NASA TECHNICAL NOTE

NASA TN D-4632

NASA TN D-4632

AN INVESTIGATION OF FULL-SCALE HELICOPTER ROTORS AT HIGH ADVANCE RATIOS AND ADVANCING TIP MACH NUMBERS

by

John L. McCloud III and James C. Biggers

Ames Research Center

and

Robert H. Stroub

Army Aeronautical Research Laboratory

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION • WASHINGTON, D. C. • JULY 1968

NASA TN D-4632

AN INVESTIGATION OF FULL-SCALE HELICOPTER ROTORS AT HIGH ADVANCE RATIOS AND ADVANCING TIP MACH NUMBERS

By John L. McCloud III and James C. Biggers
Ames Research Center
Moffett Field, Calif.

and

Robert H. Stroub
Army Aeronautical Research Laboratory
Moffett Field, Calif.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

For sale by the Clearinghouse for Federal Scientific and Technical Information
Springfield, Virginia 22151 – CFSTI price $3.00

AN INVESTIGATION OF FULL-SCALE HELICOPTER ROTORS AT HIGH ADVANCE RATIOS AND ADVANCING TIP MACH NUMBERS

By John L. McCloud III and James C. Biggers
Ames Research Center

and

Robert H. Stroub
Army Aeronautical Research Laboratory

SUMMARY

Five full-scale rotors were investigated at various advance ratios and advancing tip Mach numbers in the Ames 40- by 80-Foot Wind Tunnel. The primary differences between rotors were twist, articulation, and tip airfoil section. Four of the rotors incorporated the NACA 0012 airfoil section over the entire blade length. The fifth rotor had tapering thickness and incorporated leading-edge camber over the outer 20 percent of the blade radius.

The fully articulated rotor with zero twist blades was tested at advance ratios from 0.30 to 1.05. The other rotors were investigated in the 0.30 to 0.50 advance-ratio range. The teetering rotor with tapered tip blades was tested at advancing blade tip Mach numbers up to 1.00.

Force, moment, power, and control-setting data were obtained for a wide range of lift and propulsive forces, and are presented without discussion.

INTRODUCTION

Modern helicopter design requires a knowledge of rotor performance characteristics at high forward speeds. Theoretical predictions have not been substantiated in this area, and only a limited amount of experimental data has been available. Because of the changing environment of rotor operation encountered at high speed, many of the assumptions and approximations of rotor theory become questionable. Questions arise regarding not only the magnitudes of rotor forces and moments, but also the character of rotor operation, for example, flapping stability at advance ratios as high as 1.0.

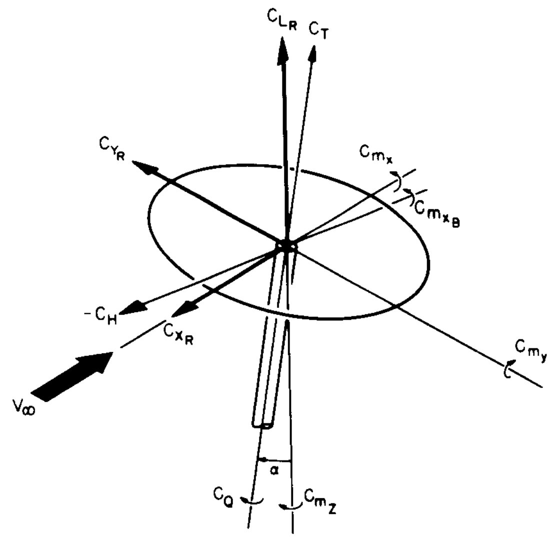
In order to investigate these questionable areas, several full-scale rotors have been tested in the 40- by 80-foot wind tunnel. The results should be useful for helicopter designs for the near future, and should provide a basis of comparison for rotor performance prediction techniques and advanced rotor systems.

Fully articulated rotors, 56 feet in diameter, and teetering rotors 48 and 34 feet in diameter, were operated at advance ratios up to 1.05 and at advancing tip Mach numbers up to 1.00.

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

NOTATION

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



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

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

$\frac{C_H}{\sigma}$ — rotor drag coefficient in shaft-axes system, $\frac{\text{shaft-axes drag}}{\rho S(\Omega R)^2}$

$\frac{C_{L_R}}{\sigma}$ — rotor lift coefficient in wind-axes system, $\frac{\text{lift}}{\rho S(\Omega R)^2}$

$\frac{C_{m_X}}{\sigma}$ — resultant rolling-moment coefficient about rotor center in wind-axes system, $\frac{\text{rolling moment}}{\rho S(\Omega R)^2 R}$

$C_{m_{X_B}}$ rolling-moment coefficient about rotor center in shaft-axes system

$\frac{C_{m_Y}}{\sigma}$ resultant pitching-moment coefficient about rotor center (same in both wind-axes and shaft-axes systems), $\frac{\text{pitching moment}}{\rho S(\Omega R)^2 R}$

$\frac{C_{m_Z}}{\sigma}$ resultant yawing-moment coefficient about rotor center in wind axes system, $\frac{\text{yawing moment}}{\rho S(\Omega R)^2 R}$

$\frac{C_P}{\sigma}$ rotor power coefficient, $\frac{(\text{torque})(\Omega)}{\rho S(\Omega R)^3}$,

(a) for articulated-rotor data, based on rotor-shaft torsion data

(b) for teetering-rotor data, based on wind-tunnel balance data

$\frac{C_{P_O}}{\sigma}$ rotor profile-power coefficient, $\frac{C_P}{\sigma} - \left(\frac{C_{L_R}}{\sigma}\right)^2 \frac{\sigma}{2(V/\Omega R)} - \frac{C_{X_R}}{\sigma} \frac{V}{\Omega R}$

$\frac{C_Q}{\sigma}$ rotor yawing-moment coefficient in shaft-axes system, $\frac{\text{shaft-axes yawing moment}}{\rho S(\Omega R)^2 R}$

$\frac{C_T}{\sigma}$ rotor thrust coefficient (shaft-axes lift coefficient), $\frac{\text{thrust}}{\rho S(\Omega R)^2}$

$\frac{C_{X_R}}{\sigma}$ rotor propulsive-force coefficient in wind-axes system, $-\frac{\text{drag}}{\rho S(\Omega R)^2}$

$\frac{C_{Y_R}}{\sigma}$ rotor side-force coefficient, $\frac{\text{side force}}{\rho S(\Omega R)^2}$ (same in both wind-axes and shaft-axes systems)

$M_{(1)(90)}$ rotor-blade tip Mach number at 90° azimuth position

q free-stream dynamic pressure, $(1/2)\rho V^2$, lb/ft^2

R rotor radius, ft

S reference area [(number of blades) × (blade chord) × (rotor radius)], ft^2

T	free-stream temperature, $^{\circ}R$
V	free-stream velocity, ft/sec
$\frac{V}{\Omega R}$	advance ratio
α_c	angle of attack of control axis (swash plate) relative to tunnel centerline, positive tilted aft, $\alpha_s - B_{1_s}$, deg
α_s	angle of rotor shaft from vertical, positive shaft tilted aft, deg
ρ	air density, slugs/ft^3
Ω	rotor rotational speed, radians/sec
σ	rotor solidity, $\frac{S}{\pi R^2}$
θ_c	cyclic pitch, deg*
θ_1	twist, deg*
$\theta_{0.75}$	collective pitch at 0.75R, deg*
θ_{grip}, θ_g	collective pitch at 2.33-ft radial distance from hub center, deg*
ψ	rotor-blade azimuth angle measured from downwind position in direction of rotation, deg

MODEL DESCRIPTION

General

Figure 1 shows the rotor systems installed in the wind-tunnel test section. Rotor-shaft angle of attack was remotely controlled using an extendable tail strut. Rotor power was provided by a 1500-hp, variable-frequency electric motor inside the faired bodies. Collective and cyclic pitch were remotely controlled and monitored from the control room. First-harmonic rotor flapping coefficients relative to the shaft were obtained from electronic flapping resolvers.

---

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

Fully Articulated Rotors

The two sets of blades investigated with the fully articulated rotor system were dimensionally identical except for twist. One set had -8° linear twist, and the other 0°. The dimensional information related to the fully articulated rotors is listed below.

Rotor radius, R, ft	28
Blade chord, c, ft	1.337
Cutout radius, ft	4.48
Rotor solidity, $bc/\pi R$	0.062
Reference area, ft^2	153.1
Blade moment of inertia about flapping hinge, $ft\text{-}lb\text{-}sec^2$	1264
Blade weight moment about flapping hinge, lb-ft	2265
Flapping hinge offset, ft	1.0
Number of blades, b	4
Airfoil	NACA 0012
Blade taper ratio	1.0

A standard H-34 transmission and rotor shaft were driven by the 1500-hp motor, and a special high-strength rotor control system was used.

Teetering Rotors

Three sets of blades were used on the teetering rotor system. The standard blades (48-ft diameter) and the 34-ft blades had NACA 0012 airfoil sections. The third blade set (48-ft diameter) was linearly tapered in thickness ratio from 0.8 R to the tip, which was approximately the NACA 21006 airfoil. The tip airfoil is described in detail in table I. The dimensional information related to the teetering rotors is given below.

Rotor radius, R, ft	24.0	17.0
Blade chord, c, ft	1.75	1.75
Cutout radius, ft	2.04	2.04
Rotor solidity, $bc/\pi R$	0.0464	0.0656
Reference area, ft^2	84.0	59.5
Blade twist, linear, deg	-10.9	-7.7
Blade taper ratio	1.0	1.0
Hub precone angle, deg	2.75	2.75
Blade moment of inertia about flapping hinge, $ft\text{-}lb\text{-}sec^2$	2458 2289*	1584
Number of blades	2	2
Airfoil	NACA 0012*	NACA 0012

*The tapered-tip blades were NACA 0012 from the root to 0.8 R, and linearly tapered in thickness from 0.8 R to the 6-percent-thick tip. The zero lift line of the cambered tip sections was varied so that the twist distribution was linear. (See table I.)

A standard UH-1D transmission and rotor shaft were used in conjunction with a speed-increasing transmission to match the motor speed to the UH-1D transmission. The rotor was controlled by a modified UH-1B control system.

OPERATING PROCEDURES

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

Data Reduction

Six-component forces and moments were measured by the wind-tunnel balance system. Tare corrections were applied to the balance data to account for forces and moments produced by the exposed model support struts, the faired body, and the rotating hub. The rotating hub tares included all hardware inboard of 0.0814 R for the articulated hub. For the teetering rotor, all rotating hardware inboard of the 2.66 ft radius station were included in the tares. The tares applied were based on wind-tunnel dynamic pressure and α_s. Rotor downwash effects on the tares were neglected because of a lack of confidence in any known technique for assessing their magnitude. The tares used are the faired curves in figures 2, 3, and 4. The control-axis angle of attack (α_c) was determined by the equation

$$\alpha_c = \alpha_s - B_{1_s}$$

where longitudinal cyclic coefficient, B_{1_s}, was obtained from model instrumentation.

Rotor torque and rotational speed were used to compute the total power coefficient C_P/σ. For the teetering rotor, rotor torque was measured with the wind-tunnel balance. For the articulated rotor, torque was measured with a shaft torsion gage as well as with the wind-tunnel balance. The shaft power data are presented in the figures since these data are independent of rotor wake interference effects on the fuselage. Comparison of torque obtained from the rotor shaft with that obtained from the wind-tunnel balance indicates that these interference effects are small. The maximum difference between these torques corresponds to 3 percent of maximum power. The rotor profile power coefficient is based on the assumption of uniform downwash distribution over the rotor disk.

Data Presentation

Test conditions for both the articulated and teetering rotors are illustrated on the rotor velocity diagrams in figure 5. Numbers adjacent to the symbols on these diagrams refer to figure numbers which present the plotted data for that condition. (An index to the figures is given in table II.)

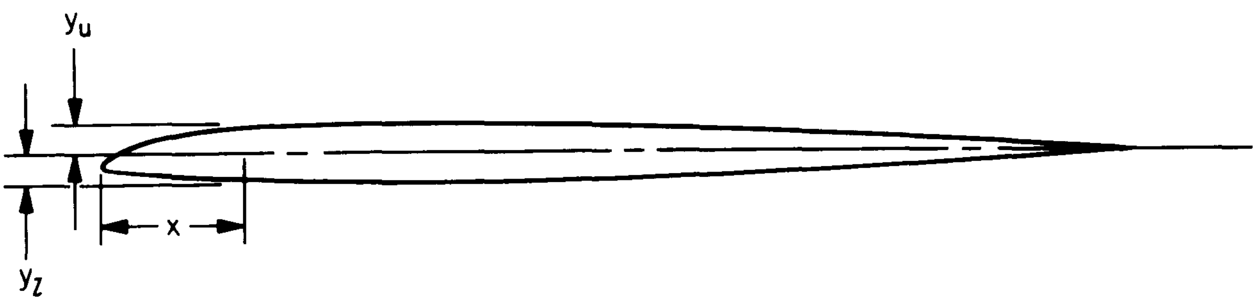
Tabulated data from the articulated and teetering rotor tests are indexed in table III and are presented in both the wind-axes and shaft-axes systems in tables IV-1 through IV-62.

Although the technique used in these tests was selected to obtain data with $a_{1_s} = b_{1_s} = 0$, numerous data were recorded for which flapping was not zero. Of those data, only those for which $|a_{1_s}|$ or $|b_{1_s}|$ was greater than 0.2° are so noted and listed in the tabulated data. For the plotted data, nonzero flapping is not noted except in figures 7 and 8 where $\pm 5^\circ$ of lateral flapping was intentionally induced for several points.

Ames Research Center
National Aeronautics and Space Administration
Moffett Field, Calif. 94035, March 5, 1968
721-01-00-13-00-21

TABLE I.- UPPER AND LOWER SURFACE COORDINATES FOR BLADE TIP AIRFOIL SECTION FOR TEETERING ROTOR TAPERED TIP BLADE

[All dimensions are in inches]



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

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

TABLE II.- INDEX TO FIGURES

Figure No.	Title
1	General view of rotor systems. (a) Articulated rotor system. (b) Teetering rotor system.
2	Tare data No. 1 (used for articulated rotor data with fairing over tail-strut dynamic absorber).
3	Tare data No. 2 (used for articulated rotor data without fairing over tail-strut dynamic absorber).
4	Tare data No. 3 (used for teetering rotor data).
5	Rotor velocity diagrams.
	Articulated rotor with $\theta_1 = -8^{\circ}$,
6	$V/\Omega R = 0.30$, $M_{(1)(90)} = 0.74$
7	$V/\Omega R = 0.40$, $M_{(1)(90)} = 0.82$
8	$V/\Omega R = 0.46$, $M_{(1)(90)} = 0.82$
	Articulated rotor with $\theta_1 = 0^{\circ}$,
9	$V/\Omega R = 0.30$, $M_{(1)(90)} = 0.73$
10	$V/\Omega R = 0.40$, $M_{(1)(90)} = 0.83$
11	$V/\Omega R = 0.46$, $M_{(1)(90)} = 0.82$
12	$V/\Omega R = 0.50$, $M_{(1)(90)} = 0.83$
13	$V/\Omega R = 0.62$, $M_{(1)(90)} = 0.73$
14	$V/\Omega R = 0.71$, $M_{(1)(90)} = 0.68$
15	$V/\Omega R = 0.82$, $M_{(1)(90)} = 0.62$
16	$V/\Omega R = 0.83$, $M_{(1)(90)} = 0.62$
17	$V/\Omega R = 1.05$, $M_{(1)(90)} = 0.54$
18	$V/\Omega R = 0.40$, $M_{(1)(90)} = 0.67$
19	$V/\Omega R = 0.41$, $M_{(1)(90)} = 0.87$

TABLE II.- INDEX TO FIGURES - Concluded

Figure No.	Title
	Articulated rotor with $\theta_1 = 0^\circ$,
20	$V/\Omega R = 0.39$, $M_{(1)(90)} = 0.89$
21	$V/\Omega R = 0.39$, $M_{(1)(90)} = 0.93$
	Teetering 48-ft rotor with standard blades,
22	$V/\Omega R = 0.30$, $M_{(1)(90)} = 0.79$
23	$V/\Omega R = 0.30$, $M_{(1)(90)} = 0.85$
24	$V/\Omega R = 0.30$, $M_{(1)(90)} = 0.95$
25	$V/\Omega R = 0.35$, $M_{(1)(90)} = 0.85$
26	$V/\Omega R = 0.35$, $M_{(1)(90)} = 0.95$
27	$V/\Omega R = 0.40$, $M_{(1)(90)} = 0.85$
	Teetering 48-ft rotor with tapered-tip blades,
28	$V/\Omega R = 0.30$, $M_{(1)(90)} = 0.85$
29	$V/\Omega R = 0.30$, $M_{(1)(90)} = 0.95$
30	$V/\Omega R = 0.30$, $M_{(1)(90)} = 1.00$
31	$V/\Omega R = 0.35$, $M_{(1)(90)} = 0.85$
32	$V/\Omega R = 0.35$, $M_{(1)(90)} = 0.94$
33	$V/\Omega R = 0.40$, $M_{(1)(90)} = 0.84$
	Teetering 34-ft rotor,
34	$V/\Omega R = 0.51$, $M_{(1)(90)} = 0.65$
35	$V/\Omega R = 0.66$, $M_{(1)(90)} = 0.55$
36	$V/\Omega R = 0.79$, $M_{(1)(90)} = 0.52$

TABLE III.- INDEX TO TABLES*

Table numbers		
Wind axes	Shaft axes	Description
		Articulated rotor with $\theta_1 = -8^\circ$,
IV- 1	IV-32	$V/\Omega R = 0.30$, $M_{(1)(90)} = 0.74$
IV- 2	IV-33	$V/\Omega R = 0.40$, $M_{(1)(90)} = 0.82$
IV- 3	IV-34	$V/\Omega R = 0.46$, $M_{(1)(90)} = 0.82$
		Articulated rotor with $\theta_1 = 0^\circ$,
IV- 4	IV-35	$V/\Omega R = 0.30$, $M_{(1)(90)} = 0.73$
IV- 5	IV-36	$V/\Omega R = 0.40$, $M_{(1)(90)} = 0.83$
IV- 6	IV-37	$V/\Omega R = 0.46$, $M_{(1)(90)} = 0.82$
IV- 7	IV-38	$V/\Omega R = 0.50$, $M_{(1)(90)} = 0.83$
IV- 8	IV-39	$V/\Omega R = 0.62$, $M_{(1)(90)} = 0.73$
IV- 9	IV-40	$V/\Omega R = 0.71$, $M_{(1)(90)} = 0.68$
IV-10	IV-41	$V/\Omega R = 0.82$, $M_{(1)(90)} = 0.62$
IV-11	IV-42	$V/\Omega R = 0.83$, $M_{(1)(90)} = 0.62$
IV-12	IV-43	$V/\Omega R = 1.05$, $M_{(1)(90)} = 0.54$
IV-13	IV-44	$V/\Omega R = 0.40$, $M_{(1)(90)} = 0.67$
IV-14	IV-45	$V/\Omega R = 0.41$, $M_{(1)(90)} = 0.87$
IV-15	IV-46	$V/\Omega R = 0.39$, $M_{(1)(90)} = 0.89$
IV-16	IV-47	$V/\Omega R = 0.39$, $M_{(1)(90)} = 0.93$

*Abbreviations in tables are:

CH for C_H/σ
CLR for C_{L_R}/σ
CMX for C_{m_X}/σ
CMXB for $C_{m_{X_B}}/\sigma$
CMY for C_{m_Y}/σ
CMZ for C_{m_Z}/σ

CP for C_P/σ
CPO for C_{P_O}/σ
CQ for C_Q/σ
CT for C_T/σ
CXR for C_{X_R}/σ
CYR for C_{Y_R}/σ
M,AT for $M_{(1)(90)}$

V/OR for $V/\Omega R$
No. 1 tare for fairing over tail strut
No. 2 tare for no fairing over tail strut

TABLE III.- INDEX TO TABLES - Concluded

Table numbers		
Wind axes	Shaft axes	Description
		Teetering rotor, standard blades:
IV-17	IV-48	$V/\Omega R = 0.30$, $M_{(1)(90)} = 0.79$
IV-18	IV-49	$V/\Omega R = 0.30$, $M_{(1)(90)} = 0.85$
IV-19	IV-50	$V/\Omega R = 0.30$, $M_{(1)(90)} = 0.95$
IV-20	IV-51	$V/\Omega R = 0.35$, $M_{(1)(90)} = 0.85$
IV-21	IV-52	$V/\Omega R = 0.35$, $M_{(1)(90)} = 0.95$
IV-22	IV-53	$V/\Omega R = 0.40$, $M_{(1)(90)} = 0.85$
		Teetering rotor, 48-ft tapered-tip blades:
IV-23	IV-54	$V/\Omega R = 0.30$, $M_{(1)(90)} = 0.85$
IV-24	IV-55	$V/\Omega R = 0.30$, $M_{(1)(90)} = 0.95$
IV-25	IV-56	$V/\Omega R = 0.30$ $M_{(1)(90)} = 1.00$
IV-26	IV-57	$V/\Omega R = 0.35$, $M_{(1)(90)} = 0.85$
IV-27	IV-58	$V/\Omega R = 0.35$, $M_{(1)(90)} = 0.94$
IV-28	IV-59	$V/\Omega R = 0.40$, $M_{(1)(90)} = 0.84$
		Teetering rotor, 34-ft blades:
IV-29	IV-60	$V/\Omega R = 0.51$, $M_{(1)(90)} = 0.65$
IV-30	IV-61	$V/\Omega R = 0.66$, $M_{(1)(90)} = 0.55$
IV-31	IV-62	$V/\Omega R = 0.79$, $M_{(1)(90)} = 0.52$

TABLE IV-1.- ARTICULATED ROTOR; -8° TWIST, $V/\Omega R$ = 0.30, $M_{(1)(90)}$ = 0.74.

TEST 276.0 RUN 3

No. 1 Tare

$\theta_{.75}$	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1s}
			(COEFFICIENTS BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED)						WIND AXES DATA				
6.	-10.0	-14.2	0.026915	0.003496	0.000273	-0.000420	-0.000166	0.002612	0.0025095	0.0013774	0.303	0.741	-1.3
8.	-10.0	-15.6	0.049948	0.008308	-0.000213	-0.000767	-0.000311	0.004492	0.0042784	0.0014990	0.304	0.746	-2.5
10.	-10.0	-16.8	0.072363	0.013059	-0.000087	-0.000943	-0.000567	0.006615	0.0061470	0.0016460	0.304	0.746	-2.8
2.	-5.0	-7.1	0.012084	-0.000545	-0.000251	-0.000119	-0.000020	0.001293	0.0012130	0.0013613	0.300	0.742	-0.8
4.	-5.0	-8.8	0.034151	0.001679	-0.000299	-0.000034	-0.000227	0.002122	0.0020347	0.0014065	0.303	0.742	-1.4
6.	-5.0	-10.3	0.057331	0.003979	-0.000278	0.000010	-0.000477	0.003185	0.0029923	0.0014515	0.303	0.740	-1.8
8.	-5.0	-11.8	0.077989	0.006593	-0.000586	0.000015	-0.000751	0.004475	0.0042396	0.0016220	0.302	0.740	-2.5
10.	-5.0	-13.7	0.094816	0.009650	-0.000849	-0.000141	-0.001102	0.006415	0.0060368	0.0021929	0.303	0.740	-3.6
11.	-5.0	-14.2	0.100129	0.010220	-0.001780	-0.000322	-0.000953	0.007809	0.0073419	0.0032341	0.301	0.741	-4.4
0.	0.	-1.8	0.013465	-0.001556	-0.000832	0.000230	-0.000072	0.000991	0.0009281	0.0013828	0.304	0.735	-0.5
2.	0.	-3.4	0.037656	-0.001502	-0.000845	0.000394	-0.000367	0.001192	0.0010874	0.0013973	0.303	0.736	-0.9
4.	0.	-4.7	0.061472	-0.001222	-0.001120	0.000486	-0.000715	0.001599	0.0014951	0.0014802	0.304	0.736	-1.7
6.	0.	-6.5	0.082906	-0.000366	-0.001172	0.000669	-0.001075	0.002417	0.0022957	0.0017053	0.304	0.736	-2.0
8.	0.	-8.2	0.102012	0.001043	-0.001662	0.000556	-0.001297	0.004055	0.0038793	0.0025074	0.307	0.733	-3.1
10.	0.	-9.6	0.106934	0.002905	-0.003198	0.000496	-0.001449	0.007019	0.0066196	0.0045684	0.302	0.737	-5.1
-4.	5.0	6.2	-0.003728	-0.001354	-0.001473	0.000137	0.000086	0.001268	0.0011893	0.0016025	0.306	0.735	-0.5
-2.	5.0	4.8	0.018556	-0.003379	-0.001539	0.000382	0.000011	0.000527	0.0005808	0.0015728	0.304	0.735	-0.1
0.	5.0	2.7	0.040802	-0.005204	-0.001541	0.000457	-0.000406	0.000074	0.0000982	0.0015069	0.303	0.734	-0.8
2.	5.0	0.9	0.061329	-0.006317	-0.001515	0.000708	-0.000761	0.000031	0.0000378	0.0015549	0.301	0.733	-1.0
4.	5.0	-0.6	0.085817	-0.008058	-0.001465	0.000812	-0.001068	0.000232	0.0002508	0.0019380	0.303	0.732	-1.5
6.	5.0	-2.5	0.102633	-0.007666	-0.001112	0.000790	-0.001362	0.001350	0.0013827	0.0026335	0.303	0.734	-2.0
8.	5.0	-5.0	0.110663	-0.005780	-0.001363	0.001090	-0.001309	0.004048	0.0040210	0.0045202	0.303	0.732	-3.3
10.	5.0	-6.6	0.116090	-0.005400	-0.001027	0.001566	-0.001442	0.006490	0.0070642	0.0073218	0.303	0.734	-4.9
-4.	10.0	10.2	0.020217	-0.005513	-0.001967	0.000348	-0.000322	0.000059	0.0001147	0.0017564	0.305	0.731	-0.1
-2.	10.0	8.6	0.043271	-0.009493	-0.002055	0.000405	-0.000588	-0.001011	-0.0009103	0.0018002	0.306	0.731	-0.3
0.	10.0	6.9	0.064221	-0.013107	-0.001785	0.000473	-0.000956	-0.001740	-0.0015583	0.0020013	0.304	0.732	-0.3
2.	10.0	5.3	0.085606	-0.016034	-0.001652	0.000471	-0.001366	-0.001988	-0.0017822	0.0023185	0.303	0.732	-0.9
4.	10.0	2.9	0.103540	-0.017311	-0.000849	0.000837	-0.001703	-0.001350	-0.0011000	0.0030837	0.305	0.734	-1.0
6.	10.0	1.0	0.113526	-0.016980	-0.002255	0.001109	-0.001619	0.001003	0.0011755	0.0049869	0.302	0.732	-2.6
7.	10.0	-0.3	0.117268	-0.017027	-0.002043	0.001437	-0.001608	0.002600	0.0027420	0.0065775	0.307	0.730	-3.0
8.	10.0	-1.1	0.120607	-0.017031	-0.001869	0.001008	-0.002053	0.003407	0.0044183	0.0081016	0.304	0.731	-4.1
9.	10.0	-2.5	0.120673	-0.015309	-0.000524	0.001334	-0.001227	0.004439	0.0060943	0.0092988	0.306	0.731	-4.7

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

α_s	$\theta_{.75}$	a_{1s}	b_{1s}
5	8	.2+.4	.2
5	10	.5	-.5
10	0	-.5	.5
10	4	.5	.5
10	6	0	-.5

TABLE IV-2.- ARTICULATED ROTOR; -8° TWIST, $V/\Omega R = 0.40$, $M_{(1)(90)} = 0.82$.

TEST 276.0 RUN 4

No. 1 Tare

$\theta_{.75}$	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1s}
			(COEFFICIENTS BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED)						WIND AXES DATA				
6.	-10.0	-14.4	0.005871	-0.001399	0.000348	-0.000596	-0.000024	0.001390	0.0013218	0.0018729	0.396	0.826	-0.9
8.	-10.0	-16.1	0.026213	0.002774	0.000270	-0.000749	-0.000231	0.003288	0.0030944	0.0019356	0.398	0.823	-1.5
10.	-10.0	-17.8	0.046759	0.007032	-0.000087	-0.001300	-0.000541	0.005332	0.0051516	0.0021807	0.398	0.822	-2.5
12.	-10.0	-19.4	0.065524	0.010801	-0.000750	-0.001560	-0.000474	0.007638	0.0071955	0.0025042	0.404	0.815	-3.7
10.	-10.0	-18.0	0.046019	0.006933	-0.000128	-0.001196	-0.000422	0.005395	0.0050653	0.0021155	0.402	0.818	-2.4
10.	-10.0	-19.4	0.051295	0.006995	0.005111	0.000154	-0.000477	0.005959	0.0052787	0.0022795	0.400	0.820	-3.0
10.	-10.0	-16.9	0.042660	0.006899	-0.004349	-0.002859	-0.000635	0.004979	0.0049656	0.0020740	0.399	0.820	-7.9
4.	-5.0	-9.3	0.019651	-0.000426	-0.000359	-0.000122	-0.000242	0.001862	0.0016864	0.0018260	0.398	0.817	-0.8
6.	-5.0	-11.0	0.040331	0.001833	-0.000449	-0.000144	-0.000438	0.002954	0.0027311	0.0018769	0.397	0.820	-1.2
8.	-5.0	-12.9	0.059256	0.003866	-0.000724	-0.000302	-0.000836	0.004229	0.0039934	0.0021771	0.399	0.818	-2.1
8.	-5.0	-14.3	0.060490	0.003432	0.005119	0.001456	-0.000706	0.004371	0.0039016	0.0022460	0.400	0.816	3.3
8.	-5.0	-12.0	0.053695	0.004346	-0.005840	-0.002199	-0.000848	0.004136	0.0040454	0.0020826	0.400	0.816	-7.7
10.	-5.0	-14.4	0.076492	0.005945	-0.001691	-0.000180	-0.001116	0.005899	0.0054458	0.0026148	0.400	0.815	-3.2
12.	-5.0	-16.3	0.087762	0.008202	-0.001334	-0.000568	-0.000952	0.007672	0.0072701	0.0033755	0.403	0.812	-4.5
4.	0.	-5.6	0.052187	-0.001825	-0.001494	0.000339	-0.000618	0.001609	0.0014402	0.0019484	0.395	0.816	-1.2
6.	0.	-7.5	0.069959	-0.001287	-0.001637	0.000463	-0.001042	0.002332	0.0021686	0.0023025	0.399	0.812	-1.7
2.	0.	-4.0	0.031924	-0.002106	-0.001250	0.000336	-0.000211	0.001265	0.0010859	0.0018431	0.397	0.816	-0.3
6.	0.	-7.6	0.069721	-0.001162	-0.001538	0.000404	-0.001014	0.002344	0.0022005	0.0022829	0.397	0.816	-1.7
6.	0.	-8.9	0.069590	-0.001627	0.005548	0.002269	-0.000951	0.002266	0.0021469	0.0024147	0.397	0.815	3.9
6.	0.	-6.4	0.066252	-0.000226	-0.007691	-0.001670	-0.000991	0.002514	0.0023903	0.0021376	0.397	0.815	-7.3
8.	0.	-9.5	0.084971	0.000316	-0.001955	0.000183	-0.000998	0.003750	0.0036284	0.0029412	0.399	0.815	-2.9
10.	0.	-11.6	0.098263	0.000472	-0.000220	-0.001019	-0.000764	0.006458	0.0067181	0.0057818	0.400	0.812	-2.9
0.	0.	-2.1	0.011986	-0.002246	-0.001250	0.000303	0.000067	0.001084	0.0009320	0.0018145	0.398	0.815	0.1
-4.	5.0	5.0	0.000283	-0.002241	-0.002157	0.000360	0.000185	0.001195	0.0010962	0.0019909	0.399	0.813	1.1
-2.	5.0	3.6	0.021430	-0.004101	-0.002133	0.000491	-0.000136	0.000442	0.0003576	0.0019473	0.396	0.815	0.4
0.	5.0	1.8	0.041965	-0.005840	-0.002071	0.000600	-0.000227	-0.000092	-0.0001295	0.0020484	0.396	0.813	-0.1
2.	5.0	0.	0.058246	-0.006491	-0.001873	0.000797	-0.000620	-0.000086	-0.0001160	0.0022188	0.400	0.812	-0.5
4.	5.0	-2.2	0.077779	-0.007437	-0.001824	0.000898	-0.001014	0.000282	0.0002737	0.0027398	0.395	0.811	-1.1
6.	5.0	-4.3	0.091022	-0.006881	-0.001628	0.000834	-0.001155	0.001664	0.0016762	0.0037526	0.396	0.814	-1.9
8.	5.0	-6.3	0.101707	-0.006473	-0.001512	0.000651	-0.001214	0.003963	0.0042230	0.0059947	0.398	0.813	-3.1
-4.	10.0	9.7	0.033681	-0.008321	-0.002626	0.000447	-0.000268	-0.000943	-0.0008179	0.0024177	0.399	0.808	0.8
-2.	10.0	7.6	0.052625	-0.011451	-0.002446	0.000408	-0.000556	-0.001831	-0.0016632	0.0026842	0.398	0.812	0.3
0.	10.0	5.4	0.069111	-0.013577	-0.002225	0.000275	-0.001081	-0.002186	-0.0019932	0.0030662	0.400	0.810	-0.2

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

α_s	$\theta_{.75}$	a_{1s}	b_{1s}
-10	10	.2	5.0
-10	10	0	-5.0
-5	8	.2	5.0
-5	8	.2	-5.0
0	6	.2	5.0
0	6	.2	-5.0
0	10	-.8	1.5

TABLE IV-3.- ARTICULATED ROTOR; -8° TWIST, $V/\Omega R = 0.46$, $M_{(1)(90)} = 0.82$.

TEST 276.0 RUN 5

No. 1 Tare

$\theta_{.75}$	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1s}
			(COEFFICIENTS BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED)							WIND AXES DATA			
8.	-10.0	-16.3	0.012481	-0.000890	0.000508	-0.000730	-0.000069	0.002217	0.0020904	0.0024863	0.457	0.827	-1.1
10.	-10.0	-18.0	0.031669	0.003165	0.000241	-0.001108	-0.000287	0.004402	0.0041897	0.0026712	0.458	0.827	-2.2
12.	-10.0	-19.9	0.050158	0.007234	0.000136	-0.001797	-0.000657	0.006856	0.0064164	0.0029164	0.460	0.827	-3.0
8.	-10.0	-17.1	0.017028	0.000030	0.002292	0.000954	0.000108	0.003048	0.0025359	0.0025024	0.458	0.825	4.3
8.	-10.0	-15.3	0.012331	-0.000856	-0.000574	-0.002490	-0.000334	0.001825	0.0020719	0.0024514	0.455	0.827	-6.5
4.	-5.0	-9.3	0.012904	-0.001860	-0.000393	-0.000090	-0.000308	0.001715	0.0014897	0.0023286	0.457	0.825	-0.3
6.	-5.0	-11.3	0.029827	0.000025	-0.000533	-0.000110	-0.000485	0.002737	0.0024503	0.0023790	0.460	0.822	-1.1
8.	-5.0	-13.1	0.046075	0.001835	-0.000570	-0.000256	-0.000901	0.003897	0.0035894	0.0026010	0.461	0.822	-1.7
10.	-5.0	-14.8	0.061633	0.003871	-0.000874	-0.000474	-0.001344	0.005186	0.0049353	0.0028995	0.460	0.823	-2.6
10.	-5.0	-16.2	0.064932	0.003232	0.005527	0.001199	-0.001381	0.005360	0.0049280	0.0031584	0.460	0.822	2.7
10.	-5.0	-13.7	0.058651	0.004451	-0.006618	-0.002171	-0.001091	0.005444	0.0050832	0.0027998	0.461	0.821	-8.1
0.	0.	-2.1	0.010188	-0.002750	-0.001436	0.000993	-0.000161	0.001126	0.0009198	0.0021786	0.460	0.820	0.5
2.	0.	-4.1	0.028299	-0.002671	-0.001417	0.000682	-0.000456	0.001198	0.0010582	0.0022377	0.462	0.816	0.0
4.	0.	-6.1	0.043554	-0.002284	-0.001447	0.000551	-0.000627	0.001574	0.0014135	0.0023305	0.458	0.820	-0.6
6.	0.	-8.1	0.059672	-0.001758	-0.001549	0.000408	-0.001122	0.002238	0.0022073	0.0027737	0.459	0.818	-1.2
6.	0.	-9.0	0.061248	-0.002693	0.004660	0.002676	-0.001142	0.002075	0.0018982	0.0028767	0.458	0.819	4.2
6.	0.	-7.4	0.055143	-0.000856	-0.006525	-0.001583	-0.001154	0.002387	0.0023025	0.0024874	0.457	0.819	-7.0
8.	0.	-10.2	0.071794	-0.000627	-0.001285	0.000446	-0.001085	0.003168	0.0032575	0.0031953	0.458	0.819	-2.2
10.	0.	-12.3	0.081465	0.000506	0.000070	-0.000125	-0.001500	0.004572	0.0056222	0.0049418	0.459	0.819	-3.1
-4.	5.0	5.1	0.006790	-0.003362	-0.002494	0.000494	0.000040	0.000924	0.0008710	0.0024211	0.462	0.815	1.7
-2.	5.0	3.3	0.025105	-0.004986	-0.002449	0.000416	-0.000221	0.000285	0.0001891	0.0024387	0.460	0.815	0.7
0.	5.0	1.3	0.040928	-0.006045	-0.002440	0.000548	-0.000245	-0.000106	-0.0002049	0.0024648	0.460	0.816	0.2
2.	5.0	-1.0	0.053448	-0.006397	-0.002337	0.000646	-0.000705	0.000005	-0.0000795	0.0026901	0.463	0.814	-0.5
-2.	5.0	3.6	0.024110	-0.004939	-0.002536	0.000455	-0.000328	0.000288	0.0003145	0.0025534	0.461	0.817	0.9
2.	5.0	-0.7	0.056994	-0.006939	-0.002414	0.000623	-0.000784	-0.000071	-0.0001582	0.0028270	0.462	0.815	-0.3
4.	5.0	-2.8	0.072478	-0.007363	-0.002240	0.000758	-0.000924	0.000275	0.0002862	0.0033352	0.462	0.813	-0.8
6.	5.0	-5.1	0.086283	-0.006799	-0.001960	0.000844	-0.000717	0.001700	0.0016893	0.0043500	0.464	0.813	-1.6
8.	5.0	-6.9	0.095566	-0.006373	-0.001536	0.000019	-0.001152	0.003172	0.0039659	0.0063002	0.462	0.814	-3.1
-4.	10.0	9.1	0.039045	-0.009579	-0.003057	0.002456	-0.000363	-0.001319	-0.0011824	0.0031248	0.460	0.816	1.1
-2.	10.0	7.2	0.056106	-0.012199	-0.003084	0.002787	-0.000920	-0.002104	-0.0019049	0.0035109	0.461	0.810	0.6
0.	10.0	4.8	0.072382	-0.014094	-0.002820	0.002206	-0.001134	-0.002321	-0.0021617	0.0040118	0.463	0.811	0.3
2.	10.0	2.7	0.085603	-0.015255	-0.002763	0.002702	-0.001513	-0.001913	-0.0017275	0.0048228	0.462	0.814	-0.4

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

α_s	$\theta_{.75}$	a_{1s}	b_{1s}
-10	10	-.3	-.1
-10	12	-.2	-.3
0	8	.4	0
0	10	.2	.3

TABLE IV-4.- ARTICULATED ROTOR; 0° TWIST, $V/\Omega R = 0.30$, $M_{(1)(90)} = 0.73$.

TEST 276.0 RUN 6

No. 1 Tare

(COEFFICIENTS BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED) WIND AXES DATA

$\theta_{.75}$	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	$A1_s$
6.	-10.0	-14.3	0.025630	0.003840	0.000335	-0.000599	0.000026	0.002801	0.0028365	0.0016075	0.303	0.739	-2.4
8.	-10.0	-15.6	0.049258	0.008496	-0.000101	-0.000777	-0.000315	0.004641	0.0045869	0.0017514	0.305	0.738	-3.1
10.	-10.0	-17.1	0.071694	0.013409	-0.000995	-0.000949	-0.000578	0.006833	0.0065951	0.0019905	0.304	0.740	-4.2
11.	-10.0	-17.8	0.080413	0.015462	-0.000908	-0.001426	-0.000516	0.007901			0.304	0.738	-4.5
4.	-10.0	-12.8	0.002033	-0.000806	0.000637	-0.000483	0.000090	0.001237	0.0013347	0.0015759	0.300	0.735	-1.5
2.	-5.0	-6.8	0.006869	-0.000598	0.000302	-0.000309	0.000034	0.001342	0.0013201	0.0014965	0.303	0.737	-1.4
4.	-5.0	-8.6	0.032069	0.001797	0.000122	-0.000148	-0.000105	0.002236	0.0022134	0.0015596	0.306	0.735	-2.0
6.	-5.0	-10.3	0.055523	0.004266	-0.000340	-0.000057	-0.000525	0.003311	0.0032726	0.0016622	0.304	0.736	-2.7
8.	-5.0	-11.8	0.075162	0.006604	-0.000892	-0.000334	-0.001017	0.004521	0.0044824	0.0018957	0.305	0.737	-3.6
10.	-5.0	-13.5	0.092491	0.009460	-0.002553	-0.000196	-0.000882	0.006987	0.0066488	0.0028998	0.304	0.739	-5.1
11.	-5.0	-13.9	0.097181	0.009578	-0.003243	-0.000237	-0.000659	0.008191			0.305	0.739	-5.9
0.	0.	-1.3	0.011578	-0.001281	-0.000090	-0.000006	0.000191	0.001089	0.0011352	0.0015121	0.305	0.734	-0.9
2.	0.	-2.8	0.035131	-0.001256	-0.000482	0.000186	-0.000188	0.001298	0.0012594	0.0015172	0.305	0.734	-1.7
4.	0.	-4.4	0.058405	-0.000996	-0.001013	0.000478	-0.000561	0.001669	0.0016157	0.0015711	0.304	0.735	-2.4
6.	0.	-6.1	0.082647	-0.000384	-0.001676	0.000409	-0.000935	0.002497	0.0024500	0.0018691	0.304	0.735	-3.2
8.	0.	-8.1	0.097650	0.001206	-0.002817	0.000391	-0.001205	0.004261	0.0041493	0.0028106	0.304	0.735	-4.3
10.	0.	-9.9	0.104978	0.002847	-0.003175	0.000570	-0.001253	0.007246	0.0070781	0.0050897	0.305	0.736	-5.9
-4.	5.0	5.9	-0.009605	-0.000417	-0.000235	-0.000099	0.000426	0.001436	0.0013605	0.0014786	0.306	0.735	-0.1
-2.	5.0	4.6	0.013741	-0.002668	-0.000633	-0.000044	0.000287	0.000738	0.0006891	0.0014893	0.307	0.729	-0.5
0.	5.0	3.1	0.037296	-0.004846	-0.000915	0.000305	-0.000087	0.000183	0.0002064	0.0015417	0.305	0.733	-1.0
2.	5.0	1.5	0.061393	-0.006773	-0.001534	0.000610	-0.000394	-0.000054	-0.0000382	0.0016497	0.306	0.733	-1.7
4.	5.0	-0.2	0.084087	-0.008555	-0.001937	0.000800	-0.001153	0.000048	0.0000836	0.0019391	0.302	0.733	-2.3
6.	5.0	-2.6	0.102068	-0.008180	-0.002672	0.000958	-0.001385	0.001559	0.0015526	0.0030121	0.307	0.734	-3.2
8.	5.0	-4.7	0.109527	-0.006575	-0.003403	0.001123	-0.001403	0.004355	0.0043886	0.0051679	0.304	0.737	-4.8
10.	5.0	-6.3	0.113408	-0.005727	-0.002479	0.000776	-0.001271	0.006824	0.0071835	0.0076175	0.304	0.737	-6.3
-4.	10.0	10.2	0.016385	-0.004846	-0.001071	0.000209	-0.000132	0.000046	0.0000982	0.0015515	0.306	0.738	-0.4
-2.	10.0	9.0	0.039440	-0.009224	-0.001455	0.000165	-0.000468	-0.001063	-0.0009616	0.0016936	0.305	0.731	-0.7
0.	10.0	7.2	0.061465	-0.012725	-0.001875	0.000257	-0.000936	-0.001774	-0.0016640	0.0018058	0.303	0.734	-1.2
2.	10.0	5.7	0.084323	-0.016471	-0.002268	0.000319	-0.001350	-0.002261	-0.0020845	0.0021921	0.304	0.730	-1.6
4.	10.0	3.5	0.101766	-0.017961	-0.002733	0.000679	-0.001746	-0.001610	-0.0014361	0.0029543	0.303	0.734	-2.2
6.	10.0	0.6	0.111988	-0.016171	-0.003495	0.001173	-0.001537	0.001070	0.0012540	0.0049089	0.305	0.735	-3.7
8.	10.0	-1.2	0.117120	-0.017300	-0.002669	0.001073	-0.002023	0.003783	0.0048350	0.0087280	0.305	0.735	-5.2

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

α_s	$\theta_{.75}$	a_{1_s}	b_{1_s}
-5	11	-.4	-.1
5	10	-.2	-.3
10	6	.5	0
10	8	-.4	.3

TABLE IV-5.- ARTICULATED ROTOR; 0° TWIST, $V/\Omega R = 0.40$, $M_{(1)(90)} = 0.83$.

TEST 276.0 RUN 7

No. 1 Tare

			(COEFFICIENTS BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED)							WIND AXES DATA			
$\theta_{.75}$	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	$A1_s$
6.	-10.0	-14.9	0.004963	-0.000716	0.001025	-0.000892	0.000015	0.001879	0.0019477	0.0022338	0.402	0.839	-2.5
8.	-10.0	-16.4	0.024990	0.003336	0.000632	-0.001243	-0.000117	0.003778	0.0037725	0.0023805	0.403	0.840	-3.3
10.	-10.0	-18.3	0.042669	0.007136	0.000146	-0.001264	-0.000488	0.005822	0.0057733	0.0027495	0.404	0.840	-4.3
11.	-10.0	-19.1	0.052771	0.009500	-0.000113	-0.001547	-0.000602	0.007093			0.401	0.837	-4.9
4.	-5.0	-9.4	0.017354	-0.000037	0.000358	-0.000482	-0.000184	0.002092	0.0020579	0.0020494	0.401	0.835	-2.3
6.	-5.0	-11.4	0.037980	0.002143	-0.000133	-0.000555	-0.000548	0.003298	0.0033016	0.0023313	0.401	0.837	-3.0
8.	-5.0	-13.3	0.055746	0.004134	-0.000838	-0.000521	-0.000812	0.004637	0.0044389	0.0025365	0.402	0.837	-3.8
10.	-5.0	-15.1	0.068525	0.006636	-0.002087	-0.000319	-0.001303	0.006507	0.0062635	0.0032373	0.401	0.839	-5.5
0.	0.	-2.1	0.010644	-0.001797	-0.000137	-0.000120	0.000142	0.001282	0.0011897	0.0019035	0.402	0.835	-1.2
2.	0.	-4.2	0.028737	-0.001692	-0.000399	-0.000002	-0.000277	0.001410	0.0013326	0.0019486	0.402	0.834	-1.8
4.	0.	-6.0	0.049499	-0.001610	-0.000987	0.000314	-0.000516	0.001769	0.0016867	0.0021425	0.401	0.835	-2.5
6.	0.	-8.1	0.066657	-0.000770	-0.001581	0.000062	-0.000893	0.002563	0.0025761	0.0025414	0.401	0.834	-3.6
8.	0.	-9.9	0.082204	0.000106	-0.003161	0.000390	-0.001156	0.004519	0.0044248	0.0038625	0.403	0.832	-4.6
9.5	0.	-11.6	0.086655	0.001876	-0.003889	0.000613	-0.001349	0.006792	0.0065302	0.0051965	0.403	0.832	-6.1
-4.	5.0	5.1	0.001537	-0.002139	-0.000598	0.000060	0.000145	0.001145	0.0010325	0.0018855	0.399	0.835	0.0
-2.	5.0	3.6	0.018014	-0.003610	-0.000951	0.000122	-0.000090	0.000530	0.0005419	0.0019600	0.400	0.832	-0.7
0.	5.0	1.6	0.037958	-0.005309	-0.001405	0.000303	-0.000315	0.000018	-0.0000276	0.0019795	0.399	0.834	-1.2
2.	5.0	-0.5	0.056138	-0.006320	-0.001798	0.000525	-0.000676	-0.000093	-0.0000980	0.0022047	0.403	0.830	-1.9
4.	5.0	-2.6	0.075066	-0.007404	-0.002573	0.000720	-0.000891	0.000258	0.0002768	0.0027957	0.399	0.833	-2.4
6.	5.0	-4.8	0.088635	-0.006607	-0.003846	0.000661	-0.001318	0.002233	0.0021985	0.0042465	0.402	0.830	-3.9
8.	5.0	-6.8	0.095261	-0.005774	-0.003808	0.001533	-0.001543	0.004911	0.0048449	0.0064563	0.401	0.832	-5.3
9.	5.0	-7.8	0.098072	-0.005709	-0.004124	0.001176	-0.001190	0.006394	0.0063007	0.0078472	0.401	0.829	-6.3
-4.	10.0	9.2	0.029977	-0.007836	-0.001619	0.000019	-0.000263	-0.001065	-0.0009748	0.0021052	0.402	0.832	-0.2
-2.	10.0	7.5	0.048863	-0.011039	-0.002018	-0.000005	-0.000671	-0.002009	-0.0018646	0.0023689	0.400	0.832	-0.7
0.	10.0	5.6	0.065931	-0.013491	-0.002487	0.000028	-0.001030	-0.002478	-0.0022574	0.0028229	0.401	0.829	-1.2

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

α_s	$\theta_{.75}$	a_{1_s}	b_{1_s}
-5	10	.4	-.4
5	8	.3	.2
5	9	.2	-.3

TABLE IV-6.- ARTICULATED ROTOR; 0° TWIST, $V/\Omega R = 0.46$, $M_{(1)(90)} = 0.82$.

TEST 276.0 RUN 8

No. 1 Tare

(COEFFICIENTS BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED) WIND AXES DATA

$\theta_{.75}$	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1s}
8.	-10.0	-16.6	0.011314	0.000217	0.000657	-0.001116	-0.000122	0.002904	0.0028498	0.0027422	0.456	0.831	-3.2
10.	-10.0	-18.7	0.026313	0.003462	0.000439	-0.001446	-0.000121	0.004619	0.0045374	0.0029104	0.456	0.829	-4.1
12.	-10.0	-20.2	0.043778	0.007300	-0.000334	-0.001259	-0.000415	0.007009	0.0067514	0.0032912	0.456	0.831	-5.4
4.	-5.0	-9.8	0.011628	-0.000938	0.000465	-0.000499	0.000008	0.002036	0.0019366	0.0023566	0.458	0.828	-2.3
6.	-5.0	-11.6	0.027563	0.000607	0.000049	-0.000415	-0.000244	0.002994	0.0028780	0.0025497	0.456	0.829	-3.0
8.	-5.0	-13.6	0.042727	0.002464	-0.000620	0.000225	-0.000777	0.004271	0.0040667	0.0028206	0.455	0.830	-3.9
10.	-5.0	-15.3	0.057941	0.004091	-0.001702	0.000143	-0.001042	0.005896	0.0055890	0.0034853	0.459	0.826	-5.0
0.	0.	-2.5	0.007521	-0.002190	-0.000116	-0.000062	0.000054	0.001262	0.0011371	0.0021558	0.467	0.818	-1.1
2.	0.	-4.6	0.025336	-0.002134	-0.000515	0.000030	-0.000248	0.001433	0.0013150	0.0022500	0.459	0.827	-1.8
4.	0.	-6.6	0.040930	-0.001775	-0.001109	0.000153	-0.000414	0.001827	0.0017257	0.0024308	0.461	0.826	-2.7
6.	0.	-8.4	0.055761	-0.001363	-0.001684	0.000403	-0.001118	0.002461	0.0023762	0.0027909	0.458	0.827	-3.4
8.	0.	-10.4	0.072057	-0.000571	-0.002886	0.000186	-0.000808	0.004079	0.0039900	0.0038999	0.458	0.823	-4.6
10.	0.	-12.5	0.079317	0.001045	-0.004263	0.000244	-0.001798	0.006788	0.0064566	0.0055522	0.457	0.824	-6.2
-4.	5.0	5.0	0.004717	-0.002856	-0.000746	0.000012	0.000426	0.001025	0.0008925	0.0021992	0.458	0.823	-0.1
-2.	5.0	3.5	0.021283	-0.004296	-0.001235	0.000161	0.000169	0.000365	0.0002743	0.0022197	0.460	0.820	-0.7
0.	5.0	1.2	0.037189	-0.005700	-0.001758	0.000400	-0.000333	-0.000117	-0.0001480	0.0023844	0.461	0.823	-1.3
2.	5.0	-1.0	0.053182	-0.006561	-0.002052	0.000593	-0.000411	-0.000188	-0.0001792	0.0026461	0.460	0.822	-1.9
4.	5.0	-3.4	0.070360	-0.007153	-0.002998	0.000869	-0.000642	0.000262	0.0003043	0.0032578	0.460	0.821	-2.8
6.	5.0	-5.6	0.081036	-0.006352	-0.003738	0.000601	-0.000827	0.001697	0.0018501	0.0043418	0.462	0.822	-4.1
8.	5.0	-7.4	0.090369	-0.006607	-0.004710	0.000925	-0.001465	0.004365	0.0044210	0.0069258	0.462	0.820	-5.7
-4.	10.0	8.7	0.035152	-0.009159	-0.002263	0.000069	-0.000302	-0.001566	-0.0014461	0.0026844	0.460	0.821	-0.5
-2.	10.0	6.9	0.051303	-0.011564	-0.002619	0.000024	-0.000529	-0.002372	-0.0022074	0.0029558	0.462	0.817	-1.0
0.	10.0	4.6	0.066925	-0.013622	-0.003255	0.000127	-0.001071	-0.002733	-0.0025558	0.0034215	0.461	0.819	-1.6
2.	10.0	2.7	0.081219	-0.015108	-0.003694	0.000277	-0.001262	-0.002493	-0.0023020	0.0042197	0.461	0.816	-2.0

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

α_s	$\theta_{.75}$	a_{1s}	b_{1s}
5	8	-.3	0

TABLE IV-7.- ARTICULATED ROTOR; 0° TWIST, $V/\Omega R = 0.50$, $M_{(1)(90)} = 0.83$.

TEST 276.0 RUN 9

Tare No. 1 ALPHA SHAFT = -10

Tare No. 2 ALPHA SHAFT = -5, -3, 2, 5, 10

(COEFFICIENTS BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED) WIND AXES DATA

$\theta_{.75}$	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	$A1_s$
8.	-10.0	-16.3	0.001020	-0.002477	0.000942	-0.001173	-0.000310	0.002210	0.0021093	0.0033385	0.496	0.848	-3.2
10.	-10.0	-18.1	0.016522	0.000756	0.000834	-0.001430	-0.000231	0.004018	0.0038675	0.0034745	0.498	0.845	-3.7
12.	-10.0	-19.8	0.033248	0.004430	0.000156	-0.001428	-0.000408	0.006495	0.0061569	0.0038928	0.495	0.849	-5.1
13.	-10.0	-20.8	0.040732	0.005841	-0.000082	-0.001062	-0.000572	0.007699	0.0073502	0.0043269	0.500	0.843	-5.3
4.	-5.0	-9.5	0.008397	-0.002079	0.000315	-0.000257	-0.000532	0.001807	0.0018699	0.0029102	0.502	0.839	-2.3
6.	-5.0	-11.5	0.020553	-0.000618	-0.000007	-0.000222	-0.000962	0.002805	0.0027671	0.0030491	0.499	0.842	-2.8
8.	-5.0	-13.4	0.035485	0.000841	-0.000557	0.000498	-0.000965	0.003976	0.0038801	0.0033803	0.502	0.839	-3.7
10.	-5.0	-15.4	0.049762	0.002555	-0.001791	-0.000336	-0.001766	0.005605	0.0055022	0.0040666	0.502	0.839	-5.0
12.	-5.0	-16.8	0.064089	0.004097	-0.003602	-0.000255	-0.000842	0.008233	0.0078646	0.0055670	0.498	0.841	-6.8
0.	-3.0	-3.6	-0.010197	-0.003289	0.000200	-0.000144	-0.000161	0.001116	0.0011179	0.0027509	0.498	0.837	-0.9
2.	-3.0	-6.1	0.005233	-0.002520	0.000028	-0.000062	-0.000308	0.001505	0.0015050	0.0027683	0.502	0.833	-1.4
4.	-3.0	-8.5	0.018562	-0.001720	-0.000150	-0.000220	-0.000677	0.002075	0.0020969	0.0029470	0.507	0.838	-2.6
6.	-3.0	-10.2	0.033092	-0.000944	-0.000662	0.000391	-0.001220	0.002833	0.0028218	0.0032315	0.505	0.837	-3.2
8.	-3.0	-12.3	0.046355	0.000132	-0.001168	0.000993	-0.001422	0.003887	0.0038687	0.0036706	0.508	0.835	-3.8
10.	-3.0	-14.4	0.055738	0.001678	-0.002406	0.000568	-0.001636	0.005645	0.0054718	0.0044296	0.508	0.837	-5.3
-2.	2.0	0.9	0.004095	-0.003178	-0.000233	-0.000205	-0.000293	0.001053	0.0011087	0.0027168	0.506	0.833	-0.9
0.	2.0	-0.9	0.019575	-0.003604	-0.000647	-0.000095	-0.000357	0.000848	0.0008782	0.0026809	0.507	0.834	-1.3
2.	2.0	-3.2	0.034707	-0.004256	-0.001165	0.000213	-0.000839	0.000788	0.0009002	0.0029940	0.509	0.833	-2.0
4.	2.0	-5.4	0.047002	-0.004168	-0.001450	0.000287	-0.001232	0.001114	0.0012728	0.0032762	0.513	0.831	-2.7
6.	2.0	-7.5	0.059795	-0.004006	-0.002390	0.000529	-0.001609	0.001964	0.0020862	0.0039160	0.511	0.832	-3.8
8.	2.0	-9.6	0.073569	-0.003638	-0.002973	0.000944	-0.001705	0.003894	0.0039808	0.0055057	0.510	0.831	-4.3
10.	2.0	-11.5	0.080522	-0.003429	-0.003706	0.000512	-0.002315	0.006443	0.0065304	0.0079014	0.514	0.833	-6.2
-4.	5.0	5.1	0.008569	-0.004114	-0.000686	-0.000140	0.000012	0.000705	0.0007412	0.0028271	0.508	0.829	-0.2
-2.	5.0	3.2	0.021813	-0.005151	-0.001148	-0.000063	-0.000303	0.000238	0.0002813	0.0028622	0.507	0.827	-0.7
0.	5.0	1.1	0.037500	-0.006269	-0.001595	0.000004	-0.000375	-0.000207	-0.0001665	0.0029403	0.509	0.825	-1.4
2.	5.0	-1.3	0.052098	-0.007092	-0.002033	0.000317	-0.000663	-0.000281	-0.0001835	0.0032633	0.509	0.825	-2.0
4.	5.0	-3.3	0.066162	-0.008009	-0.002553	0.000678	-0.001352	0.000130	0.0002636	0.0040467	0.506	0.828	-2.6
6.	5.0	-4.9	0.079870	-0.008147	-0.003960	0.000558	-0.001451	0.001505	0.0017072	0.0054481	0.507	0.826	-3.8
8.	5.0	-7.9	0.086239	-0.007232	-0.004174	0.000325	-0.001554	0.003976	0.0042200	0.0074506	0.509	0.825	-5.6
-4.	10.0	8.4	0.040903	-0.010852	-0.002820	-0.000225	-0.000447	-0.001758	-0.0018233	0.0035774	0.507	0.826	-0.6
-2.	10.0	6.7	0.054615	-0.012818	-0.003078	-0.000397	-0.000736	-0.002468	-0.0024326	0.0039079	0.509	0.825	-1.1
0.	10.0	4.3	0.070077	-0.014602	-0.003878	-0.000203	-0.000941	-0.002595	-0.0026697	0.0044473	0.508	0.824	-1.8
2.	10.0	1.9	0.084568	-0.016092	-0.003847	0.000067	-0.001340	-0.002278	-0.0021863	0.0055704	0.509	0.824	-2.0
4.	10.0	-0.1	0.098575	-0.016311	-0.004742	0.000381	-0.000356	-0.001047	-0.0008009	0.0068893	0.508	0.824	-2.8
6.	10.0	-3.1	0.106878	-0.015000	-0.005047	0.000961	0.000674	0.001370	0.0020733	0.0089844	0.507	0.826	-4.5

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

α_s	$\theta_{.75}$	a_{1_s}	b_{1_s}
5	6	-.4	-.1

TABLE IV-8.- ARTICULATED ROTOR; 0° TWIST, $V/\Omega R = 0.62$, $M_{(1)(90)} = 0.73$.

TEST 276.0 RUN 10B

No. 2 Tare

(COEFFICIENTS BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED) WIND AXES DATA

$\theta_{.75}$	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}
6.	-8.0	-12.5	-0.018372	-0.006889	0.000525	-0.000308	0.000075	-0.000013	0.0001550	0.0043591	0.613	0.738	-2.1
8.	-8.0	-14.5	-0.006915	-0.005340	0.000165	-0.000335	0.000074	0.001164	0.0012434	0.0045175	0.614	0.741	-2.5
10.	-8.0	-16.7	0.002570	-0.004524	-0.000175	-0.000365	-0.000320	0.002400	0.0023533	0.0051638	0.621	0.734	-3.2
12.	-8.0	-18.4	0.017413	-0.002453	-0.000579	-0.000708	0.000153	0.004125	0.0041091	0.0056114	0.619	0.735	-4.5
2.	-4.0	-6.2	-0.012523	-0.004677	0.000100	-0.000298	-0.000151	0.000886	0.0009333	0.0038180	0.618	0.735	-1.3
4.	-4.0	-8.6	-0.002084	-0.003976	0.000040	-0.000131	-0.000229	0.001442	0.0014692	0.0039299	0.619	0.734	-2.0
6.	-4.0	-10.7	0.010472	-0.003283	-0.000310	-0.000029	-0.000330	0.002254	0.0021852	0.0042067	0.618	0.736	-2.4
8.	-4.0	-12.7	0.020839	-0.002949	-0.000799	-0.000196	-0.000490	0.002967	0.0029071	0.0047124	0.619	0.734	-3.7
10.	-4.0	-14.7	0.031783	-0.002426	-0.001591	-0.000094	-0.000564	0.004101	0.0039295	0.0053845	0.620	0.734	-4.2
0.	0.	-2.5	0.000526	-0.003693	-0.000245	-0.000079	-0.000435	0.001266	0.0013013	0.0035853	0.618	0.733	-1.3
2.	0.	-4.3	0.014925	-0.003718	-0.000740	0.000104	-0.000226	0.001349	0.0014230	0.0037132	0.619	0.733	-1.7
4.	0.	-6.8	0.024862	-0.003920	-0.000973	0.000173	-0.000571	0.001605	0.0016787	0.0040805	0.621	0.731	-2.4
6.	0.	-8.7	0.034521	-0.003877	-0.001655	-0.000020	-0.000512	0.002146	0.0021739	0.0045353	0.624	0.732	-3.6
-4.	4.0	4.6	0.006577	-0.004822	-0.000853	-0.000014	-0.000230	0.000799	0.0008965	0.0039035	0.624	0.732	-0.4
-2.	4.0	2.5	0.016457	-0.004968	-0.001090	-0.000095	-0.000358	0.000487	0.0005782	0.0036654	0.624	0.732	-1.0
0.	4.0	0.2	0.029119	-0.005959	-0.001567	0.000028	-0.000384	0.000142	0.0004525	0.0041199	0.622	0.733	-1.6
2.	4.0	-2.0	0.039601	-0.006557	-0.002003	0.000178	-0.000577	0.000219	0.0004523	0.0044357	0.620	0.732	-2.2
4.	4.0	-4.3	0.048701	-0.006372	-0.002727	0.000042	-0.000777	0.000607	0.0009415	0.0047768	0.621	0.732	-3.3
6.	4.0	-6.5	0.063186	-0.006085	-0.003668	0.000332	0.000033	0.001585	0.0018995	0.0055615	0.634	0.738	-4.4
8.	4.0	-8.7	0.070578	-0.006689	-0.004969	0.000264	0.000046	0.003548	0.0036808	0.0075886	0.621	0.733	-5.9
6.	4.0	-6.9	0.065267	-0.006868	-0.003534	0.000433	0.000670	0.001700	0.0019345	0.0060063	0.624	0.731	-4.1
-4.	8.0	7.2	0.034702	-0.009465	-0.002532	-0.000250	-0.000194	-0.001220	-0.0012784	0.0045139	0.618	0.733	-0.8
-2.	8.0	5.1	0.046648	-0.010299	-0.003451	-0.000168	-0.000255	-0.001532	-0.0015088	0.0047705	0.620	0.731	-1.5
0.	8.0	2.6	0.056221	-0.010390	-0.003779	0.000072	0.000188	-0.001401	-0.0014244	0.0048378	0.618	0.733	-2.0
2.	8.0	0.1	0.072395	-0.011444	-0.004541	0.000274	0.001460	-0.001451	-0.0013052	0.0055209	0.619	0.733	-2.6
4.	8.0	-2.2	0.078796	-0.011470	-0.005131	0.000370	0.000704	-0.000277	-0.0002317	0.0065527	0.619	0.732	-3.6

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

α_s	$\theta_{.75}$	a_{1_s}	b_{1_s}
0	0	.4	0
8	2	.2	-.3

TABLE IV-9.- ARTICULATED ROTOR; 0° TWIST, $V/\Omega R = 0.71$, $M_{(1)(90)} = 0.68$.

