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13. ABSTRACT This report presents a comparative evaluation of the aerodynamic characteristics of an operational OH-6A helicopter as obtained from wind tunnel tests performed in the NASA-Ames 40X80 foot wind tunnel, flight tests, and digital computer studies. The objectives were: 1) Explore helicopter and rotor component stability derivatives and performance. 2) Simulate use of increased solidity by conducting a portion of the wind tunnel tests at values of thrust corresponding to values of C_T approximately one-half flight values. 3) Conduct analytical studies involving use of digital computing techniques. 4) Measurement of rotor blade and rotor mast moments.			
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AERODYNAMIC TESTS OF AN OPERATIONAL
OH-6A HELICOPTER IN THE AMES 40' x 80'
WIND TUNNEL

May 1970

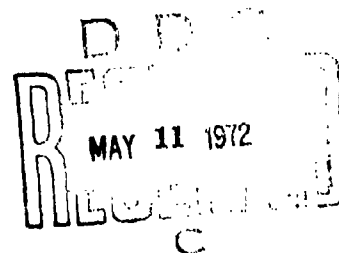
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HUGHES TOOL COMPANY-AIRCRAFT DIVISION 369-A-8020

ANALYSIS

MODEL

REPORT NO.

PAGE 1

PREPARED BY R. E. Rohbart

Aerodynamic Tests of an Operational OH-6A

CHECKED BY S. V. LaForge

Helicopter in the Ames 40' x 80' Wind Tunnel

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Aerodynamic Tests of an Operational OH-6A
Helicopter in the Ames 40' x 80' Wind Tunnel

CHECKED BY S. V. LaForge

1.0 SUMMARY

A wind tunnel test program was conducted on an operational prototype OH-6A helicopter in the NASA AMES 40' x 80' wind tunnel, April 23 thru May 8, 1968.

Helicopter and rotor component longitudinal stability derivatives were determined from the experimental data and compared with theoretical values obtained from a digital computer program, which numerically calculates the aerodynamic characteristics of a lifting rotor, using a strip analysis technique. Theory compares quite well with most of the experimentally determined stability derivatives. Specific exceptions are discussed in the body of this report.

Helicopter performance data measured in the wind tunnel show good agreement with flight data.

In addition to the wind-tunnel balance data, blade and other helicopter components were strain gaged for bending moment data and for control positions. Tests were conducted over a M range from .25 to .40, plus limited data at $M = .44$. These loads data show good agreement with flight data.

These wind tunnel tests and analyses were conducted under contract No. 66-0657-1.

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2.0 CONCLUSIONS

The results of the experimental and analytical investigations conducted in this program indicate that numerical techniques can be used to predict rotor stability derivatives. The agreement between computations and test was excellent throughout the speed range investigated ($\mu = .25$ to $.35$). It is felt that a simple computer program assuming uniform induced velocity can successfully be used to obtain rotor derivatives at the advance ratios tested.

The numerical technique was not programmed to predict the large increase in blade flapping due to retreating tip stall. Though a program which includes blade torsion as a degree of freedom and properly simulates the shift in airfoil center of pressure with blade stall can be set up to predict the increased blade flapping, such a program would be considerably more costly than that presented in this paper. Comparison of the test data with the numerical analysis indicated that retreating tip stall did not significantly change the pitching moment around the test helicopter moment center. Although the hub moment was increased by the increased blade flapping, the tilt of the rotor thrust vector was concurrently decreased due to increased drag on the retreating side. Therefore, a more sophisticated and costly program was not considered necessary to obtain valid aircraft pitching moments about its moment center.

Derivatives of the wind tunnel pitching moment data with the horizontal stabilizer both on and off were used to estimate the stabilizer effectiveness and downwash. For unstalled conditions the downwash was found to

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be approximately 1.2 times the rotor induced velocity. This average value is of comparable magnitude to those presented in the technical literature. Rotor retreating tip stall reduced the effective rotor disc area, and hence, increased the downwash velocity at the stabilizer.

Level flight performance as measured in the wind tunnel shows excellent agreement with flight test data obtained from a similar ship. Loads data show good agreement with flight data.

3.0 INTRODUCTION

The Hughes Tool Company - Aircraft Division has conducted a wind tunnel test of an operational prototype OH-6A helicopter, S/N 62-4216, equipped with production blades, in the NASA AMES 40ft. x 80ft. low speed wind tunnel, April 23 thru May 8, 1968.

The major objectives of this test series were:

- (1) Explore helicopter and rotor component stability derivatives and performance including establishment of any significant rotor/fuselage interference effects.
- (2) Simulate the use of increased solidity by conducting a portion of the wind tunnel tests at values of thrust corresponding to values of C_T/σ approximately one-half current flight operational values.
- (3) Conduct analytical studies involving the use of digital computing techniques for use in comparison with the wind tunnel experimental data.
- (4) Measurement of rotor blade and rotor support mast moments for comparison with applicable theory and correlation with available flight test data. However, the sensitivity of the mast bending moment instrumentation was inadequate for proper determination of the bending moments produced by the small flapping angles and thrust vector tilt encountered during the wind tunnel test.

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Data plots, tabulated results, and their analyses, including comparisons with applicable theories, relative to the above test objectives are presented herein. The test advance ratios, M_{∞} .25 to .40, used for the majority of the testing, correspond to helicopter forward flight speeds of approximately 93 to 154 knots. Two data points were collected at M_{∞} .44 (169 knots). Some hover runs were conducted with tunnel test section roof doors opened and closed. These were primarily for operational checkout of the helicopter and its instrumentation prior to operation of the wind tunnel. Support tare and interference runs were conducted and the data corrected for these effects.

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4.0 NOMENCLATURE

4.1 Notation (Analytical)

- A_b = 29.625 ft², main rotor blade area (4 blades)
- A_{1s} = Lateral cyclic blade angle, degrees. Positive is blade leading edge down at $\psi = 0^\circ$
- a_s' = Longitudinal tilt of thrust vector, degrees. Aft tilt is positive.
- a_{1s} = Longitudinal flapping, degrees. Positive is blade tip down at $\psi = 0^\circ$.
- B_{1s} = Longitudinal cyclic blade angle degrees. Positive is blade leading edge down at $\psi = 90^\circ$.
- b_{1s} = Lateral flapping, degrees. Positive is blade tip down at $\psi = 90^\circ$.
- b_s' = Lateral tilt of thrust vector, degrees. Tilt to right is positive.
- C_l = Section lift coefficient.
- C_d = Section drag coefficient.
- C_L^* = $\frac{L}{q A_b}$
- C_m^* = $\frac{M}{q A_b R}$
- $C_{m/\sigma}$ = $\frac{M}{\rho A_b (\Omega R)^2 R}$
- $\frac{C_l}{\sigma}$ = $\frac{C_l}{\rho A_b (\Omega R)^2 R}$
- C_T^*/σ = $\frac{L}{\rho A_b (\Omega R)^2}$
- C_x = $\frac{D}{\rho A_b (\Omega R)^2}$
- D = Drag, lbs.
- L = Lift, lbs.
- $\mathcal{L}$ = Rolling moment, lbs-ft.

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- M = Pitching Moment, lbs-ft.
- MC = Moment center. All moment data were reduced about a moment center located at W.L. 36.43, F.S. 101.85, B.L. 0.0. This corresponds to the intersection of the skewer pivot ball (pitch) axis with the mid-plane of the fuselage.
- q = Dynamic pressure, lbs/ft².
- R = 13.165 ft, main rotor blade radius.
- V' = Tunnel speed, ft/sec.
- α_s = Shaft (mast) angle, degrees.
- λ = Inflow ratio.
- $\mu = \frac{V'}{\Omega R}$
- ρ = Density, slug/ft³.
- $\sigma = A_b/\pi R^2 = .0544$, solidity ratio
- $\theta_{.75}$ = Collective pitch angle, degrees.
- ΩR = Tip speed, ft/sec.

4.2 Notation (Configuration)

- B = Main rotor blades (4). Rotor disc = 26.33 ft in diameter. Constant blade chord = .562 ft, NACA 0015, 9° washout.
- F = Model 369 (OH-6A) fuselage mounted on skewer through cargo compartment together with the Model 369 lower vertical stabilizer attached to the tail boom support (TBS). Lower vertical span = 27.5 inches from boom centerline, area = 1.78 sq ft.
- H = Horizontal stabilizer. Chord = 16.5 in., NACA 0015 airfoil section, span = 67 inches from boom centerlines, dihedral = 25 deg, area = 7.68 sq ft.
- K = Dummy skewer. Used only in conjunction with support. tare runs to determine skewer interference corrections.

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- R = Main rotor hub.
- T = Tail rotor. 2 blades. Rotor disk diameter = 4.25 ft.
- V = Upper vertical stabilizer. Span = 50.0 inches from boom centerline, area = 3.84 sq ft.

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5.0 DESCRIPTION OF TEST CONFIGURATION

5.1 Installation on Ames Supports

The HHC-AD OH-6A light observation helicopter, flight operational prototype, S/N 62-4216, was installed in the Ames 40' x 80' wind tunnel on the tunnel three - support external balance. Photographs of this installation are presented in Figs. 1 and 2.

As illustrated in these figures and the installation drawing (Fig. 3) the ship was supported on the two forward (main) struts, located on 164" centers, by means of a 5" diameter skewer passing thru the windows of the helicopter cargo compartment. This skewer was attached by a steel truss adapter to the underside of the rotor mast base by means of the same four bolts which are used to attach the mast base to the fuselage structure. The helicopter pivoted about the center line of the 4" diameter ball socket assembly mounted atop each of the two forward struts. The center line of the 5" diameter skewer was 5.83" above the ball centers, i.e., above the pitch axis. Wind shields were provided around these forward struts. The protrusions above the wind shields and the skewer itself were unshielded from the wind. Correction for their effects were evaluated by the support tare runs which followed completion of the production data runs. The attachment of the two forward struts to the balance system scales was such as to provide readouts of lift, drag, rolling moment, yawing moment and side force.

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The instrumentation and control actuator leads, the fuel line, and CO₂ fire extinguisher line were run into the helicopter thru the hollow skaver.

Fig. 3D presents a three-view drawing of the OH-6A.

5.2 Tail Boom Support

The least count of the Ames pitch balance thru the tail strut was too large to provide meaningful pitching moment data for the OH-6A helicopter configuration. Consequently HTC-AD personnel designed and fabricated a two-component strain gage balance of adequate sensitivity for the determination of the pitching moment. The HTC-AD Tail Boom Support (TBS) is shown best in figure 1, connecting the Ames tail strut to the helicopter tail support pivot.

The HTC-AD Tail Boom Support performed two additional functions. First, the spring (50 lbs./in.) and damper (standard OH-6A lag damper) combination eliminated the ground resonance problems associated with attaching the tail boom directly to the massive Ames tail strut. Second, as the load on the TBS spring changed during a test run, the fuselage angle of attack changed from the nominal value which had previously been set by the Ames tunnel operator by means of appropriate positioning of the Ames tail strut. The linear actuator, controlled by the HTC-AD console operator was used to provide vernier readjustment of the fuselage angle of attack.

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5.2 Tail Boom Support (Continued)

Shaft (mast) angle of attack (α_g) was fed digitally into the Ames data acquisition system in conjunction with the external balance readings, exclusive of pitching moment. In addition α_g was manually recorded by the helicopter control console operator.

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5.3 Support Interference Configuration

In order to determine a correction to account for the interference of the skewer support during the production data tests, an auxiliary support was utilized as illustrated in figure 3B. Data were collected over a range of α_{shaft} at two dynamic pressures, horizontal stabilizer on and off, with and without a dummy skewer installed. The incremental effect due to the presence of the skewer was used as a correction in the Ames balance data reduction program, and to the pitching moment data obtained from the Tail Boom Support balance. The pitching moment correction was small.

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5.4 Helicopter Control Console

The helicopter control console, designed and fabricated by HTC-AD, was located in the wind tunnel control room so as to provide optimum coordination between the wind tunnel operators and the helicopter operators. This control console provided remote control and monitoring of the helicopter. For operating effectiveness, it was divided into two adjacent panels: The left being the Flight Control Operator's Station; the right, the Engine Control Operator's Station.

At the Flight Control Station were those switches and panel monitoring instruments required for establishing aircraft angle of attack, tail support angle of attack, lateral cyclic position, longitudinal cyclic position, and pedal position. In addition, there were instruments for monitoring the lateral flapping and the longitudinal flapping. An oscillograph record switch was also located on this panel. However, during actual test operations, the oscillographs were operated and monitored by HTC-AD personnel who marked the applicable data point number on each record as it was taken.

The Engine Control Station had the switches for 110V AC power, fuel valve, starter, throttle, N_2 beeper, and collective. Panel instruments were provided for monitoring collective position,

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5.4 Helicopter Control Console (Continued)

throttle, N_2 , rotor rpm, N_1 , TOT, torque, DC Bus amperes, engine running-time clock, engine oil pressure, and engine oil temperature. Panel warning lights were provided as monitors of MR transmission oil pressure, oil temperature, and chip, TR transmission chip, engine chip, and fuel clog.

Both the Flight Control Operator and the Engine Control Operator maintained a running log of the operational data on his respective console coded to the Run Number and Data Point Number. In addition the 50 channel oscillograph record number was logged. The layout of the panels on the control console are detailed on the Ref. 1 drawing.

The primary rotor controls, collective, longitudinal cyclic, and lateral cyclic, were variable and powered by electrically driven screw jacks mounted in the cockpit. The rotor power and speed were controlled through the engine fuel control and the engine governor. There was a remote "beeper" switch on the control console to change the governor rpm setpoint.

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5.5 Instrumentation

In addition to the Ames external balance data, up to 53 channels of oscillograph data were recorded throughout the test on two oscillographs, one of 50 channels, the other of 18 channels directwriting. The latter was used to monitor during each run significant load values, principally pitch link load, mast longitudinal bending and tail boom vertical bending to insure that the aircraft was not being subjected to excessive loads.

The list of the oscillograph recorded data channels is presented in Table I. Main rotor data channels, i.e., items 1 thru 17 of this Table, in addition to blade flapping position, required use of a multi-channel slip ring assembly mounted atop the rotor mast assembly. The electrical leads from the stator side of the slip ring assembly were fed down thru the hollow mast. Mast bending strain gage leads did not require use of the slip ring since on the OH-6A helicopter the mast is fixed, the drive shaft rotating inside the mast to drive the rotor blades. The rotor blade loads are transferred thru two main bearings to the fixed mast.

The outputs of the control position potentiometers were fed to the control console meters as well as to the oscillograph. A blade flapping resolver was installed on blade No. 1. The resolver was mechanically constructed so that its flapping readout

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was not affected by extension of the blade retention straps under centrifugal loading nor by feathering nor by lead lag motion of the blade. Suitable electronic circuitry was provided to resolve longitudinal flapping and lateral flapping and thus give a direct continuous reading on the two respective meters located on the control console. In addition, the output of the flapping resolver potentiometer was recorded on channel 22 of the 50 channel oscillograph.

In parallel with the HTC-AD oscillographs, several of the data channels were recorded on magnetic tape for subsequent automated data reduction by NASA-Ames personnel.

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6.0. CALIBRATION AND DATA REDUCTION

6.1 Balance Calibration:

The three-support external balance of the 40' x 80' ft. wind tunnel had been previously calibrated by NASA - AMES personnel in accordance with the NASA - AMES standard procedures.

6.2 Balance Data:

Balance data were reduced in accordance with the NASA - AMES standard computer program. Weight tare corrections and support interference tare corrections based on the support interference runs were incorporated in the data reduction program. The final NASA reduced data were made available in a tabulated format appropriately coded per run number and data point number.

Pitching Moment Data from the AMES three - support external balance ~~was~~ not usable. It had been established in conferences between AMES and HTC-AD personnel prior to the test that the least count of the AMES balance was too great to achieve meaningful accuracy in the pitch data. Consequently in lieu of the AMES balance, the pitching moment data were obtained by means of an HTC-AD designed and fabricated strain gage balance on the tail boom support.

The NASA reduced data ~~are~~ presented in Appendix A, pages A-1 through A-51.

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6.3 Tail Boom Support Balance:

Because of the lack of sensitivity of the AMES pitch balance, HTC-AD designed a two component strain gage balance on the tail boom support. This balance measured the axial and normal forces at the tail pivot attachment point. Readout was on channels 8 and 9 of the HTC-AD 18 - channel oscillograph. In addition these data were recorded in parallel on magnetic tape. The tape data were reduced by the AMES computer program and transmitted to HTC-AD in tabular format. Sufficient oscillograph data points were read at HTC-AD to establish the validity of the automated reduction. The AMES values were then used to compute the pitching moments about the helicopter pitch axis.

Pitching moment data were corrected for weight tares and for support interference prior to conversion to the coefficient format used in the data presentation graphs. Values are tabulated on pages A-52 through A-55 of Appendix A.

Calibration of the tail boom support balance was conducted over the applicable load range in the HTC-AD laboratory prior to the tunnel test. Standard oscillograph R-Cal. procedures were used throughout the actual test.

6.4 Strain Gage Instrumentation:

The strain gage instrumentation listed in Table I was calibrated at HTC-AD prior to shipment of the helicopter to the wind tunnel. Since this instrumentation was identical to that used on a fully

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instrumented flight test helicopter, standard calibration procedures were employed by HTC-AD calibration and electronic personnel. Standard oscillograph R-Cal. procedures were used throughout the actual test.

6.5 Position Calibrations:

Following installation in the wind tunnel, with the helicopter set at $\alpha_s = \text{zero}$, wind off, final calibrations were conducted for all position potentiometers utilizing a precision inclinometer or scale as required. The oscillograph readouts and control console readings were simultaneously recorded against the inclinometer (or scale) readings.

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7.0 TEST PROGRAM

7.1 Test Procedure

Prior to initiation of a run, the angle of attack was set by wind tunnel personnel to give an α : zero. All zeros were recorded. The helicopter engine was started and brought up to operational rpm, initially 97% (456 rpm). This afforded a nominal 3% adjustment for maintaining a constant advance ratio, since as tunnel temperature increased, the tunnel velocity increased to maintain constant tunnel dynamic pressure. Prior to starting the tunnel, collective was increased to give approximately 1000 lbs. lift on the tunnel external balance. As the tunnel was brought up to speed, the longitudinal and lateral cyclic controls were adjusted to maintain zero longitudinal and lateral tip path plane tilt relative to the main rotor shaft.

7.2 Test Variables

The variables investigated covered α , collective, longitudinal cyclic, and lateral cyclic at several advance ratios for various helicopter configurations. In addition advance ratio was varied about the basic values by variation of rotor rpm at three fixed wind tunnel velocities.

Test advance ratios and corresponding tunnel dynamic pressures were:

μ	q , lbs/ft ²
.25	29
.30	41
.35	56
.40	73
.44	90 (2 points only)

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7.3 Test Log

A complete log of the tunnel test runs, the oscillograph data records, and tabulated reduced data for this test series are available in the HTC-AD Technical Department files. Twenty-three data runs (470 data points), four support tare runs (52 data points), and seven static weight tare runs were made. Helicopter engine operating time was 35.7 hours. Tunnel occupancy, including setup and teardown was 24 shifts. The tunnel operated on a two shifts perday basis, 5 days/week.

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8.0 DATA ANALYSIS

8.1 Method of Computing Theoretical Stability Data.

The theoretical method used herein to compute stability derivatives is simple and is inexpensive to run. The comparisons of theory and test data show excellent agreement. Consequently it is felt that this computing method is adequate for simple helicopters of modest speed ($M \leq 0.35$). Some of the test data show evidence of retreating tip stall. For these the agreement with theory is only fair. A few data points were run at $M = 0.4$. These data are quite scattered and the agreement with theory is marginal.

The theoretical stability data used to compare with the wind tunnel test data were obtained by means of a digital computer program, based on References 2 and 3, which numerically calculated the aerodynamic characteristics of the lifting rotor using the assumption of uniform induced velocity and ignoring the effects of blade flexibility. This program employed a strip analysis in computing the aerodynamic forces on the blades. The aerodynamic forces, in conjunction with centrifugal, inertial, and weight forces are combined to solve for the blade flapping. Knowing the flapping, the local blade angle of attack and the aerodynamic forces for a trim condition are obtained. The angle of attack and Mach number of each local blade section together with the tabulated blade characteristics determine the section C_l and C_d . The lift, drag, and torque of each section is then computed.

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Since the rotor blades of the test helicopter incorporated the NACA 0015 airfoil section, the tabulated values of C_ℓ and C_d were obtained from the data of Reference 6. This reference presents C_ℓ and C_d as a function of angle of attack and Mach number. These coefficients were synthesized from hovering data of a rotor with a 0015 airfoil section.

In addition to the blade section aerodynamic characteristics and the physical characteristics of the rotor, the other inputs to the computer program include: collective ($\theta_{0.75}$), longitudinal and lateral cyclic pitch (B_{1g} , A_{1g}), inflow ratio (λ), and advance ratio (μ).

The outputs are longitudinal and lateral flapping (a_{1g} and b_{1g}), thrust, hub moment, thrust vector tilt (a'_g and b'_g), and shaft angle of attack (α_g).

In performing the wind tunnel test the cyclic control was positioned so that the aircraft was trimmed to zero longitudinal flapping angle, a_{1g} . In the digital computations this trim condition was obtained by holding the collective pitch at the corresponding test value and varying the longitudinal cyclic pitch, B_{1g} , and inflow ratio, λ , to achieve the test values of thrust and zero flapping. After the trim condition was obtained, small perturbations were made in the proper parameters to compute the derivatives. Since shaft angle, α_g , is an output, an iteration has to be made to hold α_g constant when

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obtaining the derivatives with respect to control positions and μ .

Page 25 presents a flow diagram describing each step in the iteration. Additional details of the computer program are described in Appendix C.

Figure 4 shows a schematic side view of the test setup. All moments were measured around the moment center shown. Therefore, the calculated hub moments and shears were transferred to the moment center for comparison with wind tunnel data.

8.2 Summary of Measured and Theoretical Stability Derivatives

The following table summarizes the rotor stability derivatives obtained during the wind tunnel test and compares them with computed derivatives. The more important longitudinal derivatives are discussed in detail in later sections of this paper.

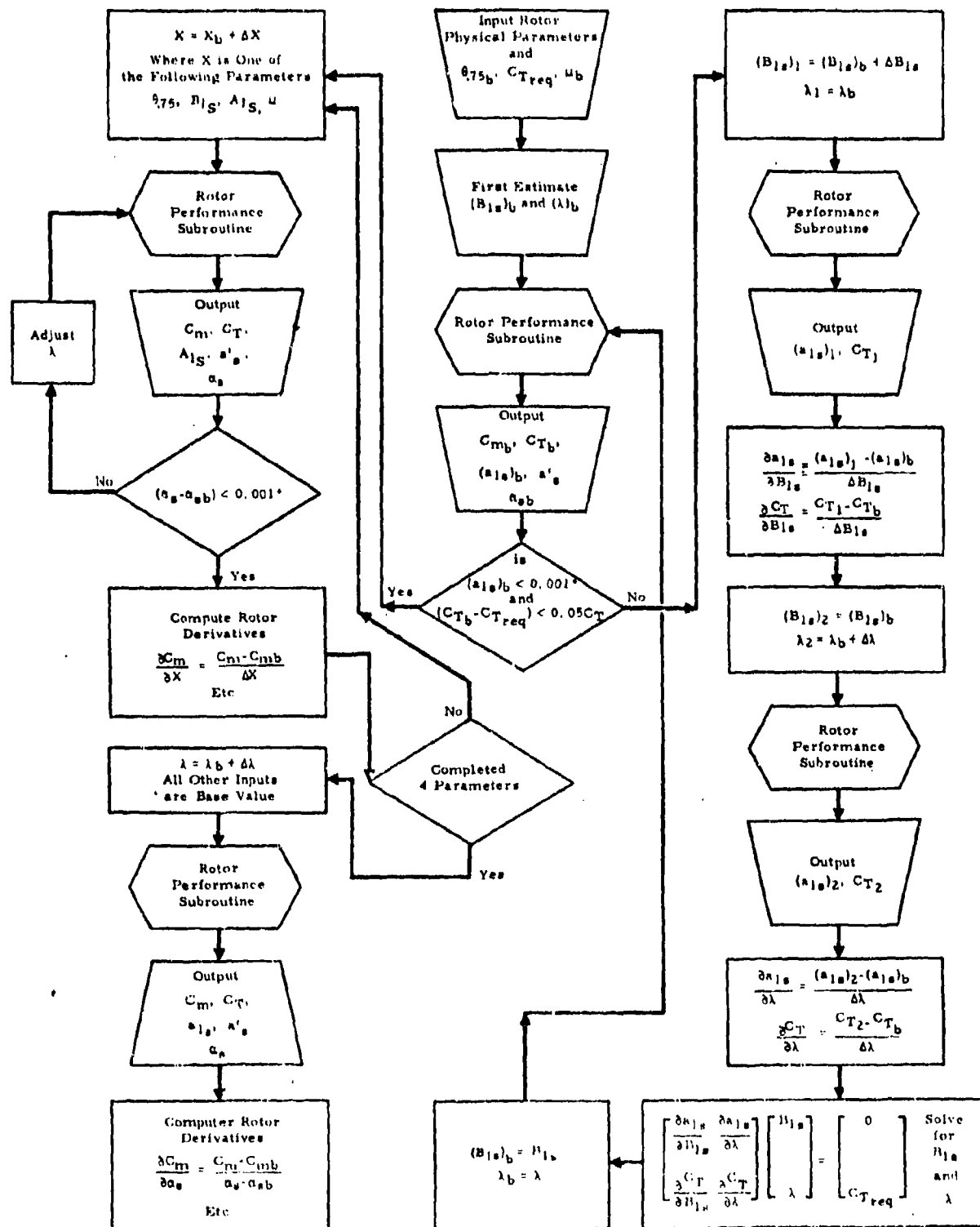
The derivatives with respect to collective and cyclic stick were obtained using the stick motions measured at the console. Plots of console collective pitch angle vs blade angle measured on the oscillograph record show that the flexibility of the control system reduces the angle of the blade by 11% to 14%. The cyclic stick is more than twice as flexible as the collective stick (stiffness of 7000 in-lb/rad as compared with 16,370 in-lb/rad for collective), so it is expected that the cyclic angle at the blade would be reduced 25% to 31%. The deflection of the control system is a function of the pitch link load; therefore, the difference between the console measured angle and the blade angle is a function of flight condition.

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COMPUTER PROGRAM FLOW CHART



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TABLE I. STABILITY DERIVATIVES

Derivative	$\mu = 0.25$		$\mu = 0.30$		$\mu = 0.35$	
	Test	Theory	Test	Theory	Test	Theory
$\partial a_{1s} / \partial \alpha_s$, deg/deg	0.15	0.14	0.32	0.20	0.25	0.28
$\partial C_m / \partial \alpha_s$, /deg	0.00014	0.00013	0.00019	0.00018	0.00025	0.00024
$\partial C_T / \partial \alpha_s$, /deg	0.0052	0.0056	0.0065	0.0069	0.0086	0.0086
$\partial C_z / \partial \alpha_s$, /deg	0.00009	-0.00004	0.00010	-0.00005	0.00025	-0.00004
$\partial a_{1s} / \partial B_{1s}$, deg/deg	-0.98	-1.17	-1.08	-1.23	-1.25	-1.36
$\partial C_m / \partial B_{1s}$, /deg	-0.0009	-0.0013	-0.0009	-0.0013	-0.0010	-0.0014
$\partial C_T / \partial B_{1s}$, /deg	0.0040	0.0056	0.0048	0.0070	0.0058	0.0082
$\partial C_z / \partial A_{1s}$, /deg	0.0008	0.0012	0.0008	0.0011	0.0009	0.0011
$\partial a_{1s} / \partial \delta_{0.75}$, deg/deg	0.60	0.82	0.76	0.96	1.35	1.43
$\partial C_m / \partial \omega$	0.014	0.013	0.015	0.015	0.007	0.010

This table shows good agreement between theory and test in the speed stability and the derivatives with angle of attack, except for the derivative of roll moment with angle of attack. These test data show hysteresis and the differences have not been resolved. The theoretical derivatives with collective pitch are 11% to 14% high and the derivatives with cyclic pitch are 25% to 31% high due to the flexibility in the control system. It can be seen from the table that when the control system flexibility is accounted for, there is good agreement between theory and test.

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Helicopter in the Ames 40' x 80' Wind Tunnel8.3 Rotor Flapping

Figure 5 presents a plot of longitudinal blade flapping versus shaft angle of attack. The theory, shown as a dashed line, compared very well at $\alpha = 0.25$, but deviated from test at the higher values of α . The theoretical retreating tip angle of attack is printed next to the trim point. One point ($\alpha = 0.35$) and $\theta_{0.75} = 10^\circ$ has a retreating tip angle of attack well into the stalled region. This test point shows the effect of stall in increasing the change in blade flapping with shaft angle of attack. Stall reduces the lift on the retreating blade and also shifts the airfoil center of pressure towards the trailing edge which tends to twist the blade nose down. Both of these effects increase flapping. The theoretical program accounted for the decrease in lift but assumed rigid blades. Therefore, the effect of dynamic twisting of the blade could not be determined.

Figure 6 presents a plot of the change in longitudinal cyclic pitch with change in shaft angle of attack to maintain zero flapping. The values of $\partial B_{1s} / \partial \alpha_s$ from test data are somewhat greater than theory. The values of B_{1s} were obtained from stick position as measured in the cockpit. Due to the flexibility of the control system, the actual values of B_{1s} at the rotor are less than the values calculated based on the static calibration. Flexibility was discussed in section 8.2.

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Aerodynamic Tests of an Operational OH-6A
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Figure 7 presents a plot of rotor pitching moment versus shaft angle of attack. The test points were obtained by subtracting the moment due to fuselage and rotor hub from the total pitching moment; thus, they represent the moment due to blades only (except for blade-fuselage interference which should be small).

Figure 8 presents derivatives of $\partial C_{m\dot{\alpha}}/\partial \alpha$ obtained by reading the slopes of Figure 7. The agreement between theory and test is excellent. At $\alpha_{0.75} = 10^\circ$, $\mu = 0.35$ the agreement with test is good even though the measured flapping was considerably greater than theory. This point is in the retreating tip stall region, which increases the drag on the retreating blade and tends to reduce the aft tilt of the rotor thrust vector. Therefore, when the moment is transferred to the test moment center (aircraft center of gravity), the increased nose up moment due to increased flapping is offset by the reduced moment due to reduced thrust vector tilt. At $\mu = 0.4$ there is a considerable amount of scatter in both the flapping and pitching moment data points, so the comparison of theory with test data is inconclusive.

8.5 Thrust Derivative

Figure 9 presents C'_T/σ vs α_0 for the values of advance ratios tested both horizontal stabilizer on and off. Figure 10 presents the derivative $\partial C'_T/\partial \mu$ vs μ . These derivatives were ob-

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tained from the slopes of the curves in Figure 9. Theory is also shown on Figure 10 and is in excellent agreement with test data.

8.6 Stabilizer Effectiveness with Angle of Attack

Figure 11 presents pitching moment data for the complete helicopter in the form of C_m/σ vs α , with the horizontal stabilizer "on" and "off". Figure 12 presents the slopes of the data in the form of $\partial C_m/\partial \alpha$, as a function of μ . (At $\mu = 0.4$, there are no data "horizontal-on".) This figure was used to estimate the ratio of actual to theoretical downwash at the horizontal stabilizer. At μ of .25 and .30, this ratio is equal to 1.2. At $\mu = .35$, the ratio is 1.0 for the unstalled test and 2.8 for the test conducted with retreating tip stall. Rotor stall reduces the effective rotor disc area, and hence, increases the downwash velocity. Thus, the high value of induced velocity can be expected. The value of induced velocity ratio of 1.2 is almost identical to the measured ratio presented in Figure 33 of Reference 7. This reference presents data obtained from a wake survey of the induced flow near a rotor.

8.7 Roll Derivative with Angle of Attack

Figure 13 presents C_l/σ vs α , for various conditions. Figure 14 presents the roll derivative with shaft angle as a function of μ . The theory shown does not agree with the test. The theoretical derivative of lateral flapping b_1 vs rotor shaft angle, α , is positive, but the theoretical derivative of lateral thrust vector

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tilt, b' , vs α , is negative, therefore, when the moment was transferred to the CG, the total became negative. The difference between theory and test is unexplained but is probably due to the low sensitivity of the balance system in relationship to the small helicopter rolling moments.

8.8 Longitudinal Stick Motion Derivatives

Figure 15 presents a plot of longitudinal flapping angle a_1 , with incremental longitudinal cyclic pitch ΔB_{1s} , determined from longitudinal stick motion. Figure 16 presents the flapping derivative $\frac{\partial a_1}{\partial B_{1s}}$ as a function of α . The test data indicate the flapping, due to stick motion, is less than theory. This is attributed to the flexibility in the control system. The longitudinal cyclic pitch system flexibility is approximately twice that of the collective system (see 8.2).

Figure 17 presents pitching moment vs ΔB_{1s} , horizontal stabilizer 'off'. The theory is also shown on this Figure. Figure 18 presents pitching moment vs ΔB_{1s} , horizontal stabilizer 'on'. Figure 19 presents $\frac{\partial C_m/\sigma}{\partial B_{1s}}$ obtained from the slopes of figures 17 and 18, and also shows the theory. As expected, the test is lower than the theory, due to the flexibility of the control system. Figure 19 shows that the derivative $\frac{\partial C_m/\sigma}{\partial B_{1s}}$ becomes more negative with the horizontal stabilizer on. This is due to the change in downwash at the stabilizer, which is a function of $\frac{\partial C_T'/\sigma}{\partial B_{1s}}$. The derivative

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$\frac{\partial C_{T'}}{\partial B_1}$ increases with μ ; therefore, the difference in moment, stabilizer on versus off, should increase with forward speed.

Figure 19 shows this trend, but the absolute value of the difference due to the stabilizer appears high. Figure 20 presents $\frac{\partial C_{T'}}{\partial B_1}$ vs μ both theory and test. The test results are less than the theory due to the control system flexibility.

8.9 Lateral Stick Motion Derivatives

Figures 21 and 22 present lateral flapping, b_1 , and rolling moment, C_{ϕ} , respectively, as a function of incremental lateral cyclic pitch, ΔA_1 . Figure 23 presents the derivative of rolling moment with lateral cyclic pitch $\frac{\partial C_{\phi}}{\partial A_1}$ taken from Figure 22. Due to flexibility in the lateral control system the test flapping and roll moments are less than theory. Both the theory and the test indicated the rolling moment derivative is independent of θ at a given value of advance ratio μ .

8.10 Collective Stick Motion Derivatives

Figures 24 and 25 present longitudinal flapping a_1 and lateral flapping b_1 vs $\theta_{0.75}$. As discussed earlier, the flexibility of the control system results in a reduction in the angle of attack change at the rotor. It is expected that the theory will be 11% to 14% greater than test. This is true except for the run at $\mu = 0.35$. The trim points have a theoretical retreating tip angle of attack of 11.2° which is into the stall region. As stall tends to increase

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the derivative of flapping with collective pitch, this effect offsets the reduction due to control system flexibility.

8.11 Speed Stability

Figures 26 and 27 present C_m/σ and C_T'/σ vs μ respectively. These tests were conducted with the horizontal stabilizer installed. The variation of μ was obtained by changing rotor speed, rather than tunnel speed. Consequently, the stabilizer lift is affected only by the change in downwash due to the change in rotor thrust. The thrust derivative is small; therefore, the effect of the stabilizer on the pitching moment derivative is also small.

The speed stability agreement, as shown in Figure 26, is very good. As noted previously, the case of $\mu = 0.35$, $\theta_{0.75} = 10$ degrees, is well into retreating tip stall, which increases the drag on the retreating side, resulting in a forward increment of tilt of the thrust vector. The moment change due to the change in thrust vector tilt appears to be greater than the moment change due to increased flapping, causing an unstable variation of pitching moment with μ . The theoretical retreating tip angle of the $\mu = 0.35$, $\theta_{0.75} = 8$ degrees point is equal to 20 degrees. Thus, the stall is even greater than the $\theta_{0.75} = 10$ degrees point discussed earlier. As expected, the slope of this case deviates from theory to a greater extent.

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Figure 27 indicates theory underestimates $\frac{\partial C_T'/\sigma}{\partial \nu}$ by a small amount. The test values of C_T'/σ include the download on the stabilizer, therefore, test data includes a small term that is neglected in the theory.

8.12 Level Flight Performance.

For helicopter level flight, the thrust is equal to the weight and the propulsive force must equal the drag. This condition is obtained when $C_X = 0$ and $\frac{C_T'}{\sigma} = \frac{W}{\rho A_b (R\Omega)^2}$. The trim point for each A tested was obtained from crossplots of θ and α_s to obtain the rotor power coefficient $C_p = \frac{750 \text{ HP}}{\rho A_b (R\Omega)^2}$. Before this could be done, C_X had to be corrected for the tare of the tail support. Also, in order to compare with flight power measurements contained in reference 8, the drag of the instrumentation wire pack, which was not included in the tare support setup, had to be removed. This drag was estimated to be one square foot of parasite area. A comparison at $W = 2090$ pounds, $R\Omega = 648$ ft/sec, and $\rho = .002306$, is shown in figure 28. These data show excellent agreement with the flight data of reference 8.

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8.11 Loads Comparisons

Comparison plots are presented for the main rotor blade 15% flapwise cyclic bending and main rotor pitch link cyclic load as obtained from the wind tunnel test and from recent flight tests. Both sets of loads data are plotted as functions of C_P/σ and C_T/σ .

Examination of figure 29, 15% flapwise cyclic bending, shows some scatter in the wind tunnel data, but no pronounced trend with either C_P/σ or C_T/σ . The flight test data also shows scatter which is generally typical of this type of flight test data. The data do show reasonable agreement. The flight test data average at a somewhat higher load level than do the wind tunnel data. However, since the flight test data are grouped at the higher values of C_T/σ and C_P/σ , this result is not unexpected. It is significant to note that the endurance limit was not exceeded for any test condition including the high μ of the wind tunnel test (equivalent to a forward speed of 154 knots, 2 points at 169 knots).

Examination of figure 30, pitch link cyclic loads, shows generally less scatter than the blade bending moment data. Otherwise, the conclusions are similar to those above.

Time histories of rotor loads as obtained from flight test and from the wind tunnel test are presented in Fig. 35. There is fair agreement between the two sources of data.

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8.14 Collective Control System Flexibility

The values of collective angle, $\theta_{0.75}$, as used herein are those read at the console, i.e., a direct function of cockpit stick position. From HTC-AD oscillograph records, the pitch link average load has been read for selected runs and plotted in Figure 31 as a function of $\theta_{0.75}$ at the console. The slopes of the lines faired thru these data points, i.e., $\frac{dP}{d\theta_{\text{console}}}$, have been used in conjunction with the value of collective control system stiffness, 16,370 in-lbs/radian, to calculate the expected change in blade angle as read by the potentiometer on the blade feathering axis and recorded on the oscillograph.

For example at $\mu = 0.25$

$$\frac{d\theta_{\text{flex.}}}{d\theta_{\text{console}}} = \frac{6.06 \text{ in.} \times 57.3}{16,370 \frac{\text{in-lbs}}{\text{rad.}}} \quad \frac{dP}{d\theta_{\text{console}}} \frac{\text{lbs}}{\text{degs}} = .100$$

$$\Delta \theta_{\text{console}} = \frac{d\theta_{\text{flex.}}}{d\theta_{\text{console}}} \times \Delta \theta_{\text{console}} = \Delta \theta_{\text{oscillograph}}$$

$$\frac{d\theta_{\text{console}}}{d\theta_{\text{oscill.}}} = \frac{1}{1 - \frac{dP_{\text{flex}}}{d\theta_{\text{console}}}} = \frac{1}{1 - .100} = 1.11$$

In a similar manner values of $\frac{d\theta_{\text{console}}}{d\theta_{\text{oscill.}}}$ of 1.13 and 1.14

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were determined for $M = 0.30$ and $M = 0.35$ respectively.

These slopes have been utilized in fairing the lines thru
the correlation data plots of Figure 32 which presents θ_{console}

versus $\theta_{\text{oscill.}}$. Taking into account the scatter in these

data, the agreement between the slopes determined empirically
as discussed above and the actual data is quite satisfactory

Flexibility has been discussed above under 8.12.. .

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8.15 Fuselage Characteristics

Plots of lift coefficient (C_L) and pitching moment coefficient (C_m^*) are presented in Figures 33 and 34 for the Rotor Off Configuration. These figures also present data collected on a 1/3 scale model of the helicopter in the Northrop/Norsair wind tunnel (Ref. 4). The pitching moment curves are in good agreement for both horizontal stabilizer on and off. The Ames data show a slightly reduced slope for C_L versus α in both cases, as well as a negative shift in the angle for zero lift, which is unexpectedly large for horizontal stabilizer off. Figure 33 also presents a computed value of pitching moment based on the Multhopp body formula of reference 5 for a fuselage fineness ration of 2.3, i.e.:

$$\frac{C_m^*}{\alpha} = \left(\frac{Vol.}{28.7} \right) (K_2 - K_1) \frac{1}{A_b R} = \left(\frac{172}{28.7} \right) (.47) \frac{1}{390} = .0072$$

This slope is somewhat higher than those shown by the full scale data and the Ref. 4 data. The Ref. 4 data were collected on a 1/3 scale model tested at a RN/ft. corresponding to that of a full scale ship at 55 knots.

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4. Report HEC-AD 369-A-8012 "Aerodynamic Tests of a 1/3 Scale Model 369 A Helicopter at Northrop/Norair Wind Tunnel - Test Series No. 9," April 1967
5. Perkins and Hage, "Airplane Performance, Stability and Control," EQN. 5-26, page 226
6. NACA TN 4356, "Effects of Compressibility on Rotor Hovering Performance and Synthesized Blade-Section Characteristics Derived from Measured Rotor Performance of Blades Having NACA 0015 Airfoil Tip Sections", by James P. Shivers and Paul J. Carpenter, dated September 1958

HUGHES TOOL COMPANY-AIRCRAFT DIVISION

MODEL

REPORT NO.

360-A-8020

PAGE 37

ANALYSIS

PREPARED BY R. E. RohlfertCHECKED BY S. V. LaForge

LIST OF REFERENCES (continued)

7. NACA TN 3691, "Analysis and Comparison with Theory of Flow Field Measurements Near a Lifting Rotor in the Langley Full-Scale Tunnel," by Harry H. Heyson, dated April 1956.
8. USARPCOM Project No. 4-3-0250-51/52/53, Part Two of Two Parts, "Report of the Engineering Flight Test Performance Phase of the OH-6A Helicopter, Unarmed (Clean) and Armed with the XM-7 or XM-8 Weapon Subsystem," U. S. Army Aviation Test Activity, Edwards AFB, California, dated August 1964.

HUGHES TOOL COMPANY-AIRCRAFT DIVISION 369-A-8020

ANALYSIS

MODEL

REPORT NO.

PAGE 38

PREPARED BY R. E. Mohrt

Aerodynamic Tests of an Operational OH-6A

CHECKED BY

Helicopter in the Ames 40' X 80' Wind Tunnel

TABLE I

List of Oscillograph Recorded Data Channels

Item No.	Description	50 Channel	18 Channel
		Oscillograph Channel No.	Direct-Writing Oscillograph Channel No.
1	M/R Blade, Flapwise Bending, 15%	-	1
2	M/R Blade, Flapwise Bending, 17%	2	-
3	M/R Blade, Flapwise Bending, 30%	3	-
4	M/R Blade, Flapwise Bending, 50%	4	-
5	M/R Blade, Flapwise Bending, 70%	5	-
6	(spare)	-	-
7	M/R Blade, Chordwise Bending, 17%	6	-
8	M/R Blade, Chordwise Bending, 50%	7	-
9	M/R Drive Shaft Bending, No. 1	8	-
10	M/R Drive Shaft Bending, No. 2	9	-
11	M/R Drive Shaft Torque	10	-
12	M/R Pitch Link Load	-	2
13	M/R Feathering Bearing Support, Tension	12	-
14	M/R Blade Retention Strap, Tension	-	16 (a)
15	M/R Blade Retention Strap, Bending	-	3
16	M/R Lead-Lag Position	15	-
17	M/R Angle Position, Feathering	16	-
18	M/R Mast Lateral Bending (outside upper)	17	-
19	M/R Mast Lateral Bending (outside lower)	-	4
20	M/R Mast Longitudinal Bending (outside upper)	19	-
21	M/R Mast Longitudinal Bending (outside lower)	-	5
22	M/R Mast Lateral Bending (inside)	20	-
23	M/R Mast Longitudinal Bending (inside)	21	-

Note: (a) For run 3 only, CH. 16 was long. accel. and CH. 17 was lateral accel.

HUGHES TOOL COMPANY-AIRCRAFT DIVISION

369-A-8020

ANALYSIS

MODEL

REPORT NO.

PAGE 38-A

PREPARED BY R. E. Rohrer

Aerodynamic Tests of an Operational CH-6A
Helicopter in the Ames 40' X 80' Wind Tunnel

CHECKED BY _____

List of Oscillograph Recorded Data Channels (Continued)

Item No.	Description	50 Channel	18 Channel
		Oscillograph Channel No.	Direct-Writing Oscillograph Channel No.
24	Longitudinal Control Link Load	-	6
25	Normal Acceleration at c.g.	-	7
26	Ship's Airspeed	26	-
27	Engine Torque Pressure	27	-
28	Longitudinal Cyclic Position	28	-
29	Lateral Cyclic Position	29	-
30	Rudder Pedal Position	30	-
31	Collective Position	31	-
32	Throttle Position	32	-
33	Tail Boom Support, Axial Load	-	8
34	Tail Boom Support, Vertical Load	-	9
35	Tail Boom Support, Position	33	-
36	Tail Boom Vertical Bending, Forward	-	10
37	Tail Boom Horizontal Bending, Forward	-	11
38	Tail Boom Torque, Forward	-	12
39	Tail Boom Vertical Bending, Aft	-	13
40	Tail Boom Horizontal Bending, Aft	-	14
41	Tail Boom Torque, Aft	-	15
42	Upper Vertical Stabilizer, Lateral Bending	34	-
43	Upper Vertical Stabilizer, Lateral Bending (near root)	35	-
44	Horizontal Stabilizer, Flapwise Bending (near root)	36, 41 (b)	-
45	Horizontal Stabilizer, Flapwise Bending (near strut attach.)	37	-
46	Horizontal Stabilizer Chordwise Bending	38	-

Note: (b) CH. 36 shifted to CH. 41 (4-17-68)

HUGHES TOOL COMPANY-AIRCRAFT DIVISION

369-A-8020

ANALYSIS _____
 PREPARED BY E. E. Mohrert
 CHECKED BY _____

MODEL _____

REPORT NO. _____

PAGE 38-B

Aerodynamic Tests of an Operational OH-6A
 Helicopter in the Ames 40' X 80' Wind Tunnel

List of Oscillograph Recorded Data Channels (Continued)

Item No.	Description	50 Channel	18 Channel
		Oscillograph Channel No.	Direct-Writing Oscillograph Channel No.
47	Horizontal Stabilizer Strut Load	39	-
48	RPM (1 per rev)	50	-
49	Skewer Position (shipac)	40	-
50	Blade Flapping Position from Flapping Resolver	22	-
51	Blade Flapping Position from Flapping Potentiometer	43	-
52	Timing Code	48	-
53	Timing Code		17 (a)

Note: (a) For run 3 only, CH. 16 was long. accel. and
 CH. 17 was lateral accel.

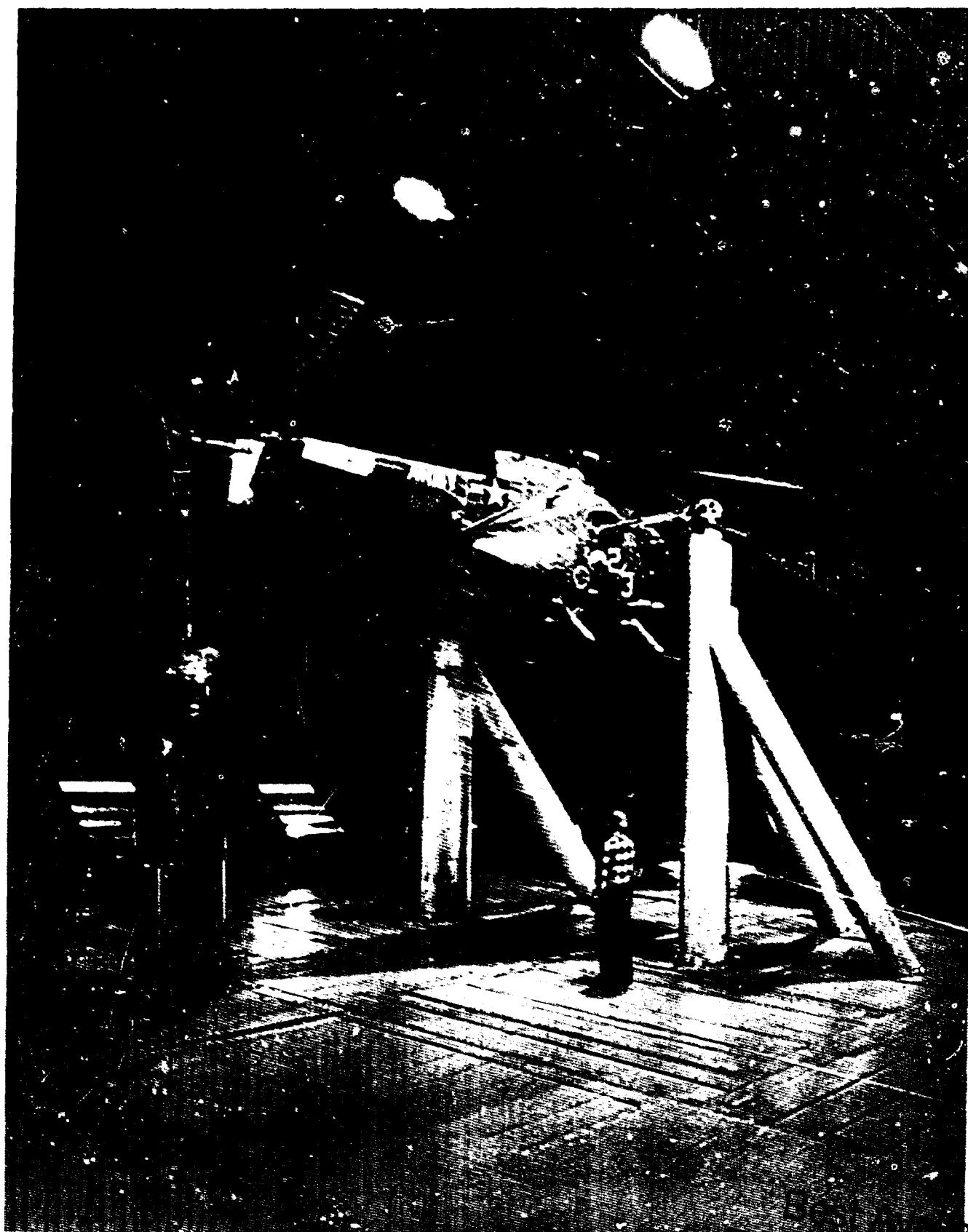


Figure 1. OH-6A Wind Tunnel Installation - Right-Rear View

able Cop

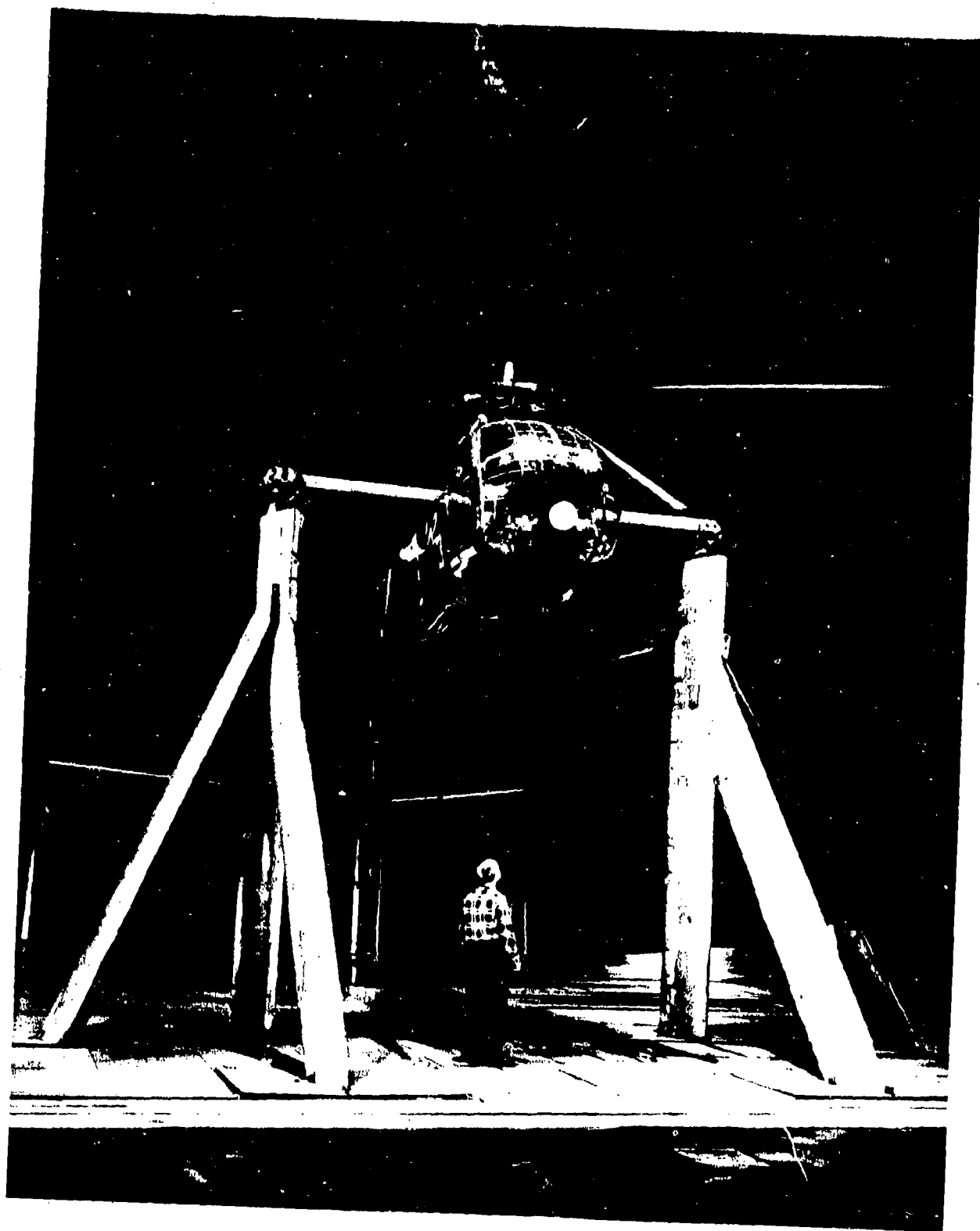
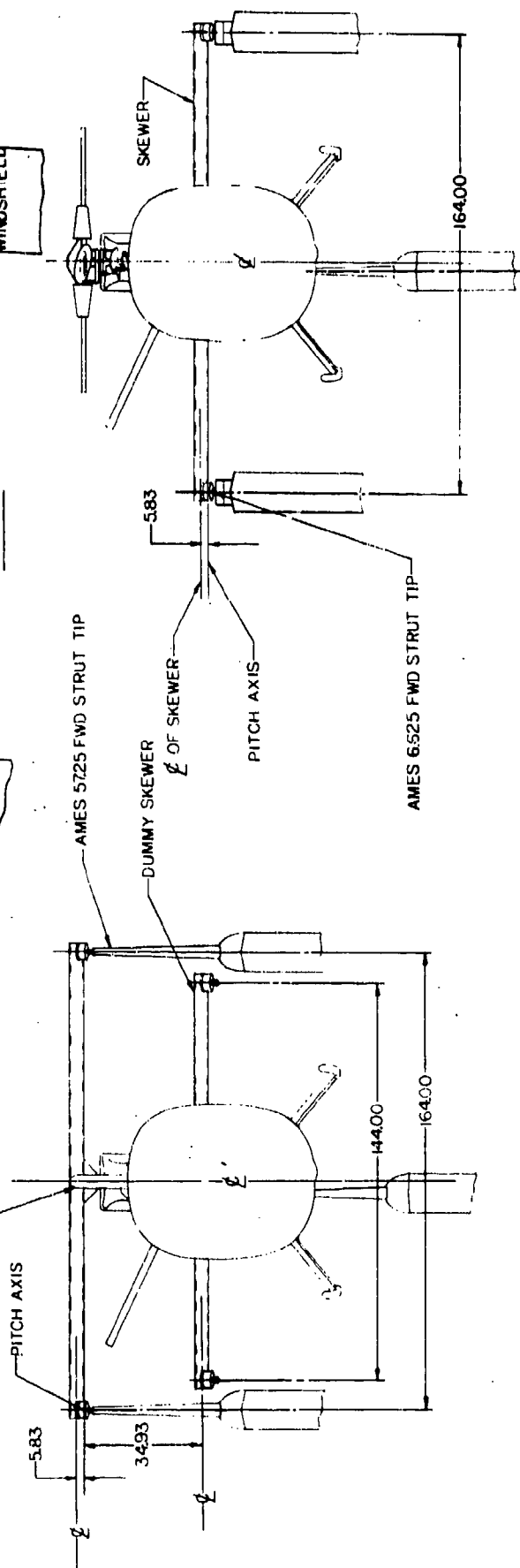
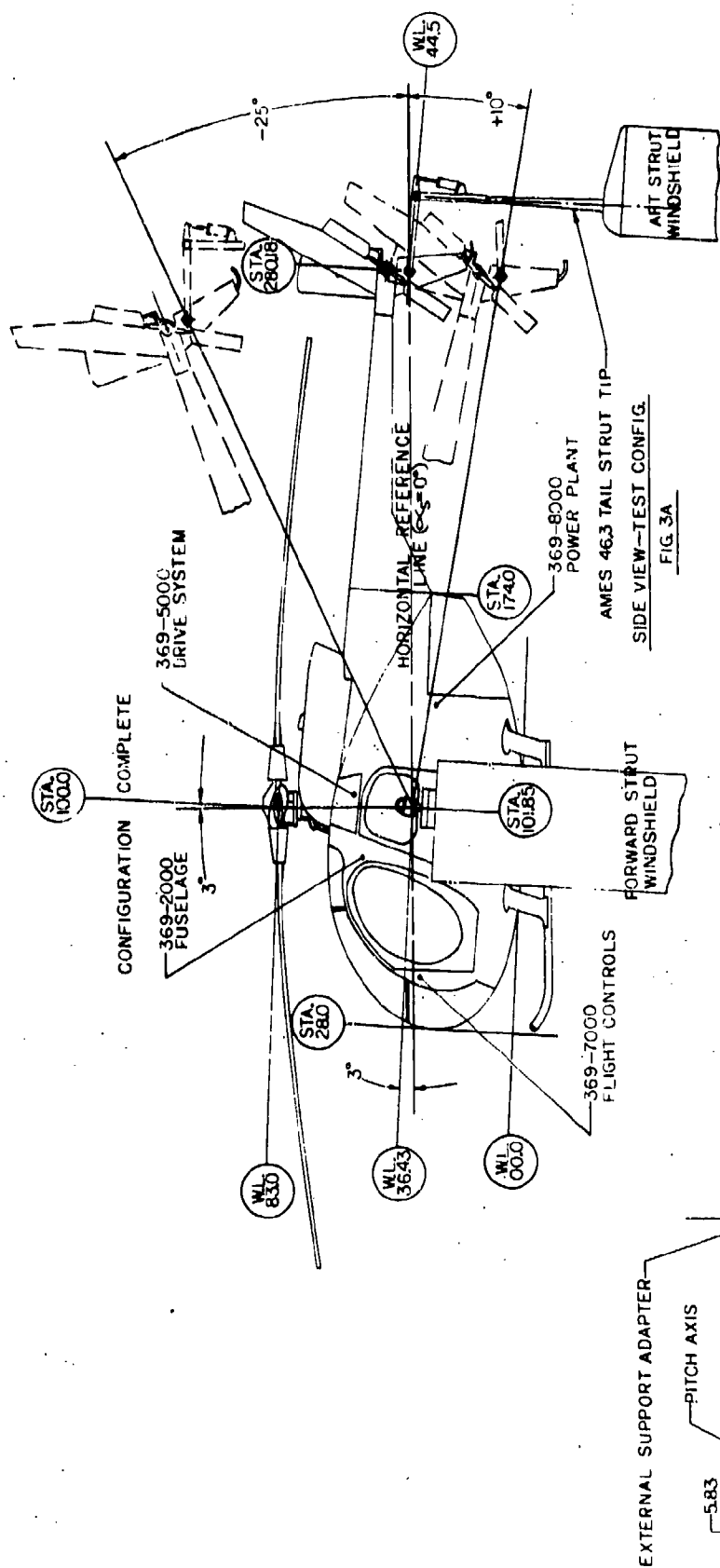


Figure 2. OH-6A Wind Tunnel Installation - Right-Front View



FRONT VIEW-SUPPORT TARE CONFIG.

