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REPORT No. 378

COMPARISON OF FULL-SCALE PROPELLERS HAVING R. A. F.-6 AND CLARK Y AIRFOIL SECTIONS

By HUGH B. FREEMAN

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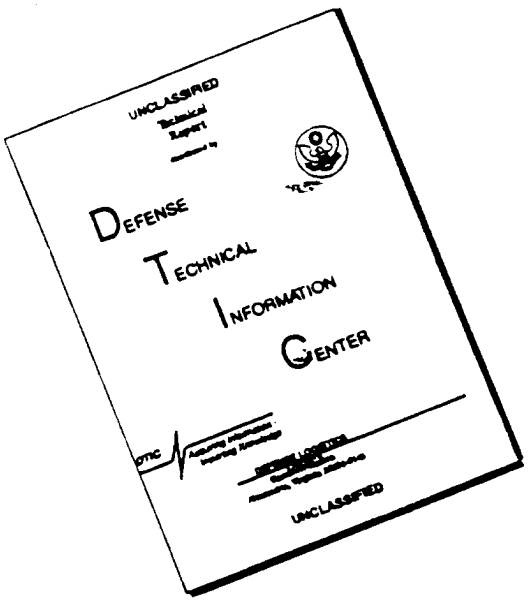

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AERONAUTICAL SYMBOLS

1. FUNDAMENTAL AND DERIVED UNITS

	Symbol	Metric		English	
		Unit	Symbol	Unit	Symbol
Length	l	meter	m	foot (or mile)	ft. (or mi.)
Time	t	second	s	second (or hour)	sec. (or hr.)
Force	F	weight of one kilogram	kg	weight of one pound	lb.
Power	P	kg/m/s		horsepower	hp
Speed		km/h	k. p. h.	mi./hr.	m. p. h.
		m/s	m. p. s.	ft./sec.	f. p. s.

2. GENERAL SYMBOLS, ETC.

W, Weight $= mg$

g, Standard acceleration of gravity $= 9.80665$ m/s^2 $= 32.1740$ ft./sec.^{2}

m, Mass $= \frac{W}{g}$

ρ, Density (mass per unit volume).

Standard density of dry air, 0.12497 (kg-m^{-4} s^2) at 15° C. and 750 mm $= 0.002378$ (lb.-ft.$^{-4}$ sec.^{2}).

Specific weight of "standard" air, 1.2255 kg/m^3 $= 0.07651$ lb./ft.^{3}.

mk^2, Moment of inertia (indicate axis of the radius of gyration k, by proper subscript).

S, Area.

S_w, Wing area, etc.

G, Gap.

b, Span.

c, Chord.

$\frac{b^2}{S}$, Aspect ratio.

μ, Coefficient of viscosity.

3. AERODYNAMICAL SYMBOLS

V, True air speed.

q, Dynamic (or impact) pressure $= \frac{1}{2}\rho V^2$.

L, Lift, absolute coefficient $C_L = \frac{L}{qS}$

D, Drag, absolute coefficient $C_D = \frac{D}{qS}$

D_o, Profile drag, absolute coefficient $C_{D_o} = \frac{D_o}{qS}$

D_i, Induced drag, absolute coefficient $C_{D_i} = \frac{D_i}{qS}$

D_p, Parasite drag, absolute coefficient $C_{D_p} = \frac{D_p}{qS}$

C, Cross-wind force, absolute coefficient $C_C = \frac{C}{qS}$

R, Resultant force.

i_w, Angle of setting of wings (relative to thrust line).

i_t, Angle of stabilizer setting (relative to thrust line).

Q, Resultant moment.

Ω, Resultant angular velocity.

$\rho\frac{Vl}{u}$, Reynolds Number, where l is a linear dimension.

e. g., for a model airfoil 3 in. chord, 100 mi./hr. normal pressure, at 15° C., the corresponding number is 234,000;

or for a model of 10 cm chord 40 m/s, the corresponding number is 274,000.

C_p, Center of pressure coefficient (ratio of distance of $c.\ p.$ from leading edge to chord length).

α, Angle of attack.

ϵ, Angle of downwash.

α_o, Angle of attack, infinite aspect ratio.

α_i, Angle of attack, induced.

α_a, Angle of attack, absolute. (Measured from zero lift position.)

γ, Flight path angle.

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COMPARISON OF FULL-SCALE PROPELLERS HAVING R. A. F.-6 AND CLARK Y AIRFOIL SECTIONS

By HUGH B. FREEMAN
Langley Memorial Aeronautical Laboratory

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REPORT No. 378

COMPARISON OF FULL-SCALE PROPELLERS HAVING R. A. F.-6 AND CLARK Y AIRFOIL SECTIONS

By Hugh B. Freeman

SUMMARY

In this report, the efficiencies of two series of propellers having two types of blade sections are compared. Six full-scale propellers were used, three having R. A. F.-6 and three Clark Y airfoil sections with thickness/chord ratios of 0.06, 0.08, and 0.10. The propellers were tested at five pitch settings, which covered the range ordinarily used in practice. These tests were conducted in the Propeller Research Tunnel of the National Advisory Committee for Aeronautics.

The propellers having the Clark Y sections gave the highest peak efficiency at the low pitch settings. At the higher pitch settings, the propellers with the R. A. F.-6 sections gave about the same maximum efficiency as the Clark Y propellers and were more efficient for the conditions of climb and take-off.

INTRODUCTION

The airfoil sections most commonly used in this country in propeller design are the R. A. F.-6 and Clark Y. The following tests, which were made incidental to some high tip speed propeller tests (Reference 1) in the Twenty-Foot Propeller Research Tunnel of the National Advisory Committee for Aeronautics, afford an interesting comparison of these airfoil sections as shown by the performance of full-scale propellers.

Six propellers were used in this investigation, three with R. A. F.-6 and three with Clark Y sections. The propellers of each group had thickness/chord ratios of 0.06, 0.08, and 0.10. The airfoil sections used on these propellers are not, strictly speaking, Clark Y or R. A. F.-6 sections but are modifications of these. However, in this report for the sake of convenience, they will be referred to simply as Clark Y and R. A. F.-6 sections.

APPARATUS AND TESTS

The Propeller Research Tunnel and its test equipment have been described in Reference 2. The propellers were driven by a 435-horsepower Curtiss D-12 engine, mounted in an open-cockpit tractor body as shown in Figure 1.

Six metal adjustable blade propellers, 9½ feet in diameter, were used in these tests. Three propellers have Clark Y and three R. A. F.-6 sections (Fig. 2). The outer third of all the propeller blades have sections of constant thickness/chord ratio. This ratio is used to designate the propellers as shown in the following table:

Propeller designation		
Clark Y	R. A. F.-6	Thickness/chord ratio
C-6	R-6	0.06
C-8	R-8	.08
C-10	R-10	.10

All of the propellers have the same pitch distribution and blade form. Figure 3 shows the blade-form curves and Figure 4, the pitch distribution along the radius. It may be noted that for each R. A. F.-6 propeller there was a Clark Y propeller the same in every respect except in the type of airfoil section used, so that these tests afford a direct comparison of the two types of airfoils.

Each of the propellers was tested at five pitch settings (11°, 15°, 19°, 23°, and 27° at 42 inches radius) covering the range ordinarily used in practice, making a total of 30 complete tests.

A detailed description of such propeller tests is given in Reference 2.

RESULTS AND DISCUSSION

The observed data and the computed nondimensional coefficients of thrust, power, and efficiency are presented in Tables I, II, and III for the R. A. F.-6 propellers and in Tables IV, V, and VI for the Clark Y propellers. These coefficients are defined as follows:

$$\text{Thrust coefficient} = C_T = \frac{\text{effective thrust}}{\rho n^2 D^4}$$

$$\text{Power coefficient} = C_P = \frac{\text{input power}}{\rho n^3 D^5}$$

$$\text{Propulsive efficiency} = \eta = \frac{\text{effective thrust} \times \text{velocity of advance}}{\text{Input power}}$$

FIGURE 1.—Set-up in Propeller Research Tunnel for propeller tests

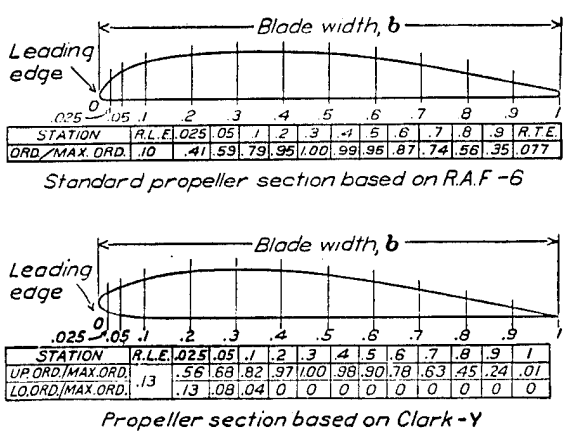

FIGURE 2.—Profiles and ordinates of the Clark Y and R. A. F.-6 sections

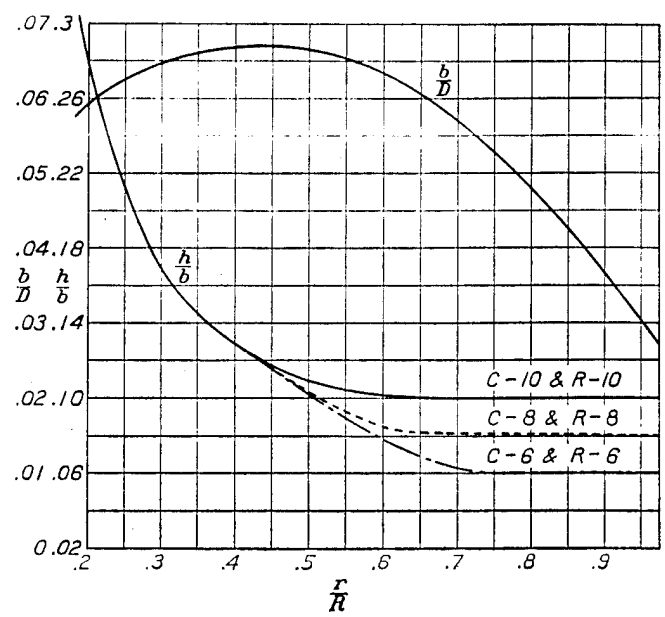

FIGURE 3.—Blade form curves; b=blade width, D=propeller diameter, h=maximum blade thickness, r=section radius, R=propeller radius

when the effective thrust = actual thrust (or tension in crank-shaft) minus drag due to the slipstream, and

ρ = mass density of the air.
n = revolutions per unit time.
D = diameter of the propeller.

Representative curves showing the coefficients plotted against V/nD for the thinnest Clark Y propeller are given in Figures 5, 6, 7, 8, and 9. From faired curves such as these, values in the Tables I-A, II-A, and III-A for the R. A. F.-6 propellers and IV-A, V-A, and VI-A for the Clark Y propellers were derived, and the corresponding values of the speed power coefficient C_S computed. This coefficient is defined as:

$$C_S = \sqrt[5]{\frac{\rho V^5}{P n^2}}$$

where V is the velocity of advance and P is the power absorbed by the propeller. Propellers operating at the same value of C_S are fulfilling like requirements of power, velocity, and revolutions, and are therefore on a fair basis for comparison. Figures 10, 11, and 12 show the efficiency plotted as ordinates against the values of C_S. In order to avoid confusion, only the curves for three pitch settings were drawn.

The thrust, power, and efficiency of the propellers of the same thickness/chord ratio at the five pitch settings are compared in Figures 13 a, b, c, 14 a, b, c, and 15 a, b, c.

The thrust curves show two marked characteristics; namely, the close agreement of the curves at high values of V/nD and the falling off of thrust of the Clark Y propellers at the low values of V/nD, i. e., high angles of attack, at the high-pitch settings.

The power curves, except for the thin propellers, show that the Clark Y sections absorb less power at the high values of V/nD than the R. A. F.-6. This results in the Clark Y propellers having a higher maximum efficiency. This is especially marked at the low-pitch settings, being 10 per cent for thickness/chord ratio 0.08 at 11°. At the higher pitch settings, the difference in maximum efficiency is small. The V/nD of maximum efficiency is higher for the Clark Y propellers than for the R. A. F.-6 as was to be expected, since the maximum (L/D) of the Clark Y section occurs at a lower angle of attack. For the thin propellers, the maximum efficiency is approximately the same at the high-pitch settings, and the Clark Y is only 3 per cent more efficient at the lowest pitch setting. However, if the peak efficiencies are compared for equal values of the speed power coefficient, there is less difference than the above comparison would lead one to expect. Figure 16 shows that for the thin propellers, operating at the same C_S, the R. A. F.-6 sections give the same maximum efficiency as the Clark Y for all pitch settings. For the thicker propellers, the Clark Y sections give a higher efficiency for low-pitch settings, but are the same as the R. A. F.-6 for high-pitch settings.

Referring to Figures 13, 14, and 15, for low values of V/nD at the high-pitch settings, the R. A. F.-6 propellers absorb less power than the Clark Y, and give a greater thrust, and consequently a higher efficiency. This is of considerable importance for the condition of climb and take-off in a high-speed airplane, especially in the case of a seaplane where a high thrust-horsepower is required in taking off the water.

In Figure 17, the maximum efficiencies are plotted against C_S to show the effect of varying the thickness of propeller blades. The effect is small, but the R. A. F.-6 propeller shows a small decrease in peak efficiency with increasing blade thickness at the lower pitch settings. It is interesting to note, however, that this is not the case with the Clark Y propellers. Here the thicker sections actually give a higher efficiency, although the difference is very slight.

CONCLUSIONS

1. On low-pitch propellers, the Clark Y sections give a higher peak efficiency than the R. A. F.-6 sections.

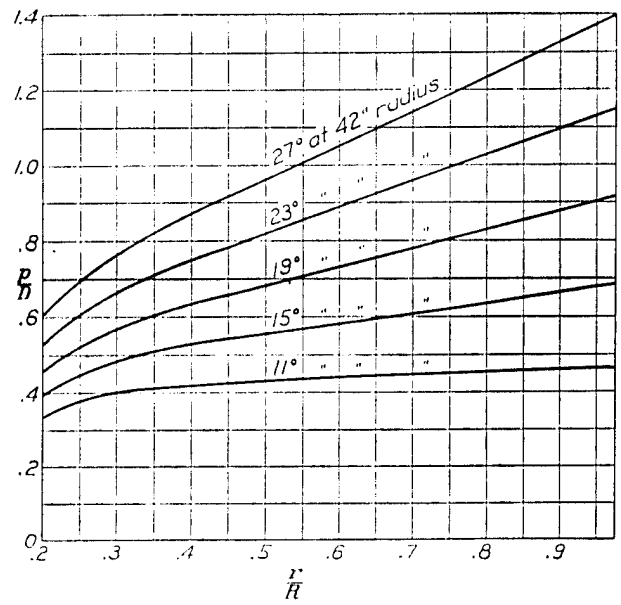

FIGURE 4.—Pitch distribution

2. On high-pitch propellers, however, the R. A. F.-6 sections give about the same peak efficiency and are more efficient than the Clark Y sections for the conditions of climb and take-off.

3. The maximum efficiency of low-pitch propellers with R. A. F.-6 sections decreases slightly with increasing blade thickness; but with Clark Y sections the efficiency increases slightly with increasing thickness.

LANGLEY MEMORIAL AERONAUTICAL LABORATORY,
NATIONAL ADVISORY COMMITTEE FOR AERONAUTICS,
LANGLEY FIELD, VA., *October 8, 1930.*

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1. Wood, Donald H.: Full-Scale Tests of Metal Propellers at High Tip Speed. N. A. C. A. Technical Report No. 375, 1930.
2. Weick, Fred E., and Wood, Donald H.: The Twenty-Foot Propeller Research Tunnel of the National Advisory Committee for Aeronautics. N. A. C. A. Technical Report No. 300, 1928.