TEST 276.0 RUN 11

No. 2 Tare

$\theta_{.75}$	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1s}
			(COEFFICIENTS BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED)							WIND AXES DATA			
6.	-4.0	-10.6	-0.000823	-0.005691	-0.000465	-0.000173	-0.000228	0.001608	0.0015680	0.0055241	0.695	0.687	-2.3
8.	-4.0	-12.6	0.005570	-0.005761	-0.000545	-0.000209	-0.000438	0.002159	0.0019942	0.0059952	0.695	0.687	-2.9
10.	-4.0	-14.5	0.014729	-0.006132	-0.001393	-0.000019	-0.000476	0.002836	0.0026571	0.0069363	0.699	0.685	-3.2
12.	-4.0	-16.6	0.021382	-0.006137	-0.001888	-0.000059	-0.000782	0.003813	0.0036316	0.0079234	0.703	0.685	-3.9
13.7	-4.0	-17.9	0.034737	-0.005943	-0.003588	-0.000158	-0.000445	0.005669	0.0052715	0.0094128	0.706	0.682	-5.2
4.	-2.0	-7.4	0.003982	-0.005063	-0.000442	-0.000106	-0.000490	0.001556	0.0015854	0.0051609	0.706	0.681	-2.1
6.	-2.0	-9.8	0.011521	-0.005458	-0.000745	0.000018	-0.000435	0.001763	0.0018773	0.0057204	0.705	0.678	-2.7
8.	-2.0	-11.6	0.019636	-0.005752	-0.001374	0.000043	-0.000602	0.002417	0.0024149	0.0064748	0.709	0.680	-3.1
10.	-2.0	-13.4	0.025829	-0.005019	-0.002449	0.000090	-0.000588	0.003337	0.0031757	0.0067383	0.716	0.683	-3.9
12.	-2.0	-15.6	0.034292	-0.005784	-0.003101	0.000129	-0.000492	0.004769	0.0045285	0.0085641	0.707	0.679	-4.5
0.	0.	-1.9	0.000461	-0.004866	-0.000653	0.000058	-0.000517	0.001258	0.0014147	0.0048718	0.710	0.678	-1.1
2.	0.	-4.3	0.010286	-0.004858	-0.000716	0.000008	-0.000326	0.001304	0.0014930	0.0049398	0.710	0.675	-1.7
4.	0.	-6.5	0.016931	-0.004837	-0.000830	0.000001	-0.000600	0.001372	0.0015940	0.0049977	0.706	0.679	-2.3
6.	0.	-8.7	0.020691	-0.005492	-0.001158	0.000029	-0.000728	0.001726	0.0019131	0.0057787	0.707	0.679	-3.0
8.	0.	-10.6	0.029314	-0.005713	-0.002389	0.000116	-0.000260	0.002471	0.0026320	0.0066594	0.712	0.677	-3.6
10.	0.	-12.5	0.036062	-0.006055	-0.002925	0.000201	-0.000417	0.003732	0.0037148	0.0079320	0.706	0.678	-4.3
-4.	2.0	3.5	0.001084	-0.005490	-0.000407	-0.000189	-0.000071	0.001210	0.0012621	0.0051640	0.711	0.676	-0.5
-2.	2.0	1.3	0.007222	-0.005156	-0.000960	-0.000014	-0.000069	0.001143	0.0011982	0.0048587	0.710	0.676	-1.1
0.	2.0	-1.0	0.014077	-0.005221	-0.001038	0.000150	-0.000320	0.000946	0.0011985	0.0049084	0.712	0.677	-1.2
2.	2.0	-3.3	0.021427	-0.005461	-0.001460	0.000147	-0.000454	0.001002	0.0011662	0.0050263	0.711	0.676	-2.2
4.	2.0	-5.6	0.026947	-0.005687	-0.001843	0.000299	-0.000326	0.001244	0.0013900	0.0054014	0.711	0.676	-2.8
6.	2.0	-7.6	0.033070	-0.006043	-0.001956	0.000080	-0.000347	0.001568	0.0018694	0.0061191	0.711	0.677	-3.3
8.	2.0	-9.8	0.039266	-0.006341	-0.002942	0.000422	0.000034	0.002592	0.0028914	0.0073263	0.710	0.676	-3.9
-4.	4.0	4.5	0.012720	-0.006299	-0.001008	-0.000273	-0.000030	0.000515	0.0007825	0.0052323	0.708	0.675	-0.7
-2.	4.0	2.4	0.020303	-0.006527	-0.001375	-0.000066	-0.000256	0.000306	0.0005639	0.0051887	0.711	0.674	-1.1
0.	4.0	0.1	0.024718	-0.006129	-0.001798	0.000084	-0.000500	0.000426	0.0006550	0.0049803	0.710	0.676	-1.8
2.	4.0	-2.3	0.034345	-0.006695	-0.001814	-0.000060	-0.000456	0.000273	0.0006229	0.0053158	0.709	0.676	-2.4
4.	4.0	-4.6	0.043748	-0.007103	-0.002555	0.000192	-0.000082	0.000669	0.0012619	0.0062179	0.709	0.676	-3.1
6.	4.0	-6.9	0.046086	-0.007007	-0.003241	0.000134	-0.000143	0.001718	0.0020923	0.0069660	0.709	0.676	-4.1
8.	4.0	-8.7	0.055790	-0.007876	-0.004045	0.000449	0.000763	0.003033	0.0033669	0.0088313	0.711	0.674	-4.7
-4.	6.0	5.9	0.025133	-0.007657	-0.002290	-0.000041	0.000353	-0.000096	-0.0001757	0.0052193	0.708	0.675	-0.7
-2.	6.0	3.7	0.034042	-0.007822	-0.002722	-0.000124	0.000302	-0.000341	-0.0003674	0.0051283	0.709	0.676	-1.3
0.	6.0	1.1	0.040292	-0.007636	-0.003237	0.000140	0.000214	-0.000229	-0.0002715	0.0050659	0.708	0.675	-1.9
2.	6.0	-1.4	0.046774	-0.008012	-0.003408	0.000255	-0.000017	0.000034	0.0000160	0.0055928	0.708	0.675	-2.5
4.	6.0	-3.6	0.053930	-0.008085	-0.004288	0.000285	-0.000028	0.000923	0.0009658	0.0065422	0.706	0.677	-3.5
-4.	8.0	6.6	0.040553	-0.011347	-0.003186	-0.000252	-0.000328	-0.001339	-0.0014529	0.0064876	0.706	0.675	-1.2
-2.	8.0	4.4	0.047483	-0.011150	-0.003695	-0.000129	-0.000547	-0.001247	-0.0013893	0.0064015	0.708	0.675	-1.5
0.	8.0	2.0	0.056809	-0.011567	-0.004419	0.000017	-0.000474	-0.001159	-0.0012935	0.0067485	0.707	0.675	-2.2
2.	8.0	-0.5	0.064117	-0.011743	-0.005115	0.000287	-0.000692	-0.000373	-0.0005022	0.0077068	0.714	0.673	-2.9

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

α_s	$\theta_{.75}$	a_{1_s}	b_{1_s}
-4	13	-1.0	.4
-2	10	- .3	-.2
-2	12	0	.3

TABLE IV-10.- ARTICULATED ROTOR; 0° TWIST, $V/\Omega R = 0.82$, $M_{(1)(90)} = 0.62$.

TEST 276.0 RUN 12

No. 2 Tare

$\theta_{.75}$	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPD	V/OR	M,AT	A_{1s}
			(COEFFICIENTS BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED)						WIND AXES DATA				
2.	-2.0	-5.0	-0.003983	-0.006244	-0.000265	-0.000250	-0.000830	0.001412	0.0014225	0.0064688	0.808	0.635	-1.1
3.	-2.0	-6.0	-0.004284	-0.006557	-0.000332	-0.000367	-0.000697	0.001390	0.0014537	0.0067975	0.815	0.630	-1.2
4.	-2.0	-7.3	-0.002134	-0.006628	-0.000675	-0.000035	-0.000666	0.001362	0.0014822	0.0068318	0.807	0.630	-1.5
5.	-2.0	-8.3	-0.002584	-0.007428	-0.000810	-0.000111	-0.001346	0.001274	0.0015267	0.0075528	0.811	0.631	-1.8
6.	-2.0	-9.5	0.001027	-0.007593	-0.001115	-0.000067	-0.000362	0.001441	0.0014907	0.0076556	0.812	0.630	-2.0
7.	-2.0	-10.5	0.004423	-0.009199	-0.001370	-0.000042	-0.001067	0.001668	0.0014906	0.0088360	0.799	0.625	-2.4
8.	-2.0	-11.4	0.008199	-0.008639	-0.001600	-0.000001	-0.001098	0.001841	0.0017233	0.0087639	0.815	0.626	-2.6
9.	-2.0	-12.5	0.007990	-0.008804	-0.002218	-0.000042	-0.001188	0.002000	0.0017724	0.0089871	0.820	0.627	-2.8
10.	-2.0	-13.7	0.012444	-0.009800	-0.002146	-0.000075	-0.000705	0.002344	0.0021552	0.0101618	0.818	0.625	-3.2
11.	-2.0	-14.5	0.014224	-0.009245	-0.002581	-0.000239	-0.000793	0.002632	0.0023731	0.0100040	0.826	0.628	-3.5
12.	-2.0	-15.9	0.018826	-0.012090	-0.003315	-0.000255	-0.001203	0.003080	0.0029568	0.0127707	0.813	0.619	-4.0
12.8	-2.0	-17.7	0.018902	-0.011578	-0.003326	-0.000665	-0.001113	0.003390	0.0030948	0.0126186	0.824	0.622	-4.2
-4.	0.	1.9	-0.003950	-0.006583	0.000380	-0.000616	-0.000074	0.001168	0.0014026	0.0067932	0.819	0.624	-0.0
-2.	0.	1.0	-0.002999	-0.006089	-0.000272	-0.000221	-0.000337	0.001311	0.0015742	0.0065304	0.814	0.622	-0.2
0.	0.	-1.9	0.000272	-0.005514	-0.000270	-0.000227	-0.000704	0.001369	0.0014945	0.0059958	0.816	0.622	-1.0
2.	0.	-4.3	0.003292	-0.006177	-0.000782	-0.000240	-0.001149	0.001356	0.0014974	0.0065526	0.818	0.622	-1.5
4.	0.	-6.3	0.010384	-0.006847	-0.001206	-0.000115	-0.000315	0.001370	0.0015401	0.0071377	0.818	0.622	-2.2
6.	0.	-8.8	0.015332	-0.007747	-0.001899	0.000363	-0.000718	0.001573	0.0015855	0.0079161	0.818	0.621	-2.6
8.	0.	-10.8	0.017134	-0.008680	-0.002162	0.000095	-0.001052	0.001856	0.0019502	0.0090545	0.820	0.618	-3.1
10.	0.	-12.9	0.024631	-0.009645	-0.003555	-0.000364	-0.000448	0.002707	0.0027199	0.0106835	0.828	0.617	3.7
-4.	2.0	2.9	0.007447	-0.007301	-0.000285	-0.000598	-0.000112	0.001013	0.0011311	0.0071463	0.824	0.618	-0.3
-2.	2.0	1.2	0.013079	-0.006460	-0.000675	-0.000339	-0.000001	0.001072	0.0011909	0.0065606	0.832	0.617	-0.8
0.	2.0	-0.9	0.015917	-0.006706	-0.001068	-0.000196	-0.000261	0.001161	0.0011904	0.0067397	0.829	0.616	-1.5
2.	2.0	-4.3	0.018192	-0.006698	-0.001159	-0.000359	-0.000652	0.001140	0.0012943	0.0068886	0.837	0.615	-2.3
4.	2.0	-6.1	0.021359	-0.006991	-0.001372	-0.000211	-0.000711	0.001347	0.0016961	0.0075357	0.838	0.615	-2.7
6.	2.0	-7.8	0.023050	-0.008390	-0.002513	0.000143	-0.001288	0.001613	0.0018292	0.0088101	0.834	0.614	-3.0
8.	2.0	-10.0	0.027647	-0.009153	-0.002907	-0.000019	-0.000984	0.002113	0.0023272	0.0099256	0.833	0.613	-3.6
-4.	4.0	4.5	0.021902	-0.008480	-0.001225	-0.000849	-0.000470	0.000303	0.0006202	0.0076285	0.829	0.614	-0.6
-2.	4.0	2.1	0.024126	-0.007794	-0.001002	-0.000977	-0.000563	0.000314	0.0007101	0.0071563	0.830	0.614	-1.2
0.	4.0	-0.3	0.030098	-0.007718	-0.001616	-0.000302	-0.000496	0.000463	0.0007101	0.0070827	0.830	0.614	-1.9
2.	4.0	-2.4	0.033628	-0.007731	-0.001999	-0.000400	-0.000357	0.000567	0.0008910	0.0073001	0.834	0.615	-2.5
4.	4.0	-5.1	0.034693	-0.008318	-0.003185	0.000152	-0.000657	0.001073	0.0016922	0.0085577	0.831	0.613	-3.1
6.	4.0	-7.2	0.035487	-0.008550	-0.003352	-0.000059	-0.000613	0.001694	0.0019625	0.0090193	0.831	0.613	-3.8

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

α_s	$\theta_{.75}$	a_{1_s}	b_{1_s}
-2	9	.4	-.1
0	10	.3	-.1
2	6	.3	-.1
4	6	.3	-.2

TABLE IV-11.- ARTICULATED ROTOR; 0° TWIST, $V/\Omega R = 0.83$, $M_{(1)(90)} = 0.62$.

TEST 276.0 RUN 13A

No. 2 Tare

(COEFFICIENTS BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED) WIND AXES DATA

$\theta_{.75}$	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}
4.7	4.0	4.7	0.015851	-0.007752	-0.001121	-0.000495	-0.000000	0.000761	0.0007839	0.0071661	0.825	0.619	-0.5
0.	4.0	0.1	0.027084	-0.007159	-0.001881	-0.000657	-0.000374	0.000631	0.0007429	0.0066269	0.826	0.619	-1.8
5.8	6.0	5.7	0.033317	-0.010048	-0.002327	-0.000862	0.000132	-0.000352	-0.0003065	0.0079696	0.828	0.619	-1.3
3.4	6.0	3.4	0.041549	-0.009874	-0.002596	-0.000501	0.000123	-0.000450	-0.0004378	0.0076719	0.828	0.619	-1.5
1.	6.0	1.1	0.045377	-0.009306	-0.002903	-0.000535	-0.000286	-0.000133	-0.0001760	0.0074600	0.829	0.617	-2.1
-1.5	6.0	-1.6	0.050676	-0.009300	-0.003551	-0.000316	0.000270	0.000321	0.0003526	0.0079624	0.829	0.617	-2.9
-3.7	6.0	-3.6	0.052808	-0.009619	-0.004074	-0.000092	-0.000460	0.000921	0.0012020	0.0091010	0.832	0.615	-3.3
6.7	8.0	6.6	0.050514	-0.013277	-0.003927	-0.001069	-0.000016	-0.001501	-0.0017688	0.0091361	0.829	0.616	-1.7
4.4	8.0	4.3	0.059451	-0.012960	-0.004307	-0.000565	-0.000168	-0.001525	-0.0017080	0.0088766	0.827	0.618	-2.1
1.5	8.0	1.5	0.058174	-0.011305	-0.004778	-0.000587	-0.000727	-0.000601	-0.0007089	0.0085649	0.831	0.616	-2.8
-.7	8.0	-0.7	0.067017	-0.011957	-0.006416	-0.000044	-0.000434	0.000153	-0.0000895	0.0097128	0.834	0.614	-3.5

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

α_s	$\theta_{.75}$	a_{1_s}	b_{1_s}
4	-4	.3	-.1
6	-4	-.3	-.3
6	2	-.4	.2
8	0	-.6	-.3

TABLE IV-12.- ARTICULATED ROTOR; 0° TWIST, $V/\Omega R = 1.05$, $M_{(1)(90)} = 0.54$.

TEST 276.0 RUN 13B

No. 2 Tare

$\theta_{.75}$	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}
			(COEFFICIENTS BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED)						WIND AXES DATA				
-4.	1.0	3.3	0.015213	-0.012551	0.000641	0.000447	0.000534	0.000029	0.0004270	0.0136225	1.052	0.545	-0.1
-2.	1.0	0.8	0.001981	-0.009363	0.000748	-0.001133	-0.001374	0.001075	0.0014757	0.0112602	1.045	0.546	-0.8
0.	1.0	-1.5	-0.010139	-0.008368	0.000956	-0.003341	-0.002799	0.001009	0.0016330	0.0104204	1.051	0.545	-1.5
2.	1.0	-4.1	-0.012657	-0.009543	0.001111	-0.002039	-0.001946	0.001008	0.0014382	0.0115279	1.058	0.543	-1.0
4.	1.0	-6.2	-0.000865	-0.010814	-0.000351	-0.001163	0.001388	0.000409	0.0012965	0.0127411	1.058	0.543	-1.6
6.	1.0	-8.2	-0.012238	-0.013151	-0.000445	-0.000385	0.002440	-0.000369	0.0004275	0.0142713	1.053	0.545	-0.9
8.	1.0	-10.7	-0.024233	-0.016758	-0.000234	0.000887	-0.000346	-0.001157	-0.0003562	0.0172443	1.051	0.544	-0.5
10.	1.0	-12.5	-0.011436	-0.020033	-0.002303	0.001626	0.001765	-0.001241	-0.0003561	0.0206549	1.049	0.544	-1.0
-4.	3.0	4.3	0.026288	-0.013214	-0.000414	-0.000692	0.000482	-0.000416	-0.0001424	0.0136973	1.049	0.544	-0.4
-2.	3.0	1.7	0.025610	-0.009850	0.000156	-0.001862	0.000251	0.000727	0.0013027	0.0116996	1.057	0.542	-1.1
0.	3.0	-0.9	0.027072	-0.010378	-0.001086	0.000175	-0.000350	0.000772	0.0013028	0.0122670	1.059	0.542	-1.6
2.	3.0	-3.6	0.009098	-0.009202	-0.000719	-0.001009	-0.001241	0.001123	0.0015007	0.0111730	1.051	0.543	-1.5
4.	3.0	-5.8	0.006390	-0.011763	-0.000424	-0.001087	-0.000704	0.000798	0.0012885	0.0136644	1.052	0.543	-2.2
6.	3.0	-8.1	-0.005611	-0.014013	-0.000823	-0.000198	-0.000600	0.000045	0.0005011	0.0152468	1.052	0.543	-1.8
8.	3.0	-9.7	0.009791	-0.016115	-0.004101	0.000274	0.003200	0.000431	0.0013050	0.0183743	1.059	0.542	-1.9
-4.	5.0	5.2	0.044457	-0.015001	-0.002338	-0.001343	0.000896	-0.001361	-0.0012165	0.0144569	1.049	0.542	-1.4
-2.	5.0	2.9	0.051927	-0.013996	-0.001504	-0.000906	-0.000072	-0.000706	-0.0005082	0.0142024	1.057	0.540	-1.4
0.	5.0	-.2	0.044998	-0.011339	-0.002145	0.000367	-0.000232	0.000535	0.0007261	0.0126700	1.059	0.541	-1.4
2.	5.0	-2.9	0.037892	-0.010270	-0.002165	-0.001568	-0.000304	0.000853	0.0013068	0.0121217	1.057	0.541	-2.5
4.	5.0	-4.9	0.031877	-0.011206	-0.002837	-0.001910	-0.000919	0.000758	0.0012927	0.0130607	1.053	0.542	-2.7
-4.	7.0	5.9	0.069819	-0.020074	-0.004603	0.000198	0.000535	-0.002805	-0.0030157	0.0179394	1.051	0.542	-1.3
-2.	7.0	2.9	0.065862	-0.015532	-0.003213	-0.000838	-0.000520	-0.001093	-0.0010180	0.0152742	1.057	0.540	-2.2
0.	7.0	0.6	0.064844	-0.013628	-0.003703	-0.000983	-0.000205	-0.000333	-0.0001436	0.0140552	1.051	0.542	-2.2
2.	7.0	-2.1	0.061455	-0.012395	-0.003868	-0.001650	0.000408	0.000248	0.0005745	0.0135079	1.052	0.542	-3.1
4.	7.0	-4.2	0.060753	-0.014310	-0.004372	0.000338	0.001127	0.000696	0.0013645	0.0163277	1.053	0.543	-3.1

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

α_s	$\theta_{.75}$	a_{1_s}	b_{1_s}
1	-4	-.4	.1
1	-2	-.4	0
1	0	.3	-.2
1	4	-.4	-.4
1	6	-.4	-.2
3	-4	.4	.2
3	0	-.4	-.3
3	2	1.0	-.2
3	4	.2	-.3
3	6	.4	-.2
3	8	-.8	0
5	-2	-.8	.4
7	-4	-.4	.4
7	-2	.4	-.2
7	2	.3	-.3
7	4	-.4	.3

TABLE IV-13.- ARTICULATED ROTOR; 0° TWIST, $V/\Omega R = 0.40$, $M_{(1)(90)} = 0.67$.

TEST 276.0 RUN 10A

No. 2 Tare

$\theta_{.75}$	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPD	V/OR	M,AT	$A1_s$
			(COEFFICIENTS BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED)						WIND AXES DATA				
6.	-10.0	-14.4	0.001434	-0.001146	0.000423	-0.000226	0.000175	0.001444	0.0015330	0.0019938	0.402	0.672	-2.3
8.	-10.0	-15.9	0.021859	0.002831	-0.000000	-0.000522	-0.000120	0.003288	0.0032886	0.0021088	0.404	0.673	-3.2
10.	-10.0	-17.5	0.039007	0.006509	-0.000616	-0.000670	-0.000364	0.005108	0.0049983	0.0022716	0.401	0.674	-4.1
12.	-10.0	-19.1	0.056795	0.010360	-0.001423	-0.000960	-0.000487	0.007246	0.0070739	0.0026616	0.402	0.675	-5.3
14.	-10.0	-20.7	0.070765	0.013917	-0.001862	-0.001558	-0.000628	0.009553	0.0091686	0.0032038	0.401	0.674	-6.5
4.	-5.0	-9.0	0.017141	0.000073	0.000169	-0.000185	-0.000252	0.001820	0.0019096	0.0018578	0.399	0.671	-2.3
6.	-5.0	-11.0	0.033562	0.001945	-0.000434	-0.000093	-0.000469	0.002876	0.0029229	0.0020567	0.401	0.672	-3.2
8.	-5.0	-12.4	0.054116	0.003791	-0.001223	-0.000089	-0.000637	0.004040	0.0039219	0.0021750	0.401	0.671	-4.1
10.	-5.0	-14.4	0.069572	0.005949	-0.001480	-0.000006	-0.000719	0.005521	0.0053379	0.0025821	0.400	0.671	-4.7
12.	-5.0	-15.7	0.081331	0.008230	-0.002794	-0.000239	-0.000947	0.007595	0.0073686	0.0035527	0.402	0.672	-6.0
14.	-5.0	-17.2	0.092569	0.010459	-0.003847	-0.000015	-0.000181	0.011192			0.402	0.672	-7.7
0.	0.	-1.9	0.007603	-0.001830	-0.000033	0.000054	-0.000047	0.001013	0.0010234	0.0017508	0.400	0.671	-1.1
2.	0.	-3.8	0.023469	-0.001517	-0.000415	0.000144	-0.000371	0.001174	0.0012048	0.0017673	0.399	0.673	-2.1
4.	0.	-5.6	0.046033	-0.001525	-0.001146	0.000241	-0.000544	0.001492	0.0014980	0.0019415	0.399	0.673	-2.9
6.	0.	-7.5	0.064394	-0.001378	-0.001403	0.000262	-0.000735	0.002074	0.0020846	0.0023113	0.398	0.673	-3.3
8.	0.	-9.3	0.078677	-0.000072	-0.002697	0.000302	-0.000824	0.003443	0.0033660	0.0029155	0.400	0.672	-4.6
10.	0.	-11.0	0.091774	0.001512	-0.003523	0.000726	-0.000961	0.005869	0.0057295	0.0044718	0.400	0.672	-5.7
12.	0.	-12.5	0.101101	0.003334	-0.005635	0.000636	-0.000324	0.009011	0.0086631	0.0065366	0.400	0.672	-8.3
-4.	5.0	5.7	-0.001690	-0.001912	-0.000456	-0.000049	0.000103	0.001136	0.0010236	0.0017905	0.401	0.672	-0.5
-2.	5.0	3.8	0.015804	-0.003453	-0.000790	0.000030	-0.000147	0.000515	0.0004505	0.0018106	0.400	0.674	-1.1
0.	5.0	2.2	0.035191	-0.005390	-0.000944	0.000247	-0.000393	-0.000123	-0.0001372	0.0019257	0.401	0.672	-1.0
2.	5.0	0.3	0.054979	-0.006895	-0.001851	0.000325	-0.000523	-0.000328	-0.0003667	0.0021530	0.399	0.674	-2.3
4.	5.0	-1.6	0.071824	-0.007587	-0.002419	0.000562	-0.000764	-0.000080	-0.0000739	0.0025616	0.400	0.671	-2.7
6.	5.0	-4.0	0.086899	-0.007172	-0.002897	0.000795	-0.000955	0.001148	0.0011209	0.0033961	0.399	0.673	-3.5
8.	5.0	-5.9	0.100620	-0.006642	-0.004564	0.000606	-0.001008	0.003520	0.0034045	0.0052637	0.399	0.673	-5.3
10.	5.0	-7.5	0.107038	-0.005529	-0.006141	0.000826	-0.001040	0.006525	0.0063979	0.0076849	0.395	0.672	-7.8
-4.	10.0	9.6	0.025138	-0.007306	-0.001599	-0.000176	-0.000326	-0.000605	-0.0007703	0.0021076	0.401	0.672	-0.8
-2.	10.0	8.2	0.044191	-0.010685	-0.001697	-0.000161	-0.000503	-0.001732	-0.0017286	0.0023872	0.399	0.674	-0.7
0.	10.0	5.7	0.062351	-0.013265	-0.002678	-0.000229	-0.001007	-0.002224	-0.0022942	0.0026962	0.399	0.673	-2.0
2.	10.0	3.7	0.080894	-0.015461	-0.002533	0.000018	-0.001155	-0.002442	-0.0024194	0.0032076	0.397	0.672	-2.0
4.	10.0	1.4	0.096683	-0.016796	-0.003817	0.000390	-0.001164	-0.001626	-0.0016780	0.0043508	0.402	0.672	-2.9
6.	10.0	-0.5	0.110284	-0.017762	-0.004886	0.000757	-0.001333	0.000339	0.0003060	0.0064958	0.401	0.672	-4.0
8.	10.0	-2.4	0.118686	-0.017275	-0.006337	0.001363	-0.001208	0.004076	0.0039923	0.0098250	0.401	0.672	-6.4

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

α_s	$\theta_{.75}$	a_{1_s}	b_{1_s}
-10	14	.3	-.2
-5	14	-.2	1.0
0	10	.2	-.3
10	8	-.3	.4

TABLE IV-14.- ARTICULATED ROTOR; 0° TWIST, $V/\Omega R = 0.41$, $M_{(1)(90)} = 0.87$.

TEST 276.0 RUN 14A

No. 2 Tare

$\theta_{.75}$	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}
			(COEFFICIENTS BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED)						WIND AXES DATA				
6.	-10.0	-15.0	0.006806	-0.000760	0.000267	-0.000278	-0.000204	0.002303	0.0023297	0.0026353	0.407	0.874	-2.4
8.	-10.0	-16.5	0.025439	0.003031	-0.000086	-0.000772	-0.000315	0.004110	0.0041235	0.0028299	0.411	0.875	-3.5
10.	-10.0	-18.2	0.043890	0.007109	-0.000507	-0.001077	-0.000484	0.006220	0.0060811	0.0030403	0.407	0.872	-4.2
4.	-5.0	-9.6	0.019107	-0.000359	-0.000002	-0.000179	-0.000367	0.002307	0.0023414	0.0024608	0.410	0.868	-2.3
6.	-5.0	-11.2	0.038313	0.001739	-0.000508	-0.000199	-0.000675	0.003527	0.0034658	0.0026445	0.408	0.869	-2.9
8.	-5.0	-13.2	0.057393	0.004081	-0.001383	-0.000329	-0.000867	0.004937	0.0049115	0.0029977	0.408	0.869	-4.3
9.5	-5.0	-14.3	0.070614	0.005600	-0.001981	-0.000051	-0.001322	0.006534	0.0063453	0.0036813	0.408	0.869	-4.6
0.	0.	-2.3	0.011827	-0.002293	-0.000175	0.000059	-0.000267	0.001290	0.0013287	0.0022516	0.407	0.869	-0.9
2.	0.	-4.2	0.032476	-0.002307	-0.000599	0.000243	-0.000415	0.001396	0.0014322	0.0022898	0.407	0.864	-1.5
4.	0.	-6.2	0.047536	-0.001597	-0.001257	0.000221	-0.001065	0.001955	0.0019840	0.0024611	0.407	0.864	-2.7
6.	0.	-8.2	0.069491	-0.001343	-0.001788	0.000459	-0.001279	0.002766	0.0028793	0.0030541	0.405	0.865	-3.1
8.	0.	-10.2	0.084096	-0.000097	-0.003499	0.000355	-0.001152	0.005085	0.0050107	0.0045070	0.404	0.867	-4.9
8.8	0.	-11.2	0.086917	0.000209	-0.003118	0.000735	-0.001265	0.006269	0.0062052	0.0055443	0.407	0.866	-5.0
-4.	5.0	5.1	0.002688	-0.002804	-0.000633	0.000151	-0.000103	0.001198	0.0011342	0.0022790	0.409	0.864	-0.1
-2.	5.0	3.6	0.020328	-0.004468	-0.000946	0.000240	-0.000262	0.000511	0.0004982	0.0022805	0.406	0.865	-0.5
0.	5.0	1.7	0.041419	-0.006296	-0.001435	0.000320	-0.000500	-0.000024	-0.	0.0024250	0.406	0.864	-1.0
2.	5.0	-0.4	0.059848	-0.007354	-0.001962	0.000437	-0.000607	-0.000114	-0.0000788	0.0026455	0.408	0.865	-1.4
4.	5.0	-2.4	0.075421	-0.008038	-0.002342	0.000726	-0.001399	0.000464	0.0005132	0.0033554	0.407	0.864	-2.2
6.	5.0	-5.0	0.089803	-0.007037	-0.003604	0.000853	-0.001270	0.002624	0.0026430	0.0048797	0.405	0.865	-3.8
8.	5.0	-7.3	0.096737	-0.006683	-0.003537	0.001072	-0.001436	0.005603	0.0055087	0.0075041	0.406	0.865	-5.3
-4.	10.0	8.9	0.030553	-0.008366	-0.001832	-0.000125	-0.000384	-0.000776	-0.0008117	0.0025440	0.410	0.861	-0.4
-2.	10.0	7.6	0.049408	-0.011792	-0.002187	-0.000237	-0.000852	-0.001789	-0.0018153	0.0027813	0.406	0.863	-0.7
0.	10.0	5.5	0.069595	-0.014929	-0.002363	-0.000110	-0.001102	-0.002471	-0.0023862	0.0033565	0.409	0.862	-0.9
2.	10.0	3.1	0.086706	-0.016830	-0.003179	0.000141	-0.001508	-0.002065	-0.0020165	0.0042563	0.407	0.863	-1.6
4.	10.0	0.3	0.098382	-0.016460	-0.004059	0.000723	-0.001479	-0.000234	-0.0001855	0.0057889	0.408	0.861	-2.9
6.	10.0	-2.5	0.106512	-0.016667	-0.004410	0.001322	-0.001517	0.002924	0.0029564	0.0089209	0.409	0.862	-4.2

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

α_s	$\theta_{.75}$	a_{1_s}	b_{1_s}
10	6	-.4	-.4

TABLE IV-15.- ARTICULATED ROTOR; 0° TWIST, $V/\Omega R = 0.39$, $M_{(1)(90)} = 0.89$.

TEST 276.0 RUN 14B

No. 2 Tare

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

$\theta_{.75}$	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}
6.	-10.0	-15.1	0.009190	-0.000374	0.000310	-0.000543	-0.000192	0.002561	0.0026563	0.0027976	0.395	0.888	-2.6
7.	-10.0	-15.8	0.018531	0.001501	0.000099	-0.000548	-0.000260	0.003410	0.0034465	0.0028245	0.397	0.888	-2.4
8.	-10.0	-16.7	0.029829	0.003788	0.000080	-0.000718	-0.000239	0.004558	0.0045260	0.0029542	0.397	0.889	-3.0
9.	-10.0	-17.6	0.037373	0.005483	-0.000275	-0.001039	-0.000506	0.005540	0.0054339	0.0031488	0.397	0.889	-3.8
4.	-5.0	-9.9	0.020747	-0.000099	0.000056	-0.000166	-0.000491	0.002563	0.0025742	0.0025791	0.394	0.887	-2.0
6.	-5.0	-11.6	0.041696	0.002008	-0.000457	-0.000067	-0.000752	0.003825	0.0037772	0.0028462	0.396	0.888	-2.8
7.	-5.0	-12.2	0.051554	0.003080	-0.000643	-0.000150	-0.000844	0.004411	0.0043896	0.0029642	0.395	0.888	-3.1
8.	-5.0	-13.2	0.062110	0.004164	-0.001347	-0.000118	-0.001076	0.005473	0.0053794	0.0034327	0.395	0.890	-3.7
0.	0.	-2.9	0.011745	-0.002287	-0.000154	0.000115	-0.000110	0.001459	0.0014758	0.0023667	0.394	0.889	-0.8
2.	0.	-4.3	0.030602	-0.002176	-0.000374	0.000254	-0.000559	0.001664	0.0016954	0.0024800	0.394	0.890	-1.4
4.	0.	-6.2	0.051233	-0.001941	-0.001176	0.000253	-0.000845	0.002121	0.0021720	0.0027305	0.394	0.892	-2.7
6.	0.	-7.9	0.072397	-0.001620	-0.002304	0.000427	-0.001073	0.003136	0.0031184	0.0033443	0.394	0.892	-3.5
8.	0.	-10.4	0.084307	0.000344	-0.003225	0.000441	-0.001067	0.005506	0.0053871	0.0046919	0.394	0.891	-4.6
7.	0.	-9.2	0.078381	-0.000747	-0.002672	0.000486	-0.001211	0.004032	0.0040007	0.0038127	0.394	0.890	-3.9
-4.	5.0	4.8	0.001551	-0.002591	-0.000441	0.000176	0.000142	0.001449	0.0013824	0.0023949	0.391	0.890	-0.1
-2.	5.0	3.5	0.020504	-0.004536	-0.001024	0.000295	-0.000150	0.000752	0.0006717	0.0024186	0.392	0.887	-0.7
0.	5.0	1.7	0.042226	-0.006527	-0.001546	0.000372	-0.000512	0.000196	0.0002198	0.0026318	0.391	0.887	-1.4
2.	5.0	-0.3	0.062692	-0.007976	-0.002122	0.000484	-0.000788	0.000103	0.0001099	0.0029274	0.392	0.887	-1.8
4.	5.0	-2.7	0.079256	-0.008225	-0.002689	0.000743	-0.001186	0.000841	0.0008547	0.0035767	0.391	0.887	-2.4
6.	5.0	-5.1	0.092118	-0.007568	-0.003551	0.000905	-0.001116	0.003124	0.0031266	0.0054294	0.393	0.888	-3.1
7.	5.0	-5.9	0.095584	-0.007713	-0.003187	0.001096	-0.001090	0.004656	0.0046038	0.0068897	0.390	0.891	-4.1
-4.	10.0	9.1	0.030199	-0.008424	-0.001747	0.000002	-0.000344	-0.000572	-0.0006316	0.0025907	0.391	0.889	-0.4
-2.	10.0	7.5	0.050683	-0.012037	-0.002099	0.000073	-0.000683	-0.001578	-0.0015588	0.0029383	0.391	0.891	-0.5
0.	10.0	5.6	0.068305	-0.014736	-0.002608	0.000081	-0.001134	-0.002083	-0.0019785	0.0034380	0.393	0.888	-1.0
2.	10.0	3.6	0.086241	-0.016908	-0.003069	0.000251	-0.001335	-0.001835	-0.0017735	0.0042513	0.391	0.889	-1.3
4.	10.0	0.7	0.100581	-0.017418	-0.003652	0.000623	-0.001101	0.000252	0.0003905	0.0063634	0.389	0.885	-2.7

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

α_s	$\theta_{.75}$	a_{1_s}	b_{1_s}
0	8	.3	0
5	6	.3	.2

TABLE IV-16.- ARTICULATED ROTOR; 0° TWIST, $V/\Omega R = 0.39$, $M_{(1)(90)} = 0.93$.

TEST 276.0 RUN 15

No. 2 Tare

$\theta_{.75}$	ALPHA SHAFT	ALPHA CONTROL	(COEFFICIENTS BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED) CLR	CXR	CYR	CMX	CMY	CMZ	CP	WIND AXES DATA CPO	V/OR	M,AT	A_{1_s}
6.	-10.0	-14.6	0.011491	-0.001031	0.000710	-0.001085	0.000160	0.003670	0.0038033	0.0041969	0.392	0.943	-2.1
8.	-10.0	-16.6	0.031844	0.002967			-0.000185				0.392	0.944	-3.0
4.	-5.0	-9.1	0.016348		-0.000110	-0.000440		0.003713	0.0035185		0.391	0.941	-2.1
6.	-5.0	-11.2	0.038069		-0.000711	-0.000388		0.005235	0.0049081		0.392	0.940	-2.8
7.	-5.0	-12.1	0.048326		-0.001160	-0.000350		0.006032			0.392	0.939	-3.1
0.	0.	-2.4	0.011120	-0.003088	0.000124	-0.000169	0.000027	0.002307	0.0023821	0.0035853	0.393	0.937	-0.8
2.	0.	-4.2	0.035761	-0.003235	-0.000398	0.000034	-0.000240	0.002410	0.0024694	0.0036386	0.393	0.937	-1.7
4.	0.	-5.8	0.055327	-0.002856	-0.000821	0.000165	-0.000408	0.003076	0.0031699	0.0040513	0.393	0.937	-2.3
6.	0.	-7.3	0.072025	-0.002339	-0.002002	0.000328	-0.001183	0.004327	0.0042480	0.0047569	0.393	0.936	-3.4
7.	0.	-8.2	0.080004	-0.001689	-0.002781	0.000426	-0.001011	0.005368	0.0052501	0.0054052	0.392	0.937	-4.0
-2.	5.0	3.7	0.017897		-0.000954	0.000267		0.001713	0.0015547		0.393	0.936	-0.4
0.	5.0	1.6	0.038243		-0.001398	0.000328		0.001203	0.0011364		0.391	0.935	-1.2
2.	5.0	-0.3	0.062733	-0.008437	-0.001780	0.000396	-0.000535	0.000912	0.0009811	0.0039578	0.390	0.936	-1.8
4.	5.0	-2.2	0.082143	-0.009047	-0.002916	0.000384	-0.000939	0.001945	0.0020498	0.0050571	0.391	0.931	-2.6
6.	5.0	-4.7	0.091584	-0.007864	-0.003250	0.000507	-0.000761	0.004039	0.0042996	0.0067377	0.394	0.931	-4.4
-4.	10.0	9.7	0.032941	-0.009983	-0.001812	0.000236	-0.000069	0.000045	-0.	0.0038361	0.393	0.927	-0.2
-2.	10.0	7.8	0.052989	-0.013070	-0.002289	0.000161	-0.000273	-0.001021	-0.0009813	0.0039230	0.392	0.926	-0.7
0.	10.0	6.0	0.070666	-0.016083	-0.002532	0.000119	-0.001041	-0.001563	-0.0014819	0.0044327	0.392	0.923	-0.9
2.	10.0	3.8	0.089679	-0.018093	-0.003098	0.000367	-0.001269	-0.000733	-0.0006680	0.0057773	0.391	0.926	-1.6
4.	10.0	1.0	0.099741	-0.017814	-0.003233	0.000749	-0.001193	0.001261	0.0014661	0.0076779	0.393	0.925	-3.0
6.	10.0	-2.0	0.105515	-0.016655	-0.003393	0.001334	0.000164	0.003651	0.0042077	0.0098649	0.392	0.925	-4.1

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

α_s	$\theta_{.75}$	a_{1_s}	b_{1_s}
-5	4	.3	-.2
0	0	.3	0
5	0	.3	-.1

TABLE IV-17.- TEETERING ROTOR; STANDARD BLADES, $V/\Omega R = 0.30$, $M_{(1)(90)} = 0.79$.

TEST 274.0 RUN 17A

No. 3 TARE

θ_{grip}	ALPHA SHAFT	ALPHA CONTRCL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}
			(COEFFICIENTS BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED) (WIND AXES)										
12.	-5.0	-8.7	0.030189	0.001406	-0.000464	0.000272	-0.000319	0.002004	0.0019731	0.0014819	0.299	0.787	0.60
10.	-5.0	-7.3	0.012521	-0.000447	-0.000317	0.000217	-0.000173	0.001306	0.0012817	0.0014037	0.300	0.785	0.84
14.	-5.0	-10.2	0.052881	0.003721	-0.000370	0.000004	-0.000588	0.002947	0.0029354	0.0016044	0.299	0.786	0.48
16.	-5.0	-11.8	0.070891	0.006105	-0.001030	-0.000106	-0.000728	0.004119	0.0041130	0.0018914	0.300	0.784	-0.00
17.	-5.0	-12.7	0.079485	0.007610	-0.001151	-0.000249	-0.000746	0.004787	0.0047901	0.0020173	0.300	0.786	-0.12
14.	-10.0	-14.2	0.024645	0.002819	-0.000113	-0.000062	-0.000375	0.002385	0.0023599	0.0014683	0.300	0.786	0.60
12.	-10.0	-12.8	0.006020	-0.000774	-0.000105	0.000100	-0.000335	0.001262	0.0012251	0.0014542	0.300	0.785	0.48
16.	-10.0	-15.5	0.044780	0.006938	-0.000053	-0.000465	-0.000532	0.003790	0.0038131	0.0015788	0.300	0.787	0.36
17.	-10.0	-16.5	0.054226	0.009047	-0.000222	-0.000601	-0.000676	0.004615	0.0046497	0.0017073	0.300	0.785	0.12
18.	-10.0	-17.1	0.062509	0.010934	-0.000254	-0.000748	-0.000726	0.005367	0.0054156	0.0018308	0.300	0.785	0.12
16.	-15.0	-19.7	0.017620	0.003123	-0.000040	-0.000376	-0.000142	0.002470	0.0024834	0.0015269	0.299	0.786	0.48
15.	-15.0	-18.8	0.010097	0.000857	-0.000014	-0.000222	-0.000091	0.001804	0.0017995	0.0015347	0.300	0.785	0.72
18.	-15.0	-21.0	0.036785	0.008970	-0.000243	-0.000859	-0.000416	0.004430	0.0045017	0.0017050	0.300	0.789	0.12
12.	0.	-4.6	0.062302	-0.000985	-0.001620	0.000271	-0.000618	0.001630	0.0016297	0.0016228	0.299	0.787	-0.36
14.	0.	-6.5	0.079271	0.000235	-0.001937	0.000290	-0.000774	0.002463	0.0024628	0.0019047	0.299	0.787	-0.36
10.	0.	-3.0	0.041078	-0.001216	-0.001194	0.000308	-0.000457	0.001223	0.0012231	0.0014554	0.299	0.787	0.00
8.	0.	-1.8	0.020380	-0.001299	-0.000940	0.000265	-0.000319	0.001078	0.0010785	0.0014338	0.298	0.788	0.00
6.	0.	-0.5	0.003484	-0.001366	-0.000709	0.000208	-0.000221	0.001074	0.0010737	0.0014803	0.298	0.788	0.12
8.	4.0	1.6	0.044860	-0.004407	-0.001691	0.000367	-0.000348	0.000383	0.0004073	0.0015728	0.300	0.786	-0.24
6.	4.0	3.0	0.025323	-0.003120	-0.001313	0.000284	-0.000231	0.000602	0.0006205	0.0015046	0.299	0.786	0.00

TABLE IV-18.- TEETERING ROTOR; STANDARD BLADES, $V/\Omega R = 0.30$, $M_{(1)(90)} = 0.85$.

TEST 274.0 RUN 16

No. 3 TARE

θ_{grip}	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}
			(COEFFICIENTS BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED) (WIND AXES)										
13.	-5.0	-9.3	0.043314	0.002487	-0.000321	-0.000117	-0.000402	0.002518	0.0025190	0.0016230	0.302	0.847	0.60
12.	-5.0	-8.5	0.033843	0.001507	-0.000287	-0.000025	-0.000437	0.002132	0.0021264	0.0015865	0.299	0.846	0.72
14.	-5.0	-10.4	0.051805	0.003748	-0.000547	-0.000163	-0.000354	0.003092	0.0030943	0.0017558	0.302	0.846	0.36
14.	-10.0	-14.1	0.026500	0.003033	-0.000017	-0.000195	-0.000321	0.002574	0.0025683	0.0016003	0.301	0.846	0.84
16.	-10.0	-15.6	0.045795	0.007000	0.000234	-0.000600	-0.000468	0.003940	0.0039842	0.0017155	0.301	0.849	0.72
16.	-15.0	-19.5	0.018718	0.003291	0.000088	-0.000433	-0.000120	0.002673	0.0026944	0.0016741	0.302	0.844	0.96
18.	-15.0	-20.9	0.035858	0.008574	0.000208	-0.000850	-0.000221	0.004398	0.0044686	0.0017740	0.303	0.847	0.84
15.	-15.0	-18.8	0.010126	0.000800	0.000034	-0.000278	-0.000183	0.001907	0.0019142	0.0016657	0.301	0.844	0.96
17.	-10.0	-16.5	0.052919	0.008737	0.000210	-0.000702	-0.000505	0.004600	0.0046523	0.0017962	0.302	0.847	0.72
14.	-10.0	-14.0	0.025629	0.002933	0.000086	-0.000277	-0.000309	0.002468	0.0024783	0.0015437	0.301	0.844	0.72
12.	-10.0	-12.8	0.007088	-0.000650	-0.000008	-0.000010	-0.000341	0.001379	0.0013597	0.0015511	0.300	0.847	0.96
12.	-5.0	-8.5	0.032068	0.001403	-0.000298	-0.000079	-0.000320	0.002076	0.0020749	0.0015741	0.300	0.847	0.60
10.	-5.0	-7.0	0.014580	-0.000393	-0.000406	0.000127	-0.000377	0.001492	0.0014750	0.0015772	0.302	0.845	0.60
10.	0.	-3.1	0.043786	-0.001367	-0.001011	0.000210	-0.000377	0.001331	0.0013309	0.0015962	0.302	0.845	0.36
12.	0.	-4.7	0.062011	-0.000929	-0.001251	0.000217	-0.000409	0.001756	0.0017560	0.0017409	0.302	0.844	0.24
14.	0.	-6.5	0.080557	0.000035	-0.001696	0.000203	-0.000437	0.002537	0.0025366	0.0020262	0.301	0.846	0.00
8.	0.	-1.4	0.022328	-0.001581	-0.000677	0.000117	-0.000341	0.001172	0.0011724	0.0016113	0.302	0.844	0.72
6.	0.	-0.4	0.004924	-0.001526	-0.000667	0.000134	-0.000608	0.001205	0.0012050	0.0016627	0.301	0.847	0.60
7.	5.0	3.1	0.043639	-0.005437	-0.001623	0.000271	-0.000393	0.000215	0.0002380	0.0017349	0.302	0.844	0.00
6.	5.0	3.8	0.033619	-0.004576	-0.001423	0.000201	-0.000445	0.000392	0.0004081	0.0017108	0.304	0.843	0.24
8.	5.0	2.5	0.054309	-0.006415	-0.001702	0.000249	-0.000530	0.000049	0.0000703	0.0017725	0.301	0.847	0.00
14.	0.	-6.5	0.082340	-0.000051	-0.001831	0.000217	-0.000494	0.002556	0.0025559	0.0020513	0.303	0.843	-0.12
15.	-5.0	-11.2	0.062146	0.004985	-0.000456	-0.000248	-0.000395	0.003666	0.0036741	0.0018659	0.304	0.845	0.48

TABLE IV-19.- TEETERING ROTOR; STANDARD BLADES, $V/\Omega R = 0.30$, $M_{(1)(90)} = 0.95$.

TEST 274.0 RUN 19

No. 3 TARE

θ_{grip}	ALPHA SHAFT	ALPHA CONTROL	(COEFFICIENTS BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED) (WIND AXES CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}
14.	-10.0	-13.1	0.027469	0.002052	0.000194	-0.000288	-0.000298	0.003526	0.0035227	0.0028514	0.298	0.951	0.84
15.	-10.0	-14.1	0.034772	0.003252	0.000242	-0.000363	-0.000770	0.003961	0.0039635	0.0028949	0.300	0.949	1.08
16.	-10.0	-14.6	0.045339	0.005088	0.000307	-0.000618	-0.000884	0.004840	0.0048741	0.0031956	0.298	0.952	0.84
16.	-15.0	-18.6	0.019081	0.002235	0.000232	-0.000603	-0.000274	0.003523	0.0035588	0.0028641	0.298	0.953	1.08
17.	-15.0	-19.5	0.027292	0.004404	0.000340	-0.000758	-0.000639	0.004308	0.0043579	0.0029885	0.298	0.954	1.08
18.	-15.0	-19.8	0.036528	0.007069	0.000417	-0.001012	-0.000754	0.005206	0.0052907	0.0030656	0.300	0.950	1.08
15.	-15.0	-17.9	0.011510	0.000150	0.000049	-0.000312	-0.000096	0.002886	0.0028683	0.0028133	0.298	0.952	1.08
14.	-10.0	-13.0	0.025542	0.001680	0.000256	-0.000277	-0.000219	0.003488	0.0034830	0.0029323	0.297	0.954	1.08
13.	-10.0	-12.3	0.017488	0.000130	0.000254	-0.000215	-0.000312	0.002953	0.0029460	0.0028836	0.298	0.950	1.08
14.	-5.0	-9.0	0.052202	0.002084	-0.000445	-0.000016	-0.000079	0.003911	0.0038973	0.0030626	0.299	0.949	0.60
13.	-5.0	-8.1	0.042904	0.001071	-0.000435	-0.000009	-0.000271	0.003496	0.0034836	0.0030209	0.298	0.951	0.72
12.	-5.0	-7.3	0.032500	0.000032	0.000037	-0.000066	-0.000111	0.003134	0.0031281	0.0030361	0.297	0.952	1.20
11.	-5.0	-6.6	0.024909	-0.000876	-0.000197	-0.000030	-0.000172	0.002917	0.0029090	0.0031221	0.298	0.954	0.96
12.	0.	-3.2	0.062407	-0.002994	-0.001255	0.000349	-0.000636	0.002795	0.0027950	0.0033842	0.298	0.953	0.36
11.	0.	-2.6	0.052515	-0.003092	-0.001098	0.000328	-0.000586	0.002456	0.0024559	0.0031656	0.299	0.949	0.36
10.	0.	-1.9	0.042569	-0.003256	-0.000673	0.000228	-0.000434	0.002345	0.0023449	0.0031742	0.298	0.954	0.72
9.	0.	-1.1	0.034478	-0.003357	-0.000607	0.000315	-0.000586	0.002243	0.0022429	0.0031522	0.298	0.951	0.84
9.	2.0	0.5	0.044667	-0.005041	-0.000884	0.000375	-0.000380	0.001872	0.0018837	0.0032242	0.297	0.954	0.00
14.	-5.0	-9.0	0.051255	0.002088	-0.000419	-0.000047	0.000053	0.004098	0.0040870	0.0032595	0.299	0.951	0.00
15.	-5.0	-9.7	0.061862	0.003145	-0.000395	-0.000027	0.000294	0.004632	0.0046172	0.0033803	0.299	0.950	0.48
16.	-5.0	-10.5	0.069841	0.004198	-0.000725	-0.000135	-0.000514	0.005210	0.0052022	0.0035661	0.300	0.949	0.24
17.	-10.0	-15.4	0.052590	0.006809	0.000223	-0.000649	-0.000862	0.005642	0.0056690	0.0034197	0.299	0.954	0.60
18.	-10.0	-16.1	0.059231	0.008521	0.000590	-0.000956	-0.000743	0.006253	0.0063238	0.0035092	0.298	0.951	0.72

TABLE IV-20.- TEETERING ROTOR; STANDARD BLADES, $V/\Omega R$ = 0.35, $M_{(1)(90)}$ = 0.85.

TEST 274.0 RUN 17B

No. 3 TARE

(COEFFICIENTS BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED) (WIND AXES)

θ_{grip}	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}
12.	-5.0	-8.9	0.026294	0.000425	-0.000593	0.000089	-0.000615	0.002047	0.0020311	0.0018369	0.348	0.847	0.48
14.	-5.0	-10.7	0.044276	0.002379	-0.000873	-0.000041	-0.000812	0.003014	0.0030064	0.0020435	0.350	0.846	0.24
14.	-10.0	-14.4	0.018214	0.000969	-0.000114	-0.000186	-0.000412	0.002244	0.0022426	0.0018821	0.349	0.847	0.36
16.	-10.0	-16.0	0.034674	0.004154	-0.000210	-0.000428	-0.000508	0.003559	0.0035794	0.0020484	0.349	0.847	0.48
16.	-15.0	-19.5	0.008736	-0.000189	-0.000165	-0.000051	-0.000124	0.001960	0.0019068	0.0019677	0.349	0.845	0.60
17.	-15.0	-20.2	0.017791	0.002468	-0.000180	-0.000374	-0.000239	0.002841	0.0028411	0.0019574	0.350	0.846	0.60
18.	-15.0	-21.0	0.025547	0.004625	-0.000208	-0.000508	-0.000319	0.003772	0.0037754	0.0021164	0.349	0.847	0.60
17.5	-10.0	-17.0	0.048797	0.006950	-0.000262	-0.000603	-0.000793	0.004716	0.0047494	0.0021657	0.349	0.849	0.36
13.	-10.0	-13.5	0.009019	-0.000804	0.000021	-0.000092	-0.000275	0.001591	0.0015823	0.0018571	0.349	0.849	0.72
15.	-5.0	-11.4	0.056380	0.003457	-0.001071	-0.000153	-0.000726	0.003562	0.0035615	0.0021469	0.348	0.850	0.00
10.	-5.0	-7.4	0.010417	-0.001193	-0.000404	0.000107	-0.000276	0.001472	0.0014572	0.0018645	0.348	0.848	0.36
12.	0.	-5.1	0.057284	-0.001448	-0.001874	0.000196	-0.000617	0.001810	0.0018096	0.0020969	0.349	0.849	-0.00
10.	0.	-3.5	0.039003	-0.001679	-0.001293	0.000179	-0.000592	0.001444	0.0014439	0.0019280	0.349	0.849	0.12
8.	0.	-1.9	0.022603	-0.001824	-0.000997	0.000090	-0.000318	0.001262	0.0012625	0.0018628	0.348	0.850	0.12
6.	0.	-0.5	0.006432	-0.001804	-0.000751	0.000045	-0.000176	0.001295	0.0012950	0.0019213	0.349	0.849	0.24
8.	4.0	1.0	0.047713	-0.005111	-0.001973	0.000173	-0.000523	0.000388	0.0003994	0.0020272	0.348	0.848	-0.12
7.	4.0	1.9	0.038856	-0.004684	-0.001944	0.000177	-0.000441	0.000435	0.0004460	0.0019792	0.349	0.847	-0.36
6.	4.0	2.5	0.030361	-0.004030	-0.001609	0.000142	-0.000511	0.000564	0.0005729	0.0019169	0.349	0.847	-0.12
14.	0.	-7.1	0.075409	-0.000656	-0.002533	0.000182	-0.000546	0.002601	0.0026007	0.0024516	0.349	0.847	0.36

TABLE IV-21.- TEETERING ROTOR; STANDARD BLADES, $V/\Omega R$ = 0.35, $M_{(1)(90)}$ = 0.95.

TEST 274.0 RUN 20

No. 3 TARE

(COEFFICIENTS BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED) (WIND AXES)

θ_{grip}	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}
12.5	-5.0	-6.9	0.044738	-0.000835	0.000170	-0.000083	-0.000554	0.003446	0.0034398	0.0035994	0.350	0.947	1.56

TEST 274.0 RUN 21

No. 3 TARE

(COEFFICIENTS BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED) (WIND AXES)

θ_{grip}	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}
13.3	-5.0	-8.2	0.047342	0.000047	-0.000721	0.000121	-0.000931	0.003664	0.0036392	0.0034737	0.349	0.948	0.60
14.	-5.0	-8.7	0.053799	0.000491	-0.000565	-0.000126	-0.000837	0.004109	0.0041043	0.0037406	0.350	0.947	0.60
14.	-7.0	-10.2	0.043036	0.001111	-0.000186	-0.000262	-0.000854	0.004076	0.0040775	0.0035658	0.350	0.946	0.60
14.	-10.0	-12.5	0.026645	0.000654	0.000396	-0.000324	-0.000911	0.003701	0.0037011	0.0034254	0.350	0.948	0.96
14.5	-10.0	-12.7	0.031651	0.001349	0.000375	-0.000408	-0.000785	0.004014	0.0040242	0.0034870	0.349	0.947	0.96
15.	-10.0	-13.2	0.033094	0.001680	0.000368	-0.000407	-0.000666	0.004259	0.0042647	0.0036057	0.349	0.949	0.96
15.	-10.0	-13.2	0.034128	0.001808	0.000342	-0.000405	-0.000861	0.004319	0.0043234	0.0036143	0.349	0.948	0.96
15.5	-10.0	-13.4	0.038875	0.002516	0.000532	-0.000667	-0.000869	0.004596	0.0046421	0.0036627	0.349	0.948	0.96

TABLE IV-22.- TEETERING ROTOR; STANDARD BLADES, $V/\Omega R = 0.40$, $M_{(1)(90)} = 0.85$.

TEST 274.0 RUN 18

No. 3 TARE

θ_{grip}	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}
			(COEFFICIENTS BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED) (WIND AXES)										
14.	-4.0	-10.4	0.044991	0.000745	-0.001028	0.000131	-0.000778	0.002840	0.0028242	0.0024091	0.399	0.846	0.48
14.	-8.0	-13.1	0.021829	0.000165	-0.000168	-0.000015	-0.000553	0.002343	0.0023227	0.0022293	0.397	0.847	0.72
16.	-8.0	-14.7	0.037953	0.002548	-0.000259	-0.000222	-0.000840	0.003546	0.0035425	0.0024388	0.401	0.843	0.72
16.	-12.0	-17.5	0.014561	-0.000269	-0.000043	-0.000037	-0.000663	0.002283	0.0022411	0.0023360	0.399	0.844	0.84
17.	-12.0	-18.2	0.023268	0.001176	0.000139	-0.000354	-0.001456	0.003123	0.0031285	0.0026266	0.400	0.844	0.84
18.	-12.0	-19.2	0.029735	0.003208	-0.000033	-0.000557	-0.000961	0.003871	0.0039022	0.0025627	0.402	0.845	0.60
18.	-12.0	-16.5	0.007338	-0.001894	0.000127	0.000006	-0.000641	0.001576	0.0015402	0.0022942	0.400	0.846	0.84
15.	-8.0	-13.7	0.029497	0.001269	-0.000088	-0.000105	-0.000705	0.002878	0.0028642	0.0023078	0.399	0.846	0.84
13.	-8.0	-12.0	0.014670	-0.000964	-0.000149	0.000021	-0.000651	0.001870	0.0018487	0.0022212	0.399	0.847	0.60
13.	-4.0	-9.3	0.036901	0.000072	-0.000983	0.000244	-0.000784	0.002462	0.0024387	0.0023309	0.400	0.845	0.48
12.	-4.0	-8.5	0.028915	-0.000447	-0.000994	0.000141	-0.000521	0.002077	0.0020619	0.0021925	0.400	0.845	-0.00
11.	-4.0	-7.5	0.021224	-0.000891	-0.000795	0.000052	-0.000270	0.001785	0.0017767	0.0021065	0.400	0.846	-0.00
10.	-4.0	-6.9	0.013786	-0.001431	-0.000850	0.000255	-0.000146	0.001540	0.0015184	0.0020781	0.399	0.849	-0.24
12.	0.	-6.0	0.052218	-0.001924	-0.001955	0.000415	-0.000670	0.001809	0.0018089	0.0024165	0.398	0.849	0.24
10.	0.	-4.0	0.038206	-0.002244	-0.001944	0.000299	-0.000413	0.001390	0.0013903	0.0022012	0.399	0.847	-0.48
11.	0.	-4.9	0.045736	-0.002140	-0.001850	0.000447	-0.000334	0.001573	0.0015725	0.0023058	0.399	0.847	0.12
9.	0.	-3.0	0.029722	-0.002196	-0.001347	0.000361	-0.000142	0.001291	0.0012910	0.0021176	0.400	0.847	0.24
10.	4.0	-1.3	0.061307	-0.006142	-0.002901	0.000388	-0.000697	0.000370	0.0003962	0.0026096	0.396	0.849	-0.36
9.	4.0	-0.4	0.053606	-0.005888	-0.003050	0.000357	-0.000676	0.000295	0.0003189	0.0024907	0.397	0.848	-0.72
8.	4.0	0.6	0.046025	-0.005574	-0.002497	0.000457	-0.000688	0.000263	0.0002944	0.0023877	0.398	0.848	-0.24
15.	-4.0	-11.2	0.052780	0.001441	-0.001072	0.000061	-0.000709	0.003395	0.0033824	0.0026458	0.399	0.846	0.60
16.	-4.0	-12.1	0.060543	0.002159	-0.001669	0.000073	-0.000699	0.003967	0.0039525	0.0028747	0.401	0.844	0.00

TABLE IV-23.- TEETERING ROTOR; 48-FT TAPERED TIP, $V/\Omega R = 0.30$, $M_{(1)(90)} = 0.85$.

TEST 274.0 RUN 4

No. 3 TARE

θ_{grip}	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}
			(COEFFICIENTS BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED)							(WIND AXES)			
12.	0.	-3.5	0.059190	-0.001435	-0.001826	0.000285	0.000160	0.001484	0.0014838	0.0016454	0.301	0.844	-00.48
10.	0.	-1.8	0.039510	-0.001653	-0.001357	0.000202	0.000087	0.001138	0.0011380	0.0015133	0.300	0.846	-00.24
8.	0.	-0.3	0.020436	-0.001560	-0.001003	0.000125	-0.000121	0.001070	0.0010701	0.0015075	0.301	0.846	-00.24
14.	0.	-5.0	0.081876	-0.001117	-0.002625	0.000352	0.000175	0.002198	0.0021981	0.0020131	0.299	0.844	-00.72
12.	-5.0	-7.3	0.032134	0.001139	-0.000506	-0.000055	-0.000216	0.001901	0.0018981	0.0014763	0.300	0.846	00.00
10.	-5.0	-5.7	0.013562	-0.000544	-0.000300	-0.000060	-0.000584	0.001323	0.0013234	0.0014716	0.299	0.845	00.00
14.	-5.0	-9.0	0.053802	0.003226	-0.000999	-0.000146	-0.000275	0.002846	0.0028482	0.0016551	0.301	0.846	-00.36

TEST 274.0 RUN 5

No. 3 TARE

θ_{grip}	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}
			(COEFFICIENTS BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED)							(WIND AXES)			
12.	-10.0	-11.5	0.005116	-0.000888	0.000143	-0.000114	-0.000313	0.001221	0.0012224	0.0014883	0.302	0.840	00.36
12.	-10.0	-13.2	0.024908	0.002787	0.000097	-0.000301	-0.000265	0.002380	0.0023960	0.0014937	0.307	0.832	00.24
16.	-10.0	-14.8	0.043469	0.006517	-0.000114	-0.000566	-0.000260	0.003729	0.0037707	0.0016409	0.305	0.840	00.12
18.	-10.0	-16.5	0.061462	0.010515	-0.000027	-0.000958	-0.000267	0.005269	0.0053558	0.0018602	0.305	0.843	00.00
16.	-15.0	-18.5	0.017667	0.002996	0.000667	-0.000603	-0.000057	0.002330	0.0024066	0.0014737	0.303	0.843	00.36
18.	-15.0	-20.1	0.035202	0.008330	0.000709	-0.001114	-0.000140	0.004078	0.0042276	0.0015866	0.306	0.840	00.24
15.	-15.0	-18.0	0.008361	0.000371	0.000649	-0.000430	-0.000026	0.001569	0.0016264	0.0015084	0.304	0.838	00.60
14.	-15.0	-17.1	0.000482	-0.001823	0.000493	-0.000156	-0.000092	0.000945	0.0009534	0.0015058	0.303	0.841	00.48
14.	-5.0	-9.2	0.051513	0.003350	-0.000788	-0.000176	-0.000548	0.002864	0.0028679	0.0016471	0.304	0.843	-00.24
16.	-5.0	-10.8	0.071583	0.005714	-0.001290	-0.000264	-0.000243	0.004018	0.0040253	0.0019007	0.303	0.842	-00.36
8.	-5.0	-4.7	-0.007860	-0.002290	-0.000345	0.000049	-0.000138	0.000972	0.0009638	0.0016525	0.303	0.841	+00.12
6.	0.	0.6	0.002054	-0.001331	-0.000775	0.000160	-0.000348	0.001230	0.0012303	0.0016312	0.301	0.844	00.00
6.	5.0	5.0	0.031660	-0.004408	-0.001495	0.000101	-0.000297	0.000411	0.0004182	0.0016683	0.301	0.843	-00.24
8.	5.0	3.6	0.050579	-0.006231	-0.002015	0.000146	-0.000269	0.000008	0.0000210	0.0016957	0.300	0.843	-00.48
10.	5.0	1.7	0.069030	-0.007278	-0.002754	0.000245	-0.000334	0.000082	0.0001029	0.0019230	0.301	0.844	-00.72
12.	5.0	0.1	0.088125	-0.008285	-0.003399	0.000384	-0.000298	0.000357	0.0003886	0.0022875	0.301	0.841	-00.84
12.	3.0	-1.3	0.078559	-0.005126	-0.002807	0.000279	-0.000308	0.000859	0.0008722	0.0019588	0.304	0.840	-00.72
12.	0.	-3.6	0.061509	-0.001393	-0.001794	0.000199	-0.000351	0.001580	0.0015796	0.0017194	0.306	0.836	-00.48
12.	-5.0	-7.5	0.031405	0.001215	-0.000470	-0.000041	-0.000280	0.001997	0.0019930	0.0015491	0.303	0.842	00.00
12.	-10.0	-11.4	0.007824	-0.000553	0.000098	-0.000129	-0.000219	0.001360	0.0013620	0.0015235	0.301	0.845	00.12

TEST 274.0 RUN 14

No. 3 TARE

θ_{grip}	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}
			(COEFFICIENTS BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED)							(WIND AXES)			
12.	-5.0	-7.8	0.028863	0.001134	-0.000422	-0.000034	-0.000585	0.001923	0.0019190	0.0015130	0.301	0.844	0.36
14.	-5.0	-9.5	0.048316	0.003552	-0.000505	-0.000250	-0.000688	0.002836	0.0028293	0.0015814	0.301	0.846	0.36

TABLE IV-23.- TEETERING ROTOR; 48-FT TAPERED TIP, $V/\Omega R$ = 0.30, $M_{(1)(90)}$ = 0.85 - Concluded.