FRONT VIEW—TEST CONFIG

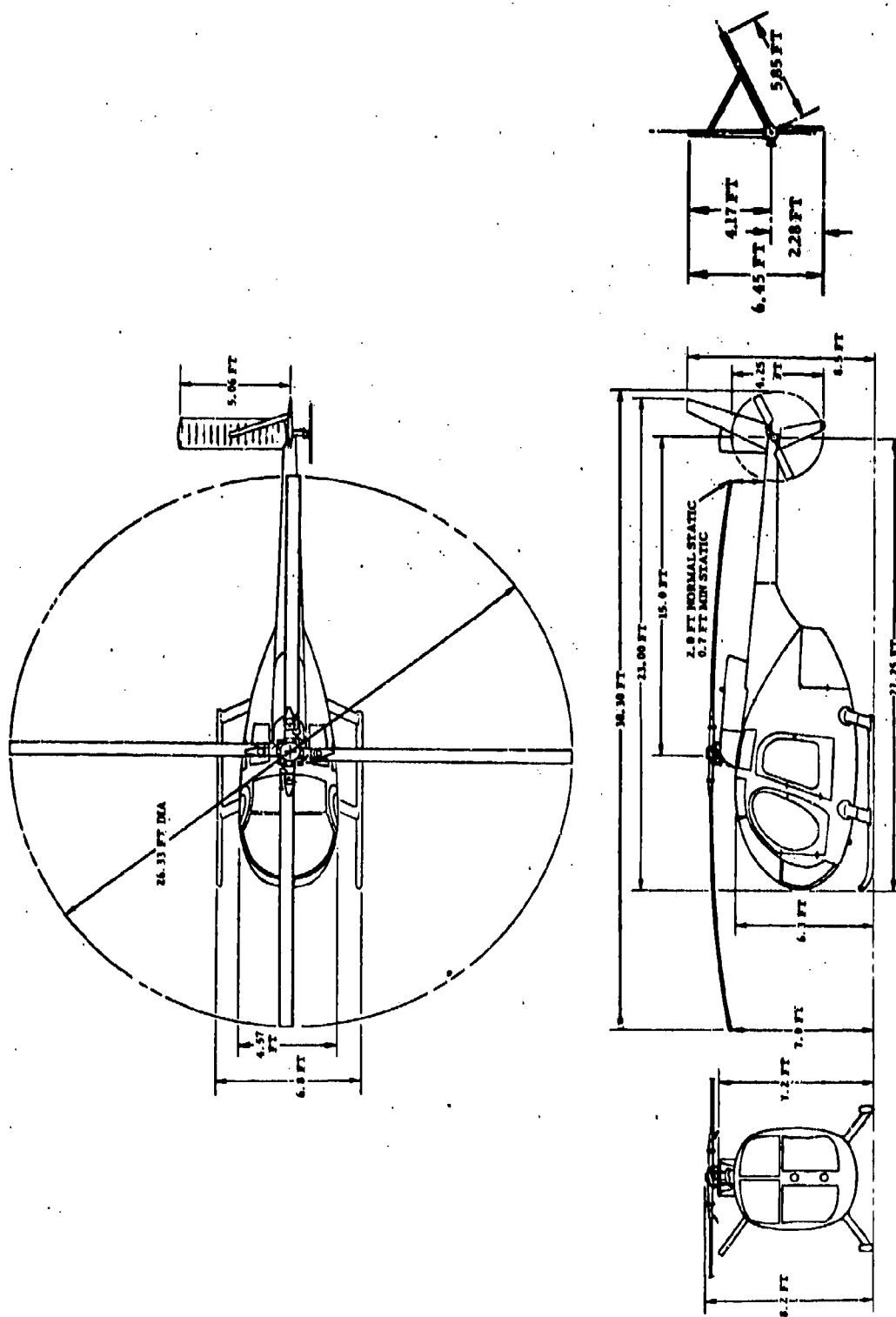


Figure 3D. Three-View Drawing

HUGHES TOOL COMPANY-AIRCRAFT DIVISION 369-A-8020

ANALYSIS R. L. Flood

MODEL

REPORT NO.

PAGE 42

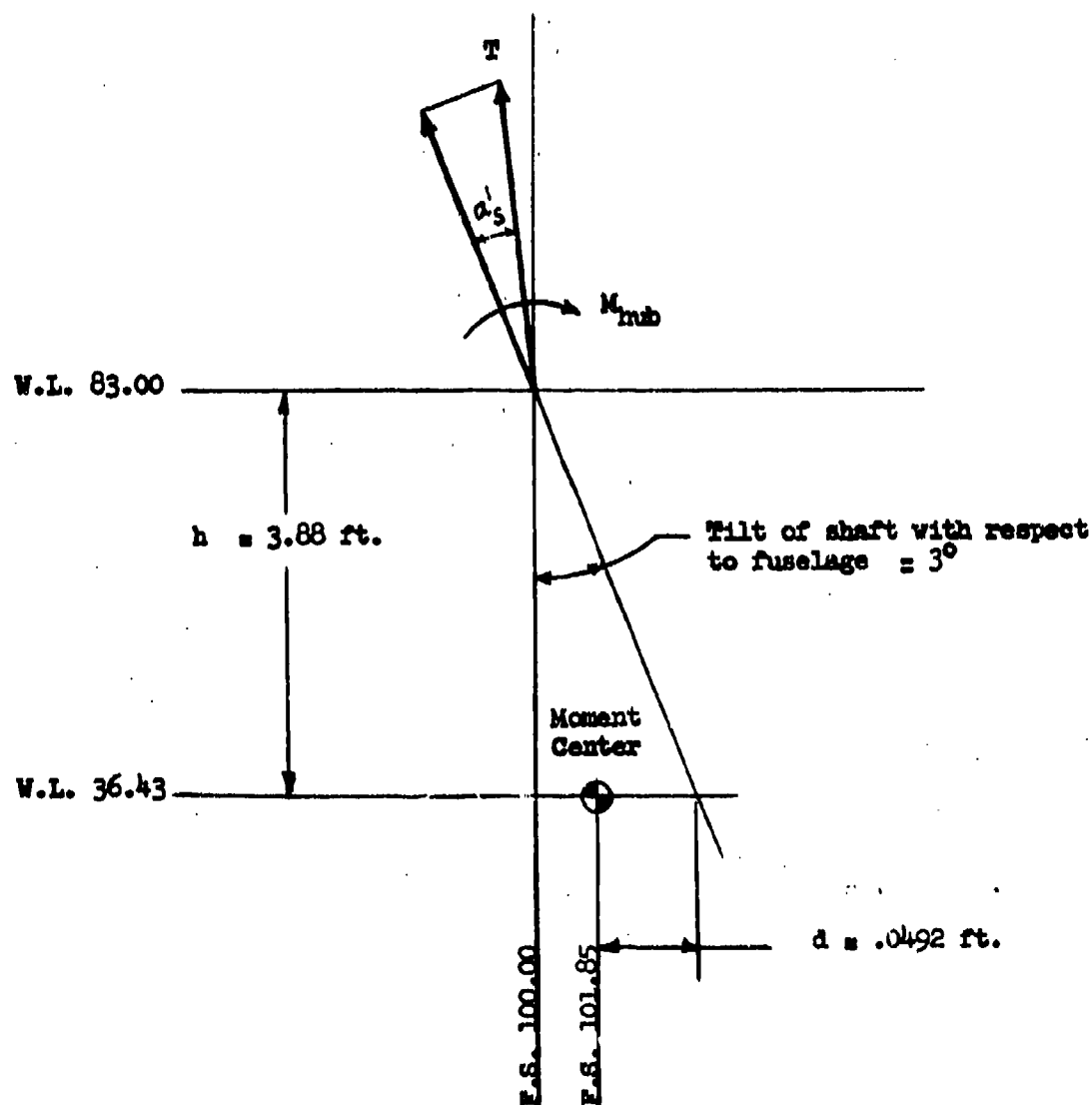
PREPARED BY R. E. Robert

Aerodynamic Tests of an Operational OH-6A

CHECKED BY S. V. LaFarge

Helicopter in the Ames 40' x 80' Wind Tunnel

SCHEMATIC, SIDE VIEW



No Scale

Figure 4

RER 7/5/69

LONGITUDINAL FLAPPING, α_{1s} , VS. ROTOR SHAFT ANGLE OF ATTACK, α_s

NOTE: SOLID SYM. IS $\alpha_{1s} = 0$ (CONSOLE)

— — — THEORY

NUMBER BY SOLID SYM. IS THEORETICAL ANGLE OF ATTACK
OF RETREATING TIP IN DEGREES

SYM. θ CONFIG.
○ 8 FRBV
□ 10
△ 11
◇ 5.5 FRB
▽ 7.0
○ 6.5
△ 5.0

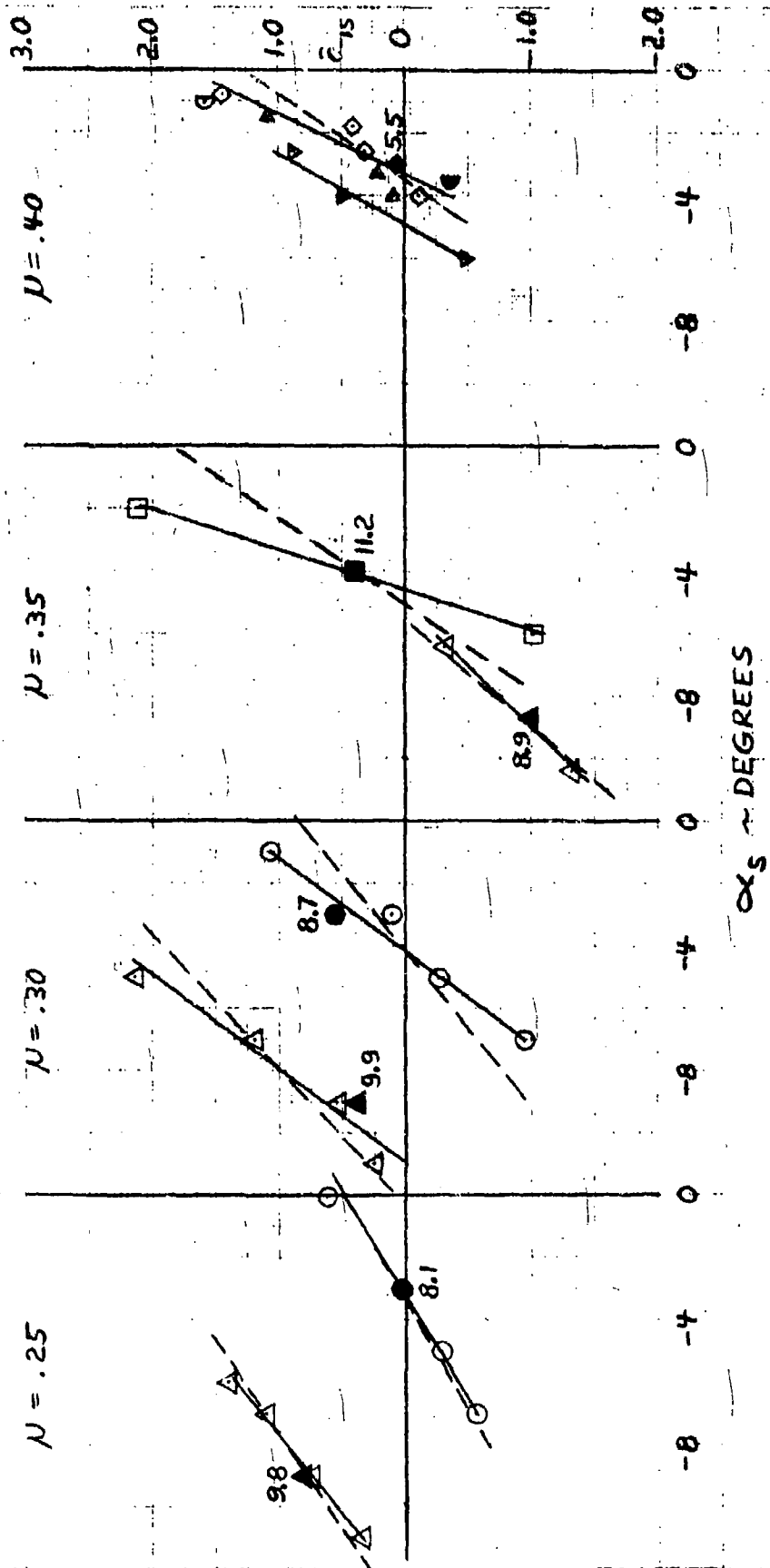
 $\mu = .25$
 $\mu = .30$
 $\mu = .35$
 $\mu = .40$


FIG. 5

DERIVATIVE OF LONGITUDINAL CYCLIC PITCH VS. ROTOR SHAFT ANGLE
OF ATTACK FOR ZERO FLAPPING VS. ADVANCE RATIO

SYM.	θ_{TS}	CONFIG.
Δ	6	FRVHT
$\circ$	8	
$\diamond$	9	
$\square$	10	
∇	12	
$\circ$	13	$\downarrow$

NOTE: $\alpha_{1s} = b_{1s} = 0^\circ$ (CONSISTENT)
FOR ALL DATA POINTS

--- THEORY

$\frac{\partial B_{1s}}{\partial \alpha_s}$

--- 10° & 12°

--- 9° & 8°

--- 10° & 8°

μ , ADVANCE RATIO

FIG. 6

REF 306/69

PITCHING MOMENT COEFFICIENT VS. ROTOR SHAFT ANGLE OF ATTACK

SYM.	θ	CONFIG.
○	8	FR8V-FR
□	10	
△	11	
◇	5.5	FR8-FR
▽	7.0	
○	6.5	
▷	5.0	
--- THEORY		

NOTE: SOLID SYM. IS $\alpha_{TS} = 0$ (CONSOLE)

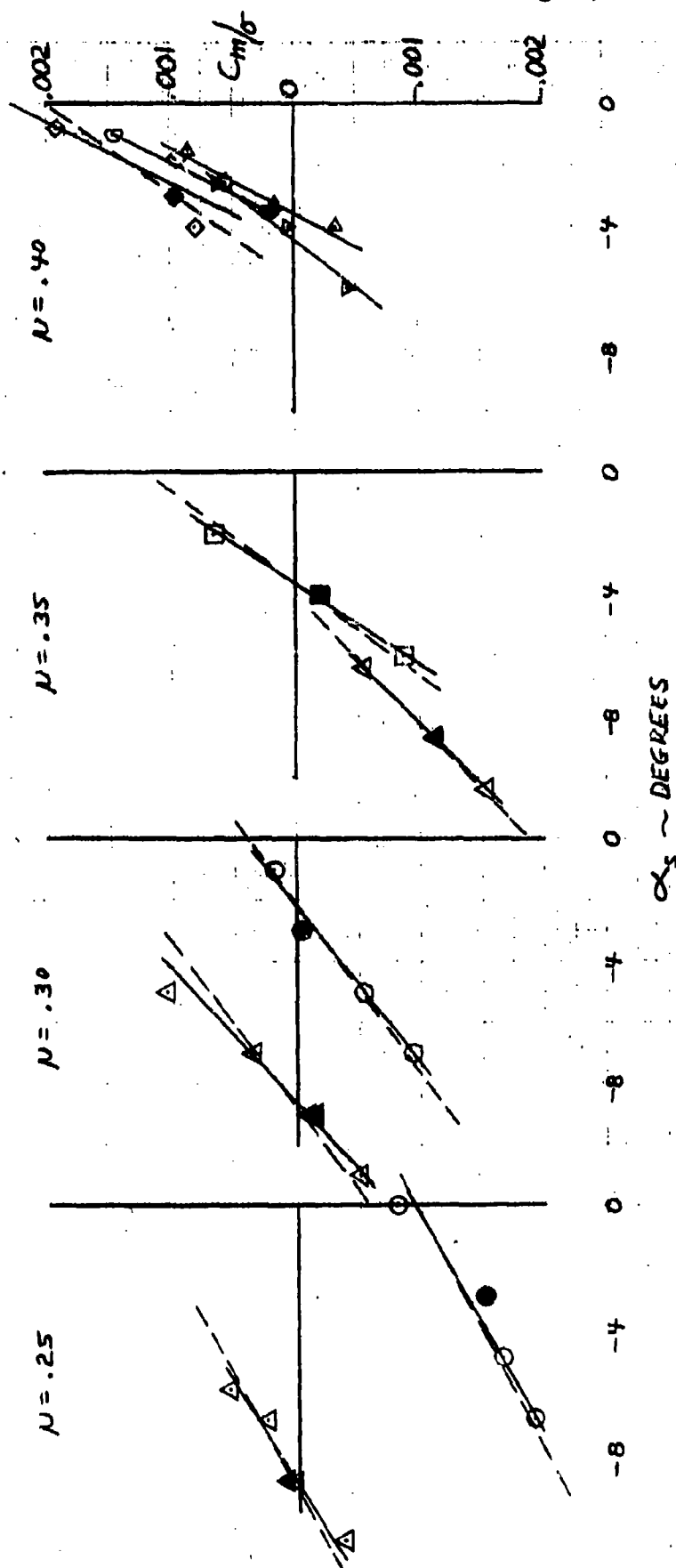


FIG. 7

7/71

DERIVATIVE OF ROTOR PITCHING MOMENT VS. ROTOR SHAFT
ANGLE OF ATTACK VS. ADVANCE RATIO

SIM.	θ	CONF.
○	8	FRB-FR
□	10	
△	11	
▽	5.0	FRB-FR
◇	5.5	
◊	6.5	
▽	7.0	

THEORY

ROTOR PITCHING MOMENT
TRANSFERRED TO C.G.

$\frac{\partial C_m}{\partial \alpha}$

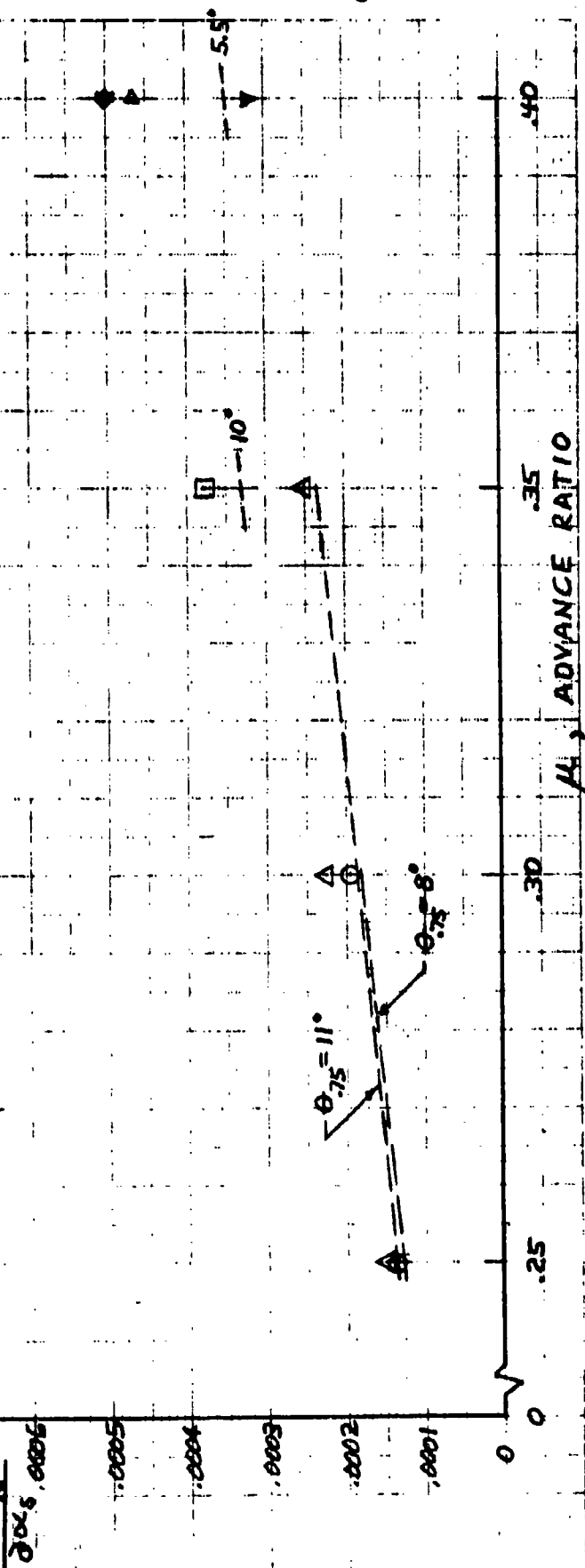
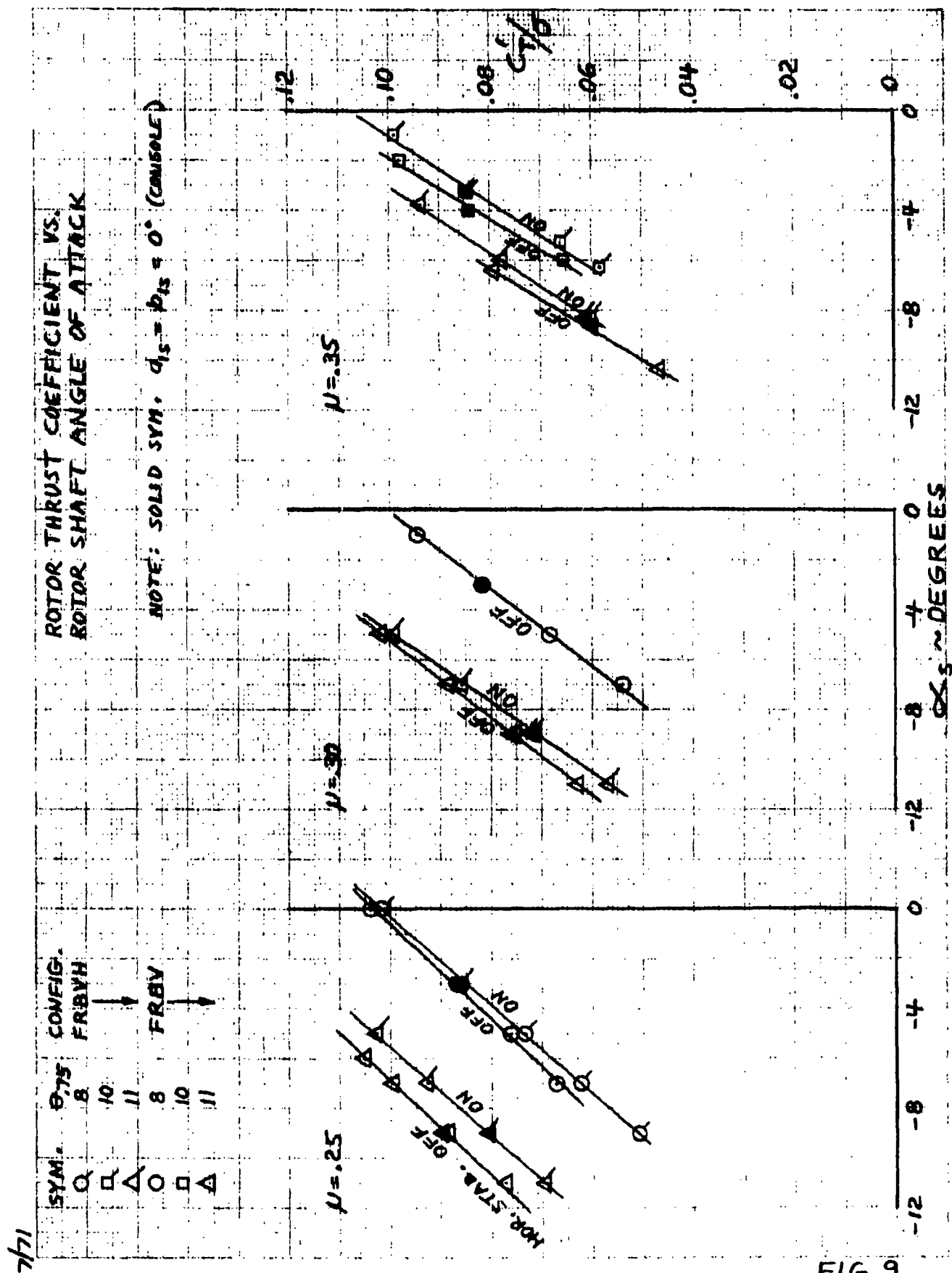


FIG. 8



DERIVATIVE OF THRUST COEFFICIENT VS. ROTOR SHAFT
ANGLE OF ATTACK VS. ADVANCE RATIO

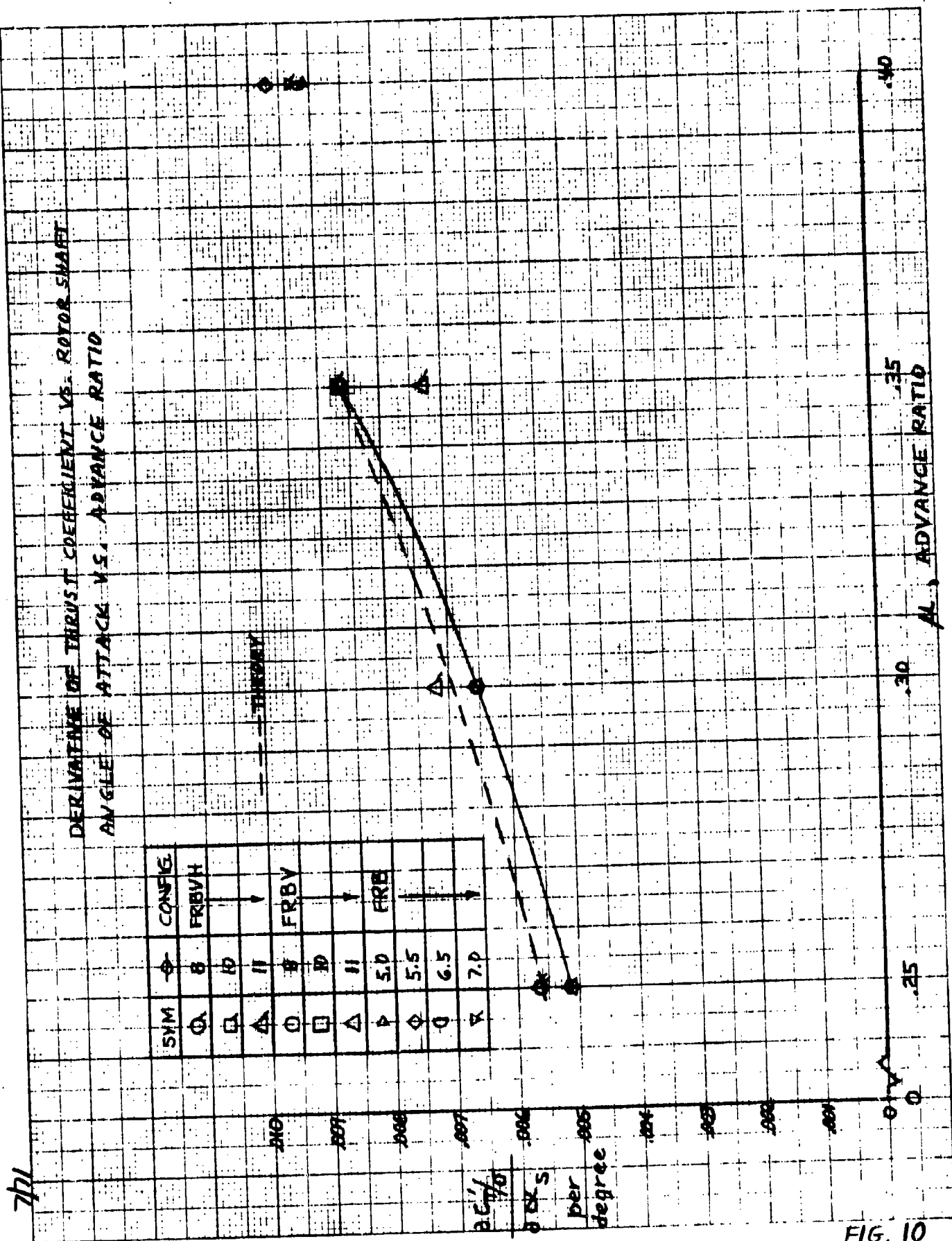


FIG. 10

7171

HELICOPTER PITCHING MOMENT VS. ROTOR SHAFT ANGLE OF ATTACK

NOTE: SOLID SYM. $a_{1s} = b_{1s} = 0^\circ$ (CONSOLE)
 --- THEORY

SYM ϕ_{75} CONFIG.
 8 8 FRBVH
 10 10
 11 11

SYM ϕ_{75} CONFIG.
 8 8 FRBV
 10 10
 11 11

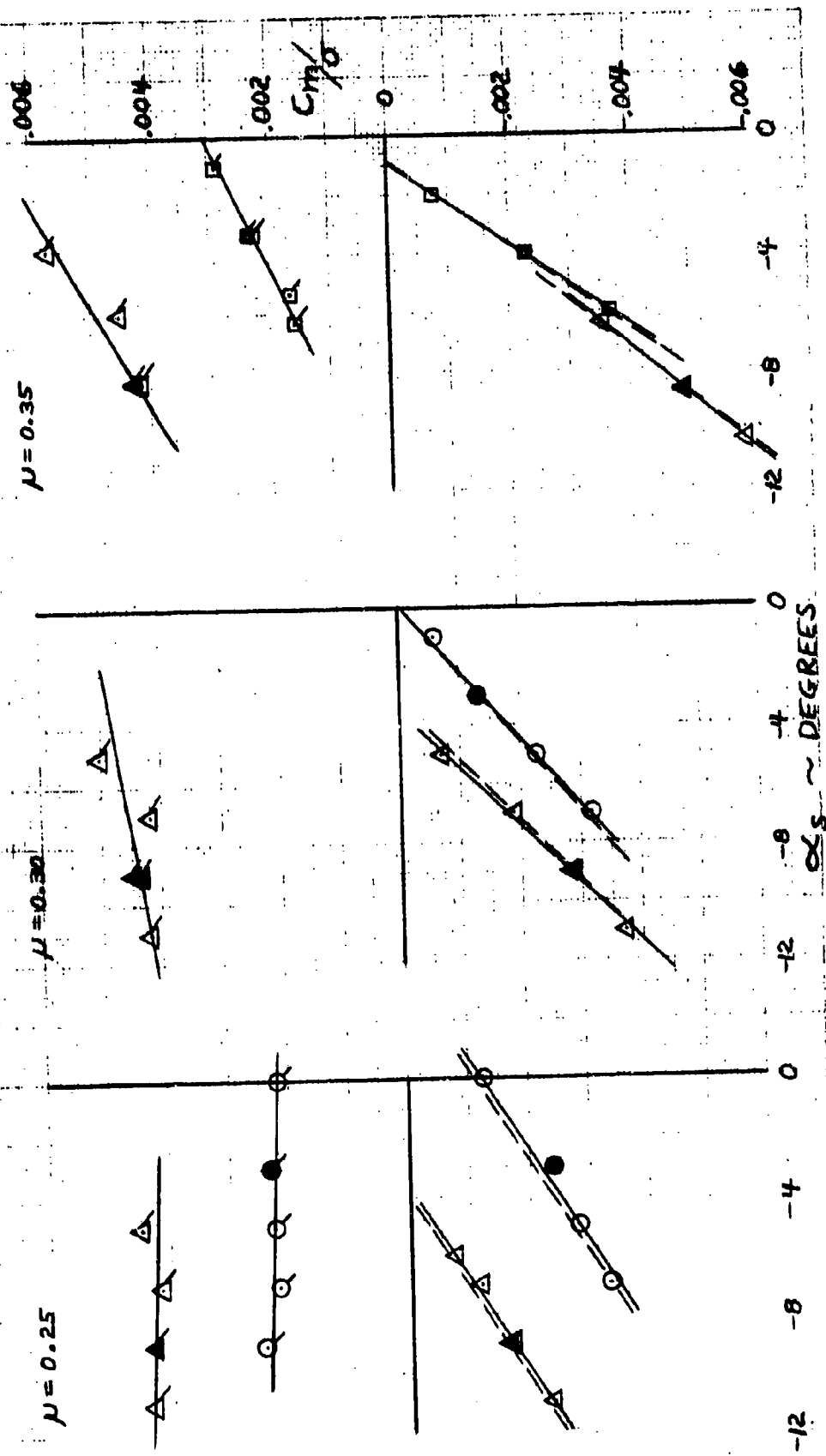


FIG. 11

7/71

DERIVATIVE OF PITCHING MOMENT VS. ROTOR SHAFT
ANGLE OF ATTACK VS. ADVANCE RATIO

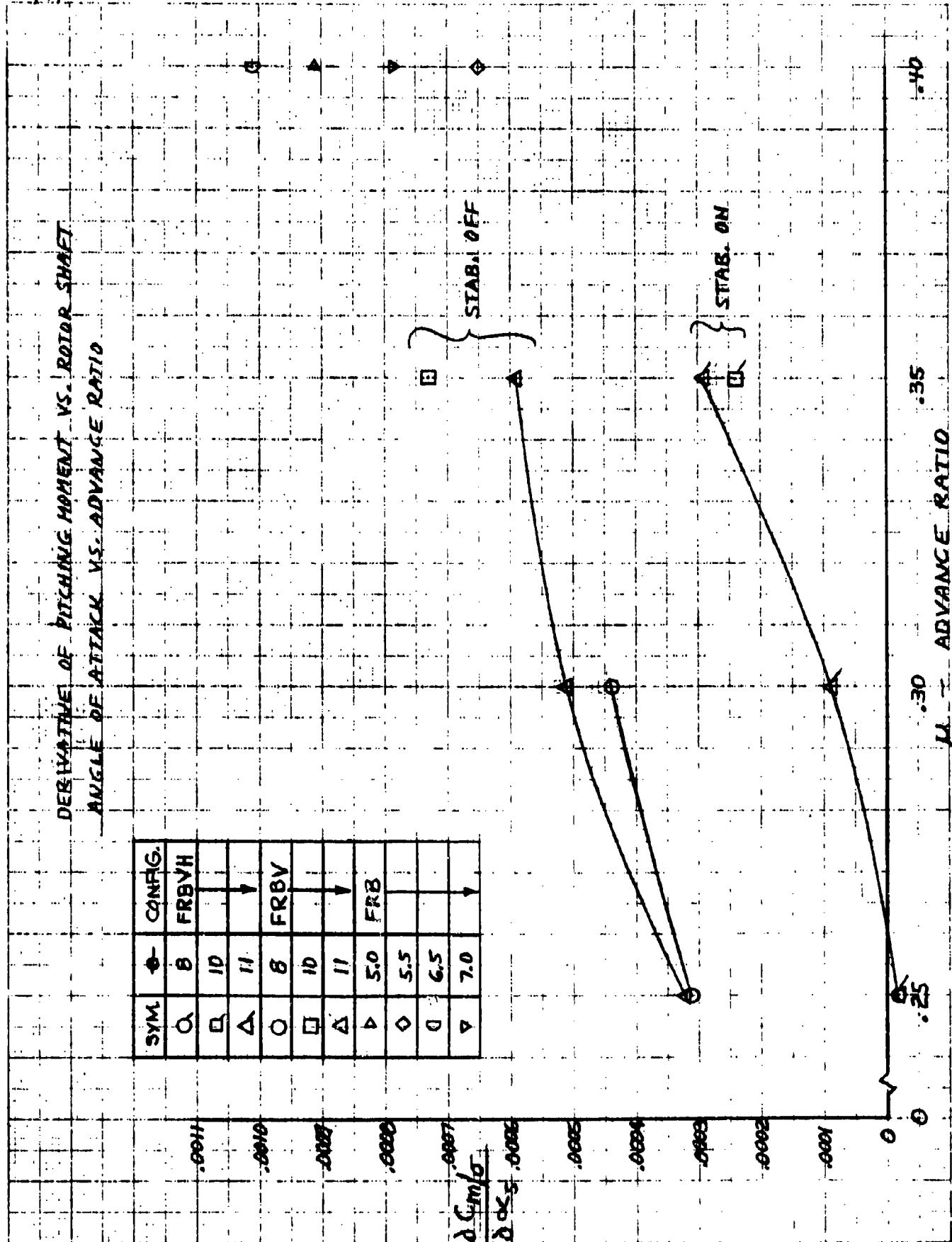


FIG. 12

PER 8/5/69

SYMBOL CONFIG.
 O 8 FRBVH
 □ 10
 △ 11
 ○ 8 FRBV
 □ 10
 △ 11
 ▽ 5.0 FRB
 ◇ 5.5
 ◊ 6.5
 ▽ 7.0

ROLL MOMENT COEFFICIENT VS. ROTOR SHAFT ANGLE OF ATTACK

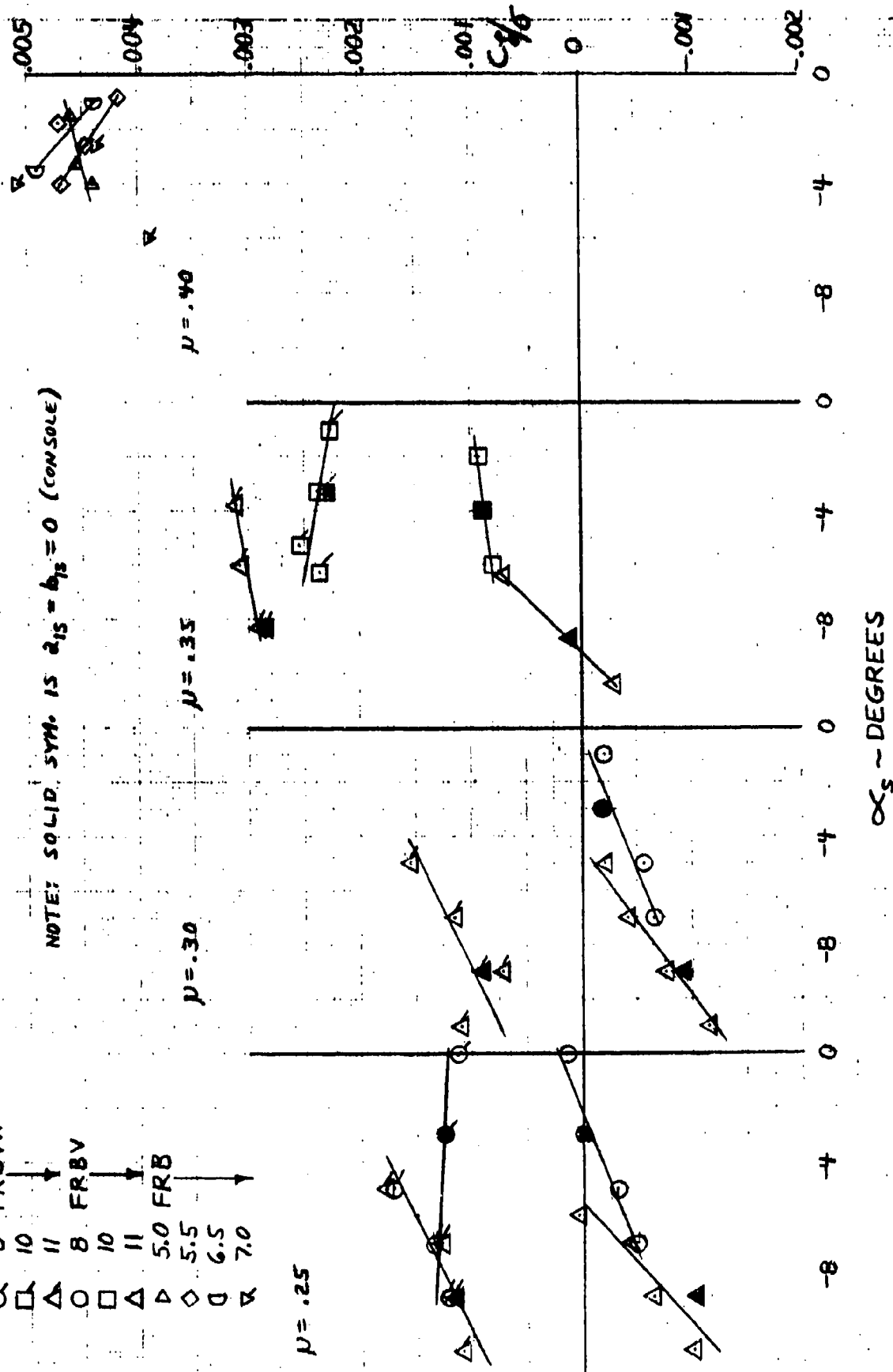
NOTE: SOLID SYM. IS $a_{15} = b_{15} = 0$ (CONSOLE)

FIG. 13

2/21

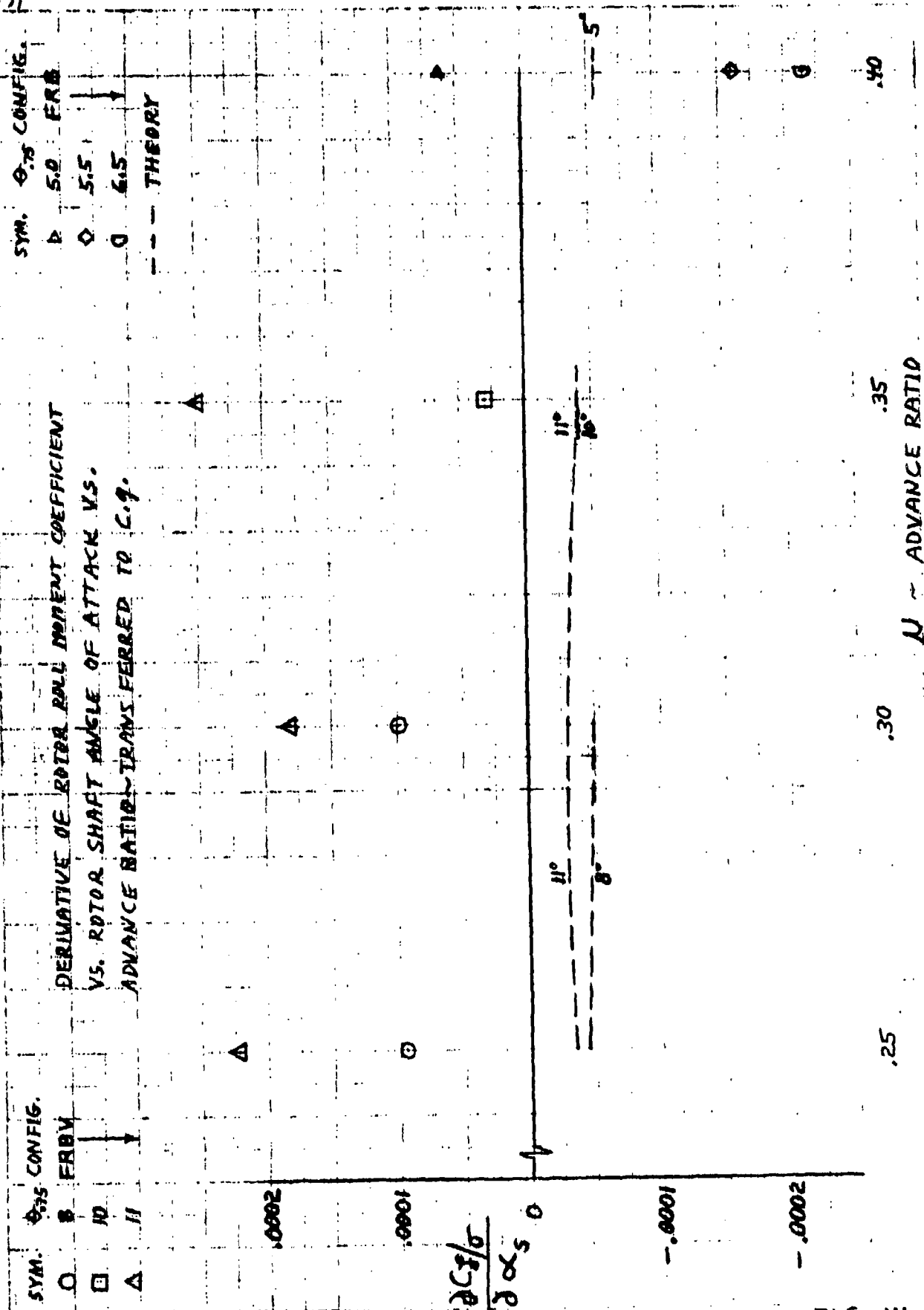


FIG. 14

LONGITUDINAL FLAPPING V_2 LONG. CYCLIC MOTION

NOTE: SOLID SYM IS $\alpha_v = 0$ (CONSOLE)
 --- THEORY

○ B FRBV
 □ 10 FRBV
 ▽ 5 FRB

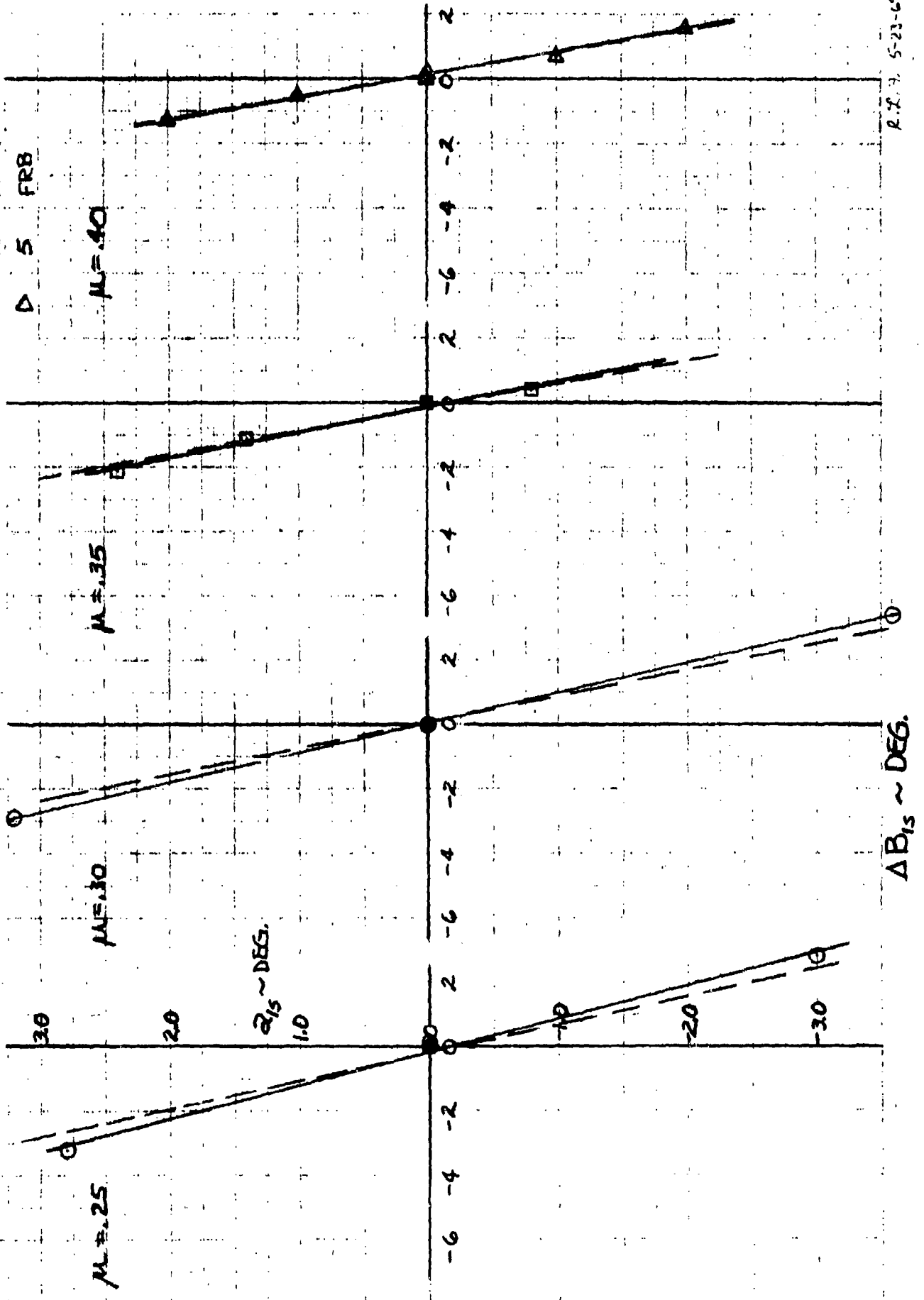


FIG. 15

7/71

DERIVATIVE OF LONGITUDINAL CYCLIC FLAPPING
VS. LONGITUDINAL CYCLIC MOTION VS ADVANCE RATIO

SYM	α_s	θ_s	CONFIG.
○	-3	8	FRBV
□	-4	10	FRBV
△	-3	5	FRB

--- THEORY

-20

-18

-16

-14

-12

-10

-8

-6

-4

-2

0

$\frac{\partial a_{1s}}{\partial \beta_{1s}}$

.25

.30

.35

.40

$\mu \sim$ ADVANCE RATIO

FIG. 16

7/71

DERIVATIVE OF ROTOR PITCHING MOMENT VS.
LONGITUDINAL CYCLIC STICK VS. ADVANCE RATIO
TRANSFERRED TO C.G.

SYN. θ_{12} CONFIG.