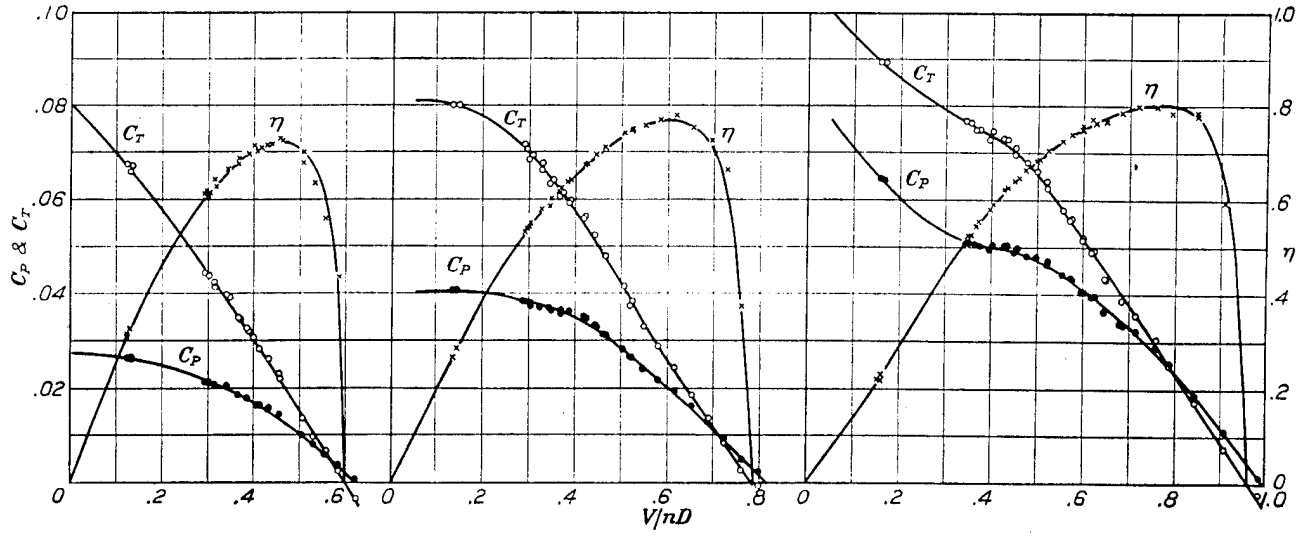

FIGURE 5.—Characteristics of propeller C-6; 11° at 42″

FIGURE 6.—Characteristics of propeller C-6; 15° at 42″

FIGURE 7.—Characteristics of propeller C-6; 19° at 42″

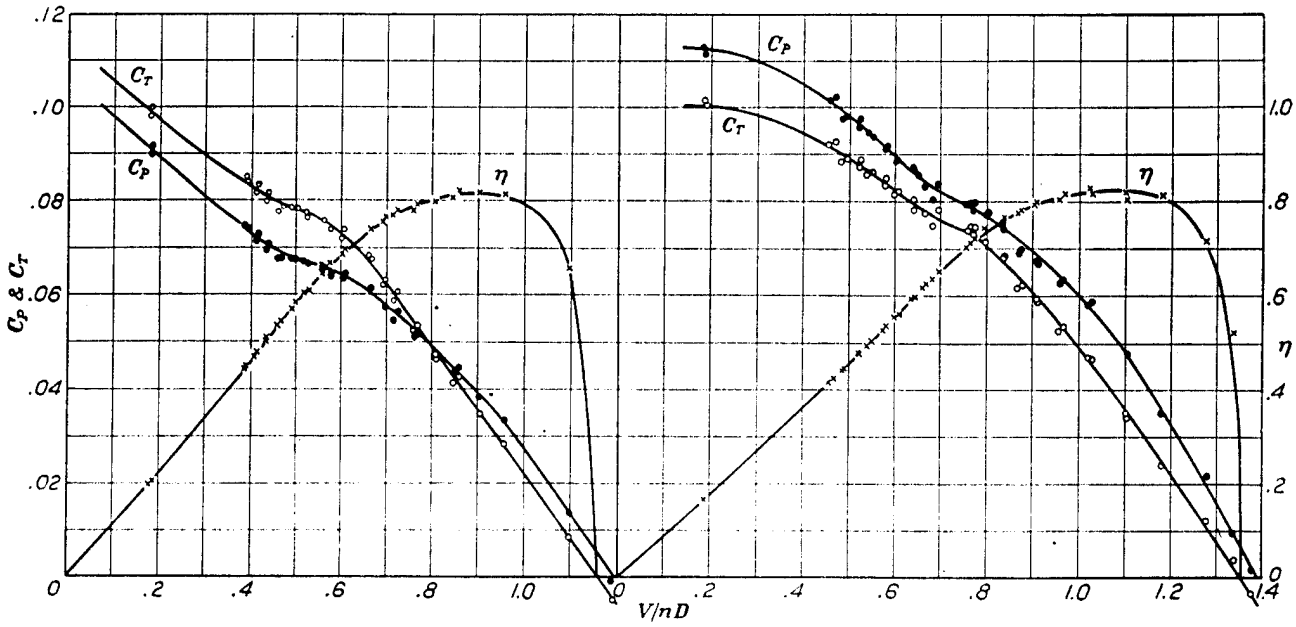

FIGURE 8.—Characteristics of propeller C-6; 23° at 42″

FIGURE 9.—Characteristics of propeller C-6; 27° at 42″

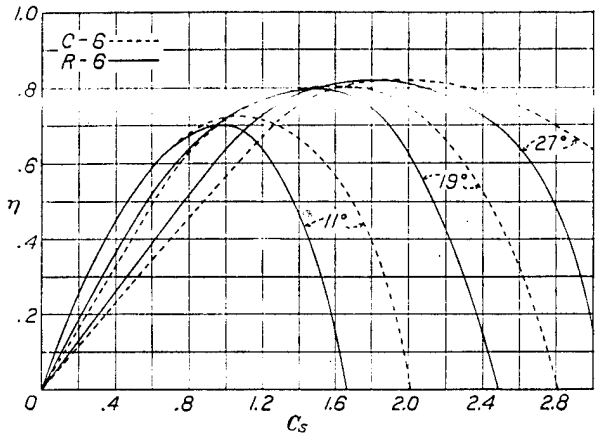

FIGURE 10.—Efficiency vs. speed power coefficient

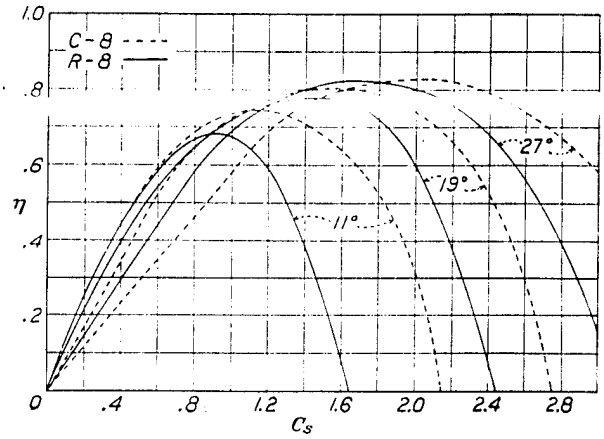

FIGURE 11.—Efficiency vs. speed power coefficient

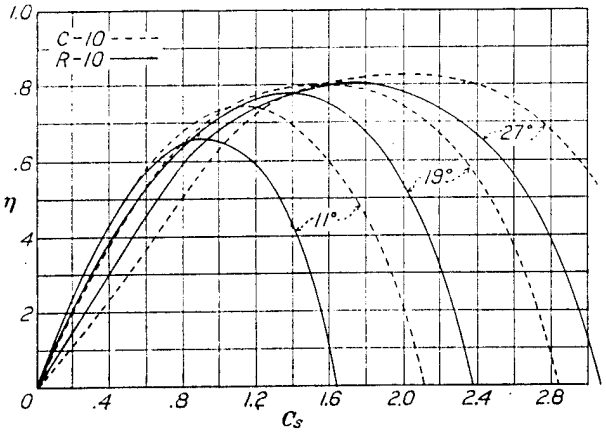

FIGURE 12.—Efficiency vs. speed power coefficient

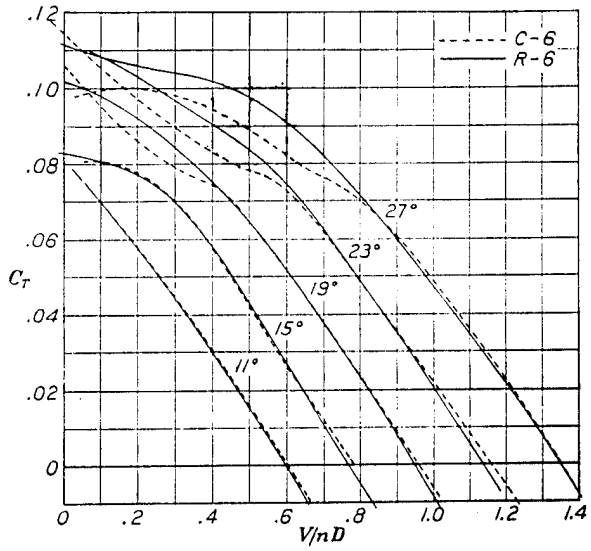

FIGURE 13a.—Thrust coefficients

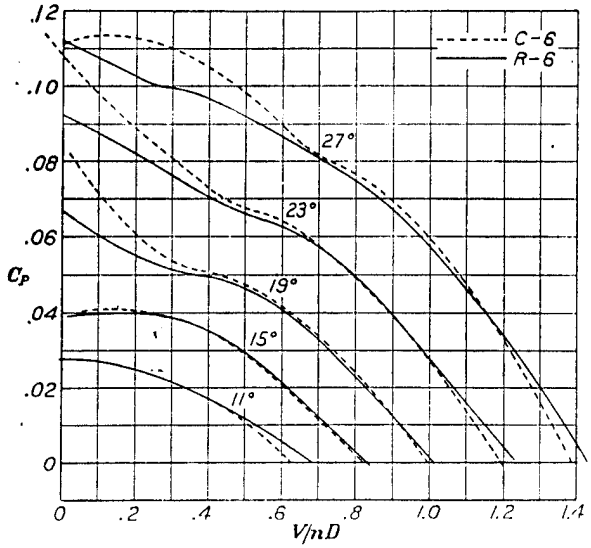

FIGURE 13b.—Power coefficients

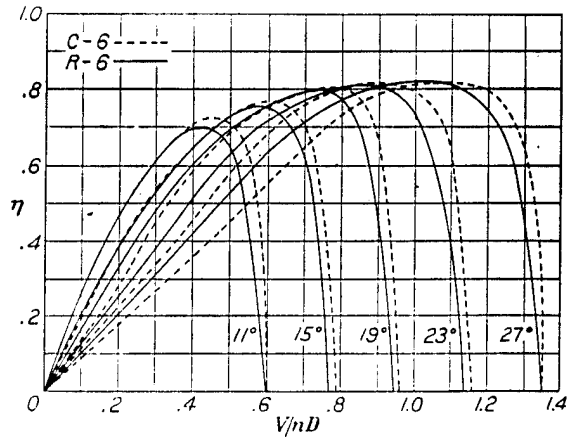

FIGURE 13c.—Efficiency

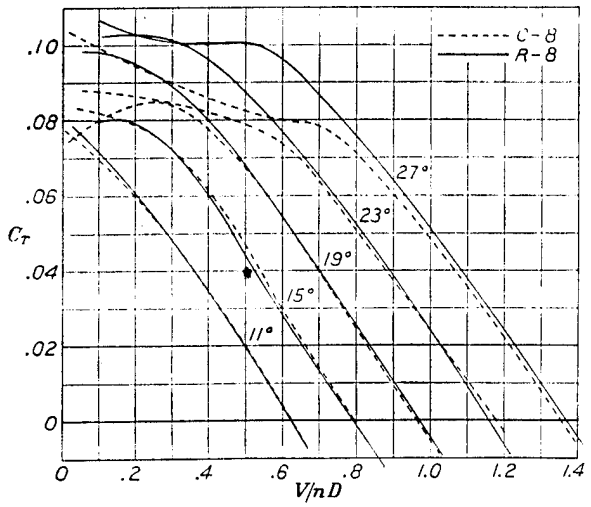

FIGURE 14a.—Thrust coefficients

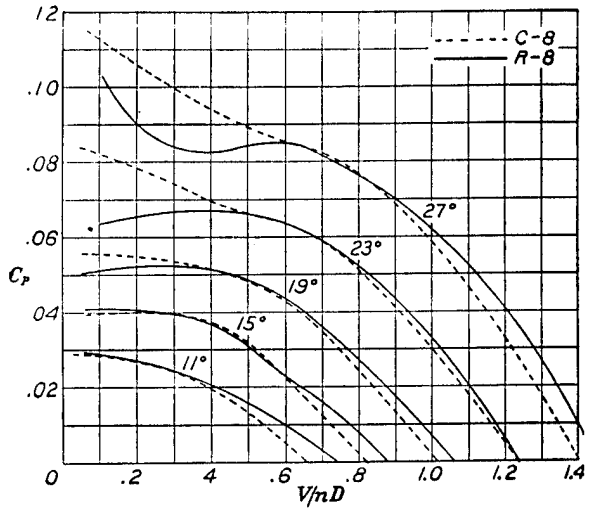

FIGURE 14b.—Power coefficients

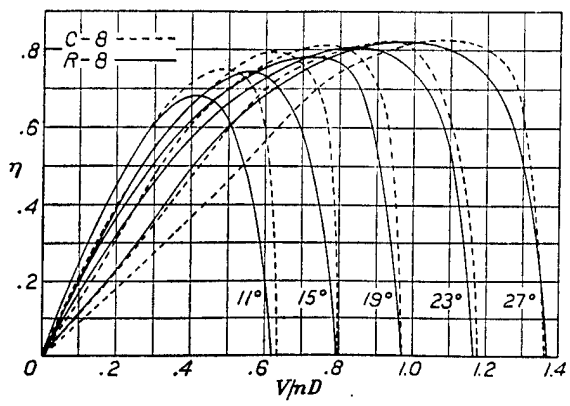

FIGURE 14c.—Efficiency

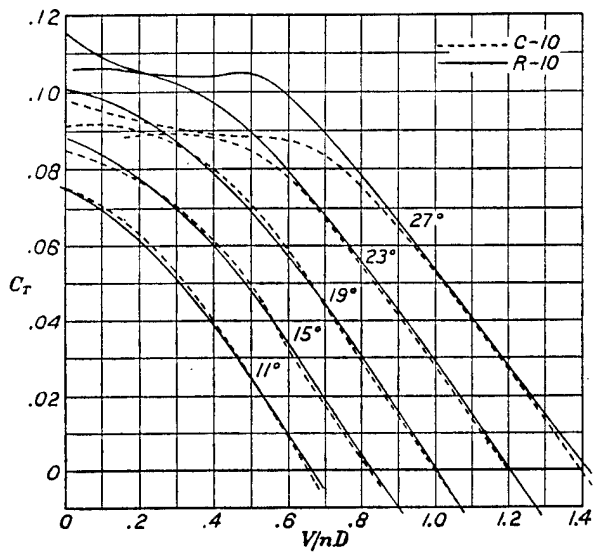

FIGURE 15a.—Thrust coefficients

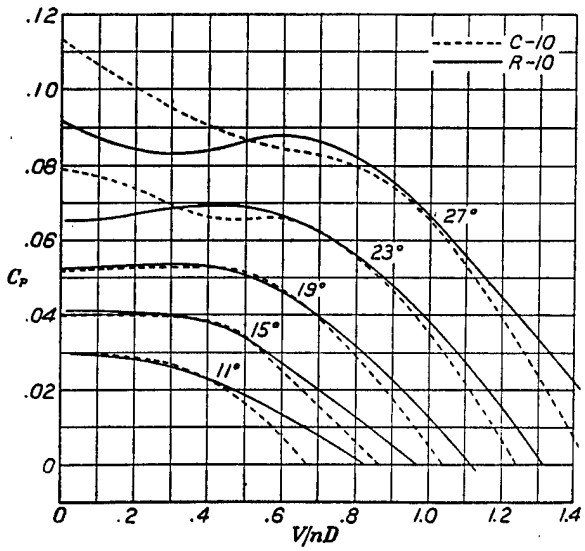

FIGURE 15b.—Power coefficients

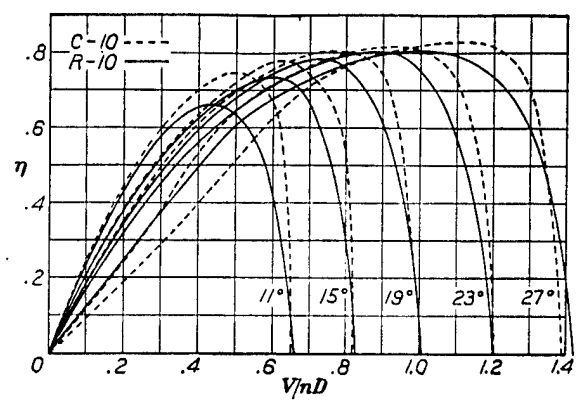

FIGURE 15c.—Efficiency

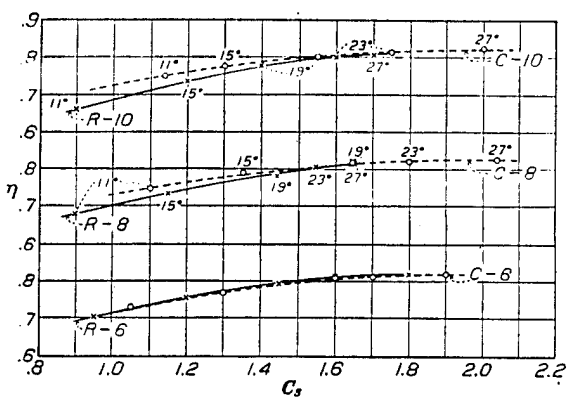

FIGURE 16.—Maximum efficiency vs. speed power coefficients

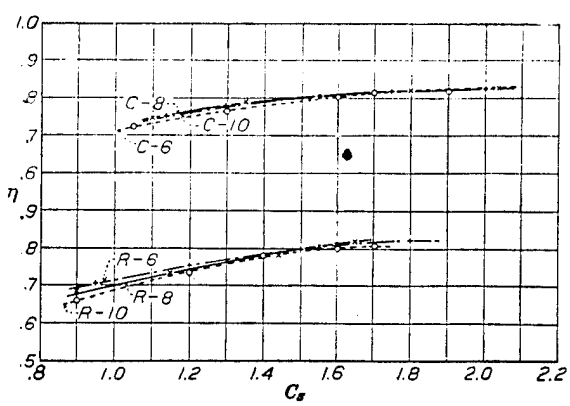

FIGURE 17.—Maximum efficiency vs. speed power coefficients

TABLE I—Continued

OBSERVED DATA—Continued

PROPELLER R-6—Continued

27° at 42-inch radius

ρ	V m. p. h.	r. p. m.	Q lb.-ft.	T lb.	C_T	C_P	$\frac{V}{nD}$	η
0.002217	83.4	1,280	999	707	0.0861	0.0804	0.603	0.646
.002217	83.2	1,270	997	704	.0870	.0814	.607	.649
.002209	88.8	1,280	1,002	701	.0856	.0808	.642	.680
.002209	88.2	1,280	1,002	699	.0853	.0808	.638	.674
.002206	92.5	1,280	1,003	690	.0844	.0812	.669	.695
.002206	93.2	1,280	1,001	691	.0846	.0809	.674	.705
.002203	104.1	1,300	1,004	667	.0792	.0789	.742	.745
.002203	103.5	1,300	1,001	666	.0791	.0785	.737	.743
.002197	103.3	1,240	889	580	.0759	.0769	.771	.761
.002197	103.3	1,240	889	583	.0763	.0769	.771	.765
.002197	102.9	1,185	792	507	.0726	.0751	.804	.777
.002197	103.3	1,190	792	501	.0712	.0744	.804	.769
.002197	103.3	1,130	697	431	.0679	.0726	.847	.792
.002197	102.7	1,130	694	428	.0674	.0723	.842	.785
.002197	102.4	1,060	567	335	.0600	.0672	.895	.799
.002197	102.4	1,050	567	335	.0612	.0684	.903	.808
.002197	101.7	1,000	468	264	.0531	.0623	.942	.803
.002197	101.7	1,000	466	262	.0527	.0620	.942	.801
.002197	102.4	940	376	201	.0457	.0566	1.008	.814
.002197	102.4	940	375	202	.0460	.0565	1.008	.821
.002189	102.1	870	278	135	.0360	.0491	1.087	.797
.002189	101.8	870	275	134	.0357	.0485	1.083	.797
.002189	102.4	810	203	89	.0274	.0413	1.170	.776
.002189	101.6	745	112	38	.0138	.0269	1.263	.649
.002189	101.4	695	46	1	.0004	.0127	1.351	.044
.002189	101.8	665	9	−24	−.0110	.0027	1.418	------
.002198	79.1	1,225	1,000	701	.0940	.0885	.598	.635
.002198	78.5	1,230	994	695	.0924	.0874	.591	.625
.002200	78.4	1,230	997	700	.0929	.0877	.560	.593
.002200	74.1	1,225	997	695	.0931	.0885	.560	.589
.002200	68.6	1,200	993	687	.0958	.0916	.529	.553
.002200	68.4	1,200	990	686	.0957	.0912	.528	.554
.002203	64.3	1,200	997	692	.0964	.0919	.496	.520
.002203	63.5	1,200	992	689	.0960	.0915	.490	.514
.002203	59.4	1,180	991	689	.0993	.0946	.466	.489
.002203	58.2	1,180	989	688	.0991	.0942	.457	.481
.002206	53.4	1,170	994	692	.1013	.0965	.423	.444
.002206	56.0	1,170	991	692	.1013	.0961	.443	.467
.002211	22.8	1,125	991	670	.1058	.1034	.188	.192
.002211	21.8	1,125	991	664	.1049	.1034	.179	.182

