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WIND TUNNEL TEST OA113 OF THE 0.010-SCALE SPACE SHUTTLE ORBITER MODEL 51-0 IN THE CALSPAN HYPERSONIC SHOCK TUNNEL (48-INCH LEG)

By

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By

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for

Engineering Analysis Division

Johnson Space Center National Aeronautics and Space Administration Houston, Texas WIND TUNNEL TEST SPECIFICS:

Test Number: Calspan 48-inch HST (184-220) NASA Series Number: OAll3 Model Number: 51-0 Test Dates: 10 through 28 August and 28 September through 4 October 1974 Occupancy Hours: 336

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WIND TUNNEL TEST OA113 OF THE 0.013-SCALE SPACE SHUTTLE ORBITER MODEL 51-0 IN THE CALSPAN HYPERSONIC SHOCK TUNNEL (48-INCH LEG)

By

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ABSTRACT

This report presents results of wind tunnel test OA113, an experimental investigation conducted in the Calspan Hypersonic Shock Tunnel, from 10 through 28 August and 28 September through 4 October 1974 using a 0.010-scale "140A/B" configuration Orbiter model designated 51-0.

The test objectives were:

- To obtain force and moment data at various Mach numbers and Reynolds numbers from which viscous interaction effects on stability and control may be determined.
- 2) To provide flow visualization data from which the effects of control surface separation may be evaluated.
- To obtain pressure data in conjunction with force and moment data to assist in analyzing viscous interaction and flow-separation effects.

A total of 121 runs were made, 108 of which provided useable data. Data were obtained at angles-of-attack of 20°, 30°, 40°, and 50° (all at $\beta = 0^{\circ}$ and a combined attitude, $\alpha = 30^{\circ}$, $\beta = 5^{\circ}$). The Mach number range covered was from 10 to 16 and the viscous interaction parameter, \bar{V}_{∞} , range was from 0.01 to 0.06.

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INTRODUCTION

This report contains information pertaining to wind tunnel test OA113, using model 51-0 in the Calspan 48-inch Hypersonic Shock Tunnel. The test began 10 August 1974 and ended 4 October 74 for a total of 121 runs. The model used was a 0.010 scale-replica of the "140A/B" configuration Orbiter, termed vehicle 4.

The purpose of the test was to: 1) obtain force and moment data at various Mach numbers and Reynolds numbers from which viscous interaction effect on stability and control may be determined, 2) provide flow visualization data from which the effects of control surface separation may be evaluated, and 3) obtain pressure data in conjunction with force and moment data to assist in analyzing viscous interaction and flow-separation effects.

Detailed model, instrumentation, and pretest information are given in Reference 15.

NOMENCLATURE

Symbol	Plot Symbol	Definition
a		calibration constant, lb/mv or in-lb/mv
А		axial force, lbs.
b _w	BREF	wing span; lateral reference length, in
ē	LREF	wing MAC length, longitudinal reference length, in.
с _р		specific heat at constant pressure, ft-lbs/slug-°R
с _А	СА	axial force coefficient, $\frac{A_{C}}{q_{\infty} S_{W}}$
С _{ср}	C(CP)	cavity pressure coefficient, $\frac{P_{cav} - P_{\infty}}{q_{\infty}}$
C _{&}	CBL	rolling moment coefficient, $\frac{\ell_{C}}{q_{\infty} b_{W}} S_{W}$
C _m	CLM	pitching moment coefficient, $\frac{m_{c}}{q_{\omega}S_{W}\bar{c}}$
C _N	CN	normal force coefficient, $\frac{N}{q_{\infty} S_{W}}$
C _n	CYN	yawing moment coefficient $\frac{n_{c}}{q_{\infty}^{S_{W}} S_{W}^{b}}$
С _р	СР	pressure coefficient, $\frac{p_m - p_{\infty}}{q_{\infty}}$
ε _γ	СҮ	side force coefficient, $\frac{\gamma}{q_{\infty} S_{W}}$
C'		(see Data Reduction Section)
С*	C*	(see Data Reduction Section)
√ C *	SQRTC*	(see Data Reduction Section)
ĥ		vertical distance from balance center to model MRC, inches

NOMENCLATURE (Continued)

н _о	H(O)	total enthalpy, ft-lbs/slug, H _o was multiplied by 10 ⁻⁶ for data display
HW	H(W)	enthalpy at wall conditions, ft-lbs/slug, H _w was multiplied by 10 ⁻⁶ for data display
٤		rolling moment about the balance center, in-lbs
٤b		Orbiter reference body length, inches
m		pitching moment about the balance center, in-lbs
Mi	M(I)	incident shock Mach number
M _∞	MACH	Mach number
MRC	MRP	model moment reference center (X ₀ , Y ₀ , Z ₀), in
n		yawing moment about the balance center, in-lbs
Ν		normal force, lbs.
p		pressure, psia
₽ _{mj}	PMj	pressure measured on model at tap number j = 1,2,3,4, psia
Р _О	P(0)	stagnation pressure, psia
р _о	PITOT	stagnation pressure behind a normal shock, psia
PTS	P(TS)	pressure in the test section before a test, microns
₽ _∞	Р	freestream static pressure, psia
q _∞	Q(PSI)	freestream dynamic pressure
Re/ft	RN/L	Reynolds number per foot, $\frac{\rho_{\infty} U_{\infty}}{\mu_{\infty}}$, $\frac{1}{ft}$, Re/ft was multiplied by 10 ⁻⁶ for data display
Re _l	REFTL	Reynolds number, $\frac{\rho_{\infty} U_{\infty} \ell_b}{\mu_{\infty}}$, Re _l was multiplied by 10 ⁻⁶ for data display, based on orbiter reference length.
S _{cav.}		model reference cavity area, in. ²
s _w	SREF	model wing reference area, in ²

NOMENCLATURE (Continued)

T		temperature, °R
Т _о	T(0)	total temperature, °R
TW	T(W)	temperature at wall conditions, °R
T *	T*	(see Data Reduction section)
T _∞	Т	freestream static temperature, °R
ū		longitudinal distance between the balance center and the model MRC, inches
U_	U	freestream velocity, ft. per sec.
v		spanwise distance between the balance center and the model MRC, inches
⊽ *	V BAR	(see Data Reduction section)
٧.	VLBAR	(see Data Reduction section)
X _{cp} / ^ℓ b	XCP/L	normal force center of pressure, $0.65 - (\frac{C_m}{CN})(\frac{\bar{c}}{z_b})$, percent model length
x _{cp} ∕≗ _b x _i	XCP/L	normal force center of pressure, $0.65 - (\frac{C_m}{CN})(\frac{\bar{c}}{x_b})$, percent model length ith component balance capsule output, i = 1,2,6, mv
X _{cp} ∕≗b X _i X _{MRC}	XCP/L XMRP	normal force center of pressure, $0.65 - (\frac{C_m}{CN})(\frac{\bar{c}}{\bar{x}_b})$, percent model length ith component balance capsule output, i = 1,2,6, mv longitudinal location of MRP, in. X ₀ Orbiter longi- tudinal station, in.
X _{cp} ∕≗b X _i X _{MRC} X _o	XCP/L XMRP XO	normal force center of pressure, $0.65 - (\frac{C_m}{CN})(\frac{\bar{c}}{\bar{x}_b})$, percent model length ith component balance capsule output, i = 1,2,6, mv longitudinal location of MRP, in. X_0 Orbiter longi- tudinal station, in. Orbiter longitudinal station, in.
X _{cp} /‱ X _i X _{MRC} X _o Y	XCP/L XMRP XO	normal force center of pressure, $0.65 - (\frac{C_m}{CN})(\frac{\bar{c}}{x_b})$, percent model length ith component balance capsule output, i = 1,2,6, mv longitudinal location of MRP, in. X_0 Orbiter longi- tudinal station, in. Orbiter longitudinal station, in. side force, lbs
X _{cp} / ² b X _i X _{MRC} X ₀ Y	XCP/L XMRP XO YMRP	normal force center of pressure, $0.65 - (\frac{C_m}{CN})(\frac{\bar{c}}{x_b})$, percent model length ith component balance capsule output, i = 1,2,6, mv longitudinal location of MRP, in. X_0 Orbiter longi- tudinal station, in. Orbiter longitudinal station, in. side force, lbs lateral location of MRP, in. Y_0
X _{cp} / [£] b X _i X _{MRC} X ₀ Y Y _{MRC}	XCP/L XMRP XO YMRP YO	normal force center of pressure, $0.65 - (\frac{C_m}{CN})(\frac{\bar{c}}{\bar{x}_b})$, percent model length ith component balance capsule output, i = 1,2,6, mv longitudinal location of MRP, in. X_0 Orbiter longi- tudinal station, in. Orbiter longitudinal station, in. side force, lbs lateral location of MRP, in. Y_0 Orbiter lateral station, in.
X _{cp} / ² b X _i X _{MRC} X ₀ Y ^Y MRC Y ₀ Z _{MRC}	XCP/L XMRP XO YMRP YO ZMRP	normal force center of pressure, $0.65 - (\frac{C_m}{CN})(\frac{\bar{c}}{\bar{x}_b})$, percent model length ith component balance capsule output, i = 1,2,6, mv longitudinal location of MRP, in. X_0 Orbiter longi- tudinal station, in. Orbiter longitudinal station, in. side force, lbs lateral location of MRP, in. Y_0 Orbiter lateral station, in. vertical location of MRP, in. Z_0

NOMENCLATURE (Continued)

. Q	ALPHA	model angle-of-attack, degrees
γ		specific heat ratio
^δ a	AILRON	aileron deflection ($\delta_{E_L} - \delta_{E_R}$)/2, degrees
^δ BF	BDFLAP	body flap deflection, degrees
δE	ELEVON	elevon deflection ($\delta E_L + \delta E_R$)/2, degrees
^δ R	RUDDER	rudder deflection, degrees
δSB	SPDBRK	speedbrake deflection, degrees
μ_{∞}	MU	freestream absolute viscosity coefficient, slugs/ft-sec, μ_∞ was multiplied by 10^8 for data display
$ ho_{\infty}$	RHO	freestream density, slugs/ft 2 , ρ_{∞} was multiplied by 10^6 for data display
σ	SIGMA	standard deviation
φ	PHI	angle of roll, degrees
β	BETA	angle of sideslip, degrees
SUBSCRIPTS		
1		driven gas initial conditions
4		denotes region behind reflected shock
AF		data based on tunnel airflow calibrations
с		corrected
cav.		cavity
ср		center of pressure
Ε.		data based on estimated values for q_{∞} (ref. 14)
i		incident shock in driven gas
L		left

NOMENCLATURE (Concluded)

m	model
0	nozzle supply stagnation conditions; Orbiter reference system
٥'	stagnation conditions behind a normal shock
R	right
ref.	reference
W	wing reference; conditions at wall
ω	freestream conditions

REMARKS (PRECISION OF DATA)

The stagnation enthalpy and the test section free stream conditions were calculated using the thermodynamic properties of real air, the incident shock wave velocity and the nozzle supply pressure. The speed of the incident shock wave was measured to within ± 1 percent. Based on the agreement of pressure transducers, the nozzle supply pressure is considered accurate to within ± 3.5 percent. The dynamic pressure was determined from a linear correlation of measured model pressures and forces (see Data Reduction section); therefore one would expect the most probable error in dynamic pressure to reflect the accuracy of these measurements which is $\pm 5\%$ and $\pm 3\%$, respectively. The resultant most probable error in dynamic pressure is, calculated as $\pm 5.8\%$. The test section Mach number which is in turn dependent upon the ratio of $p_0'/p_{0^{\infty}} q_{\omega}/p_0$ is then estimated to be accurate to $\pm 2\%$.

The model attitude was set with an inclinometer at the desired angles of pitch and roll, and they are estimated to be within \pm 0.1°.

On the basis of calibration repeatability and on the consistency and the repeatability of the pressure data, it is estimated that these data have a "most probable error" of \pm 5%.

Uncertainties in force coefficients arise from errors in q_{∞} , reference area and balance loads. The error in q_{∞} is covered in the Data Reduction section. If one assumes a negligible error in the reference area, then all that is needed to obtain the overall accuracy of the force data is a knowledge of the precision of measuring the balance loads. On the balance

REMARKS (Concluded)

output there will be an incremental error which is based on the capability of the balance to read a given load. This type of uncertainty would put on the data plot a band which would be independent of angle of attack. These incremental errors are obtained by calculating the standard deviation between applied and calculated calibration loads. The calculated loads were determined by using the calibration constants and the balance output data produced by the applied loads. For the calibrations used in the program, the results are as follows:

Component	Standard Deviation (σ)
N	± .232 pounds
m	\pm .418 inch-pounds
Y	± .775 pounds
n	\pm .670 inch-pounds
r	<u>+</u> .081 inch-pounds
Α	+ .066 pounds

For a normal or Gaussian distribution of errors, 1σ contains 68.3% of the data compared to 99.7% of the data for 3σ . Therefore, 3σ is considered to be more applicable here.

Component	(3σ)
N	± .696 pounds
m	<u>+</u> 1.254 inch-pounds
Y	<u>+</u> 2.325 pounds
n	<u>+</u> 2.010 inch-pounds
l	\pm .243 inch-pounds
А	<u>+</u> .198 pounds

CONFIGURATIONS INVESTIGATED

The test article was a 0.010-scale replica of the "140 A/B" configuration of the SSV Orbiter, vehicle 4. The model was constructed of AZ31B magnesium and consisted of the following removable items: fuselage, wing, vertical tail, orbital maneuvering system (OMS) pods and nozzles, simulated Orbiter main engine nozzles, elevons, and body flap. (See reference 16 for drawing numbers).

The following nomenclature was used to designate the model components:

Component	Definition
^B 26	Body
c ₉	Canopy
e ₄₄	Elevon (left and right)
F ₇	Body flap
M ₇	OMS pods (left and right)
N ₂₈	OMS nozzles (left and right)
N ₇₇	SSME nozzles (top, lower left, lower right)
R ₅	Rudder
٧ ₈	Vertical tail
^W 116	Wing

 $O_1 = B_{26} C_9 E_{44} F_7 M_7 N_{28} N_{77} R_5 V_8 W_{116}$

The above nomenclature is depicted in Figure 2a and defined in Table III.

CONFIGURATIONS INVESTIGATED (Concluded)

The entire test was performed with all of the above components in place. Various combinations of elevon and body flap deflections were tested. They are as follows:

Left _{Se}	Right _o	^δ BF
-40°	-40°	-11.7°
-40°	-40°	0°
0°	0°	0°
0°	0°	-11.7°
0°	0°	+16.3°
+12°	+12°	0°
+12°	+12°	+16.3°
+15°	+15°	+16.3°
+12°	0°	0°

INSTRUMENTATION

The force measurement system used for test OAll3 consisted of the Calspan 1.312 inch diameter six-component "E" balance and an accelerometer balance for inertial compensation. The "E" balance, which was mounted internally in model 51-0 consists of six piezoelectric load cells mounted to a non-metric platform which was integral with the sting support. The accelerometer balance consisted of six accelerometers (equal in number to the number of force and moment components) whose locations were selected for maximum imposed acceleration, i.e., at model extremities for pitch, roll, yaw. An analog computer was used to combine signals from the balance's six force-beams (3 normal, 2 side, and 1 axial) and the accelerometer balance system, to yield inertially compensated force beam output directly in forces and moments.

Pressure instrumentation consisted of five Calspan transducers mounted in the model. One measured balance cavity pressure, two measured lower wing surface pressure and the remaining two measured pressure on the lower fuselage centerline. Their locations are shown in Figure 2b.

The model, model cavity, and pitot pressures were measured by a system developed to meet the particular requirements of shock tunnel testing (Ref. 2). The pressure transducers employ piezoelectric elements, and their small size permits installation within the model. The transducers used in this test have a dual-element feature which reduces acceleration effects to an indicated pressure of .0003 psi/g. Pressures as low as .0008 psi may be accurately measured by these transducers. Proper shielding of

INSTRUMENTATION (Concluded)

the elements precludes temperature effects in the short test time.

The outputs from the pressure transducers and the force-balance system were recorded on the magnetic drum of a Navigational Computer Corporation MCL-100 data acquisition system (NAVCOR), which samples the data from each of 48 channels every 50 microseconds. The data from the drum are transferred to a Brush recorder for immediate examination and preliminary calculations. The average voltages obtained from the Brush recorder were subsequently punched on cards for reduction on an IBM 370-168 computer.

The Schlieren system used was of the double-pass collimated type with the knife edge horizontal. This system was used for the sensitivity needed to obtain photographs of shock waves during the low density runs. Schlieren photographs were taken on most of the runs.

TEST FACILITY DESCRIPTION

The basic components of the 48-inch Hypersonic Shock Tunnel (HST) are shown in Figure 2.c and described in Reference 1. The tunnel employs a constant-area shock tube with an 8-inch inner diameter. The driver tube is 20 feet long and is externally heated by a resistance heater to temperatures of 1460° R. The driven tube is 50 feet long. The driver gas is generally a mixture of helium and nitrogen with a maximum helium purity of 100% while the driven gas is generally air. Steady-flow test times of duration sufficient to permit accurate measurement of the various parameters of interest are achieved with the tailored-interface technique. A basic discussion of shock tunnel operation technique can be found in Reference 1.

Three axisymmetric nozzles are available to expand the test gas to high velocities:

Nozzle	Ех Туре	it Diameter in inches	Test Section Mach Number
A	Contoured	24	5.5 to 8
D	Contoured	48	10 to 16
Ε	10-1/2° Semi-angle co	ne 48	9 to 20

The contoured nozzles provide parallel flow with no pressure gradients in the streamwise direction for several feet. This is very important since the presence of a streamwise pressure gradient can have a significant effect on model test results. The nozzles employ replaceable throat inserts of different diameters so that with the particular nozzle, the test Mach number can be varied. Test air passes downstream of the test section into a receiver tank of a size sufficient to maintain the desired flow for durations of 5 to 13 milliseconds. All nozzles have been calibrated using pitot-

TEST FACILITY DESCRIPTION (Concluded)

pressure survey rakes over the Mach number range indicated.

The test section is equipped with two 16-inch diameter Schlieren windows mounted a short distance aft of the nozzle exit.

TEST PROCEDURE

The force balance system was first statically calibrated by hanging a series of weights on the balance and recording the force capsule voltage outputs. The model was then mounted on the balance and an inertial compensation procedure in which the model underwent known translational and rotational accelerations about three chosen axes was conducted. The resultant signals were used as inputs to an analog computer. The computer, by combining the force balance and accelerometer signals, supplied as outputs to the recording system the values for the aerodynamic forces and moments. Once the balance was compensated, a dynamic check calibration was made of the complete model balance system to verify the accuracy of the compensation. This procedure consisted of rapidly releasing known loads from the model and recording six-component acceleration-compensated balance data.

The pressure transducers were calibrated (i.e., voltage output vs. applied pressure) after installation in the model. The voltage variation of the transducer is linear over the range of pressure normally encountered during testing. This calibration, in conjunction with estimated values for the model pressures to be experienced during the actual test, provided the basis for adjusting the gain of the data recording system to achieve maximum "readability". The detailed calibration data are kept on file at Calspan.

The model was installed on the Calspan 1.312 inch diameter six-component "E" balance assembly, supported by a Calspan 1-inch diameter sting (H61-1042-5), as shown in Figures 2d and 2e. The sting was shock mounted

TEST PROCEDURE (Concluded)

in the tunnel sector for vibration isolation. Model attitude could be adjusted in pitch, yaw or combined pitch and yaw, by pitching the sector from 0 to 53.5 degrees and rolling the sting between 0 and \pm 180 degrees.

For the first three runs, the model was inverted ($\phi = 180^{\circ}$) and pitched to +30° angle-of-attack by means of a 45° bent sting adapter (H33-0004-1) which was inverted and pitched +15° at the sector (see Fig. 2e). This pitched the model nose below the tunnel centerline and was done to determine whether there were any radial flow gradients or flow angularities inherent to the tunnel. All of the remaining runs were performed with the model upright ($\phi = 0^{\circ}$), with the straight sting.

The entire program was performed using the contoured Mach 16 "D" nozzle in the 48-inch leg of the Calspan Hypersonic Shock Tunnel.

DATA REDUCTION

With the exception of q_{∞} and p'_0 , standard Calspan data reduction methods were used to compute force and moment coefficient data, center of pressure locations, and the remaining test section conditions. Reference 3 describes the Calspan standard data reduction methods used for the Hypersonic Shock Tunnel.

From the model-balance system static calibration data, a matrix was computed that relates the applied loads and moments to the balance outputs, accounting for all interactions and the location of the specified moment reference center. Aerodynamic forces and moments were then computed from the matrix, which for the six component balance has the form:

$$\begin{cases} N \\ m \\ Y \\ n \\ \ell \\ A \end{cases} = a_{i_j} \qquad \begin{cases} X_1 \\ X_2 \\ X_3 \\ X_4 \\ X_5 \\ X_6 \end{cases}$$

where X = balance capsule output in millivolts

- a = calibration constant (lb/mv or in-lb/mv)
- N = normal force
- m = pitching moment about the balance center
- A = axial force
- Y = side force
- l = rolling moment about the balance center
- n = yawing moment about the balance center

In addition, the pitching, yawing and rolling moment coefficients

about the model moment reference center and axial force corrected for model cavity pressure were computed from the following equations:

The pressure transducers measure the difference between the initial test section pressure and the applied local pressure. The initial pressure is of the order of 5 microns and is added to the measured pressure to obtain the absolute model pressure. The local pressure coefficient C_p was then computed.

The test conditions of pressure, temperature and Reynolds number are computed by assuming isentropic expansion of the test gas from the conditions behind the reflected shock in the driven tube to the test section Mach number. The flow is expanded sufficiently so that the air in the test section is cool enough to obey the perfect gas laws.

The stagnation enthalpy and temperature of the air behind the reflected shock is determined from

$$H_0 = H_1 (H_4/H_1)$$
 (5)

and

$$T_{0} = T_{1} (T_{4}/T_{1}), respectively$$
(6)

where H_4/H_1 and T_4/T_1 are functions of U_i , the incident shock velocity, (References 4-6). U_i is obtained by measuring the time taken by the shock wave to pass between two stations in the shock tube. H_1 is taken from Reference 7. Free stream static temperature is obtained from

$$T_{\infty} = \frac{H_0}{C_p} \left(1 + \frac{\gamma - 1}{2} - M_{\infty}^2\right)^{\gamma - 1}$$
(7)

Free stream pressure is calculated using

$$P_{\infty} = P_{p} P_{0} \left[1 + \frac{\gamma - 1}{2} M_{\infty}^{2}\right]^{\left(\frac{-\gamma}{\gamma - 1}\right)}$$
(8)

where:

$$P_{p} = \left[\frac{(P/P_{o})real}{(P/P_{o})perf}\right]$$

is the real gas correction to the ideal static-to-total pressure ratio as described in Reference 8. The source data used in this technique are References 7 and 9.

Values for absolute viscosity (μ) used to compute Reynolds numbers were obtained from Reference 10 for temperatures below 500°R and from Reference 11 for temperatures above 500°R.

Stagnation conditions behind a normal shock in the test section are based on the data of Reference 9. The balance of the primary test section properties is based on perfect gas theory.

The normal procedure used to determine free stream Mach number is through a correlation of Mach number and reservoir pressure and temperature determined from previous airflow calibrations (Reference 1). These calibrations consist of measured lateral pitot surveys for a range of tunnel operating conditions. Free stream Mach number used in the correlation

is determined from the ratio p'_0/p_0 for each airflow run (Reference 3). Dynamic pressure is then calculated from

$$q_{\infty} = -\frac{\gamma}{2} - p_{\infty} M_{\infty}^{2}$$
(9)

During this program, coefficient data scatter as high as $\pm 20\%$ was noticed at some test conditions. Since X_{CP}/k_b and L/D did not show this scatter it was concluded that the coefficient scatter was caused by insufficient knowledge of dynamic pressure. It was subsequently discovered that the forward model pressure (P_{m4}) correlated very well with normal force as shown in Figure 4a. Correlations of P_{m4}, normal force and dynamic pressure were then made using an iterative procedure. The resultant values are shown in the tabulations below and are plotted in Figures 4b to 4d.

			ALPHA		
	<u>20°</u>		<u>30°</u>	<u>40°</u>	<u>50°</u>
p _{m₄} /q∞	0.3522	0.6	689	0.9806	1.353
^δ e ^{/δ} BF	-40°/-11°	0°/	′0°	+12°/+16.3°	+15°/16.3°
N/pm4	43.34	46.5	3	52.39	54.02
·			ALPHA		
	<u>20°</u>	<u>30°</u>	<u>40°</u>	<u>50°</u>	^δ e ^{∕δ} BF
N/q _∞	15.26658	28.99053	42.49997	58.66109	-40°/-11.7°
N/q_{∞}	16.39050	31.12480	45.62880	62.97970	0°/0°
N/q _∞	18.45437	35.04398	51.37430	70.9100	+12°/+16.3°
N/q _∞	19.02763	36.13260	52.97020	73.11276	+15°/+16.3°

This procedure is based upon the assumption that viscous interaction effect on normal force is on the order of 1%, and can effectively be ignored. Therefore normal force is assumed to be linear with dynamic pressure. In addition, P_{m_4} is located on the model such that it is free from flow separation and control surface deflection effects. It can also be shown that test data for P_{m_4} is linear with the estimated value for dynamic pressure used for data reduction (see Figure 4d).

Test conditions were then obtained as follows:

- 1) Dynamic pressure for a given run was calculated from the ratio of p_m/q_{∞} for the proper angle-of-attack and the measured p_m for that run.
- 2) Pitot pressure was calculated from the theoretically established ratio of p_0/q_{∞} used in Reference 3.
- 3) Free stream Mach number and the balance of the test conditions were then calculated from the ratio p'/p, using the measured values of reservoir conditions for that run and equations 5 to 8 as discussed above. For a detailed discussion of the theoretical principles and experimental substantiation for deriving the estimated dynamic pressures, see Reference 14.

Other equations and methods special to this test are outlined below:

1) Calculation of viscous parameter \bar{V}_{∞}^{\star} (Rockwell Method)

$$\frac{T^{\star}}{T_{\infty}} = 0.5 \frac{T(W)}{T_{\infty}} + (1 + 0.2 M_{\infty}^2)[0.31462(\sin^2 \alpha) + 0.18538]$$
(10)

$$C_{\infty}^{\star} = \left(\frac{T^{\star}}{T_{\infty}}\right)^{1/2} \left(\frac{T_{\infty} + 198.6}{T^{\star} + 198.6}\right)$$
(11)

$$\bar{V}_{\infty}^{\star} = \frac{M_{\infty} \sqrt{C_{\infty}^{\star}}}{\sqrt{Re_{g}}}$$
(12)

DATA REDUCTION (Concluded)

2) Calculation of viscous parameter $\bar{v}_{\omega}^{\,\prime}$ (LANGLEY METHOD)

$$\frac{T'}{T_{\infty}} = (0.468 + 0.532 - \frac{T(W)}{T_{\infty}} + 0.039 M_{\infty}^2)$$
(13)

$$C'_{\infty} = \left(\frac{T'}{T_{\infty}}\right)^{1/2} \left[\frac{T_{\infty} + 122.1 \times 10^{-(5/T_{\infty})}}{T' + 122.1 \times 10^{-(5/T')}}\right]$$
(14)

$$\bar{v}'_{\omega} = \frac{M_{\omega}\sqrt{C'_{\omega}}}{\sqrt{Re_{\varrho}}}$$
(15)

The following reference dimensions and constants were used to compute force and moment coefficient data and center of pressure locations. These values are shown in Figure 2f.

