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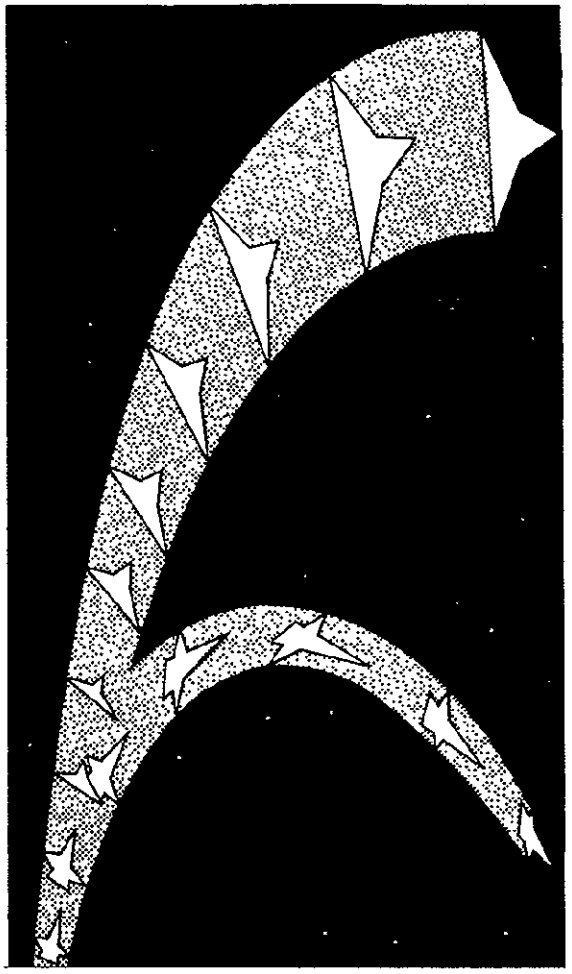

—SPACE SHUTTLE—

DETERMINATION OF STATIC LONGITUDINAL AND LATERAL DIRECTIONAL STABILITY CHARACTERISTICS OF THE NR/GD DELTA WING ORBITER/SATURN V S-IC BOOSTER

NASA
MARSHALL SPACE FLIGHT CENTER

WIND TUNNEL TEST RESULTS
DATA REPORT

FEBRUARY 1971

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Experimental aerodynamic investigations have been made in the Marshall Space Flight Center 14 x 14 inch Trisonic Wind Tunnel on a North American Rockwell Corporation delta wing orbiter mated to a Saturn V S-IC booster for the primary purpose of determining the optimum incidence angle of the orbiter relative to the booster. Tests were conducted during December 1970 and covered a Mach number range from 0.60 to 1.96 over an angle of attack schedule from -12° to 12° at zero degrees sideslip and a sideslip schedule from -1.5° to 16° at zero degrees angle of attack. Orbiter incidence angles tested were -2°, $+1^\circ$, and $+4^\circ$.

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SADSAC/SPACE SHUTTLE

WIND TUNNEL TEST DATA REPORT

CONFIGURATION: NR/GD Delta Wing Orbiter/Saturn V S-IC Booster

TEST PURPOSE: To determine Static Longitudinal and Lateral Directional Stability Characteristics of the NR/GD Delta Wing Orbiter/ Saturn V S-IC Booster

TEST FACILITY: MSFC 14 x 14 Inch Trisonic Wind Tunnel

TESTING AGENCY: Marshall Space Flight Center

TEST NO. & DATE: MSFC TWT 476, December, 1970

TEST CONDUCTOR(S): Craig H. Muhlhauser/MSFC

SADSAC COORDINATOR: J. Weaver

DATA MANAGEMENT SERVICES

LIAISON: John E. Vaughan DATA OPERATIONS: B. J. Frisbee

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Aero Thermo Data Group

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ABSTRACT

Experimental aerodynamic investigations have been made in the Marshall Space Flight Center 14 x 14 inch Trisonic Wind Tunnel on a North American Rockwell Corporation delta wing orbiter mated to a Saturn V S-IC booster for the primary purpose of determining the optimum incidence angle of the orbiter relative to the booster. Tests were conducted during December 1970 and covered a Mach number range from 0.60 to 1.96 over an angle of attack schedule from -12° to 12° at zero degrees sideslip and a sideslip schedule from -1.5° to 16° at zero degrees angle of attack. Orbiter incidence angles tested were -2°, $+1^{\circ}$, and $+4^{\circ}$.

TEST CONDITIONS

Table I lists the conditions that prevailed during collection of the data and gives the balance load limits. Data were taken over an angle of attack range from -12° to 12° at a sideslip angle of 0° and over a sideslip angle range from -1.5° to 16° at an angle of attack of 0°. The angles of attack and sideslip herein have been corrected to include the sting deflections due to loads.

Figures 1 and 2 show typical installations of the models in the MSFC 14 x 14 inch wind tunnel.

Booster base pressure and balance cavity pressure were measured at locations shown in Figure 3. A turbulent boundary layer was assured over the model by using #120 grit applied to surfaces as shown in Figure 4.

TABLE I

TEST CONDITIONS
TEST TWT 476

MACH NUMBER	REYNOLDS NUMBER per unit length	DYNAMIC PRESSURE (pounds/sq. inch)	STAGNATION TEMPERATURE (degrees Fahrenheit)
0.60	8.5×10^6	7.3	100°F (Nominal)
0.90	7.7×10^6	9.0	
1.00	7.2×10^6	9.0	
1.10	6.8×10^6	9.0	
1.20	6.6×10^6	9.0	
1.46	6.9×10^6	10.0	
1.96	6.9×10^6	10.0	

BALANCE UTILIZED: MSFC Balance #200

	CAPACITY:	ACCURACY:	COEFFICIENT TOLERANCE:
NF	175 lbs		
SF	150 lbs		
AF	100 lbs		
PM	185 in-lbs		
YM	160 in-lbs		
RM	50 in-lbs		

COMMENTS:

DATA REDUCTION

Six component aerodynamic force and moment data were recorded using an internal strain gage balance. Base pressure and balance cavity pressures were also recorded and were utilized to correct the axial force measured reading to a condition corresponding to freestream pressure acting at the base and cavity regions. The pressure data have been plotted in coefficient form herein for perusal.

The force and moment data were reduced to coefficient form using the following reference values:

S_{REF} = S-IC booster body maximum X-sectional area = 1.396 in^2

l_{REF} = b_{ref} = S-IC base diameter = 1.333 in

Additionally the moment data have been referenced about a point 5.264 inches forward of booster model station 0.0 on the longitudinal centerline (see Figure 9).

CONFIGURATIONS INVESTIGATED

CONFIGURATION NOMENCLATURE

B_5	NAR delta wing orbiter body (9992-134B) including a canopy on the upper surface aft of nose (see Figure 5)
W_{14}	NAR delta wing, complete with no clipped tip (see Figure 6)
E_3	Elevon used with W_{14} (see Figure 7)
V_{17}	Centerline vertical stabilizer with 5° (half angle) wedge trailing edge (see Figure 8)
B	S-IC Body; drawing No. GDC 383-4 (see Figure 9)
$F_{X(1,2)}$	S-IC 900 ft^2 fins each mounted at 30° or 45° angle, drawing No. GDC 383-12 (see Figure 10)
F_3	S-IC 600 ft^2 fins each mounted at selected angle (sawed off tips)
S	Strongback

CONFIGURATION COMBINATIONS TESTED

$BF_XS + B_5W_{14}E_3V_{17}$; $(X = 1, 2)$

$BS + B_5W_{14}E_3V_{17}$

The immediately following pages list pertinent dimensional data for each of the above components.

MODEL COMPONENT: BODY - B5

GENERAL DESCRIPTION: 9992-134 B Body. Delta wing orbiter including a canopy on the upper surface aft of the nose. The model scale factor is 0.0035.

DRAWING NUMBER: Lines Dwg. 9992-134B

DIMENSIONS:	FULL-SCALE	MODEL SCALE
Length, In.	2120.00	7.420
Max. Width, In.	462.86	1.620
Max. Depth, In.	274.29	0.960
Fineness Ratio	5.906	5.906
Area		
Max. Cross-Sectional (ft^2)	702.75	0.0086
Planform	-	-
Wetted	-	-
Base		

MODEL COMPONENT: Wing - W14

GENERAL DESCRIPTION: 9992-134B delta wing which is the same as wing-W13 except modified to a complete delta (no clipped tip). The total and exposed data do not include the leading cuff data which is listed below. (.0035 scale)

DRAWING NUMBER:

DIMENSIONS:

	FULL-SCALE	MODEL SCALE
TOTAL DATA		
Area		
Planform, ft^2	6084.00	0.074529
Wetted		
Span (equivalent), in.	1420.44	4.972
Aspect Ratio	2.287	2.287
Rate of Taper	1.723	1.723
Taper Ratio	0.000	0.000
Diehedral Angle, degrees	7.000	7.000
Incidence Angle, degrees	0.000	0.000
Aerodvnamic Twist, degrees about T.E.		
@ Wing Sta. 241.80 in.	0.000	0.000
@ Wing Sta. 546.07 in.	-5.000	-5.000
Sweep Back Angles, degrees		
Leading Edge	59.870	59.870
Trailing Edge	0.000	0.000
0.25 Element Line	52.266	52.266
Chords:		
Root (Wing Sta. 0.0), in.	1232.91	4.315
Tip, (equivalent) (Wing Sta. 715.55 in)	0.000	0.000
MAC (Wing Sta. 238.52 in.)	821.94	2.877
Fus. Sta. of .25 MAC, in.	1503.54	5.262
W.P. of .25 MAC, in.	46.74	0.164
B.L. of .25 MAC, in.	236.74	0.829
Airfoil Section		
Wing Sta. 241.80 in.	NACA 0009-64	NACA 0009-64
Wing Sta. 546.07 in.	NACA 0012-64	NACA 0012-64
EXPOSED DATA		
Area, ft^2	2733.29	0.03348
Span, (equivalent)	948.77	3.321
Aspect Ratio	2.287	2.287
Taper Ratio	0.000	0.000
Chords		
Root (equiv.) (Wing Sta. 237.61 in.)	823.51	2.882
Tip (equiv.) (Wing Sta. 715.55 in.)	0.000	0.000
MAC (Wing Sta. 396.92 in)	549.01	1.922
Fus. Sta. of .25 MAC, in.	1708.24	5.979
W.P. of .25 MAC, in.	66.05	0.231
B.L. of .25 MAC, in.	393.96	1.379

MODEL COMPONENT: Elevon - E3

GENERAL DESCRIPTION: Elevon used with the 9992-134B complete delta (no clipped tip) wing (wing-W14) (.0035 scale)

DRAWING NUMBER: _____

DIMENSIONS:	FULL-SCALE	MODEL SCALE
Area, ft^2	464.60	0.00569
Span (equivalent), in.	334.68	1.171
Inb'd equivalent chord(Wing Sta.211.39 in)	253.79	0.888
Outb'd equivalent chord(Wing Sta.546.07in)	146.01	0.511
Ratio movable surface chord/ total surface chord		
At Inb'd equiv. chord	0.292	0.292
At Outb'd equiv. chord	0.500	0.500
Sweep Back Angles, degrees		
Leading Edge (Hingeline)	17.851	17.851
Tailing Edge	0.000	0.000
Hingeline	17.851	17.851
Area Moment (Normal to hinge line), ft^3	8025.69	0.00034

MODEL COMPONENT: Vertical Stabilizer - V_{17}

GENERAL DESCRIPTION: Centerline vertical stabilizer with the 5° (half angle) wedge trailing edge. (.0035 scale)

DRAWING NUMBER: S-867-47, -50

DIMENSIONS:	FULL-SCALE	MODEL SCALE
TOTAL DATA		
Area, ft^2		
Planform	663.63	0.00815
Theoretical Span, in.	380.421	
Span (equivalent), in.	372.61	1.304
Aspect Ratio	1.453	1.453
Rate of Taper	0.718	0.718
Taper Ratio	0.314	0.314
Diehedral Angle, degrees	-	-
Incidence Angle, degrees	-	-
Aerodynamic Twist, degrees	-	-
Toe-In Angle , degrees	0.0	0.0
Cant Angle, degrees	0.0	0.0
Sweep Back Angles, degrees		
Leading Edge	45.0	45.0
Trailing Edge	15.734	15.734
0.25 Element Line	39.367	39.367
Chords: Theoretical Tip, in.	117.053	
Root , (W.P. 274.29 in.)	390.29	1.366
Tip, (equivalent), (W.P. 646.90 in.)	122.65	0.429
MAC(W.P. 428.19 in.)	279.74	0.979
Fus. Sta. of .25 MAC, in.	2032.98	7.115
W.P. of .25 MAC, in.	428.19	1.499
B.L. of .25 MAC, in.	0.0	0.0
Airfoil Section, wedge shape with L.E.R. and flat T.E.		
Tip L.E. Radius, in. (1.6% chord)	6.29	0.022
EXPOSED DATA		
Area		
Span, (equivalent)		
Aspect Ratio		
Taper Ratio		
Chords		
Root		
Tip		
MAC		
Fus. Sta. of .25 MAC		
W.P. of .25 MAC		
B.L. of .25 MAC		

MODEL COMPONENT: BODY - B

GENERAL DESCRIPTION: Saturn V/S-IC Booster (0.003366 Scale)

DRAWING NUMBER: GDC 383-4

DIMENSIONS:	FULL-SCALE	MODEL SCALE
		5.101 in. (1)
Length , ft.	130.33	5.264 in. (2)
Max. Width , ft.	46.84	1.893 in.
Max. Depth , ft.	46.84	1.893 in.
Fineness Ratio	0.276	0.276
Body Dia.	33 ft.	1.333 in.
Area		
Max. Cross-Sectional Body		1.396 in.^{2}
Planform		
Wetted		
Base Total		2.170 in.^{2}
Cavity		1.131 in.^{2}
Solid Base		1.039 in.^{2}

(1) To end of engine fairing.

(2) To Station 0.0

MODEL COMPONENT: Fin - F_x

GENERAL DESCRIPTION: 900 ft^2 fins mounted at (30° / 45°) degree angle

DRAWING NUMBER: _____

DIMENSIONS: (Each Fin)	FULL-SCALE	MODEL SCALE
TOTAL DATA		
Area		
Planform, ft^2	900	1.541 $in.^2$
Wetted		1.381 $in.^2$
Span (equivalent)		
Aspect Ratio		
Rate of Taper		
Taper Ratio		
Diehedral Angle, degrees		
Incidence Angle, degrees		
Aerodynamic Twist, degrees		
Toe-In Angle		
Cant Angle		
Sweep Back Angles, degrees		
Leading Edge	30°	30°
Trailing Edge	0°	0°
0.25 Element Line		
Chords:		
Root (Wing Sta. 0.0)		
Tip, (equivalent)		
MAC		
Fus. Sta. of .25 MAC		
W.P. of .25 MAC		
B.L. of .25 MAC		
Airfoil Section		
Root		
Tip		
EXPOSED DATA		
Area	154230 $in.^2$	1.541 $in.^2$
Span, (equivalent)	485 in.	1.237 in.
Aspect Ratio	1.525 in.	1.237 in.
Taper Ratio		.474
Chords		
Root	450 in.	1.515 in.
Tip	186 in.	.717 in.
MAC		1.242 in.
Fus. Sta. of .25 MAC		.895 in.
W.P. of .25 MAC		1.276 in.
B.L. of .25 MAC		1.275 in.

TEST MSFC TWT476 DATA SET COLLATION SHEET

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	CONTROL DEFLECTION i_0				NO. of RUNS	MACH NUMBERS 0.60	0.70	1.00	1.10	1.20	1.40	1.70					
R25021	BF1S+B5W14E3V17	A	0	+1°				7	8	9/1	10	11	12	13	14					
R25031		A	0	+4°				7	15	16	17	18	19	20	21					
R25041		A	0	-2°				7	22	23	24	25	26	27	28					
R25061	BS+B5W14E3V17	A	0	+1°				7	29	30	31	32	33	34	35					
R25071		A	0	+4°				7	36	37	38	39	40	41	42					
R25081		A	0	-2°				7	43	44	45	46	47	48	49					
R25053	BF1S+B5W14E3V17	0	B	+1°				7	57	58	59	60	61	62	63					
R25093	BF2S+B5W14E3V17	0	B	+1°				7	64	65	66	67	68	69	70					
R25091		A	0	+1°				7	71	72	73	74	75	76	77					

1	7	13	19	25	31	37	43	49	55	61	67	75 76
CLM	CN	CYN	CY	CBL	CA	CAF	CPB1	CPB2	CPCAV			10

COEFFICIENTS: → IDPVAR(1) | IDPVAR(2) | NDV

α or β SCHEDULES

αA: -12, -10, -8, [illegible], [illegible], 0, [illegible], [illegible], [illegible]

βB: -1.5, 1, 0, [illegible], [illegible], 3, 10, [illegible], [illegible]

TEST MSFC 476 DATA SET DESCRIPTOR SHEET

DATA SET IDENTIFIER	DATA SET DESCRIPTOR 1 11 21 31 41	Mode Type	CURVE SLOPE RANGE 51 LOWER LIMIT	61 UPPER LIMIT
R25011	MSFC 476 NR HCR ORB/S-IC BOOSTER BF1S+B5W14E3V17	1.1	-3.0	+3.0
R25021	BF1S+B5W14E3V17	1.1		
R25031	BF1S+B5W14E3V17	1.1		
R25041	BF1S+B5W14E3V17	1.1		
R25051	BF1S+B5W14E3V17	1.1		
R25053	BF1S+B5W14E3V17	2.1		
R25061	BS+B5W14E3V17	1.1		
R25071	BS+B5W14E3V17	1.1		
R25081	BS+B5W14E3V17	1.1		
R25091	BF2S+B5W14E3V17	1.1		
R25093	BF2S+B5W14E3V17	2.1		

1 SREF(1)	11 SREF(2)	21 LREF(1)	31 LREF(2)	41 BREF(1)	51 BREF(2)	61 XMRP(1)	71 XMRP(2)
1.396	SQ. IN.	1.333	INCHES	1.333	INCHES	5.264	INCHES

YMRP(1)	YMRP(2)	ZMRP(1)	ZMRP(2)	SCALE(1)	SCALE(2)	FILREF
0.0	INCHES	0.0	INCHES	0.003366		

TEST FACILITY DESCRIPTION

The Marshall Space Flight Center 14" x 14" Trisonic Wind Tunnel is an intermittent blowdown tunnel which operates by high pressure air flowing from storage to either vacuum or atmospheric conditions. A Mach number range from .2 to 5.85 is covered by utilizing two interchangeable test sections. The transonic section permits testing at Mach 0.20 through 2.50, and the supersonic section permits testing at Mach 2.74 through 5.85. Mach numbers between .2 and .9 are obtained by using a controllable diffuser. The range from .95 to 1.3 is achieved through the use of plenum suction and perforated walls. Mach numbers of 1.44, 1.93 and 2.50 are produced by interchangeable sets of fixed contour nozzle blocks. Above Mach 2.50 a set of fixed contour nozzle blocks are tilted and translated automatically to produce any desired Mach number in .25 increments.

Air is supplied to a 6000 cubic foot storage tank at approximately -40°F dew point and 500 psi. The compressor is a three-stage reciprocating unit driven by a 1500 hp motor.

The tunnel flow is established and controlled with a servo actuated gate valve. The controlled air flows through the valve diffuser into the stilling chamber and heat exchanger where the air temperature can be controlled from ambient to approximately 180°F. The air then passes through the test section which contains the nozzle blocks and test region.

Downstream of the test section is a hydraulically controlled pitch sector that provides a total angle of attack range of 20° ($\pm 10^{\circ}$). Sting offsets are available for obtaining various maximum angles of attack up to 25°.

The diffuser section has movable floor and ceiling panels which are the primary means of controlling the subsonic Mach numbers and permit more efficient running supersonically. The sector assembly and supersonic diffuser telescope into the subsonic diffuser to allow easy access to the model and test section.

Tunnel flow is exhausted through an acoustically damped tower to atmosphere or into the vacuum field of 42,000 cubic feet. The vacuum tanks are evacuated by vacuum pumps driven by a total of 500 hp.

Data is recorded by a solid state digital data acquisition system. The digital data is transferred to punched cards during the run to be reduced later by a computer to proper coefficient form.

The tunnel components and performance are discussed in more detail in NASA TM X -53185, dated December 22, 1964, and NASA TM X-53113, dated August 20, 1964.

NOMENCLATURE

SYMBOL	SADSAC SYMBOL	DEFINITION
A_b		base area; m^2, ft^2, in^2
a		speed of sound; m/sec, ft/sec
AR	ASPECT	aspect ratio, b^2/S
b	REFB	wing span or reference span; m, ft, in
c		wing chord; m, ft, in
$\bar{c}$		wing mean aerodynamic chord or reference chord; m, ft, in (see ℓ_{ref} or refl)
c.g.		center of gravity
C.P.		center of pressure
C_A	CA	axial force coefficient, F_A/qS_{ref}
C_{A_b}	CAB	base axial force coefficient, $[(p_\infty - p_b)/q](A_b/S_{ref})$
C_{A_f}	CAF	forebody axial force coefficient, $C_A - C_{A_b}$
C_D	CDTOTL	drag force coefficient in the wind axis system, $F_D/q\,S_{ref}$

NOMENCLATURE (continued)

SYMBOL	SADSAC SYMBOL	DEFINITION
C_D'	CD	drag force coefficient in the stability axis system, $F_D'/q\,S_{ref}$
C_L	CL	lift force coefficient (stability or wind axis) $F_L/q\,S_{ref}$
C_ℓ	CBL	rolling moment coefficient in body axis system, $M_x/q\,S_{ref}\,b$
$C_{\ell,s}$	CSL	rolling moment coefficient in the stability axis system, $M_{x,s}/q\,S_{ref}\,b$
$C_{\ell,w}$	CWL	rolling moment coefficient in the wind axis system, $M_{x,w}/q\,S_{ref}\,b$
C_m	CLM	pitching moment coefficient in the body axis system, $M_y/q\,S_{ref}\,\ell_{ref}$
$C_{m,s}$	CLM	pitching moment coefficient in the stability axis system, $C_{m,s} = C_m$
$C_{m,w}$	CPM	pitching moment coefficient in the wind axis system, $M_{y,w}/q\,S_{ref}\,\ell_{ref}$
C_N	CN	normal force coefficient in the body axis system, $F_N/q\,S_{ref}$

NOMENCLATURE (continued)

SYMBOL	SADSAC SYMBOL	DEFINITION
C_n	CYN	yawing moment coefficient in the body axis system, $M_z/q\,S_{ref}\,b$
$C_{n,s}$	CLN	yawing moment coefficient in the stability axis system, $C_{n,s} = C_n$
$C_{n,w}$	CLN	yawing moment coefficient in the wind axis system, $M_{z,w}/q\,S_{ref}\,b$
C_p	CP	pressure coefficient, $(p-p_\infty)/q$
C_y	CY	side force coefficient (body or stability axis system), $F_y/q\,S_{ref}$
C_c	CC	side force coefficient (wind axis system), $F_y/q\,S_{ref}$
F_A		axial force; N, lb
F_D		drag force in wind axis system; N, lb
F'_D		drag force in the stability axis system; N, lb
F_L		lift force (stability or wind axis system); N, lb
F_N		normal force; N, lb

NOMENCLATURE (continued)

SYMBOL	SADSAC SYMBOL	DEFINITION
F_Y		side force; N, lb
	N/A	normal to axial force ratio
ℓ_{ref}	REFL	reference length; m, ft, in (see $\bar{c}$)
L/D	L/D	lift-to-drag ratio, C_L/C_D (stability axis system)
L/D	CL/CD	lift-to-drag ratio, C_L/C_D (wind axis system)
M	MACH	Mach number
MRP	MRP	abbreviation for moment reference point
	XMRP	abbreviation for moment reference point on x-axis
	YMRP	abbreviation for moment reference point on y-axis
	ZMRP	abbreviation for moment reference point on z-axis
M_x		rolling moment in the body axis system; N-m, ft-lb
$M_{x,s}$		rolling moment in the stability axis system; N-m, ft-lb

NOMENCLATURE (continued)

SYMBOL	SADSAC SYMBOL	DEFINITION
$M_{x,w}$		rolling moment in the wind axis system; N-m, ft-lb
M_y		pitching moment in the body (or stability) axis system; N-m, ft-lb
$M_{y,w}$		pitching moment in the wind axis system; N-m, ft-lb
M_z		yawing moment in the body axis system; N-m, ft-lb
$M_{z,w}$		yawing moment in the wind axis system; N-m, ft-lb
p		static pressure; N/m^2; psi
P		total pressure; N/m^2; psi
q	Q(PSI) Q(PSF)	dynamic pressure; N/m^2, psi, psf
RN/L	RN/L	Reynold's number per unit length; million/ft.
S		wing area; m^2, ft^2
S_{ref}	REFS	reference area; m^2, ft^2
T		temperature; °K, °C, °R, °F
V		speed of vehicle relative to surrounding atmosphere; m/sec, ft/sec

NOMENCLATURE (continued)

SYMBOL	SADSAC SYMBOL	DEFINITION
i_T		tail incidence positive when trailing edge down, deg
$\bar{V}$		velocity of vehicle relative to surrounding atmosphere; m/sec, ft/sec
α	ALPHA	angle of attack, angle between the projection of the wind X_W-axis on the body X, Z-plane and the body X-axis; deg
β	BETA	sideslip angle, angle between the wind X_W-axis and the projection of this axis on the body X-Z-plane; deg
γ		ratio of specific heats
Γ	DIHDRL	wing dihedral angle; deg
δ		control surface deflection angle; deg positive deflections are:
	AILRON	aileron - left aileron trailing edge down
	ELEVTR	elevator - trailing edge down
	RUDDER	rudder - trailing edge to the left
	FLAP	flap - trailing edge down
	TAB	tab - trailing edge down with respect to control surface
ρ		air density; K_g/m^3, slugs/ft^3

NOMENCLATURE (continued)

SYMBOL	SADSAC SYMBOL	DEFINITION
θ		pitch angle, angle of rotation about the body Y-axis, positive when the positive Z-axis is rotated toward the positive X-axis; deg
ϕ	PHI	roll angle, angle of rotation about the body X-axis, positive when the positive Y-axis is rotated toward the positive Z-axis; deg
ψ	PSI	yaw angle, angle of rotation about the body Z-axis, positive when the positive X-axis is rotated toward the positive Y-axis; deg

NOMENCLATURE (continued)

SUBSCRIPTS	DEFINITION
a	aileron
b	base
c	canard
e	elevator or elevon
f	flap
r	rudder or ruddervator
s	stability axis system
t	tail, or total conditions
w	wind axis system
ref	reference conditions
∞	freestream condition

ADDITIONS TO STANDARD NOMENCLATURE

SYMBOL	SADSAC SYMBOL	DEFINITION
i_o	ORBINC	orbiter incidence angle, degrees (positive, nose up)

FIGURES AND PHOTOGRAPHS

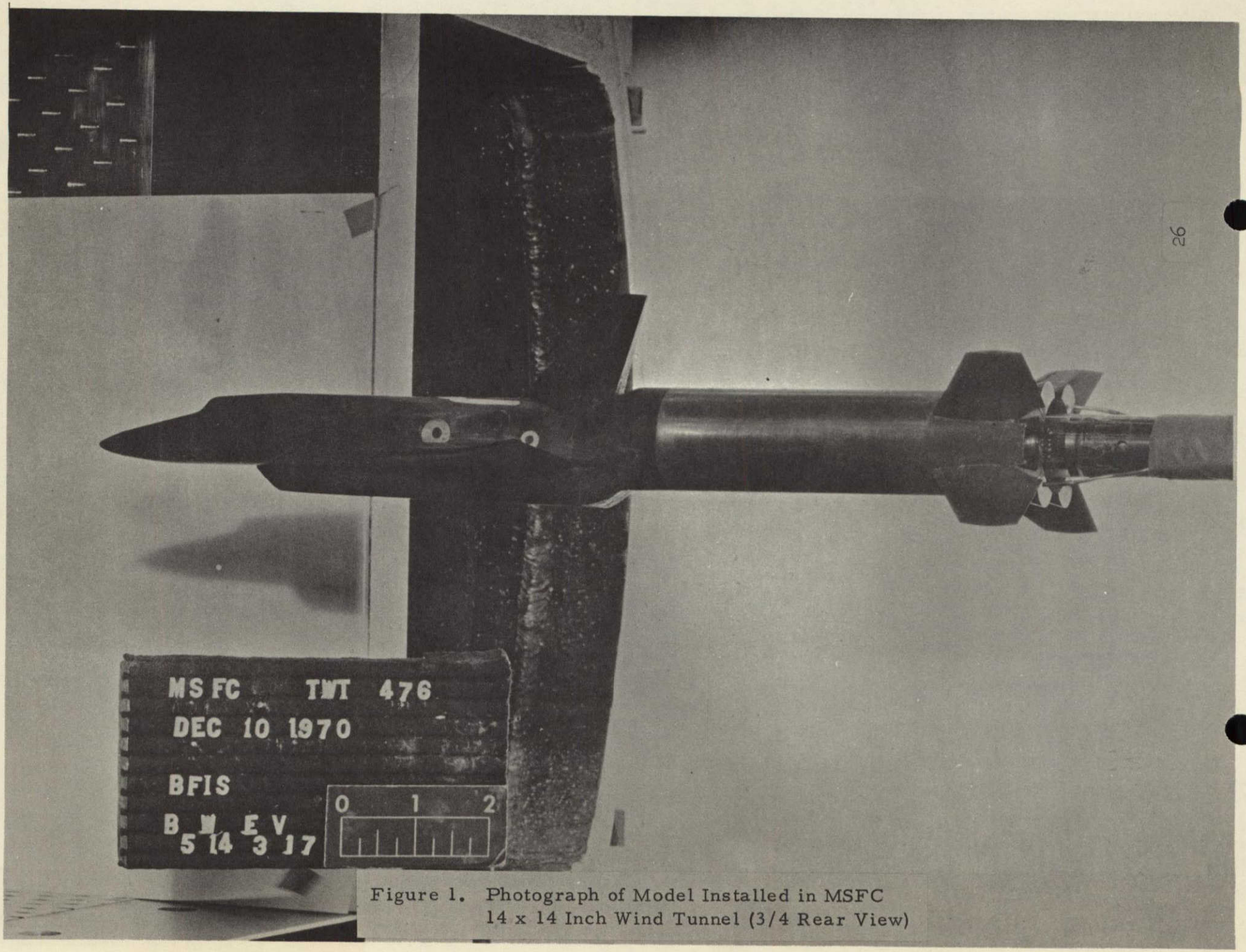


Figure 1. Photograph of Model Installed in MSFC 14 x 14 Inch Wind Tunnel (3/4 Rear View)

NOT REPRODUCIBLE

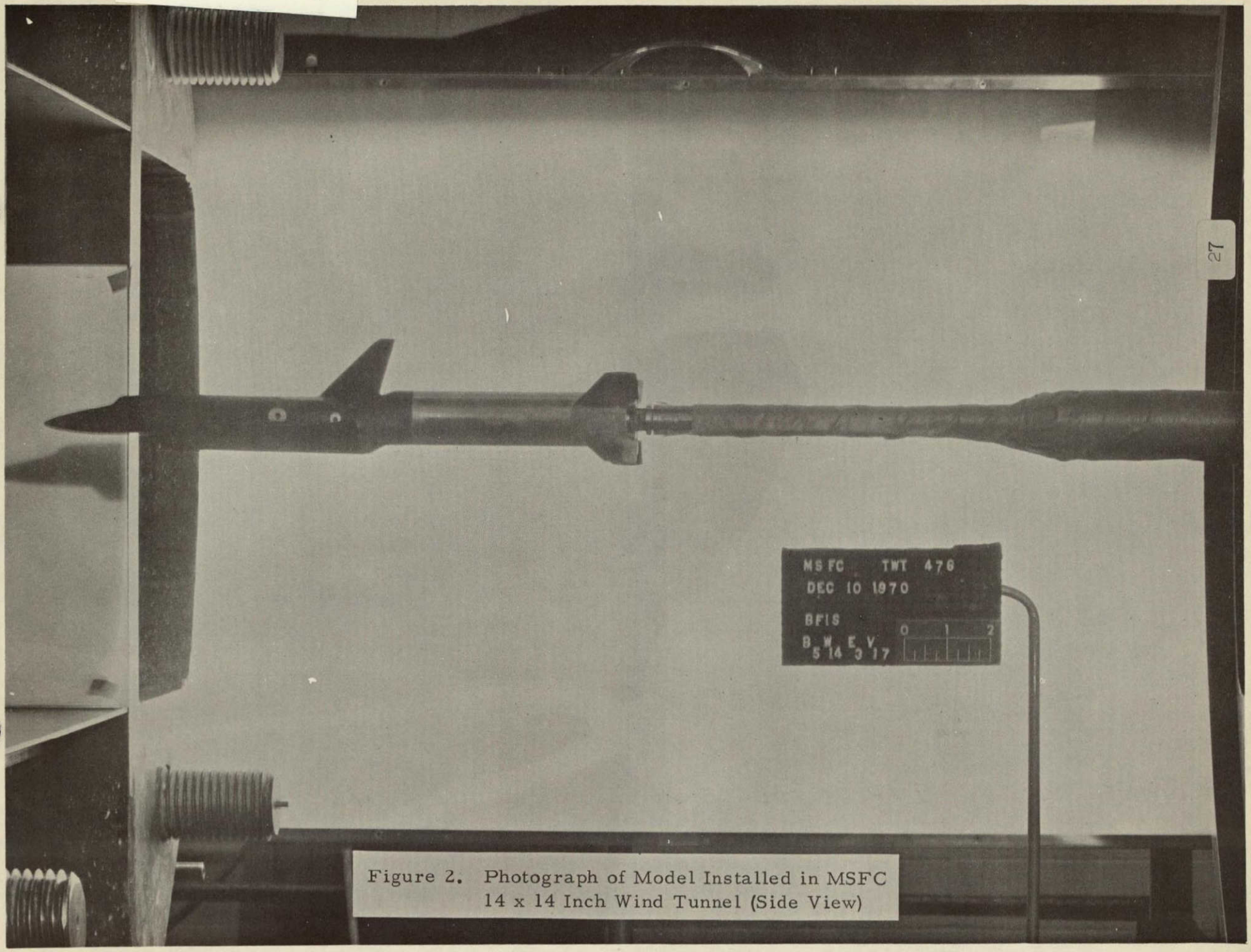


Figure 2. Photograph of Model Installed in MSFC 14 x 14 Inch Wind Tunnel (Side View)

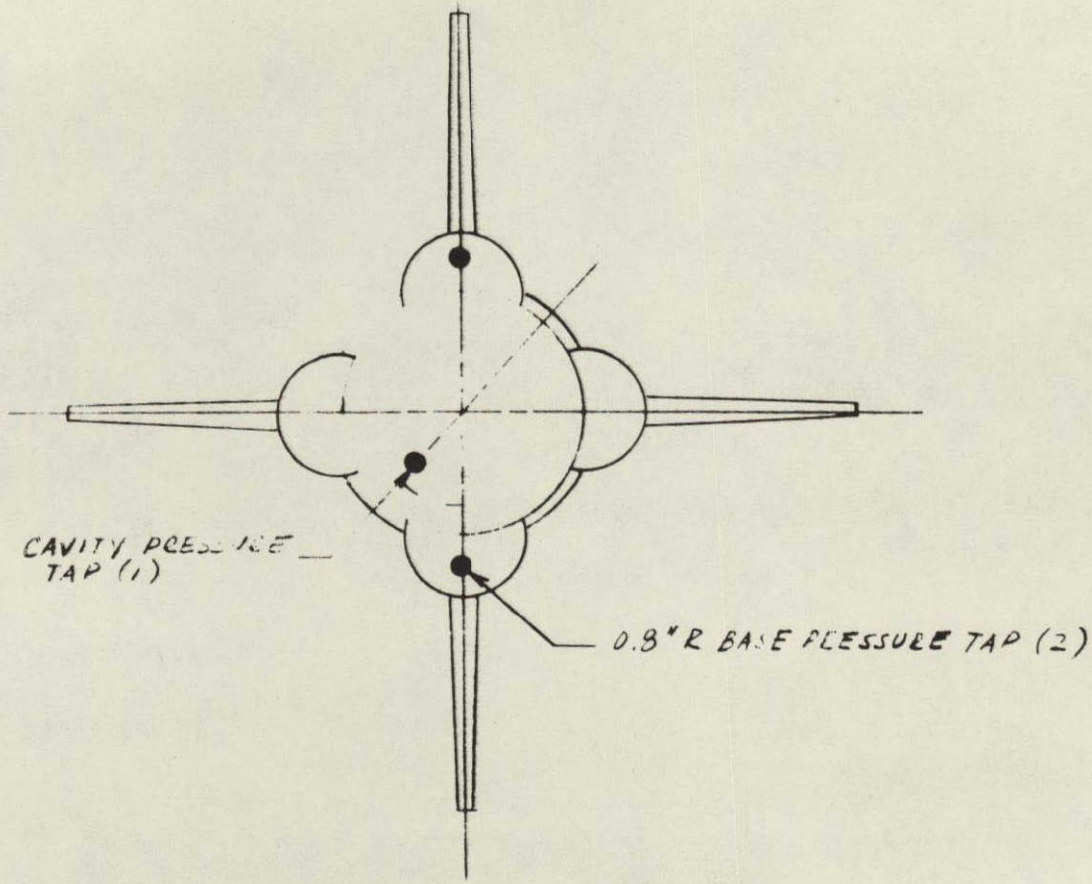


FIGURE 3. TYPICAL BASE PRESSURE LOCATIONS

NOT REPRODUCIBLE

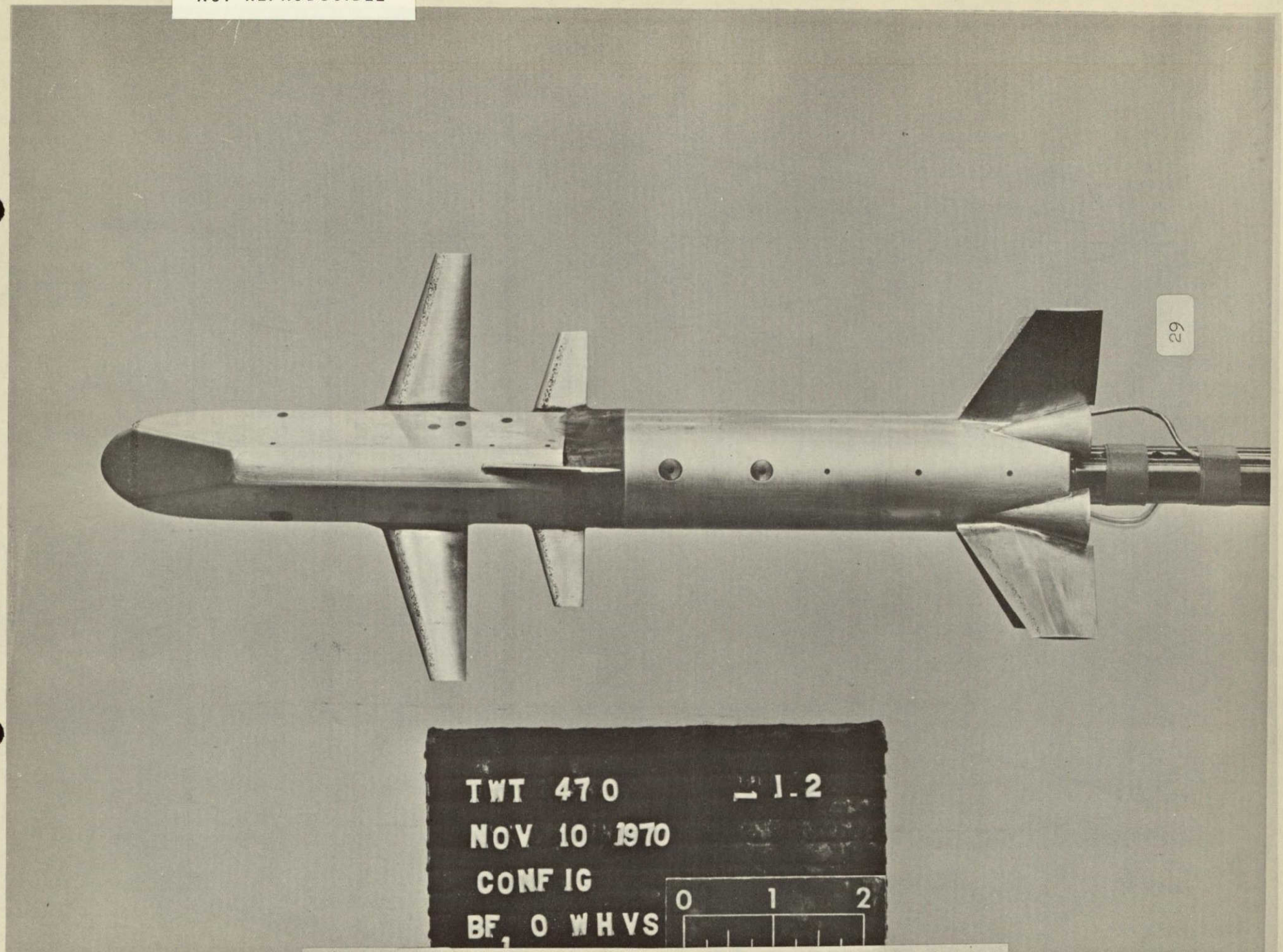


FIGURE 4 TOP VIEW OF MODEL SHOWING TRIP STRIP DETAILS

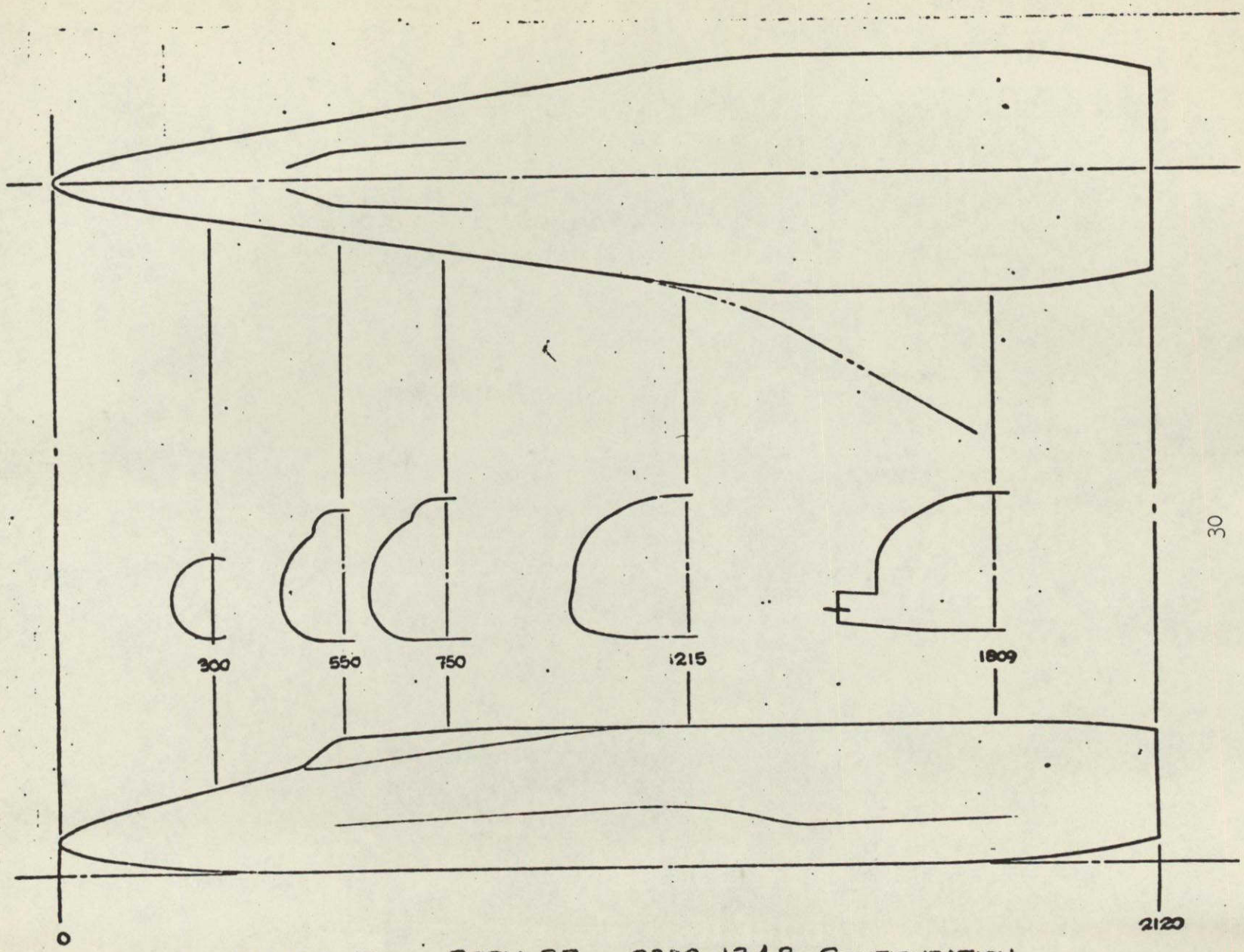
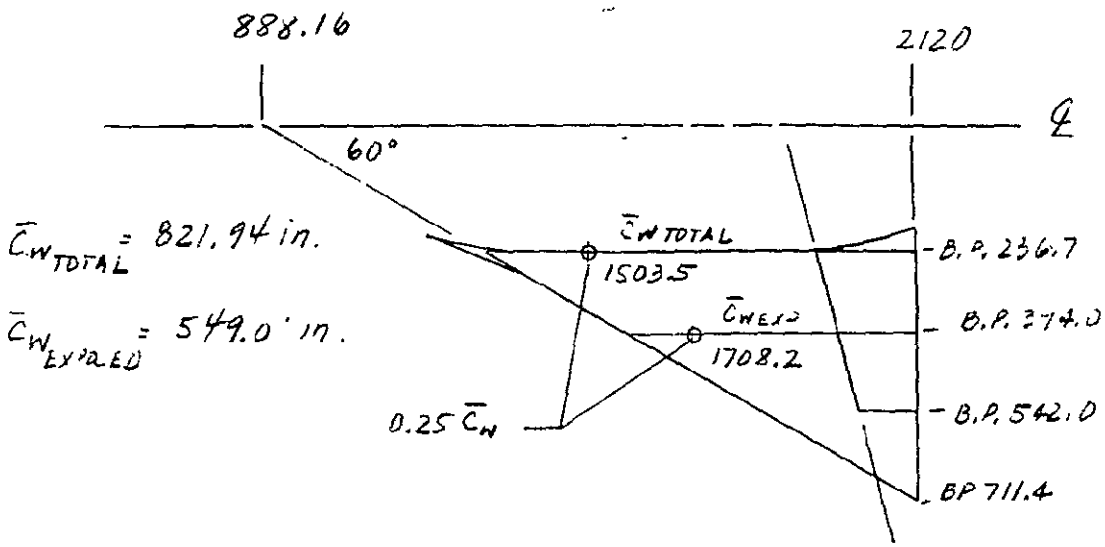
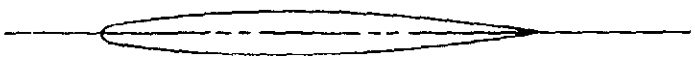
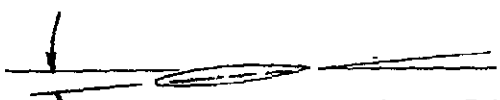


FIGURE 5. BODY B5 9992-134B CONFIGURATION





CHORD (B.P. 240.0)
0009-64 SERIES AIRFOIL



-5°

TIP CHORD (B.P. 542.0)
0012-64 SERIES AIRFOIL

NOTE: ALL DIMENSIONS ARE FULL SCALE (INCHES)

FIGURE 6. WING W14 9992-134B CONFIGURATION
COMPLETE DELTA - NO CLIPPED TIP

NOTE: ALL DIMENSIONS ARE FULL SCALE (INCHES)

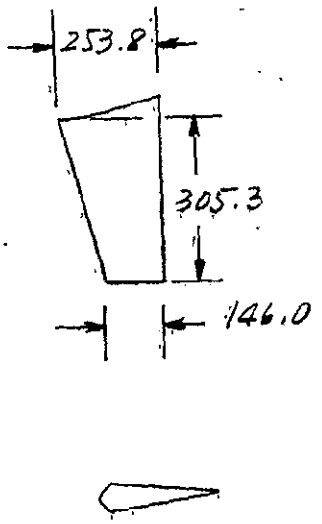


FIGURE 7. ELEVON E3 - ELEVON USED WITH WING W14

NOTE: ALL DIMENSIONS ARE FULL SCALE (INCHES)

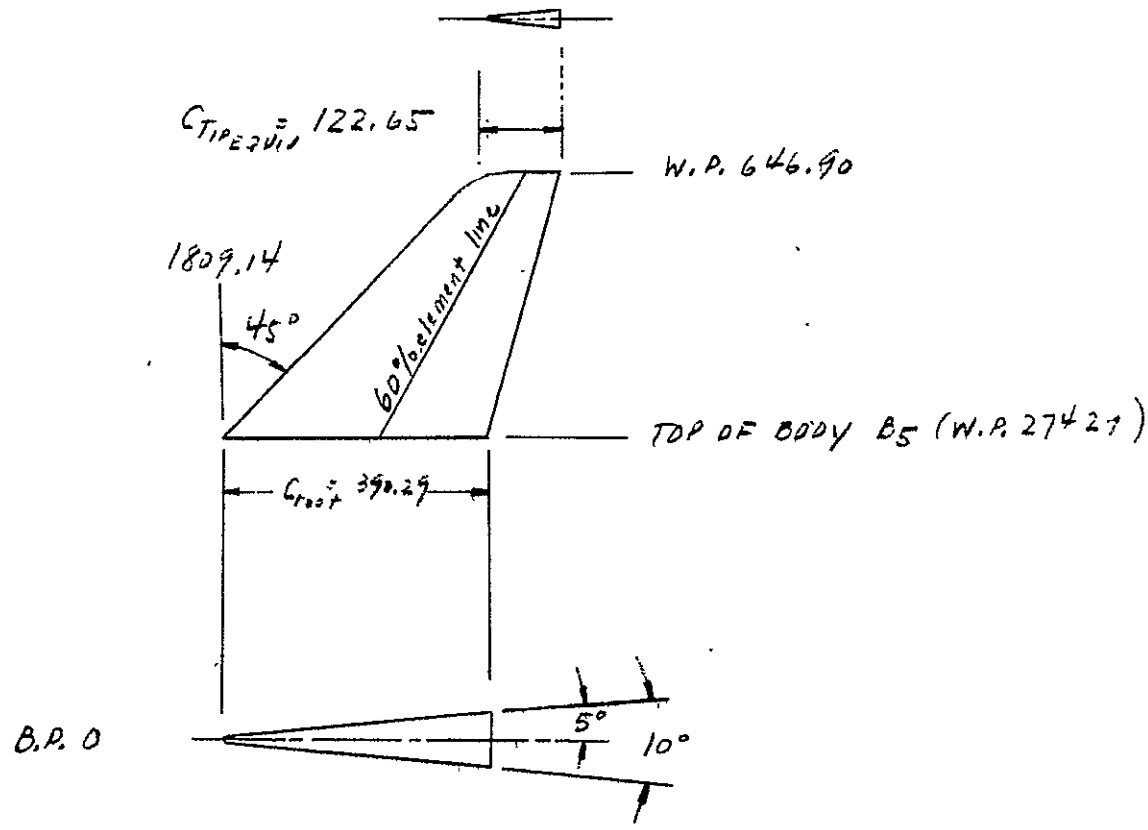


FIGURE 8. VERTICAL STABILIZER V17

NOTE: ALL DIMENSIONS ARE MODEL SCALE (INCHES)

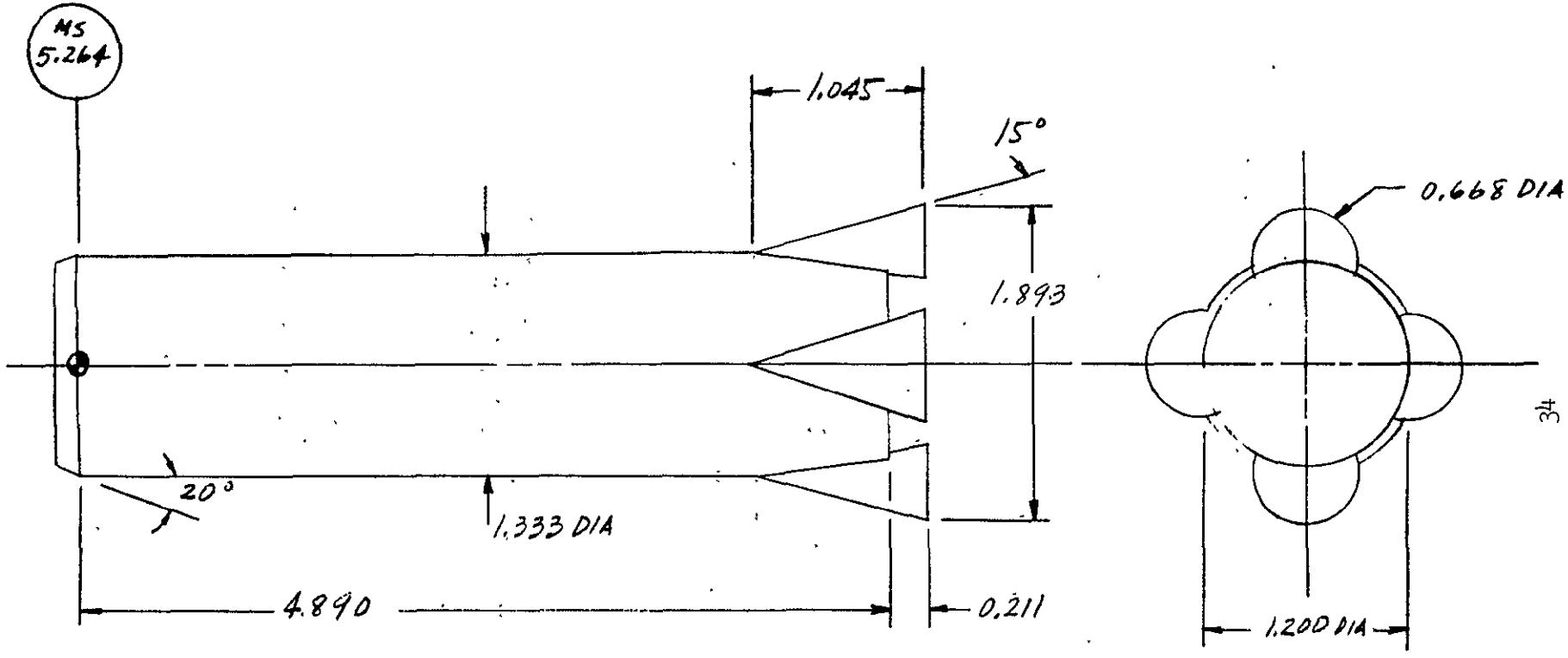


FIGURE 9. SATURN V/SIC BOOSTER

NOTE: ALL DIMENSIONS ARE MODEL SCALE (INCHES)

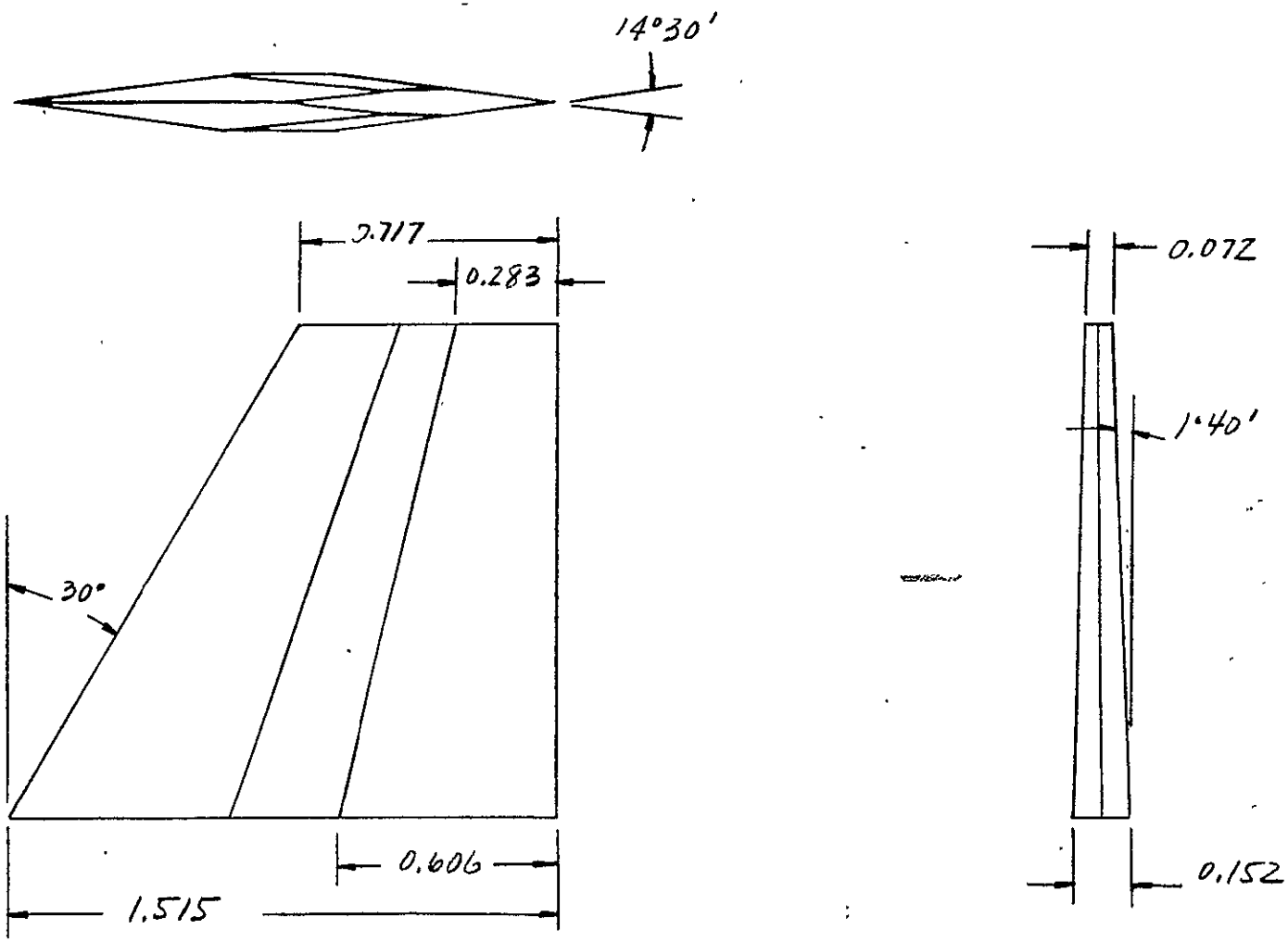
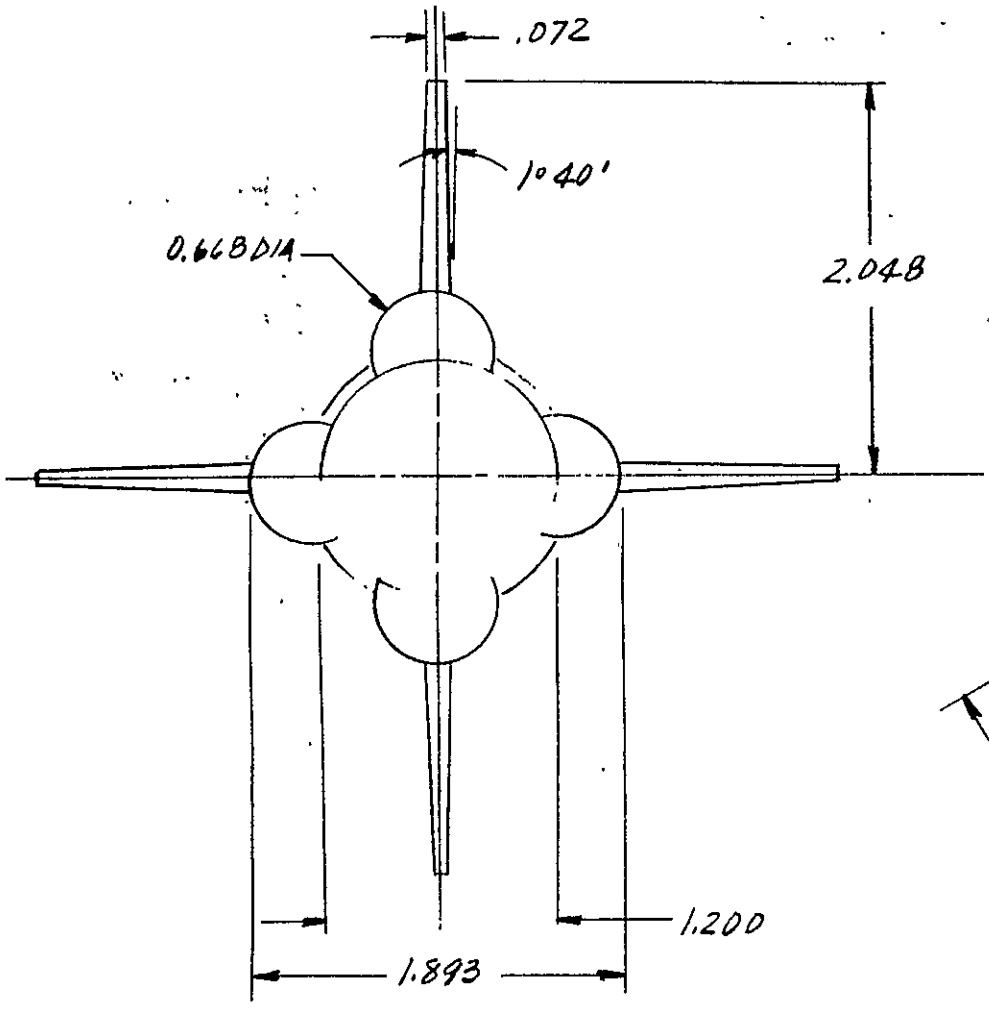
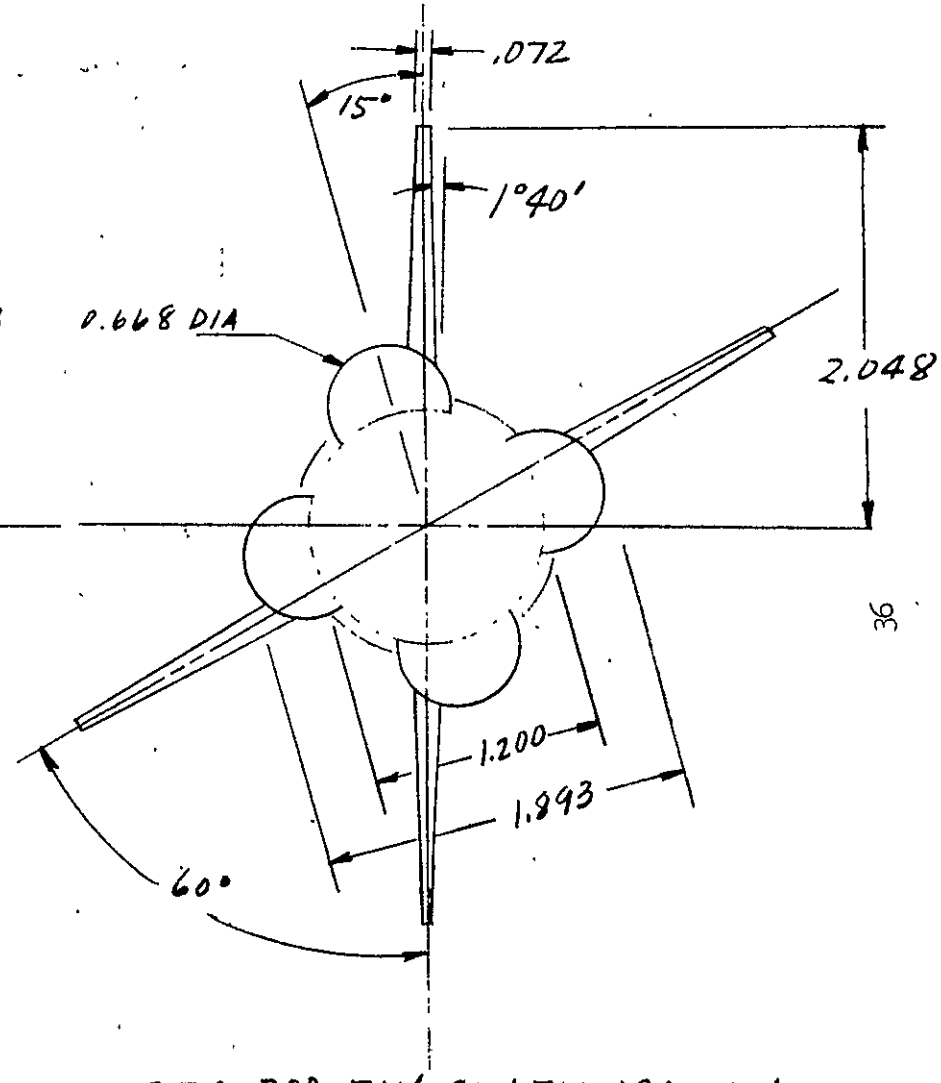


FIGURE 10. 900 FT² S-IC FIN

NOTE: ALL DIMENSIONS ARE MODEL SCALE (INCHES)



S-IC 45° FIN CONFIGURATION
(F_2)



S-IC 30° FIN CONFIGURATION
(F_1)

FIGURE 10 (CONTINUED)

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.

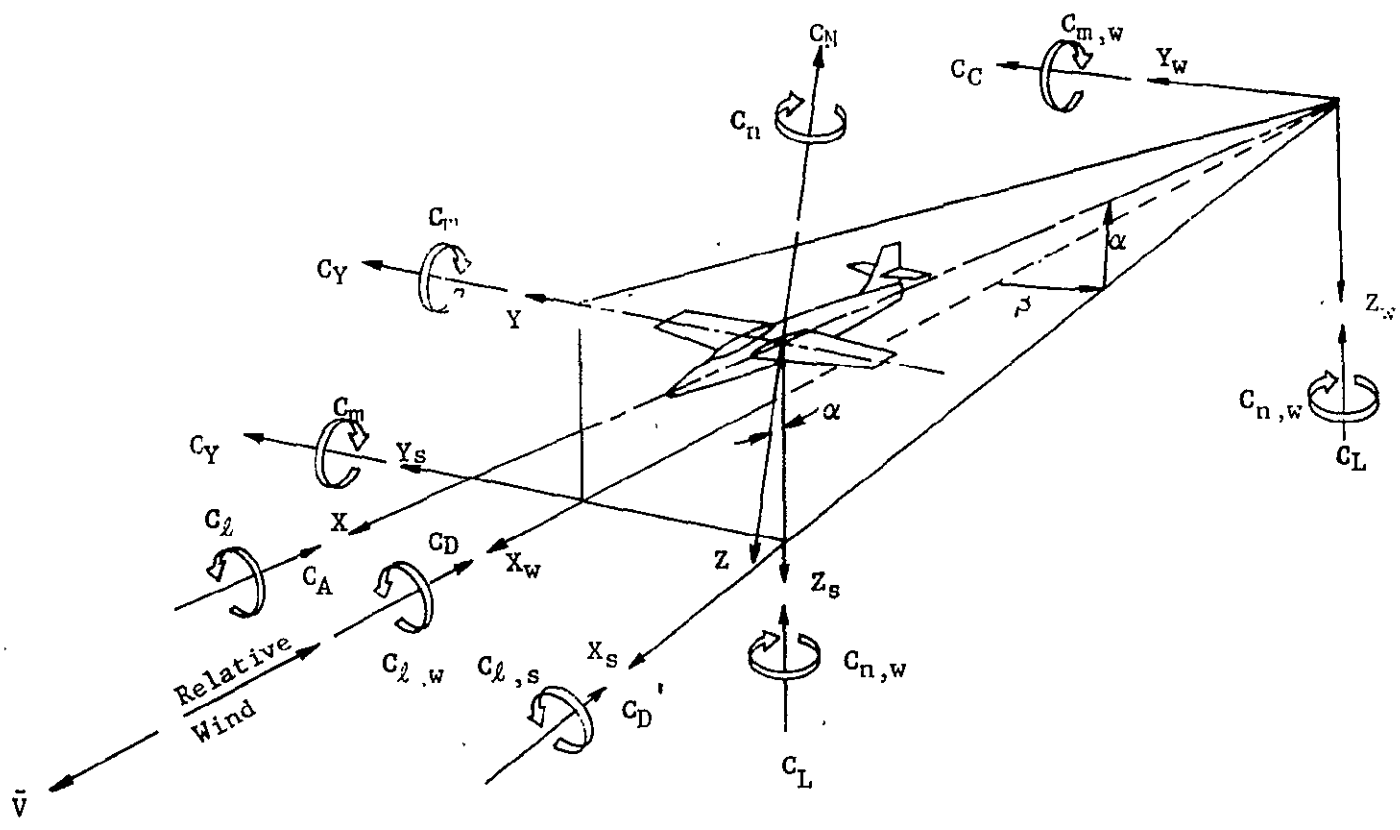


Figure 11. Axis systems, showing direction and sense of force and moment coefficients, angle of attack, and sideslip angle

DATA DISPLAY INDEX

DATA PLOT INDEX

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

DATASETS PLOTTED	DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
R25021	CN	ALPHA	1	2
R25021	CLM	ALPHA	3	4
R25021	CAF	ALPHA	5	6
R25021	CPB1	ALPHA	7	8
R25021	CPB2	ALPHA	9	10
R25021	CPCAV	ALPHA	11	12
R25031	CN	ALPHA	13	14
R25031	CLM	ALPHA	15	16
R25031	CAF	ALPHA	17	18
R25031	CPB1	ALPHA	19	20
R25031	CPB2	ALPHA	21	22
R25031	CPCAV	ALPHA	23	24
R25041	CN	ALPHA	25	26
R25041	CLM	ALPHA	27	28
R25041	CAF	ALPHA	29	30
R25041	CPB1	ALPHA	31	32
R25041	CPB2	ALPHA	33	34
R25041	CPCAV	ALPHA	35	36
R25061	CN	ALPHA	37	38
R25061	CLM	ALPHA	39	40
R25061	CAF	ALPHA	41	42
R25061	CPB1	ALPHA	43	44
R25061	CPB2	ALPHA	45	46
R25061	CPCAV	ALPHA	47	48
R25071	CN	ALPHA	49	50
R25071	CLM	ALPHA	51	52
R25071	CAF	ALPHA	53	54
R25071	CPB1	ALPHA	55	56
R25071	CPB2	ALPHA	57	58
R25071	CPCAV	ALPHA	59	60
R25081	CN	ALPHA	61	62
R25081	CLM	ALPHA	63	64
R25081	CAF	ALPHA	65	66
R25081	CPB1	ALPHA	67	68
R25081	CPB2	ALPHA	69	70
R25081	CPCAV	ALPHA	71	72
R25091	CN	ALPHA	73	74
R25091	CLM	ALPHA	75	76
R25091	CAF	ALPHA	77	78
R25091	CPB1	ALPHA	79	80
R25091	CPB2	ALPHA	81	82
R25091	CPCAV	ALPHA	83	84

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

DEPENDENT VARIABLE VS DEPENDENT VARIABLE,

DATASETS PLOTTED	DEPENDENT VARIABLE	DEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
R25021	CLM	CN	85	86
R25031	CLM	CN	87	88
R25041	CLM	CN	89	90
R25061	CLM	CN	91	92
Z25071	CLM	CN	93	94
R25081	CLM	CN	95	96
R25091	CLM	CN	97	98

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

DATASET PLOTTED	DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE
B25021	CN	MACH	99
B25021	CLM	MACH	100
B25021	CLM/CN	MACH	101
B25031	CN	MACH	102
B25031	CLM	MACH	103
B25031	CLM/CN	MACH	104
B25041	CN	MACH	105
B25041	CLM	MACH	106
B25041	CLM/CN	MACH	107
B25061	CN	MACH	108
B25061	CLM	MACH	109
B25061	CLM/CN	MACH	110
B25071	CN	MACH	111
B25071	CLM	MACH	112
B25071	CLM/CN	MACH	113
B25081	CN	MACH	114
B25081	CLM	MACH	115
B25081	CLM/CN	MACH	116
B25091	CN	MACH	117
B25091	CLM	MACH	118
B25091	CLM/CN	MACH	119

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

DATASETS PLOTTED	DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
N25021	CAF	MACH	120	120
N25031	CAF	MACH	121	121
N25041	CAF	MACH	122	122
N25061	CAF	MACH	123	123
N25071	CAF	MACH	124	124
N25081	CAF	MACH	125	125
N25091	CAF	MACH	126	126

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

MACH DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

DATASET PLOTTED	DEPENDENT VARIABLE	INDEPENDENT VARIABLE(2)	PLOT PAGE
A25021	CLMCNO	MACH	127
A25031	CLMCNO	MACH	128
A25041	CLMCNO	MACH	129
A25061	CLMCNO	MACH	130
A25071	CLMCNO	MACH	131
A25081	CLMCNO	MACH	132
A25091	CLMCNO	MACH	133

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, MULTIPLE DATASETS

DATASETS PLOTTED:
R25053 R25093

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CY	BETA	134	140
CYN	BETA	141	147
CBL	BETA	148	154
CPB1	BETA	155	161
CPB2	BETA	162	168
CPCAV	BETA	169	175

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY

DEPENDENT VARIABLE VS DEPENDENT VARIABLE, MULTIPLE DATASETS

DATASETS PLOTTED:
R25053 R25093

DEPENDENT VARIABLE	DEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CY	CYN	176	182

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY

GRADIENT OF A DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, MULTIPLE DATASETS

DATASETS PLOTTED:
R25053 R25093

GRADIENT OF DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE
CY	MACH	183
CYN	MACH	184
CBL	MACH	185

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
A25041 A25021 A25031

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CN	ALPHA	186	192
CLM	ALPHA	193	199
CAF	ALPHA	200	206

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY

DEPENDENT VARIABLE VS DEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
A25041 A25021 A25031

DEPENDENT VARIABLE	DEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CLM	CN	207	213

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY

UNIVARIATE DEPENDENT VARIABLE VS PARAMETRIC VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
A25041 A25021 A25031

DEPENDENT VARIABLE	PARAMETRIC VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CLMCNO	ORBINC	214	215

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
A25081 A25061 Q25071

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CN	ALPHA	216	222
CLM	ALPHA	223	229
CAF	ALPHA	230	236

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY

DEPENDENT VARIABLE VS DEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
A25081 A25061 Q25071

DEPENDENT VARIABLE	DEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CLM	CN	237	243

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY

UNIVARIATE DEPENDENT VARIABLE VS PARAMETRIC VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
A25081 A25061 Q25071

DEPENDENT VARIABLE	PARAMETRIC VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CLMCNO	ORBINC	244	245

EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, MULTIPLE DATASETS

DATASETS PLOTTED:
R25021 R25091

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CN	ALPHA	246	252
CLM	ALPHA	253	259
CAF	ALPHA	260	266

EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY

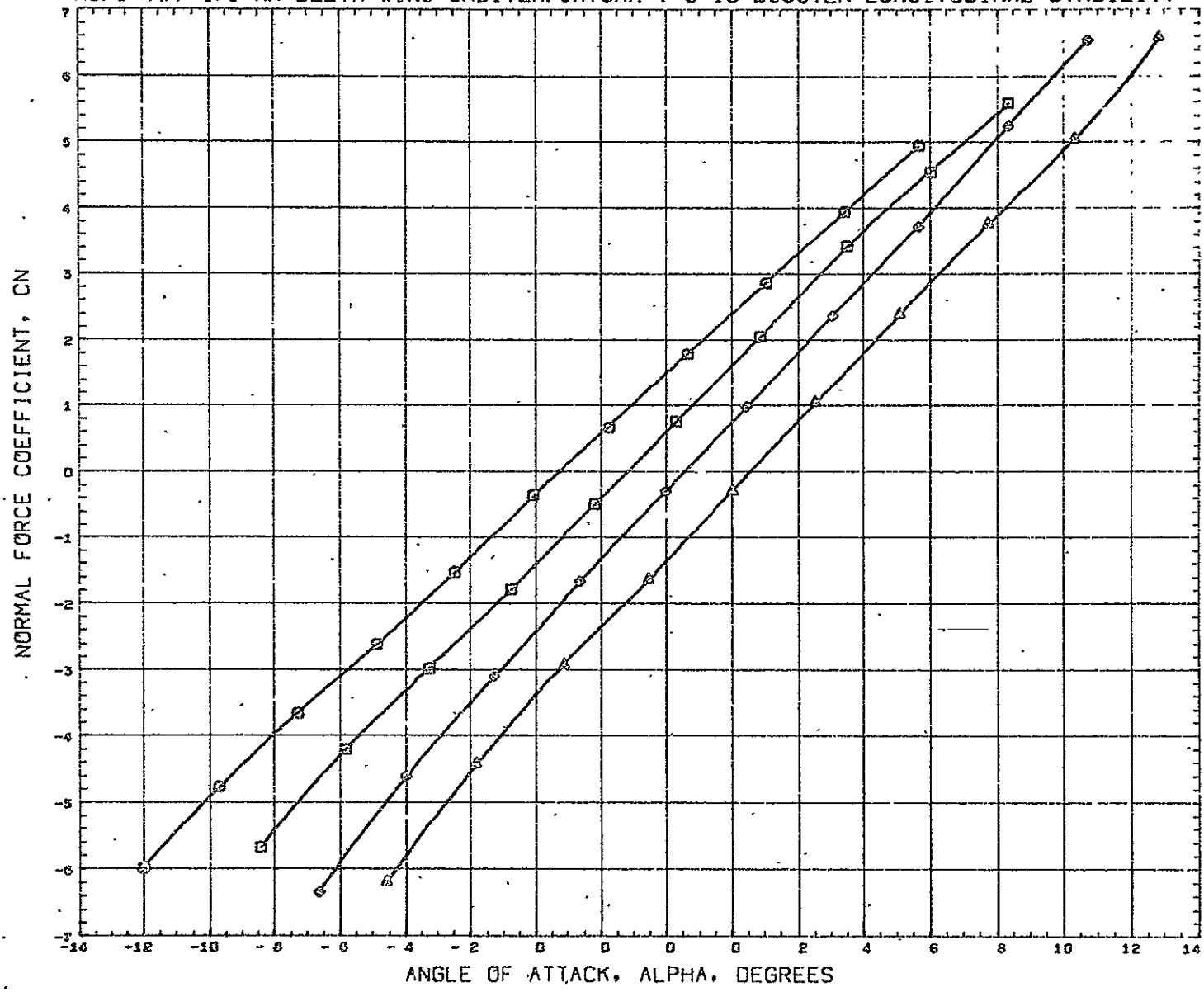
DEPENDENT VARIABLE VS DEPENDENT VARIABLE, MULTIPLE DATASETS

DATASETS PLOTTED:
R25021 R25091

DEPENDENT VARIABLE	DEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CLM	CN	267	273

DATA

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH		PARAMETRIC VALUES		
○	0.600	BETA	0.020	ORBINC	1.000
□	0.898				
◇	0.994				
△	1.106				

DATA HIST. CODE HH

REFERENCE INFORMATION

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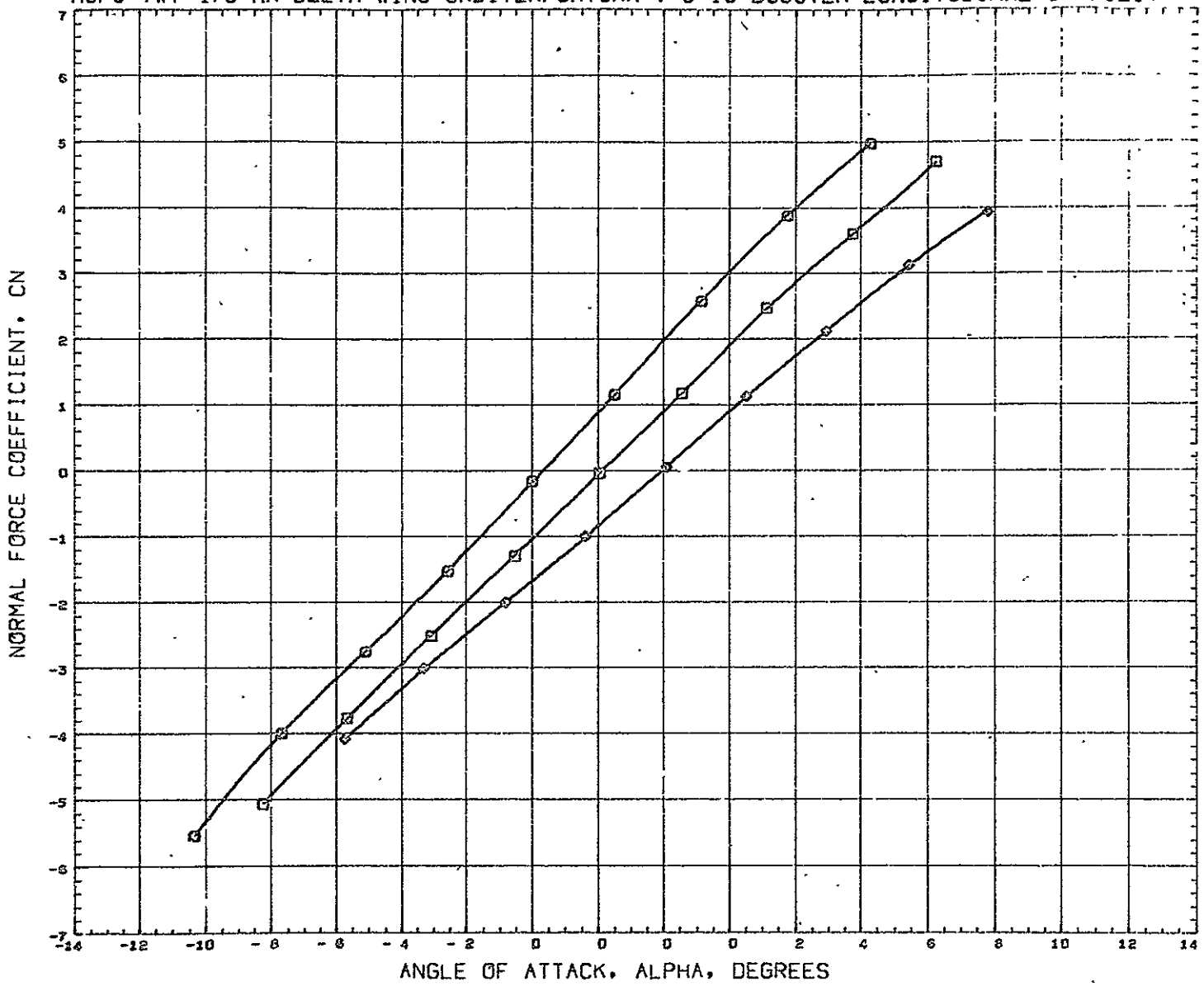
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17 (R25021) 08 JAN 71 PAGE 1

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH		PARAMETRIC VALUES		
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□	1.465				
◇	1.952				

REFERENCE INFORMATION

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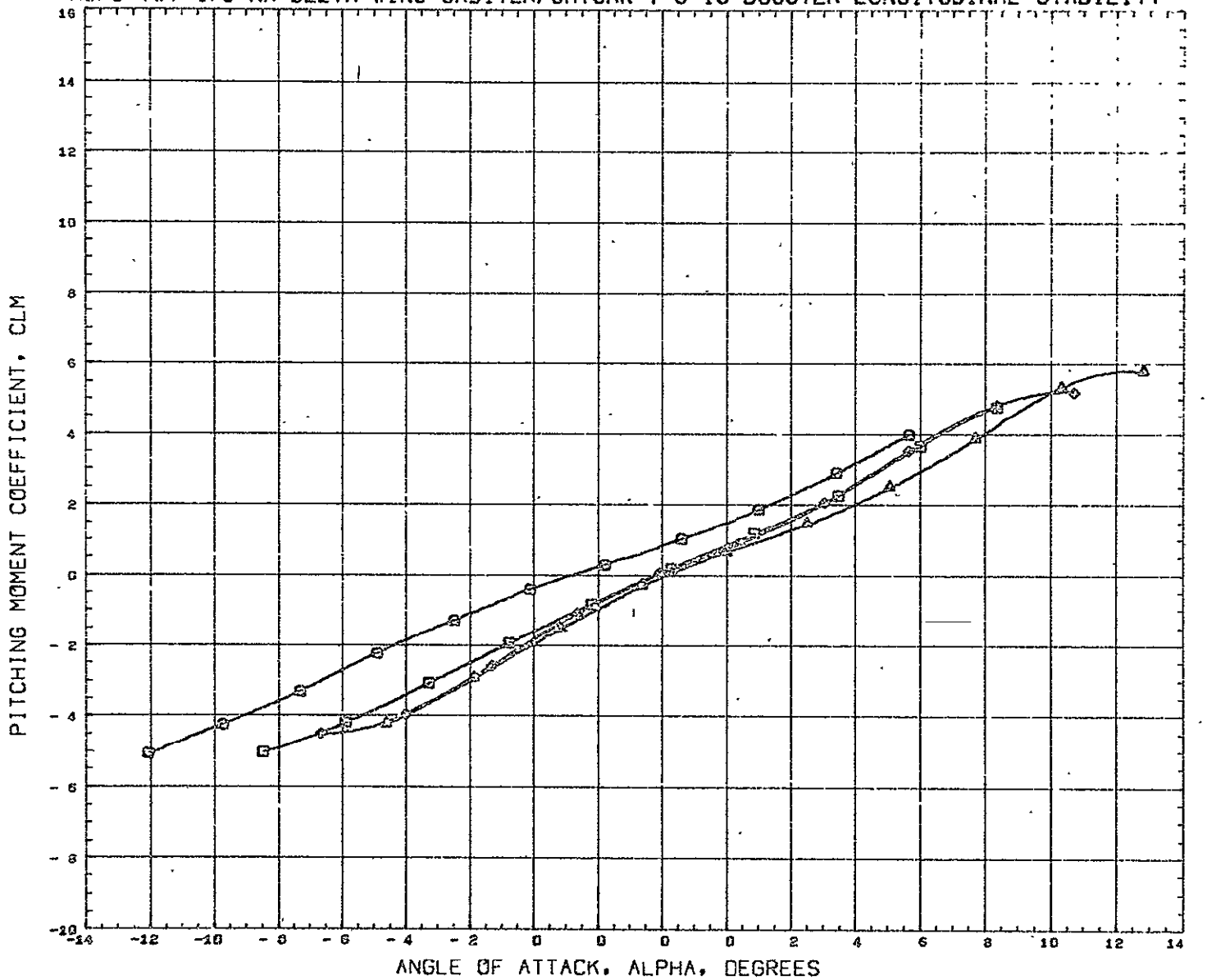
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE HH

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH		PARAMETRIC VALUES		
○	0.600	BETA	0.020	ORBINC	1.000
□	0.896				
◇	0.994				
△	1.106				

DATA HIST. CODE NH

REFERENCE INFORMATION

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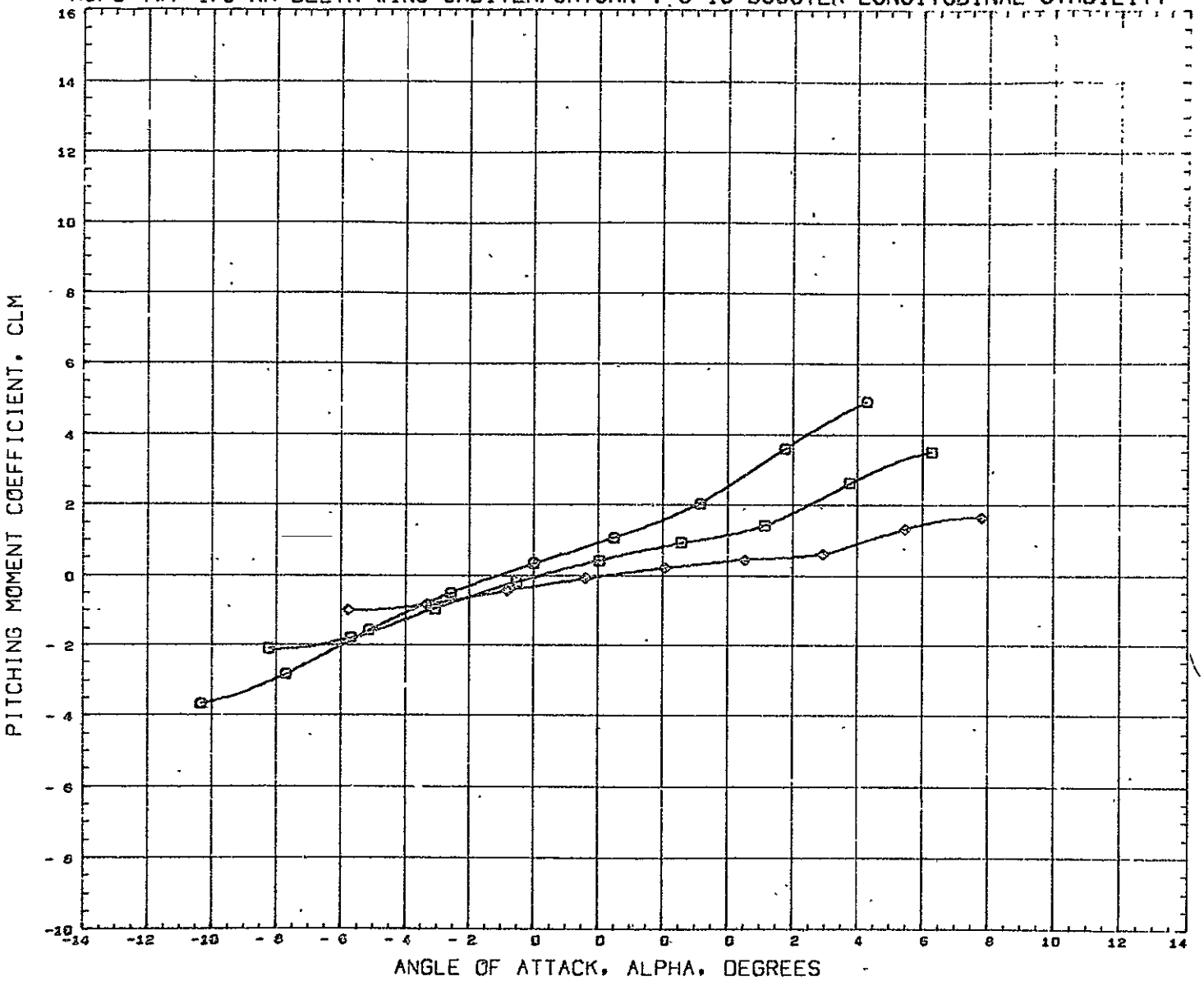
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17 (R25021) 08 JAN 71 PAGE 3

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



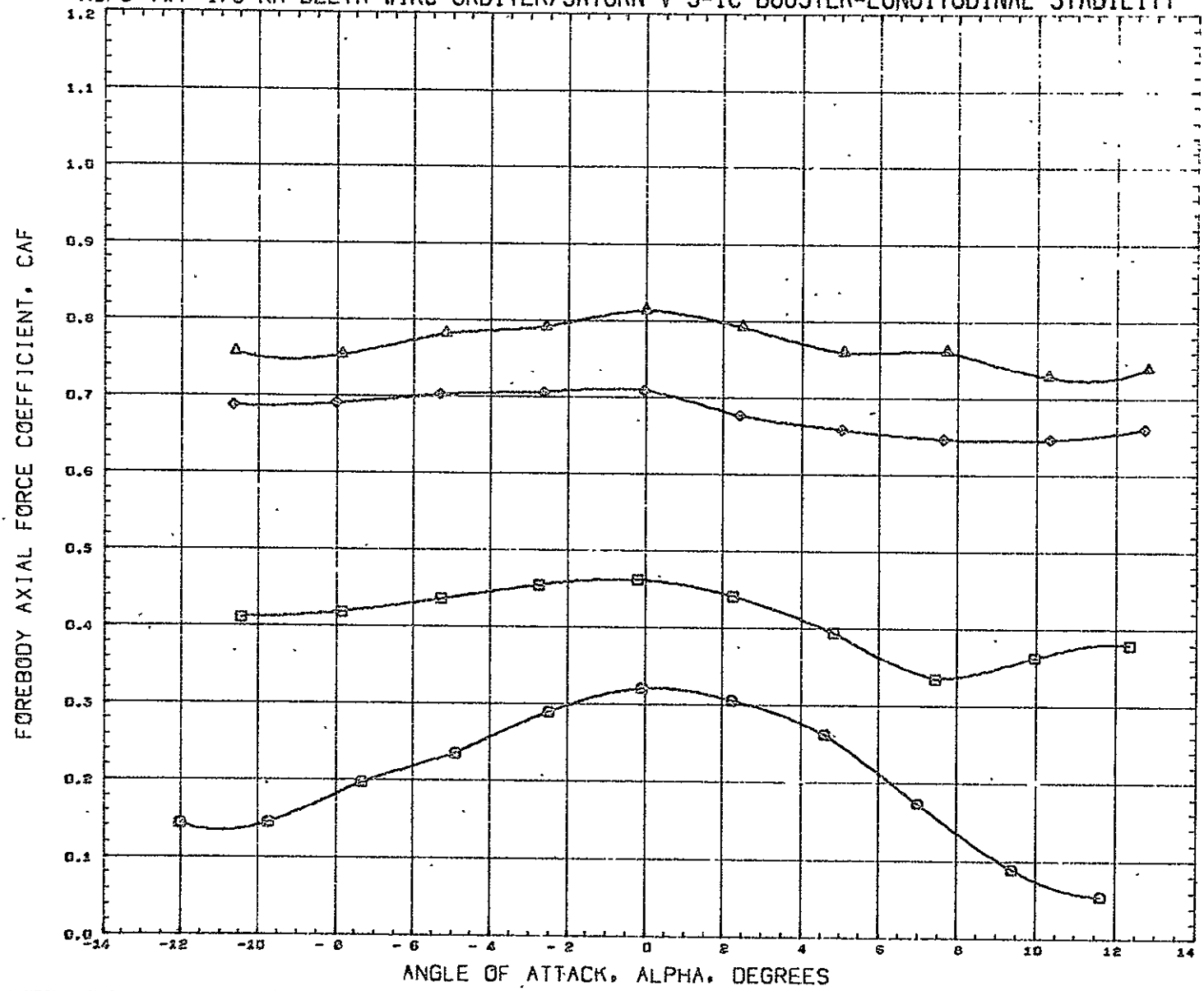
SYMBOL	MACH		PARAMETRIC VALUES		
○	1.198	BETA	0.020	ORBINC	1.000
□	1.465				
◇	1.952				

DATA HIST. CODE MH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



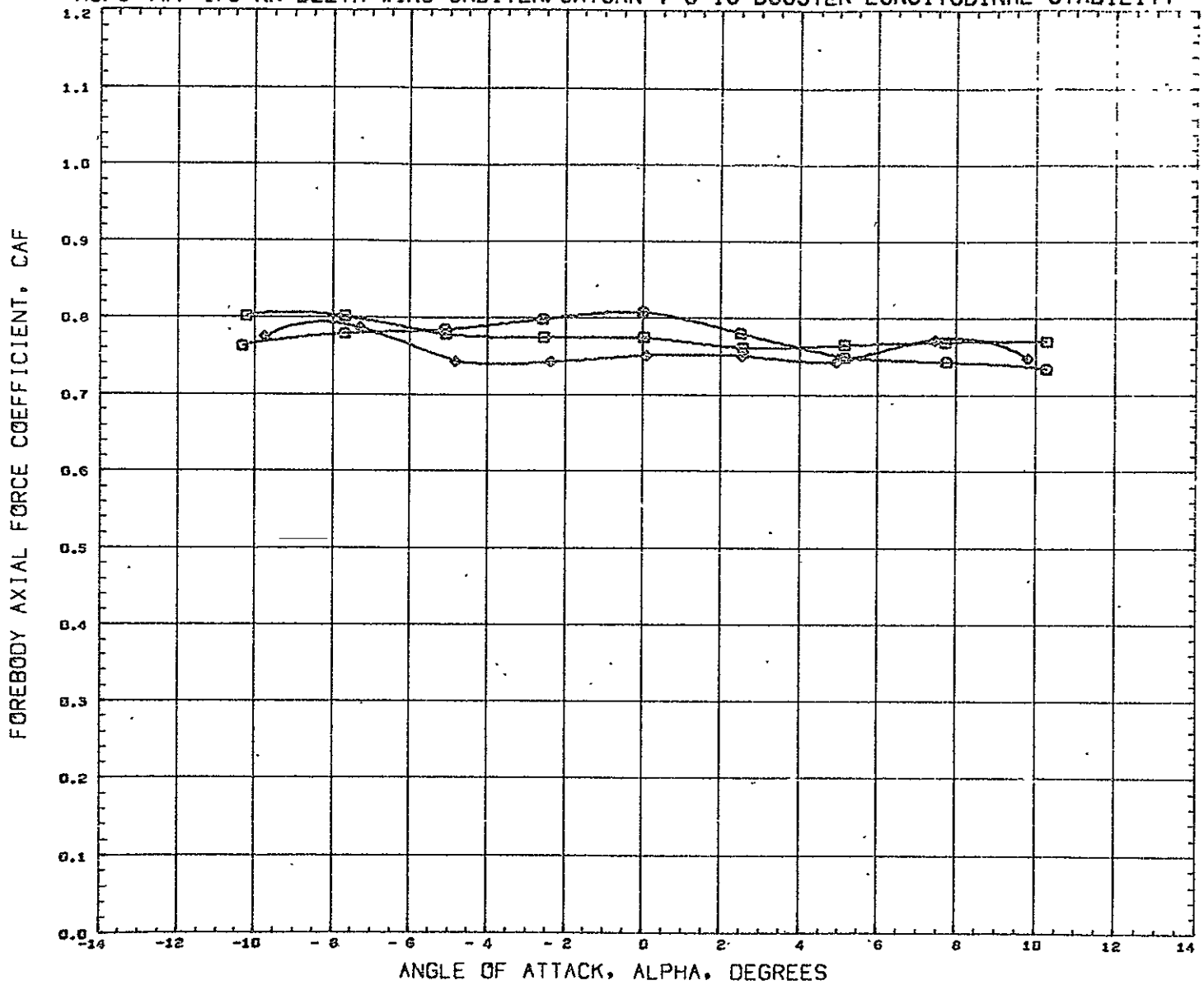
SYMBOL	MACH		PARAMETRIC VALUES		
○	0.600	BETA	0.020	ORBINC	1.000
□	0.898				
◇	0.994				
△	1.105				

DATA HIST. CODE MM

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



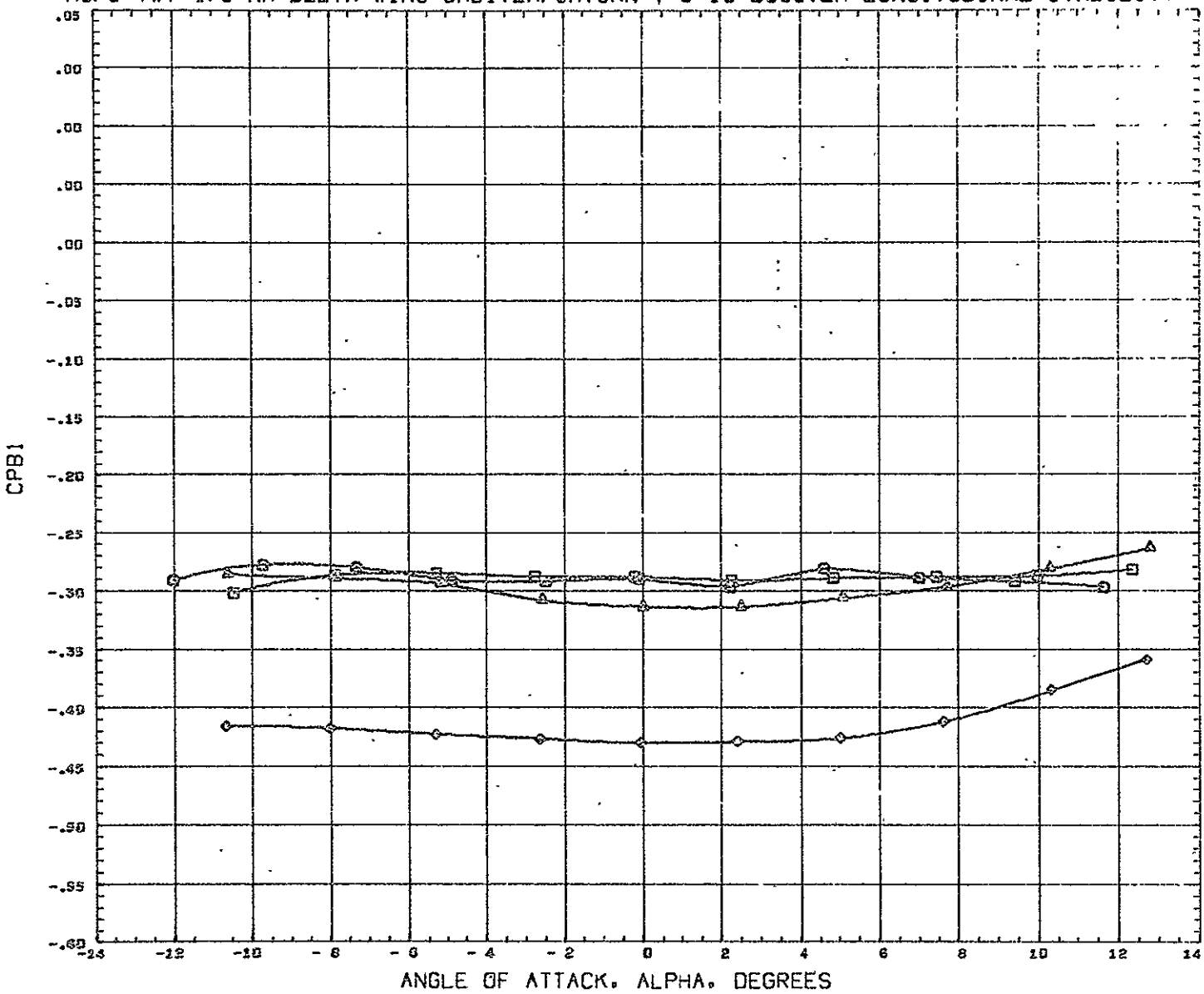
SYMBOL	MACH	PARAMETRIC VALUES			
○	1.198	BETA	0.020	ORBINC	1.000
□	1.465				
◇	1.952				

DATA HIST. CODE MH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH		PARAMETRIC VALUES		
○	0.600	BETA	0.020	ORBINC	1.000
□	0.898				
◇	0.994				
△	1.106				

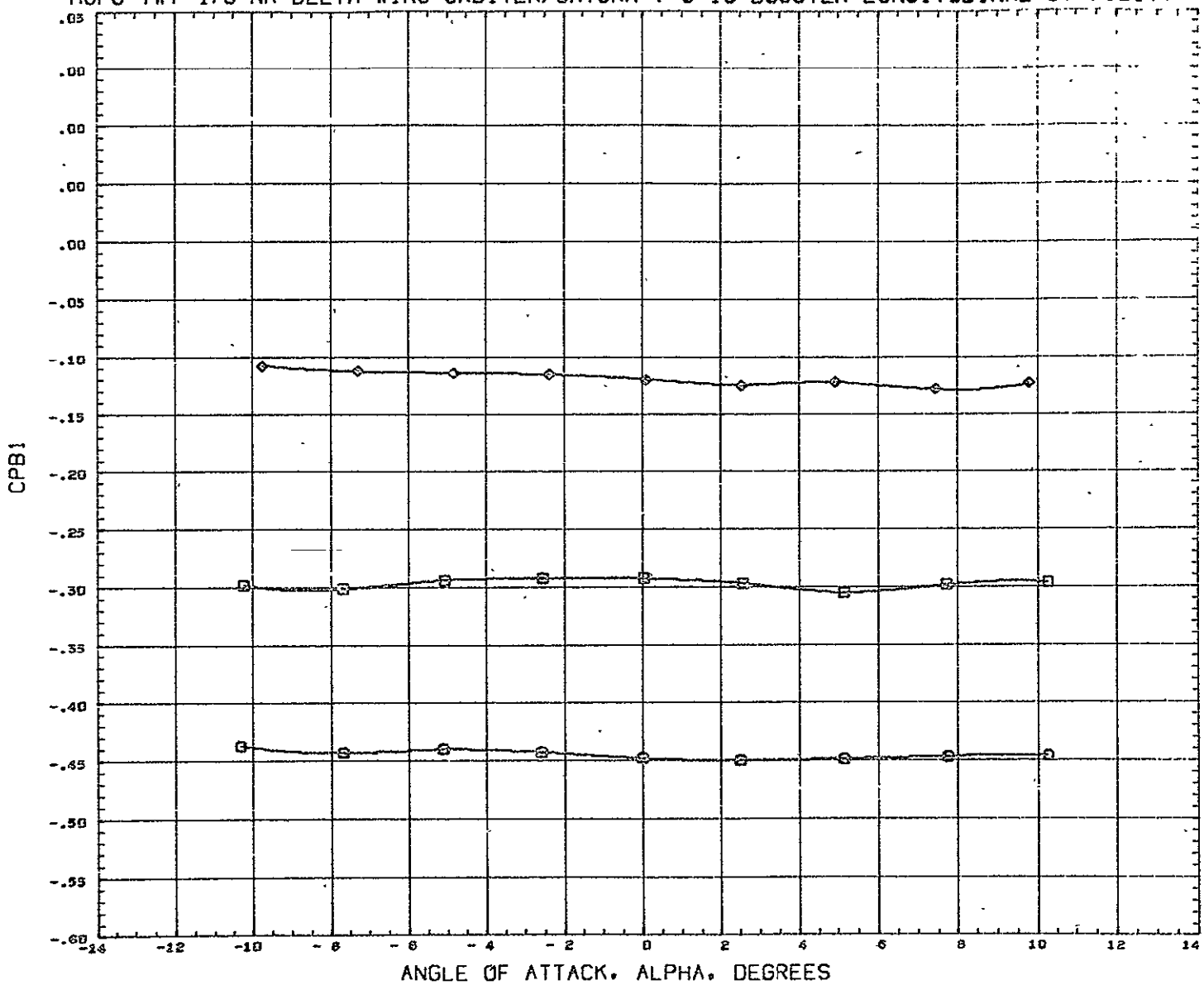
DATA HIST. CODE HH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17 (R25021) 08 JAN 71 PAGE 7

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH		PARAMETRIC VALUES		
○	1.198	BETA	0.020	ORBINC	1.000
□	1.465				
◇	1.952				

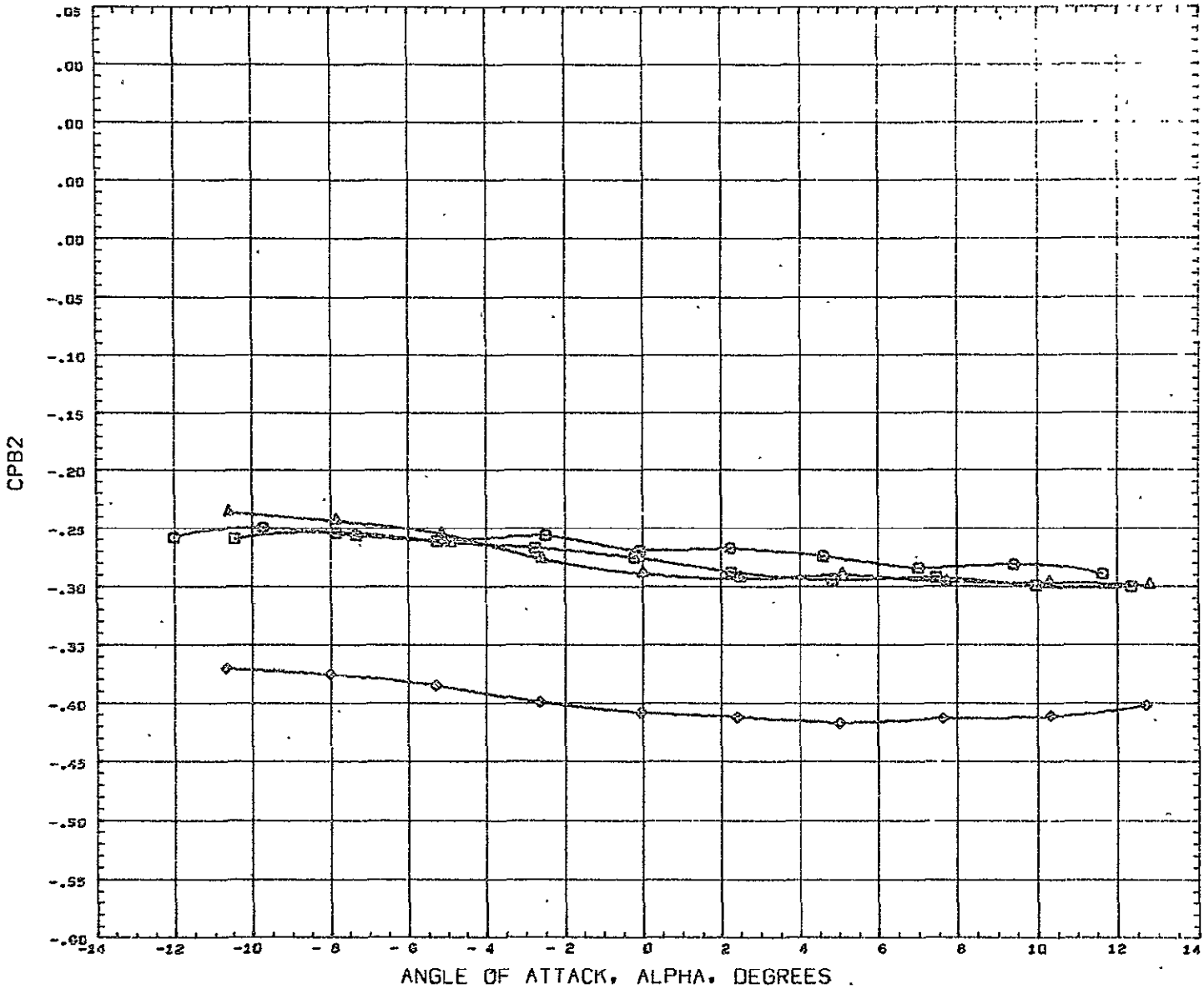
DATA HIST. CODE NM

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17 (R25021) 08 JAN 71 PAGE 8

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES			
○	0.600	BETA	0.020	ORBINC	1.000
□	0.898				
◇	0.994				
△	1.106				

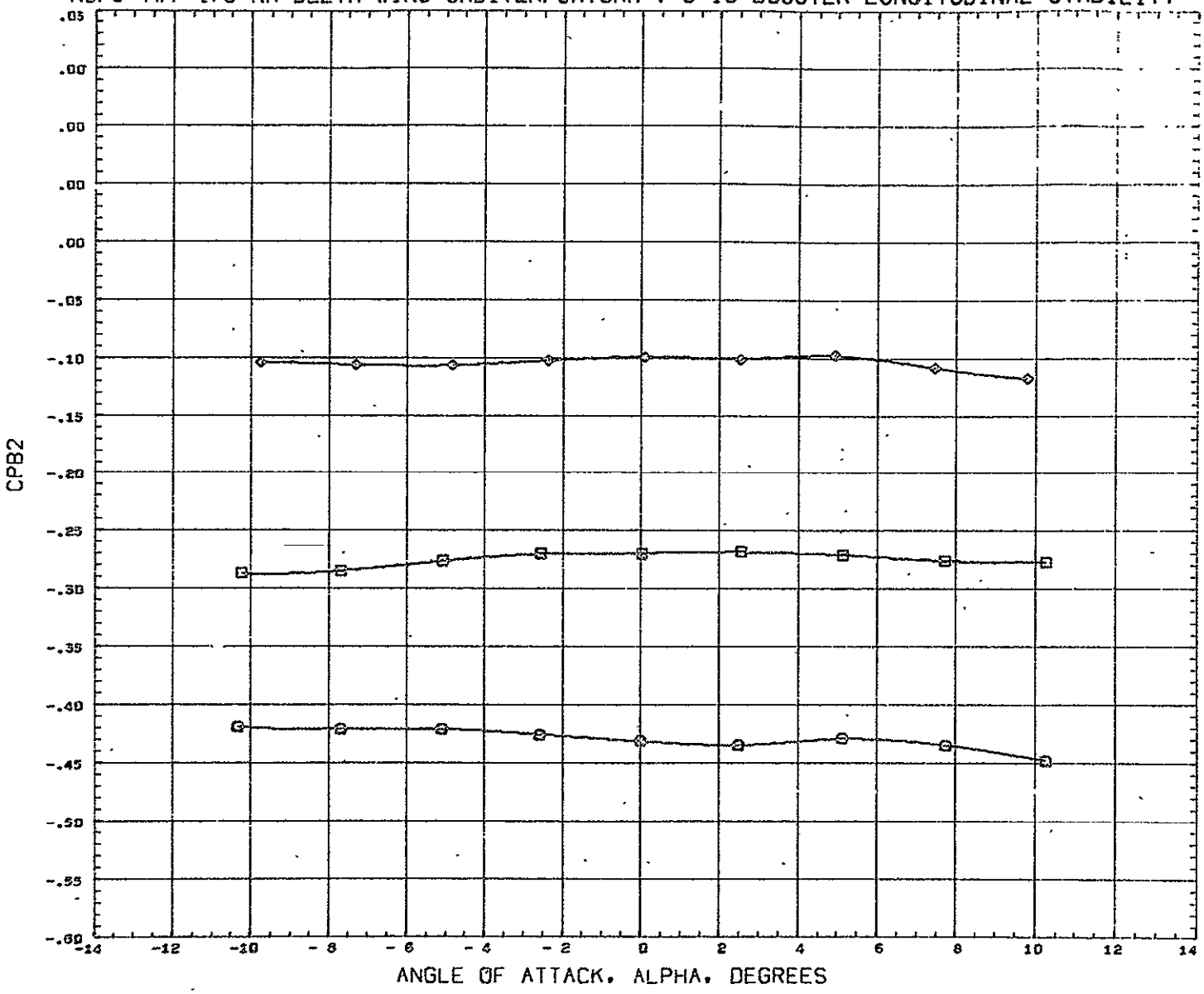
DATA HIST. CODE NH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

2.4

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH		PARAMETRIC VALUES		
○	1.198	BETA	0.020	ORBINC	1.000
□	1.465				
◇	1.952				

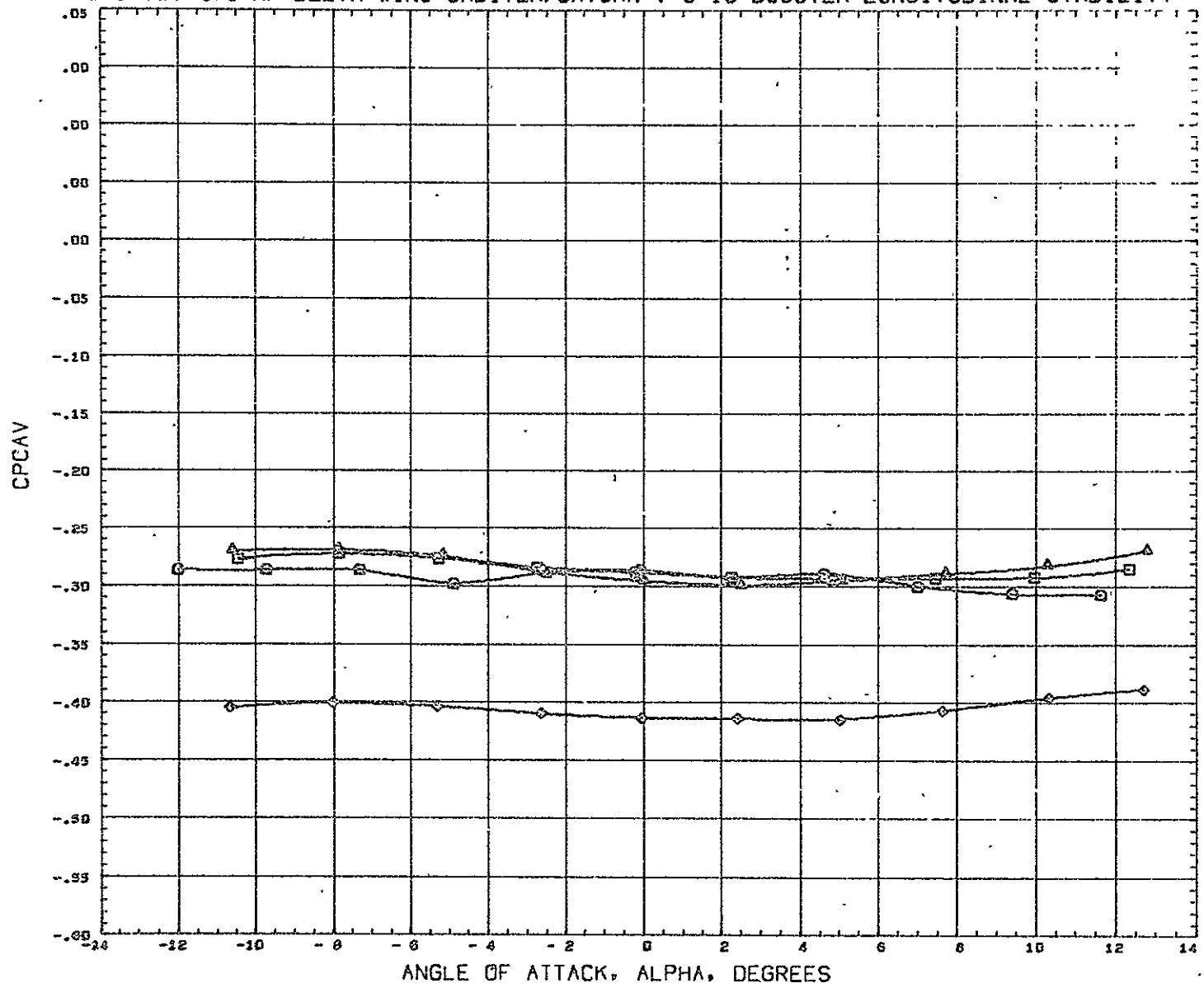
DATA HIST. CODE NH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17 (R25021) 08 JAN 71 PAGE 10

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



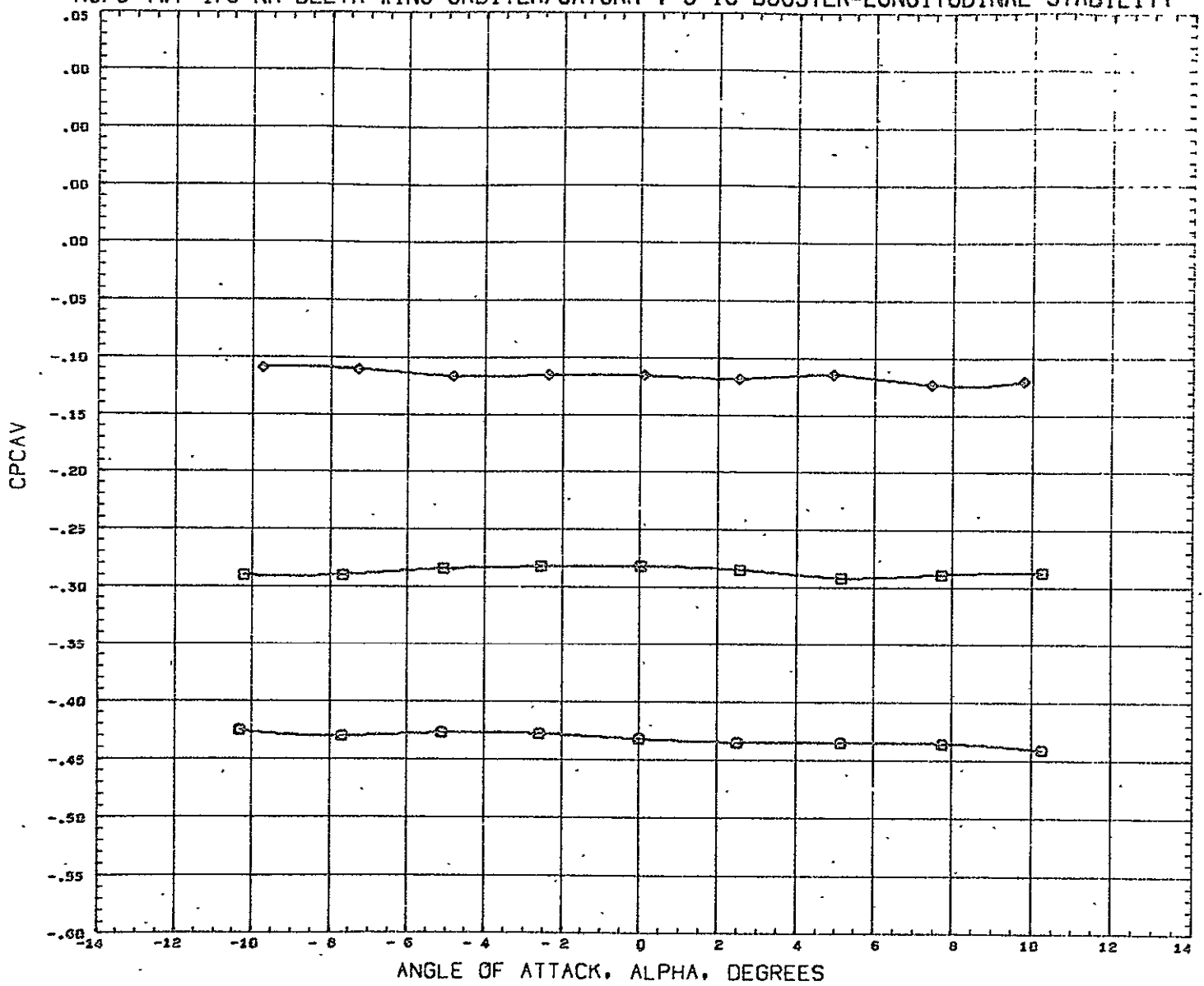
SYMBOL	MACH		PARAMETRIC VALUES		
○	0.600	BETA	0.020	ORBINC	1.000
□	0.896				
◇	0.904				
△	1.106				

DATA HIST. CODE NH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRF	5.2640	INCHES
YMRF	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



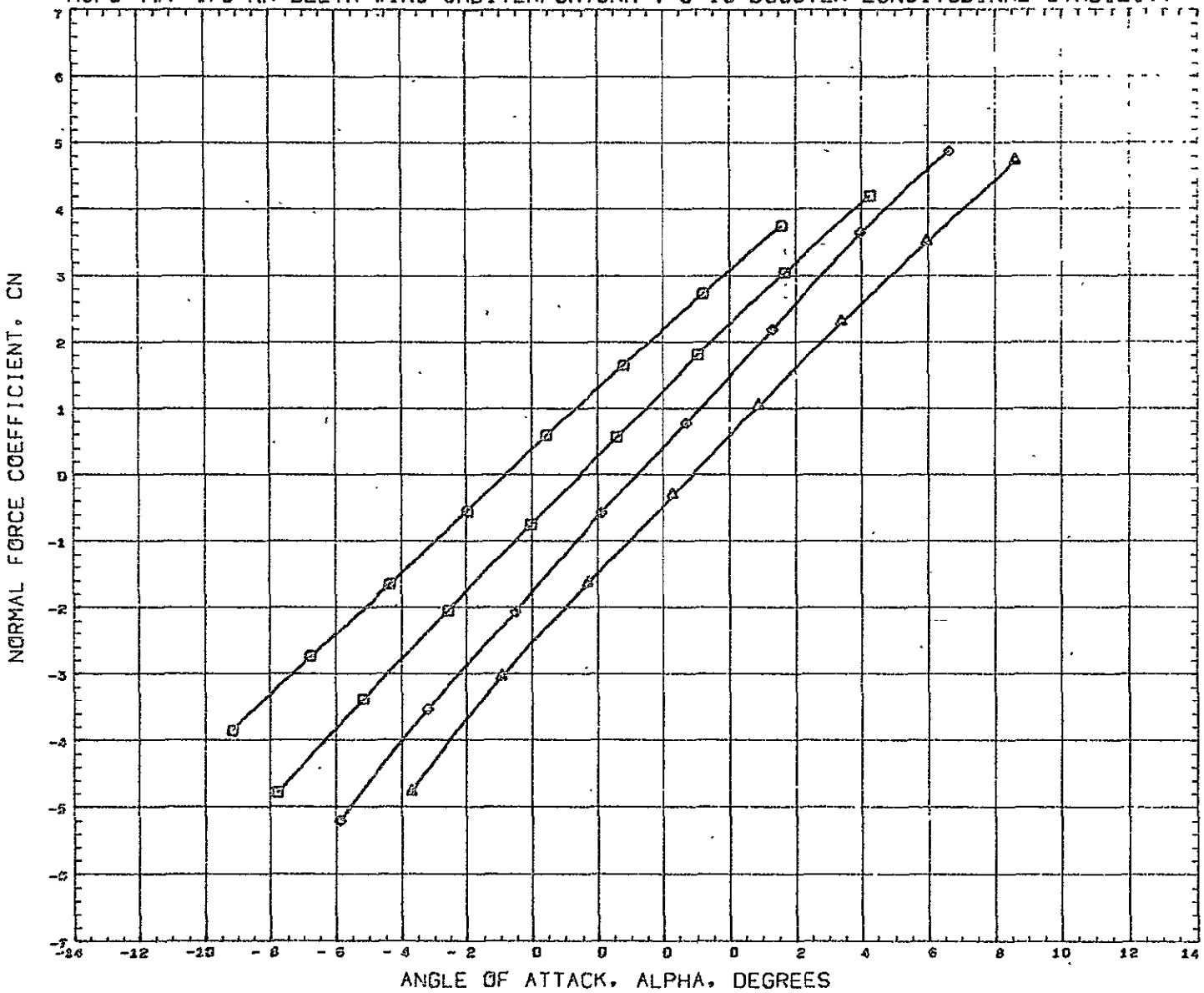
SYMBOL	MACH		PARAMETRIC VALUES		
○	1.198	BETA	0.020	ORBINC	1.000
□	1.465				
◇	1.952				

DATA HIST. CODE HN

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRF	5.2640	INCHES
YMRF	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



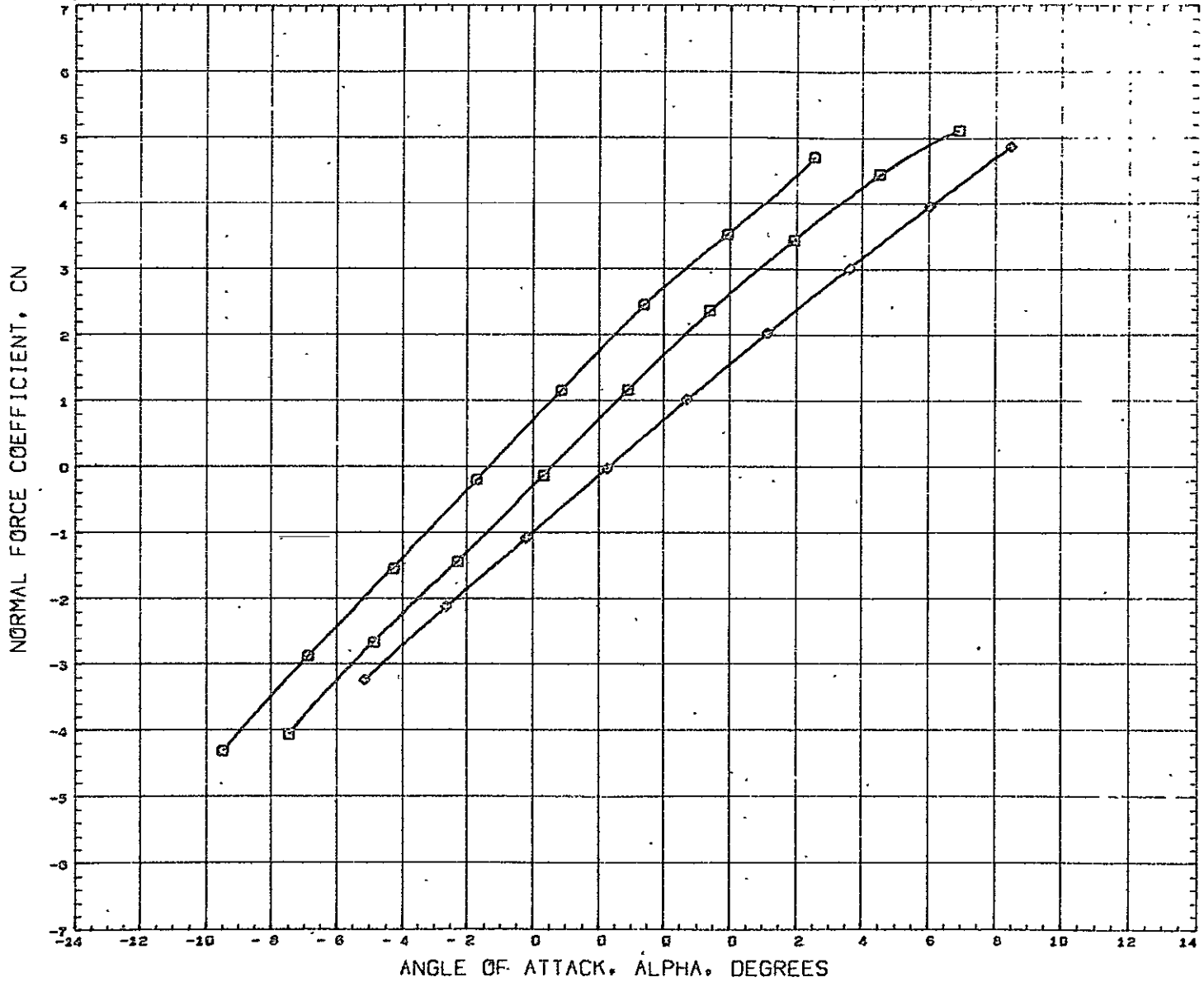
SYMBOL	MACH	PARAMETRIC VALUES			
○	0.599	BETA	- 0.020	ORBINC	4.000
□	0.895				
◇	0.993				
△	1.098				

DATA HIST. CODE MH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



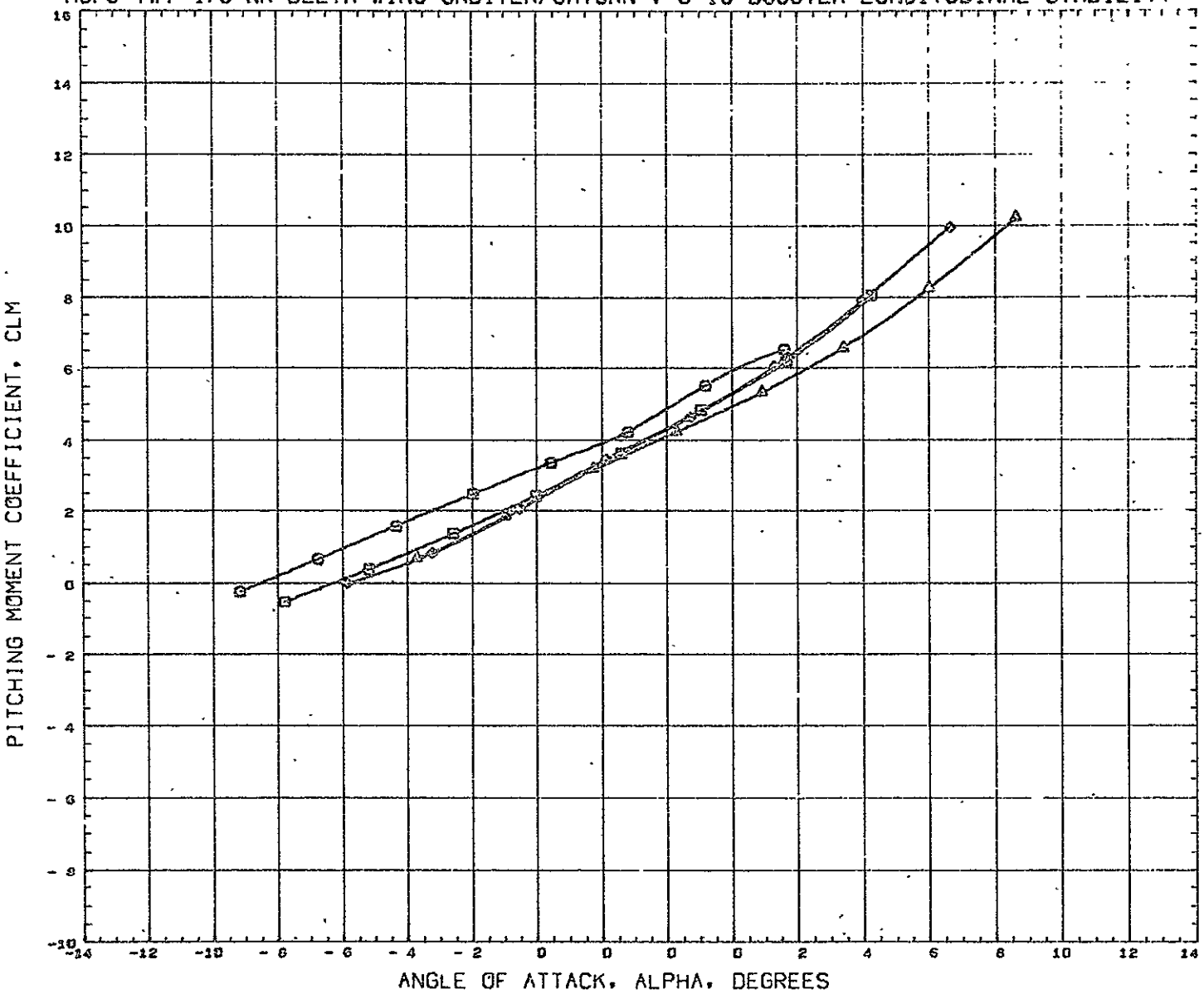
SYMBOL	MACH	PARAMETRIC VALUES			
○	1.200	BETA	- 0.020	ORBINC	4.000
□	1.454				
◇	1.953				

DATA HIST. CODE NH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRF	5.2640	INCHES
YNRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



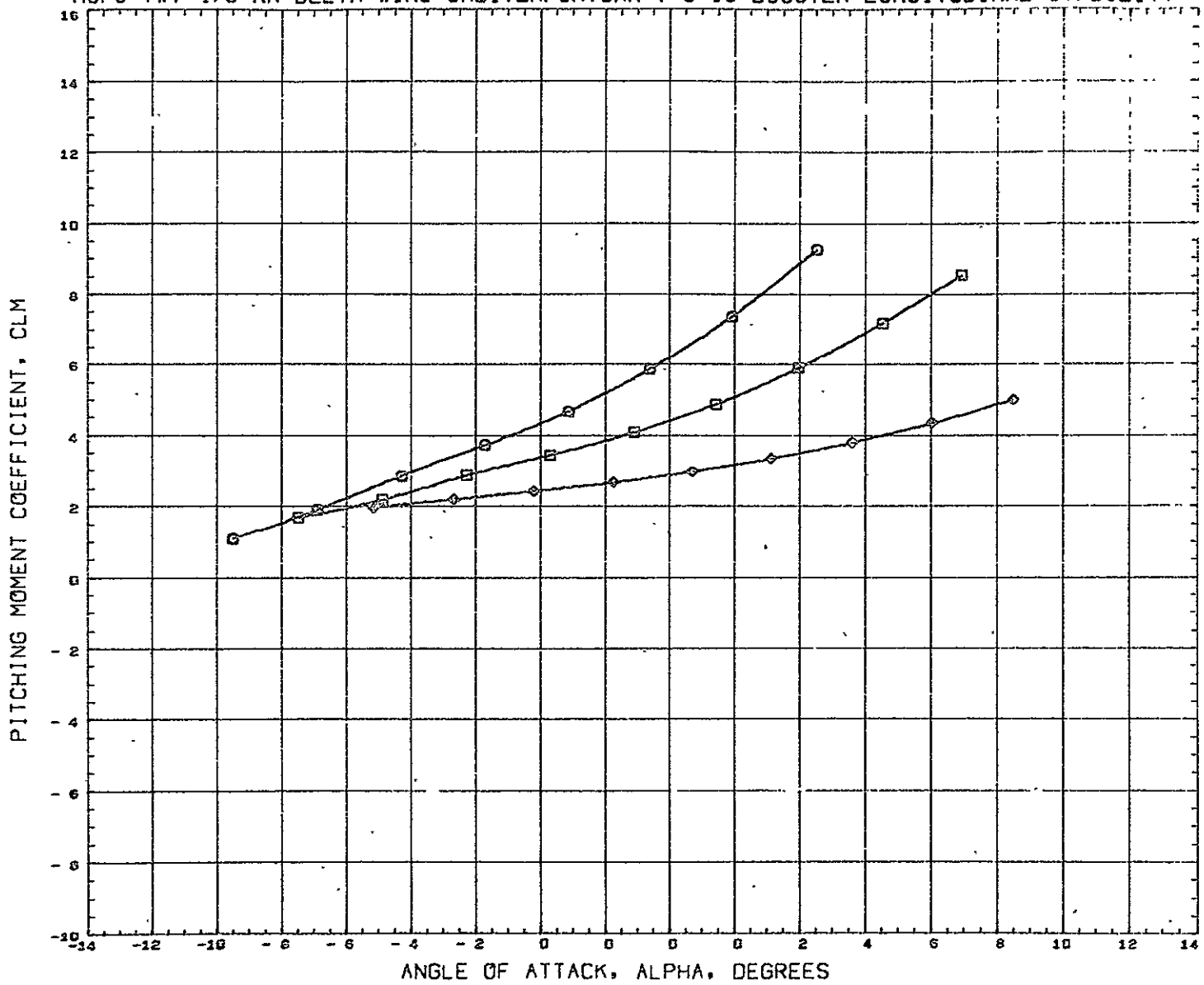
SYMBOL	MACH	PARAMETRIC VALUES			
○	0.599	BETA	- 0.020	ORBINC	4.000
□	0.895				
◇	0.993				
△	1.098				

DATA HIST. CODE HH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V-S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES			
○	1.200	BETA	- 0.020	ORBINC	4.000
□	1.454				
◇	1.953				

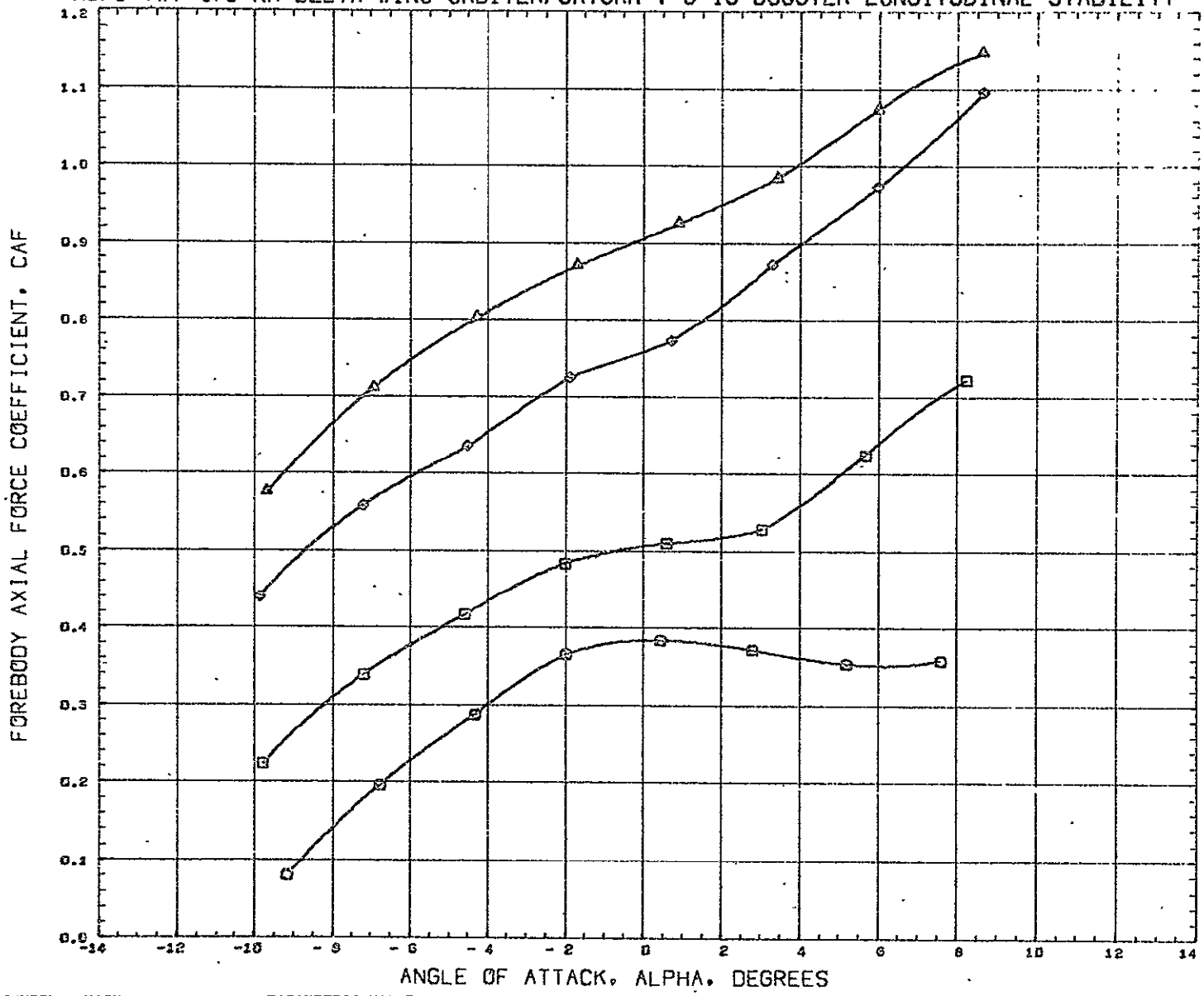
DATA HIST. CODE MM

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17 (R25031) 14 JAN 71 PAGE 16

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



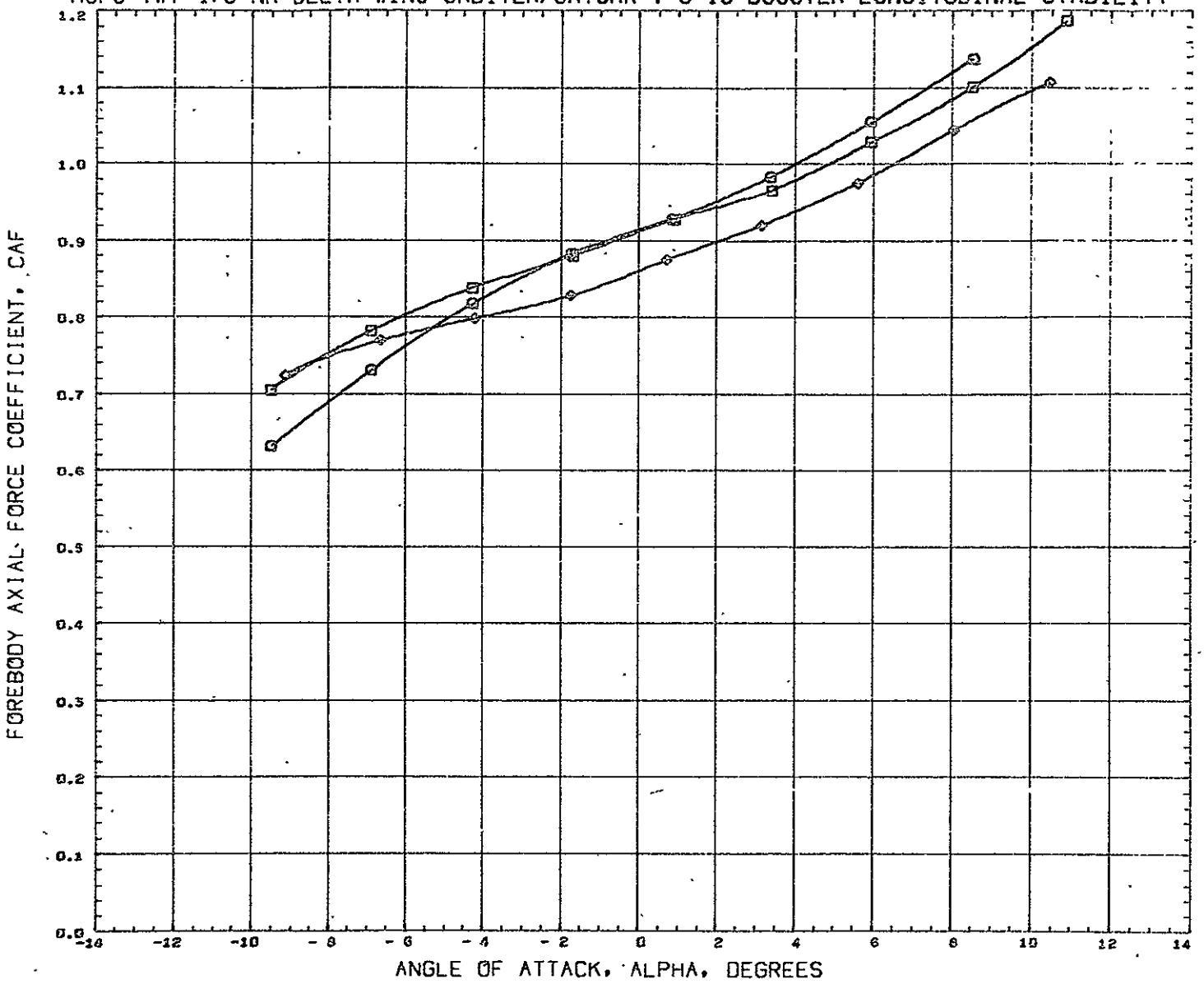
SYMBOL	MACH	PARAMETRIC VALUES			
○	0.599	BETA	- 0.020	ORBINC	4.000
□	0.895				
◇	0.993				
△	1.098				