TABLE I-A

FINAL ADJUSTED COEFFICIENTS

PROPELLER R-6

11° at 42-inch radius

$\frac{V}{nD}$	C_T	C_P	η	C_S
0.10	0.0703	0.0269	0.261	0.206
.15	.0643	.0262	.368	.311
.20	.0580	.0249	.466	.418
.25	.0514	.0235	.546	.528
.30	.0449	.0220	.613	.644
.35	.0381	.0200	.666	.764
.40	.0311	.0179	.695	.895
.45	.0235	.0152	.695	1.040
.50	.0155	.0122	.635	1.207
.55	.0077	.0091	.465	1.406

15° at 42-inch radius

0.10	0.0805	0.0397	0.203	0.191
.15	.0787	.0400	.295	.285
.20	.0766	.0399	.385	.381
.25	.0740	.0394	.470	.478
.30	.0692	.0386	.537	.574
.35	.0637	.0374	.596	.675
.40	.0580	.0358	.649	.778
.45	.0503	.0326	.693	.894
.50	.0426	.0292	.730	1.012
.55	.0345	.0252	.754	1.149
.60	.0265	.0212	.749	1.297
.65	.0186	.0169	.715	1.472
.70	.0107	.0123	.608	1.688
.75	.0027	.0077	.263	1.985

TABLE I-A—Continued

FINAL ADJUSTED COEFFICIENTS—Continued

PROPELLER R-6—Continued

19° at 42-inch radius

$\frac{V}{nD}$	C_T	C_P	η	C_S
0.10	0.0975	0.0609	0.160	0.175
.15	.0948	.0580	.245	.266
.20	.0918	.0551	.333	.357
.25	.0881	.0535	.412	.450
.30	.0842	.0515	.490	.543
.35	.0800	.0506	.553	.637
.40	.0753	.0497	.605	.729
.45	.0702	.0485	.652	.825
.50	.0646	.0468	.691	.923
.55	.0581	.0440	.727	1.027
.60	.0515	.0409	.756	1.140
.65	.0445	.0372	.777	1.255
.70	.0373	.0331	.789	1.383
.75	.0301	.0284	.795	1.528
.80	.0228	.0234	.779	1.694
.85	.0150	.0182	.700	1.895
.90	.0072	.0130	.498	2.14

23° at 42-inch radius

0.10	0.1083	0.0873	0.124	0.163
.15	.1059	.0848	.187	.246
.20	.1031	.0825	.250	.330
.25	.1000	.0791	.316	.416
.30	.0970	.0761	.382	.503
.35	.0938	.0734	.447	.590
.40	.0905	.0710	.510	.679
.45	.0870	.0682	.574	.769
.50	.0837	.0661	.633	.860
.55	.0795	.0642	.681	.953
.60	.0746	.0626	.715	1.046
.65	.0690	.0602	.745	1.140
.70	.0625	.0568	.770	1.244
.75	.0558	.0532	.786	1.350
.80	.0494	.0489	.808	1.468
.85	.0422	.0441	.811	1.587
.90	.0350	.0390	.807	1.722
.95	.0280	.0336	.791	1.873
1.00	.0204	.0278	.733	2.04
1.05	.0130	.0220	.620	2.25
1.10	.0055	.0162	.373	2.51

27° at 42-inch radius

0.10	0.1076	0.1076	0.100	0.156
.15	.1061	.1055	.151	.235
.20	.1051	.1026	.205	.315
.25	.1040	.1003	.259	.397
.30	.1032	.0995	.311	.477
.35	.1025	.0984	.365	.556
.40	.1014	.0970	.418	.638
.45	.0997	.0953	.471	.722
.50	.0971	.0922	.527	.806
.55	.0940	.0889	.581	.893
.60	.0905	.0860	.632	.982
.65	.0865	.0829	.679	1.072
.70	.0822	.0805	.715	1.159
.75	.0777	.0780	.748	1.250
.80	.0722	.0751	.770	1.343
.85	.0663	.0714	.790	1.442
.90	.0600	.0672	.803	1.545
.95	.0532	.0623	.811	1.655
1.00	.0468	.0574	.815	1.773
1.05	.0403	.0518	.817	1.900
1.10	.0341	.0464	.808	2.03
1.15	.0280	.0409	.787	2.18
1.20	.0216	.0349	.743	2.35
1.25	.0150	.0281	.666	2.55
1.30	.0080	.0216	.481	2.80

TABLE I

OBSERVED DATA

PROPELLER R-6

11° at 42-inch radius

ρ	V m. p. h.	r. p. m.	Q lb.-ft.	T lb.	C_T	C_P	$\frac{V}{nD}$	η
0.002240	83.8	1,900	479	539	0.0294	0.0173	0.408	0.693
.002240	84.4	1,900	481	545	.0298	.0174	.411	.704
.002240	87.6	1,900	454	485	.0265	.0164	.427	.690
.002240	88.1	1,900	454	490	.0268	.0164	.429	.701
.002238	93.2	1,900	420	408	.0223	.0152	.454	.666
.002238	92.8	1,900	420	431	.0236	.0152	.452	.702
.002235	103.5	1,900	331	265	.0145	.0120	.504	.610
.002235	103.2	1,900	336	276	.0151	.0122	.503	.625
.002227	103.3	1,800	257	170	.0104	.0104	.531	.531
.002227	102.5	1,700	192	94	.0065	.0087	.558	.413
.002227	102.4	1,600	124	17	.0013	.0064	.593	.123
.002227	102.1	1,500	70	−53	−.0047	.0041	.630	--------
.002227	102.1	1,400	15	−113	−.0114	.0010	.675	--------
.002229	78.8	1,870	478	548	.0311	.0180	.390	.676
.002229	78.8	1,870	475	559	.0317	.0178	.390	.694
.002232	74.6	1,860	506	641	.0367	.0191	.371	.711
.002232	75.1	1,860	507	612	.0350	.0192	.374	.683
.002232	69.1	1,900	573	733	.0402	.0208	.337	.651
.002232	69.1	1,900	570	730	.0400	.0207	.337	.650
.002235	65.0	1,900	588	785	.0430	.0213	.317	.640
.002235	65.0	1,900	587	779	.0427	.0212	.317	.638
.002235	60.9	1,900	614	838	.0459	.0222	.297	.614
.002235	60.1	1,900	617	845	.0463	.0223	.293	.608
.002235	56.0	1,900	630	891	.0488	.0228	.273	.584
.002235	55.9	1,900	630	890	.0488	.0228	.272	.582
.002243	25.1	1,900	731	1,229	.0671	.0264	.122	.311
.002243	25.9	1,900	731	1,229	.0671	.0264	.126	.321

15° at 42-inch radius

0.002259	86.1	1,910	981	1,040	0.0558	0.0348	0.417	0.668
.002259	86.4	1,910	981	1,035	.0555	.0348	.419	.668
.002256	90.2	1,900	926	960	.0521	.0332	.440	.690
.002256	90.2	1,900	926	962	.0522	.0332	.440	.692
.002256	94.8	1,900	873	879	.0477	.0313	.462	.704
.002256	94.7	1,900	874	886	.0481	.0313	.462	.710
.002242	105.6	1,900	769	731	.0399	.0277	.515	.742
.002242	105.5	1,900	775	740	.0404	.0281	.514	.739
.002235	104.6	1,800	642	598	.0365	.0259	.538	.758
.002235	104.6	1,800	640	589	.0360	.0258	.538	.751
.002235	104.2	1,700	502	446	.0305	.0227	.568	.763
.002235	104.4	1,700	502	440	.0301	.0227	.569	.754
.002235	103.7	1,600	407	327	.0253	.0208	.600	.730
.002235	104.2	1,600	413	343	.0265	.0211	.603	.757
.002235	103.7	1,505	315	236	.0206	.0182	.638	.722
.002235	103.4	1,405	227	146	.0146	.0151	.681	.661
.002235	103.4	1,310	138	59	.0068	.0105	.731	.473
.002235	102.5	1,200	63	−14	−.0019	.0057	.791	--------
.002235	102.5	1,140	−1	−75	−.0114	−.0010	.833	--------
.002247	82.1	1,910	1,019	1,096	.0591	.0364	.398	.646
.002247	79.8	1,905	1,014	1,100	.0596	.0364	.388	.635
.002247	76.8	1,900	1,022	1,125	.0613	.0368	.374	.623
.002247	76.2	1,900	1,022	1,128	.0615	.0368	.371	.620
.002250	70.7	1,900	1,022	1,159	.0630	.0368	.345	.591
.002250	70.5	1,900	1,021	1,162	.0632	.0368	.344	.591
.002250	66.0	1,880	1,022	1,200	.0668	.0376	.325	.578
.002250	66.4	1,880	1,021	1,191	.0663	.0376	.327	.577
.002253	61.7	1,860	1,026	1,221	.0692	.0384	.307	.553
.002253	61.0	1,860	1,023	1,216	.0690	.0384	.304	.546
.002253	55.7	1,845	1,025	1,250	.0721	.0391	.280	.516
.002253	57.6	1,850	1,022	1,239	.0711	.0387	.288	.529
.002259	26.2	1,840	1,029	1,378	.0796	.0394	.132	.266
.002259	26.8	1,840	1,028	1,376	.0794	.0393	.135	.272

TABLE I—Continued

OBSERVED DATA—Continued

PROPELLER R-6—Continued

19° at 42-inch radius

ρ	V m. p. h.	r. p. m.	Q lb.-ft.	T lb.	C_T	C_P	$\frac{V}{nD}$	η
0.002243	84.3	1,670	1,033	977	0.0690	0.0483	0.467	0.667
.002243	84.2	1,670	1,029	976	.0690	.0480	.467	.671
.002243	89.2	1,690	1,033	956	.0659	.0472	.489	.683
.002243	88.8	1,685	1,030	954	.0662	.0473	.488	.683
.002240	94.5	1,700	1,030	928	.0634	.0466	.515	.701
.002240	93.7	1,700	1,030	932	.0636	.0466	.510	.696
.002229	104.3	1,750	1,029	891	.0577	.0441	.552	.722
.002229	104.3	1,745	1,025	888	.0578	.0442	.553	.723
.002229	104.1	1,660	889	762	.0547	.0423	.581	.751
.002229	104.1	1,660	889	759	.0545	.0423	.581	.748
.002222	103.5	1,590	783	660	.0519	.0407	.603	.769
.002222	103.4	1,590	783	651	.0512	.0407	.602	.757
.002222	103.6	1,510	650	522	.0455	.0376	.635	.768
.002222	103.6	1,510	653	524	.0457	.0377	.635	.770
.002222	103.4	1,430	556	434	.0421	.0358	.670	.788
.002222	103.4	1,430	555	433	.0420	.0357	.670	.788
.002222	103.3	1,355	451	335	.0363	.0323	.706	.794
.002222	103.0	1,355	451	338	.0366	.0323	.704	.798
.002222	103.0	1,280	359	251	.0305	.0288	.745	.789
.002222	103.0	1,210	279	183	.0249	.0251	.788	.782
.002214	102.5	1,140	197	114	.0175	.0200	.833	.729
.002214	102.0	1,055	116	45	.0081	.0137	.895	.526
.002214	102.5	980	38	−16	−.0033	.0052	.969	--------
.002214	102.5	945	15	−34	−.0076	.0022	1.005	--------
.002223	81.1	1,670	1,030	996	.0710	.0486	.450	.657
.002223	80.2	1,660	1,026	993	.0715	.0489	.447	.654
.002226	75.1	1,660	1,029	1,016	.0731	.0490	.419	.625
.002226	74.5	1,650	1,028	1,015	.0741	.0496	.418	.624
.002226	69.5	1,650	1,029	1,040	.0759	.0496	.390	.597
.002226	69.4	1,650	1,028	1,034	.0755	.0496	.389	.592
.002229	65.3	1,645	1,030	1,062	.0777	.0500	.368	.572
.002229	65.2	1,640	1,029	1,062	.0783	.0503	.368	.573
.002229	61.2	1,630	1,032	1,085	.0809	.0509	.348	.553
.002229	60.2	1,630	1,029	1,087	.0811	.0507	.342	.547
.002229	57.7	1,630	1,032	1,105	.0824	.0509	.328	.531
.002229	56.2	1,630	1,029	1,106	.0824	.0507	.319	.518
.002238	24.4	1,470	1,024	1,033	.0944	.0619	.154	.234
.002238	26.5	1,480	1,024	1,036	.0934	.0612	.166	.253

23° at 42-inch radius

0.002227	84.3	1,440	1,010	833	0.0799	0.0638	0.542	0.679
.002227	84.0	1,440	1,010	834	.0800	.0638	.540	.677
.002224	87.2	1,440	1,014	823	.0790	.0642	.561	.691
.002224	88.3	1,440	1,010	820	.0787	.0639	.568	.700
.002217	93.9	1,455	1,015	803	.0755	.0630	.598	.716
.002217	93.4	1,445	1,009	801	.0764	.0635	.599	.721
.002210	104.1	1,475	1,014	762	.0699	.0615	.654	.744
.002210	103.9	1,475	1,010	761	.0698	.0612	.652	.744
.002210	103.9	1,400	854	630	.0643	.0576	.687	.767
.002210	103.4	1,400	858	633	.0646	.0579	.684	.763
.002210	102.8	1,330	755	544	.0615	.0564	.716	.780
.002210	102.8	1,330	753	539	.0609	.0562	.716	.776
.002203	102.8	1,275	647	448	.0553	.0529	.747	.781
.002203	102.8	1,270	644	450	.0560	.0530	.750	.793
.002203	102.8	1,200	529	349	.0486	.0487	.793	.791
.002203	102.6	1,200	528	348	.0485	.0487	.792	.789
.002203	102.4	1,120	431	276	.0442	.0456	.847	.821
.002203	102.4	1,125	430	271	.0430	.0451	.843	.804
.002203	102.4	1,060	336	197	.0352	.0397	.895	.794
.002203	102.6	1,060	336	197	.0352	.0397	.896	.794
.002203	102.2	1,000	238	128	.0257	.0316	.946	.769
.002203	103.0	920	151	69	.0164	.0237	1.037	.716
.002197	102.7	845	71	12	.0034	.0132	1.125	.287
.002197	102.4	800	16	−25	−.0079	.0033	1.185	--------
.002208	79.4	1,430	1,014	852	.0833	.0657	.514	.652
.002208	79.7	1,425	1,007	848	.0836	.0657	.518	.659
.002208	75.4	1,430	1,013	865	.0845	.0657	.488	.628
.002208	74.9	1,425	1,007	863	.0851	.0657	.487	.631
.002211	69.5	1,420	1,018	872	.0863	.0667	.453	.586
.002211	69.7	1,420	1,014	867	.0858	.0665	.454	.586
.002211	64.6	1,400	1,021	856	.0873	.0689	.427	.541
.002211	64.2	1,390	1,016	853	.0883	.0694	.428	.544
.002213	59.9	1,370	1,020	853	.0907	.0718	.405	.512
.002213	60.2	1,370	1,018	850	.0904	.0718	.407	.512
.002213	54.6	1,360	1,017	842	.0909	.0724	.372	.467
.002213	55.6	1,360	1,014	841	.0908	.0724	.379	.475
.002219	24.2	1,260	1,012	837	.1050	.0841	.178	.222
.002219	23.9	1,260	1,009	833	.1045	.0837	.176	.219

TABLE II

OBSERVED DATA

PROPELLER R-8

11° at 42-inch radius

ρ	V m. p. h.	r. p. m.	Q lb.-ft.	T lb.	C_T	C_P	$\frac{V}{nD}$	η
0.002263	85.0	1,900	555	603	0.0326	0.0199	0.414	0.679
.002263	84.9	1,900	558	607	.0328	.0200	.414	.680
.002263	88.2	1,900	527	538	.0291	.0189	.430	.663
.002263	87.7	1,900	526	552	.0299	.0188	.427	.679
.002252	93.8	1,900	492	481	.0262	.0177	.457	.676
.002252	93.2	1,900	496	489	.0266	.0178	.454	.677
.002246	104.1	1,900	422	344	.0187	.0152	.507	.625
.002246	103.5	1,900	422	342	.0186	.0152	.504	.617
.002246	103.3	1,810	337	242	.0145	.0134	.528	.572
.002239	102.7	1,710	265	148	.0100	.0118	.556	.470
.002239	102.7	1,610	203	75	.0057	.0102	.590	.329
.002239	102.5	1,515	138	0	--------	.0078	.626	--------
.002239	102.4	1,420	81	−65	−.0063	.0052	.668	--------
.002239	102.4	1,320	21	−134	−.0152	.0016	.718	--------
.002239	102.3	1,290	5	−147	−.0174	.0004	.734	--------
.002251	79.9	1,900	571	656	.0357	.0206	.389	.674
.002251	79.0	1,900	574	662	.0360	.0207	.385	.670
.002251	76.2	1,900	599	686	.0373	.0216	.371	.641
.002251	75.7	1,900	599	687	.0374	.0216	.369	.639
.002254	71.1	1,900	625	775	.0421	.0224	.347	.652
.002254	69.5	1,900	619	771	.0419	.0222	.339	.640
.002254	64.3	1,890	639	831	.0457	.0232	.315	.621
.002254	64.7	1,895	642	832	.0455	.0232	.316	.620
.002254	60.5	1,900	670	900	.0489	.0241	.295	.599
.002254	60.8	1,900	670	897	.0487	.0241	.296	.598
.002257	55.7	1,900	682	943	.0511	.0245	.271	.565
.002257	56.2	1,900	680	937	.0508	.0244	.274	.570
.002263	25.9	1,900	782	1,273	.0689	.0280	.126	.310
.002263	26.0	1,905	781	1,274	.0685	.0278	.126	.310
.002232	102.9	1,870	393	306	.0173	.0147	.510	.600
.002232	103.2	1,725	277	160	.0106	.0122	.554	.483
.002232	102.4	1,600	183	54	.0042	.0094	.593	.265
.002232	102.6	1,490	123	−22	−.0020	.0072	.638	--------
.002232	102.4	1,400	71	−81	−.0082	.0047	.677	--------
.002232	101.6	1,295	17	−140	−.0165	.0013	.727	--------

