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(NASA-CR-134424) INVESTIGATION OF SPACE N75-14809 SHUTTLE LAUNCH VEHICLE EXTERNAL TANK NOSE CONFIGURATION EFFECTS (MODEL 67-OTS) IN THE ROCKWELL INTERNATIONAL 7 BY 7 FOOT TRISONIC Unclas WIND TUNNEL (IA69) (Chrysler Corp.) 342 p G3/18 06542

SPACE SHUTTLE

AEROTHERMODYNAMIC DATA REPORT



JOHNSON SPACE CENTER

HOUSTON, TEXAS

SPACE DIVISION CHRYSLER CORPORATION

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INVESTIGATION OF SPACE SHUTTLE LAUNCH VEHICLE EXTERNAL TANK NOSE CONFIGURATION EFFECTS (MODEL 67-OTS) IN THE ROCKWELL INTERNATIONAL 7- BY 7-FOOT

TRISONIC WIND TUNNEL (IA69)

Вy

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Prepared under NASA Contract Number NAS9-13247

By

Data Management Services Chrysler Corporation Space Division New Orleans, La. 70189

for

Engineering Analysis Division

Johnson Space Center National Aeronautics and Space Administration Houston, Texas

WIND TUNNEL TEST SPECIFICS:

Test Number:Rockwell Trisonic 280NASA Series Number:IA69Model Number:67-0TSTest Dates:11 through 14 January 1974Occupancy Hours:25

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INVESTIGATION OF SPACE SHUTTLE LAUNCH VEHICLE EXTERNAL TANK NOSE CONFIGURATION EFFECTS (MODEL 67-OTS) IN THE ROCKWELL INTERNATIONAL 7- BY 7-FOOT TRISONIC WIND TUNNEL (IA69) By Robert Mennell & Robert Rogge*

ABSTRACT

Experimental aerodynamic investigations were conducted on an 0.015scale representation of the Space Shuttle Launch Configuration in the Rockwell International Trisonic Wind Tunnel during the time period of January 11 to 14, 1974. The NASA designation for this test period was IA69.

The primary test objectives were to investigate shock wave formation and record the aerodynamic stability and control effects generated by a new external tank nose configuration (MCR 467) at a Mach number of 1.2. Schlieren photographs were taken at angles of attack of -4° , 0° , and 4° , $\beta = 0^{\circ}$ with force and pressure data recorded over the alpha range of $-4^{\circ} \le \alpha \le 4^{\circ}$ at $\beta = \pm 4^{\circ}$.

The launch configuration model, consisting of the VL70-000140A/B Orbiter, the VL78-000041B ET, and the VL77-000036A SRBs, was sting mounted on a 2.5inch Task type internal balance entering through the ET base region. Wing, body, and base pressure lines for all orifices were routed internally through the model to the sting support system. Parametric variation consisted only of altering the ET nose configuration.

* Rockwell International Space Division

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TABLE OF CONTENTS

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	Page
ABSTRACT	iii
INDEX OF MODEL FIGURES	2
INDEX OF DATA FIGURES	3
NOMENCLATURE	5
CONFIGURATIONS INVESTIGATED	. 10
TEST FACILITY DESCRIPTION	13
DATA REDUCTION	15
TABLES	
I. TEST CONDITIONS	18
II. RUN NUMBER/DATA SET COLLATION SUMMARY	19
III. MODEL DIMENSIONAL DATA	20
IV. PRESSURE INSTRUMENTATION	47
FIGURES	
MODEL	48
DATA	61
APPENDICES	
A. TABULATED SOURCE DATA - FORCE	

B. TABULATED SOURCE DATA - PRESSURE

INDEX OF MODEL FIGURES

Figur	`e	Title	Page
1.		Axis systems.	48
2.		Model sketches.	
	a.	Mated Vehicle	49
	b.	Orbiter Three View	50
	c.	Aft Orbiter/ET Attach Hardware	51
	d.	Front Orbiter/ET Attach Hardware	52
	e.	External Tank, T ₁₂	53
	f.	External Tank Nose Variation, T ₁₉	54
	g.	Solid Rocket Booster, S ₁₂	55
	h.	Definition of Model Base and Cavity Areas	56
	i.	Base Pressure Tap Locations	57
	j.	Wing Pressure Orifice Locations	58
	k.	Fuselage Pressure Orifice Locations	59
3.		Model photographs.	
	a.	Front View, TWT Installation Configuration $O_1 T_A S_1 P_2 P_7$	60
	b.	Front View, TWT Installation Configuration $O_1 T_1 S_1 P_2 P_6$	60

FIGURE	TITLE	PLOTTED COEFFICIENTS SCHEDULE	CONDITIONS VARYING	PAGES
	FORCE DATA			
4	Effect of External Tank Nose Configuration, Longitudinal Char.	A B C	CONF. CONF. CONF.	1-5 6 7
5	Effect of External Tank Nose Configuration, Lat./Dir. Char., Beta = 0 and +4	D	CONF., ß	8
6	Effect of External Tank Nose Configuration, Lat./Dir. Char., Beta = 0 and -4	D	CONF., B	9
	PRESSURE DATA			
7	Effect of External Tank Nose Config. On Orbiter Pressures, Beta = 0, -4			
- -	• - Wing Top	E F	CONF., β, α, 2Y/B CONF., β, α, X/C	1-6
	- Wing Bottom	E F	CONF., β , α , $2Y/B$ CONF., β , α , X/C	25-30 31-45
	- Orbiter Fuselage	G H	CONF., β, α, PHI CONF., β, α, X/L	46-57 58-75
8	Effect of External Tank Nose Config. on Orbiter Pressures, Beta = 0, +4			
	- Wing Top	E F	CONF., α , β , 2Y/B	76-81
	- Wing Bottom	Ě	CONF., α, β, 2Υ/Β	100-105
	- Orbiter Fuselage	G H	CONF., α, β, Χ/C CONF., α, β, PHI CONF., α, β, Χ/L	106-120 121-132 133-150

INDEX OF DATA FIGURES

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FIGURE	TITLE	PLOTTED COEFFICIENTS SCHEDULE	CONDITIONS VARYING	PAGES
9	Effect of Mach Number on Orbiter Pressure Loading			
	- Wing Top - Wing Bottom	E F E	MACH, α, 2Y/B MACH, α, X/C MACH, α, 2Y/B	151-156 157-174 175-180
	- Orbiter Fuselage	F G H	MACH, α, X/C MACH, α, PHI MACH, α, X/L	181-195 196-207 208-225

INDEX OF DATA FIGURES (Concluded)

PLOTTED COEFFICIENTS SCHEDULE:

(A): CL, CDF, CN, CA, CAF, CLM VS. ALPHA

4

(B): CL VS. CDF AND CLM

(C): L/DF VS. ALPHA

(D): CY, CYN, CBL VS. ALPHA

(E): CP VS. X/C

(F): CP VS. 2Y/B

(G): CP VS. X/L

(H): CP VS. PHI

NOMENCLATURE

¹bacps ^Ab_{ET} ^АЬ ОМS A_borb A_bsrb A_b Srbn ^AC_{ET} $A_{\rm ORB}$ °_{A</sup>bal} c_{ab}acps °_{A_b</sup>et}

Symbol

Definition

SADSAC Symbol

attitude control propulsion system base area, ft² (total for right + left)

external tank total base area, ft²

orbital maneuvering system base area, ft²

Orbiter total base area, ft²

SRB shroud base area (minus projected nozzle base area, total for right + left), ft²

SRB nozzle base area, ft^2 (total for right + left)

external tank cavity area, ft²

Orbiter cavity area, ft²

balance chord force coefficient, uncorrected

chord force coefficient-correction due to ACPS base pressures. (Corrected to P_0 using A_1) ACPS

chord force coefficient correction due to ET base pressure. (Corrected to ${\rm P_{o}}$ using ${\rm A_{b}}_{\rm ET}$)

chord force coefficient correction due to OMS base pressure. (Corrected to $\rm P_{0}$ using $\rm A_{b}$) $\rm _{OMS}$

C_Aborb

с_{Ар}омs

chord force coefficient correction due to Orbiter base pressure. (Corrected to P_0 using A_b) P_{ORB}

NOMENCLATURE (Continued)

:

C _{Ab} srb		<pre>chord force_coefficient correction due to SRB shroud base pressure. (Corrected to P using A) SRB</pre>
C _{Ab} srbn		chord force coefficient correction due to SRB nozzle base pressure. (Corrected to P _o using A _b) SRBN
CACET		chord force coefficient correction due to ET cavity pressure. (Corrected to P _B using A _C) ET
CACORB	CACORD	chord force coefficient correction due to Orbiter cavity pressure. (Corrected to P _B using A _C) ORB
° _A _F	CAF	launch vehicle forebody chord force coefficient. (Corrected to P _o)
с _А Т	CA	launch vehicle total chord force coefficient. (Corrected to P _B)
с _Й	CBL	launch vehicle rolling-moment coefficient
c _D	CD	launch vehicle total chord force coefficient. (Corrected to P _B)
с _D F	CDF	launch vehicle forebody drag coefficient. (Corrected to P _o)
с _L	CL	launch vehicle total lift coefficient. (Corrected to $P_B)$
C _{LF}		launch vehicle forebody lift coefficient. (Corrected to P _o)
C _m	CLM	launch vehicle total pitching-moment coefficient. (Corrected to P _B)

NOMENCLATURE (Continued)

с _т		launch vehicle forebody pitching-moment coefficient. (Corrected to P _o)
с _N	CN	launch vehicle normal-force coefficient
C _{Pi}	CP(I)	launch vehicle pressure coefficient at station i
с _ү	СҮ	launch vehicle sideforce coefficient
C _n	CYN	launch vehicle yawing-moment coefficient
i		incidence angle of Orbiter reference plane with respect to ET reference plane, deg.
ℓ _{REF}	L _{REF}	reference length, in
Mo	МАСН	tunnel freestream Mach number
MRP(X _T ,Y	' _T ,Z _T)	moment reference point in ET coordinate system
PB		orbiter base pressure
P _i	•	model absolute pressure, psfa
Po	РО	tunnel freestream static pressure, psfa
PT	РТ	tunnel freestream total pressure, psfa
q.	Q(PSF)	tunnel freestream dynamic pressure, psf
RN	RN/L	tunnel Reynolds number, millions per foot
SREF	S _{REF}	reference area, ft ²
Т _о	то	tunnel freestream static temperature, °R
T _T	TT	tunnel freestream total temperature

NOMENCLATURE (Continued)

W _F i		<pre>model pressure weighting factor, (either 0 or 1)</pre>
Х _{СР}	ХСР	launch vehicle center of pressure location
Х _о		orbiter longitudinal station, in.
× _T		ET longitudinal station, in,
Yo		orbiter spanwise station, in.
Υ _Ţ		ET spanwise station, in.
a	ALPHA	launch vehicle angle of attack, deg
β	BETA	launch vehicle angle of sideslip, deg
δ _a	AILRON	aileron deflection $(\delta_{e_{L}} - \delta_{e_{R}})/2$, deg
å BF −	BDFLAP	body flap deflection, deg.
^δ e	ELEVON	elevon deflection ($\delta_{e_{L}} + \delta_{e_{R}}$)/2, deg
^δ R	RUDDER	rudder deflection, deg
δSB	SPDBRK	speed brake deflection angle, deg
^Λ LE		wing leading edge sweep angle, deg
φ .	рні	radial location of orbiter nose static pressure tap location, deg
a		aileron
ACPS		attitude control propulsion system
BAL		internal balance
е		elevon
ET		external tank
i		model pressure orifice number

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NOMENCLATURE (Concluded)

I		inboard
L		left
0		outboard
MPS		main propulsion system
OMS		orbiter maneuvering system
r		rudder
R		right
SRB		solid rocket booster
SRBN		solid rocket booster nozzle
b	BREF	reference span; m, ft, in
	X/L	longitudinal location on orbiter fuselage
n	2Y/B	spanwise location on orbiter wing surface
	X/C	chordwise location on orbiter wing surface
L/D _f	L/DF	lift to forebody drag ratio

CONFIGURATIONS INVESTIGATED

The model used for this test period was an 0.015-scale representation of the Rockwell International Space Shuttle Launch Vehicle consisting of Orbiter, external oxygen-hydrogen tank (ET), and solid rocket boosters (SRB). The VL70-000140A/B Orbiter model was of the blended wing body design utilizing a double delta wing $(75^{\circ}/45^{\circ}\Lambda_{LE})$, full span elevons (unswept hingeline), a centerline vertical tail with rudder and/or speedbrake deflection capability, and an orbital maneuvering system (OMS) mounted on the aft fuselage. The ET, per VL78-000041B, and the SRB's, per VL77-000036A, were designed to incorporate all full scale attach structures, protuberances, fairings, fuel feed and vent lines, etc. The alternate ET nose tested was per model dwg. SS-A01167.

The Orbiter model was constructed primarily of cast aluminum while both the ET and SRB's were of machined aluminum. The ET was designed to accept a sting-mounted 2.5-inch diameter Task type balance for use in force measurement. Orifices were located in the Orbiter, ET, and SRB base regions for use in recording base pressure levels per figures 2h and 2i. Additional pressure orifices were located in the Orbiter per figures 2j and 2k.

The following letter designations were used to describe the various launch vehicle configurations:

Symbol	Definition
AT ₉	Attach structure-rear SRB/ET per Rockwell lines VL72-000106, model dwg. SS-A01168
ат ₁₂	Attach structure-left rear ORB/ET per Rockwell lines VL78-000050, model dwg. SS-A01167

- AT₁₃ Attach structure-right rear ORB/ET per Rockwell lines VL78-000050, model dwg. SS-A01167
- AT₁₄ Attach structure-front SRB/ET per Rockwell lines VL77-000051A, model dwg SSA-01168
- AT₁₅ Attach structure-front ORB/ET, location per Rockwell lines VL72-000088D, model dwg. SS-A01167
- B₂₆ Orbiter fuselage per Rockwell lines VL70-000140A/B, model dwg. SS-A00147
- C₉ Orbiter canopy per Rockwell lines VL70-000140A/B, VL70-000143A, model dwg. SS-A00147
- E26 Orbiter full span, unswept hingeline elevons per Rockwell lines VL70-000200, model dwg. SS-A00148
- F₇ Orbiter body flap per Rockwell lines VL70-000145, model dwg. SS-A00147
- FL₁ ET/ORB. LOX feed line per Rockwell lines VL78-000050, model dwg. SS-A01167
- FL₂ ET/ORB. LH 2 feed line per Rockwell lines VL78-000050, model dwg. SS-A01167
- M₇ Orbiter OMS/RCS pods per Rockwell lines VL70-000145, model dwg. SS-A00147
- N₂₈ Orbiter OMS engine nozzles per Rockwell lines VL70-000140A, model dwg. SS-A00147
- N₄₁ SRB engine nozzles per Rockwell lines VL77-000036A
- PS₁ SRB electrical tunnel fairing per model dwg. SS-A01168
- PS2 SRB attach ring per Rockwell lines VL77-000036A, model dwg. SS-A01168
- PS₃ SRB separation rocket fairing per Rockwell lines VL77-000036A, model dwg. SS-A01168
- PT₁ ET₁₂ LOX vent line fairing per Rockwell lines VL78-000031A, model dwg. SS-A01167
- PT₂ ET LOX feed line per Rockwell lines VL78-000031A, model dwg. SS-A01167

PT3	ET LH ₂ feed line per Rockwell lines VL78-000031A, model dwg. SS-A01167
PT ₈	ET ₁₉ LOX vent line per model dwg. SS-A01167
R ₅	Orbiter rudder per Rockwell lines VL70-000146A, model dwg. SS-A00148
s ₁₂	SRB per Rockwell lines VL77-000036A, model dwg. SS-A01167
T ₁₂	ET per Rockwell lines VL78-000041A, model dwg. SS-A01167 nose @ sta. 309.00
т ₁₉	ET per model dwg. SS-A01167. Nose @ sta. 324.27
۷ ₈	Orbiter centerline vertical tail per Rockwell lines VL70-000‡46A, model dwg. SS-A00148
^W 116	Orbiter double delta wing per Rockwell lines VL70-000200, model dwg. SS-A00148

In order to facilitate the writing of various launch configuration nomenclature, the following abbreviations were used:

Symbol	Definition
01	Orbiter B ₂₆ C ₉ M ₇ N ₂₈ F ₇ W ₁₁₆ E ₂₆ V ₈ R ₅
۲ _ן	External Tank T ₁₂
T ₄	External Tank T ₁₉
s ₁	Solid Rocket Booster S ₁₂ N ₄₁
P ₂	Fairings PS ₁ , PS ₂ , and PS ₃
P ₆	Components PT_1 , PT_2 , PT_3 , AT_9 , AT_{12} , AT_{13} , AT_{14} , AT_{15} , FL_1 , FL_2
P ₇	Components PT ₂ , PT ₃ , PT ₈ , AT ₉ , AT ₁₂ , AT ₁₃ , AT ₁₄ , AT ₁₅ , FL ₁ , FL ₂

TEST FACILITY DESCRIPTION

The Rockwell International Trisonic Wind Tunnel is an intermittent blow down facility with a 7- by 7-foot tandem test section capable of testing force, inlet, pressure, and flutter models at Mach numbers from 0.1 to 3.5.

Two synchronous motor driven centrifugal compressors, operating in series, supply dry air at a rate of 401b/sec. to eight storage spheres having a total volume of 214,000 ft³. The air is dried to a moisture content of 0.0001 lb. or less of water per lb. of dry air (approx. -35°F dew point) and stored at a pressure of ten atmospheres. Flow from the air storage spheres is regulated by a servo controlled value. The eight-foot diameter valve opens within two seconds to control and stabilize the settling chamber at a preselected pressure.

Downstream of the settling chamber is a fixed nozzle which provides a transition from the circular cross-section of the settling chamber to the rectangular cross-section of the variable nozzle. Two seven-foot wide steel plates, supported between parallel walls by hydraulic jacks, form the floor and ceiling of the flexible nozzle section. Changes in nozzle contour to produce variations in Mach number are accomplished by means of these jacks and require 30 to 50 minutes to complete.

The two test sections for supersonic, transonic, and subsonic testing are 7- by 7-feet and are permanently installed in a tandem arrangment. The standard supersonic test section (for testing at Mach numbers greater than 1.3) is in the downstream end of the flexible nozzle. The test section

for subsonic and transonic operation is located in the downstream end of the porous wall area. An access door to the test section is located in the variable diffuser.

The variable diffuser downstream of the porous wall area may be adjusted to provide subsonic Mach number control, to generate transonic Mach numbers, and to minimize start time for supersonic testing with models having high tunnel blockage.

An equivalent 5° conical expansion angle is provided in a fixed diffuser which completes the basic tunnel circuit. Downstream of the diffuser is a sound abatement muffler building where the air is exhausted to the atmosphere.

DATA REDUCTION

The aerodynamic force and moment data presented were measured by the Task Corporation 2.5-inch diameter MK XB internal strain gage balance. The data have been corrected for orbiter, external tank, and solid rocket booster base pressure drag, sting and balance deflections, and model weight tare.

The corrections to the axial force were accomplished in the following manner.

+ ^CA_{CORB}

= C_{ABAL}

where

and



where

$$C_{A_{F}} = C_{A_{Tota1}} - C_{A_{b_{ORB}}} - C_{A_{b_{OMS}}} - C_{A_{b_{ACPS}}} - C_{A_{b_{SRB}}}$$

$$- C_{A_{b_{SRBN}}} - C_{A_{b_{ET}}}$$
where
$$C_{A_{b_{ORB}}} = - C_{P_{1}} \left(\frac{A_{b_{ORB}}}{S_{REF}}\right) \text{ wF}_{1}$$

$$C_{A_{b_{OMS}}} = - C_{P_{3}} \left(\frac{A_{b_{OMS}}}{S_{REF}}\right) \text{ wF}_{3}$$

$$C_{A_{b_{ACPS}}} = - C_{P_{3}} \left(\frac{A_{b_{ACPS}}}{S_{REF}}\right) \text{ wF}_{3}$$

$$C_{A_{b_{SRB}}} = - C_{P_{6}} \left(\frac{A_{b_{SRB}}}{S_{REF}}\right) \text{ wF}_{6}$$

$$C_{A_{b_{SRBN}}} (= - C_{P_{7}} \left(\frac{A_{b_{SRB}}}{S_{REF}}\right) \text{ wF}_{5}$$

The following reference dimensions were used for reducing all aerodynamic data to coefficient form:

Symbol	Definition	ion Value		
A _b ACPS	ACPS base area, ft ²	<u>Full Scale</u> 37.778	<u>Model Value</u> 0.0085	
А _Ь ЕТ	ET base area, ft ²	572.555	0.1288	
A _b oms	OMS base area, ft ²	52.000	0.0117	

A _{borb}	Orbiter base area, ft ²		337.778	0.0760
A _b srb	SRB base area, ft ²		184.332	0.0415
Absrbn	SRB nozzle base area, ft ²		217.792	0.0490
ACET	ET balance cavity area, ft ²			0.0451
A _{CORB}	Orbiter balance cavity area, ft ²			0.0340
$L_{REF} = B_{REF}$	Orbiter body length, in.		1290.300	19.3550
MRP	Launch configuration C.G., in.	ΧŢ	979.000	14.6850
		Υ _T	0.0	0.0
		ΖŢ	400.000	6.0000
SREF	Orbiter wing area, ft ²		2690.000	0.6053
WFi	Pressure weighting factor		0 or 1	

The following table describes the manifold system used to record and tabulate the 19 base pressure taps shown in figure 2(i).