DATA HIST. CODE HH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



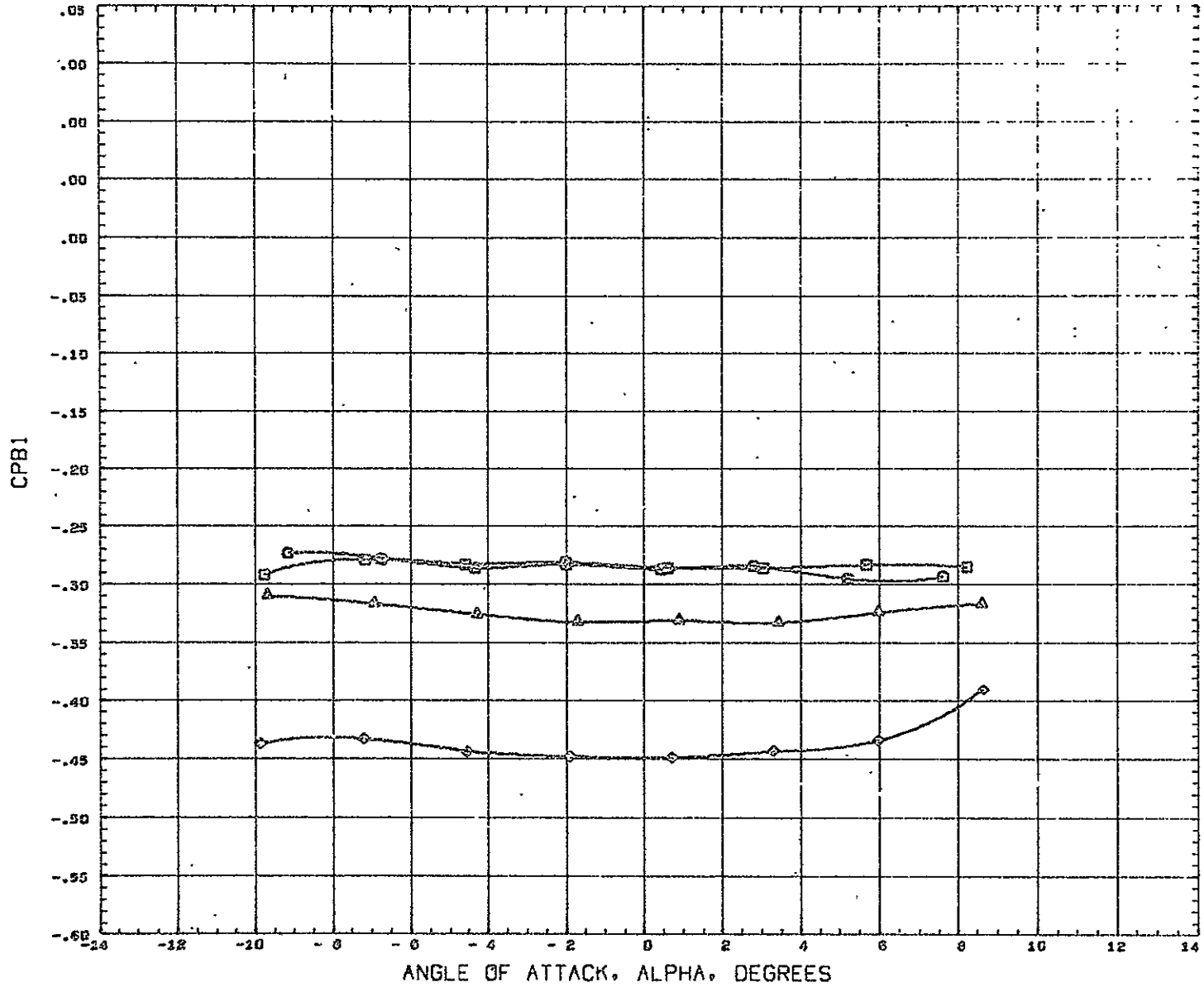
SYMBOL	MACH	PARAMETRIC VALUES			
○	1.200	BETA	- 0.020	ORBINC	4.000
□	1.454				
◇	1.953				

DATA HIST. CODE HH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER-LØNGITUDINAL STABILITY



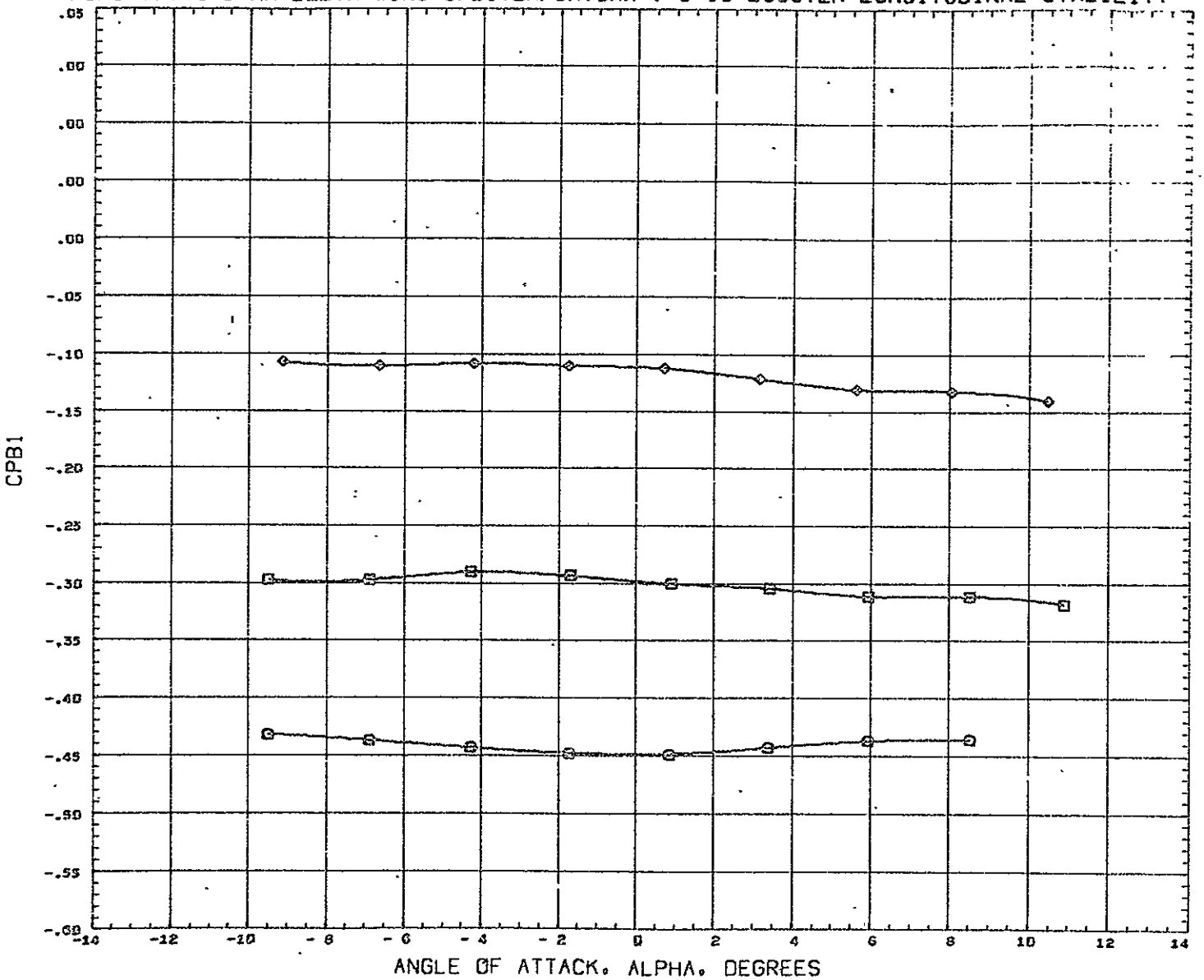
SYMBOL	MACH	PARAMETRIC VALUES			
○	0.599	BETA	- 0.020	ORBINC	4.000
□	0.885				
◇	0.993				
△	1.096				

DATA HIST. CODE HH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRF	5.2640	INCHES
YMRF	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



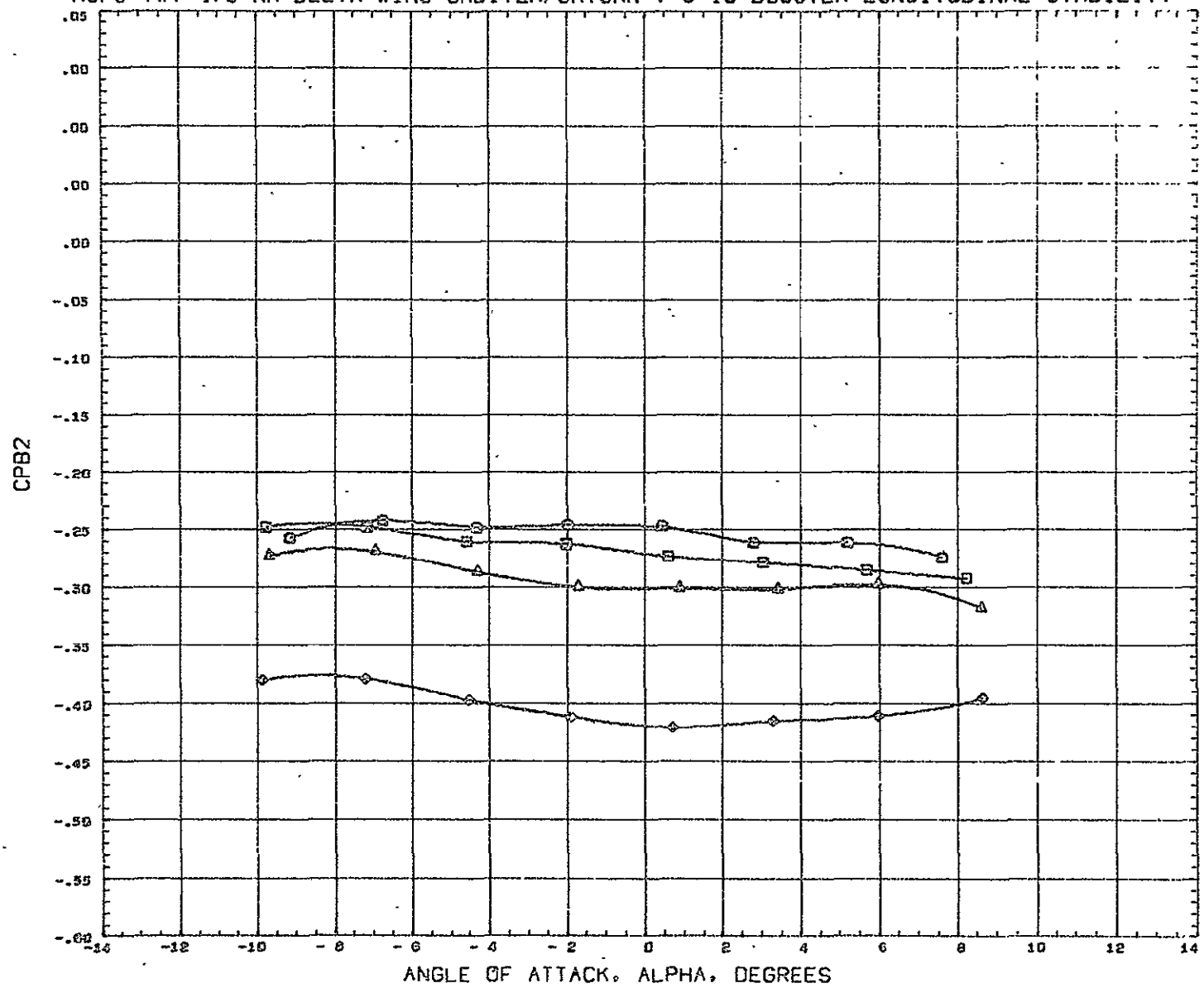
SYMBOL	MACH		PARAMETRIC VALUES		
○	1.200	BETA	- 0.020	ORBINC	4.000
□	1.454				
◇	1.953				

DATA HIST. CODE HH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



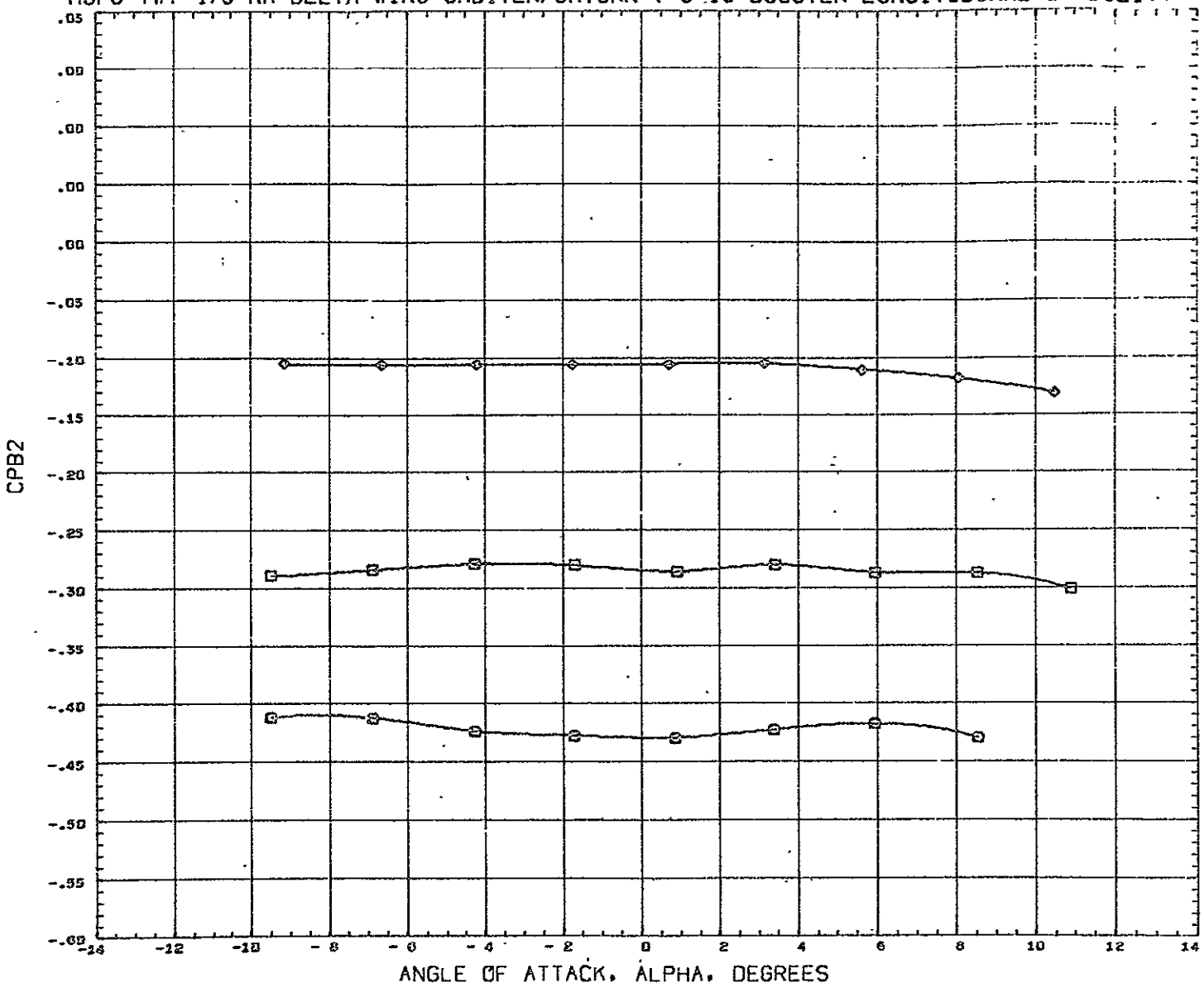
SYMBOL	MACH	PARAMETRIC VALUES			
○	0.599	BETA	- 0.020	ORBINC	4.000
□	0.893				
◇	0.993				
△	1.098				

DATA HIST. CODE HH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER-LØNGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES			
○	1.200	BETA	- 0.020	ØRBINC	4.000
□	1.454				
◇	1.953				

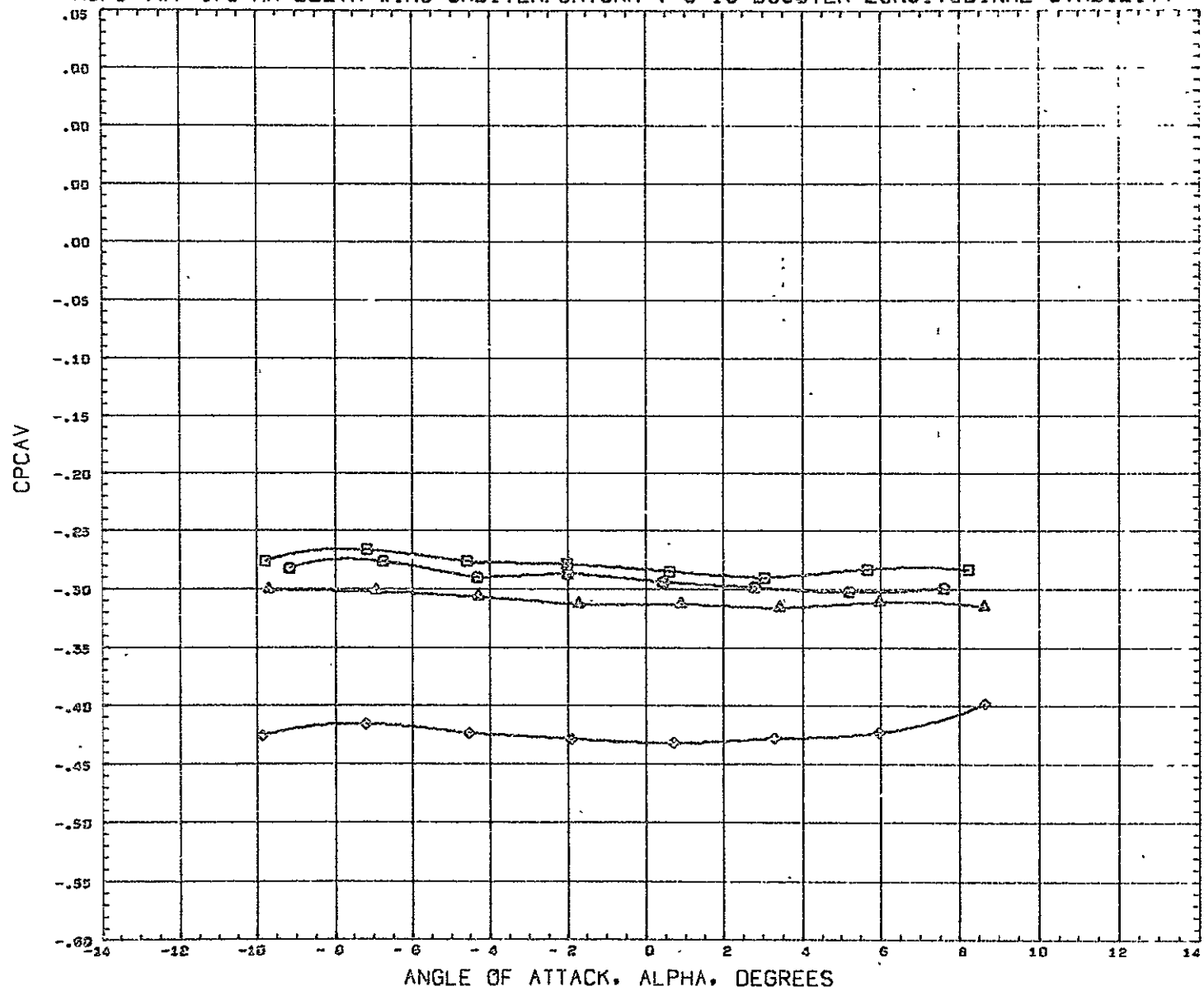
DATA HIST. CODE MH

REFERENCE INFORMATION

REFS	1.396Ø	SQ.IN.
REFL	1.333Ø	INCHES
REFB	1.333Ø	INCHES
XMRP	5.264Ø	INCHES
YMRP	0.0000	INCHES
ZMRP	0.033Ø	INCHES
SCALE	0.0034	

MSFC 476 NR HCRØRB/S-ICBØØSTER BF1S+B5W14E3V17 (R25031) 14 JAN 71 PAGE 22

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



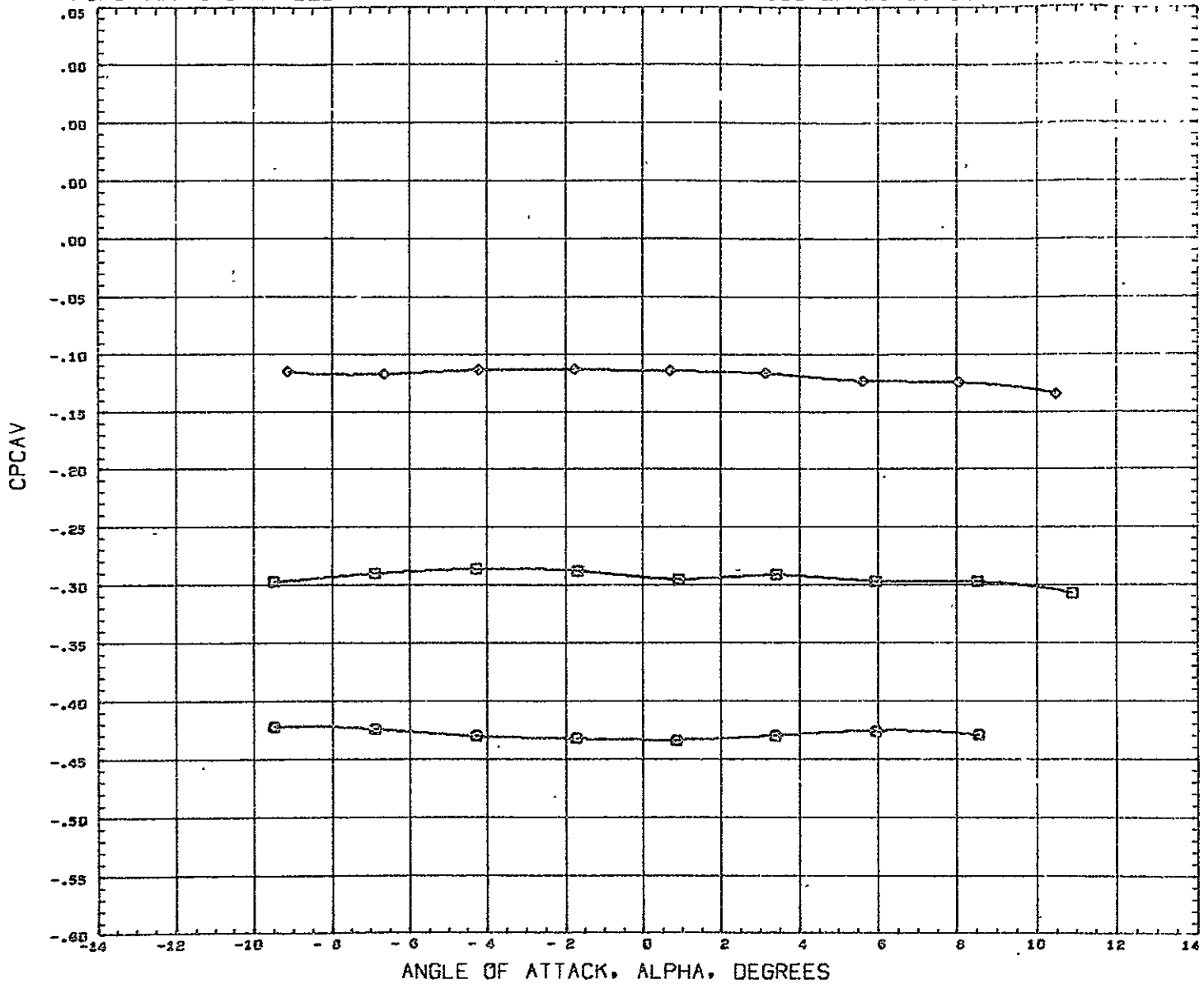
SYMBOL	MACH	PARAMETRIC VALUES			
○	0.599	BETA	- 0.020	ORBINC	4.000
□	0.895				
◇	0.993				
△	1.098				

DATA HIST. CODE HH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER-LØNGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES			
○	1.200	BETA	- 0.020	ØRBINC	4.000
□	1.454				
◇	1.953				

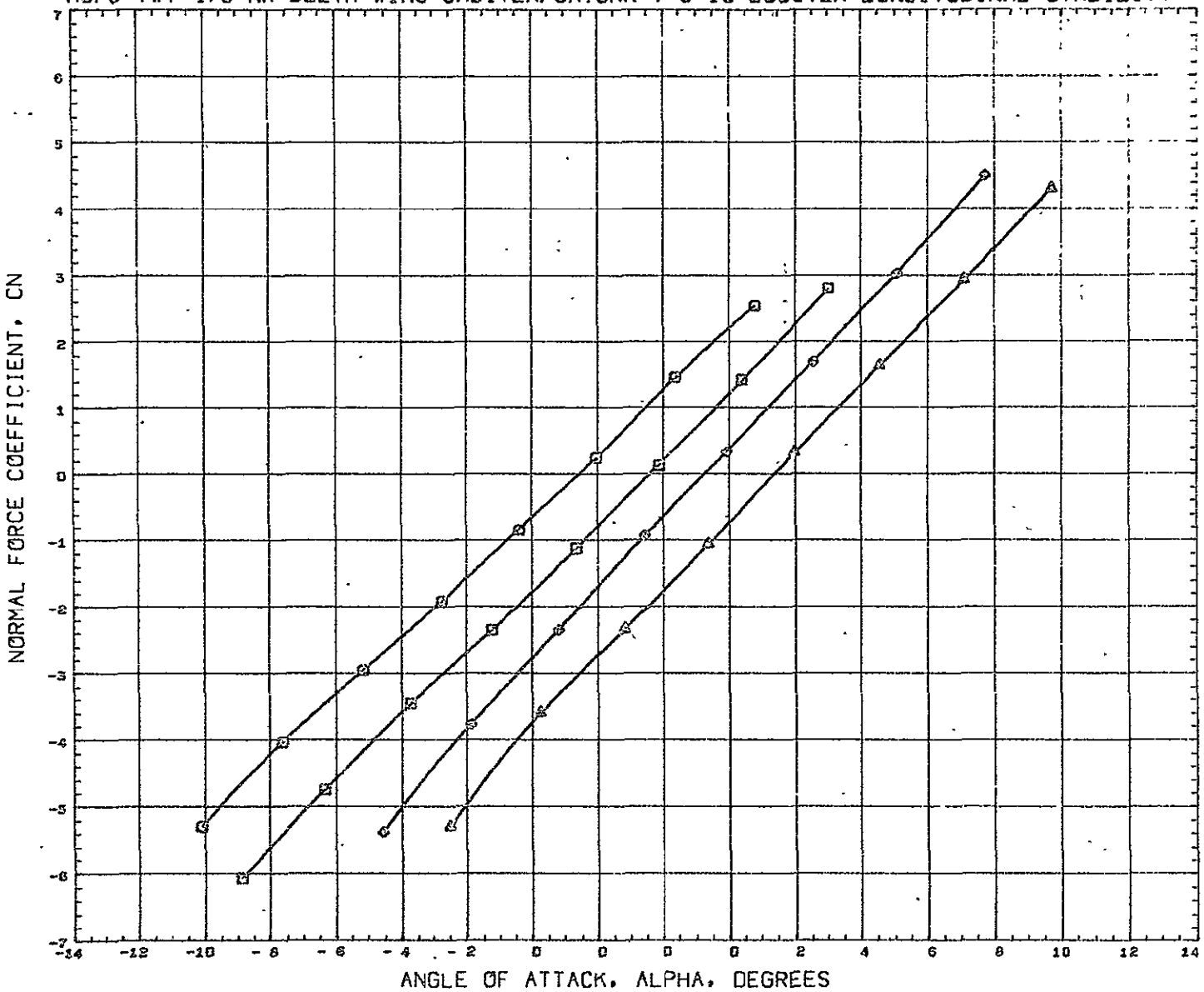
REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE HH

MSFC 476 NR HCRØRB/S-ICBØØSTER BF1S+B5W14E3V17 (R25031) 14 JAN 71 PAGE 24

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



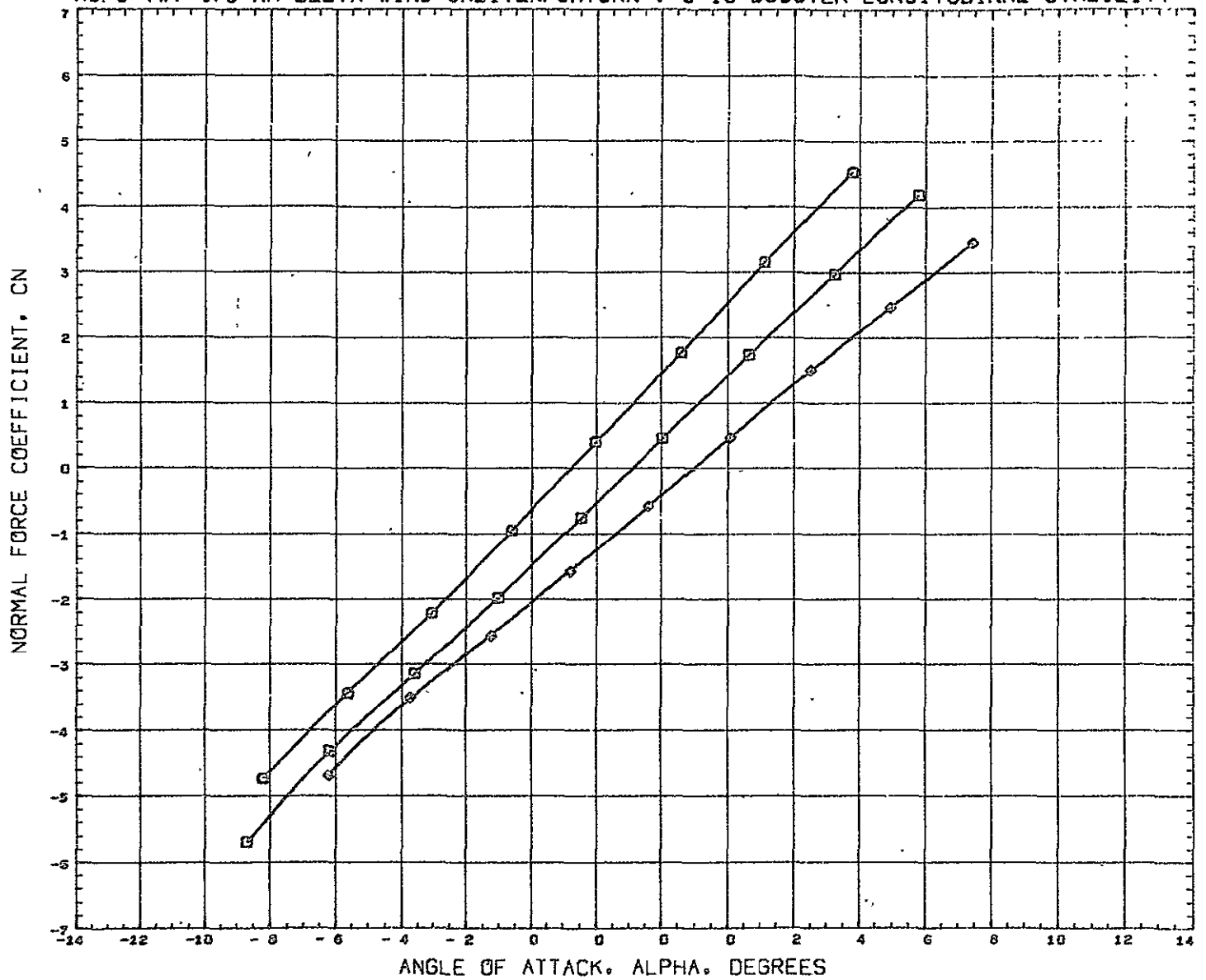
SYMBOL	MACH		PARAMETRIC VALUES		
○	0.599	BETA	0.010	ORBINC	- 2.000
□	0.897				
◇	0.994				
△	1.091				

DATA HIST. CODE HH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH		PARAMETRIC VALUES		
○	1.195	BETA	0.010	ORBINC	- 2.000
□	1.462				
◇	1.955				

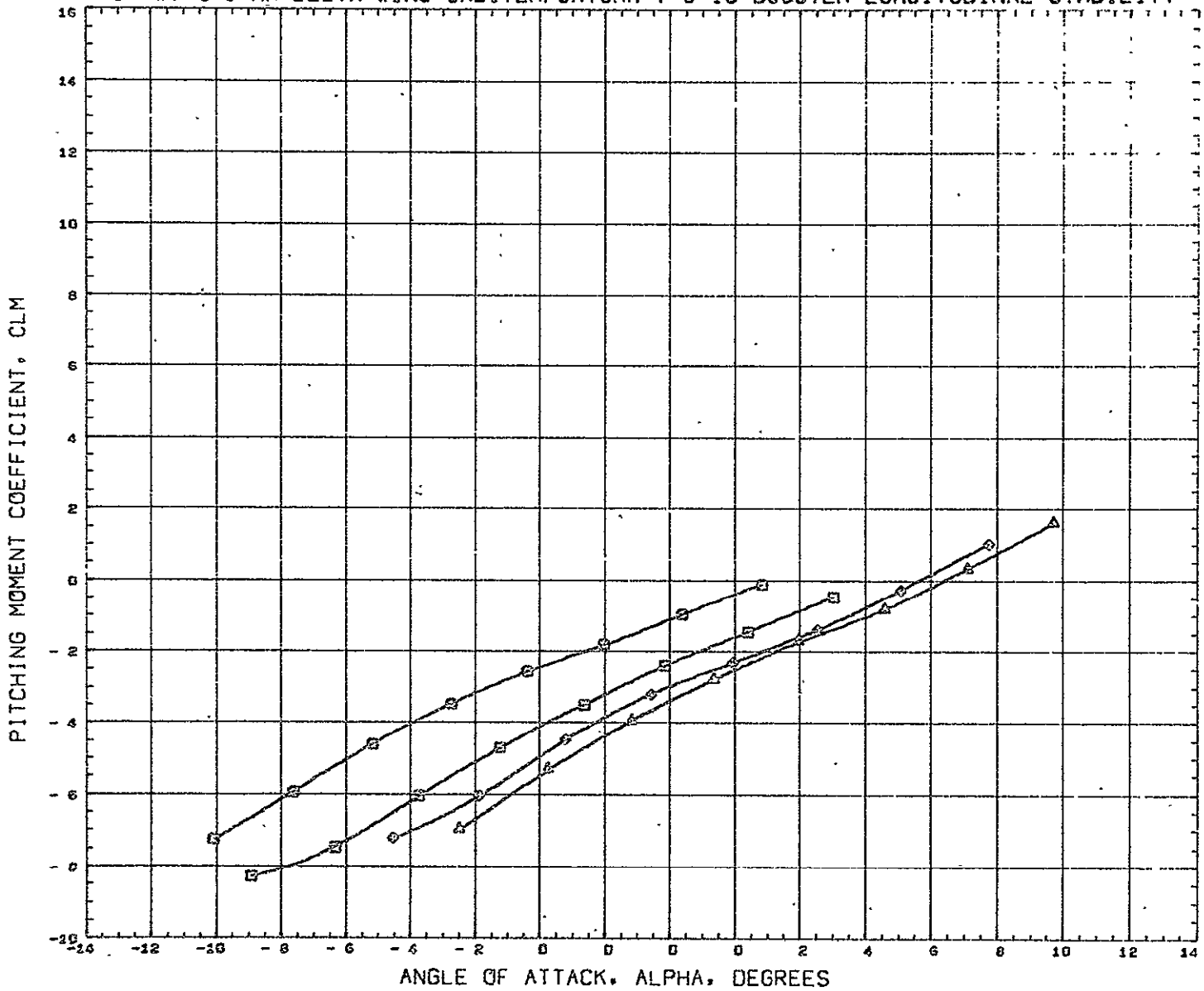
DATA HIST. CODE HH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17 (R25041) 14 JAN 71 PAGE 26

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



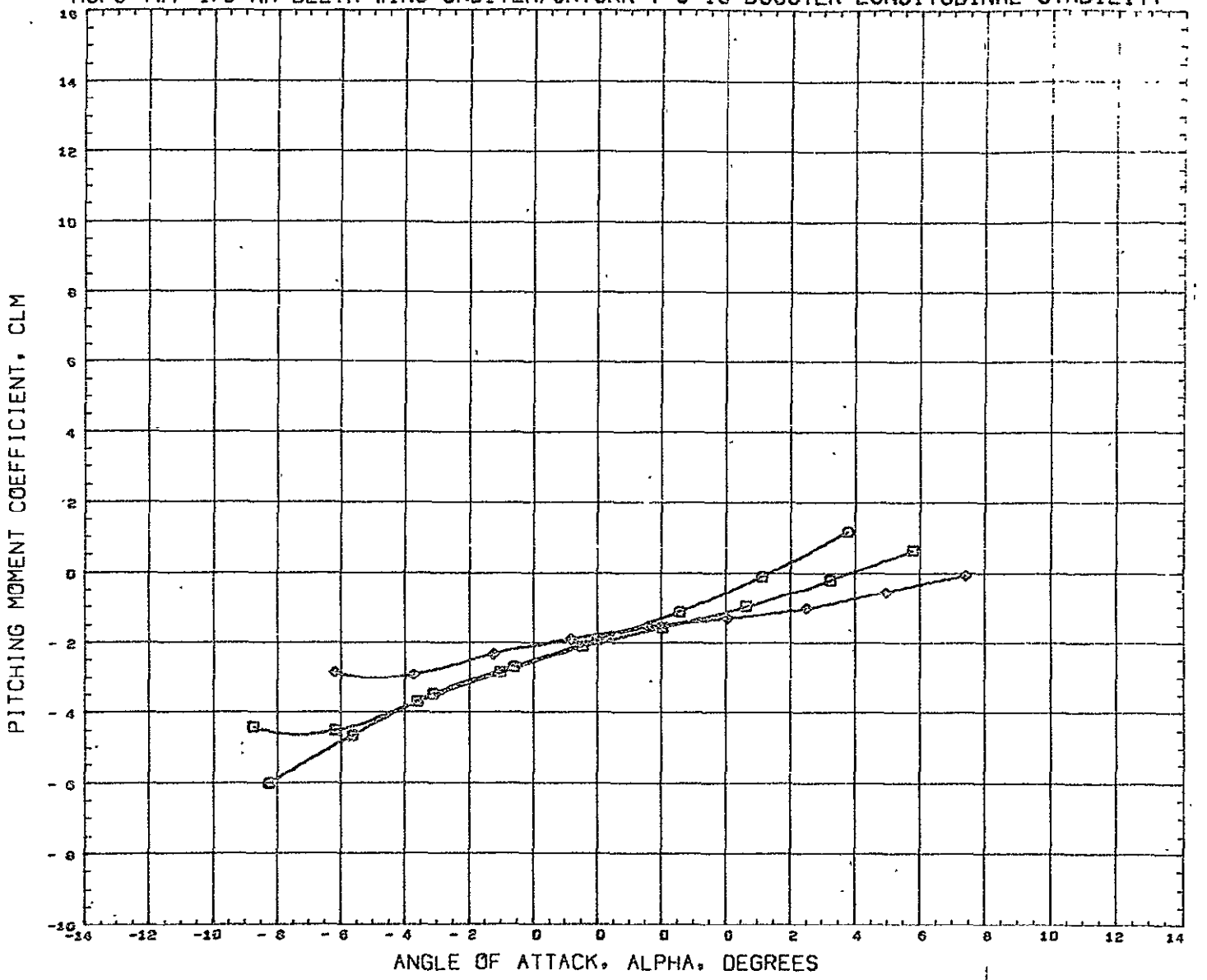
SYMBOL	MACH		PARAMETRIC VALUES		
○	0.599	BETA	0.010	ORBINC	- 2.000
□	0.897				
◇	0.994				
△	1.091				

DATA HIST. CODE HH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRF	5.2640	INCHES
YMRF	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER-LØNGITUDINAL STABILITY



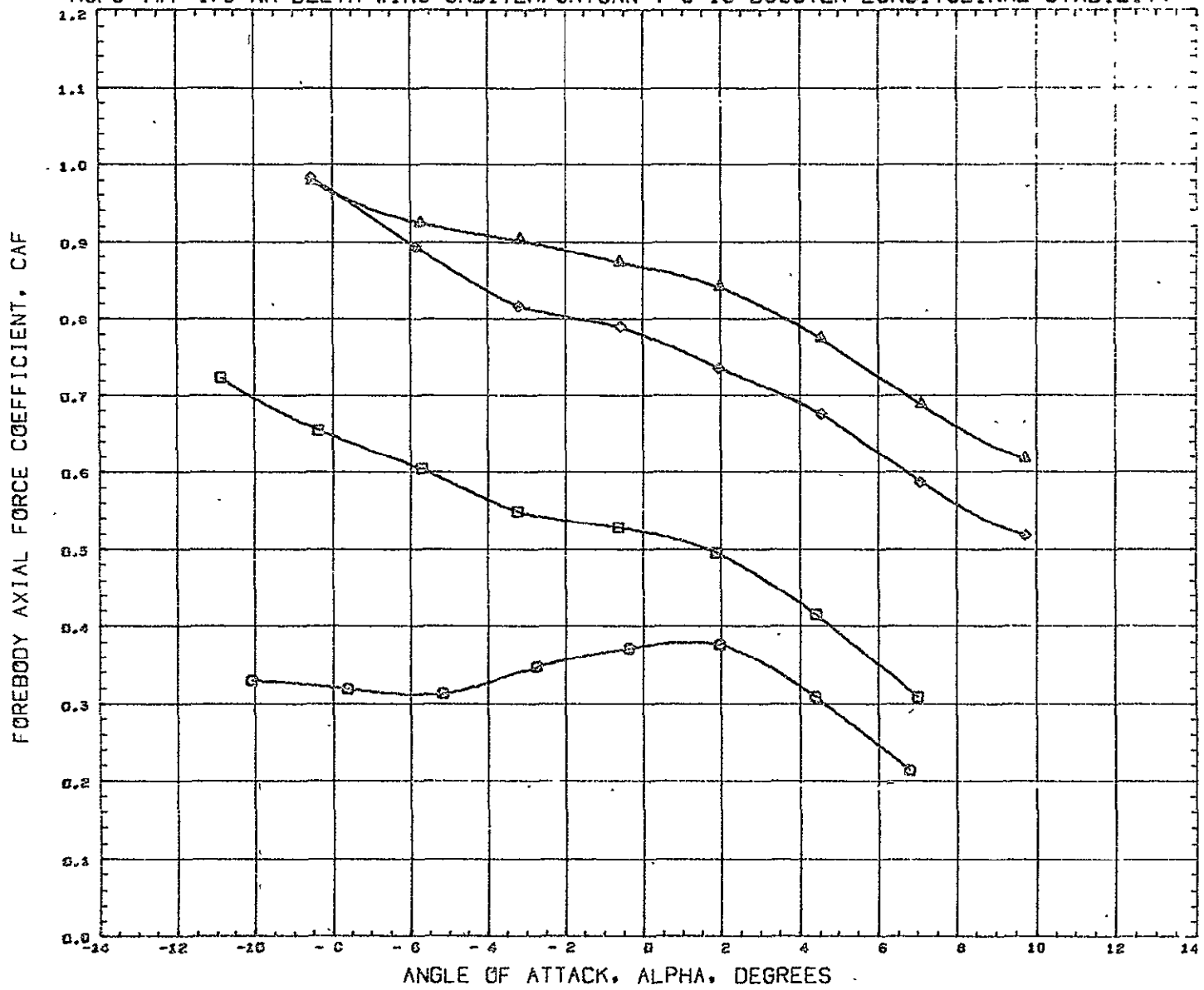
SYMBOL	MACH		PARAMETRIC VALUES		
○	1.195	BETA	0.010	ØRBINC	- 2.000
□	1.462				
◇	1.955				

DATA MIST. CODE MH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH
○	0.599
□	0.897
◇	0.994
△	1.091

PARAMETRIC VALUES

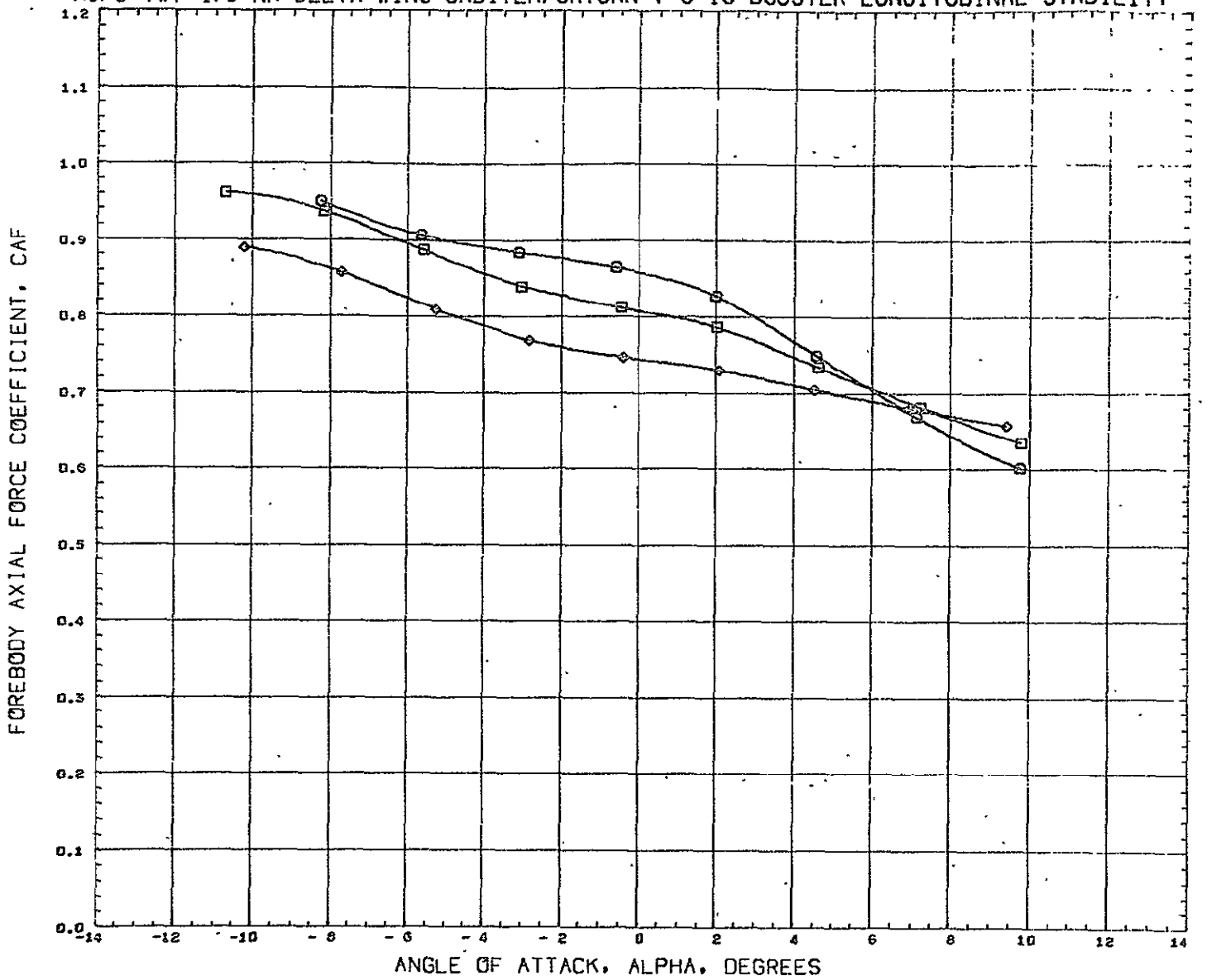
BETA 0.010 ORBINC - 2.000

DATA HIST. CODE HH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



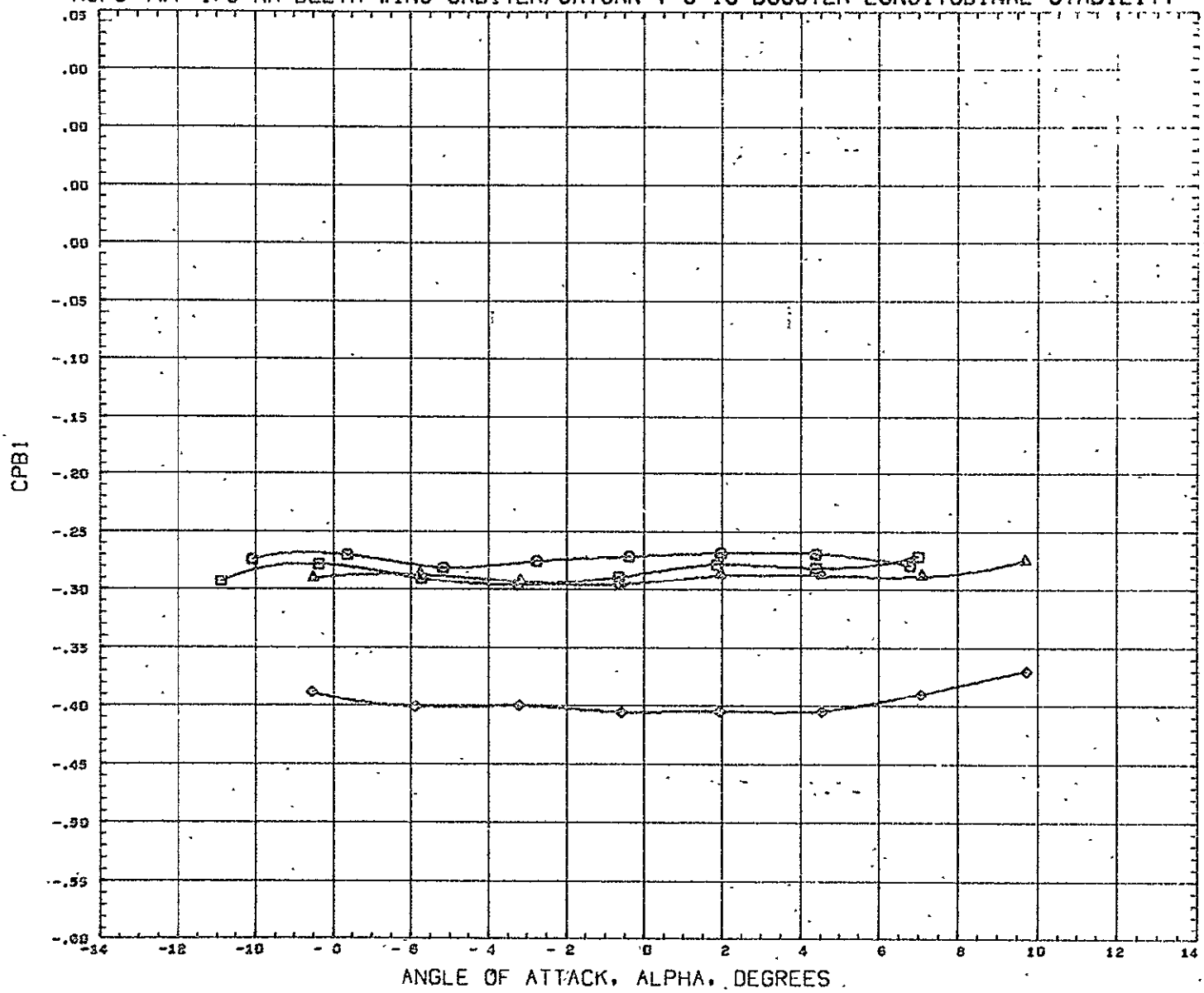
SYMBOL	MACH		PARAMETRIC VALUES		
○	1.195	BETA	0.010	ORBINC	- 2.000
□	1.462				
◇	1.955				

DATA HIST. CODE HH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH		PARAMETRIC VALUES		
○	0.599	BETA	0.010	ORBINC	- 2.000
□	0.897				
◇	0.994				
△	1.091				

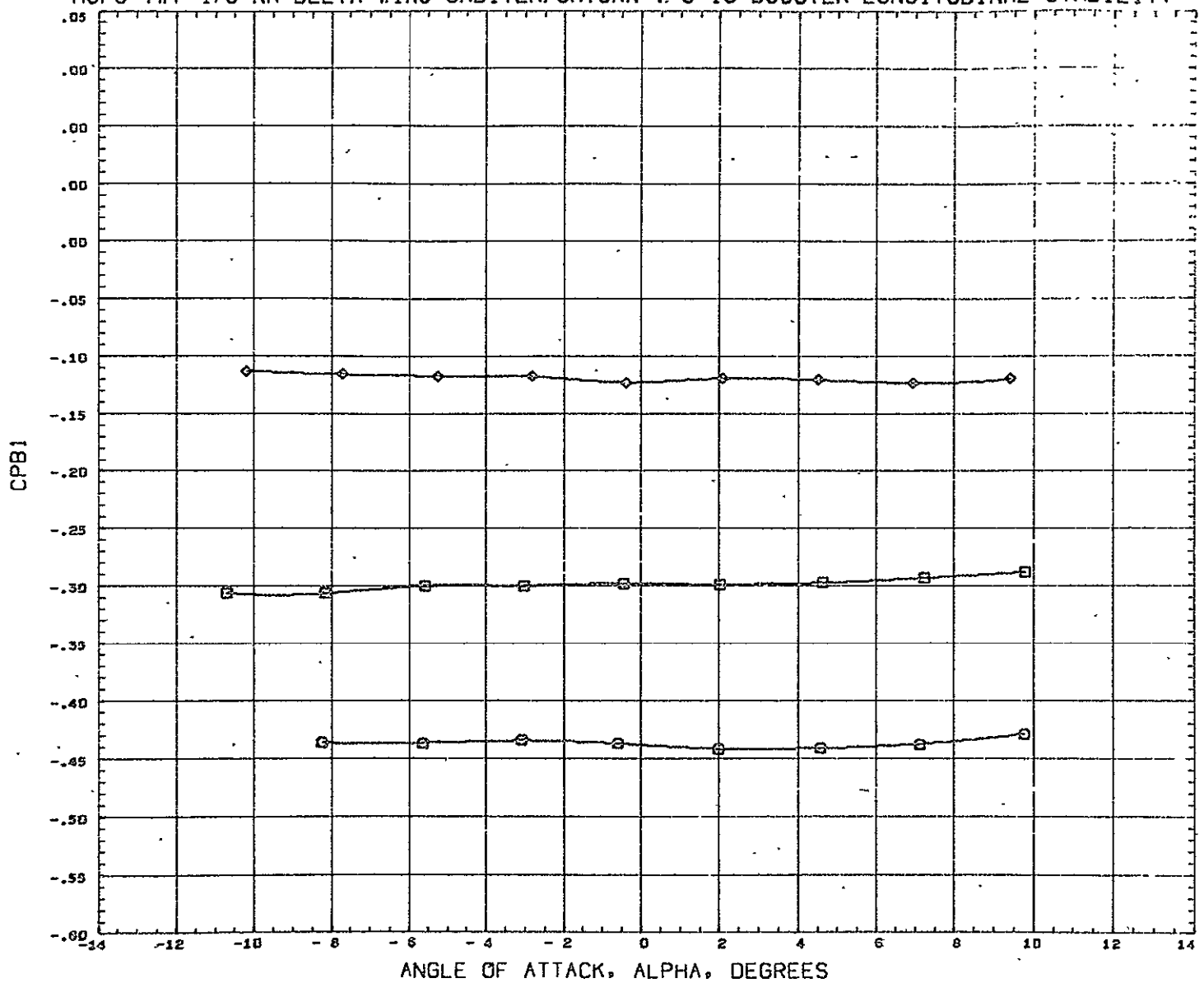
DATA HIST. CODE HH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17 (R25041) 14 JAN 71 PAGE 31

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



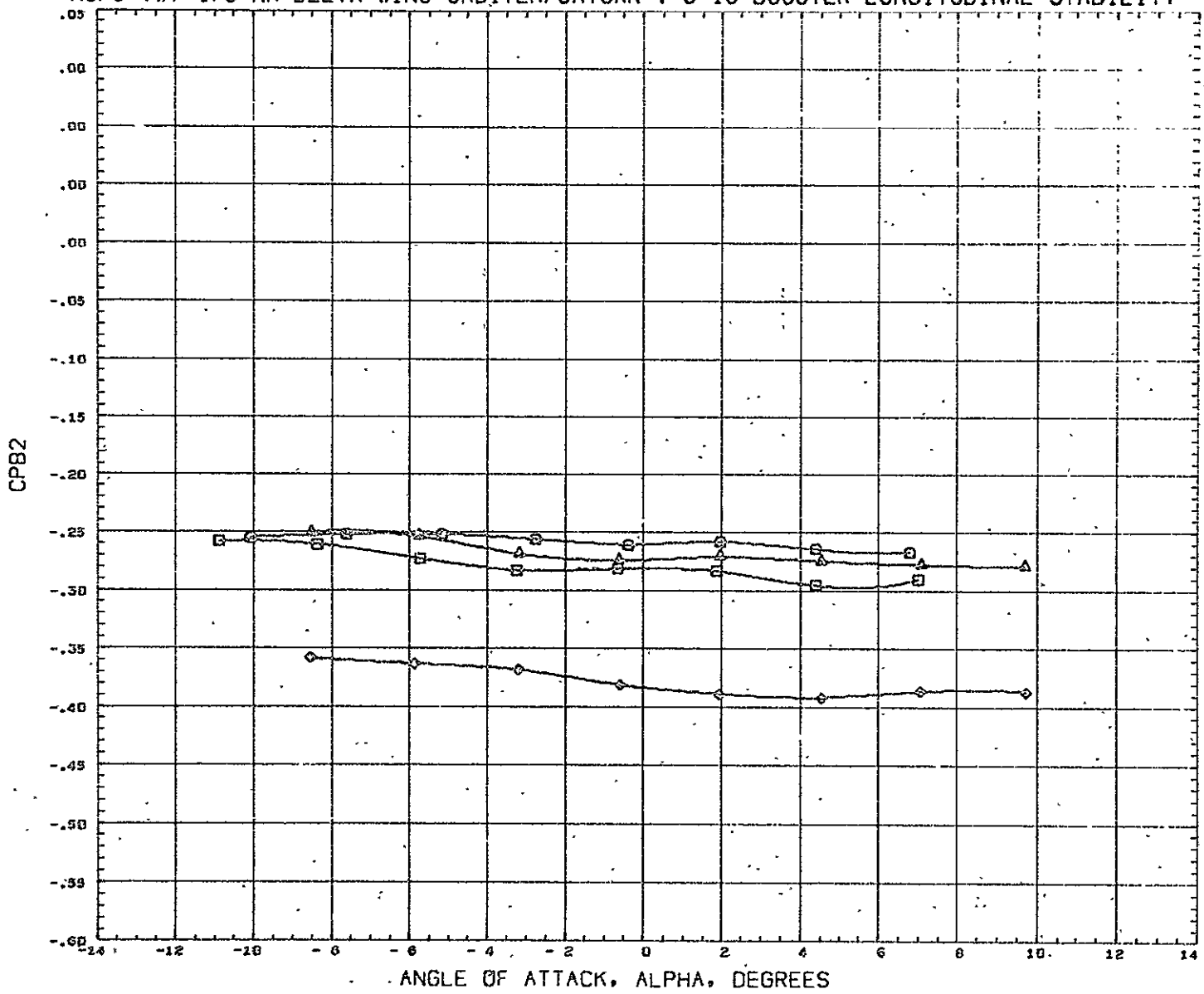
SYMBOL	MACH		PARAMETRIC VALUES		
○	1.195	BETA	0.010	ORBINC	- 2.000
□	1.462				
◇	1.955				

DATA HIST. CODE MH·

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



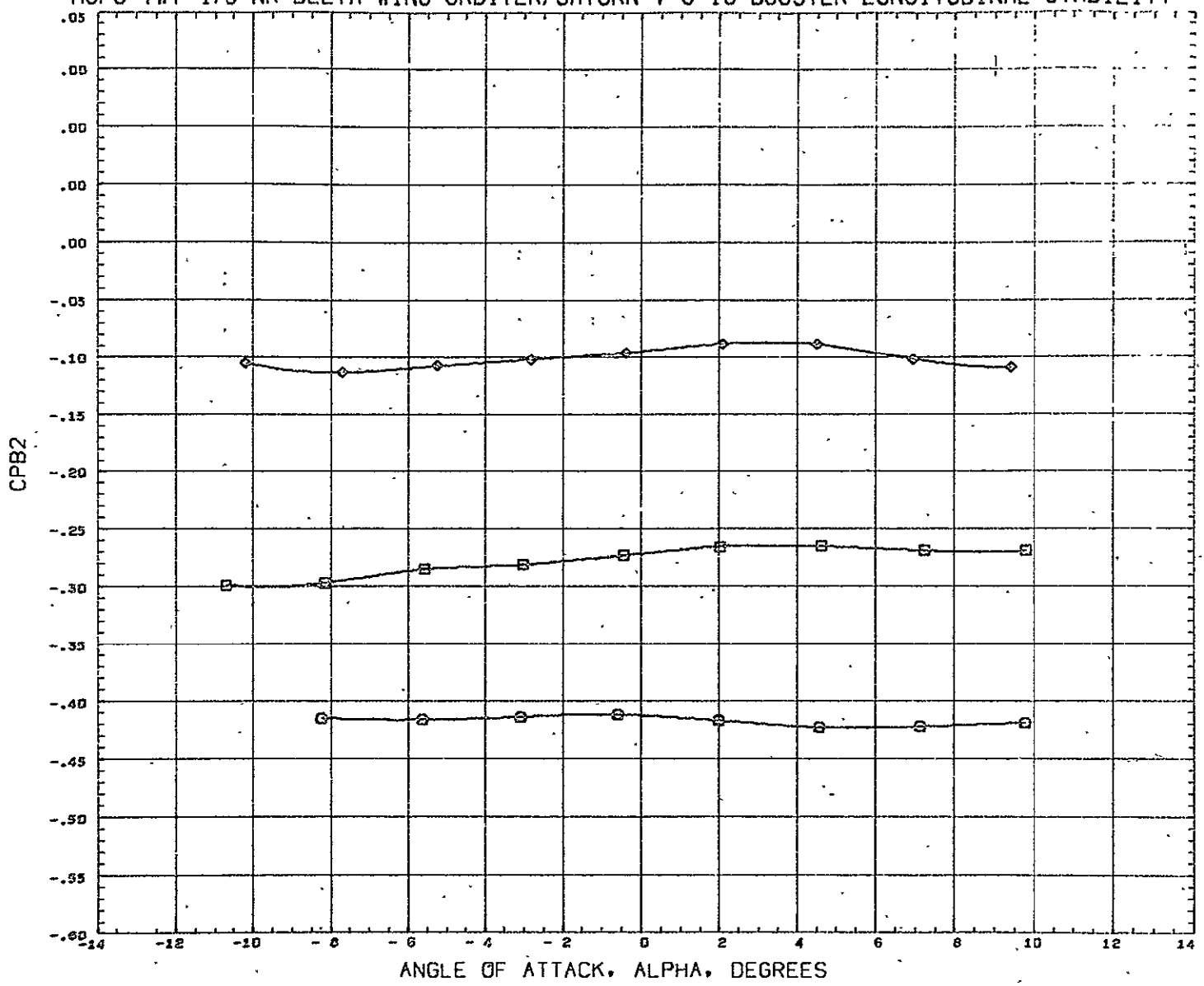
SYMBOL	MACH		PARAMETRIC VALUES		
○	0.599	BETA	0.010	ORBINC	- 2.000
□	0.697				
◇	0.994				
△	1.091				

DATA HIST. CODE HH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRP	5.2640	INCHES
YHRP	0.0000	INCHES
ZHRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH		PARAMETRIC VALUES		
○	1.195	BETA	0.010	ORBINC	2.000
□	1.462				
◇	1.955				

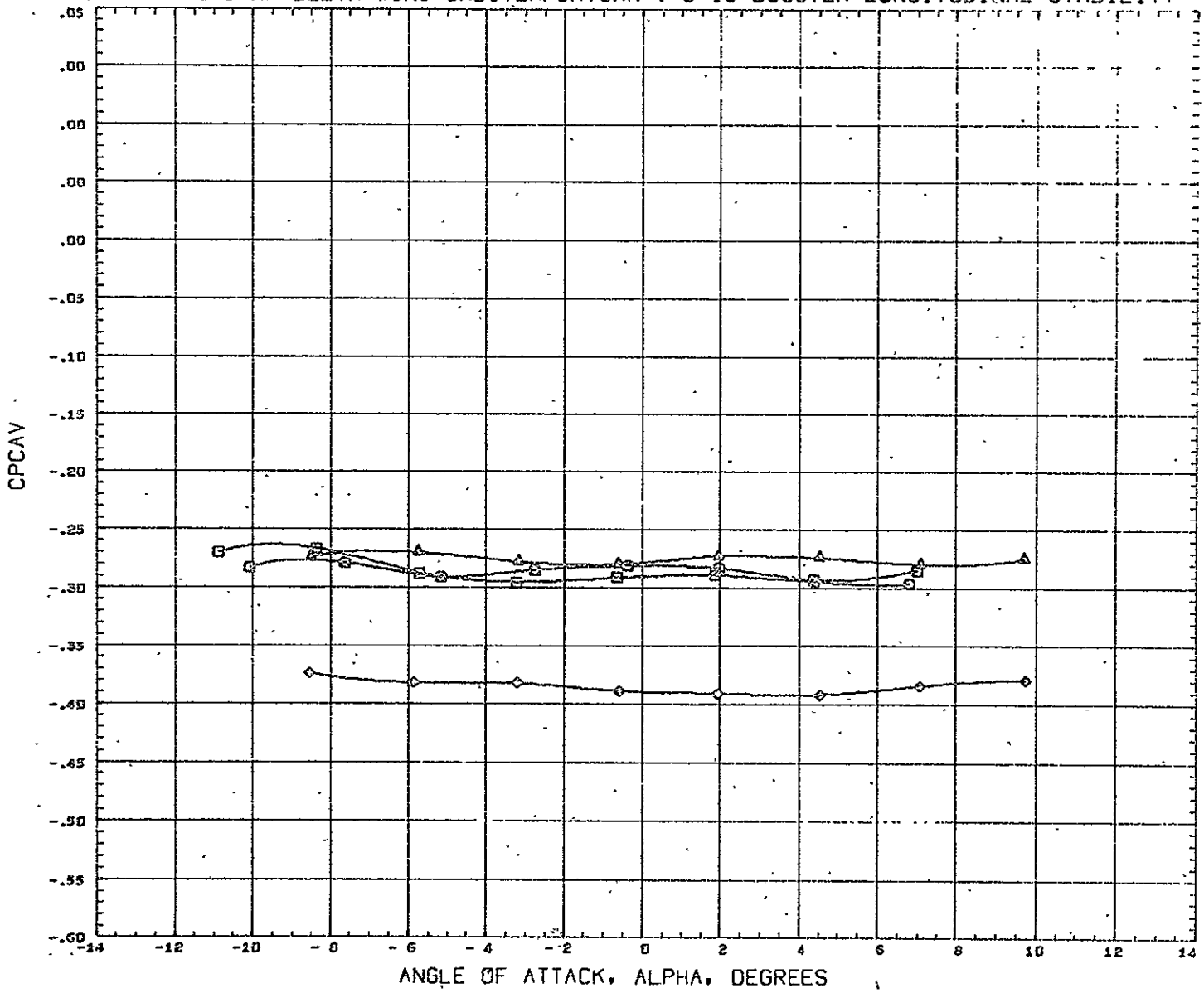
DATA HIST. CODE . MM

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V1.7 (R25041) 14 JAN 71 PAGE 34

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



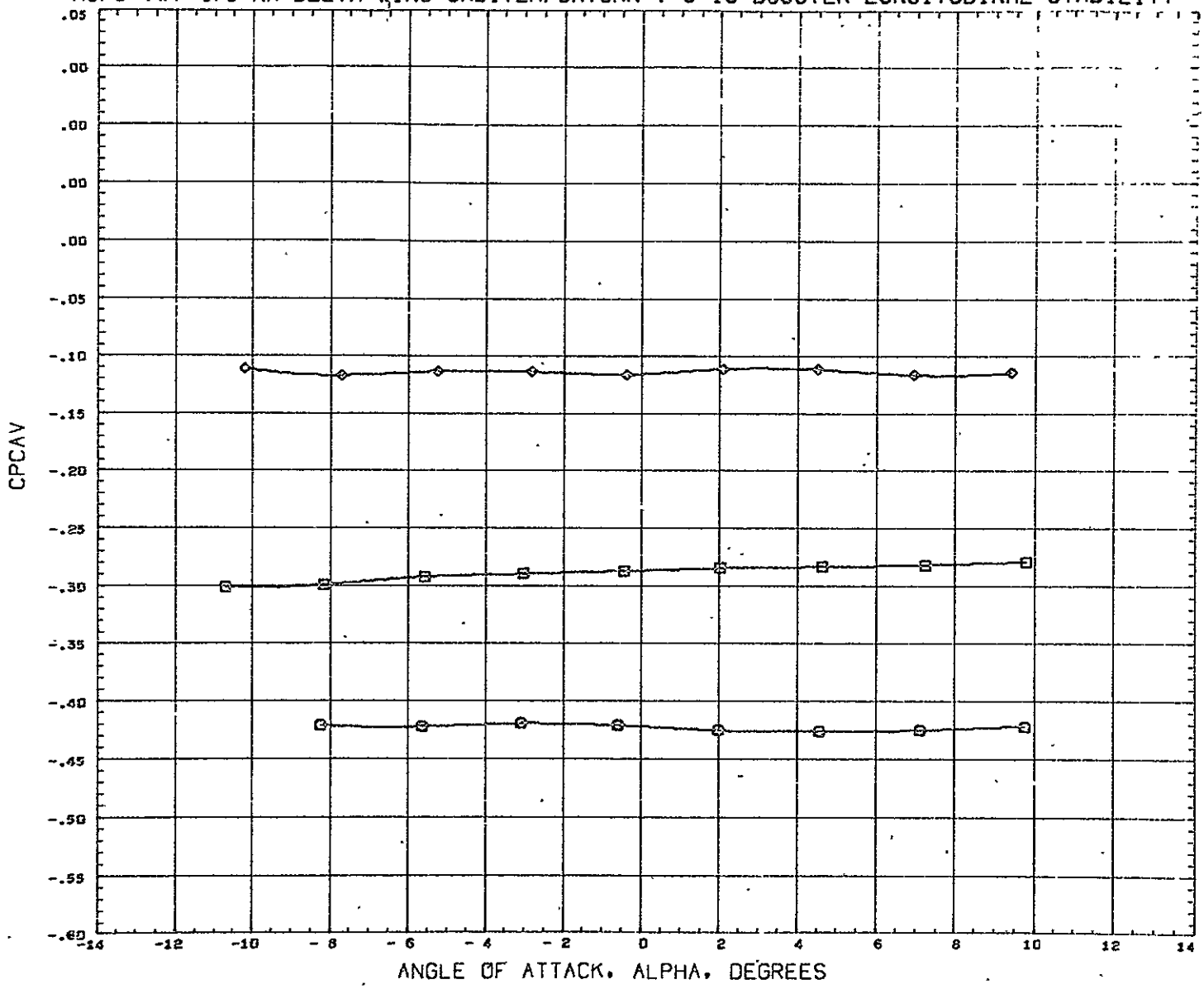
SYMBOL	MACH		PARAMETRIC VALUES		
○	0.599	BETA	0.010	ORBINC	- 2.000
□	0.897				
◇	0.994				
△	1.091				

DATA HIST. CODE HH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



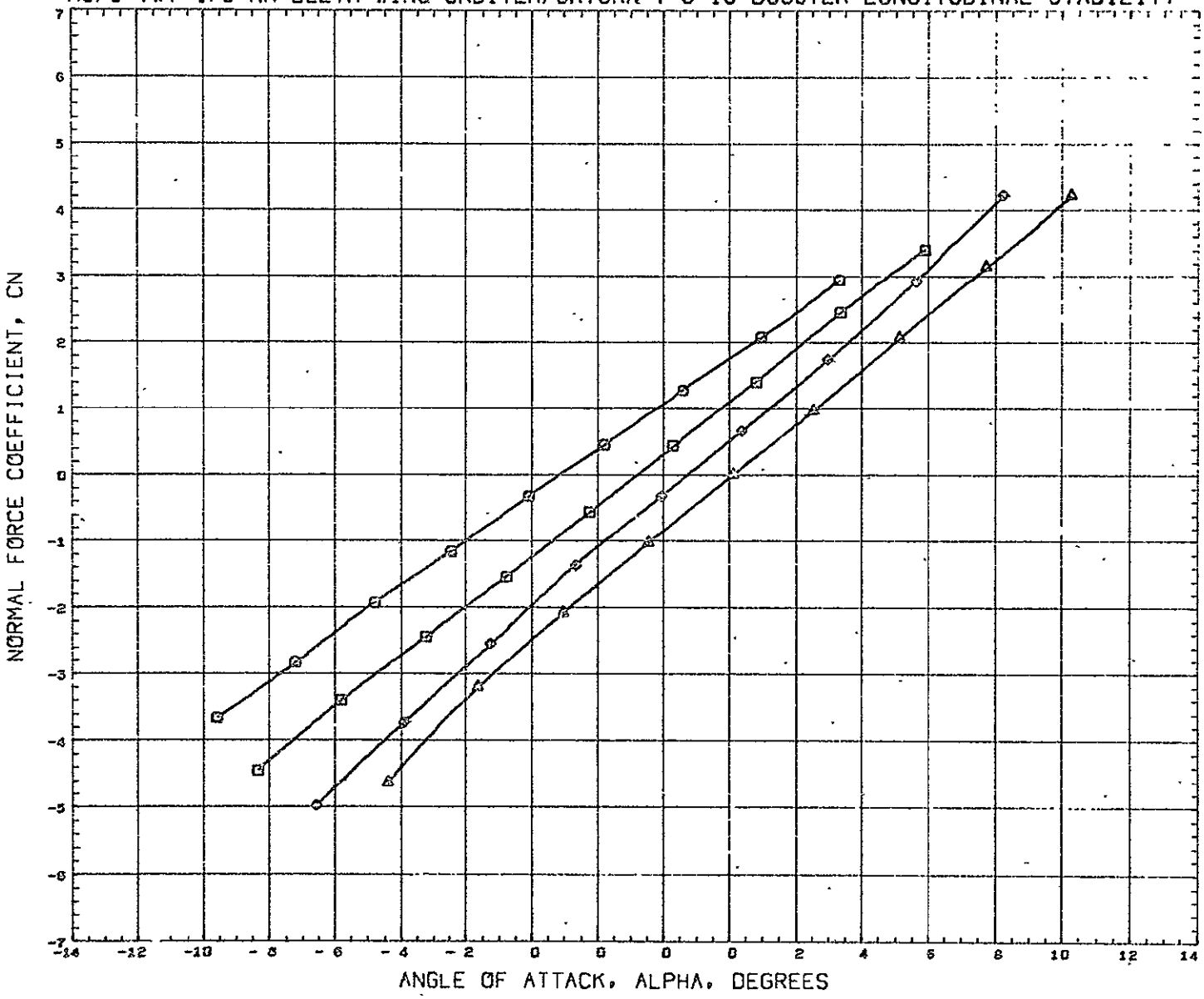
SYMBOL	MACH		PARAMETRIC VALUES		
○	1.195	BETA	0.010	ORBINC	- 2.000
□	1.462				
◇	1.955				

DATA MIST. CODE MM

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



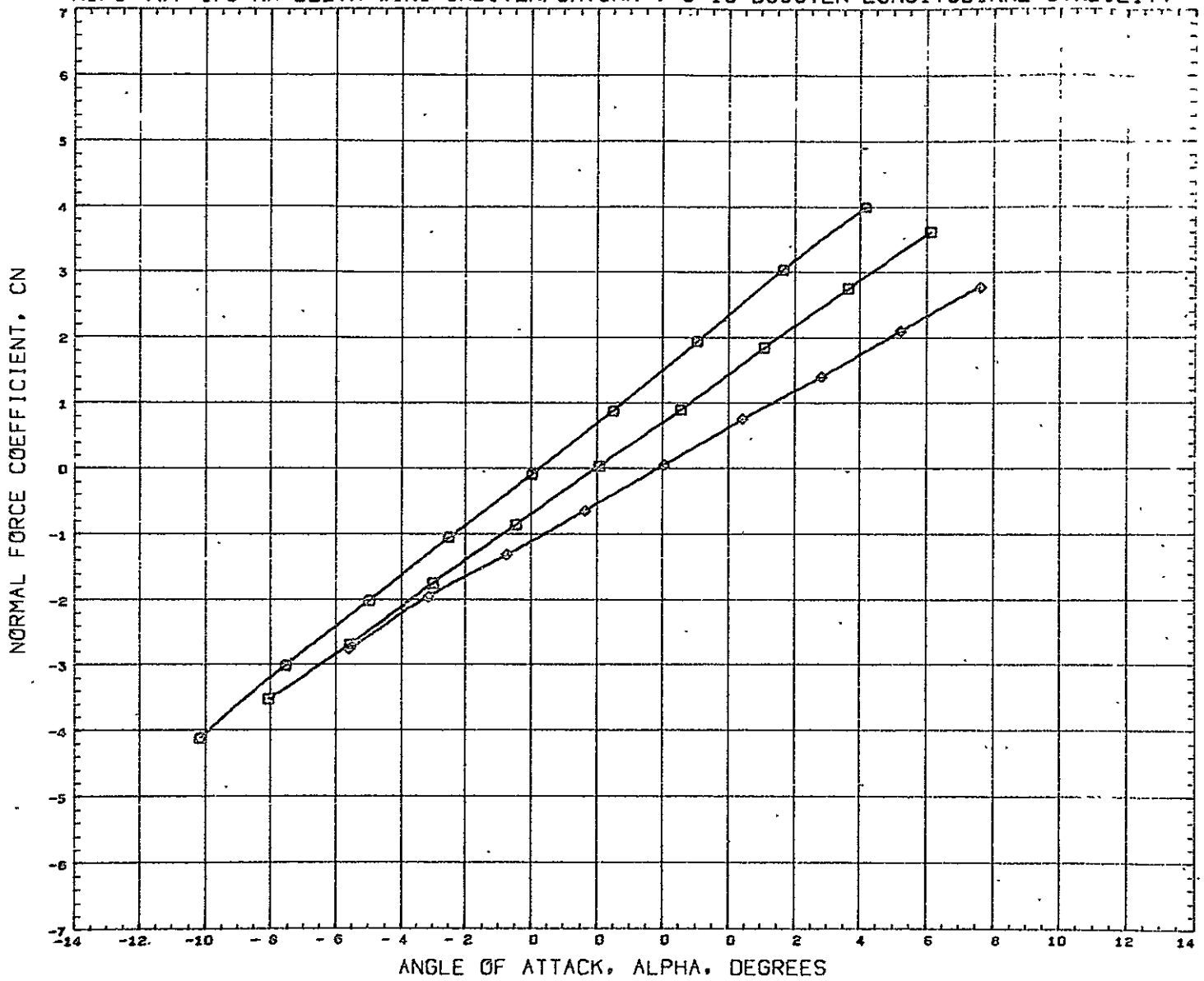
SYMBOL	MACH		PARAMETRIC VALUES		
○	0.603	BETA	0.010	ORBINC	1.000
□	0.901				
◇	0.996				
△	1.103				

DATA HIST. CODE NN

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRF	5.2640	INCHES
YMRF	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER-LØNGITUDINAL STABILITY



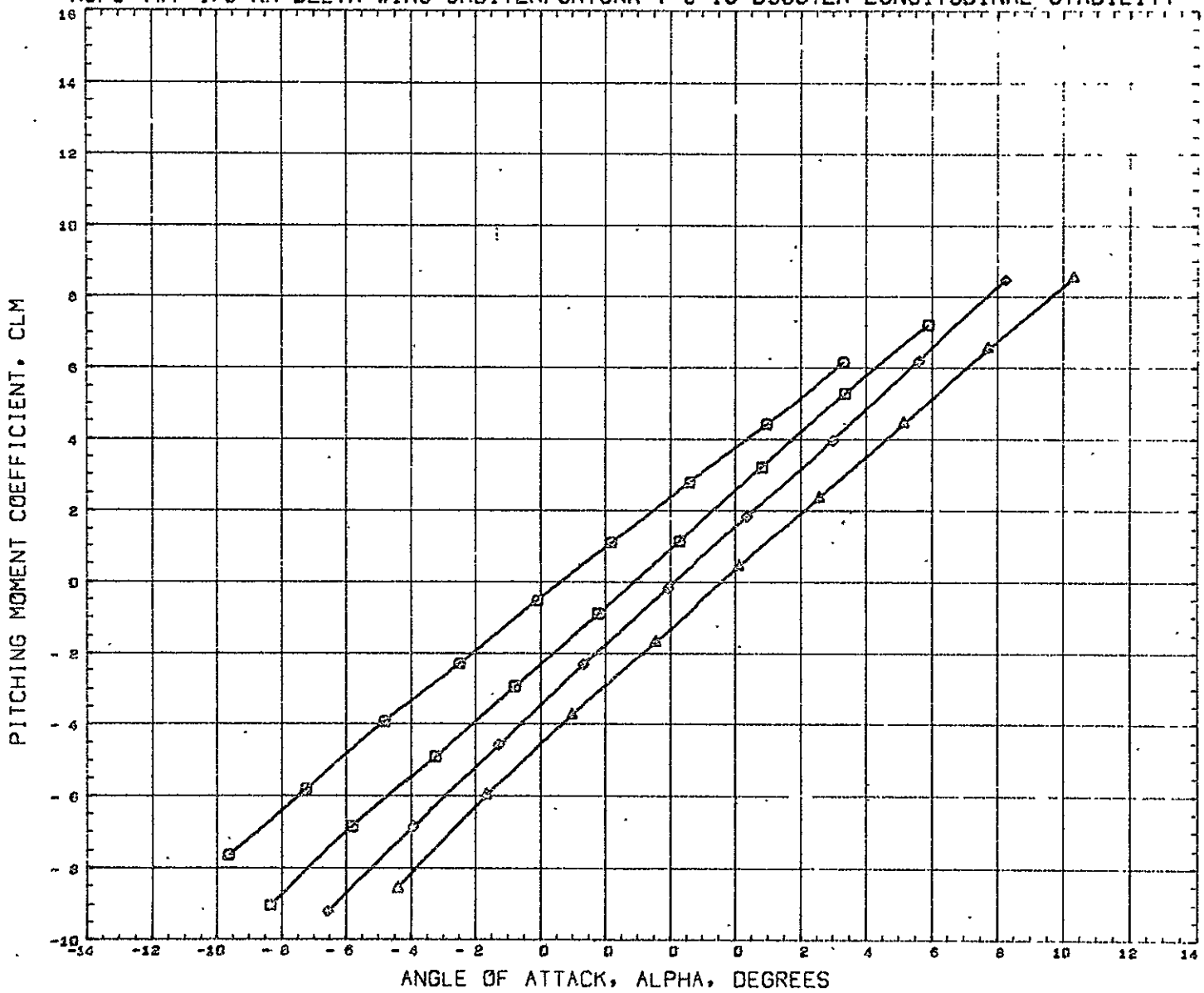
SYMBOL	MACH		PARAMETRIC VALUES		
○	1.196	BETA	0.010	ORBINC	1.000
□	1.467				
◇	1.965				

DATA HIST. CODE MH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



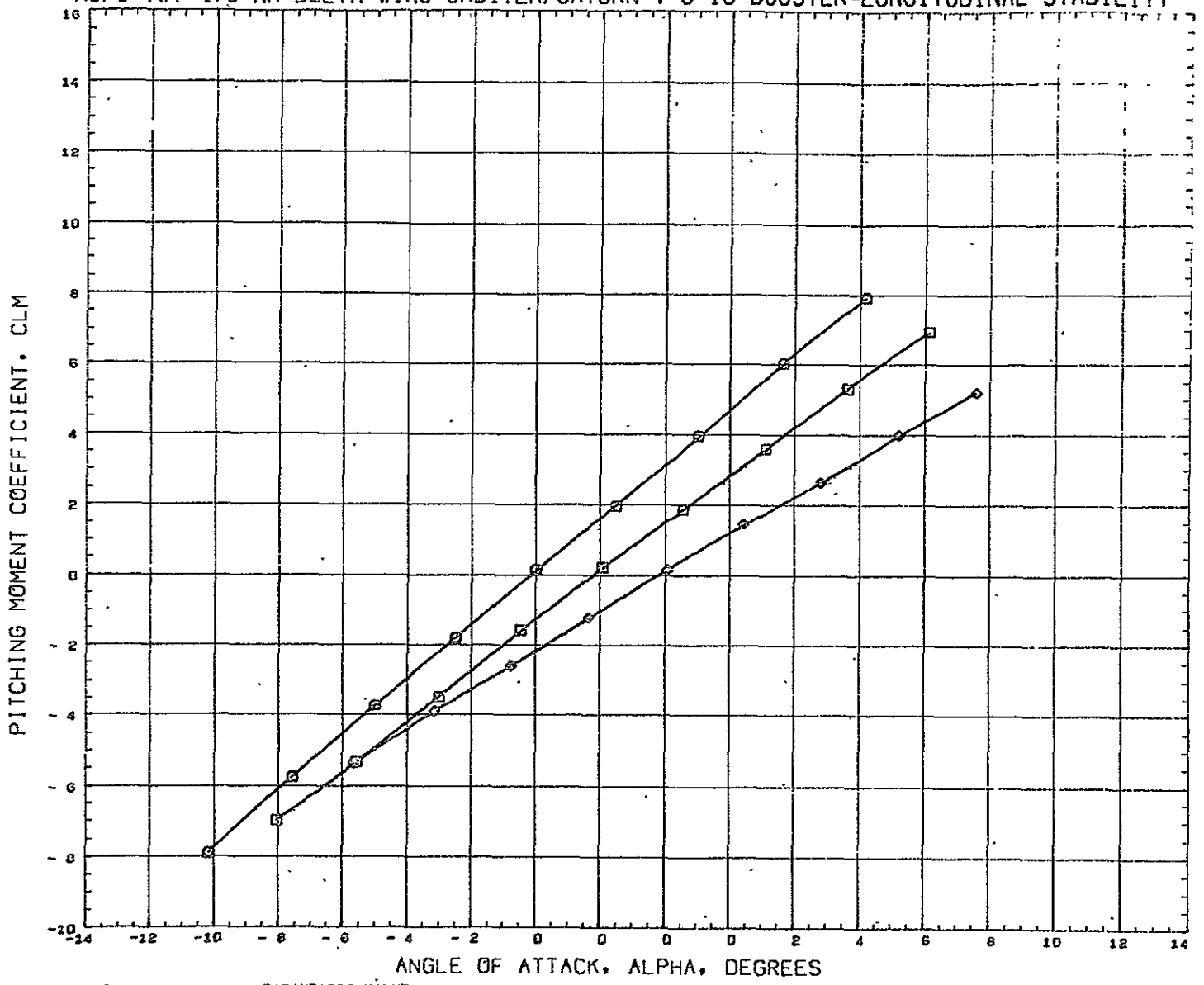
SYMBOL	MACH		PARAMETRIC VALUES		
○	0.603	BETA	0.010	ORBINC	1.000
□	0.901				
◇	0.996				
△	1.103				

DATA HIST. CODE NH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



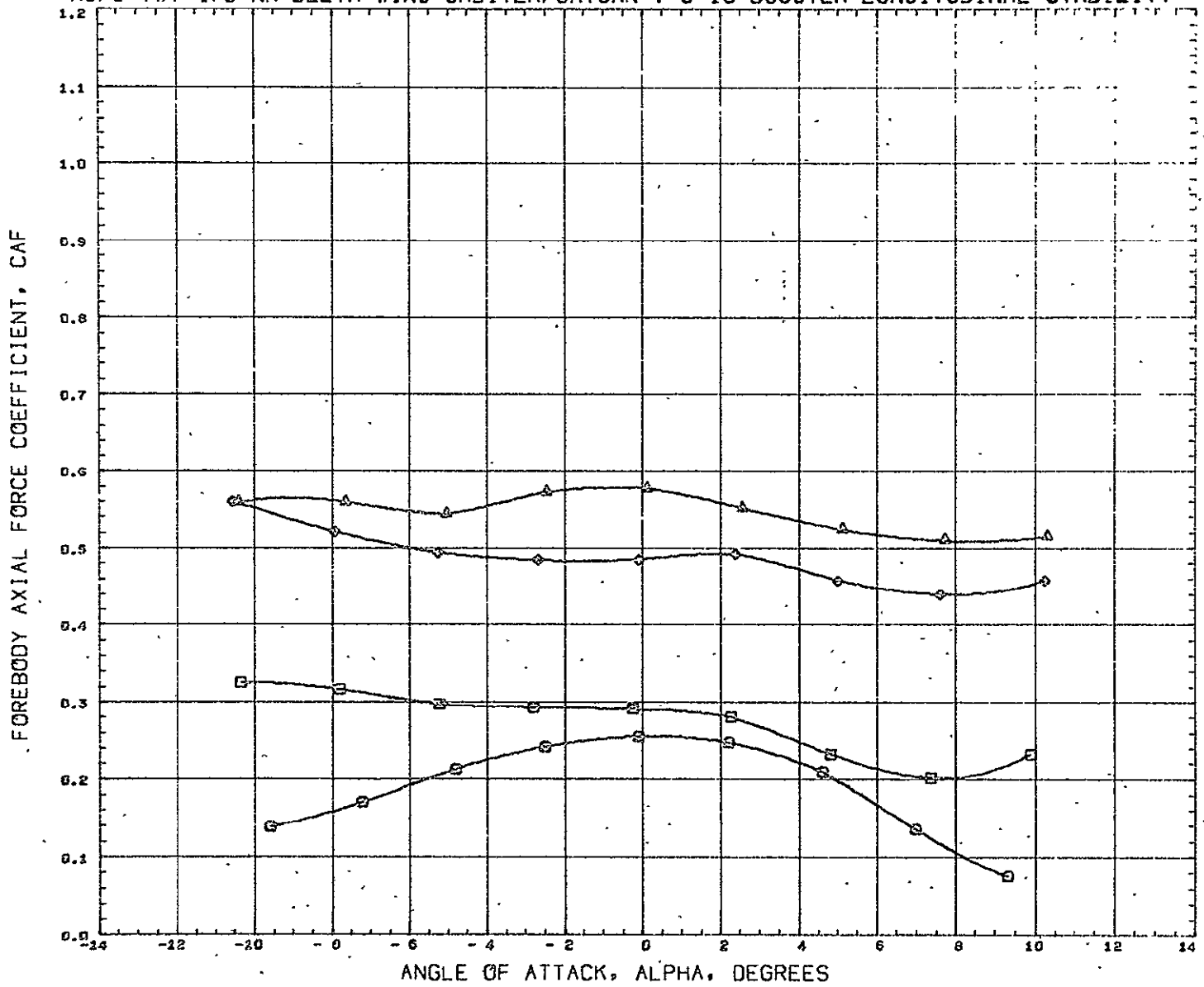
SYMBOL	MACH		PARAMETRIC VALUES		
○	1.195	BETA	0.010	ORBINC	1.000
□	1.467				
◇	1.965				

DATA HIST. CODE HH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRF	5.2640	INCHES
YMRF	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER-LØNGITUDINAL STABILITY



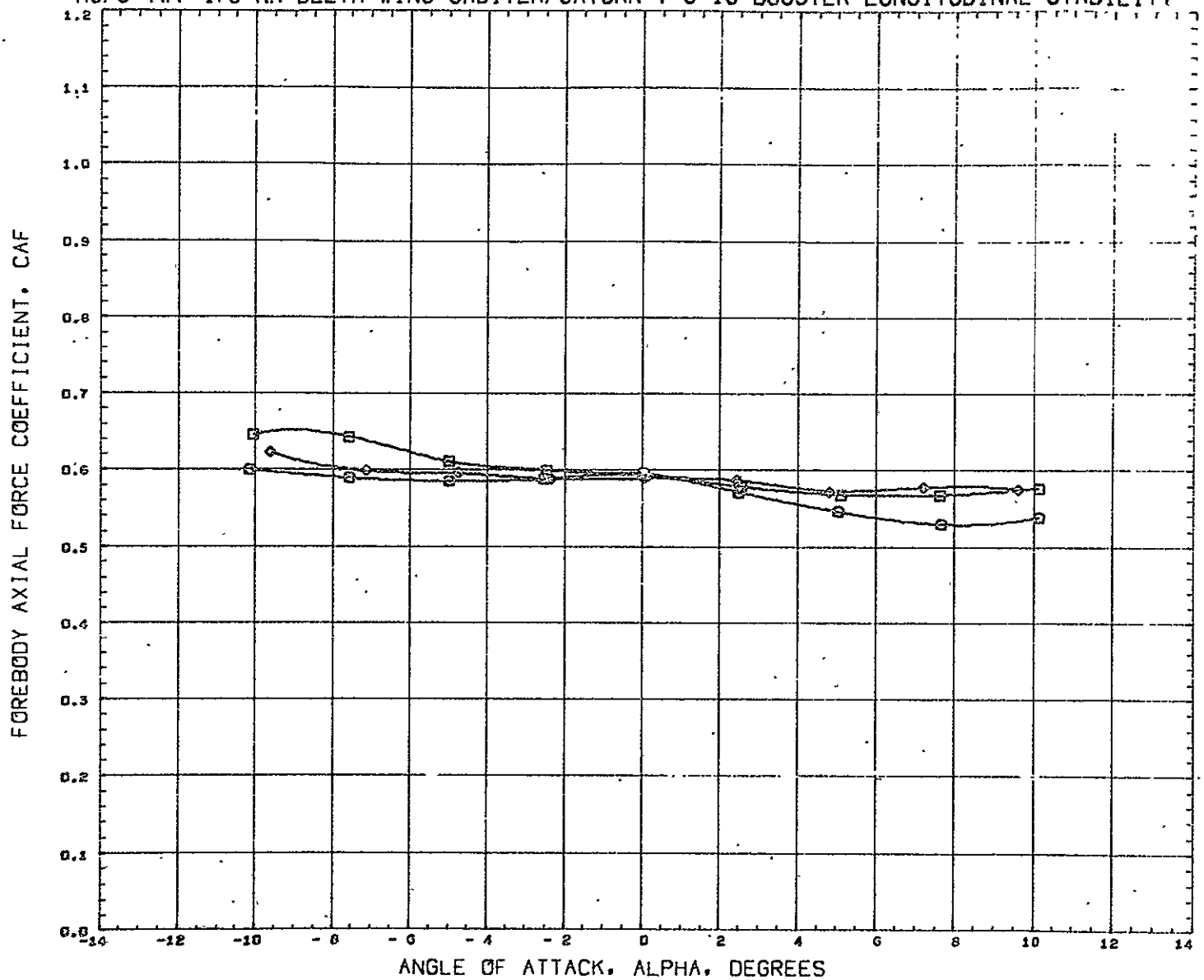
SYMBOL	MACH	PARAMETRIC VALUES			
○	0.603	BETA	0.010	ORBINC	1.000
□	0.901				
◇	0.996				
△	1.103				

DATA HIST. CODE. NH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRF	5.2640	INCHES
YMRF	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER-LØNGITUDINAL STABILITY



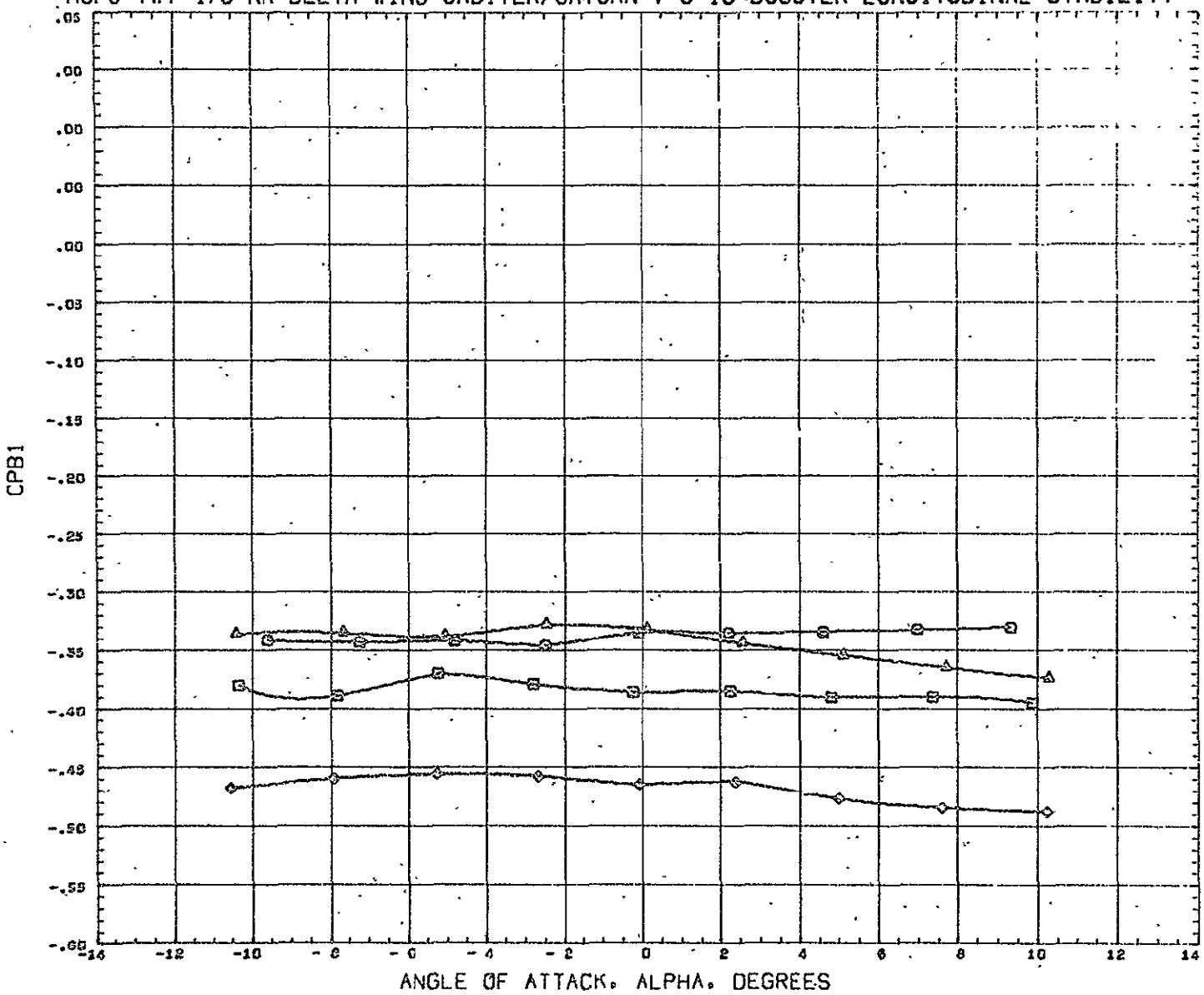
SYMBOL	MACH		PARAMETRIC VALUES		
○	1.196	BETA	0.010	ØRBINC	1.000
□	1.467				
◇	1.965				

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CØDE MN

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH
○	0.503
□	0.901
◇	0.996
△	1.103

PARAMETRIC VALUES

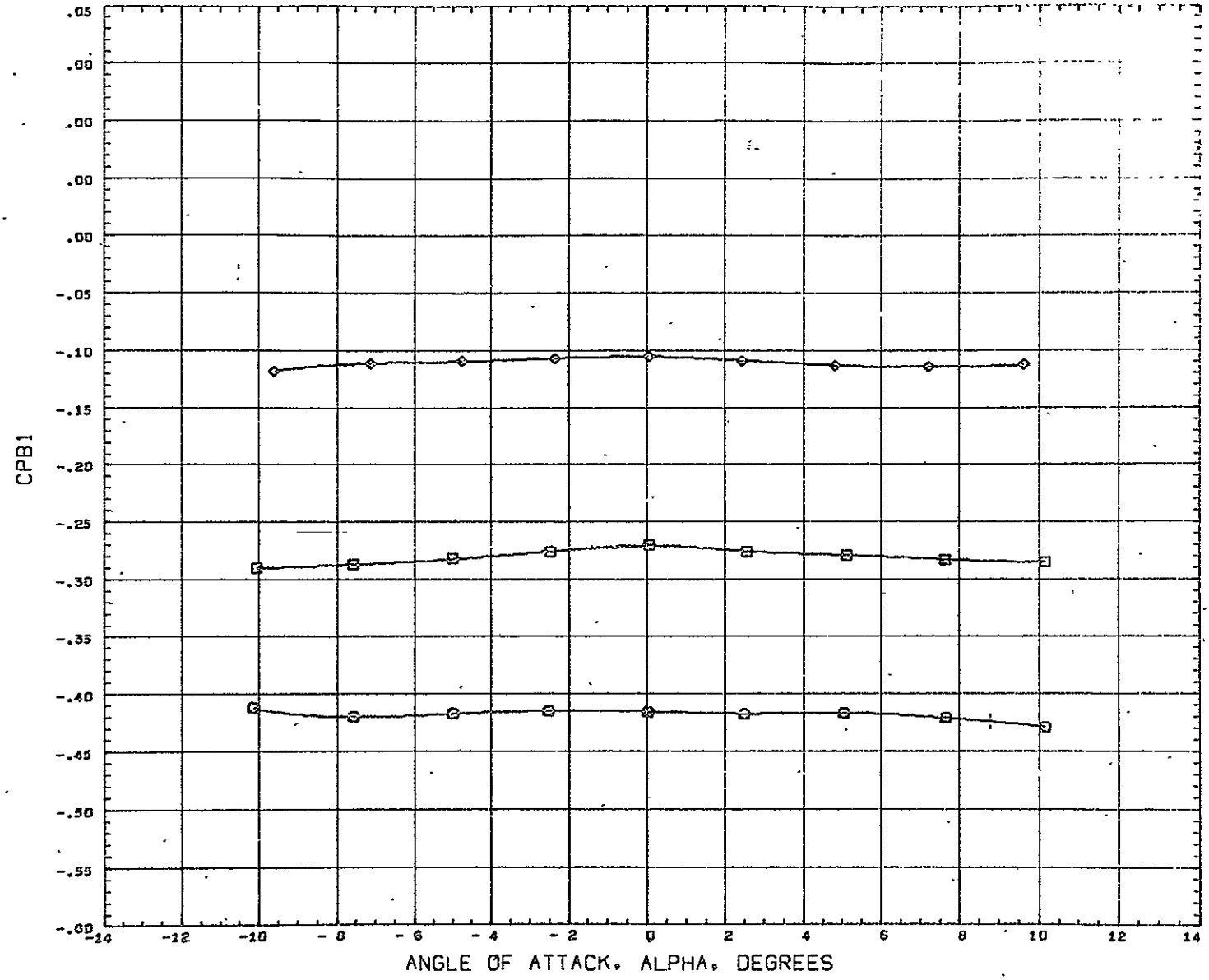
BETA	0.010	ORBINC	1.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE MM

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



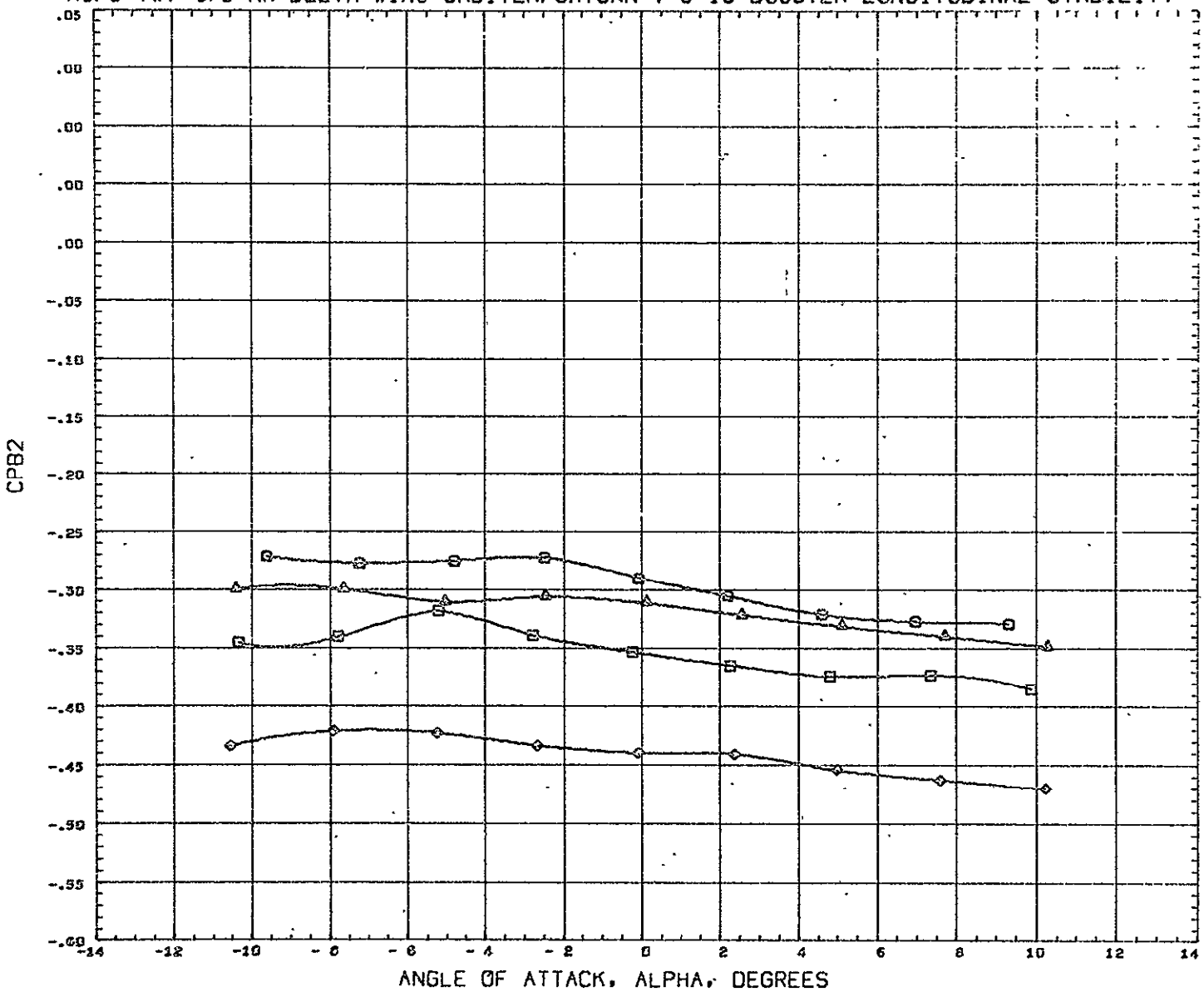
SYMBOL	MACH		PARAMETRIC VALUES		
○	1.196	BETA	0.010	ORBINC	1.000
□	1.467				
◇	1.965				

DATA HIST. CODE MH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER-LØNGITUDINAL STABILITY



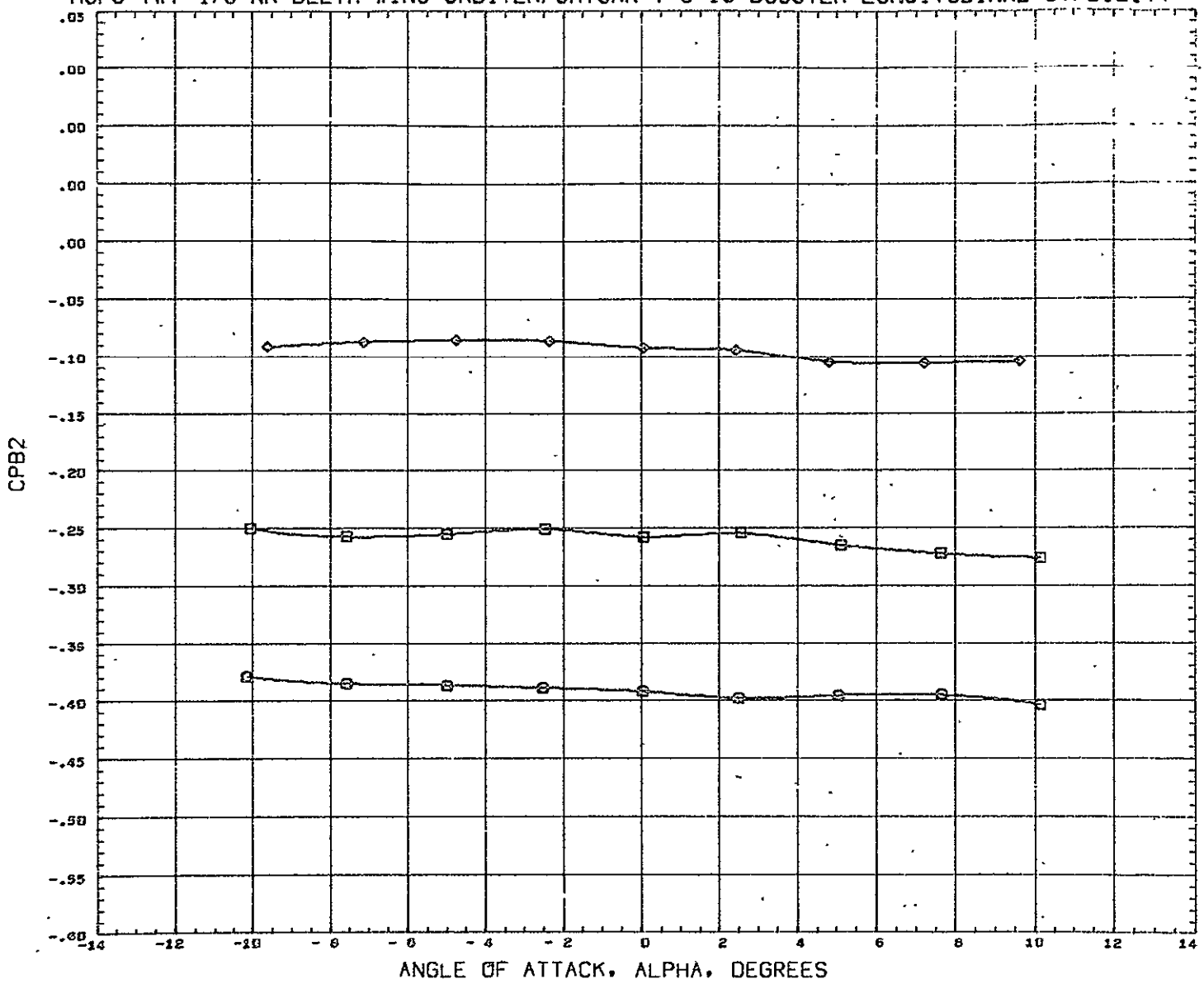
SYMBOL	MACH		PARAMETRIC VALUES		
○	0.603	BETA	0.010	ORBINC	1.000
□	0.901				
◇	0.996				
△	1.103				

DATA HIST. CODE NN

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



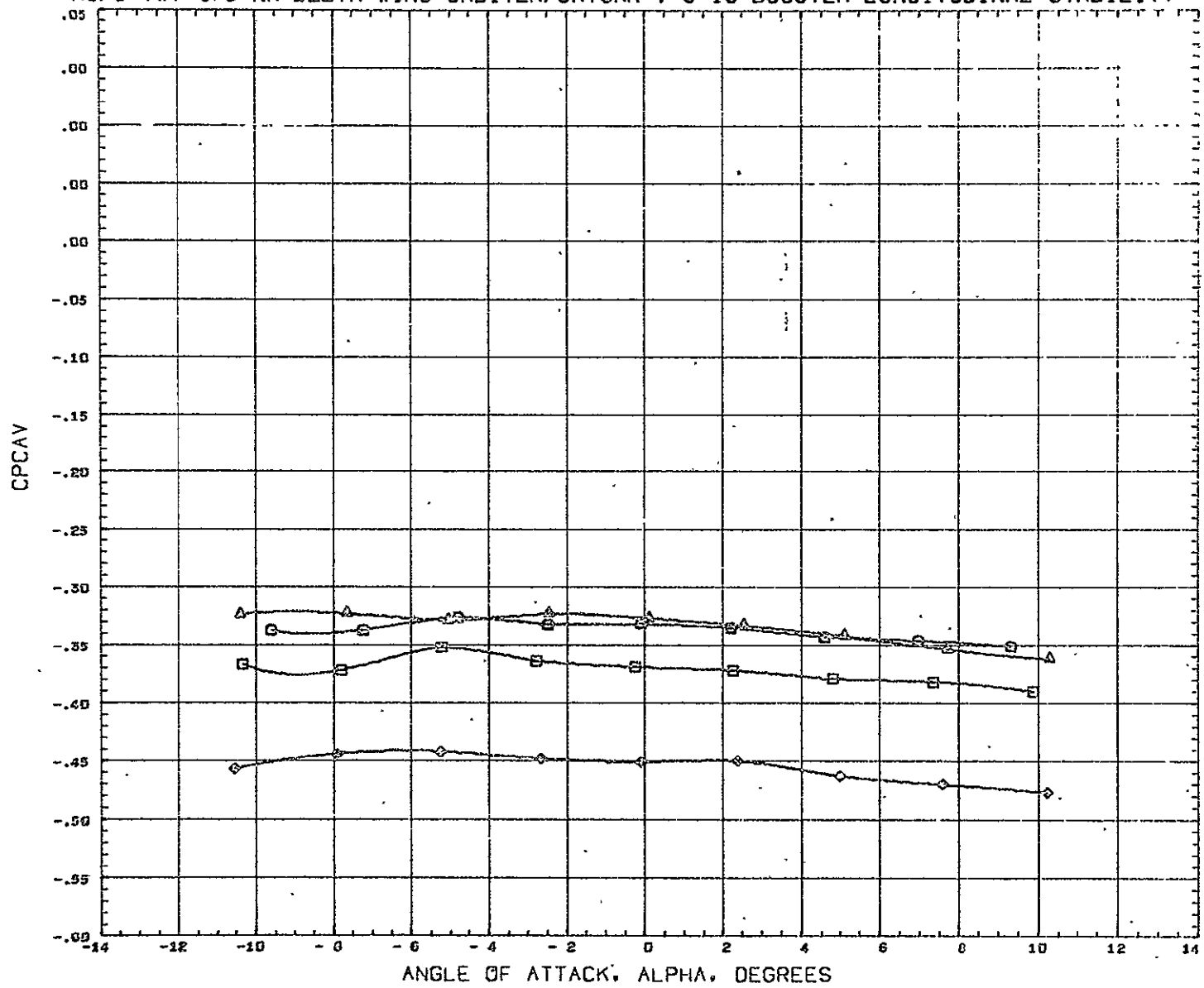
SYMBOL	MACH		PARAMETRIC VALUES		
○	1.196	BETA	0.010	ORBINC	1.000
□	1.467				
◇	1.965				

DATA HIST. CODE MH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

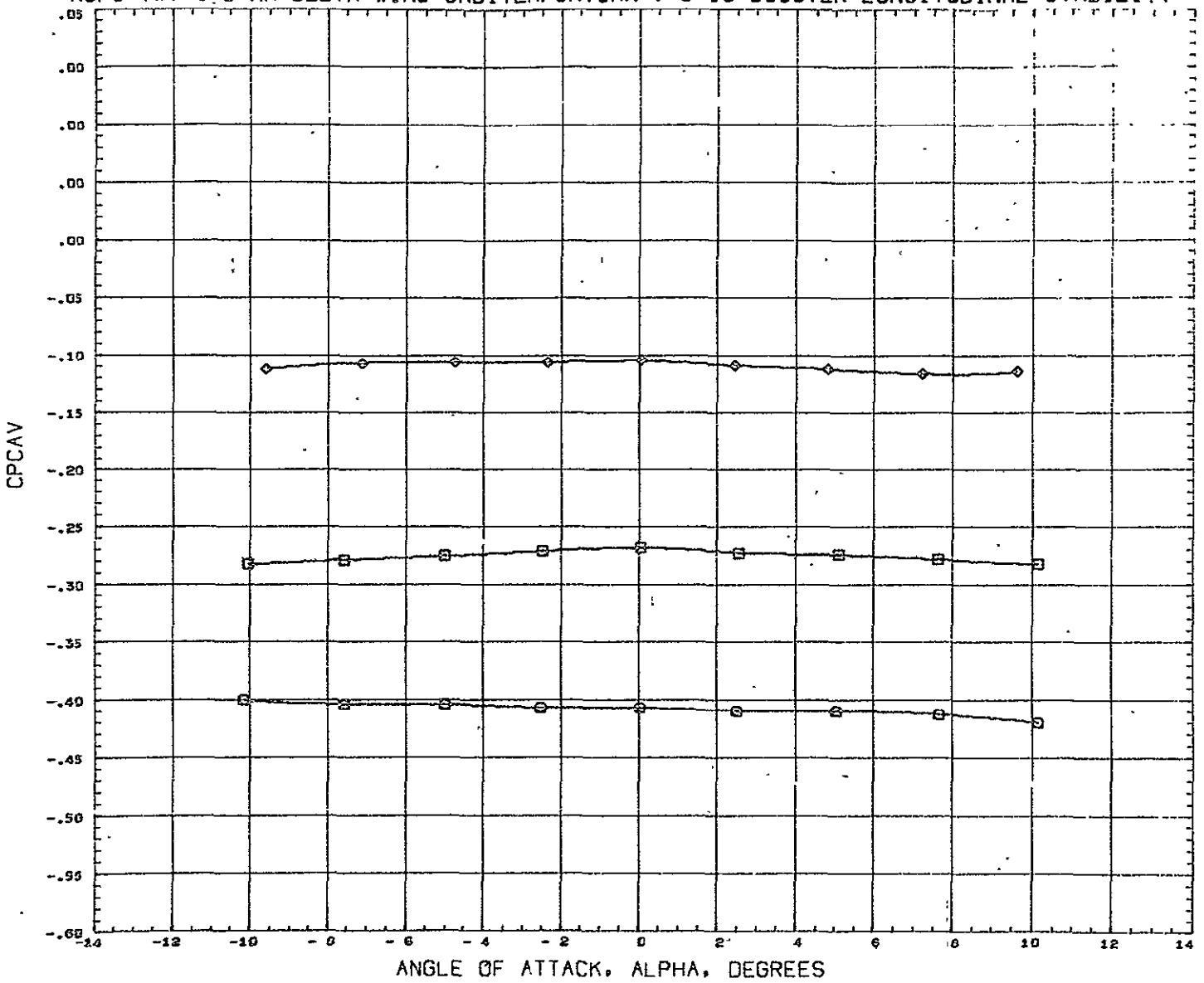


SYMBOL	MACH		PARAMETRIC VALUES		
○	0.603	BETA	0.010	ORBINC	1.000
□	0.901				
◇	0.996				
△	1.103				

DATA HIST. CODE HM

REFERENCE INFORMATION		
REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



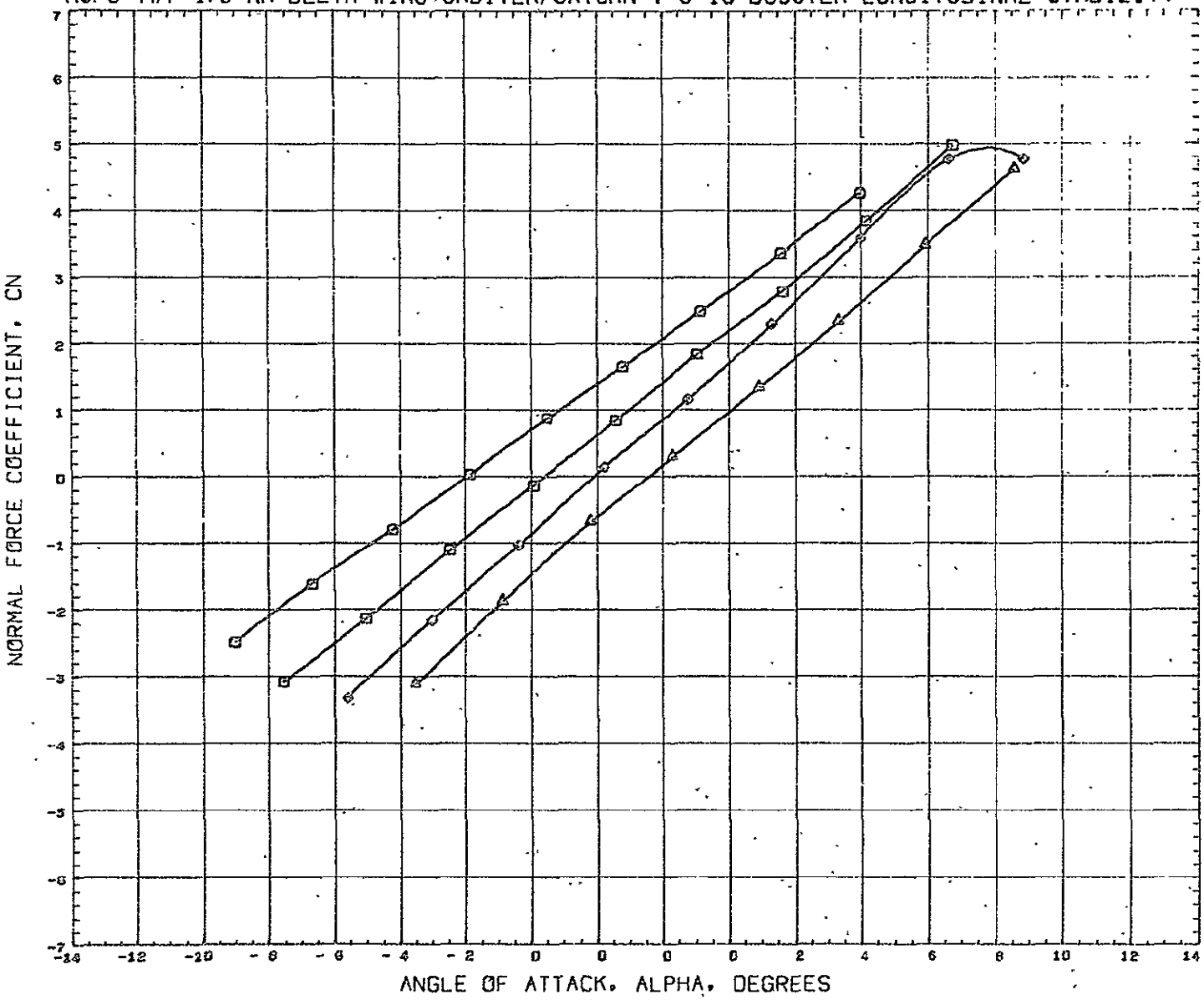
SYMBOL	MACH	PARAMETRIC VALUES			
○	1.196	BETA	0.010	ORBINC	1.000
□	1.467				
◇	1.965				

DATA HIST. CODE HH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



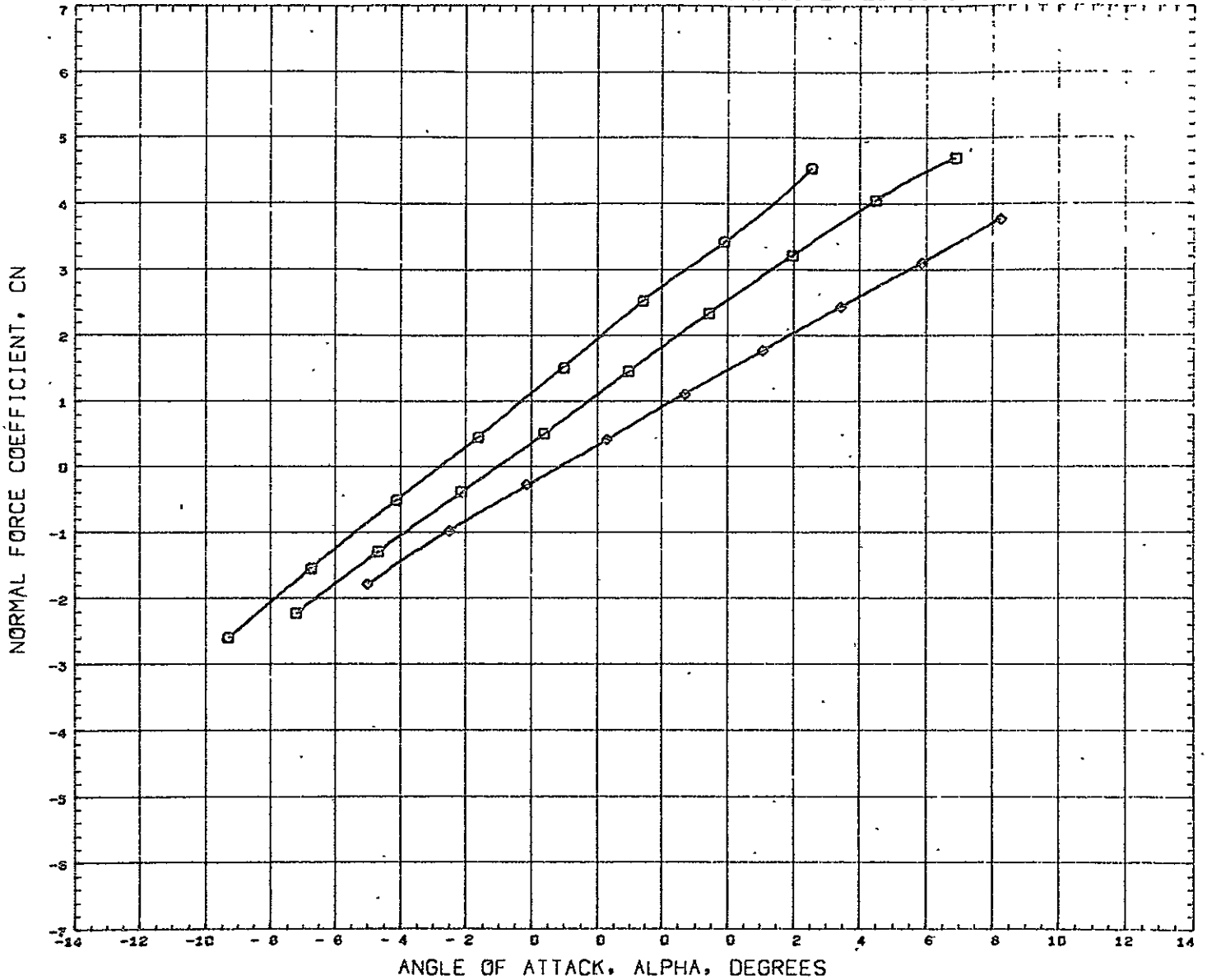
SYMBOL	MACH	PARAMETRIC VALUES			
○	0.600	BETA	- 0.020	ORBINC	4.000
□	0.889				
◇	0.992				
△	1.093				

REFERENCE FILE

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER-LØNGITUDINAL STABILITY



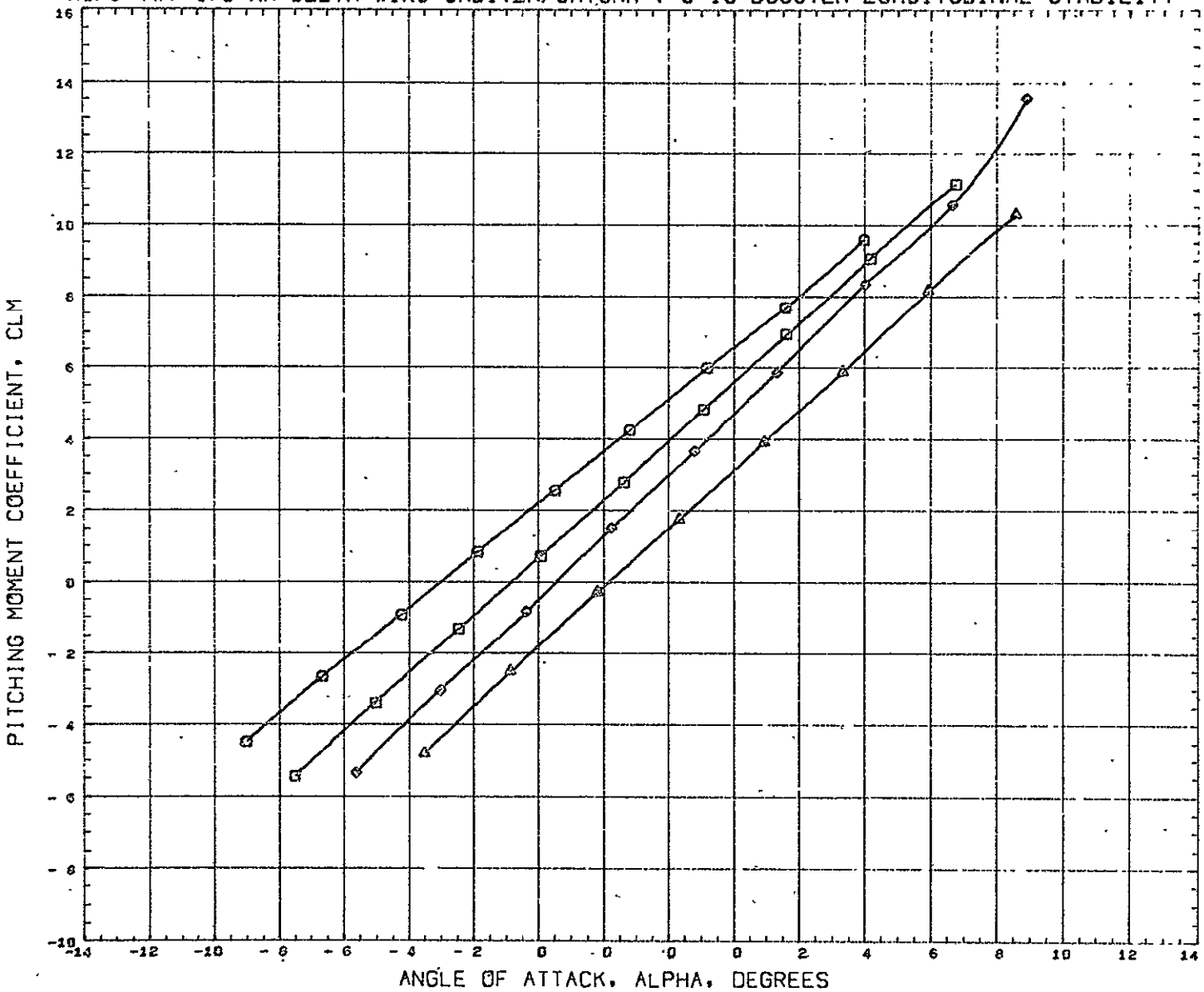
SYMBOL	MACH	PARAMETRIC VALUES			
○	1.199	BETA	- 0.020	ØRBINC	4.000
□	1.455				
◇	1.967				

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

'REFERENCE FILE

MSFC TWT 476 NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER-LØNGITUDINAL STABILITY



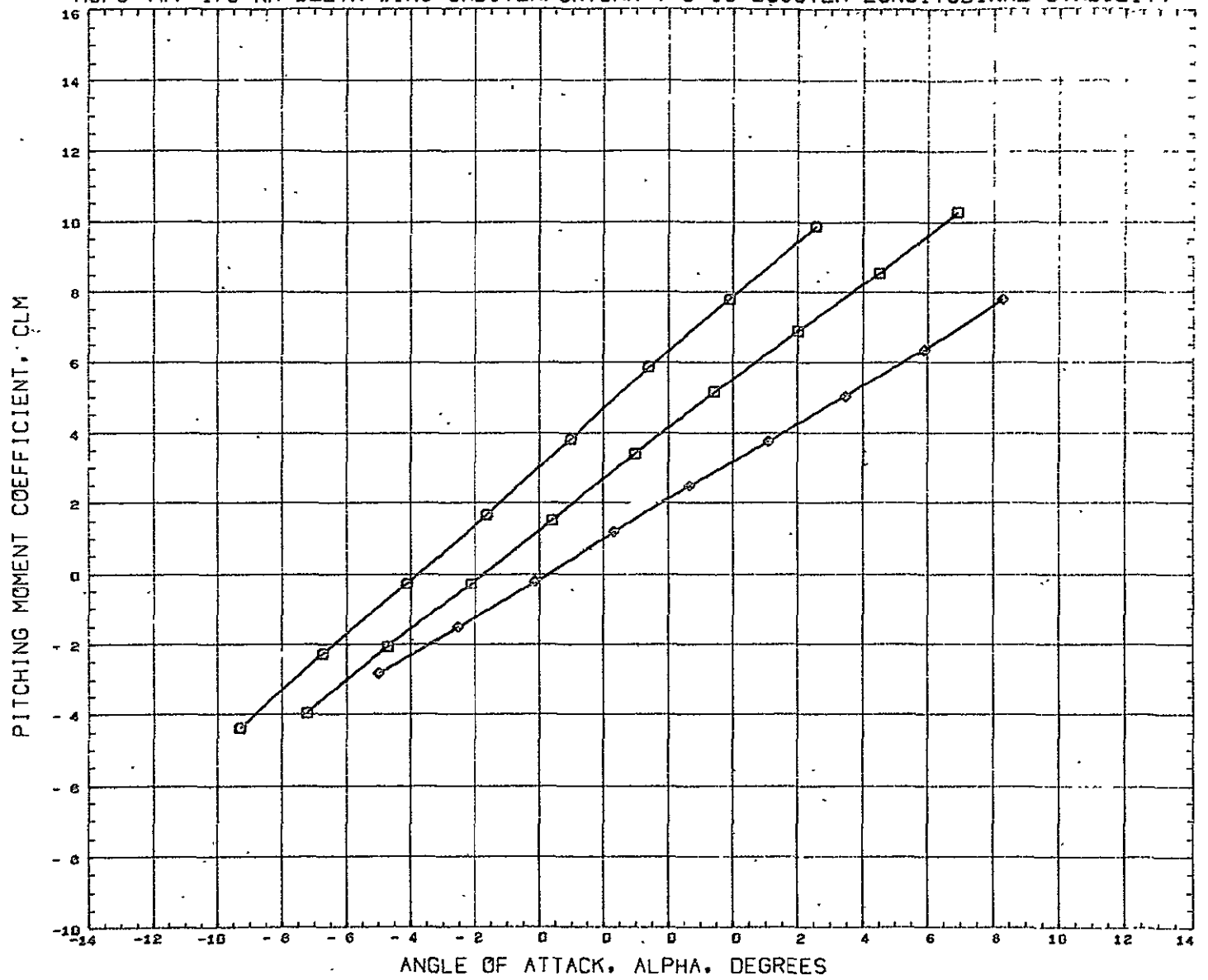
SYMBOL	MACH	PARAMETRIC VALUES			
○	0.600	BETA	- 0.020	ORBINC	4.000
□	0.689				
◇	0.992				
△	1.093				

REFERENCE FILE

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRF	5.2640	INCHES
YMRF	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



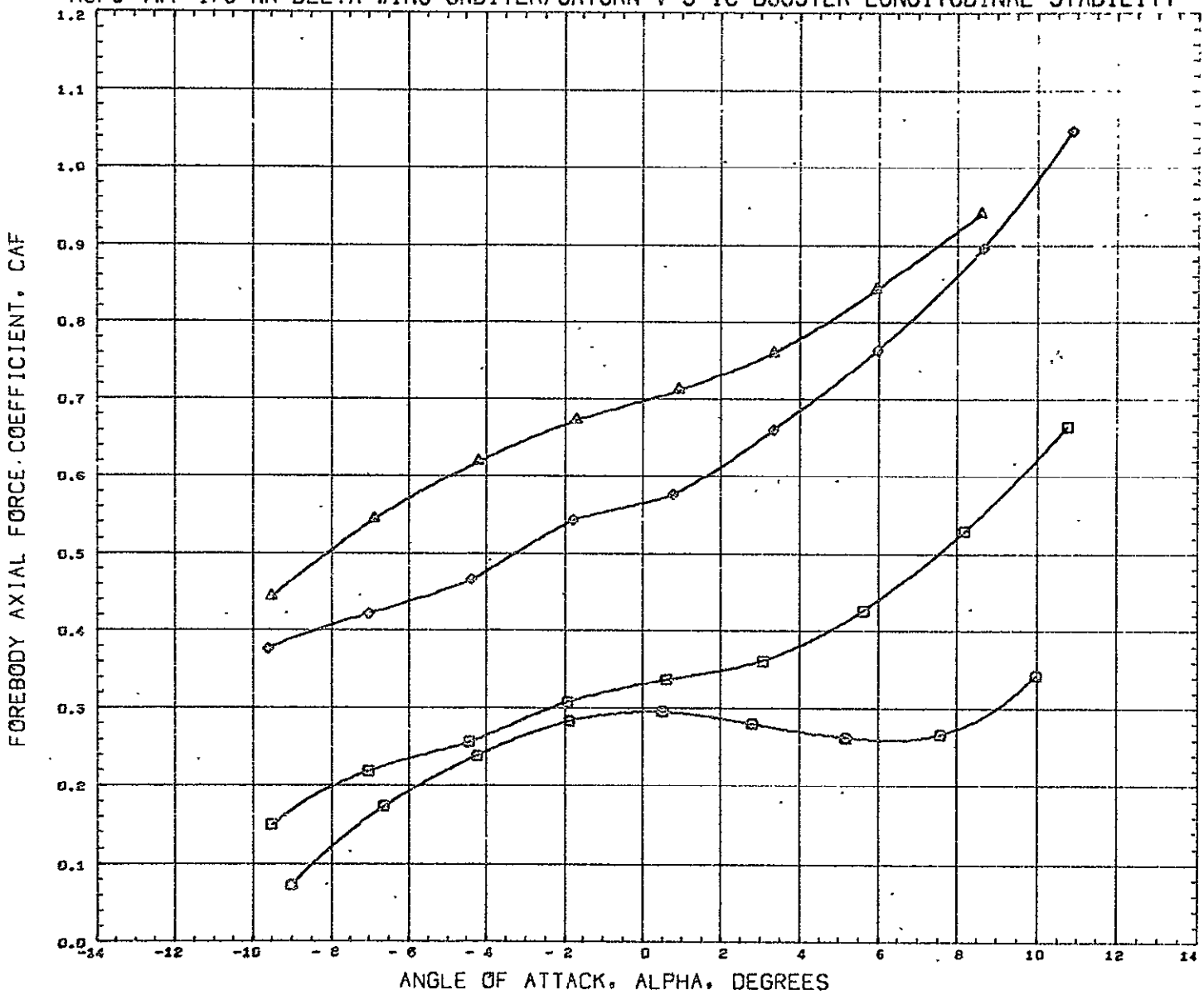
SYMBOL	MACH	PARAMETRIC VALUES			
○	1.199	BETA	- 0.020	ORBINC	4.000
□	1.455				
◇	1.967				

REFERENCE FILE

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER-LØNGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES			
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□	0.899				
◇	0.992				
△	1.093				

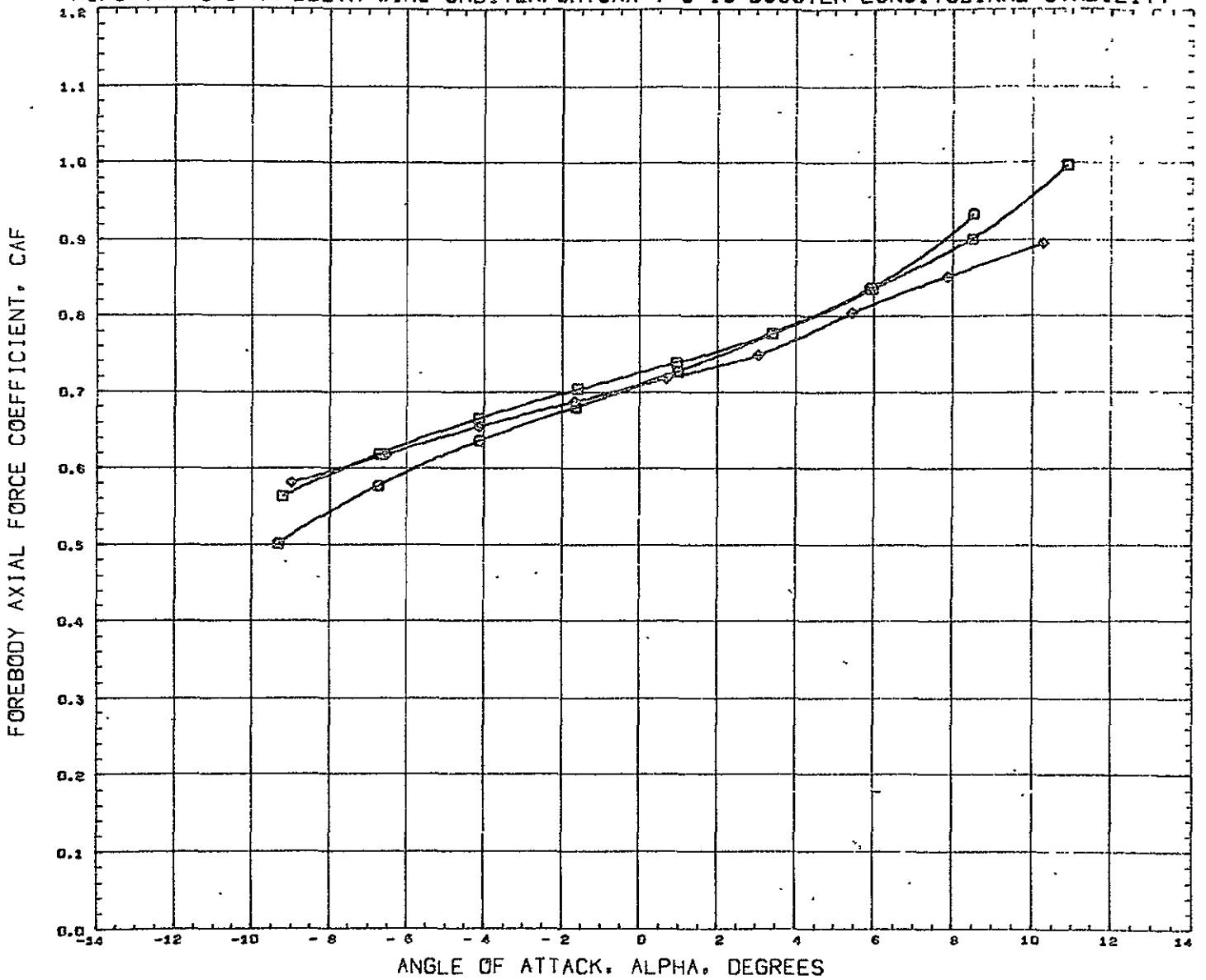
REFERENCE FILE

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC 476 NR HCRØRB/S-ICBØØSTER BS+B5W14E3V17 (R25071) 31 DEC 70 PAGE . 53

MSFC TWT 476 NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER-LØNGITUDINAL STABILITY



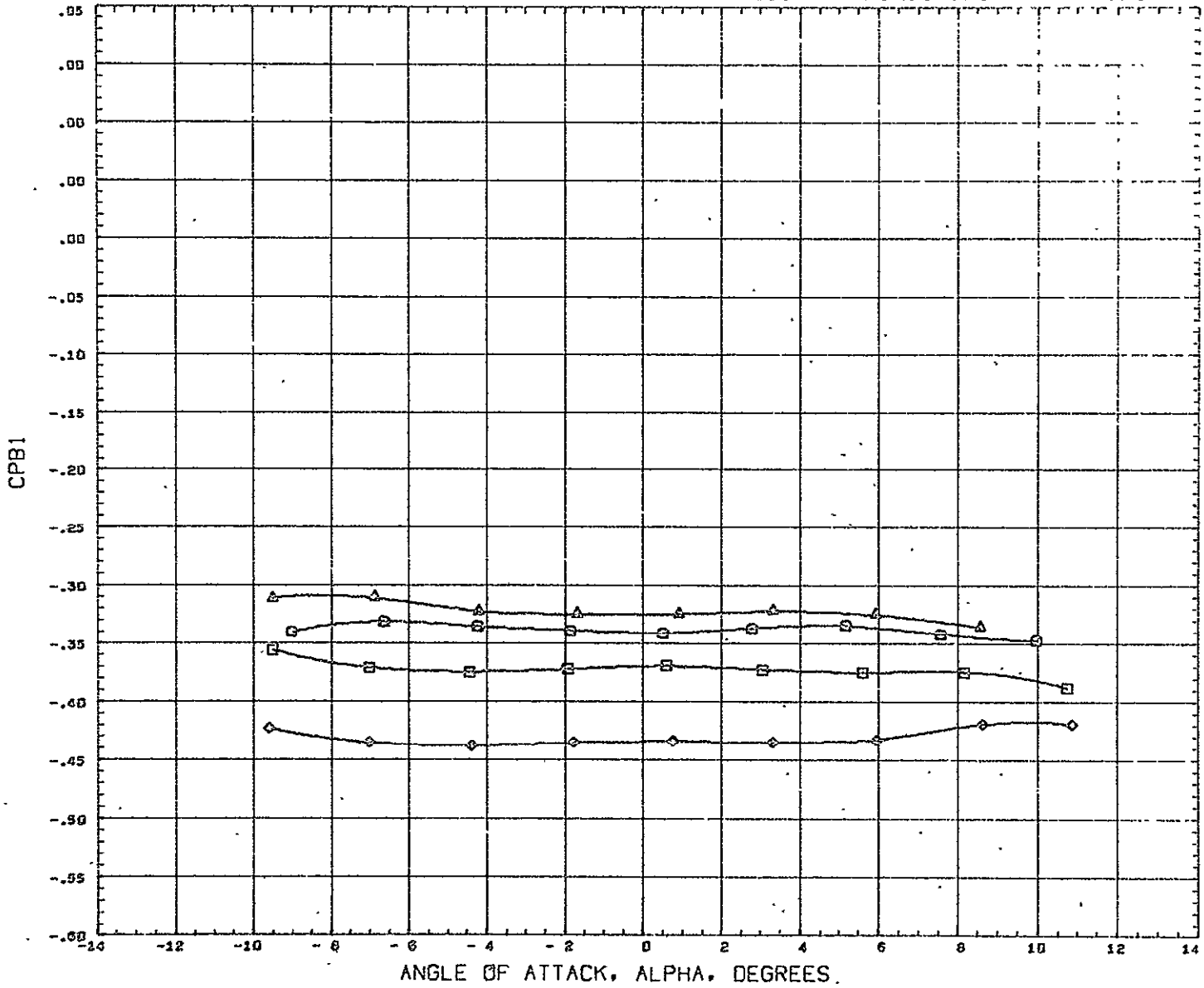
SYMBOL	MACH	PARAMETRIC VALUES			
□	1.199	BETA	- 0.020	ØRBINC	4.000
□	1.455				
◇	1.967				

REFERENCE FILE

REFERENCE INFØRMATION		
REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC 476 NR HCRØRB/S-ICBØØSTER BS+B5W14E3V17 (R25071) 31 DEC 70 · PAGE 54

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES			
○	0.600	BETA	- 0.020	ORBINC	4.000
□	0.869				
◇	0.992				
△	1.093				

REFERENCE FILE

REFERENCE INFORMATION		
REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
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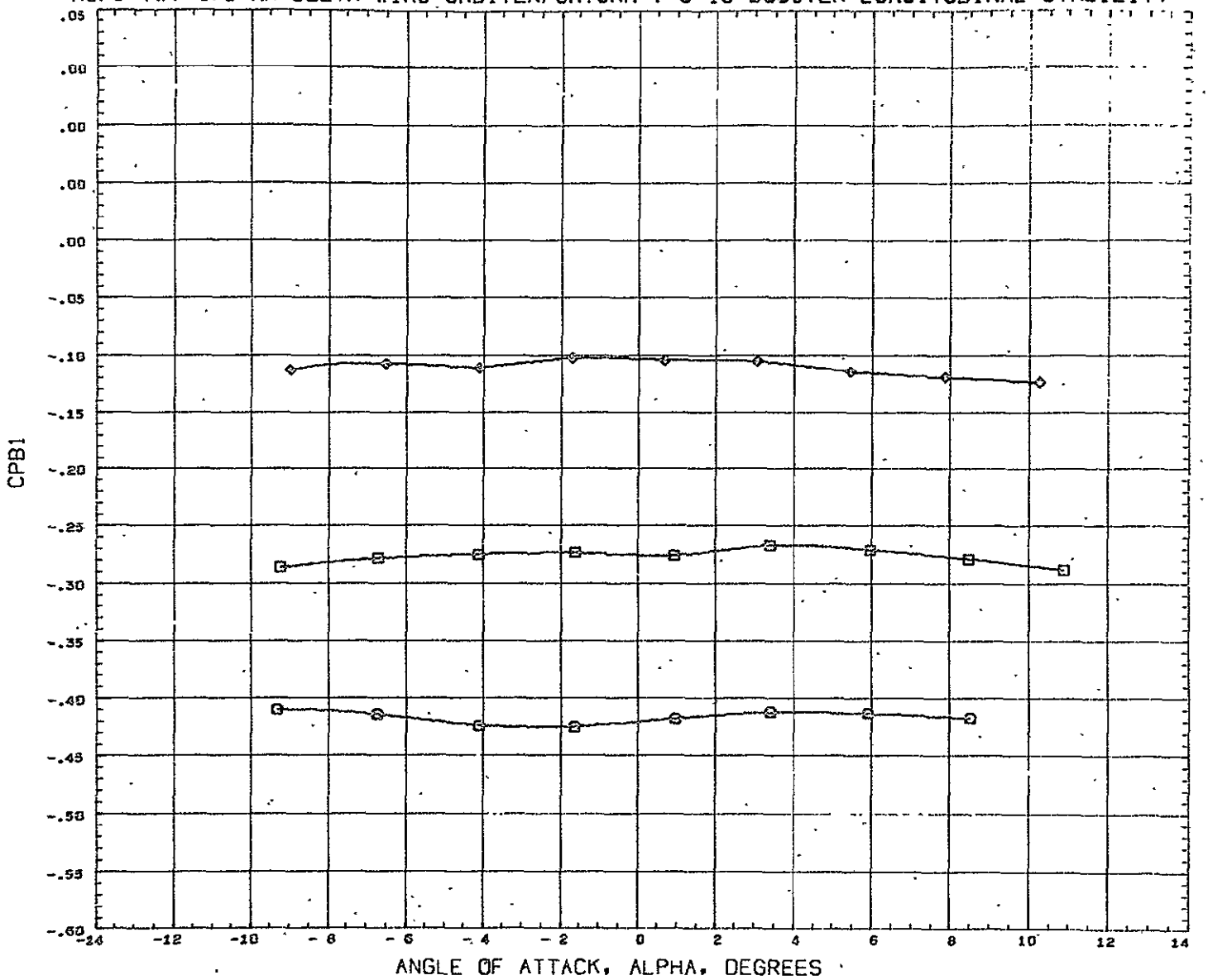
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES			
○	1.199	BETA	- 0.020	ORBINC	4.000
□	1.455				
◇	1.967				

REFERENCE FILE

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRF	5.2640	INCHES
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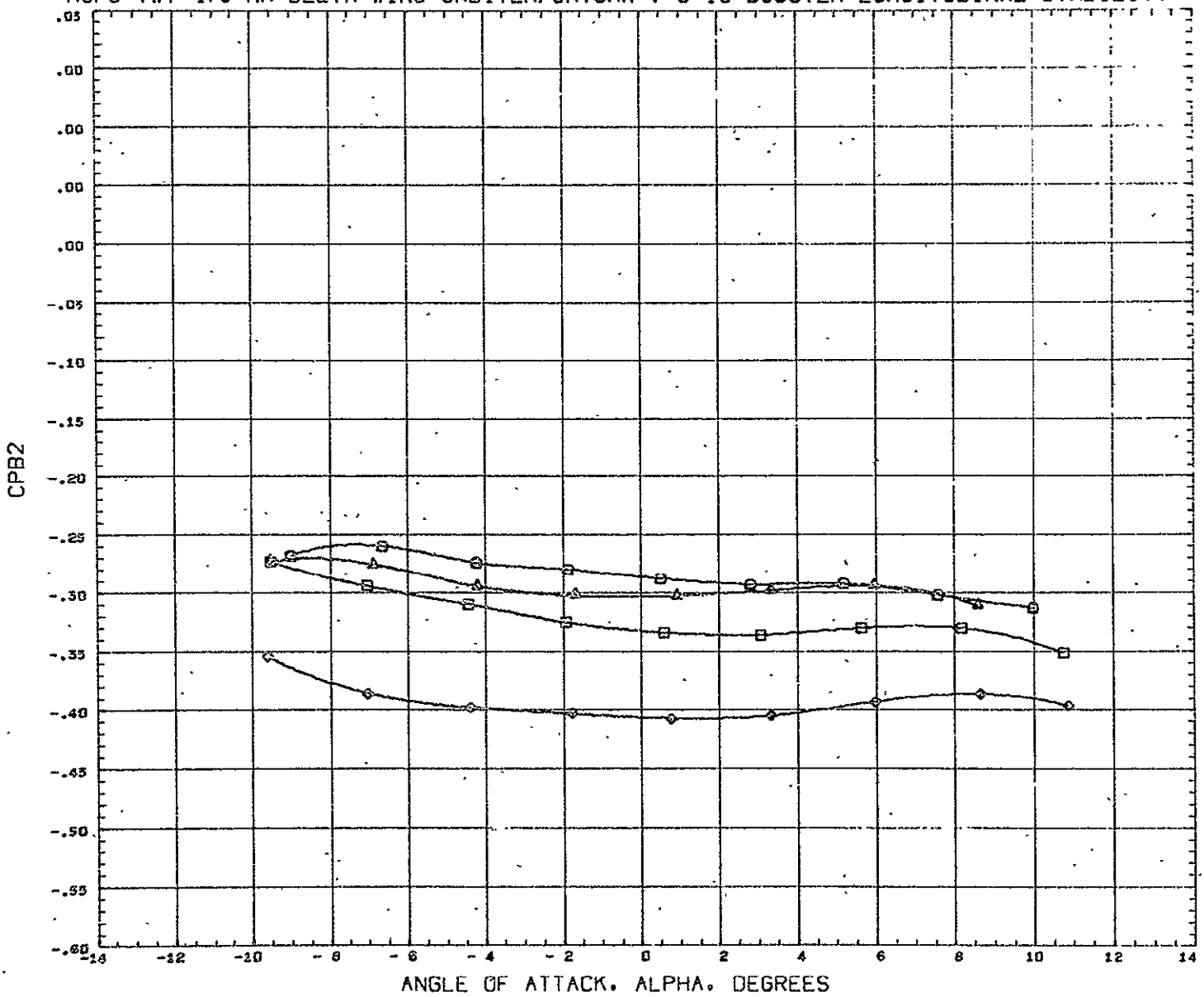
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES			
○	0.600	BETA	- 0.020	ORBINC	4.000
□	0.889				
◇	0.992				
△	1.093				

REFERENCE FILE

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
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YMRF	0.0000	INCHES
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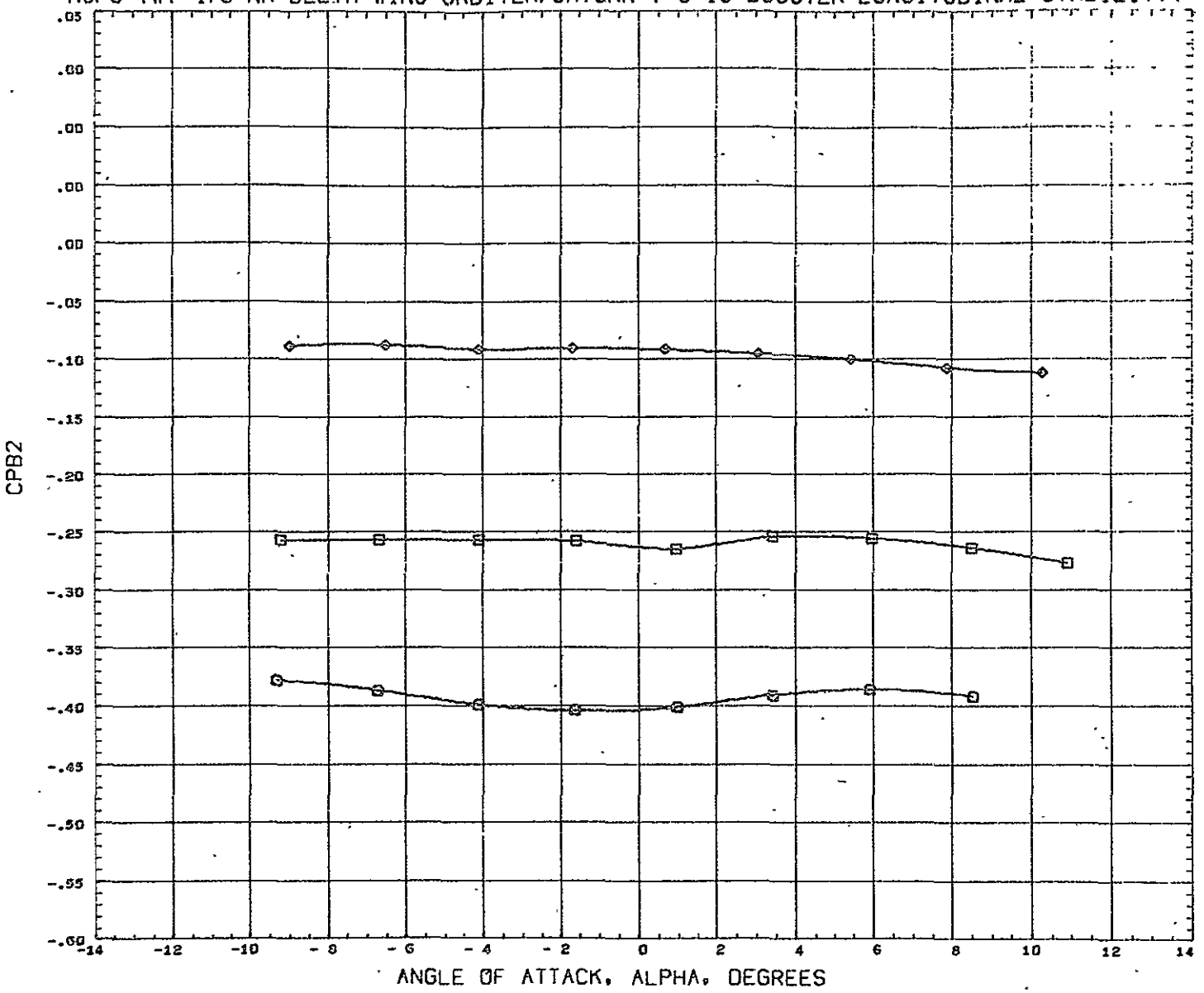
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY.