15° at 42-inch radius

0.002274	86.9	1,900	1,014	1,054	0.0568	0.0361	0.424	0.667
.002274	86.1	1,900	1,014	1,053	.0567	.0361	.420	.660
.002274	90.3	1,915	1,014	1,030	.0546	.0356	.437	.670
.002274	90.3	1,910	1,014	1,028	.0547	.0357	.438	.671
.002263	95.7	1,930	1,014	1,002	.0525	.0352	.459	.684
.002263	95.5	1,930	1,012	1,003	.0525	.0351	.458	.685
.002253	105.1	1,920	896	850	.0452	.0316	.507	.725
.002253	104.6	1,920	896	848	.0451	.0316	.504	.719
.002253	104.3	1,880	790	741	.0412	.0290	.514	.730
.002253	104.3	1,860	782	730	.0414	.0293	.519	.733
.002245	105.7	1,805	690	624	.0377	.0276	.542	.740
.002245	105.4	1,805	691	627	.0379	.0277	.541	.740
.002245	104.5	1,710	571	497	.0335	.0254	.566	.747
.002245	104.4	1,705	567	493	.0334	.0254	.567	.746
.002245	104.5	1,630	468	384	.0284	.0229	.594	.737
.002245	103.4	1,530	368	277	.0233	.0205	.626	.712
.002245	103.3	1,405	262	162	.0162	.0173	.681	.636
.002245	102.8	1,315	184	87	.0099	.0139	.724	.517
.002245	103.3	1,190	87	−8	−.0011	.0080	.804	--------
.002245	102.5	1,090	7	−83	−.0137	.0008	.871	--------
.002254	81.5	1,885	1,014	1,088	.0601	.0370	.400	.650
.002254	81.3	1,885	1,012	1,081	.0597	.0369	.399	.646
.002257	76.6	1,870	1,021	1,121	.0627	.0379	.379	.627
.002257	76.3	1,870	1,020	1,120	.0627	.0378	.378	.627
.002257	71.0	1,845	1,025	1,162	.0669	.0390	.356	.611
.002257	70.7	1,850	1,021	1,160	.0664	.0387	.354	.607
.002260	66.0	1,855	1,025	1,201	.0683	.0385	.329	.584
.002260	66.0	1,850	1,025	1,197	.0684	.0387	.330	.583
.002260	60.7	1,845	1,028	1,231	.0708	.0390	.305	.554
.002260	60.7	1,845	1,027	1,233	.0709	.0390	.305	.554
.002263	58.3	1,835	1,028	1,247	.0723	.0394	.294	.539
.002263	56.8	1,835	1,026	1,256	.0728	.0394	.287	.530
.002269	26.7	1,820	1,029	1,347	.0792	.0401	.136	.268
.002269	28.2	1,820	1,028	1,355	.0797	.0399	.143	.286

TABLE II—Continued

OBSERVED DATA—Continued

PROPELLER R-8—Continued

19° at 42-inch radius

ρ	V m. p. h.	r. p. m.	Q lb.-ft.	T lb.	C_T	C_P	$\frac{V}{nD}$	η
0.002251	84.3	1,660	1,029	970	0.0690	0.0485	0.470	0.669
.002251	84.4	1,660	1,030	967	.0688	.0486	.471	.667
.002251	89.1	1,660	1,029	948	.0675	.0485	.497	.692
.002251	89.2	1,660	1,029	942	.0670	.0485	.498	.688
.002243	94.9	1,670	1,028	923	.0652	.0480	.526	.714
.002243	94.4	1,670	1,028	922	.0651	.0480	.523	.709
.002237	103.7	1,710	1,028	880	.0596	.0460	.562	.728
.002237	103.7	1,710	1,026	877	.0593	.0458	.562	.728
.002230	103.7	1,660	930	794	.0570	.0443	.578	.744
.002230	104.1	1,660	932	793	.0570	.0444	.581	.746
.002230	103.4	1,550	771	637	.0526	.0422	.618	.770
.002230	103.5	1,560	771	634	.0517	.0415	.614	.765
.002230	103.3	1,480	655	513	.0464	.0392	.646	.765
.002230	103.3	1,490	657	517	.0462	.0388	.642	.765
.002230	103.1	1,400	531	397	.0401	.0356	.682	.768
.002230	103.1	1,390	531	399	.0409	.0360	.687	.780
.002230	102.5	1,320	434	313	.0356	.0326	.719	.785
.002230	103.3	1,315	434	307	.0352	.0330	.727	.776
.002230	102.7	1,210	310	198	.0268	.0278	.786	.758
.002230	101.9	1,080	186	94	.0160	.0209	.874	.668
.002230	101.6	1,000	88	18	.0036	.0115	.941	.291
.002230	101.6	900	13	−44	−.0108	.0021	1.045	------
.002242	80.7	1,635	1,033	999	.0735	.0505	.457	.665
.002242	79.3	1,650	1,028	993	.0719	.0493	.445	.649
.002242	74.5	1,630	1,031	1,023	.0758	.0506	.423	.634
.002242	74.9	1,630	1,028	1,020	.0756	.0504	.425	.638
.002244	70.1	1,620	1,033	1,051	.0790	.0513	.401	.618
.002244	69.3	1,620	1,030	1,047	.0787	.0512	.396	.609
.002244	65.2	1,600	1,035	1,077	.0829	.0526	.377	.594
.002244	64.1	1,610	1,031	1,077	.0819	.0518	.369	.583
.002247	60.4	1,600	1,034	1,108	.0851	.0525	.350	.567
.002247	60.8	1,600	1,032	1,104	.0848	.0525	.352	.568
.002247	57.5	1,610	1,035	1,134	.0861	.0519	.331	.549
.002247	56.9	1,610	1,031	1,128	.0857	.0518	.327	.541
.002254	25.6	1,610	1,035	1,280	.0969	.0518	.147	.275
.002254	26.8	1,610	1,035	1,279	.0968	.0518	.154	.288

23° at 42-inch radius

0.002242	86.1	1,425	1,012	839	0.0815	0.0652	0.559	0.699
.002242	86.9	1,420	1,008	833	.0813	.0653	.567	.706
.002239	89.7	1,425	1,014	819	.0797	.0652	.583	.713
.002239	90.4	1,430	1,010	816	.0786	.0646	.585	.712
.002232	94.2	1,440	1,013	806	.0771	.0639	.606	.731
.002232	94.9	1,445	1,008	799	.0757	.0633	.608	.727
.002226	105.7	1,480	1,012	759	.0688	.0606	.661	.750
.002226	105.2	1,475	1,007	758	.0690	.0608	.661	.750
.002226	104.4	1,430	908	676	.0655	.0583	.676	.760
.002226	104.3	1,420	899	664	.0653	.0585	.680	.759
.002226	103.3	1,380	832	607	.0633	.0574	.693	.764
.002226	104.2	1,360	830	601	.0645	.0588	.710	.779
.002226	102.6	1,280	697	486	.0589	.0558	.742	.784
.002226	103.3	1,280	695	486	.0589	.0555	.747	.793
.002218	103.2	1,200	587	392	.0543	.0537	.796	.805
.002218	102.9	1,205	587	392	.0538	.0534	.790	.797
.002218	102.9	1,120	459	290	.0461	.0482	.851	.814
.002218	103.4	1,120	456	289	.0459	.0479	.855	.819
.002218	102.9	1,050	344	197	.0356	.0411	.907	.786
.002218	102.6	980	269	142	.0295	.0369	.970	.776
.002218	102.3	900	159	67	.0165	.0259	1.053	.670
.002218	102.1	840	90	21	.0059	.0168	1.126	.397
.002218	102.1	770	12	−32	−.0108	.0027	1.228	------
.002231	80.1	1,430	1,020	875	.0845	.0655	.519	.670
.002231	80.7	1,420	1,014	863	.0847	.0659	.526	.676
.002231	76.3	1,415	1,017	886	.0878	.0666	.499	.658
.002231	76.3	1,415	1,014	884	.0876	.0664	.499	.658
.002233	69.6	1,420	1,016	921	.0903	.0661	.454	.620
.002233	71.0	1,415	1,014	916	.0907	.0663	.465	.636
.002233	64.5	1,415	1,015	950	.0940	.0665	.422	.597
.002233	63.5	1,415	1,014	952	.0942	.0663	.416	.591
.002236	59.6	1,410	1,021	976	.0972	.0672	.391	.565
.002236	60.9	1,405	1,015	967	.0969	.0674	.401	.577
.002236	57.0	1,410	1,016	985	.0979	.0669	.374	.547
.002236	57.3	1,410	1,015	980	.0974	.0669	.376	.547
.002242	26.0	1,415	1,014	1,060	.1045	.0660	.170	.269
.002242	26.4	1,415	1,010	1,059	.1044	.0658	.173	.274

TABLE II—Continued

OBSERVED DATA—Continued

PROPELLER R-8—Continued

27° at 42-inch radius

ρ	V m. p. h.	r. p. m.	Q lb.-ft.	T lb.	C_T	C_P	$\frac{V}{nD}$	η
0.002235	83.8	1,250	1,005	749	0.0948	0.0840	0.621	0.701
.002235	83.2	1,235	1,002	747	.0969	.0860	.624	.703
.002232	88.1	1,240	1,003	726	.0934	.0855	.658	.719
.002232	88.2	1,240	1,003	726	.0934	.0855	.659	.720
.002232	92.7	1,260	1,003	707	.0882	.0820	.681	.725
.002232	91.7	1,260	1,000	700	.0873	.0825	.674	.713
.002218	103.3	1,280	1,001	669	.0814	.0804	.747	.756
.002218	103.4	1,285	1,003	664	.0802	.0803	.745	.744
.002218	102.6	1,205	878	567	.0779	.0798	.789	.770
.002218	102.7	1,200	877	565	.0782	.0801	.792	.773
.002218	102.8	1,120	734	457	.0726	.0772	.850	.799
.002218	103.4	1,120	732	448	.0712	.0769	.855	.792
.002218	102.7	1,045	583	339	.0619	.0704	.910	.800
.002218	102.6	1,045	583	337	.0615	.0704	.909	.794
.002218	102.7	970	453	249	.0527	.0635	.981	.814
.002218	102.7	970	452	251	.0532	.0633	.981	.825
.002211	102.3	900	351	177	.0437	.0573	1.053	.803
.002211	102.3	900	350	178	.0439	.0571	1.053	.815
.002211	101.8	825	252	114	.0335	.0490	1.143	.782
.002211	101.9	750	121	39	.0138	.0284	1.258	.614
.002211	102.3	685	52	−2	−.0008	.0147	1.383	--------
.002211	101.6	645	4	−28	−.0135	.0013	1.458	--------
.002220	78.6	1,265	1,008	770	.0958	.0832	.575	.662
.002220	78.2	1,255	998	762	.0963	.0836	.577	.665
.002223	74.6	1,250	998	773	.0984	.0841	.553	.647
.002223	73.3	1,240	995	773	.0999	.0851	.547	.642
.002223	69.4	1,240	999	789	.1020	.0855	.518	.618
.002223	68.6	1,245	998	781	.1002	.0848	.510	.603
.002223	63.6	1,245	1,001	795	.1019	.0848	.473	.569
.002223	63.5	1,250	997	793	.1009	.0838	.470	.566
.002229	59.3	1,260	1,001	805	.1005	.0827	.436	.530
.002229	59.3	1,265	1,000	803	.0995	.0822	.434	.525
.002229	55.6	1,265	1,003	813	.1008	.0825	.407	.497
.002232	54.8	1,270	1,001	810	.0994	.0812	.400	.490
.002232	23.4	1,200	999	749	.1030	.0907	.181	.205
.002232	24.0	1,200	999	745	.1024	.0907	.185	.209

TABLE II-A

FINAL ADJUSTED COEFFICIENTS

PROPELLER R-8

11° at 42-inch radius

$\frac{V}{nD}$	C_T	C_P	η	C_S
0.10	0.0713	0.0281	0.254	0.203
.15	.0660	.0275	.360	.307
.20	.0600	.0265	.452	.413
.25	.0540	.0254	.531	.521
.30	.0480	.0240	.600	.633
.35	.0414	.0220	.660	.751
.40	.0345	.0202	.684	.873
.45	.0270	.0180	.675	1.005
.50	.0190	.0158	.630	1.150
.55	.0115	.0127	.498	1.318
.60	.0038	.0097	.235	1.518

15° at 42-inch radius

0.10	0.0795	0.0410	0.194	0.189
.15	.0808	.0405	.300	.285
.20	.0790	.0402	.392	.380
.25	.0755	.0400	.473	.475
.30	.0715	.0396	.542	.573
.35	.0665	.0386	.602	.673
.40	.0600	.0370	.650	.774
.45	.0530	.0314	.693	.883
.50	.0450	.0310	.725	1.00
.55	.0360	.0267	.742	1.135
.60	.0280	.0230	.730	1.275
.65	.0205	.0195	.685	1.425
.70	.0135	.0160	.585	1.60
.75	.0068	.0123	.415	1.77

TABLE II-A—Continued

FINAL ADJUSTED COEFFICIENTS—Continued

PROPELLER R-8—Continued

19° at 42-inch radius

$\frac{V}{nD}$	C_T	C_P	η	C_S
0.10	0.098	0.0515	0.190	0.181
.15	.097	.052	.280	.271
.20	.095	.0528	.36	.360
.25	.0925	.0525	.44	.452
.30	.0885	.0525	.504	.542
.35	.084	.052	.565	.633
.40	.079	.0514	.615	.725
.45	.073	.0500	.655	.818
.50	.0675	.0487	.694	.916
.55	.0612	.0465	.725	1.015
.60	.0543	.0435	.75	1.122
.65	.0470	.0397	.77	1.240
.70	.0400	.0360	.778	1.360
.75	.0327	.0315	.778	1.50
.80	.0254	.0266	.763	1.66
.85	.0183	.0216	.72	1.83
.90	.0108	.0170	.575	2.03

23° at 42-inch radius

0.10	0.1020	0.0636	0.16	0.174
.15	.1028	.0647	.242	.260
.20	.103	.0655	.315	.345
.25	.1025	.0665	.385	.430
.30	.1017	.067	.455	.515
.35	.0995	.067	.52	.601
.40	.0965	.0674	.572	.687
.45	.0923	.0667	.622	.773
.50	.0875	.0663	.66	.860
.55	.0825	.0653	.695	.950
.60	.0770	.0635	.728	1.04
.65	.071	.0612	.755	1.135
.70	.065	.0588	.778	1.215
.75	.0588	.0558	.793	1.335
.80	.0530	.0530	.802	1.440
.85	.0460	.0487	.805	1.555
.90	.0390	.0440	.80	1.680
.95	.0317	.0385	.781	1.820
1.00	.025	.0335	.745	1.970
1.05	.0175	.0270	.68	2.16
1.10	.0100	.0200	.56	2.40

27° at 42-inch radius

0.10	0.1065	0.1035	0.103	0.157
.15	.1040	.095	.164	.240
.20	.1022	.090	.227	.324
.25	.1010	.0865	.292	.408
.30	.1002	.0836	.360	.493
.35	.1002	.0824	.426	.576
.40	.1005	.082	.490	.660
.45	.1007	.0832	.545	.740
.50	.1005	.0842	.597	.822
.55	.0990	.0845	.645	.903
.60	.0962	.085	.680	.984
.65	.0921	.0837	.715	1.068
.70	.0865	.0815	.743	1.156
.75	.0805	.0785	.768	1.246
.80	.0750	.0763	.786	1.340
.85	.0690	.0732	.802	1.432
.90	.0632	.070	.814	1.530
.95	.0570	.066	.820	1.635
1.00	.0510	.0621	.820	1.740
1.05	.0445	.0575	.814	1.862
1.10	.0380	.0522	.80	1.985
1.15	.0317	.0467	.78	2.130
1.20	.0250	.0407	.737	2.275
1.25	.0180	.0341	.660	2.460
1.30	.0109	.0275	.520	2.660
1.35	.0035	.0200	.236	2.950

TABLE III

OBSERVED DATA

PROPELLER R–10

11° at 42-inch radius

ρ	V m. p. h.	r. p. m.	Q lb.-ft.	T lb.	C_T	C_P	$\frac{V}{nD}$	η
0.002228	84.2	1,890	634	674	0.0375	0.0233	0.413	0.665
.002228	83.8	1,895	638	683	.0377	.0233	.409	.662
.002228	88.2	1,910	629	643	.0350	.0226	.428	.663
.002228	87.7	1,910	630	646	.0351	.0226	.425	.660
.002225	92.1	1,900	597	580	.0319	.0217	.449	.660
.002218	92.4	1,900	597	582	.0321	.0218	.450	.662
.002215	102.5	1,900	512	427	.0236	.0187	.500	.631
.002215	102.5	1,900	515	428	.0237	.0188	.500	.630
.002241	77.6	1,895	638	715	.0393	.0231	.379	.645
.002241	78.1	1,890	638	715	.0395	.0233	.383	.649
.002234	73.6	1,870	650	760	.0430	.0244	.364	.641
.002234	73.6	1,870	651	762	.0431	.0244	.364	.643
.002219	69.9	1,900	705	850	.0469	.0257	.341	.622
.002219	69.3	1,905	706	853	.0468	.0256	.337	.616
.002219	63.9	1,890	711	894	.0499	.0262	.313	.596
.002219	63.9	1,895	713	897	.0498	.0261	.312	.595
.002219	60.9	1,885	717	925	.0519	.0266	.299	.583
.002219	60.8	1,890	718	924	.0516	.0265	.298	.580
.002221	57.7	1,895	731	958	.0531	.0268	.282	.559
.002221	56.5	1,890	729	965	.0538	.0269	.277	.554
.002228	24.8	1,900	788	1,224	.0673	.0286	.121	.284
.002228	27.4	1,900	790	1,223	.0672	.0287	.134	.313
.002220	103.3	1,840	452	347	.0204	.0176	.520	.603
.002220	103.2	1,835	450	349	.0206	.0176	.521	.610
.002220	102.5	1,710	346	228	.0155	.0156	.555	.552
.002220	102.2	1,625	286	160	.0121	.0143	.582	.493
.002220	102.2	1,475	159	22	.0020	.0096	.642	.134
.002220	101.7	1,325	98	−63	−.0071	.0073	.711	--------
.002220	101.3	1,230	55	−112	−.0147	.0048	.763	--------
.002220	101.3	1,140	6	−159	−.0244	.0006	.823	--------

