	-0.0000242	0.004463	0.0042473	0.0017745	0.270	0.900	0	17.
24.	-7.0	-12.1	0.060646	-0.000392	-0.001329	0.000217	-0.0000224	0.004076	0.0038749	0.0016750	0.270	0.901	0	16.5
25.	-7.0	-12.1	0.078495	-0.001284	-0.001473	0.000242	-0.0000386	0.004922	0.0046655	0.0018986	0.271	0.898	0	17.5
26.	-8.0	-14.1	0.059083	0.000836	-0.001354	0.000147	-0.0000145	0.004643	0.0044192	0.0016665	0.272	0.901	- .2	17.5
27.	-8.0	-15.1	0.053820	0.001430	-0.001399	0.000129	-0.0000140	0.004477	0.0042676	0.0016138	0.271	0.904	- .3	17.5
28.	-9.0	-16.1	0.048820	0.001242	-0.001313	0.000156	-0.0000216	0.004388	0.0041729	0.0015741	0.271	0.902	- .3	17.5
29.	-9.0	-13.8	0.064093	-0.000907	-0.000433	0.000146	-0.0000402	0.004755	0.0045097	0.0016916	0.271	0.901	.7	17.5
30.	-9.0	-12.8	0.073071	-0.002728	-0.000308	0.000148	-0.0000508	0.004894	0.0046241	0.0018186	0.269	0.904	.6	17.5
31.	-9.0	-11.8	0.082566	-0.004735	-0.000331	0.000212	-0.0000569	0.005078	0.0048281	0.0020242	0.270	0.902	.6	17.5
32.	-8.0	-10.8	0.088229	-0.005078	-0.000288	0.000231	-0.0000577	0.005055	0.0048064	0.0021886	0.269	0.904	.6	17.5
33.	-8.0	-12.8	0.089707	-0.000879	-0.000780	0.000148	-0.0000255	0.004850	0.0045954	0.0017889	0.272	0.902	.2	17.5

Table II - 11. Rotor No. 2.

TEST 310.[illegible] RUN 3

44 FT. TAPERED TIP ROTOR V/CR = .32 M(1.0)(90) = .87

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CQ	CP	CPO	V/CR	M(1.0)(90)	$A1_s$
1.	8.0	-12.[illegible]	-14.8	.[illegible]35846	0.[illegible]1189	-0.[illegible]115	-0.[illegible]1[illegible]5	-0.[illegible]566	0.[illegible]3692	-0.[illegible]7269	-0.[illegible]327	0.315	0.871	.2
2.	6.[illegible]	-1[illegible]	-13.1	.[illegible]17[illegible]41	[illegible].1387	-0.[illegible]171	-0.[illegible]27	-0.[illegible]50[illegible]	0.3[illegible]2161	0.[illegible]2866	0.0017574	0.318	0.873	.3
3.	10.[illegible]	-1[illegible]	-16.2	.[illegible]51649	0.[illegible]0487	-0.[illegible]085	-0.[illegible]165	-0.[illegible]784	0.[illegible]5116	0.[illegible]2081	0.0023282	0.315	0.878	
4.	12.[illegible]	-1[illegible]	-17.8	.[illegible]66988	-0.[illegible]498	-0.[illegible]311	-0.[illegible]362	-0.[illegible]639	0.[illegible]6892	0.[illegible]9399	0.0027607	0.316	0.874	
5.	13.[illegible]	-1[illegible]	-18.5	.[illegible]73783	-0.[illegible]948	-0.[illegible]598	-0.[illegible]464	-0.[illegible]791	0.[illegible]8869	0.[illegible]9959	0.0032097	0.318	0.874	.2
6.	10.[illegible]	-15.[illegible]	-20.1	.[illegible]28525	.[illegible]1857	0.[illegible]665	-0.[illegible]256	-0.[illegible]678	0.[illegible]4988	0.[illegible]0787	0.0019922	0.318	0.871	.5
7.	8.[illegible]	-15.[illegible]	-18.8	.[illegible]11886	0.[illegible]1388	0.[illegible]718	-0.[illegible]832	-0.[illegible]617	0.[illegible]2184	0.[illegible]4187	0.0018551	0.318	0.872	.5
8.	12.[illegible]	-15.[illegible]	-21.5	.[illegible]44542	0.[illegible]2413	0.[illegible]265	-0.[illegible]235	-0.[illegible]687	0.[illegible]5918	0.[illegible]9767	0.0022824	0.319	0.872	.3
9.	13.7	-15.[illegible]	-22.9	.[illegible]59260	-0.[illegible]433	0.[illegible]28	-0.[illegible]221	-0.[illegible]808	0.[illegible]8[illegible]	0.[illegible]9627	0.0026766	0.319	0.872	.2
10.	10.[illegible]	-5.[illegible]	-12.5	.[illegible]07771	-0.[illegible]095	-0.[illegible]1661	-0.[illegible]152	-0.[illegible]771	0.[illegible]5525	0.[illegible]5846	0.0029232	0.318	0.873	.0
11.	10.[illegible]	-5.[illegible]	-12.5	.[illegible]06894	0.[illegible]1727	-0.[illegible]1837	-0.[illegible]154	0.[illegible]3699	0.[illegible]5645	0.[illegible]6548	0.0039951	0.317	0.870	

TEST 310.[illegible] RUN 4

44 FT. TAPERED TIP ROTOR V/CR = .32 M(1.0)(90) = .87

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CQ	CP	CPO	V/CR	M(1.0)(90)	$A1_s$
1.	10.[illegible]	-5.[illegible]	-12.5	.[illegible]73513	0.[illegible]3178	-0.[illegible]1813	-0.[illegible]0236	-0.[illegible]1652	0.[illegible]5799	0.[illegible]7858	0.0031134	0.326	0.882	
2.	12.[illegible]	-5.[illegible]	-14.4	.[illegible]84833	-0.[illegible]1519	-0.[illegible]2134	-0.[illegible]317	-0.[illegible]493	0.[illegible]7420	0.[illegible]2771	0.0038450	0.323	0.882	
3.	8.[illegible]	-5.[illegible]	-11.8	.[illegible]61498	.[illegible]1869	-0.[illegible]1314	-0.[illegible]155	-0.[illegible]552	0.[illegible]4078	0.[illegible]0263	0.0022803	0.323	0.881	
4.	6.[illegible]	-5.[illegible]	-8.7	.[illegible]44598	0.[illegible]1473	-0.[illegible]1748	-0.[illegible]114	-0.[illegible]468	0.[illegible]2839	0.[illegible]8483	0.0019121	0.322	0.881	.1
5.	4.[illegible]	-5.[illegible]	-7.5	.[illegible]25136	0.[illegible]1463	-0.[illegible]1397	-0.[illegible]122	-0.[illegible]337	0.[illegible]1940	0.[illegible]9223	0.0016364	0.322	0.880	.3
6.	2.[illegible]	-5.[illegible]	-5.9	.[illegible]7911	.[illegible]1458	-0.[illegible]1212	-0.[illegible]064	-0.[illegible]228	0.[illegible]1325	0.[illegible]3965	0.0015473	0.322	0.883	.0
7.	6.[illegible]	[illegible].[illegible]	-5.3	.[illegible]73473	0.[illegible]6471	-0.[illegible]2323	-0.[illegible]138	-0.[illegible]7803	0.[illegible]2296	0.[illegible]3414	0.0045285	0.326	0.880	-.4
8.	8.[illegible]	[illegible].[illegible]	-7.5	.[illegible]84615	0.[illegible]6439	-0.[illegible]2343	-0.[illegible]1[illegible]3	-0.[illegible]1195	0.[illegible]3910	0.[illegible]9516	0.0055000	0.327	0.878	.6
9.	10.[illegible]	[illegible].[illegible]	-9.4	.[illegible]99981	-0.[illegible]1217	-0.[illegible]2383	-0.[illegible]154	-0.[illegible]926	0.[illegible]5768	0.[illegible]7726	0.0044232	0.324	0.881	
10.	4.[illegible]	[illegible].[illegible]	-3.5	.[illegible]54761	.[illegible]1819	-0.[illegible]1516	-0.[illegible]152	-0.[illegible]533	0.[illegible]1475	0.[illegible]4409	0.0017978	0.325	0.881	
11.	2.[illegible]	[illegible].[illegible]	-1.7	.[illegible]36045	.[illegible]1872	-0.[illegible]951	-0.[illegible]174	-0.[illegible]431	0.[illegible]1084	0.[illegible]0775	0.0015840	0.325	0.880	
12.	[illegible].[illegible]	[illegible].[illegible]	-.4	.[illegible]1987	0.[illegible]1842	-0.[illegible]1552	-0.[illegible]0122	-0.[illegible]0299	0.[illegible]0966	0.[illegible]9577	0.0015167	0.327	0.880	.1
13.	-1.[illegible]	[illegible].[illegible]	[illegible].[illegible]	.[illegible]11728	0.[illegible]1655	-0.[illegible]1445	-0.[illegible]123	-0.[illegible]281	0.[illegible]0958	0.[illegible]9591	0.0014866	0.325	0.878	
14.	-2.[illegible]	[illegible].[illegible]	[illegible].7	.[illegible]325	0.[illegible]1461	-0.[illegible]1334	-0.[illegible]114	-0.[illegible]161	0.[illegible]1082	0.[illegible]0815	0.0015564	0.325	0.878	
15.	2.[illegible]	5.[illegible]	2.[illegible]	.[illegible]07731	.[illegible]2829	-0.[illegible]2475	0.[illegible]0737	-0.[illegible]0933	-0.[illegible]0393	-0.[illegible]3863	-0.0022872	0.324	0.879	
16.	4.[illegible]	5.[illegible]	[illegible].1	.[illegible]83918	.[illegible]1994	-0.[illegible]3799	[illegible].[illegible]117	-0.[illegible]951	0.[illegible]2277	[illegible].[illegible]3656	0.0027927	0.326	0.879	-.3
17.	[illegible].[illegible]	5.[illegible]	3.5	.[illegible]43697	.[illegible]2771	-0.[illegible]1913	0.[illegible]1759	-0.[illegible]0815	-0.[illegible]0347	-0.[illegible]3361	0.0017859	0.325	0.878	.0
18.	-2.[illegible]	5.[illegible]	5.[illegible]	.[illegible]3[illegible]642	0.[illegible]2669	-0.[illegible]1912[illegible]	0.[illegible]2[illegible]33	-0.[illegible]3[illegible]825	-0.[illegible]0[illegible]54	-0.[illegible]0[illegible]203	0.0016483	0.327	0.881	

Table II - 12. Rotor No. 2.