TEST 274.0 RUN 15A

No. 3 TARE

(COEFFICIENTS BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED) (WIND AXES)

θ_{grip}	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}
12.	-5.0	-7.9	0.027365	0.001023	-0.000201	-0.000256	-0.000753	0.002085	0.0020991	0.0017344	0.300	0.848	0.24
14.	-5.0	-9.5	0.047940	0.003276	-0.000365	-0.000394	-0.000564	0.002955	0.0029786	0.0018182	0.300	0.848	0.24
16.	-5.0	-11.1	0.066284	0.005699	-0.000580	-0.000506	-0.000406	0.004056	0.0040848	0.0020389	0.299	0.849	0.12
17.	-5.0	-11.8	0.076953	0.007015	-0.000898	-0.000668	-0.000479	0.004752	0.0047918	0.0022278	0.300	0.850	-0.12
12.	-3.0	-5.9	0.038909	0.000752	-0.000232	-0.000291	-0.000615	0.002037	0.0020496	0.0017068	0.300	0.849	0.36
13.	-3.0	-6.8	0.049474	0.001529	-0.000398	-0.000247	-0.000668	0.002436	0.0024457	0.0017976	0.300	0.848	0.48
14.	-3.0	-7.7	0.059786	0.002325	-0.000830	-0.000273	-0.000471	0.002850	0.0028607	0.0018868	0.300	0.848	-0.00
15.	-3.0	-8.7	0.067131	0.003478	-0.000982	-0.000303	-0.000460	0.003358	0.0033690	0.0019769	0.300	0.848	-0.00
16.	-3.0	-9.4	0.077887	0.004224	-0.001091	-0.000401	-0.000571	0.003916	0.0039314	0.0021941	0.300	0.849	-0.12
16.5	-3.0	-9.8	0.080970	0.004712	-0.001056	-0.000491	-0.000570	0.004170	0.0041896	0.0022664	0.301	0.849	0.00
17.	-3.0	-10.2	0.086136	0.005270	-0.001145	-0.000411	-0.000525	0.004537	0.0045519	0.0023951	0.301	0.849	-0.12
12.	0.	-3.5	0.055484	-0.001005	-0.001015	-0.000082	-0.000510	0.001763	0.0017628	0.0018264	0.300	0.848	0.12
13.	0.	-4.5	0.068285	-0.000863	-0.001380	-0.000120	-0.000501	0.002068	0.0020677	0.0019659	0.300	0.847	-0.12
14.	0.	-5.5	0.076500	-0.000167	-0.001594	-0.000180	-0.000432	0.002420	0.0024203	0.0020160	0.299	0.850	-0.24
15.	0.	-6.2	0.085340	0.000065	-0.001859	-0.000222	-0.000229	0.002885	0.0028850	0.0023005	0.299	0.850	-0.36
15.5	0.	-6.5	0.089211	0.000299	-0.002016	-0.000192	-0.000195	0.003171	0.0031710	0.0024646	0.299	0.850	-0.36
16.	0.	-7.5	0.088459	0.001160	-0.002220	-0.000248	0.001662	0.003609	0.0036094	0.0026558	0.300	0.851	-0.48

TABLE IV-24.- TEETERING ROTOR; 48-FT TAPERED TIP, $V/\Omega R$ = 0.30, $M_{(1)(90)}$ = 0.95.

TEST 274.0 RUN 15B

No. 3 TARE

(COEFFICIENTS BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED) (WIND AXES)

θ_{grip}	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}
14.	-5.0	-8.7	0.049546	0.002717	-0.000641	-0.000306	-0.000659	0.003091	0.0031059	0.0021042	0.298	0.947	-0.12
15.	-5.0	-9.3	0.060165	0.003738	-0.000761	-0.000383	-0.000562	0.003730	0.0037494	0.0023518	0.299	0.951	0.12
16.	-5.0	-10.0	0.069405	0.004787	-0.000935	-0.000490	-0.000714	0.004318	0.0043444	0.0025384	0.299	0.950	-0.00
16.5	-5.0	-10.2	0.073377	0.005314	-0.000957	-0.000490	-0.000571	0.004641	0.0046664	0.0026607	0.299	0.948	-0.00
12.	-3.0	-5.2	0.041884	0.000282	-0.000540	-0.000274	-0.000436	0.002306	0.0023168	0.0020961	0.298	0.949	0.12
13.	-3.0	-6.0	0.052528	0.000930	-0.000779	-0.000245	-0.000395	0.002720	0.0027292	0.0022373	0.297	0.951	0.12
14.	-3.0	-7.0	0.061069	0.001752	-0.001010	-0.000242	-0.000358	0.003124	0.0031324	0.0023204	0.297	0.951	-0.00
15.	-3.0	-7.5	0.069888	0.002348	-0.001302	-0.000354	-0.000078	0.003599	0.0036129	0.0025394	0.297	0.951	-0.12
12.	0.	-3.0	0.057761	-0.001666	-0.001317	0.000015	-0.000509	0.001968	0.0019677	0.0022025	0.297	0.949	-0.00
13.	0.	-3.5	0.070441	-0.001733	-0.001393	-0.000142	-0.000354	0.002247	0.0022475	0.0023744	0.297	0.948	-0.00
13.5	0.	-4.2	0.072013	-0.001136	-0.001709	-0.000139	-0.000011	0.002514	0.0025137	0.0024489	0.298	0.949	-0.24
14.	0.	-4.5	0.078514	-0.001281	-0.001848	-0.000120	-0.000176	0.002761	0.0027610	0.0026637	0.298	0.950	-0.12
14.5	0.	-4.7	0.083275	-0.001057	-0.002033	-0.000131	-0.000114	0.003057	0.0030569	0.0028301	0.297	0.950	-0.24

TABLE IV-24.- TEETERING ROTOR; 48-FT TAPERED TIP, $V/\Omega R$ = 0.30, $M_{(1)(90)}$ = 0.95 - Concluded.

TEST 274.0 RUN 11

No. 3 TARE

θ_{grip}	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}
			(COEFFICIENTS BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED) (WIND AXES)										
14.	-5.0	-8.5	0.049827	0.002534	-0.000943	-0.000047	-0.000368	0.003027	0.0030198	0.0020699	0.299	0.949	-0.12
14.	-10.0	-12.6	0.023866	0.002088	0.000135	-0.000273	-0.000372	0.002547	0.0025557	0.0018886	0.298	0.951	0.60
16.	-10.0	-14.0	0.042665	0.005569	0.000077	-0.000537	-0.000625	0.003798	0.0038339	0.0020258	0.299	0.950	0.24
16.	-15.0	-18.0	0.017089	0.002499	0.000295	-0.000386	-0.000295	0.002530	0.0025436	0.0017760	0.298	0.950	0.48
17.	-15.0	-18.9	0.024906	0.004800	0.000512	-0.000757	-0.000324	0.003305	0.0033885	0.0019008	0.300	0.949	0.60
15.	-15.0	-17.3	0.008598	0.000173	0.000326	-0.000216	-0.000430	0.001854	0.0018467	0.0017894	0.299	0.949	0.48
13.	-10.0	-12.0	0.014639	0.000388	0.000165	-0.000119	-0.000642	0.001986	0.0019763	0.0018442	0.298	0.950	0.48
15.	-10.0	-13.2	0.033404	0.003815	0.000175	-0.000411	-0.000761	0.003169	0.0031918	0.0019667	0.298	0.953	0.48
13.	-5.0	-7.7	0.039998	0.001423	-0.000725	-0.000006	-0.000795	0.002558	0.0025488	0.0020002	0.298	0.951	0.00
12.	-5.0	-7.0	0.030174	0.000569	-0.000472	0.000021	-0.000827	0.002221	0.0022102	0.0019699	0.298	0.950	0.12
11.	-5.0	-6.3	0.021608	-0.000154	-0.000371	0.000070	-0.000767	0.001884	0.0018707	0.0018806	0.298	0.950	0.24
12.	0.	-3.0	0.059723	-0.001880	-0.001855	0.000341	-0.000913	0.001823	0.0018231	0.0021034	0.297	0.951	-0.24
11.	0.	-2.2	0.048358	-0.002028	-0.001486	0.000240	-0.000546	0.001607	0.0016069	0.0020301	0.298	0.949	-0.24
10.	0.	-1.5	0.039922	-0.002078	-0.001426	0.000311	-0.000641	0.001497	0.0014973	0.0019936	0.299	0.951	-0.12
9.	0.	-0.9	0.030999	-0.002015	-0.001110	0.000217	-0.000628	0.001410	0.0014097	0.0019369	0.299	0.951	-0.00
9.	5.0	3.2	0.058853	-0.007322	-0.002363	0.000358	-0.000824	0.000286	0.0003159	0.0022175	0.297	0.949	-0.36

TABLE IV-25.- TEETERING ROTOR; 48-FT TAPERED TIP, $V/\Omega R$ = 0.30, $M_{(1)(90)}$ = 1.0.

TEST 274.0 RUN 12

No. 3 TARE

θ_{grip}	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}
			(COEFFICIENTS BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED) (WIND AXES)										
12.	0.	-2.8	0.059227	-0.002587	-0.001402	0.000161	-0.000547	0.002381	0.0023814	0.0028908	0.301	0.994	0.00
12.5	0.	-2.8	0.063700	-0.002655	-0.001565	0.000207	-0.000613	0.002462	0.0024625	0.0029521	0.302	0.990	0.00
12.	-3.0	-5.3	0.040948	-0.000397	-0.000751	0.000008	-0.000323	0.002637	0.0026335	0.0026254	0.303	0.988	0.24
12.	-4.0	-6.2	0.034551	-0.000148	-0.000635	0.000005	-0.000413	0.002695	0.0026879	0.0026416	0.304	0.987	0.24
12.	-5.0	-6.9	0.030143	-0.000023	-0.000465	-0.000057	-0.000328	0.002676	0.0026705	0.0026081	0.304	0.988	0.36
12.	-6.0	-7.8	0.025232	-0.000126	-0.000254	-0.000136	-0.000499	0.002617	0.0026166	0.0026066	0.304	0.987	0.36
12.5	-6.0	-8.1	0.030834	0.000566	-0.000184	-0.000185	-0.000305	0.002796	0.0028000	0.0025552	0.305	0.987	0.48
13.	-6.0	-8.4	0.035733	0.001040	-0.000276	-0.000138	-0.000426	0.003027	0.0030249	0.0026104	0.305	0.986	0.48
14.	-6.0	-9.0	0.044562	0.002002	-0.000350	-0.000209	-0.000559	0.003530	0.0035325	0.0027701	0.306	0.986	0.48
15.	-6.0	-9.5	0.054968	0.002906	-0.000487	-0.000335	-0.000609	0.004274	0.0042851	0.0031780	0.301	0.996	0.12
13.	-7.0	-9.9	0.030972	0.000788	-0.000127	-0.000259	-0.000496	0.003162	0.0031702	0.0028591	0.301	0.996	0.48
14.	-7.0	-9.7	0.040470	0.002024	-0.000136	-0.000271	-0.000594	0.003598	0.0036042	0.0028688	0.301	0.995	0.48
14.	-9.0	-11.3	0.030289	0.001799	0.000065	-0.000390	-0.000462	0.003381	0.0034007	0.0027877	0.302	0.995	0.60
15.	-9.0	-12.0	0.038256	0.003246	0.000177	-0.000499	-0.000595	0.003844	0.0038746	0.0027820	0.302	0.994	0.60
13.	-9.0	-10.6	0.020039	0.000132	0.000147	-0.000276	-0.000397	0.002836	0.0028443	0.0027735	0.301	0.993	0.72
12.	-9.0	-10.1	0.011824	-0.001142	0.000065	-0.000223	-0.000412	0.002409	0.0024141	0.0027474	0.301	0.993	0.72
11.	-6.0	-6.7	0.017183	-0.001082	-0.000238	-0.000067	-0.000359	0.002448	0.0024414	0.0027447	0.301	0.993	0.48
10.	-6.0	-6.3	0.009154	-0.001924	-0.000268	0.000023	-0.000371	0.002220	0.0022052	0.0027758	0.300	0.995	0.60
13.	-3.0	-5.6	0.052279	0.000066	-0.000897	0.000013	-0.000630	0.003098	0.0030931	0.0028632	0.302	0.990	0.12
12.	-3.0	-4.9	0.042503	-0.000640	-0.000766	-0.000007	-0.000426	0.002861	0.0028571	0.0029100	0.300	0.994	0.24
11.	-3.0	-4.2	0.032503	-0.001096	-0.000587	-0.000003	-0.000330	0.002576	0.0025727	0.0028191	0.299	0.997	0.24
10.	-3.0	-3.5	0.023706	-0.001576	-0.000520	0.000050	-0.000422	0.002415	0.0024088	0.0028372	0.299	0.997	0.36
11.	0.	-1.6	0.050257	-0.002989	-0.001257	0.000229	-0.000706	0.002329	0.0023286	0.0030270	0.299	0.996	0.00
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	0.000159	-0.000475	0.002145	0.0021454	0.0029116	0.297	0.999	0.24

TABLE IV-26.- TEETERING ROTOR; 48-FT TAPERED TIP, $V/\Omega R = 0.35$, $M_{(1)(90)} = 0.85$.

TEST 274.0 RUN 6

No. 3 TARE

(COEFFICIENTS BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED) (WIND AXES)

θ_{grip}	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}
6.	0.	0.7	0.004132	-0.001650	-0.000938	0.000160	-0.000552	0.001242	0.0012421	0.0018159	0.349	0.851	0.24
8.	0.	-0.6	0.021443	-0.001910	-0.001168	0.000164	-0.000544	0.001163	0.0011635	0.0018019	0.350	0.847	0.00
10.	0.	-2.3	0.038385	-0.001899	-0.001471	0.000211	-0.000850	0.001257	0.0012571	0.0018262	0.351	0.845	0.00
12.	0.	-4.0	0.057006	-0.001767	-0.001930	0.000222	-0.000924	0.001589	0.0015892	0.0019966	0.352	0.845	0.00
14.	0.	-6.0	0.074851	-0.001248	-0.002636	0.000291	-0.000629	0.002261	0.0022606	0.0023280	0.351	0.846	-0.36
10.	-5.0	-6.0	0.008023	-0.001306	-0.000482	0.000110	-0.000672	0.001303	0.0012884	0.0017426	0.351	0.847	0.36
12.	-5.0	-7.6	0.027743	0.000367	-0.000610	-0.000015	-0.000595	0.001930	0.0019244	0.0017447	0.352	0.847	0.36
14.	-5.0	-9.5	0.046127	0.002100	-0.000855	-0.000093	-0.000884	0.002841	0.0028381	0.0019586	0.352	0.847	0.12
16.	-5.0	-11.2	0.061822	0.004097	-0.001180	-0.000207	-0.000391	0.003930	0.0039334	0.0022391	0.352	0.849	0.00
16.	-10.0	-14.6	0.035420	0.004131	0.000016	-0.000491	-0.000295	0.003399	0.0034326	0.0018981	0.351	0.848	0.36
14.	-10.0	-13.0	0.017362	0.000660	0.000147	-0.000277	-0.000387	0.002056	0.0020729	0.0018223	0.349	0.850	0.48
12.	-10.0	-11.4	0.000829	-0.002312	-0.000098	0.000125	-0.000698	0.000977	0.0009408	0.0017482	0.349	0.850	0.48
16.	-15.0	-18.4	0.008389	-0.000282	0.000494	-0.000226	-0.000061	0.001673	0.0016745	0.0017688	0.351	0.849	0.60
18.	-15.0	-20.0	0.024035	0.004364	0.000694	-0.000911	0.000206	0.003457	0.0035750	0.0019948	0.353	0.848	0.48
18.	-10.0	-16.4	0.051504	0.007569	-0.000030	-0.000777	-0.000316	0.004935	0.0049950	0.0021652	0.351	0.851	0.36
6.	2.0	2.1	0.014648	-0.002121	-0.001096	0.000043	-0.000182	0.001127	0.0011273	0.0018570	0.351	0.846	0.00
8.	2.0	1.0	0.032937	-0.002983	-0.001471	0.000178	-0.000372	0.000878	0.0008839	0.0018603	0.351	0.847	0.12

TABLE IV-27.- TEETERING ROTOR; 48-FT TAPERED TIP, $V/\Omega R = 0.35$, $M_{(1)(90)} = 0.94$.

TEST 274.0 RUN 10

No. 3 TARE

(COEFFICIENTS BASED ON ROTOR BLADE AREA AND ROTOK TIP SPEED) (WIND AXES)

θ_{grip}	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}
14.	-5.0	-9.2	0.042109	0.001306	-0.000666	-0.000058	-0.000568	0.003084	0.0030775	0.0025016	0.351	0.942	0.48
13.	-5.0	-8.2	0.034130	0.000428	-0.000628	-0.000058	-0.000807	0.002608	0.0026028	0.0023758	0.349	0.944	0.36
12.	-5.0	-7.5	0.024768	-0.000321	-0.000439	0.000029	-0.000935	0.002191	0.0021797	0.0022504	0.348	0.945	0.48
12.	0.	-3.7	0.055235	-0.002549	-0.001738	0.000251	-0.000384	0.001811	0.0018115	0.0025154	0.354	0.940	0.12
11.	0.	-2.9	0.046148	-0.002443	-0.001355	0.000274	-0.000453	0.001619	0.0016185	0.0023441	0.354	0.939	0.24
11.	-5.0	-6.6	0.015978	-0.001088	-0.000479	0.000133	-0.000661	0.001877	0.0018585	0.0022278	0.355	0.939	0.48
14.	-10.0	-13.0	0.016179	0.000158	0.000206	-0.000206	-0.000662	0.002270	0.0022717	0.0021987	0.354	0.941	0.60
13.	-10.0	-12.0	0.007322	-0.001427	0.000045	-0.000002	-0.000744	0.001777	0.0017508	0.0022514	0.353	0.942	0.60

TEST 274.0 RUN 9

No. 3 TARE

(COEFFICIENTS BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED)(WIND AXES)

θ_{grip}	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}
14.	-5.0	-9.2	0.043538	0.001350	-0.000615	-0.000130	-0.000641	0.003040	0.0030401	0.0024399	0.352	0.942	0.60
14.	-10.0	-13.0	0.016497	0.000165	0.000255	-0.000231	-0.000548	0.002215	0.0022216	0.0021459	0.350	0.943	0.72
15.	-10.0	-13.8	0.024041	0.001550	0.000283	-0.000335	-0.000541	0.002794	0.0028097	0.0022246	0.353	0.938	0.72
16.	-10.0	-14.5	0.032308	0.003183	0.000450	-0.000579	-0.000615	0.003369	0.0034185	0.0022194	0.355	0.935	0.72
16.	-15.0	-18.2	0.006624	-0.000974	0.000535	-0.000239	-0.000359	0.001859	0.0018550	0.0021932	0.350	0.941	0.96
14.	-5.0	-9.2	0.042150	0.001399	-0.000662	0.000011	-0.000670	0.002949	0.0029364	0.0023249	0.354	0.933	0.48
13.	-5.0	-8.1	0.033208	0.000375	-0.000571	0.000025	-0.000745	0.002598	0.0025864	0.0023814	0.354	0.942	0.60

TABLE IV-28.- TEETERING ROTOR; 48-FT TAPERED TIP, $V/\Omega R = 0.40$, $M_{(1)(90)} = 0.84$.

TEST 274.0 RUN 7

No. 3 TARE

(COEFFICIENTS BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED)(WIND AXES)

θ_{grip}	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}
12.	-4.0	-7.3	0.028193	-0.000495	-0.000797	0.000180	-0.000629	0.001965	0.0019478	0.0020992	0.399	0.846	0.48
14.	-4.0	-9.2	0.044789	0.000794	-0.001045	0.000058	-0.000688	0.002733	0.0027220	0.0022876	0.401	0.844	0.24
14.	-8.0	-11.9	0.021366	0.000146	-0.000069	-0.000011	-0.000639	0.002212	0.0021921	0.0021072	0.401	0.843	0.48
16.	-8.0	-13.5	0.037794	0.002486	-0.000092	-0.000173	-0.000761	0.003390	0.0033813	0.0022965	0.403	0.842	0.60
16.	-12.0	-16.2	0.014696	-0.000067	0.000238	0.000094	-0.000731	0.002216	0.0021482	0.0021627	0.401	0.844	0.72
18.	-12.0	-18.0	0.029574	0.003329	0.000353	-0.000403	-0.000677	0.003751	0.0037530	0.0023614	0.403	0.843	0.72
18.	-8.0	-15.3	0.052280	0.005030	-0.000178	-0.000450	-0.000926	0.004760	0.0047763	0.0025943	0.403	0.843	0.60
16.	-4.0	-10.8	0.059777	0.002045	-0.001376	0.000065	-0.000688	0.003682	0.0036688	0.0026411	0.402	0.843	0.36
17.	-4.0	-12.0	0.067206	0.002957	-0.001512	0.000166	-0.000867	0.004358	0.0043355	0.0028833	0.403	0.841	0.24
12.	0.	-4.5	0.051270	-0.002032	-0.002075	0.000416	-0.000612	0.001634	0.0016337	0.0022991	0.402	0.844	0.00
14.	0.	-6.5	0.068744	-0.001777	-0.002495	0.000529	-0.000607	0.002244	0.0022441	0.0026815	0.400	0.845	0.00
10.	0.	-2.5	0.035900	-0.002264	-0.001562	0.000347	-0.000455	0.001255	0.0012553	0.0020867	0.400	0.845	0.00
8.	0.	-0.8	0.019073	-0.002101	-0.001123	0.000286	-0.000545	0.001137	0.0011367	0.0019577	0.401	0.844	0.12
8.	4.0	1.9	0.045410	-0.005526	-0.002247	0.000384	-0.000746	0.000209	0.0002353	0.0023157	0.398	0.847	0.00
10.	4.0	-0.1	0.059835	-0.006383	-0.003007	0.000415	-0.001053	0.000323	0.0003516	0.0026938	0.400	0.846	-0.36
10.	-4.0	-5.3	0.012128	-0.001580	-0.000625	0.000076	-0.000602	0.001546	0.0015365	0.0021640	0.403	0.842	0.36
12.	-8.0	-9.9	0.005026	-0.002199	-0.000071	-0.000029	-0.000535	0.001377	0.0013674	0.0022488	0.402	0.845	0.36

TEST 274.0 RUN 15C

No. 3 TARE

(COEFFICIENTS BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED) (WIND AXES)

θ_{grip}	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}
14.	-2.0	-7.7	0.053944	-0.000207	-0.001356	0.000108	-0.000816	0.002617	0.0026118	0.0025252	0.399	0.847	0.48
15.	-2.0	-8.7	0.060952	0.000259	-0.001537	-0.000011	-0.000697	0.002995	0.0029931	0.0026741	0.401	0.846	0.24
16.	-2.0	-9.5	0.070202	0.000684	-0.001800	-0.000002	-0.000791	0.003504	0.0035022	0.0029428	0.401	0.845	0.24

TABLE IV-29.- TEETERING ROTOR; 34-FT BLADES, $V/\Omega R = 0.51$, $M_{(1)(90)} = 0.65$.

TEST 274.0 RUN 23

No. 3 TARE

θ_{grip}	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}
			(COEFFICIENTS BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED) (WIND AXES)										
12.	-4.0	-9.6	0.029793	-0.001943	-0.001352	0.000436	-0.000418	0.002533	0.0024969	0.0034260	0.508	0.651	-0.36
14.	-4.0	-11.5	0.043524	-0.001430	-0.001942	0.000401	-0.000123	0.003467	0.0034306	0.0040349	0.508	0.651	-0.36
16.	-4.0	-13.5	0.052638	-0.000799	-0.002382	0.000365	-0.000662	0.004621	0.0045844	0.0048124	0.509	0.650	-0.24
10.	-4.0	-7.7	0.018401	-0.002224	-0.001100	0.000308	-0.000124	0.001939	0.0019128	0.0030237	0.509	0.650	-0.72
15.	-4.0	-12.5	0.048248	-0.001306	-0.001987	0.000164	-0.000685	0.003890	0.0038693	0.0043856	0.510	0.650	-0.24
14.	-6.0	-12.8	0.032110	-0.001279	-0.000900	-0.000238	-0.000528	0.003393	0.0033992	0.0039830	0.509	0.648	-0.24
12.	-6.0	-10.9	0.020478	-0.001979	-0.000650	-0.000241	-0.000254	0.002291	0.0023032	0.0032830	0.509	0.648	-0.36
16.	-6.0	-14.6	0.044590	-0.000235	-0.001530	-0.000036	-0.000749	0.004588	0.0045664	0.0045576	0.509	0.648	-0.12

TEST 274.0 RUN 26

No. 3 TARE

θ_{grip}	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}
			(COEFFICIENTS BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED) (WIND AXES)										
13.	-4.0	-10.8	0.039924	-0.001627	-0.001795	0.000353	-0.000162	0.003233	0.0032010	0.0039255	0.508	0.652	-0.36
14.	-4.0	-11.8	0.045328	-0.001458	-0.002071	0.000347	-0.000415	0.003707	0.0036742	0.0042840	0.509	0.650	-0.36
15.	-4.0	-12.7	0.051313	-0.001092	-0.001934	0.000047	-0.000027	0.004033	0.0040195	0.0044074	0.510	0.648	-0.24
16.	-4.0	-13.5	0.058421	-0.000716	-0.002539	0.000254	-0.000154	0.004705	0.0046759	0.0048232	0.511	0.648	-0.36
12.	-2.0	-8.5	0.043574	-0.002552	-0.002182	0.000449	0.000335	0.002655	0.0026379	0.0038160	0.510	0.649	-0.60
14.	-2.0	-10.5	0.057079	-0.002402	-0.002777	0.000511	0.000418	0.003418	0.0033983	0.0044178	0.511	0.648	-0.48
12.	-2.0	-8.5	0.043643	-0.002635	-0.002044	0.000239	0.000517	0.002596	0.0025857	0.0038090	0.511	0.648	-0.60
10.	-2.0	-6.6	0.032804	-0.002662	-0.001270	-0.000201	0.001272	0.001984	0.0019896	0.0032775	0.510	0.648	-0.72
11.	-2.0	-7.7	0.038594	-0.002632	-0.002038	0.000620	0.000737	0.002433	0.0024097	0.0036584	0.511	0.647	-0.60
8.	-2.0	-5.0	0.019549	-0.002570	-0.001041	0.000398	0.001086	0.001716	0.0017011	0.0029920	0.512	0.648	-0.84
12.	0.	-7.3	0.056057	-0.004106	-0.002669	0.000160	0.000440	0.002220	0.0022203	0.0041193	0.512	0.648	-0.84
10.	0.	-5.4	0.044194	-0.003711	-0.002360	0.000462	0.000572	0.001730	0.0017300	0.0035038	0.512	0.648	-0.84
8.	0.	-3.7	0.031124	-0.003269	-0.001494	0.000371	0.001284	0.001443	0.0014434	0.0030539	0.512	0.648	-0.84
14.	0.	-9.2	0.065880	-0.003694	-0.003548	0.000648	0.001213	0.003260	0.0032601	0.0048840	0.515	0.646	-0.60
10.	2.0	-4.1	0.054716	-0.005593	-0.003154	0.000750	0.000657	0.001286	0.0013115	0.0039831	0.512	0.647	-0.96
8.	2.0	-2.3	0.043638	-0.005041	-0.002295	0.000360	0.000502	0.000907	0.0009186	0.0033817	0.513	0.646	-0.96
6.	2.0	-0.8	0.032084	-0.004419	-0.001962	0.000599	0.001469	0.000983	0.0010038	0.0032052	0.513	0.646	-1.2
12.	2.0	-6.0	0.068288	-0.006240	-0.003463	0.000081	0.001172	0.001975	0.0019768	0.0048852	0.514	0.646	-0.96
14.	2.0	-8.0	0.077860	-0.005931	-0.004445	0.000790	0.001122	0.003163	0.0031885	0.0058546	0.515	0.645	-0.84
16.	0.	-11.0	0.078046	-0.003865	-0.003656	0.000427	0.000908	0.004605	0.0046045	0.0062175	0.517	0.644	-0.24
15.	-2.0	-11.4	0.062101	-0.002497	-0.002650	0.000045	0.000526	0.003932	0.0039276	0.0049749	0.517	0.644	-0.60

TABLE IV-30.- TEETERING ROTOR; 34-FT BLADES, $V/\Omega R = 0.66$, $M_{(1)(90)} = 0.55$.

TEST 274.0 RUN 27

No. 3 TARE

θ_{grip}	ALPHA SHAFT	ALPHA CONTRCL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}
			(COEFFICIENTS BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED) (WIND AXES)										
12.	0.	-8.4	0.034002	-0.005523	-0.003018	0.001042	0.002759	0.001777	0.0017767	0.0053196	0.652	0.556	-0.48
10.	0.	-6.2	0.029013	-0.004954	-0.003125	0.001644	0.002152	0.001848	0.0018478	0.0050395	0.653	0.555	-0.60
8.	0.	-4.1	0.022101	-0.004698	-0.002417	0.000883	0.002090	0.001524	0.0015239	0.0045693	0.653	0.554	-1.08
6.	0.	-2.5	0.012812	-0.004042	-0.001786	0.000963	0.001460	0.001671	0.0016705	0.0043070	0.654	0.554	-1.20
14.	0.	-10.4	0.042426	-0.006537	-0.004611	0.002040	0.004750	0.002615	0.0026153	0.0068077	0.655	0.552	-0.36
12.	0.	-8.4	0.034672	-0.005892	-0.003623	0.001548	0.002443	0.001965	0.0019652	0.0057644	0.655	0.553	-0.60
12.	-2.0	-9.4	0.025905	-0.005298	-0.002126	0.001025	0.000201	0.001746	0.0017092	0.0051870	0.663	0.550	-0.36
10.	-2.0	-7.4	0.017461	-0.005056	-0.002139	0.001413	-0.001044	0.001753	0.0017030	0.0050373	0.662	0.550	-0.72
8.	-2.0	-5.1	0.011458	-0.004403	-0.002096	0.001144	-0.000633	0.001519	0.0014782	0.0043955	0.664	0.550	-0.96
14.	-2.0	-11.7	0.028681	-0.006305	-0.002909	0.001462	0.000900	0.002187	0.0021348	0.0062758	0.663	0.550	-0.24
13.	-4.0	-11.5	0.020578	-0.006435	-0.001933	0.001638	-0.001914	0.002088	0.0019682	0.0062245	0.665	0.549	-0.36
14.	-4.0	-12.7	0.023386	-0.006873	-0.002052	0.001485	-0.001783	0.002147	0.0020378	0.0065877	0.666	0.549	-0.12
15.	-4.0	-13.6	0.028335	-0.006586	-0.002493	0.001939	-0.000049	0.002643	0.0025011	0.0068466	0.666	0.549	0.00
16.	-4.0	-14.5	0.032143	-0.006982	-0.001935	0.000906	-0.000253	0.002591	0.0025213	0.0071202	0.666	0.549	0.00
12.	-4.0	-10.6	0.015771	-0.006364	-0.001611	0.001209	-0.001182	0.001785	0.0016964	0.0059209	0.666	0.549	-0.36
10.	2.0	-5.2	0.042321	-0.006331	-0.004032	0.001919	0.000742	0.001490	0.0014957	0.0056244	0.666	0.548	-0.84
8.	2.0	-3.0	0.035765	-0.006018	-0.003564	0.001905	0.001691	0.001184	0.0012499	0.0052029	0.667	0.548	-1.08
6.	2.0	-1.2	0.028333	-0.005342	-0.001829	0.000032	0.001288	0.001125	0.0011251	0.0046526	0.668	0.548	-1.32
13.	2.0	-8.5	0.051621	-0.008063	-0.005192	0.002114	0.002338	0.002086	0.0021582	0.0074101	0.668	0.548	-0.84
12.	2.0	-7.3	0.050186	-0.007537	-0.003877	0.000884	0.001516	0.001613	0.0016433	0.0065476	0.667	0.548	-0.84
8.	4.0	-2.1	0.047956	-0.007430	-0.004067	0.001132	0.002071	0.000249	0.0003276	0.0051903	0.670	0.548	-1.44
6.	4.0	-0.2	0.042675	-0.006952	-0.002248	-0.000472	0.001774	-0.000032	-0.0000645	0.0044893	0.668	0.548	-1.56
10.	4.0	-4.2	0.053789	-0.008436	-0.004300	0.001158	0.003084	0.000321	0.0004007	0.0058888	0.667	0.547	-1.08
11.	4.0	-5.4	0.059673	-0.009058	-0.005201	0.002201	0.000961	0.000875	0.0010260	0.0068957	0.667	0.547	-0.96

TABLE IV-31.- TEETERING ROTOR; 34-FT BLADES, $V/\Omega R = 0.79$, $M_{(1)(90)} = 0.52$.

TEST 274.0 RUN 29

No. 3 TARE

θ_{grip}	ALPHA SHAFT	ALPHA CONTRCL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M,AT	A_{1_s}
			(COEFFICIENTS BASED ON ROTOR BLADE AREA AND ROTOR TIP SPEED) (WIND AXES)										
12.	0.	-9.5	0.031178	-0.009999	-0.003442	0.001102	0.002000	0.001374	0.0013745	0.0091856	0.785	0.528	-0.48
11.	0.	-8.3	0.030857	-0.009479	-0.004031	0.001343	0.002954	0.001111	0.0011111	0.0085359	0.787	0.527	-0.96
10.	0.	-7.1	0.029976	-0.008726	-0.003761	0.002411	0.002489	0.001384	0.0013843	0.0082048	0.786	0.526	-0.96
9.	0.	-6.1	0.023137	-0.007974	-0.002090	-0.000395	0.002025	0.001157	0.0011575	0.0074131	0.787	0.526	-1.08
8.	0.	-5.0	0.020888	-0.006787	-0.002337	0.000774	0.002071	0.001793	0.0017933	0.0071167	0.787	0.526	-1.20
10.	2.0	-6.2	0.039647	-0.010028	-0.003583	0.001255	0.002300	0.000779	0.0008226	0.0086706	0.789	0.524	-0.96
9.	2.0	-5.2	0.035874	-0.009461	-0.004759	0.002092	0.002630	0.001067	0.0011398	0.0085787	0.792	0.524	-1.20
8.	2.0	-4.1	0.040683	-0.007894	-0.003609	0.000732	0.005380	0.000680	0.0007047	0.0068885	0.792	0.523	-1.44
11.	2.0	-7.6	0.037808	-0.010249	-0.004786	0.001395	0.001554	0.001239	0.0012866	0.0093484	0.792	0.523	-0.72
10.	2.0	-6.3	0.039812	-0.010278	-0.004718	0.001879	0.001203	0.000606	0.0006717	0.0087201	0.789	0.523	-1.20
10.	0.	-7.1	0.027435	-0.008690	-0.003789	0.002183	0.001909	0.001768	0.0017683	0.0086136	0.791	0.523	-1.32

TABLE IV-32.- ARTICULATED ROTOR; -8° TWIST, $V/\Omega R = 0.30$, $M_{(1)(90)} = 0.74$.

TEST 276.0 RUN 3

No. 1 Tare

$\theta_{.75}$	ALPHA SHAFT	ALPHA CENTROL	(SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND TIP SPEED) CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1s}
6.	-10.0	-14.2	0.027113	-0.001231	0.000273	0.000040	-0.000166	0.002645	0.0025095	0.0013774	0.303	0.741	-1.3
8.	-10.0	-15.6	0.050631	-0.000492	-0.000213	0.000024	-0.000311	0.004557	0.0042784	0.0014990	0.304	0.746	-2.5
10.	-10.0	-16.8	0.073531	0.000295	-0.000087	0.000220	-0.000567	0.006678	0.0061470	0.0016460	0.304	0.746	-2.8
2.	-5.0	-7.1	0.011991	-0.001596	-0.000251	-0.000006	-0.000020	0.001298	0.0012130	0.0013613	0.300	0.742	-0.8
4.	-5.0	-8.8	0.034167	-0.001304	-0.000299	0.000151	-0.000227	0.002117	0.0020347	0.0014065	0.303	0.742	-1.4
6.	-5.0	-10.3	0.057459	-0.001033	-0.000278	0.000287	-0.000477	0.003172	0.0029923	0.0014515	0.303	0.740	-1.8
8.	-5.0	-11.8	0.078266	-0.000229	-0.000586	0.000405	-0.000751	0.004456	0.0042396	0.0016220	0.302	0.740	-2.5
10.	-5.0	-13.7	0.095296	0.001350	-0.000849	0.000419	-0.001102	0.006403	0.0060368	0.0021929	0.303	0.740	-3.6
11.	-5.0	-14.2	0.100639	0.001454	-0.001780	0.000360	-0.000953	0.007807	0.0073419	0.0032341	0.301	0.741	-4.4
0.	0.	-1.8	0.013465	-0.001556	-0.000832	0.000230	-0.000072	0.000991	0.0009281	0.0013828	0.304	0.735	-0.5
2.	0.	-3.4	0.037656	-0.001502	-0.000845	0.000394	-0.000367	0.001192	0.0010874	0.0013973	0.303	0.736	-0.9
4.	0.	-4.7	0.061472	-0.001222	-0.001120	0.000486	-0.000715	0.001599	0.0014951	0.0014802	0.304	0.736	-1.7
6.	0.	-6.5	0.082906	-0.000366	-0.001172	0.000669	-0.001075	0.002417	0.0022957	0.0017053	0.304	0.736	-2.0
8.	0.	-8.2	0.102012	0.001043	-0.001662	0.000556	-0.001297	0.004055	0.0038793	0.0025074	0.307	0.733	-3.1
10.	0.	-9.6	0.106934	0.002905	-0.003198	0.000496	-0.001449	0.007019	0.0066196	0.0045684	0.302	0.737	-5.1
-4.	5.0	6.2	-0.003596	-0.001673	-0.001473	0.000026	0.000086	0.001275	0.0011893	0.0016025	0.306	0.735	-0.5
-2.	5.0	4.8	0.018780	-0.001749	-0.001539	0.000335	0.000011	0.000559	0.0005808	0.0015728	0.304	0.735	-0.1
0.	5.0	2.7	0.041101	-0.001629	-0.001541	0.000449	-0.000406	0.000114	0.0000982	0.0015069	0.303	0.734	-0.8
2.	5.0	0.9	0.061646	-0.000948	-0.001515	0.000703	-0.000761	0.000093	0.0000378	0.0015549	0.301	0.733	-1.0
4.	5.0	-0.6	0.086193	-0.000548	-0.001465	0.000789	-0.001068	0.000302	0.0002508	0.0019380	0.303	0.732	-1.5
6.	5.0	-2.5	0.102910	0.001308	-0.001112	0.000669	-0.001362	0.001414	0.0013827	0.0026335	0.303	0.734	-2.0
8.	5.0	-5.0	0.110746	0.003887	-0.001363	0.000733	-0.001309	0.004128	0.0040210	0.0045202	0.303	0.732	-3.3
10.	5.0	-6.6	0.116118	0.004739	-0.001027	0.000994	-0.001442	0.006602	0.0070642	0.0073218	0.303	0.734	-4.9
-4.	10.0	10.2	0.020868	-0.001919	-0.001967	0.000332	-0.000322	0.000119	0.0001147	0.0017564	0.305	0.731	-0.1
-2.	10.0	8.6	0.044262	-0.001835	-0.002055	0.000575	-0.000588	-0.000926	-0.0009103	0.0018002	0.306	0.731	-0.3
0.	10.0	6.9	0.065522	-0.001756	-0.001785	0.000767	-0.000956	-0.001631	-0.0015583	0.0020013	0.304	0.732	-0.3
2.	10.0	5.3	0.087090	-0.000925	-0.001652	0.000809	-0.001366	-0.001876	-0.0017822	0.0023185	0.303	0.732	-0.9
4.	10.0	2.9	0.104973	0.000932	-0.000849	0.001059	-0.001703	-0.001184	-0.0011000	0.0030837	0.305	0.734	-1.0
6.	10.0	1.0	0.114750	0.002991	-0.002255	0.000918	-0.001619	0.001180	0.0011755	0.0049869	0.302	0.732	-2.6
7.	10.0	-0.3	0.118444	0.003595	-0.002043	0.000963	-0.001608	0.002810	0.0027420	0.0065775	0.307	0.730	-3.0
8.	10.0	-1.1	0.121732	0.004171	-0.001869	0.000401	-0.002053	0.003530	0.0044183	0.0081016	0.304	0.731	-4.1
9.	10.0	-2.5	0.121498	0.005878	-0.000524	0.000542	-0.001227	0.004603	0.0060943	0.0092988	0.306	0.731	-4.7

For the following data points

a_{1s} and/or $b_{1s} \neq 0^{\circ} \pm .2^{\circ}$

α_s	θ	a_{1s}	b_{1s}
5	8	.2→.4	.2
5	10	.5	-.5
10	0	-.5	.5
10	4	.5	.5
10	6	0	-.5

TABLE IV-33.- ARTICULATED ROTOR; -8° TWIST, $V/\Omega R = 0.40$, $M_{(1)(90)} = 0.82$.

TEST 276.0 RUN 4

No. 1 Tare

			(SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND TIP SPEED)										
$\theta_{.75}$	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1s}
6.	-10.0	-14.4	0.005638	-0.002397	0.000348	-0.000345	-0.000024	0.001473	0.0013218	0.0018729	0.396	0.826	-0.9
8.	-10.0	-16.1	0.026296	-0.001820	0.000270	-0.000167	-0.000231	0.003368	0.0030944	0.0019356	0.398	0.823	-1.5
10.	-10.0	-17.8	0.047270	-0.001195	-0.000087	-0.000355	-0.000541	0.005476	0.0051516	0.0021807	0.398	0.822	-2.5
12.	-10.0	-19.4	0.066404	-0.000741	-0.000750	-0.000210	-0.000474	0.007793	0.0071955	0.0025042	0.404	0.815	-3.7
10.	-10.0	-18.0	0.046524	-0.001163	-0.000128	-0.000241	-0.000422	0.005521	0.0050653	0.0021155	0.402	0.818	-2.4
10.	-10.0	-19.4	0.051730	-0.002018	0.005111	0.001186	-0.000477	0.005842	0.0052787	0.0022795	0.400	0.820	-3.0
10.	-10.0	-16.9	0.043210	-0.000614	-0.004349	-0.001951	-0.000635	0.005399	0.0049656	0.0020740	0.399	0.820	-7.9
4.	-5.0	-9.3	0.019539	-0.002127	-0.000359	0.000041	-0.000242	0.001866	0.0016864	0.0018260	0.398	0.817	-0.8
6.	-5.0	-11.0	0.040337	-0.001689	-0.000449	0.000114	-0.000438	0.002956	0.0027311	0.0018769	0.397	0.820	-1.2
8.	-5.0	-12.9	0.059367	-0.001313	-0.000724	0.000068	-0.000836	0.004239	0.0039934	0.0021771	0.399	0.818	-2.1
8.	-5.0	-14.3	0.060559	-0.001854	0.005119	0.001832	-0.000706	0.004228	0.0039016	0.0022460	0.400	0.816	3.3
8.	-5.0	-12.0	0.053869	-0.000351	-0.005840	-0.001830	-0.000848	0.004312	0.0040454	0.0020826	0.400	0.816	-7.7
10.	-5.0	-14.4	0.076719	-0.000744	-0.001691	0.000335	-0.001116	0.005893	0.0054458	0.0026148	0.400	0.815	-3.2
12.	-5.0	-16.3	0.088143	0.000521	-0.001334	0.000103	-0.000952	0.007692	0.0072701	0.0033755	0.403	0.812	-4.5
4.	0.	-5.6	0.052187	-0.001825	-0.001494	0.000339	-0.000618	0.001609	0.0014402	0.0019484	0.395	0.816	-1.2
6.	0.	-7.5	0.069959	-0.001287	-0.001637	0.000463	-0.001042	0.002332	0.0021686	0.0023025	0.399	0.812	-1.7
2.	0.	-4.0	0.031924	-0.002106	-0.001250	0.000336	-0.000211	0.001265	0.0010859	0.0018431	0.397	0.816	-0.3
6.	0.	-7.6	0.069721	-0.001162	-0.001538	0.000404	-0.001014	0.002344	0.0022005	0.0022829	0.397	0.816	-1.7
6.	0.	-8.9	0.069590	-0.001627	0.005548	0.002269	-0.000951	0.002266	0.0021469	0.0024147	0.397	0.815	3.9
6.	0.	-6.4	0.066252	-0.000226	-0.007691	-0.001670	-0.000991	0.002514	0.0023903	0.0021376	0.397	0.815	-7.3
8.	0.	-9.5	0.084971	0.000316	-0.001955	0.000183	-0.000998	0.003750	0.0036284	0.0029412	0.399	0.815	-2.9
10.	0.	-11.6	0.098263	0.000472	-0.000220	-0.001019	-0.000764	0.006458	0.0067181	0.0057818	0.400	0.812	-2.9
0.	0.	-2.1	0.011986	-0.002246	-0.001250	0.000303	0.000067	0.001084	0.0009320	0.0018145	0.398	0.815	0.1
-4.	5.0	5.0	0.000478	-0.002208	-0.002157	0.000254	0.000185	0.001222	0.0010962	0.0019909	0.399	0.813	1.1
-2.	5.0	3.6	0.021706	-0.002218	-0.002133	0.000451	-0.000136	0.000483	0.0003576	0.0019473	0.396	0.815	0.4
0.	5.0	1.8	0.042315	-0.002160	-0.002071	0.000606	-0.000227	-0.000039	-0.0001295	0.0020484	0.396	0.813	-0.1
2.	5.0	0.	0.058590	-0.001390	-0.001873	0.000802	-0.000620	-0.000016	-0.0001160	0.0022188	0.400	0.812	-0.5
4.	5.0	-2.2	0.078131	-0.000630	-0.001824	0.000870	-0.001014	0.000360	0.0002737	0.0027398	0.395	0.811	-1.1
6.	5.0	-4.3	0.091275	0.001079	-0.001628	0.000686	-0.001155	0.001730	0.0016762	0.0037526	0.396	0.814	-1.9
8.	5.0	-6.3	0.101884	0.002416	-0.001512	0.000303	-0.001214	0.004005	0.0042230	0.0059947	0.398	0.813	-3.1
-4.	10.0	9.7	0.034614	-0.002346	-0.002626	0.000604	-0.000268	-0.000851	-0.0008179	0.0024177	0.399	0.808	0.8
-2.	10.0	7.6	0.053814	-0.002139	-0.002446	0.000720	-0.000556	-0.001732	-0.0016632	0.0026842	0.398	0.812	0.3
0.	10.0	5.4	0.070418	-0.001369	-0.002225	0.000650	-0.001081	-0.002105	-0.0019932	0.0030662	0.400	0.810	-0.2

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

α_s	$\theta_{.75}$	a_{1s}	b_{1s}
-10	10	.2	5.0
-10	10	0	-5.0
-5	8	.2	5.0
-5	8	.2	-5.0
0	6	.2	5.0
0	6	.2	-5.0
0	10	-.8	1.5

TABLE IV-34.- ARTICULATED ROTOR, -8° TWIST, $V/\Omega R = 0.46$, $M_{(1)(90)} = 0.82$.

TEST 276.0 RUN 5

No. 1 Tare

$\theta_{.75}$	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP′	CPO′	V/OR	M.AT	A_{1_s}
			(SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND TIP SPEED)										
8.	-10.0	-16.3	0.012137	-0.003044	0.000508	-0.000334	-0.000069	0.002310	0.0020904	0.0024863	0.457	0.827	-1.1
10.	-10.0	-18.0	0.031738	-0.002383	0.000241	-0.000327	-0.000287	0.004528	0.0041897	0.0026712	0.458	0.827	-2.2
12.	-10.0	-19.9	0.050653	-0.001585	0.000136	-0.000579	-0.000657	0.007064	0.0064164	0.0029164	0.460	0.827	-3.0
8.	-10.0	-17.1	0.016774	-0.002927	0.002292	0.001469	0.000108	0.002836	0.0025359	0.0025024	0.458	0.825	4.3
8.	-10.0	-15.3	0.011995	-0.002985	-0.000574	-0.002135	-0.000334	0.002230	0.0020719	0.0024514	0.455	0.827	-6.5
4.	-5.0	-9.3	0.012693	-0.002977	-0.000393	0.000060	-0.000308	0.001716	0.0014897	0.0023286	0.457	0.825	-0.3
6.	-5.0	-11.3	0.029716	-0.002575	-0.000533	0.000129	-0.000485	0.002736	0.0024503	0.0023790	0.460	0.822	-1.1
8.	-5.0	-13.1	0.046059	-0.002188	-0.000570	0.000085	-0.000901	0.003905	0.0035894	0.0026010	0.461	0.822	-1.7
10.	-5.0	-14.8	0.061736	-0.001516	-0.000874	-0.000020	-0.001344	0.005207	0.0049353	0.0028995	0.460	0.823	-2.6
10.	-5.0	-16.2	0.064966	-0.002439	0.005527	0.001661	-0.001381	0.005235	0.0049280	0.0031584	0.460	0.822	2.7
10.	-5.0	-13.7	0.058815	-0.000677	-0.006618	-0.001689	-0.001091	0.005613	0.0050832	0.0027998	0.461	0.821	-8.1
0.	0.	-2.1	0.010188	-0.002750	-0.001436	0.000993	-0.000161	0.001126	0.0009198	0.0021786	0.460	0.820	0.5
2.	0.	-4.1	0.028299	-0.002671	-0.001417	0.000682	-0.000456	0.001198	0.0010582	0.0022377	0.462	0.816	0.0
4.	0.	-6.1	0.043554	-0.002284	-0.001447	0.000551	-0.000627	0.001574	0.0014135	0.0023305	0.458	0.820	-0.6
6.	0.	-8.1	0.059672	-0.001758	-0.001549	0.000408	-0.001122	0.002238	0.0022073	0.0027737	0.459	0.818	-1.2
6.	0.	-9.0	0.061248	-0.002693	0.004660	0.002676	-0.001142	0.002075	0.0018982	0.0028767	0.458	0.819	4.2
6.	0.	-7.4	0.055143	-0.000856	-0.006520	-0.001583	-0.001154	0.002387	0.0023025	0.0024874	0.457	0.819	-7.0
8.	0.	-10.2	0.071794	-0.000627	-0.001285	0.000446	-0.001085	0.003168	0.0032575	0.0031953	0.458	0.819	-2.2
10.	0.	-12.3	0.081465	0.000506	0.000070	-0.000125	-0.001500	0.004572	0.0056222	0.0049418	0.459	0.819	-3.1
-4.	5.0	5.1	0.007057	-0.002757	-0.002494	0.000411	0.000040	0.000963	0.0008710	0.0024211	0.462	0.815	1.7
-2.	5.0	3.3	0.025444	-0.002779	-0.002449	0.000389	-0.000221	0.000320	0.0001891	0.0024387	0.460	0.815	0.7
0.	5.0	1.3	0.041299	-0.002454	-0.002440	0.000555	-0.000245	-0.000057	-0.0002049	0.0024648	0.460	0.816	0.2
2.	5.0	-1.0	0.053802	-0.001714	-0.002337	0.000643	-0.000705	0.000061	-0.0000795	0.0026901	0.463	0.814	-0.5
-2.	5.0	3.6	0.024449	-0.002819	-0.002536	0.000428	-0.000328	0.000327	0.0003145	0.0025534	0.461	0.817	0.9
2.	5.0	-0.7	0.057382	-0.001945	-0.002414	0.000627	-0.000784	-0.000017	-0.0001582	0.0028270	0.462	0.815	-0.3
4.	5.0	-2.8	0.072844	-0.001018	-0.002240	0.000731	-0.000924	0.000340	0.0002862	0.0033352	0.462	0.813	-0.8
6.	5.0	-5.1	0.086547	0.000747	-0.001960	0.000693	-0.000717	0.001767	0.0016893	0.0043500	0.464	0.813	-1.6
8.	5.0	-6.9	0.095757	0.001980	-0.001536	-0.000257	-0.001152	0.003161	0.0039659	0.0063002	0.462	0.814	-3.1
-4.	10.0	9.1	0.040115	-0.002653	-0.003057	0.002647	-0.000363	-0.000872	-0.0011824	0.0031248	0.460	0.816	1.1
-2.	10.0	7.2	0.057372	-0.002271	-0.003084	0.003110	-0.000920	-0.001589	-0.0019049	0.0035109	0.461	0.810	0.6
0.	10.0	4.8	0.073730	-0.001311	-0.002820	0.002576	-0.001134	-0.001902	-0.0021617	0.0040118	0.463	0.811	0.3
2.	10.0	2.7	0.086951	-0.000158	-0.002763	0.002993	-0.001513	-0.001414	-0.0017275	0.0048228	0.462	0.814	-0.4

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

α_s	$\theta_{.75}$	a_{1_s}	b_{1_s}
-10	10	-.3	-.1
-10	12	-.2	-.3
0	8	.4	0
0	10	.2	.3

TABLE IV-35.- ARTICULATED ROTOR; 0° TWIST, $V/\Omega R = 0.30$, $M_{(1)(90)} = 0.73$.

TEST 276.0 RUN 6

No. 1 Tare

$\theta_{.75}$	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1_s}
			(SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND TIP SPEED)										
6.	-10.0	-14.3	0.025908	-0.000669	0.000335	-0.000103	0.000026	0.002863	0.0028365	0.0016075	0.303	0.739	-2.4
8.	-10.0	-15.6	0.049985	-0.000187	-0.000101	0.000041	-0.000315	0.004705	0.0045869	0.0017514	0.305	0.738	-3.1
10.	-10.0	-17.1	0.072933	0.000756	-0.000995	0.000252	-0.000578	0.006894	0.0065951	0.0019905	0.304	0.740	-4.2
11.	-10.0	-17.8	0.081877	0.001264	-0.000908	-0.000032	-0.000516	0.008028			0.304	0.738	-4.5
4.	-10.0	-12.8	0.001862	-0.001146	0.000637	-0.000261	0.000090	0.001302	0.0013347	0.0015759	0.300	0.735	-1.5
2.	-5.0	-6.8	0.006790	-0.001194	0.000302	-0.000191	0.000034	0.001363	0.0013201	0.0014965	0.303	0.737	-1.4
4.	-5.0	-8.6	0.032104	-0.001004	0.000122	0.000047	-0.000105	0.002240	0.0022134	0.0015596	0.306	0.735	-2.0
6.	-5.0	-10.3	0.055683	-0.000590	-0.000340	0.000232	-0.000525	0.003304	0.0032726	0.0016622	0.304	0.736	-2.7
8.	-5.0	-11.8	0.075452	0.000028	-0.000892	0.000062	-0.001017	0.004533	0.0044824	0.0018957	0.305	0.737	-3.6
10.	-5.0	-13.5	0.092963	0.001362	-0.002553	0.000413	-0.000882	0.006978	0.0066488	0.0028998	0.304	0.739	-5.1
11.	-5.0	-13.9	0.097646	0.001072	-0.003243	0.000478	-0.000659	0.008180			0.305	0.739	-5.9
0.	0.	-1.3	0.011575	-0.001281	-0.000090	-0.000006	0.000191	0.001089	0.0011352	0.0015121	0.305	0.734	-0.9
2.	0.	-2.8	0.035131	-0.001256	-0.000482	0.000186	-0.000188	0.001298	0.0012594	0.0015172	0.305	0.734	-1.7
4.	0.	-4.4	0.058405	-0.000996	-0.001013	0.000478	-0.000561	0.001669	0.0016157	0.0015711	0.304	0.735	-2.4
6.	0.	-6.1	0.082647	-0.000384	-0.001676	0.000409	-0.000935	0.002497	0.0024500	0.0018691	0.304	0.735	-3.2
8.	0.	-8.1	0.097650	0.001206	-0.002817	0.000391	-0.001205	0.004261	0.0041493	0.0028106	0.304	0.735	-4.3
10.	0.	-9.9	0.104978	0.002847	-0.003175	0.000570	-0.001253	0.007246	0.0070781	0.0050897	0.305	0.736	-5.9
-4.	5.0	5.9	-0.009632	-0.001252	-0.000235	-0.000223	0.000426	0.001422	0.0013605	0.0014786	0.306	0.735	-0.1
-2.	5.0	4.6	0.013921	-0.001460	-0.000633	-0.000108	0.000287	0.000731	0.0006891	0.0014893	0.307	0.729	-0.5
0.	5.0	3.1	0.037577	-0.001577	-0.000915	0.000288	-0.000087	0.000208	0.0002064	0.0015417	0.305	0.733	-1.0
2.	5.0	1.5	0.061749	-0.001397	-0.001534	0.000613	-0.000394	-0.000000	-0.0000382	0.0016497	0.306	0.733	-1.7
4.	5.0	-0.2	0.084513	-0.001154	-0.001937	0.000792	-0.001153	0.000117	0.0000836	0.0019391	0.302	0.733	-2.3
6.	5.0	-2.6	0.102393	0.000747	-0.002672	0.000819	-0.001385	0.001637	0.0015526	0.0030121	0.307	0.734	-3.2
8.	5.0	-4.7	0.109683	0.002996	-0.003403	0.000739	-0.001403	0.004436	0.0043886	0.0051679	0.304	0.737	-4.8
10.	5.0	-6.3	0.113475	0.004179	-0.002479	0.000178	-0.001271	0.006866	0.0071835	0.0076175	0.304	0.737	-6.3
-4.	10.0	10.2	0.016978	-0.001927	-0.001071	0.000198	-0.000132	0.000082	0.0000982	0.0015515	0.306	0.738	-0.4
-2.	10.0	9.0	0.040442	-0.002235	-0.001455	0.000347	-0.000468	-0.001019	-0.0009616	0.0016936	0.305	0.731	-0.7
0.	10.0	7.2	0.062741	-0.001859	-0.001875	0.000561	-0.000936	-0.001703	-0.0016640	0.0018058	0.303	0.734	-1.2
2.	10.0	5.7	0.085902	-0.001578	-0.002268	0.000706	-0.001350	-0.002171	-0.0020845	0.0021921	0.304	0.730	-1.6
4.	10.0	3.5	0.103339	-0.000017	-0.002733	0.000948	-0.001746	-0.001468	-0.0014361	0.0029543	0.303	0.734	-2.2
6.	10.0	0.6	0.113094	0.003521	-0.003495	0.000969	-0.001537	0.001258	0.0012540	0.0049089	0.305	0.735	-3.7
8.	10.0	-1.2	0.118345	0.003301	-0.002669	0.000400	-0.002023	0.003912	0.0048350	0.0087280	0.305	0.735	-5.2

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

α_s	$\theta_{.75}$	a_{1_s}	b_{1_s}
-5	11	-.4	-.1
5	10	-.2	-.3
10	6	.5	0
10	8	-.4	.3

TABLE IV-36.- ARTICULATED ROTOR; 0° TWIST, $V/\Omega R = 0.40$, $M_{(1)(90)} = 0.83$.

TEST 276.C RUN 7

No. 1 Tare

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

$\theta_{.75}$	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CC	CP	CPO	V/OR	M,AT	A_{1_s}
6.	-10.0	-14.9	0.004764	-0.001567	0.001025	-0.000552	0.000015	0.002005	0.0019477	0.0022338	0.402	0.839	-2.5
8.	-10.0	-16.4	0.025190	-0.001054	0.000632	-0.000569	-0.000117	0.003936	0.0037725	0.0023805	0.403	0.840	-3.3
10.	-10.0	-18.3	0.043260	-0.000382	0.000146	-0.000234	-0.000488	0.005953	0.0057733	0.0027495	0.404	0.840	-4.3
11.	-10.0	-19.1	0.053619	0.000193	-0.000113	-0.000292	-0.000602	0.007254			0.401	0.837	-4.9
4.	-5.0	-9.4	0.017285	-0.001549	0.000358	-0.000298	-0.000184	0.002126	0.0020579	0.0020494	0.401	0.835	-2.3
6.	-5.0	-11.4	0.038023	-0.001175	-0.000133	-0.000265	-0.000548	0.003334	0.0033016	0.0023313	0.401	0.837	-3.0
8.	-5.0	-13.3	0.055895	-0.000740	-0.000838	-0.000115	-0.000812	0.004664	0.0044389	0.0025365	0.402	0.837	-3.8
10.	-5.0	-15.1	0.068843	0.000638	-0.002087	0.000249	-0.001303	0.006510	0.0062635	0.0032373	0.401	0.839	-5.5
0.	0.	-2.1	0.010644	-0.001797	-0.000137	-0.000120	0.000142	0.001282	0.0011897	0.0019035	0.402	0.835	-1.2
2.	0.	-4.2	0.028737	-0.001692	-0.000399	-0.000002	-0.000277	0.001410	0.0013326	0.0019486	0.402	0.834	-1.8
4.	0.	-6.0	0.049499	-0.001610	-0.000987	0.000314	-0.000516	0.001769	0.0016867	0.0021425	0.401	0.835	-2.5
6.	0.	-8.1	0.066657	-0.000770	-0.001581	0.000062	-0.000893	0.002563	0.0025761	0.0025414	0.401	0.834	-3.6
8.	0.	-9.9	0.082204	0.000106	-0.003161	0.000390	-0.001156	0.004519	0.0044248	0.0038625	0.403	0.832	-4.6
9.5	0.	-11.6	0.086655	0.001876	-0.003889	0.000613	-0.001349	0.006792	0.0065302	0.0051965	0.403	0.832	-6.1
-4.	5.0	5.1	0.001718	-0.001997	-0.000598	-0.000040	0.000145	0.001146	0.0010325	0.0018855	0.399	0.835	0.0
-2.	5.0	3.6	0.018260	-0.002026	-0.000951	0.000075	-0.000090	0.000539	0.0005419	0.0019600	0.400	0.832	-0.7
0.	5.0	1.6	0.038276	-0.001981	-0.001405	0.000301	-0.000315	0.000045	-0.0000276	0.0019795	0.399	0.834	-1.2
2.	5.0	-0.5	0.056475	-0.001403	-0.001798	0.000532	-0.000676	-0.000047	-0.0000980	0.0022047	0.403	0.830	-1.9
4.	5.0	-2.6	0.075426	-0.000833	-0.002573	0.000695	-0.000891	0.000320	0.0002768	0.0027957	0.399	0.833	-2.4
6.	5.0	-4.8	0.088873	0.001143	-0.003846	0.000464	-0.001318	0.002282	0.0021985	0.0042465	0.402	0.830	-3.9
8.	5.0	-6.8	0.095402	0.002551	-0.003808	0.001099	-0.001543	0.005026	0.0048449	0.0064563	0.401	0.832	-5.3
9.	5.0	-7.8	0.098196	0.002860	-0.004124	0.000614	-0.001190	0.006472	0.0063007	0.0078472	0.401	0.829	-6.3
-4.	10.0	9.2	0.030882	-0.002512	-0.001619	0.000204	-0.000263	-0.001046	-0.0009748	0.0021052	0.402	0.832	-0.2
-2.	10.0	7.5	0.050037	-0.002387	-0.002018	0.000344	-0.000671	-0.001979	-0.0018646	0.0023689	0.400	0.832	-0.7
0.	10.0	5.6	0.067272	-0.001837	-0.002487	0.000458	-0.001030	-0.002436	-0.0022574	0.0028229	0.401	0.829	-1.2

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

α_s	$\theta_{.75}$	a_{1_s}	b_{1_s}
-5	10	.4	-.4
5	8	.3	.2
5	9	.2	-.3

TABLE IV-37.- ARTICULATED ROTOR; 0° TWIST, $V/\Omega R = 0.46$, $M_{(1)(90)} = 0.82$.