15° at 42-inch radius

0.002218	84.0	1,875	1,005	1,024	0.0580	0.0377	0.415	0.638
.002218	84.4	1,870	1,003	1,019	.0580	.0378	.418	.641
.002218	89.4	1,880	1,005	991	.0559	.0375	.440	.656
.002218	88.4	1,880	1,005	999	.0564	.0375	.435	.654
.002216	93.0	1,890	1,008	975	.0545	.0373	.456	.666
.002216	93.0	1,885	1,005	977	.0549	.0373	.456	.671
.002202	103.5	1,930	999	915	.0492	.0356	.497	.687
.002202	104.1	1,935	999	909	.0488	.0354	.498	.687
.002202	102.8	1,830	834	761	.0456	.0331	.520	.717
.002202	103.1	1,835	838	763	.0454	.0331	.520	.713
.002202	102.5	1,730	673	593	.0398	.0299	.549	.731
.002202	102.3	1,730	673	594	.0399	.0299	.548	.731
.002202	102.3	1,620	564	471	.0361	.0285	.585	.741
.002202	102.0	1,620	562	471	.0361	.0284	.583	.741
.002195	101.9	1,520	434	336	.0293	.0251	.621	.725
.002195	101.9	1,515	435	336	.0294	.0253	.623	.724
.002195	101.8	1,420	353	251	.0250	.0234	.664	.709
.002195	101.6	1,415	346	241	.0243	.0231	.665	.700
.002195	102.3	1,310	260	149	.0174	.0202	.723	.623
.002195	101.9	1,230	176	67	.0089	.0155	.767	.442
.002195	101.6	1,105	89	−16	−.0026	.0097	.851	--------
.002195	101.4	1,020	37	−65	−.0126	.0047	.921	--------
.002195	100.8	980	3	−94	−.0197	.0004	.953	--------
.002207	80.9	1,855	1,008	1,053	.0613	.0388	.404	.638
.002207	79.5	1,855	1,006	1,049	.0611	.0387	.397	.627
.002207	74.9	1,860	1,008	1,083	.0627	.0386	.373	.606
.002207	74.9	1,855	1,007	1,078	.0628	.0388	.374	.606
.002209	69.9	1,850	1,009	1,108	.0648	.0391	.350	.580
.002209	69.7	1,850	1,012	1,108	.0648	.0392	.349	.577
.002209	64.9	1,845	1,014	1,140	.0671	.0394	.326	.555
.002209	64.9	1,850	1,014	1,135	.0664	.0392	.325	.551
.002212	61.0	1,840	1,016	1,164	.0686	.0396	.307	.532
.002212	61.0	1,840	1,014	1,166	.0687	.0395	.307	.534
.002212	56.9	1,830	1,016	1,197	.0714	.0401	.288	.513
.002212	56.9	1,830	1,015	1,183	.0706	.0401	.288	.507
.002218	26.5	1,820	1,020	1,356	.0817	.0406	.135	.272
.002218	26.9	1,810	1,017	1,343	.0816	.0410	.138	.275

TABLE III—Continued

OBSERVED DATA—Continued

PROPELLER R–10—Continued

19° at 42-inch radius

ρ	V m. p. h.	r. p. m.	Q lb.-ft.	T lb.	C_T	C_P	$\frac{V}{nD}$	η
0.002214	84.2	1,600	1,014	935	0.0729	0.0523	0.487	0.679
.002214	83.5	1,610	1,016	933	.0719	.0518	.480	.666
.002214	89.0	1,635	1,017	913	.0680	.0503	.504	.681
.002214	88.4	1,630	1,016	916	.0687	.0505	.502	.683
.002210	92.1	1,630	1,016	901	.0678	.0505	.523	.702
.002203	92.8	1,630	1,014	893	.0673	.0507	.527	.699
.002197	104.0	1,670	1,014	847	.0611	.0484	.576	.727
.002197	103.4	1,670	1,012	840	.0606	.0483	.574	.720
.002197	103.3	1,620	909	750	.0576	.0462	.591	.737
.002197	104.2	1,620	908	747	.0574	.0460	.596	.744
.002197	103.4	1,530	775	618	.0531	.0441	.626	.754
.002197	103.4	1,530	775	620	.0533	.0441	.626	.757
.002197	102.8	1,430	644	495	.0486	.0419	.666	.773
.002197	103.3	1,435	646	494	.0482	.0418	.667	.769
.002190	103.2	1,350	533	390	.0432	.0390	.708	.784
.002190	103.2	1,350	534	389	.9431	.0390	.708	.782
.002190	102.5	1,270	440	303	.0379	.0363	.747	.780
.002190	102.6	1,275	439	301	.0374	.0362	.745	.770
.002190	103.4	1,190	340	214	.0305	.0321	.805	.765
.002190	102.7	1,105	247	131	.0217	.0270	.861	.692
.002190	102.4	1,030	170	70	.0133	.0214	.921	.572
.002190	101.9	930	78	−2	−.0004	.0120	1.015	--------
.002190	101.6	860	16	−50	−.0136	.0029	1.095	--------
.002201	79.4	1,610	1,020	962	.0746	.0524	.457	.651
.002201	79.2	1,600	1,014	961	.0754	.0526	.458	.656
.002201	74.7	1,600	1,020	982	.0770	.0530	.432	.628
.002201	74.7	1,600	1,016	982	.0770	.0528	.432	.630
.002205	69.7	1,600	1,020	1,005	.0787	.0529	.403	.600
.002205	68.8	1,600	1,018	1,007	.0788	.0527	.398	.595
.002205	65.6	1,600	1,020	1,030	.0806	.0529	.380	.579
.002205	65.6	1,600	1,018	1,077	.0804	.0527	.380	.580
.002207	59.7	1,600	1,020	1,059	.0829	.0528	.347	.545
.002207	60.8	1,600	1,019	1,050	.0821	.0528	.350	.544
.002207	58.1	1,595	1,020	1,067	.0842	.0531	.337	.534
.002207	57.8	1,590	1,020	1,068	.0845	.0535	.337	.532
.002214	26.5	1,600	1,025	1,233	.0961	.0528	.153	.279
.002214	27.0	1,600	1,022	1,226	.0956	.0526	.156	.284

23° at 42-inch radius

0.002291	88.0	1,400	1,033	837	0.0824	0.0671	0.582	0.715
.002291	85.3	1,395	1,029	836	.0829	.0674	.566	.696
.002291	90.8	1,410	1,037	820	.0796	.0666	.596	.712
.002291	90.3	1,405	1,032	817	.0798	.0667	.595	.712
.002280	95.9	1,415	1,037	799	.0774	.0663	.628	.733
.002280	95.2	1,405	1,030	794	.0780	.0670	.627	.730
.002274	106.2	1,450	1,034	755	.0698	.0633	.679	.749
.002274	106.0	1,440	1,028	751	.0704	.0637	.682	.754
.002274	104.7	1,380	914	654	.0668	.0616	.703	.762
.002274	105.2	1,390	940	676	.0680	.0626	.701	.761
.002274	105.0	1,325	811	564	.0625	.0595	.734	.771
.002274	104.7	1,320	811	568	.0634	.0599	.735	.778
.002274	104.4	1,250	702	475	.0591	.0577	.773	.792
.002274	104.5	1,260	702	475	.0581	.0567	.768	.787
.002266	104.3	1,170	582	370	.0527	.0550	.826	.791
.002266	104.0	1,170	580	369	.0526	.0546	.823	.793
.002266	104.2	1,100	491	301	.0485	.0524	.877	.812
.002266	104.3	1,105	492	301	.0481	.0522	.874	.805
.002266	104.2	1,035	376	214	.0390	.0453	.932	.802
.002266	104.0	970	276	139	.0288	.0379	.993	.755
.002266	103.4	890	189	77	.0190	.0308	1.076	.664
.002266	103.3	825	116	31	.0089	.0219	1.159	.470
.002266	102.9	770	41	−20	−.0066	.0089	1.238	--------
.002266	102.9	730	10	−42	−.0154	.0024	1.306	--------
.002278	80.3	1,400	1,042	872	.0863	.0684	.531	.670
.002278	80.1	1,400	1,037	869	.0860	.0681	.530	.669
.002281	76.7	1,400	1,038	892	.0882	.0680	.507	.658
.002281	75.7	1,390	1,034	889	.0892	.0686	.504	.656
.002281	70.3	1,400	1,041	924	.0914	.0683	.465	.622
.002281	69.2	1,395	1,037	919	.0915	.0683	.459	.615
.002277	65.3	1,390	1,040	944	.0948	.0689	.435	.599
.002277	64.9	1,390	1,039	943	.0947	.0689	.432	.594
.002277	61.2	1,370	1,042	963	.0996	.0714	.414	.578
.002277	60.4	1,375	1,038	965	.0991	.0705	.407	.572
.002280	56.1	1,400	1,043	989	.0979	.0683	.371	.532
.002280	56.6	1,390	1,036	981	.0984	.0686	.377	.541
.002286	24.2	1,415	1,038	1,094	.1057	.0664	.158	.252
.002286	25.1	1,415	1,036	1,087	.1050	.0662	.164	.260

TABLE III—Continued

OBSERVED DATA—Continued

PROPELLER R-10—Continued

27° at 42-inch radius

ρ	V m. p. h.	r. p. m.	Q lb.-ft.	T lb.	C_T	C_P	$\frac{V}{nD}$	η
0.002278	85.3	1,230	1,021	735	0.0943	0.0865	0.642	0.700
.002278	85.3	1,225	1,018	731	.0945	.0873	.645	.698
.002278	90.2	1,230	1,020	716	.0918	.0865	.679	.720
.002278	89.8	1,230	1,015	710	.0910	.0862	.676	.714
.002268	93.9	1,240	1,016	698	.0885	.0852	.701	.728
.002268	94.7	1,230	1,012	693	.0893	.0862	.713	.739
.002262	105.4	1,250	1,014	653	.0816	.0841	.781	.758
.002262	104.6	1,250	1,014	652	.0815	.0841	.775	.751
.002262	104.2	1,200	921	582	.0790	.0829	.804	.766
.002254	104.4	1,205	924	587	.0793	.0825	.802	.771
.002254	104.4	1,140	802	491	.0740	.0800	.848	.784
.002254	104.3	1,140	802	489	.0737	.0800	.847	.780
.002254	104.9	1,070	669	390	.0668	.0756	.908	.802
.002254	105.0	1,075	671	390	.0662	.0751	.904	.797
.002254	104.5	1,000	544	297	.0582	.0708	.968	.796
.002254	104.4	1,000	547	304	.0596	.0708	.967	.814
.002254	103.5	955	454	237	.0509	.0646	1.004	.791
.002254	104.3	950	453	239	.0519	.0651	1.017	.811
.002254	103.5	890	359	176	.0436	.0588	1.077	.799
.002254	103.5	900	370	183	.0443	.0592	1.065	.797
.002246	103.6	830	280	126	.0360	.0529	1.156	.787
.002246	103.3	775	184	68	.0223	.0399	1.234	.690
.002246	103.0	700	101	21	.0084	.0269	1.362	.427
.002246	103.4	630	24	−23	−.0114	.0079	1.520	------
.002258	79.7	1,230	1,024	771	.0997	.0877	.660	.682
.002258	80.1	1,230	1,015	760	.0983	.0870	.663	.681
.002258	75.5	1,225	1,020	789	.1029	.0880	.571	.667
.002258	75.0	1,220	1,015	787	.1035	.0883	.569	.667
.002261	69.9	1,230	1,020	816	.1054	.0872	.526	.636
.002261	69.5	1,230	1,019	811	.1048	.0872	.523	.629
.002261	65.4	1,240	1,019	829	.1054	.0858	.488	.600
.002261	65.0	1,240	1,020	826	.1050	.0858	.485	.594
.002264	60.2	1,250	1,022	831	.1038	.0844	.446	.549
.002264	60.5	1,250	1,017	826	.1032	.0840	.448	.551
.002264	56.9	1,270	1,022	847	.1025	.0818	.415	.520
.002264	55.9	1,250	1,018	844	.1054	.0844	.414	.517
.002270	22.2	1,240	1,024	848	.1073	.0858	.166	.208
.002270	22.6	1,245	1,023	845	.1061	.0851	.168	.269

TABLE III-A

FINAL ADJUSTED COEFFICIENTS

PROPELLER R-10

11° at 42-inch radius

$\frac{V}{nD}$	C_T	C_P	η	C_S
0.10	0.0690	0.0292	0.236	0.202
.15	.0654	.0287	.342	.305
.20	.0613	.0283	.433	.406
.25	.0565	.0275	.513	.512
.30	.0512	.0265	.580	.620
.35	.0449	.0250	.629	.732
.40	.0382	.0232	.659	.849
.45	.0312	.0213	.659	.972
.50	.0238	.0188	.631	1.106
.55	.0165	.0162	.560	1.253
.60	.0090	.0133	.407	1.425

15° at 42-inch radius

0.10	0.0836	0.0411	0.203	0.189
.15	.0807	.0408	.297	.284
.20	.0773	.0406	.380	.379
.25	.0736	.0404	.456	.475
.30	.0694	.0398	.523	.571
.35	.0648	.0391	.580	.669
.40	.0599	.0382	.626	.767
.45	.0543	.0368	.664	.870
.50	.0481	.0344	.700	.980
.55	.0410	.0309	.730	1.103
.60	.0338	.0276	.734	1.230
.65	.0267	.0241	.720	1.369
.70	.0196	.0204	.672	1.525
.75	.0122	.0168	.545	1.696
.80	.0050	.0132	.303	1.900

TABLE III-A—Continued

FINAL ADJUSTED COEFFICIENTS—Continued

PROPELLER R-10—Continued

19° at 42-inch radius

$\frac{V}{nD}$	C_T	C_P	η	C_S
0.10	0.0978	0.0529	0.185	0.180
.15	.0960	.0527	.273	.270
.20	.0934	.0531	.351	.360
.25	.0904	.0533	.424	.449
.30	.0870	.0534	.489	.539
.35	.0832	.0533	.546	.629
.40	.0791	.0530	.597	.720
.45	.0748	.0525	.641	.813
.50	.0695	.0511	.680	.905
.55	.0635	.0490	.713	1.005
.60	.0573	.0464	.742	1.108
.65	.0507	.0433	.762	1.218
.70	.0440	.0397	.775	1.333
.75	.0375	.0360	.780	1.455
.80	.0305	.0322	.757	1.591
.85	.0232	.0280	.705	1.735
.90	.0160	.0234	.615	1.906
.95	.0085	.0185	.436	2.11

23° at 42-inch radius

0.10	0.1060	0.0654	0.162	0.172
.15	.1058	.0661	.240	.258
.20	.1052	.0671	.313	.343
.25	.1040	.0675	.385	.429
.30	.1022	.0682	.449	.513
.35	.0998	.0689	.507	.597
.40	.0970	.0695	.558	.681
.45	.0935	.0694	.606	.766
.50	.0894	.0689	.648	.852
.55	.0845	.0681	.682	.941
.60	.0795	.0670	.712	1.030
.65	.0740	.0654	.736	1.120
.70	.0682	.0630	.758	1.218
.75	.0620	.0598	.778	1.318
.80	.0559	.0565	.792	1.423
.85	.0492	.0523	.800	1.534
.90	.0430	.0483	.802	1.648
.95	.0361	.0438	.783	1.775
1.00	.0291	.0388	.750	1.915
1.05	.0220	.0335	.690	2.07
1.10	.0150	.0279	.590	2.25
1.15	.0079	.0220	.413	2.46

27° at 42-inch radius

0.10	0.1083	0.0872	0.124	0.163
.15	.1065	.0855	.187	.245
.20	.1047	.0841	.249	.329
.25	.1040	.0833	.312	.410
.30	.1038	.0830	.375	.494
.35	.1039	.0831	.438	.576
.40	.1040	.0839	.496	.658
.45	.1042	.0846	.553	.738
.50	.1046	.0863	.606	.817
.55	.1030	.0875	.647	.895
.60	.0994	.0880	.677	.975
.65	.0942	.0872	.702	1.060
.70	.0891	.0863	.724	1.143
.75	.0840	.0846	.745	1.230
.80	.0790	.0827	.764	1.320
.85	.0731	.0796	.781	1.410
.90	.0668	.0757	.793	1.506
.95	.0603	.0715	.801	1.610
1.00	.0534	.0663	.805	1.720
1.05	.0470	.0615	.802	1.833
1.10	.0402	.0563	.787	1.955
1.15	.0341	.0511	.766	2.08
1.20	.0280	.0457	.733	2.23
1.25	.0219	.0402	.680	2.37
1.30	.0158	.0342	.601	2.56
1.35	.0092	.0280	.444	2.76

TABLE IV

OBSERVED DATA

PROPELLER C–6

11° at 42-inch radius

ρ	V m. p. h.	r. p. m.	Q lb.-ft.	T lb.	C_T	C_P	$\frac{V}{nD}$	η
0.002243	84.0	1,900	454	516	0.0282	0.0164	0.409	0.705
.002243	84.3	1,900	454	516	.0282	.0164	.411	.707
.002235	88.9	1,900	432	475	.0260	.0157	.433	.719
.002235	88.2	1,900	434	478	.0262	.0157	.430	.716
.002232	93.7	1,900	397	415	.0228	.0144	.457	.723
.002232	93.8	1,900	396	418	.0229	.0144	.457	.728
.002259	103.9	1,900	273	249	.0135	.0098	.506	.698
.002259	103.5	1,895	272	240	.0131	.0098	.506	.676
.002251	103.4	1,800	203	160	.0097	.0081	.532	.634
.002251	102.6	1,710	140	93	.0063	.0062	.556	.559
.002251	101.9	1,610	71	34	.0026	.0035	.586	.436
.002251	102.4	1,515	9	−40	−.0034	.0005	.626	--------
.002230	79.3	1,900	494	588	.0323	.0179	.387	.696
.002230	79.3	1,900	497	592	.0325	.0180	.387	.697
.002230	74.9	1,900	512	634	.0348	.0186	.365	.683
.002230	74.9	1,900	515	632	.0347	.0187	.365	.677
.002233	69.7	1,900	558	721	.0395	.0203	.340	.662
.002233	69.7	1,900	559	723	.0396	.0203	.340	.663
.002233	64.8	1,900	574	759	.0416	.0208	.316	.632
.002233	64.6	1,900	574	773	.0424	.0208	.315	.642
.002236	61.5	1,900	585	800	.0438	.0212	.300	.620
.002236	60.2	1,900	585	809	.0443	.0212	.293	.612
.002242	25.3	1,900	732	1,230	.0671	.0264	.123	.313
.002242	26.6	1,900	732	1,226	.0669	.0264	.130	.328