TEST 317.0 RUN 5

44 FT. TAPERED TIP ROTOR V/CR = .36 M(1.0)(90) = .80

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CC	CP	CPO	V/CR	M(1.0)(90)	$A1_s$
1.	4.0	-12.0	-11.6	0.022319	0.001519	0.000336	-0.000186	-0.000364	0.001243	0.0012286	0.0015727	0.315	0.877	.4
2.	8.0	-12.0	-14.5	0.033342	0.001438	0.000181	-0.000158	-0.000512	0.003491	0.0034630	0.0018952	0.340	0.832	.4
3.	8.0	-14.0	-14.5	0.029219	0.001635	0.000164	-0.000096	-0.000544	0.003294	0.0033054	0.0020004	0.360	0.797	.4
4.	12.0	-12.0	-16.1	0.045062	0.001158	0.000114	-0.000234	-0.000620	0.004899	0.0048156	0.0022669	0.360	0.798	.2
5.	12.0	-14.0	-17.5	0.039618	0.000617	-0.000162	-0.000262	-0.000767	0.004485	0.0043762	0.0026317	0.359	0.797	.2
6.	13.7	-13.0	-19.7	0.047010	-0.001944	-0.000314	-0.000420	-0.000768	0.006421	0.0060951	0.0030287	0.359	0.800	.1
7.	13.7	-15.0	-22.8	0.049570	0.000686	0.000425	-0.000285	-0.000839	0.007188	0.0069876	0.0024439	0.360	0.796	.5
8.	12.0	-15.0	-21.3	0.034668	0.001403	0.000687	-0.000326	-0.000794	0.005083	0.0050413	0.0022428	0.357	0.798	.7
9.	10.0	-15.0	-20.1	0.019439	0.001780	0.000757	-0.000282	-0.000886	0.003260	0.0032915	0.0020677	0.362	0.794	.7
10.	8.0	-15.0	-18.8	0.022805	0.002483	0.000676	-0.000117	-0.000644	0.001438	0.0014920	0.0019559	0.361	0.796	.7
11.	6.0	-15.0	-17.1	-0.013343	0.002474	0.000836	-0.000179	-0.001031	-0.000128	-0.0000790	0.0020237	0.362	0.794	.6
12.	6.0	-13.0	-13.0	0.011366	0.001786	0.000352	-0.000088	-0.000446	0.001931	0.0019225	0.0018355	0.363	0.795	.5
13.	4.0	-13.0	-11.6	-0.005452	0.001805	0.000398	-0.000166	-0.000431	0.000812	0.0008077	0.0017858	0.360	0.797	.5
14.	4.0	-5.0	-7.2	0.022618	0.001716	-0.000360	0.000039	-0.000327	0.001850	0.0019017	0.0017715	0.359	0.797	.3
15.	2.0	-5.0	-6.1	0.003794	0.001651	-0.000169	0.000036	-0.000173	0.001214	0.0011936	0.0016713	0.362	0.791	.4
16.	6.0	-5.0	-9.0	0.041641	0.001693	-0.000764	0.000040	-0.000515	0.002792	0.0028382	0.0020129	0.362	0.792	.1
17.	8.0	-5.0	-10.8	0.059128	0.001445	-0.001175	-0.000082	-0.000494	0.003882	0.0038872	0.0023132	0.357	0.801	.1
18.	12.0	-5.0	-12.5	0.074999	0.000656	-0.001619	-0.000124	-0.000611	0.005503	0.0054037	0.0028822	0.362	0.790	
19.	12.0	-5.0	-14.5	0.085201	-0.000967	-0.001203	-0.000144	-0.000923	0.007370	0.0071613	0.0036164	0.363	0.790	
20.	8.0	0.0	-7.5	0.083256	0.000380	-0.002836	0.000012	-0.000434	0.003497	0.0034880	0.0031338	0.358	0.799	
21.	10.0	0.0	-9.3	0.091238	-0.001275	-0.003661	-0.000085	-0.000953	0.005367	0.0052969	0.0042520	0.358	0.799	
22.	6.0	0.0	-5.5	0.069596	0.001577	-0.001217	0.000042	-0.000662	0.002987	0.0028965	0.0023175	0.358	0.798	
23.	4.0	0.0	-3.6	0.052280	0.001977	-0.000134	-0.000026	-0.000458	0.001329	0.0014235	0.0019371	0.358	0.798	.1
24.	2.0	0.0	-2.0	0.032659	0.001927	-0.000813	-0.000038	-0.000407	0.001018	0.0011152	0.0017313	0.359	0.798	
25.	0.0	0.0	-0.5	0.017333	0.001928	-0.000495	0.000020	-0.000191	0.000955	0.0009885	0.0016659	0.362	0.789	
26.	2.0	5.0	3.7	0.047588	0.002820	-0.001825	0.000179	-0.000452	-0.000527	-0.0004409	0.0018985	0.359	0.798	.2
27.	2.0	5.0	2.0	0.065279	0.002281	-0.002587	0.000135	-0.000631	-0.000583	-0.0004898	0.0022740	0.358	0.800	-.2
28.	3.0	5.0	3.9	0.073652	0.002563	-0.002836	0.000151	-0.000717	-0.000452	-0.0003371	0.0024995	0.358	0.798	
29.	4.0	5.0	-3.1	0.081883	0.002057	-0.003717	0.000210	-0.000653	-0.000252	0.0000773	0.0028920	0.357	0.800	
30.	6.0	5.0	-2.3	0.093374	0.001346	-0.004618	0.000235	-0.000448	0.001483	0.0015848	0.0040187	0.359	0.798	

Table II-12. (Concluded)

TEST 310.0 RUN 13

44 FT. TAPERED TIP ROTOR V/OR = .36 M(1.0)(90) = .80

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	0.0	0.0	-1.0	0.010889	0.001700	-0.000294	-0.000017	-0.000156	0.000977	0.0009120	0.0015105	0.357	0.801	.2
2.	0.0	2.0	1.0	0.025287	0.002192	-0.000796	0.000090	-0.000605	0.000656	0.0005910	0.0016373	0.355	0.804	.2
3.	0.0	4.0	3.0	0.040259	0.002757	-0.001162	0.000015	-0.000450	-0.000005	-0.0000360	0.0018180	0.354	0.804	.2
4.	0.0	6.0	5.0	0.057485	0.004118	-0.001785	0.000030	-0.000703	-0.001196	-0.0010753	0.0022838	0.365	0.803	.2
5.	-2.0	6.0	5.0	0.028465	0.002173	-0.001210	0.000050	-0.000368	0.000025	-0.0000121	0.0017575	0.355	0.803	.2
6.	-2.0	4.0	3.0	0.015820	0.001911	-0.000822	0.000133	-0.000286	0.000645	0.0005438	0.0015986	0.356	0.803	.2
7.	2.0	4.0	3.0	0.078153	0.007045	-0.002996	0.000131	-0.000873	-0.001219	-0.0010776	0.0029511	0.367	0.803	.5
8.	2.0	6.0	5.0	0.092737	0.008670	-0.003691	0.000145	-0.001063	-0.001954	-0.0017556	0.0041860	0.357	0.803	.5
9.	2.0	2.0	1.0	0.060208	0.004985	-0.002311	0.000134	-0.000903	-0.000183	-0.0000849	0.0021819	0.356	0.802	.5
10.	2.0	0.0	-1.0	0.049201	0.003374	-0.001509	-0.000007	-0.000478	0.000722	0.0006671	0.0017378	0.357	0.802	.5
11.	4.0	0.0	-1.0	0.076896	0.007397	-0.002507	0.000085	-0.000818	0.000446	0.0003979	0.0026024	0.365	0.803	.5
12.	4.0	2.0	1.0	0.092042	0.009671	-0.003290	0.000221	-0.001318	0.000002	0.0000362	0.0040152	0.355	0.804	.5

For the following data points
a_{1_s} and/or $b_{1_s} \neq 0^o \pm .2^o$

PT.	THETA	ALPHA SHAFT	a_{1_s}	b_{1_s}
1	0	0	- .8	0
2	0	2	- .5	0
3	0	4	0	0
4	0	6	.8	0
5	-2	6	-1.0	0
6	-2	4	-1.4	0
7	2	4	2.4	0
8	2	6	3.6	0
9	2	2	1.8	0
10	2	0	1.2	0
11	4	0	3.4	0
12	4	2	4.3	0

Table II - 13. Rotor No. 2.

TEST 310., RUN 6

44 FT. TAPERED TIP ROTOR V/CR = .36 M(1.0)(90) = .90

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CC	CP	CPC	V/CR	M(1.0)(90)	$A1_s$
1.	6.0	-5.[illegible]	-9.2	[illegible]	0.001647	[illegible]	[illegible]	-1.000231	0.002683	0.0028525	0.0020750	0.358	0.903	.2
2.	8.[illegible]	-5.[illegible]	-11.[illegible]	0.056309	0.001435	[illegible]	-0.000155	[illegible]	0.004022	0.0039511	0.0024877	0.356	0.907	.1
3.	10.0	-5.0	-12.9	0.069519	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0054739	0.0031286	0.357	0.905	.1
4.	4.0	-5.[illegible]	-7.5	[illegible]	0.001746	[illegible]	[illegible]	[illegible]	0.001924	0.0019744	0.0018377	0.359	0.900	.3
5.	2.[illegible]	-5.[illegible]	-6.	[illegible]	0.001436	[illegible]	[illegible]	[illegible]	0.001382	0.0013427	0.0017883	0.363	0.893	.4
6.	2.[illegible]	[illegible]	-1.9	0.035448	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0017731	0.356	0.908	.1
7.	0.0	3.0	-0.6	0.018462	0.001953	[illegible]	0.000721	[illegible]	0.000604	0.0010092	0.0016831	0.357	0.907	.1
8.	4.0	3.0	-3.6	0.053813	0.002156	[illegible]	[illegible]	[illegible]	0.001453	0.0014933	0.0020562	0.356	0.907	.1
9.	6.0	[illegible]	-5.7	[illegible]	0.001585	[illegible]	[illegible]	[illegible]	0.002315	0.0024211	0.0026348	0.355	0.906	
10.	8.[illegible]	[illegible]	-7.7	0.080655	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0034366	0.358	0.904	
11.	4.0	5.0	-3.5	0.081145	0.002113	[illegible]	[illegible]	[illegible]	0.000474	0.0004073	0.0032226	0.357	0.903	
12.	6.0	5.0	-2.6	[illegible]	[illegible]	[illegible]	0.000196	[illegible]	0.002172	0.0021403	0.0043830	0.356	0.906	
13.	2.[illegible]	5.[illegible]	1.5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0028936	0.358	0.902	
14.	[illegible]	5.[illegible]	3.3	0.052359	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0021703	0.358	0.903	
15.	-2.[illegible]	5.[illegible]	5.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0019528	0.357	0.905	
16.	-2.0	7.0	6.4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0021338	0.357	0.905	-.2
17.	[illegible]	7.[illegible]	4.6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0024432	0.358	0.903	
18.	2.[illegible]	7.[illegible]	2.8	0.079677	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0032122	0.357	0.905	-.5
19.	4.[illegible]	7.[illegible]	0.8	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0042195	0.359	0.905	
20.	6.0	-10.[illegible]	-13.[illegible]	[illegible]	0.001748	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0019464	0.356	0.908	.5
21.	8.[illegible]	-1[illegible].[illegible]	-14.4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0020440	0.357	0.903	.5
22.	10.[illegible]	-1[illegible].[illegible]	-16.1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0026110	0.356	0.907	.4
23.	11.[illegible]	-1[illegible].[illegible]	-17.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0024181	0.358	0.903	.4
24.	11.0	-15.[illegible]	-21.6	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0021842	0.358	0.903	.6
25.	12.[illegible]	-15.[illegible]	-21.3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0022590	0.356	0.906	.6
26.	14.[illegible]	-15.[illegible]	-20.[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0021047	0.358	0.906	.7
27.	8.[illegible]	-15.[illegible]	-18.4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.0019765	0.356	0.905	.6

Table II - 14. Rotor No. 2.

TEST 310.0 RUN 16

44 FT. TAPERED TIP ROTOR V/OR = .40 M(1.0)(90) = .83

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	6.0	-5.0	-9.6	0.038214	0.002022	-0.000562	-0.000041	-0.000112	0.002624	0.0023882	0.0019644	0.403	0.828	.1
2.	6.0	5.0	-3.4	0.085994	0.000462	-0.004783	0.000272	-0.000415	0.001669	0.0014509	0.0041671	0.400	0.828	
3.	4.0	5.0	-1.1	0.078450	0.002415	-0.004298	0.000273	-0.000651	0.000205	0.0001584	0.0034826	0.401	0.829	
4.	2.0	5.0	0.9	0.065788	0.003268	-0.003287	0.000148	-0.000716	-0.000628	-0.0005005	0.0028421	0.402	0.829	
5.	0.0	5.0	2.9	0.051240	0.003369	-0.002481	0.000206	-0.000432	-0.000802	-0.0005503	0.0024275	0.401	0.828	-.4
6.	-2.0	5.0	4.4	0.035093	0.003244	-0.001983	0.000138	-0.000537	-0.000291	-0.0003045	0.0021379	0.400	0.829	-.5
7.	-2.0	7.0	5.9	0.049314	0.003543	-0.002722	0.000206	-0.000433	-0.001256	-0.0011591	0.0025112	0.401	0.828	-.6
8.	0.0	7.0	4.2	0.063937	0.003570	-0.003502	0.000162	-0.000528	-0.001587	-0.0014301	0.0028616	0.401	0.828	-.7
9.	2.0	0.0	-2.5	0.035811	0.002685	-0.001246	0.000114	-0.000282	0.001021	0.0009319	0.0019232	0.399	0.831	
10.	4.0	0.0	-4.1	0.051287	0.002630	-0.001867	0.000065	-0.000674	0.001428	0.0012754	0.0021603	0.400	0.830	
11.	6.0	0.0	-6.3	0.064734	0.002315	-0.002533	0.000083	-0.000674	0.002136	0.0019315	0.0025932	0.400	0.830	
12.	8.0	0.0	-8.4	0.075657	0.001243	-0.003039	0.000081	-0.000558	0.003502	0.0031032	0.0032394	0.400	0.829	-.2
13.	8.0	-5.0	-11.5	0.049986	0.002014	-0.000919	-0.000161	-0.000294	0.003689	0.0032982	0.0021984	0.401	0.830	.0
14.	10.0	-5.0	-13.2	0.062732	0.001587	-0.001376	-0.000264	-0.000621	0.005035	0.0044486	0.0026255	0.400	0.831	.1
15.	10.0	-15.0	-20.2	0.008303	0.002578	0.000168	-0.000025	-0.000713	0.002487	0.0021498	0.0022819	0.401	0.831	.1
16.	12.0	-15.0	-21.6	0.021797	0.002129	0.000024	-0.000011	-0.000382	0.004176	0.0036863	0.0022194	0.401	0.830	.6
17.	13.7	-15.0	-23.3	0.037080	0.001723	-0.000192	0.000017	-0.000492	0.006490	0.0055607	0.0022912	0.402	0.830	.7
18.	12.0	-10.0	-18.3	0.048552	0.001385	-0.000307	-0.000116	-0.000443	0.006041	0.0052635	0.0022694	0.402	0.829	.6
19.	10.0	-10.0	-16.6	0.035541	0.001784	-0.000027	-0.000055	-0.000218	0.004424	0.0038960	0.0020523	0.400	0.830	.4
20.	8.0	-10.0	-15.0	0.022210	0.002017	0.000061	-0.000052	-0.000225	0.003087	0.0027113	0.0019328	0.400	0.829	.5
21.	4.0	-5.0	-7.7	0.010459	0.001983	-0.000299	0.000011	-0.000012	0.001843	0.0016420	0.0017676	0.402	0.830	.6
														.3

