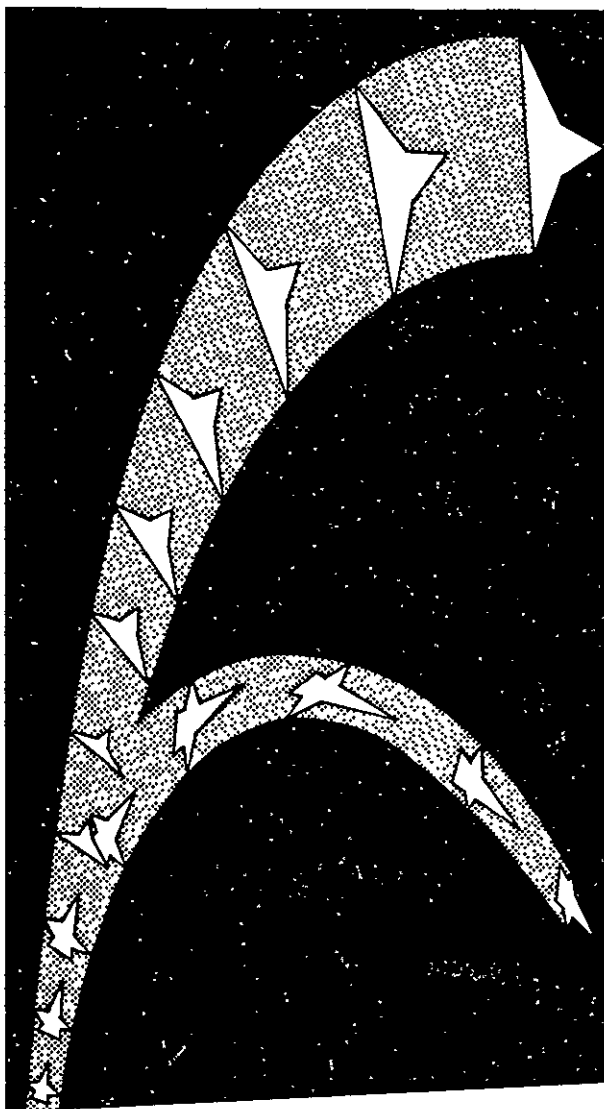


MAY 1971



SPACE SHUTTLE

STUDY TO DEVELOP A SOLUTION
FOR CONFIGURATION INSTABILITY
FOR THE 0.003366 SCALE S-IC/NR
HCR ORBITER

by

L. Watts, BOEING

MSFC 14-INCH
TRISONIC WIND TUNNEL

Marshall Spaceflight Center

N A S A

SADSAC SPACE SHUTTLE
AEROTHERMODYNAMIC
DATA MANAGEMENT SYSTEMCONTRACT NAS8-4016
AMENDMENT 130
DRL 184-58
MARSHALL SPACE FLIGHT CENTER

SPACE DIVISION

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DMS-DR-1091
May, 1971

SADSAC/SPACE SHUTTLE

WIND TUNNEL TEST DATA REPORT

CONFIGURATION: S-IC/NAR HCR Orbiter; 0.003366 Scale
TEST PURPOSE: To Establish a Solution for Configuration Instability;
Mach Numbers of 0.60 to 1.96.
TEST FACILITY: MSFC 14-Inch Trisonic Wind Tunnel
TESTING AGENCY: The Boeing Company
TEST NO. & DATE: MSFC TWT 485, March 18, 1971
TEST CONDUCTOR: L. Watts - Boeing
FACILITY COORDINATOR: Jim Weaver - MSFC

DATA MANAGEMENT SERVICES

LIAISON: *N. D. Kemp* DATA OPERATIONS: *Albert D. Martin*
for G. G. McDonald Albert D. Martin
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This report has been prepared by Chrysler Corporation Space Division under a Data Management Contract to the NASA. Chrysler assumes no responsibility for the data presented herein other than its display characteristics.

SEE NEXT PAGE FOR PERTINENT PERSONNEL INFORMATION .

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ABSTRACT

Experimental aerodynamic investigations were conducted during March 1971 at the NASA-Marshall Space Flight Center 14 x 14 inch Trisonic Wind Tunnel on a 0.003366 scale North American Space Shuttle Orbiter mated to a S-IC Booster. Six component static stability force data were recorded over a Mach number range from 0.60 to 2.0 at angles of attack from -8° to $+8^{\circ}$ at zero degrees sideslip and from -2° to $+8^{\circ}$ sideslip angle at zero degrees angle of attack. Test Reynolds number varied from 6.9×10^6 to 8.5×10^6 per unit length. Primary test emphasis was on determining the aerodynamic effects of several size spoilers and vortex generators.

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SUMMARY

Experimental aerodynamic investigations were conducted during March 1971 at the NASA-Marshall Space Flight Center 14 x 14 inch Transonic Wind Tunnel on a 0.003366 scale North American Space Shuttle Orbiter mated to a S-IC Booster. Six component static stability force data were recorded over a Mach number range from 0.60 to 2.0 at angles of attack from -8° to $+8^{\circ}$ at zero degrees sideslip and from -2° to $+8^{\circ}$ sideslip angle at zero degrees angle of attack. Test Reynolds number varied from 6.9×10^6 to 8.5×10^6 per unit length. Primary test emphasis was on determining the aerodynamic effects of several size spoilers and vortex generators.

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.

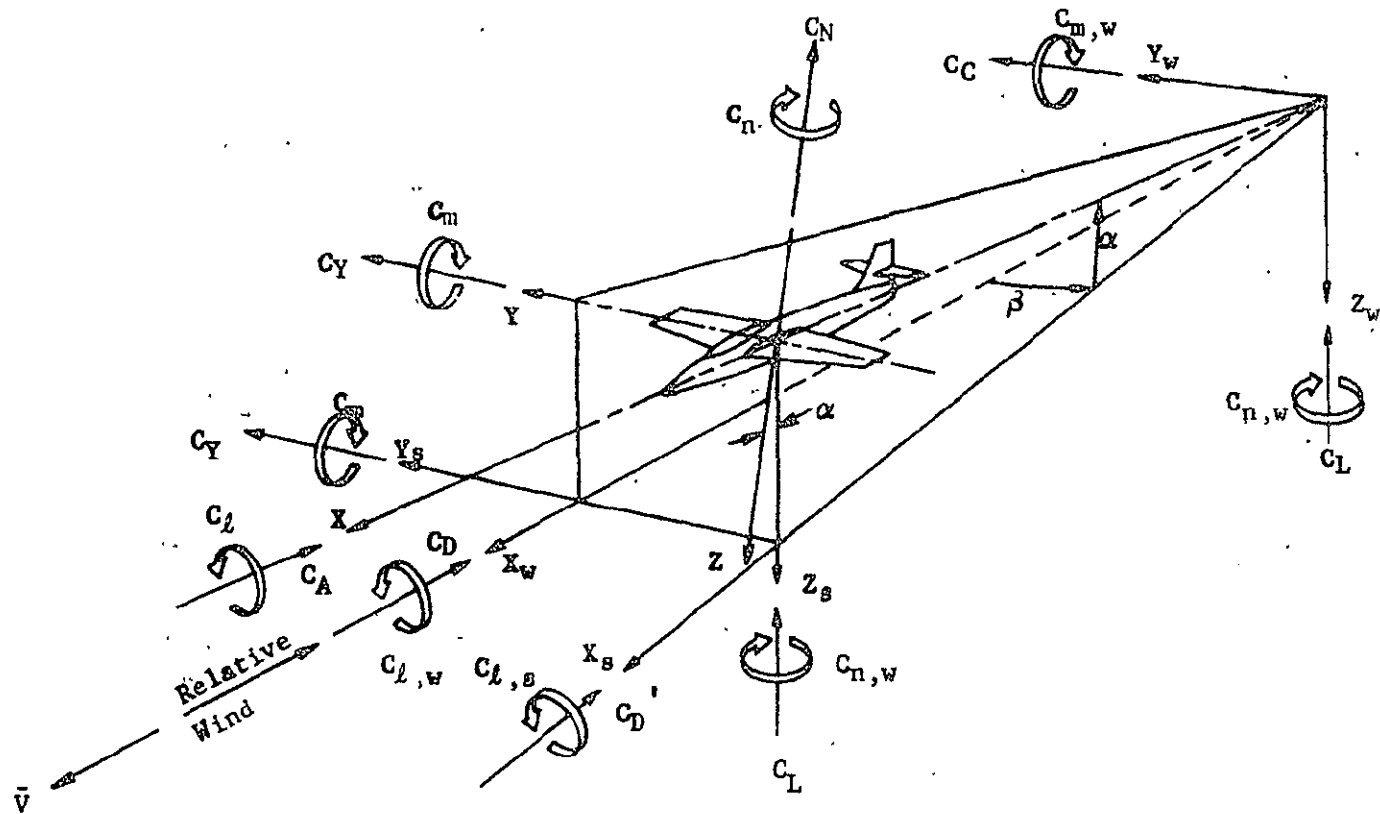


Figure 1. Axis systems, showing direction and sense of force and moment coefficients, angle of attack, and sideslip angle

COEFFICIENT	COEFFICIENT NAME	SADSAC NOMENCLATURE		
		BODY AXIS	STABILITY AXIS	WIND AXIS
C_A	Total Axial Force	CA	-	-
C_{AB}	Base Axial Force	CAB	--	-
C_{AF}	Forebody Axial Force	CAF	-	-
C_D	Total Drag Force	-	CD	CDTOTL
C_{DB}	Base Drag Force	-	CDB	CDBASE
C_{DF}	Forebody Drag Force	-	CDF	CDFORE
C_L	Lift Force	-	CL	CL
C_N	Normal Force	CN	-	-
C_Y	Side Force	CY	CY	CC
C_l	Rolling Moment	CBL	CSL	CWL
C_m	Pitching Moment	CLM	CLM	CPM
C_n	Yawing Moment	CYN	CLN	CLN
L/D	Lift-To-Drag Force Ratio	-	L/D	CL/CD
L/D	Lift-To-Forebody Drag Force Ratio	-	L/DF	CL/CDF
N/A	Normal-To-Axial Force Ratio	N/A	-	-
N/A	Normal-To-Forebody Axial Force Ratio	CN/CAF	-	-

CONFIGURATIONS INVESTIGATED

Table II indicates the exact configurations investigated and their nomenclature. It is followed in this section by descriptive forms that contain pertinent dimensional information for each model component tested. Sketches and model photographs are included immediately preceding the plotted data. A complete run summary is contained in the dataset collation sheets.

TABLE I. CONFIGURATIONS INVESTIGATED

PART, SYMBOL AND PART NUMBER TESTED	PARTS AVAILABLE FOR TESTING		CONFIGURATION IDENTIFIER						
	NAME	SYM- BOL							
	NAR-HCR ORBITER	O	B	F	S ₁				01
	S-IC BOOSTER	O	B	F					02
	S-IC 900 FT ² FINS	O	B		S ₁				03
		O	B	F	S ₁				04
		O	B			S ₂			05
		O	B	F		S ₂			06
		O	B				VD ₁		07
		O	B	F			VD ₁		08
		O	B				VD ₂		09
		O	B	F			VD ₂		10 & 20
			B				G		11
			B	F			G		12
		O	B	F	S ₃ *				13

* S₃ = S₁ shifted inboard

TEST TWT 485 DATA SET COLLATION SHEET

SHEET 1 of 2

☐ PRETEST

☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		PARAMETERS/VALUES				NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE)									
		A	B						0.60	0.90	1.00	1.10	1.20		1.96			
	OBF (SHADOW GRAPH)	E	0°					3		001%	002%		003%					
	OBF "	0°	E					3		006%	005%		004%					
R30021	OBF	A	0					6	007%	008%	009%	010%	011%		083%			
R30022	OBF	0	B					6	016%	015%	014%	013%	012%		082%			
R30041	OBF S ₁	A	0					3		019%	018%		017%					
R30061	OBF S ₂							3		020%	021%		022%					
R30081	OBF VD ₁							3		025%	024%		023%					
R30101	OBF VD ₂							3		026%	027%		028%					
R30091	OBVD ₂							3		031%	030%		029%					
R30071	OBVD ₁							3		032%	033%		034%					
R30051	OB S ₂							3		037%	036%		035%					
R30031	OB S ₁							3		038%	039%		040%					
R30011	OB	Y	Y					6	045%	044%	043%	042%	041%		084%			
R30012	OB	0	B					6	046%	047%	048%	049%	050%		085%			
R30111	GB	A	0					3		053%	052%		051%					
R30122	GBF	0	B					3		059%	058%		057%					
R30121	GBF	A	0					3		054%	055%		056%					

1 7 13 19 25 31 37 43 49 55 61 67 75 76
CLM CN CYN CY CBL CPC CL CD CAB CAF 10

COEFFICIENTS:

a or B

SCHEDULES

$$\alpha A = -1 - 8^\circ - 6^\circ - 4^\circ - 2^\circ - 0^\circ + 2^\circ + 4^\circ + 6^\circ + 8^\circ$$

$$\beta B = -2^\circ - 0^\circ + 2^\circ + 4^\circ + 6^\circ + 8^\circ$$

$$\alpha = 0^\circ, \beta = 0^\circ, \alpha + \beta E = 0^\circ + 10^\circ$$

IDPVAR(1) IDPVAR(2) NDV

☐ PRETEST

☒ POSTTEST

E - O - T

COEFFICIENTS: $\alpha A = -8^\circ, -6^\circ, -4^\circ, -2^\circ, 0^\circ, +2^\circ, +4^\circ, +6^\circ, +8^\circ$
 α or β $\beta B = -2^\circ, 0^\circ, +2^\circ, +4^\circ, +6^\circ, +8^\circ$
 SCHEDULES: $\alpha + \beta E = 0^\circ, +10^\circ$

TEST TWT #485 DATA SET DESCRIPTOR SHEET

SHEET/ of 2

[illegible]

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		SP. IN.		1.333		IN		1.333		IN		0.037		IN
	000		IN		000		IN		0.003366				BOEING MSFC # 485		
	YMRP(1)		YMRP(2)		ZMRP(1)		ZMRP(2)		SCALE(1)		SCALE(2)		FILREF		

NASA-MSFC-MAF

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		54.1N		1.333		1N		1.333		1N		10.037		1N
000		1N		000		1N		10.003366					BOEING MSFC #485		
	YMRP(1)		YMRP(2)		ZMRP(1)		ZMRP(2)		SCALE(1)		SCALE(2)		FILREF		

TEST FACILITY

The Marshall Space Flight Center 14" x 14" Transonic 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 is 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°.

TEST CONDITIONS

Table I presents the range of test variables at which data were recorded and gives some estimate of the data accuracy.

Trip strips used in the test were #120 grit, 0.06 inch wide located at 10% chord aft of the leading edge on all aerodynamic surfaces (see Figure 2). The nose of the orbiter has a trip strip 0.10 inch wide with #120 grit located 1/2 inch aft of the nose tip.

The model was sting mounted in the tunnel as depicted in Figure 8. Pitch runs were made with the model upright while sideslip runs were made in the tunnel pitch plane with the sting and model rolled 90°.

Base pressures were measured in three locations as shown in Figure 24.

The orbiter was attached to the booster with an orbiter sting. The orbiter was positioned at an incidence setting of +1° by pivoting the orbiter about a pin 1.897 inches ahead of the orbiter base.

The cradle was cast as an integral part of the orbiter. The gap between the orbiter and booster was faired with red wax.

TABLE II

TEST	CONDITIONS
TEST	485

[illegible]

BALANCE UTILIZED: MSEC Balance #200

CAPACITY:

NF	<u>175 lbs.</u>
SF	<u>150</u>
AF	<u>100</u>
PM	<u>185 m lbs</u>
YM	<u>160</u>
RM	<u>50</u>

ACCURACY:

COEFFICIENT
TOLERANCE:

[illegible]

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. ($C_{AF} = C_A - (C_{AB} + C_{AC})$). Both corrected and uncorrected values of axial force coefficient have been presented herein.

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

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

$$l_{REF} = b_{ref} = \text{S-IC base diameter} = 1.333 \text{ in.}$$

$$A_B = \text{Booster base areas} = 1.408 \text{ in}^2 \text{ (S-IC fins on)}$$

$$= 1.039 \text{ in}^2 \text{ (S-IC fins off)}$$

$$A_{CAV} = \text{Booster balance cavity area} = 1.131 \text{ in}^2$$

The ten coefficients input to SADSAC were CLM, CN, CAF, CAB, CPC, CY, CYN, CBI, CI, CD. SADSAC generated the following data from that input:

$$CLM/CN = \text{longitudinal CP/D}$$

$$CYN/CY = \text{lateral CP/D}$$

$$CBI/CY = \text{rotational CP/D}$$

$$CA = \text{uncorrected axial force coefficient}$$

$$\partial CLM / \partial CN = \text{local slope of CLM/CN vs } \alpha$$

$$\partial CYN / \partial CY = \text{local slope of CYN/CY vs } \beta$$

$$\partial CY / \partial \beta = \text{local slope of CY vs } \beta$$

$$\partial CYN / \partial \beta = \text{local slope of CYN vs } \beta$$

$\partial CBL / \partial \beta$ = local slope of CBL vs β
 ΔCN = increment of normal force coefficient due to fins or flow devices.
 ΔCLM = increment of pitching moment coefficient due to fins or flow devices.
 ΔCA = incremental axial force coefficient due to fins or flow devices.
 ΔCAF = incremental forebody axial force coefficient due to fins or flow devices.
 ΔCY = incremental side force coefficient due to fins or flow devices.
 ΔCYN = incremental yawing moment due to fins or flow devices.
 ΔCBL = incremental rolling moment due to fins or flow devices.
 $\Delta CY\beta$ = derivative of incremental side force coefficient.
 $\Delta CYN\beta$ = derivative of incremental yawing moment coefficient.
 $\Delta CBL\beta$ = derivative of incremental rolling moment coefficient.
 $\partial \Delta CYN / \partial \Delta CY$ = derivative of incremental lateral CP/D.
 $\partial \Delta CLM / \partial \Delta CN$ = derivative of incremental longitudinal CP/D.

SUMMARY DATA PLOT INDEX

TITLE NUMBER	TITLE	PLOTTED COEFFICIENTS SCHEDULE	CONDITIONS VARYING	PAGES
1	MSFC Test 485, S-IC/NAR HCR Orbiter - Longitudinal Stability	A, B, C, D, E	Alpha, Mach	1-196
2	MSFC Test 485, S-IC/NAR HCR Orbiter - Lateral-Directional Stability	F	Beta, Mach	197-221
3	MSFC Test 485, S-IC/NAR HCR Orbiter - Fin Load, Longitu- dinal Stability	G, H, I, J	Alpha, Mach	222-312
4	MSFC Test 485, S-IC/NAR HCR Orbiter - Fin Load, Lateral- Directional Stability	K, L, M	Beta, Mach	313-334
5	MSFC Test 485, S-IC/NAR HCR Orbiter - Changes Due to Devices, Longitudinal Stability	H, I, J N	Mach, Alpha Mach	335-388 405-416
6	MSFC Test 485, S-IC/NAR HCR Orbiter - Changes Due to Devices, Lateral-Directional Stability	G, L	Beta	389-404

SUMMARY DATA PLOT INDEX

(Continued)

COEFFICIENT SCHEDULES:

- A: CN, CIM, CA, CAF, D(CPD) vs. ALPHA
- B: CN vs. CIM
- C: CNALFO, CIMAFO, CAALFO, CATAFO, CIMCNO vs. MACH
- D: D(CPD) vs. MACH
- E: CN, CIM vs. MACH
- F: CY, CYN, CBL, CAF, D(CYD) vs. BETA
- G: DCY, DCYN, DCBL, DCYD, DCRD vs. MACH
- H: DCN, DCLM, DCA, DCAF, D(CPD) vs. ALPHA
- I: DCN vs. DCLM
- J: DCN(ALFO=0), DCLM(ALFO=0), DCLM(CN=0) vs. MACH
- K: DCY, DCYN, DCBL, DCA, DCAF, DCYD vs. BETA
- L: DCY vs. DCYN; DCY vs. DCBL
- M: DCY, DCYN, DCBL vs. MACH

FIGURES

NOT REPRODUCIBLE

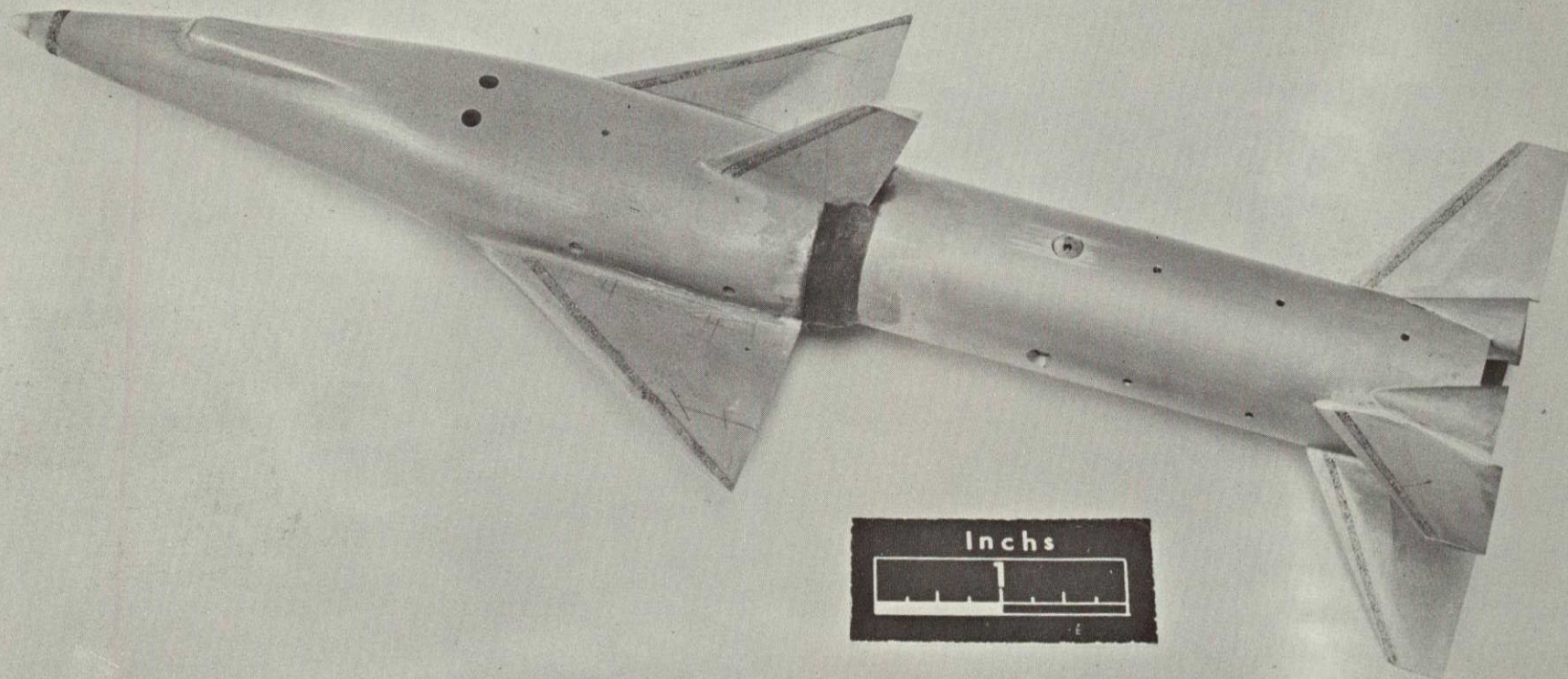


FIGURE 2.

S-IC/NAR HCR 0.003366 SCALE ORBITER MODEL
3/4 PLAN

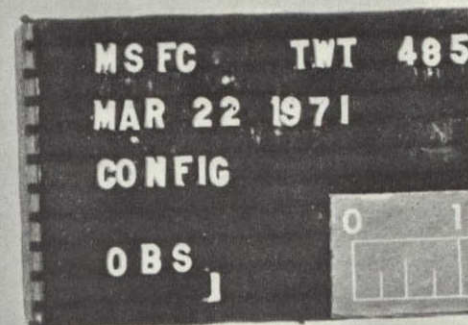
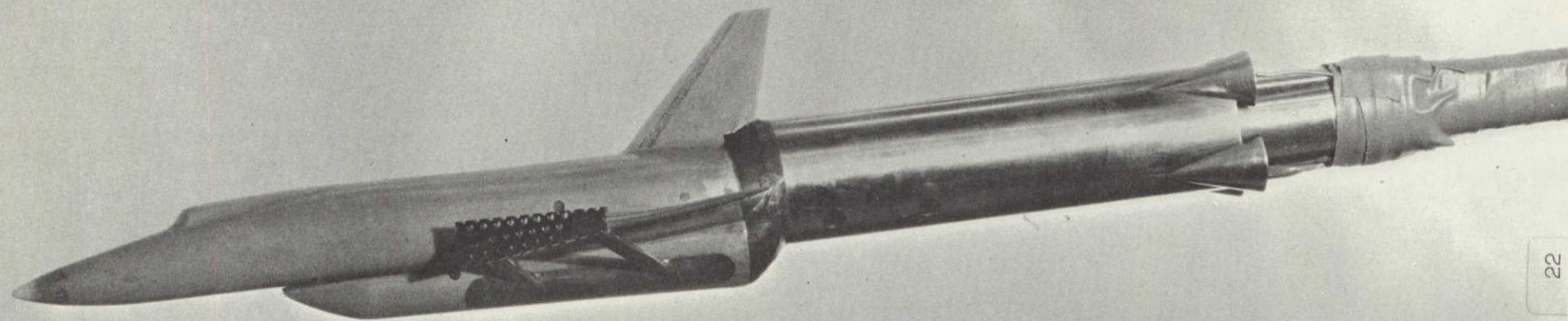


FIGURE 3.

S-IC/NAR HCR 0.003366 SCALE ORBITER MODEL
PROFILE WITH LARGE SPOILERS - S₁

NOT REPRODUCIBLE

23

MS FC TWT 485
MAR 24 1971
CONFIO
OBFS₃

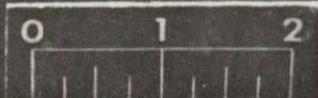
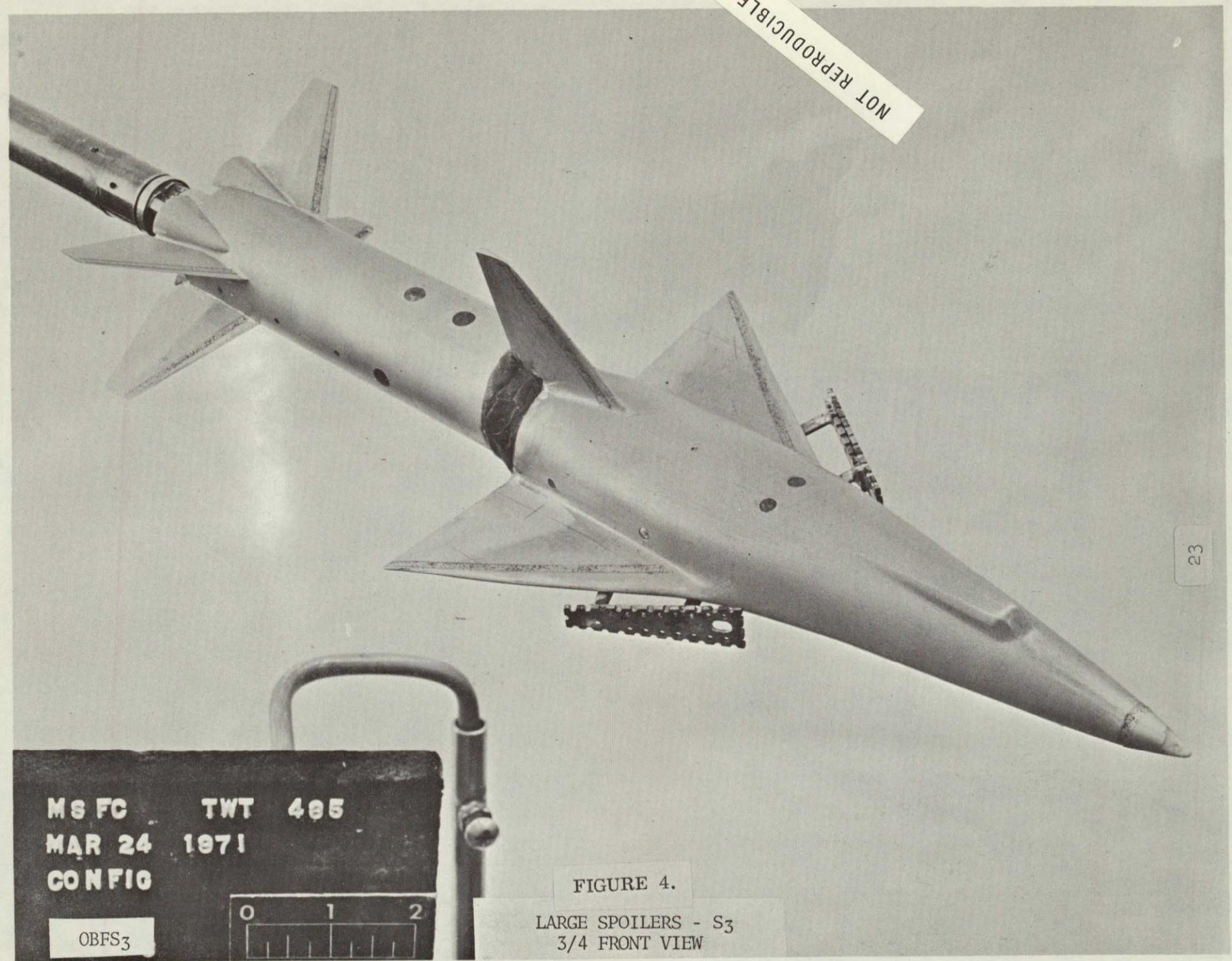


FIGURE 4.

LARGE SPOILERS - S₃
3/4 FRONT VIEW



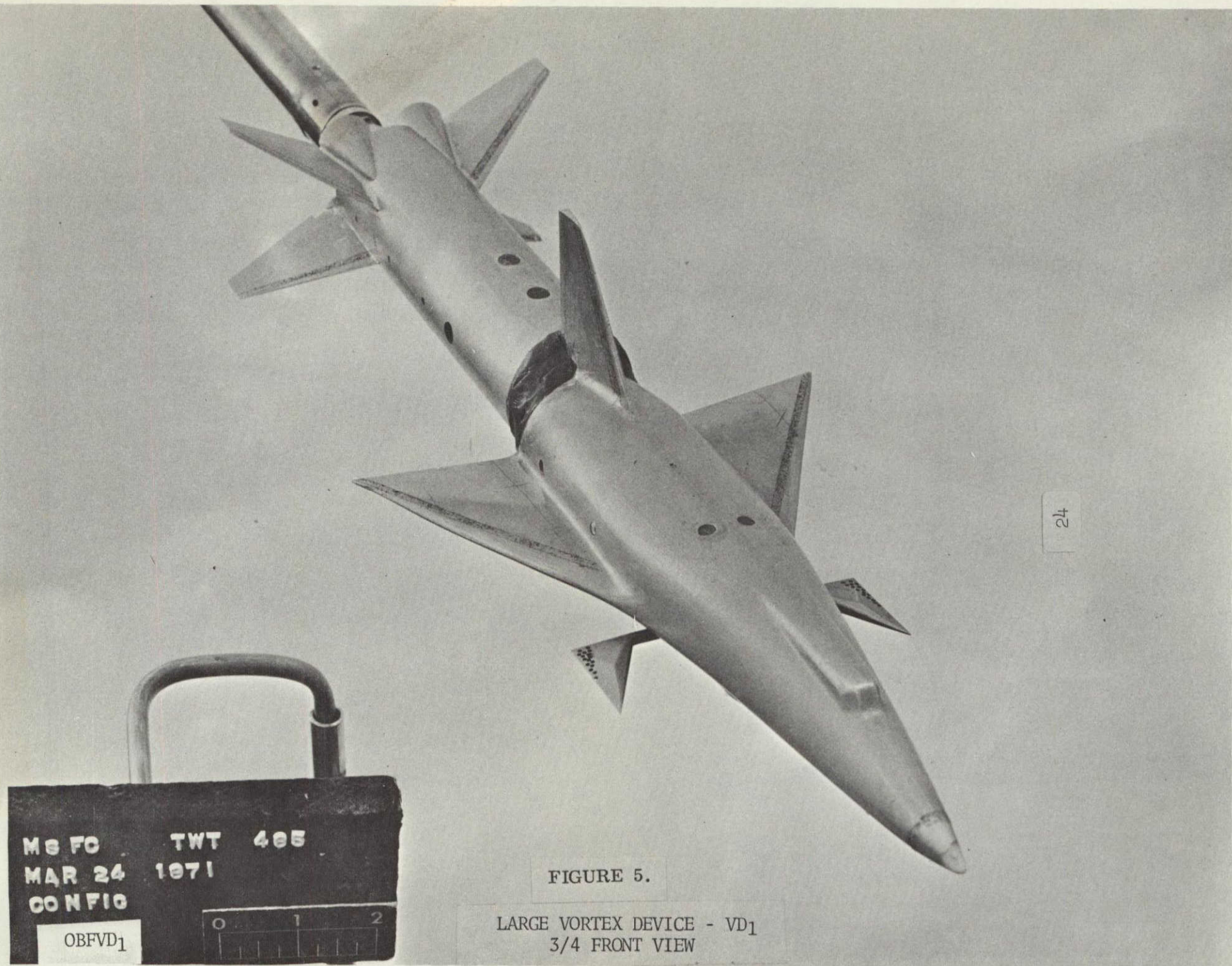
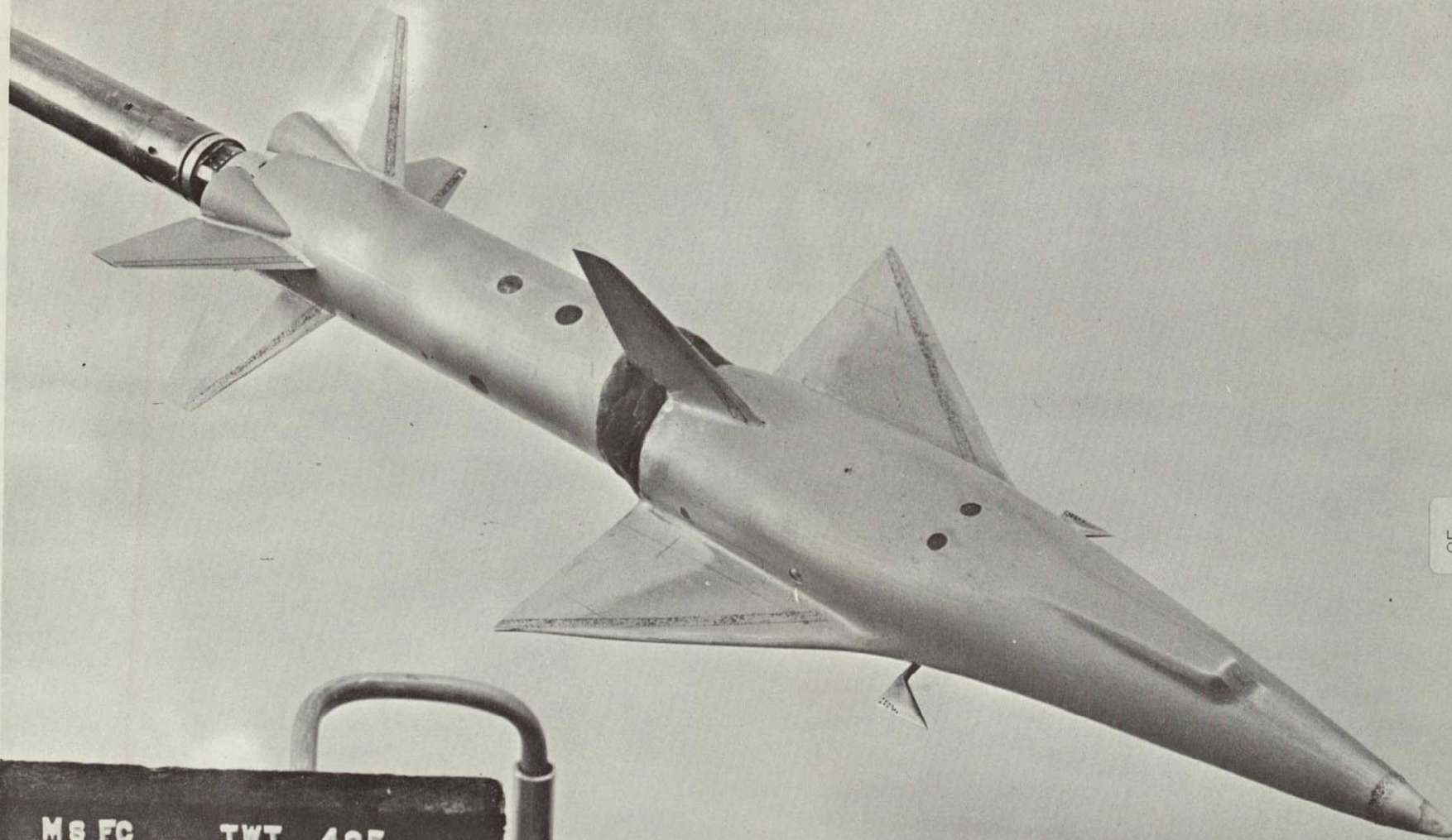


FIGURE 5.

LARGE VORTEX DEVICE - VD₁
3/4 FRONT VIEW



MS FC TWT 485
MAR 24 1971
CONFIG

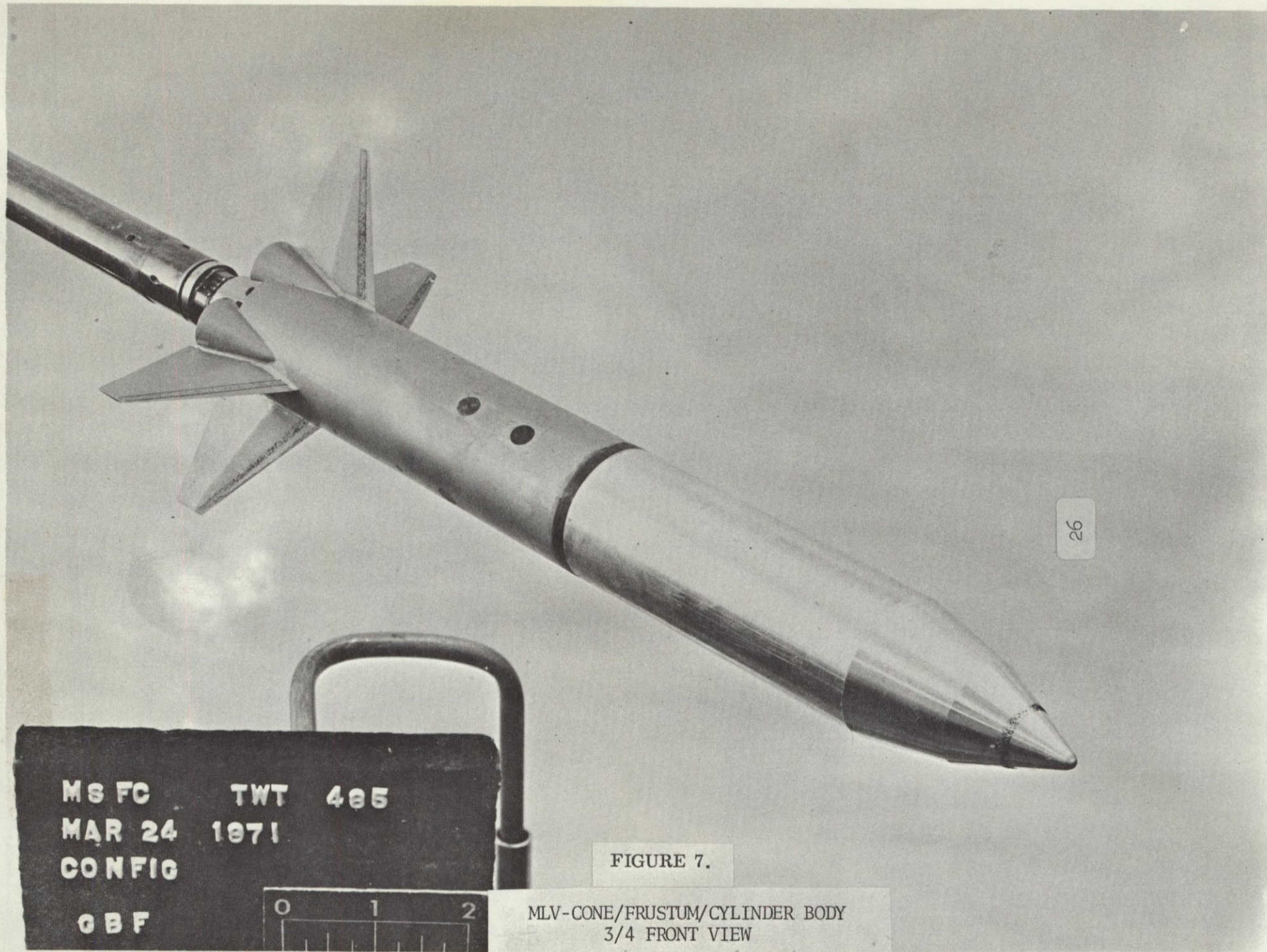
OBFVD₂

FIGURE 6.

SMALL VORTEX DEVICE- VD₂
3/4 FRONT VIEW

25

NOT REPRODUCIBLE



MS FC TWT 485
MAR 24 1971
CONFIG

GBF



FIGURE 7.

MLV-CONE/FRUSTUM/CYLINDER BODY
3/4 FRONT VIEW

NOT REPRODUCIBLE

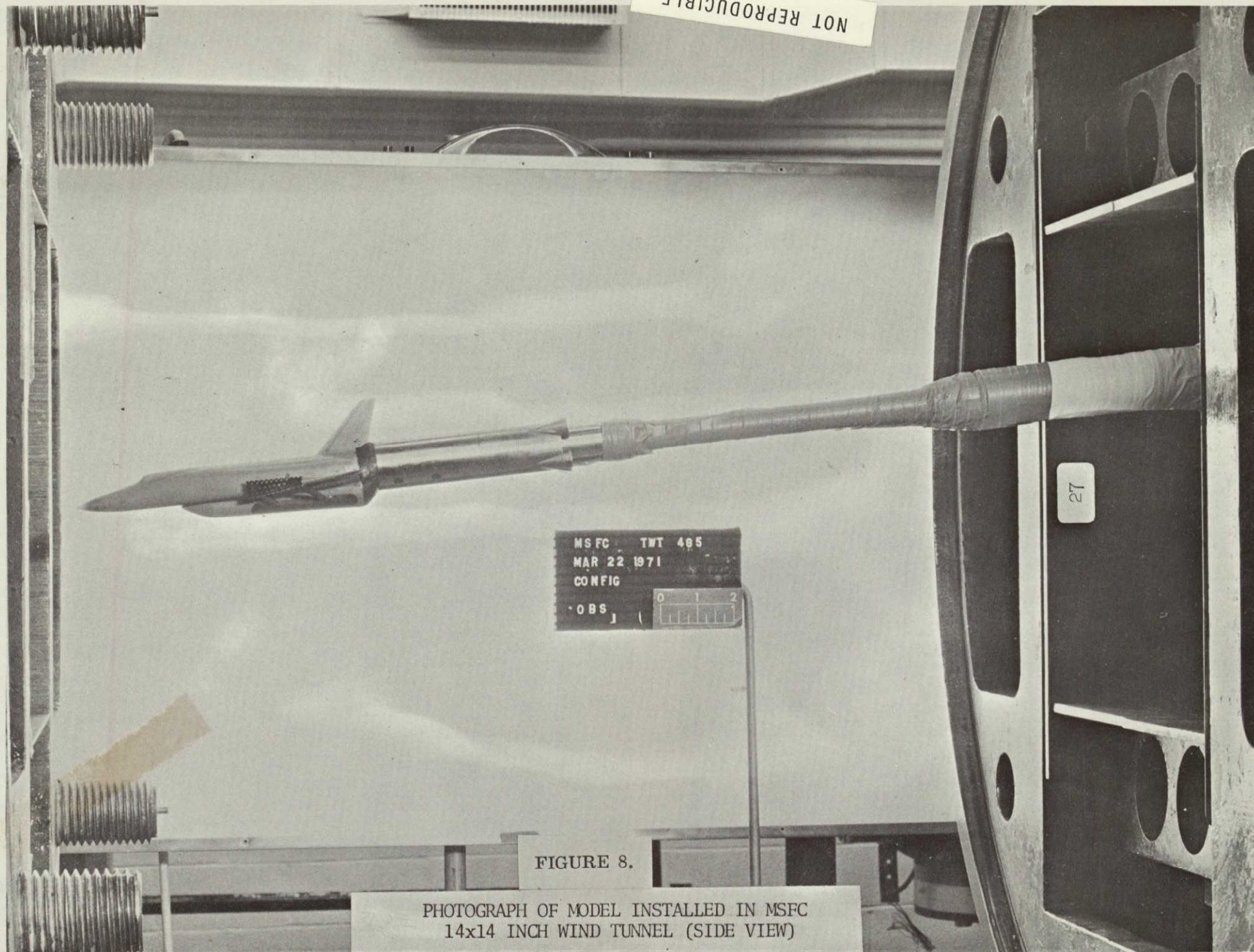


FIGURE 8.

PHOTOGRAPH OF MODEL INSTALLED IN MSFC
14x14 INCH WIND TUNNEL (SIDE VIEW)

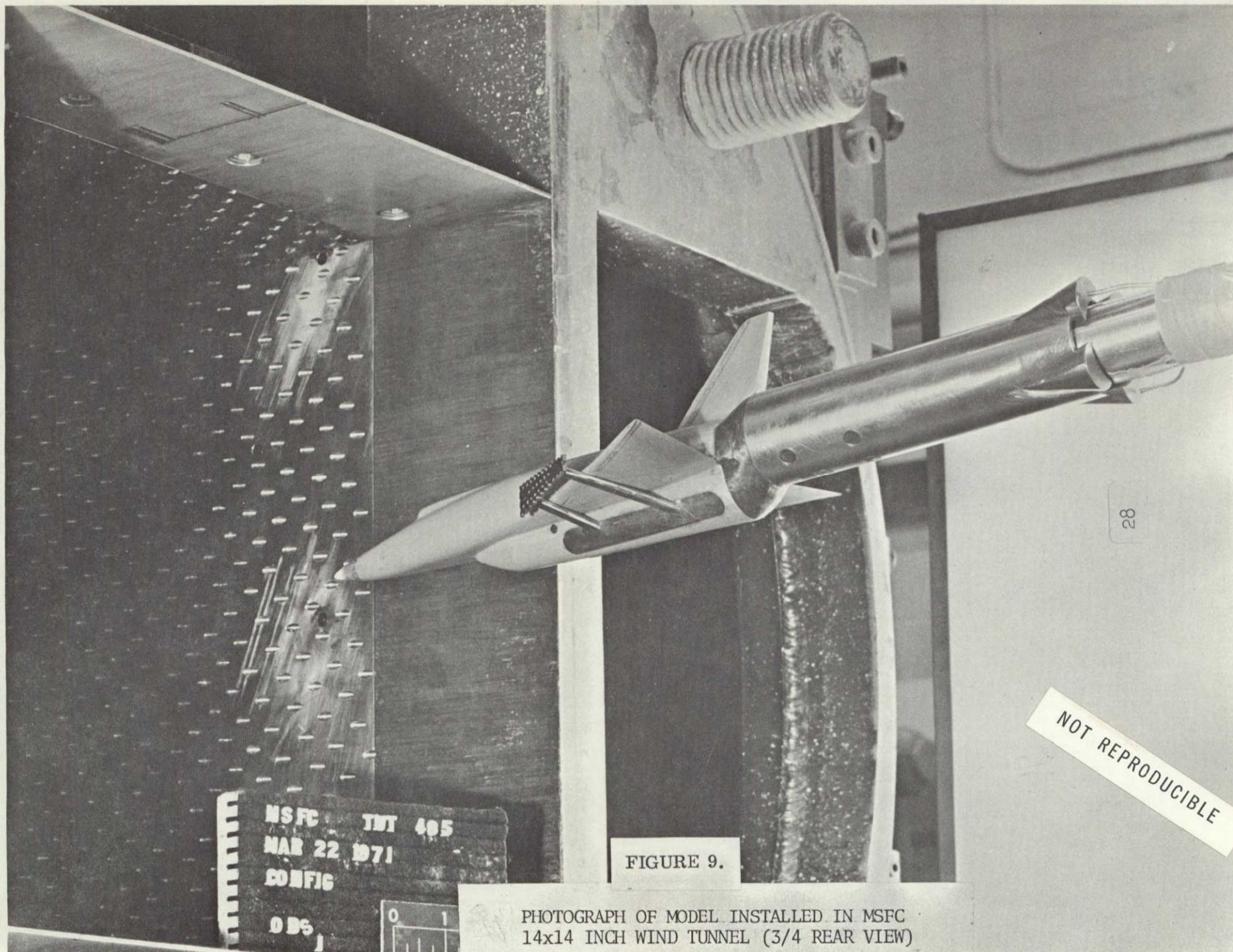


FIGURE 9.

