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RESEARCH MEMORANDUM

PROPELLER INDUCED ANGLES OF ATTACK AND SECTION ANGLES OF ATTACK FOR THE NACA 10-(3)(066)-03, 10-(3)(049)-03, 10-(3)(090)-03, 10-(5)(066)-03, AND 10-(0)(066)-03 PROPELLERS

By William B. Igoe and Robert E. Davidson

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RESEARCH MEMORANDUM

PROPELLER INDUCED ANGLES OF ATTACK AND SECTION ANGLES OF ATTACK FOR THE NACA 10-(3)(066)-03, 10-(3)(049)-03, 10-(3)(090)-03, 10-(5)(066)-03, AND 10-(0)(066)-03 PROPELLERS

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SUMMARY

The results of an induced-angle-of-attack calculation obtained by using a method applicable to propellers of arbitrary circulation distribution are presented for a series of five propellers for which blade-section pressure distribution and wake-survey measurements have been made at various advance ratios. The propellers are the NACA 10-(3)(066)-03 propeller, the NACA 10-(3)(049)-03 propeller, the NACA 10-(3)(090)-03 propeller, the NACA 10-(5)(066)-03 propeller, and the NACA 10-(0)(066)-03 propeller. The induced angles of attack are intended to be used to put the data for these propellers on a basis comparable with two-dimensional wind-tunnel data. A short description of the method of calculation is given and results of the wake-survey measurements are included.

INTRODUCTION

A series of five propellers were tested in the Langley 16-foot high-speed tunnel to determine blade section characteristics by measurement of blade section pressures (references 1 to 5). Most of the tests were made at a blade angle setting of 45° at the 0.75 radius station. In reference 1 the test equipment is described and the purpose and extent of the investigation are given at greater length.

In order to determine the angle of attack for the propeller sections, induced angles of attack have been calculated by the method of Lock (reference 6). The results of these calculations have been presented in the data papers (references 1 to 5). However, the circulation distribution for the propellers tested usually differed from the optimum or Betz distribution. Since Lock's method may be strictly applied only for

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propellers having an optimum distribution, it was therefore inadequate and a method of calculation suitable for arbitrarily loaded propellers was sought. The Theodorsen theory (reference 7) for calculating the axial interference velocity is applicable to propellers of arbitrary circulation distribution and was used to calculate the induced angles of attack which are presented herein. This theory refers to an arbitrary propeller in incompressible nonviscous flow with neither spinner body nor wind-tunnel wall present and is subject to the limitations of lifting-line theory.

SYMBOLS

The symbols used throughout this paper, some of which are defined in figure 1, are as follows:

B	number of blades
b	blade chord, feet
c_l	section lift coefficient
c_n	section normal-force coefficient
D	propeller diameter, feet
J	advance ratio (V/nD)
M	Mach number of advance
M_x	helical section Mach number $\left(M\sqrt{1 + \left(\frac{\pi x}{J}\right)^2}\right)$
n	propeller rotational speed, revolutions per second
R	propeller-tip radius, feet
r	radius to a blade element, feet
V	velocity of advance, feet per second
v_1	axial induced velocity at blade section, feet per second
w	axial displacement velocity of helical vortex surface (at infinity), feet per second

w_1	induced velocity at blade section, feet per second
x	fraction of propeller-tip radius (r/R)
x_1	reference point at which induced velocity is calculated
$x\frac{dF}{dx}$, $x\frac{dQ}{dx}$, $x\frac{dP}{dx}$	Theodorsen weight functions
α_{i_T}	induced angle of attack, degrees (as calculated using Theodorsen's theory)
α_{i_G}	induced angle of attack, degrees (as calculated by Lock's method using Goldstein correction factors)
α_x	angle of attack of blade element corrected for induced flow and blade deflection at radial station x $\left(\beta_x + \Delta\beta - \phi_o - \alpha_i\right)$, degrees
β_x	blade angle at station x, degrees
$\Delta\beta$	blade torsional deflection or blade twist, degrees
Γ	circulation at station x
Γ^*	nondimensional circulation function $(B\Gamma\omega/V^2)$
K	circulation coefficient to first order $\left(B\Gamma\omega/2\pi Vw\right)$
Δ	contribution of gap in weight function $x\frac{dF}{dx}$ at x_1
λ	advance ratio (J/π)
ϕ_o	geometric helix angle, degrees $\left(\tan^{-1}\frac{J}{\pi x}\right)$
ω	propeller rotational speed, radians per second

APPARATUS

The propeller tests were made by using a 2000-horsepower dynamometer which is described in reference 8. The tests are described in references 1 to 5. The propellers were 10 feet in diameter, rectangular in

plan form, of 8-inch chord, and were designed with NACA 16-series airfoil sections. The propellers differed from each other in design lift coefficient and thickness distribution. The design lift coefficient for each propeller was constant along the blade radius. The thickness distributions are shown in figure 2. A full description of the propellers may be found in references 1 to 5.

The five propellers tested are designated as follows:

NACA 10-(3)(066)-03
NACA 10-(3)(049)-03
NACA 10-(3)(090)-03
NACA 10-(5)(066)-03
NACA 10-(0)(066)-03

The digits in the above designations indicate the propeller diameter, 10 feet, and describe the airfoil sections at the 0.7 radius as follows: section design lift coefficient, 0.30, 0.50, or 0; section thickness ratio 0.066, 0.049, or 0.090; and the solidity per blade, 0.03.

The rake for wake-survey measurements was mounted in the tunnel radially at an angular position of 105° measured clockwise from top center as viewed looking upstream. Measurements were taken in a plane parallel to and 10.34 inches behind the plane of rotation of the propeller.

RESULTS

The results of the wake surveys are presented in figures 3 to 7 to show the distribution of section lift coefficient along the blade radius. These curves were used in the calculation of the induced angles of attack. The lift coefficients were derived from wake-survey measurements by the method of reference 9. The curves are presented for several advance ratios at each constant propeller rotational speed or constant tunnel Mach number test condition for the five propellers which were tested. Figure 8 shows a loading curve for the NACA 10-(3)(090)-03 propeller at an $M = 0.65$ test condition. This curve is a cross plot made from the pressure-distribution normal-force coefficients c_n and was used in the calculation because the propeller wake surveys at that test condition were too erratic to be considered reliable.

Table 1 is an index for the tables of induced angles of attack. Tables 2 to 6 contain the induced angle of attack α_{i_T} and the corrected angle of attack α_x for each test point of the five propellers for a blade angle setting of 45°. The values of induced angles presented in

the tables of section characteristics in references 1 to 5 have been calculated by the method of Lock. The present values in tables 2 to 6 should be used in place of these previously published values. Induced angles for the test points at other blade angle settings were not calculated. The one-blade-propeller results are included.

Theodorsen weight functions $x \frac{dF}{dx}$, $x \frac{dQ}{dx}$, and $x \frac{dP}{dx}$ for an advance ratio of 2.0 are presented in tables 7 to 9. The $x \frac{dP}{dx}$ functions are only for the second blade of a two-blade propeller where the annular blade spacing is 180°. These tables are representative of the ones used in the calculations for this paper.

DISCUSSION

In the propeller data papers (references 1 to 5) the method of Lock (reference 6) was used to calculate the induced angle of attack for the propellers of arbitrary load distribution. Lock's analysis is based upon the assumption that the induced velocity is proportional to the loading at any point. Essentially it gives the induced effects for a Betz loading whose magnitude is the same as that of the arbitrary loading at the point considered. This method gives good results if the arbitrary loading does not depart too far from an optimum or Betz loading. However, when the arbitrary loading is considerably different from the optimum, the results of the Lock method are less reliable and a more elaborate analysis is necessary. Figure 9 shows the radial variation of induced angle of attack as calculated using Theodorsen's theory for an arbitrary propeller loading from the NACA 10-(3)(066)-03 propeller at an advance ratio of 2.100 and a stream Mach number of 0.65. A comparison of this induced angle with the result from Lock's method of calculation shows the discrepancy which may be expected in using Lock's method for such a loading. The divergence is greatest near the propeller tip.

Radial loading curves.- The determination of the loading curves is important because, once these are established, the induced angles of attack may be found by a computing process. The induced angle for a section depends not only on the magnitude of the circulation at the section but also on the shape of the circulation distribution curve especially in the neighborhood of the section in question. For the present calculations, use of the propeller pressure-distribution data to form loading curves would have been desirable because the correction must be applied to these data. But the pressure data for the stations along the propeller were not measured simultaneously, which introduced the possibility of differences in section Mach number and errors in advance ratio which would alter the shape of the cross-plotted loading.

The wake-survey measurements which were taken during the propeller tests provided simultaneous values of lift coefficient to form a radial loading curve all at the same stream Mach number and advance ratio. These measurements of wake survey were thought to present a more reliable picture of the propeller loading shape and were used extensively in the present calculations. Circulation curves were obtained from wake-survey measurements at test points close to the advance ratios for which the Theodorsen weight functions were calculated.

The calculation of induced angle of attack for the five test propellers was not made for each test point since this would lead to prohibitive labor. Rather, a number of loading curves were selected for a range of advance ratios from light to heavy load for each constant propeller rotational speed or constant tunnel Mach number for the propellers tested. The radial distribution of induced angles was obtained for each loading curve and these results cross plotted against lift coefficient c_l for each radial station x. Since, to the first order, $c_l = c_n$, these cross plots were used directly to apply the results of the calculations to the data.

The wake-survey lift-coefficient distribution curves shown in figures 3 to 7 were used in the present calculation. For the most part the curves at low propeller rotational speed and at low forward Mach number do not depart radically in appearance from a Betz load. However, when the forward Mach number reaches 0.60 and above, the effects of compressibility become apparent as more of the outboard sections begin to operate above their lift-divergence Mach number. An abrupt loss of lift occurs as the lift-divergence Mach number is exceeded. Frequently, as the forward Mach number is increased, the section Mach number becomes high enough to cause some recovery of lift. This recovery would be expected to occur at or above a section Mach number of 1.0 for the thickness of the outboard sections of most of the propellers tested. These irregularities in propeller loadings, caused by compressibility and off-design operation, necessitate use of the methods of analysis which are applicable to arbitrary propellers.

Method of calculation.- If in figure 1 the interference velocity vector w_1 is considered normal to W_o, it can be shown that the induced angle of attack may be found by

$$\alpha_i = \tan^{-1} \frac{v_1}{V} \frac{J}{\pi x} \tag{1}$$

and the section angle of attack may then be determined from

$$\alpha_x = \beta_x + \Delta\beta - \phi_o - \alpha_i \tag{2}$$

The ratio v_1/V in equation (1) may be found by the formula presented in reference 7 as

$$\frac{v_1}{\frac{1}{2} w} = \frac{1}{B} \sum \int \frac{dK}{dx} x \frac{dP}{dx} dx$$

which may be written as

$$\frac{v_1}{V} = \frac{1}{4\pi B} \sum \int \frac{d\Gamma^*}{dx} x \frac{dP}{dx} dx \tag{3}$$

where the summation is over the number of blades. The weight function $x \frac{dP}{dx}$ is composed of two parts, $x \frac{dQ}{dx}$ and $x \frac{dF}{dx}$, for the blade considered. These functions may be found tabulated in reference 7.

The function $x \frac{dF}{dx}$ becomes infinite at the point x_1. The contribution Δ of this function in the region of x_1 may be found by a Taylor series expansion in $\frac{d\Gamma^*}{dx}$ about x_1. The formula from reference 7 for the contribution of $x \frac{dF}{dx}$ in the neighborhood of the singular point may be written as

$$\Delta = -b_1 \left[x_1 \Gamma^{*''} + \left(1 - \frac{1}{2} c \log \frac{\Delta x}{2}\right) \Gamma^{*'} \right] \Delta x \tag{4}$$

where

$$b_1 = \frac{\lambda}{\sqrt{\lambda^2 + x_1^2}} = \frac{1}{\sqrt{1 + \left(\frac{\pi x_1}{J}\right)^2}} \qquad c = \frac{x_1^2}{\lambda^2 + x_1^2} = \frac{1}{1 + \left(\frac{J}{\pi x_1}\right)^2}$$

and Δx is the gap at the singular point.

Sample calculation.- In order to show the method of solution and the expected accuracy of the final answer, an example of the calculation is performed as follows. Assume a two-blade propeller, 10 feet in diameter, rectangular in plan form, and having an 8-inch chord with a section-lift-coefficient c_l distribution corresponding to a Betz loading for an advance ratio of 2.0. The c_l distribution chosen is given in table 10. It is convenient to convert c_l to a nondimensional circulation coefficient by

$$\Gamma^* = c_l B \frac{b}{D} \frac{\pi}{J} \sqrt{1 + \left(\frac{\pi x}{J}\right)^2}$$

For an $x_1 = 0.9511$, the substitution is

$$\Gamma^*_{0.9511} = 0.323(2)\left(\frac{8/12}{10}\right)\frac{\pi}{2}\sqrt{1 + \left(\frac{0.9511\ \pi}{2}\right)^2} = 0.121$$

The quantity v_1/V may be computed from equation (3). Since a two-blade propeller has been assumed, there is an $x \frac{dP}{dx}$ function for the second blade. This function may be combined with the $x \frac{dQ}{dx}$ function for the first blade in a single graphical integration as

$$\int \left(x \frac{dQ}{dx} + x \frac{dP}{dx}\right) d\Gamma^*$$

which for $x_1 = 0.9511$ gives 0.113. The integral

$$\int x \frac{dF}{dx} d\Gamma^*$$

gives 0.669 when a gap of 0.05 in x about the $x_1 = 0.9511$ point is excluded from the integration. Plots for the above two graphical integrations are shown in figure 10. The gap Δ is found by using equation (4) where $x_1 = 0.9511$, $b_1 = 0.5562$, $c = 0.6906$, and $\Delta x = 0.05$. First and second derivatives with respect to x are obtained from the propeller circulation-distribution curve as

$$\Gamma^{*\prime}{}_{0.9511} = -1.192 \qquad \Gamma^{*\prime\prime}{}_{0.9511} = -14.966$$

Thus, by substitution

$$\Delta = -0.5562\left\{0.9511(-14.966) + \left[1 - \frac{1}{2}(0.6906)(-3.689)\right](-1.192)\right\}(0.05) = 0.471$$

A summation is made

$$\sum_{0.9511} = \int\left(x \frac{dQ}{dx} + x \frac{dP}{dx}\right) d\Gamma^* + \int x \frac{dF}{dx} d\Gamma^* + \Delta$$

$$= 0.113 + 0.669 + 0.471$$

$$= 1.253$$

and

$$\frac{v_1}{V} = \frac{1}{4\pi B} \sum$$

$$= 0.0398(1.253)$$

$$= 0.0499$$

Whence, from equation (1),

$$\alpha_{i_T} = 1.91^{\circ}$$

A complete tabulation is made in table 10 for this calculation at various values of propeller radial station $x = \frac{r}{R}$. Since a Betz loading was assumed in the sample calculation, a comparison of the Theodorsen results with the exact Goldstein-Lock results as given in table 10 provides a check on the accuracy of the calculation.

Comparison of propeller data with two-dimensional wind-tunnel section data.- Propeller section lift curves for an NACA 16-307 section at a Mach number of 0.70 are shown in figure 11 corrected with induced angles of attack as calculated by Lock's method and as calculated by using the Theodorsen theory for arbitrary loadings. The propeller data for these curves were obtained with the NACA 10-(3)(066)-03 propeller for a 0.65 radial station and with the NACA 10-(3)(090)-03 propeller for a 0.90 radial station. The two-dimensional data included in the figure for comparison were obtained from reference 10 and have been corrected for wind-tunnel wall interference by the method of reference 11. This figure shows the effect of tip relief on lift-curve slope with change in radial position. The outboard sections have lesser slope, a trend evident throughout the propeller data.

The induced-angle-of-attack correction for the propeller data is determined by an analysis which presumes that the propeller operates in an incompressible, nonviscous fluid, without boundary constraints such as wind-tunnel wall and spinner body. The influence of compressibility on the correction is not known but it is thought to be small and is neglected. This appears permissible in the absence of strong shocks on the propeller.

Neglect of the effect of spinner and tunnel wall in the present calculation may result in overestimation of the induced angle of attack especially for the inboard stations of the propellers. In addition, the effects of the propeller wake distortion caused by slipstream contraction and the increase of advance ratio for the surface of the propeller helix in the far wake are neglected, but for lightly loaded propellers, these effects are small.

The influence of viscosity on propeller theory is unknown and may be appreciable. The viscous effects include skin-friction drag and boundary-layer action due to centrifugal forces. These effects are included in the propeller section data which are presented in references 1

to 5 and may represent part of the difference shown in figure 11 between the propeller section data and two-dimensional wind-tunnel results.

CONCLUDING REMARKS

A comparison of the induced angles of attack calculated by a method using Theodorsen's theory with those calculated by the method of Lock for five subject propellers indicates that the results obtained by using Lock's method can be considerably in error for propellers of arbitrary load distribution.

The lift-curve slope of the propeller section data varies with radial position, decreases toward the propeller tip, and is generally less than that of two-dimensional wind-tunnel airfoil section data.

Because of observed differences, application of the propeller data to the extension of two-dimensional section data in the transonic range could be of qualitative nature only.

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TABLE 1

INDEX FOR SECTION ANGLE OF ATTACK TABLES

Radial station x	Table for NACA -									
	10-(3)(066)-03 propeller		10-(3)(049)-03 propeller		10-(3)(090)-03 propeller		10-(5)(066)-03 propeller		10-(0)(066)-03 propeller	
	B = 2	B = 1	B = 2	B = 1	B = 2	B = 1	B = 2	B = 1	B = 2	B = 1
0.30	2(a)				4(a)		5(a)			
.345			3(a)							
.45	2(b)		3(b)		4(b)		5(b)		6(a)	
.50	2(c)									
.60	2(d)		3(c)		4(c)		5(c)		6(b)	
.65	2(e)									
.70	2(f)	2(l)	3(d)	3(j)	4(d)		5(d)		6(c)	
.78	2(g)		3(e)	3(k)	4(e)		5(e)		6(d)	
.85	2(h)	2(m)	3(f)	3(l)	4(f)	4(j)	5(f)		6(e)	6(i)
.90	2(i)		3(g)	3(m)	4(g)		5(g)		6(f)	
.95	2(j)	2(n)	3(h)	3(n)	4(h)		5(h)	5(j)	6(g)	
.975	2(k)	2(o)	3(i)	3(o)	4(i)		5(i)		6(h)	

TABLE 2

BLADE SECTION ANGLE OF ATTACK

NACA 10-(3)(066)-03 PROPELLER

(a) $x = 0.30$; $\beta_{0.75R} = 45^{\circ}$; $B = 2$

1140 rpm			1350 rpm			1500 rpm			1600 rpm			M = 0.56			M = 0.60			M = 0.65		
J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x
1.633	0.57	8.24	1.696	0.70	7.09	1.963	0.10	4.38				2.121	-0.20	3.16	2.077	-0.35	3.58	2.129	0.11	2.57
1.766	.41	6.50	1.792	.53	6.03	2.015	.34	3.56				2.149	-.21	2.89	2.106	-.38	3.31	2.162	.18	2.17
1.877	.33	5.15	1.884	.40	4.99	2.118	.48	2.33				2.189	-.21	2.51	2.132	-.41	3.08	2.179	.18	2.01
2.008	.25	3.71	1.999	.31	3.74	2.197	.53	1.51				2.221	-.23	2.22	2.158	-.43	2.84	2.198	.21	1.80
2.128	.23	2.47	2.099	.25	2.74	2.284	.54	.69				2.256	-.24	1.81	2.185	-.47	2.62	2.220	.23	1.57
2.261	.20	1.24	2.205	.21	1.74	2.374	.54	-.09				2.272	-.24	1.67	2.220	-.48	2.29	2.248	.25	1.30
2.376	.15	.29	2.308	.19	.82	2.467	.48	-.77				2.319	-.25	1.27	2.247	-.51	2.08	2.268	.23	1.14
2.554	.09	-1.04	2.405	.15	.04	2.534	.37	-1.17				2.339	-.25	1.09	2.273	-.51	1.84	2.283	.19	1.04
2.480	.11	-.50	2.541	.10	-.96	2.301	.42	-.97				2.369	-.26	.85	2.299	-.53	1.63	2.319	.17	.75
2.352	.17	.47	2.484	.12	-.55	2.426	.49	-.46				2.414	-.28	.51	2.329	-.55	1.39	2.338	.12	.63
2.209	.21	1.52	2.385	.15	.20	2.335	.54	.25				2.446	-.30	.17	2.360	-.55	1.12	2.359	.12	.46
2.088	.24	2.52	2.288	.20	.99	2.242	.54	1.07				2.477	-.32	-.05	2.391	-.56	.87	2.389	-.07	.40
1.972	.27	4.09	2.178	.22	1.99	2.169	.51	1.80				2.520	-.33	-.36	2.426	-.58	.61	2.413	-.28	.41
1.855	.35	5.41	2.069	.27	3.03	2.092	.46	2.61							2.461	-.58	.33	2.433	-.34	.32
1.697	.49	7.35	1.954	.33	4.23	2.006	.25	3.75							2.512	-.61	-.03			
			1.850	.45	5.36															
			1.750	.63	6.49															
(b) $x = 0.45$; $\beta_{0.75R} = 45^{\circ}$; $B = 2$																				
1.620	2.50	8.06	1.781	1.57	6.37	1.930	1.28	4.49	2.045	1.02	3.13	2.116	1.42	1.80	2.112	1.47	1.78	2.121	1.57	1.53
1.738	1.96	6.59	1.866	1.32	5.31	2.007	.99	3.68	2.134	.84	2.15	2.131	1.30	1.73	2.134	1.43	1.53	2.148	1.31	1.46
1.858	1.60	5.08	1.950	1.13	4.26	2.063	.79	3.11	2.214	.70	1.30	2.149	1.23	1.57	2.160	1.40	1.24	2.170	1.20	1.29
1.986	1.24	3.60	2.035	.97	3.25	2.147	.67	2.13	2.276	.60	.66	2.175	1.17	1.30	2.196	1.35	.84	2.187	1.10	1.19
2.098	1.00	2.35	2.119	.87	2.25	2.226	.57	1.26	2.350	.54	-.14	2.207	1.05	1.02	2.225	1.32	.52	2.206	.98	1.08
2.199	.81	1.29	2.197	.79	1.37	2.295	.54	.46	2.427	.50	-.95	2.245	.96	.65	2.249	1.28	.27	2.230	.90	.87
2.340	.55	-.07	2.294	.61	.41	2.377	.45	-.37	2.483	.45	-1.51	2.286	.86	.26	2.291	1.22	-.16	2.253	.87	.64
2.443	.39	-1.00	2.427	.40	-.84	2.445	.27	-.93	2.511	.41	-1.76	2.314	.76	.04	2.319	1.17	-.44	2.270	.88	.42
2.568	.16	-2.04	2.558	.13	-1.91	2.536	0	-1.60	2.457	.47	-1.25	2.353	.67	-.31	2.348	1.13	-.73	2.300	.92	.05
2.516	.26	-1.62	2.491	.28	-1.39	2.503	.10	-1.37	2.394	.51	-.60	2.395	.58	-.68	2.371	1.08	-.94	2.322	.95	-.24
2.401	.45	-.63	2.362	.52	-.26	2.465	.22	-1.10	2.313	.56	.25	2.412	.54	-.82	2.413	1.01	-1.33	2.344	1.02	-.54
2.270	.66	.60	2.268	.68	.65	2.422	.33	-.75	2.249	.65	.92	2.452	.48	-1.19	2.446	.93	-1.60	2.365	1.03	-.79
2.158	.90	1.70	2.172	.84	1.63	2.391	.41	-.48	2.179	.77	1.65	2.491	.43	-1.54	2.473	.83	-1.79	2.393	1.03	-1.10
2.060	1.05	2.80	2.094	.90	2.54	2.353	.48	-.13	2.115	.89	2.34	2.532	.38	-1.91	2.501	.70	-1.94	2.424	1.00	-1.39
1.929	1.40	4.24	1.991	1.02	3.80	2.318	.53	.21												
1.783	1.80	6.03	1.917	1.19	4.68	2.275	.55	.69												
1.700	2.19	7.00	1.847	1.40	5.51	2.114	.72	2.50												
						2.051	.85	3.21												
						1.984	1.10	3.89												

TABLE 2

BLADE SECTION ANGLE OF ATTACK

NACA 10-(3)(066)-03 PROPELLER - Continued

(c) $x = 0.50$; $\beta_{0.75R} = 45°$; $B = 2$

1140 rpm			1350 rpm			1500 rpm			1600 rpm			M = 0.56			M = 0.60			M = 0.65		
J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x
1.623	2.48	8.33	1.730	1.92	7.12	1.907	1.45	4.90	2.058	1.15	2.98	2.110	1.50	1.93	2.099	1.68	1.84	2.114	1.53	1.80
1.736	2.07	6.78	1.829	1.71	5.73	1.961	1.27	4.26	2.138	.96	2.07	2.136	1.38	1.69	2.134	1.62	1.44	2.150	1.44	1.39
1.822	1.72	5.72	1.931	1.45	4.43	2.056	1.03	3.12	2.221	.84	1.11	2.160	1.26	1.49	2.159	1.55	1.18	2.170	1.33	1.24
1.924	1.45	4.44	2.031	1.22	3.20	2.132	.83	2.27	2.299	.74	.23	2.186	1.20	1.19	2.188	1.51	.84	2.193	1.13	1.17
2.060	1.12	2.82	2.135	1.00	2.00	2.216	.72	1.27	2.371	.66	-.56	2.230	1.05	.77	2.221	1.42	.50	2.220	1.07	.84
2.168	.88	1.63	2.267	.79	.54	2.305	.55	.31	2.446	.59	-1.08	2.246	.96	.66	2.262	1.32	.08	2.245	.99	.61
2.315	.60	.12	2.361	.61	-.40	2.386	.38	-.47	2.516	.52	-2.09	2.279	.88	.33	2.288	1.27	-.19	2.270	1.07	.22
2.432	.38	-.99	2.479	.38	-1.49	2.454	.24	-1.14	2.472	.35	-1.63	2.305	.79	.09	2.319	1.22	-.52	2.286	1.13	-.04
2.566	.14	-2.17	2.564	.21	-2.22	2.539	.03	-1.87	2.411	.62	-1.00	2.338	.70	-.21	2.353	1.12	-.84	2.318	1.20	-.51
2.511	.24	-1.70	2.445	.46	-1.20	2.518	.08	-1.69	2.535	.68	-.36	2.368	.62	-.49	2.381	1.05	-1.10	2.338	1.20	-.74
2.397	.46	-.68	2.325	.67	-.04	2.429	.31	-.92	2.279	.79	.40	2.394	.57	-.75	2.423	.92	-1.46	2.368	1.15	-1.05
2.243	.75	.82	2.218	.85	1.09	2.342	.47	-.06	2.209	.88	1.23	2.434	.52	-1.15	2.461	.87	-1.84	2.385	1.09	-1.20
2.105	.99	2.35	2.114	1.02	2.26	2.282	.58	.57	2.108	1.03	2.41	2.468	.46	-1.48	2.512	.64	-2.18	2.415	1.01	-1.48
1.990	1.23	3.69	1.981	1.35	3.78	2.172	.77	1.80				2.511	.38	-1.87						
1.883	1.52	4.97	1.889	1.56	4.95	2.080	.93	2.88												
1.772	1.92	6.34	1.803	1.77	6.08	2.030	1.10	3.42												
1.686	2.27	7.43				1.957	1.30	4.28												

(d) $x = 0.60$; $\beta_{0.75R} = 45°$; $B = 2$

1.634	2.36	8.55	1.689	2.24	7.87	2.536	0.15	-2.29	2.505	0.45	-2.27	2.122	1.77	1.66	2.124	1.69	1.62	2.106	1.25	2.35
1.770	2.12	6.44	1.773	2.14	6.55	2.445	.30	-1.30	2.478	.56	-2.02	2.149	1.60	1.44	2.154	1.62	1.28	2.135	1.17	1.98
1.888	1.67	4.97	1.865	1.95	5.24	2.360	.47	-.37	2.404	.76	-1.24	2.177	1.45	1.18	2.183	1.57	.92	2.167	1.11	1.56
1.995	1.33	3.70	1.995	1.61	3.53	2.259	.81	.66	2.333	.94	-.45	2.195	1.38	.99	2.204	1.52	.68	2.186	1.08	1.30
2.144	.97	1.92	2.092	1.35	2.37	2.183	1.07	1.47	2.279	1.05	.17	2.224	1.23	.72	2.230	1.45	.39	2.210	1.05	.97
2.263	.72	.59	2.185	1.12	1.30	2.088	1.31	2.60	2.211	1.15	1.01	2.250	1.11	.49	2.258	1.38	.06	2.246	1.05	.46
2.397	.47	-.89	2.302	.93	-.08	2.010	1.48	3.61	2.158	1.26	1.66	2.279	1.02	.17	2.275	1.33	-.12	2.263	1.06	.20
2.570	.07	-2.46	2.409	.66	-1.16	1.948	1.54	4.50	2.116	1.37	2.17	2.309	.88	-.09	2.310	1.26	-.54	2.283	1.13	-.14
2.501	.22	-1.80	2.565	.15	-2.49	1.975	1.51	4.11	2.041	1.60	3.06	2.338	.78	-.40	2.337	1.18	-.82	2.304	1.18	-.48
2.328	.59	-.10	2.495	.40	-1.94	2.055	1.38	3.03	2.070	1.55	2.67	2.370	.70	-.71	2.367	1.08	-1.12	2.330	1.19	-.86
2.210	.85	1.16	2.384	.72	-.91	2.140	1.16	1.99	2.136	1.30	1.95	2.405	.61	-1.08	2.395	.94	-1.35	2.351	1.13	-1.09
2.085	1.12	2.60	2.284	.95	.04	2.221	.94	1.06	2.178	1.22	1.41	2.435	.56	-1.42	2.427	.77	-1.60	2.379	1.08	-1.43
1.974	1.39	3.95	2.172	1.18	1.42	2.312	.60	.14	2.245	1.12	.57	2.468	.48	-1.74	2.456	.67	-1.86	2.400	.98	-1.61
1.857	1.78	5.37	2.074	1.40	2.56	2.389	.42	-.70	2.306	1.00	-.15	2.501	.40	-2.07	2.493	.52	-2.18	2.421	.81	-1.74
1.735	2.18	6.95	1.949	1.72	4.14	2.474	.25	-1.65	2.374	.86	-.93	2.535	.33	-2.40	2.521	.38	-2.38			
			1.859	2.02	5.27				2.444	.67	-1.69									
			1.738	2.17	7.10															

TABLE 2

BLADE SECTION ANGLE OF ATTACK

NACA 10-(3)(066)-03 PROPELLER - Continued

(e) $x = 0.65$; $\beta_{0.75R} = 45^{\circ}$; $B = 2$

1140 rpm			1350 rpm			1500 rpm			1600 rpm			M = 0.56			M = 0.60			M = 0.65		
J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x
1.637	2.27	8.75	1.742	2.18	7.25	1.960	1.76	4.32	2.032	1.87	3.16	2.119	1.81	1.84	2.136	1.64	1.63	2.084	1.20	2.90
1.750	2.12	6.95	1.841	2.05	5.74	2.055	1.58	3.03	2.130	1.45	2.07	2.164	1.48	1.49	2.172	1.59	1.17	2.112	1.09	2.54
1.883	1.87	5.03	1.949	1.78	4.27	2.135	1.36	2.04	2.223	1.27	.87	2.200	1.36	1.07	2.210	1.50	.72	2.145	.95	2.15
1.980	1.53	3.88	2.068	1.46	2.75	2.242	.97	.87	2.324	1.07	-.38	2.232	1.20	.77	2.239	1.40	.41	2.160	.90	1.97
2.126	1.09	2.20	2.163	1.23	1.62	2.364	.58	-.46	2.418	.81	-1.47	2.261	1.03	.52	2.266	1.37	.04	2.204	.87	1.32
2.230	.82	1.03	2.261	1.00	.49	2.484	.35	-1.85	2.494	.50	-2.23	2.299	.88	.13	2.297	1.25	-.30	2.222	.85	1.07
2.367	.52	-.47	2.380	.72	-.81	2.544	.22	-2.51	2.513	.31	-2.31	2.330	.82	-.24	2.321	1.19	-.57	2.243	.85	.76
2.518	.18	-1.97	2.497	.41	-1.97	2.430	.45	-1.23	2.516	.32	-2.37	2.361	.71	-.55	2.365	1.04	-1.03	2.284	.83	.16
2.582	.05	-2.57	2.564	.17	-2.53	2.305	.72	.22	2.461	.60	-1.87	2.396	.63	-.95	2.391	.92	-1.27	2.312	.80	-.22
2.458	.33	-1.40	2.432	.59	-1.34	2.206	1.15	1.21	2.372	.94	-.94	2.426	.55	-1.27	2.420	.82	-1.56	2.347	.75	-.68
2.321	.61	.03	2.318	.87	-.14	2.102	1.47	2.43	2.280	1.17	.14	2.452	.52	-1.58	2.453	.69	-1.88	2.362	.70	-.85
2.197	.91	1.39	2.218	1.10	.99	2.002	1.67	3.76	2.182	1.34	1.40	2.492	.42	-2.00	2.486	.54	-2.16	2.428	.58	-1.69
2.067	1.25	2.87	2.105	1.37	2.37				2.095	1.56	2.49	2.541	.32	-2.51	2.526	.34	-2.48			
1.949	1.64	4.24	2.010	1.56	3.53															
1.840	2.00	5.59	1.900	1.91	4.93															
1.720	2.17	7.41	1.800	2.12	6.34															
(f) $x = 0.70$; $\beta_{0.75R} = 45^{\circ}$; $B = 2$																				
1.677	2.38	7.91	1.762	2.16	6.97	1.921	2.10	4.66	2.070	1.79	2.71	2.131	1.86	1.62	2.155	1.32	1.63	2.100	1.04	2.74
1.837	2.10	5.53	1.872	2.00	5.35	2.012	1.77	3.54	2.161	1.47	1.59	2.161	1.62	1.39	2.183	1.30	1.24	2.125	.99	2.38
1.949	1.82	4.04	1.967	1.77	4.02	2.129	1.53	1.99	2.262	1.30	.24	2.191	1.47	1.07	2.210	1.28	.88	2.153	.95	1.97
2.071	1.37	2.66	2.079	1.46	2.58	2.229	1.14	.87	2.360	1.00	-.94	2.226	1.31	.71	2.228	1.26	.63	2.176	.86	1.68
2.191	.98	1.36	2.191	1.16	1.27	2.353	.77	-.57	2.468	.60	-2.15	2.253	1.20	.42	2.253	1.25	.26	2.199	.77	1.40
2.309	.67	.05	2.298	.91	.02	2.453	.48	-1.69	2.526	.24	-2.65	2.280	1.06	.16	2.282	1.22	-.12	2.220	.74	1.11
2.443	.40	-1.40	2.404	.62	-1.11	2.554	.26	-2.86	2.490	.45	-2.33	2.321	.97	-.33	2.299	1.19	-.34	2.246	.63	.81
2.585	.05	-2.76	2.529	.23	-2.31	2.510	.34	-2.34	2.431	.76	-1.76	2.351	.86	-.66	2.327	1.13	-.70	2.284	.46	.39
2.521	.17	-2.12	2.571	.07	-2.68	2.400	.61	-1.07	2.325	1.10	-.50	2.378	.76	-.94	2.372	1.01	-1.24	2.306	.33	.17
2.401	.48	-.95	2.494	.32	-1.98	2.282	.93	.30	2.231	1.36	.65	2.399	.68	-1.16	2.393	.97	-1.50	2.335	.25	-.19
2.255	.83	.62	2.368	.70	-.72	2.184	1.28	1.41	2.129	1.55	2.02	2.437	.60	-1.60	2.422	.86	-1.80	2.347	.23	-.34
2.120	1.22	2.10	2.262	1.00	.43	2.073	1.68	2.70				2.467	.52	-2.04	2.457	.72	-2.16	2.386	.25	-.96
2.012	1.58	3.32	2.163	1.23	1.60	1.993	1.93	3.68				2.509	.44	-2.39	2.484	.62	-2.43	2.413	.32	-1.42
1.890	1.99	4.79	2.030	1.58	3.19							2.542	.36	-2.74	2.516	.48	-2.72	2.445	.37	-1.95
1.765	2.24	6.56	1.923	1.90	4.61															
			1.841	2.06	5.80															

NACA

TABLE 2

BLADE SECTION ANGLE OF ATTACK

NACA 10-(3)(066)-03 PROPELLER - Continued

(g) $x = 0.78$; $\beta_{0.75R} = 45^{\circ}$; $B = 2$

1140 rpm			1350 rpm			1500 rpm			1600 rpm			M = 0.56			M = 0.60			M = 0.65		
J	α_{1T}	α_x	J	α_{1T}	α_x	J	α_{1T}	α_x	J	α_{1T}	α_x	J	α_{1T}	α_x	J	α_{1T}	α_x	J	α_{1T}	α_x
2.584	0.09	-2.84	1.710	2.44	7.66	1.871	3.14	4.68	2.097	2.05	2.20	2.158	1.69	1.44	2.158	1.19	1.73	2.184	1.01	1.90
2.479	.26	-1.74	1.868	2.33	5.23	1.954	2.73	3.71	2.158	1.70	1.55	2.168	1.67	1.30	2.188	1.12	1.36	2.168	.94	1.62
2.390	.52	-.86	2.034	1.90	2.93	2.032	2.28	2.89	2.240	1.37	.58	2.208	1.57	.77	2.217	.93	1.11	2.190	.82	1.39
2.302	.75	.08	2.182	1.35	1.29	2.135	1.84	1.68	2.312	1.04	-.23	2.252	1.37	.30	2.251	.86	.69	2.216	.67	1.13
2.209	1.06	1.07	2.365	.70	-.69	2.240	1.39	.49	2.393	.72	-1.21	2.274	1.27	.06	2.278	.72	.41	2.240	.55	.85
2.120	1.38	2.00	2.527	.18	-2.29	2.345	.95	-.67	2.454	.33	-1.79	2.310	1.15	-.36	2.311	.59	.03	2.260	.33	.75
2.026	1.73	3.03	2.572	.07	-2.73	2.474	.45	-2.05	2.516	.04	-2.51	2.348	.90	-.67	2.350	.44	-.42	2.288	.08	.55
1.914	2.22	4.25	2.434	.45	-1.38	2.550	.13	-2.79	2.486	.20	-2.18	2.384	.75	-1.05	2.364	.40	-.59	2.310	-.07	.37
1.831	2.42	5.35	2.278	1.00	.26	2.414	.73	-1.46	2.416	.55	-1.42	2.404	.73	-1.31	2.396	.31	-.99	2.336	-.25	.13
1.729	2.58	6.86	2.118	1.59	1.97	2.322	1.12	-.49	2.364	.86	-.87	2.439	.63	-1.73	2.428	.22	-1.38	2.363	-.36	-.17
1.605	2.74	8.83	1.964	2.14	3.84	2.206	1.54	.86	2.338	.98	-.60	2.466	.57	-2.05	2.467	.17	-1.90	2.390	-.46	-.49
1.673	2.67	7.72	1.806	2.39	6.17	2.094	2.01	2.16	2.284	1.14	.12	2.503	.45	-2.45	2.500	.06	-2.28	2.407	-.50	-.69
1.780	2.48	6.13				2.000	2.42	3.28	2.220	1.43	.83	2.533	.38	-2.79	2.521	-.02	-2.50	2.433	-.54	-1.05
1.872	2.33	4.77				1.934	2.86	3.91	2.141	1.75	1.78									
1.974	2.00	3.54																		
2.063	1.56	2.65																		
2.158	1.22	1.62																		
2.254	.90	.60																		
2.354	.60	-.47																		
2.443	.37	-1.39																		
2.547	.08	-2.39																		

(h) $x = 0.85$; $\beta_{0.75R} = 45^{\circ}$; $B = 2$

2.582	0.05	-2.74	1.780	3.03	6.05	2.535	-0.10	-2.53	2.532	-0.57	-2.17	2.143	1.87	1.59	2.140	0.47	2.75	2.142	1.22	1.67
2.477	.40	-1.82	1.873	2.92	4.66	2.462	.17	-1.65	2.473	.12	-2.00	2.183	1.75	1.05	2.168	.47	2.36	2.158	1.14	1.49
2.329	.79	-.27	1.980	2.42	3.38	2.380	.72	-.99	2.427	.56	-1.65	2.220	1.64	.58	2.193	.45	2.02	2.180	1.03	1.23
2.208	1.18	1.03	2.081	1.90	2.31	2.287	1.22	-.07	2.368	.93	-1.00	2.258	1.45	.19	2.220	.44	1.62	2.205	.90	.96
2.089	1.67	2.22	2.200	1.39	1.06	2.209	1.73	.66	2.318	1.12	-.46	2.297	1.28	-.23	2.249	.42	1.18	2.223	.80	.77
1.945	2.44	3.60	2.300	.95	.05	2.123	2.09	1.71	2.259	1.43	.29	2.330	1.03	-.49	2.277	.40	.76	2.256	.67	.39
1.840	2.74	4.93	2.407	.53	-1.06	1.980	3.10	3.13	2.179	1.88	1.16	2.365	.83	-.83	2.304	.38	.34	2.278	.48	.22
1.700	2.85	7.09	2.534	.10	-2.31	1.996	2.97	2.98	2.108	2.20	2.01	2.392	.65	-1.07	2.334	.35	-.12	2.288	.31	.24
1.658	2.86	7.65	2.562	.01	-2.56	2.083	2.44	2.03	2.062	2.70	2.27	2.415	.50	-1.25	2.379	.30	-.79	2.318	.16	-.08
1.752	2.83	6.08	2.488	.28	-1.90	2.241	1.52	.35	2.085	2.35	2.24	2.445	.36	-1.55	2.405	.18	-1.06	2.349	-.08	-.32
1.888	2.67	4.10	2.381	.60	-.76	2.335	1.08	-.67	2.152	1.99	1.49	2.480	.14	-1.84	2.430	.08	-1.34	2.359	-.24	-.31
2.000	2.12	2.94	2.272	1.01	.40	2.419	.55	-1.39	2.210	1.68	.83	2.511	-.05	-2.12	2.460	-.08	-1.63	2.384	-.32	-.61
2.131	1.49	1.66	2.151	1.55	1.62	2.504	.03	-2.12	2.260	1.41	.30	2.534	-.16	-2.31	2.484	-.11	-1.99	2.426	-.40	-1.15
2.246	1.07	.43	2.033	2.10	2.85				2.335	1.10	-.62				2.535	-.33	-2.55			
2.358	.67	-.72	1.938	2.55	3.96				2.392	.80	-1.30									
2.531	.17	-2.26	1.830	3.00	5.29				2.467	.25	-2.04									
									2.499	-.23	-2.09									