Table II - 15. Rotor No. 2

TEST 310.) RUN 8

44 FT. TAPERED TIP ROTOR V/CR = .41 M(1.0)(90) = .94

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CQ	CP	CPO	V/CR	M(1.0)(90	A_{1_s}
1.	8.0	-5.2	-11.4	0.051028	0.003034	-0.000928	-0.000218	-0.000659	0.004205	0.0041631	0.0033364	0.417	0.938	.3
2.	10.0	-5.0	-13.1	0.064664	0.002358	-0.001776	-0.000172	-0.000680	0.005640	0.0055777	0.0039782	0.408	0.939	.2
3.	12.0	-5.1	-14.7	0.073599	0.001368	-0.002253	-0.000154	-0.000958	0.007450	0.0071139	0.0047169	0.408	0.938	.0
4.	6.0	-5.0	-9.4	0.037550	0.002883	-0.000715	-0.000143	-0.000792	0.003036	0.0030770	0.0028259	0.407	0.937	.4
5.	4.0	-5.0	-7.4	0.022963	0.002914	-0.000328	-0.000123	-0.000826	0.002156	0.0022198	0.0026356	0.412	0.938	.3
6.	4.0	-5.0	-4.1	0.025326	0.003739	-0.001797	-0.000104	-0.001197	0.001653	0.0017630	0.0031442	0.411	0.938	.0
7.	6.0	-5.0	-6.1	0.038859	0.003761	-0.002636	-0.000190	-0.001177	0.002650	0.0027095	0.0039800	0.414	0.934	.1
8.	8.0	-5.0	-8.1	0.077569	0.002495	-0.003429	-0.000263	-0.001097	0.004196	0.0042144	0.0048772	0.413	0.934	
9.	10.0	-5.0	-10.1	0.088281	0.001643	-0.003864	-0.000336	-0.001282	0.006043	0.0058828	0.0057487	0.410	0.939	
10.	2.0	-5.0	-2.2	0.036037	0.003785	-0.001141	-0.000125	-0.001098	0.001239	0.0013368	0.0028022	0.408	0.940	
11.	0.0	-5.0	-1.5	0.023448	0.003510	-0.000664	-0.000044	-0.000253	0.001059	0.0011567	0.0025459	0.407	0.945	.1
12.	0.0	5.0	3.7	0.054702	0.005369	-0.002451	0.000043	-0.001463	-0.000522	-0.0004256	0.0033939	0.408	0.946	-.2
13.	2.0	5.0	1.1	0.069490	0.004941	-0.003498	0.000175	-0.001656	-0.000356	-0.0002653	0.0039311	0.409	0.944	-.4
14.	4.0	5.0	-1.0	0.081497	0.004333	-0.004385	0.000158	-0.001429	0.000719	0.0008311	0.0049570	0.407	0.946	
15.	6.0	5.0	-3.3	0.086212	0.003213	-0.004714	0.000239	-0.001507	0.002431	0.0025210	0.0059719	0.407	0.948	
16.	8.0	5.0	-5.2	0.093647	-0.000113	-0.004256	0.000098	-0.001744	0.004332	0.0043823	0.0069852	0.400	0.947	
17.	2.0	7.0	2.2	0.085943	0.004986	-0.005070	0.000310	-0.001909	-0.000888	-0.0007020	0.0052983	0.417	0.930	-.5

TEST 310.) RUN 9

44 FT. TAPERED TIP ROTOR V/CR = .41 M(1.0)(90) = .94

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CQ	CP	CPO	V/CR	M(1.0)(90)	A_{1_s}
1.	0.0	7.0	4.2	0.069357	0.005092	-0.003582	0.000256	-0.001142	-0.001414	-0.0014909	0.0037970	0.413	0.938	
2.	-2.0	7.0	6.3	0.057988	0.006375	-0.002886	0.000291	-0.001121	-0.001412	-0.0013211	0.0035740	0.411	0.939	
3.	2.0	7.0	2.3	0.081236	0.004274	-0.004663	0.000619	-0.001594	-0.000764	-0.0006982	0.0047063	0.410	0.941	
4.	4.0	7.0	0.3	0.096937	0.002434	-0.005278	0.000378	-0.001258	0.000747	0.0007395	0.0057822	0.411	0.941	
5.	8.0	-1.0	-14.6	0.022079	0.002921	-0.001468	-0.000193	-0.000739	0.003445	0.0033277	0.0030520	0.410	0.941	.6
6.	10.0	-1.0	-16.1	0.033635	0.002922	-0.001336	-0.000132	-0.000737	0.004866	0.0047757	0.0034884	0.411	0.940	.8
7.	12.0	-1.0	-17.6	0.047425	0.002572	-0.001222	-0.000245	-0.000609	0.006622	0.0061342	0.0036553	0.411	0.940	.5
8.	13.7	-1.0	-19.4	0.058714	0.001836	-0.000252	-0.000159	-0.000688	0.008524	0.0078363	0.0041706	0.412	0.938	.5
9.	13.7	-15.0	-22.9	0.034548	0.002823	-0.000936	-0.000188	-0.000870	0.006509	0.0062308	0.0035937	0.413	0.937	.8
10.	12.0	-15.0	-21.3	0.018972	0.002762	-0.001216	-0.000257	-0.000859	0.004532	0.0044523	0.0035044	0.413	0.936	.9
11.	10.0	-15.0	-19.8	0.007799	0.002931	-0.001134	-0.000279	-0.000518	0.002864	0.0028712	0.0032024	0.413	0.936	1.0

Table II - 16. Rotor No. 2.

TEST 310.[illegible] RUN 7

44 FT. TAPERED TIP ROTOR V/OR = .45 M(1.0)(90) = .77

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M(1.0)(90)	$A1_s$
1.	8.0	-5.0	-11.4	0.042920	0.002529	-0.001167	0.000046	-0.000089	0.003460	0.0035201	0.0028684	0.448	0.769	.1
2.	6.0	-5.0	-9.5	0.027972	0.002427	-0.000731	0.000087	-0.000001	0.002431	0.0025258	0.0024721	0.445	0.772	.3
3.	4.0	-5.0	-7.7	0.013462	0.002230	-0.000437	0.000107	0.000015	0.001651	0.0017110	0.0021660	0.444	0.771	.2
4.	10.0	-5.0	-13.4	0.055439	0.002273	-0.001658	0.000064	-0.000231	0.004714	0.0047417	0.0034208	0.447	0.773	.1
5.	12.0	-5.0	-15.1	0.064687	0.001673	-0.002219	-0.000114	-0.000488	0.006339	0.0062827	0.0042697	0.447	0.772	.0
6.	13.7	-5.0	-16.7	0.073788	0.000486	-0.002296	-0.000898	-0.001323	0.008390	0.0081782	0.0052135	0.447	0.772	.0
7.	12.0	-10.0	-18.2	0.039376	0.002468	-0.000813	-0.000014	-0.000310	0.005365	0.0052070	0.0031542	0.446	0.771	.3
8.	10.0	-10.0	-16.6	0.028747	0.002525	-0.000930	-0.000097	-0.000172	0.004014	0.0039253	0.0027639	0.445	0.771	.6
9.	8.0	-10.0	-15.0	0.014468	0.002602	-0.000949	0.000093	-0.000165	0.002522	0.0024687	0.0024787	0.444	0.771	.6
10.	13.7	-10.0	-20.0	0.052807	0.001904	-0.000713	-0.000175	-0.000838	0.007355	0.0071807	0.0037747	0.446	0.770	.2
11.	14.0	-15.0	-23.2	0.025509	0.002886	-0.000584	-0.001242	-0.000431	0.005261	0.0050870	0.0033365	0.449	0.772	.7
12.	13.7	-15.0	-21.7	0.014317	0.002943	0.000687	-0.000119	-0.000394	0.003269	0.0032820	0.0028876	0.443	0.771	.8
13.	10.0	-15.0	-20.4	0.001381	0.003312	0.000703	-0.000204	-0.000844	0.001542	0.0015904	0.0028616	0.447	0.771	.8
14.	6.0	0.0	-6.3	0.057434	0.002682	-0.002307	0.000140	-0.000322	0.001861	0.0019756	0.0029533	0.448	0.770	
15.	8.0	0.0	-8.4	0.066457	0.002335	-0.003045	0.000045	-0.001264	0.003027	0.0031285	0.0039098	0.448	0.770	
16.	10.0	0.0	-10.3	0.078450	0.002627	-0.003958	0.000119	-0.001461	0.005063	0.0051379	0.0050691	0.447	0.772	
17.	4.0	0.0	-4.3	0.043844	0.002716	-0.001705	0.000167	-0.000104	0.001256	0.0014003	0.0025030	0.446	0.770	.1
18.	2.0	0.0	-2.2	0.028589	0.002693	-0.001389	0.000075	-0.000268	0.000914	0.0010839	0.0022387	0.446	0.769	
19.	11.0	0.0	-11.2	0.082471	-0.000193	-0.004063	0.000223	-0.001780	0.006058	0.0060661	0.0055945	0.444	0.768	
20.	2.0	5.0	1.0	0.061984	0.003771	-0.003272	0.000270	-0.000885	-0.000664	-0.0006993	0.0031625	0.445	0.770	
21.	0.0	5.0	2.8	0.048524	0.003981	-0.002523	0.000284	-0.000635	-0.000770	-0.0006384	0.0029101	0.449	0.770	
22.	-2.0	5.0	4.6	0.033655	0.003815	-0.001903	0.000195	-0.000406	-0.000394	-0.0002553	0.0026981	0.449	0.770	-.4
23.	4.0	5.0	-1.3	0.074156	0.002996	-0.004024	0.000268	-0.000808	-0.000967	0.0000638	0.0039916	0.448	0.770	-.5
24.	6.0	5.0	-3.5	0.083662	0.001686	-0.004875	0.000221	-0.001497	0.001487	0.0015349	0.0051759	0.449	0.770	.0
25.	8.0	5.0	-5.5	0.091390	-0.000628	-0.005514	0.000199	-0.001247	0.003589	0.0036047	0.0064158	0.447	0.773	-.8
26.	10.0	5.0	-7.5	0.100534	-0.002247	-0.006512	0.000124	-0.001389	0.005706	0.0056914	0.0080356	0.447	0.773	.4
27.	6.0	7.0	4.0	0.063978	0.004511	-0.003570	0.000221	-0.001096	-0.001824	-0.0017735	0.0034745	0.446	0.772	-.5
28.	-2.0	7.0	6.0	0.049150	0.004488	-0.002700	0.000031	-0.000777	-0.001488	-0.0013959	0.0030814	0.446	0.771	.0
29.	2.0	7.0	2.0	0.076192	0.003945	-0.004339	0.000179	-0.001167	-0.001568	-0.0014593	0.0041032	0.446	0.771	-.7

Table II - 17. Rotor No. 2.