PRESSURE COEFFICIENT MANIFOLD NUMBER	BASE PRESSURE	LOCATION
1	1,2,3,4	Orbiter base
2	-	Spare
3	5 6	OMS base ACPS base
4	-	Spare
5	7,8,9,10,11	ET base
6	13,14	SRB base
7	15	SRBN base
8	16,17	Orbiter cavity
9	18,19	ET cavity

17

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TABLE I.

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TEST : IA69 TWT	280		DATE: 1/21/74
	TEST CO	NDITIONS	
MACH NUMBER	REYNOLDS NUMBER (per unit length)	DYNAMIC PRESSURE (pounds/sq. inch)	STAGNATION TEMPERATURE (degrees Fahrenheit)
1.08	7.4 x 10^6 /ft.	8.6	45° to 70°
1.22	7.2 x 10 ⁶ /ft.	9.2	45° to 70°
	·		
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		· · · · · · · · · · · · · · · · · · ·	
		· · · · · · · · · · · · · · · · · · ·	
			· · · · · · · · · · · · · · · · · · ·
		· · · · · · · · · · · · · · · · · · ·	
BALANCE UTILIZED:	Task 2.5-ii	nch Mk X B	
	CAPACITY:	ACCURACY:	COEFFICIENT TOLERANCE:
NF*	<u>5500 1bs</u>	<u>+0.25%</u>	
SF *	2750 lbs	<u>+0.25%</u>	
AF	<u>1250 1bs</u>	<u>±0.25%</u>	
PM RM			
YM	4000 in-1bs	±0.25%	
		······	
COMMENTS: * Each	lage		
	u u -		

TEST: IA69 TWT 280 DATE : //2//74 DATA SET/RUN NUMBER COLLATION SUMMARY DATA SET SCHD. PARAMETERS/VALUES NO. OF RUNS MACH NUMBERS CONFIGURATION IDENTIFIER αβ de SR SB TYPE SBF 1.2 1.1 REJXOI OTTIS, P2P6 A O 0 2 \mathcal{O} \mathcal{O} P 4 0 6 4 02 5 4 03 7 4 0,T45, P2P7 04 8 \mathcal{O} 05 9 4 06 10 ES T 4 07 F おしな 0 08 12 09 0 Z 17 4 10 13 OITIS, P2P6 4 11 14 0 12 16 13 4 15 The "X" in the data set identifier will be an "A" for force data; a "U" for wing upper surface. NOTE: pressure data; an "L" for wing lower surface pressure data, "F" for orbiter fuselage plessure an data, or a "B" for base pressure data. CP -> Pressure 13 19 25 31 37 43 61 67 75 76 FAF. GY.N. F.Y. CACORB -> FORCE C.N IGLM GBL. GA. P= PRESSURE DATA IDVARIO $\alpha(A) = -4, 0, 4$ COEFFICENTS IDVAR (2) NOV a OR B F = FORCE DATA SCHEDULES

TABLE II.

TABLE III. - MODEL DIMENSIONAL DATA

MODEL COMPONENT: Attach Structure AT9

GENERAL DESCRIPTION: Aft SRB/ET attach structure (3 member structure)

Model Scale: 0.015

DRAWING NO: VL72-000106

DIMENSIONS:	MEMBER		FULL SCALE	MODEL SCALE
	#1	х _в	1515	22.725
		۲ _B	<u>+ 56</u>	+ .840
		z _B	50	.750
		ХŢ	2058	30.870
		Υ _T	<u>+</u> 158	2.370
		ZT	450	6.75
	#2	х _В	1515	22.725
		YB	<u>+</u> 76	<u>+ 1.140</u>
		ΖB	18	.270
		х _т	2058	
		Υ _T	160	2.400
		z _T		6.675
	#3	Xp	1515	22 725
		B		
		YВ	<u> </u>	
		z _B	- 50	750
		X _T	2058	30.870
		ЧT	+ 158	<u>+ 2.370</u>
		z _T	350	5.250

Diameter of Members: TBD

MODEL COMPONENT: Attach Structure AT12

GENERAL DESCRIPTION: Left rear orbiter/ET attach structure (2 member structure)

Model Scale: 0.015

DRAWING NO. VL78-000050

$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	DIMENSION:	MEMBER		FULL SCALE	MODEL SCALE
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$		#1	х _о	1303	19.545
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			Yo	96	1.440
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			zo	258	3.870
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			Х _Т	1859	27.885
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$			YT	115	1.725
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$			ΖŢ	510	7.650
$\begin{array}{cccccccccccccccccccccccccccccccccccc$		<i>#</i> 2	v	1010	
Y_0 -96 -1.440 Z_0 258 3.870 X_T 2058 30.870 Y_T 115 1.725 Z_T 510 7.650		₩2	л _о		<u> 19.755 </u>
Z_0 258 3.870 X_T 2058 30.870 Y_T 115 1.725 Z_T 510 7.650			Yo	96	1.440
$\begin{array}{cccccccccccccccccccccccccccccccccccc$			Zo	258	
Y _T <u>115</u> <u>1.725</u> Z _T <u>510</u> <u>7.650</u>			х _т	2058	
Z _T 510 7.650			Υ _T	115	1.725
			z_{T}	510	7.650

Diameter of Members: TBD

1 A

MODEL COMPONENT: Attach Structure AT13

GENERAL DESCRIPTION: __ Right rear orbiter/ET attach structure (3 member structure)

Model Scale: 0.015

MODEL NO.__VL78-000050_

DIMENSION:	MEMBER		FULL SCALE	MODEL SCALE
	#1	Х _о	1313	19.695
		۲ _o	+96	1.44
		7 ₀	258	3.870
		х _т	1859	27.885
		Υ _T	_115	1.725
		z_{T}	-510	7.650
	#2	Х _о	1317	19.755
		۲ ₀	<u>+96</u>	1.440
		7 ₀	258	
		$\mathbf{x}_{\mathbf{T}}$	2058	
		Υ _T	-115	-1.725
		ΖŢ		7.650
	#3	х _о	1317	19.755
		Υ _o	96	1.440
		Zo	258	3.870
		Х _Т	2058	30.870
		Υ _T	0	0
		z_{T}	566	8.490

Diameter of Members: TBD

.

MODEL COMPONENT: Attach Structure AT14

GENERAL DESCRIPTION: Forward SRB/ET attach structure

Model Scale: 0.015

DRAWING NO: VL77-000051A

DIMENSION:

	FULL SCALE	MODEL SCALE
х _в	404	6.060
Υ _B	<u>+ 177</u>	2.655
z _B	0	0
Х _Т	947	14.205
Υ _T	<u>+</u> 167	2.505
z _T	400	6.000

Model Component: Attach Structure AT15

General Description: Forward attach structure between orbiter and external tank. Modified to accept Rockwell International Trisonic Wind Tunnel Starting Loads.

model scale: .015

	<u>Full Scale</u>	<u>Model Scale</u>
Xo	391.00	5.865
Υ _ο	0.0	0.0
XT	998.87	16.980
Y_{T}	0.0	0.0
Diameter, in.	33.33	0.500

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MODEL COMPONENT: BODY - (B26)		
GENERAL DESCRIPTION: Orbiter Fuselage Config	guration 140 A/B	
NOTE: B ₂₆ identical to B ₂₄ except underside	e of fuselage refa	ired to
accept W ₁₁₆ .	· ·	
Model Scale = 0.015	· · · · · · · · · · · · · · · · · · ·	
DRAWING NUMBER: VL70-000193 VL70-000140A		
DIMENSIONS:	FULL-SCALE	MODEL SCALE
Length (Body Fwd Sta X _o = 235) - in.	<u>1290.3</u>	19.355
Max. Width (at X _o = 1520) - in.	262.0	3.93
Max. Depth (at $X_0 = 1464$) - in.	250.0	3.75
Fineness Ratio	0_26357	0.26357
$Area - ft^2$		· · · · · · · · · · · · · · · · · · ·
Max. Cross-Sectional	340.88462	0.07670
Planform		
Wetted		
Base		
	·	

 MODEL COMPONENT :
 Canopy (Cg)

 GENERAL DESCRIPTION :
 Configuration 140 A/B Orbiter Fuselage

 Model Scale = 0.015
 Model Drawing No. SS-A00147

 VL70-000140A
 VL70-000143A

DIMENSIONS :	FULL SCALE	MODEL SCALE
Length (Xo=434.643 to 670), in.	235.357	3.530
Max Width (@ X ₀ =513.127),)7	152.412	2.286
Max Depth (@ Xo=485.0), IN	25.000	0.375
Fineness Ratio		·
Area		
Max. Cross-Sectional		·
Planform		·····
Wetted	·····	
Base		

TABLE III. - Continued. ELEVON - (E26) MODEL COMPONENT: Configuration 140 A/B Orbiter Elevon **GENERAL DESCRIPTION:** VL70-000.200 data for (1) of (2) sides. NOTE: Identical to E₂₅ except airfoil thickness Model Scale = 0.015Model Drawings No. SS-A00148 VL70-000200 VL70-000140 B DRAWING NUMBER: **DIMENSIONS:** FULL-SCALE MODEL SCALE Area 223.5814 0.0503 Span (equivalent), jn. 368.34 5.525 Inb'd equivalent chord, Im. 119.623 1.794 Outb'd equivalent chord, in. 0.828 55.1922 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 0.00 - **0.**00 Leading Edge -10.056 -10.056 Tailing Edge ٠. 0.00 0.00 Hingeline Area Moment (Normal to hinge line), ft3 851.1502 0.00287

MODEL COMPONENT: Body Flap (F7)	
GENERAL DESCRIPTION: Configurat	ion 140 A/B Orbiter Body	Flap
NOTE: Body flap has variable center	rline deilection of +13.	75° ena
-14.25° from null position.	Hinge line located at X	o =1528.3,
$Z_0 = 284.3$	Model Drawin	g No. SS-A00147
Model Scale = 0.015 DRAWING NUMBER <u>VL70-0</u>	00140A, VI.70-0003.45	
DIMENSION:	FULL SCALE	MODEL SCALE
Length (X ₀ =1520 to X ₀ =1613) - I	N. <u>93.000</u>	1.395
Max Width - IN.	262.000	3.930
Max Depth ($X_0 = 1520$) - IN.	23.000	0.345
Fineness Ratio		· · · · · · · · · · · · · · · · · · ·
$Areo - Ft^2$		
Max Cross-Sectional		
Planform *	150_5250	0.0339
Wetted	·	**************************************
Base	41.84722	0.00941

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MODEL COMPONENT Feed	line FL _l		
DESCRIPTION: LOX feed	line between ET ar	nd orbiter	
MODEL SCALE: 0.015			
DRAWING NO: VL78-00005	0	-	
DIMENSIONS:	· .	FULL SCALE	MODEL SCALE
G at: X _T		2063.5	30.953
۲ _T			_1.053
х _о		1330.5	19.958
		-70	-1.053
Diameter, In,		18.5	.278

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MODEL	COMPONEN	ľ: <u> </u>	Feed	line	FL2				 	
DESCR	IPTION:	LH2 1	feed	line	between	ET	and	orbiter		
MODEL	SCALE:	0.01	L5			-				
DRAWI	NG NO.:	1	/L78-	00005	50					

DIMENSIONS:

	FULL SCALE	MODEL SCALE
🕻 at X _T	2063.5	30.953
Υ _T	70	1.053
X _o	_ 1330.5	19.958
Yo	70	1.053
Diameter, 17.	_ 18.5	.279

MODEL DIMENSIONAL DATA

MUDEL COMPONENTOMS Pod (M7)		
GENERAL DESCRIPTION Configuration	140 A/B Orbiter	OMS-Pod
		<u></u>
Model Scale = 0.015	Model Drawing	No. 55 -A00147
VL70-000140A DRAWING NUMBER : VL70-000145		
		• •
DIMENSIONS :	FULL SCALE	MODEL SCALE
Length(OMS Fwd Sta X _o =1233.0) -IN	. 327.000	4.905
Max Width (@ X ₀ =1450.0) - IN.	94.5	1.418
Max Depth (@ X ₀ =1493.0) – IN.	109.000	1.635
Fineness Ratio		,
Area	· · · · · · · · · · · · · · · · · · ·	·
Max. Cross-Sectional		, ·
Planform	••••••	
Wetted		
Base	·	
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GENERAL DESCRIPTION:Configurat	ion 140 A/B Or	biter OMS Nozzle	
	<u></u>		
MODEL SCALE = 0.015		Model Draw	ving No. SS-A00
DRAWING NO. VL70-000140A			
DIMENSIONS		FULL SCALE	MODEL SCAL
Mach No.			100334 003.24
Length \sim in.			
Gimbal Point to Exit Pl	ane		<u>م</u>
Throat to Exit Plane			
Diameter~in.			
Exit		****	
Throat		·	
Inlet			
Area $\sim \mathrm{ft}^2$.			
Exit		-	
Throat			101120-00-00 -001-00 -001-00-00-00-00-00-00-00-00-00-00-00-00
Gimbal Point (station)~in.			
X		1518.00	22.77
Ϋ́		<u>+</u> 88.0	1.32
2	X	492.0	7.38
Null Position~deg.			
Pitch		15° 49'	15° 491
Yaw		12° 17'	12° 17'

MODEL COMPONENT: NOZZLES - N41			
GENERAL DESCRIPTION: Configuration 4 BSRM Nozzl	es		
$\frac{\text{MODEL SCALE} = 0.015}{\text{VI72-000088F}}$			
DRAWING NO. VL77-000036A			
DIMENSIONS	FULL SCALE	MODEL SCALE	
Mach No.			
Length \sim in.	с.		
Gimbal Point to Exit Plane	141.3	2.120	
Throat to Exit Plane			
Diameter~in.			
Exit	141.3	2,120	
Throat			
Inlet	·		
$Area \sim ft^2$.			
Exit	108.89 95	0.0245	
Throat			
Gimbal Point (station) \sim in.			
X	1796.15	26.942	
Y	+243.0	<u>+3.645</u>	
Z	400.0	6.0	
Null Position~deg.			
Pitch	0°	0°	
Yew	0°	0°	
FS of Nozzle Exit Plane ($X_{\rm T}$) IN. 33	2484	37.260	

MODEL COMPONENT: SRB Protuberance PS1

DESCRIPTION: Electrical tunnel fairing on top of each SRB

.

MODEL SCALE: 0.015

DRAWING NO: None

DIMENSION: (Data for 1 of 2)

	FULL SCALE	MODEL SCALE
Leading edge at X_B	467	7.001
C of tunnel Y _B	0	0
Trailing edge at X _B	_1820	27.30
Height, 10.		.045
Width, m.	6	.090
$-\Lambda_{\rm LE, deg.}$	72	72

MODEL COMPONENT: SRB Protuberance PS2	
DESCRIPTION: SRB/ET attach ring	·
MODEL SCALE: 0.015	

DRAWING NO.: VL77-000036A

DIMENSIONS: (Data for 1 of 2)

	FULL SCALE	MODEL SCALE
C at X _B	1515	22.725
Width, M.	10	.15
Heighth _, 1η,	10	.15

MODEL COMPONENT: SRB Protuberance PS3

DESCRIPTION: Separation rocket fairing on each SRB nozzle shroud located

30° inboard from top centerline.

MODEL SCALE: 0.015

DRAWING NO.: VL77-000036A

DIMENSIONS: (Data for 1 of 2)

	FULL SCALE	MODEL SCALE
Leading edge at X_B	1796	26.940
Trailing edge at $X_{\rm B}$	1889	28.335

Radial location is 30° inboard from top centerline.

MODEL COMPON	ENT: ET Protuberan	ce PT1	
DESCRIPTION:	LOX Vent Line Fairing	on Tank T12 Nose	
MODEL SCALE:	.015		
DRAWING NO.	VL78-000031A		
		FULL SCALE	MODEL SCALE
DIMENSIONS:	Leading edge at X _T	321	4.815
	ΥŢ	0	0
	Trailing edge at X_{T}	947	14.205
	ΥŢ	70	1.053

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MODEL COMPONENT: ET Protuberance PT2

DESCRIPTION: LOX feed lines on vehicle 4 tank secured to tank by brackets

with 50-inch spacing

MODEL SCALE: 0.015

DRAWING NO. VL78-000031A

	·	FULL SCALE	MODEL SCALE
DIMENSIONS:	Leading edge at X_{T}	947	14.205
	۲ _T		
	Trailing edge at $X_{\rm T}$	1330	19.950
	Υ _T	70	-1.053
Bra	cket spacing from $X_{\rm T} = 997$)n.	50	.85

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MODEL COMPONENT: ET Protuberance PT3		
DESCRIPTION: LH2 feed line on vehicle 4 tan	k secured to tar	ik by brackets
with 50-inch spacing.		
MODEL SCALE: 0.015	,	
DRAWING NO. VL78-000031A		
	FULL SCALE	MODEL SCALE
DIMENSIONS: Leading edge at X _T	947	14.205
\mathtt{Y}_{T}	70	1.053
Trailing edge at X _T	1330	19.950
۲ _T	<u> </u>	1.053
Bracket spacing from $X_{\rm T} = 997$, in.	50	.85

Model Component: ET Protuberance PT8

General Description: LOX Vent Line Fairing on Tank T19 Nose. Model Scale: .015

	Full Scale	Model Scale
Leading Edge @ XT	364.0	5.460
Υ _T	11.67	0.175
Trailing Edge @ X _T	947.00	14.205
ŶТ	- 70.00	1.053

TABLE III Continued.				
MODEL COMPONENT:RUDDER - R5				
GENERAL DESCRIPTION: Configuration 140 A/B Orbiter Rudder				
Model Scale = 0.015	Model Drawin	<u>g No. SS-A00</u> 148		
DRAWING NUMBER: VI.70-000095, VI.70-	-0001464			
DIMENSIONS:	FULL-SCALE	MODEL SCALE		
Area - FT ²	106.38	0.0239		
Span (equivalent) - IN.	201.0	3.015		
Inb'd equivalent chord, H1.	91.585	1.374		
Outb'd equivalent chord, in.	50.833	0.762		
Ratio movable surface chord/ total surface chord				
At Inb ⁴ 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		
Tailing Edge	26.25	26.25		
Hingeline	34.83	34.83		
Area Moment (Normal to hinge line) $- FT^3$ (Product of Area and Mean Chord)	526.13	0.00178		

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MODEL COMPONENT: BOOSTER SOLID ROCKET MOTOR - (S12)				
GENERAL DESCRIPTION: Configuration 3A, 1	Data for (1) of (2) sides,		
per Rockwell Lines VI.77-000036A				
Model Scale = 0.015				
DRAWING NUMBER VL72-000088 D VL72-000036A	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·		
DIMENSION:	FULL SCALE	MODEL SCALE		
Length (Includes Nozzle) - IN.	1741.0	26.115		
Mox Width (Tank Dia) - IN.	142.3	2.135		
Mox Depth (Aft Shroud) - IN.	192.0	2.880		
Fineness Ratio	9.06771	9.06771		
Area - FT ²				
Max Cross-Sectional	201.06193	0.0452		
Planform ·				
Wetted				
Base				
WP of BSRM Centerline (Z_T) - IN.	400	6.000		
FS of BSRM Nose (X_T) - IN.	743	11.145		

TABLE III Continu	led.
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MODEL COMPONENT: EXTERNAL TANK - (T12)	
GENERAL DESCRIPTION: External Oxygen 13	ydrogen Tank	
NOTE: Identical to Tll with external fu	el lines added	
Model Scale = 0.015 .		
VL78-000031 DRAWING NUMBER VL78-00004	LA 1A	
DIMENSION:	FULL SCALE	MODEL SCALE
Length - IN. (Nose @ $X_{\rm T}$ = 309)	1865	27.975
Max Width (Dia) - IN.	324	4.86
Max Depth, m.		
Fineness Ratio	5.75617	5.75617
$A_{reo} - FT^2$		
Max Cross-Sectional	572.555	0,1288
Planform		
Wetted		
Base		· · · · · · · · · · · · · · · · · · ·
WP of Tank Centerline (Zp) - IN.	400.0	6.000

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MODEL COMPONENT: EXTERNAL TANK T19		
GENERAL DESCRIPTION: External Oxygen -	Hydrogen Fuel	Tank. Same
	•	
Model Scale: .015 DRAWING NUMBER: MCR 467		
DIMENSIONS:	FULL-SCALE	MODEL SCALE
Length-in. (Nose @ X _T = 324.27)	1849.73	27.746
Max. Width , in.	330.00	4.950
Max. Depth		
Fineness Ratio		
Area , ft ²		
Max. Cross-Sectional	593.98	0.1336
Planform		
Wetted	<u> </u>	
Base		
W.P. of ET Centerline, in.	400.00	6.000

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	<i>MDEL 111 C</i>	on chiuea.	
MODEL COMPONENT: VERTICAL - V	/8,	·	
GENERAL DESCRIPTION: Configur	ation 140 A/B Orbit	er Vertical Tail	
NOTE: Similar to V5 with rad	<u>ius on TE upper cor</u>	ner and LE lower	orner
where vertical meets f	uselage.		
Model Scale = 0.015		Model Drawing	<u>z No. SS-A00148</u>
DRAWING NUMBER:	VL70-000140A VL70-000146A		
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, degr Leading Edge 0.25 Element Line Chords: Root (Theo) WP Tip (Theo) WP MAC Fus. Sta. of .25 MAC	rees	$\begin{array}{r} 413.253 \\\hline 315.720 \\\hline 1.675 \\\hline 0.507 \\\hline 0.40399 \\\hline 45.00 \\\hline 25.947 \\\hline 41.130 \\\hline 268.500 \\\hline 108.470 \\\hline 199.80756 \\\hline 1463.50 \\\hline \end{array}$	$\begin{array}{r} 0.09298 \\ \hline 4.73580 \\ \hline 1.675 \\ \hline 0.507 \\ \hline 0.40399 \\ \hline 45.00 \\ \hline 25.947 \\ \hline 41.130 \\ \hline 4.02750 \\ \hline 1.62705 \\ \hline 2.99711 \\ \hline 21.95250 \\ \hline \end{array}$
B. L. of .25 MAC Airfoil Section Leading Wedge Angle Trailing Wedge Angl Leading Edge Radius Void Area Blanketed Area	Deg e Deg	$ \begin{array}{r} 0.15.522 \\ 0.00 \\ 10.00 \\ 14.920 \\ 2.00 \\ 13.17 \\ 0.00 \\ \end{array} $	9.53283 0.00 10.00 14.920 0.0300 0.00296 0.00