□ 8 FRBV

□ 10 FRBV

△ 5 FRB

NOTE: SOLID SYM. IS $\alpha_{12} = 0$ (CONSOLE)

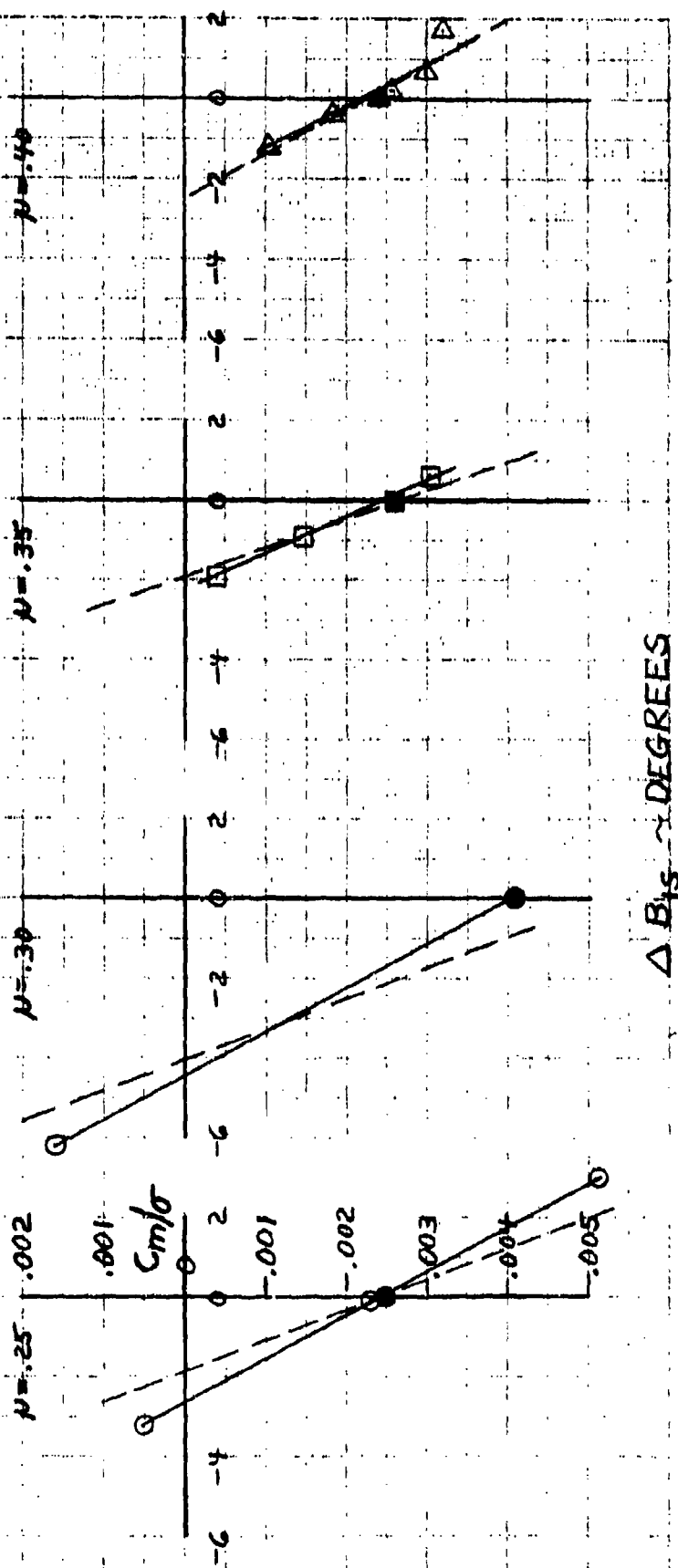


FIG. 17

7/71

HELICOPTER PITCHING MOMENT VS. LONGITUDINAL CYCLIC MOTION
CONFINED FIBER

$\mu = .35$

$\mu = .30$

$\mu = .25$

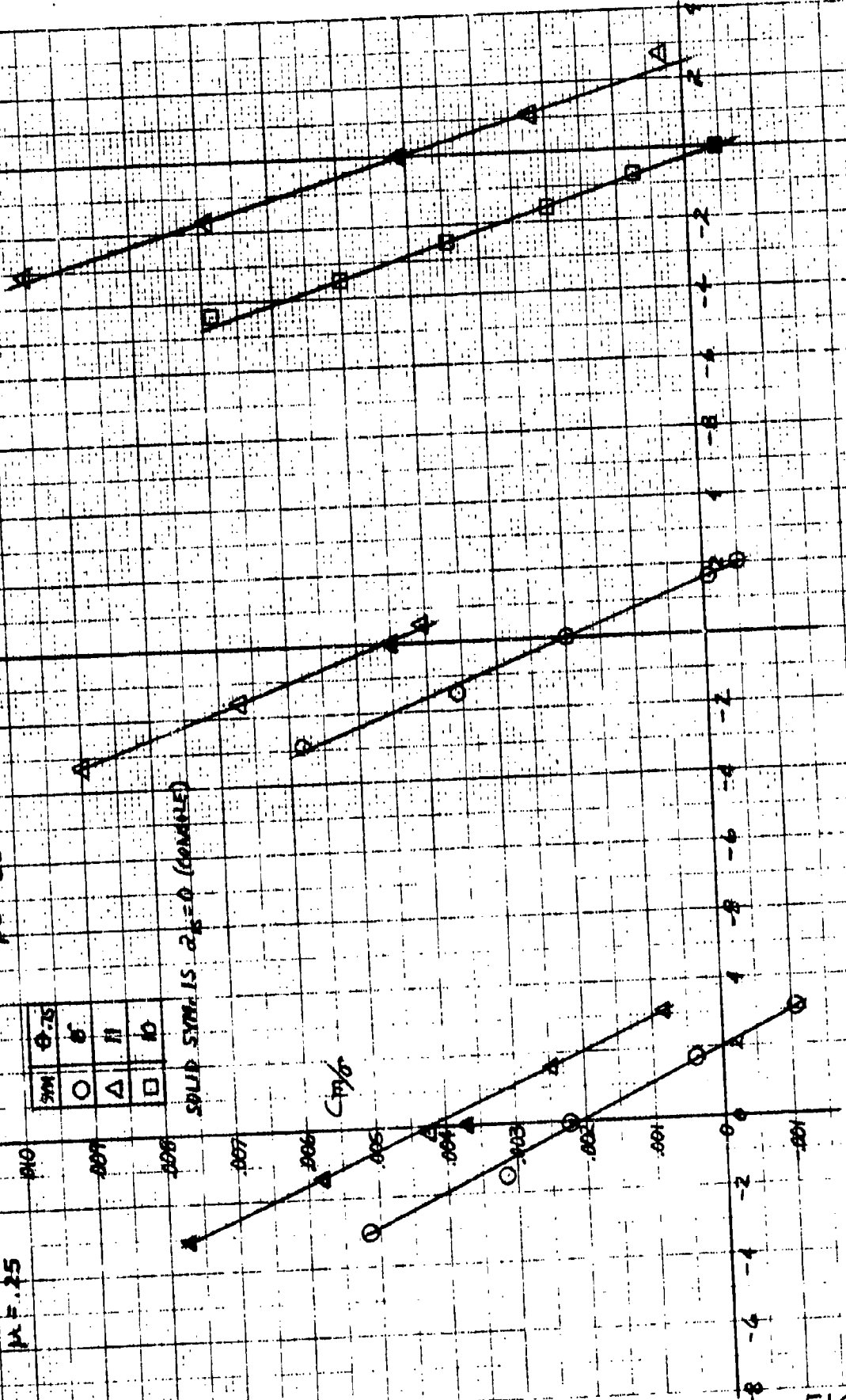
SYM	Φ	θ
○	0°	0
△	11	10
□	10	10

SOLID SYM IS $\alpha_B = 0$ (CONFINED)

Cm/g

$\Delta B_{15} \sim \text{DEGREES}$

FIG. 18



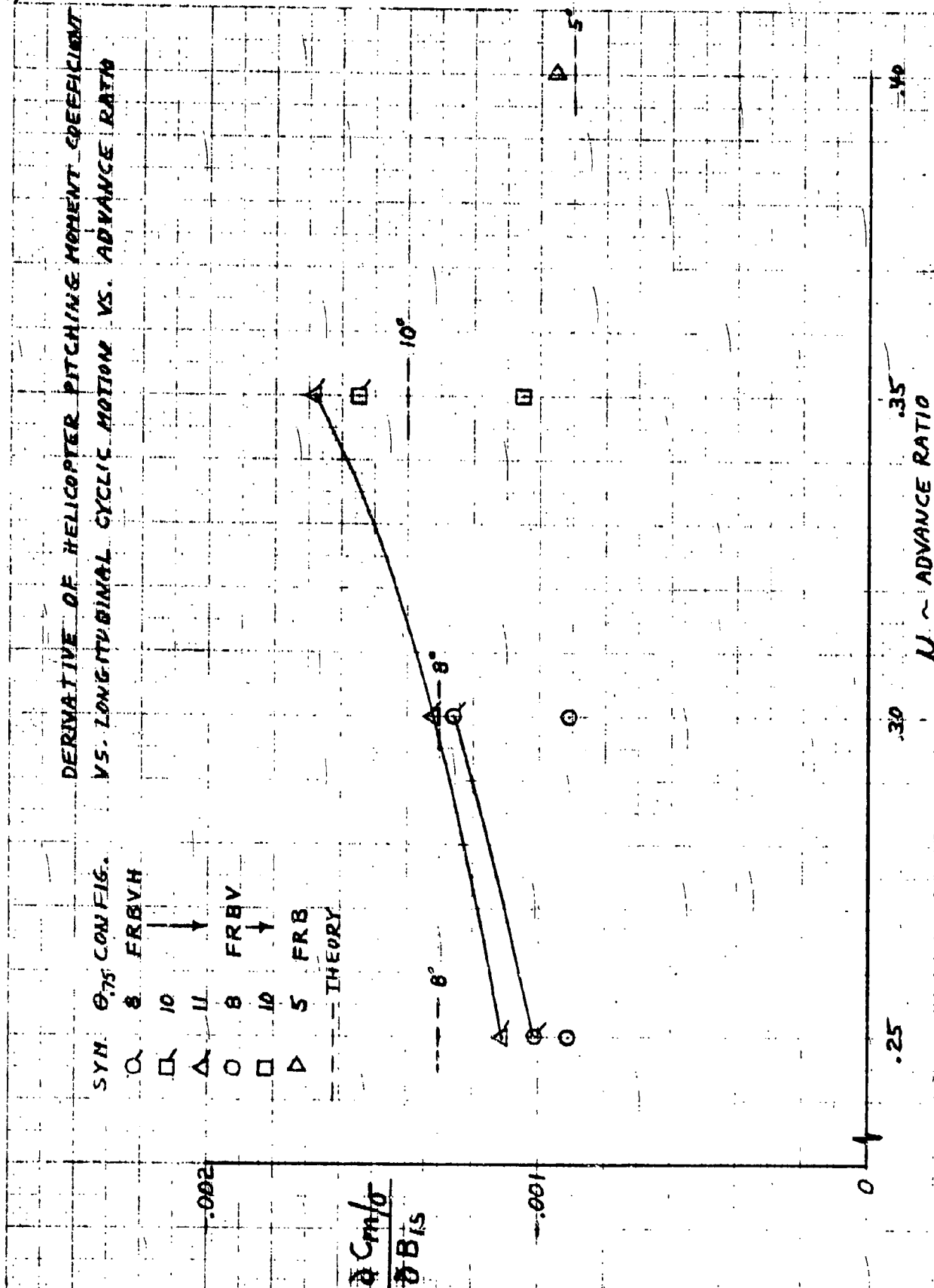


FIG. 19

7/71

DERIVATIVE OF THRUST VS. LONGITUDINAL
CYCLIC MOTION VS. ADVANCE RATIO

SYM. α_s θ 75 CONF. —
O -3 8 FRBV
□ -4 10 FRBV
△ -3 5 FRBV

--- THEORY

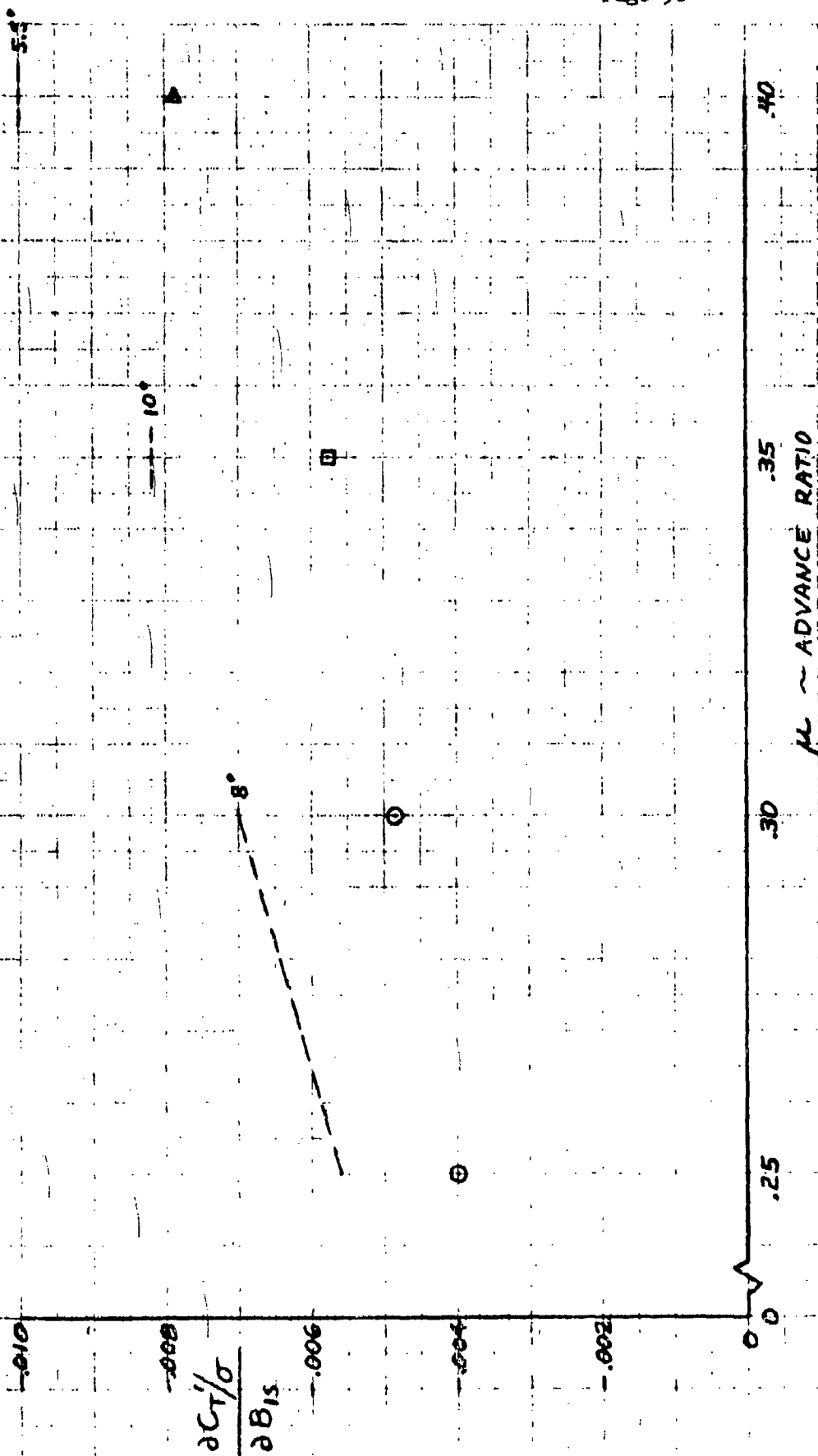


FIG. 20

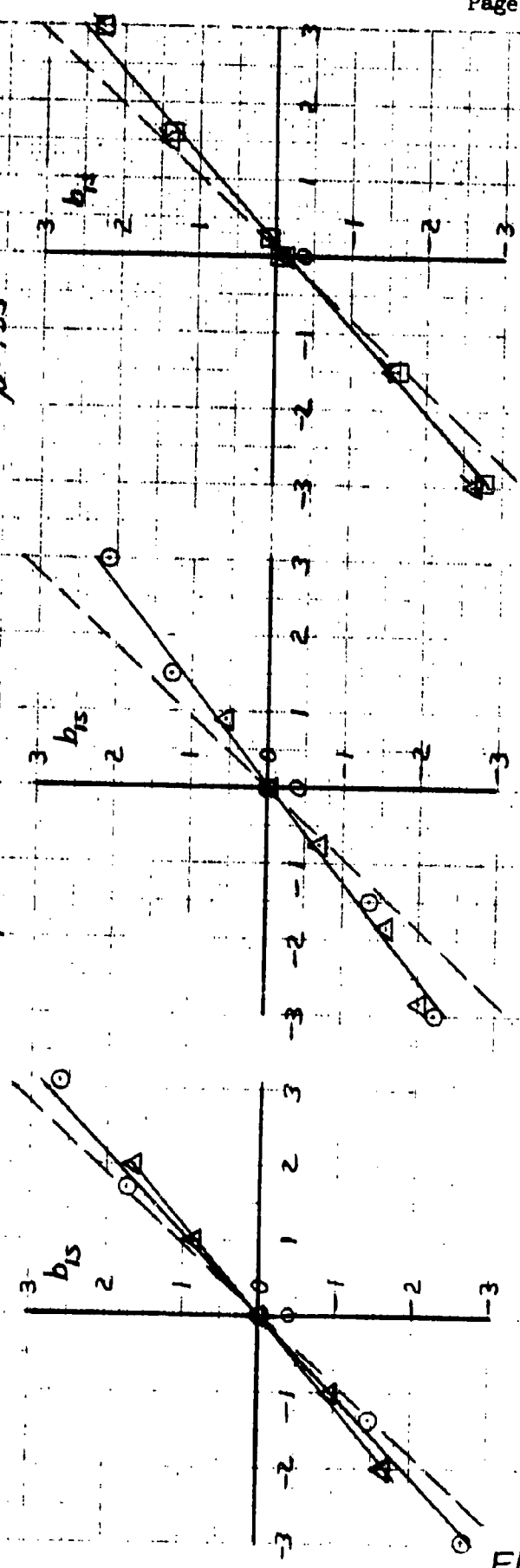
LATERAL BLADE FLAPPING VS.
LATERAL CYCLIC MOTION

SYM	ϕ_{75}	ϕ_{25}	CONFIG.
○	0	-3.0	FRBVH
□	10	-3.0	
△	11	-5.0	
×	11	-8.3	

$\mu = .25$

$\mu = .30$

$\mu = .35$



$\Delta A_{1s} \sim \text{DEGREES}$

FIG. 21

7/71

ROLL MOMENT VS. LATERAL CYCLIC MOTION

CONFIG. FREVH

SYM.	ϕ_{75}	ϕ_5	RUN	SYM.	ϕ_{75}	ϕ_5	RUN
Δ	11	-3.0	9	Δ	11	-3.3	11
$\square$	8	-3.0	13	$\square$	10	-3.0	11

$\mu = 0.25$

THEORY
 $\mu = 0.30$

$\mu = 0.35$

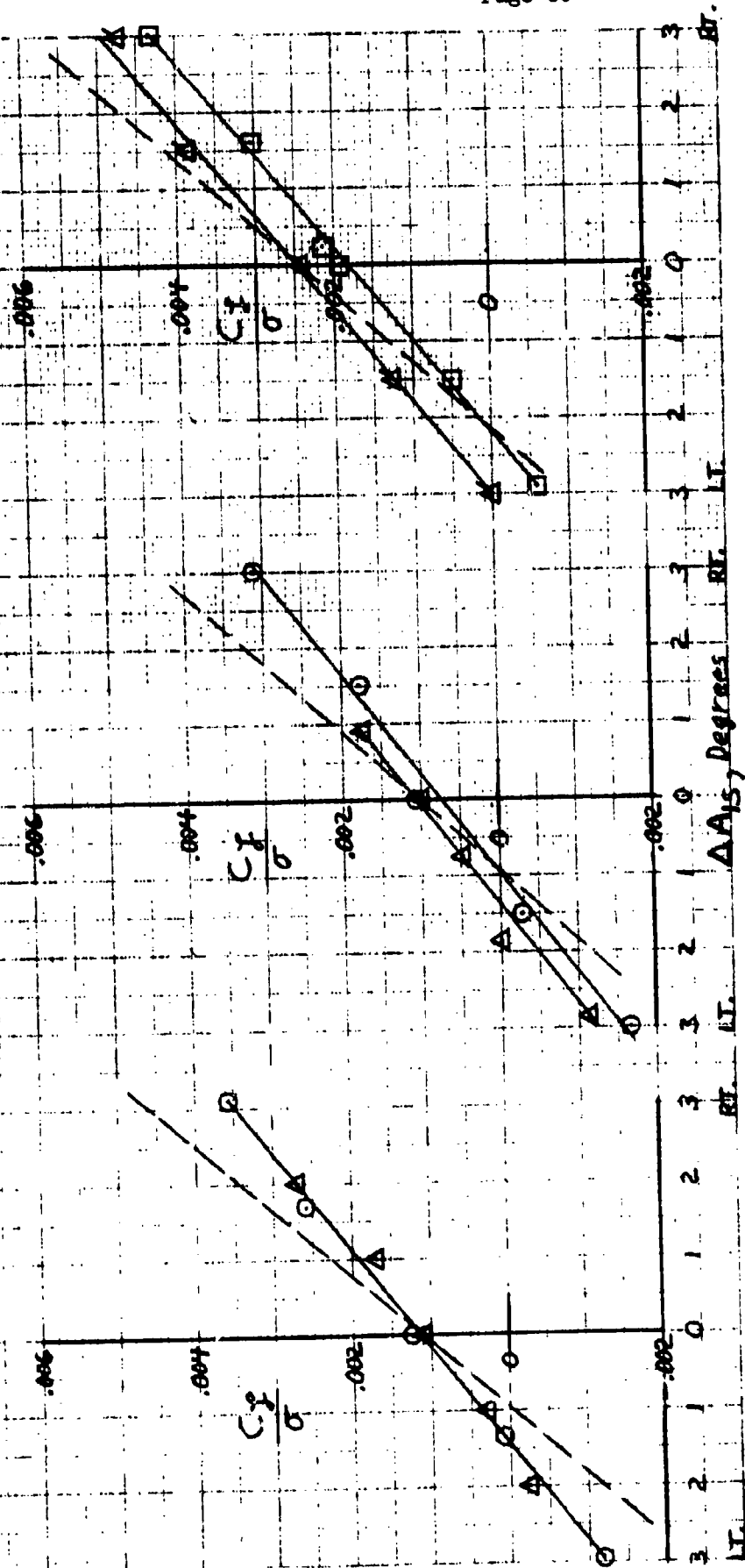


FIG.22

7/71

STAT 8A, HDM, 1 OF 1 X 01, 2-71

DERIVATIVE OF ROLL MOMENT VS. LATERAL
CYCLIC MOTION VS. ADVANCE RATIO

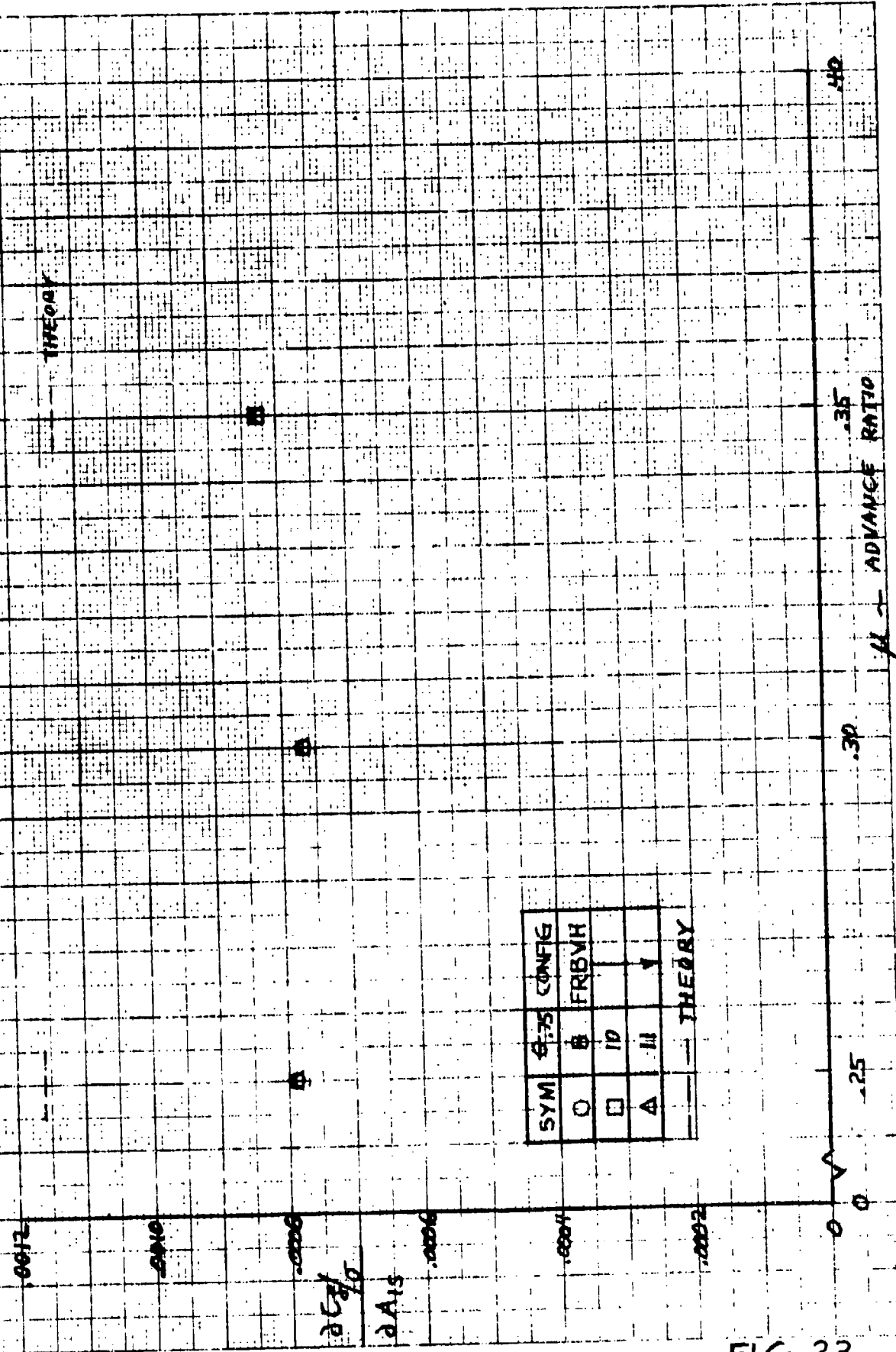


FIG. 23

7/71

LONGITUDINAL FLAPPING VS. COLLECTIVE PITCH

NOTE: SOLID SYM. IS $\alpha_3 = 0$ (CONSOLE)

SYM.	α_3	CONFIG
O	-3	FRBV
Δ	-4	FRBV

— — — THEORY

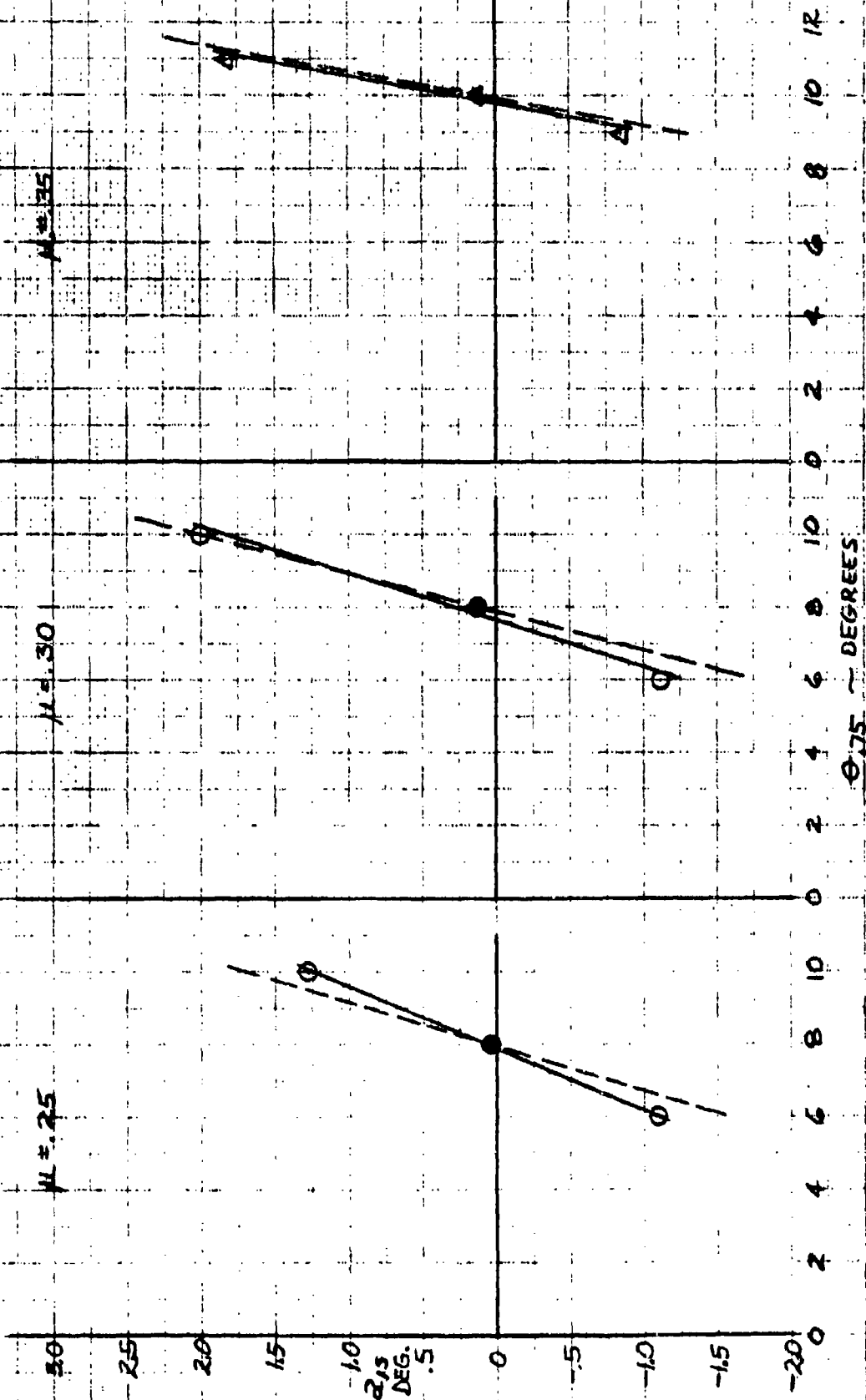


FIG. 24

7/71

LATERAL FLAPPING VS. COLLECTIVE PITCH

SYM	OKS	CONFIG.
0	-3	FRBV
4	-4	FRBV

NOTE: SOLID SYM. IS $b_{13} = 0$ (CONSOLE)

--- THEORY

$\mu = .25$

$\mu = .30$

$\mu = .35$

3.0

2.5

2.0

1.5

b_{13}
DEG.

1.0

.5

0

-.5

-1.0

-1.5

-2.0

0

2

4

6

8

10

0

2

4

6

8

10

0

2

4

6

8

10

$\theta_{13} \sim \text{DEGREES}$

FIG. 25

7/71

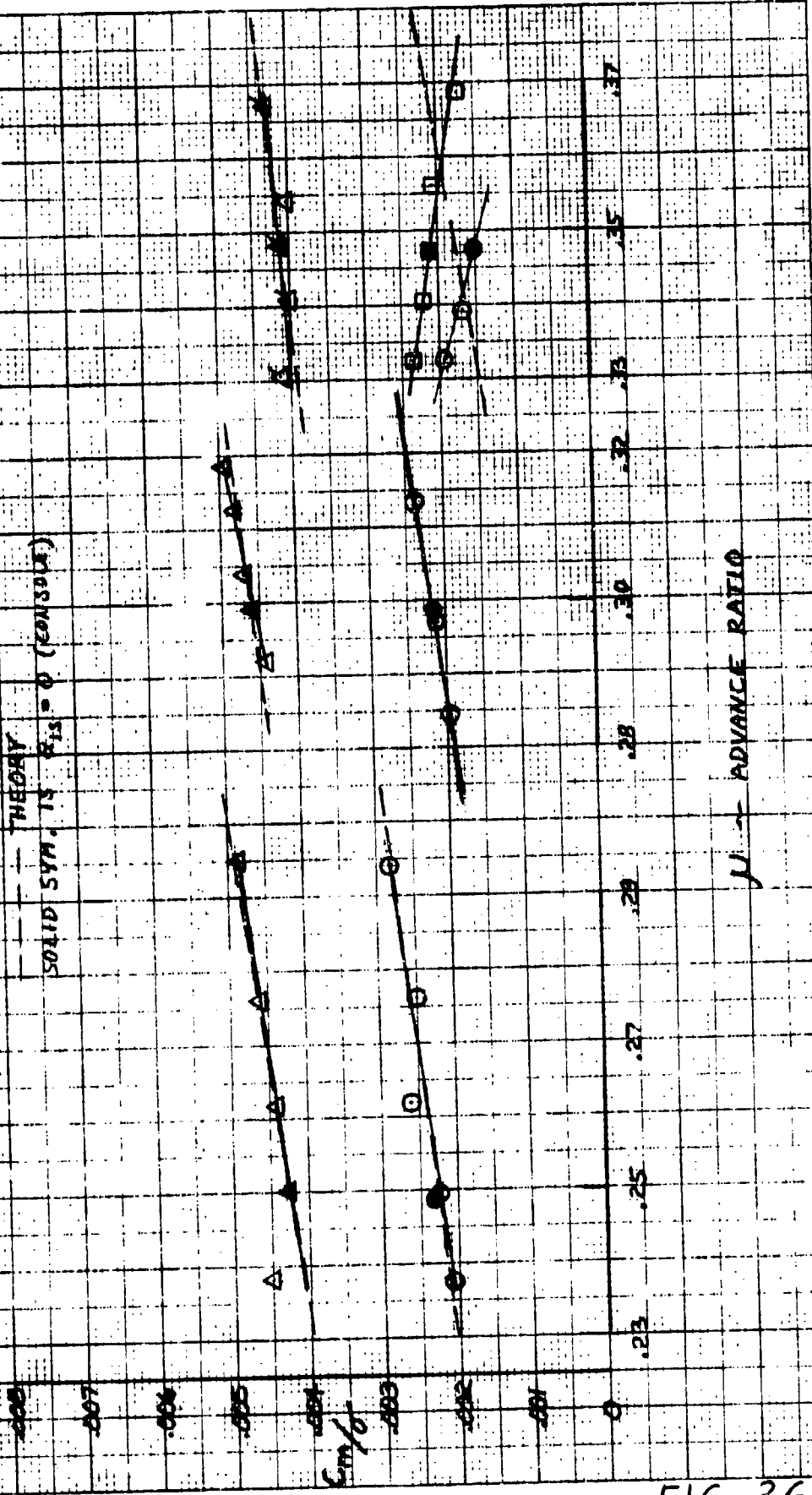
PITCHING MOMENT COEFFICIENT VS. ADVANCE RATIO

SYN. ϕ_{15} 0.5 RUN
 A 4 1 9
 O 0 3 9
 CONE. F. RUN

SYN. ϕ_{15} 1.0 RUN
 A 1 1 10
 O 0 3 9
 CONE. F. RUN

SYN. ϕ_{15} 1.5 RUN
 A 1 1 10
 O 0 3 9
 CONE. F. RUN

--- THEORY
 SOLID SYN. IS $\phi_{15} = 0$ (CONSOLE)



J - ADVANCE RATIO

FIG. 26

7/71

30°
KERN & EISEN CO.
INC.
1010 10th St.
San Francisco, CA 94103

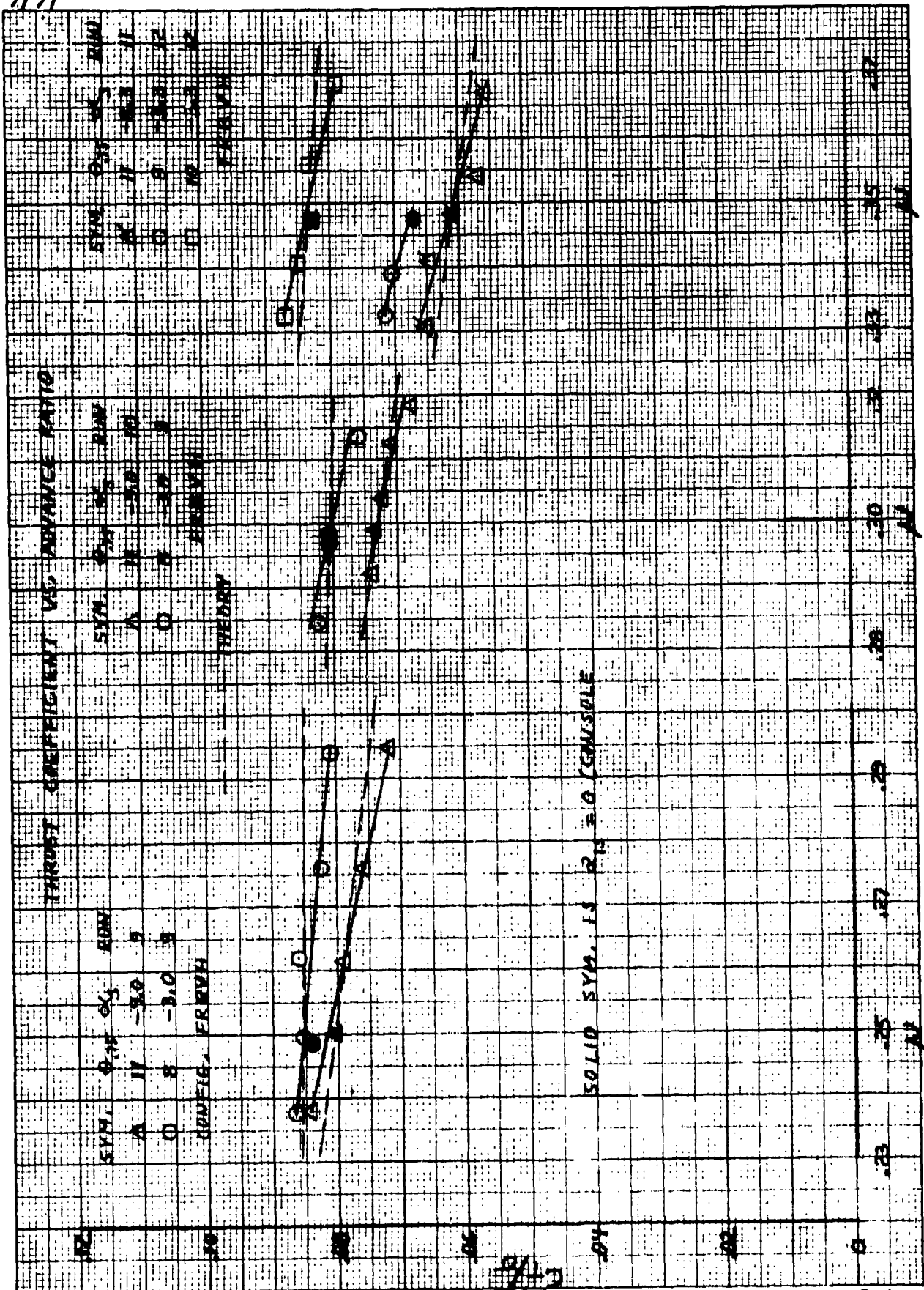


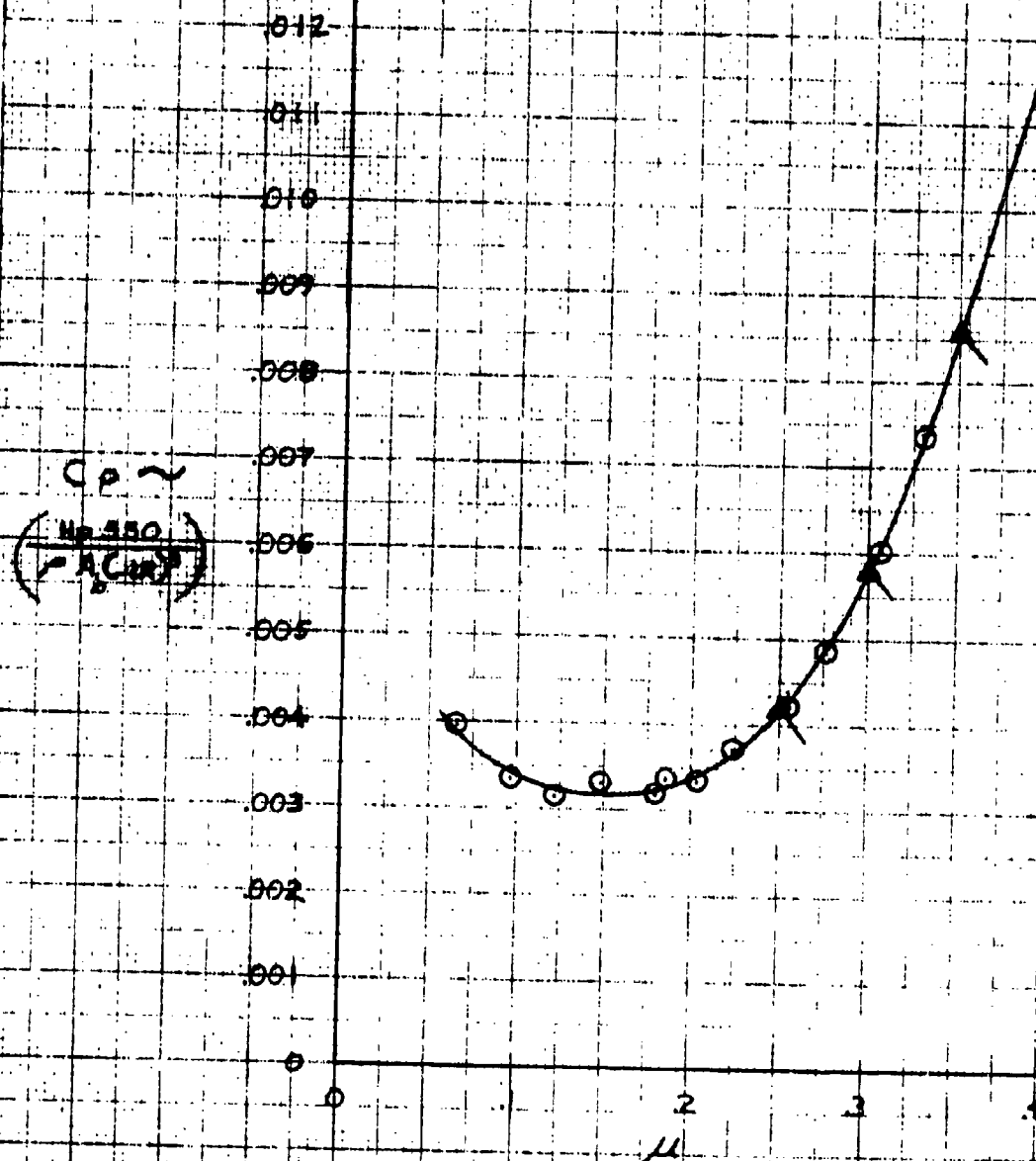
FIG. 27

369

COMPARISON OF LEVEL FLIGHT PERFORMANCE

O ~ FROM FIG. 32 USATECOM FLT TEST REPORT* (REF. 8)

△ ~ FROM AMES WIND TUNNEL TEST (369-4214) WITH
1.35 FT FLAT PLATE AREA SUBTRACTED



* PROJECT No. 4-3-0250-51/52/53 (PART 2) (GROSS WT.=2090 LBS, ROTOR SPEED=469 RPM)

FIG. 28 7-23-68
R 27

COMPARISON OF FLIGHT TEST AND WIND TUNNEL LOADS

○ ~ FLIGHT TEST

△ ~ WIND TUNNEL (A, A1, A2), FRBVHT

□ ~ WIND TUNNEL, FRBVH, FRBV, FRB

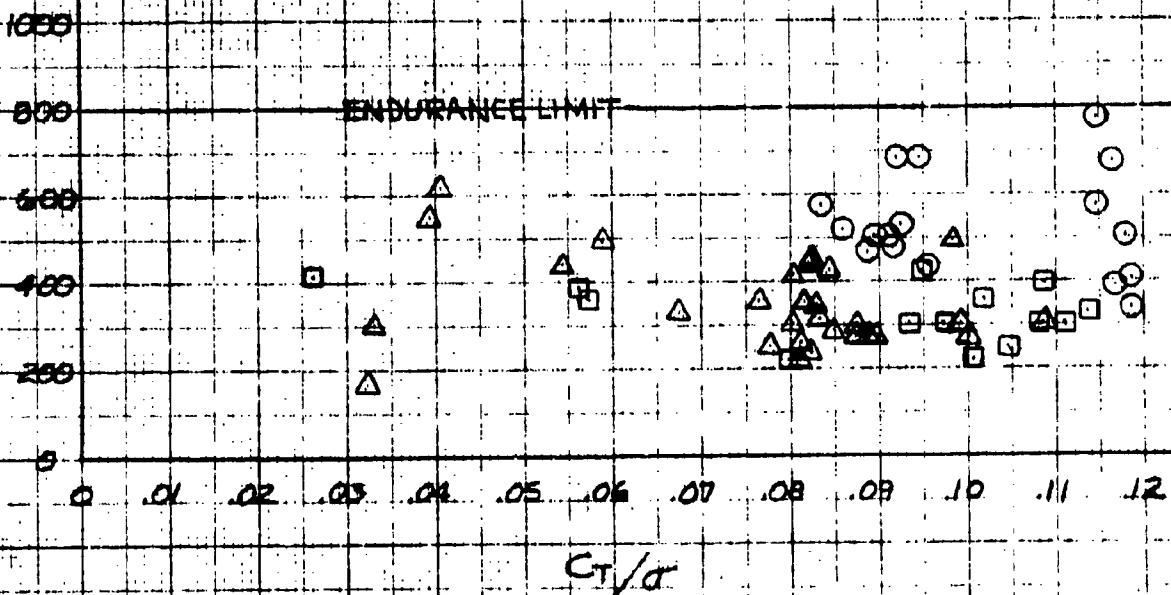
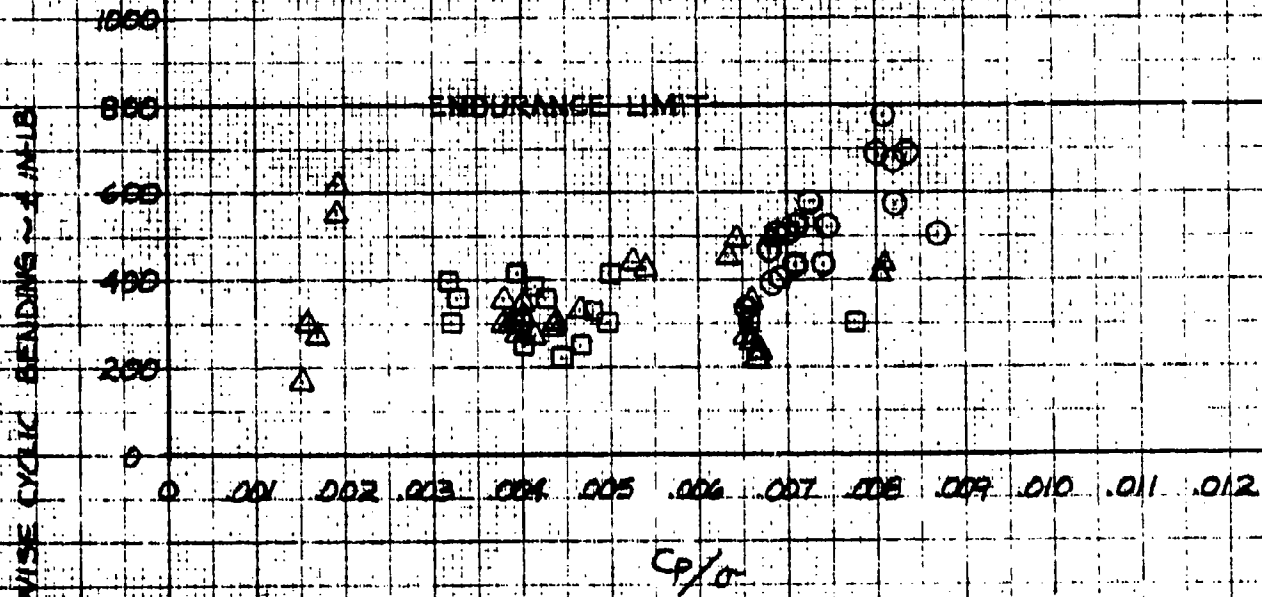


FIG. 29 R2.7. 3-26-69

COMPARISON OF FLIGHT TEST AND WIND TUNNEL LOADS

○ ~ FLIGHT TEST

△ ~ WIND TUNNEL (Q_1, Q_2, Q_3), FRBVHT

□ ~ WIND TUNNEL, FRBVH, FRBV, FRP

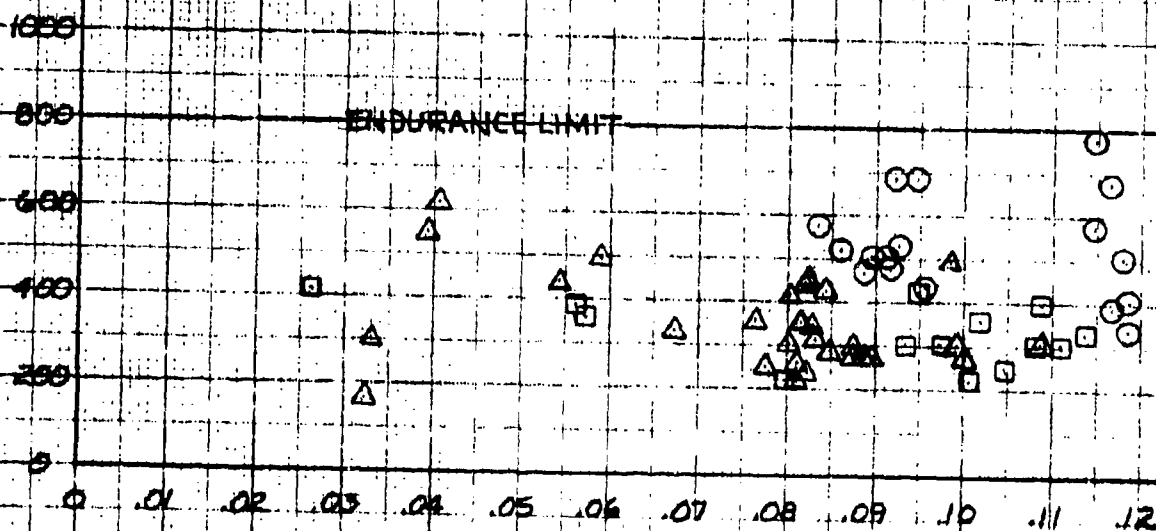
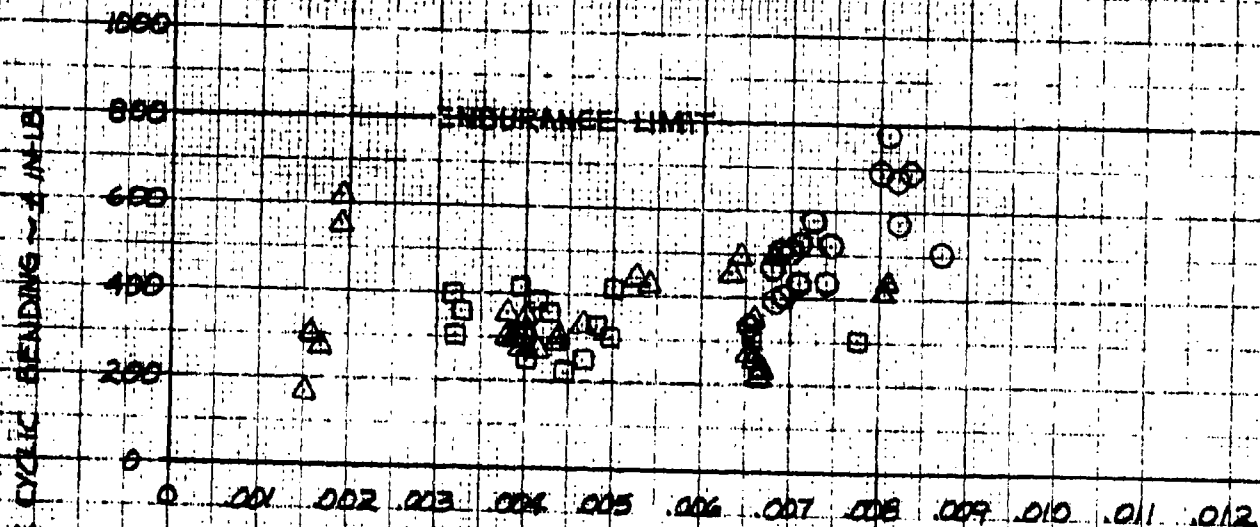


FIG. 29 R27 3-26-69

COMPARISON OF FLIGHT TEST AND WIND TUNNEL LOADS

O ~ FLIGHT TEST

Δ ~ WIND TUNNEL ($\alpha_1, \alpha_2, \alpha_3 = 0$), FRBVHT

$\square$ ~ WIND TUNNEL, FRBVH, FRBV, FRB

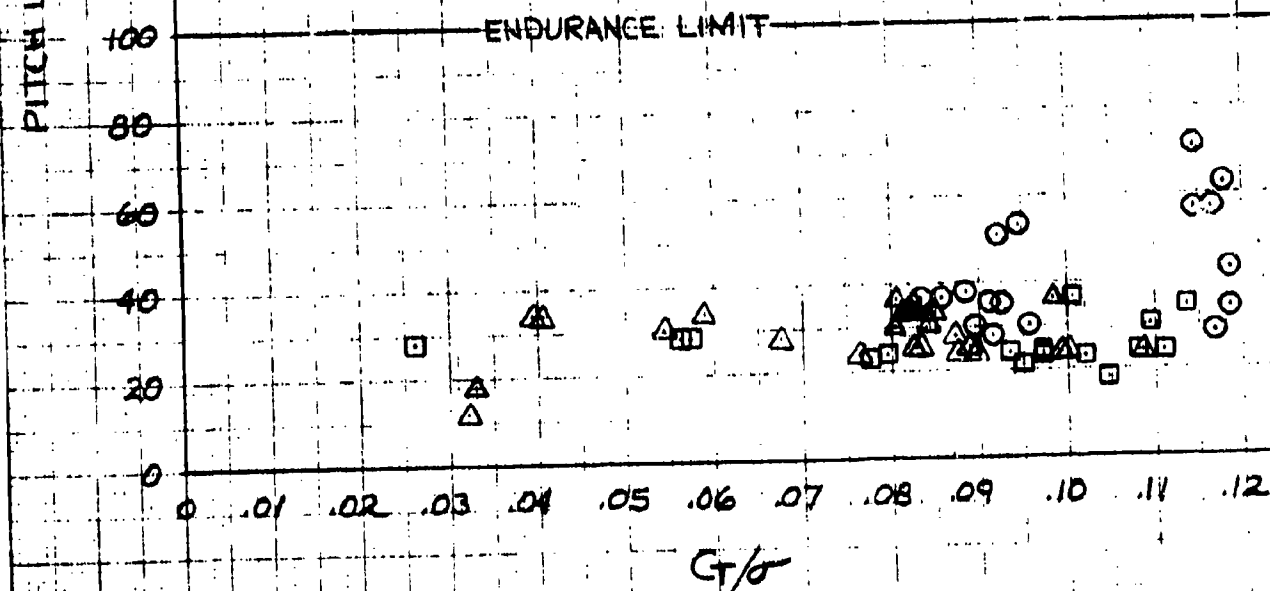
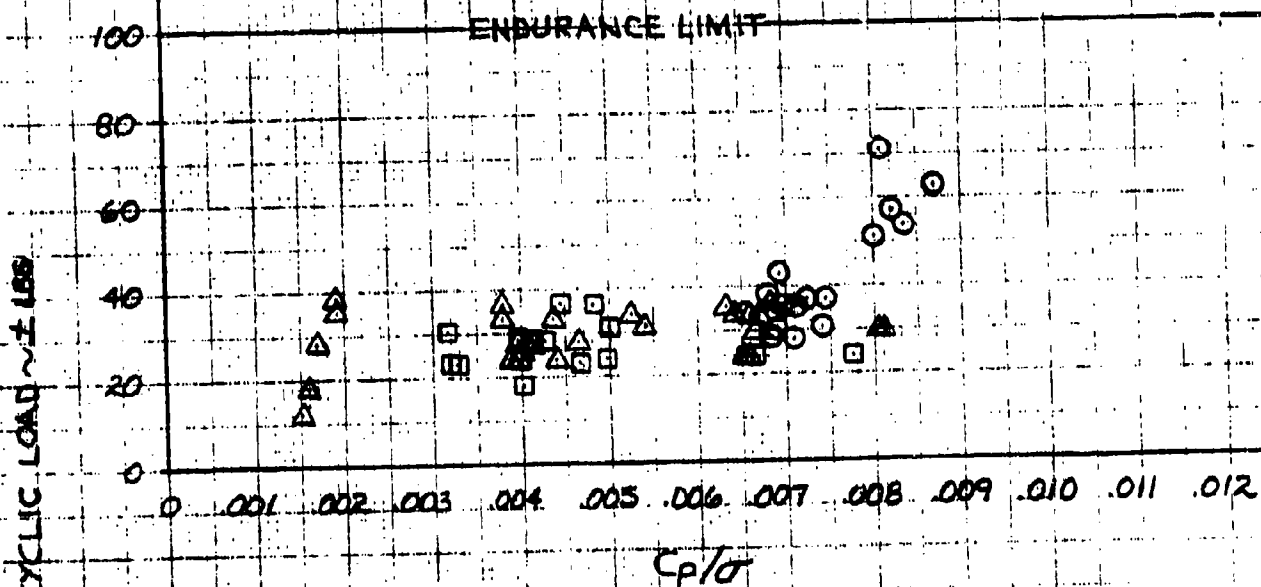