Symbol	Full Scale	Model Scale
^b w	936.7 in	9.367 in.
- c	474.8 in	4.748 in
٤ _b	1290.3 in	12.903 in
Sw	2690.0 ft ²	0.269 ft ²
x _{MRC}	1076.7 in	10.767 in
Scav.		4.50 in ²
- u		-0.519 in
YMRC	0.0 in	0.0 in
v		0.0
ZMRC	375.0 in	3.75 in
ĥ		0 <u>.250 i</u> n

DISCUSSION OF TEST RESULTS

A total of 121 runs were completed at Calspan. Of these 108 runs yielded useable data. Six test conditions were run and these are listed in Tables I and IV.

As a result of the problem with dynamic pressure, all of the coefficient data presented in this report are based upon a procedure to provide estimated dynamic pressure based on model pressure (p_{m_4}) correlations. This procdure is described in the Data Reduction section of this report.

In general, preliminary force results show less viscous interaction effect than data from test OA81 (Reference 12). ΔC_A and ΔC_m (0.65 ℓ_b) data from test OA113 are about 60 percent as large as that obtained from test OA81. Positive deflection of control surfaces show little viscous interaction effect on pitching moment except at higher angles of attack (40 and 50 degrees exhibit pitch up).

Shock wave structure can not be seen in the Schlieren photographs for test conditions where \bar{V}_{∞}^{\star} is greater than 0.036, because of the very low freestream density.

Before the test began, certain model discrepancies and errors in configuration were discovered. These model inaccuracies were corrected before test OA113, and are documented in reference 13. However, during the test, it was discovered that the +10 degree elevon brackets were actually + 12 degrees. This was indicated by data trends and later substantiated by making + 15 degree elevon deflection runs and thorough measurements.

A complete analysis and discussion of test data and results can be found in Reference 14.

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- 15. Burrows, R. R., Daileda, J. J., "Pretest Information for Wind Tunnel Test OAll3 of the 0.010-Scale Space Shuttle Orbiter Configuration 140A/B in the Calspan Hypersonic Shock Tunnel (48-inch leg)," SD74-SH-0121A dated June 14, 1974.

TABLE I.

TECT	E : 00 112. CM	104 220		DATE A 10 C - TO
152	• UA-113; CAL	104-220		DATE: 10 Aug. 74
		TEST CO	NDITIONS	
				(RESERVOIR)
п.с.	MACH NUMBER	(Der foot)	(DOUNDS/Sa, inch)	STAGNATION TEMPERATURI
	0.0	0.0222 × 106	0.000	
2	9.8	0.0323 x 10	0.282	5,140
1	10.6	0.482 × 10°	0.724	1,840
3	14.2	0.065 x 100	0.281	5,040
4A	15.0	0.081 × 100	0.1/6	3,540
10A	15.7	0.250 x 100	0.452	3,440
5	15.9	0.0397 x 10°	0.066	3,440
			· · · · · · · · · · · · · · · · · · ·	
			L	<u> </u>
84	ALANCE UTILIZED:	CALSPAN "E" Low-	Load Balance	
		CAPACITY:	ACCURACY:	COEFFICIENT TOLERANCE: *
	NF	96.3 lbs	± 3% measured load	t
	SF	62.4 1bs	± 3% measured load	t
	AF	41.0 lbs	± 3% measured load	d
	РМ	60.86 in-1bs	± 3% measured load	d
	RM	<u>12.04 in-1</u> bs	± 3% measured load	d
	ΥM	<u>43.13 in-</u> 1bs	<u>± 3% measured load</u>	d
CC	DMMENTS: *See Da	ata Reduction section	on	
	T.C. =	= Test Condition Co	de No. used by Cals	pan
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1				

		T	H						т	EST	RUN	NUN	BEF	25		,						75 76	0,1		
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	: 10 AL	E VALUES																				61	MACH	IDVAR (1)	
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	MMARY	OMINAL	2 15.		26	2	80	23			39	48	116	S	38	56	5 S	60	191	16	96	19	PA3		
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	- 184-220			NUERTED	MODEL				REPEAT	REPEAL												19	LMILY	, REFTL, S), T(0), U	1
	13 ; CAI			- Ø *																		13	1.1.4.	VLBAR, T* >(0), H(0	ſ
	-90:	A SET	ri FIER	100	002	003	004	500	900	007	800	600	010	110	012	013	014	015	016	212	018	7A ,		VBAR, V H(I), F	1
	TESI	DAT	IDEN	RUH								_									-	R DA	A.Y.	DATA DATA	-

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TABLE II. - Concluded

TEST: OA-II.	3 CAL 184-220		DAT	A SET	/RUN	NUMB	ER CO		MUS NC	MARY		DATE	0	400	47	
DATA SET		SCHI	D. CON	TROL D	EFLECT	NOT			NON	IINAL F	RUN SC	HEDULE	VALUES			
IDENTIFIER	CONFIGURATION	8	ع کر ا	₹ GF	Ser	ริธ หม	Ns 9	8 10.6	5 [[4.2	2115.0	15.7	15:9				\vdash
RUH 019	ø	50	0 15	16.3	0	0	- 1 I C	3 102	4	108	102	109				
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SCHEDULES									ļ							1

*REVISED 4/24/74

TABLE III. - MODEL DIMENSIONAL DATA

MODEL COMPONENT BODY - BOG
GENERAL DESCRIPTION Configuration 140A/B Orbiter Fuselage
NOTE: B_{24} identical to B_{24} except underside of fuselage refaired to
MODEL SCALE: 0.010
DRAWING NUMBER

DIMENSIONS	FULL SCALE	MODEL SCALE
Length (Body Fwd Sta X ₀ =235)	-In1293.3	12,933
* Max Width (@ X ₀ = 1528.3)+In.	264.0	2.640
Max Depth (@ X ₀ = 1464) - In.	250.0	2.500
Fineness Ratio		
Area - Ft. ²		
Max. Cross-Sectional	340.88	0.034
Planform		
Wetted		
Bose		
MODEL COMPONENT :_	CANOPY - C9	
---------------------	-----------------------------	
GENERAL DESCRIPTIO	Configuration 3A	
Canopy to match the	nose 140A/B	
MODEL SCALE: 0.010		
	VL70-000143A & VL70-000140A	

FULL SCALE **DIMENSIONS**: MODEL SCALE *Length (X₀=434.643 to 578) 143.357 1.434 Max Width (@ X₀ = 513.127) 152.412 1.524 Max Depth (@ X₀ = 485.0) _____,250 ____25.000_ **Fineness Ratio** Area Max. Cross-Sectional Planform Wetted Base

MODEL COMPONENT: ELEVON - ELLA (S	ee Figure 2g)	
GENERAL DESCRIPTION: <u>6.0 IN. F.S. gaps mach</u> doors, centerbody pieces, and tipseals are n	ined into E ₂₆ ele	evon. Flapper
one side).		
MODEL SCALE: 0.010		
DRAWING NUMBER: Not available		
DIMENSIONS:	FULL-SCALE	MODEL SCALE
Area - Ft ²	210.0	0.0210
Span (equivalent), In.	349.2	3.492
Inb'd equivalent chord , In.	118.0	1.180
Outb'd equivalent chord , In.	55.19	0.552
Ratio movable surface chord/ total surface chord		
At Inb'd equiv. chord	0.2096	0.2096
At Outb'd equiv. chord	0.4004	0.4004
Sweep Back Angles, degrees		
Leading Edge	0.00	0.00
Trailing edge	- 10.056	- 10.056
Hingeline	0.00	_0.00
Area Moment (Product of area & c), Ft ³	1587.25	0001 59
Mean Aerodynamic Chord, In.	_90.7	0.907

MODEL COMPONENT BODY FLAP - F7 GENERAL DESCRIPTION Configuration 140A/B Orbiter Body Flap

DIMENSIONS	FULL SCALE	MODEL SCALE
Length (X ₀ =1520 to X ₀ =1613) - In.	93.000*	0.930
Max Width - In.	262.000	2.620
Max Depth (X ₀ = 1520) - In.	23.000	0.230
Fineness Ratio		
Area - Ft ²		
Max. Cross-Sectional		·
Planform	142.6	0.0143
Wetted		<u> </u>
Base		0.0042

*Model dim. measured from Model Sta. 15.20

MODEL COMPONENT <u>OMS/RCS PODS - M7</u> GENERAL DESCRIPTION <u>Configuration 140A/B Orbiter OMS/RCS pods.</u>

MODEL SCALE: 0.010 MODEL DRAWING: SS-A00147, RELEASE 12

DRAWING NUMBER VL70-000145

TABLE III. - MODEL DIMENSIONAL DATA - Continued. MODEL COMPONENT: OMS NOZZLES - N₂₈

GENERAL DESCRIPTION: Configuration 140A/B Orbiter OMS Nozzles

MODEL SCALE: 0.010

DRAWING NO.: VL70-000140A (Location); SS-A00106, RELEASE 5 (Contour) DIMENSIONS: X_o Y_o Z_o

GIMBAL ORIGIN:

	Left Nozzle - In.	1518.0	- 88.0	492.0
	Right Nozzle - In.	1518.0	+ 88.0	492.0
NULL	POSITION:		PITCH	WAY
	Left Nozzle (Null Pitch15 ⁰⁴⁹ 12 ⁰ 17' OUTB'D)	9'; Yaw	<u>+</u> 8	13017' OUTB'D 2 ⁰ 30' INB'D
	Right Nozzle (Null Pitch 15 12°17' OUTB'D	⁰ 49'; Yaw)	<u>+</u> 8°	13 ⁰ 17' OUTB'D 2 ⁰ 17' INB'D

MODEL COMPONENT: MPG NOZZLES - N 77			
GENERAL DESCRIPTION: Simulation of the three	ee S	EME nozzles f	or the 140A/B
Orbiter configuration. Heat shields are in	clude	ed and cutout	s for sting
clearance.			
MODEL SCALE: 0.010			
DRAWING NUMBER: VI.70-005106A, SS-401247			
DIMENSIONS:		FULL SCALE	MODEL SCALE
MACH NO.			
Length - In. Gimbal Point to Exit Plane Throat to Exit Plane		153.00	
Diameter - In. Exit (External) Throat Inlet		94.00	0.940
Area - ft ² Exit Throat		48.193	0.0048
Gimbal Point (Station) In. Upper Nozzle X Y Z		<u>1445.00</u> 0.00 443.00	<u>14.450</u> 0.000 4.430
Lower Nozzles X Y Z	+	<u>1468.17</u> <u>53.00</u> <u>342.64</u>	<u>14.682</u> + <u>0.530</u> <u>3.426</u>
Null Position - Deg. Upper Nozzle Pitch Yaw		<u>16.0</u> 0.0	_ <u>16.0</u>
Lower Nozzle Pitch Yaw		<u> </u>	<u>10.0</u> <u>3.5 OUTBO</u> ARD

TABLE III MODEL DIMENS: MODEL COMPONENT: <u>RUDDER - R</u>	IONAL DATA - Contin	nued.
GENERAL DESCRIPTION: 2A. 3. 3A and 140A/B	Configuration per	Rockwell
Lines VL70-000095		
MODEL SCALE: 0.010		
DRAWING NUMBER: VL70-000095		
DIMENSIONS:	FULL-SCALE	MODEL SCALE
* Area - Ft ²	100.15	0,0100
Span (equivalent) - In.	201.0	2.010
Inb'd equivalent chord - In.	91.585	0.916
Outb'd equivalent chord - In.	<u> </u>	0.508
Ratio movable surface chord/ total surface chord		
At Inb'd equiv. chord	0.400	0.400
At Outb'd equiv. chord	0.400	0.400
Sweep Back Angles, degrees		
Leading Edge	34.83	_34_83
Trailing Edge	26.25	_26.25
Hingeline	34.83	34.83
*Area Moment (Product of area & C) -F	³ 610.92	0.000611
*Mean Aerodynamic Chord, Inches	73.2	0.732

MODEL COMPONENT: VERTICAL - V 8		
GENERAL DESCRIPTION: Configuration 3A.		
NOTE: Similar to V, with radius on TE up	pper corner and L	E lower corner
where vertical meets fuselage		
MODEL SCALE:O.010		
DRAWING NUMBER: VL70-000140A, VL70-000146	A	
DIMENSIONS:	FULL SCALE	MODEL SCALE
TOTAL DATA		
Area (Theo) - Ft ² Planform Span (Theo) - In. Aspect Ratio Rate of Taper Taper Ratio Sweep-Back Angles, Degrees. Leading Edge * Trailing Edge 0.25 Element Line Chords: Root (Theo) WP - In. Tip (Theo) WP MAC Fus. Sta. of .25 MAC W.P. of .25 MAC B.L. of .25 MAC	$ \begin{array}{r} 413.253 \\ 315.720 \\ 1.675 \\ 0.507 \\ 0.40399 \\ 45.00 \\ 26.2 \\ 41.130 \\ \hline 268.500 \\ 108.470 \\ 199.80756 \\ 1463.50 \\ 635.522 \\ 0.00 \\ \end{array} $	$\begin{array}{r} 0.041 \\ 3.157 \\ 1.675 \\ 0.507 \\ 0.40399 \\ 45.00 \\ 26.2 \\ 41.13 \\ \hline 2.685 \\ 1.0847 \\ 1.9980 \\ 14.635 \\ \hline 6.3552 \\ 0.00 \\ \hline \end{array}$
Airfoil Section Leading Wedge Angle - Deg. Trailing Wedge Angle - Deg. Leading Edge Radius	10.00 14.930 2.00 2.00 10.15	10.00 14.920 0.020
Blanketed Area	0.00	0.00

MODEL COMPONENT: WING-W116		
GENERAL DESCRIPTION: Configuration 4		
NOTE: Identical to W ₁₁₄ except airfoil thickness.	Dihedral an	gle is along
trailing edge of wing.		
MODEL SCALE: 0.010		
TEST NO.	DWG. NO	VL70-000140B
DIMENSIONS:	FULL-SCALE	MODEL SCALE
TOTAL DATA Area (.neo.) Ft ² Planform Span (Theo In. Aspect Ratio Rate of Taper Taper Ratio Dihedral Angle, degrees Incidence Angle, degrees Aerodynamic Twist, degrees Sweep Back Angles, degrees Leading Edge Trailing Edge 0.25 Element Line Chords: Root (Theo) B.P.0.0. Tip, (Theo) B.P. 468.34 MAC Fus. Sta. of .25 MAC W.P. of .25 MAC B.L. of .25 MAC	$\begin{array}{r} 2690.00 \\ \hline 936.68 \\ \hline 2.265 \\ \hline 1.177 \\ \hline 0.200 \\ \hline 3.500 \\ \hline 0.500 \\ + 3.000 \\ \hline 45.000 \\ \hline 10.056 \\ \hline 35.209 \\ \hline 689.24 \\ \hline 137.85 \\ \hline 474.81 \\ \hline 1136.83 \\ \hline 290.58 \\ \hline 182.13 \\ \hline \end{array}$	$\begin{array}{r} 0.269 \\ 9.367 \\ 2.265 \\ 1.177 \\ 0.200 \\ 3.500 \\ 0.500 \\ + 3.000 \\ \hline 45.000 \\ \hline 45.000 \\ - 10.056 \\ 35.209 \\ \hline 6.892 \\ 1.379 \\ \hline 4.748 \\ 11.368 \\ 2.906 \\ \hline 1.821 \\ \hline \end{array}$
$\frac{\text{EXPOSED DATA}{\text{Area (Theo) Ft}^2}$ Area (Theo) In. BP108 Aspect Ratio Taper Ratio Chords Root BP108 Tip 1.00 b MAC Fus. Sta. of .25 MAC W.P. of .25 MAC B.L. of .25 MAC Airfoil Section (Rockwell Mod NASA) XXXX-64 Root $\frac{t}{C} =$ Tip $\frac{t}{C} =$	$ \begin{array}{r} 1751.50 \\ 720.68 \\ 2.059 \\ 0.245 \\ 562.09 \\ 137.85 \\ 392.83 \\ 1185.98 \\ 294.30 \\ 251.77 \\ 0.113 \\ 0.12 \\ \end{array} $	$\begin{array}{c} 0.175 \\ 7.207 \\ 2.059 \\ 0.245 \\ \hline 5.621 \\ 1.379 \\ 3.928 \\ \hline 11.860 \\ 2.943 \\ 2.518 \\ \hline 0.113 \\ 0.12 \end{array}$
Data for (1) of (2) Sides Leading Edge Cuff Planform Area Ft ² Leading Edge Intersects Fus M. L. @ Sta Leading Edge Intersects Wing @ Sta 4]	113.18 500.00 1024.00	1.132 5.000 10.240

Table IV Tunnel Operating Conditions (Nominal) THROAT DIA., IN. 1.125 0.40 0.50 0.50 1.6 0.036 0.025 VBAR 0.012 0.037 0.037 0.060 PSIA RESERVOIR PRESSURE' 300 600 1600 1000 475 3000 Q, psi 0.0656 0.724 0.282 0.281 0.176 0.452 $RE/FT \times 10^{-6}$ 0.0323 0.0647 0.0397 0.250 0.482 0.081 2.9 5.5 4.28 ה. צ 5.34 4.05 4.13 9.8 10.6 15.0 14.2 15.65 15.9 Z



Notes:

Positive directions of force coefficients, moment coefficients, and angles are indicated by arrows ____

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axes have been displaced from the center For clarity, origins of wind and stability of gravity 2.



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Figure 2. - Continued.

- 2.000 1-1/1-1 0.437 ----1.000 DIA. 1042-5 19.345 -1.250 DIA. - 21.982 CALIB. "D" BAL (REF) ¥ .58 2.637 Î O.656 RAD ON MTG SURFACE OF "E" BAL. H61-104-2, WITH THE SAME HOLE PATTERN AS THE "C" & "D" BAL. 0.625 RAD. ي. 47

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d. "E" Balance Assy 6 Component - Ceramic





 $E_{l_{\rm l}l_{\rm l}}$ elevon with 6.0 inch gaps installed. Flapper doors, centerbody pieces, and tip seals are not simulated.



Figure 2. - Concluded.

g. Elevon - E₄₄

(VIEW IS PERPENDICULAR TO WING REFERENCE PLANE)



a. Downstream View of Model and Pitot Rake in 48-Inch HST Test Section Figure 3. - Model photographs.



b. Upstream View of Model and Pitot Rake Looking Toward Throat Area of 48-Inch HST



c. Sideview of Pitot Rake and Model, Mounted in Test Section of 48-Inch HST



d. Right Sideview of Calspan "E" Force Balance Assembly with Accelerometer Bracket



e. Top View of Calspan "E" Force Balance Assembly and Accelerometer Bracket



f. Left Side View of Calspan "E" Force Balance Assembly and Accelerometer Bracket



g. Top View of Model Showing Wing Accelerometers, Onboard Amplifiers and Field Effect Transistors



h. Close-up, Top View of Model Left Wing and Aft Body Showing Accelerometer, Pressure Transducers, FET, and Amplifiers



i. Bottom View of Model Showing Static Pressure Orifices, Balance Load Pan Holes, and Transducer Mount For pm3



J. Top View Showing Model Mounted on Sting-Balance Assembly and Cavity Pressure Transducer on Forward Right Side of Balance Housing

Figure 3. - Concluded.



Figure 4. - Plots



::1:









APPENDIX

TABULATED SOURCE DATA

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Data arranged in ascending order of the first independent variable, Mach number.

- 3	- 55 ¥		000. 007.11- 000.		PM4 .46220		PH4 . 04889	R 75)		.000 .000 .000 .000		C(CP) 01220		с (сР) 00267
PAC	1) (25 AF	DATA	BETA = EDFLAP = SPDBRK = AILRON =		PM3 .37550		PM3 . 04239	47 S2 ∑ □	DATA	BETA = BOFLAP = SPOBRK = AILRON =		T (H) 531.00000		T (M) 535.00000
	(RUHDD	PARAMETRIC	30.000 -40.000 .000 180. 000		PM2 .41940		PM2 .05258	OCHOSI	PARAME TRIC	30.000 -40.000 .000 180.000		H(H) 3.18900		н(н) 3.21300
			ALPHA ELEVON - RUDDER - PHI		PH1 .31760		PM1 .04488			ALPHA = ELEVON = RUDDER = PH1 =		P(TS) .00029		P(TS) .00019
ATA	544 V8R5				CBL .00141		CBL . 00185	244 VBR5				P1707 1.27600		P1T0T .13560
ED SOURCE D	428N77 W116				CYN .00107		CYN . 00059	191 M 10				SORTC+ .90780		SORTC+ .84870
113 TABULATI)) B26C9F7M7I			۲۲.	CY .00581	ħ0.	CY .00307	BEGCOFTHTM			.47	REFTL .50070	*0 .	REF TL. . 04438
041	3(CAL 184-220		000 IN. XO 000 IN. YO 000 IN. ZO	- TINA	.00000	EN/L =	CLM . 02476	11041 184-220		00 IN. X0 00 IN. Y0 00 IN. Z0	- LINA	T* 178.30000	= T/NJ	T• 00.00000
	1 I VO		• 1076.7(• .0(• 375.0(0 /1	CA .07336	3/ 0	CA .14830	04113		• 1076.76 • .00 • 375.00	1/ 0	VLBAR .01215 8	3/ 0	VLBAR .05570 14
		DATA	r. XMRP ES YMRP ES ZMRP	RUN NO.	CN .69400	RUN NO.	CN .73320		DATA	CAMAR AMAR S ZMAR S	RUN NO.	VBAR .01365	RUN NO.	VBAR . 06340
		REFERENCE	2690.0000 SQ.F ⁻ 474.8000 INCH 936.7000 INCH 0100		ALPHA -30.000		ALPHA -30.000		REFERENCE	2690.0000 SQ.F1 474.8000 INCHE 936.7000 INCHE .0100		ALPHA -30.000		ALPHA -30.000
			SREF = LREF = BREF = SCALE =		MACH 10.640		MACH 15.740			SREF = LREF = BREF = SCALE =		MACH 10.640		MACH 15.740

a. X	, 8 7 %		.000 .11.700 .000		MU 8.26600		MU 7.13700	PR 75)		000. 000. 000.		P 11 4 .0611 6		PH4 . 02585		PH4 . 15000
PA	() (25 A	DATA	BETA BEFLAP BOFLAP SPOBRK - SPOBRK - Ailron -		RHO 7.44700		RHO .41450	52) (52 V	DATA	BETA BDFLAP = SPOBRK = Ailron =		5H3 . 04956		PM3 .02142		РМЗ . 1 3290
	(TUH00)	PARAMETRIC	30.000 -40.000 180.000		Q(PSI) .69110		Q(PSI) 07273	(RUHOD)	PARAMETRIC	20.000 -40.000 .000 .000		PM2 . 06494		PH2 .03138		PM2 . 19000
			ALPHA = ELEVON = RUDDER = PHI		Р .00872		P . 00042			ALPHA = ELEVON = RUDDER = PHI =		PM1 .05020		PM1 . 02084		PM1 .13200
ATA	544 V845				T 98.25000		T 84.84000	244 VBR5				CBL .00118		CBL .00113		CBL 00097
ED SOURCE D	420N77 W116				U 170.0000		U 109.00000	N28N77 W116				CYN 00251		CYN 00505		CYN . 00022
113 TABULATI) BEGCBF 7M71			.47	T(0) 198.00000 5	ħ0.	T(0) 775.00000 7	0) B26C9F7H7			60.	CY .01070	* 0.	CY .01975	8	CY 01047
OA	3 (CAL 184-22(000 IN. X0 000 IN. Y0 000 IN. Z0	RN/L =	H(0) 13.99000 2	RN/L =	H(0) 25.85000 3	3(CAL 184-22)		000 IN. XO 000 IN. YO 000 IN. ZO	RN/L -	CLM .01497	- TINA	CLM .00335	- RN/L	CLM .02213
	OA11		- 1076.7 - 0 - 375.0	0 /1	P(0) 96.80000	3/ 0	P(0)	0411		- 1076.7 0 - 375.0	26/0	CA .10520	17/ 0	CA .11380	0 /86	CA .09214
		E DATA	TT XHRP ES YMRP ES ZHRP	RUN NO.	M(1) 2.90000 5	RUN NO.	M(1) 4.07900 5		E DATA	FT. XHRP HES YHRP HES ZMRP	RUN NO.	CN .36790	RUN NO.	CN .37020	RUN NO.	CN . 36940
		REFERENCI	690.0000 SQ. 474.8000 INC 936.7000 INC 0100		ALPHA -30.000		AL PHA -30.000		REFERENC	590.0000 50. 474.8000 INC 936.7000 INC .0100		ALPHA 20.000		ALPHA 20.000		ALPHA 20.000
			SREF = 2 LREF = 2 BREF = 5 SCALE = 5		MACH 10.640		MACH 15.740			SREF = 2 LREF = 8 BREF = 5 SCALE =		MACH 15.080		HACH 15.550		MACH 16.100