PHOTOGRAPH OF MODEL INSTALLED IN MSFC
14x14 INCH WIND TUNNEL (3/4 REAR VIEW)

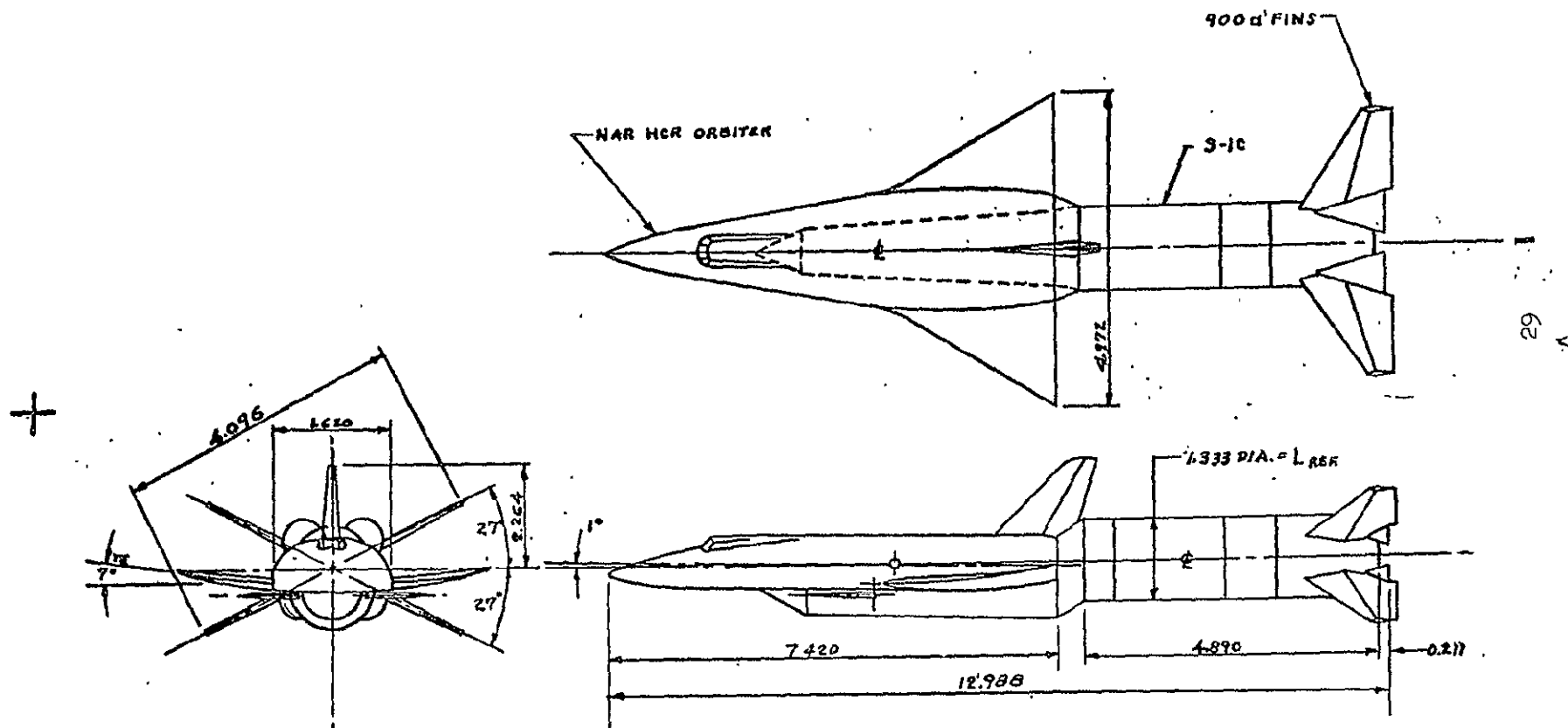


FIGURE 10. 0.003366 SCALE S-IC/NAR HCR ORBITER MODEL

DRAWING NOT TO SCALE

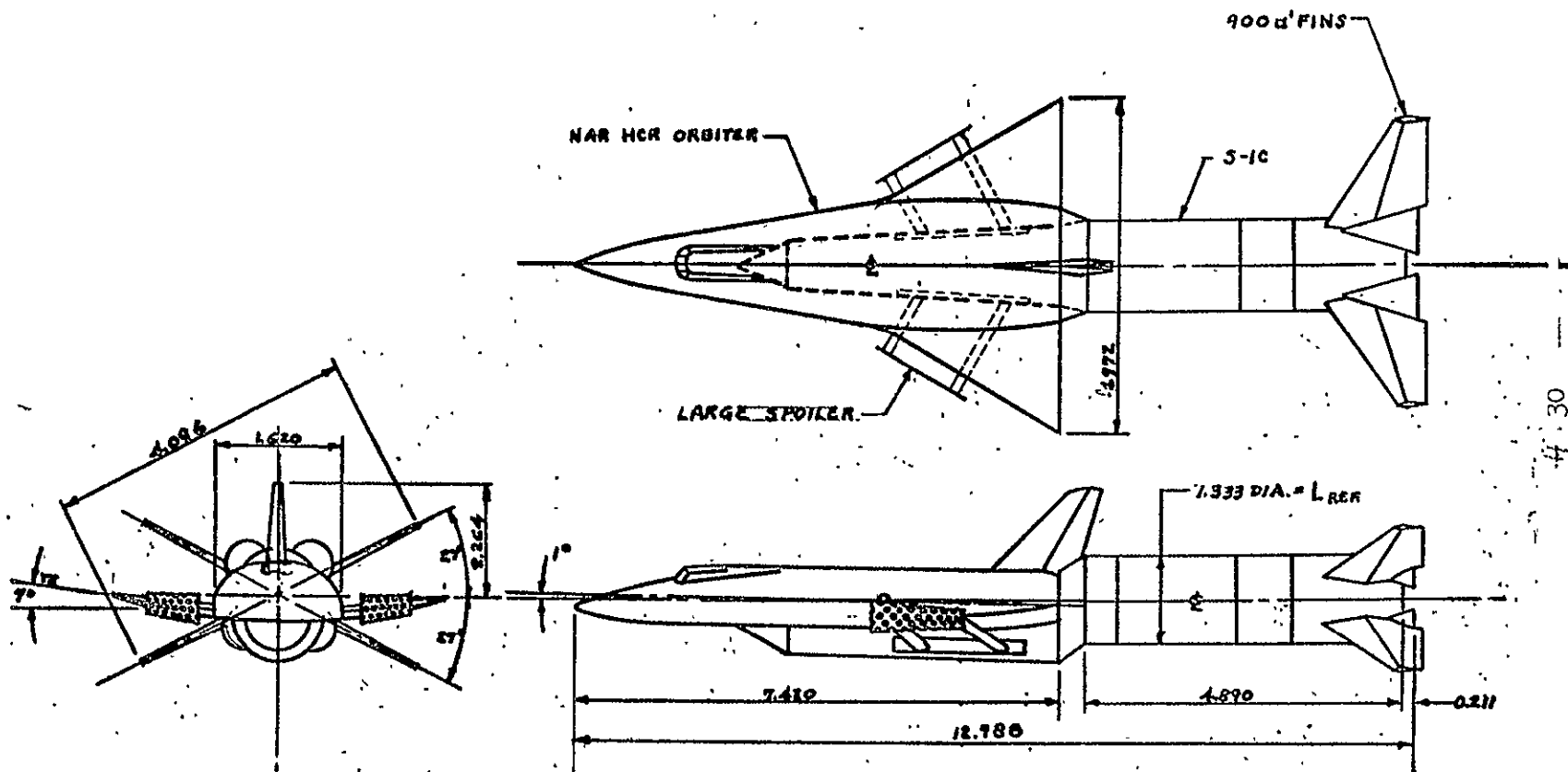


FIGURE 11. S-IC/NAR HCR ORBITER WITH SPOILERS, 0.003366 SCALE MODEL

DRAWING NOT TO SCALE

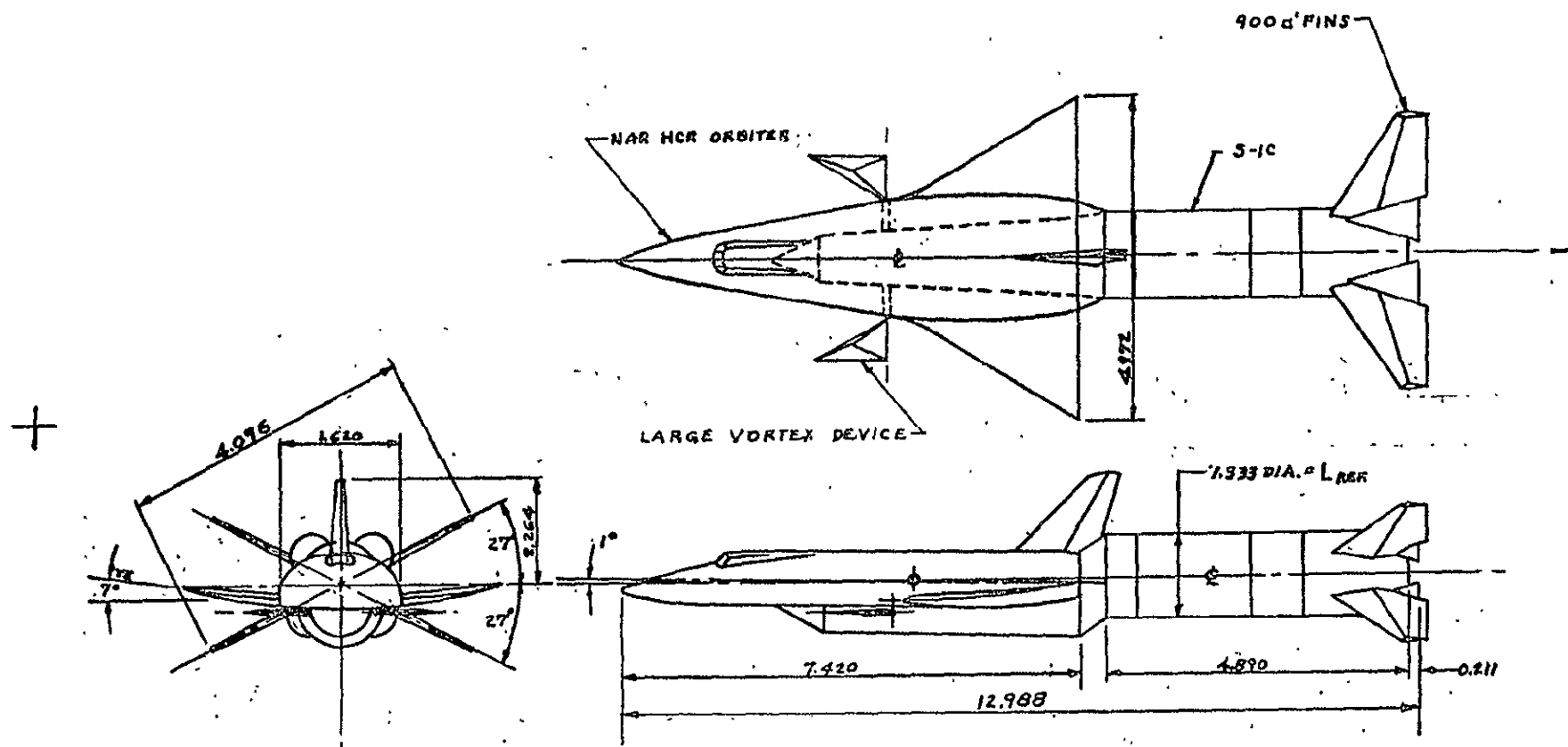


FIGURE 12. S-IC/NAR HCR ORBITER WITH VORTEX DEVICE, 0.003366 SCALE MODEL.

DRAWING NOT TO SCALE

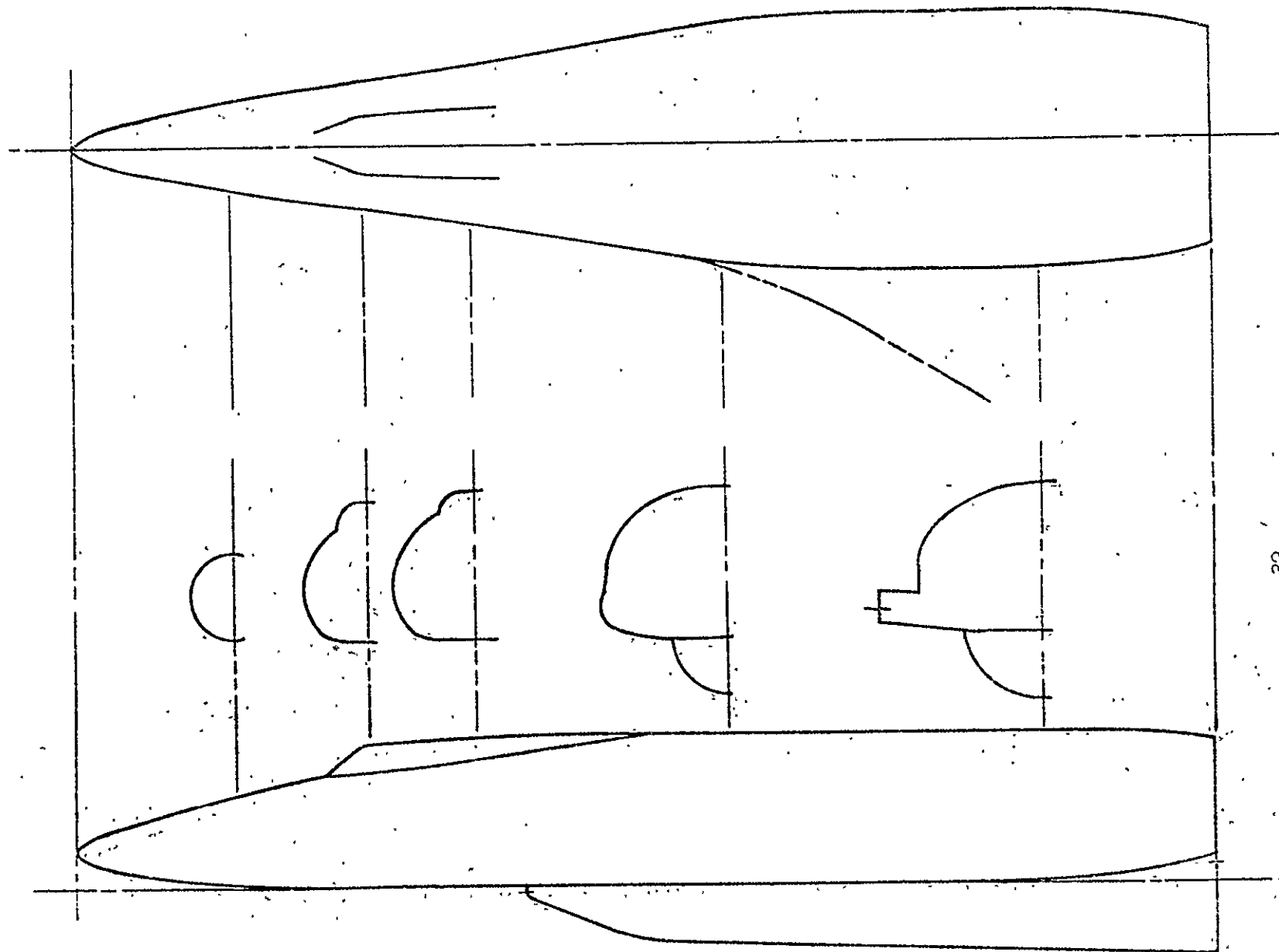


FIGURE 13. NAR HCR ORBITER BODY WITH CRADLE

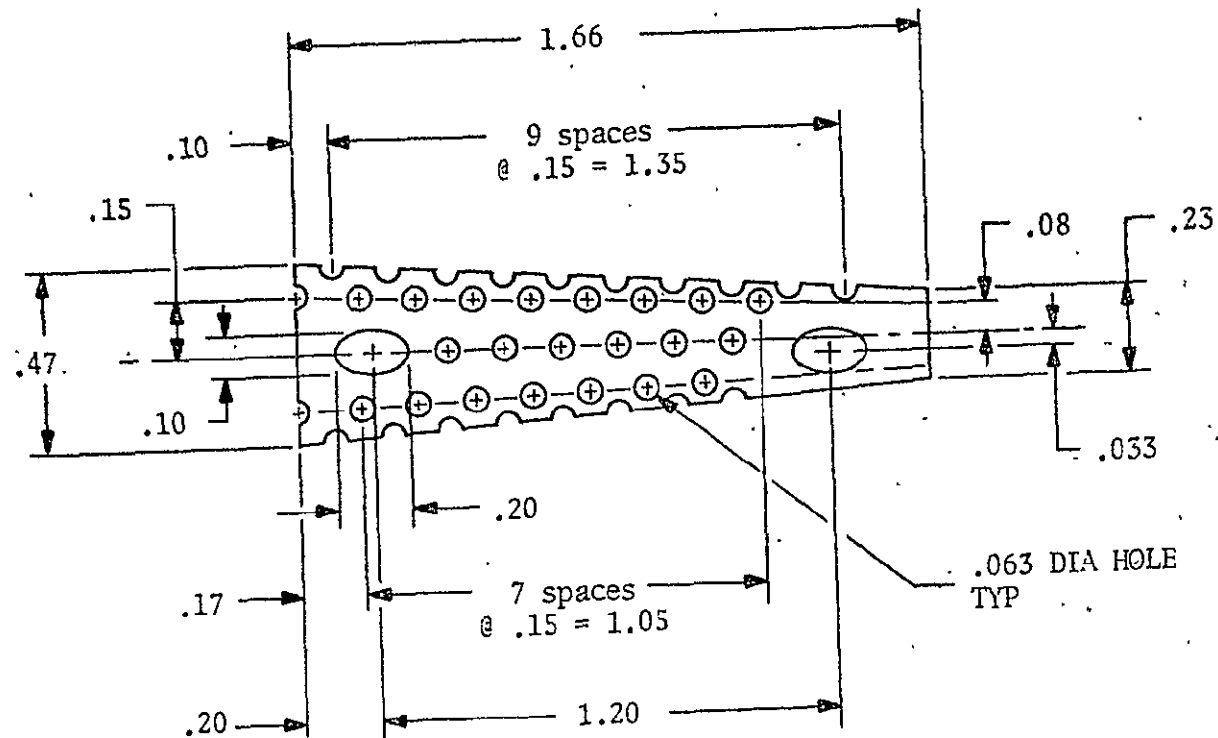


FIGURE 14. LARGE SPOILER - S1

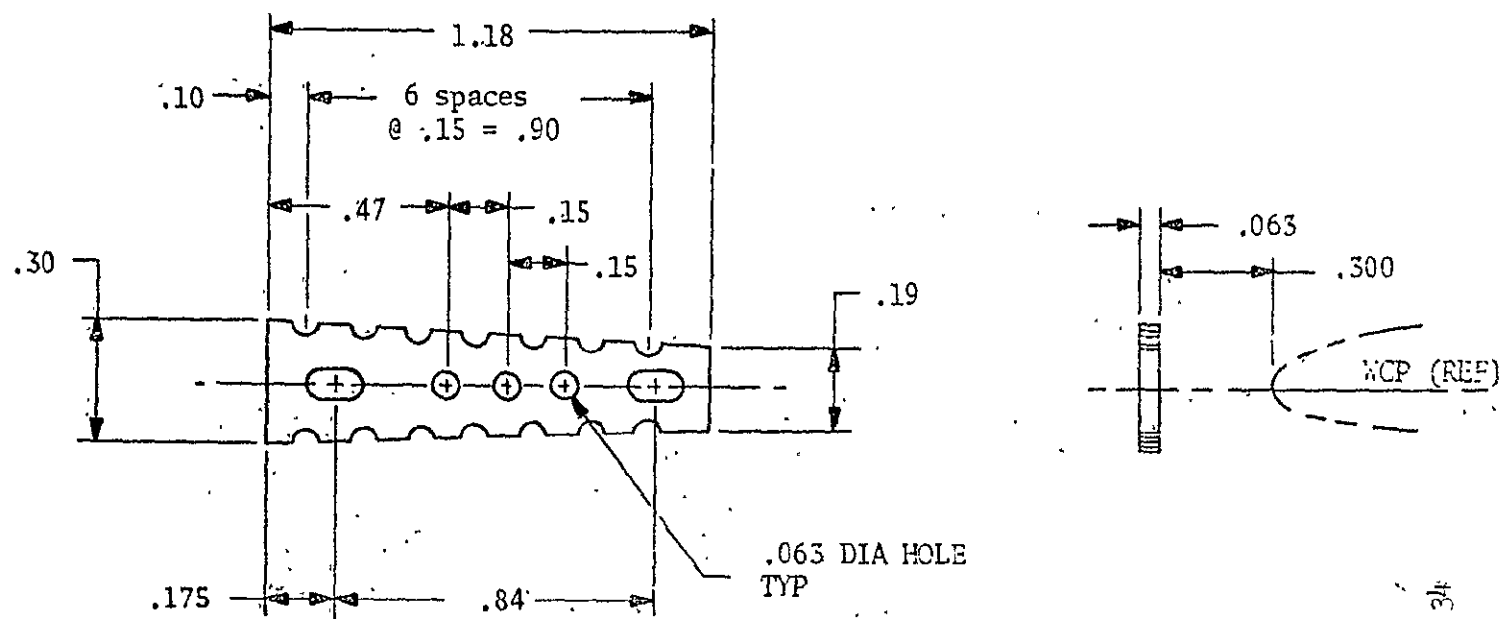


FIGURE 15.- SMALL SPOILER - S₂

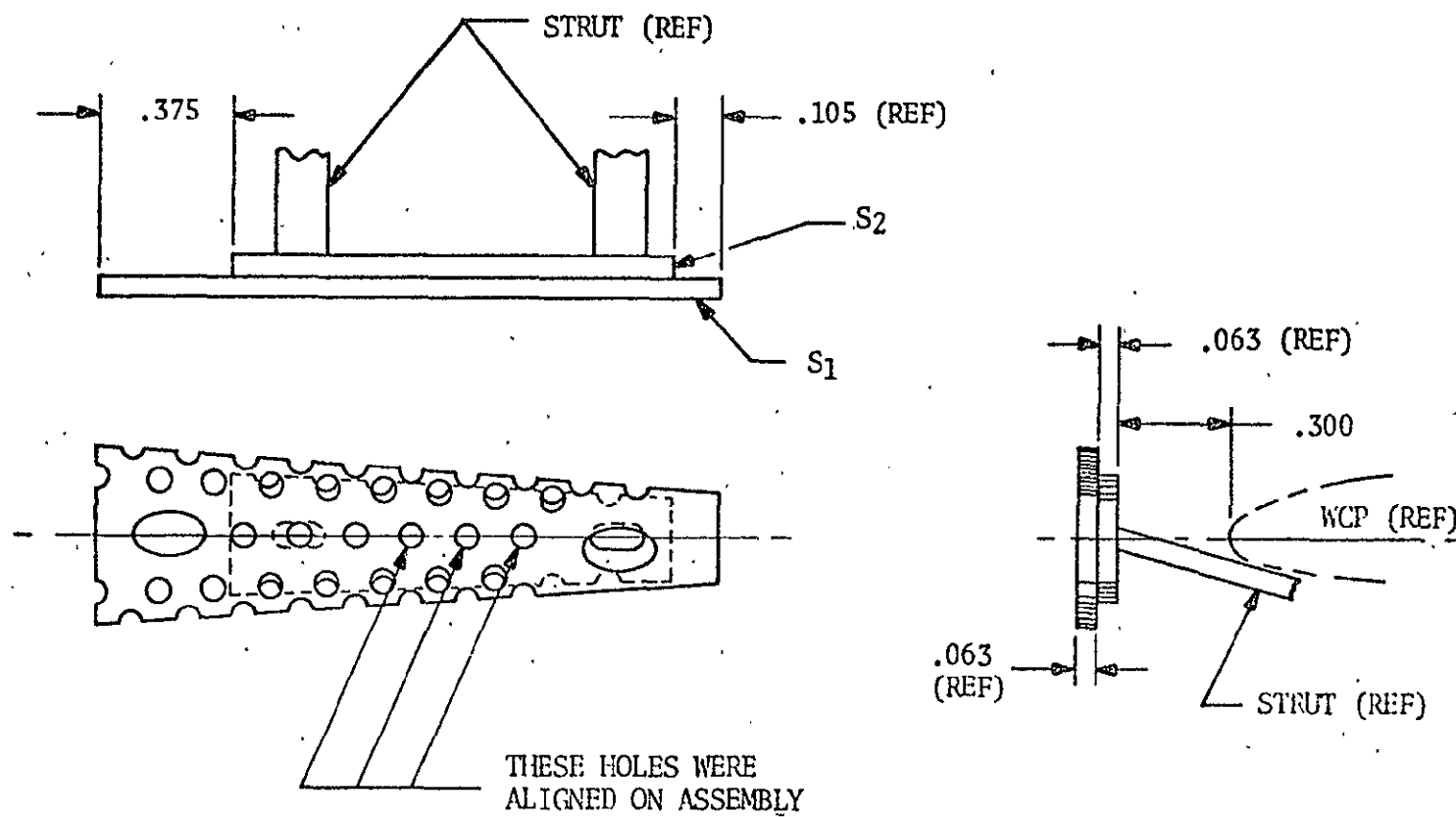
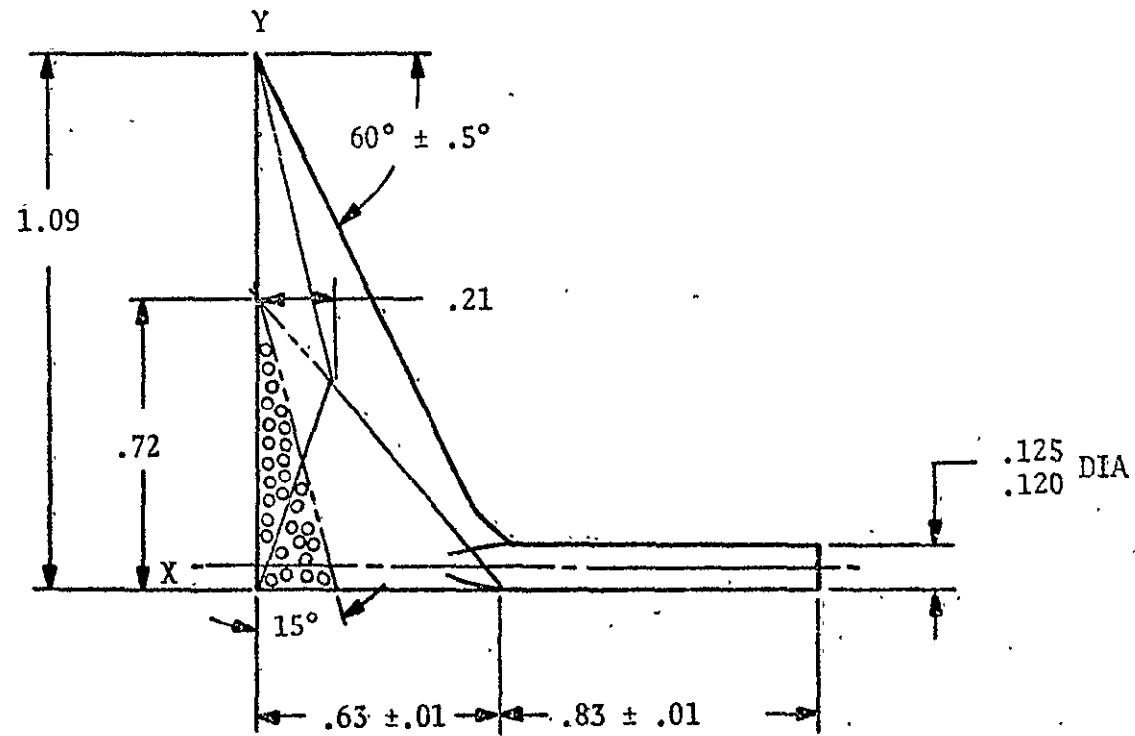


FIGURE 16. SPOILER S_3
(MODIFIED S_1/S_2)



36

FIGURE 17. LARGE VORTEX DEVICE - VD₁

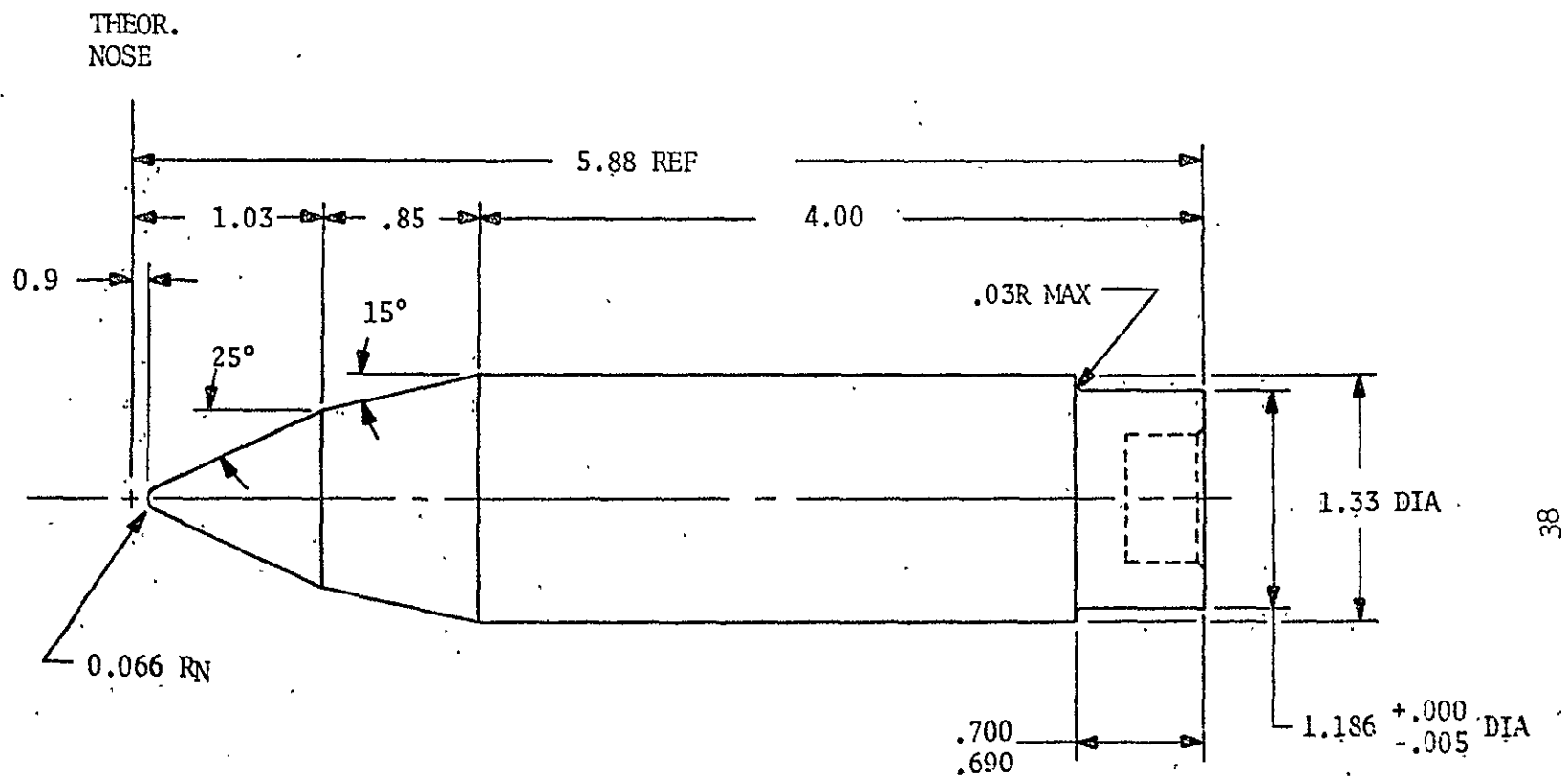


FIGURE 19. MLV CONE FRUSTUM CYLINDER FOREBODY - G

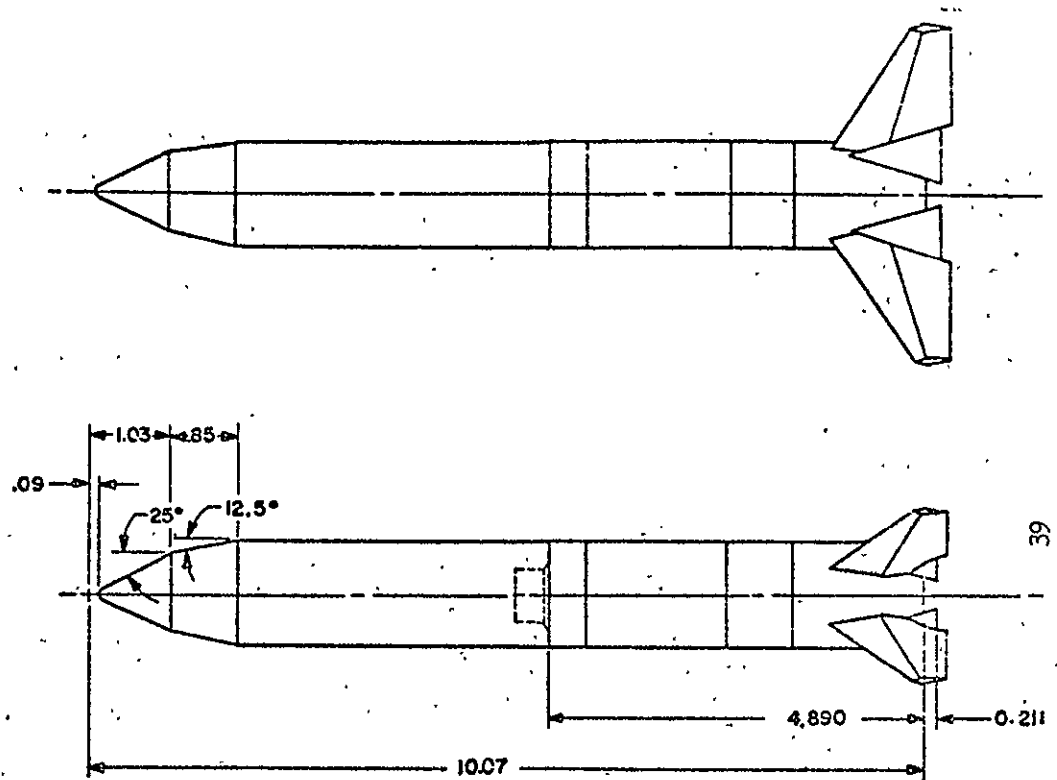
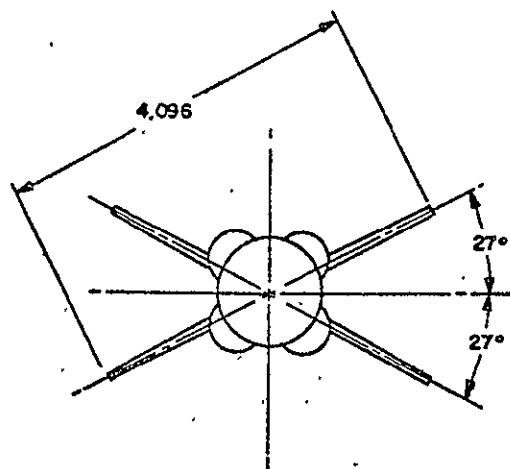


FIGURE 20.

0.003366 SCALE S-IC/MLV CONE FRUSTUM CYLINDER (G)

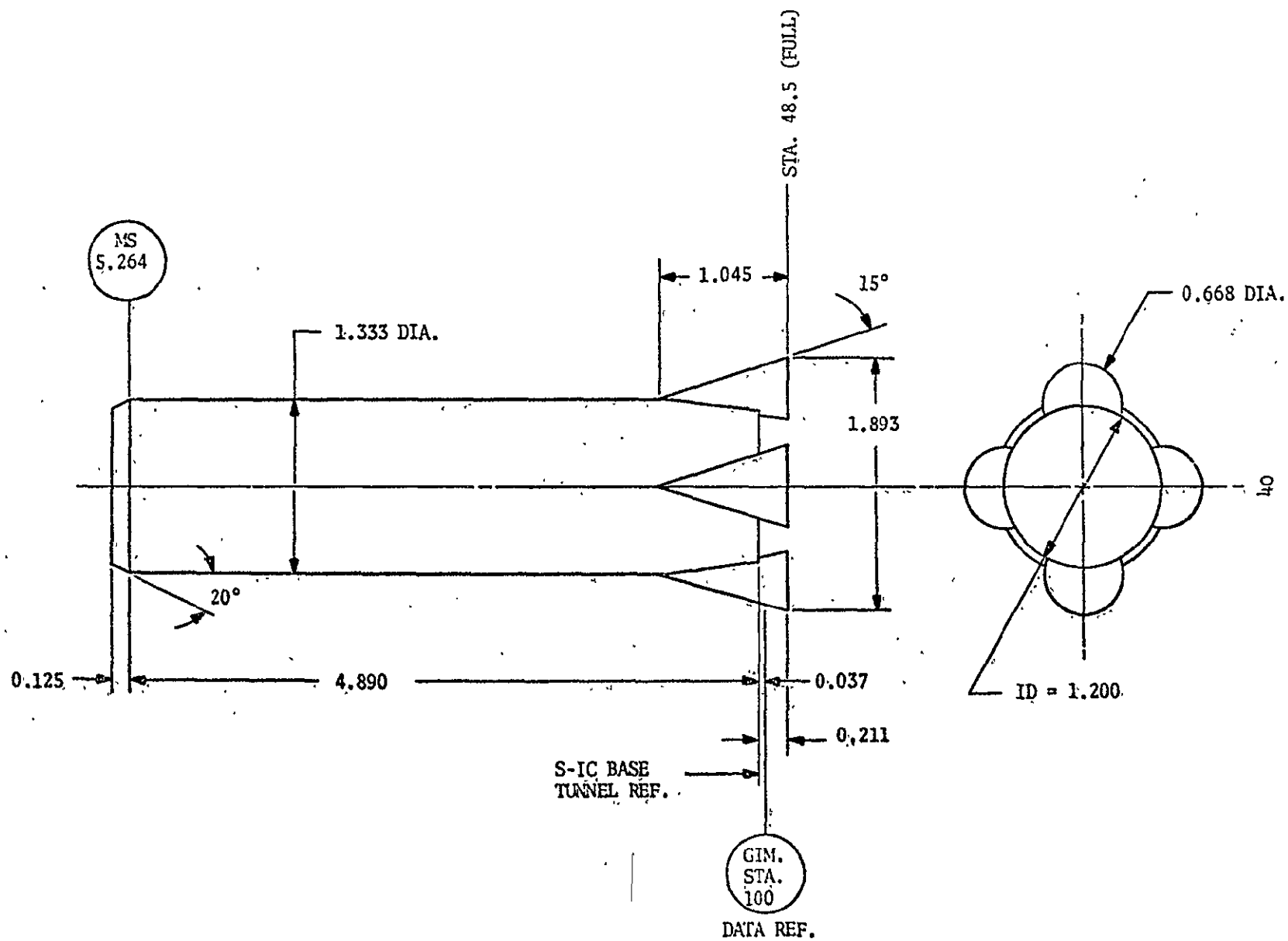


FIGURE 21. SATURN V/S-IC BOOSTER
0.003366 SCALE

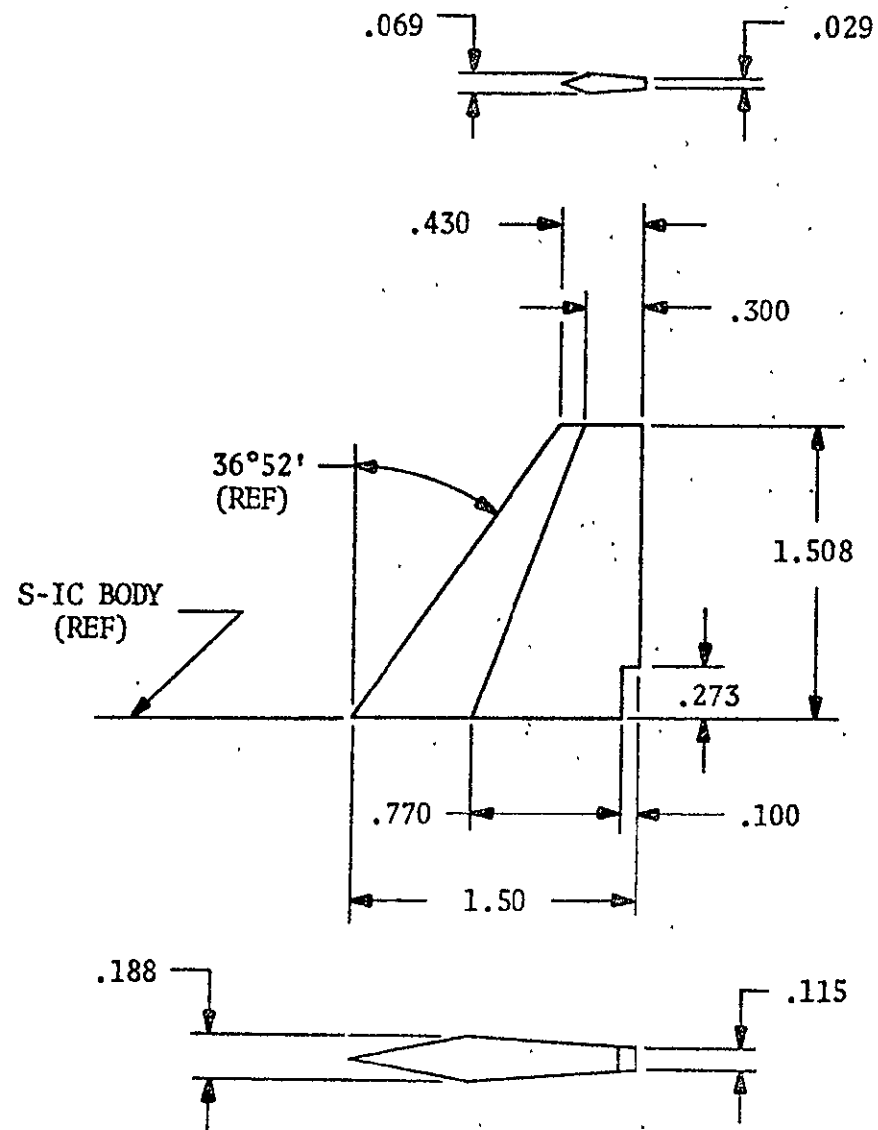


FIGURE 22. 884 SQ. FT. S-IC FIN

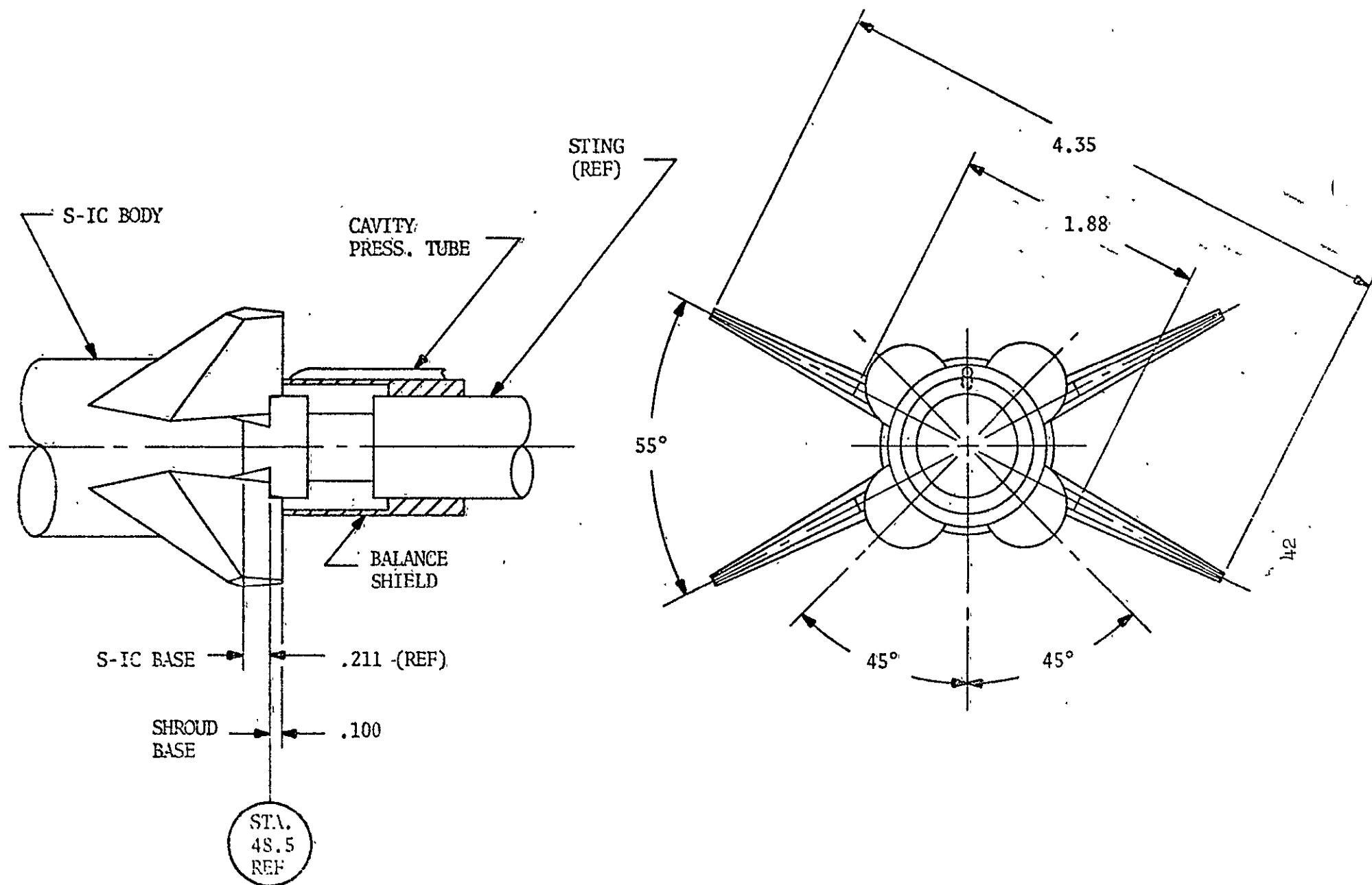


FIGURE 23. 884 SQ. FT. S-IC 27° FIN CONFIGURATION

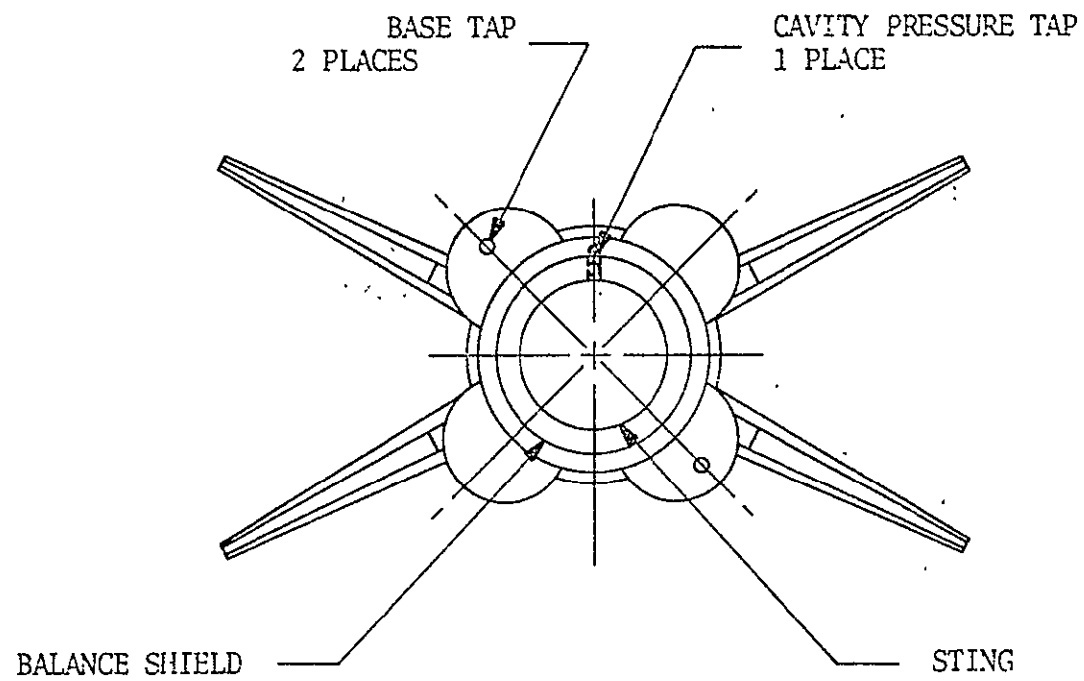


FIGURE 24. BASE PRESSURE TAP LOCATIONS

MODEL COMPONENT DESCRIPTIONS

MODEL COMPONENT: BODY - (0) - ORBITER + GRADLE (See Figure 13)

GENERAL DESCRIPTION: 0.003366 SCALE MODEL OF NAR HCR ORBITER. BODY INCLUDES
A CANOPY ON THE UPPER SURFACE AFT OF THE NOSE AND WING (SEE WING SHEET) AND
VERTICAL FIN (SEE FIN SHEET)

DRAWING NUMBER: _____

DIMENSIONS:

	<u>FULL-SCALE</u>	<u>MODEL SCALE</u>
	<u>FT/FT²</u>	<u>IN/IN²</u>
Length	<u>182.33</u>	<u>7.367</u>
Max. Width	<u>40.59</u>	<u>1.640</u>
Max. Depth	<u>24.00</u>	<u>0.970</u>
Fineness Ratio	<u>5.906</u>	<u>5.906</u>
Area		
Max. Cross-Sectional	<u>5.28 FT²</u>	<u>0.00860</u>
Planform	<u> </u>	<u> </u>
Wetted	<u> </u>	<u> </u>
Base	<u> </u>	<u> </u>

MODEL COMPONENT: WING

GENERAL DESCRIPTION: DELTA WING (W14), MODEL SCALE FACTOR IS 0.003366

DRAWING NUMBER:

DIMENSIONS:

FULL-SCALE

MODEL SCALE

TOTAL DATA

Area

Planform, ft²

6578.036

0.074529

Wetted

Span (equivalent)

125.754

5.081

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

Aerodynamic Twist, degrees

0.000

0.000

Wing Sta. 239

0.000

0.000

Wing Sta. 542

-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.

1281.934

4.315

Tip, (equivalent) in.

0

0

MAC in.

854.722

2.877

Fus. Sta. of .25 MAC in.

1563.277

5.262

W.P. of .25 MAC in.

48.722

0.164

B.L. of .25 MAC

186.868

0.629

Airfoil Section

Root

NACA 0009-64

NACA 0009-64

Tip

NACA 0012-64

NACA 0012-64

EXPOSED DATA

Area, ft²

2954.99

0.003348

Span, (equivalent) in.

986.629

3.321

Aspect Ratio

2.287

2.287

Taper Ratio

0.000

0.000

Chords

Root in.

856.2

2.882

Tip in.

0

0

MAC in.

571

1.922

Fus. Sta. of .25 MAC in.

1776.28

5.979

W.P. of .25 MAC in.

68.627

0.231

B.L. of .25 MAC in.

409.68

1.379

LEADING EDGE CUFF DATA

Area (out'bd of fus IL) FT²

50.3

0.00057

LE Intersects Fus IL at Fus. Sta.

102.46

4.140

MODEL COMPONENT: VERTICAL STABILIZER (V17)

GENERAL DESCRIPTION: CENTERLINE VERTICAL STABILIZER WITH 5° (HALF ANGLE)

WEDGE TRAILING EDGE

MODEL SCALE FACTOR IS 0.003366

DRAWING NUMBER:

DIMENSIONS:

FULL-SCALE

MODEL SCALE

TOTAL DATA

Area		
Planform Ft ²	718.448	0.00814
Wetted		
Span (equivalent) in.	365.326	1.309
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	0	0
Cant Angle	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:		
Root (Wing Sta. 0.0) in.	405.82	1.366
Tip, (equivalent) in.	126.26	0.425
MAC in.	290.84	0.979
Fus. Sta. of .25 MAC in.	2113.78	7.115
W.P. of .25 MAC in.	445.33	1.499
B.L. of .25 MAC in.	0	0
Airfoil Section, Wedge Shape with		
LER & Flat T.E.		
LER, in. (1.6% chd.) in.	6.53	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: SPOILER (S1) (See Figure 14)

GENERAL DESCRIPTION: LARGE PERFORATED PLATE SPOILER

DRAWING NUMBER: SK5-9434-004

<u>DIMENSIONS:</u>	<u>FULL-SCALE</u>	<u>MODEL SCALE</u>
Area (Front Plan)	<u>356.7 FT²</u>	<u>0.581 IN²</u>
Span (equivalent)	<u> </u>	<u> </u>
Inb'd equivalent chord Loc in	<u>371.36</u>	<u>1.25</u>
Outb'd equivalent chord Loc in	<u>563.75</u>	<u>2.02</u>
Ratio movable surface chord/ total surface chord		
At Inb'd equiv. chord	<u> </u>	<u> </u>
At Outb'd equiv. chord	<u> </u>	<u> </u>
Sweep Back Angles, degrees		
Leading Edge (Parallel to)	<u>60°</u>	<u>60°</u>
Tailing Edge	<u> </u>	<u> </u>
Location Ahead of Wing L.E.	<u>89.1 IN</u>	<u>0.300 IN</u>
Area Moment (Normal to hinge line)	<u> </u>	<u> </u>

MODEL COMPONENT: SPOILER (S2) (See Figure 15)

GENERAL DESCRIPTION: SMALL PERFORATED PLATE SPOILER

DRAWING NUMBER: SK5-9434-004

<u>DIMENSIONS:</u>	<u>FULL-SCALE</u>	<u>MODEL SCALE</u>
Area (Front Plan)	<u>177.75 FT²</u>	<u>0.2895 IN²</u>
Span (equivalent)	_____	_____
Inb'd equivalent chord Loc in	<u>371.36</u>	<u>1.25</u>
Outb'd equivalent chord Loc in	<u>537.72</u>	<u>1.81</u>
Ratio movable surface chord/ total surface chord		
At Inb'd equiv. chord	_____	_____
At Outb'd equiv. chord	_____	_____
Sweep Back Angles, degrees		
Leading Edge (Parallel to)	<u>60°</u>	<u>60°</u>
Tailing Edge	_____	_____
Location Ahead of Wing L.E.	<u>89.1 IN</u>	<u>0.300 IN</u>
Area Moment (Normal to hinge line)	_____	_____

MODEL COMPONENT: SPOILER (S₃) (See Figure 16)

GENERAL DESCRIPTION: LARGE PERFORATED PLATE SPOILER (MODIFIED S₁/S₂,
SHIFTED INBOARD)

DRAWING NUMBER: SK5-9434-005 (REF. ONLY)

<u>DIMENSIONS:</u>	<u>FULL-SCALE</u>	<u>MODEL SCALE</u>
Area (Front Plan)	<u>356.7 FT²</u>	<u>0.581 IN²</u>
Span (equivalent)	<u></u>	<u></u>
Inb'd equivalent chord Loc in	<u>315.51'</u>	<u>1.062</u>
Outb'd equivalent chord Loc in	<u>544.27</u>	<u>1.832</u>
Ratio movable surface chord/ total surface chord		
At Inb'd equiv. chord	<u></u>	<u></u>
At Outb'd equiv. chord	<u></u>	<u></u>
Sweep Back Angles, degrees		
Leading Edge (Parallel to)	<u>60°</u>	<u>60°</u>
Tailing Edge	<u></u>	<u></u>
Location Ahead of Wing L.E.	<u>107.84</u>	<u>0.363</u>
Area Moment (Normal to hinge line)	<u></u>	<u></u>

MODEL COMPONENT: VORTEX GENERATOR VD1 (See Figure 17)

GENERAL DESCRIPTION: LARGE REVERSE SWEEP TRIANGULAR PLANFORM SURFACE

DRAWING NUMBER: SK5-9434-003 & 001

DIMENSIONS: FULL-SCALE MODEL SCALE

TOTAL DATA

Area		
Planform		
Wetted		
Span (equivalent)		
Aspect Ratio		
Rate of Taper		
Taper Ratio		
Dihedral Angle, degrees	0	0
Incidence Angle, degrees	0	0
Aerodynamic Twist, degrees	0	0
Toe-In Angle		
Cant Angle		
Sweep Back Angles, degrees		
Leading Edge	60°	60°
Trailing Edge	0	0
0.25 Element Line		
Chords:		
Root (Sta. 0.0) in.	0	0
Tip, (equivalent) in.	323.82	1.090
MAC		
Fus. Sta. of .25 MAC		
W.P. of .25 MAC		
B.L. of .25 MAC		
Airfoil Section		
Root		Circular
Tip		Flat Plate
<u>EXPOSED DATA</u>		(Modified Diamond)

Area	210.6 FT ²	0.343 IN ²
Span, (equivalent) in.	187.16	0.630
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: VORTEX GENERATOR VD₂ (See Figure 18)

GENERAL DESCRIPTION: SMALL REVERSE SWEEP TRIANGULAR PLANFORM SURFACE

DRAWING NUMBER: SK5-9434-003 & 001

DIMENSIONS: FULL-SCALE MODEL SCALE

TOTAL DATA

Area		
Planform		
Wetted		
Span (equivalent)		
Aspect Ratio		
Rate of Taper		
Taper Ratio		
Dihedral Angle, degrees	0	0
Incidence Angle, degrees	0	0
Aerodynamic Twist, degrees	0	0
Toe-In Angle	0	
Cant Angle		
Sweep Back Angles, degrees		
Leading Edge	60°	60°
Trailing Edge	0	0
0.25 Element Line		
Chords:		
Root (Wing Sta. 0.0)	0	0
Tip, (equivalent) in.	160.4	0.54
MAC		
Fus. Sta. of .25 MAC		
W.P. of .25 MAC		
B.L. of .25 MAC		
Airfoil Section		
Root		Circular
Tip		Flat Plate

EXPOSED DATA

Area		53.05 FT ²	0.0864 IN ²
Span, (equivalent) in.		95.07	0.32
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 - (G) - FOREBODY (See Figure 19)

GENERAL DESCRIPTION: MLV CONE FRUSTUM CYLINDER

DRAWING NUMBER: SK5-9434-002

<u>DIMENSIONS:</u>	<u>FULL-SCALE</u>	<u>MODEL SCALE</u>
Length	<u>1538.91</u>	<u>5.18</u>
Max. Dia.	<u>396.01</u>	<u>1.333</u> <u>25°/12.5° Stepped</u> <u>Cone/Frustum</u>
Fineness Ratio	<u> </u>	<u> </u>
Area		
Max. Cross-Sectional	<u>857.144 FT²</u>	<u>1.396 IN²</u> <u>Cone/Frustum/</u> <u>Cylinder</u>
Planform	<u> </u>	<u> </u>
Wetted	<u> </u>	<u> </u>
Base	<u> </u>	<u> </u>

MODEL COMPONENT: BODY - B (See Figure 21)

GENERAL DESCRIPTION: SATURN V/S-IC BOOSTER (0.003366 SCALE)

DRAWING NUMBER: GDC 383-4

<u>DIMENSIONS:</u>	<u>FULL-SCALE</u>	<u>MODEL SCALE</u>
Length, ft.	<u>126.25</u> <u>130.28</u>	<u>5.101 in. (1)</u> <u>5.264 in. (2)</u>
Max. Width, ft.	<u>46.85</u>	<u>1.893 in.</u>
Max. Depth, ft.	<u>46.85</u>	<u>1.893 in.</u>
Fineness Ratio	<u>0.276</u>	<u>0.276</u>
Body Dia.	<u>33 ft.</u>	<u>1.333 in.</u>
Area		
Max. Cross-Sectional	<u>857.14 FT²</u>	<u>1.396 IN²</u>
Planform	<u> </u>	<u> </u>
Wetted	<u> </u>	<u> </u>
Base	<u>1332.38 FT²</u>	<u>2.170 IN²</u>
Cavity	<u>694.43 FT²</u>	<u>1.131 IN²</u>
Solid Base	<u>637.94 FT²</u>	<u>1.039 IN²</u>

(1) To end of engine fairing.