SYMBOL	MACH	PARAMETRIC VALUES			
○	1.199	BETA	- 0.020	ORBINC	4.000
□	1.455				
◇	1.967				

REFERENCE FILE

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
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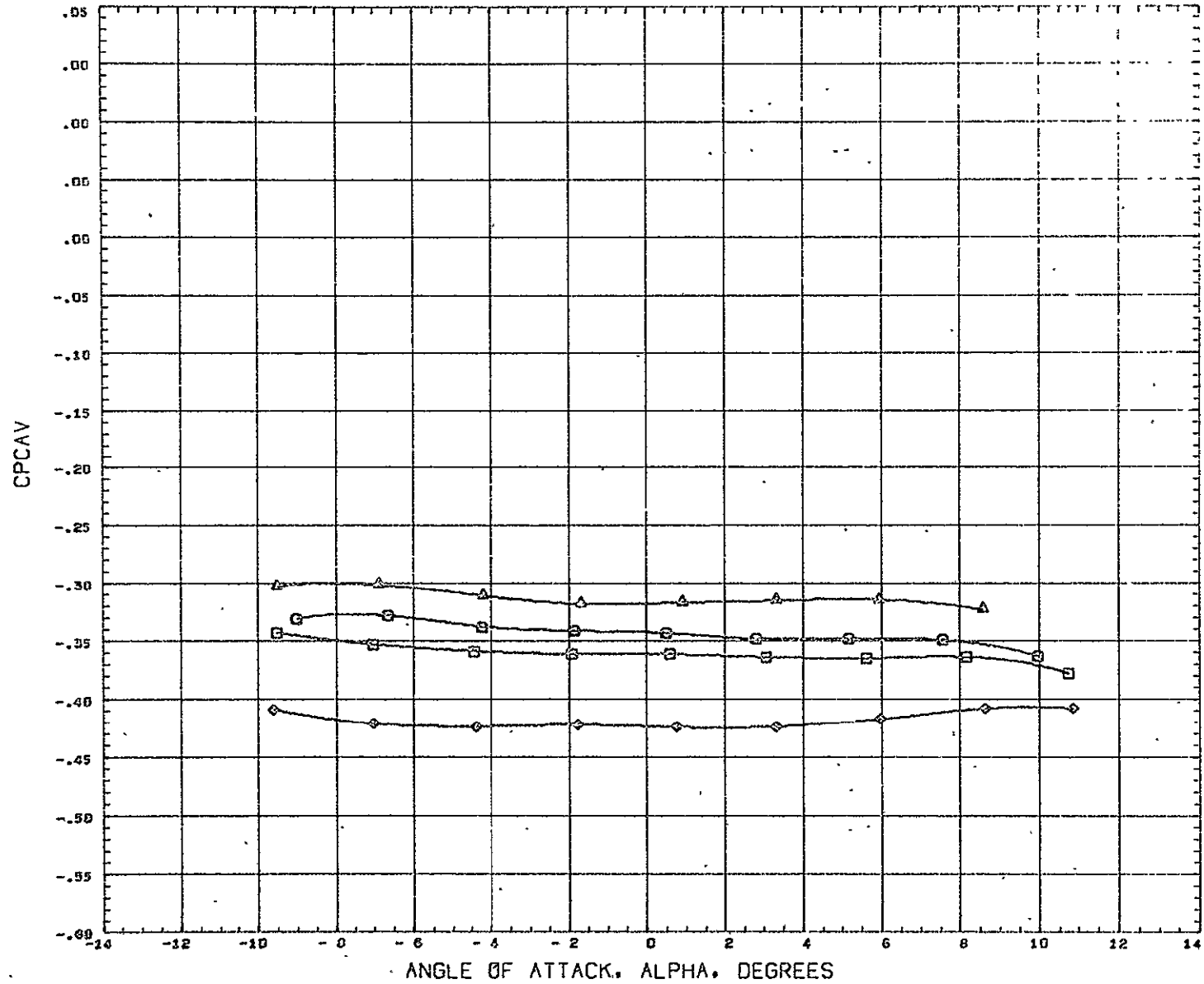
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER-LØNGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES			
○	0.600	BETA	- 0.020	ØRBINC	4.000
□	0.889				
◇	0.992				
△	1.093				

REFERENCE FILE

REFERENCE INFORMATION		
REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
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YMRP	0.0000	INCHES
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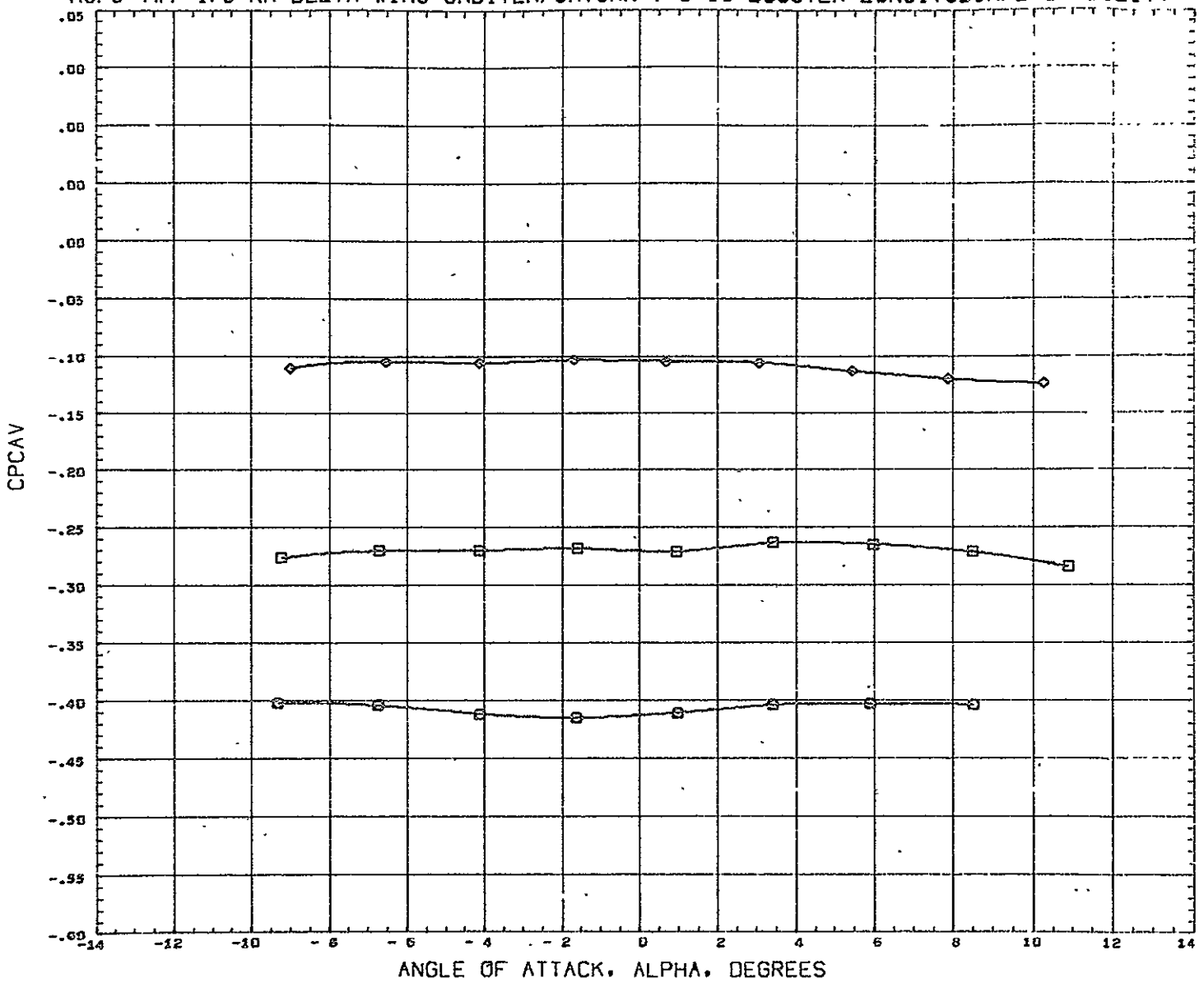
MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES			
○	1.199	BETA	- 0.020	ORBINC	4.000
□	1.455				
◇	1.967				

REFERENCE FILE

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
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YMRP	0.0000	INCHES
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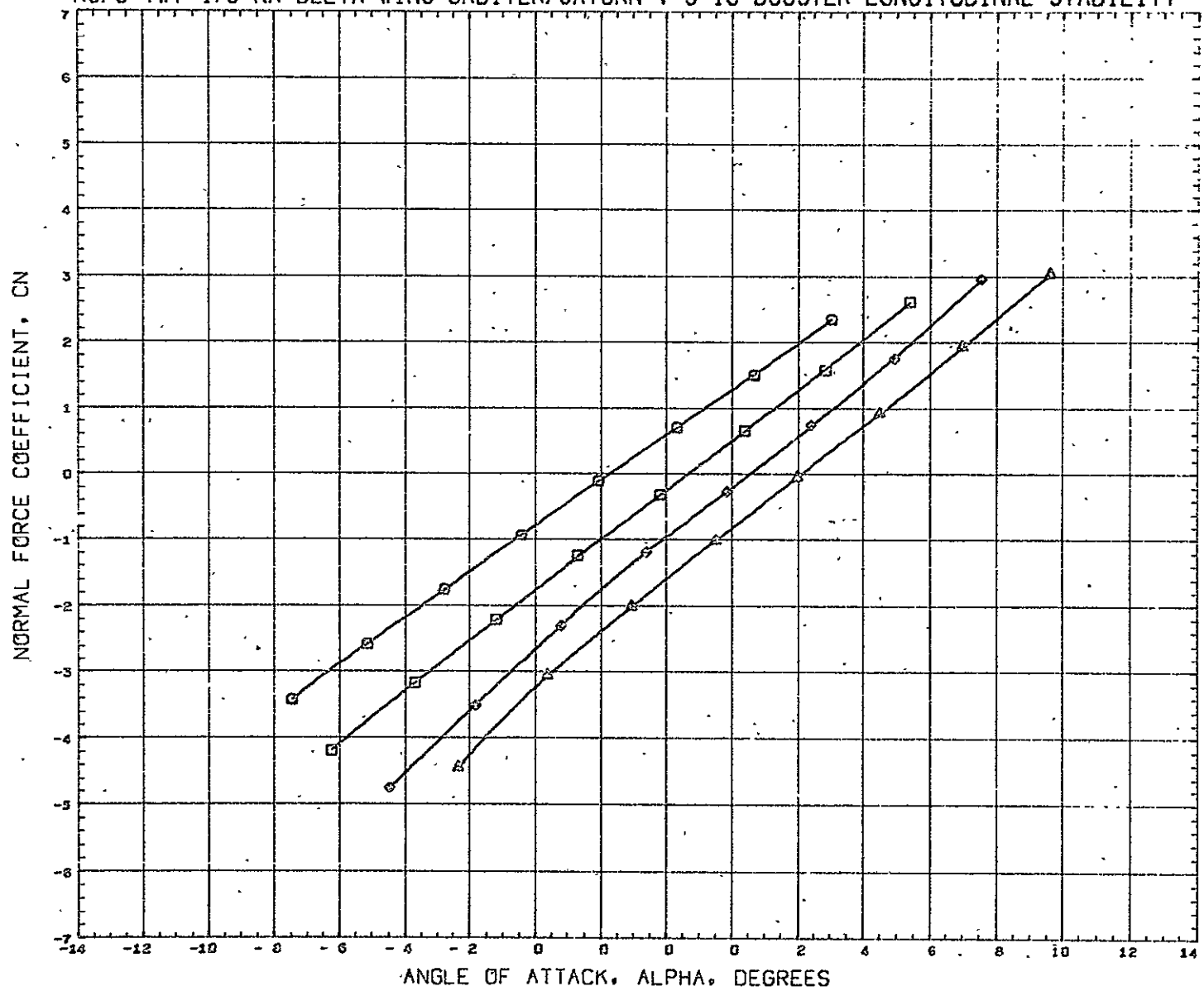
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER-LØNGITUDINAL STABILITY



SYMBOL	MACH		PARAMETRIC VALUES		
○	0.600	BETA	0.000	ØRBINC	- 2.000
□	0.896				
◇	1.002				
△	1.101				

DATA HIST. CØDE HN

REFERENCE INFØRMATIØN

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
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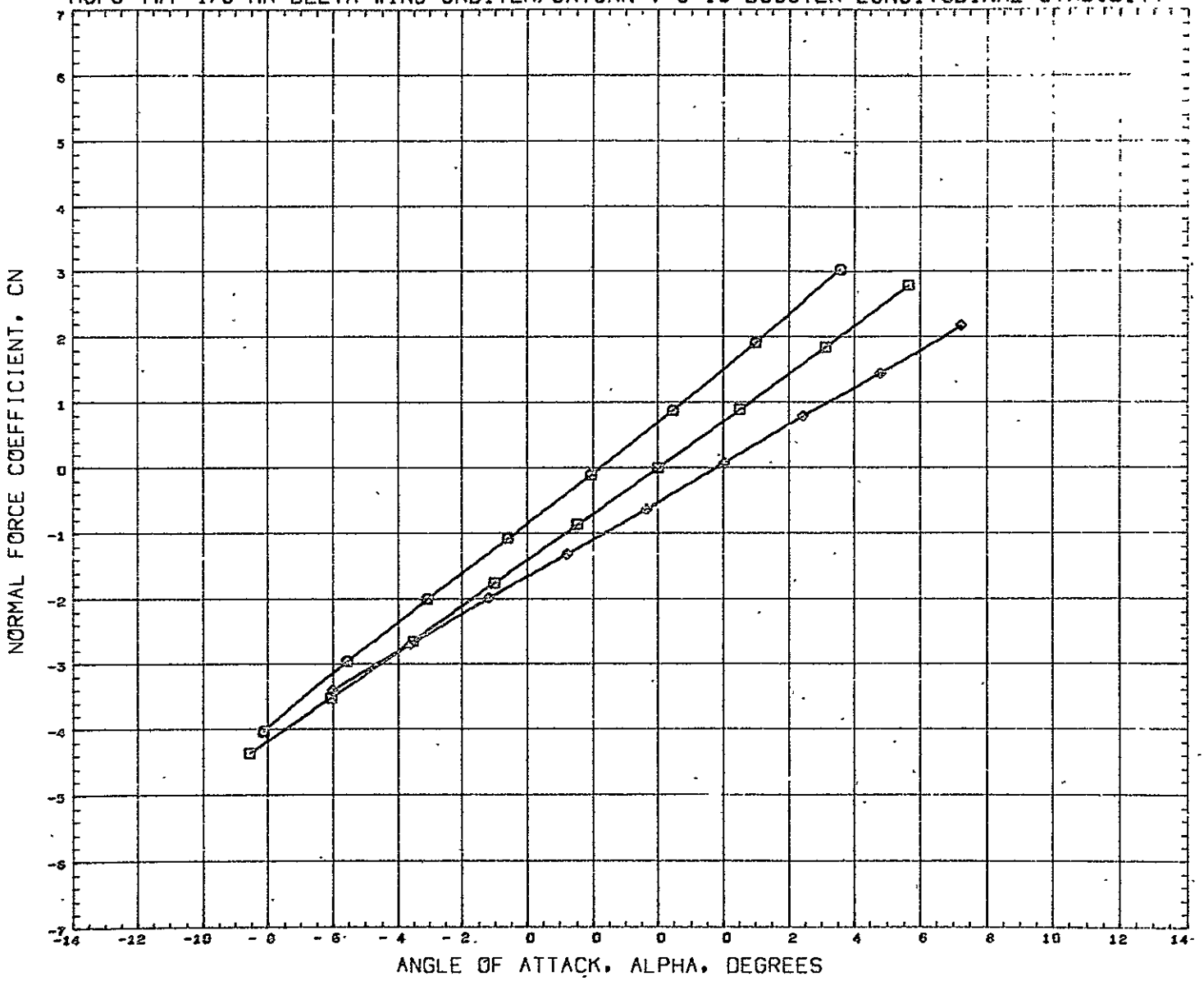
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH		PARAMETRIC VALUES		
○	1.198	BETA	0.000	ORBINC	- 2.000
□	1.459				
◇	1.955				

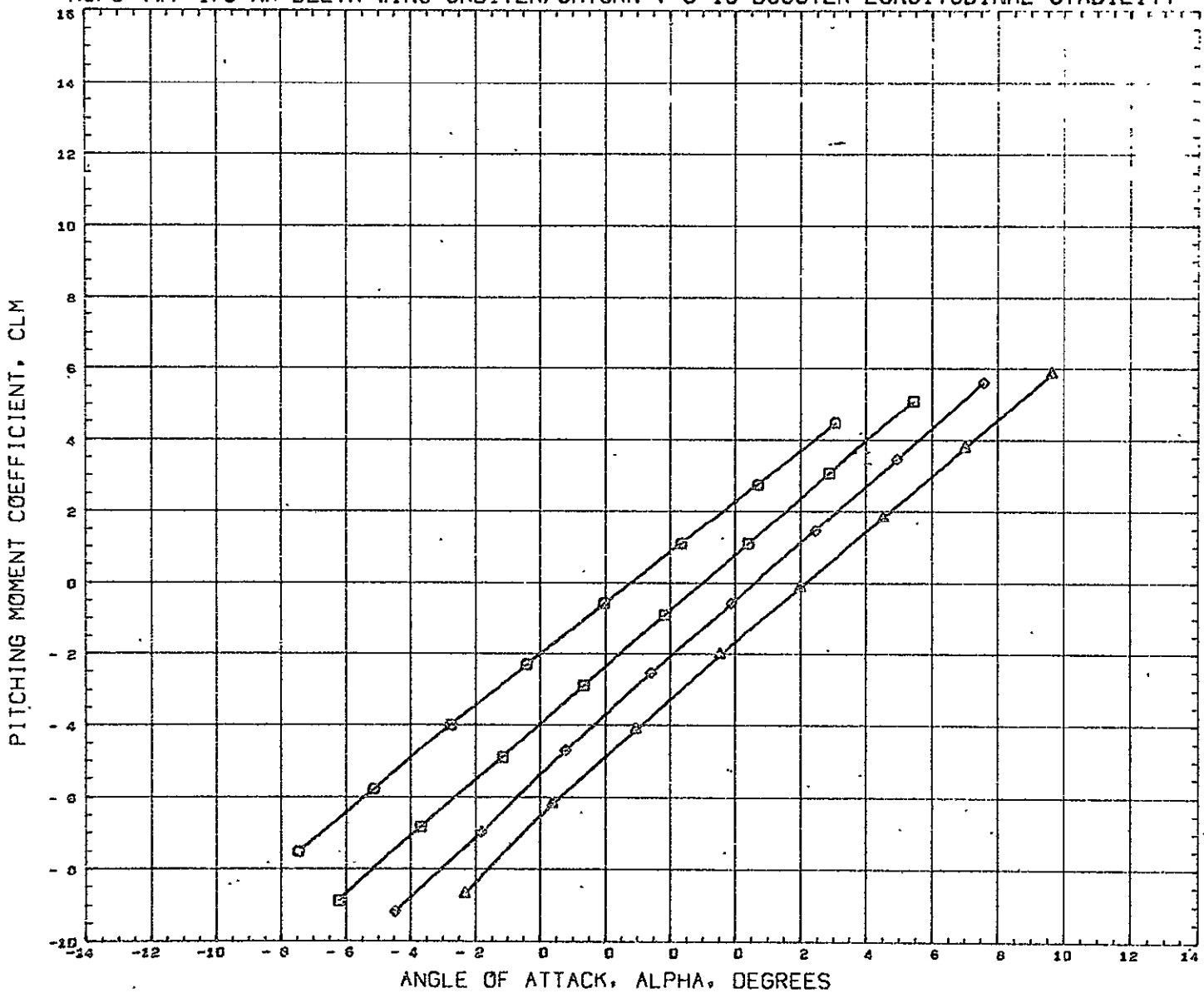
REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE MH

MSFC 476 NR HCRORB/S-ICBOOSTER BS+B5W14E3V17 (R25081) 14 JAN 71 PAGE 62

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



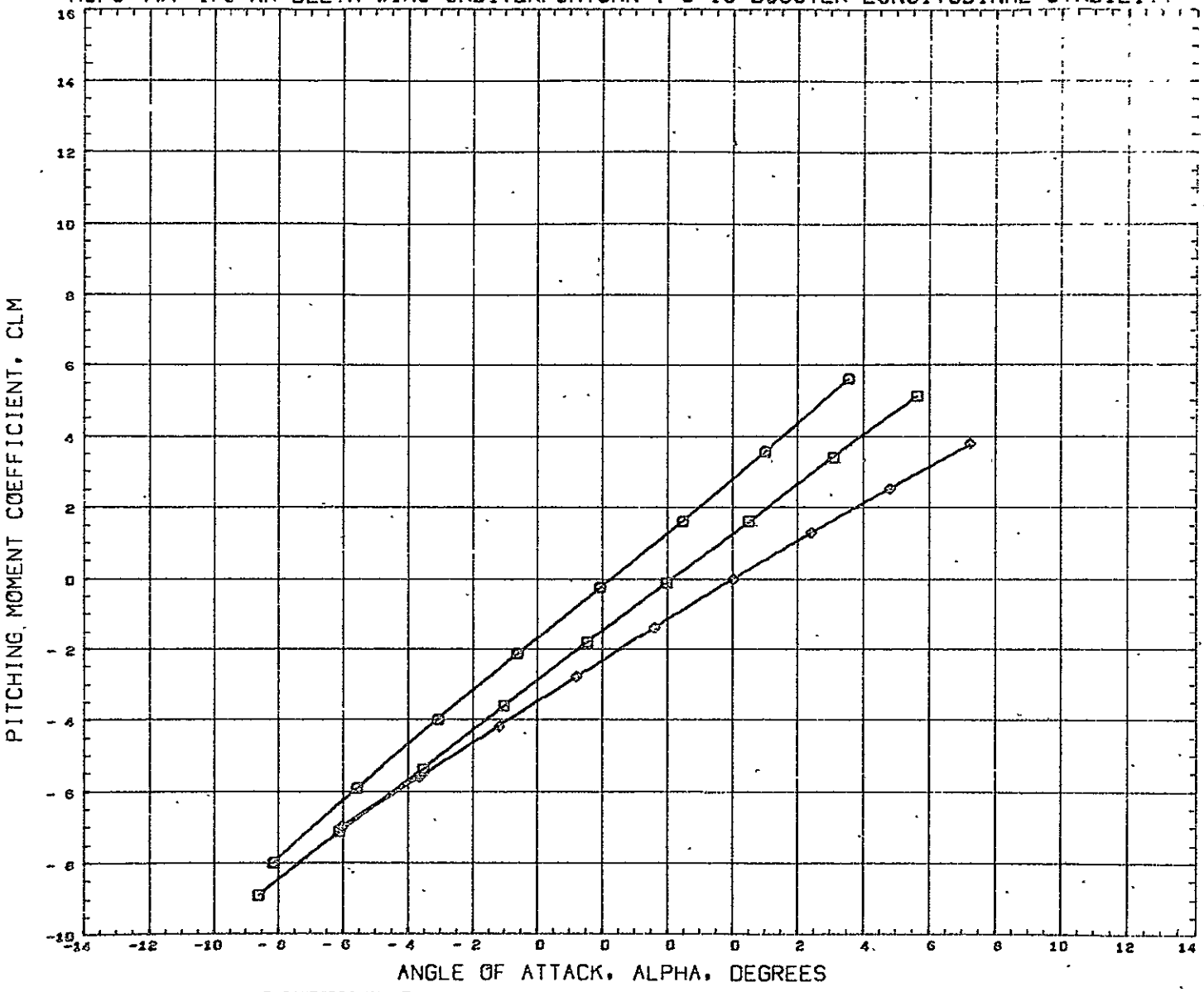
SYMBOL	MACH		PARAMETRIC VALUES		
○	0.600	BETA	0.000	ORBINC	- 2.000
□	0.895				
◇	1.002				
△	1.101				

DATA HIST. CODE HH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH		PARAMETRIC VALUES		
○	1.198	BETA	0.000	ORBINC	- 2.000
□	1.459				
◇	1.955				

DATA HIST. CODE HH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
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YMRP	0.0000	INCHES
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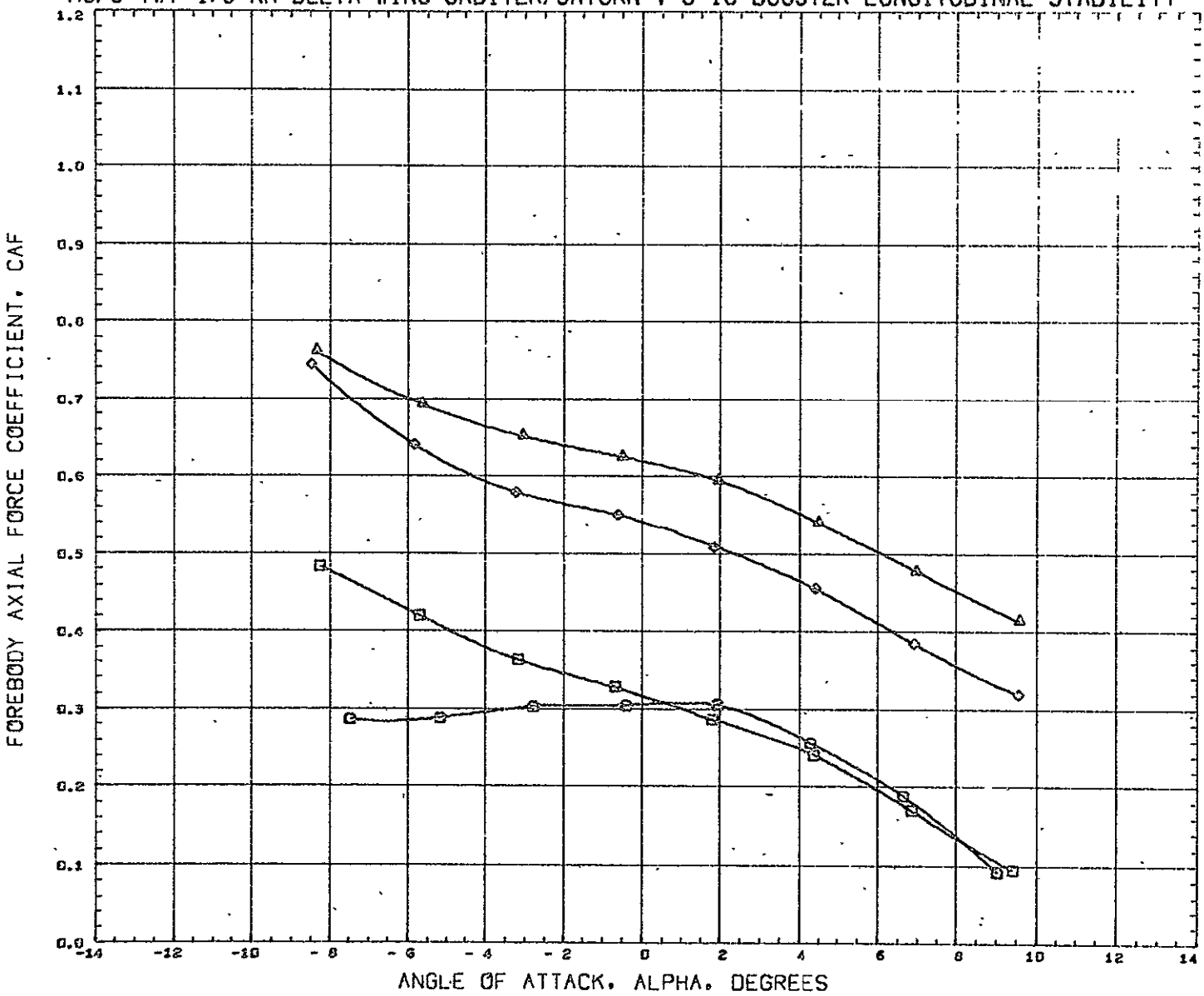
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER-LØNGITUDINAL STABILITY



SYMBOL	MACH		PARAMETRIC VALUES		
○	0.600	BETA	0.000	ØRBINC	- 2.000
□	0.896				
◇	1.002				
△	1.101				

DATA HIST. CØDE NN

REFERENCE INFØRMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
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YMRP	0.0000	INCHES
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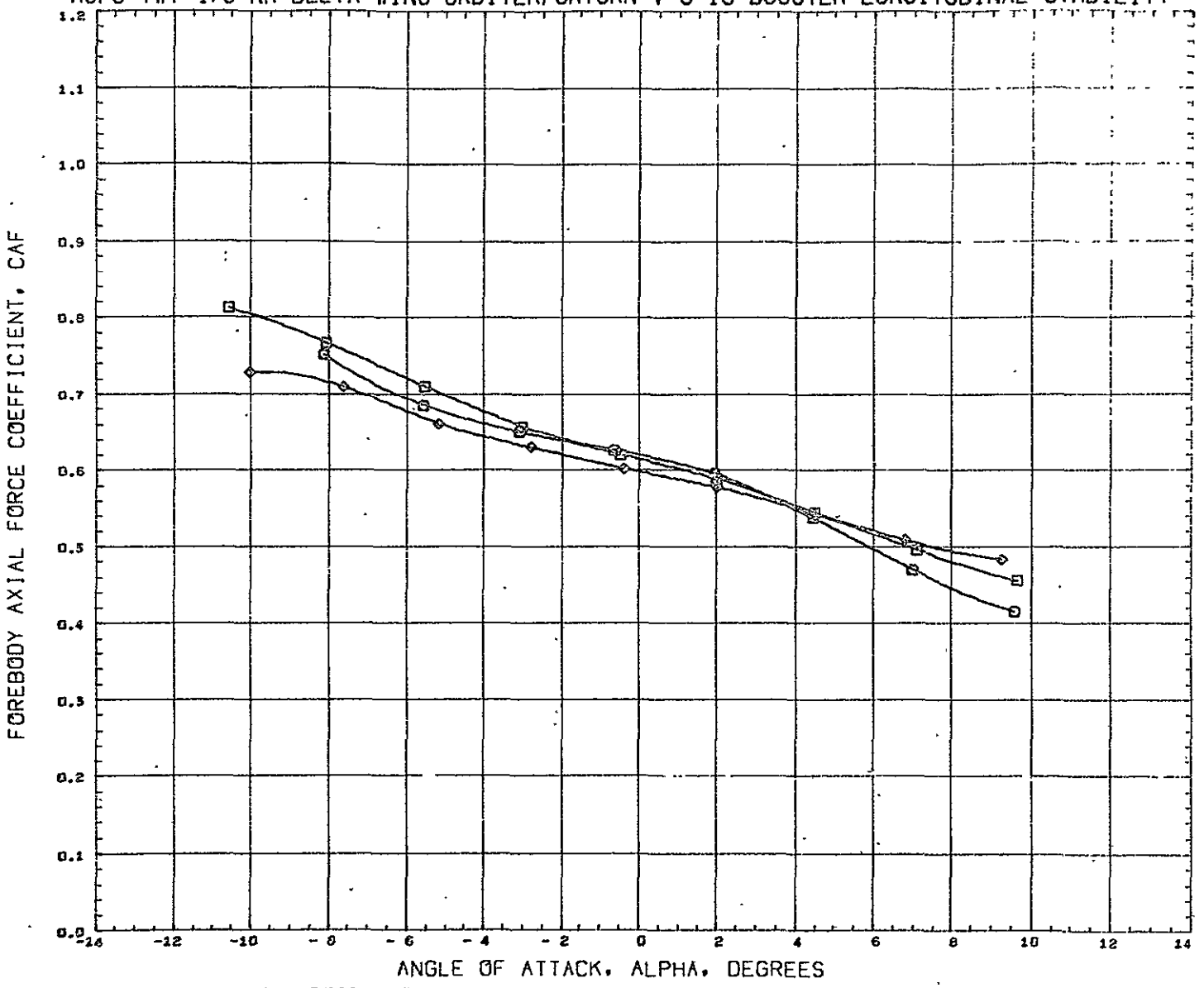
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH		PARAMETRIC VALUES		
○	1.198	BETA	0.000	ORBINC	- 2.000
□	1.459				
◇	1.955				

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
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YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
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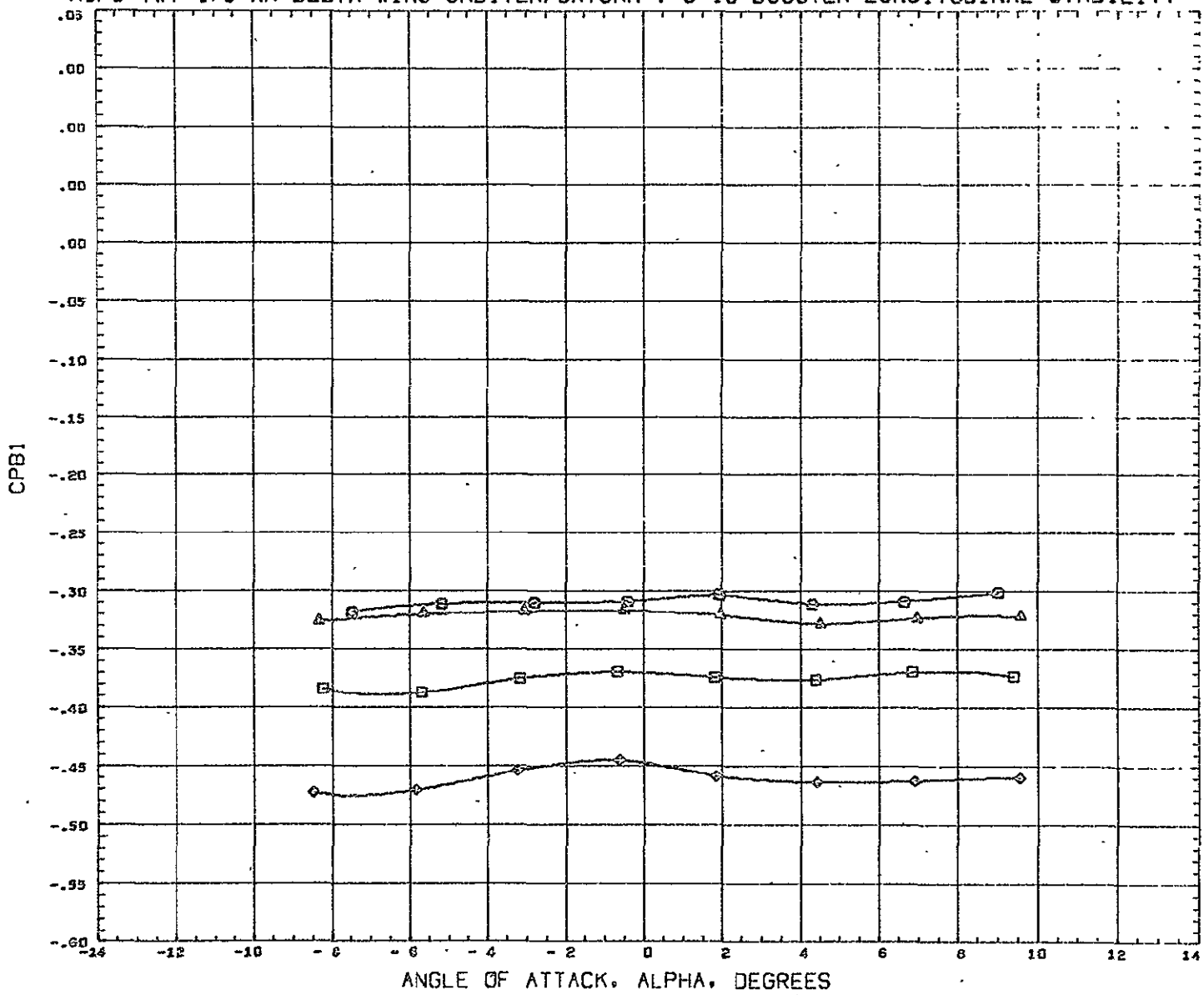
DATA HIST. CODE MM

MSFC TWT 476 NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER-LØNGITUDINAL STABILITY



SYMBOL	MACH
○	0.600
□	0.896
◇	1.002
△	1.101

PARAMETRIC VALUES

BETA 0.000 ORBINC - 2.000

DATA HIST. CODE HH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
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XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
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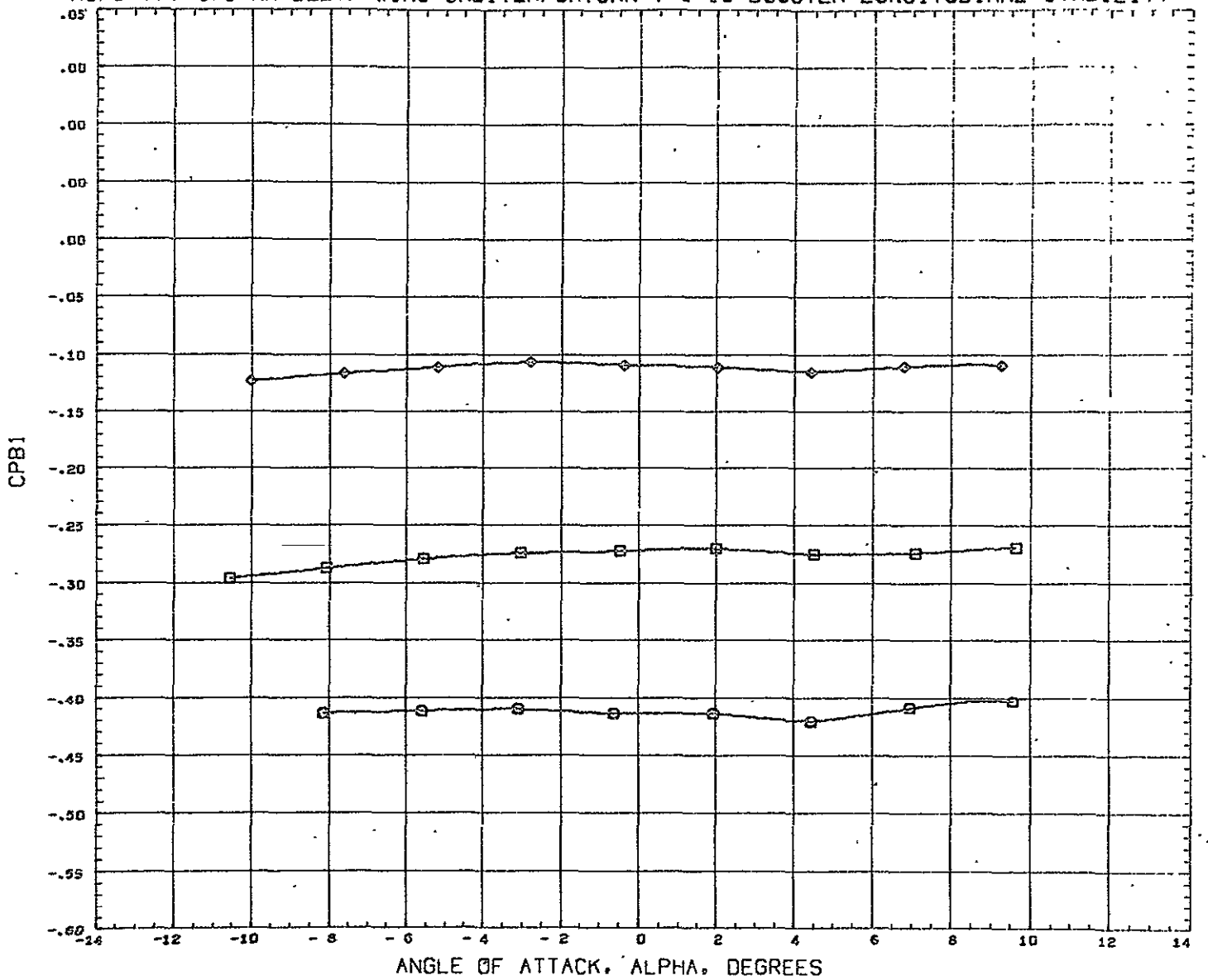
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



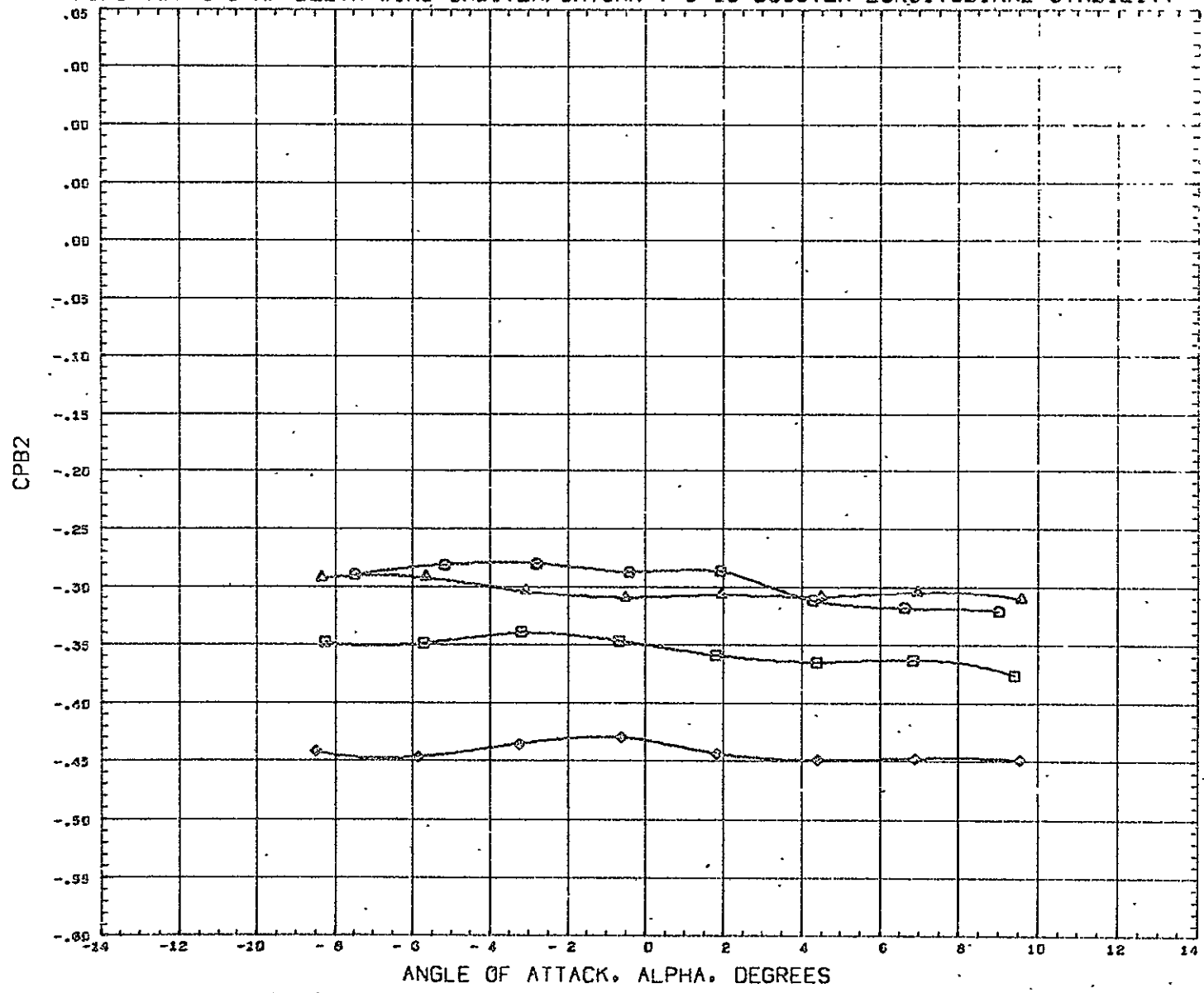
SYMBOL	MACH		PARAMETRIC VALUES		
○	1.198	BETA	0.000	ORBINC	- 2.000
□	1.459				
◇	1.955				

DATA HIST. CODE MM

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH		PARAMETRIC VALUES		
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□	0.695				
◇	1.002				
△	1.101				

DATA HIST. CODE MH

REFERENCE INFORMATION

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YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC 476 NR HCRORB/S-ICBOOSTER BS+B5W14E3V17 (R25081) 14 JAN 71 PAGE 69

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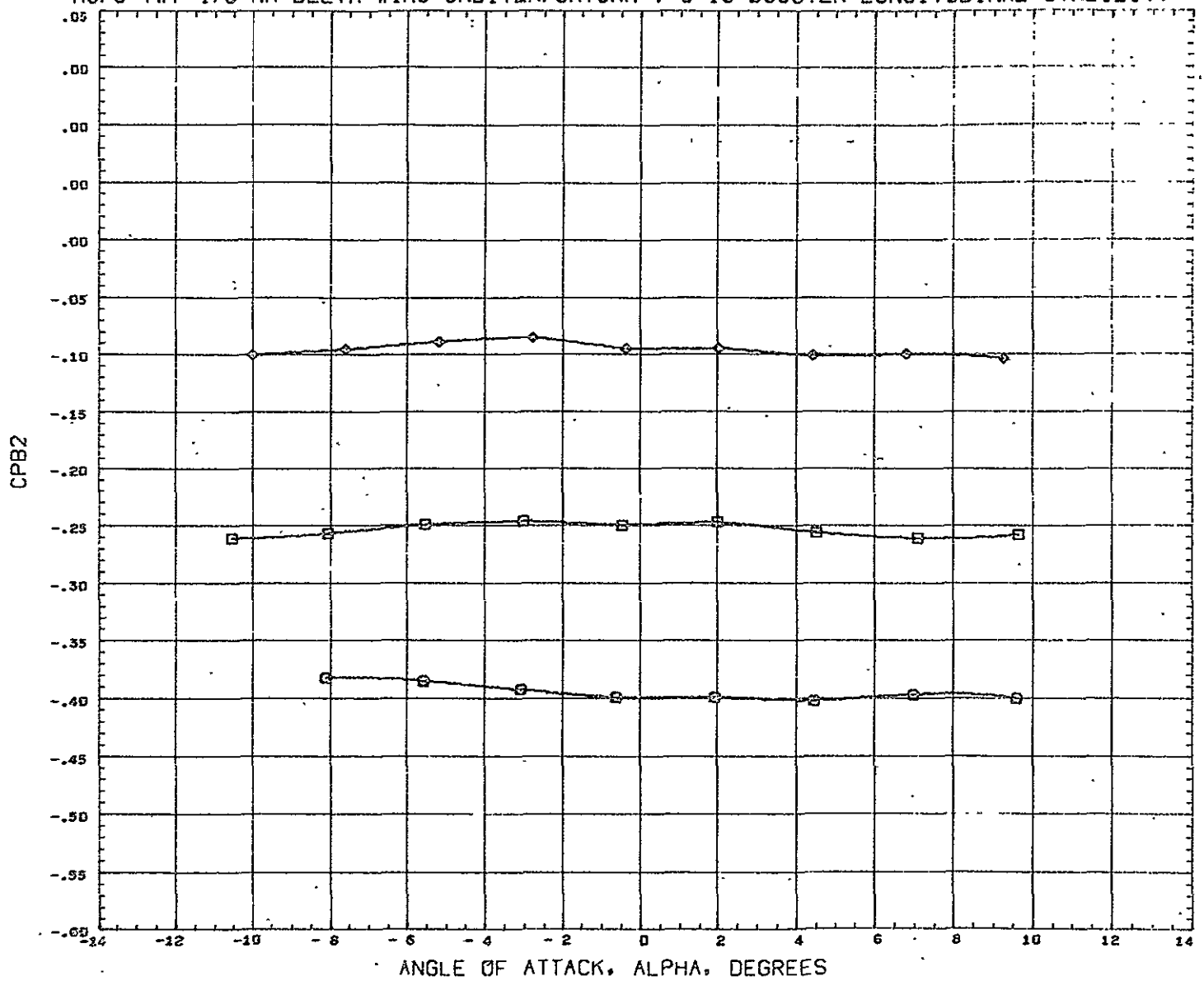
MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH		PARAMETRIC VALUES		
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◇	1.955				

DATA HIST. CODE HH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
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YMRP	0.0000	INCHES
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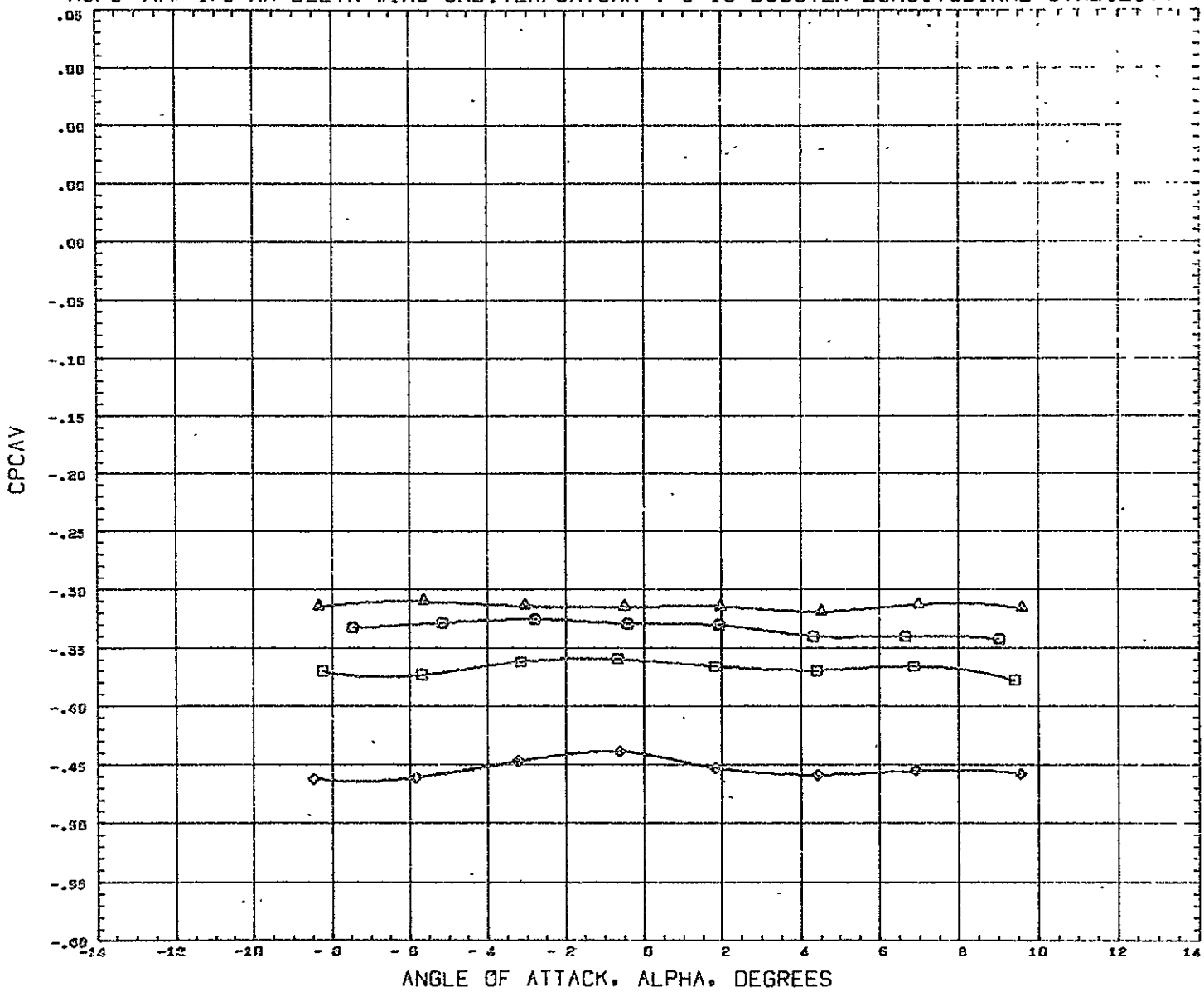
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES			
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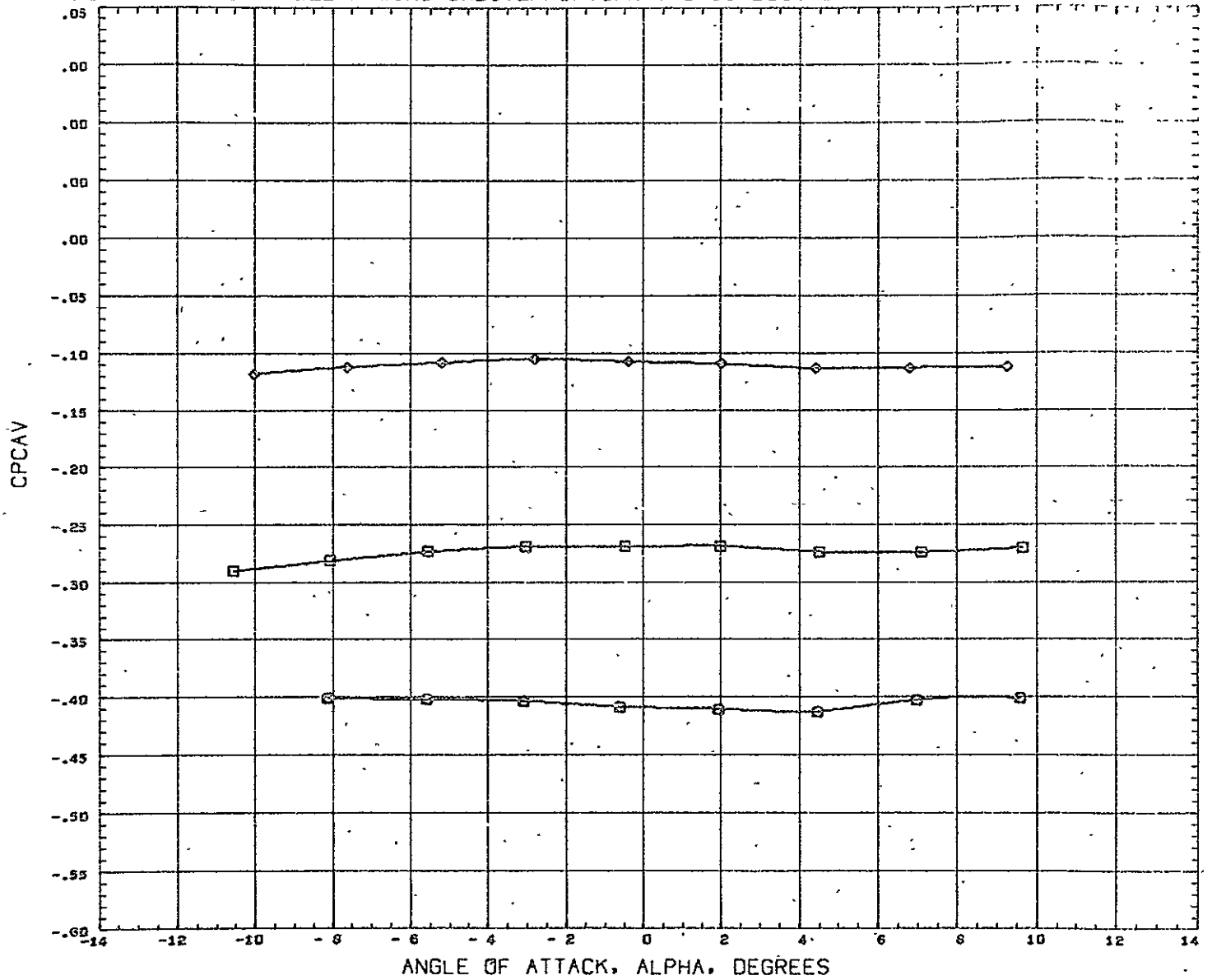
□	0.896				
◇	1.002				
△	1.101				

DATA HIST. CODE MN

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH		PARAMETRIC VALUES		
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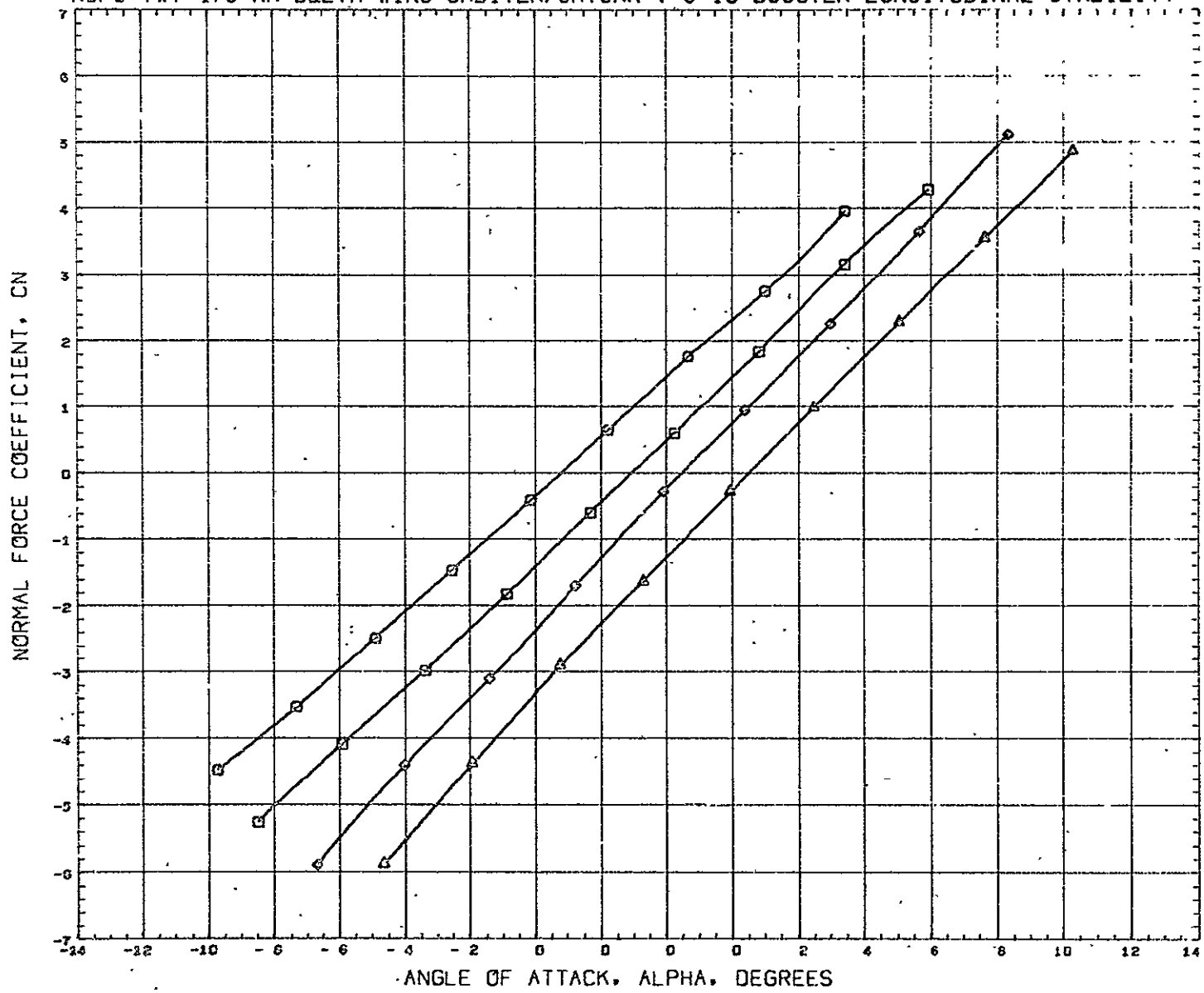
□	1.459				
◇	1.955				

DATA HIST. CODE MH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRF	5.2640	INCHES
YMRF	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH		PARAMETRIC VALUES		
○	0.601	BETA	0.000	ORBINC	1.000
□	0.696				
◇	0.997				
△	1.098				

DATA HIST. CODE MM

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
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YMRP	0.0000	INCHES
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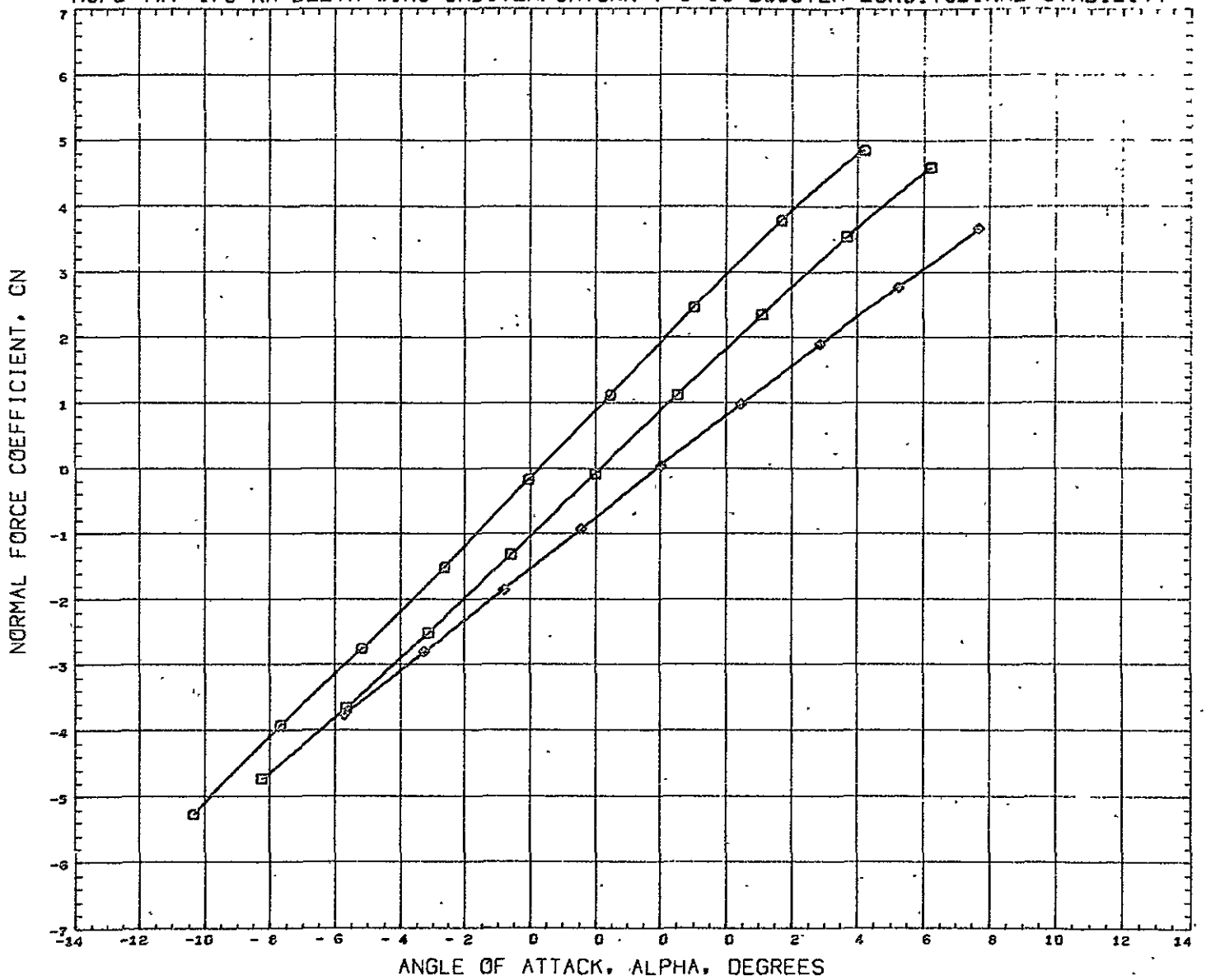
MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH		PARAMETRIC VALUES		
○	1.194	BETA	0.000	ORBINC	1.000
□	1.461				
◇	1.960				

DATA HIST. CODE MH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
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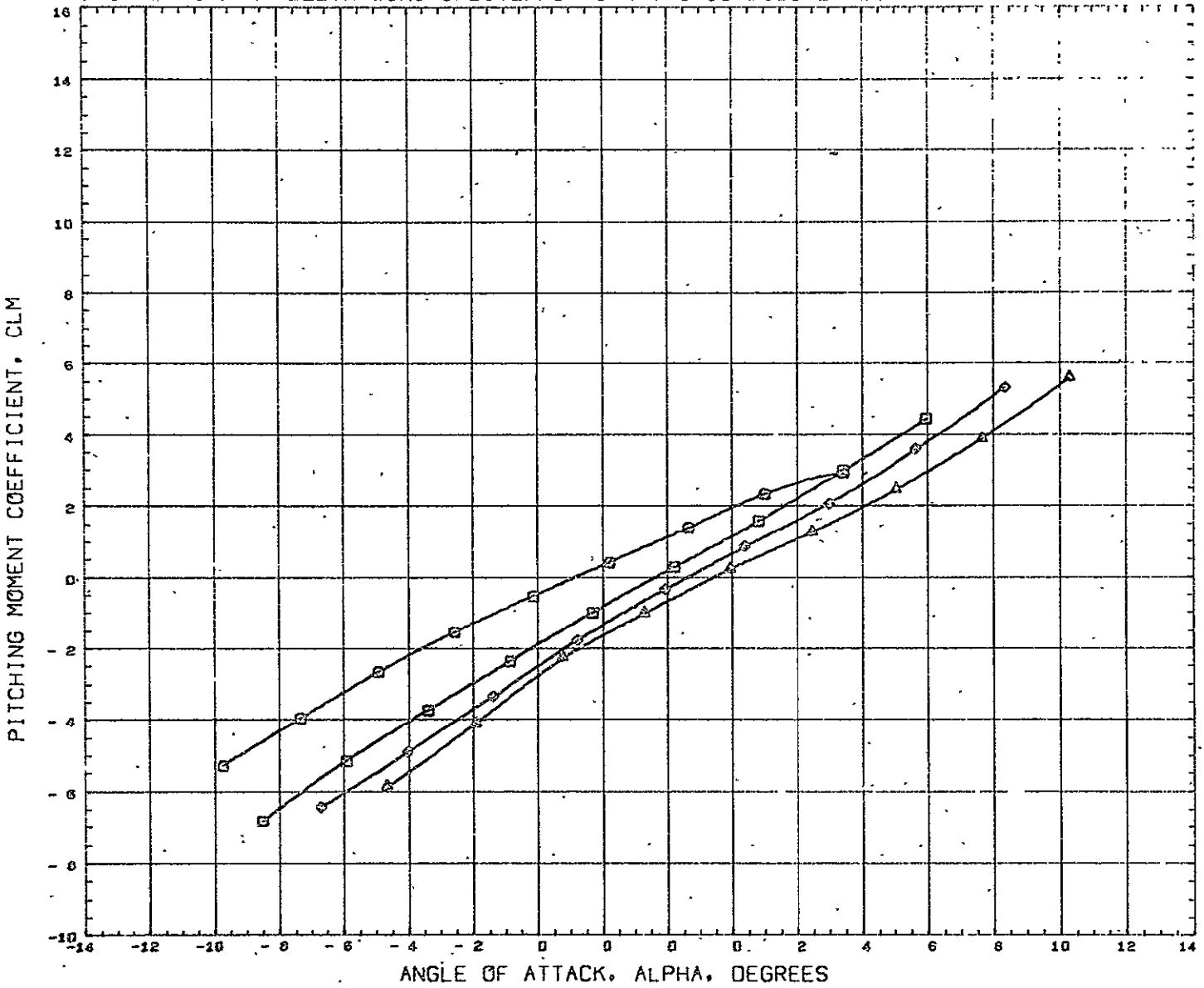
YMRF	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17 (R25091) 08 JAN 71 PAGE 74

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH		PARAMETRIC VALUES		
○	0.601	BETA	0.000	ORBINC	1.000
□	0.898				
◇	0.997				
△	1.098				

DATA HIST. CODE MH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
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YMRP	0.0000	INCHES
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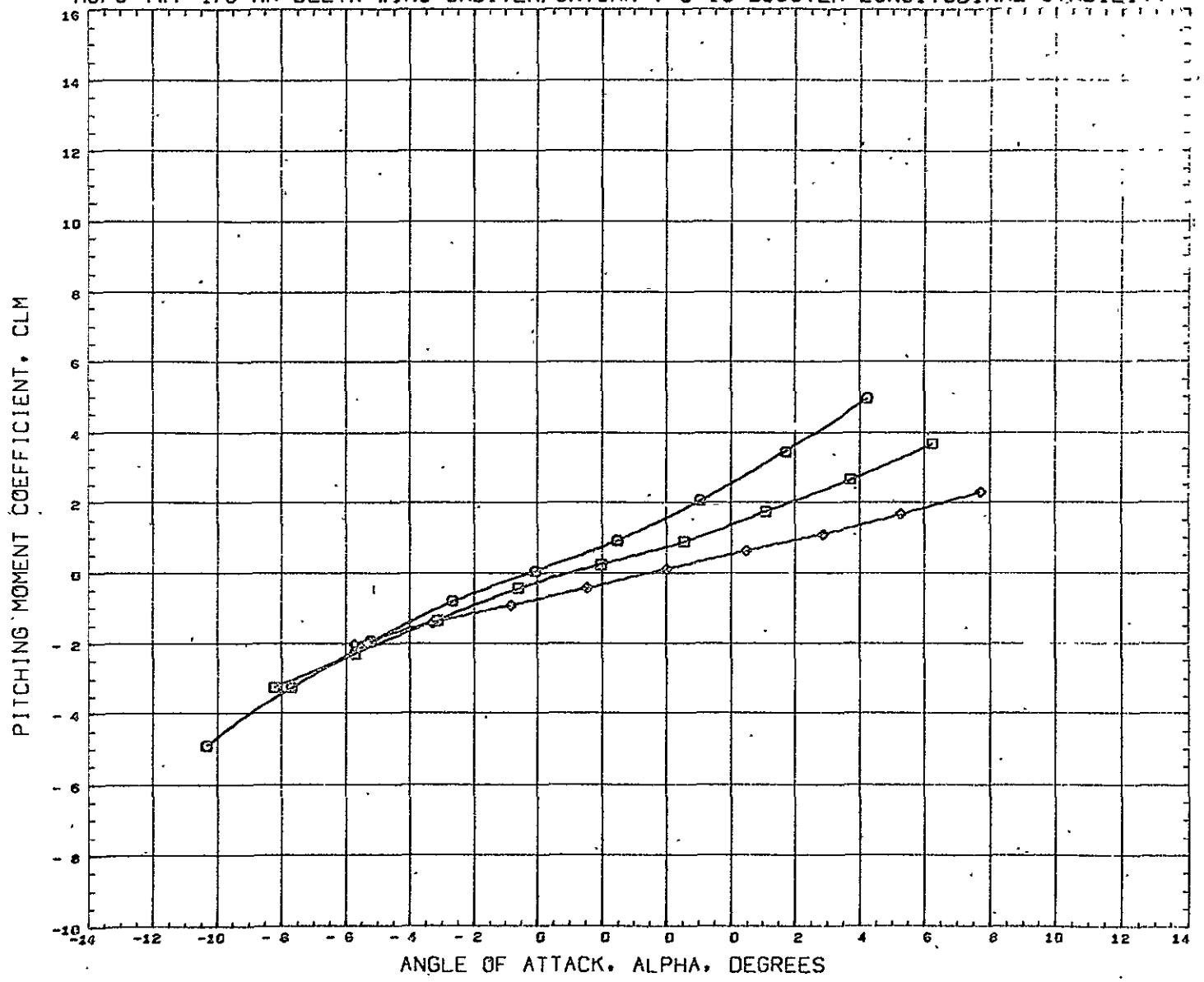
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH		PARAMETRIC VALUES		
○	1.194	BETA	0.000	ORBINC	1.000
□	1.461				
◇	1.960				

DATA HIST. CODE MH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
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XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
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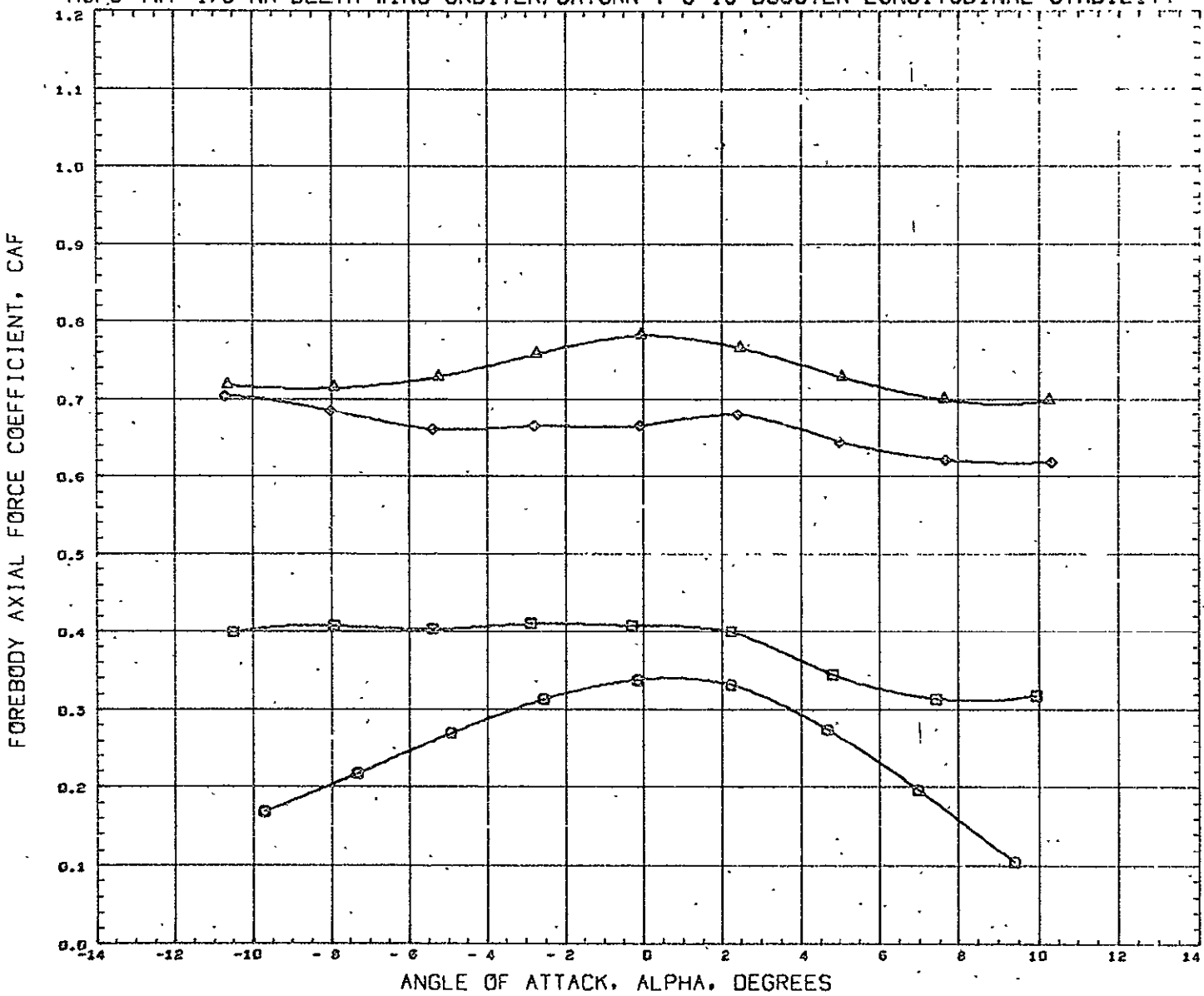
MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH.	PARAMETRIC VALUES			
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□	0.098				
◇	0.997				
△	1.098				

DATA HIST. CODE HH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
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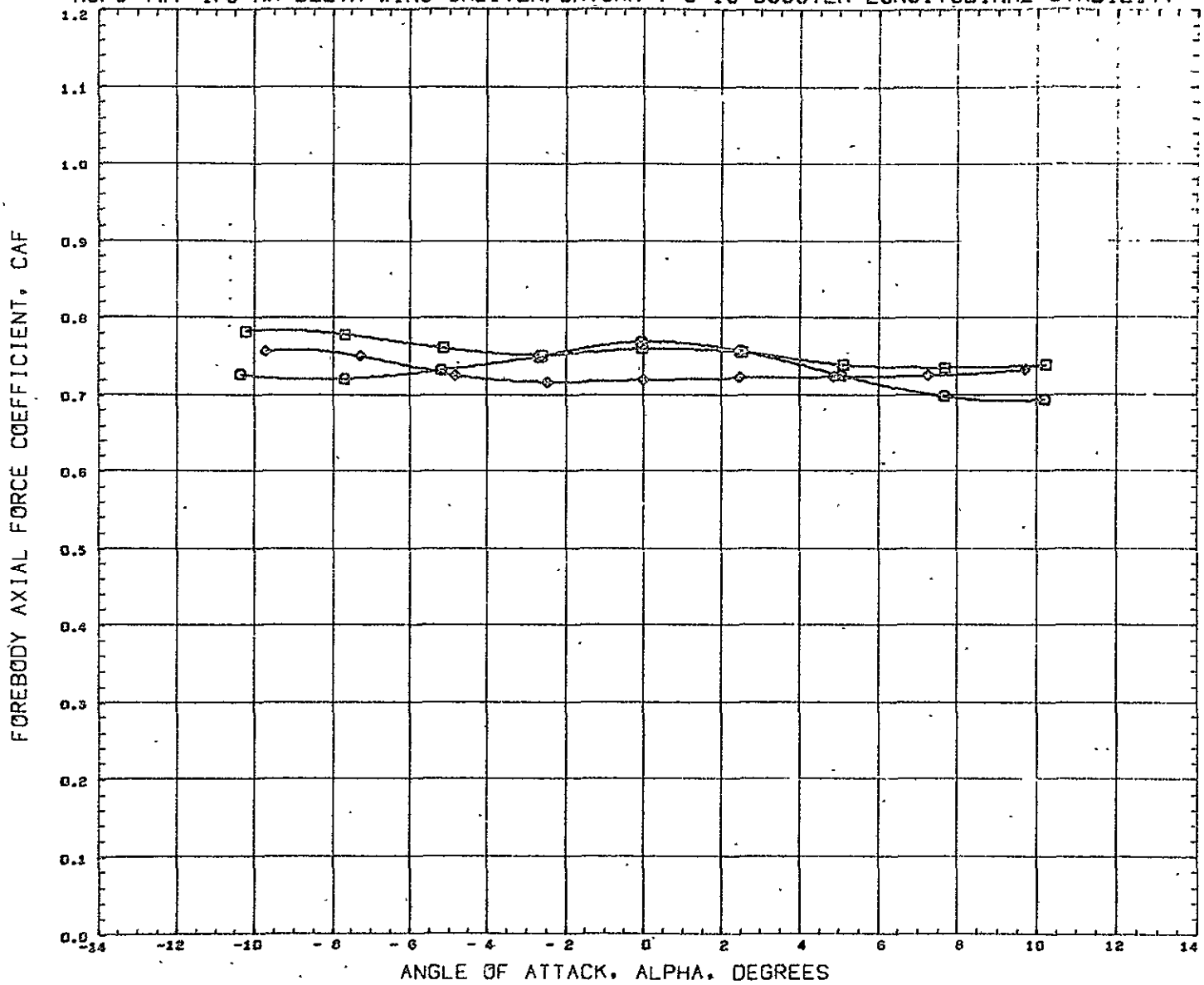
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH		PARAMETRIC VALUES		
○	1.194	BETA	0.000	ORBINC	1.000
□	1.461				
◇	1.960				

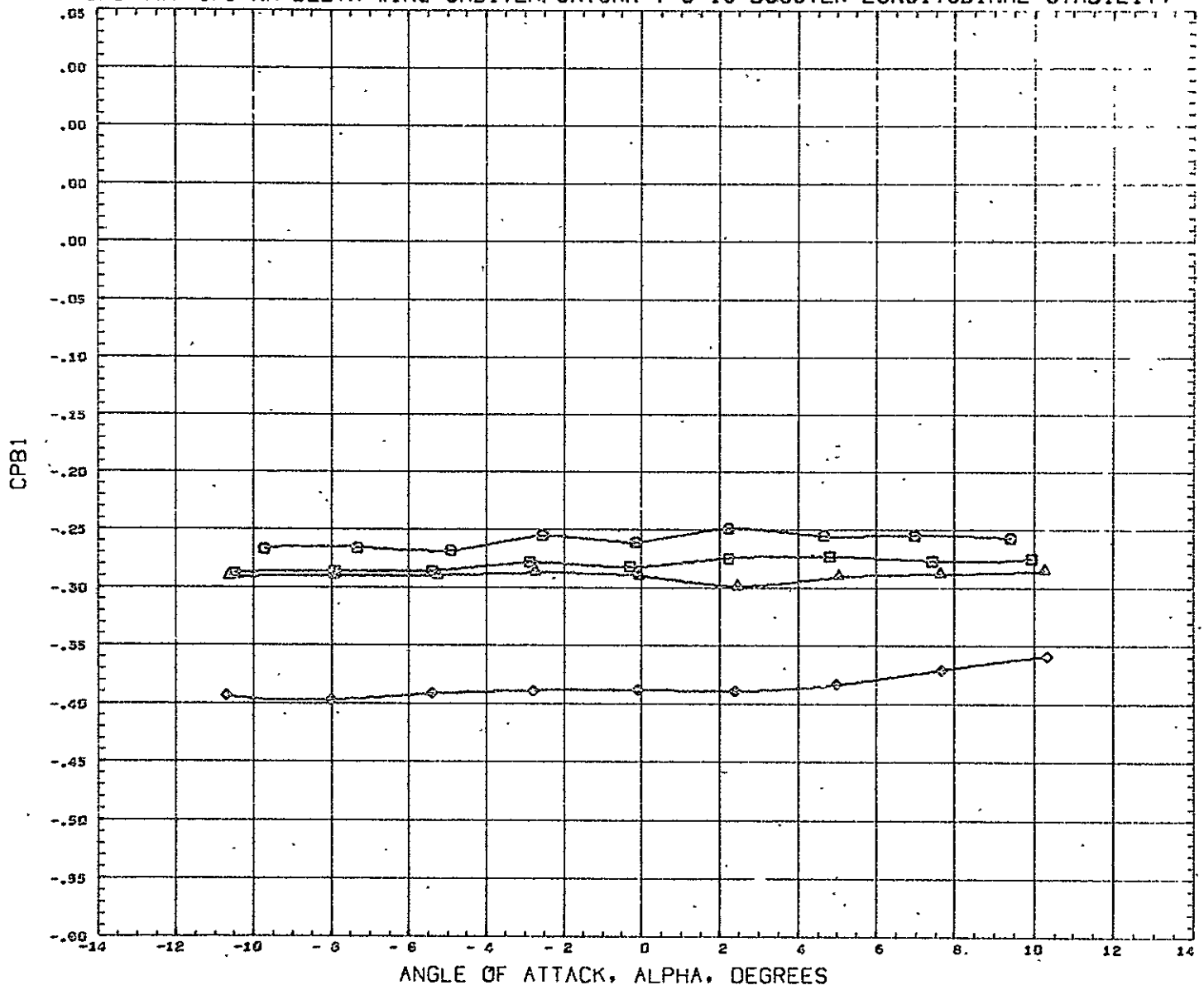
DATA HIST. CODE HH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000.	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17 (R25091) 08 JAN 71 PAGE 78

MSFC TWT 476 NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER-LØNGITUDINAL STABILITY



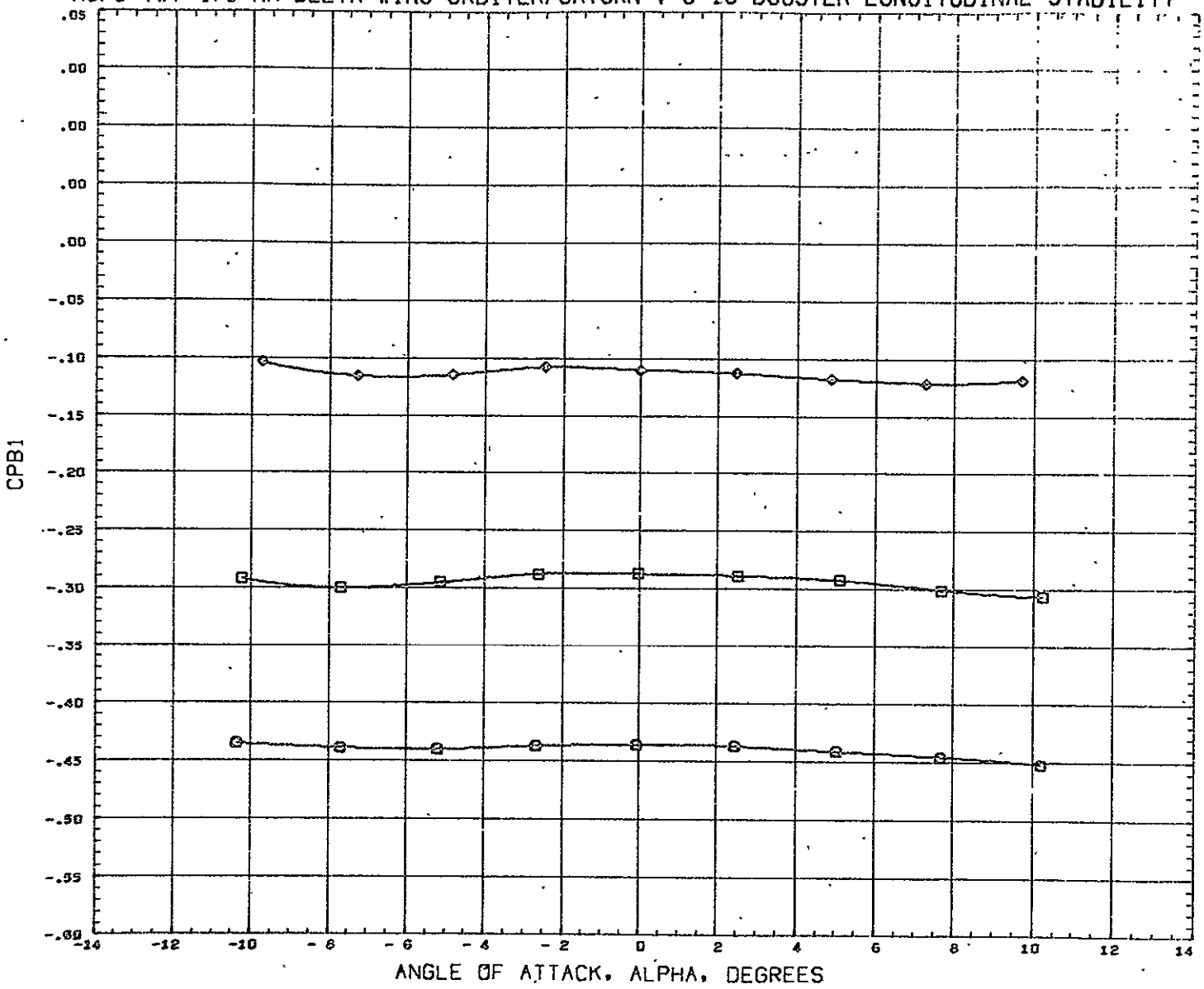
SYMBOL	MACH		PARAMETRIC VALUES		
○	0.601	BETA	0.000	ØRBINC	1.000
□	0.898				
◇	0.997				
△	1.098				

DATA HIST. CODE NM

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER-LØNGITUDINAL STABILITY



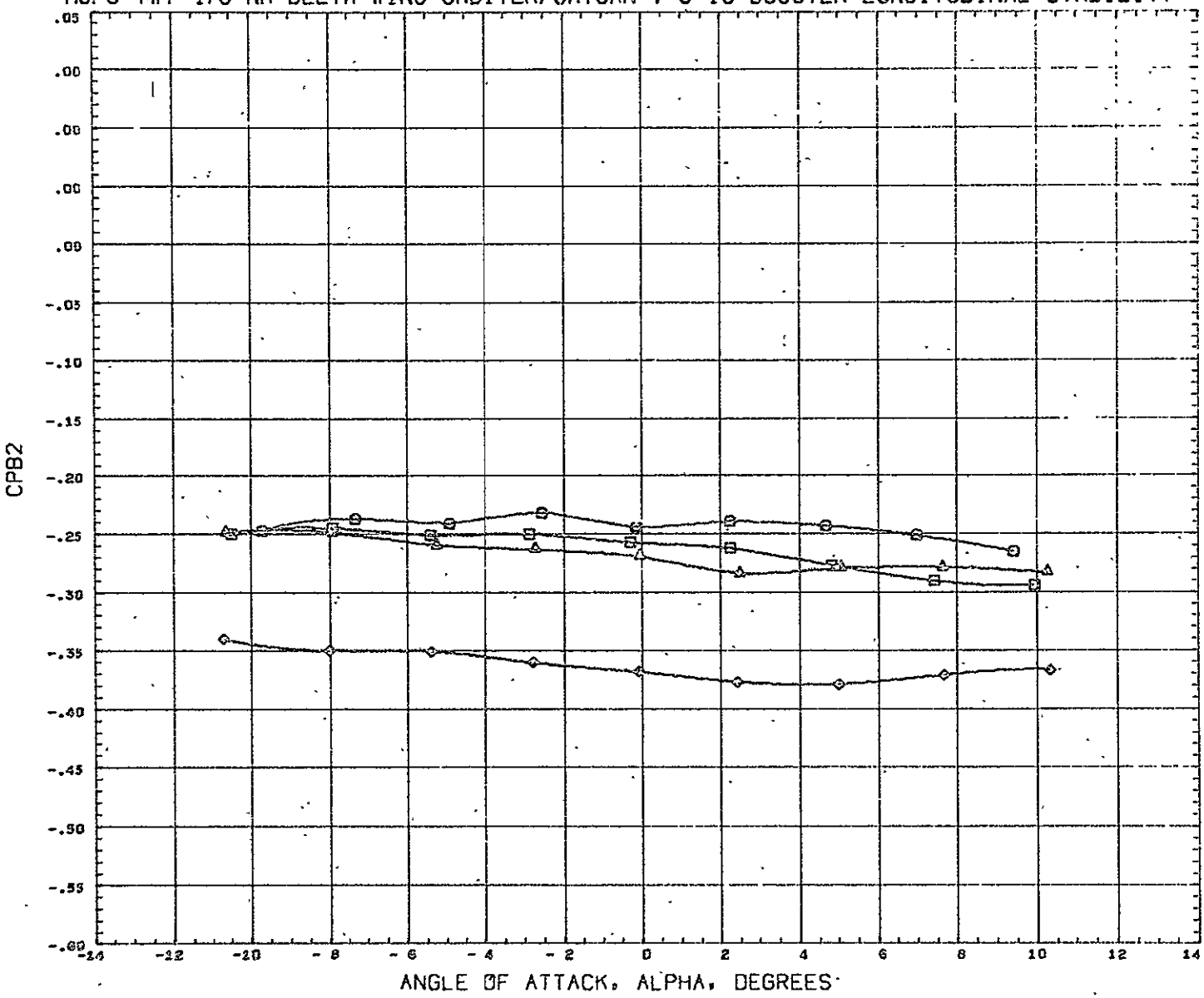
SYMBOL	MACH		PARAMETRIC VALUES		
○	1.194	BETA	0.000	ORBINC	1.000
□	1.461				
◇	1.960				

DATA HIST. CODE MH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



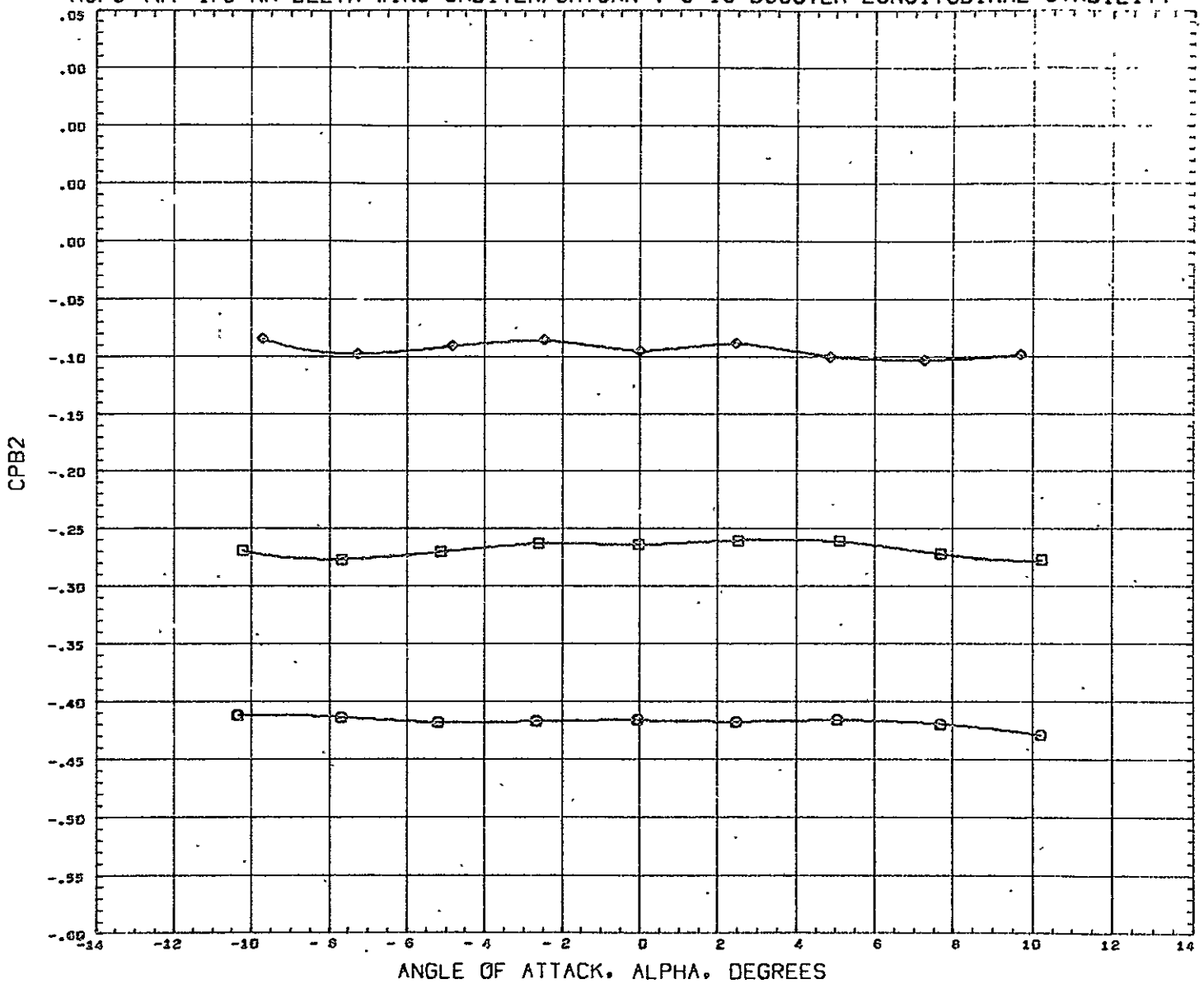
SYMBOL	MACH	PARAMETRIC VALUES			
○	0.601	BETA	0.000	ORBINC	1.000
□	0.892				
◇	0.997				
△	1.098				

DATA HIST: CODE MN

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER-LØNGITUDINAL STABILITY



SYMBOL	MACH		PARAMETRIC VALUES		
○	1.194	BETA	0.000	ORBINC	1.000
□	1.461				
◇	1.960				

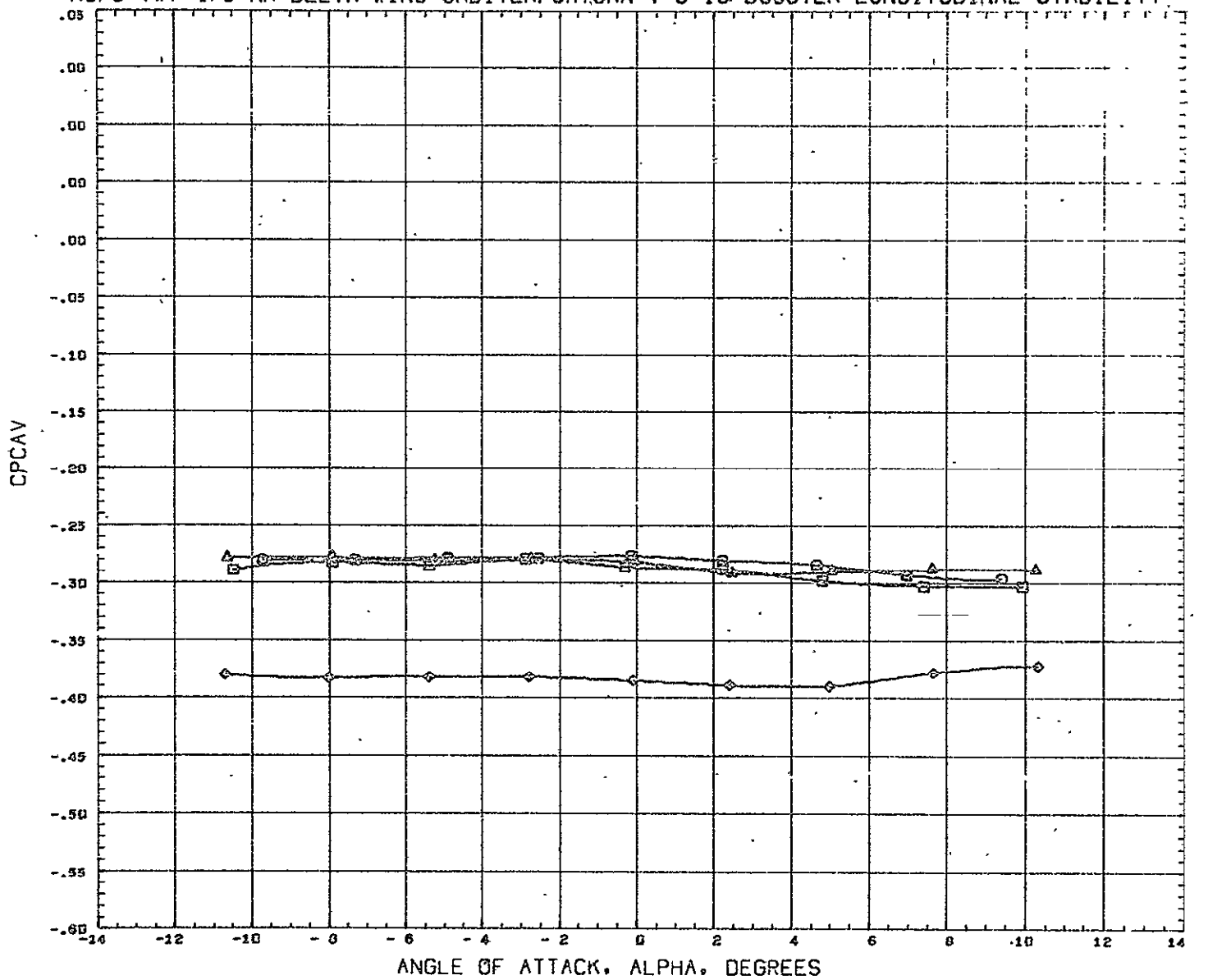
DATA HIST. CODE HH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC 476 NR HCRØRB/S-ICBØØSTER BF2S+B5W14E3V17 (R25091) 08 JAN 71 PAGE 82

MSFC TWT 476 NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER-LØNGITUDINAL STABILITY



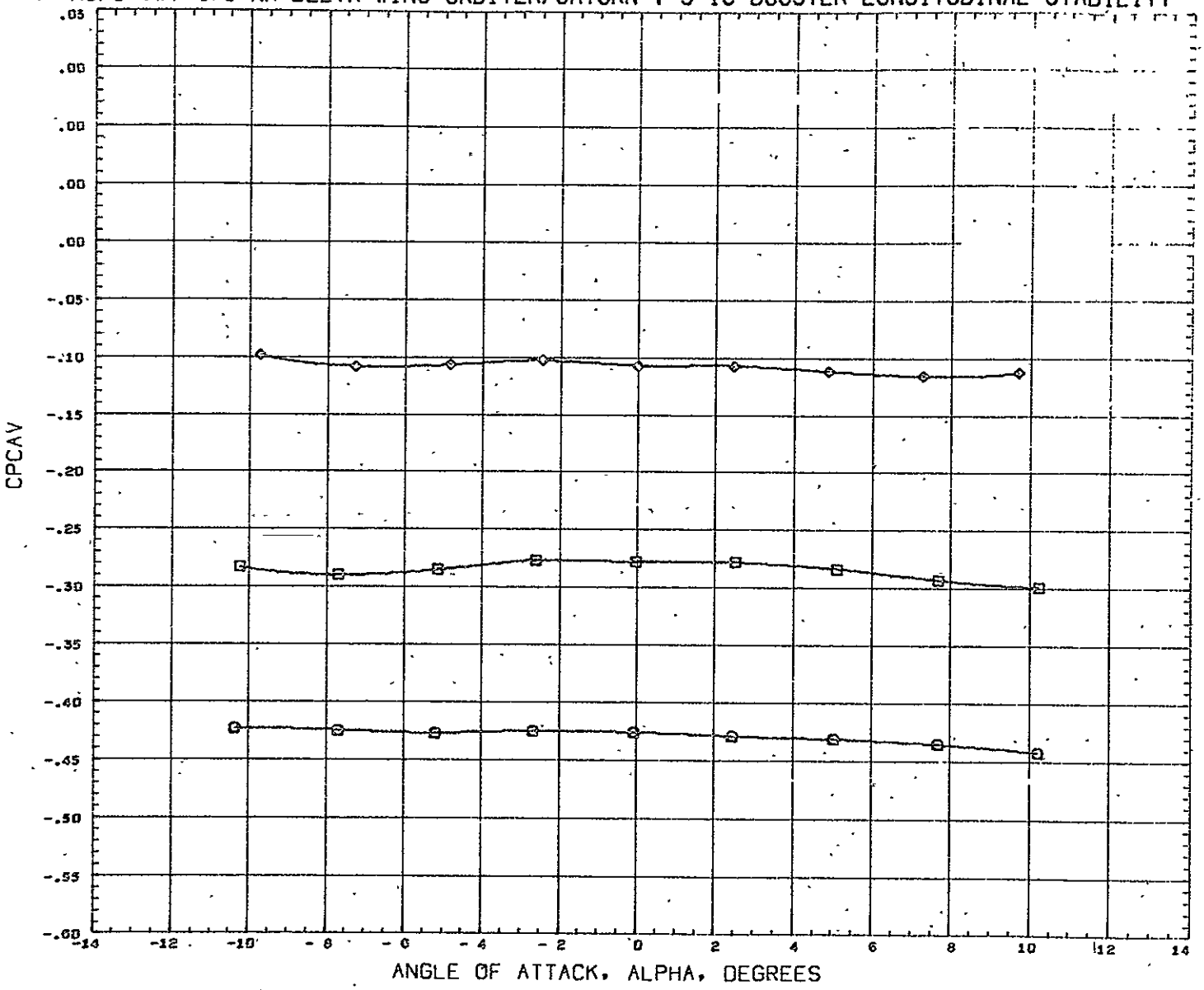
SYMBOL	MACH		PARAMETRIC VALUES		
○	0.601	BETA	0.000	ØRBINC	1.000
□	0.898				
◇	0.997				
△	1.098				

DATA HIST. CODE HH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH		PARAMETRIC VALUES		
○	1.194	BETA	0.000	ORBINC	1.000
□	1.461				
◇	1.960				

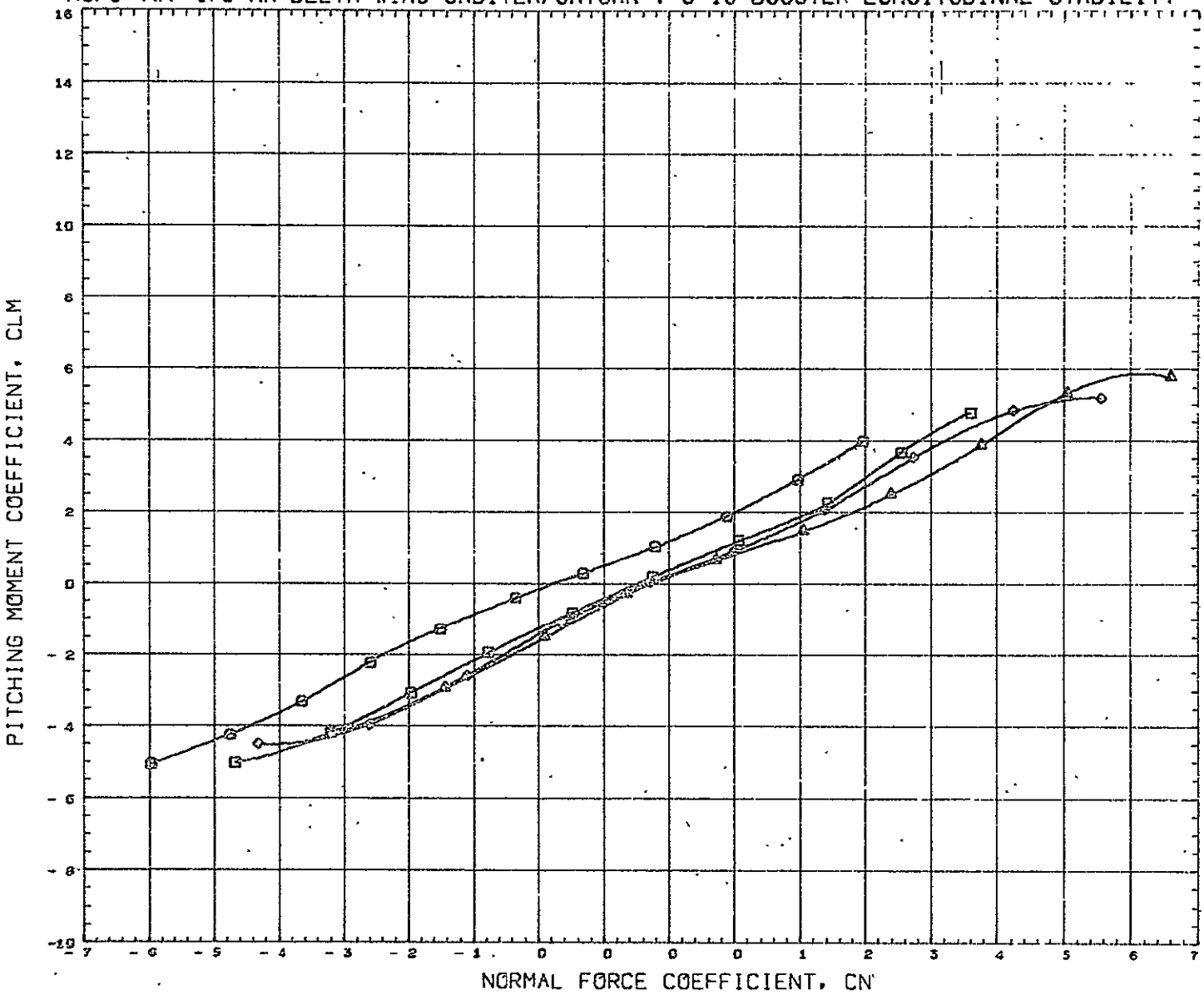
DATA HIST. CODE NH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17 (R25091) 08 JAN 71 PAGE 84

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



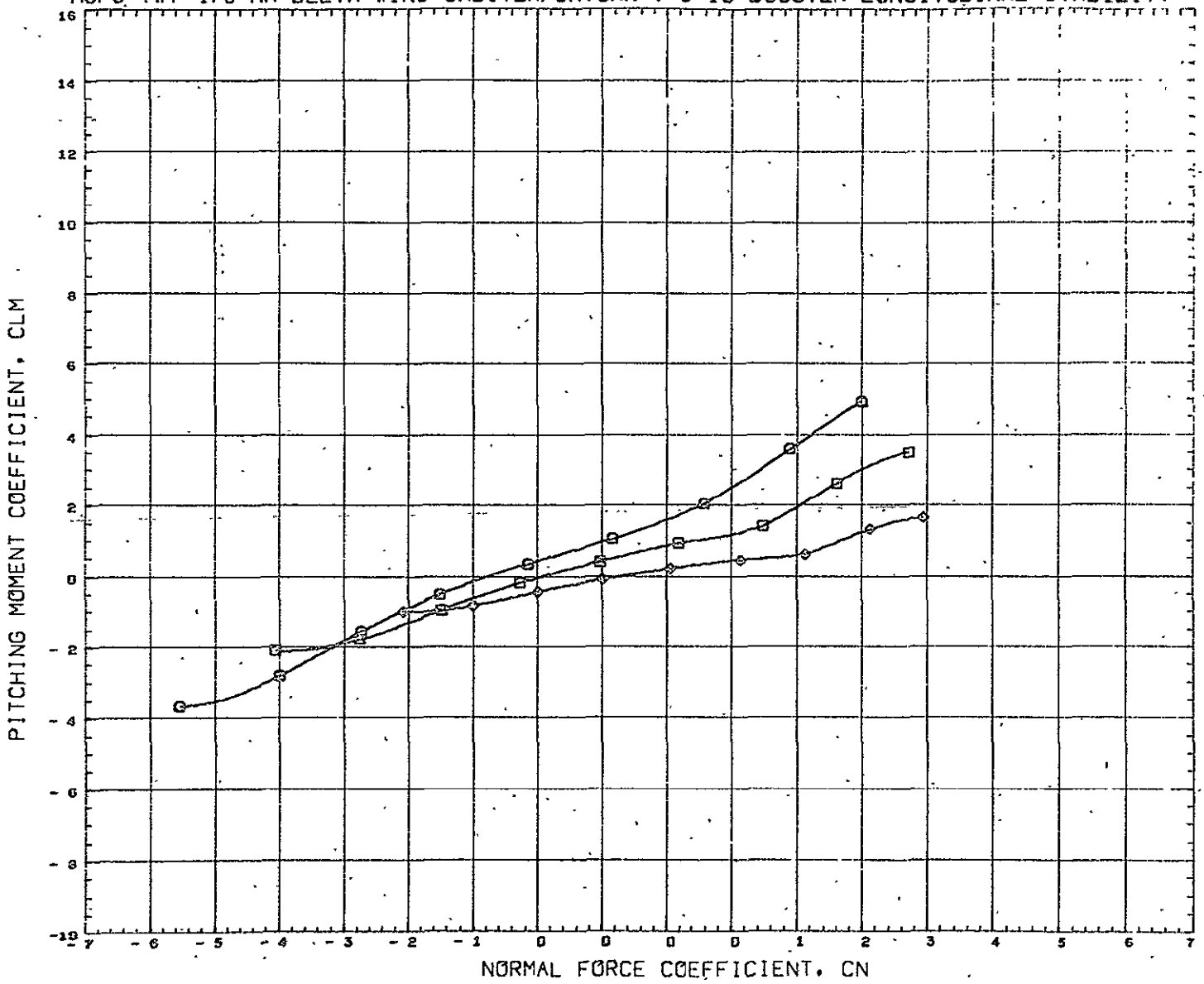
SYMBOL	MACH	PARAMETRIC VALUES			
○	0.600	BETA	0.020	ORBINC	1.000
□	0.898				
◇	0.994				
△	1.108				

DATA HIST. CODE HM

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER-LØNGITUDINAL STABILITY



SYMBOL	MACH		PARAMETRIC VALUES		
○	1.198	BETA	0.020	ØRBINC	1.000
□	1.465				
◇	1.952				

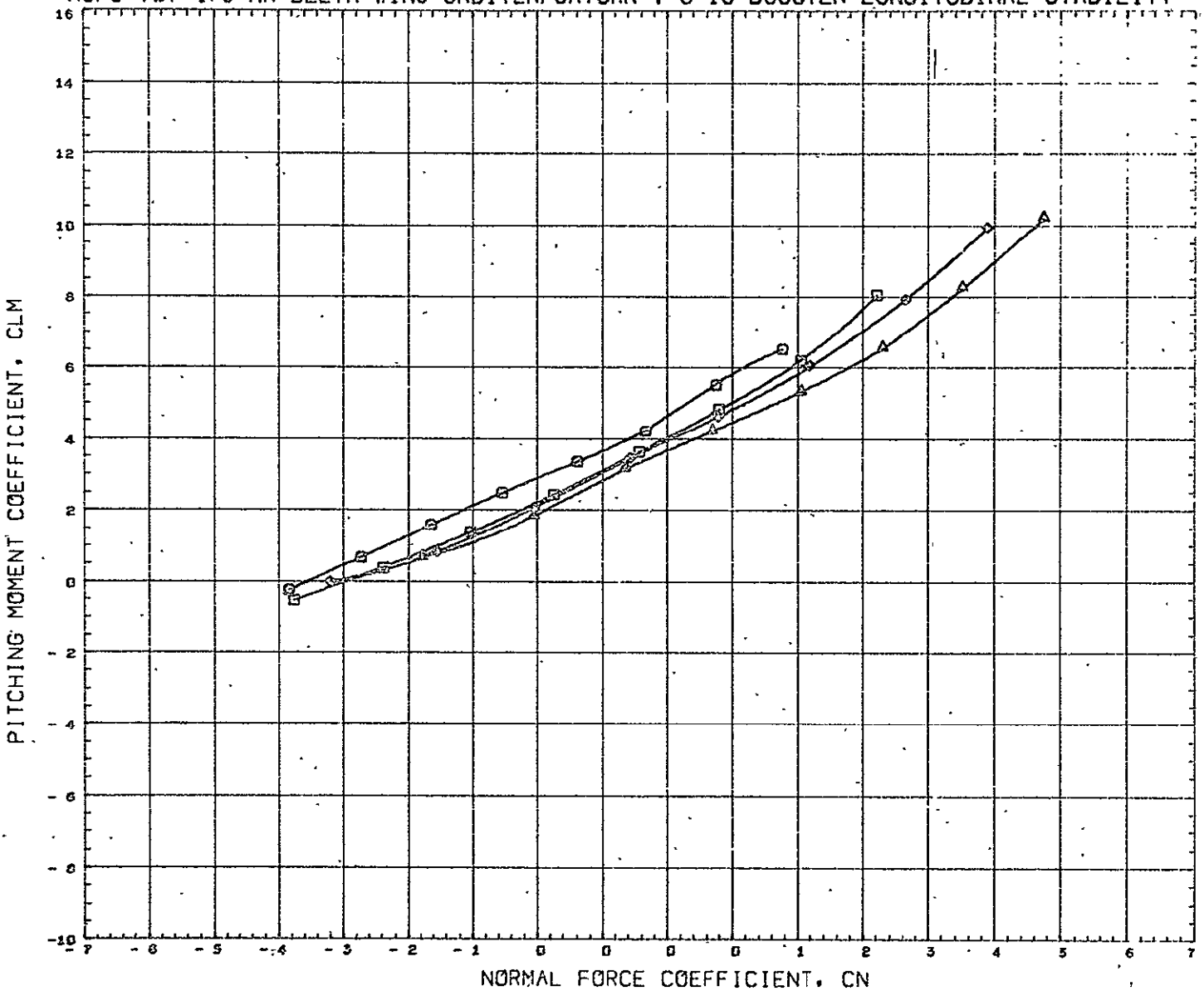
DATA HIST. CODE MM

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC 476 NR HCRØRB/S-ICBØØSTER BF1S+B5W14E3V17 (R25021) 08 JAN 71 PAGE 86

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY

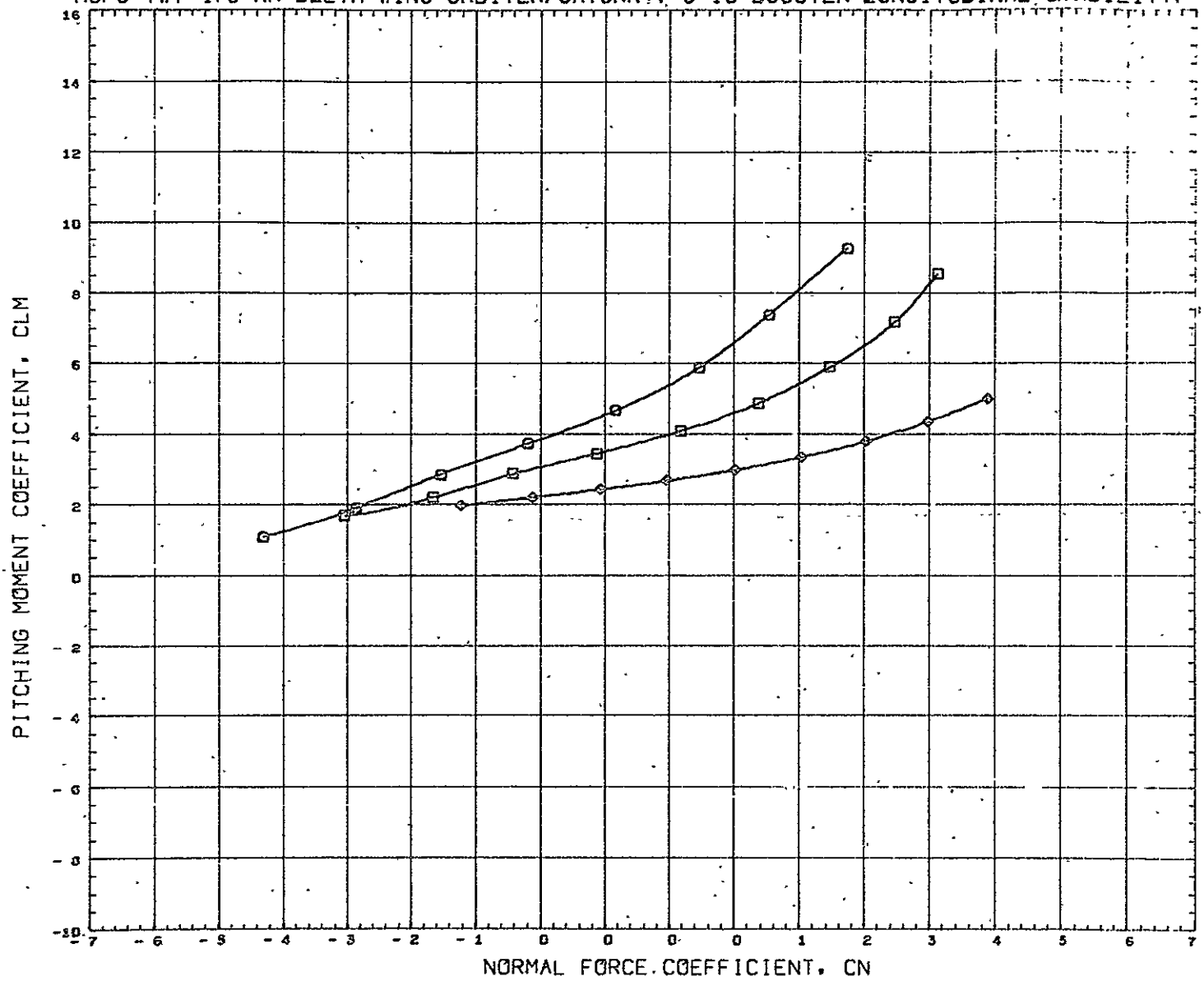


SYMBOL	MACH	PARAMETRIC VALUES			
○	0.599	BETA	- 0.020	ORBINC	4.000
□	0.895				
◇	0.993				
△	1.098				

DATA MIST. CODE MM

REFERENCE INFORMATION		
REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



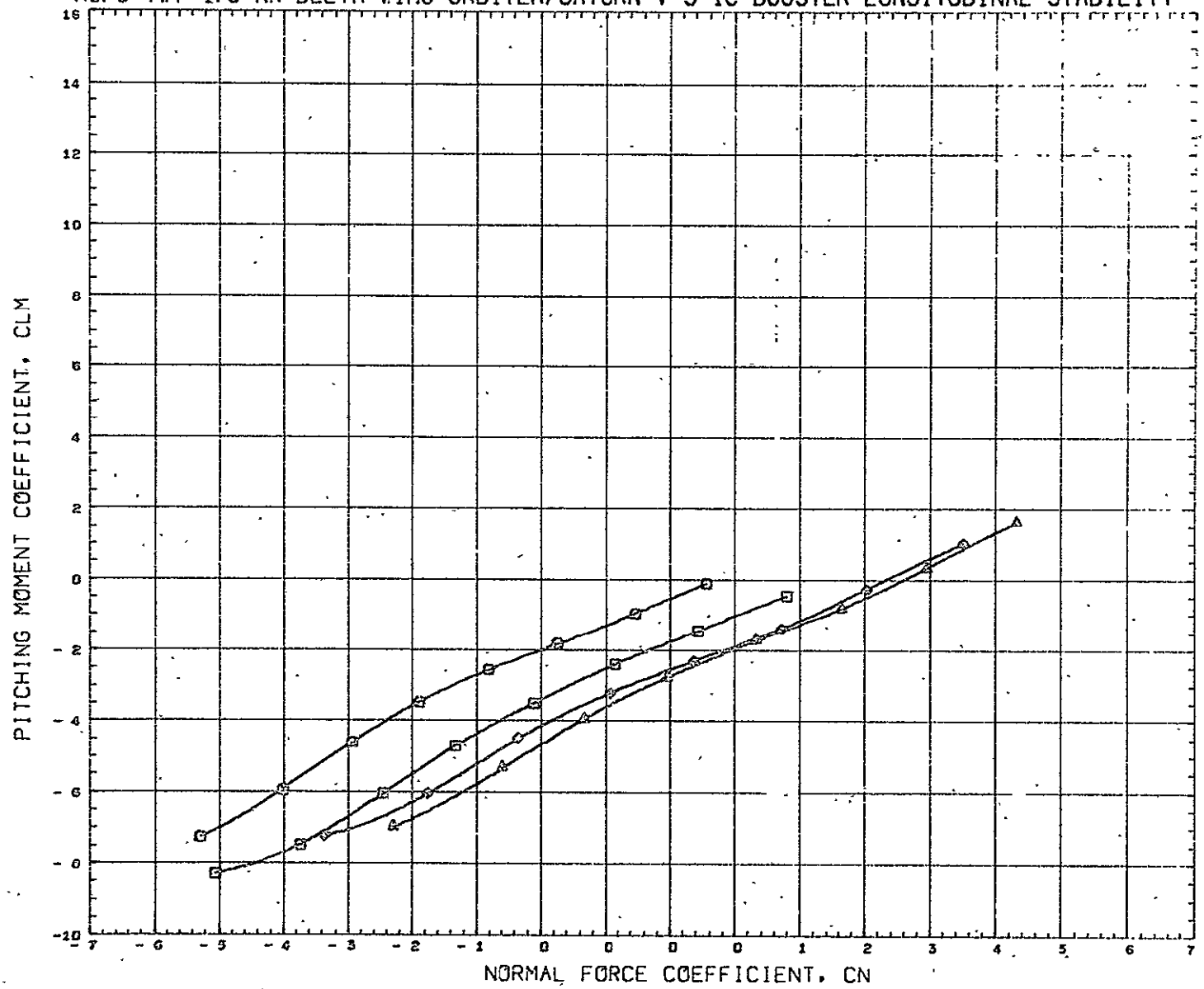
SYMBOL	MACH	PARAMETRIC VALUES			
○	1.200	BETA	- 0.020	ORBINC	4.000
□	1.454				
◇	1.953				

DATA HIST. CODE HH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



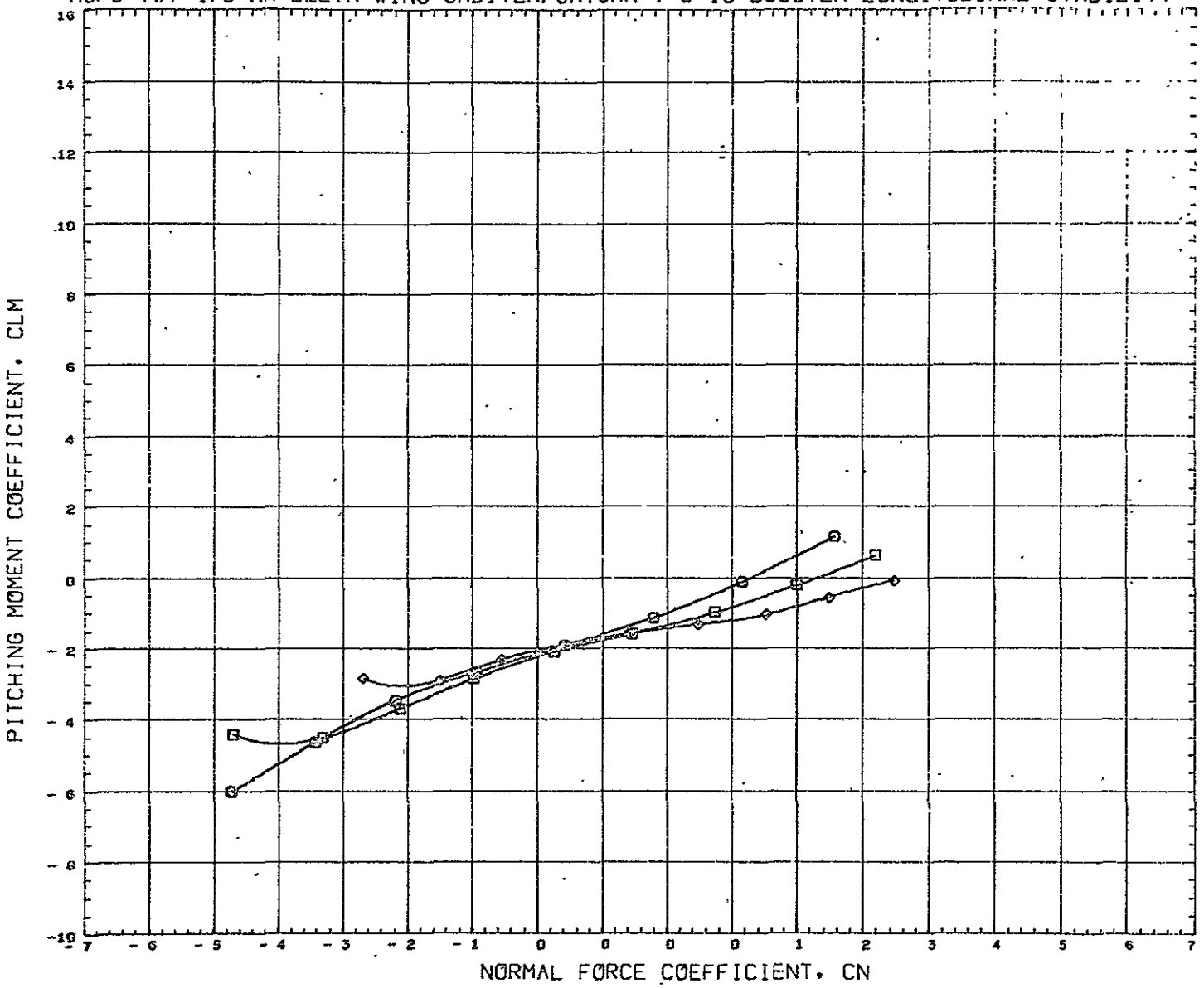
SYMBOL	MACH		PARAMETRIC VALUES		
○	0.599	BETA	0.010	ORBINC	- 2.000
□	0.897				
◇	0.994				
△	1.091				

DATA HIST. CODE HH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRF	5.2640	INCHES
YMRF	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



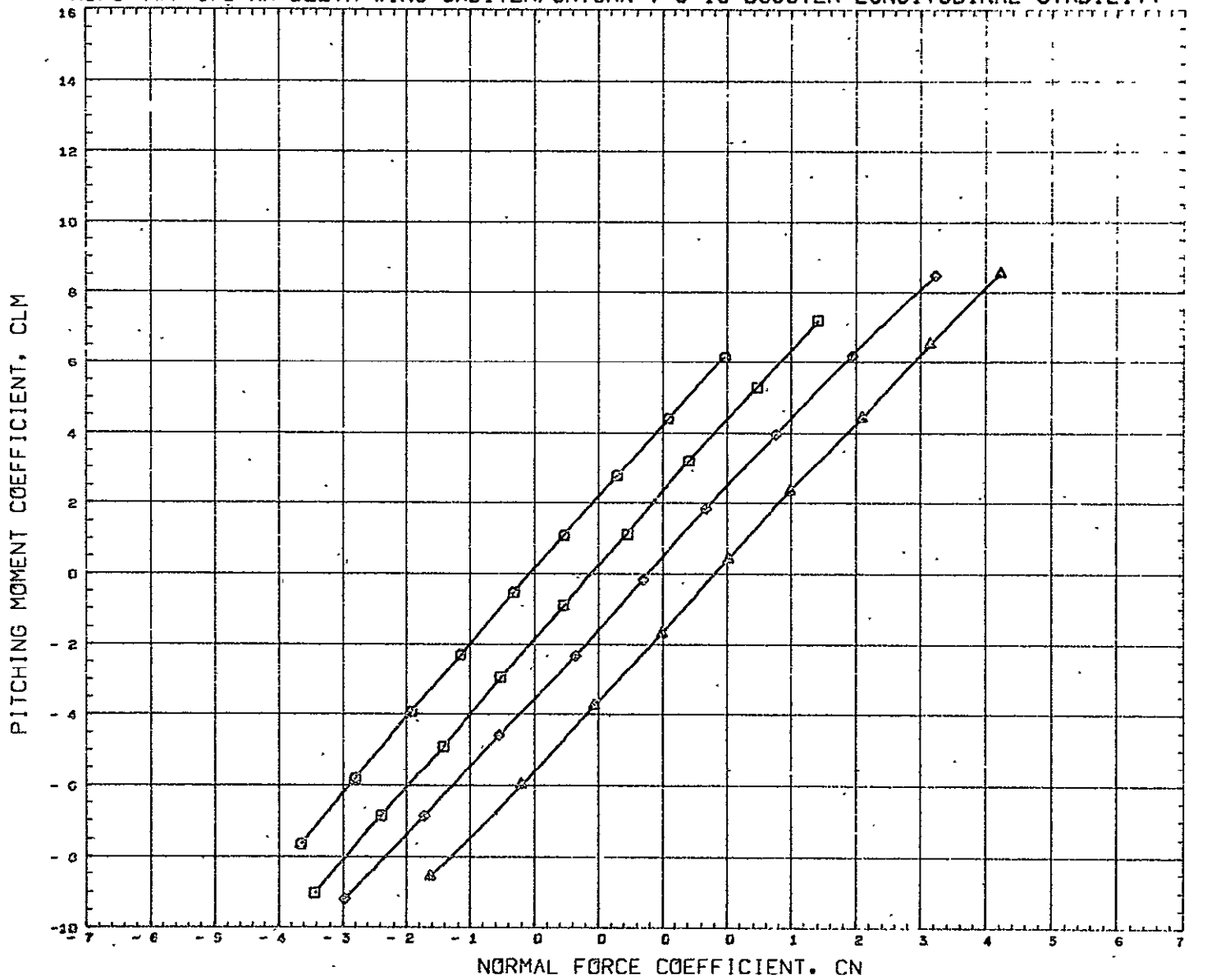
SYMBOL	MACH		PARAMETRIC VALUES		
○	1.195	BETA	0.010	ORBINC	- 2.000
□	1.452				
◇	1.955				