				IIVO	3(CAL 184-	04113 TABUL 2201826C9F7	ATED SOURCE (DATA Se44 VBR5		DOHNS)	25 (22 1	05 3 PR 75)			
REFERENCE DATA	INCE DATA									PARAMETRIC	DATA				
2690.0000 SQ.FT. XHRP = 1076.7000 1 474.8000 INCHES YHRP = .0000 1 936.7000 INCHES ZHRP = 375.0000 1 .0100	80.FT, XHAP = 1078.7000 1 INCHES YMAP = .0000 1 INCHES ZMAP = 375.0000 1	1 1076.7000 1 0000 1 375.0000 1	1076.7000 1 .0000 1 375 .0000 1	1 000	x > N z z z	999			ALPHA = ELEVON = RUDOER = PHI	20.000 -40.000 -000.000	BETA - BOFLAP - SPOBRK - AILRON -	-11.700 .000			
RUN NO. 26/ D RW/	RUN NO. 25/ 0 RN/1). 26/ 0 RN/I	IVNU D VS	RNJ	•	60.									
ALPHA VBAR VLBAR T* 20.000 .04264 .03595 1259.01	VBAR VLBAR T* .04264 .03696 1258.01	VLBAR T* .03696 1258.01	BAR T.	T• 258.0	0000	REFTL .09159	SQRTC+ 9.85580	P1707 .32190	P(TS) .00029	H(W) 3.23700	T (M) 539.0000	C (CP)			
RUN NO. 17/ 0 RN/L	RUN NO. 17/ 0 RN/L). 17/ 0 RN/L	1/ 0 KN/P	RN/L	•	1 0.									
ALPHA VBAR VLBAR T. 20.000 .06375 .05457 1195.00	VBAR VLBAR T* .06375 .05457 1195.00	VLBAR T• .05457 1195.00	BAR T• 5457 1195.00	T• 195.00	000	REFTL 04548	SQRTC+ 87430	P1T07 .13590	P(TS) .00019	H(W) 3.24300	T (M) 540.00000	C (CP) - , 00321			
RUN NO. 98/ 0 RN/L	RUN NO. 98/ 0 RN/L). 98/ 0 RN/L	B/ 0 BN/L	FN/L	•	. 25									
ALPHA VBAR VLBAR T• 20.000 .02702 .02303 1215.000	VBAR VLBAR T• .02702 .02303 1215.000	VLBAR T• .02303 1215.000	BAR T• 2303 1215.000	T.	8	REFTL .27210	SORTC+ 87540	P1101 .79180	P(TS) .000 29	н(м) 3.18300	T (H) 530.0000	C(CP) 00377			
04113(CAL184-	04113(CAL 184-	04113(CAL 184-	04113(CAL184-	3(CAL 184-		220)B26C9F7	HTN28NT7 W110	SE44 VBR5		(TUHOO)2) (5 5 A	PR 75)			
REFERENCE DATA	INCE DATA									PARAMETRIC	DATA				
2690.0000 SQ.FT. XHARP = 1076.7000 IN. X 474.8000 INCHES YHARP = .0000 IN. Y 936.7000 INCHES ZHARP = 375.0000 IN. Z .0100	10.FT. XHAR = 1076.7000 IN. X NCHES YHAR = .0000 IN. Y NCHES ZHAR = .375.0000 IN. Z		1076.7000 IN. > 0000 IN. > 375.0000 IN. 2	000 IN. 2 000 IN. 2 000 IN. 2		000			ALPHA - ELEVON - RUODER - PHI	20,000 -40,000 .000 .000	BETA = BOFLAP = SPOBRK = ATLRON =	000. 000. 000.			
RUN NO. 28/ 0 RN/L =	RUN NO. 28/ 0 RN/L -). 28/ 0 RN/L -	6/ 0 RN/L -	- INNI	_	60.									
ALPHA H(1) P(0) H(0) 20.000 4.13300 994.50000 26.830	H(I) P(0) H(0) 4.13300 994.50000 26.8300	P(0) H(0) 994.50000 26.8300	0) H(0) 0000 26.830(н(0) 26.830 (8	T (0) 3902.0000	U 1 7237.00000	T 95.78000	Р .00108	0(PSI) .17250	RHO . 94860	MU 8.0580			
RUN NO. 17/ D RN/L -	RUN NO. 17/ 0 RN/L -	. 11/ 0 RN/L -	1/ 0 RN/L -	- RN/L		ħ0.									
ALPHA M(1) P(0) H(0) 20.000 3.97200 476.50000 25.0800	H(1) P(0) H(0) 3.97200 476.50000 25.0800	Р(О) H(О) 476.50000 25.0800	о) H(O) 0000 25.0800	H(0) 25.0800	0	T (0) 3685.00000	U 7002.00000	T 84.30000	Р . 00043	0(PSI) 07294	RHO .42850	ни 7.09100			
RUN NO. 98/ 0 RN/L -	RUN NO. 98/ D RN/L -	. 98/ 0 RN/L	8/ 0 KN/L	- I/NJ		52.									
ALPHA M(1) P(0) H(0) 20.000 4.11500 3183.00000 25.770	M(I) P(O) H(O) 4.11500 3183.00000 25.770	P(0) H(0) (183.00000 25.770	0) H(0) 0000 25.770	н(0) 25.770(8	T (0) 3766.00000	U 7101.00000	T 80.86000	Р .00234	Q(PS1) .42450	RH0 2.42400	MU 6.80100			
≠ ⊎	- 52 æ		.000 11.700 .000		13851		PH4 . 4099		PH4 .1888		PM4 .1258(PH14 .0000		144 1.0347
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٩d	5) (25 A	DATA	BETA = BOFLAP = SPOBRK = A1LRON =		PM3 . 11390		PM3 . 34940		PM3 . 16010		РМ3 .10950		PM3 .00000		РМЗ .02718
		PARAMETRIC	30.000 30.000 .000 .000		PH2 . 14010		РМ2 . 40270		рм2 . 19930		PM2 .14370		PH2 . 00000		PH2 . 05039
			ALPHA = ELEVON = RUDDER = PHI		PH1 . 10520		PM1 .28570		PM1 .15640		PM1 .10530		РМ1 . 00000		PM1 .03211
LTA	548 VB42				CBL .00101		CBL .00019		CBL . 00 000		CBL .00115		CBL . 001 95		CBL .00178
D SOURCE DI	1911 H 1191				CYN , 00058		CYN 00002		CYN . 00000		CYN 00021		CYN 00126		CYN 00028
13 TABULATE)) B26C9F7M7N			£0.	CY . 00351	.38	CY . 000 35	.06	CY . 00000	60.	сҮ 00078	53.	CY .00181	.03	сү . 0000 0
0 4 1	3 (CAL 184-220		000 IN. XO 000 IN. YO 000 IN. ZO	• J/NJ	CLM .02700	e Jiny	. 035 55	e T/Ny	CLM .03157	• T/NH	CLM .03577	- Tiny	CLM .03290	e J/Na	CLM .03647
	04115		• 1076.70 • .00 • 375.00	1/ 0	CA .12190	0 / 4	CA .08228	0 /11	CA .12360	20/ O	CA .11810	78/ 0	CA . 09547	5/0	CA . 19240
		DeTA	S ZMRP	RUN NO.	CN . 73690	RUN NO.	CN .73320	RUN NO.	CN . 74610	RUN NO.	CN . 77300	RUN NO.	CN . 75050	RUN NO.	CN . 90930
		REFERENCE	2690.0000 50.F1 474.8000 INCHE 936.7000 INCHE .0100		000 - 000 30 - 000		AL PHA 30.000		AL PHA 30.030		ALPHA 40.000		ALPHA 30.000		ALPHA 30.000
			RREF = RREF = BREF =		MACH 10.080		MACH 10.670		MACH 14.120		MACH 15.020		MACH 15.680		MACH 16.560



ъ Э	R 75)		000. 001.11- 000.		C(CP) 01258		C (CP) 01189		C(CP) 00618		C(CP) 00413		C (CP) 00432		C (CP) 00089
PAG	1) (25 AP	DATA	BETA = BOFLAP = SPOBRK = AILRON =		T (H) 540.0000		T (M) 538.00000		T (H) 540.00000		T(H) 537.00000		T (M) 540.00000		T (M) 338.00000
	(SUHO0	PARAMETRIC	30,000 -40,000 -000		H(W) 3.24300		H(W) 3.23100		H(H) 3.24300		H(W) 3.22500		H(W) 3.24300 5		H(W) 3.23100 t
		-	ALPHA = ELEVON = RUDOER = PHI		P(TS) .00019		P(TS) .00015		P(TS) .0002 3		P(TS) .00025		P(TS) .00023		P(TS) .00019
ίΤΑ	H4 VBR5				P1 TOT .42750		P1101 1.13100		P1707 .53100		P1707 .34980		PI TOT .85610		P1T0T .09630
D SOURCE DA	28N77 W116E				SQRTC* . 75820		50RTC+ . 89850		SORTC• .75140		SORTC• .80480		SQRTC+ 84160		SORTC+ .85920
13 TABULATE) B26C9F7M7N			٤0.	REFTL .02916	.38	REF TL .41240	.06	REFTL .06877	60	JREFTL .09479	52	REF TL . 26590	50	REF TL . 03519
IVO	13(CAL 184-220		7000 IN. XO 2000 IN. YO 2000 IN. ZO	- I/NA	T* 2158.00000	- HNIL	T* 914.80000	RN/L -	T+ 093.00000	RN/L =	T* 711.00000	RN/L =	T+ +36.00000	- INN	T+ 393.00000
	OAL		1076.7 	1/ 0	VLBAR .04378 8	6 / 4	VLBAR .01334	11/ 0	VLBAR .03791 2	20/0	VLBAR .03607 1	78/ 0	VLBAR .02256 1	5/ 0	VLBAR . 06584 1
		DATA	· XMRP S YMRP S ZMRP	RUN NO.	VBAR . 04474	RUN NO.	VBAR .01492	RUN NO.	/BAR . 04.047	RUN NO.	/8AR . 03927	RUN NO.	/BAR 02559	RUN NO.	18AR 07584
		REFERENCE	2890.0000 SQ.FT 474.8000 INCHE 938.7000 INCHE .0100		AL PHA 30.000		AL PHA 30.000		ALPHA 30.030		ALPHA 40.000		ALPHA 1		ALPHA 1 30.000 .
			SREF =		MACH 10.080		MACH 10.670		MACH 14.120		MACH 15.020		MACH 15.680		MACH 16.560



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					OAI	13(CAL 184-2	20) 82609571	MTN26N77 WILE	544 VBR5		(TUHDO	3) (25 A	6 12 12 12 12 12 12 12 12 12 12 12 12 12
	REFEF	RENCE DAT.	<								PARAMETRIC	DATA	
SREF = .REF = 3REF = SCALE =	2690.0000 474.8000 936.7000 .0100	SQ.FT. INCHES INCHES	XMRP YMRP ZMRP		1076. .1	7000 IN. XO 0000 IN. YO 0000 IN. ZO				ALPHA - ELEVON - RUDDER - PHI -	30.000 -40.000 .000.	BETA = BDFLAP = SPOBRK = AILRON =	000. 000. 000.
		Ċ.	UN NO.		0 //	- LINI	£0.						
MACH 10.080	ALPHA 30.000	M(1 0 5.39) 200 2	д с	50000	H(O) 43.10000	T (0) 5698.00000	U 9052.0000	T 335,50000	Р .0031 9	Q(PS[) .22670	RH0 . 79660	MU 26.5800(
		۵ <u>۲</u>	UN NO.	-	÷ 0	- RN/L	.38						
MACH 10.570	ALPHA 30.000	M(1 2.92	500 S	с. Т.	(0) 6000	н(о) 14.74000	T (0) 2300.00000	U 5308.00000	T 103.00000	Р .00768	0,PSI).	RH0 6.26000	MU 8.66100
		Ŭ.	NN NO.	-	11/ 0	- I/Ny	90.						
MACH 14.120	ALPHA 30.030	M(1 5.25) 600 15	۳.	(O) 00000	H(0) 41.58000	T (0) 5604.00000	U 8996.00000	T 168.70000	Р .00202	0(PSI) .28180	RHO 1.00300	MU 14.1000
		œ	UN NO.		20/0	- T/NJ	60.						
MACH 15.020	ALPHA ALPHA	HCI 13-4 0) 200 10	<u>ج</u>	00000	H(0) 27.56000	T (0) 3990.0000	U 1 7334.00000	T 99.15000	Р .00119	0(PSI) .18730	RHO 1.00300	MU 8.34100
		œ	UN NO.	-	78/ 0	- INA	£.						
MACH 15.680	ALPHA 30.000	0 4.10) 1800 30	76.	(O) 00000	нсо) 26.61000	T (0) 3882.0000	U 1 7213.00000	T 88.03000	Р .0026 6	0(PSI) .45870	RH0 2.54000	MU 7.4060(
		œ	TUN NO.		5/ 0	= J/N2	:03						
MACH 16.560	ALPHA 30.00(M(1 0 4.03	800 4	ية. قر	6000 0	н(0) 25.6 5000	T (0) 3754 . 00000	U) 7089.00000	T 76.21000	Р .00027	05164	RHO . 29600	MU 6.40900

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DAILS TABULATED SOURCE DATA

К 1	R 75)		000. 000.		P M4 .26110		PHN .71980		P## .27200		PH4 . 17960		PM4 .52500		.00000
PAC	+) (25 AF	DATA	BETA = BDFLAP = SPDBRK = ATLRON =		РМЗ .23310		PM3 .63950		PM3 .23590		PM3 . 15880		PM3 .46040		Рм3 . 07232
	(RUHOD	PARAMETRIC	000.04 000.04 000.04 000.000		РМ2 . 24780		PM2 .70530		PM2 .25850		PM2 . 18480		PM2 .52020		PM2 . 07916
			ALPHA = ELEVON = RUDDER = PHI		РМ1 .20670		PM1 .54580		PM1 .19930		PM1 . 15930		PM1 . 39250		PM1 .06057
)ATA	544 VBR5				CBL 00098		CBL. . 00068		CBL 00187		CBL .00323		CBL .00170		CBL. 00042
ED SOURCE D	N2BN77 H116				CYN 00073		CYN 00131		CYN .00107		CYN .00027		CYN 00124		СҮN . 00698
113 TABULAT	0) B26C9F7M7			£0.	CY 00220	.47	CY .00000	.06	сҮ 04694	60.	CY .010 39	.27	СҮ . 00278	10 .	CY 04150
VO	3(CAL 184-22		000 IN. XO 000 IN. YO 000 IN. ZO	- LINA	СLM . 03929	- TINA	CLM .02917	= 'I/NJ	CLM .04358	RN/L -	CLM .03619	RN/L =	CLM . 03025	- T/N	CLM . 03422
	0411		• 1076.7 • .0 • 375.0	53/ 0	CA .10940	22/ 0	CA .07274	27/ O	CA .11340	80/0	CA .11150	0 /6/	CA .08830	18/ 0	CA .13570
		E DATA	FT. XMRP HES YMRP HES 2MRP	RUN NO.	CN 1.07600	RUN NO.	CN 1.11900	RUN NO.	CN 1.13700	RUN NO.	CN 1.12000	RUN NO.	CN 1.10400	RUN NO.	CN 1.09700
		REFERENC	690.0000 50. 474.8000 INC 936.7000 INC		ALPHA 40.000		ALPHA 40.020		ALPHA 40.170		ALPHA 40.000		ALPHA 40.030		AL PHA 40.000
			SREF = 2 .REF = - .SCALE = .		MACH 10.100		MACH 10.530		MACH 13.910		MACH 14.940		MACH 15.210		MACH 15.240

OALLS TABULATED SOURCE DATA



				9	113(CAL 184-25	0) B26C9F7M7N	28111 1116E	CH4 VBR5		(SUHDO	¥ 92) (}	њ 15 С
	REFE	RENCE DA	TA							PARAMETRIC	DATA	
SREF = LREF = BREF = SCALE =	2690.0000 474.8000 936.7000 .0100	SQ.FT. INCHES INCHES	X MRP YMRP ZMRP	101 11 11	5.0000 IN. X0 .0000 IN. Y0 5.0000 IN. Z0				ALPHA = ELEVON = RUDDER = PHI =	000 000 000 000 000	BETA = BOFLAP = SPOBRK = AILRON =	.000 -11.700 .000
			RUN NO.	5 3/ (- HN/L -	E 0.						
MACH 10.100	ALPHA	B 0	IAR 13976	VLBAR .04017	T• 7 2487.00000	REFTL .03479	SORTC + . 73450	р1701 . 49 99 0	P(15) .00025	H(M) 3.23700	T (M) 539.00000	C(CP) 0123
		_	RUN NO.	22/ (- TINY	.47						
MACH 10.530	ALPHA	87 0.	IAR 1309	VLBAR .01194	T• + 1018.0000	REFTL .50480	SQRTC+ .88330	P110T 1.35500	P(TS) .00025	н(µ) 3 .23700	T (W) 539.00000	C(CP) 01201
			RUN NO.	27/ (D RN/L =	90.						
MACH 13.910	ALPHA	87.0	JAR 13919	VLBAR 0380	T+ 1 2429.00000	REFTL .0667 5	SQRTC+ . 72810	P1101 .52200	P(TS) .00023	H(H) 3.24300	T (M) 540.0000	C (CP) 00604
			RUN NO.	90/ (D RN/L -	60 .						
MACH 14.940	ALPHA	8 °.	JAR 13949	VLBAR . 0362f	T• 5 1697.00000	REFTL .09305	SQRTC• . 80620	PITOT . 34090	P(TS) .00023	H(H) 3.25500	T (M) 542.00000	C (CP) 00433
			RUN NO.	19/	= J/Ng 0	. <i>2</i> 7						
MACH 15.210	ALPHA	87 O.	JAR 122 96	VLBAR .02096	T+ B 1674.00000	REF TL . 28900	SORTC+ . 81190	P1 T0T . 99810	P(TS) .00019	н(н) 3.25500	T (H) 542.00000	C (CP) 00495
			RUN NO.	18/ (D RN/L -	đ.						
MACH 15.24(ALPHA	¥ °.	3AR 15842	VLBAR .0533	T• 2 1670.00000	REFTL .04499	SORTC* .81290	PI TOT . 15410	P(TS) .00021	H(H) 3.24300	T (H) 540.00000	C (CP) 00231

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DAILS TABULATED SOURCE DATA

о Ж	4 75 J		000. 000.		MU 26.23000		MU 8.61100		MU 14.37000		MU 8.33200		MU 7.91800		MU 7.86300
PAC	0 (25 AF	DATA	BETA = BDFLAP = SPDBRK = AILRON =		RHO . 94 34 0		RHO 7.74300		RHO . 997 50		RHO . 98890		RH0 2.94300		RHO .45530
	(TUHDO	PARAMETRIC	000.0 1 000.0 1		Q(PS1) .26520		Q(PSI) .73340		Q(PS1) .27710		Q(PS1) 18260		0(PSI) 53480		Q(PSI) .08259
			ALPHA = ELEVON = RUDDER = PHI		р . 00371		Р . 00944		Р . 00204		Р .00117		Р .00330		Р .00051
ATA	544 VB45				T 330.30000		T 102.40000		T 172.00000		1 99.03000		T 94.12000		T 93.47000
OAII3 TABULATED SOURCE	-220) B26C9F7M7N28N77 W11		9 9 9	.03	T(0) U 5641.00000 8997.00000	.47	T(0) U 2245.00000 5223.00000	90.	T(0) U 5556.00000 8944.00000	60.	T(0) U 3958.00000 7292.00000	.27	T(0) U 3907.00000 7234.00000	*O.	T(0) U 3893.00000 7227.00000
	13(CAL 184-		7000 IN. 0000 IN. 0000 IN.	RN/L =	H(0) 42.57000	- I/NJ	H(0) 14.29000	En/L =	H(0) H1 .14000	- RN/L	H(0) 27.26000	RN/L =	H(0) 26.80000	- TINA	н(0) 26.75000
	041		10 10 10 10 10 10 10 10 10 10 10 10 10 1	0. 23/ 0	P(0) 318.80000	0. 22/0	P(0) 606.80000	0. 27/0	P(0) 1448.00000	0. 80/ 0	P(0) 1016.00000	0. 79/ 0	P(0) 3105.00000	0. 18/ 0	P(0) 505.90000
		ICE DATA	.FT. XMA CHES YMA CHES ZMA	RUN N	M(1) 5.36400	RUN N	M(1) 2.89000	RUN N	H(1) 5.22500	RUN N	M(1) 4.14500	RUN N	M(1) 4.10800	RUN N	M(1) 4.11800
		REFEREN	2690.0000 50 474.8000 11 936.7000 1N .0100		ALPHA 40.000		AL PHA 40.020		ALPHA 40.170		ALPHA 40.000		ALPHA 40.030		ALPHA 40.000
			SREF = LREF = BREF = SCALE =		MACH 10.100		MACH 10.530		MACH 13.910		MACH 14.940		MACH 15.210		MACH 15.240

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و 10	€ 12 €		.000 .000 .000		PHN. .31610		PM4 .26330		PH4 .09182		PM4 . 60680	, 19 a		.000 -11.700 .000 .000		C(CP) 01186		C(CP) 00417		C (CP) - , 002 68
)¥d	17 C 22 V	DATA	BETA = BDFLAP = SPDBRK = A1LRON =		РМЗ .27570		РМ 3 .23700		PM3 .08312		РИЗ . 58900	5) (SS AF	DATA	BETA - BOFLAP - SPOBRK - AILRON - AILRON -		T (H) 531.00000		T (M) 537.00000		T (M) 540.00000
	(RUHOO	PARANETRIC	50.000 -40.000 .000 .000		PM2 . 28640		PM2 .23570		РМ2 . 08934		PH2 . 59680	ioohns i	PARAMETRIC	50.000 -40.000 -000		H(H) 3.16900		H(W) 3.22500		H(H) 3.24300
			ALPHA ELEVON = RUDDER = PHI		PM1 .23420		PH1 .20810		PM1 .08121		PM1 .45180			ALPHA ELEVON = RUDDER = PHI		P(TS) .0002 9		P(TS) .00029		P(TS) .00015
ATA	5487 443				CBL 00364		CBL 00151		CBL 00044		CBL 00316	E44 V8R5				P1 707 .44040		P1707 .36300		P1T0T .12800
ED SOURCE D	N2BN77 W116				CYN .00216		CYN . 00396		CYN .00122		CYN 00413	NZBN77 HIIB				SORTC+ ,70970		SQRTC• .78570		SQRTC• .81880
II3 TABULAT	0) B26C9F7H7			£0.	CY 02154	60.	CY 03475	. 0	сү 00687	.26	CY 01333)) B26C9F7M7			£0.	REFTL	60.	reftl. . 03865	* 0.	REFTL . O4546
04	3(CAL 184-22(000 IN. XO 000 IN. YO 000 IN. ZO	RN/L -	CLM . 08065	EN/L =	CLM . 04453	- T/NA	CLM . 04698	RN/L =	. 00000	3 (CAL 184-22(000 IN. XO 000 IN. YO 000 IN. ZO	- LINA	T* 963.00000	- T/NJ	T - 920.00000	- J/NB	T+ 736.0000
	0411		1076.7(.00 .375.00	0 /68	CA .10410	25/ 0	CA . 09952	15/ 0	CA .13220	0 //6	CA .08884	04113		- 1076.74 - 00 - 375.00	0 /66	VLBAR .04369 29	25/0	VLBAR .03488 19	15/ 0	VLBAR .05497 1
		C DATA	T. XMRP ES YMRP ES ZMRP	RUN NO.	CN 1.42400	RUN NO.	CN 1.51300	RUN NO.	CN 1.58700	RUN NO.	CN 1.59400		: DATA	T. XHRP ES YHRP ES ZHRP	RUN NO.	VBAR .04179	RUN NO.	VBAR . 03693	RUN NO.	VBAR . 05973
		REFERENCE	2690.0000 50.f 474.8000 INC 936.7000 INC 0100		ALPHA 50.000		AL PHA 50.000		ALPHA 50.000		AL PHA 49,980		REFERENCE	2690.0000 SQ.F 474.8000 INCF 936.7000 INCF 936.7000 INCF		ALPHA 50.000		AL PHA 50.000		AL PHA 50.000
			SREF = 1 LREF = BREF = 5 SCALE =		MACH 10.050		MACH 14.760		MACH 15.550		MACH 15.950			SREF - <i>i</i> LREF - <i>i</i> BREF - <i>i</i> SCALE -		MACH 10.050		MACH 14.760		MACH 15.550

= u	а С		.000 .11.700 .000		C(CP) 00383	R 75)		.000 .000 .000		HU 27.16000		MU 8.42600		HU 6.74900		MU 6.98800
PAG	51 (25 AP	CATA	BETA = BOFLAP = SPDBRK = AILRON =		T (H) 529.0000	() (22 AP	DATA	BETA = BDFLAP = SPOBRK = AILRON =		RH0 , 80460		Rн 0 1.06700		RH0 .41770		RH0 2.53900
	iodHns)	PARAMETRIC	50.000 -40.000 .000		H(W) 3.17700	(TUH005	PARAMETRIC	50.000 -40.000 .000		Q(PS1) .23340		Q(PS1) 19450		Q(PS1) .06769		01844.
			ALPHA ELEVON - RUDDER - PHI		P(TS) .00029			ALPHA = ELEVON = RUDDER = PHI		Р .00330		P .00127		р . 00040		P .00251
DATA	SE44 VBR5				P1101 .83580	SAU VBR5				T 344.20000		T 100.20000		T 80.24000		T 83.07000
TED SOURCE (INZBNT7 WI !!				SORTC+ .80480	N28N77 W116				U 140.0000		U 244.00000		U 831.00000		U 129.00000
AII3 TABULA	20) B26C9F7M			2 8	REFTL .27850	0) B26C9F7H1			.03	T(0) 753.00000 9	60.	T(0) 910.000007	đ.	T(0) 533.00000 6	28.	1(0) 792.00000 7
đ	13(CAL 184-2)		7000 IN. X0 0000 IN. Y0 0000 IN. Z0	- LINA	T* 859.0000	3(CAL 184-25		000 IN. X0 000 IN. Y0 000 IN. Z0	- TINA	H(0) 43.95000 5	RN/L =	H(0) 26.91000 3	- J/Ng	H(0) 23.88000 3	- JINA	н(о) 25.98000 3
	140		• 1076. 7 • • 375.(. 97/ 0	VLBAR .02252 1	OALI		- 1076.7 0 - 375.0	0/66 .	P (0) 282.90000	. 25/ 0	P(0) 013.00000	. 15/ 0	P(0) 432.40000	. 97/ 0	P(0) 219.00000
		KCE DATA	a, F.T. XMRA ICHES YMRA ICHES ZMRA	N NO	VBAR . 02432		CE DATA	I.F.T. XHRP CHES YHRP CHES ZHRP	RUN NO	M([) 5.55400	RUN NO	M(1) 4.15600 1	RUN NO	M(1) 3.86400	RUN NO	M(1) 4.14200 3
		REFEREN	2690.0000 S(474.8000 1) 936.7000 1)		AL PHA 49.980		REFEREN	2690.0000 SC 474.8000 IA 936.7000 IN .0100		ALPHA 50.000		ALPHA 50.000		ALPHA 50.000		AL PHA 49.980
			SREF * ; LREF * ; BREF * SCALE *		MACH 15.950			SREF = 6 LREF = 6 BREF = 6 SCALE =		MACH 10.050		MACH 14.760		MACH 15.550		MACH 15.950



2	54) (.000 .01.11 .000		PHI .38720		PH1 .04270	22		.000 11.700 .000		C(CP) 01161		C (CP) 00042
PACE) (25 APR	DATA	BETA = BDFLAP = - SPDBRK = AILRON =		PM3 .33410		PM3 . 03424	1) (25 APA	DATA	BETA = BOFLAP = - SPOBRK = AILRON =		T (M) 540.0000		T (M) 540.00000
	(RUH008	PARAMETRIC	30.000 -40.000 .000		PH2 .37650		РН2 .04271	900HNS)	PARAMETRIC	30.000 200.04- 000.000		н(м) 3.24300		H(H) 3.24300
		-	ALPHA - Elevon - Rudder - Phi -		РМ1 . 28110		рні .03273		-	ALPHA = ELEVON = RUDDER = PHI =		P(TS) .00023		P(TS) .00031
ŢĂ	144 VBR5				CBL .00142		CBL . 00148	5487 th				P1T0T 1.06700		P1707 .11800
D SOURCE DA	28117 HI 186				CYN 00018		CYN .00079	28N77 MI 16E				SORTC• .90390		50ATC+ .85260
13 TABULATEI	BEBCOFTHTN			.38	CY .00528	#0 .	CY .00173	BEGCOFTHTN			.38	REF 7L .41000	£.	REF TL . 03973
0A1	((CAL 184-220		00 IN. X0 00 IN. Y0 00 IN. Z0	- T/NA	CLM .03393	= HN/I	CLM . 02822	110741 184-220		00 IN. X0 00 IN. Y0 00 IN. Z0	- T/NH	T∙ 198.80000	- LINA	T• 80.00000
	04113		• 1076.70 • .00 • 375.00	10/ 0	CA .08235	8/ 0	CA .14890	EIIVO		• 1076.70 • .00 • 375.00	10/ 0	VLBAR .01350 8	8/0	VLBAR .05895 13
)ATA	XMRP YMRP ZMRP	RUN NO.	N 13560	RUN NO.	:N 72860		ATA	XHRP XMRP ZMRP	RUN NO.	BAR 01515	RUN NO.	1 8AR 06725
		REFERENCE D	0.0000 50.FT. 4.8000 INCHES 8.7000 INCHES .0100		ALPHA C 30.020		ALPHA C 30.000		REFERENCE D	0.0000 SQ.FT. 4.8000 INCHES 8.7000 INCHES .0100		ALPHA V 30.020		ALPHA V 30.000
			5REF = 269 .REF = 47 3REF = 93 SCALE = 93		MACH 10.740		MACH 15.720			ясг = 269 .Асг = 47 		MACH 10.740		MACH 15.720