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GENERAL DESCRIPTION: Configuration NOTE: Identical to W ₁₁₄ except airfoil thickness. Dihe trailing edge of wing. Model Scale = 0.015 Model Scale = 0.015 Model Scale = 0.015 Model Scale = 0.015 Model Scale = 0.015 TEST NO. DWG DIMENSIONS: FULL TOTAL DATA Area (Theo.) Ft ² Planform 936 Aspect Ratio 22 Rate of Taper 1 Taper Ratio 2 Dihedral Angle, degrees(at X ₀ =1506.623, Y ₀ = 0 Dihedral Angle, degrees(at X ₀ =1506.623, Y ₀ = 0 Acrea (Theo) In. 936 Aspect Ratio 22 Reodynamic Twist, degrees 43 Sweep Back Angles, degrees 45 Leading Edge -10 0.25 Element Line 355 Chords:, 177. 689 MAC 472 Fus. Sta. of .25 MAC 1122 W.P. of .25 MAC 229 B.L. of .25 MAC 126 W.P. of .25 MAC 126 Marea (Theo) Ft ²	edral angle is Model Drawing VL70-001 NO. VL70-001 -SCALE M .00 .6816 .265 .177 .200 .500	along No. SS-A00148 01408 0200 DDEL SCALE 0.6053 14.050 2.265 1.177 0.200 3.500 0.500 +3.000 45.00 -10.056 35.209 10.339 2.068 7.222 17.051 4.365
NOTE: Identical to W_{114} except airroit unconess. Dimensional difference of wing.trailing edge of wing.Model Scale = 0.015MModel Scale = 0.015MTEST NO.DWGDIMENSIONS:FULLTOTAL DATA Area (Theo.)Ft2Planform2690Span (Theo In. Aspect Ratio936Aspect Ratio Dihedral Angle, degrees(at X_0 =1506.623, Y_0 = Incldence Angle, degrees 105, Z_0 = 282.75)Aerodynamic Twist, degrees Leading Edge Trailing Edge 0.25 Element Line45Chords:, 177 Rcot (Theo) B.P.0.0. Tip, (Theo) B.P. MAC Fus. Sta. of .25 MAC W.P. of .25 MAC W.P. of .25 MAC MAC137EXPOSED DATA Area (Theo)Ft2Span, (Theo)In. BP108Aspect Ratio Chords; 107. Root BP108738 738 738 739 739 739 739 730 739 730 739 730 <br< th=""><th>Model Drawing VL70-001 NO. VL70-001 -SCALE M .00 .6816 .265 .177 .200 .500</br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></br></th><th>No. SS-A00148 01408 0200 DEL SCALE 0.6053 14.050 2.265 1.177 0.200 3.500 0.500 +3.000 +3.000 45.00 -10.056 35.209 10.339 2.068 7.222 17.051 4.365</th></br<>	Model Drawing VL70-001 NO. VL70-001 -SCALE M .00 .6816 .265 .177 .200 .500 	No. SS-A00148 01408 0200 DEL SCALE 0.6053 14.050 2.265 1.177 0.200 3.500 0.500 +3.000 +3.000 45.00 -10.056 35.209 10.339 2.068 7.222 17.051 4.365
trailing edge of wing.Model Scale = 0.015NTEST NO.DWGDIMENSIONS:FULLTOTAL DATA Area (Theo.) Ft2FULLPlanform2690Span (Theo In.936Aspect Ratio22Rate of Taper1Taper Ratio0Dihedral Angle, degrees(at X_0 =1506.623, Y_0 =3Incidence Angle, degrees 105, Z_0 = 282.75)0Aerodynamic Twist, degrees45Leading Edge-100.25 Element Line35Chords:, 17.Rcot (Theo) B.P.0.0.Tip, (Theo) B.P.137MAC474Fus. Sta. of .25 MAC1126W.P. of .25 MAC291B.L. of .25 MAC291B.L. of .25 MAC181EXPOSED DATA732Area (Theo) Ft21811Span, (Theo) In. BP108732Aspect Ratio732Taper Ratio734Chords, vri.735Aspect Ratio735Tip 1.00 b13	Model Drawing VL70-001 NO. VL70-001 -SCALE M .00 .6816 .265 .177 .200 .500	No. SS-A00148)1408)200 DEL SCALE 0.6053 14.050 2.265 1.177 0.200 3.500 0.500 +3.000 45.00 -10.056 35.209 10.339 2.068 7.222 17.051 4.365
Model Scale = 0.015MTEST NO.DWG.DIMENSIONS:FULLTOTAL DATAArea (Theo.) Ft2PlanformSpan (Theo In.Aspect RatioDihedral Angle, degrees(at X_0 =1506.623, Y_0 =Dihedral Angle, degrees 105, Z_0 = 282.75)Aerodynamic Twist, degreesLeading EdgeTrailing EdgeO.25 Element LineChords:,177.Rcot (Theo) B.P.0.0.MACFus. Sta. of .25 MACW.P. of .25 MACW.P. of .25 MACW.P. of .25 MACB.L. of .25 MACEXPOSED DATAArea (Theo) In. BP108Aspect RatioTaper RatioTaper RatioChords, NTI.Root BP108Tip 1.00 b	Model Drawing VL70-000 NO. VL70-000 -SCALE M .00 .6816 .265 .177 .200 .500	No. SS-A00148 0140B 200 DDEL SCALE 0.6053 14.050 2.265 1.177 0.200 3.500 0.500 +3.000 +3.000 45.00 -10.056 35.209 10.339 2.068 7.222 17.051 4.365 365
TEST NO.DWG.DIMENSIONS:FULLTOTAL DATA Area (Theo.)Ft2 PlanformPlanform2690Span (Theo In.936Aspect Ratio	. NO. VI 70-004 -SCALE M . 00	0.6053 14.050 2.265 1.177 0.200 3.500 0.500 +3.000 +3.000 45.00 -10.056 35.209 10.339 2.068 7.222 17.051 4.365
$\begin{array}{c c} \underline{\text{DIMENSIONS:}} & \underline{\text{FULL}} \\ \hline \\$	-SCALE M .00 .6816 .265 .177 .200 .5000 .500 .500 .500 .500 .500 .500 .500 .500	0.6053 14.050 2.265 1.177 0.200 3.500 0.500 +3.000 45.00 -10.056 35.209 10.339 2.068 7.222 17.051 4.365
TOTAL DATAArea (Theo.) Ft^2 PlanformSpan (Theo In.Aspect RatioAspect RatioDihedral Angle, degrees(at $X_0=1506.623, Y_0=$ Dihedral Angle, degrees 105, $Z_0= 282.75$)Dihedral Angle, degreesLacodynamic Twist, degreesLeading EdgeTrailing EdgeO.25 Element LineChords:, 177.Root (Theo) B.P.0.0.Chords:, 177.Root (Theo) B.P.MACLizePlane (Theo) Ft ² Span, (Theo) In. BP108Area (Theo) In. BP108Aspect RatioChords:, 171.	.00 .6816 .265 .177 .200 .500 .500 .500 .500 .500 .500 .500	$\begin{array}{r} 0.6053 \\ \hline 14.050 \\ \hline 2.265 \\ \hline 1.177 \\ \hline 0.200 \\ \hline 3.500 \\ \hline 0.500 \\ \hline +3.000 \\ \hline 45.00 \\ \hline -10.056 \\ \hline 35.209 \\ \hline 10.339 \\ \hline 2.068 \\ \hline 7.222 \\ \hline 17.051 \\ \hline 4.365 \\ \hline \end{array}$
Initial controlFt2Area (Theo.)Ft2Planform 2690 Span (Theo In. 936 Aspect Ratio -2 Rate of Taper -1 Taper Ratio 0 Dihedral Angle, degrees(at $X_0=1506.623, Y_0=$ -3 Incidence Angle, degrees 105, $Z_0=282.75$) 0 Aerodynamic Twist, degrees $+3$ Sweep Back Angles, degrees $+3$ Leading Edge -10 Trailing Edge -10 0.25 Element Line -35 Chords:,177.Rcot (Theo) B.P.0.0.Rcot (Theo) B.P. -137 MAC -125 Fus. Sta. of .25 MAC 291 B.L. of .25 MAC 291 B.L. of .25 MAC -182 EXPOSED DATA -22 Area (Theo)Ft2Span, (Theo)In. BP108Aspect Ratio -733 Taper Ratio -733 Taper Ratio -733 Taper Ratio -733 Tip 1.00 b -133	.00 .6816 .265 .177 .200 .500 .500 .500 .500 .500 .500 .500	$\begin{array}{r} 0.6053 \\ 14.050 \\ 2.265 \\ 1.177 \\ 0.200 \\ 3.500 \\ 0.500 \\ +3.000 \\ \hline 45.00 \\ -10.056 \\ \hline 35.209 \\ 10.339 \\ 2.068 \\ \hline 7.222 \\ 17.051 \\ 4.365 \\ \hline \end{array}$
Planform2690Span (Theo In.936Aspect Ratio		$ \begin{array}{r} 14.050 \\ 2.265 \\ 1.177 \\ 0.200 \\ 3.500 \\ 0.500 \\ +3.000 \\ 45.00 \\ -10.056 \\ 35.209 \\ 10.339 \\ 2.068 \\ 7.222 \\ 17.051 \\ 4.365 \\ \end{array} $
Span (Theo In. Aspect Ratio Rate of Taper Taper Ratio Dihedral Angle, degrees(at X_0 =1506.623, Y_0 = Incidence Angle, degrees 105, Z_0 = 282.75) Aerodynamic Twist, degrees Leading Edge Trailing Edge 0.25 Element Line Chords:, 17. Rcot (Theo) B.P.0.0. Tip, (Theo) B.P. MAC Fus. Sta. of .25 MAC W.P. of .25 MAC W.P. of .25 MAC Span, (Theo) In. BP108 Aspect Ratio Taper Ratio Chords, NT. Root BP108 Tip 1.00 b $\frac{250}{0}$		$\begin{array}{r} 2.265 \\ 1.177 \\ 0.200 \\ 3.500 \\ 0.500 \\ +3.000 \\ \hline \\ +3.000 \\ \hline \\ 45.00 \\ \hline \\ -10.056 \\ \hline \\ 35.209 \\ \hline \\ 10.339 \\ \hline \\ 2.068 \\ \hline \\ 7.222 \\ \hline \\ 17.051 \\ \hline \\ 4.365 \\ \hline \end{array}$
Aspect Ratio Rate of Taper Taper Ratio Dihedral Angle, degrees(at X_0 =1506.623, Y_0 = Incidence Angle, degrees 105, Z_0 = 282.75) Aerodynamic Twist, degrees Leading Edge Trailing Edge 0.25 Element Line Chords:,177. Rcot (Theo) B.P.0.0. Tip, (Theo) B.P. MAC Fus. Sta. of .25 MAC W.P. of .25 MAC W.P. of .25 MAC Span, (Theo) In. BP108 Aspect Ratio Taper Ratio Chords.,17. Root BP108 Tip 1.00 b	177 200 500 500 500 500 500 500 500	$ \begin{array}{r} 1.177\\ 0.200\\ 3.500\\ 0.500\\ +3.000\\ 45.00\\ -10.056\\ 35.209\\ 10.339\\ 2.068\\ 7.222\\ 17.051\\ 4.365\\ \end{array} $
Rate of TaperTaper RatioDihedral Angle, degrees(at X_0 =1506.623, Y_0 =Incidence Angle, degrees 105, Z_0 = 282.75)Aerodynamic Twist, degreesSweep Back Angles, degreesLeading EdgeTrailing Edge0.25 Element LineChords:,177.Rcot (Theo) B.P.0.0.Tip, (Theo) B.P.MACFus. Sta. of .25 MACW.P. of .25 MACW.P. of .25 MACB.L. of .25 MACSpan, (Theo) In. BP108Aspect RatioTaper RatioChords,171.Root BP108Tip 1.00 b	0.200 3.500 1.500 3.000 5.00 5.00 5.00 5.00 5.00 5.00 5.00 5.00 5.00 5.00 5.00 5.00 5.00 5.00 5.00 5.209 9.2429 7.8486 4.8117 6.721 1.00 7.33491	$\begin{array}{r} 0.200 \\ \hline 3.500 \\ \hline 0.500 \\ +3.000 \\ \hline 45.00 \\ \hline -10.056 \\ \hline 35.209 \\ \hline 10.339 \\ \hline 2.068 \\ \hline 7.222 \\ \hline 17.051 \\ \hline 4.365 \\ \hline \end{array}$
Dihedral Angle, degrees(at X_0 =1506.623, Y_0 = Incidence Angle, degrees 105, Z_0 = 282.75) Aerodynamic Twist, degrees Sweep Back Angles, degrees Leading Edge Trailing Edge 0.25 Element Line Chords:, 177. Rcot (Theo) B.P.0.0. Tip, (Theo) B.P. MAC Fus. Sta. of .25 MAC W.P. of .25 MAC B.L. of .25 MAC EXPOSED DATA Area (Theo) Ft Span, (Theo) In. BP108 Aspect Ratio Taper Ratio Chords, 177. Root BP108 Tip 1.00 b 137 143 143 143 143 143 143 143 143	5.500 5.00 5.00 5.209 5.20	3.500 0.500 $+3.000$ 45.00 -10.056 35.209 10.339 2.068 7.222 17.051 4.365
Incidence Angle, degrees 105 , $Z_0 = 282.75$) Aerodynamic Twist, degrees ± 3 Sweep Back Angles, degrees ± 3 Leading Edge ± 100 Trailing Edge ± 100 0.25 Element Line ± 35 Chords:, 17. Rcot (Theo) B.P.0.0. Tip, (Theo) B.P. ± 37 MAC ± 1126 W.P. of .25 MAC ± 1126 W.P. of .25 MAC ± 1126 W.P. of .25 MAC ± 1126 EXPOSED DATA ± 25 MAC ± 1812 Area (Theo) Ft ² Span, (Theo) In. BP108 $= 736$ Aspect Ratio $= 736$ Tip 1.00 b ± 37	1.500 3.000 5.00 5.209 9.2429 7.8486 4.8117 6.721 1.00 7.33491	0.500 +3.000 45.00 -10.056 35.209 10.339 2.068 7.222 17.051 4.365
Aerodynamic Twist, degrees ± 3 Sweep Back Angles, degrees 45 Leading Edge -10 Trailing Edge 35 0.25 Element Line 35 Chords:, 17.Rcot (Theo) B.P.0.0.Rcot (Theo) B.P. 137 MAC 474 Fus. Sta. of .25 MAC 1126 W.P. of .25 MAC 291 B.L. of .25 MAC 181 EXPOSED DATA 736 Area (Theo) Ft ² 736 Span, (Theo) In. BP108 736 Aspect Ratio -10 Chords, 17. -10 Root BP108 577 Tip 1.00 b 13	3,000 5,00 5,00 5,209 9,2429 7,8486 4,8117 6,721 1,00 7,33491	+3.000 -10.056 35.209 10.339 2.068 7.222 17.051 4.365
Sweep Back Angles, degrees45Leading Edge-10Trailing Edge350.25 Element Line35Chords:, 17.Rcot (Theo) B.P.0.0.Rcot (Theo) B.P.137MAC474Fus. Sta. of .25 MAC1126W.P. of .25 MAC291B.L. of .25 MAC181EXPOSED DATA1812Area (Theo) Ft21812Span, (Theo) In. BP108736Aspect Ratio	5.00 5.209 9.2429 7.8486 4.8117 6.721 1.00 7.33491	45.00 -10.056 35.209 10.339 2.068 7.222 17.051 4.365
Leading Edge Trailing Edge 0.25 Element Line Chords:, 177 . Rcot (Theo) B.P.0.0. Tip, (Theo) B.P. MAC Fus. Sta. of .25 MAC W.P. of .25 MAC B.L. of .25 MAC EXPOSED DATA Area (Theo) Ft ² Span, (Theo) In. BP108 Aspect Ratio Taper Ratio Chords, 177 . Root BP108 Tip 1.00 b -10	0.056 5.209 9.2429 7.8486 4.8117 6.721 1.00 7.33491	-10.056 35.209 10.339 2.068 7.222 17.051 4.365
(1741111) Euge 35 0.25 Element Line 35 $Chords:,17$. Rcot (Theo) B.P.0.0. $Rcot$ (Theo) B.P. 137 MAC 474 Fus. Sta. of .25 MAC 1126 $W.P.$ of .25 MAC 291 $B.L.$ of .25 MAC 291 $B.L.$ of .25 MAC 181 $EXPOSED$ DATA 181 Area (Theo) Ft ² $Span,$ (Theo) In. BP108 Aspect Ratio	5.209 9.2429 7.8486 4.8117 6.721 1.00 7.33491	35.209 10.339 2.068 7.222 17.051 4.365
Chords:, 177 . Rcot (Theo) B.P.0.0. 689 Tip, (Theo) B.P. 137 MAC 474 Fus. Sta. of .25 MAC 1126 W.P. of .25 MAC 291 B.L. of .25 MAC 181 EXPOSED DATA 1812 Area (Theo) Ft ² Span, (Theo) In. BP108 Taper Ratio	9.2429 7.8486 4.8117 6.721 1.00 7.33491	10.339 2.068 7.222 17.051 4.365
Rcot (Theo) B.P.0.0. 689 Tip, (Theo) B.P. 137 MAC 474 Fus. Sta. of .25 MAC 1126 W.P. of .25 MAC 291 B.L. of .25 MAC 1812 EXPOSED DATA 1812 Area (Theo) Ft^2 Span, (Theo) In. BP108 Aspect Ratio -100 Chords, 171. Root BP108 Tip 1.00 b 132	9.2429 7.8486 4.8117 6.721 1.00 7.33491	2.068 7.222 17.051 4.365
Tip, (Theo) B.P. 137 MAC 474 Fus. Sta. of .25 MAC 1126 W.P. of .25 MAC 291 B.L. of .25 MAC 291 B.L. of .25 MAC 1817 Area (Theo) Ft Span, (Theo) In. BP108 Aspect Ratio -160 Chords, 171, Root BP108 Tip 1.00 b 13	7.8486 4.8117 6.721 1.00 7.33491	7.222 17.051 4.365
MAC $4/4$ Fus. Sta. of .25 MAC 1126 W.P. of .25 MAC 291 B.L. of .25 MAC 291 B.L. of .25 MAC 181 EXPOSED DATA 181 Area (Ineo) Ft ² Span, (Theo) In. BP108 Aspect Ratio	<u>4.8117</u> 6.721 1.00 7.33491	17.051 4.365
Fus. Sta. of .25 MAC1125W.P. of .25 MAC291B.L. of .25 MAC181B.L. of .25 MAC181EXPOSED DATA181Area (Theo) Ft^2 Span, (Theo)In. BP108Aspect Ratio733Taper Ratio	<u>1.00</u> 7.33491	4.365
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	7.33491	
$\begin{array}{c c} \underline{EXPOSED} & \underline{DATA} & 1811 \\ \hline \\ & \text{Area (Theo)} & \mathbf{Ft}^2 & 1811 \\ & \text{Span, (Theo)} & \mathbf{In. BP108} & 730 \\ & \text{Aspect Ratio} & 730 \\ & \text{Aspect Ratio} & 730 \\ & \text{Taper Ratio} & 730 \\ & $		2.810
Expose 1812 Area (Ineo) Ft^2 Span, (Theo)In. BP108Aspect RatioTaper RatioChords, IT.Root BP108Tip 1.00 b	:	0.100
Span, (Theo) In. BP108 730 Aspect Ratio Taper Ratio Chords, 171. Root BP108 570 Tip 1.00 b	2.2205	
Aspect Ratio Taper Ratio Chords,171. Root BP108 Tip 1.00 b	6.6816	
Taper Ratio Chords,17, Root BP108 <u>57</u> Tip 1.00 b <u>13</u>	2.058	0.2451
Chords, 17. Root BP108 <u>57</u> Tip 1.00 b <u>13</u>	0.2451	0.2451
$\frac{57}{10} = 1.00 \text{ b}$	0.6230	8.559
	57.8512	2.06
2	A 0776	5,314
MAC	<u>4.2370</u> <u>4.237</u>	17.464
Fus. Sta, of .25 MAC 110	2.00	4.380
$W_{a}P_{a} \text{ OT } _{a}23 \text{ MAC} \qquad \qquad$	39.67786	3.595
Airfoil Section (Rockwell Mod NASA)	· · ·	
XXXX-64	0 JI 2	0 113
Root $b = 0.425$		
$\overline{\mathbf{Z}}$	0.12	0.12
11p b = 1.00	~ 1 & W 	
\mathcal{L} Data for (1) of (2) Sides		-
Leading Edge Cuff -		
Planform Area Ft ²		
Londing Edge Intersects Fus M. L. @ Sta 50	79,13389	0.0266

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TABLE IV. - PRESSURE INSTRUMENTATION

% Chord	$Y_0 = 250$ C = 388.67			$Y_0 = 365$ C = 257.0			
* CHOTU	х	Upper Wing Tap No.	Lower Wing Tap No.	x	Upper Wing Tap No.	Lower Wing Tap No.	
0 0.05 0.15 0.40 0.725 0.95	0(L.E.) 19.47 58.33 155.47 281.80 369.27	22 23 24 25 26 27	28 29 30 31 32	0(L.E.) 12.87 39.13 102.80 186.33 244.13	33 34 35 36 37 38	39 40 41 42 43	

ORBITER WING STATIC TAP LOCATIONS

ORBITER NOSE STATIC TAP LOCATIONS

Xo	235	265	325	380	450	500
0° 40° 90° 180°	1,	2 3 4 5	6 7 8 9	11 12 13	14 15 16 17	18 19 20 21

Notes:

(1) Full Scale Dimensions

(2) Left Hand Only

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Notes:

- 1. Positive directions of force coefficients, moment coefficients, and angles are indicated by arrows
- 2. For clarity, origins of wind and stability axes have been displaced from the center of gravity

m

C_m

У_s

c_{l,w}

C_{D,w}

C_{l,s}

v



с_N

α

C_{n,s}

zs

zl

D

C n

C_{m,w}

β

У_w

Z

C_{n,w}



a, Mated Vehicle

Figure 2. - Model sketches.



b. Orbiter Three View

Figure 2. - Continued.