DATA HIST. CODE HH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER-LØNGITUDINAL STABILITY



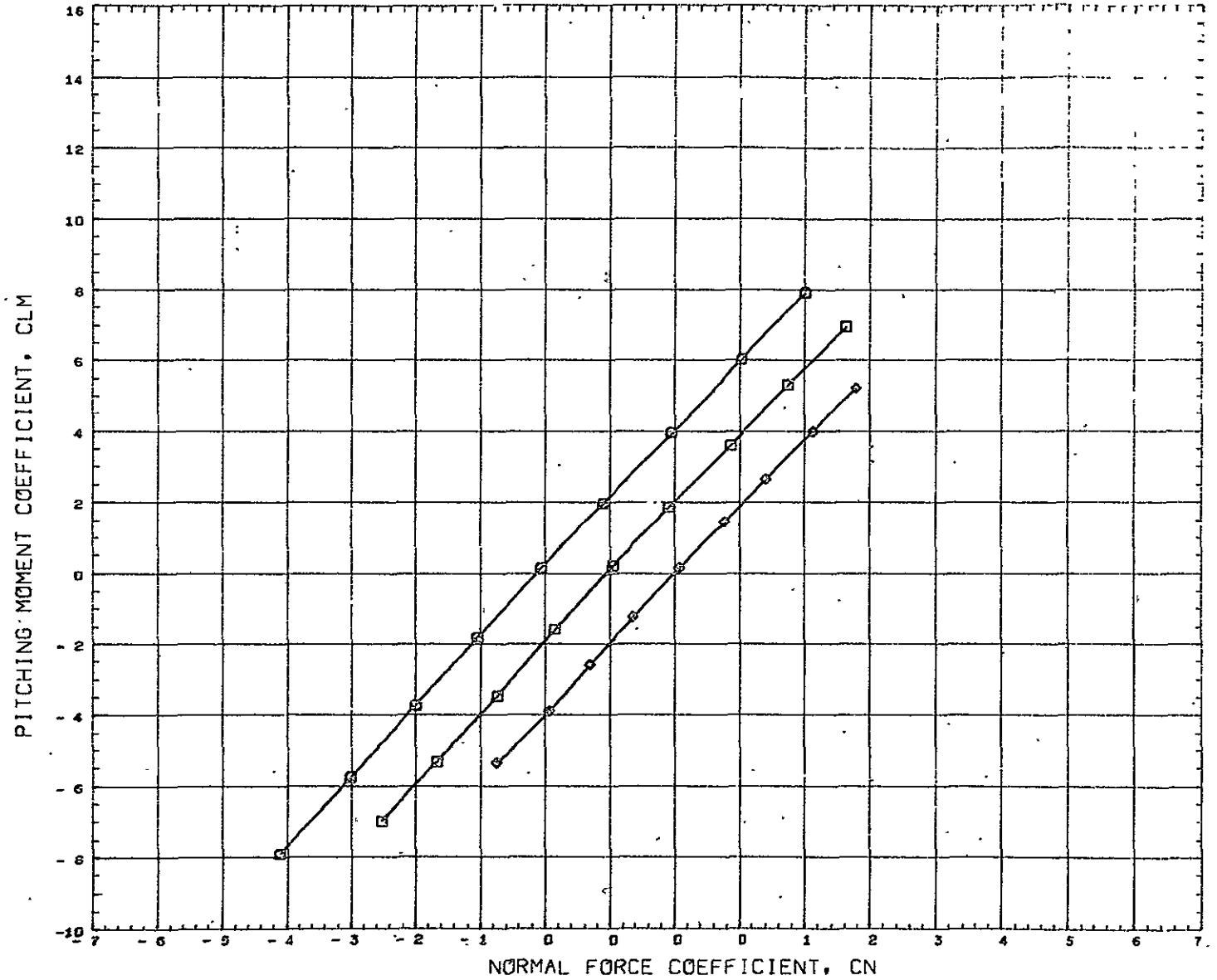
SYMBOL	MACH		PARAMETRIC VALUES		
○	0.603	BETA	0.010	ØRBINC	1.000
□	0.901				
◇	0.996				
△	1.103				

DATA HIST. CODE MN

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER-LØNGITUDINAL STABILITY



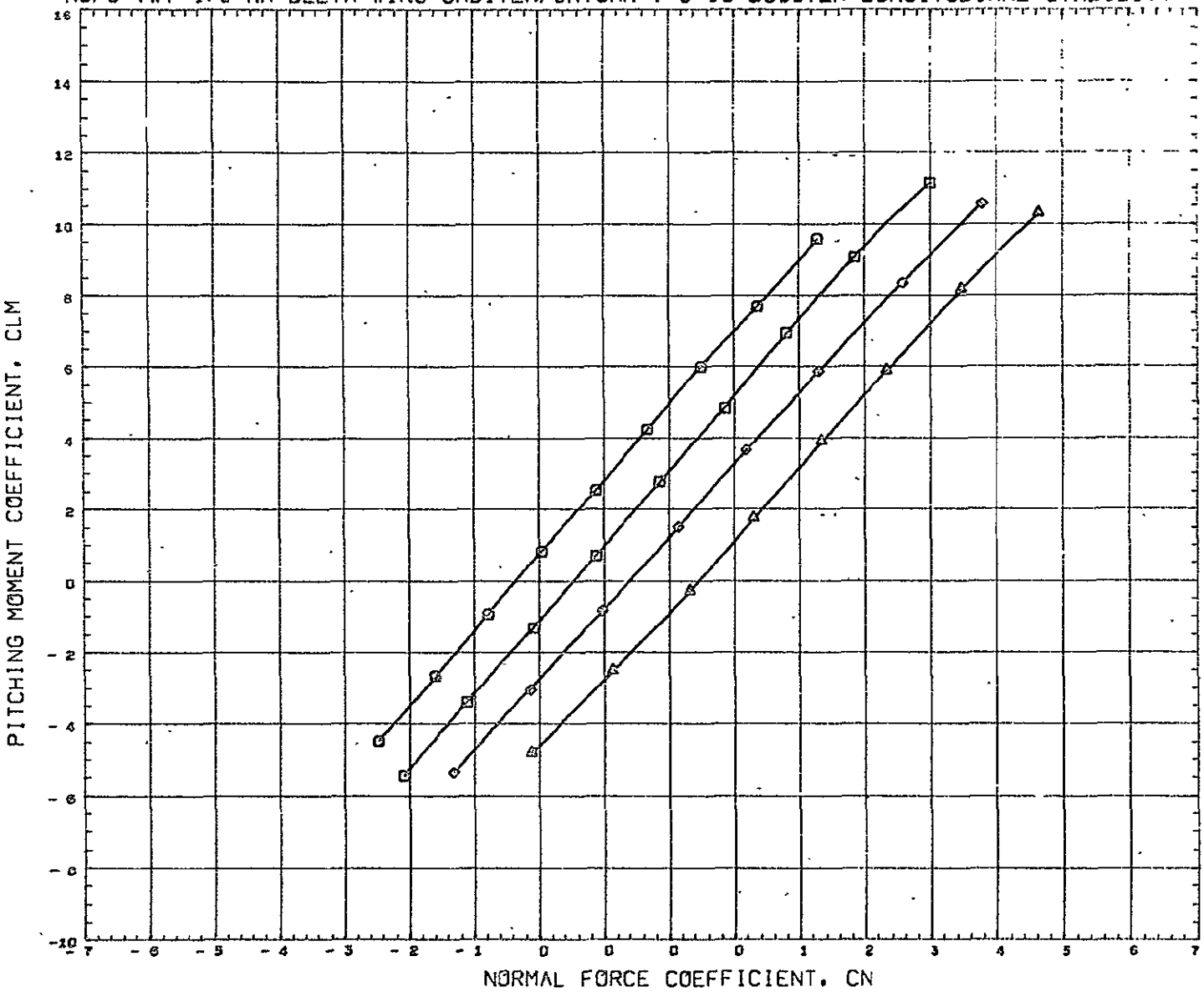
SYMBOL	MACH		PARAMETRIC VALUES		
○	1.196	BETA	0.010	ØRBINC	1.000
□	1.467				
◇	1.965				

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRF	5.2640	INCHES
YMRF	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE MH

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



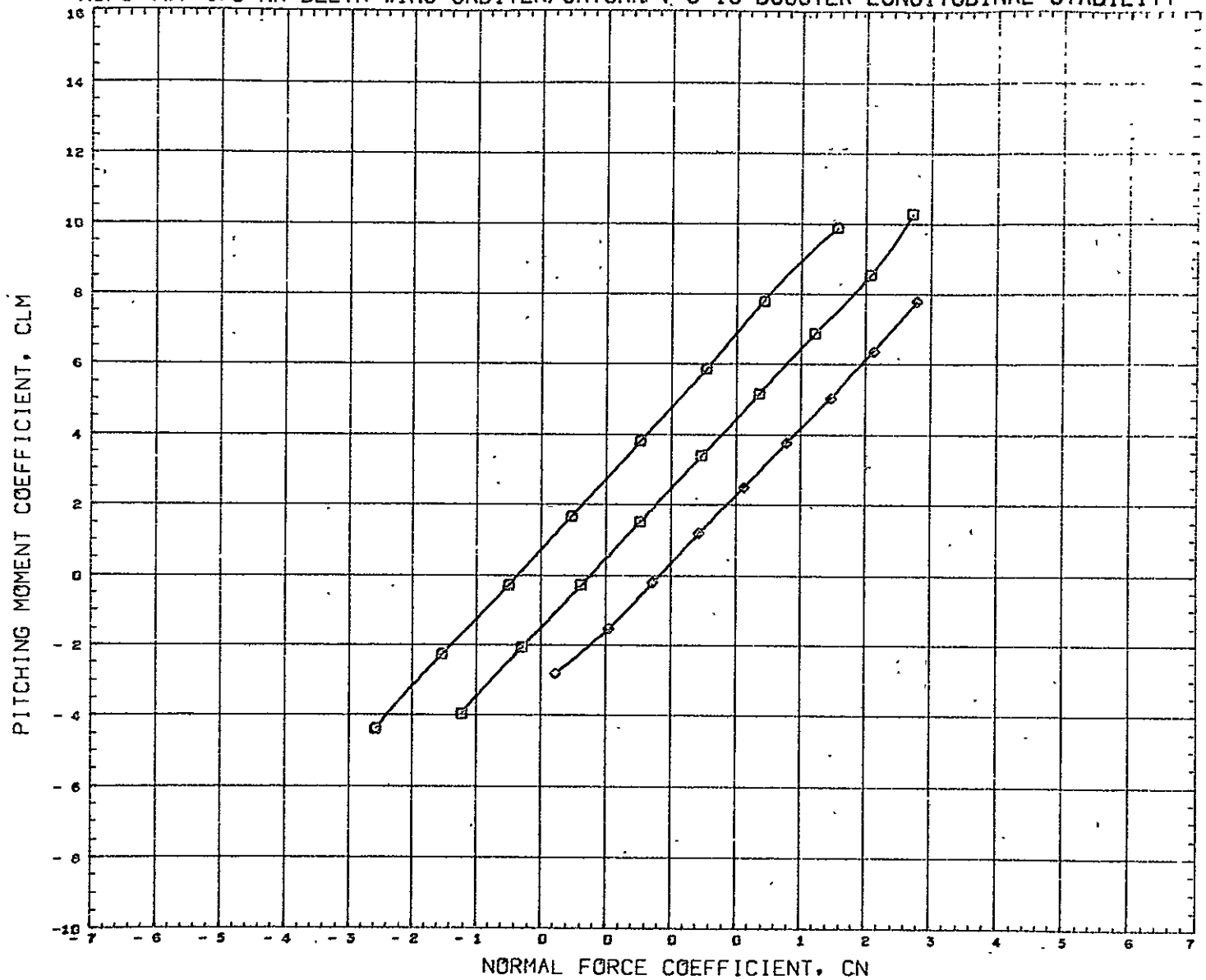
SYMBOL	MACH	PARAMETRIC VALUES			
○	0.600	BETA	- 0.020	ORBINC	4.000
□	0.889				
◇	0.992				
△	1.093				

DATA HIST. CODE #G

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



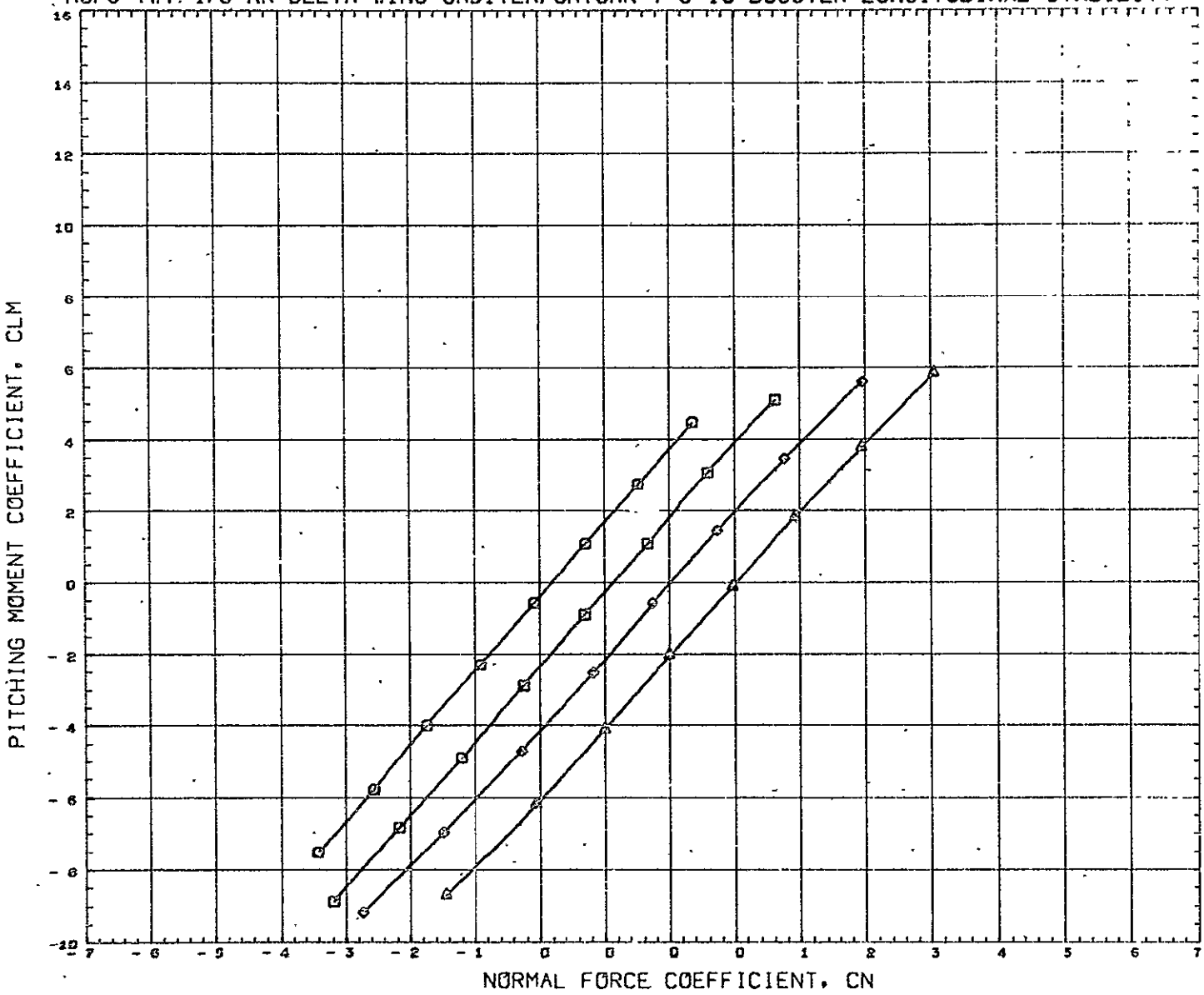
SYMBOL	MACH	PARAMETRIC VALUES			
○	1.199	BETA	- 0.020	ORBINC	4.000
□	1.455				
◇	1.967				

DATA HIST. CODE *G

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRF	5.2640	INCHES
YMRF	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

MSFC TWT. 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



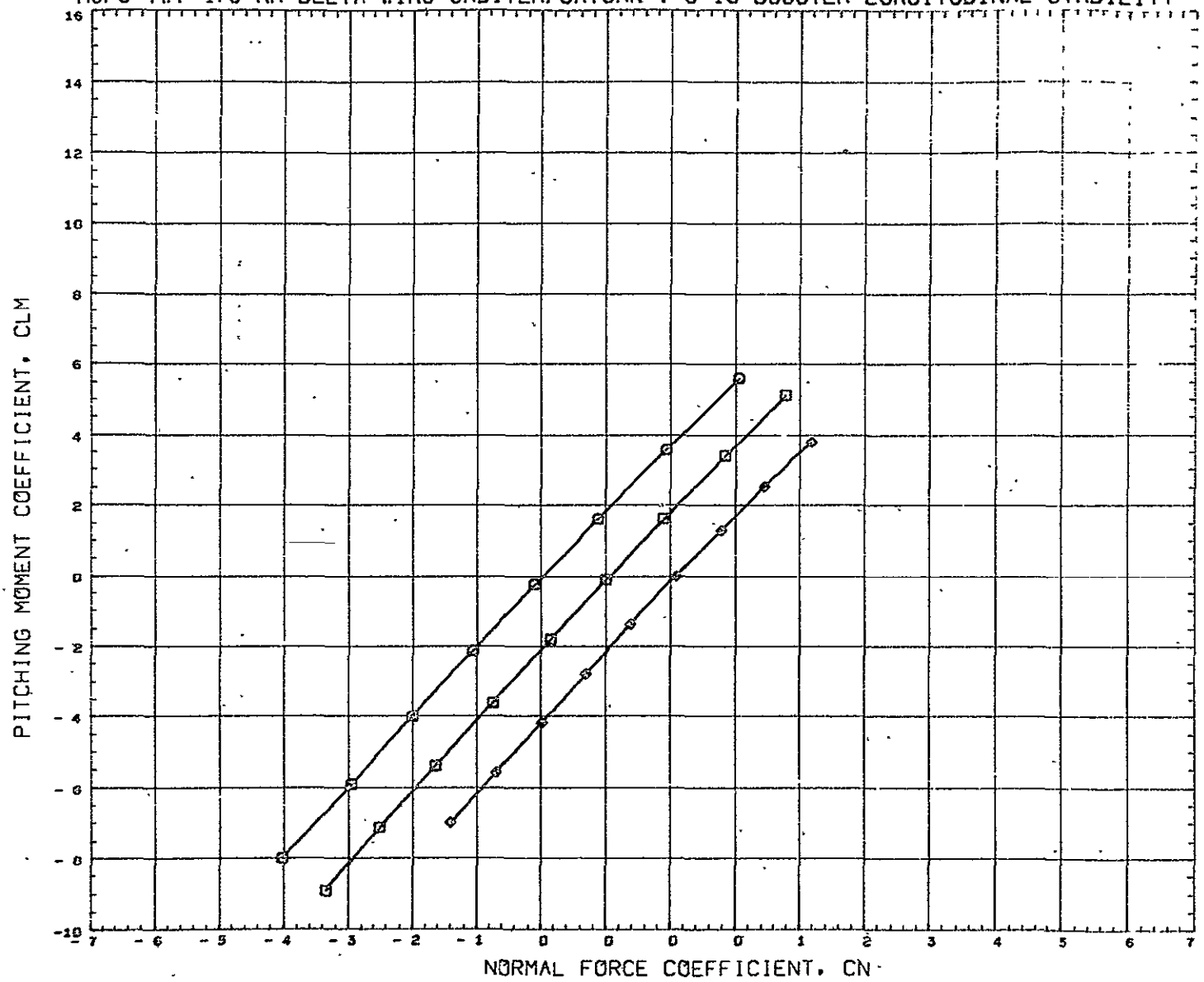
SYMBOL	MACH		PARAMETRIC VALUES		
○	0.600	BETA	0.000	ORBINC	- 2.000
□	0.896				
◇	1.002				
△	1.101				

DATA HIST. CODE MM

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN-V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH		PARAMETRIC VALUES		
○	1.198	BETA	0.000	ORBINC	- 2.000
□	1.459				
◇	1.955				

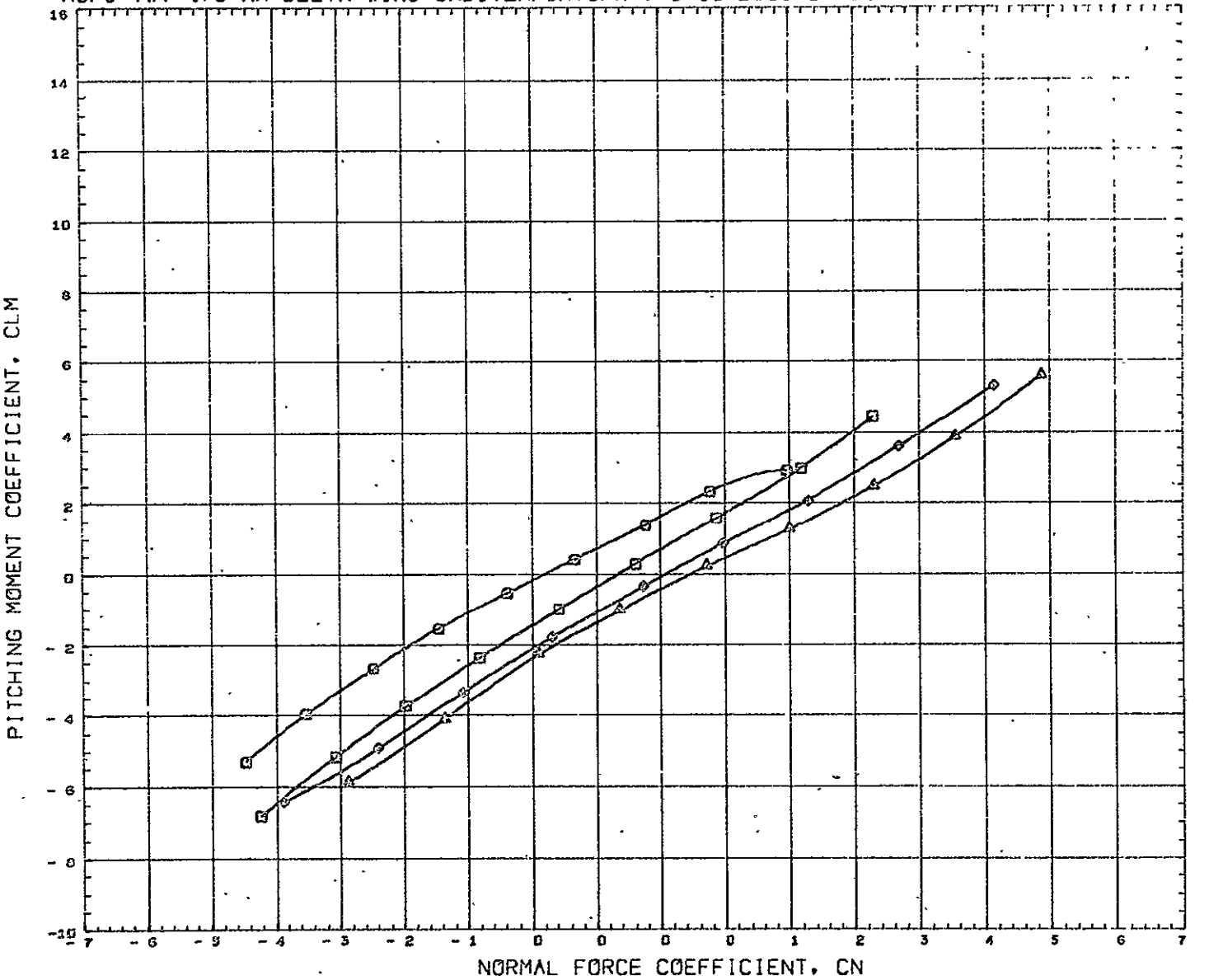
DATA HIST. CODE HH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC 476 NR HCRORB/S-ICBOOSTER BS+B5W14E3V17 (R25081) 14 JAN 71 PAGE 96

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



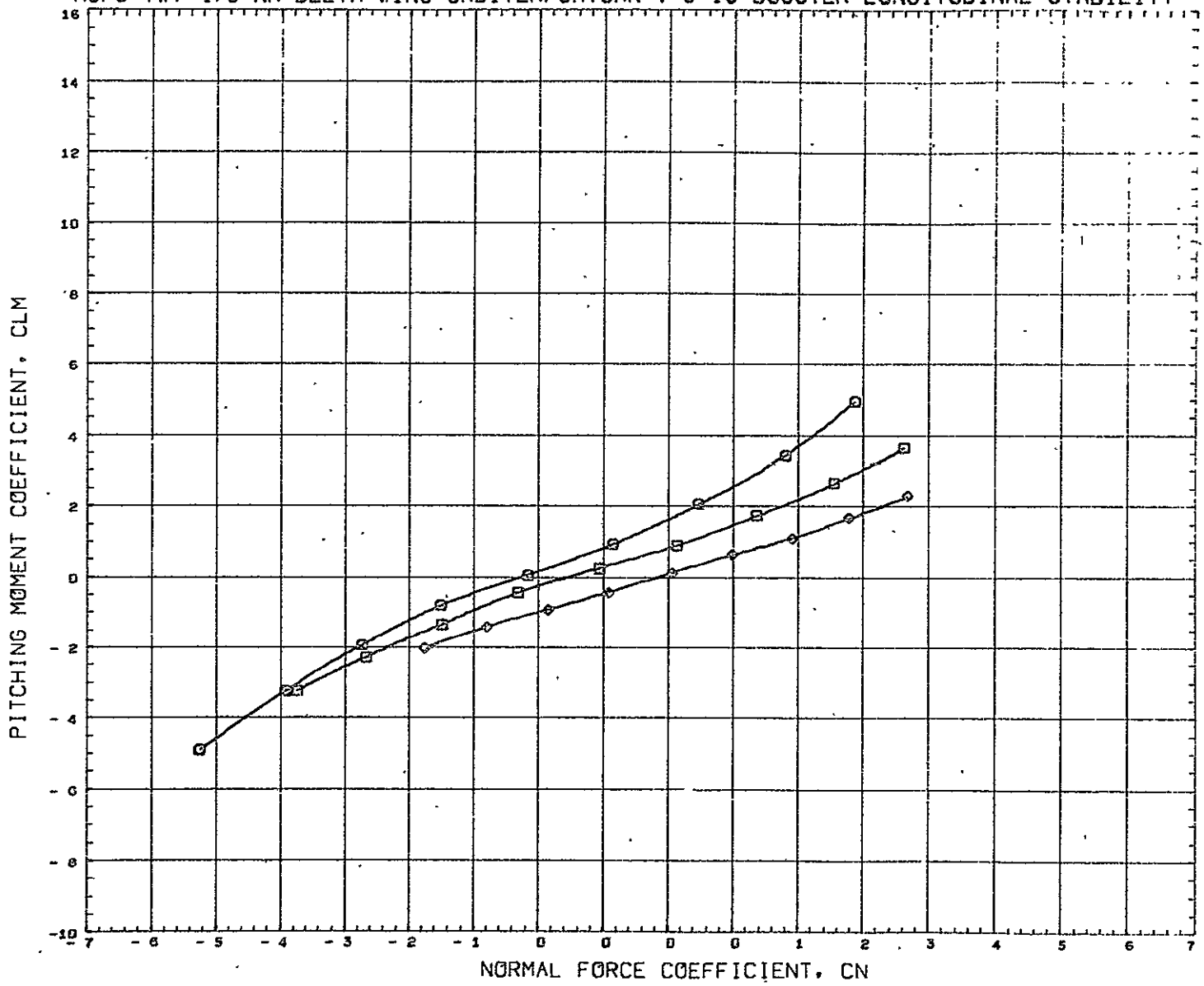
SYMBOL	MACH		PARAMETRIC VALUES		
○	0.601	BETA	0.000	ORBINC	1.000
□	0.898				
◇	0.997				
△	1.098				

DATA HIST. CODE MH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	MACH		PARAMETRIC VALUES		
○	1.194	BETA	0.000	ORBINC	1.000
□	1.461				
◇	1.960				

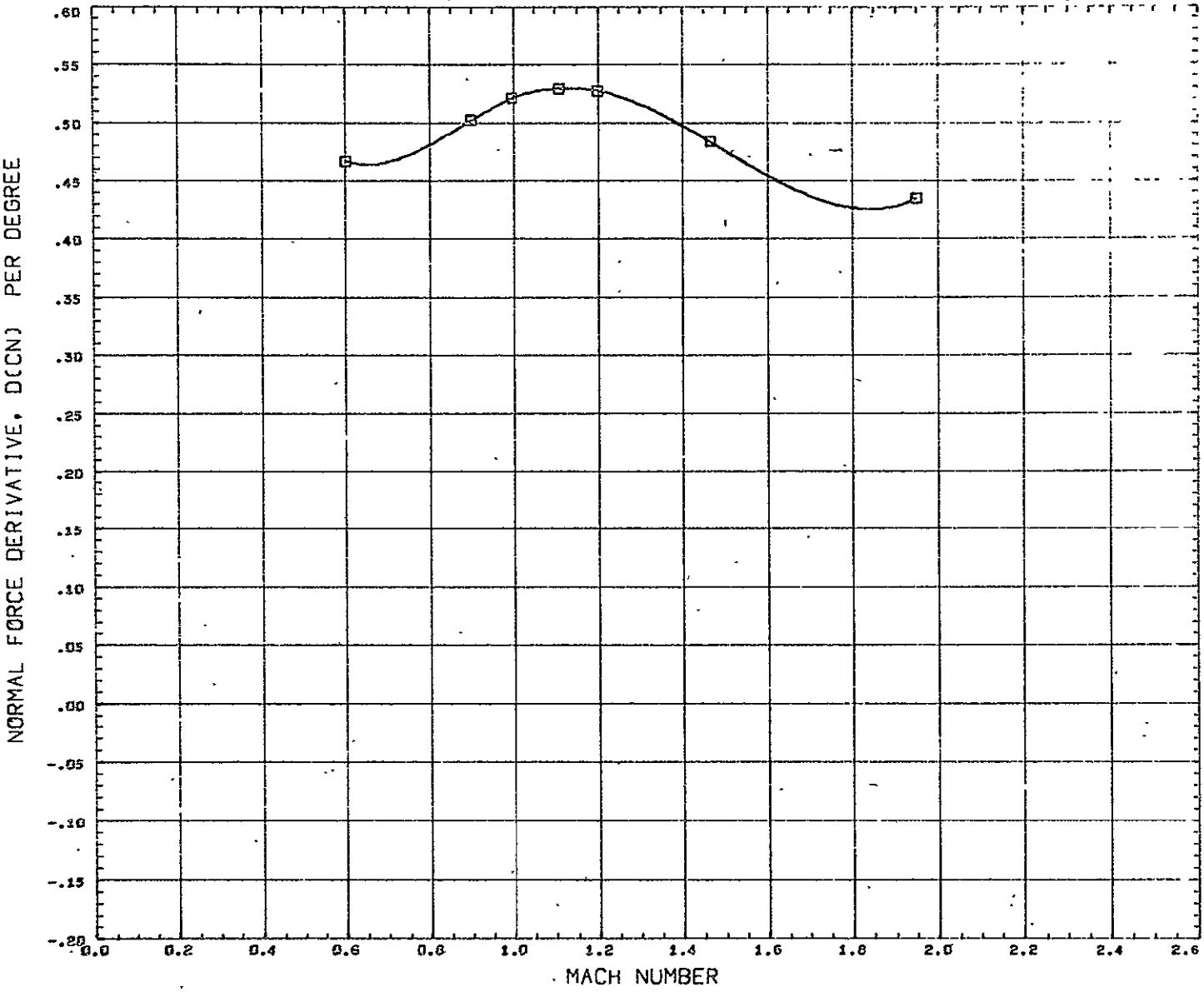
REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE HH

MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17 (R25091) 08 JAN 71 PAGE 98

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



FARAMETRIC VALUES

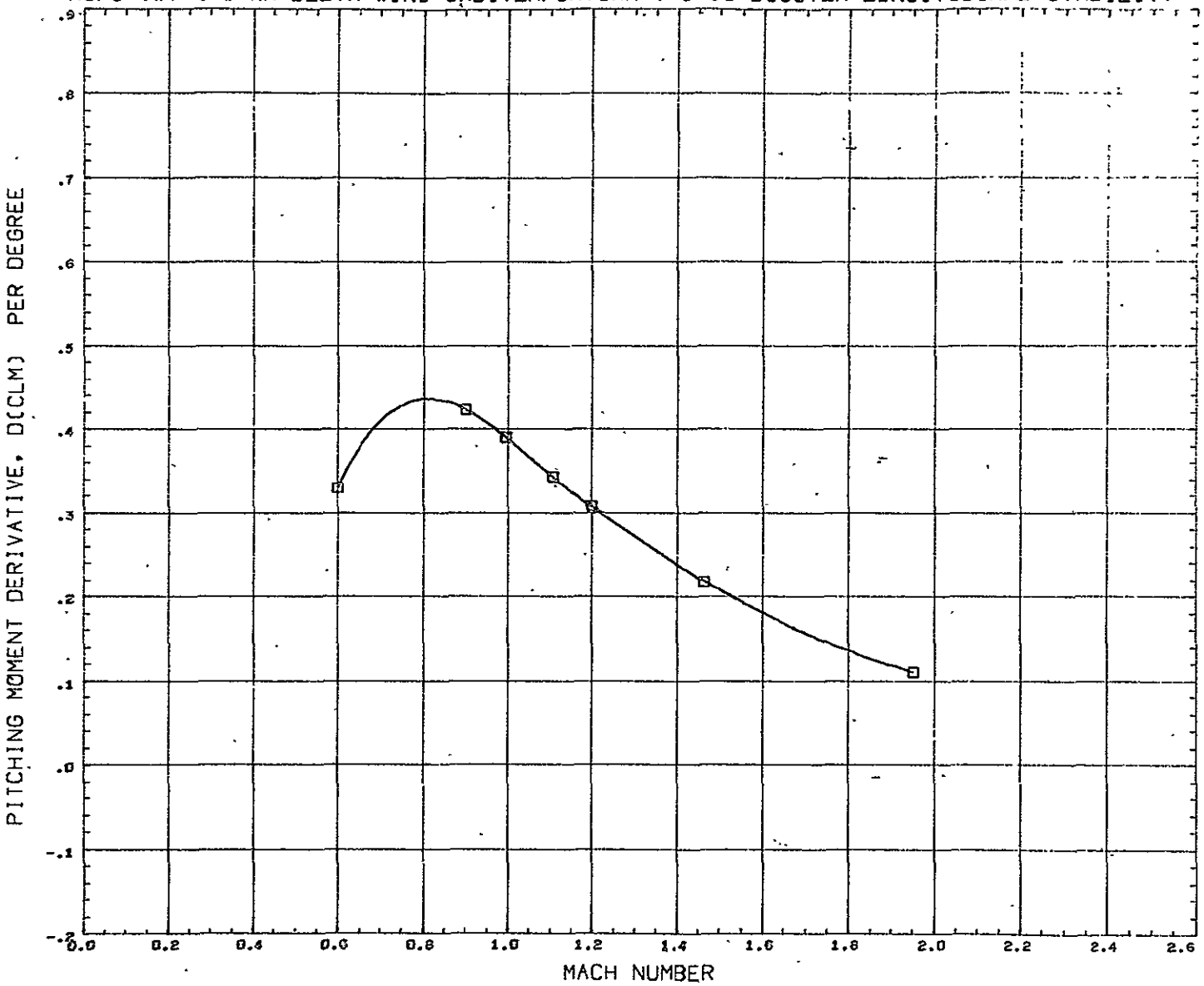
BETA 0.020 ORBINC 1.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE HMV

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



PARAMETRIC VALUES

BETA 0.020 ORBINC 1.000

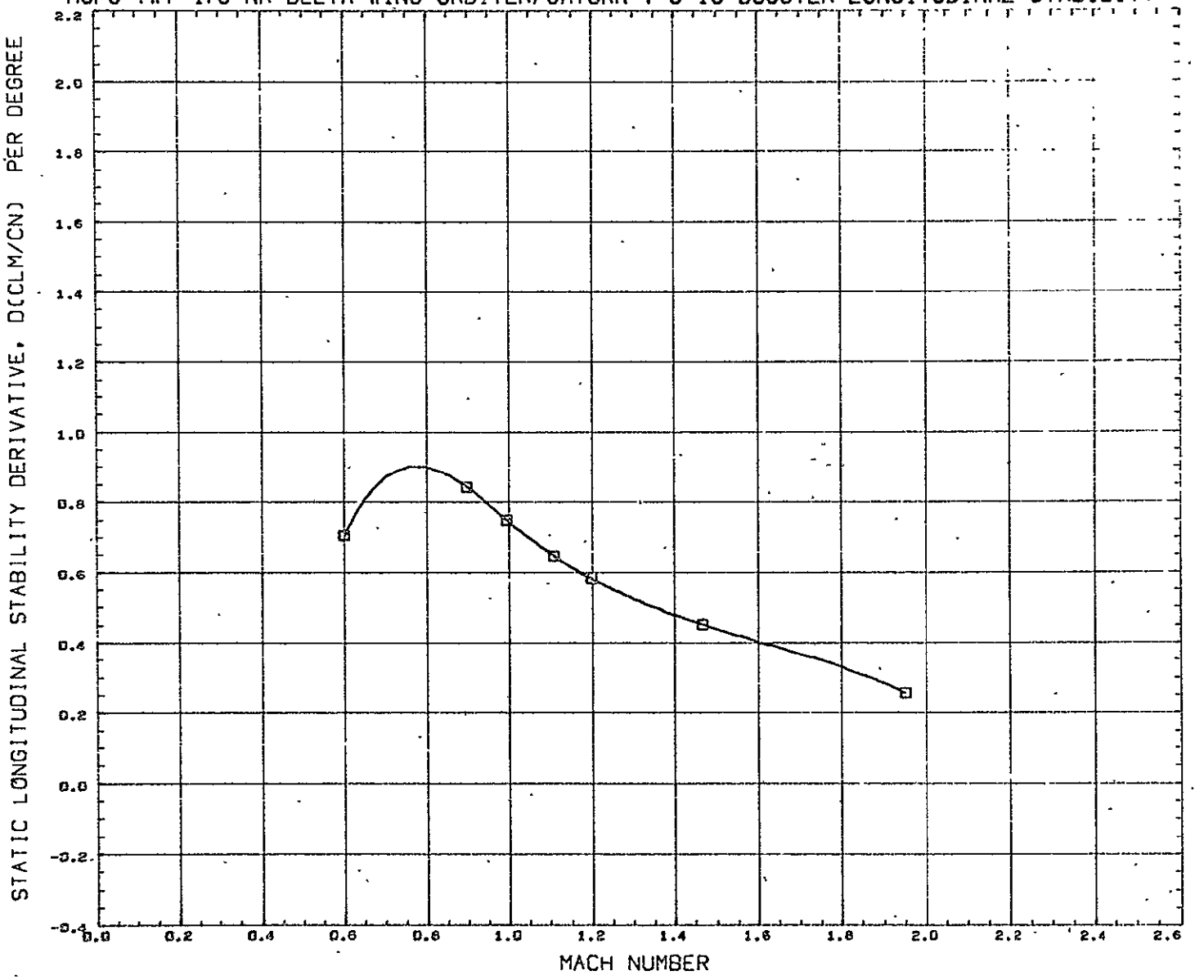
REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE HHV

MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17 (B25021) 14 JAN 71 PAGE 100

MSFC TWT 476 NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER-LØNGITUDINAL STABILITY



PARAMETRIC VALUES

BETA 0.020 ORBINC 1.000

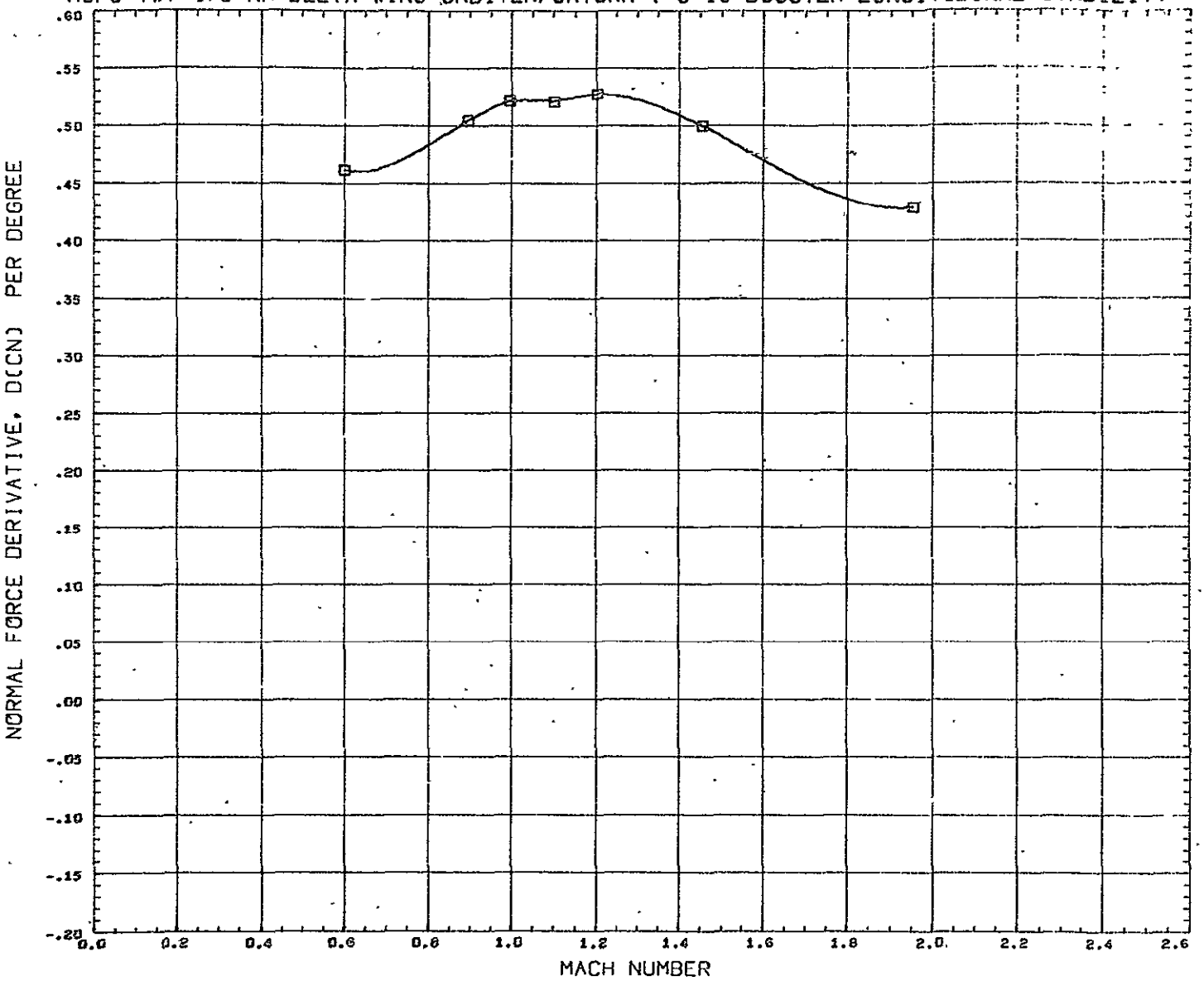
REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE MMV

MSFC 476 NR HCRØRB/S-ICBØØSTER BF1S+B5W14E3V17 (B25021) 14 JAN 71 PAGE 101

MSFC TWT 476 NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER-LØNGITUDINAL STABILITY



PARAMETRIC VALUES

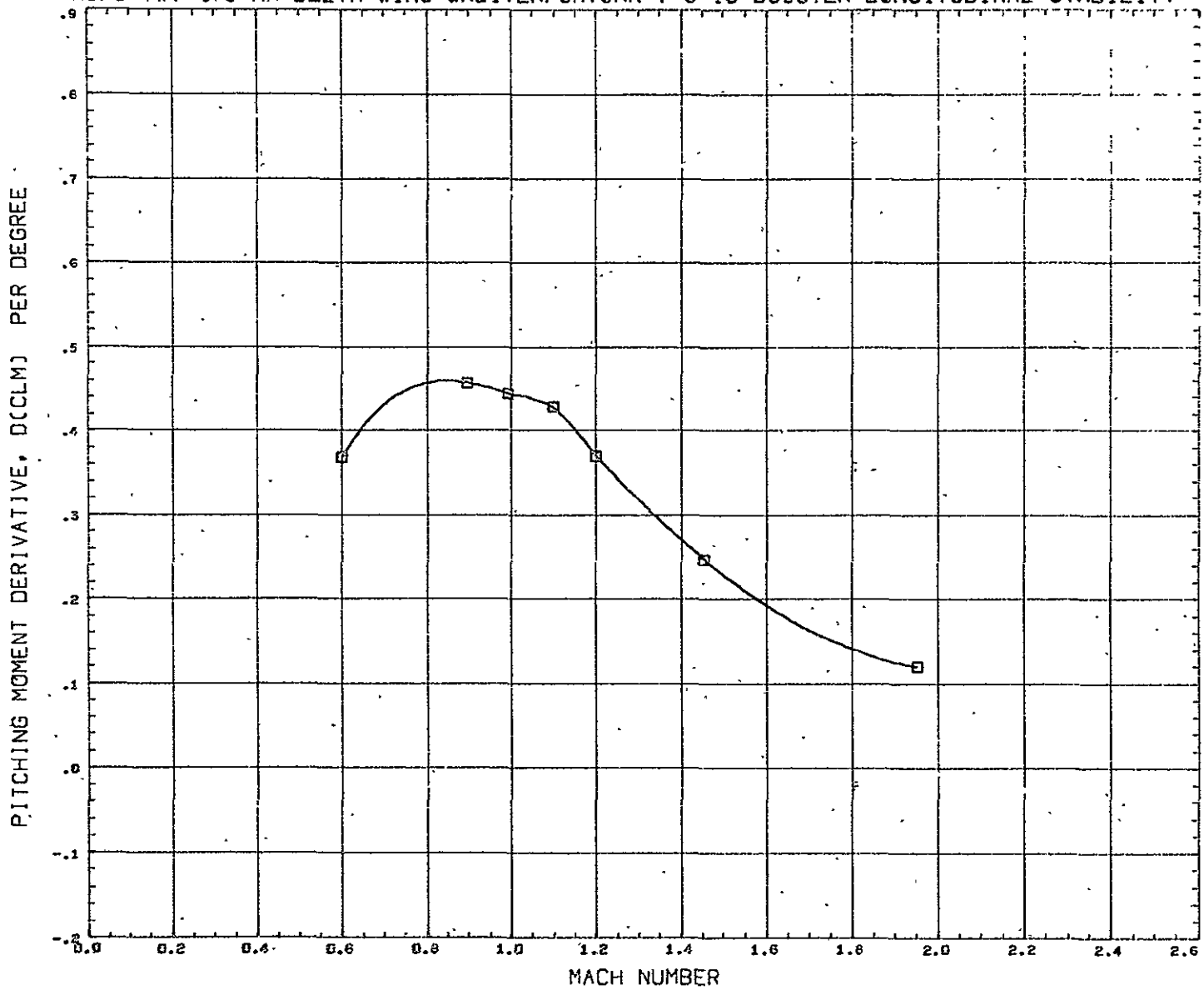
BETA - 0.020 ØRBINC 4.000

REFERENCE INFØRMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CØDE MMV

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



PARAMETRIC VALUES

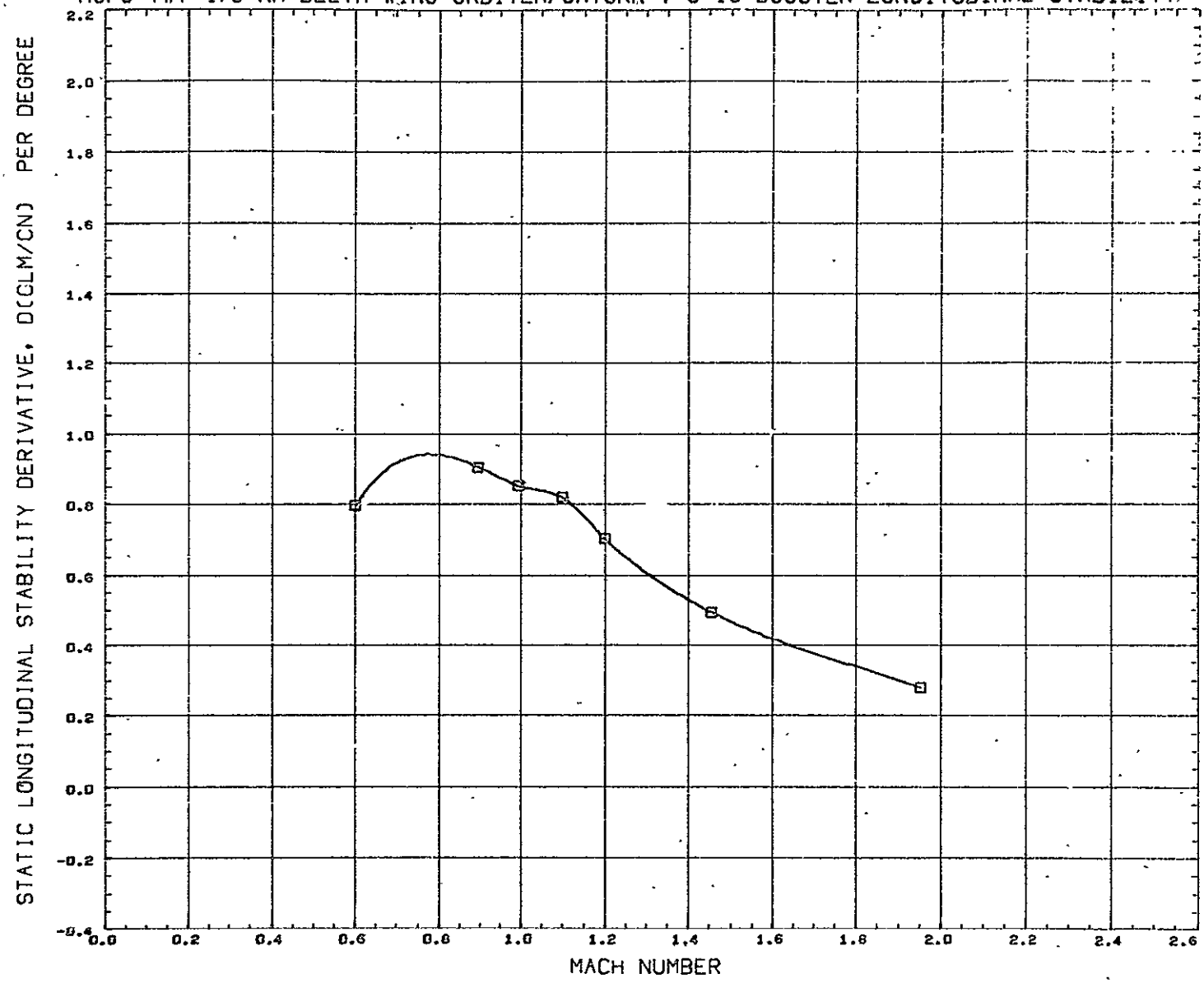
BETA - 0.020 ORBINC 4.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE NHV

MSFC TWT 476 NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER-LØNGITUDINAL STABILITY



PARAMETRIC VALUES

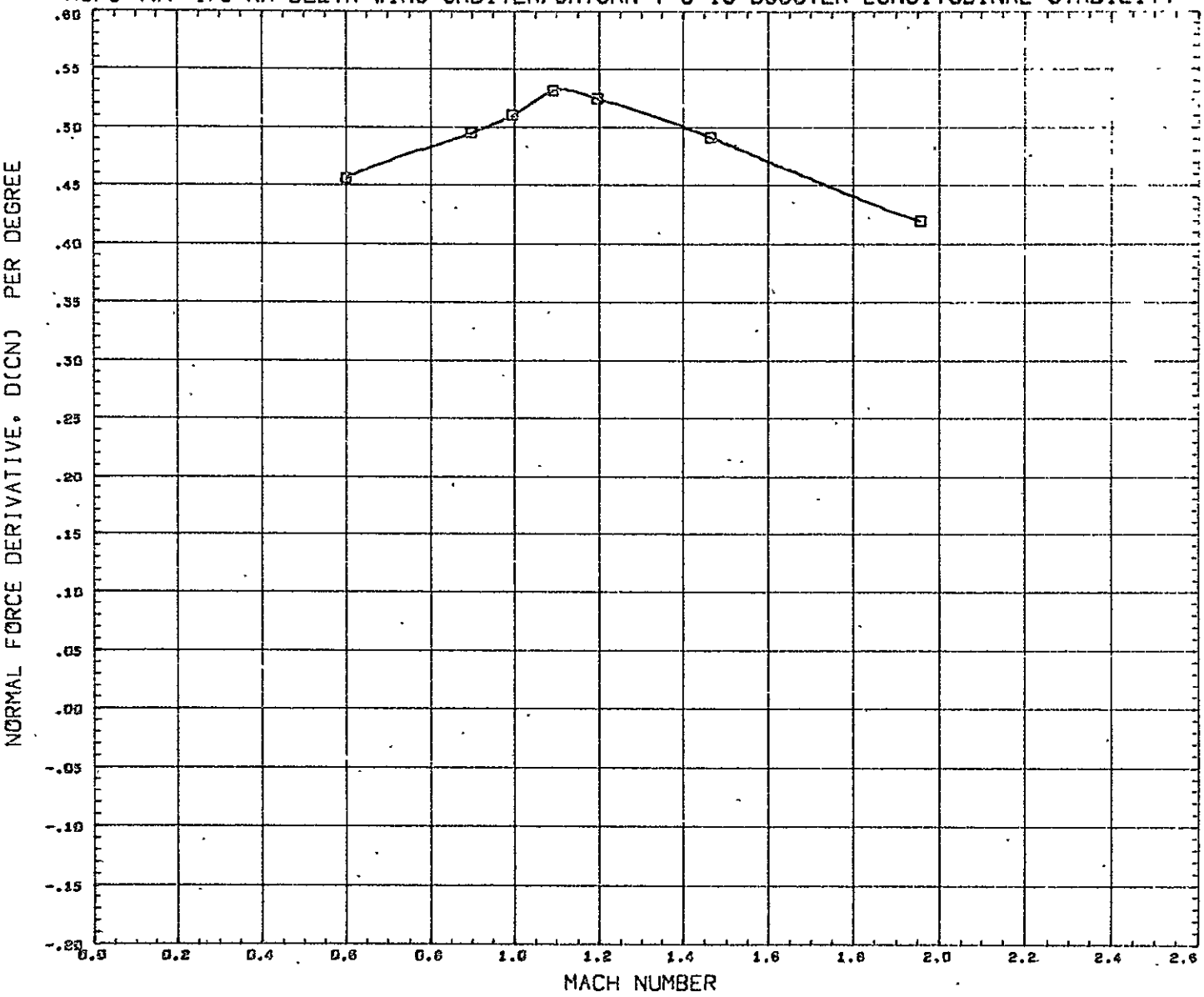
BETA - 0.020 ORBINC 4.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE MNV

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



PARAMETRIC VALUES

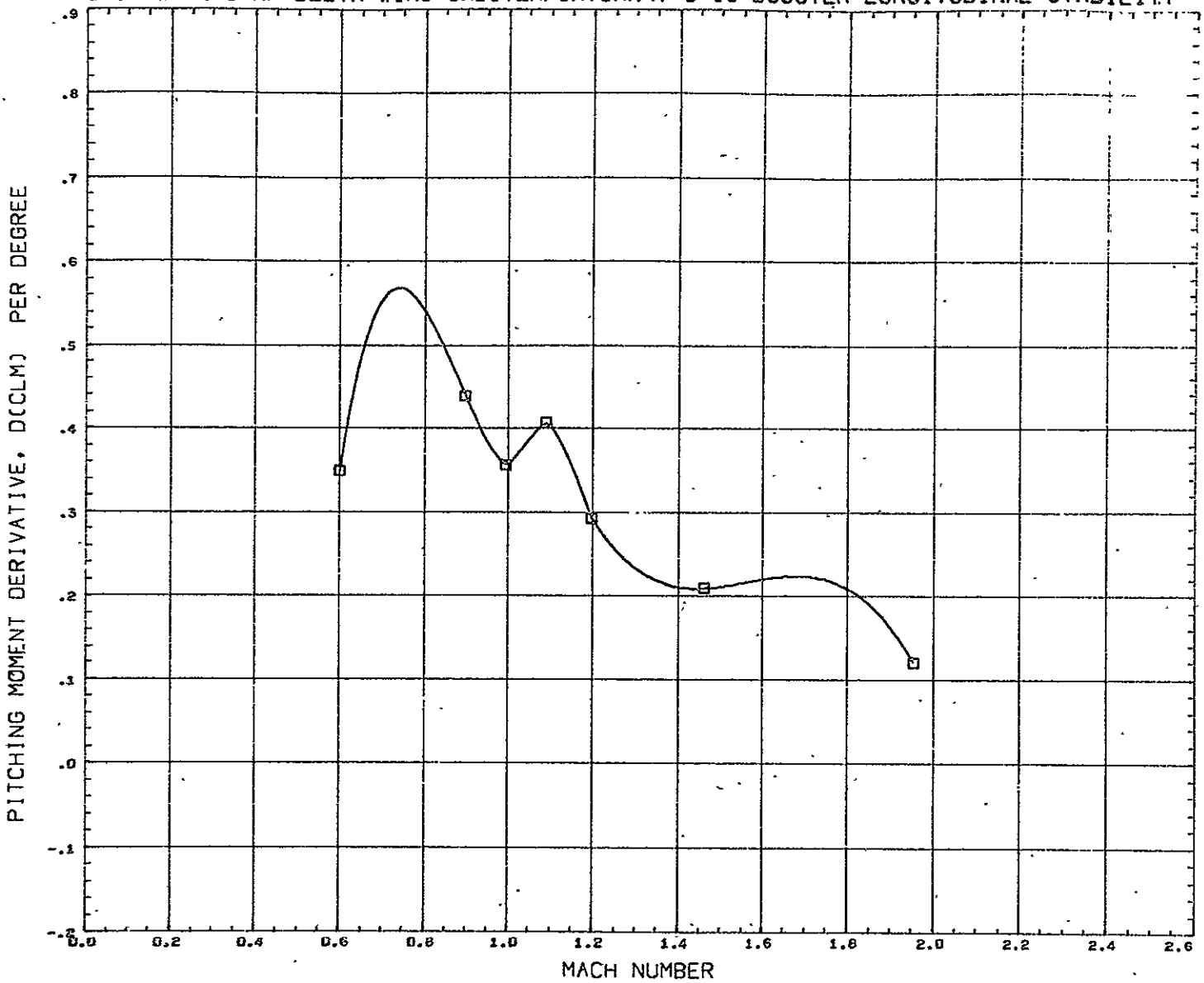
BETA 0.010 ORBINC - 2.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE HMV

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



PARAMETRIC VALUES

BETA 0.010 ORBINC - 2.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
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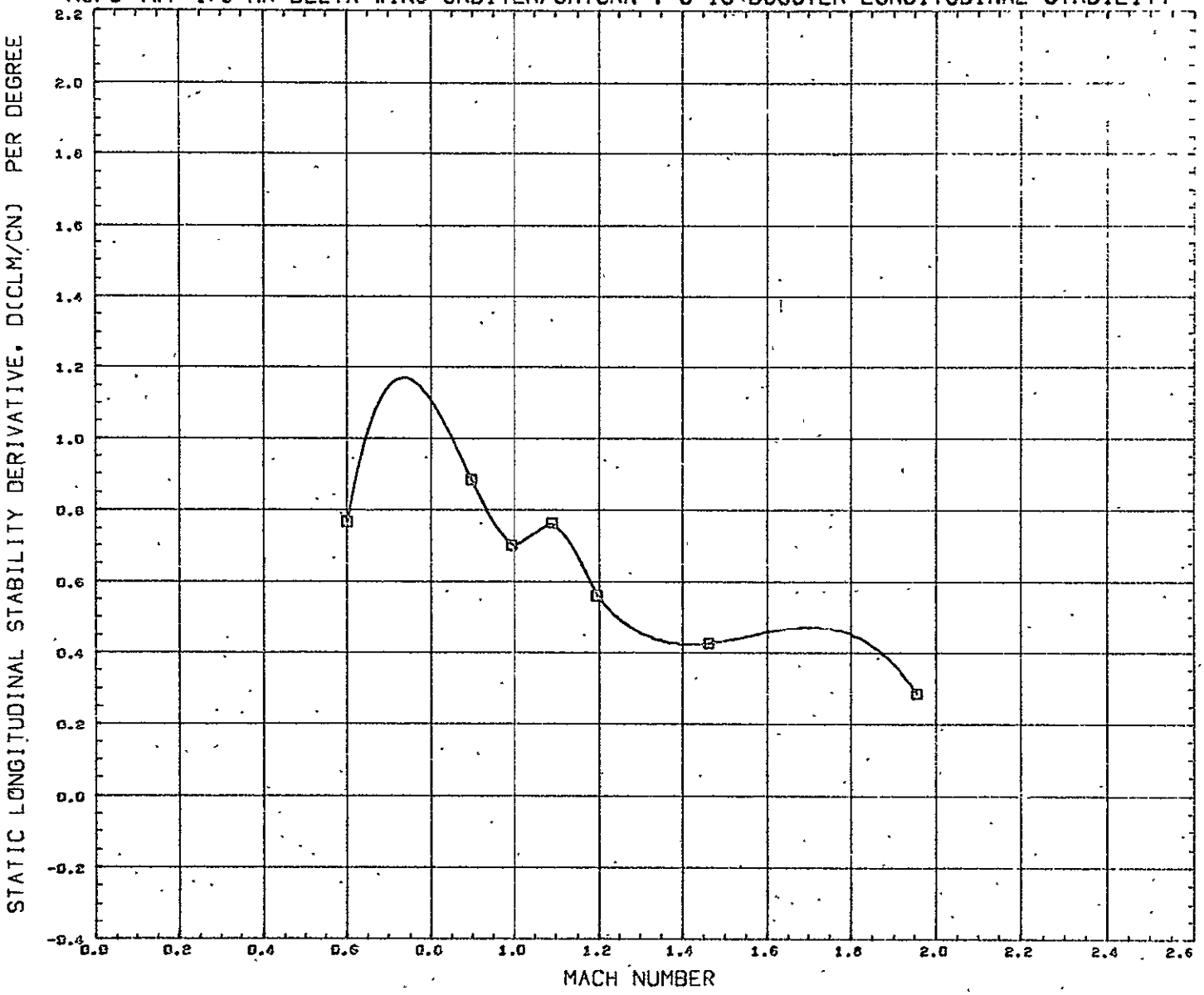
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE MMV

MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17 (B25041) 14 JAN 71 PAGE 106

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



PARAMETRIC VALUES

BETA 0.010 ORBINC - 2.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
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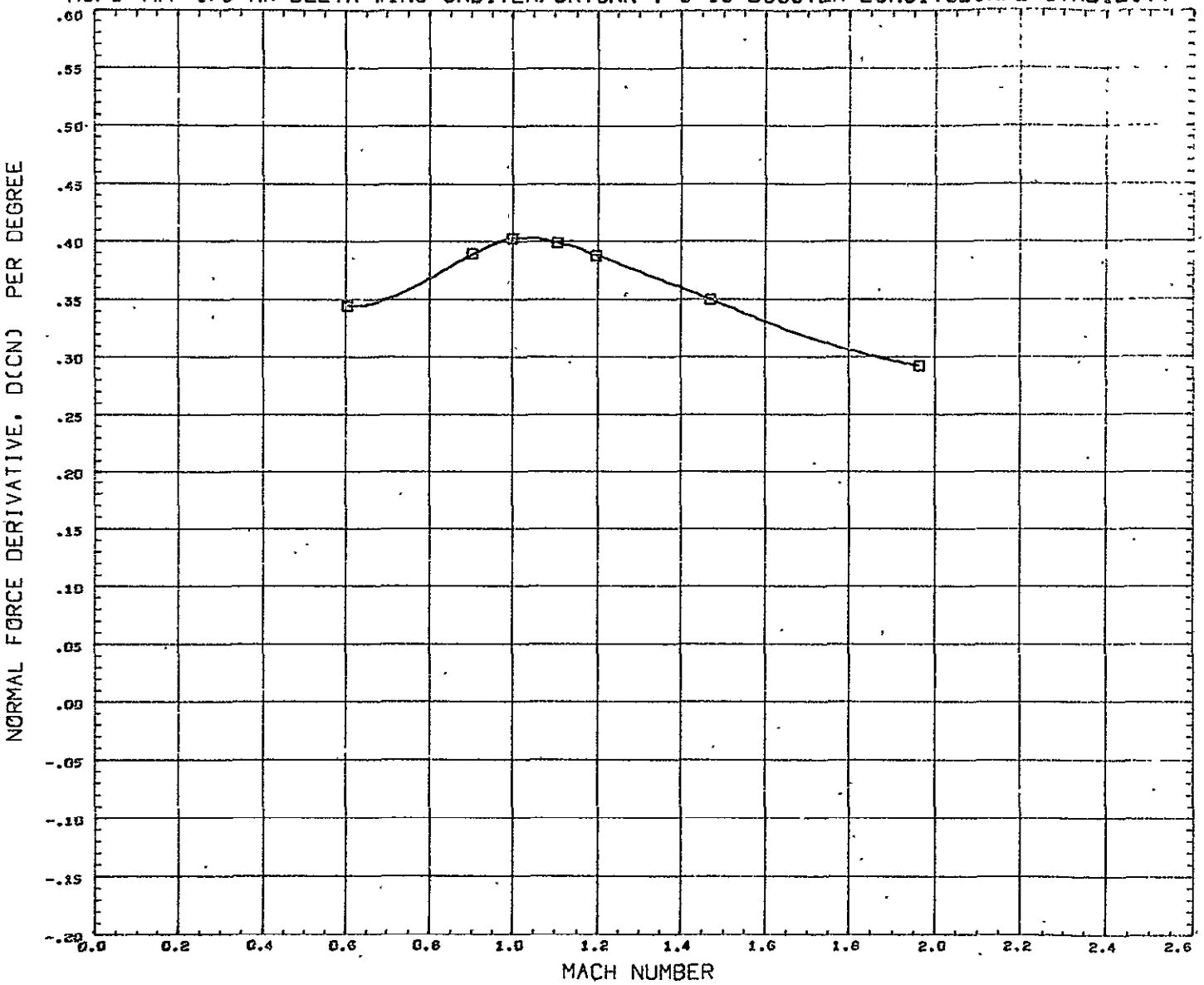
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE HHV

MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17 (B25041) 14 JAN 71 PAGE 107

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



PARAMETRIC VALUES

BETA 0.010 ORBINC 1.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
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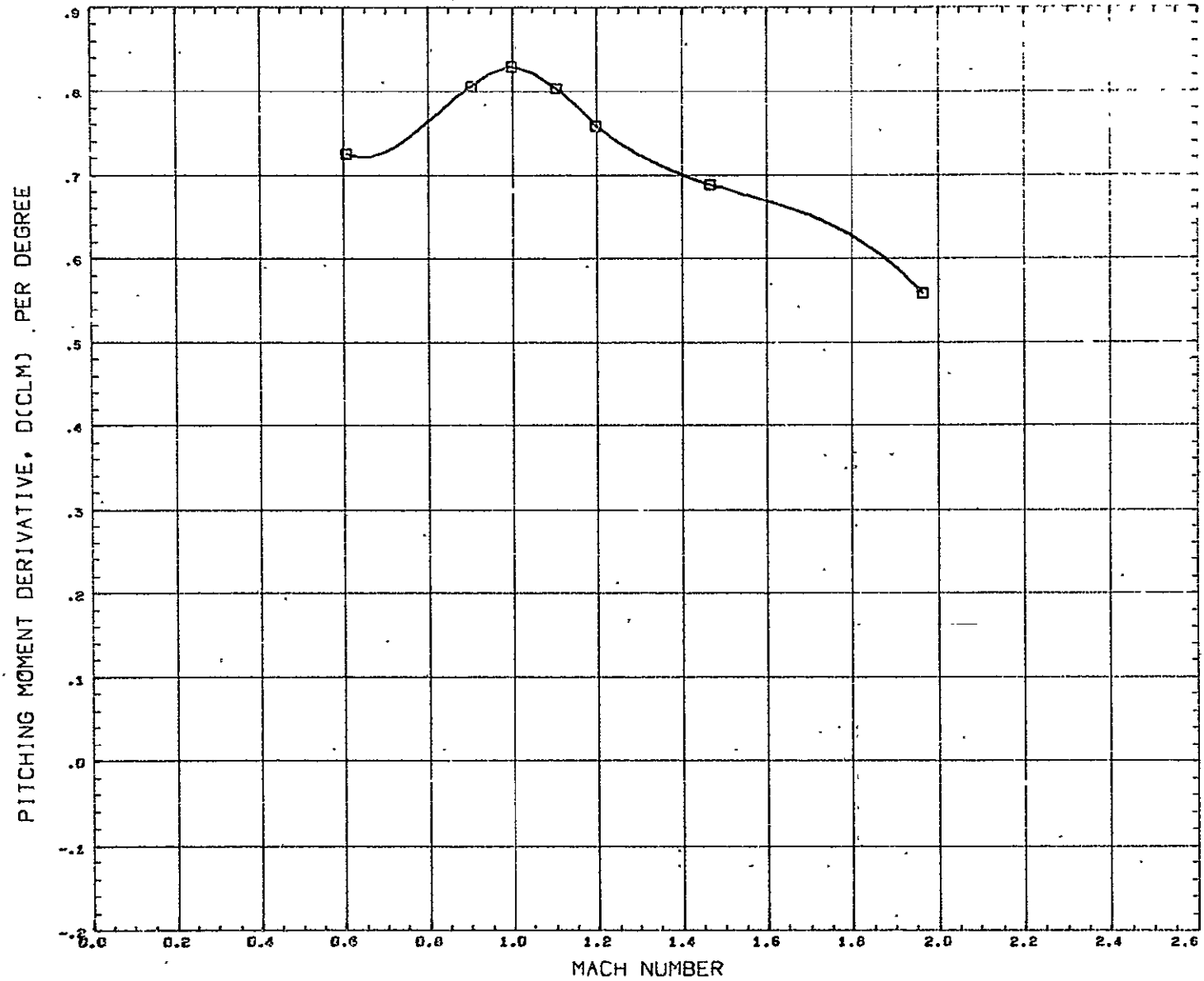
REFB	1.3330	INCHES
XHRP	5.2640	INCHES
YHRP	0.0000	INCHES
ZHRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE MHV

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



PARAMETRIC VALUES

BETA 0.010 ORBINC 1.000

DATA HIST. CODE MHV

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
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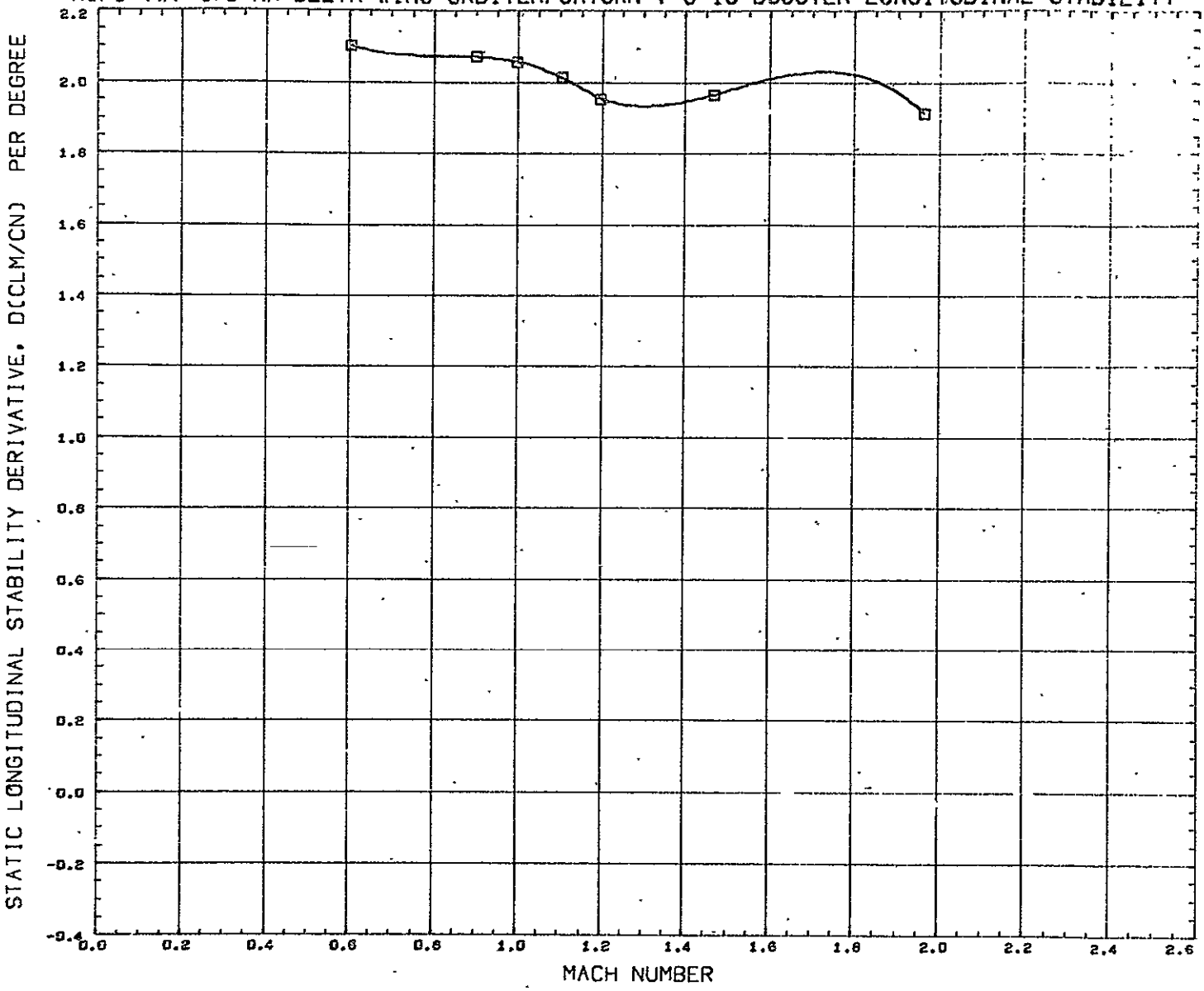
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER-LØNGITUDINAL STABILITY



PARAMETRIC VALUES

BETA 0.010 ORBINC 1.000

REFERENCE INFORMATION

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YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
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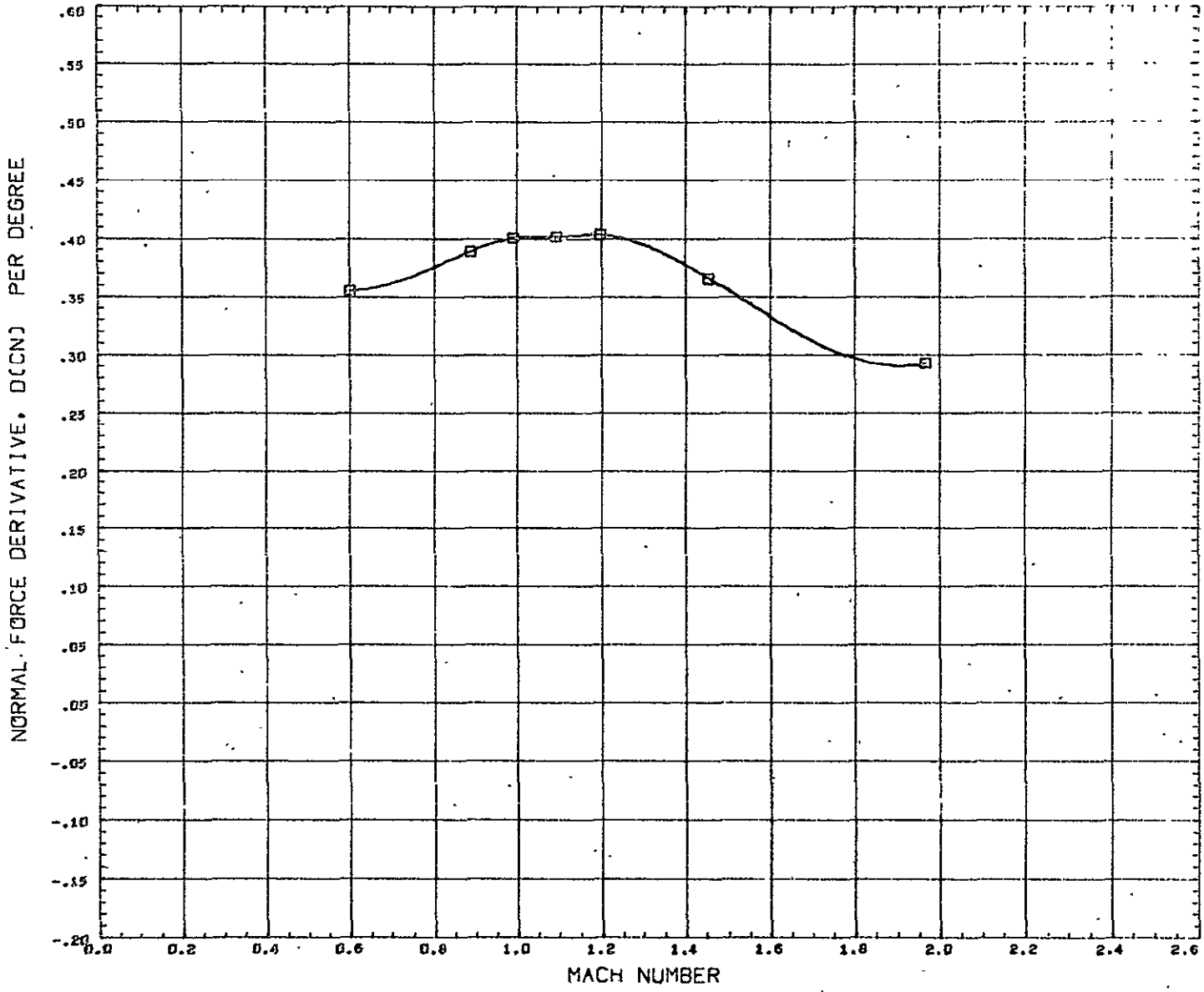
DATA HIST. CODE MHV

MSFC TWT 476 NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER-LØNGITUDINAL STABILITY



PARAMETRIC VALUES

BETA = 0.020 ØRBINC 4.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
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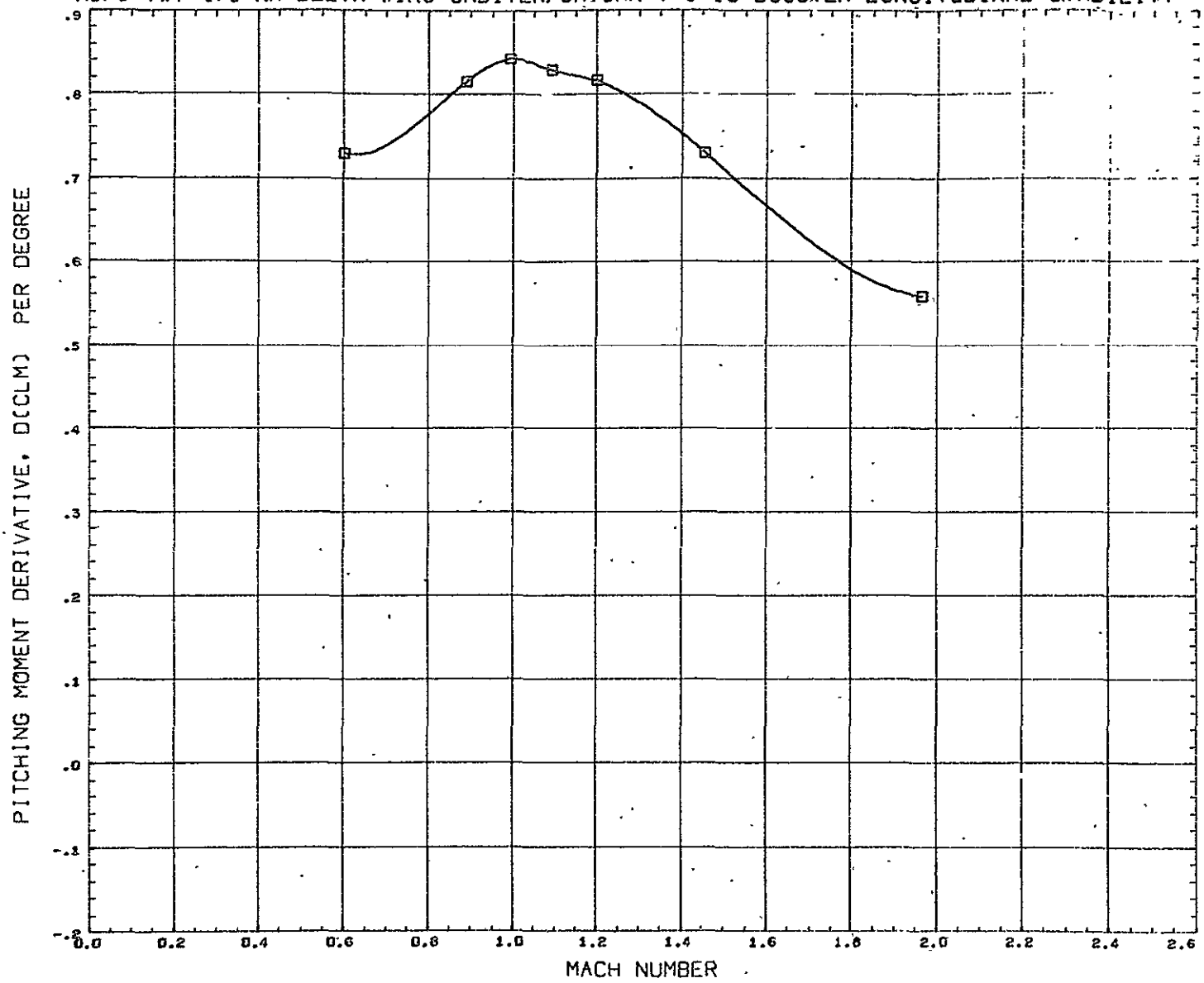
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE V

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



PARAMETRIC VALUES

BETA - 0.020 ORBINC 4.000

DATA HIST. CODE V

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
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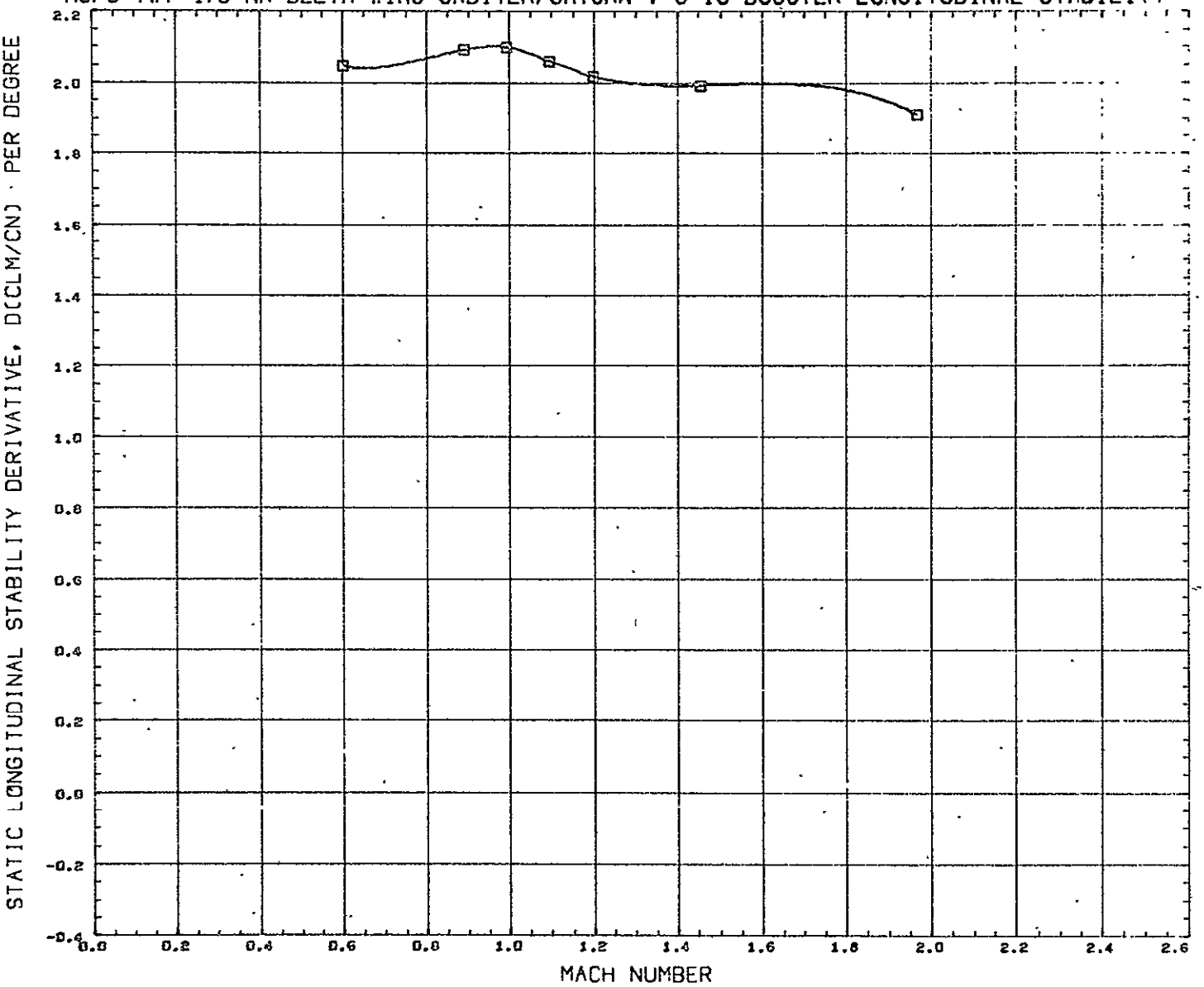
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER-LØNGITUDINAL STABILITY



PARAMETRIC VALUES

BETA - 0.020 ORBINC 4.000

DATA HIST. CODE V

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
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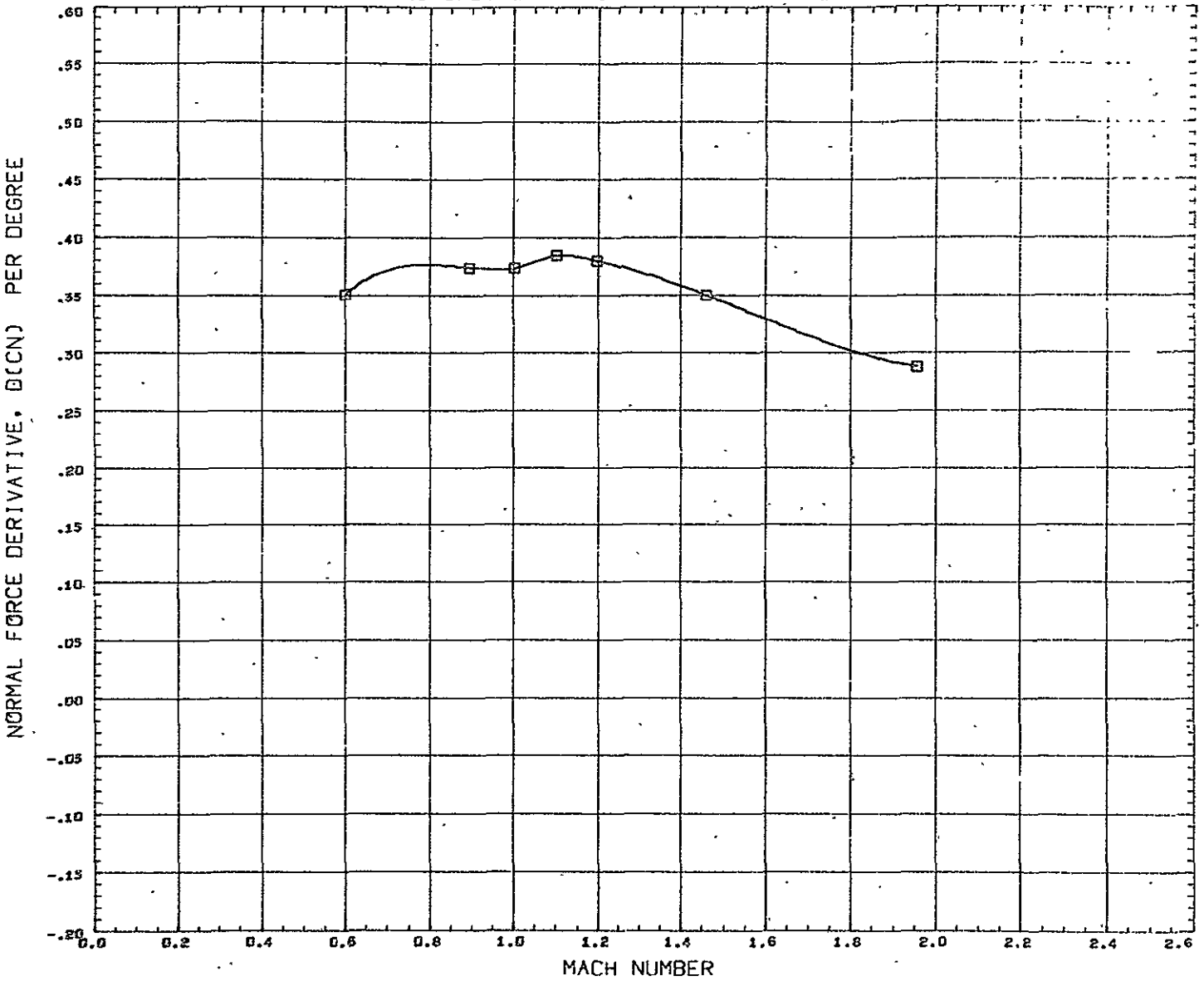
REFB	1.3330	INCHES
XMRF	5.2640	INCHES
YMRF	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



PARAMETRIC VALUES

BETA 0.000 ORBINC - 2.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
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REFB	1.3330	INCHES
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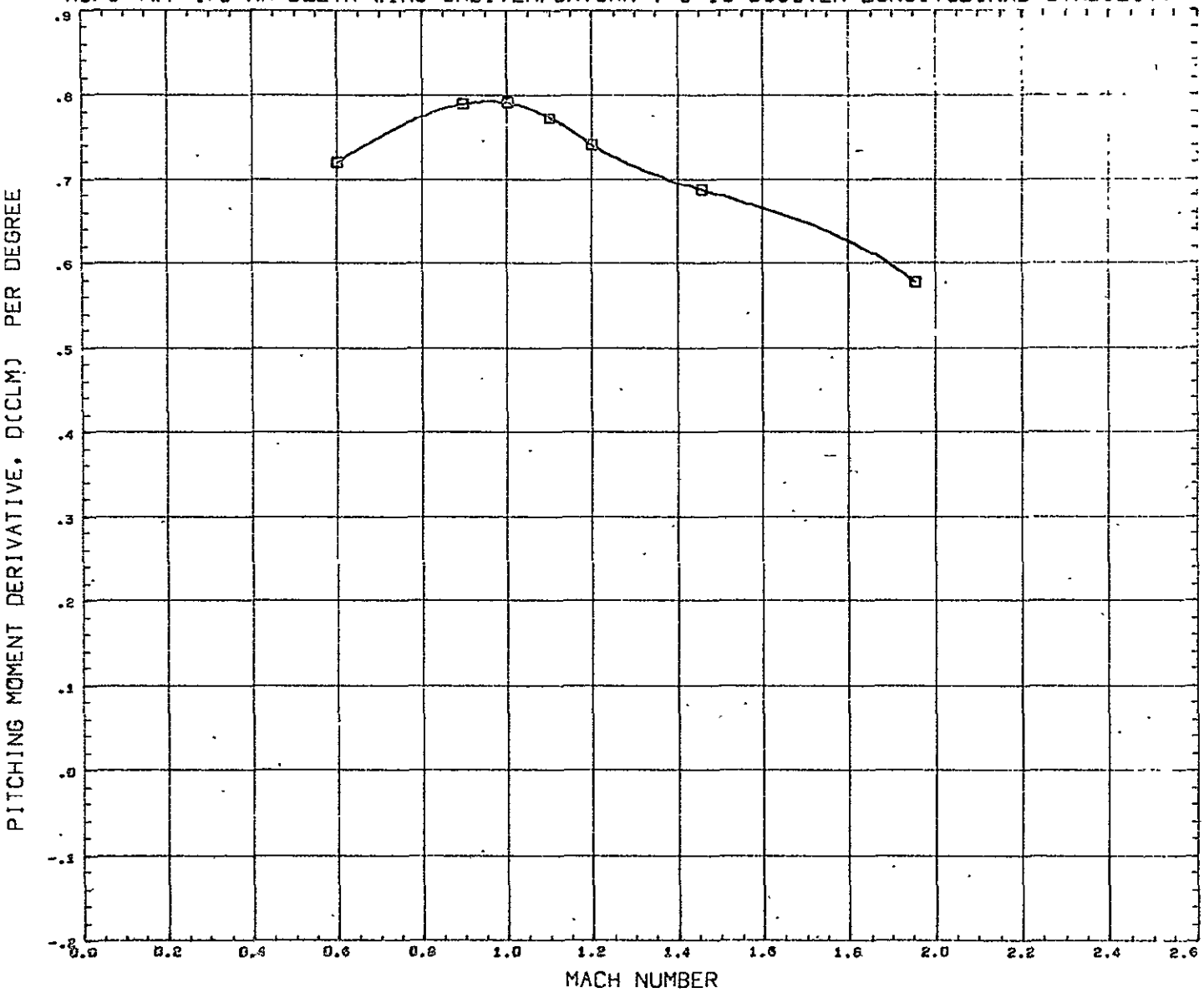
YMRF	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE MHV

MSFC TWT 476 NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER-LØNGITUDINAL STABILITY



PARAMETRIC VALUES

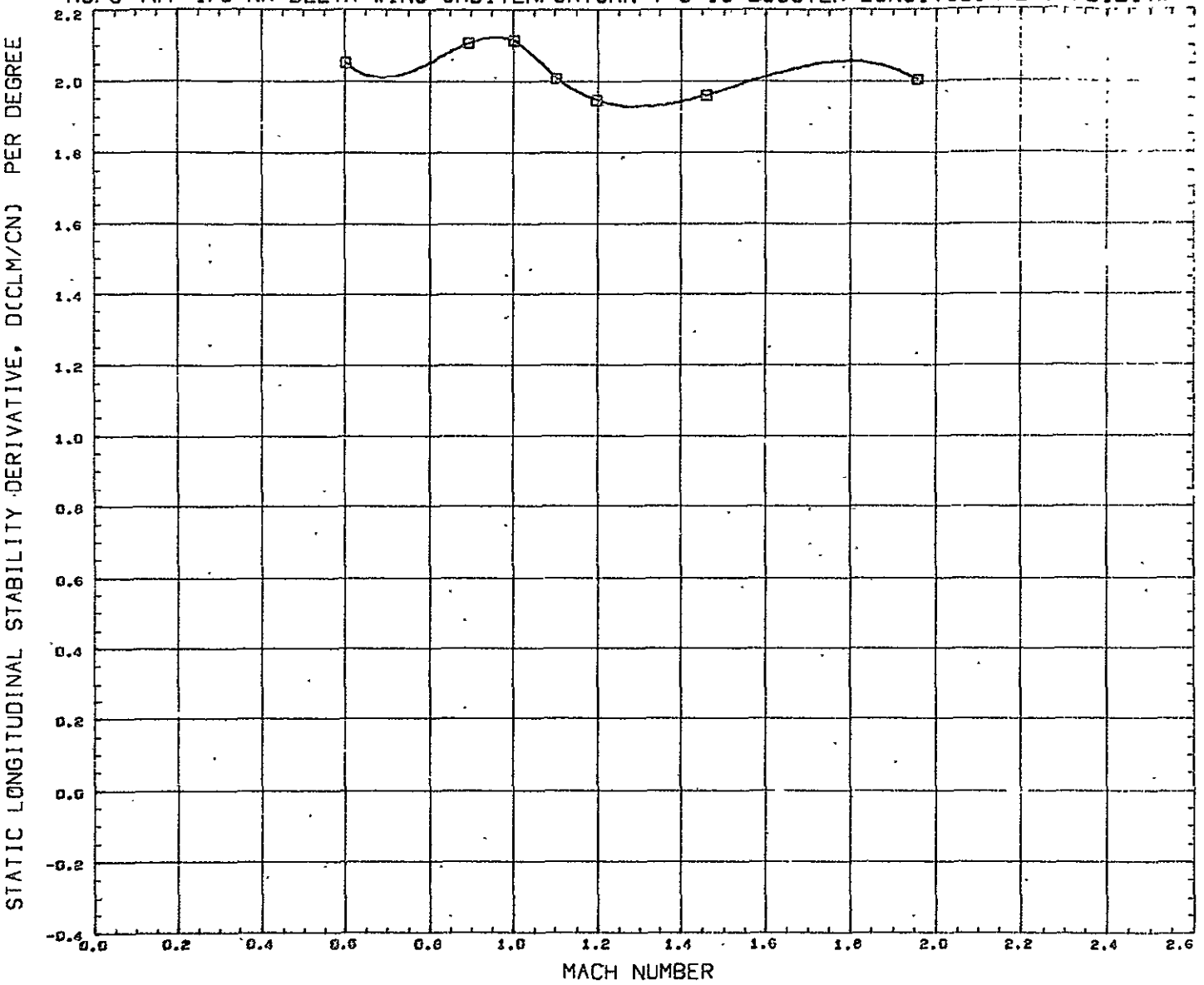
BETA 0.000 ØRBINC - 2.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRF	5.2640	INCHES
YMRF	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE MMV

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



PARAMETRIC VALUES

BETA 0.000 ORBINC - 2.000

REFERENCE INFORMATION

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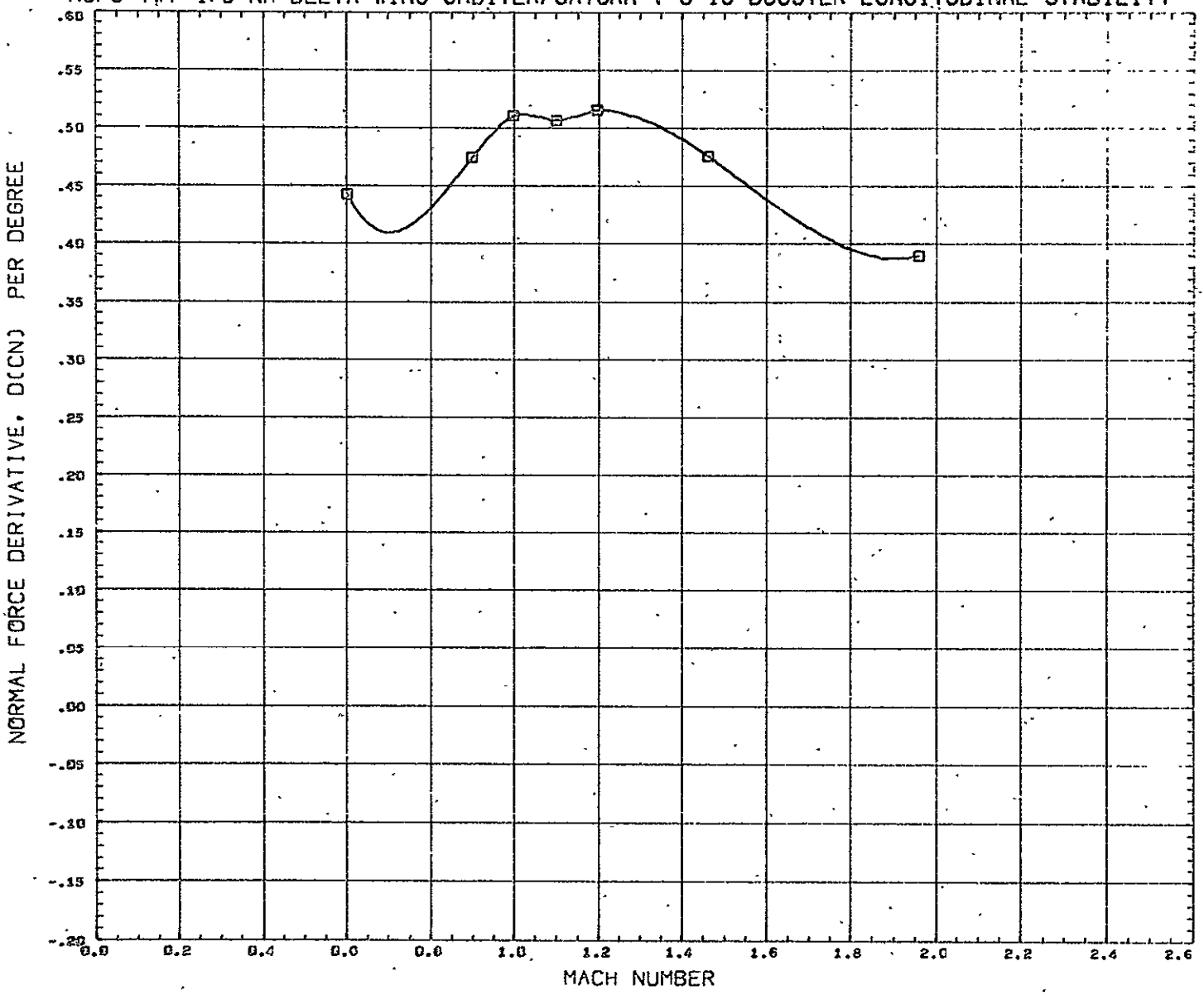
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE NHV

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



PARAMETRIC VALUES

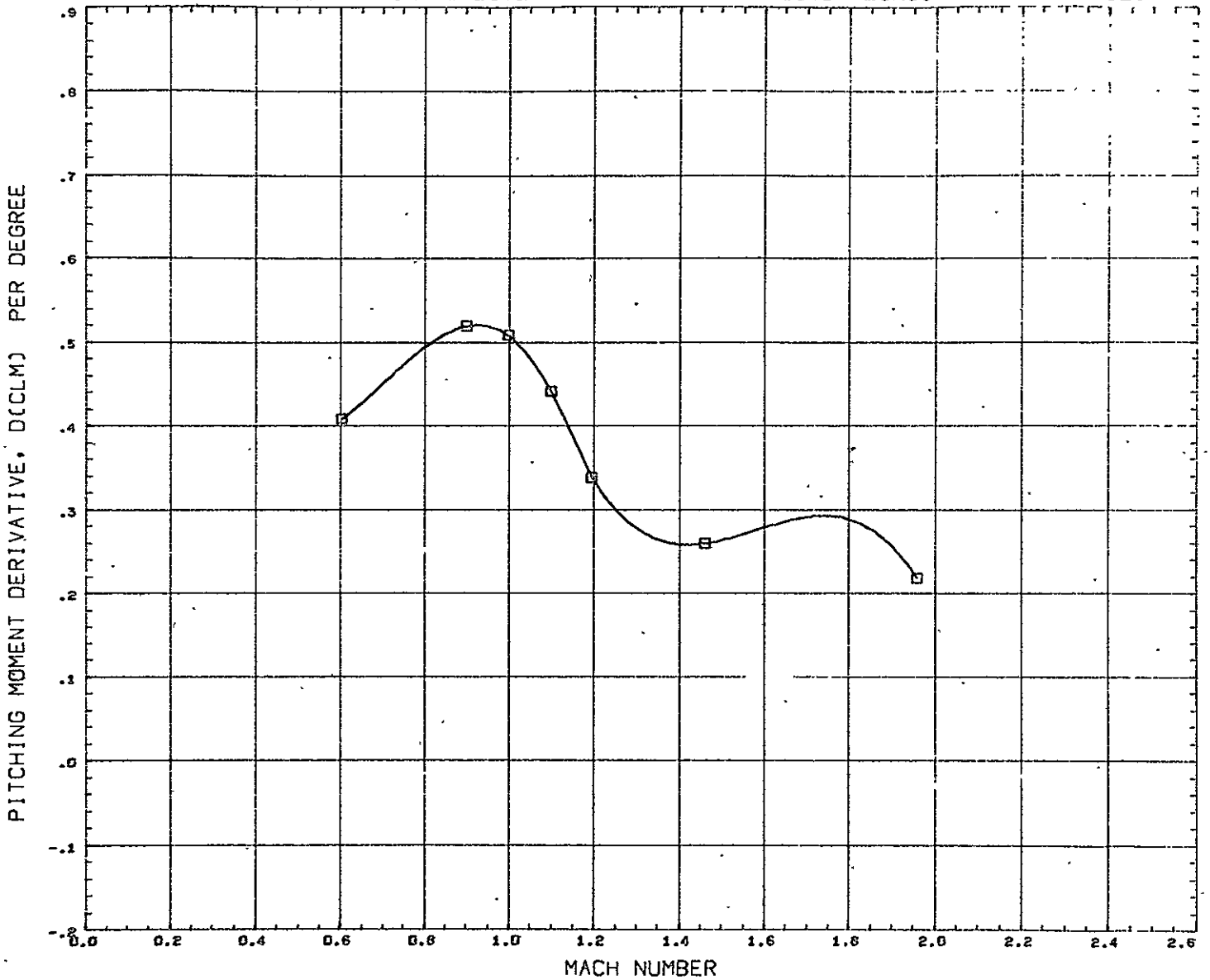
BETA 0.000 ORBINC 1.000

DATA HIST. CODE HMV

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



PARAMETRIC VALUES

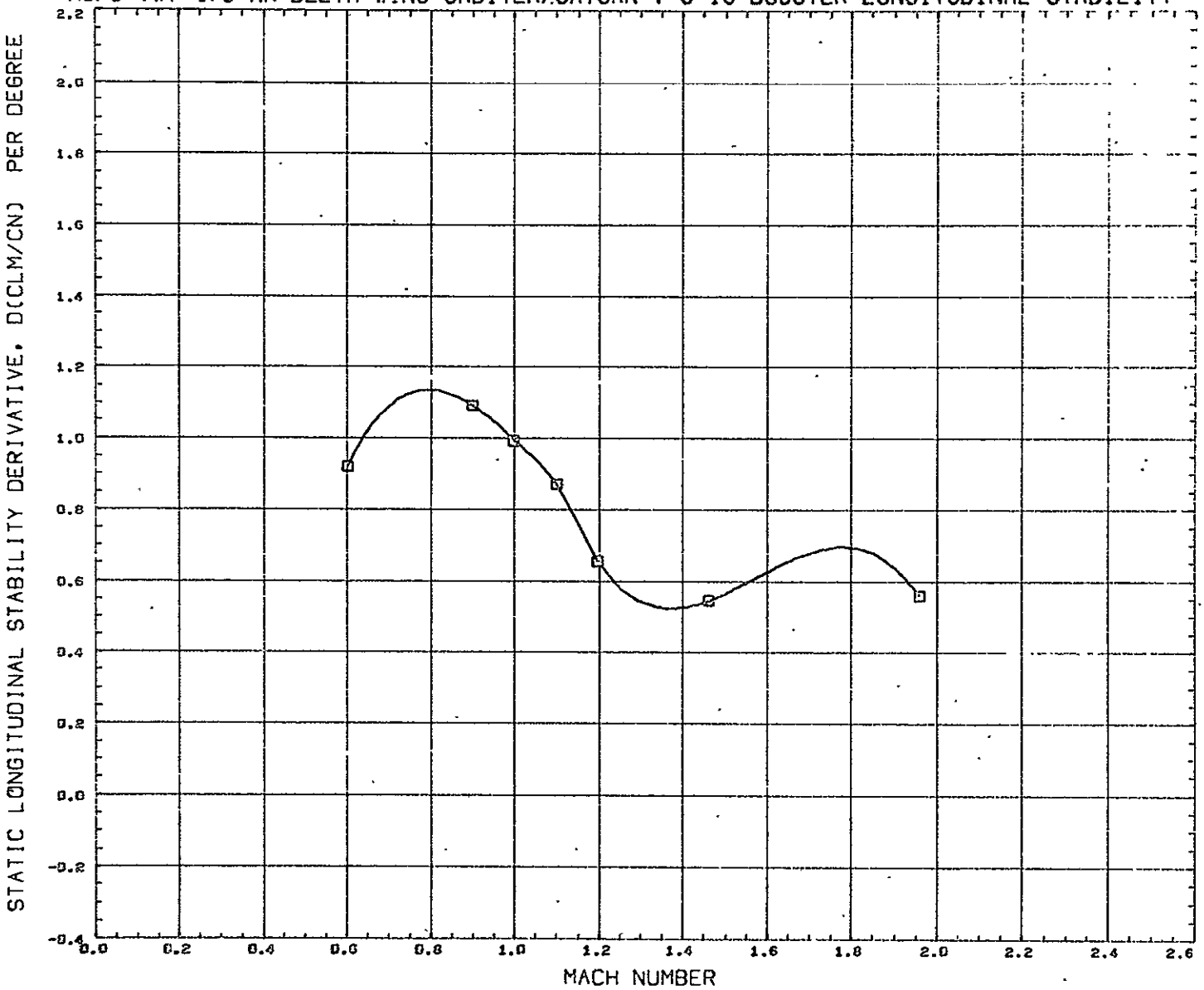
BETA 0.000 ORBINC 1.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES.
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE NHV

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



PARAMETRIC VALUES

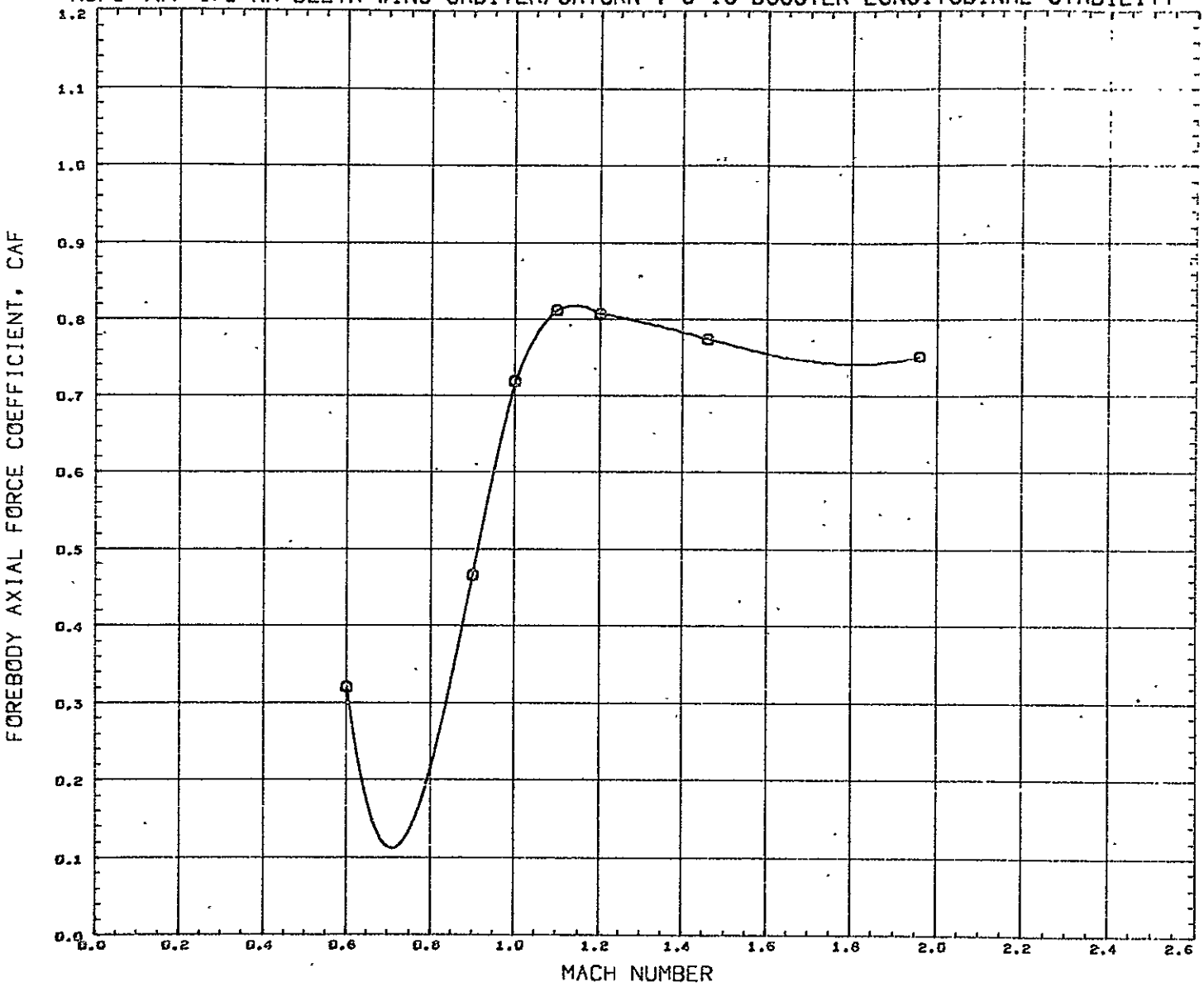
BETA 0.000 ORBINC 1.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE HHV

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	ALFHA		PARAMETRIC VALUES		
O	0.000	BETA	0.020	ORBINC	1.000

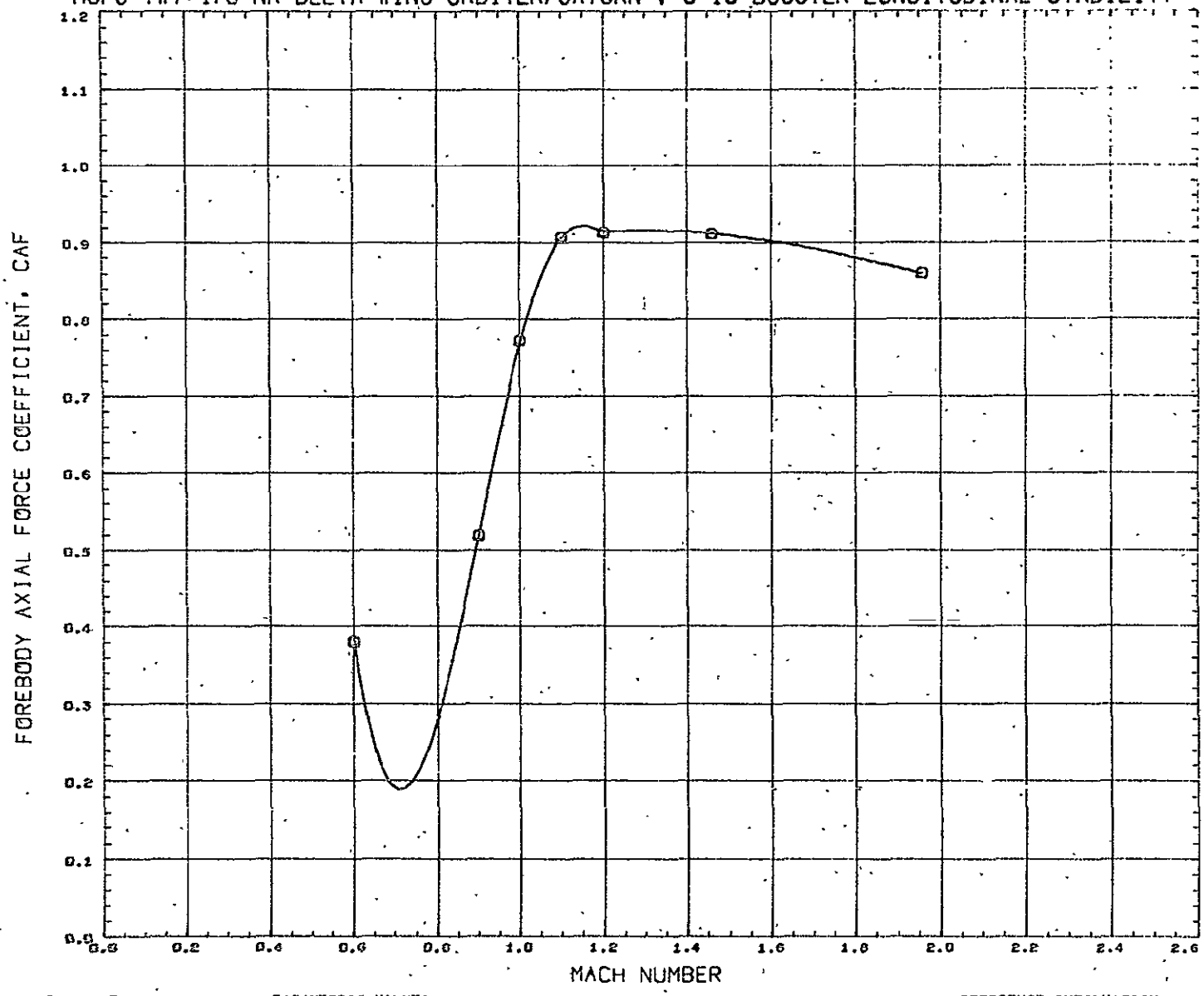
DATA HIST. CODE HHI

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17 (N25021) 14 JAN 71 PAGE 120

MSFC TWT 476 NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER-LØNGITUDINAL STABILITY



SYMBOL	ALFHA		PARAMETRIC VALUES		
O	0.000	BETA	- 0.020	ORBINC	4.000

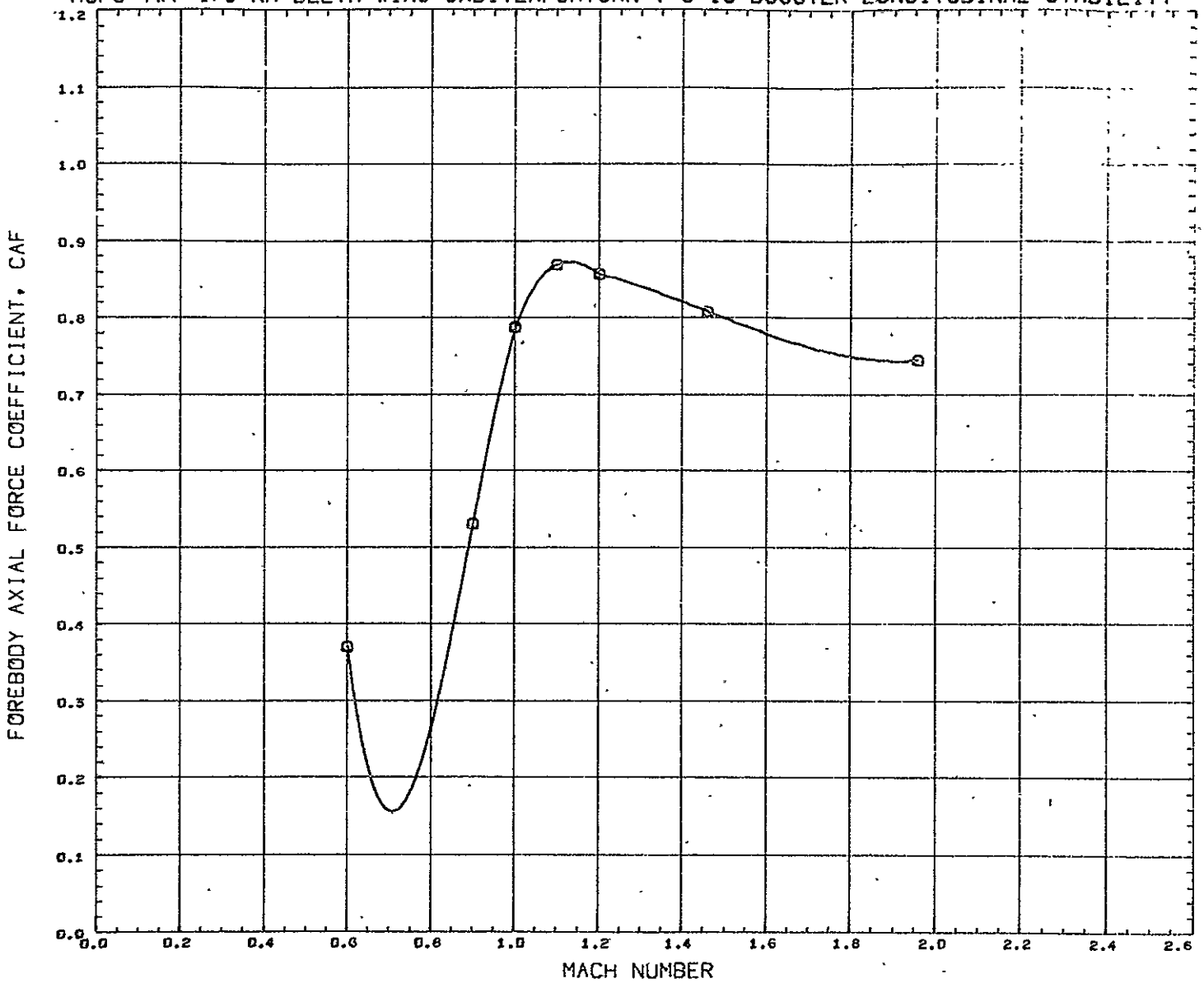
REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE NMI

MSFC 476 NR HCRØRB/S-ICBØØSTER BF1S+B5W14E3V17 (N25031) 14 JAN 71 PAGE 121

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	ALFHA		PARAMETRIC VALUES		
O	0.000	BETA	0.010	ORBINC	- 2.000

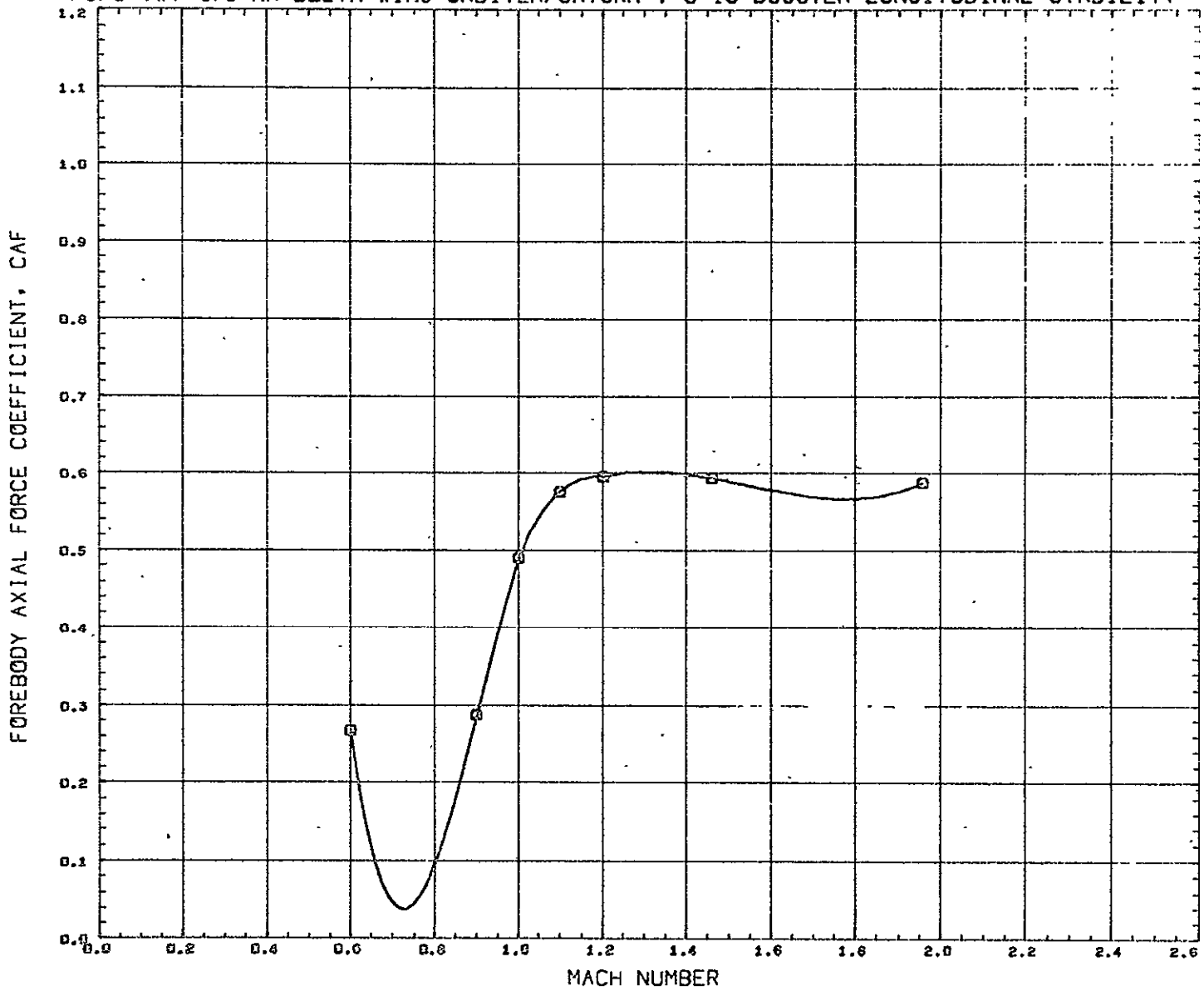
REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE HMI

MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17 (N25041) 14 JAN 71 PAGE 122

MSFC TWT 476 NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER-LØNGITUDINAL STABILITY



SYMBOL	ALPHA		PARAMETRIC VALUES		
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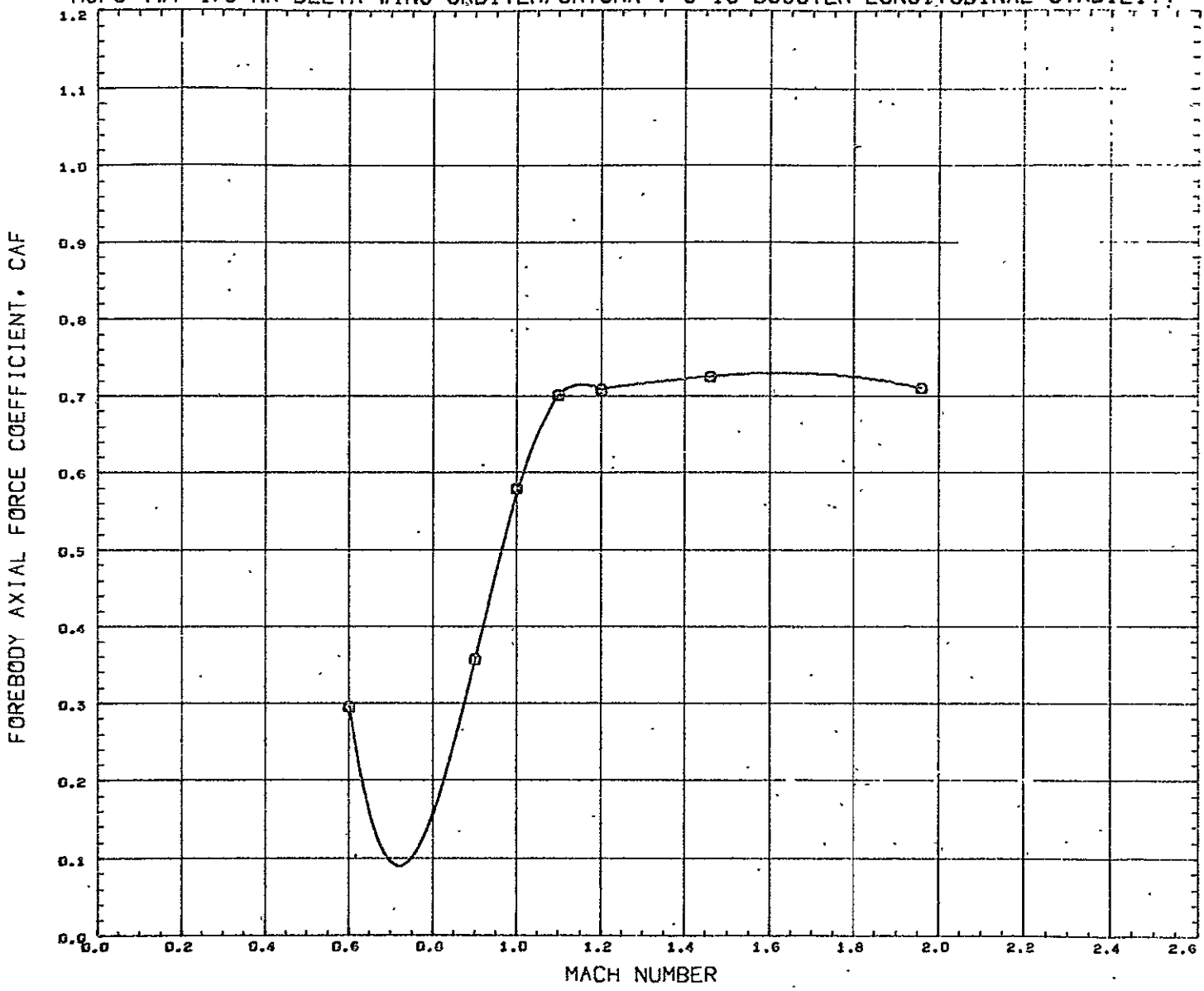
DATA HIST. CØDE HHI

REFERENCE INFØRMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC 476 NR HCRØRB/S-ICBØØSTER BS+B5W14E3V17 (N25061) 14 JAN 71 PAGE 123

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



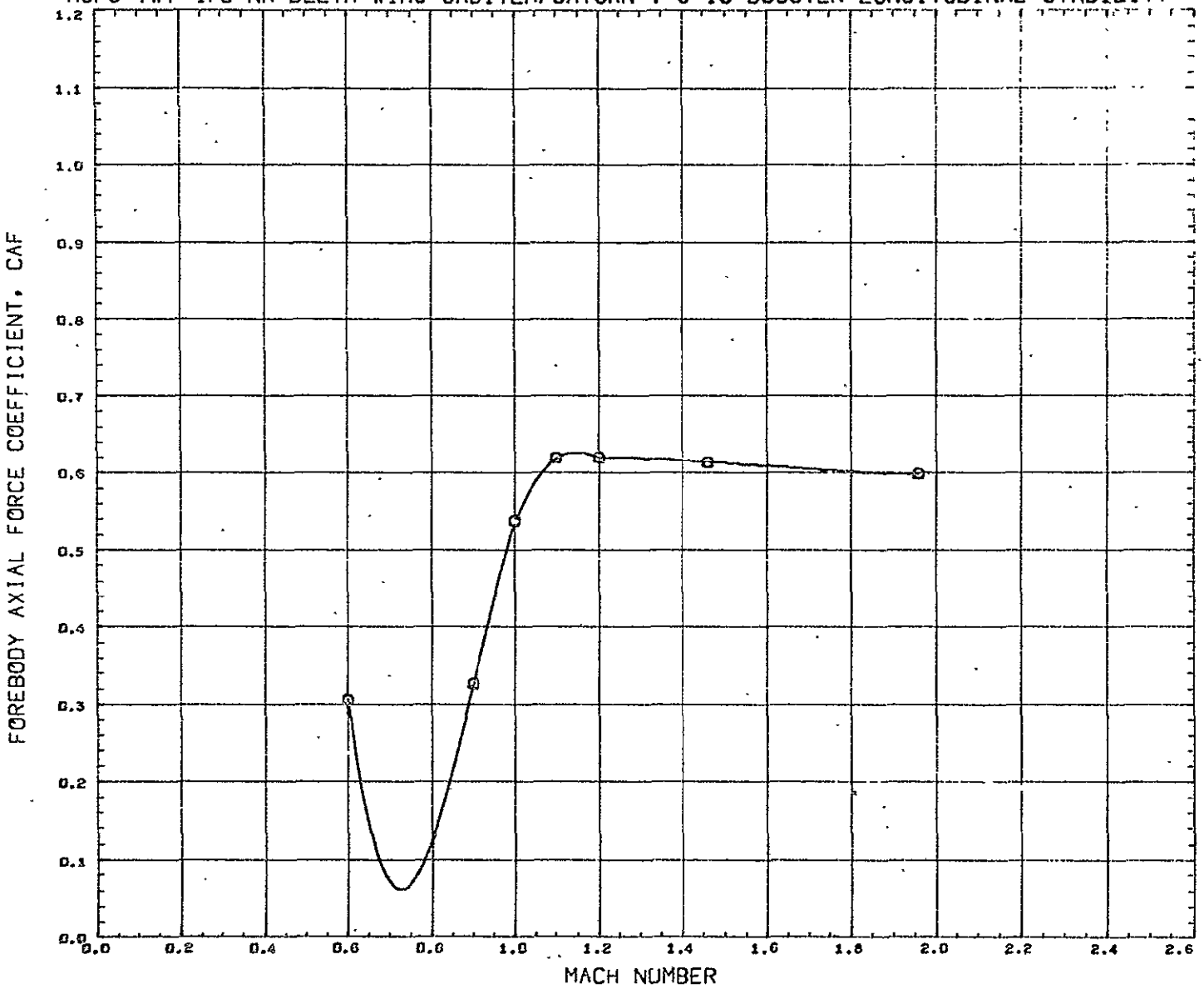
SYMBOL	ALPHA		PARAMETRIC VALUES		
O	0.000	BETA	- 0.020	ORBINC	4.000

DATA HIST. CODE I

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER-LØNGITUDINAL STABILITY



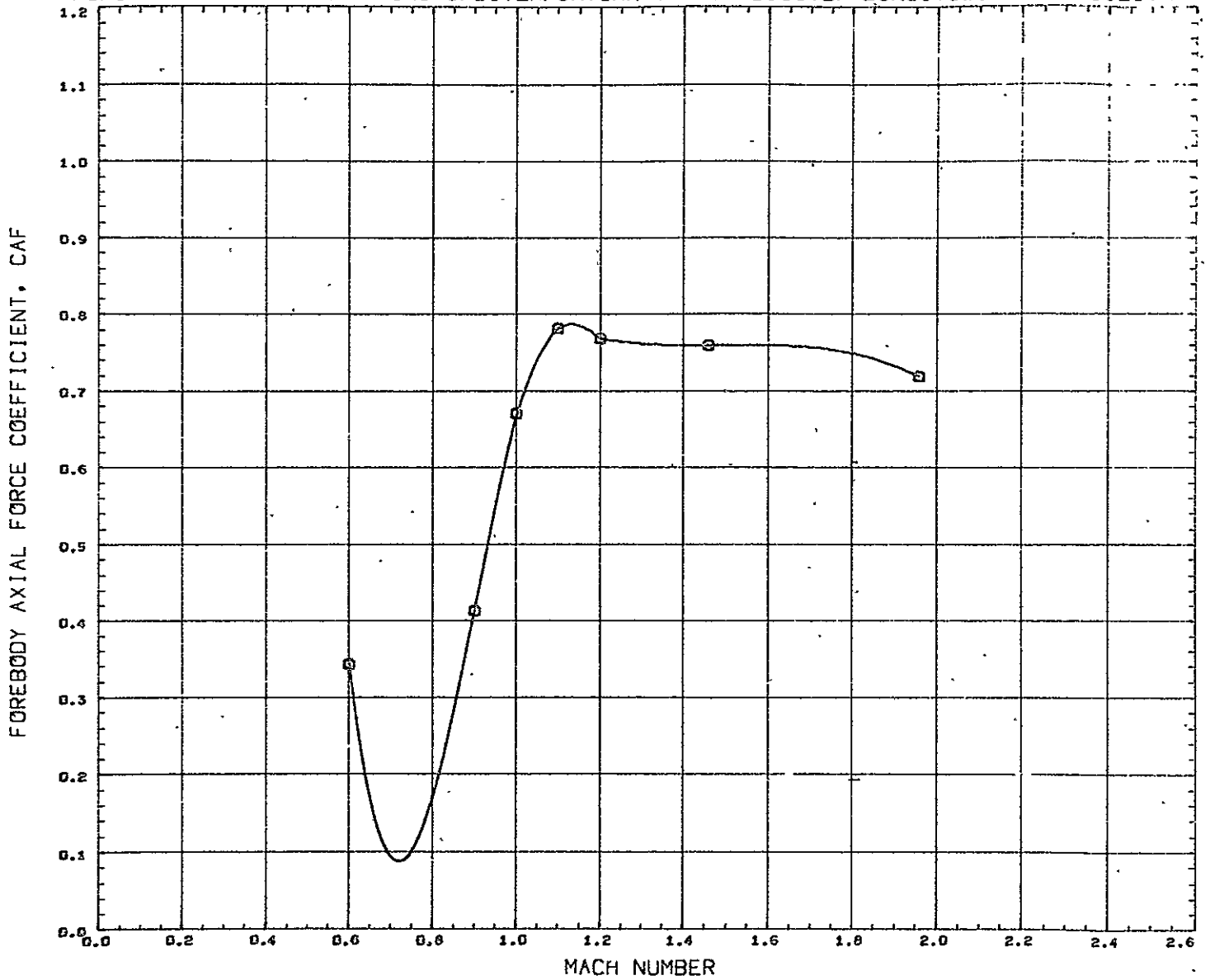
SYMBOL	ALPHA		PARAMETRIC VALUES		
O	0.000	BETA	0.000	ORBINC	- 2.000

DATA HIST. CODE HHI

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



SYMBOL	ALFHA		PARAMETRIC VALUES		
O	0.000	BETA	0.000	ORBINC	1.000

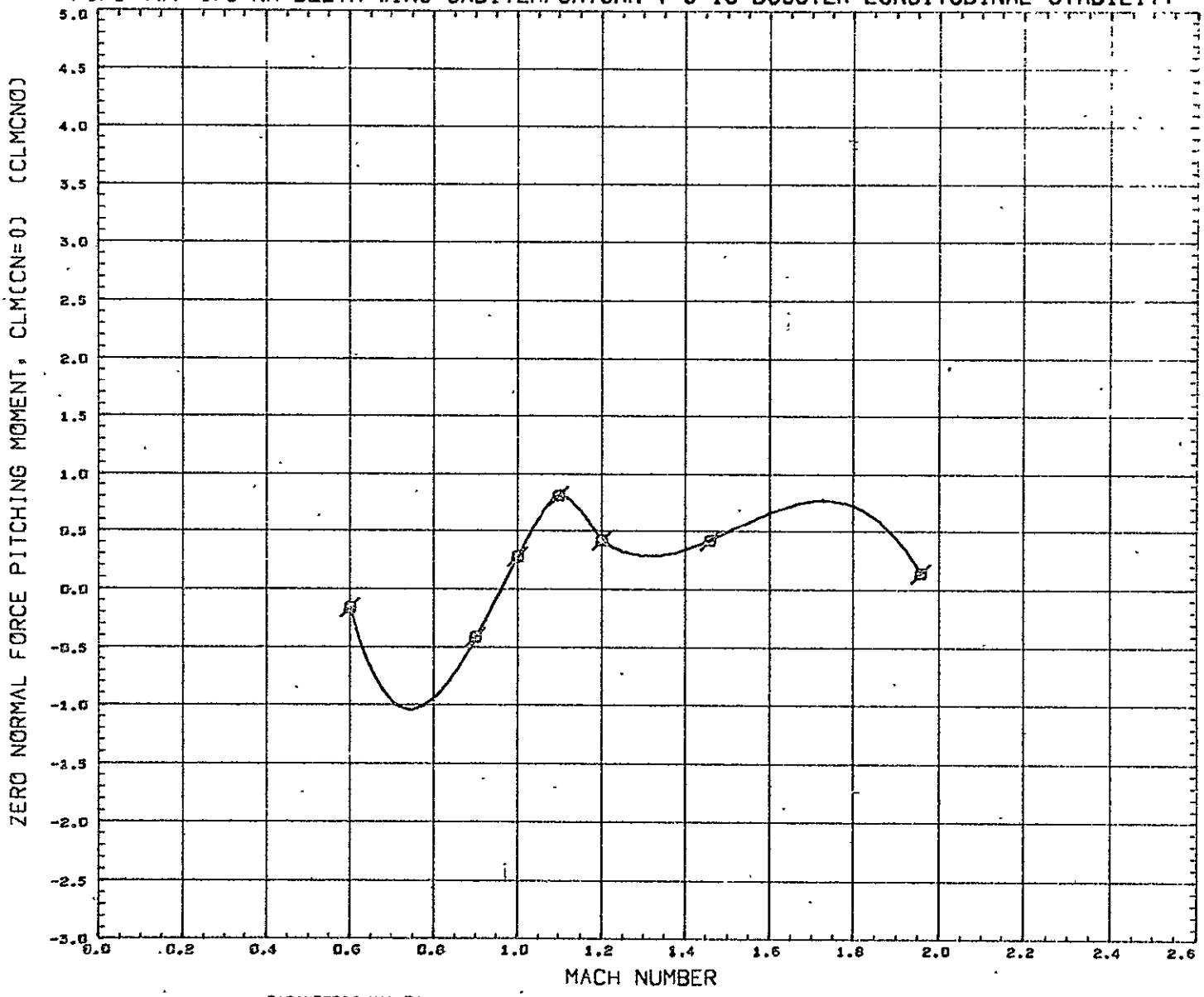
REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE MMI

MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17 (N25091) 14 JAN 71 PAGE 126

MSFC TWT 476 NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER-LØNGITUDINAL STABILITY



PARAMETRIC VALUES

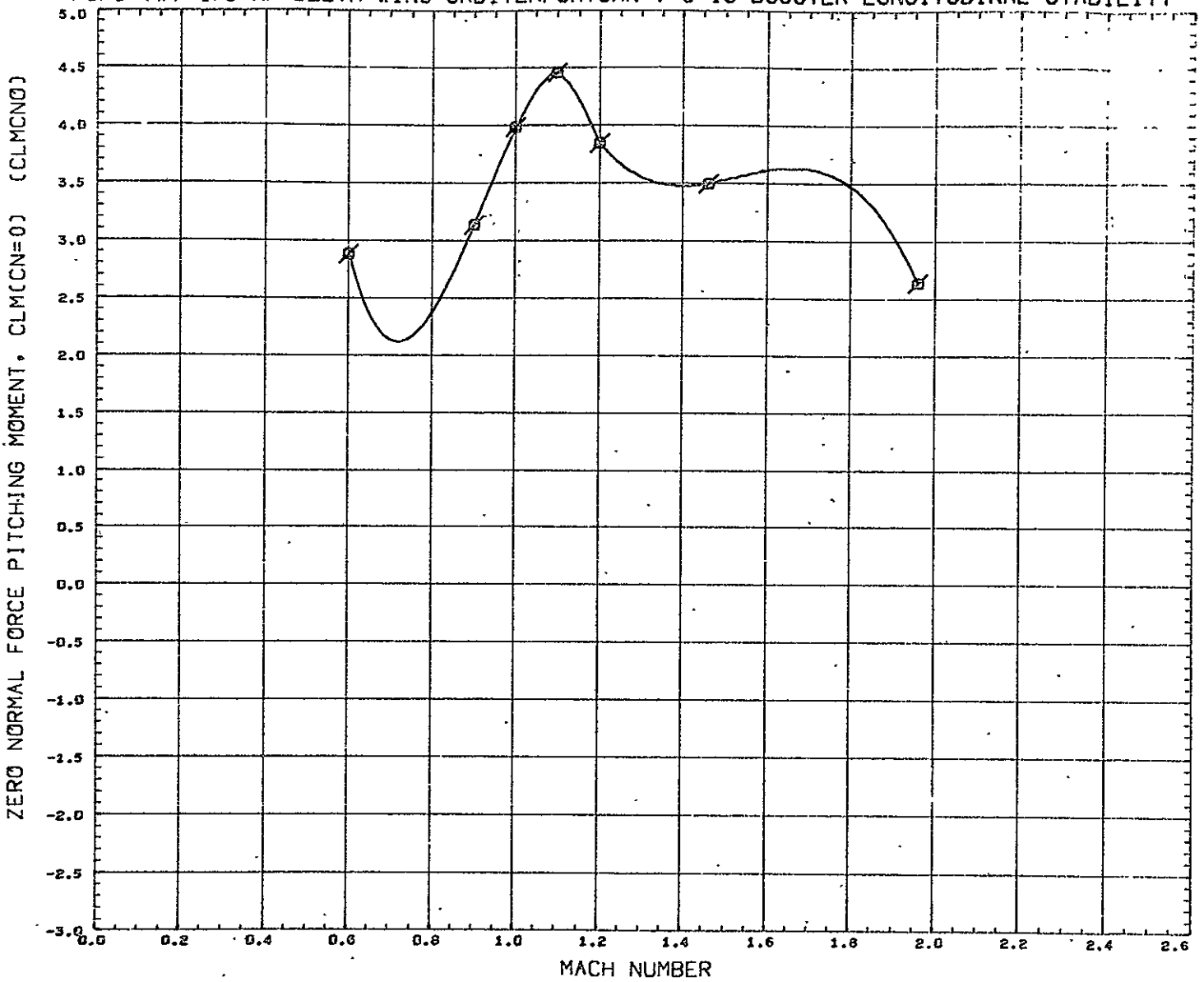
BETA 0.020 ØRBINC 1.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE HWIF