TEST 310.0 RUN 12

44 FT. TAPERED TIP ROTOR V/OR = .46 M(1.0)(90) = .86

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	8.0	-5.0	-12.0	0.042006	0.003041	-0.000775	-0.000098	-0.000512	0.003569	0.0035693	0.0031800	0.462	0.865	.4
2.	10.0	-5.0	-14.0	0.054996	0.002984	-0.001248	-0.000077	-0.001084	0.004989	0.0049690	0.0039595	0.464	0.862	.4
3.	12.0	-5.0	-15.6	0.064277	0.002303	-0.001719	-0.000078	-0.001216	0.006828	0.0066279	0.0048700	0.463	0.864	.3
4.	6.0	-5.0	-10.0	0.030602	0.003049	-0.000552	-0.000096	-0.000427	0.002625	0.0026246	0.0027439	0.462	0.865	.4
5.	4.0	-5.0	-7.7	0.017161	0.002864	-0.000264	-0.000081	-0.000429	0.001841	0.0018407	0.0024554	0.465	0.863	.4
6.	2.0	-5.0	-6.2	0.001543	0.002449	-0.000004	-0.000061	-0.000092	0.001226	0.0012260	0.0022907	0.462	0.866	.2
7.	4.0	0.0	-4.5	0.048240	0.003354	-0.001811	-0.000018	-0.000487	0.001433	0.0014333	0.0028586	0.462	0.865	
8.	6.0	0.0	-6.8	0.060819	0.003221	-0.002618	0.000078	-0.000973	0.002186	0.0021862	0.0034834	0.465	0.861	
9.	8.0	0.0	-8.9	0.071453	0.002525	-0.003268	0.000078	-0.000866	0.003611	0.0036113	0.0045046	0.464	0.862	
10.	10.0	0.0	-10.9	0.078060	0.001221	-0.003679	0.000024	-0.001342	0.005454	0.0054543	0.0056902	0.465	0.864	
11.	2.0	0.0	-2.6	0.038921	0.003243	-0.001368	0.000040	-0.000737	0.001049	0.0010490	0.0024960	0.466	0.864	
12.	0.0	0.0	-0.8	0.020528	0.003110	-0.000742	-0.000055	-0.000643	0.000901	0.0009013	0.0023275	0.466	0.863	
13.	-2.0	0.0	0.5	0.006242	0.002703	-0.000535	0.000070	-0.000366	0.001048	0.0010477	0.0023029	0.465	0.862	
14.	0.0	2.0	0.5	0.034914	0.003531	-0.001552	0.000040	-0.000597	0.000402	0.0004019	0.0025496	0.466	0.861	
15.	-2.0	2.0	2.0	0.019702	0.003164	-0.000923	0.000103	-0.000586	0.000641	0.0006415	0.0024077	0.464	0.864	
16.	2.0	2.0	-1.5	0.048848	0.003670	-0.002278	0.000128	-0.000717	0.000475	0.0004749	0.0028610	0.468	0.858	
17.	4.0	2.0	-3.7	0.061393	0.003487	-0.002973	0.000202	-0.000992	0.000926	0.0009259	0.0038336	0.464	0.864	
18.	4.0	5.0	-1.8	0.079617	0.002691	-0.004812	0.000277	-0.000881	0.000449	0.0004489	0.0046117	0.468	0.857	
19.	6.0	5.0	-4.0	0.086717	0.001060	-0.005320	0.000373	-0.000985	0.002043	0.0020426	0.0056678	0.468	0.857	
20.	2.0	5.0	0.3	0.067498	0.003732	-0.003912	0.000229	-0.000900	-0.000570	-0.0005697	0.0036758	0.468	0.856	
21.	0.0	5.0	2.1	0.055278	0.003948	-0.003071	0.000153	-0.000622	-0.000795	-0.0007952	0.0031401	0.468	0.856	
22.	-2.0	5.0	4.0	0.040057	0.003766	-0.002374	0.000151	-0.000559	-0.000508	-0.0005083	0.0027835	0.467	0.862	
23.	10.0	-10.0	-16.8	0.027653	0.003050	-0.000005	-0.000012	-0.000466	0.004185	0.0041852	0.0033086	0.464	0.864	.8
24.	8.0	-10.0	-15.3	0.014280	0.002975	0.000120	-0.000117	-0.000362	0.002786	0.0027858	0.0029826	0.463	0.863	.7
25.	6.0	-10.0	-12.9	0.001649	0.002794	0.000143	-0.000041	-0.000289	0.001555	0.0015549	0.0026931	0.462	0.864	.7
26.	12.0	-10.0	-18.3	0.039607	0.002928	-0.000296	0.000256	-0.000583	0.005662	0.0056620	0.0037220	0.464	0.863	.8
27.	13.7	-10.0	-20.3	0.050839	0.002454	-0.000692	-0.000012	-0.000705	0.007463	0.0074625	0.0043477	0.464	0.863	.7
28.	13.7	-12.0	-21.5	0.040048	0.002940	-0.000384	0.000053	-0.000580	0.006754	0.0067538	0.0041380	0.464	0.863	.9
29.	12.0	-12.0	-20.0	0.028818	0.003341	-0.000203	0.000159	-0.000897	0.005076	0.0050761	0.0037710	0.463	0.864	.9
30.	10.0	-12.0	-18.3	0.016025	0.003209	-0.000020	0.000028	-0.000260	0.003438	0.0034378	0.0033340	0.463	0.863	.9
31.	13.7	-15.0	-23.3	0.024380	0.003470	0.000090	-0.000044	-0.000722	0.005326	0.0053257	0.0039278	0.464	0.864	.9
32.	12.0	-15.0	-21.9	0.011852	0.003624	0.000139	-0.000004	-0.000472	0.003347	0.0033469	0.0035397	0.464	0.862	1.1
33.	10.0	-15.0	-20.4	-0.000105	0.003480	-0.000034	0.000064	-0.000530	0.001723	0.0017230	0.0032886	0.462	0.868	1.0

Table II - 18. Rotor No. 2.

TEST 310.0 RUN 11

44 FT. TAPERED TIP ROTOR V/OR = .45 M(1.0)(90) = .90

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	OMXB	CMY	CQ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	6.0	-5.0	-9.9	0.030773	0.002970	-0.000785	0.000093	-0.000622	0.002662	0.0026625	0.0027315	0.445	0.900	.3
2.	8.0	-5.0	-11.9	0.044983	0.003057	-0.001154	0.000058	-0.000894	0.003708	0.0037076	0.0032047	0.445	0.901	.4
3.	10.0	-5.0	-13.9	0.059781	0.002662	-0.001619	-0.000075	-0.000992	0.005255	0.0052651	0.0040013	0.447	0.897	.2
4.	12.0	-5.0	-15.5	0.066267	0.002043	-0.002060	0.000013	-0.001229	0.006748	0.0067484	0.0048325	0.446	0.899	.3
5.	13.0	-5.0	-16.4	0.068768	0.000827	-0.002315	-0.000016	-0.001003	0.007698	0.0075383	0.0049439	0.451	0.906	.1
6.	13.0	-5.0	-16.4	0.068903	0.001603	-0.002277	-0.000034	-0.001153	0.007646	0.0075462	0.0053269	0.442	0.900	.1
7.	4.0	-5.0	-7.9	0.017701	0.002939	-0.000538	-0.000061	-0.000512	0.001850	0.0018497	0.0024400	0.439	0.900	.3
8.	2.0	-5.0	-6.0	0.003727	0.002684	-0.000392	0.000068	-0.000435	0.001250	0.0012496	0.0022807	0.439	0.898	.2
9.	2.0	0.0	-2.6	0.033094	0.003844	-0.001544	0.000090	-0.001046	0.001098	0.0010981	0.0027372	0.443	0.898	.1
10.	4.0	0.0	-4.6	0.048282	0.003731	-0.002289	0.000234	-0.000822	0.001493	0.0014929	0.0030181	0.444	0.900	
11.	6.0	0.0	-6.6	0.061392	0.003614	-0.002827	0.000073	-0.000961	0.002386	0.0023863	0.0037850	0.446	0.898	
12.	8.0	0.0	-8.8	0.070868	0.002786	-0.003527	0.000142	-0.001227	0.003811	0.0038110	0.0047665	0.445	0.897	
13.	10.0	0.0	-10.8	0.078276	0.001353	-0.003850	0.000028	-0.002037	0.005775	0.0057746	0.0060310	0.446	0.896	
14.	0.0	0.0	-0.9	0.019831	0.003758	-0.001036	0.000120	-0.000854	0.000970	0.0009703	0.0026184	0.445	0.899	.1
15.	-2.0	0.0	0.6	0.005797	0.003457	-0.000656	0.092029	-0.000729	0.001080	0.0010803	0.0026221	0.447	0.895	.1
16.	2.0	2.0	-1.4	0.049593	0.004936	-0.002192	0.000104	-0.001323	0.000482	0.0004817	0.0033093	0.445	0.895	
17.	4.0	2.0	-3.6	0.063145	0.004517	-0.003187	0.000188	-0.001308	0.001035	0.0010352	0.0037998	0.445	0.896	
18.	0.0	2.0	0.5	0.034470	0.004784	-0.001636	0.000025	-0.001262	0.000486	0.0004865	0.0030953	0.447	0.894	
19.	-2.0	2.0	2.1	0.016110	0.004692	-0.001216	-0.000731	-0.004185	0.000609	0.0006085	0.0029382	0.446	0.895	
20.	-2.0	5.0	4.1	0.048382	0.005275	-0.002332	0.000198	-0.001570	-0.000580	-0.0005797	0.0038647	0.448	0.895	
21.	0.0	5.0	2.4	0.048046	0.006152	-0.003152	0.000138	-0.003754	-0.000761	-0.0007607	0.0037393	0.448	0.894	
22.	2.0	5.0	0.5	0.070687	0.005395	-0.003867	0.000146	-0.001839	-0.000567	-0.0005667	0.0043149	0.447	0.893	
23.	4.0	5.0	-1.7	0.081696	0.003976	-0.004826	0.000332	-0.001671	0.000641	0.0005406	0.0051259	0.447	0.894	
24.	8.0	-10.0	-15.1	0.017147	0.002982	0.000140	0.000001	-0.000259	0.002918	0.0029178	0.0028822	0.450	0.893	.6
25.	6.0	-10.0	-13.2	0.008715	0.002987	0.000035	0.000030	-0.000510	0.001651	0.0016512	0.0026805	0.449	0.892	.6
26.	10.0	-10.0	-16.8	0.031824	0.003067	-0.000009	-0.000065	-0.000594	0.004483	0.0044527	0.0033154	0.447	0.895	
27.	12.0	-10.0	-18.5	0.043574	0.002846	-0.000195	0.000024	-0.000768	0.005960	0.0059597	0.0037296	0.446	0.899	.8
28.	13.7	-10.0	-20.3	0.047725	0.001022	-0.000478	-0.001093	-0.002625	0.007924	0.0079245	0.0045279	0.449	0.896	.5
29.	13.7	-12.0	-21.4	0.040832	0.003023	-0.000340	0.000134	0.000287	0.007158	0.0071578	0.0046045	0.445	0.897	.8
30.	12.0	-12.0	-19.8	0.032574	0.002973	-0.000079	-0.000126	-0.000466	0.005406	0.0054065	0.0036095	0.450	0.887	.7
31.	10.0	-12.0	-18.0	0.020946	0.003107	0.000222	-0.000018	-0.000745	0.003771	0.0037706	0.0031525	0.451	0.888	.9
32.	13.7	-15.0	-23.2	0.029372	0.003120	0.000588	-0.000249	-0.001043	0.005769	0.0057694	0.0036791	0.445	0.897	1.0
33.	12.0	-15.0	-21.7	0.017217	0.003252	0.000666	-0.000366	-0.000758	0.003990	0.0039904	0.0033791	0.452	0.887	1.0
34.	10.0	-15.0	-20.1	0.004187	0.003295	0.000561	-0.001008	-0.000729	0.002349	0.0023486	0.0032939	0.451	0.886	.9

Table II - 19. Rotor No. 2.

TEST 310.1 RUN 1.