TABLE 2

BLADE SECTION ANGLE OF ATTACK

NACA 10-(3)(066)-03 PROPELLER - Continued

(i) $x = 0.90$; $\beta_{0.75R} = 45^\circ$; $B = 2$

1140 rpm			1350 rpm			1500 rpm			1600 rpm			M = 0.56			M = 0.60			M = 0.65		
J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x
1.628	3.41	7.46	1.771	3.68	5.37	1.995	3.48	2.40	2.078	2.70	1.49	2.115	1.98	1.77	2.145	1.25	1.68	2.132	1.53	1.16
1.700	3.33	6.35	1.901	3.23	3.73	2.081	2.62	1.65	2.184	1.99	.80	2.147	1.93	1.29	2.176	1.12	1.38	2.146	1.47	1.00
1.804	3.18	4.85	1.983	2.83	2.92	2.178	1.84	.84	2.288	1.36	-.28	2.179	1.83	.88	2.217	1.00	.94	2.170	1.34	.75
1.855	3.07	4.16	2.096	2.10	1.66	2.300	1.20	-.51	2.383	.79	-1.35	2.214	1.79	.34	2.253	.82	.51	2.188	1.23	.57
1.957	2.65	3.01	2.181	1.52	1.00	2.426	.48	-1.69	2.481	-.17	-2.13	2.255	1.62	-.13	2.268	.72	.37	2.215	1.13	.26
2.058	2.13	2.02	2.271	1.12	.13	2.527	-.23	-2.45	2.537	-.78	-2.33	2.288	1.39	-.41	2.300	.62	-.06	2.238	1.02	.01
2.141	1.65	1.33	2.350	.79	-.69	2.500	-.36	-2.64	2.442	.25	-1.86	2.325	1.12	-.71	2.334	.53	-.52	2.262	.91	-.25
2.238	1.25	.36	2.418	.46	-1.34	2.479	.17	-2.15	2.339	1.10	-1.08	2.349	.92	-.87	2.350	.40	-.65	2.291	.65	-.43
2.334	.70	-.43	2.492	.27	-2.15	2.377	.82	-1.28	2.227	1.72	.35	2.384	.70	-1.21	2.379	.29	-1.01	2.307	.64	-.66
2.490	.28	-2.05	2.567	-.05	-2.77	2.258	1.42	.04	2.123	2.31	1.51	2.426	.43	-1.58	2.420	.03	-1.40	2.346	.40	-1.01
2.583	0	-2.91	2.530	.14	-2.50	2.147	2.07	1.28				2.457	.23	-1.83	2.449	-.12	-1.72	2.364	.16	-1.05
2.438	.45	-1.56	2.447	.35	-1.63	2.058	2.91	2.00				2.493	-.04	-2.10	2.481	-.28	-2.06	2.442	-.62	-2.66
2.319	.83	-.35	2.380	.60	-.93							2.541	-.58	-2.23	2.520	-.52	-2.41			
2.206	1.33	.73	2.284	1.06	0															
2.079	1.93	1.92	2.201	1.46	.80															
1.999	2.38	2.64	2.114	1.99	1.54															
1.931	2.82	3.24	2.023	2.49	2.44															
1.814	3.07	4.80	1.927	3.05	3.47															
1.734	3.27	5.86	1.830	3.58	4.54															
1.674	3.34	6.76																		
(j) $x = 0.95$; $\beta_{0.75R} = 45^\circ$; $B = 2$																				
1.780	4.33	3.86	1.706	4.63	5.23	2.007	3.45	2.14	2.073	3.06	1.50	2.141	2.34	0.84	2.131	2.17	0.67	2.135	2.02	0.37
1.882	3.67	2.95	1.886	3.99	3.05	2.108	2.74	1.02	2.173	2.55	.29	2.170	2.33	.37	2.148	2.07	.52	2.161	1.92	.06
2.017	2.74	1.85	1.984	3.23	2.19	2.187	2.09	.29	2.292	1.85	-.98	2.195	2.17	.13	2.182	1.96	.17	2.184	1.79	-.17
2.138	2.14	.73	2.097	2.45	1.20	2.299	1.46	-.94	2.375	1.19	-1.75	2.213	2.08	-.06	2.210	1.84	-.11	2.210	1.70	-.48
2.250	1.46	-.15	2.198	1.80	.38	2.402	.95	-2.11	2.471	.12	-2.43	2.241	1.92	-.35	2.240	1.65	-.36	2.228	1.55	-.60
2.361	.85	-1.07	2.293	1.34	-.54	2.504	.30	-2.87	2.515	-.36	-2.74	2.262	1.74	-.51	2.259	1.50	-.51	2.254	1.43	-.87
2.502	.23	-2.27	2.415	.74	-1.71	2.550	.05	-3.27	2.435	.54	-2.18	2.293	1.58	-.81	2.289	1.29	-.74	2.279	1.33	-1.16
2.582	0	-3.02	2.541	.12	-2.75	2.468	.56	-2.60	2.343	1.32	-1.32	2.320	1.38	-1.04	2.312	1.16	-1.00	2.306	1.17	-1.39
2.455	.52	-1.98	2.589	-.12	-3.11	2.345	1.23	-1.43	2.241	2.15	-.41	2.354	1.19	-1.37	2.314	.97	-1.28	2.336	.88	-1.55
2.312	1.08	-.63	2.477	.49	-2.30	2.256	1.73	-.52	2.122	2.74	.97	2.383	1.02	-1.67	2.382	.83	-1.82	2.398	.37	-1.95
2.188	1.76	.41	2.353	.95	-1.01	2.136	2.36	.90				2.422	.77	-2.01	2.413	.71	-2.17	2.460	-.27	-2.21
2.062	2.38	1.56	2.248	1.57	-.11	2.048	2.72	2.12				2.460	.49	-2.28	2.439	.46	-2.34			
1.952	3.18	2.38	2.148	2.10	.81							2.488	.36	-2.56	2.472	.30	-2.43			
1.842	3.88	3.35	2.014	3.12	1.58							2.551	.03	-3.14	2.518	-.02	-3.04			
1.699	4.28	5.18	1.910	3.81	2.84										2.543	-.33	-3.11			
			1.796	4.26	4.21															

TABLE 2

BLADE SECTION ANGLE OF ATTACK

NACA 10-(3)(066)-03 PROPELLER - Continued

(k) $x = 0.975$; $\beta_{0.75R} = 45^{\circ}$; $B = 2$

1140 rpm			1350 rpm			1500 rpm			1600 rpm			M = 0.56			M = 0.60			M = 0.65		
J	α_{i_T}	α_k	J	α_{i_T}	α_k	J	α_{i_T}	α_k	J	α_{i_T}	α_k	J	α_{i_T}	α_k	J	α_{i_T}	α_k	J	α_{i_T}	α_k
1.769	6.00	2.25	1.950	5.24	0.67	2.141	3.78	-0.66	2.059	4.42	0.32	2.151	3.13	-0.18	2.169	2.63	-0.22	2.141	2.87	-0.66
1.931	4.92	.88	2.038	4.15	.34	2.205	2.95	-.93	2.110	3.98	-.11	2.176	2.97	-.41	2.232	2.42	-.98	2.157	2.82	-.86
2.102	3.24	.08	2.130	3.01	.11	2.281	2.14	-1.39	2.213	3.00	-.85	2.221	2.77	-.93	2.258	2.23	-1.21	2.179	2.68	-1.06
2.291	1.63	-.93	2.221	2.26	-.46	2.364	1.46	-2.01	2.327	2.10	-1.87	2.240	2.54	-1.01	2.283	2.02	-1.40	2.196	2.56	-1.20
2.488	.54	-2.44	2.301	1.80	-1.24	2.439	1.01	-2.68	2.409	.96	-2.20	2.276	2.20	-1.21	2.305	1.87	-1.61	2.224	2.30	-1.36
2.578	.17	-3.19	2.379	1.27	-1.76	2.489	.68	-3.08	2.538	-.45	-3.14	2.293	2.02	-1.30	2.340	1.42	-1.83	2.251	2.17	-1.64
2.374	.89	-1.33	2.468	.80	-2.54	2.540	.38	-3.51	2.490	.18	-2.89	2.326	1.83	-1.61	2.382	1.27	-2.16	2.268	1.95	-1.68
2.200	2.18	-.22	2.570	.12	-3.15	2.524	.34	-3.24	2.370	1.35	-1.88	2.362	1.37	-1.73	2.415	.67	-2.21	2.299	1.78	-1.97
2.018	3.95	.55	2.539	.35	-3.00	2.466	.65	-2.71	2.314	1.95	-1.50	2.400	1.22	-2.17	2.468	.25	-2.65	2.321	1.55	-2.06
1.840	5.71	1.47	2.430	.86	-2.08	2.415	1.11	-2.43	2.267	2.36	-.64	2.416	1.10	-2.30	2.502	-.08	-2.83	2.338	1.33	-2.09
			2.379	1.43	-1.92	2.328	1.67	-1.67	2.167	3.27	-.37	2.462	.78	-2.64				2.375	.97	-2.28
			2.272	2.00	-.92	2.251	2.29	-1.05				2.505	.52	-3.02				2.416	.53	-2.44
			2.181	2.53	-.15	2.184	2.92	-.55				2.539	.28	-3.27				2.432	.34	-2.47
			2.117	3.15	.15															
			2.079	3.52	.34															
			1.992	4.68	.53															
			1.952	5.16	.72															

(l) $x = 0.70$; $\beta_{0.75R} = 45^{\circ}$; $B = 1$

1500 rpm			M = 0.56			M = 0.58			M = 0.60			M = 0.65		
2.273	0.83	0.53	2.447	0.67	-1.80	2.222	1.63	0.40	2.287	1.16	-0.14	2.250	0.73	0.65
2.222	1.03	.45	2.425	.77	-1.61	2.202	1.68	.64	2.220	1.38	.63	2.212	.80	1.17
2.182	1.12	1.59	2.397	.87	-1.31	2.180	1.72	.93	2.197	1.40	.95	2.185	.82	1.58
2.120	1.34	2.31	2.365	.97	-.97	2.150	1.71	1.38	2.176	1.42	1.23	2.166	.85	1.85
2.056	1.52	3.12	2.332	1.18	-.71	2.124	1.82	1.66	2.150	1.44	1.59	2.138	.88	2.28
2.020	1.69	3.50	2.301	1.30	-.37	2.180	1.70	2.01	2.130	1.44	1.87	2.125	.92	2.45
1.977	1.86	4.01	2.281	1.41	-.20	2.081	1.69	2.42	2.103	1.43	2.27	2.100	1.02	2.76
1.928	1.93	4.72	2.245	1.47	.27	2.060	1.67	2.75	2.084	1.43	2.55	2.077	1.14	3.02
1.867	1.97	5.67	2.230	1.56	.40	2.038	1.65	3.11	2.064	1.43	2.87	2.059	1.25	3.21
1.820	1.93	6.49	2.202	1.64	.74	2.013	1.61	3.53	2.042	1.46	3.18	2.040	1.37	3.41
1.753	1.93	7.59	2.178	1.73	1.02	1.996	1.58	3.83	2.025	1.51	3.41	2.011	1.50	3.80
1.715	1.92	8.24	2.149	1.80	1.39	1.977	1.55	4.16	2.010	1.60	3.56	1.992	1.56	4.08
			2.130	1.87	1.61	1.955	1.52	4.55	1.991	1.70	3.76			
			2.103	1.99	1.92	1.943	1.48	4.79	1.964	1.92	4.02			
			2.084	2.08	2.13									
			2.063	2.22	2.33									
			2.040	2.38	2.54									
			2.020	2.44	2.80									
			2.000	2.63	2.94									

TABLE 2

BLADE SECTION ANGLE OF ATTACK

NACA 10-(3)(066)-03 PROPELLER - Continued

(m) $x = 0.85$; $\beta_{0.75R} = 45^{\circ}$; $B = 1$

1500 rpm			M = 0.57			M = 0.59			M = 0.61			M = 0.64		
J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x
2.297	1.02	-6.32	2.493	-0.05	-1.84	2.513	0.44	-2.75	2.365	0.20	-0.45	2.336	-0.05	-0.15
2.241	1.29	.58	2.448	.22	-1.45	2.468	.47	-2.11	2.334	.27	-.03	2.308	.05	.18
2.185	1.48	1.30	2.354	.77	-.50	2.425	.57	-1.56	2.317	.27	.24	2.282	.18	.46
2.150	1.69	1.66	2.325	.84	-.24	2.377	.60	-.86	2.281	.34	.76	2.259	.40	.61
2.087	1.87	2.54	2.298	.99	.04	2.335	.67	-.30	2.254	.42	1.11	2.239	.58	.74
2.036	2.10	3.18	2.267	1.12	.37	2.298	.73	.21	2.233	.50	1.39	2.218	.75	.91
1.979	2.26	3.99	2.241	1.23	.67	2.258	.78	.77	2.213	.52	1.64	2.191	.82	1.27
1.939	2.48	4.45	2.213	1.35	.98	2.219	.87	1.29	2.183	.68	1.93	2.173	.97	1.41
1.894	2.76	4.94	2.185	1.45	1.33	2.183	.98	1.73	2.162	.83	2.10	2.150	1.04	1.71
1.847	2.89	5.61	2.155	1.55	1.72	2.148	1.08	2.18	2.134	1.03	2.27	2.125	1.15	2.01
1.787	3.04	6.48	2.121	1.65	2.16	2.108	1.26	2.60	2.123	1.18	2.27	2.106	1.25	2.22
1.741	2.98	7.31	2.096	1.65	2.57	2.074	1.36	3.02	2.098	1.32	2.51	2.094	1.35	2.31
			2.084	1.64	2.77	2.043	1.52	3.33	2.083	1.54	2.51	2.063	1.43	2.73
			2.058	1.42	3.41	2.018	1.62	3.60	2.053	1.77	2.77	2.035	1.50	3.12
			2.035	1.25	3.95	2.002	1.68	3.78	2.039	1.98	2.79	2.019	1.52	3.37
			2.013	1.27	4.29				2.020	2.18	2.89			
									2.001	2.31	3.09			
									1.977	2.52	3.31			

(n) $x = 0.95$; $\beta_{0.75R} = 45^{\circ}$; $B = 1$

1500 rpm			M = 0.56			M = 0.59			M = 0.61			M = 0.64		
2.508	-0.10	-2.52	2.440	0.26	-1.86	2.336	0.63	-0.65	2.434	-0.04	-1.76	2.319	-0.01	-0.41
2.468	.23	-2.26	2.410	.38	-1.43	2.245	1.11	.32	2.353	.53	-1.00	2.279	.22	-.04
2.392	.59	-1.50	2.383	.43	-1.07	2.221	1.52	.28	2.320	.95	-.99	2.246	.47	.21
2.353	.77	-1.09	2.361	.57	-.86	2.192	1.77	.76	2.266	1.62	-.63	2.212	.68	.52
2.286	1.11	-.38	2.297	.92	-.21	2.172	2.21	.35	2.239	1.93	-.54	2.185	1.08	.53
2.243	1.25	.17	2.250	1.27	.15	2.148	2.58	.35	2.212	2.02	-.20	2.167	1.40	.49
2.176	1.40	.89	2.228	1.42	.35	2.119	2.93	.44	2.188	2.40	-.24	2.154	1.67	.42
2.129	1.55	1.83	2.208	1.54	.54	2.098	3.23	.45	2.163	2.58	-.06	2.130	1.83	.64
2.082	1.82	2.41	2.170	1.74	.95	2.076	3.52	.50	2.137	2.65	.23	2.111	2.01	.76
2.024	2.14	3.14	2.144	1.98	1.15	2.057	3.64	.66	2.117	2.88	.28	2.087	2.12	1.02
1.975	2.59	3.58	2.119	2.13	1.39	2.032	3.96	.71	2.090	3.17	.41	2.069	2.27	1.16
1.928	3.09	3.93	2.102	2.53	1.27	2.013	4.18	.76	2.073	3.25	.59	2.049	2.32	1.43
1.861	3.97	4.24	2.073	2.86	1.41	1.992	4.31	.94	2.049	3.40	.81	2.032	2.42	1.60
1.815	4.46	4.54	2.052	3.17	1.44	1.970	4.36	1.21	2.025	3.58	1.02	2.013	2.48	1.83
1.764	5.06	4.79	2.031	3.70	1.24	1.951	4.44	1.42	2.003	3.72	1.25			
1.697	5.20	5.72	2.013	3.86	1.37	1.929	4.49	1.71	1.983	3.86	1.45			
			1.993	4.14	1.42				1.965	3.98	1.64			
			1.971	4.55	1.35				1.946	4.17	1.78			
			1.949	4.61	1.64									
			1.930	4.77	1.78									
			1.908	4.81	2.09									
			1.883	4.93	2.37									

NACA

TABLE 2

BLADE SECTION ANGLE OF ATTACK

NACA 10-(3)(066)-03 PROPELLER - Concluded

(o) $x = 0.975$; $\beta_{0.75R} = 45^{\circ}$; $B = 1$

1500 rpm			M = 0.57			M = 0.59			M = 0.61			M = 0.65		
J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x
2.480	0.20	-2.48	2.365	1.27	-1.65	2.326	0.83	-0.74	2.326	1.78	-1.85	2.343	0.19	-1.03
2.409	.80	-2.03	2.336	1.49	-1.43	2.295	1.16	-.59	2.293	2.13	-1.67	2.321	.32	-.83
2.367	1.20	-1.79	2.311	1.79	-1.34	2.285	1.00	-.26	2.260	2.34	-1.34	2.303	.46	-.71
2.308	1.53	-1.21	2.283	1.95	-1.08	2.249	1.89	-.57	2.253	2.92	-1.81	2.273	.63	-.44
2.260	1.74	-.65	2.256	2.26	-.97	2.220	2.20	-.42	2.221	3.23	-1.63	2.251	.88	-.35
2.190	2.04	.23	2.240	2.38	-.84	2.206	2.53	-.54	2.185	3.47	-1.33	2.232	1.07	-.25
2.123	2.22	1.22	2.200	2.78	-.62	2.161	2.69	0	2.172	3.53	-1.21	2.212	1.22	-.11
2.077	2.33	1.94	2.174	3.16	-.58	2.147	3.06	-.16	2.149	3.63	-.99	2.175	1.53	.15
2.005	2.69	2.88	2.160	3.36	-.55	2.119	3.35	-.04	2.116	3.80	-.69	2.165	1.72	.12
1.948	3.22	3.39	2.121	3.77	-.33	2.100	3.60	0	2.105	3.86	-.58	2.141	1.95	.26
1.887	4.00	3.71	2.101	4.20	-.44	2.073	3.68	.33	2.080	4.05	-.39	2.122	2.11	.39
1.850	4.45	3.90	2.086	4.42	-.42	2.052	3.90	.41	2.058	4.13	-.14	2.101	2.37	.45
1.811	5.13	3.88	2.055	4.67	-.17	2.026	4.12	.57	2.030	4.22	.24	2.080	2.73	.42
1.761	5.53	4.30	2.033	5.13	-.27	2.010	4.32	.61	2.016	4.37	.32	2.061	2.95	.51
1.729	6.29	4.05	2.014	5.48	-.33	1.996	4.58	.54	1.995	4.46	.58	2.041	3.32	.45
			1.998	5.67	-.26	1.972	4.61	.86	1.977	4.53	.81	2.026	3.47	.54
						1.951	4.82	.97	1.960	4.59	1.05			
						1.932	5.00	1.08	1.922	4.71	1.60			

TABLE 3

BLADE SECTION ANGLE OF ATTACK

NACA 10-(3)(049)-03 PROPELLER

(a) $x = 0.345$; $\beta_{0.75R} = 45^{\circ}$; $B = 2$

1140 rpm			1350 rpm			1500 rpm			1600 rpm			M = 0.56			M = 0.60			M = 0.65		
J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x
1.881			1.975			2.165			2.233	-0.55	2.53	2.227			2.204	0.38	1.94	2.175		
1.934			2.023			2.206			2.263	-.11	1.74	2.247			2.231	.33	1.69	2.191	1.10	1.21
2.025	1.02	3.19	2.100	0.50	2.88	2.252			2.304	.18	.99	2.272	0.45	1.04	2.265	.23	1.41	2.216	.98	1.04
2.164	.63	1.98	2.158	.40	2.28	2.315	0.28	0.78	2.340	.42	.38	2.280	.40	1.02	2.280	.22	1.26	2.222	.92	1.03
2.246	.36	1.39	2.209	.16	1.99	2.370	.13	.38	2.377	.53	-.10	2.302	.35	.85	2.301	.18	1.06	2.243	.82	.90
2.318	.23	.79	2.279	0	1.40	2.414	.15	-.06	2.411	.57	-.47	2.329	.35	.58	2.318	.17	.89	2.254	.79	.81
2.402			2.340	.02	.75	2.463	.23	-.58	2.447			2.343	.36	.43	2.349	.17	.54	2.275	.74	.64
2.485			2.421			2.484	.28	-.81	2.456			2.342	.39	.41	2.361	.18	.40	2.280	.69	.64
2.537			2.528			2.445	.19	-.38	2.423	.58	-.60	2.385	.42	-.04	2.383	.19	.18	2.299	.66	.47
2.447			2.472			2.388	.14	.19	2.393	.55	-.26	2.405	.40	-.21	2.383	.25	.12	2.318	.65	.29
2.356	.23	.42	2.395	.08	.17	2.346	.18	.57	2.360	.48	.13	2.427	.35	-.37	2.399	.31	-.10	2.340	.65	.07
2.281	.28	1.11	2.318	0	1.00	2.296	.41	.84	2.320	.35	.65	2.454	.27	-.55	2.418	.35	-.34	2.361	.70	-.18
2.203	.47	1.73	2.257	.03	1.60	2.218			2.280	.02	1.42	2.472	.21	-.66	2.435	.48	-.64	2.374	.74	-.34
2.103	.78	2.52	2.176	.28	2.23	2.184			2.248	-.32	2.14									
2.069	.80	2.89	2.141	.44	2.45															
1.996	1.10	3.46	2.083	.51	3.07															
1.909			2.021																	

(b) $x = 0.45$; $\beta_{0.75R} = 45^{\circ}$; $B = 2$

1140 rpm			1350 rpm			1500 rpm			1600 rpm			M = 0.56			M = 0.58			M = 0.60			M = 0.65		
J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x
1.925	1.32	3.45	1.959			2.125			2.196	1.40	1.28	2.227	1.33	0.77	2.230	1.41	0.81	2.208	1.65	0.82	2.169	1.40	1.20
2.016	.95	2.55	2.030	2.22	2.55	2.185	1.58	1.13	2.275	1.32	.25	2.243	1.35	.54	2.234	1.39	.76	2.235	1.55	.50	2.198	1.41	.77
2.108	1.10	1.23	2.127	1.95	1.42	2.234	1.53	.49	2.319	1.30	-.37	2.260	1.37	.31	2.270	1.34	.27	2.244	1.48	.44	2.210	1.41	.60
2.197	1.07	.13	2.224	1.63	.42	2.295	1.48	-.26	2.371	1.32	-1.14	2.275	1.38	.10	2.286	1.33	.05	2.270	1.42	.10	2.229	1.41	.34
2.288			2.296	1.38	-.26	2.367	1.37	-1.10	2.427			2.304	1.38	-.28	2.313	1.30	-.31	2.306	1.27	-.29	2.253	1.40	.03
2.424			2.371	1.15	-.96	2.423	1.36	-1.79	2.458			2.329	1.37	-.59	2.342	1.30	-.73	2.313	1.26	-.39	2.263	1.38	-.09
2.500			2.476			2.506			2.448			2.355	1.32	-.88	2.363	1.30	-1.04	2.332	1.26	-.67	2.275	1.37	-.24
2.580			2.521			2.457	1.42	-2.26	2.403	1.35	-1.64	2.377	1.24	-1.10	2.390	1.32	-1.44	2.356	1.28	-1.05	2.290	1.33	-.39
2.550			2.487			2.408	1.35	-1.59	2.368	1.32	-1.10	2.399	1.17	-1.32	2.406			2.366	1.31	-1.22	2.291	1.30	-.38
2.485			2.425			2.325	1.44	-.62	2.354	1.30	-.87	2.424	1.01	-1.50	2.436			2.377	1.37	-1.44	2.311	1.26	-.60
2.374			2.356	1.17	-.79	2.277	1.50	-.04	2.282	1.31	.15	2.450	.86	-1.71	2.445			2.403			2.331	1.22	-.79
2.260	1.12	.43	2.246	1.53	.23	2.217	1.55	.72	2.219	1.32	1.14	2.478			2.462			2.426			2.353	1.13	-.96
2.158	1.02	1.82	2.272	1.45	-.03	2.161															2.375	1.00	-1.08
2.077	1.04	2.88	2.183	1.77	.84																		
1.958			2.088	2.10	1.83																		
			1.988	2.03	3.37																		

TABLE 3

BLADE SECTION ANGLE OF ATTACK

NACA 10-(3)(049)-03 PROPELLER - Continued

(c) $x = 0.60$; $\beta_{0.75R} = 45^{\circ}$; $B = 2$

1140 rpm			1350 rpm			1500 rpm			1600 rpm			M = 0.56			M = 0.60			M = 0.65		
J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x
1.889	1.41	6.20	1.968	1.61	5.15	2.158	1.35	2.50	2.205	1.15	2.12	2.228	1.21	1.45	2.222	1.42	1.00	2.172	1.81	0.73
1.948	1.53	5.06	2.035	1.53	4.07	2.203	1.16	1.85	2.258	1.05	1.18	2.242	1.17	1.21	2.230	1.39	.87	2.191	1.80	.39
2.032	1.64	4.05	2.084	1.38	3.37	2.269	1.00	.84	2.300	.96	.48	2.267	1.10	.79	2.261	1.31	.33	2.204	1.78	.18
2.116	1.49	2.36	2.176	1.12	2.09	2.323	.84	.10	2.347	.93	-.41	2.291	1.02	.42	2.266	1.29	.24	2.220	1.71	-.05
2.205	.95	1.53	2.239	.95	1.22	2.377	.76	-.80	2.392	.99	-1.49	2.313	.95	.02	2.294	1.18	-.54	2.239	1.69	-.37
2.293	.71	.48	2.328	.72	1.06	2.457	.50	-1.06	2.439	1.16	-2.80	2.335	.86	-.25	2.316	1.08	-.56	2.258	1.60	-.61
2.382	.69	-.79	2.398	.58	-.89	2.500	.32	-2.88	2.445	1.22	-3.01	2.355	.81	-.72	2.341	.95	-.95	2.267	1.56	-.73
2.467	.69	-1.97	2.463	.40	-1.75	2.477	.41	-2.46	2.418	1.11	-2.24	2.377	.76	-.96	2.354	.90	-1.18	2.294	1.50	-1.13
2.558	.71	-3.19	2.517	.25	-2.48	2.420	.59	-1.41	2.364	.94	-.78	2.393	.70	-1.21	2.379	.79	-1.62	2.314	1.45	-1.39
2.508	.71	-2.53	2.499	.30	-2.22	2.360	.79	-.53	2.322	.94	.07	2.418	.61	-1.60	2.394	.71	-1.87	2.324	1.40	-1.51
2.431	.69	-1.47	2.428	.49	-1.29	2.292	.91	.55	2.281	.99	.80	2.438	.52	-1.89	2.405	.64	-2.06	2.347	1.32	-1.76
2.352	.69	-.36	2.298	.81	.42	2.229	1.08	1.47	2.235	1.09	1.57	2.466	.40	-2.32	2.418	.55	-2.27	2.362	1.24	-1.90
2.264	.76	.85	2.196	1.07	1.81	2.193	1.24	1.96				2.483	.34	-2.59				2.376	1.17	-2.03
2.158	1.14	2.06	2.141	1.21	2.57															
2.083	1.58	2.79	2.067	1.45	3.59															
1.990	1.60	4.28	2.008	1.57	4.50															
1.903	1.42	5.95																		

(d) $x = 0.70$; $\beta_{0.75R} = 45^{\circ}$; $B = 2$

1140 rpm			1350 rpm			1500 rpm			1600 rpm			M = 0.56			M = 0.58			M = 0.60			M = 0.65		
J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x
1.875	2.27	6.08	1.988	1.90	5.20	2.171	2.25	1.90	2.213	1.63	2.03	2.237	1.63	1.24	2.226	1.75	1.01	2.209	1.83	0.97	2.171	0.68	1.69
1.935	2.12	5.18	2.057	1.83	4.00	2.229	1.54	1.38	2.261	1.41	1.06	2.243	1.58	1.15	2.247	1.59	.73	2.228	1.71	.73	2.196	.65	1.23
1.999	1.95	4.23	2.125	1.58	2.98	2.287	1.07	.67	2.306	1.15	.25	2.275	1.36	.62	2.258	1.52	.57	2.247	1.52	.38	2.203	.62	1.12
2.088	1.65	3.00	2.200	1.35	1.84	2.341	.92	-.30	2.349	.81	-.39	2.290	1.17	.46	2.290	1.23	.15	2.280	1.31	-.14	2.241	.54	.41
2.157	1.45	2.05	2.274	1.07	.75	2.391	.73	-1.17	2.388	.51	-1.15	2.308	1.07	.15	2.308	1.11	-.15	2.293	1.17	-.33	2.254	.32	.16
2.215	1.18	1.35	2.362	.78	-.54	2.448	.37	-2.12	2.429	-.19	-1.71	2.343	.90	-.50	2.325	1.02	-.50	2.309	1.03	-.61	2.262	.50	.02
2.288	.84	.49	2.432	.45	-1.44	2.473	.03	-2.46	2.448	-.37	-2.11	2.357	.78	-.70	2.352	.78	-.97	2.318	.93	-.73	2.284	.47	-.38
2.351	.62	-.29	2.510	.05	-2.49	2.427	.55	-1.78	2.417	.17	-1.71	2.378	.66	-1.08	2.387	.56	-1.64	2.352	.66	-1.31	2.296	.47	-.61
2.452	.24	-1.48	2.480	.22	-2.09	2.370	.82	-.81	2.380	.66	-1.05	2.408	.48	-1.39	2.395	.49	-1.75	2.368	.60	-1.67	2.313	.45	-.88
2.567	-.24	-2.72	2.405	.56	-1.07	2.329	.94	-.06	2.330	1.02	-.16	2.425	.37	-1.88	2.384	.52	-1.51	2.378	.48	-1.81	2.328	.45	-1.15
2.514	.02	-2.19	2.340	.86	-.23	2.271	1.17	.89	2.289	1.23	.58	2.438	.28	-2.07	2.402	.47	-1.90	2.383	.38	-1.84	2.335	.45	-1.27
2.402	.43	-.91	2.257	1.16	.97	2.213	1.74	1.52	2.251	1.42	1.29	2.457	.15	-2.38	2.416	.34	-2.08	2.416	.20	-2.58	2.367	.44	-1.76
2.323	.76	.01	2.177	1.43	2.18							2.484	-.01	-2.82	2.448	.17	-2.56	2.431	.13	-2.94			
2.259	1.04	.77	2.109	1.66	3.21										2.456	.06	-2.60						
2.192	1.27	1.64	2.044	1.84	4.23																		
2.140	1.46	2.31																					
2.063	1.73	3.35																					
1.978	2.02	4.52																					
1.915	2.23	5.41																					

TABLE 3

BLADE SECTION ANGLE OF ATTACK

NACA 10-(3)(049)-03 PROPELLER - Continued

(e) $x = 0.78$; $\beta_{0.75R} = 45^{\circ}$; $B = 2$

1140 rpm			1350 rpm			1500 rpm			1600 rpm			M = 0.56			M = 0.58			M = 0.60			M = 0.65		
J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x
1.880	2.60	5.74	2.023	2.45	4.45	2.169	2.41	2.20	2.239	1.94	1.40	2.218	2.04	1.50	2.218	2.02	1.08	2.203	1.48	1.48	2.168	1.11	1.09
1.971	2.34	4.49	2.127	1.87	2.97	2.219	1.93	1.51	2.280	1.51	.66	2.251	1.75	1.00	2.231	1.80	1.00	2.226	1.42	1.05	2.185	1.02	.84
2.055	2.07	3.33	2.201	1.45	1.95	2.282	1.34	.66	2.323	1.08	-.13	2.271	1.51	.75	2.246	1.46	.99	2.243	1.32	.75	2.204	.90	.56
2.124	1.74	2.46	2.293	.98	.58	2.337	.89	-.17	2.373	.46	-.95	2.294	1.33	.34	2.273	1.22	.55	2.267	1.17	.24	2.215	.74	.46
2.210	1.32	1.39	2.346	.66	-.16	2.384	.50	-.89	2.411	-.08	-1.68	2.321	1.07	-.15	2.304	1.02	-.08	2.289	.92	-.15	2.249	.49	-.06
2.285	.93	.49	2.419	.40	-1.31	2.443	-.05	-1.79	2.443	-.43	-2.39	2.343	.82	-.48	2.323	.78	-.37	2.302	.82	-.43	2.254	.37	-.05
2.374	.42	-.50	2.482	.09	-2.23	2.477	.22	-3.03	2.434	-.34	-2.17	2.368	.59	-.92	2.345	.60	-.84	2.323	.75	-.98	2.273	.18	-.27
2.460	-.20	-1.29	2.508	-.13	-2.56	2.416	.29	-1.45	2.399	.14	-1.47	2.385	.46	-1.22	2.371	.31	-1.27	2.341	.49	-1.24	2.290	0	-.46
2.532	-.79	-1.87	2.455	.20	-1.80	2.365	.69	-.64	2.364	.63	-.85	2.410	.18	-1.58	2.389	.14	-1.54	2.347	.40	-1.33	2.298	-.13	-.50
2.487	-.58	-1.34	2.389	.49	-.82	2.314	1.08	.17	2.346	.84	-.53	2.439	-.07	-2.04	2.418	-.08	-2.02	2.362	.23	-1.60	2.319	-.26	-.81
2.431	.04	-1.06	2.326	.77	.12	2.262	1.52	.93	2.316	1.19	-.04	2.464	-.32	-2.39	2.438	-.27	-2.24	2.385	-.13	-1.88	2.335	-.35	-1.05
2.349	.62	-.29	2.238	1.25	1.42	2.202	2.08	1.74	2.269	1.58	.92							2.397	-.25	-2.10	2.341	-.51	-1.01
2.261	1.11	.72	2.174	1.63	2.30				2.222	1.99	1.83							2.415	-.44	-2.40	2.362	-.80	-1.13
2.186	1.48	1.67	2.091	2.11	3.46																2.373	-.90	-1.24
2.092	1.88	2.88																					
2.027	2.22	3.66																					
1.923	2.52	5.12																					

(f) $x = 0.85$; $\beta_{0.75R} = 45^{\circ}$; $B = 2$

1.897	2.61	5.47	1.998	3.18	4.59	2.166	2.55	2.50	2.207	2.55	2.02	2.216	2.31	1.44	2.208	1.96	1.57	2.200	1.50	1.59	2.170	1.06	1.97
1.983	2.49	4.20	2.063	2.78	3.65	2.214	2.27	1.55	2.278	1.76	.65	2.244	2.16	.94	2.233	1.94	.97	2.235	1.26	1.07	2.186	.87	.82
2.062	2.19	3.17	2.132	2.21	2.80	2.286	1.63	.41	2.321	1.25	-.28	2.250	2.04	.88	2.254	1.80	.54	2.260	1.17	.44	2.209	.67	.48
2.172	1.67	1.80	2.221	1.54	1.63	2.323	1.21	-.13	2.381	.54	-1.60	2.271	1.84	.58	2.266	1.71	.30	2.264	1.07	.40	2.227	.38	.30
2.255	1.20	.80	2.285	1.18	.65	2.389	.64	-1.24	2.434	-.50	-2.41	2.308	1.43	-.01	2.303	1.28	-.42	2.302	.72	-.52	2.247	.16	.03
2.362	.57	-.44	2.365	.73	-.65	2.452	-.18	-2.08	2.453	-.90	-2.67	2.326	1.17	-.27	2.328	1.02	-.94	2.328	.33	-.99	2.265	-.04	-.21
2.450	.05	-1.44	2.433	.39	-1.73	2.489	-.74	-2.52	2.446	-.81	-2.54	2.339	1.01	-.49	2.347	.82	-1.29	2.345	.19	-1.42	2.286	-.23	-.49
2.573	-.87	-2.62	2.517	-.21	-2.95	2.421	.20	-1.63	2.418	-.18	-2.16	2.361	.72	-.89	2.367	.57	-1.60	2.352	.23	-1.68	2.293	-.37	-.51
2.540	-.59	-2.34	2.462	.19	-2.15	2.351	.90	-.56	2.393	.14	-1.61	2.401	.33	-1.66	2.388	.28	-1.87	2.360	-.08	-1.84	2.312	-.56	-.71
2.407	.26	-.90	2.408	.50	-1.31	2.315	1.34	-.06	2.367	.68	-1.25	2.428	.06	-2.10	2.413	-.02	-2.18	2.390	-.36	-2.16	2.326	-.75	-.80
2.325	.74	.03	2.344	.76	-.23	2.256	1.87	.90	2.349	1.00	-.96	2.436	-.12	-2.12	2.423	-.23	-2.22	2.404	-.48	-2.39	2.340	-.85	-.96
2.217	1.45	1.22	2.277	1.20	.81	2.207	2.29	1.71	2.305	1.42	.10	2.466	-.42	-2.56	2.465	-.86	-2.59	2.424	-.90	-2.47	2.364	-1.09	-1.15
2.180	1.65	1.67	2.203	1.69	1.86				2.256	2.00	1.11	2.492	-.78	-2.81							2.374	-1.29	-1.12
2.130	1.91	2.29	2.116	2.31	3.03				2.233	2.25	1.57												
2.028	2.38	3.56	2.056	2.92	3.66																		
1.943	2.56	4.79																					

TABLE 3

BLADE SECTION ANGLE OF ATTACK

NACA 10-(3)(049)-03 PROPELLER - Continued

(g) $x = 0.90$; $\beta_{0.75R} = 45^{\circ}$; $B = 2$

1140 rpm			1350 rpm			1500 rpm			1600 rpm			M = 0.56			M = 0.58			M = 0.60			M = 0.65		
J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x
1.872	2.84	5.40	2.031	3.43	3.64	2.153	2.73	2.42	2.229	2.71	1.19	2.242	2.54	.49	2.219	2.02	1.17	2.206	1.88	0.89	2.160	1.29	0.66
1.960	2.73	3.82	2.099	2.98	2.66	2.219	2.21	1.42	2.300	1.53	0	2.264	2.40	.10	2.245	1.94	.54	2.215	1.77	.82	2.182	1.14	.33
2.039	2.42	3.15	2.180	2.16	1.73	2.251	1.86	.90	2.362	.48	-1.34	2.284	2.16	-.19	2.263	1.88	.07	2.237	1.61	.48	2.203	.90	.08
2.151	1.87	1.78	2.271	1.41	.54	2.311	1.37	-.18	2.421	-.67	-2.29	2.296	2.00	-.37	2.282	1.74	-.42	2.253	1.40	.23	2.218	.58	0
2.214	1.51	1.04	2.341	.90	-.53	2.355	.84	-.81	2.438	-1.06	-2.51	2.311	1.65	-.45	2.310	1.58	-1.27	2.278	1.17	-.47	2.243	.27	-.37
2.282	1.08	.26	2.424	.42	-1.93	2.423	.08	-1.85	2.401	-.26	-1.99	2.328	1.40	-.73	2.334	1.32	-1.78	2.284	1.01	-.52	2.261	.07	-.65
2.340	.79	-.48	2.524	-.15	-3.66	2.472	-.68	-2.43	2.386	.12	-1.83	2.352	1.04	-1.12	2.346	1.08	-1.88	2.328	.40	-1.52	2.275	-.18	-.75
2.406	.48	-1.34	2.480	.06	-2.84	2.499	-.85	-2.98	2.350	.68	-1.08	2.367	.72	-1.30	2.373	.69	-2.24	2.346	-.06	-1.70	2.297	-.56	-.87
2.478	.17	-2.30	2.383	.63	-1.21	2.448	-.32	-2.14	2.329	1.20	-.78	2.381	.52	-1.60	2.398	.34	-2.54	2.361	-.43	-1.79	2.304	-.70	-.88
2.574	-.32	-3.51	2.310	1.05	.02	2.402	.40	-1.62	2.285	1.76	.31	2.399	.32	-1.93	2.416	-.32	-2.33	2.376	-.58	-2.05	2.340	-1.26	-1.00
2.519	-.02	-2.85	2.241	1.62	.97	2.330	1.11	-.43	2.265	2.07	.68	2.415	.13	-2.19	2.451	-.93	-2.61	2.392	-.80	-2.22	2.355	-1.42	-1.09
2.451	.27	-1.93	2.150	2.35	2.19	2.287	1.56	.26	2.218	2.71	1.51	2.430	-.23	-2.23				2.409	-1.08	-2.36	2.363	-1.64	-1.02
2.376	.59	-.92	2.070	3.36	2.88	2.241	1.94	1.10				2.449	-.51	-2.41				2.429	-1.27	-2.54			
2.327	.89	-.34	2.081	3.17	2.84	2.192	2.44	1.91				2.474	-.72	-2.80									
2.238	1.27	.86										2.494	-.89	-3.09									
2.200	1.53	1.26																					
2.112	2.05	2.28																					
2.008	2.58	3.51																					
1.934	2.77	4.51																					

(h) $x = 0.95$; $\beta_{0.75R} = 45^{\circ}$; $B = 2$

1140 rpm			1350 rpm			1500 rpm			1600 rpm			M = 0.56			M = 0.58			M = 0.60			M = 0.65		
J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x
1.923	3.92	3.38	2.016	4.99	2.39	2.176	3.30	1.52	2.227	3.31	0.65	2.215	3.22	0.36	2.215	2.37	0.89	2.200	2.36	0.40	2.172	2.31	-0.78
2.023	3.16	2.55	2.088	4.69	1.13	2.209	2.84	1.05	2.300	1.82	-.38	2.249	2.90	-.12	2.241	2.29	.25	2.221	2.20	.15	2.197	1.77	-.83
2.051	2.88	2.36	2.183	2.97	.80	2.281	1.90	-.01	2.351	.75	-1.42	2.256	2.62	-.01	2.254	2.02	.14	2.240	2.01	-.10	2.222	1.24	-.94
2.125	2.39	1.61	2.248	2.12	.23	2.328	1.43	-.80	2.423	-.87	-2.49	2.289	2.18	-.43	2.287	1.76	-.76	2.256	1.76	-.39	2.242	.66	-.91
2.257	1.41	.29	2.335	1.13	-.74	2.323	.96	-1.57	2.451	-1.53	-2.82	2.311	1.66	-.54	2.300	1.48	-1.00	2.269	1.54	-.69	2.263	.35	-1.22
2.335	1.07	-.77	2.405	.65	-1.94	2.429	.11	-2.23	2.413	-.47	-2.53	2.340	1.30	-1.08	2.318	1.11	-1.27	2.289	1.27	-1.20	2.283	-.17	-1.21
2.391	.80	-1.50	2.479	.13	-3.14	2.486	-.78	-2.86	2.382	.14	-1.99	2.362	.85	-1.39	2.342	.69	-1.59	2.304	.82	-1.30	2.308	-.61	-1.31
2.487	.48	-2.92	2.528	-.08	-4.09	2.456	-.36	-2.49	2.364	.79	-1.95	2.394	.46	-2.13	2.370	.58	-2.26	2.331	.20	-1.70	2.339	-1.13	-1.37
2.551	.20	-3.82	2.512	-.03	-3.76	2.399	.52	-1.83	2.336	1.25	-1.26	2.421	.05	-2.51	2.405	-.19	-2.41	2.350	-.13	-2.07	2.381	-1.68	-1.49
2.529	.26	-3.48	2.447	.30	-2.57	2.376	.77	-1.47	2.295	1.88	-.23	2.438	-.44	-2.42	2.417	-.44	-2.46	2.362	-.38	-2.14	2.162	2.54	-.80
2.457	.57	-2.46	2.400	.58	-1.74	2.353	1.12	-1.24	2.263	2.63	.21	2.460	-.68	-2.73	2.433	-.57	-2.76	2.378	-.54	-2.44			
2.375	.88	-1.29	2.350	.92	-.90	2.305	1.55	-.30	2.244	3.06	.40	2.490	-.99	-3.08	2.450	-.99	-2.78	2.399	-.65	-2.84			
2.304	1.20	-.35	2.300	1.42	-.21	2.286	1.77	-.01										2.430	-1.18	-2.98			
2.244	1.61	.32	2.239	2.22	.32	2.267	2.06	.22															
2.170	2.05	1.17	2.153	3.44	.98	2.203	2.85	1.21															
2.107	2.59	1.72	2.067	4.80	1.48	2.218	2.76	.86															
1.996	3.49	2.66																					
1.935	3.92	3.19																					

TABLE 3

BLADE SECTION ANGLE OF ATTACK

NACA 10-(3)(049)-03 PROPELLER - Continued

(i) $x = 0.975$; $\beta_{0.75R} = 45^\circ$; $B = 2$

1140 rpm			1350 rpm			1500 rpm			1600 rpm			M = 0.56			M = 0.58			M = 0.60			M = 0.65		
J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x
1.923	5.69	1.49	1.995	6.12	1.65	2.116	5.17	1.41	2.190	4.09	0.81	2.222	4.35	-0.99	2.242	2.59	-0.14	2.238	2.61	-0.74	2.159	1.92	-0.22
2.009	5.06	.77	2.059	5.66	.73	2.187	3.99	.48	2.281	2.49	-.38	2.235	4.05	-.98	2.259	2.29	-.37	2.250	2.21	-.66	2.177	1.65	-.35
2.081	3.86	.79	2.140	4.72	-.09	2.238	2.83	.17	2.344	1.39	-1.87	2.248	3.61	-.84	2.282	2.01	-.92	2.266	1.99	-1.11	2.200	1.37	-.61
2.187	2.93	-.01	2.226	3.43	-.69	2.274	2.14	-.14	2.414	.08	-3.25	2.256	3.25	-.68	2.301	1.44	-1.15	2.293	1.52	-1.71	2.209	1.05	-.51
2.281	1.92	-.73	2.329	1.80	-1.37	2.329	1.37	-.84	2.465	-1.19	-3.83	2.278	2.83	-.82	2.321	1.23	-1.58	2.312	.91	-1.84	2.221	.88	-.67
2.373	1.18	-1.65	2.427	.54	-2.45	2.377	.96	-1.75	2.449	-.73	-3.69	2.299	2.18	-.75	2.339	.78	-1.69	2.330	.63	-2.22	2.238	.76	-1.04
2.455	.65	-2.61	2.532	-.84	-3.54	2.439	.26	-2.76	2.437	-.38	-3.63	2.314	1.71	-.72	2.359	.36	-1.86	2.350	.05	-2.24	2.259	.55	-1.45
2.578	-.37	-3.84	2.495	-.50	-3.00	2.499	-1.22	-3.87	2.408	.14	-3.09	2.330	1.37	-.89	2.386	-.24	-1.99	2.375	-.55	-2.47	2.270	.43	-1.63
2.536	-.14	-3.30	2.384	1.05	-1.94	2.465	-.45	-2.96	2.370	.90	-2.59	2.344	1.07	-1.05	2.408	-.74	-2.05	2.395	-.87	-2.66	2.280	.09	-1.54
2.436	.77	-2.38	2.288	2.42	-1.02	2.416	.25	-2.13	2.338	1.59	-1.82	2.359	.87	-1.40	2.432	-1.19	-2.22	2.421	-1.16	-2.97	2.308	-.33	-2.39
2.354	1.45	-1.57	2.189	3.91	-.36	2.375	.86	-1.61	2.312	1.93	-1.04	2.377	.56	-1.73	2.463	-1.61	-2.62				2.318	-.55	-2.80
2.230	2.34	-.25	2.095	5.34	.27	2.316	1.66	-.78	2.262	2.75	.07	2.403	.20	-2.21							2.342	-.99	-3.66
2.142	3.30	.31	2.041	5.80	.97	2.271	2.15	-.06	2.228	3.41	.47	2.426	-.51	-2.16							2.368	-1.51	-4.61
2.071	4.20	.62				2.223	3.10	.33				2.445	-.87	-2.29							2.375	-2.03	-5.24
1.977	5.23	1.11				2.170	3.96	1.00				2.468	-.94	-2.77									
												2.492	-1.22	-2.99									