MSFC TWT 476 NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER-LØNGITUDINAL STABILITY



PARAMETRIC VALUES

BETA - 0.020 ØRBINC 4.000

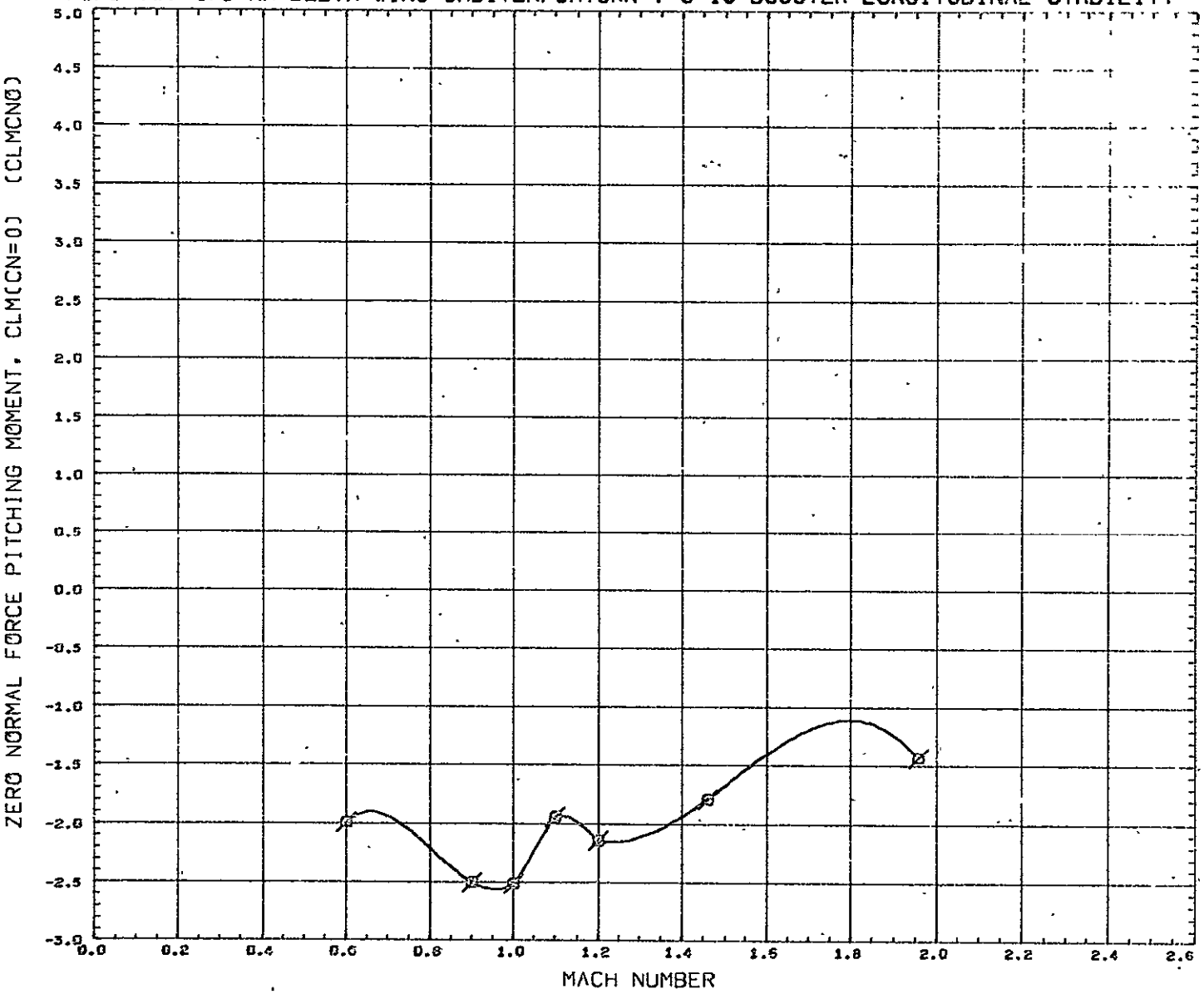
REFERENCE INFØRMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRF	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CØDE HWIF

MSFC 476 NR HCRØRB/S-ICBØØSTER BF1S+B5W14E3V17 (A25031) 14 JAN 71 PAGE 128

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



PARAMETRIC VALUES

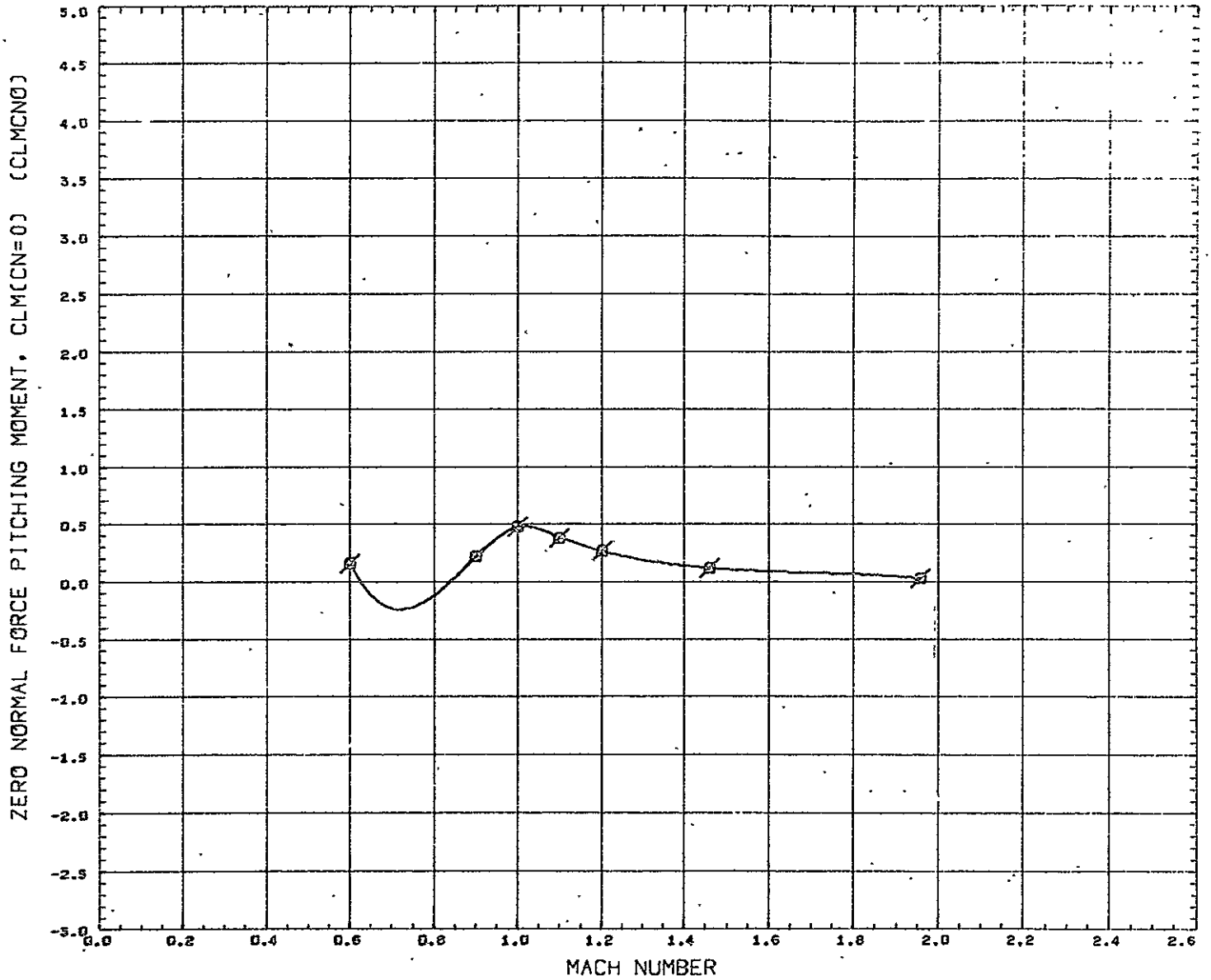
BETA 0.010 ORBINC - 2.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRF	5.2640	INCHES
YMRF	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE MHIF

MSFC TWT 476 NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER-LØNGITUDINAL STABILITY



PARAMETRIC VALUES

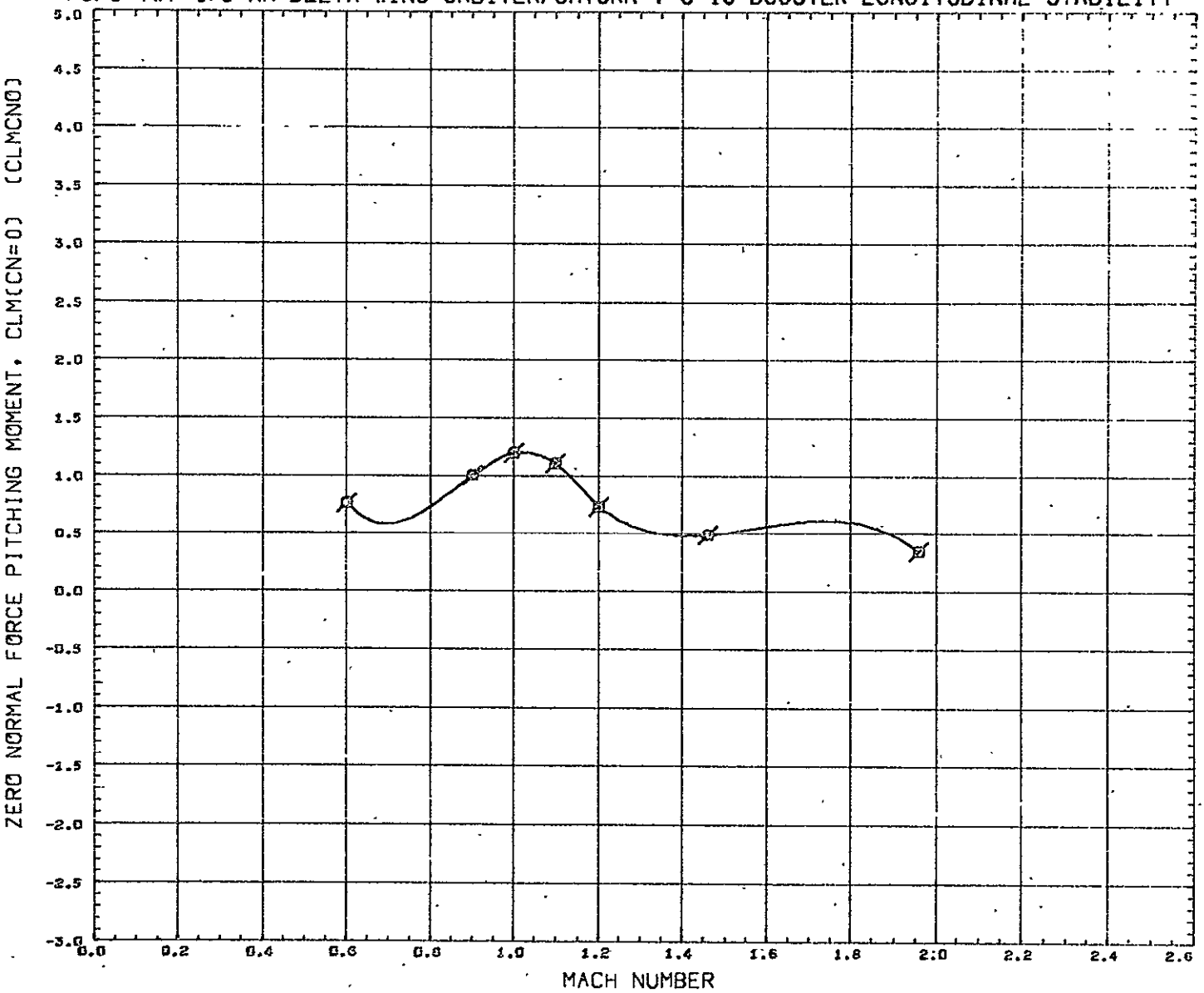
BETA 0.010 ØRBINC 1.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE HHIF

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



PARAMETRIC VALUES

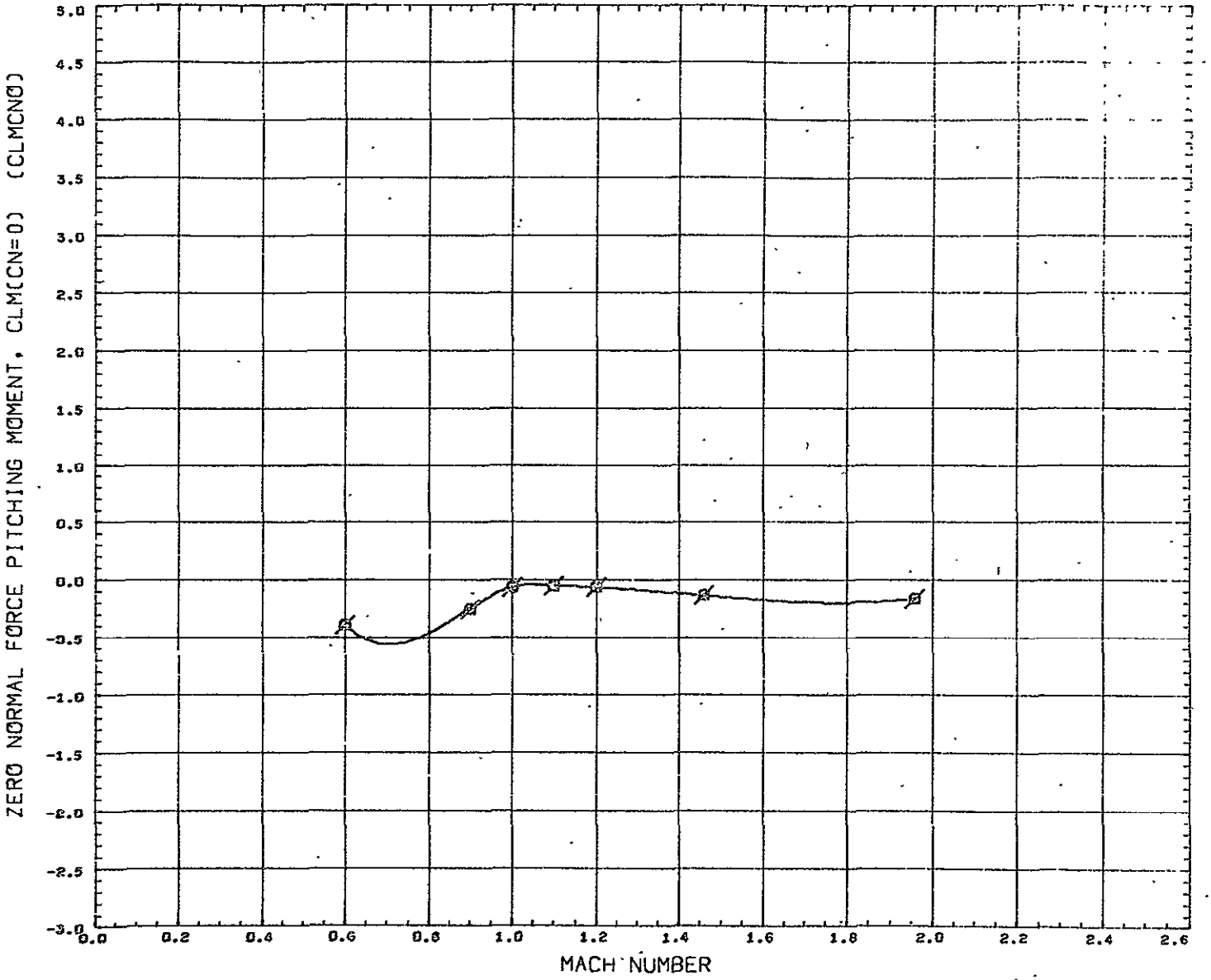
BETA - 0.020 ORBINC 4.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE IFM

MSFC TWT 476 NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER-LØNGITUDINAL STABILITY



PARAMETRIC VALUES

BETA 0.000 ORBINC - 2.000

DATA HIST. CODE HHIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
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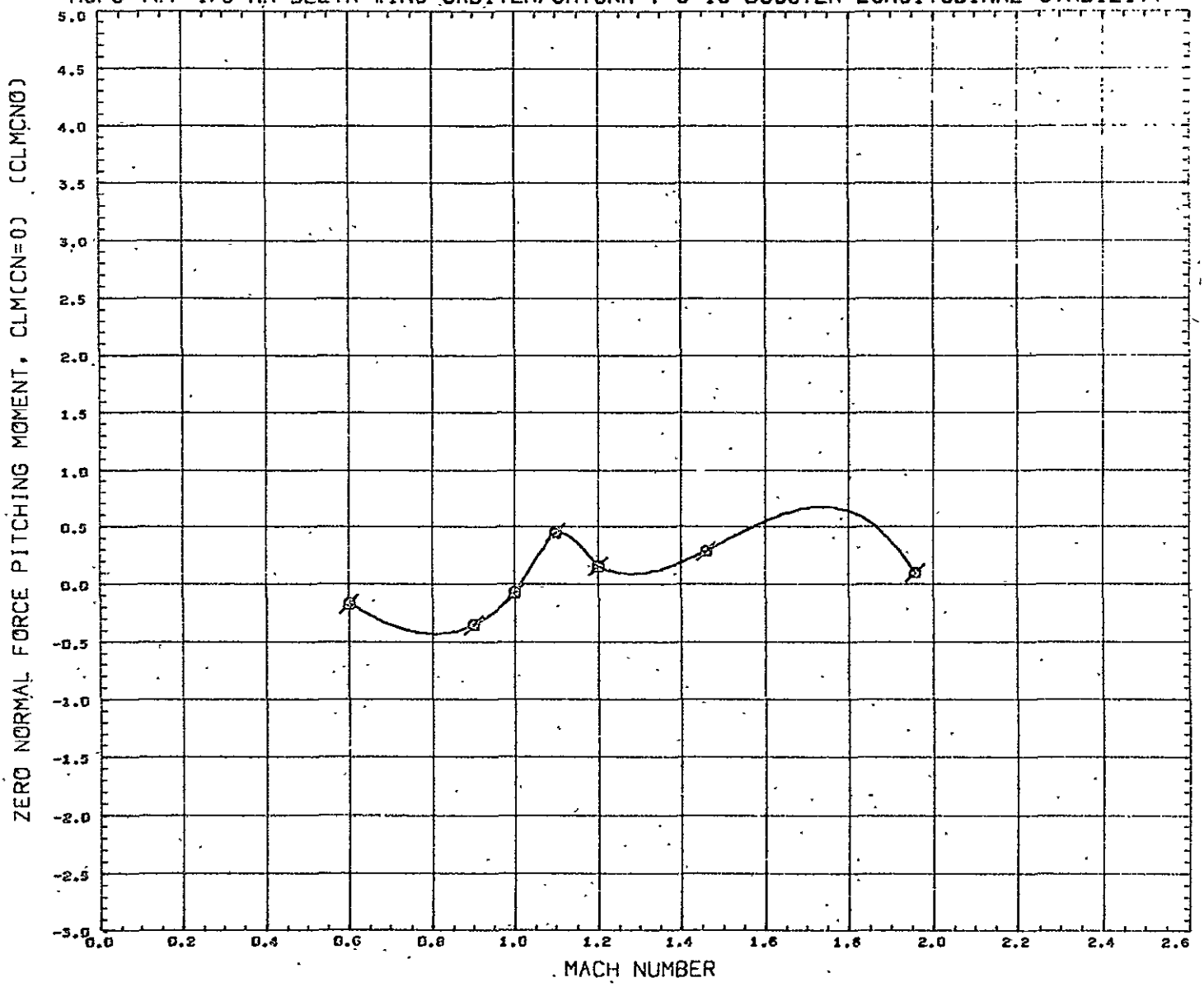
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

MSFC TWT 476 NR DELTA WING ORBITER/SATURN V S-IC BOOSTER-LONGITUDINAL STABILITY



PARAMETRIC VALUES

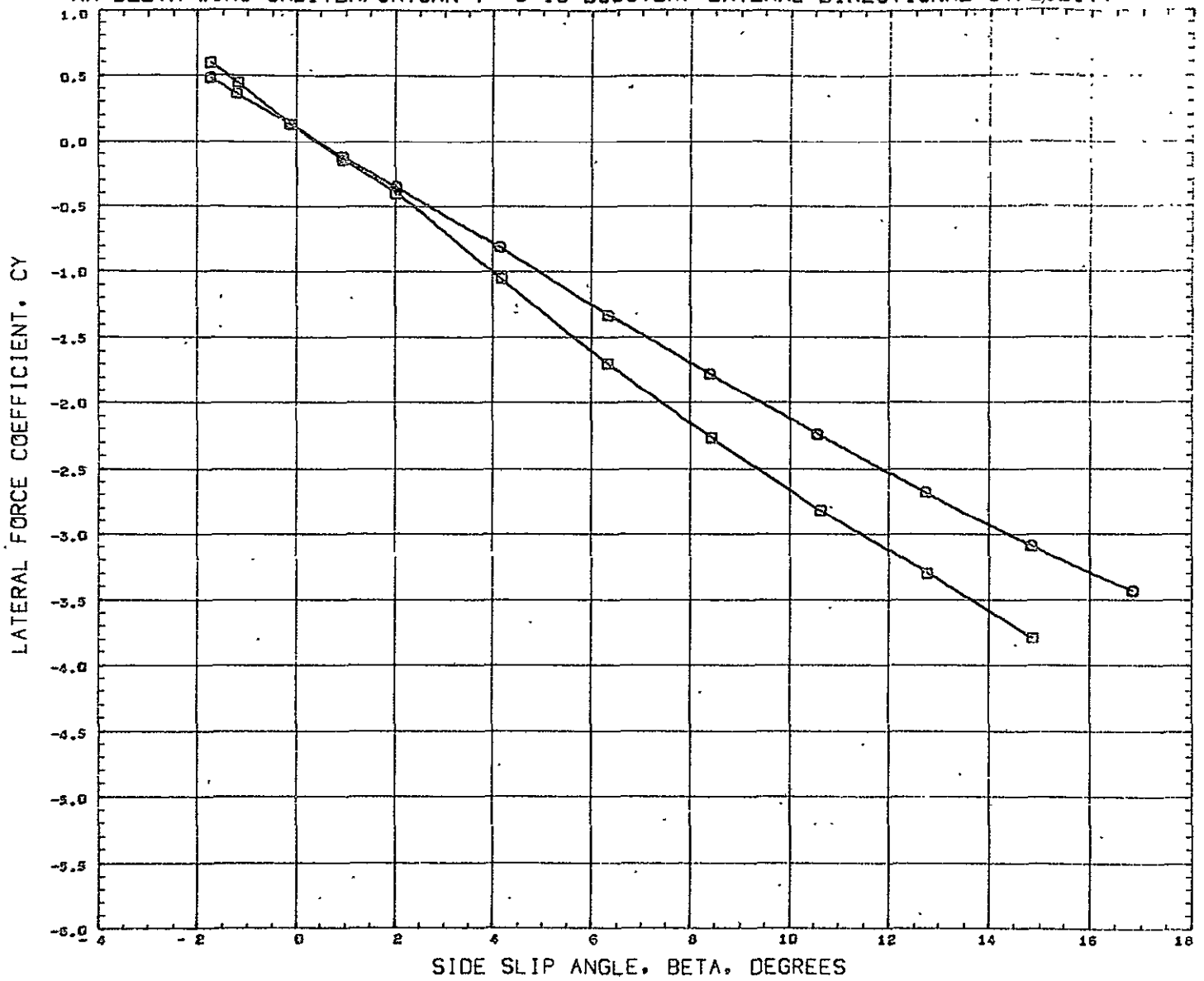
BETA	0.000	ORBINC	1.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE MMIF

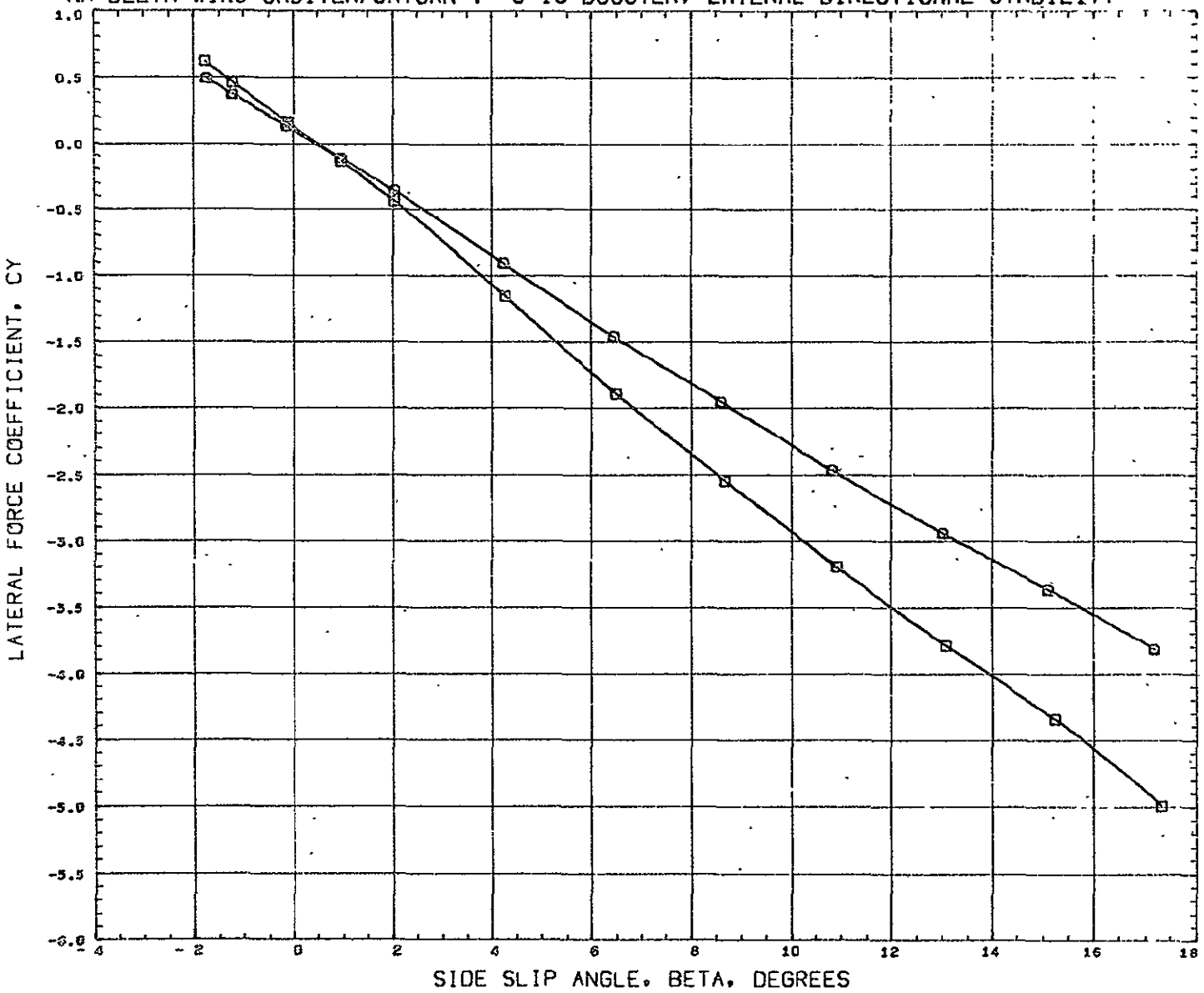
NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER, LATERAL-DIRECTIØNAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES				REFERENCE INFORMATION		
(R25053)	○	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	ALPHA	- 0.050	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R25093)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XHRP	5.2640	INCHES
								YHRP	0.0000	INCHES
								ZHRP	0.0330	INCHES
								SCALE	0.0034	

MACH 0.603

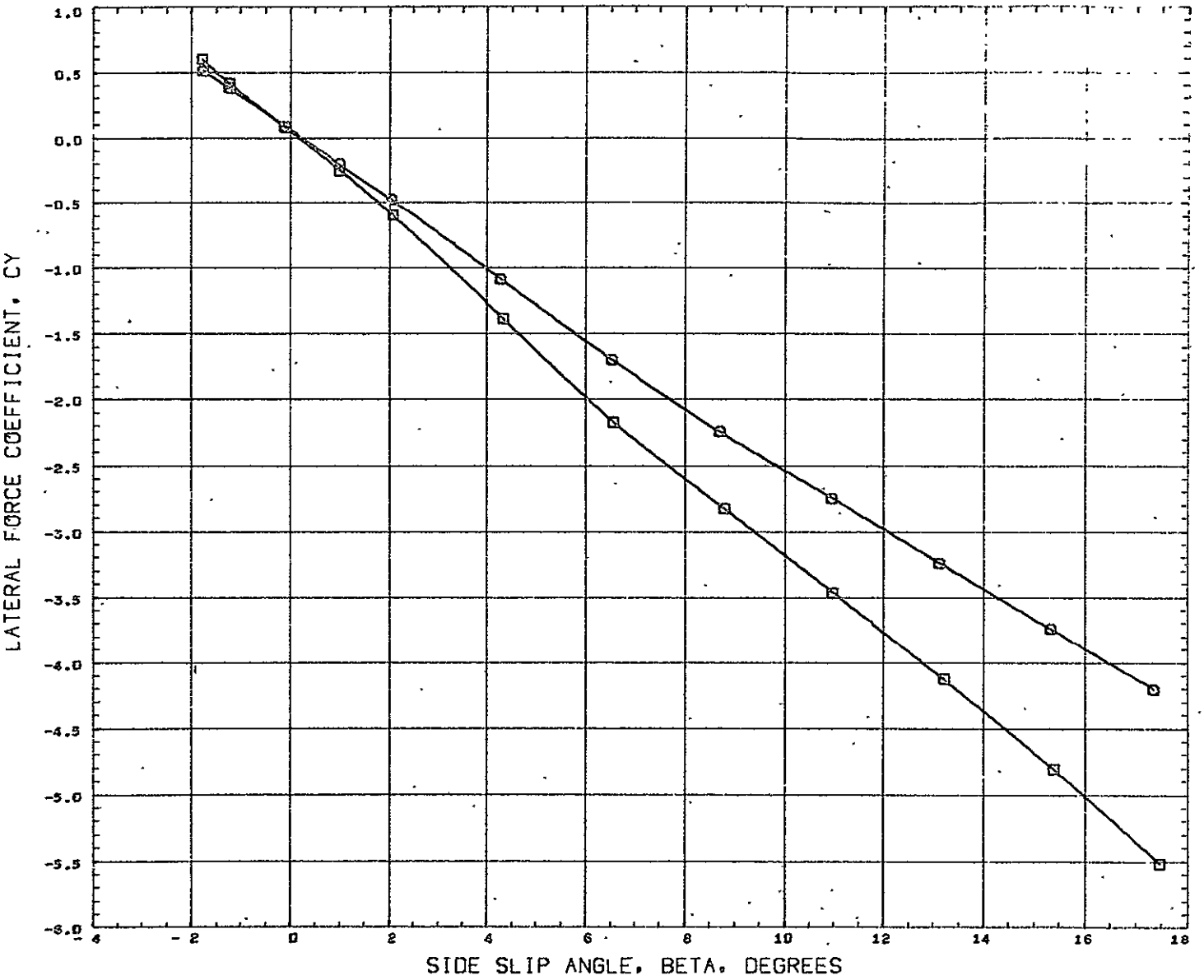
NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES		REFERENCE INFORMATION		
(R25053)	○	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	ALPHA - 0.050	ORBINC 1.000	REFS	1.3960	SQ.IN.
(R25093)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17			REFL	1.3330	INCHES
						REFB	1.3330	INCHES
						XMRF	5.2640	INCHES
						YMRF	0.0000	INCHES
						ZMRP	0.0330	INCHES
						SCALE	0.0034	

MACH 0.899

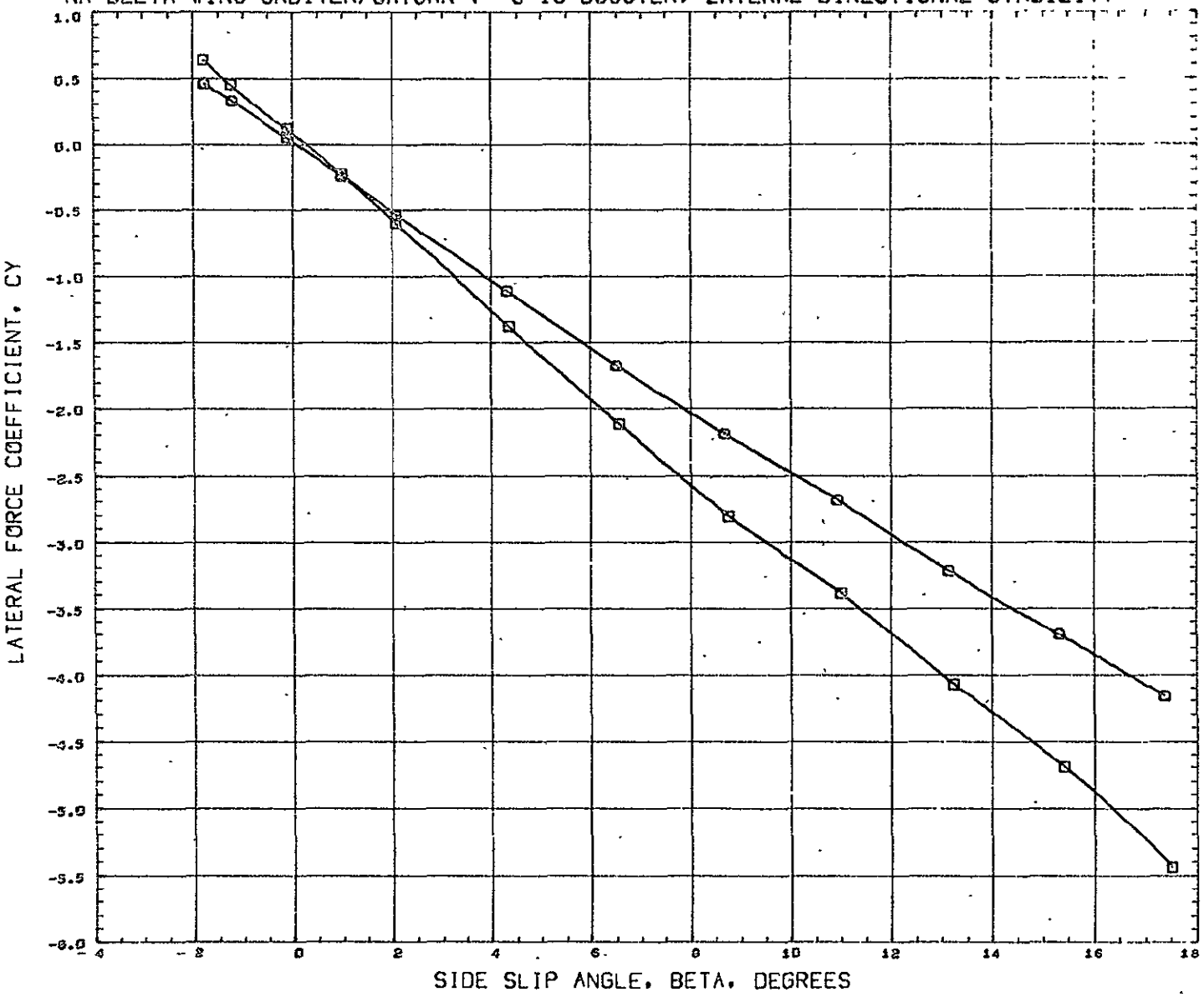
NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES				REFERENCE INFORMATION		
(R25053)	○	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	ALPHA	- 0.050	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R25093)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XMRP	5.2640	INCHES
								YMRP	0.0000	INCHES
								ZMRP	0.0330	INCHES
								SCALE	0.0034	

MACH 0.998

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES		REFERENCE INFORMATION		
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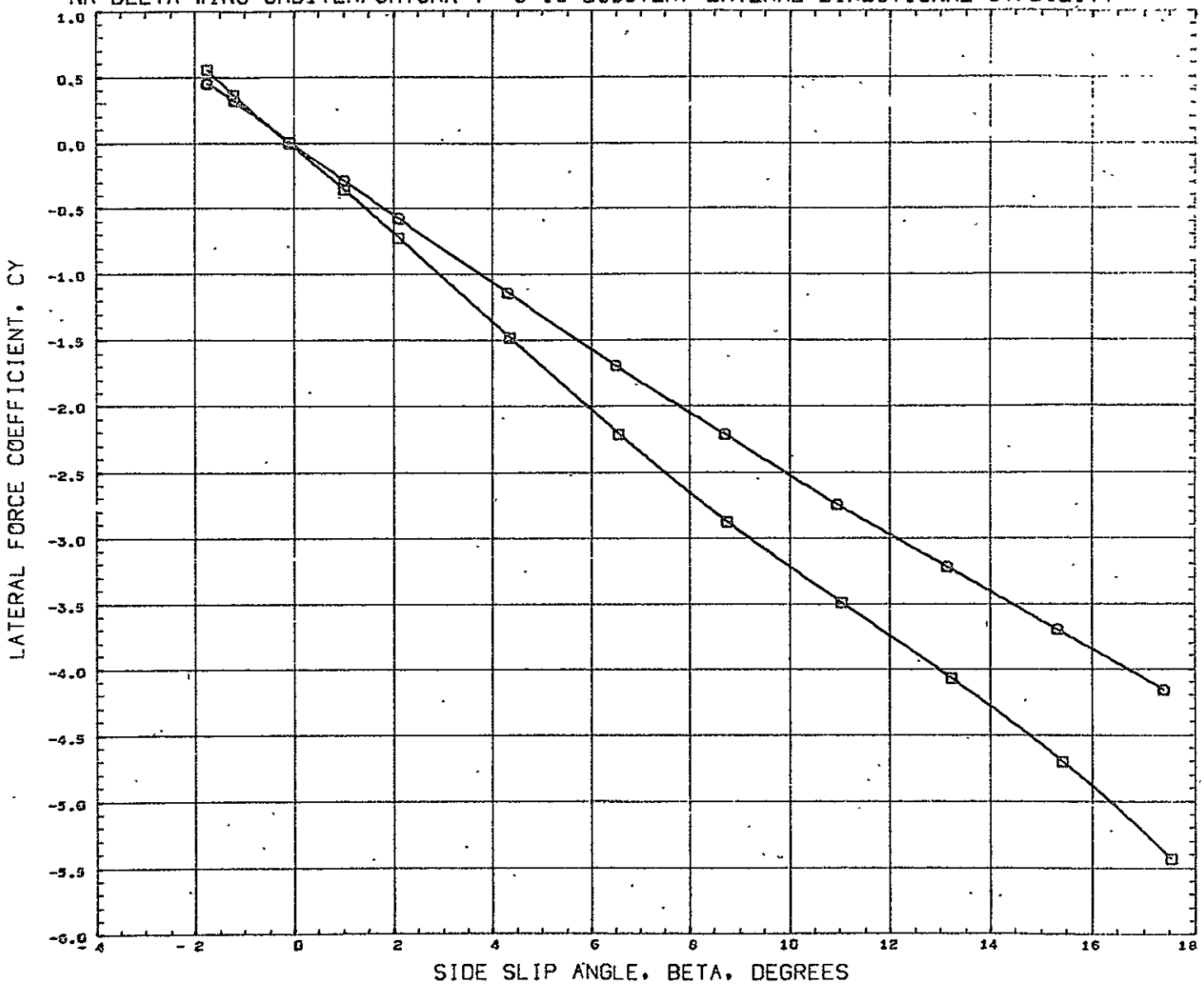
(R25093)	□	HSFC 476 NR MCRORB/S-ICBOOSTER	BF2S+B5W14E3V17			REFL	1.3330	INCHES
						REFB	1.3330	INCHES
						XMRP	5.2640	INCHES
						YMRP	0.0000	INCHES
						ZMRP	0.0330	INCHES
						SCALE	0.0034	

MACH 1.097

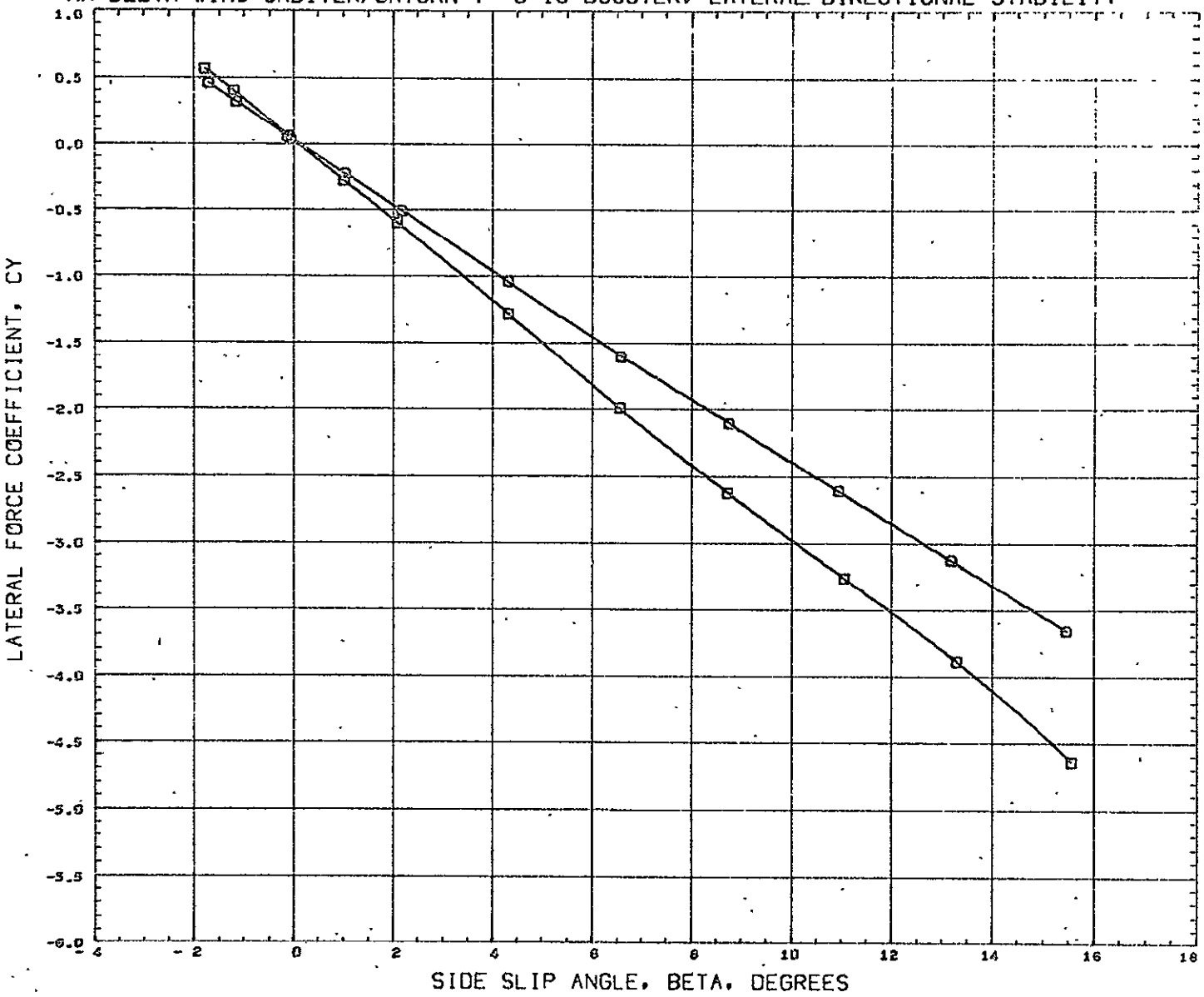
NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES				REFERENCE INFORMATION		
(R25053)	○	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	ALPHA	- 0.050	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R25093)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XMRP	5.2640	INCHES
								YMRP	0.0000	INCHES
								ZMRP	0.0330	INCHES
								SCALE	0.0034	

MACH 1.196

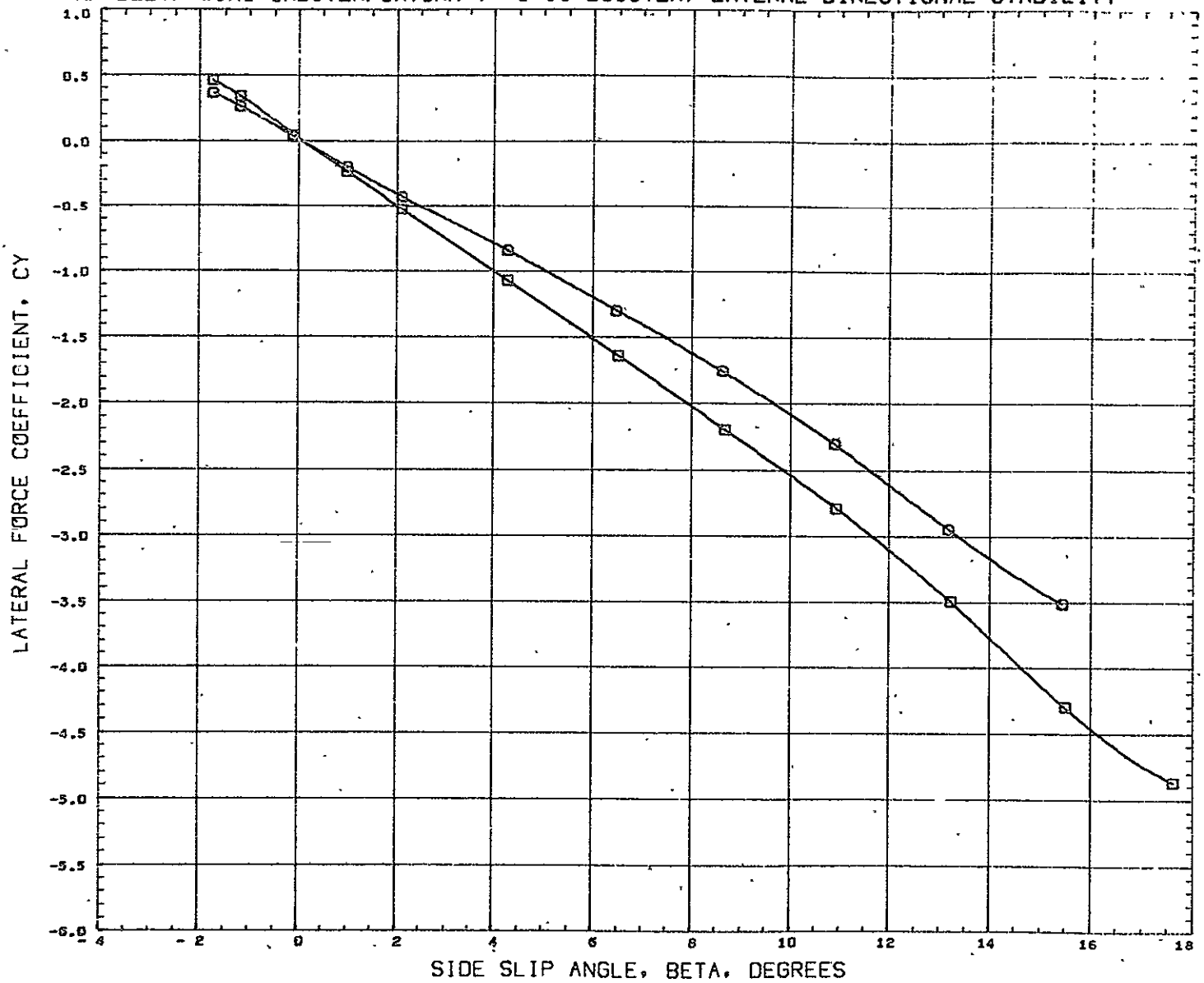
NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER. LATERAL-DIRECTIØNAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	PARAMETRIC VALUES	REFERENCE INFORMATION		
(R25053)	○	NSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17	ALPHA - 0.050 ØRBINC 1.000	REFS	1.3960	SQ.IN.
(R25093)	□	NSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17		REFL	1.3330	INCHES
				REFB	1.3330	INCHES
				XMRF	5.2640	INCHES
				YMRF	0.0000	INCHES
				ZMRF	0.0330	INCHES
				SCALE	0.0034	

MACH 1.455

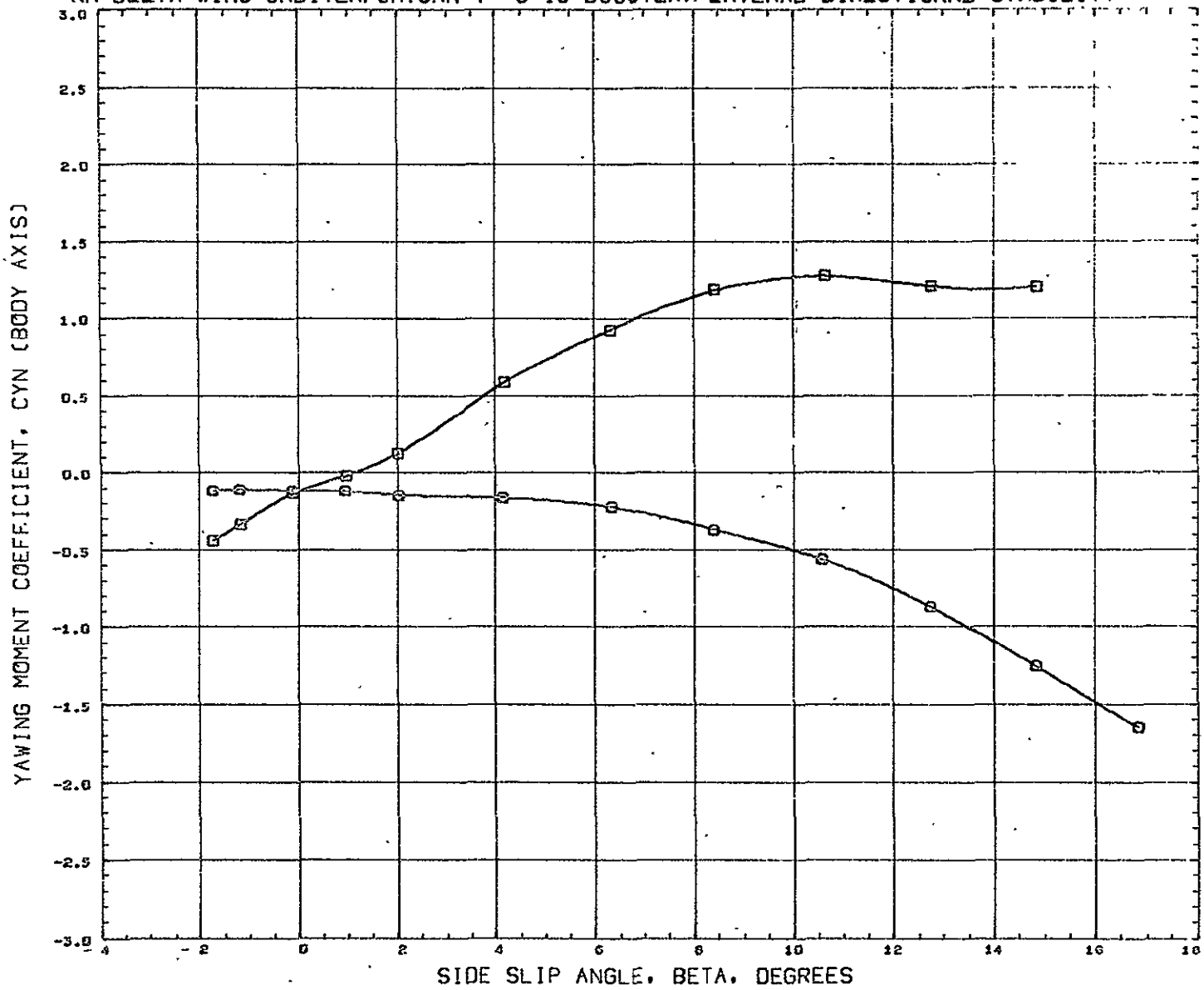
NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES				REFERENCE INFORMATION		
(R25053)	O	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	ALPHA	- 0.050	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R25093)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XMRP	5.2640	INCHES
								YMRP	0.0000	INCHES
								ZMRP	0.0330	INCHES
								SCALE	0.0034	

MACH 1.959

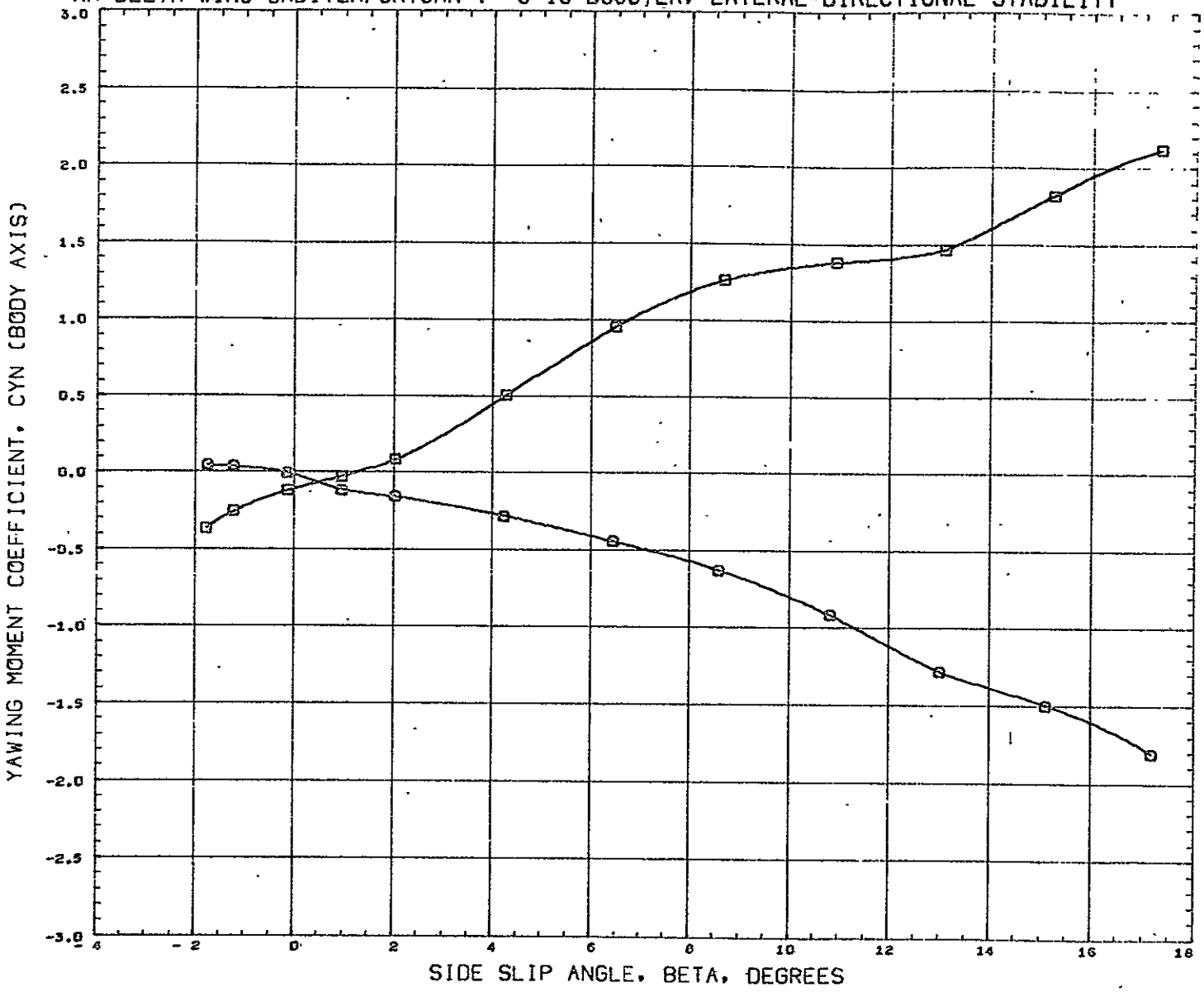
NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES				REFERENCE INFORMATION		
(R25053)	○	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	ALFHA	- 0.050	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R25093)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XMRF	5.2640	INCHES
								YMRF	0.0000	INCHES
								ZMRF	0.0330	INCHES
								SCALE	0.0054	

MACH 0.603

NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER, LATERAL-DIRECTIØNAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	
(R25053)	○	MSFC 476 NR MCRORB/S-ICBOOSTER	BF1S+B5W14E3V17
(R25093)	□	MSFC 476 NR MCRORB/S-ICBOOSTER	BF2S+B5W14E3V17

PARAMETRIC VALUES

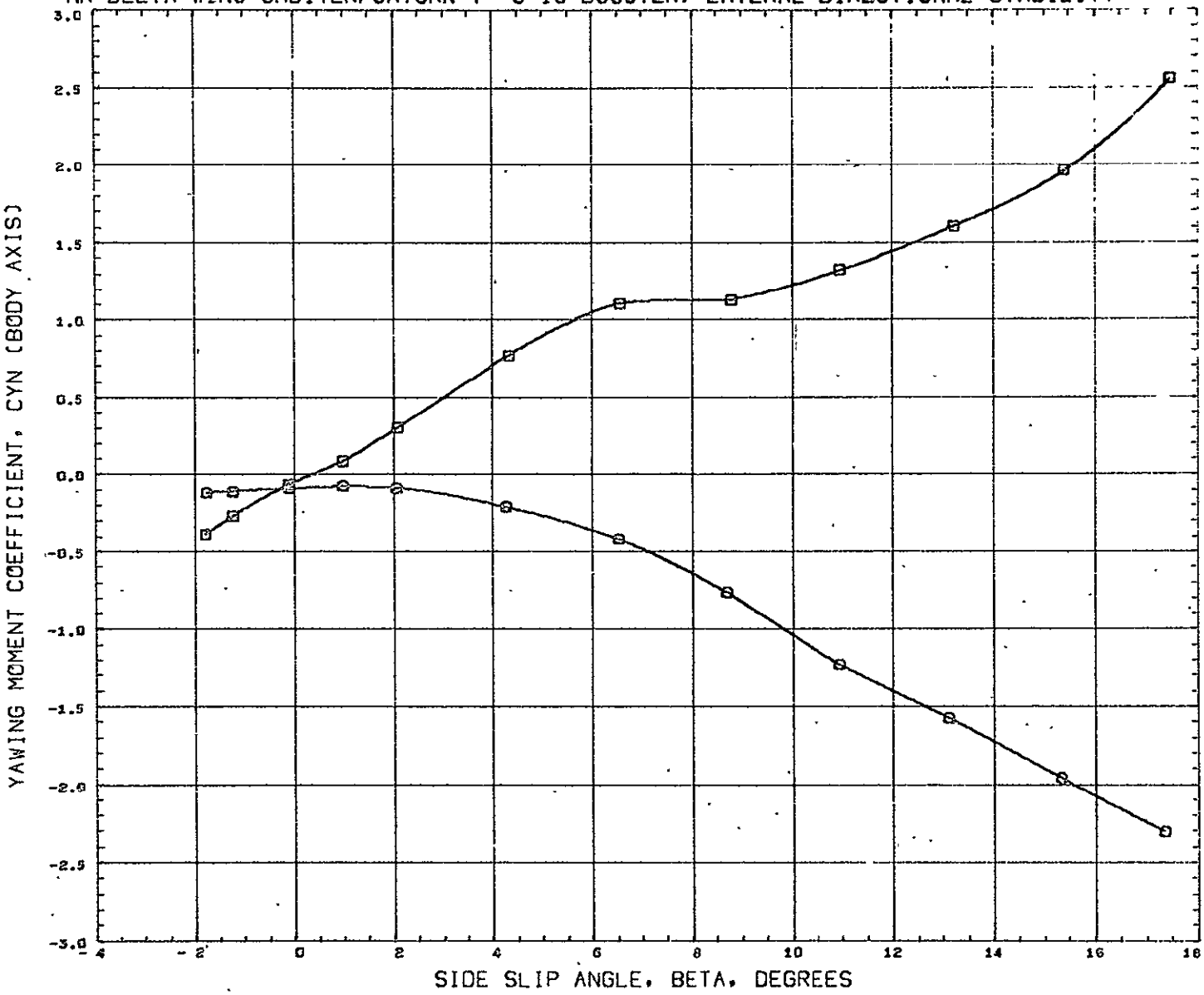
ALFHA - 0.050 ORBINC 1.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MACH 0.899

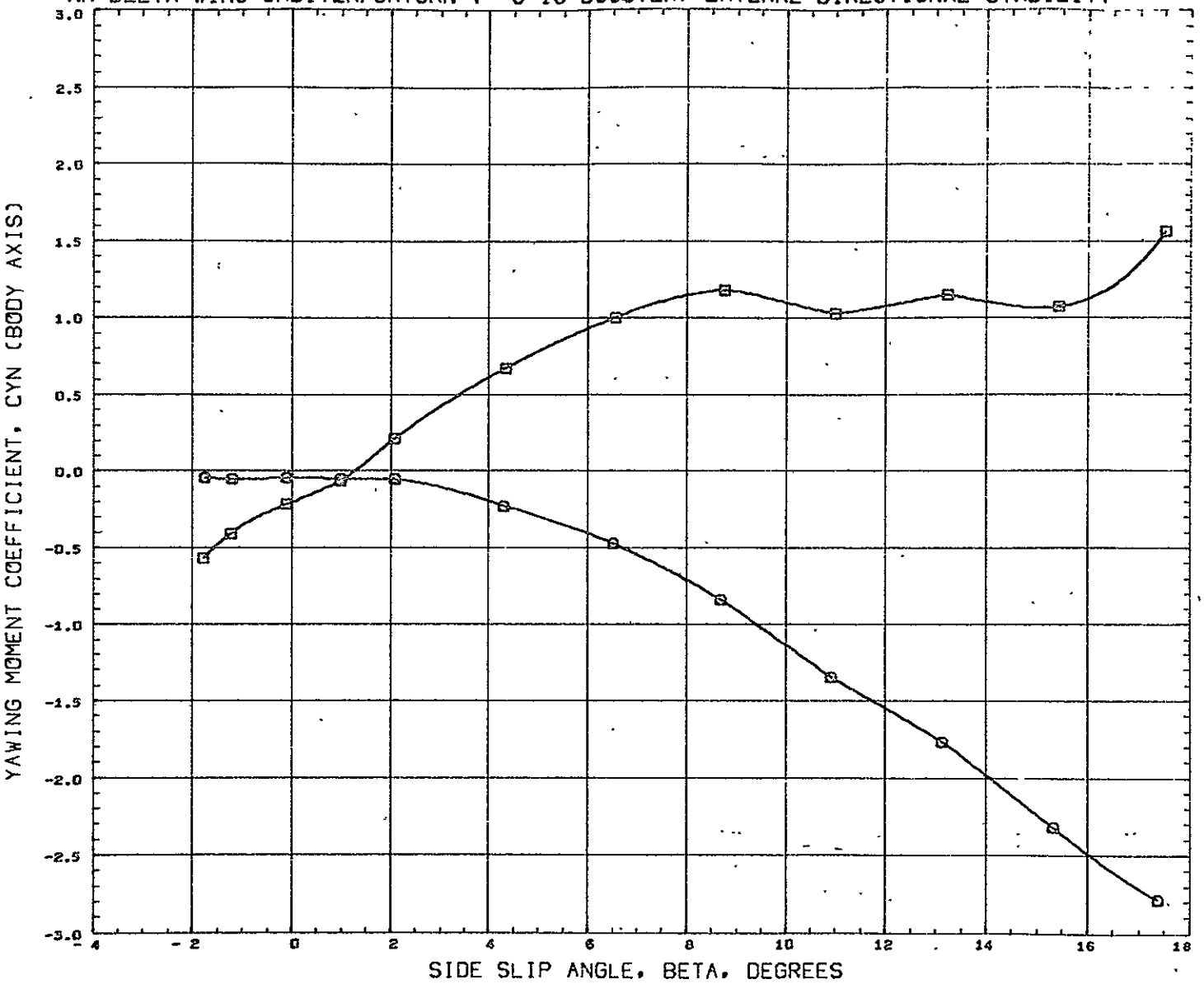
NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES				REFERENCE INFORMATION		
(R25053)	O	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	ALPHA	- 0.050	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R25093)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XMRP	5.2640	INCHES
								YMRP	0.0000	INCHES
								ZMRP	0.0330	INCHES
								SCALE	0.0034	

MACH 0.998

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		FARAMETRIC VALUES				REFERENCE INFORMATION		
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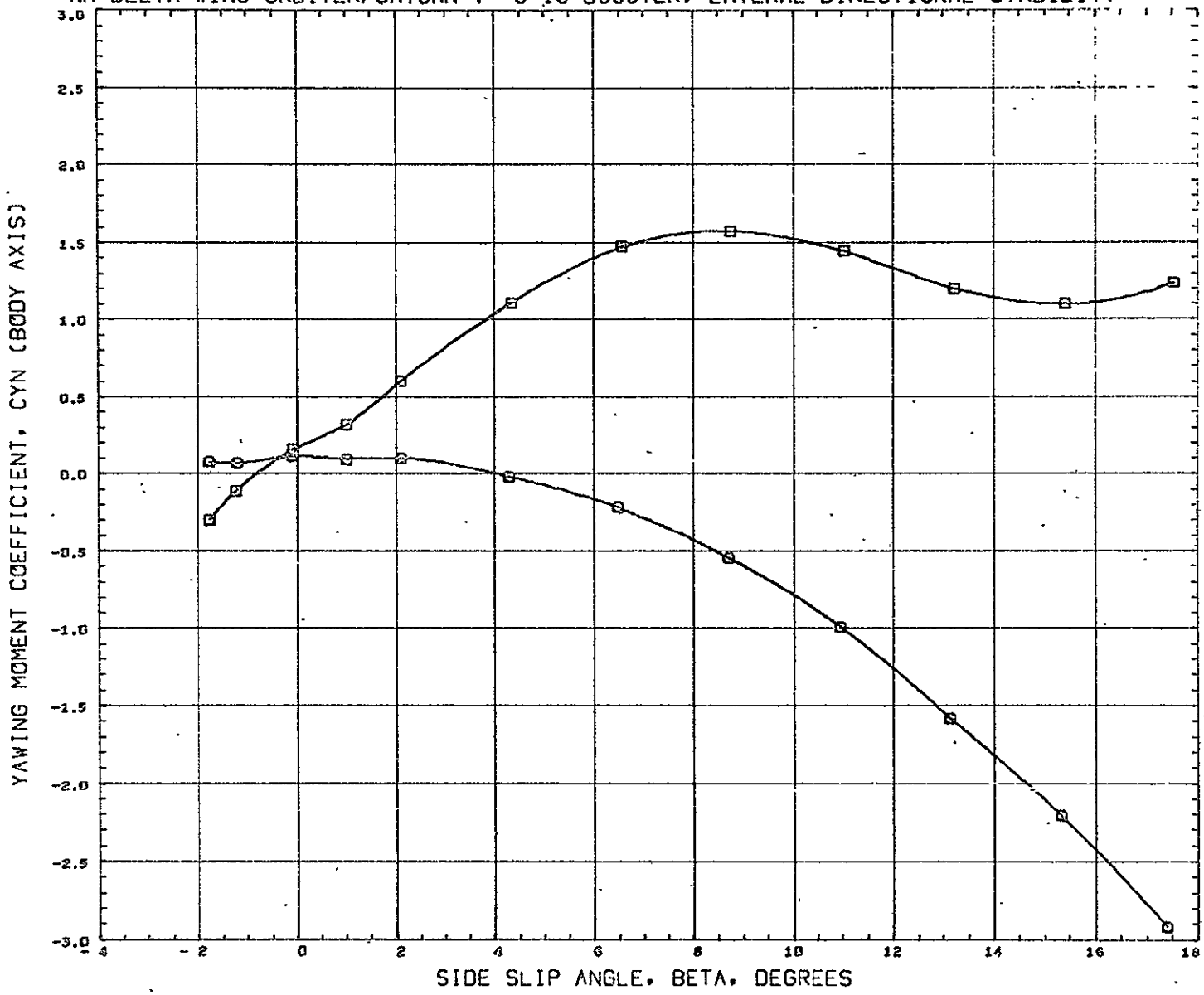
(R25093)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XMRP	5.2640	INCHES
								YMRP	0.0000	INCHES
								ZMRP	0.0330	INCHES
								SCALE	0.0034	

MACH 1.097

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	
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(R25093)	□	MSFC 476 NR MCRORB/S-ICBOOSTER	BF2S+B5W14E3V17

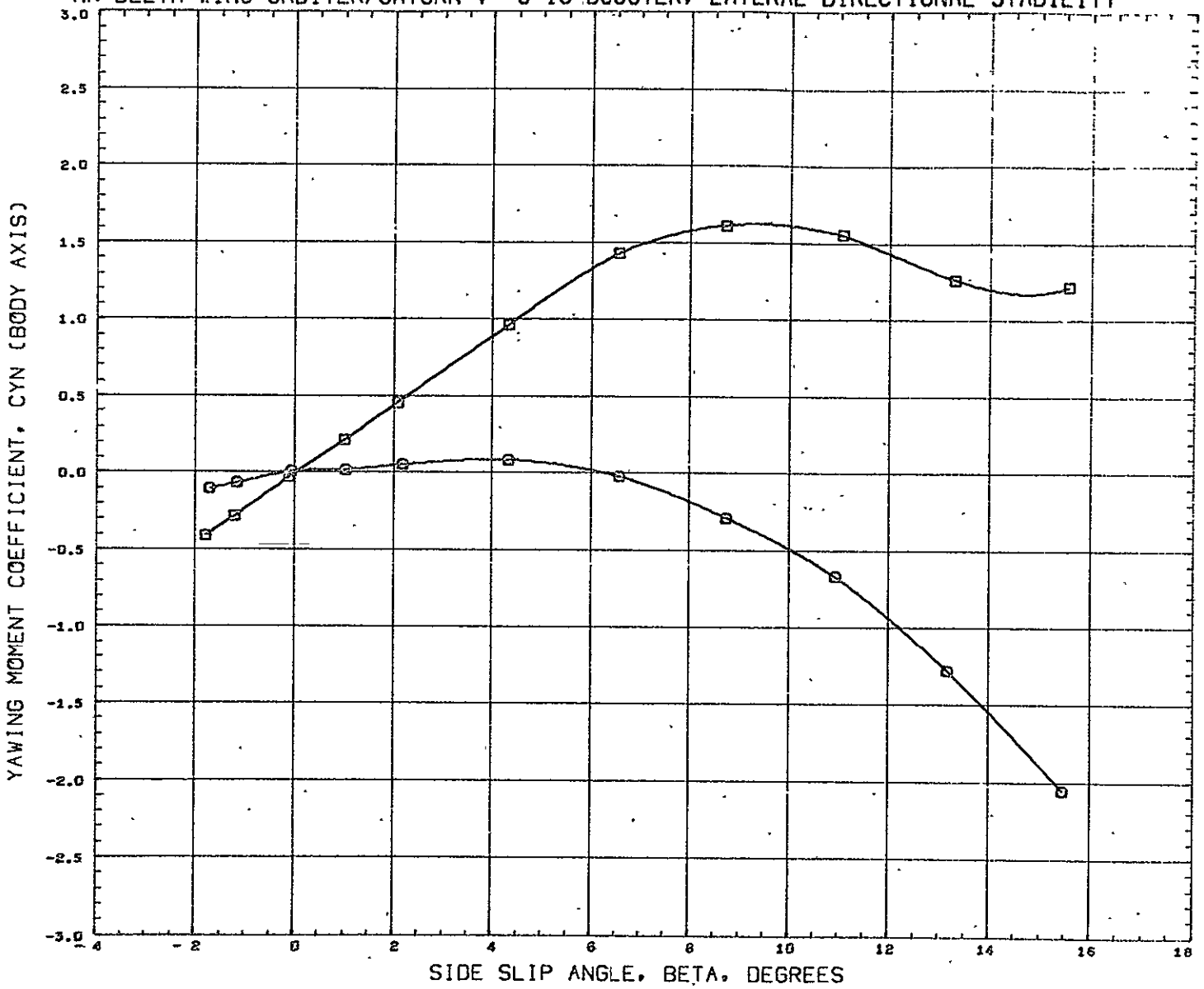
PARAMETRIC VALUES: ALPHA - 0.050 ORBINC 1.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRF	5.2640	INCHES
YMRF	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

MACH 1.196

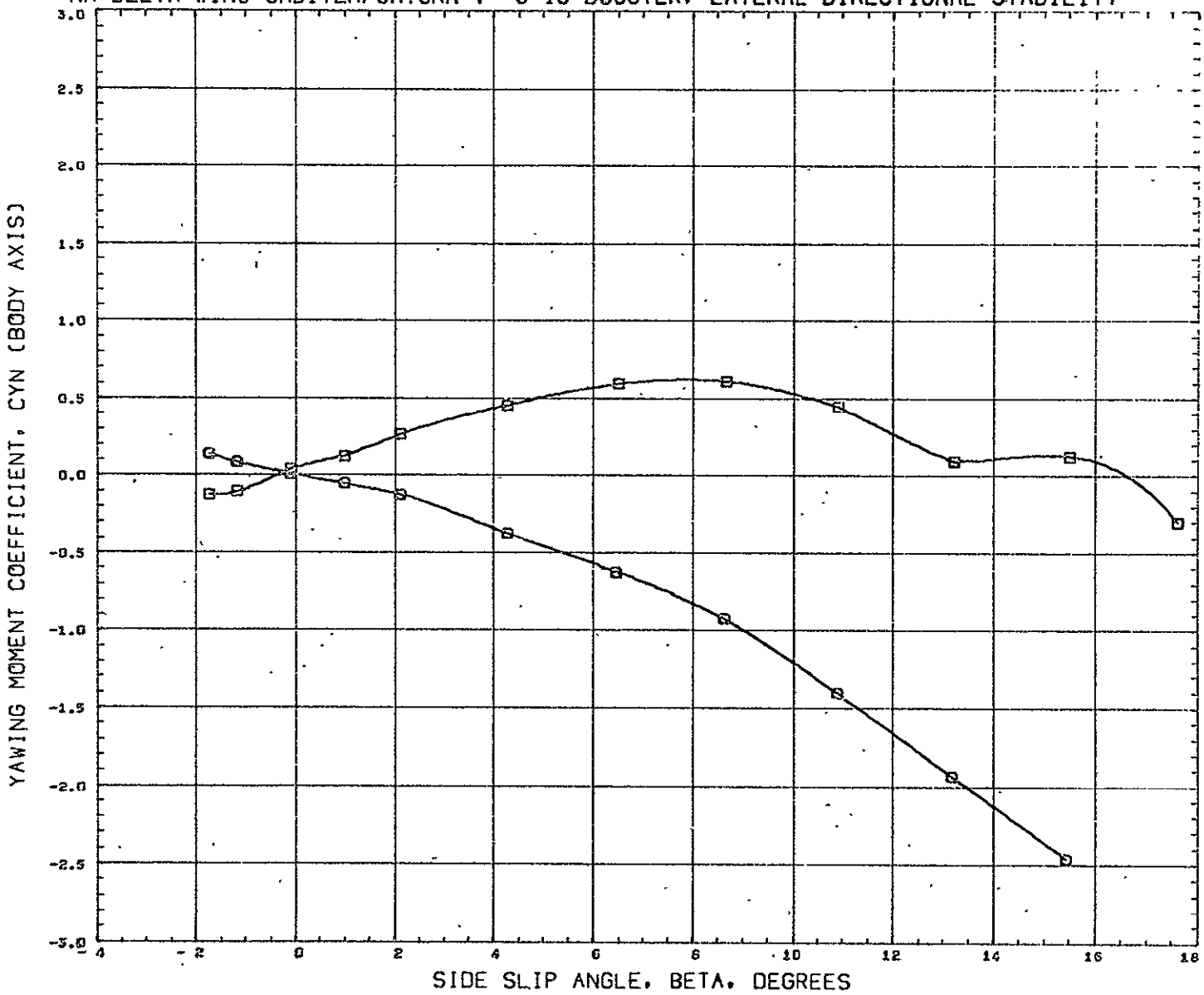
NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES				REFERENCE INFORMATION		
(R25053)	○	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	ALPHA	- 0.050	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R25093)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XMRP	5.2640	INCHES
								YMRP	0.0000	INCHES
								ZMRP	0.0330	INCHES
								SCALE	0.0034	

MACH 1.455

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	
(R25053)	○	HSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17
(R25093)	□	HSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17

PARAMETRIC VALUES

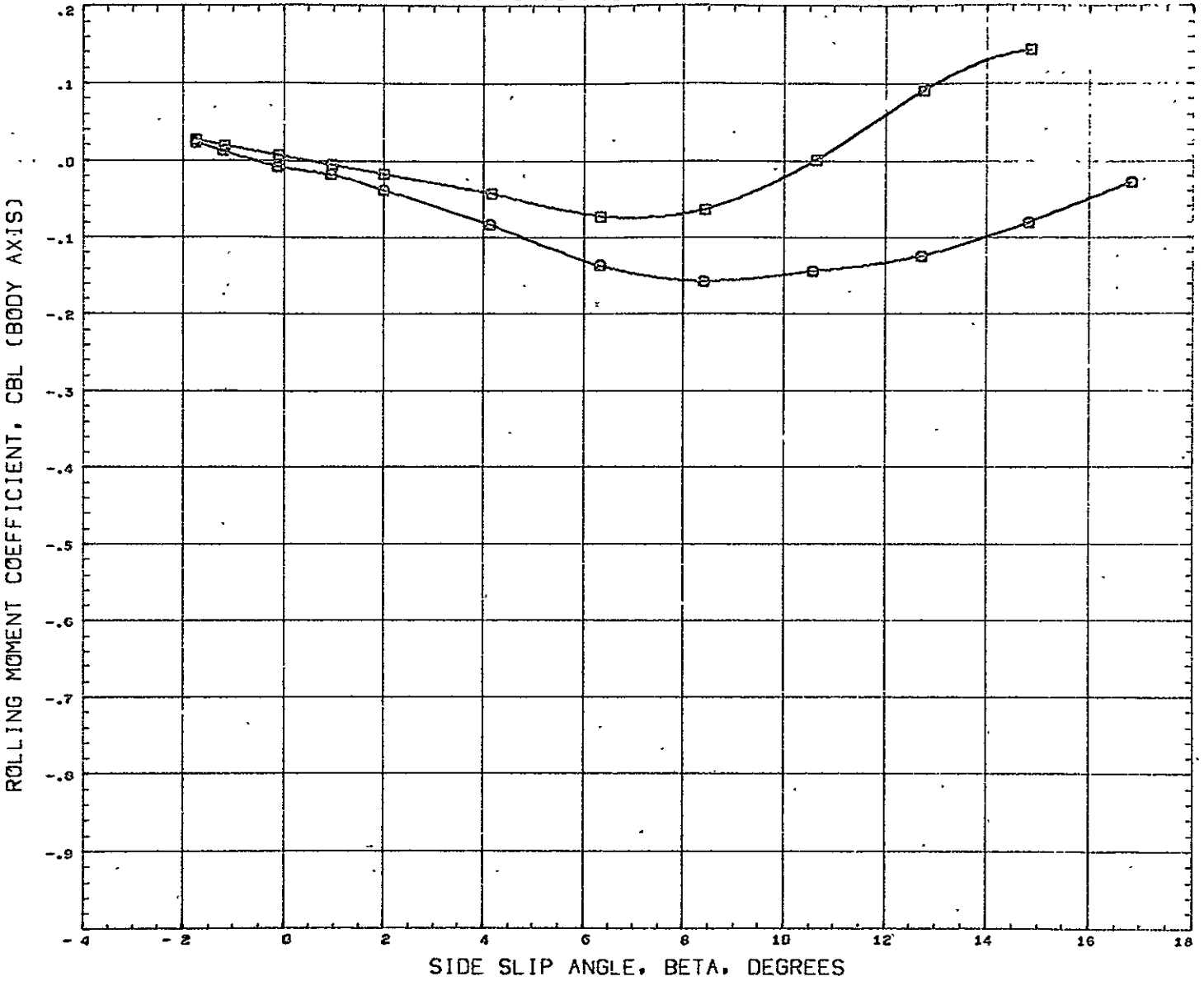
ALPHA - 0.050 ORBINC 1.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRF	5.2640	INCHES
YMRF	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

MACH 1.959

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	
(R25053)	O	MSFC 476 NR MCRORB/S-ICBOOSTER	BF1S<B5W14E3V17
(R25093)	□	MSFC 476 NR MCRORB/S-ICBOOSTER	BF2S+B5W14E3V17

PARAMETRIC VALUES

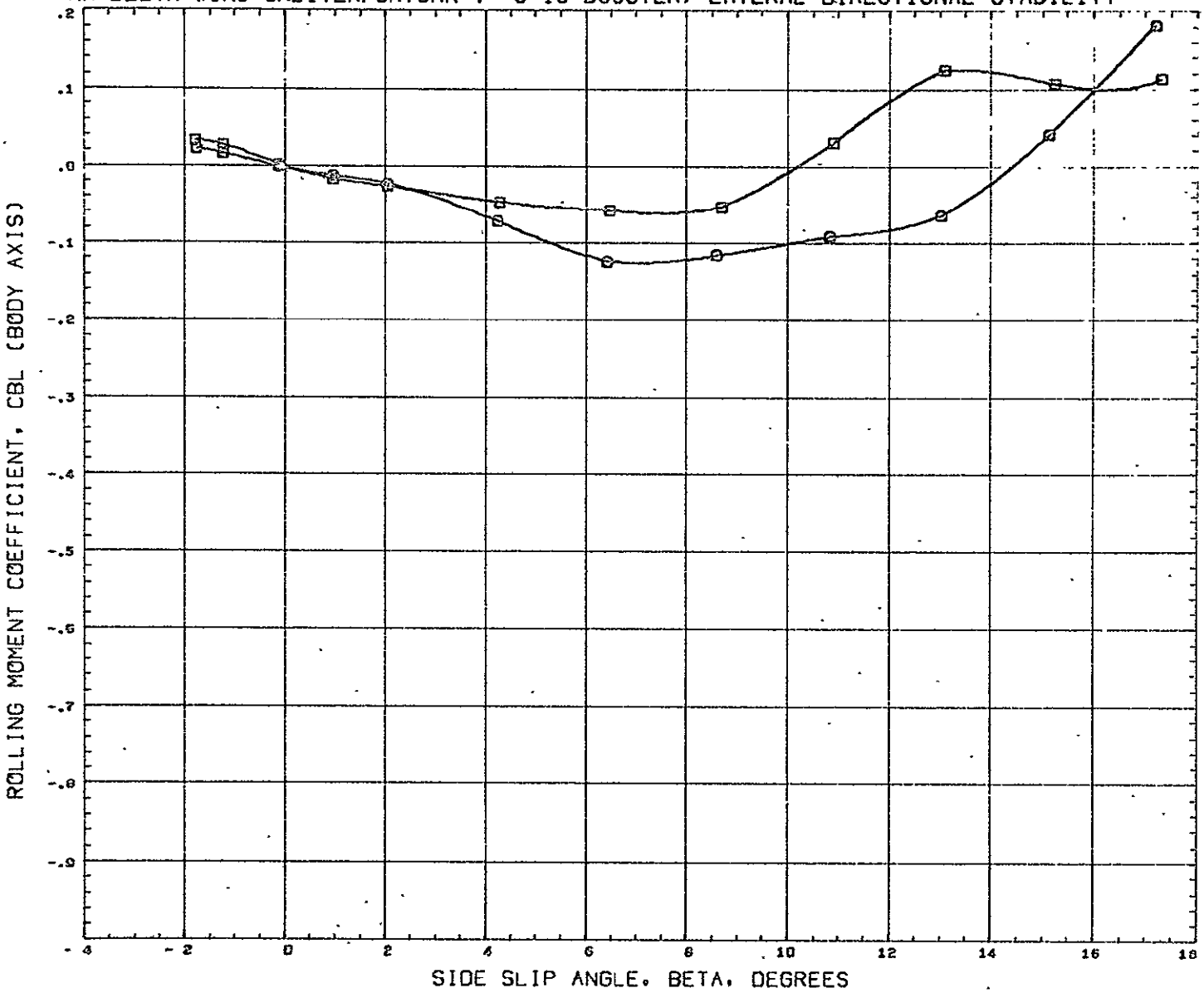
ALPHA - 0.050 ORBINC 1.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRF	5.2640	INCHES
YMRF	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

MACH 0.603

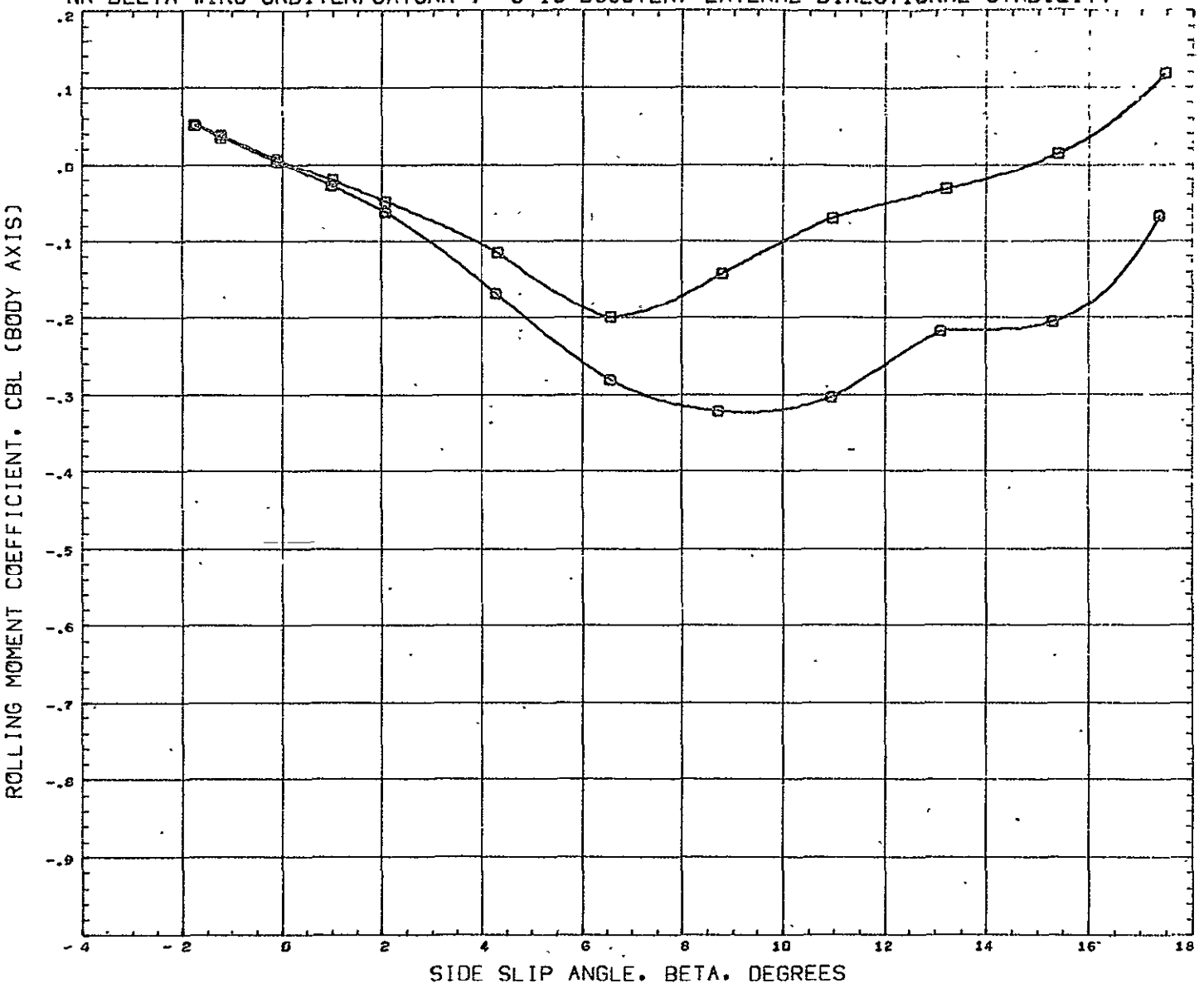
NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES		REFERENCE INFORMATION		
(R25053)	○	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	ALPHA - 0.050	ORBINC 1.000	REFS	1.3960	SQ.IN.
(R23D93)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17			REFL	1.3330	INCHES
						REFB	1.3330	INCHES
						XMRP	5.2640	INCHES
						YMRP	0.0000	INCHES
						ZMRP	0.0330	INCHES
						SCALE	0.0034	

MACH 0.899

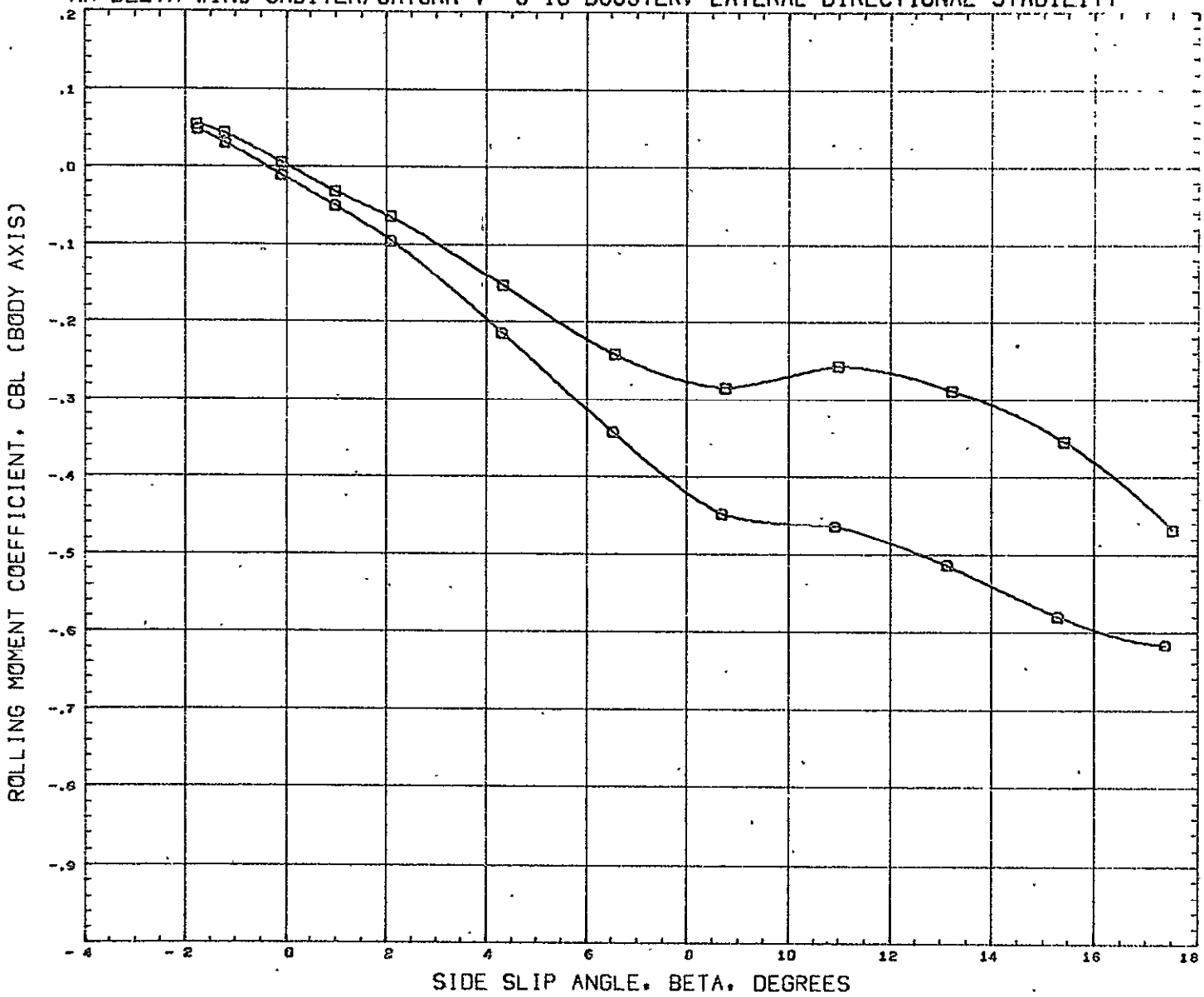
NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES				REFERENCE INFORMATION		
(R25053)	○	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	ALPHA	- 0.050	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R25093)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XMRP	5.2640	INCHES
								YMRP	0.0000	INCHES
								ZMRP	0.0330	INCHES
								SCALE	0.0034	

MACH 0.998

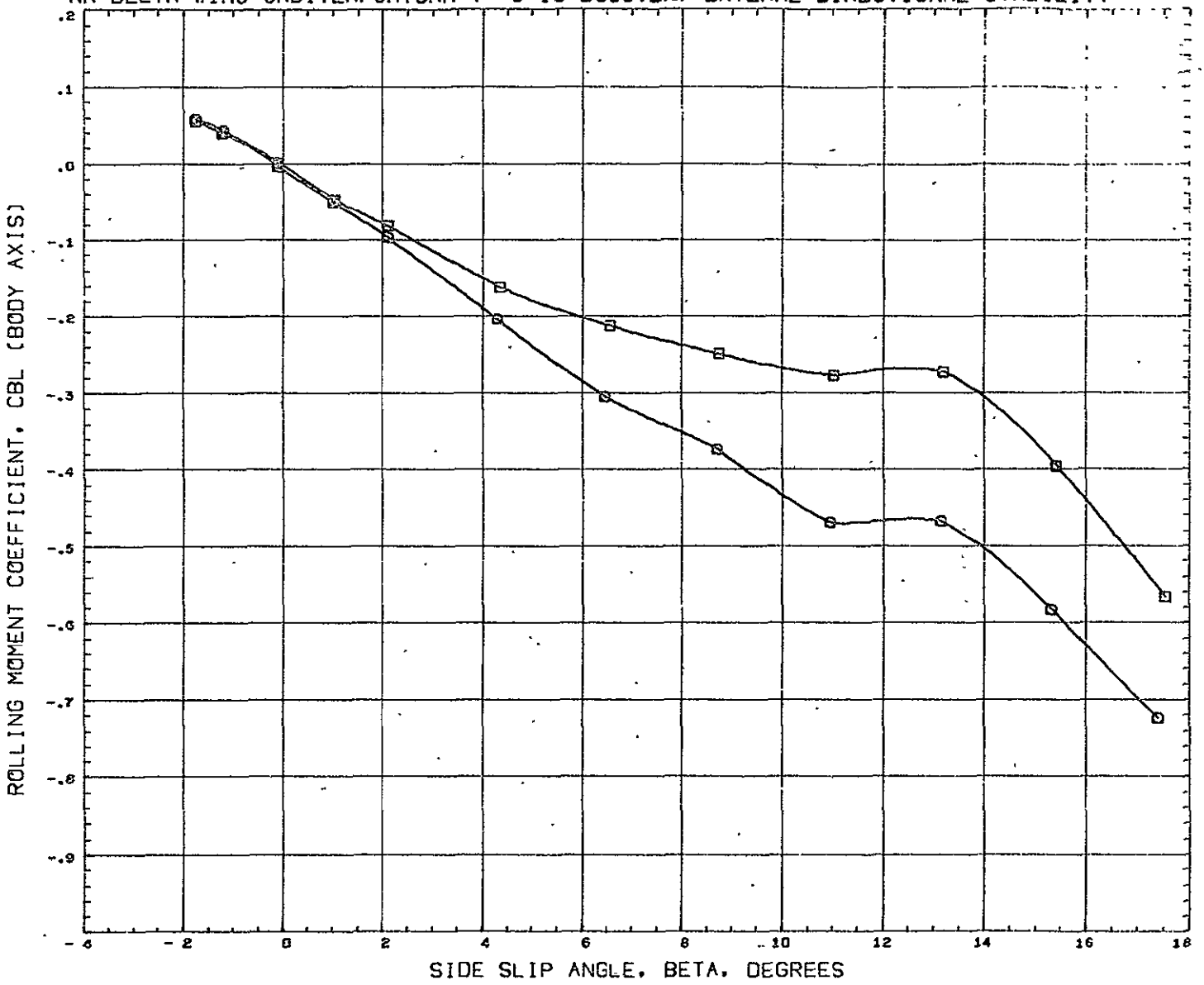
NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER, LATERAL-DIRECTIØNAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES				REFERENCE INFORMATION		
(R25053)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	ALPHA	- 0.050	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R25093)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XMRP	5.2640	INCHES
								YMRP	0.0000	INCHES
								ZMRP	0.0330	INCHES
								SCALE	0.0034	

MACH 1.097

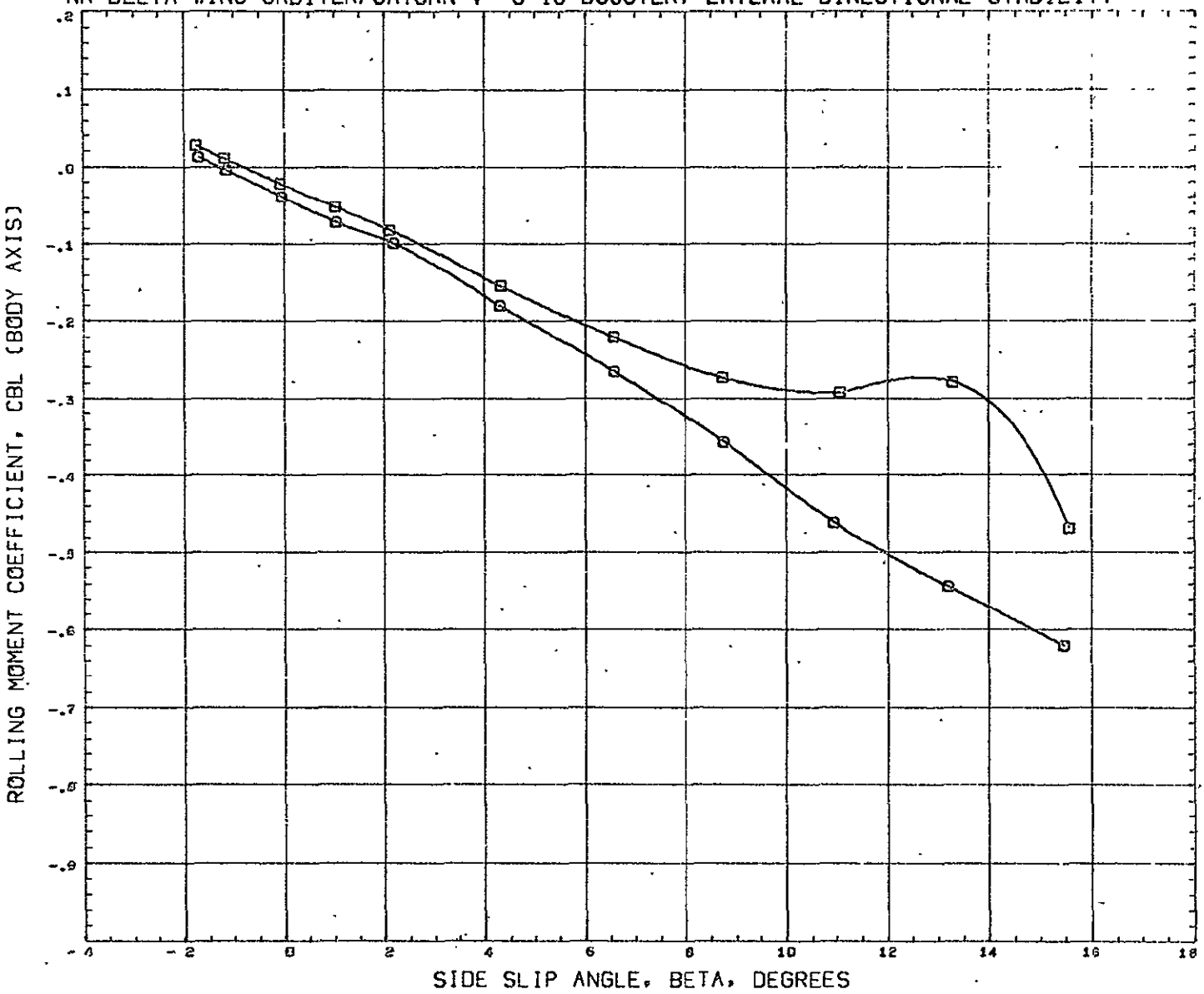
NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES				REFERENCE INFORMATION		
(R25053)	○	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	ALPHA	- 0.050	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R25093)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XMRP	5.2640	INCHES
								YMRP	0.0000	INCHES
								ZMRP	0.0330	INCHES
								SCALE	0.0034	

MACH 1.196

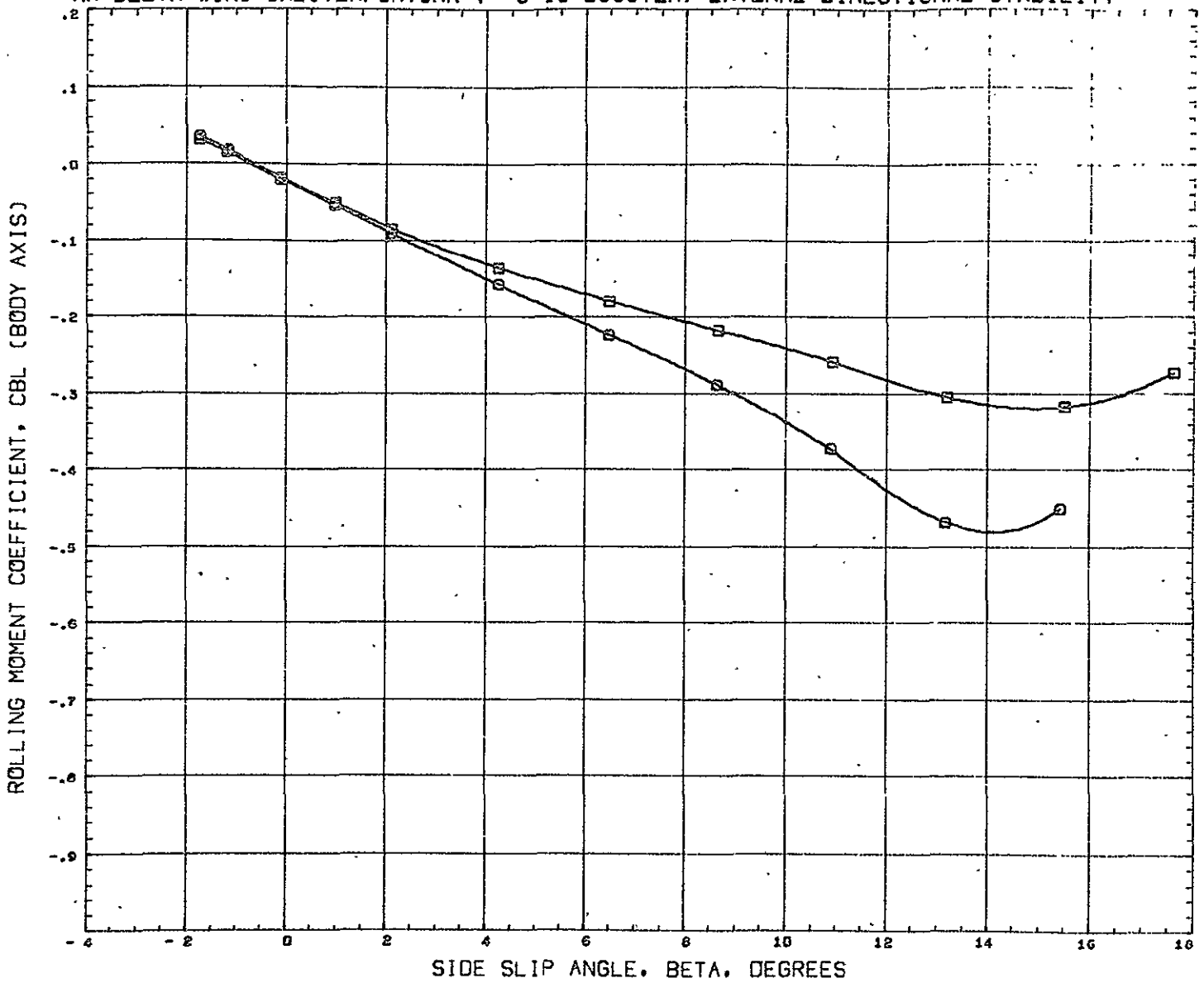
NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES			REFERENCE INFORMATION		
(R25053)	○	MSFC 475 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	ALPHA	- 0.050	ORBINC 1.000	REFS	1.3960	SQ.IN.
(R25093)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17				REFL	1.3330	INCHES
							REFB	1.3330	INCHES
							XMRP	5.2640	INCHES
							YMRP	0.0000	INCHES
							ZMRP	0.0330	INCHES
							SCALE	0.0034	

MACH 1.455

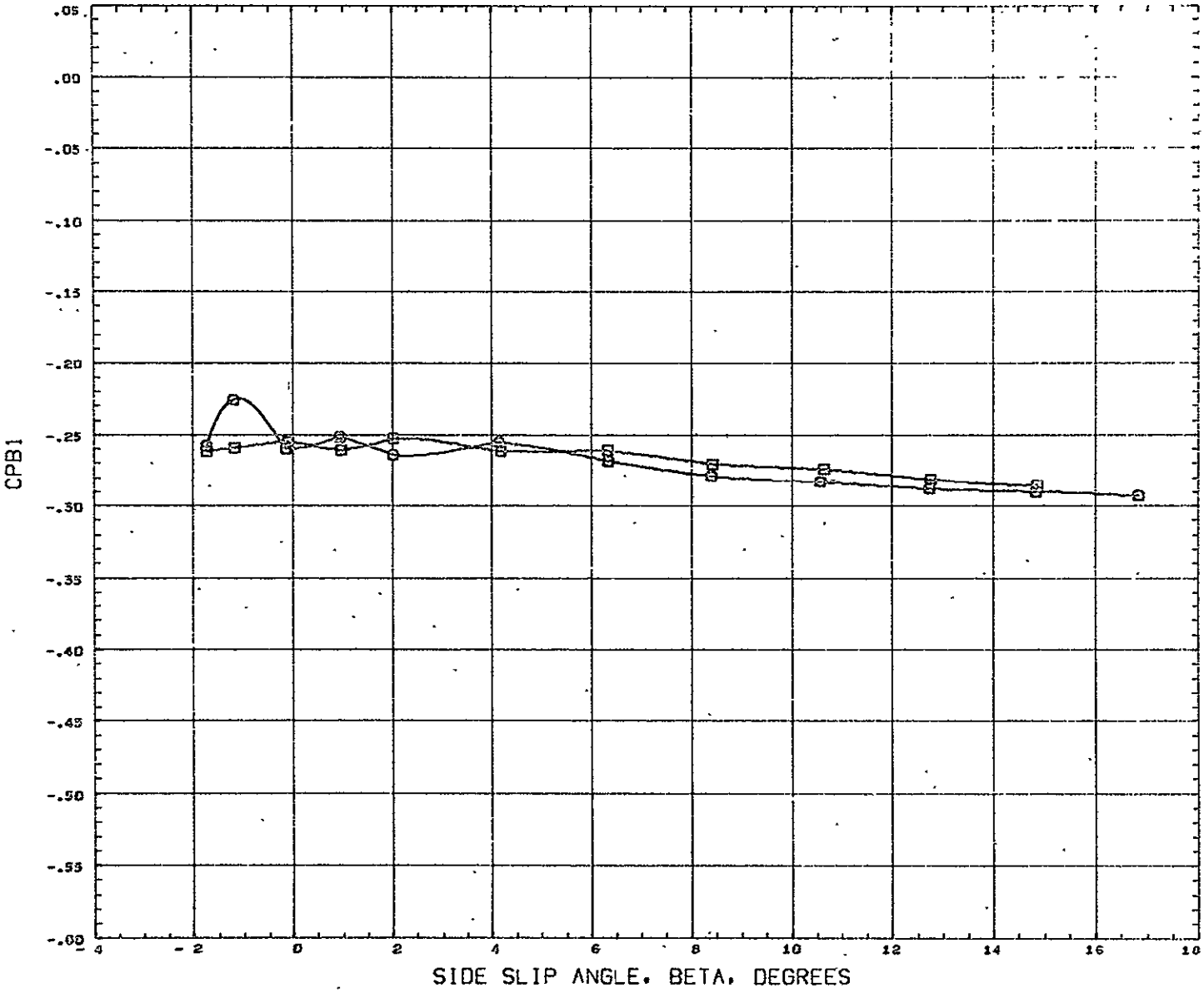
NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER, LATERAL-DIRECTIØNAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES				REFERENCE INFORMATION		
(R25053)	○	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	ALPHA	- 0.050	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R25093)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XMRP	5.2640	INCHES
								YMRP	0.0000	INCHES
								ZMRP	0.0330	INCHES
								SCALE	0.0034	

MACH 1.959

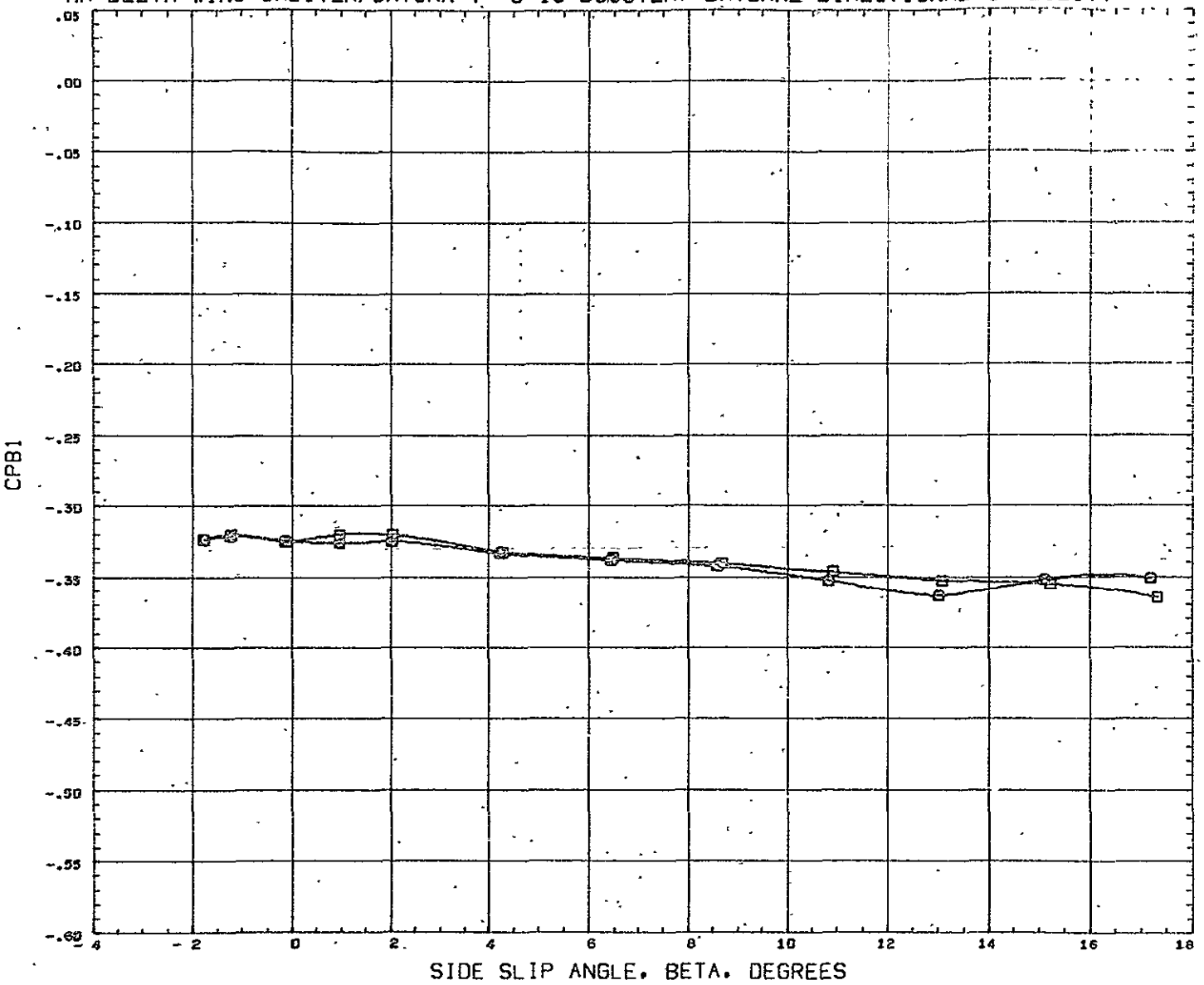
NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES		REFERENCE INFORMATION		
(R25053)	○	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	ALPHA - 0.050	ORBINC 1.000	REFS	1.3960	SQ.IN.
(R25093)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17			REFL	1.3330	INCHES
						REFB	1.3330	INCHES
						XMRP	5.2640	INCHES
						YMRP	0.0000	INCHES
						ZMRP	0.0330	INCHES
						SCALE	0.0034	

MACH 0.603

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	
(R25053)	○	MSFC 476 NR MCRORB/S-ICBOOSTER	BF1S+B5W14E3V17
(R25093)	□	MSFC 476 NR MCRORB/S-ICBOOSTER	BF2S+B5W14E3V17

PARAMETRIC VALUES

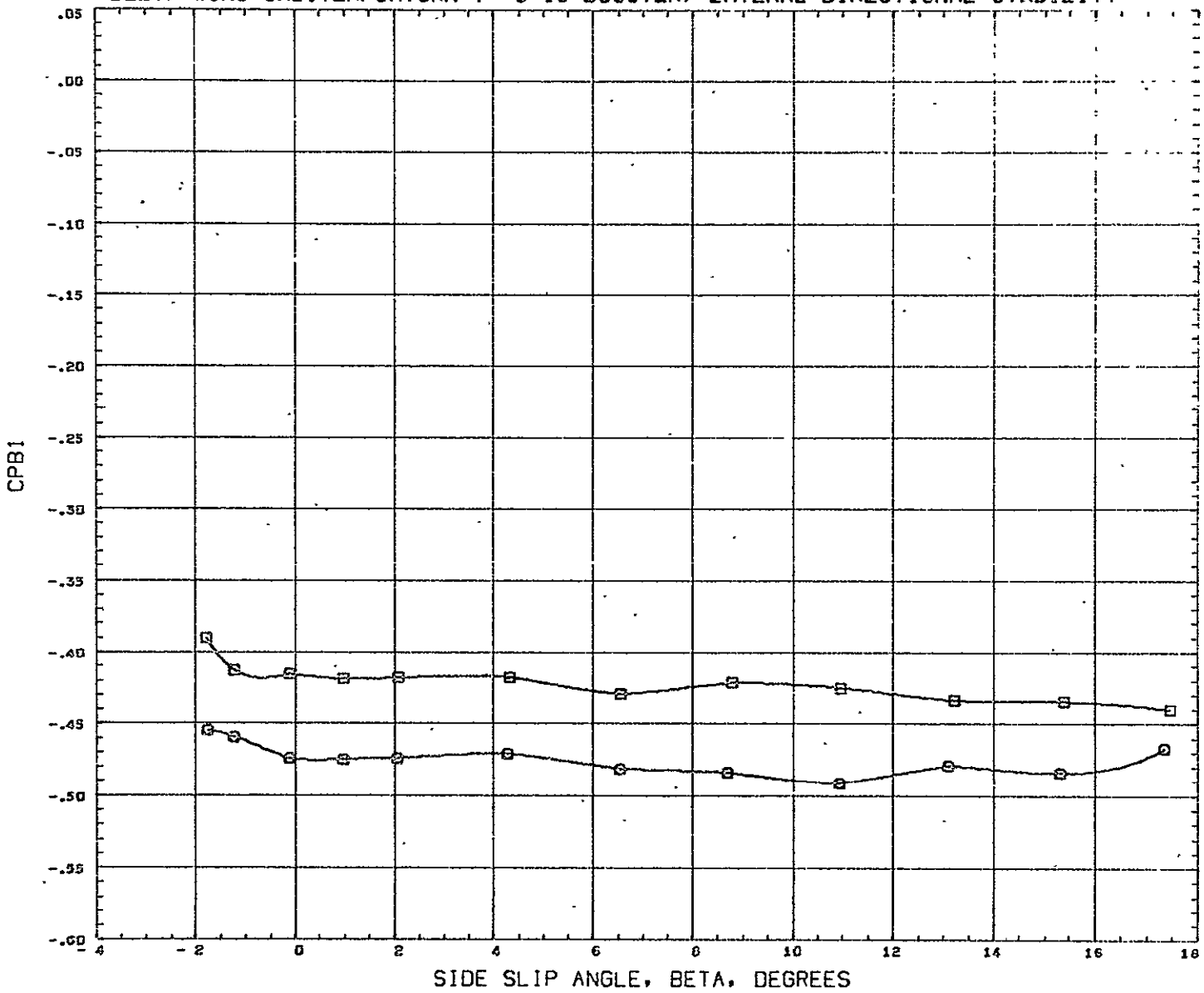
ALPHA - 0.050 ORBINC 1.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRF	5.2640	INCHES
YMRF	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

MACH 0.099

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY

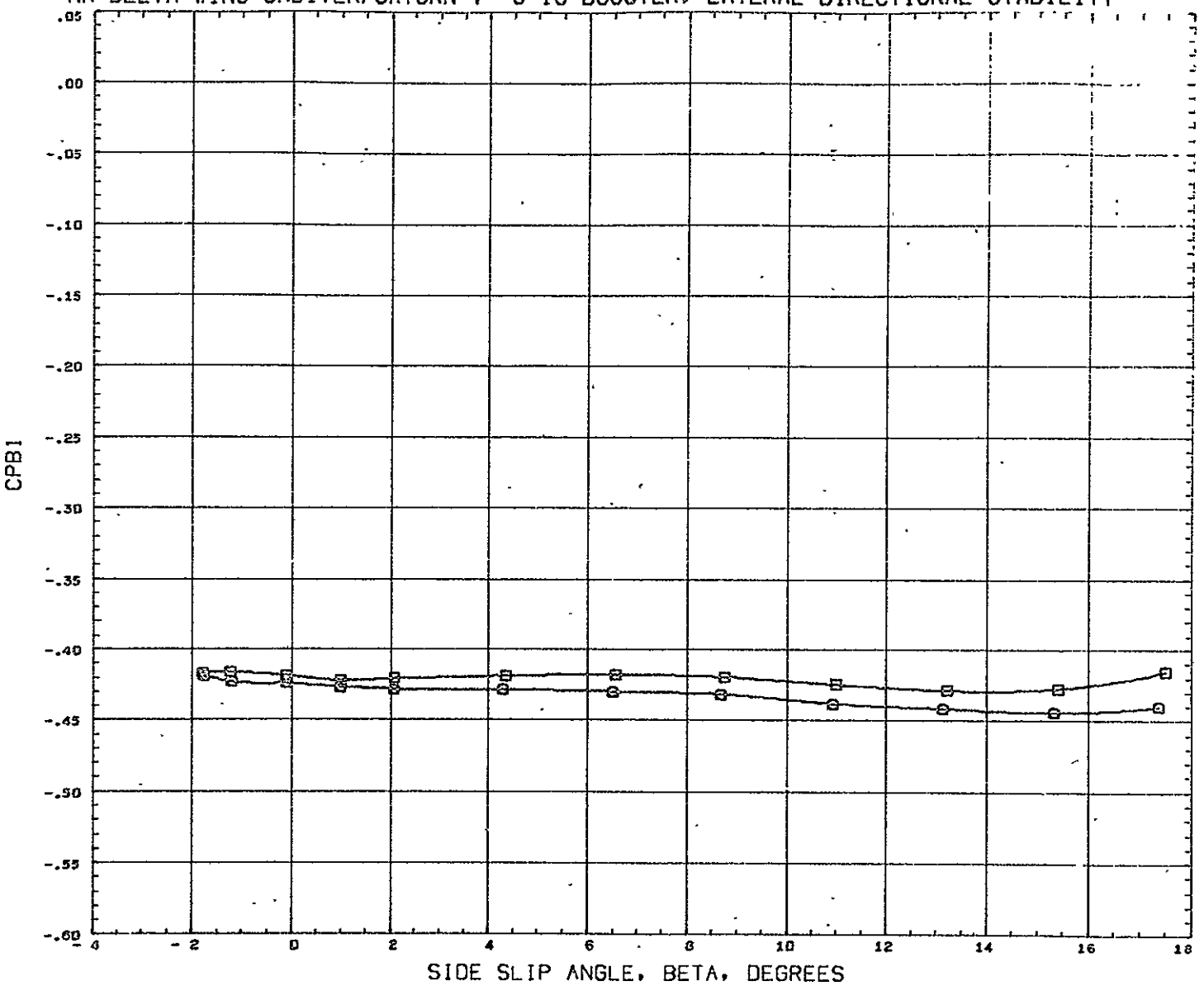


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES			
(R25053)	○	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	ALPHA - 0.050	ORBINC	1.000	
(R25093)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17				

REFERENCE INFORMATION		
REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MACH 0.998

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	
(R25053)	○	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17
(R25093)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17

PARAMETRIC VALUES

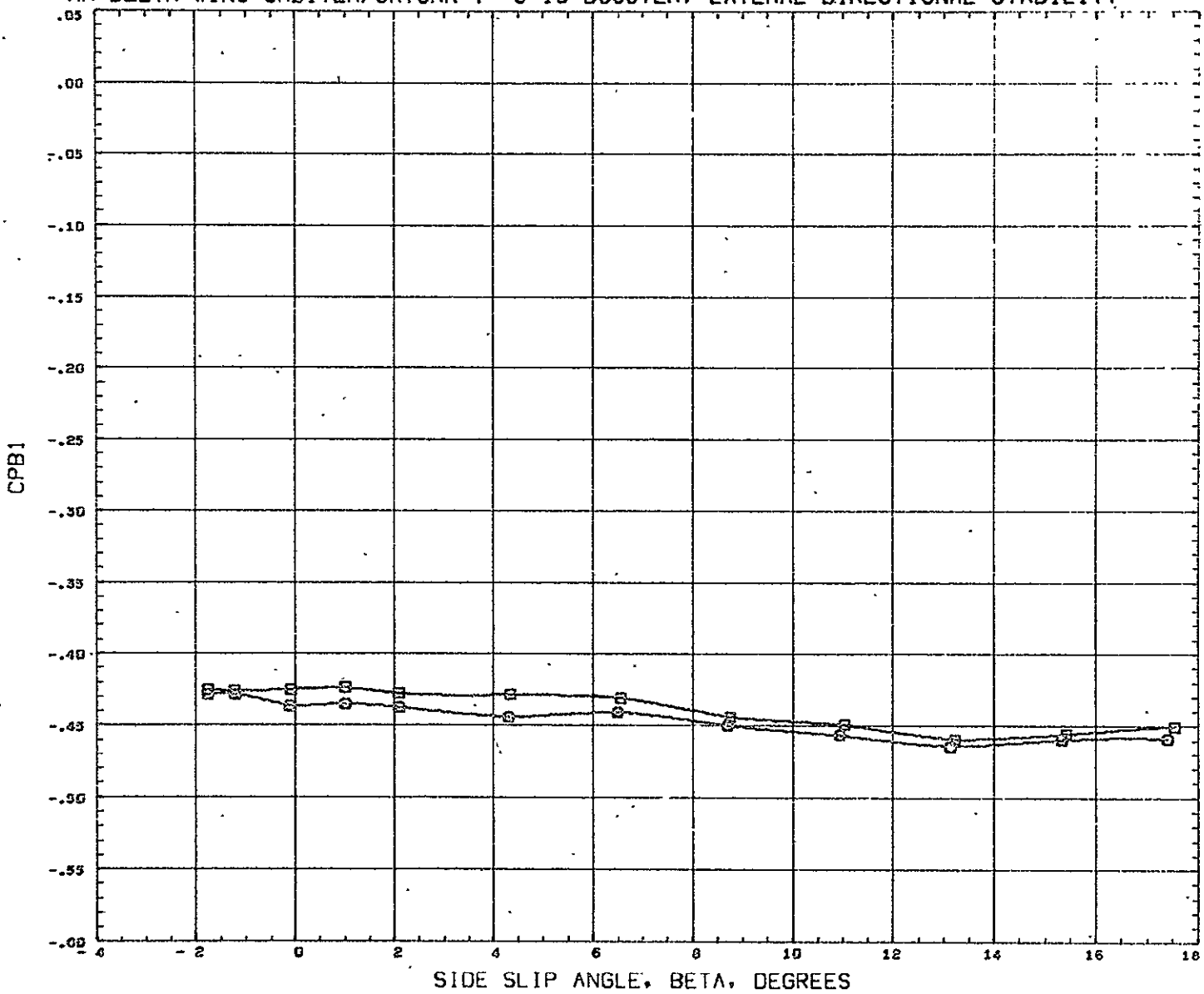
ALFHA - 0.050 ORBINC 1.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MACH 1.097

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	
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(R25D93)	□	MSFC 476 NR MCRORB/S-ICBOOSTER	BF2S+B5W14E3V17

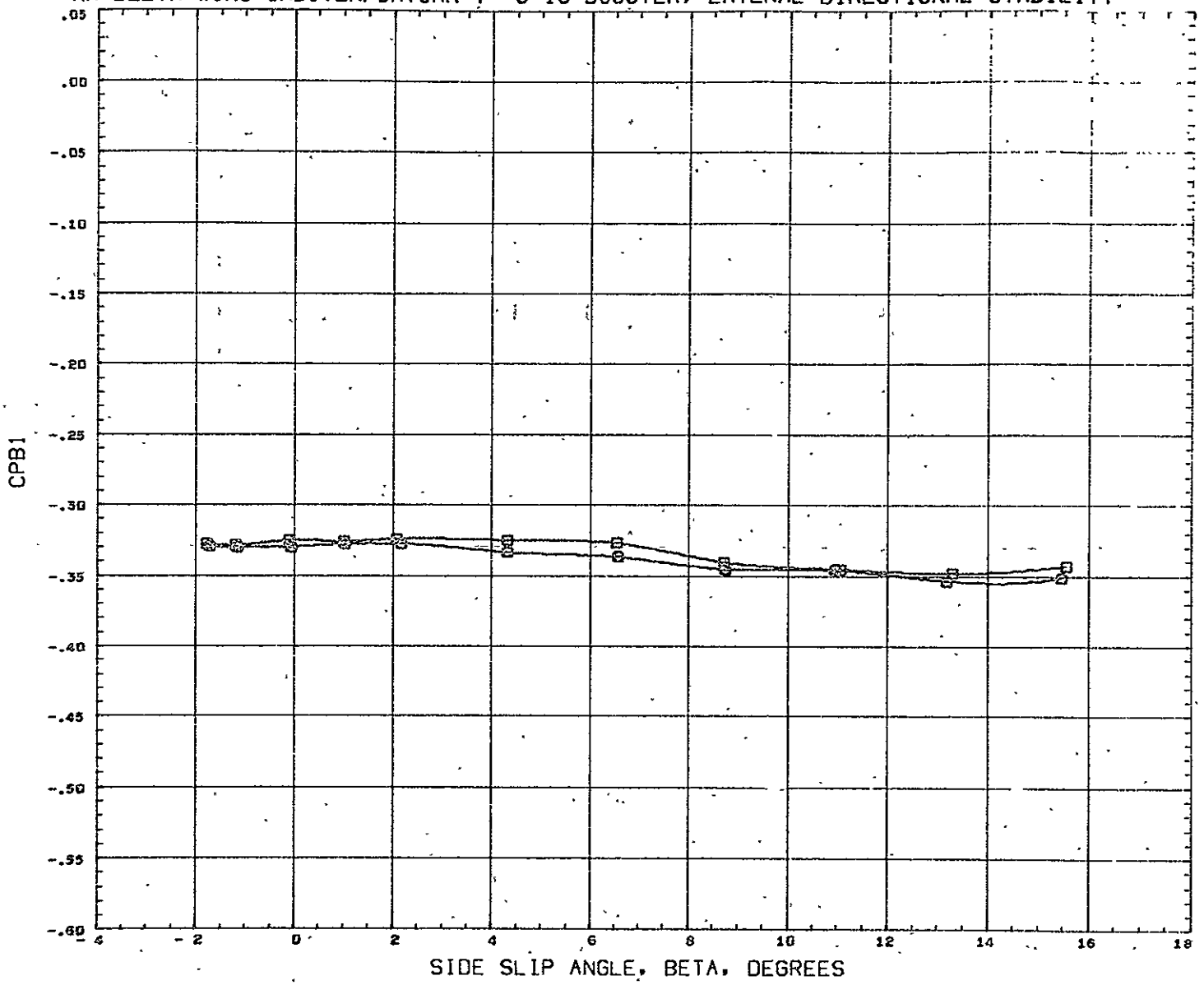
PARAMETRIC VALUES: ALFHA - 0.050 ORBINC 1.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MACH 1.196

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY

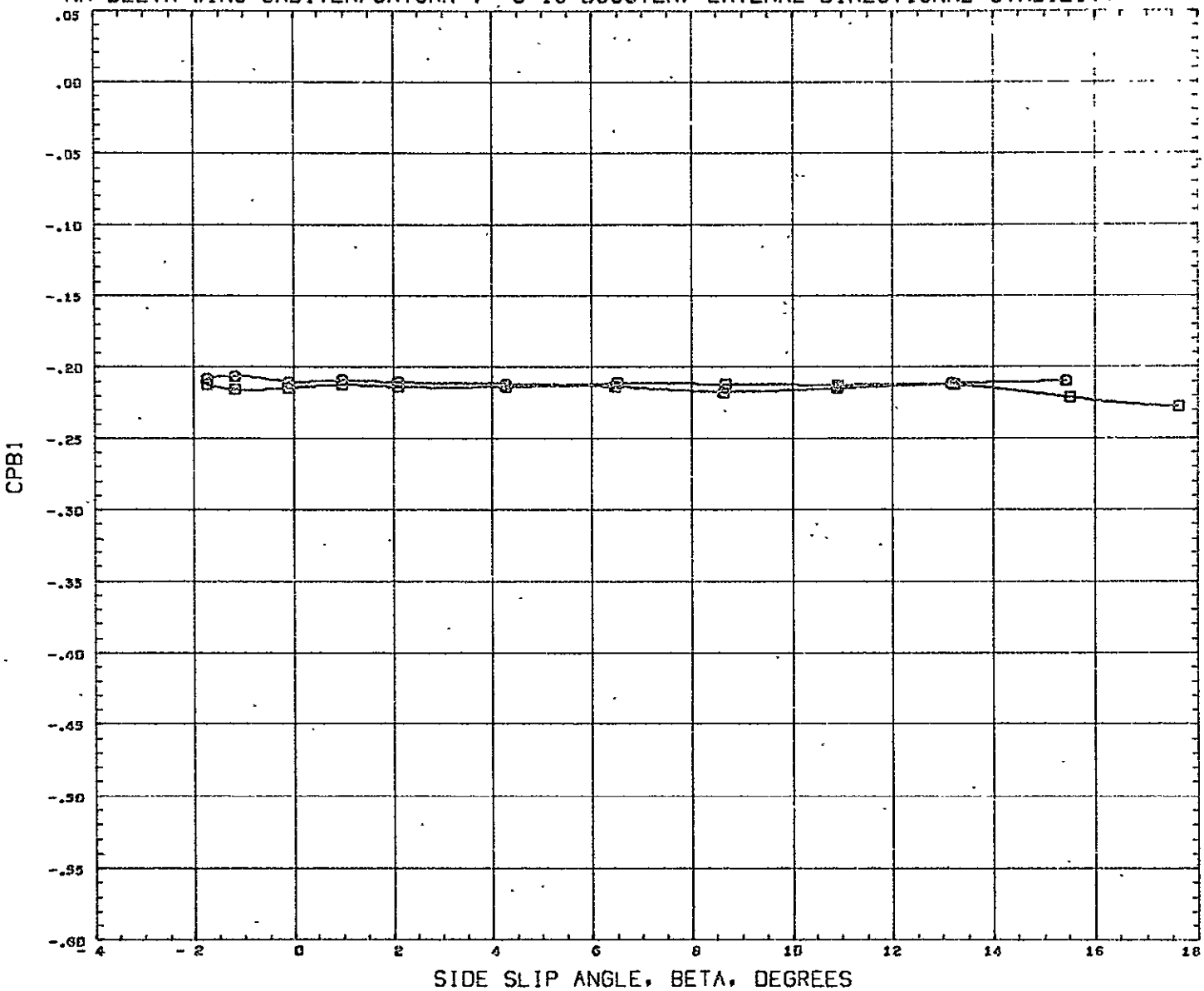


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES			
(R25053)	○	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	ALFHA	- 0.050	ORBINC	1.000
(R25093)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17				

REFERENCE INFORMATION		
REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MACH 1.455

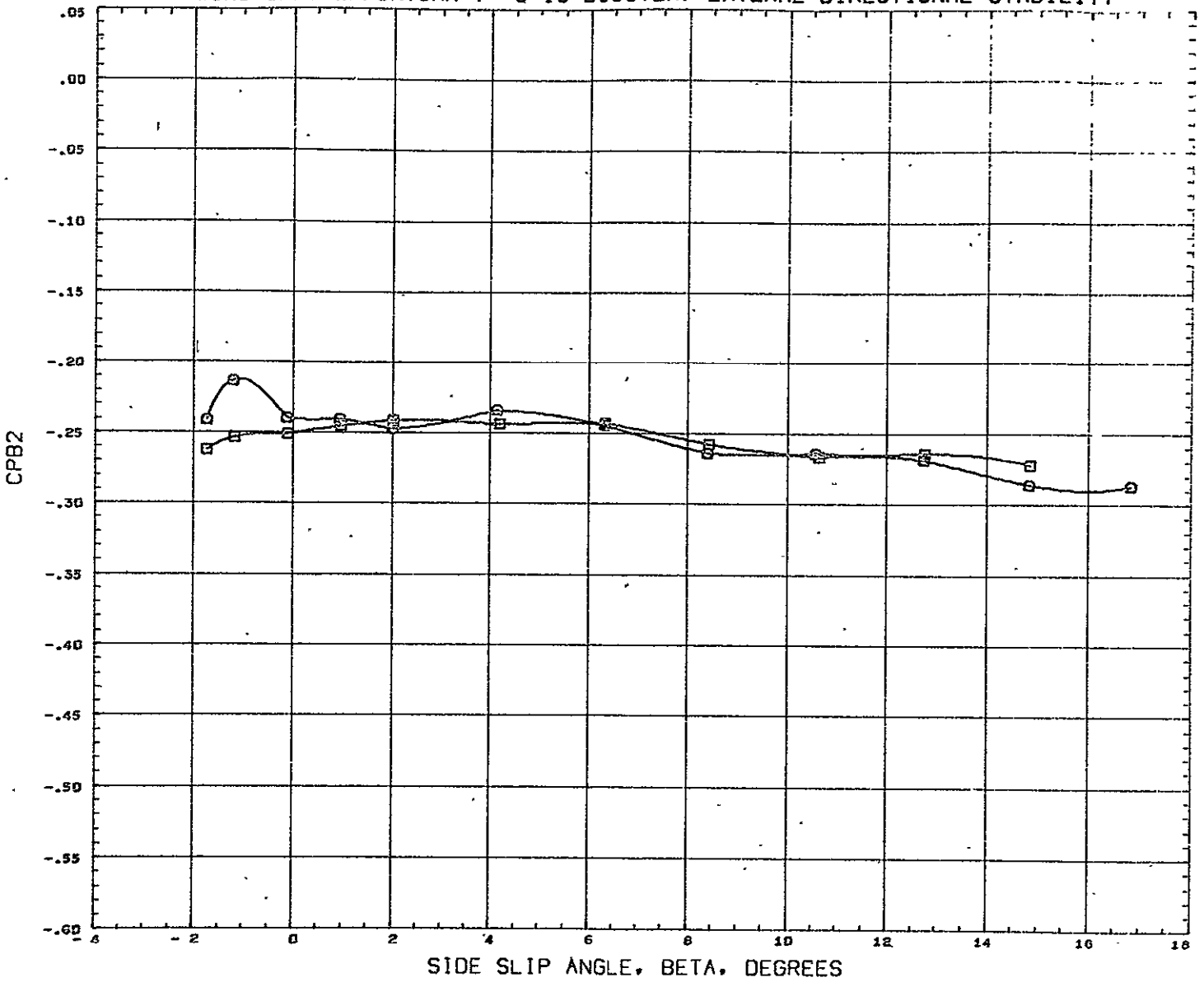
NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES		REFERENCE INFORMATION		
(R25053)	○	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	ALPHA - 0.050	ORBINC 1.000	REFS	1.3960	SQ.IN.
(R25093)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17			REFL	1.3330	INCHES
						REFB	1.3330	INCHES
						XMRP	5.2640	INCHES
						YMRP	0.0000	INCHES
						ZMRP	0.0330	INCHES
						SCALE	0.0034	

MACH 1.959

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	
(R25053)	○	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17
(R25093)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17

PARAMETRIC VALUES

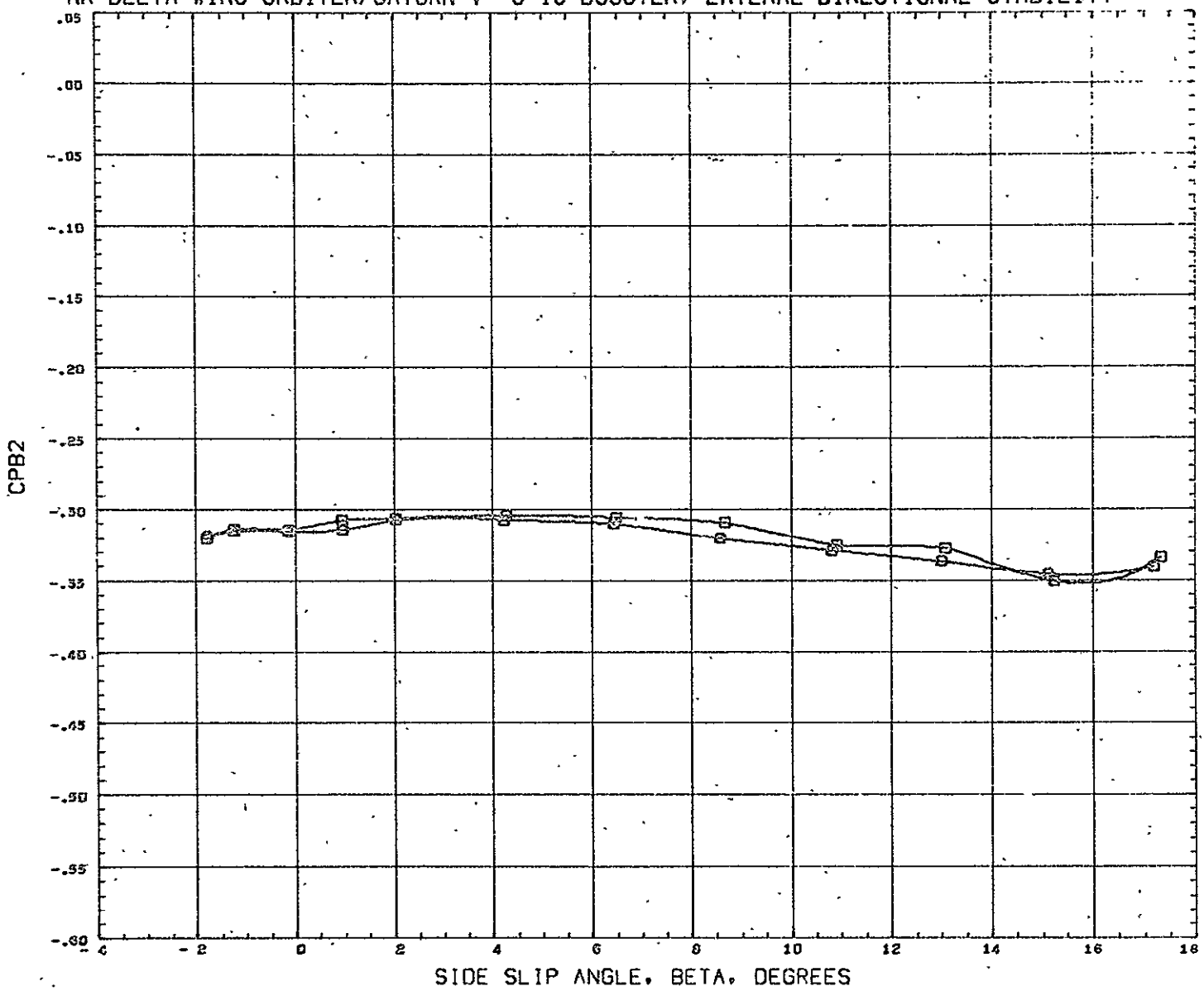
ALPHA - 0.050 ORBINC 1.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRF	5.2640	INCHES
YMRF	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

MACH 0.603

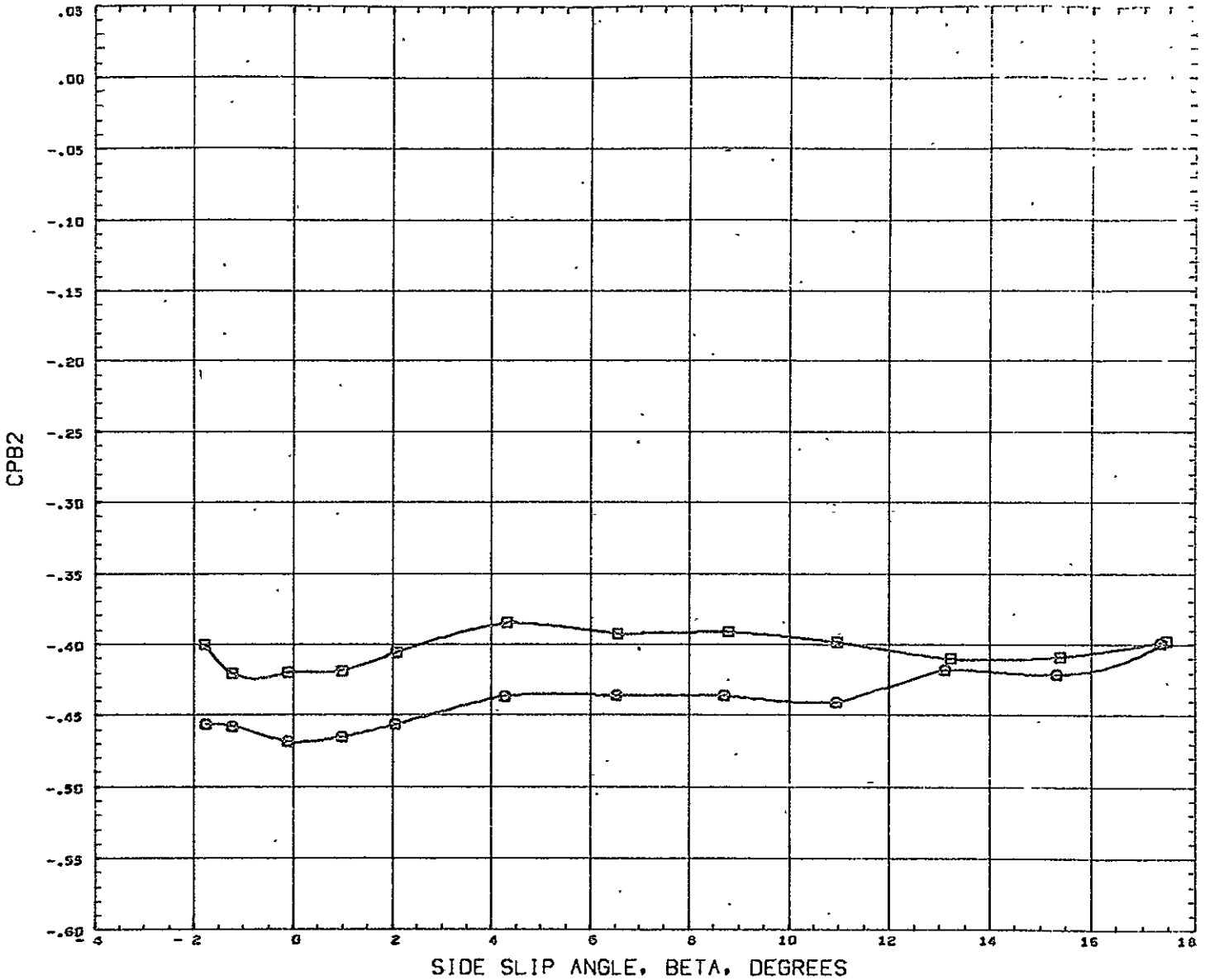
NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES		REFERENCE INFORMATION		
(R25053)	○	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	ALPHA - 0.050	ORBINC 1.000	REFS	1.3960	SQ.IN.
(R25093)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17			REFL	1.3330	INCHES
						REFB	1.3330	INCHES
						XMRP	5.2640	INCHES
						YMRP	0.0000	INCHES
						ZMRP	0.0330	INCHES
						SCALE	0.0034	