TEST 276.0 RUN 8

No. 1 Tare

$\theta_{.75}$	ALPHA SHAFT	ALPHA CONTROL	(SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND TIP SPEED) CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1s}
8.	-10.0	-16.6	0.011180	-0.001751	0.000657	-0.000595	-0.000122	0.003053	0.0028498	0.0027422	0.456	0.831	-3.2
10.	-10.0	-18.7	0.026515	-0.001159	0.000439	-0.000621	-0.000121	0.004800	0.0045374	0.0029104	0.456	0.829	-4.1
12.	-10.0	-20.2	0.044381	-0.000413	-0.000334	-0.000023	-0.000415	0.007121	0.0067514	0.0032912	0.456	0.831	-5.4
4.	-5.0	-9.8	0.011502	-0.001948	0.000465	-0.000320	0.000008	0.002072	0.0019366	0.0023566	0.458	0.828	-2.3
6.	-5.0	-11.6	0.027511	-0.001798	0.000049	-0.000153	-0.000244	0.003019	0.0028780	0.0025497	0.456	0.829	-3.0
8.	-5.0	-13.6	0.042779	-0.001269	-0.000620	0.000596	-0.000777	0.004235	0.0040667	0.0028206	0.455	0.830	-3.9
10.	-5.0	-15.3	0.058077	-0.000974	-0.001702	0.000657	-0.001042	0.005861	0.0055890	0.0034853	0.459	0.826	-5.0
0.	0.	-2.5	0.007521	-0.002190	-0.000116	-0.000062	0.000054	0.001262	0.0011371	0.0021558	0.467	0.818	-1.1
2.	0.	-4.6	0.025336	-0.002134	-0.000515	0.000030	-0.000248	0.001433	0.0013150	0.0022500	0.459	0.827	-1.8
4.	0.	-6.6	0.040930	-0.001775	-0.001109	0.000153	-0.000414	0.001827	0.0017257	0.0024308	0.461	0.826	-2.7
6.	0.	-8.4	0.055761	-0.001363	-0.001684	0.000403	-0.001118	0.002461	0.0023762	0.0027909	0.458	0.827	-3.4
8.	0.	-10.4	0.072057	-0.000571	-0.002886	0.000186	-0.000808	0.004079	0.0039900	0.0038999	0.458	0.823	-4.6
10.	0.	-12.5	0.079317	0.001045	-0.004263	0.000244	-0.001798	0.006788	0.0064566	0.0055522	0.457	0.824	-6.2
-4.	5.0	5.0	0.004948	-0.002434	-0.000746	-0.000078	0.000426	0.001022	0.0008925	0.0021992	0.458	0.823	-0.1
-2.	5.0	3.5	0.021577	-0.002425	-0.001235	0.000129	0.000169	0.000378	0.0002743	0.0022197	0.460	0.820	-0.7
0.	5.0	1.2	0.037544	-0.002437	-0.001758	0.000408	-0.000333	-0.000082	-0.0001480	0.0023844	0.461	0.823	-1.3
2.	5.0	-1.0	0.053551	-0.001901	-0.002052	0.000607	-0.000411	-0.000135	-0.0001792	0.0026461	0.460	0.822	-1.9
4.	5.0	-3.4	0.070716	-0.000994	-0.002998	0.000843	-0.000642	0.000337	0.0003043	0.0032578	0.460	0.821	-2.8
6.	5.0	-5.6	0.081282	0.000735	-0.003738	0.000450	-0.000827	0.001743	0.0018501	0.0043418	0.462	0.822	-4.1
8.	5.0	-7.4	0.090601	0.001294	-0.004710	0.000541	-0.001455	0.004429	0.0044210	0.0069258	0.462	0.820	-5.7
-4.	10.0	8.7	0.036208	-0.002916	-0.002263	0.000340	-0.000302	-0.001530	-0.0014461	0.0026844	0.460	0.821	-0.5
-2.	10.0	6.9	0.052532	-0.002480	-0.002619	0.000436	-0.000529	-0.002331	-0.0022074	0.0029558	0.462	0.817	-1.0
0.	10.0	4.6	0.068274	-0.001794	-0.003255	0.000599	-0.001071	-0.002670	-0.0025558	0.0034215	0.461	0.819	-1.6
2.	10.0	2.7	0.082609	-0.000775	-0.003694	0.000706	-0.001262	-0.002407	-0.0023020	0.0042197	0.461	0.816	-2.0

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

α_s	$\theta_{.75}$	a_{1s}	b_{1s}
5	8	-.3	0

TABLE IV-37.- ARTICULATED ROTOR; 0° TWIST, $V/\Omega R = 0.46$, $M_{(1)(90)} = 0.82$.

TEST 276.0 RUN 8

No. 1 Tare

$\theta_{.75}$	ALPHA SHAFT	ALPHA CONTROL	(SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND TIP SPEED) CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1s}
8.	-10.0	-16.6	0.011180	-0.001751	0.000657	-0.000595	-0.000122	0.003053	0.0028498	0.0027422	0.456	0.831	-3.2
10.	-10.0	-18.7	0.026515	-0.001159	0.000439	-0.000621	-0.000121	0.004800	0.0045374	0.0029104	0.456	0.829	-4.1
12.	-10.0	-20.2	0.044381	-0.000413	-0.000334	-0.000023	-0.000415	0.007121	0.0067514	0.0032912	0.456	0.831	-5.4
4.	-5.0	-9.8	0.011502	-0.001948	0.000465	-0.000320	0.000008	0.002072	0.0019366	0.0023566	0.458	0.828	-2.3
6.	-5.0	-11.6	0.027511	-0.001798	0.000049	-0.000153	-0.000244	0.003019	0.0028780	0.0025497	0.456	0.829	-3.0
8.	-5.0	-13.6	0.042779	-0.001269	-0.000620	0.000596	-0.000777	0.004235	0.0040667	0.0028206	0.455	0.830	-3.9
10.	-5.0	-15.3	0.058077	-0.000974	-0.001702	0.000657	-0.001042	0.005861	0.0055890	0.0034853	0.459	0.826	-5.0
0.	0.	-2.5	0.007521	-0.002190	-0.000116	-0.000062	0.000054	0.001262	0.0011371	0.0021558	0.467	0.818	-1.1
2.	0.	-4.6	0.025336	-0.002134	-0.000515	0.000030	-0.000248	0.001433	0.0013150	0.0022500	0.459	0.827	-1.8
4.	0.	-6.6	0.040930	-0.001775	-0.001109	0.000153	-0.000414	0.001827	0.0017257	0.0024308	0.461	0.826	-2.7
6.	0.	-8.4	0.055761	-0.001363	-0.001684	0.000403	-0.001118	0.002461	0.0023762	0.0027909	0.458	0.827	-3.4
8.	0.	-10.4	0.072057	-0.000571	-0.002886	0.000186	-0.000808	0.004079	0.0039900	0.0038999	0.458	0.823	-4.6
10.	0.	-12.5	0.079317	0.001045	-0.004263	0.000244	-0.001798	0.006788	0.0064566	0.0055522	0.457	0.824	-6.2
-4.	5.0	5.0	0.004948	-0.002434	-0.000746	-0.000078	0.000426	0.001022	0.0008925	0.0021992	0.458	0.823	-0.1
-2.	5.0	3.5	0.021577	-0.002425	-0.001235	0.000129	0.000169	0.000378	0.0002743	0.0022197	0.460	0.820	-0.7
0.	5.0	1.2	0.037544	-0.002437	-0.001758	0.000408	-0.000333	-0.000082	-0.0001480	0.0023844	0.461	0.823	-1.3
2.	5.0	-1.0	0.053551	-0.001901	-0.002052	0.000607	-0.000411	-0.000135	-0.0001792	0.0026461	0.460	0.822	-1.9
4.	5.0	-3.4	0.070716	-0.000994	-0.002998	0.000843	-0.000642	0.000337	0.0003043	0.0032578	0.460	0.821	-2.8
6.	5.0	-5.6	0.081282	0.000735	-0.003738	0.000450	-0.000827	0.001743	0.0018501	0.0043418	0.462	0.822	-4.1
8.	5.0	-7.4	0.090601	0.001294	-0.004710	0.000541	-0.001455	0.004429	0.0044210	0.0069258	0.462	0.820	-5.7
-4.	10.0	8.7	0.036208	-0.002916	-0.002263	0.000340	-0.000302	-0.001530	-0.0014461	0.0026844	0.460	0.821	-0.5
-2.	10.0	6.9	0.052532	-0.002480	-0.002619	0.000436	-0.000529	-0.002331	-0.0022074	0.0029558	0.462	0.817	-1.0
0.	10.0	4.6	0.068274	-0.001794	-0.003255	0.000599	-0.001071	-0.002670	-0.0025558	0.0034215	0.461	0.819	-1.6
2.	10.0	2.7	0.082609	-0.000775	-0.003694	0.000706	-0.001262	-0.002407	-0.0023020	0.0042197	0.461	0.816	-2.0

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

α_s	$\theta_{.75}$	a_{1s}	b_{1s}
5	8	-.3	0

TABLE IV-38.- ARTICULATED ROTOR; 0° TWIST, $V/\Omega R = 0.50$, $M_{(1)(90)} = 0.83$.

TEST 276.0 RUN 9

Tare No. 1 ALPHA SHAFT = -10
Tare No. 2 ALPHA SHAFT = -5, -3, 2, 5, 10

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

$\theta_{.75}$	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1s}
8.	-10.0	-16.3	0.000575	-0.002616	0.000942	-0.000771	-0.000310	0.002380	0.0021093	0.0033385	0.496	0.848	-3.2
10.	-10.0	-18.1	0.016402	-0.002125	0.000834	-0.000710	-0.000231	0.004206	0.0038675	0.0034745	0.498	0.845	-3.7
12.	-10.0	-19.8	0.033512	-0.001411	0.000156	-0.000279	-0.000408	0.006644	0.0061569	0.0038928	0.495	0.849	-5.1
13.	-10.0	-20.8	0.041127	-0.001321	-0.000082	0.000291	-0.000572	0.007766	0.0073502	0.0043269	0.500	0.843	-5.3
4.	-5.0	-9.5	0.008184	-0.002803	0.000315	-0.000098	-0.000532	0.001822	0.0018699	0.0029102	0.502	0.839	-2.3
6.	-5.0	-11.5	0.020421	-0.002407	-0.000007	0.000023	-0.000962	0.002813	0.0027671	0.0030491	0.499	0.842	-2.8
8.	-5.0	-13.4	0.035424	-0.002255	-0.000557	0.000842	-0.000965	0.003917	0.0038801	0.0033803	0.502	0.839	-3.7
10.	-5.0	-15.4	0.049795	-0.001792	-0.001791	0.000154	-0.001766	0.005613	0.0055022	0.0040666	0.502	0.839	-5.0
12.	-5.0	-16.8	0.064203	-0.001504	-0.003602	0.000463	-0.000842	0.008224	0.0078646	0.0055670	0.498	0.841	-6.8
0.	-3.0	-3.6	-0.010355	-0.002751	0.000200	-0.000085	-0.000161	0.001122	0.0011179	0.0027509	0.498	0.837	-0.9
2.	-3.0	-6.1	0.005094	-0.002790	0.000028	0.000017	-0.000308	0.001566	0.0015050	0.0027683	0.502	0.833	-1.4
4.	-3.0	-8.1	0.018446	-0.002689	-0.000150	-0.000111	-0.000677	0.002084	0.0020969	0.0029470	0.507	0.838	-2.6
6.	-3.0	-10.1	0.032997	-0.002675	-0.000662	0.000538	-0.001220	0.002809	0.0028218	0.0032315	0.505	0.837	-3.2
8.	-3.0	-12.3	0.046299	-0.002295	-0.001168	0.001195	-0.001422	0.003830	0.0038687	0.0036706	0.508	0.835	-3.8
10.	-3.0	-14.4	0.055759	-0.001241	-0.002406	0.000862	-0.001636	0.005608	0.0054718	0.0044296	0.508	0.837	-5.3
-2.	2.0	0.9	0.004204	-0.003033	-0.000233	-0.000242	-0.000293	0.001045	0.0011087	0.0027168	0.506	0.833	-0.9
0.	2.0	-0.9	0.019689	-0.002919	-0.000647	-0.000124	-0.000357	0.000844	0.0008782	0.0026809	0.507	0.834	-1.3
2.	2.0	-3.2	0.034835	-0.003042	-0.001165	0.000185	-0.000839	0.000795	0.0009002	0.0029940	0.509	0.833	-2.0
4.	2.0	-5.4	0.047119	-0.002525	-0.001450	0.000248	-0.001232	0.001123	0.0012728	0.0032762	0.513	0.831	-2.7
6.	2.0	-7.5	0.059898	-0.001917	-0.002390	0.000460	-0.001609	0.001981	0.0020862	0.0039160	0.511	0.832	-3.8
8.	2.0	-9.6	0.073651	-0.001068	-0.002973	0.000808	-0.001705	0.003925	0.0039808	0.0055057	0.510	0.831	-4.3
10.	2.0	-11.5	0.080593	-0.000617	-0.003706	0.000286	-0.002315	0.006457	0.0065304	0.0079014	0.514	0.833	-6.2
-4.	5.0	5.1	0.008895	-0.003352	-0.000686	-0.000201	0.000012	0.000690	0.0007412	0.0028271	0.508	0.829	-0.2
-2.	5.0	3.2	0.022179	-0.003230	-0.001148	-0.000084	-0.000303	0.000232	0.0002813	0.0028622	0.507	0.827	-0.7
0.	5.0	1.1	0.037904	-0.002977	-0.001595	0.000022	-0.000375	-0.000206	-0.0001665	0.0029403	0.509	0.825	-1.4
2.	5.0	-1.3	0.052518	-0.002525	-0.002033	0.000340	-0.000663	-0.000252	-0.0001835	0.0032633	0.509	0.825	-2.0
4.	5.0	-3.3	0.066608	-0.002212	-0.002553	0.000664	-0.001352	0.000189	0.0002636	0.0040467	0.506	0.828	-2.6
6.	5.0	-4.9	0.080276	-0.001155	-0.003960	0.000425	-0.001451	0.001548	0.0017072	0.0054481	0.507	0.826	-3.8
8.	5.0	-7.9	0.086541	0.000311	-0.004174	-0.000022	-0.001554	0.003989	0.0042200	0.0074506	0.509	0.825	-5.6
-4.	10.0	8.4	0.042166	-0.003585	-0.002820	0.000084	-0.000447	-0.001770	-0.0018233	0.0035774	0.507	0.826	-0.6
-2.	10.0	6.7	0.056011	-0.003140	-0.003078	0.000038	-0.000736	-0.002500	-0.0024326	0.0039079	0.509	0.825	-1.1
0.	10.0	4.3	0.071548	-0.002211	-0.003878	0.000250	-0.000941	-0.002591	-0.0026697	0.0044473	0.508	0.824	-1.8
2.	10.0	1.9	0.086077	-0.001162	-0.003847	0.000462	-0.001340	-0.002231	-0.0021863	0.0055704	0.509	0.824	-2.0
4.	10.0	-0.1	0.099909	0.001054	-0.004742	0.000557	-0.000356	-0.000965	-0.0008009	0.0068893	0.508	0.824	-2.8
6.	10.0	-3.1	0.107859	0.003787	-0.005047	0.000709	0.000674	0.001516	0.0020733	0.0089844	0.507	0.826	-4.5

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

α_s	$\theta_{.75}$	a_{1s}	b_{1s}
5	6	-.4	-.1

TABLE IV-39.- ARTICULATED ROTOR; 0° TWIST, $V/\Omega R$ = 0.62, $M_{(1)(90)}$ = 0.73.

TEST 276.0 RUN 10B

No. 2 Tare

$\theta_{.75}$	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1_s}
			(SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND TIP SPEED)										
6.	-8.0	-12.5	-0.019152	-0.004265	0.000525	-0.000307	0.000075	0.000030	0.0001550	0.0043591	0.613	0.738	-2.1
8.	-8.0	-14.5	-0.007591	-0.004326	0.000165	-0.000170	0.000074	0.001199	0.0012434	0.0045175	0.614	0.741	-2.5
10.	-8.0	-16.7	0.001915	-0.004838	-0.000175	-0.000028	-0.000320	0.002427	0.0023533	0.0051638	0.621	0.734	-3.2
12.	-8.0	-18.4	0.016902	-0.004852	-0.000579	-0.000127	0.000153	0.004183	0.0041091	0.0056114	0.619	0.735	-4.5
2.	-4.0	-6.2	-0.012819	-0.003792	0.000100	-0.000236	-0.000151	0.000904	0.0009333	0.0038180	0.618	0.735	-1.3
4.	-4.0	-8.6	-0.002356	-0.003821	0.000040	-0.000030	-0.000229	0.001448	0.0014692	0.0039299	0.619	0.734	-2.0
6.	-4.0	-10.7	0.010218	-0.004005	-0.000310	0.000128	-0.000330	0.002250	0.0021852	0.0042067	0.618	0.736	-2.4
8.	-4.0	-12.7	0.020583	-0.004396	-0.000799	0.000012	-0.000490	0.002973	0.0029071	0.0047124	0.619	0.734	-3.7
10.	-4.0	-14.7	0.031536	-0.004637	-0.001591	0.000192	-0.000564	0.004098	0.0039295	0.0053845	0.620	0.734	-4.2
0.	0.	-2.5	0.000526	-0.003693	-0.000245	-0.000079	-0.000435	0.001266	0.0013013	0.0035853	0.618	0.733	-1.3
2.	0.	-4.3	0.014925	-0.003718	-0.000740	0.000104	-0.000226	0.001349	0.0014230	0.0037132	0.619	0.733	-1.7
4.	0.	-6.8	0.024862	-0.003920	-0.000973	0.000173	-0.000571	0.001605	0.0016787	0.0040805	0.621	0.731	-2.4
6.	0.	-8.7	0.034521	-0.003877	-0.001655	-0.000020	-0.000512	0.002146	0.0021739	0.0045353	0.624	0.732	-3.6
-4.	4.0	4.6	0.006898	-0.004352	-0.000853	-0.000070	-0.000230	0.000796	0.0008965	0.0039035	0.624	0.732	-0.4
-2.	4.0	2.5	0.016763	-0.003808	-0.001090	-0.000129	-0.000358	0.000479	0.0005782	0.0036654	0.624	0.732	-1.0
0.	4.0	0.2	0.029464	-0.003914	-0.001567	0.000018	-0.000384	0.000143	0.0004525	0.0041199	0.622	0.733	-1.6
2.	4.0	-2.0	0.039962	-0.003778	-0.002003	0.000162	-0.000577	0.000230	0.0004523	0.0044357	0.620	0.732	-2.2
4.	4.0	-4.3	0.049027	-0.002959	-0.002727	-0.000001	-0.000777	0.000608	0.0009415	0.0047768	0.621	0.732	-3.3
6.	4.0	-6.5	0.063457	-0.001662	-0.003668	0.000220	0.000033	0.001604	0.0018995	0.0055615	0.634	0.738	-4.4
8.	4.	-8.7	0.070873	-0.001750	-0.004969	0.000016	0.000046	0.003557	0.0036808	0.0075886	0.621	0.733	-5.9
6.	4.0	-6.9	0.065587	-0.002299	-0.003534	0.000313	0.000670	0.001726	0.0019345	0.0060063	0.624	0.731	-4.1
-4.	8.0	7.2	0.035681	-0.004543	-0.002532	-0.000078	-0.000194	-0.001243	-0.0012784	0.0045139	0.618	0.733	-0.8
-2.	8.0	5.1	0.047628	-0.003706	-0.003451	0.000046	-0.000255	-0.001540	-0.0015088	0.0047705	0.620	0.731	-1.5
0.	8.0	2.6	0.05712.	-0.002465	-0.003779	0.000266	0.000188	-0.001377	-0.0014244	0.0048378	0.618	0.733	-2.0
2.	8.0	0.1	0.073283	-0.001257	-0.004541	0.000474	0.001460	-0.001399	-0.0013052	0.0055209	0.619	0.733	-2.6
4.	8.0	-2.2	0.079625	-0.000392	-0.005131	0.000405	0.000704	-0.000223	-0.0002317	0.0065527	0.619	0.732	-3.6

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

α_s	$\theta_{.75}$	a_{1_s}	b_{1_s}
0	0	.4	0
8	2	.2	-.3

TABLE IV-40.- ARTICULATED ROTOR; 0° TWIST, $V/\Omega R$ = 0.71, $M_{(1)(90)}$ = 0.68.

TEST 276.0 RUN 11

No. 2 Tare

$\theta_{.75}$	ALPHA SHAFT	ALPHA CONTROL	(SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND TIP SPEED) CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1_s}
6.	-4.0	-10.6	-0.001218	-0.005620	-0.000465	-0.000061	-0.000228	0.001616	0.0015680	0.0055241	0.695	0.687	-2.3
8.	-4.0	-12.6	0.005154	-0.006135	-0.000545	-0.000058	-0.000438	0.002168	0.0019942	0.0059952	0.695	0.687	-2.9
10.	-4.0	-14.5	0.014266	-0.007144	-0.001393	0.000178	-0.000476	0.002831	0.0026571	0.0069363	0.699	0.685	-3.2
12.	-4.0	-16.6	0.020902	-0.007614	-0.001888	0.000207	-0.000782	0.003808	0.0036316	0.0079234	0.703	0.685	-3.9
13.7	-4.0	-17.9	0.034238	-0.008352	-0.003588	0.000238	-0.000445	0.005666	0.0052715	0.0094128	0.706	0.682	-5.2
4.	-2.0	-7.4	0.003803	-0.005199	-0.000442	-0.000051	-0.000490	0.001559	0.0015854	0.0051609	0.706	0.681	-2.1
6.	-2.0	-9.8	0.011324	-0.005857	-0.000745	0.000079	-0.000435	0.001761	0.0018773	0.0057204	0.705	0.678	-2.7
8.	-2.0	-11.6	0.019423	-0.006433	-0.001374	0.000127	-0.000602	0.002414	0.0024149	0.0064748	0.709	0.680	-3.1
10.	-2.0	-13.4	0.025638	-0.005918	-0.002449	0.000206	-0.000588	0.003332	0.0031757	0.0067383	0.716	0.683	-3.9
12.	-2.0	-15.6	0.034069	-0.006977	-0.003101	0.000295	-0.000492	0.004761	0.0045285	0.0085641	0.707	0.679	-4.5
0.	0.	-1.9	0.000461	-0.004866	-0.000653	0.000058	-0.000517	0.001258	0.0014147	0.0048718	0.710	0.678	-1.1
2.	0.	-4.3	0.010286	-0.004858	-0.000716	0.000008	-0.000326	0.001304	0.0014930	0.0049398	0.710	0.675	-1.7
4.	0.	-6.5	0.016931	-0.004837	-0.000830	0.000001	-0.000600	0.001372	0.0015940	0.0049977	0.706	0.679	-2.3
6.	0.	-8.7	0.020691	-0.005492	-0.001158	0.000029	-0.000728	0.001726	0.0019131	0.0057787	0.707	0.679	-3.0
8.	0.	-10.6	0.029314	-0.005713	-0.002389	0.000116	-0.000260	0.002471	0.0026320	0.0066594	0.712	0.677	-3.6
10.	0.	-12.5	0.036062	-0.006055	-0.002925	0.000201	-0.000417	0.003732	0.0037148	0.0079320	0.706	0.678	-4.3
-4.	2.0	3.5	0.001275	-0.005449	-0.000407	-0.000231	-0.000071	0.001202	0.0012621	0.0051640	0.711	0.676	-0.5
-2.	2.0	1.3	0.007398	-0.004901	-0.000960	-0.000054	-0.000069	0.001142	0.0011982	0.0048587	0.710	0.676	-1.1
0.	2.0	-1.0	0.014251	-0.004727	-0.001038	0.000116	-0.000320	0.000951	0.0011985	0.0049084	0.712	0.677	-1.2
2.	2.0	-3.3	0.021605	-0.004710	-0.001460	0.000112	-0.000454	0.001066	0.0011662	0.0050263	0.711	0.676	-2.2
4.	2.0	-5.6	0.027129	-0.004743	-0.001843	0.000256	-0.000326	0.001254	0.0013900	0.0054014	0.711	0.676	-2.8
6.	2.0	-7.6	0.033261	-0.004885	-0.001956	0.000025	-0.000347	0.001570	0.0018694	0.0061191	0.711	0.677	-3.3
8.	2.0	-9.8	0.039463	-0.004967	-0.002942	0.000331	0.000034	0.002605	0.0028914	0.0073263	0.710	0.676	-3.9
-4.	4.0	4.5	0.013128	-0.005396	-0.001008	-0.000308	-0.000030	0.000495	0.0007825	0.0052323	0.708	0.675	-0.7
-2.	4.0	2.4	0.020709	-0.005095	-0.001375	-0.000087	-0.000256	0.000301	0.0005639	0.0051887	0.711	0.674	-1.1
0.	4.0	0.1	0.025085	-0.004390	-0.001798	0.000054	-0.000500	0.000431	0.0006550	0.0049803	0.710	0.676	-1.8
2.	4.0	-2.3	0.034728	-0.004283	-0.001814	-0.000079	-0.000456	0.000268	0.0006229	0.0053158	0.709	0.676	-2.4
4.	4.0	-4.6	0.044137	-0.004034	-0.002555	0.000145	-0.000082	0.000681	0.0012619	0.0062179	0.709	0.676	-3.1
6.	4.0	-6.9	0.046463	-0.003775	-0.003241	0.000014	-0.000143	0.001723	0.0020923	0.0069660	0.709	0.676	-4.1
8.	4.0	-8.7	0.056203	-0.003966	-0.004045	0.000236	0.000763	0.003056	0.0033669	0.0088313	0.711	0.674	-4.7
-4.	6.0	5.9	0.025796	-0.004988	-0.002290	-0.000031	0.000353	-0.000099	-0.0001757	0.0052193	0.708	0.675	-0.7
-2.	6.0	3.7	0.034673	-0.004220	-0.002722	-0.000088	0.000302	-0.000353	-0.0003674	0.0051283	0.709	0.676	-1.3
0.	6.0	1.1	0.040870	-0.003382	-0.003237	0.000163	0.000214	-0.000213	-0.0002715	0.0050659	0.708	0.675	-1.9
2.	6.0	-1.4	0.047356	-0.003079	-0.003408	0.000250	-0.000017	0.000060	0.0000160	0.0055928	0.708	0.675	-2.5
4.	6.0	-3.6	0.054480	-0.002403	-0.004288	0.000187	-0.000028	0.000948	0.0009658	0.0065422	0.706	0.677	-3.5
-4.	8.0	6.6	0.041738	-0.005592	-0.003186	-0.000063	-0.000328	-0.001361	-0.0014529	0.0064876	0.706	0.675	-1.2
-2.	8.0	4.4	0.048573	-0.004433	-0.003695	0.000146	-0.000547	-0.001253	-0.0013893	0.0064015	0.708	0.675	-1.5
0.	8.0	2.0	0.057866	-0.003548	-0.004419	0.000178	-0.000474	-0.001145	-0.0012935	0.0067485	0.707	0.675	-2.2
2.	8.0	-0.5	0.065128	-0.002706	-0.005115	0.000336	-0.000692	-0.000329	-0.0005022	0.0077068	0.714	0.673	-2.9

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

α_s	$\theta_{.75}$	a_{1_s}	b_{1_s}
-4	13	-1.0	.4
-2	10	-.3	-.2
-2	12	0	.3

TABLE IV-41.- ARTICULATED ROTOR; 0° TWIST, $V/\Omega R = 0.82$, $M_{(1)(90)} = 0.62$.

TEST 276.0 RUN 12

No. 2 Tare

$\theta_{.75}$	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1_s}
			(SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND TIP SPEED)										
2.	-2.0	-5.0	-0.004198	-0.006101	-0.000265	-0.000201	-0.000830	0.001420	0.0014225	0.0064688	0.808	0.635	-1.1
3.	-2.0	-6.0	-0.004511	-0.006403	-0.000332	-0.000318	-0.000697	0.001402	0.0014537	0.0067975	0.815	0.630	-1.2
4.	-2.0	-7.3	-0.002364	-0.006549	-0.000675	0.000013	-0.000666	0.001362	0.0014822	0.0068318	0.807	0.630	-1.5
5.	-2.0	-8.3	-0.002841	-0.007334	-0.000810	-0.000066	-0.001346	0.001277	0.0015267	0.0075528	0.811	0.631	-1.8
6.	-2.0	-9.5	0.000761	-0.007624	-0.001115	-0.000016	-0.000362	0.001442	0.0014907	0.0076556	0.812	0.630	-2.0
7.	-2.0	-10.5	0.004099	-0.009348	-0.001370	0.000016	-0.001067	0.001669	0.0014906	0.0088360	0.799	0.625	-2.4
8.	-2.0	-11.4	0.007892	-0.008920	-0.001600	0.000063	-0.001098	0.001840	0.0017233	0.0087639	0.815	0.626	-2.6
9.	-2.0	-12.5	0.007678	-0.009078	-0.002218	0.000028	-0.001188	0.002000	0.0017724	0.0089871	0.820	0.627	-2.8
10.	-2.0	-13.7	0.012094	-0.010228	-0.002146	0.000007	-0.000705	0.002346	0.0021552	0.0101618	0.818	0.625	-3.2
11.	-2.0	-14.5	0.013893	-0.009736	-0.002581	-0.000147	-0.000793	0.002639	0.0023731	0.0100040	0.826	0.628	-3.5
12.	-2.0	-15.9	0.018392	-0.012740	-0.003315	-0.000148	-0.001203	0.003087	0.0029568	0.0127707	0.813	0.619	-4.0
12.8	-2.0	-17.7	0.018486	-0.012231	-0.003326	-0.000546	-0.001113	0.003411	0.0030948	0.0126186	0.824	0.622	-4.2
-4.	0.	1.9	-0.003950	-0.006583	0.000380	-0.000616	-0.000074	0.001168	0.0014026	0.0067932	0.819	0.624	-0.0
-2.	0.	1.0	-0.002999	-0.006089	-0.000272	-0.000221	-0.000337	0.001311	0.0015742	0.0065304	0.814	0.622	-0.2
0.	0.	-1.9	0.000272	-0.005514	-0.000270	-0.000227	-0.000704	0.001369	0.0014945	0.0059958	0.816	0.622	-1.0
2.	0.	-4.3	0.003292	-0.006177	-0.000782	-0.000240	-0.001149	0.001356	0.0014974	0.0065526	0.818	0.622	-1.5
4.	0.	-6.3	0.010384	-0.006847	-0.001206	-0.000115	-0.000315	0.001370	0.0015401	0.0071377	0.818	0.622	-2.2
6.	0.	-8.8	0.015332	-0.007747	-0.001899	0.000363	-0.000718	0.001573	0.0015855	0.0079161	0.818	0.621	-2.6
8.	0.	-10.8	0.017134	-0.008680	-0.002162	0.000095	-0.001052	0.001856	0.0019502	0.0090545	0.820	0.618	-3.1
10.	0.	-12.9	0.024631	-0.009645	-0.003555	-0.000364	-0.000448	0.002707	0.0027199	0.0106835	0.828	0.617	3.7
-4.	2.0	2.9	0.007697	-0.007036	-0.000285	-0.000633	-0.000112	0.000992	0.0011311	0.0071463	0.824	0.618	-0.3
-2.	2.0	1.2	0.013296	-0.006000	-0.000675	-0.000376	-0.000[illegible]01	0.001060	0.0011909	0.0065606	0.832	0.617	-0.8
0.	2.0	-0.9	0.016142	-0.006147	-0.001068	-0.000236	-0.000261	0.001153	0.0011904	0.0067397	0.829	0.616	-1.5
2.	2.0	-4.3	0.018414	-0.006059	-0.001159	-0.000399	-0.000652	0.001127	0.0012943	0.0068886	0.837	0.615	-2.3
4.	2.0	-6.1	0.021590	-0.006241	-0.001372	-0.000258	-0.000711	0.001339	0.0016961	0.0075357	0.838	0.615	-2.7
6.	2.0	-7.8	0.023329	-0.007580	-0.002513	0.000087	-0.001288	0.001617	0.0018292	0.0088101	0.834	0.614	-3.0
8.	2.0	-10.0	0.02795[illegible]	-0.008182	-0.002907	-0.000092	-0.000984	0.002111	0.0023272	0.0099256	0.833	0.613	-3.6
-4.	4.0	4.5	0.022440	-0.006932	-0.001225	-0.000868	-0.000470	0.000243	0.0006202	0.0076285	0.829	0.614	-0.6
-2.	4.0	2.1	0.024611	-0.006092	-0.001002	-0.000996	-0.000563	0.000245	0.0007101	0.0071563	0.830	0.614	-1.2
0.	4.0	-0.3	0.030563	-0.005600	-0.001616	-0.000333	-0.000496	0.000441	0.0007161	0.0070827	0.830	0.614	-1.9
2.	4.0	-2.4	0.034086	-0.005366	-0.001999	-0.000438	-0.000357	0.000537	0.0008910	0.0073001	0.834	0.615	-2.5
4.	4.0	-5.1	0.035189	-0.005877	-0.003185	0.000077	-0.000657	0.001081	0.0016922	0.0085577	0.831	0.613	-3.1
6.	4.0	-7.2	0.035997	-0.006054	-0.003352	-0.000177	-0.000613	0.001686	0.0019625	0.0090193	0.831	0.613	-3.8

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

α_s	$\theta_{.75}$	a_{1_s}	b_{1_s}
-2	9	.4	-.1
0	10	.3	-.1
2	6	.3	-.1
4	6	.3	-.2

TABLE IV-42.- ARTICULATED ROTOR; 0° TWIST, $V/\Omega R = 0.83$, $M_{(1)(90)} = 0.62$.

TEST 276.0 RUN 13A

No. 2 Tare

$\theta_{.75}$	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1_s}
			(SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND TIP SPEED)										
4.7	4.0	4.7	0.016353	-0.006627	-0.001121	-0.000547	-0.000000	0.000725	0.0007839	0.0071661	0.825	0.619	-0.5
0	4.0	0.1	0.027517	-0.005252	-0.001881	-0.000700	-0.000374	0.000584	0.0007429	0.0066269	0.826	0.619	-1.8
5.8	6.0	5.7	0.034184	-0.006510	-0.002327	-0.000820	0.000132	-0.000440	-0.0003065	0.0079696	0.828	0.619	-1.3
3.4	6.0	3.4	0.042353	-0.005477	-0.002596	-0.000451	0.000123	-0.000500	-0.0004378	0.0076719	0.828	0.619	-1.5
1.0	6.0	1.1	0.046101	-0.004512	-0.002903	-0.000518	-0.000286	-0.000188	-0.0001760	0.0074600	0.829	0.617	-2.1
-1.5	6.0	-1.6	0.051371	-0.003952	-0.003551	-0.000348	0.000270	0.000286	0.0003526	0.0079624	0.829	0.617	-2.9
-3.7	6.0	-3.6	0.053524	-0.004047	-0.004074	-0.000188	-0.000460	0.000906	0.0012020	0.0091010	0.832	0.615	-3.3
6.7	8.0	6.6	0.051870	-0.006117	-0.003927	-0.000850	-0.000016	-0.001635	-0.0017688	0.0091361	0.829	0.616	-1.7
4.4	8.0	4.3	0.060676	-0.004560	-0.004307	-0.000347	-0.000168	-0.001589	-0.0017080	0.0088766	0.827	0.618	-2.1
1.5	8.0	1.5	0.059181	-0.003099	-0.004778	-0.000498	-0.000727	-0.000677	-0.0007089	0.0085649	0.831	0.616	-2.8
-.7	8.0	-0.7	0.068029	-0.002513	-0.006416	-0.000065	-0.000434	0.000145	-0.0000895	0.0097128	0.834	0.614	-3.5

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

α_s	$\theta_{.75}$	a_{1_s}	b_{1_s}
4	-4	.3	-.1
6	-4	-.3	-.3
6	2	-.4	.2
8	0	-.6	-.3

TABLE IV-43.- ARTICULATED ROTOR; 0° TWIST, $V/\Omega R$ = 1.05, $M_{(1)(90)}$ = 0.54.

TEST 276.0 RUN 13B

No. 2 Tare

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

$\theta_{.75}$	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1_s}
-4.	1.0	3.3	0.015430	-0.012283	0.000641	0.000447	0.000534	0.000037	0.0004270	0.0136225	1.052	0.545	-0.1
-2.	1.0	0.8	0.002144	-0.009327	0.000748	-0.001151	-0.001374	0.001055	0.0014757	0.0112602	1.045	0.546	-0.8
0.	1.0	-1.5	-0.009992	-0.008543	0.000956	-0.003358	-0.002799	0.000950	0.0016330	0.0104204	1.051	0.545	-1.5
2.	1.0	-4.1	-0.012489	-0.009763	0.001111	-0.002056	-0.001946	0.000972	0.0014382	0.0115279	1.058	0.543	-1.0
4.	1.0	-6.2	-0.000676	-0.010828	-0.000351	-0.001170	0.001388	0.000388	0.0012965	0.0127411	1.058	0.543	-1.6
6.	1.0	-8.2	-0.012007	-0.013363	-0.000445	-0.000379	0.002440	-0.000376	0.0004275	0.0142713	1.053	0.545	-0.9
8.	1.0	-10.7	-0.023937	-0.017179	-0.000234	0.000907	-0.000346	-0.001142	-0.0003562	0.0172443	1.051	0.544	-0.5
10.	1.0	-12.5	-0.011085	-0.020230	-0.002303	0.001648	0.001765	-0.001212	-0.0003561	0.0206549	1.049	0.544	-1.0
-4.	3.0	4.3	0.026943	-0.011820	-0.000414	-0.000670	0.000482	-0.000452	-0.0001424	0.0136973	1.049	0.544	-0.4
-2.	3.0	1.7	0.026091	-0.008496	0.000156	-0.001897	0.000251	0.000629	0.0013027	0.0116996	1.057	0.542	-1.1
0.	3.0	-0.9	0.027578	-0.008947	-0.001086	0.000134	-0.000350	0.000781	0.0013028	0.0122670	1.059	0.542	-1.6
2.	3.0	-3.6	0.009567	-0.008713	-0.000719	-0.001066	-0.001241	0.001069	0.0015007	0.0111730	1.051	0.543	-1.5
4.	3.0	-5.8	0.006997	-0.011412	-0.000424	-0.001127	-0.000704	0.000740	0.0012885	0.0136644	1.052	0.543	-2.2
6.	3.0	-8.1	-0.004870	-0.014287	-0.000823	-0.000200	-0.000600	0.000035	0.0005011	0.0152468	1.052	0.543	-1.8
8.	3.0	-9.7	0.010621	-0.015580	-0.004101	0.000252	0.003200	0.000445	0.0013050	0.0183743	1.059	0.542	-1.9
-4.	5.0	5.2	0.045595	-0.011069	-0.002338	-0.001219	0.000896	-0.001473	-0.0012165	0.0144569	1.049	0.542	-1.4
-2.	5.0	2.9	0.052950	-0.009417	-0.001504	-0.000841	-0.000072	-0.000782	-0.0005082	0.0142024	1.057	0.540	-1.4
0.	5.0	-0.2	0.045815	-0.007374	-0.002145	0.000319	-0.000232	0.000565	0.0007261	0.0126700	1.059	0.541	-1.4
2.	5.0	-2.9	0.038643	-0.006929	-0.002165	-0.001636	-0.000304	0.000713	0.0013068	0.0121217	1.057	0.541	-2.5
4.	5.0	-4.9	0.032732	-0.008386	-0.002837	-0.001969	-0.000919	0.000589	0.0012927	0.0130607	1.053	0.542	-2.7
-4.	7.0	5.9	0.071745	-0.011415	-0.004603	0.000538	0.000535	-0.002760	-0.0030157	0.0179394	1.051	0.542	-1.3
-2.	7.0	2.9	0.067264	-0.007390	-0.003213	-0.000698	-0.000520	-0.001186	-0.0010180	0.0152742	1.057	0.540	-2.2
0.	7.0	0.6	0.066021	-0.005624	-0.003703	-0.000935	-0.000205	-0.000450	-0.0001436	0.0140552	1.051	0.542	-2.2
2.	7.0	-2.1	0.062507	-0.004813	-0.003868	-0.001668	0.000408	0.000045	0.0005745	0.0135079	1.052	0.542	-3.1
4.	7.0	-4.2	0.062044	-0.006800	-0.004372	0.000251	0.001127	0.000732	0.0013645	0.0163277	1.053	0.543	-3.1

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

α_s	$\theta_{.75}$	a_{1_s}	b_{1_s}
1	-4	-.4	.1
1	-2	-.4	0
1	0	.3	-.2
1	4	-.4	-.4
1	6	-.4	-.2
3	-4	.4	.2
3	0	-.4	-.3
3	2	1.0	-.2
3	4	.2	-.3
3	6	.4	-.2
3	8	-.8	0
5	-2	-.8	.4
7	-4	-.4	.4
7	-2	.4	-.2
7	2	.3	-.3
7	4	-.4	.3

TABLE IV-44.- ARTICULATED ROTOR; 0° TWIST, $V/\Omega R = 0.40$, $M_{(1)(90)} = 0.67$.

TEST 276.0 RUN 10A

No. 2 Tare

$\theta_{.75}$	ALPHA SHAFT	ALPHA CONTROL	(SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND TIP SPEED) CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1s}
6.	-10.0	-14.4	0.001213	-0.001378	0.000423	0.000029	0.000175	0.001461	0.0015330	0.0019938	0.402	0.672	-2.3
8.	-10.0	-15.9	0.022019	-0.001008	-0.000000	0.000057	-0.000120	0.003328	0.0032886	0.0021088	0.404	0.673	-3.2
10.	-10.0	-17.5	0.039545	-0.000364	-0.000616	0.000227	-0.000364	0.005146	0.0049983	0.0022716	0.401	0.674	-4.1
12.	-10.0	-19.1	0.057731	0.000340	-0.001423	0.000313	-0.000487	0.007303	0.0070739	0.0026616	0.402	0.675	-5.3
14.	-10.0	-20.7	0.072136	0.001417	-0.001862	0.000124	-0.000628	0.009678	0.0091686	0.0032038	0.401	0.674	-6.5
4.	-5.0	-9.0	0.017082	-0.001422	0.000169	-0.000025	-0.000252	0.001829	0.0019096	0.0018578	0.399	0.671	-2.3
6.	-5.0	-11.0	0.033604	-0.000988	-0.000434	0.000158	-0.000469	0.002873	0.0029229	0.0020567	0.401	0.672	-3.2
8.	-5.0	-12.4	0.054240	-0.000940	-0.001223	0.000263	-0.000637	0.004032	0.0039219	0.0021750	0.401	0.671	-4.1
10.	-5.0	-14.4	0.069826	-0.000137	-0.001480	0.000475	-0.000719	0.005501	0.0053379	0.0025821	0.400	0.671	-4.7
12.	-5.0	-15.7	0.081739	0.001111	-0.002794	0.000424	-0.000947	0.007587	0.0073686	0.0035527	0.402	0.672	-6.0
14.	-5.0	-17.2	0.093128	0.002351	-0.003847	0.000961	-0.000181	0.011150			0.402	0.672	-7.7
0.	0.	-1.9	0.007603	-0.001830	-0.000033	0.000054	-0.000047	0.001013	0.0010234	0.0017508	0.400	0.671	-1.1
2.	0.	-3.8	0.023469	-0.001517	-0.000415	0.000144	-0.000371	0.001174	0.0012048	0.0017673	0.399	0.673	-2.1
4.	0.	-5.6	0.046033	-0.001525	-0.001146	0.000241	-0.000544	0.001492	0.0014980	0.0019415	0.399	0.673	-2.9
6.	0.	-7.5	0.064394	-0.001378	-0.001403	0.000262	-0.000735	0.002074	0.0020846	0.0023113	0.398	0.673	-3.3
8.	0.	-9.3	0.078677	-0.000072	-0.002697	0.000302	-0.000824	0.003443	0.0033660	0.0029155	0.400	0.672	-4.6
10.	0.	-11.0	0.091774	0.001512	-0.003523	0.000726	-0.000961	0.005869	0.0057295	0.0044718	0.400	0.672	-5.7
12.	0.	-12.5	0.101101	0.003334	-0.005635	0.000636	-0.000324	0.009011	0.0086631	0.0065366	0.400	0.672	-8.3
-4.	5.0	5.7	-0.001517	-0.002052	-0.000456	-0.000148	0.000103	0.001127	0.0010236	0.0017905	0.401	0.672	-0.5
-2.	5.0	3.8	0.016045	-0.002062	-0.000790	-0.000015	-0.000147	0.000515	0.0004505	0.0018106	0.400	0.674	-1.1
0.	5.0	2.2	0.035527	-0.002302	-0.000944	0.000256	-0.000393	-0.000101	-0.0001372	0.0019257	0.401	0.672	-1.0
2.	5.0	0.3	0.055371	-0.002077	-0.001851	0.000352	-0.000523	-0.000298	-0.0003667	0.0021530	0.399	0.674	-2.3
4.	5.0	-1.6	0.072212	-0.001298	-0.002419	0.000567	-0.000764	-0.000031	-0.0000739	0.0025616	0.400	0.671	-2.7
6.	5.0	-4.0	0.087193	0.000429	-0.002897	0.000692	-0.000955	0.001213	0.0011209	0.0033961	0.399	0.673	-3.5
8.	5.0	-5.9	0.100816	0.002153	-0.004564	0.000297	-0.001008	0.003559	0.0034045	0.0052637	0.399	0.673	-5.3
10.	5.0	-7.5	0.107113	0.003821	-0.006141	0.000254	-0.001040	0.006572	0.0063979	0.0076849	0.395	0.672	-7.8
-4.	10.0	9.6	0.026025	-0.002830	-0.001599	-0.000068	-0.000326	-0.000626	-0.0007703	0.0021076	0.401	0.672	-0.8
-2.	10.0	8.2	0.045375	-0.002848	-0.001697	0.000142	-0.000503	-0.001734	-0.0017286	0.0023872	0.399	0.674	-0.7
0.	10.0	5.7	0.063708	-0.002236	-0.002678	0.000161	-0.001007	-0.002230	-0.0022942	0.0026962	0.399	0.673	-2.0
2.	10.0	3.7	0.082350	-0.001179	-0.002533	0.000442	-0.001155	-0.002402	-0.0024194	0.0032076	0.397	0.672	-2.0
4.	10.0	1.4	0.098131	0.000248	-0.003817	0.000667	-0.001164	-0.001533	-0.0016780	0.0043508	0.402	0.672	-2.9
6.	10.0	-0.5	0.111693	0.001659	-0.004886	0.000687	-0.001333	0.000465	0.0003060	0.0064958	0.401	0.672	-4.0
8.	10.0	-2.4	0.119883	0.003597	-0.006337	0.000634	-0.001208	0.004251	0.0039923	0.0098250	0.401	0.672	-6.4

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

α_s	$\theta_{.75}$	a_{1s}	b_{1s}
-10	14	.3	-.2
-5	14	-.2	1.0
0	10	.2	-.3
10	8	-.3	.4

TABLE IV-45.- ARTICULATED ROTOR; 0° TWIST, $V/\Omega R$ = 0.41, $M_{(1)(90)}$ = 0.87.

TEST 276.0 RUN 14A

No. 2 Tare

$\theta_{.75}$	ALPHA SHAFT	ALPHA CONTROL	(SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND TIP SPEED) CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1s}
6.	-10.0	-15.0	0.006571	-0.001931	0.000267	0.000126	-0.000204	0.002316	0.0023297	0.0026353	0.407	0.874	-2.4
8.	-10.0	-16.5	0.025579	-0.001433	-0.000086	-0.000047	-0.000315	0.004182	0.0041235	0.0028299	0.411	0.875	-3.5
10.	-10.0	-18.2	0.044457	-0.000620	-0.000507	0.000020	-0.000484	0.006312	0.0060811	0.0030403	0.407	0.872	-4.2
4.	-5.0	-9.6	0.019003	-0.002023	-0.000002	0.000023	-0.000367	0.002314	0.0023414	0.0024608	0.410	0.868	-2.3
6.	-5.0	-11.2	0.038319	-0.001607	-0.000508	0.000109	-0.000675	0.003531	0.0034658	0.0026445	0.408	0.869	-2.9
8.	-5.0	-13.2	0.057531	-0.000937	-0.001383	0.000103	-0.000867	0.004947	0.0049115	0.0029977	0.408	0.869	-4.3
9.5	-5.0	-14.3	0.070834	-0.000576	-0.001981	0.000519	-0.001322	0.006513	0.0063453	0.0036813	0.408	0.869	-4.6
0.	0.	-2.3	0.011827	-0.002293	-0.000175	0.000059	-0.000267	0.001290	0.0013287	0.0022516	0.407	0.869	-0.9
2.	0.	-4.2	0.032476	-0.002307	-0.000599	0.000243	-0.000415	0.001396	0.0014322	0.0022898	0.407	0.864	-1.5
4.	0.	-6.2	0.047536	-0.001597	-0.001257	0.000221	-0.001065	0.001955	0.0019840	0.0024611	0.407	0.864	-2.7
6.	0.	-8.2	0.069491	-0.001343	-0.001788	0.000459	-0.001279	0.002766	0.0028793	0.0030541	0.405	0.865	-3.1
8.	0.	-10.2	0.084096	-0.000097	-0.003499	0.000355	-0.001152	0.005085	0.0050107	0.0045070	0.404	0.867	-4.9
8.8	0.	-11.2	0.086917	0.000209	-0.003118	0.000735	-0.001265	0.006269	0.0062052	0.0055443	0.407	0.866	-5.0
-4.	5.0	5.1	0.002922	-0.002559	-0.000633	0.000046	-0.000103	0.001207	0.0011342	0.0022790	0.409	0.864	-0.1
-2.	5.0	3.6	0.020640	-0.002680	-0.000946	0.000194	-0.000262	0.000530	0.0004982	0.0022805	0.406	0.865	-0.5
0.	5.0	1.7	0.041811	-0.002662	-0.001435	0.000321	-0.000500	0.000004	-0.	0.0024250	0.406	0.864	-1.0
2.	5.0	-0.4	0.060261	-0.002110	-0.001962	0.000445	-0.000607	-0.000076	-0.0000788	0.0026455	0.408	0.865	-1.4
4.	5.0	-2.4	0.075835	-0.001434	-0.002342	0.000683	-0.001399	0.000525	0.0005132	0.0033554	0.407	0.864	-2.2
6.	5.0	-5.0	0.090075	0.000816	-0.003604	0.000621	-0.001270	0.002688	0.0026430	0.0048797	0.405	0.865	-3.8
8.	5.0	-7.3	0.096951	0.001774	-0.003537	0.000580	-0.001436	0.005675	0.0055087	0.0075041	0.406	0.865	-5.3
-4.	10.0	8.9	0.031542	-0.002934	-0.001832	0.000011	-0.000384	-0.000786	-0.0008117	0.0025440	0.410	0.861	-0.4
-2.	10.0	7.6	0.050705	-0.003033	-0.002187	0.000078	-0.000852	-0.001803	-0.0018153	0.0027813	0.406	0.863	-0.7
0.	10.0	5.5	0.071130	-0.002617	-0.002363	0.000320	-0.001102	-0.002453	-0.0023862	0.0033565	0.409	0.862	-0.9
2.	10.0	3.1	0.088311	-0.001518	-0.003179	0.000498	-0.001508	-0.002009	-0.0020165	0.0042563	0.407	0.863	-1.6
4.	10.0	0.3	0.099745	0.000874	-0.004059	0.000753	-0.001479	-0.000105	-0.0001855	0.0057889	0.408	0.861	-2.9
6.	10.0	-2.5	0.107788	0.002082	-0.004410	0.000795	-0.001517	0.003109	0.0029564	0.0089209	0.409	0.862	-4.2

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

α_s	$\theta_{.75}$	a_{1s}	b_{1s}
10	6	-.4	-.4

TABLE IV-46.- ARTICULATED ROTOR; 0° TWIST, $V/\Omega R = 0.39$, $M_{(1)(90)} = 0.89$.

TEST 276.0 RUN 14B

No. 2 Tare

$\theta_{.75}$	ALPHA SHAFT	ALPHA CONTROL	(SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND TIP SPEED) CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1_s}
6.	-10.0	-15.1	0.008986	-0.001965	0.000310	-0.000090	-0.000192	0.002616	0.0026563	0.0027976	0.395	0.888	-2.6
7.	-10.0	-15.8	0.018510	-0.001740	0.000099	0.000053	-0.000260	0.003454	0.0034465	0.0028245	0.397	0.888	-2.4
8.	-10.0	-16.7	0.030034	-0.001449	0.000080	0.000084	-0.000239	0.004613	0.0045260	0.0029542	0.397	0.889	-3.0
9.	-10.0	-17.6	0.037757	-0.001090	-0.000275	-0.000061	-0.000506	0.005636	0.0054339	0.0031488	0.397	0.889	-3.8
4.	-5.0	-9.9	0.020660	-0.001907	0.000056	0.000058	-0.000491	0.002567	0.0025742	0.0025791	0.394	0.887	-2.0
6.	-5.0	-11.6	0.041712	-0.001634	-0.000457	0.000266	-0.000752	0.003817	0.0037772	0.0028462	0.396	0.888	-2.8
7.	-5.0	-12.2	0.051626	-0.001425	-0.000643	0.000235	-0.000844	0.004407	0.0043896	0.0029642	0.395	0.888	-3.1
8.	-5.0	-13.2	0.062236	-0.001265	-0.001347	0.000360	-0.001076	0.005463	0.0053794	0.0034327	0.395	0.890	-3.7
0.	0.	-2.9	0.011745	-0.002287	-0.000154	0.000115	-0.000110	0.001459	0.0014758	0.0023667	0.394	0.889	-0.8
2.	0.	-4.3	0.030602	-0.002176	-0.000374	0.000254	-0.000559	0.001664	0.0016954	0.0024800	0.394	0.890	-1.4
4.	0.	-6.2	0.051233	-0.001941	-0.001176	0.000253	-0.000845	0.002121	0.0021720	0.0027305	0.394	0.892	-2.7
6.	0.	-7.9	0.072397	-0.001620	-0.002304	0.000427	-0.001073	0.003136	0.0031184	0.0033443	0.394	0.892	-3.5
8.	0.	-10.4	0.084307	0.000344	-0.003225	0.000441	-0.001067	0.005506	0.0053871	0.0046919	0.394	0.891	-4.6
7.	0.	-9.2	0.078381	-0.000747	-0.002672	0.000486	-0.001211	0.004032	0.0040037	0.0038127	0.394	0.890	-3.9
-4.	5.0	4.8	0.001771	-0.002446	-0.000441	0.000049	0.000142	0.001459	0.0013824	0.0023949	0.391	0.890	-0.1
-2.	5.0	3.5	0.020821	-0.002732	-0.001024	0.000228	-0.000150	0.000775	0.0006717	0.0024186	0.392	0.887	-0.7
0.	5.0	1.7	0.042634	-0.002822	-0.001546	0.000354	-0.000512	0.000228	0.0002198	0.0026318	0.391	0.887	-1.4
2.	5.0	-0.3	0.063149	-0.002481	-0.002122	0.000474	-0.000788	0.000145	0.0001099	0.0029274	0.392	0.887	-1.8
4.	5.0	-2.7	0.079671	-0.001286	-0.002689	0.000667	-0.001186	0.000903	0.0008547	0.0035767	0.391	0.887	-2.4
6.	5.0	-5.1	0.092427	0.000489	-0.003551	0.000629	-0.001116	0.003191	0.0031266	0.0054294	0.393	0.888	-3.1
7.	5.0	-5.9	0.095893	0.000647	-0.003187	0.000686	-0.001090	0.004734	0.0046038	0.0068897	0.390	0.891	-4.1
-4.	10.0	9.1	0.031203	-0.003052	-0.001747	0.000101	-0.000344	-0.000563	-0.0006316	0.0025907	0.391	0.889	-0.4
-2.	10.0	7.5	0.052003	-0.003053	-0.002099	0.000346	-0.000683	-0.001541	-0.0015588	0.0029383	0.391	0.891	-0.5
0.	10.0	5.6	0.069826	-0.002651	-0.002608	0.000442	-0.001134	-0.002037	-0.0019785	0.0034380	0.393	0.888	-1.0
2.	10.0	3.6	0.087867	-0.001675	-0.003069	0.000566	-0.001335	-0.001764	-0.0017735	0.0042513	0.391	0.889	-1.3
4.	10.0	0.7	0.102078	0.000313	-0.003652	0.000570	-0.001101	0.000356	0.0003905	0.0063634	0.389	0.885	-2.7

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

α_s	$\theta_{.75}$	a_{1_s}	b_{1_s}
0	8	.3	0
5	6	.3	.2

TABLE IV-47.- ARTICULATED ROTOR; 0° TWIST, $V/\Omega R = 0.39$, $M_{(1)(90)} = 0.93$.

TEST 276.0 RUN 15

No. 2 Tare

$\theta_{.75}$	ALPHA SHAFT	ALPHA CONTROL	(SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND TIP SPEED) CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1_s}
6.	-10.0	-14.6	0.011138	-0.003010	0.000710	-0.000431	0.000160	0.003802	0.0038033	0.0041969	0.392	0.943	-2.1
8.	-10.0	-16.6	0.031875	-0.002608			-0.000185				0.392	0.944	-3.0
4.	-5.0	-9.1	0.015984		-0.000110	-0.000115		0.003738	0.0035185		0.391	0.941	-2.1
6.	-5.0	-11.2	0.037831		-0.000711	0.000069		0.005249	0.0049081		0.392	0.940	-2.8
7.	-5.0	-12.1	0.048138		-0.001160	0.000177		0.006039			0.392	0.939	-3.1
0.	0.	-2.4	0.011123	-0.003088	0.000124	-0.000169	0.000027	0.002307	0.0023821	0.0035853	0.393	0.937	-0.8
2.	0.	-4.2	0.035761	-0.003235	-0.000398	0.000034	-0.000249	0.002410	0.0024694	0.0036386	0.393	0.937	-1.7
4.	0.	-5.8	0.055327	-0.002856	-0.000821	0.000165	-0.000408	0.003076	0.0031699	0.0040513	0.393	0.937	-2.3
6.	0.	-7.3	0.072025	-0.002339	-0.002002	0.000328	-0.001183	0.004327	0.0042480	0.0047569	0.393	0.936	-3.4
7.	0.	-8.2	0.080004	-0.001689	-0.002781	0.000426	-0.001011	0.005368	0.0052501	0.0054052	0.392	0.937	-4.0
-2.	5.0	3.7	0.018446		-0.000954	0.000116		0.001729	0.0015547		0.393	0.936	-0.4
0.	5.0	1.6	0.038835		-0.001398	0.000222		0.001227	0.0011364		0.391	0.935	-1.2
2.	5.0	-0.3	0.063230	-0.002937	-0.001780	0.000315	-0.000535	0.000943	0.0009811	0.0039578	0.390	0.936	-1.8
4.	5.0	-2.2	0.082619	-0.001853	-0.002916	0.000213	-0.000939	0.001971	0.0020498	0.0050571	0.391	0.931	-2.6
6.	5.0	-4.7	0.091921	0.000148	-0.003250	0.000153	-0.000761	0.004068	0.0042996	0.0067377	0.394	0.931	-4.4
-4.	10.0	9.7	0.034174	-0.004111	-0.001812	0.000224	-0.000069	0.000086	-0.	0.0038361	0.393	0.927	-0.2
-2.	10.0	7.8	0.053862	-0.003774	-0.002289	0.000336	-0.000273	-0.000978	-0.0009813	0.0039230	0.392	0.926	-0.7
0.	10.0	6.0	0.072385	-0.003568	-0.002532	0.000388	-0.001041	-0.001519	-0.0014819	0.0044327	0.392	0.923	-0.9
2.	10.0	3.8	0.091458	-0.002245	-0.003098	0.000489	-0.001269	-0.000658	-0.0006680	0.0057773	0.391	0.926	-1.6
4.	10.0	1.0	0.101319	-0.000224	-0.003233	0.000519	-0.001193	0.001371	0.0014661	0.0076779	0.393	0.925	-3.0
6.	10.0	-2.0	0.106804	0.001920	-0.003393	0.000679	0.000164	0.003827	0.0042077	0.0098649	0.392	0.925	-4.1

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

α_s	$\theta_{.75}$	a_{1_s}	b_{1_s}
-5	4	.3	-.2
0	0	.3	0
5	0	.3	-.1

TABLE IV-48.- TEETERING ROTOR; STANDARD BLADES, $V/\Omega R = 0.30$, $M_{(1)(90)} = 0.79$.

TEST 274.0 RUN 17A

No. 3 TARE

θ_{grip}	ALPHA SHAFT	ALPHA CONTROL	(SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND TIP SPEED) CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1_s}
12.	-5.0	-8.7	0.030197	-0.001230	-0.000464	0.000446	-0.000319	0.001973	0.0019731	0.0014819	0.299	0.787	0.60
10.	-5.0	-7.3	0.012434	-0.001536	-0.000317	0.000330	-0.000173	0.001282	0.0012817	0.0014037	0.300	0.785	0.84
14.	-5.0	-10.2	0.053004	-0.000902	-0.000370	0.000261	-0.000588	0.002935	0.0029354	0.0016044	0.299	0.786	0.48
16.	-5.0	-11.8	0.071153	-0.000097	-0.001030	0.000254	-0.000728	0.004113	0.0041130	0.0018914	0.300	0.784	-0.00
17.	-5.0	-12.7	0.079846	0.000653	-0.001151	0.000169	-0.000746	0.004790	0.0047901	0.0020173	0.300	0.786	-0.12
14.	-10.0	-14.2	0.024760	-0.001503	-0.000113	0.000354	-0.000375	0.002360	0.0023599	0.0014683	0.300	0.786	0.60
12.	-10.0	-12.8	0.005794	-0.001808	-0.000105	0.000318	-0.000335	0.001225	0.0012251	0.0014542	0.300	0.785	0.48
16.	-10.0	-15.5	0.045304	-0.000943	-0.000053	0.000200	-0.000532	0.003813	0.0038131	0.0015788	0.300	0.787	0.36
17.	-10.0	-16.5	0.054973	-0.000506	-0.000222	0.000210	-0.000676	0.004650	0.0046497	0.0017073	0.300	0.785	0.12
18.	-10.0	-17.1	0.063458	-0.000087	-0.000254	0.000196	-0.000726	0.005416	0.0054156	0.0018308	0.300	0.785	0.12
16.	-15.0	-19.7	0.017828	-0.001544	-0.000040	0.000276	-0.000142	0.002483	0.0024834	0.0015269	0.299	0.786	0.48
15.	-15.0	-18.8	0.009975	-0.001786	-0.000014	0.000253	-0.000091	0.001799	0.0017995	0.0015347	0.300	0.785	0.72
18.	-15.0	-21.0	0.037853	-0.000856	-0.000243	0.000317	-0.000416	0.004502	0.0045017	0.0017050	0.300	0.789	0.12
12.	0.	-4.6	0.062302	-0.000985	-0.001620	0.000271	-0.000618	0.001630	0.0016297	0.0016228	0.299	0.787	-0.36
14.	0.	-6.5	0.079271	0.000235	-0.001937	0.000290	-0.000774	0.002463	0.0024628	0.0019047	0.299	0.787	-0.36
10.	0.	-3.0	0.041078	-0.001216	-0.001194	0.000308	-0.000457	0.001223	0.0012231	0.0014554	0.299	0.787	0.00
8.	0.	-1.8	0.020380	-0.001299	-0.000940	0.000265	-0.000319	0.001078	0.0010785	0.0014338	0.298	0.788	0.00
6.	0.	-0.5	0.003484	-0.001366	-0.000709	0.000208	-0.000221	0.001074	0.0010737	0.0014803	0.298	0.788	0.12
8.	4.0	1.6	0.045058	-0.001267	-0.001691	0.000339	-0.000348	0.000407	0.0004073	0.0015728	0.300	0.786	-0.24
6.	4.0	3.0	0.025479	-0.001346	-0.001313	0.000242	-0.000231	0.000621	0.0006205	0.0015046	0.299	0.786	0.00

TABLE IV-49.- TEETERING ROTOR; STANDARD BLADES, $V/\Omega R = 0.30$, $M_{(1)(90)} = 0.85$.

TEST 274.0 RUN 16

No. 3 TARE

θ_{grip}	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1_s}
			(SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND TIP SPEED)										
13.	-5.0	-9.3	0.043366	-0.001298	-0.000321	0.000103	-0.000402	0.002519	0.0025190	0.0016230	0.302	0.847	0.60
12.	-5.0	-8.5	0.033846	-0.001449	-0.000287	0.000161	-0.000437	0.002126	0.0021264	0.0015865	0.299	0.846	0.72
14.	-5.0	-10.4	0.051935	-0.000782	-0.000547	0.000107	-0.000354	0.003094	0.0030943	0.0017558	0.302	0.846	0.36
14.	-10.0	-14.1	0.026624	-0.001614	-0.000017	0.000255	-0.000321	0.002568	0.0025683	0.0016003	0.301	0.846	0.84
16.	-10.0	-15.6	0.046315	-0.001059	0.000234	0.000093	-0.000468	0.003984	0.0039842	0.0017155	0.301	0.849	0.72
16.	-15.0	-19.5	0.018932	-0.001666	0.000088	0.000274	-0.000120	0.002694	0.0026944	0.0016741	0.302	0.844	0.96
18.	-15.0	-20.9	0.036855	-0.000999	0.000208	0.000317	-0.000221	0.004469	0.0044686	0.0017740	0.303	0.847	0.84
15.	-15.0	-18.6	0.009988	-0.001848	0.000034	0.000225	-0.000183	0.001914	0.0019142	0.0016657	0.301	0.844	0.96
17.	-10.0	-16.5	0.053632	-0.000585	0.000210	0.000107	-0.000505	0.004652	0.0046523	0.0017962	0.302	0.847	0.72
14.	-10.0	-14.0	0.025749	-0.001562	0.000086	0.000155	-0.000309	0.002478	0.0024783	0.0015437	0.301	0.844	0.72
12.	-10.0	-12.8	0.006868	-0.001871	-0.000008	0.000229	-0.000341	0.001360	0.0013597	0.0015511	0.300	0.847	0.96
12.	-5.0	-8.5	0.032068	-0.001398	-0.000298	0.000102	-0.000320	0.002075	0.0020749	0.0015741	0.300	0.847	0.60
10.	-5.0	-7.0	0.014490	-0.001662	-0.000406	0.000256	-0.000377	0.001475	0.0014750	0.0015772	0.302	0.845	0.60
10.	0.	-3.1	0.043786	-0.001367	-0.001011	0.000210	-0.000377	0.001331	0.0013309	0.0015962	0.302	0.845	0.36
12.	0.	-4.7	0.062011	-0.000929	-0.001251	0.000217	-0.000409	0.001756	0.0017560	0.0017409	0.302	0.844	0.24
14.	0.	-6.5	0.080557	0.000035	-0.001696	0.000203	-0.000437	0.002537	0.0025366	0.0020262	0.301	0.846	0.00
8.	0.	-1.4	0.022328	-0.001581	-0.000677	0.000117	-0.000341	0.001172	0.0011724	0.0016113	0.302	0.844	0.72
6.	0.	-0.4	0.004924	-0.001526	-0.000667	0.000134	-0.000608	0.001205	0.0012050	0.0016627	0.301	0.847	0.60
7.	5.0	3.1	0.043947	-0.001613	-0.001623	0.000251	-0.000393	0.000238	0.0002380	0.0017349	0.302	0.844	0.00
6.	5.0	3.8	0.033890	-0.001629	-0.001423	0.000166	-0.000445	0.000408	0.0004081	0.0017108	0.304	0.843	0.24
8.	5.0	2.5	0.054662	-0.001657	-0.001702	0.000243	-0.000530	0.000070	0.0000703	0.0017725	0.301	0.847	0.00
14.	0.	-6.5	0.082340	-0.000051	-0.001831	0.000217	-0.000494	0.002556	0.0025559	0.0020513	0.303	0.843	-0.12
15.	-5.0	-11.2	0.062344	-0.000450	-0.000456	0.000073	-0.000395	0.003674	0.0036741	0.0018659	0.304	0.845	0.48

TABLE IV-50.- TEETERING ROTOR; STANDARD BLADES, $V/\Omega R = 0.30$, $M_{(1)(90)} = 0.95$.