(j) $x = 0.70$; $\beta_{0.75R} = 45^\circ$; $B = 1$

M = 0.56			M = 0.58			M = 0.60			M = 0.65		
J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x
2.420	1.25	-2.63	2.015	2.73		2.345	1.04	-1.51	2.223	0.82	0.49
2.316	1.30	-.31	2.059	2.66		2.283	1.61	-.51	2.181	1.07	1.11
2.281	1.35	.28	2.082	2.64		2.238	2.00	-.20	2.160	1.14	1.42
2.252	1.41	.76	2.094	2.63		2.217	2.00	.15	2.138	1.22	1.74
2.225	1.54	1.15	2.130	2.47	2.21	2.190	1.75	.84	2.119	1.24	2.05
2.189	1.83	1.62	2.156	2.29	1.72	2.166	1.55	1.43	2.102	1.22	2.37
2.163	2.23	1.85	2.180	2.06	1.39	2.150	1.49	1.78	2.082	1.17	2.79
2.151	2.63	1.78	2.198	1.84	1.22	2.119	1.19	2.64	2.056	1.07	3.36
2.119	3.12	2.15	2.233	1.63	.74	2.098	1.02	3.21	2.038	1.03	3.74
2.102	3.44	2.25	2.250	1.48	.58	2.081	.92	3.63	2.022	.92	4.18
2.079	3.58	2.68	2.285	1.29	.13	2.058	.90	4.10	2.003	.72	4.77
2.052	3.64	3.24	2.368	.97	-1.57	2.038	.85	4.55			
2.028	3.66	3.74				2.024	.78	4.89			
2.010	3.66	4.11									
1.988	3.66	4.55									

NACA

TABLE 3

BLADE SECTION ANGLE OF ATTACK

NACA 10-(3)(049)-03 PROPELLER - Continued

(k) $x = 0.78$; $\beta_{0.75R} = 45^{\circ}$; $B = 1$

1500 rpm			1600 rpm			M = 0.56			M = 0.58			M = 0.60			M = 0.65		
J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x
2.499	-0.15	-3.29	2.428	-0.15	-2.17	2.410	0.14	-1.54	2.342	0.87	-1.01	2.335	0.18	-0.76	2.221	0.48	0.58
2.430	.53	-2.05	2.339	.83	-.34	2.313	1.16	-.05	2.256	1.42	.55	2.282	.79	.19	2.188	.77	1.03
2.396	.66	-1.34	2.315	1.06	.07	2.277	1.52	.27	2.219	1.62	1.12	2.264	.95	.38	2.164	1.02	1.25
2.356	.90	-.64	2.288	1.29	.53	2.260	1.79	.32	2.208	1.68	1.30	2.222	1.16	.89	2.138	1.21	1.58
2.288	1.17	.68	2.260	1.58	1.00	2.228	1.96	.80	2.175	1.70	1.72	2.200	1.24	1.18	2.116	1.37	1.84
2.252	1.35	1.28	2.235	1.78	1.53	2.196	1.97	1.53	2.151	1.64	2.72	2.175	1.34	1.51	2.104	1.52	1.94
2.215	1.58	1.99	2.197	2.16	2.42	2.174	1.95	2.06	2.130	1.49	3.50	2.156	1.40	1.78	2.084	1.65	2.19
2.190	1.79	2.40	2.170	2.54	3.01	2.149	1.91	2.78	2.110	1.26	4.39	2.124	1.46	2.32	2.059	1.80	2.54
2.140	2.12	3.49	2.143	2.80	3.67	2.122	1.88	3.51	2.089	1.16		2.111	1.52	2.50	2.040	1.88	2.85
2.110	2.50	4.12	2.103	2.98	4.64	2.107	1.87	3.89	2.062	1.04		2.089	1.60	2.84	2.017	1.93	3.31
			2.080	3.08	5.13	2.076	1.86	4.65	2.041	.84		2.067	1.74	3.12	2.004	1.99	3.56
			2.047	3.13	5.88	2.048	1.87	5.30	2.020	.53		2.043	1.99	3.35	1.989	2.13	3.76
						2.026	1.88	5.78	1.996	.28		2.017	2.10	3.75			
						2.007	1.91	6.13				2.011	2.20	3.79			
						1.984	1.95	6.56									

(l) $x = 0.85$; $\beta_{0.75R} = 45^{\circ}$; $B = 1$

M = 0.56			M = 0.58			M = 0.60			M = 0.65		
J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x
2.007	2.08	6.15	2.337	0.42	-1.18	2.372	-0.06	-1.97	2.208	0.59	0.58
2.031	2.08	5.63	2.284	1.21	.15	2.310	.28	-.34	2.171	.87	1.14
2.056	1.99	5.17	2.258	1.40	.56	2.266	.61	.68	2.147	1.04	1.47
2.081	1.96	4.61	2.231	1.55	1.02	2.250	.85	.72	2.126	1.27	1.67
2.103	1.92	4.12	2.206	1.61	1.53	2.223	1.04	1.02	2.107	1.49	1.83
2.119	1.90	3.74	2.173	1.62	2.36	2.205	1.21	1.15	2.090	1.67	2.00
2.153	1.87	2.87	2.149	1.59	3.08	2.172	1.56	1.38	2.069	1.91	2.21
2.180	1.88	2.14	2.122	1.59	4.02	2.150	1.83	1.51	2.046	2.04	2.58
2.206	1.94	1.45	2.107	1.61	4.58	2.122	2.17	1.68	2.031	2.28	2.68
2.232	2.10	.71	2.087	1.67		2.103	2.34	1.87	2.014	2.39	2.98
2.262	1.99	.20	2.064	1.82		2.079	2.48	2.20	1.995	2.49	3.33
2.297	1.52	0	2.042	1.99		2.056	2.57	2.56	1.979	2.64	3.59
2.328	1.16	-.34	2.015	2.15		2.037	2.64	2.86			
2.351	.82	-.70				2.020	2.70	3.16			
2.451	-.39	-2.23				1.995	2.78	3.58			

TABLE 3

BLADE SECTION ANGLE OF ATTACK

NACA 10-(3)(049)-03 PROPELLER - Continued

(m) $x = 0.90$; $\beta_{0.75R} = 45^{\circ}$; $B = 1$

1600 rpm			M = 0.56			M = 0.58			M = 0.60			M = 0.65		
J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x
2.451	-1.45	-2.57	2.010	3.82	4.21	2.363	0.27	-1.53	2.369	0.31	-2.13	2.204	0.77	0.18
2.381	-.23	-1.31	2.027	3.82	3.84	2.291	1.16	-.25	2.302	.99	-.80	2.174	1.07	.57
2.353	.74	-1.27	2.059	3.50	3.44	2.255	1.51	.33	2.275	1.20	-.32	2.161	1.22	.71
2.331	1.06	-.74	2.085	3.22	3.10	2.229	1.88	.56	2.243	1.46	.02	2.128	1.46	1.17
2.297	1.45	.02	2.109	2.97	2.77	2.217	2.06	.67	2.223	1.62	.20	2.109	1.63	1.40
2.263	1.87	.69	2.132	2.79	2.35	2.178	2.55	1.18	2.202	1.75	.45	2.090	1.86	1.58
2.230	2.37	1.31	2.159	2.62	1.77	2.154	2.81	1.66	2.174	1.86	.83	2.069	1.99	1.90
2.189	2.83	2.38	2.185	2.51	1.27	2.129	3.03	2.31	2.152	1.92	1.16	2.046	2.28	2.12
2.166	3.32	2.77	2.211	2.37	.80	2.108	3.33	2.86	2.129	1.95	1.57	2.031	2.62	2.12
2.143	3.57	3.35	2.238	2.17	.39	2.085	3.67		2.108	2.12	1.79	2.015	2.76	2.37
2.115	3.87	3.93	2.274	1.87	-.06	2.063	3.94		2.078	2.57	1.92	1.990	2.99	2.76
2.075	4.13	4.77	2.295	1.57	-.18	2.043	4.46		2.053	3.03	1.97	1.974	3.53	2.65
			2.332	1.23	-.69	2.017	4.33		2.039	3.35	1.92			
			2.357	.93	-1.17				2.011	4.41	1.43			
			2.462	-.54	-2.71									

(n) $x = 0.95$; $\beta_{0.75R} = 45^{\circ}$; $B = 1$

1500 rpm			1600 rpm			M = 0.56			M = 0.58			M = 0.60			M = 0.65		
J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x
2.385	0.72	-1.67	2.331	1.49	-1.36	2.350	0.65	-0.75	2.346	-0.02	-1.01	2.318	-0.20	-1.24	2.215	0.71	-0.22
2.333	1.43	-.92	2.291	1.88	-.31	2.340	.89	-.67	2.288	.79	.05	2.275	.62	-.12	2.182	1.14	.16
2.230	2.55	.77	2.237	2.58	.85	2.282	1.39	.21	2.260	1.33	.30	2.255	.88	.25	2.160	1.48	.31
2.053	5.81		2.190	3.59	1.58	2.366	1.71	.20	2.231	1.76	.56	2.228	1.38	.23	2.136	1.76	.50
2.020	6.46		2.152	4.67	1.96	2.227	2.18	.55	2.206	2.13	.81	2.205	1.63	.38	2.125	2.07	.47
2.046	6.02		2.111	6.02	1.92	2.211	2.50	.59	2.180	2.65	.97	2.180	1.95	.50	2.094	2.29	.90
2.116	4.69	2.60	2.027	7.09	2.97	2.182	2.92	.87	2.157	2.86	1.46	2.156	2.12	.78	2.077	2.48	1.08
2.148	3.99	2.05	1.971	7.22	3.94	2.160	3.24	1.09	2.132	3.34	1.88	2.131	2.32	1.04	2.052	2.74	1.38
2.211	2.87	1.05	1.927			2.137	3.53	1.41	2.119	3.64	2.11	2.109	2.55	1.23	2.030	3.07	1.57
2.182	3.17	1.66	1.997	7.19	3.47	2.122	3.83	1.49	2.087	3.97		2.088	2.73	1.45	2.016	3.42	1.55
2.138	4.06	2.36	2.072	6.95	2.05	2.101	4.14	1.71	2.063	4.23		2.067	3.02	1.57	2.002	3.82	1.51
2.090	5.11		2.135	5.41	1.79	2.085	4.43	1.80	2.050	4.27		2.044	3.17	1.90	1.987	4.23	1.47
			2.169	4.28	1.72	2.063	4.77	1.98	2.025	4.28		2.018	3.37	2.23	1.968	5.13	1.08
			2.228	2.97	.77	2.052	4.93	2.08	2.007	4.29		2.005	3.60	2.27			
			2.261	2.32	.26	2.024	5.25	2.37	1.993	4.29		1.981	3.90	2.47			
						2.017	5.49	2.28				1.963	4.25	2.50			

TABLE 3

BLADE SECTION ANGLE OF ATTACK

NACA 10-(3)(049)-03 PROPELLER - Concluded

(o) $x = 0.975$; $\beta_{0.75R} = 45^{\circ}$; $B = 1$

1500 rpm			1600 rpm			M = 0.56			M = 0.58			M = 0.60			M = 0.65		
J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x
2.334	1.51	-1.12	2.345	1.90	-2.48	2.371	0.07	-1.03	2.344	0.31	-1.38	2.304	-0.22	-0.85	2.258	1.59	-2.47
2.244	2.85	-.02	2.323	2.37	-1.99	2.347	.34	-.42	2.328	.59	-1.16	2.291	.05	-.06	2.240	1.64	-1.97
2.081	7.03		2.286	2.87	-1.21	2.317	.62	.14	2.309	.88	-.83	2.265	.43	.43	2.209	1.69	-1.15
2.029	8.71		2.252	3.38	-.54	2.293	1.00	.30	2.267	1.43	-.07	2.244	.76	.48	2.192	1.77	-.82
1.976	9.45		2.216	4.23	-.12	2.260	1.39	.57	2.242	2.17	-.20	2.211	1.24	.58	2.167	1.83	-.31
2.010	8.83		2.188	5.16	.04	2.238	1.82	.59	2.220	2.43	.08	2.190	1.56	.64	2.153	1.93	-.10
2.058	7.82		2.162	6.26	-.07	2.213	2.26	.69	2.191	2.91	.32	2.162	1.93	.75	2.128	2.06	.31
2.127	5.48	1.34	2.135	7.05	.08	2.179	2.70	1.06	2.166	3.42	.56	2.135	2.10	1.08	2.114	2.16	.52
2.185	4.25	.43	2.107	7.70	.31	2.157	3.26	1.06	2.141	3.70	1.12	2.122	2.30	1.13	2.093	2.29	.82
2.285	2.18	-.48	2.079	8.17	.59	2.132	3.78	1.18	2.108	4.17	2.00	2.083	2.90	1.28	2.075	2.42	1.07
			2.048	8.48	1.05	2.110	4.06	1.47	2.096	4.29		2.058	3.12	1.55	2.053	2.63	1.35
			2.012	8.71		2.087	4.52	1.57	2.056	4.39		2.038	3.31	1.77	2.027	2.81	1.79
			1.980	8.87		2.062	5.12	1.55	2.039	4.38		2.018	3.82	1.66	2.011	3.57	1.41
			1.960	8.94		2.045	5.50	1.55	2.022	4.37		1.995	4.18	1.77	1.994	4.13	1.30
			1.930	8.95		2.018	6.40	1.22	1.998	4.34							
						1.989	7.15	1.07									
						1.982	7.37	.79									

TABLE 4

BLADE SECTION ANGLE OF ATTACK

NACA 10-(3)(090)-03 PROPELLER

(a) $x = 0.30$; $\beta_{0.75R} = 45^{\circ}$; $B = 2$

1140 rpm			1350 rpm			1500 rpm			1600 rpm			M = 0.56			M = 0.60			M = 0.64		
J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x
2.554	-0.33	-0.62	2.533	-0.16	-0.63	1.653			2.465	-0.33	0.06	2.508	-0.32	-0.28	2.426	0.01	0.01	2.374	-0.74	1.20
2.369	-.51	1.00	2.389	-.25	.58	1.786	-0.90	7.52	2.419	-.65	.73	2.462	-.36	.12	2.397	.02	.24	2.344	-.73	1.45
2.207	-.77	2.69	2.266	-.75	2.13	1.899	-1.39	6.58	2.364	-.87	1.42	2.414	-.40	.50	2.361	.04	.52	2.319	-.66	1.55
2.034	-1.19	4.85	2.076	-1.07	4.29	2.029	-1.43	5.15	2.310	-.85	1.85	2.368	-.55	1.06	2.312	.05	.93	2.286	-.58	1.80
1.879	-1.53	6.97	1.940	-1.57	6.28	2.145	-.70	3.22	2.244	-.65	2.24	2.325	-.60	1.44	2.268	.05	1.32	2.255	-.50	2.00
1.721	-.56	8.06	1.791	-1.26	7.82	2.282	-.35	1.61	2.192	-.76	2.84	2.279	-.64	1.89	2.225	-.01	1.78	2.231	-.42	2.14
1.555	-.23	10.25	1.657	-.94	9.38	2.395	-.28	.56	2.135	-1.05	3.68	2.231	-.62	2.34	2.200	-.05	2.05	2.199	-.34	2.36
1.401			1.492	-.65	11.74	2.514			2.070	-1.54	4.83	2.179	-.56	2.77	2.150	-.07	2.55	2.172	-.26	2.55
1.350			1.415	-.49	12.97	2.454	-.22	.03	2.017	-1.84	5.70	2.138	-.61	3.22	2.116	-.07	2.90	2.142	-.23	2.82
1.476	-.28	11.64	1.565	-.78	10.65	2.352	-.25	.89	1.952	-1.83	6.41	2.097	-.69	3.71	2.081	-.06	3.25	2.125	-.21	2.94
1.624	-.30	9.23	1.715	-1.05	8.65	2.218	-.49	2.31	1.902	-1.75	6.92	2.058	-.76	4.18	2.048	-.05	3.58	2.095	-.14	3.18
1.791	-1.10	7.65	1.863	-1.42	7.06	2.094	-.99	4.02	1.846	-1.64	7.50	2.017	-.86	4.68	2.020	-.03	3.86	2.069	-.05	3.38
1.942	-1.95	6.64	1.998	-1.57	5.63	1.968	-1.47	5.84				1.977	-.95	5.27	1.984	-.01	4.24	2.042	-.06	3.68
2.122	-.80	3.55	2.159	-.55	2.93	1.849	-1.18	6.99				1.951	-1.00	5.61				2.020	-.05	3.89
2.278	-.63	1.91	2.309	-.40	1.40	1.736	-.39	7.69										1.999	-.04	4.08
2.461	-.43	.19	2.471	-.23	-.09													1.984	-.03	4.27

(b) $x = 0.45$; $\beta_{0.75R} = 45^{\circ}$; $B = 2$

1140 rpm			1350 rpm			1500 rpm			1600 rpm			M = 0.56			M = 0.60			M = 0.63		
J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x
2.606	-0.41	-1.81	2.558	-0.50	-1.25	2.535	-0.55	-0.99	2.492	-0.85	-0.22	1.947	-0.05	5.46	1.961	-0.20	5.40	1.973	0.24	4.79
2.446	-.09	-.57	2.408	-.26	0	2.402	-.46	.25	2.423	-.67	.29	1.965	-.07	5.22	1.985	-.20	5.06	1.992	.24	4.53
2.261	.38	.95	2.268	0	1.27	2.221	-.05	1.85	2.342	-.54	1.03	1.988	-.10	4.94	2.017	-.20	4.61	2.056	.24	3.66
2.072	.75	2.88	2.097	.42	2.91	2.087	.61	2.83	2.280	-.37	1.54	2.021	-.12	4.50	2.042	-.20	4.27	2.089	.23	3.24
1.919	1.01	4.69	1.951	.78	4.50	1.963	.80	4.30	2.173	-.05	2.48	2.055	-.15	4.09	2.073	-.20	3.88	2.109	.21	3.00
1.750	.40	7.86	1.817	.99	6.25	1.854	.76	5.92	2.088	.30	3.19	2.083	-.18	3.74	2.106	-.20	3.44	2.146	.20	2.56
1.585	.29	10.78	1.676	1.05	8.46	1.731	1.01	7.58	2.028	.46	3.81	2.112	-.22	3.41	2.131	-.21	3.14	2.161	.14	2.42
1.386	2.26	12.65	1.420	2.17	12.08	1.599			1.941	.63	4.84	2.142	-.24	3.05	2.158	-.23	2.80	2.188	.10	2.14
1.482	1.21	11.78	1.564	1.43	10.05	1.662	1.67	8.07	1.772	.79	7.20	2.175	-.27	2.67	2.192	-.25	2.40	2.213	.04	1.89
1.675	-.09	9.58	1.759	1.01	7.14	1.792	.72	6.90	1.837	.74	6.25	2.200	-.29	2.38	2.223	-.27	2.04	2.248	-.06	1.58
1.833	.83	6.14	1.891	.93	5.20	1.906	.80	5.11	1.959	.60	4.62	2.245	-.34	1.90	2.264	-.50	1.79	2.275	-.16	1.38
1.982	.92	3.90	2.011	.62	3.83	1.958	.81	4.36	2.048	.42	3.59	2.279	-.36	1.52	2.294	-.59	1.54	2.308	-.34	1.18
2.157	.61	1.95	2.181	.21	2.08	2.012	.76	3.67	2.136	.11	2.77	2.304	-.40	1.27	2.328	-.68	1.24	2.336	-.55	1.07
2.354	.16	.14	2.344	-.15	.57	2.143	.37	2.37	2.223	-.19	2.02	2.338	-.44	.94	2.358	-.68	.91	2.376	-.84	.93
2.500	-.24	-.97	2.484	-.40	-.64	2.311	-.27	1.04	2.300	-.47	1.42	2.388	-.56	.51	2.390	-.58	.46			
						2.478	-.52	-.46	2.374	-.60	.73	2.416	-.70	.35	2.434	-.47	-.12			
									2.470	-.76	-.10	2.460	-.74	-.07						
												2.504	-.75	-.50						

TABLE 4

BLADE SECTION ANGLE OF ATTACK

NACA 10-(3)(090)-03 PROPELLER - Continued

(c) $x = 0.60$; $\beta_{0.75R} = 45^{\circ}$; $B = 2$

1140 rpm			1350 rpm			1500 rpm			1600 rpm			M = 0.56			M = 0.60			M = 0.63		
J	α_{1T}	α_x	J	α_{1T}	α_x	J	α_{1T}	α_x	J	α_{1T}	α_x	J	α_{1T}	α_x	J	α_{1T}	α_x	J	α_{1T}	α_x
1.540	3.48	8.86	2.551			1.663	1.61	8.60	1.840	1.88	5.49	1.972	2.60	2.77	2.465	-0.03	-1.18	1.981	-0.03	5.18
1.671	3.08	6.92	2.423			1.757	2.10	6.51	1.922	1.70	4.40	1.986	2.47	2.69	2.439	.04	-.93	1.998	-.03	4.92
1.779	2.32	5.88	2.271	0.82	0.37	1.899	1.81	4.53	1.980	1.56	3.65	2.022	2.22	2.41	2.406	.15	-.63	2.033	-.04	4.42
1.894	1.77	4.62	2.142	1.17	1.72	1.985	1.58	3.47	2.058	1.44	2.63	2.053	2.01	2.17	2.366	.50	-.50	2.053	-.02	4.10
1.972	1.51	3.71	2.025	1.41	3.10	2.121	1.24	1.89	2.137	1.21	1.74	2.091	1.74	1.89	2.333	.62	-.19	2.079	0	3.71
2.074	1.22	2.54	1.905	1.70	4.59	2.259	.90	.42	2.231	.93	.77	2.125	1.63	1.53	2.302	.80	.02	2.107	.08	3.24
2.191	.94	1.25	1.792	2.09	5.98	2.393	.45	-.78	2.301	.73	.08	2.165	1.41	1.21	2.274	.93	.24	2.132	.14	2.82
2.318	.65	-.08	1.652	2.58	7.84	2.523			2.371	.55	-.62	2.205	1.25	.82	2.234	1.11	.58	2.157	.19	2.43
2.443	.45	-1.38	1.427	3.83	10.72	2.455	.25	-1.31	2.494	.30	-1.82	2.241	1.11	.49	2.204	1.15	.95	2.188	.36	1.85
2.569	.15	-2.49	1.525	3.07	9.63	2.334	.61	-.23	2.422	.43	-1.11	2.284	.94	.10	2.168	1.22	1.35	2.210	.50	1.41
2.510	.34	-2.02	1.710	2.41	7.02	2.192	1.04	1.14	2.350	.63	-.44	2.326	.85	-.34	2.142	1.27	1.65	2.242	.73	.77
2.412	.50	-1.06	1.850	1.86	5.29	2.069	1.38	2.47	2.273	.80	.96	2.371	.75	-.79	2.116	1.31	1.96	2.272	.87	.25
2.379	.55	-.72	1.948	1.57	4.07	1.951	1.66	3.89	2.196	1.03	1.13	2.410	.64	-1.16	2.092	1.33	2.27	2.306	1.06	-.37
2.270	.78	.39	2.095	1.31	2.21	1.834	1.95	5.41	2.105	1.30	2.10	2.476	.46	-1.76	2.062	1.35	2.67	2.332	1.09	-.71
2.138	.93	1.95	2.211	1.04	.92	1.701	2.18	7.38	2.041	1.42	2.89	2.517	.26	-2.03	2.050	1.35	2.85	2.362	1.04	-1.02
2.019	1.26	3.18	2.362	.61	-.55				1.962	1.59	3.90				2.010	1.36	3.40	2.391	.90	-1.23
1.901	1.78	4.50	2.498	.64	-2.17				1.892	1.75	4.80				1.998	1.36	3.57			
1.768	2.46	5.92													1.965	1.36	4.05			
1.654	3.18	7.12																		

(d) $x = 0.70$; $\beta_{0.75R} = 45^{\circ}$; $B = 2$

1140 rpm			1350 rpm			1500 rpm			1600 rpm			M = 0.56			M = 0.60			M = 0.64		
J	α_{1T}	α_x	J	α_{1T}	α_x	J	α_{1T}	α_x	J	α_{1T}	α_x	J	α_{1T}	α_x	J	α_{1T}	α_x	J	α_{1T}	α_x
1.373			1.488	2.25	11.13	1.643			2.454	0.26	-1.43	2.518	0.11	-2.01	2.453	0.90	-2.03	1.997	1.27	3.68
1.520			1.624	2.65	8.28	1.762	2.45	6.16	2.357	.58	-.49	2.464	.27	-1.51	2.414	.95	-1.59	2.017	1.04	3.60
1.658	2.36	7.91	1.753	2.49	6.29	1.890	2.23	4.35	2.295	.84	.03	2.406	.59	-1.11	2.363	.98	-.96	2.038	.80	3.53
1.812	2.15	5.69	1.893	2.14	4.43	2.019	1.83	2.82	2.211	1.20	.80	2.366	.70	-.72	2.326	1.00	-.50	2.058	.53	3.50
1.973	1.91	3.37	2.014	1.75	3.01	2.105	1.55	1.87	2.137	1.46	1.57	2.327	.90	-.53	2.290	1.02	-.04	2.075	.45	3.33
2.127	1.55	1.54	2.144	1.35	1.56	2.237	1.13	.49	2.062	1.73	2.39	2.283	1.08	-.04	2.251	1.02	.47	2.097	.30	3.16
2.277	1.03	.05	2.285	.85	.16	2.343	.75	-.51	1.971	1.97	3.53	2.236	1.28	.38	2.212	1.00	1.02	2.114	.13	3.09
2.423	.46	-1.20	2.417	.53	-1.18	2.474	.32	-1.70	1.887	2.35	4.45	2.196	1.47	.73	2.173	.98	1.56	2.138	-.06	2.95
2.553	.03	-2.31	2.522	.36	-2.27	2.533	.12	-2.21	1.916	2.21	4.14	2.161	1.61	1.07	2.140	.97	2.03	2.154	-.15	2.81
2.495	.20	-1.80	2.472	.45	-1.77	2.418	.50	-1.19	2.010	1.87	3.03	2.128	1.77	1.38	2.106	.93	2.54	2.178	-.18	2.52
2.362	.69	-.69	2.352	.58	-.42	2.283	.92	.11	2.103	1.62	1.90	2.083	1.98	1.99	2.080	.86	2.97	2.201	-.17	2.19
2.210	1.27	.70	2.225	1.10	.71	2.175	1.34	1.12	2.174	1.35	1.16	2.055	2.09	2.11	2.049	.77	3.49	2.223	-.14	1.87
2.057	1.76	2.31	2.089	1.53	2.14	2.065	1.66	2.32	2.258	1.00	.36	2.019	2.22	2.51	2.020	.63	4.05	2.242	-.09	1.56
1.908	1.98	4.29	1.959	1.92	3.65	1.966	1.98	3.43	2.336	.71	-.38	1.987	2.34	2.87	1.983	.40	4.82	2.267	-.04	1.18
1.750	2.32	6.42	1.834	2.25	5.23	1.837	2.36	5.05	2.393	.50	-.90	1.958	2.45	3.19				2.290	.12	.72
1.605	2.00	9.18	1.695	2.62	7.12	1.694												2.313	.18	.36
1.447			1.560	2.75	9.29													2.332	.23	.10
																		2.360	.23	-.27
																		2.378	.22	-.49

NACA

TABLE 4

BLADE SECTION ANGLE OF ATTACK

NACA 10-(3)(090)-03 PROPELLER - Continued

(e) $x = 0.78$; $\beta_{0.75R} = 45^{\circ}$; $B = 2$

1140 rpm			1350 rpm			1500 rpm			1600 rpm			M = 0.56			M = 0.60			M = 0.65		
J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x
1.405			1.497	2.61	10.31	1.716	3.08	6.22	1.871	2.89	4.16	1.954	0.82	4.85	2.464	0.29	-1.67	2.382	-0.82	0.40
1.553			1.628	2.85	7.86	1.829	2.62	4.87	1.958	2.41	3.29	1.985	.87	4.33	2.430	.10	-1.04	2.343	-.34	.42
1.707	2.50	6.76	1.766	2.74	5.74	1.968	2.13	3.25	2.030	2.13	2.48	2.015	.91	3.85	2.386	-.24	-.13	2.312	-.03	.51
1.870	2.27	4.45	1.897	2.26	4.19	2.092	1.70	1.89	2.113	1.85	1.53	2.066	.94	3.06	2.347	-.30	.45	2.285	.14	.69
2.031	1.76	2.61	2.031	1.77	2.71	2.214	1.29	.61	2.202	1.42	.69	2.090	.98	2.67	2.306	-.25	.94	2.272	.30	.70
2.172	1.28	1.14	2.168	1.33	1.22	2.326	.82	-.41	2.290	1.07	-.18	2.128	1.00	2.11	2.232	-.05	1.74	2.234	.49	1.03
2.336	.73	-.45	2.305	.82	-.10	2.451	.51	-1.70	2.366	.55	-.68	2.177	1.00	1.43	2.182	.16	2.21	2.198	.68	1.32
2.481	.30	-1.81	2.445	.40	-1.46	2.513	.26	-2.20	2.456	-.11	-1.20	2.210	.99	.97	2.151	.29	2.50	2.171	.88	1.48
2.584	.01	-2.73	2.532	.06	-2.16	2.476	.38	-1.87	2.405	.25	-.89	2.263	.94	.31	2.121	.45	2.76	2.141	1.05	1.74
2.542	.11	-2.34	2.490	.21	-1.82	2.389	.65	-1.05	2.332	.82	-.49	2.307	.85	-.19	2.080	.69	3.09	2.114	1.16	2.01
2.417	.49	-1.22	2.370	.61	-.74	2.264	1.06	.17	2.253	1.24	.18	2.349	.76	-.65	2.051	.87	3.32	2.091	1.34	2.16
2.250	1.00	.39	2.241	1.07	.49	2.137	1.54	1.42	2.167	1.59	1.01	2.387	.60	-.97	2.012	1.15	3.59	2.060	1.48	2.47
2.103	1.51	1.84	2.112	1.53	1.79	2.033	1.90	2.53	2.080	1.90	1.97	2.446	.32	-1.44	1.981	1.42	3.77	2.035	1.62	2.69
1.942	1.99	3.66	1.971	1.95	3.40	1.910	2.37	3.89	2.017	2.15	2.66	2.504	.11	-1.95	2.301	-.25	1.01	2.022	1.73	2.78
1.778	2.51	5.75	1.830	2.45	5.03	1.801	2.73	5.21	1.920	2.57	3.72							1.987	1.87	3.17
1.611			1.693	2.87	6.78															
1.458																				

(f) $x = 0.85$; $\beta_{0.75R} = 45^{\circ}$; $B = 2$

1140 rpm			1350 rpm			1500 rpm			1600 rpm			M = 0.56			M = 0.60			M = 0.64		
J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x
1.368			1.468	2.83	10.24	2.561	0.19	-2.87	1.791	3.35	4.77	2.534	0.04	-2.36	1.958	2.19	3.19	2.386	-0.54	-0.08
1.512			1.600	3.33	7.58	2.455	.61	-1.97	1.869	2.96	3.99	2.482	.16	-1.85	1.977	2.03	3.06	2.357	-.07	-.18
1.660	2.85	6.86	1.744	3.22	5.42	2.312	1.05	-.57	1.961	2.55	3.01	2.440	.34	-1.50	2.019	1.62	2.87	2.323	.30	-.11
1.798	2.64	4.95	1.880	2.49	4.07	2.197	1.50	.54	2.062	2.17	1.89	2.397	.50	-1.10	2.045	1.40	2.71	2.308	.48	-.10
1.982	2.01	2.88	2.013	1.99	2.64	2.083	1.83	1.81	2.141	1.91	1.00	2.364	.65	-.83	2.073	1.28	2.44	2.270	.66	.23
2.132	1.52	1.30	2.142	1.50	1.31	1.957	2.30	3.16	2.248	1.60	-.22	2.328	.74	-.45	2.095	1.05	2.36	2.231	.88	.53
2.234	1.14	.31	2.276	.97	.03	1.850	2.85	4.21	2.326	1.16	-.86	2.286	.80	.05	2.129	.81	2.12	2.208	1.05	.67
2.373	.74	-1.06	2.410	.32	-1.05	1.709	3.55	5.69	2.412	.59	-1.46	2.254	.82	.45	2.146	.57	2.13	2.186	1.19	.83
2.538	.22	-2.52	2.543	.04	-2.41	1.779	3.20	4.95	2.519	-.25	-2.02	2.222	.83	.89	2.198	.23	1.75	2.157	1.30	1.13
2.625	-.01	-3.29	2.488	.17	-1.86	1.904	2.64	3.60	2.464	.08	-1.64	2.184	.84	1.39	2.240	-.05	1.48	2.131	1.43	1.19
2.468	.40	-1.86	2.364	.74	-.89	2.009	2.11	2.59	2.361	.87	-1.05	2.151	.84	1.85	2.257	-.15	1.33	2.098	1.53	1.73
2.312	.89	-.44	2.208	1.26	.64	2.140	1.70	1.13	2.280	1.37	-.44	2.124	.84	2.23	2.290	-.27	1.01	2.079	1.63	1.91
2.183	1.32	.81	2.087	1.71	1.86	2.254	1.35	-.09	2.195	1.75	.38	2.092	.83	2.70	2.336	-.24	.38	2.049	1.77	2.20
2.079	1.68	1.86	1.953	2.17	3.32	2.382	.85	-1.27	2.095	2.04	1.54	2.066	.82	3.08	2.363	-.10	-.12	2.031	1.88	2.35
1.900	2.23	3.85	1.809	2.82	4.82	2.507	.41	-2.42	2.023	2.35	2.28	2.030	.80	3.62	2.403	.04	-.78	2.002	1.95	2.72
1.765	2.80	5.30	1.676	3.35	6.36				1.931	2.70	3.31	2.007	.79	3.96	2.436	.15	-1.32	1.983	2.08	2.87
1.607			1.536	2.90	9.05				1.827	3.17	4.41	1.982	.74	4.39	2.460	.24	-1.72			
1.440												1.954	.68	4.86						
												1.951	.66	4.93						

TABLE 4

BLADE SECTION ANGLE OF ATTACK

NACA 10-(3)(090)-03 PROPELLER - Continued

(g) $x = 0.90$; $\beta_{0.75R} = 45^{\circ}$; $B = 2$

1140 rpm			1350 rpm			1500 rpm			1600 rpm			M = 0.56			M = 0.60			M = 0.65		
J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x
2.552	0.11	-2.63	2.575	-0.03	-2.80	2.555	0.05	-2.74	1.842	3.47	3.76	1.966	2.01	3.28	1.998	2.36	2.32	2.002	2.12	2.46
2.485	.32	-2.05	2.501	.34	-2.26	2.510	.28	-2.41	1.913	3.12	3.06	1.992	1.84	3.06	2.023	2.32	2.00	2.035	2.03	2.07
2.406	.61	-1.39	2.445	.60	-1.83	2.449	.51	-1.87	1.990	2.71	2.34	2.024	1.57	2.86	2.054	2.10	1.76	2.066	1.92	1.72
2.332	.85	-.71	2.381	.86	-1.29	2.410	.67	-1.52	2.075	2.25	1.56	2.048	1.40	2.69	2.080	2.00	1.49	2.092	1.75	1.52
2.248	1.22	-.03	2.312	1.05	-.59	2.364	.92	-1.18	2.157	1.88	.75	2.076	1.24	2.45	2.111	1.82	1.23	2.118	1.39	1.51
2.179	1.51	.58	2.246	1.36	-.02	2.318	1.11	-.77	2.244	1.41	-.02	2.107	1.15	2.10	2.131	1.61	1.17	2.129	1.52	1.22
2.072	1.87	1.65	2.181	1.57	.63	2.256	1.30	-.02	2.310	1.00	-.54	2.138	1.08	1.73	2.165	1.37	.94	2.161	1.42	.88
2.000	2.22	2.30	2.111	1.86	1.30	2.210	1.51	.30	2.396	.45	-1.17	2.173	1.00	1.33	2.208	1.12	.60	2.195	1.29	.54
1.926	2.50	3.06	2.033	2.22	2.03	2.153	1.82	.77	2.277	1.20	-.28	2.193	.96	1.09	2.229	.81	.63	2.223	1.16	.29
1.848	2.83	3.85	1.970	2.42	2.73	2.112	1.94	1.23	2.207	1.57	.34	2.238	.84	.59	2.267	.46	.47	2.244	1.01	.16
1.774	3.18	4.59	1.894	2.75	3.47	2.041	2.26	1.92	2.117	2.06	1.15	2.267	.80	.24	2.293	.20	.39	2.274	.90	-.13
1.685	3.46	5.66	1.834	3.27	3.87	1.988	2.58	2.36	2.039	2.35	1.98	2.293	.75	-.05	2.325	.17	-.01	2.309	.71	-.40
1.616	3.46	6.72	1.759	3.97	4.29	1.930	2.85	2.94	1.941	2.88	2.90	2.326	.66	-.40	2.369	.24	-.65	2.341	.50	-.59
1.543	3.61	7.72	1.696	4.28	4.94	1.883	3.18	3.31	1.890	3.17	3.35	2.379	.55	-.99	2.403	.32	-1.17	2.363	.33	-.71
1.461	3.56	9.09	1.618	4.45	5.98	1.822	3.50	3.90				2.417	.45	-1.37	2.440	.35	-1.72	2.392		
			1.552	4.30	7.16	1.760	3.82	4.52				2.450	.31	-1.66						
			1.511	4.01	8.10	1.715	4.24	4.78				2.479	.20	-1.91						
												2.536	-.01	-2.41						

(h) $x = 0.95$; $\beta_{0.75R} = 45^{\circ}$; $B = 2$

2.578	0.18	-2.79	2.554	-0.25	-2.12	2.529	0.04	-2.23	1.913	4.27	2.06	1.967	2.80	2.65	2.536	-0.13	-2.19	2.014	2.44	2.12
2.550	.31	-2.01	2.503	.17	-1.92	2.485	.20	-1.82	2.002	3.67	1.37	2.000	2.59	2.38	2.481	-.07	-1.58	2.043	2.31	1.84
2.422	.61	-1.39	2.440	.55	-1.51	2.437	.50	-1.49	2.076	2.78	1.21	2.037	2.35	2.09	2.445	.12	-1.34	2.074	2.08	1.62
2.346	.91	-.77	2.376	.85	-1.00	2.375	.80	-.99	2.140	2.12	.95	2.073	2.06	1.87	2.399	.19	-.82	2.113	1.92	1.23
2.257	1.26	0	2.322	1.07	-.52	2.316	1.16	-.57	2.226	1.50	.35	2.098	1.80	1.77	2.357	.35	-.45	2.132	1.77	1.12
2.184	1.60	.59	2.253	1.37	.07	2.252	1.53	-.10	2.329	.85	-.45	2.129	1.66	1.48	2.309	.56	-.04	2.156	1.65	.91
2.107	2.04	1.17	2.205	1.69	.39	2.180	1.98	.43	2.395	.50	-1.01	2.161	1.52	1.17	2.274	.92	.06	2.179	1.49	.75
2.019	2.61	1.78	2.126	2.03	1.12	2.134	2.24	.79	2.470	.03	-1.55	2.188	1.43	.89	2.236	1.29	.19	2.213	1.36	.40
1.950	3.09	2.26	2.052	2.50	1.66	2.072	2.54	1.38	2.501	-.34	-1.58	2.234	1.23	.46	2.187	1.68	.47	2.243	1.23	.11
1.868	3.75	2.75	1.988	2.88	2.17	2.022	2.82	1.80	2.453	.02	-1.31	2.253	1.13	.31	2.159	2.00	.54	2.270	1.15	-.18
1.776	4.26	3.56	1.930	3.30	2.58	1.960	3.33	2.19	2.365	.56	-.66	2.309	.95	-.26	2.119	2.38	.72	2.302	.92	-.38
1.709	4.55	4.25	1.858	3.73	3.19	1.896	3.95	2.50	2.268	1.09	.17	2.346	.77	-.56	2.091	2.80	.69	2.333	.74	-.61
1.639	4.87	4.98	1.804	4.37	3.33	1.840	4.45	2.83	2.195	1.62	.68	2.384	.66	-.95	2.056	3.02	.97	2.356	.58	-.77
1.570	5.03	5.87	1.733	5.38	3.37	1.762	5.15	3.27	2.113	2.37	1.08	2.416	.45	-1.12	2.019	3.34	1.18	2.383	.31	-.87
1.488	5.13	7.04	1.657	5.87	4.00				2.006	3.47	1.51	2.460	.19	-1.45	1.993	3.44	1.46			
1.396	5.32	8.30	1.604	6.15	4.52				1.973	3.95	1.51	2.494	.09	-1.78						
1.338			1.541	6.07	5.37							2.536	-.06	-2.15						
			1.475	6.00	6.65							2.550	-.08	-2.30						

NACA

TABLE 4

BLADE SECTION ANGLE OF ATTACK

NACA 10-(3)(090)-03 PROPELLER - Concluded

(i) $x = 0.975$; $\beta_{0.75R} = 45^{\circ}$; $B = 2$

1140 rpm			1350 rpm			1500 rpm			1600 rpm			M = 0.56			M = 0.60			M = 0.64		
J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x
1.352	7.86	6.36	1.475	9.34	3.22	1.683			1.922	5.21	0.98	1.968	3.65	1.80	2.004	4.31	0.44	1.989	2.99	1.94
1.454	7.54	5.07	1.586	8.35	2.54	1.740	6.33	2.43	2.046	3.95	.47	1.998	3.46	1.55	2.043	4.20	-.01	2.024	2.90	1.53
1.617	6.80	3.32	1.685	7.10	2.31	1.811	5.77	1.94	2.125	2.97	.34	2.046	3.18	1.15	2.063	3.93	-.03	2.043	2.72	1.44
1.778	5.79	1.98	1.779	6.06	1.98	1.899	4.85	1.56	2.190	2.21	.18	2.065	2.86	1.20	2.092	3.72	-.23	2.074	2.54	1.19
1.922	4.36	1.37	1.877	5.09	1.54	1.960	4.18	1.35	2.291	1.32	-.34	2.093	2.58	1.09	2.126	3.23	-.21	2.098	2.34	1.05
2.077	2.80	.82	2.000	3.58	1.31	2.044	3.62	.72	2.368	.57	-.67	2.135	2.29	.79	2.151	3.01	-.34	2.128	2.20	.77
2.236	1.54	.02	2.129	2.57	.55	2.150	2.64	.21	2.458	-.20	-1.10	2.155	1.98	.82	2.177	2.85	-.54	2.148	2.02	.67
2.404	.60	-1.12	2.582	-.02	-2.63	2.275	1.66	-.49	2.469			2.189	1.66	.68	2.201	2.61	-.62	2.177	1.88	.41
2.553	.08	-2.34	2.534	.17	-2.24	2.380	1.00	-1.22	2.427	.07	-.96	2.228	1.35	.46	2.235	2.33	-.80	2.206	1.76	.13
2.620	-.21	-2.82	2.478	.49	-1.87	2.502	.42	-2.22	2.344	.76	-.52	2.266	1.21	.09	2.271	1.91	-.85	2.235	1.56	-.08
2.481	.31	-1.74	2.407	.76	-1.26	2.622			2.262	1.60	-.22	2.298	1.13	-.26	2.299	1.53	-.84	2.263	1.40	-.30
2.326	.93	-.50	2.350	1.02	-.81	2.573	-.06	-2.64	2.168	2.53	.17	2.342	.95	-.65	2.335	1.24	-1.02	2.296	1.22	-.56
2.171	1.99	.39	2.283	1.41	-.32	2.458	.71	-1.95	2.108	3.16	.38	2.377	.89	-1.05	2.363	.90	-1.04	2.326	1.02	-.78
1.999	3.55	1.12	2.221	1.92	-.03	2.325	1.30	-.80	2.010	4.25	.69	2.437	.73	-1.66	2.410	.56	-1.29	2.359	.85	-1.06
1.871	4.83	1.61	2.153	2.42	.38	2.213	2.06	-.07	1.956	4.78	.92	2.488	.50	-2.08	2.439	.27	-1.36	2.387	.58	-1.17
1.686	6.30	2.80	2.076	2.85	.99	2.106	2.96	.50				2.537	.26	-2.44	2.481	-.09	-1.50	2.428	.25	-1.38
1.533	7.22	4.16	2.011	3.33	1.41	2.012	3.70	1.09				2.574	.10	-2.74	2.536	-.55	-1.72			
1.403	7.63	5.77	1.933	4.15	1.69	1.873	5.10	1.69												
			1.845	5.27	1.81	1.784	5.88	2.22												
			1.751	6.32	2.12															
			1.648	7.47	2.49															
			1.550	8.31	3.12															