15° at 42-inch radius

0.002228	86.6	1,910	976	1,040	0.0565	0.0351	0.420	0.676
.002228	87.0	1,915	979	1,036	.0560	.0350	.421	.674
.002228	90.8	1,900	915	951	.0523	.0333	.443	.696
.002228	90.9	1,900	913	951	.0523	.0333	.443	.696
.002225	94.7	1,900	864	878	.0483	.0315	.462	.708
.002225	94.7	1,900	865	880	.0484	.0315	.462	.710
.002215	103.4	1,900	776	754	.0417	.0284	.504	.740
.002215	103.4	1,900	777	754	.0417	.0284	.504	.740
.002215	102.7	1,820	664	630	.0380	.0264	.523	.753
.002215	102.6	1,820	665	632	.0381	.0266	.522	.748
.002215	102.6	1,730	546	497	.0331	.0241	.549	.754
.002215	102.4	1,635	443	390	.0290	.0219	.580	.768
.002207	102.4	1,540	349	291	.0246	.0195	.616	.777
.002207	102.2	1,450	257	196	.0187	.0162	.653	.754
.002207	102.0	1,365	185	128	.0138	.0132	.692	.723
.002207	102.0	1,300	121	73	.0086	.0095	.727	.663
.002207	101.1	1,230	55	18	.0024	.0048	.761	.376
.002207	101.1	1,170	24	−5	−.0007	.0023	.800	--------
.002216	79.9	1,900	988	1,077	.0595	.0362	.389	.640
.002216	79.8	1,900	988	1,075	.0594	.0362	.389	.638
.002219	75.5	1,900	988	1,100	.0607	.0361	.368	.619
.002219	75.5	1,895	985	1,100	.0610	.0362	.369	.622
.002219	70.5	1,890	988	1,132	.0632	.0370	.345	.589
.002219	70.5	1,880	988	1,132	.0639	.0368	.347	.602
.002222	65.9	1,865	990	1,161	.0664	.0375	.327	.579
.002222	65.5	1,855	990	1,162	.0672	.0379	.327	.580
.002222	60.5	1,860	990	1,191	.0685	.0377	.301	.547
.002222	60.7	1,850	989	1,187	.0690	.0381	.304	.551
.002215	58.5	1,850	992	1,213	.0708	.0383	.293	.541
.002215	57.5	1,840	989	1,211	.0713	.0386	.289	.534
.002224	26.4	1,795	1,000	1,293	.0798	.0408	.136	.266
.002224	28.2	1,790	997	1,285	.0798	.0409	.146	.284

19° at 42-inch radius

0.002218	85.0	1,645	994	917	0.0676	0.0484	0.478	0.668
.002218	85.2	1,650	993	915	.0670	.0481	.478	.666
.002215	89.2	1,655	995	905	.0659	.0480	.499	.685
.002215	89.1	1,655	993	904	.0658	.0479	.499	.686
.002215	94.3	1,675	992	885	.0629	.0467	.521	.702
.002207	94.2	1,670	991	888	.0638	.0470	.522	.708
.002203	102.9	1,725	990	859	.0578	.0441	.552	.724
.002203	103.1	1,720	989	854	.0579	.0444	.555	.724
.002203	103.3	1,670	914	778	.0559	.0435	.573	.736
.002203	103.1	1,670	912	779	.0560	.0434	.572	.738
.002203	102.9	1,600	786	656	.0514	.0408	.596	.751
.002203	102.9	1,600	786	660	.0517	.0408	.596	.755
.002195	102.7	1,530	700	570	.0491	.0399	.622	.766
.002195	102.6	1,535	700	576	.0492	.0396	.619	.769
.002195	102.3	1,470	589	465	.0433	.0363	.644	.768
.002195	102.4	1,470	589	465	.0433	.0363	.645	.769
.002195	103.0	1,400	497	379	.0389	.0338	.681	.784
.002195	103.2	1,400	497	378	.0388	.0338	.683	.784
.002195	102.7	1,330	428	315	.0359	.0322	.715	.797
.002195	102.7	1,330	427	315	.0359	.0321	.715	.799
.002195	102.3	1,250	337	234	.0302	.0288	.758	.795
.002187	102.2	1,200	276	181	.0254	.0256	.789	.783
.002187	102.1	1,120	176	108	.0174	.0187	.844	.784
.002187	102.1	1,040	90	39	.0073	.0111	.909	.596
.002187	102.2	960	9	−10	−.0022	.0013	.986	--------
.002199	79.7	1,630	995	940	.0710	.0498	.453	.646
.002199	79.7	1,640	991	935	.0699	.0490	.450	.642
.002199	75.1	1,620	994	952	.0730	.0504	.429	.621
.002199	75.6	1,620	990	949	.0728	.0503	.432	.625
.002202	70.1	1,620	994	967	.0741	.0503	.401	.591
.002202	69.9	1,630	995	964	.0727	.0497	.397	.581
.002202	64.4	1,620	995	977	.0748	.0503	.368	.547
.002202	64.9	1,620	994	977	.0748	.0503	.371	.552
.002202	60.4	1,610	999	988	.0766	.0512	.347	.519
.002202	61.0	1,605	997	980	.0762	.0514	.352	.522
.002211	23.5	1,430	991	915	.0893	.0642	.159	.221
.002211	25.7	1,430	990	914	.0892	.0642	.166	.231

TABLE IV—Continued

OBSERVED DATA—Continued

PROPELLER C–6—Continued

23° at 42-inch radius

ρ	V m. p. h.	r. p. m.	Q lb.-ft.	T lb.	C_T	C_P	$\frac{V}{nD}$	η
0.002236	85.3	1,410	987	759	0.0755	0.0650	0.560	0.661
.002236	85.1	1,405	985	756	.0757	.0654	.561	.649
.002236	88.7	1,425	992	759	.0739	.0639	.576	.666
.002236	88.6	1,420	990	754	.0738	.0643	.578	.664
.002236	93.5	1,420	993	751	.0735	.0646	.610	.694
.002236	93.5	1,430	991	746	.0720	.0635	.605	.686
.002222	105.2	1,460	993	726	.0678	.0613	.667	.738
.002222	104.8	1,460	990	726	.0678	.0611	.665	.738
.002222	104.4	1,390	844	605	.0623	.0572	.696	.758
.002222	104.8	1,390	844	607	.0625	.0572	.698	.763
.002222	104.8	1,360	769	546	.0587	.0546	.714	.768
.002222	104.8	1,340	769	546	.0605	.0562	.724	.780
.002222	104.4	1,260	626	426	.0534	.0519	.767	.789
.002222	104.4	1,270	626	424	.0523	.0510	.761	.780
.002222	103.5	1,185	509	330	.0468	.0477	.809	.794
.002222	103.7	1,190	507	330	.0464	.0471	.807	.795
.002215	104.2	1,140	424	268	.0411	.0431	.846	.807
.002215	104.0	1,120	423	267	.0425	.0445	.860	.821
.002215	103.4	1,060	327	195	.0346	.0384	.903	.814
.002215	103.6	1,000	253	142	.0283	.0334	.959	.813
.002215	103.2	870	80	32	.0084	.0139	1.098	.655
.002215	103.0	800	−5	−16	−.0050	−.0010	1.193	--------
.002224	78.7	1,400	995	763	.0773	.0667	.521	.604
.002224	79.6	1,405	992	760	.0765	.0663	.525	.606
.002227	73.9	1,390	996	763	.0784	.0677	.492	.570
.002227	75.2	1,390	992	759	.0780	.0674	.501	.580
.002227	70.5	1,390	997	763	.0784	.0677	.470	.544
.002227	69.3	1,390	995	758	.0779	.0674	.462	.534
.002230	64.7	1,360	997	759	.0813	.0705	.440	.507
.002230	64.7	1,370	992	756	.0798	.0694	.437	.503
.002230	60.3	1,340	997	755	.0833	.0728	.417	.477
.002230	60.2	1,350	992	751	.0817	.0713	.413	.473
.002230	56.2	1,330	997	750	.0841	.0741	.391	.444
.002230	55.6	1,320	992	746	.0849	.0745	.390	.445
.002236	23.7	1,190	987	714	.0997	.0913	.184	.201
.002236	23.4	1,200	987	712	.0978	.0898	.181	.197

27° at 42-inch radius

0.002220	84.8	1,225	981	602	0.0779	0.0861	0.641	0.595
.002220	84.3	1,220	981	599	.0802	.0868	.640	.591
.002220	89.8	1,250	983	606	.0772	.0828	.665	.620
.002220	89.6	1,250	983	606	.0772	.0828	.664	.619
.002217	93.5	1,245	981	607	.0781	.0836	.695	.649
.002217	93.4	1,270	980	603	.0745	.0800	.681	.634
.002214	105.3	1,280	983	605	.0737	.0792	.762	.709
.002214	104.3	1,280	983	602	.0734	.0792	.755	.700
.002214	104.3	1,250	940	579	.0740	.0795	.773	.720
.002214	104.8	1,260	939	580	.0729	.0780	.770	.720
.002206	104.4	1,210	850	522	.0714	.0770	.799	.741
.002206	104.2	1,210	848	521	.0713	.0767	.797	.741
.002206	104.1	1,150	737	443	.0672	.0739	.838	.762
.002206	104.1	1,150	737	444	.0673	.0739	.838	.763
.002206	103.4	1,100	629	370	.0613	.0689	.870	.774
.002206	103.5	1,095	629	371	.0620	.0696	.875	.779
.002206	103.5	1,060	570	330	.0588	.0672	.904	.791
.002206	104.0	1,060	570	330	.0588	.0672	.908	.795
.002199	103.5	1,000	469	259	.0521	.0623	.958	.801
.002199	103.4	990	465	259	.0531	.0631	.967	.814
.002199	103.2	930	378	199	.0462	.0582	1.028	.816
.002199	103.7	940	384	205	.0466	.0578	1.021	.823
.002199	103.4	870	268	131	.0348	.0471	1.101	.814
.002199	103.4	870	268	129	.0343	.0471	1.101	.802
.002199	102.6	805	170	77	.0239	.0349	1.181	.809
.002199	103.4	750	92	34	.0121	.0217	1.277	.714
.002199	103.3	715	35	9	.0035	.0091	1.338	.520
.002199	102.8	690	6	−9	−.0038	.0017	1.380	--------
.002208	79.2	1,210	981	597	.0816	.0887	.606	.558
.002208	78.7	1,210	974	595	.0814	.0883	.602	.555
.002211	74.4	1,195	979	594	.0831	.0907	.577	.529
.002211	74.3	1,185	974	592	.0843	.0918	.581	.534
.002211	69.8	1,175	974	592	.0857	.0933	.550	.505
.002211	68.3	1,170	973	587	.0857	.0941	.541	.493
.002214	65.2	1,160	972	587	.0871	.0955	.521	.475
.002214	65.0	1,150	972	587	.0887	.0971	.523	.478
.002214	60.3	1,150	972	584	.0882	.0971	.486	.441
.002214	60.8	1,145	972	582	.0886	.0979	.492	.445
.002214	55.5	1,125	970	582	.0919	.1013	.457	.415
.002214	56.9	1,120	970	579	.0922	.1021	.470	.424
.002220	21.6	1,070	970	576	.1002	.1116	.187	.168
.002220	21.5	1,065	966	577	.1012	.1122	.187	.169

TABLE IV–A

FINAL ADJUSTED COEFFICIENTS

PROPELLER C–6

11° at 42-inch radius

$\frac{V}{nD}$	C_T	C_P	η	C_S
0.10	0.0697	0.0269	0.259	0.206
.15	.0638	.0260	.368	.311
.20	.0573	.0249	.460	.418
.25	.0508	.0234	.542	.530
.30	.0442	.0215	.617	.646
.35	.0374	.0196	.667	.769
.40	.0305	.0172	.710	.904
.45	.0230	.0142	.729	1.055
.50	.0154	.0109	.706	1.239
.55	.0079	.0069	.630	1.490

15° at 42-inch radius

0.10	0.0808	0.0408	0.198	0.190
.15	.0795	.0410	.291	.284
.20	.0773	.0403	.384	.380
.25	.0740	.0397	.466	.476
.30	.0697	.0383	.546	.575
.35	.0637	.0372	.598	.675
.40	.0574	.0354	.648	.780
.45	.0501	.0325	.693	.893
.50	.0425	.0290	.732	1.014
.55	.0340	.0247	.757	1.150
.60	.0265	.0206	.770	1.305
.65	.0188	.0162	.755	1.482
.70	.0119	.0118	.702	1.702
.75	.0043	.0070	.462	2.02

19° at 42-inch radius

0.10	0.0949	0.0704	0.134	0.170
.15	.0901	.0652	.207	.259
.20	.0861	.0607	.284	.350
.25	.0826	.0560	.369	.446
.30	.0793	.0533	.447	.540
.35	.0763	.0514	.519	.634
.40	.0739	.0504	.585	.728
.45	.0700	.0493	.640	.822
.50	.0655	.0479	.685	.917
.55	.0586	.0446	.723	1.023
.60	.0518	.0412	.751	1.138
.65	.0450	.0377	.775	1.253
.70	.0380	.0334	.796	1.380
.75	.0309	.0289	.802	1.520
.80	.0238	.0238	.800	1.690
.85	.0165	.0181	.775	1.900
.90	.0091	.0122	.673	2.18
.95	.0018	.0060	.285	2.64

23° at 42-inch radius

0.10	0.1058	0.0980	0.108	0.159
.15	.1012	.0935	.162	.241
.20	.0970	.0890	.218	.324
.25	.0936	.0848	.276	.410
.30	.0898	.0809	.333	.497
.35	.0866	.0771	.393	.585
.40	.0831	.0734	.452	.675
.45	.0803	.0698	.518	.766
.50	.0780	.0676	.577	.858
.55	.0764	.0661	.635	.946
.60	.0727	.0640	.681	1.040
.65	.0680	.0612	.722	1.140
.70	.0621	.0579	.758	1.239
.75	.0556	.0533	.782	1.349
.80	.0488	.0489	.799	1.462
.85	.0422	.0443	.810	1.585
.90	.0357	.0394	.815	1.720
.95	.0287	.0327	.809	1.870
1.00	.0216	.0273	.791	2.05
1.05	.0154	.0203	.749	2.29
1.10	.0080	.0135	.648	2.54

TABLE IV–A—Continued

FINAL ADJUSTED COEFFICIENTS—Continued

PROPELLER C–6—Continued

27° at 42-inch radius

$\frac{V}{nD}$	C_T	C_P	η	C_S
0.10	0.0997	0.1132	0.088	0.155
.15	.1000	.1128	.133	.232
.20	.1000	.1123	.178	.310
.25	.0992	.1118	.222	.388
.30	.0980	.1100	.267	.467
.35	.0962	.1076	.313	.547
.40	.0941	.1049	.359	.628
.45	.0918	.1019	.405	.710
.50	.0890	.0981	.453	.796
.55	.0855	.0939	.501	.883
.60	.0820	.0891	.552	.974
.65	.0786	.0851	.600	1.067
.70	.0757	.0818	.648	1.155
.75	.0735	.0793	.695	1.244
.80	.0702	.0764	.735	1.339
.85	.0658	.0732	.765	1.433
.90	.0600	.0684	.789	1.540
.95	.0546	.0645	.804	1.645
1.00	.0489	.0600	.814	1.758
1.05	.0428	.0547	.820	1.880
1.10	.0356	.0477	.819	2.02
1.15	.0290	.0410	.811	2.18
1.20	.0218	.0326	.794	2.38
1.25	.0147	.0245	.750	2.62
1.30	.0080	.0160	.649	2.95

TABLE V

OBSERVED DATA

PROPELLER C–8

11° at 42-inch radius

ρ	V m. p. h.	r. p. m.	Q lb.-ft.	T lb.	C_T	C_P	$\frac{V}{nD}$	η
0.002257	85.3	1,890	523	599	0.0328	0.0190	0.418	0.722
.002257	85.4	1,860	504	574	.0325	.0189	.425	.732
.002254	88.6	1,870	466	515	.0289	.0173	.439	.734
.002254	88.7	1,860	461	510	.0289	.0173	.442	.739
.002254	92.0	1,890	460	499	.0274	.0167	.451	.740
.002254	92.0	1,880	450	485	.0269	.0165	.453	.738
.002251	95.7	1,900	446	474	.0258	.0160	.466	.749
.002251	95.0	1,900	447	474	.0258	.0161	.463	.743
.002240	104.6	1,890	344	329	.0182	.0126	.512	.740
.002240	104.5	1,880	344	328	.0183	.0127	.515	.743
.002240	104.2	1,770	243	214	.0135	.0101	.545	.727
.002240	104.2	1,770	243	214	.0135	.0101	.545	.727
.002240	104.0	1,630	140	100	.0074	.0069	.591	.637
.002240	103.3	1,510	48	9	.0008	.0027	.633	.179
.002240	103.3	1,470	15	−23	−.0021	.0009	.651	-------
.002249	79.7	1,870	537	635	.0357	.0200	.395	.706
.002249	79.7	1,880	529	627	.0349	.0194	.393	.705
.002252	75.7	1,900	596	733	.0399	.0215	.369	.685
.002252	74.9	1,900	592	733	.0399	.0213	.365	.684
.002252	70.1	1,900	641	820	.0446	.0231	.342	.660
.002252	70.4	1,920	644	823	.0438	.0226	.340	.659
.002255	64.9	1,880	632	838	.0465	.0231	.320	.644
.002255	64.8	1,880	635	842	.0467	.0232	.319	.642
.002255	60.9	1,880	647	885	.0492	.0237	.300	.623
.002255	59.8	1,890	653	897	.0492	.0237	.293	.608
.002258	55.6	1,890	673	948	.0520	.0244	.272	.580
.002258	56.2	1,880	672	947	.0525	.0246	.277	.591
.002264	24.7	1,920	804	1299	.0687	.0281	.119	.291
.002264	26.2	1,930	802	1292	.0676	.0278	.126	.306