TEST 274.0 RUN 19

No. 3 TARE

θ_{grip}	ALPHA SHAFT	ALPHA CONTROL	(SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND TIP SPEED) CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1_s}
14.	-10.0	-13.1	0.027408	-0.002749	0.000194	0.000329	-0.000298	0.003523	0.0035227	0.0028514	0.298	0.951	0.84
15.	-10.0	-14.1	0.034809	-0.002836	0.000242	0.000330	-0.000770	0.003963	0.0039635	0.0028949	0.300	0.949	1.08
16.	-10.0	-14.6	0.045534	-0.002862	0.000307	0.000232	-0.000884	0.004874	0.0048741	0.0031956	0.298	0.952	0.84
16.	-15.0	-18.6	0.019009	-0.002779	0.000232	0.000329	-0.000274	0.003559	0.0035588	0.0028641	0.298	0.953	1.08
17.	-15.0	-19.5	0.027501	-0.002810	0.000340	0.000383	-0.000639	0.004358	0.0043579	0.0029885	0.298	0.954	1.08
18.	-15.0	-19.8	0.037113	-0.002626	0.000417	0.000370	-0.000754	0.005291	0.0052907	0.0030656	0.300	0.950	1.08
15.	-15.0	-17.9	0.011156	-0.002834	0.000049	0.000446	-0.000096	0.002868	0.0028683	0.0028133	0.298	0.952	1.08
14.	-10.0	-13.0	0.025446	-0.002781	0.000256	0.000332	-0.000219	0.003483	0.0034830	0.0029323	0.297	0.954	1.08
13.	-10.0	-12.3	0.017244	-0.002909	0.000254	0.000301	-0.000312	0.002946	0.0029460	0.0028836	0.298	0.950	1.08
14.	-5.0	-9.0	0.052185	-0.002474	-0.000445	0.000325	-0.000079	0.003897	0.0038973	0.0030626	0.299	0.949	0.60
13.	-5.0	-8.1	0.042834	-0.002672	-0.000435	0.000296	-0.000271	0.003484	0.0034836	0.0030209	0.298	0.951	0.72
12.	-5.0	-7.3	0.032379	-0.002800	0.000037	0.000208	-0.000111	0.003128	0.0031281	0.0030361	0.297	0.952	1.20
11.	-5.0	-6.6	0.024738	-0.003043	-0.000197	0.000224	-0.000172	0.002909	0.0029090	0.0031221	0.298	0.954	0.96
12.	0.	-3.2	0.062407	-0.002994	-0.001255	0.000349	-0.000636	0.002795	0.0027950	0.0033842	0.298	0.953	0.36
11.	0.	-2.6	0.052515	-0.003092	-0.001098	0.000328	-0.000586	0.002456	0.0024559	0.0031656	0.299	0.949	0.36
10.	0.	-1.9	0.042569	-0.003256	-0.000673	0.000228	-0.000434	0.002345	0.0023449	0.0031742	0.298	0.954	0.72
9.	0.	-1.1	0.034478	-0.003357	-0.000607	0.000315	-0.000586	0.002243	0.0022429	0.0031522	0.298	0.951	0.84
9.	2.0	0.5	0.044816	-0.003479	-0.000884	0.000309	-0.000380	0.001884	0.0018837	0.0032242	0.297	0.954	0.00
14.	-5.0	-9.0	0.051242	-0.002387	-0.000419	0.000310	0.000053	0.004087	0.0040870	0.0032595	0.299	0.951	0.00
15.	-5.0	-9.7	0.061900	-0.002259	-0.000395	0.000377	0.000294	0.004617	0.0046172	0.0033803	0.299	0.950	0.48
16.	-5.0	-10.5	0.069941	-0.001905	-0.000725	0.000320	-0.000514	0.005202	0.0052022	0.0035661	0.300	0.949	0.24
17.	-10.0	-15.4	0.052974	-0.002427	0.000223	0.000341	-0.000862	0.005669	0.0056690	0.0034197	0.299	0.954	0.60
18.	-10.0	-16.1	0.059811	-0.001893	0.000590	0.000144	-0.000743	0.006324	0.0063238	0.0035092	0.298	0.951	0.72

TABLE IV-51.- TEETERING ROTOR; STANDARD BLADES, $V/\Omega R = 0.35$, $M_{(1)(90)} = 0.85$.

TEST 274.0 RUN 17B

No. 3 TARE

θ_{grip}	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1_s}
			(SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND TIP SPEED)										
12.	-5.0	-8.9	0.026231	-0.001868	-0.000593	0.000267	-0.000615	0.002031	0.0020311	0.0018369	0.348	0.847	0.48
14.	-5.0	-10.7	0.044315	-0.001489	-0.000873	0.000222	-0.000812	0.003006	0.0030064	0.0020435	0.350	0.846	0.24
14.	-10.0	-14.4	0.018106	-0.002208	-0.000114	0.000206	-0.000412	0.002243	0.0022426	0.0018821	0.349	0.847	0.36
16.	-10.0	-16.0	0.034869	-0.001930	-0.000210	0.000196	-0.000508	0.003579	0.0035794	0.0020484	0.349	0.847	0.48
16.	-15.0	-19.5	0.008389	-0.002444	-0.000165	0.000458	-0.000124	0.001907	0.0019068	0.0019677	0.349	0.845	0.60
17.	-15.0	-20.2	0.017824	-0.002221	-0.000180	0.000374	-0.000239	0.002841	0.0028411	0.0019574	0.350	0.846	0.60
18.	-15.0	-21.0	0.025873	-0.002145	-0.000208	0.000485	-0.000319	0.003775	0.0037754	0.0021164	0.349	0.847	0.60
17.5	-10.0	-17.0	0.049262	-0.001629	-0.000262	0.000225	-0.000793	0.004749	0.0047494	0.0021657	0.349	0.849	0.36
13.	-10.0	-13.5	0.008742	-0.002358	0.000021	0.000186	-0.000275	0.001582	0.0015823	0.0018571	0.349	0.849	0.72
15.	-5.0	-11.4	0.056467	-0.001470	-0.001071	0.000158	-0.000726	0.003562	0.0035615	0.0021469	0.348	0.850	0.00
10.	-5.0	-7.4	0.010273	-0.002096	-0.000404	0.000234	-0.000276	0.001457	0.0014572	0.0018645	0.348	0.848	0.36
12.	0.	-5.1	0.057284	-0.001448	-0.001874	0.000196	-0.000617	0.001810	0.0018096	0.0020969	0.349	0.849	-0.00
10.	0.	-3.5	0.039003	-0.001679	-0.001293	0.000179	-0.000592	0.001444	0.0014439	0.0019280	0.349	0.849	0.12
8.	0.	-1.9	0.022603	-0.001824	-0.000997	0.000090	-0.000318	0.001262	0.0012625	0.0018628	0.348	0.850	0.12
6.	0.	-0.5	0.006432	-0.001804	-0.000751	0.000045	-0.000176	0.001295	0.0012950	0.0019213	0.349	0.849	0.24
8.	4.0	1.0	0.047953	-0.001770	-0.001973	0.000145	-0.000523	0.000399	0.0003994	0.0020272	0.348	0.848	-0.12
7.	4.0	1.9	0.039088	-0.001962	-0.001944	0.000146	-0.000441	0.000446	0.0004460	0.0019792	0.349	0.847	-0.36
6.	4.0	2.5	0.030568	-0.001902	-0.001609	0.000102	-0.000511	0.000573	0.0005729	0.0019169	0.349	0.847	-0.12
14.	0.	-7.1	0.075409	-0.000656	-0.002533	0.000182	-0.000546	0.002601	0.0026007	0.0024516	0.349	0.847	0.36

TABLE IV-52.- TEETERING ROTOR; STANDARD BLADES, $V/\Omega R = 0.35$, $M_{(1)(90)} = 0.95$.

TEST 274.0 RUN 20

No. 3 TARE

θ_{grip}	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1_s}
			(SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND TIP SPEED)										
12.5	-5.0	-6.9	0.044495	-0.004731	0.000170	0.000218	-0.000554	0.003440	0.0034398	0.0035994	0.350	0.947	1.56

TEST 274.0 RUN 21

No. 3 TARE

θ_{grip}	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1_s}
			(SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND TIP SPEED)										
13.3	-5.0	-8.2	0.047166	-0.004079	-0.000721	0.000440	-0.000931	0.003639	0.0036392	0.0034737	0.349	0.948	0.60
14.	-5.0	-8.7	0.053637	-0.004200	-0.000565	0.000233	-0.000837	0.004104	0.0041043	0.0037406	0.350	0.947	0.60
14.	-7.0	-10.2	0.042850	-0.004142	-0.000186	0.000237	-0.000854	0.004078	0.0040775	0.0035658	0.350	0.946	0.60
14.	-10.0	-12.5	0.026354	-0.003983	0.000396	0.000324	-0.000911	0.003701	0.0037011	0.0034254	0.350	0.948	0.96
14.5	-10.0	-12.7	0.031405	-0.004168	0.000375	0.000295	-0.000785	0.004024	0.0040242	0.0034870	0.349	0.947	0.96
15.	-10.0	-13.2	0.032883	-0.004092	0.000368	0.000338	-0.000666	0.004265	0.0042647	0.0036057	0.349	0.949	0.96
15.	-10.0	-13.2	0.033924	-0.004146	0.000342	0.000351	-0.000861	0.004323	0.0043234	0.0036143	0.349	0.948	0.96
15.5	-10.0	-13.4	0.038721	-0.004273	0.000532	0.000141	-0.000869	0.004642	0.0046421	0.0036627	0.349	0.948	0.96

TABLE IV-53.- TEETERING ROTOR; STANDARD BLADES, $V/\Omega R = 0.40$, $M_{(1)(90)} = 0.85$.

TEST 274.0 RUN 18

No. 3 TARE

θ_{grip}	ALPHA SHAFT	ALPHA CONTROL	(SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND TIP SPEED) CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1_s}
14.	-4.0	-10.4	0.044933	-0.002395	-0.001028	0.000329	-0.000778	0.002824	0.0028242	0.0024091	0.399	0.846	0.48
14.	-8.0	-13.1	0.021640	-0.002875	-0.000168	0.000311	-0.000553	0.002323	0.0023227	0.0022293	0.397	0.847	0.72
16.	-8.0	-14.7	0.037938	-0.002759	-0.000259	0.000274	-0.000840	0.003543	0.0035425	0.0024388	0.401	0.843	0.72
16.	-12.0	-17.5	0.014187	-0.003291	-0.000043	0.000438	-0.000663	0.002241	0.0022411	0.0023360	0.399	0.844	0.84
17.	-12.0	-18.2	0.023004	-0.003687	0.000139	0.000303	-0.001456	0.003128	0.0031285	0.0026266	0.400	0.844	0.84
18.	-12.0	-19.2	0.029752	-0.003044	-0.000033	0.000260	-0.000961	0.003902	0.0039022	0.0025627	0.402	0.845	0.60
18.	-12.0	-16.5	0.006784	-0.003378	0.000127	0.000334	-0.000641	0.001540	0.0015402	0.0022942	0.400	0.846	0.84
15.	-8.0	-13.7	0.029387	-0.002849	-0.000088	0.000297	-0.000705	0.002864	0.0028642	0.0023078	0.399	0.846	0.84
13.	-8.0	-12.0	0.014393	-0.002996	-0.000149	0.000281	-0.000651	0.001849	0.0018487	0.0022212	0.399	0.847	0.60
13.	-4.0	-9.3	0.036816	-0.002502	-0.000983	0.000415	-0.000784	0.002439	0.0024387	0.0023309	0.400	0.845	0.48
12.	-4.0	-8.5	0.028813	-0.002463	-0.000994	0.000285	-0.000521	0.002062	0.0020619	0.0021925	0.400	0.845	-0.00
11.	-4.0	-7.5	0.021111	-0.002369	-0.000795	0.000176	-0.000270	0.001777	0.0017767	0.0021065	0.400	0.846	-0.00
10.	-4.0	-6.9	0.013653	-0.002389	-0.000850	0.000362	-0.000146	0.001518	0.0015184	0.0020781	0.399	0.849	-0.24
12.	0.	-6.0	0.052218	-0.001924	-0.001955	0.000415	-0.000670	0.001809	0.0018089	0.0024165	0.398	0.849	0.24
10.	0.	-4.0	0.038206	-0.002244	-0.001944	0.000299	-0.000413	0.001390	0.0013903	0.0022012	0.399	0.847	-0.48
11.	0.	-4.9	0.045736	-0.002140	-0.001850	0.000447	-0.000334	0.001573	0.0015725	0.0023058	0.399	0.847	0.12
9.	0.	-3.0	0.029722	-0.002196	-0.001347	0.000361	-0.000142	0.001291	0.0012910	0.0021176	0.400	0.847	0.24
10.	4.0	-1.3	0.061586	-0.001850	-0.002901	0.000361	-0.000697	0.000396	0.0003962	0.0026096	0.396	0.849	-0.36
9.	4.0	-0.4	0.053886	-0.002134	-0.003050	0.000335	-0.000676	0.000319	0.0003189	0.0024907	0.397	0.848	-0.72
8.	4.0	0.6	0.046301	-0.002350	-0.002497	0.000437	-0.000688	0.000294	0.0002944	0.0023877	0.398	0.848	-0.24
15.	-4.0	-11.2	0.052752	-0.002244	-0.001072	0.000298	-0.000709	0.003382	0.0033824	0.0026458	0.399	0.846	0.60
16.	-4.0	-12.1	0.060546	-0.002070	-0.001669	0.000349	-0.000699	0.003953	0.0039525	0.0028747	0.401	0.844	0.00

TABLE IV-54.- TEETERING ROTOR; 48-FT TAPERED TIP, $V/\Omega R = 0.30$, $M_{(1)(90)} = 0.85$.

TEST 274.0 RUN 4

No. 3 TARE

	ALPHA	ALPHA	(SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND TIP SPEED)										
θ_{grip}	SHAFT	CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1_s}
12.	0.	-3.5	0.059190	-0.001435	-0.001826	0.000285	0.000160	0.001484	0.0014838	0.0016454	0.301	0.844	-00.48
10.	0.	-1.8	0.039510	-0.001653	-0.001357	0.000202	0.000087	0.001138	0.0011380	0.0015133	0.300	0.846	-00.24
8.	0.	-0.3	0.020436	-0.001560	-0.001003	0.000125	-0.000121	0.001070	0.0010701	0.0015075	0.301	0.846	-00.24
14.	0.	-5.0	0.081876	-0.001117	-0.002625	0.000352	0.000175	0.002198	0.0021981	0.0020131	0.299	0.844	-00.72
12.	-5.0	-7.3	0.032111	-0.001666	-0.000506	0.000111	-0.000216	0.001898	0.0018981	0.0014763	0.300	0.846	00.00
10.	-5.0	-5.7	0.013463	-0.001724	-0.000300	0.000055	-0.000584	0.001323	0.0013234	0.0014716	0.299	0.845	00.00
14.	-5.0	-9.0	0.053879	-0.001476	-0.000999	0.000103	-0.000275	0.002848	0.0028482	0.0016551	0.301	0.846	-00.36

TEST 274.0 RUN 5

No. 3 TARE

	ALPHA	ALPHA	(SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND TIP SPEED)										
θ_{grip}	SHAFT	CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1_s}
12.	-10.0	-11.5	0.004884	-0.001763	0.000143	0.000100	-0.000313	0.001222	0.0012224	0.0014883	0.302	0.840	00.36
12.	-10.0	-13.2	0.025014	-0.001580	0.000097	0.000117	-0.000265	0.002396	0.0023960	0.0014937	0.307	0.832	00.24
16.	-10.0	-14.8	0.043940	-0.001130	-0.000114	0.000090	-0.000260	0.003771	0.0037707	0.0016409	0.305	0.840	00.12
18.	-10.0	-16.5	0.062354	-0.000317	-0.000027	-0.000028	-0.000267	0.005356	0.0053558	0.0018602	0.305	0.843	00.00
16.	-15.0	-18.5	0.017841	-0.001678	0.000667	0.000021	-0.000057	0.002407	0.0024066	0.0014737	0.303	0.843	00.36
18.	-15.0	-20.1	0.036158	-0.001065	0.000709	-0.000020	-0.000140	0.004228	0.0042276	0.0015866	0.306	0.840	00.24
15.	-15.0	-18.0	0.008172	-0.001806	0.000649	-0.000009	-0.000026	0.001626	0.0016264	0.0015084	0.304	0.838	00.60
14.	-15.0	-17.1	-0.000006	-0.001885	0.000493	0.000094	-0.000092	0.000953	0.0009534	0.0015058	0.303	0.841	00.48
14.	-5.0	-9.2	0.051609	-0.001152	-0.000788	0.000075	-0.000548	0.002868	0.0028679	0.0016471	0.304	0.843	-00.24
16.	-5.0	-10.8	0.071808	-0.000546	-0.001290	0.000087	-0.000243	0.004025	0.0040253	0.0019007	0.303	0.842	-00.36
8.	-5.0	-4.7	-0.008030	-0.001596	-0.000345	0.000133	-0.000138	0.000964	0.0009638	0.0016525	0.303	0.841	+00.12
6.	0.	0.6	0.002054	-0.001331	-0.000775	0.000160	-0.000348	0.001230	0.0012303	0.0016312	0.301	0.844	00.00
6.	5.0	5.0	0.031924	-0.001632	-0.001495	0.000065	-0.000297	0.000418	0.0004182	0.0016683	0.301	0.843	-00.24
8.	5.0	3.6	0.050930	-0.001799	-0.002015	0.000144	-0.000269	0.000021	0.0000210	0.0016957	0.300	0.843	-00.48
10.	5.0	1.7	0.069401	-0.001234	-0.002754	0.000237	-0.000334	0.000103	0.0001029	0.0019230	0.301	0.844	-00.72
	5.0	0.1	0.088511	-0.000573	-0.003399	0.000351	-0.000298	0.000389	0.0003886	0.0022875	0.301	0.841	-00.84
	3.0	-1.3	0.078719	-0.001007	-0.002807	0.000233	-0.000308	0.000872	0.0008722	0.0019588	0.304	0.840	-00.72
	0.	-3.6	0.061509	-0.001393	-0.001794	0.000199	-0.000351	0.001580	0.0015796	0.0017194	0.306	0.836	-00.48
	.0	-7.5	0.031391	-0.001527	-0.000470	0.000133	-0.000280	0.001993	0.0019930	0.0015491	0.303	0.842	00.00
	0	-11.4	0.007609	-0.001903	0.000098	0.000110	-0.000219	0.001362	0.0013620	0.0015235	0.301	0.845	00.12

RUN 14

ALPHA	(SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND TIP SPEED)										
[illegible]RCL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1_s}
	0.028852	-0.001386	-0.000422	0.000134	-0.000585	0.001919	0.0019190	0.0015130	0.301	0.844	0.36
	0.048442	-0.000673	-0.000505	0.000197	-0.000688	0.002829	0.0028293	0.0015814	0.301	0.846	0.36

TABLE IV-54.- TEETERING ROTOR; 48-FT TAPERED TIP, $V/\Omega R$ = 0.30, $M_{(1)(90)}$ = 0.85 - Concluded.

TEST 274.0 RUN 15A

No. 3 TARE

	ALPHA	ALPHA	(SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND TIP SPEED)										
θ_{grip}	SHAFT	CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1_s}
12.	-5.0	-7.9	0.027350	-0.001366	-0.000201	-0.000074	-0.000753	0.002099	0.0020991	0.0017344	0.300	0.848	0.24
14.	-5.0	-9.5	0.048043	-0.000914	-0.000365	-0.000135	-0.000564	0.002979	0.0029786	0.0018182	0.300	0.848	0.24
16.	-5.0	-11.1	0.066528	-0.000100	-0.000580	-0.000151	-0.000406	0.004085	0.0040848	0.0020389	0.299	0.849	0.12
17.	-5.0	-11.8	0.077271	0.000282	-0.000898	-0.000252	-0.000479	0.004792	0.0047918	0.0022278	0.300	0.850	-0.12
12.	-3.0	-5.9	0.038895	-0.001286	-0.000232	-0.000184	-0.000615	0.002050	0.0020496	0.0017068	0.300	0.849	0.36
13.	-3.0	-6.8	0.049487	-0.001063	-0.000398	-0.000119	-0.000668	0.002446	0.0024457	0.0017976	0.300	0.848	0.48
14.	-3.0	-7.7	0.059825	-0.000808	-0.000830	-0.000124	-0.000471	0.002861	0.0028607	0.0018868	0.300	0.848	-0.00
15.	-3.0	-8.7	0.067221	-0.000040	-0.000982	-0.000126	-0.000460	0.003369	0.0033690	0.0019769	0.300	0.848	-0.00
16.	-3.0	-9.4	0.078001	0.000142	-0.001091	-0.000196	-0.000571	0.003931	0.0039314	0.0021941	0.300	0.849	-0.12
16.5	-3.0	-9.8	0.081106	0.000468	-0.001056	-0.000272	-0.000570	0.004190	0.0041896	0.0022664	0.301	0.849	0.00
17.	-3.0	-10.2	0.086294	0.000755	-0.001145	-0.000173	-0.000525	0.004552	0.0045519	0.0023951	0.301	0.849	-0.12
12.	0.	-3.5	0.055484	-0.001005	-0.001015	-0.000082	-0.000510	0.001763	0.0017628	0.0018264	0.300	0.848	0.12
13.	0.	-4.5	0.068285	-0.000863	-0.001380	-0.000120	-0.000501	0.002068	0.0020677	0.0019659	0.300	0.847	-0.12
14.	0.	-5.5	0.076500	-0.000167	-0.001594	-0.000180	-0.000432	0.002420	0.0024203	0.0020160	0.299	0.850	-0.24
15.	0.	-6.2	0.085340	0.000065	-0.001859	-0.000222	-0.000229	0.002885	0.0028850	0.0023005	0.299	0.850	-0.36
15.5	0.	-6.5	0.089211	0.000299	-0.002016	-0.000192	-0.000195	0.003171	0.0031710	0.0024646	0.299	0.850	-0.36
16.	0.	-7.5	0.088459	0.001160	-0.002220	-0.000248	0.001662	0.003609	0.0036094	0.0026558	0.300	0.851	-0.48

TABLE IV-55.- TEETERING ROTOR; 48-FT TAPERED TIP, $V/\Omega R$ = 0.30, $M_{(1)(90)}$ = 0.95.

TEST 274.0 RUN 15B

No. 3 TARE

	ALPHA	ALPHA	(SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND TIP SPEED)										
θ_{grip}	SHAFT	CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1_s}
14.	-5.0	-8.7	0.049594	-0.001612	-0.000641	-0.000035	-0.000559	0.003106	0.0031059	0.0021042	0.298	0.947	-0.12
15.	-5.0	-9.3	0.060262	-0.001520	-0.000761	-0.000057	-0.000562	0.003749	0.0037494	0.0023518	0.299	0.951	0.12
16.	-5.0	-10.0	0.069558	-0.001280	-0.000935	-0.000112	-0.000714	0.004344	0.0043444	0.0025384	0.299	0.950	-0.00
16.5	-5.0	-10.2	0.073561	-0.001101	-0.000957	-0.000084	-0.000571	0.004666	0.0046664	0.0026607	0.299	0.948	-0.00
12.	-3.0	-5.2	0.041842	-0.001910	-0.000540	-0.000153	-0.000436	0.002317	0.0023168	0.0020961	0.298	0.949	0.12
13.	-3.0	-6.0	0.052505	-0.001820	-0.000779	-0.000102	-0.000395	0.002729	0.0027292	0.0022373	0.297	0.951	0.12
14.	-3.0	-7.0	0.061077	-0.001446	-0.001010	-0.000078	-0.000358	0.003132	0.0031324	0.0023204	0.297	0.951	-0.00
15.	-3.0	-7.5	0.069915	-0.001312	-0.001302	-0.000165	-0.000078	0.003613	0.0036129	0.0025334	0.297	0.951	-0.12
12.	0.	-3.0	0.057761	-0.001666	-0.001317	0.000015	-0.000509	0.001968	0.0019677	0.0022025	0.297	0.949	-0.00
13.	0.	-3.5	0.070441	-0.001733	-0.001393	-0.000142	-0.000354	0.002247	0.0022475	0.0023744	0.297	0.948	-0.00
13.5	0.	-4.2	0.072013	-0.001136	-0.001709	-0.000139	-0.000011	0.002514	0.0025137	0.0024489	0.298	0.949	-0.24
14.	0.	-4.5	0.078514	-0.001281	-0.001848	-0.000120	-0.000176	0.002761	0.0027610	0.0026637	0.298	0.950	-0.12
14.5	0.	-4.7	0.083275	-0.001057	-0.002033	-0.000131	-0.000114	0.003057	0.0030569	0.0028301	0.297	0.950	-0.24

TABLE IV-55.- TEETERING ROTOR; 48-FT TAPERED TIP, $V/\Omega R = 0.30$, $M_{(1)(90)} = 0.95$ - Concluded.

TEST 274.0 RUN 11

No. 3 TARE

θ_{grip}	ALPHA SHAFT	ALPHA CONTROL	(SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND TIP SPEED) CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1_s}
14.	-5.0	-8.5	0.049858	-0.001818	-0.000943	0.000217	-0.000368	0.003020	0.0030198	0.0020699	0.299	0.949	-0.12
14.	-10.0	-12.6	0.023865	-0.002088	0.000135	0.000173	-0.000372	0.002556	0.0025557	0.0018886	0.298	0.951	0.60
16.	-10.0	-14.0	0.042984	-0.001924	0.000077	0.000131	-0.000625	0.003834	0.0038339	0.0020258	0.299	0.950	0.24
16.	-15.0	-18.0	0.017154	-0.002009	0.000295	0.000282	-0.000295	0.002544	0.0025436	0.0017760	0.298	0.950	0.48
17.	-15.0	-18.9	0.025300	-0.001810	0.000512	0.000124	-0.000324	0.003388	0.0033885	0.0019008	0.300	0.949	0.60
15.	-15.0	-17.3	0.008350	-0.002059	0.000326	0.000271	-0.000430	0.001847	0.0018467	0.0017894	0.299	0.949	0.48
13.	-10.0	-12.0	0.014484	-0.002160	0.000165	0.000228	-0.000642	0.001976	0.0019763	0.0018442	0.298	0.950	0.48
15.	-10.0	-13.2	0.033559	-0.002043	0.000175	0.000145	-0.000761	0.003192	0.0031918	0.0019667	0.298	0.953	0.48
13.	-5.0	-7.7	0.039970	-0.002068	-0.000725	0.000217	-0.000795	0.002549	0.0025488	0.0020002	0.298	0.951	0.00
12.	-5.0	-7.0	0.030108	-0.002063	-0.000472	0.000215	-0.000827	0.002210	0.0022102	0.0019699	0.298	0.950	0.12
11.	-5.0	-6.3	0.021413	-0.002028	-0.000371	0.000234	-0.000767	0.001871	0.0018707	0.0018806	0.298	0.950	0.24
12.	0.	-3.0	0.059723	-0.001880	-0.001855	0.000341	-0.000913	0.001823	0.0018231	0.0021034	0.297	0.951	-0.24
11.	0.	-2.2	0.048358	-0.002028	-0.001486	0.000240	-0.000546	0.001607	0.0016069	0.0020301	0.298	0.949	-0.24
10.	0.	-1.5	0.039922	-0.002078	-0.001426	0.000311	-0.000641	0.001497	0.0014973	0.0019936	0.299	0.951	-0.12
9.	0.	-0.9	0.030999	-0.002015	-0.001110	0.000217	-0.000628	0.001410	0.0014097	0.0019369	0.299	0.951	-0.00
9.	5.0	3.2	0.059267	-0.002164	-0.002363	0.000332	-0.000824	0.000316	0.0003159	0.0022175	0.297	0.949	-0.36

TABLE IV-56.- TEETERING ROTOR; 48-FT TAPERED TIP, $V/\Omega R = 0.30$, $M_{(1)(90)} = 1.00$.

TEST 274.0 RUN 12

No. 3 TARE

θ_{grip}	ALPHA SHAFT	ALPHA CONTROL	(SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND TIP SPEED) CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1_s}
12.	0.	-2.8	0.059227	-0.002587	-0.001402	0.000161	-0.000547	0.002381	0.0023814	0.0028908	0.301	0.994	0.00
12.5	0.	-2.8	0.063700	-0.002655	-0.001565	0.000207	-0.000613	0.002462	0.0024625	0.0029521	0.302	0.990	0.00
12.	-3.0	-5.3	0.040871	-0.002540	-0.000751	0.000146	-0.000323	0.002633	0.0026335	0.0026254	0.303	0.988	0.24
12.	-4.0	-6.2	0.034457	-0.002557	-0.000635	0.000193	-0.000413	0.002688	0.0026879	0.0026416	0.304	0.987	0.24
12.	-5.0	-6.9	0.030026	-0.002650	-0.000465	0.000176	-0.000328	0.002671	0.0026705	0.0026081	0.304	0.988	0.36
12.	-6.0	-7.8	0.025080	-0.002763	-0.000254	0.000138	-0.000499	0.002617	0.0026166	0.0026066	0.304	0.987	0.36
12.5	-6.0	-8.1	0.030724	-0.002660	-0.000184	0.000108	-0.000305	0.002800	0.0028000	0.0025552	0.305	0.987	0.48
13.	-6.0	-8.4	0.035646	-0.002700	-0.000276	0.000179	-0.000426	0.003025	0.0030249	0.0026104	0.305	0.986	0.48
14.	-6.0	-9.0	0.044527	-0.002667	-0.000350	0.000161	-0.000559	0.003532	0.0035325	0.0027701	0.306	0.986	0.48
15.	-6.0	-9.5	0.054970	-0.002856	-0.000487	0.000114	-0.000609	0.004285	0.0042851	0.0031780	0.301	0.996	0.12
13.	-7.0	-9.9	0.030837	-0.002992	-0.000127	0.000129	-0.000496	0.003170	0.0031702	0.0028591	0.301	0.996	0.48
14.	-7.0	-9.7	0.040415	-0.002923	-0.000136	0.000170	-0.000594	0.003604	0.0036042	0.0028688	0.301	0.995	0.48
14.	-9.0	-11.3	0.030197	-0.002962	0.000065	0.000143	-0.000462	0.003401	0.0034007	0.0027877	0.302	0.995	0.60
15.	-9.0	-12.0	0.038293	-0.002779	0.000177	0.000108	-0.000595	0.003875	0.0038746	0.0027820	0.302	0.994	0.60
13.	-9.0	-10.6	0.019813	-0.003004	0.000147	0.000171	-0.000397	0.002844	0.0028443	0.0027735	0.301	0.993	0.72
12.	-9.0	-10.1	0.011500	-0.002978	0.000065	0.000157	-0.000412	0.002414	0.0024141	0.0027474	0.301	0.993	0.72
11.	-6.0	-6.7	0.016975	-0.002872	-0.000238	0.000189	-0.000359	0.002441	0.0024414	0.0027447	0.301	0.993	0.48
10.	-6.0	-6.3	0.008903	-0.002870	-0.000268	0.000255	-0.000371	0.002205	0.0022052	0.0027758	0.300	0.995	0.60
13.	-3.0	-5.6	0.052211	-0.002670	-0.000897	0.000176	-0.000630	0.003093	0.0030931	0.0028632	0.302	0.990	0.12
12.	-3.0	-4.9	0.042411	-0.002864	-0.000766	0.000143	-0.000426	0.002857	0.0028571	0.0029100	0.300	0.994	0.24
11.	-3.0	-4.2	0.032401	-0.002796	-0.000587	0.000132	-0.000330	0.002573	0.0025727	0.0028191	0.299	0.997	0.24
10.	-3.0	-3.5	0.023591	-0.002815	-0.000520	0.000176	-0.000422	0.002409	0.0024088	0.0028372	0.299	0.997	0.36
11.	0.	-1.6	0.050257	-0.002989	-0.001257	0.000229	-0.000706	0.002329	0.0023286	0.0030270	0.299	0.996	0.00
10.	0.	-1.0	0.040680	-0.003010	-0.000951	0.000159	-0.000475	0.002145	0.0021454	0.0029116	0.297	0.999	0.24

TABLE IV-57.- TEETERING ROTOR; 48-FT TAPERED TIP, $V/\Omega R = 0.35$, $M_{(1)(90)} = 0.85$.

TEST 274.0 RUN 6

No. 3 TARE

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

θ_{grip}	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1_s}
6.	0.	0.7	0.004132	-0.001650	-0.000938	0.000160	-0.000552	0.001242	0.0012421	0.0018159	0.349	0.851	0.24
8.	0.	-0.6	0.021443	-0.001910	-0.001168	0.000164	-0.000544	0.001163	0.0011635	0.0018019	0.350	0.847	0.00
10.	0.	-2.3	0.038385	-0.001899	-0.001471	0.000211	-0.000850	0.001257	0.0012571	0.0018262	0.351	0.845	0.00
12.	0.	-4.0	0.057006	-0.001767	-0.001930	0.000222	-0.000924	0.001589	0.0015892	0.0019966	0.352	0.845	0.00
14.	0.	-6.0	0.074851	-0.001248	-0.002636	0.000291	-0.000629	0.002261	0.0022606	0.0023280	0.351	0.846	-0.36
10.	-5.0	-6.0	0.007879	-0.002001	-0.000482	0.000224	-0.000672	0.001288	0.0012884	0.0017426	0.351	0.847	0.36
12.	-5.0	-7.6	0.027669	-0.002053	-0.000610	0.000153	-0.000595	0.001924	0.0019244	0.0017447	0.352	0.847	0.36
14.	-5.0	-9.5	0.046134	-0.001928	-0.000855	0.000155	-0.000884	0.002838	0.0028381	0.0019586	0.352	0.847	0.12
16.	-5.0	-11.2	0.061944	-0.001307	-0.001180	0.000137	-0.000391	0.003933	0.0039334	0.0022391	0.352	0.849	0.00
16.	-10.0	-14.6	0.035600	-0.002082	0.000016	0.000107	-0.000295	0.003433	0.0034326	0.0018981	0.351	0.848	0.36
14.	-10.0	-13.0	0.017213	-0.002365	0.000147	0.000084	-0.000387	0.002073	0.0020729	0.0018223	0.349	0.850	0.48
12.	-10.0	-11.4	0.000415	-0.002421	-0.000098	0.000293	-0.000698	0.000941	0.0009408	0.0017482	0.349	0.850	0.48
16.	-15.0	-18.4	0.008030	-0.002443	0.000494	0.000215	-0.000061	0.001675	0.0016745	0.0017688	0.351	0.849	0.60
18.	-15.0	-20.0	0.024346	-0.002005	0.000694	0.000015	0.000206	0.003575	0.0035750	0.0019948	0.353	0.848	0.48
18.	-10.0	-16.4	0.052036	-0.001489	-0.000030	0.000092	-0.000316	0.004995	0.0049950	0.0021652	0.351	0.851	0.36
6.	2.0	2.1	0.014714	-0.001608	-0.001096	0.000003	-0.000182	0.001127	0.0011273	0.0018570	0.351	0.846	0.00
8.	2.0	1.0	0.033021	-0.001832	-0.001471	0.000147	-0.000372	0.000884	0.0008839	0.0018603	0.351	0.847	0.12

TABLE IV-58.- TEETERING ROTOR; 48-FT TAPERED TIP, $V/\Omega R = 0.35$, $M_{(1)(90)} = 0.94$.

TEST 274.0 RUN 10

No. 3 TARE

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

θ_{grip}	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1_s}
14.	-5.0	-9.2	0.042062	-0.002369	-0.000666	0.000211	-0.000568	0.003077	0.0030775	0.0025016	0.351	0.942	0.48
13.	-5.0	-8.2	0.034038	-0.002548	-0.000628	0.000170	-0.000807	0.002603	0.0026028	0.0023758	0.349	0.944	0.36
12.	-5.0	-7.5	0.024646	-0.002479	-0.000439	0.000219	-0.000935	0.002180	0.0021797	0.0022504	0.348	0.945	0.48
12.	0.	-3.7	0.055235	-0.002549	-0.001738	0.000251	-0.000384	0.001811	0.0018115	0.0025164	0.354	0.940	0.12
11.	0.	-2.9	0.046148	-0.002443	-0.001355	0.000274	-0.000453	0.001619	0.0016185	0.0023441	0.354	0.939	0.24
11.	-5.0	-6.6	0.015823	-0.002476	-0.000479	0.000296	-0.000661	0.001858	0.0018585	0.0022278	0.355	0.939	0.48
14.	-10.0	-13.0	0.015961	-0.002654	0.000206	0.000191	-0.000662	0.002272	0.0022717	0.0021987	0.354	0.941	0.60
13.	-10.0	-12.0	0.006963	-0.002677	0.000045	0.000306	-0.000744	0.001751	0.0017508	0.0022514	0.353	0.942	0.60

TEST 274.0 RUN 9

No. 3 TARE

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

θ grip	ALPHA SHAFT	ALPHA CONTROL	CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1_s}
14.	-5.0	-9.2	0.043490	-0.002449	-0.000615	0.000135	-0.000641	0.003040	0.0030401	0.0024399	0.352	0.942	0.60
14.	-10.0	-13.0	0.016275	-0.002703	0.000255	0.000157	-0.000548	0.002222	0.0022216	0.0021459	0.350	0.943	0.72
15.	-10.0	-13.8	0.023945	-0.002648	0.000283	0.000155	-0.000541	0.002810	0.0028097	0.0022246	0.353	0.938	0.72
16.	-10.0	-14.5	0.032370	-0.002476	0.000450	0.000014	-0.000615	0.003418	0.0034185	0.0022194	0.355	0.935	0.72
16.	-15.0	-18.2	0.006146	-0.002656	0.000535	0.000258	-0.000359	0.001855	0.0018550	0.0021932	0.350	0.941	0.96
14.	-5.0	-9.2	0.042112	-0.002280	-0.000662	0.000268	-0.000670	0.002936	0.0029364	0.0023249	0.354	0.933	0.48
13.	-5.0	-8.1	0.033115	-0.002521	-0.000571	0.000251	-0.000745	0.002586	0.0025864	0.0023814	0.354	0.942	0.60

TABLE IV-59.- TEETERING ROTOR; 48-FT TAPERED TIP, $V/\Omega R = 0.40$, $M_{(1)(90)} = 0.85$.

TEST 274.0 RUN 7

No. 3 TARE

θ_{grip}	ALPHA SHAFT	ALPHA CONTROL	(SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND TIP SPEED) CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1_s}
12.	-4.0	-7.3	0.028090	-0.002460	-0.000797	0.000317	-0.000629	0.001948	0.0019478	0.0020992	0.399	0.846	0.48
14.	-4.0	-9.2	0.044736	-0.002332	-0.001045	0.000249	-0.000688	0.002722	0.0027220	0.0022876	0.401	0.844	0.24
14.	-8.0	-11.9	0.021179	-0.002829	-0.000069	0.000297	-0.000639	0.002192	0.0021921	0.0021072	0.401	0.843	0.48
16.	-8.0	-13.5	0.037772	-0.002798	-0.000092	0.000300	-0.000761	0.003381	0.0033813	0.0022965	0.403	0.842	0.60
16.	-12.0	-16.2	0.014361	-0.003121	0.000238	0.000553	-0.000731	0.002148	0.0021482	0.0021627	0.401	0.844	0.72
18.	-12.0	-18.0	0.029620	-0.002892	0.000353	0.000386	-0.000677	0.003753	0.0037530	0.0023614	0.403	0.843	0.72
18.	-8.0	-15.3	0.052471	-0.002295	-0.000178	0.000217	-0.000926	0.004776	0.0047763	0.0025943	0.403	0.843	0.60
16.	-4.0	-10.8	0.059774	-0.002130	-0.001376	0.000322	-0.000688	0.003669	0.0036688	0.0026411	0.402	0.843	0.36
17.	-4.0	-12.0	0.067248	-0.001738	-0.001512	0.000470	-0.000867	0.004336	0.0043355	0.0028833	0.403	0.841	0.24
12.	0.	-4.5	0.051270	-0.002032	-0.002075	0.000416	-0.000612	0.001634	0.0016337	0.0022991	0.402	0.844	0.00
14.	0.	-6.5	0.068744	-0.001777	-0.002495	0.000529	-0.000607	0.002244	0.0022441	0.0026815	0.400	0.845	0.00
10.	0.	-2.5	0.035900	-0.002264	-0.001562	0.000347	-0.000455	0.001255	0.0012553	0.0020867	0.400	0.845	0.00
8.	0.	-0.8	0.019073	-0.002101	-0.001123	0.000286	-0.000545	0.001137	0.0011367	0.0019577	0.401	0.844	0.12
8.	4.0	1.9	0.045685	-0.002345	-0.002247	0.000368	-0.000746	0.000235	0.0002353	0.0023157	0.398	0.847	0.00
10.	4.0	-0.1	0.060134	-0.002193	-0.003007	0.000391	-0.001053	0.000352	0.0003516	0.0026938	0.400	0.846	-0.36
10.	-4.0	-5.3	0.011988	-0.002422	-0.000625	0.000184	-0.000602	0.001537	0.0015365	0.0021640	0.403	0.842	0.36
12.	-8.0	-9.9	0.004671	-0.002877	-0.000071	0.000163	-0.000535	0.001367	0.0013674	0.0022488	0.402	0.845	0.36

TEST 274.0 RUN 15A

No. 3 TARE

θ_{grip}	ALPHA SHAFT	ALPHA CONTROL	(SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND TIP SPEED) CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1_s}
14.	-2.0	-7.7	0.053904	-0.002089	-0.001356	0.000200	-0.000816	0.002612	0.0026118	0.0025252	0.399	0.847	0.48
15.	-2.0	-8.7	0.060924	-0.001868	-0.001537	0.000093	-0.000697	0.002993	0.0029931	0.0026741	0.401	0.846	0.24
16.	-2.0	-9.5	0.070183	-0.001766	-0.001800	0.000120	-0.000791	0.003502	0.0035022	0.0029428	0.401	0.845	0.24

TABLE IV-60.- TEETERING ROTOR; 34-FT BLADES, $V/\Omega R = 0.51$, $M_{(1)(90)} = 0.65$.

TEST 274.0 RUN 23

No. 3 TARE

θ_{grip}	ALPHA SHAFT	ALPHA CONTROL	(SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND TIP SPEED) CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1_s}
12.	-4.0	-9.6	0.029585	-0.004017	-0.001352	0.000612	-0.000418	0.002497	0.0024969	0.0034260	0.508	0.651	-0.36
14.	-4.0	-11.5	0.043319	-0.004462	-0.001942	0.000641	-0.000123	0.003431	0.0034306	0.0040349	0.508	0.651	-0.36
16.	-4.0	-13.5	0.052454	-0.004469	-0.002382	0.000687	-0.000662	0.004584	0.0045844	0.0048124	0.509	0.650	-0.24
10.	-4.0	-7.7	0.018201	-0.003502	-0.001100	0.000443	-0.000124	0.001913	0.0019128	0.0030237	0.509	0.650	-0.72
15.	-4.0	-12.5	0.048039	-0.004669	-0.001987	0.000435	-0.000685	0.003869	0.0038693	0.0043856	0.510	0.650	-0.24
14.	-6.0	-12.8	0.031801	-0.004628	-0.000900	0.000118	-0.000528	0.003399	0.0033992	0.0039830	0.509	0.648	-0.24
12.	-6.0	-10.9	0.020159	-0.004108	-0.000650	0.000000	-0.000254	0.002303	0.0023032	0.0032830	0.509	0.648	-0.36
16.	-6.0	-14.6	0.044321	-0.004894	-0.001530	0.000443	-0.000749	0.004566	0.0045664	0.0045576	0.509	0.648	-0.12

TEST 274.0 RUN 26

No. 3 TARE

θ_{grip}	ALPHA SHAFT	ALPHA CONTROL	(SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND TIP SPEED) CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1_s}
13.	-4.0	-10.8	0.039714	-0.004408	-0.001795	0.000577	-0.000162	0.003201	0.0032010	0.0039255	0.508	0.652	-0.36
14.	-4.0	-11.8	0.045116	-0.004616	-0.002071	0.000605	-0.000415	0.003674	0.0036742	0.0042840	0.509	0.650	-0.36
15.	-4.0	-12.7	0.051112	-0.004669	-0.001934	0.000328	-0.000027	0.004019	0.0040195	0.0044074	0.510	0.648	-0.24
16.	-4.0	-13.5	0.058228	-0.004790	-0.002539	0.000582	-0.000154	0.004676	0.0046759	0.0048232	0.511	0.648	-0.36
12.	-2.0	-8.5	0.043459	-0.004071	-0.002182	0.000541	0.000335	0.002638	0.0026379	0.0038160	0.510	0.649	-0.60
14.	-2.0	-10.5	0.056960	-0.004393	-0.002777	0.000630	0.000418	0.003398	0.0033983	0.0044178	0.511	0.648	-0.48
12.	-2.0	-8.5	0.043524	-0.004157	-0.002044	0.000330	0.000517	0.002586	0.0025857	0.0038090	0.511	0.648	-0.60
10.	-2.0	-6.6	0.032691	-0.003805	-0.001270	-0.000131	0.001272	0.001990	0.0019896	0.0032775	0.510	0.648	-0.72
11.	-2.0	-7.7	0.038479	-0.003977	-0.002038	0.000704	0.000737	0.002410	0.0024097	0.0036584	0.511	0.647	-0.60
8.	-2.0	-5.0	0.019448	-0.003251	-0.001041	0.000457	0.001086	0.001701	0.0017011	0.0029920	0.512	0.648	-0.84
12.	0.	-7.3	0.056057	-0.004106	-0.002669	0.000160	0.000440	0.002220	0.0022203	0.0041193	0.512	0.648	-0.84
10.	0.	-5.4	0.044194	-0.003711	-0.002360	0.000462	0.000572	0.001730	0.0017300	0.0035038	0.512	0.648	-0.84
8.	0.	-3.7	0.031124	-0.003269	-0.001494	0.000371	0.001284	0.001443	0.0014434	0.0030539	0.512	0.648	-0.84
14.	0.	-9.2	0.065880	-0.003694	-0.003548	0.000648	0.001213	0.003260	0.0032601	0.0048840	0.515	0.646	-0.60
10.	2.0	-4.1	0.054878	-0.003680	-0.003154	0.000705	0.000657	0.001312	0.0013115	0.0039831	0.512	0.647	-0.96
8.	2.0	-2.3	0.043787	-0.003515	-0.002295	0.000328	0.000502	0.000919	0.0009186	0.0033817	0.513	0.646	-0.96
6.	2.0	-0.8	0.032219	-0.003297	-0.001962	0.000564	0.001469	0.001004	0.0010038	0.0032052	0.513	0.646	-1.2
12.	2.0	-6.0	0.068464	-0.003853	-0.003463	0.000012	0.001172	0.001977	0.0019768	0.0048852	0.514	0.646	-0.96
14.	2.0	-8.0	0.078020	-0.003210	-0.004445	0.000679	0.001122	0.003189	0.0031885	0.0058546	0.515	0.645	-0.84
16.	0.	-11.0	0.078046	-0.003865	-0.003656	0.000427	0.000908	0.004605	0.0046045	0.0062175	0.517	0.644	-0.24
15.	-2.0	-11.4	0.061976	-0.004663	-0.002653	0.000182	0.000526	0.003928	0.0039276	0.0049749	0.517	0.644	-0.60

TABLE IV-61.- TEETERING ROTOR; 34-FT BLADES, $V/\Omega R$ = 0.66, $M_{(1)(90)}$ = 0.55.

TEST 274.0 RUN 27

No. 3 TARE

θ_{grip}	ALPHA SHAFT	ALPHA CONTROL	(SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND TIP SPEED) CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1_s}
12.	0.	-8.4	0.034002	-0.005523	-0.003018	0.001042	0.002759	0.001777	0.0017767	0.0053196	0.652	0.556	-0.48
10.	0.	-6.2	0.029013	-0.004954	-0.003125	0.001644	0.002152	0.001848	0.0018478	0.0050395	0.653	0.555	-0.60
8.	0.	-4.1	0.022101	-0.004698	-0.002417	0.000883	0.002090	0.001524	0.0015239	0.0045693	0.653	0.554	-1.08
6.	0.	-2.5	0.012812	-0.004042	-0.001786	0.000963	0.001460	0.001671	0.0016705	0.0043070	0.654	0.554	-1.20
14.	0.	-10.4	0.042426	-0.006537	-0.004611	0.002040	0.004750	0.002615	0.0026153	0.0068077	0.655	0.552	-0.36
12.	0.	-8.4	0.034672	-0.005892	-0.003623	0.001548	0.002443	0.001965	0.0019652	0.0057644	0.655	0.553	-0.60
12.	-2.0	-9.4	0.025705	-0.006199	-0.002126	0.001085	0.000201	0.001709	0.0017092	0.0051870	0.663	0.550	-0.36
10.	-2.0	-7.4	0.017263	-0.005662	-0.002139	0.001474	-0.001044	0.001703	0.0017030	0.0050373	0.662	0.550	-0.72
8.	-2.0	-5.1	0.011297	-0.004800	-0.002096	0.001196	-0.000633	0.001478	0.0014782	0.0043955	0.664	0.550	-0.96
14.	-2.0	-11.7	0.028443	-0.007303	-0.002909	0.001537	0.000900	0.002135	0.0021348	0.0062758	0.663	0.550	-0.24
13.	-4.0	-11.5	0.020079	-0.007854	-0.001933	0.001780	-0.001914	0.001968	0.0019682	0.0062245	0.665	0.549	-0.36
14.	-4.0	-12.7	0.022799	-0.008484	-0.002052	0.001631	-0.001733	0.002038	0.0020378	0.0065877	0.666	0.549	-0.12
15.	-4.0	-13.5	0.027806	-0.008547	-0.002493	0.002119	-0.000049	0.002501	0.0025011	0.0068466	0.666	0.549	0.00
16.	-4.0	-14.5	0.031578	-0.009207	-0.001935	0.001084	-0.000253	0.002521	0.0025213	0.0071202	0.666	0.549	0.00
12.	-4.0	-10.5	0.015289	-0.007449	-0.001611	0.001330	-0.001182	0.001696	0.0016964	0.0059209	0.666	0.549	-0.36
10.	2.0	-5.2	0.042516	-0.004850	-0.004032	0.001868	0.000742	0.001496	0.0014957	0.0056244	0.666	0.548	-0.84
8.	2.0	-3.0	0.035963	-0.004767	-0.003564	0.001863	0.001691	0.001250	0.0012499	0.0052029	0.667	0.548	-1.08
6.	2.0	-1.2	0.028502	-0.004350	-0.001829	-0.000007	0.001288	0.001125	0.0011251	0.0046526	0.668	0.548	-1.32
13.	2.0	-8.5	0.051871	-0.006257	-0.005192	0.002040	0.002338	0.002158	0.0021582	0.0074101	0.668	0.548	-0.84
12.	2.0	-7.3	0.050418	-0.005781	-0.003877	0.000827	0.001516	0.001643	0.0016433	0.0065476	0.667	0.548	-0.84
8.	4.0	-2.1	0.048357	-0.004067	-0.004067	0.001112	0.002071	0.000328	0.0003276	0.0051903	0.670	0.548	-1.44
6.	4.0	-0.2	0.043056	-0.003958	-0.002248	-0.000469	0.001774	-0.000065	-0.0000645	0.0044893	0.668	0.548	-1.56
10.	4.0	-4.2	0.054246	-0.004663	-0.004300	0.001133	0.003084	0.000401	0.0004007	0.0058888	0.667	0.547	-1.08
11.	4.0	-5.4	0.060159	-0.004873	-0.005201	0.002134	0.000961	0.001026	0.0010260	0.0068957	0.667	0.547	-0.96

TABLE IV-62.- TEETERING ROTOR; 34-FT BLADES, $V/\Omega R$ = 0.79, $M_{(1)(90)}$ = 0.52.

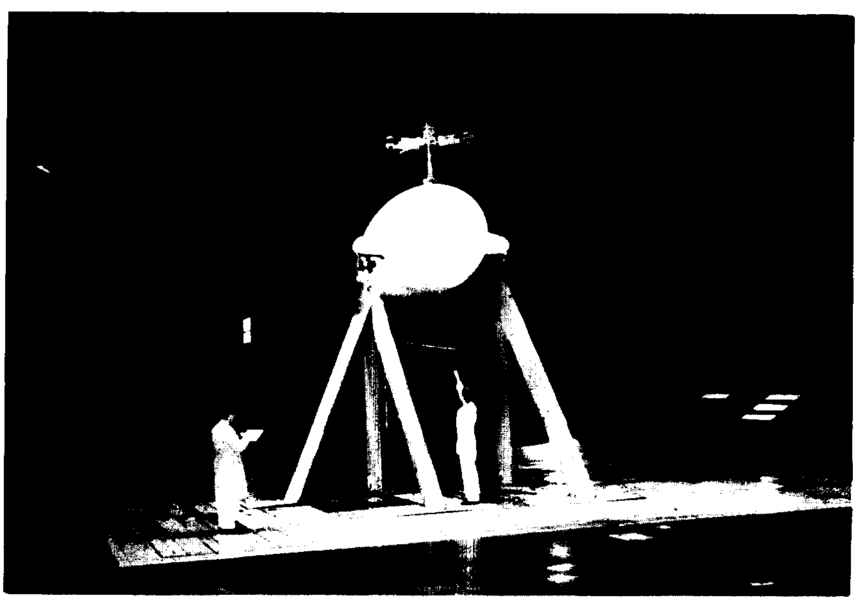
TEST 274.0 RUN 29

No. 3 TARE

θ_{grip}	ALPHA SHAFT	ALPHA CONTROL	(SHAFT AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND TIP SPEED) CT	-CH	CYR	CMXB	CMY	CQ	CP	CPO	V/OR	M,AT	A_{1_s}
12.	0.	-9.5	0.031178	-0.009999	-0.003442	0.001102	0.002000	0.001374	0.0013745	0.0091856	0.785	0.528	-0.48
11.	0.	-8.3	0.030857	-0.009479	-0.004031	0.001343	0.002954	0.001111	0.0011111	0.0085359	0.787	0.527	-0.96
10.	0.	-7.1	0.029976	-0.008726	-0.003761	0.002411	0.002489	0.001384	0.0013843	0.0082048	0.786	0.526	-0.96
9.	0.	-6.1	0.023137	-0.007974	-0.002090	-0.000395	0.002025	0.001157	0.0011575	0.0074131	0.787	0.526	-1.08
8.	0.	-5.0	0.020888	-0.006787	-0.002337	0.000774	0.002071	0.001793	0.0017933	0.0071167	0.787	0.526	-1.20
10.	2.0	-6.2	0.039972	-0.008638	-0.003583	0.001227	0.002300	0.000823	0.0008226	0.0086706	0.789	0.524	-0.96
9.	2.0	-5.2	0.036183	-0.008204	-0.004759	0.002053	0.002630	0.001140	0.0011398	0.0085787	0.792	0.524	-1.20
8.	2.0	-4.1	0.040934	-0.006469	-0.003609	0.000708	0.005380	0.000705	0.0007047	0.0068885	0.792	0.523	-1.44
11.	2.0	-7.6	0.038143	-0.008924	-0.004786	0.001351	0.001554	0.001287	0.0012866	0.0093484	0.792	0.523	-0.72
10.	2.0	-6.3	0.040146	-0.008883	-0.004718	0.001857	0.001203	0.000672	0.0006717	0.0087201	0.789	0.523	-1.20
10.	0.	-7.1	0.027435	-0.008690	-0.003789	0.002183	0.001909	0.001768	0.0017683	0.0086136	0.791	0.523	-1.32

A-37645

(a) Articulated rotor system.



A-37408

(b) Teetering rotor system.

Figure 1.- General view of rotor systems.

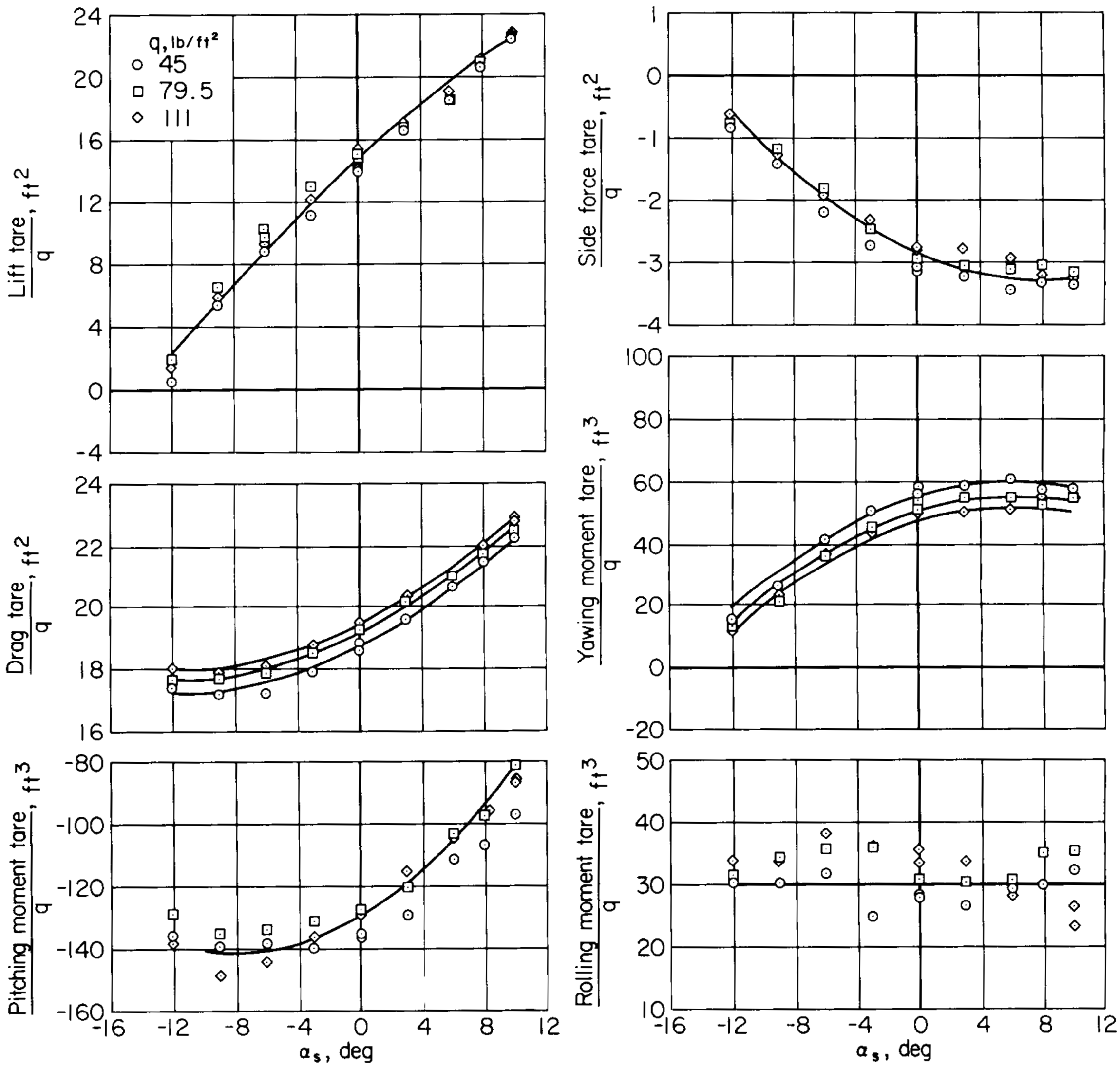


Figure 2.- Tare data No. 1 (used for articulated rotor with fairing over tail-strut dynamic absorber).

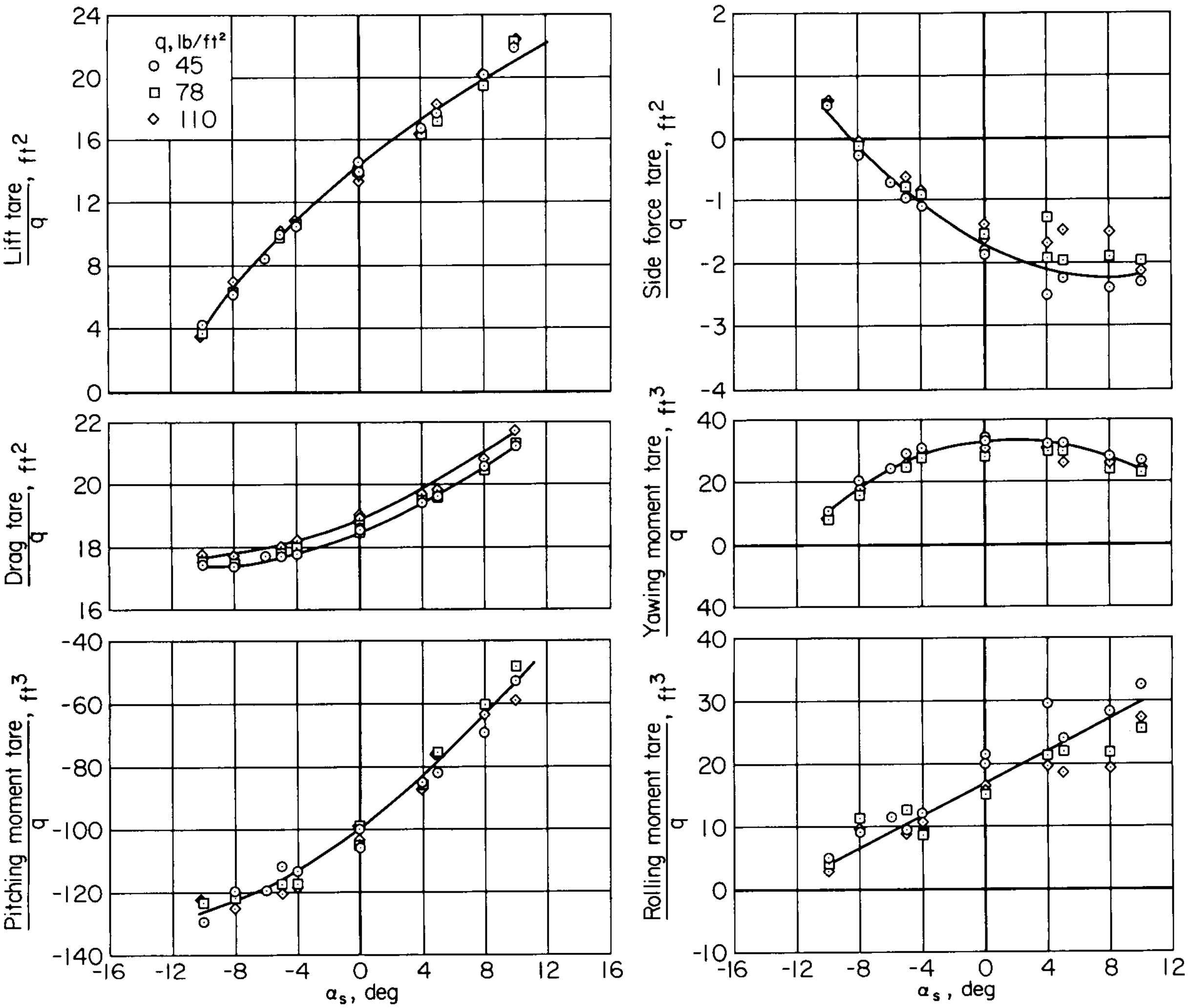


Figure 3.- Tare data No. 2 (used for articulated rotor without fairing over tail-strut dynamic absorber).