(j) $x = 0.85$; $\beta_{0.75R} = 45^{\circ}$; $B = 1$

1500 rpm			M = 0.57			M = 0.59			M = 0.61			M = 0.65		
J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x
2.053	1.61	2.45	2.456	0.23	-1.58	2.479	-0.15	-1.49	2.360	-0.71	0.53	2.224	0.84	0.67
2.003	1.87	2.92	2.349	.23	-.22	2.403	-.04	-.64	2.295	-.50	1.18	2.212	.88	.73
1.935	2.29	3.49	2.286	.33	.52	2.333	.10	.13	2.234	-.05	1.54	2.189	.93	1.06
1.890	2.61	3.84	2.239	.44	1.04	2.275	.25	.74	2.177	.31	1.96	2.171	1.01	1.22
1.850	2.81	4.26	2.190	.56	1.59	2.202	.57	1.42	2.148	.50	2.17	2.148	1.18	1.38
1.786	3.13	4.91	2.159	.66	1.92	2.143	.96	1.84	2.132	.71	2.19	2.121	1.31	1.63
1.728	3.27	5.67	2.136	.76	2.14	2.075	1.35	2.42	2.108	.87	2.36	2.106	1.40	1.75
1.691	3.31	6.22	2.106	.87	2.46	2.061	1.53	2.44	2.089	1.03	2.46	2.087	1.51	1.91
1.627	3.21	7.33	2.081	.93	2.75	2.037	1.70	2.61	2.062	1.22	2.66	2.066	1.64	2.08
1.680	3.26	6.44	2.063	.94	3.00	2.002	1.83	3.00	2.037	1.39	2.84	2.047	1.74	2.26
			2.042	.98	3.26	1.978	1.94	3.24	2.018	1.60	2.91	2.030	1.81	2.44
			2.017	1.07	3.54	1.960	2.00	3.45	1.998	1.83	2.97	2.000	1.96	2.74
			2.000	1.20	3.66	1.946	2.08	3.58	1.974	1.92	3.23	1.979	2.11	2.91
			1.978	1.36	3.82	1.929	2.13	3.79	1.952	2.07	3.39			
			1.958	1.46	4.02	1.906	2.21	4.06	1.936	2.10	3.60			
			1.938	1.66	4.13				1.921	2.15	3.77			
			1.921	1.84	4.20									
			1.900	1.93	4.43									

NACA

TABLE 5

BLADE SECTION ANGLE OF ATTACK

NACA 10-(5)(066)-03 PROPELLER

(a) $x = 0.30$; $\beta_{0.75R} = 45^{\circ}$; $B = 2$

1140 rpm			1350 rpm			1500 rpm			1600 rpm			M = 0.56			M = 0.58			M = 0.60			M = 0.65		
J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x
1.661	0.82	7.45	1.801			1.962			2.134	0	2.54	2.111	-0.42	3.20	2.106	-0.43	3.29	2.108	0.92	1.93	2.077	-0.02	3.19
1.811	.02	6.17	1.925	0.77	4.04	2.048	-0.33	3.75	2.224	-.42	2.10	2.138	-.57	3.11	2.140	-.47	2.99	2.142	.74	1.77	2.101	-.08	3.00
1.949	-.18	4.69	2.061	.06	3.22	2.132	-.30	2.87	2.303	-.74	1.71	2.180	-.70	2.84	2.172	-.52	2.72	2.180	.62	1.50	2.130	-.26	2.88
2.095	.19	2.73	2.188	-.37	2.38	2.238	-.28	1.81	2.395	-.78	.97	2.218	-.79	2.61	2.212	-.55	2.37	2.224	.58	1.12	2.151	-.39	2.80
2.236	.46	1.09	2.372	-.23	.60	2.322	-.30	1.09	2.474			2.259	-.82	2.22	2.253	-.58	2.01	2.226	.64	.70	2.184	-.52	2.60
2.432	0	-.12	2.522			2.412	-.36	.39	2.554			2.314	-.83	1.73	2.288	-.59	1.71	2.296	.79	.24	2.208	-.65	2.50
2.614			2.657			2.501	-.47	-.19	2.611			2.358	-.80	1.31	2.327	-.58	1.36	2.234	.92	-.32	2.239	-.76	2.32
2.715			2.576			2.599	-.66	-.72	2.585			2.393	-.78	.96	2.371	-.57	.97	2.380	.92	-.62	2.261	-.80	2.15
2.658			2.431	.14	-.25	2.543	-.54	-.44	2.510			2.442	-.73	.49	2.416	-.49	.52	2.426	.84	-.91	2.293	-.75	1.79
2.554	-.30	-.74	2.271	-.40	1.64	2.467	-.43	.03	2.436	-.61	.46	2.485	-.69	.08	2.462	-.30	-.04	2.473	.71	-1.15	2.319	-.66	1.48
2.361	.25	.21	2.125	-.20	2.83	2.361	-.32	.78	2.350	-.79	1.35	2.540	-.63	-.31	2.525	-.11	-.71	2.520	.54	-1.33	2.350	-.46	1.01
2.176	.41	1.71	1.986	.48	3.52	2.283	-.29	1.42	2.253	-.57	1.98	2.622	-.56	-.98	2.566	.01	-1.14	2.578	.35	-1.57	2.383		
2.035	0	3.55	1.852			2.185	-.29	2.32	2.182	-.18	2.25				2.598	.18	-1.54				2.412		
1.887	-.18	5.06				2.114	-.31	3.05													2.451		
1.752	.27	6.71				2.139	-.35	4.13															

(b) $x = 0.45$; $\beta_{0.75R} = 45^{\circ}$; $B = 2$

1140 rpm			1350 rpm			1500 rpm			1600 rpm			M = 0.56			M = 0.58			M = 0.60			M = 0.65		
J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x
1.589	3.42	7.66	2.647			2.584	0.64	-2.78	2.136	1.49	1.42	2.655	0.35	-3.14	2.138	1.59	1.29	2.169	1.85	0.67	2.123	2.50	0.52
1.778	2.13	5.74	2.473	0.82	-1.83	2.511	.69	-2.09	2.227	1.03	.74	2.600	.46	-2.73	2.164	1.40	1.16	2.192	1.82	.41	2.139	2.52	.28
1.965	1.67	3.41	2.329	1.29	-.71	2.431	.74	-1.28	2.330	.74	-.20	2.559	.54	-2.40	2.196	1.27	.88	2.217	1.78	.14	2.172	2.47	-.10
2.152	1.32	1.29	2.207	1.52	.45	2.345	.80	-.37	2.424	1.07	-1.61	2.512	.66	-2.04	2.216	1.17	.79	2.238	1.75	-.11	2.179	2.38	-.10
2.285	1.07	-.04	2.087	1.47	1.93	2.284	.87	.29	2.514			2.466	.81	-1.70	2.247	1.08	.45	2.266	1.68	-.39	2.206	2.25	-.32
2.400	.86	-1.10	1.978	1.05	3.91	2.201	1.00	1.16	2.469			2.429	.86	-1.36	2.271	1.03	.22	2.293	1.62	-.66	2.218	2.18	-.41
2.522	.64	-2.10	1.872			2.139	1.14	1.79	2.381	.78	-.84	2.384	.94	-.95	2.299	1.00	-.07	2.319	1.53	-.89	2.253	1.98	-.63
2.659	.43	-3.21	1.768			2.068	1.31	2.53	2.295	.79	.15	2.347	1.03	-.62	2.327	.97	-.37	2.346	1.45	-1.12	2.273	1.89	-.79
2.594	.55	-2.81	1.819			1.983	1.47	3.50	2.188	1.18	1.07	2.318	1.08	-.35	2.357	.95	-.69	2.378	1.37	-1.41	2.299	1.75	-.96
2.469	.74	-1.69	1.926			2.021	1.40	3.05	2.108	1.67	1.59	2.280	1.17	0	2.384	.92	-.96	2.911	1.28	-1.68	2.303	1.72	-.97
2.338	.98	-.54	2.027	1.28	3.00	2.084	1.26	2.37				2.232	1.23	.27	2.419	.85	-1.28	2.430	1.20	-1.81	2.333	1.60	-1.20
2.190	1.22	.92	2.143	1.55	1.20	2.158	1.10	1.59				2.214	1.31	.65	2.447	.77	-1.49	2.468	1.10	-2.11	2.356	1.93	-1.81
2.049	1.50	2.23	2.269	1.44	-.22	2.227	.97	.87				2.178	1.36	1.04	2.482	.68	-1.77	2.492	1.02	-2.28	2.780		
1.872	1.87	4.57	2.408	1.06	-1.39	2.318	.84	-.12				2.140	1.47	1.40	2.510	.62	-2.01	2.525	.90	-2.50	2.417		
1.679	2.52	6.98	2.550	.52	-2.31	2.395	.76	-.90				2.117	1.52	1.64	2.544	.50	-2.23	2.561	.78	-2.73			
1.541						2.480	.70	-1.77							2.583	.36	-2.48						
						2.547	.67	-2.46															

NACA

TABLE 5

BLADE SECTION ANGLE OF ATTACK

NACA 10-(5)(066)-03 PROPELLER - Continued

(c) $x = 0.60$; $\beta_{0.75R} = 45^{\circ}$; $B = 2$

1140 rpm			1350 rpm			1500 rpm			1600 rpm			M = 0.56			M = 0.58			M = 0.60			M = 0.65		
J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x
1.569	2.65	9.41	1.709			2.027	1.65	3.16	2.095	1.73	2.01	2.621	0.49	-3.67	2.584	0.02	-2.91	2.112	1.68	1.58	2.448		
1.718	2.25	7.15	1.822			2.105	1.47	2.18	2.183	1.29	1.15	2.563	.50	-3.03	2.549	.16	-2.61	2.148	1.70	1.05	2.403		
1.860	1.82	5.24	1.957	1.72	3.98	2.193	1.23	1.15	2.237	1.14	.52	2.527	.52	-2.63	2.509	.28	-2.24	2.192	1.61	.51	2.388	0.77	-1.52
1.998	1.56	3.39	2.081	1.62	2.20	2.306	.92	-.13	2.314	1.04	-.46	2.492	.57	-2.27	2.471	.45	-1.95	2.229	1.44	.16	2.350	.84	-1.10
2.150	1.29	1.48	2.199	1.28	.87	2.417	.67	-1.39	2.383	.94	-1.33	2.447	.64	-1.78	2.421	.60	-1.48	2.275	1.30	-.35	2.313	.90	-.67
2.309	.94	-.28	2.322	.93	-.44	2.520	.41	-2.47	2.458	.74	-2.16	2.403	.74	-1.31	2.381	.72	-1.12	2.307	1.17	-.66	2.299	.92	-.51
2.459	.63	-1.82	2.450	.60	-1.75	2.589	.24	-3.18	2.551			2.379	.79	-1.04	2.343	.88	-.81	2.348	1.04	-1.09	2.264	.95	-.07
2.554	.43	-2.73	2.580	.42	-3.11	2.559	.34	-2.79	2.509	.62	-2.71	2.338	.91	-.63	2.315	.96	-.54	2.387	.92	-1.48	2.235	.95	.33
2.685	.08	-3.82	2.668			2.483	.54	-2.12	2.434	.84	-1.93	2.302	1.01	-.28	2.289	1.06	-.25	2.431	.78	-1.91	2.202	.92	.82
2.621	.25	-3.20	2.625			2.383	.74	-1.01	2.354	.98	-.96	2.269	1.12	.04	2.260	1.17	.04	2.477	.67	-2.37	2.183	.92	1.09
2.511	.50	-2.30	2.524	.48	-2.52	2.254	1.04	.48	2.280	1.07	-.02	2.246	1.22	.24	2.241	1.28	.21	2.533	.50	-2.89	2.162	.95	1.36
2.380	.78	-1.01	2.388	.75	-1.12	2.171	1.31	1.39	2.221	1.17	.71	2.212	1.32	.59	2.211	1.39	.55	2.367	.38	-3.18	2.125	1.00	1.84
2.231	1.12	.55	2.282	1.05	-.02	2.069	1.58	2.60	2.141	1.43	1.63	2.188	1.40	.84	2.185	1.52	.82				2.116	1.07	1.90
2.079	1.42	2.36	2.136	1.49	1.54	1.981	1.74	3.76				2.168	1.50	1.02	2.152	1.70	1.14						
1.931	1.68	4.28	2.025	1.70	2.95							2.135	1.60	1.42	2.131	1.83	1.32						
1.796	1.99	6.12	1.875									2.117	1.68	1.63									
1.636	2.37	8.47	1.762																				

(d) $x = 0.70$; $\beta_{0.75R} = 45^{\circ}$; $B = 2$

1140 rpm			1350 rpm			1500 rpm			1600 rpm			M = 0.56			M = 0.60			M = 0.65			M = 0.70		
J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x
1.608	2.55	9.02	1.663			1.962	2.58	3.63	2.071	2.10	2.33	2.116	2.22	1.18	2.553	0.02	-2.94	2.124	0.98	1.77	2.609	-0.21	-3.30
1.766	2.33	6.52	1.786			2.051	2.23	2.51	2.144	1.95	1.31	2.156	2.17	.57	2.528	.18	-2.79	2.152	.89	1.44	2.570	-.08	-2.92
1.945	1.92	4.07	1.885			2.130	1.86	1.61	2.212	1.77	.41	2.179	2.07	.31	2.489	.37	-2.48	2.183	.74	1.13	2.528	.12	-2.55
2.139	1.55	1.57	1.984	2.10	3.46	2.212	1.52	.69	2.290	1.50	-.52	2.206	2.00	-.02	2.460	.50	-2.23	2.219	.62	.72	2.487	.33	-2.23
2.254	1.30	.21	2.095	1.82	2.02	2.315	1.22	-.57	2.370	1.20	-1.43	2.241	1.80	-.30	2.449	.63	-1.82	2.259	.50	.27	2.446	.54	-1.89
2.367	1.02	-1.02	2.209	1.48	.66	2.388	.94	-1.35	2.450	.73	-2.17	2.276	1.63	-.60	2.377	.78	-1.39	2.286	.41	-.02	2.407	.69	-1.54
2.514	.63	-2.50	2.312	1.07	-.40	2.475	.63	-2.26	2.536			2.304	1.48	-.87	2.338	.86	-.92	2.326	.28	-.45	2.376	.87	-1.34
2.654	-.02	-3.55	2.438	.68	-1.72	2.595	.17	-3.48	2.480	.50	-2.41	2.362	1.12	-1.23	2.311	.92	-.58	2.364	.16	-.84	2.337	1.05	-1.02
2.592	.37	-3.21	2.547	.37	-2.82	2.528	.47	-2.84	2.418	.95	-1.90	2.388	.96	-1.43	2.281	.98	-.20	2.397	.07	-1.20	2.297	1.22	-.63
2.443	.82	-1.80	2.637			2.436	.81	-1.89	2.329	1.34	-.95	2.424	.81	-1.78	2.246	1.02	.28	2.434	0	-1.61	2.271	1.35	-.36
2.321	1.13	-.51	2.584	.32	-3.24	2.341	1.07	-.80	2.259	1.60	-.14	2.468	.65	-2.22	2.220	1.05	.63	2.456			2.234	1.50	.08
2.195	1.41	.91	2.486	.52	-2.20	2.267	1.34	.03	2.183	1.86	.78	2.512	.50	-2.64	2.197	1.08	.93	2.098	1.00	2.14	2.208	1.62	.38
2.066	1.68	2.50	2.371	.88	-1.05	2.173	1.65	1.15	2.100	2.06	1.90	2.552	.37	-3.00	2.164	1.12	1.34				2.167	1.66	1.01
1.875	2.07	5.02	2.249	1.30	.27	2.096	1.97	2.03				2.622	.17	-3.61	2.128	1.14	1.84				2.137	1.65	1.52
1.667	2.49	8.04	2.162	1.66	1.17	2.013	2.32	3.03							2.106	1.17	2.14						
			2.068	1.96	2.29																		
			1.958	2.16	3.82																		
			1.845																				
			1.734																				

TABLE 5

BLADE SECTION ANGLE OF ATTACK

NACA 10-(5)(066)-03 PROPELLER - Continued

(e) $x = 0.78$; $\beta_{0.75R} = 45^{\circ}$; $B = 2$

1140 rpm			1350 rpm			1500 rpm			1600 rpm			M = 0.56			M = 0.58			M = 0.60			M = 0.65		
J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x	J	α_{1_T}	α_x
1.606	2.66	8.49	1.793			2.003	2.58	3.02	2.165	1.97	1.01	2.114	1.90	1.32	2.110	1.02	2.56	2.103	1.58	1.62	2.089	1.19	1.87
1.689	2.68	7.49	1.890			2.100	2.26	1.71	2.267	1.60	-.32	2.146	1.48	1.38	2.152	1.11	1.73	2.142	1.30	1.33	2.102	1.11	1.76
1.816	2.73	5.35	1.988	2.40	3.16	2.169	1.94	.91	2.349	1.06	-1.11	2.192	1.17	.96	2.198	1.17	.88	2.174	1.16	1.02	2.132	.93	1.48
1.928	2.57	3.72	2.130	1.91	1.42	2.305	1.38	-.71	2.444	.20	-1.79	2.229	1.02	.56	2.244	1.14	.14	2.206	.82	.92	2.160	.84	1.14
2.052	2.19	2.23	2.272	1.40	-.18	2.409	.94	-1.82	2.528			2.278	.93	-.01	2.281	.97	-.29	2.244	.60	.39	2.179	.65	1.05
2.169	1.64	1.08	2.420	.76	-1.63	2.505	.36	-2.65	2.483	-.16	-2.07	2.326	.90	-.61	2.329	.80	-.82	2.275	.50	.22	2.213	.53	.65
2.300	1.18	-.31	2.567	.18	-3.07	2.582	-.02	-3.40	2.406	.61	-1.59	2.371	.87	-1.21	2.370	.64	-1.19	2.323	.35	-.37	2.243	.35	.39
2.423	.71	-1.51	2.634			2.547	.16	-3.07	2.315	1.31	-.81	2.417	.77	-1.80	2.422	.50	-1.71	2.362	.27	-.87	2.268	.20	.18
2.549	.26	-2.69	2.606			2.470	.60	-2.38	2.235	1.71	.10	2.489	.50	-2.54	2.488	.32	-2.52	2.407	.15	-1.40	2.299	.01	-.07
2.649	-.09	-3.60	2.490	.53	-2.36	2.359	1.14	-1.28	2.130	2.16	1.41	2.542	.22	-2.95	2.519	.24	-2.78	2.443	.07	-1.81	2.326	-.17	-.26
2.601	.09	-3.18	2.367	1.00	-1.14	2.252	1.58	-.06				2.578	.08	-3.28	2.511	.17	-3.16	2.486	-.01	-2.31	2.359	-.35	-.55
2.492	.53	-2.23	2.223	1.58	.37	2.148	2.05	1.14				2.620	-.15	-3.57	2.596	.09	-3.71	2.534	-.12	-2.83	2.386	-.50	-.77
2.367	.93	-.98	2.087	2.10	1.89	2.063	2.40	2.19										2.566	-.20	-3.16	2.418	-.67	-1.03
2.258	1.35	-.11	1.945	2.54	3.72																2.451	-.88	-1.26
2.106	1.90	1.73	1.837																				
1.982	2.42	3.01																					
1.876	2.68	4.43																					
1.774	2.72	6.04																					
1.652	2.67	8.13																					

(f) $x = 0.85$; $\beta_{0.75R} = 45^{\circ}$; $B = 2$

2.709	-0.38	-4.56	1.762			2.038	2.93	1.70	2.545	-1.23	-2.42	2.128	1.72	1.01	2.163	1.13	1.05	2.135	1.57	0.64	2.472		
2.541	.38	-3.18	1.887			2.104	2.62	.89	2.493	-.42	-2.45	2.152	1.37	.95	2.177	1.18	.75	2.158	1.37	.52	2.446	-1.01	-1.71
2.376	1.06	-1.66	2.053	2.60	1.56	2.233	1.96	-.56	2.438	.25	-2.22	2.192	1.19	.50	2.216	1.15	.10	2.173	1.27	.41	2.411	-.62	-1.54
2.183	1.83	.30	2.186	1.97	.14	2.313	1.48	-1.38	2.360	.82	-1.50	2.235	1.00	.05	2.240	1.03	-.18	2.220	1.00	.03	2.374	-.31	-1.44
2.178	1.78	.42	2.344	1.26	-1.49	2.436	.74	-2.54	2.302	1.38	-1.09	2.276	.92	-.43	2.270	.97	-.62	2.240	.87	-.13	2.351	-.09	-1.34
2.030	2.72	1.64	2.464	.77	-2.70	2.540	-.03	-3.40	2.240	1.87	-.54	2.323	.83	-.96	2.324	.78	-1.21	2.265	.78	-.42	2.317	.11	-1.07
1.879	3.13	3.56	2.610	0	-4.04	2.611	-.41	-4.07	2.151	2.43	.44	2.367	.82	-1.57	2.350	.67	-1.45	2.290	.67	-.70	2.280	.28	-.70
1.710	3.08	6.34	2.700			2.578	-.28	-3.72	2.080	2.74	1.39	2.414	.78	-2.24	2.387	.61	-1.86	2.314	.60	-1.01	2.264	.44	-.63
1.551	3.00	9.13	2.654	-.28	-4.36	2.497	.42	-3.18	2.115	2.53	.98	2.453	.67	-2.72	2.414	.53	-2.13	2.346	.41	-1.33	2.233	.63	-.36
1.629	3.03	7.77	2.538	.34	-3.32	2.385	1.16	-2.18	2.191	2.15	.02	2.514	.27	-3.18	2.449	.48	-2.55	2.370	.28	-1.56	2.205	.78	-.10
1.799	3.15	4.82	2.413	1.04	-2.25	2.273	1.76	-1.01	2.269	1.65	-.81	2.564	.03	-3.53	2.481	.40	-2.93	2.392	.17	-1.77	2.170	.95	.26
1.959	2.96	2.48	2.276	1.55	-.79	2.177	2.19	.12	2.337	1.08	-1.38	2.602	-.23	-3.87	2.526	.27	-3.44	2.429	-.04	-2.09	2.147	1.10	.46
2.086	2.33	1.21	2.126	2.20	.82	2.062	2.79	1.44	2.396	.60	-1.87	2.659	-.51	-4.33	2.563	.11	-3.83	2.464	-.22	-2.39	2.117	1.22	.81
2.267	1.43	-.50	1.972	2.90	2.56	1.968	3.30	2.53	2.469	.01	-2.48	2.460	.63	-2.78	2.601	.07	-4.33	2.496	-.33	-2.71			
2.426	.85	-2.14	1.856						2.529	-.69	-2.73				2.636	-.09	-4.84	2.522	-.41	-2.96			
2.614	.02	-3.76																2.560	-.58	-3.27			

TABLE 5

BLADE SECTION ANGLE OF ATTACK

NACA 10-(5)(066)-03 PROPELLER - Continued

(g) $x = 0.90$; $\beta_{0.75R} = 45°$; $B = 2$

1140 rpm			1350 rpm			1500 rpm			1600 rpm			M = 0.56			M = 0.58			M = 0.60			M = 0.65		
J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x
1.579	3.81	7.77	2.711			2.004	3.55	1.64	2.103	2.84	0.88	2.677	-0.68	-4.57	2.637	-0.53	-4.39	2.611	-0.88	-3.77	2.110	1.45	0.53
1.739	3.74	5.15	2.635	-0.14	-4.40	2.059	3.20	1.05	2.170	2.55	-.04	2.641	-.44	-4.37	2.585	-.27	-3.91	2.563	-.65	-3.39	2.142	1.33	.13
1.876	3.38	3.31	2.501	.69	-3.27	2.153	2.80	-.13	2.240	2.23	-.95	2.588	-.19	-3.91	2.544	-.08	-3.49	2.522	-.46	-3.06	2.161	1.25	-.08
1.983	2.98	2.03	2.402	1.22	-2.36	2.218	2.32	-.72	2.295	1.78	-1.46	2.547	.17	-3.69	2.512	.08	-3.17	2.485	-.15	-2.90	2.194	1.08	-.42
2.114	2.45	.66	2.300	1.71	-1.35	2.304	1.78	-1.57	2.352	1.32	-1.98	2.512	.42	-3.44	2.476	.28	-2.85	2.445	.04	-2.57	2.213	.95	-.58
2.255	1.78	-.74	2.211	2.14	-.45	2.392	1.25	-2.43	2.410	.73	-2.37	2.482	.62	-3.21	2.424	.50	-2.34	2.405	.27	-2.22	2.255	.79	-1.06
2.379	1.24	-1.94	2.111	2.65	.56	2.476	.62	-3.14	2.457	.26	-2.68	2.429	1.00	-2.79	2.391	.65	-2.05	2.374	.42	-1.91	2.284	.65	-1.34
2.505	.63	-3.03	2.022	3.13	1.50	2.563	.05	-3.96	2.509	-.57	-2.68	2.398	1.41	-1.93	2.354	.77	-1.69	2.344	.69	-1.71	2.312	.50	-1.60
2.635	-.01	-4.09	1.926			2.634	-.84	-4.21	2.561	-1.16	-2.84	2.346	1.47	-1.58	2.319	.88	-1.35	2.303	.94	-1.29	2.336	.30	-1.74
2.712	-.42	-4.65	1.830			2.596	-.52	-3.90	2.554	-1.18	-2.72	2.316	1.56	-1.20	2.280	1.03	-.93	2.271	1.14	-.99	2.371	-.05	-1.88
2.667	-.20	-4.31	1.733			2.523	.27	-3.54	2.499	-.63	-2.47	2.281	1.65	-.93	2.249	1.21	-.62	2.253	1.41	-.98	2.405	-.38	-2.00
2.578	.31	-3.67	1.653			2.438	.90	-2.81	2.439	.40	-2.52	2.254	1.67	-.48	2.220	1.45	-.38	2.209	1.86	-.77	2.439	-.70	-2.13
2.445	.98	-2.58	1.693			2.352	1.44	-1.99	2.389	.87	-2.16	2.221	1.73	-.01	2.185	1.85	-.16	2.167	2.17	-.52	2.471	-1.07	-2.17
2.313	1.57	-1.35	1.783			2.261	2.17	-1.27	2.337	1.42	-1.83	2.185	1.75	.38	2.149	2.35	.01	2.150	2.48	-.60	2.501		
2.170	2.17	.11	1.869			2.186	2.58	-.46	2.275	1.98	-1.31	2.159	1.77	.92				2.131	2.62	-.50			
2.053	2.69	1.29	1.970	3.43	2.04	2.106	3.04	.42	2.224	2.23	-.67	2.127	1.14	-2.44									
1.913	3.20	2.91	2.062	2.90	1.10	2.048	3.32	.96	2.161	2.57	.11												
1.806	3.56	4.25	2.157	2.40	.11																		
1.649	3.76	6.62	2.257	1.95	-.96																		
			2.320	1.59	-1.53																		
			2.447	.97	-2.76																		
			2.559	.34	-3.77																		
			2.626	-.12	-4.29																		
			2.678	-.27	-4.86																		

(h) $x = 0.95$; $\beta_{0.75R} = 45°$; $B = 2$

2.793			2.038	4.00	0.69	2.088	4.55	0.53	2.097	3.70	0.46	2.122	3.52	-0.46	2.129	3.83	-0.80	2.132	3.61	-1.25	2.104	2.25	0.02
2.616	0.50	-4.05	2.179	3.00	-.51	2.128	3.75	-.36	2.185	3.10	-.67	2.162	3.44	-1.05	2.161	3.28	-.88	2.161	3.13	-1.15	2.132	2.17	-.34
2.419	1.90	-2.83	2.296	2.14	-1.43	2.198	2.95	-.71	2.269	2.35	-1.28	2.195	3.30	-1.43	2.197	2.63	-.90	2.189	2.53	-.94	2.157	2.07	-.64
2.224	2.83	-1.23	2.427	1.28	-2.40	2.294	2.26	-1.56	2.343	1.65	-1.87	2.236	3.02	-1.73	2.229	2.38	-1.20	2.222	2.20	-1.05	2.189	1.98	-1.05
2.039	3.68	.82	2.563	.24	-3.45	2.389	1.23	-2.04	2.435	.62	-2.39	2.270	2.53	-1.72	2.264	1.95	-1.35	2.253	1.95	-1.26	2.212	1.75	-1.17
1.875	4.50	2.49	2.673			2.474	.76	-2.94	2.521	-.30	-2.80	2.314	1.95	-1.74	2.296	1.74	-1.61	2.287	1.54	-1.37	2.243	1.45	-1.34
1.682	5.51	4.58	2.603	-.18	-3.62	2.564	-.08	-3.58	2.549			2.363	1.68	-2.16	2.337	1.43	-1.85	2.312	1.36	-1.58	2.266	1.32	-1.55
1.598	5.71	5.76	2.493	.75	-2.94	2.614	-.73	-3.74	2.479	.19	-2.69	2.416	1.06	-2.35	2.388	1.06	-2.13	2.353	1.02	-1.91	2.304	1.02	-1.80
1.777	5.03	3.51	2.352	1.73	-1.85	2.520	.23	-3.17	2.392	1.14	-2.19	2.465	.63	-2.68	2.426	.90	-2.48	2.381	.84	-2.17	2.326	.76	-1.85
1.939	4.16	1.84	2.229	2.58	-.88	2.434	1.08	-2.61	2.322	1.83	-1.68	2.517	.37	-3.19	2.471	.58	-2.80	2.412	.58	-2.37	2.356	.40	-1.91
2.135	3.22	-.12	2.110	3.47	.07	2.343	1.79	-1.86	2.240	2.60	-1.02	2.549	.13	-3.41	2.520	.40	-3.35	2.451	.20	-2.54	2.390	.17	-2.17
2.311	2.46	-1.88				2.247	2.55	-1.11	2.151	3.43	-.05	2.612	-.16	-4.00	2.573	.28	-4.01	2.490	.03	-2.89	2.413	-.13	-2.15
2.523	1.30	-3.62				2.168	3.33	-.61				2.653	-.40	-4.32	2.637	-.48	-4.18	2.527	-.27	-3.06	2.455	-.41	-2.41
2.704						2.093	4.12	-.13										2.568	-.42	-3.41	2.483		
																		2.599	-.68	-3.53			

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TABLE 5

BLADE SECTION ANGLE OF ATTACK

NACA 10-(5)(066)-03 PROPELLER - Concluded

(i) $x = 0.975$; $\beta_{0.75R} = 45^\circ$; $B = 2$

1140 rpm			1350 rpm			1500 rpm			1600 rpm			M = 0.56			M = 0.58			M = 0.60			M = 0.65		
J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x
1.679	7.66	2.67	2.739			2.087	6.00	-1.33	2.177	4.54	-1.57	2.147	4.80	-1.93	2.148	3.25	-0.38	2.143	4.10	-1.66	2.110	2.91	-0.52
1.794	7.21	1.27	2.688	0.10	-4.02	2.145	4.72	-1.36	2.278	3.62	-2.46	2.179	4.76	-2.41	2.181	2.95	-.70	2.172	3.40	-1.37	2.136	2.75	-.78
1.898	6.50	.36	2.502	1.14	-3.21	2.254	3.44	-1.86	2.370	2.50	-2.93	2.218	4.60	-2.82	2.214	2.80	-1.14	2.205	2.48	-.85	2.150	2.66	-.91
1.974	5.93	-.23	2.408	1.85	-2.55	2.378	1.92	-2.29	2.460	1.45	-3.39	2.258	4.49	-3.26	2.251	2.65	-1.60	2.243	2.14	-1.06	2.164	2.53	-1.00
2.080	5.27	-1.10	2.323	2.42	-1.87	2.475	.84	-2.77	2.555	-.29	-3.09	2.284	4.20	-3.33	2.285	2.49	-1.96	2.275	1.91	-1.31	2.199	2.41	-1.42
2.201	4.27	-1.07	2.231	3.05	-1.13	2.581	-.08	-3.59	2.581			2.314	3.80	-3.33	2.318	2.32	-2.26	2.308	1.62	-1.55	2.222	2.30	-1.66
2.317	3.08	-2.33	2.152	3.94	-.80	2.551	.12	-3.30	2.507	.70	-3.40	2.354	3.05	-3.15	2.354	2.05	-2.44	2.350	1.36	-1.64	2.235	2.15	-1.71
2.445	2.07	-3.09	2.049	5.03	-.27	2.434	1.24	-2.51	2.423	2.05	-3.37	2.395	2.52	-3.25	2.394	1.79	-2.69	2.375	1.23	-2.23	2.273	1.81	-1.92
2.563	.97	-3.56	2.097	4.50	-.50	2.336	2.52	-2.23	2.323	3.02	-2.64	2.434	1.85	-3.18	2.434	1.60	-3.05	2.411	.87	-2.41	2.293	1.43	-1.83
2.744			2.169	3.70	-.82	2.235	3.36	-1.47	2.232	4.03	-2.04	2.475	1.34	-3.30	2.473	1.23	-3.24	2.447	.62	-2.66	2.324	1.02	-1.86
2.646	0	-3.67	2.267	2.78	-1.39	2.119	5.13	-1.34	2.119	5.07	-1.07	2.517	.73	-3.31	2.519	.90	-3.59	2.477	.44	-2.88	2.354	.66	-1.92
2.511	1.51	-3.42	2.355	2.18	-2.10	2.040	6.28	-1.17				2.560	.23	-3.42	2.555	.49	-3.73	2.525	.19	-3.24	2.383	.28	-1.93
2.391	2.51	-2.79	2.470	1.40	-3.00							2.610	-.03	-3.86	2.593	.12	-3.92	2.555	.02	-3.45	2.413	-.08	-1.97
2.275	3.44	-2.09	2.575	.63	-3.98							2.654	-.33	-4.16	2.647	-.69	-3.88	2.600	-.35	-3.65	2.450	-.17	-2.35
2.147	4.62	-1.43	2.696									2.697	-.52	-4.54	2.693	-1.10	-4.10	2.642	-.65	-3.87	2.483		
2.032	5.54	-.70																			2.520		
1.939	6.12	.12																					
1.830	6.84	1.00																					
1.749	7.29	1.90																					
1.600	7.82	3.81																					

(j) $x = 0.95$; $\beta_{0.75R} = 45^\circ$; $B = 1$

1500 rpm			M = 0.56			M = 0.58			M = 0.60			M = 0.65		
J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x
2.592	0.32	-4.42	2.336	1.75	-1.84	2.454	0.75	-2.75	2.323	2.03	-2.44	2.277	1.58	-1.97
2.512	.98	-3.78	2.301	2.08	-1.69	2.379	1.04	-2.02	2.289	2.55	-2.42	2.245	1.76	-1.69
2.399	1.65	-2.61	2.267	2.28	-1.43	2.311	1.49	-1.59	2.257	2.87	-2.24	2.225	1.80	-1.42
2.288	2.32	-1.52	2.232	2.33	-1.27	2.279	1.77	-1.42	2.230	3.20	-2.17	2.199	1.94	-1.16
2.185	3.17	-.83	2.222	2.70	-1.22	2.245	2.12	-1.35	2.211	3.27	-1.96	2.178	2.08	-.98
2.092	4.25	-.25	2.194	2.95	-1.06	2.225	2.33	-1.10	2.183	3.35	-1.66	2.159	2.15	-.75
2.059	4.58	-.01	2.172	3.26	-1.04	2.198	2.60	-.90	2.160	3.51	-1.51	2.125	2.31	-.37
2.033	4.90	.11	2.145	3.44	-.78	2.172	3.03	-.87	2.141	3.55	-1.30	2.116	2.49	-.41
1.990	5.42	.32	2.128	3.62	-.66	2.154	3.62	-1.11	2.115	3.62	-1.03	2.103	2.61	-.32
1.965	5.65	.51	2.106	3.85	-.51	2.129	3.77	-.79	2.102	3.57	-.82	2.068	2.92	-.06
1.930	6.03	.72	2.079	4.06	-.26	2.103	4.13		2.072	3.74	-.58	2.064	3.03	-.07
1.897	6.33	.98	2.049	4.26	.05	2.084	4.22		2.049	3.84	-.36	2.042	3.23	.06
1.849	6.77	1.34	2.030	4.40	.22	2.063	4.42		2.030	3.93	-.18	2.019	3.30	.37
1.812	7.12	1.61	2.006	4.44	.57	2.043	4.51		2.010	4.02	.03			
1.785	7.28	1.89				2.022	4.57		1.985	4.07	.37			
1.751	7.57	2.15				2.003	4.67		1.970	4.12	.57			
						1.986	4.75							
						1.956	4.80							
						1.951	4.82							

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TABLE 6

BLADE SECTION ANGLE OF ATTACK

NACA 10-(0)(066)-03 PROPELLER

(a) $x = 0.45$; $\beta_{0.75R} = 45^{\circ}$; $B = 2$

1140 rpm			1350 rpm			1500 rpm			1600 rpm			M = 0.56			M = 0.60			M = 0.65		
J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x
1.801	1.16	6.81	1.863	1.48	5.38	2.493	0.15	-1.07	2.032	0.85	3.77	2.313	0.43	0.64	2.457	0.42	-1.02	2.451	0.06	-0.53
1.930	.86	4.98	1.970	1.06	4.24	2.398	.30	-.21	2.127	.59	2.75	2.455	-.02	-.50	2.415	.42	-.53	2.442	.16	-.54
2.066	.70	3.28	2.095	.74	2.88	2.312	.41	.63	2.218	.52	1.67	2.445	.05	-.46	2.396	.42	-.31	2.410	.26	-.27
2.187	.58	1.87	2.183	.53	1.98	2.217	.56	1.60	2.319	.50	.49	2.424	.11	-.29	2.368	.42	.03	2.383	.42	-.13
2.299	.50	.64	2.315	.34	.61	2.152	.65	2.31	2.415	.39	-.49	2.384	.23	.02	2.337	.42	.40	2.358	.53	.04
2.446	.40	-.86	2.412	.16	-.27	2.060	.80	3.35	2.457	.32	-.96	2.354	.32	.27	2.310	.43	.72	2.336	.62	.20
2.376	.45	-.17	2.447	.10	-.58	1.988	1.00	4.14	2.369	.45	-.03	2.324	.40	.54	2.284	.43	1.04	2.307	.73	.43
2.265	.52	1.01	2.377	.24	.02	1.923	1.15	5.58	2.282	.51	.91	2.284	.45	.96	2.247	.45	1.48	2.284	.79	.64
2.135	.62	2.47	2.249	.41	1.30	1.956	1.08	4.51	2.173	.52	2.23	2.256	.45	1.29	2.228	.47	1.69	2.264	.88	.78
2.010	.75	3.98	2.150	.60	2.31	2.029	.88	3.69	2.087	.70	3.17	2.234	.44	1.57	2.206	.51	1.92	2.240	.98	.97
1.882	.97	5.56	2.038	.90	3.47	2.112	.71	2.77	2.027	.85	3.83	2.199	.48	1.96	2.176	.58	2.23	2.216	1.07	1.17
			1.919	1.25	4.79	2.192	.60	1.87				2.187	.52	2.07	2.155	.68	2.40	2.194	1.14	1.37
						2.263	.50	1.11				2.153	.60	2.44	2.132	.79	2.58	2.172	1.20	1.58
						2.353	.35	.24				2.138	.65	2.58	2.116	.91	2.67	2.149	1.25	1.82
						2.445	.24	-.66				2.115	.73	2.80	2.088	1.07	2.87	2.132	1.33	1.95

(b) $x = 0.60$; $\beta_{0.75R} = 45^{\circ}$; $B = 2$

1140 rpm			1350 rpm			1500 rpm			1600 rpm			M = 0.56			M = 0.60			M = 0.65		
J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x
1.814	1.80	6.32	1.841	1.47	6.31	1.870	1.44	6.11	1.990	1.62	4.24	2.054	1.41	3.50	2.093	1.49	2.88	2.452	0.02	-0.71
1.923	1.45	4.94	1.955	1.14	4.87	1.961	1.31	4.85	2.063	1.34	3.40	2.087	1.10	3.30	2.115	1.32	2.73	2.420	.15	-.41
2.044	1.03	3.55	2.075	.81	3.41	2.050	1.08	3.72	2.135	1.02	2.64	2.102	.97	3.19	2.143	1.11	2.54	2.390	.31	-.19
2.158	.71	2.27	2.164	.77	2.19	2.138	.88	2.62	2.228	.71	1.59	2.153	.76	2.63	2.171	.96	2.29	2.369	.50	-.10
2.285	.42	.97	2.292	.41	.82	2.237	.65	1.44	2.304	.51	.73	2.183	.67	2.28	2.200	.83	1.99	2.360	.59	-.08
2.434	.15	-.71	2.386	.20	-.17	2.318	.42	.57	2.387	.40	-.29	2.199	.61	2.10	2.222	.72	1.78	2.316	.78	.32
2.379	.27	-.16	2.449	.07	-.82	2.463	-.05	-.95	2.446	.33	-1.00	2.255	.53	1.37	2.244	.60	1.57	2.291	.95	.50
2.214	.54	1.68	2.334	.28	.40	2.405	.18	-.34	2.419	.35	-.66	2.282	.48	1.05	2.266	.56	1.30	2.272	1.08	.62
2.096	.83	3.02	2.229	.49	1.59	2.292	.51	.82	2.359	.43	.06	2.309	.45	.70	2.295	.47	.97	2.245	1.19	.89
1.991	1.23	4.13	2.126	.70	2.79	2.181	.76	2.12	2.283	.55	.97	2.338	.40	.35	2.320	.40	.68	2.233	1.29	.96
1.873	1.64	5.53	2.023	.96	4.03	2.102	.97	3.05	2.199	.77	1.95	2.371	.33	-.02	2.342	.34	.44	2.208	1.39	1.20
			1.916	1.25	5.36	2.006	1.18	4.28	2.104	1.15	2.98	2.410	.22	-.44	2.370	.27	.12	2.176	1.53	1.51
						1.940	1.35	5.12	2.036	1.47	3.68	2.446	.12	-.81	2.400	.20	-.23	2.159	1.62	1.66
															2.430	.12	-.56	2.134	1.65	1.98
															2.451	.07	-.80			

CONFIDENTIAL

[redacted]