Figure 2. - Continued.

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f. External Tank Nose Variation, T₁₉

Figure 2. - Continued.



Figure 2. - Continued.



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h. Definition of Model Base and Cavity Areas
 Figure 2. - Continued.





j. Base Pressure Tap Locations

Figure 2. - Continued.





- (1) Full Scale Dimensions
- (2) Pressure Orifices on Left Hand Side of Model
- (3) X/c = 0,.05, .15, .40, .725, and .95

j. Wing Pressure Orifice Locations

Figure 2. - Continued.

Notes:

(1) All Dimensions Full Scale

(2) Pressure Orifices on Left Hand Side of Model





k. Fuselage Pressure Orifice Locations

Figure 2. - Concluded.



a. Front View, TWT Installation Configuration 01 T4 S1 P2 P7



b. Front View, TWT Installation Configuration $0_1 T_1 S_1 P_2 P_6$ Figure 3. - Model Photographs

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DATA FIGURES - FORCE

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DRAG COEFFICIENT. FOREBODY





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PAGE 9 DATA FIGURES - PRESSURE





ETA

DATA SET SYMBOL

CONFIGURATION DESCRIPTION







CHORDWISE LOCATION ON ORBITER WING SURFACE, X/C OF EXTERNAL TANK NOSE CONFIG ON ORBITER PRESSURES, BETA = -4 Ο, EFFECT FIG 7 PAGE .780 4 2Y/B ALPHA = .000 Ξ 1.200 MACH =

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CONFIGURATION DESCRIPTION

DATA SET SYMBOL

BETA















DATA SET SYMBOL

CONFIGURATION DESCRIPTION

VING

LIPPER

SURFACE

BETA

PRES





BETA





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PAGE 15



DATA SET SYMBOL

CONFIGURATION DESCRIPTION

BETA





 DATA SET SYMBOL
 CONFIGURATION DESCRIPTION
 BET

 (RF3L05)
 IA69
 01
 T4
 S1
 P2
 P7
 VING UPPER SURFACE PRESS.
 -4.

 (RF3L06)
 IA69
 01
 T4
 S1
 P2
 P7
 VING UPPER SURFACE PRESS.
 -4.

 (RF3L01)
 IA69
 01
 T1
 S1
 P2
 P6
 VING UPPER SURFACE PRESS.
 -4.

 (RF3L02)
 IA69
 01
 T1
 S1
 P2
 P6
 VING UPPER SURFACE PRESS.
 -4.

BETA .000 -4.000 .000 -4.000





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BETA

DATA SET SYMBOL

CONFIGURATION DESCRIPTION



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-1.0_+ 1 -0 .2 .3 6 .5 8 n. CHORDWISE LOCATION ON ORBITER WING SURFACE, X/C EFFECT OF EXTERNAL TANK NOSE CONFIG ON ORBITER PRESSURES, BETA = FIG 7 0. -4 MACH = 1.200 ALPHA = -4.000 2Y/B .780 PAGE = 26





MACH = 1.200 ALPHA = .000 2Y/B = .534 PAGE 27


















VING LOVER

SURFACE

CONFIGURATION DESCRIPTION

DATA SET SYMBOL



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DATA SET SYNBOL

RF3L051

CONFIGURATION DESCRIPTION





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DATA SET SYMBOL

CONFIGURATION DESCRIPTION

1.200 ALPHA = 4.000 X/C .725 Ŧ





CONFIGURATION DESCRIPTION





CONFIGURATION DESCRIPTION

DATA SET SYMBOL











DATA SET SYMBOL

CONFIGURATION DESCRIPTION



DATA SET SYN	BOL CONFIG	RATION DESCR	IPTION	EE TA
(RF3F06) (RF3F06) (RF3F01) (RF3F02)		T4 S1 P2 P7 T4 S1 P2 P7 T1 S1 P2 P6 T1 S1 P2 P6 T1 S1 P2 P6	ORBITER FUSELAGE P ORBITER FUSELAGE P ORBITER FUSELAGE P ORBITER FUSELAGE P	RESSURES .000 RESSURES -4.000 RESSURES .000 RESSURES -4.000







CONFIGURATION DESCRIPTION

DATA SET SYMBOL





CONFIGURATION DESCRIPTION

DATA SET SYMBOL





DATA SET SYMBOL CONFIGURATION DESCRIPTION





DATA SET SYMBOL

1469

(RF3F05)

CONFIGURATION DESCRIPTION

CR91 TER





DATA SET SYMBOL CONFIGURATION DESCRIPTION BETA CI T4 SI P2 P7 CI T4 SI P2 P7 CI T1 SI P2 P6 CI T1 SI P2 P6 CI T1 SI P2 P6 B 1 A69 1 A69 1 A69 1 A69 CR91 TER (RF3F06) (RF3F01) (RF3F02) ORBITER FUSELAGE PRESSURES ORBITER FUSELAGE PRESSURES ORBITER FUSELAGE PRESSURES 000 ~4.000



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1.200 ALPHA = .000 X/L .349 PAGE =

68






DATA SET SYMBOL









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DATA SET SYMBOL CONFIGURATION DESCRIPTION BETA (RF3F05) AIASS 01 T4 SI P2 P7 ORBITER FUSELAGE PRESSURES .000 (RF3F05) AIASS 01 T4 SI P2 P7 ORBITER FUSELAGE PRESSURES .4.000 (RF3F01) AIASS 01 T1 SI P2 P6 ORBITER FUSELAGE PRESSURES .000 (RF3F02) AIASS 01 T1 SI P2 P6 ORBITER FUSELAGE PRESSURES .4.000

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DATA SET SYMBOL











DATA SET S	SYMBOL	. 001	Flour	INTIC	n descr	NIPTION		• •	BETA
(RF3U05)	Ω	1469	81 1	14 SI	P2 P7	VING LIPPER	SURFACE	PRESS.	.000
(R-3004)		IA69	Ōi 1	i Ši	P2 P7	VING UPPER	SURFACE	PRESS.	4.000
(RF3001)	<u>ठ</u>	IAE9	Či i	TÎ ŠI	PŽ PG	VING UPPER	SURFACE	PRESS.	
(RF3.03)	Δ	1469	Ōi ī	ti ši	P2 P6	VING UPPER	SURFACE	PRESS.	4.000







1.200 ALPHA = -4.000.725 MACH X/C Ħ PAGE Ξ 86





EFFECT OF EXTERNAL TANK NOSE CONFIG ON ORBITER PRESSURES, FIG 8 BETA =0, +4 MACH 1.200 ALPHA = .000 .000 X/C PAGE Ξ 88 Ξ

COEFFICIENT.





DATA SET SYMEDL

CONFIGURATION DESCRIPTION

BETA





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CONFIGURATION DESCRIPTION

DATA SET SYMBOL

BETA











DATA SET SYNED





DATA SET SYMBOL





DATA SET SYMBOL CONFIGURATION DESCRIPTION BETA (RF3L05) (RF3L04) (RF3L01) (RF3L03) 1A69 1A69 1A69 1A69 01 T4 S1 P2 P7 01 T4 S1 P2 P7 01 T1 S1 P2 P6 01 T1 S1 P2 P6 01 T1 S1 P2 P6 VING LOVER SURFACE PRESS. VING LOVER SURFACE PRESS. VING LOVER SURFACE PRESS. VING LOVER SURFACE PRESS. 4.000 8







DATA SET SYMBOL

CONFIGURATION DESCRIPTION


DATA SET S	YMBOL	. CO N	F1GL	JRA'	110	NDE	ESCI	RIPTION			BETA	
(RF3LOS)	ρ	1463	<u>O</u> I	<u>14</u>	SI	P2	P7	VING LOW	ER SURFACE	PRESS.	.000	
(RF3L01)	8	1469	01	11	51 51	P2	PG	VING LOW	ER SURFACE	PRESS	4,000	
(RF3∟03)	\bigtriangleup	[\69	01	Т1	\$ 1	P2	P6	VING LOW	ER SURFACE	PRESS.	4.000	









-1.0 1 1 .0 . 1 .2 .3 .6 .8 **`**.9 1.0 .4 .5 SPANWISE LOCATION ON ORBITER WING SURFACE. 2Y/B FIG EFFFCT OF EXTERNAL TANK NOSE CONFIG ON ORBITER PRESSURES. 8 BETA = 0. +41.200 ALPHA = -4.000PAGE 108 MACH X/C .400 Ξ Ξ

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 DATA SET SYMBOL
 CONFIGURATION DESCRIPTION
 BETA

 [RF3L05]
 IA69
 01 T4 S1 P2 P7
 VING LOWER SURFACE PRESS.
 .000

 [RF3L04]
 IA69
 01 T4 S1 P2 P7
 VING LOWER SURFACE PRESS.
 4.000

 [RF3L01]
 IA69
 01 T1 S1 P2 P6
 VING LOWER SURFACE PRESS.
 4.000

 [RF3L03]
 IA69
 01 T1 S1 P2 P6
 VING LOWER SURFACE PRESS.
 4.000





 DATA SET SYMBOL
 CONFIGURATION DESCRIPTION
 BETA

 [RF3L05]
 IA63
 01
 T4
 SI
 P2
 P7
 VING LOVER SURFACE PRESS.
 .000

 [RF3L04]
 IA69
 01
 T4
 SI
 P2
 P7
 VING LOVER SURFACE PRESS.
 .000

 [RF3L01]
 IA69
 01
 T4
 SI
 P2
 P7
 VING LOVER SURFACE PRESS.
 .000

 [RF3L01]
 IA69
 01
 T1
 SI
 P2
 P6
 VING LOVER SURFACE PRESS.
 .000

 [RF3L03]
 IA69
 01
 T1
 SI
 P2
 P6
 VING LOVER SURFACE PRESS.
 4.000





DATA SET SYMBOL

CONFIGURATION DESCRIPTION























FIG 8 EFFECT OF EXTERNAL TANK NOSE CONFIG ON ORBITER PRESSURES, BETA = 0, +4 MACH = 1.200 ALPHA = .000 PHI = 180.000 PHI = 180.000 PHI = 128











PRESSURE









DATA SET SYMBOL CONFIGURATION DESCRIPTION (RF3F05) (RF3F04) (RF3F01) (RF3F03) 01 T4 S1 P2 P7 01 T4 S1 P2 P7 01 T1 S1 P2 P6 01 T1 S1 P2 P6 01 T1 S1 P2 P6 ORBITER FUSELAGE PRESSURES ORBITER FUSELAGE PRESSURES ORBITER FUSELAGE PRESSURES ORBITER FUSELAGE PRESSURES .000 4.000 .000 4.000 1A69 1A69 1A69 1A69 <u>р</u>





DATA SET SY	MBOL CO		TION D	ESCR1PT	ION			BETA
(RE3E05)		01 T4	\$1 P2	P7 08	REITER	FUSELAGE	PRESSURES	.000
[RF3F04]			S1 P2	P7 (R	BITER	FUSELAGE	PRESSURES	4.000
i BEGEGSI	X iiii	ni ti	SI P2	PE		FUSELAGE	PRESSURES	4 000





DATA SET SYMBOL

CONFIGURATION DESCRIPTION



-1.0_20 1 200 0 20 40 60 80 100 120 140 160 180 ANGULAR LOCATION ON ORBITER FUSELAGE SURFACE, PHI, DEG. EFFECT OF EXTERNAL TANK NOSE CONFIG ON ORBITER PRESSURES. BETA =FIG 0, +4 8 .388 PAGE :38 MAC-1.200 -4.000 X/L A_PHA = Ξ Ξ

COEFFICIENT.

DATA SET SYMBOL CONFIGURATION DESCRIPTION								
(RF3F05) (RF3F04) (RF3F01) (RF3F03)	1A69 1A69 1A69 1A69		(4 S1 (4 S1 (1 S1 (1 S1	P2 P7 P2 P7 P2 P6 P2 P6 P2 P6	ORBITER FUSELAC ORBITER FUSELAC ORBITER FUSELAC ORBITER FUSELAC	E PRESSURES E PRESSURES E PRESSURES E PRESSURES	.000 4.000 .000 4.000	



PRESSURE COEFFICIENT.








DATA SET SYMBOL CONFIGURATION DESCRIPTION						
(RF3F05)		01 T4	S1 P2 P7	ORBITER FUSELAGE	PRESSURES	.000
[RF3F04]	1469	01 T4	S1 P2 P7	CRBITER FUSELAGE	PRESSURES	4.000
(RF3FOI)		OI TI	51 P2 P6	ORBITER FUSELAGE	PRESSURES	.000
(RE3F03)	∆ I∧69	ÓI TÌ	S1 P2 P6	ORBITER FUSELAGE	PRESSURES	4.000









BETA

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DATA SET SYMBOL

CONFIGURATION DESCRIPTION

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DATA SET SYMBOL	CONF 1	IGURATION DESCRI	PTION	BETA
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PRESSURE COEFFICIENT.







COEFFICIENT.



DATA SET SYMBOL CONFIGURATION DESCRIPTION BETA 01 T4 S1 P2 P7 01 T4 S1 P2 P7 01 T4 S1 P2 P7 01 T1 S1 P2 P6 01 T1 S1 P2 P6 1A69 1A69 1A69 1A69 ORBITER FUSELAGE PRESSURES ORBITER FUSELAGE PRESSURES ORBITER FUSELAGE PRESSURES ORBITER FUSELAGE PRESSURES (RF3F05) 28 (RF3F04) (RF3F01) (RF3F03)



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(RF3F04)		1469	01	T4	S1	P2	P7 -	ORBITER	FUSELAGE	PRESSURES	4.000
(RF3F01)	ত	1469	01	ΤŤ	Ŝİ.	P2	P6	ORBITER	FUSELAGE	PRESSURES	.000
[RE 3F 03]	Δ	1469	01	71	S 1	P2	P6	ORBITER	FUSELAGE	PRESSURES	4,000











PRESSURE COEFFICIENT.





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SMECL	MACH	X/C	ALPHA		PARAMETRIC VALUES			
0	1.078	.150	-4.230	BETA	.000	ELEVON	.000	
Ö	1.220			RUDDER	.000	SPOBRK	.000	
				BOFLAP	.000			











X/C ALPHA PARAMETRIC VALUES SYMBOL HACH .000 -.030 BETA .000 ELEVON .000 1.078 SPOBRK .000









HACH

X/C

ALPHA

SYMEOL

PAGE 167

PARAMETRIC VALUES



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PAGE .169





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ALPHA

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SYMBOL

MACH

PAGE 176

PARAMETRIC VALUES


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SYNBOL

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PAGE 182

PARAMETRIC VALUES





PAGE	185
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CONFIGURATION DESCRIPTION ELEVON RUCCER DATA SET SYNBOL BETA .0000 .0000 .0000 (RF3L01) OPEN 1469 01 T1 S1 P2 P6 VING LOVER SURFACE PRESS.

X/C **ALPHA** STIBOL HACH PARAMETRIC VALUES Ö .950 -4.230 BETA .000 ELEVON .000 1.078 .000 SPDBRK 1.220 RUDDER .000 .000 BOFLAP



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PAGE 222

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CONFIGURATION DESCRIPTION 1A69 01 T1 S1 P2 P6 ORBITER FUSELAGE PRESSURES

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APPENDIX A

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TABULATED SOURCE DATA - FORCE

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Tabulations of plotted data are available on request from Data Management Services.

DATE 11 S	EP 74		TABU	ATED SOURCE	DATA, R.I	. TWT 280 -	1869			PA	GE 1
		·	IAI	59 O1 T4	31 P2 P7				(RF3A	07) { 17 A	PR 74)
	REFE	RENCE DATA							PARAMETRI	C DATA	
SREF = LREF = BREF = SCALE =	,6053 19,3550 19,3550 ,0150	SQ.FT. XHR INCHES YHR INCHES ' 2HR	P = 14. P = . P = 6.	.6850 INCHE .0000 INCHES .0000 INCHES				BETA = BDFLAP = SPDBRK =	-4.000 .000 .000	ELEVON = RUDDER =	.000 .000
		RUN	NO. 11/	2 RN/L =	7.30 GF		:RVAL = -5.	.00/ 5.00			
	MACH 1.218 1.218 1.218	ALPHA -4.190 090 3.970 GRADIENT	0N - ,28040 - ,01640 ,21700 ,06096	CAF .25950 .26150 .25630 00039	CLM .10598 .00900 07940 02271	Cy .17100 .16280 .15900 00147	CYN 07520 07120 06980 .00066	CBL .02940 .03300 .03500 .00069	CA .4659D .4630D .45520 00131	CACORB 00010 00010 00010 00010	
			IAG	9 01 74	SI P2 P7				(RF3AL)8) { 17 A	PR 774)
	REFER	ENCE DATA							PARAMETRIC	DATA	
SREF = UREF = OREF = SCALE =	.6053 19.3550 19.3550 .0150	SQ.FT. XMR INCHES YMR INCHES 2MR	° = 14. ° = . ° = 6.	6850 INCHE DDOU INCHES DDOU INCHES				BETA = BDFLAP = SPOBRK =	000. 000. 000.	ELEVON = RUDDER =	.000 .000
		RUN	NO. 12/	2 RN/L =	7.30 GR	ADIENT INTE	RVAL = -5.	00/ 5.00			
	MACH 1.222 1.222 1.222	ALPHA ~4.070 .070 4.150 GRADIENT	ON 28010 01130 .22140 .06102	CAF .26170 .26290 .25690 -,00058	CLM .11260 .01160 ~.07840 ~.02324	Cy 00550 00630 00530 .00002	CYN 100580 100650 100630 100008	CBL .00010 .00020 .00020 .00020	CA .45930 .45700 .45060 00106	CACORB .00000 .00000 .00000 .00000	
			IAG	9 O1 T4	S1 P2 P7				(RF3AC	19) (17 AF	¥R 74)
	REFER	ENCE DATA							PARAMETRIC	DATA	
SREF = LREF = BREF = SCALE =	.6053 : 19.3550) 19.3550) .0150	SQ.FT. XHRF INCHES YHRF INCHES ZMRP	= 14,(= ,(= 6,(5850 INCHE 3000 INCHES 3000 INCHES				BETA = BDFLAP = SPDBRK =	.000 .000 .000	ELEVON = RUDDER =	.000. .009
		RUN	NO. 17/ 2	? RN/L ≖	7.20 GR	ADIENT INTER	RVAL ≏ -5,	00/ 5.00			
	HACH 1.221 1.221	ALPHA -4.010 .030	CN 27630 01170	CAF ,25990 ,26200	CLM ,10980 ,01020	CY 00390 00520	CYN 100520 100610	CBL ,00000	CA ,4569D ,45490	CACORB +00000	

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1.221

4.080

GRADIENT

.21880

.06120

.25740

-.00031

-.07900

-.02334

-.00290

.00012

.00460

-.00007

.00030

.00304

.44900

-.00098

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.00000

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			Sounds Barray Al	L. INI 200 -	1403			TAU	~ ~
		1459	01 T4 S1 P2 P7				(RF3A1	(0) (17 AF	²R 74)
	REFERENCE DATA						PARAMETRIC	: DATA	
SAEF = LREF = BREF = SCALE =	.6053 SQ.FT, XMR 19.3550 INCHES TMR 19.3550 INCHES 2MR ,0150	P = 14,6850 P = ,0000 P = 6,0000	Ing ie Ing ie s Ing ie s			BETA = Boflap = Spobrk =	4.000 .009 .009	ELEVON = RUDDER =	.000. 000.
	RUN	NO, 13/2 R	N/L = 7,30 (RADIENT INTE	RVAL = -5,	007 5,00			•
	MACH ALPHA 1.217 -4.150 1.217 -,070 1.217 4.010 GRADIENT	ON CA 27780 .2 01540 .2 .21880 .2 .060860	F CLM 7250 .10470 7090 .00900 634008290 011202299	Cr 17850 17130 16620 .00151	CrN .08420 .08030 .07800 ~.00076	CBL 02840 03210 03340 00061	CA .46430 .46130 .45220 00148	CACORB .000000 .000000 .000000 .000000	
		LA69	01 T1 S1 P2 P6				(RF3A1	.1) (17 AF	7R 74)
	REFERENCE DATA						PARAMETRIC	DATA	
SREF = LREF = BREF = SCALE =	.6053 SQ.FT. X9R/ 19.3550 INCHES YMR/ 19.3550 INCHES ZMR/ .0150	P ≃ 14.6850 P ≖ .0000 P = 6,0000	INCHE INCHES INCHES			BETA = BDFLAP = SPDBRK =	4.000 .000 .000	ELEVON = RUDDER =	.000 .000
	RUN	NO. 14/ 2 R	N/L = 7,20 G	RADIENT INTE	RVAL = -5.	00/ 5,00			
	MACH ALPHA 1.217 -4.100 1.217220 1.217 4.040 GRADIENT	ON CAU 27220 .2 02440 .2 .22000 .24 .0604208	F CLM 7140 .10260 7170 .01200 632008190 010202266	CY 17640 17100 16620 .00125	CYN .D8240 .07910 .07720 00064	CBL 02830 03170 03330 00061	CA .46320 .46080 .45260 00131	CACORB .00000 .00000 .00000 .00000	
		1469	O1 T1 S1 P2 P6				(RF3A1	2) (17 AP	1R 74)
	· REFERENCE DATA						PARAMETRIC	DATA	
SREF = LREF = BREF = SCALE =	.6053 SQ.FT. XHRF 19.3550 INCHES YHRF 19.3550 INCHES ' ZHRF .0150	* = 14.6850 * = .0000 ; * = 6.0000 ;	INCHE INCHES INCHES			Beta = Boflap = Spdbrk =	.090 .000 .000	ELEVON = RUDDER =	.000 .000
	RUN	NO, 16/2 R	1/L = 7.20 G	RADIENT INTE	RVAL = -5.0	00/ 5.00			
	MACH ALPHA 1.221 -4.190	ON CAI	CLM 5160 .11340	CY 00350	CYN ,00470	CBL .00000	CA .45980	CACORB	