(2) To Station 0.0

MODEL COMPONENT: S-IC FIN (See Figure 22)

GENERAL DESCRIPTION: 884 SQ. FT., 440" SPAN

DRAWING NUMBER: _____

<u>DIMENSIONS:</u>	<u>FULL-SCALE</u>	<u>MODEL SCALE</u>
Area (Front Plan)	<u>875.56 FT²</u>	<u>1.426 IN²</u>
Span (equivalent)	<u>107.66 FT</u>	<u>4.35 IN</u>
Inboard equivalent chord Loc in	<u>16.51 FT</u>	<u>0.667 IN</u>
Outboard equivalent chord Loc in	<u>53.83 FT</u>	<u>2.175 IN</u>
Ratio movable surface chord/ total surface chord		
Chords		
Root	<u>37.13 FT</u>	<u>1.500 IN</u>
Tip	<u>10.64 FT</u>	<u>0.430 IN</u>
Sweep Back Angles, degrees		
Leading Edge (Parallel to)	<u>36° 52'</u>	<u>36° 52'</u>
Trailing Edge	<u>0.0</u>	<u>0.0</u>
Area Moment (Normal to hinge line)		
Aspect Ratio	<u>3.17</u>	<u>3.17</u>
Trailing Edge Thickness		
At root	<u>34.10 IN</u>	<u>0.115 IN</u>
At tip	<u>8.61 IN</u>	<u>0.029 IN</u>

STANDARD NOMENCLATURE

NOMENCLATURE

<u>SYMBOL</u>	<u>SADSAC SYMBOL</u>	<u>DEFINITION</u>
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 $\bar{l}_{ref}$ 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)

<u>SYMBOL</u>	<u>SADSAC SYMBOL</u>	<u>DEFINITION</u>
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, $M_x/q S_{ref} b$
$C_{l,s}$	CSL	rolling moment coefficient in the stability axis system, $M_{x,s}/q S_{ref} b$
$C_{l,w}$	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, $M_y/q S_{ref} l_{ref}$
$C_{m,s}$	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, $M_{y,w}/q S_{ref} l_{ref}$
C_N	CN	normal force coefficient in the body axis system, $F_N/q S_{ref}$

NOMENCLATURE (continued)

<u>SYMBOL</u>	<u>SADSAC SYMBOL</u>	<u>DEFINITION</u>
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)

<u>SYMBOL</u>	<u>SADSAC SYMBOL</u>	<u>DEFINITION</u>
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)

<u>SYMBOL</u>	<u>SADSAC SYMBOL</u>	<u>DEFINITION</u>
$M_{x,w}$		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)

<u>SYMBOL</u>	<u>SADSAC SYMBOL</u>	<u>DEFINITION</u>
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
		air density; K_g/m^3 , slugs/ft ³

NOMENCLATURE (continued)

<u>SYMBOL</u>	<u>SADSAC SYMBOL</u>	<u>DEFINITION</u>
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)

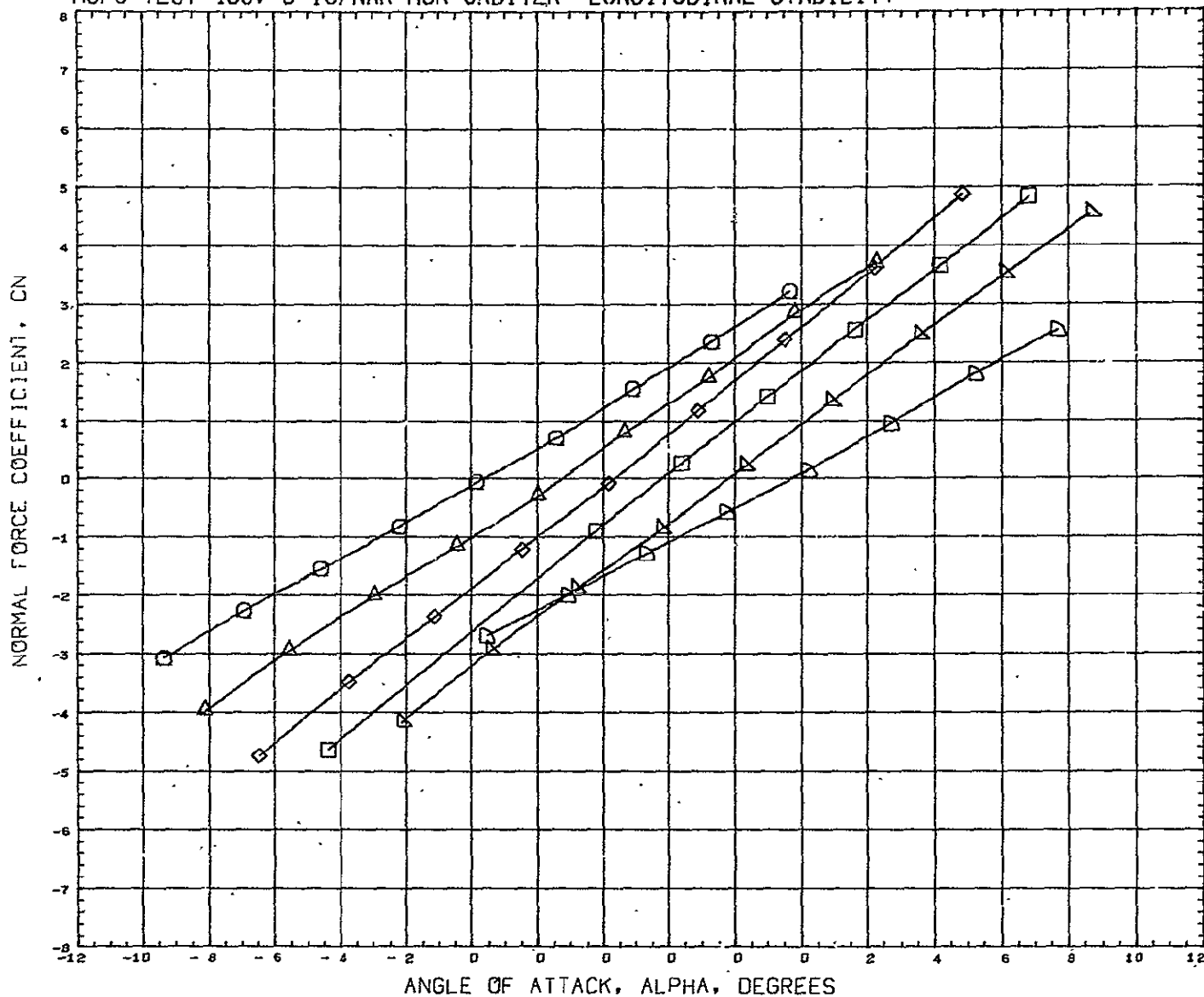
<u>SUBSCRIPTS</u>	<u>DEFINITION</u>
a	aileron
b	base
c	canard
e	elevator or elevon
f	flap
r	rudder or ruddervator
s	stability axis system
t	tail, or total conditions
w	wind axis system
ref	reference conditions
∞	freestream condition

NOMENCLATURE ADDITIONS

SYMBOL	SADSAC SYMBOL	
ΔC_N	DCN	Increment of normal force coefficient due to component addition $\Delta C_N = (C_{N_{with}} - C_{N_{without}})$
ΔC_A	DCA	Increment of axial force coefficient due to component addition $\Delta C_A = (C_{A_{with}} - C_{A_{without}})$
ΔC_{AF}	DCAF	Increment of forebody axial force coefficient due to component addition; $\Delta C_m = (C_{m_{with}} - C_{m_{without}})$
ΔC_ℓ	DCBL	Increment of rolling moment coefficient due to com- ponent addition; $\Delta C = (C_{with} - C_{without})$
ΔC_m	DCYN	Increment of yawing moment coefficient due to com- ponent addition; $\Delta C_n = (C_{n_{with}} - C_{n_{without}})$
ΔC_m	DCLM	Increment of pitching moment coefficient due to com- ponent addition; $\Delta C_m = (C_{m_{with}} - C_{m_{without}})$
ΔC_y	DCY	Increment of side force coefficient due to component addition; $\Delta C_y = (C_{y_{with}} - C_{y_{without}})$
D		Body diameter
CP		Center of Pressure

DATA

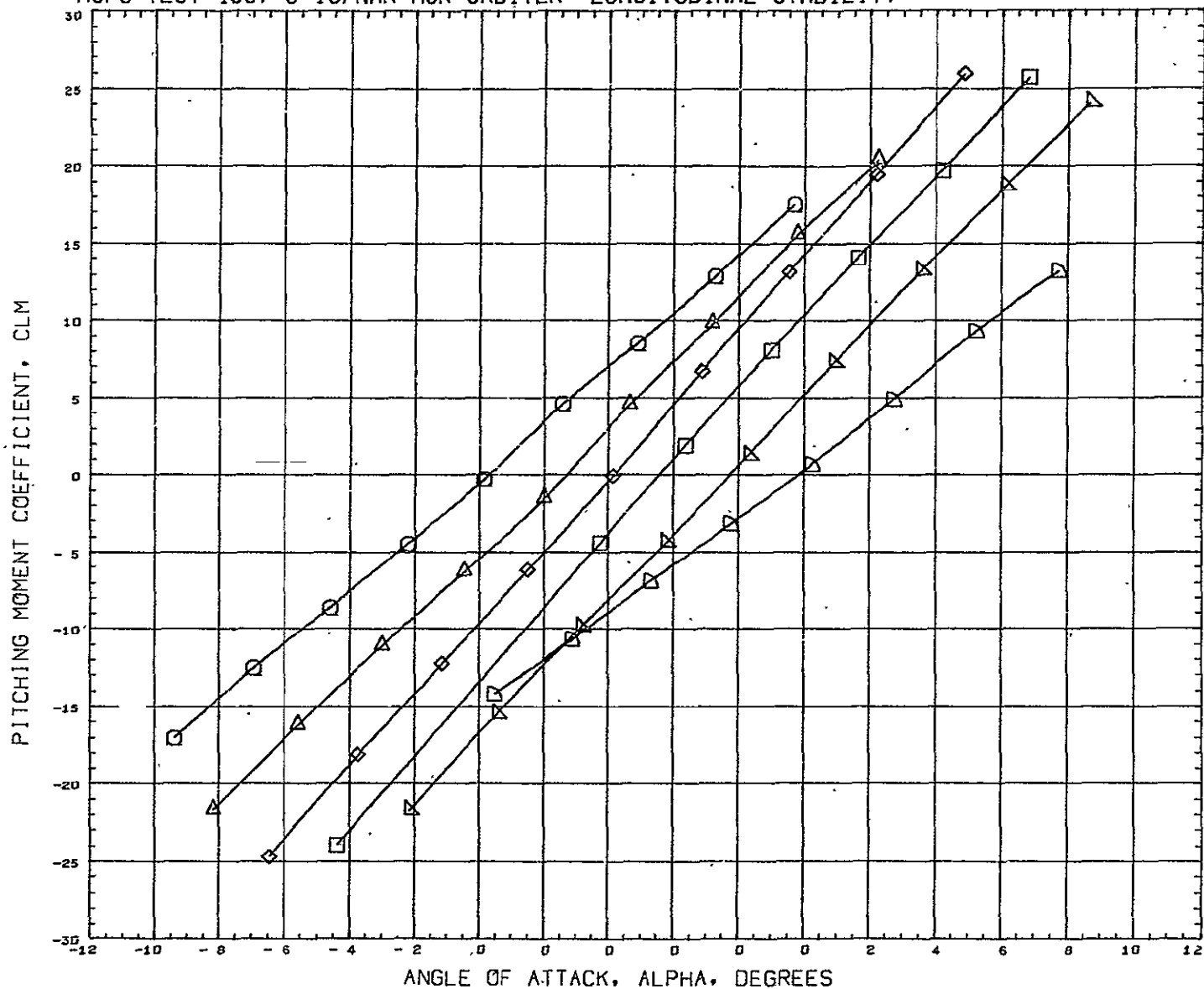
MSFC TEST 485. S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL MACH PARAMETRIC VALUES
 0.607 BETA 0.030
 0.902
 1.004
 1.102
 1.197
 1.949 DATA HIST. CODE *E

REFERENCE INFORMATION
 REFS 1.3960 SQ.IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XHRF 0.0370 IN
 YHRF 0.0000 IN
 ZHRF 0.0000 IN
 SCALE 0.0034

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.607		0.030
◇	0.902		
△	1.004		
□	1.102		
▽	1.197		
◇	1.949		

DATA HIST. CODE *E

REFERENCE INFORMATION		
REFS	1.3960	SO.IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

M485-MSFC-S1C NAR HCR ORBITER

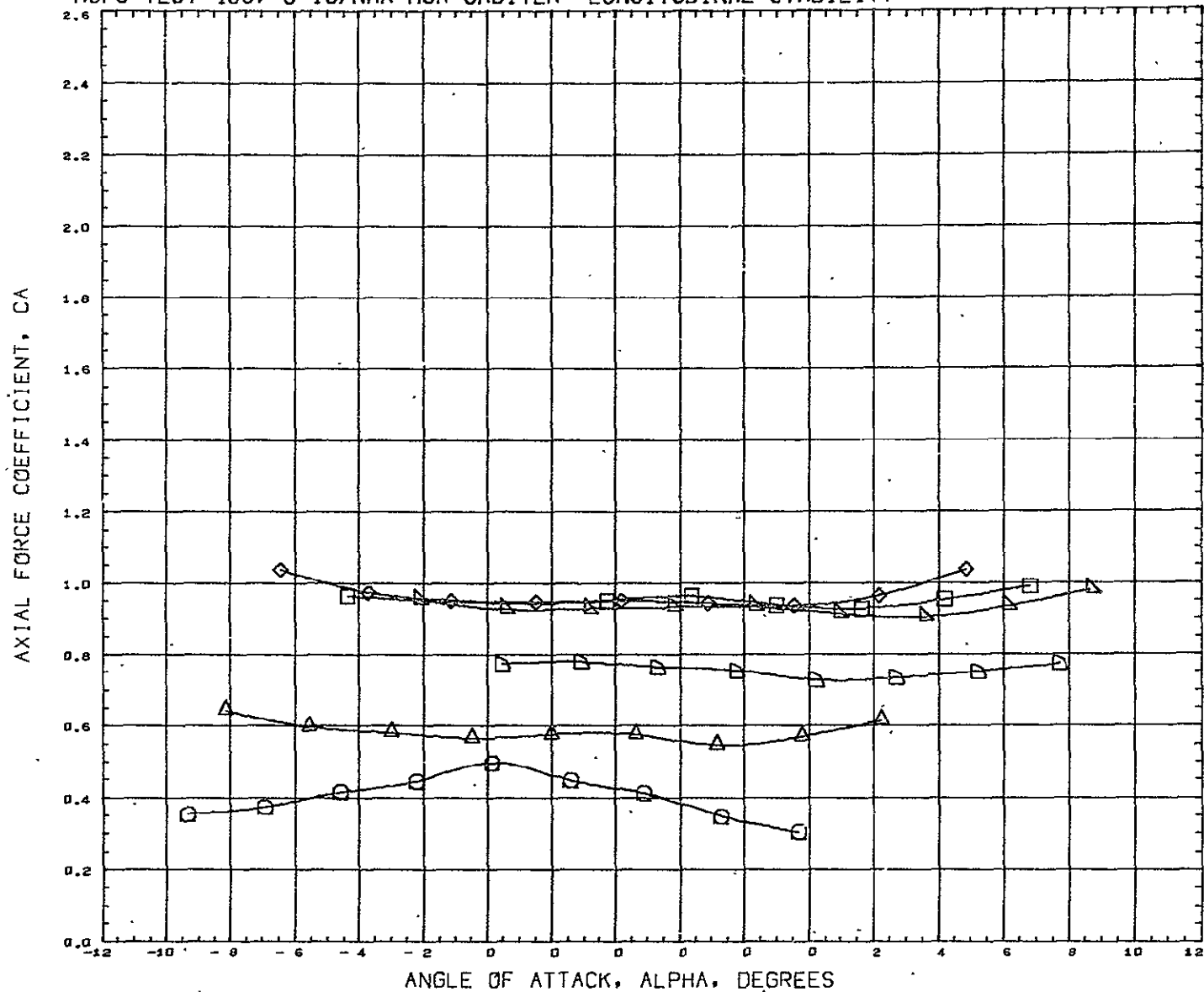
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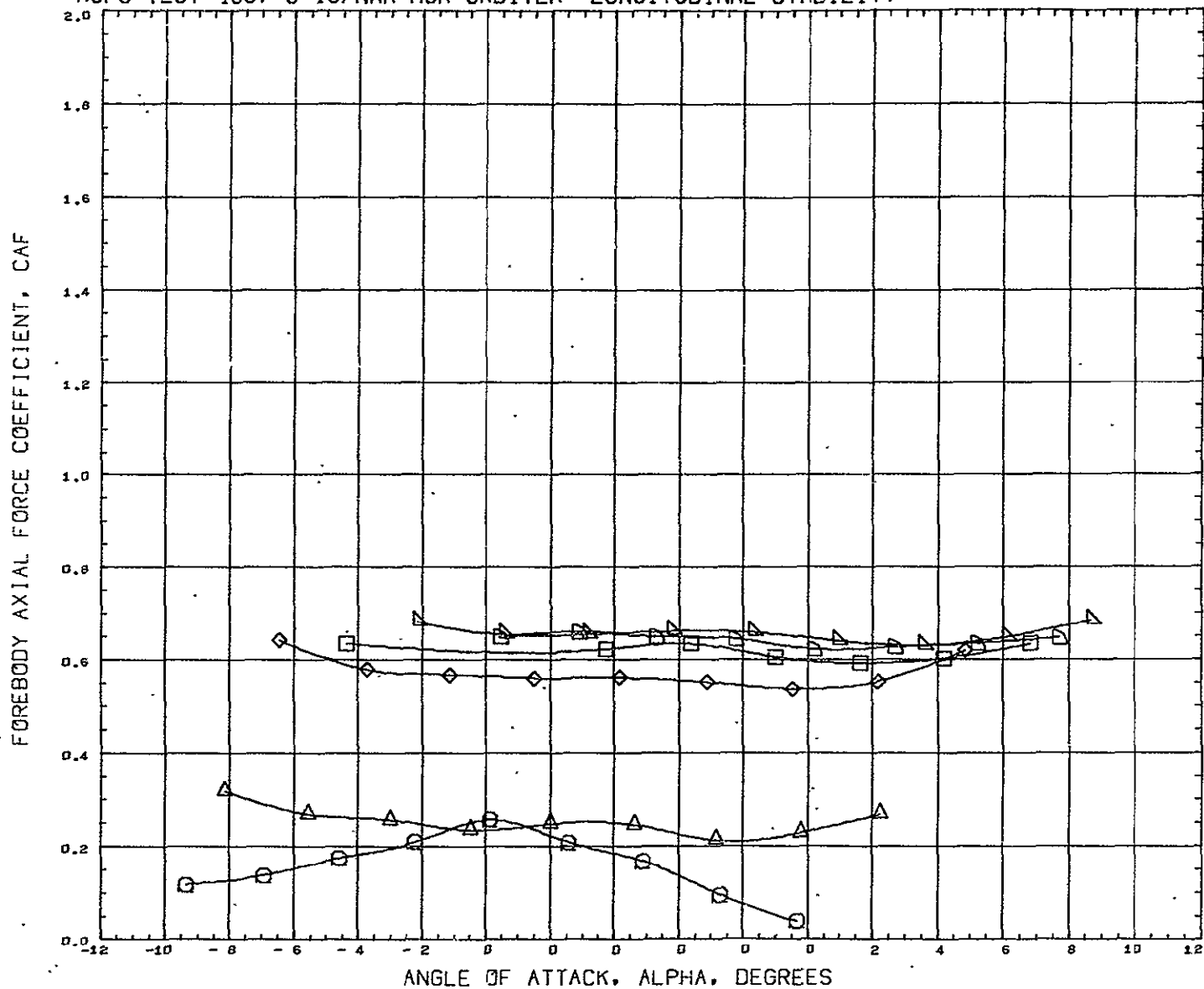
MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
◇	0.607		0.030
□	0.902		
△	1.004		
○	1.102		
▽	1.197		
DATA HIST. CODE	1.949		#E

REFERENCE INFORMATION		
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REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0375	IN
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ZMRP	0.0000	IN
SCALE	0.0034	

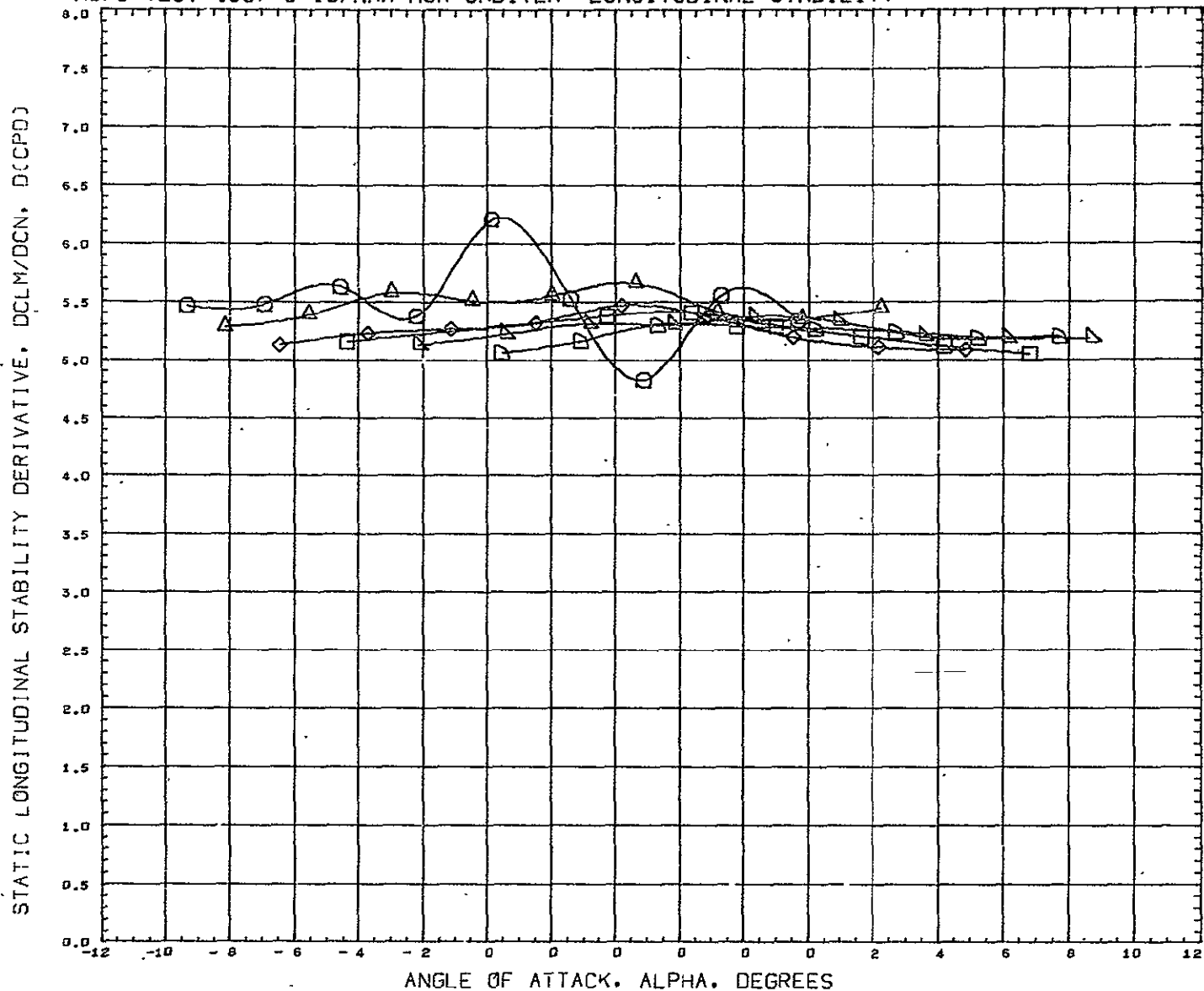
MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
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□	0.902		
△	1.004		
○	1.102		
	1.197		
	1.949	DATA MIST. CODE	#E

REFERENCE INFORMATION		
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REFL	1.3330	IN
REFD	1.3430	IN
XMRP	0.0370	IN
YMRP	1.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.607		0.030
△	0.992		
◇	1.004		
□	1.102		
▽	1.197		
◇	1.949	DATA HIST. CODE	*E

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

M485-MSFC-S1C NAR HCR ORBITER

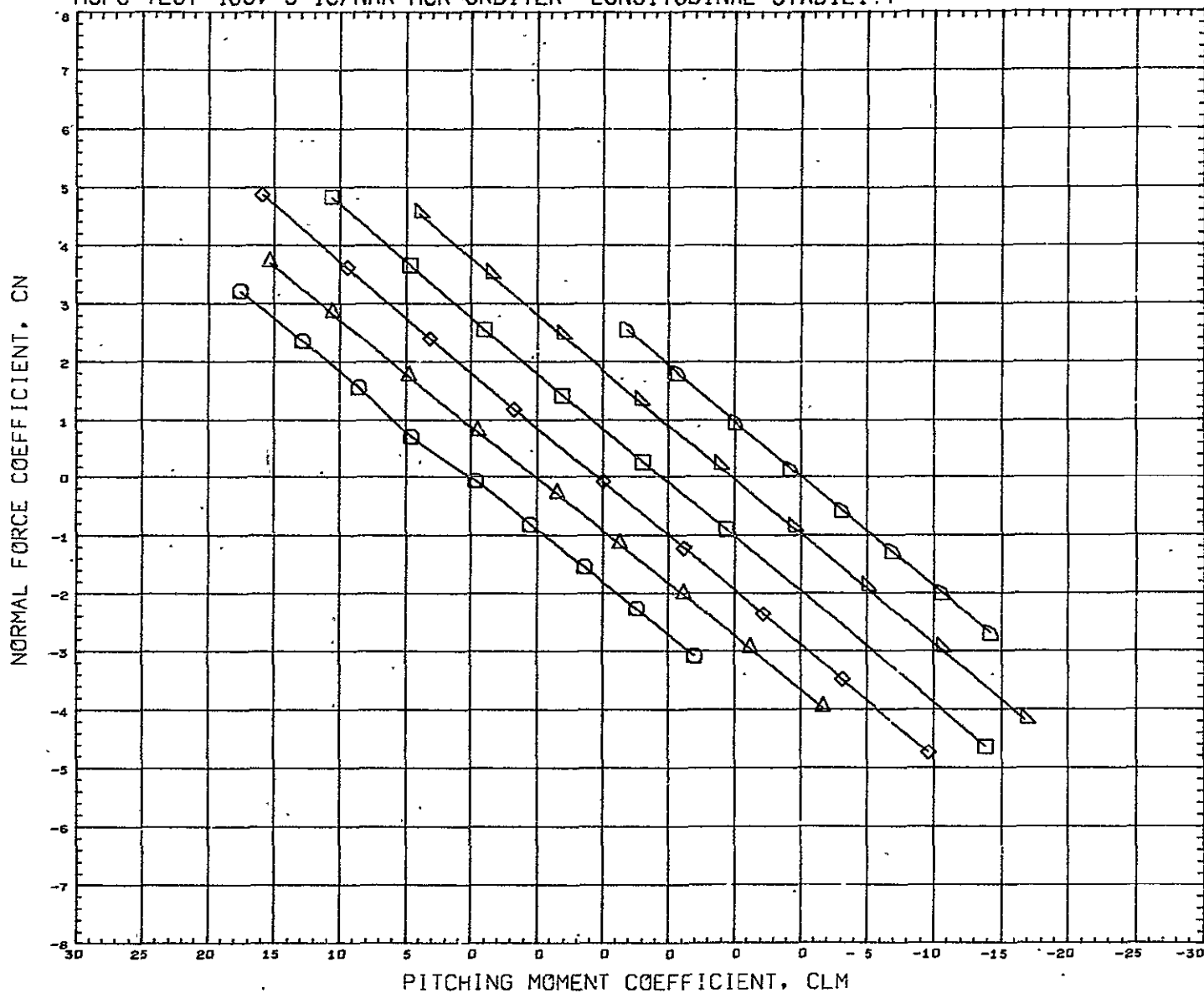
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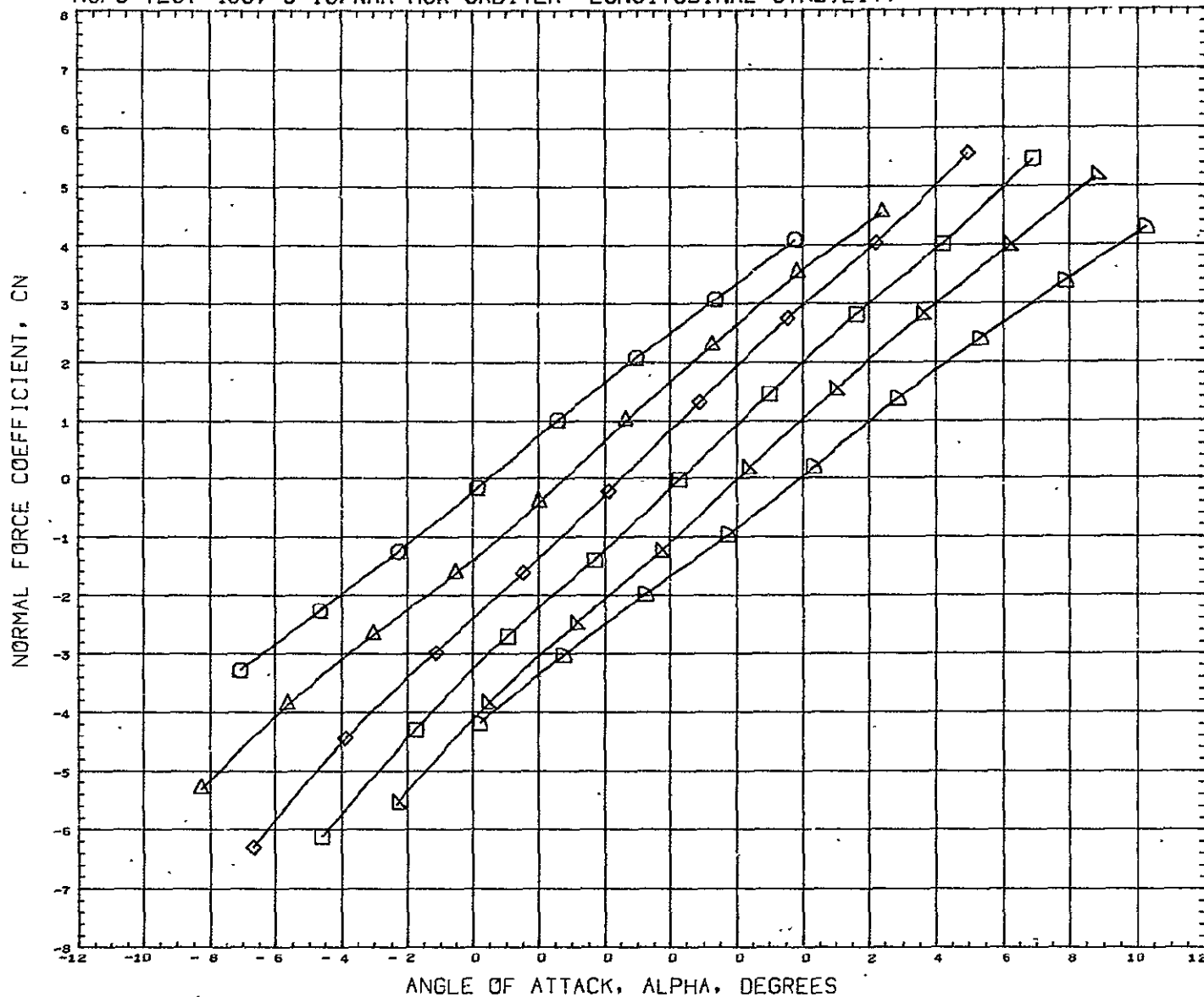
MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.607		0.030
□	0.902		
△	1.004		
◇	1.102		
☆	1.197		
⊗	1.949		
		DATA HIST. CODE	*E

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.607		0.990
△	0.904		
◇	1.006		
□	1.108		
▽	1.204		
◇	1.955		
		DATA HIST. CODE	*E

REFERENCE INFORMATION		
REFS	1.3960	SQ.IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

M485-MSFC-S1C NAR HCR ORBITER

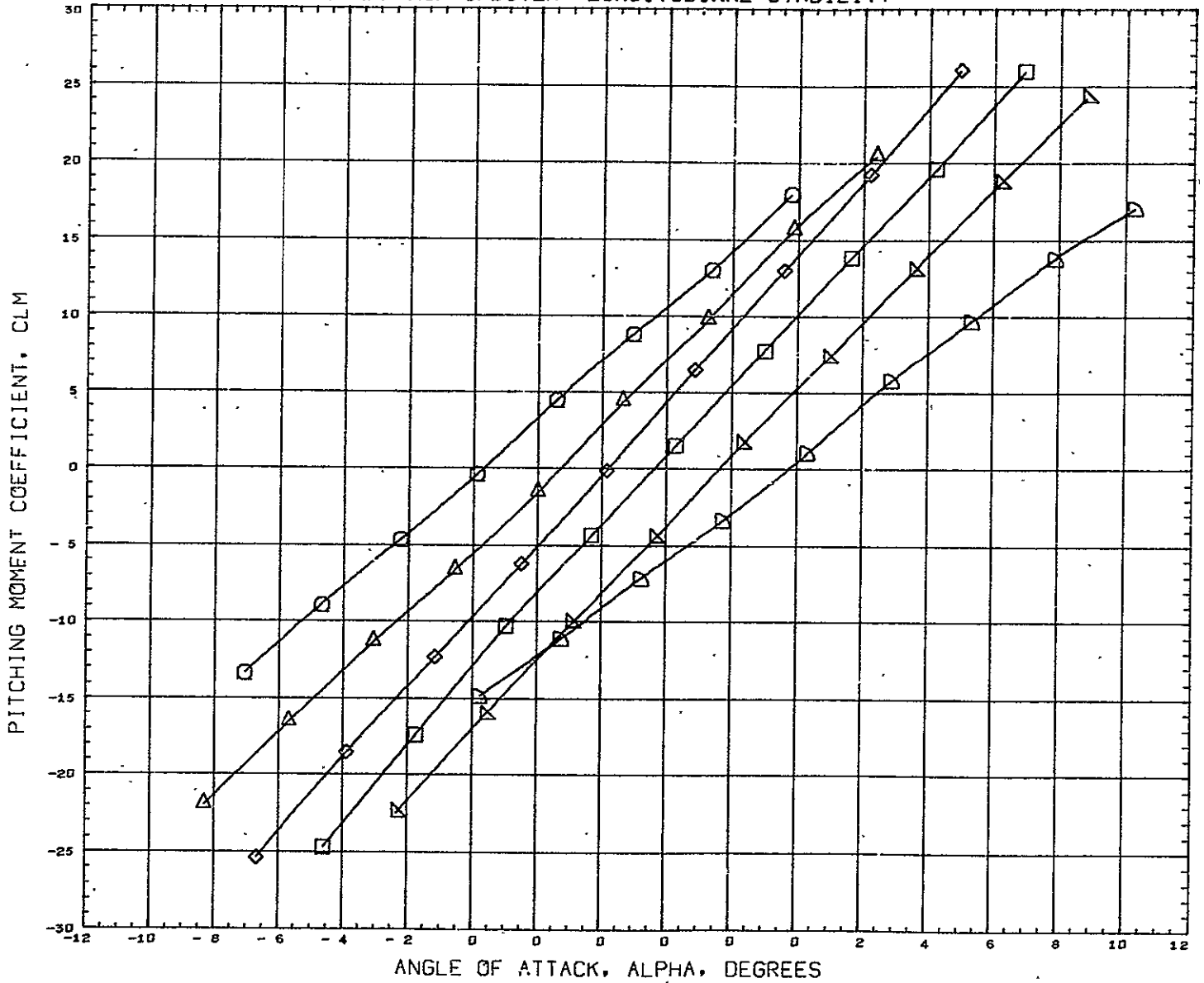
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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.607	0.000	
△	0.904		
◇	1.006		
□	1.108		
▽	1.204		
◊	1.955		

DATA HIST. CODE #E

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRF	0.0070	IN
YMRF	0.0000	IN
ZMRF	0.0000	IN
SCALE	0.0034	

4485-MSFC-S1C NAR HCR ORBITER

0BF

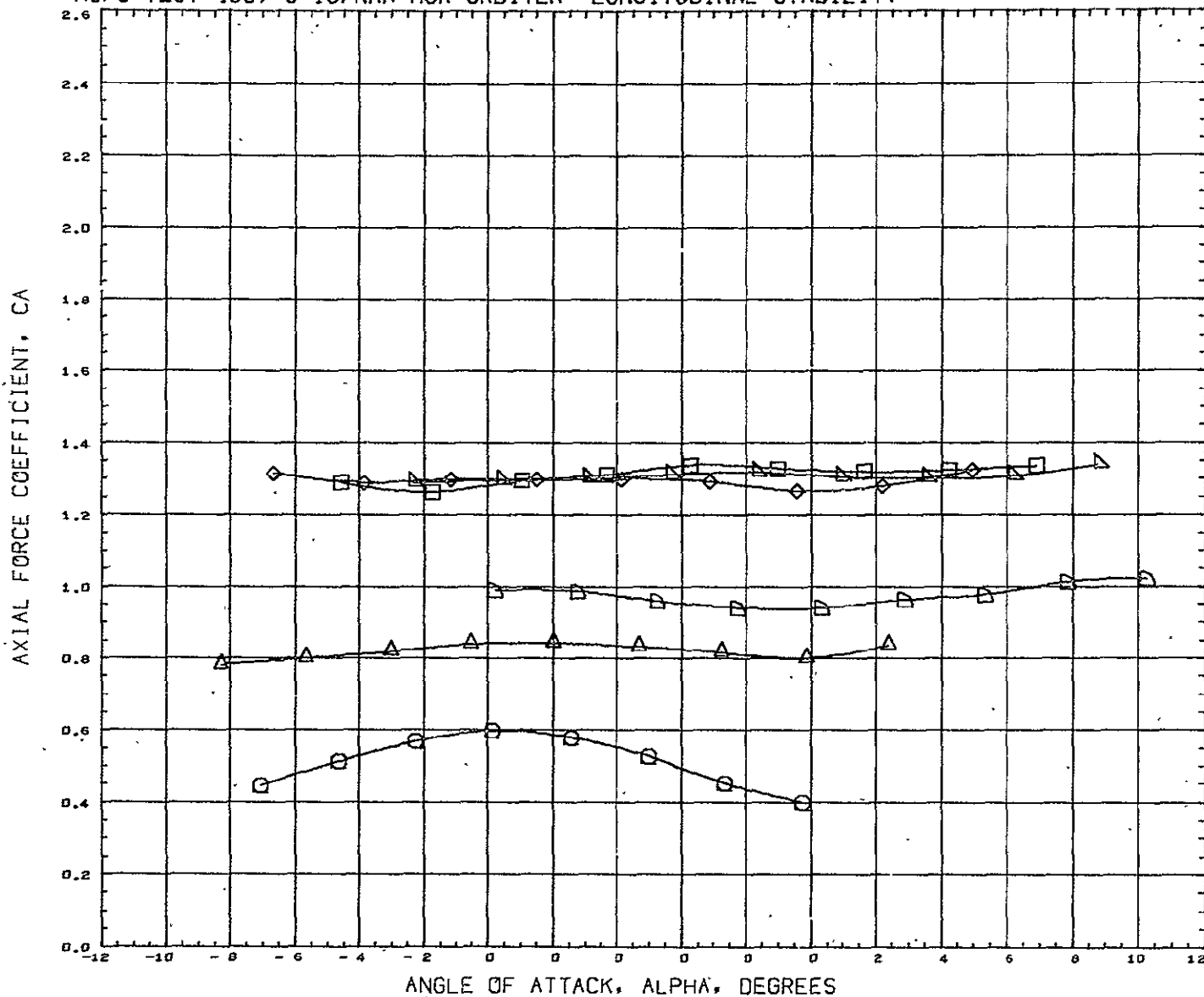
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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	HACH	BETA	PARAMETRIC VALUES
○	0.607	0.000	
△	0.904		
◇	1.006		
□	1.108		
◻	1.204		
◻	1.955	DATA HIST. CODE	#E

REFERENCE INFORMATION		
REFS	1.3960	Sq. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
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SCALE	0.0034	

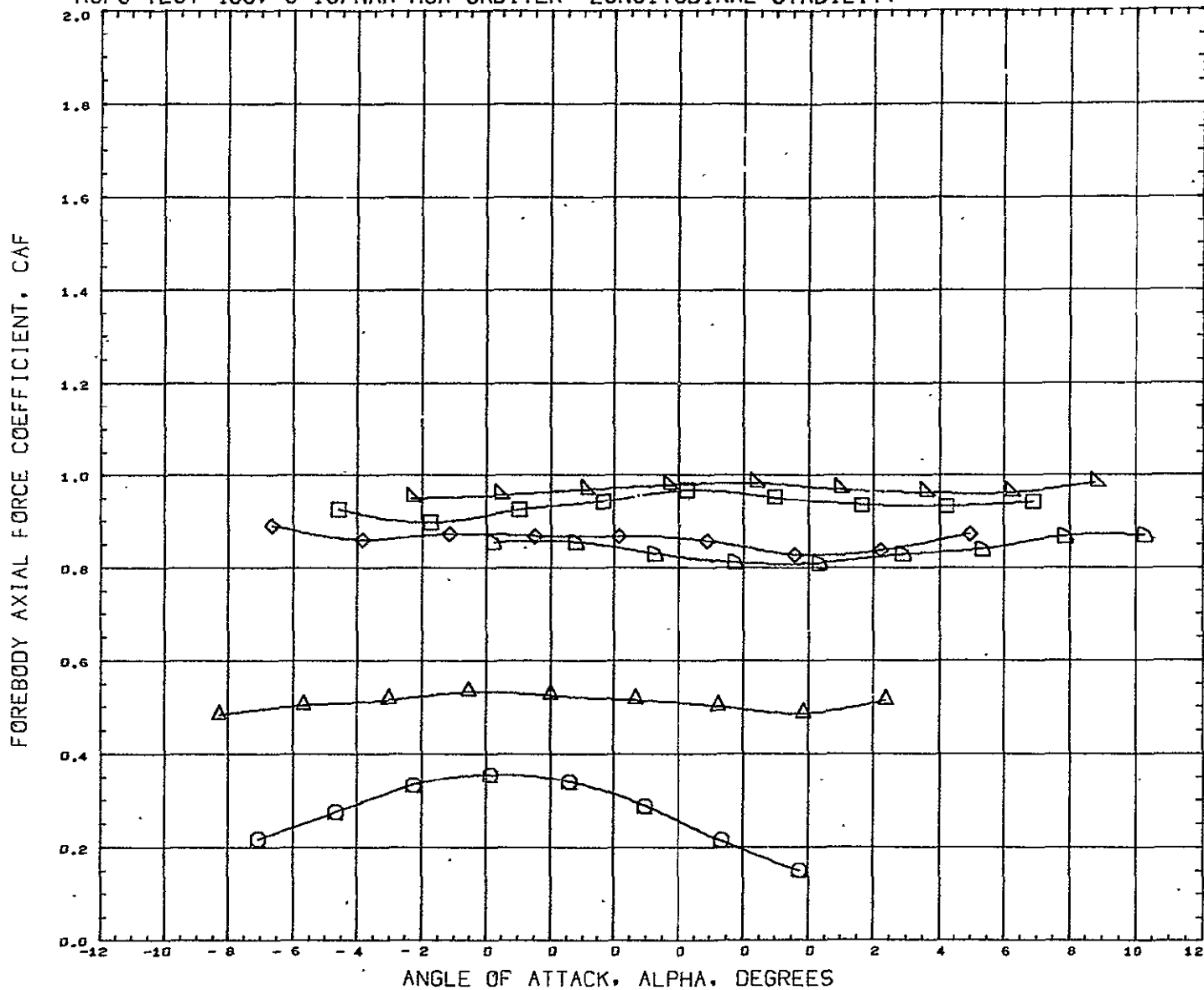
M485-MSFC-S1C NAR HCR ORBITER

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

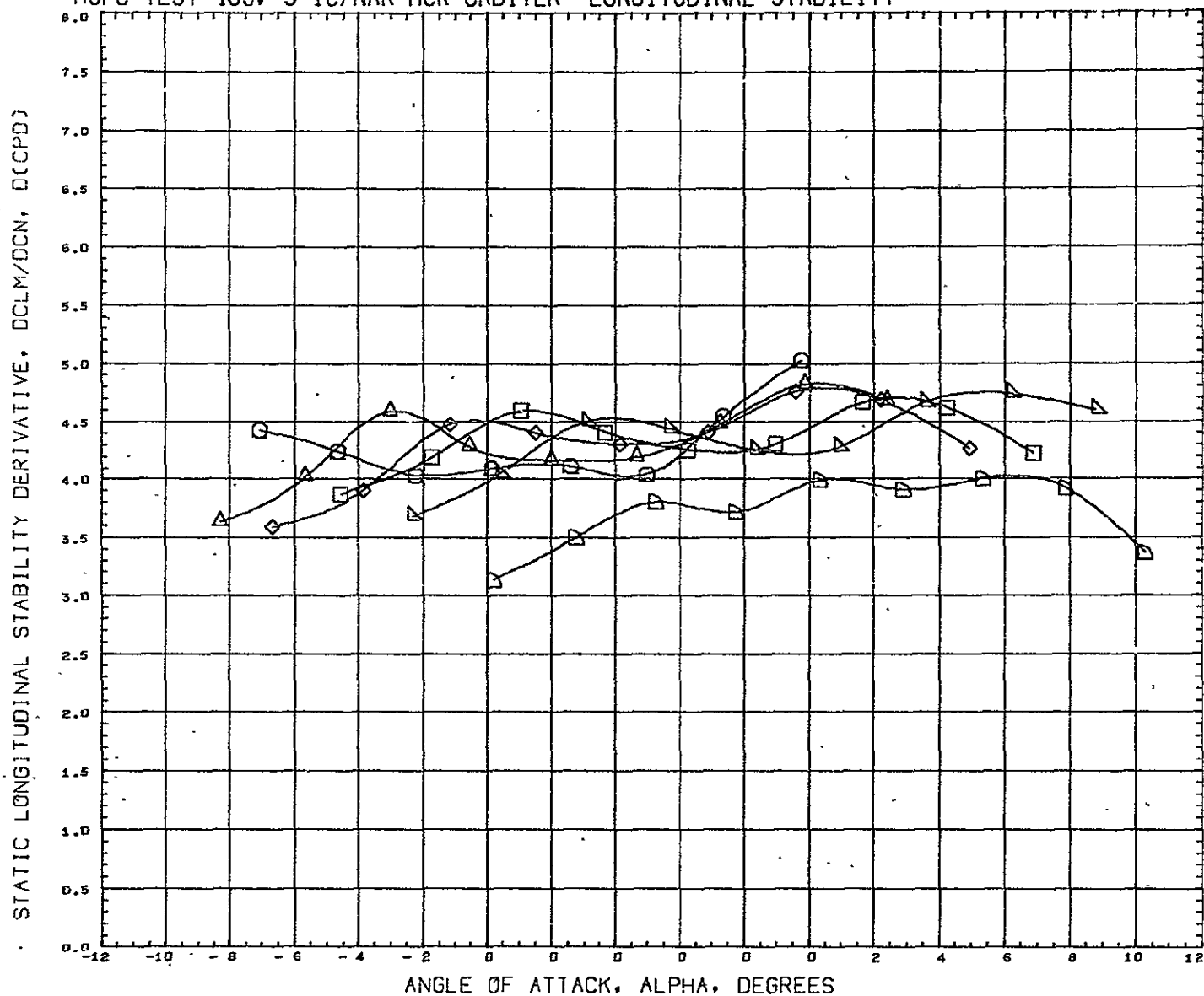


SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.607	0.000	
△	0.904		
◇	1.006		
□	1.108		
▽	1.204		
×	1.955		

DATA HIST. CODE *E

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRF	0.0370	IN
YMRF	0.0300	IN
ZMRF	0.0300	IN
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.607		0.000
□	0.904		
△	1.006		
◇	1.108		
×	1.204		
	1.955	DATA HIST. CODE	#E

REFERENCE INFORMATION		
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REFL	1.3330	IN
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XMRP	0.0372	IN
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ZMRP	0.0000	IN
SCALE	0.0034	

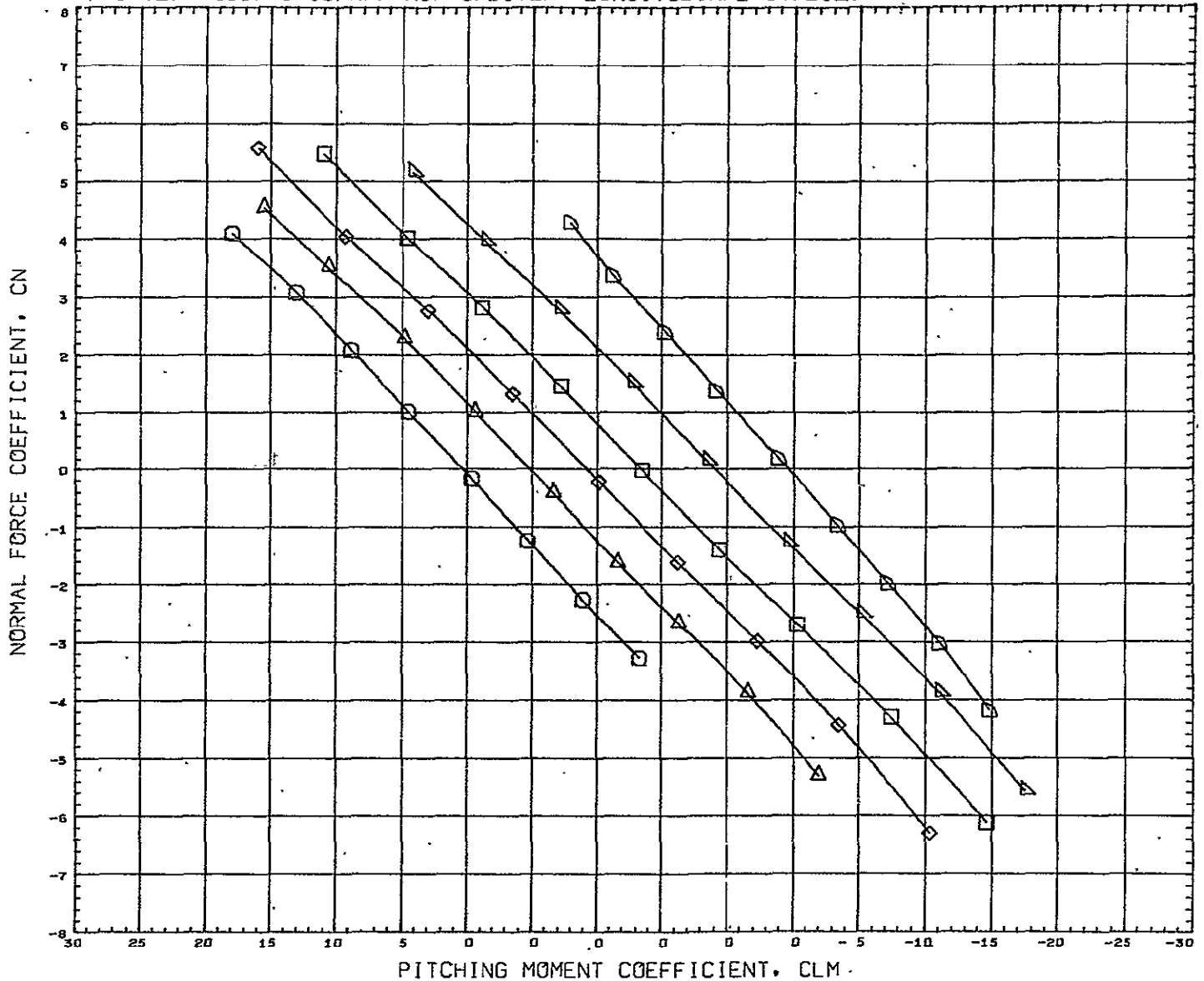
M485-MSFC-S1C NAR HCR ORBITER

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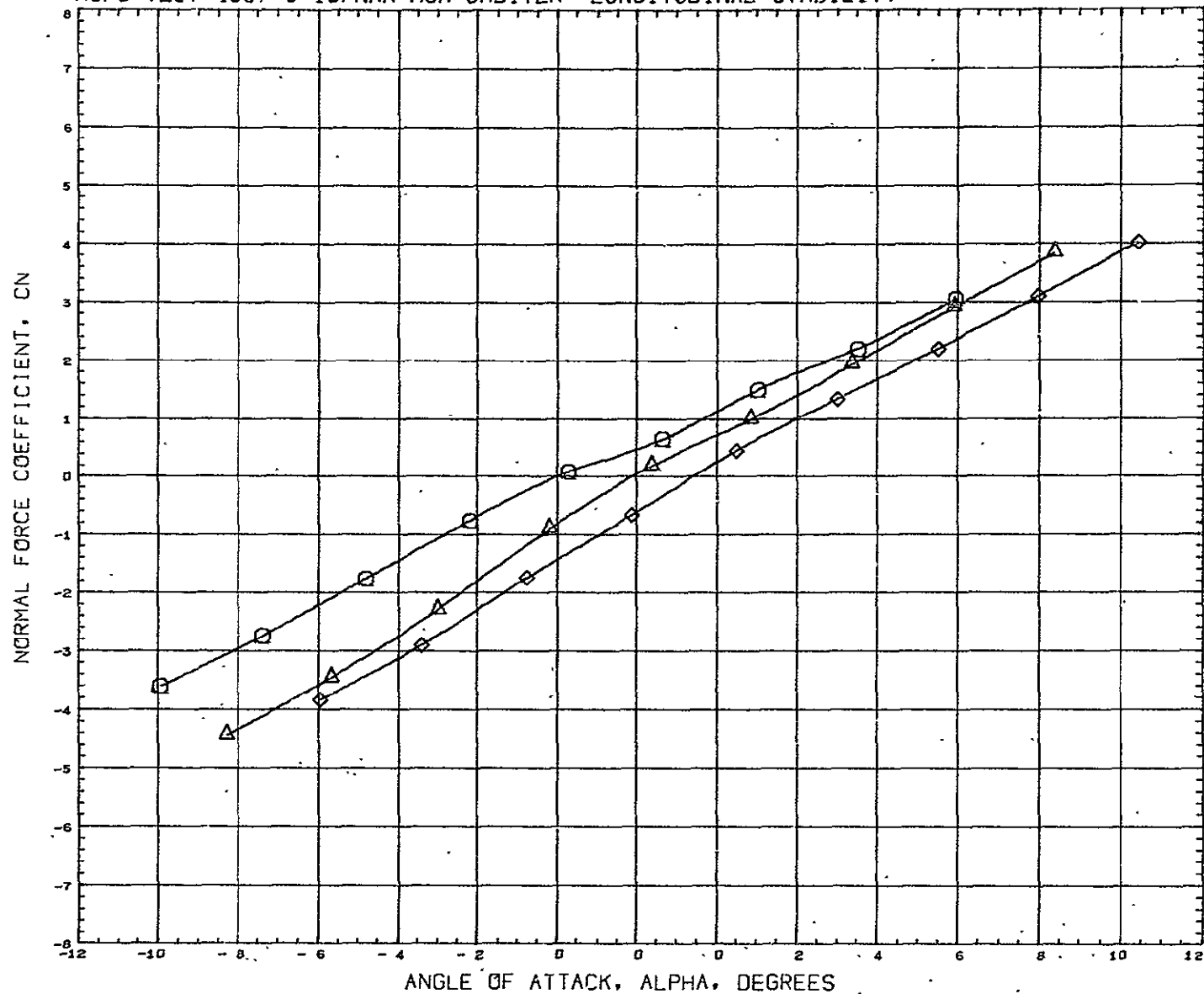
MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
◇	0.607		0.000
△	0.904		
□	1.006		
○	1.108		
▽	1.204		
+	1.955		
		DATA HIST. CODE	#E

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.903		0.040
△	1.005		
◇	1.198		

REFERENCE INFORMATION		
REFS	1.3960	50 IN.
REFL	1.3330	IN
REFB	1.3330	IN
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YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *E

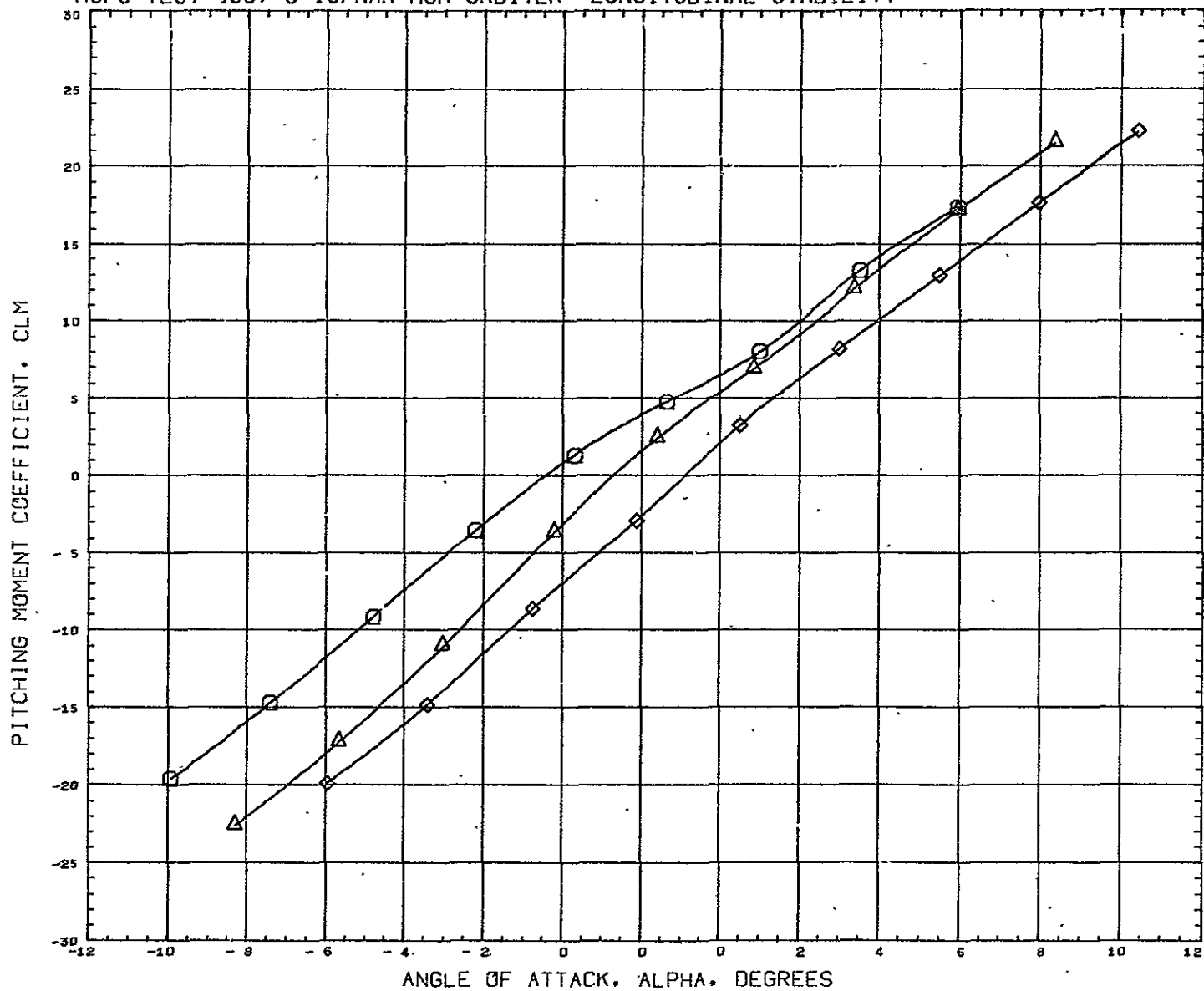
M485-MSFC-S1C NAR HCR ORBITER

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL MACH BETA PARAMETRIC VALUES

○ 0.903 0.040

△ 1.005

◇ 1.198

REFERENCE INFORMATION

REFS 1.3960 SQ. IN.