!	0E 13 PR 75)		.000 -11.700 .000 .000		MU 8.32900		MU 7.00800	je se		000 . 000 . 000 .		P114 . 00000	A 75)		-11.700 000 0000		C(CP) 00053
i	PA 18) (25 A	CATA	BETA - BOFLAP - SPOBRK - AILRON -		RHO 6.06500		RHO . 36800	7) (25 A	DATA	BETA		PM3 . 03064	7) (25 AF	DATA	BETA BOFLAP = SPOBRK = Atlron =		T (M) 539.00000
	(TUH0(PARAMETRIC	30.000 000.04- 000.000		0(PSI) .57780		Q (PS1) .06329	00HO20	PARAME TRIC	30.05 000.04- 000.		PM2 .03756	.00HNS)	PARAMETRIC	30.000 000.04- 000.000		H(W) 3.23700
			ALPHA ELEVON • RUDDER • PH1		Р .00715		Р .000 37			ALPHA = ELEVON = RUDDER = PHI		PMI . 02933			ALPHA = Elevon = Rudder = Phi =		P(TS) .00023
	UATA BE44 VBR5				T 99.0000		T 83.32000	E44 VB45				CBL . 00057	244 V8R5				P1T0T .09837
	TN28N77 WI				U 3238.00000		U 1037.00000	DI IM LLNBRN				CYN . 00000	NZBN77 WI16				SQRTC+ . 86220
	20) B28C9F7M			.38	T (0) 254.0000	-04	T (0)	0) B26C9F7M			.03	CY .00000	0) B26C9F7H7			.03	REFTL .03662
č	0 13(CAL 184-22		7000 IN. XO 2000 IN. YO 2000 IN. ZO	RN/L =	H(O) 14.35000 2	RN/L -	H(0) 25.33000 3	3 (CAL 184-22		000 IN. XO 000 IN. YO 000 IN. ZO	- INA	СLM .02410	3(CAL 184-22)		000 IN. XO 000 IN. YO 000 IN. ZO	e 'l/Ny	T• 575.00000
	IVO		- 1076.7	0 /01 .	P(0) 526.00000	. 8/ 0	P(0) 438.30000	0411		1078.7 1078.7 375.0	0/6 .	CA .16170	OAL		1076.7(.00 .375.00	0/6	VLBAR .06449 13
		CE DATA	, FT. XMRF MES YMRF MES ZMRF	RUN NO	H(1) 2.89100	RUN NO	M(1) 3.89400		E DATA	FT . XMRP HES YMRP HES ZMRP	RUN NO	CN . 74660		E DATA	FT. XMRP HES YMRP HES ZMRP	RUN NO.	VBAR .07438
		REFEREN	2690.0000 SQ 474.8000 IN 936.7 000 IN .0100		ALPHA 30.020		ALPHA 30.000		REFERENC	2690.0000 SQ. 474.8000 INC 936.7000 INC .0100		AL PHA 30.000		REFERENC	1990.0000 SQ. 474.8000 INC 935.7000 INC .0100		ALPHA 30.000
			SREF LREF BREF SCALE		MACH 10.740		MACH 15.720			SREF =		MACH 16.510			SREF = ⁶ LREF = 6 BREF = 5 SCALE =		MACH 16.510



ž	a 75 -		.000 .000 .000		MU 6.34400	е С		000 000 000		PM4 . 06822		PM4 .02785	ج د 15		000 000 000		C(CP) 00462		C (CP) 00086
PAG	1) (25 API	DATA	BETA = BDFLAP = SPOBRK = A1LRON =		RHO . 30740	3) (25 AP	DATA	BETA = BDFLAP = SPDBRK = AILRON =		PH3 .05512		PM3 . 02246	3) (25 A ^p	DATA	BETA = Bufl ap = Spubrk = Ailron =		T (H) 541.000 00		T (M) 539.00000
	(TUH007	PARAMETRIC	000.02 000.04-		0(PSI) 05277	(RUH00	PARAMETRIC	20.000 .000 .000		PM2 . 07859		PM2 .03371	100HNS)	PARAMETRIC	000.05 .000 .000.		H(W) 3.24900		H(M) 3.23700
			ALPHA = Elevon = Rudder = Phi =		Р . 00028			ALPHA = ELEVON = RUDDER = PHI		PHI .05763		РМ1 .02397			ALPHA - ELEVON - RUDDER - PHI -		P(TS) .00 029		P(TS) .00029
ATA	CH4 VBR5				T 75.45000	E44 V8R5				CBL. 00018		CBL 00094	5487 443				P1107 . 35990		P1T0T .14600
to source d	428N77 W1161				U 332.00000	APPIN HILE				CYN - , 00009		CYN .00354	N28N77 W116				SQRTC+ . 85390		SQRTC• .87360
13 TABULATE) B26C9F7M7N			. 03	T(0) 104.00000 70)) B26C9F7M71			60.	сҮ 00277	ŧ.	CY 03525))826C9F7M7I			60.	REF TL . 10030	君.	REFTL .04810
041	31CAL 184-220		000 IN. X0 000 IN. Y0 000 IN. Z0	BN/L -	н(о) 25.24000 37	3 (CAL 184 -22(000 IN. XO 000 IN. YO 000 IN. ZO	- T/NA	CLM 00288	RN/L -	CLM 01614	3(CAL 184-22(000 IN. X0 000 IN. Y0 000 IN. Z0	= 1/NB	T• 261.00000	- TINA	T• 186.00000
	OALL		• 1076.7(• .0(• 375.0(0/8	P(0) 22.20000	OALL		• 1076.7(• .0 • 375.0	39/ 0	CA .10340	32/ 0	CA . 12540	OALI		1076.7 1076.7 375.0	39/ 0	VL6AR .03500 1	32/0	VLBAR . 05239 1
		DATA	T. XHRP ES YHRP ES ZHRP	RUN NO.	M(1) 3,99400 46		C DATA	T, XMRP €S YMRP €S ZMRP	RUN NO.	CN . 38360	RUN NO.	CN . 39170		E DATA	FT . XHRP ES YHRP ES ZHRP	RUN NO.	VBAR . 04029	RUN NO.	VBAR . 06108
		REFERENCE	580.0000 SQ.F 474.8000 INCF 938.7000 INCF .0100		AL PHA 30.000		REFERENCE	890.0000 SQ.f 474.8000 INC 936.7000 INC 0100		ALPHA 20.000	•	ALPHA 20.000		REFERENCI	2890.0000 50.1 474.8000 INC 936.7000 INC		ALPHA 20.000		ALPHA 20.000
			SREF = 2 LREF = 3 BREF = 5 SCALE =		MACH 16.510			SREF = 2 LREF = 2 BREF = 5 Scale =		MACH 14.940		MACH 15.330			SREF = 2 LREF = 2 BREF = 2 SCALE =		MACH 14.940		MACH 15.330

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12	{ 75 }		000 000		MU 8.21900		MU 7.23300	2		000 000 000		P M4 . 18680		P 11		PM4 .20840		PH4 .12560		PHN . 051 05
PA06	- 29 APF	DATA	BETA - BOFLAP - SPOBRK - ATLRON -		RHO 1.05900		RHO .46430	- 25 APR	DATA	BETA = BDFLAP = SPDBRK = AILRON =		РНЗ . 1607 0		PH3 .34770		PM3 .18010		PM3 .10760		PM3 . 04394
	(TUHDOB	PARAMETRIC	20 .000 .000 .000		Q(PS1)		Q(PS1) .07833	(RUH009	ARAMETRIC	30.000 .000 .000 .000		PM2 .19970		PM2 .42820		PM2 .22150		PM2 .13210		PM2 . 05444
		-	ALPHA = ELEVON = RUDDER = PHI		Р .001 23		Р - 00048			ALPHA = ELEVON = RUDDER = PHI =		PHI .15750		PM1 .29210		PM1 .16270		PM1 .10270		PMI .04670
ATA	E44 V8R5				T 97.69000		T 85.98000	544 V8R5				CBL .00150		CBL. 00082		CBL .00033		CBL 00010		CBL .00120
ED SOURCE D	N28N77 W116				U 243.00000		U 971.00000	ISI IM LLNBA				CYN .00067		CYN 00099		CYN .000 39		CYN 00120		CYN 00141
113 TABULAT	0) B26C9F7M7			60.	T(0) 811.00000 7	1 0.	T(0) 558.0000 6	0) 82609F7H71			EO .	CY .00360	**.	CY 00120	.07	CY .00149	60.	CY .00000	ħ0.	сҮ .00000
¥0	3(CAL 184-22		000 IN. XO 000 IN. YO 000 IN. ZO	- INA	H(0) 26.89000 3	- RN/L	H(0) 24.88000 3	3 (CAL 184-22)		000 IN. X0 000 IN. Y0 000 IN. Z0	= 1/Na	00991	EN/L =	CLM 01686	= T/Ny	СLM 00799	- RN/L	CLM 01314	EN/L =	CLM 01866
	0411		• 1076.7 • .0 • .375.0	39/ 0	P(0) 164.00000	32/0	P(0) 75.6000	OALL		 1076.7(0(375.0(0 /14	CA .11450	40/ 0	CA .07726	0 /11	CA .11160	0 / 16	CA .11120	33/ 0	CA . 14940
		CE DATA	.FT. XMRP CHES YMRP CHES ZMRP	RUN NO.	M(1) 4.12100 10	RUN NO.	M(!) 3.96200 4		CE DATA	.FT. XHRP CHES YHRP CHES ZHRP	RUN NO.	CN .76390	RUN NO.	CN . 80380	RUN NO.	CN . 76600	RUN NO.	CN . 78600	RUN NO.	CN .80360
		REFEREN	2590.0000 50 474.8000 IN 936.7000 IN .0100		ALPHA 20.000		ALPHA 20.000		REFEREM	690.0000 SQ 474.8000 IN 936.7000 IN 0100		ALPHA 30.000		ALPHA 30.000		AL PHA 30.000		ALPHA 30.000		ALPHA 30.000
			SREF = 2 LREF = 2 BREF = 5 SCALE =		MACH 14.940		MACH 15.330			SREF = 2 LREF = 2 BREF = 5 SCALE = 5		MACH 9.912		MACH 10.660		MACH 14.190		MACH 15.040		MACH 15.440



				V O	113 TABULATE	ED SOURCE D	ATA				2
			041	113(CAL 184-22(0) B26C9F7M7N	428N77 H116E	E44 VBR5		(RUH00	8) (25 APR	Ŕ
	REFER	ENCE DATA						-	PARAMETRIC	DATA	
SREF = LREF = BREF = SCALE =	2690.0000 474.8000 936.7000	SQ.FT. XHRP INCHES YHRP INCHES ZHRP	078. 375.	.7000 IN. XO .0000 IN. YO .0000 IN. ZO				ALPHA = ELEVON = RUDOER = PHI =	30.000 .000 .000 .000	BETA = BOFLAP = SPOBRK = AILRON =	000 000 000
		RUN NO). 74/ 0	- T/NJ	ŧ.						
MACH 15.910	ALPHA 30.030	CN . 82650	CA .09258	CLM 01203	CY .00421	CYN .00079	CBL .00087	PHI .22740	PH2 . 32480	PM3 . 25470	PHN . 29370
			0 4 1	113(CAL 184-22(0) B26C9F7M7N	EBN77 HI 166	E44 VBR5		(CHIDO	9) (25 APR	75)
	REFER	ENCE DATA							PARAMETRIC	DATA	
SREF = LREF = BREF = SCALE =	2690.0000 1 474.8000 936.7000	SQ.FT. XHRP INCHES YHRP INCHES ZHRP	1076.	.7000 IN. XO .0000 IN. YO .0000 IN. ZO				ALPHA = ELEVON = RUDOER = PHI =	000.02 000.02	BETA = BOFLAP = SPDBRK = AILRON =	000.
		RUN NO). 41/ 0	- I/NA	£0.						
MACH 9.912	ALPHA 30.000	VBAR . 04038	VLBAR . 03958	T+ 2166.00000	REFTL .03474	SORTC+ . 75940	P1 T0T . 52550	P(TS) .0002 3	H(W) 3.24906	T (M) 541.00000	C (CP) 01260
		RUN NO). 40/ D	- HNI	**.						
MACH 10.660	ALPHA 30.000	VBAR .01420	VLBAR .01257	T.* 854.90000	REFTL .47190	SORTC+ .91580	P1 T0T 1.11500	P(TS) .00029	H(W) 3.24900	T (H) 541.00000	C(CP) 01165
		RUN NO	. 77/ 0	- T/NJ	.07						
MACH 14.190	ALPHA 30.000	VBAR . 03844	VLBAR .03598	T• 2087.00000	REF TL .07701	SQRTC+ .75200	P1101 .58730	P(TS) .0002 3	H(H) 3.25500	T (M) 542.00000	C (CP) 00583
		RUN NC	0.34/0	- HNA	60.						
MACH 15.040	AL PHA 30.000	VBAR .039 97	VLBAR . 03558	T+ 1451.00000	REFTL .09820	SORTC+ .83260	Р1 ТОТ . 34960	P(TS) .00023	H(H) 3.24300	T (M) 540.00000	C(CP) 00431
		RUN K	0 / 33/ 0	- LINA	- D t						
MACH 15.440	AL PHA 30.000	VBAR .06168	VLBAR . 05438	T + 1396,00000	REFTL .04487	50RTC+ .84640	P1T0T .14120	P(TS) .000 35	H(H) 3.24300	T (M) 540.00000	C(CP)
		RUN N	0. 74/ 0	e J/Na	ź.						
MACH 15.910	ALPHA 30.030	VBAR . 02623	VLBAR . 02306	T+ 1435.00000	REFTL .28210	50RTC+ .84410	P1101 .81940	P(TS) .00023	H(H) 3.23100	T (M) 538.00000	C(CP) 00415

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ЭЕ 17	. 57. 84		000 000 000		MU 27.39000		MU 7.85500		MU 13.95000		MU 8.13900		MU 7.37200		HU 7.19100
PA	9) (25 A	DATA	BETA = BOFLAP = SPDBRK = AILRON =		RHO .97680		RHO 6.82900		RHO 1.11200		RHO 1.02500		RH0 .43420		RH0 2.43000
	(TUH00	PARAMETRIC	30,000 .000 .000		Q(PSI) 27860		0(PSI) (124)0		0(PS1) .31170		0(PS1) .18730		0(PSI) .07572		01624.
			ALPHA = ELEVON = RUDDER = PHI		Р . 004 05		Р .00760		Р .00221		P .00118		₽ .00045		Р .00248
DATA	3544 VBR5				T 347.70000		T 93.36000		T 166.80000		T 96.74000		T 87.63000		T 85.49000
ABULATED SOURCE	COFTHTN26NTT WILL) U 000 9063.00000		000 5049.00000		ט 000 8984,0000) U 000 7255.00000		000 7087.00000		000 7214.00000
04113 TJ	-220)828(2 2 2	£0°	T (0 5716.00	**.	T (0 2100.00	.07	T(0) 5596.00	60.	T (0) 3921.000	đ.	T (0) 3763.000	ź.	T (0) 3878.000
	13(CAL 184		7000 IN. 0000 IN. 0000 IN.	RN/L -	H(0) 43.2700(EN/L =	H(0) 13.34000	- RN/L	H(0) 41.47000	BN/L =	H(0) 26.97000	RN/L =	н(о) 25.70000	- Ina	H(0) 26.6000
	OAI		80 = 1076. 19 = 375.	0. 41/ 0	P(0) 312.50000	0. 40/ 0	P(0) 522.00000	0. 77/ 0	P(0) 1794.00000	D. 34/ D	P(0) 1069.00000	0. 33/ 0	P(0) 483.20000). 74/ 0	P(0) 1159.00000
		CE DATA	.FT. XMR CHES YMR CHES ZMR	RUN N	M(1) 5.39400	RUN N	M(1) 2.75800	RUN N	M(1) 5.22800	RUN M	M(1) 4.13700	n n	M(1) 4.02700	RUN M	M(1) 4.12300 3
		REFEREN	2690.0000 SQ 474.8000 IN 936.7000 IN .0100		ALPHA 30.000		AL PHA 30.000		ALPHA 30.000		ALPHA 30.000		AL PHA 30.000		AL PHA 30.030
			SREF = LREF = BREF = SCALE =		MACH 9.912		MACH 10.660		MACH 14.190		MACH 15.040		MACH 15.440		MACH 15.910

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			OAL	13(CAL 184-25	20) 828C9F7H7	NZBN77 HI 16	5787 443		(RUHO)	0) (22 M	- FF #
	REFER	ENCE DATA							PARAMETRIC	DATA	
SREF = LREF = BREF = SCALE =	2690.0000 5 474.8000 5 936.7000 1	SQ.FT. XMRP INCHES YMRP INCHES ZMRP	• 1076. • <u>-</u> .	7000 IN. X0 0000 IN. Y0 0000 IN. Z0				ALPHA - ELEVON - RUDDER - PHI	30.000 .000 .000	GETA	5.000 .000 .000
		RUN NO.	116/ 0	- INA	60.						
HACH 15.090	ALPHA 30.370	CN .85270	CA .12680	CLM 01754	сҮ - , 03945	CYN 01005	CBL 00744	PM1 .09400	PH2 .11140	рн3 . 09850	PH4 11010
		RUN NO.	45/ 0	- INA	1 0.						
MACH 15.570	AL PHA 30.400	CN .84810	CA .15260	сLM 02061	CY 05067	CYN 01076	CBL - , 00880	PH1 .04724	PM2 . 04994	рнз . 04614	PH1. . 05050
		RUN NO.	115/ 0	- HNIL	82.						
MACH 15.910	AL PHA 30.370	CN .86410	CA . 098 96	CLM 02382	CY 04428	CYN 01034	CBL - , 00906	1 M1 .22140	PM2 . 30590	рн 3 .27760	PN4 .29810
			IVO	13(CAL 184-22	10) B26C9F7M7	NZBN77 W116	544 1845		(SUHD1	0) (25 A	е С 85 ж.
	REFERE	INCE DATA							PARAMETRIC	DATA	
SREF = LREF = BREF = SCALE =	2690.0000 5 474.8000 1 936.7000 1 .0100	SQ.FT. XMRP INCHES YMRP INCHES ZMRP	1076. 375.	7000 IN. XO 0000 IN. YO 0000 IN. ZO				ALPHA - ELEVON - RUDDER - PHI	30 .000 .000 .000	BETA = BOFLAP = SPOBRK = A1LRON =	5.000 .000 .000 .000
		RUN NO.	116/ 0	RN/L -	6 0 .						
MACH 15.090	AL PHA 30.370	VBAR .04183	VLBAR .03710	T• 1405.00000	REFTL .09207	50RTC+ .84140	P1101 .30520	P(TS) .00027	H(H) 3.20100	T (H) 533.00000	C (CP) 00344
		RUN NO.	45/0	- TINH	1 0.						
MACH 15.570	ALPHA 30.400	VBAR .06231	VLBAR . 05493	T* 1416.00000	REFTL .04453	SORTC+ .84480	P1T0T .13980	P(TS) .00023	H(H) 3.26100	T (H) 543.00000	C(CP) 00124
		RUN NO.	115/ 0	EN/L -	Ŕ						
MACH 15.910	ALPHA 30.370	VBAR .02568	VLBAR .02253	T+ 1406.00000	REF TL . 27720	50RTC+ .84970	P110T .83050	P(TS) .000 29	H(H) 3.19500	T (H) 532.00000	C (CP) 00408

OAII3 TABULATED SOURCE DATA

6 	14 75)		5.000 .000 .000 .000		HU 7.74900		MU 7.31800		MU 6.99200	R 75)		000 ·		P M . .25780		Pre-		PHH . 32960		P## . 16440
PAG	0) (25 AF	DATA	BETA - BDFLAP - SPDBRK - ATLRON -		RH0 .93470		RH0 .42580		RH O 2,53500	1) (25 AP	DATA	BETA = BDFLAP = SPDBRK = A1LRON =		PM3 .23020		РМ3 .64010		PM3 .28770		РМЗ . 14300
	(TUH01)	PARAMETRIC	000 . 0E		Q(PS1) .16360		46420.		06244.	(10H07)	PARAMETRIC	000.0 1 000. 000.		PM2 .25710		PM2 .74680		PM2 .33370		PM2 . 15180
			ALPHA ELEVON - RUDDER - PHI		P .00103		P . 00044		P .00251			ALPHA = ELEVON = RUDDER = PH1 =		PM1 .21150		PM1 .57400		PM1 . 25330		PM1 . 13660
DATA	SE44 VBR5				T 92.11000		T 86.99000		T 83.13000	E44 V8R5				CBL 00022		CBL .00290		CBL 00073		CBL 00131
ted source (INZBN77 WII				U 100.0000		U 119.0000		U 113.00000	NZBN77 WILE				CYN . 00100		CYN . 00260		CYN 00021		CYN 00136
VII3 TABULA	20) B26C9F7M			60.	T(0) 5772.00000 7	5.	T(0) 5794.00000 7	58.	T (0) 1781 . 00000 7	0)B26C9F7M7			£0.	CY .00705	.47	CY .01418	.07	CY 00130	.08	CY 00217
õ	13(CAL 184-26		7000 IN. X0 3000 IN. Y0 3000 IN. Z0	RN/L -	H(0) 25.83000 3	EN/L -	H(0) 25.93000 3	- RN/L	н(о) 25.87000 3	3(CAL 184-22		000 IN. X0 000 IN. Y0 000 IN. Z0	- TINA	CLM -, 03543	RN/L =	CLM 04672	- FN/A	CLM 02105	- JINU	сLM 03921
	OAL		• 1076.7 • 375.0	116/ 0	P(0) 328.10000	45/ 0	P(0) 199.70000	115/ 0	P(0) 55.00000	0411		• 1076.7 • .0 • 375.0	12/ O	CA .11050	0 / 11	CA .07050	76/ 0	CA .10960	35/ 0	CA .11400
		ICE DATA	1.FT. XMRP ACHES YMRP ACHES ZMRP	RUN NO.	M(1) 4.09400	RUN NO.	M([) 4.02300 4	RUN NO.	M(1) 4.10800 31		CE DATA	I.F.T. XMRP ICHES YMRP ICHES ZMRP	RUN NO.	CN 1.17700	RUN NO.	CN 1.17800	RUN NO.	CN 1.17200	RUN NO.	CN 1.16400
		REFEREN	2690.0000 SC 474.8000 IN 936.7000 IN .0100		ALPHA 30.370		ALPHA 30.400		ALPHA 30.370		REFEREN	2690.0000 SO 474.8000 IN 936.7000 IN .0100		AL PHA 39.980		ALPHA 40.030		40.000		ALPHA 40.000
			SREF = LREF = BREF = SCALE =		MACH 15.090		MACH 15.570		MACH 15.910			SREF = LREF = BREF = SCALE =		MACH 10.080		MACH 10.540		MACH 13.520		MACH 15.170

					10-181-12.12	0.826095747	Sentry Hilds	E44 VBR5		(RUHO1)	1) (35 APR	Ŕ
					21 CMP 104 - EE							
	REFER	ENCE DATA							-	PARAMETRIC	DATA	
SREF = LREF = BREF = SCALE =	2690.0000 474.8000 938.7000 .0100	SQ.FT. XMR INCHES YMR INCHES ZMR		1076.7 .0 375.0	000 IN. X0 000 IN. Y0 000 IN. Z0				ALPHA = ELEVON = RUDDER = PHI =	000 000 000 000	BETA = BOFLAP = SPOBRK = AILRON =	000 000 000
		RUN M	<u>.</u>	5/0	- T/NA	ŧ.						
MACH 15.730	ALPHA 40.020	CN 1.17400	S O.	1668	CLM 03787	CY 00513	СҮN 00190	CBL 00 262	PH1 . 30950	PH2 .40370	PM3 .35400	PH4 .40350
		RUN W	м С.	6/0	RN/L =	4 0.						
MACH 15.890	ALPHA 40.000	CN 1.18400	5 .	5650	03805	CY 00740	сун 00028	00041	РМ1 . 0600 3	PM2 .06750	РМ3 . 05900	Pm4 .06764
				1 I VO	3(CAL 184-22	0) B26C9F7H7I	N28N77 W1164	244 VBR5		10HNS)	1) (25 API	6
	REFER	RENCE DATA								PARAMETRIC	DATA	
SREF = LREF = BREF = SCALE =	2690.0000 474.8000 936.7000 .0100	SQ.FT. XHR INCHES YHR INCHES ZHR		1076.7 .0 375.0	000 IN. XO 000 IN. YO 000 IN. ZO				ALPHA = ELEVON = RUDDER = PHI	000.0 1 000. 000.	BETA	000 000 000
		RUN M		2/ 0	RN/L =	E0.						
MACH 10.080	AL PHA 39.98(VBAR 0 .04038	50	.BAR 14086 2	T+ 534.0000	REFTL .03347	SORTC• .73310	P1 TOT .49410	P(TS) .00023	H(H) 3.22500	T (M) 537.00000	C(CP) 01009
		N ND	Э	0 / 1	- LINA	۲۲.						
MACH 10.540	ALPHA 40.03	VBAR 0 .01300	3.5	.BAR 1190 1	T+ 044.0000	REFTL .50560	SORTC+ .87730	P1101 1.42500	P(TS) .00023	H(W) 3.24300	T (M) 540.00000	C(CP) 01179
		RUN N	, o	16/ D	- RN/L	.07						
MACH 13.520	ALPHA 40.00	VBAR 0 .03574	3.5	-BAR)3482 2	T* 2450.00000	REF TL . 07545	SORTC+ .72600	P1101 .63330	P(TS) .00023	H(H) 3.25500	T (M) 542.00 00	C (CP) 00636
		run n	ġ.	35/ 0	- INN	.08						
MACH 15.170	ALPHA 40.00	VBAR 0 .04104	3.2	-BAR 33751 1	T+ 1671.00000	REFTL . 09009	SORTC* .81190	P1707 .31260	P(TS) .0002 3	H(H) 3.21900	T (H) 536.00000	C (CP) 00392
		n ndr	ç	75/ 0	EN/L =	Ŕ.						
MACH 15.730	ALPHA 40.02	VBAR 0 .02576	5 .	-BAR 12324 1	T+ 1606.00000	REF TL . 25550	SORTC • . 82760	P1707 .76680	P(TS) .0002 3	H(H) 3.24300	T (H) 540.00000	C (CP) 00460