FIG. 30 R.2.7. 3-27-69

PITCH LINK AVERAGE LOAD VS. COLLECTIVE

$\mu = 0.25$

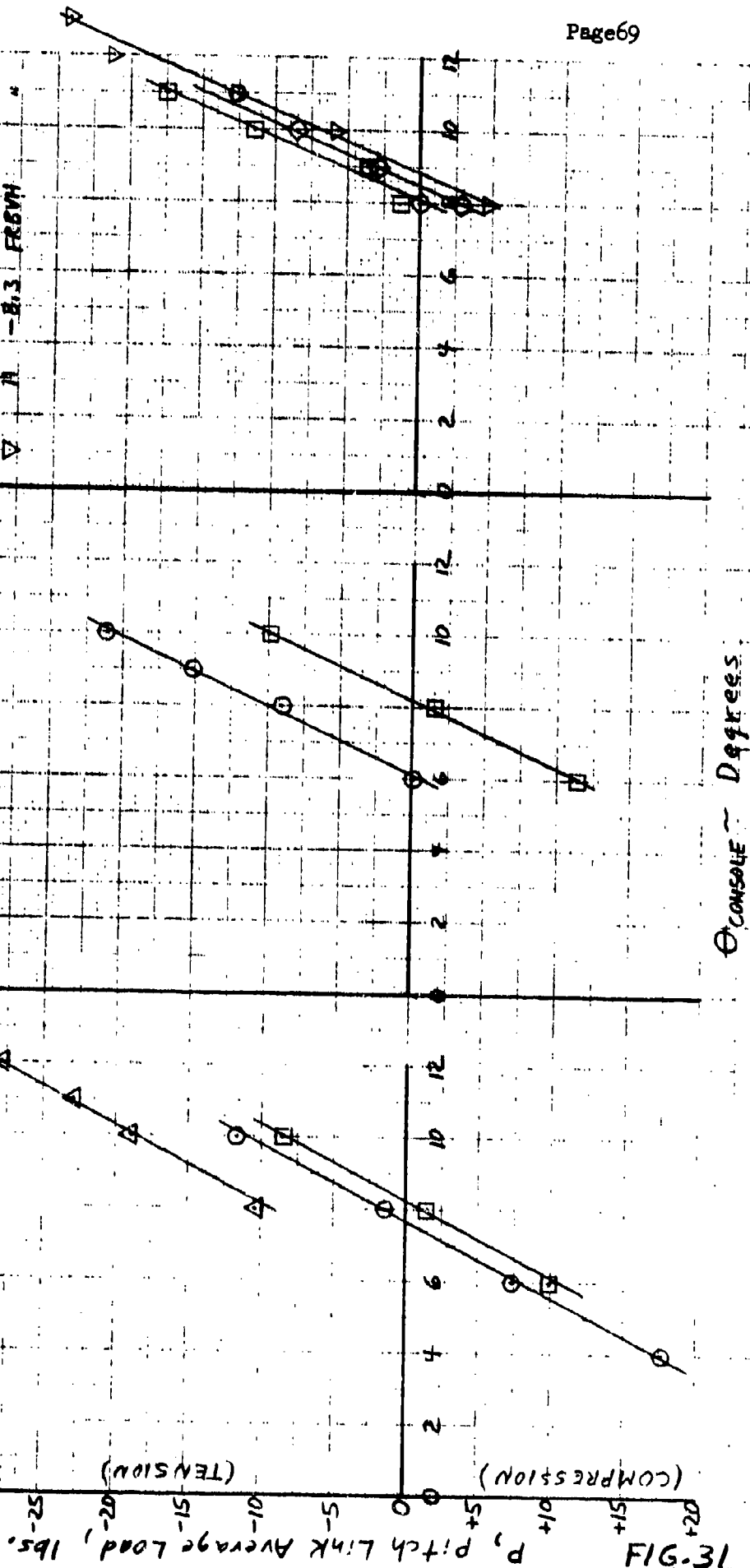
SYN	ROW	α_s	CONFIG.	SLOPE
□	14	-3.0	FRBV	-4.70
○	13	-3.0	FRBVH	"
△	13	-3.0	FRBVH	"

$\mu = 0.30$

SYN	ROW	α_s	CONFIG.	SLOPE
□	14	-3.0	FRBV	-5.28
○	9	-3.0	FRBVH	"

$\mu = 0.35$

SYN	ROW	α_s	CONFIG.	SLOPE
□	14	-4.0	FRBV	-5.86
○	11	-3.0	FRBVH	"
◇	11	-2.6	FRBVH	"
▽	11	-8.3	FRBVH	"



Console - Degrees

FIG. 13-91F

13 NOV. 68

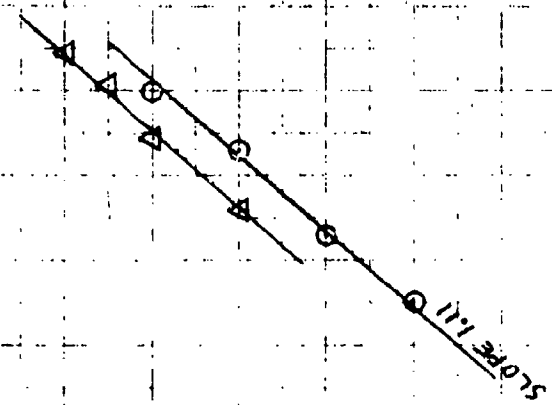
CONSOLE COLLECTIVE VS. OSCILLOGRAPH COLLECTIVE

$\theta_{\text{console}} \sim \text{Degr.}, \text{ Console Collective Setting}$

$\mu = 0.25$

RUN 13

SYN	α	DATA POINTS
O	-3.0	12-15
Δ	-9.0	21-24

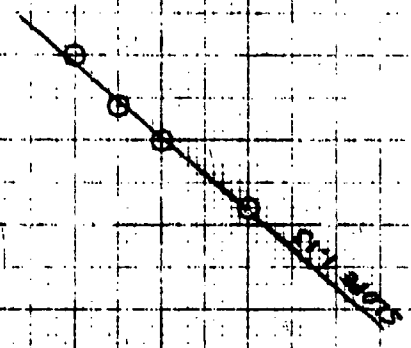


CONSOLE COLLECTIVE - FRBVM

$\mu = 0.30$

RUN 11

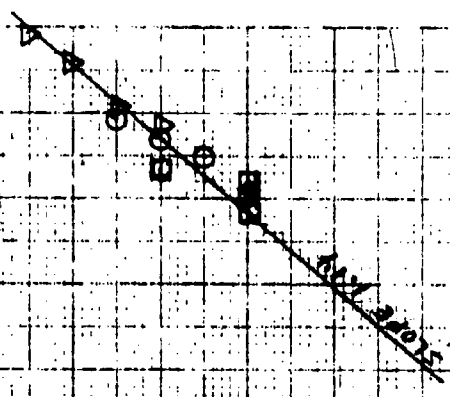
SYN	α	DATA POINTS
O	-3.0	22-25



$\mu = 0.35$

RUN 11

SYN	α	DATA POINTS
$\square$	-2.6	25-28
O	-3.0	25-28
Δ	-8.3	1-5



$\theta_{\text{osc}} \sim \text{Degrees}, \text{ Oscillograph Collective Reading}$



12/30/68

FUSELAGE + TAIL AERODYNAMIC CHARACTERISTICS

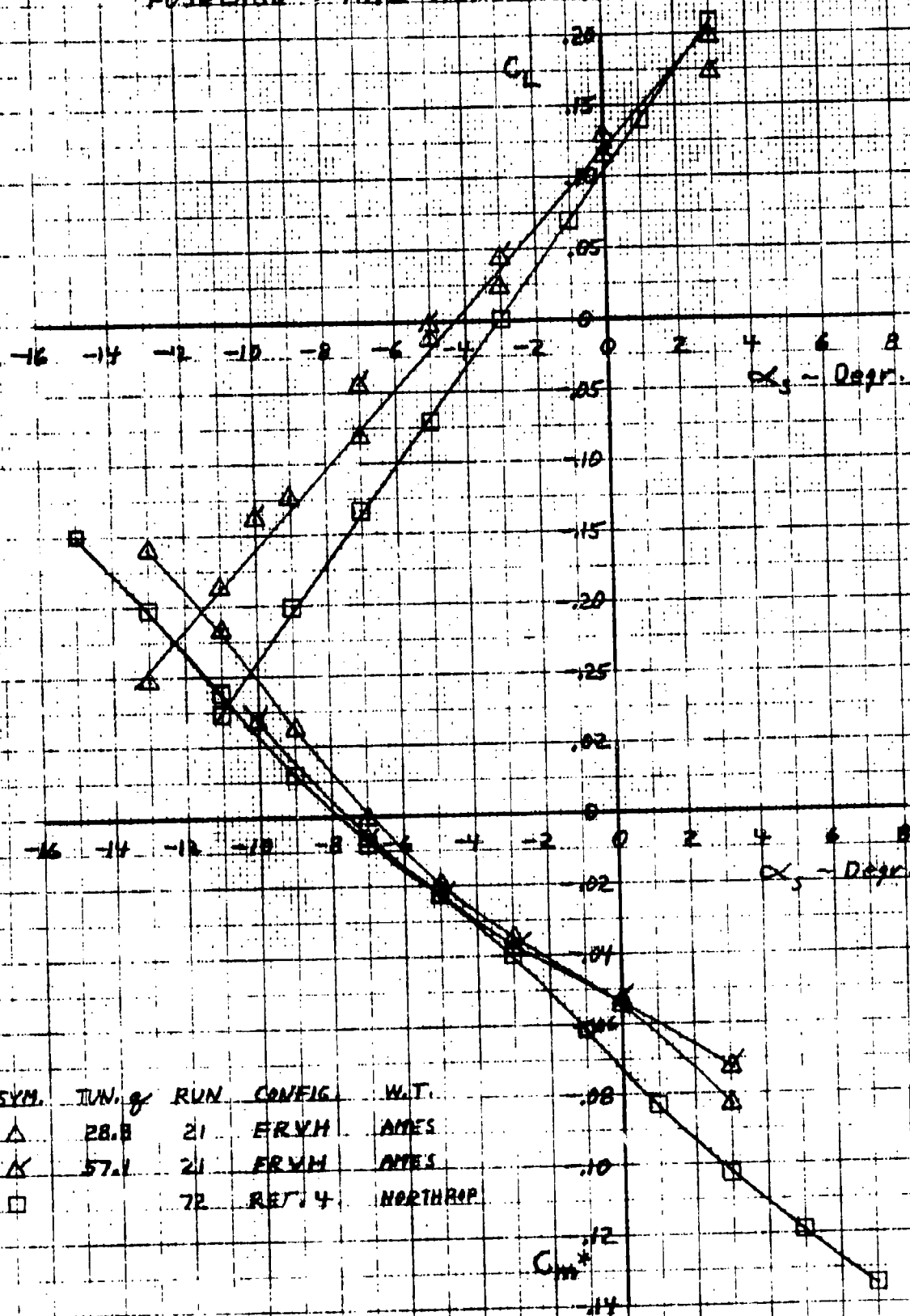
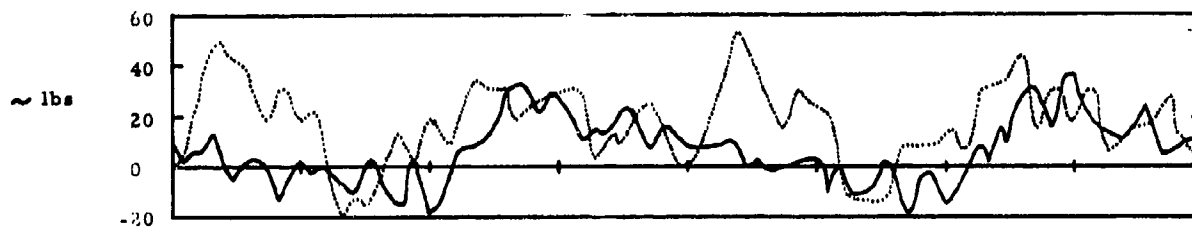


FIG. 34

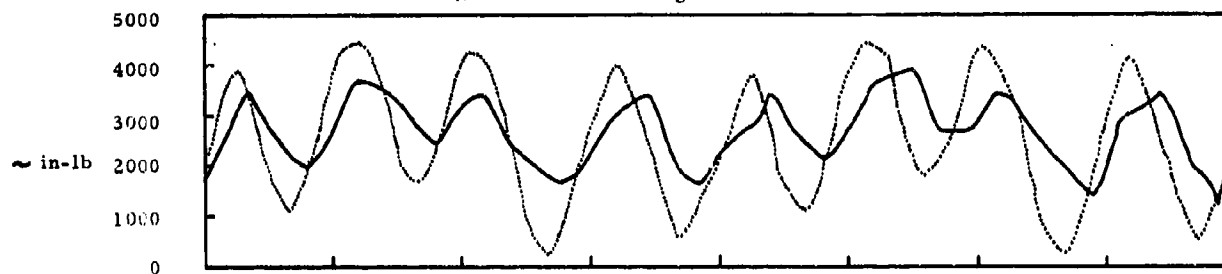
TIME HISTORIES OF ROTOR LOADS

— Ames Wind Tunnel Data, $\mu = 0.349$, $C_T/\sigma = 0.0843$
 Flight Test Data, $\mu = 0.344$, $C_T/\sigma = 0.0894$

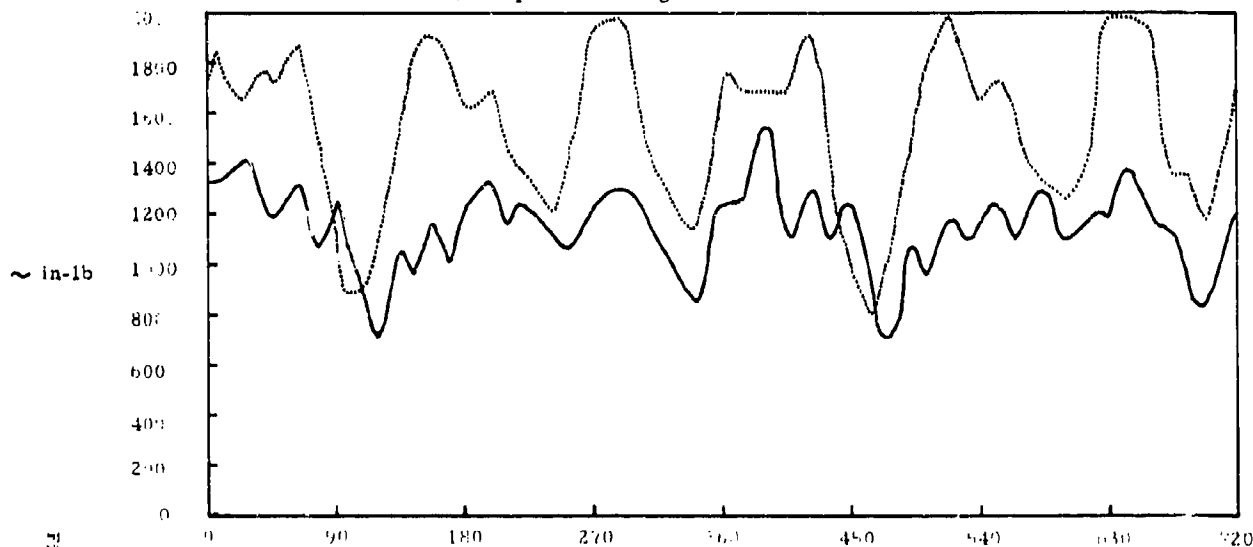
Main Rotor Pitch Link Load



Main Rotor Blade - 17% Chordwise Bending



Main Rotor Blade - 15% Flapwise Bending



Rotor Azimuth Position

$\psi \sim$ degree

OUT

ETC-AD Report 369-A-8020

TEST 316.0 RUN 2 STATIC 1 ROTOR SCALE DATA * PROGRAM L3330 * WIND AXES
81'S DIFFER ON BEGINNING AND END ZEROES. BEGINNING VALUE 496.0, END VALUE = 500.0 COUNTS. END VALUE WILL BE USED.
UPDATE = 6 17 38 150" TIME 457.09

BAROMETRIC PRESSURE = 30.01

CONFIG. FRBVHT

PT	ALPHA	B I	Q	LIFT.U	DRAG.U	SIDE F.U	PITCH.U	YAW.U	ROLL.U	HP	OMEGA.R	TEMP	NOTES
AVC	ALFA	RHO*100	V.KTS	CL	CD	CY	CM	CN	CRDL	CPO	CO	M.OMR	RUN
A.F.C	L/D/E	V/OR		CLR	CXR	CYR	CMY	CMZ	CMX		COO	M.AT	THETA
1	-3.00	2.85	28.79	1510.	309.	13.	588.	52.	199.	79.0	645.4	65.0	
1	-7.25	0.2321	93.31	1.7469	0.2222	0.0282	0.0524	-0.0271	0.0317	0.0023514	-0.0008565	2.5744	468.
	-5.85	3.31	0.2440	0.052021	-0.006618	0.000841	0.001561	-0.003808	0.000944	0.0036649	0.0004569	0.7146	4.0
2	-3.00	3.50	28.89	1960.	285.	13.	566.	149.	241.	92.1	637.1	66.0	
1	-4.87	0.2321	93.47	2.2675	0.1931	0.0271	0.0502	-0.0180	0.0351	0.0028517	-0.0006389	0.5671	462.
	-6.50	4.14	0.2476	0.069519	-0.005923	0.000831	0.001541	-0.000553	0.001177	0.0037869	0.0003263	0.7075	6.0
3	-3.00	4.35	28.68	2360.	253.	-5.	1004.	328.	97.	111.6	623.3	66.0	
1	-3.27	0.2322	93.12	2.7555	0.1576	0.0097	0.0899	-0.0030	0.0230	0.0036873	-0.0001326	0.5548	492.
	-7.35	4.65	0.2522	0.087603	-0.005011	0.000307	0.002857	-0.000094	0.000731	0.0041230	0.0003031	0.6947	8.0
4	-3.00	5.90	28.86	2855.	213.	-14.	1582.	668.	81.	149.4	628.8	69.0	
1	-1.88	0.2308	93.70	3.3169	0.1001	-0.0031	0.0961	0.0280	0.0269	0.0046380	0.0003864	0.5581	454.
	-8.90	4.85	0.2515	0.104895	-0.003449	-0.000097	0.003340	0.000884	0.000662	0.0045155	0.0005259	0.6985	17.0
5	-8.00	3.05	28.82	1225.	204.	31.	1062.	225.	432.	98.2	595.7	69.0	
1	-4.14	0.2308	93.62	1.4077	0.1018	0.0473	0.0945	-0.0112	0.0459	0.0037388	-0.0006137	0.5287	431.
	-11.05	2.93	0.2652	0.049520	-0.003582	0.001665	0.003326	-0.000393	0.001613	0.0044375	0.0003849	0.6690	6.0
6	-8.00	3.95	28.82	1705.	125.	27.	1313.	401.	296.	134.3	617.8	69.0	
1	-0.27	0.2308	93.62	1.9704	0.0992	0.0426	0.1169	0.0744	0.0364	0.0045856	-0.0003018	0.5483	448.
	-11.95	3.74	0.2558	0.064453	-0.000301	0.001395	0.003824	0.000145	0.001191	0.0042209	-0.0003863	0.6886	8.0
7	-8.00	4.80	28.84	2230.	45.	14.	1749.	697.	215.	175.5	631.6	70.0	
1	-1.88	0.2304	93.75	2.5838	-0.0846	0.0271	0.1556	0.0309	0.0292	0.0057453	0.0008314	0.5600	450.
	-12.80	4.26	0.2505	0.081026	0.002655	0.000851	0.004883	0.000968	0.000916	0.0043664	-0.0005475	0.7003	17.0
8	-13.00	3.50	28.77	975.	122.	83.	1702.	41.	723.	133.4	637.1	70.0	
1	-0.82	0.2304	93.63	1.1174	0.0159	0.0687	0.1517	-0.0114	0.0617	0.0041592	-0.0007690	0.5649	462.
	-16.50	2.10	0.2481	0.034376	-0.000490	0.002113	0.004668	-0.000351	0.001899	0.0044511	-0.0007771	0.7050	8.0
9	-13.00	2.65	28.68	525.	241.	92.	1303.	-202.	824.	98.6	628.8	70.0	
1	-14.83	0.2304	93.47	0.5909	0.1565	0.0807	0.1165	-0.0335	0.0713	0.0031967	-0.0015330	0.5576	456.
	-15.65	1.10	0.2509	0.018597	-0.004925	0.002541	0.003668	-0.001356	0.002243	0.0043949	-0.0003349	0.6975	6.0
10	-13.00	4.15	28.72	1475.	0.	82.	1929.	322.	496.	177.4	628.8	70.0	
1	-4.27	0.2304	93.55	1.7073	-0.1274	0.0682	0.1723	0.0135	0.0417	0.0057543	0.0001196	0.5576	456.

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HFC-AD Report No. 369-A-8020															Page 1	
-17.19	3.05	0.2522	0.835886	0.804077	0.032151	0.085431	0.00426	0.007814	0.0044319	0.0012828	0.6976	10.38				
11	-3.00	3.75	41.91	1810.	468.	7.	979.	399.	90.9	628.8	72.9	456.				
1	-7.24	0.2280	113.36	1.4391	0.2834	-0.0460	0.0599	0.0228	0.2028680	-0.0008646	0.5576	456.				
	-6.75	3.27	0.3063	0.086619	-0.011129	-0.032128	0.002774	0.000410	0.001056	0.002525	0.7272	6.0				
12	-3.00	5.20	41.99	2210.	447.	3.	608.	293.	117.3	630.5	72.9	456.				
1	-7.24	0.2281	113.41	1.7666	0.2245	-0.0492	0.0496	0.0164	0.0040003	-0.0033046	0.5492	456.				
	-8.20	3.56	0.3085	0.084051	-0.010684	-0.002343	0.002359	0.000779	0.0066730	0.0023681	0.7186	8.0				
13	-3.00	6.05	41.93	2445.	421.	-4.	987.	325.	126.5	628.8	72.9	456.				
1	-5.92	0.2281	113.61	1.9498	0.2023	-0.0560	0.0634	0.0182	0.0041469	0.002018	0.5565	456.				
	-9.05	4.07	0.3049	0.090657	-0.009406	-0.002511	0.002838	0.006848	0.0062813	0.0023371	0.7262	19.7				
14	-13.00	3.30	41.98	535.	411.	118.	2389.	985.	115.3	623.3	72.9	456.				
1	-26.90	0.2281	113.67	0.4078	0.2069	0.0013	0.1276	0.0418	0.0038805	-0.002011	0.5516	456.				
	-16.30	0.89	0.3076	0.019321	-0.009800	0.000063	0.000946	0.001596	0.0068642	0.0049826	0.7215	8.0				
15	-13.00	3.70	42.17	743.	358.	89.	2073.	988.	139.3	628.8	72.9	456.				
1	-15.94	0.2281	113.93	0.5701	0.1628	-0.0222	0.1261	0.0417	0.0045632	-0.0036205	0.5565	456.				
	-17.35	1.62	0.3047	0.035894	-0.005275	-0.001032	0.005238	0.001934	0.0069243	0.0013457	0.7293	13.3				
16	-13.00	4.35	42.22	995.	297.	89.	1858.	988.	168.9	631.6	72.9	456.				
1	-8.34	0.2281	114.00	0.7735	0.1137	-0.0222	0.1129	0.0417	0.0044323	-0.001462	0.5590	456.				
	-17.35	1.62	0.3047	0.035894	-0.005275	-0.001032	0.005238	0.001934	0.0069243	0.0013457	0.7293	13.3				
17	-13.00	5.45	41.77	1550.	166.	123.	2539.	890.	225.7	623.3	72.9	456.				
1	0.26	0.2281	113.38	1.2310	-0.0057	0.0033	0.1541	0.0363	0.0075694	-0.0022287	0.5516	456.				
	-18.45	2.52	0.3070	0.058020	0.000268	0.000157	0.007262	0.001710	0.0071988	-0.0036093	0.7210	12.0				
18	-8.00	5.20	41.98	1875.	289.	41.	1327.	730.	170.9	642.6	73.0	456.				
1	-3.80	0.2277	113.78	1.4852	0.0986	-0.0203	0.0811	0.0392	0.0052567	-0.0038955	0.5682	488.				
	-13.22	3.15	0.2969	0.066325	-0.004404	-0.000907	0.003622	0.001751	0.0061726	0.0035294	0.7380	13.8				
19	-8.00	6.55	42.26	2315.	215.	61.	2030.	711.	215.6	628.8	73.0	456.				
1	-1.18	0.2276	114.17	1.8268	0.0378	-0.0043	0.1214	0.0378	0.0070771	-0.0006186	0.5560	456.				
	-14.55	3.64	0.3065	0.085780	-0.001174	-0.000204	0.005699	0.001774	0.0069676	-0.0007281	0.7264	13.7				
20	-8.00	4.70	42.08	1635.	324.	41.	1640.	603.	155.3	637.1	73.0	456.				
1	-5.59	0.2276	113.91	1.2891	0.1262	-0.0203	0.1000	0.0314	0.0049013	-0.0038264	0.5633	462.				
	-12.70	2.78	0.3018	0.058703	-0.005745	-0.000925	0.004554	0.001430	0.0063241	0.0005967	0.7333	9.0				
21	-8.00	4.35	41.96	1390.	353.	27.	1560.	676.	135.8	642.6	73.0	456.				
1	-7.81	0.2277	113.75	1.0956	0.1503	-0.0316	0.0954	0.0359	0.0041773	-0.0009242	0.5602	446.				
	-12.35	2.45	0.2988	0.048896	-0.006708	-0.001409	0.004257	0.001604	0.0059038	0.0008623	0.7387	8.0				
ZERO VALUES IN															Page 2	
TOTAL PHYS. UNITS..																
ALPHA 8 1																
503. 11461. 11573. 15200. 3286. 3163. 9201. 9196. 6.500 499. 495.																
25.0 57302.5 57862.5 15200.0 8215.0 7906.3 9201.0 9195.5 0.162 1376.																
OMEGA CF CR G																
POM																

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06/27/68
TIME 457.09

ROTOR SCALE DATA * PROGRAM LA3530 * WIND AXES

AMES RESEARCH CENTER * ROTOR SCALE DATA

CONFIG. FRBVHT

TEST 316.0 RUN 2

LOH HELICOPTER SKEWER TARE TAIL CN

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

PT.	THETA	ALPHA SHAFT	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPU	V/DR MIL.3(90)
1.	4.0	-3.0	-5.8	0.052021	-0.006618	0.000841	0.000944	0.001561	-0.000838	0.0023514	0.0036649	0.244
2.	6.0	-3.0	-6.5	0.069519	-0.005920	0.000831	0.001077	0.001541	-0.000353	0.0028517	0.0037869	0.248
3.	8.0	-3.0	-7.3	0.087603	-0.005011	0.000307	0.000731	0.002857	-0.000094	0.0036073	0.0041230	0.252
4.	10.0	-3.0	-8.3	0.106895	-0.003449	-0.000097	0.000662	0.003140	0.000884	0.0048381	0.0045155	0.251
5.	12.0	-8.0	-11.0	0.0049520	-0.0003582	0.001665	0.001613	0.003326	-0.000393	0.0037388	0.0044375	0.265
6.	8.0	-8.0	-11.9	0.064453	-0.003301	0.011395	0.001191	-0.003824	0.000145	0.0045856	0.0042279	0.256
7.	10.0	-8.0	-12.8	0.081186	0.002655	0.000951	0.000916	0.004883	0.000868	0.0057453	0.0043664	0.251
8.	8.0	-13.0	-16.5	0.034376	-0.003490	0.002113	0.001899	0.004668	-0.000351	0.0041592	0.0041511	0.248
9.	6.0	-13.0	-15.6	0.018597	-0.004925	0.002541	0.002243	0.003668	-0.001356	0.0031467	0.003949	0.251
10.	10.0	-13.0	-17.1	0.053826	0.004017	0.002151	0.001314	0.005431	0.003426	0.0057543	0.0044319	0.251
11.	6.0	-3.0	-6.7	0.066619	-0.011129	-0.002128	0.001056	0.002774	-0.000610	0.0029680	0.0054276	0.304
12.	8.0	-3.0	-8.2	0.084051	-0.010684	-0.002343	0.000779	0.002359	-0.000264	0.0040013	0.0066730	0.308
13.	9.0	-3.0	-9.0	0.093657	-0.009406	-0.002511	0.000848	0.002808	0.000246	0.0041465	0.0062813	0.305
14.	8.0	-13.0	-16.3	0.013321	-0.002980	0.002623	0.001981	0.004346	-0.001596	0.0038805	0.0088642	0.308
15.	9.0	-13.0	-16.7	0.026658	-0.007614	-0.001038	0.001952	0.005897	-0.000186	0.0045632	0.0088284	0.306
16.	12.0	-13.0	-17.3	0.035894	-0.005275	-0.001332	0.001934	0.005238	0.000297	0.0054323	0.0069243	0.305
17.	12.0	-13.0	-18.4	0.028020	-0.00268	0.000157	0.001710	0.007262	0.000167	0.0075694	0.0071888	0.307
18.	12.0	-8.0	-13.2	0.066325	-0.004434	-0.000907	0.001751	0.003622	-0.000355	0.0052567	0.0061726	0.299
19.	12.0	-8.0	-14.5	0.085780	-0.001774	-0.000204	0.001774	0.005699	-0.000375	0.0070771	0.0069676	0.306
20.	9.0	-8.0	-12.7	0.058703	-0.002745	-0.002925	0.001432	0.004534	-0.000634	0.004901	0.0063441	0.302
21.	9.0	-8.0	-12.3	0.048896	-0.006708	-0.001409	0.001604	0.004257	-0.000778	0.0041773	0.0059638	0.299

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HTC-AD Report No. 369-A-8020

TEST 1 0 RUN 3 STATIC 1
BI'S OFFER ON BEGINNING AND END ZEROS. BEGINNING VALUE = 500.0. END VALUE = 489.0 COUNTS. END VALUE WILL BE USED.
SOME OF THESE ZEROS DISAGREE BY MORE THAN 25 COUNTS. FL+ RL- CR- POWER
END 11458. 11572. 15202. 12. 3321. 3133. 9201. 9205. 495.
BEGINNING 11460. 11571. 15200. 12. 3295. 3155. 9201. 9199. 495.

1 ZEROS AVERAGED ANYWAY.)

BAROMETRIC PRESSURE = 30.03

CONF. FRVHT

PT	ALPHA	B 1	Q	LIFT.U	DRAG.U	SIDE F.U	PITCH.U	YAW.U	ROLL.U	HP	OMEGA.R	TEMP	NOTES
AVG	ALFA	BHOLLO	V/TS	CL	CD	CV	CM	CMZ	CRNL	CP	CQ	M.DMR	RPM
ALF C	L/D.E	V/OR		CLR	CKR	CVR	CMY		CMX	CPD	CQD	M.AT	THETA
1	0.00	2.60	55.80	933.	787.	-17.	-50.	203.	152.	90.2	642.6	71.3	
1	-31.25	0.2271	131.33	0.5395	0.3273	-0.0171	-0.0023	-0.0136	0.0173	0.00000	-0.00000	0.5742	473.
	-2.60	1.65	0.3420	0.031547	-0.019140	-0.000998	-0.000133	-0.000795	0.001014	0.00000	0.00000	0.7795	3.0
2	0.00	2.70	55.80	878.	781.	-20.	-32.	195.	231.	46.8	642.6	79.3	
1	-32.60	0.2238	132.31	0.5062	0.3237	-0.0189	-0.0015	-0.0140	0.0210	0.0014640	-0.0008451	0.5653	466.
	-2.70	1.30	0.3475	0.030584	-0.019544	-0.001140	-0.000089	-0.000845	0.001266	0.00081830	0.00058738	0.7614	92.9
3	-3.00	5.00	55.87	1678.	688.	-37.	826.	154.	467.	90.2	642.6	81.0	
1	-15.37	0.2234	132.52	0.9848	0.2651	-0.0111	0.0379	-0.0235	0.0341	0.0030151	-0.0015301	0.5645	466.
	-8.00	2.46	0.3481	0.059653	-0.016058	-0.000672	0.002298	-0.001424	0.002266	0.0003262	0.0003781	0.7613	6.0
4	-3.20	6.60	55.92	2023.	658.	-32.	752.	63.	504.	125.3	645.4	82.0	
1	-11.68	0.2225	132.82	1.1923	0.2466	-0.0077	0.0345	-0.0279	0.0359	0.0036226	-0.0017913	0.5659	468.
	-9.60	2.82	0.3474	0.071936	-0.014875	-0.000564	0.002080	-0.001680	0.002165	0.00086546	0.0029737	0.7624	8.0
5	-3.00	8.40	55.89	2388.	621.	-33.	825.	393.	531.	158.6	642.6	83.0	
1	-9.02	0.2221	132.92	1.4135	0.2244	-0.0085	0.00379	-0.0126	0.0371	0.0049985	-0.0030861	0.5629	466.
	-11.40	3.17	0.3491	0.086134	-0.013674	-0.000517	0.002338	-0.0020769	0.0022599	0.00091441	0.00333095	0.7595	13.0
6	-3.00	10.15	56.03	2643.	581.	-29.	1017.	503.	552.	203.2	639.9	84.0	
1	-7.26	0.2217	133.21	1.5635	0.1991	-0.0049	0.0469	-0.0044	0.0382	0.0065905	-0.0033953	0.5600	464.
	-13.15	3.24	0.3514	0.096522	-0.012294	-0.000305	0.002874	-0.002072	0.002261	0.0003992	0.0032738	0.7568	12.0
7	-0.00	5.00	55.80	1138.	594.	13.	1712.	-3.	883.	130.	642.6	87.0	
1	-17.90	0.2205	133.29	0.6555	0.2118	0.0169	0.0787	-0.0301	0.0094	0.0041271	-0.0022476	0.5639	466.
	-13.00	1.67	0.3501	0.040173	-0.012977	0.001035	0.004022	-0.001864	0.003026	0.00085448	0.0021701	0.7572	8.0
8	-8.00	6.35	55.82	1558.	532.	28.	1624.	-83.	889.	168.0	642.6	88.0	
1	-10.83	0.2201	133.44	0.9094	0.1740	0.0161	0.0746	-0.0338	0.0487	0.0053752	-0.0024725	0.5634	466.
	-14.35	2.22	0.3505	0.055856	-0.010690	0.001602	0.004583	-0.002076	0.002994	0.0008798	0.0031322	0.7568	12.0
9	-8.00	7.70	55.85	1993.	463.	36.	1933.	-54.	769.	217.0	642.6	88.0	
1	-6.43	0.2201	133.47	1.1721	0.1321	0.0345	0.0888	-0.0326	0.0442	0.0069551	-0.0023604	0.5636	466.
	-15.70	2.69	0.3506	0.072024	-0.008120	0.001877	0.005457	-0.002022	0.002715	0.0009491	0.0030836	0.7568	12.0
10	-8.00	8.60	56.01	2178.	433.	30.	2005.	86.	911.	244.1	645.4	90.0	
1	-5.05	0.2193	133.91	1.2803	0.1139	0.0287	0.1057	-0.0267	0.0554	0.0076947	-0.0023504	0.5617	468.
	-16.60	2.83	0.3502	0.078503	-0.006930	0.001762	0.004684	-0.001636	0.003091	0.00096433	0.0031718	0.7585	13.0
11	-12.00	5.35	55.78	748.	569.	42.	2358.	-148.	1177.	152.1	648.1	89.0	
1	-25.94	0.2197	133.51	0.4200	0.2043	0.0051	0.1176	-0.0248	0.0532	0.0047235	-0.0021351	0.5647	473.
	-17.35	1.01	0.3477	0.025385	-0.012346	0.000337	0.007110	-0.001500	0.003215	0.0008653	0.0021067	0.7611	1.0
12	-12.00	6.60	55.80	1218.	455.	70.	2645.	-60.	1327.	211.5	645.4	90.0	
1	-10.86	0.2193	133.66	0.7044	0.1351	0.0222	0.1358	-0.0208	0.0601	0.0066653	-0.0022095	0.5617	468.
	-18.60	1.64	0.3496	0.043021	-0.008252	0.001354	0.009231	-0.001273	0.003673	0.0009030	0.0007320	0.7581	12.0
13	-12.00	7.25	55.87	1468.	407.	80.	2908.	-179.	1318.	242.8	645.4	91.0	
1	-7.05	0.2189	133.84	0.8545	0.1056	0.0334	0.1380	-0.0265	0.0598	0.0076670	-0.0023512	0.5612	468.
	-19.25	1.93	0.3501	0.052368	-0.006472	0.002058	0.008329	-0.001625	0.003662	0.0009197	0.00092985	0.7577	13.0
ZERO VALUES IN													
TOTAL COUNTS..													
TOTAL PHYS. UNITS..													
ALPHA B 1 FL+ RL+ CR CF Q OMEGA PUM													
0. 489. 11459. 11572. 15200. 12. 3321. 3133. 9201. 9205. 495.													
24.4 57295.0 57857.5 15200.0 8270.0 7863.0 9201.9 9202.0 6.030 320. 495.													

05/27/68
TIME 457.19

ROTOR SCALE DATA * PROGRAM LA3530 * WIND AXES

AMES RESEARCH CENTER * ROTOR SCALE DATA

CONFIG. FRBVHT

TEST 316.0 RUN 3

LOW HELICOPTER SKENER TARE TAIL ON

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

PT.	THETA	ALPHA SHAFT CONTROL	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPU	V/OR MIL. (1902)
1.	0.0	0.0	-2.6	0.031547	-0.019140	-0.000998	0.001914	-0.002133	-0.000795	-0.000000	0.000000	0.342
2.	0.0	0.0	-2.7	0.030564	-0.019544	-0.001140	0.001266	-0.000089	-0.000085	0.001464	0.001830	0.348
3.	0.0	0.0	-3.0	0.059653	-0.016058	-0.000672	0.002066	0.002298	-0.001424	0.003615	0.003262	0.348
4.	0.0	0.0	-3.0	0.071936	-0.014875	-0.000464	0.002165	0.002080	-0.001689	0.003892	0.003854	0.347
5.	0.0	0.0	-3.0	0.086134	-0.013674	-0.000517	0.002259	0.002308	-0.000976	0.004985	0.004919	0.349
6.	0.0	0.0	-3.1	0.096522	-0.012294	-0.000305	0.002361	0.002874	-0.000272	0.006505	0.005992	0.351
7.	0.0	0.0	-13.0	0.049173	-0.012977	0.001035	0.003026	0.004822	-0.001844	0.004127	0.004848	0.350
8.	0.0	0.0	-14.3	0.055056	-0.013690	0.001605	0.002994	0.004583	-0.002076	0.005375	0.004879	0.350
9.	0.0	0.0	-15.7	0.072024	-0.008120	0.001877	0.002715	0.005457	-0.002092	0.006905	0.006349	0.351
10.	0.0	0.0	-16.6	0.078503	-0.006930	0.002162	0.003091	0.006484	-0.001636	0.007694	0.007433	0.352
11.	0.0	0.0	-17.3	0.085385	-0.012346	0.003007	0.003315	0.007113	-0.001500	0.008735	0.008653	0.348
12.	0.0	0.0	-18.6	0.043031	-0.008252	0.001357	0.003673	0.008282	-0.001273	0.006665	0.006458	0.350
13.	0.0	0.0	-19.2	0.052368	-0.006472	0.002358	0.003662	0.008329	-0.001625	0.007667	0.007197	0.350

TEST 316. RUN 9 STATIC 2 3 CA FT 103. LAST STATIC AC ENCOUNTERED IS THE ONE ACTUALLY USED. UPDATE = 6 17 60 1500 TIME 180.73

STATIC NC. CHANGES FROM 2 10 3 CA FT 103. LAST STATIC AC ENCOUNTERED IS THE ONE ACTUALLY USED. (IF A STATIC IS STARTING HERE, IT WILL BE SCRAMBLED WITH THE RUN BECAUSE K STILL = 1. LATER CHANGE TO K=9 WHEN I REAP.J SOME OF THESE ZERGES DISAGREE BY MORE THAN 25 COUNTS. FL+ RL+ C Q FL- RL- CP CM POWER

END 11459. 11574. 15203. Q 3319. 3125. 5208. 9196. 4944. BEGINNING 11459. 11574. 15203. 3. 2256. 3153. 5208. 9201. 454.

(ZERGES AVERAGED ANYWAY.)

BAROMETRIC PRESSURE = 29.34

CONFIG. ERBVH

PT	ALPHA	B 1	U	LIFT, L	CRAG, U	SIDE F, U	PITCH, U	YAW, L	ROLL, L	MP	OPEGAR	TEMP	NOTES
AVG	ALFA, RHO*10	Y, KTS	V/CN	CL	CD	CY	CM	CPZ	CPX	CP	CC	P, CMR	RPM
ALF C	L/D, E			CLR	CR	CYR	CMY			CPC	CCO	ALAY	THETA
1	1.25	29.3	29.3	215.	394.	-48.	244.	485.	173.	36.9	632.0	61.0	
1	1.25	29.3	29.3	215.	394.	-48.	244.	485.	173.	36.9	632.0	61.0	
1	1.25	29.3	29.3	215.	394.	-48.	244.	485.	173.	36.9	632.0	61.0	
2	5.25	29.3	29.3	2265.	-24.	-23.	1836.	1496.	218.	96.1	633.0	65.0	
1	3.58	29.3	29.3	2265.	-24.	-23.	1836.	1496.	218.	96.1	633.0	65.0	
1	14.25	12.76	12.76	2.281436	0.035593	-0.000457	0.005267	0.002250	0.001114	0.0010407	0.0010407	0.7649	11.0
3	5.25	28.65	28.65	2235.	-25.	20.	1757.	1567.	522.	98.0	633.0	66.0	
1	3.64	29.3	29.3	2.5852	-0.1645	0.0286	0.1560	0.1123	0.0544	0.0031258	0.0031258	0.5834	459.
1	14.25	11.65	11.65	0.066452	0.035120	0.000089	0.004857	0.003433	0.001694	0.0011419	0.0011419	0.7040	11.0
4	5.25	28.64	28.64	2152.	-31.	54.	1576.	1648.	495.	100.9	633.0	66.0	
1	3.65	29.3	29.3	2.5285	-0.1702	0.0617	0.1292	0.1174	0.0873	0.0031916	0.0031916	0.5834	459.
1	14.25	11.65	11.65	0.076855	0.003318	0.002111	0.004340	0.003662	0.002721	0.0011889	0.0011889	0.7041	11.0
5	5.25	28.31	28.31	2270.	-19.	-63.	1935.	1422.	18.	93.3	633.0	67.0	
1	3.43	29.3	29.3	2.6242	-0.1574	-0.0615	0.1717	0.1974	0.0056	0.0029567	0.0029567	0.5628	459.
1	14.25	12.7	12.7	0.0261923	0.004914	-0.002109	0.005341	0.003041	0.003308	0.0009883	0.0009883	0.7035	11.0
6	5.25	28.89	28.89	2320.	-13.	-107.	2187.	1393.	-176.	88.9	633.0	67.0	
1	3.21	29.3	29.3	2.6846	-0.1534	-0.1188	0.1524	0.1913	-0.0076	0.0028494	0.0028494	0.5628	459.
1	14.25	13.76	13.76	0.063746	0.004692	-0.003705	0.006033	0.002848	-0.000236	0.0009137	0.0009137	0.7034	11.0
7	5.25	28.54	28.54	2221.	-21.	-23.	1759.	1394.	275.	96.2	633.0	68.0	
1	3.56	29.3	29.3	2.5635	-0.1597	-0.0211	0.1559	0.1039	0.0323	0.0030557	0.0030557	0.5623	459.
1	14.45	12.27	12.27	0.087252	0.004999	-0.000655	0.004081	0.003754	0.001012	0.0011048	0.0011048	0.7030	11.0
8	5.25	28.82	28.82	2555.	-77.	-27.	1907.	1696.	254.	118.7	663.3	68.0	
1	4.35	29.3	29.3	2.5668	-0.2256	-0.0245	0.1657	0.1217	0.0305	0.0032758	0.0032758	0.5893	481.
1	14.25	12.75	12.75	0.064224	0.004655	-0.000655	0.004819	0.003435	0.000576	0.0009401	0.0009401	0.7297	11.0
9	5.25	28.79	28.79	1995.	-26.	-22.	1675.	1360.	334.	75.5	605.4	70.0	
1	2.62	29.3	29.3	2.3121	-0.1061	-0.0184	0.1452	0.0919	0.0350	0.0028982	0.0028982	0.5368	439.

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1	-6.73	0.2264	112.51	1.7523	0.2116	-0.1324	0.0585	0.0652	0.0191	0.0028569	0.0028569	0.5835	463.
	-8.31	4.22	0.2685	0.375847	-0.059425	-0.035657	0.032638	0.02905	0.00050	0.0005092	0.0005092	0.7317	8.0
23	-3.0	5.55	41.16	1.880	429.	-52.	357.	1104.	355.	85.0	641.2	7710	
1	-9.0	0.2251	113.19	1.3593	0.2152	-0.1265	0.0247	0.0639	0.0227	0.0027819	0.0027819	0.5449	465.
	-8.50	3.28	0.2575	0.060330	-0.009554	-0.005616	0.001098	0.002834	0.000520	0.0032960	0.0032960	0.7332	6.8
24	-3.0	5.50	41.20	2470.	435.	-95.	1365.	1168.	432.	93.9	638.5	7810	
1	-6.25	0.2251	113.36	2.054	0.2197	-0.1269	0.0252	0.0678	0.0256	0.0029797	0.0029797	0.5619	463.
	-8.50	4.67	0.2557	0.090353	-0.009867	-0.005168	0.003027	0.003044	0.001151	0.0032007	0.0032007	0.7303	9.0
25	-3.0	5.55	41.22	2752.	422.	-90.	1522.	1222.	561.	98.6	641.2	7710	
1	-5.96	0.2247	113.47	2.2351	0.2337	-0.1248	0.1159	0.0712	0.0332	0.0030541	0.0030541	0.5638	465.
	-8.50	4.54	0.2587	0.099869	-0.010423	-0.005566	0.005247	0.003176	0.001481	0.0032988	0.0032988	0.7322	10.0
26	-3.0	5.30	41.13	2230.	427.	-96.	1054.	1133.	295.	91.9	641.2	7910	
1	-6.73	0.2247	113.37	1.8115	0.2138	-0.1259	0.0657	0.0657	0.0318	0.0028826	0.0028826	0.5638	465.
	-8.30	4.33	0.2564	0.080668	-0.005520	-0.005782	0.002926	0.003226	0.002747	0.0031302	0.0031302	0.7321	7.0
27	-3.0	5.30	41.25	2510.	416.	-105.	1157.	1205.	321.	102.2	674.3	8010	
1	-5.72	0.2242	113.64	2.0359	0.2038	-0.1370	0.0719	0.0700	0.0183	0.0027879	0.0027879	0.5924	489.
	-8.30	4.79	0.2844	0.082357	-0.008243	-0.005562	0.002910	0.002831	0.003741	0.0044838	0.0044838	0.7609	7.0
28	-3.0	5.30	41.11	1925.	445.	-85.	1588.	1039.	365.	79.4	610.9	8010	
1	-6.42	0.2243	113.44	1.0458	0.2283	-0.1241	0.0679	0.0599	0.0211	0.0028839	0.0028839	0.5366	443.
	-8.30	3.81	0.3134	0.075925	-0.011239	-0.006098	0.003235	0.002542	0.001037	0.0039063	0.0039063	0.7048	4.0
29	-3.0	5.30	41.25	2250.	429.	-100.	1125.	1113.	355.	90.6	646.8	8210	
1	-6.71	0.2234	113.85	1.8229	0.2144	-0.1329	0.0709	0.0643	0.0206	0.0027862	0.0027862	0.5671	469.
	-8.30	4.35	0.2571	0.081464	-0.005464	-0.005466	0.003088	0.002838	0.000911	0.0030054	0.0030054	0.7336	7.0
40	-6.00	15.05	1.10	0.	1.	-3.	-13.	33.	2.	3.2	688.1	8210	0.0
1	-9.0	0.2275	113.0	0.0000	0.0169	-0.1285	-0.0338	0.0859	0.0362	0.000796	0.000796	0.6034	499.
	-15.05	0.0000	0.0000	-0.0000	-0.0000	-0.0000	-0.0000	0.0000	0.0000	0.0000	0.0000	0.6034	0.0
ZERO VALUES IN													
TOTAL COUNTS..													
TOTAL PHYS. UNITS..													
T = 2 CP = 00.													
ALPHA													
0. 502. 11459. 11574. 15203. 3308. 7847.5 9280.0 9195.5 1408.													
C													
FL+													
FL-													
RL-													
CF													
CR													
C													
CPEGA													
PCM													

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06/21/68
TIME 706.73

RCICR SCALE DATA * PROGRAM LA3530 * MINC AXES

AMES RESEARCH CENTER * RCICR SCALE DATA

TEST 316.5 RUN 9

CONFIG. FRBYH

LCR HELICOPTER SMOKE TARE TAIL ON

MINC AXES COEFFICIENTS, BASED ON RCICR PLATE AREA AND RCICR TIP SPEED

PT.	THETA	ALPHA	SPATI	CONTRL	CLR	CMR	CVR	CPX	CMY	CMZ	CP	CPC	V/CR	W/L	01(90)
1.	11.0	-1.2	-1.2	-1.2	0.025771	-0.009904	-0.001920	0.000818	0.000818	0.001156	0.001156	0.001156	0.249	0.707	0.707
2.	11.0	-1.2	-1.2	-1.2	0.001436	0.005053	-0.007697	0.001174	0.005053	0.001156	0.001156	0.001156	0.250	0.705	0.705
3.	11.0	-1.2	-1.2	-1.2	0.001492	0.001129	0.001889	0.001194	0.001889	0.001156	0.001156	0.001156	0.250	0.704	0.704
4.	11.0	-1.2	-1.2	-1.2	0.001855	0.005318	0.002111	0.002721	0.004340	0.001156	0.001156	0.001156	0.250	0.704	0.704
5.	11.0	-1.2	-1.2	-1.2	0.001923	0.004914	-0.002105	0.003361	0.003361	0.001156	0.001156	0.001156	0.250	0.703	0.703
6.	11.0	-1.2	-1.2	-1.2	0.003746	0.004652	-0.003705	-0.002236	0.003003	0.001156	0.001156	0.001156	0.250	0.703	0.703
7.	11.0	-1.2	-1.2	-1.2	0.001252	0.004999	-0.003659	0.001112	0.004081	0.001156	0.001156	0.001156	0.250	0.703	0.703
8.	11.0	-1.2	-1.2	-1.2	0.004224	0.004614	-0.003659	0.001112	0.004081	0.001156	0.001156	0.001156	0.250	0.703	0.703
9.	11.0	-1.2	-1.2	-1.2	0.001933	0.001223	0.001628	0.001101	0.001101	0.001156	0.001156	0.001156	0.250	0.703	0.703
10.	11.0	-1.2	-1.2	-1.2	0.001755	0.001755	-0.001755	0.001194	0.001194	0.001156	0.001156	0.001156	0.250	0.703	0.703
11.	11.0	-1.2	-1.2	-1.2	0.001755	0.001755	-0.001755	0.001194	0.001194	0.001156	0.001156	0.001156	0.250	0.703	0.703
12.	11.0	-1.2	-1.2	-1.2	0.001755	0.001755	-0.001755	0.001194	0.001194	0.001156	0.001156	0.001156	0.250	0.703	0.703
13.	11.0	-1.2	-1.2	-1.2	0.001755	0.001755	-0.001755	0.001194	0.001194	0.001156	0.001156	0.001156	0.250	0.703	0.703
14.	11.0	-1.2	-1.2	-1.2	0.001755	0.001755	-0.001755	0.001194	0.001194	0.001156	0.001156	0.001156	0.250	0.703	0.703
15.	11.0	-1.2	-1.2	-1.2	0.001755	0.001755	-0.001755	0.001194	0.001194	0.001156	0.001156	0.001156	0.250	0.703	0.703
16.	8.0	-1.2	-1.2	-1.2	0.001755	0.001755	-0.001755	0.001194	0.001194	0.001156	0.001156	0.001156	0.250	0.703	0.703
17.	8.0	-1.2	-1.2	-1.2	0.001755	0.001755	-0.001755	0.001194	0.001194	0.001156	0.001156	0.001156	0.250	0.703	0.703
18.	8.0	-1.2	-1.2	-1.2	0.001755	0.001755	-0.001755	0.001194	0.001194	0.001156	0.001156	0.001156	0.250	0.703	0.703
19.	8.0	-1.2	-1.2	-1.2	0.001755	0.001755	-0.001755	0.001194	0.001194	0.001156	0.001156	0.001156	0.250	0.703	0.703
20.	8.0	-1.2	-1.2	-1.2	0.001755	0.001755	-0.001755	0.001194	0.001194	0.001156	0.001156	0.001156	0.250	0.703	0.703
21.	8.0	-1.2	-1.2	-1.2	0.001755	0.001755	-0.001755	0.001194	0.001194	0.001156	0.001156	0.001156	0.250	0.703	0.703
22.	8.0	-1.2	-1.2	-1.2	0.001755	0.001755	-0.001755	0.001194	0.001194	0.001156	0.001156	0.001156	0.250	0.703	0.703
23.	8.0	-1.2	-1.2	-1.2	0.001755	0.001755	-0.001755	0.001194	0.001194	0.001156	0.001156	0.001156	0.250	0.703	0.703
24.	8.0	-1.2	-1.2	-1.2	0.001755	0.001755	-0.001755	0.001194	0.001194	0.001156	0.001156	0.001156	0.250	0.703	0.703
25.	8.0	-1.2	-1.2	-1.2	0.001755	0.001755	-0.001755	0.001194	0.001194	0.001156	0.001156	0.001156	0.250	0.703	0.703
26.	8.0	-1.2	-1.2	-1.2	0.001755	0.001755	-0.001755	0.001194	0.001194	0.001156	0.001156	0.001156	0.250	0.703	0.703
27.	8.0	-1.2	-1.2	-1.2	0.001755	0.001755	-0.001755	0.001194	0.001194	0.001156	0.001156	0.001156	0.250	0.703	0.703
28.	8.0	-1.2	-1.2	-1.2	0.001755	0.001755	-0.001755	0.001194	0.001194	0.001156	0.001156	0.001156	0.250	0.703	0.703
29.	8.0	-1.2	-1.2	-1.2	0.001755	0.001755	-0.001755	0.001194	0.001194	0.001156	0.001156	0.001156	0.250	0.703	0.703
30.	8.0	-1.2	-1.2	-1.2	0.001755	0.001755	-0.001755	0.001194	0.001194	0.001156	0.001156	0.001156	0.250	0.703	0.703

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TEST 316. RUN 1. STATIC 2. 3. CN PT 59. LAST STATIC NO ENCOUNTERED IS THE ONE ACTUALLY USED.
 STATIC NO. CHANGES FROM 2 TO 3. CN PT 59. LAST STATIC NO ENCOUNTERED IS THE ONE ACTUALLY USED.
 (IF A STATIC IS STARTING HERE, IT WILL BE SCRAMBLED WITH THE RUN BECAUSE A STILL 3. LATER CHANGE TO 59. CN PT 59. LAST STATIC NO ENCOUNTERED IS THE ONE ACTUALLY USED.)
 SCNE CF THESE ZERGES DISAGREE BY MORE THAN 25 COUNTS. FL+ RL+ C FL- RL- CR POWER
 ENC 11458. 11574. 15204. 13. 3331. 3116. 3261. 9196. 456.
 BEGINNING 11458. 11574. 15202. 0. 3298. 3156. 3260. 9198. 494.

(ZERGES AVERAGED ANYWAY.)