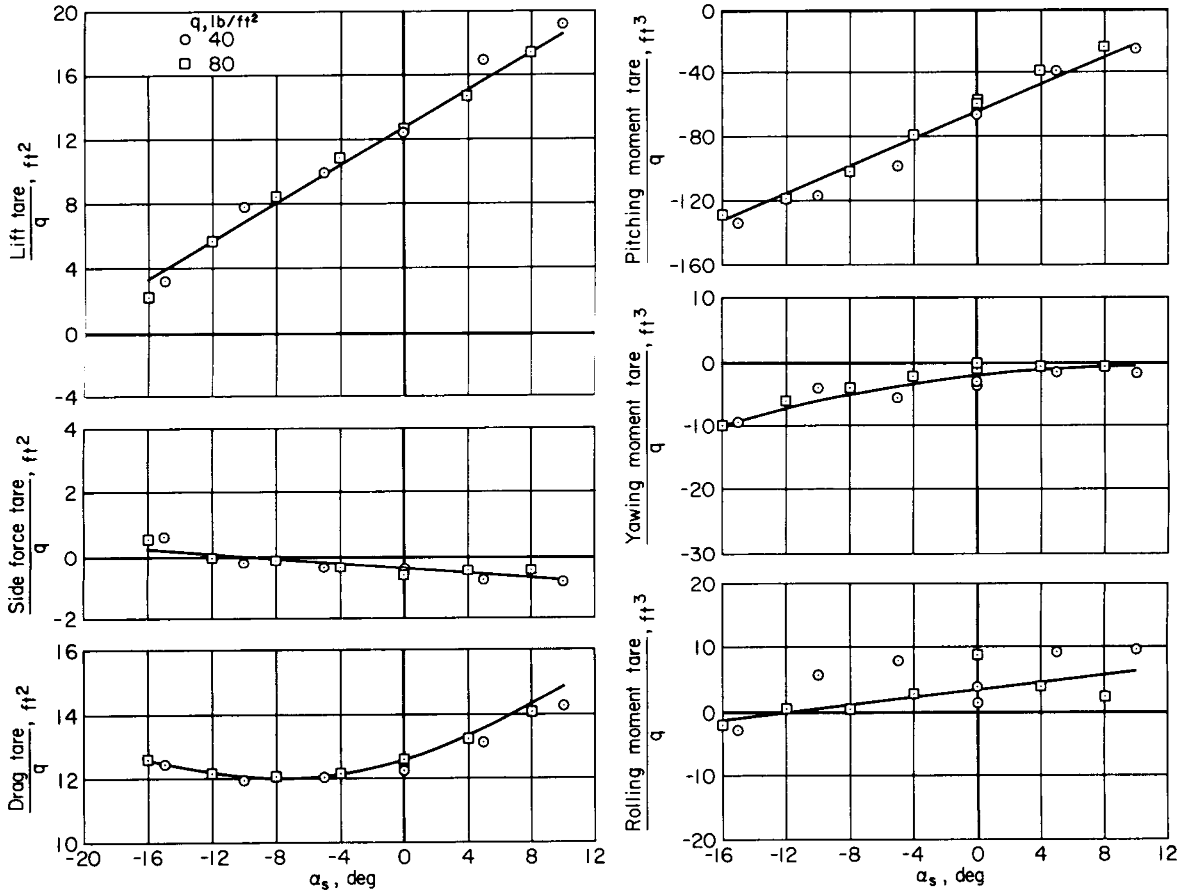
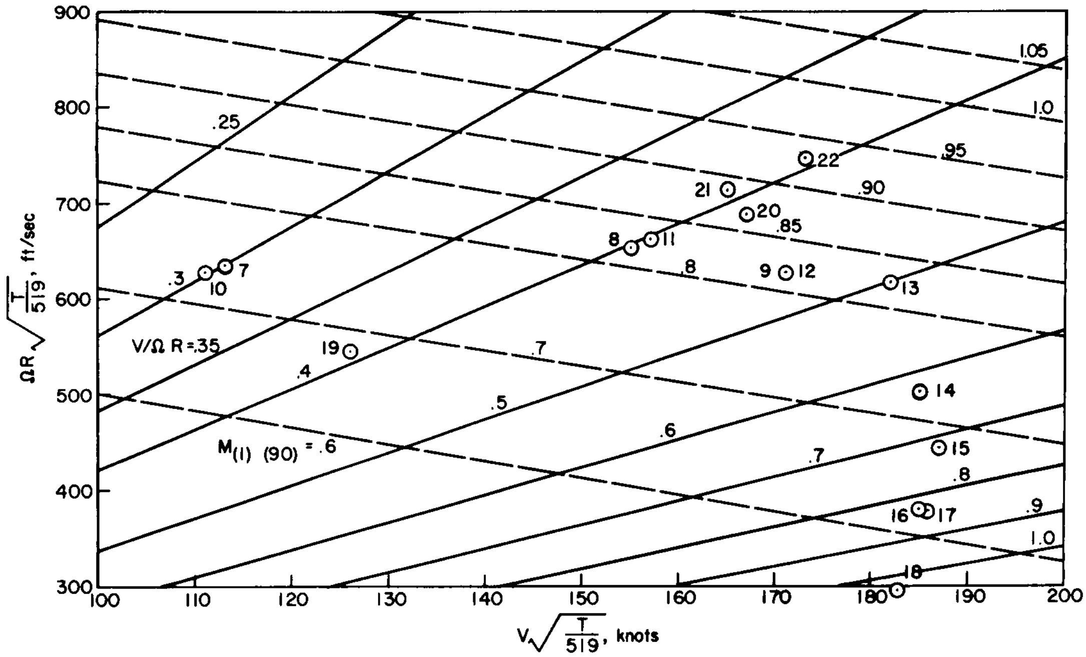
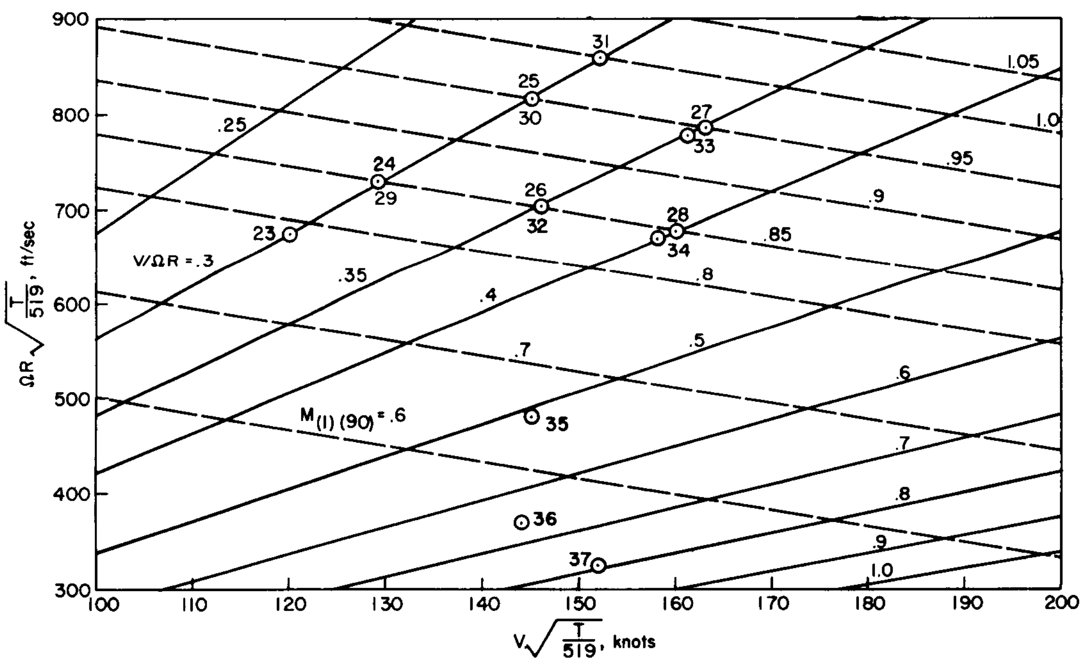


Figure 4.- Tare data No. 3 (used for teetering rotor).

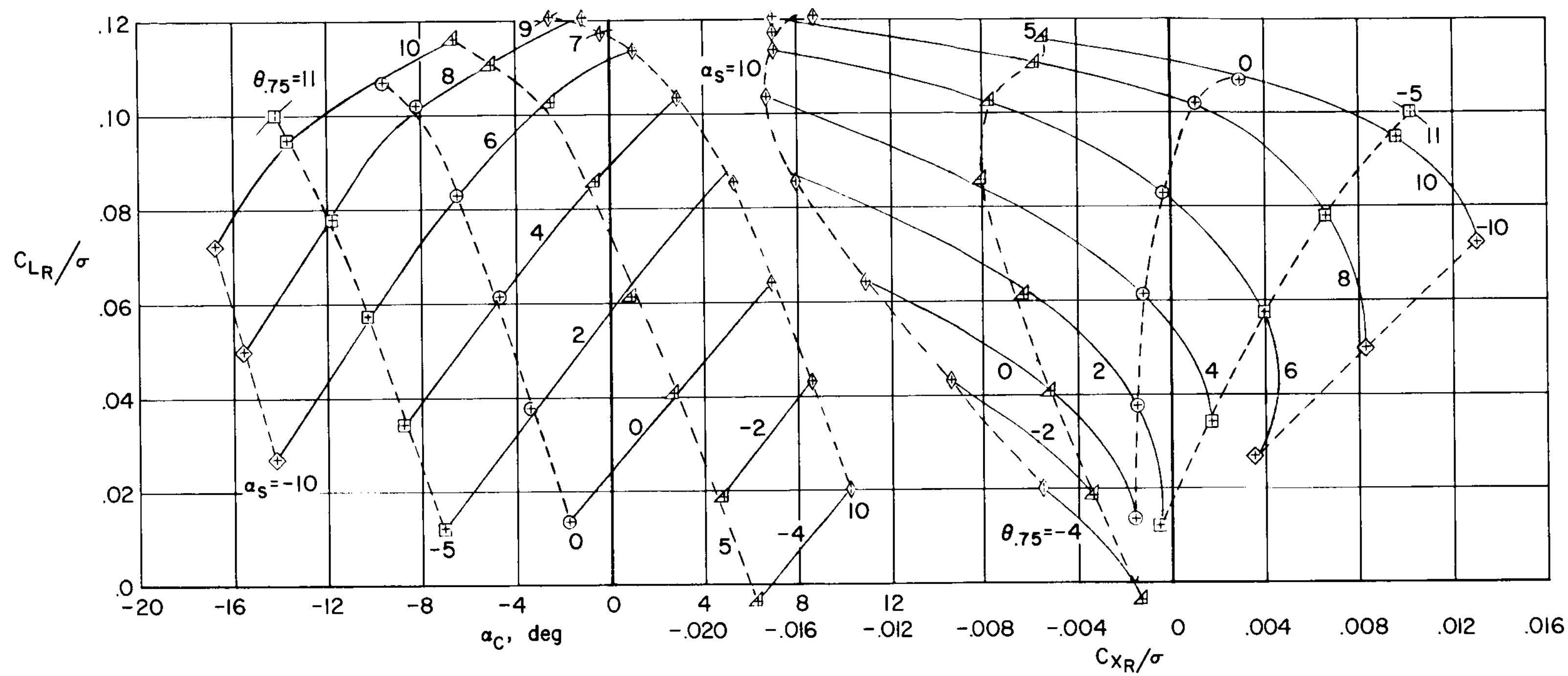


(a) Articulated rotors.

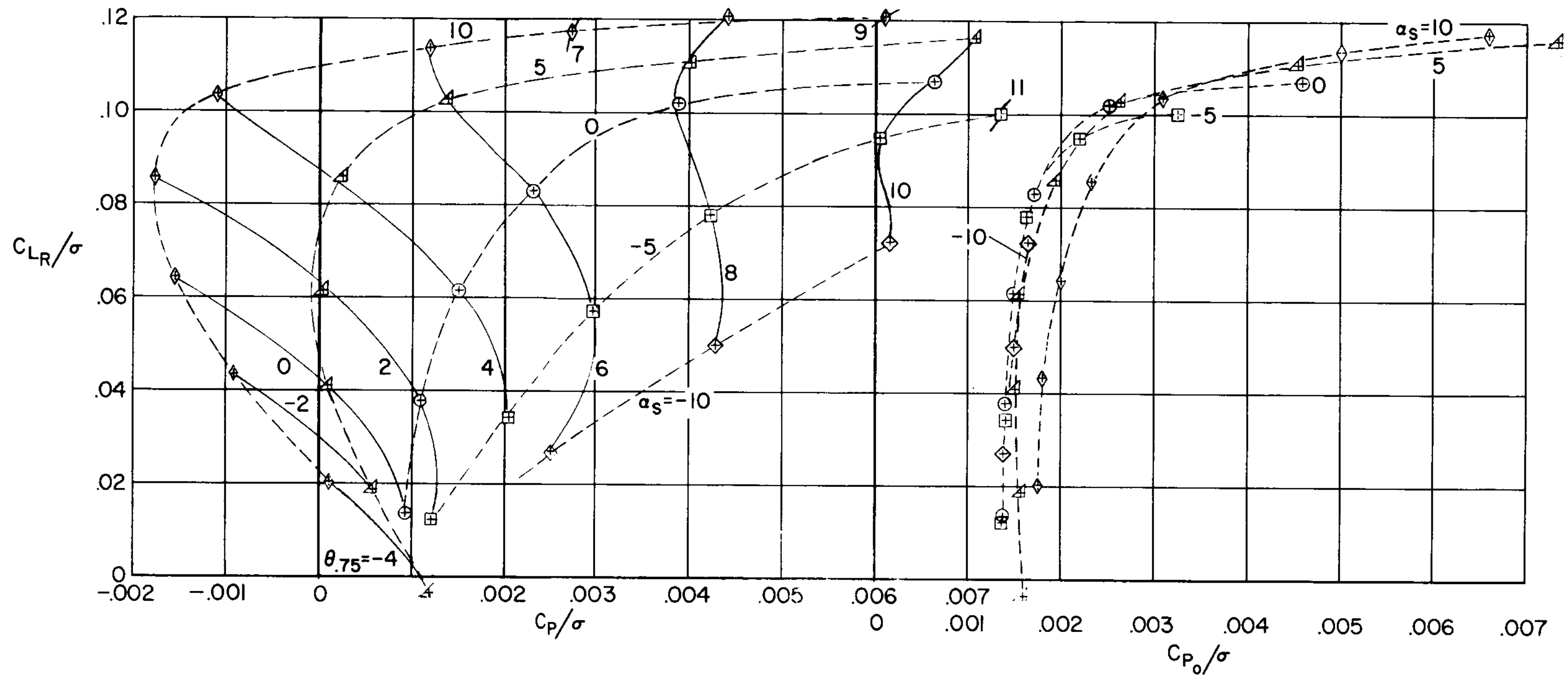


(b) Teetering rotors.

Figure 5.- Rotor velocity diagrams.

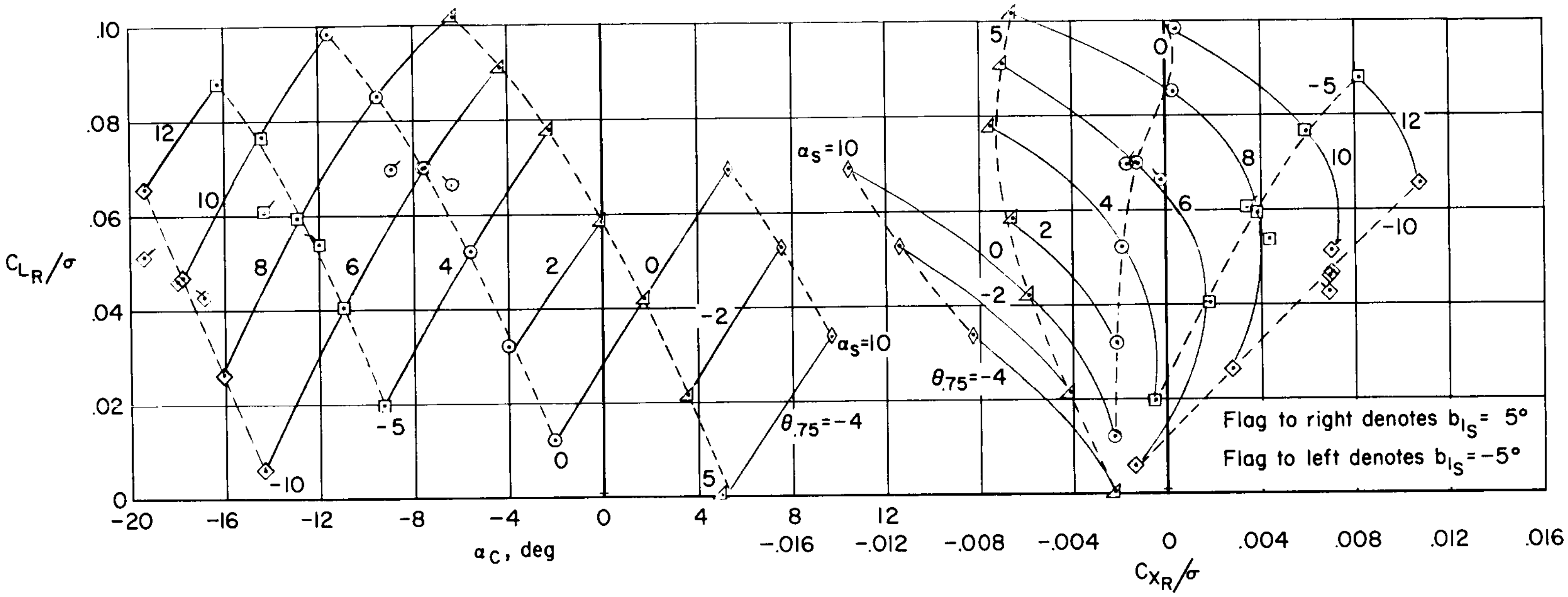


(a) Control axis and propulsive force coefficients.

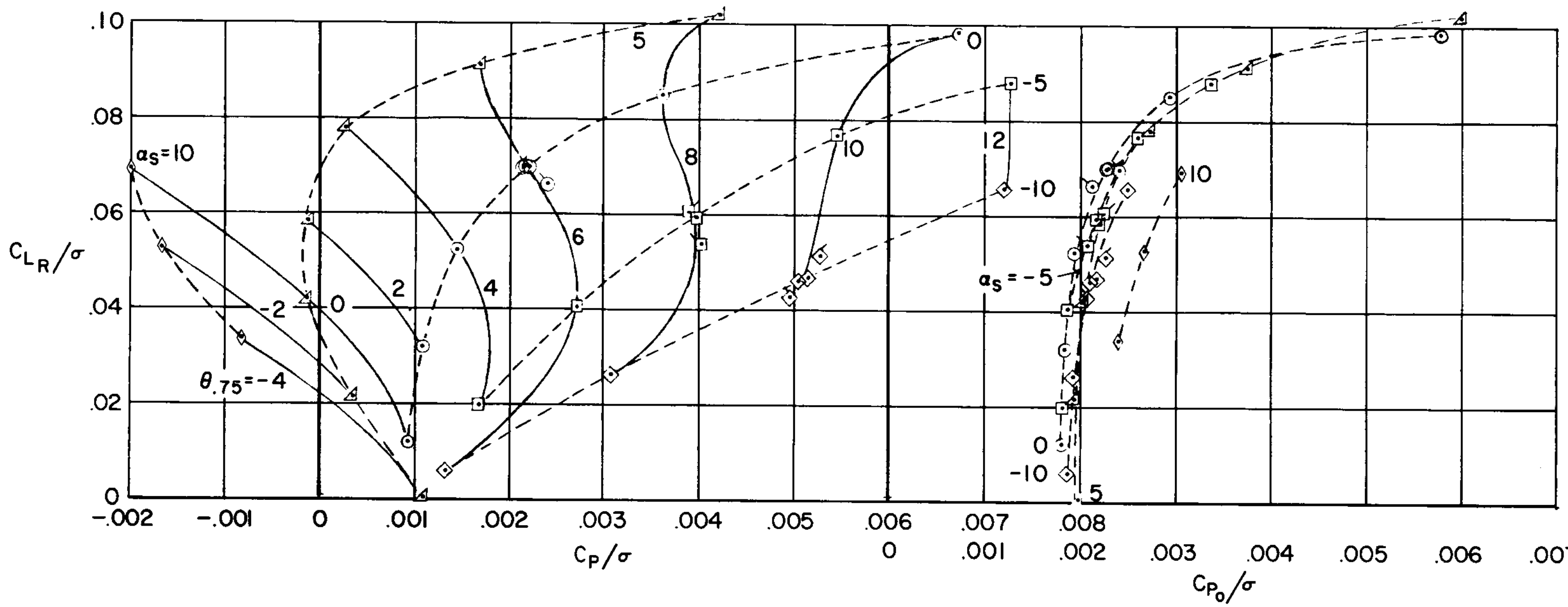


(b) Power coefficients.

Figure 6.- Articulated rotor with $\theta_1 = -8^{\circ}$, $V/\Omega R = 0.30$, $M_{(1)(90)} = 0.74$.

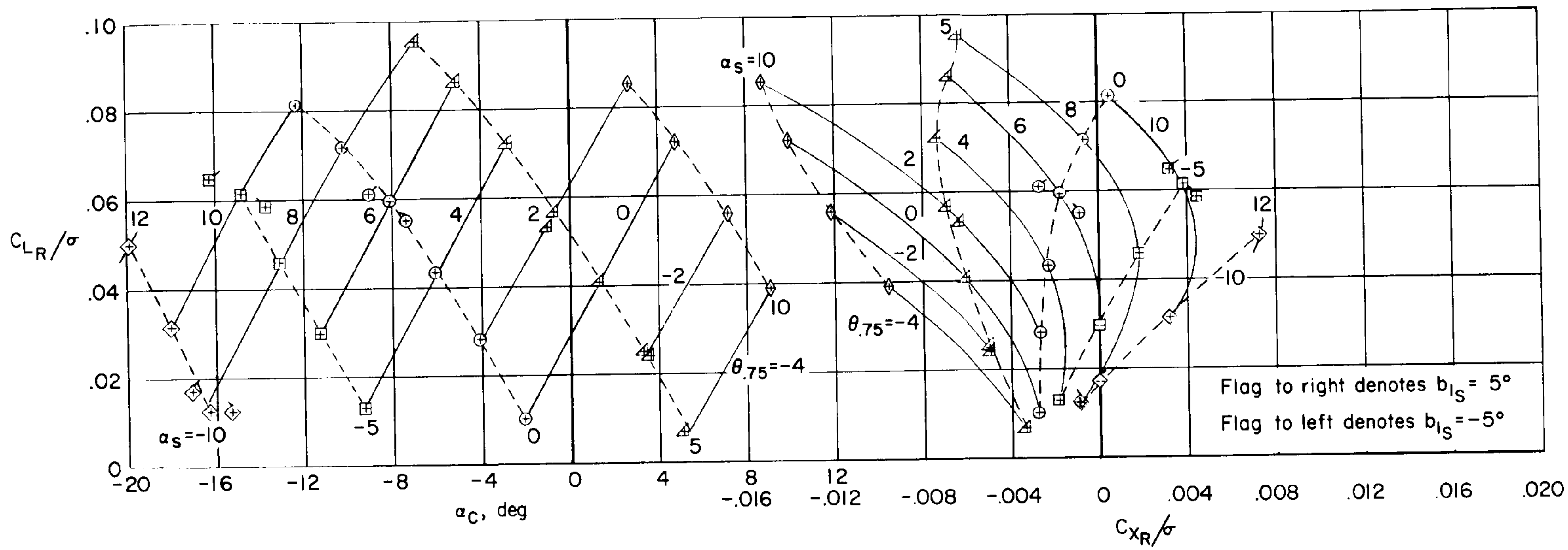


(a) Control axis and propulsive force coefficients.

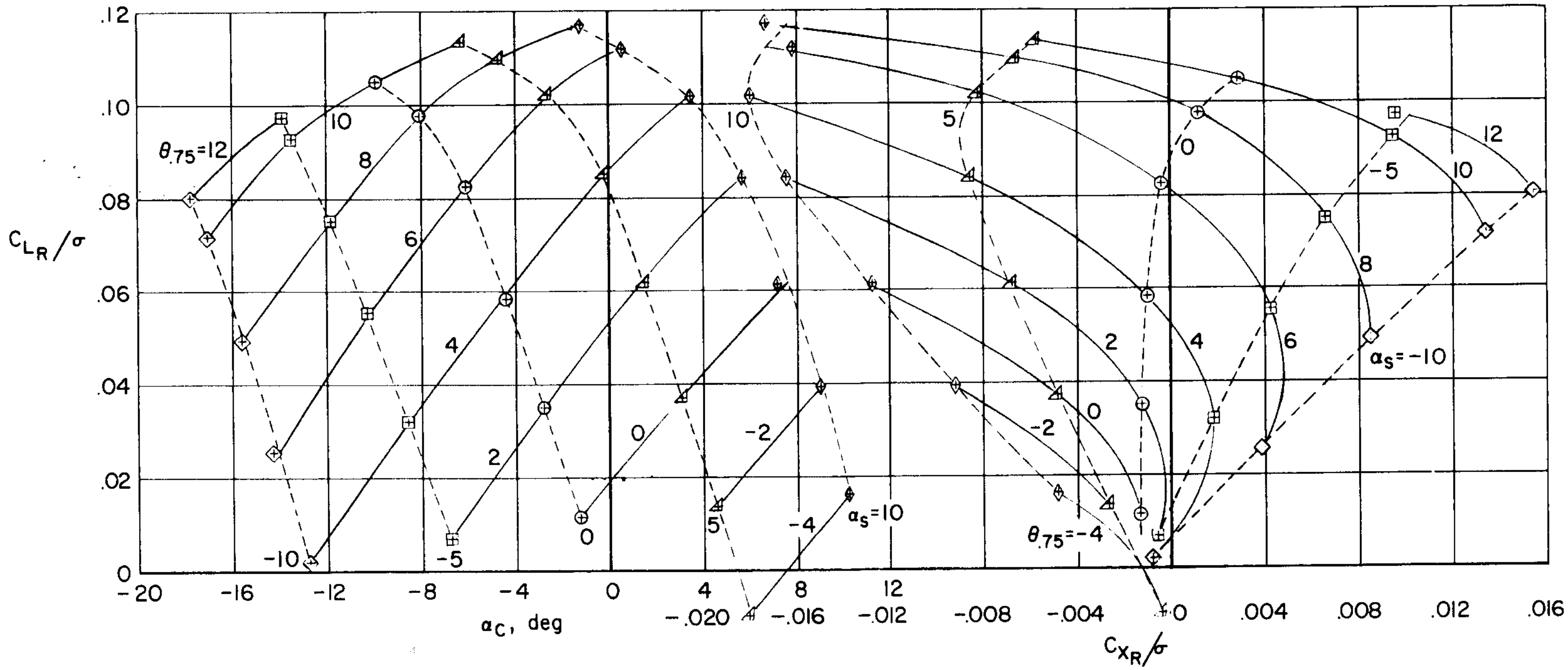


(b) Power coefficients.

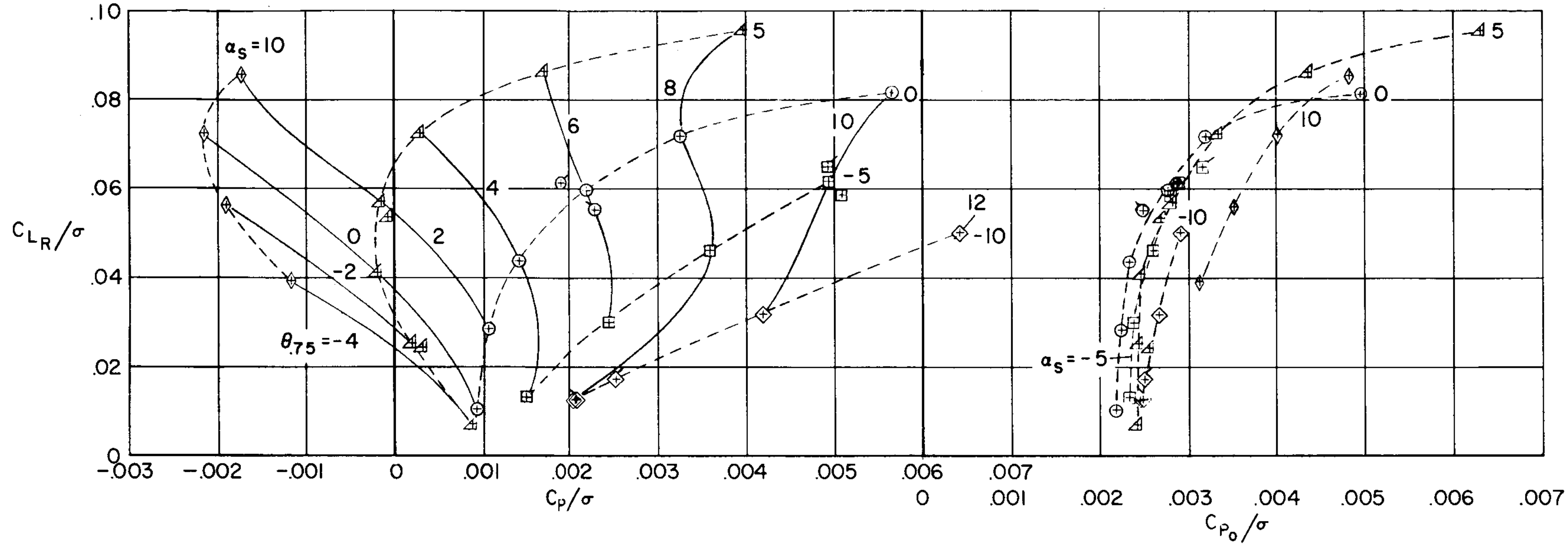
Figure 7.- Articulated rotor with $\theta_1 = -8^{\circ}$, $V/\Omega R = 0.40$, $M_{(1)(90)} = 0.82$.



(a) Control axis and propulsive force coefficients.

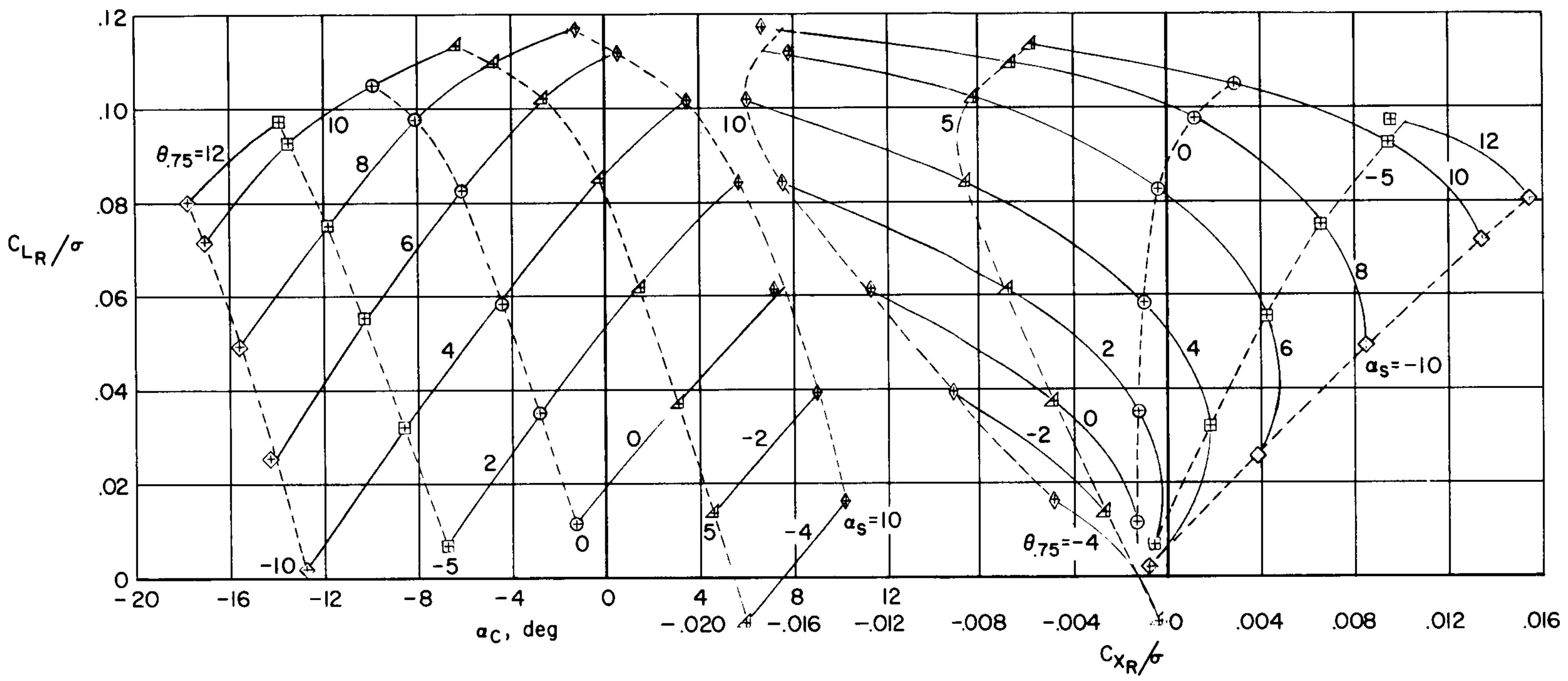


(a) Control axis and propulsive force coefficients.

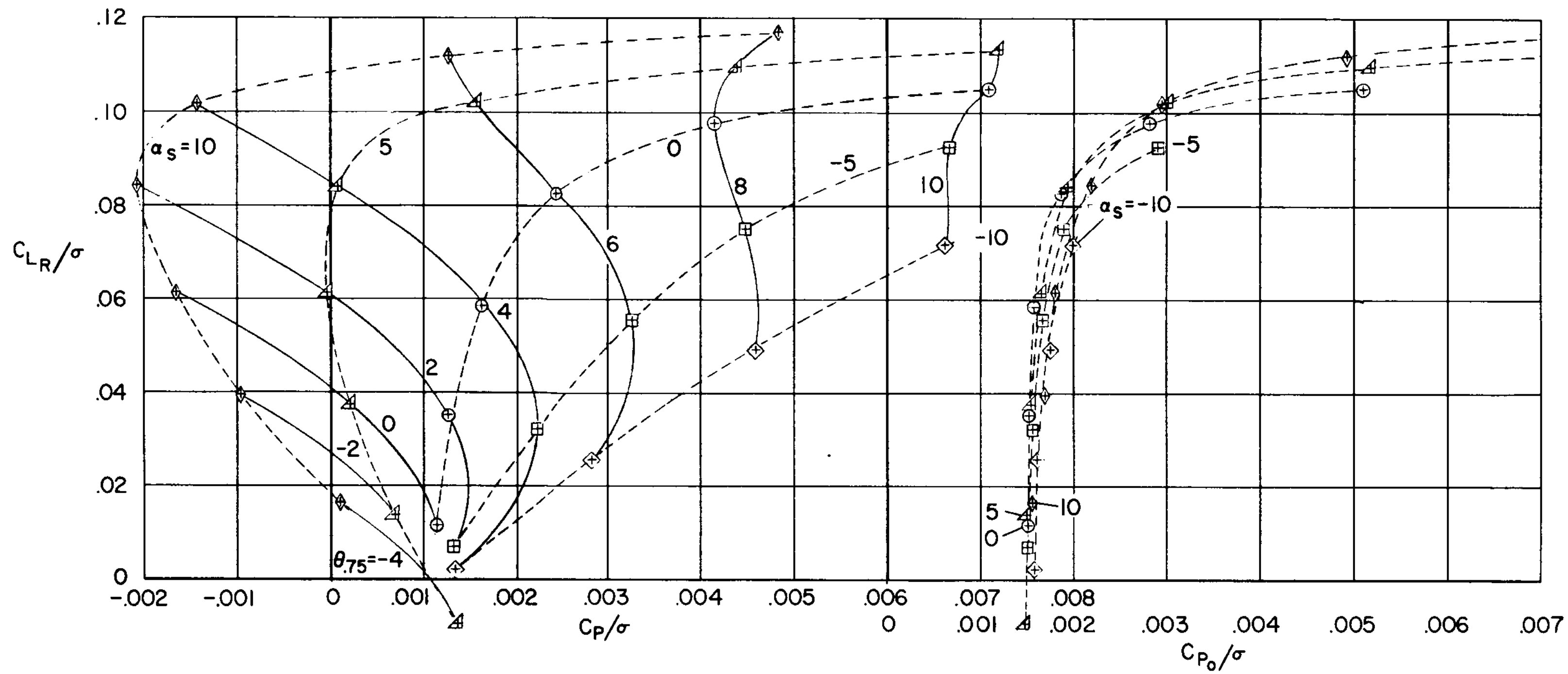


(b) Power coefficients.

Figure 8.- Articulated rotor with $\theta_1 = -8^\circ$, $V/\Omega R = 0.46$, $M_{(1)(90)} = 0.82$.

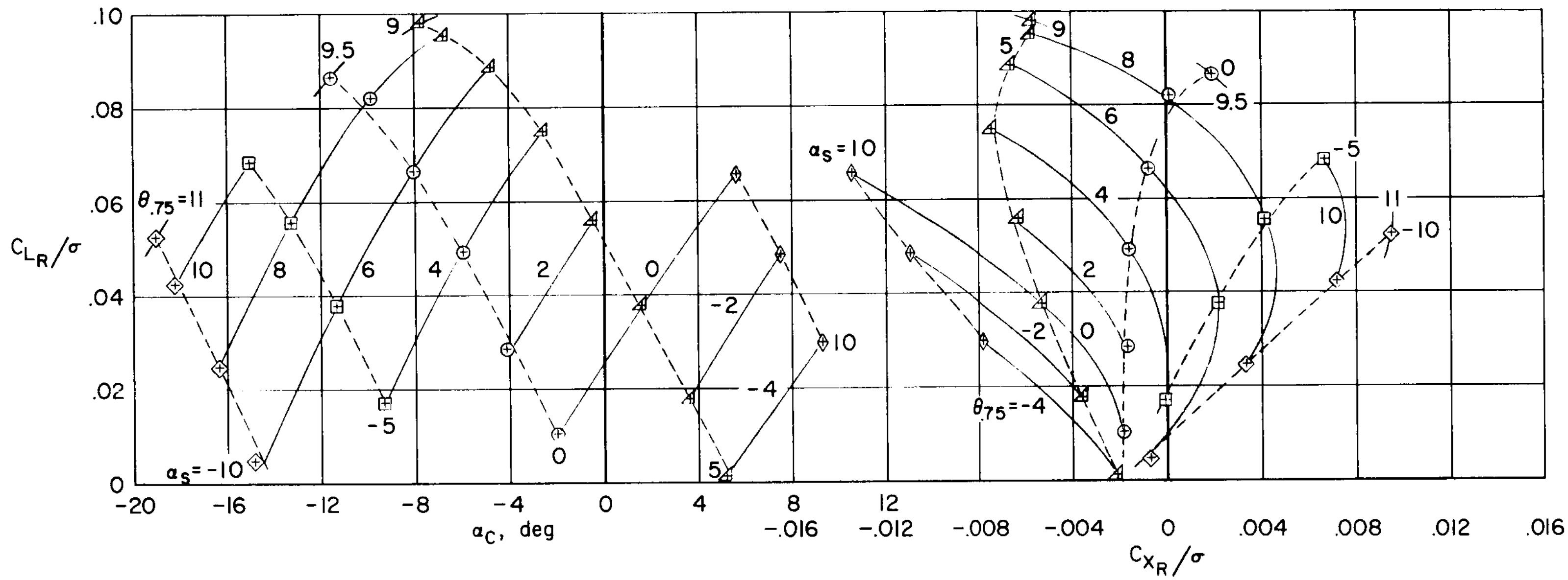


(a) Control axis and propulsive force coefficients.

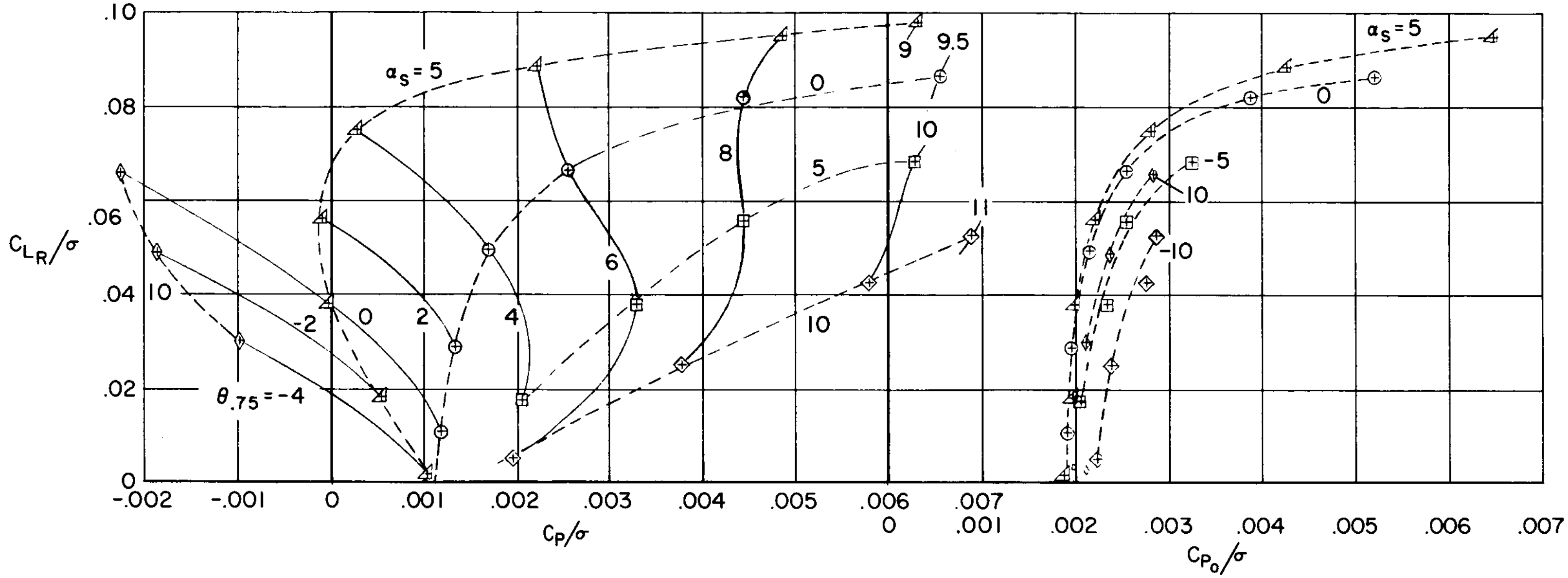


(b) Power coefficients.

Figure 9.- Articulated rotor with $\theta_1 = 0^\circ$, $V/\Omega R = 0.30$, $M_{(1)(90)} = 0.73$.

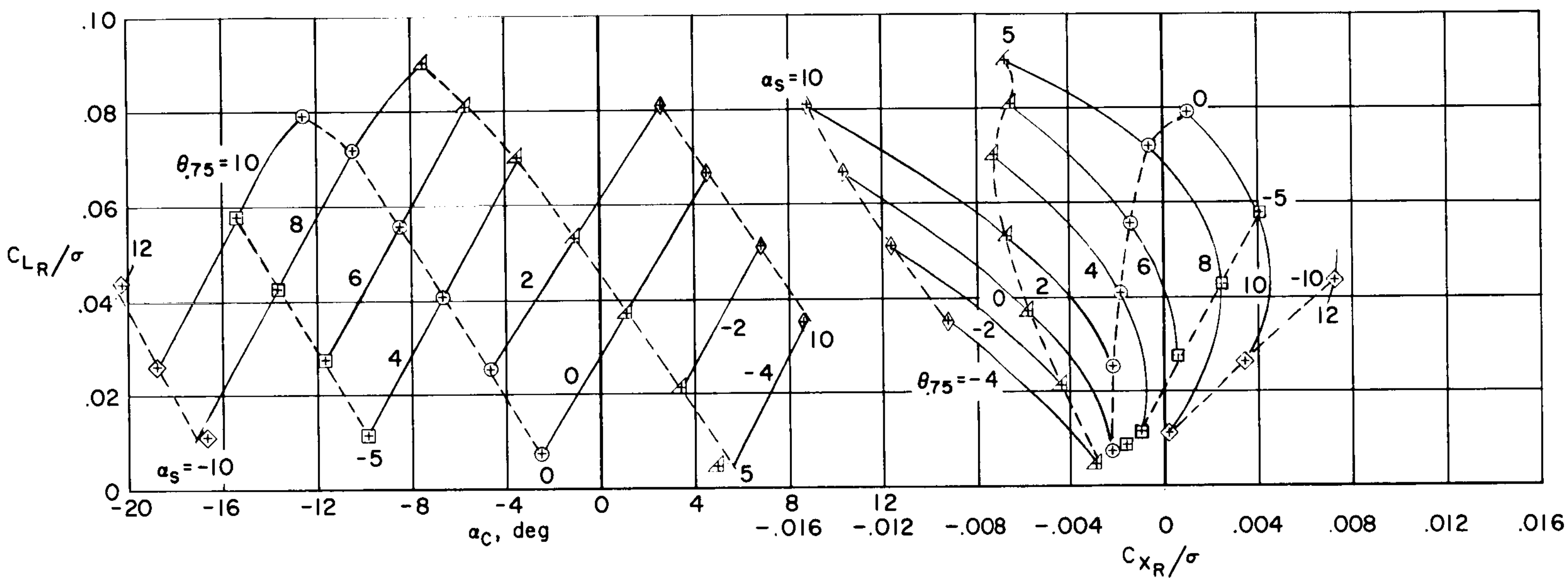


(a) Control axis and propulsive force coefficients.

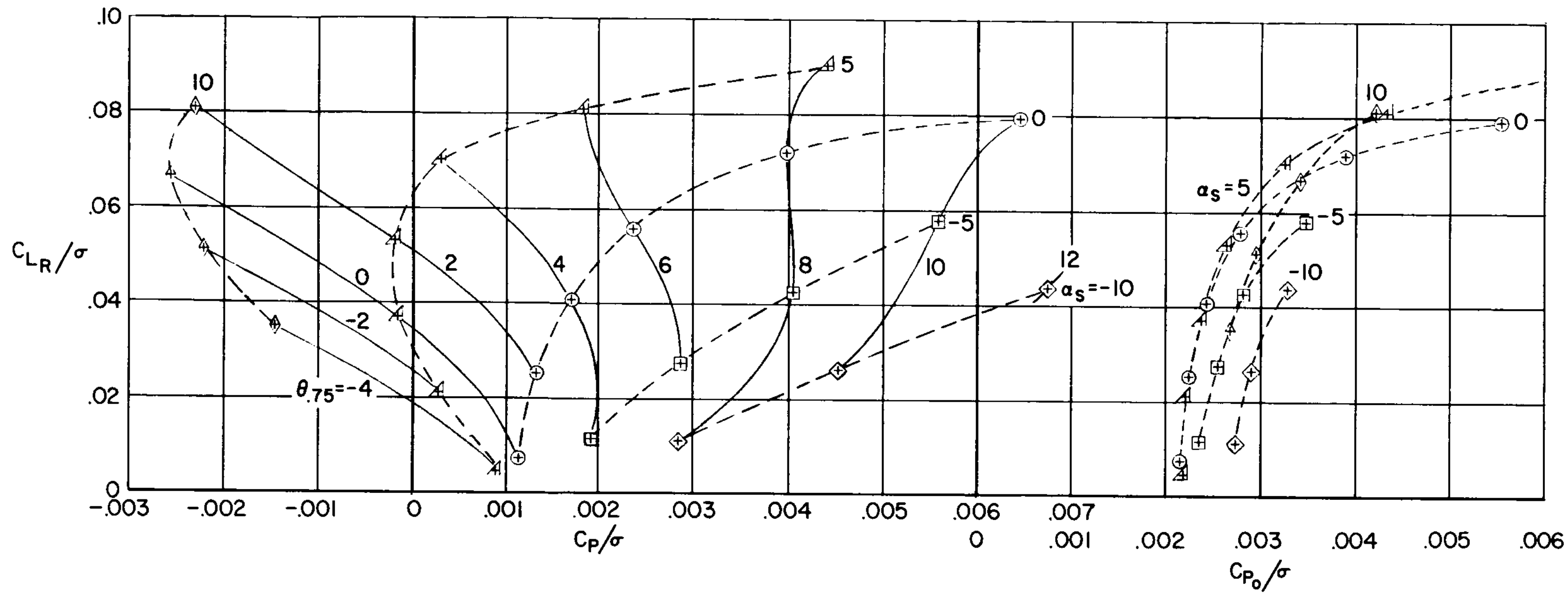


(b) Power coefficients.

Figure 10.- Articulated rotor with $\theta_1 = 0^\circ$, $V/\Omega R = 0.40$, $M_{(1)(90)} = 0.83$.

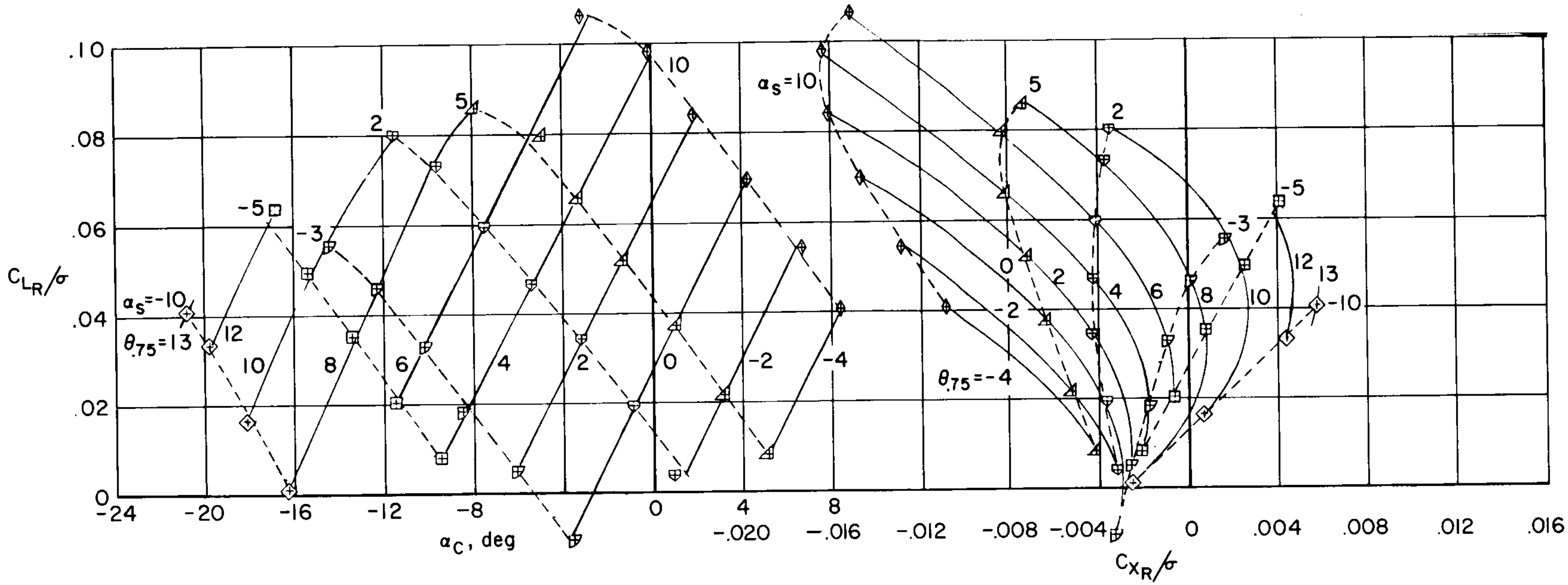


(a) Control axis and propulsive force coefficients.

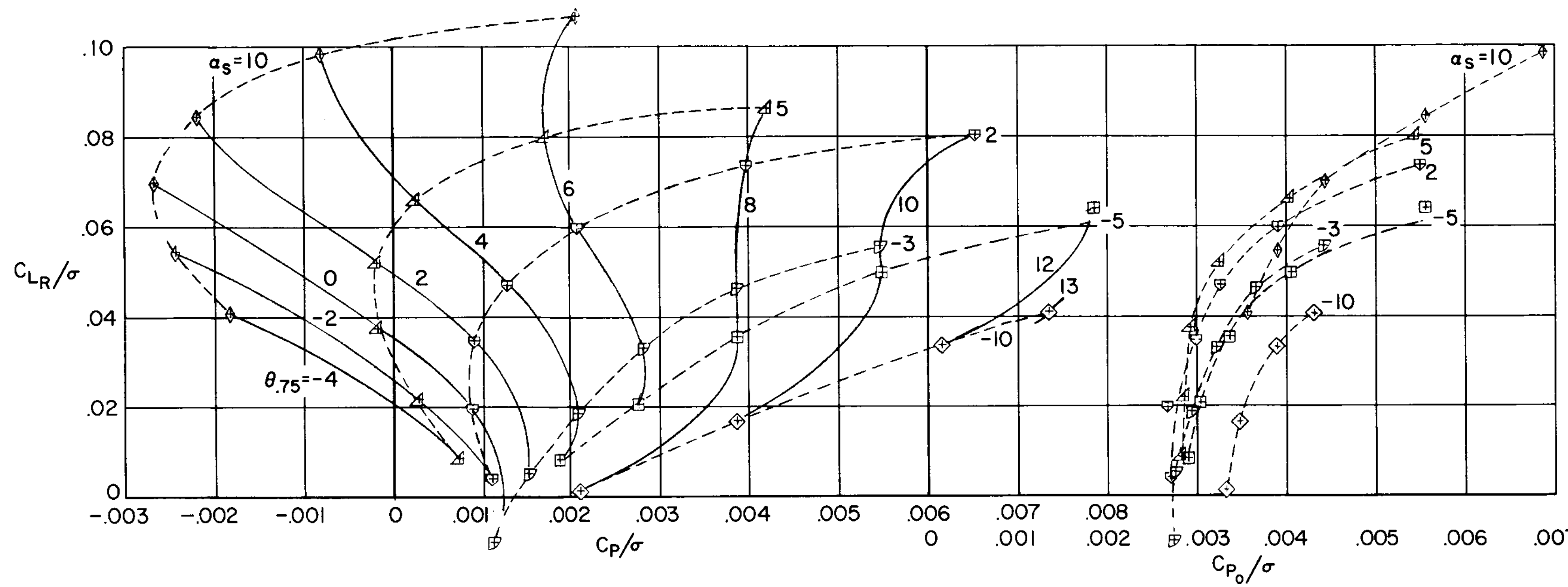


(b) Power coefficients.

Figure 11.- Articulated rotor with $\theta_1 = 0^{\circ}$, $V/\Omega R = 0.46$, $M_{(1)(90)} = 0.82$.

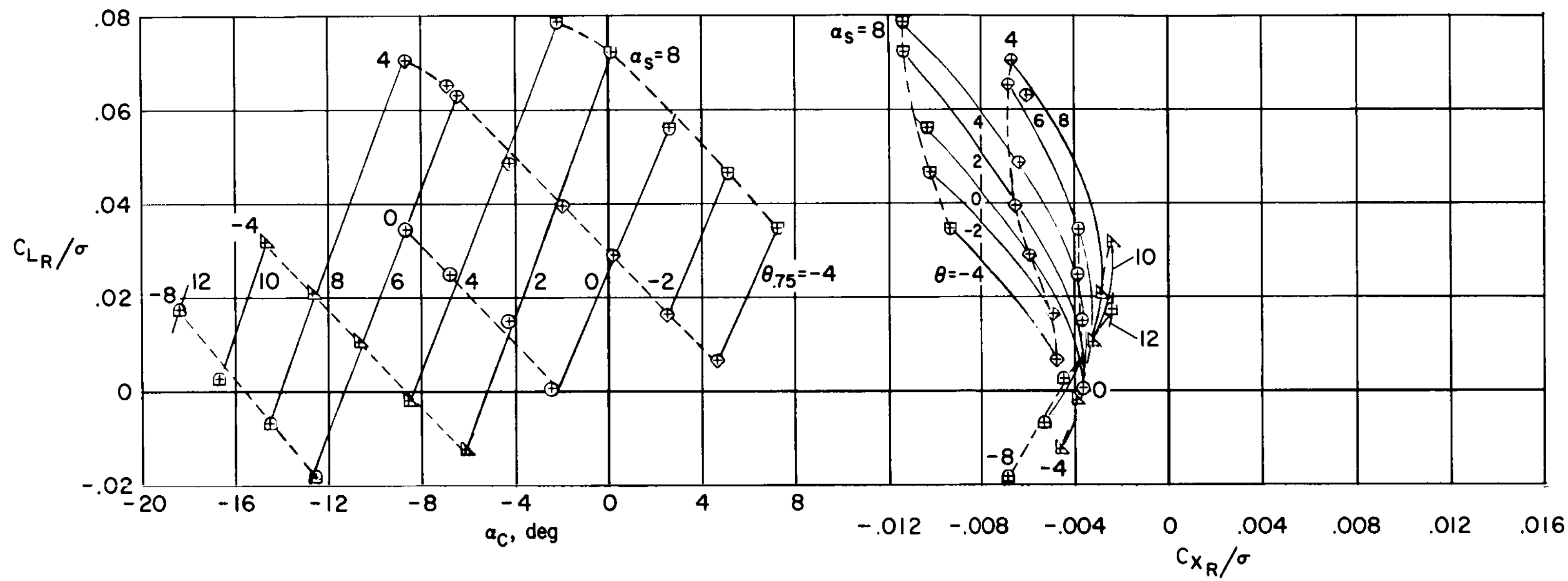


(a) Control axis and propulsive force coefficients.

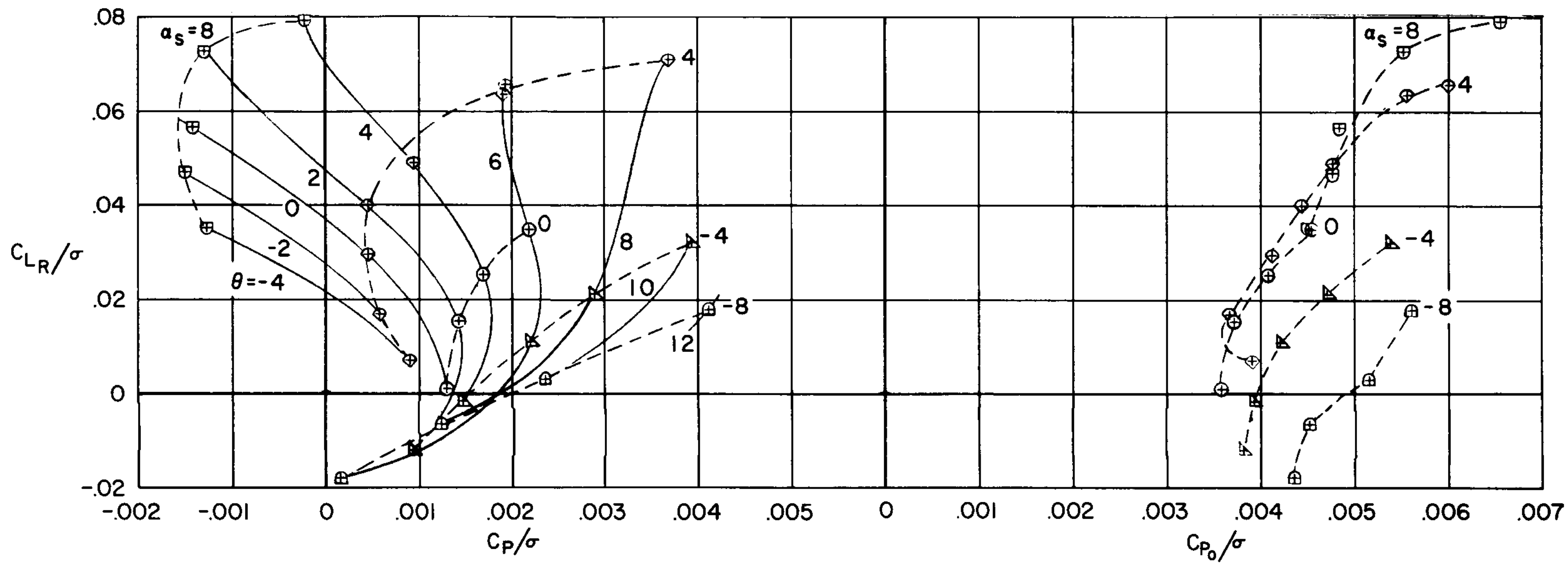


(b) Power coefficients.

Figure 12.- Articulated rotor with $\theta_1 = 0^{\circ}$, $V/\Omega R = 0.50$, $M_{(1)(90)} = 0.82$.

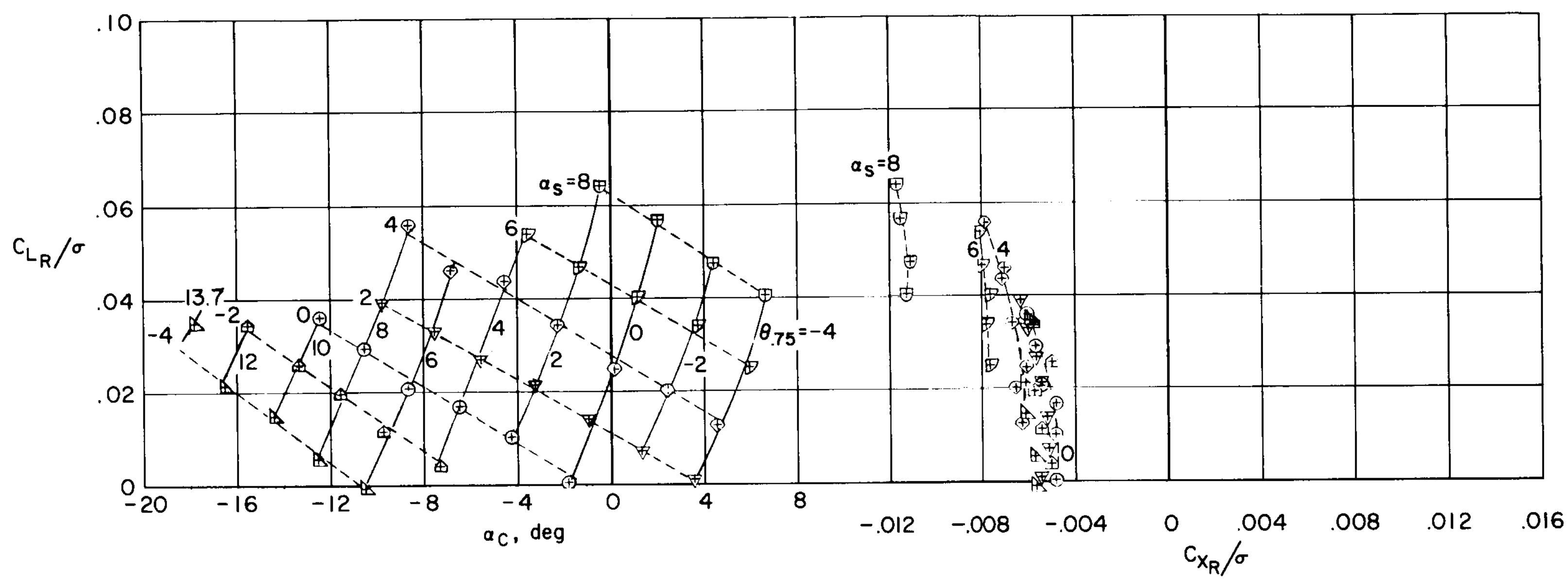


(a) Control axis and propulsive force coefficients.

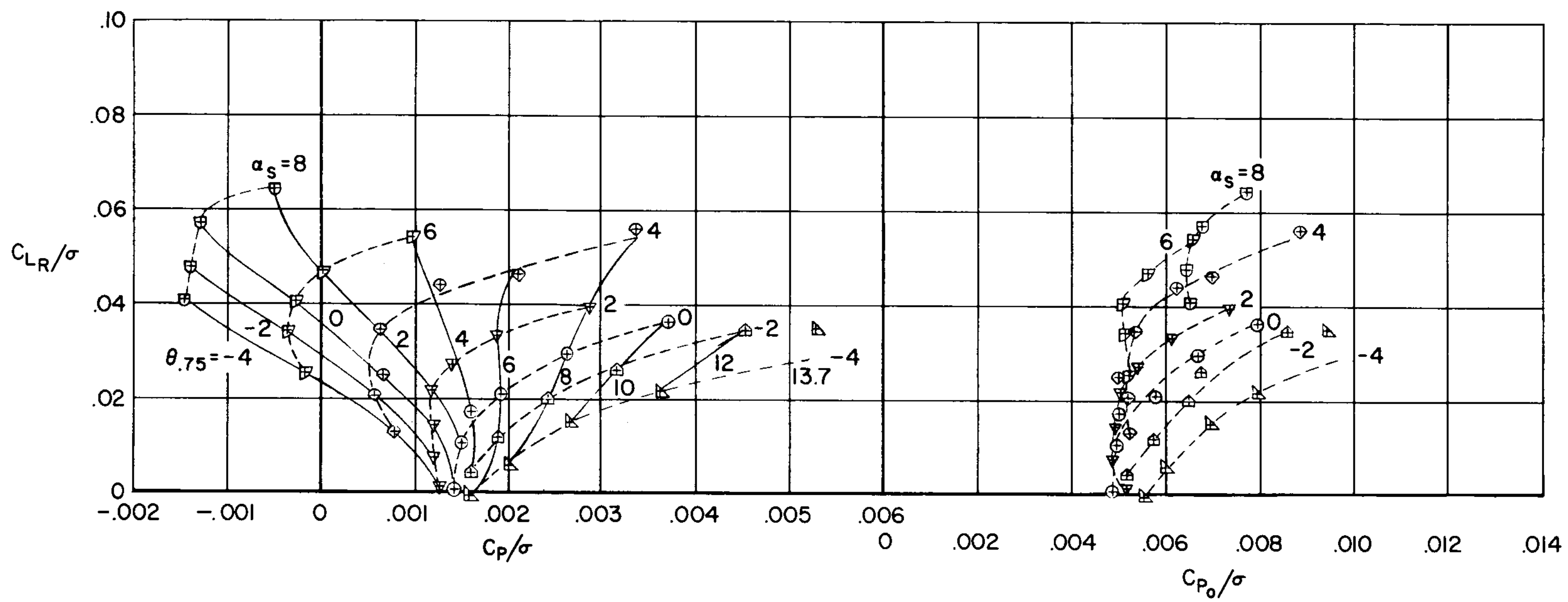


(b) Power coefficients.

Figure 13.- Articulated rotor with $\theta_1 = 0^{\circ}$, $V/\Omega R = 0.62$, $M_{(1)(90)} = 0.73$.