DAII3 TABULATED SOURCE DATA

5	- 57 ¥		0 00 000		C (CP) 00055	- 51 ¥		000		MU 26.70000		MU 8.89100		MU 15.33000		MU 7.95500		MU 7.05300		MU 6.74300
Ă		DATA	9ETA - 9DFLAP - SPDBRK - AILRON -		T (H) 537.00000	17 C 52 V	DATA	BETA - BDFLAP - SPOBRK - AILRON -		RH0 .91600		RHO 7.87300		RHO 1.19700		RHO .92140		RHO 2.37200		RHO .40680
	10HNS)	PARAMETRIC	000.04 000.		H(H) 3.22500	(10H01	PARAMETRIC	000 000 000 000		0(PSI) 26190		0(PSI) 04177.		Q(PS1) .33600		Q(PS1) .16750		0(PSI) 05114.		0(PS1) .06880
			ALPHA - ELEVON - RUDDER - PHI		P(TS) .00025			ALPHA = ELEVON = RUDDER = PHI		Р . 00368		Р . 00992		Р .00262		Р .00104		Р .00237		Р . 000 3 9
DATA	0E44 V8R5				P 1707 .12820	3644 V8R5				T 337.30000		T 105.70000		T 183.90000		T 84.56000		T 83.85000		T 80.18000
TED SOURCE	TN28N77 HII				SQRTC• .83500	11 M LL 11				U 1075.00000		U 1312.00000		U 1993.00000		U 236.0000		U 066.00000		U 980.0000
AII3 TABULA	20) B28C9F7M			* D.	REFTL .04526	201828C9F7M			£0.	T(0) 1709.00000 5	747	T(0) 306.00000 5	.07	T(0) 615.0000 B	80.	T(0) 897.00000 7	ŧ.	T(0) 747.000 00 7	÷0.	T(0) 559.00000 8
o	13(CAL 184-2		7000 IN. XO 0000 IN. YO 0000 IN. ZO	- INA	T• 1571.00000	13(CAL 184-25		7000 IN. X0 0000 IN. Y0 0000 IN. Z0	- TINA	H(0) 43.32000 5	RN/L -	H(0) 14.78000 2	RN/L =	H(0) 41.65000 5	- JINY	H(0) 26.82000 3	EN/L =	H(0) 25.53000 3	EN/L =	H(0) 24.90000 30
	OAI		9 1078. 375.). 36/ 0	VLBAR .05598	OAL		1078.7 • • .0 • 375.0	. 42/ 0	P(0) 317.50000	0 /11 .	P(0) 645.50000	. 76/ 0	P(0) 548.00000	. 35/ 0	P(0) 995.10000	. 75/ 0	P(0) 757.00000	36/ 0	P(0) 97.80000
		VCE DATA	J.FT. XHRI KCHES YHRI KCHES ZHRI	RUN NC	VBAR . 06239		ICE DATA	J. F.T. XMRF ICHES YMRF ICHES ZMRR	RUN NO	M(1) 5.44100	RUN NO	M(1) 2.91800	RUN NO	H(1) 5.24100 1	RUN NO	H(1) 4.15600	RUN NO	H(1) 4.01400 2'	RUN NO.	M(]) 3.98000 4
		REFERE	2690.0000 St 474.8000 11 936.7000 11 936.000 11		ALPHA 40.000		REFEREN	2590.0000 50 474.8000 1A 935.7000 1A		AL PHA 39.980		ALPHA 40.030		AL PHA 40.000		ALPHA 40.000		ALPHA 40.020		ALPHA 40.000
			SREF = ; LREF = ; BREF = SCALE =		MACH 15.890			sref = 2 Lref = 2 Bref = 5 Scale =		MACH 10.080		MACH 10.540		MACH 13.520		MACH 15.170		MACH 15.730		MACH 15.890

55	13		000 ·		PM4 .31940		PH4 . 23990		Prt. .63510		P#14 . 09192	R 75)		0 00 000 000		C (CP) 01226		C(CP) 00421		C (CP) 00384
PAG	FR 25 1	DATA	BETA		РМ 3 . 28550		РМ3 .21750		РН3 .58780		РН3 . 08280	e) (25 AP	DATA	BETA ====================================		T (M) 531.00000		T (M) 540.00000		T (H) 531.00000
	(RUHO 12	ARAMETRIC	50.000 .000 .000		РМ2 .28100		PM2 .22490		PH/2 .61110		РН2 .08927	(SUHD1	PARAMETRIC	50.000 .000 .000		H(H) 3.18900		H(H) 3.24300		H(H) 3.18900
		-	ALPHA = ELEVON = RUDDER = PHI =		PM1 . 22830		РМ1 . 19290		РМ1 .48790		PM1 .07976			ALPHA = ELEVON = RUDDER = PHI		P(TS) .00029		P(TS) .0002 3		P(TS) .000 33
UTA .	144 VBR5				CBL - , 00460		CBL 00215		CBL. 00392		CBL 00014	E44 VBR5				P1T0T .44450		P1101 .33120		P1101 .87480
D SOURCE DA	28N77 W116E				CYN .00101		CYN 00156		CYN . 00420		CYN 00058	191 IM LLN82				SORTC+		SORTC• .78550		SORTC+ .80220
13 TABULATE) B26C9F7H7N			٤٥.	CY 01823	60.	сҮ .00000	82.	cY 01615	1 0.	CY 00538	I) B26C9F7M7h			.03	REF TL . 03030	60.	REFTL .09215	.26	REFTL .28410
041	11041184-220		00 IN. XO 00 IN. YO 10 IN. ZO	- TIN	СLM 01672	EN/L -	сLM 07951	EN/L =	сLM 07864	RN/L =	CLM 05880	51CAL 184-220		00 IN. X0 00 IN. Y0 00 IN. Z0	BN/L =	T* 901.00000	RN/L -	T* 849.00000	- T/NJ	T+ B66.0000
	E1140		• 1076.70 • .00 • .375.00	100/ 0	CA .10400	38/ 0	CA .10490	101/ 0	CA .08301	37/ 0	CA .12750	EI IVO		- 1076.70 00 - 375.00	100/ 0	VLBAR .04285 21	38/ 0	VLBAR .03687 1	101/ 0	VLBAR .02206 11
		C DATA	T, XHRP ES YHRP ES ZMRP	RUN NO.	CN 1.59000	RUN NO.	CN 1.66100	RUN NO.	CN 1.66400	RUN NO.	CN 1.65200		E DATA	FT XHRP ES YHRP ES ZHRP	RUN NO.	VBAR . 04105	RUN NO.	VBAR . 03915	RUN NO.	VBAR . 02376
		REFERENCE	890.0000 50.5 474.8000 INCH 938.7000 INCH		ALPHA 50.000		ALPHA 50.030		ALPHA 50.000		AL PHA 50.030		REFERENCI	2690.0000 SQ.1 474.8000 INCI 936.7000 INCI 0100		ALPHA 50.000		ALPHA 50.030		AL PHA 50.000
			SREF = 2 LREF = 8 BREF = 5 SCALE =		MACH 10.040		MACH 15.130		MACH 15.790		MACH 15.890			SREF = 6 LREF = 6 BREF = 6 SCALE =		MACH 10.040		MACH 15,130		MACH 15.790

£ 23	14 75 J		000 000		C (CP) 00085	R 75)		000 ·		MU 26.67000		MU 8.15800		MU 7.15800		MU 6.61000
PAC		DATA	BETA = BDFLAP = SPDBRK = AILRON =		T (W) 538.00000	av 53 AP	DATA	BETA = BOFLAP = SPOBRK = A1LRON =		RHO .83200		RHO .95720		RHO 2.64900		RHO .40830
	lohns)	PARAMETRIC	50.000 .000 .000		H(W) 3.23100	(TUH018	PARAMETRIC	50.000 .000 .000		Q(PS1) .23570		04271.		00694.		0(PSI) 06766
			ALPHA = ELEVON = RUDDER = PH1 =		P(TS) .00025		-	ALPHA = ELEVON = RUDDER = PH1		Р .00334		۹ 00111		Р . 002 69		P .00038
0474	3E44 VBR5				P1 TOT . 12600	E44 VBR5				T 336.80000		T 96.97000		T 85.09000		T 78.60000
LED SOURCE [11 M LLNB2N1				SORTC+ .81770	N28N77 W116				U 032.00000		U 308.00000		U 141.00000		U 308.00000
VII3 TABULA	201826C9F7M			40.	REFTL .04587	0) B26C9F7M7			£0°	T(0) 654.00000 9	60.	T(0) 966.00000 7	.28	T(0) 906.00000 7	۰ ۵ ۰	T(0) 596.00000 89
õ	13(CAL 184-26		7000 IN. X0 3000 IN. Y0 3000 IN. Z0	- LINA	T• 767.00000	3(CAL 184-22		000 IN. XO 000 IN. YO 000 IN. ZO	RN/L -	H(0) 42.92000 5	- T/NA	H(0) 27.34000 3	- INA	H(0) 26.08000 3	- RN/L	H(0) 24.40000 3
	041		1076.7 375.0	. 37/ 0	VLBAR .05575 1	OALL		1076.7 1076.7 375.0	. 100/ 0	P(0) 278.00000	. 38/ 0	P(0) 049.00000	0 /101 .	P(0) 212.00000	37/ 0	P(0) 84.10000
		KE DATA	I.FT. XMRP CHES YMRP CHES ZMRP	RUN NO	VBAR . 06066		CE DATA	.FT. XMRP CHES YMRP CHES ZMRP	RUN NO	M(1) 5.47800	RUN NO	M(1) 4.16800 1(RUN NO.	M(1) 4.13500 32	RUN NO.	M(1) 3.92600 4
		REFEREN	2690.0000 SC 474.8000 IN 936.7000 IN .0100		ALPHA 50.030		REFEREN	690.0000 SQ 474.8000 IN 936.7000 IN .0100		ALPHA 50.000		ALPHA 50.030		ALPHA 50.000		ALPHA 50.030
			SREF = 6 LREF = 6 BREF = 5 SCALE =		MACH 15.890			SREF = 2 LREF = BREF = SCALE =		MACH 10.040		MACH 15.130		MACH 15.790		MACH 15.890

					OAL	13 TABULATE	D SOURCE DI	ATA			PAG	τ. Ψ
				04113	3 (CAL 184-220	1) B26C9F7M7N	IZBNTT HIIGE	544 VB45		(RUHDE)	3) (25 AP	R 75)
	REFER	ENCE DATA								PARAMETRIC	DATA	
SREF - LREF - BREF - SCALE -	2690.0000 474.8000 936.7000 .0100	SQ.FT. XHRP INCHES YHRP INCHES ZHRP		1078.71 .01 375.0(000 IN. X0 000 IN. Y0 000 IN. Z0				ALPHA = ELEVON = RUDDER = PHI	20.000 12.000 .000	BETA BOFLAP BOFLAP SPOBRK = AILRON =	.000 16.300 .000
		RUN NO		B/ 0	- TINA	£0.						
MACH 10.040	AL PHA 20.030	CN .45280	S I	2790	CLM 05150	CY 00788	CYN 00143	CBL 00059	РМ1 . 07255	Р М2 . 09629	Ри3 .06599	PHN . 08507
		RUN NO	ត	8/ 0	RN/L =	60.						
MACH 14.960	ALPHA 20.030	CN .44310	S I	2940	CLM 05479	CY .00277	CYN . 00143	CBL .00026	PM1 .05514	PM2 .07544	Рм3 . 0503 9	PH% .06237
		RUN NO	ni -	0 //	- T/NJ	ŧ.						
MACH 15.420	AL PHA 20.030	CN .45590	S	5640	СLM 06087	CY .00000	CYN .00136	CBL .00050	PM1 .02681	PM2 .03462	PM3 .022 34	PH1 .02834
		RUN NO	56	5/ 0	- INA	٤٦.						
MACH 15.800	AL PHA 20.030	CN , 45540	S	0640	CLM 05873	CY 00936	CYN . 00027	CBL 00097	PM1 .14050	PM2 .20980	РМ3 . 14500	PH4 . 16740
				0411	3(CAL 184-220	I) B26C9F7H7N	1911H LUNG	544 1845		(10HNS)	3) (52 M	ж С
	REFER	ENCE DATA								PARAMETRIC	DATA	
SREF = LREF = BREF = SCALE =	2690.0000 474.8000 936.7000	SQ.FT. XHRP INCHES YHRP INCHES ZHRP		1076.7 .0 375.0	000 IN. XO 000 IN. YO 000 IN. ZO				ALPHA - ELEVON - RUDDER - PHI -	20.000 12.000 .000	BETA = BDFLAP = SPDBRK = AILRON =	. 000 16.300 . 000
		RUN NO	ō.	6/0	EN/L =	.03						
MACH 10.040	ALPHA 20.030	VBAR . 04534	<u>, 5</u>	BAR 4310 1	T* 890.00000	REF7L .02988	50RTC+ .78050	P1 T0T .45360	P(TS) .00029	H(H) 3.19500	T (H) 532.00000	C(CP) 01231
		RUN NO	°.	8/ 0	= T/NB	60.						
MACH 14.960	ALPHA 20.030	VBAR .04191	30	BAR 3636 1	T• 254.00000	REFTL .09325	50RTC + . 85580	P1T0T . 32860	P(TS) .00023	H(H) 3.27900	T (H) 546.00000	C(CP) 00479
		RUN NO	n 	0 /1	- T/NB	đ.						
MACH 15.420	ALPHA 20.030	VBAR .06150	30	8AR 5285 1	T• 218.00000	REFTL .04735	50RTC+ .88790	P1T0T .14880	P(TS) .0002 3	H(H) 3.27300	T (M) 545.00000	C (CP) 00190

32	475)		. 000 16.300 . 000		C (CP) - , 00422	R 75)		.000 16.300 .000 .000		MU 27.23000		MU 8.11600		MU 7.37200		MU 7.15200
PAG	5) (25 AF	DATA	BETA = BOFLAP = SPOBRK = AILRON =		T (M) 530.0000	1) (25 AP	DATA	BETA = BOFLAP = SPDBRK = ATLRON =		RHO .82720		RHO .97740		RH0 .45870		RH0 2.67900
	TOHNSY	PARAMETRIC	20.000 12.000 .000		н(м) 3.18300	(10H013	PARAMETRIC	20.000 12.000 .000		0+0+2.		Q(PS1) .17610		Q(PSI) 07982		0(PSI) 47510
			ALPHA = ELEVON = RUDDER = PH1		P(TS) .00029			ALPHA = ELEVON = RUDDER = PHI		Р . 00340		P .00112		Р . 00048		Р .00271
DATA	3544 V8R5				P1707 .88620	E44 VBR5				T 345.20000		T 96.47000		T 87.63000		T 85.02000
red source c	I IM LLNBRNI				SQRTC+ .86920	N2BN77 WILE				U 1148.00000		U 204.00000		U 079.00000		U 146.00000
VII3 TABULAI	201826C9F7M7			.27	REFTL .28780	0) B26C9F7H7			E 0.	T(0) 764.00000 9	60.	T(0) 880.00000 7	70 .	T(0) 760.000 00 7	.27	T(0) B10.00000 7
6	31CAL 184-26		000 IN. X0 1000 IN. Y0 1000 IN. Z0	EN/L -	T* 228.0000	3(CAL 184-25		000 IN. X0 000 IN. Y0 000 IN. Z0	RN/L -	H(0) 44.03000 5	- T/NJ	H(0) 26.60000 3	RN/L =	H(0) 25.65000 3	- RN/L	H(0) 26.11000 3
	0411		• 1076.7 • .C	0 / 26	VLBAR .02194 1	OALI		- 1076.7 - 0 375.0	. 98/ 0	P(0) 291.30000	. 58/ 0	P(0) 971.60000	. 57/ 0	P(0) 505.70000	. 95/ 0	P(0) 272.00000
		CE DATA	.F.T. XMRP CHES YMRP CHES ZMRP	RUN NO	VBAR . 02561		CE DATA	.FT. XHRP CHES YMRP CHES ZMRP	RUN NO	M(1) 5.54900	RUN NO	M(1) 4.05700	RUN NO	M(1) 3.98300	RUN NO	M(I) 4.14600 3
		REFEREN	8590.0000 SQ 474.8000 IN 936.7000 IN .0100		ALPHA 20.030		REFEREN	690.0000 SQ 474.8000 IN 936.7000 IN .0100		ALPHA 20.030		AL PHA 20.030		ALPHA 20.030		ALPHA 20.030
			SREF = 2 LREF = 2 BREF = 5 SCALE =		MACH 15.800			SREF = 2 LREF = 2 BREF = 5 SCALE =		MACH 10.040		MACH 14.960		MACH 15.420		MACH 15.800

				OALI	3(CAL 184-22	0) 826C9F7M7h	N28N77 W116E	SABY 445		(RUHO)	4) (25 AP	- 52 -
	REFE	RENCE DATA							-	PARAMETRIC	: DATA	
SREF = LREF = BREF = SCALE =	2690.0000 474.8000 936.7000 .0100	SQ.FT. XM INCHES YM INCHES ZM	6 6 6 2	1076.7 .0 .375.0	000 IN. X0 0000 IN. Y0 1000 IN. Z0				ALPHA = ELEVON = RUODER = PHI =	30.000 12.000 .000	BETA - BOFLAP - SPOBRK - AILRON -	.000 16.300 .000 .000
		RUN	ŝ	68/ 0	- TIN	٤0.						
MACH 10.110	AL PHA 30.00(CN 0 .92320		СА .14880	СLM 10790	сҮ 00263	CYN . 00015	CBL. . 00 020	РМ1 . 14460	РМ2 . 18110	РМЗ . 14260	PHH . 1671
		RUN	ŷ.	64/0	- T/NA	54.						
MACH 10.720	AL PHA 29.98(CN 0 .88050		CA .10400	CLM 10940	сү 00354	CYN 00073	CBL 00202	PHI . 33450	PH2 .48660	РНЗ . 397 30	PH4 .4816
		RUN	9 9	63/ 0	- TNR	80.						
MACH 14.140	ALPHA 29.98(CN 0 .88550		CA .13890	СLM 11320	сҮ . 00544	CYN .00038	CBL. . 00165	РМ1 . 16360	PM2 .21820	PH3 .17670	PM4 .2053(
		RUN	ġ	59/ 0	RN/L -	60.						1
MACH 14.930	ALPHA 30.000	CN 0 .89770		CA .14700	CLM 10760	CY . 00482	CYN .00134	CBL .00084	РМ1 . 09919	PM2 .13130	РМЗ . 10380	PHH . 1222(
		- NDR	ý.	54/0	RN/L =	.05						
MACH 15.660	ALPHA 29.95(CN 0 .88170		CA .17620	CLM 10710	CY 01183	CYN -,00068	CBL. 00032	PHI .04494	PM2 . 05838	РНЗ .04777	PH4 05390
		- NDH	Ŷ.	82/0	- T/NB	.26						
MACH 15.710	ALPHA 30.00(CN 91280		CA . 12530	CLM 11580	CY .00024	CYN 00073	CBL .00075	PM1 .23980	РН2 .34720	РМ3 .27100	PM4 .32010

DAII3 TABULATED SOURCE DATA

0E 27	PR 75 J		. 000 16.300 . 000		C (CP) 01231		C (CP) 01169		c (CP) 00572		C (CP) 00383		C(CP) .00120		C (CP) 00459
PA	÷ (29 ∧	DATA	BETA - BOFLAP - SPOBRK - AILRON -		T (W) 545.00000		T (M) 545.00000		T (H) 543.0000		T (M) 546.00000		T (H) 541.00000		T (W) 542.00000
	IOHNSI	PARAMETRIC	30.000 12.000 .000		н(м) 3. 27300		H(W) 3.27300		н(н) 3.26100		н(н) 3.27900		н(м) 3.24900		H(H) 3.25500
			ALPHA = ELEVON = RUDDER = PHI		P(TS) .00029		P(TS) .00023		P(TS) .00023		P(TS) .00023		P(TS) .00048		P(TS) .0002 3
ATA	544 V8R5				P170T .46880		P1T0T 1.32900		P1 TOT .59070		P1707 . 34090		P1101 14910		P1 T0T . 89300
D SOURCE D	1911 M 1191				SQRTC+ . 75880		SORTC• .89790		SORTC• .76510		SORTC+ .83080		SQRTC• . 84950		SORTC+ .84210
113 TABULATE)) B26C9F7M7N			.03	REFTL .03265	st.	REFTL .48570	80.	REFTL .08752	60.	REFTL .09400	. 05	REFTL .04898	5 2	REFTL .27920
40	13(CAL 184-22(7000 IN. XO 0000 IN. YO 0000 IN. ZO	- T/NB	₹• 2138.0000	= TNV	T• 921.00000	RN/L =	T+ 1938.00000	RN/L =	T+ 1458.00000	RN/L =	7+ 392,00000	- TINA	T+ +35.00000
	041		• 1076. • 375.	68/ 0	VLBAR . 04 148	64/0	VLBAR .01234	63/ 0	VLBAR . 03398	59/ 0	VLBAR . 03608	54/ 0	VLBAR .05280 1	82/ 0	VLBAR .02207 1
		DATA	T. XMRP ES YMRP ES ZMRP	RUN NO.	VBAR . 04244	RUN NO.	VBAR .01381	RUN NO.	VBAR . 03656	RUN NO.	VBAR . 04046	RUN NO.	VBAR . 0601 3	RUN NO.	VBAR . 02504
		REFERENCE	2690.0000 Sa.F 474.8000 INCH 936.7000 INCH .0100		ALPHA 30.000		AL PHA 29.980		AL PHA 29.980		AL PHA 30.000		AL PHA 29.950		ALPHA 30.000
			SREF = LREF = BREF = SCALE =		MACH 10.110		MACH 10.720		MACH 14.140		MACH 14.930		MACH 15.660		MACH 15.710

(TUH014) (253 APR 75)	PARAMETRIC DATA	ALPHA 30.000 BETA 000 ELEVON 12.000 BOFLAP 16.300 RUDDER .000 SPDBRK .000 PHI .000 AILRON .000		0 .00347 .24870 .88410 26.2000		0 .00894 .71950 7.32000 8.61900		P Q(PSI) RHO MU 0 .00224 .31410 1.22200 12.91000		P Q(PSI) RHO HU 0 .00117 .18260 .99670 8.27900		0 .00047 .07997 R40 MU 00 .00047 .01997		DO277 .47850 2.65200 7.36200
6E44 VBR				T 329.8000		T 102.5000		T 154.1000		T 98.4100		T 84.8900		T 87.5200
TINZBN77 HII				U 9000.0009		U 5321.00000		U 8605.00000		U 7264 . 00000		U 7078.00000		U 7209.00000
20)82609F7F			£0.	T (0) 5659.00000	с <u>+</u> .	T (0) 2311.00000	80.	T (0) 5227.00000	60,	T (0) 3936.00000	. 05	T(0) 3754.00000	8.	T (0) 3879.00000
13(CAL 184-2		7000 IN. XC 0000 IN. YC 0000 IN. ZC	= T/NY	H(0) 42.59000	= T/NB	H(0) 14.81000	- RN/L	н(о) 38.05000	- RN/L	н(о) 27.04000	HN/L -	н(0) 25.63000	RN/L .	H(0) 26.58000
OAI		• 1076. • 375.	. 68/ 0	P(0) 300.60000	0/19.	P(0) 652.70000	. 63/ 0	P (0) 555.00000	. 59/ 0	P (0) 308.00000	. 54/ 0	P(0) 546.00000	. 82/ 0	P(0) 37.00000
	DATA	S ZMRP	RUN NO	M(1) 6.30300	run no	M(1) .89100	RUN NO	M(1) .97400 10	RUN NO.	M(1) .09500 1(RUN NO.	M(1) .01200	RUN NO.	M(1) .08800 36
	REFERENCE	5590.0000 50.F ¹ 474.8000 INCHE 936.7000 INCHE .0100		AL PHA 30.000		AL PHA 29.980		AL PHA 29.980 4		ALPHA 30.000 4		ALPHA 29.950 4		ALPHA 30,000 4
		SPEF = 2 REF = 3 SCALE = 5		MACH 10.110		MACH 10.720		MACH 14.140		MACH 14.930		MACH 15.660		MACH 15.710

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OA113 TABULATED SOURCE DATA

8	1 22 1		.000 18.300 .000		PM4 .26980		PH4 .69590		PH4 .31390		PM4 .20350		P 114 . 07906		PM4 .45670
PAOE	5) (25 APR	DATA	BETA		PM3 . 24410		РМЗ .63070		PM3 .27550		РМЗ . 18030		РНЗ . 0699 5		5M3 .40000
	ETOHUR:	PARAMETRIC	40.000 12.000 .000		PM2 .25660		PM2 .68580		PM2 .31020		РМ2 . 20980		PM2 . 08196		PM2 .45930
			ALPHA - ELEVON - RUDDER - PHI -		PM1 .22080		PMI .52500		PMI . 25640		РМІ .17460		РНI .07071		РМ1 . 34960
ATA	244 V8R5				CBL - , 00243		CBL 00243		CBL .00141		CBL . 00 254		CBL .00252		CBL . 00079
ED SOURCE D	458N77 WI 161				CYN 00047		CYN .00011		CYN . 00060		CYN . 00218		CYN . 00395		CYN . 00094
II3 TABULATE)) B26C9F7M7I			.03	CY .00000	Ŧ	сҮ 00195	80.	сҮ . 00454	60.	CY .01049	.05	CY .01667	ĸ	CY .00522
YO	3 (CAL 184 -22(000 IN. XO 000 IN. YO 000 IN. ZO	= T/NJ	CLM 16640	- INA	СLM 17880	- T/NA	сLM 15620	- TINA	CLM 15770	- 1/NA	СLM 14900	EN/L =	CLM 16910
	OALL		• 1076.70 • .00 • .375.00	67/ 0	CA . 15680	66/ 0	CA .12270	62/ 0	CA .15190	60/ 0	CA .16310	55/ 0	CA .17610	0 /18	CA .13940
		DATA	T. XMRP ES YMRP ES ZMRP	RUN NO.	CN 1.31300	RUN NO.	CN 1.38400	RUN NO.	CN 1 . 32000	RUN NO.	CN 1.33400	RUN NO.	CN 1.35100	RUN NO.	CN 1.37800
		REFERENCE	690.0000 SQ.F 474.8000 INCF 936.7000 INCF		AL PHA 40.050		ALPHA 40.050		ALPHA 40.000		ALPHA 40.000		ALPHA 40.000		ALPHA +0.000
			SREF = 2 LREF = BREF = 5 SCALE = 5		MACH 9.925		MACH 10.690		MACH 13.950		MACH 14.730		MACH 15.450		MACH 15.650



		.000 16.300 .000 .000		C (CP) 01308		C(CP) 011 45		C (CP) 00579		C (CP) 00466		C(CP) 00155		C(CP) 00449
97 55 AP	DATA	BETA * BDFLAP * SPOBRK * AILRON *		T (M) 546.00000		T (H) 546.00000		T (M) 542.0000		T (H) 546.00000		T (H) 542.00000		T (M) 541.00000
SIOHNS)	ARAMETRIC	40.000 12.000 .000		H(H) 3.27900		H(H) 3.27900		H(H) 3.25500		н(м) 3.27900		H(W) 3.25500		H(W) 3.24900
	-	ALPHA = ELEVON = RUDDER = PHI		P(TS) .00023		P(TS) .00029		P(TS) .00021		P(TS) .00023		P(TS) .00025		P4TS) .00019
CH4 VBR5				P1T0T .51840		P1707 1.31000		P110T .60180		P110T .38730		P1T0T .14970		P1101 .86760
28N77 HI 16E				SORTC• .73380		SORTC• .87670		SQRTC• .73980		SQRTC• .79830		SORTC• .83070		SORTC+ .81820
1) B26C9F7H7N			£0.	REFTL .03411	Ŧ	REFTL .46920	.08	REFTL .08639	60.	REF TL . 09831	.05	REFTL .05026	8.	REFTL .26940
3 (CAL 184-220		000 IN. XO 000 IN. YO 000 IN. ZO	- INN	T• 550.00000	- TINA	T.● 056.00000	- J/NJ	T+ 270.00000	- RN/L	T• 742.0000	- T/NB	T+ 569.000 0 0	EN/L =	T+ 661.00000
OALI		- 1076.7 0 - 375.0	67/ 0	VLBAR . 03996 2	66/ 0	VLBAR .01250 1	62/0	VLBAR .03378 2	60/0	VLBAR .03464 1	55/ 0	VLBAR . 05165 1	81/0	VLBAR . 02239 1
	ATA	XMRP YMRP ZMRP	RUN NO.	BAR 03943	RUN NO.	BAR 01368	RUN NO.	BAR 03511	RUN NO.	BAR 03751	RUN NO.	8AR 0572 5	RUN NO.	8AR 02468
	ENCE	SQ.FT. INCHES INCHES		5 .		5 -		5 -		5 .		5.		5 -
	REFER	2690.0000 474.8000 936.7000		AL.PHA 40.050		ALPHA 40.050		AL PHA 40.000		ALPHA 40.000		AL PHA 40.000		ALPHA 40.000
		SREF = LREF = EREF = SCALE =		MACH 9.925		MACH 10.690		MACH 13.950		MACH 14.730		MACH 15.450		MACH 15.650