REFL 1.3330 IN

REFB 1.3330 IN

XMRP 0.0370 IN

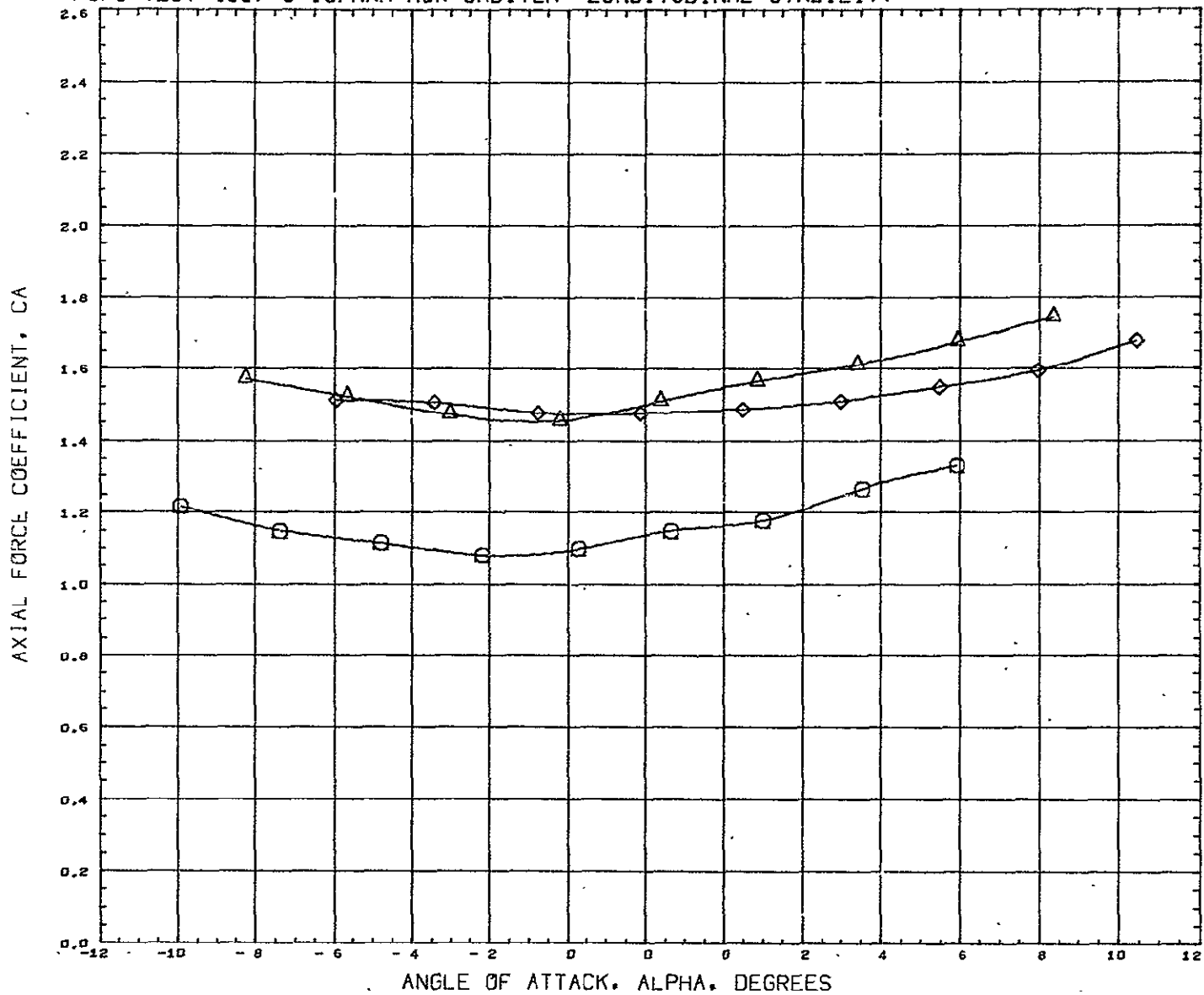
YMRP 0.0000 IN

ZMRP 0.0000 IN

SCALE 0.0034

DATA HIST. CODE *E

MSFC TEST 485; S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL MACH
 ○ 0.903
 △ 1.005
 ◇ 1.198

BETA 0.040
 PARAMETRIC VALUES

REFERENCE INFORMATION

REFS	1.3960	SG, IN.
REFL	1.3330	IN
REFB	1.3230	IN
XMRP	0.0375	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *E

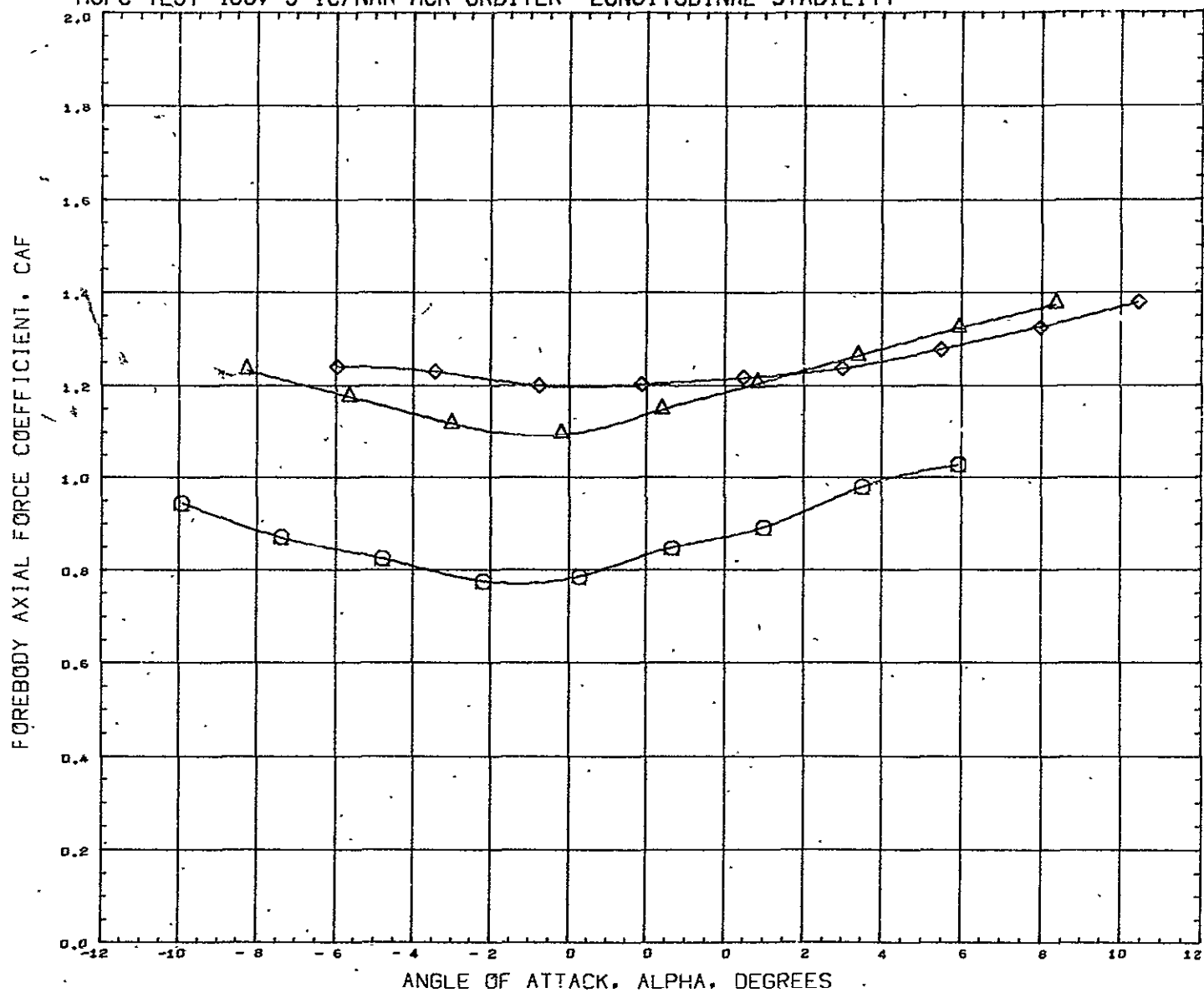
M485-MSFC-S1C NAR HCR ORBITER

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL MACH
 ○ 0.903
 △ 1.095
 ◇ 1.198

BETA 0.040

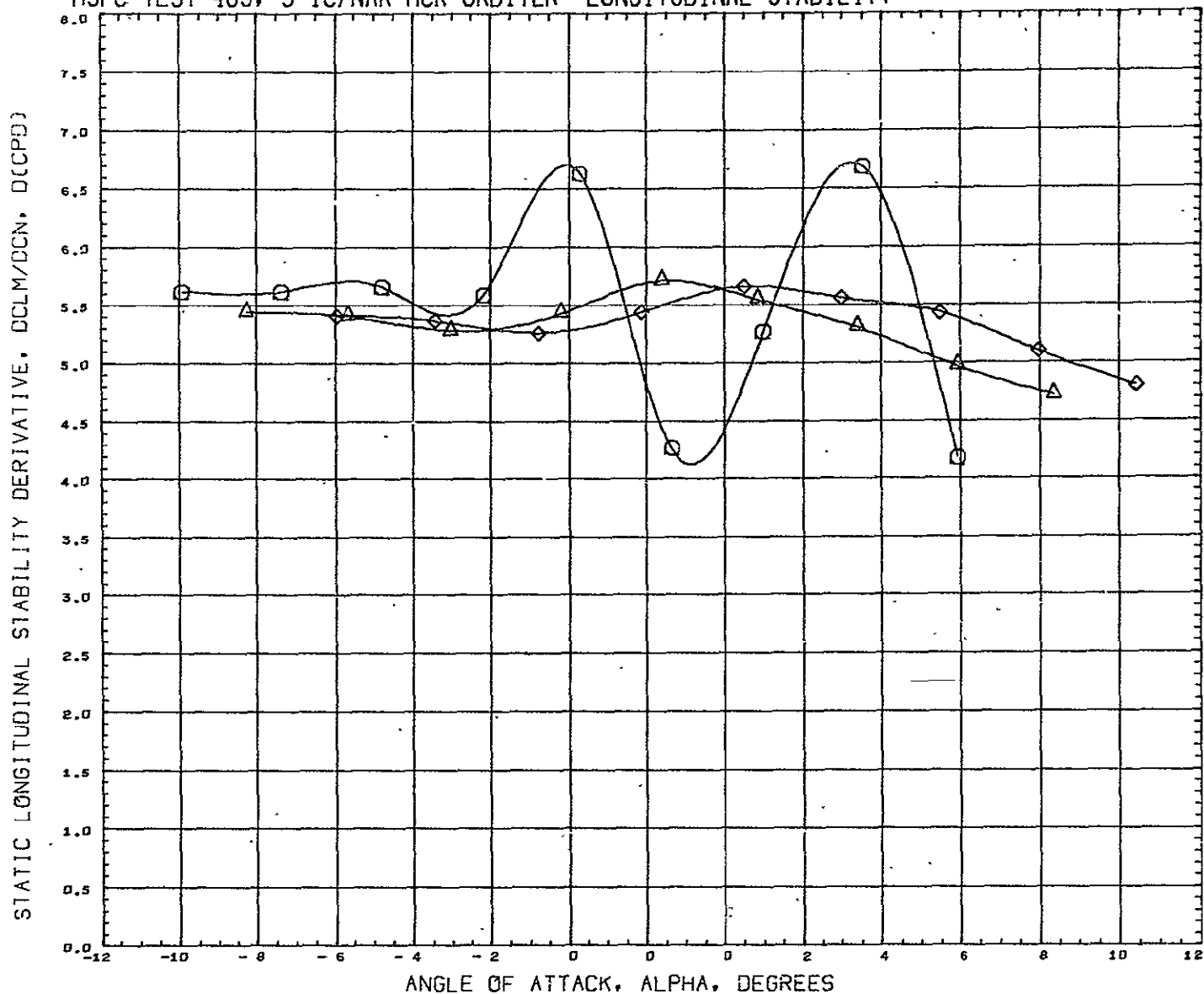
PARAMETRIC VALUES

REFERENCE INFORMATION

REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFD	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE #E

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL MACH BETA PARAMETRIC VALUES

○ 0.903 0.040

△ 1.005

◇ 1.198

REFERENCE INFORMATION

REFS 1.3960 SQ. IN.

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REFB 1.3330 IN

XMRP 0.0376 IN

YMRP 0.0000 IN

ZMRP 0.0000 IN

SCALE 0.0034

DATA HIST. CODE #E

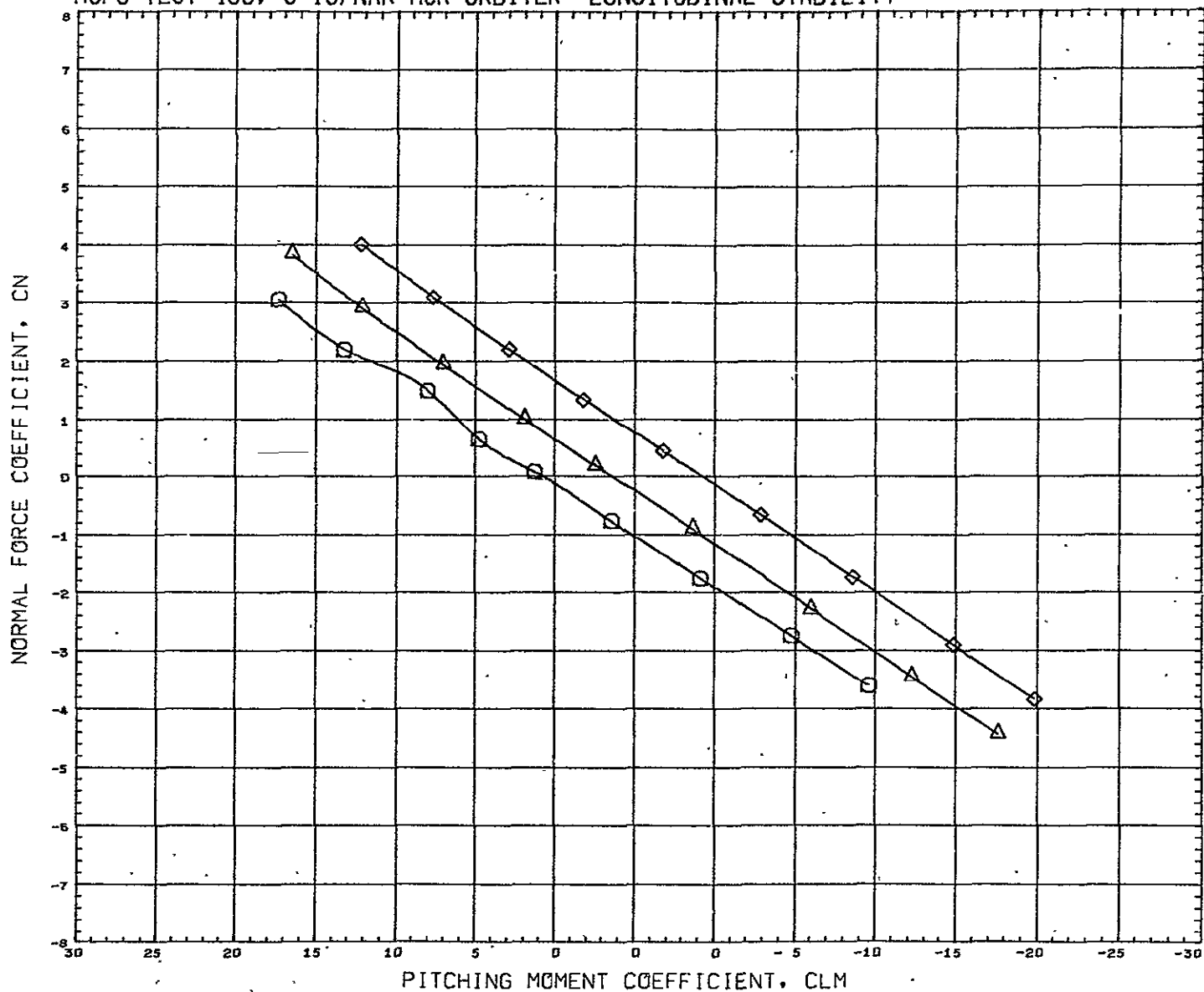
M485-MSFC-S1C NAR HCR ORBITER

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

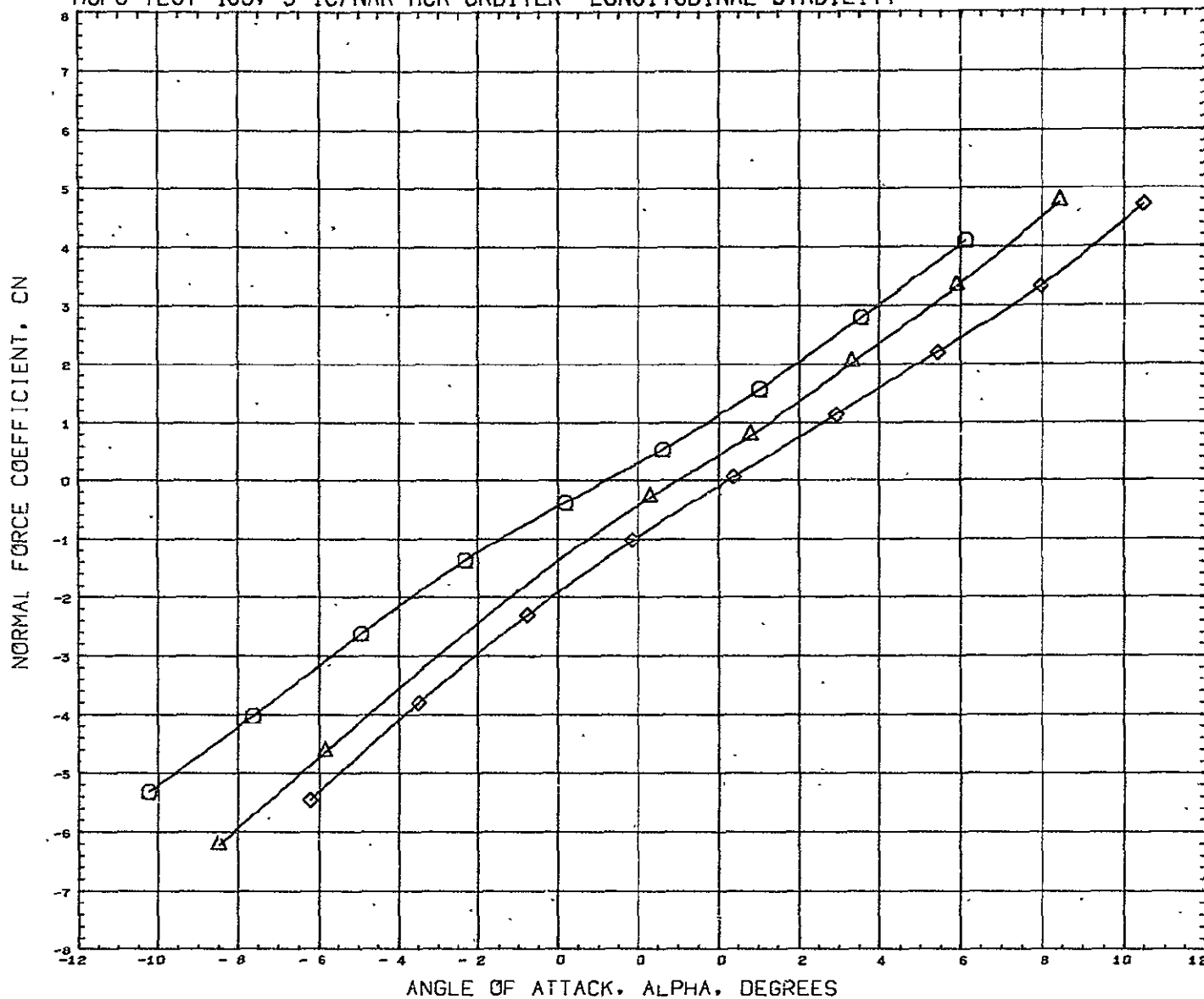


SYMBOL MACH BETA PARAMETRIC VALUES
 ○ 0.903
 △ 1.005
 ◇ 1.198

DATA HIST. CODE #E

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP - 0.0373 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL MACH BETA PARAMETRIC VALUES
 ○ 0.906 0.060
 △ 1.004
 ◇ 1.207

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XNRF 0.0370 IN
 YNRF 0.0000 IN
 ZNRF 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *E

M485-MSFC-S1C NAR HCR ORBITER

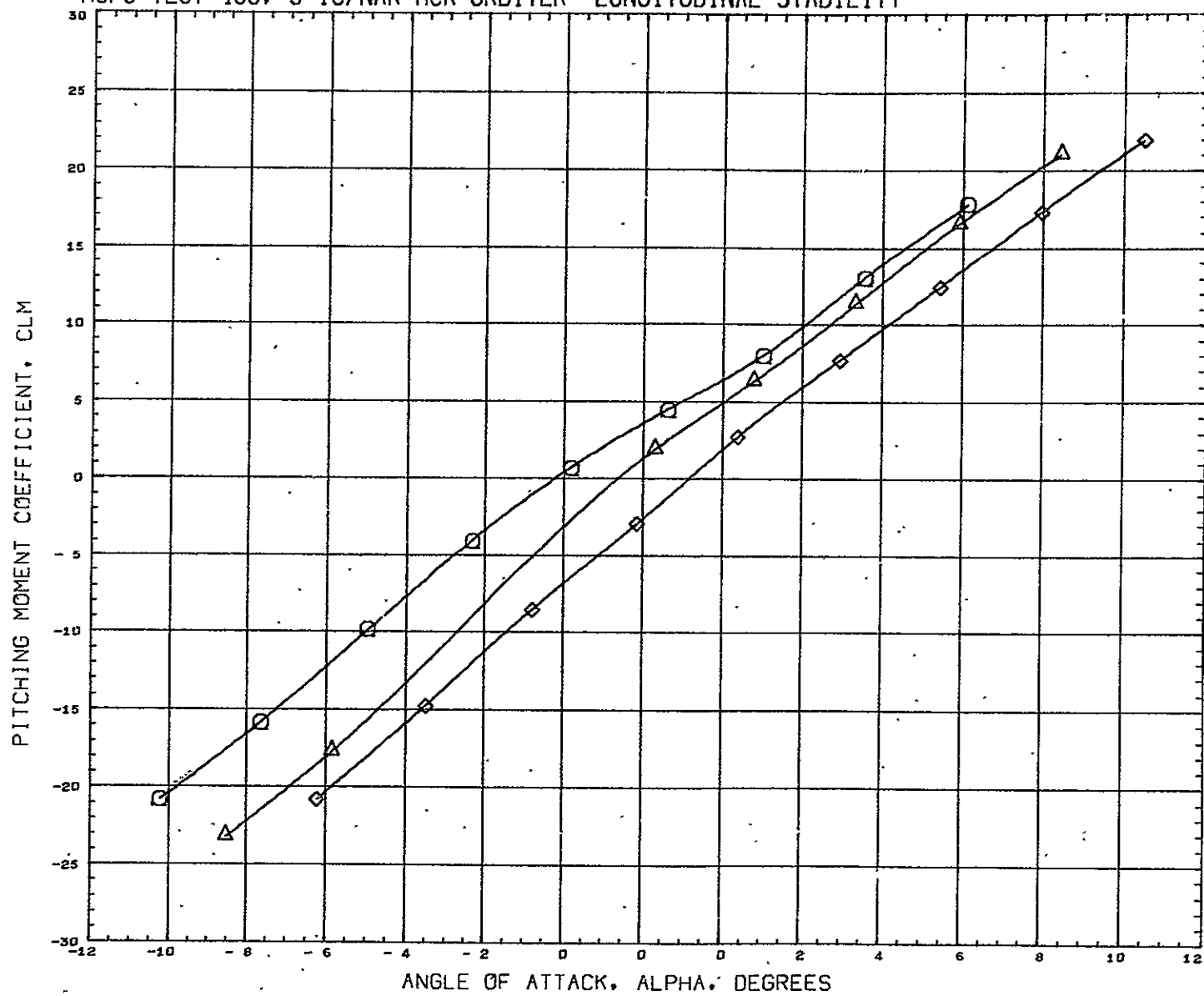
OBFS1

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	HACH	BETA	PARAMETRIC VALUES
○	0.906		0.060
△	1.004		
◇	1.207		

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3150	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *E

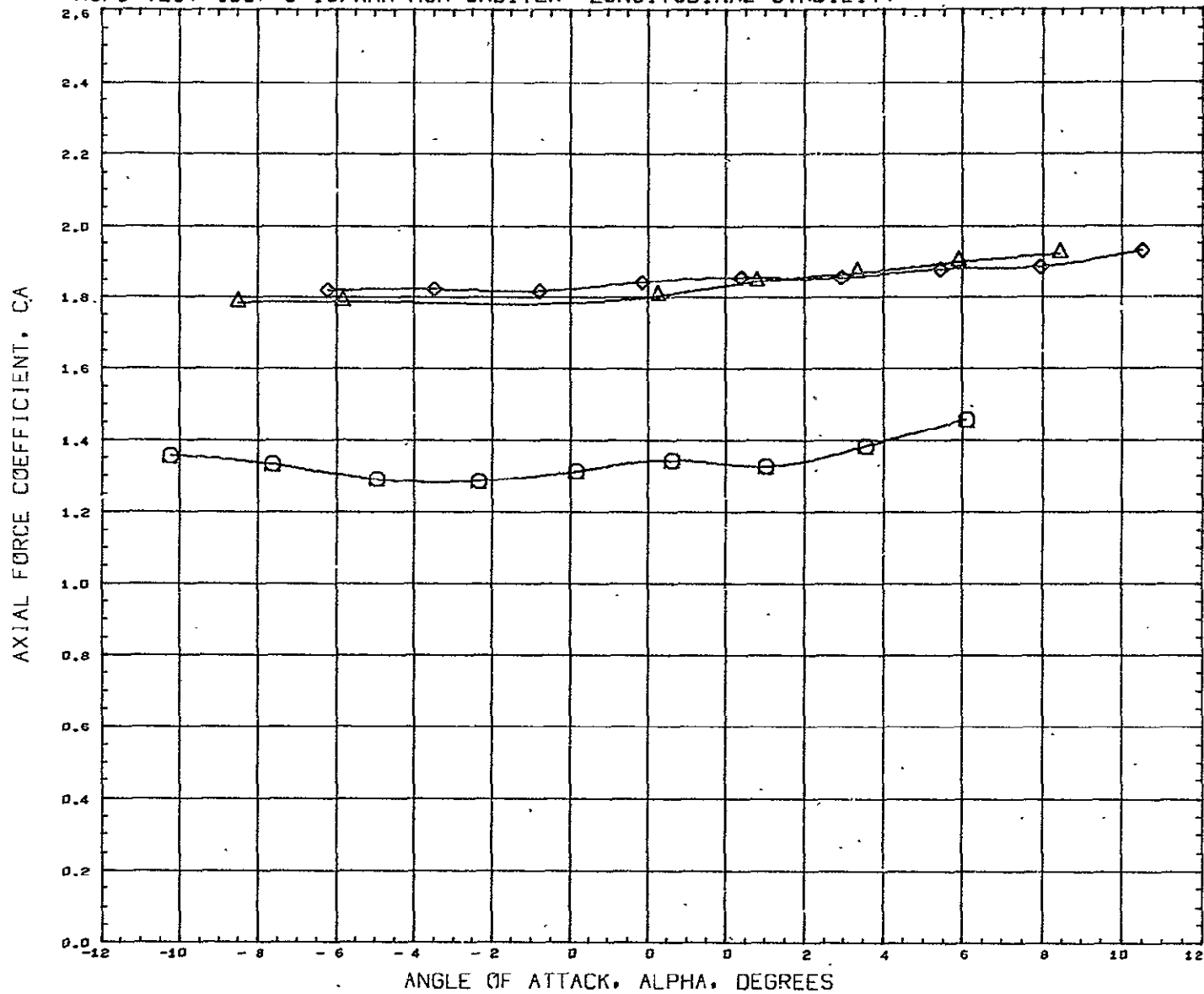
M485-MSFC-S1C NAR HCR ORBITER

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL MACH BETA PARAMETRIC VALUES
 ○ 0.986 0.060
 △ 1.094
 ◇ 1.207

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRF - 0.0370 IN
 YMRF 0.0000 IN
 ZMRF 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE #E

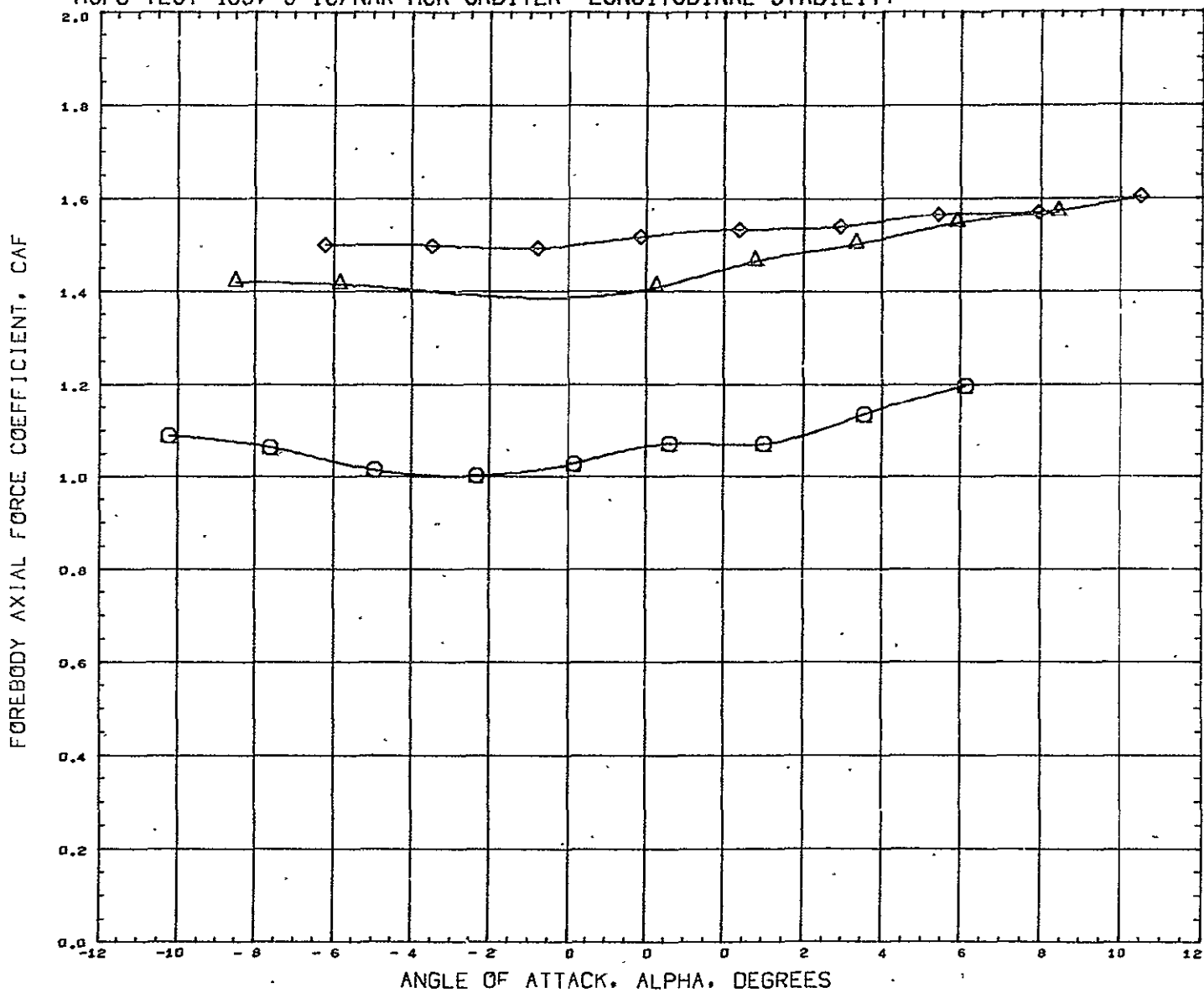
M485-MSFC-S1C NAR HCR ORBITER

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.906		0.060
△	1.004		
◇	1.207		

REFERENCE INFORMATION		
REFS	1.3960	50.IN.
REFL	1.3330	IN
REFD	1.3330	IN
XMRP	0.070	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	IN

DATA HIST. CODE #E

M485-MSFC-S1C NAR HCR ORBITER

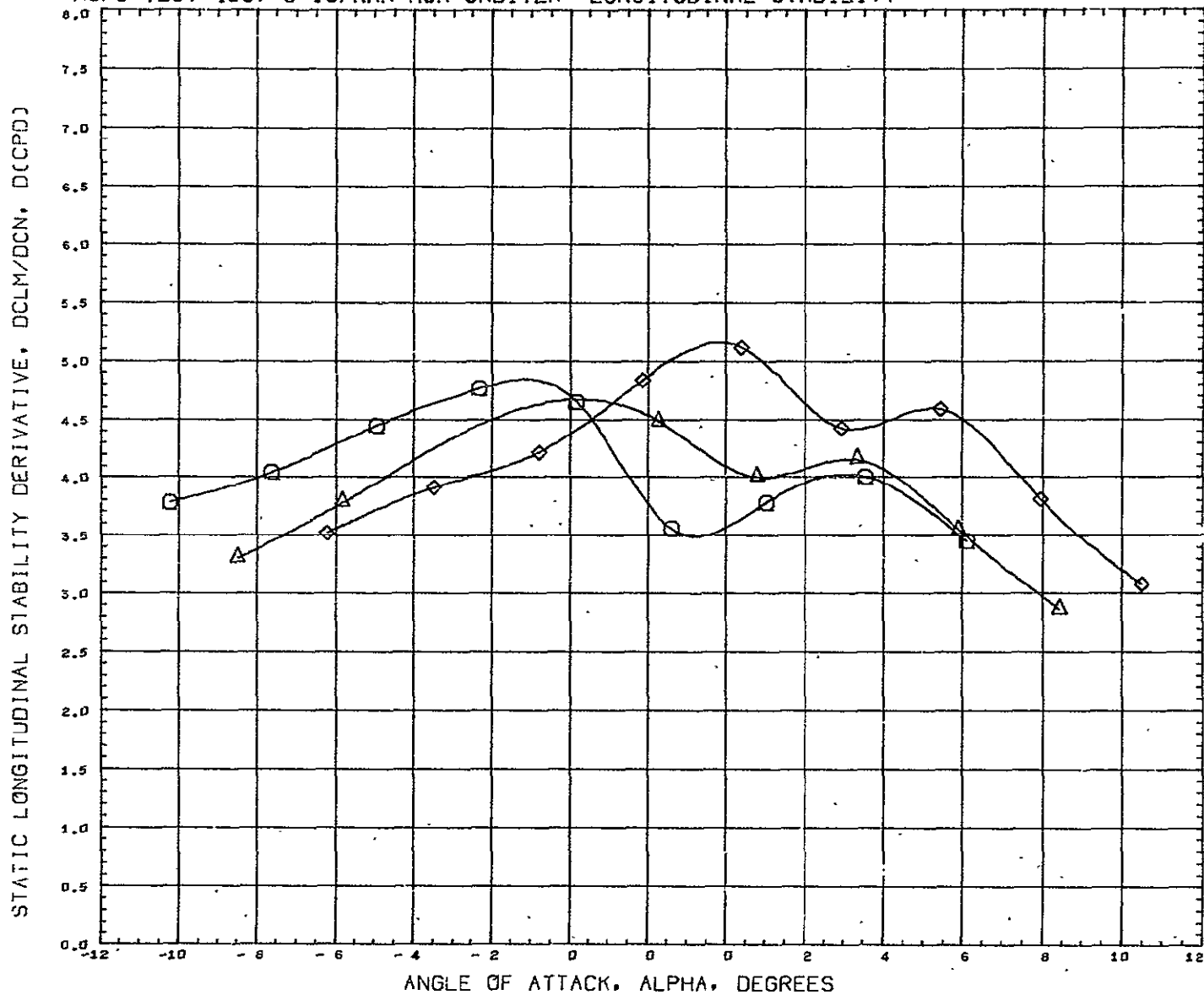
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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL MACH PARAMETRIC VALUES
 ○ 0.906 BETA 0.060
 △ 1.004
 ◇ 1.207

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFD 1.3330 IN
 XMRP - 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *E

M485-MSFC-S1C NAR HCR ORBITER

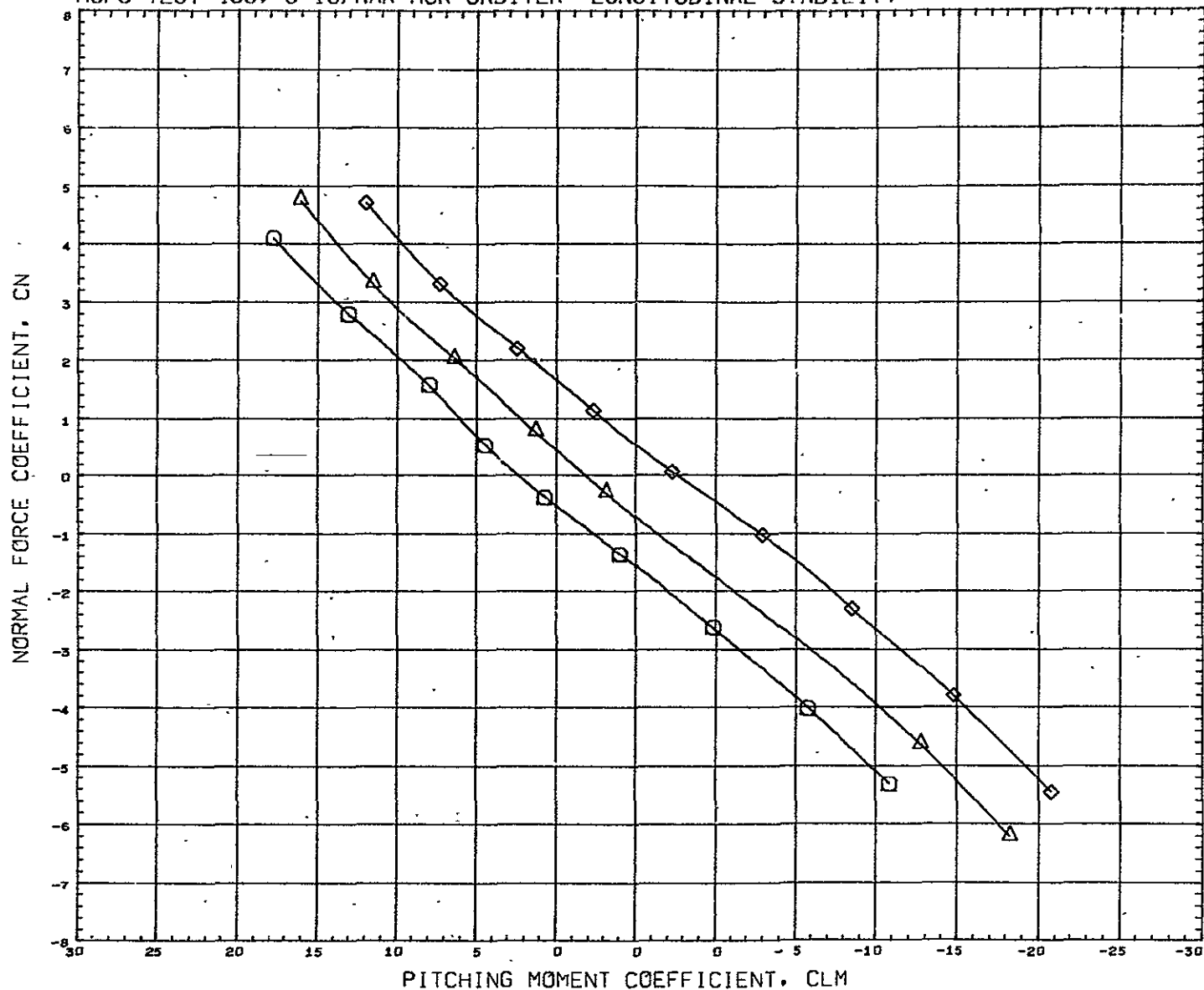
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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.906		0.060
△	1.004		
◇	1.207		

DATA HIST. CODE *E

REFERENCE INFORMATION		
REFS	1.3960	sq.in.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0310	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

M485-MSFC-S1C NAR HCR ORBITER

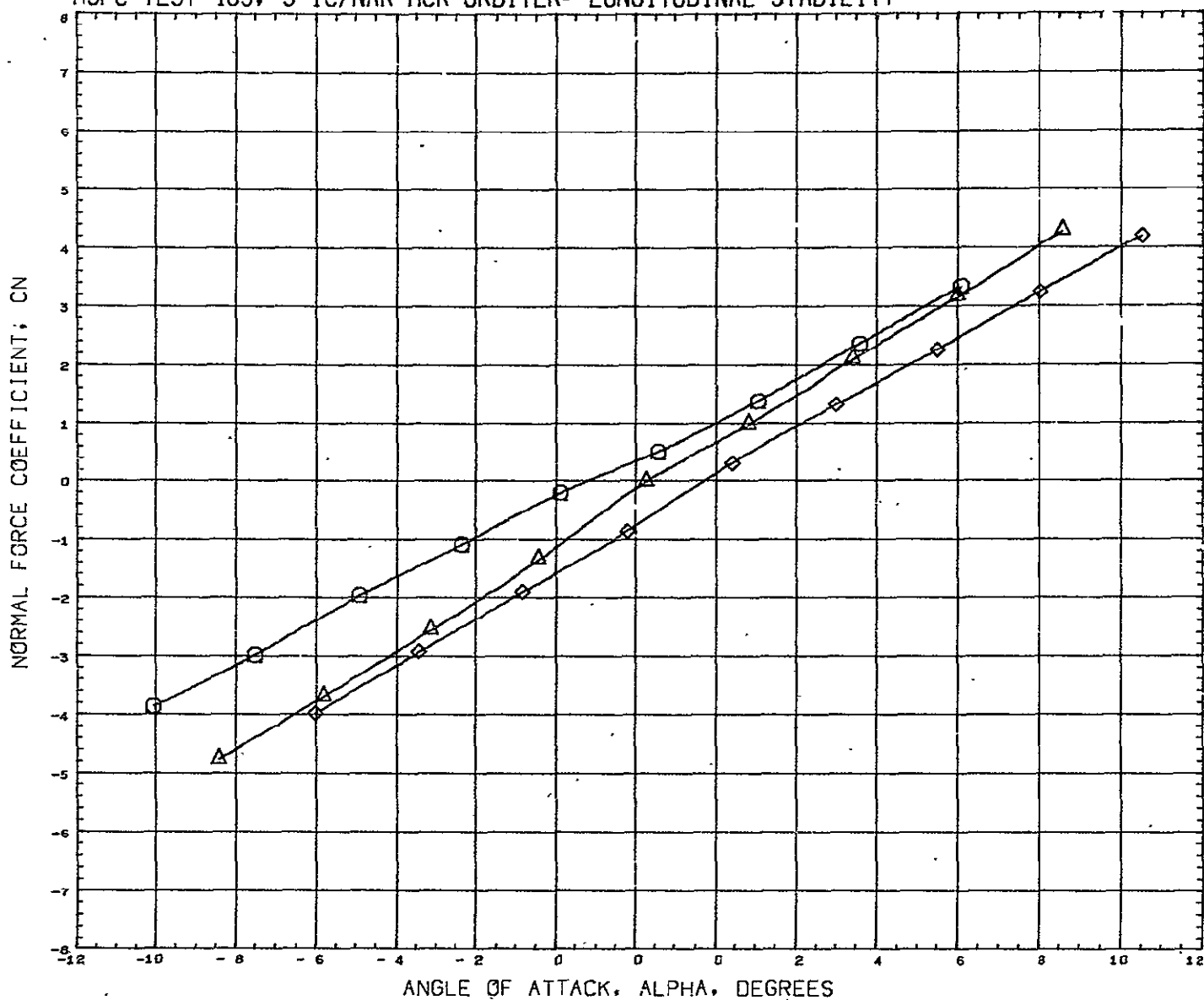
OBFS1

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.901		0.040
△	1.002		
◇	1.201		

REFERENCE INFORMATION		
REFS	1.3960	50. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE #E

M485-MSFC-S1C NAR HCR ORBITER

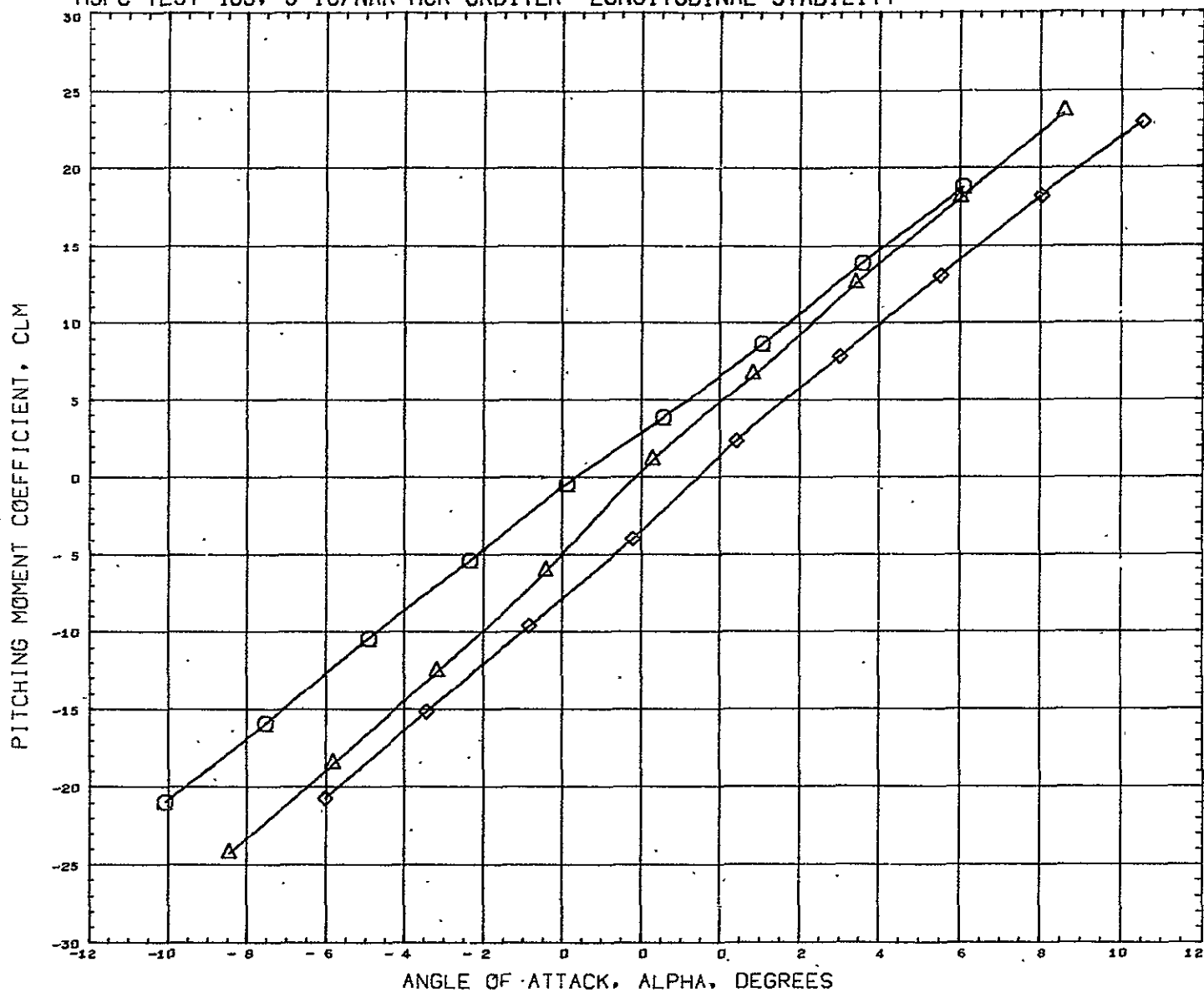
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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.901		0.040
△	1.002		
◇	1.201		

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE #E

M485-MSFC-S1C NAR HCR ORBITER

OBS2

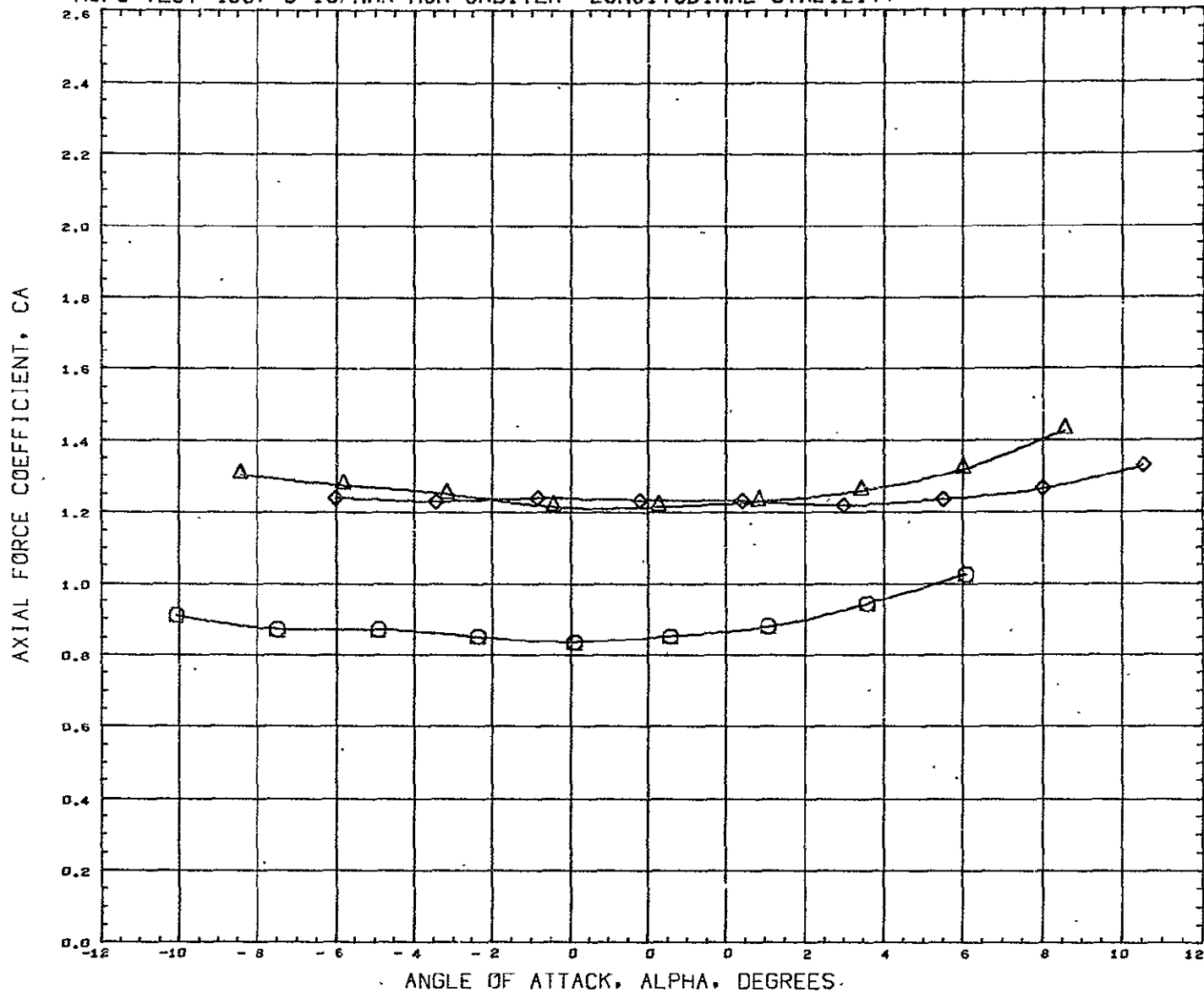
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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	NACH	BETA	PARAMETRIC VALUES
○	0.901		0.049
△	1.002		
◇	1.201		

REFERENCE INFORMATION		
REFS	1.3960	SQ.IN.
REFL	1.3330	IN
REFB	1.3530	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *E

M485-MSFC-S1C NAR HCR ORBITER

0BS2

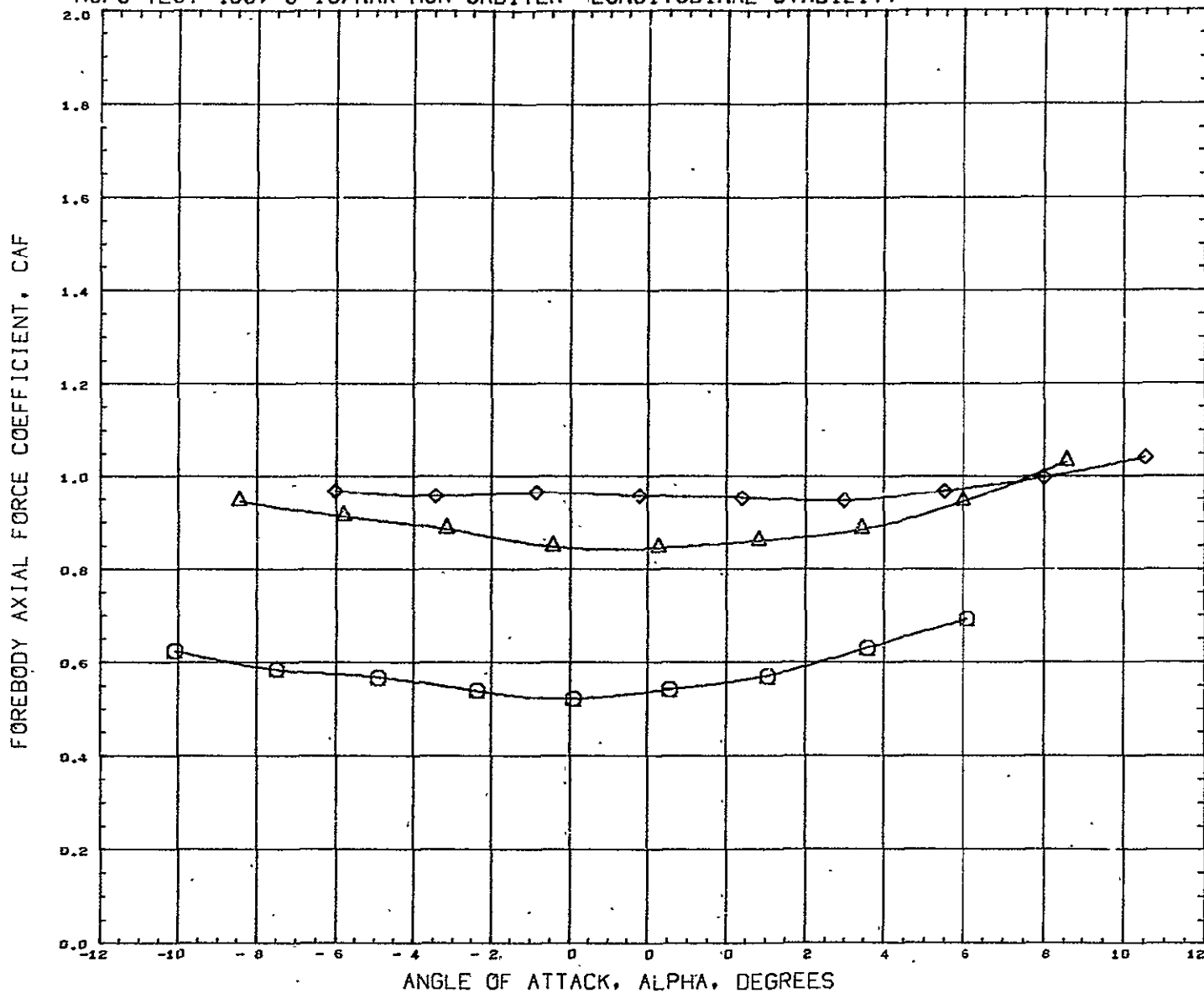
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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.901		0.040
△	1.002		
◇	1.201		

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRF	0.0370	IN
YMRF	0.0000	IN
ZMRF	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE #E.