MACH 0.899

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	
(R25053)	O	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17
(R25093)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17

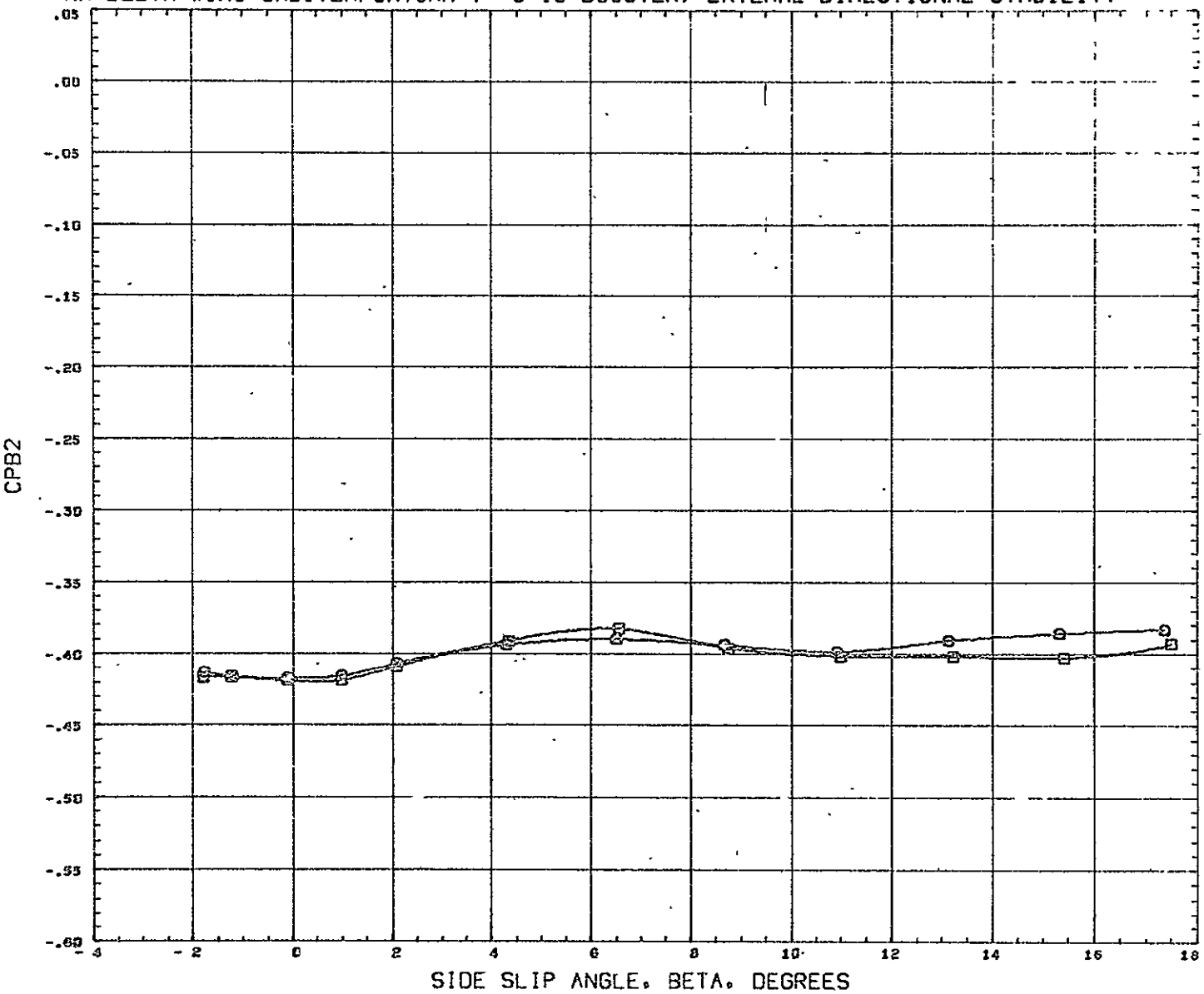
PARAMETRIC VALUES: ALPHA - 0.050 ORBINC 1.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRF	5.2640	INCHES
YMRF	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

MACH 0.998

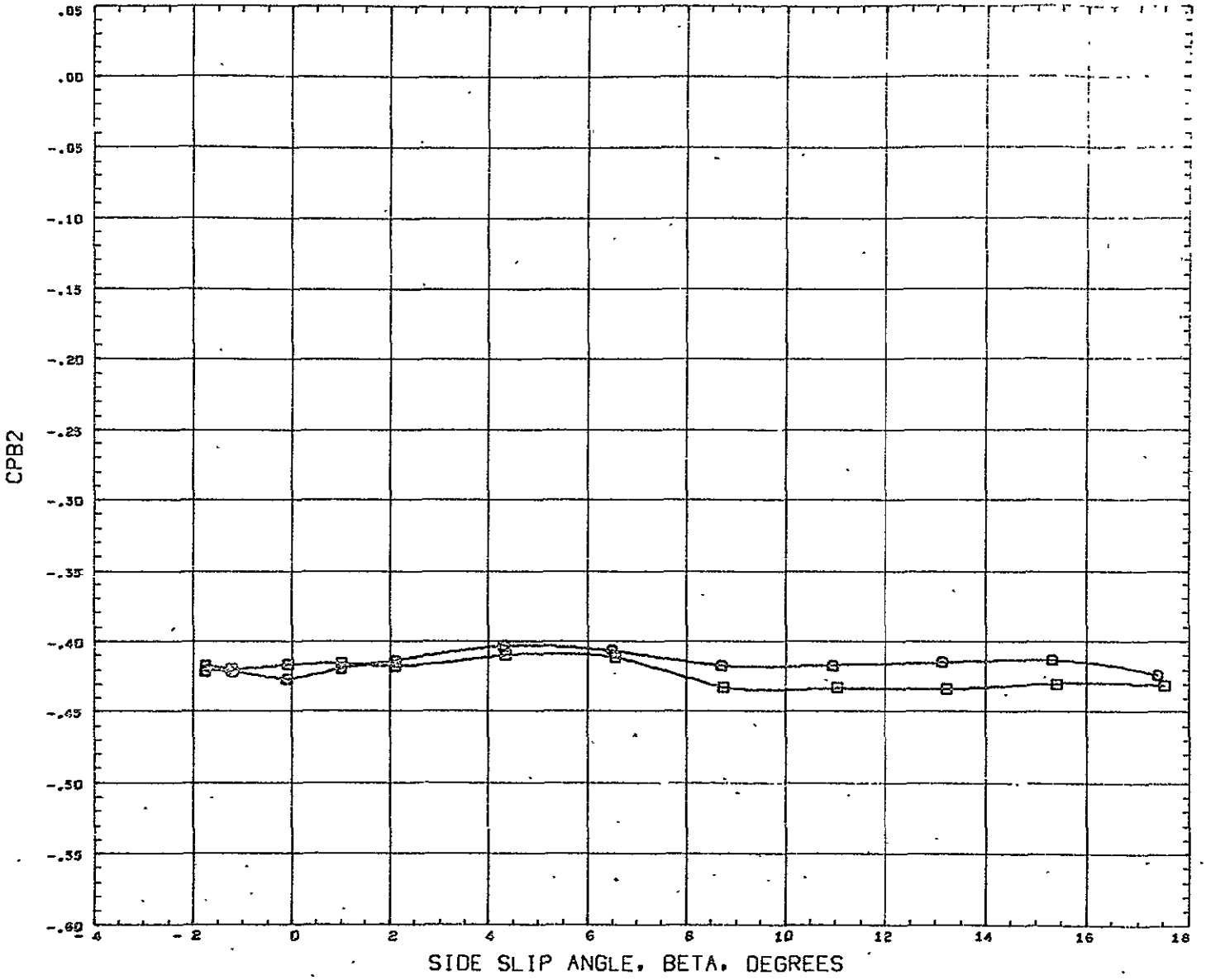
NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER, LATERAL-DIRECTIØNAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	PARAMETRIC VALUES	REFERENCE INFORMATION		
(R25053)	O	MSFC 476 NR MCRORB/S-ICBOOSTER BF1S+B5W14E3V17	ALPHA - 0.050 ORBINC 1.000	REFS	1.3960	SQ.IN.
(R25093)	□	MSFC 476 NR MCRORB/S-ICBOOSTER BF2S+B5W14E3V17		REFL	1.3330	INCHES
				REFB	1.3330	INCHES
				XMRP	5.2640	INCHES
				YMRP	0.0000	INCHES
				ZMRP	0.0330	INCHES
				SCALE	0.0034	

MACH 1.097

NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER, LATERAL-DIRECTIØNAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	
(R25053)	○	MSFC 476 NR MCRORB/S-ICBOOSTER	BF1S+B5W14E3V17
(R25093)	□	MSFC 476 NR MCRORB/S-ICBOOSTER	BF2S+B5W14E3V17

PARAMETRIC VALUES

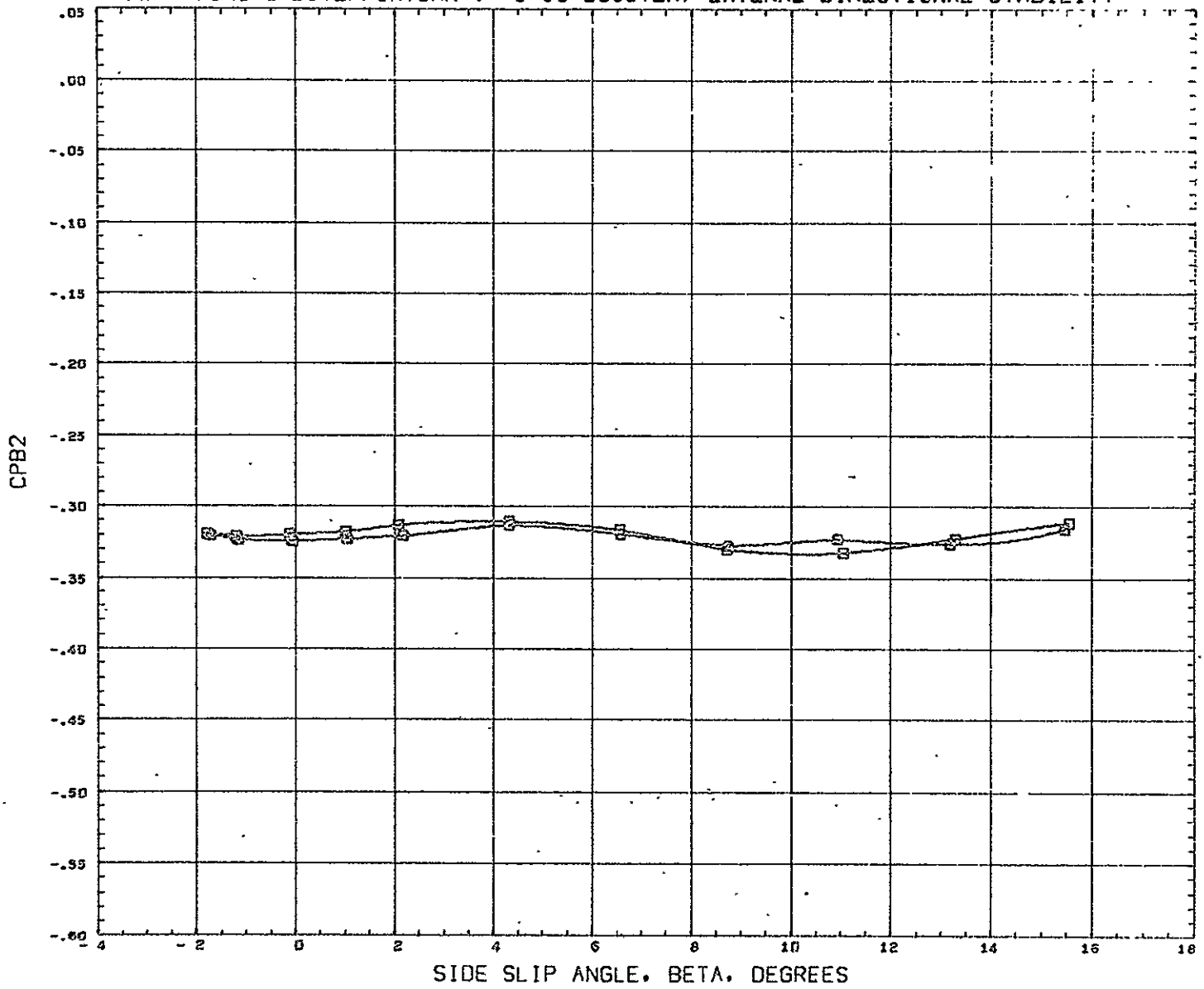
ALFHA - 0.050 ORBINC 1.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRF	5.2640	INCHES
YMRF	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

MACH 1.196

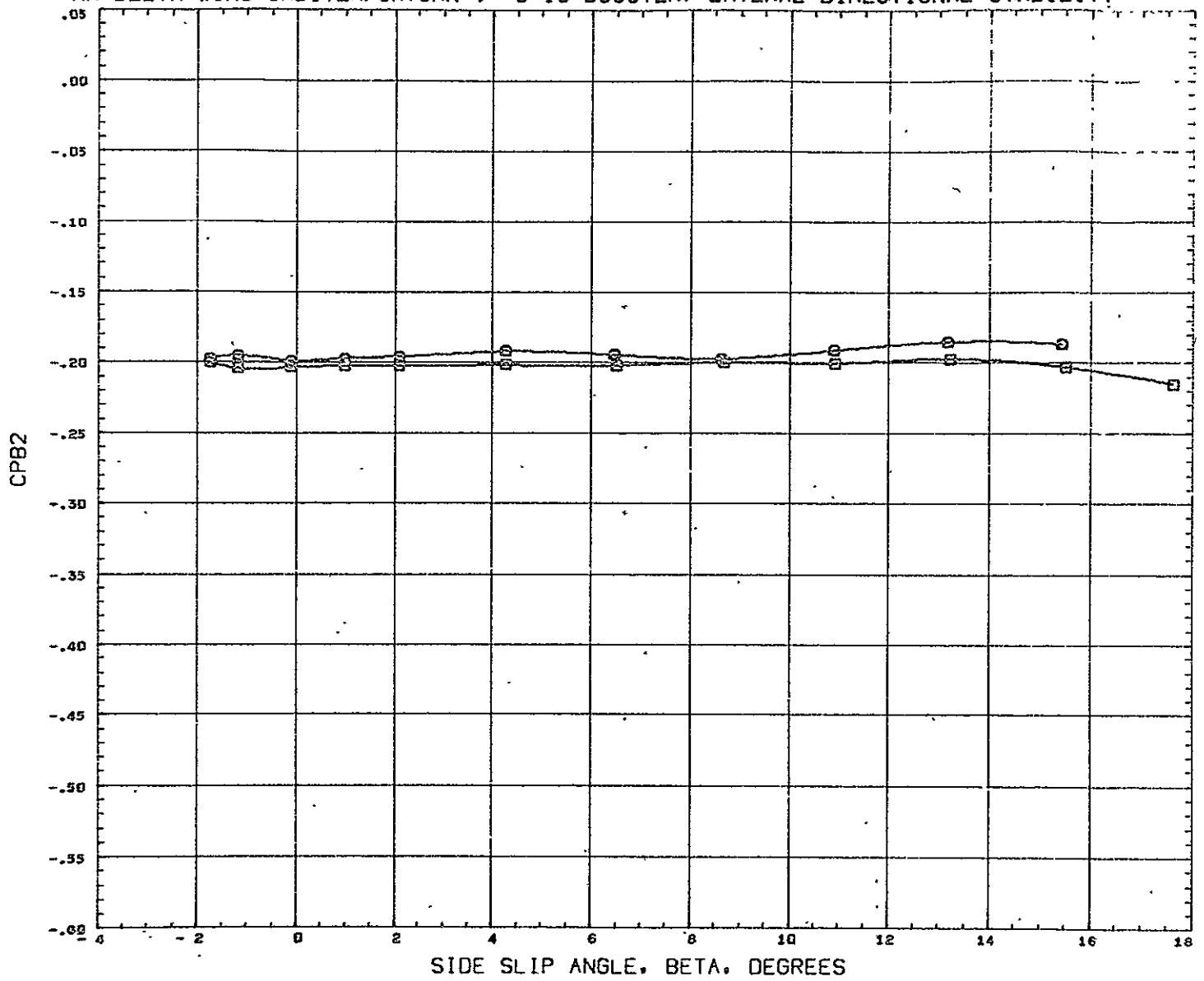
NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES				REFERENCE INFORMATION		
(R25053)	○	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	ALPHA	- 0.050	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R25093)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XMRP	5.2640	INCHES
								YMRP	0.0000	INCHES
								ZMRP	0.0330	INCHES
								SCALE	0.0034	

MACH 1.455

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(R25053)	○	MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17
(R25093)	□	MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES

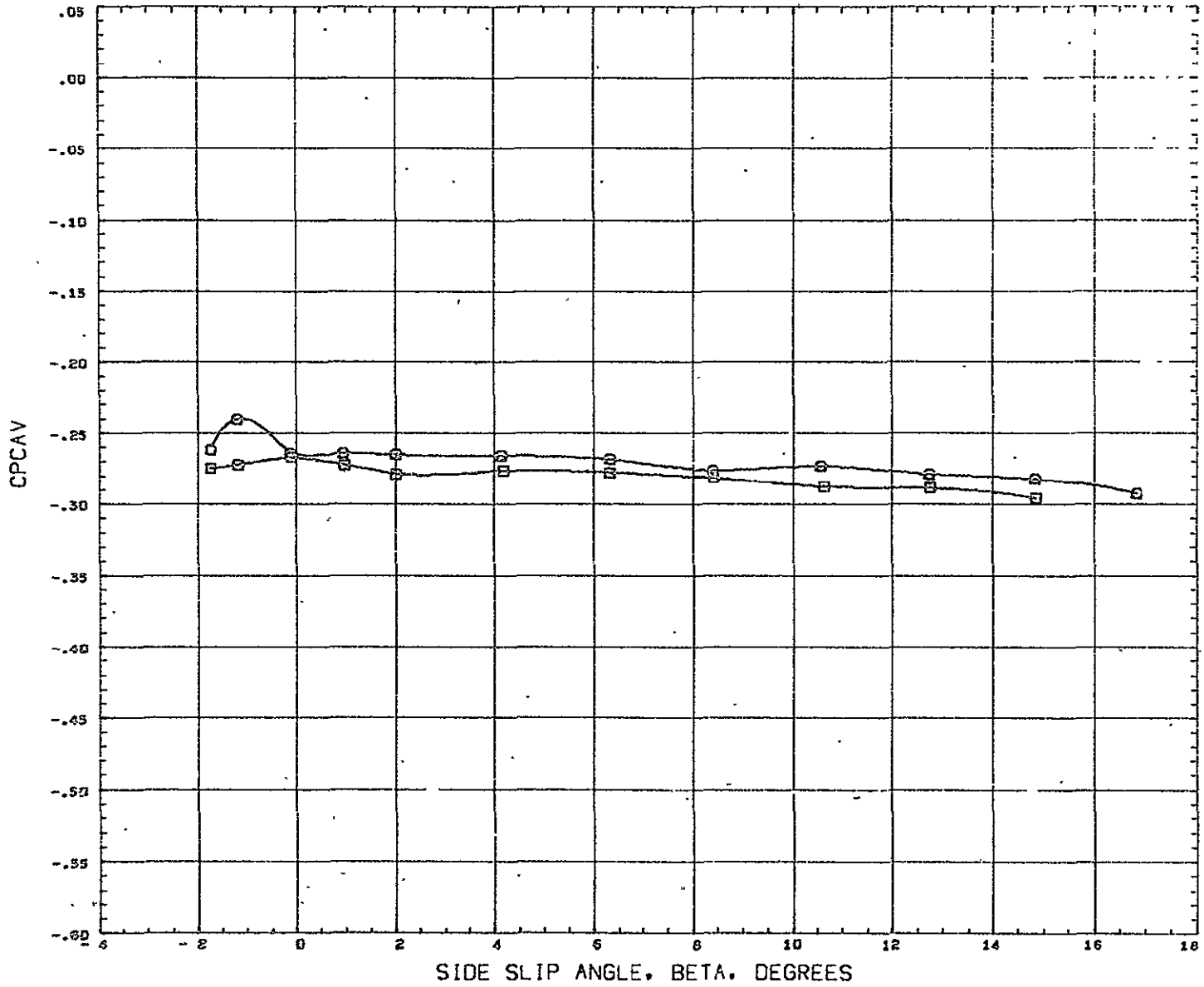
ALPHA - 0.050 . ORBINC 1.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MACH 1.959

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	
(R25053)	○	MSFC 476 NR MCRORB/S-ICBOOSTER	BF1S+B5W14E3V17
(R25093)	□	MSFC 476 NR MCRORB/S-ICDOOSTER	BF2S+B5W14E3V17

PARAMETRIC VALUES

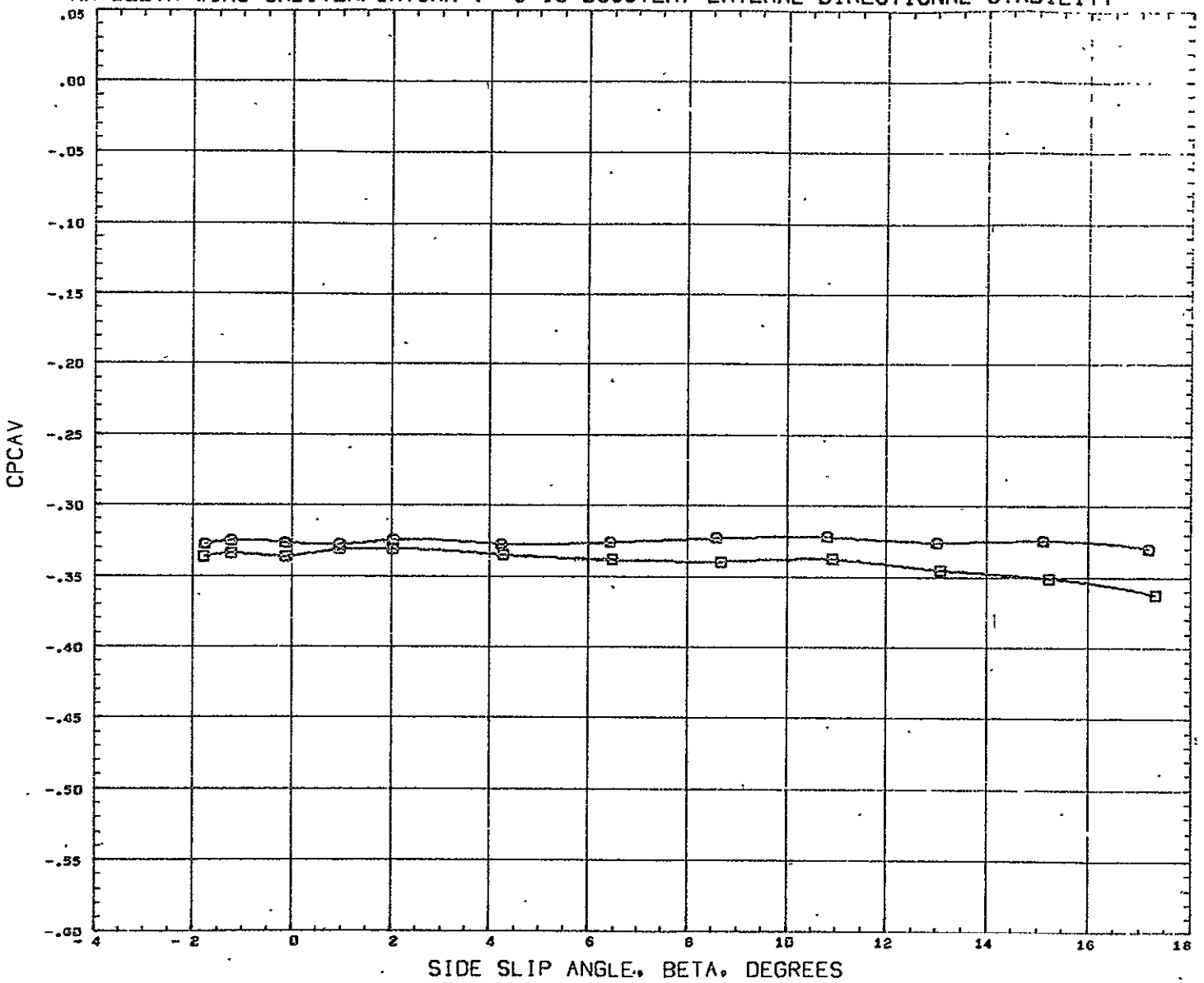
ALPHA - 0.050 ORBINC 1.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MACH 0.603

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	
(R25053)	○	MSFC 476 NR MCRORB/S-ICBOOSTER	BF1S+B5W14E3V17
(R25093)	□	MSFC 476 NR MCRORB/S-ICBOOSTER	BF2S+B5W14E3V17

PARAMETRIC VALUES

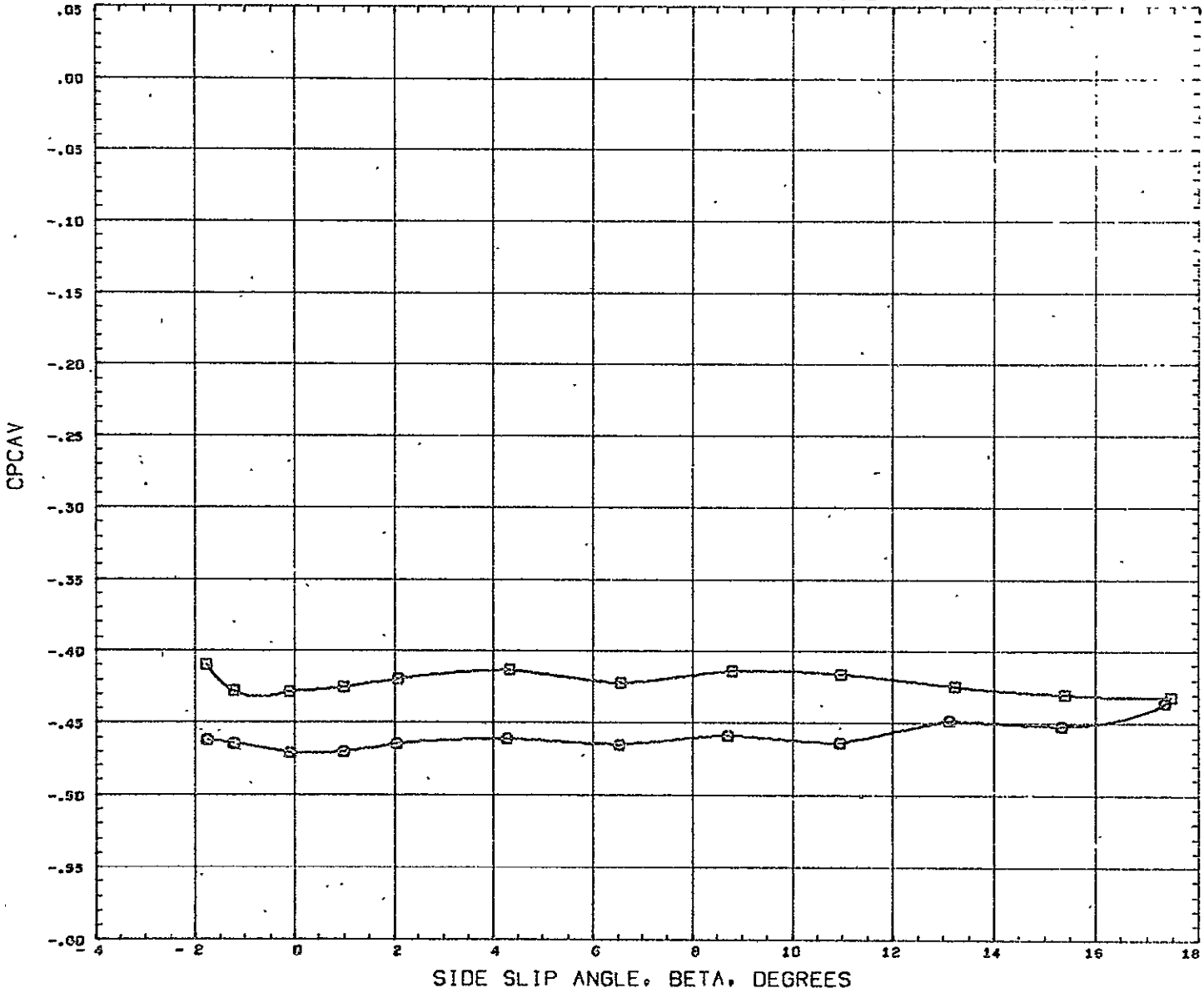
ALPHA - 0.050 ORBINC 1.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRF	5.2640	INCHES
YMRF	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

MACH 0.899

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	
(R25053)	○	NSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17
(R23093)	□	NSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17

PARAMETRIC VALUES

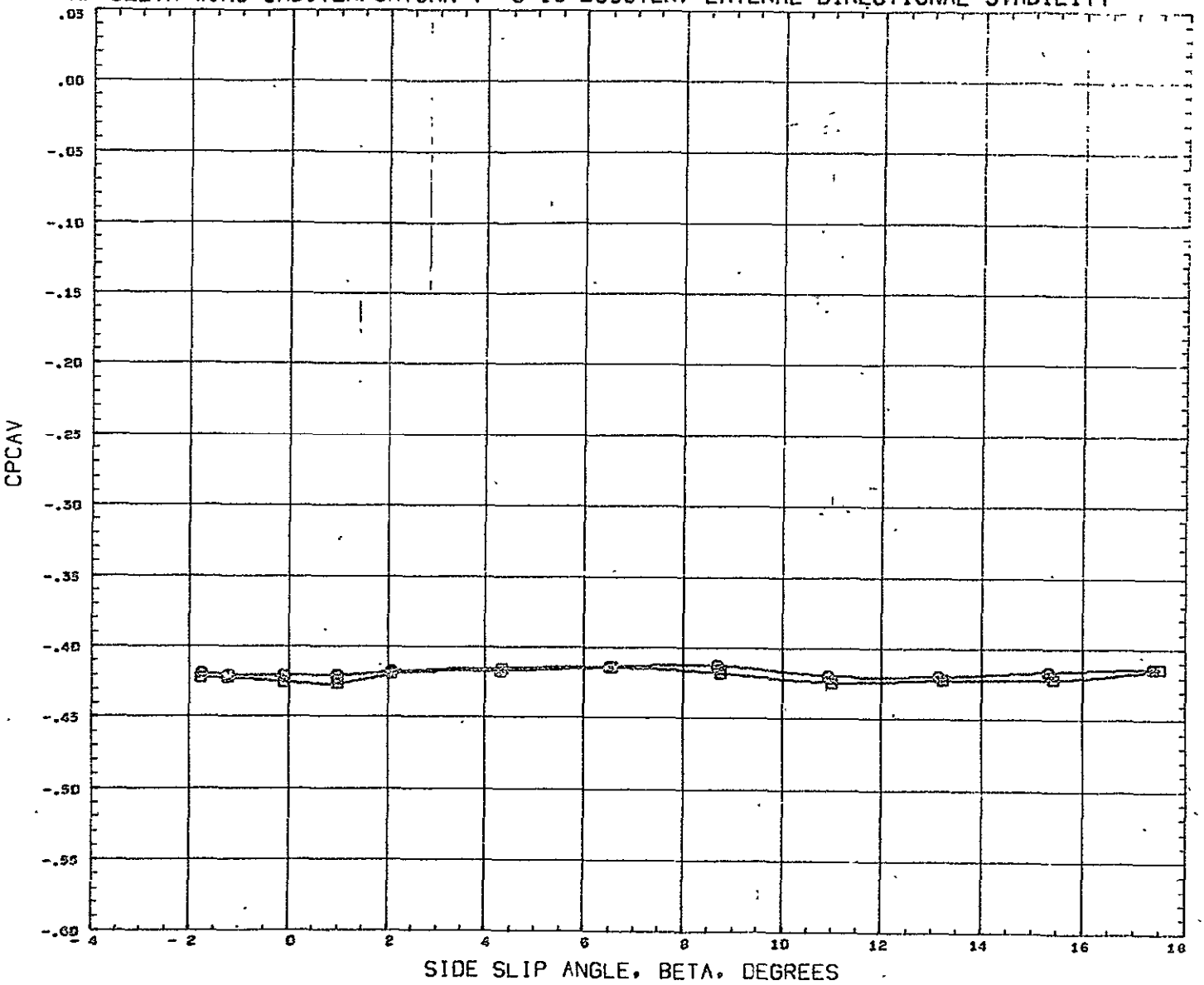
ALPHA - 0.050 ORBINC 1.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MACH 0.998

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	
(R25053)	O	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17
(R25093)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17

PARAMETRIC VALUES

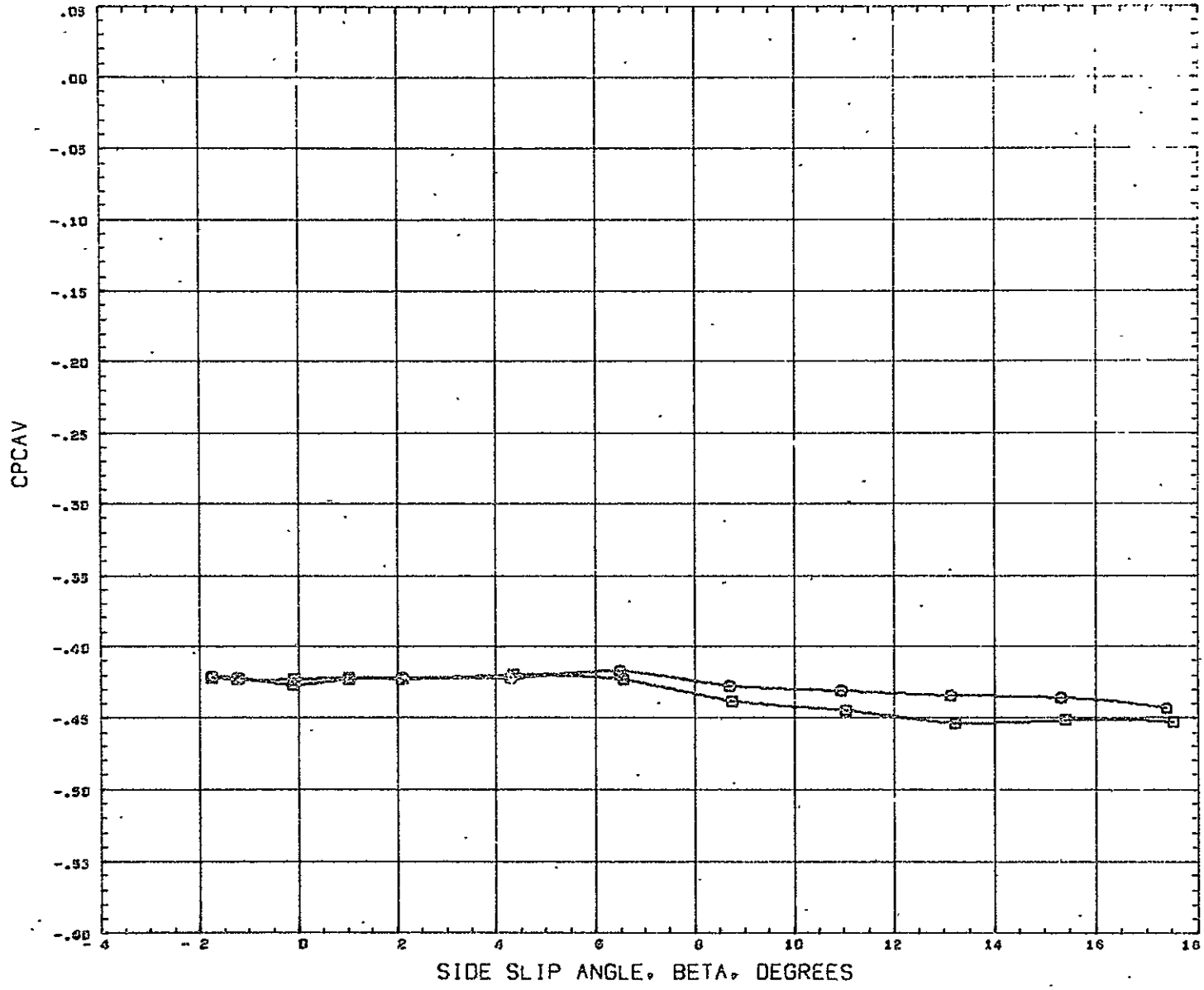
ALPHA - 0.050 ORBINC 1.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MACH 1.097

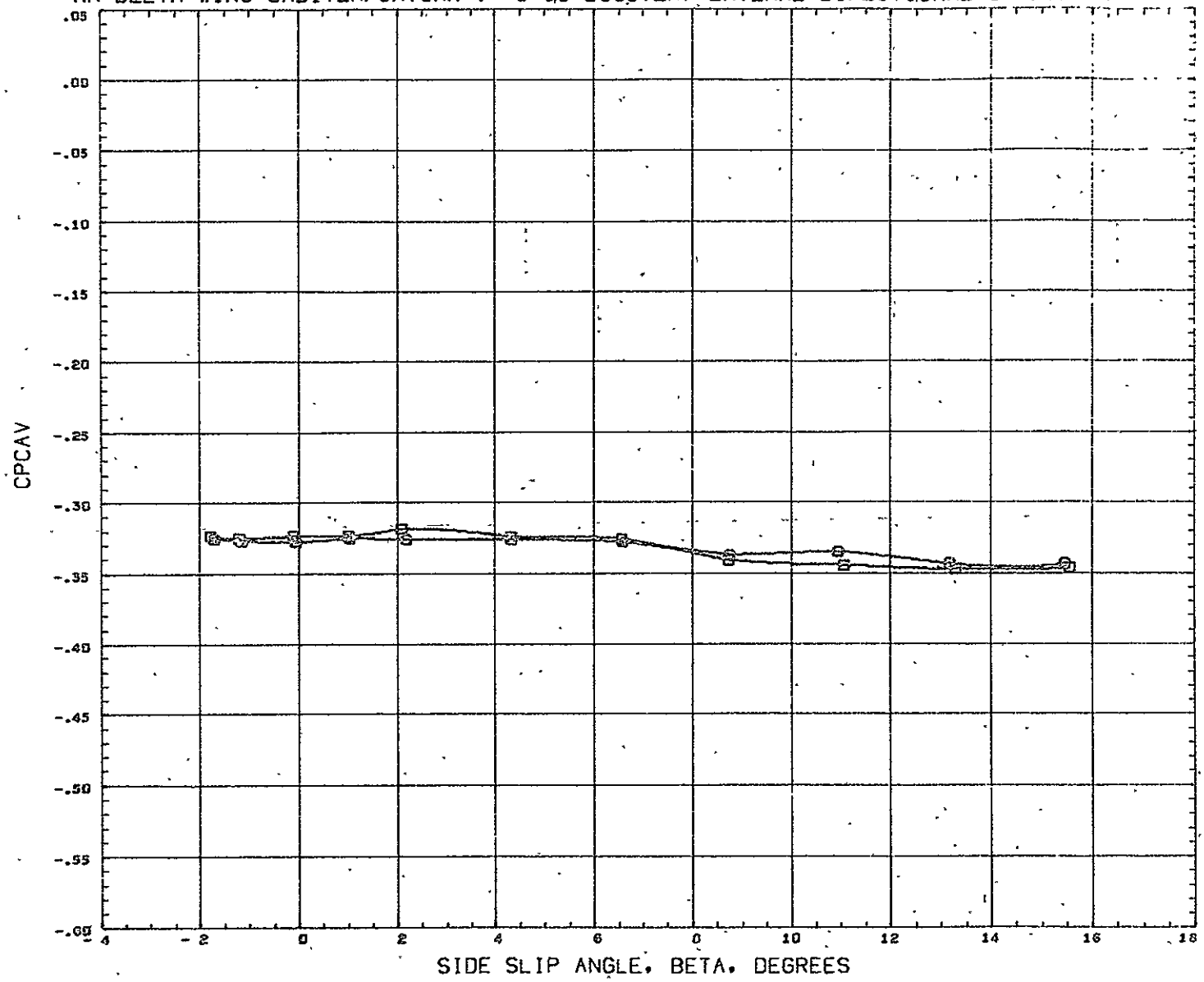
NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES			REFERENCE INFORMATION		
(R25055)	○	MSFC 476 NR MCRORB/S-ICBOOSTER	BF1S+B5WI4E3V17	ALPHA	- 0.050	ORBINC 1.000	REFS	1.3960	SQ.IN.
(R25093)	□	MSFC 476 NR MCRORB/S-ICBOOSTER	BF2S+B5WI4E3V17				REFL	1.3330	INCHES
							REFB	1.3330	INCHES
							XMRF	5.2640	INCHES
							YMRF	0.0000	INCHES
							ZMRP	0.0330	INCHES
							SCALE	0.0034	

MACH 1.196.

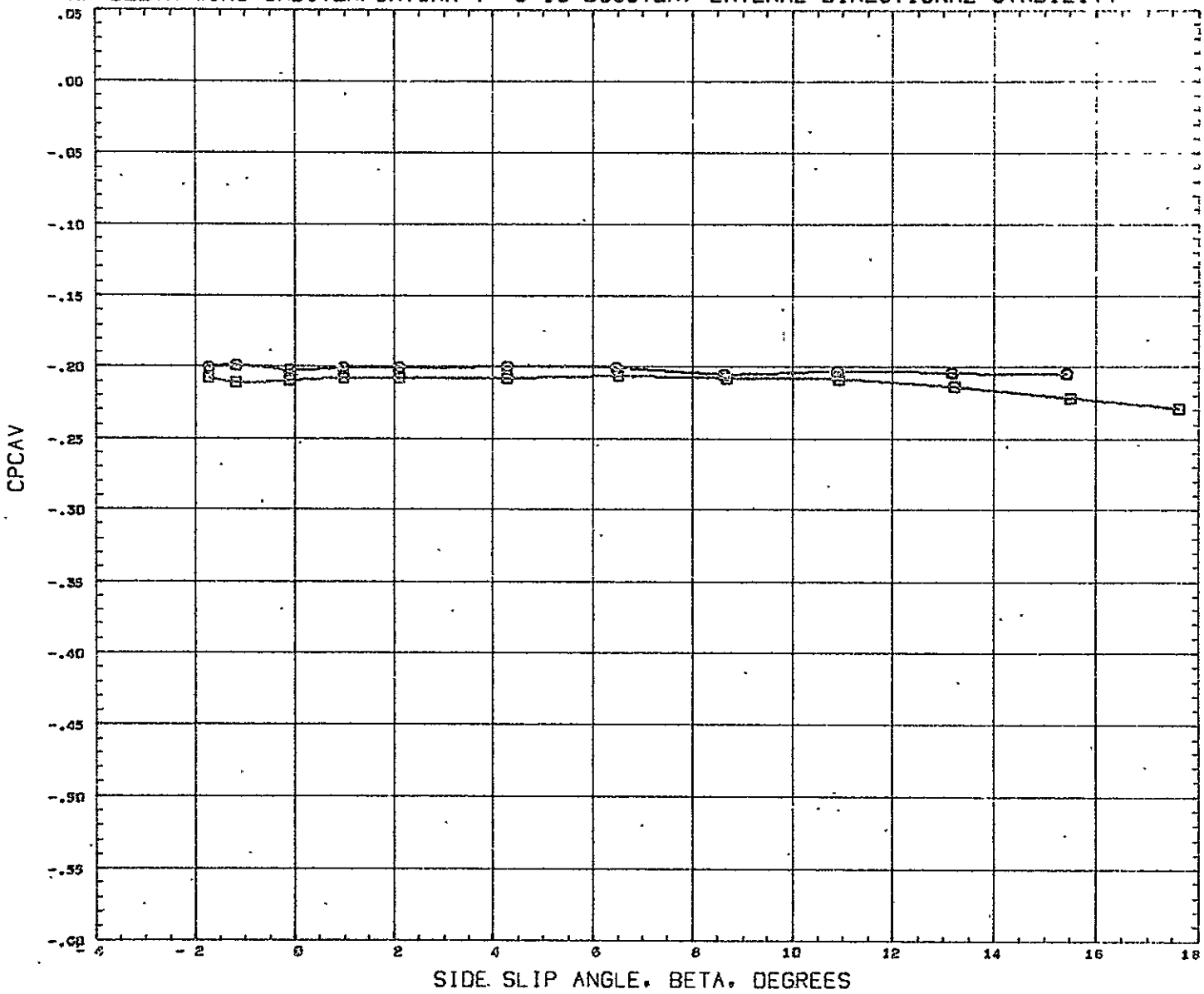
NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES				REFERENCE INFORMATION		
(R25053)	○	NSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	ALPHA	- 0.050	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R25093)	□	NSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XMRP	5.2640	INCHES
								YMRP	0.0000	INCHES
								ZMRP	0.0330	INCHES
								SCALE	0.0034	

MACH 1.455

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	
(R25053)	○	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17
(R25093)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17

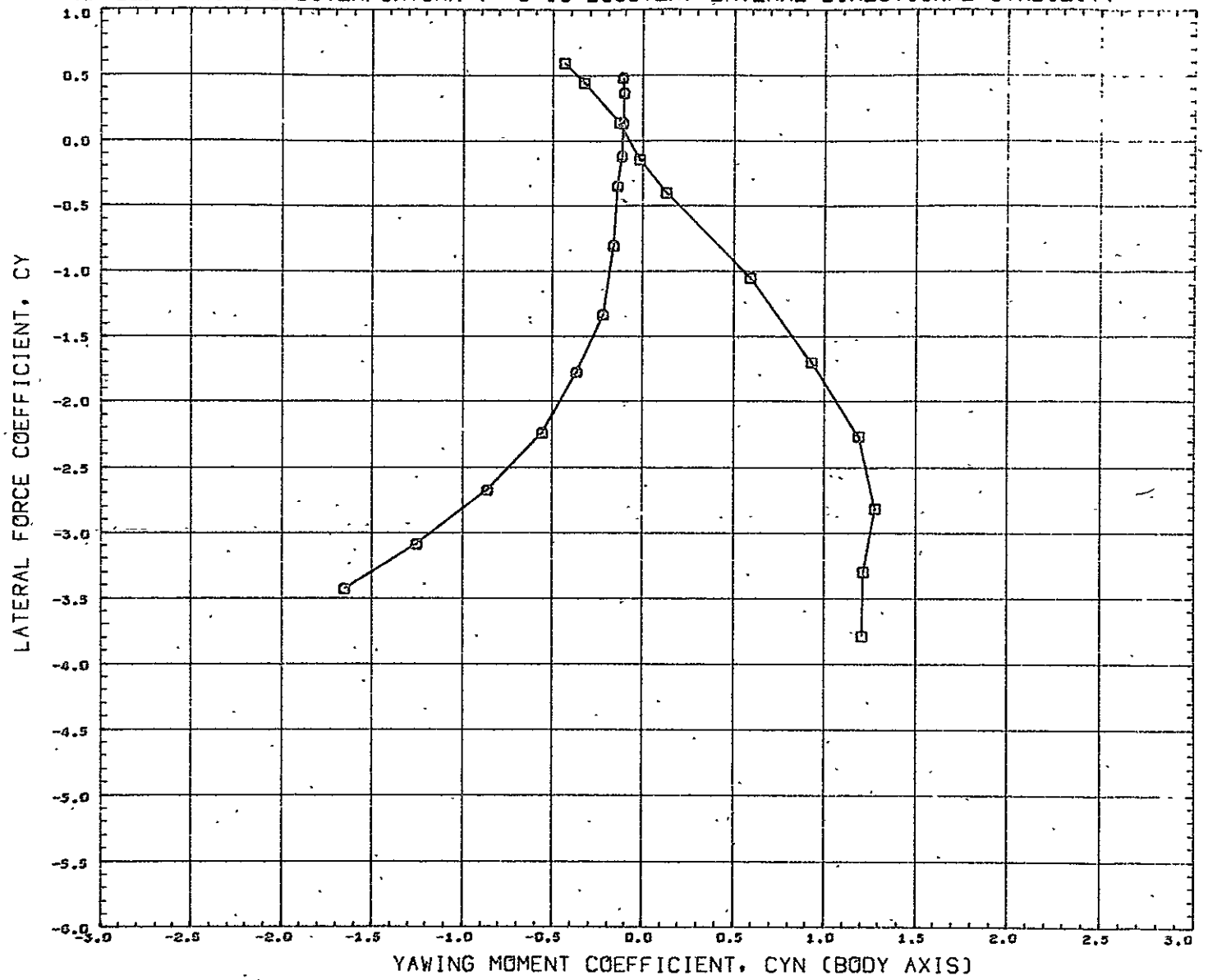
PARAMETRIC VALUES: ALPHA - 0.050 ORBINC 1.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MACH 1.959

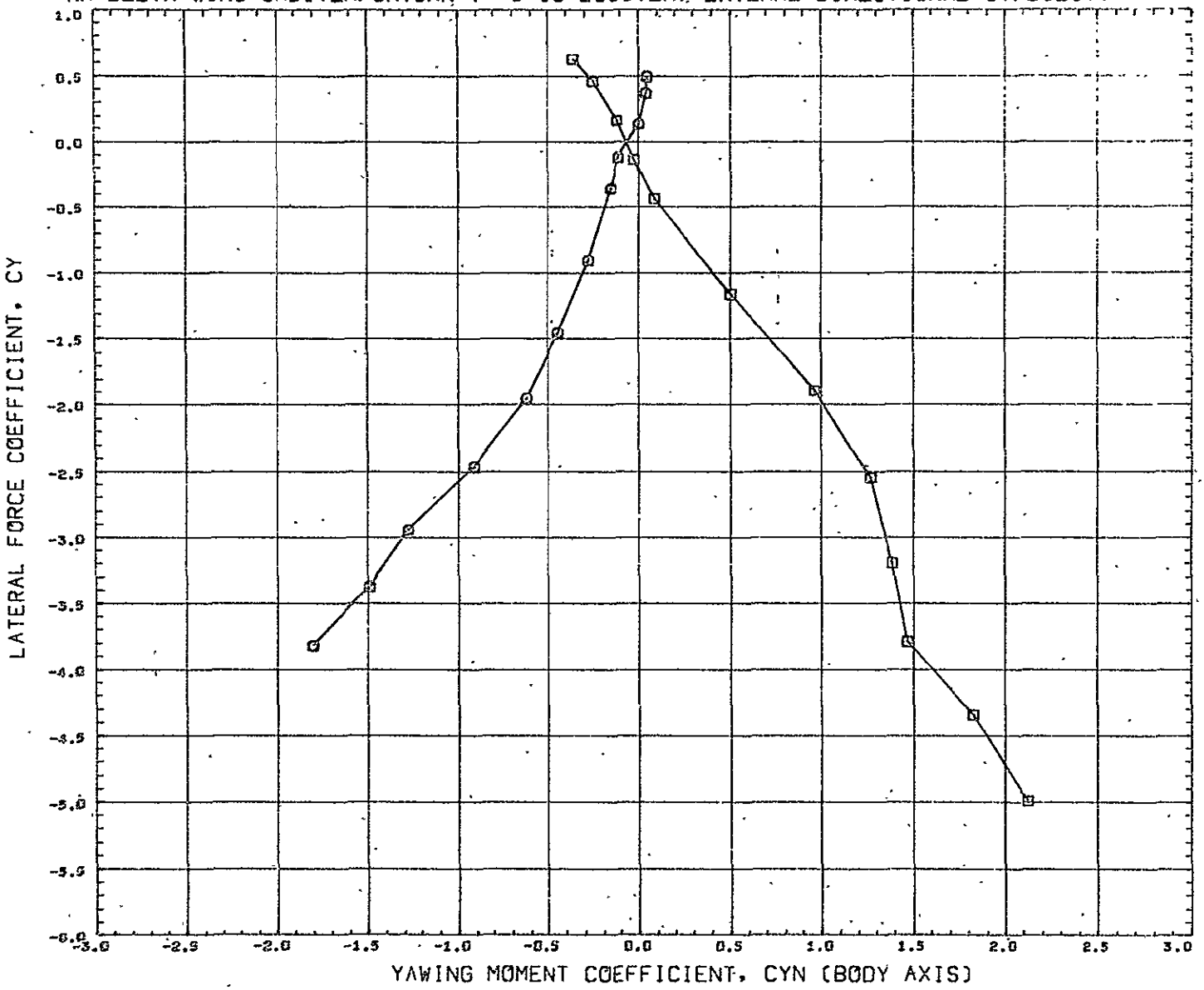
NR DELTA WING ØRBITER/SATURN V S-IC BØØSTER, LATERAL-DIRECTIØNAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES				REFERENCE INFORMATION		
(R25053)	O	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	ALFHA	- 0.050	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R25093)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XMRF	5.2640	INCHES
								YMRF	0.0000	INCHES
								ZMRF	0.0330	INCHES
								SCALE	0.0034	

MACH 0.603

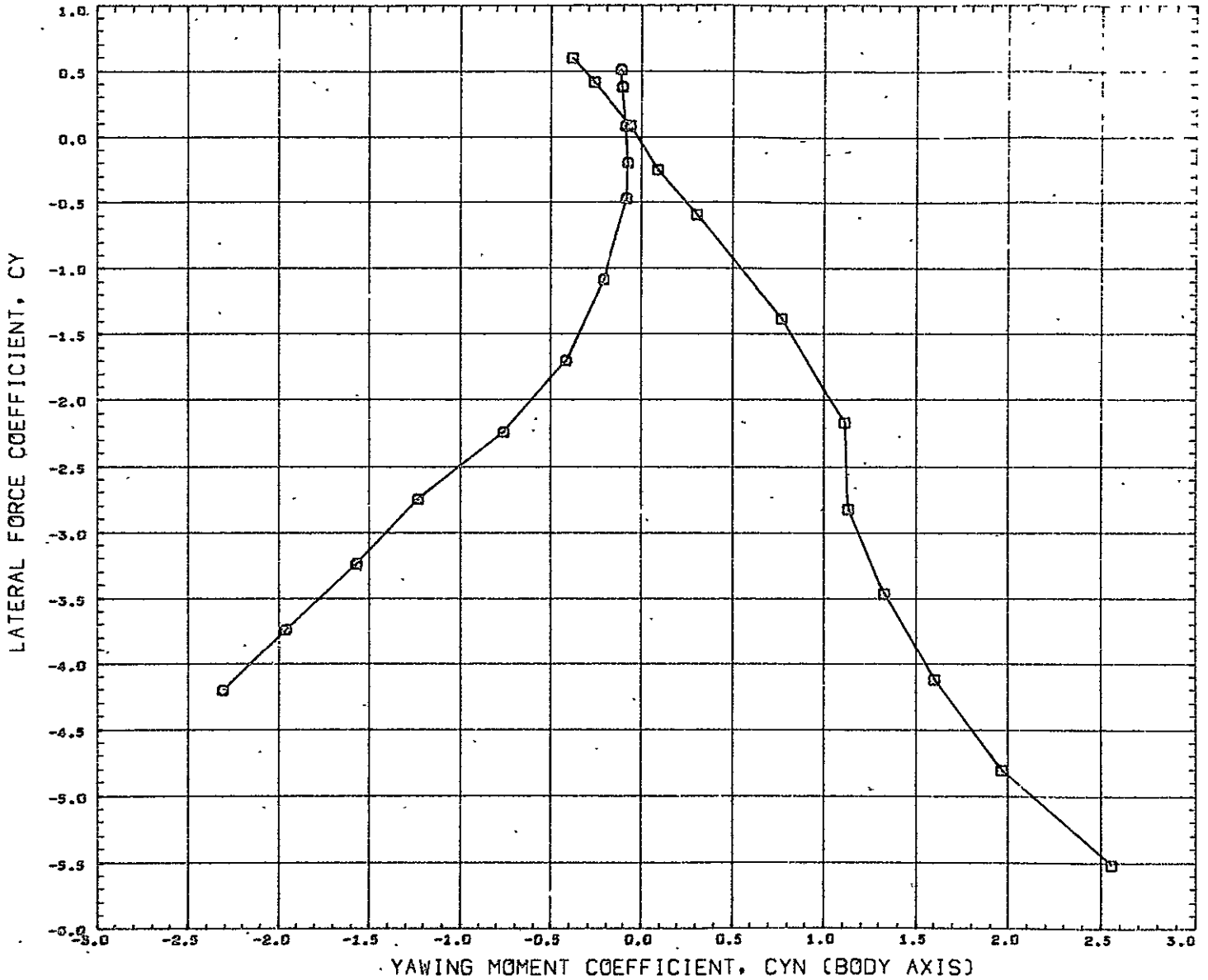
NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES		REFERENCE INFORMATION		
(R25053)	O	MSFC 476 NR MCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	ALPHA - 0.050	ORBINC 1.000	REFS	1.3960	SQ.IN.
(R25093)	□	MSFC 476 NR MCRORB/S-ICBOOSTER	BF2S+B5W14E3V17			REFL	1.3330	INCHES
						REFB	1.3330	INCHES
						XMRP	5.2640	INCHES
						YMRP	0.0000	INCHES
						ZMRP	0.0330	INCHES
						SCALE	0.0034	

MACH 0.899

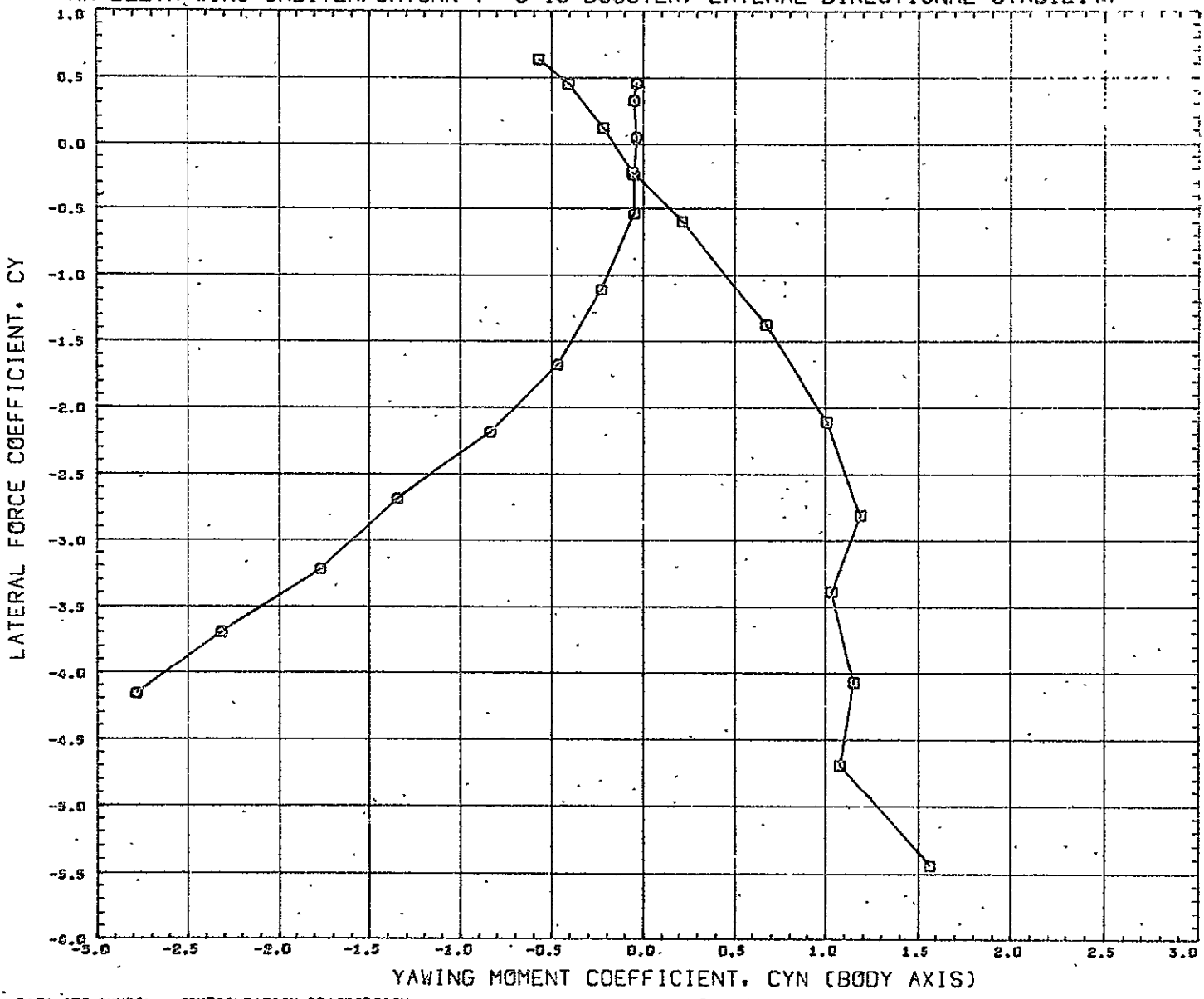
NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES		REFERENCE INFORMATION		
(R25053)	○	MSFC 476 NR MCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	ALPHA - 0.050	ORBINC 1.000	REFS	1.3960	SQ.IN.
(R25093)	□	MSFC 476 NR MCRORB/S-ICBOOSTER	BF2S+B5W14E3V17			REFL	1.3330	INCHES
						REFB	1.3330	INCHES
						XMRP	5.2640	INCHES
						YMRP	0.0000	INCHES
						ZMRP	0.0330	INCHES
						SCALE	0.0034	

MACH 0.998

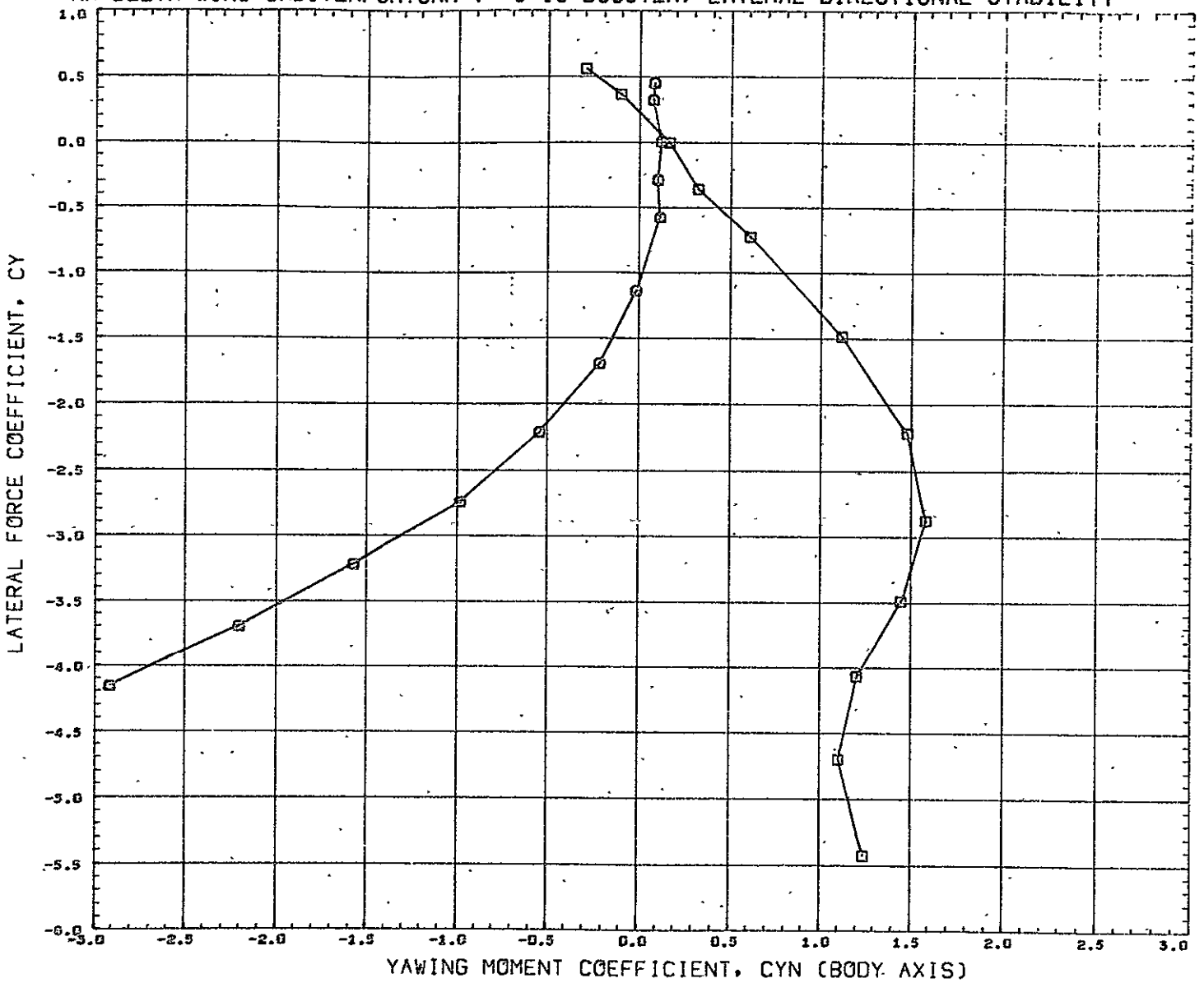
NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES		REFERENCE INFORMATION		
(R25053)	○	MSFC 476 NR MCROXB/S-ICBOOSTER	BF1S+B5W14E3V17	ALPHA - 0.050	ORBINC 1.000	REFS	1.3960	SQ.IN.
(R25093)	□	MSFC 476 NR MCROXB/S-ICBOOSTER	BF2S+B5W14E3V17			REFL	1.3330	INCHES
						REFB	1.3330	INCHES
						XMRP	5.2640	INCHES
						YMRP	0.0000	INCHES
						ZMRP	0.0330	INCHES
						SCALE	0.0034	

MACH 1.097

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	
(R25053)	○	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17
(R25093)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17

PARAMETRIC VALUES

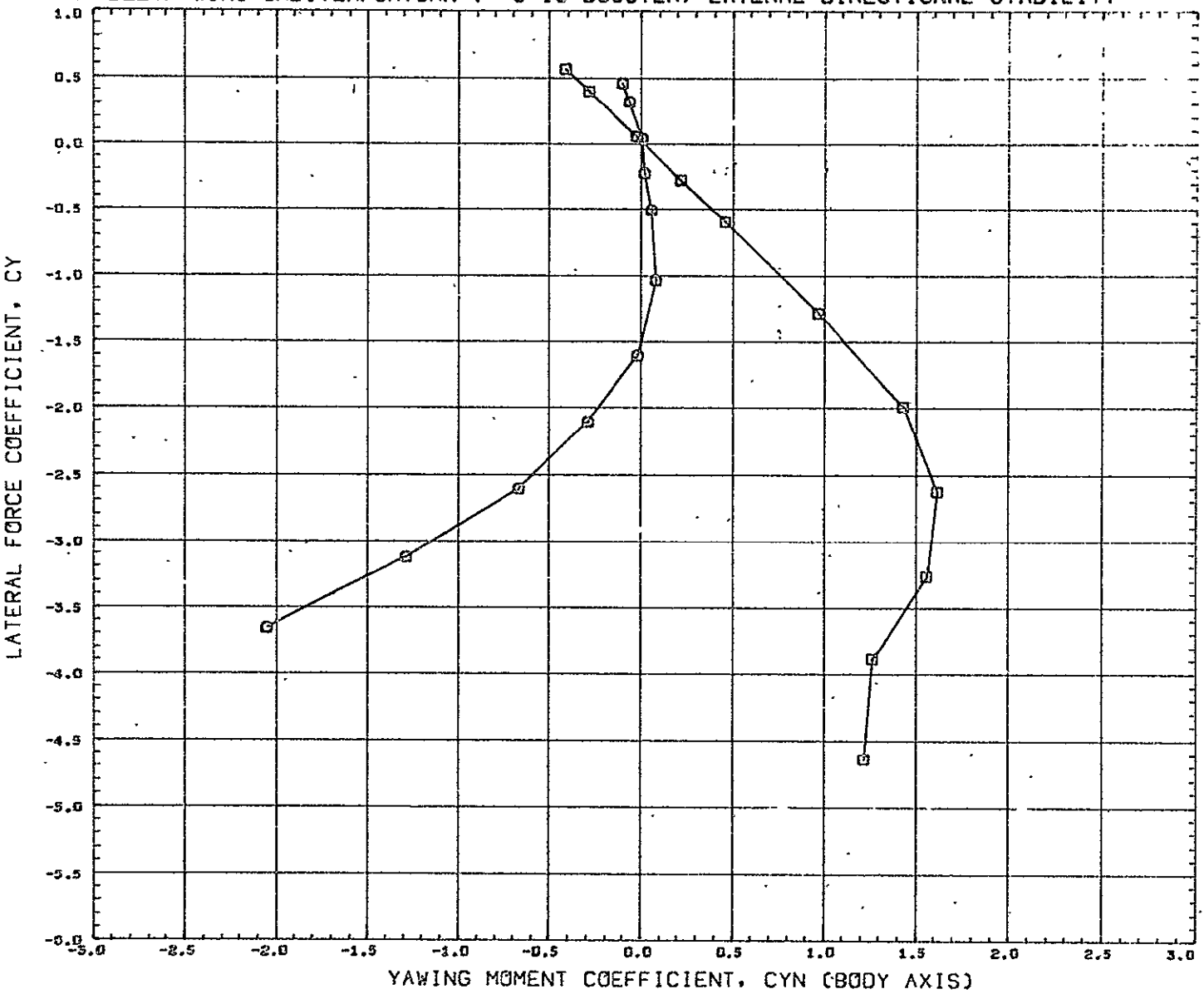
ALPHA - 0.050. ORBINC 1.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MACH 1.196

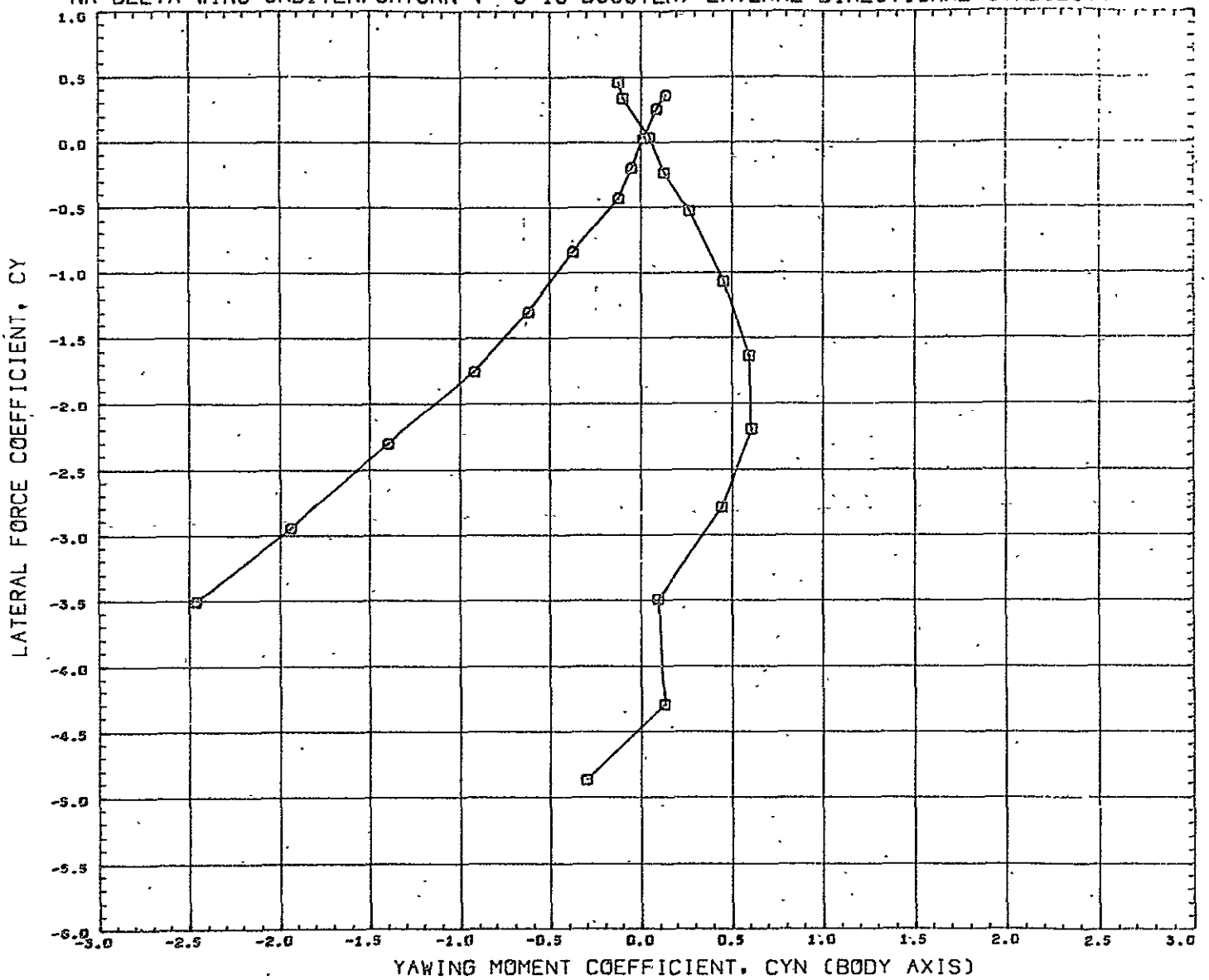
NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES				REFERENCE INFORMATION		
(R25053)	○	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	ALFHA	- 0.050	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R25093)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XMRP	5.2640	INCHES
								YMRP	0.0000	INCHES
								ZMRP	0.0330	INCHES
								SCALE	0.0034	

MACH 1.455

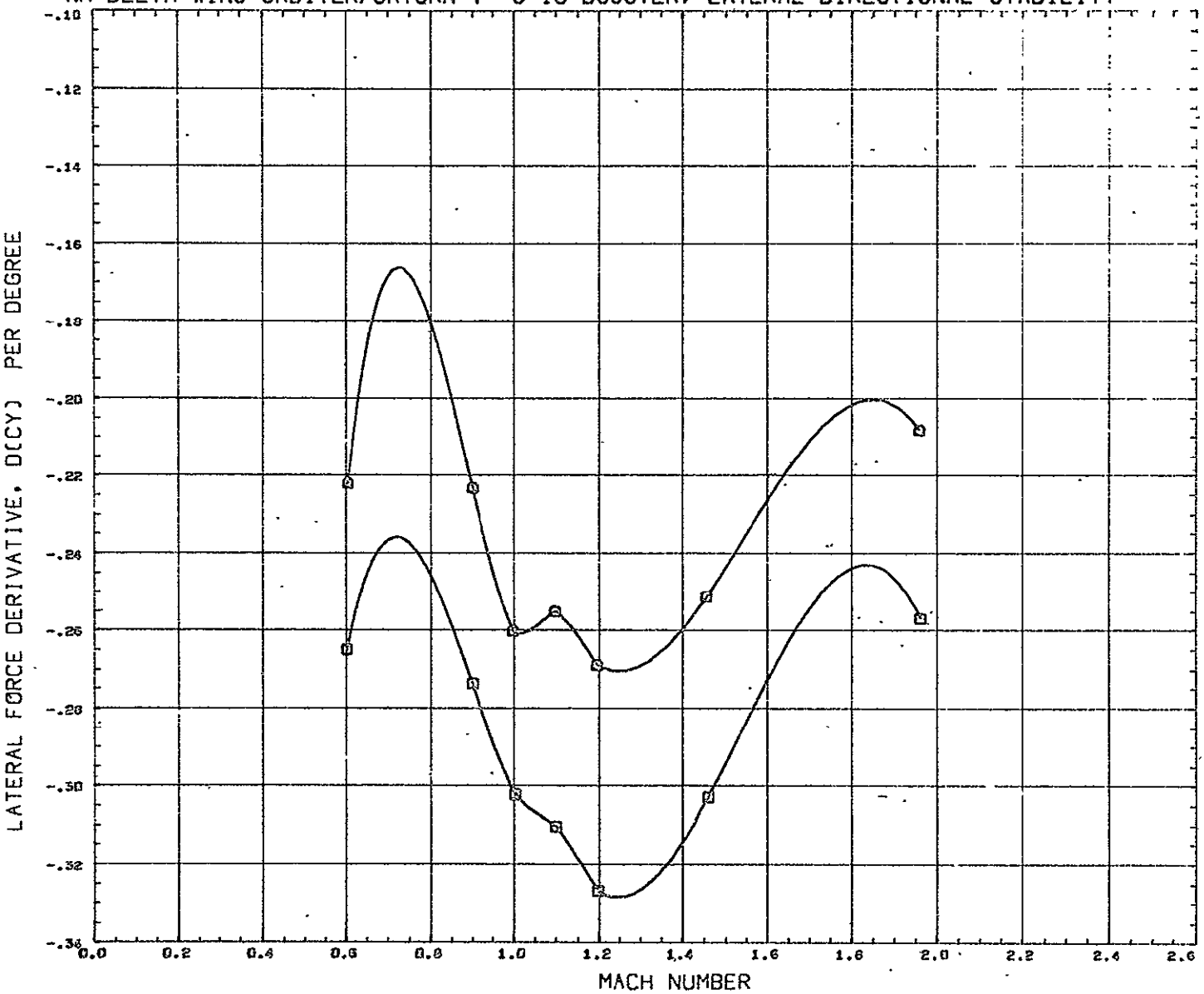
NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES				REFERENCE INFORMATION		
(R25053)	O	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	ALPHA	- 0.050	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R25093)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XMRP	5.2640	INCHES
								YMRP	0.0000	INCHES
								ZMRP	0.0330	INCHES
								SCALE	0.0034	

MACH 1.959

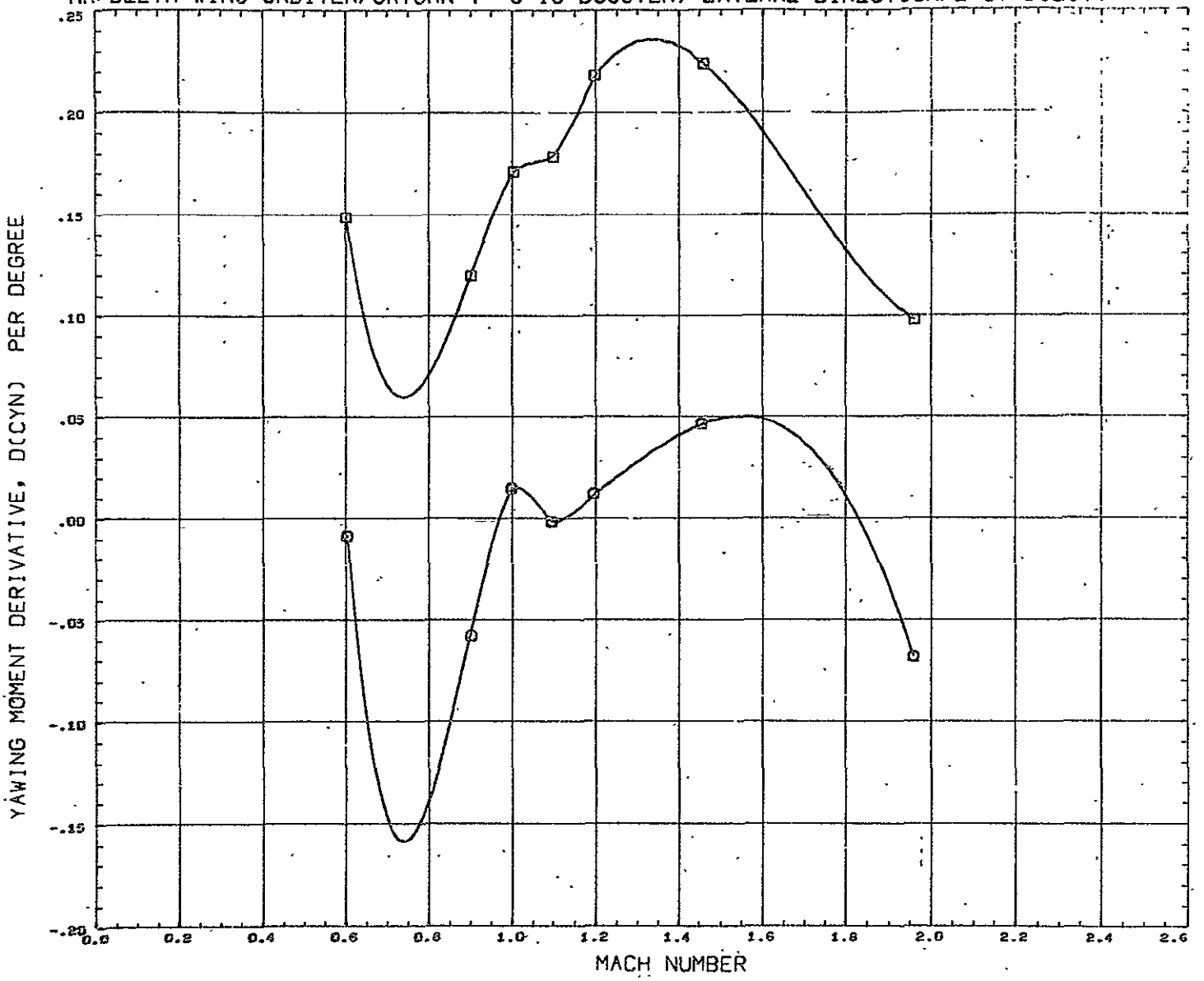
NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES			
(R25053)	○	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	ALPHA - 0.050	ORBINC	1.000	
(R25093)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17				

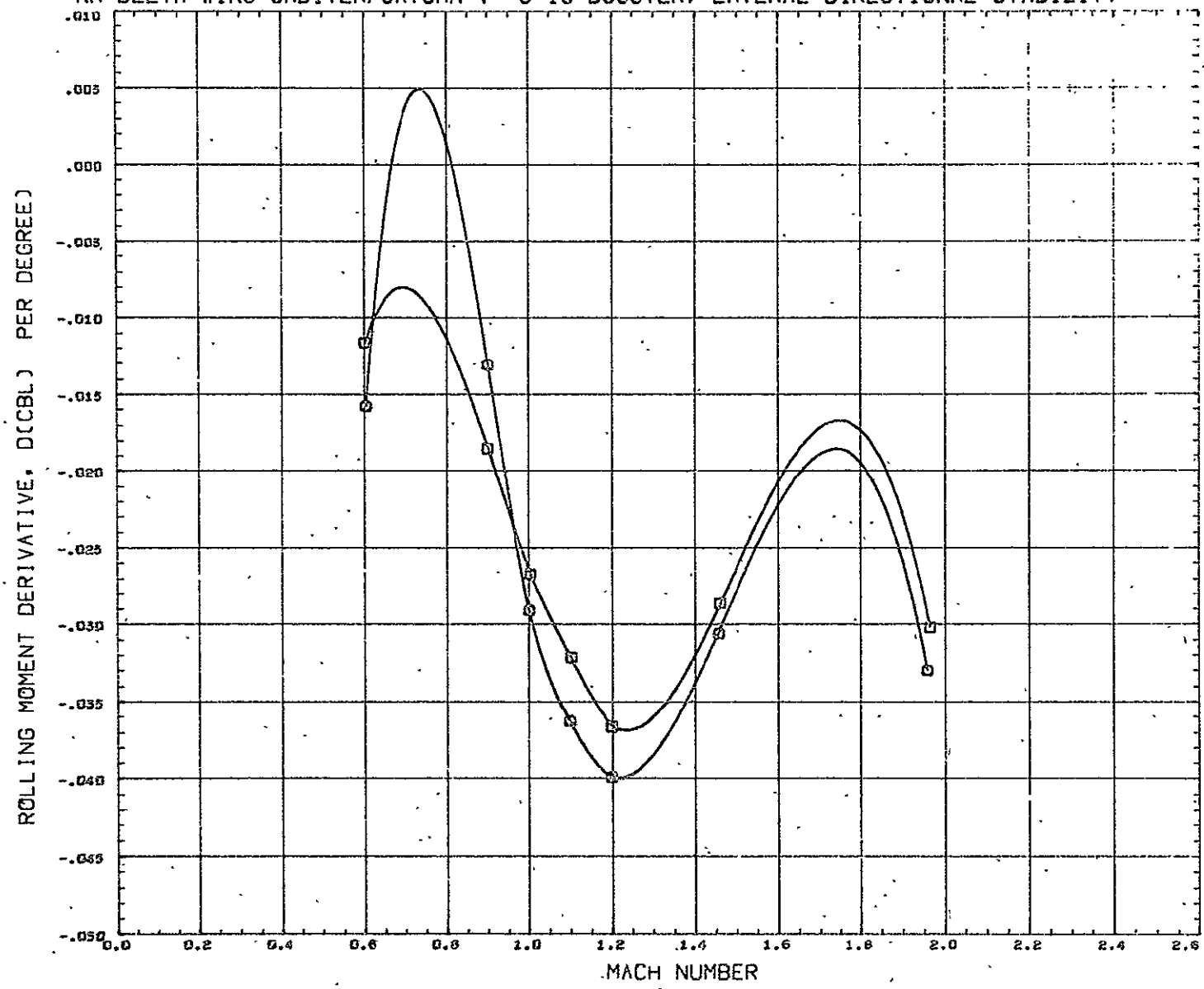
REFERENCE INFORMATION		
REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES				REFERENCE INFORMATION		
(R25053)	○	NSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	ALPHA	- 0.050	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R25093)	□	NSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XMRP	5.2640	INCHES
								YMRP	0.0000	INCHES
								ZMRP	0.0330	INCHES
								SCALE	0.0034	

NR DELTA WING ORBITER/SATURN V S-IC BOOSTER, LATERAL-DIRECTIONAL STABILITY

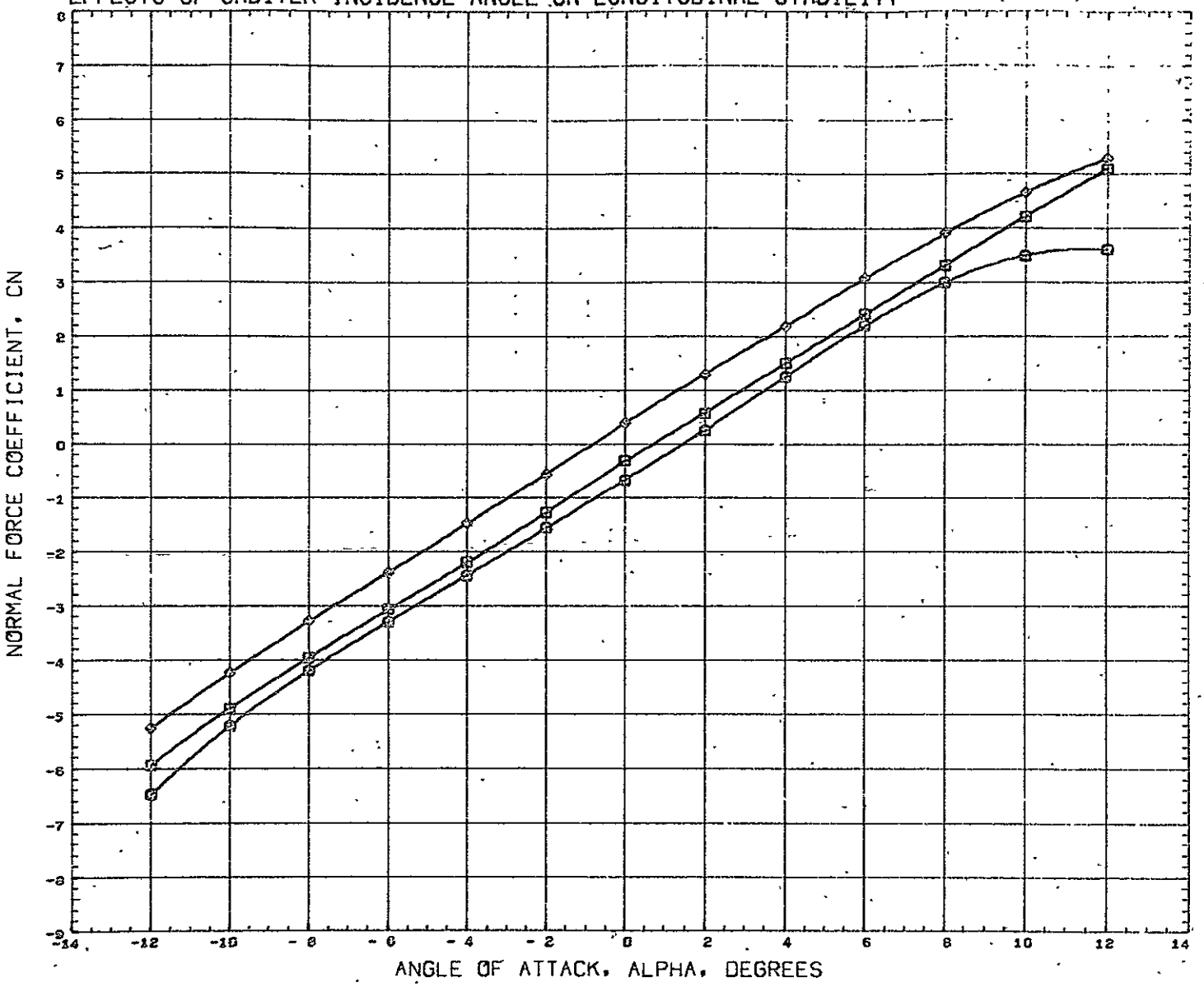


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	
(R25053)	○	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17
(R25093)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17

PARAMETRIC VALUES: ALFNA - 0.050 ORBINC 1.000

REFERENCE INFORMATION		
REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



SYMBOL	ORBINC		PARAMETRIC VALUES		
○	- 2.000	MACH	0.600	BETA	0.010
□	1.000				
◇	4.000				

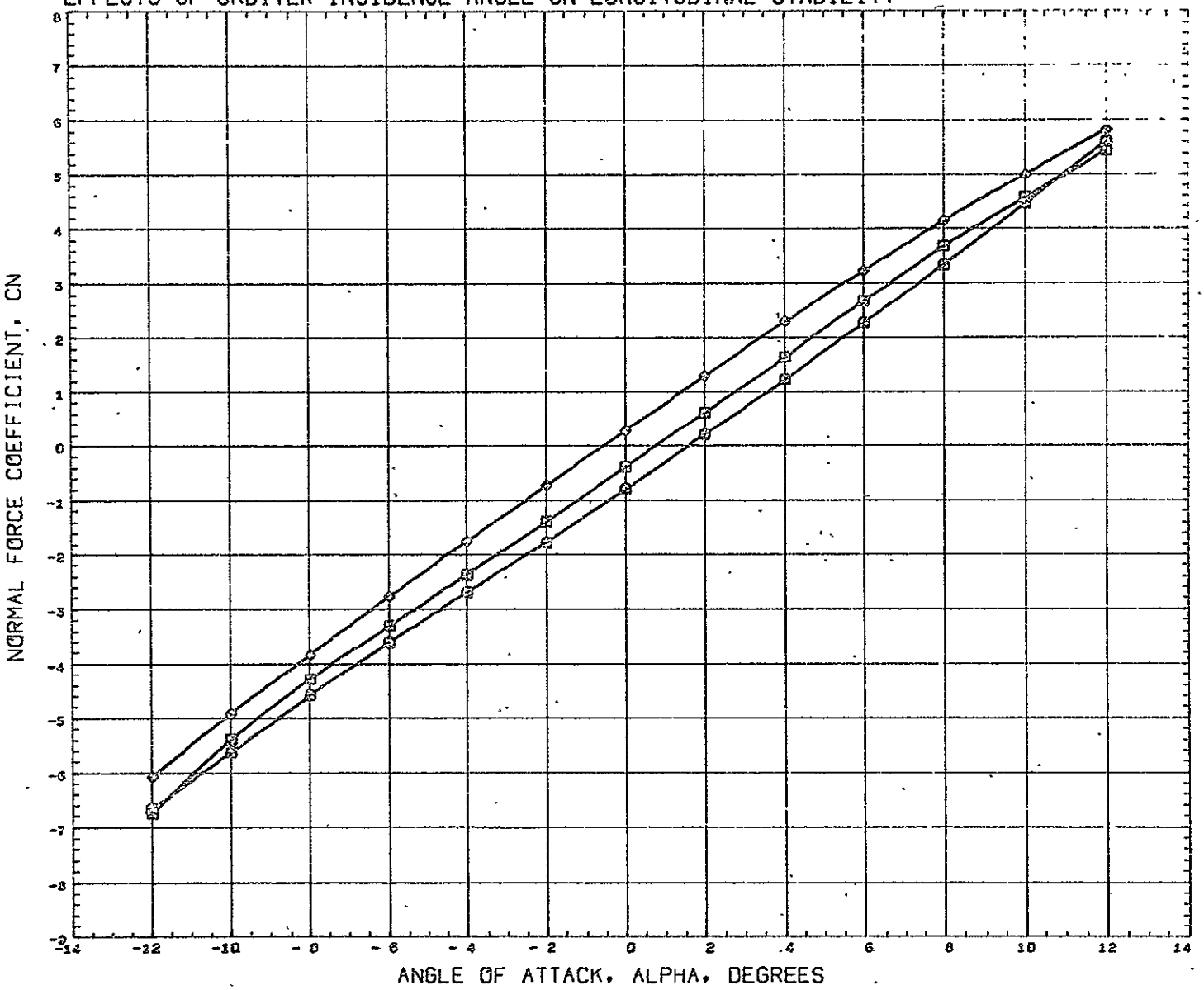
REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE .MMIF

MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17 (A25041) 14 JAN 71 PAGE 186

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



SYMBOL	ORBINC		PARAMETRIC VALUES		
○	2.000	MACH	0.900	BETA	0.010
□	1.000				
◇	4.000				

DATA HIST. CODE HHIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17 (A25041) 14 JAN 71 PAGE 187

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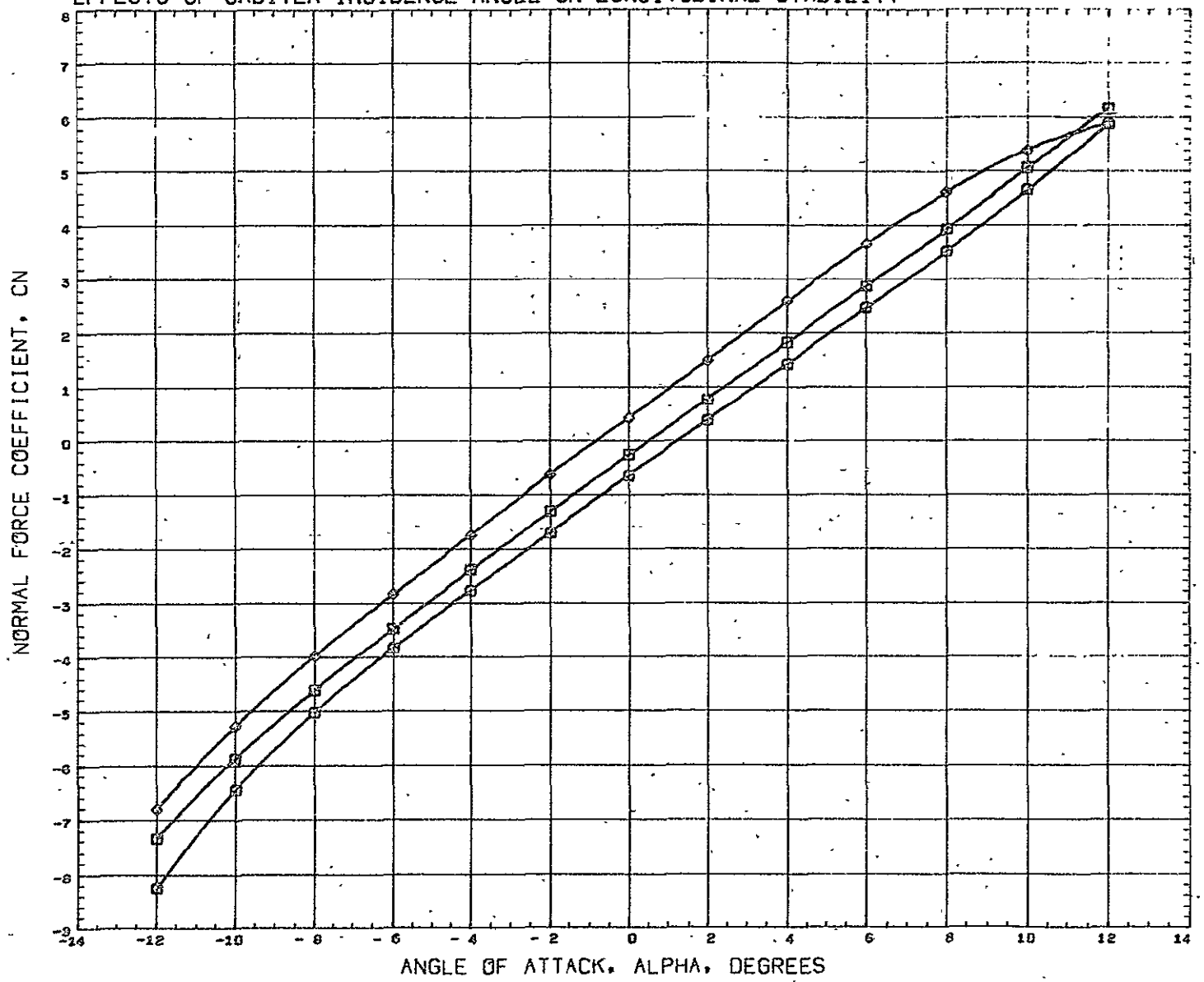
EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



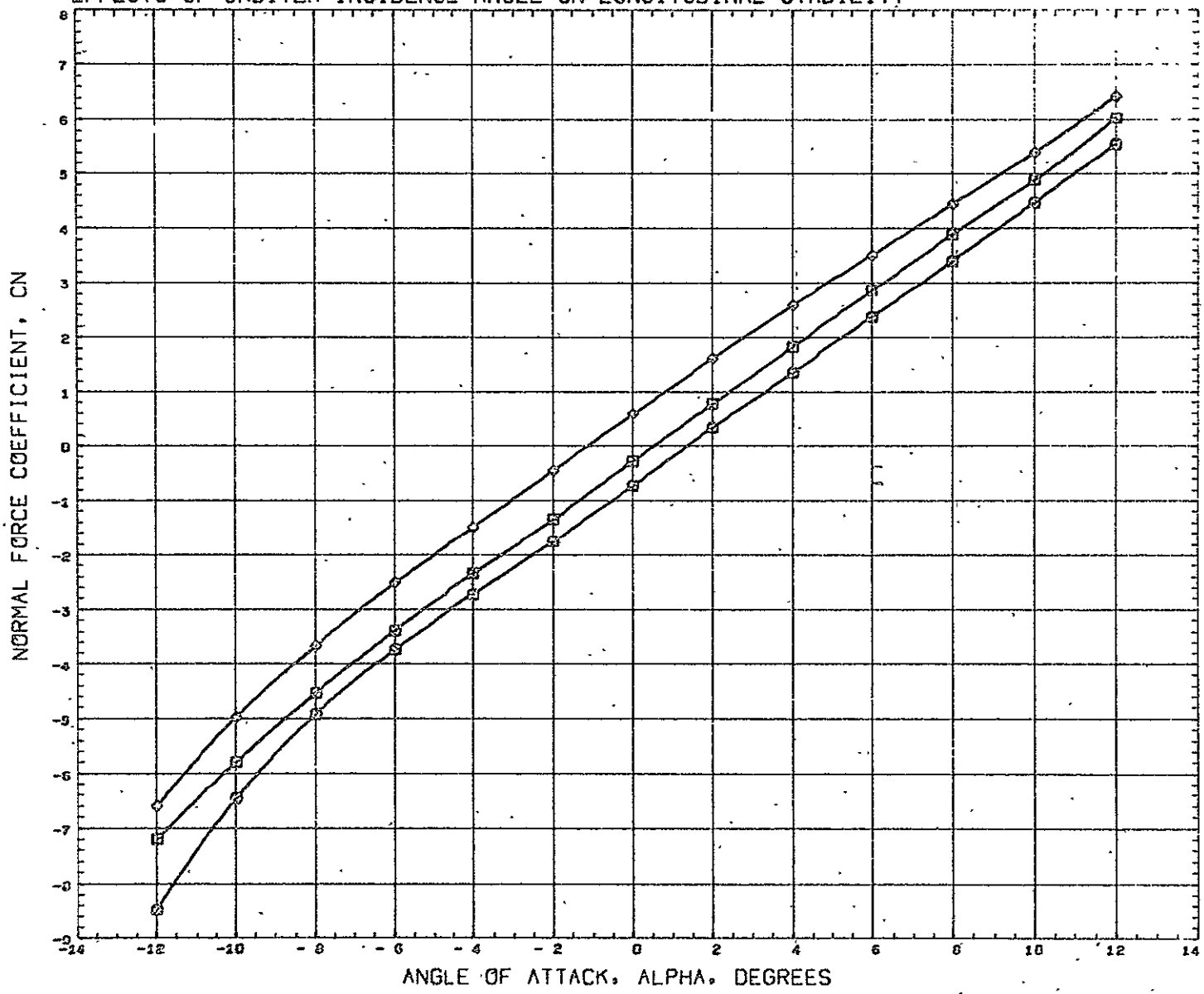
SYMBOL	ORBINC		PARAMETRIC VALUES		
○	2.000	MACH	1.000	BETA	0.010
□	1.000				
◇	4.000				

DATA HIST. CODE MMIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



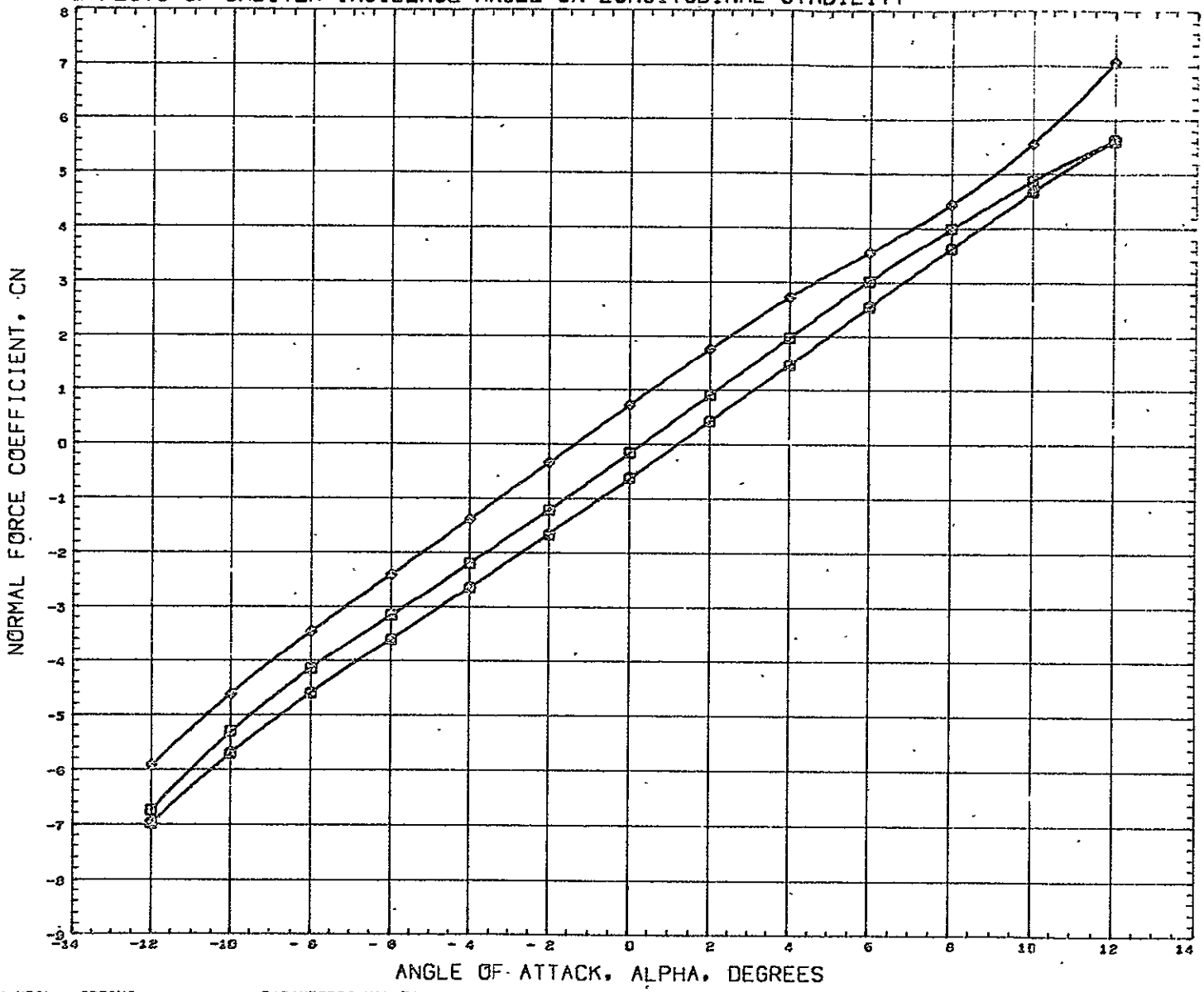
SYMBOL	ORBINC		PARAMETRIC VALUES		
□	- 2.000	MACH	1.100	BETA	0.010
□	1.000				
◇	4.000				

DATA HIST. CODE HMIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



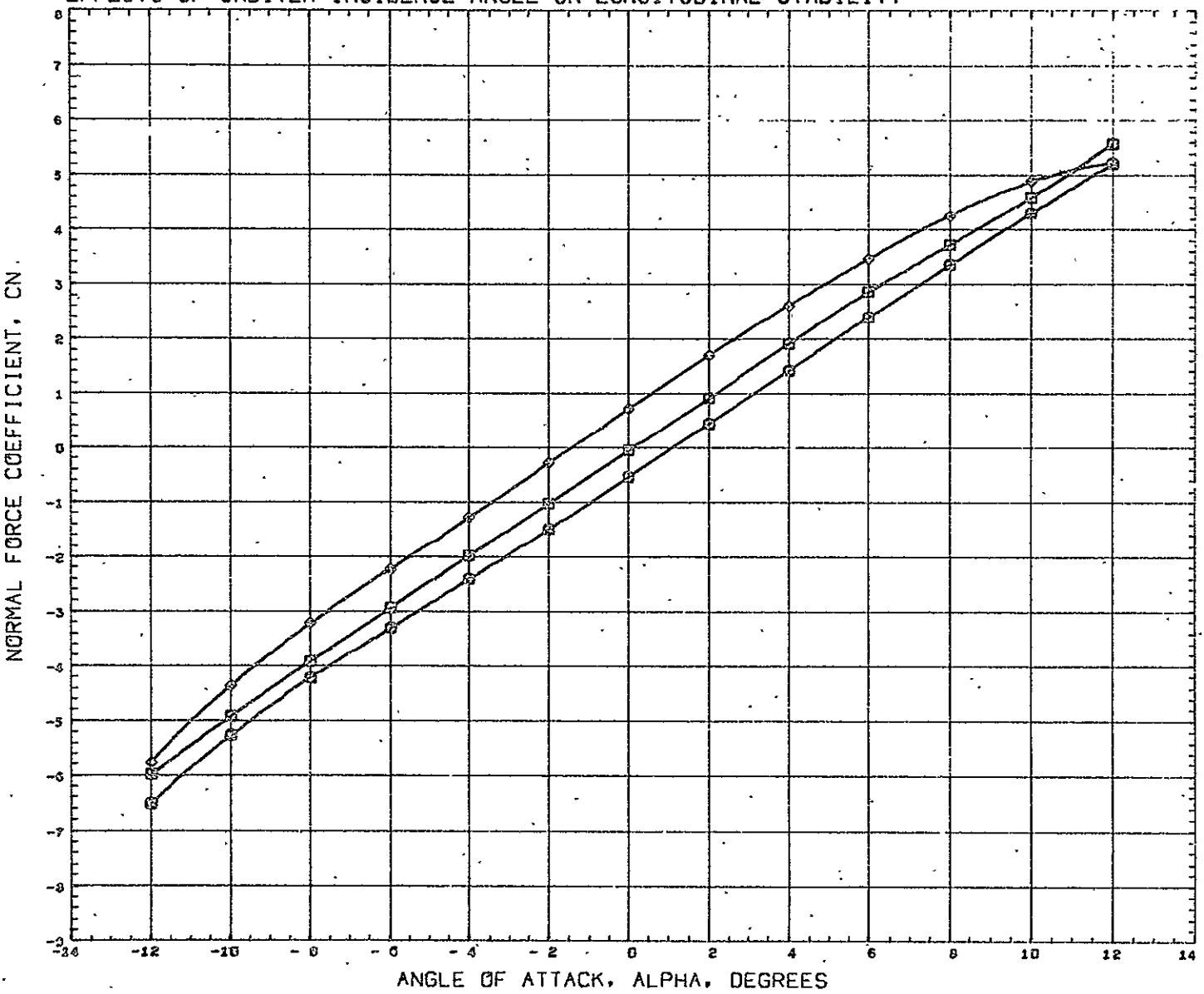
SYMBOL	ORBINC		PARAMETRIC VALUES		
○	2.000	MACH	1.200	BETA	0.010
□	1.000				
◇	4.000				

DATA HIST. CODE HHIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



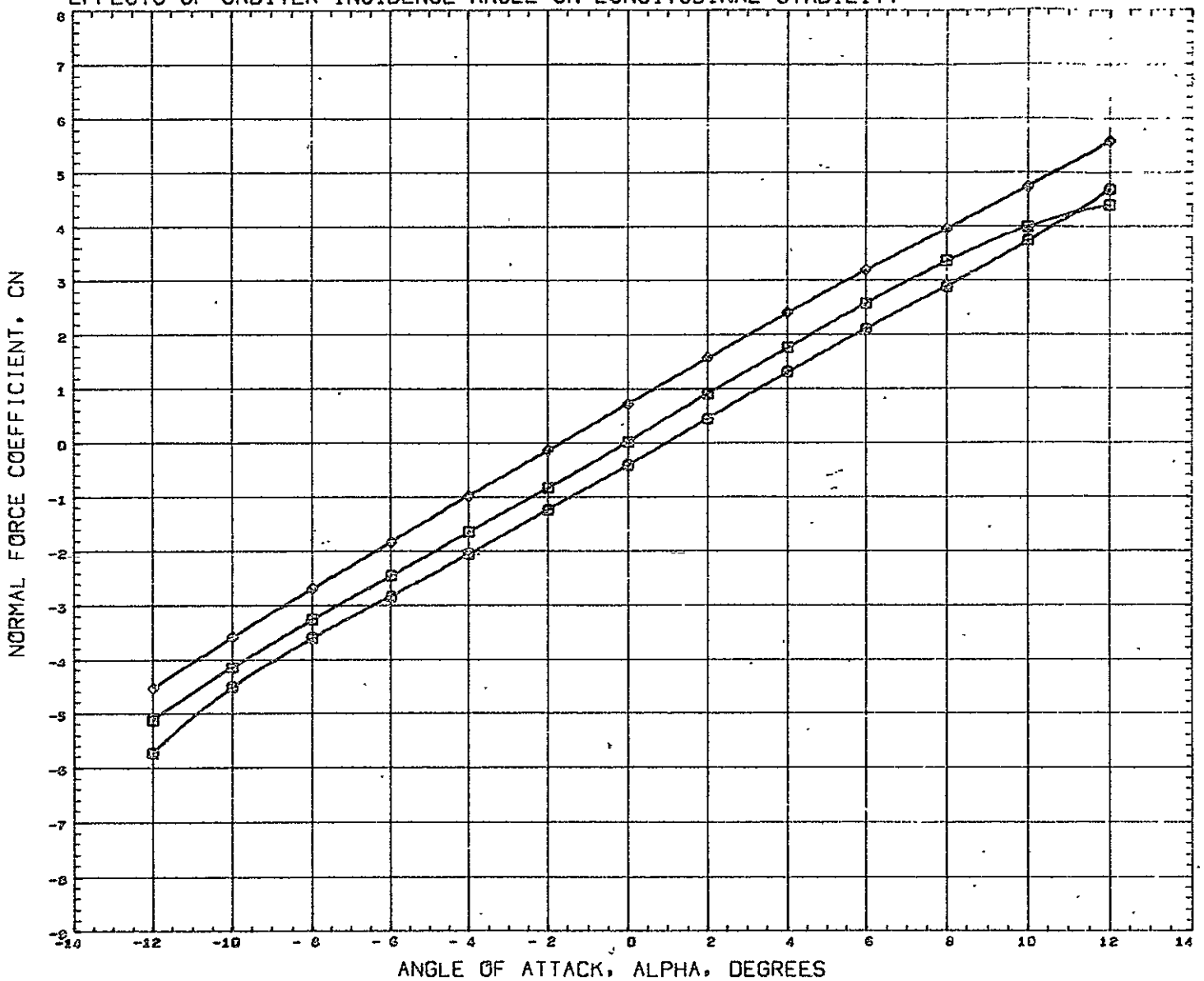
SYMBOL	ORBINC		PARAMETRIC VALUES		
○	2.000	MACH	1.460	BETA	0.010
□	1.000				
◇	4.000				

DATA HIST. CODE HHIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



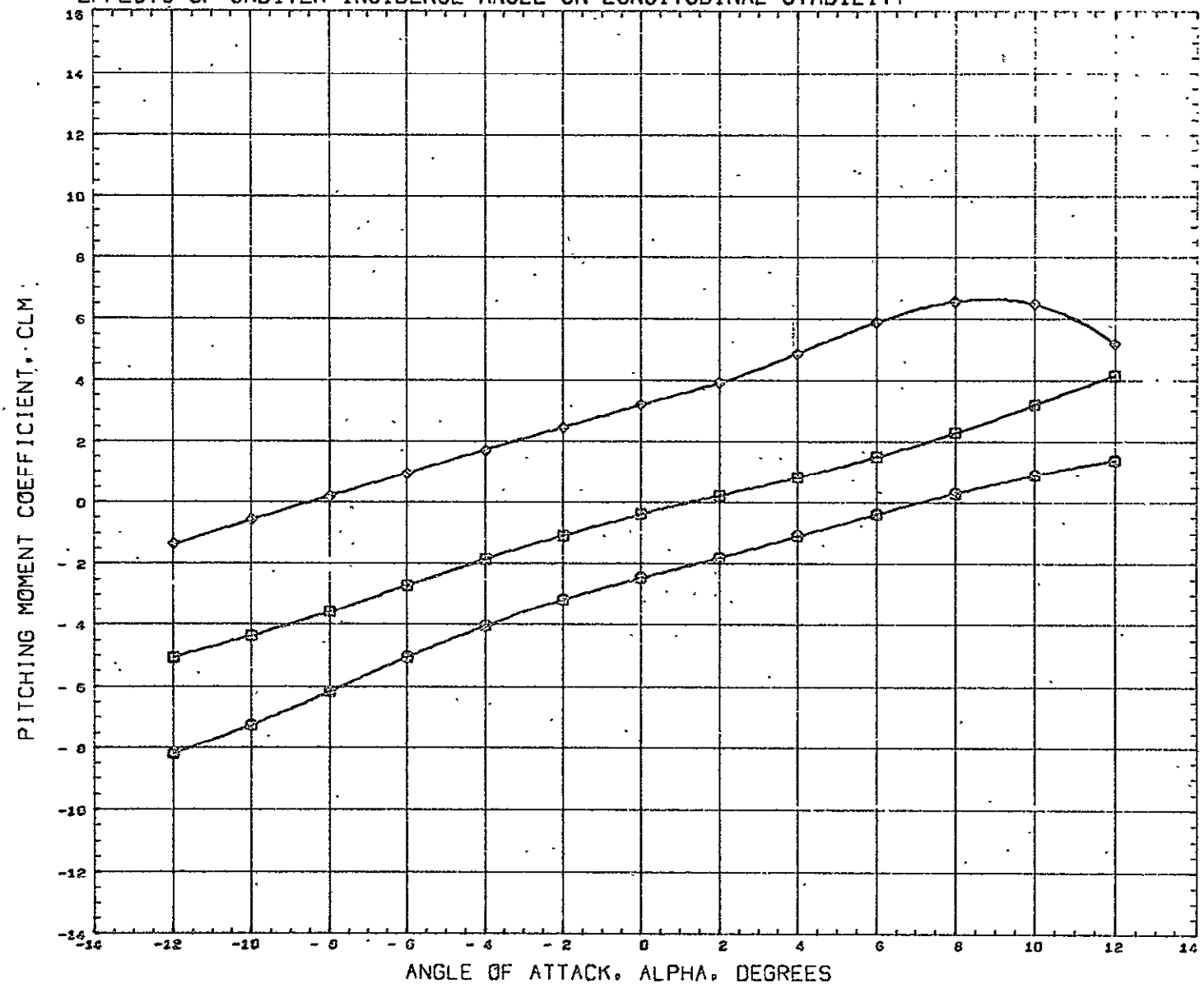
SYMBOL	ORBINC		PARAMETRIC VALUES		
○	- 2.000	MACH	1.960	BETA	0.010
□	1.000				
◇	4.000				

DATA HIST. CODE HMIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



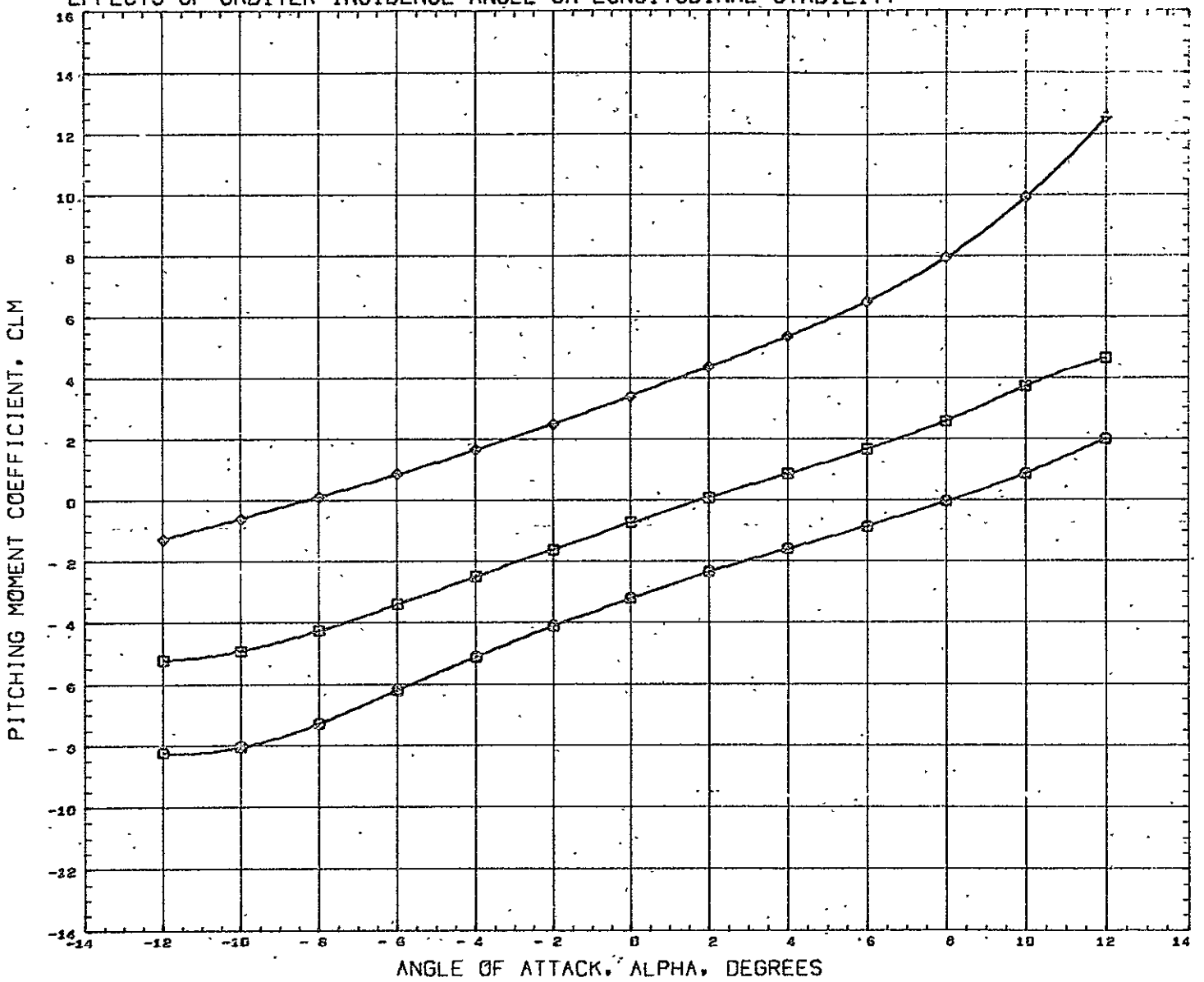
SYMBOL	ORBINC		PARAMETRIC VALUES		
□	2.000	MACH	0.600	BETA	0.010
□	1.000				
◇	4.000				

DATA HIST. CODE HNIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



SYMBOL	ORBINC		PARAMETRIC VALUES		
○	2.000	MACH	0.900	BETA	0.010
□	1.000				
◇	4.000				

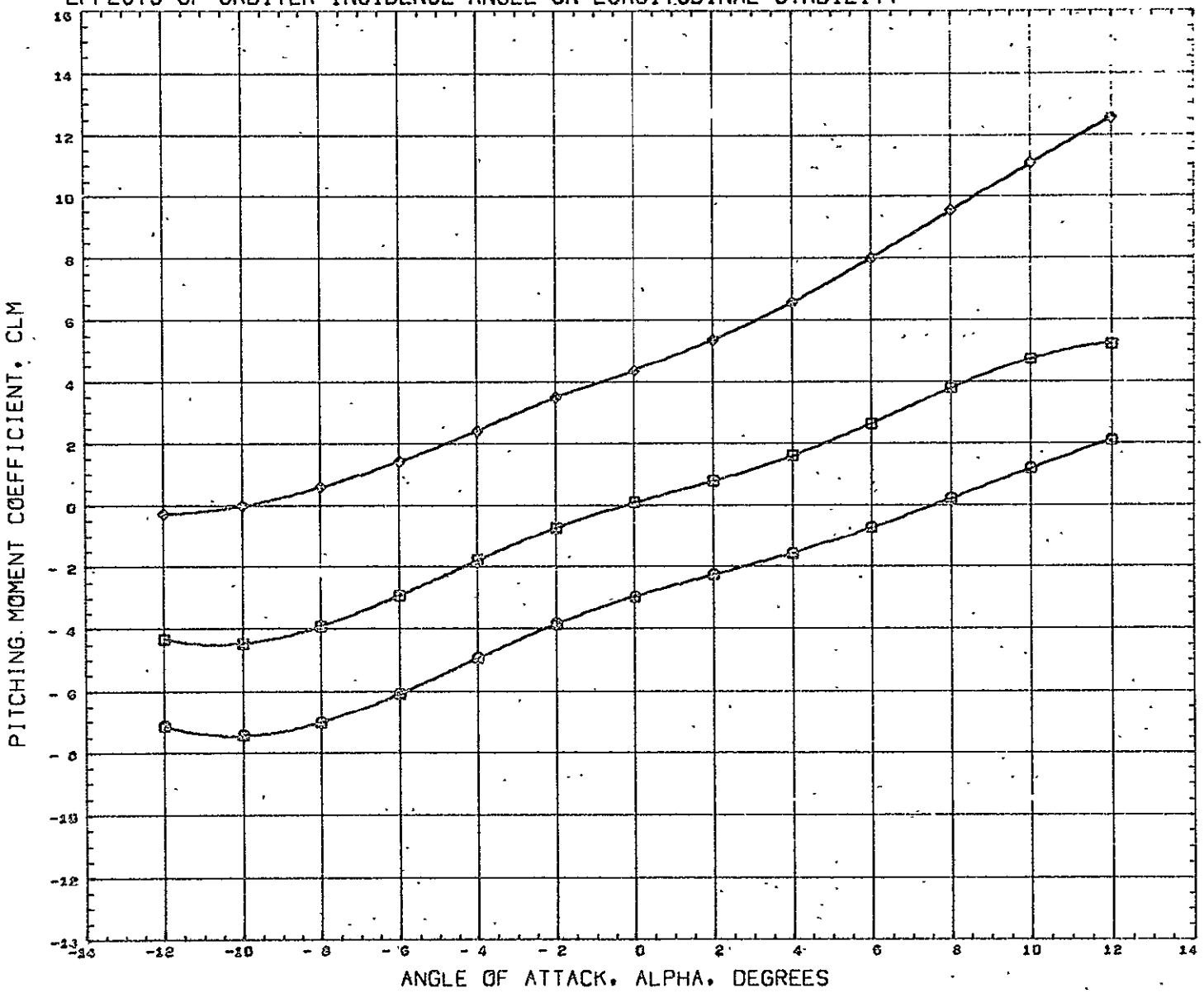
DATA HIST. CODE HMIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+BSW14E3V17 (A25041) 14 JAN 71 PAGE 194

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



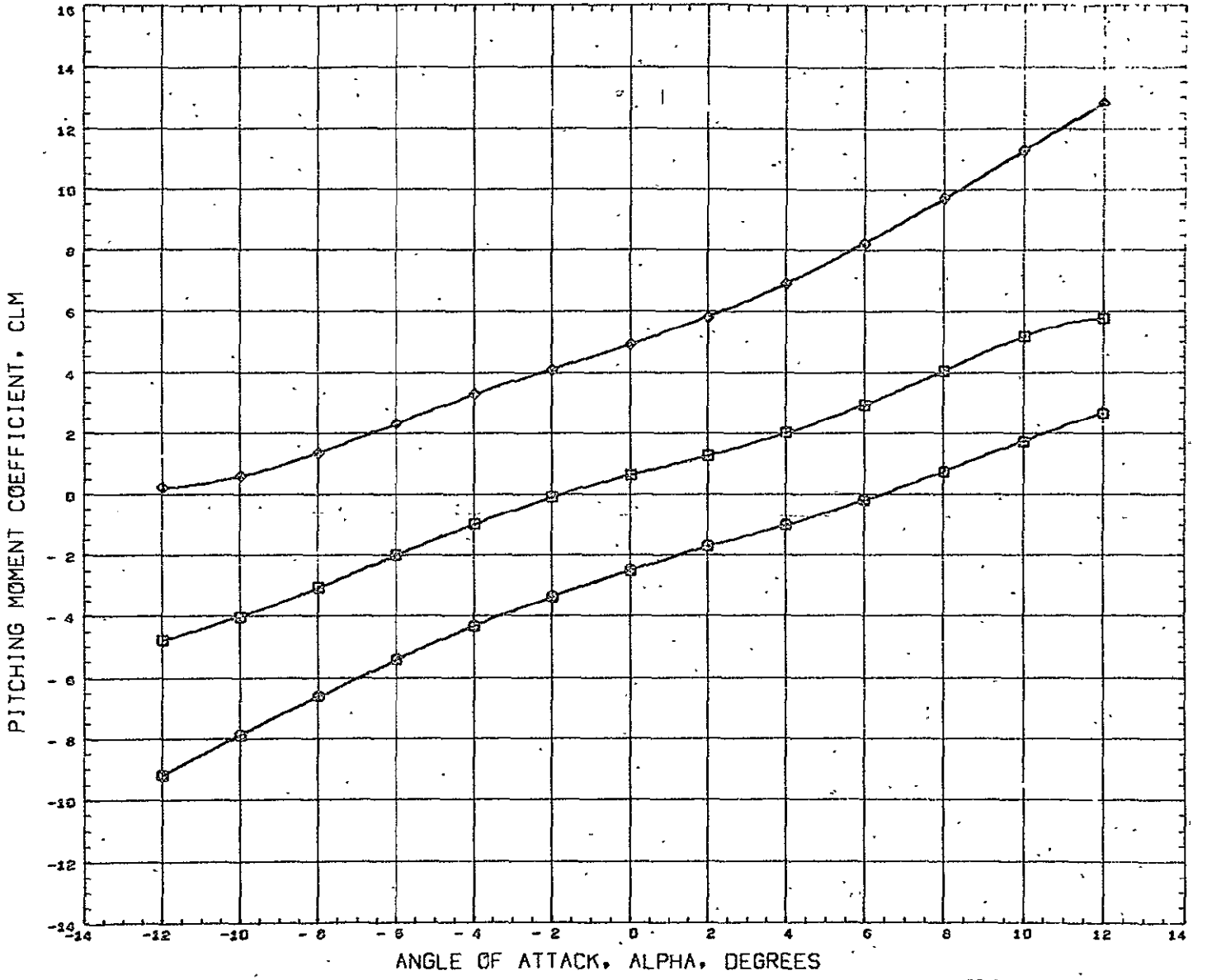
SYMBOL	ORBINC		PARAMETRIC VALUES		
○	2.000	MACH	1.000	BETA	0.010
□	1.000				
◇	4.000				

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE HMIF

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



SYMBOL	ORBINC		PARAMETRIC VALUES		
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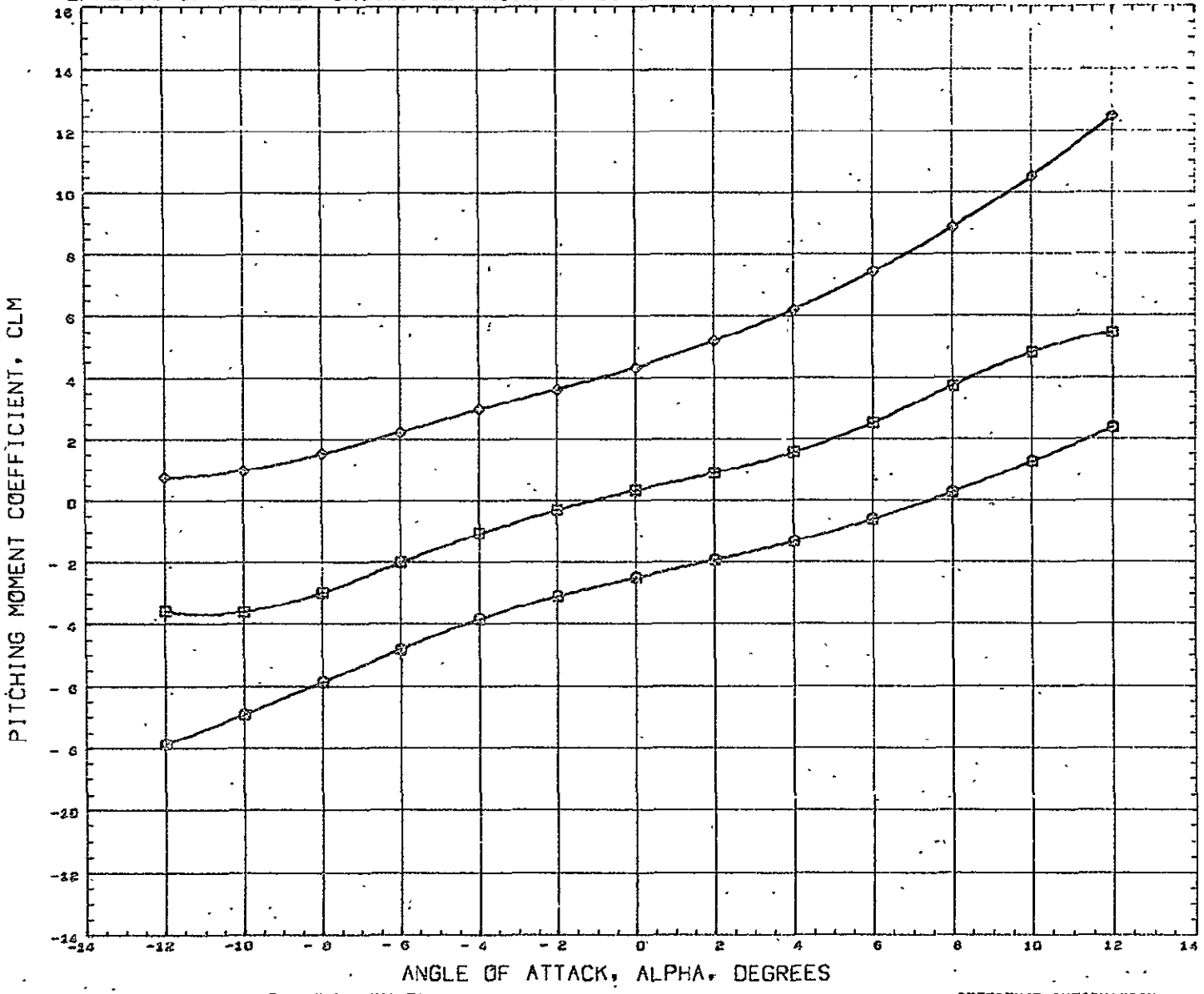
□	1.000				
◇	4.000				

REFERENCE INFORMATION

REFS	1.3960.	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE HMIF

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



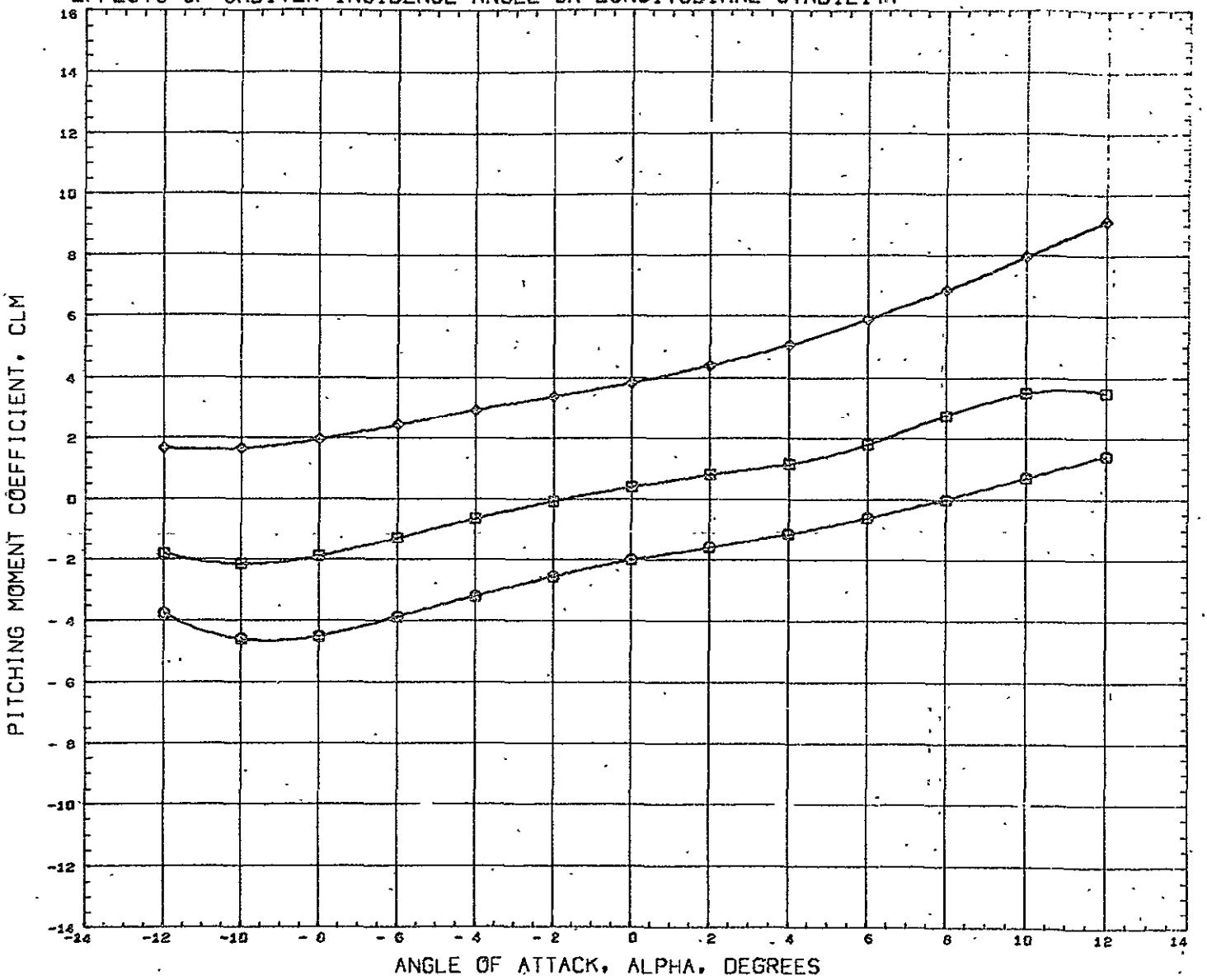
SYMBOL	ORBINC		PARAMETRIC VALUES		
○	- 2.000	MACH	1.200	BETA	0.010
□	1.000				
◇	4.000				

DATA HIST. CODE MHIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRF	5.2640	INCHES
YHRF	0.0000	INCHES
ZHRF	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



SYMBOL	ORBINC		PARAMETRIC VALUES		
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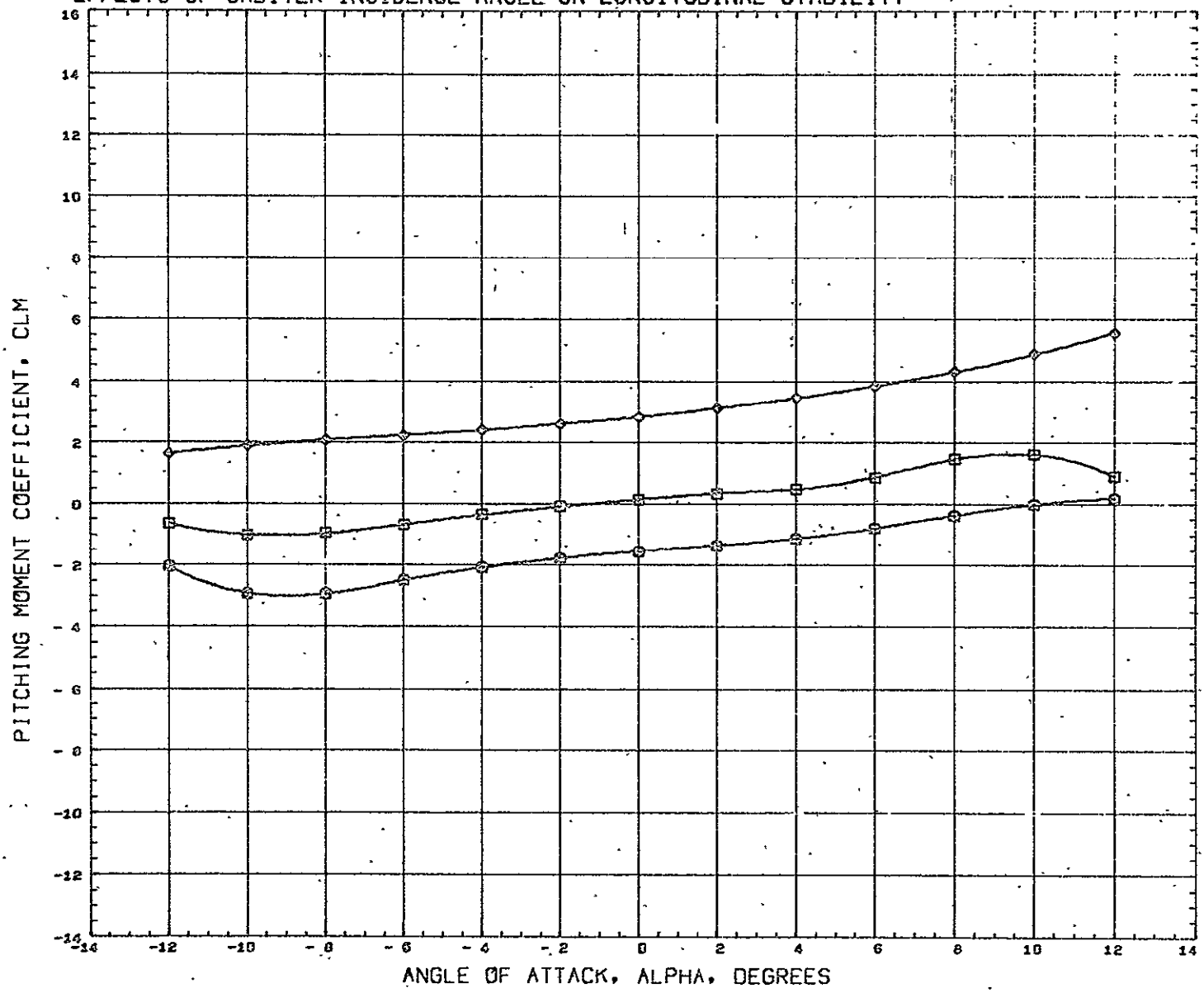
□	1.000				
◇	4.000				

DATA HIST. CODE HHIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRF	5.2640	INCHES
YMRF	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



SYMBOL	ORBINC		PARAMETRIC VALUES		
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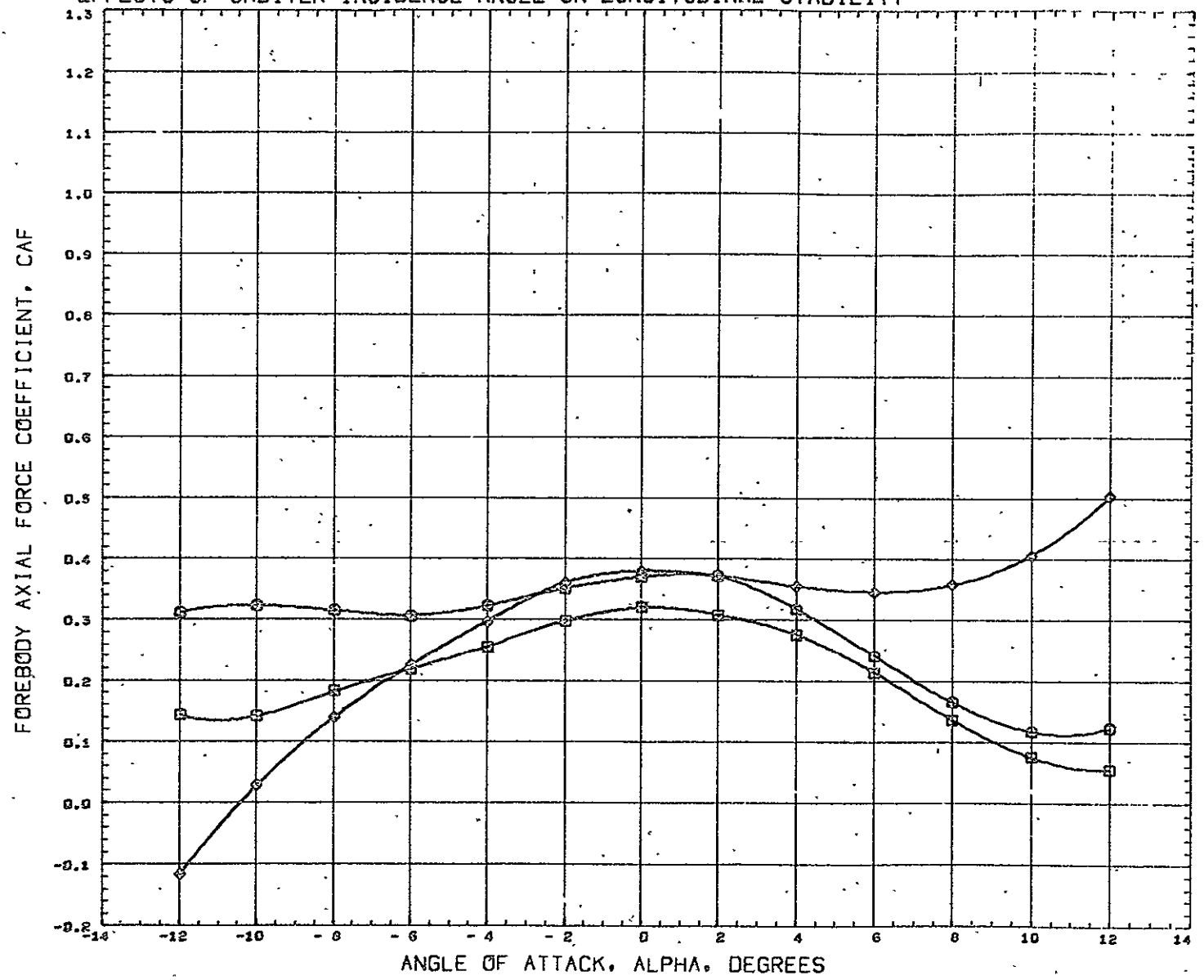
□	1.000				
◇	4.000				