TABULATED SOURCE DATA, R.I. TWT 280 - 1459

DATE 11 SEP 74

1.221

1,221

-.100

4.000

GRADIENT

-.01850

.21210

.06077

.26300

.25790

-.00045

.01360

-.07530

-.02304

-.00460

100000

.00043

.00540

.00270

-,00024

.00000

.00050

.00006

.45800

.45210

-.00094

.00000

.00000

.00000

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TABULATED SOURCE DATA	, R.I. TWT 280 - 1A69
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DATE 11 SEP 74

[169 O1 T1 S1 P2 P6

REFERENCE DATA

PARAMETRIC DATA

SREF	2	,6053 SQ.FT,	XHRP	Ξ	14.6850 INCHE		BETA =	-4.000	FLEVON =	.000
LREF	z.	19.3550 INCHES	YHRP	Ξ	.0000 INCHES	•	BOFLAP =	.000	RUDDER =	000
BREF	x	19.3550 INCHES '	ZMRP	Ξ	6.0000 INCHES		SPOBRK =	.000	NODDEN -	,000
SCALE	x	.0150						1000		

RUN NO. 15/ 2 RN/L = 7.20 GRADIENT INTERVAL = -5.00/ 5.00

HACH	· ALPHA	ON	CAF	CL M	â	CYN	CBL	CA.	CACORB
1,216	-4,250	28180	.25990	.10590	16610	07260	.02950	.46660	.00000
1.218	060	01190	.26360	.00630	16060	06940	.03310	.46440	00010
1,218	4.020	.21810	.25700	07990	15500	06560	.03490	.45640	00010
	GRADIENT	.06047	00035	02247	-,00158	.00085	.00065	00123	09001

PAGE 3

(RF3A13) (17 APR 74)

APPENDIX B

TABULATED SOURCE DATA - PRESSURE

Tabulations of plotted data are available on request from Data Management Services.

- management of the

DATE U7 CCT 74	TABULATED SCURCE DATA, R.I. TWT 280 - 1469	PAGE 1
	1469 C1 71 S1 P2 P6 BASE PRESSURES	(RF3801) (16 APR 74)
REFERENCE	DATA	FARAMETRIC DATA
SREF = 2690.0000 SQ.FT	, XMRP = 979,0000 TNK ST	GETA = .000 ELEVON = .000
LREF = 1290.3000 IN.	YMRP = .0000 TNK EP	Rudder = ,000 Spderk = ,000
BREF = 1290,3000 IN, SCALE = .0150	2MRP = 400.0000 TNK WL	EDFLAF = ,UUU
MACH (1) = 1.070	ALFHA (1) = -4.230 RN/L = 7.400	
SECTION (1)BASE	DEPENDENT VARIABLE CP	
X/L 1.0000		
TAP NO		
1.0003806		
2.000 .0000		
3.0003544		
4,000 .0000		
5.0004732		
6.0004402		
7.0004071		
8.0003808		
9.0004391		
MACH (1) = 1.078	ALFHA (2) =030 RN/L = 7.400	
SECTION (1) BASE	DEFENDENT VARIABLE CP	
WL 1.0000	· · · · ·	
TAP NO		
1.0003722		
2.000 .0000		
3.000 -,3675		
4.000 .0000		
5,0004652		
6.0004776		
7.0004199		
8.0003723		

9.000 -.4433

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DATE U7 CCT 74	T	ABULATED SCURCE	E DATA, R.I.	TWT 280 - IA69		FAGE	2
		IA69 C4 T1 S	I P2 P6 BAS	E FRESSURES	(RF3801)		
MACH (1) = 1.078	ALPHA (3) =	4,000	RN/L =	7,400			
SECTION (1) BASE		DEFENDENT	VARIABLE CP				
x/L 1.0000							
TAP NO							
1.0003585							
2,000 ,0000							
3.0003547							
4.000 .0000							-
5.0004494							
6.0004713							
7.0004161							
ð.000 - .3 594							
9.0004201							
MACH (2) = 1.220	ALPHA (1) =	-4,120	RN/L =	7.400			
SECTION (1) BASE		DEPENDENT	VARIABLE CP				
X/L 1.0000							
TAP NO							
1,000 -,3389							
2,000 ,0000							
3.0003131							
4.000 .0000							
5.0003919							
5.0004003 7.000 - 3169							
7.0000469 A (222 - 3324							
3.000 .0000							
MACH (2) = 1.220	ALPHA (2) =	.110	RN/L =	7,400			
SECTION (1) BASE		DEPENDENT V	ARIABLE CP				
X/L 1.0000							
TAP NO							
1.0003334							
5.000 0000							
3.000 - 3247							
4.000 .0000							
5.0003705							
6.0004375							
7,0003596							
6,0003320							
9.0003462							

DATE U7 C	CT 74	TA	EULATED SCURO	E DATA, R.I.	. TWT 280 - LA	69		FAGE	3	
			IA69 C1 T1 S	1 P2 P6 BA	SE PRESSURES		(RF 38 01)			
MACH (2)) = 1,220	ALPHA (3) =	4.200	RN/L =	7.400					
SECTION	(1) BASE		DEFENDENT	VARIABLE CF	•					
X/L	1.0000									
TAP NO										
1,000	3388									
2,000	.0000									
3.000	-,3332									
4.000	.0000									
5.000	~.3573									
6.000	- 4474									
7.000	3818									
8.000	3387									•

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9.000 -.3269

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IA69 CL TI SI P2 P6 BASE PRESSURES

REFERENCE DATA

PARAMETRIC DATA

(RE3602) (16 APR 74)

SREF	=	2590.0000 SQ.FT.	XMRP	=	979,0000 TNK ST	BETA =	-4.000	ELEVON =	.000
LREF	=	1290,3000 IN,	YMRP	=	JOOD TNK BP	RUDDER =	.000	SPDERK =	.000
BREF	=	1290,3000 IN.	ZMRP	z	400.0003 TNK WL	EDFLAP =	.000		
SCALE	=	.0150							

MACH (1) = 1.216 ALPHA (1) = -4.150 RN/L = 7.400

SECTION (1) BASE DEPENDENT VARIABLE CP

. .

X/L 1.0000

TAP NO 1,000 -.3504 2,000 .0000 3,000 -.3217

. .

4,000 ,0000 5,000 -,3953 6,000 -,4289 7,000 -,3625 6,000 -,3515 9,000 -,3686

MACH (1) = 1.216 ALPHA (2) =

RN/L = 7,400

SECTION (1) BASE

DEPENDENT VARIABLE CP

.050

X/L 1.0000

 TAP NC

 1.000
 -.3379

 2.000
 .0000

 3.000
 -.3315

 4.000
 .0000

 5.000
 -.3683

 6.000
 -.4666

 7.020
 -.3886

 6.000
 -.3414

 9.000
 -.3379

DATE U7 C	CT 74	TAE	SULATED SCUR	E DATA, R		TWT 280 - 1469		PAGE	5
		1	1A69 C4 71 S	51 P2 P6	BASE	PRESSURES	(RF3802)		
MACH (1) = 1.216	ALFHA (3) =	4.140	RNAL	z	7.400			
SECTION	(1)BASE		. DEPENDENT	VARIABLE	CP				
X/L	1.0000								
TAP NO									
1.000	3407								
2,000	.0000	•							
3,000	3384								
4.000	.0000								
5.000	3553								
6,000	4775								
7.000	- 4047								
8.000	3435								
9,000	-,3307								

	TABULATED SCURCE DATA, R.I. TWI 280 - TA69	PAGE 6
	IA69 C1 T1 S1 P2 P6 BASE PRESSURES	(RF3803) (16 APR 74)
REFERENCE DATA		FARAMETRIC DATA
SREF = 2690.0000 SQ.FT. ;	MARP = 979.0000 TNK ST	BETA = 4.000 ELEVON = .000
LREF = 1290.3000 IN.)	MRP = .0000 TNK 6P	RUDDER = .000 SPDORK = .000
BREF = 1290.3000 IN. 7	2MRP = 400,0000 TNK WL	EDFLAP = .000
SCALE = .0150		
MACH (1) = 1.216 ALP	(1) = -4.200 RN/L = 7.300	
SECTION (1) BASE	DEPENDENT VARIABLE CP	
X/L 1.0000		
TAP NO		
1.0003385		
2,000 .0000		
3,0003210		
4.000 .0000		
5.0003937		
6.0003750		
7.0003338	•	
8.0003386		
9.0003694		
MACH (1) = 1.216 ALFH	A (2) = .000 RN/L = 7.300	
MACH (1) = 1.216 ALFH SECTION (1) BASE	A (2) = .000 Fin/L = 7.300 DEPENDENT VARIABLE CP	
MACH (1) = 1.216 ALFH SECTION (1)BASE X/L 1.0000	A (2) = .000 FRVL = 7.300 DEPENDENT VARIABLE CP	
MACH (1) = 1.216 ALFH SECTION (1)BASE X/L 1.0000 TAP NO	a (2) = .00) RN/L = 7.300 DEFENDENT VARIABLE CP	
MACH (1) = 1.216 ALFH SECTION (1)BASE X/L 1.0000 TAP NO 1.0003289	a (2) = .000) RN/L = 7.300 DEPENDENT VARIABLE CP	
MACH (1) = 1.216 ALFH SECTION (1)BASE X/L 1.0000 TAP NO 1.0003289 2.000 .0000	a (2) = .000) FRV/L = 7.300 DEFENDENT VARIABLE CP	
MACH (1) = 1.216 ALFH SECTION (1)BASE X/L 1.0000 TAP NO 1.0003289 2.000 .0000 3.0003209	a (2) = .000) FRV/L = 7.300 DEFENDENT VARIABLE CP	
MACH (1) = 1.216 ALFH SECTION (1)BASE X/L 1.0000 TAP NO 1.0003289 2.000 .0000 3.0003209 4.000 .0000	a (2) = .000) frv/l = 7.300 Deffendent variable CP	
MACH (1) = 1.216 ALFH SECTION (1)BASE X/L 1.0000 TAP NO 1.0003289 2.000 .0000 3.0003209 4.000 .0000 5.0003709	a (2) = .000) frv/l = 7.300 Deffendent variable (p	
MACH (1) = 1.216 ALFH SECTION (1)BASE X/L 1.0000 TAP NO 1.0003289 2.000 .0000 3.0003209 4.000 .0000 5.0003709 6.0003851	a (2) = .000) frv/l = 7.300 Deffendent variable (p	
MACH (1) = 1.216 ALFH SECTION (1) BASE X/L 1.0000 TAP NO 1.0003289 2.000 .0000 3.0003209 4.000 .0005 5.0003709 6.0003851 7.0003354	a (2) = .000) frv/l = 7.300 Deffendent variable (p	
MACH (1) = 1.216 ALFH SECTION (1) BASE X/L 1.0000 TAP NO 1.0003289 2.000 .0000 3.0003209 4.000 .0000 5.0003209 4.000 .0000 5.0003259 6.0003354 8.0003279	a (2) = .000) frv/L = 7.300 Deffendent variable (p	
MACH (1) = 1.216 ALFH SECTION (1) BASE X/L 1.0000 TAP NO 1.0003289 2.000 .0000 3.0003209 4.000 .0000 5.0003709 6.0003851 7.000354 8.0003279 9.0003593	a (2) = .000) frv/L = 7.300 Deffendent variable (p	
MACH (1) = 1.216 ALFH SECTION (1)BASE X/L 1.0000 TAP NO 1.0003289 2.000 .0000 3.0003209 4.000 .0000 5.0003709 6.0003851 7.0003851 7.0003279 9.0003593	A (2) = .000) RIVL = 7.300 DEFENDENT VARIABLE CP	

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TABULATED	SCURCE	DATA.	R.L.	w	280	-	IA69	
INDUCATED	SCORE	UAIA,	K.L.	EMI.	280	-	1405	1

DATE U7 CCT 74

1A69 C4 T1 S1 P2 P6 BASE PRESSURES

DEPENDENT VARIABLE CP

MACH (1) = 1.216 ALPHA (3) = 4.110 RN/L = 7.300

SECTION (1) BASE

X/L 1.0000

TAP NG 1.000 -.3325 2.000 .0000

 3.000
 -.3246

 4.000
 .0000

 5.000
 -.3464

 6.000
 -.4136

 7.000
 -.3625

 8.000
 -.3297

9,000 -.3262

(RF3803)

	DATE UT CCT 74	TABULATED SCURCE DATA, R.I. TWT 280 - 1469	PAGE 8	
		IA69 C4 T4 S1 P2 P7 BASE FRESSURES	(RF3804) (16 APR 74)	
	REFERENCE DATA	、	PARAMETRIC DATA	
- 	SREF = 2690.0000 SQ.FT. XMRP = LREF = 1290.3000 IN. YMRP = BREF = 1290.3000 IN. ZMRP = SCALE = _0150	= 979.0000 TNK ST = .0000 TNK 8P = 400.0000 TNK WL	BETA = 4,000 ELEVON = .000 RUDDER = .000 SFDBTK = .000 BDFLAP = .000	
	MACH (1) = 1.215 ALFHA (1)) = -4.210 RN/L = 7.200		
	SECTION (1) BASE	DEPENDENT VARIABLE OP		
	x/L 1.0000			
·	TAP NO 1.0003386 2.000 .0000 3.0003173 4.000 .0000 5.0003808 6.0003699 7.0003417 8.0003383 9.0003563 MACH (1) = 1.215 AUPHA (2)	≖ .010 fRV/L ≈ 7.200		
	SECTION (1) BASE	DEPENDENT VARIABLE CP		
	X/L 1.0000			
	TAP NO 1.0003276 2.000 .0000 3.0003198 4.000 .0000 5.0003586 6.0003818 7.0003489 8.0003262 9.0003479			

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DATE OF C	. 1 /4	TA	BULATED SCU	RCE DATA, I	 7	WT 280 - IA6	9		PAGE	9.	
			IA69 CI T4	S1 P2 P7	BASE	RESSURES		(RF3804)			
MACH (1)) = 1.215	ALPHA (3) =	4.140	RN/L	z	7.200					
SECTION	(1)BASE		DEPENDER	IT VARIABLE	E CP						
X/L	1,0000										
TAP NO											
1.000	3337										
2,000	.0000										
3,000	3225										
4,000	.0000										
5.000	3341										
6.000	4084										
7.000	3791					÷					
8,000	3302										
9.000	3105										

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DATE 07	CCT 74	TABULATED SCURCE DATA, R.I.	1WT 280 - 1869		PAGE 10	l i
		1469 Ct 14 S1 P2 P7 BAS	e rressures	(RF3805	(16 APR 74	>
	REFERENCE DATA			PARAMETRIC	DATA	
* SREF = LREF = DREF = SCALE =	2690.0000 SQ.FT. XMRP = 1290.3000 IN. YMRP = 1290.3000 IN. ZMRP = .0150	979.0000 TNK ST .0000 TNK 8P 400.0000 TNK WL	beta Ruode Bofla	= .000 000, = R 000, = P	Elevon = .00 Spodik = .00	ם ט
MACH (1) = 1.220 ALPHA (1) =	-4.150 RN/L =	7.200			
SECTION	(1) ĐASE	DEFENDENT VARIABLE OP				
×~L	1.0000					
ТАР № 1,000 2,000 3,000 4,000 5,000 6,000 7,000 8,000 9,000 МАОН (1 SECTION	3396 .0000 3159 .0000 3754 3824 3637 3398 3433 () = 1.220 ALPHA (2) = (1)BASE	.080 RN/L ≖ DEPENDENT VARIABLE CP	7.200			
X/L TAP NO 1.000 2.000 3.000 4.000 5.000 6.000 7.000 8.000 9.000	1.0000 3322 .0000 3247 .0000 3542 4271 3653 3308 3288					

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DATE U7 O	CT 74	T/	BULATED SOUR	CE DATA, R.	I. TWT 280 - IA	469		PAGE	11
			IA69 C4 74	S1 P2 P7 B4	ase fressures		(RF3845)		
MACH (1) = 1,220	ALPHA (3) =	*.200	RN/L =	7.200				
SECTION	(1) BASE		DEFENDEN	T VARIABLE (CP	·			
X/L	1,0000								
TAP NO									
1,000	3377								
2,000	.0000								
3,000	+.3325								
4.000	.0000								
5.000	3352								
6.000	4441								
7,000	3911								
8.000	3384								
9.000	3102								

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DATE UT CCT 74	TABULATED SCURCE	DATA, R.I. TWT 280	~ 1469		PAG	E 12
	IA69 Ct T4 51	P2 P7 BASE PRESSU	ÆS	(RF38	06) (16 AFF	ī74)
REFERENCE D	ATA			PARAMETRI	C DATA	
SREF = 2690.0000 59.FT.	XMRP = 979.0000 TNK ST		BETA	= -4.000	ELEVCN =	.000
LREF = 1290.3000 IN.	YMRP = .0000 TNK BP		RUDDER	= .000	SPDERK =	.000
BREF = 1290.3000 IN.	ZMRP = 400,0000 TNK WL		EDFLAP	= .000		
SCALE = .0150						
MACH (1) = 1.215	ALPHA (1) = -4.030	RN/L = 7.200				
SECTION (1) BASE	DEPENDENT V	ARIABLE CP				
X/L 1,0000						
TAP NO						
1,000 -,3492						
2.000 .0000						
3.000 -,3277						
4,000 ,0000						
5,000 -,3805						
6.0004414 .						
7.0003849						
8,000 -,3526						
9.0003554						
MACH (1) = 1.215 A	LPHA (2) = .150 6	N/L = 7.200				
SECTION (1) BASE	DEPENDENT VA	VRIABLE CP				
X/L 1.0000						
TAP NO						
1.0003398						
2,000 .0000						
3.000 -,3329						
4,000 ,0000						
5.0003572						
6.000 -,4622						
7.0003927						
8,000 ~,3438						

9,000 -,3209

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DATE U7 CCT 74		TABULATED SCURCE	DATA, R.I.	TWT 280 - 1469		
		IA69 C4 T4 S1	P2 P7 BASE	PRESSURES		(RF3806)
MACH (1) =	1.215 ALFHA (3) =	4,330	RN/L =	7,200	×	
SECTION (1) BAS	£	DEPENDENT	VARIABLE CP			
x/L 1.000						

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TAP NO 1.000 -,3420 .0000 2.000 3.000 -.3374 4,000 .0000 5.000 -.3369 6.000 -.4739 7.000 -.4116 8.000 -.3452 9.000 -.3104

DATE U7 CCT 74

IA69 CI TA SI P2 P7 BASE FRESSURES

REFERENCE DATA

(RF38U7) (16 APR 74)

PARAMETRIC DATA

SREF	x	2690.0000 SQ.FT.	XMRP	=	979.0000 TN	ST	BETA =	-4,000	ELEVON =	.000
UREF	=	1290.3000 IN.	YMRP	z	.0000 TN	BP	Rudder =	.000	SPDERK =	.000
BREF	=	1290,3000 IN.	ZMRP	2	400.0000 TN	WL	EDFLAP =	.000		
SCALE	Ξ	.0150								

MACH (1) = 1.218 ALFHA (1) = -4.190 RN/L = 7.300

SECTION (1) BASE

DEPENDENT VARIABLE CP

X/L 1.0000

TAP NO

 1,000
 -.3478

 2,000
 .0000

 3,000
 -.3326

 4,000
 .0000

 5,000
 -.4047

 6,000
 -.4072

 8,000
 -.3503

 9,000
 -.3813

MACH (1) = 1.218 ALPHA (2) = -.090 RN/L = 7.300

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SECTION (1) BASE

DEPENDENT VARIABLE CP

X/L 1.0000

 TAP NO

 1.000
 ~.3371

 2.000
 .0000

 3.000
 ~.3287

 4.000
 .0000

 5.000
 ~.3912

 6.000
 ~.4678

 7.000
 ~.4061

 6.000
 ~.3403

 9.000
 ~.3588

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TABULATED SCURCE DATA, R.I. TWT 280 - 1469

(RF3807)