44 FT. TAPERED TIP ROTOR V/OR = .51 M(1.0)(90) = .81

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	6.0	-5.0	-9.6	0.022425	0.003987	-0.001046	0.000195	-0.000537	0.002401	0.0024008	0.0034135	0.514	0.805	.4
2.	6.0	3.0	-6.8	0.025423	0.004565	-0.002712	0.000218	-0.001374	0.002879	0.0028787	0.0043092	0.518	0.802	.1
3.	8.0	5.0	-9.0	0.026578	0.004779	-0.003698	0.000253	-0.001868	0.003304	0.0033042	0.0052291	0.519	0.802	.0
4.	4.0	0.0	-4.9	0.023421	0.004191	-0.001809	-0.000078	-0.001078	0.001393	0.0013932	0.0034628	0.511	0.809	.2
5.	2.0	-2.0	-2.8	0.025717	0.004992	-0.002232	0.001218	-0.001040	0.000698	0.0006978	0.0027096	0.512	0.808	.1
6.	2.0	5.0	0.2	0.030496	0.005256	-0.003824	0.000252	-0.002681	-0.000552	-0.0005522	0.0048861	0.521	0.799	
7.	0.0	5.0	2.1	0.032527	0.005299	-0.002415	-0.000822	-0.001806	-0.000943	-0.0009431	0.0040640	0.521	0.799	
8.	-2.0	5.0	4.1	0.039922	0.005497	-0.001981	-0.000011	-0.002073	-0.000725	-0.0007247	0.0037819	0.512	0.809	
9.	8.0	-5.0	-11.8	0.034210	0.006422	-0.001367	0.000257	-0.001366	0.003317	0.0033167	0.0039870	0.512	0.808	.6
10.	10.0	-5.0	-13.7	0.044938	0.006454	-0.001683	0.000763	-0.001601	0.004420	0.0044203	0.0045834	0.508	0.811	.5
11.	12.0	-10.0	-16.8	0.018331	0.004282	-0.000526	0.000275	-0.000688	0.003554	0.0035537	0.0040631	0.509	0.810	.8
12.	12.0	-10.0	-16.5	0.029473	0.004291	-0.001625	-0.000171	-0.000750	0.005041	0.0050413	0.0045432	0.509	0.812	.9
13.	13.7	-10.0	-20.4	0.039466	0.004421	-0.000828	0.000436	-0.001959	0.006472	0.0064716	0.0051189	0.510	0.809	.7
14.	12.7	-12.0	-21.5	0.029227	0.004691	-0.000258	-0.000181	-0.000734	0.005698	0.0056983	0.0048936	0.512	0.810	.9
15.	12.0	-6.0	-17.4	0.034044	0.004284	-0.001775	-0.000329	-0.001123	0.005469	0.0054686	0.0047075	0.512	0.809	.8
16.	10.0	-8.0	-15.7	0.031419	0.004307	-0.000931	0.000319	-0.000745	0.004056	0.0040563	0.0040254	0.510	0.808	.8
17.	8.0	-8.0	-13.9	0.027836	0.004736	-0.000722	0.000335	-0.000711	0.002789	0.0027896	0.0036351	0.510	0.808	.8
18.	8.0	-3.0	-11.8	0.034307	0.004648	-0.001226	0.000349	-0.001549	0.003422	0.0034198	0.0044805	0.512	0.809	.6
19.	6.0	-3.0	-8.8	0.032839	0.004108	-0.001793	0.000355	-0.001625	0.002442	0.0024422	0.0036042	0.510	0.810	.5
20.	4.0	-3.0	-6.6	0.022683	0.003966	-0.001762	0.000530	-0.000729	0.001840	0.0018396	0.0032283	0.510	0.810	.4
21.	4.0	2.0	-3.7	0.033844	0.004533	-0.001368	-0.000217	-0.001497	0.002681	0.0026807	0.0052496	0.516	0.811	
22.	2.0	2.0	-1.6	0.043216	0.004641	-0.000217	0.000078	-0.001407	0.000554	0.0005545	0.0036067	0.512	0.808	
23.	6.0	2.0	-5.8	0.026608	0.004471	-0.003538	0.000240	-0.001869	0.001858	0.0018577	0.0050986	0.511	0.810	

Table II-19. (Concluded)

TEST 310.0 RUN 14

44 FT. TAPERED TIP ROTOR V/OR = .51 M(1.0)(90) = .81

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	2.0	-2.0	-4.0	0.016586	0.003254	-0.000687	-0.000033	-0.000283	0.001277	0.0012825	0.0026617	0.514	0.805	.3
2.	2.0	-2.0	-3.0	0.026185	0.004285	-0.000901	-0.000029	-0.000609	0.001131	0.0011118	0.0028208	0.517	0.803	.2
3.	2.0	0.0	-1.0	0.048181	0.006329	-0.001738	-0.000017	-0.001039	0.000157	0.0002447	0.0033858	0.514	0.805	.2
4.	2.0	2.0	1.0	0.076474	0.009794	-0.002878	0.000097	-0.001250	-0.001068	-0.0009358	0.0052405	0.518	0.799	.2
5.	0.0	0.0	-1.0	0.016944	0.003288	-0.000729	-0.000041	-0.000148	0.000999	0.0009423	0.0026076	0.511	0.806	.2
6.	0.0	2.0	1.0	0.038915	0.004712	-0.001637	-0.000129	-0.000629	0.000074	0.0001221	0.0031617	0.513	0.805	.2
7.	0.0	4.0	3.0	0.063241	0.007278	-0.002527	-0.000187	-0.001235	-0.001665	-0.0014673	0.0043300	0.513	0.805	.2
8.	0.0	6.0	5.0	0.087219	0.009602	-0.003391	0.000037	-0.001471	-0.003042	-0.0026958	0.0065611	0.515	0.805	.2
9.	-2.0	6.0	5.0	0.051681	0.004876	-0.002825	-0.000031	-0.000564	-0.001541	-0.0013806	0.0037603	0.514	0.804	.1
10.	-2.0	4.0	3.0	0.028909	0.003636	-0.001678	-0.000085	-0.000571	0.000116	0.0001206	0.0029580	0.510	0.809	.1
11.	4.0	0.0	-1.0	0.087023	0.012557	-0.003416	0.000492	-0.001488	0.000251	0.0003019	0.0063242	0.510	0.808	.1
12.	4.0	-2.0	-3.0	0.066146	0.009993	-0.002664	0.000075	-0.001630	0.000646	0.0006424	0.0043658	0.513	0.804	.1
13.	4.0	-4.0	-5.0	0.041634	0.006298	-0.001503	0.000013	-0.000751	0.001494	0.0013890	0.0030255	0.510	0.808	.1

For the following data points
a_{1_s} and/or $b_{1_s} \neq 0^o \pm .2^o$

PT.	THETA	ALPHA SHAFT	a_{1_s}	b_{1_s}
1	2	-2	0	0
2	2	-2	1.4	0
3	2	0	2.9	0
4	2	2	4.8	0
5	0	0	0	0
6	0	2	1.4	0
7	0	4	2.9	0
8	0	6	4.3	0
9	-2	6	.8	0
10	-2	4	- .7	0
11	4	0	6.7	0
12	4	-2	5.3	0
13	4	-4	3.4	0

Table II - 20. Rotor No. 2.

TEST 310.0 RUN 15

44 FT. TAPERED TIP ROTOR V/OR = .52 M(1.0)(90) = .81

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	6.0	-5.0	-10.1	0.023627	0.004043	-0.000595	-0.000193	-0.000715	0.002469	0.0022069	0.0032143	0.526	0.811	.5
2.	8.0	-5.0	-12.0	0.036362	0.004439	-0.001154	-0.000024	-0.001052	0.003304	0.0029701	0.0035596	0.522	0.814	.5
3.	10.0	-5.0	-14.1	0.047585	0.004662	-0.001646	-0.000063	-0.001049	0.004823	0.0040518	0.0042038	0.523	0.812	.4
4.	12.0	-5.0	-15.8	0.055494	0.004265	-0.002035	-0.000144	-0.001370	0.006034	0.0053004	0.0048435	0.522	0.812	.4
5.	12.0	-7.0	-17.0	0.046165	0.004673	-0.001258	-0.000011	-0.000993	0.005319	0.0049301	0.0043093	0.524	0.810	.7
6.	12.0	-10.0	-18.6	0.029926	0.004802	-0.000419	-0.000089	-0.000729	0.004867	0.0041751	0.0038868	0.522	0.811	1.0
7.	10.0	-7.0	-15.3	0.036898	0.004527	-0.000904	-0.000012	-0.000665	0.004365	0.0037786	0.0037098	0.521	0.811	.9
8.	8.0	-7.0	-13.3	0.026329	0.004405	-0.000735	-0.000364	-0.000810	0.003252	0.0028128	0.0038849	0.521	0.810	.8
9.	8.0	0.0	-9.3	0.064825	0.003386	-0.003196	-0.000070	-0.001430	0.003607	0.0030012	0.0045620	0.521	0.809	.2
10.	6.0	0.0	-7.1	0.055322	0.004117	-0.002799	-0.000056	-0.001243	0.002016	0.0018455	0.0038420	0.521	0.814	.3
11.	4.0	0.0	-4.9	0.046657	0.004084	-0.002104	-0.000051	-0.000709	0.001354	0.0012606	0.0033063	0.524	0.809	.2
12.	2.0	0.0	-2.9	0.032504	0.003744	-0.001441	-0.000026	-0.000600	0.001087	0.0009530	0.0028641	0.524	0.809	.2
13.	2.0	2.0	-1.6	0.046169	0.004001	-0.002286	-0.000012	-0.000686	0.000484	0.0004284	0.0032517	0.522	0.812	.1
14.	0.0	2.0	0.2	0.033740	0.003874	-0.001713	-0.000060	-0.000594	0.000492	0.0003959	0.0029725	0.521	0.811	.1
15.	0.0	5.0	2.0	0.054054	0.004268	-0.003315	-0.000072	-0.000626	-0.000946	-0.0007831	0.0037155	0.518	0.814	
16.	0.0	7.0	3.2	0.068557	0.004097	-0.004557	-0.000132	-0.000851	-0.001930	-0.0016774	0.0045585	0.520	0.810	
17.	2.0	5.0	0.2	0.064473	0.003935	-0.004078	-0.000031	-0.000820	-0.000717	-0.0005722	0.0041648	0.518	0.814	
18.	4.0	5.0	-2.1	0.075696	0.003124	-0.005293	-0.000283	-0.001029	0.000352	0.0002781	0.0050921	0.524	0.807	
19.	4.0	2.0	-3.7	0.055317	0.003549	-0.004134	-0.000126	-0.000802	0.001003	0.0009034	0.0036444	0.527	0.805	
20.	6.0	2.0	-5.9	0.066061	0.003276	-0.003932	-0.000189	-0.001247	0.001984	0.0017418	0.0044419	0.522	0.810	
21.	6.0	-3.0	-8.8	0.038400	0.004290	-0.001499	-0.000072	-0.000776	0.002469	0.0021692	0.0032504	0.521	0.809	.4
22.	4.0	-3.0	-6.8	0.024971	0.005334	-0.134523	-0.192017	-0.002960	0.041599	0.0016847	0.0037697	0.526	0.804	.5
23.	8.0	-3.0	-10.9	0.049367	0.004406	-0.002005	-0.000030	-0.001167	0.003296	0.0029619	0.0037843	0.519	0.813	.5
24.	10.0	-3.0	-12.8	0.056758	0.004054	-0.002600	-0.000069	-0.001599	0.004675	0.0040871	0.0044885	0.519	0.812	.4

Table II - 21. Rotor No. 3.