M485-MSFC-S1C NAR HCR ORBITER

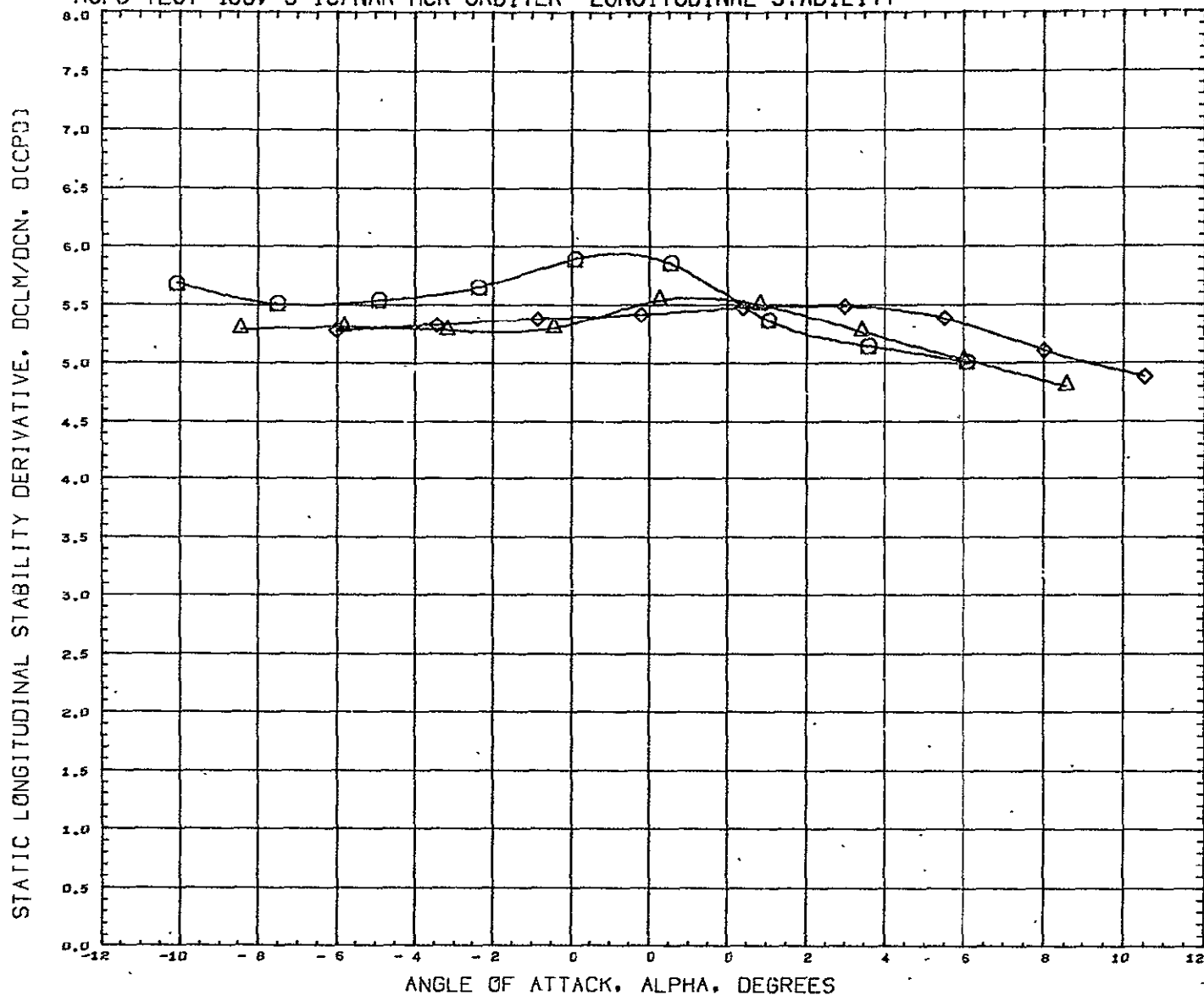
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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL MACH BETA PARAMETRIC VALUES
 O 0.901 BETA 0.040
 Δ 1.002
 ◇ 1.201

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP - 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE #E

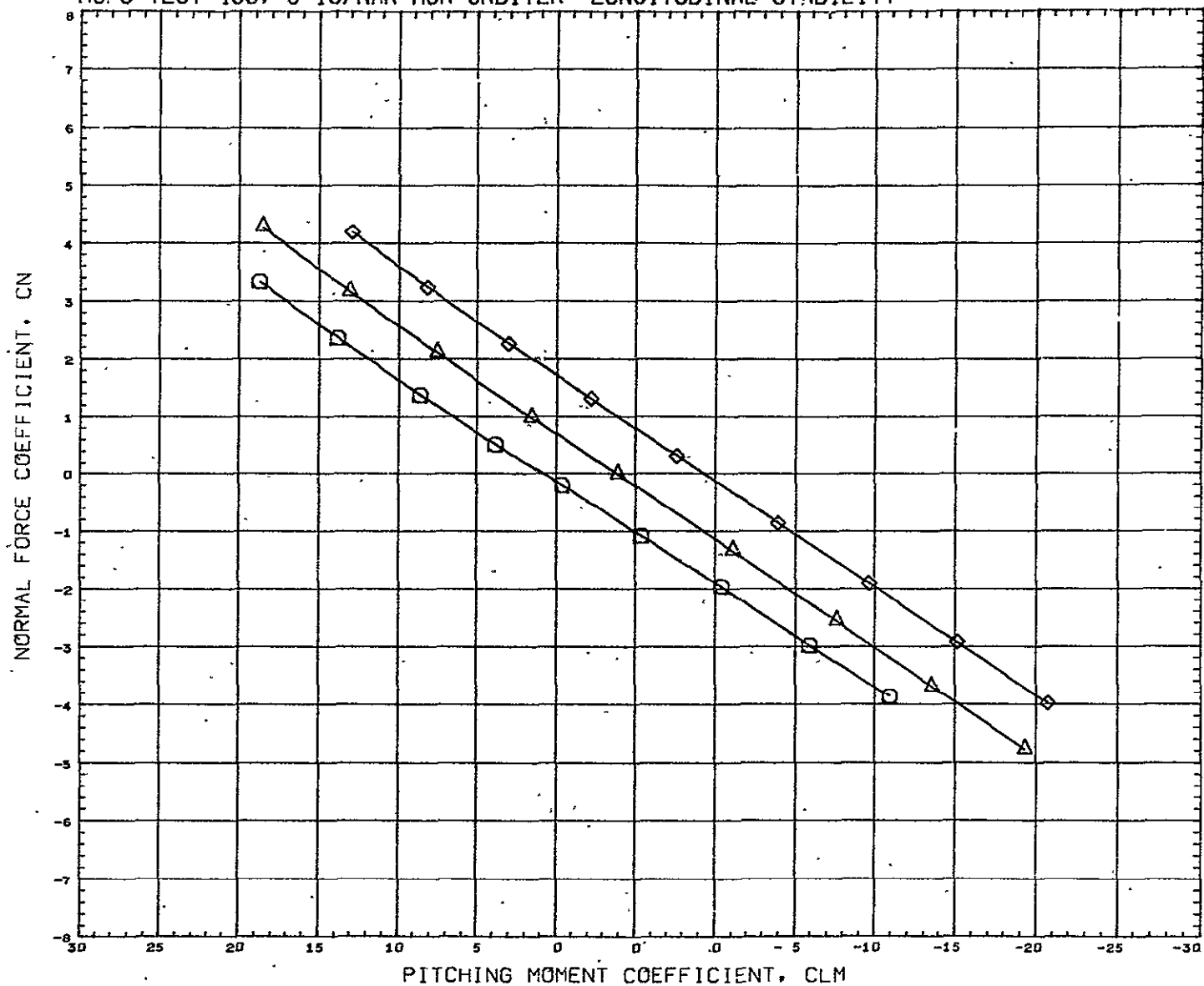
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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

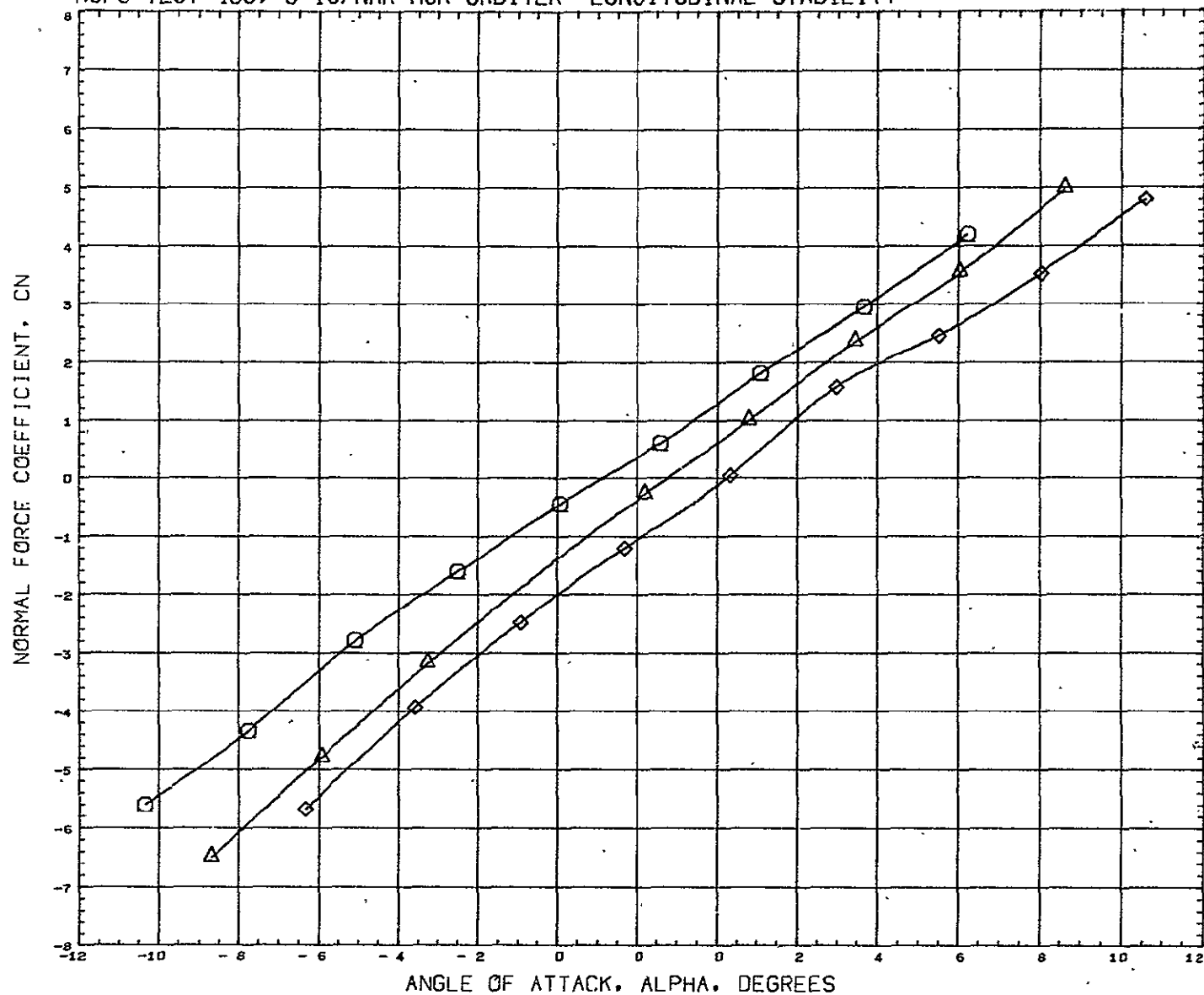


SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.901		-0.040
△	1.002		
◇	1.201		

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
YMRF	0.0370	IN
YMRF	0.0000	IN
ZMRF	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *E

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.998		0.050
△	1.005		
◇	1.203		

DATA HIST. CODE *E

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRF	0.0370	IN
YMRF	0.0000	IN
ZMRF	0.0000	IN
SCALE	0.0034	

M485-MSFC-S1C NAR HCR ORBITER

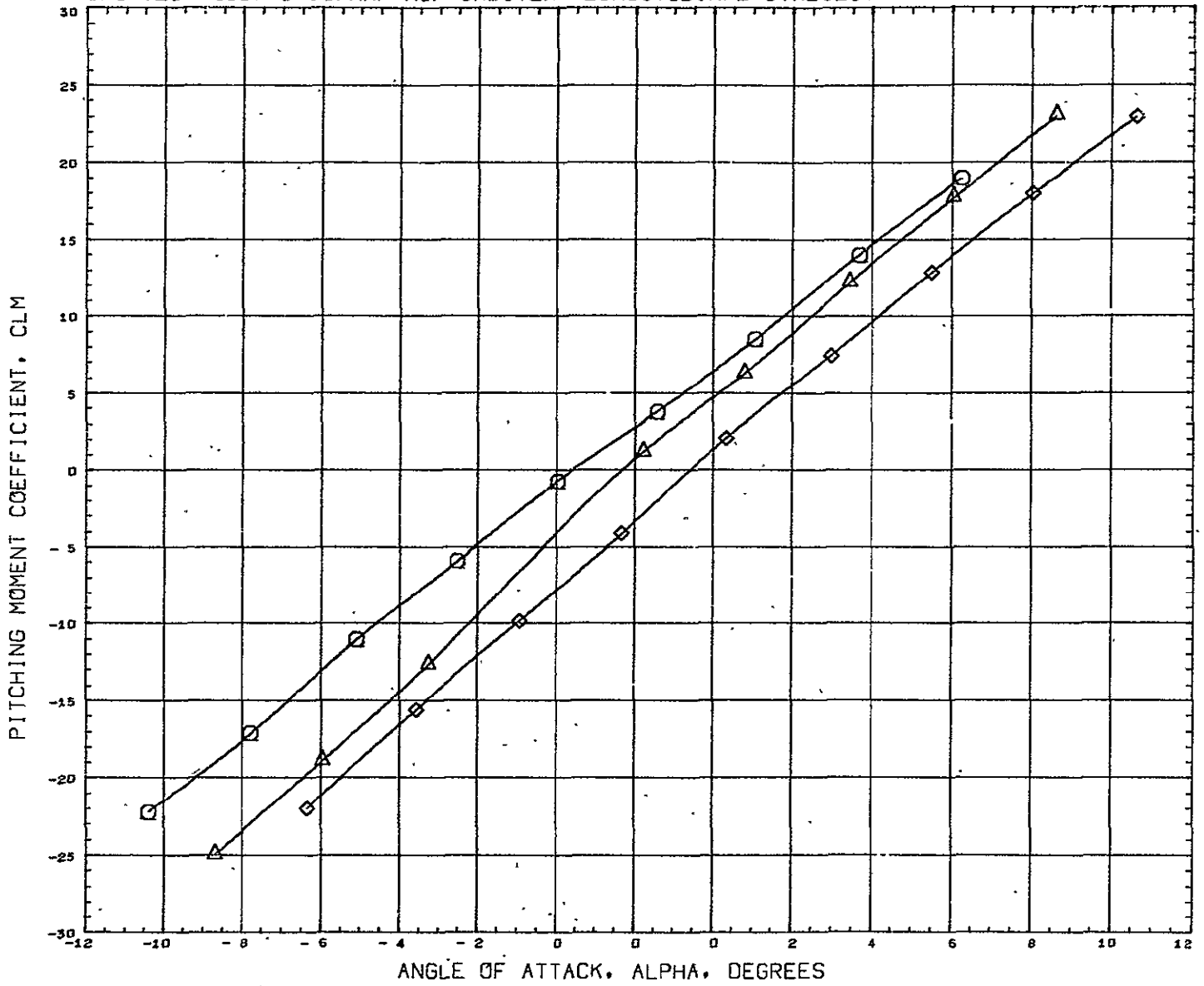
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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

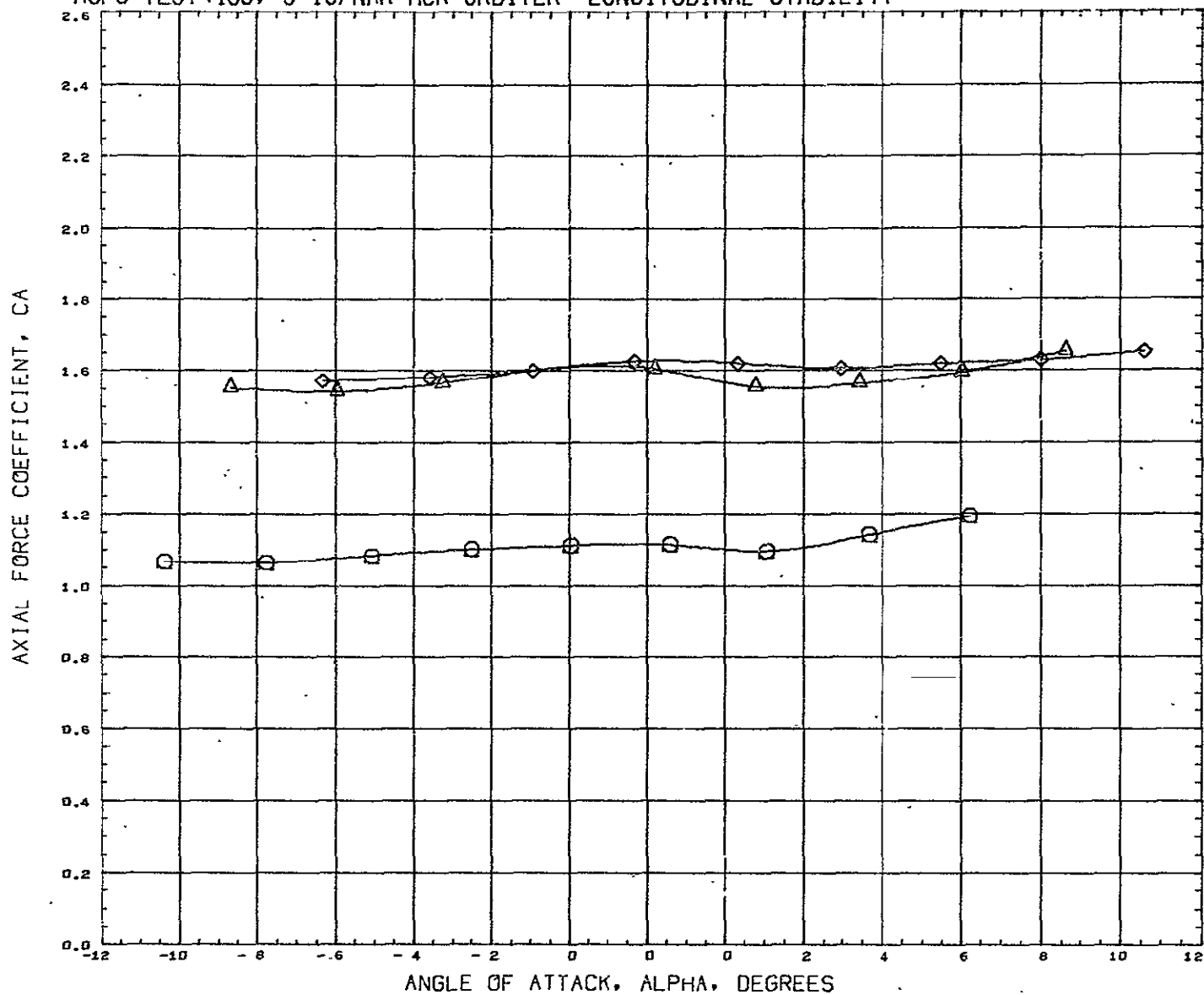


SYMBOL	MACH	BETA	PARAMETRIC VALUES
□	0.908		0.050
△	1.005		
◇	1.203		

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3350	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *E

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.908		0.050
△	1.005		
◇	1.203		

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XHRF	0.0375	IN
YHRF	0.0000	IN
ZHRF	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE #E

M485-MSFC-S1C NAR HCR ORBITER

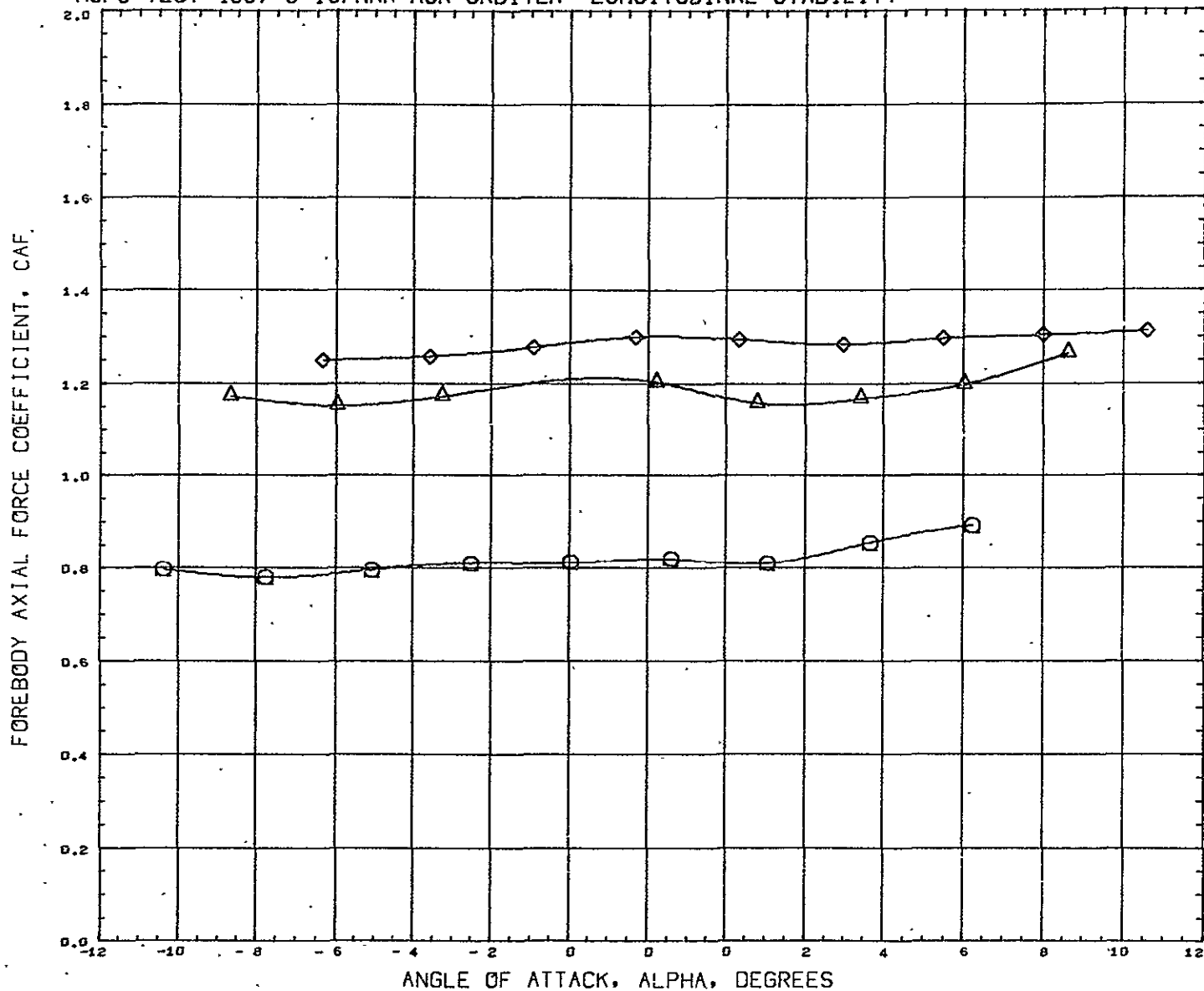
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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

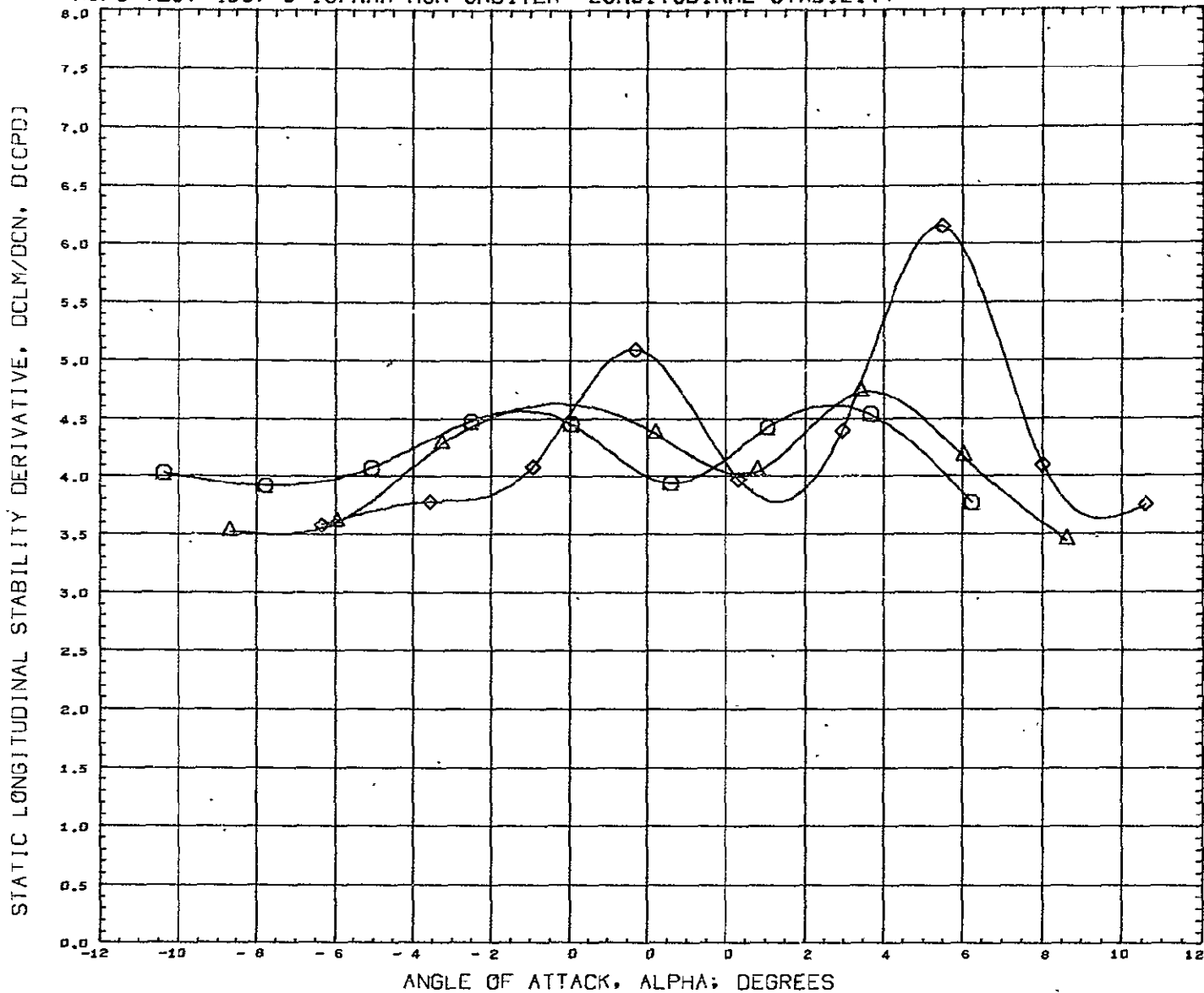


SYMBOL HACH BETA PARAMETRIC VALUES
 ○ 0.908
 △ 1.005
 ◇ 1.203

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP - 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *E

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.908		0.050
△	1.005		
◇	1.203		

REFERENCE INFORMATION		
REFS	1.3960	50. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *E

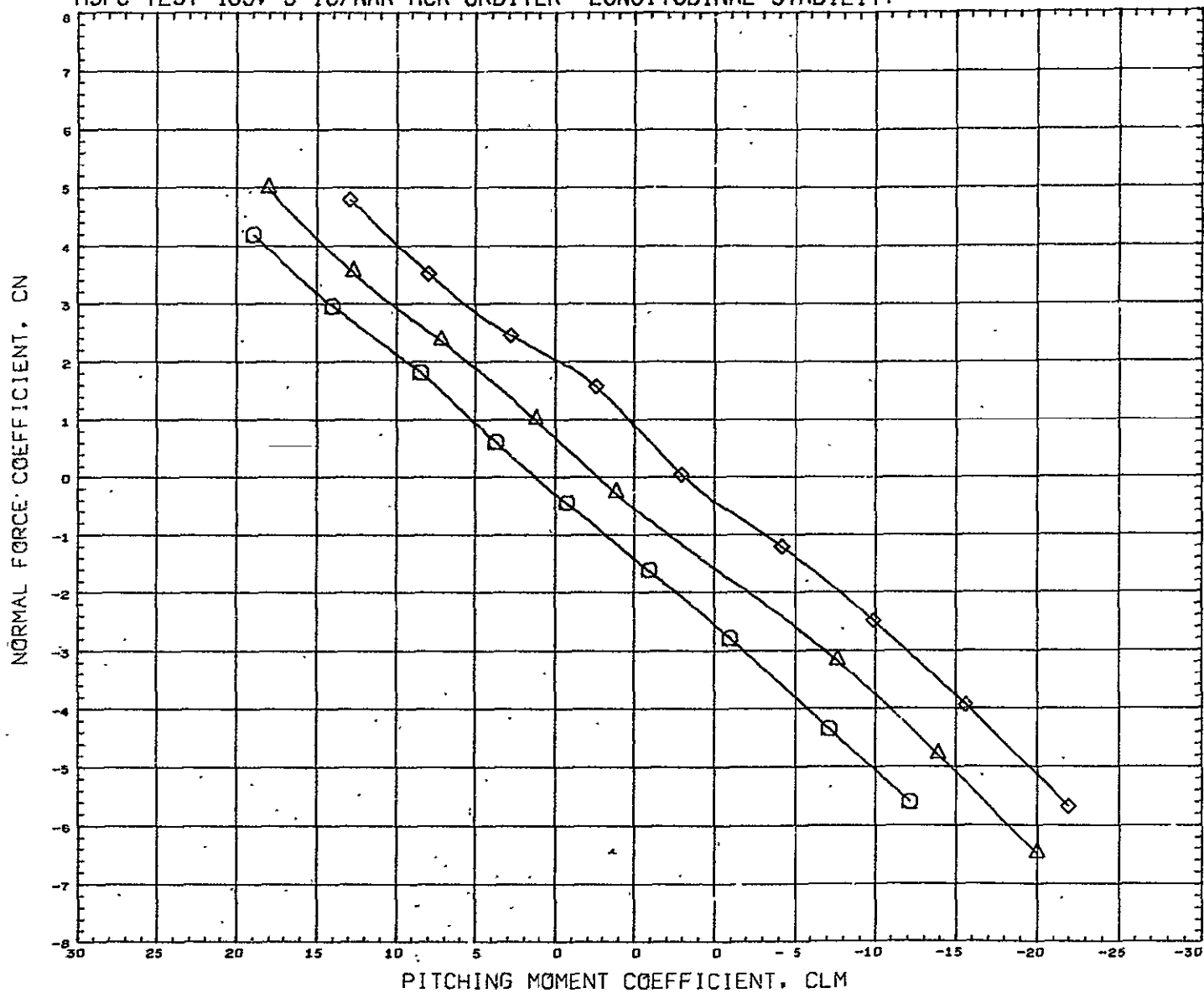
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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

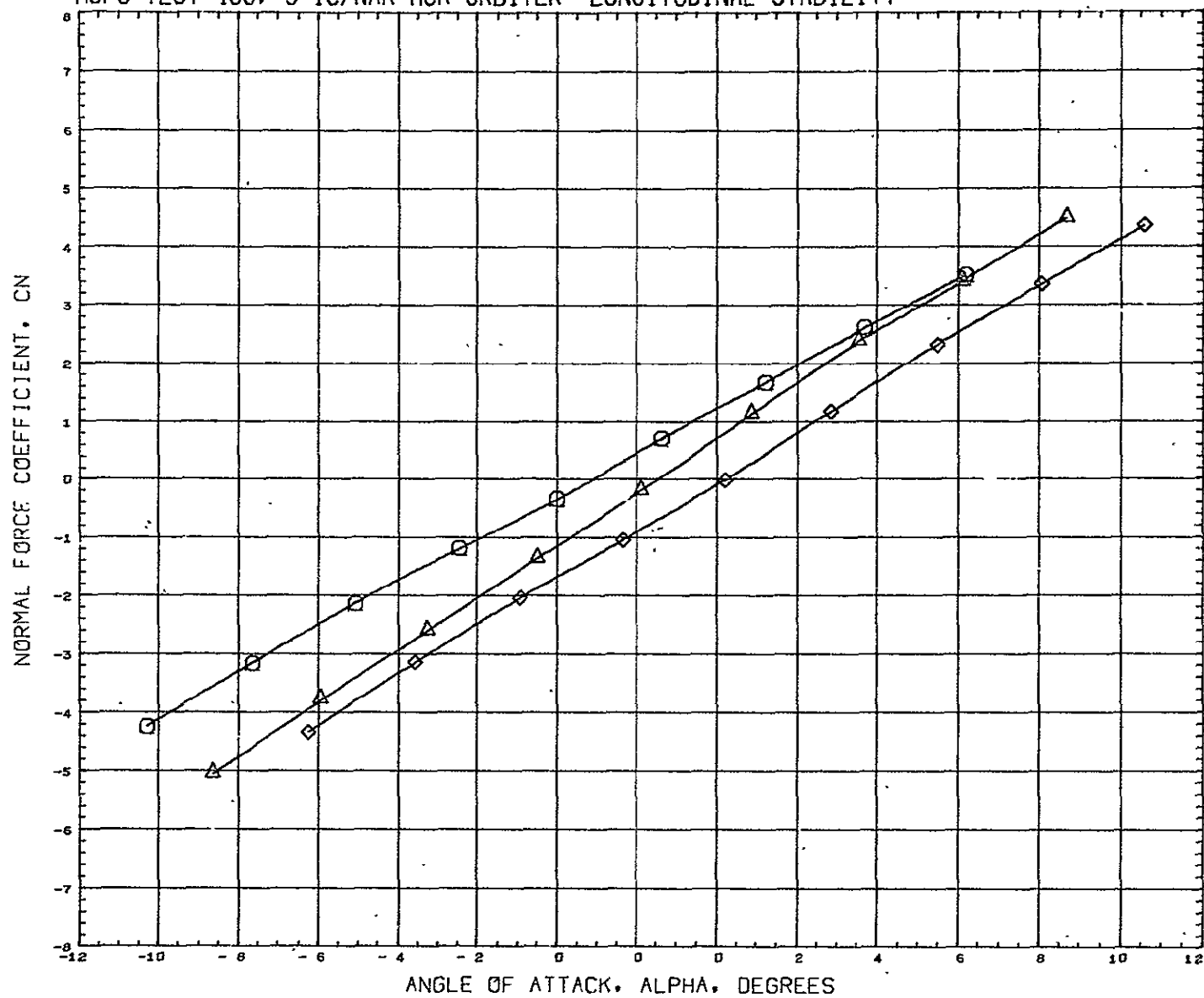


SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.908		0.050
△	1.095		
◇	1.203		

REFERENCE INFORMATION		
REFS	1.3960	50. IN.
REFL	1.3330	IN
REFS	1.3330	IN
XMRP	0.0170	IN
YMRP	0.0000	IN
ZMRP	1.0000	IN
SCALE	0.0034	IN

DATA HIST. CODE *E

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.905		0.060
△	1.003		
◇	1.202		

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE #E

M485-MSFC-S1C NAR HCR ORBITER

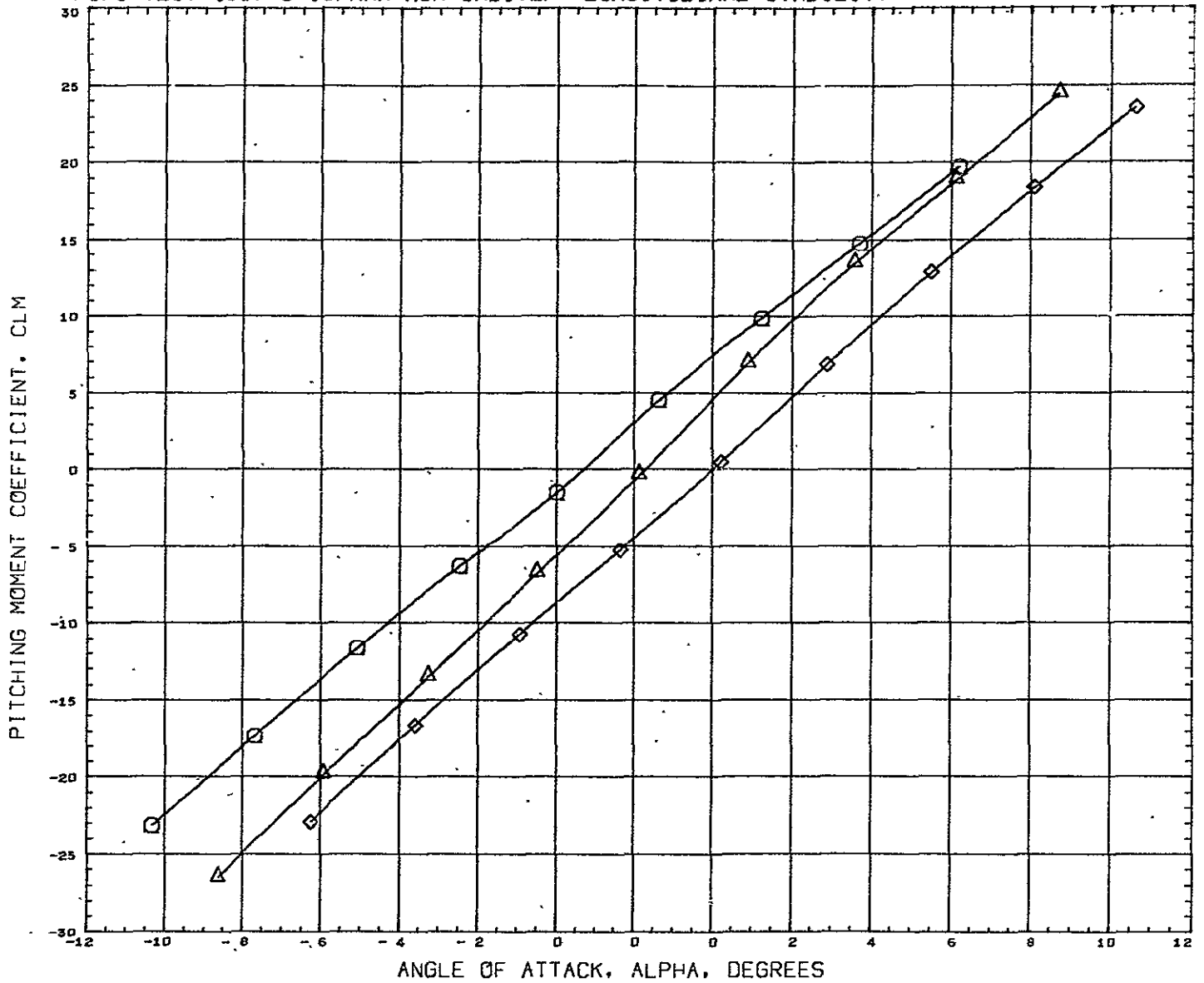
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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.905		0.060
△	1.003		
◇	1.202		

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XHRP	0.0370	IN
YHRP	0.0000	IN
ZHRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE #E

M485-MSFC-S1C NAR HCR ORBITER

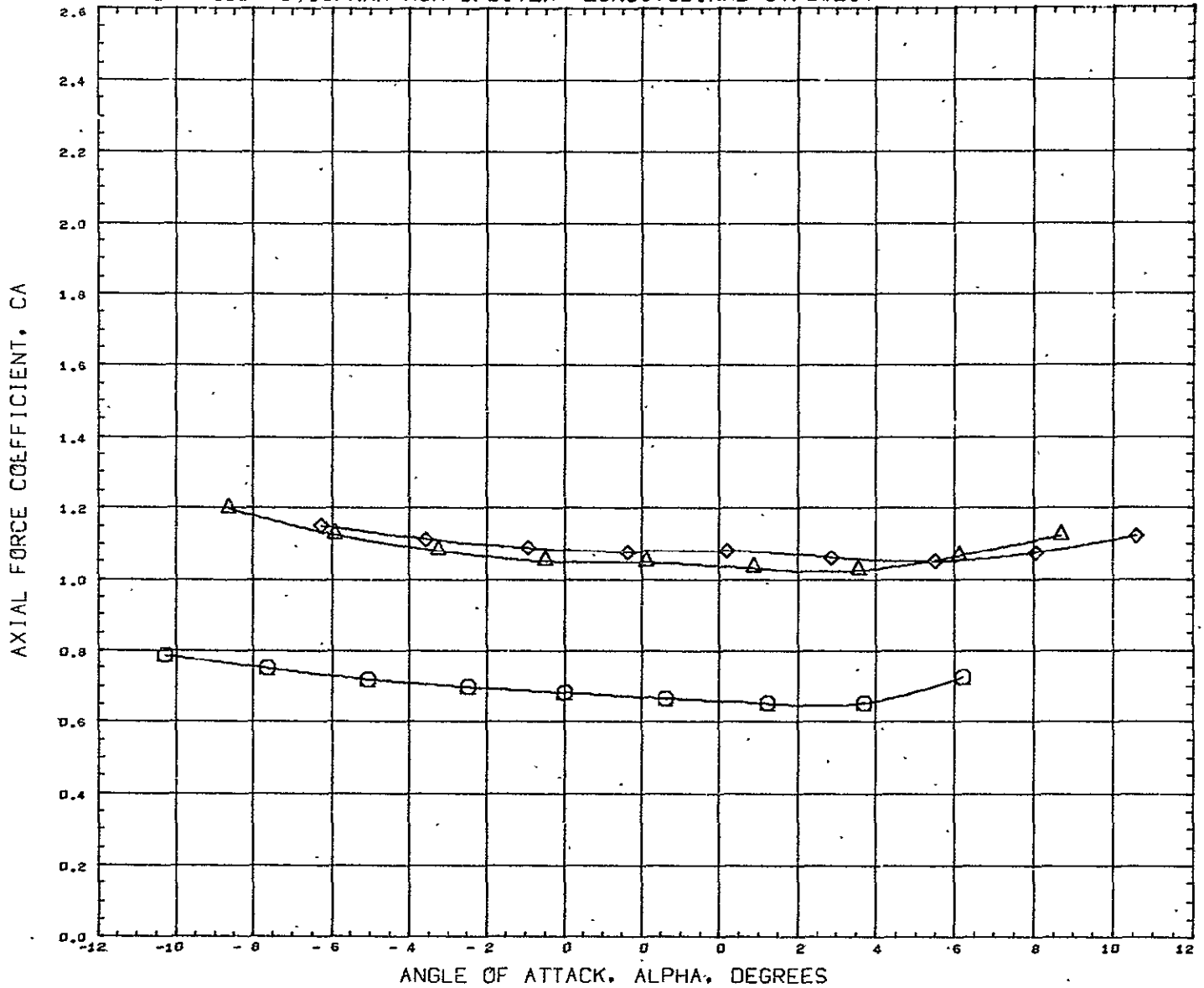
OBVD1

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL MACH BETA PARAMETRIC VALUES
 ○ 0.905
 △ 1.003
 ◇ 1.202

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP - 0.0270 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE #E

M485-MSFC-S1C NAR HCR ORBITER

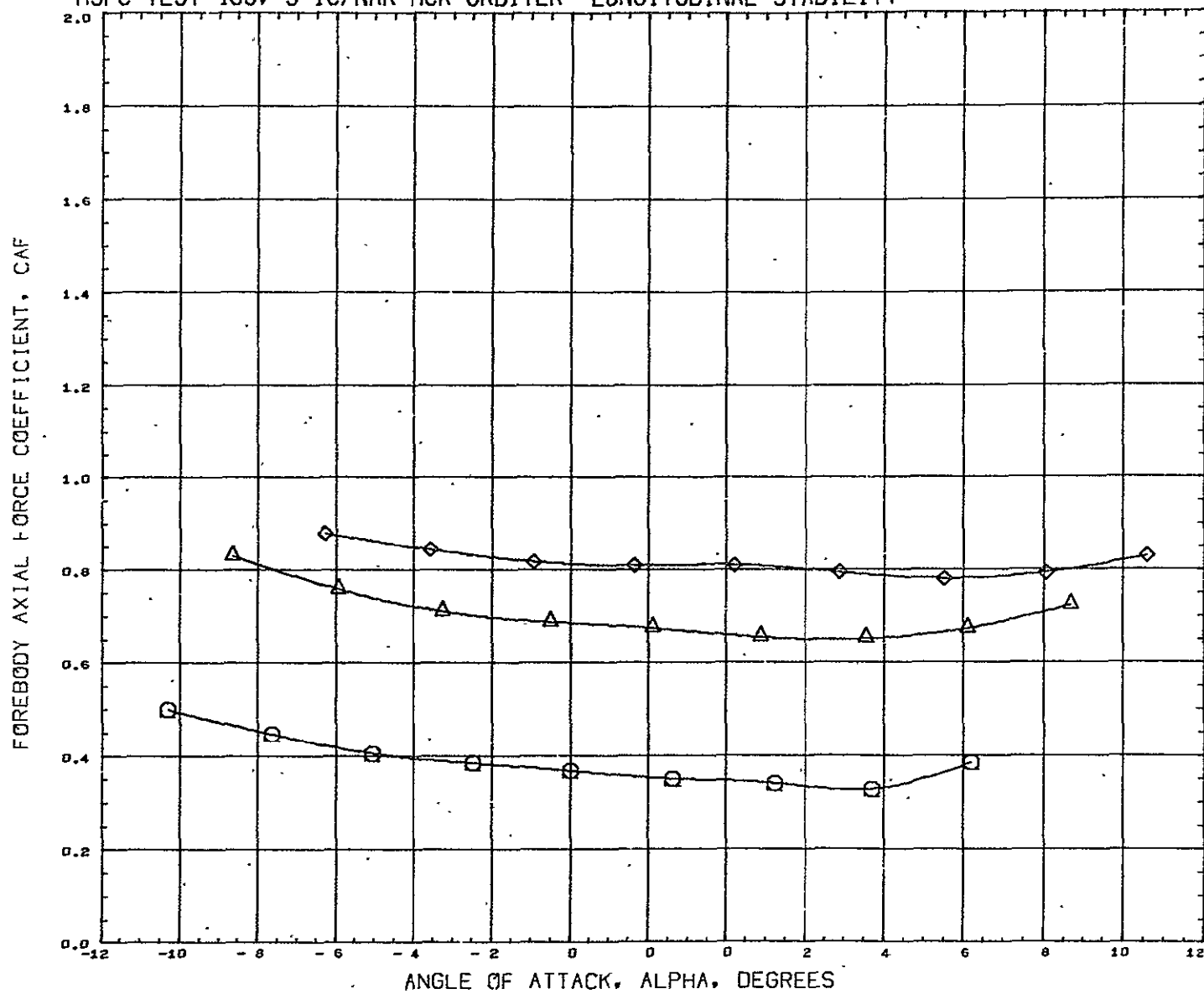
OBVD1

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.905		0.060
△	1.003		
◇	1.202		