TABLE V—Continued

OBSERVED DATA—Continued

PROPELLER C-8—Continued

15° at 42-inch radius

ρ	V m. p. h.	r. p. m.	Q lb.-ft.	T lb.	C_T	C_P	$\frac{V}{nD}$	η
0.002255	87.6	1,880	1,006	1,054	0.0585	0.0369	0.432	0.685
.002255	89.6	1,900	1,005	1,042	.0566	.0361	.437	.685
.002255	91.8	1,910	1,006	1,031	.0554	.0357	.445	.691
.002255	92.3	1,910	1,007	1,028	.0552	.0357	.447	.691
.002244	96.8	1,940	1,004	1,007	.0527	.0348	.462	.699
.002244	96.2	1,940	1,005	1,007	.0527	.0348	.459	.695
.002241	104.0	1,910	884	851	.0460	.0317	.504	.731
.002241	104.5	1,920	884	850	.0454	.0313	.504	.731
.002241	105.4	1,905	865	835	.0454	.0311	.512	.748
.002241	104.3	1,910	865	840	.0454	.0310	.506	.741
.002233	103.9	1,790	688	654	.0404	.0281	.537	.772
.002233	103.6	1,780	679	644	.0402	.0280	.539	.774
.002233	103.6	1,680	527	476	.0334	.0245	.571	.778
.002233	103.6	1,670	518	468	.0332	.0243	.574	.784
.002233	103.4	1,580	422	372	.0294	.0222	.606	.802
.002233	103.3	1,590	417	365	.0286	.0216	.602	.797
.002233	103.2	1,510	321	264	.0229	.0184	.633	.786
.002233	103.0	1,395	219	165	.0168	.0147	.684	.780
.002233	102.6	1,300	139	92	.0108	.0107	.731	.733
.002233	102.6	1,190	38	11	.0015	.0035	.798	.349
.002233	105.6	1,970	998	957	.0488	.0337	.496	.718
.002233	104.4	1,970	998	961	.0490	.0337	.491	.714
.002242	83.1	1,890	1,013	1,084	.0599	.0370	.407	.659
.002242	82.5	1,900	1,008	1,085	.0593	.0364	.402	.655
.002245	77.1	1,880	1,012	1,122	.0626	.0373	.380	.638
.002245	77.6	1,870	1,016	1,113	.0627	.0378	.384	.637
.002245	71.6	1,860	1,017	1,154	.0657	.0382	.356	.613
.002245	70.4	1,870	1,015	1,156	.0651	.0378	.349	.601
.002248	65.4	1,840	1,020	1,195	.0693	.0392	.329	.582
.002248	64.8	1,850	1,020	1,200	.0690	.0387	.324	.578
.002248	61.1	1,840	1,022	1,229	.0713	.0392	.308	.560
.002248	61.4	1,860	1,018	1,228	.0698	.0383	.306	.558
.002251	55.7	1,830	1,022	1,254	.0735	.0396	.282	.523
.002251	57.2	1,830	1,019	1,249	.0732	.0395	.289	.536
.002257	26.4	1,820	1,024	1,385	.0819	.0400	.134	.275
.002257	26.8	1,830	1,020	1,380	.0807	.0395	.136	.277

19° at 42-inch radius

0.002249	87.4	1,645	1,022	949	0.0688	0.0491	0.492	0.689
.002249	87.4	1,640	1,021	947	.0692	.0494	.493	.691
.002245	91.3	1,670	1,024	936	.0661	.0478	.506	.700
.002245	91.1	1,660	1,025	935	.0667	.0485	.508	.699
.002245	95.2	1,670	1,028	915	.0646	.0480	.528	.711
.002245	96.1	1,680	1,024	914	.0638	.0473	.530	.715
.002234	104.3	1,710	1,024	882	.0598	.0459	.565	.736
.002234	104.3	1,700	1,023	878	.0601	.0463	.568	.737
.002234	104.3	1,650	929	794	.0577	.0447	.585	.755
.002234	104.1	1,650	931	794	.0577	.0448	.584	.752
.002234	103.9	1,570	778	639	.0512	.0414	.613	.758
.002234	104.4	1,565	776	635	.0513	.0414	.618	.766
.002234	103.6	1,470	632	496	.0454	.0382	.653	.776
.002234	103.6	1,450	604	472	.0445	.0376	.662	.784
.002228	102.9	1,330	465	343	.0385	.0345	.716	.799
.002228	104.3	1,340	462	342	.0378	.0337	.721	.809
.002228	103.4	1,270	352	247	.0304	.0286	.754	.802
.002228	103.4	1,260	351	247	.0309	.0290	.760	.810
.002228	103.3	1,185	262	174	.0246	.0245	.807	.810
.002228	103.3	1,100	156	90	.0148	.0169	.870	.758
.002228	102.9	1,020	82	36	.0069	.0103	.934	.620
.002228	102.5	960	17	−6	−.0013	.0024	.989	--------
.002236	80.9	1,640	1,022	976	.0717	.0496	.457	.661
.002236	80.9	1,640	1,019	976	.0717	.0495	.457	.662
.002236	75.8	1,630	1,024	1,004	.0746	.0504	.431	.638
.002236	75.7	1,630	1,022	1,002	.0745	.0503	.430	.637
.002239	69.3	1,610	1,024	1,031	.0786	.0516	399	.608
.002239	70.1	1,610	1,025	1,030	.0785	.0516	.403	.613
.002242	65.4	1,605	1,029	1,051	.0803	.0521	.377	.581
.002242	64.5	1,630	1,024	1,049	.0777	.0503	.366	.565
.002242	60.7	1,600	1,029	1,062	.0818	.0525	.351	.547
.002242	60.8	1,615	1,027	1,058	.0799	.0514	.349	.542
.002242	56.1	1,640	1,030	1,067	.0782	.0500	.317	.492
.002242	56.7	1,630	1,028	1,064	.0788	.0505	.322	.502
.002248	21.1	1,550	1,030	1,605	.0823	.0558	.144	.212
.002248	25.1	1,550	1,027	1,606	.0824	.0556	.150	.222

TABLE V—Continued

OBSERVED DATA—Continued

PROPELLER C-8—Continued

23° at 42-inch radius

ρ	V m. p. h.	r. p. m.	Q lb.-ft.	T lb.	C_T	C_P	$\frac{V}{nD}$	η
0.002242	85.3	1,440	1,013	794	0.0756	0.0636	0.549	0.653
.002242	85.4	1,440	1,013	799	.0761	.0636	.549	.657
.002242	90.2	1,430	1,018	793	.0762	.0650	.584	.684
.002242	89.1	1,430	1,013	792	.0761	.0647	.577	.679
.002239	94.6	1,450	1,020	785	.0738	.0634	.604	.703
.002239	94.6	1,450	1,015	778	.0731	.0630	.604	.701
.002229	104.9	1,470	1,016	752	.0690	.0617	.661	.739
.002229	105.3	1,470	1,011	749	.0687	.0613	.663	.743
.002229	104.9	1,405	898	651	.0654	.0597	.691	.757
.002229	105.1	1,400	899	651	.0659	.0602	.695	.760
.002229	104.9	1,340	778	546	.0603	.0568	.725	.770
.002229	105.1	1,340	779	547	.0604	.0568	.726	.772
.002229	104.4	1,270	663	450	.0553	.0539	.761	.781
.002229	104.4	1,260	660	450	.0562	.0545	.767	.791
.002229	104.4	1,200	551	358	.0493	.0502	.806	.792
.002229	104.9	1,200	551	356	.0490	.0502	.810	.791
.002229	104.2	1,130	455	286	.0444	.0468	.854	.810
.002229	104.2	1,150	453	284	.0426	.0450	.839	.794
.002221	104.3	1,070	355	213	.0370	.0408	.903	.819
.002221	104.2	1,060	353	212	.0375	.0414	.910	.824
.002221	104.2	990	250	139	.0282	.0335	.975	.821
.002221	103.6	930	171	85	.0196	.0260	1.032	.776
.002221	103.3	860	69	25	.0067	.0123	1.112	.608
.002221	102.7	800	21	−2	−.0006	.0043	1.189	--------
.002230	80.9	1,425	1,009	796	.0777	.0652	.526	.627
.002230	80.3	1,410	1,006	791	.0789	.0664	.527	.626
.002233	75.2	1,410	1,010	797	.0793	.0665	.494	.589
.002233	74.3	1,405	1,008	792	.0794	.0670	.490	.581
.002233	69.9	1,400	1,017	795	.0803	.0680	.462	.546
.002233	68.6	1,400	1,011	792	.0799	.0677	.454	.536
.002236	64.6	1,390	1,020	793	.0812	.0690	.430	.506
.002236	64.7	1,390	1,015	789	.0807	.0687	.431	.506
.002236	59.2	1,380	1,020	787	.0817	.0700	.397	.463
.002236	59.2	1,390	1,015	787	.0805	.0687	.394	.462
.002236	55.2	1,370	1,018	789	.0831	.0711	.373	.436
.002242	22.5	1,290	1,008	734	.0870	.0790	.161	.178
.002242	22.7	1,285	1,004	730	.0872	.0794	.164	.180

27° at 42-inch radius

0.002234	84.9	1,240	997	629	0.0809	0.0847	0.634	0.606
.002234	85.9	1,260	999	628	.0783	.0825	.631	.599
.002226	89.6	1,260	1,006	633	.0792	.0835	.658	.624
.002226	89.6	1,250	1,001	631	.0802	.0840	.664	.634
.002223	93.6	1,265	1,004	634	.0788	.0825	.685	.652
.002223	94.4	1,260	1,004	635	.0795	.0833	.694	.662
.002220	104.9	1,280	1,003	629	.0764	.0807	.759	.719
.002220	103.6	1,290	1,001	627	.0750	.0791	.744	.705
.002213	104.2	1,270	950	592	.0733	.0778	.760	.716
.002213	104.2	1,260	948	591	.0743	.0787	.766	.723
.002213	104.0	1,200	837	517	.0717	.0768	.803	.750
.002213	104.0	1,200	838	516	.0715	.0769	.803	.747
.002213	103.4	1,140	735	444	.0682	.0747	.840	.767
.002213	103.6	1,150	735	445	.0672	.0734	.834	.764
.002213	103.3	1,100	642	376	.0621	.0701	.870	.771
.002213	103.3	1,090	641	378	.0635	.0713	.878	.782
.002205	103.4	1,050	578	333	.0606	.0695	.912	.795
.002205	103.4	1,055	579	333	.0600	.0690	.908	.790
.002205	103.0	990	466	259	.0530	.0631	.963	.809
.002205	103.0	990	465	256	.0524	.0629	.963	.802
.002205	102.7	930	372	199	.0461	.0570	1.022	.827
.002205	102.7	930	372	199	.0461	.0570	1.022	.827
.002205	102.7	880	288	141	.0365	.0493	1.081	.800
.002205	102.6	875	282	139	.0364	.0489	1.086	.808
.002205	102.6	820	207	96	.0286	.0408	1.158	.812
.002205	102.2	780	144	62	.0204	.0314	1.213	.788
.002205	101.7	720	70	25	.0097	.0179	1.308	.706
.002205	101.7	680	1	−9	−.0039	.0003	1.385	--------
.002214	80.4	1,250	991	620	.0792	.0838	.596	.563
.002214	80.3	1,240	991	619	.0800	.0851	.600	.564
.002217	75.3	1,240	994	616	.0798	.0853	.562	.526
.002217	75.4	1,220	989	613	.0821	.0877	.572	.535
.002217	70.1	1,230	990	605	.0797	.0863	.528	.488
.002217	69.4	1,220	987	605	.0810	.0873	.527	.489
.002220	65.3	1,210	994	602	.0819	.0893	.500	.459
.002220	64.3	1,210	989	598	.0814	.0889	.492	.450
.002220	59.0	1,190	992	595	.0837	.0923	.459	.416
.002220	59.4	1,195	988	593	.0827	.0912	.460	.417
.002220	55.1	1,180	991	591	.0846	.0939	.432	.389
.002220	54.6	1,185	987	589	.0835	.0927	.427	.385
.002226	21.9	1,100	981	577	.0947	.1068	.184	.164
.002226	21.3	1,100	975	575	.0944	.1057	.179	.160

TABLE V–A

FINAL ADJUSTED COEFFICIENTS

PROPELLER C–8

11° at 42-inch radius

$\frac{V}{nD}$	C_T	C_P	η	C_S
0.10	0.0700	0.0283	0.247	0.204
.15	.0654	.0277	.354	.308
.20	.0603	.0267	.452	.412
.25	.0547	.0253	.540	.521
.30	.0488	.0238	.615	.634
.35	.0420	.0220	.668	.751
.40	.0350	.0196	.714	.880
.45	.0278	.0169	.740	1.018
.50	.0206	.0138	.746	1.177
.55	.0130	.0100	.715	1.382
.60	.0056	.0056	.600	1.695

15° at 42-inch radius

0.10	0.0815	0.0394	0.207	0.191
.15	.0802	.0400	.301	.285
.20	.0782	.0401	.390	.380
.25	.0761	.0398	.478	.476
.30	.0716	.0393	.546	.574
.35	.0666	.0387	.603	.670
.40	.0605	.0371	.653	.772
.45	.0545	.0351	.699	.879
.50	.0470	.0319	.737	.995
.55	.0382	.0272	.772	1.130
.60	.0297	.0225	.791	1.283
.65	.0218	.0179	.790	1.452
.70	.0139	.0128	.762	1.676
.75	.0070	.0077	.685	1.985

19° at 42-inch radius

0.10	0.0798	0.0558	0.143	0.178
.15	.0828	.0554	.224	.268
.20	.0841	.0550	.306	.357
.25	.0849	.0543	.391	.448
.30	.0838	.0535	.470	.540
.35	.0815	.0525	.544	.632
.40	.0775	.0514	.603	.724
.45	.0725	.0500	.653	.818
.50	.0677	.0487	.695	.915
.55	.0615	.0464	.729	1.017
.60	.0545	.0432	.757	1.128
.65	.0472	.0393	.780	1.240
.70	.0398	.0350	.796	1.370
.75	.0321	.0298	.807	1.517
.80	.0251	.0249	.804	1.676
.85	.0175	.0191	.777	1.878
.90	.0110	.0139	.710	2.12
.95	.0027	.0080	.440	2.49

23° at 42-inch radius

0.10	0.0877	0.0822	0.106	0.165
.15	.0871	.0801	.163	.248
.20	.0864	.0785	.220	.333
.25	.0855	.0763	.280	.419
.30	.0845	.0741	.342	.505
.35	.0831	.0717	.405	.593
.40	.0817	.0698	.468	.682
.45	.0802	.0678	.532	.771
.50	.0788	.0668	.590	.860
.55	.0770	.0652	.650	.950
.60	.0739	.0637	.696	1.041
.65	.0696	.0619	.732	1.135
.70	.0640	.0590	.760	1.237
.75	.0573	.0552	.779	1.340
.80	.0508	.0512	.794	1.450
.85	.0441	.0465	.805	1.570
.90	.0375	.0414	.815	1.702
.95	.0308	.0357	.820	1.850
1.00	.0240	.0299	.802	2.01
1.05	.0172	.0244	.742	2.20
1.10	.0106	.0185	.630	2.44
1.15	.0040	.0115	.400	2.81

TABLE V–A—Continued

FINAL ADJUSTED COEFFICIENTS—Continued

PROPELLER C–8—Continued

27° at 42-inch radius

$\frac{V}{nD}$	C_T	C_P	η	C_S
0.10	0.0990	0.1125	0.088	0.155
.15	.0963	.1094	.132	.234
.20	.0940	.1058	.178	.314
.25	.0917	.1023	.224	.394
.30	.0896	.0992	.271	.476
.35	.0875	.0962	.318	.560
.40	.0855	.0945	.362	.642
.45	.0838	.0918	.411	.726
.50	.0819	.0890	.460	.811
.55	.0805	.0865	.512	.899
.60	.0800	.0850	.565	.984
.65	.0795	.0837	.617	1.069
.70	.0779	.0820	.665	1.153
.75	.0752	.0797	.707	1.244
.80	.0711	.0766	.743	1.340
.85	.0660	.0729	.770	1.437
.90	.0602	.0688	.788	1.539
.95	.0544	.0642	.805	1.647
1.00	.0482	.0591	.815	1.760
1.05	.0420	.0535	.824	1.888
1.10	.0355	.0473	.825	2.03
1.15	.0290	.0405	.822	2.18
1.20	.0222	.0333	.800	2.36
1.25	.0155	.0254	.762	2.61
1.30	.0085	.0177	.624	2.91

TABLE VI

OBSERVED DATA

PROPELLER C–10

11° at 42-inch radius

ρ	V m. p. h.	r. p. m.	Q lb.-ft.	T lb.	C_T	C_P	$\frac{V}{nD}$	η
0.002263	84.9	1,870	583	652	0.0364	0.0216	0.420	0.708
.002263	86.4	1,880	583	644	.0356	.0213	.426	.712
.002260	92.4	1,890	555	589	.0323	.0201	.453	.728
.002252	92.1	1,890	560	600	.0330	.0204	.451	.730
.002249	95.2	1,880	529	551	.0307	.0194	.469	.741
.002252	95.0	1,890	530	552	.0304	.0193	.465	.734
.002246	105.1	1,870	415	398	.0224	.0154	.520	.755
.002246	105.1	1,870	407	392	.0220	.0152	.520	.755
.002241	103.9	1,790	338	308	.0189	.0137	.537	.741
.002241	103.5	1,700	247	206	.0141	.0112	.564	.711
.002241	103.7	1,580	152	109	.0086	.0079	.608	.657
.002241	103.7	1,500	74	35	.0031	.0043	.640	.459
.002241	103.0	1,430	26	−10	−.0009	.0016	.667	-------
.002250	83.0	1,910	636	726	.0391	.0226	.402	.695
.002250	82.2	1,905	637	732	.0396	.0228	.400	.695
.002250	76.6	1,890	650	773	.0425	.0236	.375	.675
.002253	75.8	1,900	656	783	.0425	.0235	.369	.668
.002253	71.3	1,905	708	871	.0471	.0253	.347	.646
.002253	69.7	1,910	710	885	.0476	.0252	.338	.638
.002256	66.0	1,880	697	892	.0495	.0256	.325	.629
.002256	65.0	1,890	701	900	.0494	.0254	.318	.619
.002256	59.8	1,900	731	967	.0525	.0263	.291	.581
.002256	60.3	1,890	731	968	.0531	.0265	.295	.591
.002256	57.5	1,910	768	1,026	.0551	.0272	.279	.565
.002259	56.0	1,910	769	1,039	.0557	.0273	.272	.555
.002262	24.6	1,910	815	1,274	.0682	.0289	.119	.282
.002262	26.5	1,900	820	1,272	.0688	.0294	.129	.302