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DAILS TABULATED SOURCE DATA

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ii y	47 75)		.000 15.300 .000 .000		MU 27.45000		нU 8.75100		MU 13.30000		MU 8.82300		MU 7.10600		MU 7.41500
PA(5) (22 AF	DATA	BETA = BDFLAP = SPOBRK = AILRON =		RHO . 95860		RHO 7.14500		RHO 1.24000		RHD 1.09100		RHO .47710		RH0 2.57800
	(TUHD15	PARAMETRIC	40.000 12.000 .000		Q(PSI) 27480		Q(PSI) 70880		Q(PS1) .32000		0(124) 0130-		Q(PS1) .08033		0(PS1) .46500
			ALPHA • ELEVON • RUDDER • PH1		Р . 00 3 98		Р . 00886		Р • 00235		Р .00136		Р . 00048		Р . 00271
ATA	SE44 VBR5				T 348.60000		T 104.00000		T 158.90000		T 104.90000		T 84.48000		T 88.14000
red source c	7N26N77 W116				U 9087.00000		U 1345.00000		U 1621.00000		U 399.00000		U 963.00000		U 207.00000
AII3 TABULA	20) 826C9F7M			٤٥.	T(0) 5750.00000 9	**.	T(0) 232.0000	80.	T(0) 5243.00000 E	60.	T(0) •063.00000 7	.05	T(0) 653.00000 6	ĸ	T (0) 878.0000 7
0	13(CAL 184-2		7000 IN. X0 0000 IN. Y0 0000 IN. Z0	RN/L -	H(0) 13.49000	- TINA	H(0) 14.95000 (- T/NJ	H(0) 38.21000	BN/L =	H(0) 28.08000 4	- T/NJ	H(0) 24.82000	RN/L +	H(0) 26.57000 3
	041		076. 375.	0. 67/ 0	P(0) 311.60000). 66/ 0	P(0) 635.9 00 00). 62/ D	P(0) 1588.00000	0. 60/ 0	P(0) P(0)). 55/ 0	P(0) 505.40000	0. 81/ 0	P(0) 0000-+0000
		VCE DATA	a, F.T. XMRN KCHES YMRN KCHES ZMRN	N N	M(1) 5.35600	n n	M(1) 2.90200	RUN NC	M(1) 4.99600	RUN W	M(1) 4.18100	RUN NC	M(1) 3.93300	RUN NO	M(I) 4.09600 3
		REFERE	2690.0000 S 474.8000 11 936.7000 11		ALPHA 40.050		ALPHA 40.050		ALPHA 40.000		ALPHA 40.000		ALPHA 40.000		ALPHA 40.000
			SREF = 1 LREF = 1 BREF = 5 SCALE = 5		MACH 9.925		MACH 10.690		MACH 13.950		MACH 14.730		MACH 15.450		MACH 15.650



- 5 7 8		.000 16.300 .000 .000		PHH . 33680		PM4 .93610		PM4 .44370		PM4 .23880		PHH .10010		Prt4 .62290
52 V	DATA	BETA = BDFLAP = SPDBRK = Atlron =		РМЗ . 31 230		РНЗ . 00000		РМЗ .43070		PM3 . 21380		PM3 .08762		PH3 .56340
(RUHD16	PARAMETRIC	50.000 1 2.000 .000		PM2 .32330		РМ2 . 000 00		PM2 .46030		PH2 .22440		PH2 .09356		PH2 .59190
	-	ALPHA = ELEVON = RUDDER = PHI =		РМІ .27010		Рм1 . 00000		РМ1 . 34680		PM1 . 18950		PHI .08458		PM1 .45710
544 V8R5				CBL .00721		CBL 00158		CBL. 00407		CBL . 001 68		CBL . 00623		CBL 00292
28N77 W116				CYN .00329		CYN 00025		CYN .00535		CYN .00176		CYN .00121		CYN -,00036
)) B26C9F7M7h			.03	CY .02018	.47	CY .00107	.07	сү 00400	80.	CY .01280	.05	CY .01410	S.	сү 00047
3 (CAL 184-22(00 IN. X0 00 IN. Y0 00 IN. Z0	- TINH	CLM 23410	EN/L =	CLM 25080	- TINH	CLM 24760	HN/L -	CLM 18930	RN/L =	CLM 17190	EN/L =	CLM 27470
OALLE		• 1076.70 • .00 • 375.00	86/ 0	CA .16930	85/ 0	CA .12950	0 /+8	CA .16930	61/ 0	CA .15820	56/ 0	CA .18760	83/ 0	CA 00037
	DATA	T, XMRP ES YMRP ES ZMRP	RUN NO.	CN 1.84700	RUN NO.	CN 1.88100	RUN NO.	CN 1.84400	RUN NO.	CN 1.78300	RUN NO.	CN 1.73700	RUN NO.	CN 1.92300
	REFERENCE	1690.0000 50.F 474.8000 1NCF 936.7000 1NCF 936.7000 1NCF		AL PHA 50.000		ALPHA 50.000		ALPHA 50.000		AL PHA 50.000		ALPHA 50.000		AL PHA 50.000
		SREF = 2 LREF = 6 BREF = 5 SCALE =		MACH 10.140		MACH 10.710		MACH 13.750		MACH 14.950		MACH 15.650		MACH 15.770

PAOE 32

OAII3 TABULATED SOURCE DATA

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33	12		.000 16.300 .000		C(CP) 01196		C (CP) 01088		C(CP) 00542		C (CP) 00360		C(CP) 00152		с (СР) 00320
PAGE	6) (25 APR	DATA	BETA - BOFLAP - SPOBRK - AILRON -		T(W) 537.00000		T (M) 537.00000		T(H) 537.00000		T(W) 541.00000		T (H) 543.00000		T (M) 536.00000
	(SUH01)	PARAMETRIC	50.000 12.000 .000		н(ы) 3.22500		H(H) 3.22500		H(H) 3,22500		H(W) 3.24900		H(W) 3.26100		н(µ) 3.21900
		-	ALPHA - ELEVON - RUDDER - PHI		P(TS) .00023		P(TS) .00023		P(TS) .00023		P(TS) .00025		P(TS) .00023		P(TS) .00023
ATA	544 V8R5				P170T .47090		P1101 1.27700		P1107 .61670		P1101 .32970		P1707 .13740		P1101 .85790
counce or	128N77 W116				SORTC+ .71050		SORTC+ .87160		SORTC• .70840		SORTC. .78430		SQRTC+ .81600		SQRTC+ .79710
II3 TABULATE)) B26C9F7M7h			E0.	REFTL .03230	۲۲.	REFTL .50680	.07	REFTL .07885	.08	REF TL . 08983	.05	REFTL .04892	33	REFTL .26910
YO	113(CAL184-22(.7000 IN. XO .0000 IN. YO .0000 IN. ZO	- RN/L	T+ 2916.00000	- TINA	T• 1128.00000	RN/L =	T* 2758.00000	= N/N	T+ 1946.00000	= T/NB	T• 1762.00000	EN/L =	T• 1903.00000
	٩O		= 1076 = 375	96/ 0	VLBAR . 04174	85/ 0	VLBAR .01214	84/0	VLBAR .03468	61/ 0	VLBAR . 03691	56/ 0	VLBAR .05319	83/ 0	VLBAR . 02256
		ATA (XMRP XMRP ZMRP	RUN NO.	BAR 04003	RUN NO.	BAR 01311	RUN NO.	8AR 03469	RUN NO.	BAR 03911	RUN NO.	8AR 05774	RUN NO.	3AR J2423
		REFERENCE (2690.0000 SQ.FT. 474.8000 INCHES 936.7000 INCHES 0100		ALPHA V 50.000		ALPHA V 50.000		ALPHA V 50.000		ALPHA V 50.000		ALPHA V 50.000		ALPHA VI 50.000
			SREF = LREF = BREF = SCALE =		MACH 10.140		MACH 10.710		MACH 13.750		MACH 14.950		MACH 15.650		MACH 15.770

	BEEE	KNCF DATA			0411	13(CAL 184-	-220) B26C9F	THTNEBNTT HII	6E44 VBR5	-	TUH011	6) (25 AF Data	а К
L			8	-		7	ç						000
SMEF = EREF = SCALE = SCALE	2000, 1000 474, 8000 938, 7000 938, 7000	HX SHONI			375.0	NI 0000	9 <u>6 5</u>			ELEVON - RUDDER - PHI	000.000.000.000	BDFLAP = SPDBRK = AILRON =	15.300
		RUN	Ŷ.	ð	8/ 0	RN/L -	£0.						
MACH 10.140	ALPHA 50.000	M(1) 5.42700	0 R	9.9 2	0000	H(0) 43.13000	T(0) 5691.0000	U 0 8059.00000	T 332.10000	Р . 00347	0(PS1) 24970	RHO . 87620	MU 26.35000
		RUN	Ŝ	ð	5/ 0	- TINA	747						
MACH 10.710	ALPHA 50.000	M(1) 2.86500	5	5.6(0000 0000	H(0) 14.00000	T (0)	U 0 5173.00000	T 97.09000	P . 00861	0(PSI) .69170	RH0 7.44400	MU 8.16800
		RUN	ý.	ద	•	- RN/L	.07						
MACH 13.750	ALPHA 50.000	M(1) 5.21500	159	5.00 2.00	0000	H(0) 40.56000	T (0) 5488.0000	U 0 8879.00000	T 173.40060	P .00247	Q(PS1) .32750	RHO 1.19600	MU 14.48000
		RUN	Ś	6	1/ 0	- TINA	80.						
MACH 14.950	AL PHA 50.000	M(1) 4.15600	8	P.(0000	H(0) 27.30000	T (0) 3962.0000	u 0 7298.00000	T 99.13000	P .00113	Q(PSI) .17660	RHO , 95490	ы. 8.34000
		RUN	ş	ŝ	2/ O	- INA	. 05						
MACH 15.650	ALPHA 50.000	M(1) 3.87700	Å Å	P.(0000	H(0) 24.28000	T (0) 3586.0000	U 0 6889.00000	T 80.57000	P .000+3	Q(PSI) .07376	RHO .44760	MU 6.77600
		RUN A	ġ	6	3/ 0	EN/L =	52.						
MACH 15.770	ALPHA 50.000	M(]) 4.14200	316(P.(0000	H(0) 28.64000	T (0) 3880.0000	U 0 7217.00000	T 87.13000	P .00264	Q(PS1) .45970	RHO 2.54200	MU 7.32900

OAII3 TABULATED SOURCE DATA

PAOE

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				õ	1113 TABULAT	ED SOURCE D	ATA			A	Я В
			140	113(CAL 184-25	20) B26C9F7M7	NZBN77 HI 16	E44 VBR5		(RUH0	17) (25 A	PH 75)
	REFERE	INCE DATA							PARAMETRI	C DATA	
SREF = LREF = BREF = SCALE =	2690.0000 5 474.8000 1 936.7000 1 936.7000 1	IQ.FT. XMRP NCHES YMRP NCHES ZMRP	• 1076. • 375.	7000 IN. X0 0000 IN. Y0 0000 IN. Z0				ALPHA = ELEVON = RUDDER = PH1	30.000 15.000 .000	BETA BUFLAP - BUFLAP - SPOBRK - AILRON -	.000 16.300 .000 .000
		RUN NO.	0/16	- RN/L	6 0.						
MACH 9.886	ALPHA 30.000	CN .84740	CA . 15460	CLM 08170	CY 01208	CYN . 00245	CBL 00277	PM1 .12720	РМ2 .17130	PM3 . 14390	P144 . 16930
		RUN NO.	106/ 0	- TINA	74.						
MACH 10.730	ALPHA 29.970	CN .88110	CA .11260	CLM 09842	CY 00818	CYN .00257	CBL . 00000	PMI . 33980	РМ2 .52370	PM3 . 4 3440	PHH .48170
		RUN NO.	0 /16	- TINA	60.						
MACH 15.170	ALPHA 30.000	CN . 88780	CA .15010	СLM 10780	сҮ 00250	CYN 00074	CBL . 00089	РМ1 . 09890	PM2 .12650	PH3 .10290	PHH . 11760
		RUN NO.	110/ 0	RN/L -	÷0,						
MACH 15.670	ALPHA 30.030	CN .92270	CA . 19310	СLM 11030	сү 00594	CYN .00217	CBL 00181	PM1 .04707	PM2 .05601	PM3 . 04590	PH4 . 04920
		RUN NO.	107/ 0	RN/L =	ĸ						
MACH 15.690	AL PHA 30.000	CN .96040	CA .13120	CLM 13380	сү 00264	CYN 00026	CBL. .00017	PM1 .23740	PH2 . 34920	PM3 . 29450	PM4 .31320
			IVO	13(CAL 184-22(0) B26C9F7M7A	1911 H 196	544 V8R5		(CHOS)	7) (25 //	R 75)
	REFEREI	NCE DATA							PARAMETRIC	DATA	
SREF = LREF = BREF = SCALE =	2690 .0000 S(474.8000 I) 936.7000 I) .0100	a.F.T. XHRP VCHES YHRP VCHES ZHRP	• 1076.' • .(• 375.(7000 IN. XO 0000 IN. YO 0000 IN. Zo				ALPHA = ELEVON = RUDDER = PHI =	30.000 15.000 .000	Beta = Boflap = Spubrk = Atlron =	.000 16.300 .000
		RUN NO.	0 /16	= T/NJ	£0.						
MACH 9.886	ALPHA 30.000	VBAR . 04157	VLBAR . 04068 2	T+ 2098.00000	REF TL . 03292	SORTC• . 76290	P1701 .47780	P(TS) .00029	H(W) 3.18300	T (M) 530.00000	C(CP) 01275
		RUN NO.	106/ 0	RN/L =	.47						
MACH 10.730	AL PHA 29.970	VBAR .01369	VLBAR .01221	7• 899.80000	REFTL .50080	SORTC • . 90280	P1T0T 1.32900	P(TS) .00029	H(H) 3.16500	T (H) 527.00000	C(CP) 01155

Е 36	R 75)		.000 1 6 .300 .000 .000		C (CP) 00379		C (CP) 00102		C (CP) 00466	بر در		.000 16.300 .000		MU 26.75000		MU 8.43800		HU 7.71100		HU 7.37100
PAG	1 (22 AP	DATA	BETA BOFLAP BOFLAP SPDBRK -		T (H) 528.00000		T (M) 529.00000		T (M) 530.0000	7) (25 AF	DATA	BETA = BOFLAP = SPOBRK = Ailron =		RHO .91910		RHO 7.45700		RHO . 99180		RHO . 408 30
	(SUH017	PARAMETRIC	30.000 15.000 .000		н(н) 3.17100		H(W) 3.17700		H(W) 3.18300	(TUHUT)	PARAMETRIC	30.000 15.000 .000		Q(PS1) .25350		0(PSI) .71950		Q(PSI)		0,123 07336
		-	AL MA = ELEVON = RUDDER = PH1		P(TS) 00023		P(TS) .00029		P(TS) .00029			Al PHA = El Evon = Ridder = Pii		Р . 00370		Р .00691		Р . 001 08		5000°.
ATA	E44 V8R5				P110T .32570		PITOT .13690		P1T0T .87240	E44 VBR5				T 338.0000		T 100. 30000		T 91.65000		T 87.52000
ED SOURCE D	N28N77 W116				SQRTC+ .84220		SORTC+ .84320		50RTC+ .84020	DI IM LLNBAN				U 1912.00000		U 1.00000		U 7121.00000		U 71 9 3.00000
113 TABULATI	0) B26C9F7M7I			60.	REFTL .09846	ş.	REFTL .04283	52.	REF TL . 26750	01826C9F7M7			£0.	T(0) 547.00000 E	۲۴.	T (0) 266.0000 1	6 0.	T (0) 5784.00000	₽0.	T (0) 5846.00000
۲Ö	31CAL 184-221		000 IN. XO 000 IN. YO 000 IN. ZO	- TINA	T• 402.00000	- INA	T+ 425.0000	= T/NH	T* 442.0000	3 (CAL 184-22		000 IN. X0 000 IN. Y0 1000 IN. Z0	e J/NA	H(0) 41.85000	RN/L +	H(0) 14.53000 2	RN/L -	H(0) 25.97000	- TINA	H(0) 28.47000 3
	OALL		• 1076.7 • .0 • 375.0	0 / 16 .	VLBAR .03605 1	. 110/ 0	VLBAR .05629 1	. 107/ 0	VLBAR .02251 1	0411		• 1076.7 • .0 • 375.0	0/169.	P(0) 272.10000	. 106/ 0	P(0) 653.6000	0 /16 .	P(0) 018.00000	0. 110/ 0	P(0) 510.60000
		E DATA	FT, XMRP HES YMRP HES ZMRP	RUN NO	VBAR .04071	RUN NO	VBAR .06385	RUN NO	VBAR . 02550		E DATA	, FT. XMRP XES YMRP XES ZMRP	RUN NO	H(1) 5.41000	RUN NO	M(1) 2.96700	RUN NO	M(1) 4.14800 1	RUN NO	M(1) 4,18400
		REFERENC	690.0000 50.474.8000 1W 936.7000 1W 0100 1W		ALPHA 30.000		ALPHA 30.030		AL PHA 30.000		REFEREN	5590.0000 50 474.8000 IN 936.7000 IN .0100		AL PHA 30.000		ALPHA 29.970		ALPHA 30.000		ALPHA 30.030
			SREF = 2 LREF = 8 BREF = 5 SCALE =		MACH 15.170		MACH 15.670		MACH 15.690			SREF = 6 LREF = 6 BREF = 5 SCALE = 5		MACH 9.886		MACH 10.730		HACH 15.170		MACH 15.870

6	ĥ		. 000 16. 300 . 000 . 000	MU 7.46200	75)		.000 .000 .000		19430 . 19430		PH4 . 75390		P#1 . 18180		PHI 07306		PM4 .46440
PAGE	1 (25 APR	DATA	BETA = BOFLAP = SPOBRK = ATLRON =	RHO 2.56200	- 55 AFR	DATA	BETA = BDFLAP = SPOBRK = AILRON =		PM3 .16390		РМЗ .68000		PM3 . 16240		PH3 .06804		PM3 .41540
	(10H017	PARAMETRIC	30.000 15.000 .000	0(PS1) 0,0740	810H019	ARAMETRIC	40.000 15.000 000		PM2 .17430		PM2 .74100		PM2 . 18100		PM2 .07301		РМ2 .46910
		-	ALPHA = ELEVON = RUDDER = PHI =	P .00271		-	ALPHA = ELEVON = RUDDER = PH1 =		PMI . 1518ů		PM1 .54820		PM1 .15070		PMI .06686		PH1 . 34040
ATA	E44 VBR5			T 88.71000	244 V845				CBL. - , 00569		CBL 00072		CBL .00107		CBL 00703		CBL 00079
ed source d	N2BN77 W116			U 249.0000	N28N77 HI 16				CYN .00474		CYN 00117		CYN . 00000		CYN .00202		CYN 00081
113 TABULAT	0) 826C9F7H7I			.25 T(0) 904.00000 7;	0)B26C9F7H7I			£0.	сү 01549	81.	CY 00113	60.	CY .00000	đ.	сҮ 02 456	.25	CY 00153
VO	3(CAL 184-22		000 IN. X0 000 IN. Y0 000 IN. Z0	RN/L = H(0) 26.88000 3	3 (CAL 184-22		000 IN. X0 000 IN. Y0 000 IN. Z0	EN/L -	СLM 10680	- T/NA	CLM 19120	RN/L =	CLM 14610	- TINA	14310 14310	RN/L -	CLM 17200
	OALL		• 1076.7 • .0 • 375.0	107/ 0 P(0) 36.00000	OALL		- 1076.76 - 00 - 375.00	3 3/ 0	CA .16920	105/ 0	CA .12360	0 /06	CA .16370	92/0	CA .20770	0 /68	CA .14420
		E DATA	FT XHRP ES YHRP ES ZHRP	RUN NO. M(1) 4.21300 311		E DATA	T, XMRP ES YMRP ES ZMRP	RUN NO.	CN 1.24600	RUN NO.	CN 1.41500	RUN NO.	CN 1.35000	RUN NO.	CN 1.32200	RUN NO.	CN 1.38400
		REFERENC	690.0000 SQ. 474.8000 INC 936.7000 INC 936.0100	AL PHA 30.000		REFERENCI	690.0000 SQ.1 474.8000 INCI 936.7000 INCI .0100		ALPHA 40.070		AL PHA 40.000		ALPHA 40.020		ALPHA 40.030		ALPHA 40.020
			SREF = 2 LREF = BREF = SCALE =	MACH 15.690			SREF = 2 LREF = 2 BREF = 5 SCALE = 5		MACH 10.120		MACH 10.600		MACH 15.050		MACH 15.400		MACH 15.680