TABLE 6

BLADE SECTION ANGLE OF ATTACK

NACA 10-(5)(066)-03 PROPELLER - Continued

(c) $x = 0.70$; $\beta_{0.75R} = 45^\circ$; $B = 2$

1140 rpm			1350 rpm			1500 rpm			1600 rpm			M = 0.56			M = 0.60			M = 0.65		
J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x
1.798			1.833	1.73	6.59	1.868	1.86	6.22	1.972	1.92	4.73	2.068	2.51	2.70	2.096	1.92	2.85	2.094		
1.920	1.50	5.27	1.936	1.51	5.22	1.925	1.78	5.48	2.062	1.66	3.56	2.090	2.32	2.54	2.128	1.90	2.41	2.141		
2.065	1.20	3.35	2.046	1.30	3.73	2.022	1.50	4.15	2.158	1.28	2.42	2.110	2.04	2.49	2.149	1.88	2.13	2.162		
2.158	.85	2.39	2.158	.90	2.46	2.092	1.24	3.34	2.232	.95	1.62	2.132	1.86	2.32	2.178	1.82	1.73	2.184		
2.292	.45	.96	2.241	.56	1.61	2.211	.86	1.92	2.315	.50	.83	2.156	1.66	2.14	2.190	1.79	1.57	2.209		
2.432	.02	-.45	2.359	.21	.33	2.324	.44	.69	2.401	.21	-.13	2.175	1.37	2.12	2.214	1.61	1.37	2.232	0.35	2.23
2.377	.18	.11	2.430	-.13	-.28	2.447	-.15	-.43	2.463	-.01	-.79	2.208	1.19	1.78	2.236	1.41	1.22	2.265	.49	1.60
2.249	.58	1.40	2.399	.05	-.04	2.395	.16	-.03	2.428	.13	-.44	2.243	.98	1.45	2.251	1.06	1.33	2.297	.63	1.00
2.142	.91	2.56	2.303	.33	.98	2.285	.61	1.12	2.372	.32	.18	2.271	.83	1.17	2.276	.98	1.02	2.316	.65	.71
2.004	1.35	4.14	2.206	.71	1.96	2.151	1.05	2.62	2.287	.66	1.08	2.299	.68	.88	2.290	.82	.96	2.342	.63	.36
1.866	1.51	6.10	2.083	1.16	3.31	2.067	1.39	3.57	2.205	1.02	1.96	2.331	.50	.59	2.316	.62	.77	2.365	.56	.10
			1.959	1.48	4.89	1.967	1.66	4.89	2.129	1.44	2.72	2.360	.39	.27	2.338	.50	.54	2.390	.43	-.12
			1.871	1.65	6.09	1.893	1.87	5.84	2.034	1.74	3.92	2.399	.24	-.14	2.359	.41	.32	2.426	.23	-.42
												2.452	-.09	-.56	2.387	.30	.02	2.453	.03	-.58
															2.419	.16	-.32	2.464	-.17	-.53
															2.449	0	-.59			
															2.471	-.13	-.77			

(d) $x = 0.78$; $\beta_{0.75R} = 45^\circ$; $B = 2$

1.910	1.52	5.37	1.839	1.75	6.51	1.826	2.20	6.63	1.960	2.23	4.76	2.490	-0.022	-1.05	2.117	1.26	3.27	2.135	1.45	2.58
2.058	1.19	3.46	1.972	1.53	4.68	1.914	2.05	5.48	2.051	1.93	3.59	2.462	-.15	-.73	2.144	1.15	2.99	2.170	1.30	2.21
2.175	.75	2.21	2.066	1.24	3.52	2.033	1.63	3.97	2.145	1.43	2.56	2.422	-.02	-.29	2.181	1.02	2.53	2.196	1.14	1.99
2.313	.24	.80	2.170	.78	2.39	2.118	1.33	2.91	2.244	.88	1.55	2.394	.08	.04	2.207	.93	2.21	2.217	.90	1.92
2.451	-.30	-.50	2.286	.44	1.05	2.225	.87	1.71	2.353	.34	.39	2.366	.19	.35	2.231	.86	1.88	2.242	.61	1.84
2.372	-.02	.26	2.385	.05	.10	2.346	.28	.50	2.463	-.38	-.57	2.333	.34	.72	2.256	.82	1.50	2.267	.39	1.69
2.240	.50	1.55	2.443	-.27	-.41	2.440	-.28	-.32	2.412	-.04	-.14	2.303	.52	1.02	2.285	.78	1.06	2.296	.19	1.46
2.131	.93	2.66	2.419	-.13	-.23	2.399	.04	-.04	2.312	.48	.88	2.276	.70	1.26	2.307	.71	.76	2.316	.07	1.28
1.998	1.38	4.17	2.340	.19	.54	2.282	.57	1.14	2.208	1.06	1.94	2.257	.89	1.38	2.335	.55	.45	2.345	-.05	.96
1.861	1.59	6.17	2.244	.56	1.53	2.176	1.04	2.29	2.096	1.66	3.13	2.229	1.09	1.64	2.371	.35	-.12	2.369	-.11	.67
1.822	1.62	6.75	2.135	.98	2.72	2.092	1.42	3.23	2.009	2.06	4.14	2.211	1.30	1.71	2.398	.12	-.12	2.406	-.20	.19
			2.005	1.46	4.22	1.970	1.86	4.78	1.926	2.30	5.24	2.187	1.45	1.95	2.421	-.12	-.21	2.425	-.23	-.04
			1.907	1.65	5.59	1.879	2.15	5.90				2.158	1.59	2.28	2.452	-.39	-.35	2.453	-.25	-.43
												2.134	1.74	2.53						
												2.106	1.82	2.90						
												2.091	1.92	3.05						
												2.069	1.98	3.34						

TABLE 6

BLADE SECTION ANGLE OF ATTACK

NACA 10-(0)(066)-03 PROPELLER - Continued

(e) $x = 0.85$; $\beta_{0.75R} = 45^{\circ}$; $B = 2$

1140 rpm			1350 rpm			1500 rpm			1600 rpm			M = 0.56			M = 0.60			M = 0.65		
J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x
1.867	1.84	5.91	1.830	1.90	6.76	1.825	2.58	6.57	1.980	2.57	4.48	2.473	-0.26	-0.53	2.471	-0.40	-0.43	2.452	-0.58	0.10
1.976	1.56	4.54	1.950	1.73	5.10	1.947	2.62	4.78	2.070	2.14	3.42	2.448	-.13	-.32	2.445	-.22	-.27	2.433	-.34	.13
2.093	1.10	3.27	2.052	1.48	3.73	2.043	2.18	3.59	2.157	1.64	2.49	2.412	.04	.04	2.414	.15	-.11	2.414	-.23	.30
2.221	.69	1.84	2.169	1.02	2.41	2.127	1.57	2.84	2.266	1.03	1.33	2.376	.23	.41	2.397	.33	-.15	2.386	.02	.47
2.358	.14	.49	2.269	.58	1.37	2.236	.94	1.75	2.357	.43	.47	2.346	.39	.73	2.368	.53	.08	2.362	.24	.63
2.455	-.25	-.43	2.376	.16	.27	2.342	.44	.62	2.463	-.23	-.57	2.315	.59	1.05	2.338	.68	.45	2.339	.40	.82
2.415	-.10	-.04	2.450	-.17	-.42	2.458	-.20	-.48	2.413	.12	-.12	2.276	.90	1.39	2.308	.74	.94	2.313	.62	1.04
2.283	.40	1.26	2.337	.28	.70	2.422	.02	-.17	2.309	.67	1.00	2.246	1.07	1.73	2.281	.72	1.46	2.288	.85	1.21
2.170	.85	2.41	2.226	.77	1.81	2.293	.66	1.15	2.219	1.25	1.87	2.220	1.25	1.97	2.254	.68	1.98	2.253	1.15	1.45
2.045	1.30	3.77	2.122	1.20	2.94	2.211	1.13	1.96	2.119	1.86	2.90	2.202	1.40	2.12	2.221	.71	2.53	2.239	1.31	1.49
1.931	1.66	5.12	2.000	1.60	4.43	2.104	1.66	3.12	2.008	2.42	4.18	2.169	1.54	2.52	2.194	.81	2.88	2.221	1.51	1.56
1.827	1.95	6.42	1.901	1.82	5.79	2.002	2.32	4.15				2.145	1.61	2.84	2.165	.93	3.21	2.200	1.67	1.69
						1.917	2.72	5.14				2.121	1.66	3.17	2.145	1.05	3.38	2.173	1.80	1.95
												2.094	1.71	3.56	2.127	1.22	3.46	2.160	1.93	2.01
												2.079	1.74	3.77	2.105	1.42	3.57			

(f) $x = 0.90$; $\beta_{0.75R} = 45^{\circ}$; $B = 2$

1140 rpm			1350 rpm			1500 rpm			1600 rpm			M = 0.56			M = 0.60			M = 0.65		
J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x
2.471	-0.29	-0.90	2.484	-0.34	-1.02	1.835	2.88	5.94	1.974	2.97	4.03	2.467	-0.15	-0.80	2.462	-0.43	-0.58	2.465	-0.95	-0.02
2.388	.06	-.14	2.397	.06	-.21	1.928	2.73	4.80	2.049	2.48	3.25	2.409	.10	-.24	2.426	-.14	-.31	2.437	-.59	.01
2.319	.33	.52	2.313	.44	.61	2.009	2.32	3.82	2.109	1.93	2.79	2.389	.20	-.04	2.395	.13	-.26	2.412	-.33	.13
2.222	.64	1.58	2.233	.80	1.41	2.121	1.70	2.60	2.177	1.34	2.26	2.360	.36	.28	2.372	.37	-.15	2.389	0	.15
2.148	.91	2.38	2.150	1.34	2.10	2.204	1.14	1.82	2.258	.98	1.28	2.329	.52	.66	2.339	.57	.23	2.366	.18	.36
2.077	1.24	3.08	2.062	1.73	3.05	2.292	.64	.94	2.321	.61	.61	2.292	.78	1.04	2.322	.67	.47	2.337	.50	.51
1.990	1.62	3.98	1.990	2.09	3.82	2.381	.22	-.02	2.397	.18	-.24	2.267	.94	1.32	2.289	.78	1.00	2.315	.71	.67
1.916	1.90	4.81	1.846	2.48	5.68	2.463	-.31	-.75	2.469	-.31	-.95	2.246	1.13	1.49	2.261	.92	1.38	2.288	.96	.87
1.830	2.16	5.84	1.906	2.36	4.93	2.432	-.14	-.45	2.428	-.03	-.54	2.227	1.30	1.62	2.232	.96	1.88	2.265	1.10	1.08
1.878	1.97	5.30	2.026	1.95	3.39	2.335	.40	.51	2.361	.39	.16	2.199	1.41	1.98	2.211	1.05	2.06	2.232	1.22	1.44
1.955	1.75	4.37	2.121	1.43	2.44	2.255	.82	1.35	2.299	.77	.81	2.168	1.56	2.34	2.191	1.28	2.24	2.217	1.32	1.56
2.025	1.49	3.60	2.194	1.05	1.73	2.159	1.34	2.34	2.227	1.13	1.63	2.145	1.60	2.67	2.167	1.51	2.36	2.197	1.39	1.77
2.118	1.02	2.70	2.266	.67	1.06	2.074	2.01	3.06	2.139	1.58	2.64	2.126	1.64	2.93	2.135	1.92	2.40	2.172	1.46	2.05
2.185	.78	1.96	2.358	.23	.16	1.972	2.52	4.27	2.086	2.03	3.08	2.087	1.67	3.50	2.119	2.18	2.37	2.146	1.51	2.37
2.264	.49	1.13	2.443	-.17	-.63	1.877	2.96	5.29	2.022	2.52	3.67				2.093	2.57	2.34	2.126	1.55	2.60
2.342	.24	.30																		
2.429	-.10	-.55																		

NACA

TABLE 6

BLADE SECTION ANGLE OF ATTACK

NACA 10-(5)(066)-03 PROPELLER - Continued

(g) $x = 0.95$; $\beta_{0.75R} = 45^\circ$; $B = 2$

1140 rpm			1350 rpm			1500 rpm			1600 rpm			M = 0.56			M = 0.60			M = 0.65		
J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x
2.482	-0.25	-0.75	1.834	4.10	4.56	1.840	4.03	5.10	1.989	3.69	3.46	2.105	2.72	2.57	2.478	-0.44	-0.39	2.450	-0.57	0.17
2.396	.06	.09	1.918	3.54	3.88	1.935	3.75	4.08	2.075	3.21	2.48	2.123	2.72	2.30	2.438	-.16	-.18	2.434	-.43	.26
2.326	.34	.77	2.023	2.60	3.11	2.049	2.78	3.09	2.172	1.91	2.15	2.149	2.52	2.10	2.407	.22	-.17	2.418	-.14	.21
2.231	.78	1.65	2.137	1.80	2.18	2.139	1.90	2.50	2.282	1.20	1.05	2.181	2.24	1.87	2.378	.45	.01	2.393	.10	.50
2.154	1.14	2.31	2.245	.94	1.45	2.237	1.21	1.62	2.381	.47	.12	2.212	1.90	1.72	2.355	.68	.16	2.370	.30	.49
2.081	1.56	3.04	2.362	.35	.36	2.350	.52	.52	2.467	-.35	-.54	2.241	1.50	1.63	2.329	.90	.44	2.341	.55	.77
2.007	2.13	3.55	2.455	-.09	-.51	2.467	-.40	-.36	2.433	.06	-.36	2.271	1.23	1.38	2.307	1.07	.72	2.314	.70	1.09
1.927	2.63	4.22	2.397	.15	.07	2.412	.05	.04	2.329	.76	.69	2.302	.96	1.12	2.276	1.33	1.07	2.281	.88	1.44
1.957	2.45	3.97	2.314	.55	.84	2.309	.74	.95	2.231	1.44	1.65	2.322	.79	.93	2.244	1.62	1.40	2.275	1.02	1.39
2.030	1.97	3.38	2.201	1.09	1.94	2.203	1.46	1.91	2.133	2.47	2.25	2.356	.51	.58	2.217	1.89	1.61	2.253	1.15	1.58
2.122	1.37	2.64	2.096	2.09	2.50	2.118	2.03	2.71	2.040	3.45	2.84	2.387	.35	.21	2.199	2.16	1.63	2.231	1.27	1.78
2.194	.95	2.02	1.974	3.14	3.37	2.006	3.00	3.58				2.423	.11	-.09	2.163	2.42	1.89	2.210	1.37	1.96
2.304	.47	.94	1.883	3.81	4.16	1.906	3.97	4.28				2.450	-.06	-.28	2.125	2.70	2.13	2.198	1.45	2.08
2.373	.22	.24													2.103	2.92	2.21	2.156	1.61	2.48
2.449	-.14	-.42																2.147	1.69	2.53
																		2.118	1.80	2.81

(h) $x = 0.975$; $\beta_{0.75R} = 45^\circ$; $B = 2$

1.922	3.69	3.57	2.475	-0.12	-0.38	1.844	5.00	4.42	1.979	5.25	2.43	2.456	-0.19	0.15	2.449	-0.26	0.16	2.459	-0.53	0.37
2.002	3.09	3.01	2.418	.23	.07	1.923	4.73	3.64	2.071	4.10	2.04	2.421	.10	.33	2.422	-.09	.31	2.431	-.10	.35
2.096	2.33	2.41	2.299	.97	1.00	1.992	3.95	3.22	2.132	3.29	1.81	2.391	.28	.39	2.393	.29	.33	2.408	.11	.49
2.191	1.59	1.78	2.183	1.84	1.81	2.054	3.23	2.76	2.177	2.58	1.77	2.362	.57	.80	2.370	.43	.53	2.389	.28	.61
2.313	.91	.73	2.066	3.06	2.33	2.142	2.48	2.24	2.246	1.87	1.34	2.342	.82	.93	2.349	.72	.59	2.355	.54	.91
2.409	.33	0	1.966	4.24	2.75	2.222	1.72	1.72	2.303	1.24	1.02	2.313	1.09	1.17	2.326	1.16	.62	2.324	.70	1.28
2.449	.02	-.21	1.853	5.14	3.59	2.299	1.15	1.07	2.376	.48	.57	2.279	1.37	1.49	2.292	1.41	1.05	2.294	1.04	1.45
2.379	.53	.22	1.861	5.02	3.60	2.378	.48	.51	2.427	.12	.05	2.259	1.66	1.54	2.275	1.72	1.08	2.269	1.25	1.62
2.346	.66	.54	1.900	4.57	3.51	2.483	-.59	-.03	2.480	-.34	-.43	2.230	2.05	1.64	2.244	2.12	1.29	2.237	1.48	1.85
2.265	1.12	1.20	2.026	3.67	2.34	2.428	-.05	.26	2.457	-.17	-.18	2.208	2.33	1.73	2.220	2.56	1.27	2.218	1.62	1.97
2.233	1.26	1.51	2.128	2.34	2.12	2.361	.52	.73	2.400	.27	.36	2.181	2.50	1.99	2.203	2.83	1.27	2.194	1.86	2.06
2.147	1.88	2.12	2.242	1.40	1.39	2.262	1.40	1.41	2.335	.76	.97	2.167	2.67	2.04	2.177	3.06	1.42	2.152	2.03	2.47
2.063	2.54	2.68	2.355	.75	.44	2.182	1.97	2.11	2.271	1.49	1.31	2.136	2.86	2.33	2.154	3.24	1.55	2.141	2.09	2.55
1.977	3.24	3.22	2.457	-.07	-.17	2.118	2.73	2.33	2.229	2.02	1.46	2.114	3.11	2.42	2.133	3.45	1.64			
						2.043	3.44	2.89	2.173	2.70	1.72	2.094	3.39	2.43	2.111	3.68	1.70			
						1.960	4.38	3.36	2.109	3.53	1.96	2.071	3.54	2.63	2.092	3.86	1.77			
						1.898	4.95	3.77	2.057	4.27	2.10									
									2.008	4.80	2.40									

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TABLE 6

BLADE SECTION ANGLE OF ATTACK

NACA 10-(0)(066)-03 PROPELLER - Concluded

(i) $x = 0.85$; $\beta_{0.75R} = 45^{\circ}$; $B = 1$

M = 0.56			1500 rpm			M = 0.56			M = 0.58			M = 0.60			M = 0.62		
J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x	J	α_{i_T}	α_x
2.333	1.20	0.13	2.234	1.14	1.73	2.333	1.08	0.43	2.311	1.25	0.51	2.392	0.45	-0.19	2.389	0.26	0.10
2.270	1.26	1.13	2.169	1.55	2.37	2.304	1.20	.83	2.260	1.67	1.10	2.325	.87	.55	2.332	1.16	.18
2.201	1.32	2.21	2.118	2.06	2.69	2.276	1.36	1.16	2.189	2.45	1.54	2.254	1.50	1.33	2.253	1.95	.86
2.155	1.42	2.86	2.067	2.29	3.28	2.244	1.53	1.54	2.165	2.58	1.77	2.219	1.82	1.65	2.224	2.15	1.15
2.123	1.50	3.31	2.014	2.70	3.75	2.226	1.62	1.76	2.148	2.80	1.81	2.171	2.18	2.02	2.192	2.40	1.38
2.087	1.52	3.85	1.971	2.90	4.29	2.200	1.90	1.90	2.117	2.92	2.12	2.149	2.29	2.20	2.171	2.45	1.64
2.062	1.58	4.19	1.920	3.30	4.76	2.173	2.01	2.23	2.095	3.11	2.23	2.120	2.60	2.30	2.133	2.62	2.00
2.032	1.60	4.65	1.849	3.67	5.34	2.151	2.24	2.35	2.076	3.36	2.26	2.092	2.80	2.48	2.115	2.78	2.07
2.003	1.68	5.01				2.132	2.39	2.50	2.053	3.60	2.33	2.069	3.00	2.59	2.083	2.96	2.32
1.976	1.76	5.35				2.110	2.75	2.47	2.031	3.85	2.38	2.037	3.25	2.77	2.056	3.10	2.53
1.955	1.91	5.52				2.091	3.02	2.48	2.012	4.02	2.47	2.018	3.35	2.92	2.028	3.33	2.68
1.937	2.00	5.69				2.051	3.40	2.69	1.992	4.24	2.53	1.998	3.59	2.96	1.993	3.53	2.95
1.912	2.10	5.97				2.040	3.55	2.70	1.974	4.56	2.46	1.977	3.87	2.86			
1.892	2.34	6.01				2.025	3.93	2.53	1.948	5.00	2.38	1.956	4.28	2.83			
									1.930	5.27	2.36	1.933	4.48	2.94			

TABLE 7

FUNCTION $x \frac{dF}{dx}$ AGAINST x

$\left[J = 2.0\right]$

x \ x_1	0.1564	0.3090	0.4540	0.5878	0.7071	0.8090	0.8910	0.9511	0.9877	1.0000
0.1564	∞	0.8741	0.4014	0.2571	0.1950	0.1694	0.1496	0.1419	0.1384	0.1374
.2170		2.0280	.6950	.4068	.2937	.2400	.2125	.1982	.1913	.1892
.2500		3.6757	.9295	.5103	.3572	.2862	.2500	.2310	.2217	.2190
.2840		10.0019								
.3090	-2.0087	∞	1.6227	.7568	.4956	.3820	.3252	.2955	.2810	.2766
.3340		-12.2616								
.4290			13.6107							
.4540	-1.4906	-2.9126	∞	2.3247	1.1131	.7480	.5887	.5100	.4725	.4613
.4790			-15.9764							
.5628				16.0892						
.5878	-1.3003	-1.9162	-3.7214	∞	3.0838	1.5263	1.0583	.8586	.7694	.7434
.6128				-18.4672						
.6821					17.7593					
.7071	-1.1948	-1.5617	-2.3138	-4.5428	∞	4.0382	2.0833	1.5072	1.2834	1.2216
.7321					-20.0908					
.7840						18.8784				
.8090	-1.1265	-1.3765	-1.8289	-2.7571	-5.5429	∞	5.4385	2.9687	2.2948	2.1284
.8340						-21.1419				
.8660							19.6181			
.8910	-1.0803	1.2659	-1.5887	-2.1631	-3.3538	-6.9988	∞	7.8916	4.7249	4.1448
.9160							-21.8156			
.9261								20.0860		
.9511	-1.0500	-1.1986	-1.4567	-1.8874	-2.6601	-4.3067	-9.5423	∞	13.6321	10.0534
.9761								-22.2313	44.9243	
.9827									105.6547	
.9877	-1.0327	-1.1620	-1.3888	-1.7566	-2.3767	-3.5377	-6.1846	-15.4497	∞	42.4728
.9927									-108.3835	
.9977							-5.6625	-12.3003	-54.7402	231.9840
1.0000	-1.0270	-1.1503	-1.3676	-1.7174	-2.2964	-3.3433	-5.5558	-11.7568	-44.6943	∞

TABLE 8

FUNCTION $-x \frac{dQ}{dx}$ AGAINST x

$\left[J = 2.0\right]$

x \ x_1	0.1564	0.3090	0.4540	0.5878	0.7071	0.8090	0.8910	0.9511	0.9877	1.00
0.1564	0.0038	0.0113	0.0208	0.0300	0.0389	0.0450	0.0523	0.0582	0.0622	0.0633
.3090	.0160	.0318	.0489	.0627	.0742	.0809	.0918	.0982	.1021	.1032
.4540	.0348	.0610	.0822	.0969	.1102	.1168	.1279	.1339	.1379	.1396
.5878	.0541	.0901	.1171	.1310	.1459	.1530	.1613	.1672	.1720	.1742
.7071	.0728	.1177	.1460	.1621	.1777	.1861	.1930	.2001	.2053	.2080
.8090	.0875	.1390	.1683	.1881	.2030	.2138	.2211	.2299	.2359	.2383
.8910	.0996	.1529	.1859	.2081	.2230	.2357	.2459	.2569	.2628	.2656
.9511	.1094	.1631	.1990	.2219	.2378	.2509	.2661	.2780	.2832	.2871
.9877	.1149	.1682	.2069	.2308	.2441	.2590	.2781	.2918	.2960	.2999
1.00	.1160	.1708	.2092	.2336	.2469	.2611	.2829	.2960	.3002	.3043

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TABLE 9

FUNCTION $-x \frac{dP}{dx}$ AGAINST x

$\left[J = 2.0 \text{ for } B = 2\right]$

x \ x_1	0.1564	0.3090	0.4540	0.5878	0.7071	0.8090	0.8910	0.9511	0.9877	1.00
0.1564	0.510	0.277	0.185	0.132	0.098	0.080	0.067	0.059	0.057	0.056
.3090	.672	.465	.330	.252	.196	.162	.139	.125	.119	.117
.4540	.726	.565	.432	.345	.281	.233	.204	.186	.172	.167
.5878	.750	.619	.490	.404	.339	.291	.256	.233	.217	.211
.7071	.782	.657	.530	.447	.387	.343	.305	.275	.258	.252
.8090	.824	.693	.578	.495	.434	.390	.349	.313	.294	.289
.8910	.859	.728	.624	.540	.475	.426	.384	.347	.328	.323
.9511	.884	.758	.658	.576	.507	.453	.408	.373	.355	.350
.9877	.897	.780	.684	.600	.528	.469	.424	.394	.375	.368
1.00	.901	.787	.690	.607	.534	.474	.431	.402	.381	.374

TABLE 10

SAMPLE CALCULATION OF INDUCED ANGLE-OF-ATTACK DISTRIBUTION

x_1	0.1564	0.3090	0.4540	0.5878	0.7071	0.8090	0.8910	0.9511	0.9877
c_l	.440	.722	.835	.843	.768	.637	.482	.323	.151
Γ^*	.0945	.1673	.2137	.2391	.2393	.2147	.1728	.1210	.0581
$\Gamma^{*\prime}$	.545	.397	.260	.105	-.111	-.391	-.664	-1.192	2.583
$\Gamma^{*\prime\prime}$	-.582	-1.081	-.983	-1.465	-2.416	-2.711	-5.299	-14.966	-159.69
$\int\left(x\frac{dQ}{dx} + x\frac{dP}{dx}\right)d\Gamma^*$	.110	.132	.136	.132	.127	.122	.117	.113	.110
$\int x\frac{dF}{dx}\,d\Gamma^*$	.133	.222	.488	.760	.933	.963	.947	.669	.216
Δ	-.145	-.009	.001	.024	.065	.094	.180	.471	.895
Σ	.098	.345	.625	.916	1.125	1.179	1.244	1.253	1.221
v_1/V	.0039	.0137	.0249	.0365	.0448	.0469	.0495	.0499	.0486
α_{i_T}	.90	1.62	2.00	2.26	2.31	2.12	2.03	1.91	1.79
α_{i_G}		1.66	2.02	2.15	2.16	2.12	2.08	2.03	2.00
percent error		2.4	1.0	5.1	6.9	0	2.4	5.9	10.5

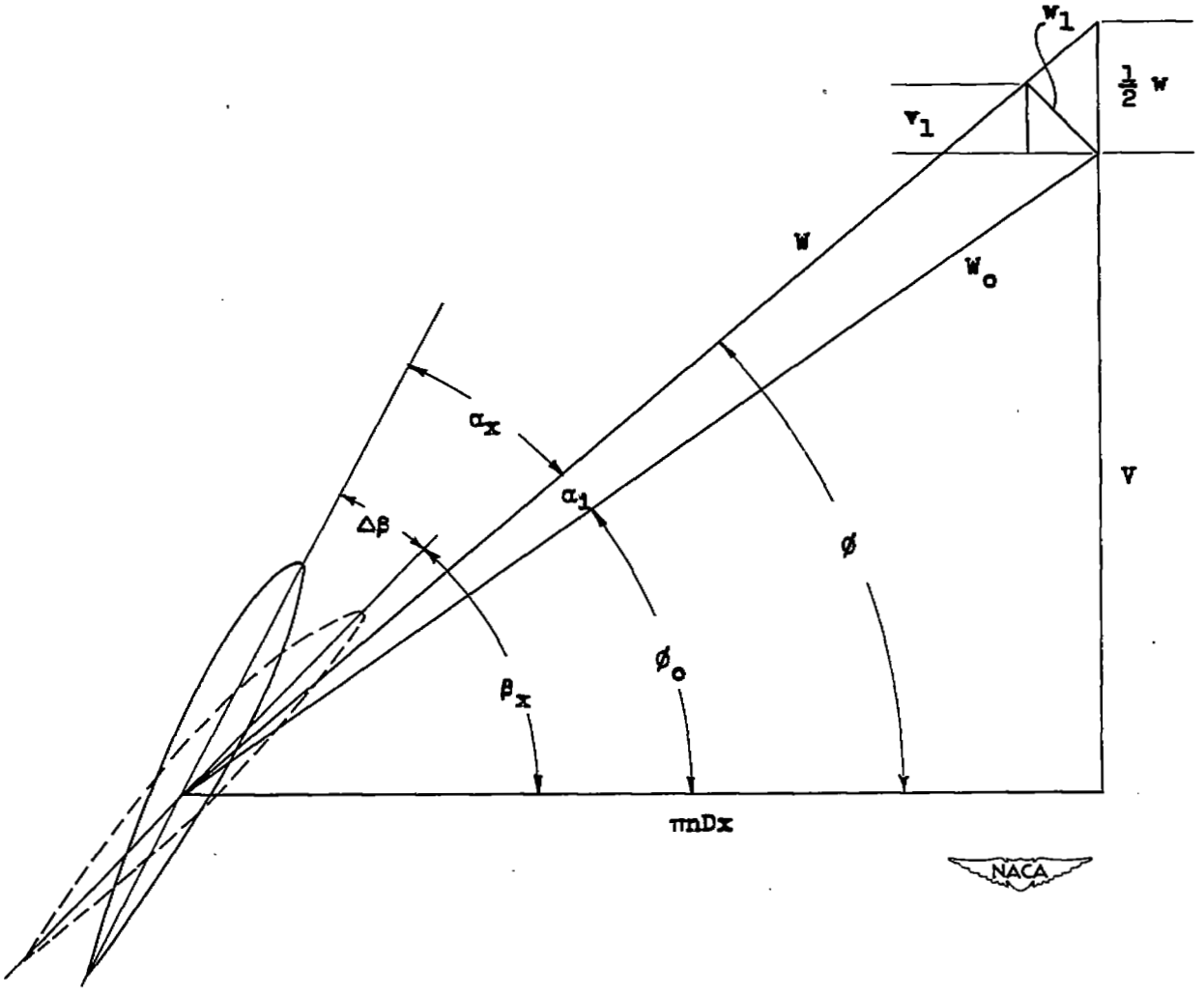


Figure 1.- Velocity vector diagram for a propeller section.

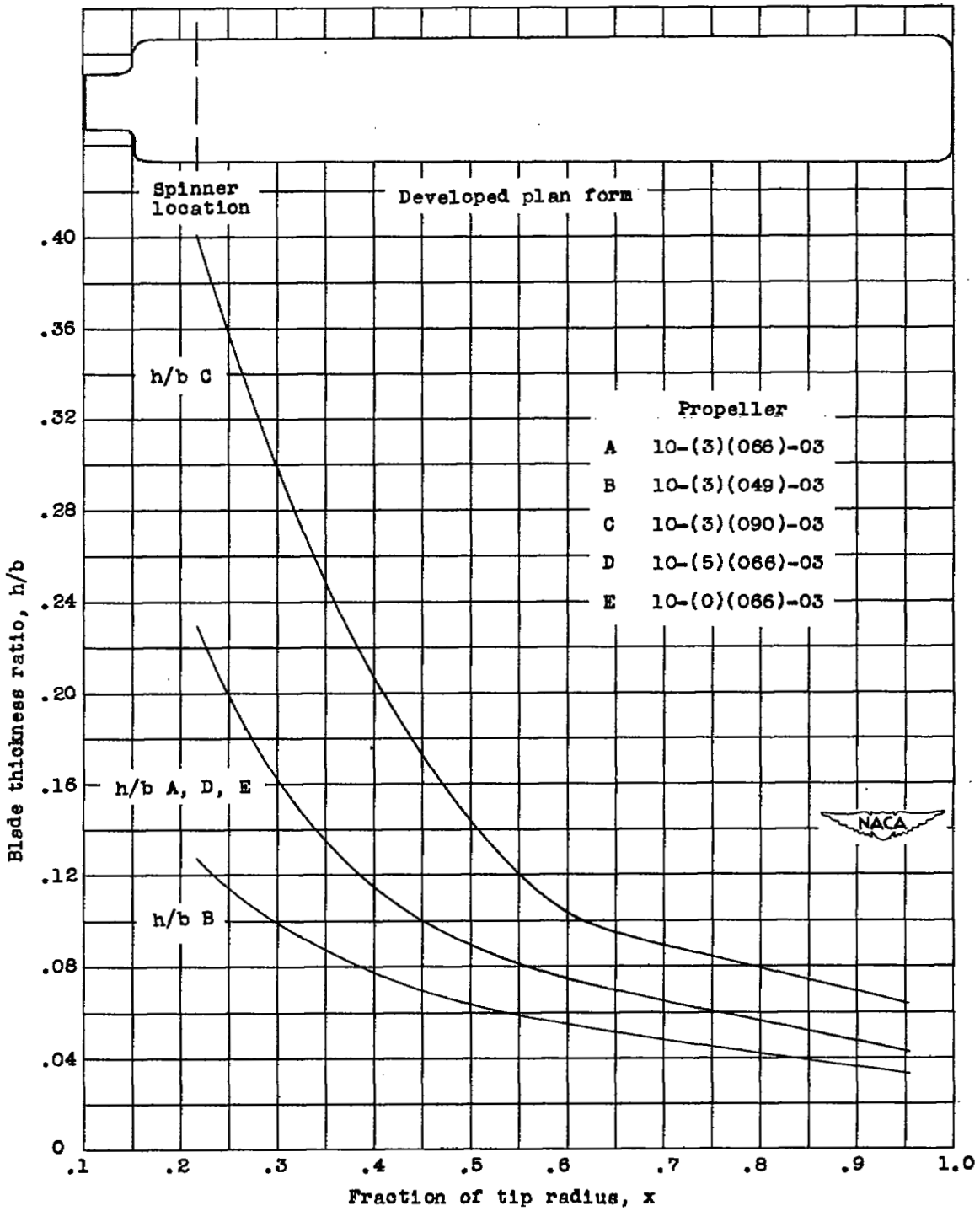
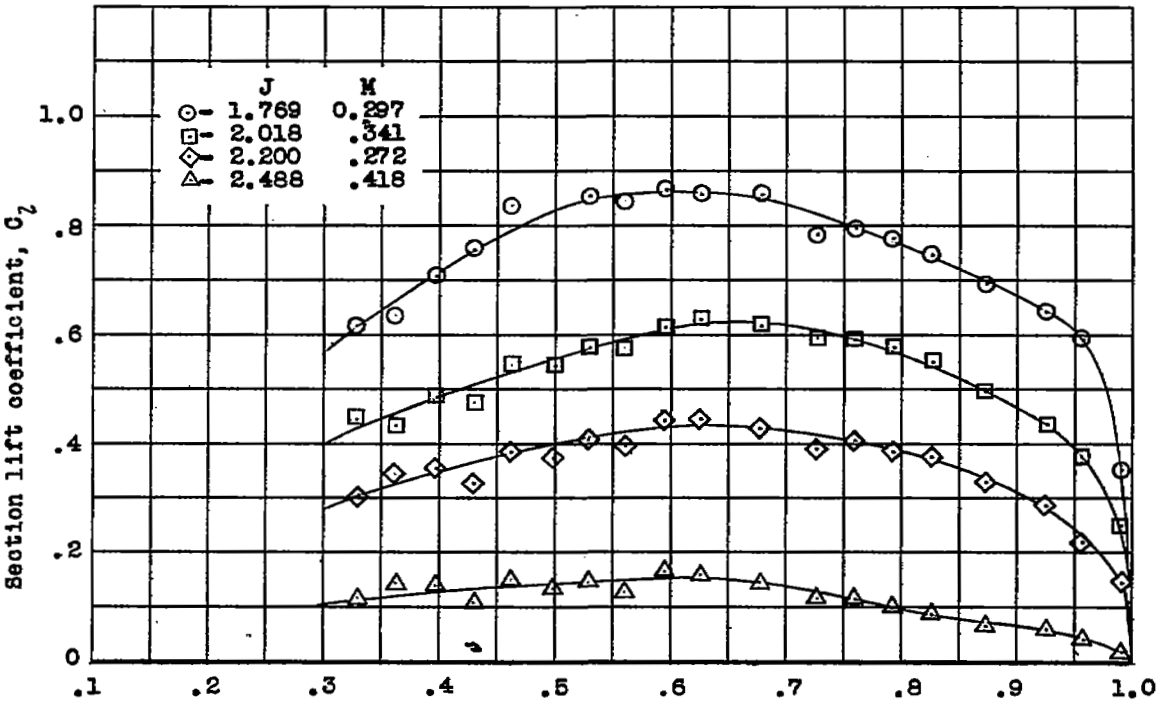
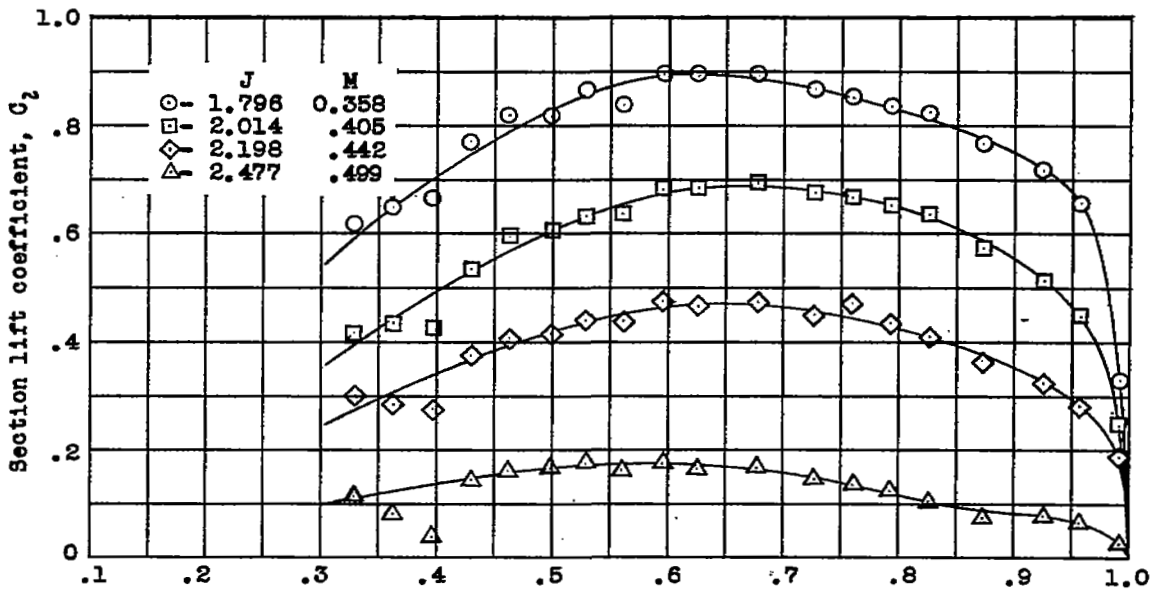


Figure 2.- Propeller-blade-form curves.

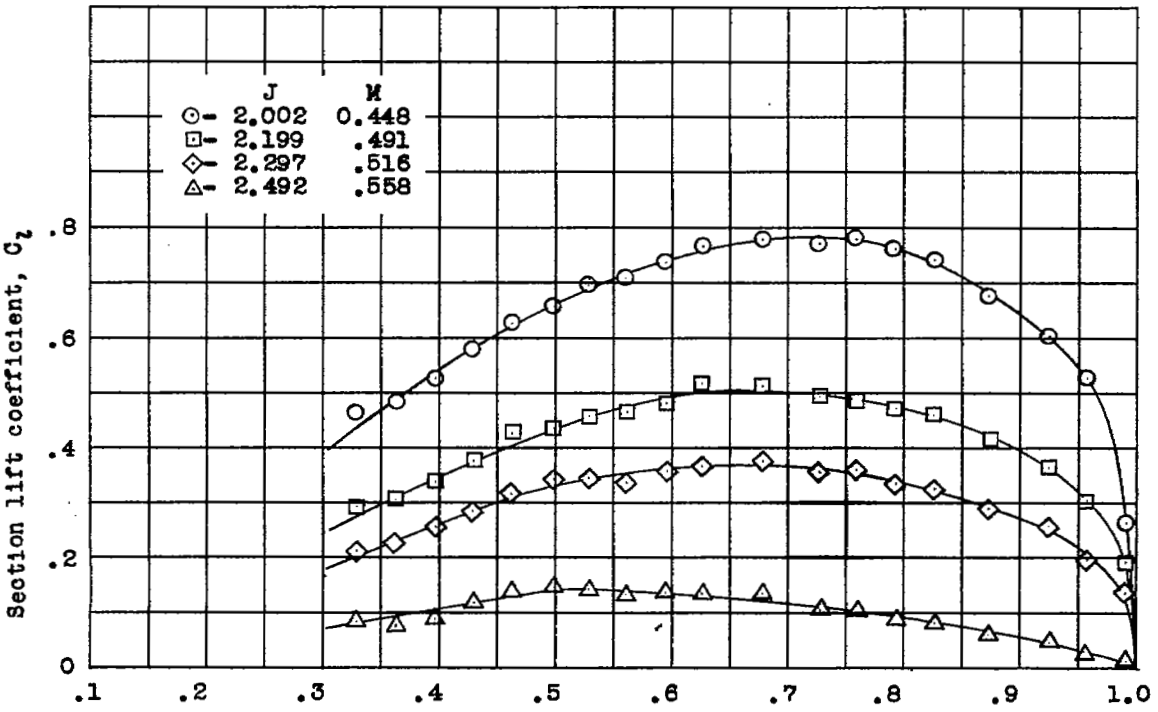


(a) 1140 rpm; B = 2.

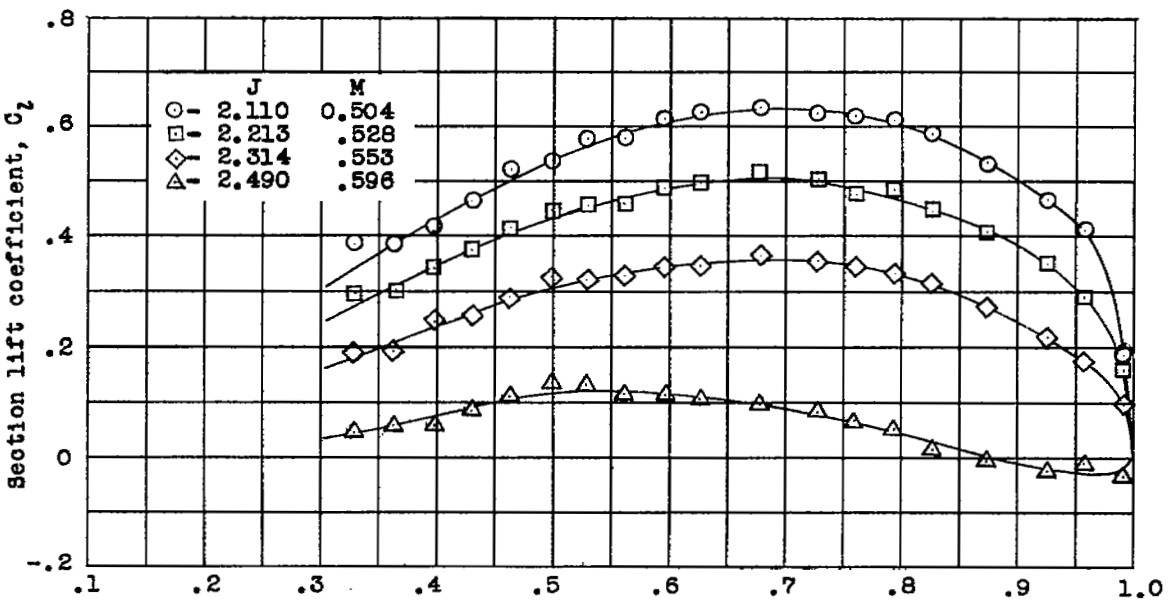


(b) 1350 rpm; B = 2.

Figure 3.- Lift coefficient distribution curve from wake survey. NACA 10-(3)(066)-03; $\beta_{0.75R} = 45^{\circ}$.

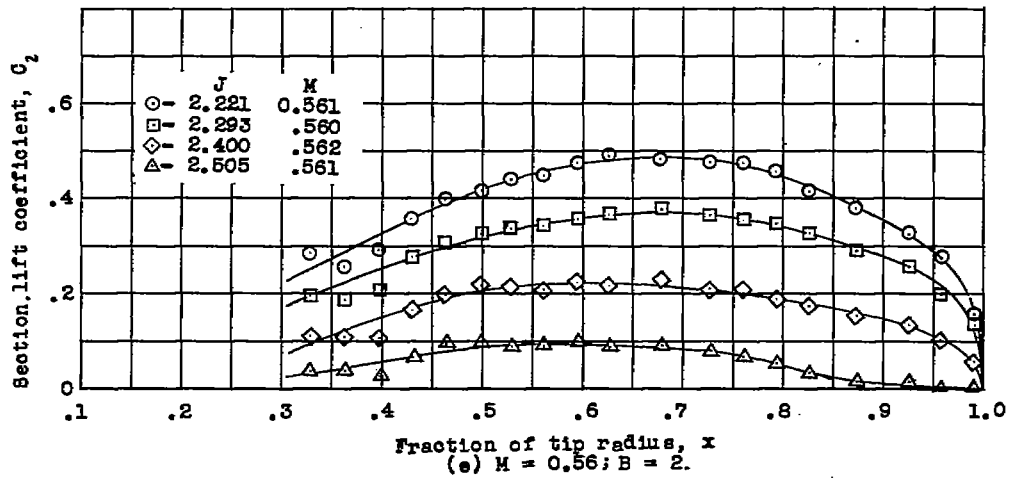


(c) 1500 rpm; B = 2.