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE MNIF

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



SYMBOL	ORBINC	PARAMETRIC VALUES			
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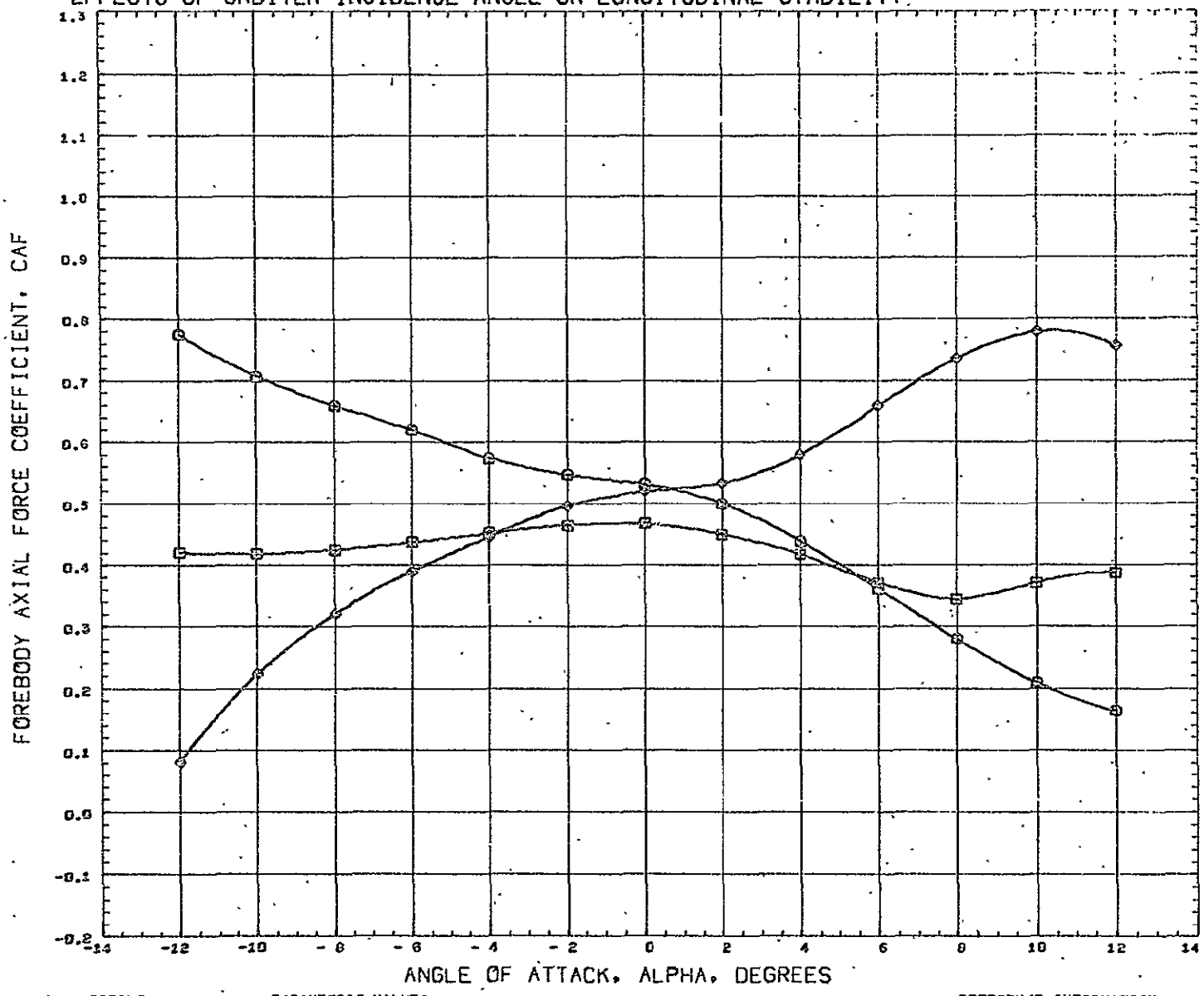
□	1.000				
◇	4.000				

DATA HIST. CODE HHIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



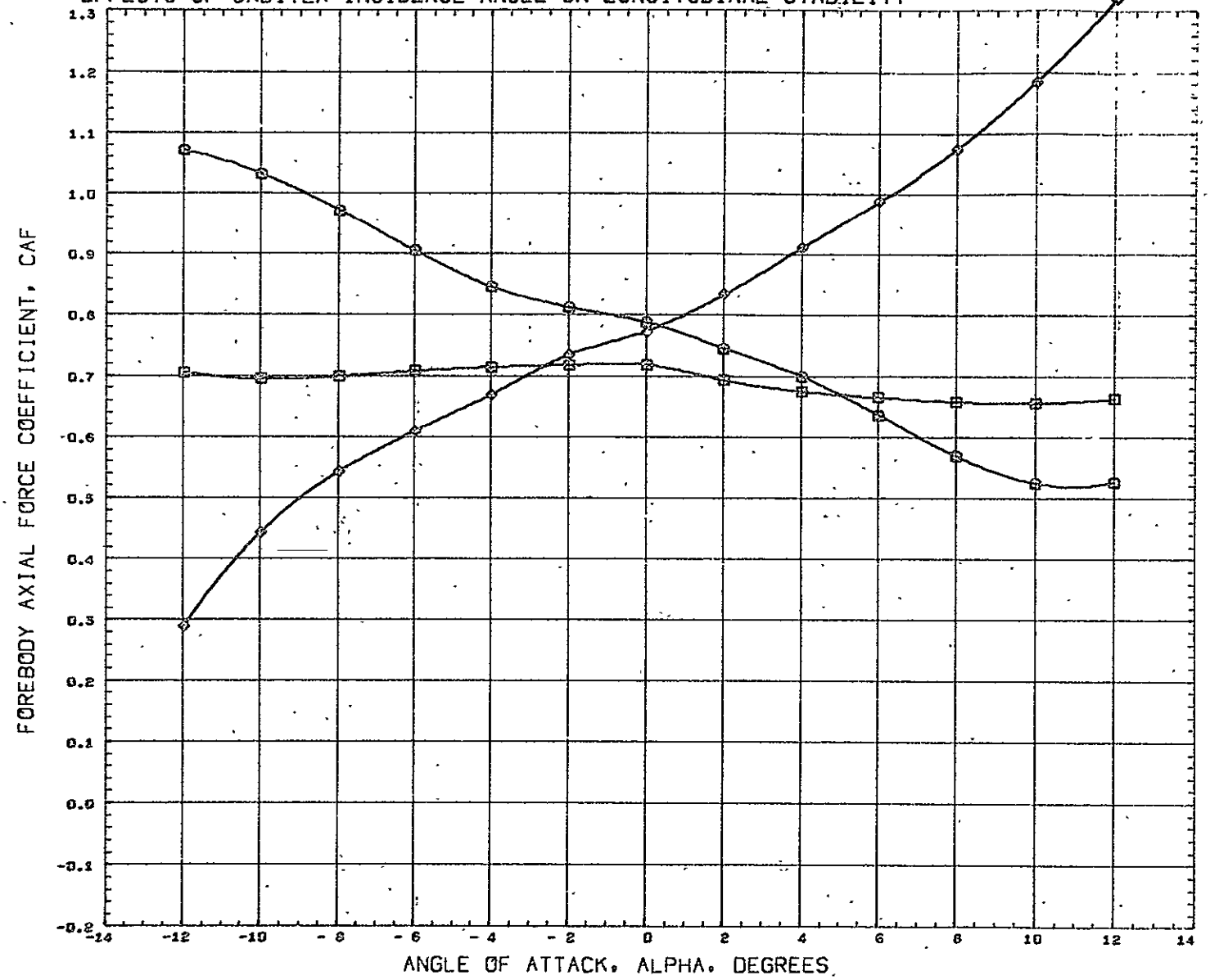
SYMBOL	ORBIAC	PARAMETRIC VALUES			
○	2.000	MACH	0.900	BETA	0.010
□	1.000				
◇	4.000				

DATA HIST. CODE HNIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



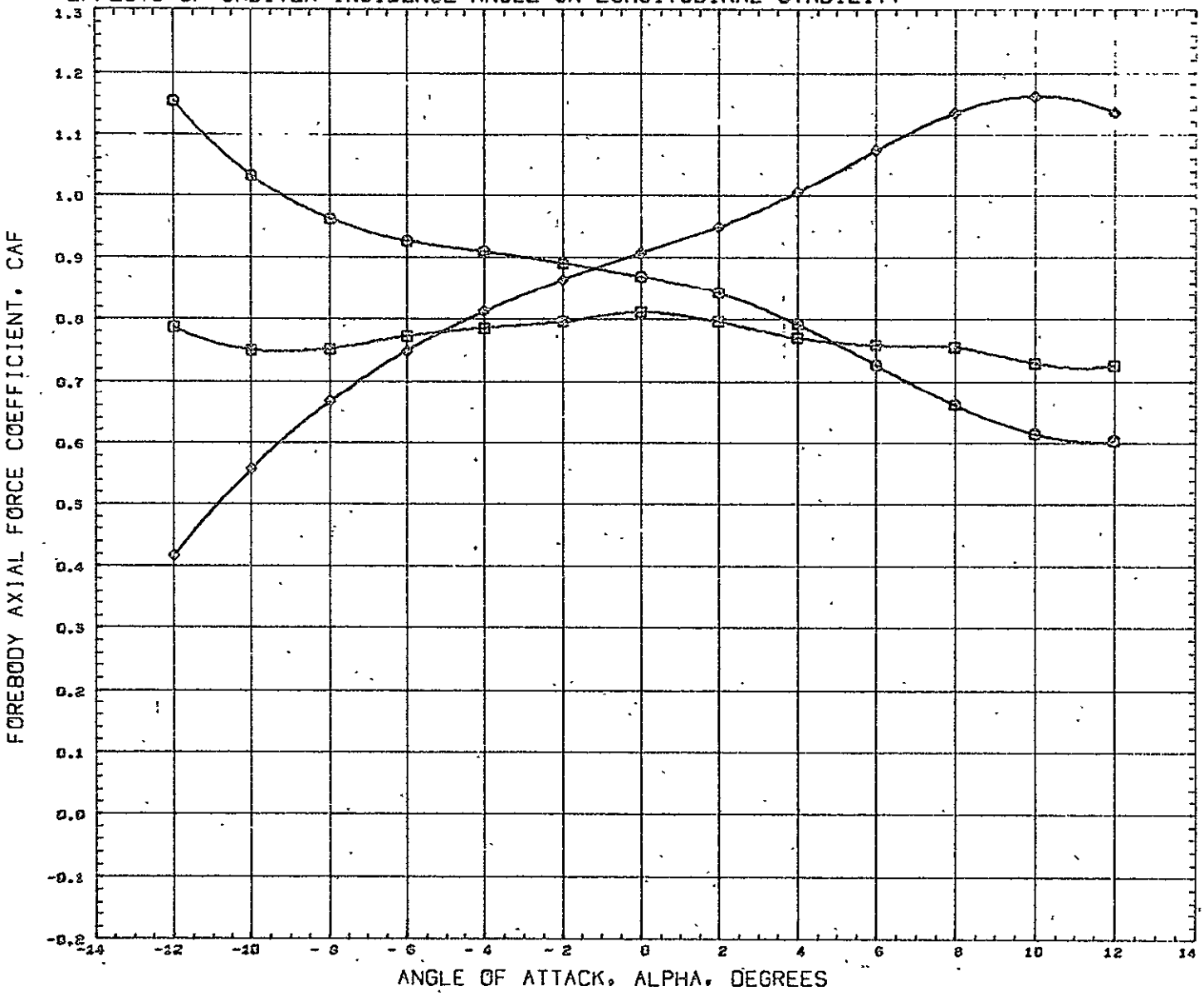
SYMBOL	ORBINC		PARAMETRIC VALUES		
○	2.000	MACH	1.000	BETA	0.010
□	1.000				
◇	4.000				

DATA HIST. CODE HHIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



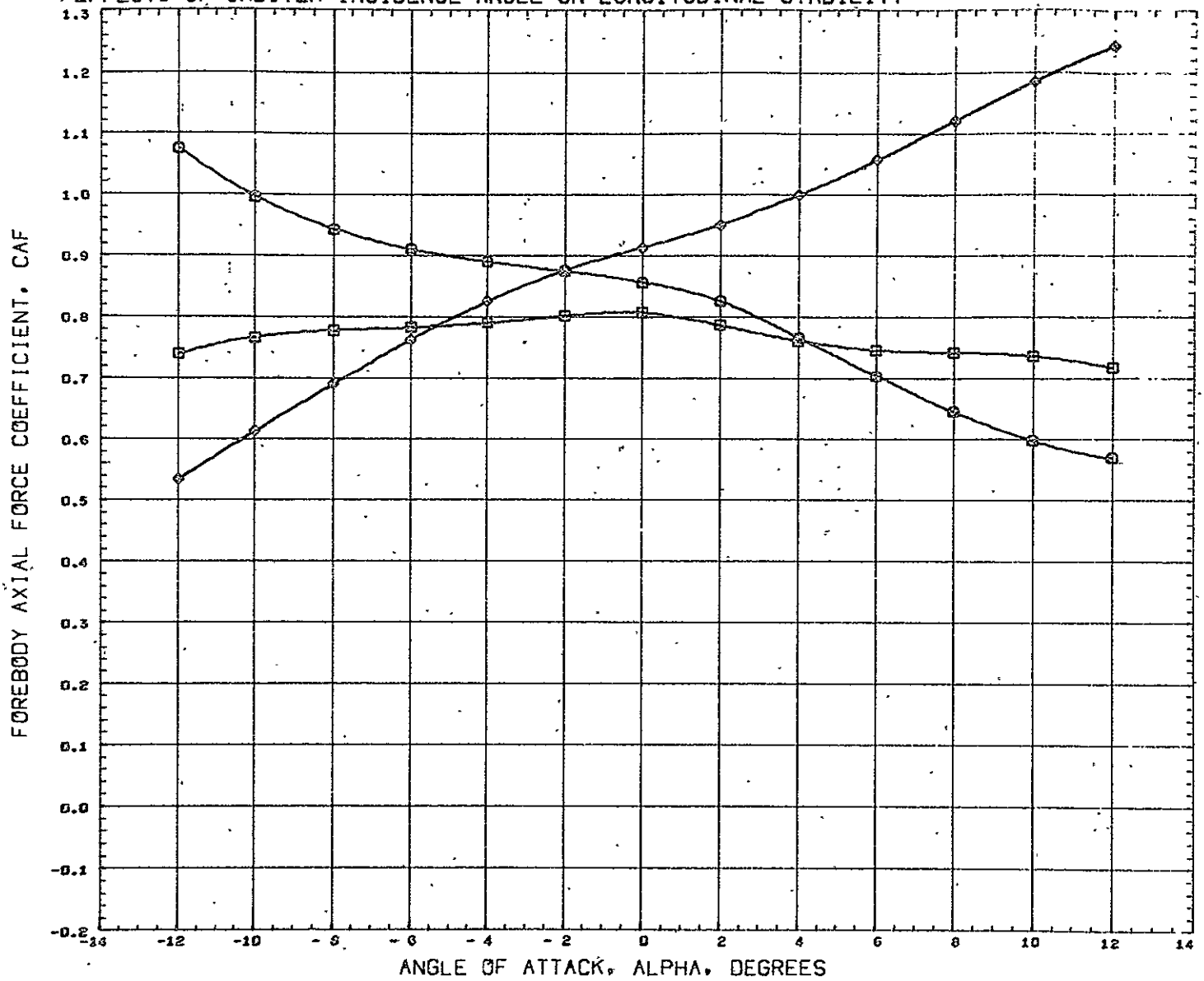
SYMBOL	ORBINC		PARAMETRIC VALUES		
○	2.000	MACH	1.100	BETA	0.010
□	1.000				
◇	4.000				

DATA HIST. CODE HMIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



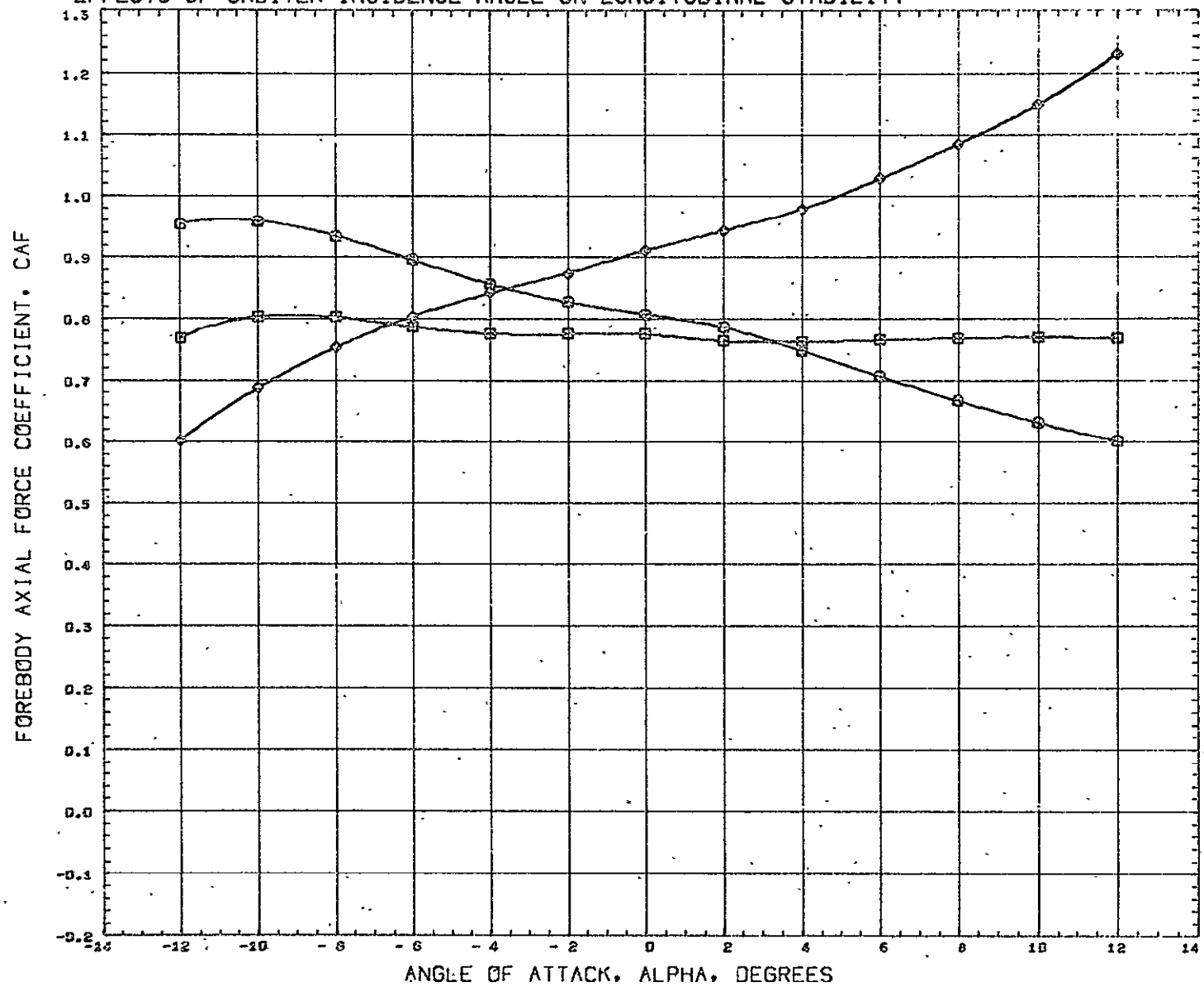
SYMBOL	ORBINC		PARAMETRIC VALUES		
○	- 2.000	MACH	1.200	BETA	0.010
□	1.000				
◇	4.000				

DATA HIST. CODE HHIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



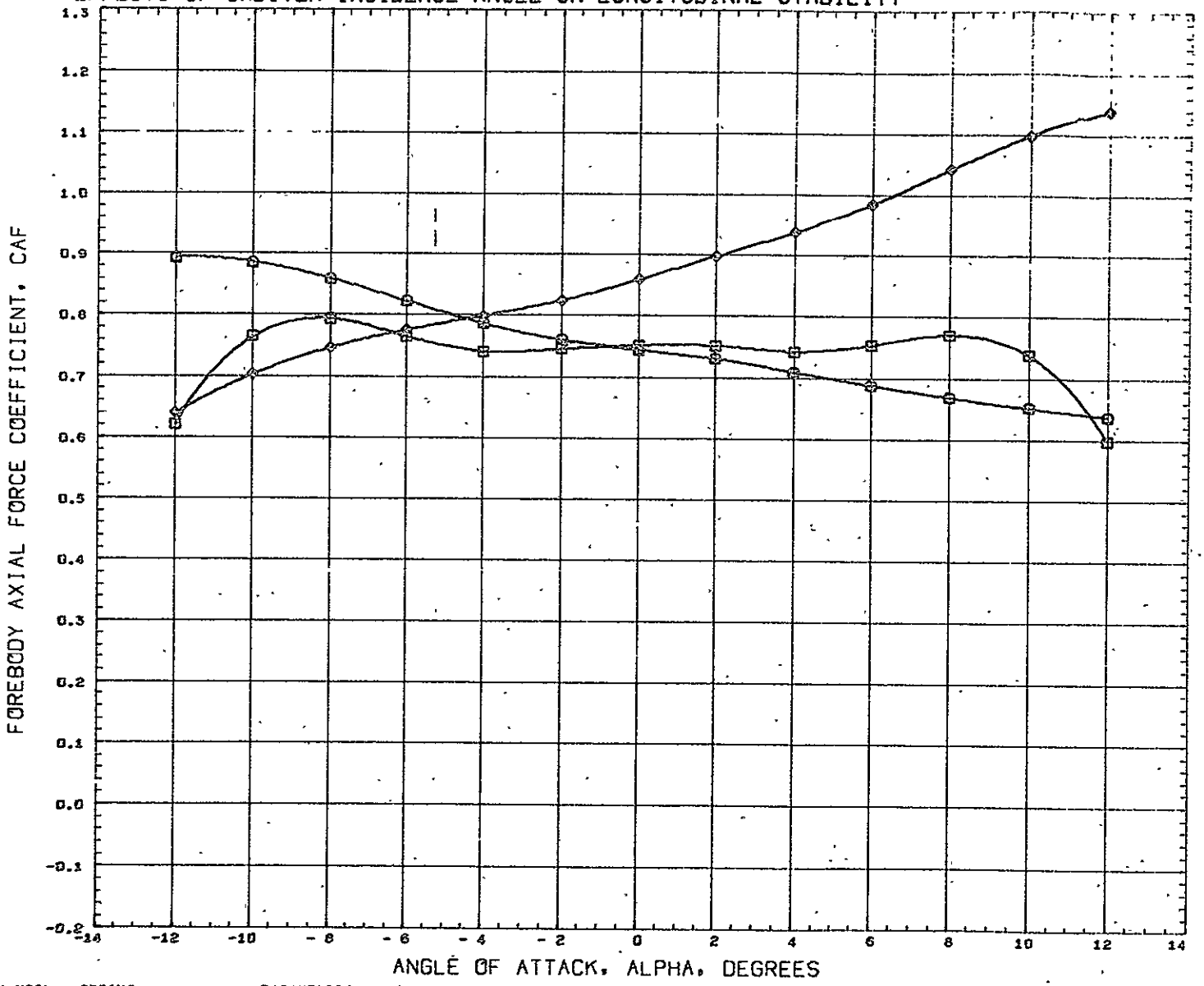
SYMBOL	ORBINC		PARAMETRIC VALUES		
○	2.000	MACH	1.460	BETA	0.010
□	1.000				
◇	4.000				

DATA HIST. CODE HMIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



SYMBOL	ORBINC
○	2.000
□	1.000
◇	4.000

PARAMETRIC VALUES

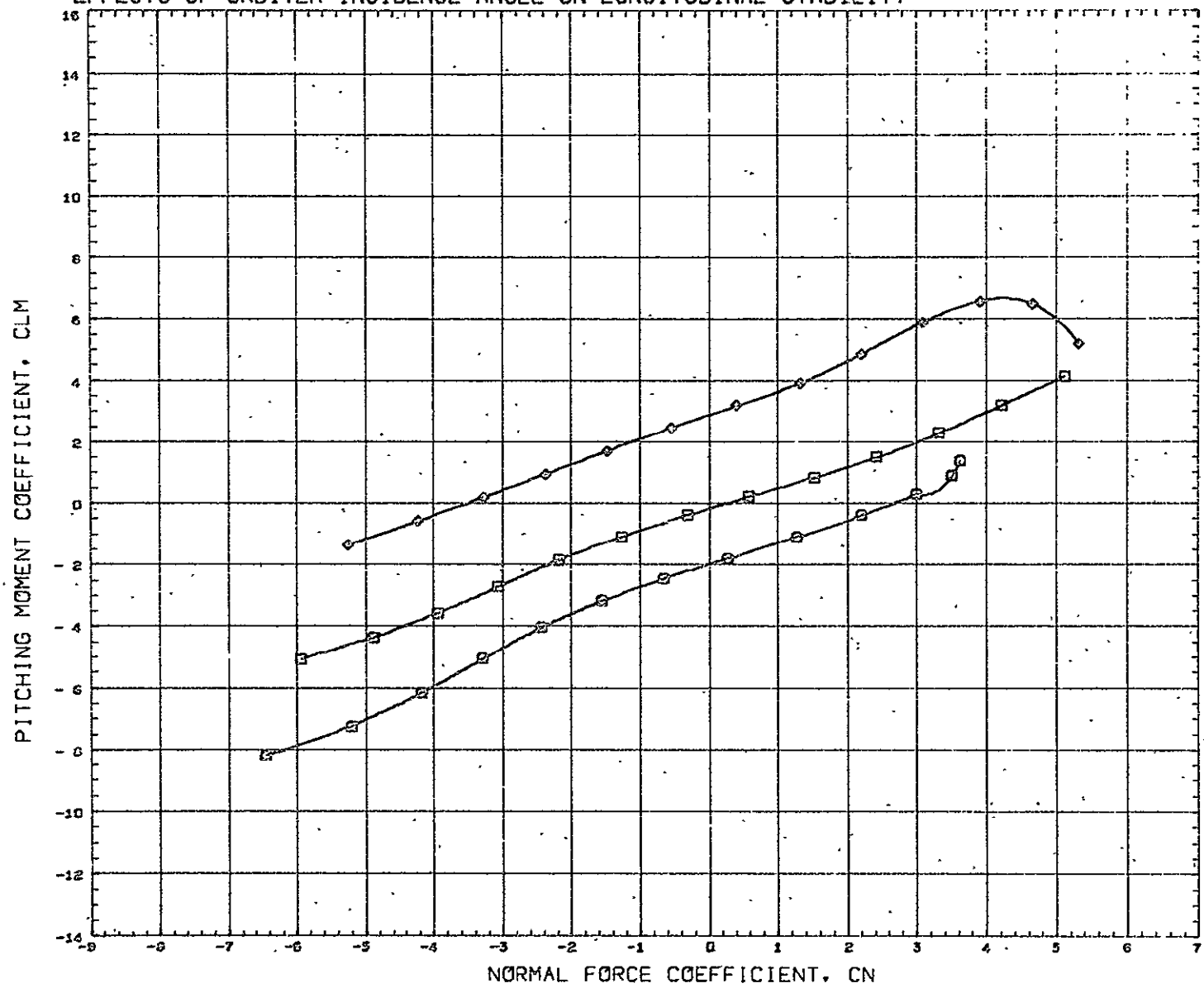
MACH 1.960 BETA 0.010

DATA HIST. CODE MMIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



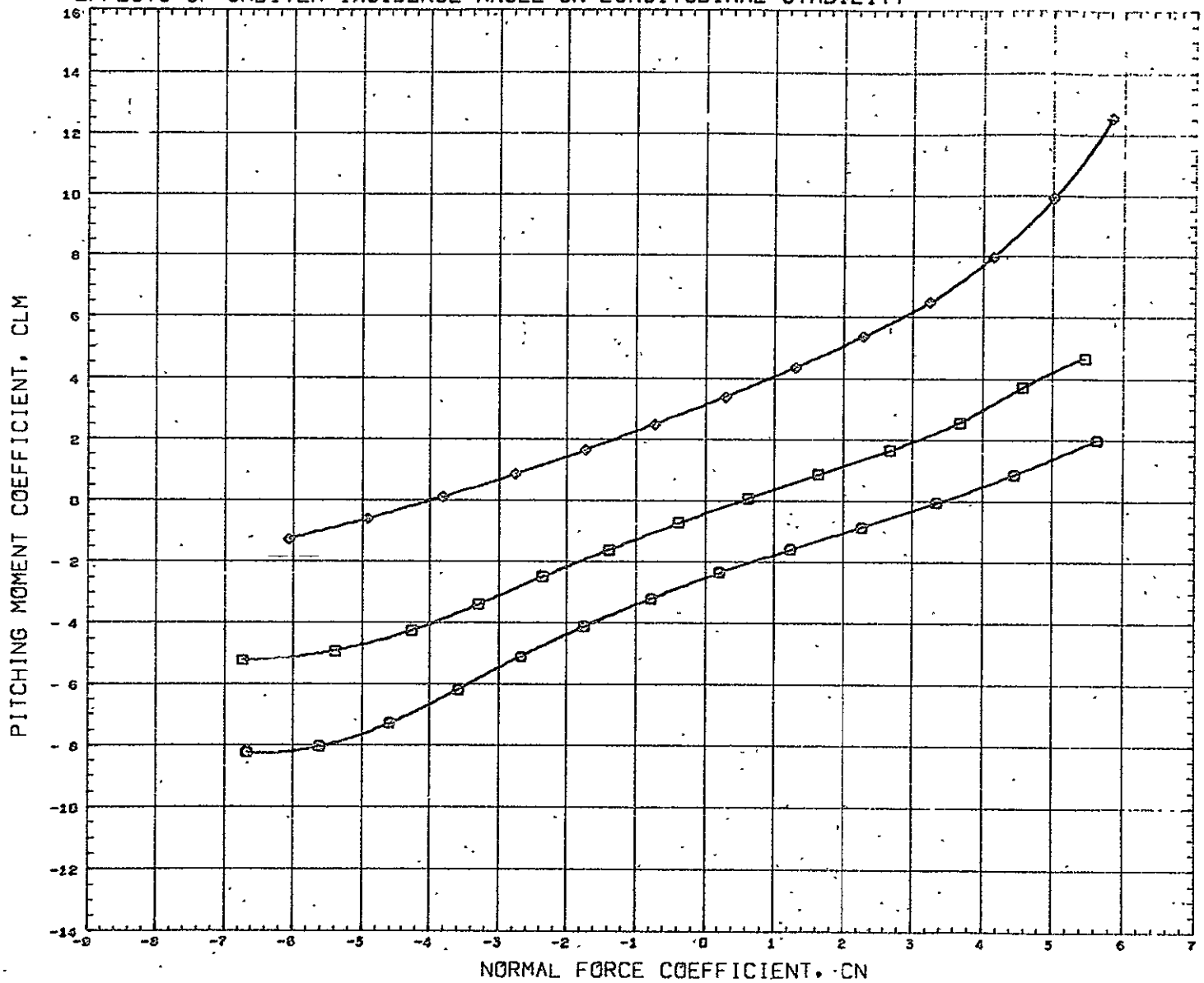
SYMBOL	ORBINC		PARAMETRIC VALUES		
□	2.000	MACH	0.600	BETA	0.010
□	1.000				
◇	4.000				

DATA HIST. CODE HHIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



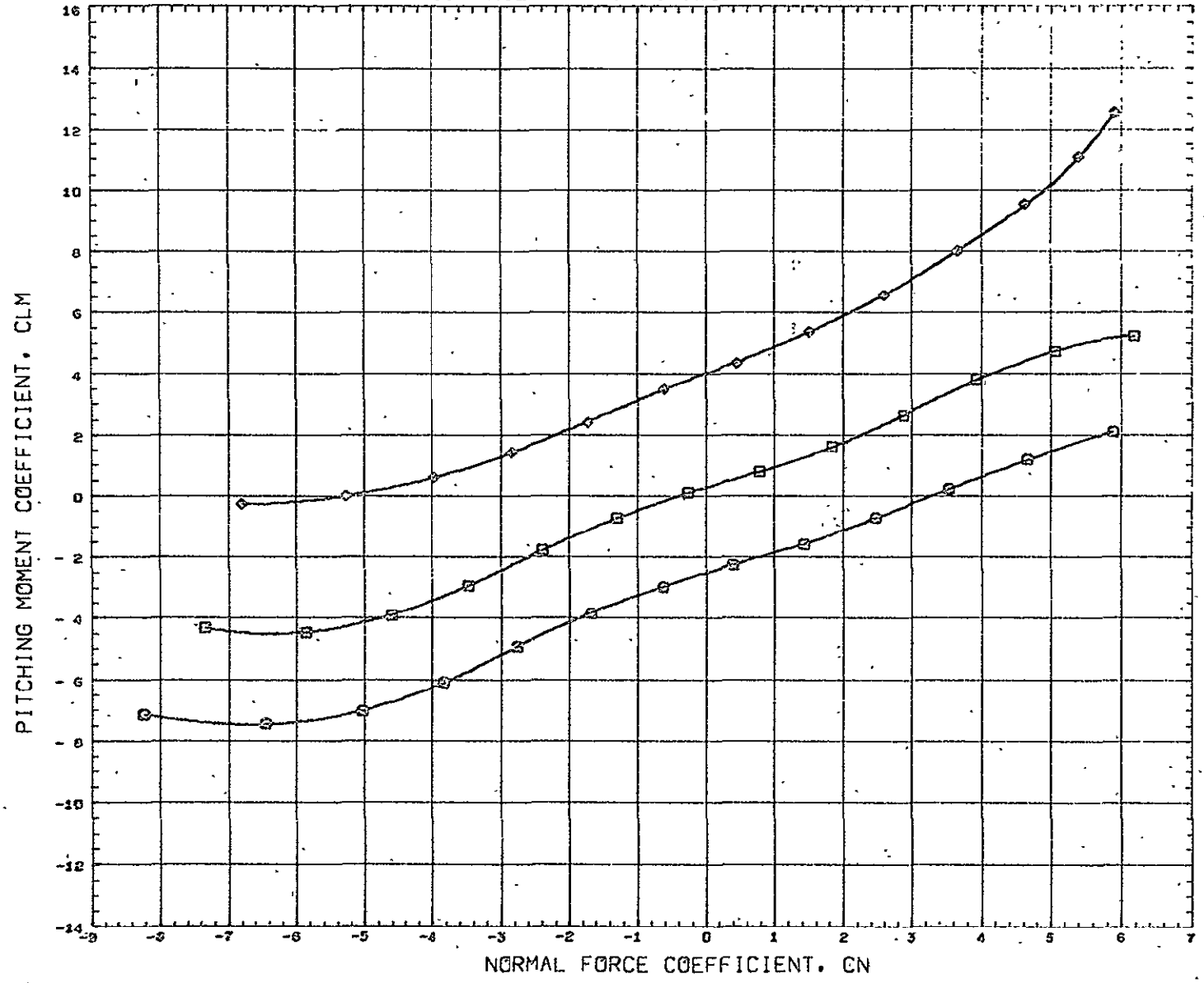
SYMBOL	ORBINC		PARAMETRIC VALUES		
○	- 2.000	MACH	0.900	BETA	0.010
□	1.000				
◇	4.000				

DATA HIST. CODE MMIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



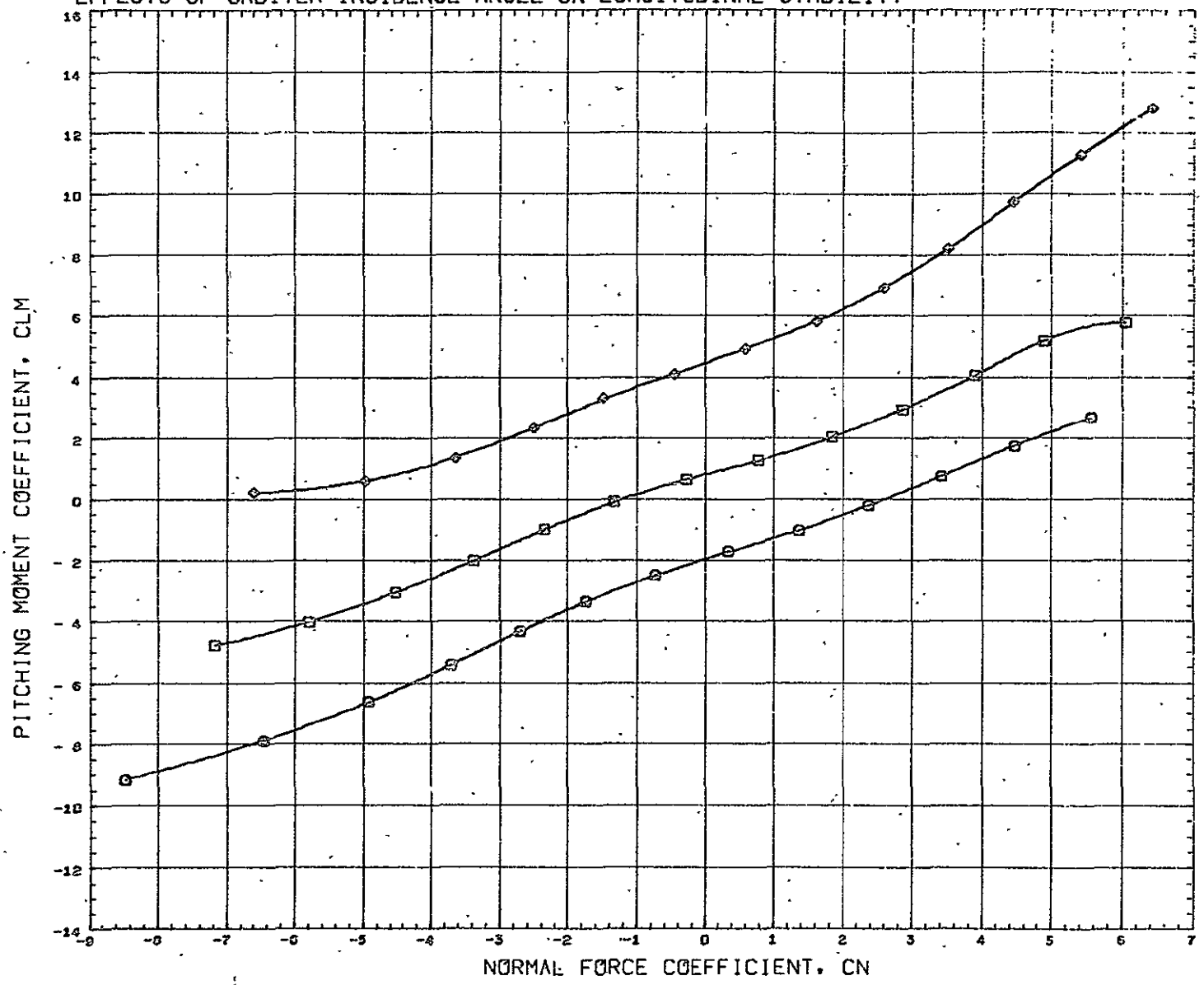
SYMBOL	ORBINC		PARAMETRIC VALUES		
○	2.000	MACH	1.000	BETA	0.010
□	1.000				
◇	4.000				

DATA HIST. CODE MHIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



SYMBOL	ORBINC		PARAMETRIC VALUES		
○	2.000	MACH	1.100	BETA	0.010
□	1.000				
◇	4.000				

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE MNIF

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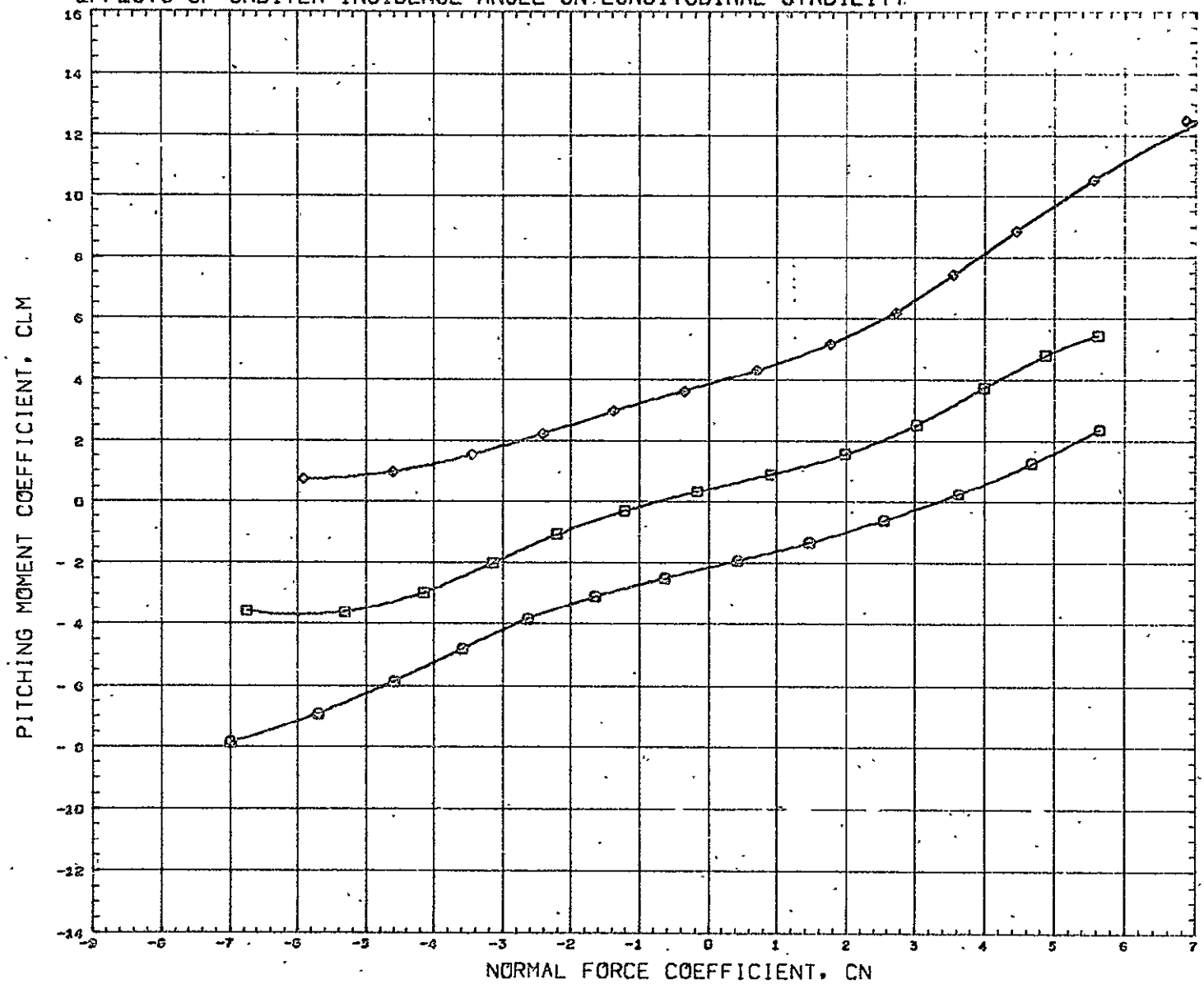
EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



SYMBOL	ORBINC		PARAMETRIC VALUES		
□	- 2.000	MACH	1.200	BETA	0.010
□	1.000				
◇	4.000				

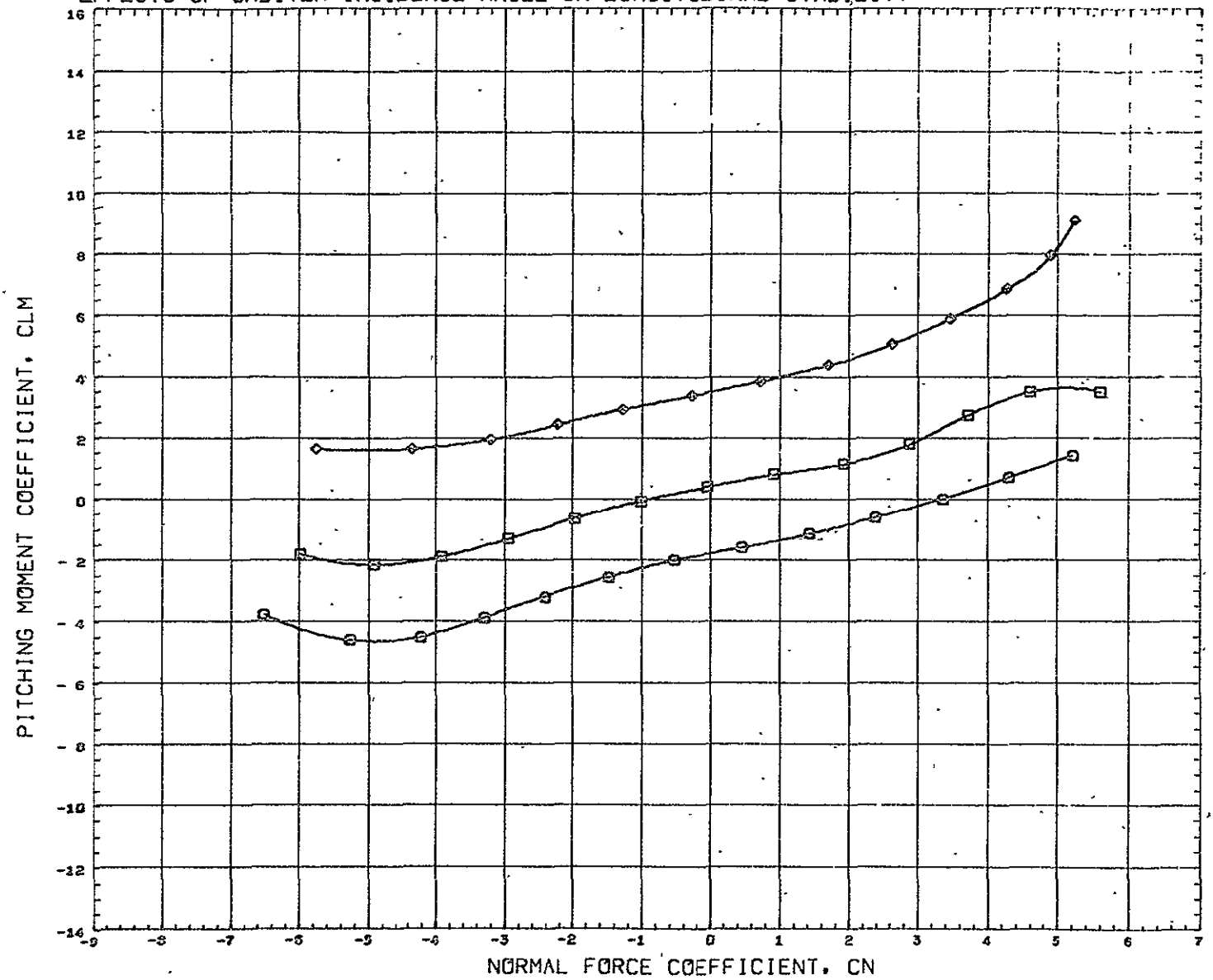
DATA HIST. CODE HNIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17 (A25041) 14 JAN 71 PAGE 211

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



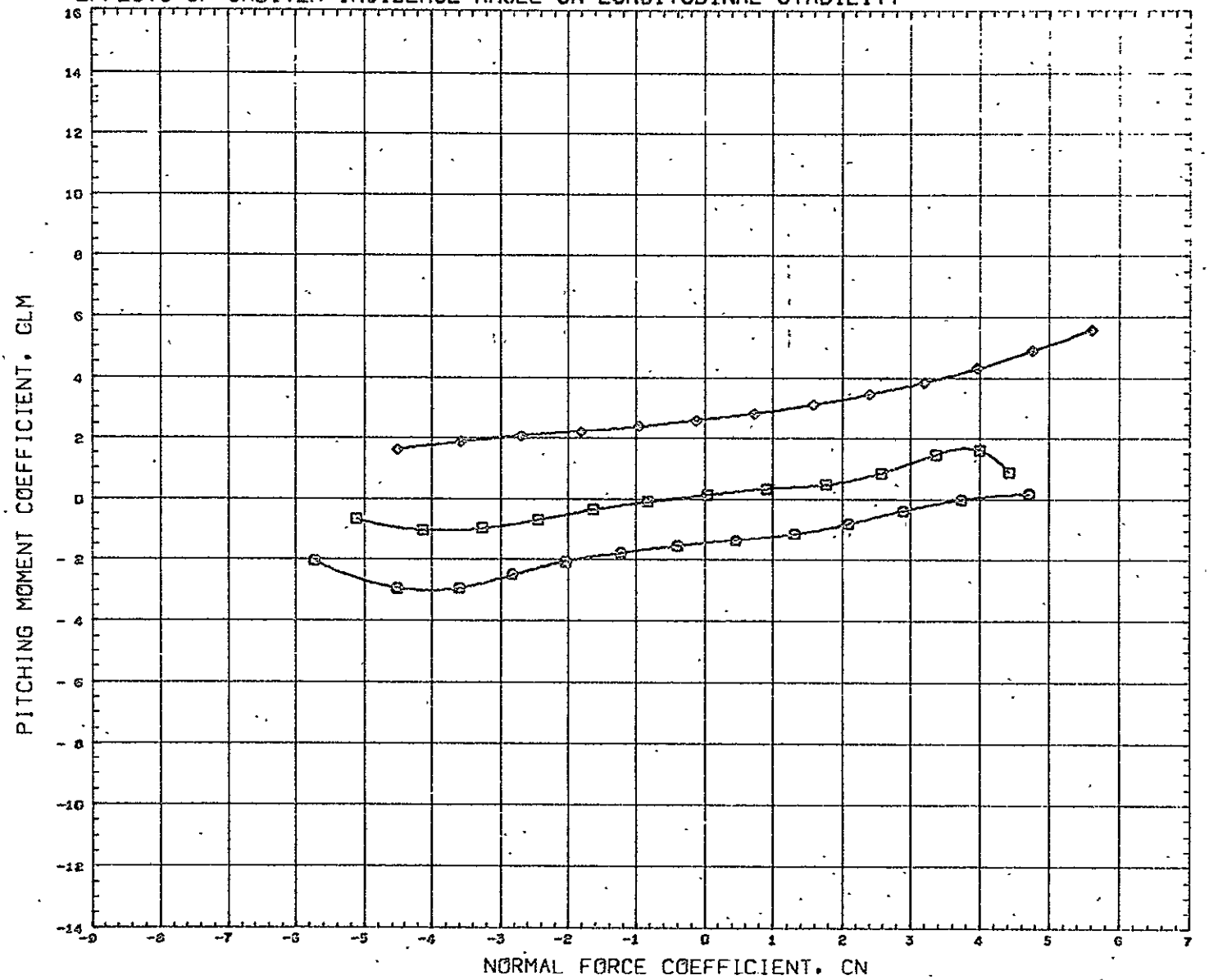
SYMBOL	ORBINC		PARAMETRIC VALUES		
○	- 2.000	MACH	1.460	BETA	0.010
□	1.000				
◇	4.000				

DATA HIST. CODE NHIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



SYMBOL	ORBINC		PARAMETRIC VALUES		
○	- 2.000	MACH	1.960	BETA	0.010
□	1.000				
◇	4.000				

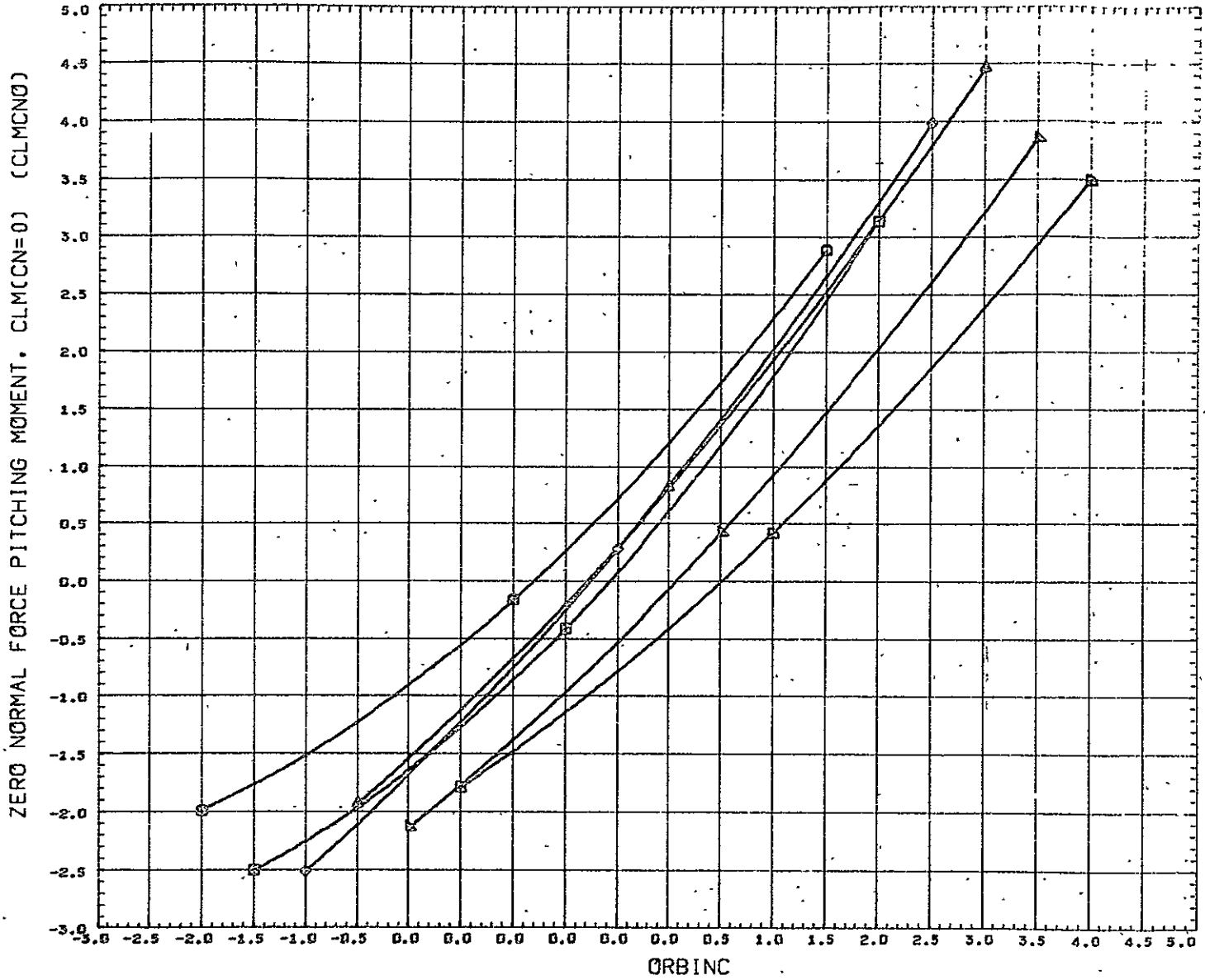
DATA HIST. CODE MNIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRF	5.2640	INCHES
YMRF	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17 (A25041) 14 JAN 71 PAGE 213

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY

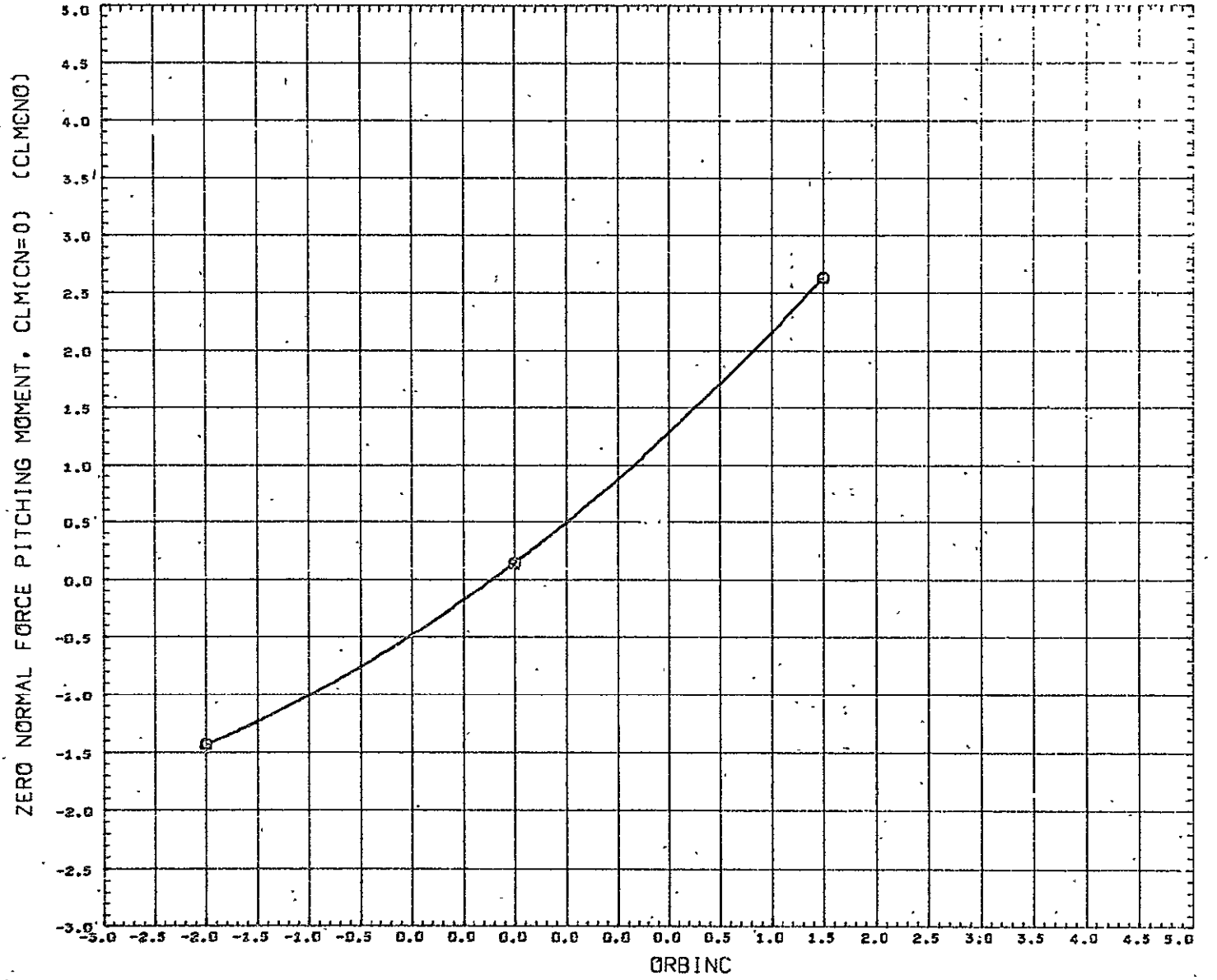


SYMBOL	MACH		PARAMETRIC VALUES
○	0.600	BETA	0.010
□	0.900		
◇	1.000		
△	1.100		
▷	1.200		
D	1.460	DATA HIST. CODE	HMIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES.
XMRF	5.2640	INCHES
YMRF	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



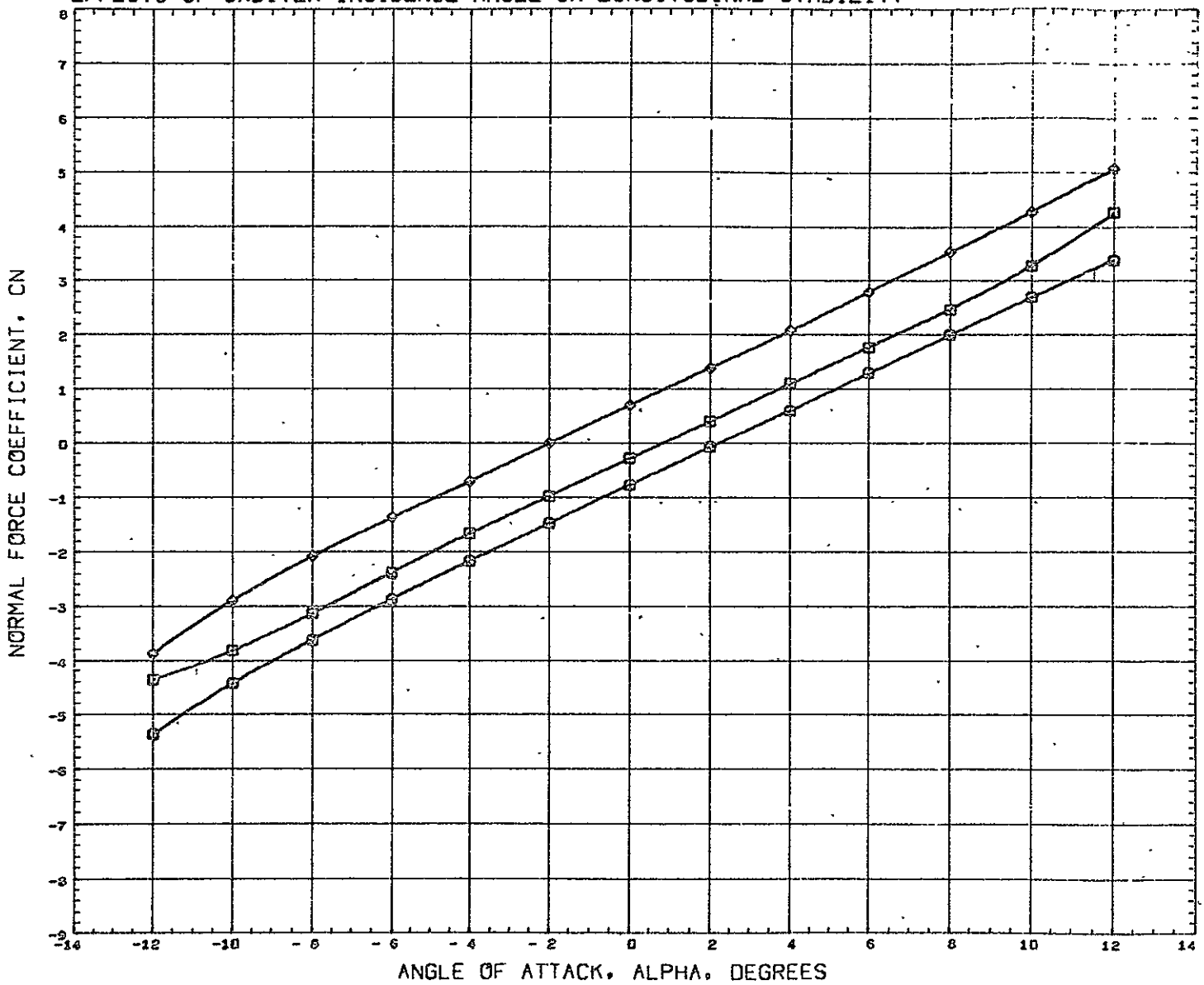
SYMBOL	MACH		PARAMETRIC VALUES
O	1.960	BETA	0.010

DATA HIST. CODE HHIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRF	5.2640	INCHES
YMRF	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



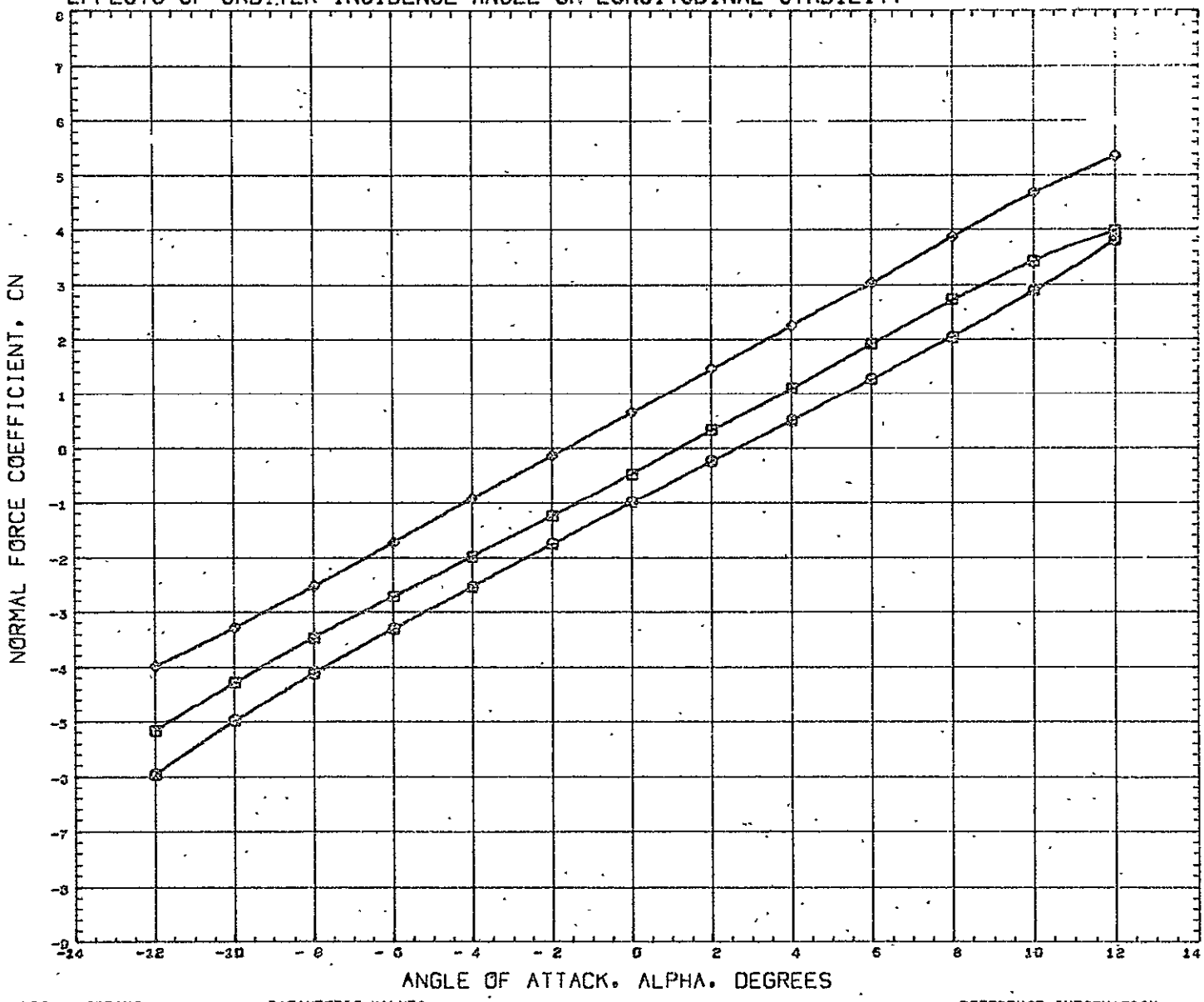
SYMBOL	ORBINC		PARAMETRIC VALUES		
○	- 2.000	NACH	0.600	BETA	0.000
□	1.000				
◇	4.000				

DATA HIST. CODE HHIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



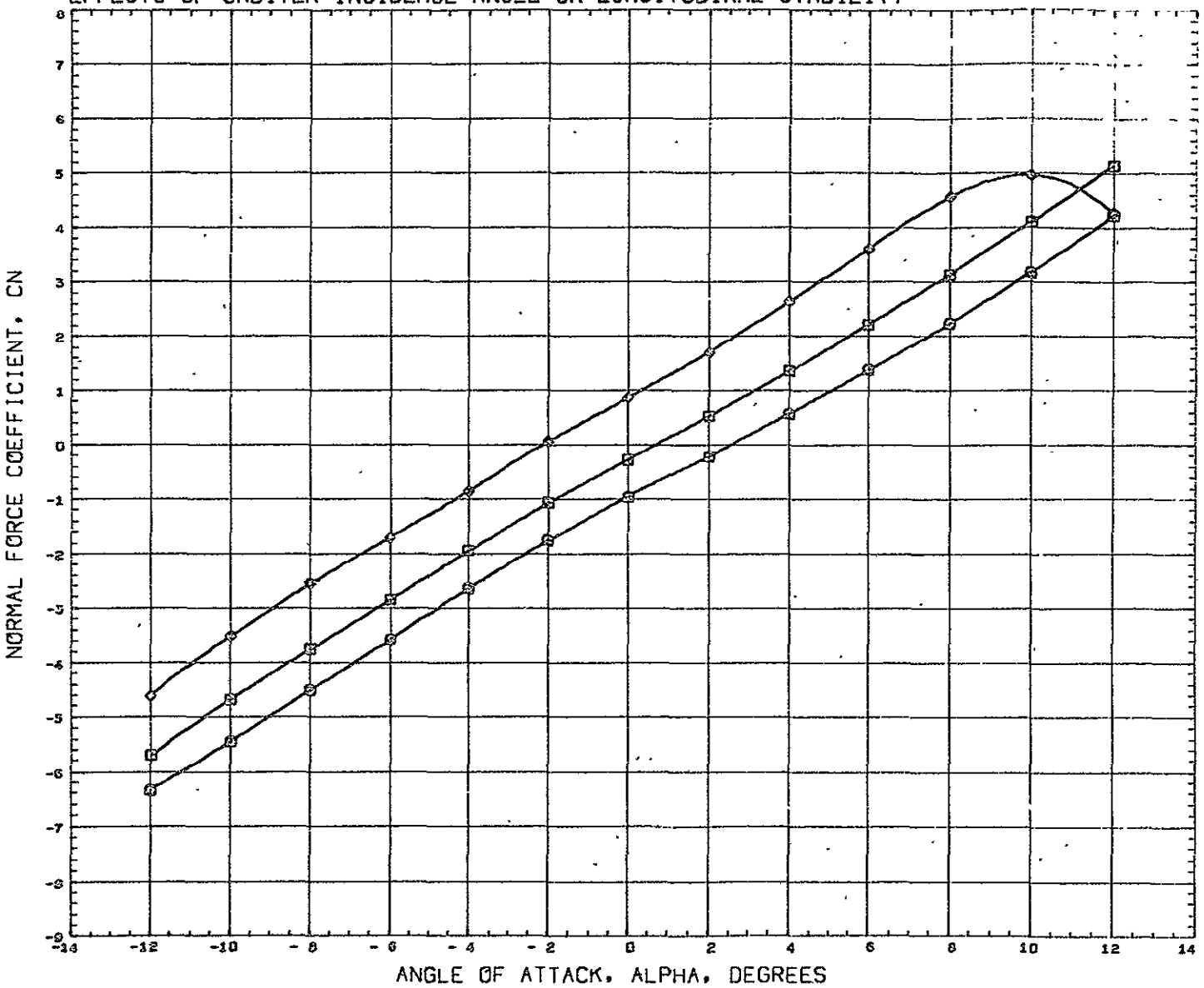
SYMBOL	ORBINC		PARAMETRIC VALUES		
○	2.000	MACH	0.900	BETA	0.000
□	1.000				
◇	4.000				

DATA HIST. CODE HHIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



SYMBOL	ORBINC		PARAMETRIC VALUES		
○	2.000	MACH	1.000	BETA	0.000
□	1.000				
◇	4.000				

DATA HIST. CODE HHIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

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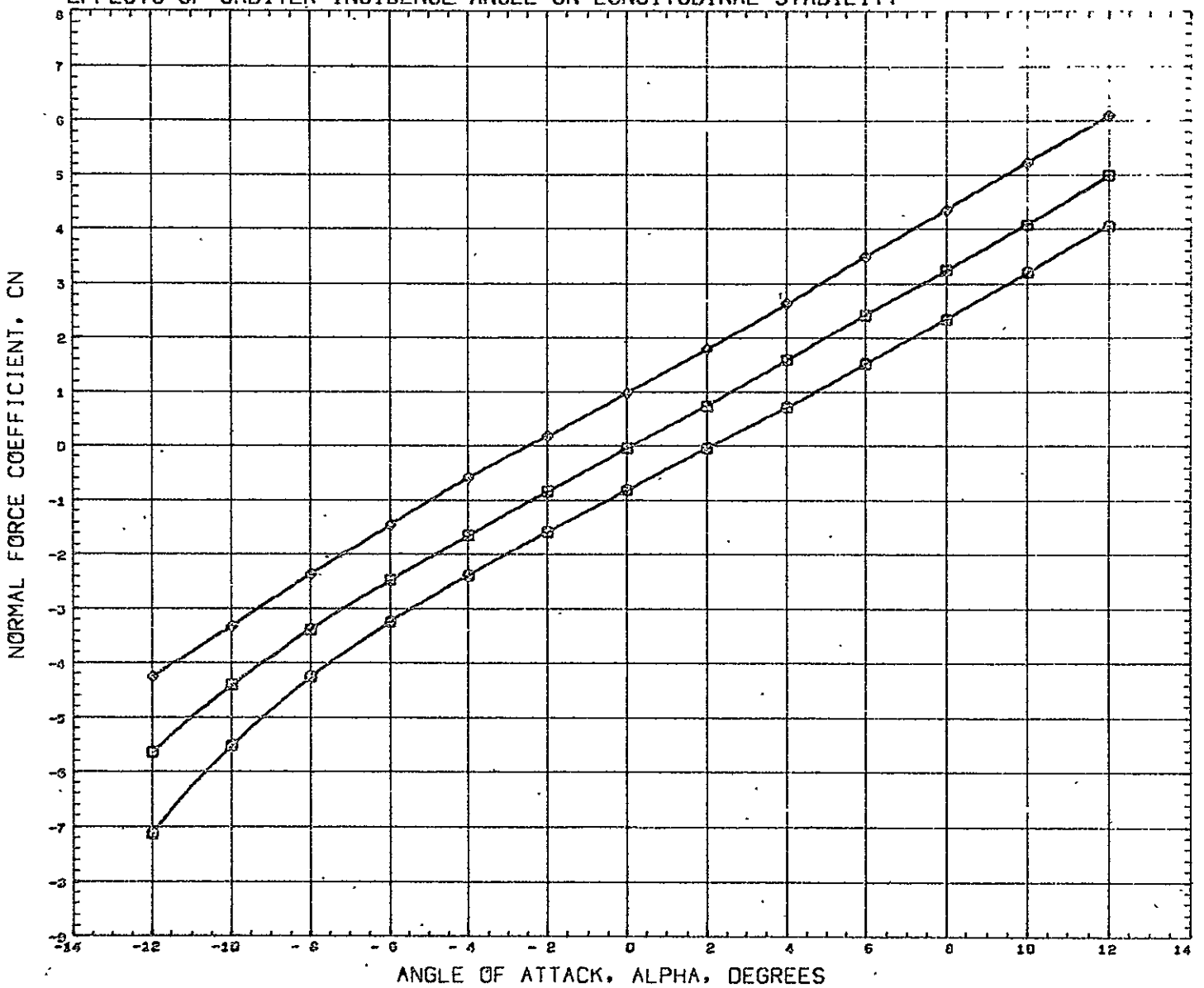
EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



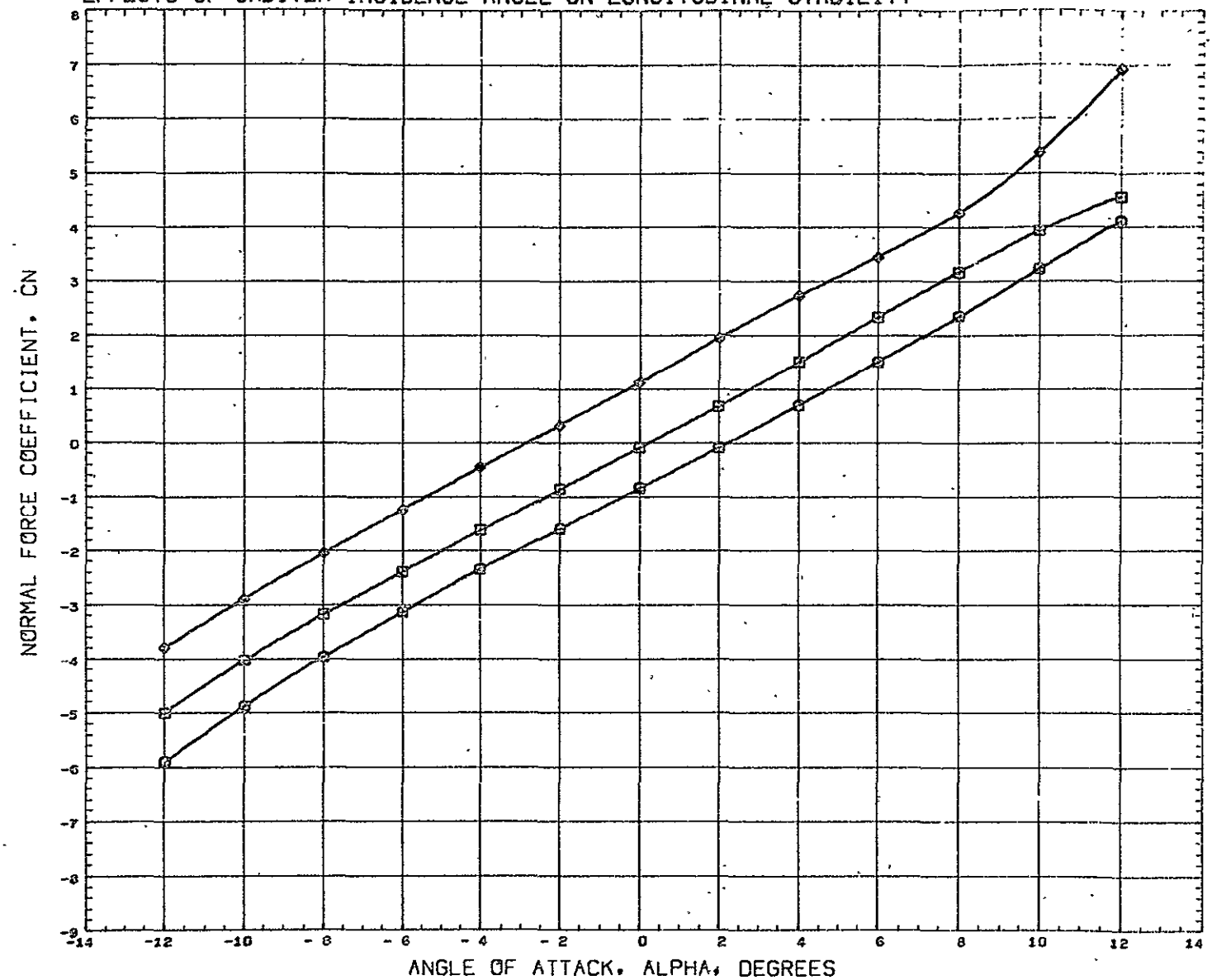
SYMBOL	ORBINC		PARAMETRIC VALUES		
○	- 2.000	MACH	1.100	BETA	0.000
□	1.000				
◇	4.000				

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRP	5.2640	INCHES
YHRP	0.0000	INCHES
ZHRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE MHIF

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



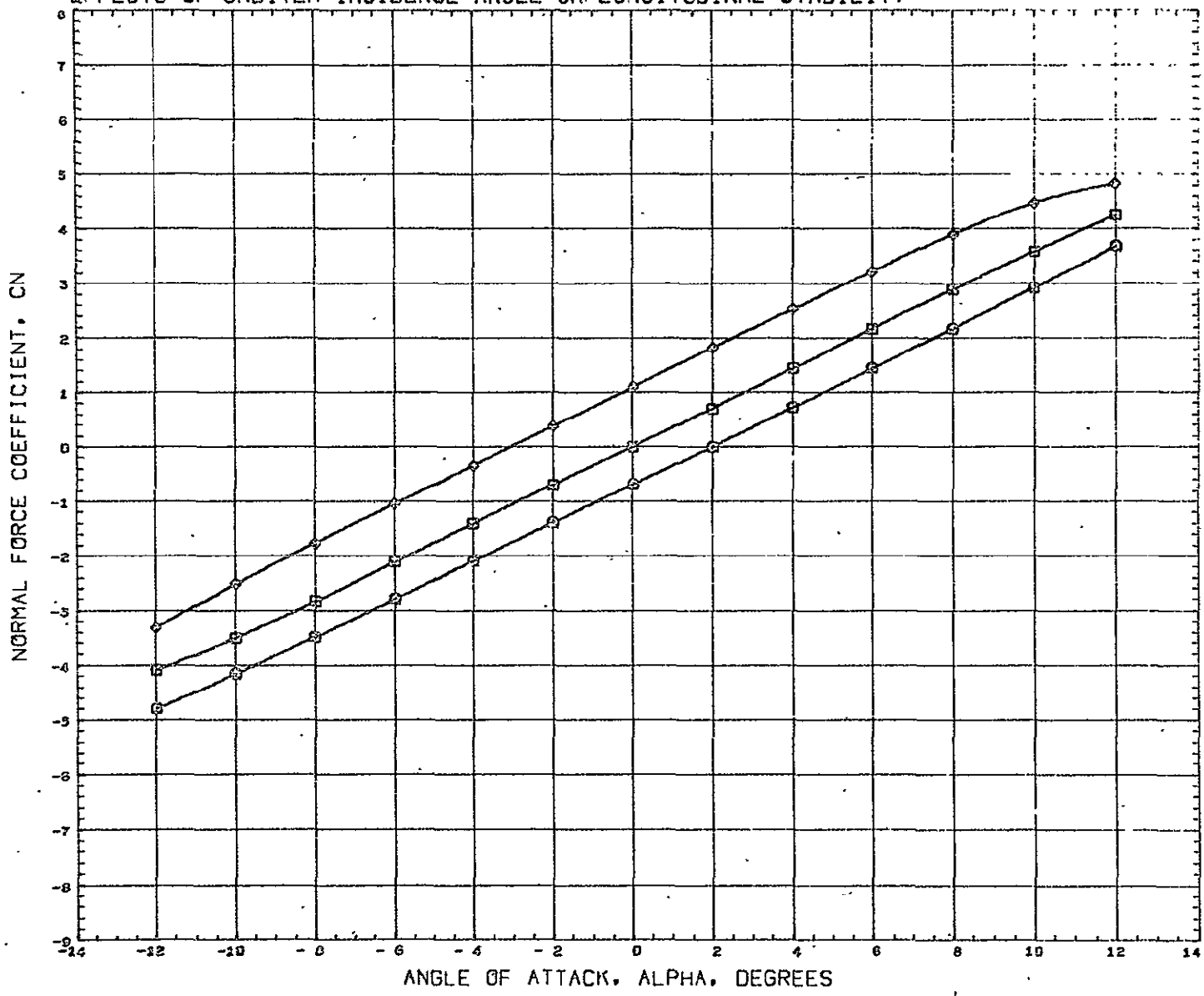
SYMBOL	ORBINC		PARAMETRIC VALUES		
○	- 2.000	MACH	1.200	BETA	0.000
□	1.000				
◇	4.000				

DATA HIST. CODE MMIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



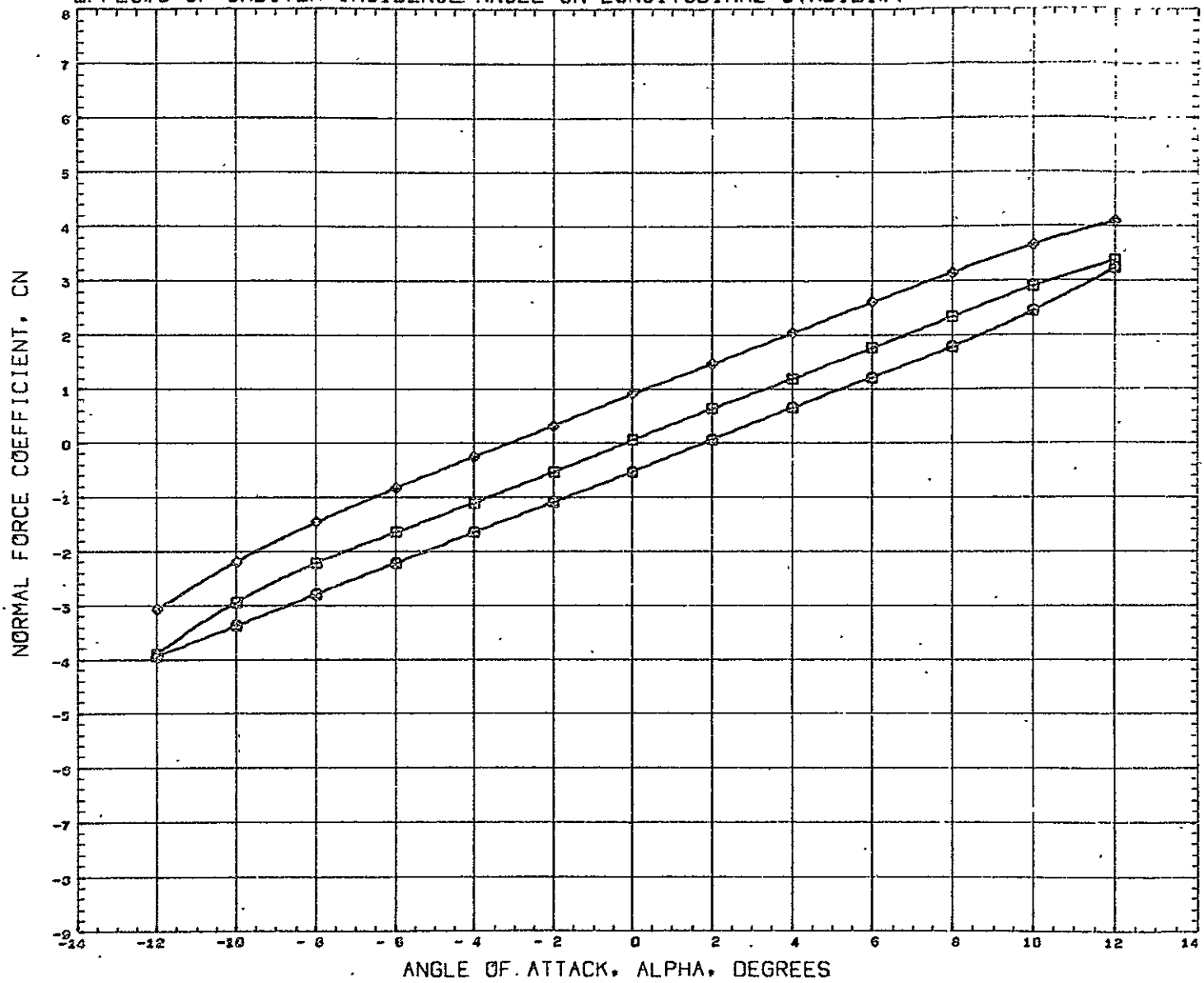
SYMBOL	ORBINC		PARAMETRIC VALUES		
○	2.000	MACH	1.460	BETA	0.000
□	1.000				
◇	4.000				

DATA HIST. CODE HHIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRF	5.2640	INCHES
YMRF	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



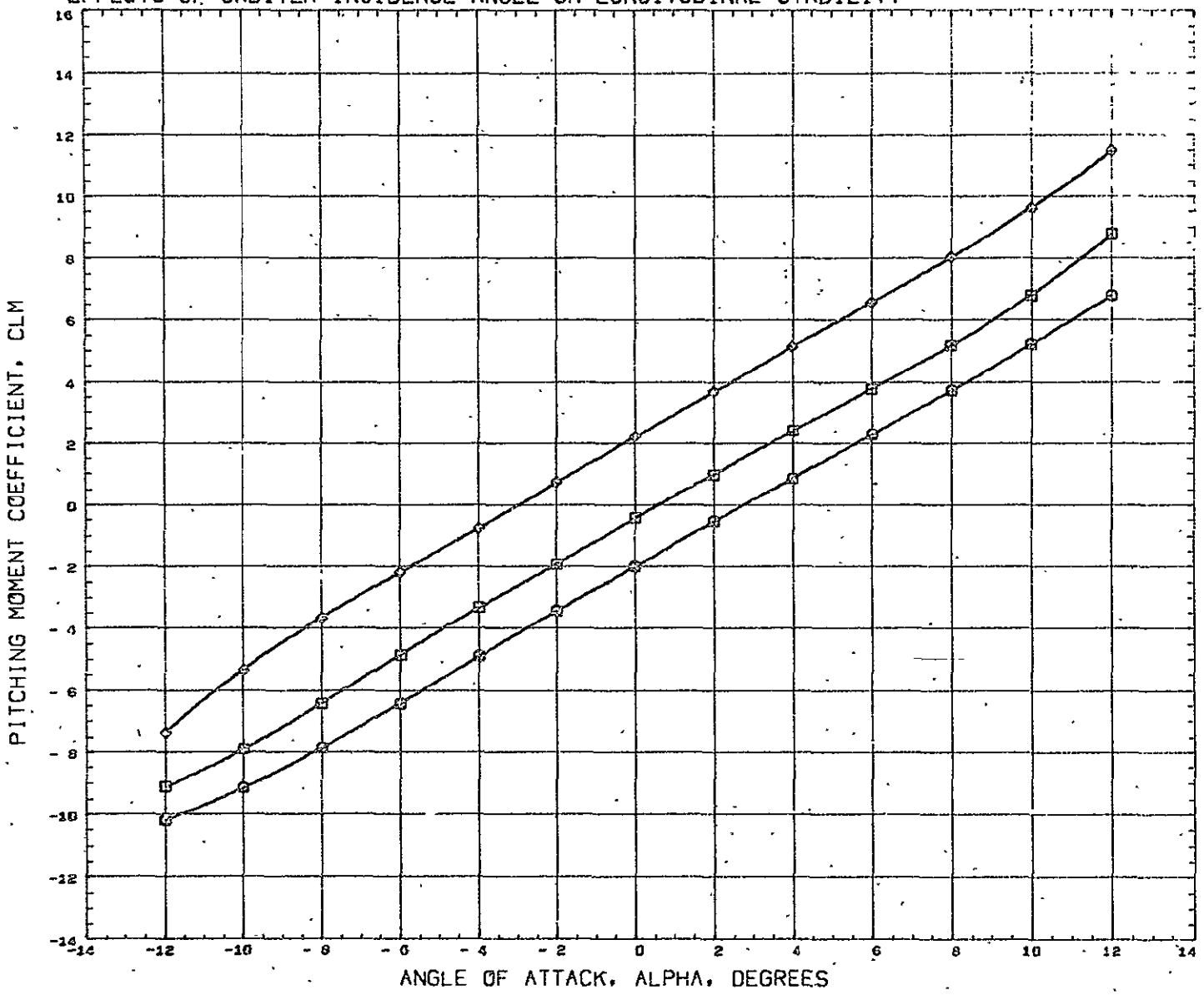
SYMBOL	ORBINC		PARAMETRIC VALUES		
○	2.000	MACH	1.960	BETA	0.000
□	1.000				
◇	4.000				

DATA HIST. CODE MMIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



SYMBOL	ORBINC		PARAMETRIC VALUES		
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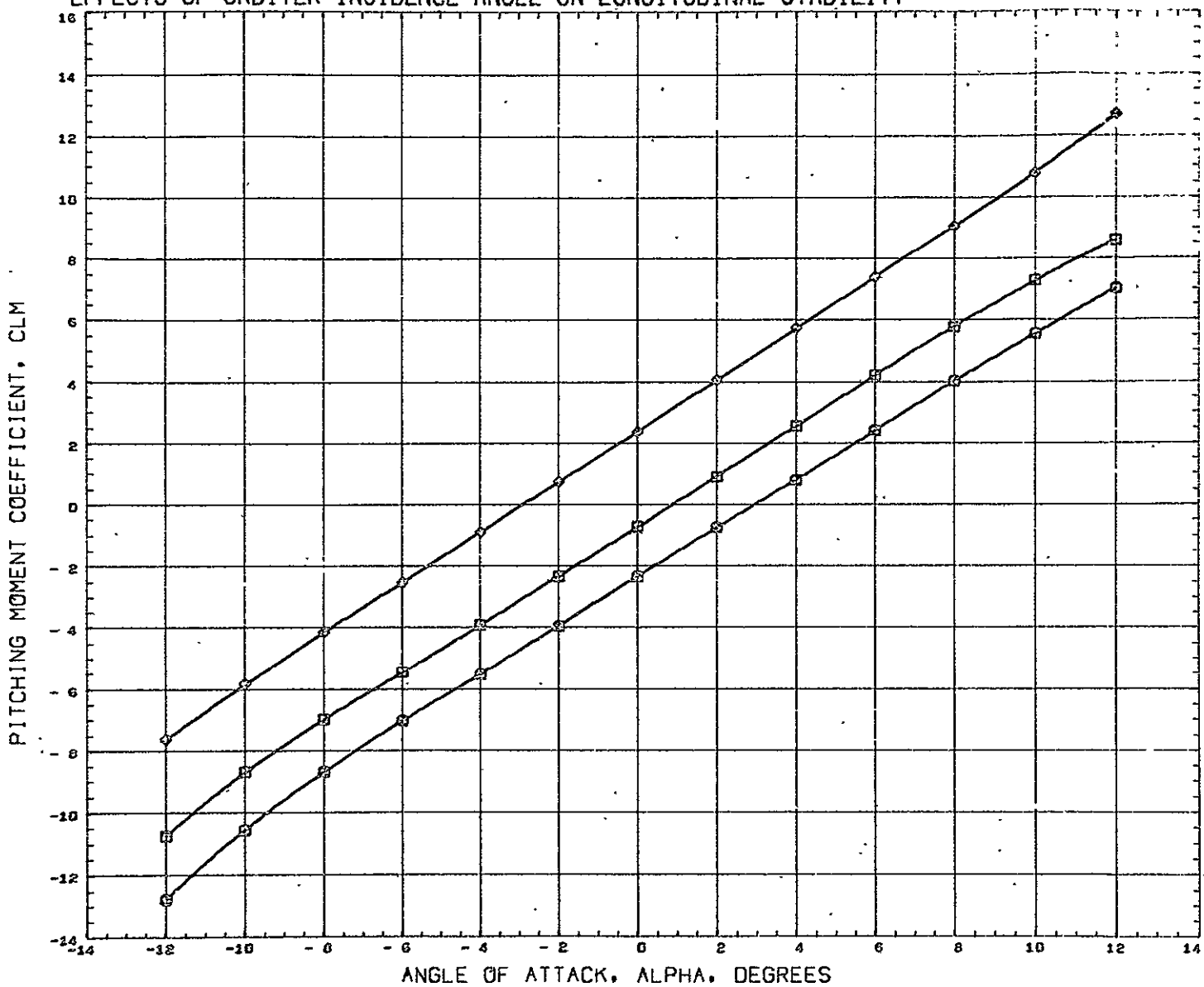
□	1.000				
◇	4.000				

DATA HIST. CODE MMIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



SYMBOL	ORBINC		PARAMETRIC VALUES		
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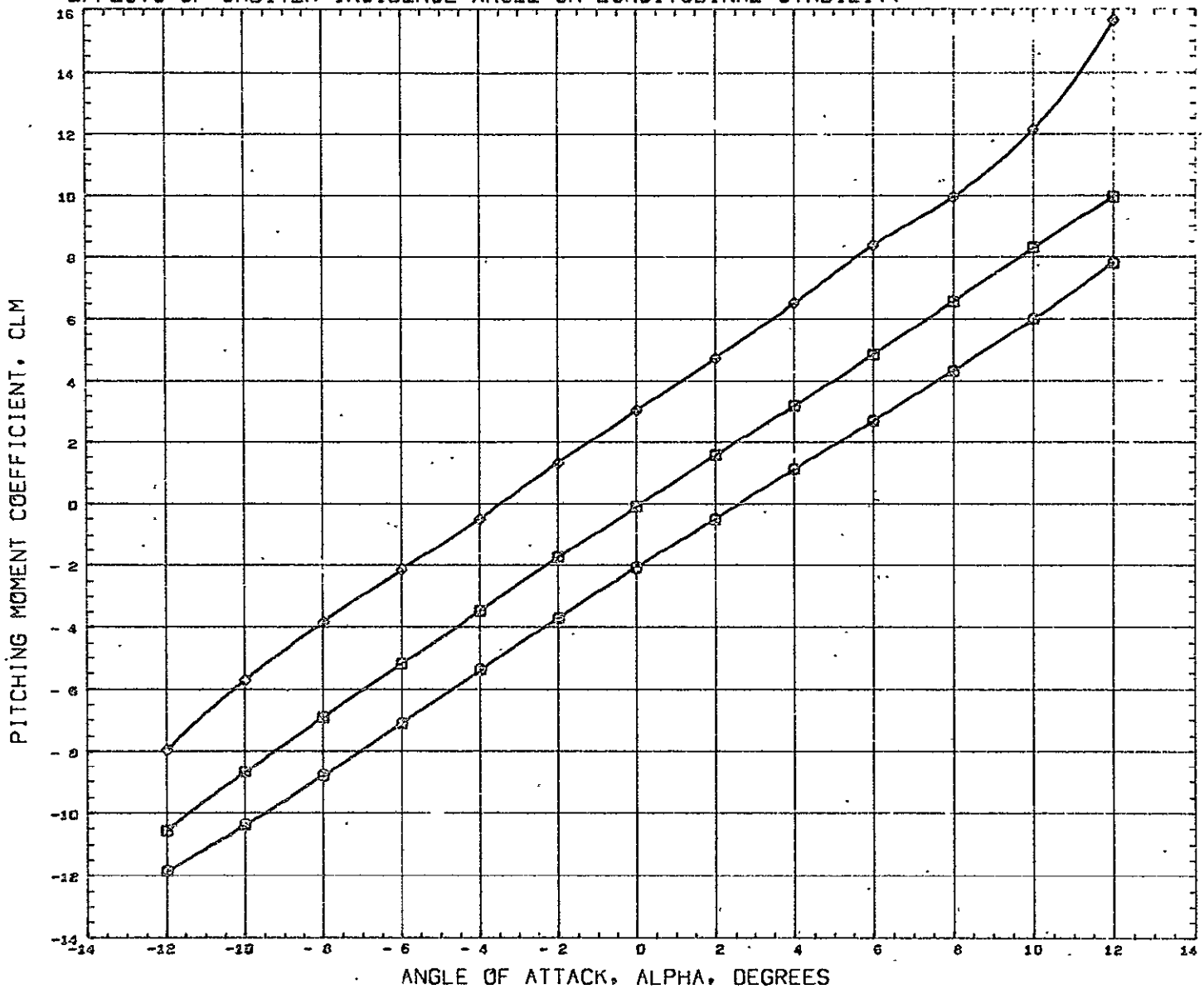
□	1.000				
◇	4.000				

DATA HIST. CODE MMIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



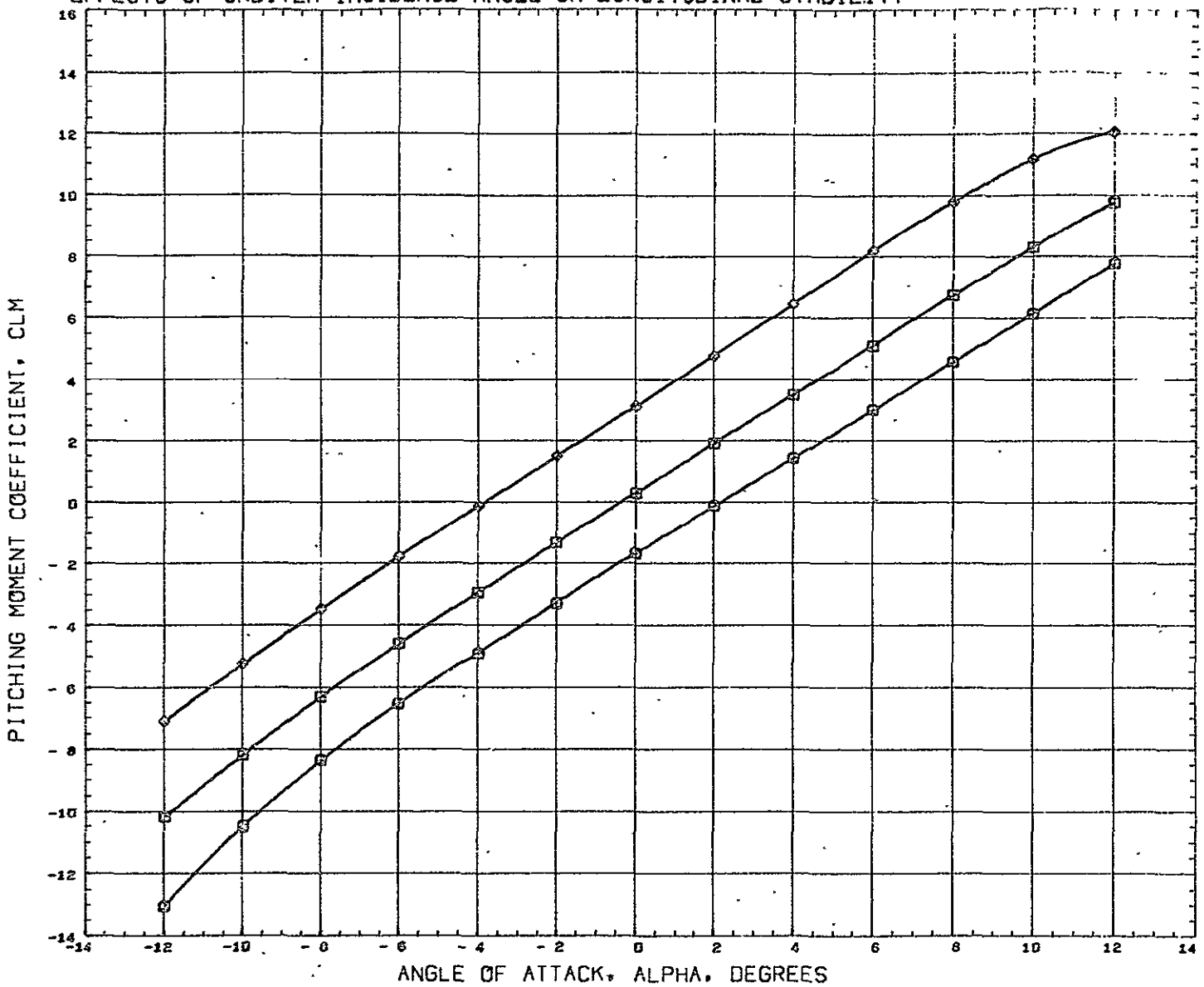
SYMBOL	ORBINC		PARAMETRIC VALUES		
○	- 2.000	MACH	1.000	BETA	0.000
□	1.000				
◇	4.000				

DATA HIST. CODE HMIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



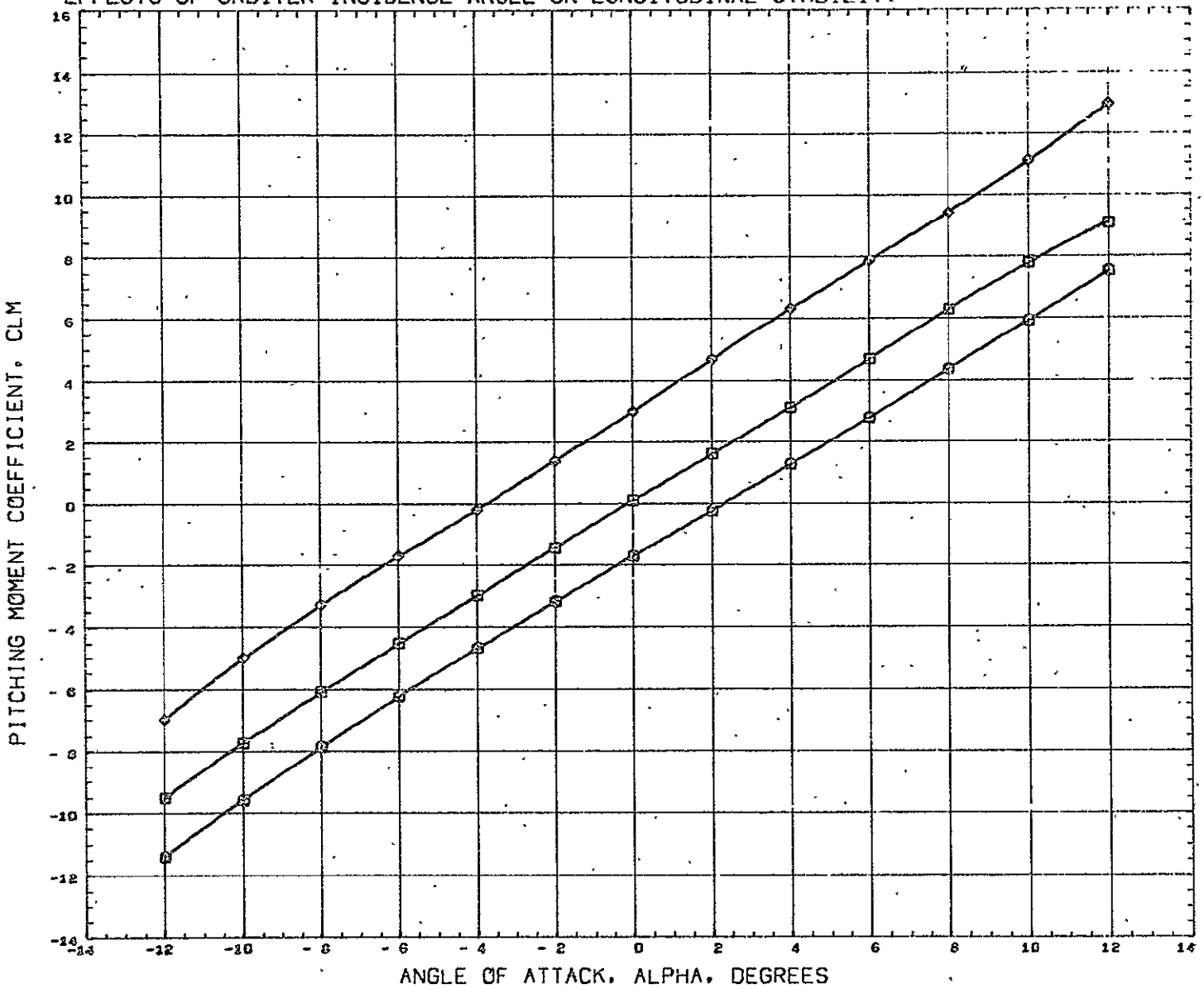
SYMBOL	ORBINC		PARAMETRIC VALUES		
○	- 2.000	MACH	1.100	BETA	0.000
□	1.000				
◇	4.000				

DATA HIST. CODE MHIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRF	5.2640	INCHES
YMRF	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



SYMBOL	ORBINC		PARAMETRIC VALUES		
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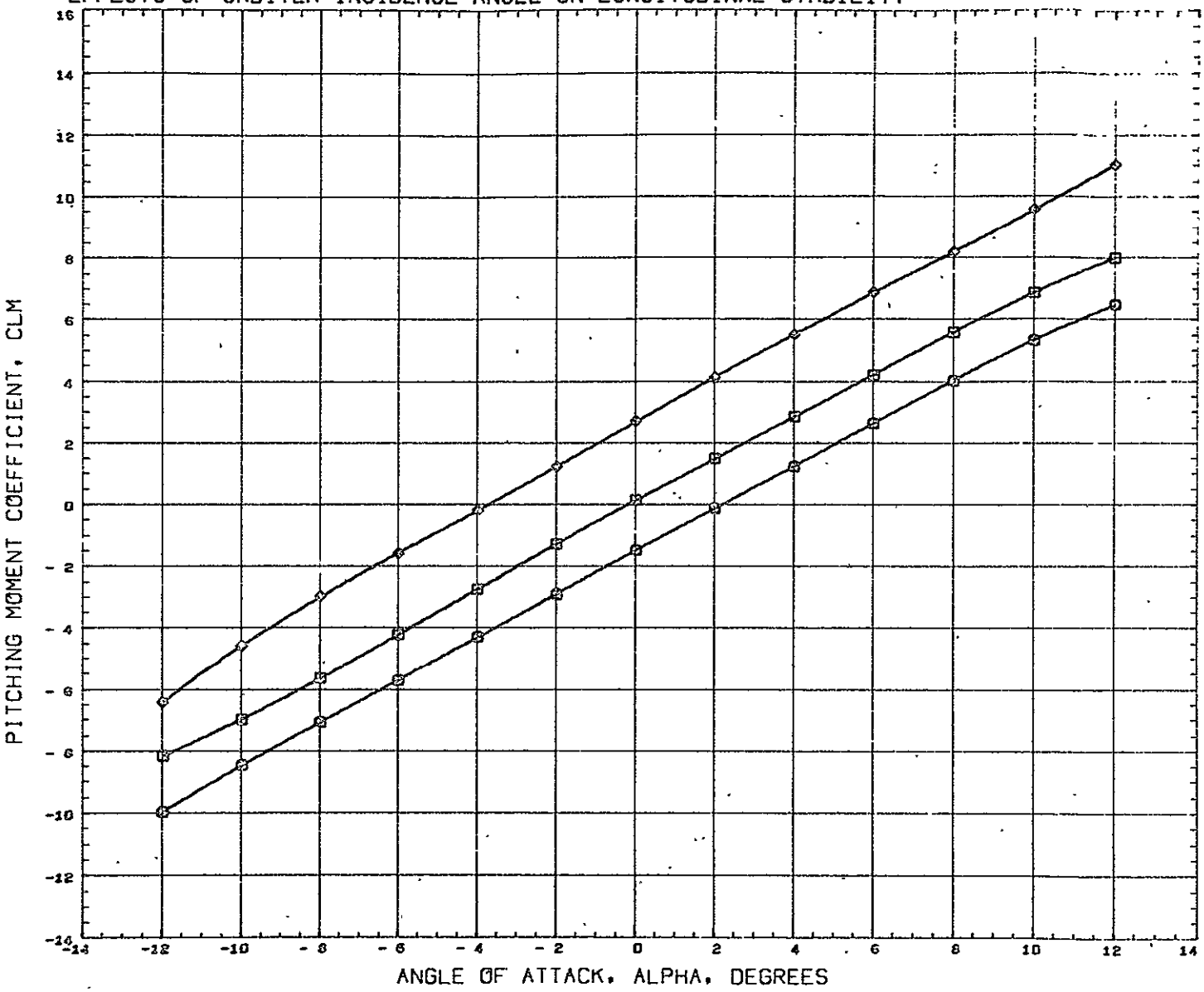
□	1.000				
◇	4.000				

DATA HIST. CODE HHIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



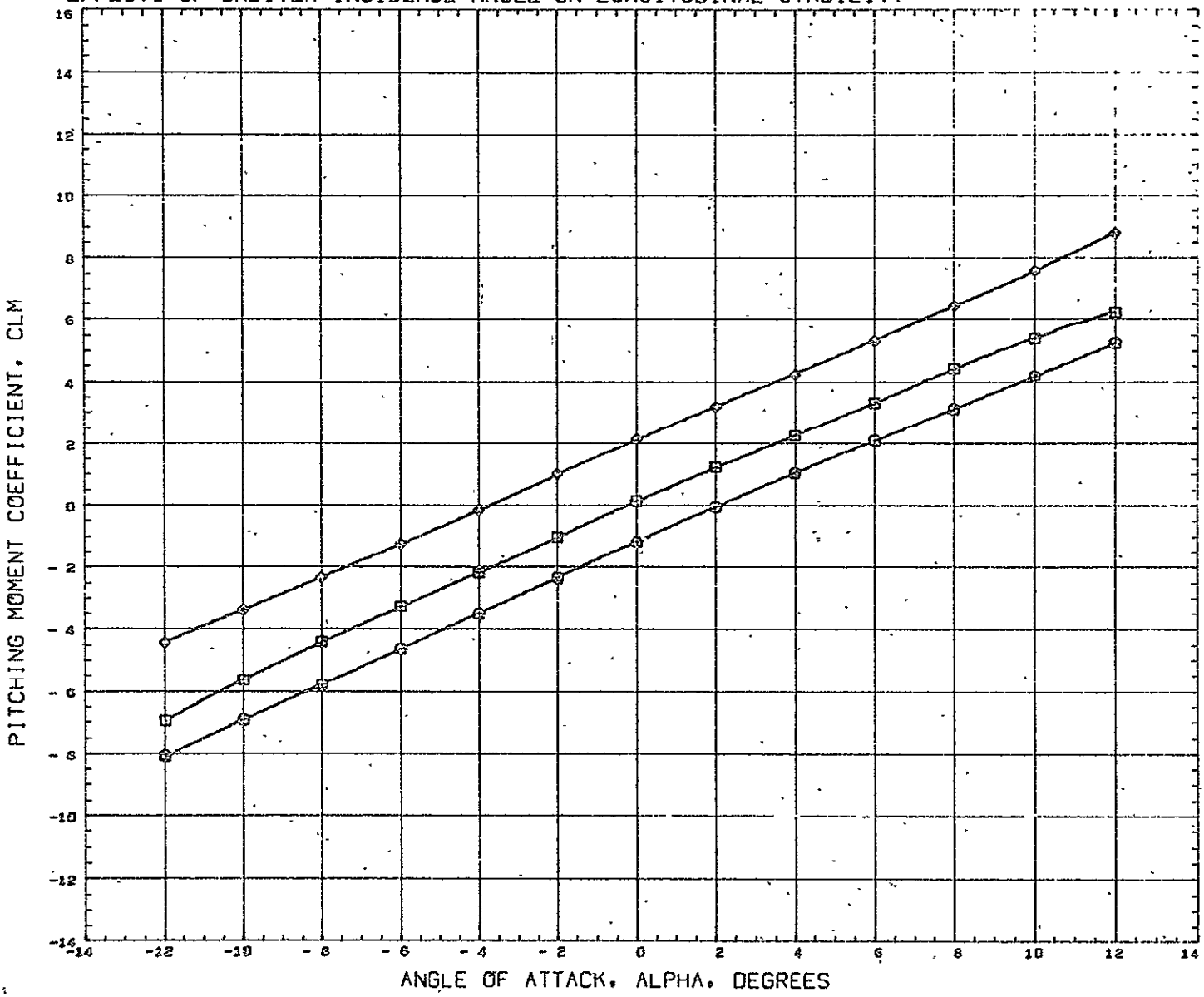
SYMBOL	ORBINC		PARAMETRIC VALUES		
○	- 2.000	MACH	1.460	BETA	0.000
□	1.000				
◇	4.000				

DATA HIST. CODE HHIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRP	5.2640	INCHES
YHRP	0.0000	INCHES
ZHRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



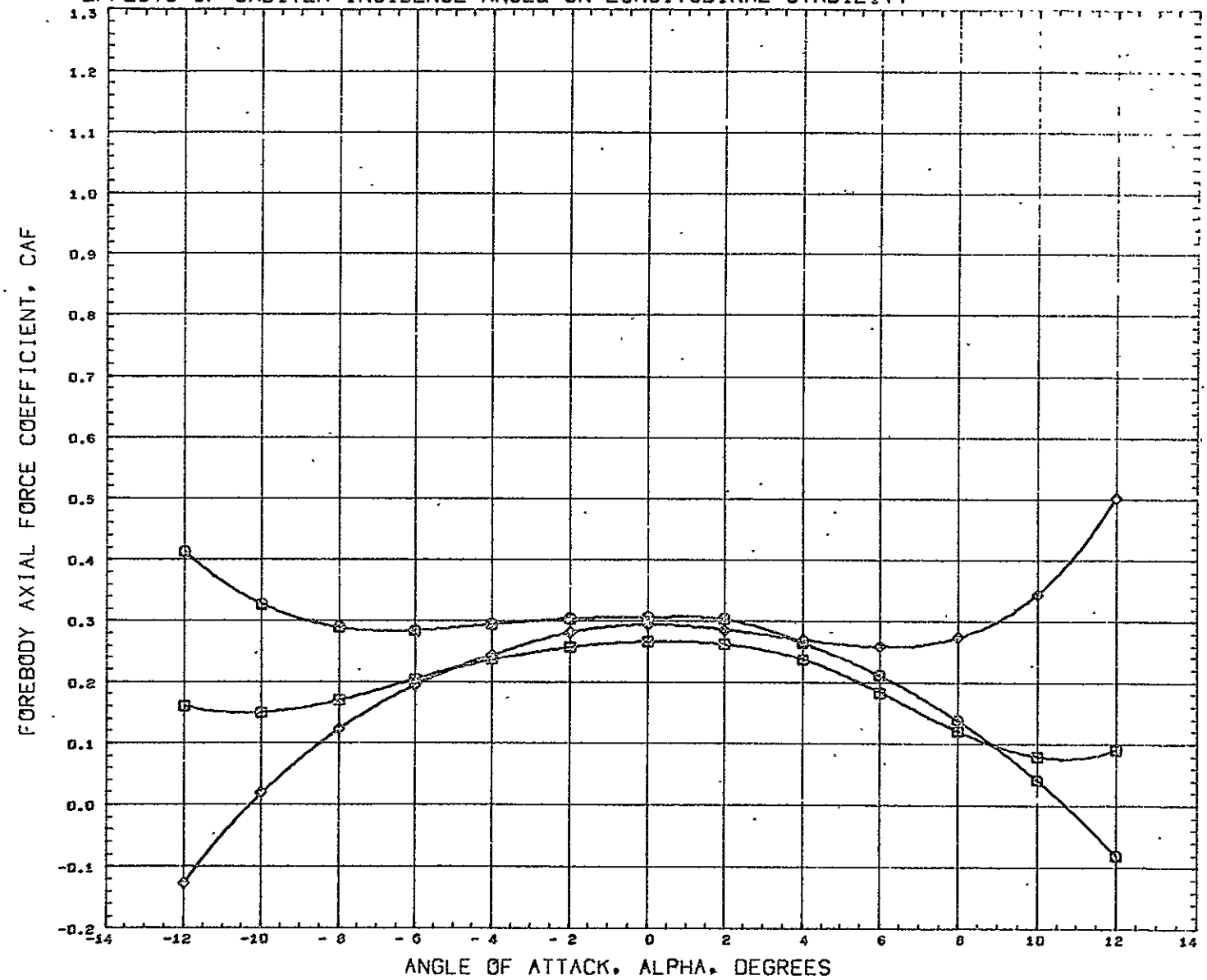
SYMBOL	ORBINC		PARAMETRIC VALUES		
○	- 2.000	MACH	1.960	BETA	0.000
□	1.000				
◇	4.000				

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE MNIF

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



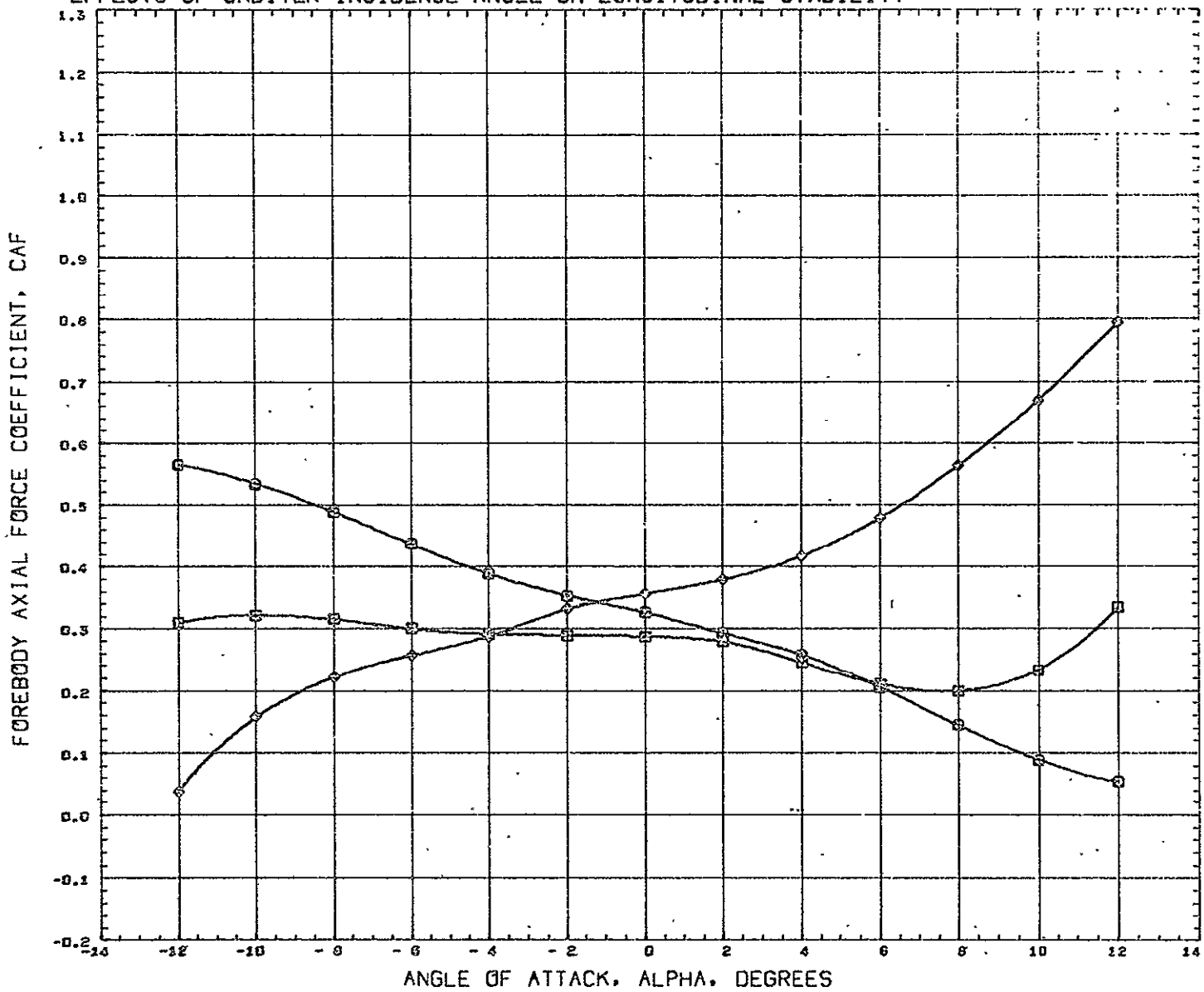
SYMBOL	ORBINC		PARAMETRIC VALUES		
○	2.000	MACH	0.600	BETA	0.000
□	1.000				
◇	4.000				

DATA HIST. CODE HMIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



SYMBOL	ORBINC	PARAMETRIC VALUES			
○	2.000	MACH	0.900	BETA	0.000
□	1.000				
◇	4.000				

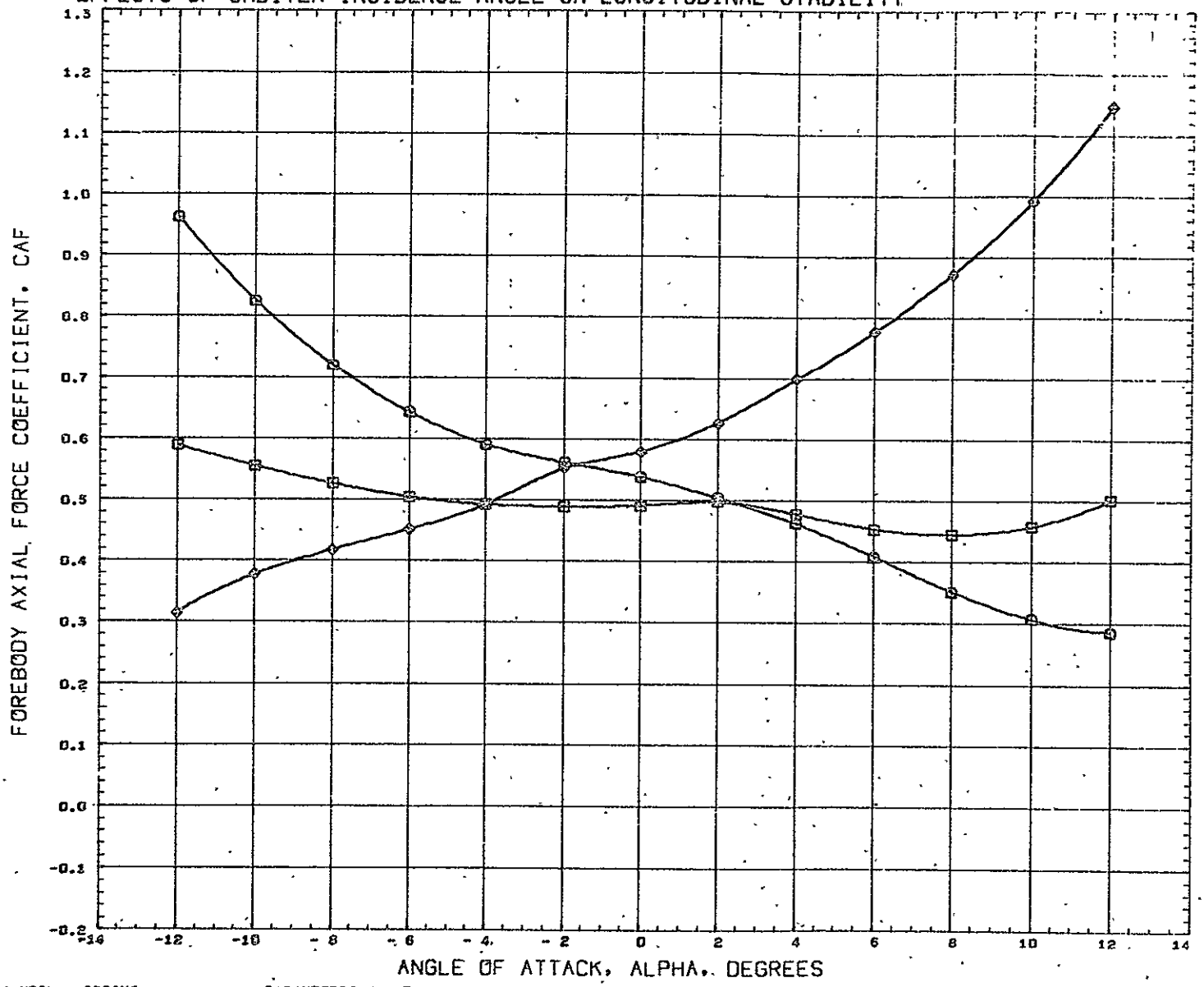
REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

DATA HIST. CODE HHIF

MSFC 476 NR HCRORB/S-ICBOOSTER BS+B5W14E3V17 (A25081) 14 JAN 71 PAGE 231

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



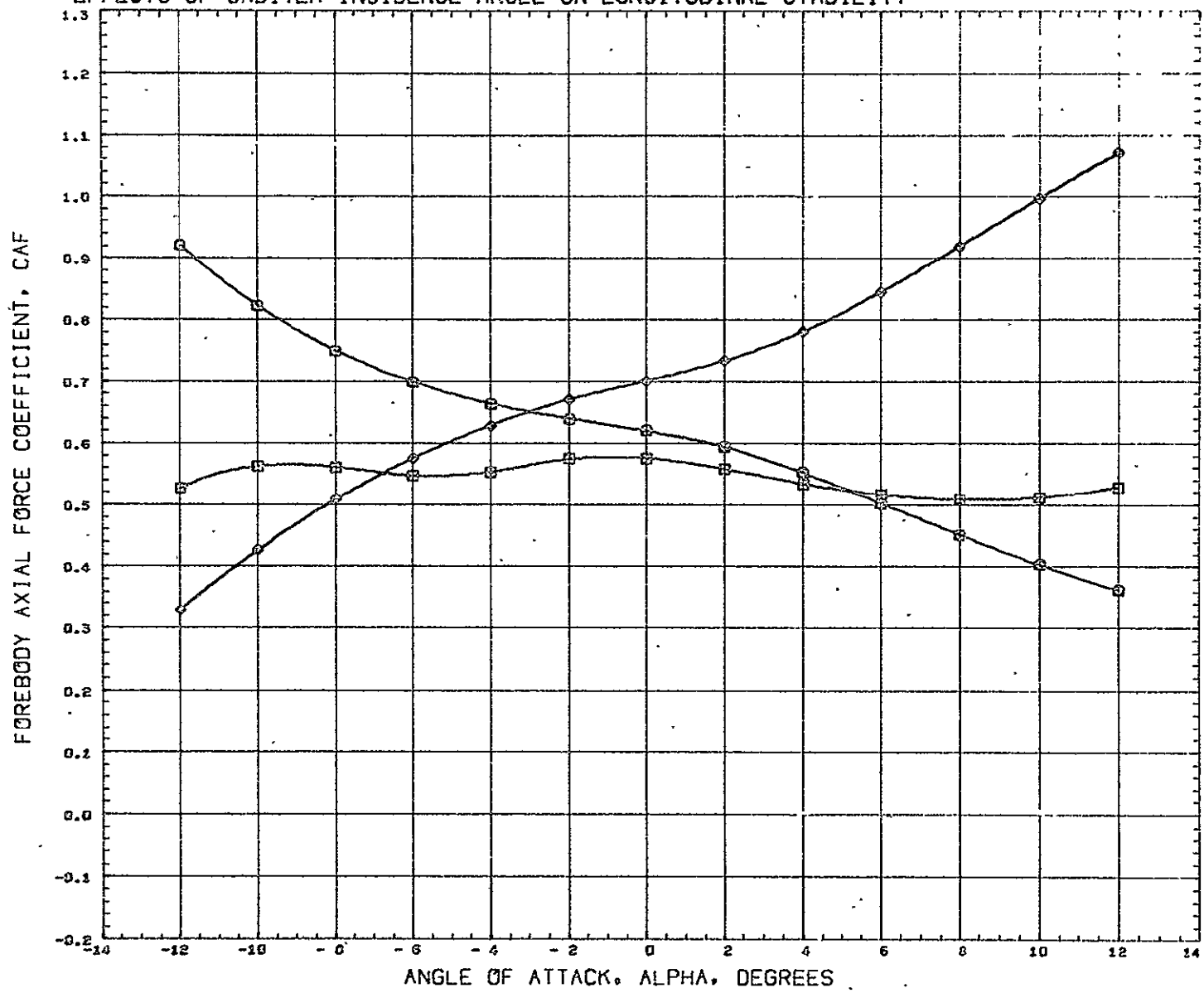
SYMBOL	ORBINC		PARAMETRIC VALUES		
○	2.000	MACH	1.000	BETA	0.000
□	1.000				
◇	4.000				

DATA HIST. CODE HHIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



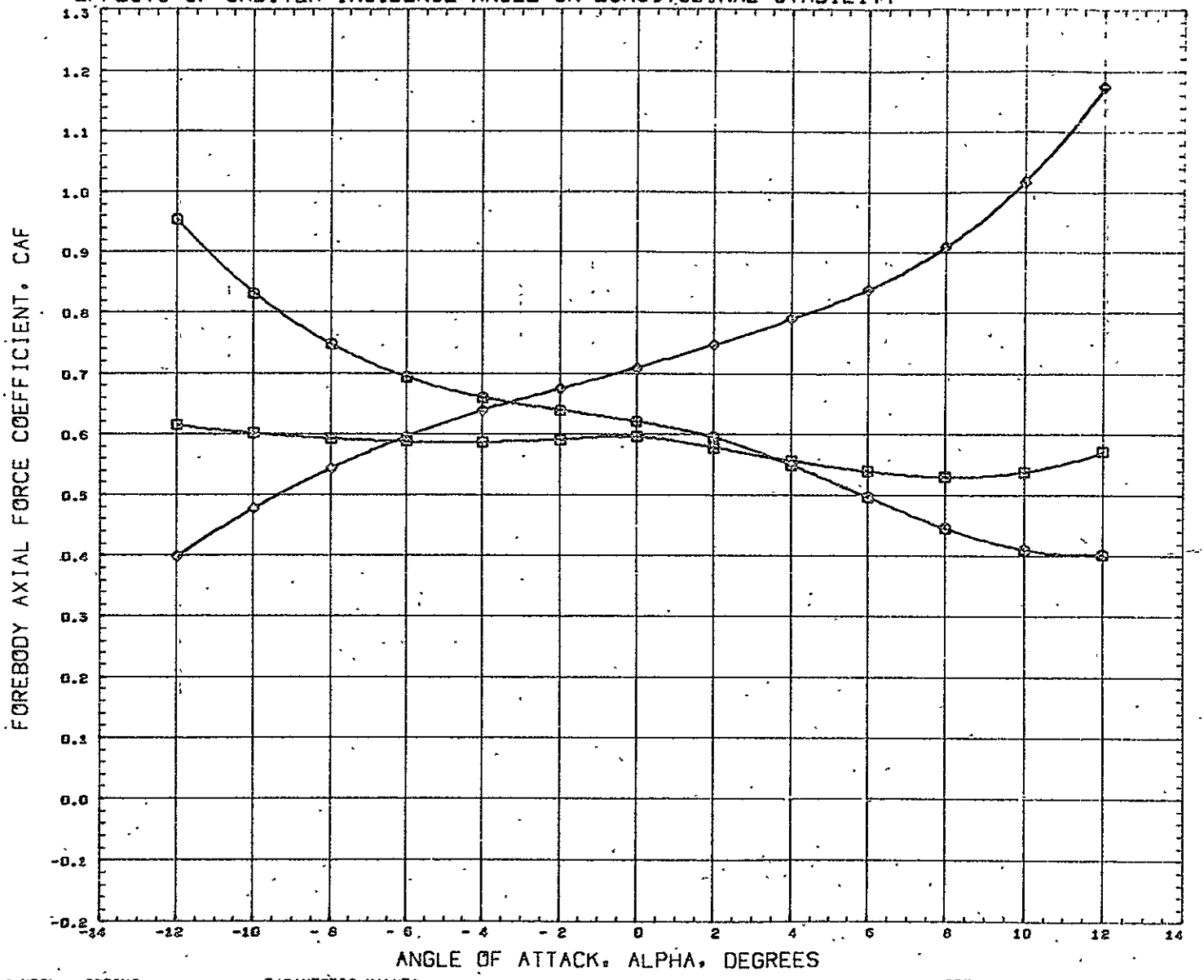
SYMBOL	ORBINC		PARAMETRIC VALUES		
○	2.000	MACH	1.100	BETA	0.000
□	1.000				
◇	4.000				

DATA HIST. CODE NMIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



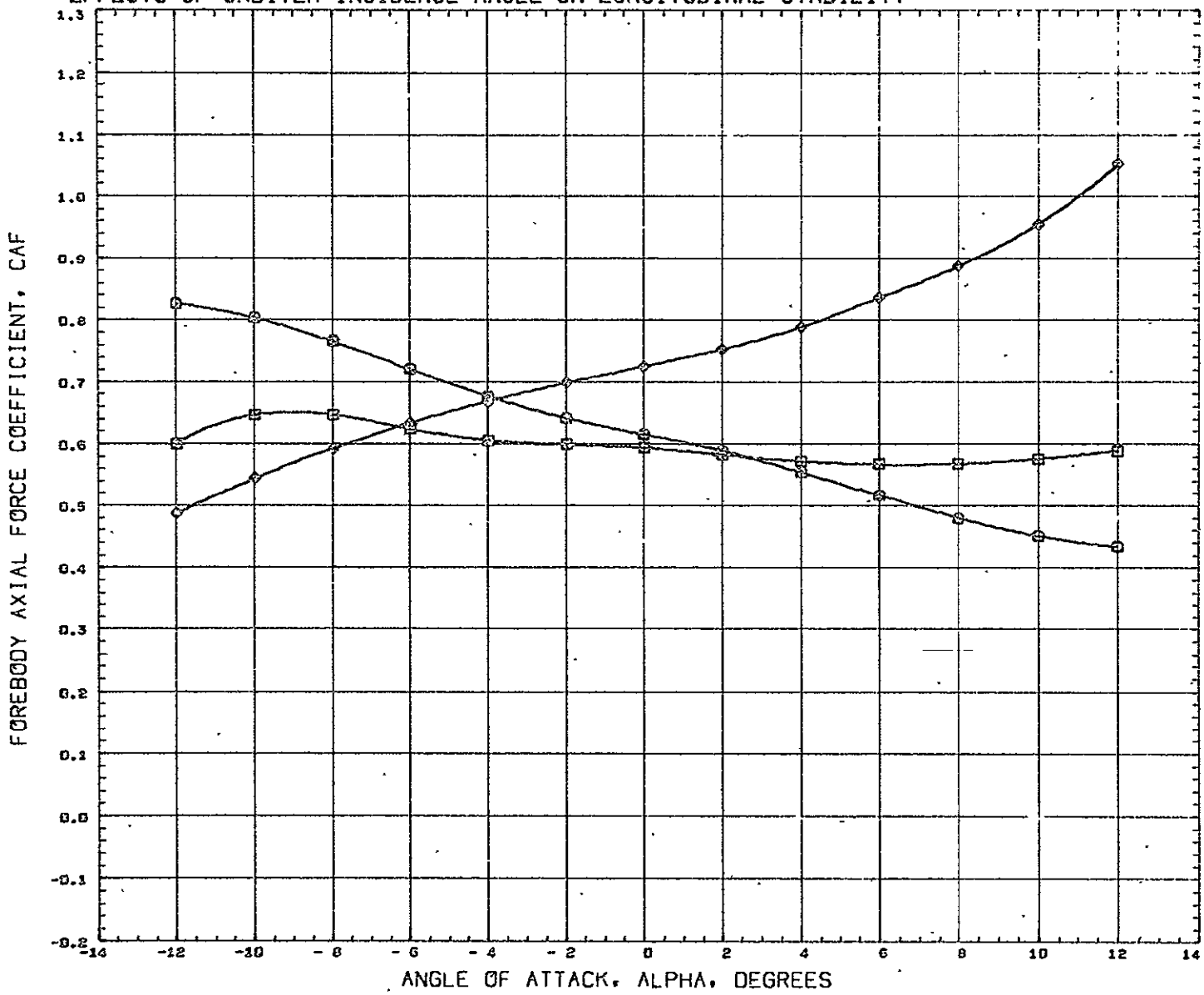
SYMBOL	ORBINC		PARAMETRIC VALUES		
○	2.000	MACH	1.200	BETA	0.000
□	1.000				
◇	4.000				

DATA HIST. CODE HHIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



SYMBOL	ORBINC	PARAMETRIC VALUES			
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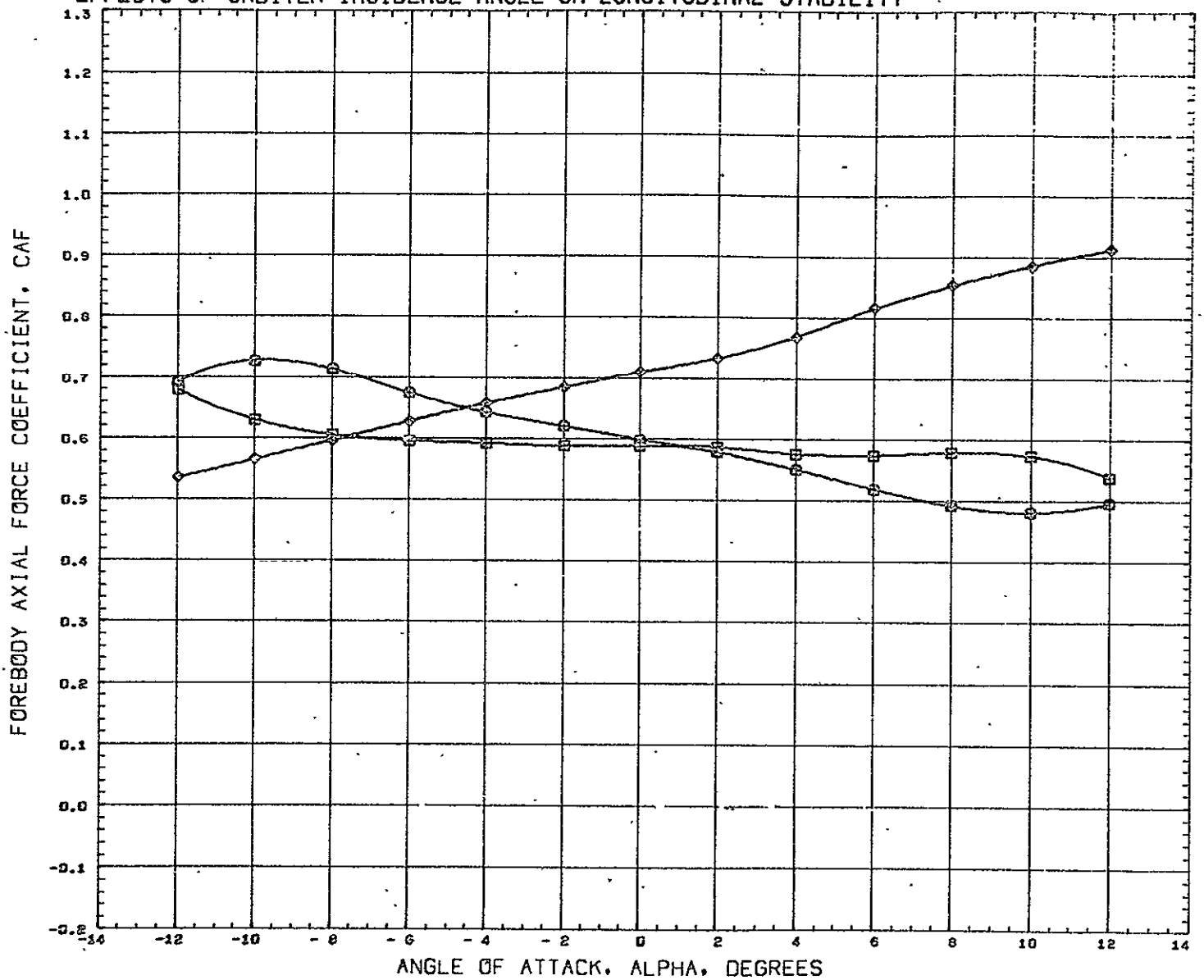
□	1.000				
◇	4.000				

DATA HIST. CODE HHIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



SYMBOL	ORBINC		PARAMETRIC VALUES		
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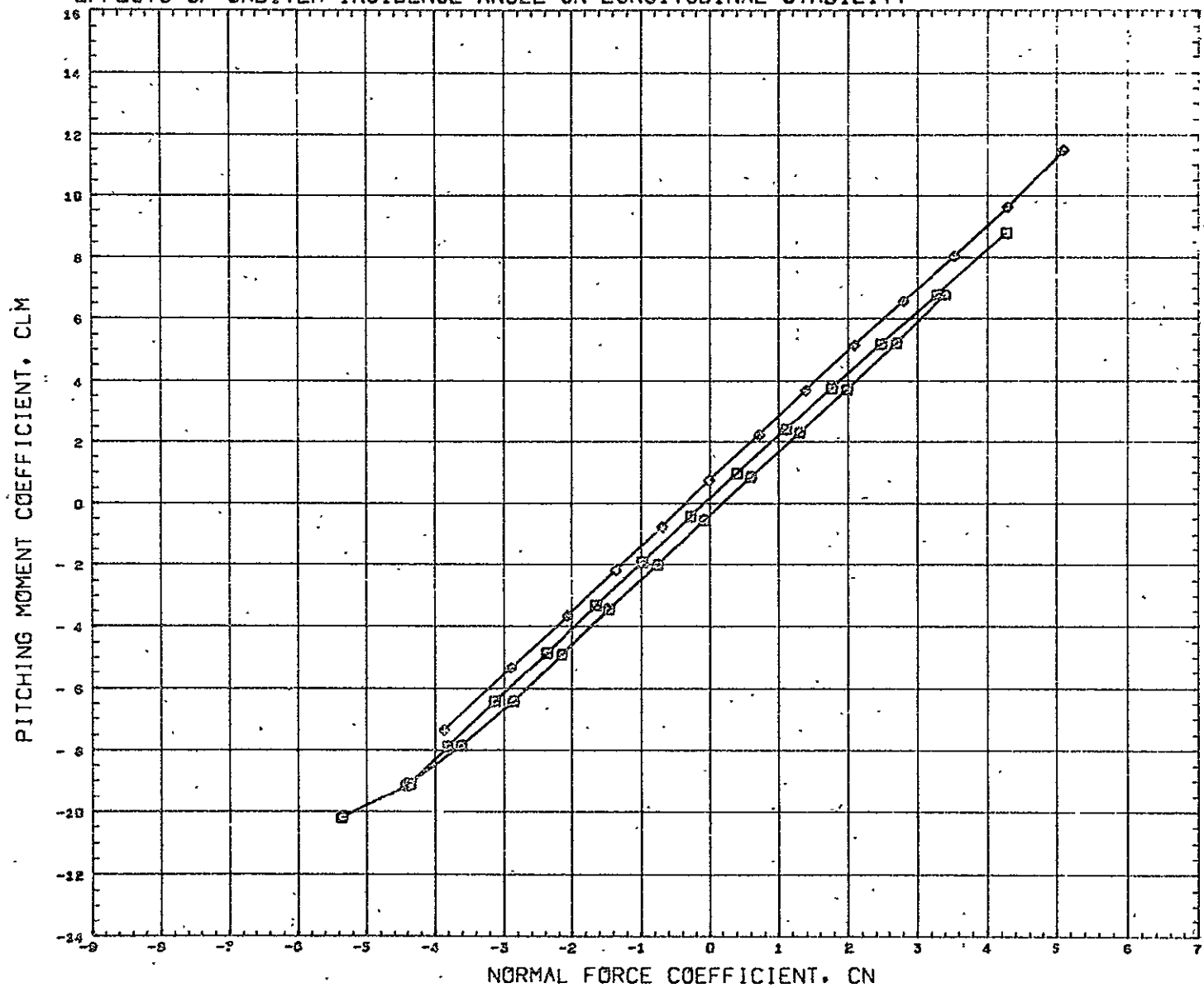
□	1.000				
◇	4.000				