SORTC* PITOT P(TS) H(I .73790 .37220 .00029 3.16 SORTC* PITOT P(TS) H(I .80000 1.41800 .00029 3.16 .80540 .34470 .00023 3.22 .81460 .13850 .00023 3.22 .81460 .13850 .00023 3.27 .81460 .13850 .00023 3.27 .81720 .88350 .00029 3.27 .00029 3.27 M/T HIL6EWY VBR5 .00029 3.27 .00029 3.27 .00029 3.27 .00028 .00029 3.27 .00068 .00020 3.27 .00068 .00020 3.27 .00068 .00020 3.27 .00068 .00020 3.27 .00068 .00020 3.27 .00028 .00020 3.27 .00028 .00029 3.27 .00028 .00028 .00029 3.27 .00028 .00000 .00028 .00008	SORTC* PITOT P(TS) H(H .73790 .37220 .00029 3.16 .37290 .37220 .00029 3.16 .80000 1.41800 .00029 3.15 .800540 .34470 .00023 3.22 .80540 .13850 .00023 3.22 .817 H(H .807C* PITOT P(TS) H(H .807C* PITOT P(TS) 3.27 .17 .81720 .88350 .00023 3.20 .17 .0029 3.20 .0029 3.	SGRTC* PITOT PITS H(1) -73790 .37220 .00029 3.11 -73790 .1.41800 .00029 3.11 -880000 1.41800 .00023 3.22 -80540 .13850 .00023 3.22 -81450 .13850 .00023 3.27 -81450 .13850 .00023 3.27 -1107 PITS H(15) H(15) -81450 .13850 .00023 3.27 -1107 PITS H(15) H(15) -1115544 V8R5 - 40.4 -1115544 V8R5 - 40.4 -111554 -	SORTC* PITOT P(TS) H(H) .73790 .37220 .00029 3.162 SORTC* PITOT P(TS) H(H) .86000 1.41800 .00029 3.162 SORTC* PITOT P(TS) H(H) .80540 .34470 .00023 3.162 .80550 .13850 .00023 3.262 .81720 .88350 .00029 3.207 .81720 .88350 .00029 3.207 .00028 1.5.00 PLI * 40.00 .00276 .15.00 PLI * 40.00 .0029 3.207 .0029 3.201 .0029 3.201 .00200 317.40000 317.40000 .00276 .197
TC* PITOT P(TS) H(h 790 .37220 .00029 3.16 TC* PITOT P(TS) H(h 500 1.41800 .00029 3.16 540 .34470 .00023 3.26 540 .34470 .00023 3.26 540 .13850 .00023 3.26 710 PITOT P(TS) H(h 720 .13850 .00023 3.26 717 PITOT P(TS) H(h 720 .13850 .00023 3.27 17 PITOT P(TS) H(h 720 .88350 .00023 3.27 1116£44 V8R5 .00029 3.27 1116£44 V8R5 .00029 3.27 1116£244 V8R5 .00028 3.27 6116 PLMA .40.0 .00028 70 PHI .00028 .00028 70 PHI .00028 .00028 70 PHI .00028 .00028	TC* P1101 P(TS) H(H) 790 .37220 .00029 3.16 TC* P1101 P(TS) H(H) 000 1.41800 .00029 3.16 540 .34470 .00023 3.22 540 .34470 .00023 3.22 540 .13850 .00023 3.17 60 .13850 .00023 3.17 70 .13850 .00023 3.17 71 P1101 P(TS) H(H) 720 .13850 .00023 3.22 717 P1101 P(TS) H(H) 720 .13850 .00023 3.27 720 .88350 .00023 3.20 71 P1162 P144 40.0 71 PH4 .0.0 .0 71 PH1 .0 .0	TC* P1TOT P(TS) H(I) 790 .37220 .00029 3.11 700 1.41800 .00029 3.11 700 1.41800 .00023 3.22 540 .34470 .00023 3.22 540 .34470 .00023 3.22 540 .34470 .00023 3.22 540 .13850 .00023 3.22 700 .13850 .00023 3.22 71 P1TOT P(TS) H(I) 720 .88350 .00023 3.22 720 .88350 .00023 3.22 720 .88350 .00023 3.22 720 .88350 .000229 3.22 720 .88350 .000229 3.22 720 .88350 .000229 3.22 720 .88350 .000229 3.22 71 P1 .01 .01 720 .9101 .00229 3.22 73 .000223 .01 .01 74 PHA .01 .01 700 .012 .012 .01	TC* PITOT P(TS) H(W) 790 .37220 .00029 3.163 700 1.41800 .00029 3.163 700 1.41800 .00029 3.163 700 1.41800 .00023 3.163 710 P1TOT P(TS) H(W) 700 1.41800 .00023 3.163 710 P1TOT P(TS) H(W) 70 .13850 .00023 3.263 71 .13850 .00023 3.271 70 .13850 .00023 3.171 70 .13850 .00023 3.203 71 .171 .171 .171 70 .13850 .00029 3.203 71 .171 .171 .171 70 .187 .171 .171 71 .187 .171 .171 71 .187 .197 .197 71 .197 .197 .197 71 .197 .197 .197 71
SGRTC* PITOT PITS) .880000 1.41800 .00029 SGRTC* PITOT PITS) .80540 .34470 .00023 .81460 .13850 .00023 .81460 .13850 .00029 .81720 .88350 .00029 .81720 .88350 .00029 .81720 .88350 .00029	SGRTC* PITOT PITS) .880000 1.41800 .00029 SGRTC* PITOT PITS) .80540 .34470 .00023 .81460 .13850 .00023 .81460 .13850 .00023 .81720 .88350 .00029 .81720 .88350 .00029 .00029	SGRTC* PITOT PITS) SGRTC* PITOT PITS SGRTC* PITOT PITOT PITS SGRTC* PITOT PITOT PITS SGRTC* PITOT PITOT PITOT PITOT PITS SGRTC* PITOT PITOT PITOT PITOT PITS SGRTC* PITOT PITOT PITOT PITOT PITOT PIT	SGRTC* PITOT PITS) .880000 1.41800 .00029 .80540 .34470 .00023 .80540 .34470 .00023 .81450 .13850 .00023 .81450 .13850 .00023 .81750 .88350 .00029 .8177 MILEE44 VBR5 MT7 MILEE44 VBR5 .00002 317.40000 .00276
SQRTC* PITOT PITS) .880000 1.418000 .00029 SQRTC* PITOT PITS) .805400 .344700 .00023 .81460 .13850 .00023 .81460 .13850 .00029 .81720 .88350 .00029 .81720 .88350 .00029 .81720 .88350 .00029 .8172 .88350 .00029 .8172 .88350 .00029 .8172 .88350 .00029 .8172 .88350 .00029 .8172 .88350 .00029 .8172 .8126 .88350 .00029 .8172 .8126 .88350 .00029 .8172 .8126 .88350 .00029 .8176 .8126 .88350 .00029 .8176 .8126 .88350 .00029 .8176 .88550 .88550 .00029 .8176 .88550 .85550 .85550 .855500 .85550 .85550 .85550 .85550 .85550 .85550 .855	SGRTC* PITOT PITS) .88000 I.41800 .00029 SGRTC* PITOT PITS) .80540 .34470 .00023 .81450 .13850 .00023 .81450 .13850 .00029 .81720 .88350 .00029 .01720 .88350 .00029 .00029	SGRTC* PITOT PITS) .880000 1.418000 .00023 SGRTC* PITOT PITS) .805400 .344700 .00023 .81460 .138550 .00023 .81720 .883550 .00023 .81720 .883550 .00023 .81720 .883550 .00023 .91720 .9110 PITS) .00000 317.40000 .00276	SGRTC* PITOT PTTS) .880000 I.41800 .00029 SGRTC* PITOT PTTS) .80540 .34470 .00023 .81460 .13850 .00023 .81720 .88350 .00029 .81720 .88350 .00029 MT7 HI I6E44 V8R5 BN77 HI I6E44 V8R5 BN77 HI I6E44 V8R5 BN77 HI 16E44 V77 HI 16E44 V8R5 BN77 HI 160000 HI 160000 HI 160000 HI 1600
SGRTC* PITOT PIT5) .80540 .34470 .00023 .80540 .34470 .00023 SGRTC* PITOT PIT5) .81460 .13850 .00029 .81720 .88350 .00029 .8177 HII6E44 V8A5 RALPHA = ELEVON = RUDGEA = PHI = PHI	SGRTC* PITOT PITS) .80540 .34470 .00023 .80540 .34470 .00023 .81460 .13850 .00023 .81450 .13850 .00023 .81720 .88350 .00029 .8177 HIL6E44 V8R5 ALPHA = FA	SGRTC* PITOT PITS) SGRTC* PITOT PITS] SGRTC* PITOT PITCE PIT	SORTC* PITOT PITS) .80540 .34470 .00023 .80540 .13850 .00023 .81450 .13850 .00023 .81720 .88350 .00029 8077 HILGE44 VBR5 PHI = PHI = PHI = PHI =
SORTC* PITOT PITS) HI .80540 .34470 .00023 3.2 SORTC* PITOT PITS) HI .81460 .13850 .00023 3.1 .81720 .88350 .00029 3.2 .81720 .88350 .00029 3.2 .8177 HILSE44 VBR5 fARAH ALPHA * 40. ELEVON * 15. RUDDER * .	SORTC• PITOT P(TS) H(.80540 .34470 .00023 3.2 SORTC• PITOT P(TS) H(.81460 .13850 .00023 3.1 .81720 .88350 .00029 3.2 .81720 .88350 .00029 3.2 .81720 .88350 .00029 3.2 .81720 .88350 .00029 3.2 .917 H(EE44 VBR5 .00028 .00029 3.2 .00029 3.2 .00028 .00028 .00029 3.2 .00028 .00028 .00029 3.2 .00028 .000028 .00028 .00028 .000028 .000028 .000028 .000028 .000028 .000028 .000028 .000028 .000028 .000028 .000028 .000028 .000028 .000028 .000028 .000028 .000028 .0000000000	SORTC* PITOT P(TS) H(.80540 .34470 .00023 3.2 SORTC* PITOT P(TS) H(.81460 .13850 .00023 3.1 .81720 .88350 .00029 3.2 M/7 H116E44 V8A5 .00029 3.2 M77 H116E44 V8A5 .00029 3.2 M77 H116E44 V8A5 .00029 3.2 M1PHA • 40. ELEVON • 15. RUDDER • 15. PHI • 20 .00000 317.40000 .00276 .1	SORTC* PITOT PITS) HI .80540 .34470 .00023 3.2 SORTC* PITOT PITS) HI .81450 .13850 .00023 3.1 .81720 .88350 .00029 3.2 .8177 HIL6E44 V8R5 .00029 3.2 .8177 HIL6E44 V8R5 .00029 3.2 .00268 = .0 .00028 = .0 .00028 = .0 .00008 17.40000 .00276 .1
SGRTC* PITOT P(TS) H(I) .81460 .13850 .00023 3.11 SGRTC* PITOT P(TS) H(I) .81720 .88350 .00029 3.2 .00229 3.2 M/7 HIIGE44 VBR5 .000229 3.2 .00229 3.2 .0022	SGRTC* PITOT P(TS) H(I) .81460 .13850 .00023 3.11 SGRTC* PITOT P(TS) H(I) SGRTC* PITOT P(TS) H(I) .00029 3.21 M/T HII6E44 VBR5 .00029 3.21 M/T HII6E44 VBR5 .00029 3.21 .00268 - 15.0 RUDDER - 15.0 PHI - 0.0	SGRTC* PITOT P(TS) H(I .81460 .13850 .00023 3.17 SGRTC* PITOT P(TS) H(I SGRTC* PITOT P(TS) 3.21 .81720 .88350 .00029 3.21 M77 HII6E444 V8R5 .00029 3.21 RADER = 40.0 PHI = 0.0 PHI = 0.1 .00000 317.40000 .00276 .15	SORTC* PITOT P(TS) H(I) -81450 .13850 .00023 3.17 SORTC* PITOT P(TS) H(I) SORTC* PITOT P(TS) H(I) -81720 .88350 .00029 3.24 BN77 HIL6E44 VBR5 .00029 3.24 PLPA = 40.0 FARANS PHI = 0.0 PHI =
SQRTC* PITOT P(TS) H(H .81460 .13850 .00023 3.17 SQRTC* PITOT P(TS) H(H .81720 .88350 .00029 3.20 M/7 HIJ6E44 V8R5 .00029 3.20 M/7 HIJ6E44 V8R5 .00029 3.20 ALPHA * 40.0 ELEVON * 15.0 RUDDER * 0.0	SGRTC* PITOT P(TS) H(H .81450 .13850 .00023 3.17 SGRTC* PITOT P(TS) H(H .81720 .88350 .00029 3.20 .01029 3.20 M/7 H116E44 VBR5 .00029 3.20 ALPHA = 40.0 FLEVON = 15.0 RUDDER = .0	SQRTC* PITOT P(TS) H(1) .81460 .13850 .00023 3.17 SQRTC* PITOT P(TS) H(1) SQRTC* PITOT P(TS) 3.21 .017 H(16E444 V8R5 .00029 3.21 .017 ALPHA = 40.0 .017 P(1) = .00 .017 P(1) = .0000 3.71,40000 317.4000 .00276 .15	SQRTC* PITOT P(TS) H(H .81460 .13850 .00023 3.17 SQRTC* PITOT P(TS) H(H .81720 .88350 .00029 3.20 BN77 H116E44 V8A5 .00029 3.20 ALPHA * 40.00 RUDDER * .00 PHI * .00 PHI * .00 PHI * .00 PHI * .00 PHI * .00
SGRTC* PITOT P(TS) H(H -81720 .88350 .00029 3.20 M/7 HIIGE44 V8R5 .00029 3.20 ALPHA * 40.0 ELEVON * 15.0 RUDDER * .0	SGRTC* P110T P(15) H(W .81720 .88350 .00029 3.20 M/7 H116E44 V8R5 FARANE FARANE FARANE PH1 = .0	SGRTC* PITOT P(TS) H(I) SGRTC* PITOT P(TS) H(I) AI77 MII6E44 VBR5 .00029 3.21 FARAM	SORTC* PITOT PITS) HIW .81720 .88350 .00029 3.20 BN77 HIISE44 VBR5 .00029 3.20 ALPHA = 40.0 RUDDER = .0 PHI = .0 PHI = .0
SQRTC* PITOT P(TS) H(H .81720 .88350 .00029 3.20 M/7 HISE44 V8R5 (1 FARANE FARANE ALPHA * 40.0 ELEVON * 15.0 PHI * .0	SGRTC* PITOT P(TS) H(H .81720 .88350 .00029 3.20 M/7 HII6E44 V8R5 fARANE FARANE ALPHA = 40.0 ELEVON = 15.0 PHI = .0	SGRTC• PITOT P(TS) H(1) .81720 .88350 .00029 3.2(M77 H116E44 VBR5 .00029 3.2(FARAHE FARAHE FARAHE PUDDER = .0 PH1 = .0 PH1 = .0 .00000 317.40000 .00276 .15	SQRTC* PITOT P(TS) H(H .81720 .88350 .00029 3.20 BN77 HILSE44 VBR5 .00029 3.20 ALPHA = 40.00 RUDDER = .00 PHI = .00
177 ил 165 чч. VBR5 (7 F ARAME ALPHA = 40.0 ELEVON = 15.0 RUDDER = .0	177 ы116Ечч VBR5 (1) F.ARAHE ALPHA = 40.0 ELEVON = 15.0 RUDDER = .0 PH1 = .0	N77 WILGE44 VBR5 (1 FARAHE ALPHA = 40.0 ELEVON = 15.0 PHI = 00 PHI = 00 PHI = 00 10 T P 00275 115	BN77 HILEE44 VBR5 (TU FARANE1 FARANE1 FARANE1 40.00 ALPHA 40.00
FARAME ALPHA = 40.0 ELEVON = 15.0 RUDDER = .0 PHI = .0	FARAME ALPHA = 40.0 ELEVON = 15.0 RUDDER = .0 PHI = .0	FARME ALPHA = 40.0 ELEVON = 15.0 RUDDER = .0 PHI = .0 .0 .00000 317.40000 .00276 .11	FARANET ALPHA = 40.00 ELEVON = 15.00 RUDDER = .00 PHI = .00 U T P 0.0275 .197
ALPHA - 40.0 ELEVON - 15.0 RUDDER0 PHI0	ALPHA - 40.0 ELEVON - 15.0 RUDDER0 PHI0	ALPHA - 40.0 ELEVON - 15.0 RUDDER - 15.0 PHI - 0 PHI - 0 0 317.40000 - 00276 11	ALPHA - 40.0 ELEVON - 15.0 RUDDER0 PHI0 PHI0 B.00000 317.40000 .00276 .19
		U T P Q16 .00000 317.40000 .00276 .15	U T P 00276 0.19

DAILS TABULATED SOURCE DATA

ዩ አ	24 HS		.000 16.300 .000 .000	ŝ	ни 6.29800		MU 7.71800		нU 7.44100	А 15 - С		.000 .000 .000 .000		PH4 .28450		PHH . 99670		PM4 .25180		PHN . 67960
Ă	8) (22 AI	DATA	BETA BOFLAP SPOBRK ALLON	s 2	01066.		RHO . 4 0850		RHO 2.60600	9) (25 AP	DATA	EETA = EOFLAP = SPOBRK = AILRON =		РН3 .27890		PM3 . 94 150		PH3 . 24090		РМЗ . 60940
	(TUH01	PARAMETRIC	40.000 15.000 .000		.18460		Q(PS1) .07421	·	Q(PS1) 047340	(RUHD1)	PARAMETRIC	50.000 15.000 .000 .000		PM2 . 28990		PM2 .93840		PM2 .25600		PM2 .64450
			ALPHA ELEVON - PHI	c	.00116		Р . 00045		P .00275			ALPHA = ELEVON = RUDDER = PHI		PM1 .23820		PM1 .71610		PMI .21730		PM1 .50190
DATA	6544 V8R5			ŀ	1 98.63000		T 91.74000		T 88.45000	1644 V8R5				CBL 00790		CBL .00000		CBL 00648		CBL 01109
TED SOURCE	I IN LLNBRUL			:	7328.00000		U 7233.00000		U 7233.00000	911M LLNBZNI				CYN .00533		CYN 00355		CYN . 00406		CYN .00397
AII3 TABULA	20) B26C9F7H			60.	3985.00000	5.	T (0) 3884 . 00000 '	ĸ	T (0) 3894 . 00000 -	201826C9F7M			£0.	CY 00760	97.	CY 01214	.10	CY 00547	.27	CY 01711
0	13(CAL 184-2		7000 IN. XO 0000 IN. YO 0000 IN. ZO	RN/L =	27.52000	= T/NJ	H(0) 26.78000	- Int	H(0) 26.76000 3	3(CAL 184-25		000 IN. X0 000 IN. Y0 000 IN. Z0	EN/L =	CLM 22160	- T/NB	CLM 30740	= T/Ng	CLM 22170	EN/L =	сLM 25510
	OAL		• 1078. • • 375. •	0 /06	67.00000	92/0	P(0) 78.00000	0 /68	P(0) 87.00000	0411		• 1076.7 • .0 • 375.0	103/ 0	CA .17750	104/0	CA .14320	108/ 0	CA . 16850	102/0	CA .15250
		CE DATA	I.F.T. XMRP CHES YMRP CHES 2MRP	NUR NO	4.20800 10	RUN NO.	M(1) 4.21900 4	RUN NO.	M(1) 4.17000 31		CE DATA	.FT. XMRP CHES YMRP CHES ZMRP	RUN NO.	CN 1.87500	RUN NO.	CN 2.01000	RUN NO.	CN 1.82300	RUN NO.	CN 1.87200
		REFEREN	2690.0000 50 474.8000 IN 936.7000 IN 936.7000 IN		ALPHA 40.020		AL PHA 40.030		ALPHA 40.020		REFEREN	690.0000 SQ 474.8000 IN 936.7000 IN .0100		ALPHA 50.000		ALPHA 50.000		AL.PHA 50.000		ALPHA 50.000
			SREF = 6 LREF = 6 BREF = 5 SCALE =		MACH 15.050		MACH 15.400		MACH 15.680			SREF = 2 LREF = 2 BREF = 5 SCALE = 3		MACH 10.180		MACH 10.630		MACH 15.030		MACH 15.550


			YO	VII3 TABULATI	ED SOURCE D	ATA A			PAG	0 7 9
		OAI	113(CAL184-22	(0) B26C9F7H7I	N28N77 W116	EH4 VOR5		(RUH01	9V (52) (6)	Å K
2	DATA							PARAMETRIC	DATA	
ACHES ICHES	XHRP XHRP ZMRP	- 1076. - 375.	.7000 IN. XO .0000 IN. YO .0000 IN. ZO				ALPHA = ELEVON = RUDDER = PHI	50.000 15.000 .000	BETA = BOFLAP = SPDBRK = ATLRON =	.000 16.300 .000
	RUN NO.	108/ 0	- LINA	ŧ.						
<u> </u>	N 87900	CA . 20820	CLM 20910	CY 01121	CYN .00510	CBL 00711	PM1 .09218	PM2 . 09824	PH3 . 09526	PHH . 09687
		140	113(CAL 184-22	0) B26C9F7M71	N2BN77 W116	E44 VBR5		(OHUS)	(9) (22 AF	1475 J
NCE	ATA							PARAMETRIC	DATA	
SQ.FT.	XMRP XMRP ZMRP	- 1076. - 375.	7000 IN. X0 0000 IN. Y0 0000 IN. Z0				ALPHA ELEVON = RUDDER = PHI	50.000 15.000 .000	BETA = BOFLAP = SPOBRK = A!LRON =	.000 .000 .000 .000
	RUN NO.	103/ 0	RN/L =	£0.						
> ·	BAR 04338	VLBAR .04519	t∙ 2879.00000	REF TL . 02789	SORTC+	P1707 . 39610	P(TS) .00029	.H(H) 3.15900	T (M) 526.00000	C (CP) 01061
	RUN NO.	104/ 0	RN/L =	94.						
5.	BAR 01307	VLBAR .01220	T• 1170.00000	REF TL .49080	SORTC+ .86120	P1707 1.36000	P(TS) .00029	H(W) 3.16500	T (W) 527.00000	C (CP) 01069
	RUN NO.	108/ 0	- LINA	.10						
5 .	BAR 03728	VLBAR . 03495	T• 1859.00000	REF TL . 10290	50RTC+ .79570	P170T .34670	P(TS) .00019	H(H) 3.17700	T (M) 529.00000	C (CP) 00412
	RUN NO.	102/ 0	EN/L -	۲۶.						
5 .	BAR 02299	VLBAR . 02144	T+ 1882.00000	REF TL . 29120	50RTC+ .79770	P1707 .93730	P(TS) .00029	н(м) 3.18900	T(H) 531.00000	C(CP) 00382
	RUN NO.	109/ 0	RN/L =	đ.						
5.	BAR 06299	VLBAR .05918	1• 1987.00000	REFTL .03782	50RTC• .78480	P1707 .13310	2(TS) .00029	H(H) 3.17700	T (M) 529.00000	C (CP) 00031

.

0E 41	PR 75)		. 000 15.300 . 000		HU 25.9000		HU 8.73900		MU 7.85000		MU 7.44500		HU 7.87700	14 JS)		.000 .000 .000 .000		PH4 .12600		PH1 . 05306
Č	6) (22 M	DATA	BETA - BOFLAP - SPOBRK - AILRON -		RH0 .74620		RHO 7.51000		RHO 1.05600		RH0 2.81000		RH0 .37410	0) (SS AF	DATA	BETA = BOFLAP = SPDBRK = ATLRON =		РМЗ . 10890		PH3 .04707
	(TUH01	PARAMETRIC	50.000 15.000 .000		01012.		Q(PSI) .73600		Q(PS1) .18590		Q(PS1) .50240		G(PS1)	(RUH02(PARAMETRIC	30.000 .000 .000		PM2 .13790		PM2 . 05803
			ALPHA ELEVON RUDDER PHI		Р . 00289		Р .00930		Р .00117		Р . 00296		р . 00042			ALPHA = ELEVON = RUDDER = PHI		PM1 .10640		PM1 . 04527
DATA	SE44 VBR5				T 325.40000		T 103.90000		T 93.31000		T 88.5000		T 93.63000	244 VBR5				CBL 00064		CBL . 00000
TED SOURCE	TN28N77 WI II				U 9005.00000		U 5313.00000		u 7120.00000		U 71.75.00090		U 7407.00000	N28NT7 W116				CYN 00044		CYN . 00000
AII3 TABULA	20) B26C9F7M			.03	T (0) 5610.00000	87.	T (0) 2301.00000	.10	1 (0) 3786.00000	Ŀ5,	T (0) 3839.00000 ·	ħ0.	T(0) 4043.00000 -	20)B26C9F7H			6 0.	сү .00000	.05	C۲ 00000
0	13(CAL.184-2		7000 IN. X0 0000 IN. Y0 0000 IN. Z0	RN/L =	H(0) 42.61000	- RN/L	н(о) 14.77000	- RN/L	н(о) 25.98000	RN/L -	H(0) 26.34000	EN/L =	н(0) 28.07000	13(CAL 184-2		7000 IN. XO 3000 IN. YO 3000 IN. ZO	- TINH	CLM 04384	= J/NJ	CLM 03681
	140		• • 1076. • • 375.	0. 103/ 0	P(0) 262.80000	1. 104/ 0	P(0) 641.70000	. 108/ 0	P(0) 037.00000	. 102/ 0	P(0) 218.0000	. 109/ 0	P(0) 502.50000	OAL		• 1076. • 375.(. 52/ 0	CA .12810	. 53/ 0	CA . 14350
		ICE DATA	I.FT. XHRA ICHES YMRA ICHES ZMRA	RUN M	M(1) 5.51100	N NN	M(1) 2.99700	RUN NC	M(1) 4.14000 1	N NON	M(1) 4.15800 3	RUN NO	M(]) 4.32200		CE DATA	.FT. XMRP CHES YMRP CHES ZMRP	RUN NO	CN .82880	RUN NO	CN . 82390
		REFEREN	2690.0000 SC 474.8000 IA 936.7000 IN .0100		ALPHA 50.000		AL PHA 50.000		ALPHA 50.000		ALPHA 50.000		AL PHA 50.000		REFEREN	2690.0000 50 474.8000 IN 936.7000 IN		ALPHA 30.000		ALPHA 1.000
			SREF = ; LREF = ; BREF = ; SCALE = ;		MACH 10.180		MACH 10.630		MACH 15.030		MACH 15.550		MACH 15.610			SREF = 2 Lref = 3 Scale = 5		MACH 14.970		MACH 15.530



5 5	Ê		.000 16.300 .000 .000		PM4 . 26330	k -		.000 16.300 .000 .000		c (CP) 00539		C(CP) 00192		C(CP) 80398
PAOE	APA 25 1 0	DATA	BETA == BOFLAP == SPOBRK == ATLRON ==		PM3 . 22680	847 SS) (WLYO	BETA = BOFLAP = SPOBRK = AILRON =		T (H) 545.00000		T (M) 546.00000		T (M) 528.0000
	(RUH020	ARAMETRIC	000 000 000 000		РМ2 . 29370	(SUH020	ARAMETRIC	30.000 000 000 000 000		H(H) 3.27300		н(м) 3.27900		H(H) 3.15900
		ũ	ALPHA = ELEVON = RUDDER = PHI =		PM1 .21670		L	ALPHA = ELEVON = RUDDER = PHI =		P(TS) .00023		P(TS) .00023		P(TS) .000 29
TA	44 V845				CBL . 00064	H4 VBR5				P1 T0T . 34970		P110T .14700		P1T0T .73100
D SOURCE DA	28N77 HI 16E				CYN 00079	28N77 HI 16E				SORTC • . 82990		50RTC+ , 89640		SORTC• .85390
13 TABULATE	B26C9F7M7N			.23	CY 00205	B26C9F7M7N			60.	REFTL .09595	.05	REFTL .04965	.23	REFTL .25080
140	11041 184-220		100 IN. X0 100 IN. Y0 100 IN. Z0	- TINI	CLM 04643	110-110-220		00 IN. X0 100 IN. Y0 100 IN. Z0	EN/L =	T+ 165.00000	- T/NA	T• 339.00000	EN/L =	T+ 399.00000
	EIIVO		• 1078.70 • .00 • 375.00	0 /111	CA . 1 1 080	OALLE		 1076.70 .00 .375.00 	52/0	VLBAR .03577 14	53/ 0	VLBAR .05219 10	111/ 0	VLBAR . 02394 13
		T.A	аяну сану Санур	RUN NO.	7760		T.A.	drimy drimy	RUN NO.	AR 4011	RUN NO.	AR 6247	RUN NO.	AR 2737
		FERENCE DA	00 SQ.FT. 00 INCHES 100 INCHES 00		HA CN		FERENCE DA	000 SQ.FT. 000 INCHES 000 INCHES 000 INCHES		BV AH		BA MH		AH 000
		æ	2 690 .00 474.80 936.70 .01		ALF 30.		æ	2690.00 474.80 936.70 01.00		ALF 30.		ALF 1.		ALF 30.
			SREF = LREF = BREF = SCALE =		MACH 16.050			SREF = Lref = Bref = Scale =		MACH 14.970		MACH 15.530		MACH 16.050

PAGE

						5	DA113 TABULA	TED SOURCE (DATA			۲d	96 43
04113(CAL16	OAI 13 (CAL 16	04113(CAL16	OAI 13 (CAL 16	113 (CAL 16	NLIE MLIE	1	220) B26C9F7M	TN28N77 HI I	5E44 V8R5		CTUHO	20) (22 V	P8 75
REFERENCE DATA	RENCE DATA										PARAMETRI	C DATA	
2690.0000 SQ.FT. XMAP = 1076.7000 IN. 474.8000 INCHES YMAP = .0000 IN. 936.7000 INCHES ZMAP = 375.0000 IN. .0100	50.FT. XMAP = 1076.7000 IN. I INCHES YMAP = .0000 IN. I INCHES ZMAP = 375.0000 IN.	RP = 1076.7000 IN. RP = .0000 IN. RP = 375.0000 IN.	- 1076.7000 IN. 	3.7000 IN. .0000 IN.	zzz	がれな	0.0.0			ALPHA = ELEVON = RUDDER = PHI	30.000 .000 .000	BETA BUFLAP = SPDBRK = AILRON =	.000 16.300 .000
RUN NO. 52/ 0 RN/L -	RUN NO. 52/ 0 RN/L -	NO. 52/ 0 RN/L -	52/ 0 RN/L -	- RN/L	- 1/1		60.						
ALPHA M(I) P(O) H(O) 30.000 4.11800 1050.00000 27.2200	M(I) P(O) H(O) H(O) 00000 27.2200	Р(0) H(0) 1050.00000 27.2200	P(0) H(0) 0.00000 27.2200	H(0) 1 27.2200	H(0)	Q	T(0) 3957.00000	U 7288.00000	T 98.57000	الم 10019	Q(PS1) .18730	RHO 1.01600	MU 8.29200
RUN NO. 53/ 0 RN/L -	RUN NO. 53/ 0 RN/L -	NO. 53/ 0 RN/L -	53/ 0 RN/L	- RN/L	- N/L		5 0.						
ALPHA M(1) P(0) H(0) 1.000 3.90800 509.40000 24.8800	M(1) P(0) H(0) 0 3.90800 509.40000 24.8800	P(0) H(0) 509.40000 24.8800	Р(О) H(О) 9.40000 24.88000	H(0) 24.8800	H(0) .8800		T(0) 3665.00000 (U 6973.00000	T 83.84000	Р .00047	Q(PS1) .07887	RHO .46710	HU 7.05200
RUN NO. 111/ 0 RN/L =	RUN NO. 111/ 0 RN/L -	NO. 111/ D RN/L -	• 1/11 0 KN/L	HAVL -			.23						
ALPHA M(1) P(0) H(0) 30.000 4.14200 2902.00000 25.70000 3	ж(1) Р(0) H(0) 0 4.14200 2902.00000 25.70000 3	Р(0) Н(0) 2902.00000 25.70000 3	P(0) H(0) 2.00000 25.70000 3	H(0) 25.70000 3	H(0)	(F)	T (0) 5754.00000 '	U 7091.00000	T 81.13000	P .00217	0(PSI) .39200	RH0 2.24500	MU 6.82400
04113(CAF 184-25	04113(CAF 184-25	04113(CAL184-22	04113(CAL 184-22	113(CAL 184-22	AL 184-22	ល្ម	0)B26C9F7M	TN26NT7 W116	SE44 VBR5		(RUH02	51) (52 M	XR 75)
REFERENCE DATA	RENCE DATA										PARAMETRIC) DATA	
2690.0000 S0.FT. XMRP = 1076.7000 IN. X0 474.8000 INCHES YMRP = .00000 IN. Y0 936.7000 INCHES ZMRP = 375.0000 IN. Z0 .0100 .0100	SQ.FT. XMRP = 1076.7000 IN. XO INCHES YMRP = .0000 IN. YO INCHES ZMRP = 375.0000 IN. ZO	RP = 1076.7000 IN. XO RP = .0000 IN. YO RP = .375.0000 IN. 20	 1076.7000 IN. X0 .0000 IN. Y0 375.0000 IN. Z0 	7000 IN. X0 0000 IN. Y0 0000 IN. Z0	20 20 1 2 20 1 2 20					ALPHA = ELEVON = RUDDER = PHI	000.0 4	HETA = HOFLAP = SPOBRK = AILRON =	.000 16.300 .000 .000
RUN NO. 51/ 0 RN/L -	RUN NO. 51/ 0 RN/L -	NO. 51/ 0 RN/L -	- 1/NJ 0 /15	- RN/L	- 1/N		60.						
ALPHA CN CA CLM 40.050 1.23700 .1214007806	CN CA CLM 0 1.23700 .1214007806	CA CLM .1214007806	CA CLM .1214007806	CLM 07806	CLM . 07806		CY 00260	CYN 00101	CBL 00066	PM1 .15520	PM2 . 18490	Р М 3 . 16890	PH4 . 19150
RUN NO. 50/ 0 RN/L =	RUN NO. 50/ 0 RN/L =	NO. 50/ 0 RN/L =	50/ 0 RN/L =	- RN/L	- N/L		*0.						
ALPHA CN CA CLM 40.050 1.23300 .1560007334	CN CA CLM) 1.23300 .1560007334	CA CLM .1560007334	CA CLM .1560007334	CLM 07334	CLM .07334		CY 00682	CYN 00073	CBL 00018	PM1 .06369	PM2 . 0704 I	PM3 .06614	-114 - 07333
RUN NO. 1121 0 RN/L -	RUN NO. 112/ 0 RN/L -	NO. 112/ 0 RN/L -	112/ 0 RN/L -	- TINA	- 1/1		.27						
ALPHA CN CA CLM 40.050 1.31300 .1024008201	CN CA CLM) 1.31300 .1024008201	CA CLM .1024008201	CA CLM .1024008201	CLM 08201	сLM . 08201		CY - , 00553	CYN . 00204	CBL. 00680	PHI .37640	PM2 .48760	PM3 .45390	PHH .46770