CONFIG. FRBYH

BAROMETRIC PRESSURE = 29.95

PT	ALPHA	B I	C	LIFT, L	DRAG, U	SIDE F, U	PITCH, U	YAW, U	ROLL, U	HP	CMGADR	TEMP	MCIES
AVG	ALFA	PHO+1, C	V, KTS	CL	CC	CV	CP	CA	CHOLL	CF	CC	M, DR	MR
ALF C	L/D, E	V/C		CLR	CXK	CVR	CMY	CPZ	CPX	CPO	CCO	M, AT	THETA
1	-3.0	5.45	41.16	2315	424	-94	85.4	1143	327	92.8	642.6	82.0	
1	-6.36	0.2235	113.70	1.897	0.2116	-0.1282	0.0533	0.0663	0.0187	0.0029076	0.0029076	0.5635	466.
	-8.45	4.54	2.2580	0.054536	-0.009433	-0.005715	0.002362	0.002955	0.000836	0.0053130	0.0050730	0.7317	8.0
2	-3.0	5.55	41.56	2269	419	-105	877	1100	215	85.9	645.4	86.0	
1	-6.46	0.2219	113.58	1.8397	0.2083	-0.1407	0.0548	0.0638	0.0118	0.0028019	0.0028019	0.5638	468.
	-8.55	4.51	2.2581	0.054536	-0.009254	-0.008251	0.002435	0.002833	0.000836	0.0049510	0.0049510	0.7319	8.0
3	-3.0	4.72	41.23	2470	473	-110	1795	869	326	68.9	645.4	86.0	
1	-7.14	0.2215	114.22	2.143	0.2511	-0.1411	0.1117	0.0492	0.0186	0.0021466	0.0021466	0.5638	468.
	-7.1	4.57	2.2587	0.054536	-0.011232	-0.006567	0.004583	0.032193	0.000831	0.0047647	0.0047647	0.7322	8.0
4	-3.0	5.45	41.25	2265	424	-94	970	1096	253	85.4	645.4	87.0	
1	-6.55	0.2214	114.35	1.8352	0.2107	-0.1356	0.0607	0.0632	0.0141	0.0027911	0.0027911	0.5633	468.
	-8.3	4.55	2.2591	0.054536	-0.009424	-0.005757	0.002716	0.002828	0.000630	0.0049969	0.0049969	0.7318	8.0
5	-3.0	4.72	41.18	2395	465	-95	1582	888	438	70.0	645.4	87.0	
1	-7.18	0.2215	114.25	1.9451	0.2451	-0.1269	0.0985	0.0554	0.0256	0.0021858	0.0021858	0.5633	468.
	-7.1	4.58	2.2588	0.054536	-0.011232	-0.006567	0.004583	0.032193	0.000831	0.0047647	0.0047647	0.7316	8.0
6	-3.0	2.70	41.13	2595	534	-87	2283	683	481	51.6	645.4	87.0	
1	-8.14	0.2215	114.19	2.1116	0.2321	-0.1225	0.1424	0.0377	0.0284	0.0016114	0.0016114	0.5633	468.
	-5.7	5.7	2.2586	0.054536	-0.013472	-0.005461	0.006348	0.001680	0.001264	0.0048270	0.0048270	0.7315	8.0
7	-3.0	6.85	41.23	2554	378	-55	328	1231	248	112.4	645.4	88.0	
1	-5.94	0.2215	114.43	1.8642	0.1732	-0.1321	0.0204	0.0779	0.0137	0.0034515	0.0034515	0.5628	468.
	-5.85	3.55	2.2593	0.054536	-0.007757	-0.005917	0.000913	0.003489	0.000616	0.0032681	0.0032681	0.7312	8.0
8	-3.0	7.30	41.25	1995	371	-105	-15	1363	279	113.0	645.4	88.0	
1	-5.92	0.2215	114.46	1.6141	0.1673	-0.1370	-0.0012	0.0798	0.0157	0.0035348	0.0035348	0.5628	468.
	-10.32	3.88	2.2593	0.054536	-0.013472	-0.005461	0.006348	0.001680	0.001264	0.0048270	0.0048270	0.7312	8.0
9	-3.0	5.55	41.18	2445	416	-92	1763	1051	471	88.3	645.4	88.0	
1	-6.42	0.2211	114.33	1.8231	0.2350	-0.1265	0.1663	0.0311	0.0234	0.0027616	0.0027616	0.5628	468.

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-8.55	4.55	0.2550	7.081491	-0.009163	-0.005656	0.002962	0.002820	0.001344	C.0048972	0.0048972	0.7310	0.0
10	-3.07	5.55	41.18	2165.	493.	-36.	1195.	660.	96.3	845.4	8910	468.
1	-0.31	0.2206	114.40	1.7564	0.1941	-0.3855	0.0368	0.3355	C.0030162	0.0030162	0.5623	468.
-8.55	4.32	0.2554	0.373699	-0.008698	-0.003605	0.001648	0.003113	0.001766	C.0050572	0.0050572	0.7306	0.0
11	-3.07	5.55	41.27	2090.	392.	14.	1270.	1145.	100.7	845.4	8910	468.
1	-0.22	0.2206	114.67	1.6905	0.1843	-0.0454	0.0383	0.0655	0.0031540	0.0031540	0.5623	468.
-8.55	4.17	0.2557	0.075943	-0.008278	-0.001613	0.001719	0.003322	0.003122	C.0051115	0.0051115	0.7308	0.0
12	-3.07	5.55	41.13	2295.	426.	-142.	1029.	-73.	86.2	845.4	8910	468.
1	-0.53	0.2217	114.40	1.8652	0.2134	-0.1645	0.0642	-0.0262	C.0027017	0.0027017	0.5623	468.
-8.55	4.62	0.2552	0.083478	-0.009551	-0.007546	0.002873	0.002691	-0.000279	C.0049257	0.0049257	0.7305	0.0
13	-3.07	5.55	41.18	2305.	432.	-202.	1173.	-564.	79.8	845.4	8910	468.
1	-0.65	0.2207	114.33	1.8756	0.2188	-0.2179	0.0733	-0.0365	0.0024996	0.0024996	0.5623	468.
-8.55	4.74	0.2992	0.083645	-0.009579	-0.005779	-0.005742	0.003275	-0.001656	C.0047842	0.0047842	0.7304	0.0
14	-3.07	5.55	41.13	2225.	427.	-52.	1086.	211.	37.8	845.4	8910	468.
1	-0.55	0.2207	114.40	1.8036	0.2085	-0.1274	0.0570	0.0171	0.0027508	0.0027508	0.5623	468.
-8.55	4.48	0.2552	0.084721	-0.009721	-0.005231	-0.005702	0.002577	0.000766	0.0049459	0.0049459	0.7305	0.0
15	-3.07	5.55	41.27	2485.	482.	-52.	1156.	269.	102.1	845.4	8910	468.
1	-0.73	0.2202	114.87	2.0111	0.2256	-0.1387	0.0504	0.0139	0.0031655	0.0031655	0.5617	468.
-7.00	4.18	0.2551	0.089983	-0.011526	-0.016254	0.012253	0.003177	0.000624	C.0058773	0.0058773	0.7324	0.0
16	-3.07	5.55	41.27	1855.	368.	-75.	1122.	419.	83.6	845.4	8910	468.
1	-0.17	0.2202	114.70	1.5252	0.1650	-0.1084	0.0697	0.0240	0.0028236	0.0028236	0.5617	468.
-6.55	4.37	0.3002	0.086625	-0.007424	-0.004879	-0.004879	0.003137	0.001079	0.0044236	0.0044236	0.7309	0.0
17	-7.00	4.60	41.25	1550.	341.	-42.	1031.	522.	77.9	845.4	8910	468.
1	-0.61	0.2202	114.67	1.2463	0.1445	-0.0837	0.07817	0.0285	0.0024435	0.0024435	0.5617	468.
-11.60	3.95	0.2555	0.086146	-0.006499	-0.0033763	0.003674	0.002619	0.001282	C.0041078	0.0041078	0.7302	0.0
18	-5.00	5.75	41.27	1995.	189.	-35.	1522.	545.	124.4	845.4	8910	468.
1	-0.89	0.2202	114.70	1.6753	0.2223	-0.0884	0.0921	0.0268	0.0039050	0.0039050	0.5617	468.
-14.75	5.44	0.3003	0.072413	-0.007115	-0.003166	0.005173	0.004145	0.001208	C.0037339	0.0037339	0.7303	11.0
19	-9.00	7.15	41.53	2435.	302.	-44.	1560.	532.	163.1	845.4	8910	468.
1	1.44	0.2202	115.07	1.537.	0.2493	-0.0535	0.1165	0.0256	C.0051198	0.0051198	0.5617	468.
-16.15	6.40	0.3005	0.086017	0.002233	-0.004232	0.007563	0.005367	0.001159	C.0037381	0.0037381	0.7308	13.0
20	-9.00	7.20	41.13	2431.	308.	-40.	1566.	427.	159.9	845.4	8910	468.
1	1.26	0.2203	114.50	1.9723	0.2434	-0.0566	0.1164	0.0154	C.0050184	0.0050184	0.5617	468.
-16.20	6.37	0.2595	0.086430	0.001945	-0.004061	0.008061	0.005210	0.000686	C.0037256	0.0037256	0.7308	13.0
21	-5.00	5.17	40.97	1765.	237.	-35.	1285.	544.	102.6	845.4	8910	468.
1	-2.31	0.2203	114.27	1.4278	0.2577	-0.0824	0.1194	0.0268	0.0022506	0.0022506	0.5617	468.
-14.10	4.66	0.2568	0.083756	-0.002574	-0.003681	0.005356	0.003481	0.001197	C.0036459	0.0036459	0.7296	10.0
22	-6.00	4.00	40.78	1275.	322.	-36.	951.	575.	73.7	845.4	8910	468.

1	-7.44	0.2203	114.00	1.0327	0.1342	-0.0875	0.1089	0.0573	0.0289	0.0023138	0.0023138	0.5017	460.
	-13.22	3.44	0.2581	0.04589	-0.005992	-0.003168	0.004045	0.002546	0.001206	0.0039081	0.0039081	0.7292	8.0
23	-5.00	5.75	41.25	2.350	196.	-44.	1753.	1497.	490.	123.5	648.1	91.0	
1	-0.59	0.2198	114.77	1.6430	0.0284	-0.0937	0.1090	0.0906	0.0232	0.0038339	0.0038339	0.5636	470.
	-14.70	5.48	0.2589	0.073389	-0.001268	-0.004187	0.004849	0.004044	0.001036	0.0037227	0.0037227	0.7321	11.0
24	-9.00	5.70	41.34	2.155.	174.	-37.	1655.	1549.	475.	131.6	644.7	91.0	
1	-0.33	0.2198	114.51	1.7373	0.0102	-0.0879	0.1213	0.0936	0.0222	0.0037885	0.0037885	0.5700	482.
	-14.70	5.83	0.2918	0.073955	-0.000426	-0.003743	0.005164	0.003985	0.000944	0.0034028	0.0034028	0.7407	11.0
25	-9.00	5.55	41.21	1.945.	205.	-25.	1839.	1442.	546.	115.7	637.1	91.0	
1	-1.31	0.2198	114.71	1.5711	0.0360	-0.0815	0.1145	0.0873	0.0276	0.0037812	0.0037812	0.5540	462.
	-14.55	5.41	0.3039	0.072545	-0.001661	-0.003763	0.005286	0.004030	0.001274	0.0038148	0.0038148	0.7224	11.0
26	-9.00	5.55	41.30	1.805.	238.	-32.	1703.	1319.	544.	102.5	620.5	91.0	
1	-2.46	0.2198	114.84	1.4525	0.0265	-0.0888	0.1058	0.0794	0.0265	0.0036246	0.0036246	0.5377	450.
	-14.55	5.56	0.3124	0.071879	-0.002422	-0.004514	0.005162	0.003174	0.001291	0.0041400	0.0041400	0.7082	11.0
27	-9.00	5.55	41.06	1.650.	259.	-32.	1831.	1221.	586.	91.6	606.8	91.0	
1	-3.48	0.2198	114.52	1.3340	0.0810	-0.0890	0.1144	0.0738	0.0293	0.0034651	0.0034651	0.5272	440.
	-14.55	4.75	0.3185	0.067668	-0.004111	-0.004514	0.005803	0.003744	0.001487	0.0043835	0.0043835	0.6957	11.0
28	-9.00	5.75	41.27	2.110.	193.	-32.	1797.	1484.	501.	122.7	648.1	91.0	
1	-0.51	0.2198	114.81	1.0216	0.0258	-0.0888	0.1117	0.0901	0.0239	0.0038052	0.0038052	0.5636	470.
	-14.75	5.45	0.2991	0.072474	-0.001154	-0.003765	0.004952	0.004026	0.001067	0.0036764	0.0036764	0.7321	11.0
29	-9.00	4.00	41.27	2.220.	233.	-39.	2604.	1398.	697.	103.9	648.1	91.0	
1	-1.87	0.2198	114.81	1.7535	0.0586	-0.0896	0.1018	0.0788	0.0360	0.0032261	0.0032261	0.5636	470.
	-13.00	4.26	0.2990	0.063157	-0.002617	-0.004554	0.007233	0.003121	0.001689	0.0034241	0.0034241	0.7321	11.0
30	-9.00	2.35	41.23	2.355.	294.	-37.	3481.	1159.	771.	89.7	648.1	91.0	
1	-3.21	0.2198	114.74	1.5390	0.1088	-0.0880	0.1166	0.0856	0.0407	0.0027860	0.0027860	0.5636	470.
	-11.35	6.33	0.2988	0.06559	-0.003920	-0.003920	0.009669	0.003108	0.001816	0.0035552	0.0035552	0.7321	11.0
31	-9.00	6.42	41.25	1.950.	194.	-43.	1586.	1580.	548.	123.7	648.1	91.0	
1	-0.54	0.2198	114.77	1.5734	0.0259	-0.0829	0.1086	0.0913	0.0268	0.0038387	0.0038387	0.5636	470.
	-15.00	5.25	0.2989	0.070279	-0.001158	-0.004151	0.004405	0.004076	0.001198	0.0037354	0.0037354	0.7321	11.0
32	-9.00	5.75	41.25	1.965.	194.	-47.	1772.	1492.	469.	123.4	648.1	91.0	
1	-1.97	0.2198	114.71	1.5875	0.0269	-0.0835	0.1103	0.0904	0.0219	0.0038257	0.0038257	0.5636	470.
	-14.75	5.32	0.2987	0.071828	-0.002102	-0.004024	0.004923	0.004032	0.000974	0.0037320	0.0037320	0.7320	11.0
33	-9.00	5.75	41.18	1.930.	196.	-9.	1543.	1540.	752.	123.6	648.1	91.0	
1	-1.05	0.2198	114.67	1.3598	0.0287	-0.0811	0.0561	0.0534	0.0156	0.0038284	0.0038284	0.5636	470.
	-14.75	5.18	0.2986	0.069548	-0.003129	-0.002903	0.004286	0.004166	0.001764	0.0037798	0.0037798	0.7320	11.0
34	-9.00	5.75	41.13	2.205.	197.	-70.	1941.	1475.	287.	124.8	648.1	91.0	
1	-1.35	0.2198	114.67	1.0232	0.0297	-0.1152	0.1211	0.0858	0.0106	0.0038744	0.0038744	0.5636	470.
	-14.75	5.32	0.2985	0.072291	-0.003123	-0.0035131	0.005591	0.004652	0.000473	0.0037931	0.0037931	0.7319	11.0

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35	-9.00	5.75	41.18	2030.	-107.	1978.	1390.	120.	819.2	648.1	910
1	-1.20	0.2158	114.67	3.334	-0.1455	0.1232	0.0841	0.0002	0.0037015	0.0037015	0.5636
	-14.75	5.53	0.2986	-0.001536	-0.002488	0.003494	0.003749	0.000009	0.0036719	0.0036719	0.7320
36	-5.00	5.75	41.23	2070.	-136.	2304.	1317.	-285.	118.6	648.1	910
1	-1.59	0.2158	114.74	0.0318	-0.1788	0.1434	0.0898	-0.0231	0.0036811	0.0036811	0.5636
	-14.75	5.72	0.2988	-0.001418	-0.007625	0.006401	0.003548	-0.001129	0.0035972	0.0035972	0.7321
37	-5.00	5.75	41.11	1980.	-39.	1665.	1478.	443.	122.0	648.1	910
1	-3.58	0.2159	114.57	0.0274	-0.0898	0.1039	0.0898	0.0204	0.0036844	0.0036844	0.5636
	-14.75	5.38	0.2984	-0.001177	-0.002546	0.004825	0.003595	0.000008	0.0037032	0.0037032	0.7318
38	-7.00	5.75	41.21	2370.	-45.	1879.	1437.	474.	114.8	648.1	910
1	-2.13	0.2159	114.57	0.0716	-0.0863	0.1173	0.0838	0.0257	0.0035428	0.0035428	0.5636
	-12.75	5.52	0.2984	-0.003187	-0.003542	0.003219	0.003130	0.001142	0.0038445	0.0038445	0.7318
39	-5.00	5.75	41.35	2740.	-51.	2188.	1347.	590.	106.1	648.1	910
1	-3.72	0.2158	114.84	0.02157	-0.0558	0.1259	0.0870	0.0246	0.0032538	0.0032538	0.5636
	-10.75	5.50	0.2991	-0.002622	-0.003970	0.006077	0.003442	0.001547	0.0043174	0.0043174	0.7322
40	-11.00	5.75	41.34	1580.	-22.	1921.	1373.	587.	118.7	648.1	910
1	-3.78	0.2159	114.47	0.0174	-0.0504	0.1201	0.0892	0.0246	0.0036837	0.0036837	0.5636
	-16.75	5.57	0.2981	-0.005936	-0.004017	0.005325	0.003965	0.001093	0.0036184	0.0036184	0.7317
41	-5.00	5.75	41.41	1595.	-36.	1854.	1392.	374.	115.8	648.1	910
1	-1.13	0.2158	115.01	0.0337	-0.0687	0.1148	0.0837	0.0159	0.0035545	0.0035545	0.5636
	-14.50	5.63	0.2993	-0.001926	-0.003578	0.003150	0.003754	0.000713	0.0035531	0.0035531	0.7324
ZERO VALUES IN ALPHA B I FL+ RL+ C FL- RL- CF CR C OMEGA PCN											
TOTAL PHYS. UNITS.. 3.3 25.0 57290.0 57870.0 15203.0 15203.0 11574. 11574. 3134. 3134. 9197.0 9197.0 0.162 1409.											

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ACTOR SCALE DATA * PROGRAM L43530 * WIND AXES

AMES RESEARCH CENTER * ACTOR SCALE DATA

CONFIG. FRANK
LOM HELICOPTER

SWINGER TARE TAIL ON

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

PT.	THETA	ALPHA	CLR	CNR	CYR	CMK	CMV	CRZ	CP	CPU	VAOR	WIND
		CONTROL										
1.	8.0	-3.4	0.084565	-0.079433	-0.005715	0.000836	0.002362	0.002955	0.0029076	0.0050730	0.299	0.732
2.	8.0	-3.4	0.081741	-0.009254	-0.006251	0.000523	0.002435	0.002833	0.0028015	0.0049510	0.298	0.732
3.	8.0	-3.4	0.084627	-0.011202	-0.006297	0.000821	0.002493	0.002193	0.0021466	0.0047647	0.299	0.732
4.	8.0	-3.4	0.082376	-0.009424	-0.005757	0.000630	0.002716	0.002828	0.0027811	0.0045569	0.299	0.732
5.	8.0	-3.4	0.086336	-0.010937	-0.005757	0.001145	0.004358	0.002249	0.0021858	0.0047675	0.299	0.732
6.	8.0	-3.4	0.084161	-0.013472	-0.005461	0.001264	0.006368	0.001680	0.0016114	0.0048270	0.299	0.732
7.	8.0	-3.4	0.074527	-0.017757	-0.005917	0.000616	0.003913	0.003489	0.0034515	0.0052681	0.299	0.731
8.	8.0	-3.4	0.072318	-0.017496	-0.006138	0.001703	0.003924	0.003577	0.0035348	0.0053035	0.299	0.731
9.	8.0	-3.4	0.081451	-0.009163	-0.005636	0.001354	0.002932	0.002820	0.0027161	0.0048972	0.299	0.731
10.	8.0	-3.4	0.078655	-0.008658	-0.003605	0.001768	0.001658	0.003113	0.0030162	0.0050572	0.299	0.731
11.	8.0	-3.4	0.075943	-0.008278	-0.003183	0.003122	0.001719	0.002322	0.0031540	0.0051115	0.300	0.731
12.	8.0	-3.4	0.083478	-0.009551	-0.007540	0.000273	0.002873	0.002651	0.0027817	0.0049257	0.299	0.730
13.	8.0	-3.4	0.083845	-0.015779	-0.007472	0.001650	0.003215	0.002417	0.0022496	0.0047642	0.299	0.730
14.	8.0	-3.4	0.081721	-0.015931	-0.007572	0.001766	0.002517	0.002795	0.0027508	0.0049499	0.299	0.730
15.	8.0	-3.4	0.083983	-0.011526	-0.006234	0.001624	0.002223	0.002177	0.0021651	0.0058173	0.299	0.733
16.	8.0	-3.4	0.086625	-0.017424	-0.004819	0.001875	0.003137	0.002728	0.0026236	0.0044236	0.300	0.730
17.	8.0	-3.4	0.086246	-0.004499	-0.003763	0.001283	0.003674	0.002619	0.0024435	0.0041078	0.300	0.730
18.	11.0	-9.0	0.072810	-0.010151	-0.003868	0.001278	0.003173	0.004145	0.0031630	0.0037339	0.301	0.731
19.	13.0	-5.7	0.088017	-0.022233	-0.004232	0.001159	0.007563	0.005307	0.0051198	0.0037381	0.300	0.731
20.	13.0	-9.0	0.084834	-0.011945	-0.004061	0.000868	0.006026	0.005218	0.0050184	0.0037256	0.299	0.730
21.	15.0	-5.0	0.063756	-0.002374	-0.003681	0.001157	0.002536	0.002481	0.0023506	0.0036499	0.299	0.730
22.	8.0	-3.4	0.084565	-0.005892	-0.003888	0.001286	0.004884	0.002546	0.0023138	0.0039081	0.298	0.729
23.	11.0	-5.0	0.073339	-0.011268	-0.004187	0.001136	0.004869	0.004046	0.0038335	0.0037227	0.299	0.732
24.	11.0	-9.0	0.073959	-0.011426	-0.003743	0.000944	0.005164	0.003985	0.0037885	0.0034028	0.292	0.747
25.	11.0	-5.0	0.072545	-0.0031661	-0.003763	0.001274	0.005286	0.004030	0.0037812	0.0038148	0.304	0.722
26.	11.0	-9.0	0.070819	-0.003051	-0.004332	0.001291	0.005162	0.003874	0.0036246	0.0041480	0.312	0.708
27.	11.0	-9.0	0.067668	-0.004111	-0.004214	0.001487	0.005803	0.003274	0.0031631	0.0041835	0.319	0.696
28.	11.0	-9.0	0.07274	-0.011154	-0.003969	0.001067	0.004952	0.004026	0.0038592	0.0036764	0.299	0.732
29.	11.0	-9.0	0.081457	-0.002617	-0.004036	0.001609	0.007233	0.003521	0.0032261	0.0034241	0.299	0.732
30.	11.0	-5.0	0.084559	-0.004857	-0.003930	0.001816	0.006969	0.003108	0.0027860	0.0035552	0.299	0.732
31.	11.0	-9.0	0.07279	-0.001158	-0.004151	0.001198	0.004405	0.004076	0.0038387	0.0037354	0.299	0.732
32.	11.0	-9.0	0.070828	-0.001272	-0.004038	0.000979	0.004923	0.004032	0.0038297	0.0037326	0.299	0.732
33.	11.0	-5.0	0.065548	-0.001279	-0.002931	0.001764	0.004266	0.004166	0.0038384	0.0037798	0.299	0.732
34.	11.0	-5.0	0.072291	-0.001323	-0.005131	0.000473	0.005351	0.003998	0.0038744	0.0037531	0.298	0.732
35.	11.0	-5.0	0.073206	-0.001535	-0.004688	0.000009	0.005494	0.003749	0.0037015	0.0036719	0.299	0.732
36.	11.0	-9.0	0.074665	-0.001416	-0.007625	-0.001129	0.006401	0.003548	0.0036611	0.0035572	0.298	0.732
37.	11.0	-9.0	0.071377	-0.001217	-0.003996	0.000906	0.004625	0.003995	0.0036044	0.0037032	0.298	0.732
38.	11.0	-7.0	0.085667	-0.003167	-0.003840	0.001142	0.005215	0.003730	0.0035626	0.0036446	0.298	0.732
39.	11.0	-5.0	0.099262	-0.004919	-0.003977	0.001547	0.006377	0.003442	0.0032936	0.0034374	0.295	0.732
40.	11.0	-11.0	0.056936	-0.003773	-0.004017	0.001193	0.005235	0.003965	0.0036837	0.0036184	0.298	0.732
41.	11.0	-5.0	0.071526	-0.001424	-0.003976	0.000713	0.005150	0.003754	0.0035555	0.0035531	0.299	0.732

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PRCTR SCALE DATA • PROGRAM LA3530 • WING AXES

TEST 316. RUN 11 STATIC 2
STATIC NO. CHANGES FROM 2 TO
(IF A STATIC IS STARTING HERE,

IF A STATIC IS STARTING HERE, IT WILL BE SCRAMBLED WITH THE RUN BECAUSE IS STILL IN A LATER CHANGE TO R-9 WHEN I NEED.)

BAROMETRIC PRESSURE = 29.86

CONF. FRBVH

CONFIG. FRBVH														
PT	ALPHA	B 1	C	LIFT-U	DRAG-U	SIDE F-U	PITCH-U	YAW-U	ROLL-U	HP	OMEGA-R	TEMP	NOTES	
AVG	ALFA	RPO-100	V-KTS	CL	CD	CV	CM	CN	CRCLL	CP	CC	M-OWR	RPN	
ALF C	L/D-E		V/GN	CLR	CAR	CVR	CPY	CMZ	CMX	CPC	CCC	PLAT	THELA	
1	-2.35	6.20	55.85	1723.	450.	-66.	1593.	1547.	735.	67.7	645.4	78.0		
1	-7.06	5.23	132.53	1.1556	2.1250	-0.02408	0.0725	0.0417	0.0439	0.0020964	0.0020984	0.5680	468.	
-14.5	4.58	4.58	134.66	0.06047	0.037527	-0.002448	0.004415	0.002525	0.002636	0.0044116	0.0044116	0.7648	11.0	
2	-6.35	6.20	55.75	2.63.	426.	-72.	2276.	1659.	612.	80.7	642.6	78.0		
1	-5.19	5.23	132.47	1.2196	0.1107	-0.0361	0.0523	0.0485	0.0455	0.0025324	0.0025324	0.5636	466.	
-14.5	5.44	5.44	134.75	0.073826	0.026772	-0.002238	0.005587	0.002961	0.002757	0.0044384	0.0044384	0.7623	12.0	
3	-8.30	6.20	55.85	2358.	423.	-55.	3000.	1822.	1110.	84.8	642.6	79.0		
1	-4.44	6.22	132.77	1.3916	0.1081	-0.0273	0.1277	0.0530	0.0553	0.0026674	0.0026674	0.5650	466.	
-14.5	6.13	6.13	134.87	0.084611	0.026571	-0.001657	0.002872	0.003222	0.003608	0.0044503	0.0044503	0.7621	13.0	
4	-8.30	6.20	55.85	1352.	452.	-74.	1262.	1293.	702.	55.5	642.6	79.0		
1	-1.63	6.22	132.48	0.876.	0.1513	-0.0363	0.0565	0.0353	0.0403	0.0017592	0.0017592	0.5650	466.	
-14.5	3.95	3.95	134.88	0.046795	0.009162	-0.002319	0.003539	0.002134	0.002442	0.0047614	0.0047614	0.7616	10.0	
5	-8.30	6.20	55.85	753.	519.	-72.	622.	552.	733.	17.7	642.6	79.0		
1	-6.56	6.22	132.34	0.4247	0.2123	-0.0361	0.0278	0.0154	0.0417	0.0005558	0.0005558	0.5650	466.	
-14.5	1.79	1.79	134.76	0.025655	0.012828	-0.002360	0.001679	0.000929	0.002517	0.0049632	0.0049632	0.7614	8.0	
6	-8.30	6.20	55.75	1713.	454.	-75.	1672.	1255.	612.	65.7	642.6	79.0		
1	-7.24	6.22	132.60	1.1045	0.1277	-0.0361	0.0769	0.0411	0.0455	0.0020660	0.0020660	0.5650	466.	
-14.5	4.56	4.56	134.83	0.060918	0.027744	-0.002312	0.004664	0.002491	0.002762	0.0044131	0.0044131	0.7618	11.0	
7	-8.30	6.20	55.75	1853.	423.	-77.	1842.	1628.	781.	76.5	656.4	79.0		
1	-5.59	6.22	132.62	1.1136	0.1089	-0.0393	0.0847	0.0457	0.0441	0.0022568	0.0022568	0.5772	476.	
-14.5	5.14	5.14	134.55	0.064725	0.003633	-0.002266	0.004926	0.002654	0.002562	0.0040808	0.0040808	0.7739	11.0	
8	-8.30	6.20	55.75	1593.	476.	-76.	1805.	1664.	754.	85.6	672.2	79.0		
1	-4.84	6.22	131.31	1.1922	0.1210	-0.0475	0.0846	0.0520	0.0417	0.0024836	0.0024836	0.5693	486.	
-14.5	5.16	5.16	133.07	0.065189	0.035525	-0.002596	0.004627	0.002843	0.002281	0.0039613	0.0039613	0.7842	11.0	
9	-8.30	6.20	55.68	1558.	476.	-77.	1613.	1469.	823.	54.6	631.6	79.0		
1	-8.82	6.22	132.51	0.9118	0.1415	-0.0355	0.0742	0.0359	0.0459	0.0018102	0.0018102	0.5553	458.	
-14.5	4.12	4.12	133.41	0.037173	0.003871	-0.002514	0.004659	0.002250	0.002881	0.0047205	0.0047205	0.7520	11.0	
10	-8.30	6.20	55.73	1423.	455.	-73.	1652.	1231.	633.	48.2	609.5	79.0		
1	-1.63	6.22	132.57	0.8292	0.1551	-0.0371	0.0769	0.0321	0.0373	0.0017771	0.0017771	0.5359	442.	

-14.50	3.72	0.3671	0.355873	-0.010452	-0.002501	0.005122	0.002162	0.002510	0.003327	0.005327	0.7327	11.0
11	-8.35	6.25	55.78	467.	-18.	1939.	1471.	765.	60.8	639.9	8110	444.
1	-7.54	0.2218	132.87	0.1354	-0.03357	0.0694	0.0383	0.0434	0.0019453	0.0019453	0.5616	444.
-14.50	4.45	0.3555	0.359625	-0.000318	-0.002441	0.00262	0.002355	0.002664	0.0045847	0.0045847	0.7584	11.0
12	-8.30	7.45	55.82	459.	-18.	834.	1569.	686.	70.3	639.9	8110	444.
1	-8.64	0.2218	132.90	0.1304	-0.03355	0.0393	0.0427	0.0365	0.0022467	0.0022467	0.5616	444.
-15.75	3.75	0.3556	0.352745	-0.000814	-0.002430	0.002413	0.002625	0.002420	0.00458404	0.00458404	0.7584	11.0
13	-8.30	8.85	55.75	464.	-15.	410.	1626.	517.	77.7	639.9	8110	444.
1	-10.48	0.2218	132.84	0.1338	-0.03351	0.0189	0.0436	0.0319	0.0024448	0.0024448	0.5616	444.
-17.15	2.98	0.3554	0.354373	-0.000812	-0.002341	0.001158	0.002797	0.001560	0.0052095	0.0052095	0.7583	11.0
14	-8.35	4.45	55.71	492.	-14.	2726.	1325.	776.	45.9	639.9	8110	444.
1	-7.50	0.2218	132.78	0.1510	-0.0463	0.1255	0.0319	0.0530	0.0014671	0.0014671	0.5616	444.
-12.75	5.33	0.3553	0.3553	-0.0009265	-0.002475	0.000859	0.001957	0.003253	0.0043271	0.0043271	0.7583	11.0
15	-8.30	3.55	55.82	533.	-42.	3471.	1208.	935.	36.9	639.9	8110	444.
1	-7.96	0.2218	132.67	0.1766	-0.03314	0.1601	0.0269	0.0510	0.0011796	0.0011796	0.5616	444.
-11.35	5.52	0.3555	0.377396	-0.001912	-0.001924	0.000805	0.001598	0.003126	0.0044991	0.0044991	0.7581	11.0
16	-8.35	6.35	55.85	463.	-81.	1579.	1560.	675.	65.6	639.9	8110	444.
1	-7.92	0.2218	132.92	0.1328	-0.03314	0.0726	0.0423	0.0393	0.0022250	0.0022250	0.5616	444.
-14.65	4.14	0.3556	0.35563	-0.0008163	-0.002542	0.000461	0.002630	0.002412	0.0048194	0.0048194	0.7584	11.0
17	-8.35	6.35	55.85	459.	-33.	1454.	1650.	1186.	66.1	642.6	8110	444.
1	-7.78	0.2218	133.31	0.1298	-0.03115	0.0667	0.0437	0.0628	0.0020867	0.0020867	0.5640	466.
-14.65	4.27	0.3494	0.357999	-0.0007923	-0.000765	0.004072	0.002668	0.003035	0.0045528	0.0045528	0.7610	11.0
18	-8.30	6.30	55.73	456.	-17.	1214.	1686.	1518.	70.6	642.6	8110	444.
1	-7.53	0.2214	132.94	0.1291	-0.03174	0.0939	0.0384	0.0780	0.0022339	0.0022339	0.5635	466.
-14.65	4.66	0.3492	0.356455	-0.0007966	-0.001163	0.003457	0.002951	0.004754	0.0047322	0.0047322	0.7602	11.0
19	-8.35	6.35	55.78	433.	-125.	1874.	1483.	265.	64.9	642.6	82.0	466.
1	-7.58	0.2214	132.95	0.1269	-0.03682	0.0829	0.0370	0.0206	0.0020533	0.0020533	0.5635	466.
-14.65	4.65	0.3493	0.3493	-0.0007744	-0.0004161	0.003060	0.002258	0.001256	0.0044556	0.0044556	0.7603	11.0
20	-8.30	6.30	55.68	455.	-170.	1872.	1363.	-152.	64.0	642.6	82.0	466.
1	-6.55	0.2214	132.48	0.13635	-0.03564	0.0863	0.0337	0.0510	0.0020245	0.0020245	0.5635	466.
-14.65	4.86	0.3455	0.364772	-0.0007841	-0.000568	0.005256	0.002055	0.000663	0.0044341	0.0044341	0.7601	11.0
21	-8.30	6.05	55.71	456.	-73.	1779.	1526.	244.	65.4	642.6	82.0	466.
1	-7.32	0.2214	132.91	0.1354	-0.03373	0.0819	0.0412	0.0470	0.0020690	0.0020690	0.5635	466.
-14.35	4.55	0.3491	0.351263	-0.0007872	-0.000273	0.004491	0.002308	0.002661	0.0044246	0.0044246	0.7602	11.0
22	-6.55	6.05	55.80	504.	-78.	1748.	1471.	245.	58.2	642.6	82.0	466.
1	-6.58	0.2214	133.32	0.12679	-0.03329	0.0824	0.0336	0.0504	0.0018394	0.0018394	0.5635	466.
-12.55	5.36	0.3494	0.377388	-0.0009474	-0.000267	0.004495	0.002173	0.003377	0.0046833	0.0046833	0.7603	11.0
23	-3.85	6.00	55.73	555.	-64.	2532.	1503.	636.	66.4	642.6	82.0	466.

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1	-7.84	U.2214	132.96	1.5406	C.2122	-0.03162	0.0945	0.0379	0.0316	0.0021008	0.0021008	0.5635	446.
	-9.8	5.4	3.3452	2.091947	-0.012945	-0.002329	0.005761	0.002312	0.003112	0.0059324	0.0059324	0.7602	11.0
24	-8.3	6.05	55.89	108.9	463.	-75.	1723.	1529.	695.	64.1	642.6	82.0	
1	-8.63	0.2214	133.13	0.5867	0.1322	-0.03169	0.0789	0.0405	0.0576	0.0020269	0.0020269	0.5635	466.
	-14.35	4.45	0.3497	0.060323	-0.000086	-0.002358	0.004826	0.002473	0.002913	0.0055713	0.0055713	0.7602	11.0
25	-2.65	6.10	55.99	211.3	623.	-135.	075.	1333.	450.	57.1	642.6	82.0	
1	-10.76	0.2214	133.13	1.1873	0.2257	-0.0117	0.0401	0.0312	0.0351	0.0018056	0.0018056	0.5635	466.
	-8.70	3.89	0.3497	0.072591	-0.013797	-0.004382	0.002454	0.001905	0.002146	0.0062204	0.0062204	0.7602	11.0
26	-2.65	6.10	55.85	261.9	643.	-124.	2032.	1485.	535.	43.6	642.6	82.0	
1	-8.71	0.2214	133.13	1.0543	0.2381	-0.0054	0.02943	0.0247	0.0373	0.0020122	0.0020122	0.5635	466.
	-8.70	4.75	0.3495	0.094951	-0.014548	-0.003598	0.005763	0.002118	0.002276	0.0063955	0.0063955	0.7604	10.0
27	-2.65	6.10	55.85	231.3	638.	-136.	1057.	1339.	465.	58.0	642.6	82.0	
1	-9.74	0.2214	133.13	1.3056	0.2351	-0.0051	0.0485	0.0316	0.0348	0.0018343	0.0018343	0.5635	466.
	-8.65	4.23	0.3495	0.08368	-0.014563	-0.004420	0.002992	0.001933	0.002127	0.0063097	0.0063097	0.7602	11.0
28	-2.65	6.10	55.71	1558.	629.	-133.	664.	1330.	355.	58.6	642.6	82.0	
1	-11.05	0.2214	132.91	1.1825	0.2308	-0.0722	0.0394	0.0318	0.0305	0.0018538	0.0018538	0.5635	466.
	-8.70	3.78	0.3491	0.072348	-0.014564	-0.004357	0.001862	0.001540	0.001857	0.0063590	0.0063590	0.7602	11.0
29	-3.65	8.45	55.85	272.3	533.	-134.	-65.	1412.	316.	98.6	642.6	82.0	
1	-7.57	0.2214	133.26	1.2231	0.1712	-0.0722	0.0394	0.0318	0.0317	0.0020269	0.0020269	0.5635	466.
	-11.65	3.56	0.35	0.074916	-0.014586	-0.004407	0.003183	0.002314	0.001665	0.0063571	0.0063571	0.7600	10.0
30	-3.65	8.45	55.80	2158.	551.	-137.	275.	1725.	416.	91.1	642.6	82.0	
1	-8.00	0.2214	133.14	1.3309	0.1628	-0.0722	0.03126	0.0318	0.0317	0.0020269	0.0020269	0.5635	466.
	-11.2	4.19	0.3497	0.079549	-0.014574	-0.004415	0.000772	0.002992	0.001938	0.0063029	0.0063029	0.7598	10.0
31	-3.65	7.35	55.71	2253.	574.	-136.	697.	1614.	432.	81.9	642.6	82.0	
1	-6.25	0.2214	133.13	1.3679	0.1974	-0.0725	0.0321	0.0343	0.0323	0.0025948	0.0025948	0.5629	466.
	-1.35	4.36	0.3454	0.083172	-0.01259	-0.004423	0.001959	0.002702	0.001969	0.0062679	0.0062679	0.7596	10.0
32	-3.65	8.45	55.76	2423.	635.	-138.	1412.	1510.	528.	71.7	642.6	82.0	
1	-8.51	0.2214	133.12	1.4378	0.2150	-0.0682	0.03659	0.0391	0.0368	0.0022706	0.0022706	0.5629	466.
	-9.60	4.56	0.3496	0.087800	-0.013143	-0.004167	0.000425	0.002392	0.002247	0.0062652	0.0062652	0.7590	10.0
33	-3.65	5.75	55.75	2578.	647.	-126.	2019.	1358.	551.	58.2	642.6	82.0	
1	-8.55	0.2214	133.14	1.5324	0.2413	-0.0680	0.03629	0.0323	0.0357	0.0018426	0.0018426	0.5629	466.
	-8.75	4.75	0.3454	0.093625	-0.014731	-0.004523	0.003878	0.001922	0.002523	0.0063134	0.0063134	0.7597	10.0
34	-3.65	4.65	55.71	2768.	739.	-134.	2603.	1197.	602.	43.3	642.6	82.0	
1	-9.61	0.2214	133.23	1.6489	0.2793	-0.0712	0.03159	0.0251	0.0493	0.0013705	0.0013705	0.5629	466.
	-7.65	4.85	0.3494	0.105656	-0.017347	-0.004349	0.007316	0.001930	0.003009	0.0065383	0.0065383	0.7596	10.0
35	-3.65	7.45	55.67	2322.	577.	-126.	884.	1627.	465.	81.6	642.6	82.0	
1	-8.19	0.2214	133.23	1.3748	0.1983	-0.0680	0.0365	0.0441	0.0340	0.0025869	0.0025869	0.5629	466.
	-1.3	4.41	0.3455	0.084173	-0.012121	-0.004374	0.002484	0.002699	0.002081	0.0062777	0.0062777	0.7599	10.0

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36	-3.00	7.30	55.78	2603.	588.	-124.	1367.	1673.	665.	85.5	642.6	84.0	446.
1	-7.56	6.2206	133.24	1.5468	C.2053	-0.0645	C.0629	C.5460	C.431	0.0027140	0.0027140	0.5024	446.
	-1.33	4.76	3.3501	C.9.718	-C.012574	-0.003952	0.003951	0.002854	0.002639	0.0046171	0.0046171	0.7392	11.0
37	-3.00	7.30	55.75	1598.	577.	-130.	450.	1558.	443.	76.9	645.4	84.0	448.
1	-8.61	6.2206	133.21	1.1749	0.1399	-0.0645	0.0207	0.0415	0.0328	0.0024051	0.0024051	0.5024	448.
	-1.33	3.83	3.3484	7.071297	-0.012068	-0.004151	0.001257	0.002517	0.001993	0.0042165	0.0042165	0.7616	9.0
38	-3.00	7.30	55.80	1658.	580.	-116.	451.	1471.	465.	88.0	645.4	84.0	448.
1	-8.17	6.2206	133.27	0.9982	C.2052	-0.0607	0.0021	C.6372	0.0339	0.0021509	0.0021509	0.5048	468.
	-1.33	3.31	3.3485	3.767635	-C.012461	-0.003687	0.000127	0.002262	0.002061	0.0042072	0.0042072	0.7617	9.0
39	-3.00	7.30	55.75	2313.	574.	-137.	661.	1628.	416.	83.2	645.4	84.0	480.
1	-8.17	6.2206	133.21	1.3718	C.1970	-0.0726	0.0304	0.0447	0.0316	0.0026064	0.0026064	0.5048	480.
	-1.33	4.38	3.3484	1.563248	-0.011556	-C.004408	0.001645	0.002111	0.001917	0.0042313	0.0042313	0.7616	10.0
40	-3.00	7.30	55.66	2223.	561.	-80.	366.	1766.	817.	94.1	645.4	84.0	468.
1	-8.19	6.2206	133.12	1.2193	0.1897	-0.0367	0.0169	0.0514	0.0500	0.0029499	0.0029499	0.5048	468.
	-1.33	4.10	3.3482	3.76942	-C.011457	-0.002245	0.001222	0.003113	0.003025	0.0044533	0.0044533	0.7615	10.0
41	-3.00	7.30	55.82	2148.	552.	-32.	175.	1855.	1286.	58.0	645.4	84.0	468.
1	-8.21	6.2206	133.29	1.2701	C.1832	-C.0064	0.0082	0.0548	0.0717	0.0030957	0.0030957	0.5048	468.
	-1.33	3.55	3.3486	1.077176	-0.011132	-C.003513	0.000459	0.003328	0.004356	0.0065116	0.0065116	0.7617	10.0
42	-3.00	7.30	55.87	2378.	587.	-153.	921.	1549.	-96.	77.4	642.6	84.0	466.
1	-8.24	6.2206	133.35	1.4.81	0.2343	-0.1354	0.0423	0.0475	0.0583	0.0024558	0.0024558	0.5024	466.
	-1.33	4.31	3.3523	3.086363	-0.012514	-C.006467	0.002594	0.002486	0.000506	0.0042597	0.0042597	0.7394	10.0
43	-3.00	7.30	55.64	2418.	584.	-256.	928.	1466.	-466.	73.5	642.6	84.0	460.
1	-8.27	6.2206	133.27	1.4386	0.2343	-0.1460	0.0428	0.0276	-0.0092	0.0023323	0.0023323	0.5024	460.
	-1.33	4.68	3.3485	0.087854	-0.012460	-C.008915	0.002612	0.002306	-0.000564	0.0060863	0.0060863	0.7599	10.0
44	-3.00	7.30	55.68	2318.	559.	-132.	704.	1634.	450.	83.5	642.6	84.0	446.
1	-8.24	6.2206	133.12	1.3767	0.1945	-0.0722	0.0324	0.0453	0.0352	0.0026506	0.0026506	0.5024	446.
	-1.33	4.42	3.3487	3.364153	-0.011392	-C.004234	0.001581	0.002767	0.002150	0.0042579	0.0042579	0.7591	10.0

ZERO VALUES IN ALPHA B I FL+ RL+ FL- RL- CR C OMEGA PGA
 TOTAL COUNTS: 501. 11461. 11579. 15208. 57862.5 57862.5 57862.5 57862.5 57862.5 57862.5 57862.5 57862.5 57862.5 57862.5
 TOTAL PHYS. UNITS: 25.7 57305.0 57862.5 57862.5 57862.5 57862.5 57862.5 57862.5 57862.5 57862.5 57862.5 57862.5 57862.5 57862.5

T = 3 CP = CG.

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06/21/68 TIME 700.73

RECICR SCALE CATA • PROGRAM LA3530 • WINE AXES

AMES RESEARCH CENTER • FACTOR SCALE DATA

TEST 316.: RUN 11

CONFIG. FRBVH
LCF HELICOPTER SKENER

BY THE SKINNER TARE TAIL CH

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

PT.	THETA	ALPHA	SAFT	CCNTROL	CLK	CXR	CYR	CMX	CMY	CPZ	CP	CPO	V/CR	MIL-01190
1.	11.0	-6.2	-14.5	-0.06757	-0.062448	0.002636	0.004415	0.002505	0.002094	0.004416	0.347	0.765		
2.	12.0	-8.3	-14.5	-0.06702	-0.062308	0.002757	0.003872	0.002961	0.002324	0.004384	0.348	0.762		
3.	13.0	-6.3	-14.5	-0.06571	-0.06187	0.003608	0.003371	0.003122	0.002674	0.004503	0.349	0.762		
4.	10.0	-8.3	-14.5	-0.069162	-0.062315	0.002442	0.003539	0.002134	0.001752	0.0047614	0.348	0.762		
5.	8.0	-8.3	-14.5	-0.062828	-0.062236	0.002517	0.001679	0.000929	0.000252	0.0049322	0.348	0.762		
6.	11.0	-8.3	-14.5	-0.067744	-0.062312	0.002752	0.004654	0.002491	0.002066	0.0044731	0.348	0.762		
7.	11.0	-8.3	-14.5	-0.067330	-0.062286	0.002562	0.004526	0.002654	0.002358	0.0040808	0.341	0.774		
8.	11.0	-8.3	-14.5	-0.065525	-0.062256	0.002281	0.004627	0.002843	0.0024836	0.0039613	0.331	0.784		
9.	11.0	-8.3	-14.5	-0.067173	-0.062254	0.002881	0.003639	0.002251	0.001802	0.0047305	0.334	0.752		
10.	11.0	-8.3	-14.5	-0.065876	-0.062251	0.002515	0.003122	0.002162	0.001771	0.0043827	0.367	0.733		
11.	11.0	-8.3	-14.5	-0.065625	-0.062241	0.002664	0.003282	0.002355	0.001953	0.0045847	0.350	0.758		
12.	11.0	-8.3	-15.7	-0.069314	-0.062438	0.002528	0.003213	0.002625	0.002467	0.0044804	0.351	0.758		
13.	11.0	-8.3	-17.1	-0.064373	-0.062341	0.001960	0.001158	0.002797	0.002468	0.00452095	0.350	0.758		
14.	11.0	-8.3	-12.7	-0.067418	-0.062245	0.003253	0.003769	0.001957	0.0014671	0.0043271	0.350	0.758		
15.	11.0	-8.3	-11.3	-0.0673812	-0.0621924	0.003126	0.003903	0.001948	0.0011796	0.0044591	0.351	0.758		
16.	11.0	-8.3	-14.6	-0.068692	-0.062163	0.002542	0.004461	0.002250	0.0022250	0.0048194	0.351	0.758		
17.	11.0	-8.3	-14.6	-0.067959	-0.0621703	0.003835	0.004072	0.002668	0.0020867	0.0045928	0.349	0.761		
18.	11.0	-8.3	-14.6	-0.066455	-0.062166	0.004755	0.003507	0.002951	0.0022315	0.0047322	0.349	0.760		
19.	11.0	-8.3	-14.6	-0.062364	-0.062161	0.001256	0.005860	0.001258	0.0020593	0.0044556	0.349	0.760		
20.	11.0	-8.3	-14.6	-0.064712	-0.062161	0.002163	0.005336	0.001055	0.0020245	0.0044341	0.349	0.760		
21.	11.0	-8.3	-14.2	-0.064290	-0.062171	0.002861	0.004351	0.002308	0.0020630	0.0045244	0.349	0.760		
22.	11.0	-6.0	-12.7	-0.067738	-0.062167	0.003077	0.004903	0.003173	0.0018394	0.0046833	0.349	0.760		
23.	11.0	-3.8	-9.8	-0.063947	-0.062129	0.003112	0.005781	0.002312	0.0021608	0.0049324	0.349	0.760		
24.	11.0	-8.3	-14.2	-0.063323	-0.062226	0.002913	0.004826	0.002472	0.0022265	0.0045311	0.350	0.760		
25.	8.0	-2.6	-8.7	-0.062591	-0.062382	0.003146	0.002434	0.001905	0.0018056	0.0042204	0.350	0.760		
26.	10.0	-2.6	-8.7	-0.064955	-0.062398	0.002376	0.003760	0.002118	0.0020122	0.0043955	0.350	0.760		
27.	9.0	-2.4	-8.4	-0.063080	-0.062343	0.002127	0.002965	0.001913	0.0018341	0.0043857	0.350	0.760		
28.	8.0	-2.6	-8.7	-0.062280	-0.062337	0.001637	0.001882	0.001940	0.0018538	0.0043790	0.349	0.760		
29.	10.0	-3.3	-11.9	-0.074916	-0.062486	0.004407	0.001653	0.003114	0.0031225	0.0043571	0.350	0.760		
30.	10.0	-3.7	-11.2	-0.075545	-0.0621176	0.001536	0.000772	0.002392	0.0022565	0.0043029	0.350	0.760		
31.	10.0	-3.7	-10.3	-0.083372	-0.0621050	0.001869	0.001559	0.0021702	0.0022548	0.0042679	0.349	0.760		
32.	10.0	-3.0	-9.6	-0.082800	-0.0621343	0.00247	0.004025	0.002392	0.0022706	0.0042652	0.350	0.760		
33.	10.0	-3.0	-8.7	-0.083623	-0.0621474	0.002421	0.003576	0.001972	0.0018426	0.0043134	0.350	0.760		
34.	10.0	-3.7	-7.6	-0.11656	-0.0621747	0.003309	0.007316	0.001530	0.0013705	0.0043983	0.345	0.760		
35.	10.0	-3.0	-10.3	-0.084173	-0.062121	0.003374	0.002344	0.002244	0.0022869	0.0042373	0.350	0.760		
36.	11.0	-3.0	-10.3	-0.094718	-0.06212974	0.002639	0.003851	0.002894	0.002740	0.0041171	0.350	0.760		
37.	9.0	-3.0	-10.3	-0.071297	-0.0621208	0.001993	0.0019151	0.002257	0.0024691	0.0042165	0.349	0.762		
38.	8.0	-3.0	-10.3	-0.066630	-0.0621261	0.002061	0.000127	0.002262	0.0021509	0.0042072	0.350	0.762		
39.	10.0	-3.0	-10.5	-0.083248	-0.06211958	0.001917	0.001645	0.002711	0.0025664	0.0042313	0.348	0.762		
40.	10.0	-3.0	-10.5	-0.075942	-0.0621497	0.003039	0.001022	0.003112	0.0023495	0.0044533	0.348	0.761		
41.	10.0	-3.0	-10.5	-0.077176	-0.06211132	0.004356	0.003459	0.003328	0.0030957	0.0045116	0.349	0.762		
42.	10.0	-3.0	-10.5	-0.086368	-0.06212514	0.000587	0.002554	0.002486	0.0022558	0.0042597	0.350	0.759		
43.	10.0	-3.0	-10.5	-0.087864	-0.06212463	0.000915	0.002612	0.002306	0.0023323	0.0040863	0.350	0.759		
44.	10.0	-3.0	-10.4	-0.084153	-0.06211892	0.004294	0.001981	0.002787	0.0024506	0.0042594	0.350	0.759		

TEST 1000 FOR 1000

STATIC CHANGES FROM 2 TO 3 CM PT 100. LAST STATIC NO ENCOUNTERED IS THE ONE ACTUALLY USED.

(IF A STATIC IS STARTING HERE, IT WILL BE SCRAMBLED WITH THE ONE BECAUSE IT STILL IS IN AFTER CHARGE TO 1-9 MINUTE MIN.)