1A69 CI T4 S1 P2 P7 BASE PRESSURES MACH (1) = 1,218 ALPHA (3) = 3.970 RN/L = 7.300 SECTION (1) BASE DEPENDENT VARIABLE CP X/L 1,0000 TAP NO 1.000 -.3365 2.000 .0000 3.000 -.3311 4,000 .0000 5.000 -.3768

6.000 ~.4699 7.000 -.4110 8.000 -.3394 9.000 -.3568

REFERENCE DATA	IA69 C1 T4 S1 P2 P7 BASE PRESSURES		(RF3808) (16 AF	R 74 .
REFERENCE DATA		£		
		F.	ARAMETRIC DATA	
SREF = 2690.0000 SQ.FT. XMRP =	979.UCUU TNK ST	BETA =	.000 ELEVON =	.00
LREF = 1290,3000 IN. YMRP =	JUDU TNK BP	rudder =	.000 SPDERK =	.00
BREF = 1290.3000 IN. ZMRP =	400,0000 TNK WL	edflaf =	.020	
SCALE = .0150				
1ACH (1) = 1,222 ALPHA (1)	= -4,070 RN/L = 7,300			
SECTION (1) BASE	DEFENDENT VARIABLE CF			
CCCC. 1.0000				
TAP NO				
1.0003410				•
2,000 .0000				
3.0003259				
4.000 .0000				
5.0003999				
6.0004183				
7,0003725				
8.0003401				
9.0003705				
ACH $(1) = 1.222$ ALPHA (2)	= ,070 RN/L = 7,300			
SECTION (1)BASE	DEPENDENT VARIABLE CP			
/L 1.0000				
TAP NO				
1.000 ~.3314				
2.000 .0000				
3.0003243				
4.000 .0000				
5.0003852				
6.0004288				
7.0003747				
0.000 -,3300				
9,0003564				
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TABULATED SCURCE DATA, R.I. TWT 280 - 1469

DATE 07 CCT 74

PAGE 17

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IA69 CI TA SI P2 P7 BASE PRESSURES

(RF380a)

MACH (1) = 1.222 ALPHA (3) = 4.150 RN/L = 7.300

X/L 1.0000 TAP NC 3336 1.000 3336 2.000 .0000 3.000 3288 4.000 .0000 5.000 3728 6.000 3350 7.000 3912 8.000 3330 9.000 3464	SECTION	(1)BASE	DEPENDENT VARIABLE CP
TAP NC 1.000 3336 2.000 .0000 3.000 3288 4.000 .0000 5.000 3728 6.000 4359 7.000 3912 8.000 3330 9.000 3464	X/L	1.0000	
1.000 3336 2.000 .0000 3.000 3288 4.000 .0000 5.000 3728 6.000 4359 7.000 3912 8.000 3330 9.000 3464	TAP NO		
2.000 .0000 3.000 3288 4.000 .0000 5.000 3728 6.000 4359 7.000 3912 8.000 3330 9.000 3464	1.000	3336	· · · · · · · · · · · · · · · · · · ·
3.0003288 4.000 .0000 5.0003728 6.0004359 7.0003912 8.0003330 9.0003464	2.000	.0000	
4.000 .0000 5.0003728 6.0004359 7.0003912 8.0003330 9.0003464	3,000	3288	·
5.0003728 6.0004359 7.0003912 8.0003330 9.0003464	4.000	.0000	
6.0004359 7.0003912 8.0003330 9.0003464	5.000	3728	
7.0003912 8.0003330 9.0003464	6.000	4359	
9.0003330 9.0003464	7.000	3912	
9.0003464	9.000	3330	
	9.000	3464	

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REFERENCE DA	A	۲	ARAMETICIC DATA
SREF = 2690.0000 SQ.FT.	XMRP ≈ 979.0000 TNK ST	BETA =	.000 ELEVON =
UREF = 1290,3000 IN,	YMRP = ,0000 TNK BP	RUDDER =	.000 SPDERK =
BREF = 1290.3000 IN.	2MRP = 400,0000 TNK WL	BOFLAP =	.000
SCALE = .0150			
MACH (1) = 1.221 AL	₩A (1) = -4,010 RN/L = 7,200		
SECTION (1) BASE	DEPENDENT VARIABLE CP		
X/L 1,0000			
TAP NO			
1.0003411			
2.000 .0000			
3.0003245			
4.000 .0000			
5.0003980			
6.0004220			
7.0003680			
8,0003409			
9.0003663			
MACH (1) = 1,221 ALF	14 (2) = .030 RN/L = 7.200		
SECTION (1) BASE	DEPENDENT VARIABLE OP		
X/L 1.0000			·
TAP NO			
1.0003305			
2.000 .0000			
3.0003237			
4.000 .0000			
5,000 -,3788			
6.0004308			
7.0003765			
8,000 -,3297 9,000 - 3609			
9,000 -,0009			

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	DATE UT CCT 74	TABULATED SCURCE DATA, R.I. TWT 280 - 1469		PAGE 19	
		IA69 CI TA SI P2 P7 BASE PRESSURES	(RF3809)		
	MACH (1) = 1.221	ALFHA (3) ≈ 4.080			
	SECTION (1)BASE	DEFENDENT VARIABLE CP			
•	X/L 1.0000				
	TAP NO				
	1.0003341				
	2,000 ,0000				
	3.0003295				`
	4.000 .0000				
	5.0003638				
	6.0004352				
	7,000 -,3887				
	8.000 -,3337				
	9.0003382				

DATE U7 CCT 74

LREF = 1290.3000 IN.

BREF = 1290.3000 IN.

SCALE = .0150

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TABULATED SCURCE DATA, R.I. TWT 280 - 1469

PAGE 20

IA69 CI TA SI P2 P7 BASE PRESSURES

(RF3810) (16 APR 74)

REFERENCE DATA

BETA =	4,000	ELEVCN =	.000
rudder =	.000	SPDDRK =	.000
EDFLAP =	.000		

PARAMETRIC DATA

MACH (1) = 1,217 ALPHA (1) = -4,150 RN/L = 7,300

ZMRP = 400,0000 TNK WL

.0000 TNK BP

SECTION (1) BASE DEPENDENT VARIABLE OP

SREF = 2690.0000 SQ.FT. XMRP = 979.0000 TNK ST

YMRP =

X/L 1.0000

 TAP NO

 1.000
 -.3348

 2.000
 .0000

 3.000
 -.3172

 4.000
 .0000

 5.000
 -.4044

 6.000
 -.374

 8.000
 -.3348

 9.000
 -.3348

MACH (1) = 1.217 ALPHA (2) = +.070 RN/L = 7,300

SECTION (1) BASE

DEPENDENT VARIABLE OP

X/L 1,0000

 TAP NO

 1.000
 -.3285

 2.000
 .0000

 3.000
 -.3176

 4.000
 .0000

 5.000
 -.3935

 6.000
 -.3756

 7.000
 -.3559

 8.000
 -.3293

 9.000
 -.3762

DATE U/ O	CT 74	TABULATED SCURCE DATA, R.I. TWT 280 - 1469	FAGE	21
		IA69 CL T4 S1 P2 P7 BASE PRESSURES	(RF3810)	
масн (1) = 1.217	$ALPHA (3) \approx 4.010$ (RVL = 7.300)		
SECTION	(1)BASE	DEPENDENT VARIABLE CP		·
X/L	1.0000			
TAP NO				
1.000	3280			
2.000	,0000			
3,000	3125	,		
4,000	.0000			
5.000	3742			
6.000	4001			
7.000	3731			
8.000	3281			
9.000	-,3493			

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DATE U7 CCT 74

(RF3811) (16 APR 74)

IA69 CO TI SI P2 P6 BASE PRESSURES

REFERENCE DATA

PARAMETRIC DATA

SREF	=	2690.0000 SQ.FT.	XMRP	=	979.0000 TNK ST	BETA	z .	4,000	ELEVCN =	.000
UREF	Ξ	1290.3000 IN.	YMRP	=	,0000 TNK 8P	RUDDER	=	.000	SPDORK =	,000
DREF	=	1290.3000 IN,	ZMRP	=	400,0000 TNK WL	EDFLAP	2	.000		
SCALE	-	.0150								

MACH (1) = 1.217 ALPHA (1) = -4.100RN/L = 7.200

SECTION (1) BASE

DEPENDENT VARIABLE CP

X/L 1.0000

TAP NO 1.000 -.3341 2.000 .0000 3.000 -.3167 4.000 .0000 5.000 -.4042 6,000 -.3704 7.000 -.3447 0.000 -.3351 9.000 -.3803

MACH (1) = 1.217 ALPHA (2) = -.220 RN/L = 7.200

SECTION (1) BASE

DEPENDENT VARIABLE CP

X/L 1.0000

TAP NO 1.000 -.3264 2.000 .0000 3.000 -.3143 4.000 .0000 5.000 -.3907 6.000 -.3770 7.000 -.3549 8.000 ~.3279 9.000 -.3742

PAGE 23

(RF3811)

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IA69 CI TI SI P2 P6 BASE PRESSURES

MACH (1) = 1,217	ALFHA (3) ⇒	4,040	RN/L	= 7	7.200
SECTION	(1)BASE		DEFENDENT	VARIABLE	CP	
¥⁄L	1.0000					· · · · · ·
TAP NO						
1.000	3283					
2.000	.0000					
3,000	3137					
4.000	.0000					•
5.000	3738					
6.000	-,4008					
7.000	3797					
9,000	3284					
9.000	3485					

DATE UT CCT 74		TABULATED SCI	RCE DATA, R.I.	TWT 280 - 1469			PAG	E 24	
		IA69 C4 T1	IS1 P2 P6 BAS	e fressures		(RF381	2) (16 AP	R 74 }	
REFERE	NCE DATA				PA	RAMETRIC	DATA		
SREF = 2690.0000 S LREF = 1290.3000 I BREF = 1290.3000 I SCALE = .0150	Q.FT. XMRP = N. YMRP = N. ZMRP =	979,0000 TNK 1000 TNK 400,0000 TNK	57 69 WL		BETA = RUDDER = EDFLAP =	000. 000, 000,	ELEVCN = SPDERK =	000. 000.	
MACH (1) = 1.22	1 ALPHA (1);	= -4,190	RN/L =	7.200					
SECTION (1)BASE		DEFENDE	NT VARIABLE CP						
x/L 1.0000									
TAP NC 1.0003391									
2.000 .0000 3.000323 5									
4,000 ,0000									
5,000 -,3998									
6.0004221									
7,000 -,3809									
8,000 -,3380									
9.0003703									
MACH (1) = 1.221	ALPHA (2) =	100	RN∕L =	7,200					
SECTION (1) BASE		DEFENCE	NT VARIABLE OP						
X/L 1,0000									
TAP NO									
1.0003327									
2.000 .0000									
3.0003244									
4,000 .0000									
5.0003880									
6.0004258									
7,000 -,3793									
8.0003317									
9.0003598									
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(RF3812)

IA69 OL TI SI P2 P6 BASE PRESSURES

MACH (1)	= 1,221	ALPHA (3) =	4.000	RN/L =	7,200	
SECTION	(1)BASE		DEPENDENT	VARIABLE CP		
X/L	1.0000					
TAP NO						
1.000	3349					
2,000	.0000				•	
3,000	3297					
4.000	.0000					
5,000	3780					
6.000	4307					

8.000 -.3340

-.3858

7.000

9.000 -.3471

	DATE UT CCT 74	TABULATED SCURCE DATA, R.I. TWT 200 - 1469		PAGE 26
		IA69 CI TI SI P2 P6 BASE PRESSURES		(RF3813) (16 AFR 74)
	REFERENCE D	ATA		PARAMETRIC DATA
	SREF = 2690.0000 SQ.FT.	XMRP = 979.0000 TNK ST	BETA =	~4.000 ELEVON = .000
	UREF # 1290,3000 IN.	YMRP = .0000 TNK BP	RUDDER =	.000 SFDERK # .000
	EREF = 1290,3000 IN.	ZMRP = 400,0000 TNK WL	EDFLAP =	.000
	SCALE = .0150			
	MACH (1) = 1.218 A	LF+A(1) = -4.250 RN/L = 7.200		
	SECTION (1) BASE	DEPENDENT VARIABLE CP		
	X/L 1.0000			
₹.	TAP NO			
	1.0003480			
	2.000 .0000			
	3.0003333			
	4.000 .0000			
	5.0004065			
	6.0004732		•	
	7.0004076			
	8,000 -,3495			
	9.0003822			
	MACH (1) = 1.218 A	.P+A (2) = ~.060 RN/L = 7,200		
	SECTION (1) BASE	DEFENDENT VARIABLE OP		
	X/L 1.0000			
	TAP NO			
:	1.0003362			
	2.000 .0000			
	3.0003266			
	4.000 .0000			
	5.0003917			
	6.000 ~.4607			
	7.0004042			
	8.0003382			
	9.0003586			

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DATE U7 CCT 74	TABULATED SCURCE DATA, R.I. TWT 280 - 1469	PAGE 27
	1A69 Ct T1 S1 P2 P6 BASE FRESSURES	(RF 3 813)
MACH (1) = 1.218	ALPHA (3) = 4.020 RN/L = 7.200	
SECTION (1) BASE	DEPENDENT VARIABLE CP	
X/L 1.0000		
TAP NO		
1,000 -,3374		
0000, 000.5		
3.0003318		
4,000 .0000		
5.0003767		
6.0004698		
7.0004151		
8.000 -,3393		

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9.000 -.3538

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DATE U7 CCT 74

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TABULATED SOURCE DATA, R.I. TWT 280 - 1469

PAGE 20

IA69 CI TI SI PZ P6 CREITER FUSELAGE PRESSURES

PARAMETRIC DATA

(RE3EU1) (16 APR 74)

REFERENCE DATA

.

SREF	z	2690.0000 SQ.FT,	XMRP	z	979.0000 1	TNK	ST	BETA	Ξ	.000	ELEVON = .	.000
LREF	z	1290,3000 IN.	YMRP	=	.0000 1	TNK	8P	RUDDET	:=	.000	SFDERK = .	000
EREF	=	1290.3000 IN.	ZMRP	=	400.0000 1	TNK.	WL.	EDFLAF	• =	.000		
SCALE	=	.0150										

MACH (1) = 1.078 ALPHA(1) = -4.230RN/L = 7.400

SECTION (1) FUSELAGE DEPENDENT VARIABLE CP

X/L .1821 .2054 .2519 .2945 .3488 .3875

PHI .000 1,2709 .4458 .4433 ~.5770 -.4055 40.000 .5163 .3290 .1236 -.2917 -.2844 90.000 .5206 .2826 .2194 .0351 -.2322 180.000 .6533 .4180 ,5098 .7178 -.7915

MACH (1) = 1.078 ALPHA (2) = -,030 RN/L = 7.400

SECTION (1) FUSELAGE DEPENDENT VARIABLE CP XL ,1821 .2054 .2519 .2945 .3488 .3875 PHI .000 1.2869 .3945 .3486 -.5667 -.3505 40.000 .4876 .2577 .0733 -.3097 -.2895 90,000 .0286 -.2248 .4652 .2137 ,1729 180.000 .5470 .2949 .6713 -.8375 .4196 MACH (1) = 1.078 ALPHA (3) = 4,000RN/L = 7,400 SECTION (1) FUSELAGE DEPENDENT VARIABLE OF X/L .1821 .2519 .2054 .2945 .3488 .3875 **FHI** .000 1.2870 .3340 .2771 -.5189 -.2270 40.000 .4557 .2078 .0150 -.3118 -.1672 90,000 .4221 .1605 ,1127 .0195 -.2192

.4518

.1639

.3241

.6295 -.9005

(RF3FU1)

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IA69 CI TI SI P2 P6 CRBITER FUSELAGE PRESSURES MAOH (2) = 1,220 ALPHA(1) = -4.120RN/L = 7.400 SECTION (1) FUSELAGE DEPENDENT VARIABLE CP X/L .1821 ,2054 .2519 .2945 .3488 .3875 PHI .4835 .000 1.3639 .5052 -,4432 -.2545 40,000 .5881 .3720 .2116 -.1620 -.0831 90.000 .5786 .3355 .2943 .1615 -.0709 180,000 .6891 .8008 -.5939 .4433 .5584 MACH (2) = 1,220 ALPHA (2) = .110 RN/L = 7.400 SECTION (1) FUSELAGE DEPENDENT VARIABLE CP X/L .1821 .2054 .2519 .2945 .3488 .3875 PHI .000 1,3881 .4582 .4129 -.4620 -.2586 40.000 .5654 .3002 .1555 -.2125 -.3001 90.000 .5399 .2843 .2300 .1288 -.0705 180.000 .5934 .2967 .4439 .7566 -.6330 MACH (2) = 1.220 ALPHA(3) = 4.200RN/L = 7.400 SECTION (1) FUSELAGE DEFENDENT VARIABLE OF X/L .1821 .2054 .2519 .2945 .3488 .3875 **HHI** .000 1.3723 .3911 .3418 -.4569 -.2130 .5322 40.000 .2578 .1291 -.2593 -.3687

90,000 .4943 .2468 .1516

.1089 -.0887 180.000 .5048 .1926 .2704 .7319 -.6782 DATE U7 CCT 74

TABULATED SCURCE DATA, R.I. TWT 280 - 1A69

PAGE 30

1A69 C4 T1 S1 P2 P6 ORBITER FUSELAGE PRESSURES

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REFERENCE DATA

FAVORE INTEL DATA	PARAMETRIC DATA	
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(RF3FU2) (15 APR 74)

SREF	=	2690.0000 SQ.FT.	XMRP	=	979.0000 TNK	ST	BETA		4.000	ELEVCN =	,000
UREF	2	1290,3000 IN.	YMRP	=	,0000 TNK	8P	RUDDER	2	.000	SPDBRK =	.000
DREF	#	1290.3000 IN.	ZMRP	=	400,0000 TNK	WL	EDFLAP	2	.000		
SCALE	z	.0150									

MACH (1) = 1.216 ALPHA (1) = -4.150 RN/L = 7.400

SECTION (1) FUSELAGE DEPENDENT VARIABLE CP

X/L .1821 .2054 .2519 .2945 .3488 .3875

FHI

160,000

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.000	1.3789	.5228	.5385		4767	2840	
40.000		7093	.4491	.3367	0963	0845	
90,000		.7380	.4527	,3944	.2612	.0234	
190,000		. 677U	.4453	.5487	.7797	-,5980	

MACH (1) = 1.216 ALFHA (2) = .050 RN/L = 7.400

SECTION	(1)FUSEL	AGE			DEPEND	ENT VARIAE	SLE CP	
X/L	.1821	.2054	.2519	.2945	.3488	.3875		
PH1								
.000	1.4130	.4897	.4722		4951	3128		
40.000		.7075	.3854	.3099	1235	1152		
90.000		.6904	.3839	.3305	.2351	.0117		
180.000		.5682	.3050	.4454	.7335	6324		
масн (1) = 1.6	216 AI	" рн а (3)	= 4	.140	RN/L	=	7,400
SECTION	(1) FUSEL	AGE			DEFENDE	NT VARIAB	LE CP	
X/L	,1821	.2054	.2519	,2945	.3488	.3875		
ni l								
.000	1.3972	.4606	.4101		5135	2838		
40.000		.7071	.3425	.2952	-,1499	1521		
90.000		.6500	.3316	.2692	.2020	,0032		

.4791 .1743 .3176 .7027 -.6847

DATE UT CCT 74

TABULATED SCURCE DATA, R.I. TWT 280 - 1469

PAGE 31

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IA69 CI TI SI P2 P6 ORBITER FUSELAGE PRESSURES

(RF3FU3) (16 AFR 74)

REFERENCE DATA PARAMETRIC DATA SREF = 2690.0000 SQ.FT, XMRP = 979.0000 TNK ST BETA = 4.000 ELEVON = LREF # 1290.3000 IN. YMRP = .0000 TNK EP RUDDER ≃ ,000 SFDDFK = BREF = 1290.3000 IN. ZMRP = 400,0000 TNK W_ BOFLAP = .000 SCALE = .0150 MACH (1) = 1.216 ALPHA (1) = -4.200 RN/L = 7.300 SECTION (1) FUSELAGE DEPENDENT VARIABLE CP X/L .1021 .2054 .2519 .2945 .3400 .3075 PHI .000 1.2799 .4549 .5012 -.4616 -.2268 40.000 .4256 .3479 .0900 -.1929 -.2451 90,000 .4050 .2515 .2215 .0450 -.1653 180,000 .6659 .4151 .5494 .7741 -.5530 MACH (1) = 1.216 ALPHA (2) = .000 RN/L = 7.300 SECTION (1) FUSELAGE DEPENDENT VARIABLE CP X/L .1821 .2054 .2519 .2945 .3488 .3875 PHI .000 1.3011 .4355 .4296 -.4671 -.2875 40.000 .4020 .2694 .0319 -.2752 -.2139 90.000 .3572 .1603 .1614 .0240 -.1595 180,000 .5674 .2636 .4362 .7295 -.5961 MACH (1) = 1.216 ALFHA (3) = 4,110 RN/L = 7.300 SECTION (1) FUSELAGE DEPENDENT VARIABLE CP X/L .1821 .2054 .2519 .2945 .3488 .3875 £HHT

.000	1.2794	.4157	.3653		-,4812	2880	
40.000		.3805	.2231	.0017	3421	-,1982	
90.000		. 31 4 1	.1312	.0741	.0205	1733	
180.000		.4748	.1690	.2830	.6979	6511	