TABLE VI—Continued

OBSERVED DATA—Continued

PROPELLER C-10—Continued

15° at 42-inch radius

ρ	V m. p. h.	r. p. m.	Q lb.-ft.	T lb.	C_T	C_P	$\frac{V}{nD}$	η
0.002212	89.2	1,885	1,001	1,008	0.0567	0.0372	0.438	0.668
.002212	89.6	1,885	1,002	1,007	.0566	.0373	.440	.667
.002209	92.4	1,885	1,004	998	.0562	.0375	.454	.681
.002209	93.2	1,890	1,005	998	.0559	.0373	.457	.685
.002209	96.9	1,900	1,003	976	.0541	.0368	.472	.695
.002209	96.9	1,905	1,003	976	.0538	.0366	.471	.692
.002196	106.7	1,950	998	925	.0490	.0350	.507	.709
.002196	106.7	1,950	995	917	.0486	.0349	.507	.706
.002196	106.1	1,880	878	817	.0466	.0330	.523	.738
.002196	106.1	1,880	874	809	.0461	.0329	.523	.733
.002196	105.6	1,800	721	672	.0418	.0296	.543	.767
.002196	105.3	1,790	718	660	.0415	.0298	.545	.759
.002188	105.3	1,710	615	550	.0380	.0281	.570	.771
.002188	105.3	1,710	611	542	.0375	.0279	.570	.766
.002188	105.3	1,640	518	452	.0339	.0257	.595	.785
.002188	105.3	1,640	518	446	.0335	.0257	.595	.776
.002188	104.9	1,570	446	374	.0306	.0242	.619	.782
.002188	105.1	1,570	444	373	.0305	.0241	.620	.785
.002221	103.6	1,470	326	253	.0233	.0198	.653	.767
.002221	103.3	1,390	254	185	.0191	.0173	.688	.758
.002221	103.1	1,290	153	96	.0115	.0121	.740	.703
.002221	103.1	1,190	78	35	.0049	.0072	.802	.544
.002221	102.8	1,105	4	−18	−.0029	.0004	.861	--------
.002200	80.7	1,870	1,004	1,061	.0610	.0382	.400	.639
.002200	80.5	1,870	1,003	1,059	.0609	.0381	.399	.638
.002200	75.6	1,865	1,009	1,090	.0629	.0386	.375	.611
.002200	75.8	1,860	1,007	1,091	.0634	.0387	.377	.618
.002203	69.8	1,850	1,012	1,124	.0659	.0392	.349	.587
.002203	69.8	1,850	1,009	1,130	.0663	.0391	.349	.592
.002203	64.4	1,840	1,013	1,159	.0683	.0397	.324	.560
.002203	64.8	1,840	1,009	1,160	.0686	.0396	.326	.565
.002199	61.4	1,845	1,012	1,182	.0699	.0396	.308	.544
.002199	62.0	1,845	1,009	1,176	.0695	.0395	.311	.547
.002199	58.0	1,840	1,013	1,202	.0713	.0398	.292	.523
.002199	57.5	1,840	1,012	1,201	.0712	.0398	.289	.517
.002208	26.9	1,840	1,012	1,355	.0800	.0396	.135	.274
.002208	26.9	1,840	1,008	1,344	.0794	.0394	.135	.273

19° at 42-inch radius

0.002194	86.4	1,605	1,012	929	0.0726	0.0522	0.498	0.693
.002194	86.9	1,620	1,012	926	.0712	.0514	.497	.688
.002194	91.6	1,630	1,012	908	.0688	.0507	.520	.706
.002194	91.7	1,630	1,009	904	.0685	.0506	.520	.704
.002191	95.6	1,645	1,009	889	.0662	.0497	.538	.717
.002191	95.9	1,645	1,008	887	.0660	.0497	.540	.717
.002181	104.5	1,665	1,013	849	.0621	.0489	.581	.738
.002181	105.1	1,670	1,006	848	.0616	.0483	.583	.743
.002181	104.7	1,600	909	751	.0595	.0476	.606	.758
.002181	104.7	1,610	906	750	.0587	.0469	.602	.754
.002181	104.0	1,530	784	635	.0550	.0450	.629	.769
.002181	104.0	1,530	786	631	.0547	.0450	.629	.765
.002174	103.3	1,440	635	494	.0485	.0411	.664	.784
.002174	103.5	1,440	635	493	.0484	.0411	.666	.785
.002174	103.3	1,340	504	382	.0432	.0377	.714	.818
.002174	102.9	1,340	512	378	.0428	.0383	.711	.795
.002174	102.6	1,265	406	286	.0363	.0342	.751	.797
.002174	102.9	1,260	405	286	.0366	.0343	.756	.807
.002174	102.5	1,175	296	193	.0284	.0289	.808	.794
.002174	102.6	1,170	297	194	.0288	.0292	.812	.801
.002174	102.0	1,090	192	115	.0197	.0218	.867	.783
.002174	101.7	1,000	94	41	.0083	.0126	.942	.622
.002174	102.3	930	20	−2	−.0005	.0031	1.019	--------
.002183	82.0	1,600	1,012	948	.0750	.0528	.475	.675
.002183	82.0	1,610	1,008	948	.0741	.0519	.472	.674
.002186	76.6	1,610	1,012	980	.0765	.0520	.441	.649
.002186	76.8	1,610	1,007	974	.0760	.0519	.442	.647
.002186	70.8	1,600	1,012	1,001	.0791	.0528	.410	.614
.002186	71.2	1,605	1,008	1,005	.0788	.0523	.411	.619
.002189	65.2	1,600	1,010	1,047	.0826	.0527	.377	.591
.002189	64.2	1,600	1,009	1,040	.0820	.0525	.371	.580
.002189	59.7	1,600	1,013	1,063	.0838	.0529	.345	.546
.002189	60.0	1,600	1,008	1,063	.0838	.0525	.347	.554
.002192	56.4	1,590	1,010	1,088	.0867	.0533	.328	.534
.002192	57.3	1,600	1,008	1,075	.0846	.0525	.332	.535
.002195	25.5	1,600	1,012	1,168	.0919	.0526	.148	.258
.002195	25.9	1,610	1,009	1,153	.0897	.0518	.149	.258

TABLE VI—Continued

OBSERVED DATA—Continued

PROPELLER C-10—Continued

23° at 42-inch radius

ρ	V m. p. h.	r. p. m.	Q lb.-ft.	T lb.	C_T	C_P	$\frac{V}{nD}$	η
0.002187	86.8	1,420	1,003	811	0.0814	0.0665	0.566	0.694
.002187	87.1	1,420	1,001	811	.0814	.0665	.568	.696
.002187	90.4	1,430	1,004	802	.0793	.0658	.585	.703
.002187	90.3	1,420	1,002	794	.0795	.0665	.589	.704
.002177	94.4	1,440	1,002	779	.0764	.0648	.607	.716
.002177	95.2	1,430	998	779	.0774	.0657	.616	.726
.002174	105.0	1,450	1,002	740	.0716	.0641	.671	.750
.002174	104.4	1,440	998	736	.0723	.0647	.671	.748
.002174	104.2	1,390	897	645	.0679	.0625	.694	.754
.002174	104.2	1,380	895	651	.0695	.0631	.699	.770
.002167	104.3	1,325	785	551	.0640	.0602	.729	.775
.002167	104.1	1,340	785	552	.0627	.0588	.719	.766
.002167	104.3	1,290	712	489	.0600	.0577	.749	.779
.002167	104.3	1,280	712	485	.0604	.0586	.755	.778
.002167	103.9	1,220	607	399	.0547	.0550	.789	.785
.002167	103.9	1,220	607	399	.0547	.0550	.789	.785
.002167	103.6	1,140	509	322	.0505	.0527	.842	.805
.002167	103.4	1,150	506	322	.0497	.0517	.833	.801
.002160	103.4	1,070	397	243	.0434	.0469	.895	.828
.002160	103.3	1,065	395	242	.0436	.0471	.898	.831
.002160	102.8	1,000	297	169	.0346	.0402	.952	.819
.002160	103.5	1,000	296	169	.0346	.0401	.958	.823
.002160	103.3	930	192	99	.0234	.0300	1.028	.802
.002160	102.6	860	120	52	.0144	.0220	1.105	.722
.002160	102.6	800	38	9	.0029	.0080	1.188	.426
.002169	79.9	1,425	993	833	.0836	.0661	.519	.657
.002169	79.5	1,425	989	831	.0834	.0656	.517	.657
.002172	74.7	1,430	993	851	.0845	.0656	.484	.623
.002172	74.5	1,420	989	846	.0853	.0659	.486	.629
.002172	69.9	1,430	990	862	.0856	.0653	.453	.594
.002172	69.9	1,430	989	862	.0856	.0651	.453	.596
.002175	64.0	1,430	991	875	.0867	.0652	.414	.551
.002175	64.9	1,425	987	871	.0872	.0654	.422	.563
.002175	59.7	1,415	993	878	.0892	.0668	.391	.522
.002175	60.2	1,410	990	872	.0891	.0670	.395	.525
.002178	56.2	1,410	993	860	.0876	.0672	.370	.484
.002178	56.2	1,405	992	859	.0883	.0677	.370	.482
.002184	22.6	1,330	993	766	.0876	.0754	.157	.183
.002184	23.4	1,320	991	764	.0888	.0761	.164	.192

27° at 42-inch radius

0.002207	86.6	1,250	996	684	0.0877	0.0844	0.642	0.667
.002207	86.7	1,260	993	683	.0861	.0828	.637	.662
.002207	91.7	1,260	993	675	.0851	.0828	.674	.693
.002207	91.4	1,270	989	674	.0837	.0811	.666	.687
.002204	94.7	1,270	993	668	.0830	.0816	.691	.703
.002204	94.7	1,270	989	666	.0828	.0812	.691	.705
.002194	105.5	1,280	989	639	.0786	.0803	.763	.747
.002194	104.9	1,270	989	639	.0799	.0816	.826	.809
.002194	104.5	1,220	878	554	.0750	.0786	.793	.757
.002194	104.5	1,210	881	554	.0762	.0801	.800	.761
.002194	104.3	1,160	774	471	.0705	.0766	.833	.767
.002194	104.3	1,155	771	473	.0714	.0770	.836	.775
.002186	104.2	1,100	673	398	.0665	.0744	.877	.784
.002186	103.6	1,090	675	401	.0682	.0760	.880	.790
.002186	104.2	1,045	599	344	.0637	.0734	.923	.801
.002186	104.2	1,045	599	344	.0637	.0734	.923	.801
.002186	103.6	990	494	272	.0561	.0675	.969	.805
.002186	103.5	990	92	271	.0559	.0672	.968	.805
.002186	103.5	945	412	221	.0500	.0617	1.014	.822
.002186	103.5	945	411	219	.0496	.0616	1.014	.816
.002186	103.3	895	348	177	.0447	.0581	1.069	.822
.002186	103.1	900	319	177	.0442	.0576	1.061	.815
.002186	103.3	840	258	122	.0349	.0489	1.139	.813
.002186	103.1	840	259	122	.0349	.0491	1.136	.807
.002179	102.7	790	186	84	.0273	.0400	1.204	.822
.002179	102.6	780	182	82	.0273	.0402	1.218	.827
.002179	102.6	750	123	48	.0173	.0294	1.267	.745
.002179	102.1	700	54	13	.0054	.0148	1.351	.491
.002179	102.1	660	3	−10	−.0046	.0009	1.433	--------
.002188	80.4	1,260	985	683	.0869	.0828	.591	.620
.002188	80.3	1,250	981	680	.0879	.0841	.595	.622
.002191	75.4	1,250	986	675	.0871	.0843	.559	.577
.002191	75.2	1,240	981	675	.0885	.0852	.562	.584
.002191	69.3	1,240	982	669	.0877	.0852	.518	.533
.002191	68.8	1,230	981	665	.0886	.0866	.518	.530
.002194	64.6	1,230	983	661	.0880	.0865	.486	.494
.002194	64.6	1,230	981	660	.0879	.0865	.486	.494
.002194	60.5	1,225	985	655	.0880	.0875	.457	.460
.002194	60.9	1,220	978	653	.0884	.0874	.462	.467
.002197	56.4	1,220	981	645	.0872	.0877	.428	.426
.002197	57.1	1,210	981	648	.0891	.0891	.437	.437
.002203	21.5	1,130	972	588	.0924	.1009	.176	.161
.002203	21.9	1,120	968	583	.0932	.1026	.181	.164

TABLE VI-A

FINAL ADJUSTED COEFFICIENTS

PROPELLER C-10

11° at 42-inch radius

$\frac{V}{nD}$	C_T	C_P	η	C_S
0.10	0.0700	0.0295	0.237	0.202
.15	.0670	.0290	.346	.304
.20	.0630	.0285	.441	.407
.25	.0580	.0280	.518	.512
.30	.0525	.0265	.594	.620
.35	.0460	.0248	.649	.733
.40	.0395	.0226	.699	.855
.45	.0330	.0205	.724	.978
.50	.0255	.0170	.750	1.129
.55	.0170	.0129	.724	1.313
.60	.0095	.0085	.670	1.558

15° at 42-inch radius

0.10	0.0818	0.0400	0.204	0.190
.15	.0795	.0400	.298	.285
.20	.0770	.0400	.384	.380
.25	.0742	.0400	.464	.475
.30	.0702	.0397	.530	.572
.35	.0660	.0392	.589	.670
.40	.0612	.0384	.638	.768
.45	.0560	.0370	.681	.870
.50	.0500	.0348	.718	.978
.55	.0416	.0302	.758	1.107
.60	.0330	.0255	.776	1.250
.65	.0248	.0208	.775	1.410
.70	.0175	.0164	.745	1.590
.75	.0105	.0115	.684	1.835

19° at 42-inch radius

0.10	0.0910	0.0520	0.174	0.181
.15	.0910	.0521	.262	.271
.20	.0900	.0523	.344	.361
.25	.0884	.0525	.421	.451
.30	.0860	.0526	.490	.542
.35	.0832	.0527	.552	.630
.40	.0801	.0528	.606	.720
.45	.0757	.0523	.651	.813
.50	.0708	.0513	.690	.905
.55	.0655	.0498	.724	1.002
.60	.0591	.0472	.751	1.106
.65	.0520	.0436	.775	1.219
.70	.0450	.0394	.790	1.337
.75	.0368	.0345	.799	1.470
.80	.0294	.0294	.801	1.616
.85	.0224	.0238	.789	1.794

TABLE VI-A—Continued

FINAL ADJUSTED COEFFICIENTS—Continued

PROPELLER C-10—Continued

23° at 42-inch radius

$\frac{V}{nD}$	C_T	C_P	η	C_S
0.10	0.0870	0.0769	0.113	0.167
.15	.0882	.0755	.175	.251
.20	.0889	.0740	.240	.337
.25	.0890	.0720	.309	.423
.30	.0890	.0695	.380	.511
.35	.0886	.0676	.459	.600
.40	.0880	.0663	.531	.688
.45	.0864	.0656	.592	.775
.50	.0845	.0658	.641	.862
.55	.0817	.0659	.682	.948
.60	.0780	.0656	.713	1.035
.65	.0732	.0646	.737	1.124
.70	.0672	.0620	.760	1.222
.75	.0610	.0588	.779	1.322
.80	.0547	.0551	.794	1.429
.85	.0483	.0510	.805	1.542
.90	.0416	.0461	.812	1.668
.95	.0349	.0408	.812	1.802
1.00	.0280	.0349	.802	1.957
1.05	.0211	.0284	.781	2.14
1.10	.0142	.0214	.730	2.37
1.15	.0072	.0140	.591	2.70

27° at 42-inch radius

0.10	0.0950	0.1055	0.090	0.157
.15	.0933	.1029	.136	.236
.20	.0925	.100	.185	.317
.25	.0915	.0972	.235	.399
.30	.0908	.0950	.287	.481
.35	.0898	.0922	.340	.565
.40	.0888	.0900	.395	.647
.45	.0882	.0880	.451	.733
.50	.0880	.0863	.509	.816
.55	.0877	.0852	.566	.902
.60	.0870	.0839	.622	.986
.65	.0858	.0835	.668	1.069
.70	.0830	.0822	.706	1.154
.75	.0800	.0814	.737	1.240
.80	.0752	.0791	.760	1.330
.85	.0703	.0766	.780	1.423
.90	.0651	.0739	.793	1.517
.95	.0591	.0700	.802	1.614
1.00	.0530	.0652	.813	1.728
1.05	.0467	.0597	.822	1.846
1.10	.0402	.0536	.825	1.978
1.15	.0337	.0469	.826	2.12
1.20	.0270	.0398	.813	2.29
1.25	.0201	.0321	.783	2.49
1.30	.0130	.0240	.704	2.74
1.35	.0056	.0157	.482	3.10

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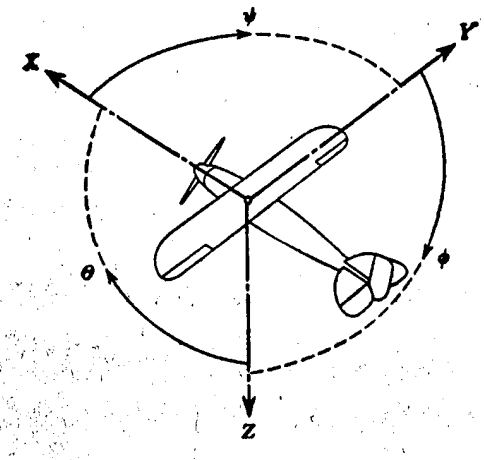

Positive directions of axes and angles (forces and moments) are shown by arrows

Axis		Force (parallel to axis) symbol	Moment about axis			Angle		Velocities	
Designation	Symbol		Designation	Symbol	Positive direction	Designation	Symbol	Linear (component along axis)	Angular
Longitudinal	X	X	rolling	L	$Y \longrightarrow Z$	roll	ϕ	u	p
Lateral	Y	Y	pitching	M	$Z \longrightarrow X$	pitch	θ	v	q
Normal	Z	Z	yawing	N	$X \longrightarrow Y$	yaw	ψ	w	r

Absolute coefficients of moment

$$C_l = \frac{L}{qbS} \qquad C_m = \frac{M}{qcS} \qquad C_n = \frac{N}{qbS}$$

Angle of set of control surface (relative to neutral position), δ. (Indicate surface by proper subscript.)

4. PROPELLER SYMBOLS

D, Diameter.
p, Geometric pitch.
p/D, Pitch ratio.
V', Inflow velocity.
V_s, Slipstream velocity.
T, Thrust, absolute coefficient $C_T = \frac{T}{\rho n^2 D^4}$
Q, Torque, absolute coefficient $C_Q = \frac{Q}{\rho n^2 D^5}$

P, Power, absolute coefficient $C_P = \frac{P}{\rho n^3 D^5}$.
C_s, Speed power coefficient $= \sqrt[5]{\frac{\rho V^5}{P n^2}}$.
η, Efficiency.
n, Revolutions per second, r. p. s.
Φ, Effective helix angle $= \tan^{-1}\left(\frac{V}{2\pi r n}\right)$

5. NUMERICAL RELATIONS

1 hp = 76.04 kg/m/s = 550 lb./ft./sec.
1 kg/m/s = 0.01315 hp
1 mi./hr. = 0.44704 m/s
1 m/s = 2.23693 mi./hr.

1 lb. = 0.4535924277 kg
1 kg = 2.2046224 lb.
1 mi. = 1609.35 m = 5280 ft.
1 m = 3.2808333 ft.