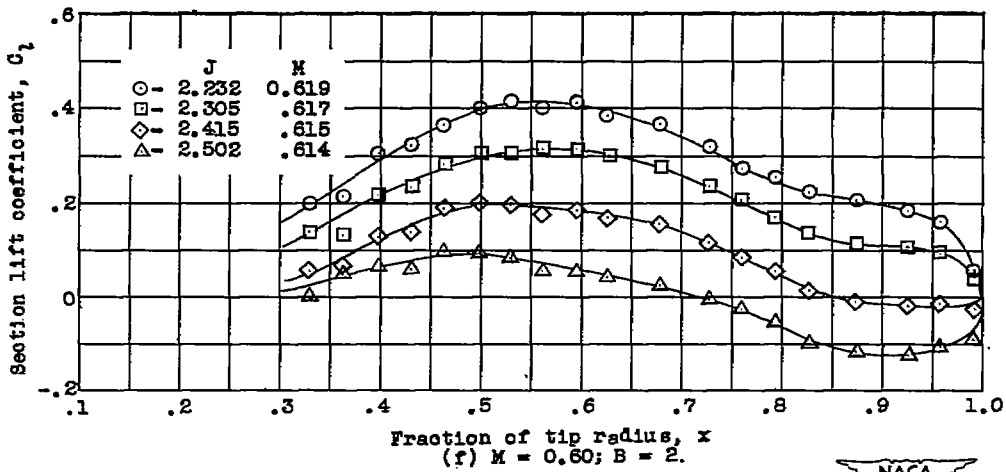


(d) 1600 rpm; B = 2.

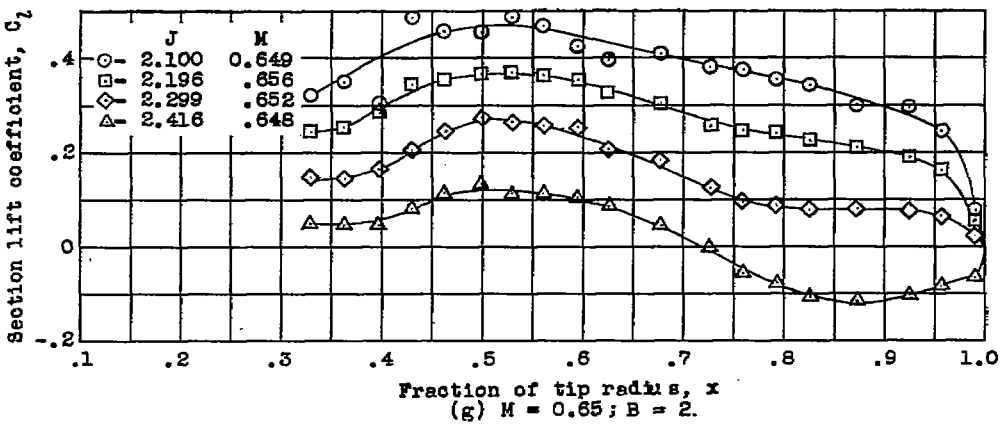
Figure 3.- Continued.



(e) M = 0.56; B = 2.

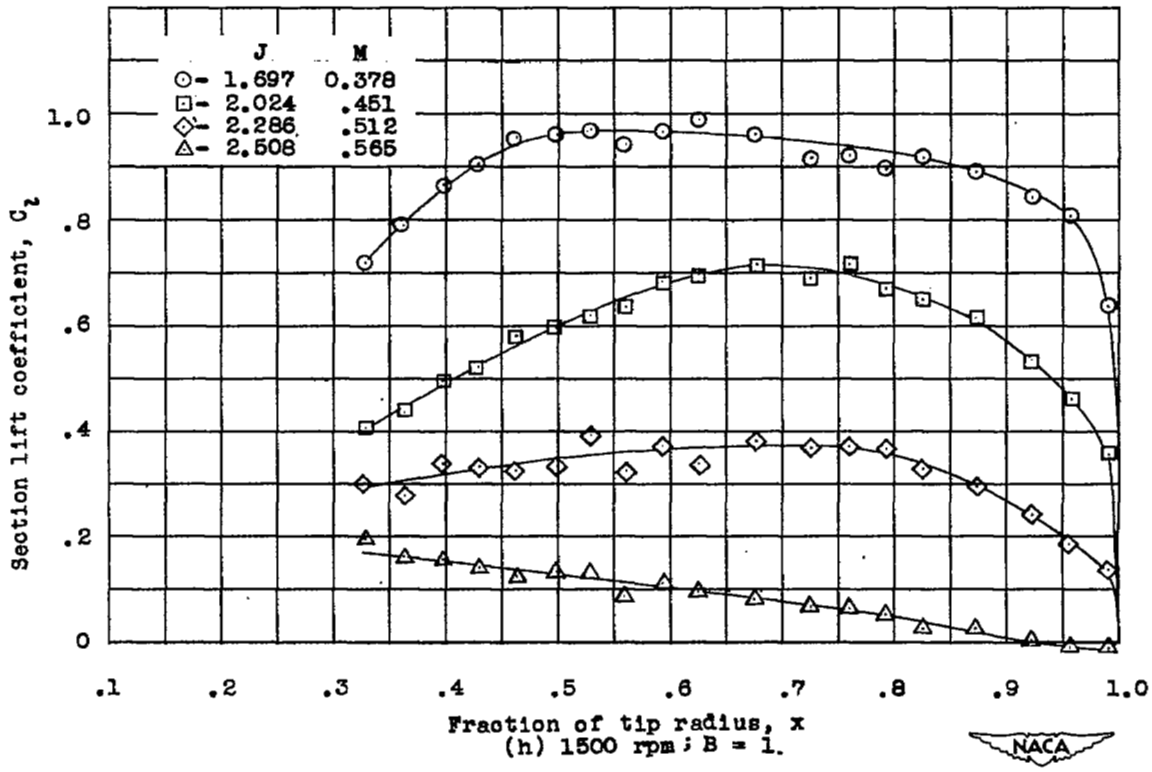


(f) M = 0.60; B = 2.

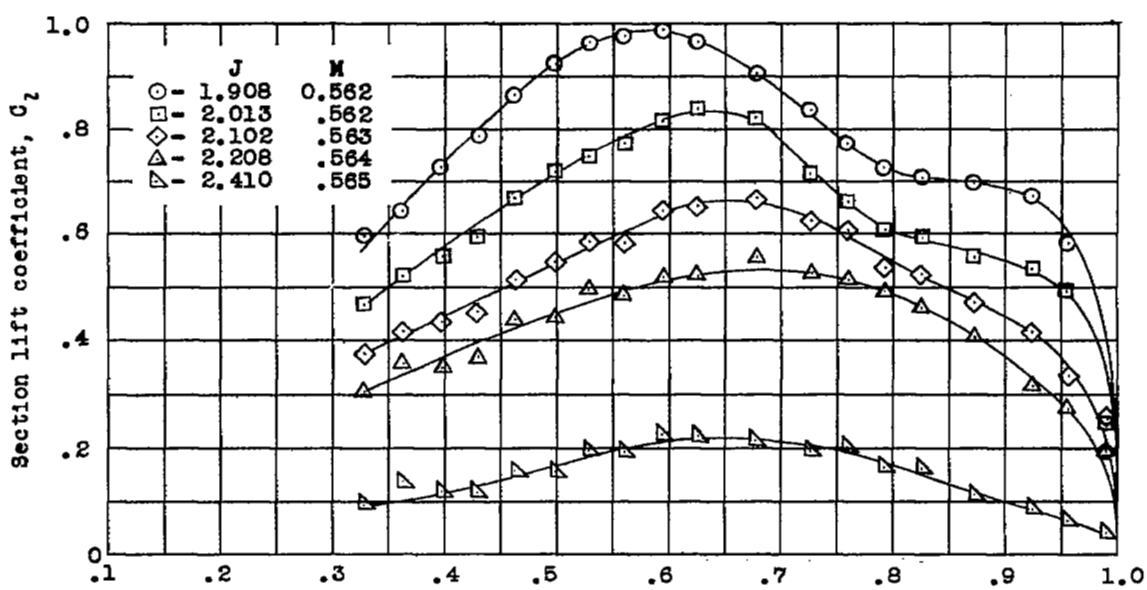


(g) M = 0.65; B = 2.

Figure 3.- Continued.

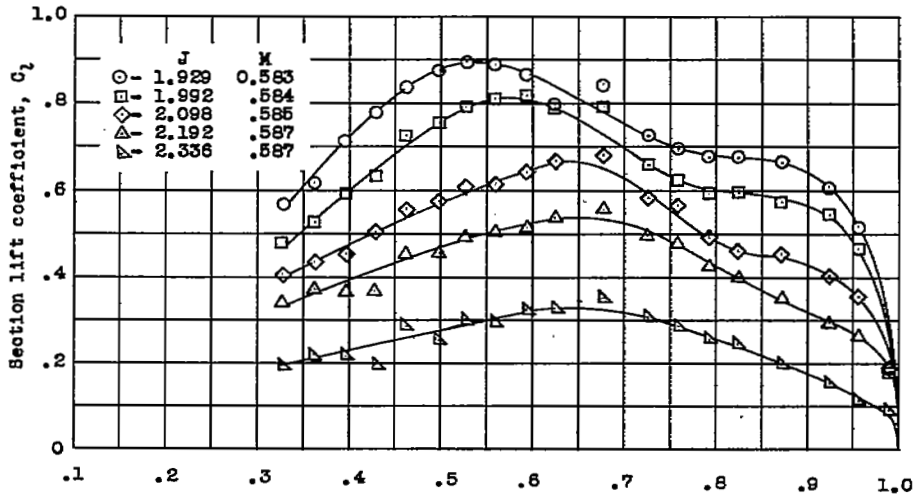


(h) 1500 rpm; B = 1.

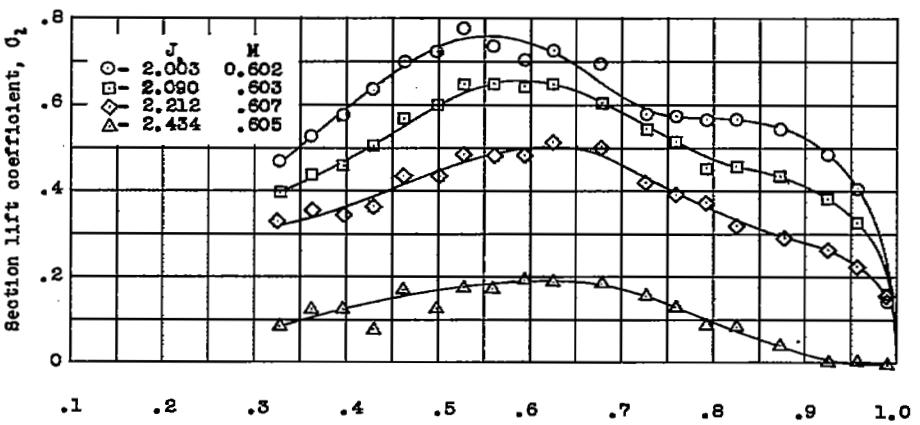


(i) M = 0.56; B = 1.

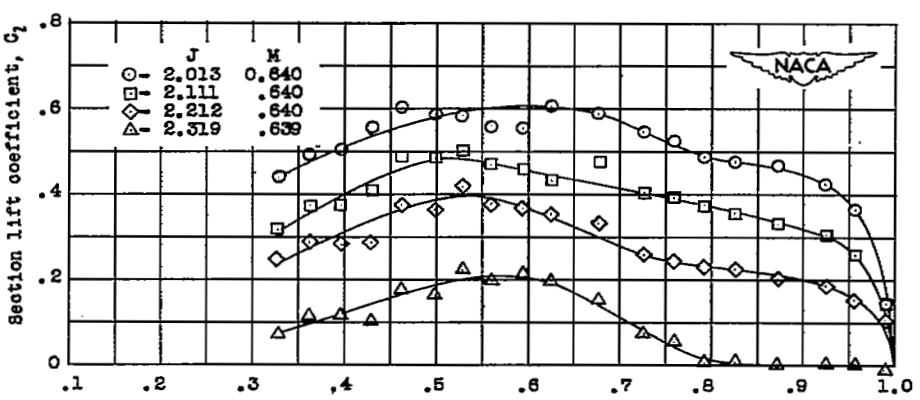
Figure 3.- Continued.



(j) M = 0.58; B = 1.

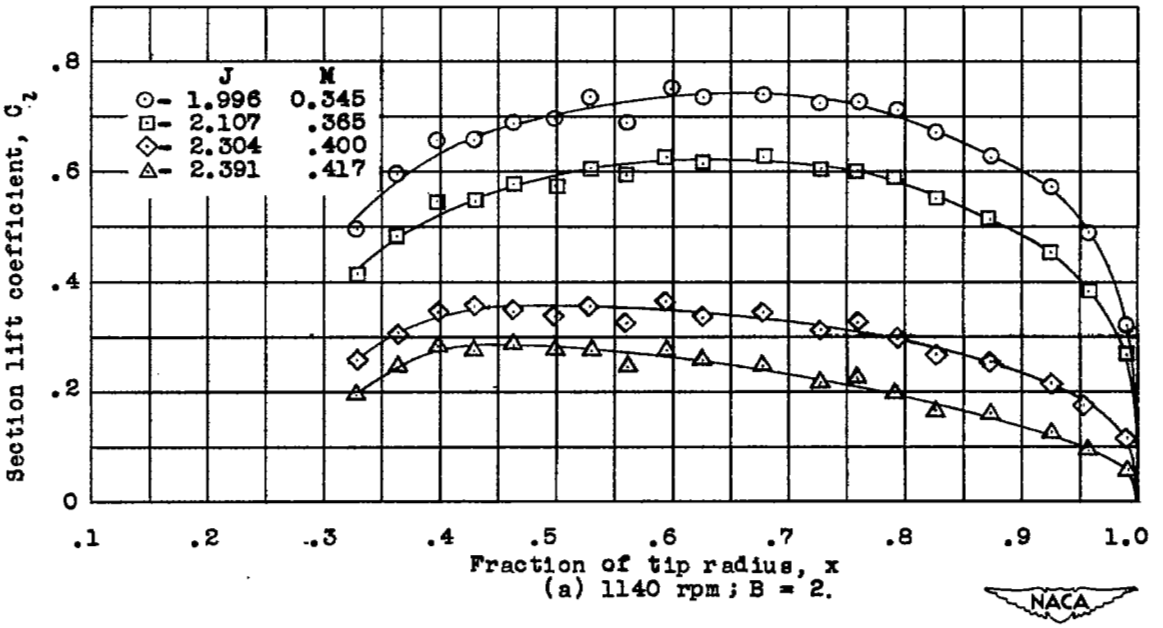


(k) M = 0.60; B = 1.

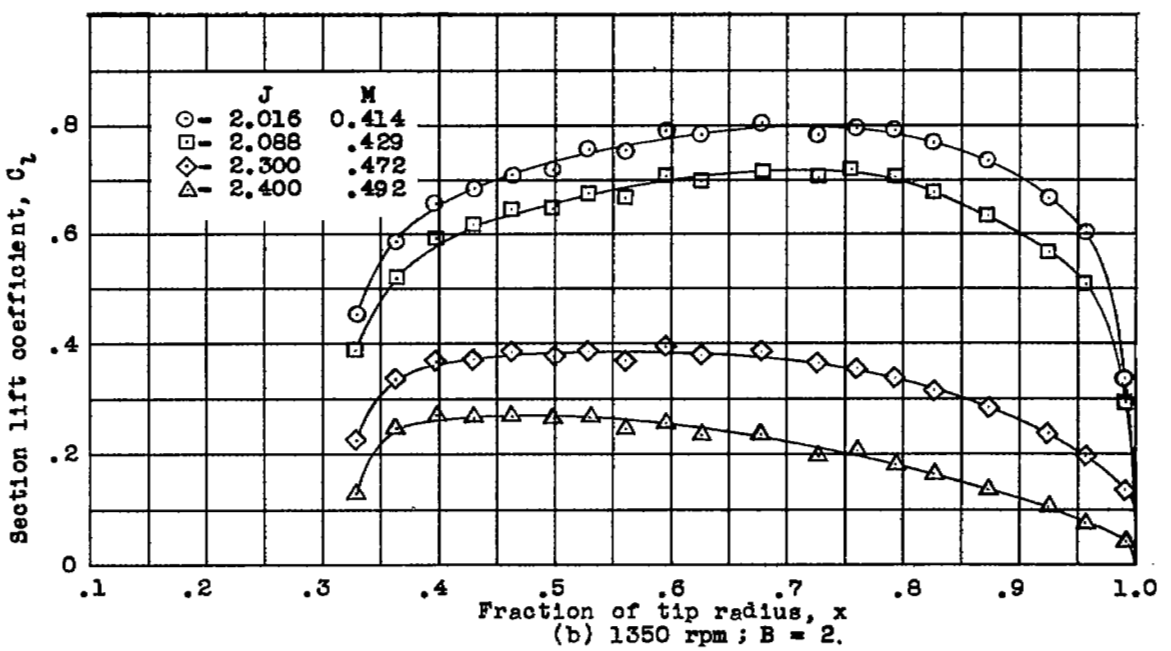


(l) M = 0.65; B = 1.

Figure 3.- Concluded.



(a) 1140 rpm ; B = 2.



(b) 1350 rpm ; B = 2.

Figure 4.- Lift coefficient distribution curve from wake survey. NACA 10-(3)(049)-03; $\beta_{0.75R} = 45^{\circ}$.

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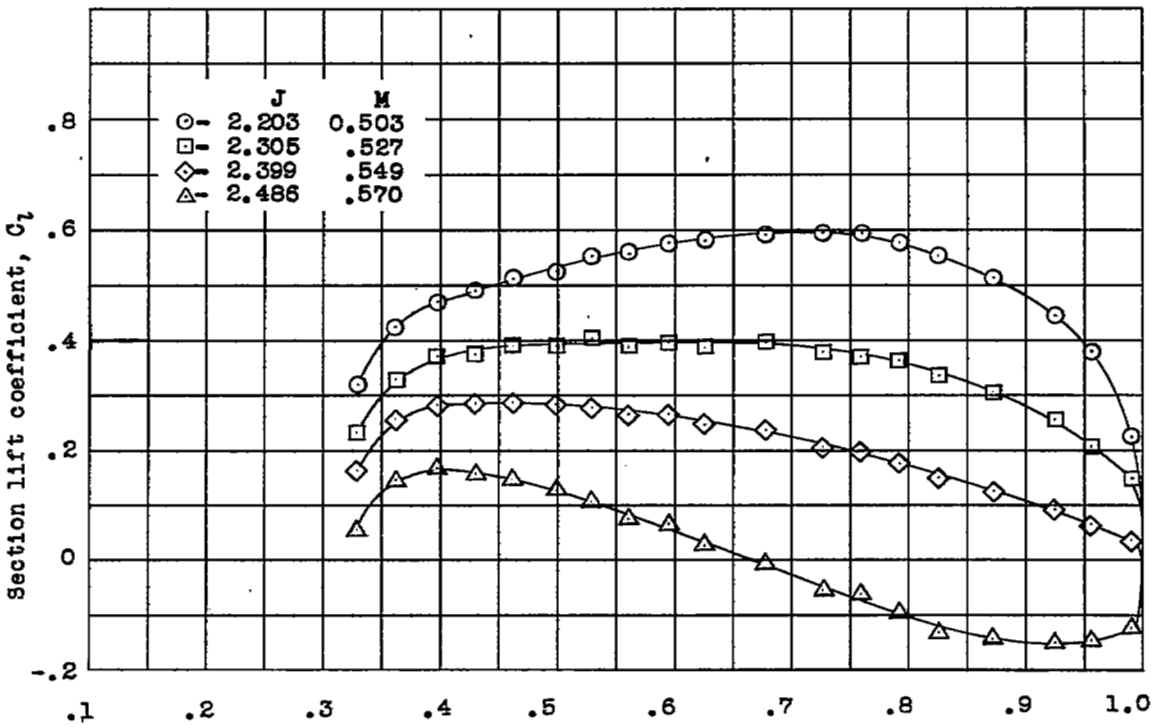
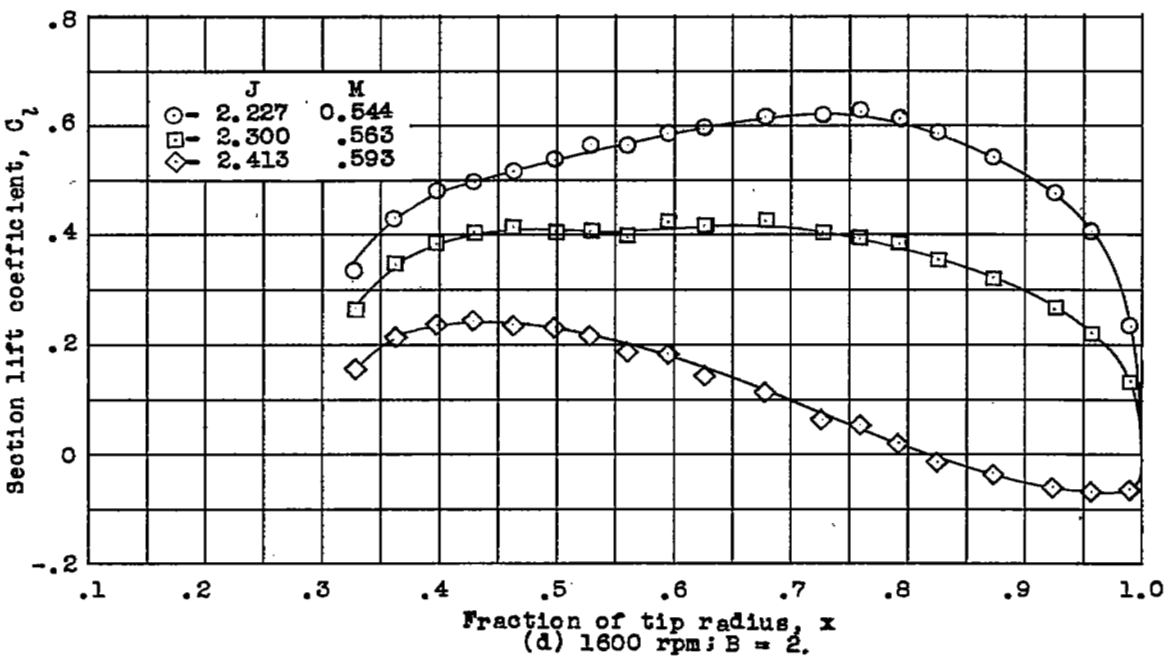
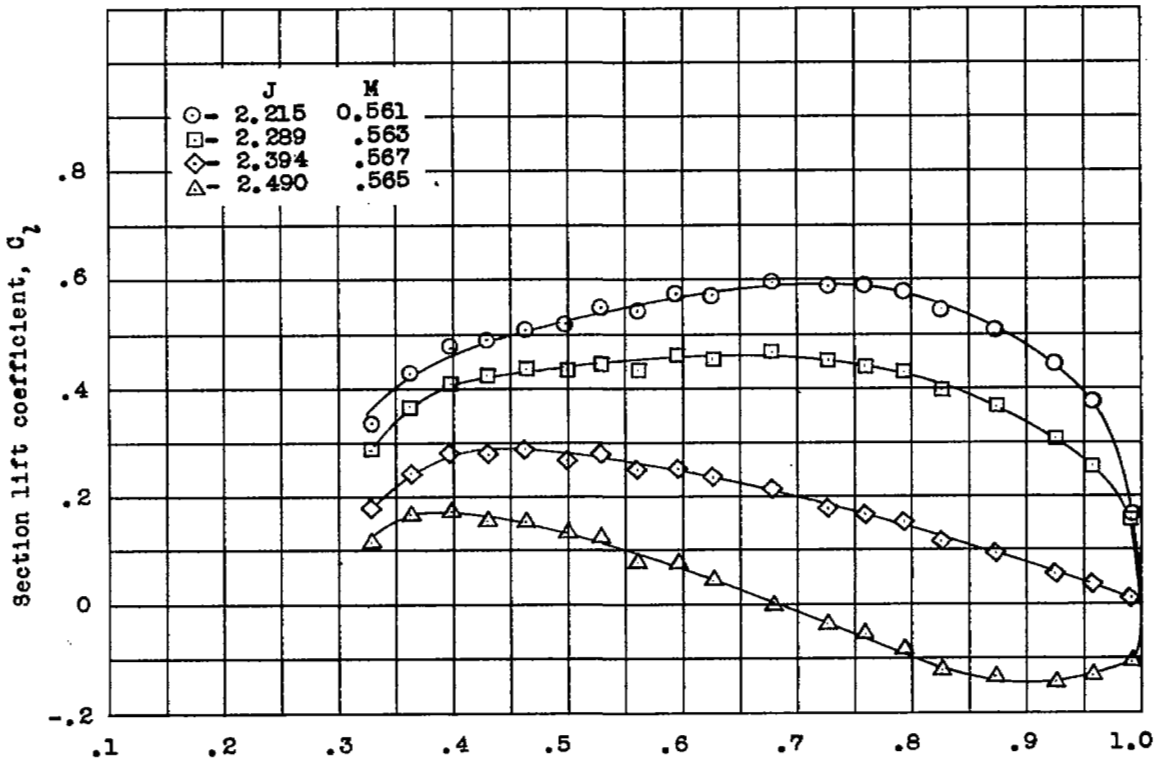


(c) 1500 rpm; B = 2.

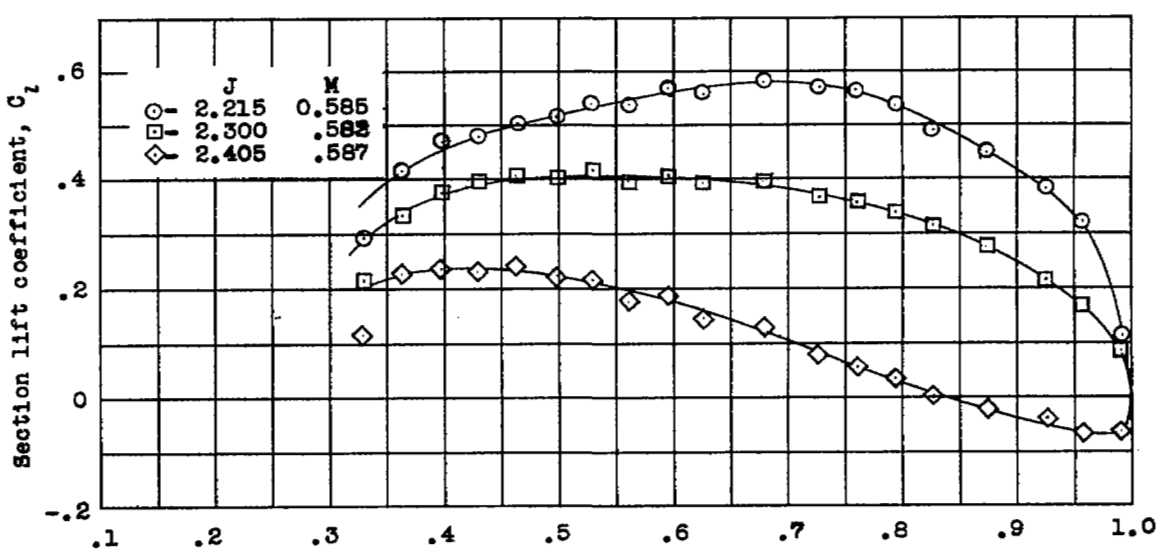


(d) 1600 rpm; B = 2.

Figure 4.- Continued.

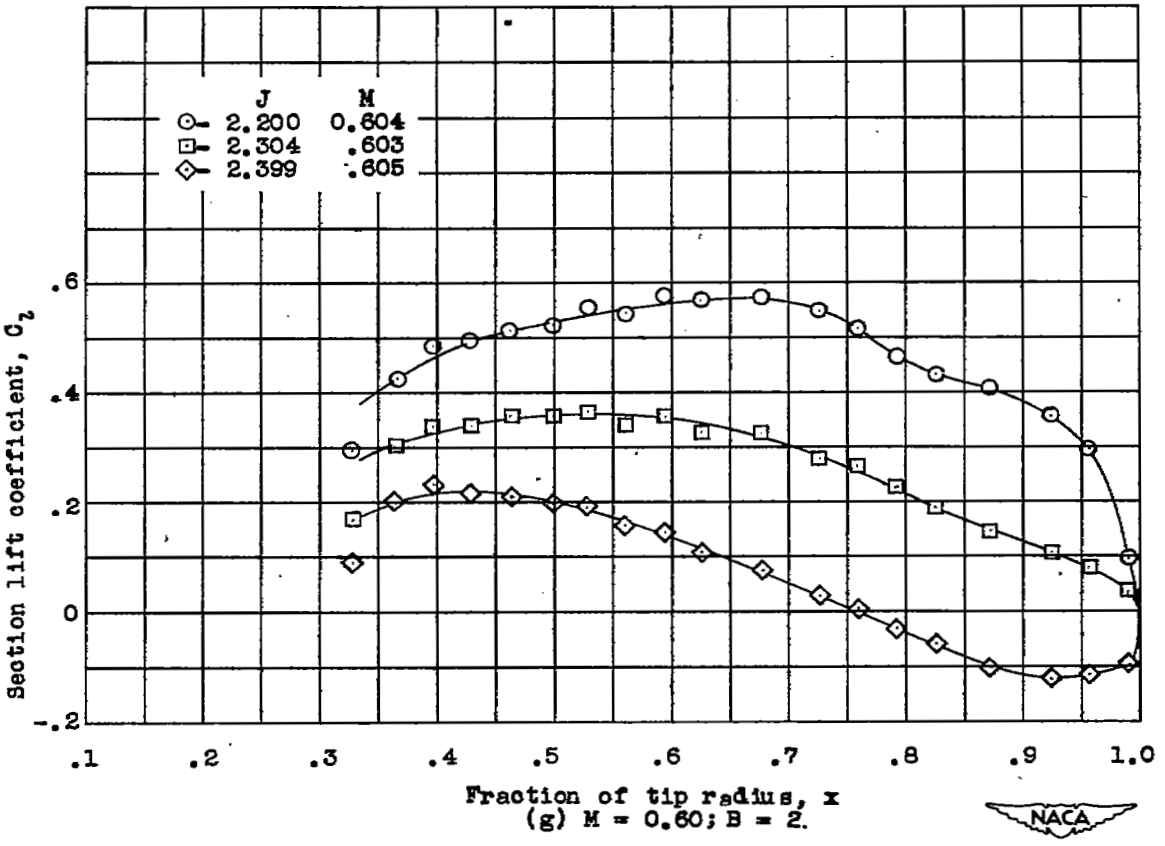


(e) M = 0.56 ; B = 2.

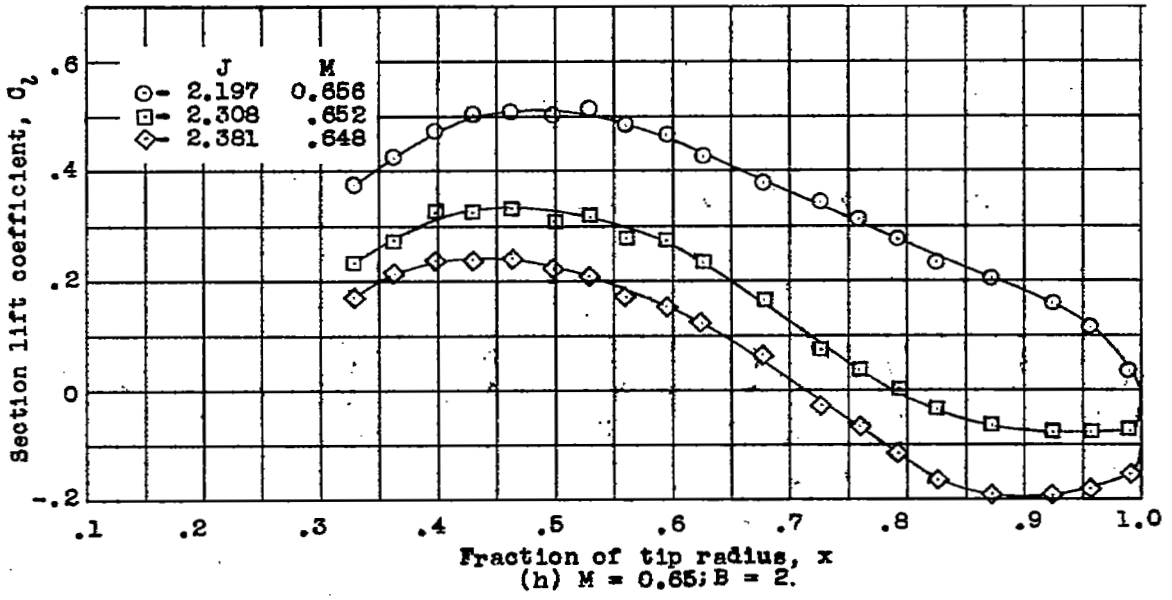


(f) M = 0.58; B = 2.

Figure 4.- Continued.

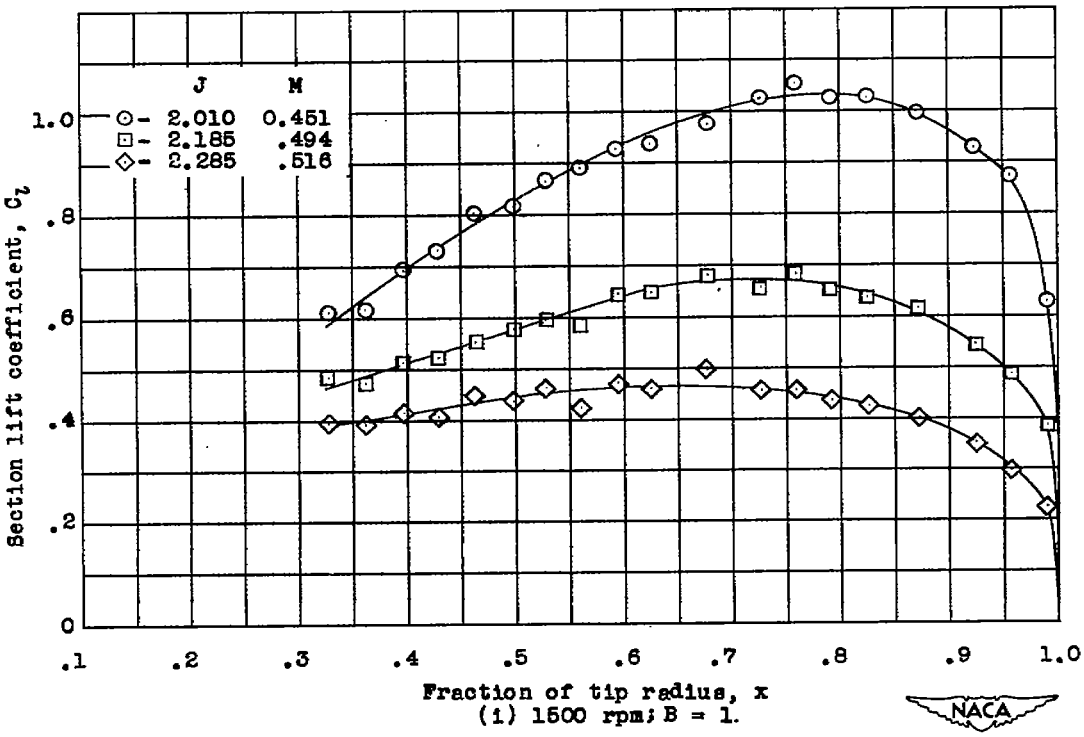


(g) M = 0.60; B = 2.

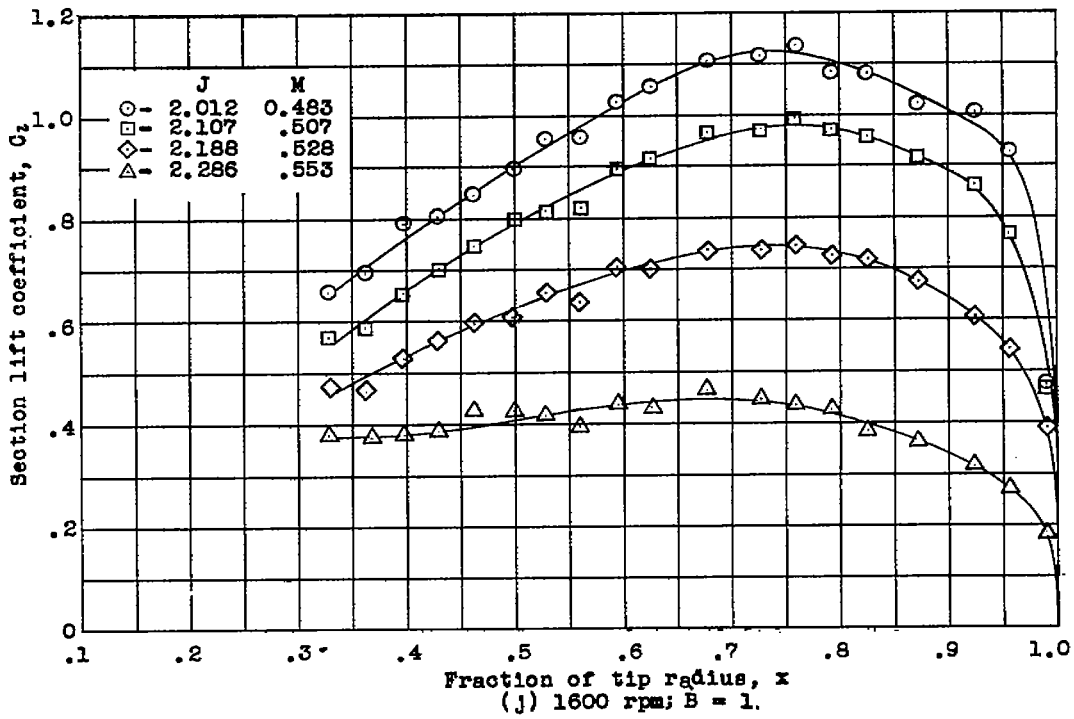


(h) M = 0.65; B = 2.

Figure 4.- Continued.

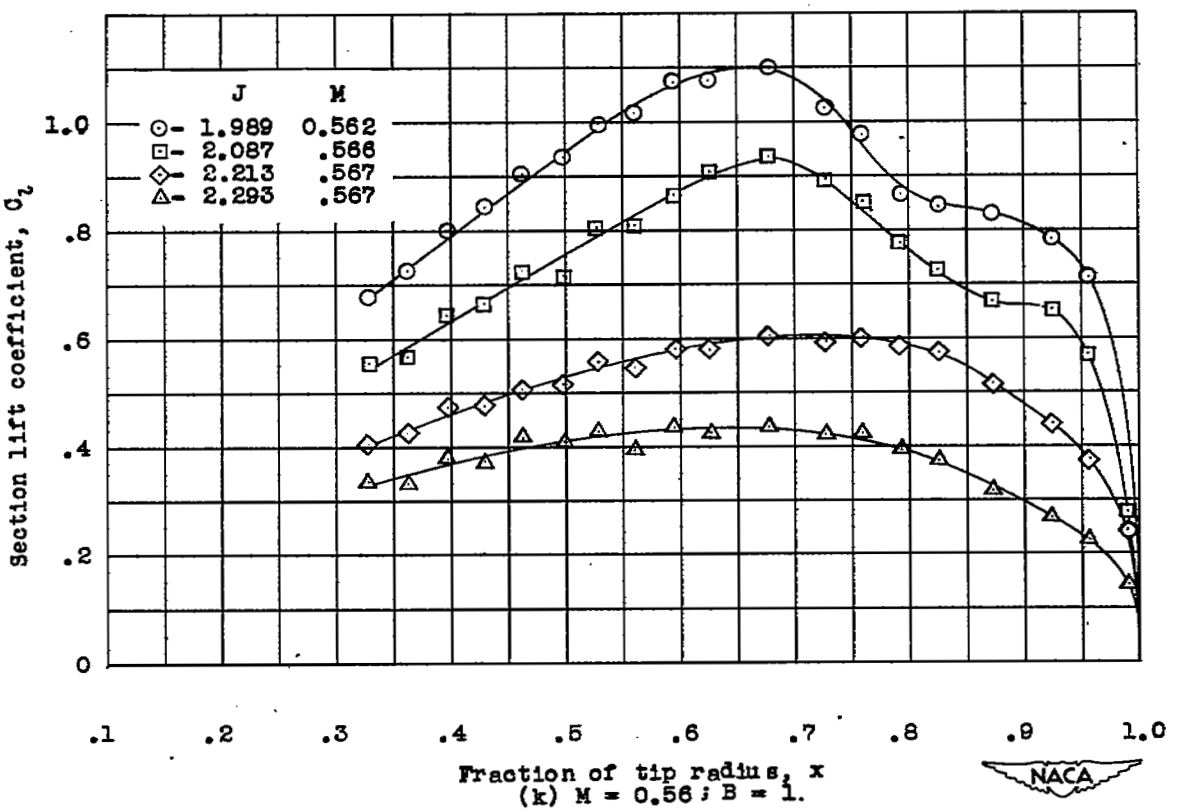


(i) 1500 rpm; B = 1.

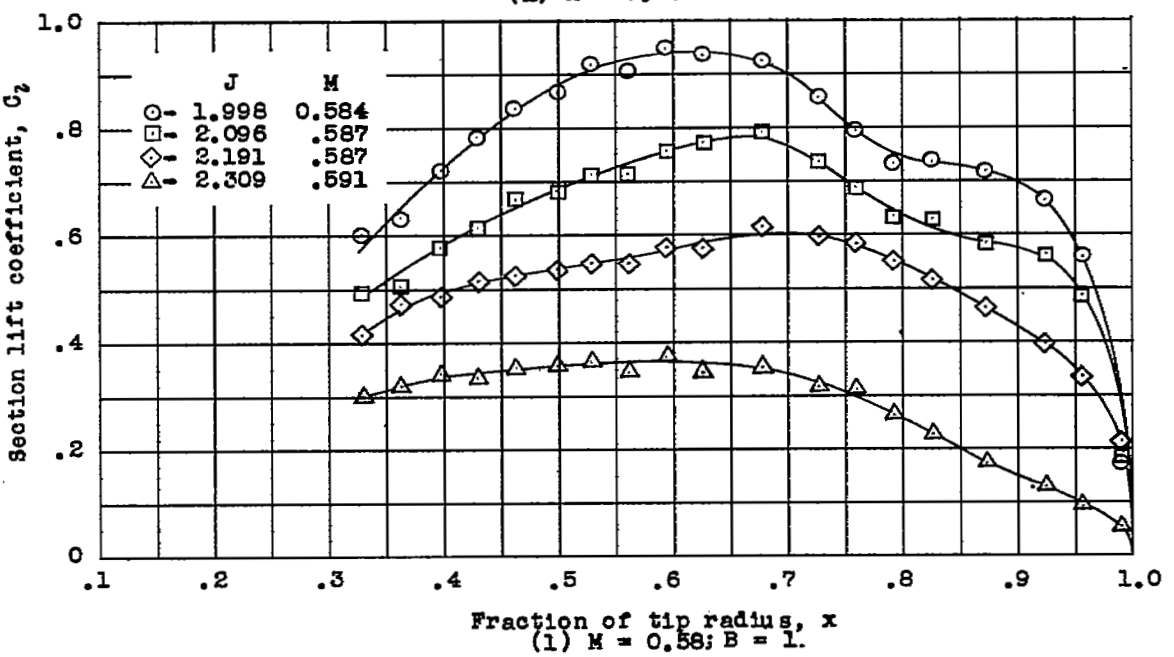


(j) 1600 rpm; B = 1.

Figure 4.- Continued.