REFERENCE INFORMATION		
REFS	1.3960	SQ.IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	IN

DATA HIST. CODE #E

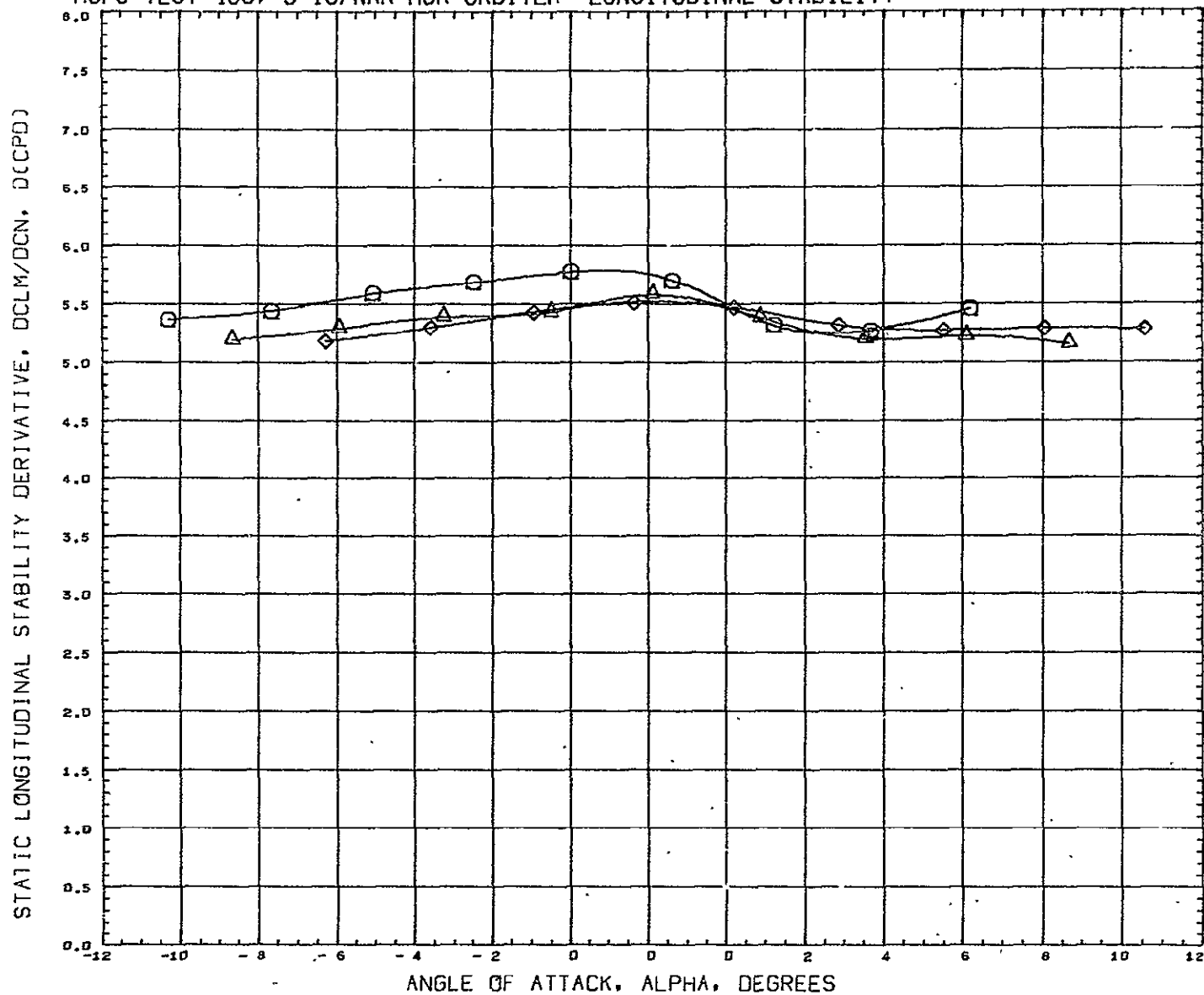
M485-MSFC-S1C NAR HCR ORBITER

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL MACH
 ○ 0.905
 △ 1.003
 ◇ 1.202

PARAMETRIC VALUES
 BETA 0.060

REFERENCE INFORMATION

REFS	1.3960	sq. in.
REFL	1.3330	IN
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XMRP	0.9370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *E

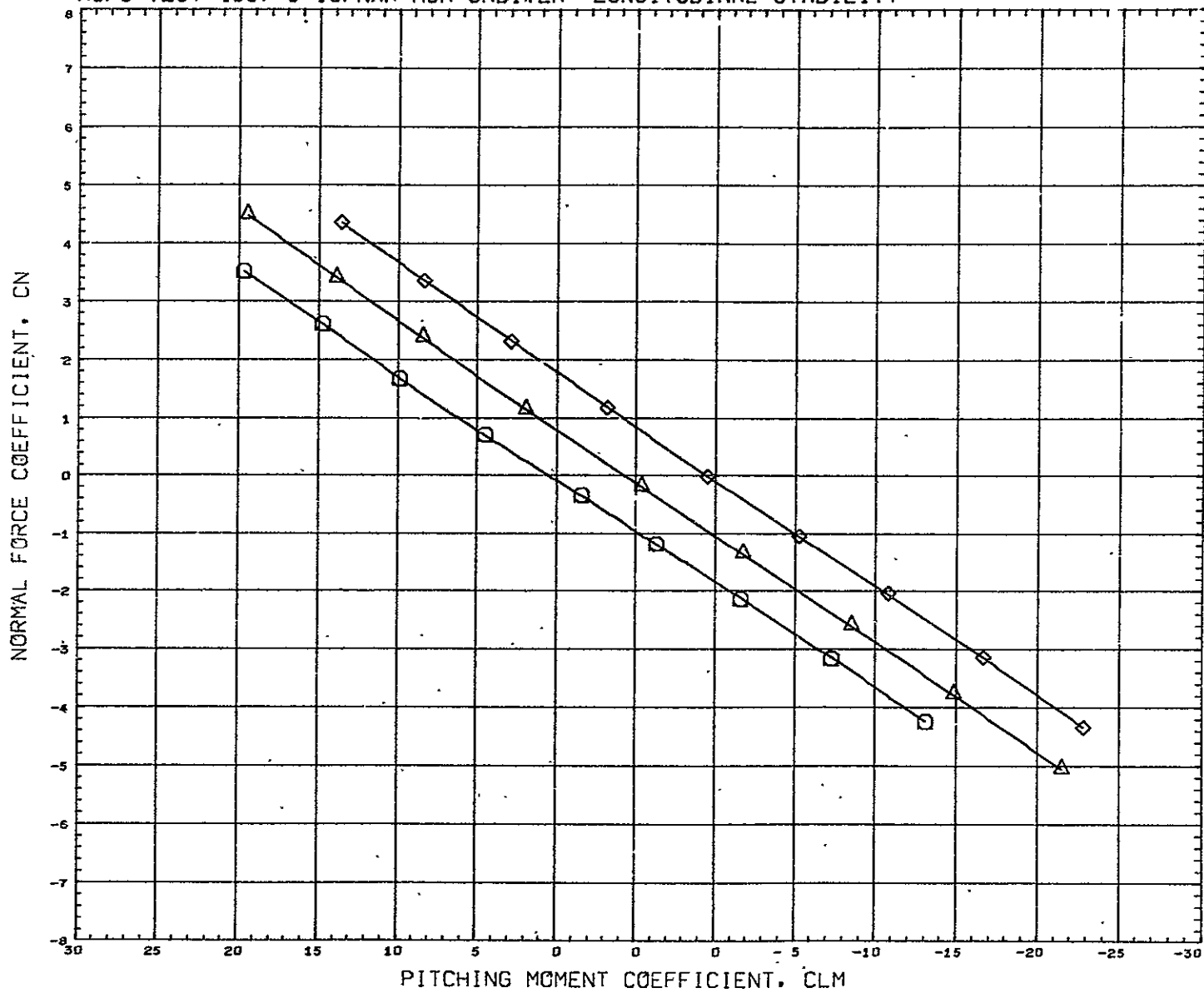
M485-MSFC-S1C NAR HCR ORBITER

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.905		0.060
△	1.003		
◇	1.202		

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0300	IN
ZMRP	0.0000	IN
SCALE	0.0034	

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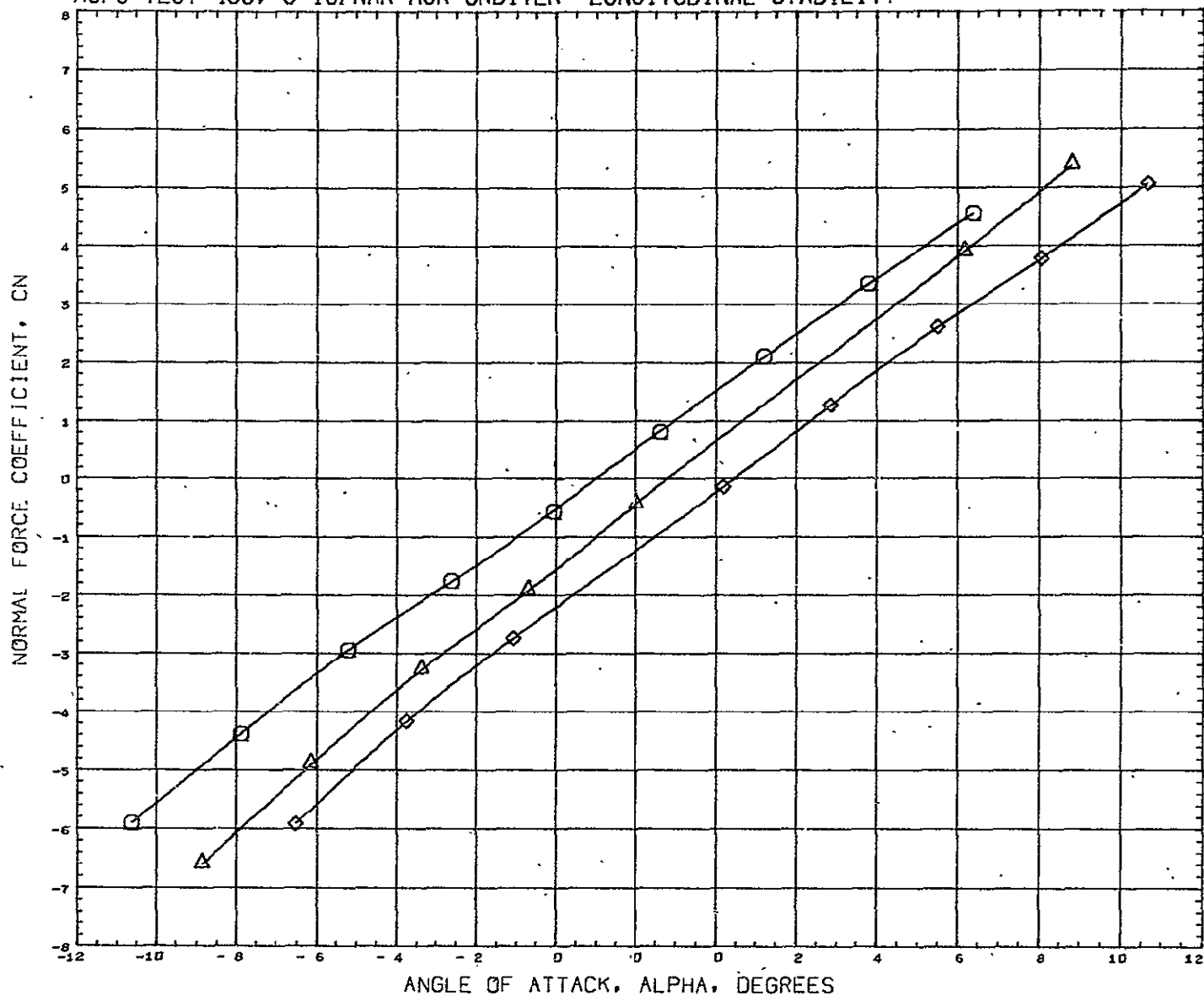
M485-MSFC-S1C NAR HCR ORBITER

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.997		0.040
△	1.006		
◇	1.202		

REFERENCE INFORMATION		
REFS	1.3960	SO.IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRF	0.0375	IN
YMRF	0.0000	IN
ZMRF	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *E

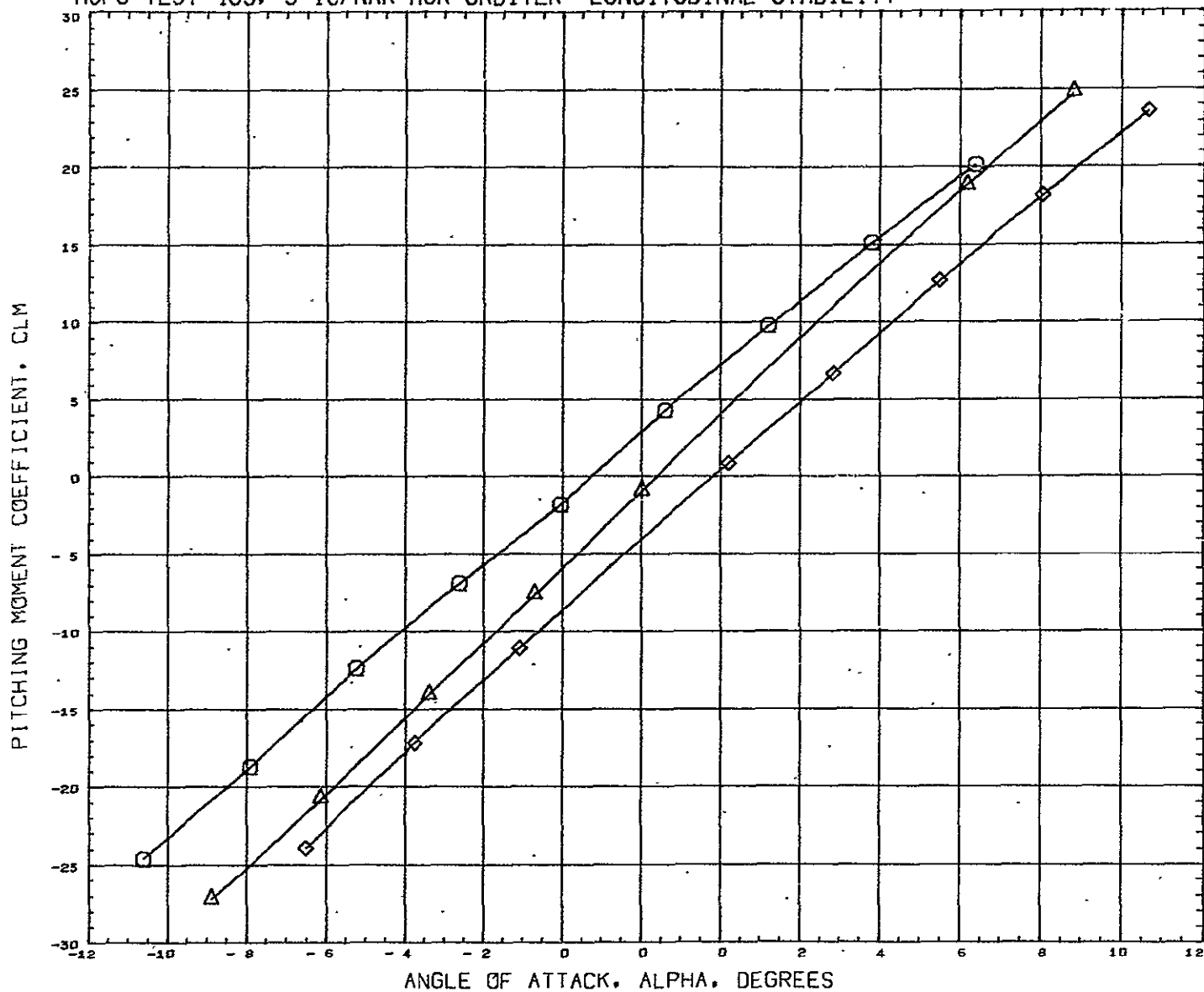
M485-MSFC-S1C NAR HCR ORBITER

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

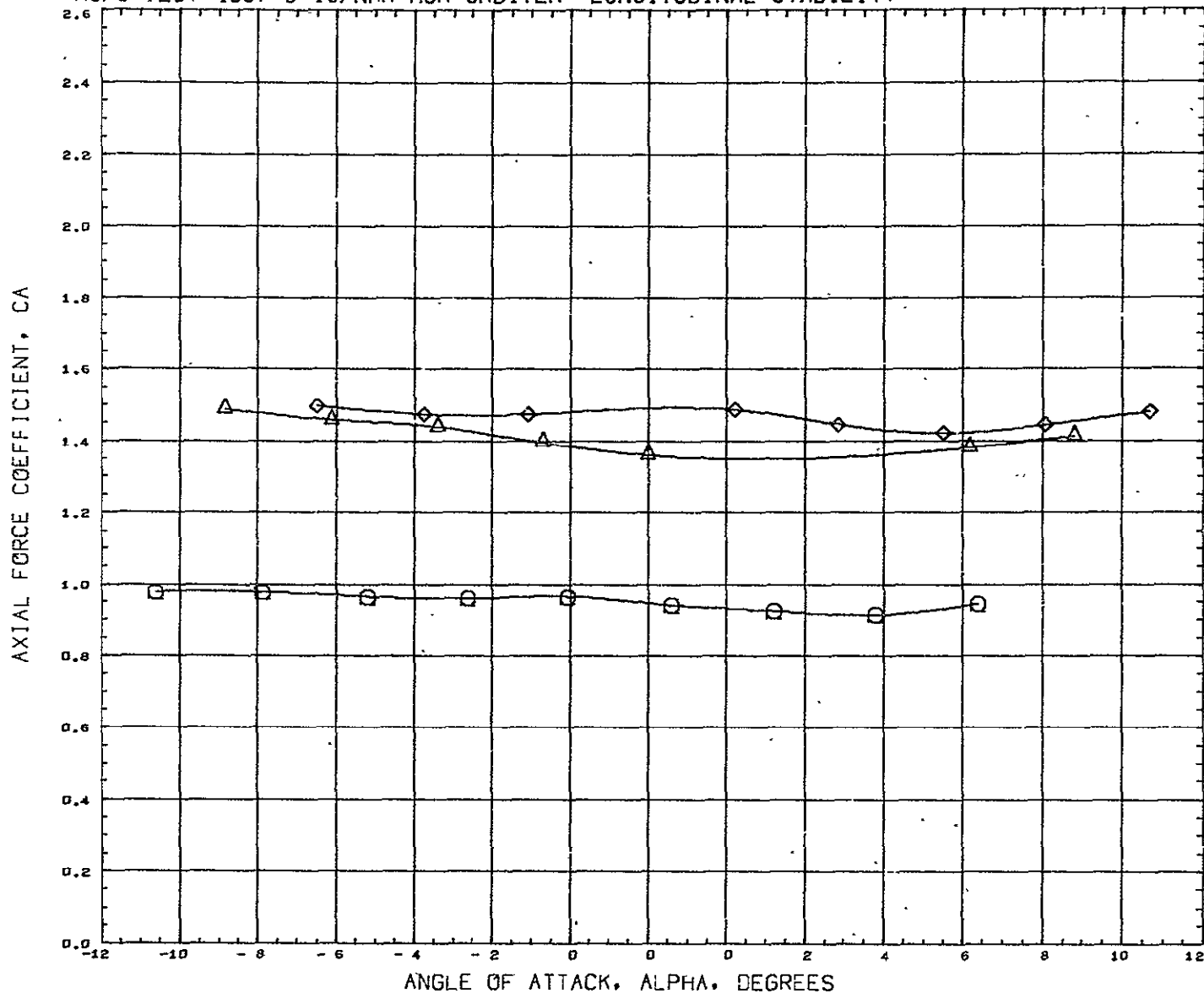


SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.907		0.040
△	1.006		
◇	1.202		

DATA HIST. CODE #E

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL MACH BETA PARAMETRIC VALUES

○ 0.907 0.040

△ 1.006

◇ 1.202

REFERENCE INFORMATION

REFS 1.3960 SQ. IN.

REFL 1.3330 IN

REFB 1.3330 IN

XMRP 0.0370 IN

YMRP 0.0000 IN

ZMRP 0.0000 IN

SCALE 0.0034

DATA HIST. CODE #E

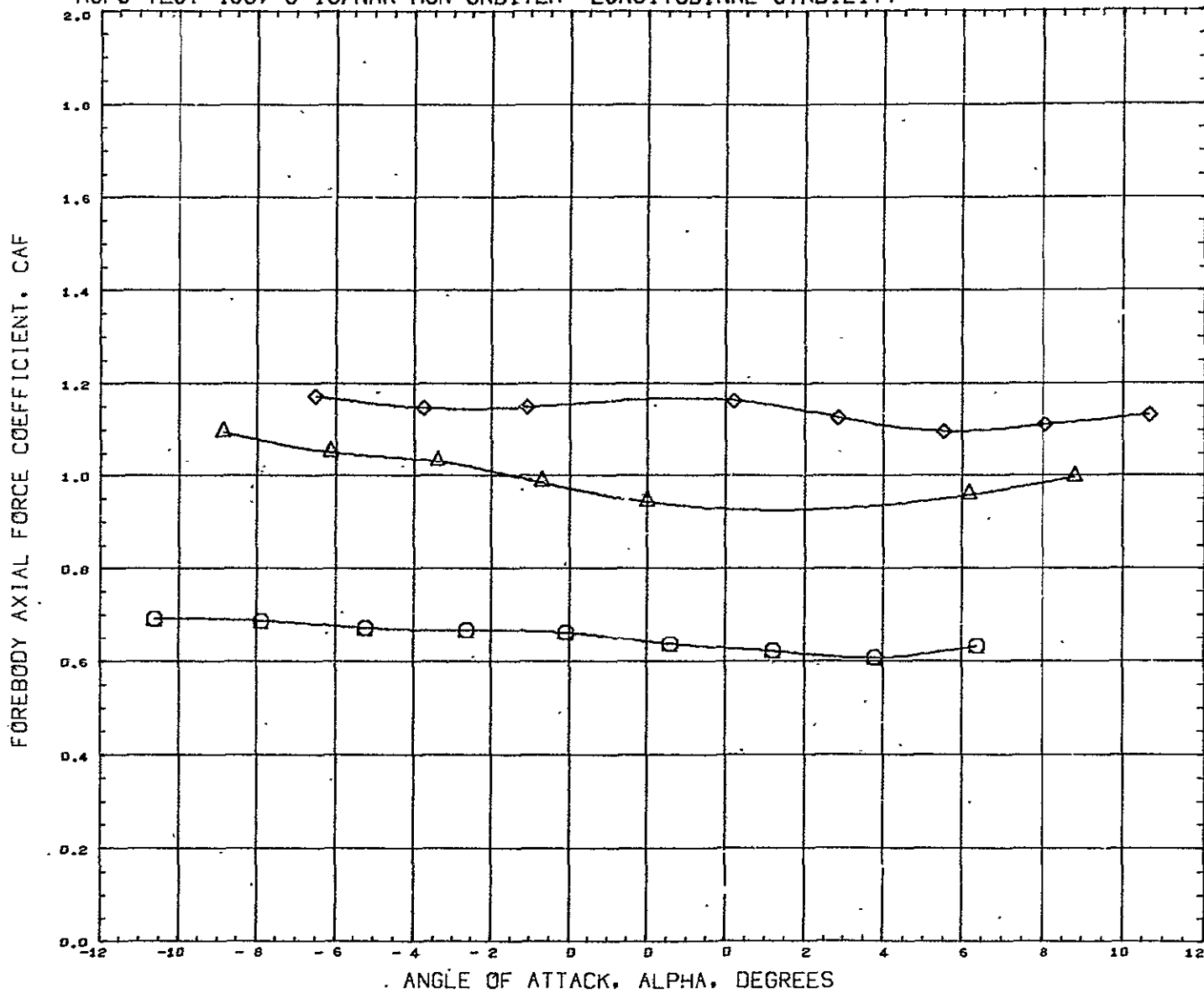
M485-MSFC-S1C NAR HCR ORBITER

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.907		0.040
△	1.006		
◇	1.202		

REFERENCE INFORMATION		
REFS	1.3960	SO. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE #E.

M485-MSFC-S1C NAR HCR ORBITER

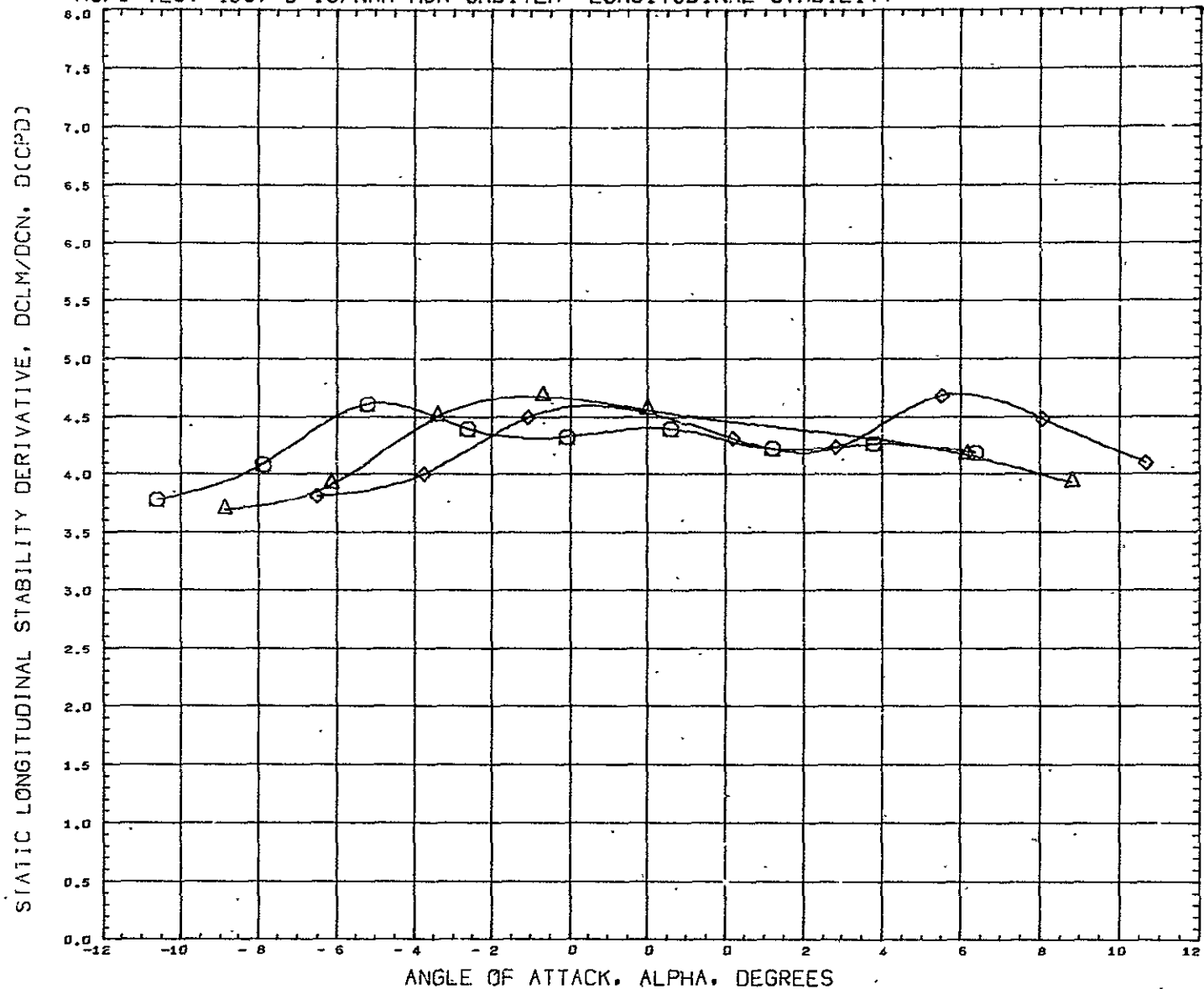
OBTV01

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL MACH BETA PARAMETRIC VALUES
 O 0.957 0.040
 Δ 1.006
 ◇ 1.202

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFE 1.3530 IN
 XMRP 0.370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE #E

M485-MSFC-S1C NAR HCR ORBITER

OB-VD1

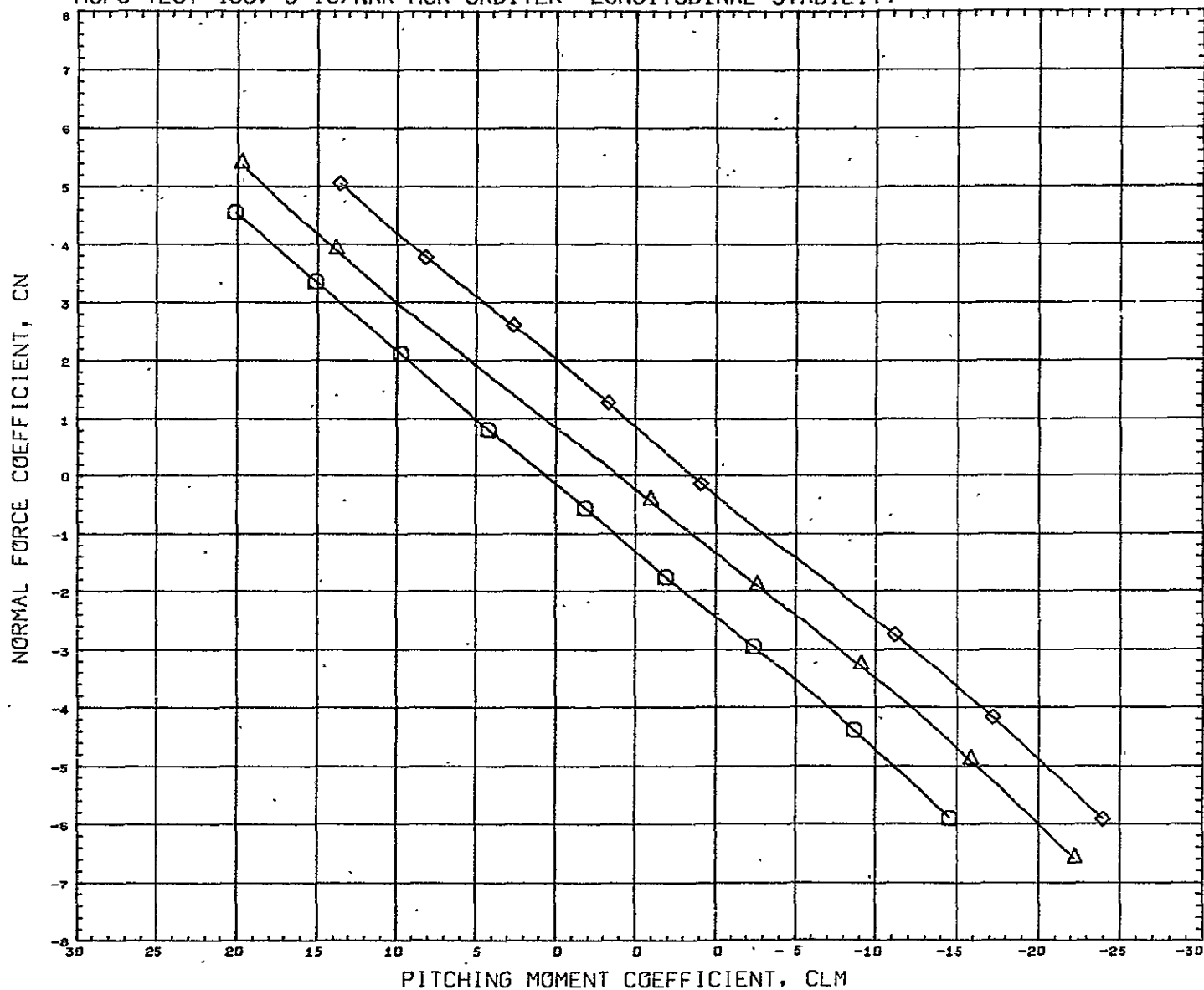
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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

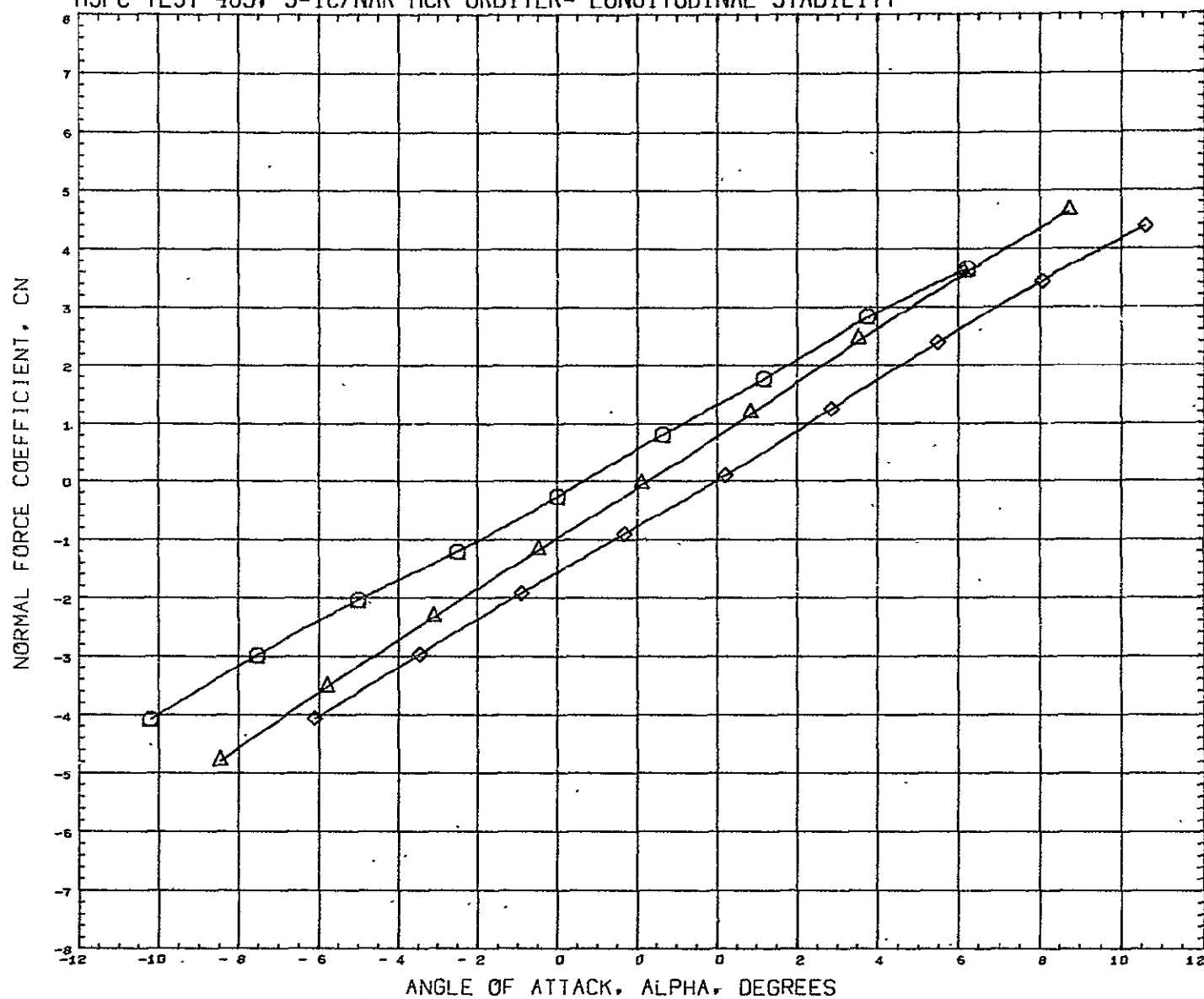


SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.907		0.040
△	1.006		
◇	1.202		

DATA HIST. CODE #E

REFERENCE INFORMATION		
REFS	1.3960	sq. in.
REFL	1.3330	in
REFB	1.3330	in
XMRP	0.0370	in
YMRP	0.0000	in
ZMRP	0.0000	in
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL MACH BETA PARAMETRIC VALUES
○ 0.906 0.040
△ 1.003
◇ 1.208

REFERENCE INFORMATION
REFS 1.3960 59. IN.
REFL 1.3330 IN
REFB 1.3330 IN
XMRP 0.0375 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE *E

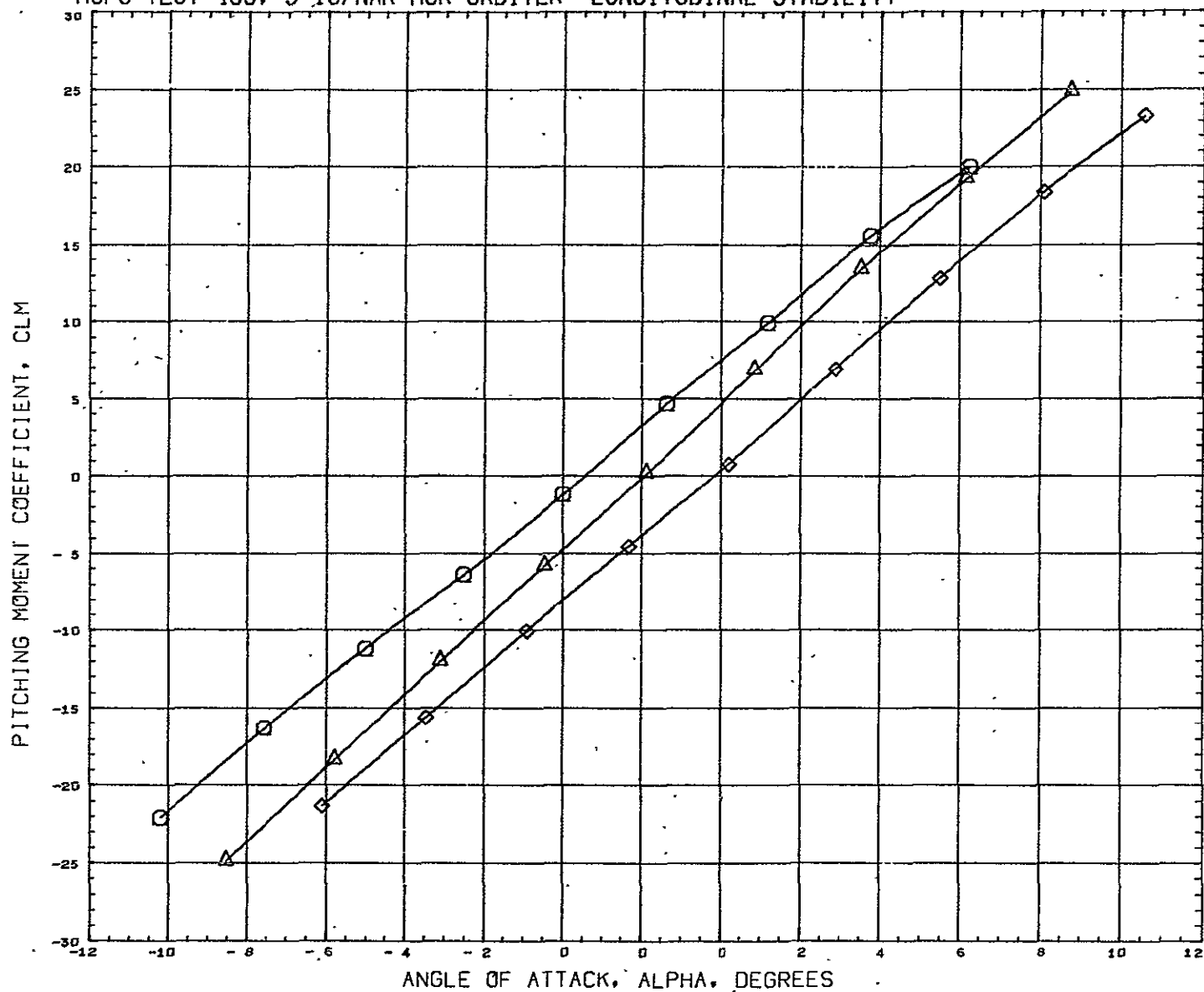
M485-MSFC-S1C NAR HCR ORBITER

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

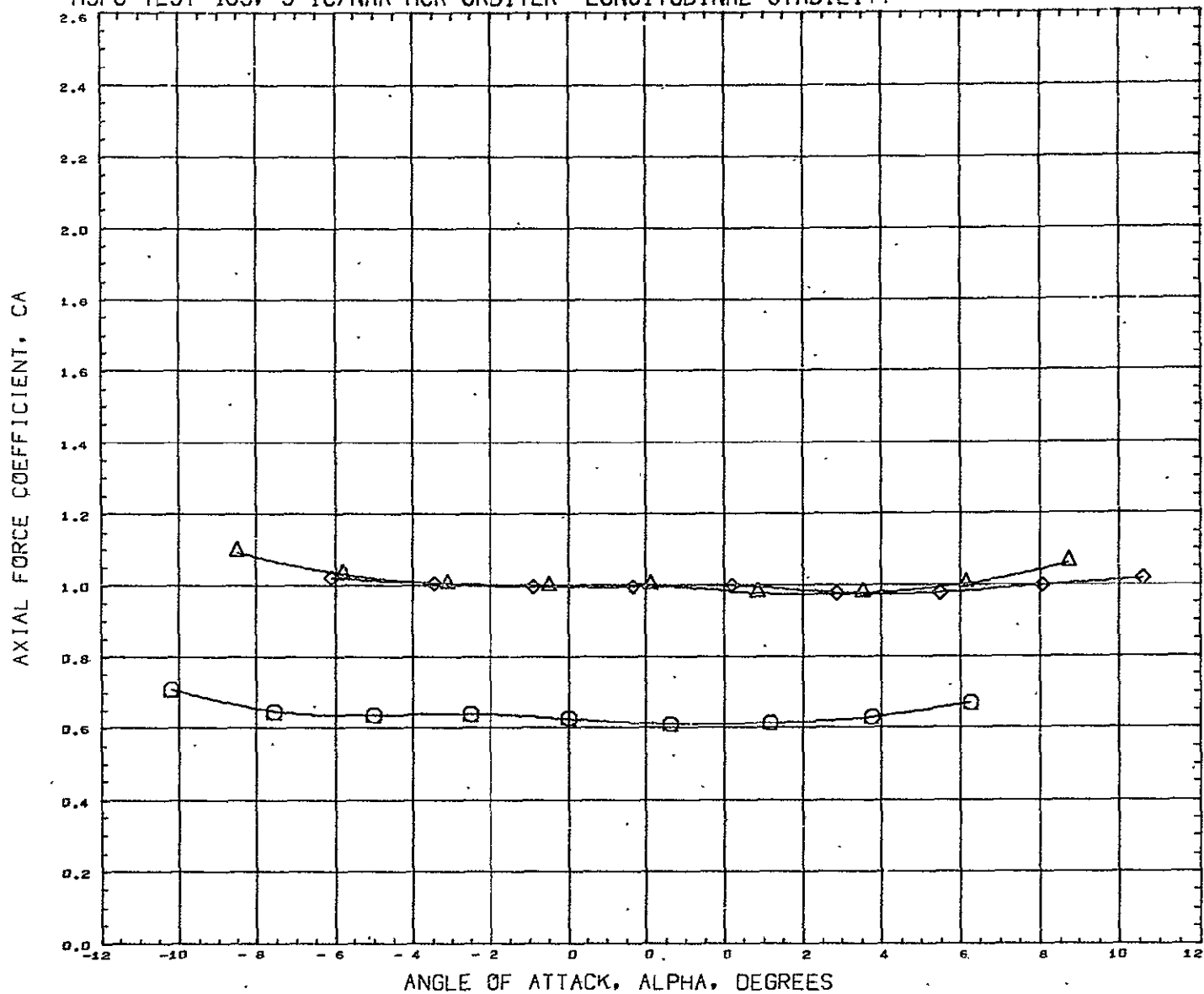


SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.906		0.040
△	1.003		
◇	1.208		

REFERENCE INFORMATION		
REFS	1.3960	50. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XNRP	0.0373	IN
YNRP	0.0000	IN
ZNRP	0.0000	IN
SCALE	0.0034	IN

DATA HIST. CODE *E

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL MACH BETA PARAMETRIC VALUES
○ 0.906 - 0.040
△ 1.003 - -
◇ 1.208 - -

REFERENCE INFORMATION
REFS 1.3960 SQ. IN.
REFL 1.3330 IN
REFB 1.3330 IN
XMRP 0.0170 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE *E

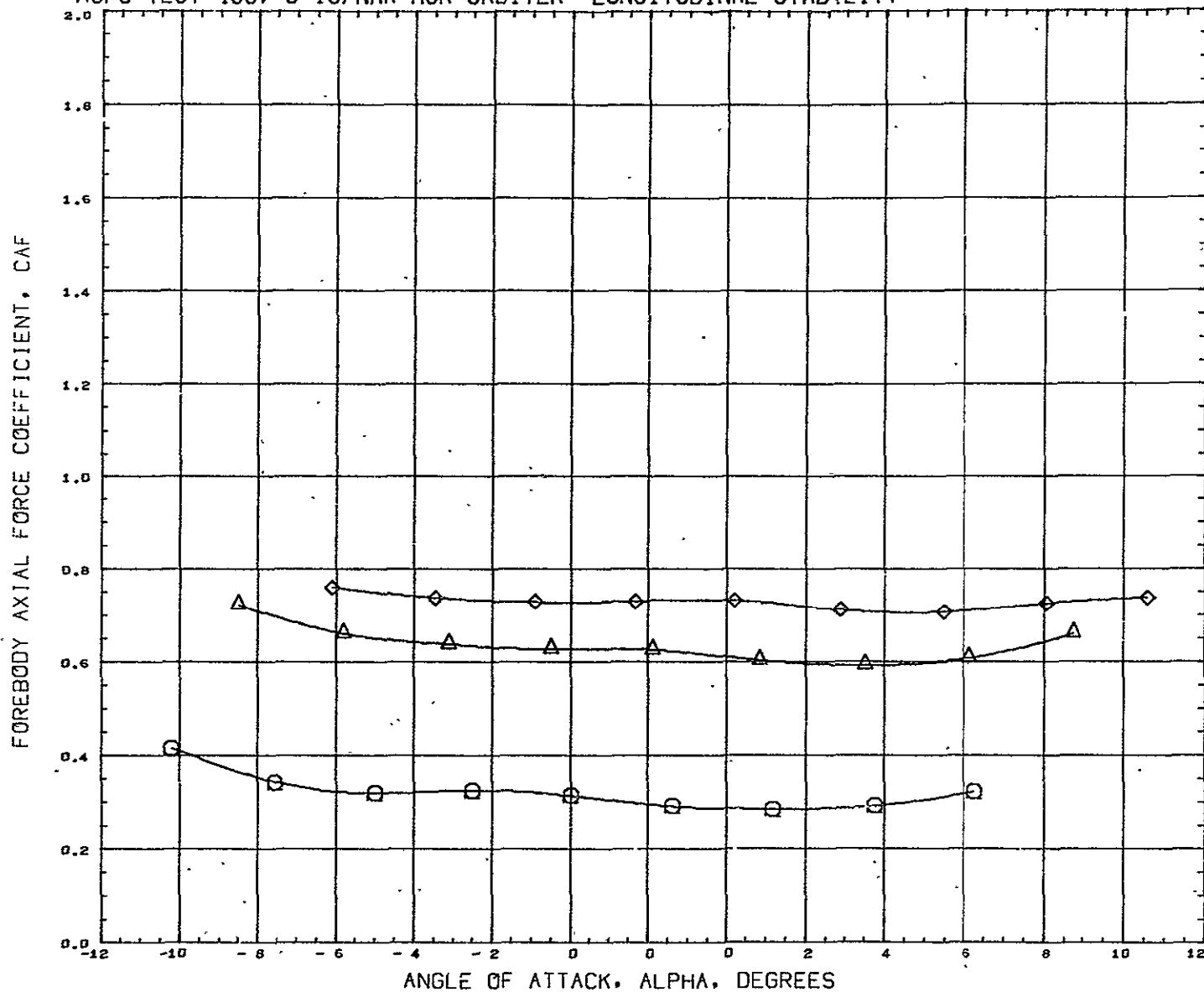
M485-MSFC-S1C NAR HCR ORBITER

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

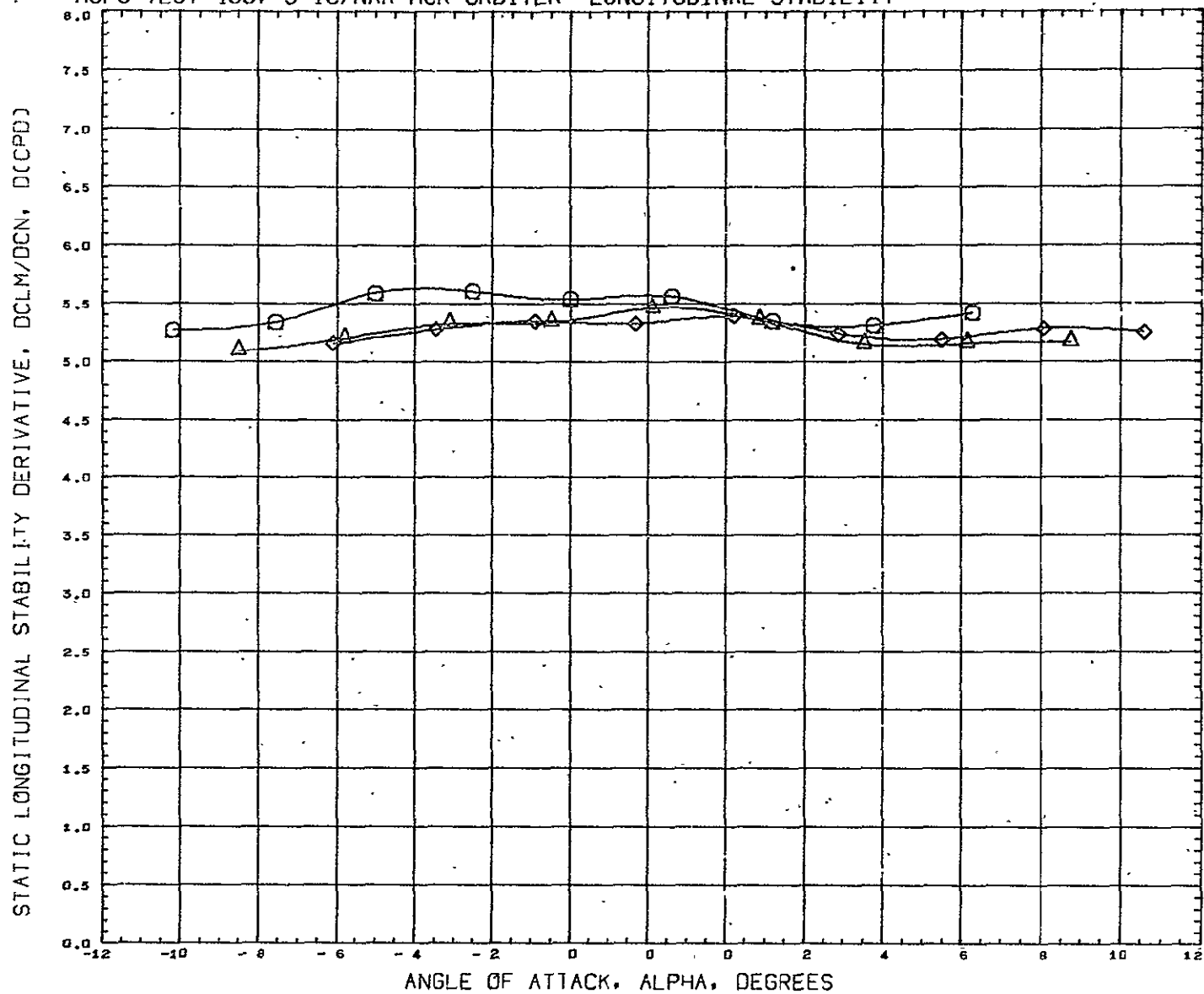


SYMBOL	HACH	BETA	PARAMETRIC VALUES
○	0.906		0.040
△	1.003		
◇	1.208		

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRF	0.0370	IN
YMRF	0.0000	IN
ZMRF	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE #E

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.906		0.040
△	1.003		
◇	1.208		