		IA69 CL T4 S1 P2 P7 CRBITER	FUSELAGE FRESSURES	(RF3F04) (16 A	RR 74
रि।	EFERENCE DATA			PARAMETRIC DATA	
STEF = 2690.0	000 SQ.FT. XMRP	= 979,0000 TNK ST	BETA =	4.000 ELEVCN =	.00
UREF" = 1290,30	DOU IN. YMRP	= .0000 TNK BP	RUDDER =	.000 SPDBRK =	.00
OREF = 1290,30	000 IN. ZMRP	= 400.0000 TNK WL	eoflap =	.000	
SCALE = .01	150				
MACH (1) =	1.215 ALPHA (1	i) = -4.210 RN/L = 7.2	00	•	
SECTION (1) FUS	SELAGE	DEPENDENT VARIABLE OP			
X/L .182	21 .2054 .2519	.2945 .3488 .3875			
PHI					
.000 1,273	4347 .5378	46672395			
40.000	.4149 .3555	.096418352804			
90.000	.4158 .2501	.2194 .04521575			
180.000	.6681 .4241	.5505 .77975518			
MACH (1) = ;	1.215 ALPHA (2) = .010 RN/L = 7.2	ω		
SECTION (1)FUS	ELAGE	DEPENDENT VARIABLE OP			
X/L .182	1 .2054 .2519	.2945 .3488 .3875			
₽+1					
.000 1.301!	5 .4150 .4548	48093171			
40,000	.3766 .2797	.049824523377			
90,000	.3634 .1604	.1656 .02751666			
180.000	.5633 .27 6 4	.4378 .72815915			
MACH (1) = 1	1.215 ALFHA (3)	= 4,140 RN/L = 7,20	υ		
SECTION (1)FUSE	ELAGE	DEPENDENT VARIABLE CP			
X/L .1821	.2054 .2519	.2945 .3488 .3875			
PH1					
PH1 .000 1.2860	,3889 ,2606	50153096			
PH1 .000 1.2860 40.000) .3889 .2606 .3633 .2168	50153096 .024733362641			
PH1 .000 1.2060 40.000 90.000) .3889 .2606 .3633 .2168 .3120 .1115	50153096 .024733362641 .0861 .02401707			

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DATE UT O	CT 74			TABL	lated s	CURCE DATA	, R.I	. TWT 200 - 1A69			PA	GE 33
				IA	69 C4 ·	T4 S1 P2 P	7 OR	BITER FUSELAGE PR	ESSUTES	(RF3F	U5) (16 A	PR 74)
	REFE	DRENCE DA	TA							PARAMETRI	C DATA	
SREF = 2	2690.0000) SQ.FT.	XMRP	= 979	.0000 7	WK ST				000	FI FUCH -	רעיני
LREF = :	1290,3000	IN.	YMRP	=	.0000 ח	K 8P				000	SECENCIA -	.000
Bref = 1	290.3000) IN.	ZMRP	= 400	.0000 17	K WL			EDELAP =	.000		1000
SCALE =	.0150)								1000		
MACH (1)	= 1.	220 A	LPHA (1) = -	4.150	RN/L	z	7,200				
SECTION	(1)FUSEL	AGE			DEPEND	ENT VARIA	BLE (F	3				
XL	.1821	.2054	.2519	.2945	.3488	.3875						
PH I												
.000	1.3520	.4571	.5220		4357	2554				- '		
40.000		.5583	.3726	.2148	1550	0770					. ·	
90.000		.5780	.3336	.2949	,1634	0709						
180,000		.6875	.4452	.5581	.8030	5915						
масн (1)	= 1,3	220 AI	з) анц) =	.080	RN/L	=	7.200			J	
SECTION (1) FUSEL/	AGE			DEFEND	ENT VARIAB	LE CP					
X/L	.1821	.2054	.2519	.2945	.3488	.3875						
PHI												
.000	1.3861	.4173	.4096		4506	2511						
40,000		.5342	.2776	.1518	2236	2273						
90,000		.5322	.2749	.2202	.1343	0836						
180.000		.5861	.2984	.4445	.7584	6290						
MACH (1)	= 1.2	20 AL	РНА (3)	= 4	.200	RN/L	=	7.200				
SECTION (1) FUSELA	GE			CEPENDE	INT VARIABL	E G					
XL	.1821	.2054	.2519	.2945	.3488	.3075						
PHI					`							
.000	1,3708	.3020	.3160		-,4624	2356						
40,000		.5116	.2104	.1269	2720	3474						
90,000		4864	.2463	.1514	1097	0939						
180,000		.4977	.1910	.2869	.7304	6786						

DATE U7 CCT 74 TABULATED SCURCE DATA, R.I. TWT 280 - 1469 PAGE 34 IA69 CE TA SI P2 P7 CREITER FUSELAGE PRESSURES (RF3F06) (16 AFR 74) REFERENCE DATA PARAMETRIC DATA SREF = 2690.0000 SQ.FT. WARP = 979.0000 TNK ST BETA = -4.000 ELEVCN = LREF = 1290.3000 IN. YMRP = SFDBRK = .0000 TNK BP RUDDER = .000 OREF = 1290.3000 IN. ZMRP = 400,0000 TNK W_ BOFLAP = .000 SCALE = .0150 MACH (1) = 1.215 ALPHA (1) = -4.030RN/L = 7.200 SECTION (1) FUSELAGE DEPENDENT VARIABLE CP X/L .1821 .2054 .2519 .2945 .3488 .3875 PHI .000 1.3706 .4899 .5409 -,4757 -,2846 40,000 .6881 .4412 .3183 -.0989 -.0848 90,000 .7309 .3922 .4482 .2596 .0232 180,000 .6772 .4408 .5466 .7822 -.5999 MACH (1) = 1.215 ALPHA (2) = .150 RN/L = 7.200 SECTION (1) FUSELAGE DEPENDENT VARIABLE CP X/L .1821 .2054 .2519 .2945 .3488 .3875 AH1 .000 1.4030 .4642 .4739 -.4876 -.2983 40.000 .6878 .3813 .2929 -.1219 -.1986 90.000 .6864 .3861 .3247 .2332 .0082 180.000 ,7307 -,6309 .5687 .3042 .4416 MACH (1) = 1.215 ALPHA (3) = 4.330RN/L = 7.200 SECTION (1) FUSELAGE DEPENDENT VARIABLE CP X/L .1821 .2054 .2519 .2945 .3488 .3875 AHI -. .000 1.3953 .3898 .3625 -.4490 -.2374 40,000 .3127 .2818 -.1610 -.1729 .6652 90.000 .3309 .2572 .1936 -.0040 .6445

.000

.000

4.1

180.000

.4753

.1726

.3017

.7063 -.6856

DATE U7 CCT 74 TABULATED SOURCE DATA, R.I., TWT 280 - 1469 PAGE 35 IA69 Ct T1 S1 P2 P6 WING UPPER SURFACE PRESS. (RF3U01) (16 APR 74) REFERENCE DATA PARAMETRIC DATA SREF = 2690.0000 \$3.FT, XMRP = 979.0000 IN. BETA = .000 ELEVON = .000 LREF = 1290.3000 IN. YMRP = JOOOD TNK BP RUDDER = .000 SPDBRK = .000 BREF = 1290,3000 IN. ZMRP = 400,0000 TNK WL BOFLAP = .000 SCALE ≈ .0150 SCALE MACH (1) = 1.078 ALPHA (1) = -4.230 RN/L = 7.400 SECTION (1) UPPER WING DEPENDENT VARIABLE OP 2Y/B .5340 .7800 x/c £. .000 ,4930 .4045 .050 .1086 .0545 .150 -.2191 -.2192 .. 400 -.3445 -.5067 .725 - 1264 - 1906 .950 -.2321 -.2151 MACH (1) = 1,078 ALPHA (2) = -.030 RN/L = 7.400 SECTION (1) UPPER WING DEFENDENT VARIABLE CP 2Y/8 .5340 .7800 х⁄с .000 .5526 .5177 .050 -.0396 -.1164 .150 -.3659 -.3740 .400 -.4765 -.6552 -.1330 -.3268 .725 .950 -.2416 -.2150 MACH (1) = 1,078 ALPHA (3) = 4,000RN/L = 7.400 SECTION (1) UPPER WING DEPENDENT VARIABLE CP 2Y/8 .5340 .7800 жc .000 .5348 .5021 .050 -.2289 -.3661 .150 -.5502 -.5705 .400 -.6037 -.8109 .725 -.2530 -.4881 -.2652 -.4773 .950

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	DATE 07 CCT 74	TABULATED SCURCE DATA, R.I., TWT 280 - IA69	FAGE 36
		IA69 CI TI SI P2 P6 WING UPPER SURFACE FRESS. (RF3	(10)
	MACH (2) = 1,220 ALPHA (1)	= -4.120 RN/L = 7.400	
	SECTION (1) UPPER WING	DEPENDENT VARIABLE CP	
	21/8 .5340 .7800		
	X/C		
	.000 .5424 .4806		· ·
	.050 .2023 .1631		
	,15009470843		
	.40025923615		· ·
	.725 .03991632	`	
	.95009381298		
	MACH (2) = 1.220 ALRHA (2) =	.110 RN/L ≈ 7.400	
	SECTION (1) UPPER WING	DEPENDENT VARIABLE CP	v
	2Y/B .5340 .7800		
	x/c		
	.000 .5956 .5559		
	.050 .0375 .0140		
	.15026362166		
	.40035324821		
	.72508744932		
	.95010712079		
	MACH (2) = 1.220 ALFHA (3) =	4,200 RN/L = 7,400	
·	SECTION (1) UPPER WING	DEPENDENT WARTABLE OP	
	21/8 .5340 .7800		
	x/c		
	.000 .5802 .5867		
	.05017291867		
	.15045063922		
	.40043586235		
	.72522336233		
	.95013283329		
		· · · ·	
		·	

DATE U7 CCT 74 1A69 C4 T1 S1 P2 P6 WING UPPER SURFACE PRESS. (RF3UU2) (16 APR 74) REFERENCE DATA PARAMETRIC DATA SREF = 2690,0000 SQ.FT. XMRP = 979,0000 IN. .000 BETA = -4.000 ELEVON = UREF = 1290,3000 IN. YMRP = .0000 TNK EP RUDDER = .000 SPDORK = .000 BREF = 1290,3000 IN. ZMRP = 400.0000 TNK WL EDFLAP = .000 SCALE = .0150 SCALE MACH (1) = 1.216 ALPHA (1) = -4.150 RN/L = 7.400 SECTION (1) UPPER WING DEPENDENT VARIABLE CP 2Y/B .5340 .7800 x/c .000 .6394 .5058 .050 .2325 .1915 .150 -.1131 -.0908 .400 -.2998 -.3945 .725 .0129 ~.4309 .950 -.0482 -.1647 MACH (1) = 1.216, ALFHA (2) = .050 RN/L = 7.400 SECTION (1) UPPER WING DEPENDENT VARIABLE CP 2Y/8 .5340 .7800 х⁄с .000 .7013 .6508 .0774 .050 .0404 .150 -.2839 -.2107 .400 -.4118 -.5064 .725 -.1616 -.5448 .950 -.0550 -.2143 MACH (1) = 1.216 ALPHA (3) = 4.140 RN/L = 7.400SECTION (1) UPPER WING DEPENDENT VARIABLE OP 2Y/B .5340 ,7800 х⁄с .000 .6968 .6736 .050 -.1199 -.1757 .150 -.4411 -.3907 .400 -.5478 -.6416 .725 -.2699 -.6575

.950 -.1096 -.2881

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TABULATED SCURCE DATA, R.I. TWT 280 - 1469

PAGE 37

	DATE UT CCT 74	TABULATED SCURCE DATA, R.I. TWI 280 - 1469		PAC	E 38
		1A69 C4 T1 S1 P2 P6 WING UPPER SURFACE PRESS.	•	(RF3UD3) (16 AF	ir 74)
	REFERENCE DATA		I	PARAMETRIC DATA	
	5REF = 2690,0000 SQ.FT. XMRP	= 979,0000 IN.	ĐETA =	4,000 ELEVON =	.000
	$LREF = 1290,3000 \text{ IN}, \qquad YMRP$	= .0000 TNK 8P	RUDDER =	.000 SPDORK =	.000
	$B_{CALE} \approx 1290.3000$ IN. $2M_{TP}$ SCALE = .0150 SCALE	= 400.0000 THK W_	EDFLAP =	.000	
	MACH (1) = 1.216 ALPHA (1) = -4.200 RN/L = 7.300			
	SECTION (1) UPPER WING	DEFENDENT VARIABLE CP			
	21/8 .5340 .7800				
	x/c				
	.000 ,4702 .3798				
	.050 .1782 .1317				
	.15009960914				
	.4UI24523386 725 - 0145 - 0699				
	-95014031494				
	SECTION (1) UPPER WING	DEFENDENT VARIABLE CP			
	2Y/B .5340 .7800				
	x/c				
	.000 .5323 .4669				
	.050 .01860087			1	
	.15023832330				
	.40034174686				
	.72503872581				
	.99016121498				
	MACH (1) = 1.216 ALPHA (3)	= 4.110 RN/L = 7.300			
	SECTION (1) UPPER WING	DEPENDENT VARIABLE CP			
	2778 .5340 .7800				
	х∕с				
•	.000 .5064 .4806				
	.05016422169				
	.40043/16044				
	725 - 1479 - 4104				

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DATE 07 CCT 74	TABULATED SCURCE DATA, R.I. TWI 280 - 1469	PAGE 39
	IA69 CI TA SI P2 P7 WING UPPER SURFACE PRESS	(RF3UD4) (16 APR 74)
REFERENCE DATA		PARAMETRIC DATA
SREF = 2690,0000 SQ.FT, XMRP :	= 979.0000 IN.	BETA = 4.000 ELEVON = .000
LREF = 1290.3000 IN. YMRP =	0000 TNK BP	RUDDER = ,000 SEDERK = ,000
DREF = 1290,3000 IN. ZMTF :	= 400.0000 TNK WL	EDFLAP = .000
SCALE = .UI5U SCALE		
MACH (1) = 1,215 ALPHA (1)	= -4.210 (RV/L = 7.200	
SECTION (1) UPPER WING	DEPENDENT VARIABLE CP	
21/8 .5340 .7800		
х∕с		
.000 .4671 .3816	·	
.050 .1753 .1299		
.150 .00000908		<i>#</i>
.40024423357		
.72501320584		
.9501400 -,1503		
MACH (1) = 1.215 ALPHA (2)	= .010 RN/L = 7.200	
SECTION (1) UPPER WING	DEPENDENT VARIABLE CP	
21/8 .5340 .7800		
x/c		
.000 .5314 .4716		
.050 .01700081		
.150 .00002318		
.40034174688		
.72504032669		
.95015951535		
MACH (1) = 1.215 ALPHA (3)	= 4.140 RN/L = 7.200	
SECTION (1) UPPER WING	DEPENDENT VARIABLE CP	· · · · · · · · · · · · · · · · · · ·
21/8 .5340 .7800		
x/c		
.DOD .5117 .4894		
.05016762105		
.150 .00003991		
·/2015U443U4		

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DATE U7 CCT 74	TABULATED SCURCE DATA, R.I. TWT 280 - 1469	PAGE
	IA69 CO TA SI P2 P7 WING UPPER SURFACE PR	ESS. (RF3005) (16 AFR 7
REFERENCE DATA		PARAMETRIC DATA
SREF = 2690.0000 SQ.FT. XMRP	= 979.0000 IN.	BETA = .000 ELEVON =
LREF = 1290.3000 IN. YMRP	= .0000 TNK BP	RUDDER = .000 SPDBRK =
BREF = 1290.3000 IN. ZMRP	= 400.0000 TNK WL	EDFLAP = .000
$SCALE \approx .0150$ $SCALE$		
MACH $(1) = 1.220$ ALPHA (:	l) = -4.150 RN/L = 7.200	
SECTION (1) UPPER WING	DEPENDENT VARIABLE CP	
2Y/B .5340 .7800		
x/c		
.000 .5476 .4818		
.050 .20410030		
.150 .0000 ~.0853		
.40026283611		
.725 .04011710		
.95009401297		
MACH (1) = 1.220 ALPHA (2) = .080 RN/L = 7.200	
SECTION (1) UPPER WING	DEPENDENT VARIABLE OP	
21/8 .5340 .7800		
х∕с		
.000 .6004 .5611		
.050 .04020028		
.150 .00002148		
.40035574790		
.72503754916		
.95010482043		
MACH (1) = 1,220 ALPHA (3.) ≈ 4.200 ftN/L = 7.200	
SECTION (1) UPPER WING	DEPENDENT VARIABLE CP	
21/0 .5340 .7800		
жс	· · · · · · · · · · · · · · · · · · ·	
.000 .5996 .5855		
.05015940033		
.150 .00003888		
.40043766202	4	
.72522206185		
.95012943196		

DATE U7 CCT 74 TABULATED SCURCE DATA, R.I. TWT 280 ~ 1A69 PAGE 41 IA69 C1 T4 S1 P2 P7 WING UPPER SURFACE FRESS. (RF3UD6) (16 AFR 74) REFERENCE DATA PARAMETRIC DATA SREF = 2690.0000 SQ.FT. XMRP = 979,0000 IN, .000 DETA = -4,000 ELEVON = LREF = 1290.3000 IN. YMRP = ,0000 TNK 8P 1000 SPDERK = .000 RUDDER = BREF = 1290.3000 IN. ZMRP = 400.0000 TNK W. EDFLAP = .000 SCALE = .0150 SCALE MACH (1) = 1.215 ALPHA (1) = -4.030 RN/L = 7.200 SECTION (1) UPPER WING DEPENDENT VARIABLE CP 21/8 .5340 .7800 хис .000 .6448 .5855 .050 .2299 -.0028 .150 .0000 -.0970 ,400 -.3071 -.3986 .725 .0115 -.4399 .950 -.0493 -.1615 MACH (1) = 1.215 ALPHA (2) = ,150 RN/L = 7.200 SECTION (1) UPPER WING DEPENDENT VARIABLE CP 21/8 .5340 .7800 X/C .000 .7053 .6479 ,050 .0740 -.0026 .150 .0000 -.2146 .400 -.4126 -.5096 .725 -.1604 -.5423 .950 -.0542 -.2063 MACH (1) = 1.215 ALPHA (3) = 4.330 RN/L = 7.200 SECTION (1) UPPER WING DEPENDENT VARIABLE CP 21/8 .5340 .7800 х⁄с .000 .6964 .6699 .050 -.1147 -.0028 .150 .0000 -.3959 .400 -.5467 -.6432 .725 -.2710 -.6541 .950 -.1103 -.2890

DATE UT CCT 74	TABULATED SCURCE DATA, R.I. TWT 280 - IA69	、	PAGE	: 42
	1469 CI TI SI P2 P6 WING LOWER SURFACE PRES	s,	(RF3L01) (16 APR	i 74 J
REFERENCE DATA		f	WARAMETRIC DATA	
SREF ≈ 2690,0000 SQ.FT. XMRP	= 979.0000 IN.	ĉeta =	.000 ELEVON =	.000
LREF = 1290,3000 IN. YMRP	= .0000 TNK 8P	RUDDER =	,000 SPDERK =	.000
BREF = 1290,3000 IN. ZMRP	= 400,0000 TNK WL	EDFLAP =	.000	
SCALE = .0150 SCALE				
MACH (1) = 1,078 ALFHA (1)	≥ -4.230 RN/L ≈ 7.400			
SECTION (1) LOWER WING	DEPENDENT VARIABLE CP			
2Y/B .5340 .7800				
. X/C				
.0506885				
.15018852005				
.400 -:00930172				
.72529972631				
.95076865878				
MACH (1) = 1.078 ALFHA (2)	=030 RN/L = 7.400			
SECTION (1) LOWER WING	DEPENDENT VARIABLE CP			
2Y/B .5340 .7800				
x/c				
.05011810018				
.1500053 .0455				
.400 .1203 .0371				
.72527802689				
.95077816028				
MACH (1) = 1.078 ALPHA (3)	= 4,000 RN/L = 7,400			
SECTION (1)LOWER WING	DEPENDENT VARIABLE CP			
21/8 .5340 .7800				
ж/с				
.050 .1142 .2994				
.150 .1479 .1988				
.400 .1589 .0697	1.			
.72528802728				
.95077566172	,			

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TABULATED SCURCE DATA, R.I. TWT 280 - IA69

1A69 CI TI SI P2 P6 WING LOWER SURFACE PRESS.