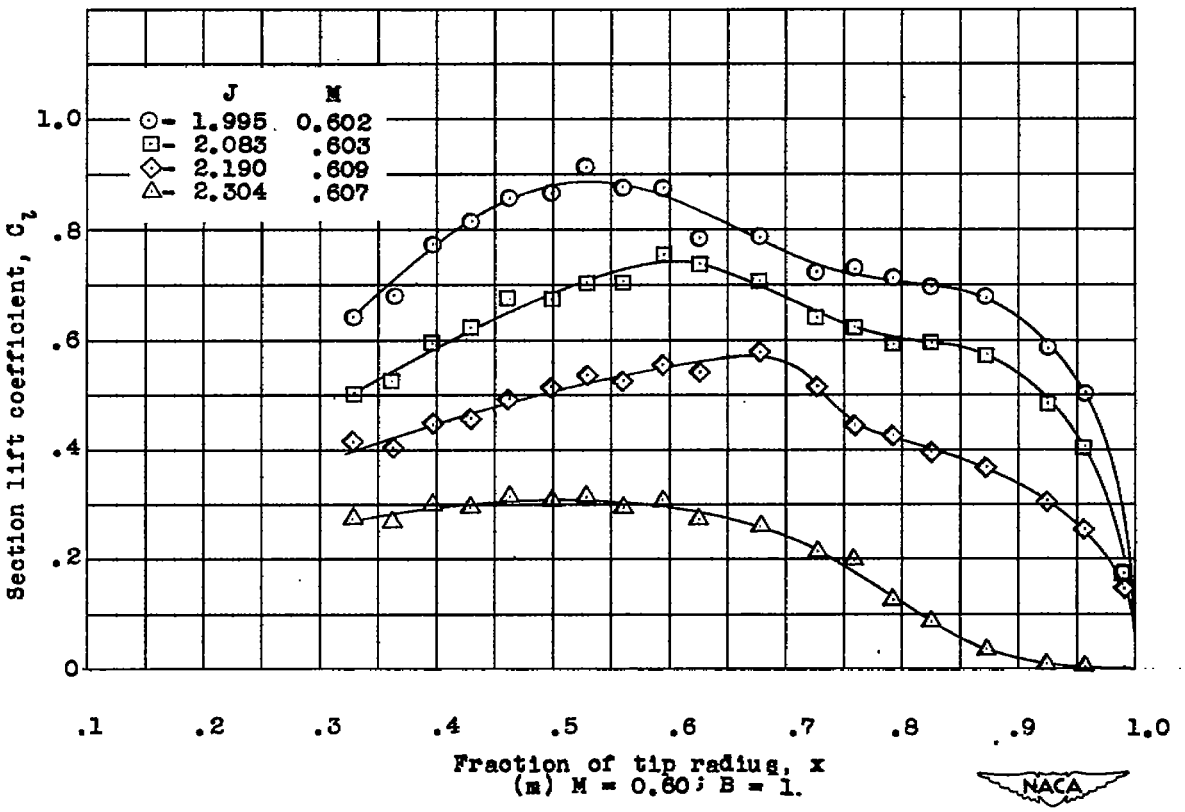


(k) M = 0.56 ; B = 1.

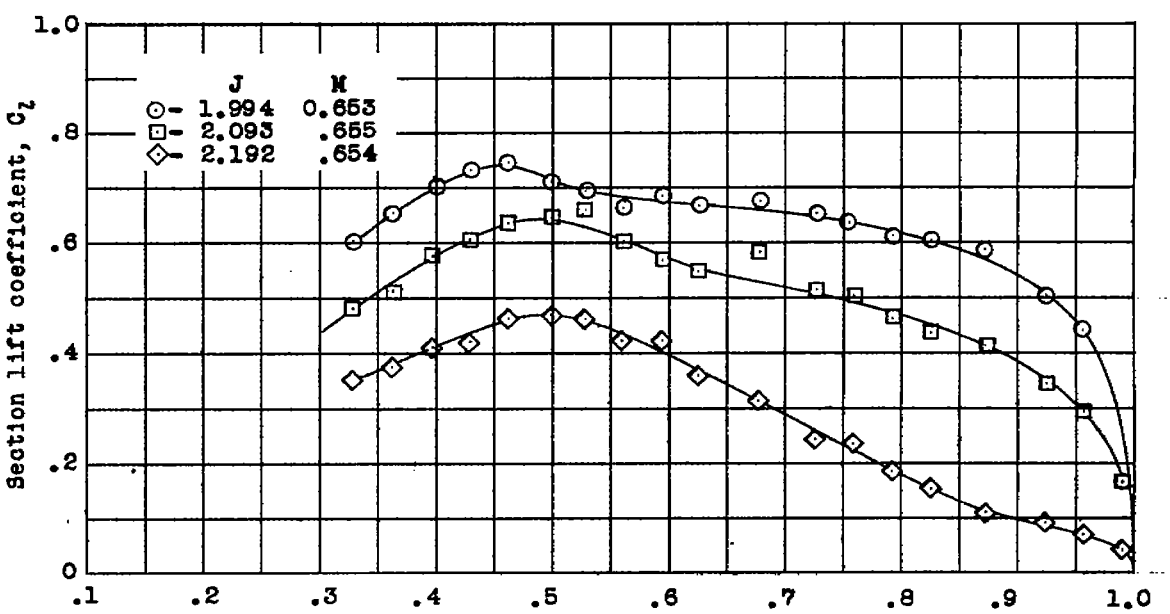


(l) M = 0.58; B = 1.

Figure 4.- Continued.

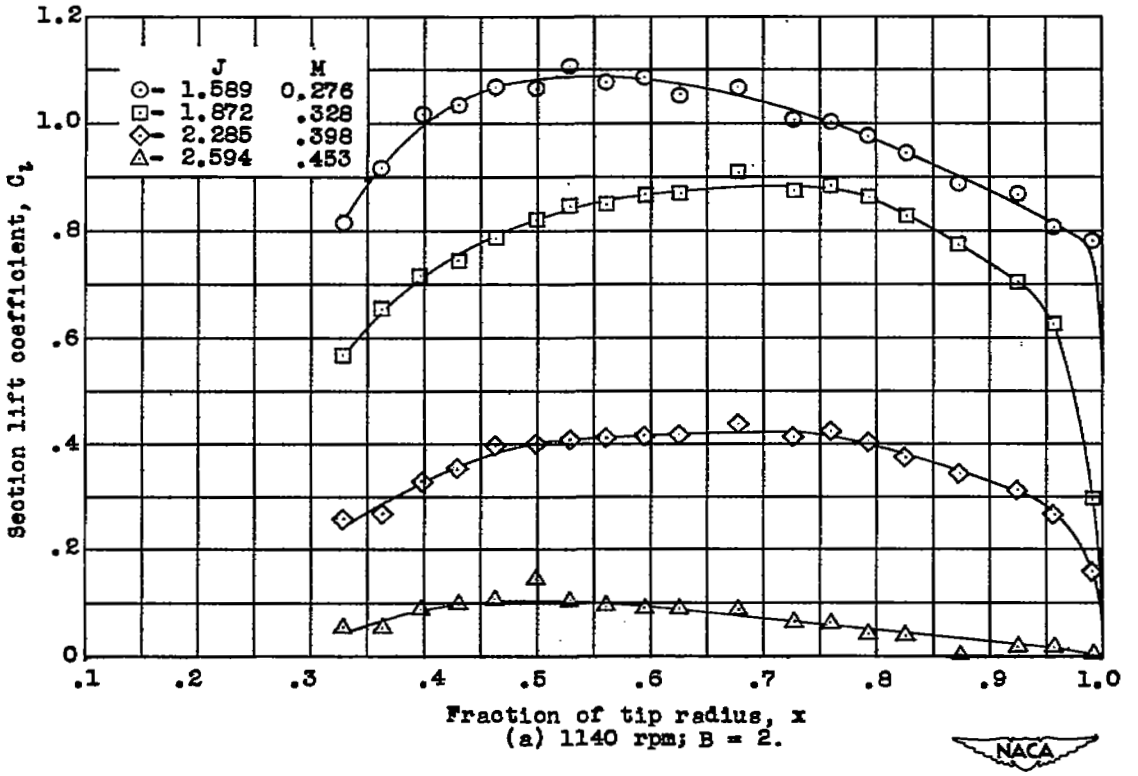


(m) M = 0.60; B = 1.



(n) M = 0.65; B = 1.

Figure 4.- Concluded.



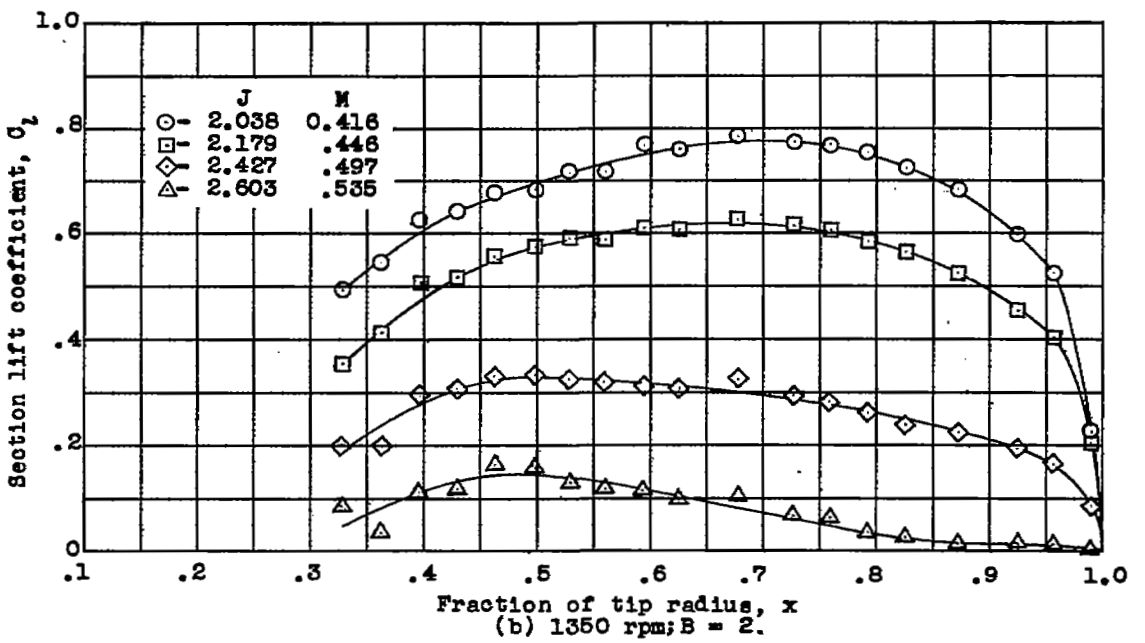
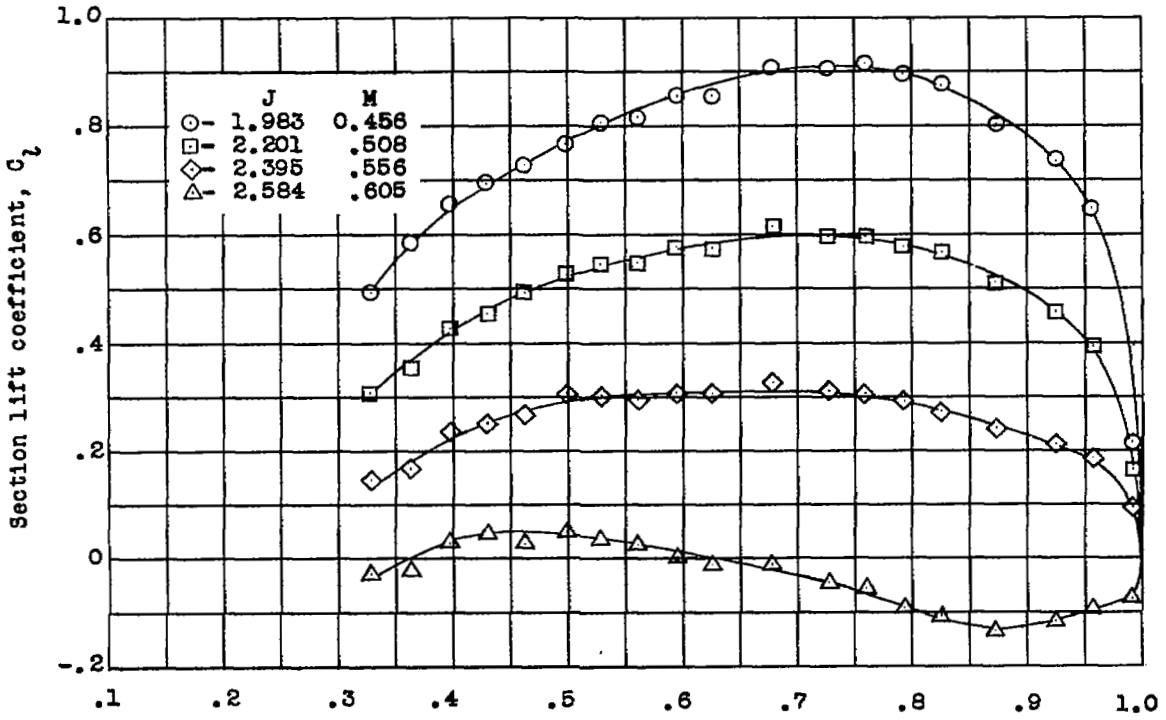
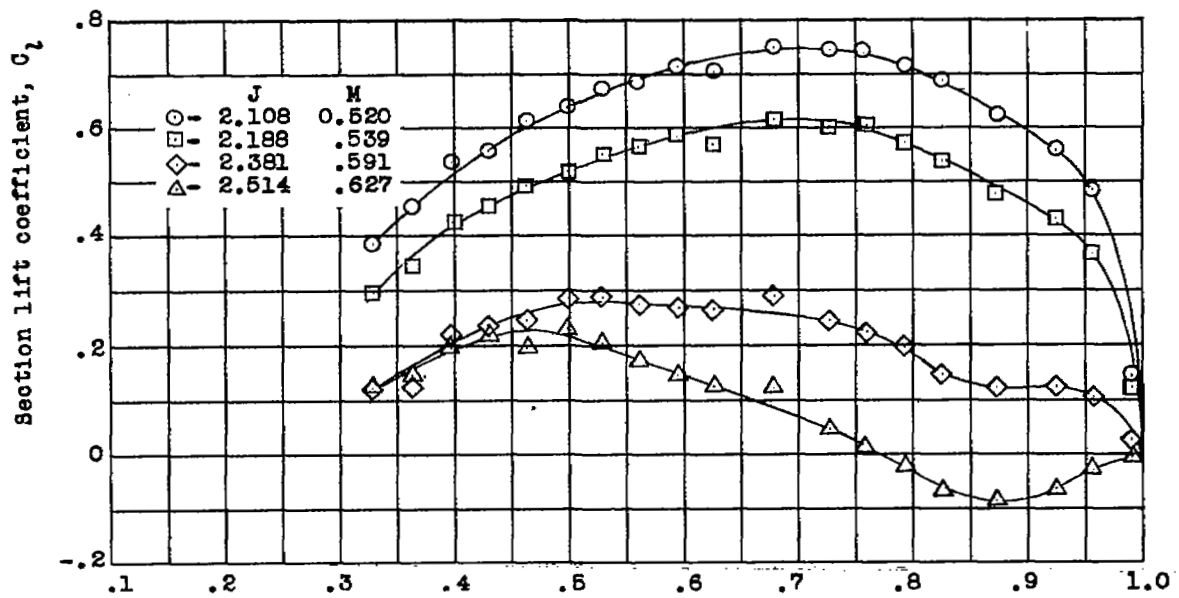


Figure 5.- Lift coefficient distribution curve from wake survey. NACA 10-(5)(066)-03; $\beta_{0.75R} = 45^{\circ}$.



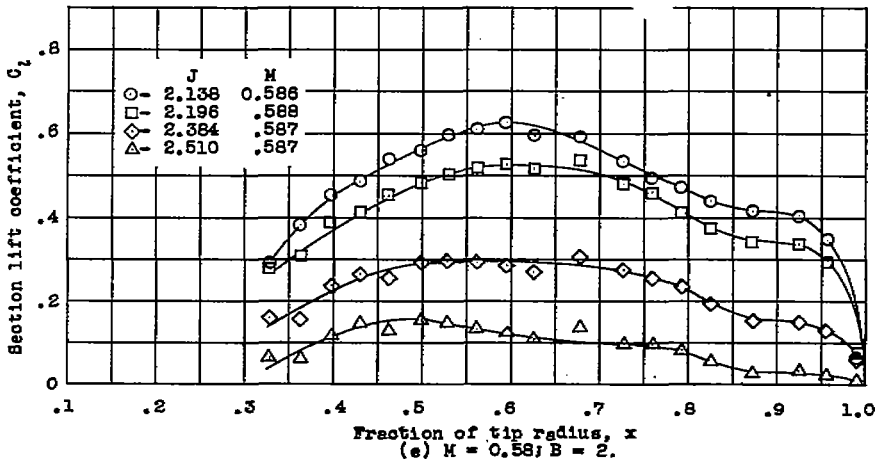
(c) 1500 rpm; B = 2.



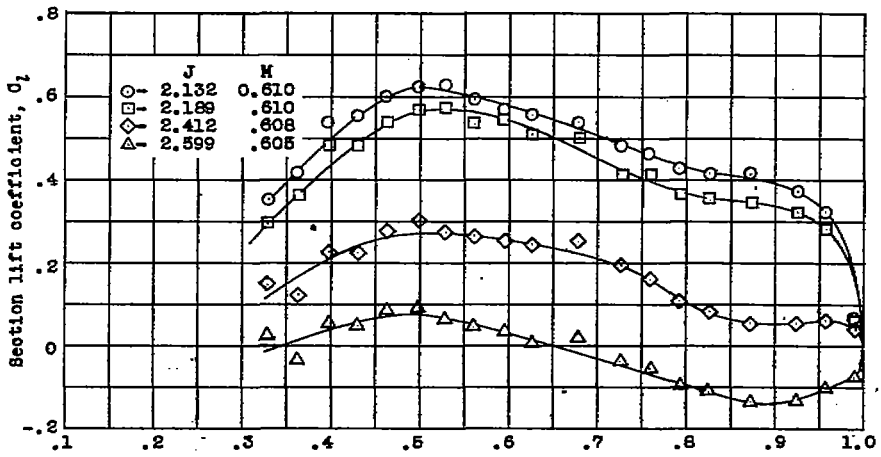
(d) 1600 rpm; B = 2.

Figure 5.- Continued.

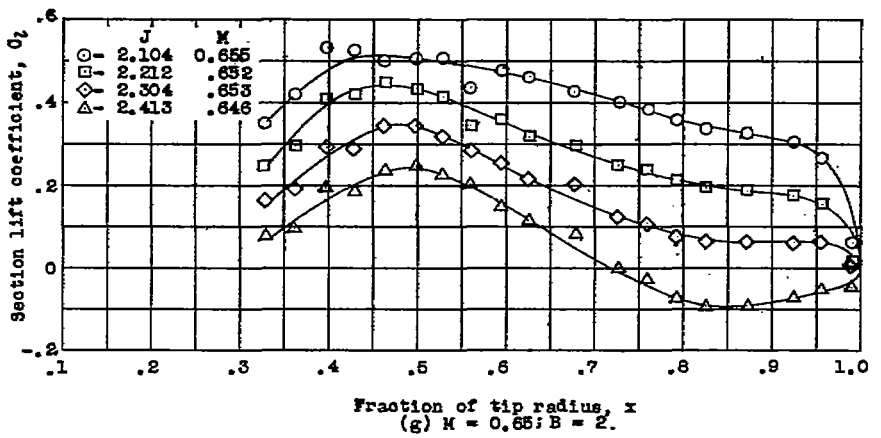
9U



(e) M = 0.58; B = 2.

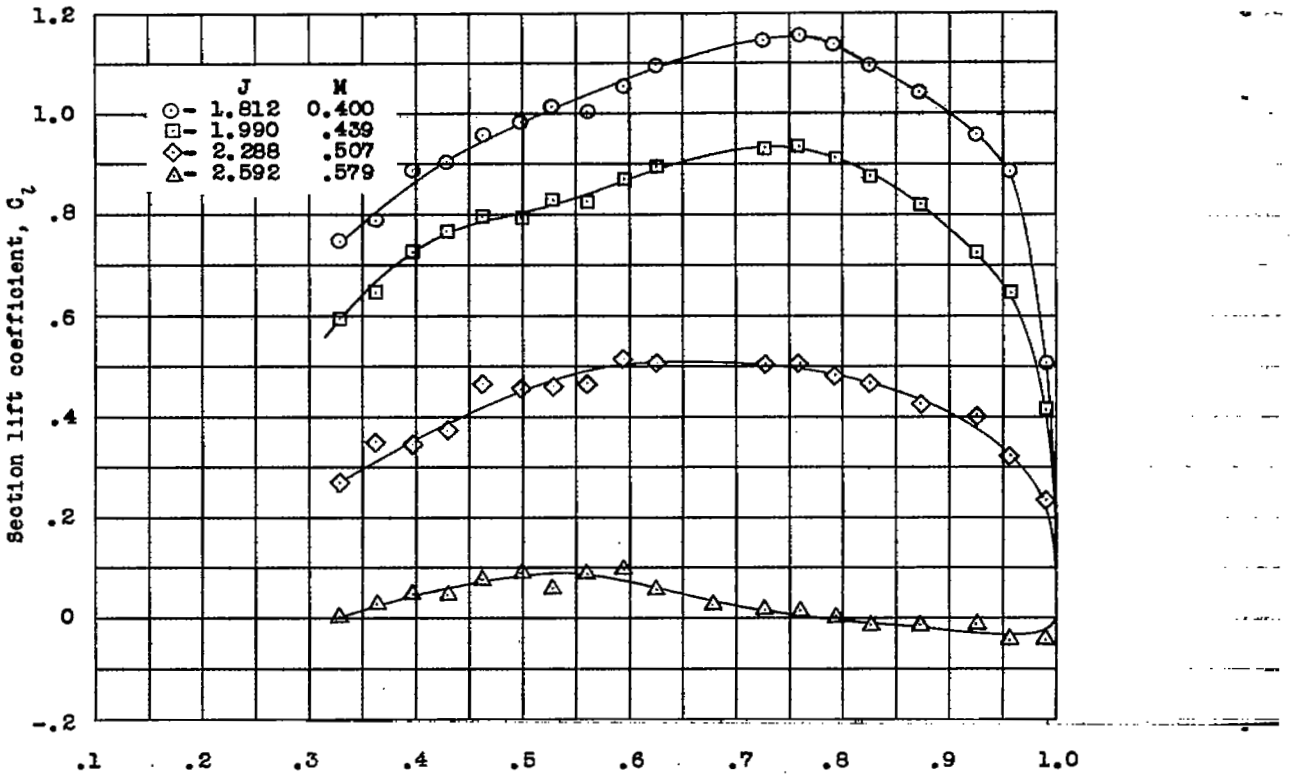


(f) M = 0.60; B = 2.

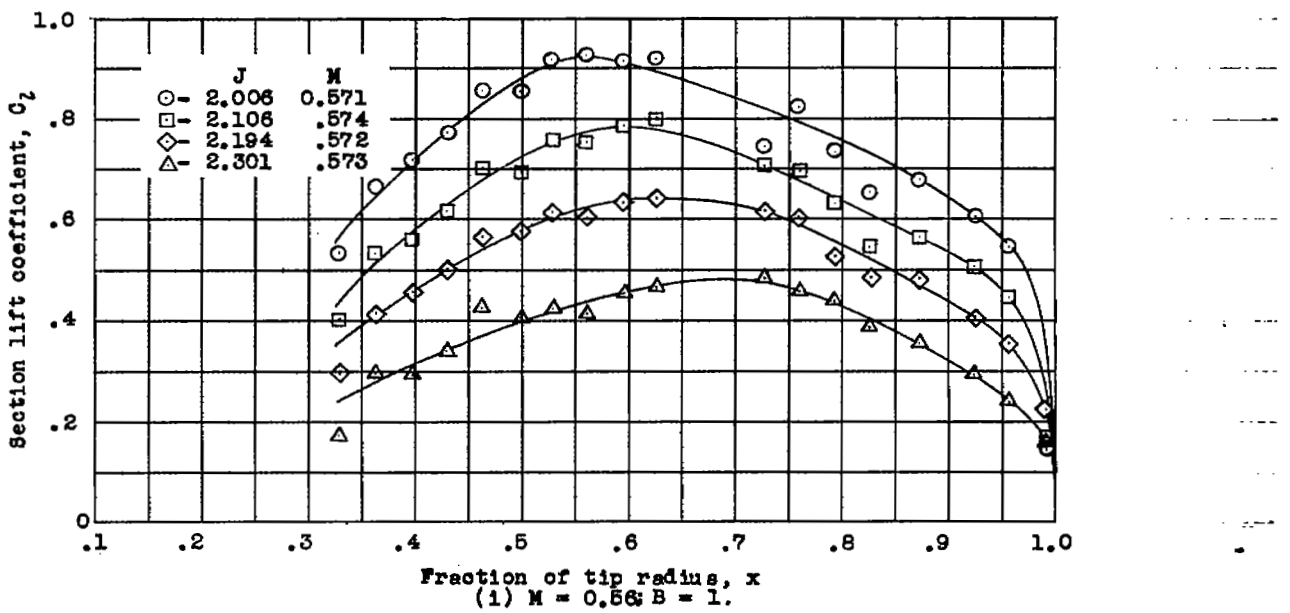


(g) M = 0.65; B = 2.

Figure 5.- Continued.



(h) 1500 rpm; B = 1.



(i) M = 0.56; B = 1.

Figure 5.- Continued.

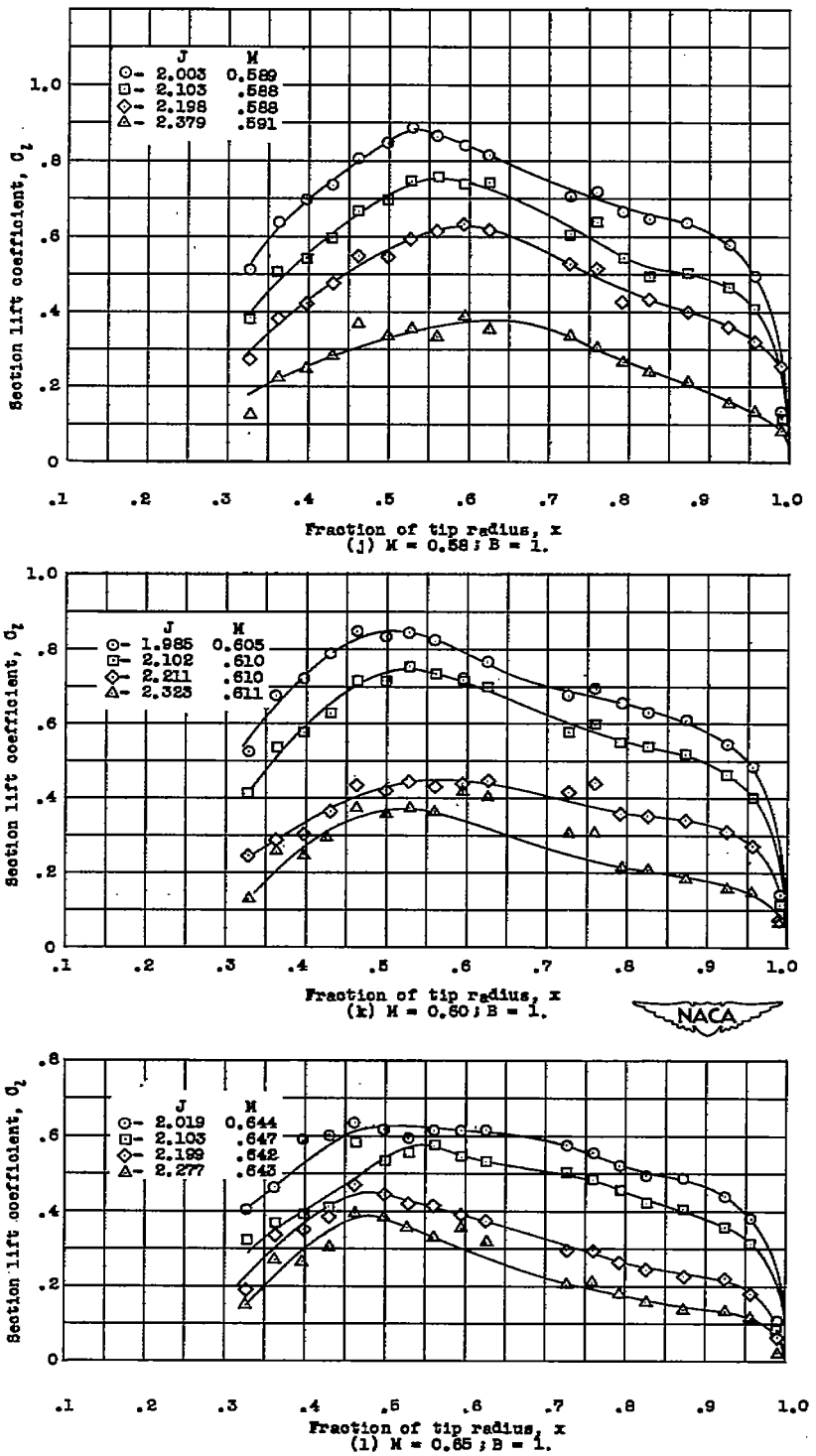
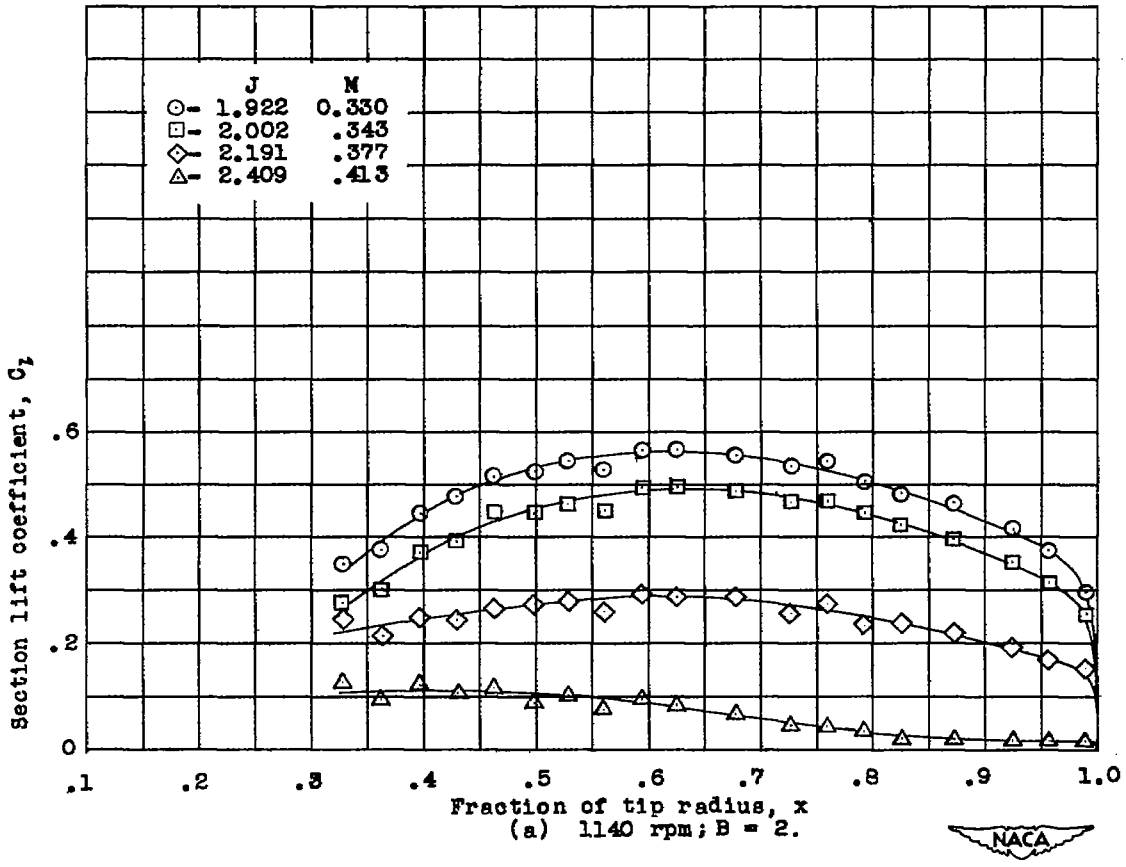


Figure 5.- Concluded.



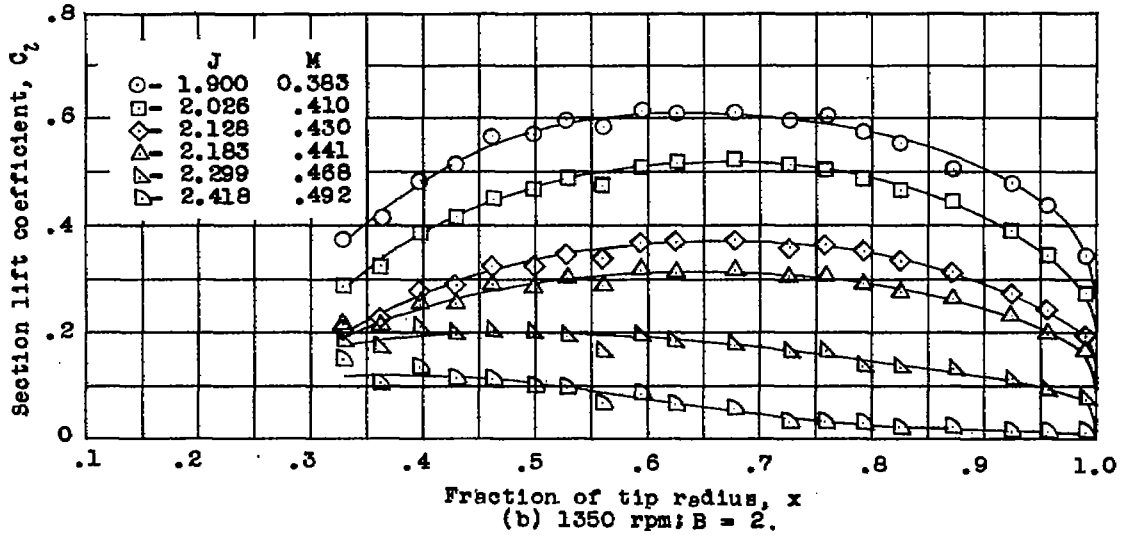
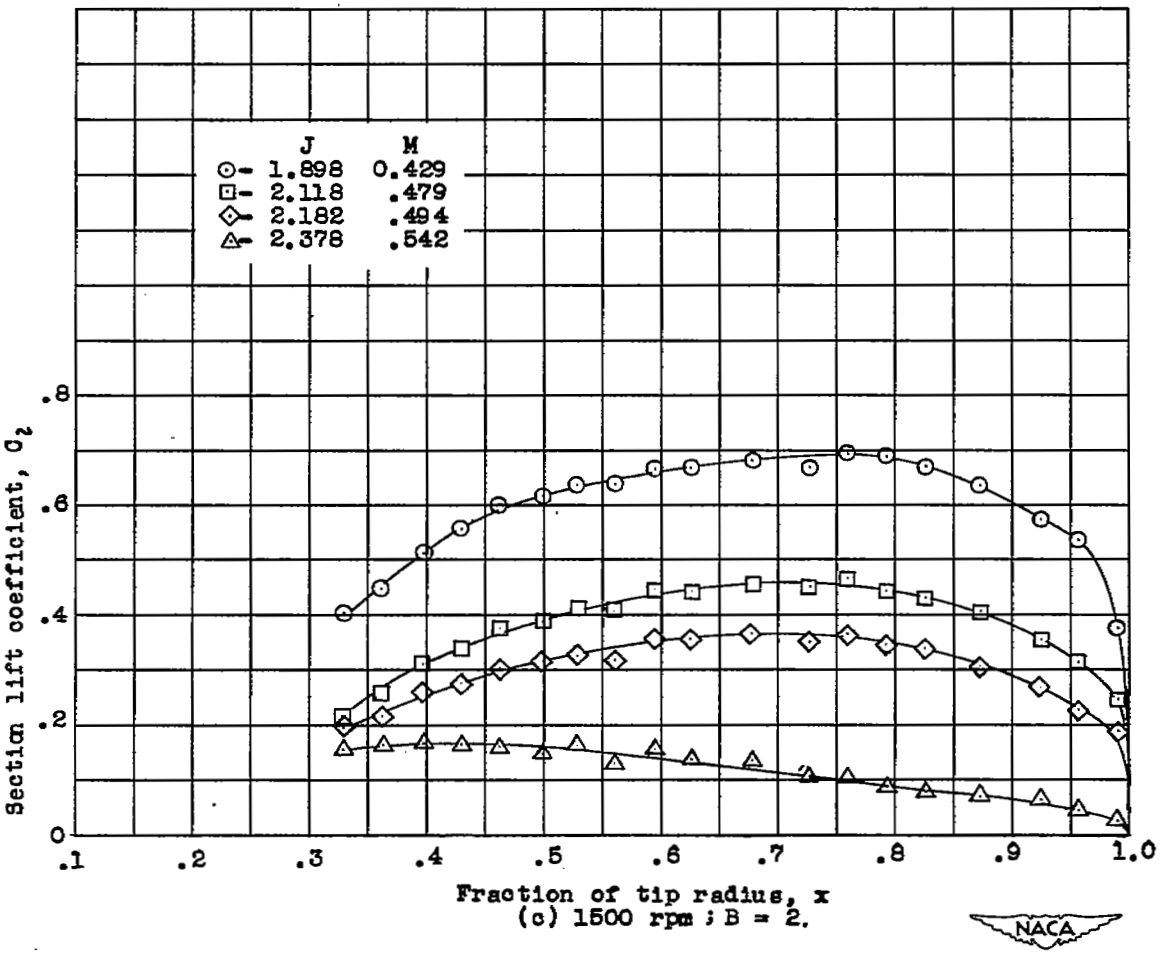
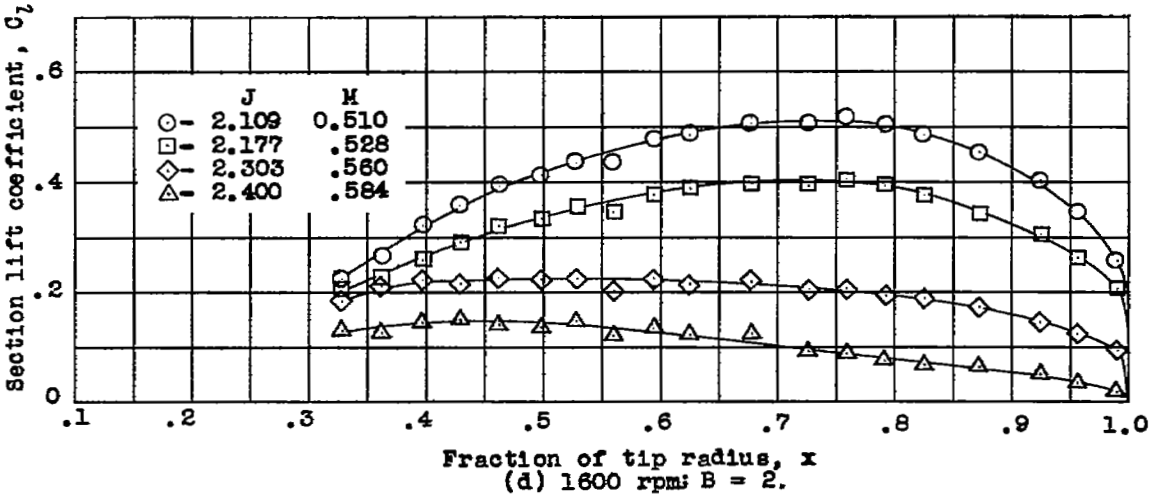


Figure 6.- Lift coefficient distribution curve from wake survey. NACA 10-(0)(066)-03; $\beta_{0.75R} = 45^{\circ}$.

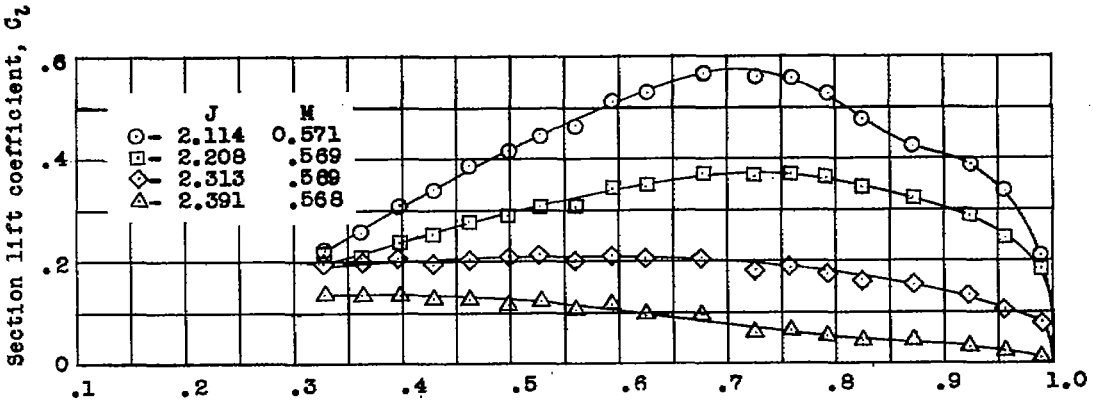


(c) 1500 rpm ; B = 2.

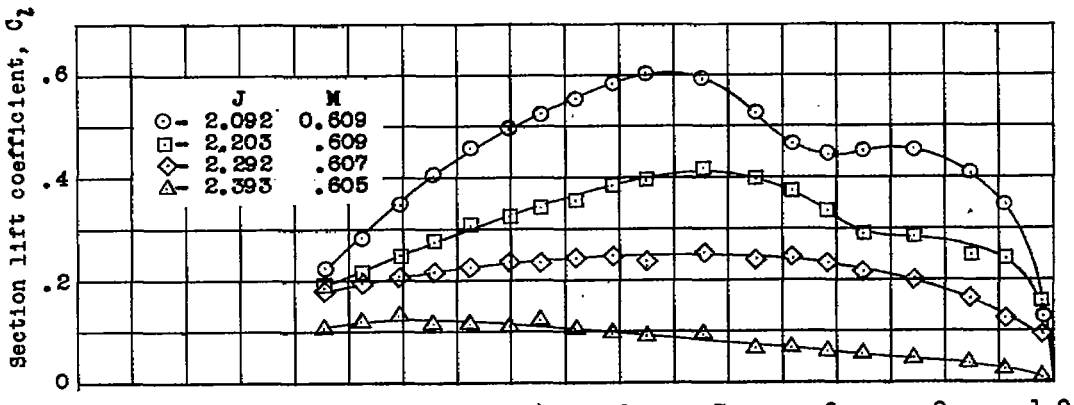


(d) 1600 rpm; B = 2.

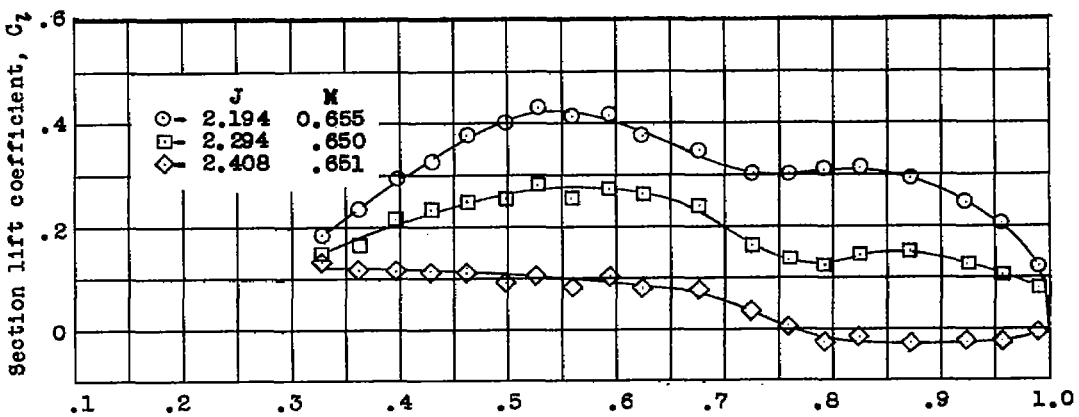
Figure 6.- Continued.



(e) M = 0.56; B = 2.