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *E

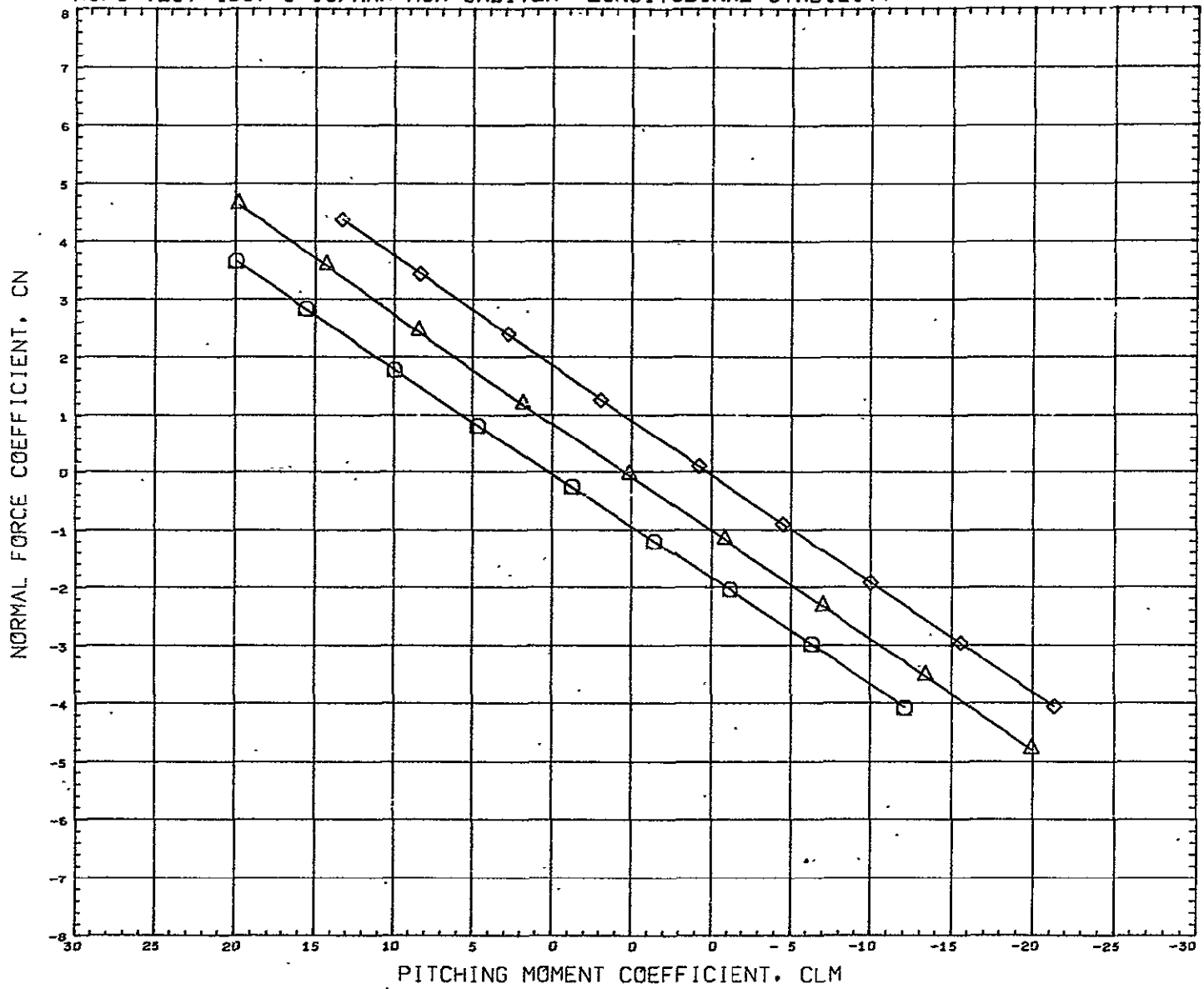
M485-MSFC-S1C NAR HCR ORBITER

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

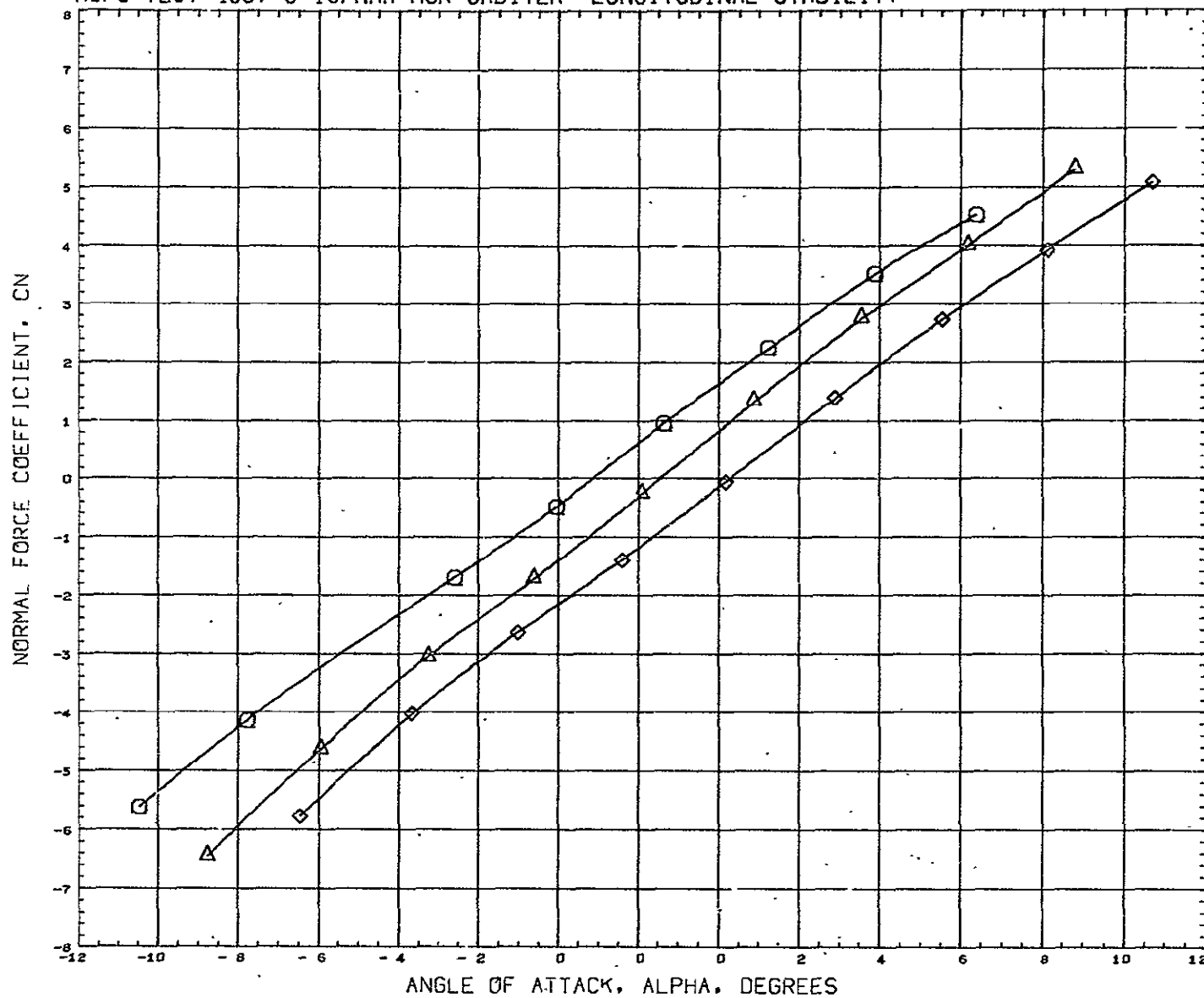


SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.906		0.040
△	1.003		
◇	1.208		

DATA HIST. CODE #E

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0300	IN
ZMRP	0.0300	IN
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.906		0.050
△	1.002		
◇	1.204		

REFERENCE INFORMATION		
REFS	1.3960	50 IN.
REFL	1.3330	IN
REFB	1.3330	IN
XNRP	0.0370	IN
YNRP	0.0000	IN
ZNRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *E

M485-MSFC-S1C NAR HCR ORBITER

0BFVD2

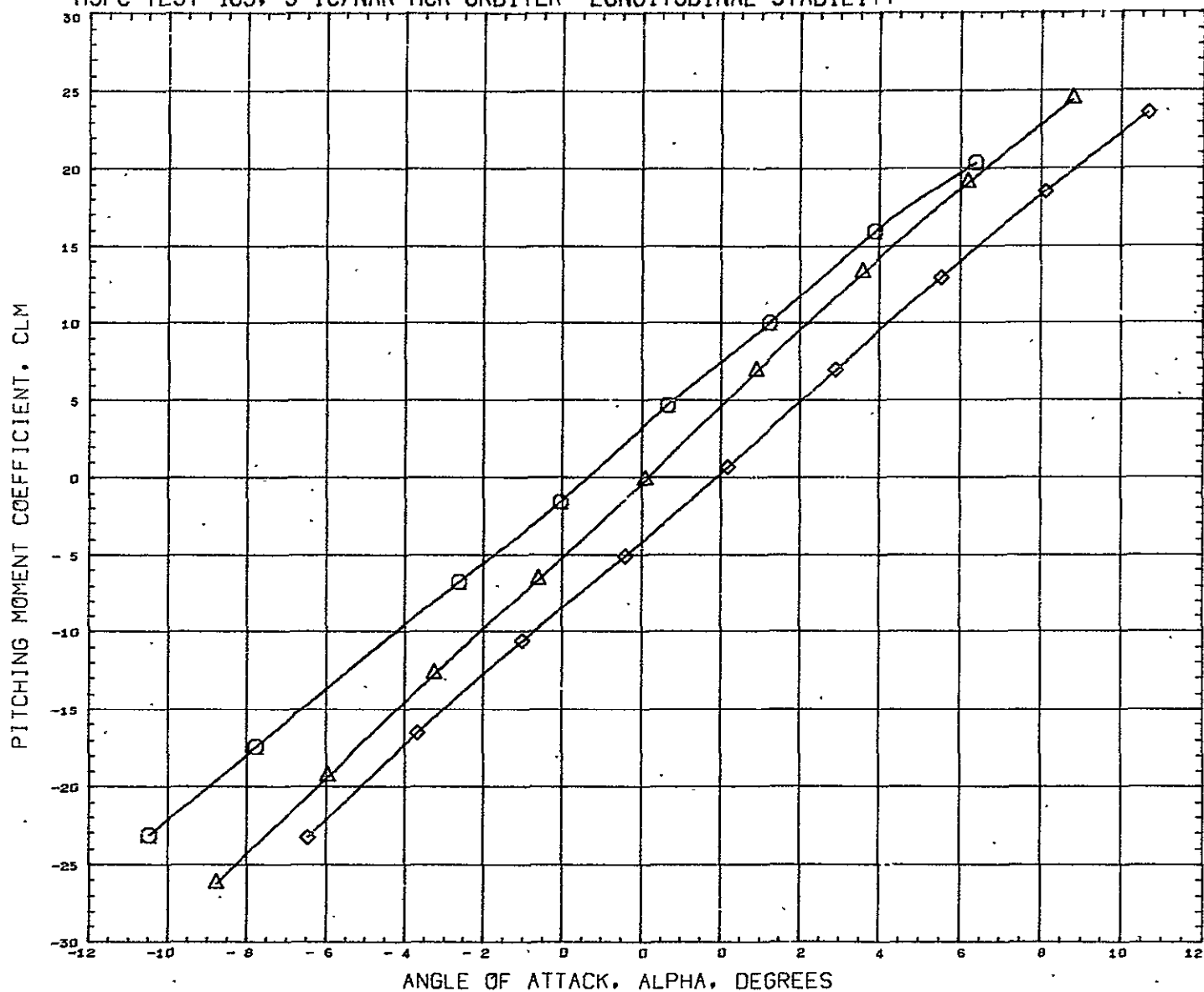
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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.906		0.050
△	1.002		
◇	1.204		

REFERENCE INFORMATION		
REFS	1.3960	SG. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE #E

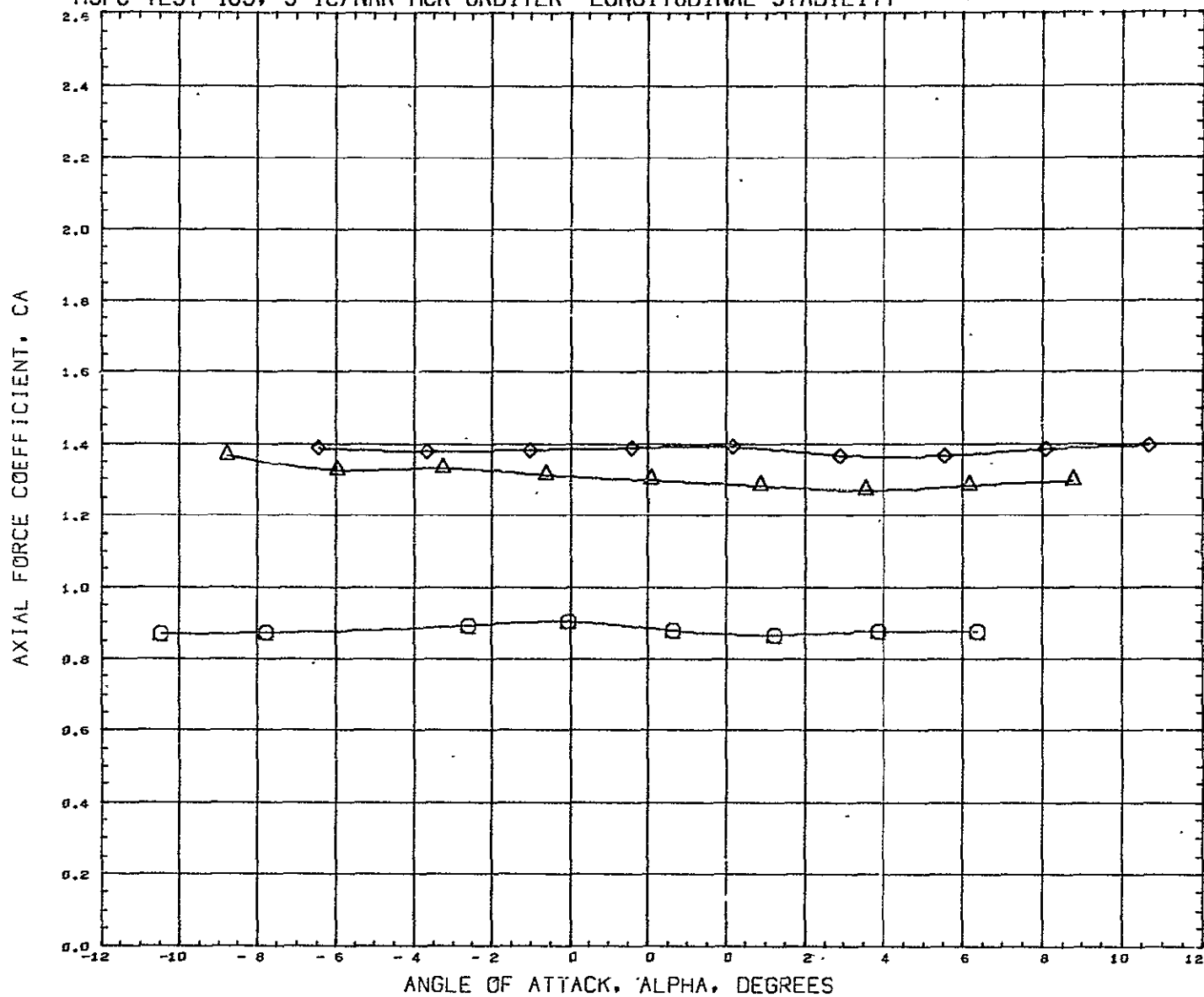
M485-MSFC-S1C NAR HCR ORBITER

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.906		0.050
△	1.002		
◇	1.204		

DATA HIST. CODE *E

REFERENCE INFORMATION		
REFS	1.3960	50. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	IN

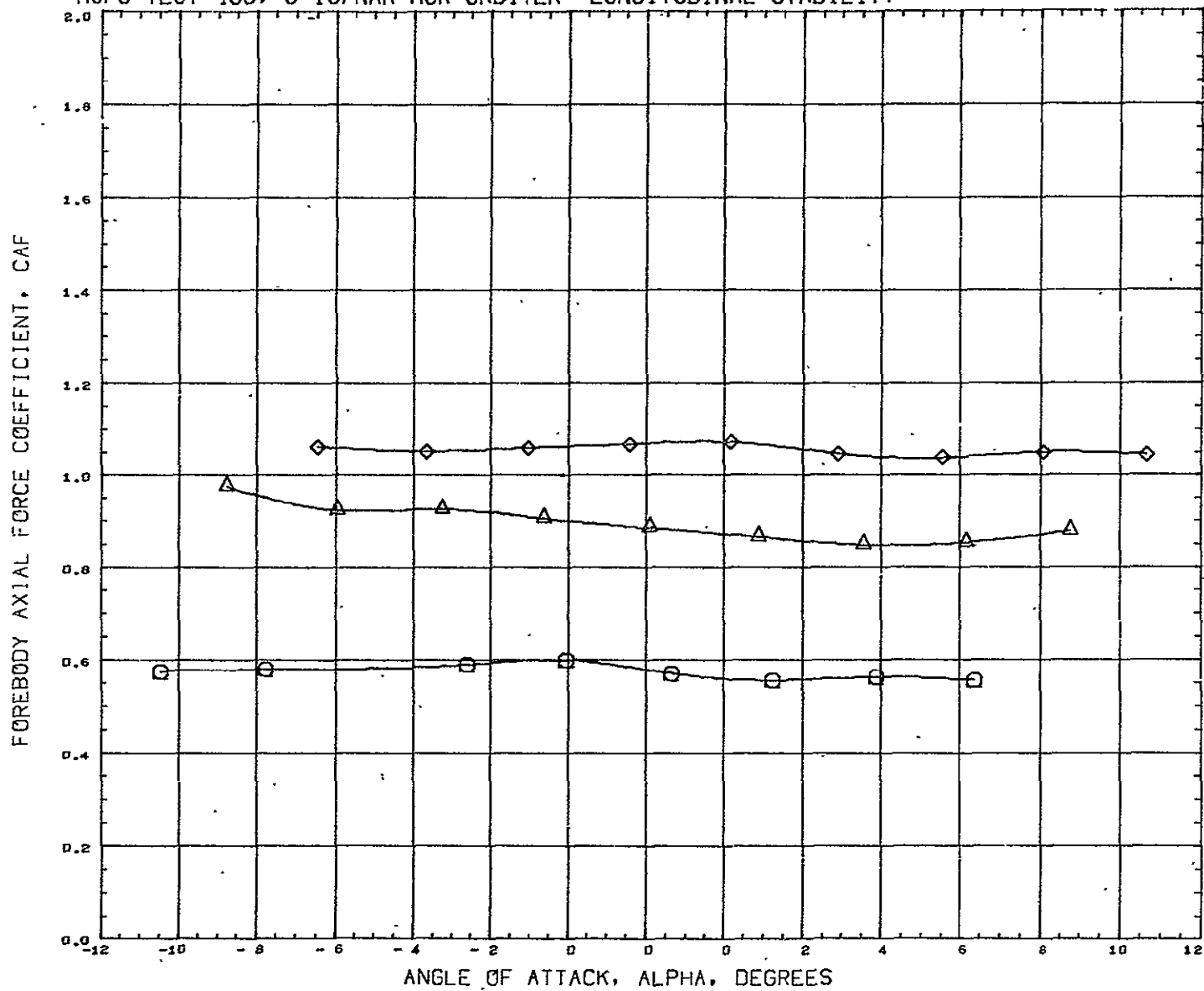
M485-MSFC-S1C NAR HCR ORBITER

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.906		0.050
△	1.002		
◇	1.204		

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *E

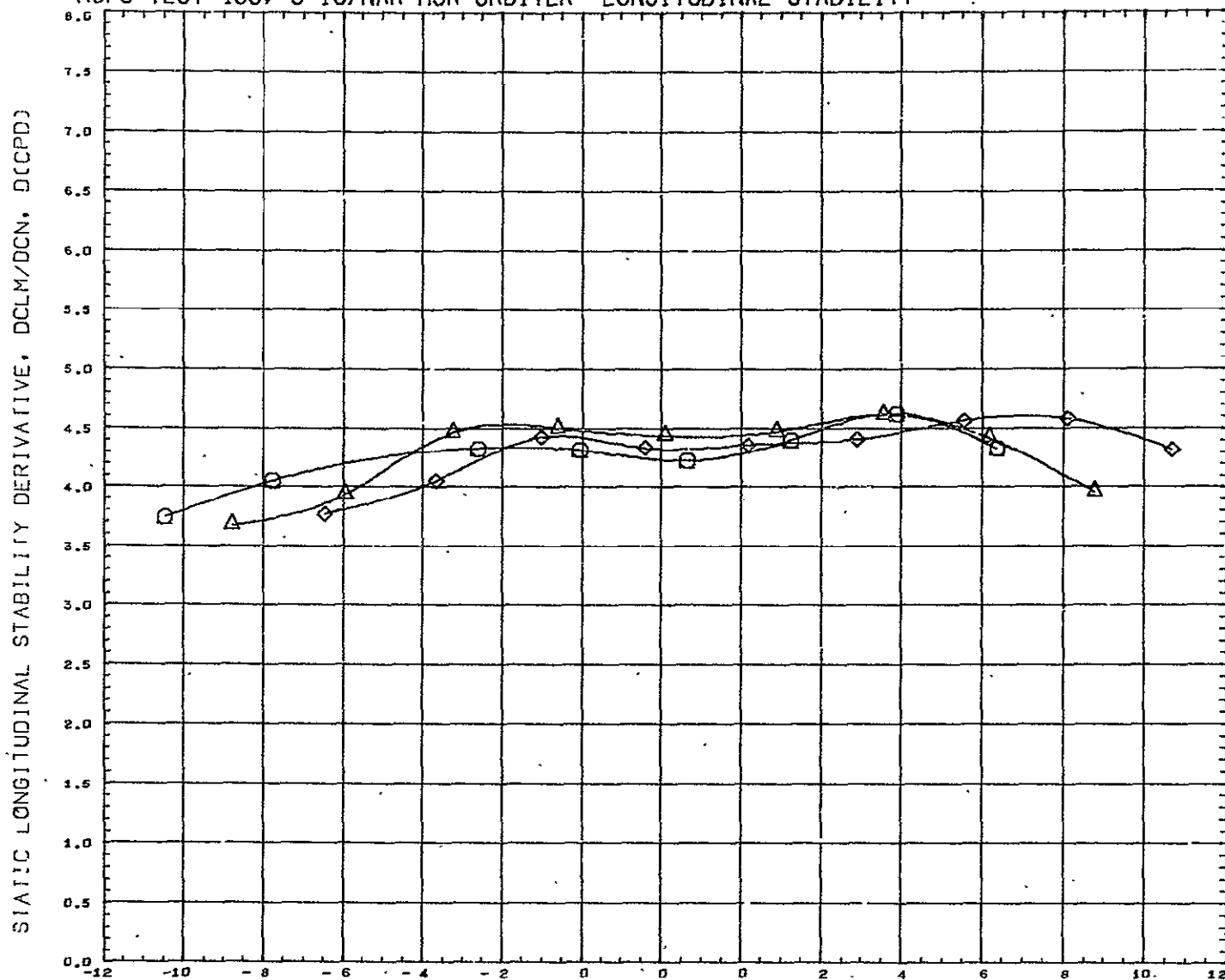
M485-MSFC-S1C NAR HCR ORBITER

0BFVD2

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.906		0.050
△	1.002		
◇	1.204		

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *E

M485-MSFC-S1C NAR HCR ORBITER

08FVD2

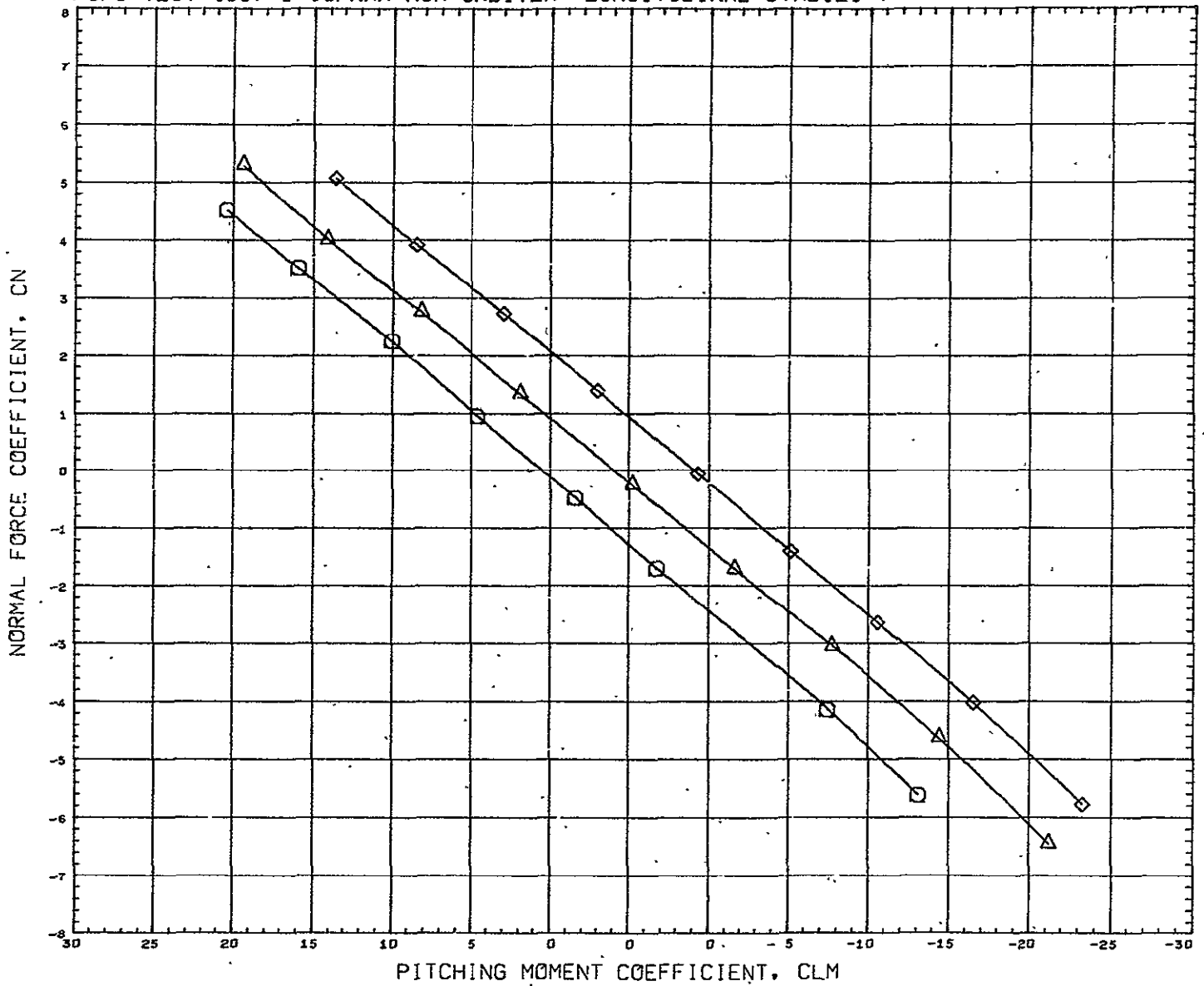
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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.906		0.050
△	1.002		
◇	1.204		

REFERENCE INFORMATION		
REFS	1.3960	50 IN.
REFL	1.3330	IN
REFB	1.3330	IN
XHRP	0.0370	IN
YHRP	0.0000	IN
ZHRP	0.0000	IN
SCALE	0.0034	IN

DATA HIST. CODE #E

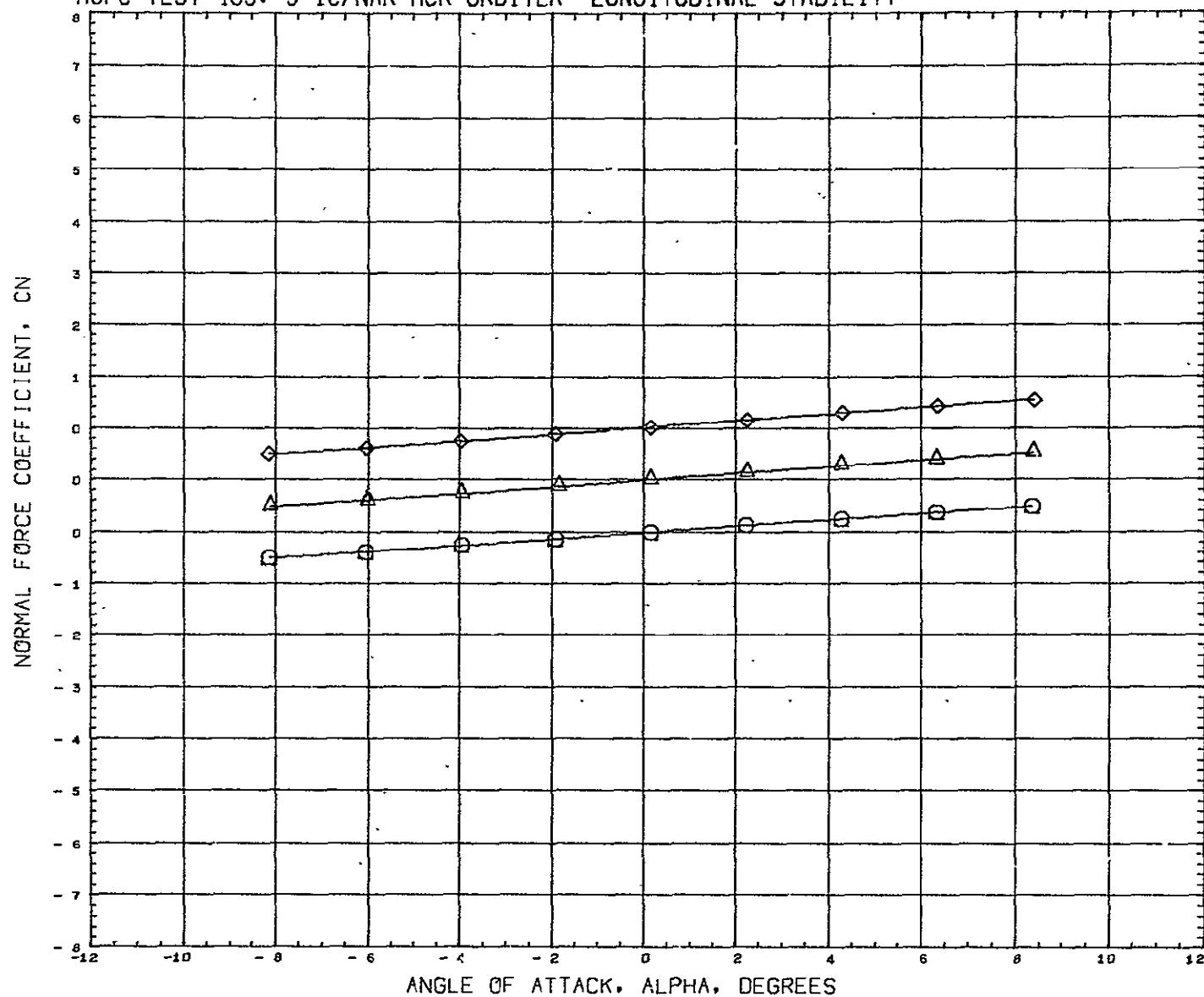
M485-MSFC-S1C NAR HCR ORBITER

OB:VD2

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MSFC TEST 485. S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL MACH BETA PARAMETRIC VALUES
 ○ 0.904
 △ 1.003
 ◇ 1.200

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP - 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034 TN

DATA HIST. CODE #E

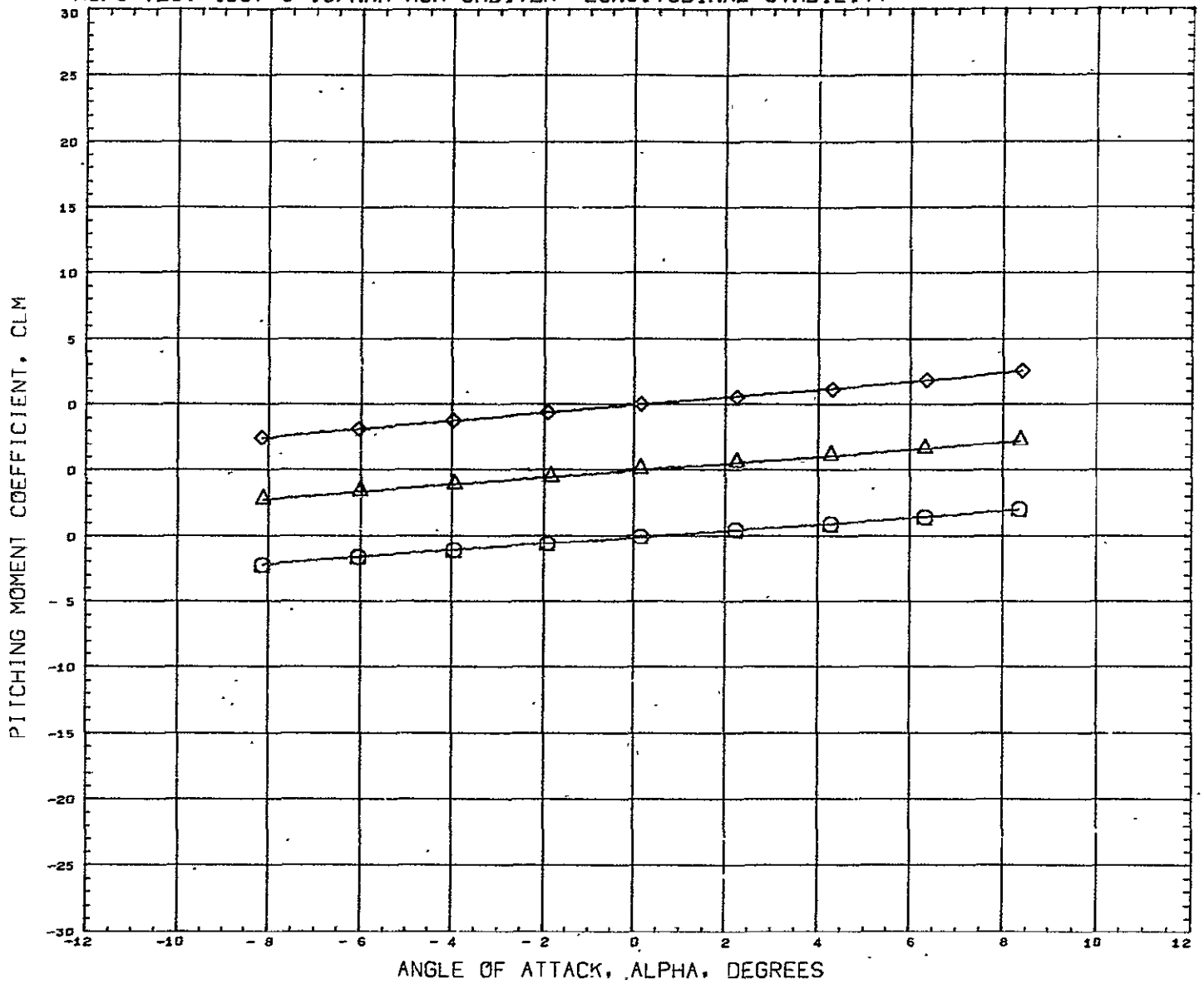
M485-MSFC-S1C NAR HCR ORBITER

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

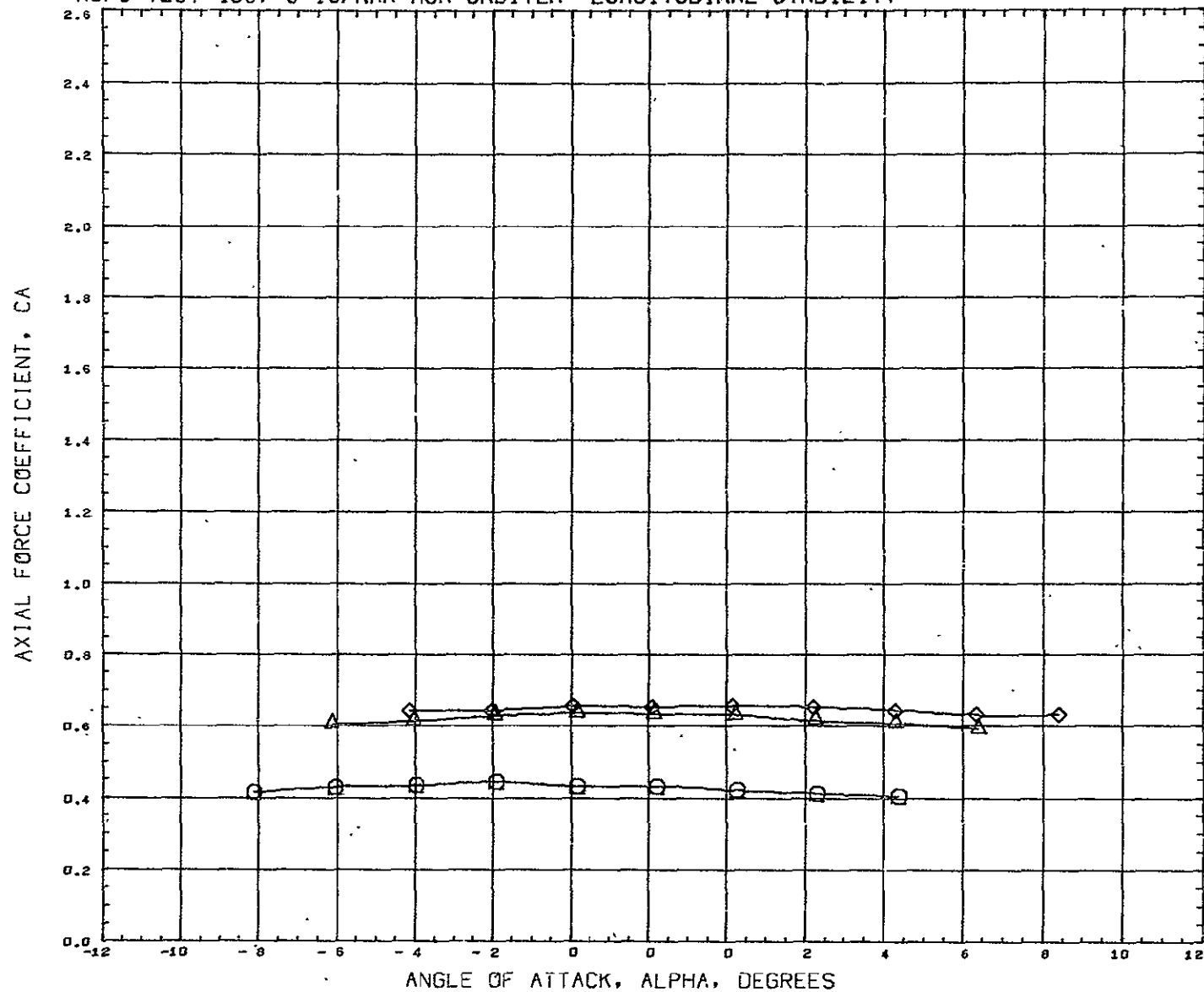


SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.904		0.000
△	1.003		
◇	1.200		

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0570	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *E

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.904		0.000
△	1.003		
◇	1.200		

REFERENCE INFORMATION		
REFS	1.3960	sq. in.
REFL	1.3330	in
REF0	1.3330	in
XMRP	0.0370	in
YMRP	0.0000	in
ZMRP	0.0000	in
SCALE	0.0034	

DATA HIST. CODE *E

M485-MSFC-S1C NAR HCR ORBITER

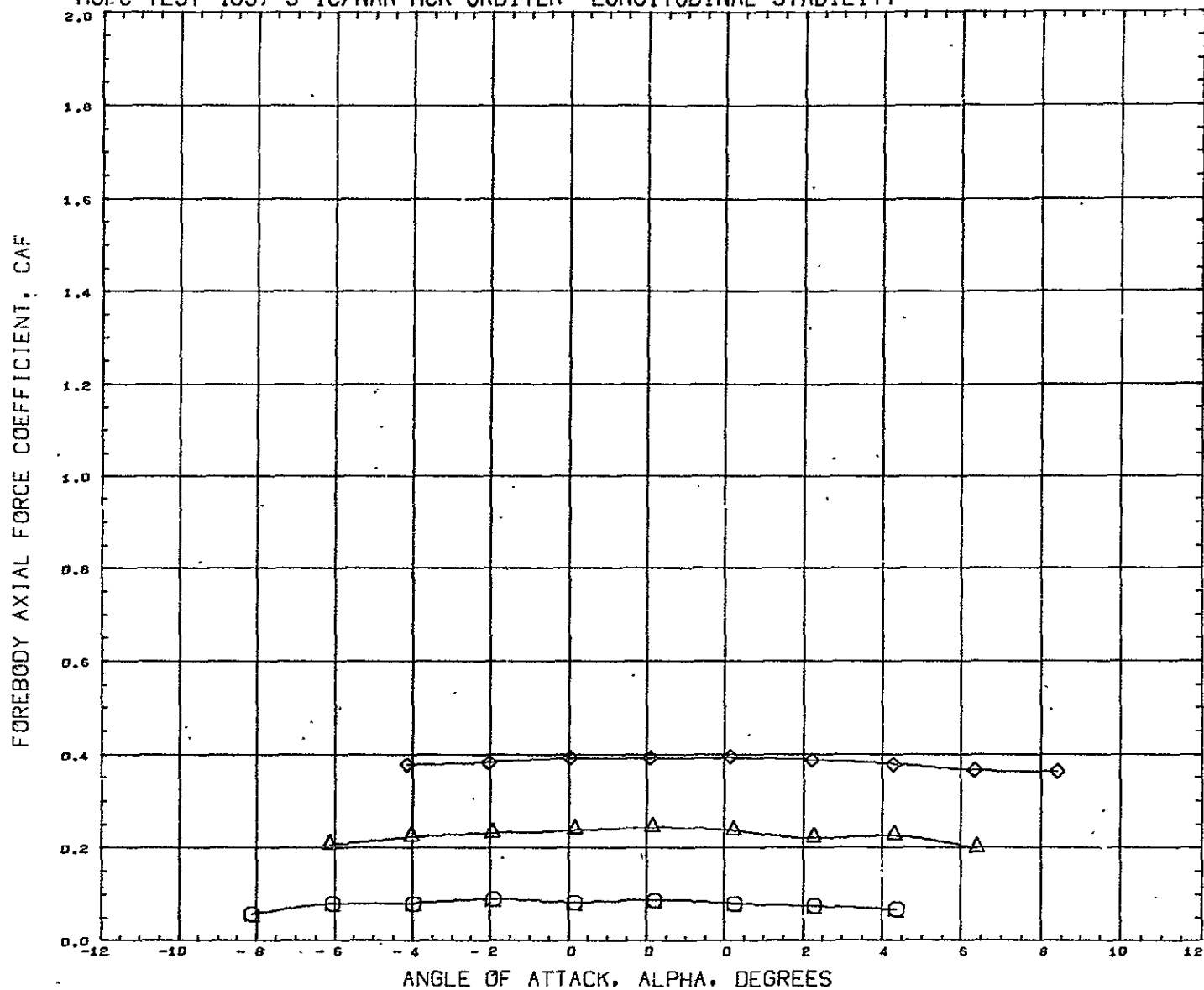
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MSEC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL MACH BETA PARAMETRIC VALUES

○ 0.904 0.000

△ 1.003

◇ 1.200

REFERENCE INFORMATION

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REFL 1.3330 IN

REFB 1.3330 IN

XMRP 0.0370 IN

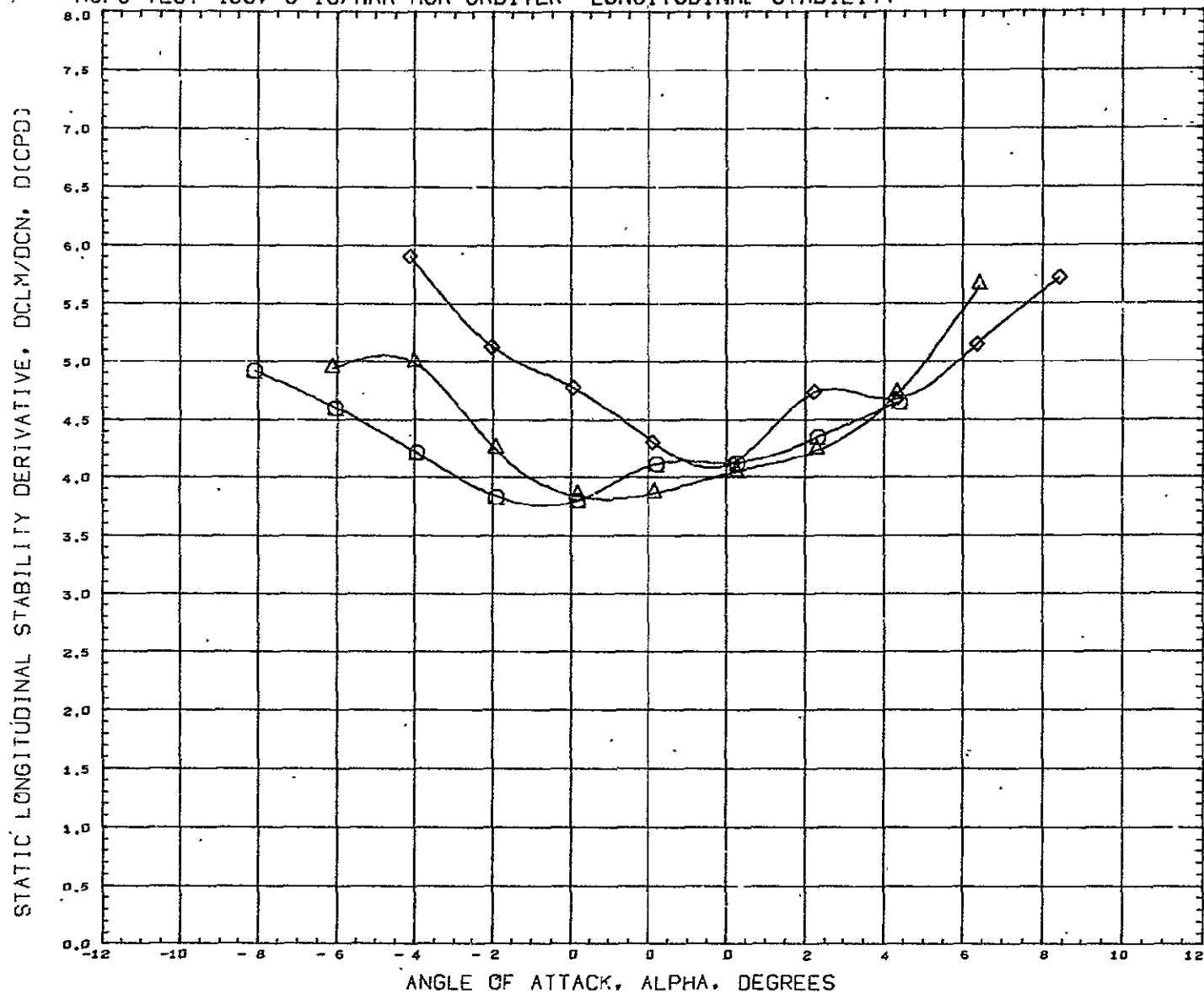
YMRP 0.3000 IN

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SCALE 0.0034

DATA HIST. CODE. #E

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

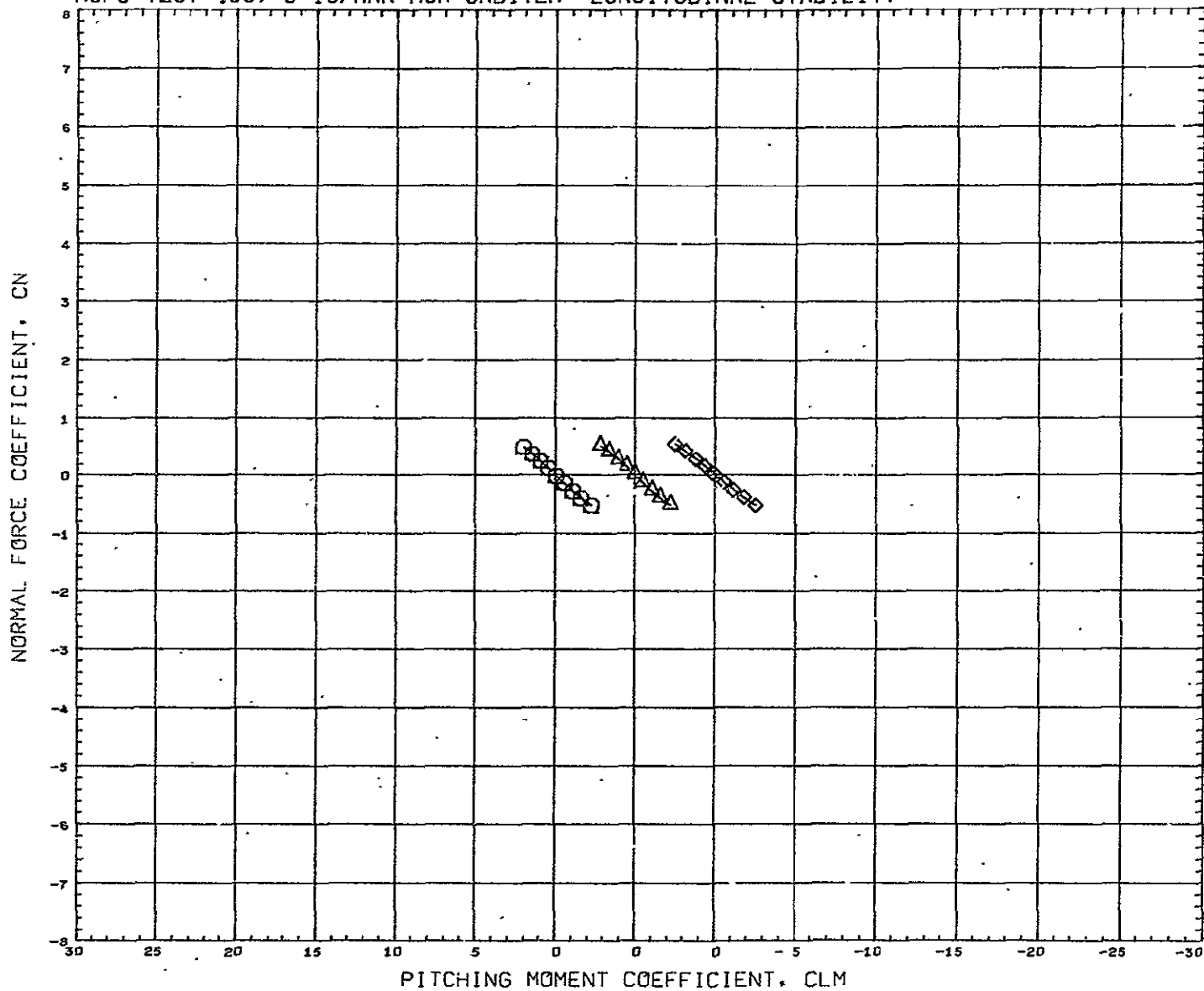


SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.904		0.000
△	1.003		
◇	1.200		

REFERENCE INFORMATION		
REFS	1.3960	50. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0000	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE #E

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

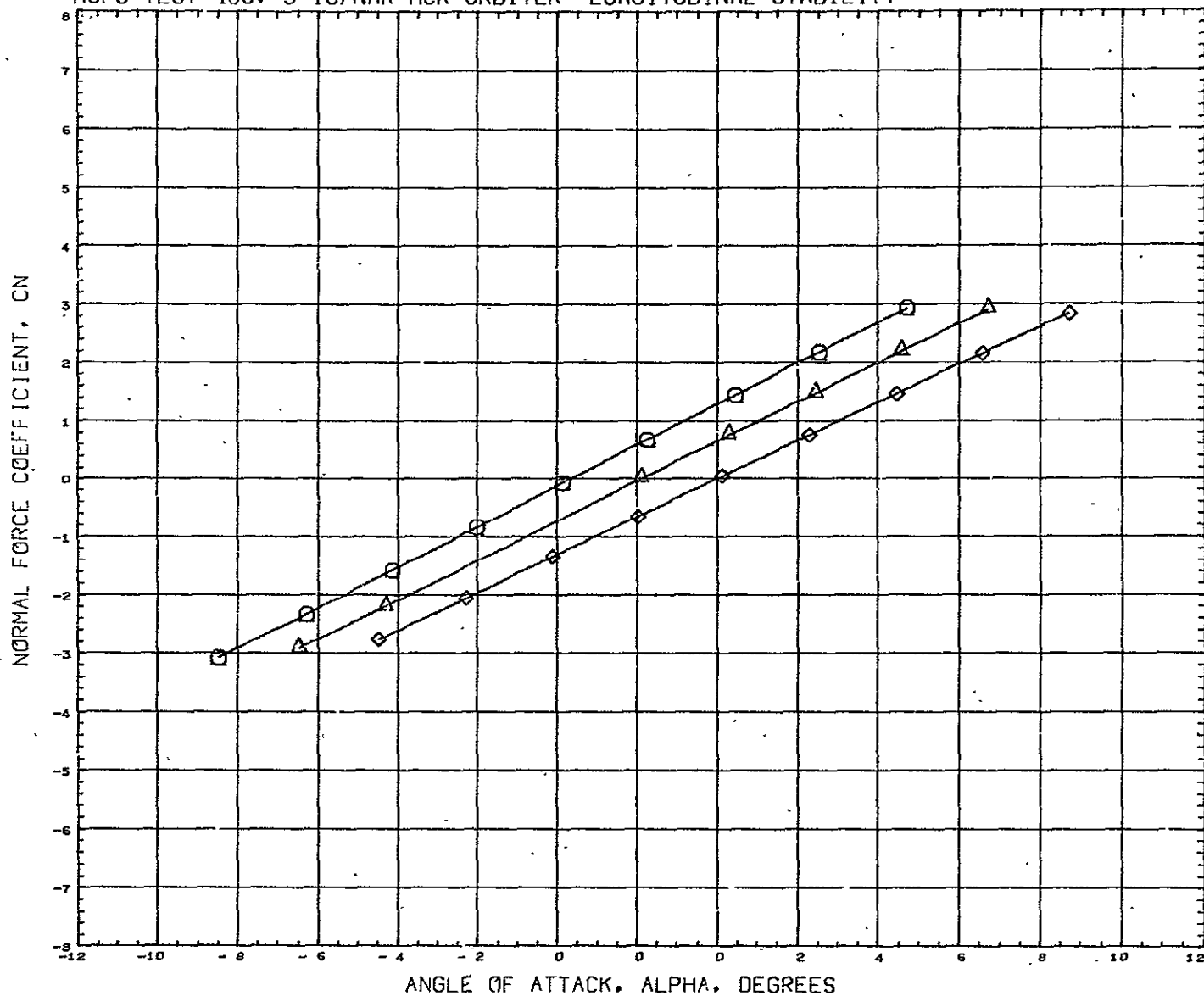


SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.904		0.000
△	1.003		
◇	1.200		

REFERENCE INFORMATION		
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REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0570	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE #E

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL MACH BETA PARAMETRIC VALUES

○ 0.904 0.000

△ 1.009

◇ 1.201

REFERENCE INFORMATION

REFS 1.3960 SQ. IN.