BAROMETRIC PRESSURE = 30.23

CONFIG. FRBVH

HTC-AD Report No. 369-A-8020

PT	ALPHA	B	C	CRAGU	SIDE	FU	PTICH	U	YAN	U	ACLL	U	HP	CP	CPO	CC	CC	CC	TEPP	NOTES
AVG	ALFA	RHO	100	V	KTS	Y/CR	CL	CL	CL	CL	CL	CL	CL	CL	CL	CL	CL	CL	CL	CL
1	-3.3	5.55	55.82	67.	-125.	734.	1479.	544.	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6
1	-11.	-2285	131.26	1.1124	-0.013046	-0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046
2	-3.21	5.55	55.82	67.	-125.	734.	1479.	544.	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6
1	-9.28	-2285	131.26	1.1124	-0.013046	-0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046
3	-3.3	5.55	55.82	67.	-125.	734.	1479.	544.	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6
1	-9.28	-2285	131.26	1.1124	-0.013046	-0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046
4	-3.3	5.55	55.82	67.	-125.	734.	1479.	544.	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6
1	-9.28	-2285	131.26	1.1124	-0.013046	-0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046
5	-3.3	5.55	55.82	67.	-125.	734.	1479.	544.	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6
1	-9.28	-2285	131.26	1.1124	-0.013046	-0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046
6	-3.3	5.55	55.82	67.	-125.	734.	1479.	544.	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6
1	-9.28	-2285	131.26	1.1124	-0.013046	-0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046
7	-3.3	5.55	55.82	67.	-125.	734.	1479.	544.	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6
1	-9.28	-2285	131.26	1.1124	-0.013046	-0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046
8	-3.3	5.55	55.82	67.	-125.	734.	1479.	544.	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6
1	-9.28	-2285	131.26	1.1124	-0.013046	-0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046
9	-3.3	5.55	55.82	67.	-125.	734.	1479.	544.	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6
1	-9.28	-2285	131.26	1.1124	-0.013046	-0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046
10	-3.3	5.55	55.82	67.	-125.	734.	1479.	544.	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6
1	-9.28	-2285	131.26	1.1124	-0.013046	-0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046
11	-3.3	5.55	55.82	67.	-125.	734.	1479.	544.	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6
1	-9.28	-2285	131.26	1.1124	-0.013046	-0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046
12	-3.3	5.55	55.82	67.	-125.	734.	1479.	544.	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6
1	-9.28	-2285	131.26	1.1124	-0.013046	-0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046
13	-3.3	5.55	55.82	67.	-125.	734.	1479.	544.	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6	66.6
1	-9.28	-2285	131.26	1.1124	-0.013046	-0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046	0.013046

ZERO VALUES IN ALPHA B J FLA BLA

06/21/68
TIME 788.73

RECORDER SCALE DATA • PROGRAM LA3520 • MINE AXES

APES RESEARCH CENTER • ROTOR SCALE DATA

TEST 316.2 RUN 12

CONFIG. FRVBH

LGH HELICOPTER GUNNER TARE TAIL CM

MINE AXES COEFFICIENTS, BASED ON ROTOR BLADE AREA AND ROTOR IIP SPEED

PT.	THETA	ALPHA	SHAFT	CLR	CNR	CVR	CMX	CPY	CMZ	CP	CPD	V/CR
1.	8.0	-3.3	-9.2	0.267139	-0.213146	-0.003847	0.002270	0.002035	0.002339	0.0021047	0.0062843	0.347
2.	8.0	-3.3	-9.2	0.071461	-0.112271	-0.0023714	0.002114	0.002460	0.002175	0.0020498	0.0058136	0.335
3.	8.0	-3.3	-9.2	0.071550	-0.111557	-0.002335	0.002159	0.0021297	0.002180	0.0020630	0.0054197	0.332
4.	10.0	-3.3	-10.7	0.082755	-0.112316	-0.0033963	0.002132	0.001515	0.002852	0.0021658	0.0064007	0.347
5.	10.0	-3.3	-10.7	0.085941	-0.111918	-0.004007	0.002217	0.002688	0.002877	0.0027452	0.0058842	0.340
6.	10.0	-3.3	-10.7	0.087104	-0.110098	-0.003742	0.001868	0.002742	0.002916	0.0026038	0.0055404	0.332
7.	10.0	-3.3	-10.7	0.083058	-0.112829	-0.003964	0.002560	0.002083	0.002862	0.0027097	0.0067512	0.356
8.	10.0	-3.3	-10.6	0.078874	-0.114407	-0.003976	0.002781	0.001778	0.002852	0.0027265	0.0075794	0.369
9.	10.0	-2.3	-11.7	0.084652	-0.111915	-0.003747	0.002281	0.001822	0.002943	0.0028068	0.0063035	0.347
10.	10.0	-1.7	-8.4	0.093898	-0.115575	-0.004682	0.002261	0.002682	0.003089	0.0030485	0.0078378	0.348
11.	10.0	-5.3	-12.3	0.066051	-0.095547	-0.003537	0.002543	0.001585	0.002824	0.0025875	0.0059719	0.348
12.	10.0	-6.3	-13.8	0.058634	-0.079354	-0.003420	0.002357	0.001105	0.002811	0.0025352	0.0055275	0.349
13.	10.0	-3.3	-10.7	0.084912	-0.111997	-0.003746	0.002376	0.002026	0.002979	0.0028374	0.00644504	0.348

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TEST 316.7 NO. 13 STATIC 1
STATIC NO. CHANGES FROM 1 IC 3 ON PT 103. LAST STATIC AC ENCOUNTERED IS THE ONE ACTUALLY USED.
IF A STATIC IS STARTING HERE, IT WILL BE SCRAPELED WITH THE ARM BECAUSE K STILL - 1. LATER CHANGE TO K-9 MIN-Y HELP.1
81'S DIFFER CN BEGINNING AND END ZEROS. BEGINNING VALUE = 502.0, ENC VALLE = 501.0 COUNTS. ENC VALLE WILL BE USED.

CONFIG. FRBVH

BAHMETRIC PRESSURE = 30.14

PT	ALPHA	B I	Q	LIFT-U	CRAG-U	SIZE F-U	PITCH-U	YAW-U	RCLL-U	MP	OMEGA-R	TEPP	NOTES
AVG	ALFA	RPO+1.0	V/KTS	CL	CD	CY	CM	CA	CCELL	CP	CC	P-CAR	
ALF C	L/D-E	V/D-E	V/D-E	CLR	CMR	CYR	CMY	CMZ	CPX	CPC	CCO	P-CAT	TMETA
1	-3.5	7.45	28.95	2458.	236.	-63.	1071.	559.	314.	52.3	649.5	76.0	
1	-2.71	0.2272	54.58	2.8435	0.1347	-0.0612	0.0949	0.0539	0.0414	0.0015617	0.0015617	0.5716	471.
1	-3.45	8.53	2.2458	0.08585	-0.004369	-0.001847	0.002867	0.001847	0.001245	0.0017455	0.0017455	0.7121	8.0
2	-3.0	4.65	28.83	2483.	237.	-65.	1076.	561.	282.	52.2	649.5	76.0	
1	-2.72	0.2272	54.58	2.844	0.1365	-0.0624	0.0961	0.0539	0.0350	0.0015589	0.0015589	0.5716	471.
1	-7.65	8.57	0.2453	0.086761	-0.004317	-0.001878	0.002889	0.001878	0.001172	0.0017339	0.0017339	0.7118	8.0
3	-3.0	4.70	28.91	3.93.	260.	-51.	2090.	1139.	336.	68.2	649.5	76.0	
1	-2.61	0.2268	54.52	3.2904	0.1632	-0.0467	0.1035	0.0659	0.0435	0.0020354	0.0020354	0.5711	471.
1	-7.73	8.49	0.2458	0.118468	-0.004329	-0.001911	0.002874	0.002111	0.001314	0.0019492	0.0019492	0.7115	10.0
4	-3.0	4.65	28.91	1938.	243.	-66.	1066.	877.	264.	45.0	649.5	76.0	
1	-3.66	0.2268	54.59	2.2402	0.1433	-0.0642	0.0628	0.0466	0.0373	0.0013470	0.0013470	0.5711	471.
1	-7.65	7.12	0.2458	0.067675	-0.004329	-0.001941	0.001859	0.001408	0.001121	0.0019043	0.0019043	0.7115	6.0
5	-3.0	4.65	28.83	1373.	266.	-52.	245.	801.	135.	38.5	649.5	80.0	
1	-6.16	0.2264	54.56	1.5836	0.1739	-0.0484	0.0218	0.0356	0.0259	0.0011542	0.0011542	0.5706	471.
1	-7.65	4.58	0.2457	0.047812	-0.004358	-0.001958	0.002868	0.001197	0.000782	0.0021687	0.0021687	0.7108	4.0
6	-3.0	4.75	28.85	2513.	234.	-60.	1104.	568.	320.	52.7	649.5	80.0	
1	-2.61	0.2263	54.62	2.5172	0.1332	-0.0568	0.0982	0.0545	0.0422	0.0015187	0.0015187	0.5706	471.
1	-7.75	8.73	0.2458	0.068146	-0.004324	-0.001916	0.002967	0.001648	0.001275	0.0017082	0.0017082	0.7108	8.0
7	-3.0	6.50	28.95	2298.	180.	-68.	215.	1172.	192.	72.0	649.5	80.0	
1	-1.51	0.2263	54.76	2.6567	0.1654	-0.0670	0.0244	0.0728	0.0306	0.0021567	0.0021567	0.5706	471.
1	-9.51	7.76	0.2462	0.065544	-0.0043103	-0.002031	0.003079	0.002278	0.000926	0.0019579	0.0019579	0.7111	8.0
8	-3.0	7.85	28.92	2123.	143.	-72.	214.	1337.	113.	87.0	649.5	80.0	
1	-0.61	0.2263	54.72	2.4545	0.0263	-0.0726	-0.0243	0.0874	0.0236	0.0026063	0.0026063	0.5706	471.
1	-10.85	6.88	0.2461	0.074351	-0.0043096	-0.002202	0.002976	0.002647	0.000714	0.0021915	0.0021915	0.7113	8.0
9	-3.0	3.63	28.76	2568.	275.	-59.	1445.	832.	420.	39.7	649.5	81.0	
1	-3.48	0.2255	54.52	2.9914	0.1821	-0.0547	0.1289	0.0423	0.0315	0.0011929	0.0011929	0.5708	471.
1	-6.0	8.55	0.2456	0.091254	-0.0043495	-0.001951	0.003889	0.001276	0.001555	0.0016406	0.0016406	0.7101	8.0
1	-3.0	1.6	28.92	2703.	353.	-52.	2122.	641.	405.	23.3	649.5	81.0	

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1	-4.81	0.2255	54.87	3.2254	0.2716	-0.0461	0.1882	0.0257	0.0455	0.0007003	0.0007003	0.5788	471.
	-4.83	8.56	0.2464	0.057884	-0.008242	-0.001460	0.005712	0.006780	0.001502	0.0016729	0.0016729	0.7105	8.0
11	-3.00	4.85	25.33	2.368.	239.	-55.	995.	554.	293.	51.9	641.2	8.0	
1	-2.88	0.2255	55.03	2.7251	0.1370	-0.0578	0.0877	0.0538	0.0350	0.0016178	0.0016178	0.5628	465.
	-7.85	8.21	0.2253	0.085341	-0.004291	-0.001610	0.082738	0.001684	0.001222	0.0019002	0.0019002	0.7036	8.0
12	-3.00	4.85	28.95	2.313.	222.	2.	662.	1028.	785.	55.8	641.2	81.0	
1	-2.53	0.2255	94.92	2.6699	0.1180	0.0120	0.0586	0.0601	0.0828	0.0017394	0.0017394	0.5622	465.
	-7.85	8.12	0.2495	0.083336	-0.003084	0.000495	0.061829	0.001877	0.002588	0.0019037	0.0019037	0.7034	8.0
13	-3.00	4.85	28.95	2.283.	225.	54.	224.	1126.	1149.	63.7	644.0	81.0	
1	-2.14	0.2255	94.84	2.6392	0.0985	0.0742	0.0464	0.0696	0.1153	0.0019619	0.0019619	0.5632	467.
	-7.85	7.76	0.2486	0.081540	-0.003344	0.002293	0.061435	0.002151	0.003562	0.0019911	0.0019911	0.7057	8.0
14	-3.00	4.85	28.95	2.448.	242.	-114.	1091.	935.	-118.	52.2	646.8	81.0	
1	-2.86	0.2255	94.92	2.3272	0.1613	-0.1213	0.0965	0.0519	0.0029	0.0015862	0.0015862	0.5676	469.
	-7.85	8.25	0.2477	0.085747	-0.004336	-0.003712	0.052982	0.001593	0.003190	0.0018341	0.0018341	0.7082	8.0
15	-3.00	4.85	28.95	2.473.	245.	-178.	1207.	866.	-585.	47.9	646.8	81.0	
1	-2.91	0.2255	94.82	2.8632	0.1454	-0.1553	0.1071	0.0457	-0.0386	0.0014574	0.0014574	0.5676	469.
	-7.85	8.75	0.2474	0.087638	-0.004451	-0.003577	0.003277	0.001397	-0.001182	0.0017143	0.0017143	0.7080	8.0
16	-3.00	4.75	28.99	2.408.	232.	-61.	1081.	522.	304.	59.7	644.0	81.0	
1	-2.84	0.2255	94.92	2.7836	0.1378	-0.0593	0.0958	0.0517	0.0403	0.0015312	0.0015312	0.5652	467.
	-7.75	8.54	0.2488	0.086055	-0.0034265	-0.0031824	0.002964	0.001595	0.001246	0.0017828	0.0017828	0.7058	8.0
17	0.00	4.75	28.95	2.853.	386.	-83.	1214.	886.	291.	55.5	649.5	81.0	
1	-5.37	0.2255	94.84	3.5555	0.3114	-0.1020	0.1076	0.0549	0.0372	0.0016663	0.0016663	0.5700	471.
	-4.75	8.42	0.2465	0.101917	-0.003459	-0.003258	0.003288	0.001666	0.001129	0.0028513	0.0028513	0.7105	8.0
18	-5.00	4.75	29.07	2.588.	173.	-50.	1206.	555.	479.	47.4	644.0	81.0	
1	-1.47	0.2255	95.04	2.2640	0.0638	-0.0432	0.1064	0.0521	0.0551	0.0014612	0.0014612	0.5652	467.
	-9.75	8.87	0.2491	0.07337.	-0.0031888	-0.0031339	0.003312	0.001616	0.001709	0.0013436	0.0013436	0.7080	8.0
19	-7.00	4.75	28.95	1.752.	128.	-41.	765.	1020.	365.	52.7	644.0	81.0	
1	-0.37	0.2255	94.84	2.0174	0.0105	-0.0328	0.0661	0.0593	0.0439	0.0016529	0.0016529	0.5652	467.
	-11.75	9.42	0.2486	0.062328	-0.000323	-0.001043	0.002104	0.001832	0.001358	0.0013082	0.0013082	0.7057	8.0
20	-5.00	4.75	28.97	1.443.	115.	-31.	983.	1018.	355.	54.9	644.0	81.0	
1	-0.28	0.2255	94.88	1.6537	-0.0080	-0.0308	0.0875	0.0616	0.0396	0.0016909	0.0016909	0.5652	467.
	-13.75	8.28	0.2487	0.025134	0.002248	-0.002951	0.002651	0.001206	0.001226	0.0013433	0.0013433	0.7857	8.0
21	-5.00	5.22	29.21	2.333.	-24.	-25.	1754.	1498.	413.	54.9	641.2	82.0	
1	3.49	0.2255	95.36	2.6697	-0.1626	-0.0262	0.1550	0.0742	0.0424	0.0030284	0.0030284	0.5623	465.
	-14.20	13.47	0.2510	0.084109	0.005123	-0.000826	0.004853	0.003283	0.001368	0.0009760	0.0009760	0.7034	11.0
22	-5.00	5.22	28.95	2.643.	-54.	-21.	2169.	1664.	434.	110.7	644.0	82.0	
1	3.74	0.2255	95.01	3.0505	-0.1992	-0.0164	0.1919	0.0748	0.0462	0.0034153	0.0034153	0.5647	467.
	-14.2	13.54	0.2492	0.094579	0.006175	-0.006600	0.005952	0.003685	0.001431	0.0009705	0.0009705	0.7053	12.0

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23	-9.03	5.27	28.85	2.23.	9.	-31.	1472.	1310.	402.	75.5	644.0	82.0
1	3.08	-2.255	94.77	2.3396	-0.1259	-0.0295	0.1359	0.0875	0.0438	0.0024531	0.0024531	0.5047
	-14.2	13.25	3.2484	0.072177	0.003884	-0.000911	0.004039	0.002698	0.001353	0.0009179	0.0009179	0.7049
24	-9.03	5.27	28.76	1428.	130.	-28.	873.	1602.	365.	52.3	641.2	82.0
1	3.08	-2.255	94.62	1.6483	-0.0191	-0.0250	0.0779	0.0599	0.0410	0.0016355	0.0016355	0.5047
	-14.2	13.25	3.2484	0.051118	0.000592	-0.000776	0.002416	0.001657	0.001270	0.0012027	0.0012027	0.7049
25	-9.03	5.27	28.59	2233.	-25.	-33.	1641.	1459.	370.	93.0	644.0	82.0
1	3.08	-2.255	94.01	2.5728	-0.1642	-0.0333	0.1452	0.1007	0.0405	0.0028078	0.0028078	0.5047
	-14.2	13.25	3.2484	0.079763	0.000591	-0.001034	0.004502	0.003122	0.001255	0.0009249	0.0009249	0.7049
26	-9.03	5.27	28.54	2.08.	-47.	-42.	999.	1555.	311.	102.6	641.2	82.0
1	3.08	-2.255	94.09	2.3767	-0.1897	-0.0443	0.2083	0.1092	0.0351	0.0032071	0.0032071	0.5047
	-15.55	12.37	3.2523	0.07446	0.000592	-0.001287	0.002765	0.003421	0.001099	0.0011175	0.0011175	0.7049
27	-9.03	5.27	28.52	2.113.	-95.	-42.	523.	1726.	142.	120.3	644.0	82.0
1	3.08	-2.255	94.02	2.3140	-0.2457	-0.0441	0.1562	0.1243	0.0302	0.0037114	0.0037114	0.5047
	-17.45	11.12	3.2491	0.071322	0.000623	-0.001367	0.001434	0.003357	0.000627	0.0012492	0.0012492	0.7049
28	-9.03	5.27	28.52	2478.	11.	-25.	2436.	1352.	370.	83.9	644.0	82.0
1	3.08	-2.255	94.05	2.6653	-0.1235	-0.0223	0.2161	0.0512	0.0308	0.0025881	0.0025881	0.5047
	-12.95	14.73	3.2497	0.068616	0.000619	-0.0006720	0.000682	0.002820	0.001262	0.0007794	0.0007794	0.7049
29	-9.03	5.27	28.52	2633.	67.	-23.	3161.	1228.	571.	70.5	646.8	82.0
1	3.08	-2.255	94.05	3.464	-0.3581	-0.0219	0.2834	0.0802	0.0586	0.0021467	0.0021467	0.5047
	-11.4	14.57	3.2470	0.093413	0.001761	-0.000642	0.000597	0.002458	0.001758	0.0007472	0.0007472	0.7049
30	-9.03	5.27	28.52	2309.	-26.	-30.	1772.	1492.	460.	94.9	644.0	82.0
1	3.08	-2.255	94.89	2.6648	-0.1655	-0.0291	0.1571	0.1036	0.0487	0.0029292	0.0029292	0.5047
	-14.25	13.72	3.2467	0.082475	0.0009120	-0.000900	0.004600	0.003204	0.001507	0.0009120	0.0009120	0.7049
ZERO VALUES IN												
TOTAL COUNTS...				ALPHA	6.1	FL+	FL-	RL-	CF	CR	OPEGA	PCW
TOTAL PHYS. UNITS...				521.	11459.	11574.	3311.	3134.	9200.	9155.	511.	495.
				25.	57295.0	57867.5	15231.5	7835.0	9200.0	9194.5	0.050	1408.

I = 3 CP = CC.

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ROTOR SCALE DATA • PROGRAM L4350C • WIND AXES

AMES RESEARCH CENTER • ROTOR SCALE DATA

CONFIG. FRBVH

LCH HELICOPTER SKINNER TARE TAIN ON

TEST 316. NUN 13

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

PT.	THETA	ALPHA SHAFT CONTROL	CLR	CAR	CVR	CMK	CPV	CMZ	CP	CPO	V/DR W(1.0)(90)
1.	8.0	-3.0	1.023425	-0.004065	-0.001847	0.001245	0.002467	0.001629	0.001547	0.001745	0.246 0.712
2.	8.0	-3.0	1.023425	-0.004065	-0.001847	0.001245	0.002467	0.001629	0.001547	0.001745	0.246 0.712
3.	12.0	-3.0	1.023425	-0.004065	-0.001847	0.001245	0.002467	0.001629	0.001547	0.001745	0.246 0.712
4.	6.0	-3.0	1.023425	-0.004065	-0.001847	0.001245	0.002467	0.001629	0.001547	0.001745	0.246 0.712
5.	4.0	-3.0	1.023425	-0.004065	-0.001847	0.001245	0.002467	0.001629	0.001547	0.001745	0.246 0.712
6.	8.0	-3.0	1.023425	-0.004065	-0.001847	0.001245	0.002467	0.001629	0.001547	0.001745	0.246 0.712
7.	8.0	-3.0	1.023425	-0.004065	-0.001847	0.001245	0.002467	0.001629	0.001547	0.001745	0.246 0.712
8.	8.0	-3.0	1.023425	-0.004065	-0.001847	0.001245	0.002467	0.001629	0.001547	0.001745	0.246 0.712
9.	8.0	-3.0	1.023425	-0.004065	-0.001847	0.001245	0.002467	0.001629	0.001547	0.001745	0.246 0.712
10.	8.0	-3.0	1.023425	-0.004065	-0.001847	0.001245	0.002467	0.001629	0.001547	0.001745	0.246 0.712
11.	8.0	-3.0	1.023425	-0.004065	-0.001847	0.001245	0.002467	0.001629	0.001547	0.001745	0.246 0.712
12.	8.0	-3.0	1.023425	-0.004065	-0.001847	0.001245	0.002467	0.001629	0.001547	0.001745	0.246 0.712
13.	8.0	-3.0	1.023425	-0.004065	-0.001847	0.001245	0.002467	0.001629	0.001547	0.001745	0.246 0.712
14.	8.0	-3.0	1.023425	-0.004065	-0.001847	0.001245	0.002467	0.001629	0.001547	0.001745	0.246 0.712
15.	8.0	-3.0	1.023425	-0.004065	-0.001847	0.001245	0.002467	0.001629	0.001547	0.001745	0.246 0.712
16.	8.0	-3.0	1.023425	-0.004065	-0.001847	0.001245	0.002467	0.001629	0.001547	0.001745	0.246 0.712
17.	8.0	-3.0	1.023425	-0.004065	-0.001847	0.001245	0.002467	0.001629	0.001547	0.001745	0.246 0.712
18.	8.0	-3.0	1.023425	-0.004065	-0.001847	0.001245	0.002467	0.001629	0.001547	0.001745	0.246 0.712
19.	8.0	-3.0	1.023425	-0.004065	-0.001847	0.001245	0.002467	0.001629	0.001547	0.001745	0.246 0.712
20.	8.0	-3.0	1.023425	-0.004065	-0.001847	0.001245	0.002467	0.001629	0.001547	0.001745	0.246 0.712
21.	11.0	-3.0	1.023425	-0.004065	-0.001847	0.001245	0.002467	0.001629	0.001547	0.001745	0.246 0.712
22.	12.0	-3.0	1.023425	-0.004065	-0.001847	0.001245	0.002467	0.001629	0.001547	0.001745	0.246 0.712
23.	10.0	-3.0	1.023425	-0.004065	-0.001847	0.001245	0.002467	0.001629	0.001547	0.001745	0.246 0.712
24.	8.0	-3.0	1.023425	-0.004065	-0.001847	0.001245	0.002467	0.001629	0.001547	0.001745	0.246 0.712
25.	11.0	-3.0	1.023425	-0.004065	-0.001847	0.001245	0.002467	0.001629	0.001547	0.001745	0.246 0.712
26.	11.0	-3.0	1.023425	-0.004065	-0.001847	0.001245	0.002467	0.001629	0.001547	0.001745	0.246 0.712
27.	11.0	-3.0	1.023425	-0.004065	-0.001847	0.001245	0.002467	0.001629	0.001547	0.001745	0.246 0.712
28.	11.0	-3.0	1.023425	-0.004065	-0.001847	0.001245	0.002467	0.001629	0.001547	0.001745	0.246 0.712
29.	11.0	-3.0	1.023425	-0.004065	-0.001847	0.001245	0.002467	0.001629	0.001547	0.001745	0.246 0.712
30.	11.0	-3.0	1.023425	-0.004065	-0.001847	0.001245	0.002467	0.001629	0.001547	0.001745	0.246 0.712

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ROTOR SCALE DATA * PROGRAM L43530 * WIND AXES

UPDATE = 6 17 68 1200 TIME 834.96

TEST 316.0 RUN 14 STATIC 1

STATIC NO. CHANGES FROM 1 TO 3 ON PT 100. LAST STATIC NO. ENCOUNTERED IS THE ONE ACTUALLY USED.

IF A STATIC IS STARTING HERE, IT WILL BE SCRAMBLED WITH THE RUN BECAUSE K SYLL = 1. LAYER CHANGE TO K-9 DON'T HELP.)

BAROMETRIC PRESSURE = 30.01

CONFIG. FRBV

PT	ALPHA	B I	Q	LIFT, U	DRAG, U	SIDE F, U	PITCH, U	YAW, U	ROLL, U	HP	ONEGAP	TEMP	WINDS
AVG	ALFA	RHO	100	V, KTS	CD	CV	CM	CM	CMX	CPD	CO	M, OMR	RPM
ALF C	L/D, E	V/D, R		CLR	CD	CV	CM	CM	CMX	CPD	CO	N, AT	THETA
1	-3.00	4.95	28.97	2435.	237.	-101.	-168.	1450.	-4.	116.3	642.6	79.0	
1	-2.95	0.2265	94.76	2.8101	0.1449	-0.1183	-0.0148	0.1163	0.0010	0.0035955	0.0035955	0.5653	466.
	-7.95	4.80	0.2489	0.08723	-0.00488	-0.003683	-0.000460	0.003602	0.000031	0.0038847	0.0038847	0.7057	8.0
2	-5.00	4.95	28.78	2130.	185.	-91.	-48.	1536.	-146.	127.1	642.6	79.0	
1	-1.40	0.2265	94.44	2.4715	0.0605	-0.1098	-0.0043	0.1272	-0.0104	0.0039273	0.0039273	0.5653	466.
	-9.95	4.52	0.2481	0.07637	-0.001861	-0.003379	-0.000131	0.003914	-0.000321	0.0037553	0.0037553	0.7052	8.0
3	-7.00	4.95	28.81	1885.	123.	-89.	-673.	1631.	-193.	137.0	642.6	80.0	
1	-0.26	0.2261	94.57	2.1805	0.0098	-0.1110	-0.0059	0.1366	-0.0157	0.0042423	0.0042423	0.5645	466.
	-11.95	4.09	0.2484	0.067263	-0.003334	-0.003423	-0.001848	0.004215	-0.000486	0.0038223	0.0038223	0.7057	8.0
4	0.00	4.95	28.85	2885.	383.	-118.	116.	1215.	64.	90.9	642.6	80.0	
1	-5.45	0.2251	94.69	3.3544	0.3199	-0.1374	0.0103	0.0010	0.0046	0.0028148	0.0028148	0.5645	466.
	-4.95	5.34	0.2487	0.103736	-0.009893	-0.004250	0.000318	0.002815	0.000143	0.0040983	0.0040983	0.7049	8.0
5	-3.00	4.95	29.30	2435.	245.	-103.	-218.	1453.	-125.	116.3	642.6	80.0	
1	-3.11	0.2261	95.39	2.7768	0.1511	-0.1205	-0.0191	0.1144	-0.0097	0.0036025	0.0036025	0.5645	466.
	-7.95	4.76	0.2506	0.087161	-0.004742	-0.003781	-0.000600	0.003591	-0.000306	0.0039659	0.0039659	0.7059	8.0
6	-3.00	4.95	29.02	1895.	246.	-92.	-737.	1281.	-71.	111.5	642.6	80.0	
1	-4.07	0.2261	94.92	2.1766	0.1549	-0.1042	-0.0625	0.1010	-0.0051	0.0031442	0.0031442	0.5645	466.
	-7.95	4.04	0.2493	0.067643	-0.004816	-0.003364	-0.001943	0.003142	-0.000158	0.0038456	0.0038456	0.7052	6.0
7	-3.00	4.95	29.14	3395.	255.	-101.	404.	1694.	-88.	137.9	642.6	80.0	
1	-2.64	0.2261	95.12	3.5586	0.1442	-0.1185	0.0356	0.1367	-0.0067	0.0042716	0.0042716	0.5645	466.
	-7.95	5.22	0.2498	0.111158	-0.005126	-0.003698	0.000110	0.004266	-0.000210	0.0042094	0.0042094	0.7055	13.0
8	-9.00	4.95	28.95	2510.	-18.	-79.	-432.	2179.	-371.	187.5	642.6	80.0	
1	-3.09	0.2261	94.80	2.8953	-0.1562	-0.1037	-0.0383	0.1843	-0.0033	0.0038059	0.0038059	0.5645	466.
	-13.95	5.22	0.2490	0.089760	0.004843	-0.003215	-0.001187	0.005715	-0.001033	0.0037250	0.0037250	0.7051	11.0
9	-11.00	4.95	28.92	2170.	-62.	-79.	-605.	2252.	-329.	192.8	642.6	80.0	
1	-4.76	0.2261	94.76	2.4956	-0.2080	-0.1094	-0.0537	0.1931	-0.0031	0.0039739	0.0039739	0.5645	466.
	-15.95	4.76	0.2469	0.077306	0.006443	-0.003391	-0.001662	0.005889	-0.000995	0.0037161	0.0037161	0.7059	11.0
10	-7.00	4.95	28.92	2780.	54.	-98.	84.	21.5.	-177.	178.3	642.6	80.0	

1	1.27	0.2261	94.76	3.2164	-0.0713	-0.1096	0.0075	0.1778	-0.03145	0.0055224	0.0055224	0.5645	466.
	-11.95	5.31	0.2489	0.099634	0.022209	-0.003395	0.002231	0.005509	-0.000448	0.0036878	0.0036878	0.7053	11.0
11	-6.00	4.95	28.95	2932.	109.	-85.	132.	265.	-2.	172.8	642.6	80.0	
1	3.11	0.2261	94.80	3.3897	-0.0066	-0.1042	0.0117	0.1737	0.0014	0.0033498	0.0033498	0.5645	466.
	-12.95	5.23	0.2490	0.105090	0.002205	-0.002230	0.002364	0.005384	0.000043	0.0040925	0.0040925	0.7051	11.0
12	-9.00	4.95	29.14	2482.	-20.	-83.	-165.	2233.	-224.	189.8	642.6	80.0	
1	3.19	0.2261	95.12	2.8408	-0.1583	-0.1081	-0.0145	0.1874	-0.0204	0.0058767	0.0058767	0.5645	466.
	-13.95	5.13	0.2498	0.088657	0.005942	-0.003374	-0.009454	0.005849	-0.000637	0.0037864	0.0037864	0.7055	11.0
13	-9.00	5.85	41.14	2152.	193.	-114.	-856.	2356.	-211.	181.6	642.6	82.0	
1	-0.70	0.2240	113.57	1.7138	0.0210	-0.1163	-0.0334	0.1259	-0.0215	0.0056783	0.0056783	0.5635	436.
	-14.85	4.03	0.2983	0.076239	-0.003936	-0.005173	-0.002375	0.005621	-0.000933	0.0054274	0.0054274	0.7315	11.0
14	-11.00	5.85	41.10	1785.	175.	-95.	-948.	2345.	-246.	180.7	642.6	82.0	
1	-0.25	0.2240	113.50	1.4107	0.0061	-0.1065	-0.0592	0.1245	-0.0258	0.0056497	0.0056497	0.5635	466.
	-16.85	3.45	0.2981	0.062684	-0.003269	-0.004733	-0.002631	0.005533	-0.001146	0.0053715	0.0053715	0.7314	11.0
15	-7.00	5.85	41.17	2485.	254.	-112.	-408.	2156.	-52.	161.9	642.6	82.0	
1	-2.07	0.2240	113.60	1.9910	0.0718	-0.1100	-0.0254	0.1134	-0.0095	0.0050629	0.0050629	0.5635	466.
	-12.85	4.61	0.2984	0.088622	-0.003196	-0.004896	-0.001132	0.005549	-0.000423	0.0053006	0.0053006	0.7316	11.0
16	-5.00	5.85	41.00	2842.	340.	-108.	139.	2031.	12.	148.9	642.6	83.0	
1	-3.61	0.2236	113.47	2.2932	0.1448	-0.1136	0.0387	0.1150	-0.0330	0.0046644	0.0046644	0.5629	466.
	-10.85	4.80	0.2980	0.101848	-0.006433	-0.004599	0.000387	0.004663	-0.000221	0.0056349	0.0056349	0.7307	11.0
17	-9.00	5.85	41.29	2120.	198.	-113.	-613.	2342.	-153.	179.5	642.6	83.0	
1	-0.83	0.2235	113.87	1.8832	0.0245	-0.1151	-0.0381	0.1245	-0.0173	0.0056227	0.0056227	0.5629	466.
	-14.85	3.99	0.2991	0.075279	-0.001096	-0.003150	-0.001705	0.005570	-0.000773	0.0043351	0.0043351	0.7313	11.0
18	-3.00	5.65	41.38	2290.	415.	-128.	-192.	1544.	31.	102.4	642.6	83.0	
1	-6.42	0.2235	114.00	1.8227	0.2050	-0.1167	-0.0119	0.0714	-0.0041	0.0032078	0.0032078	0.5629	466.
	-8.65	4.23	0.2994	0.081711	-0.009189	-0.005231	-0.003933	0.003203	-0.000184	0.0053528	0.0053528	0.7315	8.0
19	-5.00	5.65	41.31	1925.	353.	-116.	-207.	1602.	-116.	111.7	642.6	83.0	
1	-5.73	0.2235	113.90	1.5276	0.1532	-0.1094	-0.0439	0.0773	-0.0128	0.0034979	0.0034979	0.5629	466.
	-10.65	3.82	0.2992	0.068360	-0.006857	-0.004897	-0.001964	0.003461	-0.000574	0.0051244	0.0051244	0.7314	8.0
20	-7.00	5.65	41.40	1535.	330.	-112.	-191.	1695.	-137.	121.8	642.6	83.0	
1	-6.28	0.2235	114.04	1.2542	0.1325	-0.1094	-0.0265	0.0339	-0.0147	0.0038165	0.0038165	0.5629	466.
	-12.65	3.00	0.2995	0.054514	-0.003943	-0.004939	-0.002826	0.003765	-0.000657	0.0053317	0.0053317	0.7316	8.0
21	-1.00	5.65	41.38	2640.	501.	-143.	112.	1379.	46.	83.3	642.6	83.0	
1	-7.50	0.2235	114.00	2.1066	0.2773	-0.1277	0.0069	0.0582	-0.0046	0.0026101	0.0026101	0.5629	466.
	-6.65	4.57	0.2994	0.094438	-0.012431	-0.005723	0.000311	0.002607	-0.000207	0.0055222	0.0055222	0.7315	8.0
22	-3.00	5.65	41.29	2305.	411.	-129.	-425.	1508.	-112.	100.0	642.6	83.0	
1	-6.30	0.2235	113.87	1.8352	0.2025	-0.1177	-0.0264	0.0695	-0.0130	0.0031335	0.0031335	0.5629	466.
	-8.65	4.33	0.2991	0.082078	-0.009058	-0.005266	-0.001180	0.003107	-0.000581	0.0052300	0.0052300	0.7313	8.0

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H-C-AD Rep. No. 369-A-8020														Page 28	
23	-3.00	5.65	41.33	1685.	418.	-117.	-696.	1372.	-5.	87.4	642.6	83.0	466.		
1	-8.88	0.2235	113.94	1.3333	0.2278	-0.1078	-0.00432	0.0609	-0.0063	0.0027380	0.0027380	0.5629	466.		
	-8.65	3.32	0.2993	0.059569	-0.009307	-0.004827	-0.001934	0.002727	-0.000284	0.0052036	0.0052036	0.7314	6.0		
24	-3.00	5.65	41.33	2885.	435.	-134.	205.	1673.	-22.	114.1	642.6	84.0	466.		
1	-5.48	0.2231	114.04	2.3112	0.2217	-0.1217	0.0127	0.0796	-0.0074	0.0035820	0.0035820	0.5624	466.		
	-8.65	4.88	0.2995	0.103679	-0.009447	-0.005460	0.000570	0.003569	-0.000333	0.0055853	0.0055853	0.7309	10.0		
25	-3.00	8.80	41.45	1860.	335.	-123.	-1307.	1794.	-185.	129.5	642.6	84.0	466.		
1	-5.42	0.2231	114.14	1.4708	0.1395	-0.1125	-0.0610	0.0069	-0.0175	0.0039392	0.0039392	0.5624	466.		
	-11.80	3.54	0.2998	0.066094	-0.008269	-0.005057	-0.003640	0.003993	-0.000786	0.0054222	0.0054222	0.7310	8.0		
26	-3.00	2.75	41.24	2685.	522.	-132.	856.	1256.	179.	76.4	642.6	84.0	466.		
1	-7.77	0.2231	113.91	2.1527	0.2939	-0.1273	0.0520	0.0539	0.0050	0.0023971	0.0023971	0.5624	466.		
	-5.75	4.65	0.2992	0.096346	-0.013153	-0.005385	0.02327	0.002412	0.000226	0.0054882	0.0054882	0.7307	8.0		
27	-4.00	7.40	55.71	2330.	555.	-156.	-594.	2099.	134.	151.0	642.6	84.0	466.		
1	-7.78	0.2216	132.86	1.3846	0.1891	-0.0966	-0.0273	0.0796	0.0146	0.0047719	0.0047719	0.5624	466.		
	-11.47	3.55	0.3489	0.084237	-0.011514	-0.005866	-0.01664	0.004646	0.000888	0.0082358	0.0082358	0.7387	10.0		
28	-2.00	7.30	55.80	2720.	662.	-154.	-112.	1941.	166.	134.8	645.4	84.0	466.		
1	-8.96	0.2216	132.97	1.6175	0.2251	-0.0933	-0.0052	0.0731	0.0153	0.0042043	0.0042043	0.5648	466.		
	-9.30	3.64	0.3478	0.097808	-0.015426	-0.005643	-0.003312	0.004239	0.000923	0.008206	0.008206	0.7613	10.0		
29	-6.00	7.35	55.75	1840.	515.	-158.	-1095.	2145.	172.	158.1	645.4	84.0	466.		
1	-8.38	0.2216	132.91	1.0859	0.1691	-0.1026	-0.0253	0.0835	0.0131	0.0049339	0.0049339	0.5648	466.		
	-13.35	2.84	0.3476	0.065634	-0.009670	-0.006681	-0.003038	0.005944	0.000791	0.0079584	0.0079584	0.7612	10.0		
30	-4.00	7.35	55.99	2285.	555.	-168.	-432.	2079.	197.	150.7	645.4	84.0	466.		
1	-7.89	0.2215	133.20	1.3512	0.1871	-0.1030	-0.0198	0.0789	0.0178	0.0047016	0.0047016	0.5648	466.		
	-11.35	3.40	0.3484	0.081972	-0.011353	-0.006250	-0.01252	0.004789	0.001083	0.0081317	0.0081317	0.7616	10.0		
31	-4.00	7.35	55.71	1905.	571.	-155.	1114.	1954.	23.	140.3	645.4	84.0	466.		
1	-10.01	0.2216	132.86	1.1268	0.1988	-0.0960	0.0513	0.0734	0.0095	0.0043776	0.0043776	0.5648	466.		
	-11.35	2.85	0.3475	0.068920	-0.012032	-0.005737	0.003097	0.004428	0.000572	0.0081854	0.0081854	0.7611	8.0		
32	-4.00	7.30	55.73	1235.	735.	-168.	12069.	2079.	281.	149.9	645.4	84.0	466.		
1	-22.48	0.2216	132.88	0.7203	0.2981	-0.1038	0.0564	0.0791	0.0214	0.0046760	0.0046760	0.5648	466.		
	-11.30	1.42	0.3475	0.043496	-0.018030	-0.006271	0.003602	0.004778	0.001291	0.0107835	0.0107835	0.7611	8.0		
33	-4.00	7.30	55.82	2655.	575.	-157.	-24.	2225.	245.	163.1	645.4	84.0	466.		
1	-7.23	0.2216	133.00	1.5786	0.2704	-0.0969	-0.0013	0.0857	0.0198	0.0050889	0.0050889	0.5648	466.		
	-11.30	3.68	0.3478	0.095493	-0.012122	-0.006561	-0.006779	0.005185	0.001231	0.0085921	0.0085921	0.7613	11.0		
34	-4.00	7.35	55.75	2020.	562.	-150.	-821.	1960.	61.	140.7	645.4	84.0	466.		
1	-9.26	0.2216	132.91	1.1835	0.1930	-0.0929	-0.0378	0.0736	0.0113	0.0043891	0.0043891	0.5648	466.		
	-11.35	3.03	0.3476	0.071504	-0.011662	-0.005610	-0.002281	0.004447	0.000681	0.0087426	0.0087426	0.7612	9.0		
35	-8.70	7.40	55.75	1685.	444.	-158.	-1420.	2530.	-109.	144.8	645.4	88.0	466.		
1	-6.85	0.2220	133.40	0.9883	0.1188	-0.1064	-0.07653	0.1125	0.0017	0.0061206	0.0061206	0.5628	466.		
	-16.10	2.53	0.3409	0.060146	-0.007229	-0.006475	-0.003976	0.006208	0.000112	0.0083605	0.0083605	0.7591	11.0		

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HTC-AD Report No. 369-A-8020

36	-10.43	7.40	55.62	1333.	461.	-135.	-1647.	2320.	-207.	176.3	645.4	88.0
1	-9.54	0.2230	133.23	0.7709	3.1295	-0.0975	-0.0759	0.0919	-0.0051	0.0055406	3.0055496	0.5628
	-17.80	2.34	0.3484	0.040798	-0.007863	-0.005919	-0.004610	0.005577	-0.000309	0.0081094	0.0081794	0.7599
37	-6.40	7.45	55.62	2205.	471.	-140.	-973.	2307.	71.	180.4	645.4	88.0
1	-5.94	0.2199	133.49	1.3052	0.1357	-0.1024	-0.0446	0.0949	0.0116	0.0056710	0.0056710	0.5628
	-13.85	3.37	0.3491	0.079526	-0.008272	-0.006238	-0.002716	0.005786	0.000707	0.0080659	0.0080659	0.7592
38	-4.30	7.55	55.60	2280.	537.	-165.	-876.	2112.	202.	131.4	645.4	88.0
1	-7.98	0.2199	133.46	1.3522	0.1897	-0.1018	-0.0403	0.0806	0.0178	0.0048294	0.0048294	0.5628
	-11.55	3.35	0.3490	0.082363	-0.011552	-0.006201	-0.002452	0.004908	0.001087	0.0083239	0.0083239	0.7592
39	-4.00	6.60	55.92	2480.	587.	-162.	-268.	2023.	166.	145.0	645.4	88.0
1	-8.01	0.2199	133.60	1.4704	0.2069	-0.0998	-0.0123	0.0764	0.0163	0.0045834	0.0045834	0.5628
	-12.60	3.59	0.3494	0.089756	-0.012632	-0.006081	-0.000750	0.004664	0.000996	0.0083731	0.0083731	0.7594
40	-4.00	5.85	55.85	2625.	522.	-166.	68.	1832.	271.	132.5	645.4	88.0
1	-8.34	0.2199	133.51	1.5598	0.2286	-0.1023	0.0131	0.0770	0.0211	0.0041652	0.0041652	0.5628
	-9.85	3.77	0.3492	0.095093	-0.011939	-0.006234	0.009191	0.004265	0.001284	0.0083281	0.0083281	0.7593
41	-4.00	8.13	55.85	2235.	544.	-162.	-1312.	2145.	208.	156.3	645.4	88.0
1	-7.80	0.2199	133.51	1.3239	0.1815	-0.0998	-0.0465	0.0821	0.0182	0.0049130	0.0049130	0.5628
	-12.13	3.31	0.3492	0.088710	-0.011562	-0.006086	-0.002834	0.005102	0.001107	0.0082684	0.0082684	0.7593
42	-3.00	5.20	29.24	2460.	237.	-107.	-133.	1433.	-99.	115.6	645.4	88.7
1	-2.92	0.2228	95.66	2.8323	0.1443	-0.1257	-0.0117	0.1143	-0.0076	0.0035869	0.0035869	0.5628
	-8.25	4.91	0.2502	0.088632	-0.004515	-0.003933	-0.000367	0.003578	-0.000237	0.0038614	0.0038614	0.7036
43	-3.00	7.90	29.09	2145.	155.	-105.	-1164.	1674.	-236.	137.6	645.4	88.0
1	-1.13	0.2228	95.74	2.8613	0.0486	-0.1232	-0.1026	0.1353	-0.0197	0.0042887	0.0042887	0.5628
	-10.90	4.38	0.2534	0.077160	-0.001523	-0.003863	-0.000217	0.004242	-0.000619	0.0040333	0.0040333	0.7937
44	-3.00	1.90	28.71	2825.	358.	-99.	901.	1131.	71.	88.7	645.4	88.0
1	-5.02	0.2228	95.11	3.2956	0.2897	-0.1170	0.0805	0.3395	0.0081	0.0027508	0.0027508	0.5628
	-4.93	5.25	0.2487	0.101949	-0.008963	-0.003619	0.002499	0.002768	0.000249	0.0038436	0.0038436	0.7028
45	-3.00	4.85	28.99	2465.	237.	-101.	98.	1426.	-46.	114.8	645.4	88.0
1	-2.91	0.2228	95.58	2.8426	0.1447	-0.1188	0.0087	0.1140	-0.0028	0.0035616	0.0035616	0.5628
	-7.85	4.94	0.2503	0.088619	-0.004521	-0.003711	0.000271	0.003362	-0.000087	0.0038334	0.0038334	0.7035

ZERO VALUES IN ALPHA B I FL+ RL+ D FL- RL- CF CR O OMEGA POW
TOTAL COUNTS.. 0. 501. 11459. 11575. 3317. 3129. 9200. 9195. 3.003 495.
TOTAL PHYS. UNITS.. 3. 25.0 57295.3 57875.0 15203.0 8291.3 7821.3 9209.0 9195.0 0.275 1409.

T = 3 CP = CO.

16/21/68
TIME 834.96

ROTOR SCALE DATA * PROGRAM L3330 * WIND AXES

AMES RESEARCH CENTER * ROTOR SCALE DATA

TEST 316.3 RUN 14

CONFIG. FRBV

LUM HELICOPTER SKEWER TARE TAIL OFF

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

PT.	THEIA	ALPHA SHAFT CONTROL	ALPHA CONTROL	CLR	CXR	CYR	CMX	CMY	CMZ	CP	CPO	V/OR	M(1.0)(90)
1.	8.0	-3.0	-7.9	0.087029	-0.004480	-0.003680	0.000031	-0.000469	0.003602	0.0035955	0.0038847	0.249	0.706
2.	8.0	-5.0	-9.9	0.076037	-0.001861	-0.003379	-0.000321	-0.000131	0.003914	0.0039273	0.0037550	0.248	0.705
3.	8.0	-7.0	-11.9	0.067263	-0.000304	-0.003423	-0.000486	-0.001848	0.004215	0.0042423	0.0036223	0.248	0.705
4.	8.0	-2.0	-4.9	0.123736	-0.008893	-0.004252	0.000143	0.003318	0.002819	0.0028148	0.0040983	0.249	0.705
5.	8.0	-3.0	-7.9	0.087161	-0.004742	-0.003378	-0.000306	-0.000390	0.003591	0.0036025	0.0039659	0.251	0.706
6.	8.0	-3.0	-7.9	0.067648	-0.004816	-0.003364	-0.000158	-0.001943	0.003140	0.0031462	0.0038436	0.249	0.705
7.	13.0	-3.0	-7.9	0.111058	-0.005126	-0.003698	-0.000213	-0.001112	0.004266	0.0042716	0.0042094	0.258	0.706
8.	11.0	-4.0	-13.9	0.087161	-0.004843	-0.0033215	-0.000133	-0.001187	0.003715	0.0037207	0.0042094	0.249	0.705
9.	11.0	-11.0	-15.9	0.077306	-0.006443	-0.0033395	-0.000995	-0.001862	0.003589	0.0035979	0.0037161	0.249	0.705
10.	11.0	-7.0	-11.9	0.096634	-0.002209	-0.003395	-0.000448	-0.000231	0.005524	0.0055224	0.0038878	0.249	0.705
11.	11.0	-6.0	-13.9	0.135592	0.000205	-0.003320	0.000043	0.000364	0.005384	0.0053498	0.0040925	0.249	0.705
12.	11.0	-9.0	-13.9	0.086057	-0.004942	-0.003374	-0.000637	-0.000454	0.005869	0.0058767	0.0037864	0.250	0.706
13.	11.0	-9.0	-14.8	0.076239	-0.000936	-0.003173	-0.000933	-0.002375	0.005601	0.0056783	0.0054274	0.298	0.732
14.	11.0	-11.0	-16.8	0.062684	-0.002269	-0.004733	-0.001146	-0.002631	0.005533	0.0056497	0.0053715	0.298	0.731
15.	11.0	-7.0	-12.8	0.086622	-0.003196	-0.004866	-0.001423	-0.001132	0.005349	0.0053629	0.0053306	0.298	0.732
16.	11.0	-5.0	-10.8	0.101848	-0.006433	-0.004999	-0.002221	-0.001387	0.004663	0.0046644	0.0056349	0.299	0.731
17.	11.0	-9.0	-14.8	0.075279	-0.001096	-0.005130	-0.003773	-0.001705	0.005572	0.0056227	0.0054351	0.299	0.731
18.	8.0	-3.0	-8.6	0.081711	-0.009189	-0.005231	-0.000184	-0.000533	0.003203	0.0032078	0.0053528	0.299	0.732
19.	8.0	-5.0	-10.6	0.068367	-0.006857	-0.004897	-0.000574	-0.001964	0.003461	0.0034979	0.0051244	0.299	0.731
20.	8.0	-7.0	-12.6	0.054014	-0.002543	-0.004909	-0.000657	-0.002836	0.003765	0.0038165	0.0053317	0.303	0.732
21.	8.0	-1.0	-6.6	0.094433	-0.012431	-0.005723	-0.00327	0.000311	0.00267	0.0026171	0.0055222	0.299	0.732
22.	8.0	-3.0	-8.6	0.082078	-0.009058	-0.005266	-0.000561	-0.001180	0.003177	0.0031335	0.0052300	0.299	0.731
23.	6.0	-3.0	-8.6	0.059569	-0.009307	-0.004827	-0.002264	-0.001934	0.002727	0.0027381	0.0052006	0.299	0.731
24.	10.0	-3.0	-8.6	0.13679	-0.00947	-0.00567	-0.003333	-0.001573	0.002359	0.002382	0.0052583	0.301	0.731
25.	8.0	-3.0	-11.8	0.06394	-0.006269	-0.005157	-0.001786	-0.003660	0.003903	0.0039392	0.0054222	0.300	0.731
26.	8.0	-3.0	-9.7	0.094346	-0.013153	-0.005385	-0.002226	-0.002327	0.002412	0.0023971	0.0054982	0.299	0.731
27.	10.0	-4.0	-11.4	0.084297	-0.011514	-0.005384	-0.000888	-0.001664	0.004866	0.0047719	0.0082358	0.349	0.759
28.	10.0	-2.0	-9.3	0.097808	-0.015426	-0.005643	-0.000923	-0.003312	0.004239	0.0042043	0.0080206	0.348	0.761
29.	10.0	-6.0	-13.3	0.065634	-0.009672	-0.006281	-0.003791	-0.002328	0.005044	0.0050319	0.0079584	0.348	0.761
30.	10.0	-4.0	-11.3	0.081972	-0.011353	-0.006250	-0.002103	-0.001202	0.004789	0.0047216	0.0081317	0.348	0.762
31.	8.0	-4.0	-11.3	0.088320	-0.012032	-0.005797	-0.000572	-0.003047	0.004428	0.0043776	0.0081854	0.347	0.761
32.	8.0	-4.0	-11.3	0.063490	-0.010309	-0.006271	-0.001291	-0.003662	0.004778	0.0046767	0.0078783	0.349	0.761
33.	11.0	-4.0	-11.3	0.095493	-0.012122	-0.005961	-0.002201	-0.003079	0.005185	0.0050689	0.0085921	0.348	0.761
34.	9.0	-4.0	-11.3	0.071524	-0.011662	-0.005410	-0.000681	-0.002281	0.004457	0.0043891	0.0080426	0.346	0.761
35.	11.0	-8.0	-16.1	0.060146	-0.007239	-0.006475	-0.000102	-0.003976	0.006208	0.0061206	0.0083605	0.349	0.759
36.	11.0	-10.0	-17.8	0.046798	-0.007863	-0.005919	-0.000309	-0.004619	0.005577	0.0055406	0.0081094	0.348	0.759
37.	11.0	-6.0	-13.8	0.079536	-0.002272	-0.006238	0.000707	-0.002716	0.005766	0.0056713	0.0086659	0.349	0.759
38.	10.0	-4.0	-11.5	0.082363	-0.011552	-0.006031	0.001567	-0.002452	0.004908	0.0048329	0.0083239	0.349	0.759
39.	10.0	-4.0	-13.6	0.089756	-0.012632	-0.006781	0.002396	-0.003750	0.004664	0.0045834	0.0083701	0.349	0.759
40.	10.0	-4.0	-9.8	0.095593	-0.013937	-0.005234	0.001284	-0.001191	0.004255	0.0041652	0.0083281	0.349	0.759
41.	10.0	-4.0	-12.1	0.080713	-0.011062	-0.006766	0.001107	-0.002834	0.005032	0.0049130	0.0082684	0.349	0.757
42.	8.0	-3.0	-8.2	0.088632	-0.004515	-0.005933	-0.000237	-0.003367	0.003378	0.0033860	0.0086115	0.250	0.774
43.	8.0	-3.0	-13.9	0.077160	-0.001523	-0.007363	-0.0070619	-0.003217	0.004242	0.0042687	0.0074033	0.250	0.704
44.	8.0	-3.0	-4.9	0.101949	-0.008963	-0.003819	0.000249	0.002489	0.002768	0.0027508	0.0038436	0.249	0.703
45.	8.0	-3.0	-7.8	0.088619	-0.004521	-0.003711	-0.000887	0.000271	0.003562	0.0035616	0.0038334	0.250	0.703

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TEST 316.0 RUN 15 STATIC 3 ROTOR SCALE DATA * PROGRAM LA3531 * WIND AXES UPDATE = 6 17 68 1203 TIME 034.96

CONFIG. FRB

BAROMETRIC PRESSURE = 30.52

PT	ALPHA	B I	Q	LIFT.U	DRAG.U	SIDE F.U	PITCH.U	YAW.U	ROLL.U	HP	OMEGA.R	TEMP	NOTES
AVG	ALFA	RHO100	V.KTS	CL	CD	CV	CM	CMZ	CMX	CPO	CQ	M.OGA	M.AT
ALF C	L/D.E	V/DOR	CLR	CLR	CXR	CVR	CMV	CMZ	CMX	CPO	CQ	M.OGA	M.AT
1	-3.00	4.30	55.41	1620.	658.	-145.	-257.	1631.	225.	105.0	639.9	76.0	
1	-14.90	0.2250	131.48	0.9584	0.2550	-0.0898	-0.0119	0.0563	0.0180	0.033093	0.0033093	0.5642	464.
	-7.30	2.37	0.3468	0.057645	-0.015336	-0.025402	-0.007717	0.003371	0.001084	0.0083684	0.0083684	0.7599	5.5
2	-3.00	4.60	72.09	1410.	917.	-159.	-617.	1642.	-15679.	223.2	639.9	76.0	
1	-20.84	0.2232	150.59	0.6817	0.2595	-0.0643	-0.0219	0.0630	0.0164	0.0070947	0.0070947	0.5642	464.
	-7.60	1.44	0.3972	0.053782	-0.020476	-0.033357	-0.001731	0.004969	-0.006744	0.0155303	0.0155303	0.7883	5.5
3	-4.00	4.60	72.90	1135.	915.	-157.	-630.	1644.	414.	154.5	639.9	76.0	
1	-24.52	0.2231	151.56	0.5499	0.2559	-0.0421	-0.0221	0.0657	0.0586	0.0049139	0.0049139	0.5642	464.
	-8.60	1.39	0.3998	0.043945	-0.020049	-0.003368	-0.001768	0.005253	0.004684	0.0127982	0.0127982	0.7897	5.5
5	-1.80	4.60	72.79	1602.	941.	-164.	-399.	1636.	472.	149.6	639.9	76.0	
1	-18.68	0.2231	151.34	0.8023	0.2712	-0.0441	-0.0141	0.0617	0.0591	0.0047631	0.0047631	0.5642	464.
	-6.40	1.94	0.3992	0.063334	-0.021613	-0.003517	-0.001120	0.004913	0.004709	0.0131129	0.0131129	0.7894	5.5
6	-0.80	4.60	72.79	2005.	1008.	-164.	152.	1538.	303.	139.6	639.9	76.0	
1	-17.43	0.2231	151.34	0.9519	0.2988	-0.03437	0.0053	0.0565	0.0523	0.0044448	0.0044448	0.5642	464.
	-5.40	2.21	0.3992	0.075856	-0.023811	-0.003402	0.003426	0.004503	0.004165	0.0135584	0.0135584	0.7894	5.5
7	-2.60	5.40	72.60	1675.	913.	-164.	-590.	1800.	387.	171.7	639.9	76.0	
1	-17.58	0.2231	151.14	0.8023	0.2942	-0.0453	-0.0239	0.03713	0.0362	0.004576	0.004576	0.5642	464.
	-8.00	1.92	0.3987	0.063738	-0.020230	-0.003600	-0.001637	0.005666	0.004469	0.0132340	0.0132340	0.7891	5.5
8	-3.50	5.40	72.60	1525.	911.	-168.	-580.	1884.	535.	171.8	639.9	76.0	
1	-19.01	0.2231	151.14	0.7326	0.2924	-0.0480	-0.0238	0.03726	0.03618	0.004602	0.004602	0.5642	464.
	-8.90	1.76	0.3987	0.058226	-0.020059	-0.003814	-0.001652	0.005771	0.004915	0.0132263	0.0132263	0.7891	6.5
9	-1.00	5.40	72.55	2140.	986.	-171.	87.	1730.	402.	156.0	639.9	76.0	
1	-15.92	0.2231	151.09	1.0172	0.2932	-0.0478	0.0011	0.03634	0.0354	0.0049590	0.0049590	0.5642	464.
	-6.40	2.32	0.3986	0.080789	-0.020050	-0.003796	0.000244	0.005037	0.004604	0.0137004	0.0137004	0.7890	6.5

ZERO VALUES IN ALPHA B I FL+ RL+ D FL- RL- CF CR Q OMEGA POW

TOTAL COUNTS.. 0. 501. 11460. 11576. 15224. 3317. 9201. 9195. 3.000 511. 495.