(RF3LU1)

MACH (2) = 1,220 ALFHA (1) = -4,120 RN/L = 7,400 SECTION (1) LOWER WING DEPENDENT VARIABLE CP 21/B .5340 .7800 хvс .050 -.4071 -.5181 .150 -.1238 -.4067 .400 .0401 -.0748 .725 -.1250 -.0679 .950 -.5712 -.3686 MACH (2) = 1.220 ALFHA (2) = .110 RN/L = 7,400 SECTION (1) LOWER WING DEPENDENT VARIABLE CP 2Y/8 .5340 .7800 x/c .050 -.0800 -.0751 .150 .0193 .0612 .400 .1727 .1915 .725 -.0893 -.0803 .950 -.5449 -.3823 MACH (2) = 1.220 ALPHA (3) = 4.200RN/L = 7.400 SECTION (1) LOWER WING DEPENDENT VARIABLE CP 2Y/8 .5340 .7800 хс .050 .1789 .3684 ,150 .1999 .2835 .400 .2493 .2080 .725 -.1029 -.0859 .950 -.5527 -.3969

DATE U7 CCT 74

Lefe Cat 11 SLIPE PE MINE LOURE SUPPACE PRESS. UPENDE 1 CEFERENCE DATA DESCRIPTION SUFF = 12800.0000 SP.FT. MAP = 979.0000 TM MP DESTA = -4.000 ELEVA = .0000 SUFF = 12800.0000 SP.FT. MAP = 40.0000 TM MP DESTA = -4.000 ELEVA = .0000 SUFF = 12800.0000 SP.FT. MAP = 40.0000 TM MP DESTA = -4.000 ELEVA = .0000 SUFF = 12800.0000 SP.FT. MAP = 40.0000 TM MP DESTA = -4.000 ELEVA = .0000 SUFF = 12800.0000 SP.FT. MAP = 40.000 TM MP DESTA = 7.400 SECTION (1)LOUET MIM DEFENDENT WRITABLE CP 27/8 .5340 .7800 VC .000030424749 .15030424749 .300 .7800 MOM (1) = 1.216 ALPMA (2) = .050 MPL = 7.400 SECTION (1)LOUET MIM DEFENDENT WRITABLE CP V/ .3340 .7800 V/ .5340 .780	DATE U7 OCT 74	TABULATED SOURCE DATA, R.I. TWT 280 - IA69		FA	GE 44
REFERENCE DATA DEAT = -4.000 RECORT ELA = -4.000 RECORT		IA69 CI TI SI P2 P6 WING LOWER SURFACE PRESS.		(RF3LU2) (16 A	R 74)
SHEP = 2690,0000 SA,FT. MARP = 979,0000 IN, BETA = -4,000 ELEVON = .000 UEF = 1280,0000 IN, MHP = .0000 TN ML BETA = -4,000 ELEVON = .000 SCALE = .0100 SCALE BETA = .40,000 ELEVON = .000 MCH (1) = 1.216 ALPMA (1) = -4,150 RVL = .7,400 BETA = .40,000 ELEVON = .000 SECTION (1)LCAET MING DEPENDENT WRIABLE CP PT/B .5340 .7800 V/C .030030424749 .15008233965 .4000 .0807 .0346 .72506100000 .90030423740 SECTION (1)LCAET WING DEPENDENT WRIABLE CP Y/B .5340 .7800 X/C .030303033380 MCH (1) # 1.216 ALPHA (2) = .0300 RVL = .7,400 SECTION (1)LCAET WING DEPENDENT WRIABLE CP Y/B .5340 .7800 X/C .0352 .2817 .100 .0522 .2817 .4140 RVL = .7,400 SECTION (1)LCAET WING DEPENDENT WRIABLE CP Y/B .5340 .7800 X/C .0340 .7800 X/C .0340 .7800 X/C .0340 .7800 X/C .0340 .7800 X/C .1340 RVL = .7,400	REFERENCE DATA		I	PARAMETRIC DATA	
ULED = 1280.3000 IN, VHP = 4.0000 TM &P ACUDO TM VAL BEFF = 1280.3000 IN, VHP = 4.000.0000 TM VAL SCALE = .0130 SCALE MACH (1) = 1.216 ALPHA (1) = -4.150 RVL = 7.400 SECTION (1)LCMET WING DEFENDENT WARIABLE CP 27/8 .5340 .7800 V/C .05008224789 .15008224789 .15008224789 .15008233865 .400 .0807 .0940 V/C .05008010900 SECTION (1)LCMET WING DEFENDENT WARIABLE CP 27/8 .5340 .7800 V/C .05008431249 .150 .0552 .2617 .400 .22592250 .400 .22554068 .99013193543 MCH (1) = 1.216 ALPHA (3) = 4.140 RVL = 7.400 SECTION (1)LCMET WING DEFENDENT WARIABLE CP 7/8 .5340 .7800 V/C .05003431249 .150 .0552 .2617 .400 .22592250 .400 .22564068 .99013193543 MCH (1) = 1.216 ALPHA (3) = 4.140 RVL = 7.400 SECTION (1)LCMET WING DEFENDENT WARIABLE CP 7/8 .5340 .7800 X/C .050226403 .15128073565 40028073555 40028073555 40028073555 40028073555 40028073555 40028072809 28073555 	SREF = 2690,0000 SQ.FT. XMRP =	979.0000 IN.	EETA =	-4.000 ELEVON =	.000
Bib - 1250,5000 IN. 2010 SALE BDCM - 2,000 MACH (1) = 1.216 ALPHA (1) = -4.150 RVL = 7,400 SECTION (1)LCMET MARE DEPENDENT WRIABLE CP 27/8 .5340 .7800 XC	U(EF = 1290,3000 IN, YMRP =	,0000 TNK BP		JOOD SFDBRK =	.000
MACH (1) = 1.216 ALFHA (1) = -4.150 RVL = 7,400 SECTION (1)LOUER HANG DEFENDENT WARIABLE CP 2Y/B .5340 .7800 V/C .0507 .0542 .725 .0630 .0300 .850 .5300 .0300 .850 .5300 .0300 .850 .5300 .0300 .850 .5300 .0300 .850 .5300 .0300 .850 .5300 .0300 .850 .5300 .0300 .850 .5300 .0300 .850 .5300 .7800 V/C .030 .0303 .150 .0253 .0268 .150 .1003 .0264 .150 .2265 .0268 .150 .2265 .0268 .150 .2265 .0268 .150 .2261 .030 .150 .2261 .030 .150 .2261 .0400 .150 .2261 .0400 .150 .2261 .0400 .150 .2261 .0400 .150 .2261 .0400 .150 .2261 .0400 .	SCALE = $.0150$ SCALE		EUFLAP =	.000	
SECTION (1) LCUET WING DEPENDENT WARIABLE CP 2Y/8 .5340 .7800 //C .05034233963 .400 .0607 .09233963 .3000 .400 .0607 .0930 .30300 .95053083380 .0000 SECTION (1) LCWET WING DEPENDENT WARIABLE CP 2Y/8 .5340 .7800 XC .05500253 .2817 .400 .3236 .2220 .2821 .2817 .400 .3236 .2230 .28250668 .99051193543 DEPENDENT WARIABLE CP X/76 .5340 .7800 X/2 .0552 .2817 .400 .3238 .2220 .28250668 .99051193543 DEPENDENT WARIABLE CP X/8 .5340 .7800 X/2 .0530 .7800 X/2 .0531 .7800 .57250688 .2807 .99051193543 DEPENDENT WARIABLE CP X/8 .5340 .7800 X/2 .0530 .2807 .3565 .100 .3159 .2807 .3565 .100 .3159 .2807 .3565 .100 .3159 .2807 .3565 .100 .3159 .2807 .3565	MACH (1) = 1.216 ALPHA (1)	≂ -4.150 RN/L ≈ 7.400			
27/8 .5340 .7000 x/c .150038424749 .150038424749 .1500 .0007 .0546 .400 .0007 .0546 .0300 .35053993390 xACH (1) = 1.216 ALPHA (2) = .000 RVL = 7,400 SECTION (1)LOUER WING DEPENDENT WARIABLE CP 27/8 .5340 .7600 vC .05020249 .15002430249 .150 .0052 .2617 .1500255 .26467 .159 .2220 .7250159 .2250 .2617 .7250159 .2250 .2617 .7250159 .2254 DEPENDENT WARIABLE CP XOU (1) = 1.216 ALPHA (3) = 4.140 RVL = 7.400 SECTION (1)LOUER WING DEPENDENT WARIABLE CP Y/8 .5340 .7800 xOU (1) = 1.216 ALPHA (3) = 4.140 RVL = 7.400 SECTION (1)LOUER WING DEPENDENT WARIABLE CP Y/8 .5340 .7800 xOU (1) = 1.216 ALPHA (3) = 4.140 RVL = 7.400 XOU (1) = 1.216 ALPHA (3) = 4.140 RVL = 7.400 XOU (1) = 1.216 ALPHA (3) = 4.140 RVL = 7.400 XOU (1) = .51195343 XOU (2) .2126 .4493 .5340 .7800 XOU (2) .2126 .4493 .530 .2007 .3565 .400 .3519 .2000 .775	SECTION (1) LOWER WING	DEFENDENT VARIABLE CP			
VC .050038424749 1.50008233965 .4000 .0607 .0546 .72505100300 .95053083380 WACH (1) = 1.216 ALPHA (2) = .050 RWL = 7,400 SECTION (1)LOLER WING DEFENDENT WARIABLE CP 2Y/B .5340 .7800 WC .050003430249 .150 .0552 .2517 .400 .3259 .2220 .7250463 .99051193543 MCH (1) = 1.216 ALPHA (3) = 4.140 RWL = 7.400 SECTION (1)LOLER WING DEFENDENT WARIABLE CP Y/B .5340 .7800 X/C .0255 .0468 .99051193543 .0474 (3) = 4.140 RWL = 7.400 SECTION (1)LOLER WING DEFENDENT WARIABLE CP Y/B .5340 .7800 X/C .0500 .2126 .4493 .150 .2807 .3565 .150 .2807 .3565 .050 .2126 .4493 .150 .2807 .3565 .150 .2807 .3565 .150 .2807 .3565 .150 .2807 .3565 .150 .2807 .3565 .150 .2807 .3565	2Y/B .5340 .7800				
. 05030424749 .15008233963 .400 .0807 .0546 .72508100300 .95053083380 WACH (1) = 1.216 ALPHA (2) = .050 RWL = 7,400 SECTION (1)LCWER WING DEPENDENT VARIABLE CP 2Y/B .5340 .7800 X/C .05003430249 .150 .0552 .2617 .400 .3239 .2220 .72502550468 .95051193543 ACH (1) = 1.216 ALPHA (3) = 4.140 RWL = 7.400 SECTION (1)LCWER WING DEPENDENT VARIABLE CP Y/B .5340 .7800 X/C .050 .2126 .4493 .150 .2827 .3565 .029902990299	жс				
. 1500233965 .400 .0607 .0300 .99053083380 WACH (1) = 1.216 ALPHA (2) = .030 RN/L = 7.400 SECTION (1)LCVER WING DEPENDENT WARIABLE OP PY/B .5340 .7800 V/C .05003430249 .150 .0552 .2617 .400 .3239 .2220 .72502550468 .9905119543 WACH (1) = 1.216 ALPHA (3) = 4.140 RM/L = 7.400 SECTION (1)LCVER WING DEPENDENT WARIABLE OP Y/B .5340 .7800 X/C .050 .2126 .4493 .151 .2807 .3565 .400 .5319 .2500 .725029902990299	.05038424749				
. ADU . JUBY . LB46 .72505100300 .95053083380 WACH (1) = 1.216 ALPHA (2) = .USO RM/L = 7.400 SECTION (1) LOVER WING DEFENDENT WARIABLE OP 27/B .5340 .7800 X/C .050U3430249 .150 .U352 .2617 .400 .3239 .2220 .725U255 .U468 .95051193543 WACH (1) = 1.216 ALPHA (3) = 4.140 RM/L = 7.400 SECTION (1) LOVER WING DEFENDENT WARIABLE OP Y/B .5340 .7800 X/C .050 .2126 .4493 .150 .2807 .3565 .400 .3519 .2500 .72502990529	.15009233965				
$\frac{1}{250} - \frac{1}{1500} - \frac{1}{1500} - \frac{1}{1500}$ $\frac{1}{2500} - \frac{1}{1500} - \frac{1}$	•400 •0607 •0546				
27/8 .5340 .7800 v/c .050 0343 0249 .150 .0552 .2617 .400 .3239 .2220 .725 0255 0468 .990 5119 3543 MOH (1) = 1.216 ALPHA (3) = 4.140 fm/L = 7.400 SECTION (1) LCAER WING DEPENDENT WARIABLE CP Y/B .5340 .7800 x/c .050 .2126 .4493 .1519 .2507 .3565 .4020 .3519 .2500 .725 0299 0299	wach $(1) = 1.216$ ALPHA (2) . SECTION (1) LOWER WING	= .USU RN/L = 7,400 DEPENDENT VARIABLE CP			
X/C .05003430249 .150 .0552 .2617 .400 .3239 .2220 .72502550468 .95051193543 ACH (1) = 1.216 ALPHA (3) = 4.140 FAVL = 7.400 SECTION (1) LOVER WING DEPENDENT VARIABLE CP Y/B .5340 .7800 X/C .050 .2126 .4493 .150 .2807 .3565 .400 .3519 .2500 .72502990529	2Y/B .5340 .7800				
	x/c				
.150 .0552 .2617 .400 .3239 .2220 .72502550468 .95051193543 ACH (1) = 1.216 ALPHA (3) = 4.140 RN/L = 7.400 SECTION (1)LOWER WING DEPENDENT VARIABLE CP Y/B .5340 .7800 X/C .050 .2126 .4493 .150 .2807 .3565 .400 .3519 .2500 .72502990529	.05003430249				
.400 .3239 .2220 .72502550468 .95051193543 AOH (1) = 1.216 ALPHA (3) = 4.140 FAVL = 7.400 SECTION (1)LOVER WING DEPENDENT VARIABLE OP Y/B .5340 .7800 X/C .050 .2126 .4493 .150 .2807 .3565 .400 .3519 .2500 .72502990529	.150 .0552 .2617				
.72502550468 $.95051193543$ $ACH (1) = 1.216 ALPHA (3) = 4.140 FRVL = 7.400$ $SECTION (1)LOWER WING DEPENDENT VARIABLE OP$ $Y/B53407800$ $X/C .05021264493 15028073565 40035192500 72502990529$.400 .3239 .2220				
35051193543 WACH (1) = 1.216 ALPHA (3) = 4.140 FRVL = 7.400 SECTION (1)LOWER WING DEPENDENT VARIABLE OP Y/B .5340 .7800 X/C .050 .2126 .4493 .150 .2807 .3565 .400 .3519 .2500 .72502990529	.72502550468				
ACH $(1) = 1.216$ ALPHA $(3) = 4.140$ FRVL = 7.400 SECTION (1) LOWER WING DEPENDENT VARIABLE OP Y/B .5340 .7800 X/C .050 .2126 .4493 .150 .2807 .3565 .400 .3519 .2500 .72502990529	,9505119 -,3543				
SECTION (1) LOWER WING DEPENDENT VARIABLE OP X/C .050 .2126 .4493 .150 .2807 .3565 .400 .3519 .2500 .72502990529	40H (1) = 1,216 ALPHA (3) =	= 4.140 RN/L = 7.400			
X/C .050 .2126 .4493 .150 .2807 .3519 .2500 .725 0299 0299	SECTION (1) LOWER WING	DEPENDENT VARIABLE CP			
X/C .050 .2126 .4493 .150 .2807 .3565 .400 .3519 .2500 .72502990529	Y/B .5340 .7800				
.050 .2126 .4493 .150 .2807 .3565 .400 .3519 .2500 .72502990529	x/c				
.150 .2807 .3565 .400 .3519 .2500 .72502990529	.050 .2126 .4493				
.400 .3519 .2500 .72502990529	.159 .2807 .3565				
	.400 .3519 .2500				
	.72502990529				

TABULATED SCURCE DATA, R.I. TWT 280 - 1469 DATE U7 CCT 74 PAGE 45 IA69 CE TI SI P2 P6 WING LOWER SURFACE PRESS. (RF3L03) (16 APR 74) ----REFERENCE DATA PARAMETRIC DATA SREF = 2690,0000 SQ.FT. XMRP = 979,0000 IN. .000 BETA = 4.000 ELEVON = UREF = 1290.3000 IN. YMRP = .0000 TNK BP RUDDER = .000 SPDORK = .000 BREF = 1290,3000 IN. ZMRP = 400.0000 TNK WL EOFLAP = .000 SCALE = .0150 SCALE MACH (1) = 1.216 ALFHA (1) = -4,200 RN/L = 7,300 SECTION (1) LOWER WING DEPENDENT VARIABLE CP 2Y/B .5340 .7800 x/c .050 -.2934 -.5567 .150 -.0855 -.1662 .400 -.0071 -.1222 .725 -.2927 -.1445 .950 -.4940 -.4350 MACH (1) = 1.216 ALPHA (2) = .000 RN/L = 7.300 SECTION (1) LOWER WING DEPENDENT VARIABLE OF 21/B .5340 .7600 х⁄с -.0327 -.0377 .050 .150 .0327 .0337 .400 .0331 .0630 .725 -.2452 -.1421 .950 -.5473 -,4409 MACH (1) = 1,216 ALPHA (3) = 4,110'RN/L = 7,300 SECTION (1) LOWER WING DEPENDENT VARIABLE CP 2Y/8 .5340 .7800 х⁄с .050 .1385 .2706 .150 .1428 .1891 .400 .1207 .1351 -.2341 -.1531 .725 .950 -.5525 -,4548

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DATE UT CCT 74	TABULATED SCURCE DATA, R.I. TWT 280 -	1469	PAGE 46
	IA69 CH TA SI P2 P7 WING LOWER SUR	FACE FRESS.	(RF3L04) (16 APR 74)
		· · · · ·	
REFERENCE DATA		PARA	ÆTRIC DATA
SREF = 2690.0000 SQ.FT. XM	₹P = 979.0000 IN.	BETA = 4	.000 ELEVON = .000
LREF = 1290,3000 IN. YMR	2P = .0000 TNK BP	RUDDER =	,000 SHDERK = .000
BREF = 1290,3000 IN. 2M	$i^{p} = 400.0000 \text{ TNK WL}$	EDFLAP =	,000
SCALE = .0150 SCALE			
MACH (1) = 1.215 ALPHA	(1) = -4.210 RN/L = 7.200		
SECTION (1) LOWER WING	DEPENDENT VARIABLE OP		
21/8 .5340 .7800			
×/C	, .		
.05029025553			
.15008911711			
.40000541223			
.72528571440		•	
,9504 8 344345			
MACH (1) = 1.215 ALFHA	(2) = .010 RN/L = 7.200		
SECTION (1) LOWER WING	DEFENDENT VARIABLE OP		
21/8 .5340 .7800		۰.	
x /c			
.05002890338			
.150 .0351 .0406			
.400 .0746 .0393			
.72524001423			
.950 -,5456 -,4392			
MACH (1) = 1,215 ALPHA ((3) = 4.140 RN/L = 7.200		
SECTION (1) LOWER WING	DEPENDENT VARIABLE CP		
21/8 .5340 .7800			
<i>x</i> /c			
.050 .1402 .2681			
.150 .1442 .1892			
.400 .1314 .1344			
.72522951514			
.95055064531			

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TABULATED SOURCE DATA, R.I., TWT 280 - 1469

PAGE 47

1A69 CI T4 S1 P2 P7 WING LOWER SURFACE PRESS.

(RF3L05) (16 APR 74)

PARAMETRIC DATA

SREF	₽	2690.0000 SA.FT.	XMRP	Ŧ	979.0000 IN.	BETA =	.000	ELEVON =	.000
LREF	2	1290.3000 IN.	TMRP	×	JOOD TINK OP	RUDDER =	.000	SPDERK =	.000
oref:	æ	1290,3000 IN.	ZMRP	=	400,0000 TNK W_	EDFLAP =	.000		
SCALE	=	.0150 SCALE							

MACH (1) = 1.220 ALRHA (1) = -4.150 RN/L = 7.200

SECTION (1) LOWER WING

DATE U7 CCT 74

DEPENDENT VARIABLE OP

2Y/B .5340 .7800

REFERENCE DATA

X/C

 .050
 -.4001
 -.5121

 .150
 -.1298
 -.4003

 .400
 .0471
 -.0593

 .725
 -.1291
 -.0690

 .950
 -.5725
 -.3680

MACH (1) = 1,220 ALPHA (2) = ,080 RN/L = 7,200

SECTION (1) LOWER WING

DEPENDENT VARIABLE OP

DEPENDENT VARIABLE CP

21/8 .5340 .7800

X/C

 .050
 -.0864
 -.0850

 .150
 .0193
 .0730

 .400
 .1570
 .1908

 .725
 -.0909
 -.0785

 .950
 -.5469
 -.3835

MACH (1) = 1,220 ALPHA (3) = 4,200 RN/L = 7,200

SECTION (1) LOWER WING 2Y/B .5340 .7800 X/C .050 .1639 .3564

.150 .1922 .2761 .400 .2423 .2069 .725 -.1023 -.0860 .950 -.5543 -.3978

DATE UT C	CT 74		TABULATED SCURCE DATA, R.I. TWT 280 - 1469							PAGE 48			
				I.	A69 CE T	4 51 P2 P	97 WI	IG LOWER SURFA	ce press.		(RF3L	06) (16 A	PR 74)
	REFE	RENCE D	АТА								PARAMETRI	C DATA	
REF =	2690,0000	SQ.FT.	XMRP	= 979	NI 0000.6	•				BETA =	-4.000	ELEVON #	.000
REF =	1290,3000) IN.	YMRP	=	.0000 TN	K BP				rudder =	.000	SPDE/RK =	-000-
REF =	1290.3000	IN.	ZMRP	= 400	NT 0000.1	(WL				EDFLAP =	.000		
CALE =	.0150	SCALE											
аон (1) = 1.	215 🖌	ULPHA (1) = -	4.030	RN/L	=	7.200					
SECTION	(1)LOWER	WING			DEFENDE	ENT VARIA	BLE (P						
Y /8	.5340	.7800											
хс									,				
.050	3734	4671											
.150	0861	3764											
.400	.0997	.0893											
.725	0568	0289											
.950	5311	3407								١		1	
SECTION	(1)LOVER	WING			DEFENDE	NT VARIA	BLE OP						
r/8	.5340	.7800											
x⁄c													
.050	~.0513	0247											
.150	.0540	.2509											
•400	.3194	.2235											
.725	0271	0485											
.950	-,5151	-,3570											
(1)	= 1,2	15 AL	LPHA (3)	= 4	.330	RN/L	=	7,200					
ECTION (1)LOVER	WING			DEFENDE	NT VARIAE	NE CP						
78	.5340	.7800											
жc													
.050	.2137	.4565											
.150	.2846	.3623											
.400	.3554	.2540											
.725	0282	0529											
0.50	- 5212	3201											

NASA-MSFC-MAF

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