	בכח בכסרת.		
ALPHA ELEVON RUDDER PHI		999	076.7000 IN. XO .0000 IN. YO 375.0000 IN. ZO
	•	ö.	/ 0 KN/L = .0
. SORTC• PITOT P(TS 28470 .000	REFTL .09552	_	IAR T+ 1513 1705.00000
	+	ō,	1 0 KN/L - 0
. SORTC• PITOT P(TS 00.83130 .13890 .000	EFTL 04700	£ .	AR T+ R 357 1570.00000 .
		12.	1 0 RN/L = .27
. SORTC• PITOT P(TS 50 .82450 .88690 .000	FTL 8950	μ	JAR T• RE 191 1629.00000 .2
Thrinzentt MIIGE44 Vers	C9F71	220)826	04113(CAL 184-220)B26
ALPHA ELEVON RUDDER		000	075.7000 IN. XO 0000 IN. YO 375.0000 IN. ZO
		60.	/ 0 RN/L = .09
U T P 10 7303.00000 103.00000 .001	0000	11 3974.0)) H(0) T() 000 27.36000 3974.0
		đ.	1 0 RN/L04
U T P 0 6960.00000 83.86000 .000	. 00	T (0 3651.00) H(O) T(O 000 Z4.79000 3651.00
		5	1, 0 RN/L = .27
U T P 10 7140.00000 84.55000 .002	0000	T (0)) H(0) T(0 000 26.07000 3802.00

						OALL3 TABULAT	red source c	DATA			PA	5
				۷O	113(CAL 184-	220)B26C9F7M	N26N77 W116	3544 VBR5		(RUH08	53) (52 V	PR 75)
	REFER	RENCE DATI	<							PARAMETRIC	CATA	
SREF = LREF = BREF = SCALE =	2690.0000 474.8000 936.7000	SQ.FT. INCHES INCHES	XMRP YMRP ZMRP	• 1076 • 375	.7000 IN. X .0000 IN. Y .0000 IN. Z	000			ALPHA ELEVON - RUDDER - PHI	000.0E	BETA = Edflap = Spdbrk = Atlron =	.000 -11.700 .000
		Æ	UN NO.	47/ 0	- HNIL	60.						
MACH 14.90	000,000 30,000	CN	760	CA . 1 1 0 8 0	CLM 00507	CY 00267	CYN 00147	CBL 00127	PMI .09812	РМ2 .13320	PM3 . 10450	PH4 . 12790
		Æ	UN NO.	46/0	- RN/L	-0 .						
MACH 15.74	ALPHA 30.000	. 86!	510	CA . 15240	CLM 00460	сү 00820	CYN . 00045	CBL 00109	PH1 . 04353	PM2 . 05682	PH3 .04514	PTH-
				. VO	113(CAL 184-	220)828C9F7H7	NZBN77 WIIG	E44 V845		COHOS)	2) (22 M	ę K
	REFER	ENCE DATA	~						-	PARAMETRIC	DATA	
SREF = LREF = BREF = SCALE =	2690.0000 474.8000 936.7000	SQ.FT. INCHES INCHES	ARMX YMRP ZMRP	= 1076 = 375	.7000 IN. X .0000 IN. Y .0000 IN. Z	000			ALPHA ELEVON RUDDER	30.000 .000 .000	EETA = EDFLAP = SPDBRK = AILRON =	.000 .000 .000 .000
		æ	UN NO.	47/ 0	EN/L =	60.						
MACH 14.90) 30,000	VBAF 035	<u>م</u> م	VLBAR . 03569	T• 1476.00000	REFTL .09526	50RTC+ .82740	P1T0T .35570	P(TS) .00023	H(M) 3.26100	T (W) 543.00000	C (CP) 00452
		æ	2 2 2	46/ 0	- I/NA	40.						
MACH 15.74(ALPHA 30.000	VBAF . 063	223 323	VLBAR .05534	T+ 1369.00000	REFTL .04527	50RTC+ .85490	P110T .13200	P(TS) .00029	н(м) 3.26100	T (H) 543.00000	C (CP) .001 68

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8 19 0		.000 .000 .000 .000		MU 8.45400		HU 6.92100	د د		.000 -11.700 .000		PHH . 17800		07523
av 62) (3	DATA	BETA Boflap = Spdbrk = Ailron =		RHO 1.02300		RHO .41630	3) (25 AF	DATA	BETA = BOFLAP = SPOBRK = AILRON =		PM3 .15640		РМ3 . 06825
(TUH02	PARAMETRIC	30 .000 000 000		0(PSI), 19050		07084	(RUH02)	PARAMETRIC	000.04 000 000 000		PM2 .17850		РМ2 .07382
	-	ALPHA = Elevon = Rudder = Phi		P .00122		Р . 00041		_	ALPHA = ELEVON = RUDDER = PHI =		PM1 .23760		PM1 .06698
5481 443				T 100.50000		T 82.28000	544 VBR5				CBL. .00159		CBL 00013
N28N77 W116				U 324.00000		U 000.0000	N28N77 HI16				. 00104		CYN 00171
0) B26C9F7H7			60.	T(0) 988.00000 7	÷0.	T(0) 585.000007	0) B26C9F7H7			60.	сү . 004 84	ŧ.	CY . 00000
3(CAL 184-22)		000 IN. X0 000 IN. Y0 000 IN. Z0	EN/L -	H(0) 27.49000 3	RN/L =	H(0) 25.06000 3	3 (CAL 184-22)		000 IN. XO 000 IN. YO 000 IN. ZO	EN/L =	СLМ - ,01994	- I/NA	CLM 01879
0411)		- 1076.7(0(- 375.0(47/ 0	P(0) 149.00000	46/ 0	P(0) 90.00000	OALL		= 1076.7(= .01 = 375.01	48/ 0	CA .11720	0 /64	СА . 14480
	E DATA	FT, XHRP = ES YHRP = ES ZMRP =	RUN NO.	M(1) 4.15700 10	RUN NO.	M(1) 3.94700 4		E DATA	FT. XMRP HES YMRP HES ZMRP	RUN NO.	CN 1.17700	RUN NO.	CN 1.19000
	REFERENC	2690.0000 50. 474.8000 1NC 936.7000 1NC .0100		ALPHA 30.000		AL PHA 30.000		REFERENC	2690.0000 50. 474.8000 1m 936.7000 1m .0100		AL PHA 40.000		ALPHA 40.030
		SREF = LREF = BREF = SCALE =		MACH 14.900		MACH 15.740			SREF = LREF = BREF = SCALE =		MACH 15.080		MACH 15.740

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DAIL3 TABULATED SOURCE DATA

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DAI 13 TAL

0E 47	24 FR		.000 -11.700 .000 .000		C (CP) 00396		C (CP) 001 28	- 54 H				мU 8.28900		MU 6.98000
¥4	3) (52)	DATA	BETA BETA BOFLAP SPOBRK AILRON		T (H) 540.00000		T (M) 542.00000	3) (25 A	DATA	BETA = BDFLAP = SPDBRK = AILRON =		RHO . 96950		RH0 .44450
	SUHUS	PARAMETRIC	000.0 1 000.0 1		H(H) 3.24300		H(W) 3.25500	(TUH02	PARAMETRIC	000.0 1 000.		Q(PSI)		Q(PS1) .07635
			ALPHA - ELEVON - RUDOER - PHI -		P(TS) .00023		P(TS) .000 23			ALPHA = ELEVON = RUDDER # PHI =		P .00114		Р . 00044
ATA	544 V8R5				P110T .33890		P1101 .14230	E44 V8R5				T 98.53000		T 82.98000
ED SOURCE D	N28N77 W116				SORTC+ .80480		SQRTC+ .82960	N28N77 W116				U 343.00000		U 033.00000
113 TABULATI	0) B26C9F7M7I			60.	REFTL .09232	40.	REFTL .04815	0) 826C9F7M71			60 [.]	T(0) 001.00000 7	ħ0.	T(0) 714.00000 71
YO	13(CAL 184-22)		000 IN. X0 0000 IN. Y0 0000 IN. Z0	- I/Ny	T• 715.0000	- TINA	T+ 595,0000	13 (CAL 184 -221		7000 IN. XO 0000 IN. YO 0000 IN. ZO	= T/NJ	H(0) 27.62000 4	= "I/NH	H(0) 25.30000 3
	0411		• 1078.7 • .0 • 375.0	0 /81	VLBAR . 03668 1	0 /61	VLBAR . 05362 1	OAL		• 1076.7 • .0	18/0	P(0) 064.00000	0 /64	P(0) 531.10000
		DATA	T. XMRP ES YMRP ES ZMRP	NUN NO	VBAR . 03996	RUN NO	VBAR . 05953		DATA	T. XHRP ES YHRP ES ZHRP	RUN NO	M(1) 4.19200 1	RUN NO	M(1) 3.97600
		REFERENCE	2690.0000 SQ.F 474.8000 INCF 936.7000 INCF 936.7000 INCF		ALPHA 40.000		ALPHA 40.030		REFERENCE	2690.0000 50.F 474.8000 INC 936.7000 INC 936.7000 INC		ALPHA 40.000		ALPHA 40.030
			SREF = LREF = BREF = SCALE =		MACH 15.080		MACH 15.740			SREF = LREF = BREF = SCALE =		MACH 15.080		MACH 15.740

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1076.7000 IN. XC .0000 IN. YC 375.0000 IN. ZC
29/ 0 RN/L =
.000000 27.40000
(0)H (0)e
30/ 0 KN/L =
-(0) H(0) -90000 25.14000 36
04113(CAL184-220)
1076.7000 IN. XO .0000 IN. YO 375.0000 IN. ZO
58/ 0 KN/L -
A CLM 11090 .02313
13/ 0 RN/L
.Á CLM 09123 -, 04395 -
31/ 0 KN/L = .(
A CLM 13640 .01964 -

						5	OALLE TABUL	ATED SOURCE D	ATA			PAG	2 2
					OAL	13(CAL 184-2	22018280857	MTN28N77 W116	544 V845		SUHUS	5) (25 AP	35)
	REFERE	NCE DAT	<								PARAME TRIC	DATA	
SREF = SREF = SREF = SCALE =	2690.0000 5 474.8000 1 936.7000 1 0100	00.FT. NCHES NCHES	XMRP YMRP ZMRP		1076. 375.	7000 IN. X 0000 IN. Y 0000 IN. Z	000			ALPHA - ELEVON - RUDDER - PHI	000 ° 000 °	BETA = BOFLAP = SPDBRK = AILRON =	000 000
		œ	CN NO.	•••	58/ 0	RN/L -	90.			•			
MACH 15.320	ALPHA 40.000	VBA . 04	8 231	2.2	LBAR 03876	T• 1729.00000	REFTL .08496	SORTC*	P1101 .30690	P(TS) .00019	H(H) 3.25500	T (M) 542.00000	C (CP) 00443
		æ	UN NO.	-	13/ 0	RN/L -	8						
MACH 15.590	ALPHA 40.000	487 20.	R 406	5 7	LBAR 02186	T• 1660.00000	REFTL .28070	SORTC+ .81740	P1707 .91550	P(TS) .00029	H(H) 3.18900	T (W) 531.00000	C(CP) 00352
		œ	GN NO.		31/ 0	RN/L -	40.						
MACH 15.930	ALPHA 40.000	VBA . 06	a vra	5 7	LBAR 05556	T+ 1563.00000	REFTL .0455 3	SORTC+ .83700	P1 TOT . 12700	P(TS) .00029	H(H) 3.23700	T (M) 539.00000	C(CP) 00013
					OAL	13(CAL 184-)	220) B26C9F7	HTN28NTT WILE	SE44 VBR5		(TUH02	5) (25 AM	8 75 J
	REFERE	INCE DAT	<								PARAMETRIC	DATA	
SREF = .rref = .sref = : .cale = :	2690.0000 5 474.8000 1 936.7000 1 0100	SQ.FT. INCHES INCHES	anna Ymri Zmri Zmri		1076. 375.	7000 IN. X 0000 IN. Y 0000 IN. Z	000			ALPHA = ELEVON = RUDOER = PH1	40.000 -40.000 000.	BETA BOFLAP SPOBRK - AILRON -	000 000 000
		œ	UN NO.		28/ 0	- INI	80.						
MACH 15.320	ALPHA 40.000	DM 19.4	.) 600 10	с	(0) 00000	н(о) 27.87000	T (0) +034.0000	U 7378.00000	T 96.46000	Р . 00100	0(PSI).	RHO . 86930	MU 8.11500
			KN NO.	-	13/ 0	EN/L -	8.						
MACH 15.590	ALPHA 40.000	MC1 4.16	1) 1500 34	Р 202.	(O)	H(0) 28.66000	T (0) 3878.0000	U) 7218.00000	T 69.12000	Р .00288	09064.	RHO 2.71200	NU 7.49700
		æ	ON NO		31/ 0	- YNN	đ.						
MACH 15.930	ALPHA 40.000	Ш. В.	1)	۲. وې	5000	н(0) гч. 72000	T (0) 3638.00000	U 8954.00000	1 79.24000	Р . 000 38	Q(PS1) .06816	RHO . 40600	MU 6.65500

5	Ŕ		000 000 000		P#1		PH 05175		PM4 .31660	ک ر ک		000 000		C (CP) 00338		C(CP) 00223		C(CP)
PAGE) (25 APR	DATA	BETA = BDFLAP = SPDBRK = ATLRON =		рнз - 09 94 3		РМЗ . 04673		PM3 .29150	(25 APR	ATA	ETA = Ioflap = Pobrk = Ilron =		T (M) 38.00000		T (W) 40.00000		T (W)
	(RUH026	ARAMETRIC (30.000 12.000 .000 .000		PM2 .11400		PM2 .05709		PM2 . 35460	(SUH026)	RAMETRIC D	30.000 B 12.000 B .000 5		H(W) 3.23100 5		Н(Ы) 3.24300 5		H(M)
		a.	ALPHA - ELEVON - RUDDER - PHI		PMI .08731		PMI .04457		PM1 .24870		ā	ALPHA = ELEVON = RUDDER = PHI		P(TS) .0002 5		P(TS) .00023		P(TS)
ATA	544 V8R5				CBL -,00040		CBL .00047		CBL .00012	144 V845				P1101 .30550		P170T .14380		P1101
D SOURCE DI	I28N77 WI 166				CYN .00030		CYN . 00146		CYN . 00028	28N77 W116E				SQRTC+ .83670		SORTC+ .85220		SQRTC+
13 TABULATE) B26C9F7M7N			80.	CY 00533	ð.	CY . 00962	.27	CY 00124	B26C9F7M7N			80.	REFTL .0897 5	5	REFTL .04795	27	REFTL
041	3 (CAL 184-220		00 IN. X0 00 IN. Y0 00 IN. Z0	EN/L -	CLM 07821	EN/L =	СLM 08309	EN/L -	СLM . 00000	110-110-1250		00 IN. XO 00 IN. YO 00 IN. ZO	- TINA	T• 42.0000	- LINA	T• 73.00000	EN/L -	÷
	OALL		• 1078.70 • .00 • .375.00	69/0	CA .15020	7 <i>2/</i> 0	CA .16520	121/ 0	CA .11860	04113		• 1076.70 • .00 • 375.00	0 /69	VLBAR .03791 14	72/ D	VLBAR .05317 13	121/ 0	VLBAR
		DATA	· XMRP S YMRP S ZMRP	RUN NO.	CN . 89610	RUN NO.	CN . 90350	RUN NO.	CN . 94280		DATA	XMRP XMRP ZMRP	RUN NO.	/BAR .04276	RUN NO.	/BAR 06057	RUN NO.	BAR
		REFERENCE	2690.0000 SQ.FT 474.8000 INCHE 936.7000 INCHE .0100		ALPHA 30.000		AL PHA 30.030		ALPHA 29.980		REFERENCE	2690.0000 50.FT 474.8000 INCHE 936.7000 INCHE .0100		ALPHA 30.000		ALPHA 30.030		ALPHA
			SREF = LREF = BREF = SCALE =		MACH 15.310		MACH 15.560		MACH 15.760			SREF = 2 LREF = 2 BREF = 5 SCALE =		MACH 15.310		MACH 15.560		MACH

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							0	1113 TAB	ULATEL	D SOUNCE L					5
					VO	II3(CA	L 184-2	20)82609	FTMTNE	BUTT WILE	3544 VBR5		(TUH02	16) (25 AP	- 92, X
	REFER	RENCE DA1	2										PARAMETRIC	DATA	
SREF = LREF = BREF = SCALE =	2690.0000 474.8000 936.7000	SQ.FT. INCHES INCHES	XMRP Ymrp Zmrp		1076 375	.0000	IN. X0 IN. Y0 IN. Z0					ALPHA = ELEVON = RUODER = PH1 =	30.000 12.000 .000	BETA - BDFLAP - SPDBRK - AILRON -	000 000
		u.	SUN NO.	-	69/ 0	Ň	י ר	80.							
MACH 15.310	AL PHA 30.000	1) M ([) \$700 10		(O)	н 58.	(0) 78000	T (0) 3895.000(00 723	U 32.00000	T 92.81000	р . 00100	Q(PSI) 16370	61106 .	MU 7.80800
		Œ	RU NO.	•	72/ O	ž	י ל	5.							
MACH 15.560	ALPHA 30.030	M(1 3.97	() 1900 5	e 80	(0) 50000	55. н 55.	(0) 17000	T (0) 3695.000(00 701	U 13.00000	T 84.43000	P . 00045	41240.	RH0 .45170	MU 7.10200
		Œ	RUN NO.	-	21/ O	ž	י ר	.27							
MACH 15.760	ALPHA 29.980	DM 1	1) 3500 32	۹. 206. –	(0)	н 26.1	(0) 08000	T (0) 3806.000(114 00	U 1.00000	T 85.38000	P .00271	Q(PS1) 47210	RH0 2.66700	MU 7.18300
					8	113(CA	L 184-2	20)82609	FJHJNE	BNTT WILE	5787 443		(RUH02	11) (25 AP	- 57 H
	REFER	ENCE DAT	2										PARAMETRIC	DATA	
SREF = LREF = BREF = SCALE =	2690.0000 474.8000 936.7000	SQ.FT. INCHES INCHES	Children Ymige Zmildren		1076 375	.0000	DX .N N .N N .ZO					ALPHA = ELEVON = RUDOER = PHI	40.000 12.000 .000	BETA = BOFLAP = SPOBRK = Atlron =	000 ·
		Ľ	SUN NO.		70/ 0	N.	י י	60.							
MACH 14.880	ALPHA 39.970	S.	00/6	υ.	.A 14580	σŗ	LH 1110	CY .0124	5	CYN . 00285	CBL . 00226	PM1 . 15580	PM2 . 18440	Р н3 .16070	PH4 . 18180
		*	NO.	_	71/ 0	Å.	י ז'	S 0.							
MACH 15.310	ALPHA 40.000	C. S.	9 700	υ.	.A 17670	5 ;	11060 11060	CY .018	53	CYN . 00292	CBL. .00348	PHI .07007	PM2 . 07902	PM3 . 06993	PHF

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DAII3 TABULATED SOURCE DATA

PAGE 53

				OA.	113 TABULATI	ED SOURCE DI	ATA			PAG	т С
			140	13(CAL 184-22)	0) B28C9F7H7I	NZBN77 WI 166	E44 VBR5		SOHUR)	8) (25 AP	с Б
	REFER	TENCE DATA						-	PARAMETRIC	DATA	
SREF = LREF = BREF = SCALE =	2690.0000 474.8000 936.7000 .0100	SQ.FT. XMRP INCHES YMRP INCHES ZMRP	• 1078. • 375.	7000 IN. X0 0000 IN. Y0 0000 IN. Z0				ALPHA = ELEVON = RUDDER = PHI	30.000 6.000 .000	BETA BEFLAP SPDBRK = Allron =	.000 .000 .000 .000
		RUN NO.	. 120/ 0	EN/L =	£0.						
MACH 10.046	AL PHA	CN) .80760	CA .13390	ссм 02981	сҮ .00194	CYN 00479	CBL. . 00868	PMI 11690	PM2 .15340	рм з . 12910	PH4 . 14700
		RUN NO.	0 /611 .	RN/L =	ħ.						
MACH 10.820	ALPHA 29.980	CN . 86540	CA . 08533	CLM 04915	CY . 00219	CYN 00552	CBL .01128	PM1 .31770	PH2 .46810	PM3 .40360	PH4 . 44480
		RUN NO.	. 73/ 0	RN/L =	5 0.						
MACH 14.710	ALPHA 30.000	CN) .86070	CA .12010	CLM 05432	сҮ . 00554	CYN 00342	CBL .00877	РМ1 .06001	PM2 .07203	РНЗ .06126	PHN .06730
		RUN NO.	. 117/ 0	RN/L -	60.						
MACH 14.990	ALPHA 29.980	CN 86250	CA .12540	CLM 04245	CY .00243	CYN 00543	CBL .01023	PM1 .10160	PM2 .13650	04111. .11140	PHH . 12330
		RUN NO.	. 118/ 0	EN/L =	.26						
MACH 15.930	ALPHA 29.980	CN . 89290	CA .10770	CLM 03627	CY .0047 3	CYN 00582	CBL .01380	PHI .23820	PH2 . 34830	РН3 .27630	PHH . 29970
			OAL	13(CAL 184-22()) B26C9F7H7H	N28N77 WI 16E	CH4 VBR5		SOHUSI	8) (25 AM	с 52 С
	REFER	ENCE DATA						-	PARAMETRIC	DATA	
SREF = LREF = BREF = SCALE =	2690 .0000 474.8000 936.7000 .0100	SQ.FT. XMRP INCHES YMRP INCHES ZMRP	• 1076.' • 375.'	7000 IN. XO 0000 IN. YO 0000 IN. ZO				ALPHA = ELEVON = RUDDER = PHI =	30.000 6.000 .000	BETA BOFLAP SPOBRK -	.000 .000 .000
		RUN NO.	. 120/ 0	- T/NJ	£0.						
MACH 10.040	ALPHA 29.980	VBAR 04539	VLBAR . 04443 {	T+ 2153.00000	REF TL . 02820	SQRTC+ .75880	P1107 .41570	P(TS) .000 25	Н(М) 3.18900	T (M) 531.00000	C(CP) 01251
		RUN NO.	. 119/ 0	= T/Ny	**.						
MACH 10.820	ALPHA 29.980	VBAR 01419	VLBAR . 01262	†∗ 895.20000	REFTL .47690	50RTC+ .90550	P1707 1.22700	P(TS) .00025	н(м) 3.18900	T(W) 531.00000	C(CP) 01147

92 22 32	PR 75)		.000 .000 .000 6.000		C (CP) 00344		C (CP) 004 35		с (сР) 004 04	1 57 A		. 000 . 000 . 000 . 000		HU 26.73000		MU 8.22300		MU 7.72000		HU 7.93800
Ă	₩ 52 × (8)	DATA	BETA = BOFLAP = SPOBRK = ATLRON =		T (H) 535.00000		T (H) 528.50000		T (H) 529.5000	8) (25 A F	DATA	BETA = BOFLAP = SPOBRK = AILRON =		RH0 .77460		RH0 6.95500		RH0 .60470		RHO 1.04000
	(SUHD2	PARAMETRIC	30.000 6.000 .000		H(M) 3.21300		н(м) 3.17400		н(м) 3.18000	(TUHO24	PARAMETRIC	30.000 6.000 .000 .000		04022.		04499°		Q(PSI) .10030		Q(PS1) .18410
			ALPHA - ELEVON - RUDDER - PH1		P(TS) .00023		P(TS) .00025		P(TS) .000 25			ALPHA = ELEVON = RUDDER = PHI		P .00312		Р .00810		Р .00066		Р .00117
DATA	5644 V8R5				P1101 .18680		P1101 .34340		P1T0T .83640	E44 V875				T 337.70000		T 87.74000		T 91.76000		T 84.36000
TED SOURCE	TN28N77 WI				SORTC+ .84920		SQRTC• .83920		SORTC+	M28N77 WILE				U 1052.0000		U 1245.00000		U 1911.00000		U 140.0000
AII3 TABULA	20)B26C9F7M			5 0.	REFTL .05819	60.	REFTL .10060	9 2 .	REFTL .28040	0) B26C9F7HC			.03	T(0) 672.00000 9	* * .	T (0) 245.00000 5	50.	T(0) 606.00000 B	60.	T(0) 804.00000 7
ō	13(CAL 184-2)		7000 IN. X0 2000 IN. Y0 3000 IN. Z0	- RN/L	T* :340.00000	- RN/L	T* 408.0000	- INI	T* 396.00000	3 (CAL 184-22		000 IN. X0 000 IN. Y0 000 IN. Z0	- T/Na	H(0) 43.11000 5	- I/NA	H(0) 14.38000 2	- I/NA	H(0) 24.49000 3	RN/L -	H(0) 26.13000 3
	140		. 1076 	. 73/ 0	VLBAR .04585 1	. 117/ 0	VLBAR .03524 1	. 118/ 0	VLBAR .02244 1	0411		• 1076.7 • .0 • 375.0	. 120/ 0	P(0) 262.00000	. 119/ 0	P(0) 525.10000	. 73/ 0	P(0) +95.10000	. 117/ 0	P(0) 117.00000
		CE DATA	.F.T. XMRP CHES YMRP CHES ZMRP	RUN NO	VBAR . 05178	RUN NO	VBAR .03967	RUN NO	VBAR . 02560		E DATA	FT. XHRP HES YMRP HES ZMRP	RUN NO	M(1) 5.49200	RUN NO	M(1) 2.92300	RUN NO.	M(!) 3.95800 4	RUN NO.	M(I) 4.15800 1(
		REFEREN	2690.0000 SQ 474.8000 IN 936.7000 IN 936.7000 IN		ALPHA 30.000		AL PHA 29.980		AL PHA 29.980		REFEREN	690.0000 50 474.8000 1N 936.7000 1N .0100		AL PHA 29.980		ALPHA 29.980		AL PHA 30.000		ALPHA 29.980
			SREF = LREF = BREF = SCALE =		MACH 14.710		MACH 14.990		MACH 15.930			SREF = 6 LREF = 6 BREF = 5 SCALE =		MACH 10.040		MACH 10.820		MACH 14.710		MACH 14.990



5 5 5 000. 000. 6.000		MU 6.9660
Pace Data (25 AP Data Berlap = Spobrk = Ailron =		RHO 2.5560 0
(TUHO28 ARAMETRIC 30,000 6,000 .000		0(PS1) 44850
ALPHA - LEVON - RUDDER - PHI		P .00252
ATA E44 VBR5		T 82.82000
ED SOURCE D NIZBN77 WI 15		U 7108.00000
113 TABULAT 0182609F7M7	.26	T (0) 5774 . 00000
0, 3(calib4-22 1000 in. X0 1000 in. X0	= 1/NA	H(0) 25.83000
0A11 0A11 0A11 0A11	. 118/ 0	P(0) 192.00000
E DATA FT XMRP HES XMRP HES ZMRP	RUN NO	M(1) 4.12500 3
REFERENC 590.0000 50. 74.8000 INC 336.7000 INC		AL PHA 29.980
SREF = 24 LREF = 24 BREF = 5 SCALE = 5		MACH 15.930

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