TOTAL PHYS. UNITS.. 0.0 25.0 57300.0 57880.0 15204.0 8292.5 7817.5 9201.0 9195.0 0.075 1409.

06/21/68
TIME 834.96

ROTOR SCALE DATA * PROGRAM LA353 * WIND AXES

AXES RESEARCH CENTER * ROTOR SCALE DATA

CONFIG. FRB

TEST 310.0 RUN 15

LOW HELICOPTER SKEMER TARE TAIL OFF

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

PT.	THETA	ALPHA SHAFT CONTROL	CLR	CXR	CVR	CMX	CMY	CMZ	CP	CPO	V/DR M(L.)(90)
1.	5.5	-3.0	-7.3	0.057645	-0.715338	-0.035402	0.001284	-0.000717	0.003373	0.0083684	0.347
2.	5.5	-3.0	-7.6	0.053782	-0.720476	-0.033550	0.043744	-0.001731	0.004969	0.0151313	0.397
3.	5.5	-4.0	-8.6	0.043945	-0.720476	-0.033550	0.034684	-0.001768	0.0049139	0.0137682	0.450
5.	5.5	-1.8	-8.4	0.063934	-1.021613	-0.03517	0.004709	-0.001123	0.0047631	0.0131129	0.399
6.	5.5	-0.8	-5.4	0.075956	-0.023811	-0.033482	0.034165	0.00426	0.004448	0.0135584	0.399
7.	5.5	-2.6	-8.0	0.063738	-0.020200	-0.033600	0.034469	-0.001657	0.0054576	0.0132234	0.399
8.	6.5	-3.5	-8.9	0.058226	-0.020959	-0.033814	0.034915	-0.001652	0.0054602	0.0132263	0.399
9.	6.5	-1.0	-8.4	0.080789	-0.022325	-0.033796	0.034474	-0.002244	0.005237	0.0137004	0.399

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TEST 316.0 RUN 16 STATIC 3 ROTOR SCALE DATA * PROGRAM L3530 * WIND AXES UPDATE = 6 17 68 1200 TIME 834.96

CONFIG. FRB

BAROMETRIC PRESSURE = 29.99

PT	ALPHA	B I	Q	LIFT.U	DRAG.U	SIDE F.U	PITCH.U	YAW.U	ROLL.U	HF	OMEGA.R	TEMP	NOTES
AVG	ALFA	RHO	V/KTS	CL	CU	CY	CM	CMZ	CMX	CP	CO	M	
ALF C	L/D,E	V/OR		CLR	CXR	CYR	CMY			CPO	COO		
1	0.00	-1.25	1.00	1540.	0.	14.	-67.	1275.	-73.	0.0	0.0	69.0	Q=0
1	0.00	0.2338	0.00	52.0270	-0.0000	0.4730	-0.1729	3.2706	-0.1866	0.0000000	0.0000000	0.0000	0.
1.25	0.00	0.0000	0.0000	0.000000	0.000000	0.000000	-0.000000	0.000000	-0.000000	0.0000000	-0.0000000	0.0000	6.0
2	0.00	-0.55	1.00	1975.	-19.	-11.	366.	1659.	-91.	0.0	0.0	69.0	Q=0
1	0.00	0.2338	0.00	66.7230	-0.0000	0.3716	-0.1729	4.2546	-0.2329	0.0000000	0.0000000	0.0000	0.
0.05	0.00	0.0000	0.0000	0.000000	0.000000	0.000000	0.000000	0.000000	-0.000000	0.0000000	-0.0000000	0.0000	8.0
3	0.00	-0.50	1.00	2555.	-1.	16.	-108.	2394.	-252.	212.4	642.6	69.0	Q=0
1	0.00	0.2338	0.00	84.6284	-0.0000	0.5405	-0.2763	6.1407	-0.6470	0.0000000	0.0000000	0.0000	466.
0.50	0.00	0.0000	0.0000	0.000000	0.000000	0.000000	-0.000000	0.000000	-0.000000	0.0000000	0.0000000	0.0000	10.0
4	0.00	-0.85	1.00	2775.	-4.	14.	243.	2689.	-234.	230.5	642.6	72.0	Q=0
1	0.00	0.2338	0.00	93.7500	-0.0000	0.4730	-0.1729	6.0972	-0.7287	0.0000000	0.0000000	0.0000	466.
0.85	0.00	0.0000	0.0000	0.000000	0.000000	0.000000	0.000000	0.000000	-0.000000	0.0000000	0.0000000	0.0000	10.0
5	-2.00	4.50	72.88	1460.	928.	-174.	-516.	1745.	355.	161.1	639.9	78.0	Q=0
1	-0.30	0.2220	151.80	0.7504	0.2590	-0.7490	-0.3132	0.0660	0.0557	0.0000000	0.0000000	0.0000	466.
-7.10	1.71	0.4004	0.0004	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0000000	0.0000000	0.0000	5.5
6	-3.30	4.20	72.76	1275.	923.	-175.	-451.	1637.	381.	153.3	648.1	92.0	Q=0
1	-2.66	0.2164	153.64	0.6155	0.2569	-0.7505	-0.3159	0.0638	0.0567	0.0000000	0.0000000	0.0000	470.
-7.50	1.54	0.4001	0.0001	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0000000	0.0000000	0.0000	5.0
7	-1.50	4.20	72.86	1670.	963.	-178.	-57.	1555.	418.	144.6	648.1	94.0	Q=0
1	-19.14	0.2156	154.02	0.7969	0.2766	-0.7502	-0.3020	0.0584	0.0571	0.0000000	0.0000000	0.0000	470.
-5.70	1.94	0.4011	0.0011	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0000000	0.0000000	0.0000	5.0
8	-4.20	4.20	72.65	1055.	914.	-179.	-618.	1667.	334.	156.6	650.9	98.0	Q=0
1	-26.21	0.2141	154.34	0.5139	0.2330	-0.7493	-0.3018	0.0635	0.0630	0.0000000	0.0000000	0.0000	472.
-8.20	1.29	0.4002	0.0002	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0000000	0.0000000	0.0000	5.0
9	-4.00	5.20	72.69	1475.	876.	-182.	-536.	1950.	565.	180.7	650.9	98.0	Q=0
1	-18.34	0.2141	154.39	0.7089	0.2350	-0.7500	-0.3019	0.0584	0.0571	0.0000000	0.0000000	0.0000	472.
-9.20	1.76	0.4004	0.0004	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0000000	0.0000000	0.0000	7.0
10	-6.00	5.20	72.69	1015.	800.	-160.	-1102.	1972.	155.	185.2	653.6	99.0	Q=0
1	-25.46	0.2137	154.53	0.4944	0.2354	-0.7475	-0.3018	0.0584	0.0571	0.0000000	0.0000000	0.0000	474.
-11.20	1.22	0.3990	0.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0000000	0.0000000	0.0000	7.0
11	-2.60	5.20	72.93	1875.	930.	-182.	-440.	1877.	312.	176.8	653.6	102.0	Q=0
1	-16.22	0.2133	154.93	0.8924	0.2596	-0.7526	-0.3015	0.0584	0.0571	0.0000000	0.0000000	0.0000	474.
-7.80	2.11	0.4000	0.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0000000	0.0000000	0.0000	7.0
ZERO VALUES IN	ALPHA	B I	Q	LIFT.U	DRAG.U	SIDE F.U	PITCH.U	YAW.U	ROLL.U	HF	OMEGA.R	TEMP	NOTES
TOTAL COUNTS..	0.0	0.0	0.0	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0000	494.
TOTAL PHYS. UNITS..	0.0	0.0	0.0	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.0000	1409.

06/21/68
TIME 034.96

ROTOR SCALE DATA • PROGRAM L3553 • WIND AXES

AMES RESEARCH CENTER • ROTOR SCALE DATA

TEST 316.0 RUN 16

CONFIG. FRB

LOH HELICOPTER SKENER TARE TAIL OFF

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

PT.	THETA	ALPHA SHAFT CONTROL	CLR	CXR	CYR	CMX	CMY	CHZ	CP	CPO	V/DR M(1.01190)
1.	6.0	0.0	0.00000	0.00000	0.00000	-0.00000	-0.00000	0.00000	0.00000	0.00000	0.000
2.	8.0	0.0	0.00000	0.00000	0.00000	-0.00000	-0.00000	0.00000	0.00000	0.00000	0.000
3.	10.0	0.0	0.00000	0.00000	0.00000	-0.00000	-0.00000	0.00000	0.00000	0.00000	0.000
4.	10.9	0.0	0.00000	0.00000	0.00000	-0.00000	-0.00000	0.00000	0.00000	0.00000	0.000
5.	5.0	-2.6	0.00000	0.00000	0.00000	-0.00000	-0.00000	0.00000	0.00000	0.00000	0.000
6.	5.0	-3.3	0.00000	0.00000	0.00000	-0.00000	-0.00000	0.00000	0.00000	0.00000	0.000
7.	5.0	-1.5	0.00000	0.00000	0.00000	-0.00000	-0.00000	0.00000	0.00000	0.00000	0.000
8.	5.0	-4.0	0.00000	0.00000	0.00000	-0.00000	-0.00000	0.00000	0.00000	0.00000	0.000
9.	7.0	-4.0	0.00000	0.00000	0.00000	-0.00000	-0.00000	0.00000	0.00000	0.00000	0.000
10.	7.0	-6.0	0.00000	0.00000	0.00000	-0.00000	-0.00000	0.00000	0.00000	0.00000	0.000
11.	7.0	-2.6	0.00000	0.00000	0.00000	-0.00000	-0.00000	0.00000	0.00000	0.00000	0.000

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TEST 316. J RUN 17 STATIC 3 ROTOR SCALE DATA * PROGRAM LAS32 * WIND AXES UPDATE = 6 17 68 1200 TIME 034.96

CONFIG. FRB

BAROMETRIC PRESSURE = 29.94

REC-AD Report No. 369-A-8020

PT	ALPHA	B I	Q	LIFT.U	DRAG.U	SIDE F.U	PITCH.U	YAW.U	ROLL.U	HP	OMEGA.R	TEMP	NOTES
AVG	ALFA	RHO100	V.KTS	CL	CD	CY	CM	CM	CMX	CP	CO	MIDW	END
ALF C	L/D.E	V/OR		CLR	CAR	CVR	CMY	-CMZ		CPO	CQU	M.AT	THETA
1	0.37	4.35	72.56	1265.	937.	-169.	-321.	1502.	358.	140.1	646.8	82.0	
1	-23.86	0.2271	152.08	0.6084	0.2691	-0.0466	-0.3114	0.3555	0.0527	0.3043736	0.0043736	0.5671	469.
	-4.95	1.52	0.3969	0.047922	-0.021192	-0.003671	-0.000894	0.004374	0.004148	0.0126270	0.0126270	0.7922	4.5
2	-3.00	4.35	72.66	1195.	941.	-172.	-300.	1553.	352.	145.1	646.8	85.0	
1	-24.72	0.2188	152.68	0.5786	0.2664	-0.0489	-0.3136	0.3604	0.0553	0.3043552	0.0045552	0.5655	469.
	-7.05	1.44	0.3585	0.045933	-0.021144	-0.004195	-0.001139	0.004945	0.004373	0.0128155	0.0128155	0.7907	5.0
3	-3.00	4.35	72.59	1385.	932.	-189.	-406.	1612.	352.	150.1	646.8	85.0	
1	-21.49	0.2188	152.63	0.6673	0.2627	-0.0529	-0.3144	0.3624	0.0551	0.3043796	0.0047096	0.5655	469.
	-7.35	1.65	0.3983	0.052922	-0.020834	-0.004195	-0.001139	0.004945	0.004373	0.0128155	0.0128155	0.7907	5.0
4	-3.00	5.20	72.59	1265.	939.	-174.	-224.	1678.	278.	156.3	646.8	85.0	
1	-22.40	0.2188	152.60	0.6115	0.2520	-0.0531	-0.3079	0.3647	0.0525	0.3043796	0.0049048	0.5655	469.
	-8.27	1.53	0.3983	0.048493	-0.021985	-0.0033973	-0.000627	0.0035133	0.004167	0.0127333	0.0127333	0.7907	5.0
5	-3.00	6.30	72.52	1095.	919.	-166.	-819.	1682.	321.	157.1	646.8	89.0	
1	-25.78	0.2172	153.09	0.5326	0.2572	-0.0566	-0.30290	0.3651	0.0539	0.3043669	0.0049669	0.5635	469.
	-9.30	1.32	0.3995	0.042505	-0.020525	-0.003720	-0.002313	0.005199	0.004372	0.0130441	0.0130441	0.7886	5.0
6	-3.00	3.95	72.52	1555.	943.	-187.	-204.	1632.	325.	151.7	646.8	89.0	
1	-19.76	0.2172	153.09	0.7469	0.2684	-0.0564	-0.3072	0.3630	0.0540	0.3043793	0.0047973	0.5635	469.
	-6.95	1.82	0.3995	0.050606	-0.021418	-0.004537	-0.000575	0.005330	0.004312	0.0131120	0.0131120	0.7886	5.0
7	-3.00	3.20	72.71	1690.	963.	-176.	65.	1509.	435.	141.6	649.5	91.0	
1	-18.86	0.2164	153.57	0.8085	0.2762	-0.0599	0.0023	0.3688	0.0583	0.3043363	0.0044363	0.5648	471.
	-6.20	1.98	0.3991	0.064376	-0.021996	-0.004772	0.000183	0.004686	0.004645	0.0129317	0.0129317	0.7902	5.0
8	-3.00	4.70	72.68	1400.	934.	-183.	-566.	1601.	309.	155.6	649.5	92.0	
1	-21.32	0.2160	153.68	0.6738	0.2629	-0.0526	-0.3022	0.3642	0.0539	0.3043851	0.0048851	0.5643	471.
	-7.70	1.64	0.3994	0.053736	-0.020968	-0.004193	-0.001594	0.005117	0.004295	0.0130624	0.0130624	0.7897	5.0

ZERO VALUES IN ALPHA B I FL+ RL+ D FL- RL- CF CR U OMEGA POW
 TOTAL COUNTS.. 0. 501. 11460. 11578. 15233. 3285. 3165. 9203. 9199. 9.500 495.
 TOTAL PHYS. UNITS.. 0.0 57300.0 57890.0 15233.0 8212.5 7911.3 9202.5 9199.0 0.237 1408.

I = 3 CP = CQ.

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06/21/68
TIME 834.96

ROTOR SCALE DATA * PROGRAM LA353N * WIND AXES

AMES RESEARCH CENTER * ROTOR SCALE DATA

CONF. FRB

TEST 316.5 RUN 17

LOW HELICOPTER SKEMER TARE TAIL OFF

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

PT.	THETA	ALPHA SHAFT CONTROL	CLR	CXR	CVR	CMK	CMY	CMZ	CP	CPO	V/OR MIL-21190)
1.	4.5	3.0	0.247922	-0.021192	-0.003671	0.004148	-0.003894	0.004374	0.0043736	0.0126270	0.397
2.	4.5	-3.0	0.245933	-0.021144	-0.003885	0.014392	-0.003839	0.004792	0.0045552	0.0128362	0.398
3.	5.0	-3.0	0.252922	-0.020834	-0.004195	0.004375	-0.001139	0.004945	0.0047036	0.0128135	0.398
4.	5.0	-3.0	0.248493	-0.019985	-0.003973	0.004167	-0.003627	0.005130	0.0049048	0.0127033	0.398
5.	5.0	-3.0	0.242505	-0.020525	-0.003720	0.004302	-0.002313	0.005199	0.0049669	0.0130441	0.400
6.	5.0	-3.0	0.259606	-0.021418	-0.004503	0.004312	-0.003575	0.005530	0.0047973	0.0131120	0.405
7.	5.0	-3.0	0.264376	-0.021996	-0.004772	0.004645	0.004163	0.004686	0.0044363	0.0129317	0.399
8.	5.0	-3.0	0.253736	-0.020968	-0.004193	0.004295	-0.001594	0.005117	0.0048851	0.0130624	0.399

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TEST 316.0 RUN 18 STATIC 3 ROTOR SCALE DATA * PROGRAM LA353 * WIND AXES
 BL'S DIFFER ON BEGINNING AND END ZEROES. BEGINNING VALUE = 592.0, END VALUE = 501.0 COUNTS. END VALUE WILL BE USED.

36/21/68
 6 17 68 1200 TIME 834.96

MTC-AD Report No. 369-A-8020

BAROMETRIC PRESSURE = 29.94

CONFIG. FRB

PT	ALPHA	B I	Q	LIFT	DRAG	SIDE	PITCH	ROLL	HP	OMEGA	TEMP	NOTES
AVG	ALFA	RHO	WTS	CL	CD	CY	CM	CMX	CP	CQ	M.A.T	ETA
ALF C	L/D E	V/D R		CLR	CXR		CMY					
1	0.00	3.60	90.50	1085.	1278.	-167.	-174.	1386.	235.5	648.1	73.0	
1	-28.84	0.2218	169.24	0.4994	0.2150	0.3154	-0.0249	0.0746	0.072448	0.0372448	0.5731	470.
	-3.60	1.15	5.4497	0.348506	-0.026708	0.061499	-0.003478	0.007245	0.010699	0.0188713	0.8257	2.5
2	0.00	3.85	89.81	1125.	1264.	-174.	-197.	1392.	229.7	648.1	73.0	
1	-28.11	0.2219	168.57	0.5144	0.2148	0.3114	-0.030543	0.007166	0.019122	0.0185392	0.8247	1.4
	-3.85	1.19	5.4390	0.349565	-0.026481	0.071094	-0.003478	0.007245	0.010699	0.0188713	0.8257	2.5
3	-4.50	5.85	73.05	1590.	855.	-196.	-155.	2101.	196.9	650.9	79.0	
1	-16.30	0.2212	152.26	0.7601	0.2223	-0.03686	-0.03265	0.0016	0.0563	0.0059982	0.5723	472.
	-15.35	1.07	0.3948	0.559244	-0.017326	-0.094725	-0.002068	0.006362	0.034387	0.0125971	0.7983	7.7
4	-4.50	5.60	73.08	1550.	865.	-192.	-180.	2065.	191.3	650.9	82.0	
1	-17.00	0.2230	152.71	0.7414	0.2267	-0.0578	-0.03276	0.0097	0.0597	0.0058623	0.5707	472.
	-15.11	1.03	0.3960	0.558132	-0.017777	-0.094529	-0.002164	0.006247	0.034680	0.0126679	0.7967	7.7
5	-6.20	5.80	73.10	1030.	853.	-174.	-190.	1934.	177.6	650.9	82.0	
1	-23.73	0.2230	152.73	0.5001	0.2198	-0.0530	-0.03344	0.00959	0.0566	0.0054413	0.5707	472.
	-11.80	1.30	0.3961	0.039223	-0.017243	-0.094154	-0.002690	0.0095956	0.034440	0.0121649	0.7968	7.7
6	-7.30	5.70	73.05	830.	891.	-154.	-162.	1799.	156.5	645.4	83.0	
1	-30.20	0.2196	152.82	0.4065	0.2372	-0.0465	-0.0571	0.0095	0.0568	0.0049261	0.5654	468.
	-13.00	1.06	0.3997	0.032469	-0.018942	-0.093676	-0.004564	0.009547	0.034535	0.0124252	0.7913	7.7
ZERO VALUES IN	ALPHA	B I	FL+	RL+	D	FL-	RL-	CF	Q	OMEGA	PQM	
TOTAL COUNTS..	0.	501.	11460.	11576.	15208.	3286.	3152.	9203.	5.503	510.	495.	
TOTAL DIVE	0.	250.	57300.	57880.	15216.3	8215.0	7905.1	9232.5	9199.5	1407.		

ZERO VALUES IN ALPHA B I FL+ RL+ D FL- RL- CF CR Q OMEGA POM
 TOTAL COUNTS.. 0. 501. 11462. 11576. 15206. 3286. 9203. 9200. 5.503 495.
 TOTAL PHYS. UNITS.. 0.0 25.0 57307.0 57880.0 15236.0 8215.0 7905.1 9202.5 9199.5 0.137 1407.

I = 3 CP = CO.

26/21/58
TIME H34.96

ROTOR SCALE DATA * PROGRAM LA353 * WIND AXES

AMES RESEARCH CENTER * ROTOR SCALE DATA

CONFIG. FRB

TEST 316.0 RUN 18

LOW HELICOPTER SKWER TARE TAIL OFF

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

PT.	THETA	ALPHA SHAFT CONTROL	ALPHA CONTROL	CLR	CXR	CYR	CMX	CHV	CMZ	CP	CPO	V/DR MEL.21(92)
1.	2.0	0.0	-3.6	0.348536	-0.026708	0.031499	0.010699	-0.00478	0.007245	0.007245	0.0188710	0.441 0.826
2.	1.4	0.0	-3.8	0.349566	-0.026481	0.031004	0.010122	-0.003543	0.007066	0.007066	0.0185392	0.439 0.825
3.	7.7	-4.5	-10.3	0.359244	-0.017326	-0.094725	0.004387	-0.002068	0.005362	0.005902	0.0125971	0.395 0.795
4.	7.7	-4.5	-10.1	0.358132	-0.017777	-0.014529	0.004880	-0.002164	0.005627	0.005863	0.0126679	0.396 0.797
5.	7.7	-6.2	-11.8	0.339223	-0.017243	-0.004154	0.004440	-0.002696	0.005956	0.005443	0.0121649	0.396 0.797
6.	7.7	-7.3	-13.0	0.332669	-0.018942	-0.033676	0.004535	-0.004564	0.005547	0.0049261	0.0124252	0.405 0.791

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TEST 214.0 RUN 19. STATIC 4. 1 AM USING STATIC 5. UPDATE = 05/23/68. 6P 1200 TIME 0.00
 MOTOR SCALE DATA PROGRAM FSA0131.0 WIND AXES
 I DO NOT HAVE STATIC 4. 1 AM USING STATIC 5.

CONFIDENTIAL

BAROMETRIC PRESSURE = 29.96

HTC-AD Report No. 369-A-8020

PT	ALPHA	B I	O	LIFT U	DRAG U	SIDE E U	PITCH U	YAW U	ROLL U	HP	OMEGA R	IFMP	NOTES
AVG	ALFA	RHO100	V KTS	CL	CD	CV	CM	CM	CMX	CP	CO	R.OMR	RPM
ALF C	L/D E	V/GP	V/GP	CLF	CD	CVR	CMV	CMZ	CMX	CPD	COQ	M.AT	THETA
1	0.0	0.0	28.64	0.1023	0.3993	-0.0124	0.0120	0.0141	0.0248	17.7	0.005484	0.5376	467.0
1	-75.90	0.2241	94.72	0.03157	-0.012572	-0.000390	0.003376	0.000568	0.000780	0.0037222	0.0037222	0.6975	0.0
2	-3.00	0.0	28.52	0.055	0.390	-0.0195	-0.0253	0.0106	0.0202	19.3	0.005484	0.5376	467.0
1	-80.80	0.2241	94.52	0.02043	-0.012600	-0.000413	0.000794	0.000659	0.000748	0.0037744	0.0037744	0.6972	0.0
3	-6.00	0.0	29.09	0.0348	0.3966	-0.0157	-0.0163	0.0106	0.0202	8.4	0.002688	0.5376	462.0
1	-84.98	0.2241	95.47	0.01114	-0.012687	-0.000502	-0.001544	0.000339	0.000645	0.0034776	0.0034776	0.6986	0.0
4	-8.00	0.0	28.55	0.0118	0.4000	-0.0195	-0.0163	0.0106	0.0202	1.1	0.002581	0.5376	462.0
1	-91.68	0.2241	94.64	0.000371	-0.012572	-0.000613	-0.001989	0.000383	0.000688	0.0034103	0.0034103	0.6974	0.0
5	-10.00	0.0	28.64	0.0354	0.4017	-0.0136	-0.0163	0.0106	0.0202	4.7	0.001483	0.5376	462.0
1	-95.04	0.2292	93.67	-0.00189	-0.012568	-0.000418	-0.012569	0.000357	0.000687	0.0032177	0.0032177	0.7018	0.0
6	-12.00	0.0	28.64	0.055	0.4052	-0.0195	-0.0163	0.0106	0.0202	12.3	0.003480	0.5376	462.0
1	-99.10	0.2292	93.67	-0.001038	-0.012476	-0.000509	-0.003327	0.000574	0.000868	0.0034825	0.0034825	0.7018	0.0
7	-13.00	0.0	28.66	0.0943	0.4096	-0.0242	-0.0158	0.0126	0.0143	8.9	0.002787	0.5376	462.0
1	-102.96	0.2292	93.71	-0.002506	-0.012622	-0.000745	-0.003568	0.000387	0.000430	0.0034112	0.0034112	0.7018	0.0
8	-15.24	0.0	28.73	0.1158	0.4115	-0.0123	-0.0255	0.0177	0.0158	15.4	0.004887	0.5376	462.0
1	-105.24	0.2291	93.83	0.003269	-0.012404	-0.000391	0.000787	0.000489	0.000996	0.0035709	0.0035709	0.7040	0.0
9	-17.17	0.0	56.80	0.160	0.4178	-0.0068	-0.0010	0.0207	0.0175	40.3	0.012823	0.5376	462.0
1	-107.17	0.2261	132.81	0.005431	-0.025844	-0.000745	-0.000186	0.001292	0.001153	0.012823	0.012823	0.5376	462.0

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10	-3.00	0.0	56.21	110.	656.	-44.	-55.	457.	677.	37.7	637.1	420.
1	-81.01	0.2261	132.70	0.0655	0.4143	-0.0265	-0.0251	0.0209	0.0281	0.001985	0.0011985	0.5679
	-3.00	0.14	0.3534	0.024050	-0.025605	-0.01638	-0.01551	0.01291	0.00130	0.001981	0.001981	0.7421
11	-5.30	0.0	57.22	58.	700.	-93.	-932.	387.	563.	29.4	637.1	462.
1	-85.50	0.2256	133.44	0.0125	0.4130	-0.0314	-0.0438	0.0134	0.0134	0.0009390	0.0009390	0.7370
	-5.30	0.07	0.3535	0.002029	-0.025808	-0.001974	-0.002612	0.001085	0.001578	0.000982	0.000982	0.7625
12	-8.40	0.0	56.85	-20.	711.	-56.	-1421.	438.	362.	33.5	637.1	462.
1	-91.41	0.2256	132.99	0.0119	0.4228	-0.0330	-0.0443	0.0198	0.0144	0.0010671	0.0010671	0.5633
	-8.40	0.03	0.3523	-0.007038	-0.026246	-0.002047	-0.003980	0.001229	0.001015	0.00103143	0.00103143	0.7618
13	-10.00	0.0	57.03	-35.	705.	-49.	-1457.	411.	331.	32.3	637.1	462.
1	-92.84	0.2256	133.22	-0.0070	0.4179	-0.0203	-0.0255	0.0104	0.0149	0.0010289	0.0010289	0.5633
	-10.00	0.04	0.3525	-0.001291	-0.026027	-0.001826	-0.004080	0.001203	0.000828	0.00102143	0.00102143	0.7625
14	0.0	0.0	57.24	155.	709.	-22.	145.	500.	578.	44.7	637.1	462.
1	-77.64	0.2256	133.58	0.0013	0.4175	-0.03133	-0.0083	0.0228	0.0227	0.0014247	0.0014247	0.5633
	0.0	0.19	0.3535	0.005710	-0.026141	-0.000810	0.000517	0.001425	0.001423	0.0014247	0.0014247	0.7627
15	0.0	0.0	73.24	120.	828.	-33.	-151.	412.	328.	54.4	637.1	462.
1	-78.44	0.2226	151.77	0.0879	0.4295	-0.0150	-0.0053	0.0217	0.0256	0.0017547	0.0017547	0.5617
	0.0	0.19	0.4071	0.007194	-0.024716	-0.001215	-0.000430	0.001755	0.000809	0.00157101	0.00157101	0.7876
16	-2.60	0.0	72.70	115.	924.	-54.	-574.	576.	632.	40.8	637.1	462.
1	-82.91	0.2226	151.50	0.0510	0.4231	-0.0253	-0.0202	0.0210	0.0213	0.0014083	0.0014083	0.5617
	-2.60	0.11	0.4014	0.004259	-0.034562	-0.002337	-0.001428	0.001491	0.001394	0.00154280	0.00154280	0.7872
17	-5.70	0.0	72.70	55.	916.	-81.	-1232.	578.	691.	39.8	637.1	462.
1	-86.57	0.2222	151.54	0.0250	0.4259	-0.0383	-0.0435	0.0179	0.0230	0.0012630	0.0012630	0.5617
	-5.70	0.06	0.4015	0.002060	-0.034325	-0.003000	-0.003404	0.001444	0.001850	0.00150333	0.00150333	0.7865
18	-8.20	0.0	72.77	12.	926.	-55.	-1811.	414.	489.	30.8	637.1	462.
1	-49.38	0.2218	151.76	0.00375	0.4297	-0.0258	-0.0039	0.0144	0.0172	0.0009694	0.0009694	0.5617
	-8.20	0.01	0.4030	0.000375	-0.034728	-0.002083	-0.005147	0.001180	0.001394	0.00149316	0.00149316	0.7861
19	-10.00	0.0	72.67	-40.	928.	-42.	-2093.	362.	400.	25.2	637.1	462.
1	-92.47	0.2218	151.66	-0.0180	0.4312	-0.0198	-0.0710	0.0128	0.0141	0.0008176	0.0008176	0.5617
	-10.00	0.04	0.4018	-0.001501	-0.024632	-0.001595	-0.005362	0.001031	0.001141	0.00149000	0.00149000	0.7860
20	0.0	0.0	72.60	190.	922.	-20.	33.	627.	640.	55.1	637.1	462.
1	-78.35	0.2214	151.72	0.0884	0.4288	-0.0117	-0.0012	0.0221	0.0230	0.0012886	0.0012886	0.5617
	0.0	0.19	0.4020	0.007142	-0.034439	-0.001104	0.000094	0.001789	0.001895	0.00157086	0.00157086	0.7893
21	0.0	0.0	56.59	155.	731.	-15.	-430.	488.	493.	42.8	637.1	462.
1	-77.29	0.2232	133.43	0.0085	0.4367	-0.0003	-0.0109	0.0221	0.0223	0.0013918	0.0013918	0.5617
	0.0	0.20	0.3535	0.006154	-0.027284	-0.000578	-0.001243	0.001382	0.001305	0.0010235	0.0010235	0.7582
ZEPD VALUES IN ALPHA												
TOTAL COUNTS..												
TOTAL PHYS. UNITS..												
T = 3 CP = 100.												

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TEST 316.0 DYN 20 STATIC 4
 BL'S DIFFER OF BEGINNING AND END TARGE. BEGINNING VALUE = 681.0, END VALUE = 504.0 COUNTS. END VALUE WILL BE USED.
 I DO NOT HAVE STAT C 4. I AM USING STATIC 100

RCR SCALE DATA * PROGRAM L43590 * WIND AXES

06/19/68

UPDATE = 0 20 66 1200 TIME 957.01

BAROMETRIC PRESSURE = 29.98

CONFIG. FRV

PT	ALPHA	B I	Q	V.MTS	LIFT.U	ORAG.U	STOE F.U	PITCH.U	YAW.U	ROLL.U	HP	OMEGA.R	TEMP	NOTES
AVG	ALFA	RHO*100	V/CR	CL	CM	CMZ	CMY	CMX	CMZ	CMX	CP	CGO	K.O.MA	M.AT THETA
1	-3.00	-0.15	28.71	89.	354.	-21.	161.	233.	233.	237.	0.0	0.0	44.0	0.0
1	-76.12	0.2328	93.05	0.1030	0.4166	-0.0247	0.0144	0.0208	0.0208	0.0230	0.0000000	0.0000000	0.0000	0.0
2	-2.85	0.25	0.0000	0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	0.000000	0.0000000	-0.0000000	0.0000	0.0
2	-5.00	-0.15	57.17	33.	712.	-86.	-686.	518.	518.	489.	0.0	0.0	68.0	0.0
1	-87.39	0.2279	132.71	0.0192	0.4207	-0.0508	-0.0272	0.0232	0.0232	0.0219	0.0000000	0.0000000	0.0000	0.0
4	-4.85	0.05	0.0000	0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	0.000000	0.0000000	-0.0000000	0.0000	0.0
3	-10.00	-0.15	56.99	-53.	741.	-66.	-976.	738.	738.	301.	0.0	0.0	68.0	0.0
1	-94.05	0.2279	132.49	-0.0311	0.4393	-0.0391	-0.0638	0.0332	0.0332	0.0135	0.0000000	0.0000000	0.0000	0.0
4	-9.85	-0.07	0.0000	-0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	0.000000	0.0000000	-0.0000000	0.0000	0.0
4	-7.00	-0.15	57.03	13.	732.	-79.	-776.	717.	717.	474.	0.0	0.0	74.0	0.0
1	-89.02	0.2254	133.30	0.0074	0.4336	-0.0468	-0.0349	0.0322	0.0322	0.0213	0.0000000	0.0000000	0.0000	0.0
4	-6.85	0.02	0.0000	0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	0.000000	0.0000000	-0.0000000	0.0000	0.0
5	-5.00	-0.10	57.01	53.	735.	-72.	-928.	646.	646.	416.	0.0	0.0	75.0	0.0
1	-85.91	0.2249	133.39	0.0311	0.4356	-0.0427	-0.0417	0.0313	0.0313	0.0187	0.0000000	0.0000000	0.0000	0.0
4	-4.90	0.07	0.0000	0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	0.000000	0.0000000	-0.0000000	0.0000	0.0
6	-3.00	-0.10	57.03	108.	735.	-45.	-467.	603.	603.	551.	0.0	0.0	75.0	0.0
1	-81.68	0.2249	133.42	0.0637	0.4354	-0.0267	-0.0210	0.0371	0.0371	0.0248	0.0000000	0.0000000	0.0000	0.0
4	-2.95	0.15	0.0000	0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	0.000000	0.0000000	-0.0000000	0.0000	0.0
7	0.00	-0.10	57.03	158.	739.	-17.	-183.	545.	545.	522.	0.0	0.0	76.0	0.0
1	-77.97	0.2245	133.55	0.0933	0.4377	-0.0101	-0.0082	0.0245	0.0245	0.0239	0.0000000	0.0000000	0.0000	0.0
4	0.10	0.21	0.0000	0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	0.000000	0.0000000	-0.0000000	0.0000	0.0
8	3.00	-0.10	57.10	183.	751.	-7.	-346.	581.	581.	522.	0.0	0.0	76.0	0.0
1	-76.34	0.2245	133.63	0.1080	0.4443	-0.0041	0.0151	0.0261	0.0261	0.0235	0.0000000	0.0000000	0.0000	0.0
4	3.10	0.24	0.0000	0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	0.000000	0.0000000	-0.0000000	0.0000	0.0
9	-13.00	-0.10	28.85	-93.	366.	-1.	-469.	114.	114.	69.	0.0	0.0	77.0	0.0
1	-104.18	0.2272	94.43	-0.1083	0.4286	-0.0012	-0.0417	0.0164	0.0164	0.0061	0.0000000	0.0000000	0.0000	0.0
4	-12.90	-0.25	0.0000	-0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	0.000000	0.0000000	-0.0000000	0.0000	0.0
10	-11.00	-0.10	28.88	-7.	362.	-18.	-119.	3.9.	3.9.	220.	0.0	0.0	77.0	0.0

1 2 3 CP - CD.

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TEST 31A.0 RUM 21 STATIC 4
 81'S DIFFER ON BEGINNING AND END ZEROES. BEGINNING VALUE = 803.0, END VALUE = 901.0 COUNTS. END VALUE WITH BE USED.
 I DO NOT HAVE STATIC 4. I AM USING STATIC 100

ROTOR SCALE DATA * PROGRAM LA3530 * HIND AXES

06/19/68

UPDATE - 6 20 6G 1200 TIME 957.01

CONFIG. FRVH

BAROMETRIC PRESSURE = 29.98

PT	ALPHA	B I	Q	LIFT.U	DRAG.U	SIDE F.U	PITCH.U	YAW.U	ROLL.U	HP	OMEGA.R	TEMP	NOTES
AVG	ALFA	RHO+100	V.KTS	CL	CO	CV	CM	CN	CMX	CP	CQ	M.OHR	RPM
ALF C	L/D.E	V/GR	CLR	CXR	CYR	CMY	CMZ	CMZ	CMZ	CPO	CQO	M.AT	THETA
1	3.00	0.05	28.96	170.	375.	-41.	-968.	652.	158.	0.0	0.0	78.0	0.0
1	-65.58	0.2267	94.70	0.1083	0.4369	-0.0472	-0.0858	0.8578	0.0140	0.000000	0.000000	0.0000	0.0
	2.95	0.45	0.0000	0.000000	-0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	-0.000000	0.0000	0.0
2	0.00	0.05	29.01	110.	365.	-19.	-596.	479.	120.	0.0	0.0	79.0	0.0
1	-73.21	0.2263	94.86	0.1281	0.4245	-0.0215	-0.0927	0.8424	0.0113	0.000000	0.000000	0.0000	0.0
	-0.05	0.30	0.0030	0.000000	-0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	-0.000000	0.0000	0.0
3	-3.00	0.05	29.10	20.	362.	-15.	-354.	304.	276.	0.0	0.0	79.0	0.0
1	-86.83	0.2263	95.02	0.0232	0.4197	-0.0168	-0.0312	0.8268	0.0243	0.000000	0.000000	0.0000	0.0
	-3.05	0.06	0.0000	0.000000	-0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	-0.000000	0.0000	0.0
4	-5.00	0.00	28.77	-10.	357.	-13.	-9.	180.	308.	0.0	0.0	80.0	0.0
1	-91.61	0.2259	94.56	-0.0117	0.4166	-0.0147	-0.0008	0.8160	0.0275	0.000000	0.000000	0.0000	0.0
	-5.00	-0.03	0.0000	-0.000000	-0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	-0.000000	0.0000	0.0
5	-7.00	0.00	29.01	-10.	359.	-5.	287.	48.	393.	0.0	0.0	80.0	0.0
1	-101.05	0.2259	94.95	-0.0815	0.4175	-0.0052	0.0185	0.8043	0.0348	0.000000	0.000000	0.0000	0.0
	-7.00	-0.20	0.0000	-0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	0.000000	-0.000000	0.0000	0.0
6	-9.00	0.00	28.84	-105.	362.	-1.	432.	-30.	288.	-0.0	0.0	80.0	0.0
1	-106.20	0.2259	94.88	-0.1230	0.4235	-0.0006	0.0384	-0.8027	0.0256	-0.000000	-0.000000	0.0000	0.0
	-9.00	-0.29	0.0000	-0.000000	-0.000000	-0.000000	0.000000	-0.000000	0.000000	-0.000000	-0.000000	0.0000	0.0
7	-11.00	0.00	28.84	-160.	367.	14.	440.	-217.	553.	-0.0	0.0	80.0	0.0
1	-113.58	0.2259	94.68	-0.1874	0.4293	0.0158	0.0569	-0.0193	0.0492	-0.000000	-0.000000	0.0000	0.0
	-11.00	-0.44	0.0000	-0.000000	-0.000000	0.000000	0.000000	-0.000000	0.000000	-0.000000	-0.000000	0.0000	0.0
8	-13.00	0.00	28.77	-215.	376.	18.	902.	-198.	617.	-0.0	0.0	80.0	0.0
1	-119.79	0.2259	94.56	-0.2525	0.4409	0.0205	0.0804	-0.0176	0.0550	-0.000000	-0.000000	0.0000	0.0
	-13.00	-0.57	0.0000	-0.000000	-0.000000	0.000000	0.000000	-0.000000	0.000000	-0.000000	-0.000000	0.0000	0.0
9	3.00	0.00	57.07	295.	756.	-58.	-2026.	1319.	13.	0.0	0.0	81.0	0.0
1	-68.67	0.2224	134.21	0.1746	0.4472	-0.0140	-0.0911	0.8593	0.0006	0.000000	0.000000	0.0000	0.0
	3.00	0.39	0.0000	0.000000	-0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	-0.000000	0.0000	0.0
10	0.00	0.00	57.05	195.	742.	-42.	-1317.	938.	248.	0.0	0.0	81.0	0.0

Best Available Copy

ROTOR SCALE DATA • PROGRAM LA3530 • WIND AXES UPDATE = 6 20 60 1200 TIME 957.01

TEST 316.0 RUN 22 STATIC 4
BEGINNING ZERO ONLY
I DO NOT HAVE STATIC 4. I AM USING STATIC 100
BAROMETRIC PRESSURE = 29.90

CONFIG, FVH

PT	ALPHA	B I	Q	LIFT,U	DRAG,U	SIDE F,U	PITCH,U	YAW,U	ROLL,U	HP	OMEGA	TEMP	NOTES
AVG	ALFA	RHO	V,KTS	CL	CD	CY	CM	CM	CMX	CP	CO	M,CMR	ASR
ALF C	L/D,E	V/CR		CLR	CXR	CYR	CMY	CMZ		CPO	COO	M,AT	THETA
1	3.00	0.00	28.81	160.	314.	-55.	-1197.	639.	53.	0.0	0.0	82.0	0.0
1	-63.00	0.2245	94.92	0.1877	0.3683	-0.0645	-0.1066	0.0549	0.0047	0.0000000	0.0000000	0.0000	0.0
	3.00	0.51	0.0000	0.000000	-0.000000	-0.000000	-0.000000	0.000000	0.000000	0.0000000	-0.0000000	0.0000	0.0
2	0.00	0.00	28.81	105.	310.	-28.	-592.	497.	-24.	0.0	0.0	82.0	0.0
1	-71.29	0.2245	94.92	0.1231	0.3636	-0.0328	-0.0728	0.0442	-0.0021	0.0000000	0.0000000	0.0000	0.0
	0.00	0.34	0.0000	0.000000	-0.000000	-0.000000	-0.000000	0.000000	-0.000000	0.0000000	-0.0000000	0.0000	0.0
3	-3.00	0.00	28.64	15.	305.	-24.	-398.	273.	167.	0.0	0.0	82.0	0.0
1	-87.18	0.2245	94.64	0.0177	0.3598	-0.0283	-0.0287	0.0244	0.0150	0.0000000	0.0000000	0.0000	0.0
	-3.00	0.05	0.0000	0.000000	-0.000000	-0.000000	-0.000000	0.000000	0.000000	0.0000000	-0.0000000	0.0000	0.0
4	-5.00	0.00	29.09	-20.	311.	-16.	6.	146.	252.	0.0	0.0	82.0	0.0
1	-93.68	0.2244	95.39	-0.0232	0.3612	-0.0186	0.0007	0.0146	0.0222	0.0000000	0.0200000	0.0000	0.0
	-5.00	-0.06	0.0000	-0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	0.0000000	-0.0000000	0.0000	0.0
5	-7.00	0.00	29.07	-65.	312.	-13.	303.	28.	304.	0.0	0.0	82.0	0.0
1	-101.77	0.2244	95.35	-0.0755	0.3624	-0.0151	0.0267	0.0025	0.0265	0.0000000	0.0000000	0.0000	0.0
	-7.00	-0.21	0.0000	-0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	0.0000000	-0.0000000	0.0000	0.0
6	-10.00	0.00	28.99	-130.	313.	3.	794.	-162.	428.	-0.0	0.0	83.0	0.0
1	-112.55	0.2240	95.32	-0.1515	0.3647	0.0035	0.0702	-0.0143	0.0379	-0.0000000	-0.0000000	0.0000	0.0
	-10.00	-0.42	0.0000	-0.000000	-0.000000	0.000000	0.000000	-0.000000	0.000000	-0.0000000	-0.0000000	0.0000	0.0
7	-11.00	0.00	28.71	-150.	313.	7.	980.	-167.	365.	-0.0	0.0	83.0	0.0
1	-115.61	0.2240	94.85	-0.1765	0.3683	0.0082	0.0885	-0.0149	0.0326	-0.0000000	-0.0000000	0.0000	0.0
	-11.00	-0.48	0.0000	-0.000000	-0.000000	0.000000	0.000000	-0.000000	0.000000	-0.0000000	-0.0000000	0.0000	0.0
8	-13.00	-0.20	28.71	-210.	318.	18.	1287.	-163.	583.	-0.0	0.0	83.0	0.0
1	-123.44	0.2240	94.85	-0.2471	0.3742	0.0212	0.1150	-0.0324	0.0521	-0.0000000	-0.0000000	0.0000	0.0
	-12.00	-0.46	0.0000	-0.000000	-0.000000	0.000000	0.000000	-0.000000	0.000000	-0.0000000	-0.0000000	0.0000	0.0
9	3.00	0.00	57.06	290.	639.	-85.	-1830.	1285.	-87.	0.0	0.0	83.0	0.0
1	-65.59	0.2210	134.63	0.1717	0.3784	-0.0503	-0.0923	0.0578	-0.0034	0.0000000	0.0000000	0.0000	0.0
	3.00	0.45	0.0000	0.000000	-0.000000	-0.000000	-0.000000	0.000000	-0.000000	0.0000000	-0.0000000	0.0000	0.0
10	0.00	0.00	56.94	170.	426.	-74.	-1110.	942.	-20.	0.0	0.0	84.0	0.0

Test Available Copy

[illegible]

$\gamma = \exists CP = CQ.$

Best Available Copy

06/19/68
00 1200 TIME 957.01

ROTOR SCALE DATA • PROGRAM LA3530 • WIND AXES

YES 316.0 RUN 23 STATIC 4
I DO NOT HAVE STATIC 4. 4 AM USING STATIC 100

BAROMETRIC PRESSURE = 29.89

CONFIG. FV

PT	ALPHA	B 1	Q	VKTS	L/D/E	LIFT.U	DRAG.U	SIDE F.U	PITCH.U	YAW.U	ROLL.U	HP	OMEGA.R	TEMP	NOTES
AVG	ALFA	RHO*100		VOR		CL	CD	CY	CM	CN	CRLL	CP	CO	M.O.M	RPM
ALF C						CLR	CXR	CYR	CMY	CNZ	CRX	CPO	COO	N.A.S	THETA
1	3.00	0.00	57.24			138.	621.	-32.	240.	471.	555.	0.0	0.0	88.0	0.0
1	-77.52	0.2189	135.50			0.2811	0.3663	-0.0166	0.0108	0.0211	0.0249	0.000000	3.0000000	0.0000	0.0
	3.00	0.22	0.0000			0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	0.000000	-0.0000000	0.0000	0.0
2	0.00	0.00	57.03			78.	612.	-32.	106.	471.	428.	0.0	0.0	88.0	0.0
1	-82.78	0.2189	135.24			0.0459	0.3625	-0.0187	0.0048	0.0212	0.0192	0.000000	0.0000000	0.0000	0.0
	0.00	0.13	0.0000			0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	0.000000	-0.0000000	0.0000	0.0
3	-3.00	0.00	56.89			38.	608.	-43.	-317.	447.	569.	0.0	0.0	89.0	0.0
1	-86.47	0.2185	135.20			0.0223	0.3610	-0.0371	-0.0233	0.0202	0.0258	0.000000	0.0000000	0.0000	0.0
	-3.00	0.06	0.0000			0.000000	-0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	-0.0000000	0.0000	0.0
4	-5.00	0.00	57.06			-3.	618.	-83.	-347.	471.	440.	0.0	0.0	89.0	0.0
1	-90.23	0.2185	135.39			-0.0015	0.3659	-0.0488	-0.0246	0.0212	0.0207	0.000000	0.0000000	0.0000	0.0
	-5.00	-0.00	0.0000			-0.000000	-0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	-0.0000000	0.0000	0.0
5	-7.00	0.00	56.87			-43.	620.	-85.	-348.	432.	480.	0.0	0.0	90.0	0.0
1	-93.92	0.2181	135.29			-0.0252	0.3683	-0.0561	-0.0382	0.0285	0.0217	0.000000	0.0000000	0.0000	0.0
	-7.00	-0.07	0.0000			-0.000000	-0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	-0.0000000	0.0000	0.0
6	-9.00	0.00	57.08			-83.	630.	-85.	-379.	669.	471.	0.0	0.0	90.0	0.0
1	-97.46	0.2181	135.55			-0.0488	0.3729	-0.0500	-0.0395	0.0300	0.0212	0.000000	0.0000000	0.0000	0.0
	-9.00	-0.13	0.0000			-0.000000	-0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	-0.0000000	0.0000	0.0
7	-11.00	0.00	56.92			-118.	631.	-57.	-1242.	489.	188.	0.0	0.0	90.0	0.0
1	-100.55	0.2181	135.35			-0.0697	0.3743	-0.0135	-0.0860	0.0220	0.0089	0.000000	0.0000000	0.0000	0.0
	-11.00	-0.19	0.0000			-0.000000	-0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	-0.0000000	0.0000	0.0
8	-1.00	0.00	57.13			73.	613.	-35.	-152.	335.	231.	0.0	0.0	90.0	0.0
1	-83.25	0.2181	135.60			0.0429	0.3625	-0.0204	-0.0068	0.0240	0.0114	0.000000	0.0000000	0.0000	0.0
	-1.00	0.12	0.0000			0.000000	-0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	-0.0000000	0.0000	0.0
9	1.00	0.00	56.96			98.	616.	-34.	-86.	427.	533.	0.0	0.0	91.0	0.0
1	-81.01	0.2177	135.53			0.0578	0.3653	-0.0211	-0.0016	0.0192	0.0240	0.000000	0.0000000	0.0000	0.0
	1.00	0.16	0.0000			0.000000	-0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	-0.0000000	0.0000	0.0

ZERO VALUES IN ALPHA B 1 RL 11491, 11597, 11598, 11599, 11600, 11601, 11602, 11603, 11604, 11605, 11606, 11607, 11608, 11609, 11610, 11611, 11612, 11613, 11614, 11615, 11616, 11617, 11618, 11619, 11620, 11621, 11622, 11623, 11624, 11625, 11626, 11627, 11628, 11629, 11630, 11631, 11632, 11633, 11634, 11635, 11636, 11637, 11638, 11639, 11640, 11641, 11642, 11643, 11644, 11645, 11646, 11647, 11648, 11649, 11650, 11651, 11652, 11653, 11654, 11655, 11656, 11657, 11658, 11659, 11660, 11661, 11662, 11663, 11664, 11665, 11666, 11667, 11668, 11669, 11670, 11671, 11672, 11673, 11674, 11675, 11676, 11677, 11678, 11679, 11680, 11681, 11682, 11683, 11684, 11685, 11686, 11687, 11688, 11689, 11690, 11691, 11692, 11693, 11694, 11695, 11696, 11697, 11698, 11699, 11700, 11701, 11702, 11703, 11704, 11705, 11706, 11707, 11708, 11709, 11710, 11711, 11712, 11713, 11714, 11715, 11716, 11717, 11718, 11719, 11720, 11721, 11722, 11723, 11724, 11725, 11726, 11727, 11728, 11729, 11730, 11731, 11732, 11733, 11734, 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12593, 12594, 12595, 12596, 12597, 12598, 12599, 12600, 12601, 12602, 12603, 12604, 12605, 12606, 12607, 12608, 12609, 12610, 12611, 12612, 12613, 12614, 12615, 12616, 12617, 12618, 12619, 12620, 12621, 12622, 12623, 12624, 12625, 12626, 12627, 12628, 12629, 12630, 12631, 12632, 12633, 12634, 12635, 12636, 12637, 12638, 12639, 12640, 12641, 12642, 12643, 12644, 12645, 12646, 12647, 12648, 12649, 12650, 12651, 12652, 12653, 12654, 12655, 12656, 12657, 12658, 12659,

TEST 310.0 MIN IN 15.45
BEGINNING ZERO ONLY

SUPPORT TARE CONFIR. FVHK

BAROMETRIC PRESSURE = 29.85

PT	ALPHA	B 1	Q	LIFT, U	DRAG, U	SIDE F, U	PITCH, U	YAW, U	ROLL, U	HP	OMEGA, R	TEMP	NOTES
AVG	ALFA	RHO+100	V, KTS	CL	CD	CY	CM	CM	CM	CP	CO	M, UMR	RPM
ALF C	L/D, E	V/D		CLR	CX		CMY	CMZ	CMX	CPO	COO	M, AT	THETA
1	0.00	0.00	28.47	135.	435.	-3.	222.	308.	-90.	0.0	0.0	590.0	0.0
1	-72.76	0.1160	131.25	0.1602	0.5161	-0.0036	0.0200	0.0278	-0.0081	0.0000000	0.0000000	0.0000	0.0
	3.00	0.31	0.0000	0.000000	-0.000000	-0.000000	0.000000	0.000000	-0.000000	0.0000000	-0.0000000	0.0000	0.0
2	-3.00	0.00	28.62	60.	431.	3.	900.	179.	90.	0.0	0.0	590.0	0.0
1	-82.07	0.1160	131.34	0.0704	0.5082	0.0035	0.0807	0.0161	0.0081	0.0000000	0.0000000	0.0000	0.0
	-3.00	0.14	0.0000	0.000000	-0.000000	0.000000	0.000000	0.000000	0.000000	0.0000000	-0.0000000	0.0000	0.0
3	-5.00	0.00	28.76	40.	430.	3.	850.	155.	90.	0.0	0.0	590.0	0.0
1	-84.69	0.1160	131.91	0.0470	0.5051	0.0035	0.0758	0.0138	0.0080	0.0000000	0.0000000	0.0000	0.0
	-5.00	0.09	0.0000	0.000000	-0.000000	0.000000	0.000000	0.000000	0.000000	0.0000000	-0.0000000	0.0000	0.0
4	-7.00	0.00	28.78	-10.	428.	12.	1336.	-14.	234.	-0.0	-0.0	590.0	0.0
1	-91.34	0.1160	131.97	-0.0117	0.5024	0.0141	0.1191	-0.0013	0.0208	-0.0000000	-0.0000000	0.0000	0.0
	-7.00	-0.02	0.0000	-0.000000	-0.000000	0.000000	0.000000	-0.000000	0.000000	-0.0000000	-0.0000000	0.0000	0.0
5	-9.00	0.00	28.83	-65.	430.	29.	1621.	-169.	378.	-0.0	0.0	590.0	0.0
1	-98.60	0.1160	132.08	-0.0762	0.5039	0.0340	0.1443	-0.0150	0.0336	-0.0000000	-0.0000000	0.0000	0.0
	-9.00	0.15	0.0000	-0.000000	-0.000000	0.000000	0.000000	-0.000000	0.000000	-0.0000000	-0.0000000	0.0000	0.0
6	-11.00	0.00	29.02	-125.	429.	59.	1891.	-351.	687.	-0.0	0.0	600.0	0.0
1	-106.24	0.1149	133.15	-0.1435	0.4994	0.0887	0.1672	-0.0311	0.0407	-0.0000000	-0.0000000	0.0000	0.0
	-11.00	-0.29	0.0000	-0.000000	-0.000000	0.000000	0.000000	-0.000000	0.000000	-0.0000000	-0.0000000	0.0000	0.0
7	-13.00	0.00	28.78	-155.	426.	55.	2295.	-347.	750.	-0.0	0.0	610.0	0.0
1	-109.99	0.1139	133.22	-0.1819	0.5000	0.0646	0.2045	-0.0309	0.0468	-0.0000000	-0.0000000	0.0000	0.0
	-13.00	-0.36	0.0000	-0.000000	-0.000000	0.000000	0.000000	-0.000000	0.000000	-0.0000000	-0.0000000	0.0000	0.0
8	-0.00	0.00	54.33	205.	660.	-25.	585.	969.	-60.	0.0	0.0	610.0	0.0
1	-76.53	0.1125	184.17	0.1275	0.5347	-0.0155	0.0274	0.0417	-0.0028	0.0000000	0.0000000	0.0000	0.0
	0.00	0.25	0.0000	0.000000	-0.000000	-0.000000	0.000000	0.000000	-0.000000	0.0000000	-0.0000000	0.0000	0.0
9	-3.00	0.00	54.38	110.	651.	-17.	1271.	447.	152.	0.0	0.0	640.0	0.0
1	-82.63	0.1094	186.81	0.0683	0.5287	-0.0106	0.0400	0.0211	0.0072	0.0000000	0.0000000	0.0000	0.0
	-3.00	0.13	0.0000	0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	0.0000000	-0.0000000	0.0000	0.0
10	-5.00	0.00	54.47	45.	646.	-20.	1488.	146.	369.	0.0	0.0	630.0	0.0
1	-86.96	0.1084	187.83	0.0279	0.5247	-0.0124	0.0700	0.0069	0.0268	0.0000000	0.0000000	0.0000	0.0
	-5.00	0.05	0.0000	0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	0.0000000	-0.0000000	0.0000	0.0
11	-7.00	0.00	54.24	-35.	847.	8.	1789.	-156.	339.	-0.0	0.0	650.0	0.0
1	-92.37	0.1084	187.41	-0.0218	0.5274	0.0050	0.0844	-0.0074	0.0160	-0.0000000	-0.0000000	0.0000	0.0
	-7.00	-0.04	0.0000	-0.000000	-0.000000	0.000000	0.000000	-0.000000	0.000000	-0.0000000	-0.0000000	0.0000	0.0
12	-9.00	0.00	54.60	-100.	846.	41.	2491.	-427.	738.	-0.0	0.0	670.0	0.0
1	-96.74	0.1065	189.39	-0.0621	0.5253	0.0255	0.1175	-0.0201	0.0348	-0.0000000	-0.0000000	0.0000	0.0
	-9.00	-0.12	0.0000	-0.000000	-0.000000	0.000000	0.000000	-0.000000	0.000000	-0.0000000	-0.0000000	0.0000	0.0
13	-11.00	0.00	54.38	-210.	845.	50.	3092.	-694.	1177.	-0.0	0.0	680.0	0.0
1	-103.91	0.1076	190.18	-0.1305	0.5268	0.0311	0.1459	-0.0327	0.0355	-0.0000000	-0.0000000	0.0000	0.0
	-11.00	-0.25	0.0000	-0.000000	-0.000000	0.000000	0.000000	-0.000000	0.000000	-0.0000000	-0.0000000	0.0000	0.0