TEST 310.0 RUN 19

34 FT. 0012 ROTOR V/OR = .51 M(1.0)(90) = .63

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	8.0	-2.0	-9.6	0.046005	0.004323	-0.002206	-0.000205	0.006463	0.003024	0.0028436	0.0040947	0.511	0.648	.0
2.	10.0	-2.0	-11.6	0.056616	0.004608	-0.002827	0.000021	0.006402	0.003965	0.0037217	0.0048651	0.512	0.647	.0
3.	6.0	-2.0	-7.8	0.037184	0.004234	-0.002568	0.001227	0.006751	0.002865	0.0022558	0.0036787	0.514	0.644	.0
4.	4.0	-2.0	-5.8	0.029564	0.003674	-0.001259	-0.000228	0.006514	0.001797	0.0017716	0.0031824	0.508	0.643	.0
5.	2.0	-2.0	-3.7	0.012549	0.003562	-0.000668	0.000812	0.007035	0.001306	0.0013811	0.0029683	0.512	0.644	.4
6.	0.0	-2.0	-2.0	0.000672	0.003392	-0.000252	-0.000080	0.006589	0.001137	0.0011443	0.0028651	0.511	0.644	.5
7.	0.0	2.0	0.7	0.028484	0.003851	-0.002350	0.001399	0.006673	0.001152	0.0006763	0.0030295	0.512	0.641	
8.	2.0	2.0	-1.2	0.036261	0.004005	-0.002182	-0.000057	0.006361	0.000789	0.0006718	0.0032641	0.508	0.642	
9.	4.0	2.0	-3.3	0.048564	0.004058	-0.003036	0.000364	0.006589	0.001231	0.0010761	0.0038726	0.512	0.641	
10.	6.0	2.0	-5.5	0.058471	0.004316	-0.003838	0.000182	0.005049	0.001769	0.0016368	0.0046639	0.511	0.640	
11.	8.0	2.0	-7.2	0.068394	0.004056	-0.004321	0.000061	0.005222	0.002878	0.0024352	0.0054269	0.511	0.640	
12.	10.0	2.0	-8.8	0.079146	0.003877	-0.005276	0.000322	0.004484	0.004191	0.0037198	0.0067122	0.511	0.639	
13.	10.0	0.0	-10.2	0.068045	0.004457	-0.003828	-0.000121	0.005080	0.004008	0.0036887	0.0056594	0.509	0.641	
14.	12.0	-2.0	-15.7	0.088295	0.004390	-0.003686	-0.000136	0.005358	0.005780	0.0051166	0.0058353	0.509	0.641	
15.	12.0	-4.0	-14.6	0.086791	0.004860	-0.002757	-0.000014	0.005471	0.005447	0.0049261	0.0051658	0.507	0.643	
16.	10.0	-4.0	-12.7	0.066686	0.004485	-0.002082	-0.000005	0.005905	0.004264	0.0038069	0.0043643	0.512	0.639	
17.	8.0	-4.0	-11.1	0.056220	0.004188	-0.001515	-0.000065	0.005875	0.003289	0.0029804	0.0038068	0.510	0.641	
18.	6.0	-4.0	-9.1	0.026899	0.003883	-0.001145	0.000191	0.006067	0.002537	0.0022832	0.0033298	0.509	0.638	
19.	4.0	-4.0	-7.2	0.011893	0.003492	-0.000585	-0.000273	0.006091	0.001768	0.0017114	0.0030488	0.507	0.639	
20.	6.0	-6.0	-10.9	0.012391	0.003741	-0.000451	-0.000105	0.005962	0.002132	0.0020298	0.0032499	0.507	0.639	
21.	8.0	-6.0	-12.1	0.026956	0.004205	-0.000874	-0.000079	0.005629	0.003100	0.0028311	0.0035893	0.508	0.639	
22.	10.0	-6.0	-13.8	0.033842	0.004443	-0.001108	-0.000020	0.005533	0.004091	0.0037397	0.0041153	0.511	0.638	
23.	12.0	-6.0	-15.8	0.047187	0.004842	-0.001865	-0.000070	0.005280	0.005569	0.0050282	0.0048217	0.510	0.637	
24.	14.0	-6.0	-17.8	0.061482	0.005096	-0.001935	-0.000299	0.005154	0.007298	0.0066486	0.0057088	0.511	0.637	
25.	8.0	0.0	-8.5	0.056982	0.004081	-0.003142	0.000168	0.005772	0.002922	0.0026991	0.0045754	0.511	0.637	
26.	6.0	0.0	-6.7	0.046701	0.003978	-0.002521	0.000051	0.006070	0.002210	0.0020543	0.0039432	0.510	0.637	
27.	4.0	0.0	-4.7	0.035182	0.003859	-0.001962	-0.000195	0.005902	0.001623	0.0014904	0.0033797	0.510	0.637	
28.	2.0	0.0	-2.5	0.025141	0.003805	-0.001369	-0.000088	0.006094	0.001162	0.0010876	0.0029890	0.510	0.637	
29.	0.0	0.0	-0.5	0.012107	0.003608	-0.000774	-0.000070	0.006164	0.001023	0.0009986	0.0028209	0.508	0.638	
30.	0.0	4.0	2.0	0.036717	0.004566	-0.002292	0.000096	0.005563	0.000081	0.0000400	0.0035655	0.508	0.638	
31.	0.0	6.0	3.1	0.047231	0.004904	-0.003002	-0.000108	0.005651	-0.000840	-0.0006883	0.0042112	0.513	0.637	
32.	2.0	6.0	1.5	0.059468	0.004547	-0.003858	0.000188	0.006239	-0.000784	-0.0006056	0.0046832	0.513	0.637	
33.	2.0	4.0	0.1	0.047546	0.004660	-0.002766	-0.000120	0.005517	0.000179	0.0001201	0.0040490	0.511	0.639	
34.	4.0	4.0	-2.1	0.059570	0.004249	-0.003687	-0.000057	0.006040	0.000626	0.0004412	0.0045126	0.512	0.639	.6
35.	4.0	6.0	-0.9	0.069718	0.003867	-0.004547	0.000294	0.005817	0.000066	0.0000398	0.0053060	0.510	0.641	.0
36.	6.0	6.0	-2.9	0.081485	0.003246	-0.005350	0.000088	0.005714	0.001014	0.0008493	0.0064657	0.514	0.637	
37.	6.0	4.0	-4.2	0.070468	0.003988	-0.004576	0.000012	0.005874	0.001628	0.0013347	0.0055917	0.514	0.637	
38.	6.0	8.0	-1.7	0.094068	0.002004	-0.006294	0.000487	0.005636	0.000622	0.0005257	0.0077084	0.513	0.637	
39.	4.0	8.0	0.2	0.084258	0.003081	-0.005358	0.000271	0.005779	-0.000860	-0.0006075	0.0064895	0.510	0.635	
40.	4.0	10.0	1.5	0.097115	0.002081	-0.006016	0.000321	0.005776	-0.001482	-0.0011745	0.0078669	0.510	0.635	.0

Table II-21. (Concluded)

TEST 310.0 RUN 24

34 FT. 0012 ROTOR V/OR = .5 M(1.0)(90) = .63

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
36.	2.0	-4.0	-5.2	0.002484	0.003283	-0.000724	-0.000150	0.004948	0.001420	0.0012180	0.0027834	0.505	0.621	
37.	4.0	-6.0	-8.6	0.002673	0.003375	-0.000607	-0.000124	0.004956	0.001526	0.0013768	0.0029309	0.505	0.623	.1
38.	6.0	10.0	-0.5	0.103749	0.001034	-0.005766	0.000294	0.003558	0.000145	0.0002915	0.0091958	0.503	0.623	.0
39.	8.0	8.0	-3.8	0.098191	0.001212	-0.004902	0.000231	0.004210	0.002087	0.0017908	0.0086799	0.505	0.623	.1
40.	8.0	6.0	-4.8	0.087975	0.002455	-0.004895	0.000310	0.004307	0.002243	0.0018743	0.0072623	0.505	0.623	.0
41.	8.0	4.0	-6.1	0.080616	0.003762	-0.004952	0.000020	0.004033	0.002373	0.0019577	0.0062838	0.506	0.624	.0
42.	10.0	4.0	-7.5	0.087455	0.002784	-0.004439	0.000260	0.004201	0.003978	0.0033742	0.0073812	0.507	0.624	.2
43.	12.0	0.0	-12.1	0.078789	0.003302	-0.003746	0.000694	0.003920	0.005844	0.0051221	0.0063816	0.504	0.623	.5

For the following data points
a_{1_s} and/or $b_{1_s} \neq 0^\circ \pm .2^\circ$

PT.	THETA	ALPHA SHAFT	a_{1_s}	b_{1_s}
25	4	7	0	.7
39	8	8	0	.7
40	8	6	0	.4
42	10	4	0	.6
43	12	0	0	.6

Table II - 22. Rotor No. 3.

TEST 310.0 RUN 29

34 FT. 0012 ROTOR V/OR = .65 M(1.0)(90) = .54

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	0.0	0.0	-0.9	0.010147	0.004985	-0.001162	-0.000035	0.009854	0.001320	0.0011998	0.0044359	0.650	0.540	-1.0
2.	0.0	2.0	-0.0	0.022680	0.005254	-0.001985	-0.000144	0.010279	0.000870	0.0007986	0.0047150	0.652	0.541	- .7
3.	0.0	4.0	0.9	0.037955	0.005775	-0.002577	-0.000583	0.010399	0.000016	0.0001331	0.0055556	0.653	0.542	
4.	0.0	6.0	2.0	0.047867	0.006054	-0.003570	-0.000498	0.010700	-0.000741	-0.0006656	0.0057831	0.654	0.542	-1.4
5.	0.0	7.0	2.4	0.053058	0.006072	-0.004197	-0.000706	0.007906	-0.001424	-0.0010645	0.0069161	0.650	0.540	-1.4
6.	0.0	8.0	3.0	0.061867	0.005910	-0.004864	-0.000050	0.007609	-0.002035	-0.0015968	0.0076118	0.649	0.540	
7.	0.0	5.0	1.6	0.040981	0.005761	-0.003115	-0.000542	0.008926	-0.000196	-0.0002661	0.0057073	0.650	0.541	-1.1
8.	2.0	5.0	-0.6	0.047566	0.006021	-0.003810	-0.000835	0.008776	-0.000024	-0.0001345	0.0063825	0.653	0.539	-1.0
9.	2.0	6.0	-0.2	0.051515	0.005420	-0.004735	-0.000314	0.008947	-0.000402	-0.0003992	0.0064737	0.650	0.540	-1.0
10.	2.0	7.0	0.1	0.057683	0.005310	-0.005338	-0.000404	0.008260	-0.000993	-0.0007984	0.0070266	0.650	0.540	-1.1
11.	2.0	8.0	0.6	0.066735	0.005300	-0.005516	-0.000236	0.007830	-0.001717	-0.0013306	0.0078928	0.649	0.540	
12.	2.0	4.0	-1.4	0.043009	0.006240	-0.003465	-0.000345	0.008659	0.000506	0.0002661	0.0061742	0.650	0.541	- .8
13.	2.0	2.0	-2.3	0.030045	0.006023	-0.002813	0.000024	0.008281	0.001003	0.0009316	0.0054820	0.650	0.541	- .7
14.	2.0	0.0	-3.2	0.017574	0.005761	-0.001695	-0.000500	0.008892	0.001383	0.0013308	0.0050657	0.651	0.541	- .6
15.	2.0	-2.0	-4.2	0.008002	0.005592	-0.001097	-0.000091	0.008906	0.001411	0.0014637	0.0049083	0.649	0.540	- .5
16.	4.0	-2.0	-6.5	0.013886	0.006020	-0.001745	-0.000078	0.008680	0.001798	0.0017299	0.0053166	0.650	0.541	- .4
17.	4.0	-4.0	-7.5	0.003681	0.006673	-0.000847	-0.000485	0.008830	0.001717	0.0016142	0.0051498	0.655	0.539	- .3
18.	4.0	0.0	-5.7	0.024088	0.006170	-0.002373	-0.000230	0.008981	0.001728	0.0016141	0.0056222	0.654	0.539	- .4
19.	4.0	2.0	-4.5	0.037773	0.006360	-0.003885	0.000177	0.008861	0.001404	0.0010760	0.0060227	0.654	0.539	- .6
20.	4.0	3.0	-4.1	0.044587	0.006400	-0.004132	0.000143	0.009377	0.001257	0.0008071	0.0064176	0.654	0.539	- .5
21.	4.0	4.0	-3.6	0.051446	0.006299	-0.004709	-0.000041	0.008952	0.000796	0.0005380	0.0068627	0.654	0.539	- .7
22.	4.0	5.0	-3.1	0.054696	0.005875	-0.005235	0.000258	0.009715	0.000599	0.0004035	0.0071963	0.653	0.539	- .7
23.	4.0	6.0	-2.5	0.059899	0.005651	-0.005619	-0.000208	0.009287	0.000186	-0.0001347	0.0074617	0.654	0.538	- .8
24.	4.0	7.0	-2.0	0.067518	0.006022	-0.006063	-0.000190	0.008313	-0.000473	-0.0006737	0.0083967	0.654	0.538	- .9
25.	4.0	8.0	-1.5	0.072790	0.004967	-0.006685	0.000419	0.007480	-0.000642	-0.0008084	0.0087688	0.653	0.538	-1.0
26.	6.0	7.0	-3.9	0.074168	0.005449	-0.006615	-0.000105	0.008697	0.000558	0.0004042	0.0095789	0.654	0.538	- .6
27.	6.0	8.0	-3.5	0.079040	0.004363	-0.006134	0.000107	0.009465	0.000363	0.0002695	0.0099827	0.654	0.538	
28.	6.0	6.0	-4.5	0.065712	0.005906	-0.006552	-0.000036	0.007916	0.000752	0.0004042	0.0085295	0.654	0.538	- .8
29.	6.0	4.0	-5.6	0.056222	0.006588	-0.005583	0.000178	0.008272	0.001429	0.0009434	0.0076794	0.657	0.539	
30.	6.0	2.0	-6.6	0.043166	0.006716	-0.004556	0.000706	0.008431	0.001955	0.0014821	0.0067624	0.654	0.538	
31.	6.0	0.0	-7.6	0.032187	0.006727	-0.003426	0.000360	0.009060	0.001974	0.0018864	0.0062350	0.654	0.538	- .2
32.	6.0	-2.0	-8.7	0.021500	0.006793	-0.002208	-0.000193	0.009245	0.002111	0.0018864	0.0058111	0.654	0.538	- .2
33.	6.0	-4.0	-9.5	0.008262	0.005996	-0.001188	0.000016	0.009395	0.001927	0.0018897	0.0054209	0.654	0.538	.0
34.	8.0	-4.0	-11.6	0.015617	0.006900	-0.001297	-0.000679	0.009294	0.002504	0.0024297	0.0062082	0.654	0.538	.0
35.	8.0	-6.0	-12.6	0.006651	0.006925	-0.001012	0.548506	0.009290	-0.055256	0.0018898	0.0059403	0.655	0.538	.0

ROTOR SCALE DATA * PROGRAM LA2530 * BODY AXES

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TIME 907.07

Table II-22. (Concluded)