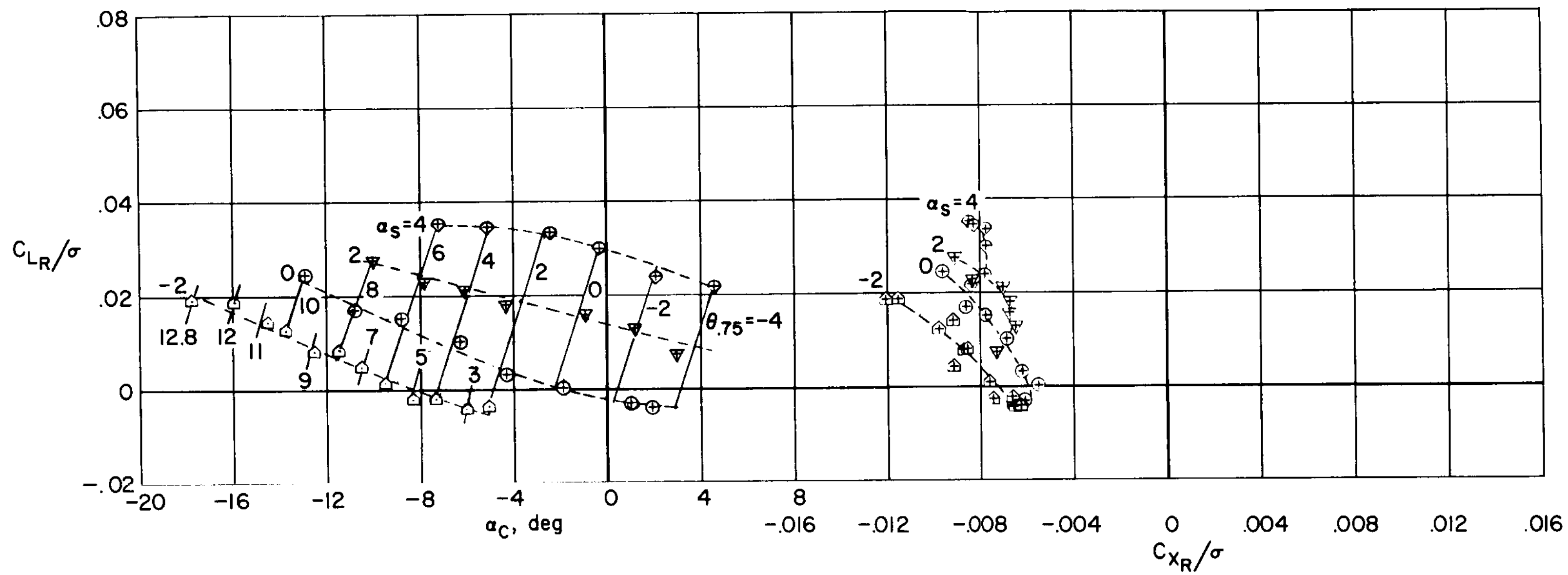


(a) Control axis and propulsive force coefficients.

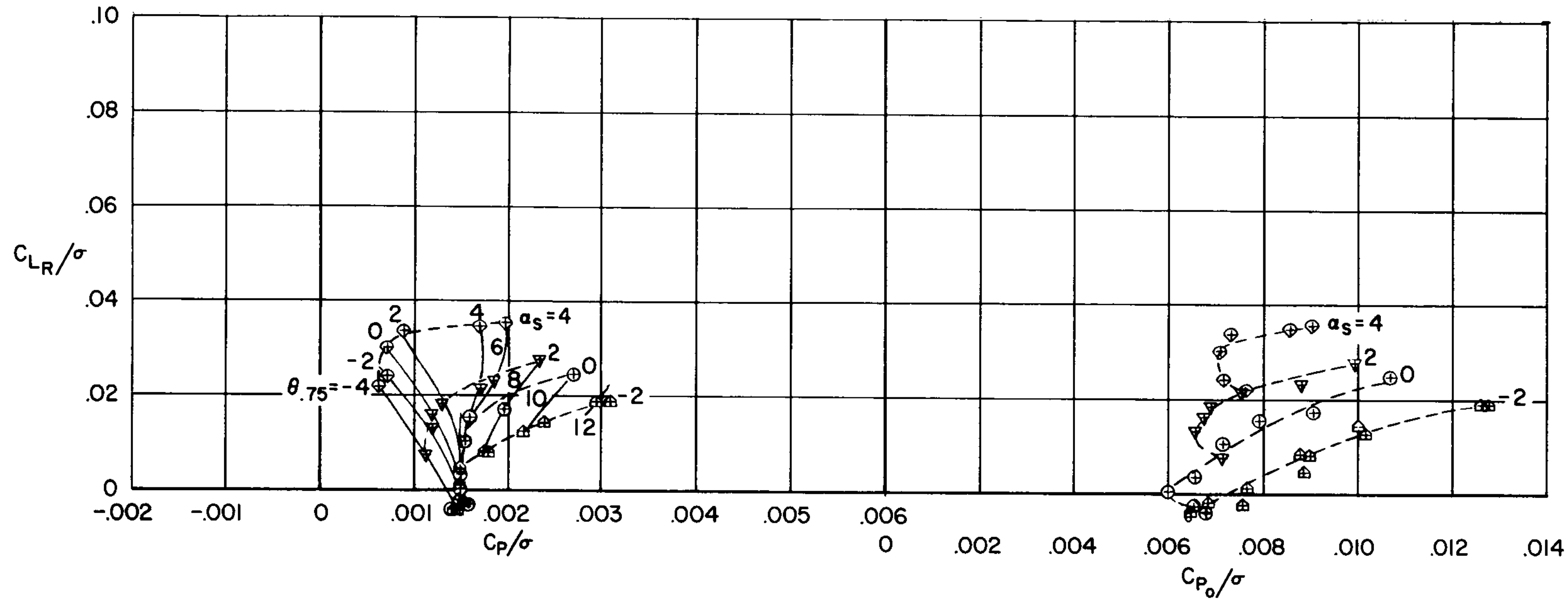


(b) Power coefficients.

Figure 14.- Articulated rotor with $\theta_1 = 0^\circ$, $V/\Omega R = 0.71$, $M_{(1)(90)} = 0.68$.

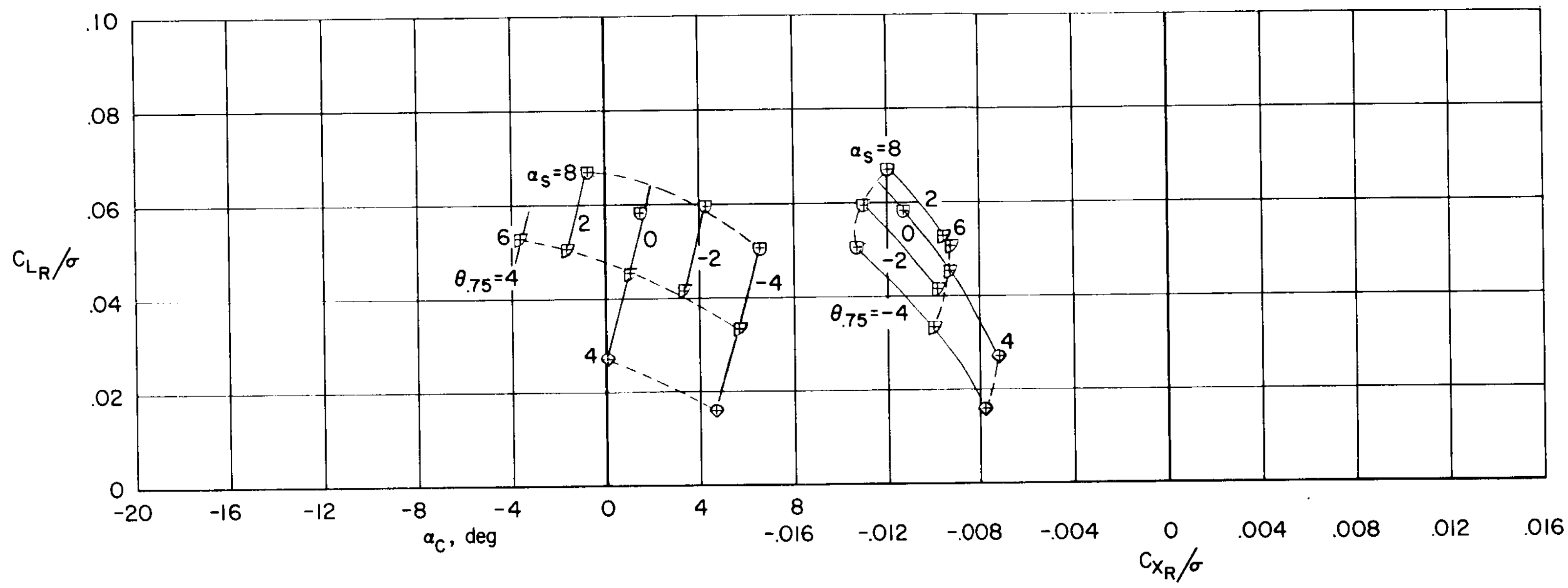


(a) Control axis and propulsive force coefficients.

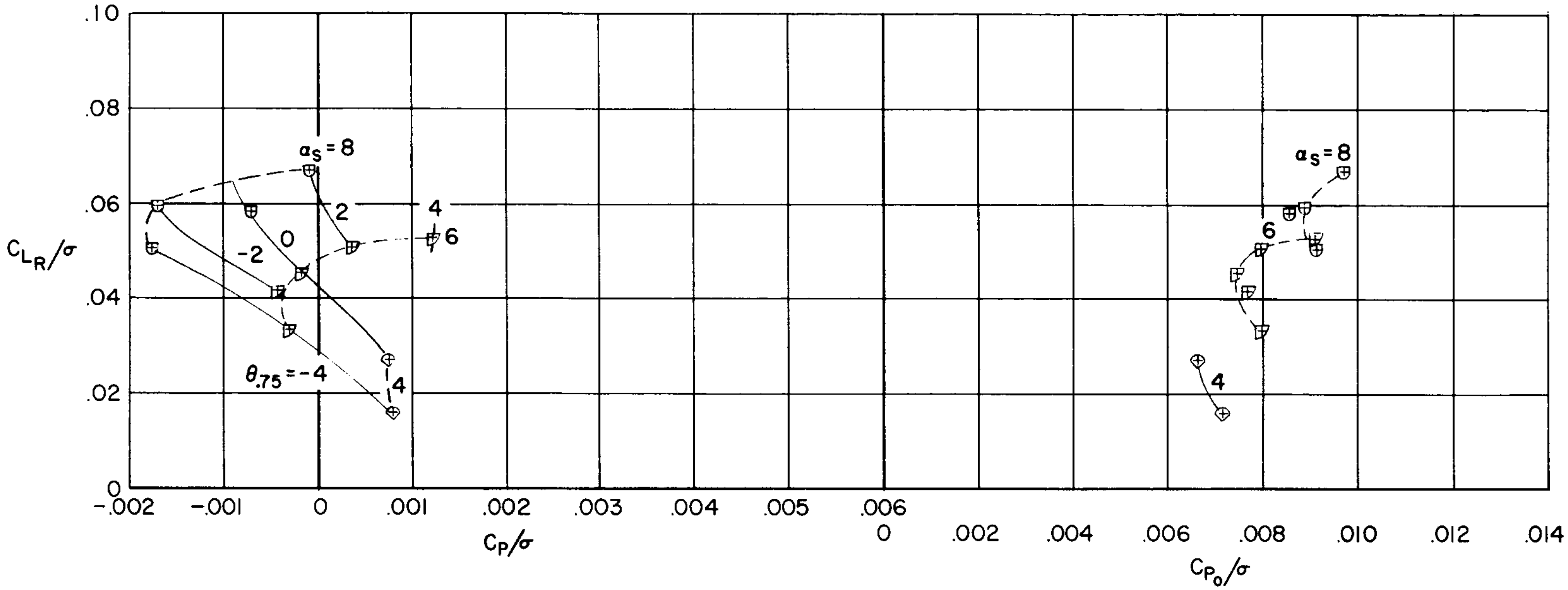


(b) Power coefficients.

Figure 15.- Articulated rotor with $\theta_1 = 0^{\circ}$, $V/\Omega R = 0.82$, $M_{(1)(90)} = 0.62$.

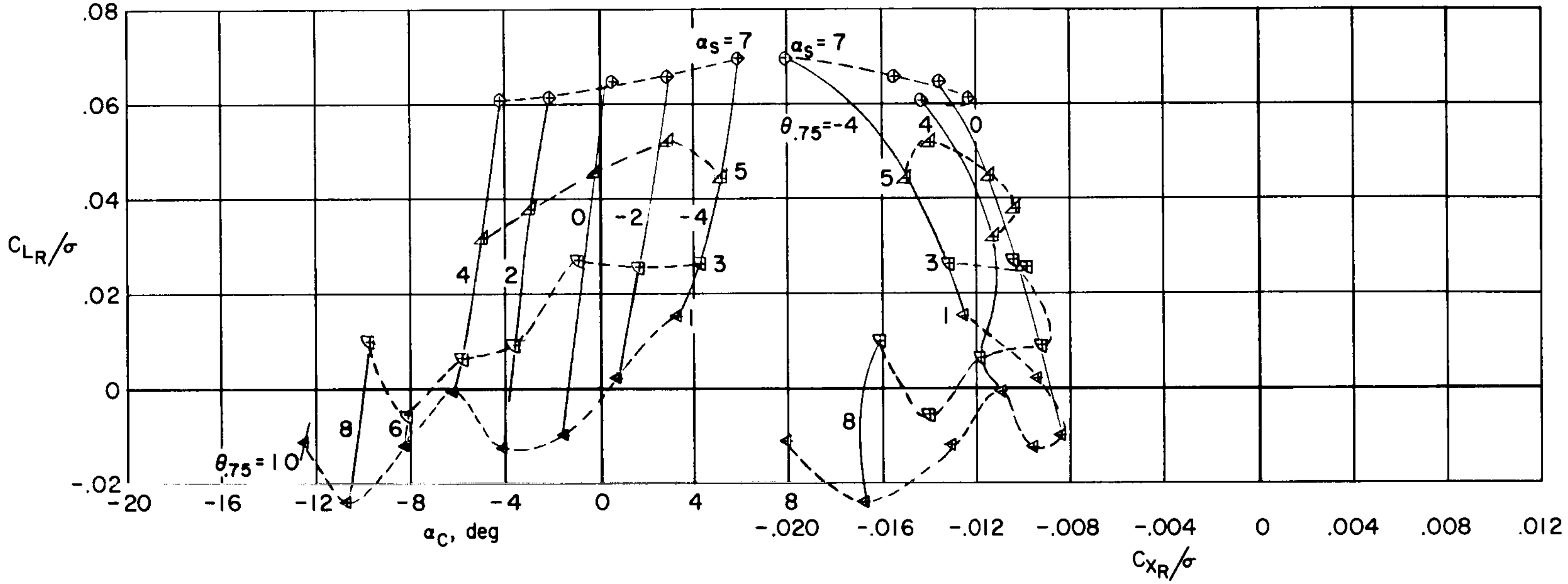


(a) Control axis and propulsive force coefficients.

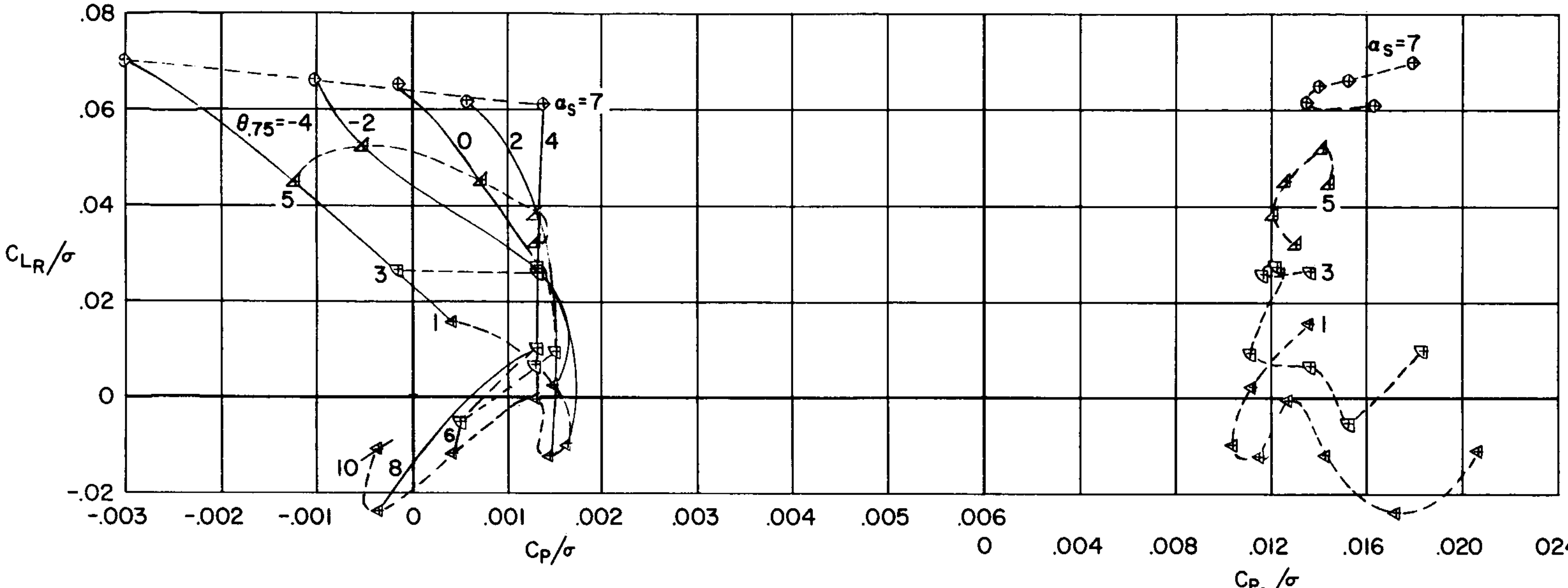


(b) Power coefficients.

Figure 16.- Articulated rotor with $\theta_1 = 0^{\circ}$, $V/\Omega R = 0.83$, $M_{(1)(90)} = 0.62$.

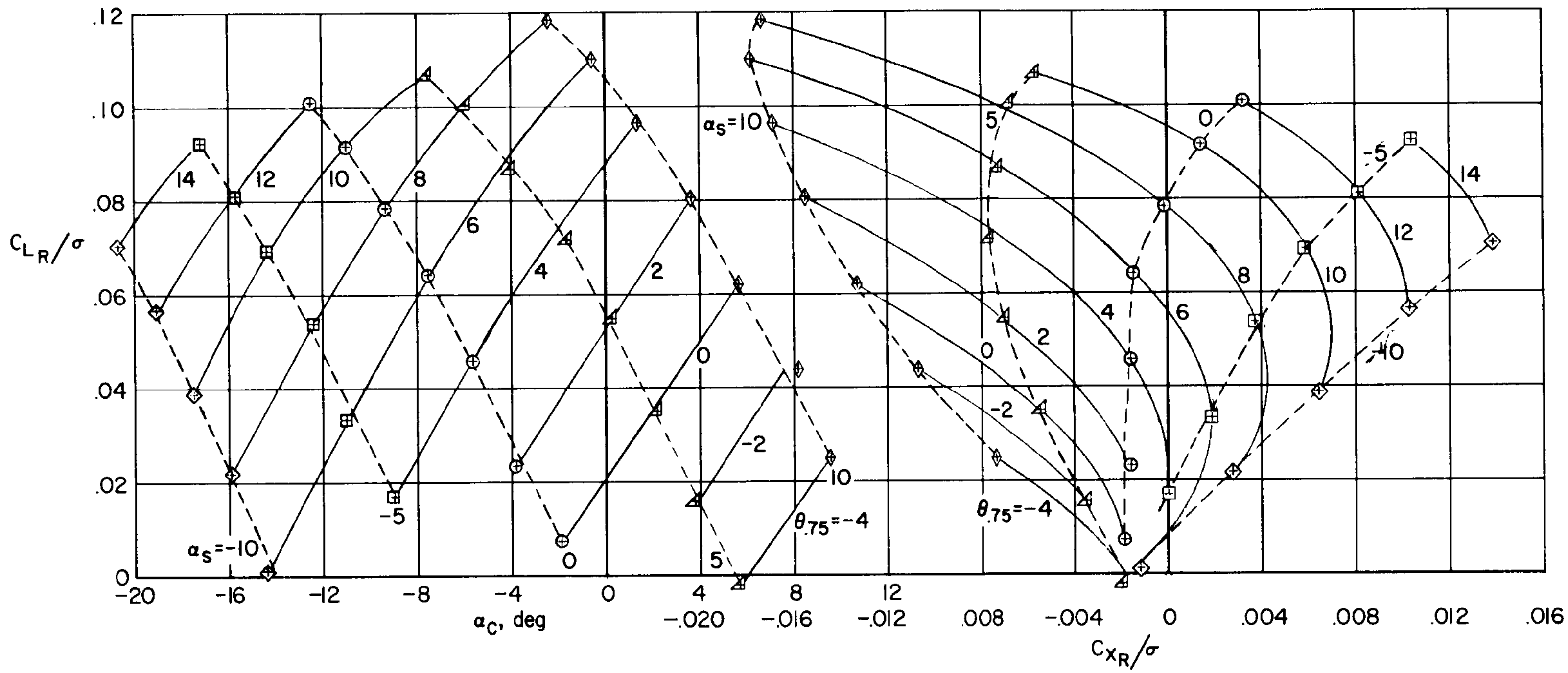


(a) Control axis and propulsive force coefficients.

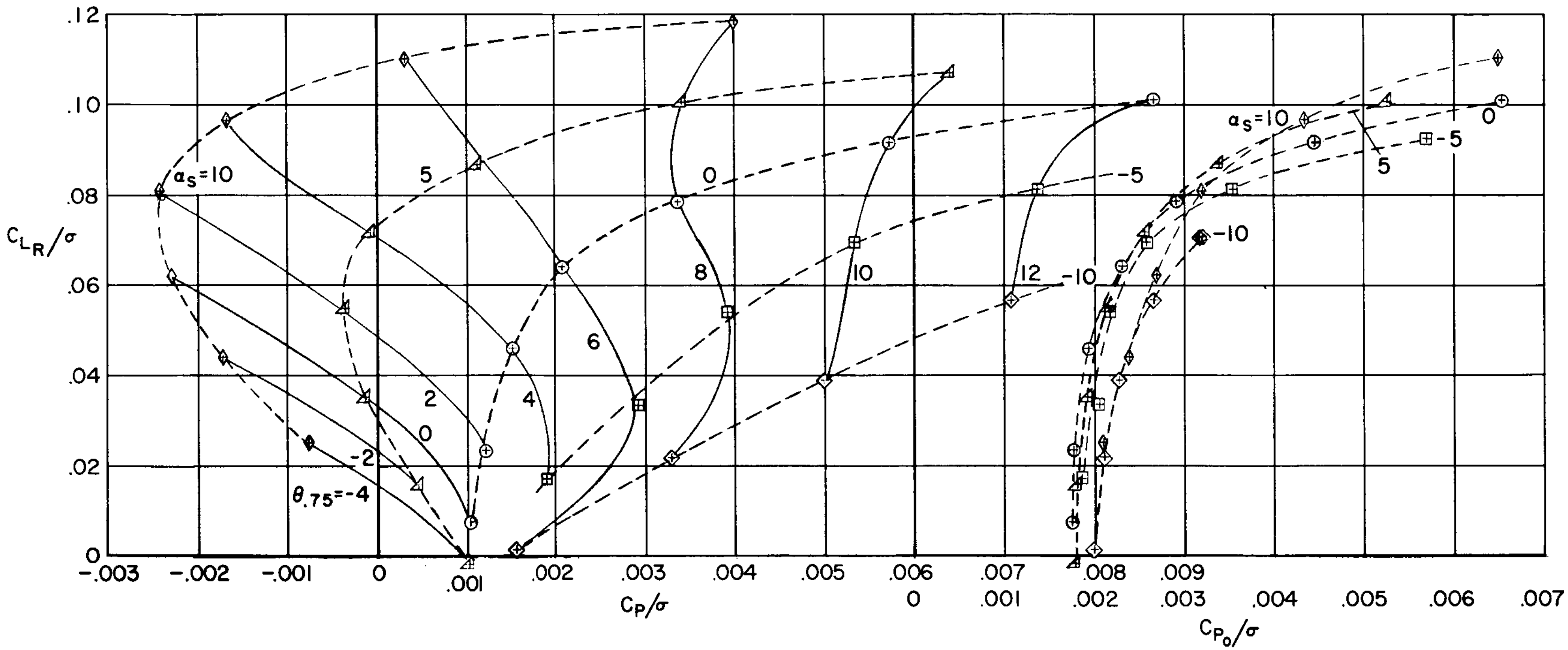


(b) Power coefficients.

Figure 17.- Articulated rotor with $\theta_1 = 0^\circ$, $V/\Omega R = 1.05$, $M_{(1)(90)} = 0.54$.

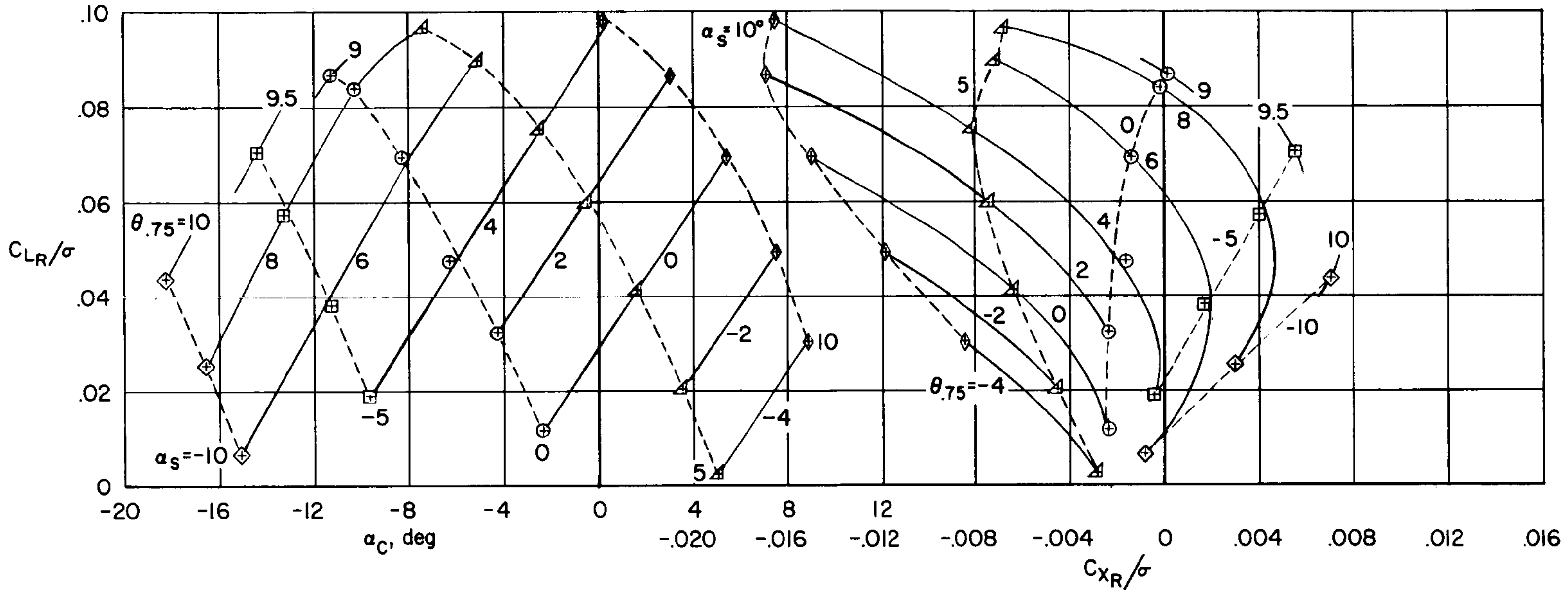


(a) Control axis and propulsive force coefficients.

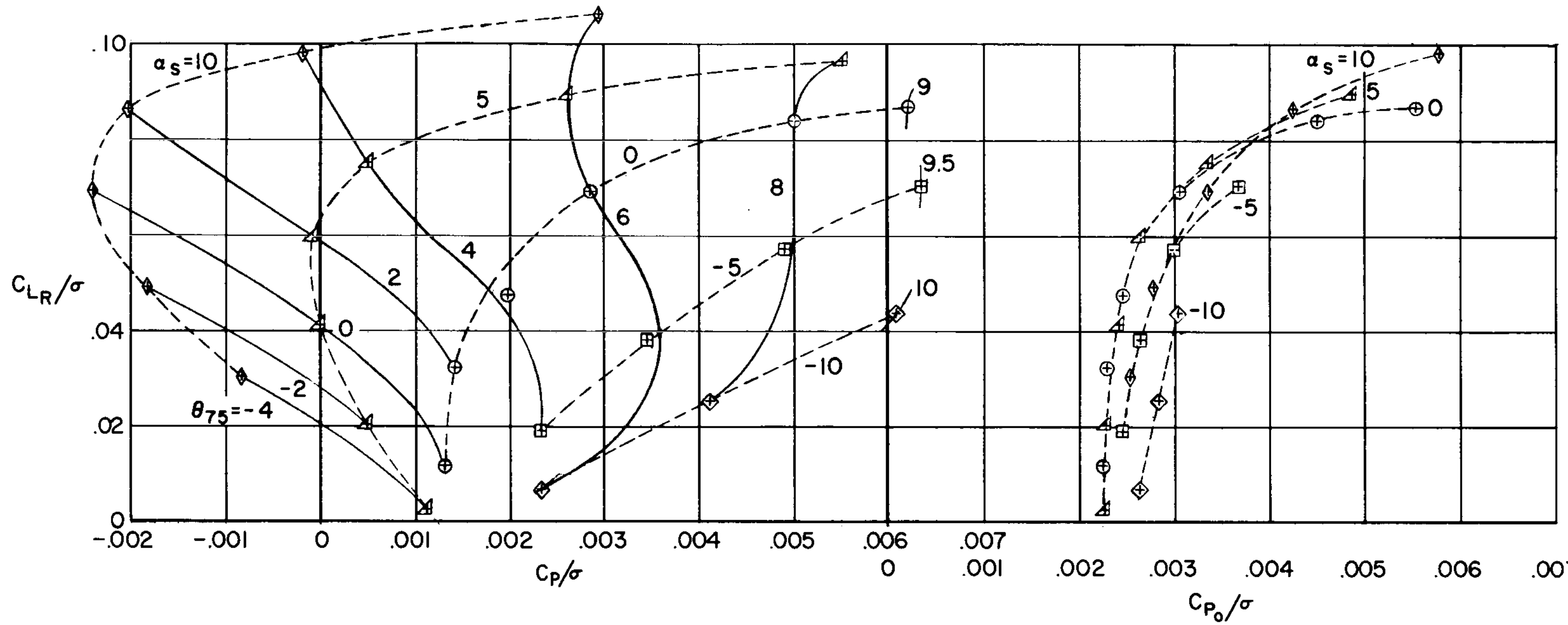


(b) Power coefficients.

Figure 18.- Articulated rotor with $\theta_1 = 0^{\circ}$, $V/\Omega R = 0.40$, $M_{(1)(90)} = 0.67$.

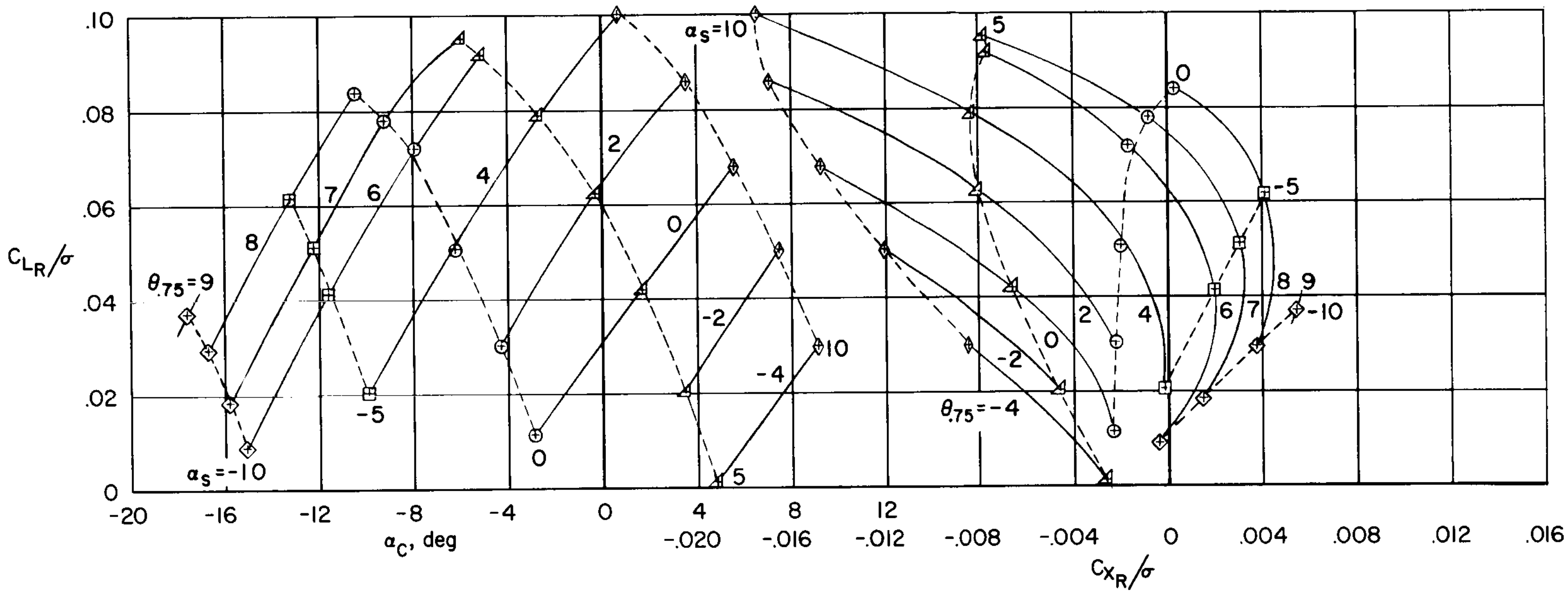


(a) Control axis and propulsive force coefficients.

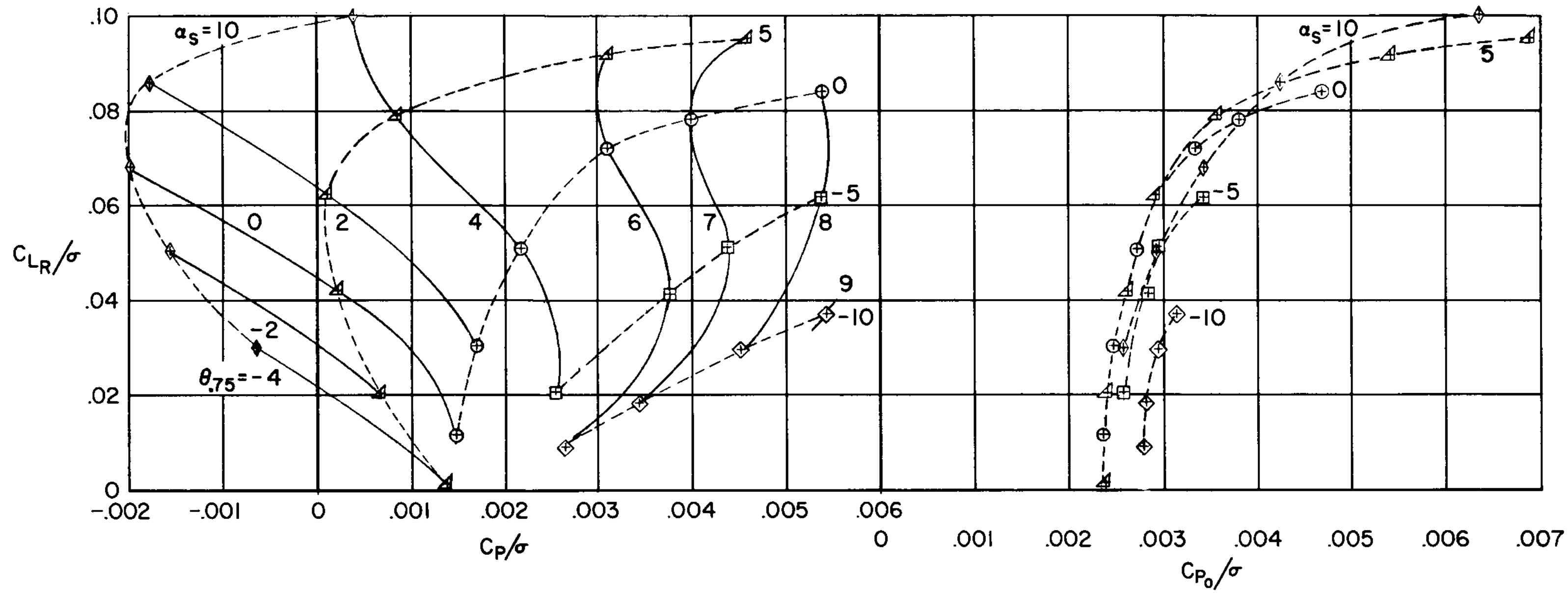


(b) Power coefficients.

Figure 19.- Articulated rotor with $\theta_1 = 0^{\circ}$, $V/\Omega R = 0.41$, $M_{(1)(90)} = 0.87$.

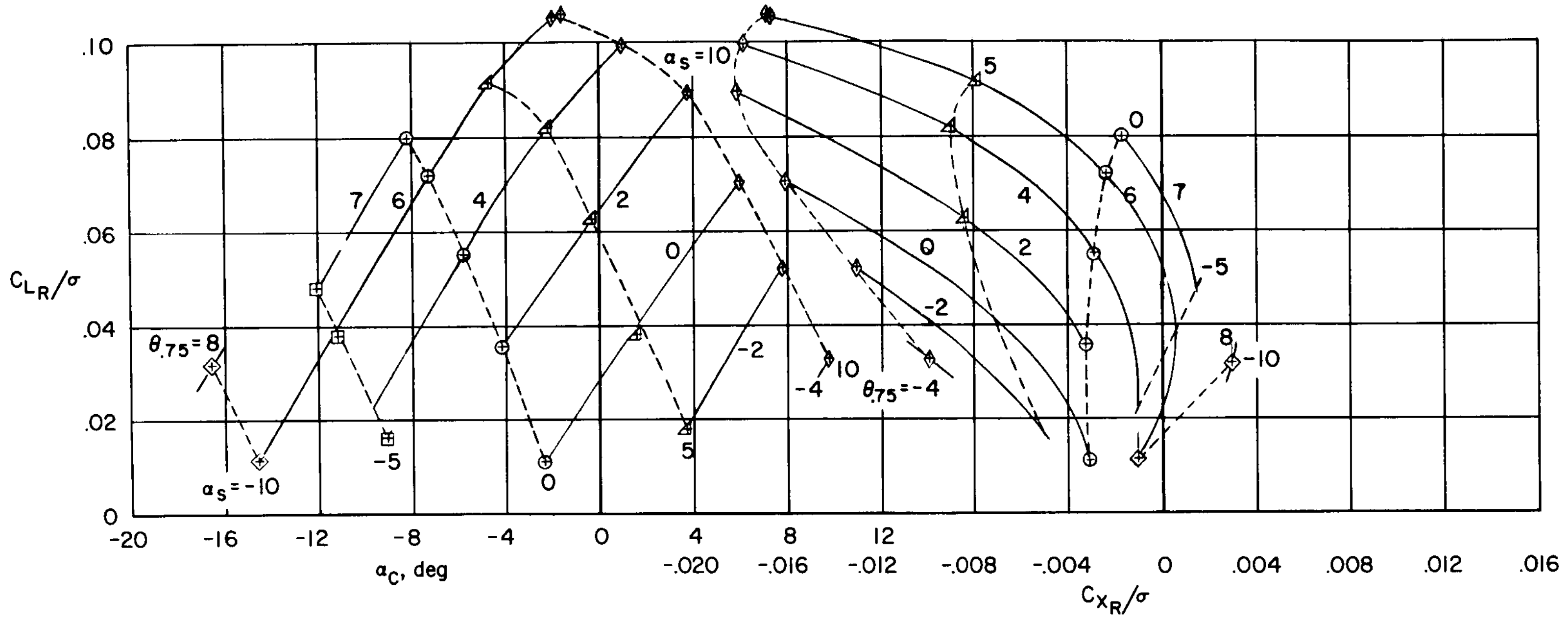


(a) Control axis and propulsive force coefficients.

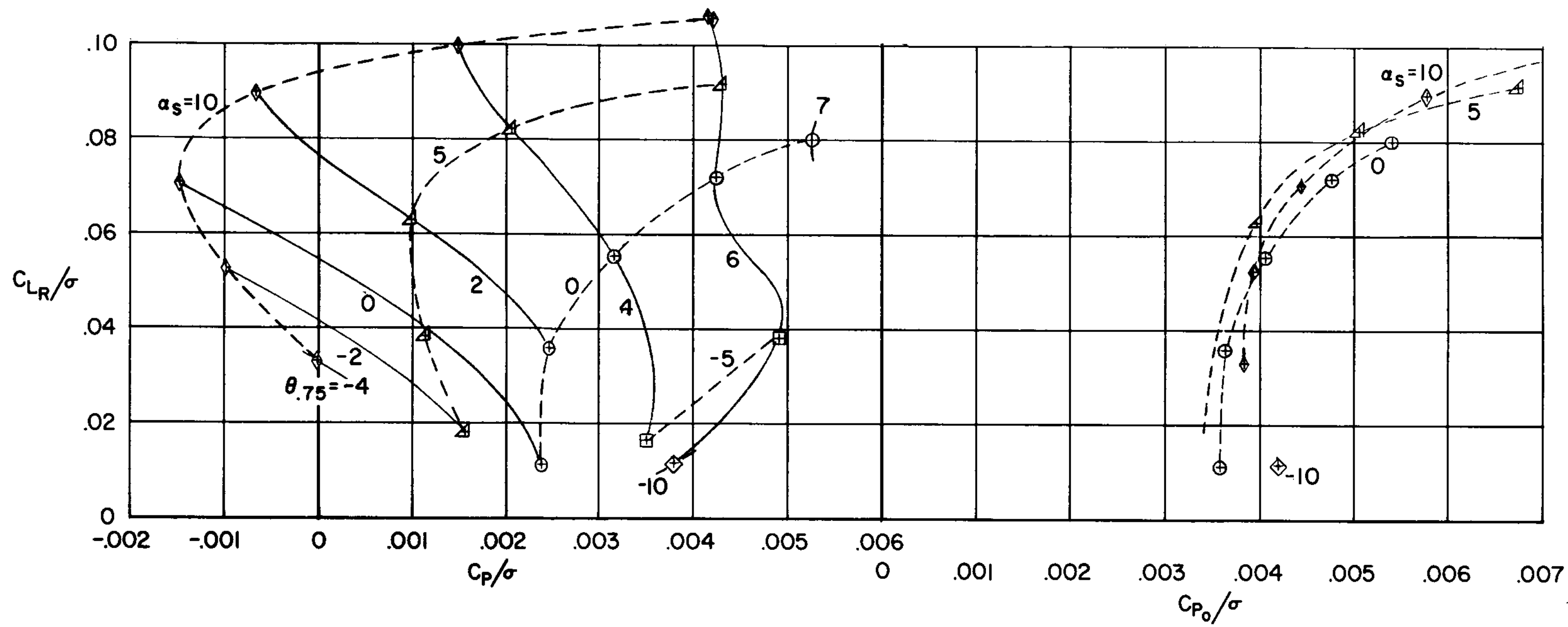


(b) Power coefficients.

Figure 20.- Articulated rotor with $\theta_1 = 0^\circ$, $V/\Omega R = 0.39$, $M_{(1)(90)} = 0.89$.

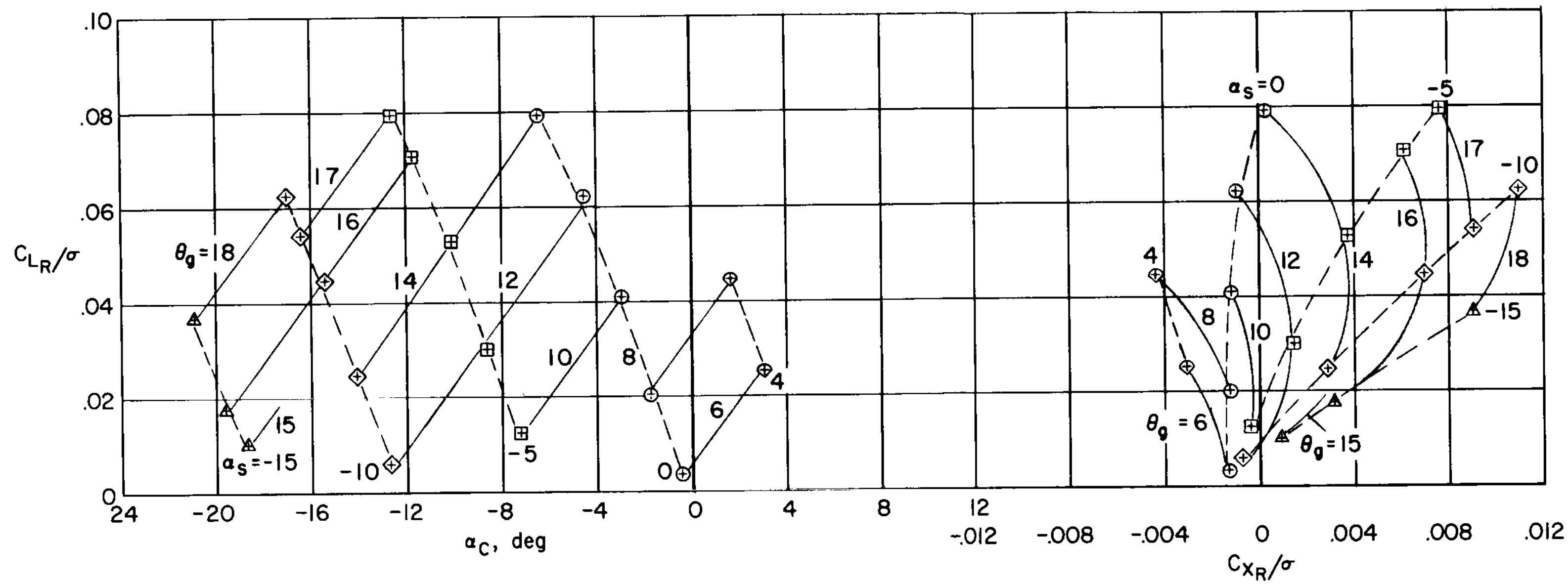


(a) Control axis and propulsive force coefficients.

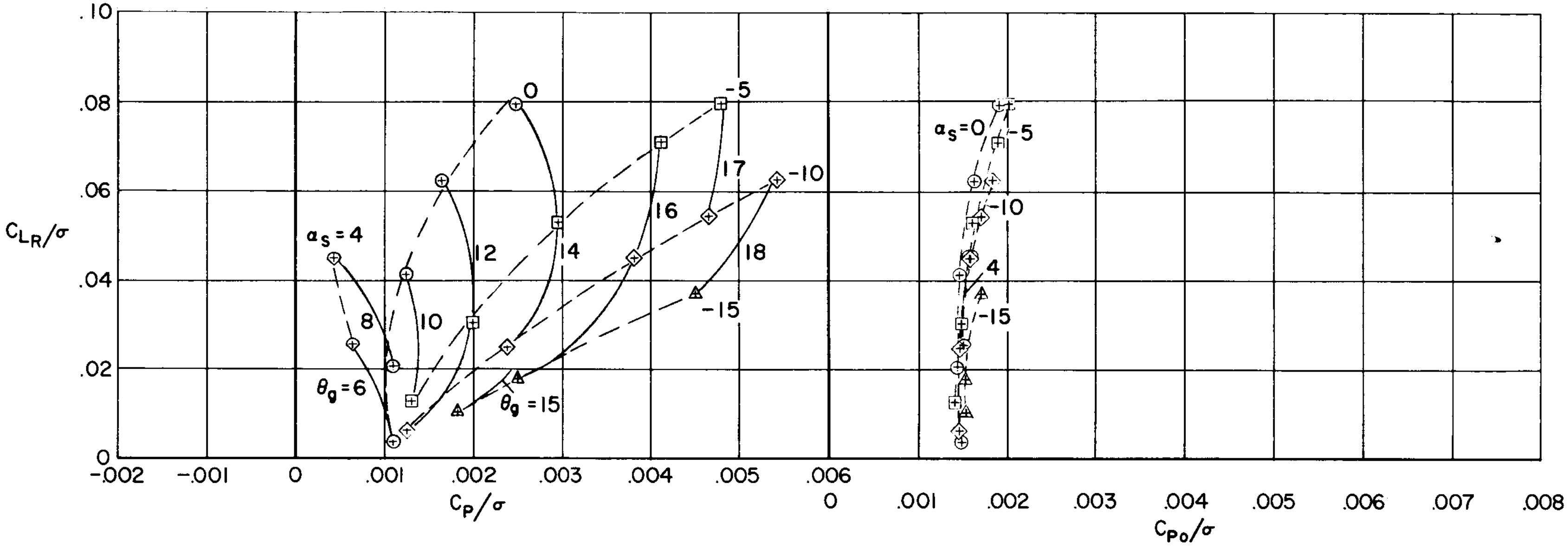


(b) Power coefficients.

Figure 21.- Articulated rotor with $\theta_1 = 0^\circ$, $V/\Omega R = 0.39$, $M_{(1)(90)} = 0.93$.

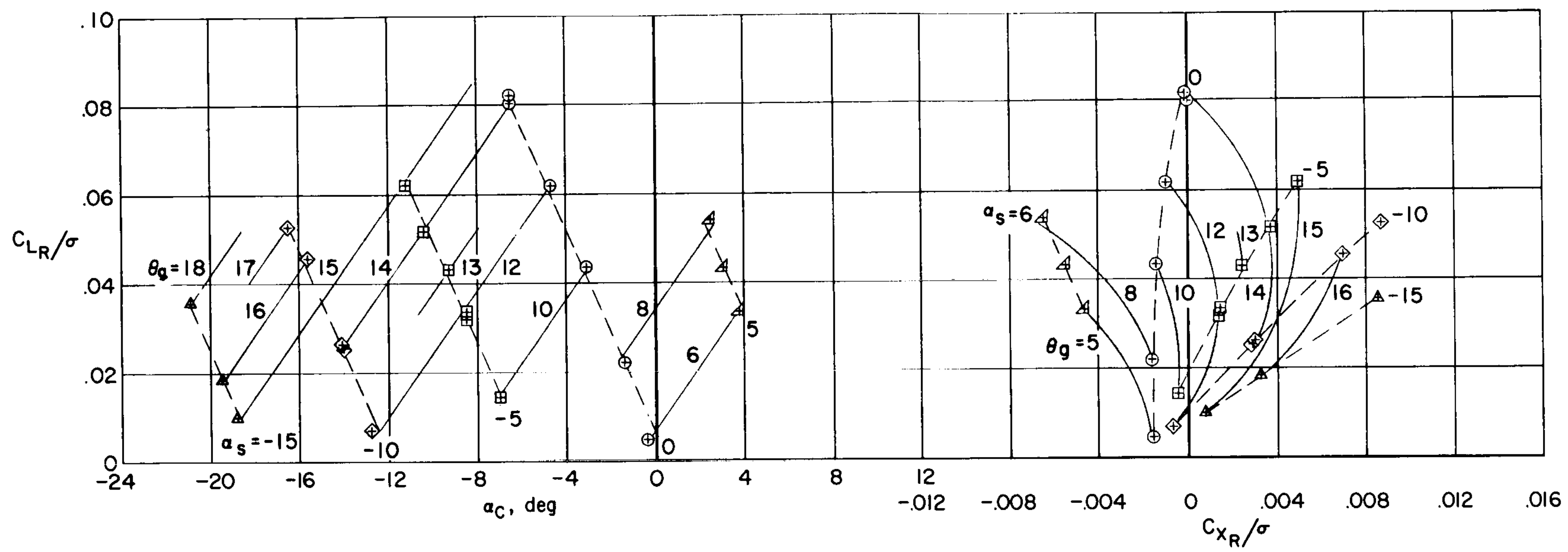


(a) Control axis and propulsive force coefficients.

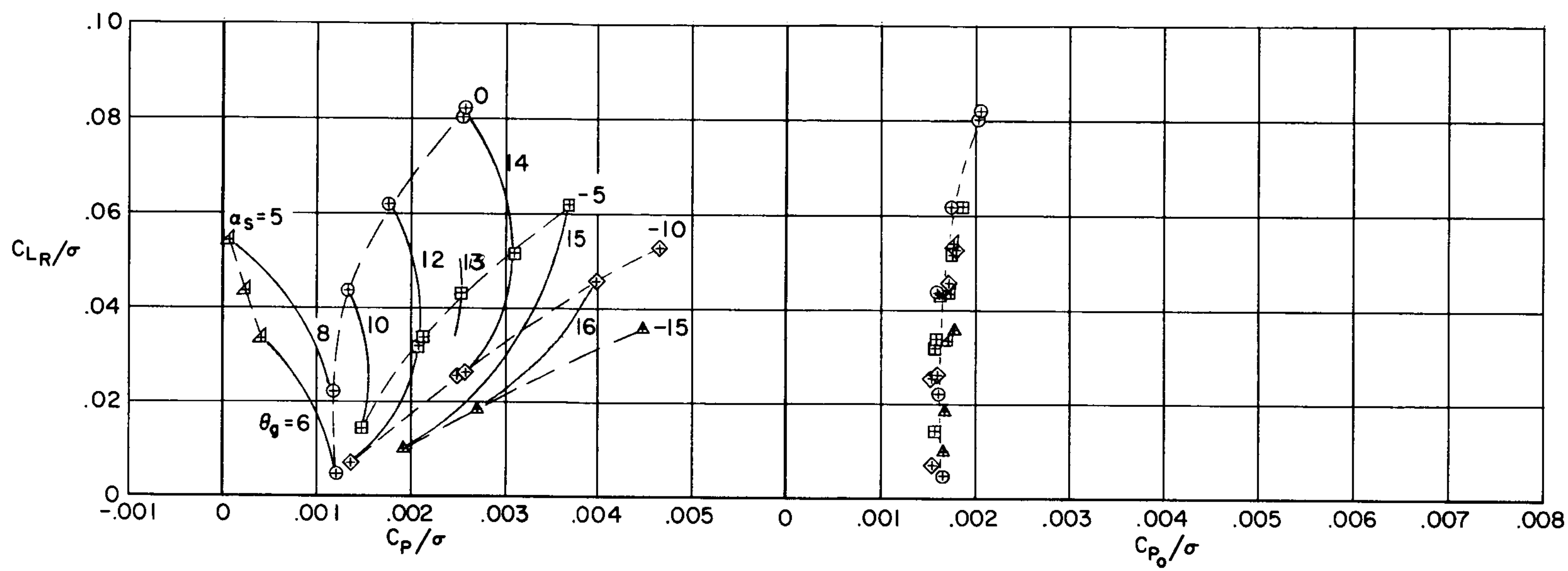


(b) Power coefficients.

Figure 22.- Teetering 48-ft rotor with standard blades, $V/\Omega R = 0.30$, $M_{(1)(90)} = 0.79$.

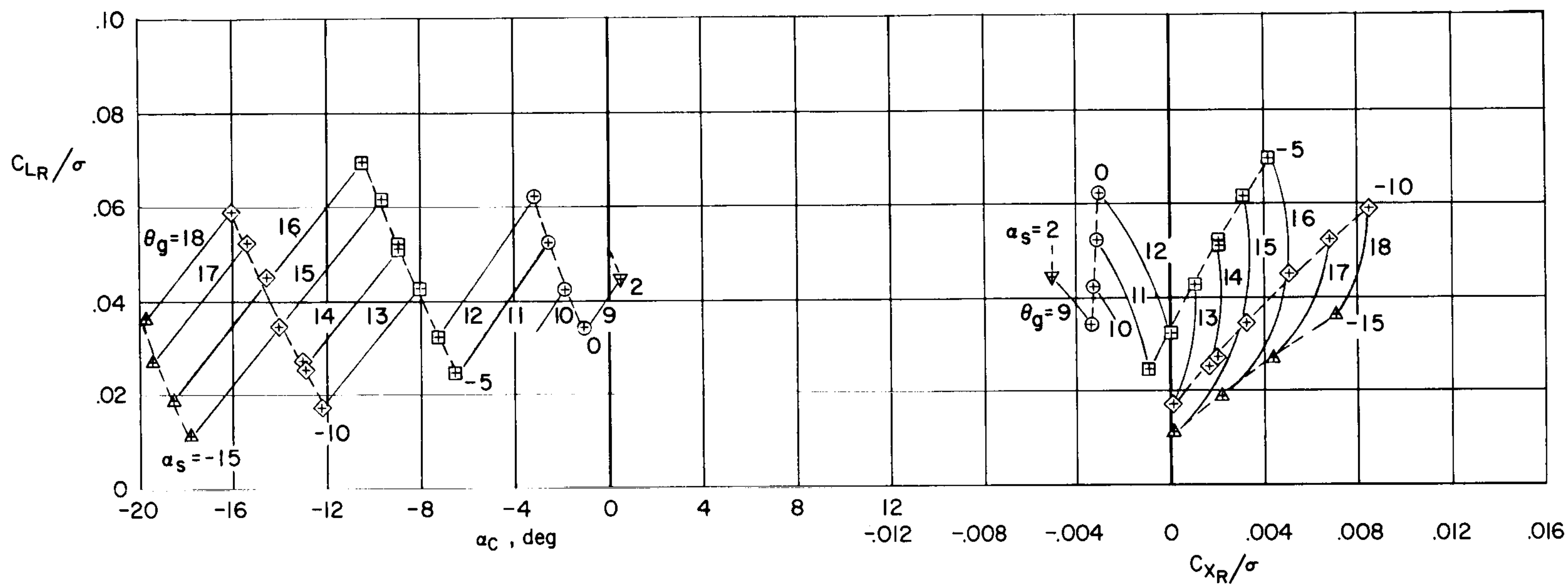


(a) Control axis and propulsive force coefficients.

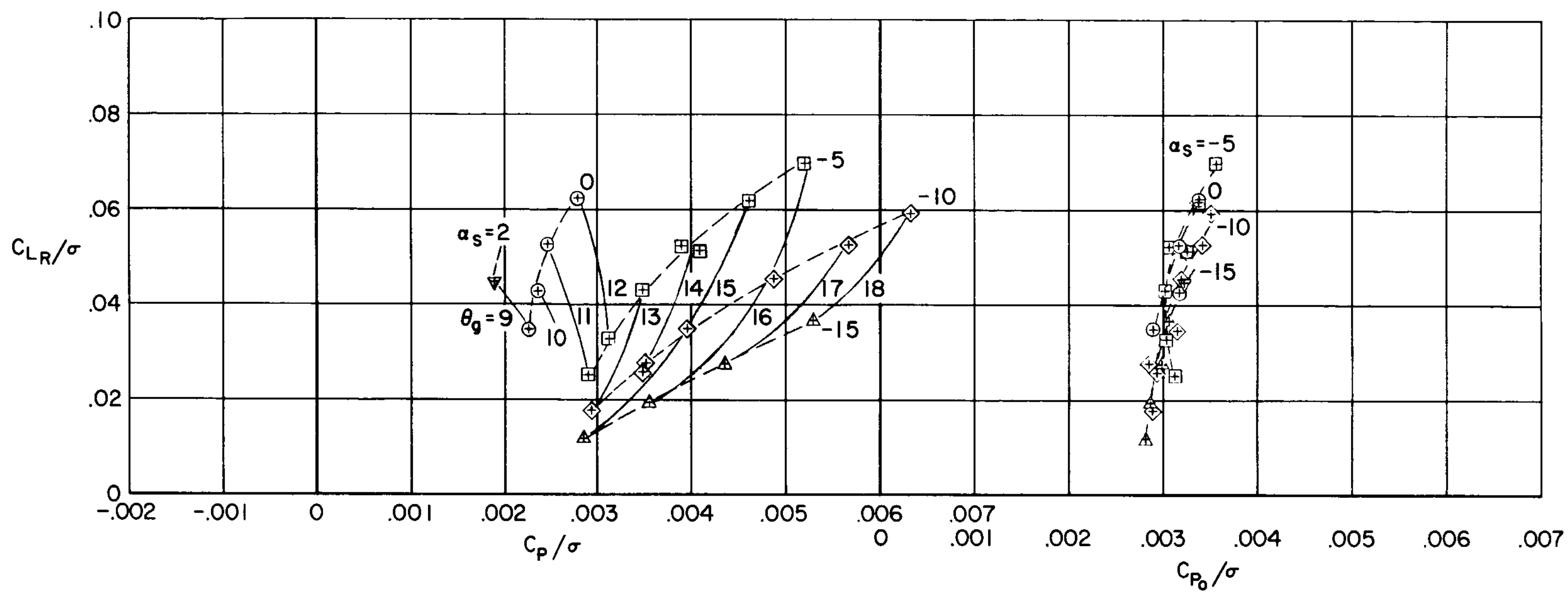


(b) Power coefficients.

Figure 23.- Teetering 48-ft rotor with standard blades, $V/\Omega R = 0.30$, $M_{(1)(90)} = 0.85$.

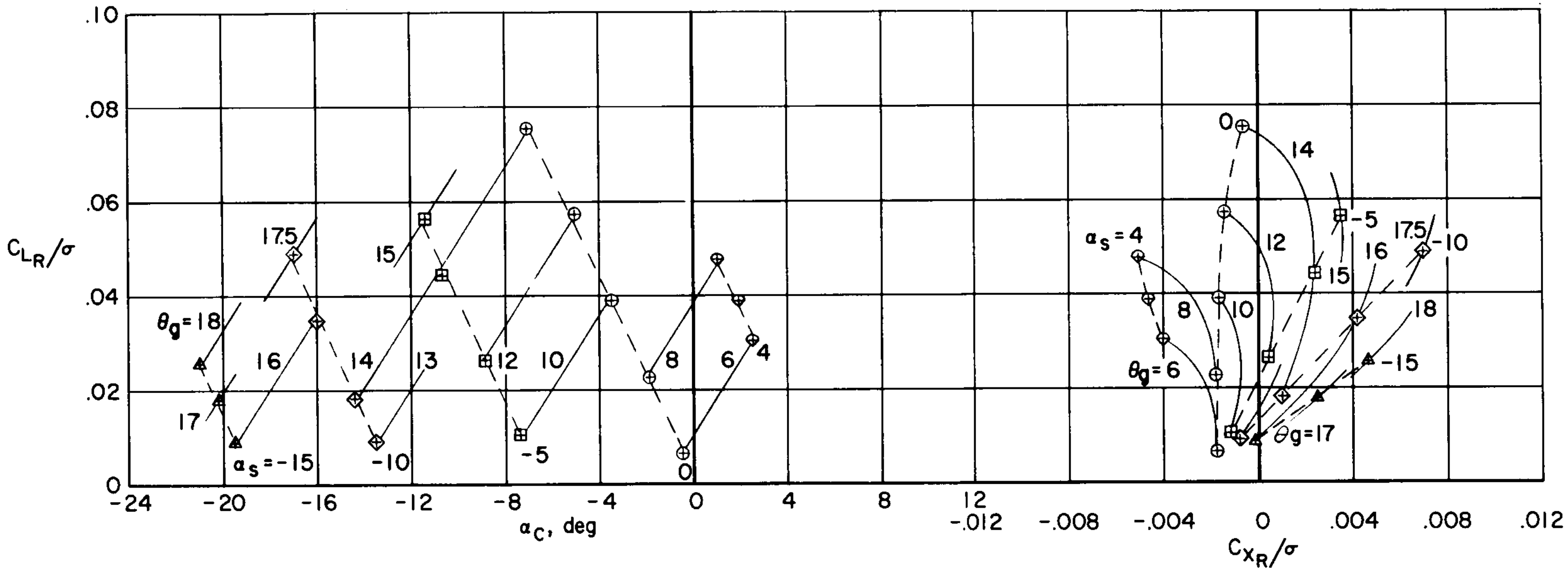


(a) Control axis and propulsive force coefficients.

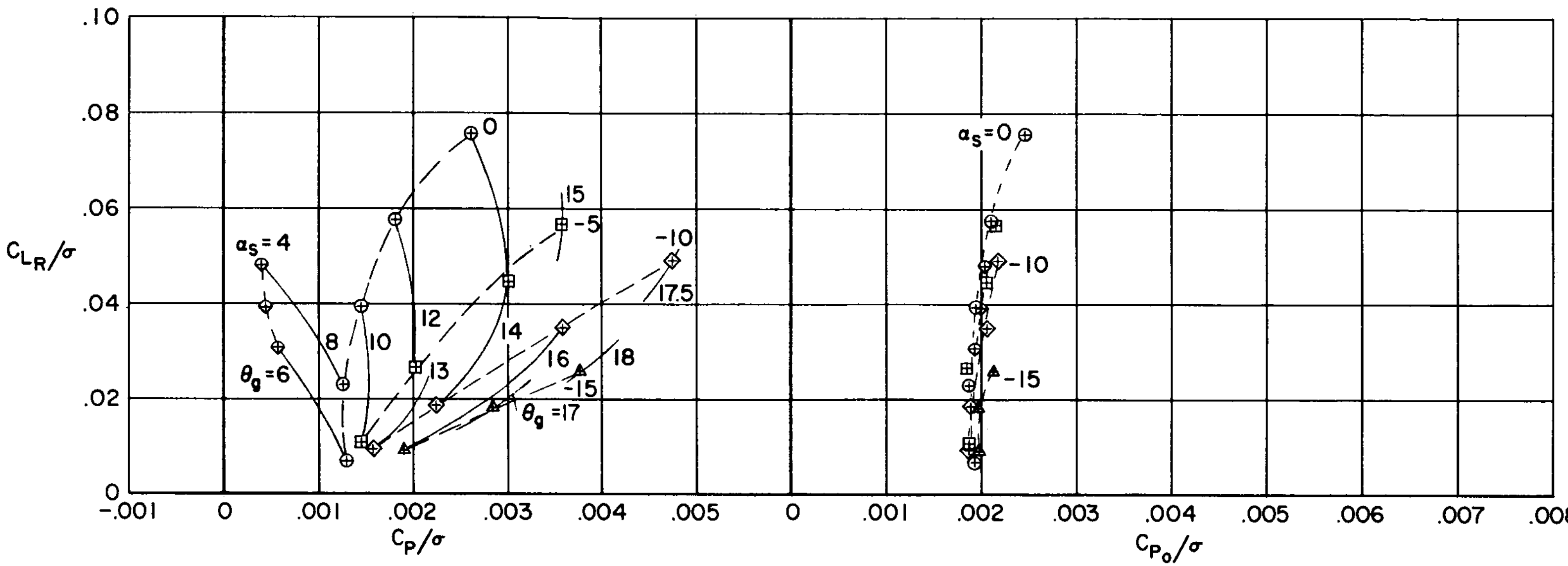


(b) Power coefficients.