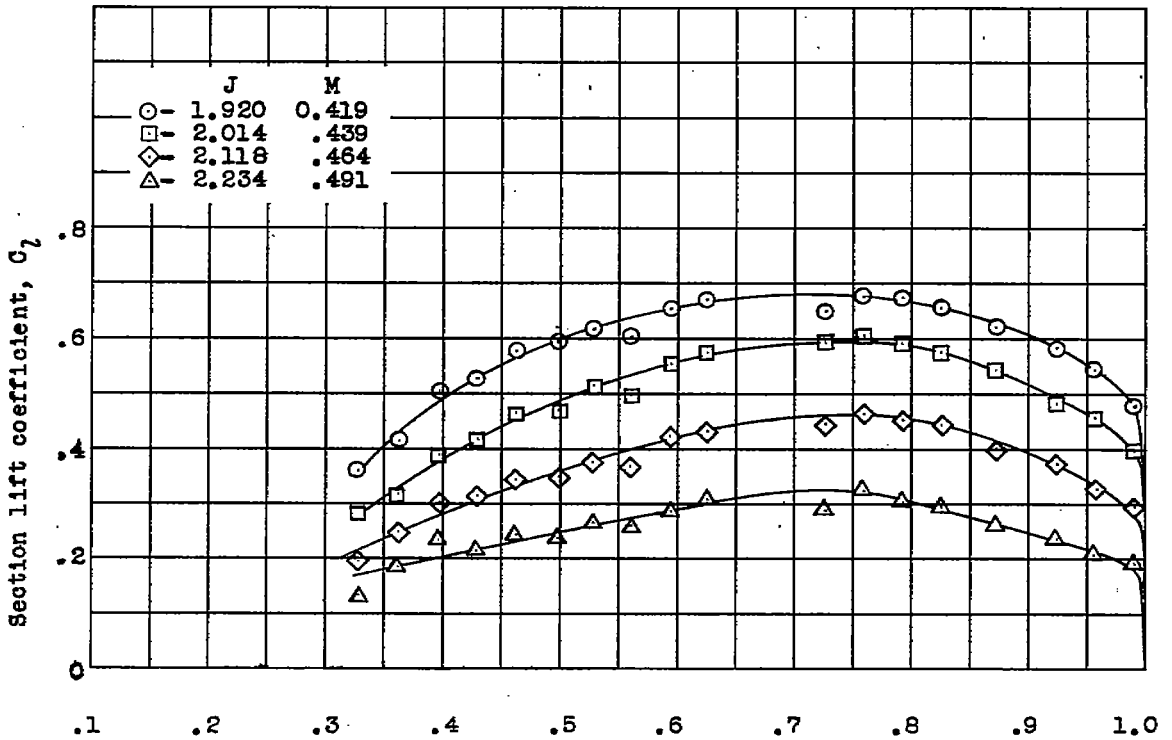


(f) M = 0.60; B = 2.

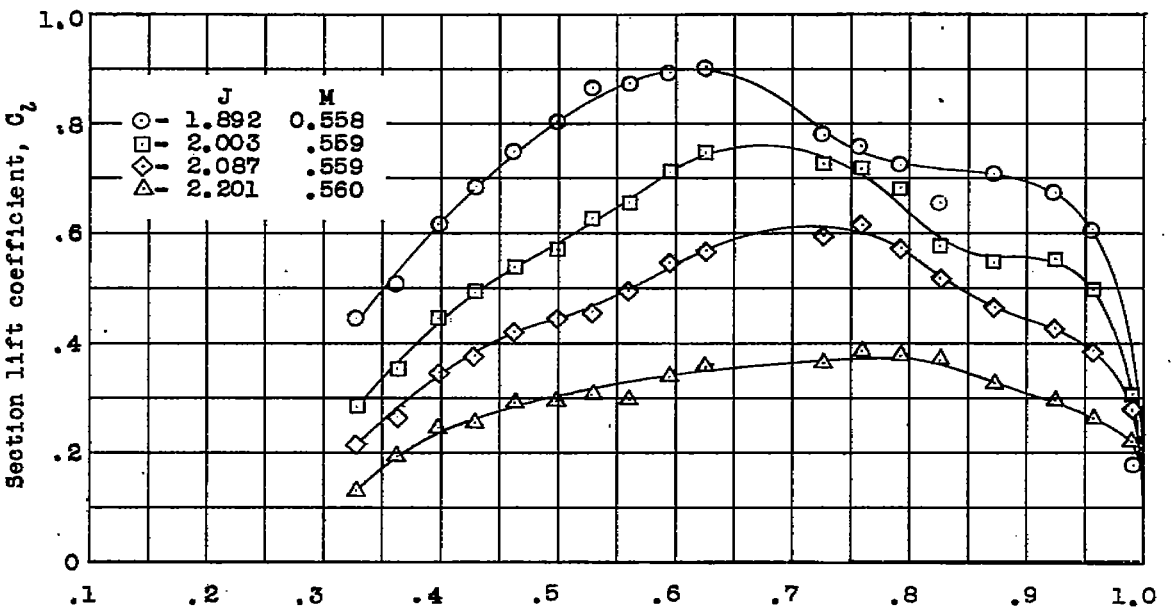


(g) M = 0.65; B = 2.

Figure 6.- Continued.

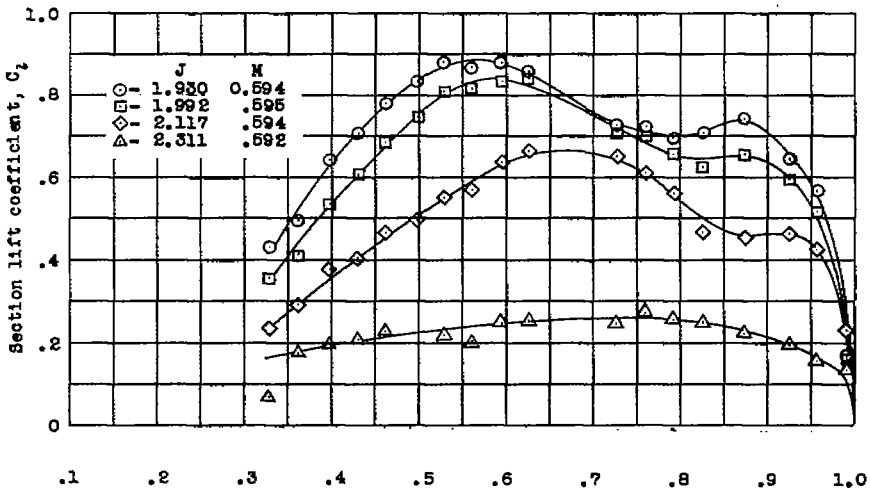


(h) 1500 rpm; B = 1.

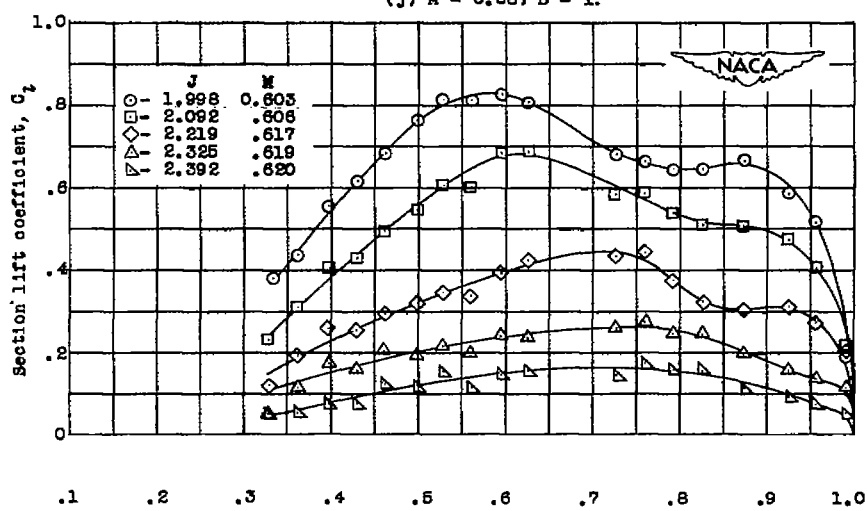


(i) M = 0.56; B = 1.

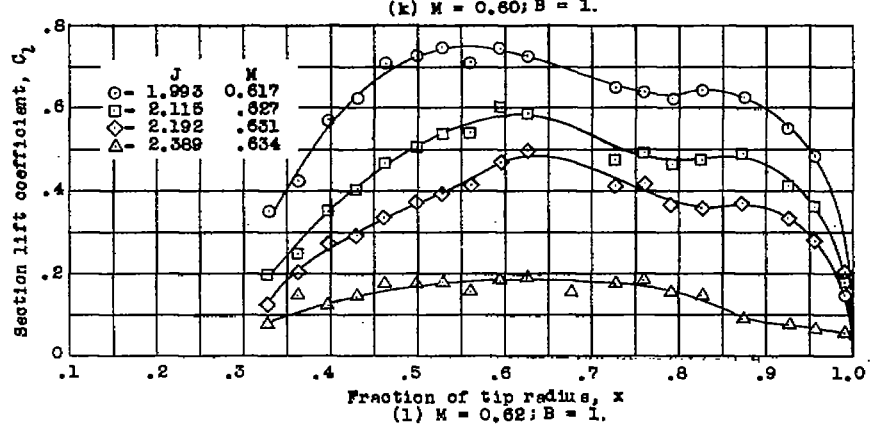
Figure 6.- Continued.



(j) M = 0.58; B = 1.



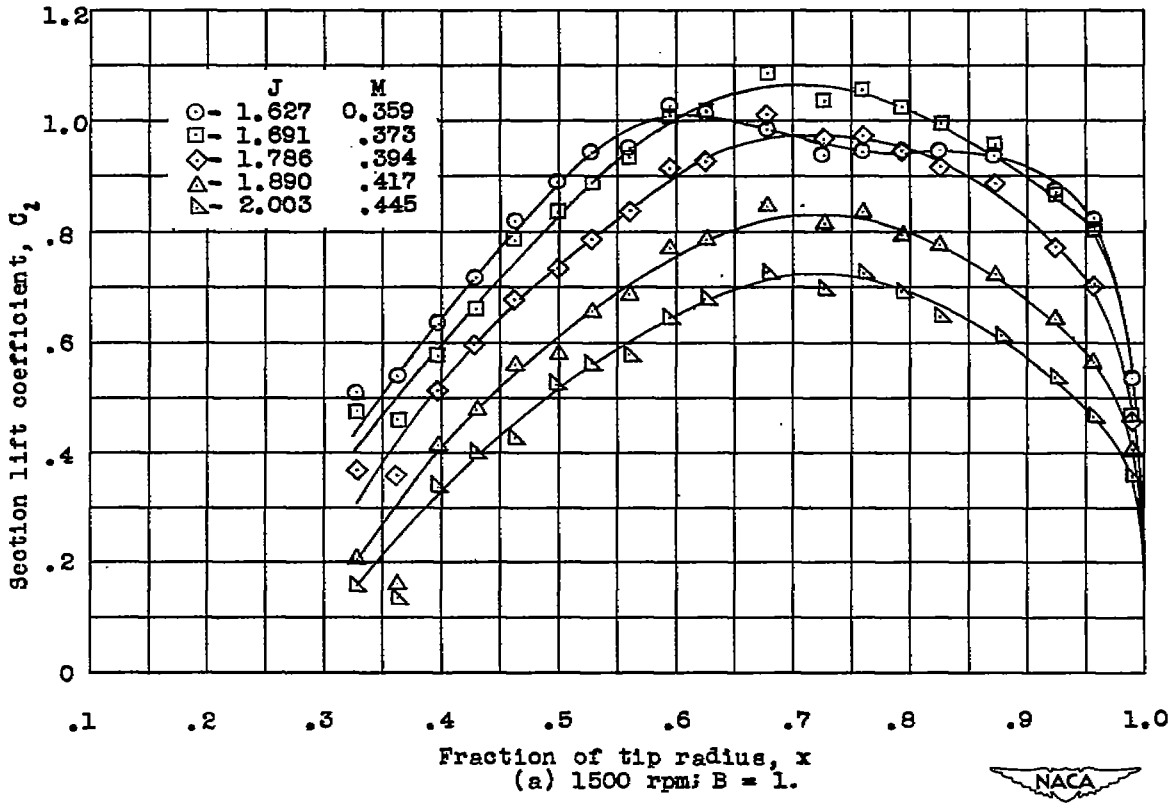
(k) M = 0.60; B = 1.



(l) M = 0.62; B = 1.

Figure 6.- Concluded.

10U



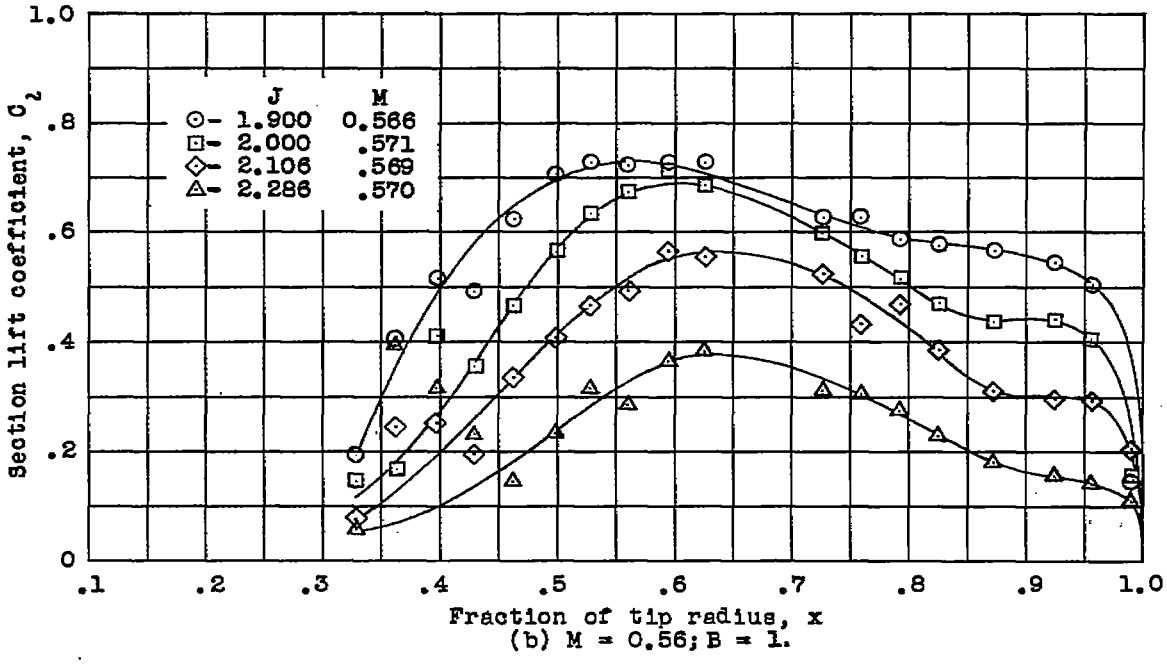
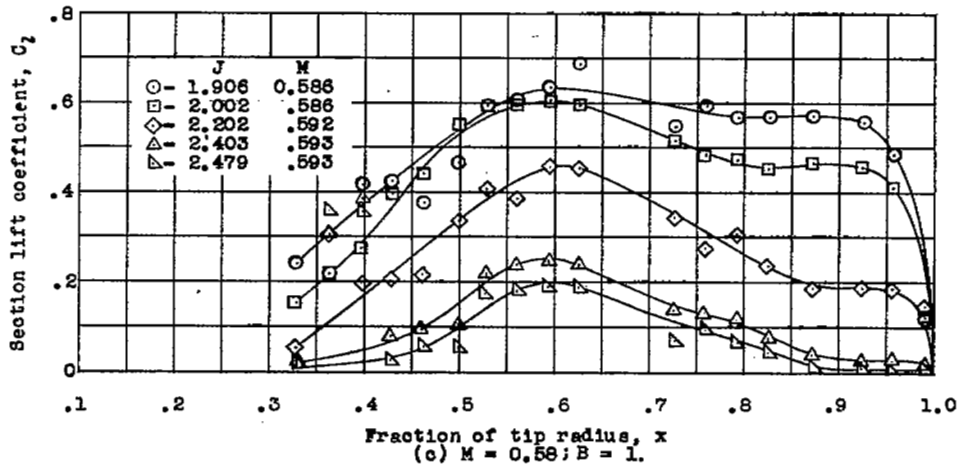
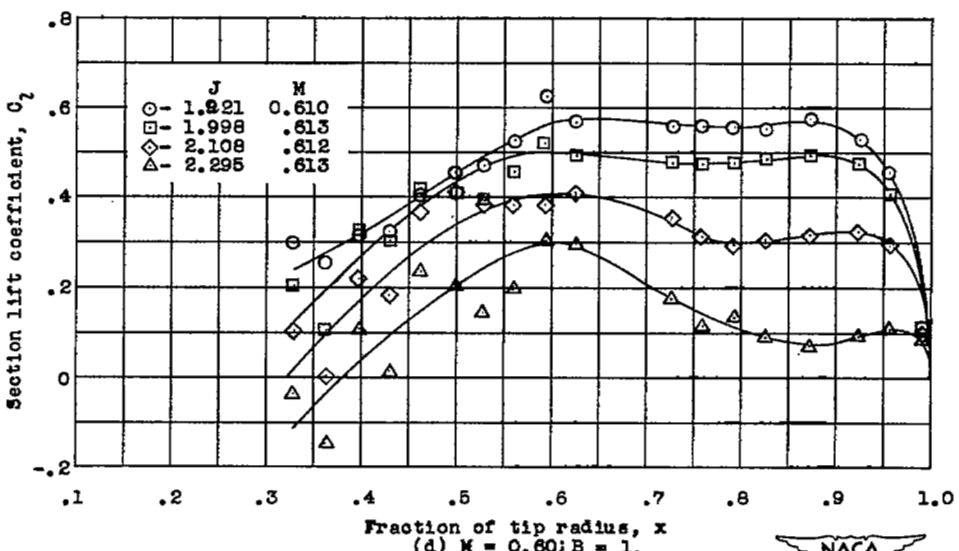


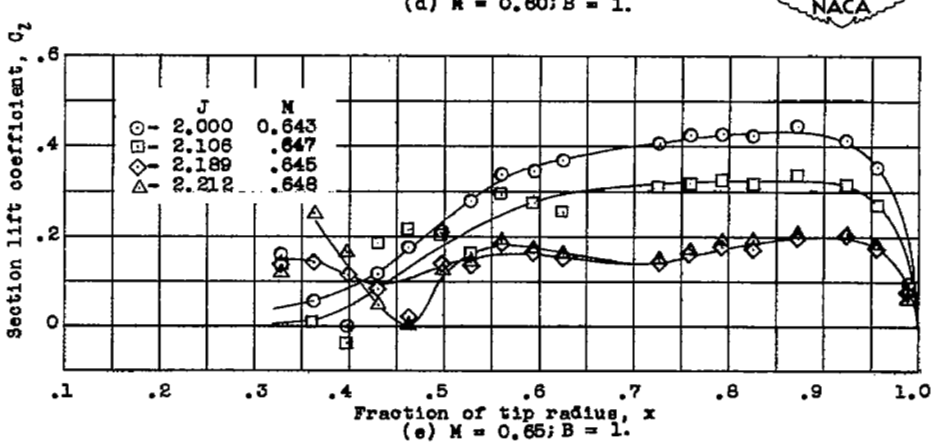
Figure 7.- Lift coefficient distribution curve from wake survey. NACA 10-(3)(09)-03; $\beta_{0.75R} = 45^{\circ}$.



(c) M = 0.58; B = 1.

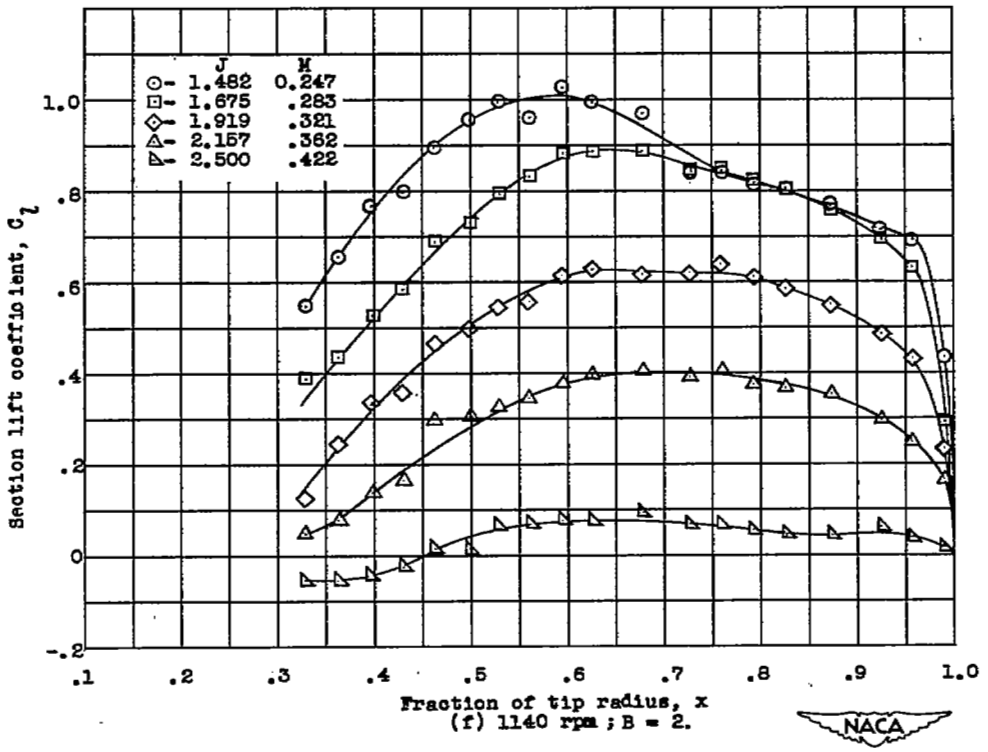


(d) M = 0.60; B = 1.

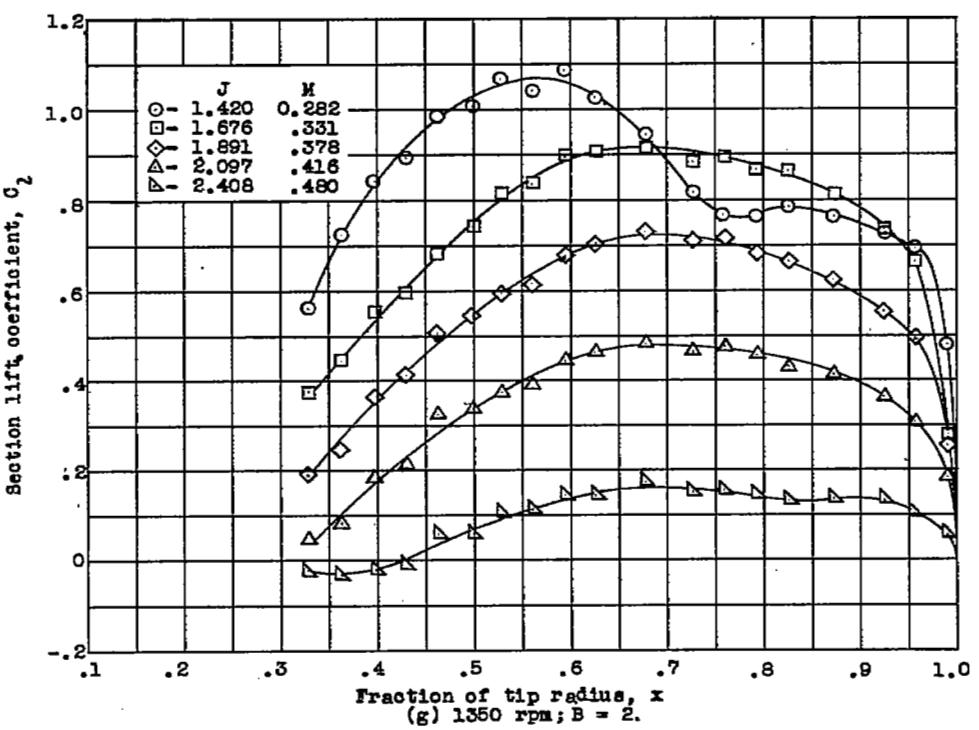


(e) M = 0.65; B = 1.

Figure 7.- Continued.

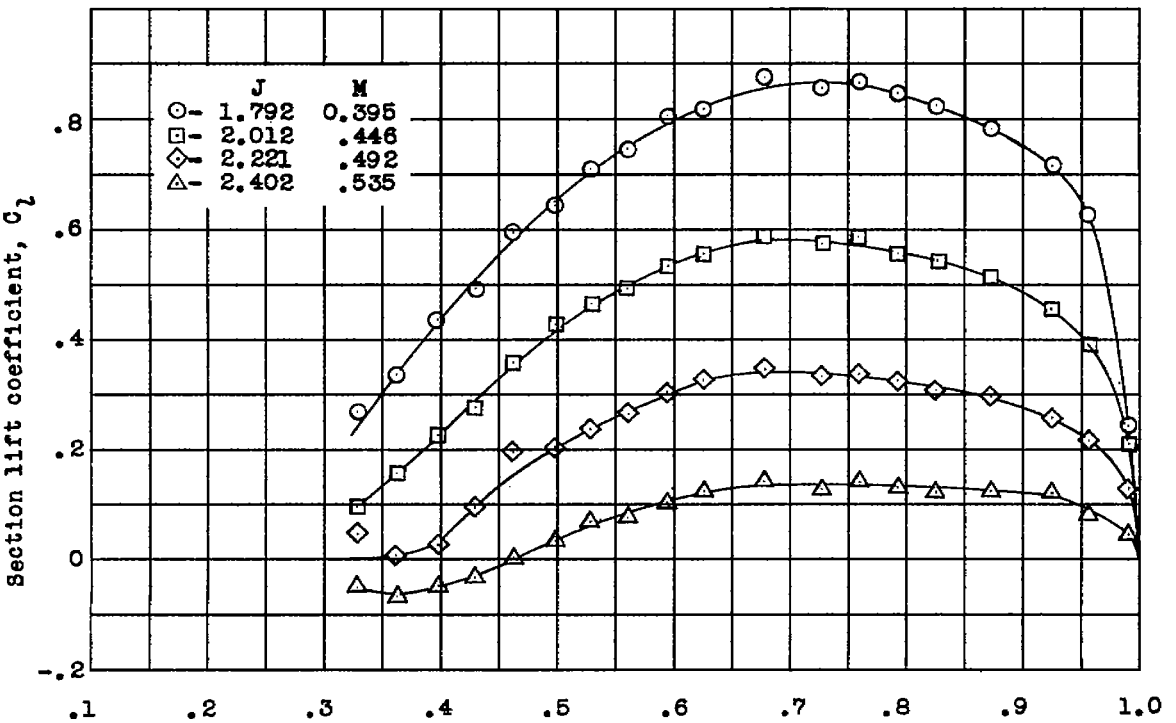


(f) 1140 rpm ; B = 2.

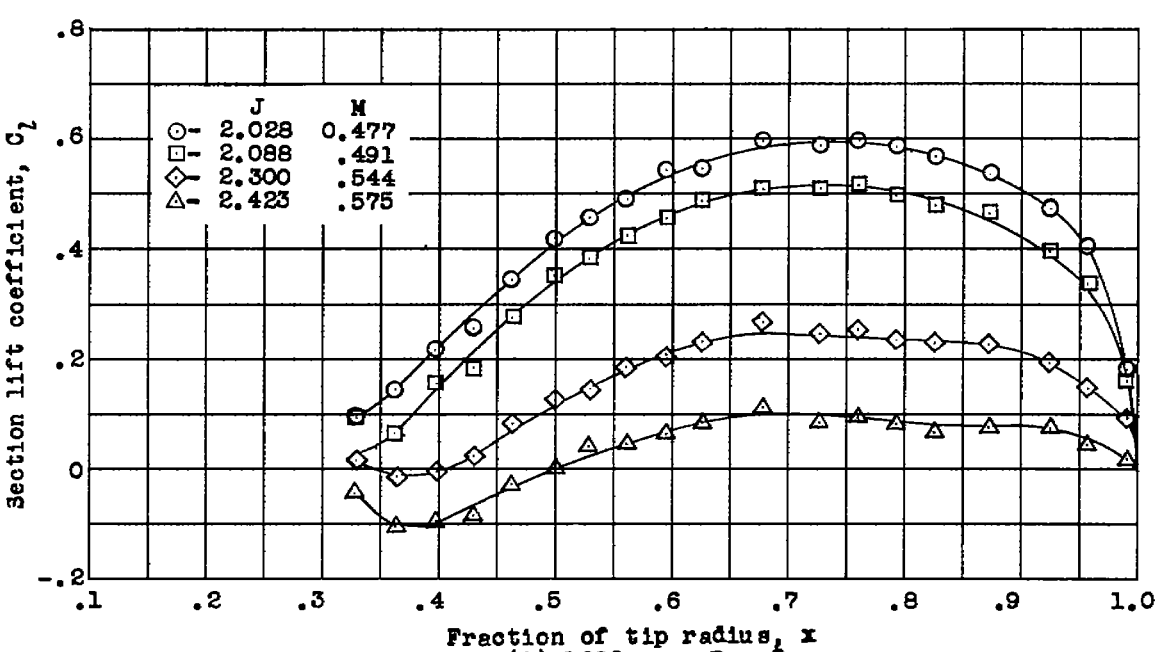


(g) 1350 rpm; B = 2.

Figure 7.- Continued.

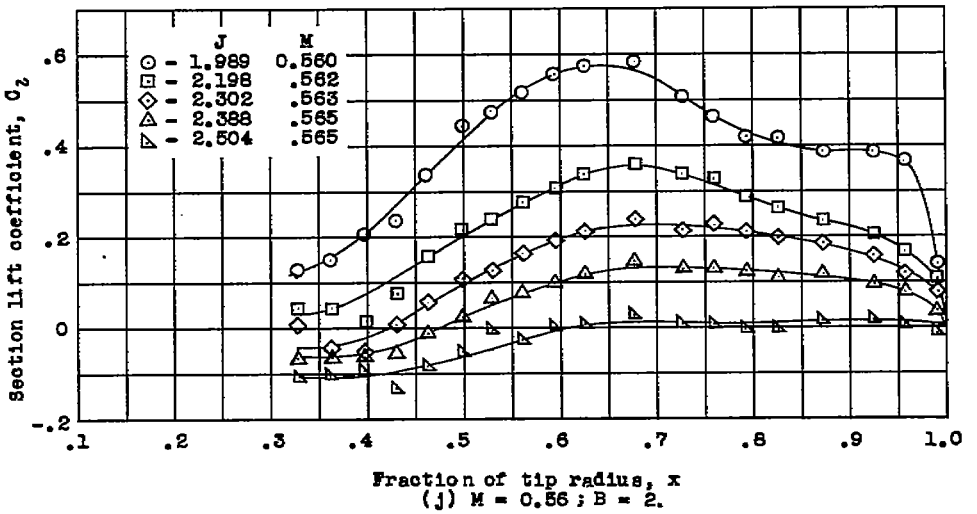


(h) 1500 rpm; B = 2.

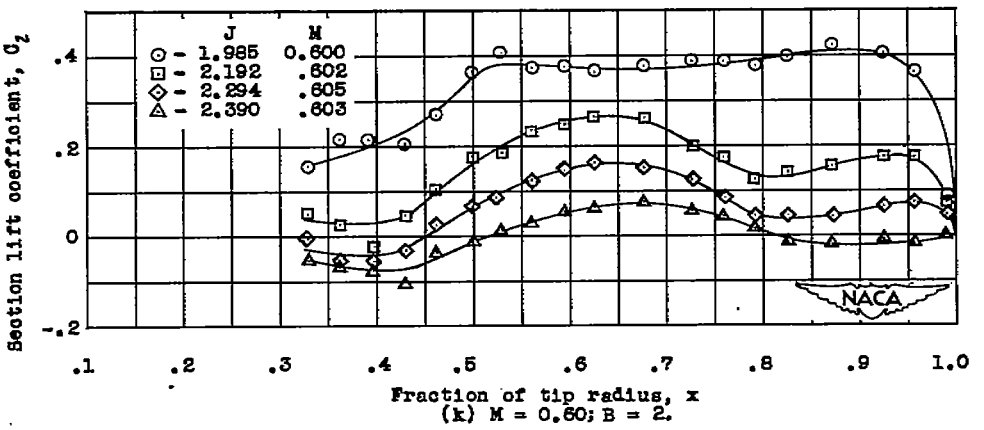


(i) 1600 rpm ; B = 2.

Figure 7.- Continued.

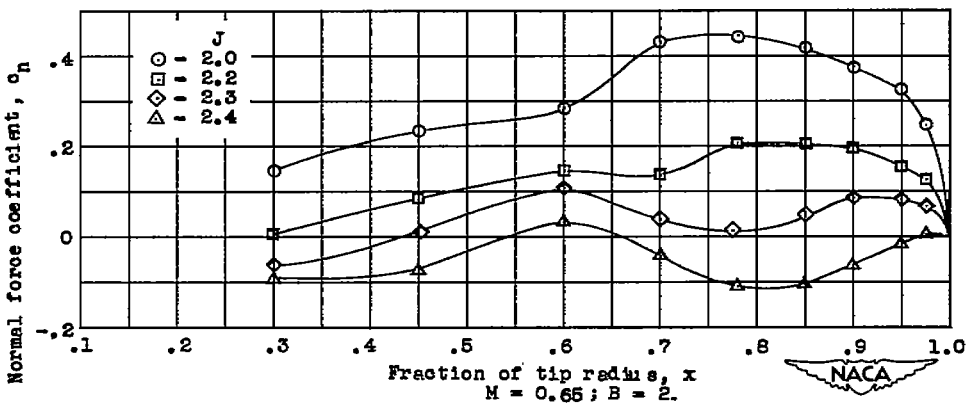


(j) M = 0.56 ; B = 2.



(k) M = 0.60; B = 2.

Figure 7.- Concluded.



M = 0.65 ; B = 2.

Figure 8.- Normal force coefficient distribution curve. NACA 10-(3)(090)-03; $\beta_{0.75R} = 45^{\circ}$.

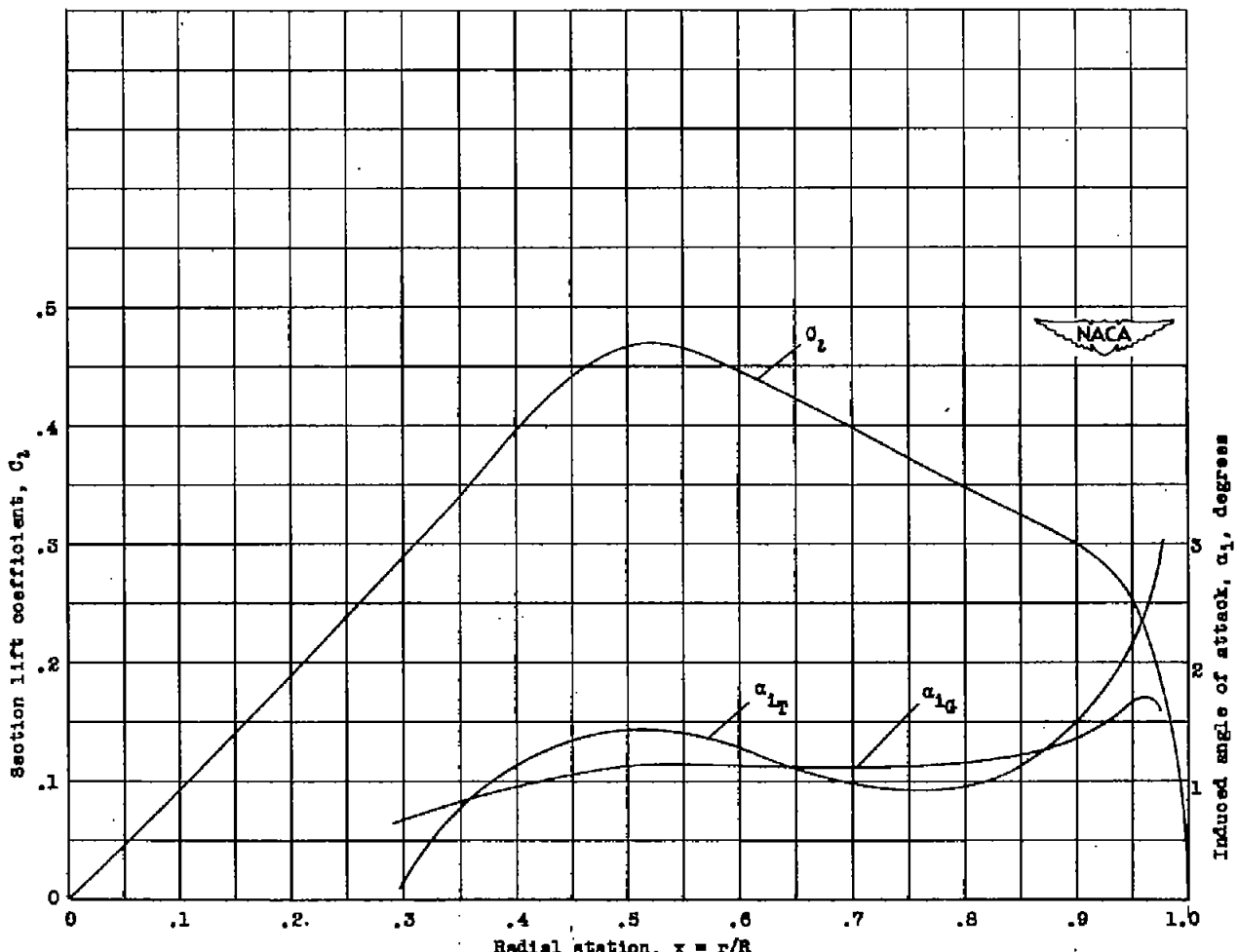


Figure 9.- Comparison of induced angle of attack α_{i_G} and α_{i_T} for an arbitrary propeller loading. NACA 10-(3)(066)-03 propeller; $\beta_{0.75R} = 45^{\circ}$; M = 0.65; J = 2.100; B = 2.

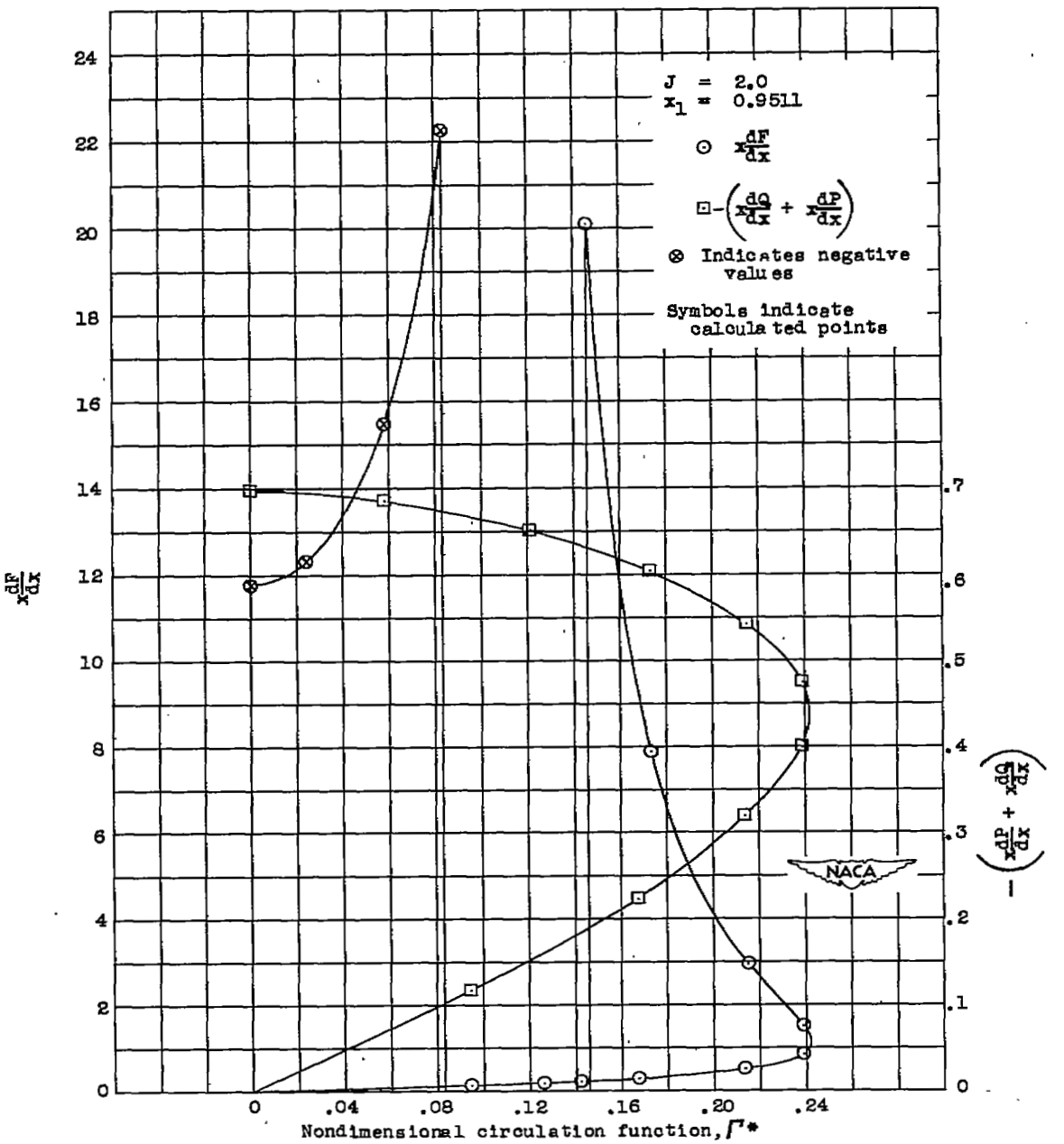


Figure 10.- Plot of weight functions $x\frac{dF}{dx}$ and $-\left(x\frac{dP}{dx} + x\frac{dQ}{dx}\right)$ against Γ^*.

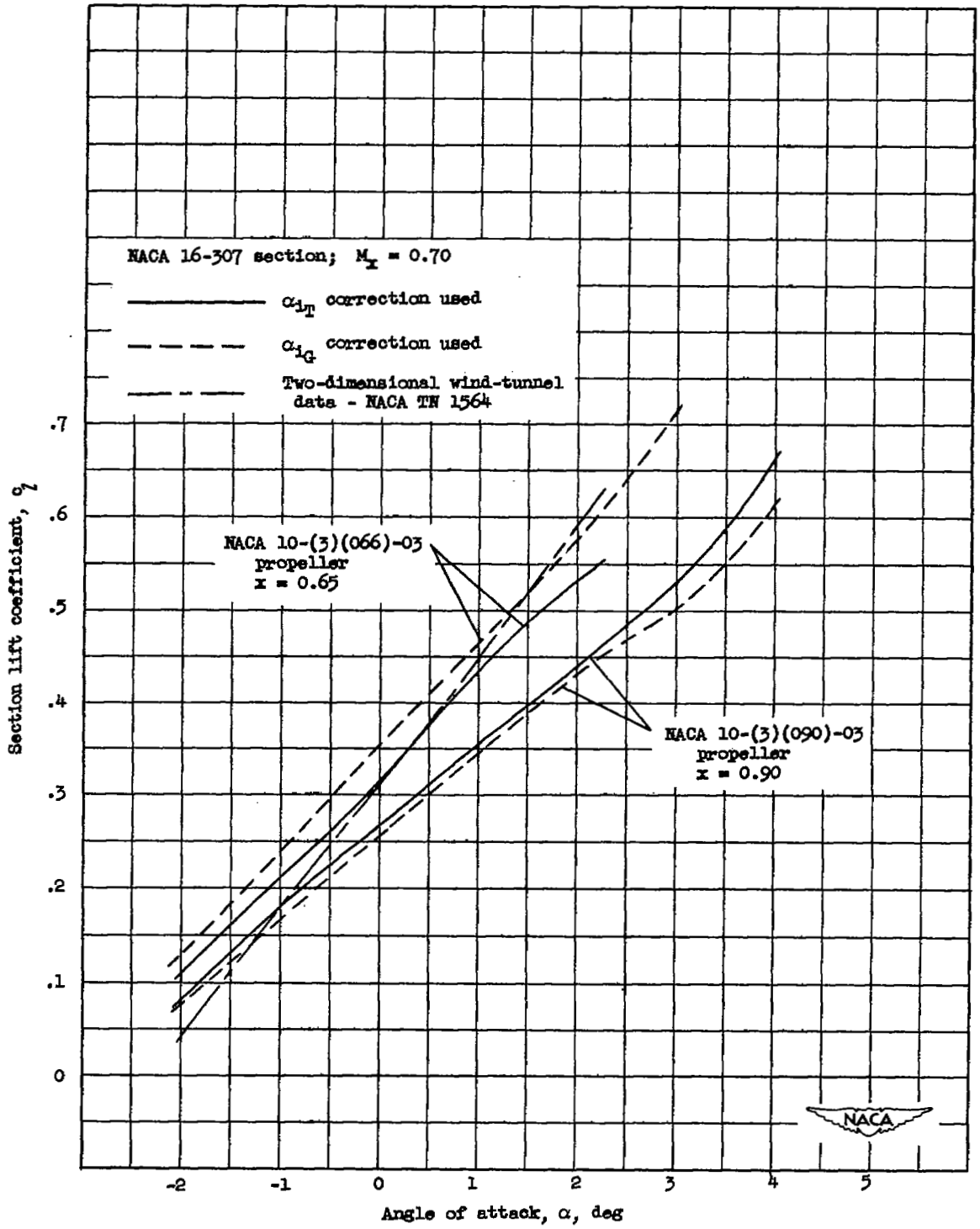


Figure 11.- Comparison of lift curves.

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