TEST 310.0 RUN 23

34 FT. 0012 ROTOR V/OR = .65 M(1.0)(90) = .54

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
36.	8.0	-2.0	-10.7	0.027573	0.007219	-0.002432	-0.000029	0.009607	0.002529	0.0024298	0.0064837	0.655	0.538	.1
37.	8.0	0.0	-9.7	0.037534	0.006920	-0.003765	0.000290	0.009177	0.002524	0.0022947	0.0067517	0.654	0.538	-.1
38.	8.0	2.0	-8.7	0.049552	0.006599	-0.004949	0.000733	0.008972	0.002447	0.0020248	0.0073516	0.655	0.538	-.1
39.	8.0	4.0	-7.5	0.062552	0.006387	-0.005614	0.000293	0.008481	0.002072	0.0017547	0.0085816	0.654	0.538	.0
40.	8.0	6.0	-6.0	0.075342	0.006156	-0.005741	0.000262	0.007690	0.002022	0.0017548	0.0106362	0.654	0.538	.4
41.	8.0	8.0	-4.0	0.101536	0.007325	-0.006365	0.000332	0.005711	0.002141	0.0018898	0.0153902	0.655	0.538	.4
42.	10.0	6.0	-6.0	0.104245	0.010636	-0.006245	0.000756	0.004153	0.004243	0.0036441	0.0171360	0.653	0.538	.0
43.	10.0	4.0	-8.0	0.081245	0.009274	-0.006284	0.000223	0.005463	0.003620	0.0031164	0.0125999	0.657	0.538	.3
44.	10.0	2.0	-10.0	0.058790	0.008102	-0.005109	0.000488	0.008090	0.003225	0.0028405	0.0093426	0.657	0.539	.5
45.	10.0	0.0	-11.5	0.044512	0.008054	-0.004379	0.000743	0.008408	0.003279	0.0029750	0.0081488	0.655	0.538	.1
46.	10.0	-2.0	-12.5	0.035133	0.008517	-0.003269	0.000033	0.008604	0.003237	0.0029748	0.0076784	0.654	0.538	.2
47.	10.0	-4.0	-13.5	0.022188	0.007761	-0.001849	-0.000156	0.009311	0.003059	0.0028399	0.0068734	0.655	0.538	.3
48.	10.0	-6.0	-14.5	0.012395	0.007543	-0.001178	0.000969	0.009518	0.002668	0.0025695	0.0066298	0.656	0.538	.4
49.	10.0	-8.0	-15.4	0.002803	0.007728	-0.000367	-0.000177	0.008758	0.002093	0.0018931	0.0066463	0.655	0.538	.4

For the following data points
a_{1_s} and/or $b_{1_s} \neq 0^o \pm .2^o$

PT.	THETA	ALPHA SHAFT	a_{1_s}	b_{1_s}
40	8	6	1.0	0
41	8	8	2.9	0
42	10	6	4.8	0
43	10	4	2.9	0
43	10	2	.5	0

Table II - 23. Rotor No. 3.

TEST 310.0 RUN 20

34 FT. 0012 ROTOR V/OR = .75 M(1.0)(90) = .50

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	8.0	0.0	-9.5	0.042483	0.007378	-0.003689	0.000086	0.011269	0.002507	0.0023610	0.0072555	0.675	0.538	
2.	6.0	0.0	-7.6	0.034085	0.006486	-0.003241	-0.000209	0.011667	0.002138	0.0018053	0.0061226	0.674	0.537	
3.	6.0	0.0	-7.8	0.025685	0.007874	-0.003312	0.000025	0.012568	0.001803	0.0017341	0.0075900	0.747	0.302	
4.	8.0	0.0	-9.8	0.034513	0.008471	-0.004429	0.000067	0.016331	0.002015	0.0021107	0.0084432	0.754	0.500	
5.	8.0	-2.0	-11.1	0.021244	0.009274	-0.002841	0.000223	0.015036	0.001971	0.0021108	0.0085221	0.754	0.500	
6.	10.0	-2.0	-12.9	0.024283	0.010106	-0.003354	-0.000076	0.018476	0.002428	0.0022908	0.0092434	0.754	0.500	
7.	6.0	-2.0	-9.1	0.018379	0.008314	-0.001913	-0.000098	0.013371	0.001754	0.0017656	0.0076867	0.756	0.500	
8.	6.0	-4.0	-9.8	0.008379	0.007889	-0.001079	-0.000341	0.013045	0.001566	0.0015891	0.0073510	0.756	0.500	
9.	8.0	-4.0	-11.9	0.005564	0.009192	-0.001291	-0.000468	0.013948	0.001678	0.0017658	0.0084123	0.757	0.500	
10.	10.0	-4.0	-13.8	0.011656	0.010074	-0.001868	-0.000245	0.015318	0.002254	0.0022955	0.0092801	0.757	0.500	
11.	10.0	-4.0	-8.0	-0.004747	0.008476	-0.000497	-0.000194	0.013878	0.001277	0.0012361	0.0063788	0.757	0.500	
12.	8.0	-2.0	-8.6	0.007581	0.006774	-0.001258	-0.000425	0.013880	0.001462	0.0015892	0.0065138	0.757	0.500	
13.	2.0	-2.0	-4.1	0.003976	0.005880	-0.000898	-0.000269	0.014519	0.001286	0.0014126	0.0057555	0.757	0.500	
14.	2.0	0.0	-3.3	0.014783	0.006337	-0.001688	0.000161	0.014386	0.001389	0.0014128	0.0062075	0.758	0.500	
15.	0.0	0.0	-1.1	0.006686	0.003992	-0.001049	-0.000159	0.014388	0.001091	0.0012360	0.0057684	0.757	0.500	
16.	0.0	2.0	-0.1	0.022879	0.005940	-0.002303	-0.000033	0.014860	0.001090	0.0008846	0.0059683	0.758	0.500	-1.0
17.	0.0	4.0	0.7	0.024806	0.006360	-0.003314	-0.000097	0.000546	0.000098	0.0003538	0.0064473	0.758	0.500	-1.3
18.	0.0	6.0	1.9	0.044607	0.003521	-0.004136	-0.000216	0.017446	-0.000487	-0.0003538	0.0057500	0.758	0.500	-1.4
19.	0.0	8.0	2.4	0.071077	0.003797	-0.005547	-0.000312	0.017723	-0.002283	-0.0017690	0.0083605	0.757	0.500	-1.4
20.	2.0	8.0	0.5	0.078469	0.001764	-0.006270	-0.000411	0.020643	-0.002209	-0.0015921	0.0077414	0.757	0.500	-1.4
21.	2.0	6.0	-0.6	0.060099	0.005691	-0.005508	0.000043	0.015205	-0.000728	-0.0005307	0.0083668	0.758	0.500	-1.0
22.	2.0	4.0	-1.8	0.044520	0.004692	-0.004394	-0.000046	0.017847	0.000468	0.0003538	0.0061730	0.758	0.500	-1.0
23.	4.0	4.0	-3.9	0.050074	0.007149	-0.005402	0.000375	0.013595	0.000719	0.0005307	0.0084834	0.758	0.500	- .8
24.	4.0	2.0	-4.8	0.034817	0.007714	-0.004611	0.000834	0.012571	0.001316	0.0012384	0.0079558	0.758	0.500	- .5
25.	4.0	0.0	-5.8	0.022084	0.007645	-0.003065	0.000553	0.012943	0.001602	0.0014153	0.0071924	0.758	0.500	- .4
26.	6.0	2.0	-7.0	0.041314	0.008298	-0.004883	0.000399	0.012802	0.001813	0.0012719	0.0086843	0.769	0.496	- .3
27.	2.0	2.0	-2.6	0.030236	0.007045	-0.003177	-0.000214	0.012784	0.001158	0.0008862	0.0069888	0.759	0.500	- .8
28.	4.0	6.0	-3.0	0.062057	0.006210	-0.006819	0.000561	0.012702	0.000078	0.0000000	0.0094442	0.759	0.500	- .9

Table II - 24. Rotor No. 3.

TEST 310.0 RUN 21

34 FT. 0012 ROTOR V/OR = .86 M(1.0)(90) = .47

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	0.0	0.0	-1.1	0.009157	0.007066	-0.000928	-0.000609	0.019990	0.001227	0.0014035	0.0075418	0.869	0.462	-1.1
2.	0.0	2.0	-0.4	0.026547	0.007059	-0.002131	-0.001087	0.018328	0.000847	0.0011213	0.0078475	0.850	0.467	-1.4
3.	0.0	4.0	0.3	0.045011	0.007637	-0.003270	-0.000817	0.018133	0.000302	0.0004548	0.0095867	0.856	0.465	-1.5
4.	0.0	6.0	1.3	0.056705	0.007490	-0.004359	-0.000562	0.016965	-0.000910	-0.0006728	0.0104929	0.850	0.467	-1.4
5.	0.0	8.0	2.0	0.079161	0.004583	-0.006229	-0.000187	0.020188	-0.002404	-0.0017940	0.0111936	0.850	0.467	-1.8
6.	2.0	6.0	-1.0	0.060818	0.007118	-0.005632	-0.000658	0.018068	-0.000826	-0.0004548	0.0108952	0.855	0.465	-1.3
7.	2.0	4.0	-2.1	0.046016	0.009138	-0.004386	-0.000372	0.016314	0.000144	0.0004557	0.0109444	0.857	0.465	-1.1
8.	2.0	2.0	-2.9	0.027341	0.008457	-0.002906	-0.000665	0.018881	0.001071	0.0009113	0.0089407	0.857	0.465	-1.0
9.	2.0	0.0	-3.4	0.013687	0.007142	-0.001837	-0.000715	0.019224	0.001087	0.0013644	0.0074707	0.856	0.465	-1.0
10.	2.0	-2.0	-4.2	-0.002404	0.007132	-0.000710	-0.000927	0.018179	0.001190	0.0015919	0.0077696	0.857	0.466	- .8
11.	4.0	-2.0	-6.6	0.002290	0.008156	-0.002013	-0.000130	0.018512	0.001377	0.0015918	0.0085009	0.856	0.465	- .5
12.	4.0	-4.0	-7.5	-0.014106	0.007956	0.000086	-0.001002	0.017211	0.000795	0.0011371	0.0087550	0.857	0.466	- .4
13.	4.0	0.0	-6.0	0.015054	0.008878	-0.003038	-0.000111	0.017350	0.001504	0.0015919	0.0091897	0.857	0.466	- .7
14.	4.0	2.0	-5.1	0.030815	0.008291	-0.004190	-0.000343	0.019389	0.001128	0.0011371	0.0091239	0.857	0.466	- .7
15.	4.0	4.0	-4.3	0.045101	0.007290	-0.005873	0.000253	0.019743	0.000589	0.0006822	0.0095164	0.855	0.465	- .7
16.	4.0	6.0	-3.4	0.060928	0.006939	-0.007381	-0.000038	0.019467	-0.000020	0.0000000	0.0112382	0.857	0.466	-1.0
17.	4.0	8.0	-2.4	0.088609	0.004439	-0.008449	-0.000628	0.020044	-0.000826	-0.0006822	0.0133489	0.856	0.465	-1.1
18.	6.0	6.0	-5.0	0.075838	0.008894	-0.009339	0.000500	0.018632	0.000854	0.0009098	0.0150440	0.855	0.465	- .2
19.	6.0	4.0	-6.6	0.050323	0.010861	-0.006794	0.000072	0.015839	0.001347	0.0011370	0.0138230	0.856	0.465	- .6
20.	6.0	2.0	-7.5	0.037054	0.010887	-0.005773	0.000264	0.016996	0.001313	0.0011371	0.0115101	0.856	0.466	- .4
21.	6.0	0.0	-8.4	0.015861	0.010392	-0.003967	0.000220	0.017821	0.001262	0.0015919	0.0104820	0.857	0.466	- .3
22.	6.0	-2.0	-9.2	0.001615	0.011049	-0.002194	-0.000264	0.016006	0.001063	0.0015919	0.0110050	0.857	0.466	
23.	6.0	-4.0	-10.0	-0.012952	0.010534	-0.000839	-0.000693	0.016735	0.000555	0.0009097	0.0106852	0.857	0.466	
24.	6.0	-6.0	-10.8	-0.043437	0.008254	0.000081	-0.000051	0.003029	0.000732	0.0002274	0.0110705	0.856	0.465	
25.	8.0	-6.0	-12.7	-0.021441	0.011505	-0.000182	-0.000888	0.017438	-0.000308	0.0000000	0.0117022	0.856	0.466	
26.	8.0	-4.0	-12.0	-0.011686	0.011957	-0.000748	-0.000853	0.017636	0.000649	0.0009097	0.0118227	0.857	0.466	
27.	8.0	-2.0	-11.2	0.005416	0.012286	-0.002571	-0.000259	0.017488	0.001101	0.0013644	0.0117105	0.856	0.465	
28.	8.0	0.0	-10.3	0.017837	0.011751	-0.003784	-0.000809	0.018193	0.001089	0.0015919	0.0110404	0.856	0.465	
29.	8.0	2.0	-9.7	0.032439	0.011171	-0.005867	-0.000051	0.018325	0.001609	0.0015919	0.0120805	0.856	0.465	
30.	10.0	0.0	-12.1	0.032562	0.013828	-0.006097	0.000271	0.018403	0.001969	0.0020468	0.0138570	0.857	0.466	.4
31.	10.0	-2.0	-13.3	0.009845	0.014000	-0.003584	-0.000199	0.018052	0.001581	0.0015920	0.0132835	0.857	0.466	.1
32.	10.0	-4.0	-14.1	-0.004386	0.013955	-0.002418	-0.000021	0.017204	0.001273	0.0011371	0.0133263	0.857	0.466	.2
33.	10.0	-6.0	-15.0	-0.015165	0.013415	-0.001386	0.000237	0.018022	-0.000032	0.0004548	0.0132331	0.857	0.466	.2
34.	10.0	-8.0	-15.8	-0.026746	0.012890	-0.000103	-0.000775	0.017116	-0.001269	-0.0008971	0.0131075	0.851	0.467	.4

For the following data points
a_{1_s} and/or $b_{1_s} \neq 0^\circ \pm .2^\circ$

PT.	THETA	ALPHA SHAFT	a_{1_s}	b_{1_s}
18	6	6	1.2	0
30	10	0	1.2	.6

Table II – 25. Rotor No. 3.