Figure 24.- Teetering 48-ft rotor with standard blades, $V/\Omega R = 0.30$, $M_{(1)(90)} = 0.95$.

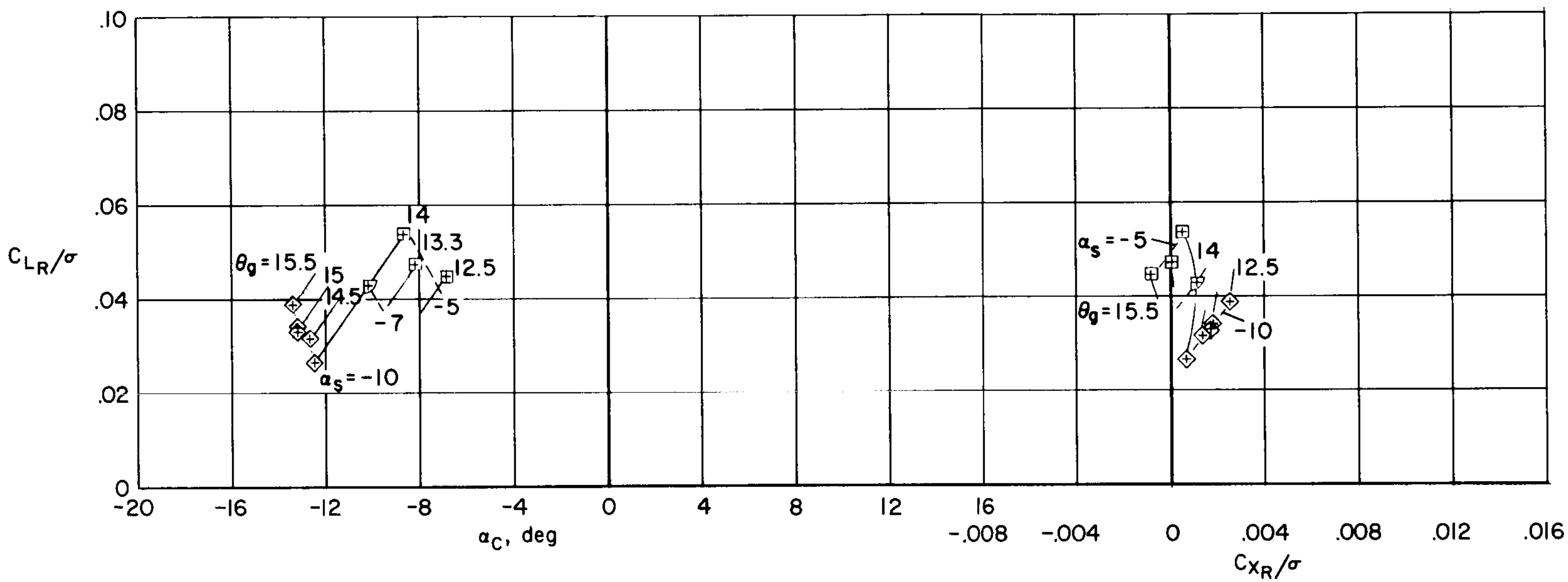


(a) Control axis and propulsive force coefficients.

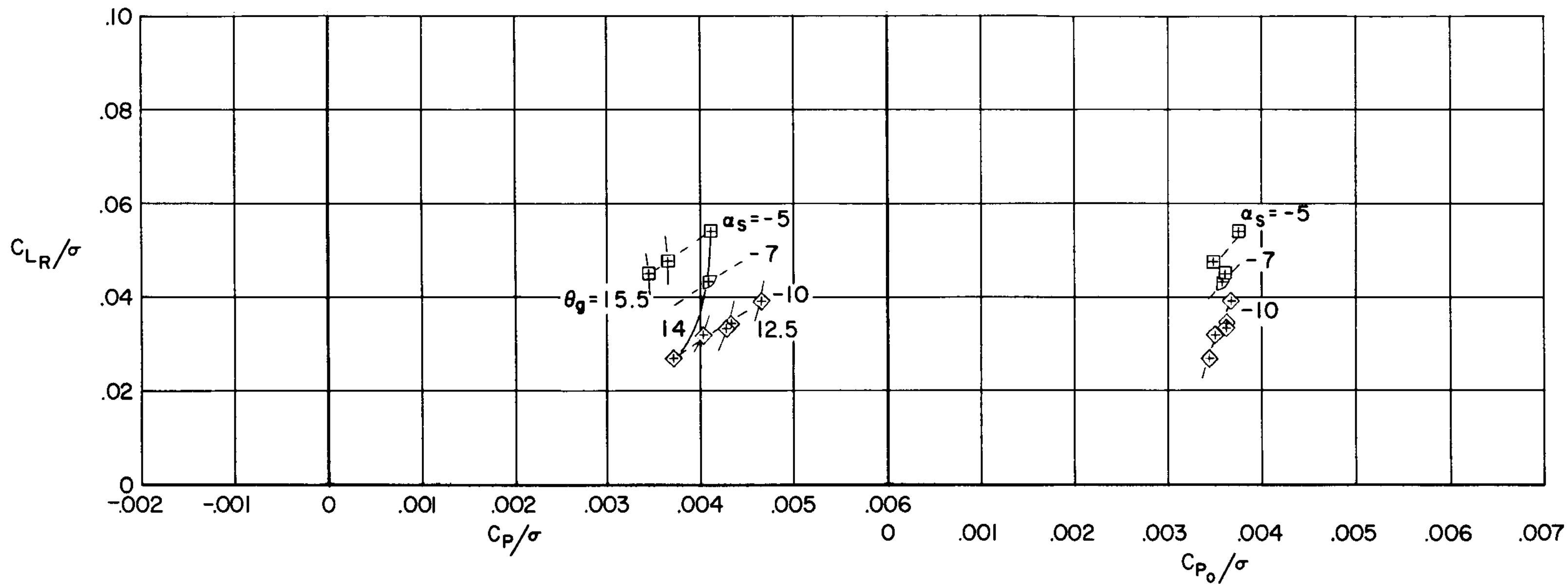


(b) Power coefficients.

Figure 25.- Teetering 48-ft rotor with standard blades, $V/\Omega R = 0.35$, $M_{(1)(90)} = 0.85$.

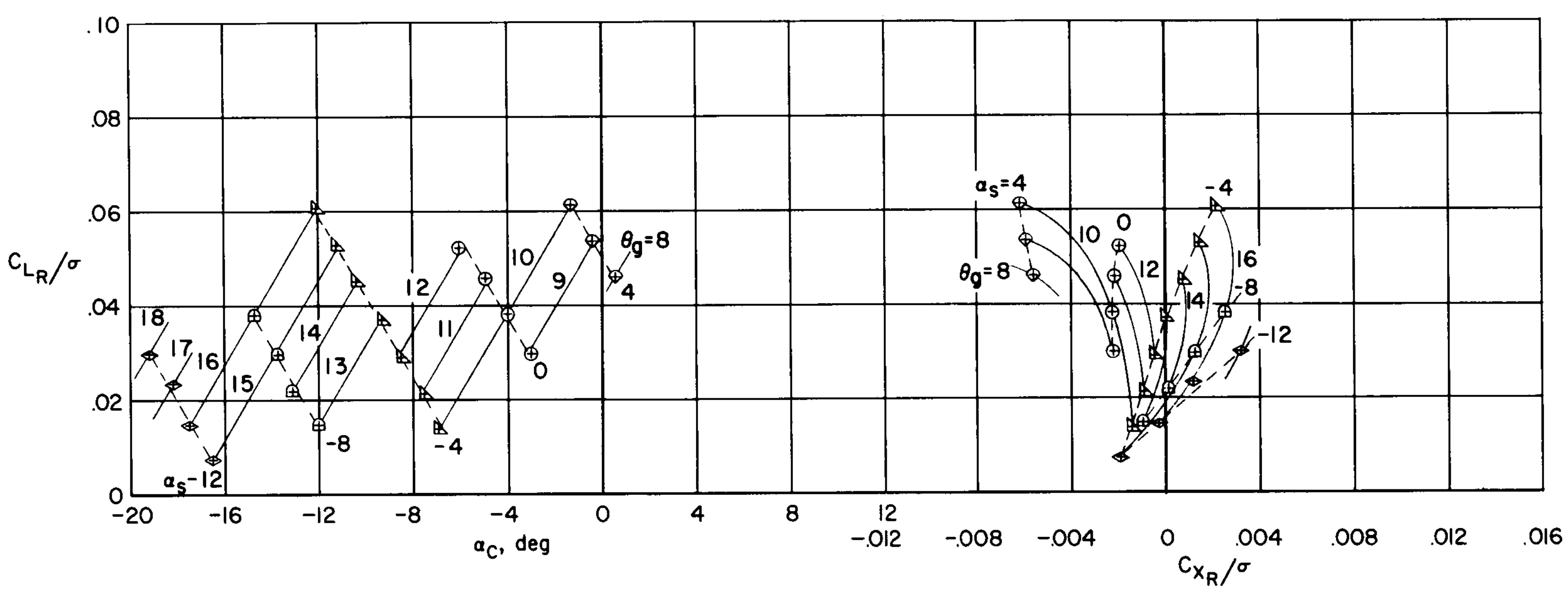


(a) Control axis and propulsive force coefficients.

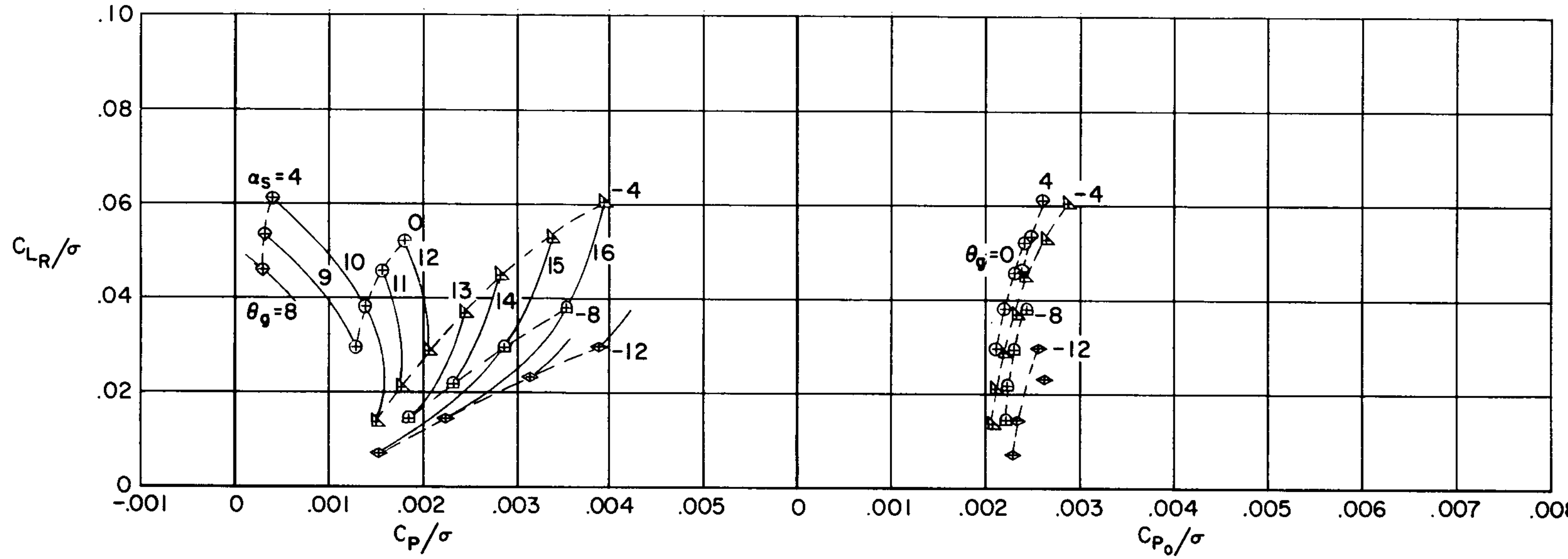


(b) Power coefficients.

Figure 26.- Teetering 48-ft rotor with standard blades, $V/\Omega R = 0.35$, $M_{(1)(90)} = 0.95$.

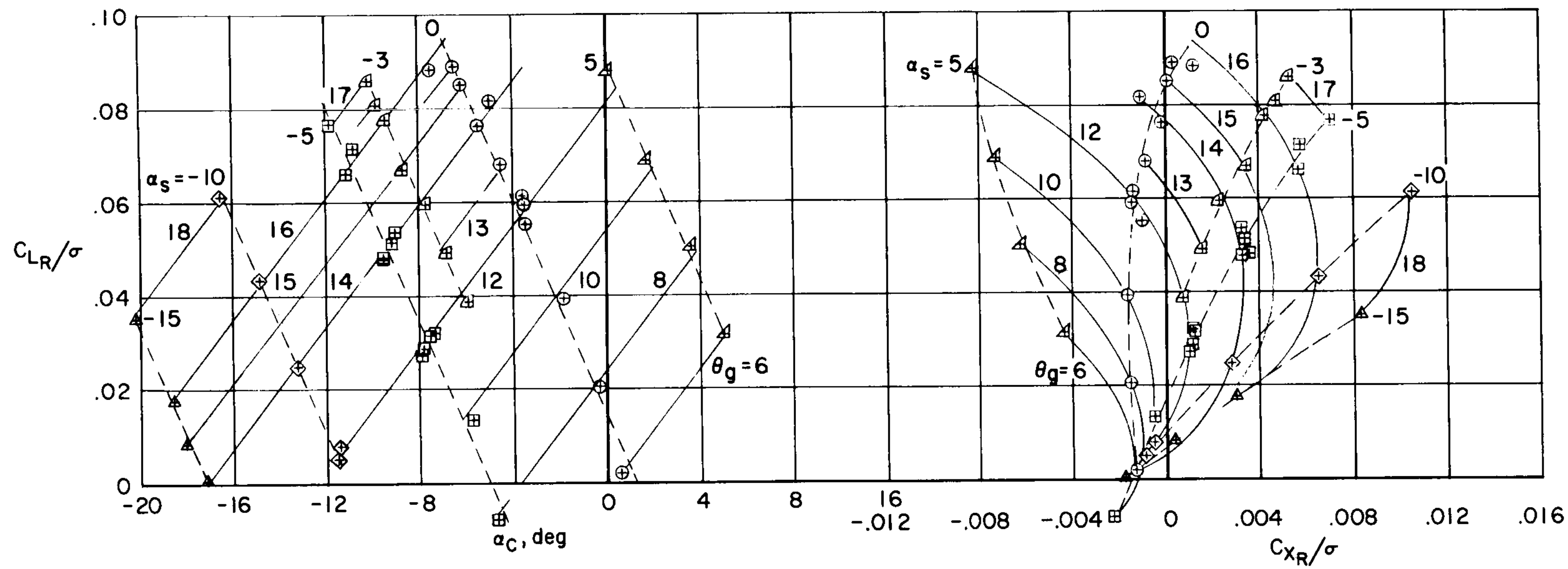


(a) Control axis and propulsive force coefficients.

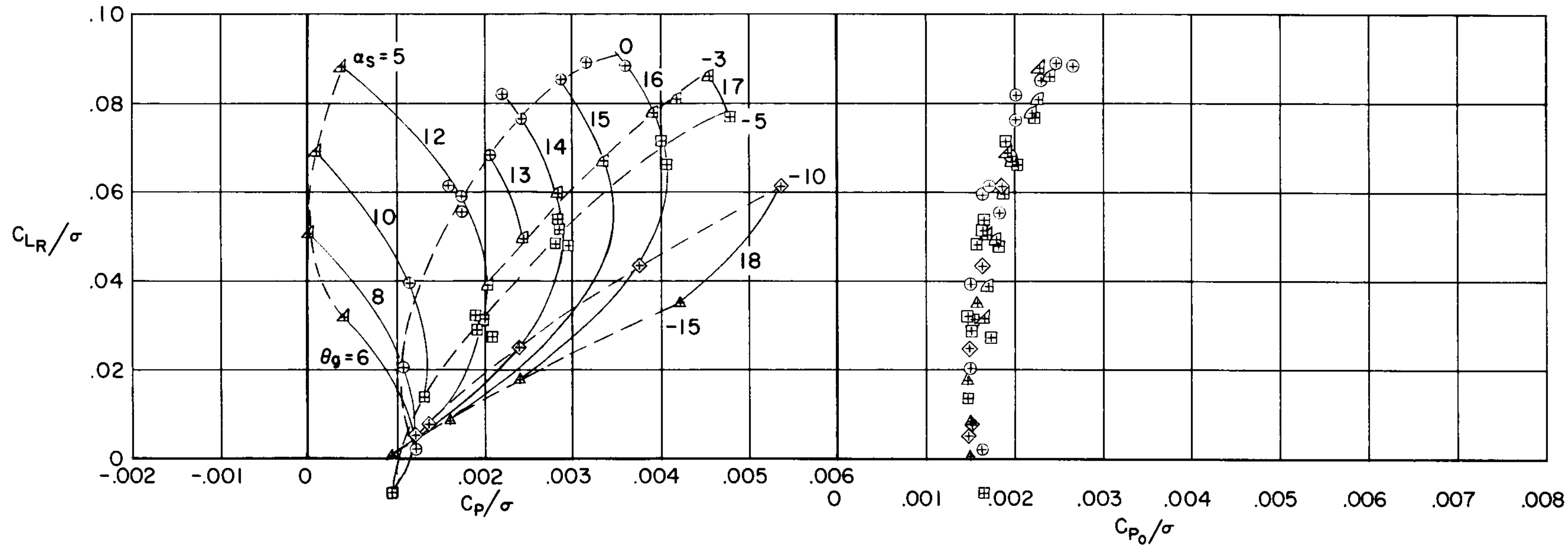


(b) Power coefficients.

Figure 27.- Teetering 48-ft rotor with standard blades, $V/\Omega R = 0.40$, $M_{(1)(90)} = 0.85$.

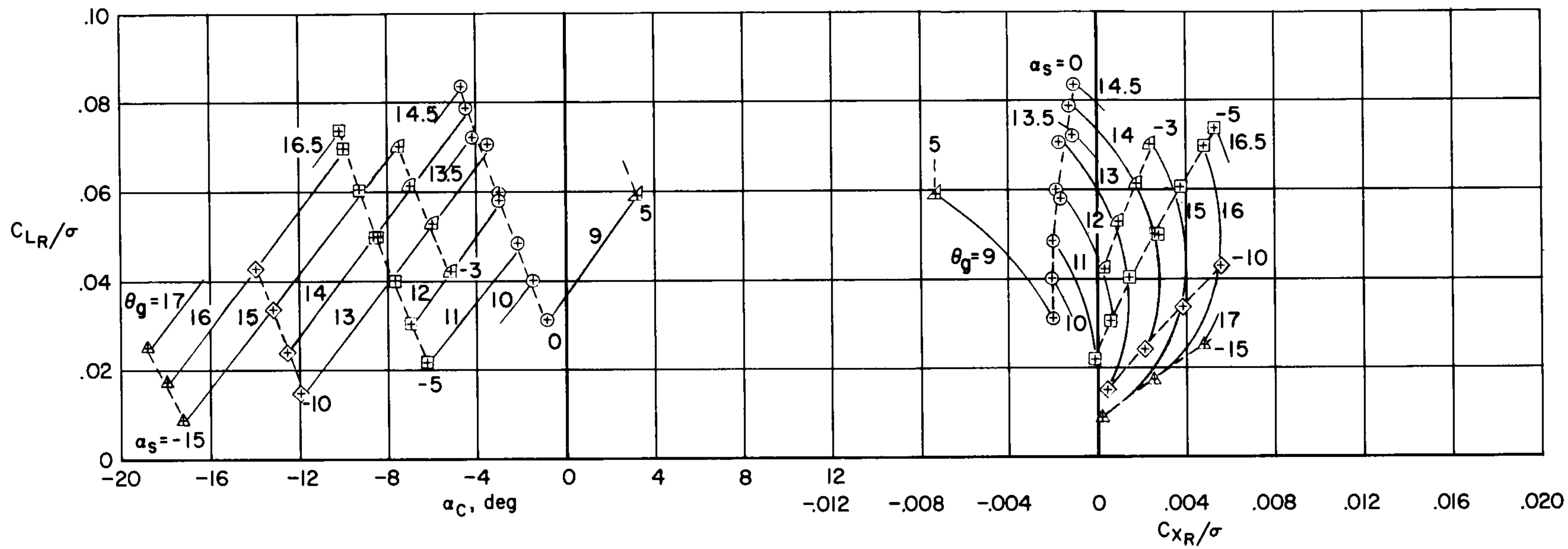


(a) Control axis and propulsive force coefficients.

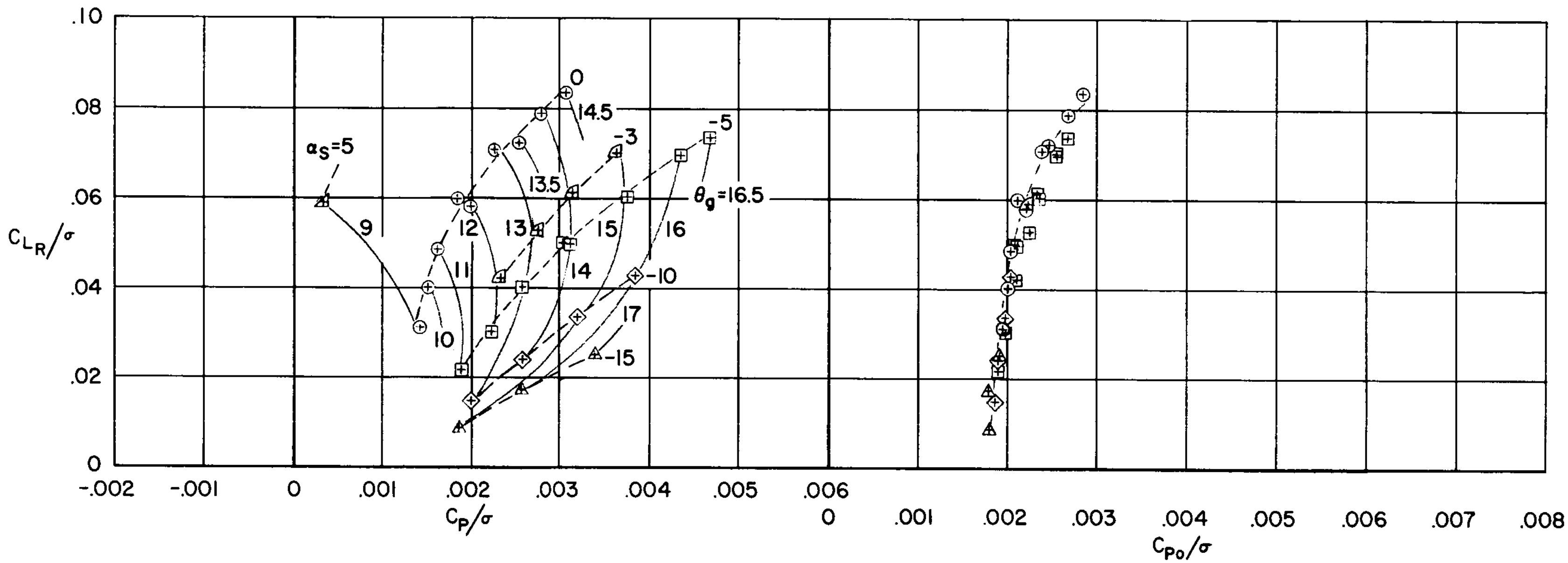


(b) Power coefficients.

Figure 28.- Teetering 48-ft rotor with tapered tip blades, $V/\Omega R = 0.30$, $M_{(1)(90)} = 0.85$.

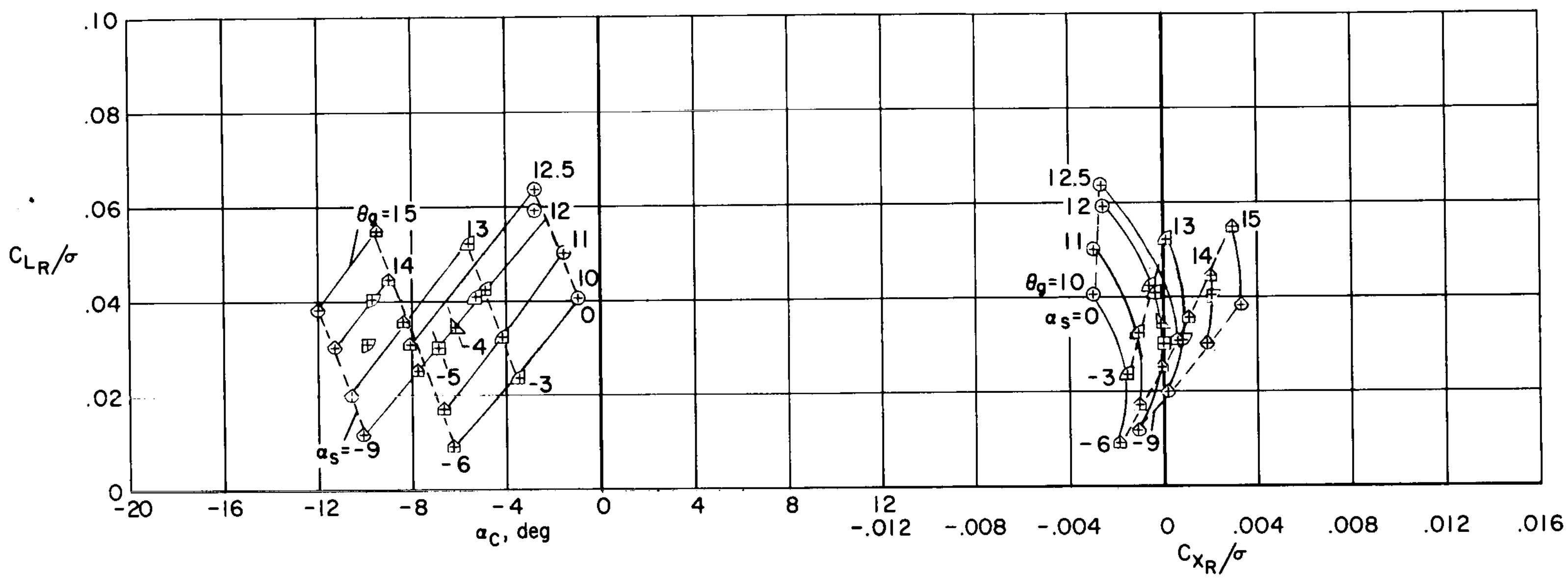


(a) Control axis and propulsive force coefficients.

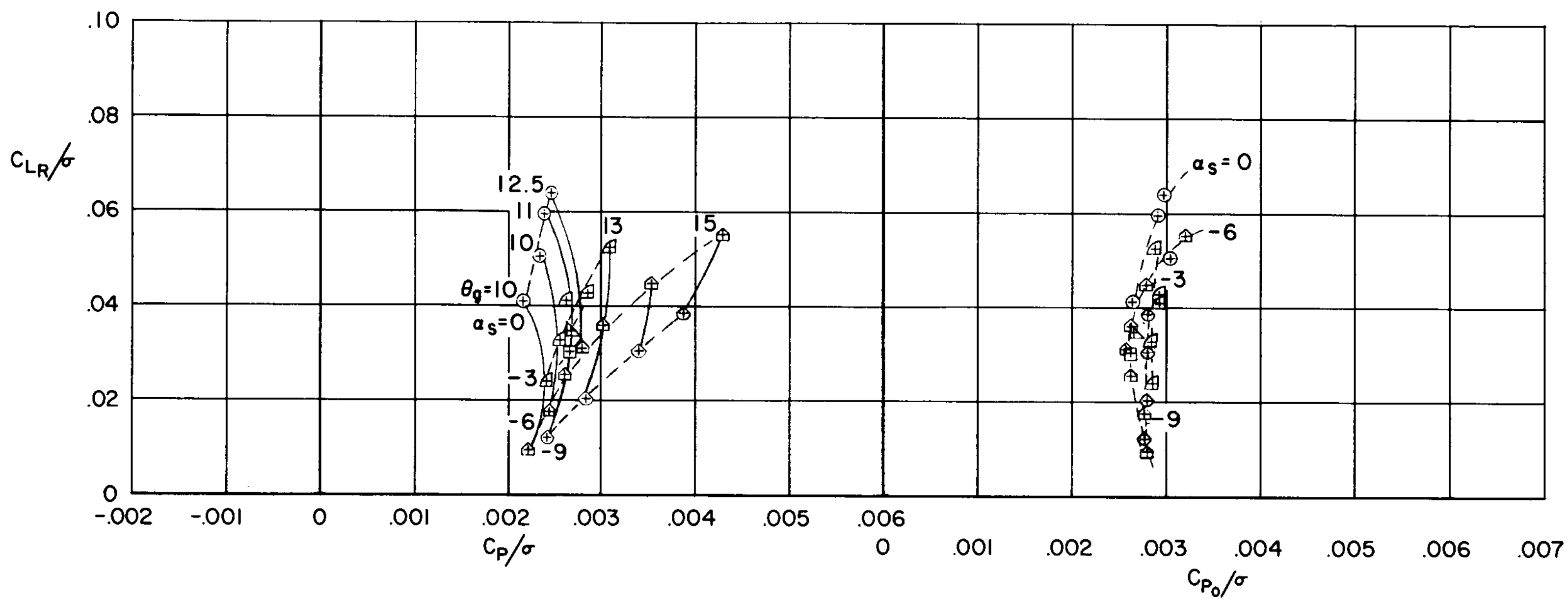


(b) Power coefficients.

Figure 29.- Teetering 48-ft rotor with tapered tip blades, $V/\Omega R = 0.30$, $M_{(1)(90)} = 0.95$.

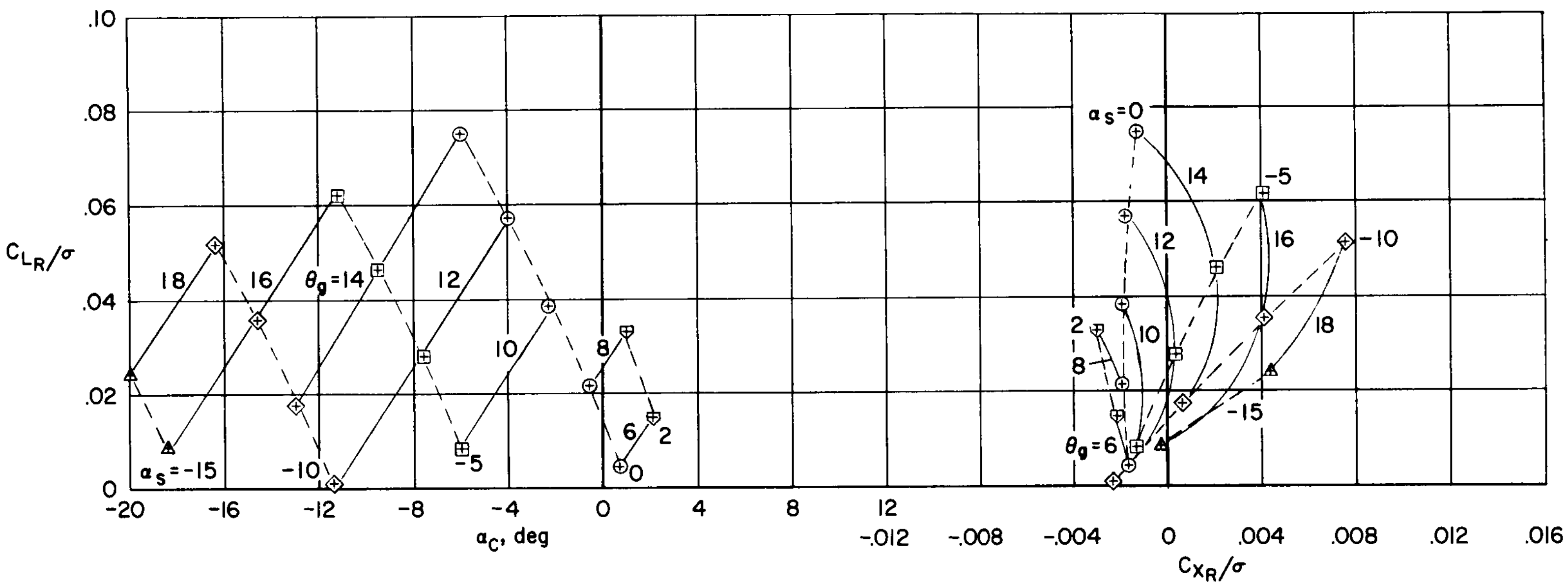


(a) Control axis and propulsive force coefficients.

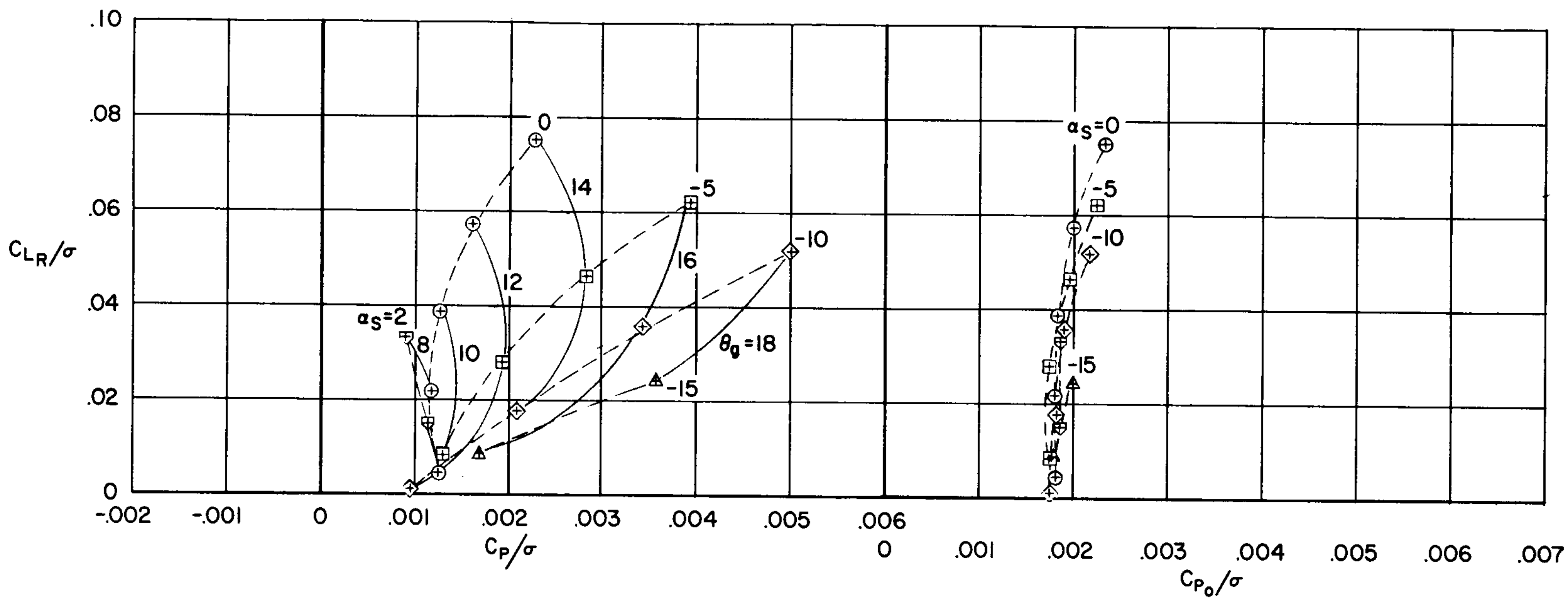


(b) Power coefficients.

Figure 30.- Teetering 48-ft rotor with tapered tip blades, $V/\Omega R = 0.30$, $M_{(1)(90)} = 1.00$.

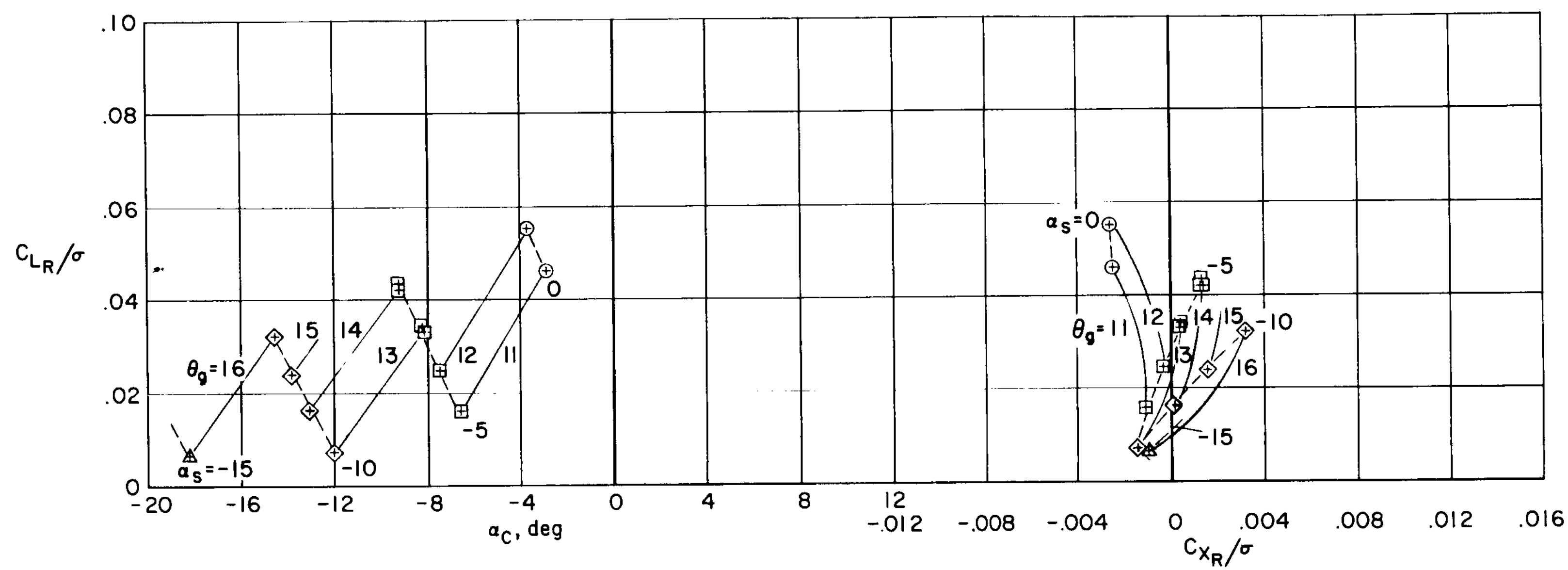


(a) Control axis and propulsive force coefficients.

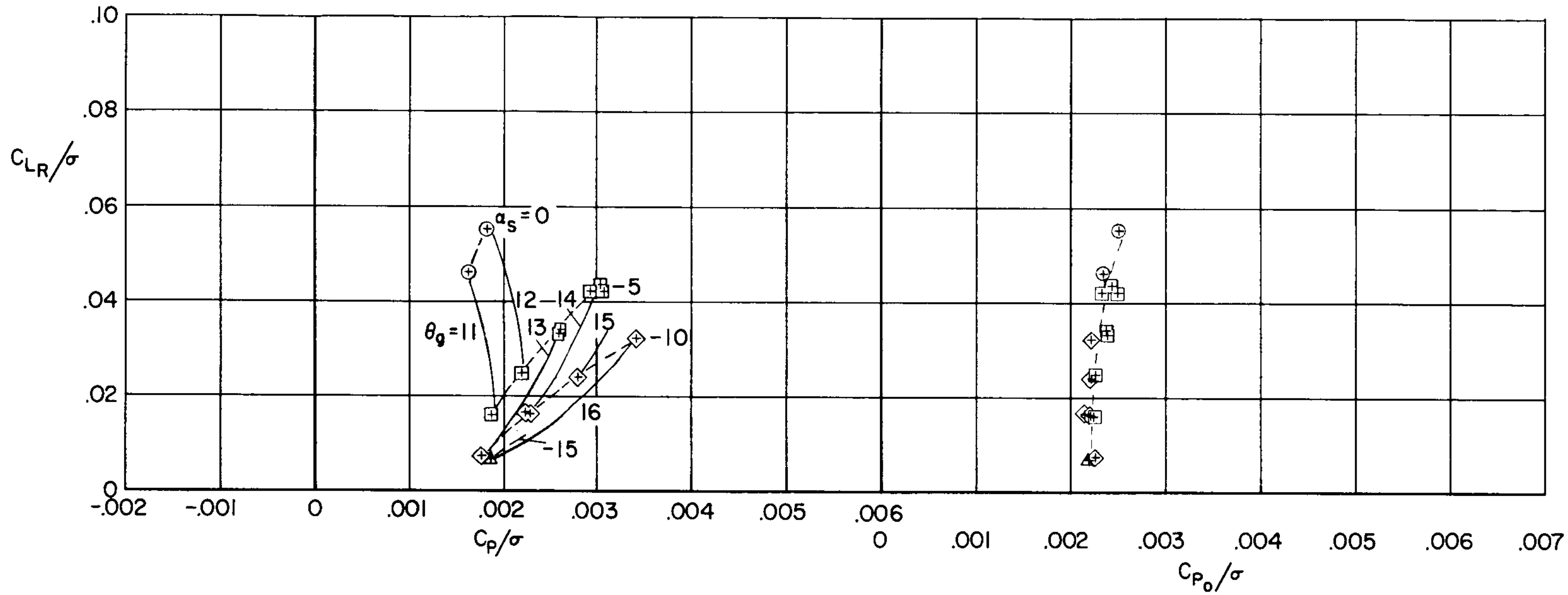


(b) Power coefficients.

Figure 31.- Teetering 48-ft rotor with tapered tip blades, $V/\Omega R = 0.35$, $M_{(1)(90)} = 0.85$.

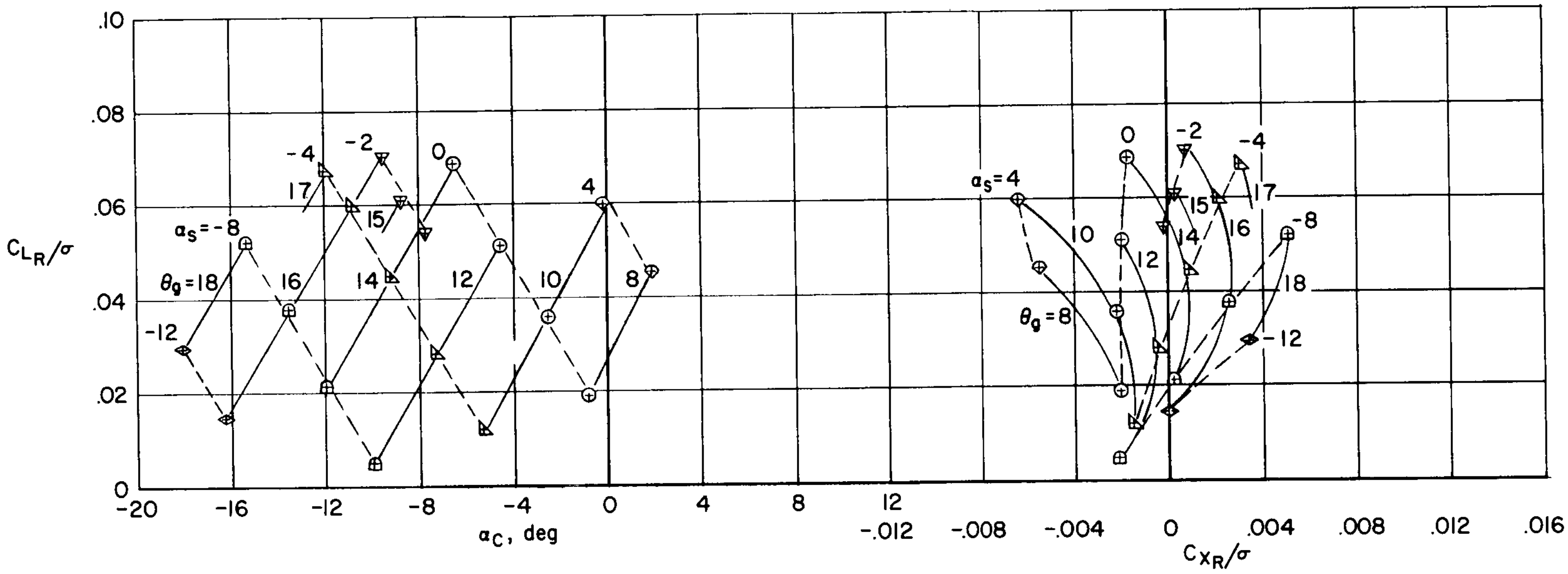


(a) Control axis and propulsive force coefficients.

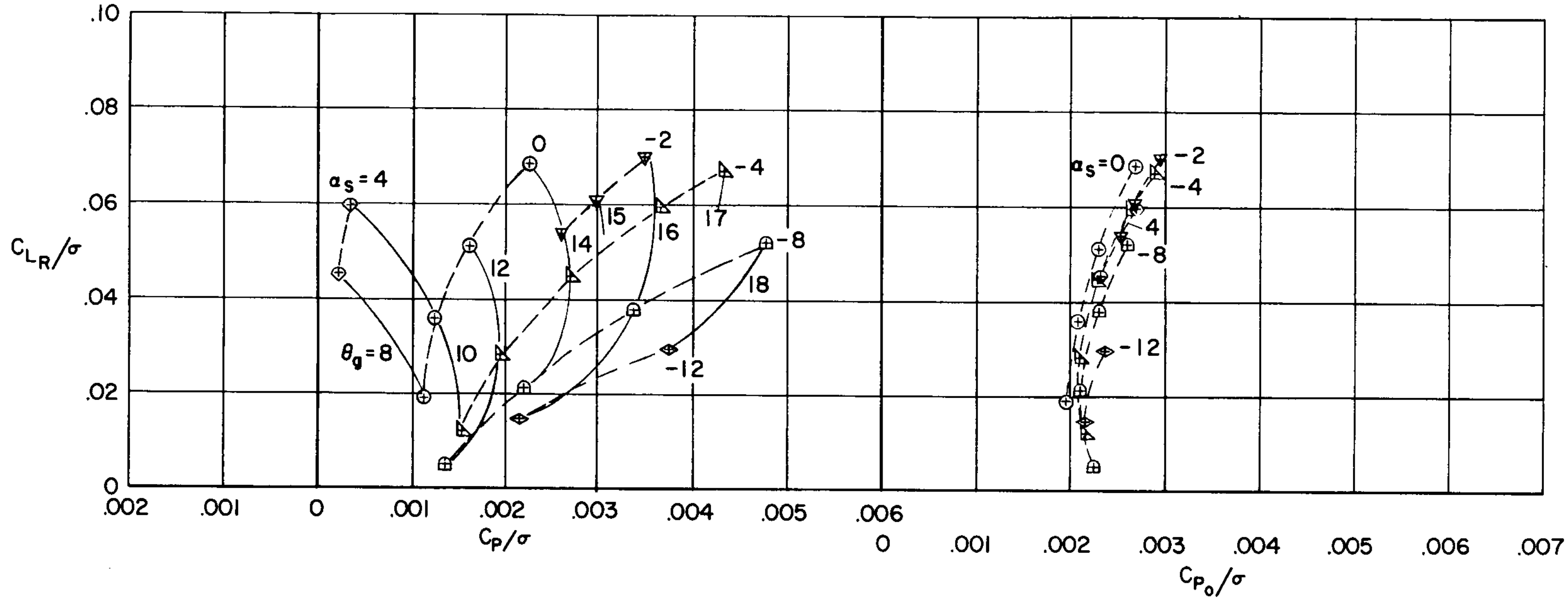


(b) Power coefficients.

Figure 32.- Teetering 48-ft rotor with tapered tip blades, $V/\Omega R = 0.35$, $M_{(1)(90)} = 0.94$.

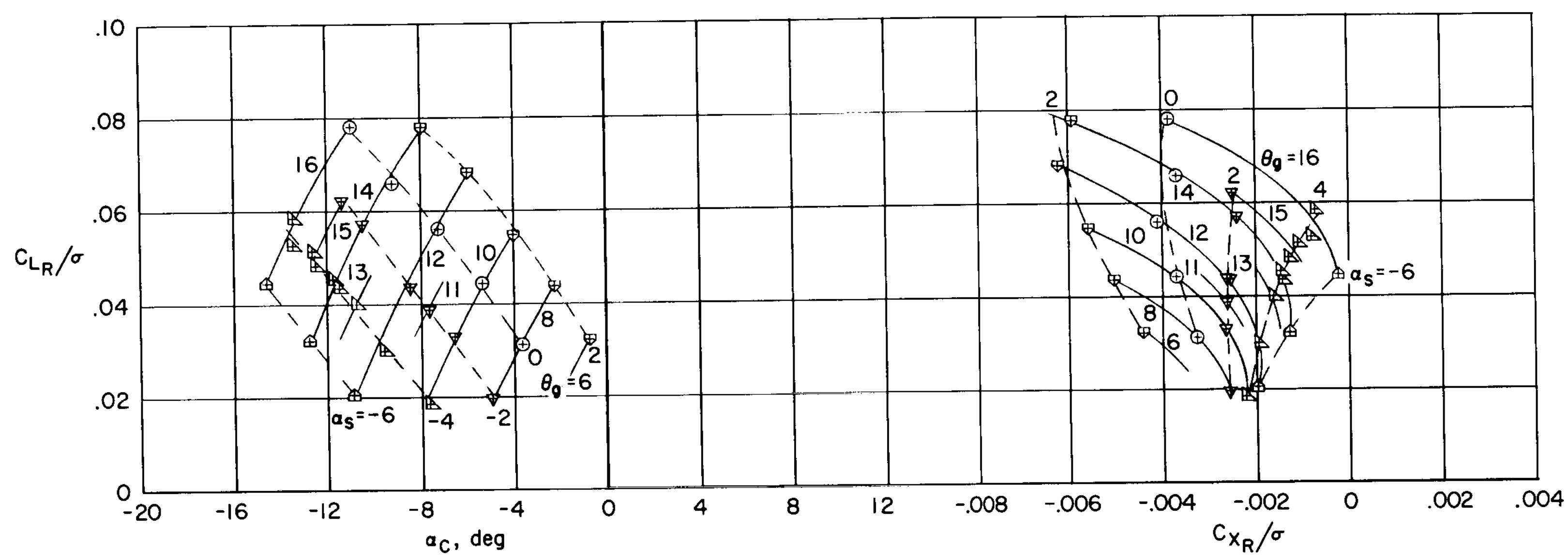


(a) Control axis and propulsive force coefficients.

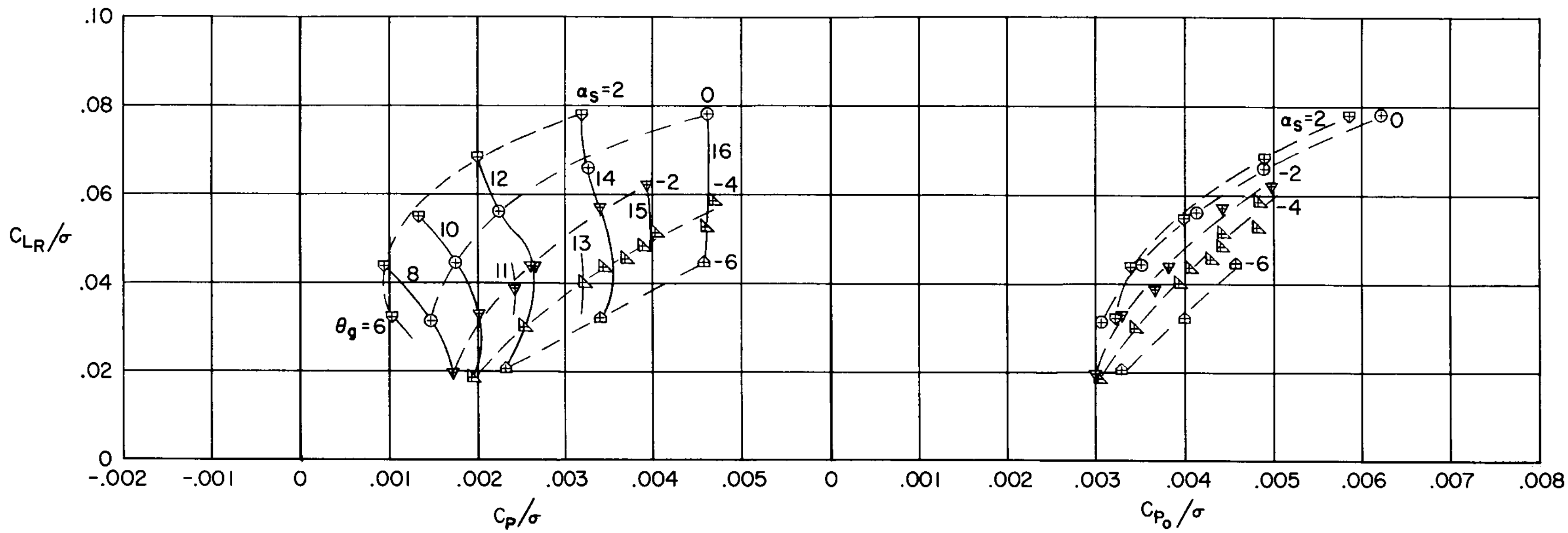


(b) Power coefficients.

Figure 33.- Teetering 48-ft rotor with tapered tip blades, $V/\Omega R = 0.40$, $M_{(1)(90)} = 0.84$.

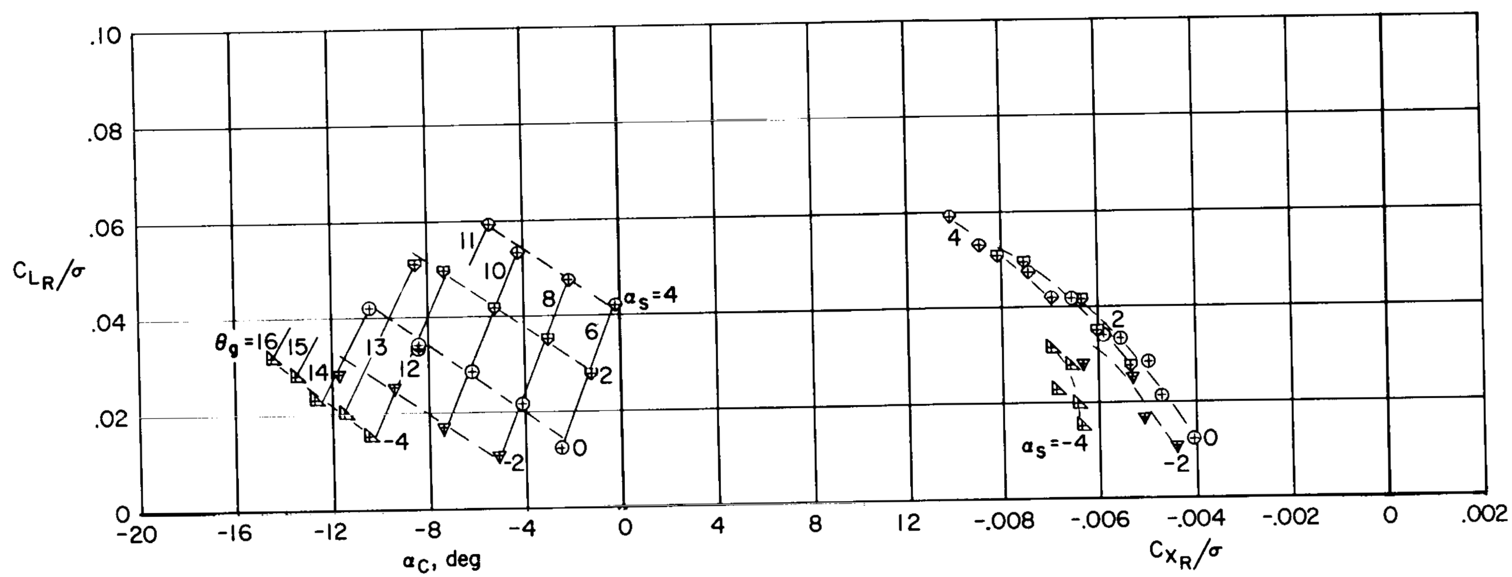


(a) Control axis and propulsive force coefficients.

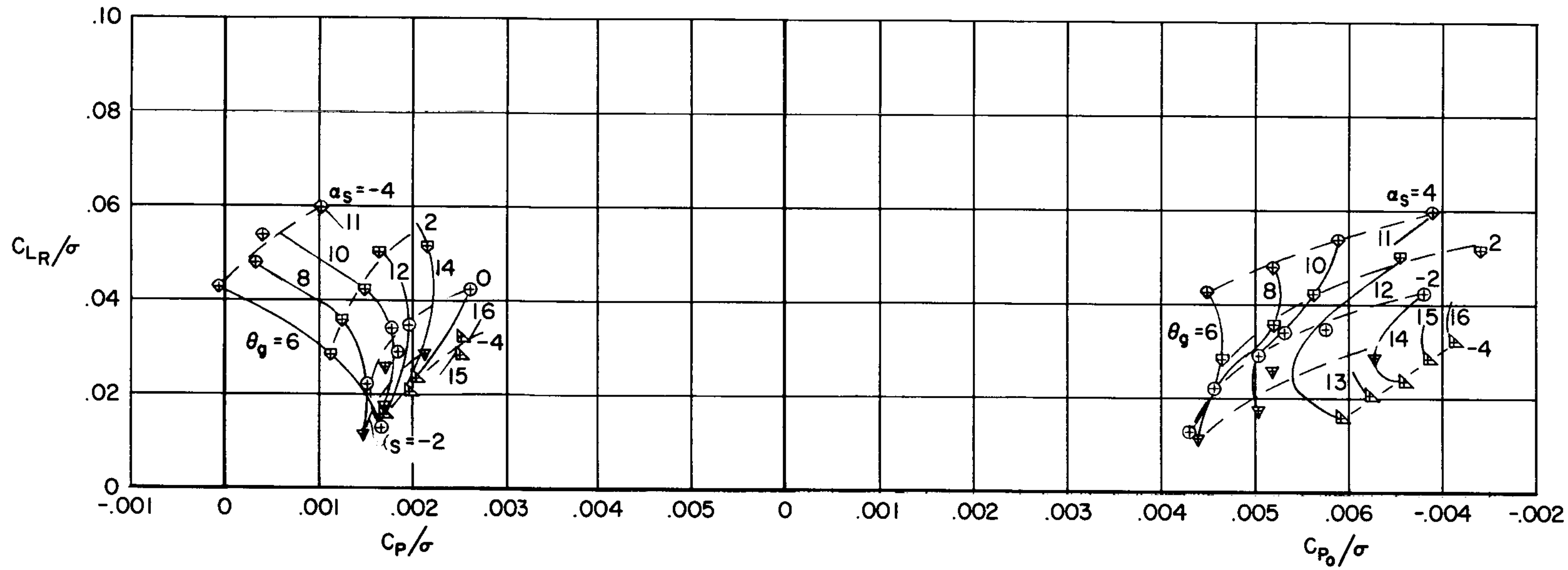


(b) Power coefficients.

Figure 34.- Teetering 34-ft rotor $V/\Omega R = 0.51$, $M_{(1)(90)} = 0.65$.

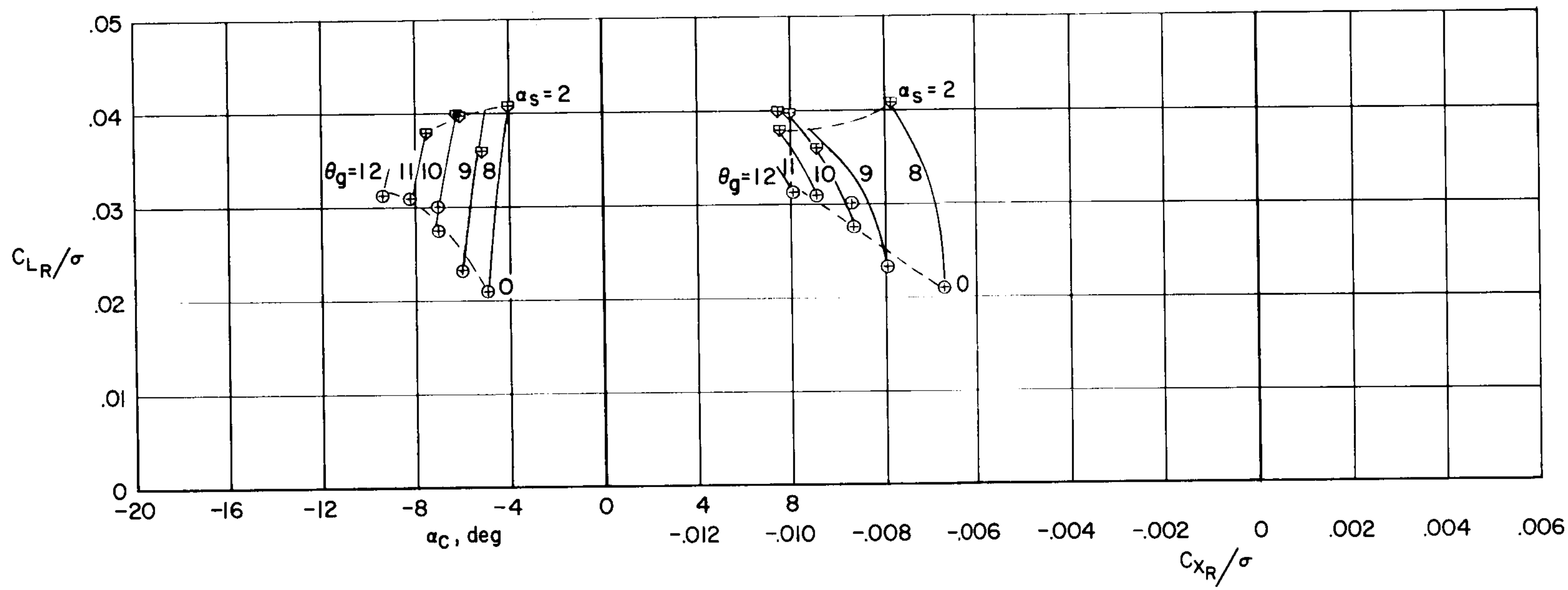


(a) Control axis and propulsive force coefficients.

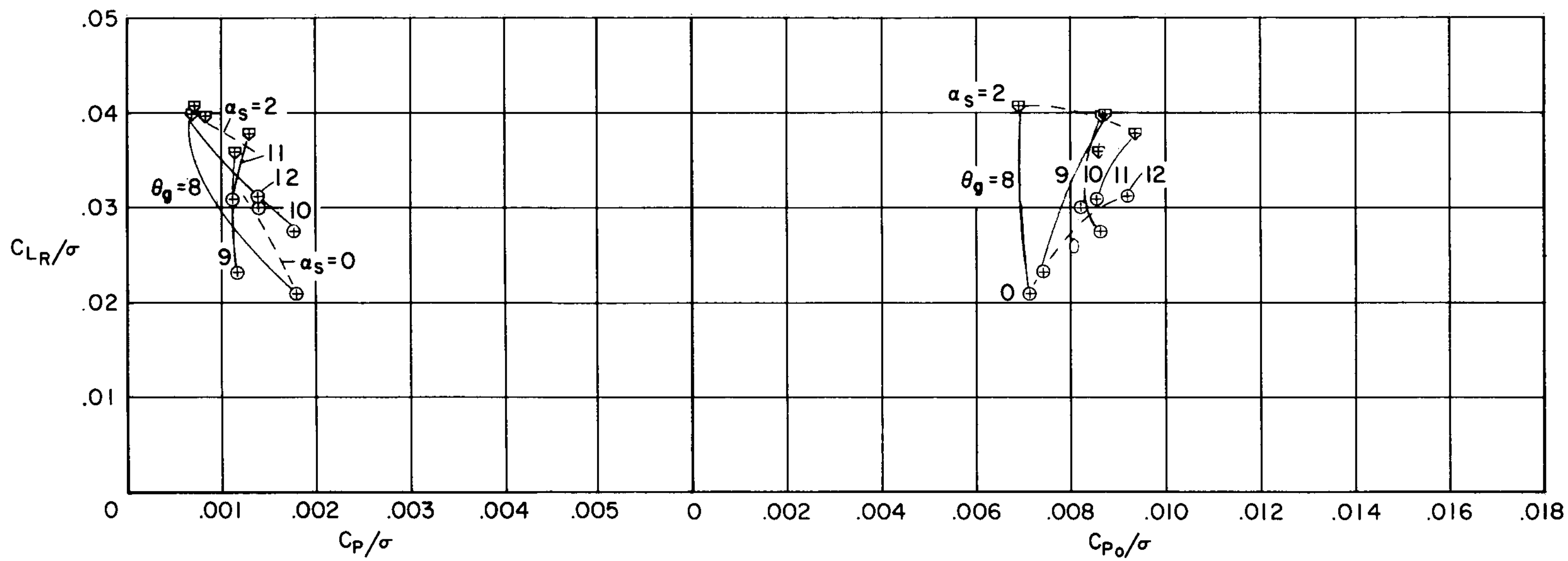


(b) Power coefficients.

Figure 35.- Teetering 34-ft rotor $V/\Omega R = 0.66$, $M_{(1)(90)} = 0.55$.



(a) Control axis and propulsive force coefficients.



(b) Power coefficients.

Figure 36.- Teetering 34-ft rotor $V/\Omega R = 0.79$, $M_{(1)(90)} = 0.52$.