ZERO VALUES IN ALPHA 0 1 FL+ RL+ 0 FL- AL- CA 2 OMEGA 499.
TOTAL 310.0 MIN IN 15.45
BEGINNING ZERO ONLY

SUPPORT TARE CONFIG. EVK

PT	ALPHA	B I	Q	LIFT-U	DRAG-U	SIDE P-U	PITCH-U	YAW-U	ROLL-U	HP	OMEGA-R	TEMP	NOTES
AVG	ALFA	PHO-100	V/DR	CL	CO	CY	CA	CM	CRLL	CP	CQ	M,OMR	RPM
ALP C	L/D, E			CLR	CXR	CVR	CAY	CNZ	CNX	CPO		M,AT	THETA
1	0.00	0.00	23.88	105.	430.	5.	408.	274.	143.	0.0	0.0	49.0	
1	-75.28	0.2305	93.78	0.1228	0.5031	0.00000	0.00000	0.0244	0.00000	0.0000000	0.0000000	0.0000	0.0
2	-3.00	0.00	28.95	45.	429.	10.	416.	134.	134.	0.0	0.0	49.0	
1	-81.38	0.2305	93.90	0.0759	0.5007	0.0117	0.0369	0.0119	0.0123	0.0000000	0.0000000	0.0000	0.0
1	-3.00	0.15	0.0000	0.000000	-0.000000	0.000000	0.000000	0.000000	0.000000	0.0000000	-0.0000000	0.0000	0.0
3	-5.00	0.00	29.02	25.	424.	29.	300.	-40.	92.	-0.0	0.0	49.0	
1	-86.63	0.2305	94.01	0.0291	0.4936	0.0288	0.0285	-0.0035	0.00000	-0.0000000	-0.0000000	0.0000	0.0
1	-5.00	0.06	0.0000	0.000000	-0.000000	0.000000	0.000000	-0.000000	0.000000	-0.0000000	-0.0000000	0.0000	0.0
4	-7.00	0.00	28.97	25.	421.	16.	65.	29.	107.	0.0	0.0	70.0	
1	-86.60	0.2301	94.02	0.0292	0.4909	0.0187	0.0037	0.0026	0.00000	0.0000000	0.0000000	0.0000	0.0
1	-7.00	0.06	0.0000	0.000000	-0.000000	0.000000	0.000000	0.000000	0.000000	0.0000000	-0.0000000	0.0000	0.0
5	-9.00	0.00	28.88	15.	423.	28.	-119.	64.	172.	0.0	0.0	70.0	
1	-87.97	0.2301	93.87	0.0175	0.4949	0.0328	-0.0105	0.0057	0.0152	0.0000000	0.0000000	0.0000	0.0
1	-9.00	0.04	0.0000	0.000000	-0.000000	0.000000	-0.000000	0.000000	0.000000	0.0000000	-0.0000000	0.0000	0.0
6	-11.00	0.00	28.97	-25.	424.	26.	-55.	17.	182.	0.0	0.0	70.0	
1	-93.37	0.2301	94.02	-0.0292	0.4946	0.0303	-0.0049	0.0015	0.0161	0.0000000	0.0000000	0.0000	0.0
1	-11.00	-0.06	0.0000	-0.000000	-0.000000	0.000000	-0.000000	0.000000	0.000000	0.0000000	-0.0000000	0.0000	0.0
7	-13.00	0.00	28.95	-40.	422.	18.	-31.	125.	139.	0.0	0.0	70.0	
1	-95.41	0.2301	93.99	-0.0467	0.4925	0.0210	-0.0027	0.0110	0.0123	0.0000000	0.0000000	0.0000	0.0
1	-13.00	-0.09	0.0000	-0.000000	-0.000000	0.000000	-0.000000	0.000000	0.000000	0.0000000	-0.0000000	0.0000	0.0
8	0.00	0.00	54.31	145.	843.	-9.	1141.	486.	343.	0.0	0.0	71.0	
1	-80.24	0.2288	129.45	0.0902	0.5244	-0.0056	0.0539	0.0230	0.0162	0.0000000	0.0000000	0.0000	0.0
1	0.00	0.17	0.0000	0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	0.0000000	-0.0000000	0.0000	0.0
9	-3.00	0.00	54.26	120.	840.	-15.	775.	225.	36.	0.0	0.0	72.0	
1	-81.87	0.2264	129.71	0.0747	0.5230	-0.0093	0.0366	0.0106	0.0017	0.0000000	0.0000000	0.0000	0.0
1	-3.00	0.14	0.0000	0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	0.0000000	-0.0000000	0.0000	0.0
10	-5.00	0.00	54.38	80.	841.	-20.	841.	248.	125.	0.0	0.0	75.0	
1	-84.57	0.2260	129.98	0.0497	0.5223	-0.0124	0.0161	0.0126	0.0036	0.0000000	0.0000000	0.0000	0.0
1	-5.00	0.10	0.0000	0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	0.0000000	-0.0000000	0.0000	0.0
11	-7.00	0.00	54.36	55.	842.	-14.	155.	209.	253.	0.0	0.0	74.0	
1	-86.26	0.2256	130.07	0.0342	0.5222	-0.0075	0.0059	0.0099	0.0119	0.0000000	0.0000000	0.0000	0.0
1	-7.00	0.07	0.0000	0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	0.0000000	-0.0000000	0.0000	0.0
12	-9.00	0.00	54.45	10.	830.	-10.	134.	256.	72.	0.0	0.0	76.0	
1	-89.31	0.2247	130.43	0.0042	0.5150	-0.0062	0.0063	0.0121	0.0034	0.0000000	0.0000000	0.0000	0.0
1	-9.00	0.01	0.0000	0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	0.0000000	-0.0000000	0.0000	0.0
13	-11.00	0.00	54.43	-20.	834.	15.	101.	47.	-36.	0.0	0.0	77.0	
1	-91.37	0.2243	130.52	-0.0124	0.5177	0.0093	0.0048	0.0032	-0.0017	0.0000000	0.0000000	0.0000	0.0
1	-11.00	-0.02	0.0000	-0.000000	-0.000000	0.000000	0.000000	0.000000	-0.000000	0.0000000	-0.0000000	0.0000	0.0
ZERO VALUES IN													
ALPHA													
B I													
Q													
LIFT-U													
DRAG-U													
SIDE P-U													
PITCH-U													
YAW-U													
ROLL-U													
HP													
OMEGA-R													
TEMP													
NOTES													
TOTAL COUNTS..													
TOTAL PHYS. UNITS..													
ALPHA													
B I													
Q													
LIFT-U													
DRAG-U													
SIDE P-U													
PITCH-U													
YAW-U													
ROLL-U													
HP													
OMEGA-R													
TEMP													
NOTES													

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SUPPORT TARE CONFIG. EV

HYDRAULIC PRESSURE = 29.97

PT	ALPHA	B I	Q	LIFT, U	DRAG, U	SIDE F, U	PITCH, U	YAW, U	ROLL, U	HP	OMEGA R	TEMP	NOTES
AVG	ALFA	ALFA	V, KTS	CL	CD	CY	CM	CM	CMX	CP	CO	M, OHM	APM
ALF C	L/D, E	V/G		CLR	CXA		CAY	CMZ		CPO	COO	MIAT	THETA
1	-3.00	0.00	28.99	70.	349.	6.	524.	231.	151.	0.0	0.0	75.0	0.0
1	-78.66	0.2279	94.51	0.0816	0.4066	0.0064	0.0464	0.0204	0.0134	0.000000	0.000000	0.0000	0.0
1	0.00	0.20	0.0000	0.000000	-0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	-0.000000	0.0000	0.0
2	-3.00	0.00	28.54	60.	345.	5.	237.	220.	220.	0.0	0.0	75.0	0.0
1	-83.39	0.2280	93.76	0.0473	0.4083	0.0053	0.0213	0.0198	0.0197	0.000000	0.000000	0.0000	0.0
1	-3.00	0.12	0.0000	0.000000	-0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	-0.000000	0.0000	0.0
3	-5.00	0.00	29.04	20.	343.	2.	-34.	187.	214.	0.0	0.0	75.0	0.0
1	-85.00	0.2279	94.58	0.0349	0.3990	0.0017	-0.0030	0.0165	0.0189	0.000000	0.000000	0.0000	0.0
1	-5.00	0.09	0.0000	0.000000	-0.000000	0.000000	-0.000000	0.000000	0.000000	0.000000	-0.000000	0.0000	0.0
4	-7.00	0.00	29.02	5.	342.	19.	-58.	130.	-22.	0.0	0.0	75.0	0.0
1	-89.13	0.2279	94.55	0.0058	0.3982	0.0215	-0.0051	0.0115	-0.0020	0.000000	0.000000	0.0000	0.0
1	-7.00	0.01	0.0000	0.000000	-0.000000	0.000000	-0.000000	0.000000	-0.000000	0.000000	-0.000000	0.0000	0.0
5	-9.00	0.00	29.16	-20.	338.	17.	5.	181.	200.	0.0	0.0	76.0	0.0
1	-93.39	0.2275	94.87	-0.0232	0.3916	0.0191	0.0004	0.0159	0.0176	0.000000	0.000000	0.0000	0.0
1	-9.00	-0.06	0.0000	-0.000000	-0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	-0.000000	0.0000	0.0
6	-11.00	0.00	28.71	-55.	336.	22.	-439.	41.	26.	0.0	0.0	76.0	0.0
1	-99.30	0.2275	94.12	-0.0647	0.3954	0.0253	-0.0392	0.0037	0.0023	0.000000	0.000000	0.0000	0.0
1	-11.00	-0.16	0.0000	-0.000000	-0.000000	0.000000	-0.000000	0.000000	0.000000	0.000000	-0.000000	0.0000	0.0
7	-13.00	0.00	28.99	-60.	341.	-6.	-278.	256.	103.	0.0	0.0	76.0	0.0
1	-103.20	0.2275	94.59	-0.0932	0.3973	-0.0064	-0.0246	0.0227	0.0091	0.000000	0.000000	0.0000	0.0
1	-13.00	-0.23	0.0000	-0.000000	-0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	-0.000000	0.0000	0.0
8	0.00	0.00	34.19	105.	480.	-3.	786.	430.	282.	0.0	0.0	76.0	0.0
1	-81.22	0.2247	130.11	0.0655	0.4239	-0.0047	0.0372	0.0203	0.0133	0.000000	0.000000	0.0000	0.0
1	0.00	0.15	0.0000	0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	0.000000	-0.000000	0.0000	0.0
9	-3.00	0.00	54.39	60.	667.	-20.	363.	273.	175.	0.0	0.0	75.0	0.0
1	-84.86	0.2235	130.71	0.0373	0.4144	-0.0121	0.0171	0.0129	0.0083	0.000000	0.000000	0.0000	0.0
1	-3.00	0.09	0.0000	0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	0.000000	-0.000000	0.0000	0.0
10	-5.00	0.00	34.18	25.	444.	-26.	190.	305.	249.	0.0	0.0	80.0	0.0
1	-87.85	0.2231	130.83	0.0155	0.4137	-0.0158	0.0090	0.0144	0.0117	0.000000	0.000000	0.0000	0.0
1	-5.00	0.04	0.0000	0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	0.000000	-0.000000	0.0000	0.0
11	-7.00	0.00	34.29	0.	461.	-31.	-48.	201.	296.	0.0	0.0	81.0	0.0
1	-90.00	0.2227	130.83	-0.0000	0.4113	-0.0190	-0.0023	0.0095	-0.0140	0.000000	0.000000	0.0000	0.0
1	-7.00	-0.00	0.0000	-0.000000	-0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	-0.000000	0.0000	0.0
12	-9.00	0.00	34.38	-50.	661.	-17.	35.	160.	223.	0.0	0.0	81.0	0.0
1	-94.33	0.2226	130.95	-0.0311	0.4106	-0.0103	0.0016	0.0075	0.0105	0.000000	0.000000	0.0000	0.0
1	-9.00	-0.08	0.0000	-0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	0.000000	-0.000000	0.0000	0.0
13	-11.00	0.00	34.31	-90.	652.	-34.	24.	266.	164.	0.0	0.0	81.0	0.0
1	-97.86	0.2227	130.86	-0.0560	0.4056	-0.0208	0.0011	0.00426	0.0077	0.000000	0.000000	0.0000	0.0
1	-11.00	-0.14	0.0000	-0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	0.000000	-0.000000	0.0000	0.0

ZERO VALUES IN ALPHA B I FL+ RL+ D FL- CF CR Q OMEGA POM
TOTAL COUNTS.. 0. 501. 11400. 11522. 15202. 3251. 3188. 9203. 9200. 4000 495.
TOTAL PHYS. UNITS.. 0.0 25.0 5491.5 51607.5 15202.0 3251.3 3188.0 9202.5 9200.0 4000.0

TEST 314.0 RUN 27 STATIC. 01/28/69 12 00 00 1200 TIME 827.68
 STATIC NO. CHANGES FROM 8 TO 9 ON PT. 1. THIS STATION WAS RECONSTRUCTED BY THE DATA CENTER. 3 USED.
 IF A STATIC IS STARTING HERE, IT WILL BE SCRAMBLED WITH THE RUN BECAUSE K STILL = 1. LATER CHANGE TO K=9 WON'T HELP.)

BAROMETRIC PRESSURE = 29.94

SUPPORT TARE CONFIG. FVH

PT	ALPHA	B-1	Q	LIFT, U	DRAG, U	SIDE F, U	PITCH, U	YAW, U	ROLL, U	HP	OMEGA, R	TEMP	NOTES
AVG	ALFA	RHO100	V, KTS	CL	CD	CY	CM	CN	CROLL	CP	CCO	MIDNA	RPM
ALF, C	L/D, E	V/D, R		CLR	CLR	CYR	CMY	CMZ	CMX	CPO	CCO	M, AT	THETA
1	0.00	0.00	28.91	123.1	353.	-14.	-103.	315.	60.	0.0	0.0	81.0	0.0
1	-70.46	0.2252	94.95	0.1431	0.4119	-0.0158	-0.0091	0.0279	0.0053	0.0000000	0.0000000	0.0000000	0.0
	0.00	0.35	0.0000	0.000000	-0.000000	-0.000000	-0.000000	0.000000	0.000000	0.0000000	-0.0000000	0.0000000	0.0
2	-3.00	0.00	28.89	43.	348.	2.	207.	41.	45.	0.0	0.0	81.0	0.0
1	-83.03	0.2252	94.91	0.0497	0.4064	0.0018	0.0184	0.0036	0.0040	0.0000000	0.0000000	0.0000000	0.0
	-3.00	0.12	0.0000	0.000000	-0.000000	0.000000	0.000000	0.000000	0.000000	0.0000000	-0.0000000	0.0000000	0.0
3	-5.00	0.00	28.89	13.	348.	21.	239.	-165.	263.	0.0	0.0	81.0	0.0
1	-87.94	0.2252	94.91	0.0146	0.4064	0.0240	0.0212	-0.0146	0.0234	-0.0000000	-0.0000000	0.0000000	0.0
	-5.00	0.04	0.0000	0.000000	-0.000000	0.000000	0.000000	-0.000000	0.000000	-0.0000000	-0.0000000	0.0000000	0.0
4	-7.00	0.00	28.89	-28.	342.	28.	454.	-210.	375.	-0.0	0.0	80.0	0.0
1	-94.60	0.2256	94.32	-0.0322	0.3994	0.0322	0.0403	-0.0186	0.0333	-0.0000000	-0.0000000	0.0000000	0.0
	-7.00	-0.08	0.0000	-0.000000	-0.000000	0.000000	0.000000	-0.000000	0.000000	-0.0000000	-0.0000000	0.0000000	0.0
5	-9.00	0.00	28.89	-38.	344.	41.	822.	-311.	667.	-0.0	0.0	80.0	0.0
1	-104.29	0.2256	94.82	-0.1023	0.4017	0.0474	0.0730	-0.0276	0.0592	-0.0000000	-0.0000000	0.0000000	0.0
	-9.00	-0.25	0.0000	-0.000000	-0.000000	0.000000	0.000000	-0.000000	0.000000	-0.0000000	-0.0000000	0.0000000	0.0
6	-11.00	0.00	28.89	-128.	349.	43.	1083.	-460.	614.	-0.0	0.0	80.0	0.0
1	-110.10	0.2256	94.82	-0.1491	0.4076	0.0497	0.0562	-0.0408	0.0545	-0.0000000	-0.0000000	0.0000000	0.0
	-11.00	-0.37	0.0000	-0.000000	-0.000000	0.000000	0.000000	-0.000000	0.000000	-0.0000000	-0.0000000	0.0000000	0.0
7	-13.00	0.00	28.89	-188.	353.	25.	1574.	-243.	750.	-0.0	0.0	80.0	0.0
1	-118.01	0.2253	94.82	-0.2193	0.4122	0.0287	0.1397	-0.0216	0.0666	-0.0000000	-0.0000000	0.0000000	0.0
	-13.00	-0.53	0.0000	-0.000000	-0.000000	0.000000	0.000000	-0.000000	0.000000	-0.0000000	-0.0000000	0.0000000	0.0
8	0.00	0.00	54.28	164.	685.	-35.	-46.	796.	211.	0.0	0.0	80.0	0.0
1	-76.25	0.2228	130.76	0.1043	0.4261	-0.0240	-0.0022	0.0376	0.0100	0.0000000	0.0000000	0.0000000	0.0
	0.00	0.24	0.0000	0.000000	-0.000000	-0.000000	-0.000000	0.000000	0.000000	0.0000000	-0.0000000	0.0000000	0.0
9	-3.00	0.00	54.18	58.1	673.	-30.	863.	359.	481.	0.0	0.0	82.0	0.0
1	-85.11	0.2220	130.89	0.0359	0.4193	-0.0184	0.0314	0.0170	0.0228	0.0000000	0.0000000	0.0000000	0.0
	-3.00	0.03	0.0000	0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	0.0000000	-0.0000000	0.0000000	0.0
10	-5.00	0.00	54.39	-13.	674.	-22.	741.	56.	608.	0.0	0.0	82.0	0.0
1	-91.66	0.2220	131.15	-0.0078	0.4163	-0.0134	0.0349	0.0027	0.0287	0.0000000	0.0000000	0.0000000	0.0
	-5.00	-0.02	0.0000	-0.000000	-0.000000	-0.000000	0.000000	0.000000	0.000000	0.0000000	-0.0000000	0.0000000	0.0
11	-7.00	0.00	54.32	-83.	671.	-5.	1091.	-220.	710.	-0.0	0.0	83.0	0.0
1	-97.01	0.2216	131.19	-0.0513	0.4170	-0.0028	0.0515	-0.0104	0.0335	-0.0000000	-0.0000000	0.0000000	0.0
	-7.00	-0.12	0.0000	-0.000000	-0.000000	-0.000000	0.000000	-0.000000	0.000000	-0.0000000	-0.0000000	0.0000000	0.0
12	-9.00	0.00	54.25	-158.	668.	28.	1658.	-575.	798.	-0.0	0.0	83.0	0.0
1	-103.24	0.2216	131.10	-0.0981	0.4157	0.0171	0.0803	-0.0272	0.0377	-0.0000000	-0.0000000	0.0000000	0.0
	-9.00	-0.24	0.0000	-0.000000	-0.000000	0.000000	0.000000	-0.000000	0.000000	-0.0000000	-0.0000000	0.0000000	0.0
13	-11.00	0.00	54.21	-238.	677.	32.	2086.	-580.	988.	-0.0	0.0	83.0	0.0
1	-109.34	0.2216	131.04	-0.1480	0.4216	0.0196	0.0987	-0.0275	0.0468	-0.0000000	-0.0000000	0.0000000	0.0
	-11.00	-0.35	0.0000	-0.000000	-0.000000	0.000000	0.000000	-0.000000	0.000000	-0.0000000	-0.0000000	0.0000000	0.0

ZERO VALUES IN ALPHA B-1 FL+ RL- CF CR O OMEGA POM
 TOTAL COUNTS.. 0. 501. 11399. 11519. 15203. 3256. 3178. 9203. 9200. 4.500 511. 495.
 TOTAL PHYS. UNITS.. 0.0 25.0 56995.0 57592.5 15202.5 8140.0 7945.0 9202.5 9200.0 0.112 1409.

PITCHING MOMENT COEFFICIENT, C_m/σ
(Tail Boom Support Strain Gage Balance Data)

RUN	CONFIG.	DATA POINT	α_s	C_m/σ	RUN	CONFIG.	DATA POINT	α_s	C_m/σ
2	FRBVHT	1	-3	.00161	9	FRBVH	16	-3	.00233
		2	↓	.00202			17	↓	.00207
		3	↓	.00279			18	↓	.00260
		4	↓	.00298			19	↓	.00250
		5	-8	.00339			20	↓	.00282
		6	↓	.00371			21	↓	.00224
		7	↓	.00408			22	↓	.00278
		8	-13	.00503			23	↓	.00058
		9	↓	.00439			24	↓	.00310
		10	↓	.00594			25	↓	.00436
		11	-3	.00208			26	↓	.00242
		12	↓	.00255			27	↓	.00231
		13	↓	.00270			28	↓	.00213
		14	-13	.00630			29	↓	.00250
		15	↓	.00619					
		16	↓	.00633	10	FRBVH	1	-3	.00219
		17	↓	.00779			2	↓	.00194
		18	-8	.00424			3	↓	.00398
		19	↓	.00545			4	↓	.00198
		20	↓	.00433			5	↓	.00357
		21	↓	.00362			6	↓	.00581
3	FRBVHT	1	0	-.00061			7	↓	-.00009
		2	0	-.00075			8	↓	-.00052
		3	-3	.00132			9	↓	.00187
		4	↓	.00155			10	↓	.00115
		5	↓	.00202			11	↓	.00070
		6	↓	.00236			12	↓	.00204
		7	-8	.00370			13	↓	.00253
		8	↓	.00433			14	-3	.00203
		9	↓	.00485			15	-1	.00139
		10	↓	.00551			16	-5	.00239
		11	-12	.00630			17	-7	.00295
		12	↓	.00693			18	-9	.00490
		13	↓	.00755			19	↓	.00550
9	FRBVH	1	0	.00050			20	↓	.00507
		2	-9	.00447			21	↓	.00424
		3	↓	.00422			22	↓	.00381
		4	↓	.00368			23	↓	.00461
		5	↓	.00448			24	↓	.00442
		6	↓	.00495			25	↓	.00468
		7	↓	.00425			26	↓	.00480
		8	↓	.00449			27	↓	.00495
		9	↓	.00441			28	↓	.00451
		10	↓	.00460			29	↓	.00671
		11	↓	.00448			30	↓	.00899
		12	-9	.00429			31	↓	.00406
		13	-7	.00414			32	↓	.00429
		14	-5	.00449			33	↓	.00409
		15	-11	.00432			34	↓	.00458
							35	↓	.00499
							36	↓	.00524
							37	↓	.00432

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column)

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PITCHING MOMENT COEFFICIENT, C_m/σ

(Tail Boom Support Strain Gage Balance Data)

RUN	CONFIG.	DATA POINT	α_s	C_m/σ	RUN	CONFIG.	DATA POINT	α_s	C_m/σ
10		38	-7	.00418	12	FRBVH	1	-3.3	.00118
		39	-5	.00502			2		.00157
		40	-11	.00422			3		.00169
		41	-9	.00447			4		.00176
11	FRBVH	1	-8.3	.00423			5		.00208
		2		.00534			6		.00206
		3		.00768			7		.00150
		4		.00293			8		.00147
		5		.00107			9	-3.3	.00233
		6		.00412			10	-1	.00287
		7		.00402			11	-5.3	.00165
		8		.00414			12	-6.3	.00159
		9		.00402			13	-3.3	.00224
		10		.00432	13	FRBVH	1	-3	.00213
		11		.00411			2		.00210
		12		.00221			3		.00427
		13		.00030			4		.00109
		14		.00690			5		.00007
		15		.00953			6		.00223
		16		.00387			7		.00037
		17		.00349			8		.00108
		18		.00149			9		.00313
		19		.00432			10		.00513
		20		.00493			11		.00183
		21	-8.3	.00424			12		.00149
		22	-6	.00451			13		.00124
		23	-3.8	.00573			14		.00224
		24	-8.3	.00416			15		.00262
		25	-2.6	.00185			16	-3	.00232
		26		.00446			17	0	.00217
		27		.00306			18	-5	.00226
		28		.00152			19	-7	.00220
		29	-3	.00044			20	-9	.00244
		30		.00074			21		.00513
		31		.00198			22		.00539
		32		.00343			23		.00353
		33		.00498			24		.00235
		34		.00686			25		.00369
		35		.00221			26		.00244
		36		.00362			27		.00080
		37		.00055			28		.00578
		38		.00016			29		.00773
		39		.00197			30		.00426
		40		.00110					
		41		.00047					
		42		.00229					
		43		.00275					
		44	-3	.00194					

PITCHING MOMENT COEFFICIENT, C_m/σ
(Tail Boom Support Strain Gage Balance Data)

RUN	CONFIG.	DATA POINT	α_s	C_m/σ	RUN	CONFIG.	DATA POINT	α_s	C_m/σ
14	FRBV	1	-3	-.00239	15	FRB	1	-3	-.00103
		2	-5	-.00281			2	-3	-.00165
		3	-7	-.00332			3	-4	-.00231
		4	0	-.00124			4	-	-
		5	-3	-.00139			5	-1.8	-.00108
		6	-3	-.00182			6	-0.8	.00036
		7	-3	.00023			7	-2.6	-.00187
		8	-9	-.00160			8	-3.5	-.00267
		9	-11	-.00234			9	-1	-.00020
		10	-7	-.00117					
		11	-6	-.00074	16	FRB	1	0	---
		12	-9	-.00168			2	↓	---
		13	-9	-.00286			3	↓	---
		14	-11	-.00371			4	↓	---
		15	-7	-.00187			5	-2.6	-.00226
		16	-5	-.00068			6	-3.3	-.00261
		17	-9	-.00282			7	-1.5	-.00104
		18	-3	-.00128			8	-4	-.00345
		19	-5	-.00226			9	-4	-.00307
		20	-7	-.00316			10	-6	-.00452
		21	-1	-.00057			11	-2.6	-.00184
		22	-3	-.00145					
		23	↓	-.00224	17	FRB	1	0	---
		24	↓	-.00021			2	-3	---
		25	↓	-.00408			3	↓	-.00244
		26	-3	.00158			4	↓	-.00300
		27	-4	-.00229			5	↓	-.00321
		28	-2	-.00074			6	↓	-.00185
		29	-6	-.00368			7	↓	-.00105
		30	-4	-.00230			8	↓	-.00254
		31	↓	-.00287					
		32	↓	---	18	FRB	1	0	-.00073
		33	↓	-.00298			2	0	-.00060
		34	↓	-.00481			3	-4.5	-.00428
		35	-8.7	-.00488			4	-4.5	-.00405
		36	-10.4	-.00591			5	-6.2	-.00450
		37	-6.4	-.00354			6	-7	-.00469
		38	-4	-.00257					
		39	↓	-.00144					
		40	↓	-.00037					
		41	-4	-.00304					
		42	-3	-.00248					
		43	↓	-.00517					
		44	↓	+.00049					
		45	↓	-.00231					

PITCHING MOMENT COEFFICIENT, C_m/σ and C_m^*
(Tail Boom Support Strain Gage Balance Data)

RUN	CONFIG.	DATA POINT	α_s	C_m/σ	RUN	CONFIG.	DATA POINT	α_s	C_m^*
19	FR	1	0	-.00047	20	FRV	1	-3	.0177
		2	-3	-.00079			2	-5	-.0352
		3	-6	-.00150			3	-10	-.0575
		4	-8	-.00155			4	-7	-.0447
		5	-10	-.00191			5	-5	-.0345
		6	-12	-.00209			6	-3	-.0223
		7	-13	-.00223			7	0	-.0064
		8	0	-.00013			8	3	.0141
		9	0	-.00061			9	-13	-.0600
		10	-3	-.00175			10	-11	-.0597
		11	-5.3	-.00272			11	-9	-.0449
		12	-8.4	-.00367			12	-7	-.0379
		13	-10	-.00423			13	-5	-.0299
		14	0	-.00065			14	-3	-.0169
		15	0	-.00094			15	0	-.0029
		16	-2.6	-.00252			16	3	.0191
		17	-5.7	-.00393	21	FRVH	1	3	-.0834
		18	-8.2	-.00513			2	0	-.0547
		19	-10	-.00576			3	-3	-.0349
		20	0	-.00056			4	-5	-.0194
		21	0	-.00078			5	-7	-.0006
							6	-9	.0251
							7	-11	.0531
							8	-13	.0761
							9	3	-.0725
							10	0	-.0528
							11	-3	-.0379
							12	-5	-.0228
							13	-7	-.0063
							14	-10	.0264

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PREPARED BY E. E. RohbartCHECKED BY E. V. LaForteAerodynamic Tests of an Operational OH-6A
Helicopter in the Ames 40' X 80' Wind Tunnel

APPENDIX B

PHYSICAL DESCRIPTION OF MAIN ROTOR AND CONTROLS

The main rotor is a four-bladed, fully articulated system having a lead-lag hinge located 16.19 inches from the C_L of rotation and a flapping and feathering hinge located 5.50 inches from the C_L of rotation. Centrifugal force is transmitted from the blade through the lead-lag hinge to the out-board end of a pack of thin stainless steel straps and is reacted by the centrifugal force of the opposite blade, so that the hub is not relied on to carry the centrifugal force. The inherent flexibility of the laminated strap packs permits flapping and pitching motions to be accommodated by structural deformations. The flapping and feathering hinge serves primarily as an alignment point; a self-lubricated spherical bearing free to slide on a pin provides freedom for all angular motions and permits elongation of the straps due to centrifugal force.

The straps are of high strength stainless steel strip, with teflon sheets between the laminations to prevent fretting. The hub is a premium strength aluminum alloy casting, mounted on tapered roller bearings which transmit thrust and hub moments to the mast. A six-inch radius curved surface (shoe) is provided to permit wrapping of the straps due to flapping and pitching motions.

The blade is a composite structure consisting of: 2024-T4 aluminum extruded spar, 2024-T3 aluminum skin, 2024-T3 aluminum channel, 2024-T3 aluminum strip, and extruded brass weight at the leading edge. All these parts are bonded together. At the blade tip, a bronze weight is bonded and riveted to the blade. At the root of the blade, the upper and lower root fittings are bonded and bolted to the blade. At this location, the blade

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PREPARED BY E. E. RehtertAerodynamic Tests of an Operational OH-6A
Helicopter in the Ames 40' X 80' Wind TunnelCHECKED BY E. V. LaForge

has reinforcement from the 2024-T3 aluminum doublers. A 2014-T6 aluminum forging is attached to the root of the blade for taking the damper arm load. The blade has -8° twist and no taper. Figure B-1 presents significant blade dimensions, the flapwise inertia, and the chordwise inertia.

The blade has an NACA 0015 airfoil section of 6.83 inch chord. With the trailing edge extension the overall chord is 7.21 inches. Figures B-2, -3, -4 present the spanwise distribution of weight, chordwise c.g. location, and chordwise moment. Table B-1 presents a summary of the Rotor Mass properties.

The main rotor hub controls are illustrated in Fig. B-5. Cyclic and collective pitch motions of the rotating swashplate are carried to the integral horns on the pitch housings by short links with rod and bearings. The rotating swashplate is driven by links fastened to the hub. The rotating swashplate is connected to the non-rotating swashplate through a double row ball bearing. The outer race of this bearing is a part of the rotating swashplate; the inner race is a part of the non-rotating swashplate. The non-rotating swashplate tilts on a self-lubricated bearing surface moving against a hard surface on the main rotor mast. Rotation of the non-rotating swashplate is prevented by one of the links that transmit control motion from the mixer assembly.

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PREPARED BY R. E. Bohrt

CHECKED BY S. V. LaForge

Aerodynamic Tests of an Operational CH-6A
Helicopter in the Ames 40' X 80' Wind Tunnel

TABLE B-I

SUMMARY - ROTOR MASS PROPERTIES

	UNITS	REMOVABLE BLADE	LEAD-LAG BLADE	FLAPPING BLADE
WEIGHT	Lbs.	26.96	28.61	37.25
CENTER OF GRAVITY				
Pitch Axis (.25C)	In.	0.03	0.04	0.21
Leading Edge	In.	11.74	1.75	1.91
Center Line of Rotation	In.	80.53	76.85	61.74
First Moment	Lb.-In.	2171	2199	2300
MOMENTS OF INERTIA ABOUT				
Center Line Rotat & .25C	Lb-In.Sq.		239883.	241256.
	S1-Ft.Sq.		51.78	52.07
L-L Hinge & .25C (Sta 16.19)	Lb-In.Sq.	$I_{LL} = 176192.$		
	S1-Ft.Sq.		38.03	
Flap Hinge & .25C (Sta 5.50)	Lb-In.Sq.			217083.
	S1-Ft.Sq.			46.86
Pitch Axis (.25C)	Lb-In.Sq.		99.72	173.33
	S1-Ft.Sq.		.0215	.0374
CENTROIDAL MOM OF INERTIA				
Flapping	Lb-In.Sq.	64529.	70865.	99162.
	S1-Ft.Sq.	13.93	15.30	21.40
Pitching	Lb-In.Sq.	94.42	98.24	170.63
	S1-Ft.Sq.	.0204	.0212	.0368
Lead-Lag	Lb-In.Sq.	54582.	70919.	99269.
	S1-Ft.Sq.	13.94	15.31	21.43
PRODUCT OF INERTIA				
About Center of Rotat & .25 Chord	Lb-In.Sq.	-73.	-65.	10.
			MLL 1735	

ITEM	WEIGHT (LBS)	IZ (Lb-IN SQ)*
ROTATING HUB & RETENTION ITEMS	29.00	464.
FROM HUB CENTER LINE TO FLAP HINGE		
IZ = W(R SQD), R = 4.00 IN		
IZ = 29.00 (16.00) = 464. Lb-In Sq		
*. FLAPPING BLADES	149.01	965025.
WT = 37.25 X 4. = 149.01 Lbs		
IZ = 241256. X 4. = 965025. Lb-In Sqd		
TOTAL ROTOR GROUP	178.01	965489.
	(208.39 S1-Ft Sq)	

* Weight & Moment of Inertia About Rotor Centerline

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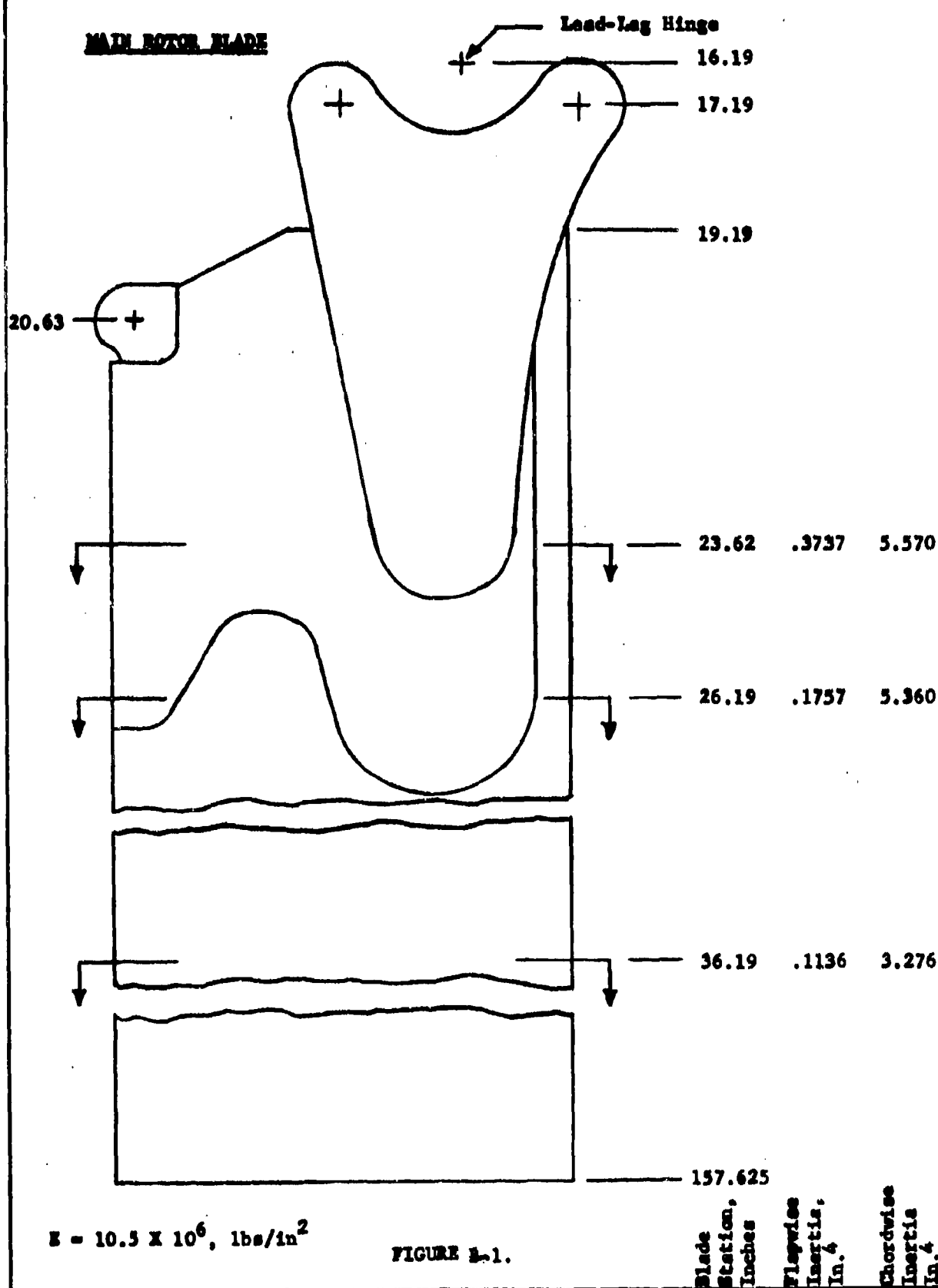
ANALYSIS
 PREPARED BY R. E. Rehtert
 CHECKED BY S. V. LaForge

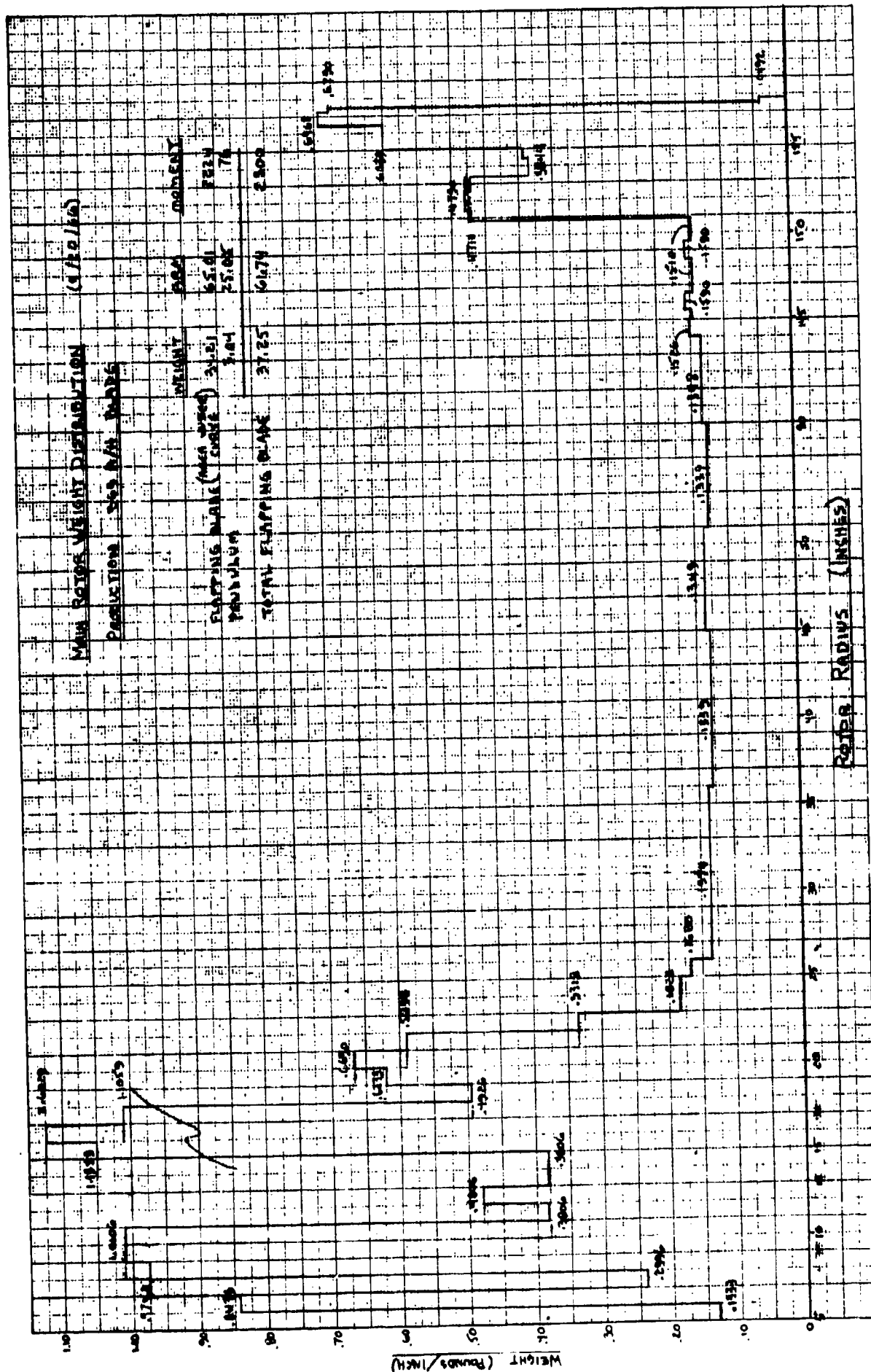
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Aerodynamic Tests of an Operational OH-6A
 Helicopter in the Ames 40' X 80' Wind Tunnel





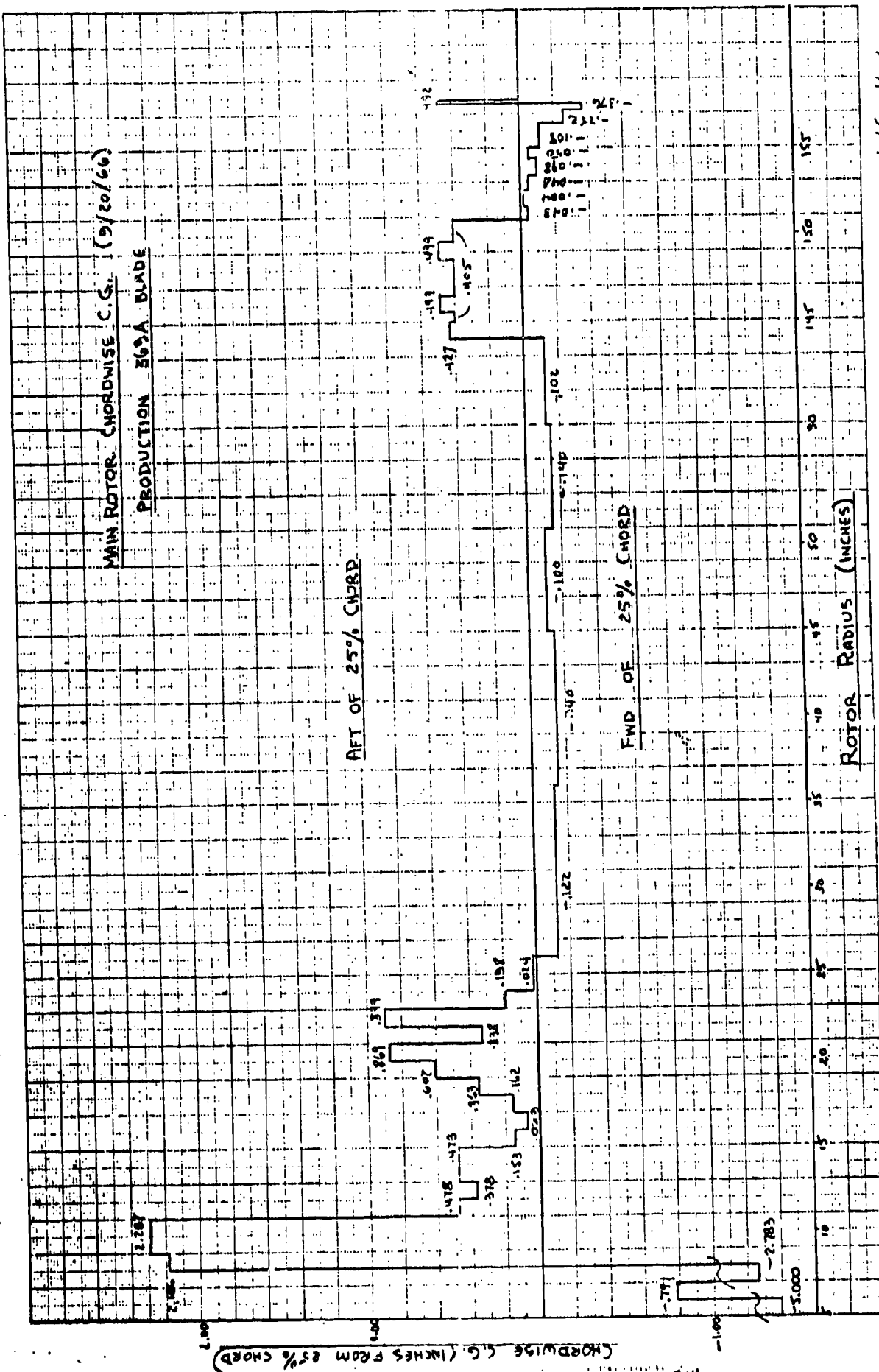
MAIN ROTOR CHORDWISE C.G. (9/20/66)

PRODUCTION 363A BLADE

AFT OF 25% CHORD

FWD OF 25% CHORD

ROTOR RADIUS (INCHES)



11C. 13

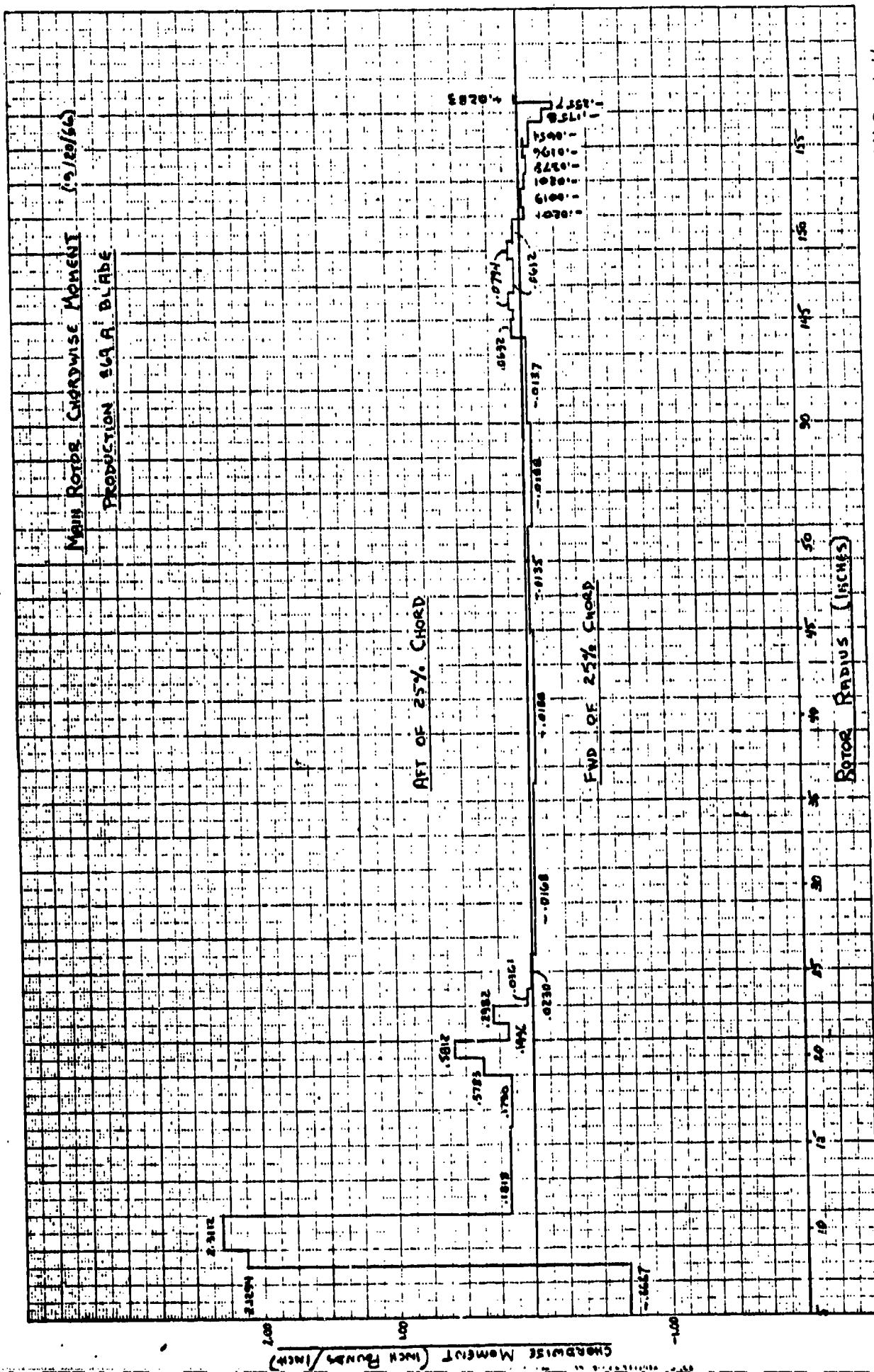


FIG. B-7

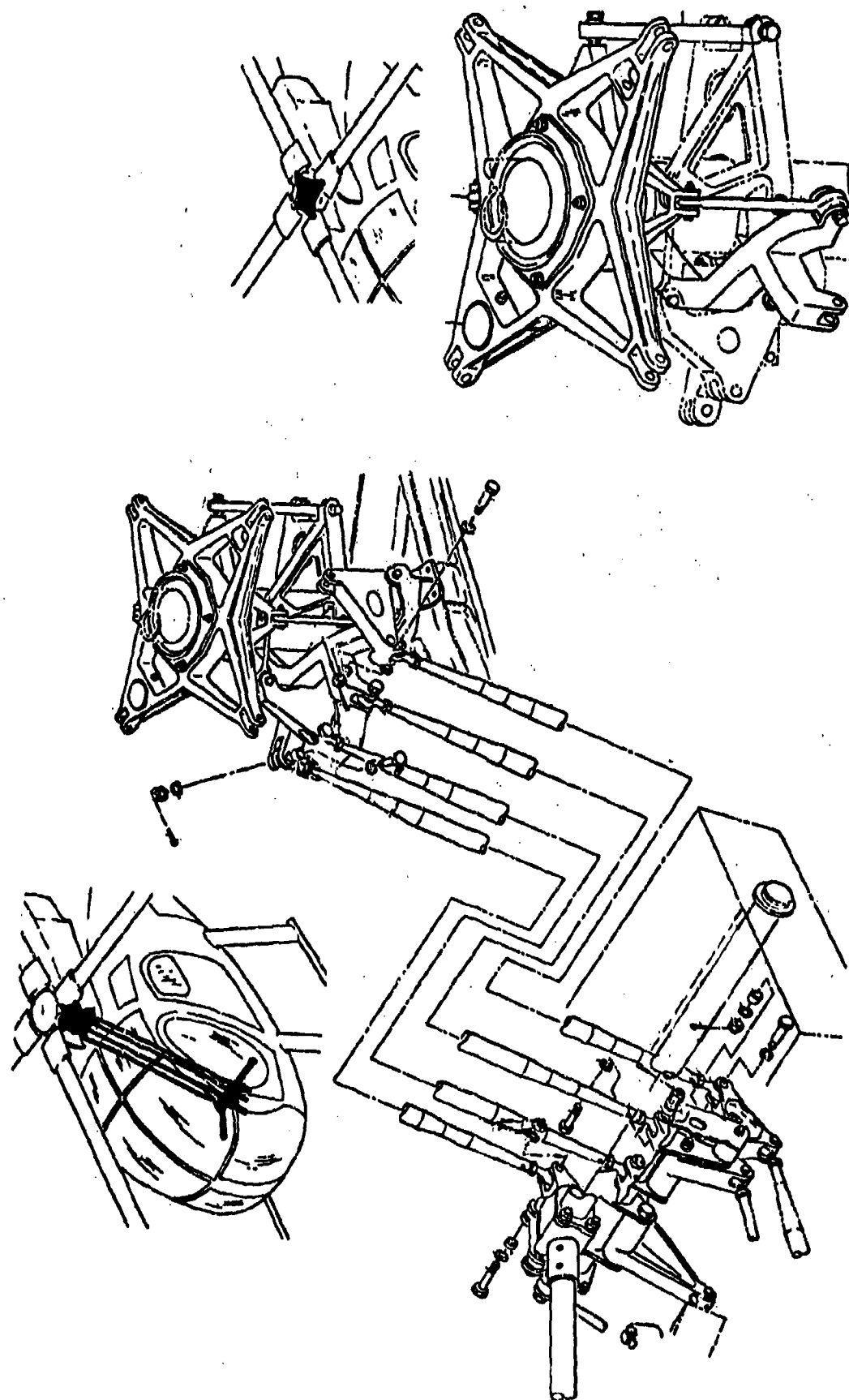


FIGURE B-5 - MAIN ROTOR CONTROLS & HUB