TEST 310.0 RUN 22

34 FT. 0012 ROTOR V/OR = .94 M(1.0)(90) = .49

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

RT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	0.0	0.0	-1.4	0.016292	0.009670	-0.001045	0.004606	0.035292	0.001309	0.0015265	0.0106550	0.945	0.500	-1.4
2.	0.0	2.0	-0.6	0.032904	0.008900	-0.002956	0.004970	0.036825	0.001124	0.0010966	0.0105714	0.947	0.499	
3.	0.0	4.0	0.2	0.049068	0.007381	-0.003729	0.004346	0.039295	0.000581	0.0004394	0.0105729	0.947	0.499	-1.8
4.	0.0	6.0	1.1	0.066391	0.007161	-0.005639	0.005189	0.034809	-0.000694	-0.0006599	0.0123810	0.938	0.496	
5.	2.0	4.0	-2.5	0.047381	0.007557	-0.005357	0.005575	0.035258	0.000830	0.0006556	0.0107033	0.934	0.496	-1.5
6.	2.0	6.0	-1.4	0.062063	0.006452	-0.006331	0.005718	0.035285	0.000159	0.0000000	0.0119237	0.934	0.496	
7.	2.0	8.0	-0.7	0.092329	0.004668	-0.007170	0.005460	0.035502	-0.001853	-0.0015297	0.0144739	0.933	0.496	-1.8
8.	2.0	2.0	-3.0	0.031996	0.008941	-0.004002	0.005329	0.034674	0.001303	0.0010989	0.0104735	0.936	0.496	
9.	2.0	0.0	-3.9	0.011960	0.008421	-0.002032	0.004230	0.035764	0.001851	0.0015857	0.0095133	0.944	0.493	-1.2
10.	2.0	5.0	-1.9	0.052169	0.007059	-0.005627	0.005452	0.036380	0.000497	0.0004497	0.0112771	0.943	0.492	-1.4
11.	2.0	7.0	-1.2	0.077632	0.006886	-0.007694	0.006345	0.035118	-0.000185	-0.0006761	0.0146094	0.950	0.493	
12.	4.0	7.0	-3.4	0.077686	0.008312	-0.009071	0.006582	0.031610	0.000413	-0.0002257	0.0162916	0.944	0.491	-1.1
13.	4.0	8.0	-3.0	0.087919	0.004970	-0.007570	0.005664	0.037296	0.000166	-0.0004516	0.0155919	0.950	0.492	
14.	4.0	6.0	-4.0	0.066870	0.008763	-0.008583	0.006734	0.034049	0.000326	0.0000000	0.0146797	0.950	0.492	
15.	4.0	5.0	-4.5	0.051543	0.008281	-0.007456	0.005713	0.036362	0.000931	0.0004470	0.0123911	0.944	0.494	-1.1
16.	4.0	4.0	-5.0	0.047395	0.009758	-0.006599	0.005863	0.033738	0.001412	0.0006805	0.0128913	0.942	0.489	-1.1
17.	4.0	2.0	-5.8	0.028568	0.010543	-0.004876	0.005786	0.032874	0.001389	0.0011342	0.0119801	0.943	0.489	- .9
18.	4.0	0.0	-6.4	0.011584	0.010247	-0.003813	0.005781	0.032772	0.001215	0.0013637	0.0110375	0.944	0.489	- .6
19.	6.0	0.0	-8.6	0.008460	0.013235	-0.004009	0.005886	0.031466	0.000893	0.0011363	0.0136210	0.943	0.489	
20.	6.0	2.0	-7.9	0.031247	0.013461	-0.006390	0.006476	0.031249	0.001274	0.0009107	0.0146009	0.944	0.489	
21.	6.0	4.0	-7.0	0.040785	0.011478	-0.007371	0.006274	0.033900	0.001896	0.0009106	0.0143426	0.943	0.489	- .4
22.	6.0	5.0	-6.5	0.053580	0.010857	-0.008258	0.006122	0.033543	0.001621	0.0006830	0.0152159	0.945	0.489	
23.	6.0	6.0	-6.0	0.061880	0.010003	-0.008561	0.006228	0.033640	0.001649	0.0006830	0.0160568	0.944	0.489	
24.	8.0	2.0	-9.9	0.028113	0.015428	-0.006503	0.006418	0.032069	0.001579	0.0011425	0.0166249	0.946	0.488	.4
25.	8.0	1.0	-10.4	0.018097	0.015907	-0.005715	0.006559	0.031191	0.001449	0.0011425	0.0164700	0.946	0.488	.2
26.	8.0	0.0	-10.8	0.009641	0.016465	-0.004516	0.005866	0.030658	0.000839	0.0011445	0.0167131	0.946	0.488	

Table II – 26. Rotor No. 3.

TEST 310.0 RUN 24

34 FT. 0012 ROTOR V/OR = /./ M(1.0)(90) = .52

SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CT	CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M(1.0)(90)	A_{1_s}
1.	0.0	0.0	-1.0	0.011358	0.007943	-0.001043	-0.000773	0.032879	0.001505	0.0016873	0.0090945	0.983	0.489	-1.3
2.	0.0	0.0	-1.2	0.012140	0.009380	-0.001286	-0.000491	0.046411	0.001561	0.0016927	0.0110084	0.994	0.505	-1.4
3.	0.0	0.0	-1.2	0.014520	0.010062	-0.001343	-0.000403	0.057483	0.001564	0.0017077	0.0121070	1.034	0.514	-1.4
4.	0.0	0.0	-1.3	0.018777	0.011240	-0.001123	-0.001098	0.076990	0.001568	0.0017319	0.0140077	1.093	0.526	-1.5
5.	0.0	0.0	-1.4	0.018883	0.011155	-0.000991	-0.001193	0.076622	0.001378	0.0017483	0.0139616	1.096	0.524	-1.4
6.	0.0	2.0	-0.6	0.048320	0.011016	-0.003014	-0.000262	0.075720	0.001503	0.0013017	0.0151879	1.099	0.521	-1.8
7.	0.0	4.0	-0.2	0.070304	0.010871	-0.004502	-0.001580	0.079923	0.000403	0.0005861	0.0178105	1.103	0.525	-2.0
8.	0.0	6.0	0.5	0.088959	0.010536	-0.006727	-0.001667	0.077742	-0.001015	-0.0005963	0.0211573	1.111	0.522	-2.3
9.	0.0	8.0	0.6	0.091302	0.008946	-0.006787	-0.001025	0.074320	-0.001357	-0.0010755	0.0188888	1.096	0.517	-2.2
10.	2.0	6.0	-1.7	0.086065	0.009491	-0.007993	-0.000709	0.070420	-0.000696	-0.0005982	0.0192796	1.090	0.516	-1.6
11.	2.0	7.0	-1.4	0.101765	0.010242	-0.008670	-0.000547	0.069761	-0.001341	-0.0013166	0.0230994	1.095	0.517	-1.8
12.	2.0	5.0	-2.3	0.071422	0.011431	-0.007001	-0.000477	0.070148	0.000432	0.0001197	0.0192018	1.092	0.516	-1.5
13.	2.0	4.0	-2.6	0.060918	0.011334	-0.006349	0.000157	0.071808	0.000988	0.0006004	0.0175112	1.094	0.516	-1.4
14.	2.0	3.0	-3.1	0.047822	0.010406	-0.005277	0.000267	0.072380	0.001460	0.0008405	0.0148672	1.093	0.515	-1.2
15.	2.0	2.0	-3.5	0.036263	0.011412	-0.004838	-0.000128	0.070665	0.001801	0.0013254	0.0151535	1.094	0.515	-1.2
16.	2.0	1.0	-3.7	0.024475	0.012599	-0.003789	-0.000301	0.068807	0.001755	0.0015691	0.0158153	1.095	0.515	-1.1
17.	2.0	0.0	-4.1	0.019370	0.012627	-0.003006	-0.000077	0.068954	0.001739	0.0015688	0.0153719	1.094	0.514	-1.1
18.	2.0	-1.0	-4.3	0.004032	0.012388	-0.002103	-0.001267	0.069510	0.001678	0.0015689	0.0150419	1.094	0.514	
19.	1.0	0.0	-3.0	0.013696	0.011292	-0.002549	-0.000720	0.068814	0.001671	0.0018131	0.0141458	1.093	0.514	-1.2
20.	1.0	2.0	-2.0	0.043182	0.011357	-0.004154	-0.000039	0.070348	0.001671	0.0013294	0.0153056	1.091	0.513	-1.4
21.	1.0	4.0	-1.4	0.069977	0.010397	-0.005233	-0.000623	0.071078	0.000715	0.0006043	0.0171052	1.091	0.513	-1.6
22.	1.0	6.0	-0.8	0.089829	0.009330	-0.007899	-0.000523	0.070838	-0.000911	-0.0008489	0.0193109	1.092	0.513	-1.8
23.	3.0	6.0	-3.2	0.077612	0.010612	-0.008400	-0.000698	0.069008	-0.000291	-0.0001213	0.0200896	1.092	0.512	-1.3
24.	3.0	7.0	-2.7	0.087550	0.008976	-0.008884	-0.000860	0.069324	-0.000481	-0.0006074	0.0205761	1.093	0.512	-1.5
25.	4.0	7.0	-3.5	0.096419	0.011468	-0.009389	-0.000419	0.067476	-0.000522	-0.0003651	0.0244342	1.095	0.512	- .6
26.	4.0	6.0	-4.3	0.071418	0.011365	-0.008729	-0.000732	0.069936	0.000265	-0.0001219	0.0202955	1.096	0.512	- .7
27.	4.0	4.0	-5.1	0.051348	0.013428	-0.007666	0.000235	0.069084	0.000809	0.0006095	0.0191405	1.098	0.512	-1.0
28.	4.0	2.0	-6.0	0.034317	0.013638	-0.005848	-0.001535	0.069284	0.000690	0.0008546	0.0170388	1.094	0.511	- .7
29.	4.0	0.0	-6.7	0.009104	0.015327	-0.004345	-0.000060	0.067295	0.000912	0.0010988	0.0178618	1.094	0.511	- .6
30.	5.0	0.0	-7.9	0.000770	0.016904	-0.005155	-0.000346	0.067701	0.000566	0.0008545	0.0193303	1.093	0.511	- .5
31.	6.0	0.0	-8.9	0.001113	0.018485	-0.005240	-0.000418	0.068165	0.000315	0.0003663	0.0205879	1.094	0.511	- .2
32.	6.0	2.0	-8.3	0.021137	0.017074	-0.007167	-0.000428	0.066896	0.000732	0.0003669	0.0198306	1.094	0.511	- .5
33.	6.0	1.0	-8.8	0.008243	0.017374	-0.005828	0.000089	0.067005	0.000849	0.0003674	0.0195144	1.093	0.510	
34.	7.0	0.0	-10.1	-0.000393	0.019516	-0.005506	-0.000029	0.066122	0.000422	-0.0001225	0.0212060	1.093	0.510	
35.	8.0	0.0	-5.8	0.006914	0.013469	-0.003994	0.000207	0.066448	0.001608	0.0013497	0.0160974	1.095	0.510	

For the following data point
a_{1_s} and/or $b_{1_s} \neq 0^\circ \pm .2^\circ$

PT.	THETA	ALPHA SHAFT	a_{1_s}	b_{1_s}
25	4	7	0	.7