DATA HIST. CODE MHIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



SYMBOL	ORDINC		PARAMETRIC VALUES		
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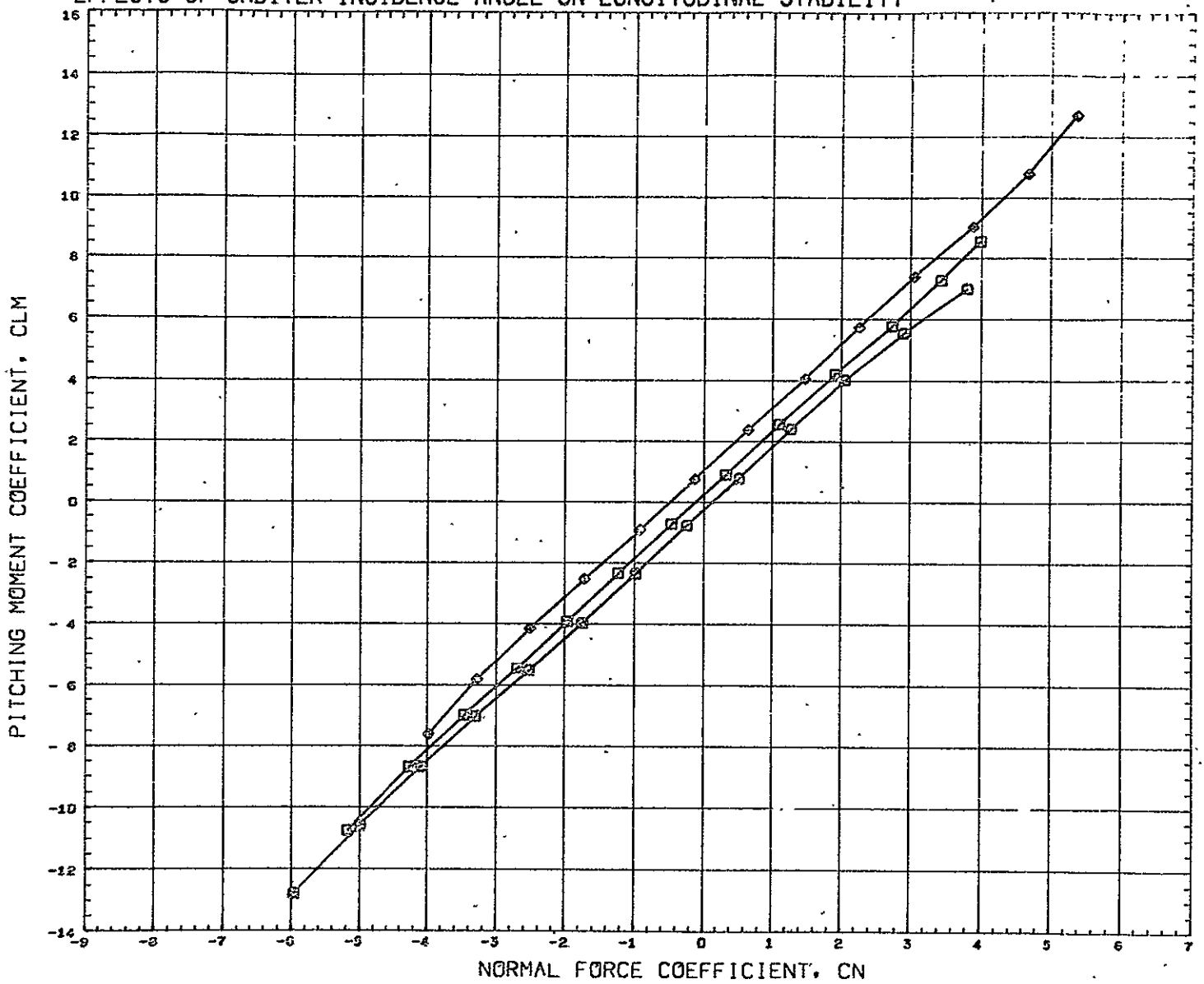
□	1.000				
◇	4.000				

DATA HIST. CODE NHIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



SYMBOL	ORBINC		PARAMETRIC VALUES		
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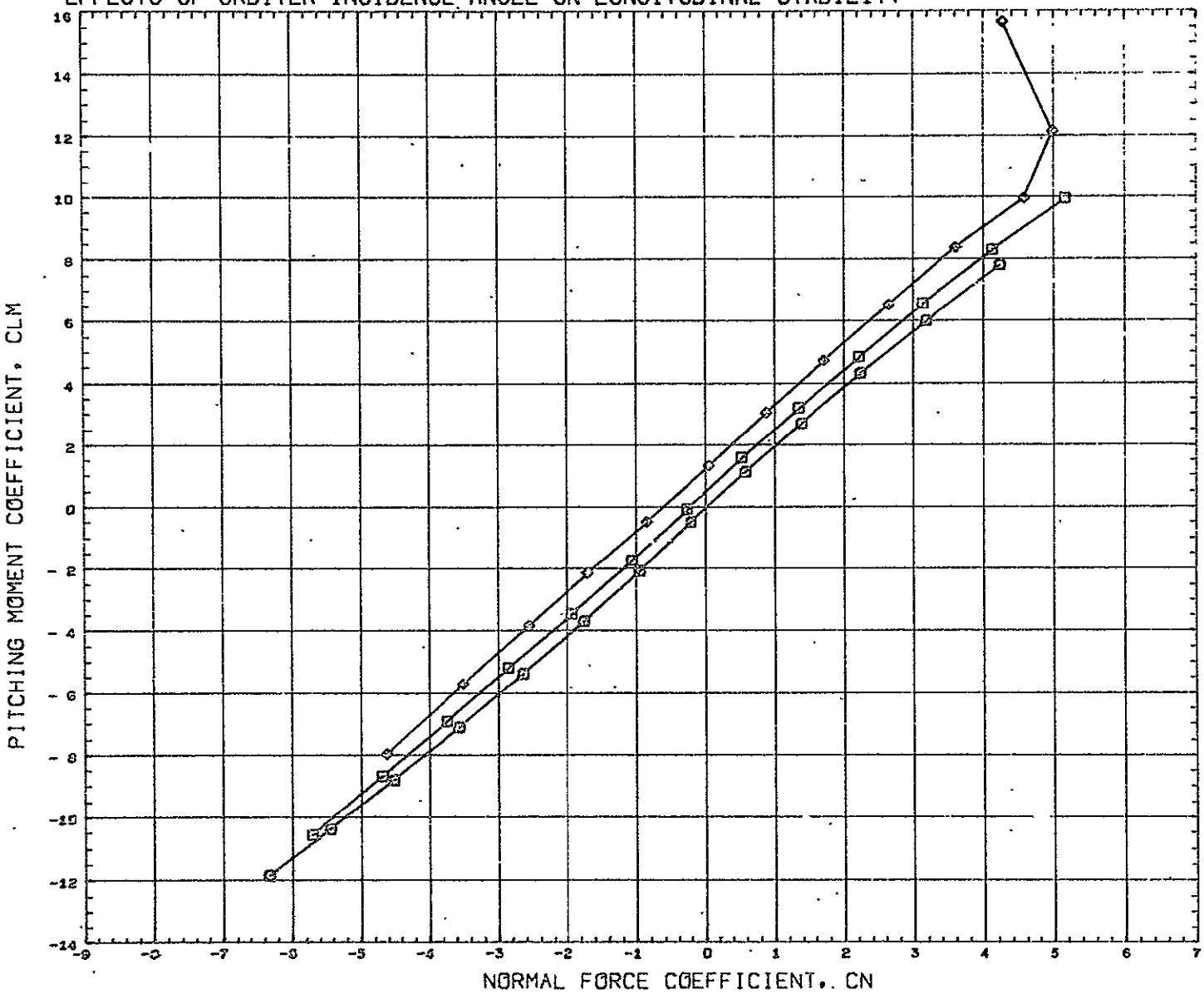
□	1.000				
◇	4.000				

DATA HIST. CODE HMIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



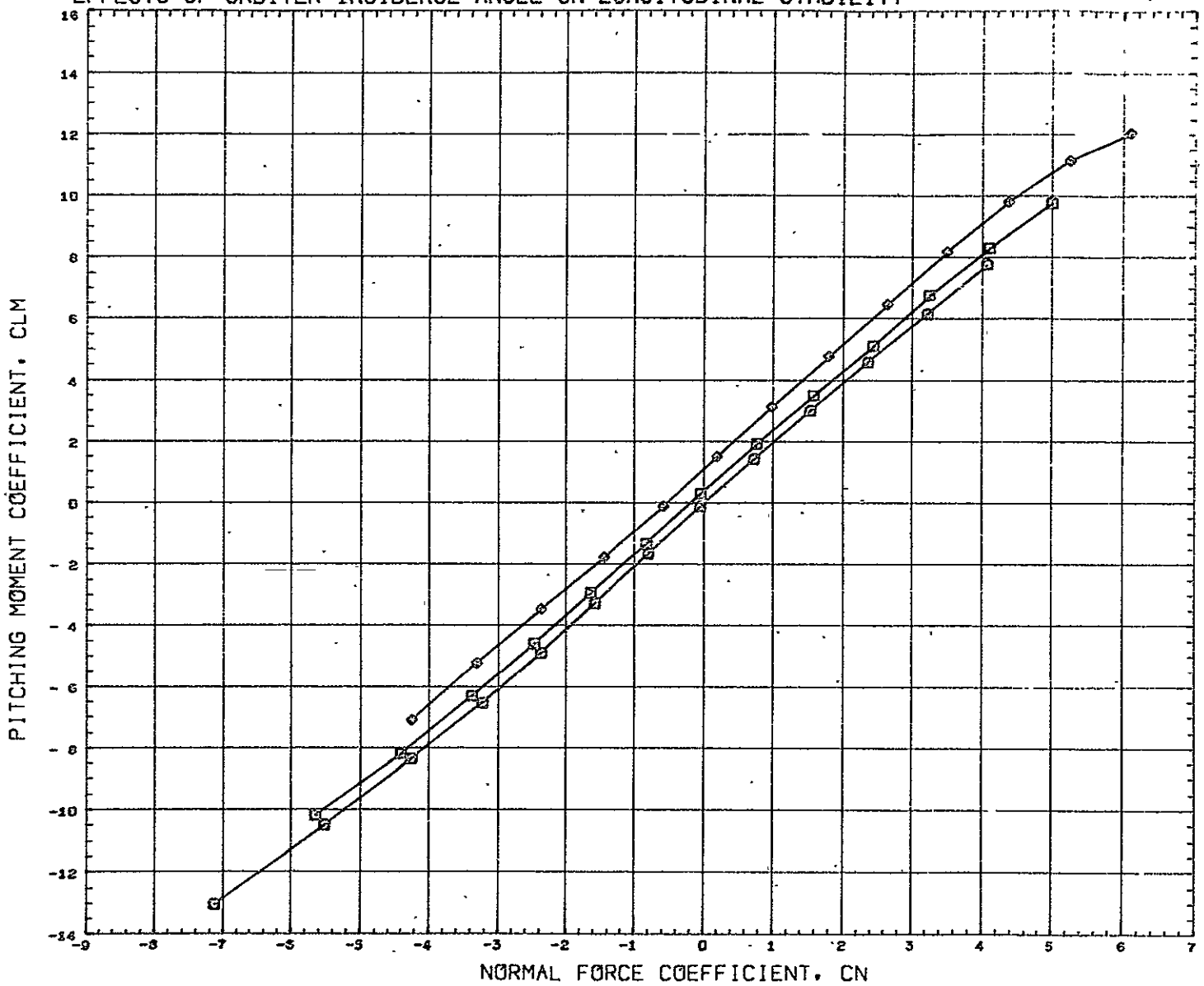
SYMBOL	ORBINC		PARAMETRIC VALUES		
○	- 2.000	MACH	1.000	BETA	0.000
□	1.000				
◇	4.000				

DATA HIST. CODE HHIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



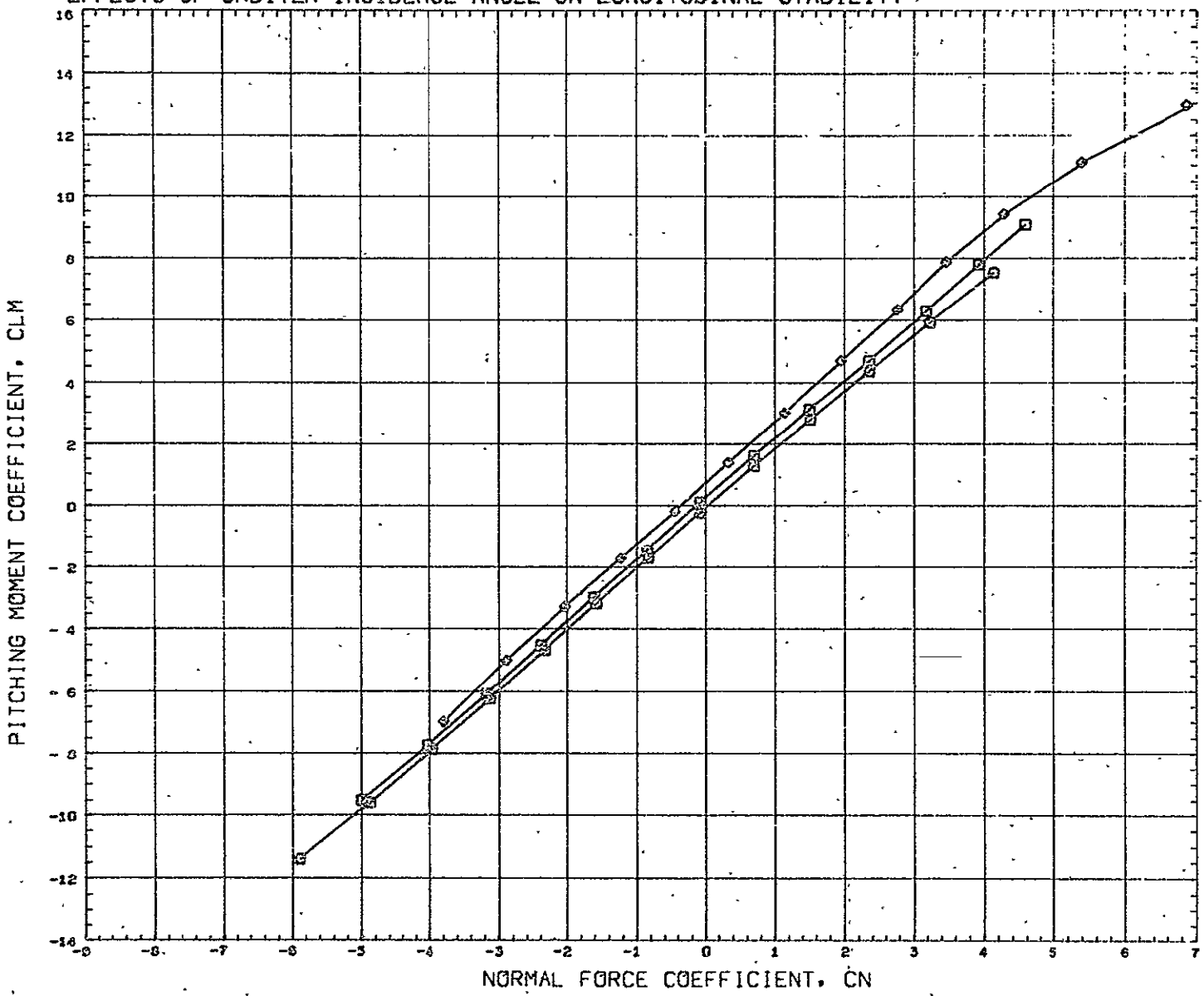
SYMBOL	ORBINC		PARAMETRIC VALUES		
○	- 2.000	MACH	1.100	BETA	0.000
□	1.000				
◇	4.000				

DATA HIST. CODE HHIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



SYMBOL	ORBINC		PARAMETRIC VALUES		
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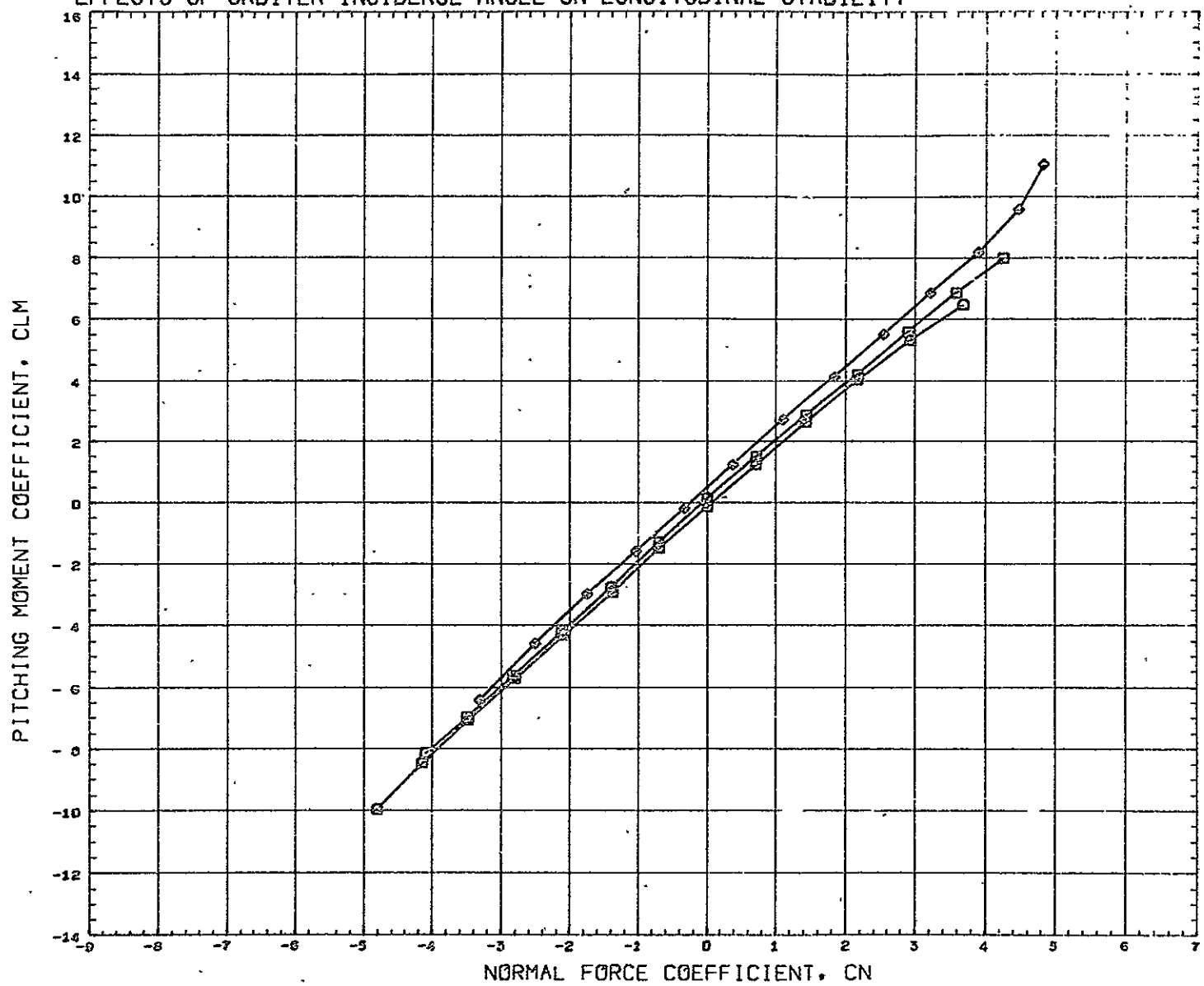
□	1.000				
◇	4.000				

DATA HIST. CODE NMIF

REFERENCE INFORMATION

REFS	1.3960	SQ:IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRF	5.2640	INCHES
YMRF	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



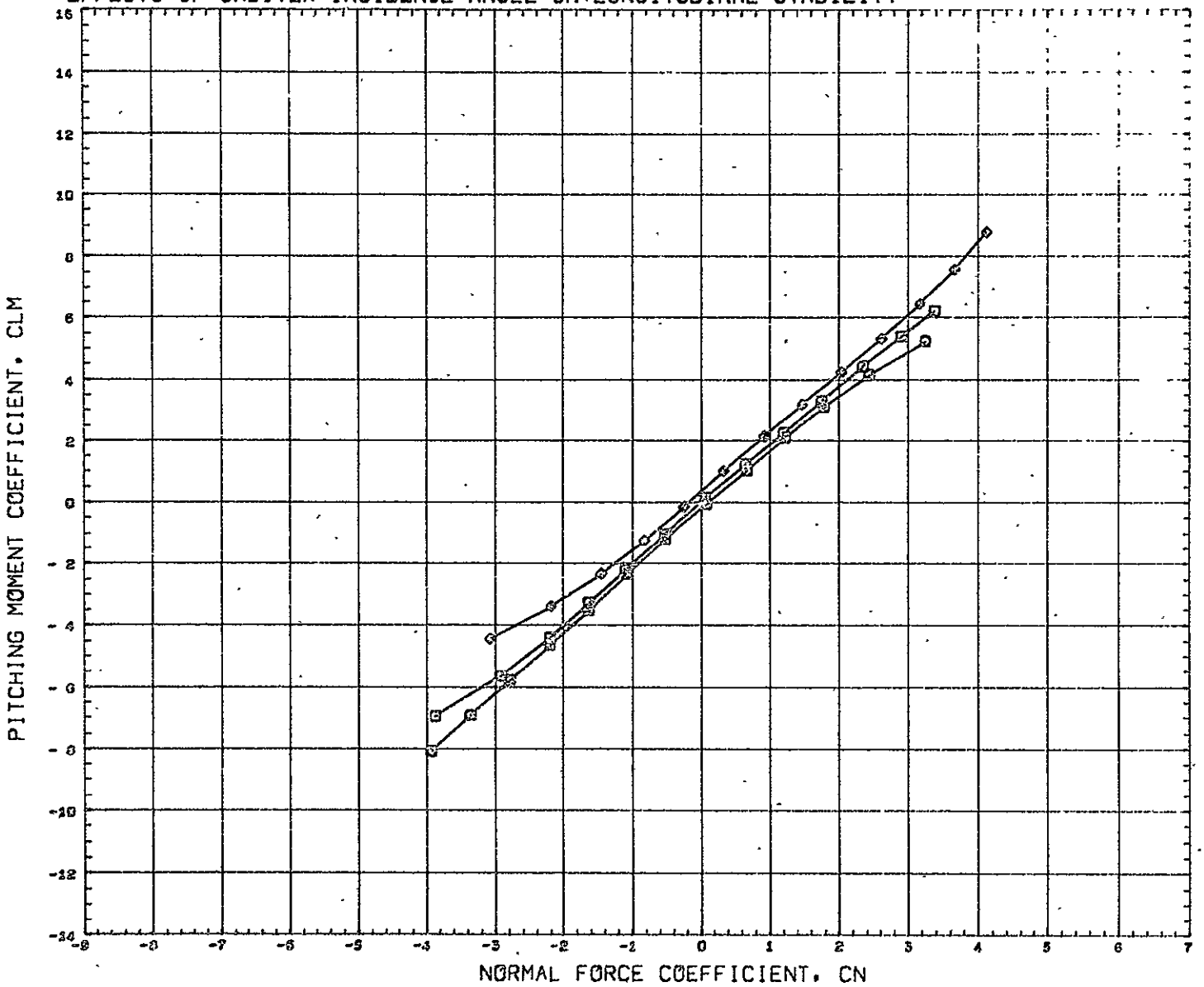
SYMBOL	ORBINC		PARAMETRIC VALUES		
○	- 2.000	MACH	1.460	BETA	0.000
□	1.000				
◇	4.000				

DATA HIST. CODE HHIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



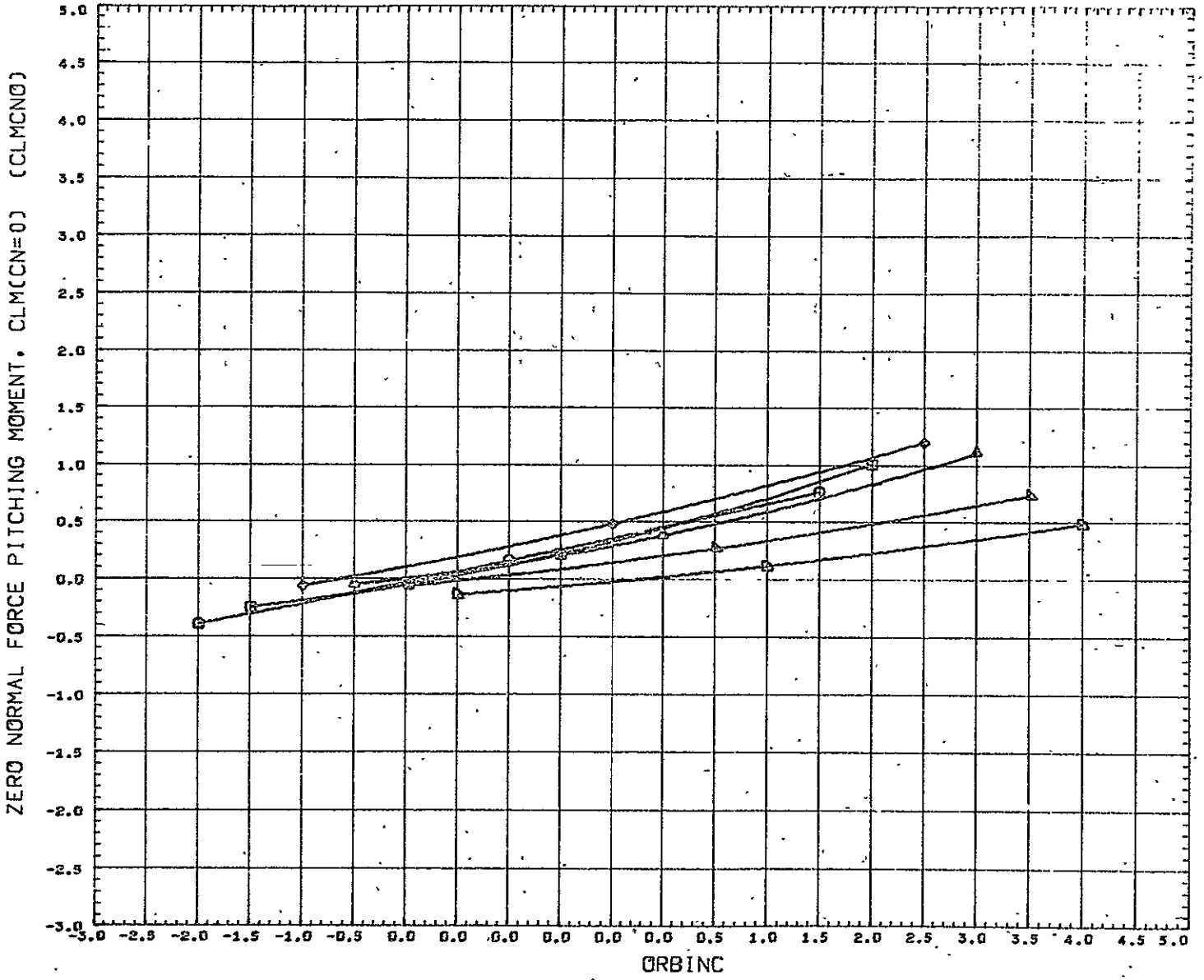
SYMBOL	ORBINC		PARAMETRIC VALUES		
○	2.000	MACH.	1.950	BETA	0.000
□	1.000				
◇	4.000				

DATA HIST. CODE HMIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY

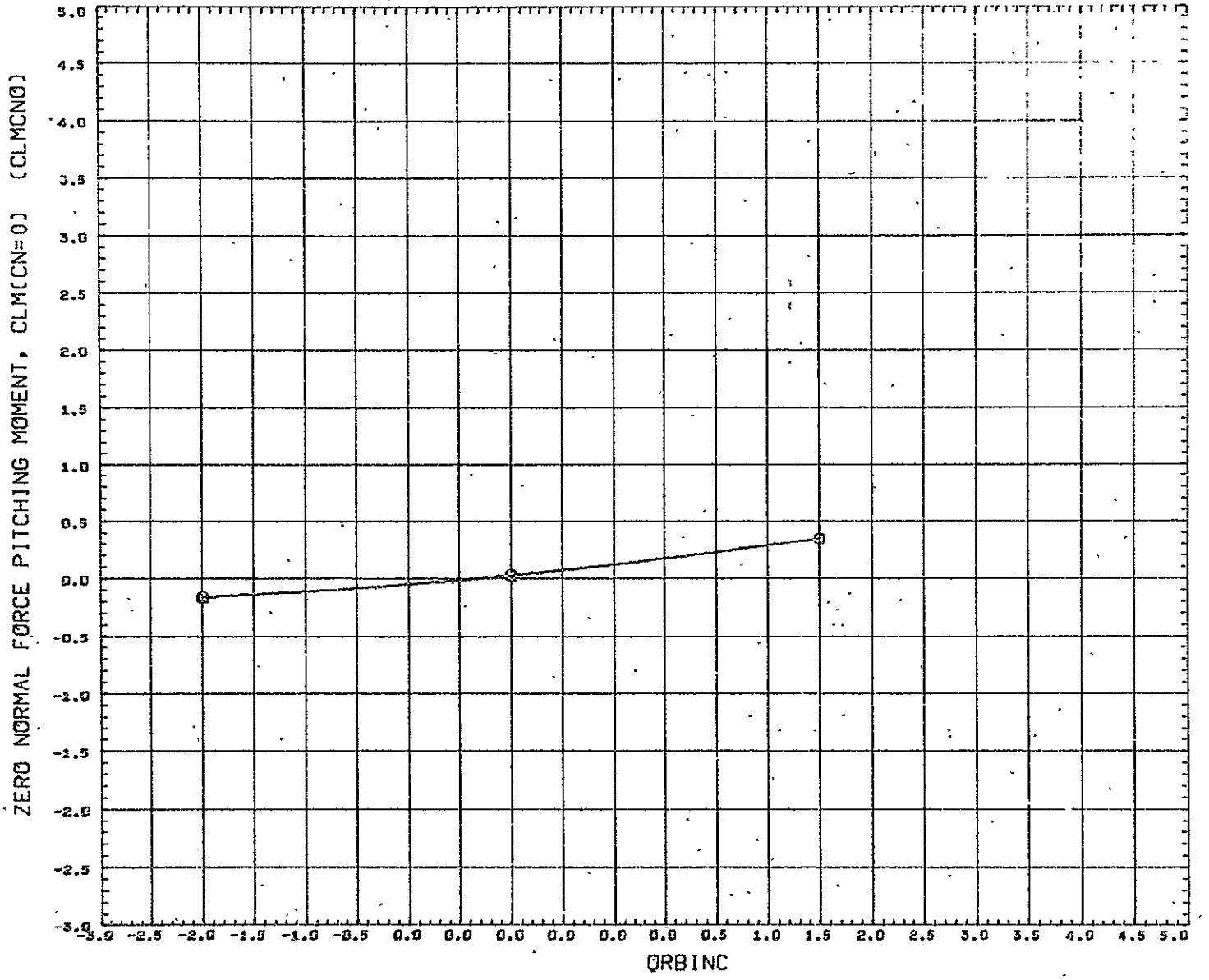


SYMBOL	MACH		PARAMETRIC VALUES
○	0.600	BETA	0.000
□	0.900		
◇	1.000		
△	1.100		
▷	1.200		
D	1.460	DATA HIST. CODE	HHIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

EFFECTS OF ORBITER INCIDENCE ANGLE ON LONGITUDINAL STABILITY



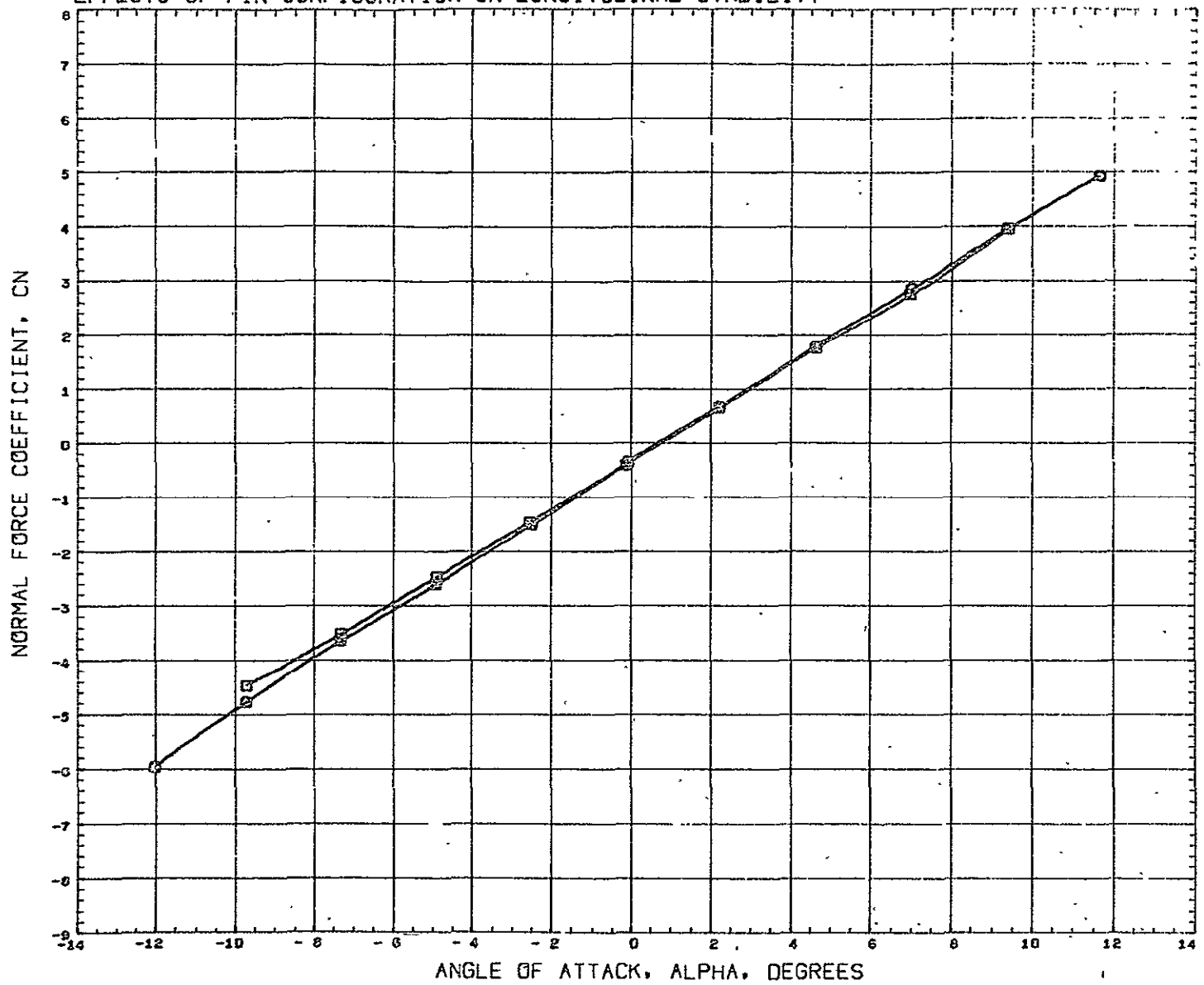
SYMBOL	MACH		PARAMETRIC VALUES
O	1.960	BETA	0.000

DATA HIST. CODE HHIF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XHRP	5.2640	INCHES
YHRP	0.0000	INCHES
ZHRP	0.0330	INCHES
SCALE	0.0034	

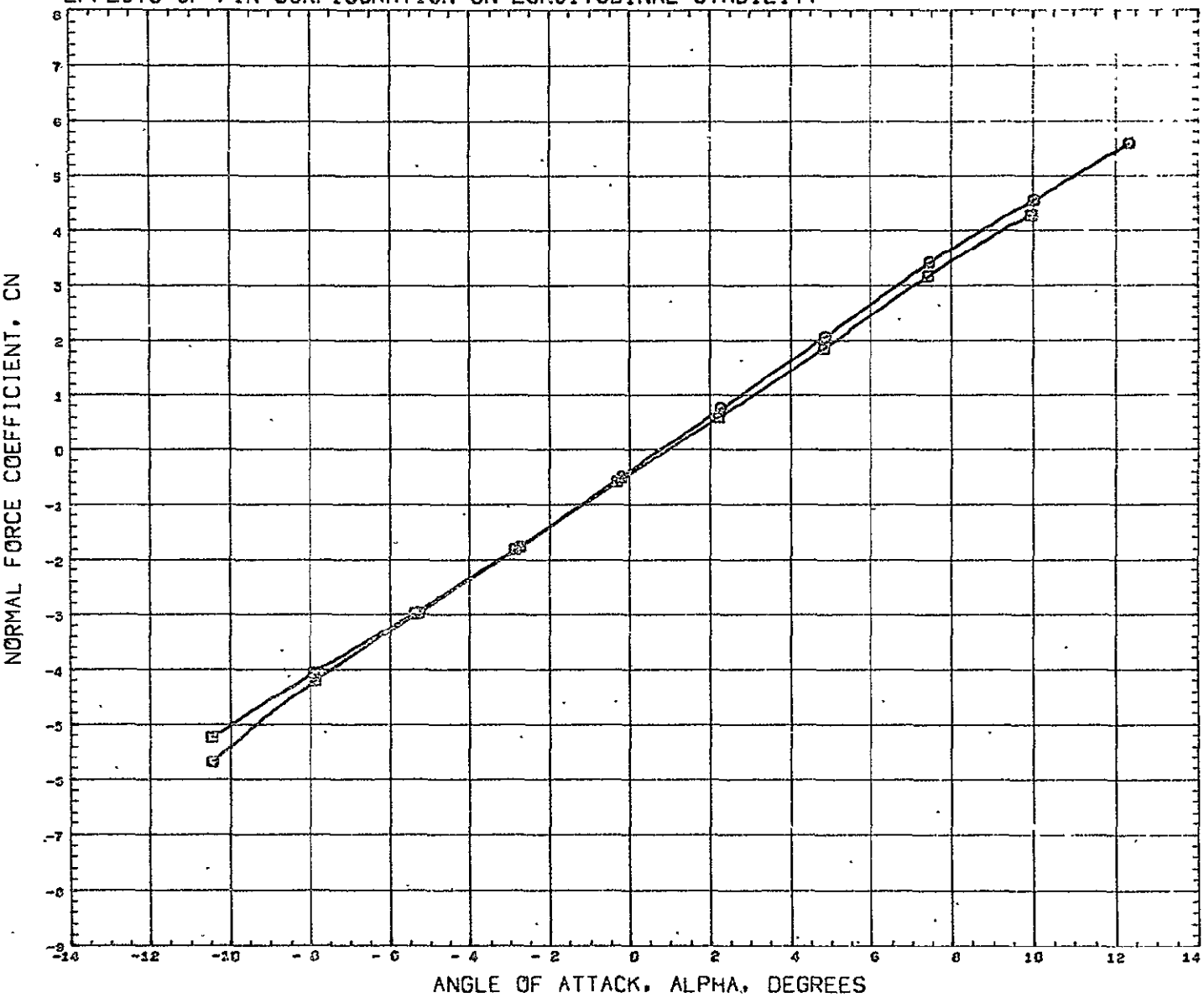
EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES				REFERENCE INFORMATION		
(R25021)	○	MSFC 476 NR HCROSB/S-ICBOOSTER	BF1S+B5W14E3V17	BETA	0.020	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R25091)	□	MSFC 476 NR HCROSB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XMRP	5.2640	INCHES
								YMRP	0.0000	INCHES
								ZMRP	0.0330	INCHES
								SCALE	0.0034	

MACH 0.600

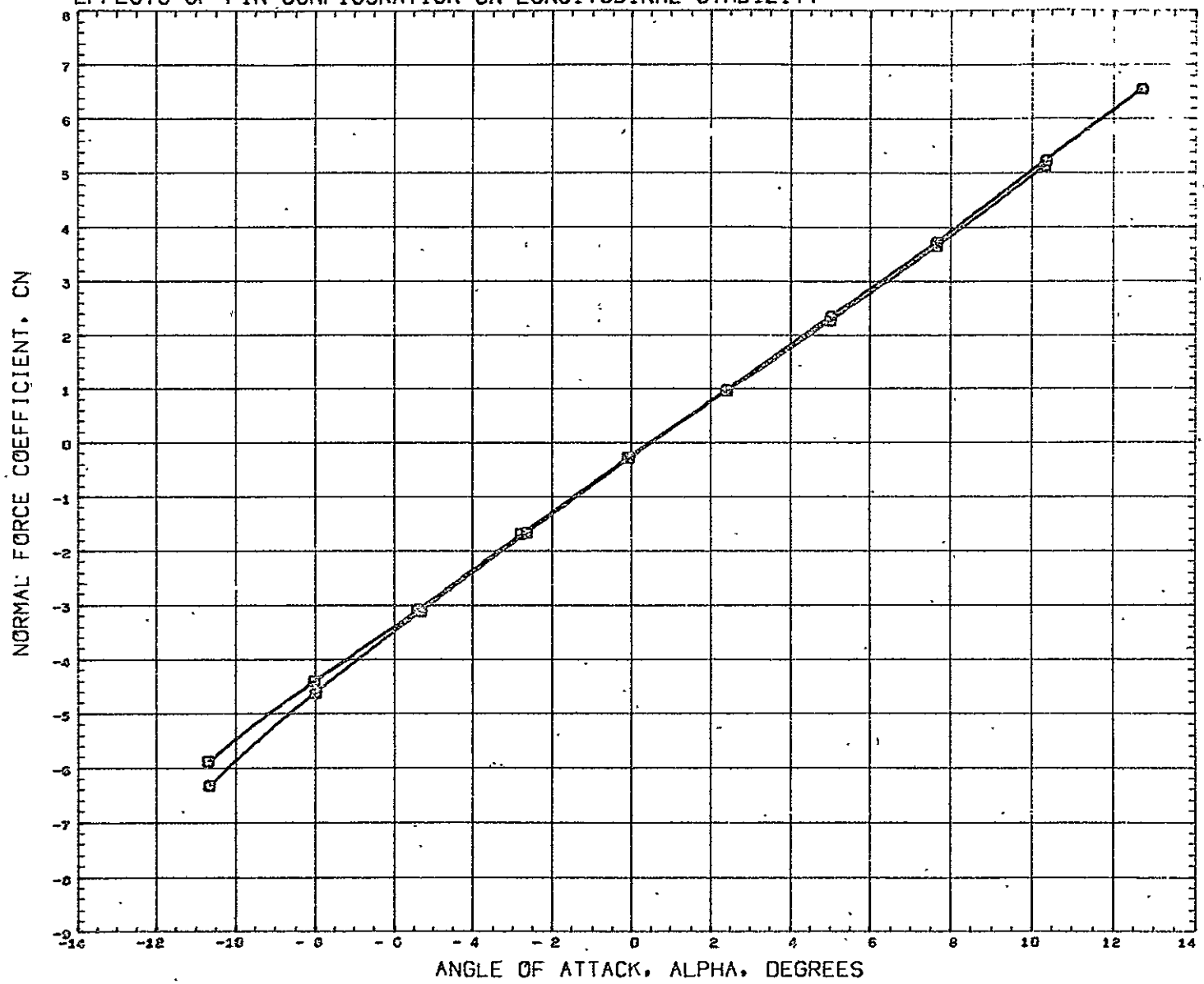
EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES				REFERENCE INFORMATION		
(R29021)	○	MSFC 476 MR MCROXB/S-ICBOOSTER	BF1S+B5W14E3V17	BETA	0.020	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R29091)	□	MSFC 476 MR MCROXB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XMRP	5.2640	INCHES
								YMRP	0.0000	INCHES
								ZMRP	0.0330	INCHES
								SCALE	0.0034	

MACH 0.098

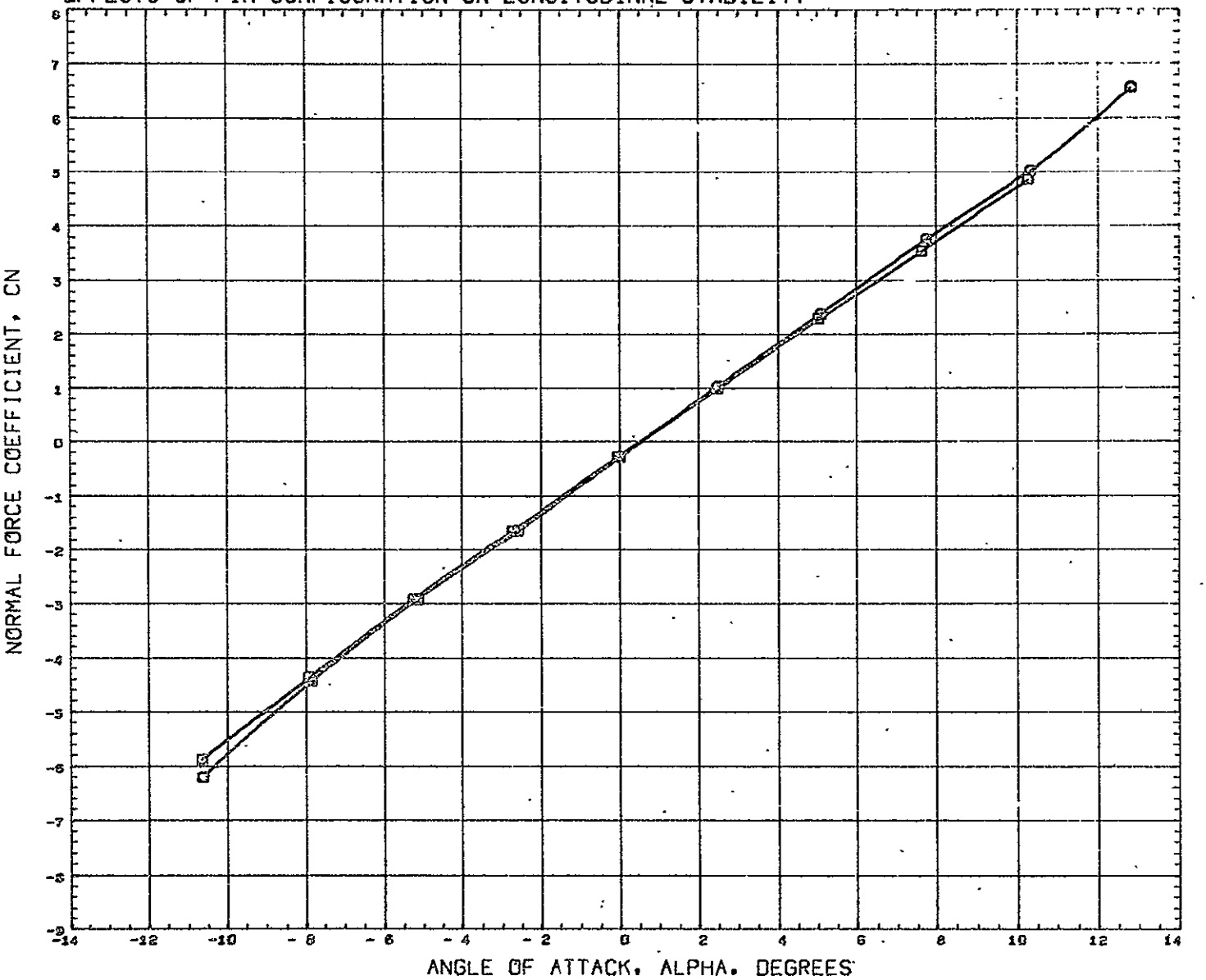
EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES				REFERENCE INFORMATION		
(R25021)	○	MSFC 476 NR HCROXB/S-ICBOOSTER	BF1S+B5W14E3V17	BETA	0.020	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R25091)	□	MSFC 476 NR HCROXB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XMRP	5.2640	INCHES
								YMRP	0.0000	INCHES
								ZMRP	0.0330	INCHES
								SCALE	0.0034	

MACH 0.994

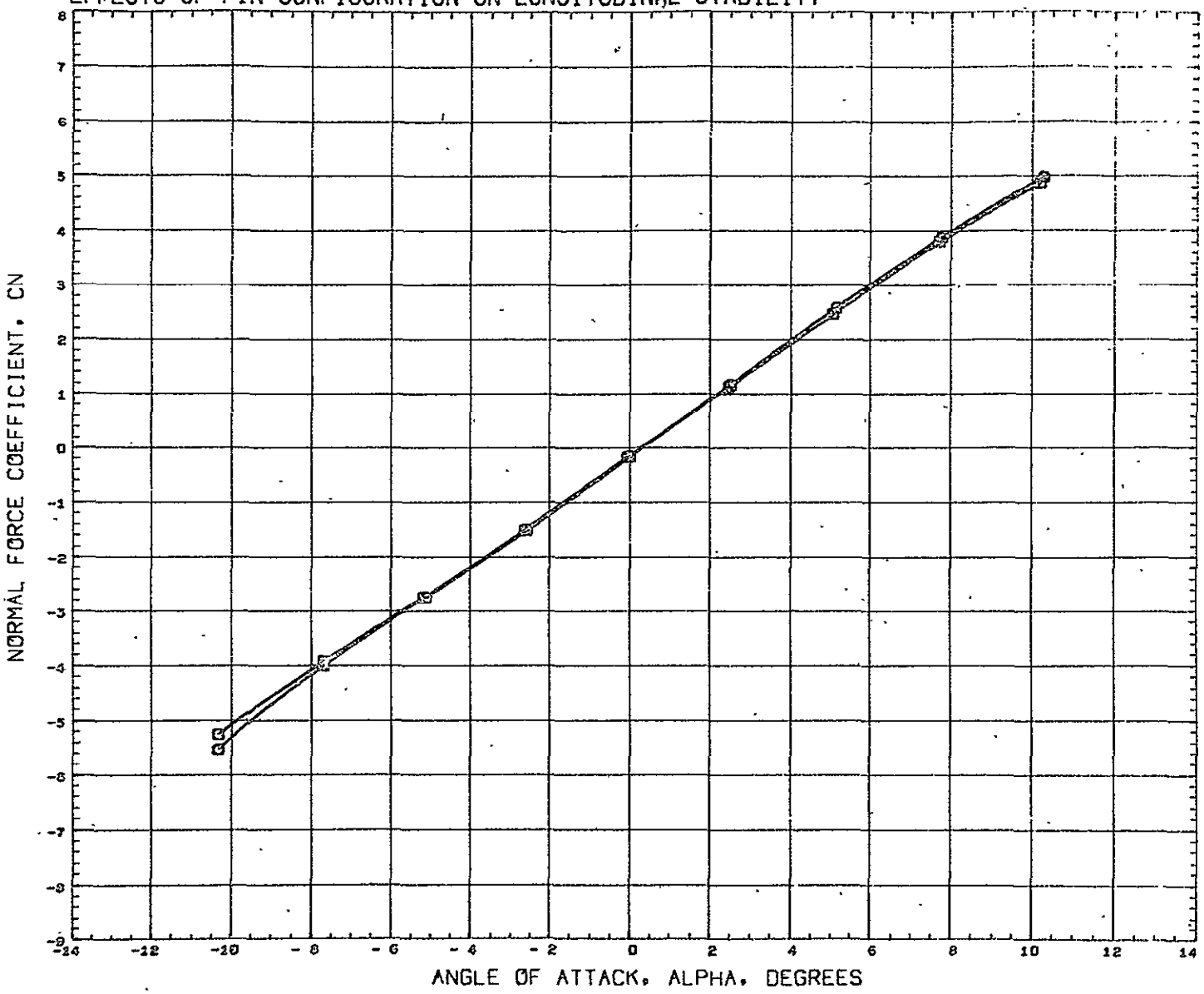
EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES				REFERENCE INFORMATION		
(R25021)	○	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	BETA	0.020	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R25091)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XMRP	5.2640	INCHES
								YMRP	0.0000	INCHES
								ZMRP	0.0330	INCHES
								SCALE	0.0034	

MACH 1.105

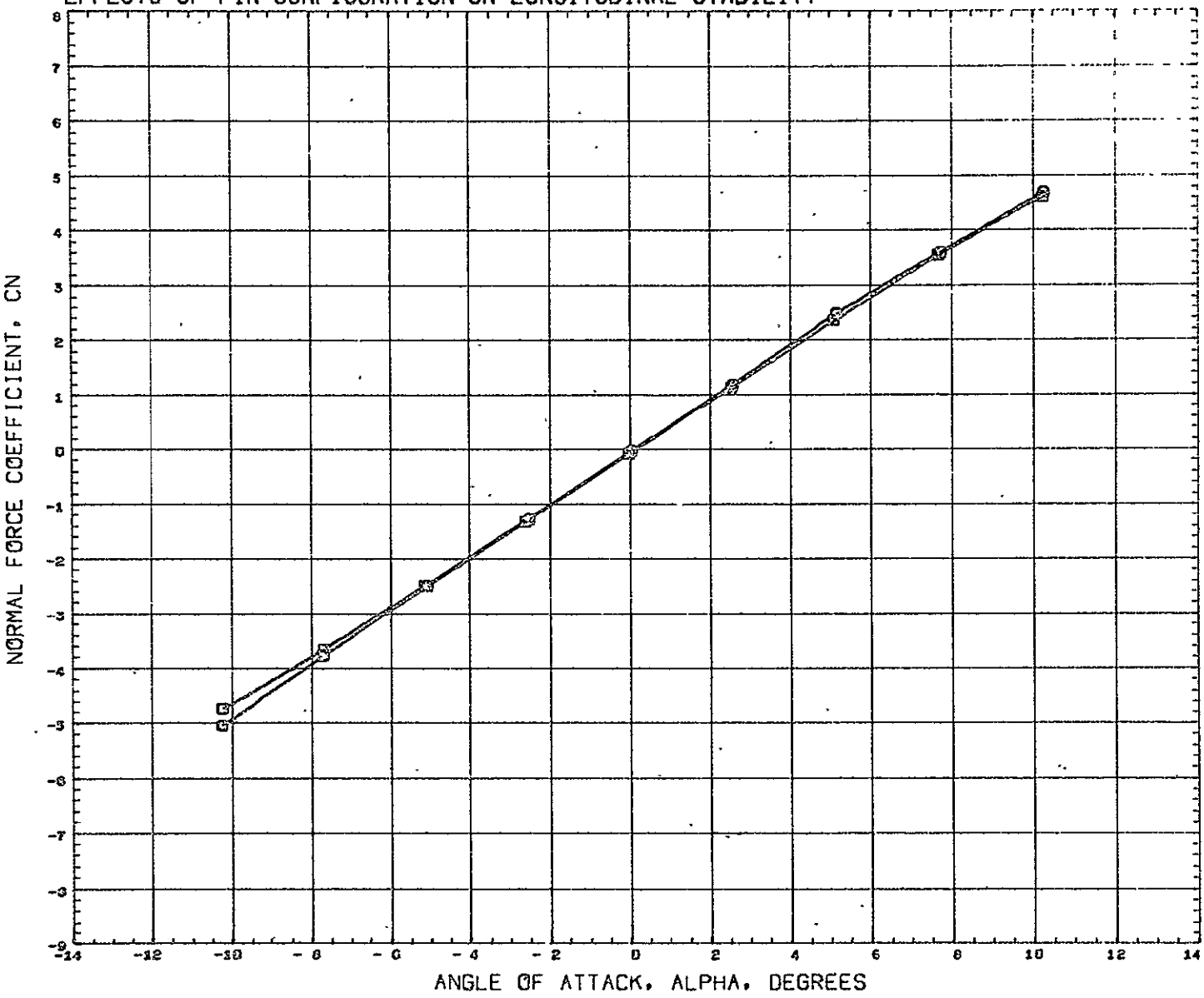
EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES				REFERENCE INFORMATION		
(R25021)	○	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	BETA	0.020	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R25091)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XMRP	5.2640	INCHES
								YMRP	0.0000	INCHES
								ZMRP	0.0330	INCHES
								SCALE	0.0034	

MACH 1.190

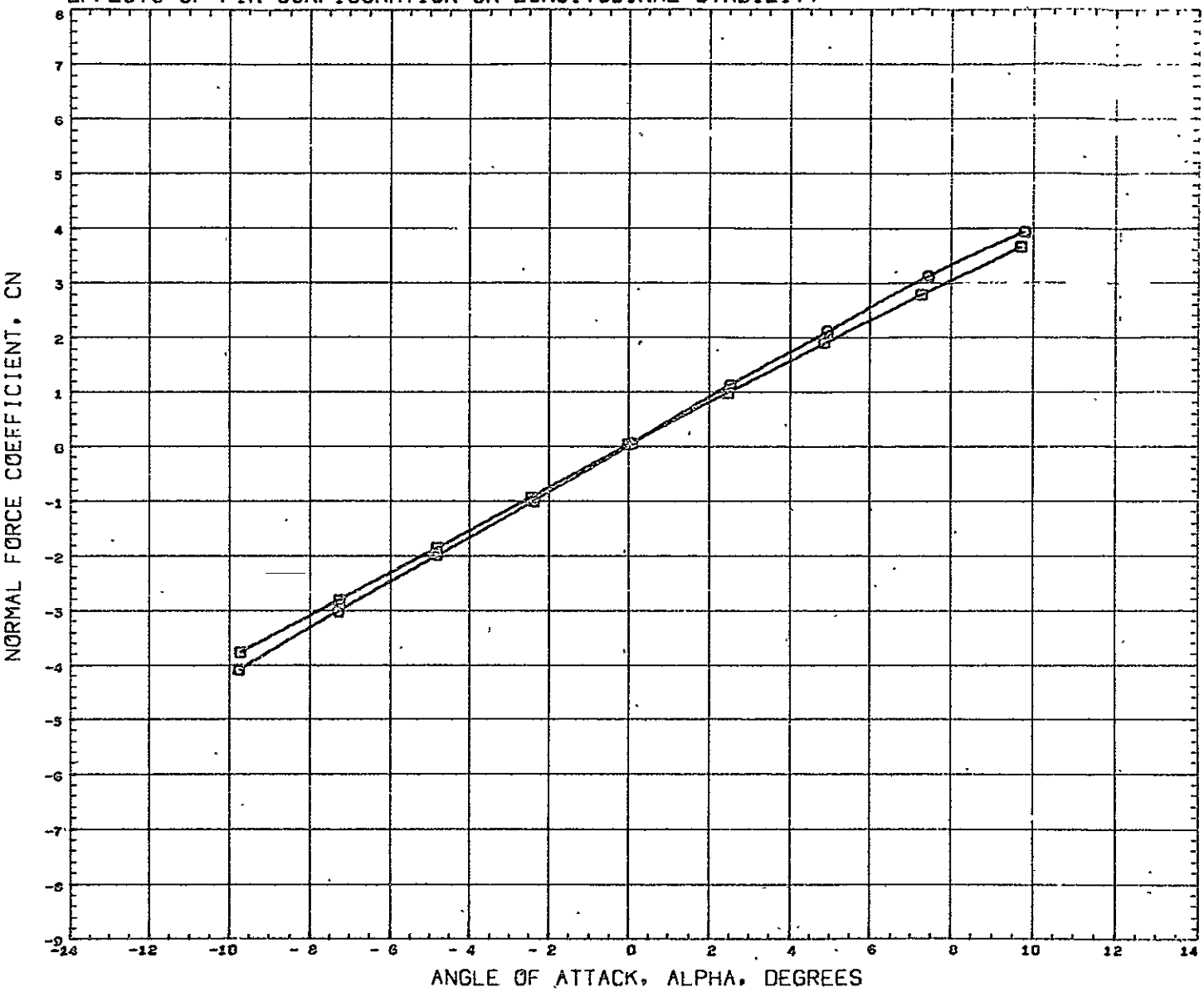
EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES				REFERENCE INFORMATION		
(R25021)	○	HSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	BETA	0.020	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R25D91)	□	HSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XMRP	5.2640	INCHES
								YMRP	0.0000	INCHES
								ZMRP	0.0330	INCHES
								SCALE	0.0034	

MACH 1.465

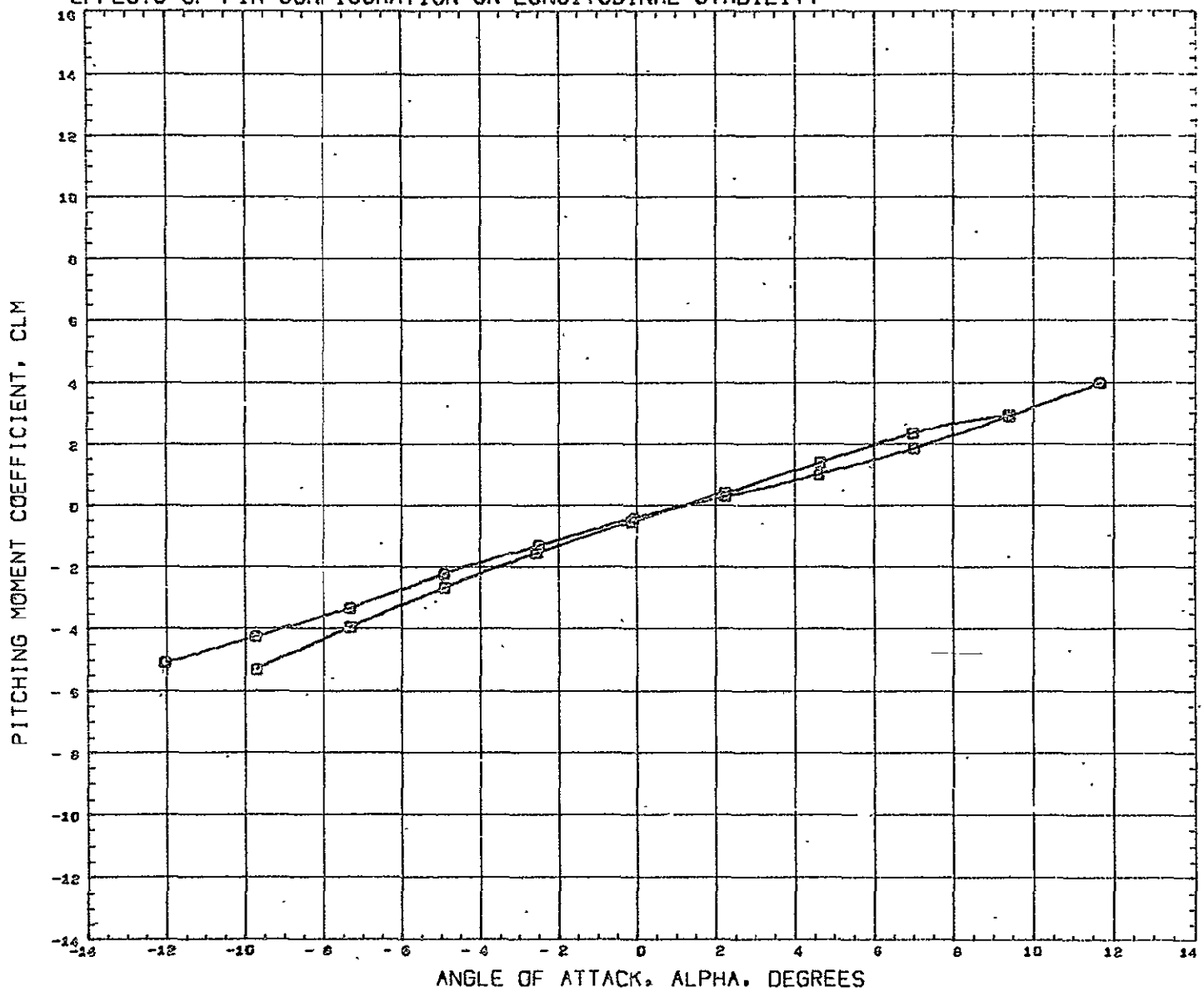
EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES				REFERENCE INFORMATION		
(R25D21)	O	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	BETA	0.020	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R25D91)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XMRF	5.2640	INCHES
								YMRF	0.0000	INCHES
								ZMRF	0.0330	INCHES
								SCALE	0.0034	

MACH 1.952

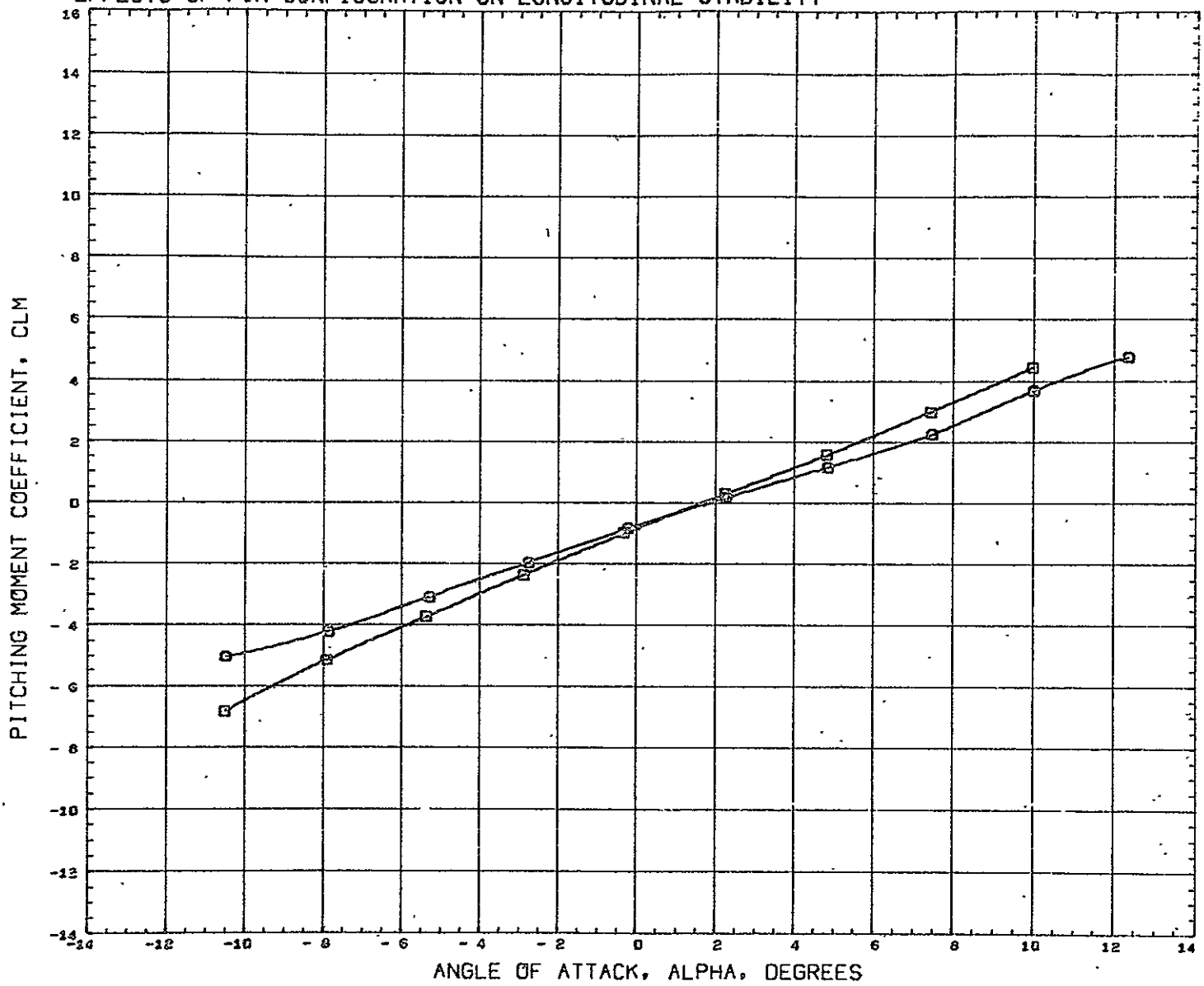
EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	PARAMETRIC VALUES				REFERENCE INFORMATION		
(R25021)	○	MSFC 476 NR MCRORB/S-ICBOOSTER BF1S+B5W14E3V17	BETA	0.020	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R25091)	□	MSFC 476 NR MCRORB/S-ICBOOSTER BF2S+B5W14E3V17					REFL	1.3330	INCHES
							REFB	1.3330	INCHES
							XMRP	5.2640	INCHES
							YMRP	0.0000	INCHES
							ZMRP	0.0330	INCHES
							SCALE	0.0034	

MACH 0.600

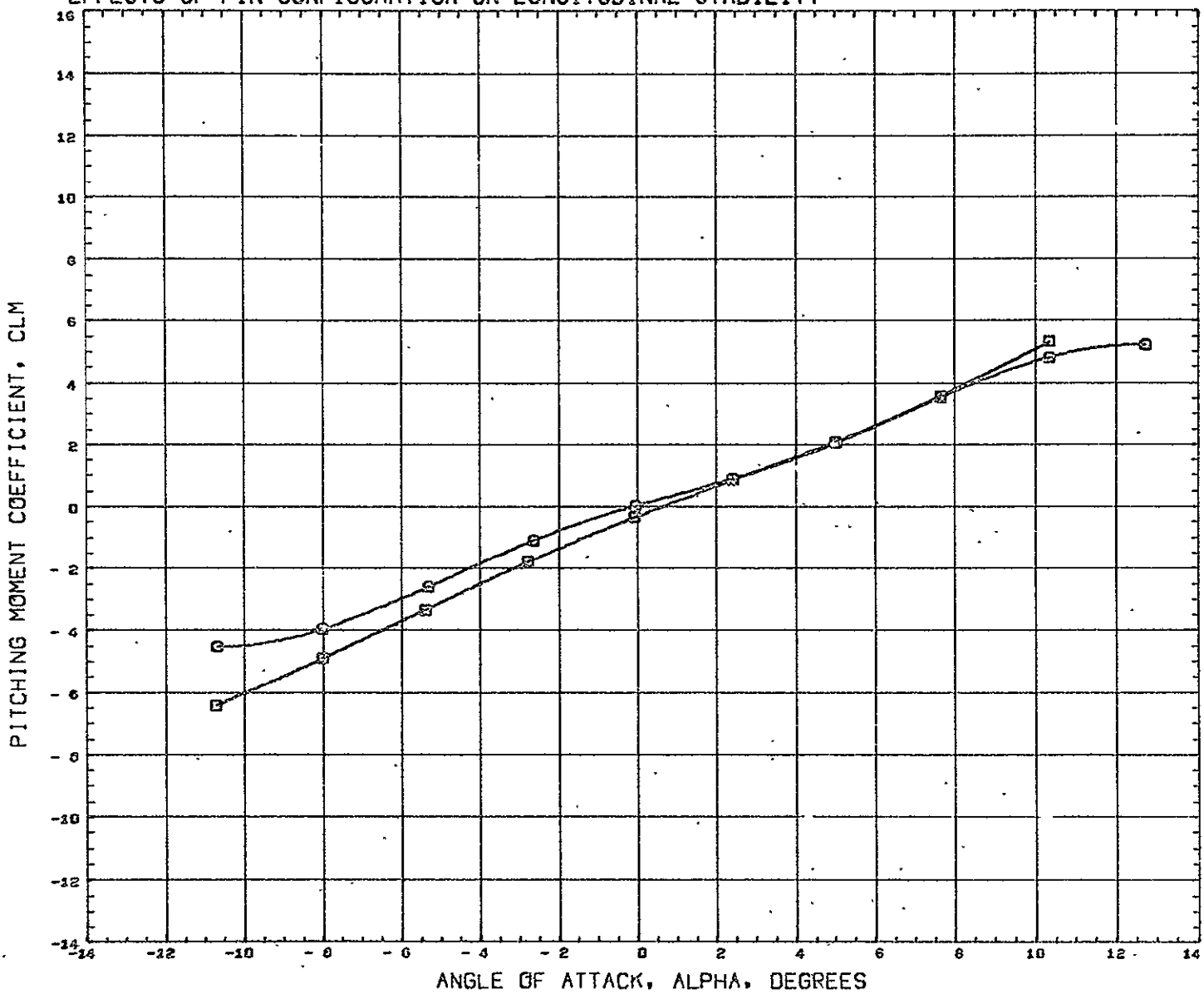
EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES				REFERENCE INFORMATION		
(R25021)	○	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	BETA	0.020	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R25091)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XMRP	5.2640	INCHES
								YMRP	0.0000	INCHES
								ZMRP	0.0330	INCHES
								SCALE	0.0034	

MACH 0.698

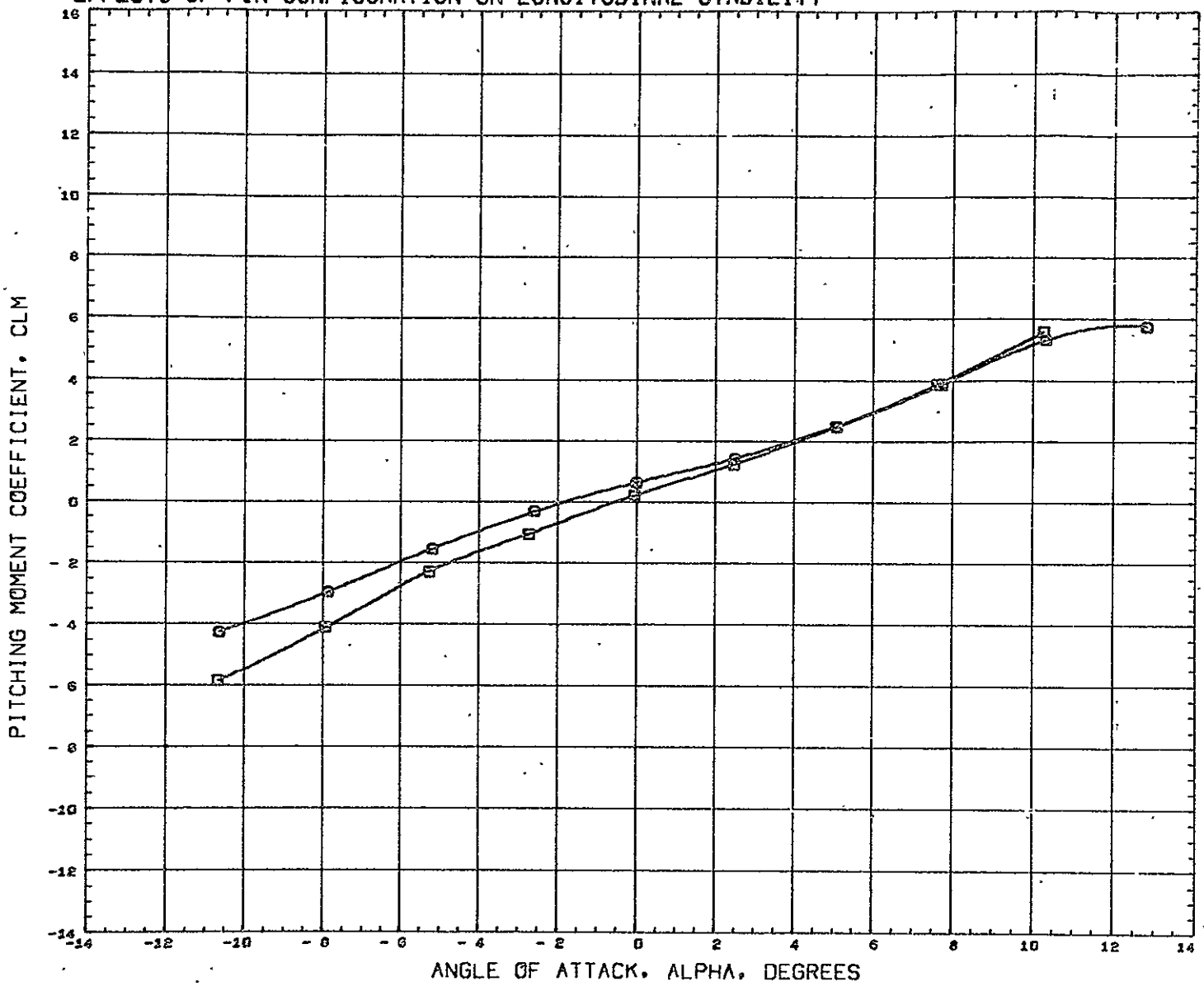
EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES				REFERENCE INFORMATION		
(R25021)	○	MSFC 476 WR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	BETA	0.020	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R25091)	□	MSFC 476 WR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XMRF	5.2640	INCHES
								YMRF	0.0000	INCHES
								ZMRF	0.0330	INCHES
								SCALE	0.0034	

MACH 0.994

EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	
(R25021)	O	MSFC 475 NR MCRORB/S-ICBOOSTER	BF1S+B5W14E3V17
(R25091)	□	MSFC 476 NR MCRORB/S-ICBOOSTER	BF2S+B5W14E3V17

PARAMETRIC VALUES

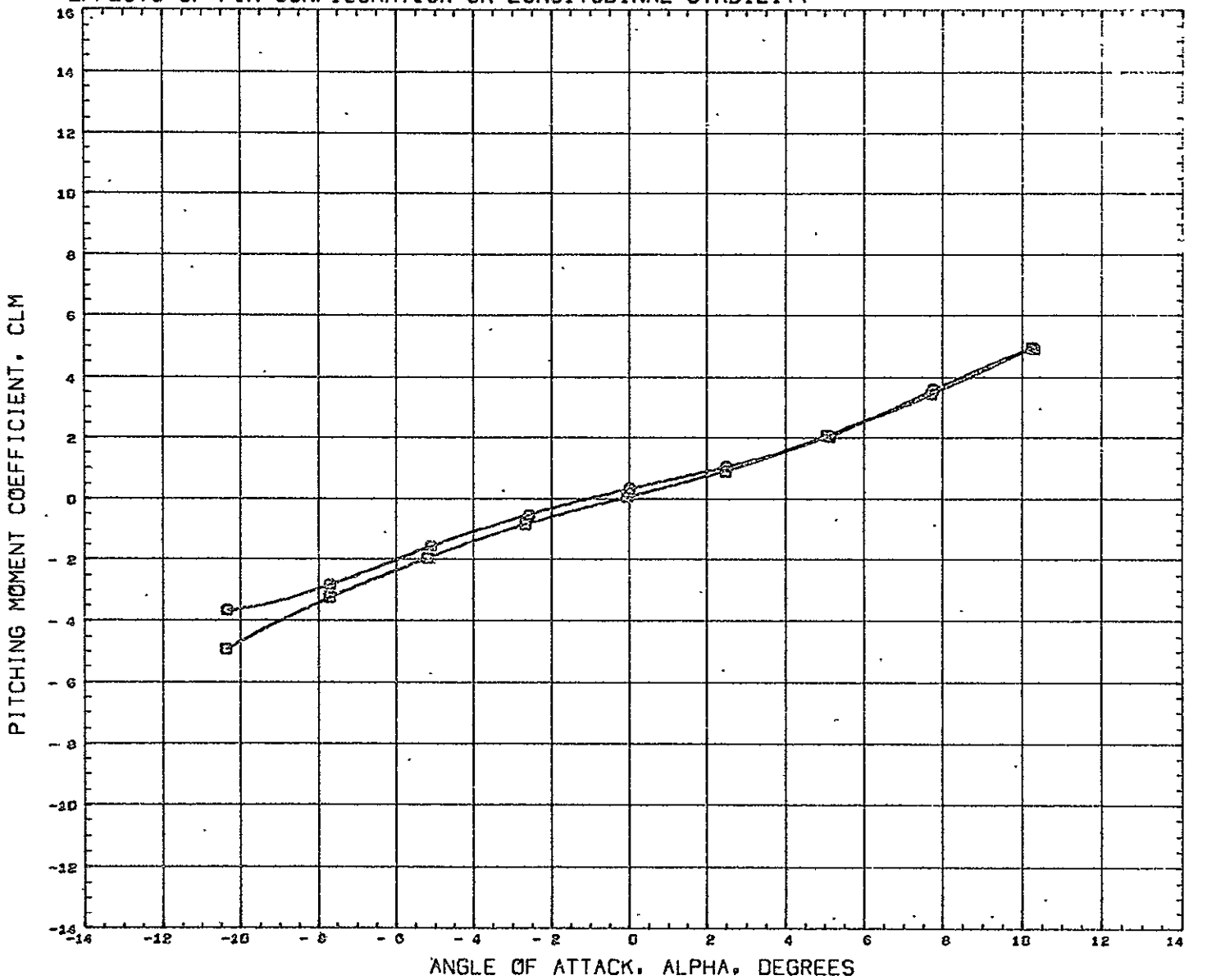
BETA 0.020 ORBINC 1.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MACH 1.105

EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(R25021)	○	NSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17
(R25091)	□	NSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES

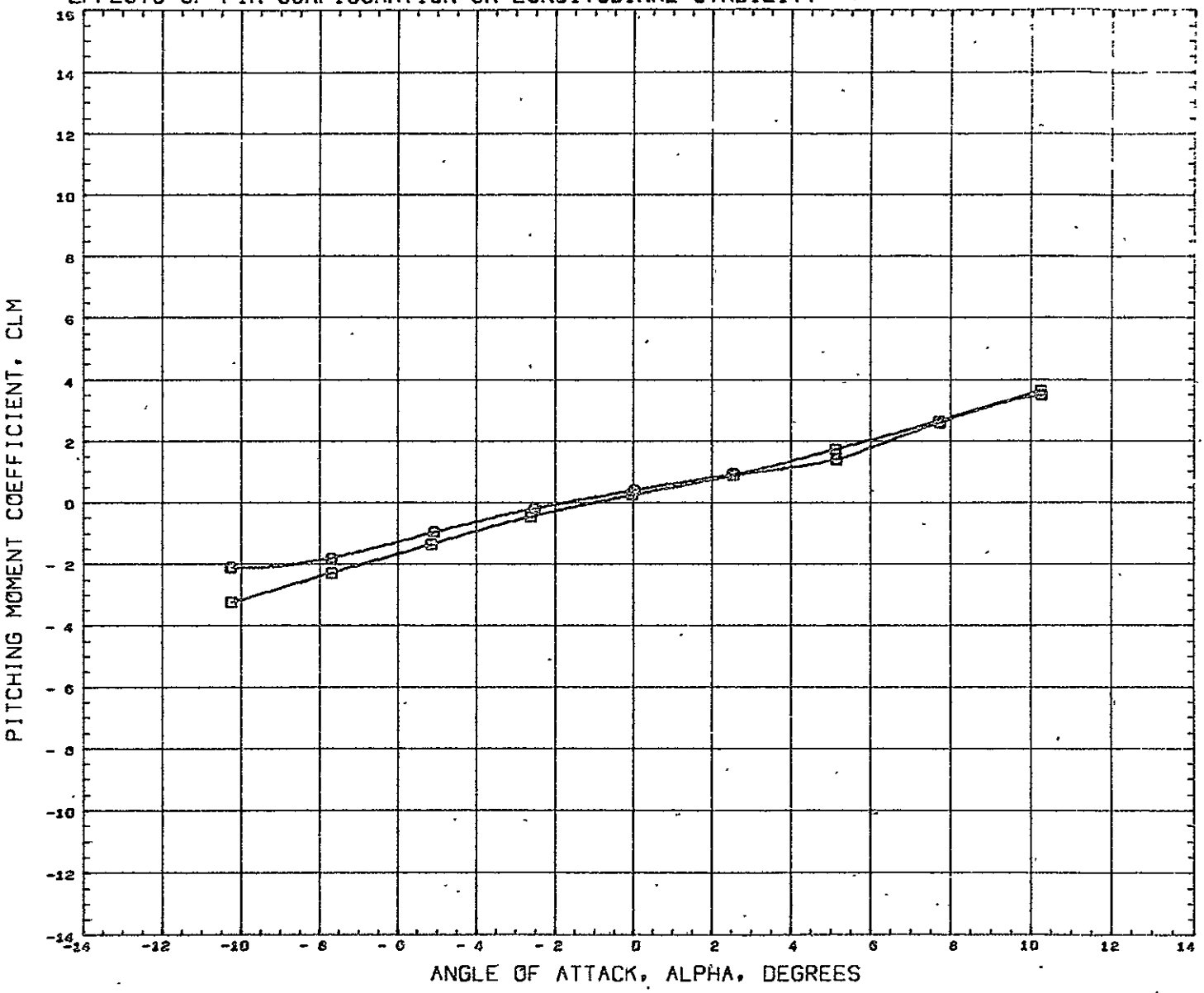
BETA	0.020	ORBINC	1.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MACH 1.198

EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(R25021)	○	HSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B5W14E3V17
(R25091)	□	HSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B5W14E3V17

PARAMETRIC VALUES

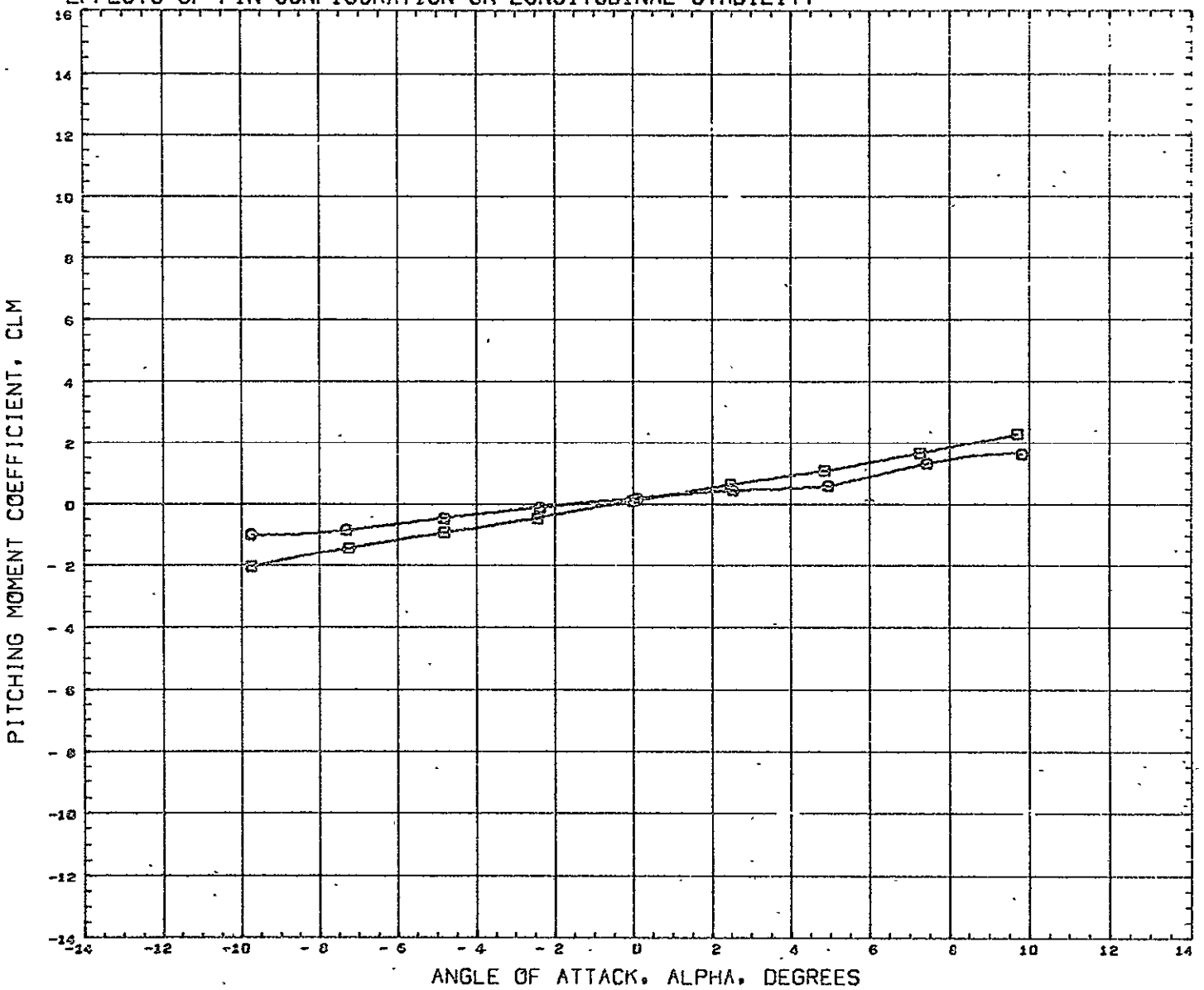
BETA 0.020 ORBINC 1.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRF	5.2640	INCHES
YMRF	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

MACH 1.465

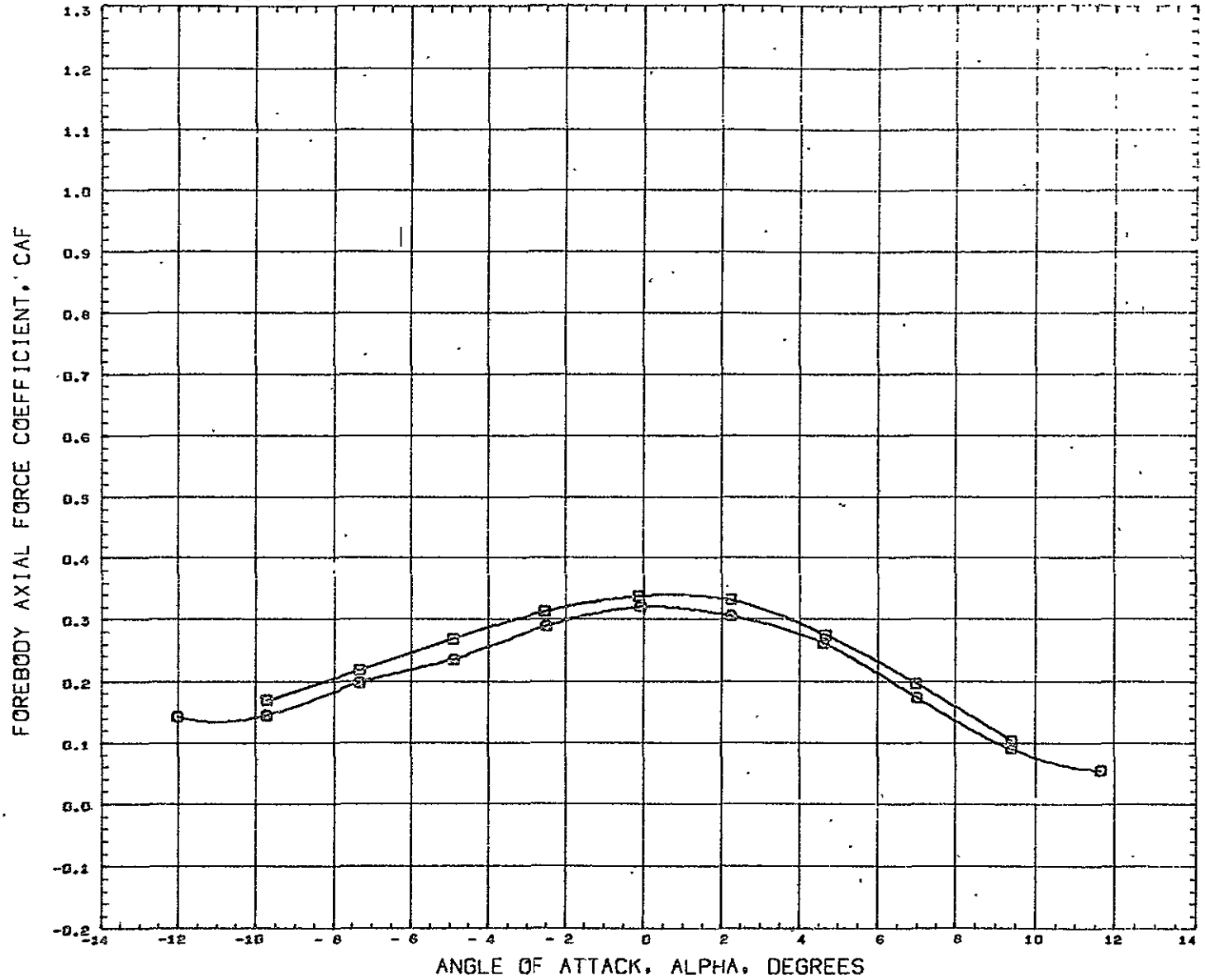
EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES				REFERENCE INFORMATION		
(R25021)	○	MSFC 476 NR MCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	BETA	0.020	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R25091)	□	MSFC 476 NR MCRORB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XMRP	5.2640	INCHES
								YMRP	0.0000	INCHES
								ZMRP	0.0330	INCHES
								SCALE	0.0034	

MACH 1.952

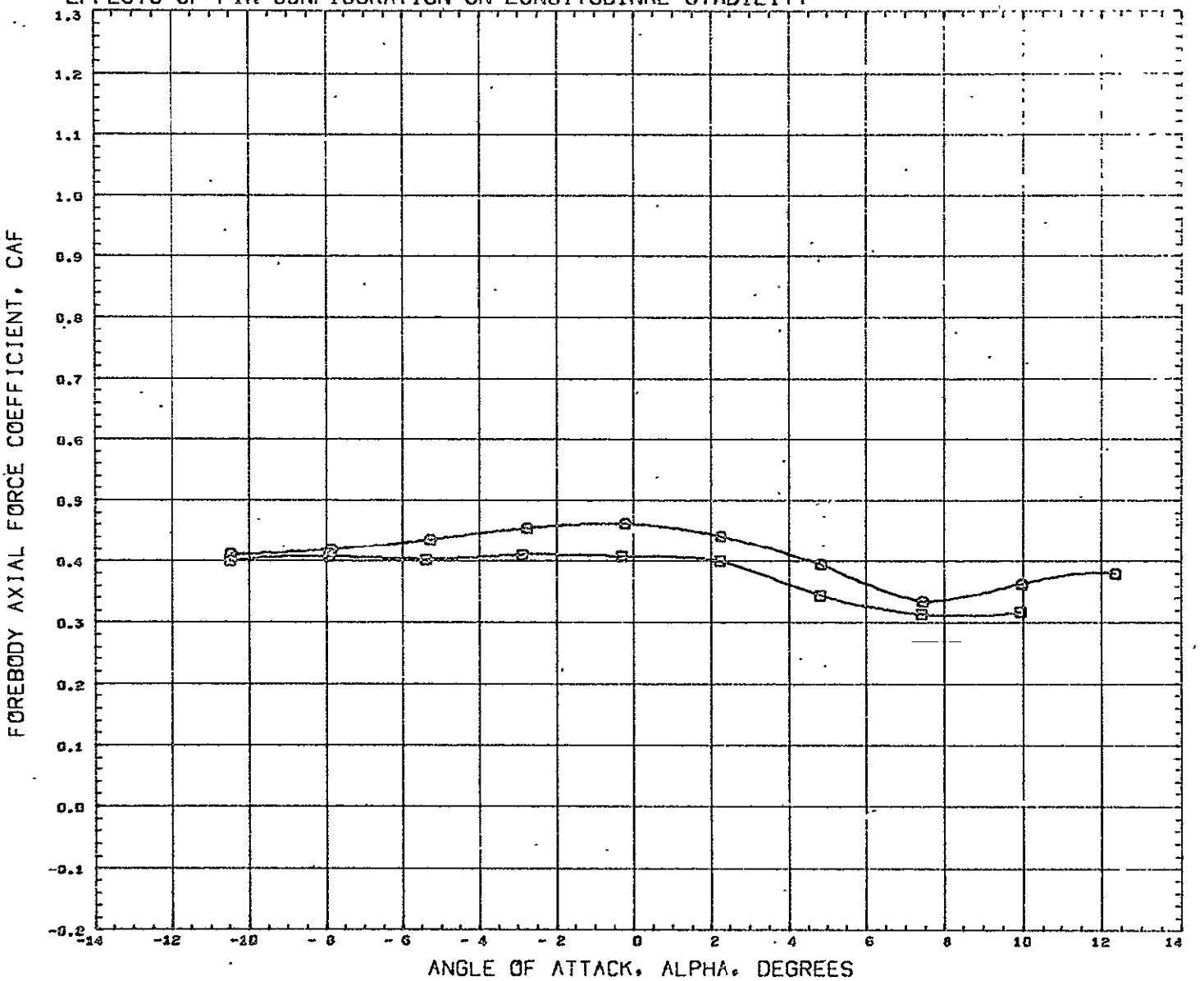
EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES				REFERENCE INFORMATION		
(R25021)	○	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	BETA	0.020	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R25091)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XMRP	5.2640	INCHES
								YMRP	0.0000	INCHES
								ZMRP	0.0330	INCHES
								SCALE	0.0034	

MACH 0.600

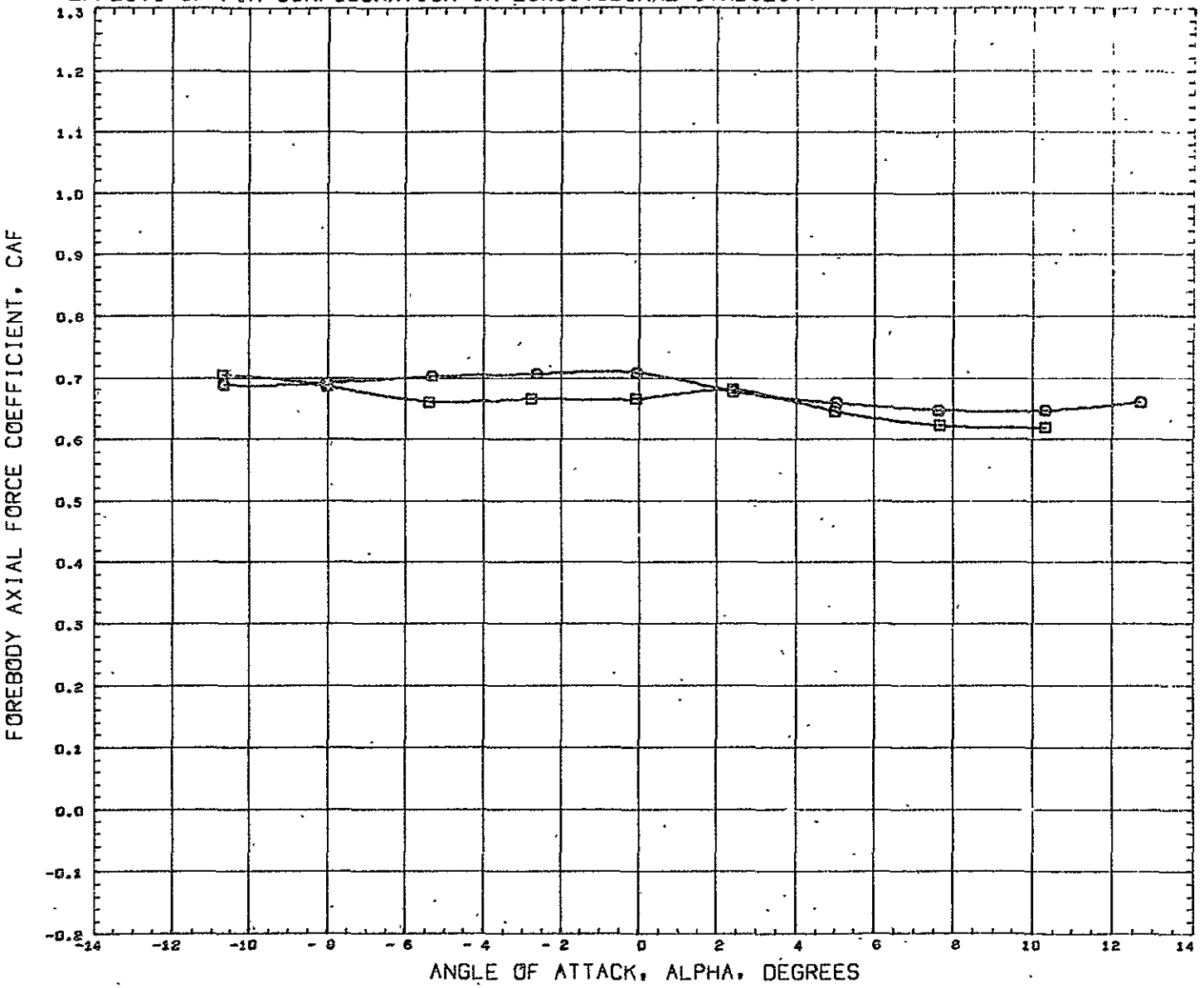
EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES				REFERENCE INFORMATION		
(R25021)	○	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	BETA	0.020	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R25091)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XMRP	5.2640	INCHES
								YMRP	0.0000	INCHES
								ZMRP	0.0330	INCHES
								SCALE	0.0034	

MACH 0.898

EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	
(R25021)	○	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17
(R25091)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17

PARAMETRIC VALUES

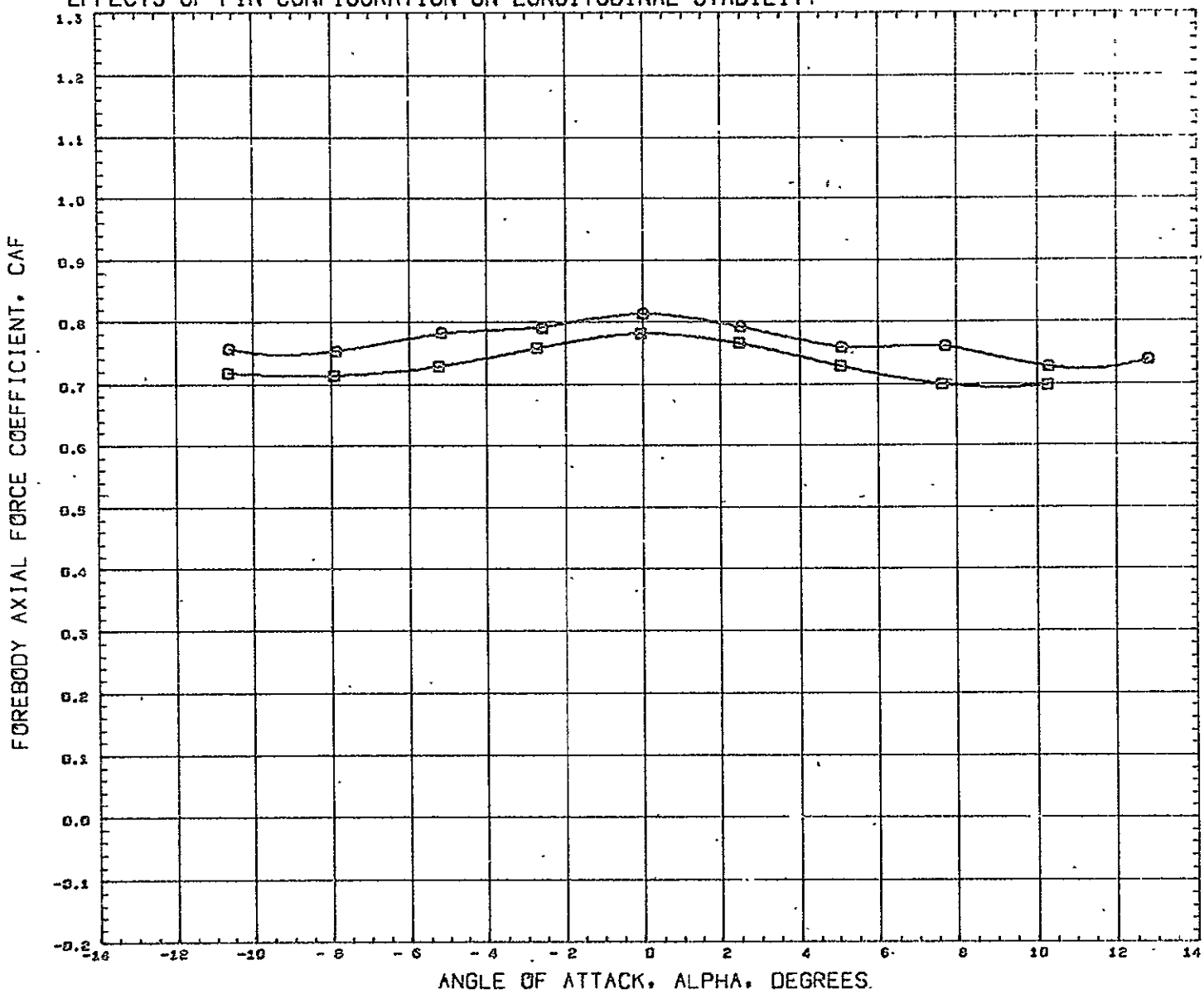
BETA 0.020 ORBINC 1.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MACH 0.994

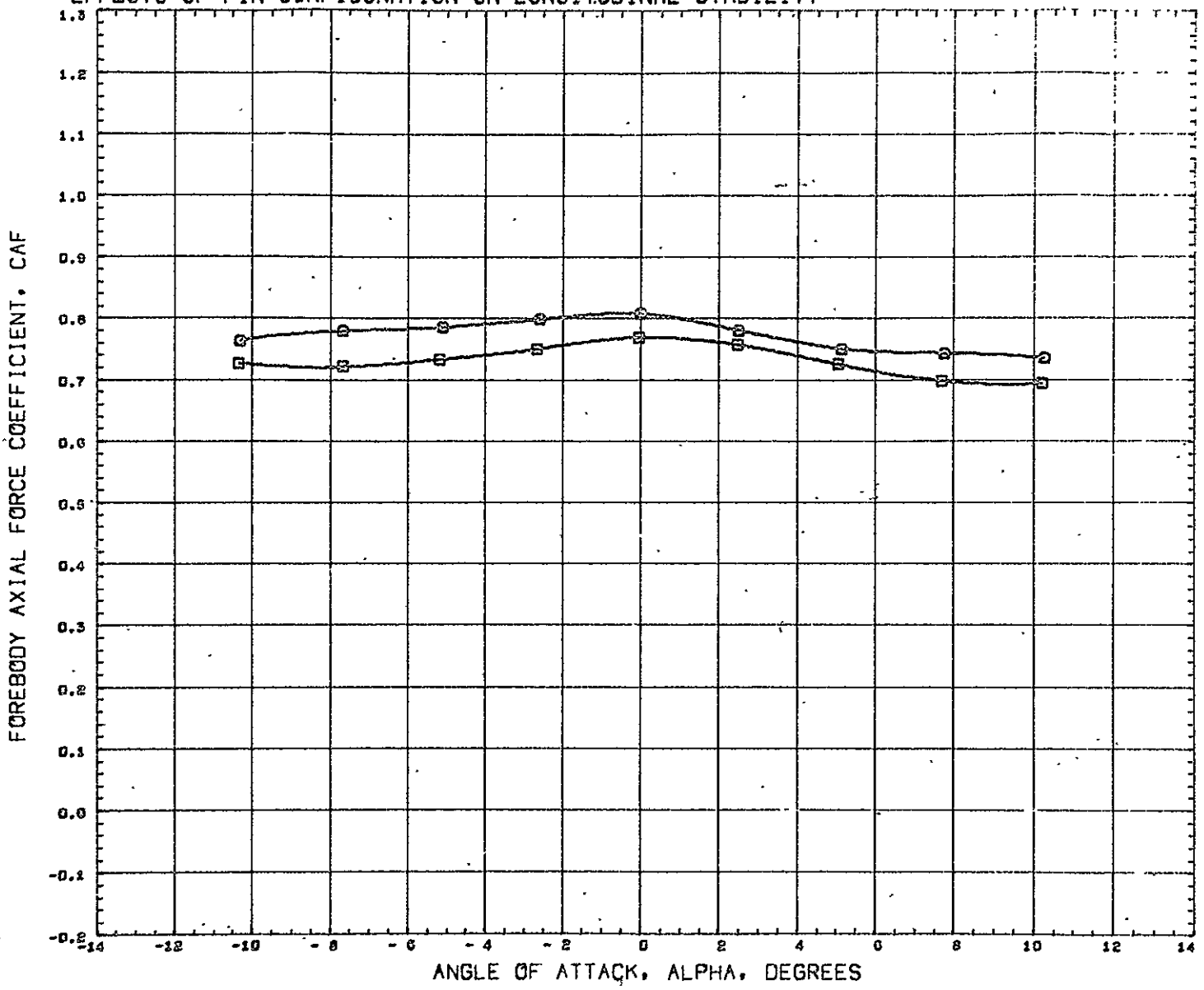
EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES				REFERENCE INFORMATION		
(R25021)	O	MSFC 476 NR MCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	BETA	0.020	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R25091)	□	MSFC 476 NR MCRORB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XMRP	5.2640	INCHES
								YMRP	0.0000	INCHES
								ZMRP	0.0330	INCHES
								SCALE	0.0034	

MACH 1.106

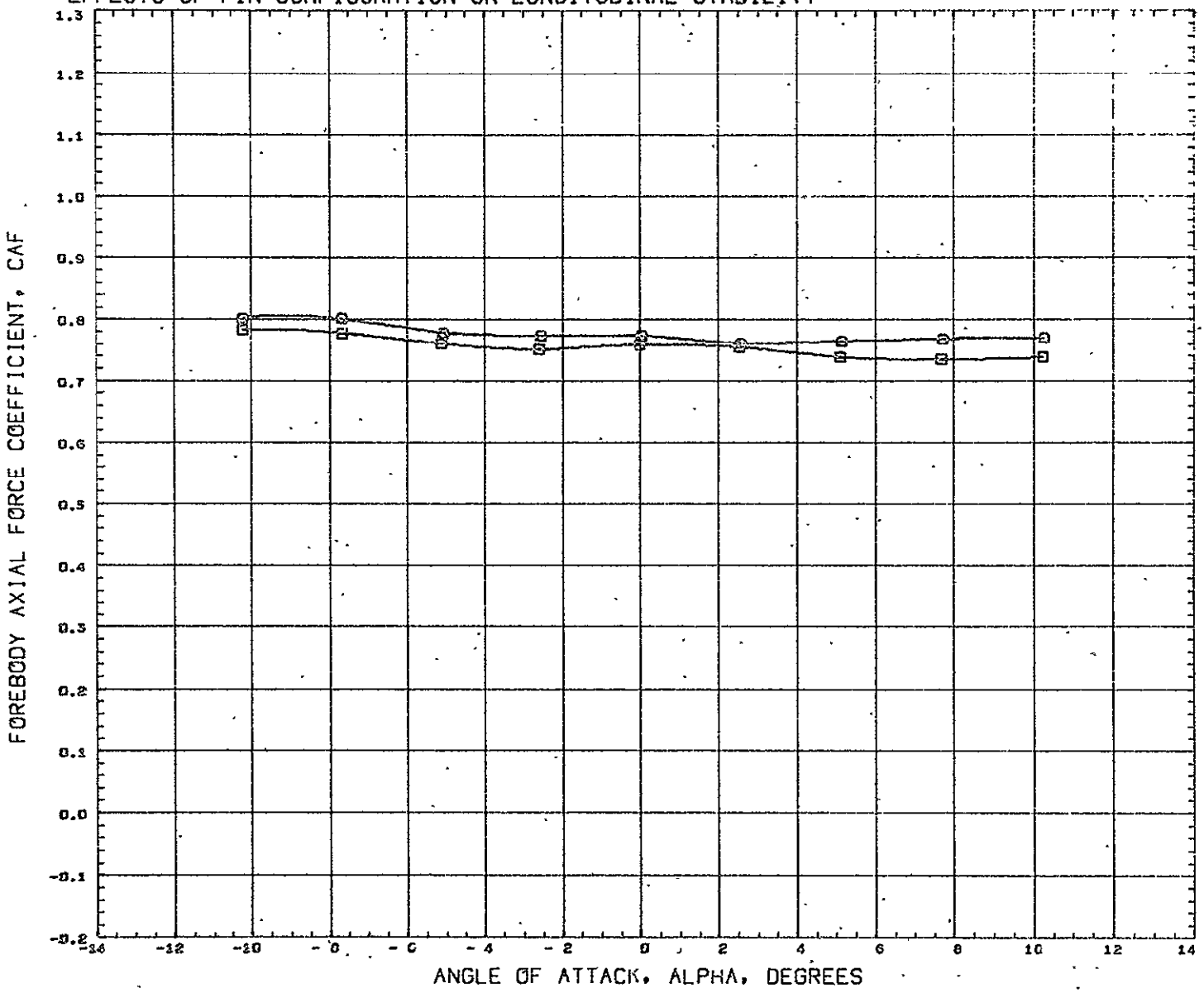
EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES				REFERENCE INFORMATION		
(R25021)	○	HSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	BETA	0.020	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R25091)	□	HSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XMRP	5.2640	INCHES
								YMRP	0.0000	INCHES
								ZMRP	0.0330	INCHES
								SCALE	0.0034	

MACH 1.198

EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(R25021)	○	MSFC 476 NR HCRORB/S-ICBOOSTER BF1S+B3W14E3V17
(R25091)	□	MSFC 476 NR HCRORB/S-ICBOOSTER BF2S+B3W14E3V17

PARAMETRIC VALUES

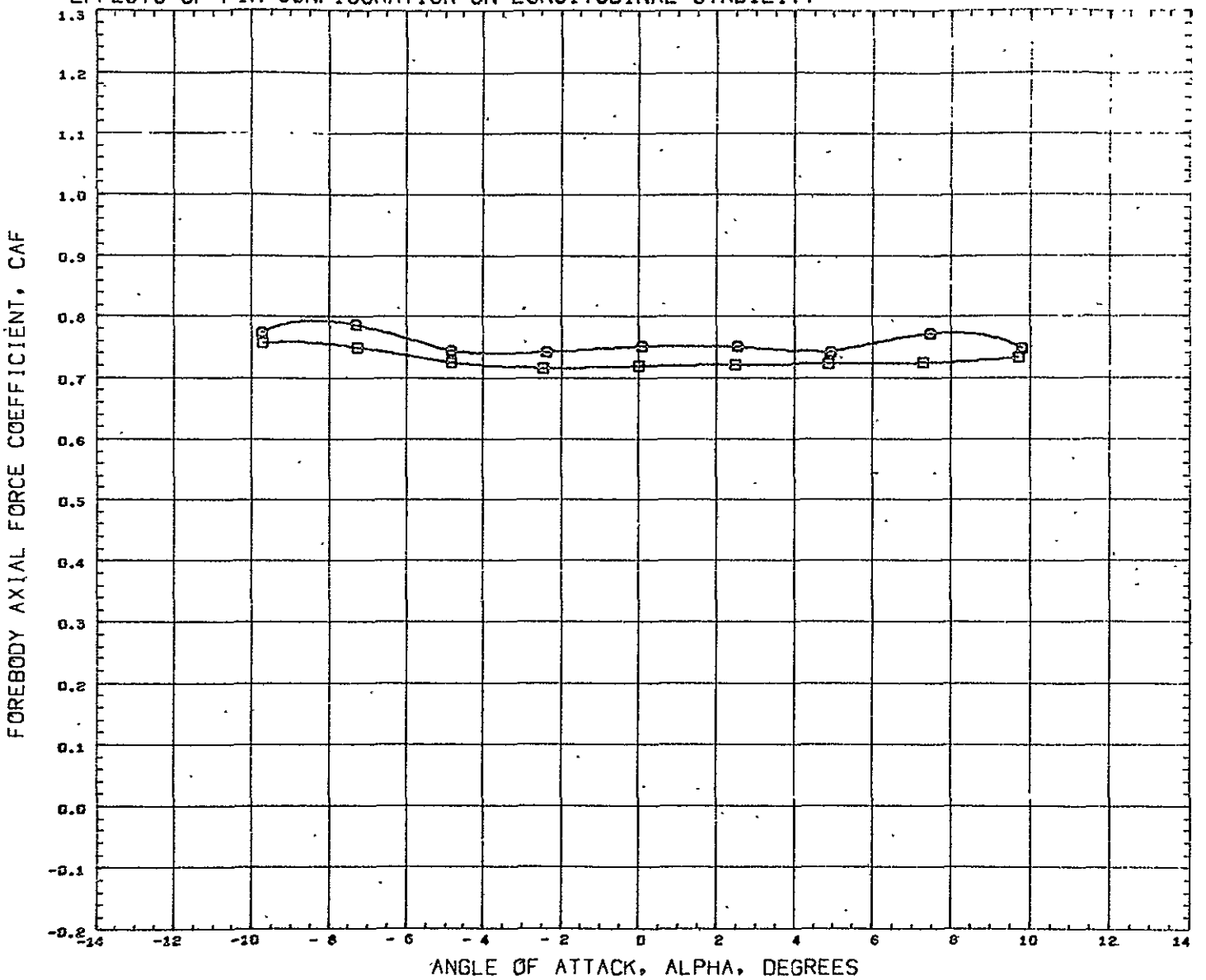
BETA 0.020 ORBINC 1.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRF	5.2640	INCHES
YMRF	0.0000	INCHES
ZMRF	0.0330	INCHES
SCALE	0.0034	

MACH 1.465

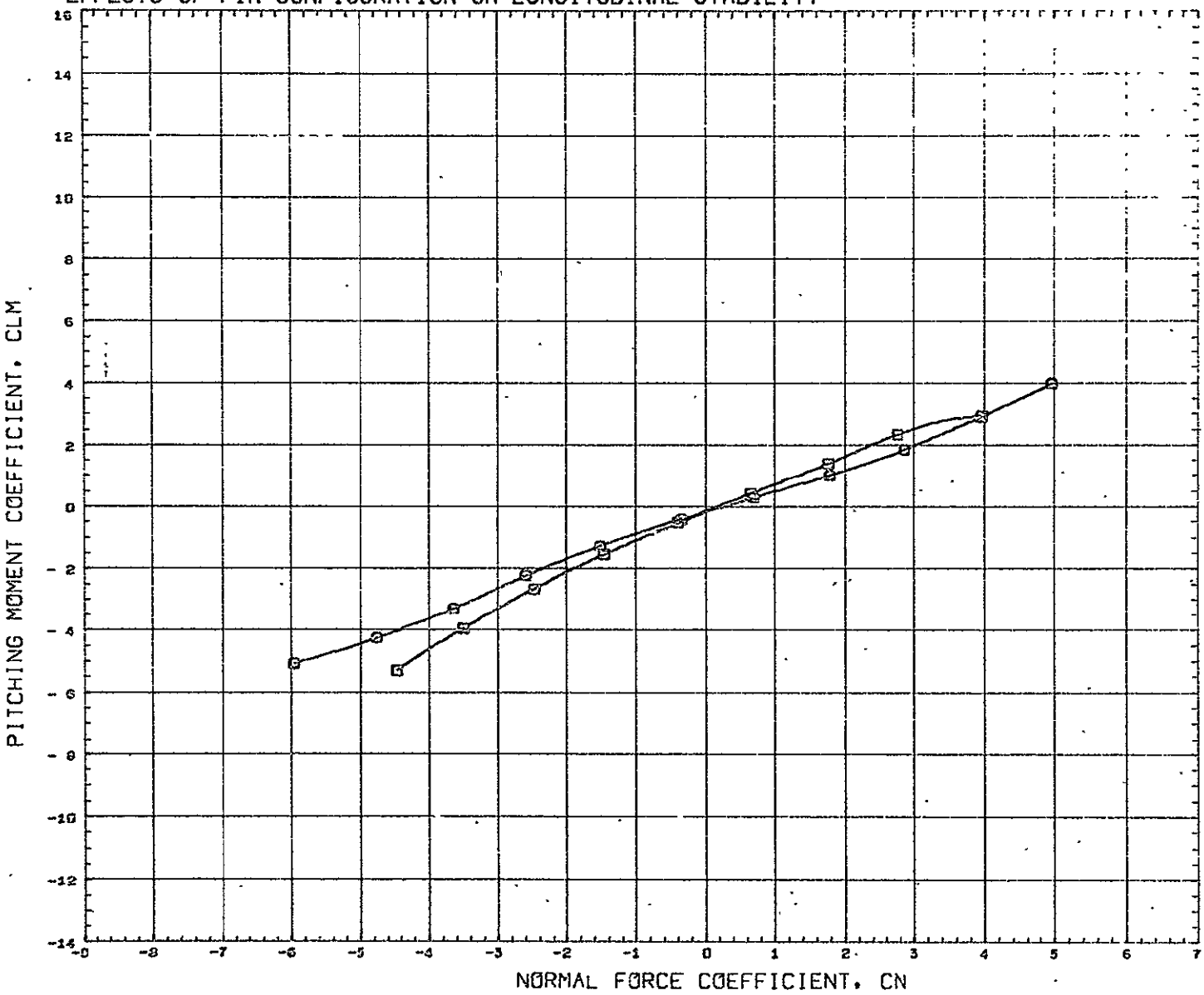
EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES				REFERENCE INFORMATION		
(R25021)	○	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	BETA	0.020	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R25091)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XMRP	5.2640	INCHES
								YMRP	0.0000	INCHES
								ZMRP	0.0330	INCHES
								SCALE	0.0034	

MACH 1.952

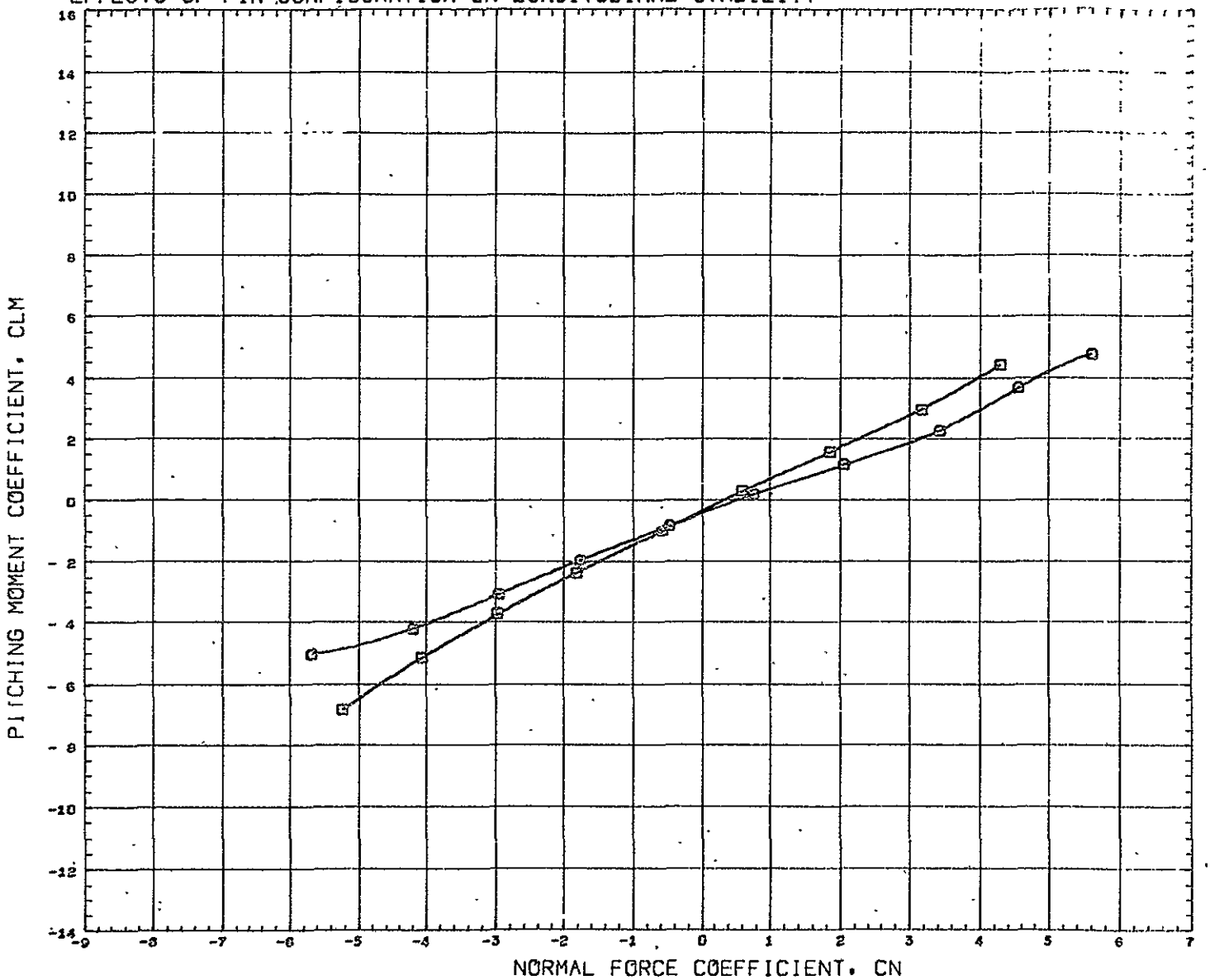
EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES				REFERENCE INFORMATION		
(R25021)	○	NSFC 476 NR HCRORBYS-ICBOOSTER	BF1S+B5W14E3V17	BETA	0.020	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R25091)	□	NSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XMRF	5.2640	INCHES
								YMRF	0.0000	INCHES
								ZMRF	0.0330	INCHES
								SCALE	0.0034	

MACH 0.600

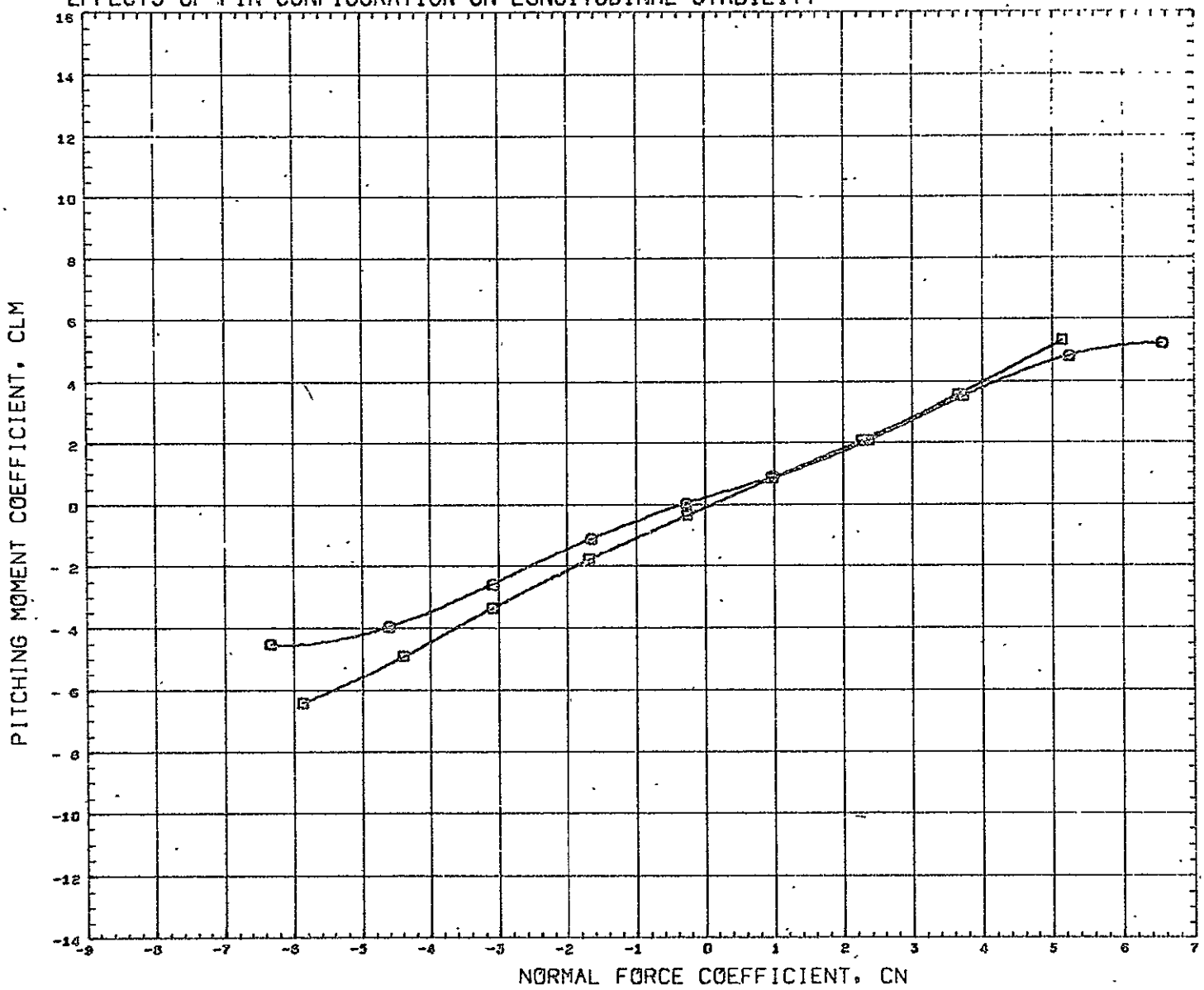
EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES				REFERENCE INFORMATION		
(R25021)	○	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	BETA	0.020	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R25091)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XMRP	5.2640	INCHES
								YMRP	0.0000	INCHES
								ZMRP	0.0330	INCHES
								SCALE	0.0034	

MACH 0.896

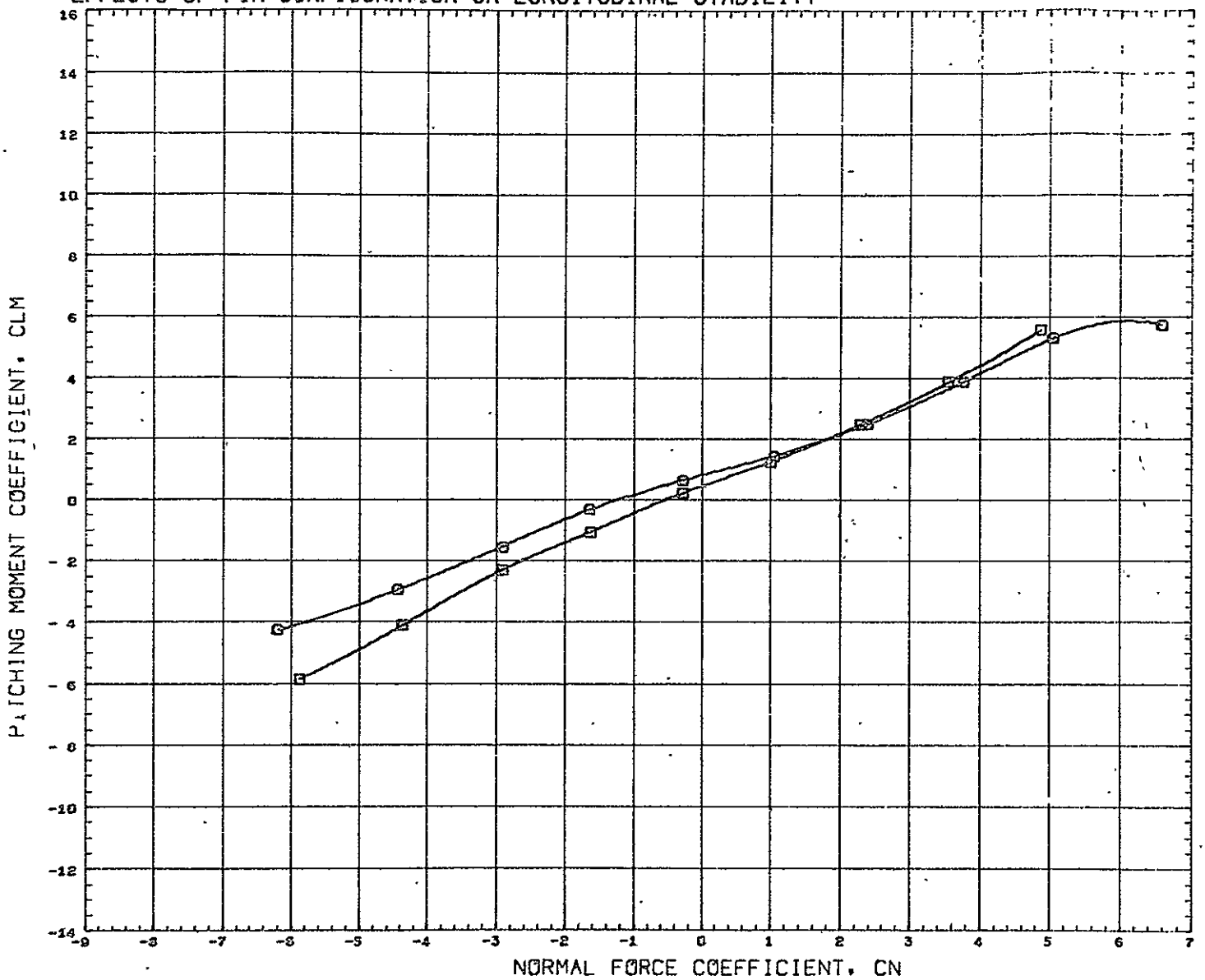
EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES				REFERENCE INFORMATION		
(R25021)	○	MSFC 476 NR HCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	BETA	0.020	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R25091)	□	MSFC 476 NR HCRORB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XMRP	5.2640	INCHES
								YMRP	0.0000	INCHES
								ZMRP	0.0330	INCHES
								SCALE	0.0034	

MACH 0.994

EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	
(R25021)	○	MSFC 476 NR MCRORB/S-ICBOOSTER	BF1S+B5W14E3V17
(R25091)	□	MSFC 476 NR MCRORB/S-ICBOOSTER	BF2S+B5W14E3V17

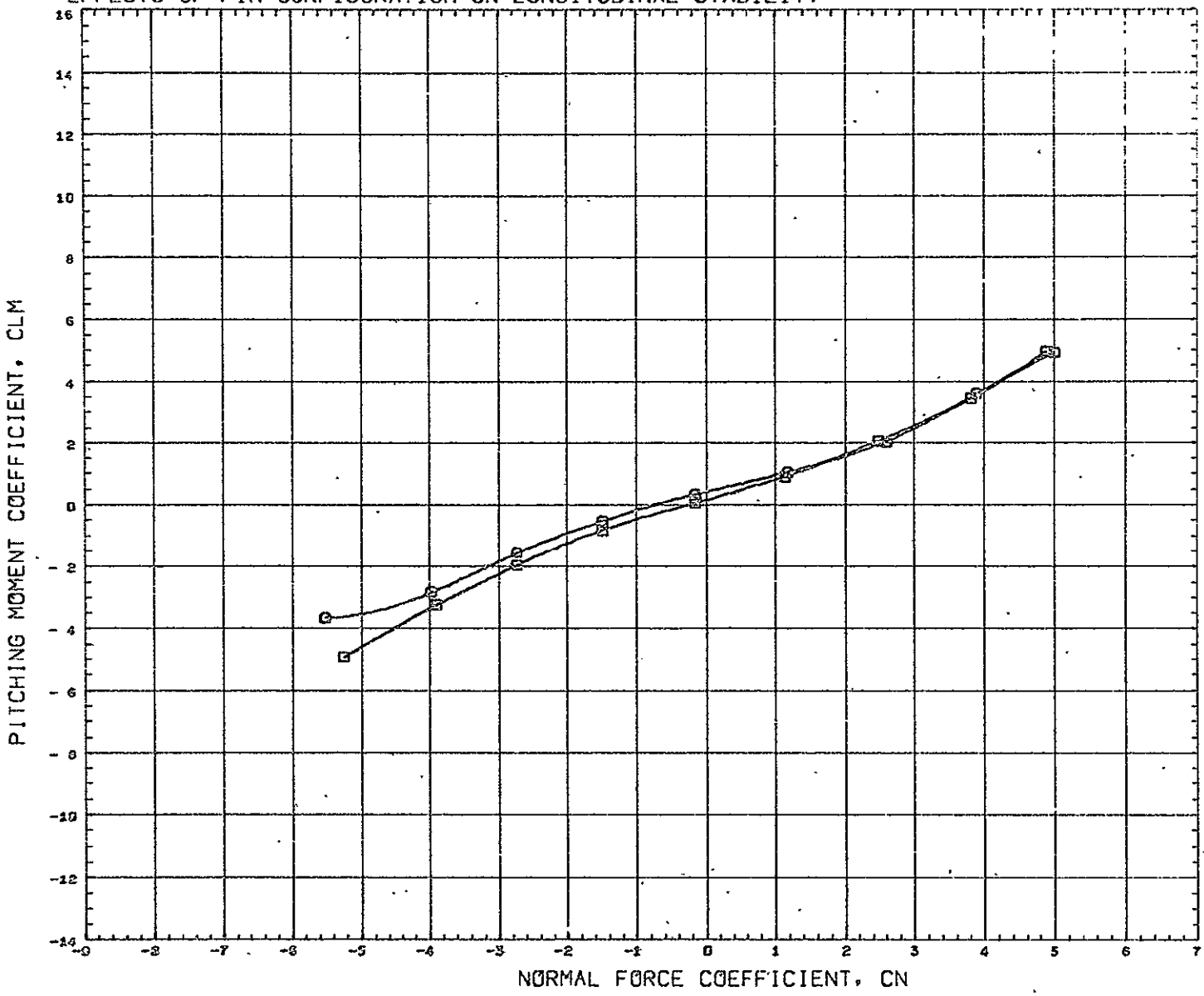
PARAMETRIC VALUES: BETA 0.020 ORBINC 1.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	INCHES
REFB	1.3330	INCHES
XMRP	5.2640	INCHES
YMRP	0.0000	INCHES
ZMRP	0.0330	INCHES
SCALE	0.0034	

MACH 1.106

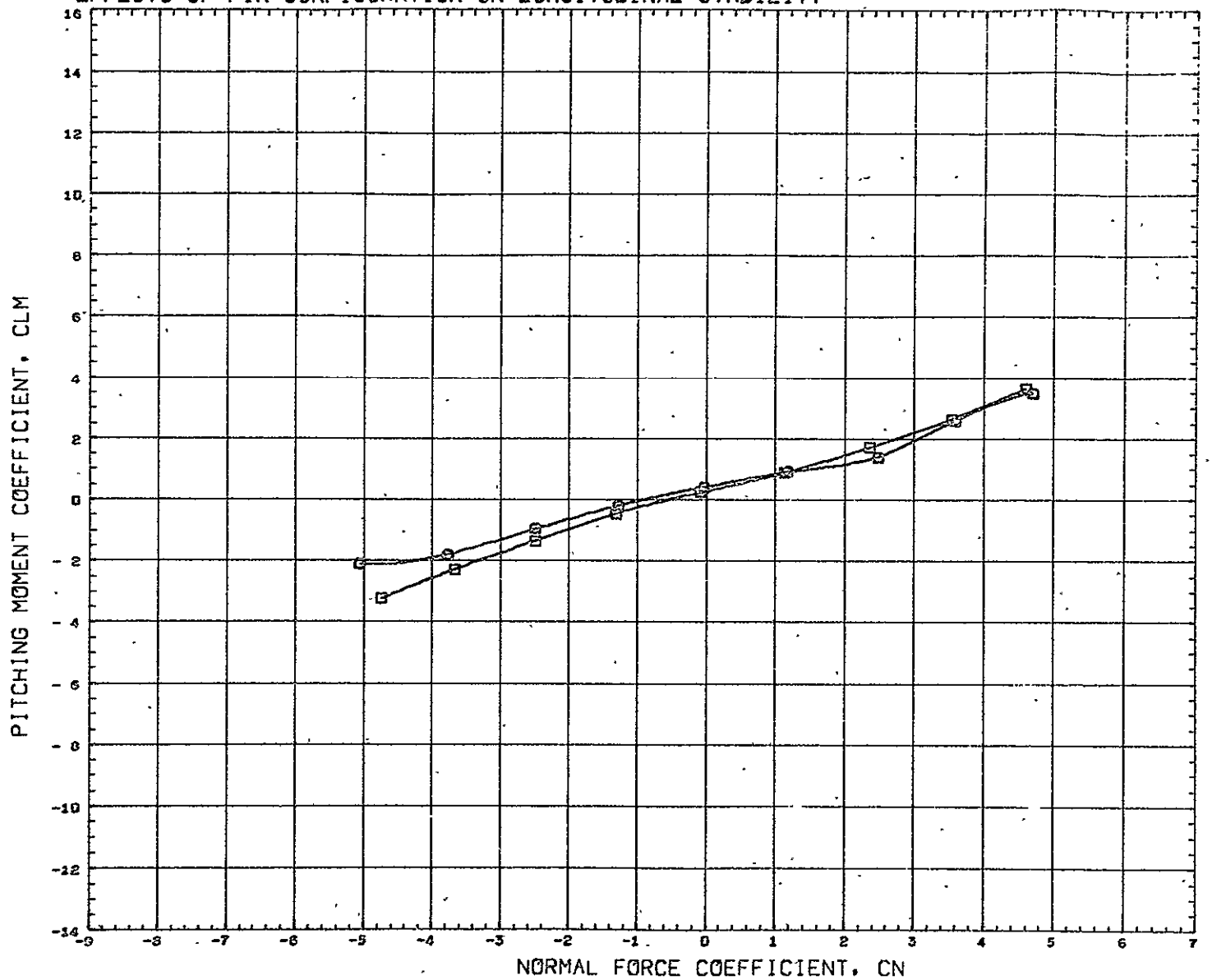
EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES				REFERENCE INFORMATION		
(R25021)	O	MSFC 476 NR MCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	BETA	0.020	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R25091)	□	MSFC 476 NR MCRORB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XMRP	5.2640	INCHES
								YMRP	0.0000	INCHES
								ZMRP	0.0330	INCHES
								SCALE	0.0034	

MACH 1.198

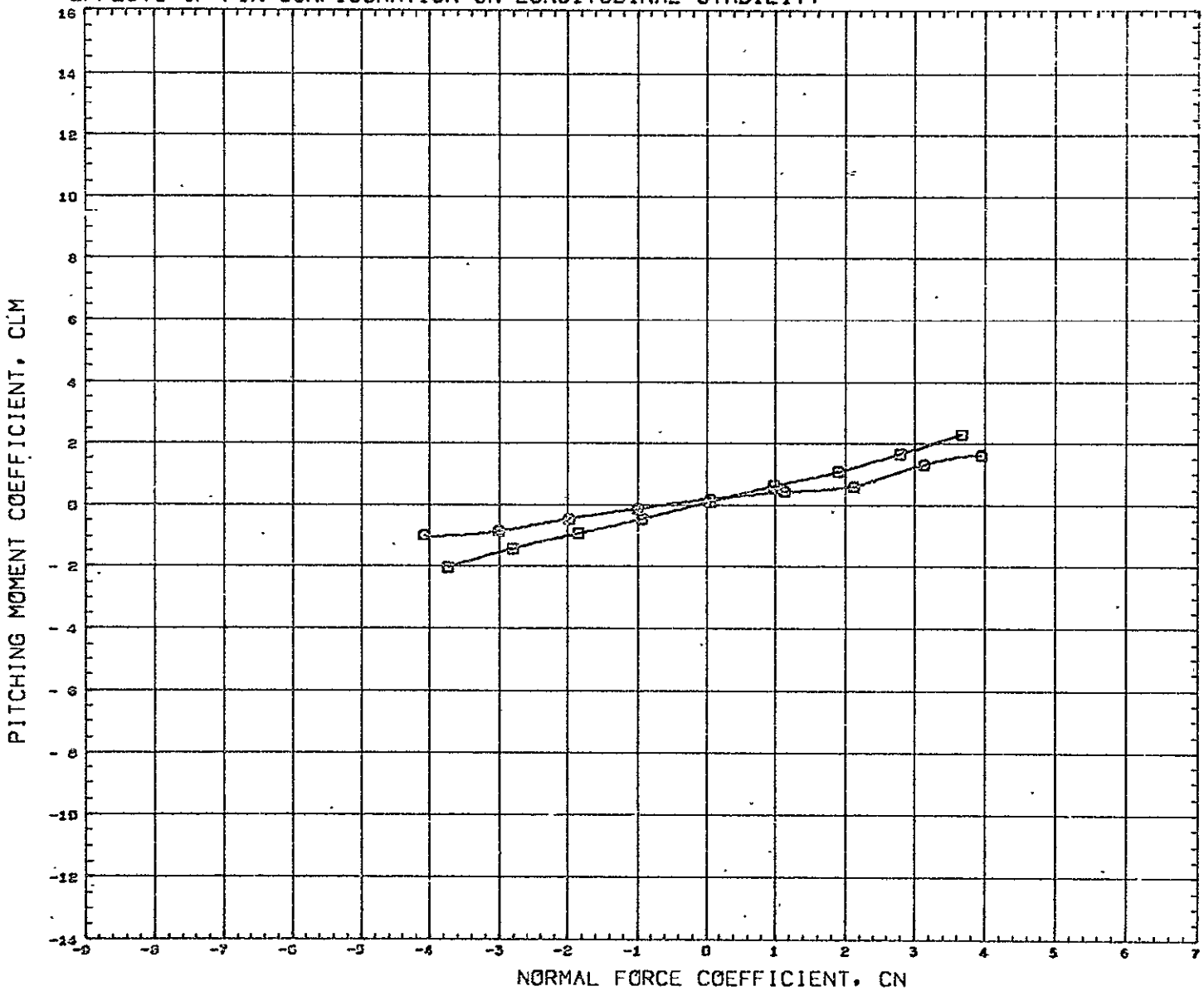
EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES				REFERENCE INFORMATION		
(R25021)	○	MSFC 476 NR MCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	BETA	0.020	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R25091)	□	MSFC 476 NR MCRORB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XMRP	5.2640	INCHES
								YMRP	0.0000	INCHES
								ZMRP	0.0330	INCHES
								SCALE	0.0034	

MACH 1.465

EFFECTS OF FIN CONFIGURATION ON LONGITUDINAL STABILITY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		PARAMETRIC VALUES				REFERENCE INFORMATION		
(R23021)	○	MSFC 476 NR MCRORB/S-ICBOOSTER	BF1S+B5W14E3V17	BETA	0.020	ORBINC	1.000	REFS	1.3960	SQ.IN.
(R25091)	□	MSFC 476 NR MCRORB/S-ICBOOSTER	BF2S+B5W14E3V17					REFL	1.3330	INCHES
								REFB	1.3330	INCHES
								XMRP	5.2640	INCHES
								YMRP	0.0000	INCHES
								ZMRP	0.0330	INCHES
								SCALE	0.0034	

MACH 1.952