REFL 1.3330 IN

REFB 1.3330 IN

XMRP 0.0370 IN

YMRP 0.0000 IN

ZMRP 0.0000 IN

SCALE 0.0034

DATA HIST. CODE *E

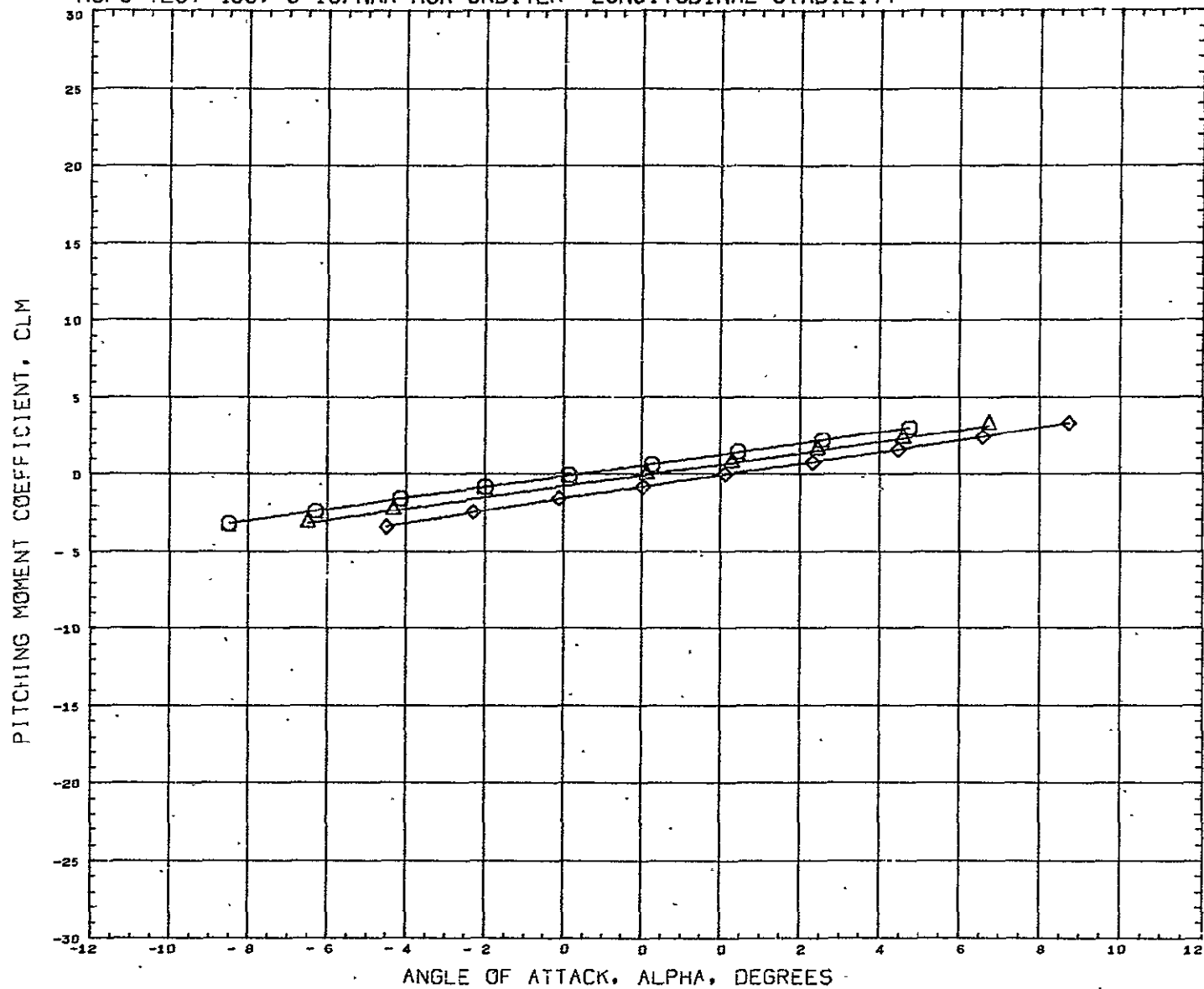
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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL MACH
 ○ 0.904
 △ 1.009
 ◇ 1.201

PARAMETRIC VALUES
 BETA 0.000

REFERENCE INFORMATION

REFS	1.3960	SO.IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *E

M485-MSFC-S1C NAR HCR ORBITER

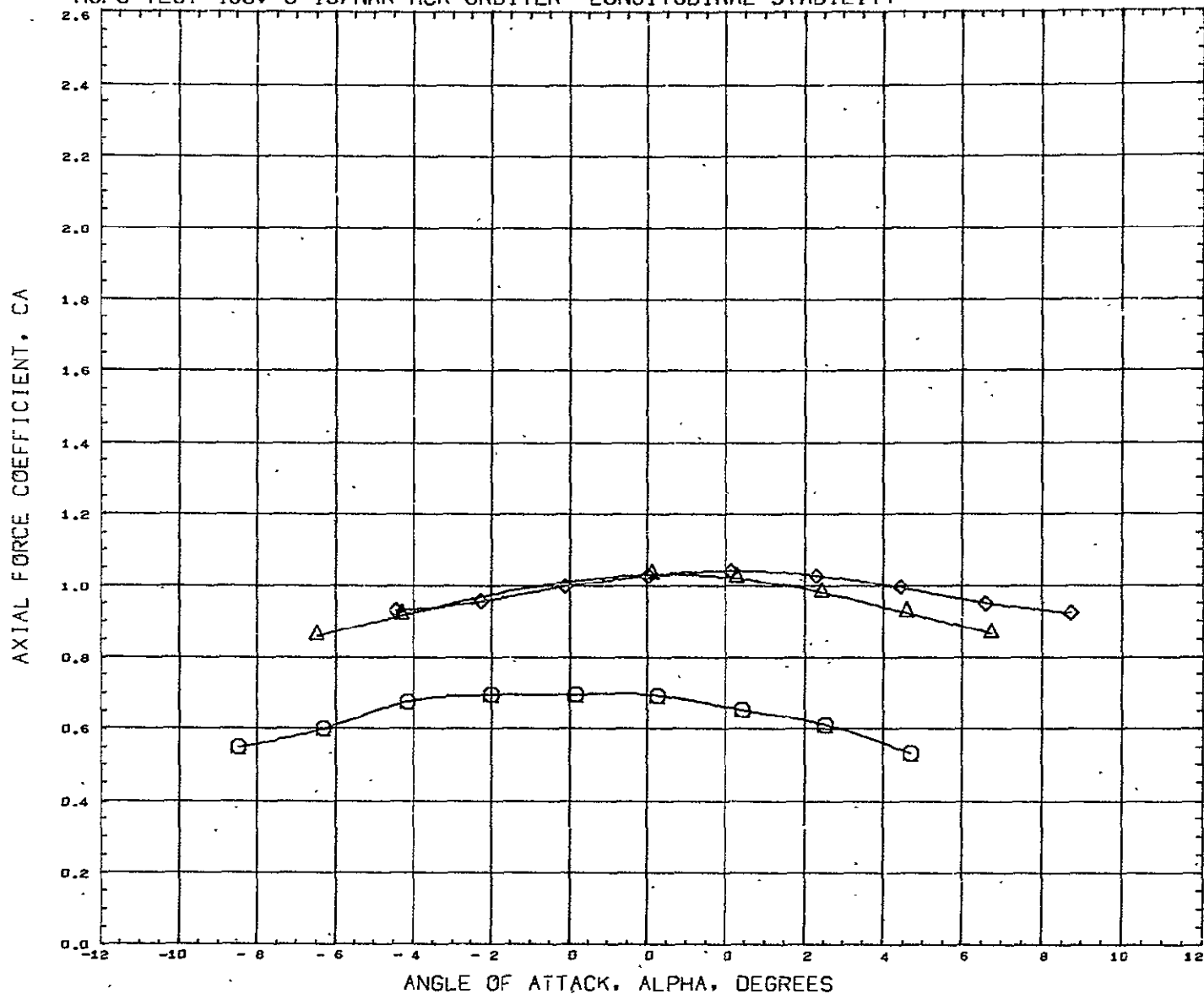
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68

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL MACH BETA PARAMETRIC VALUES

$\circ$ 0.904 0.000 0.000

$\triangle$ 1.009

$\diamond$ 1.201

REFERENCE INFORMATION

REFS 1.3960 SQ. IN.

REFL 1.3330 IN

REFB 1.3330 IN

XMRP 0.0373 IN

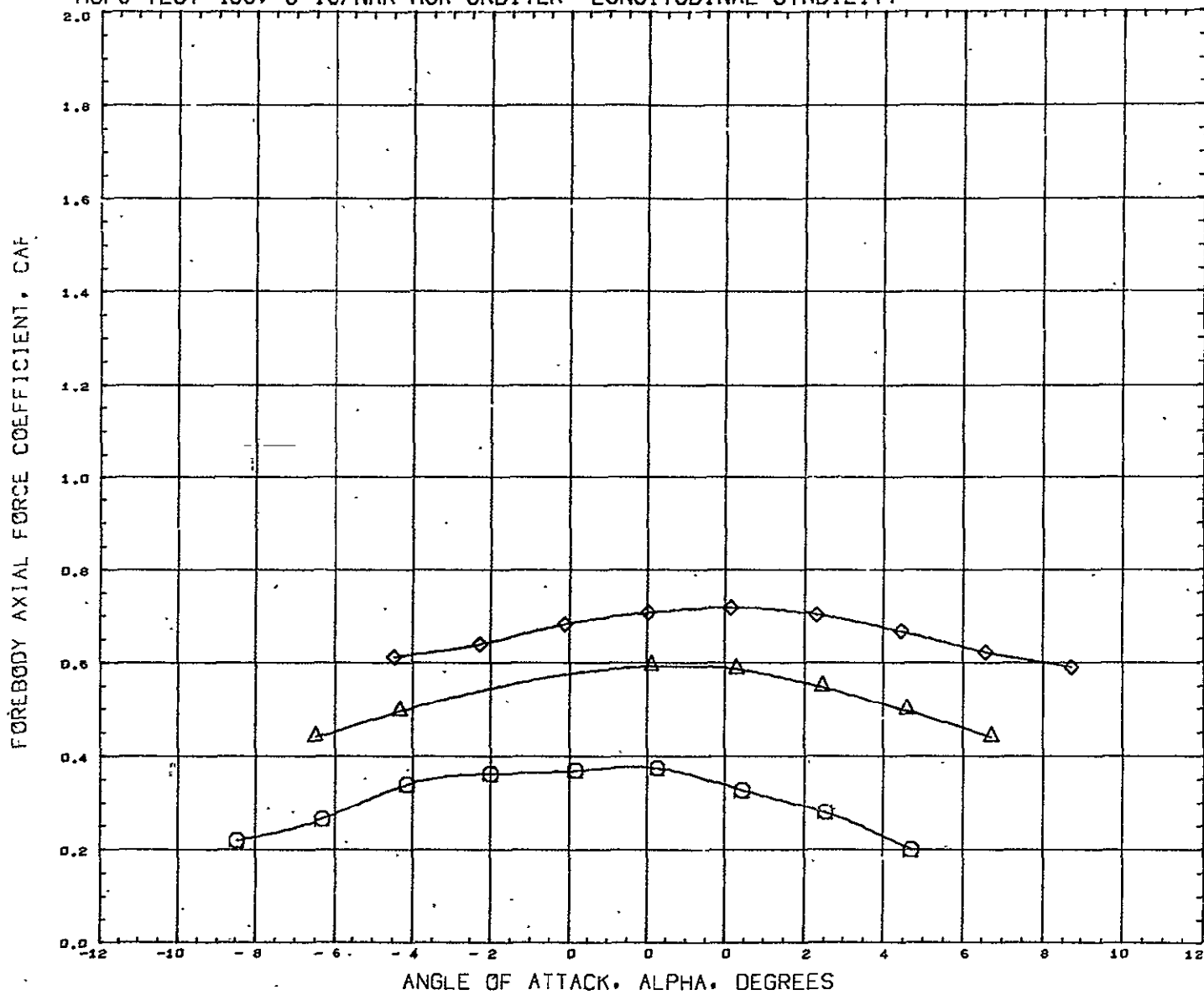
YMRP 0.0000 IN

ZMRP 0.0000 IN

SCALE 0.0034

DATA HIST. CODE #E

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL MACH BETA PARAMETRIC VALUES

○ 0.904 0.000

△ 1.009 0.000

◇ 1.201 0.000

REFERENCE INFORMATION

REFS 1.3960 SQ. IN.

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REFB 1.3330 IN

XMRP - 0.0370 IN

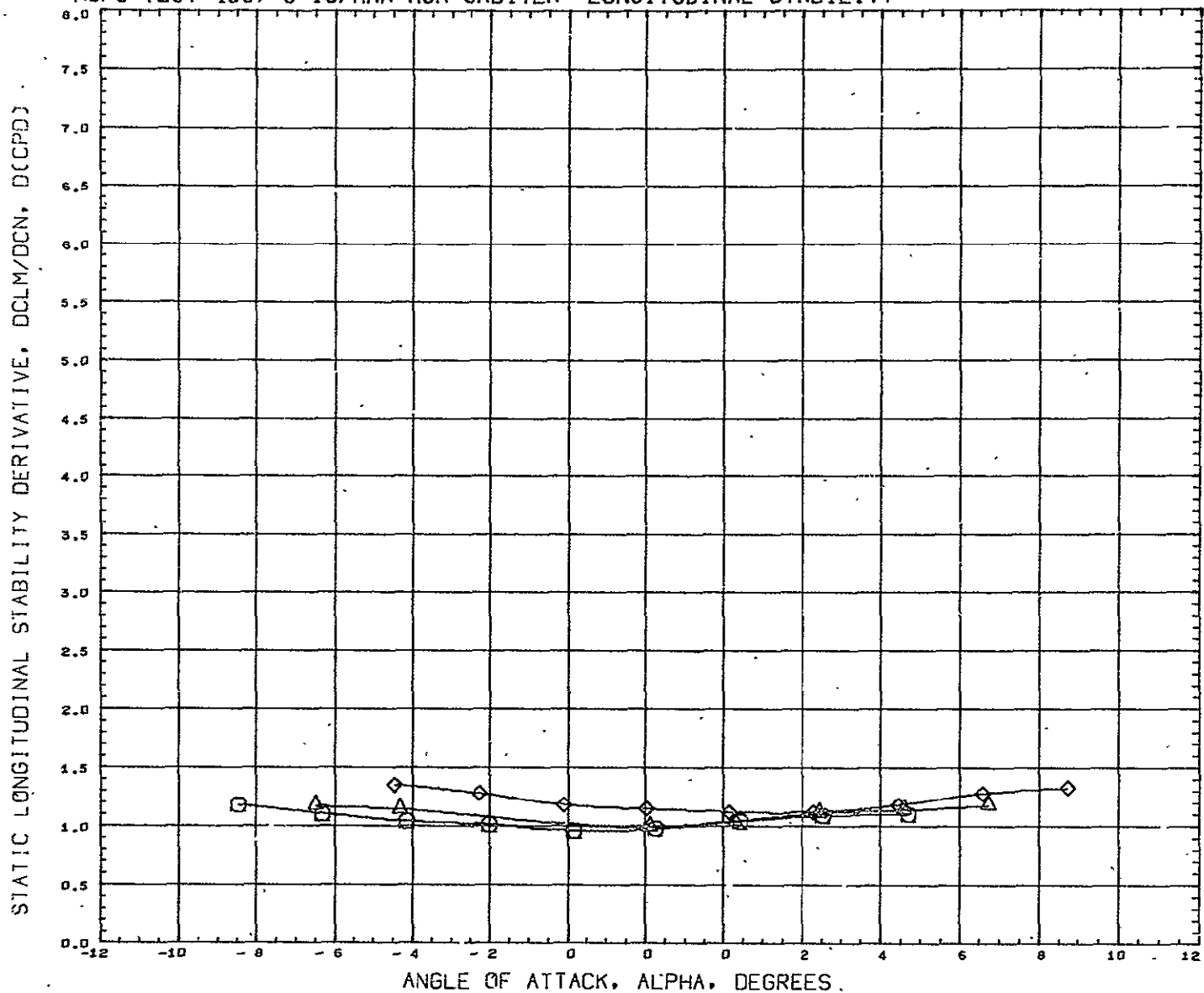
YMRP 0.0000 IN

ZMRP 0.0000 IN

SCALE 0.0034

DATA HIST. CODE *E

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
□	0.904		0.000
△	1.009		
◇	1.201		

REFERENCE INFORMATION		
REFS	1.3960	50. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRF	0.0370	IN
YMRF	0.0000	IN
ZMRF	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE WE

M485-MSFC-S1C NAR HCR ORBITER

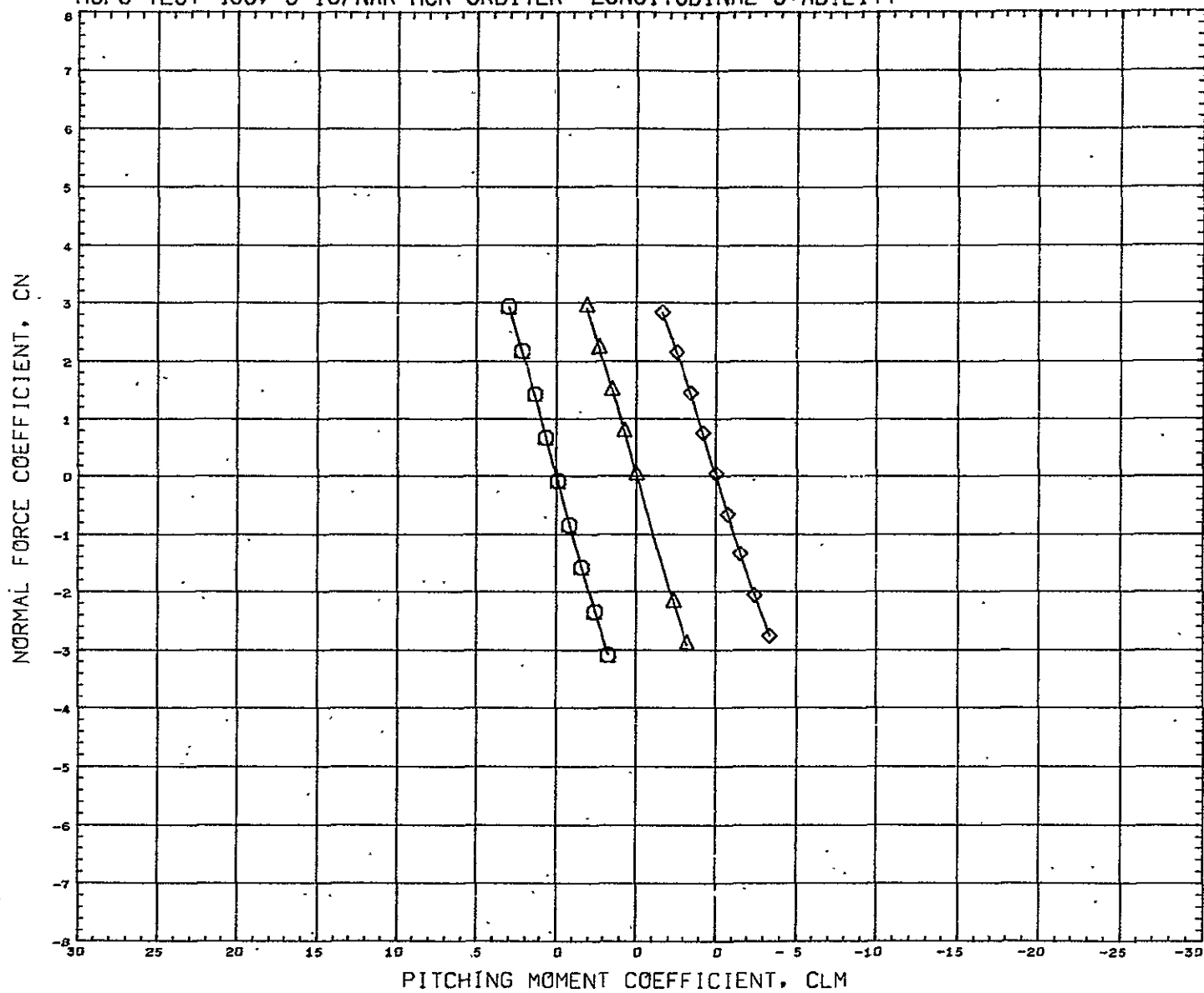
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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

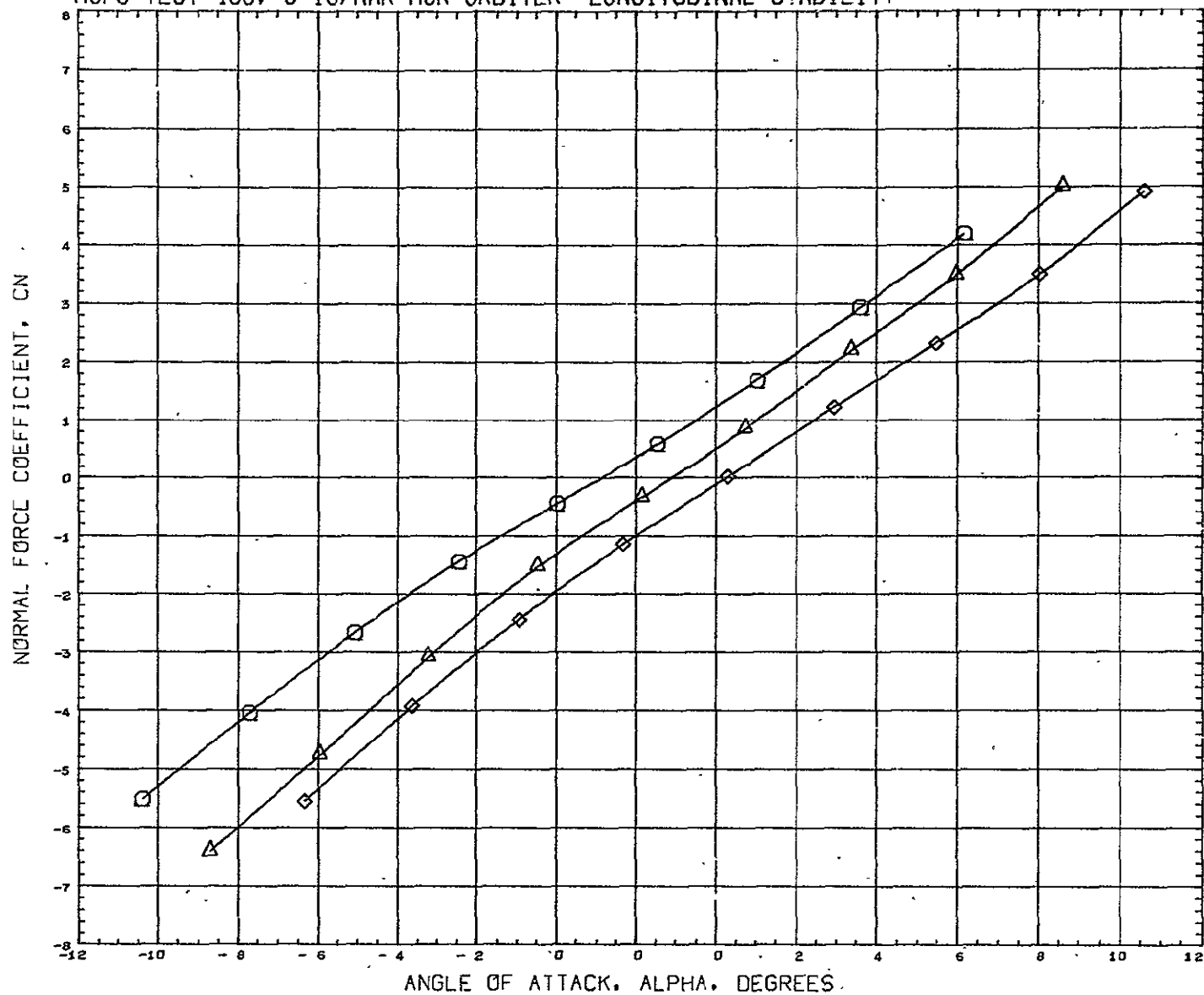


SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.904		0.000
△	1.009		
◇	1.201		

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *E

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.905		0.050
△	1.005		
◇	1.201		

DATA HIST. CODE *E

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

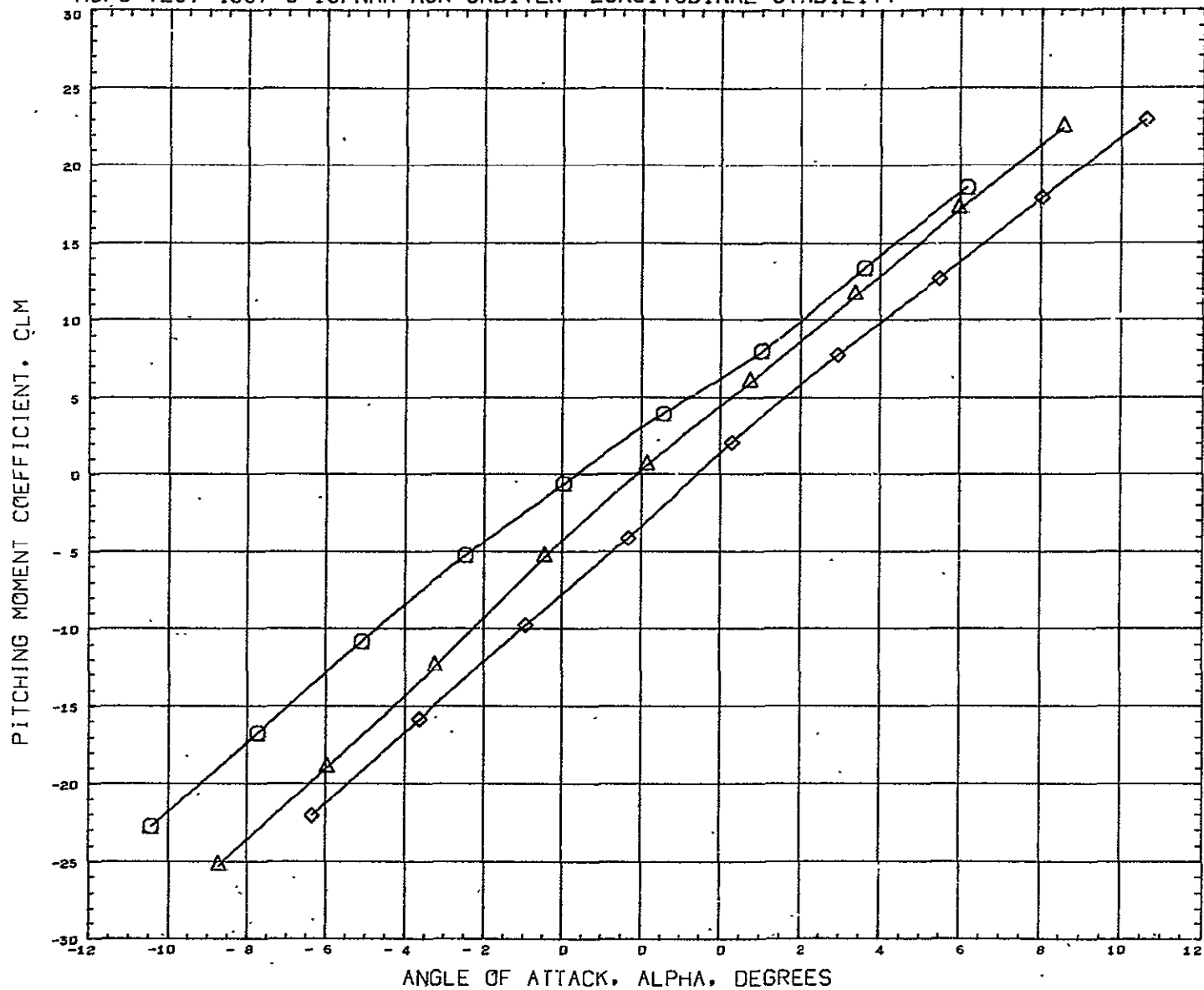
Y485-MSFC-S1C NAR HCR ORBITER

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

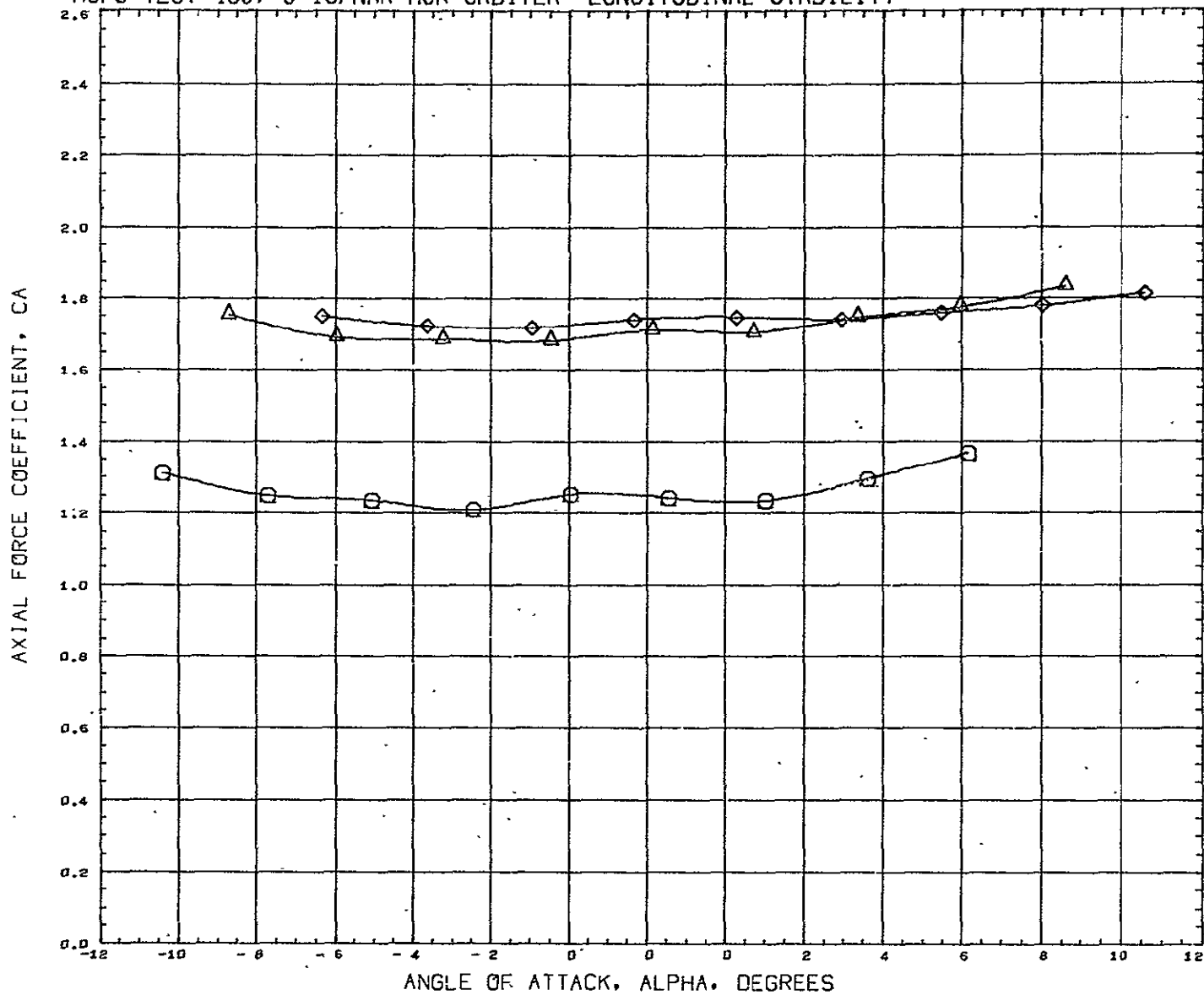


SYMBOL	MACH	BETA	PARAMETRIC VALUES
□	0.905		0.050
△	1.005		
◇	1.201		

REFERENCE INFORMATION		
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REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0003	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE WE

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.905		0.050
△	1.005		
◇	1.201		

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *E

M485-MSFC-S1C NAR HCR ORBITER

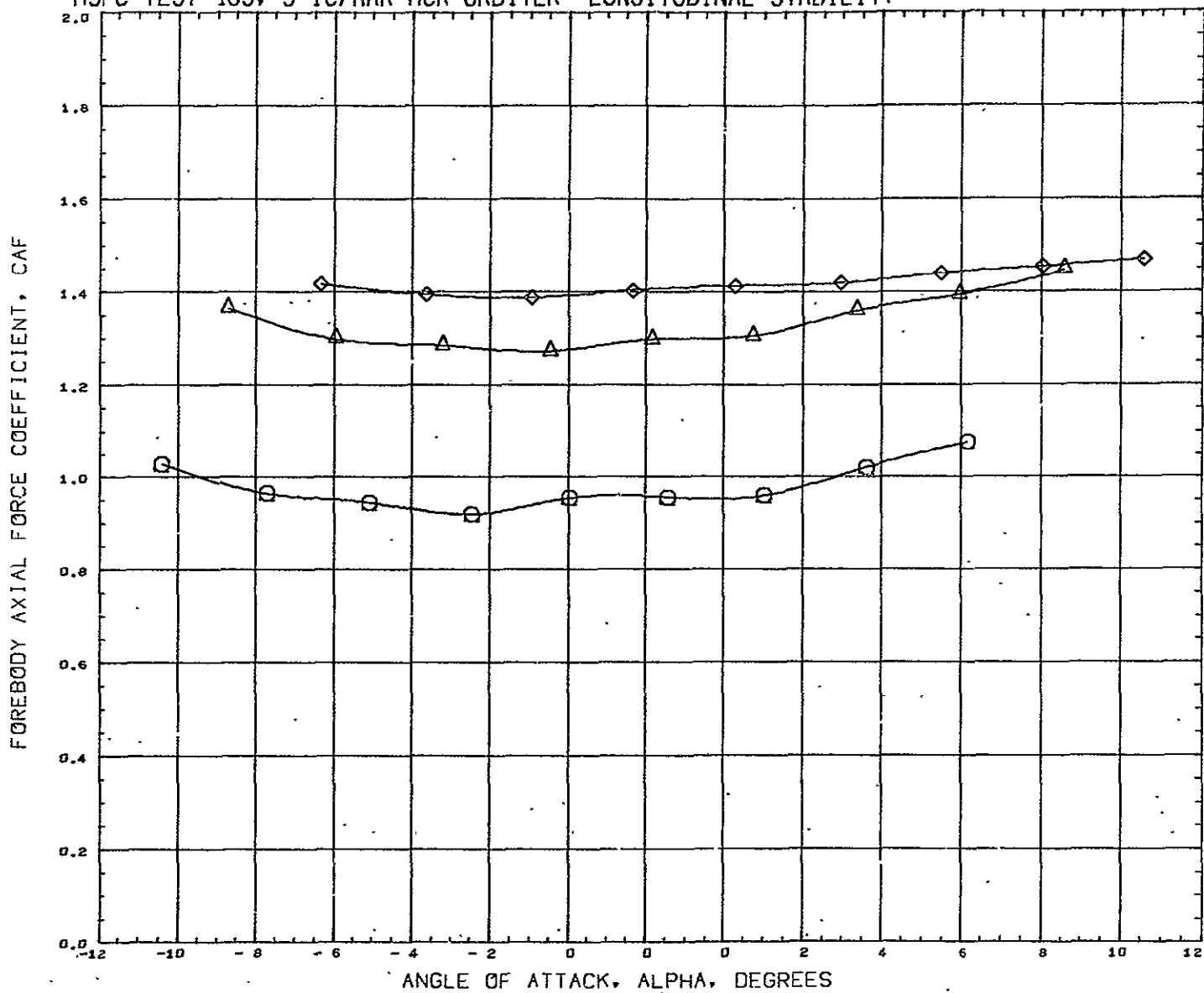
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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

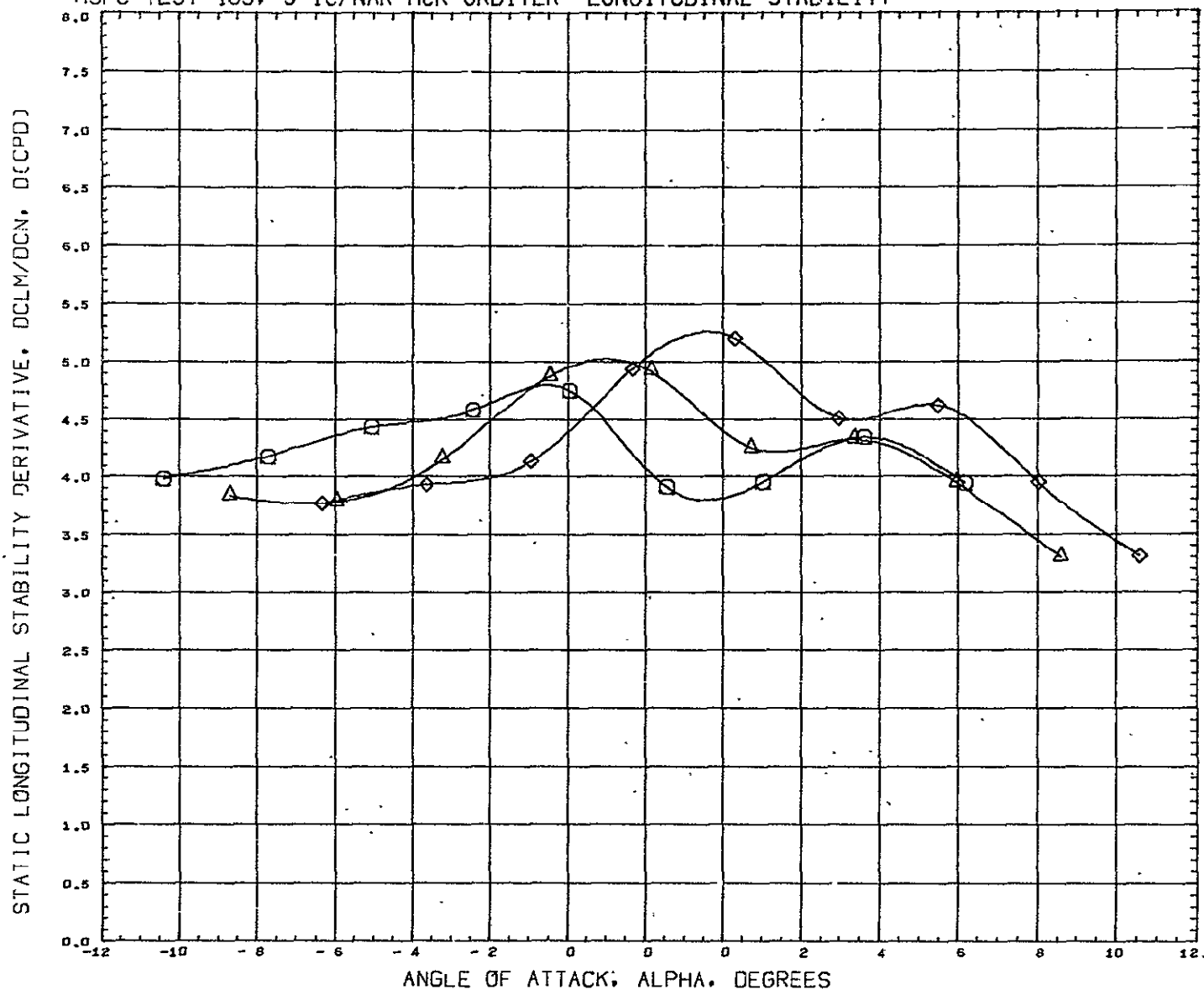


SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.905		0.050
△	1.095		
◇	1.201		

REFERENCE INFORMATION		
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REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.9370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE #E

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL MACH BETA PARAMETRIC VALUES
 ○ 0.905
 △ 1.005
 ◇ 1.201

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
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 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE #E

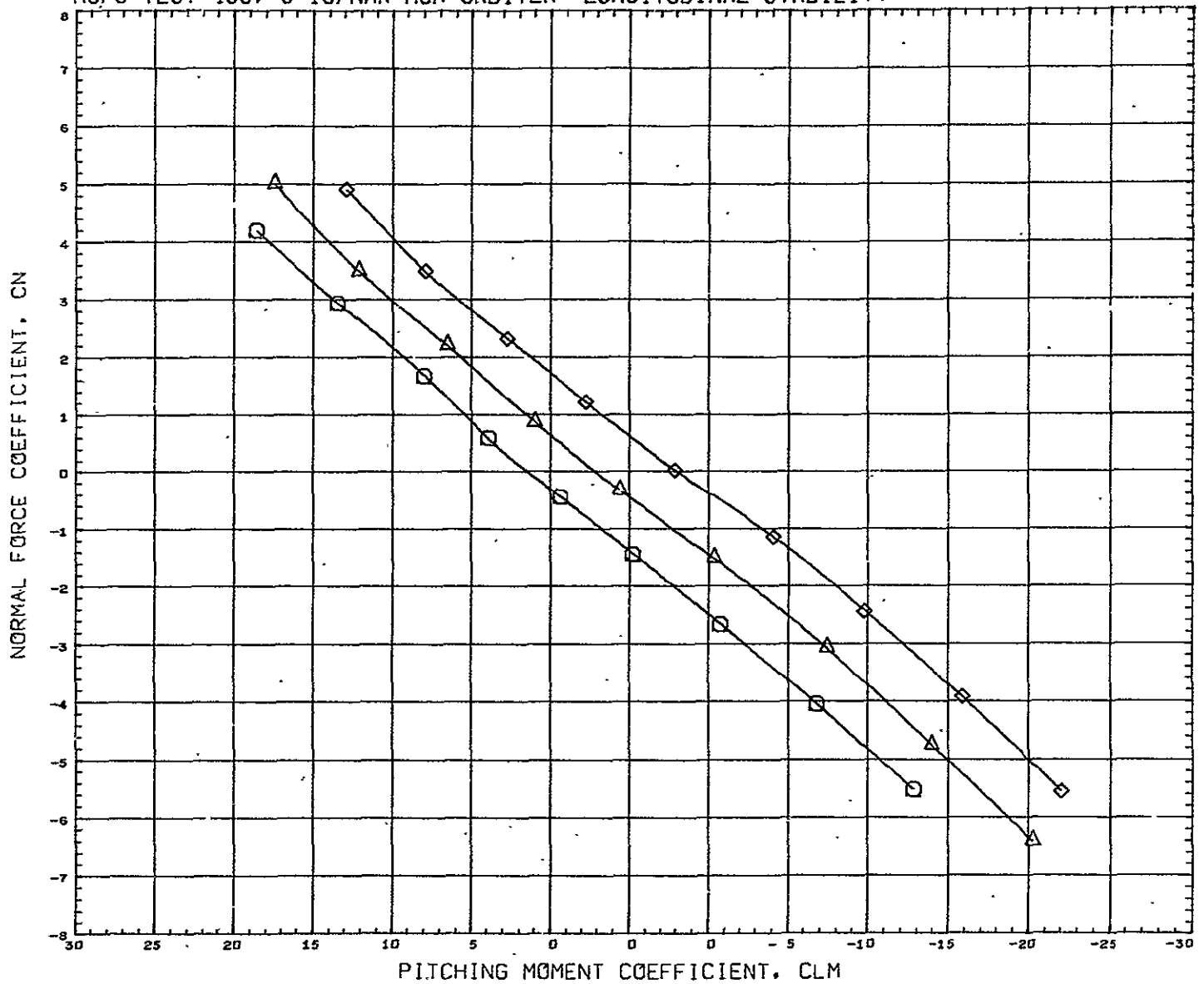
M485-MSFC-S1C NAR HCR ORBITER

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

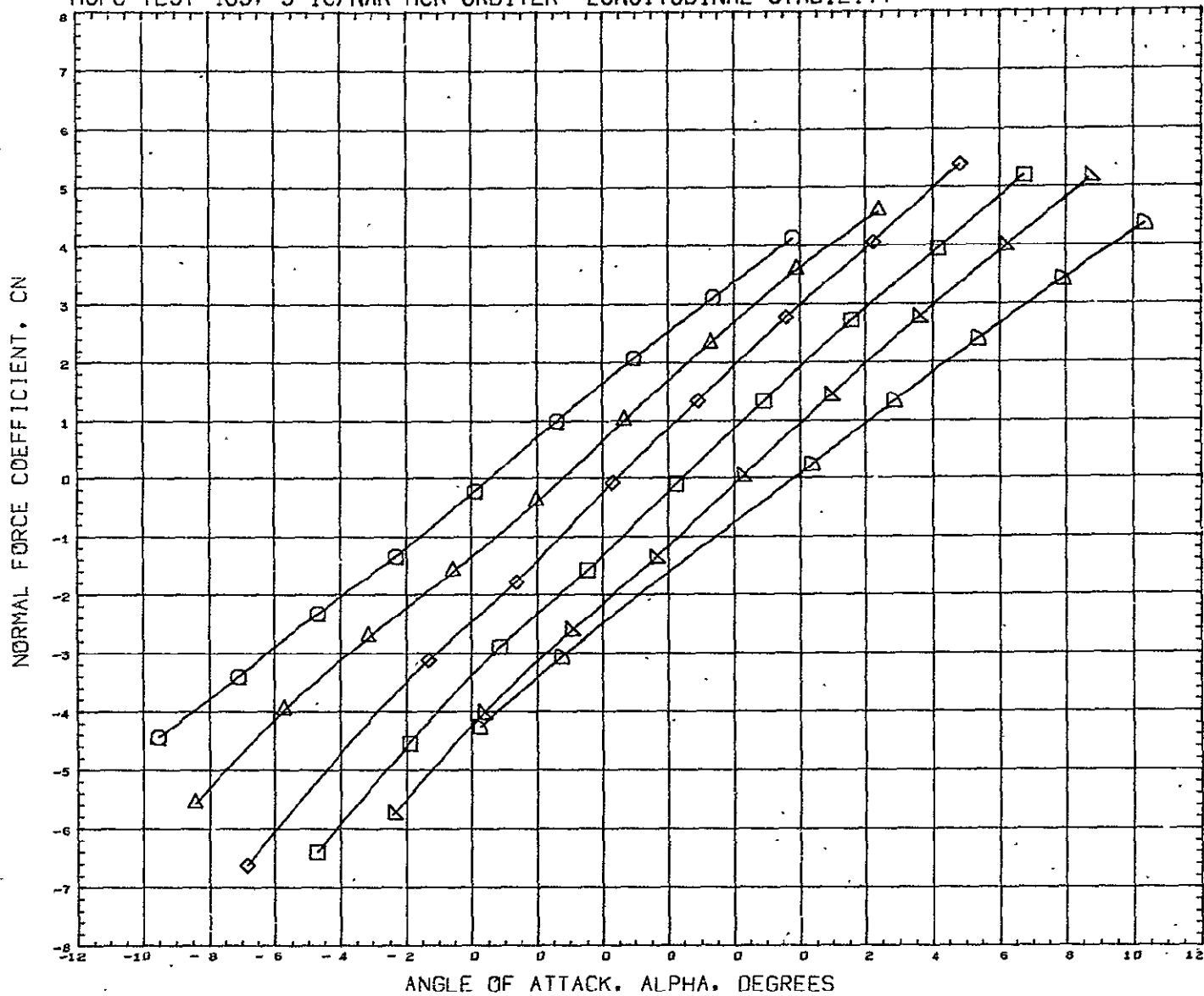


SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.905		0.050
△	1.005		
◇	1.201		

REFERENCE INFORMATION		
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REFL	1.3330	IN
REFB	1.3330	IN
XHRF	0.0370	IN
YHRF	0.0000	IN
ZHRF	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *E

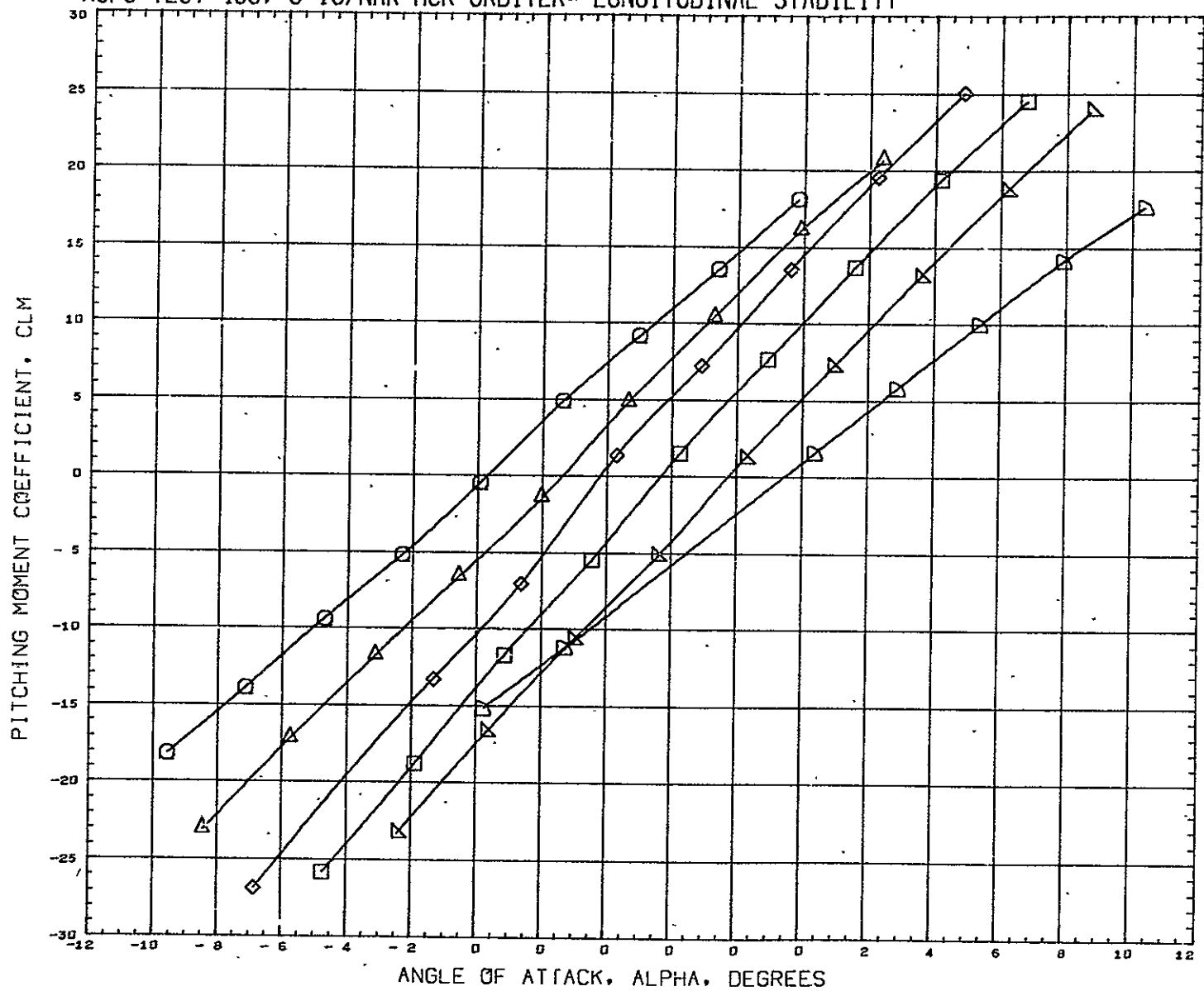
MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.607	0.000	
△	0.903		
□	1.003		
◇	1.102		
◊	1.199		
○●	1.957		

REFERENCE INFORMATION		
REFS	1.3960	sq. in.
REFL	1.3330	in
REFB	1.3330	in
XMRP	0.0370	in
YMRP	0.0000	in
ZMRP	0.0000	in
SCALE	0.0034	

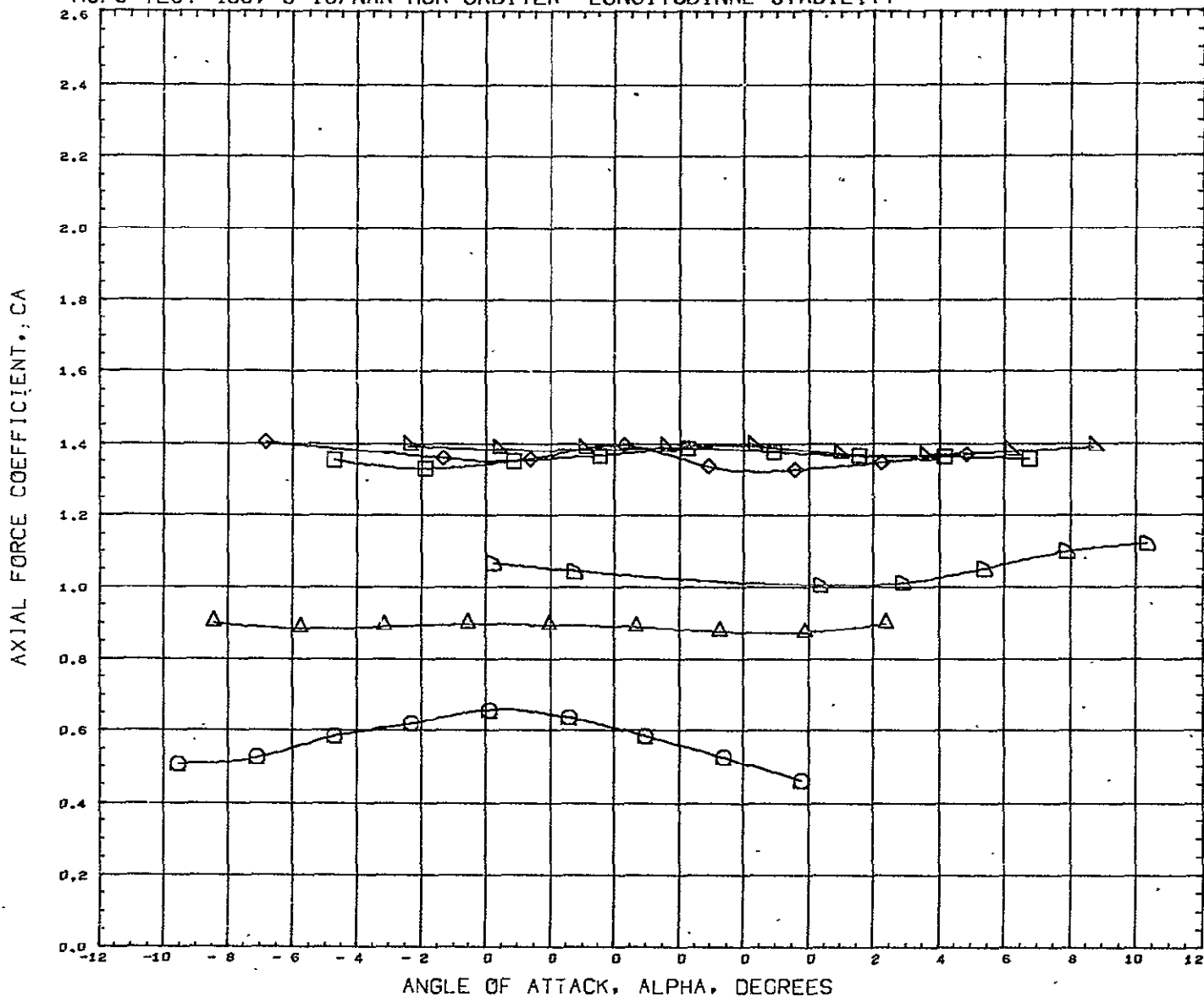
MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.607	0.000	
△	0.903	0.000	
□	1.005	0.000	
◇	1.102	0.000	
▽	1.199	0.000	
	1.957	DATA HIST. CODE	#E

REFERENCE INFORMATION		
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REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.3003	IN
ZMRP	0.0000	IN
SCALE	0.0034	IN

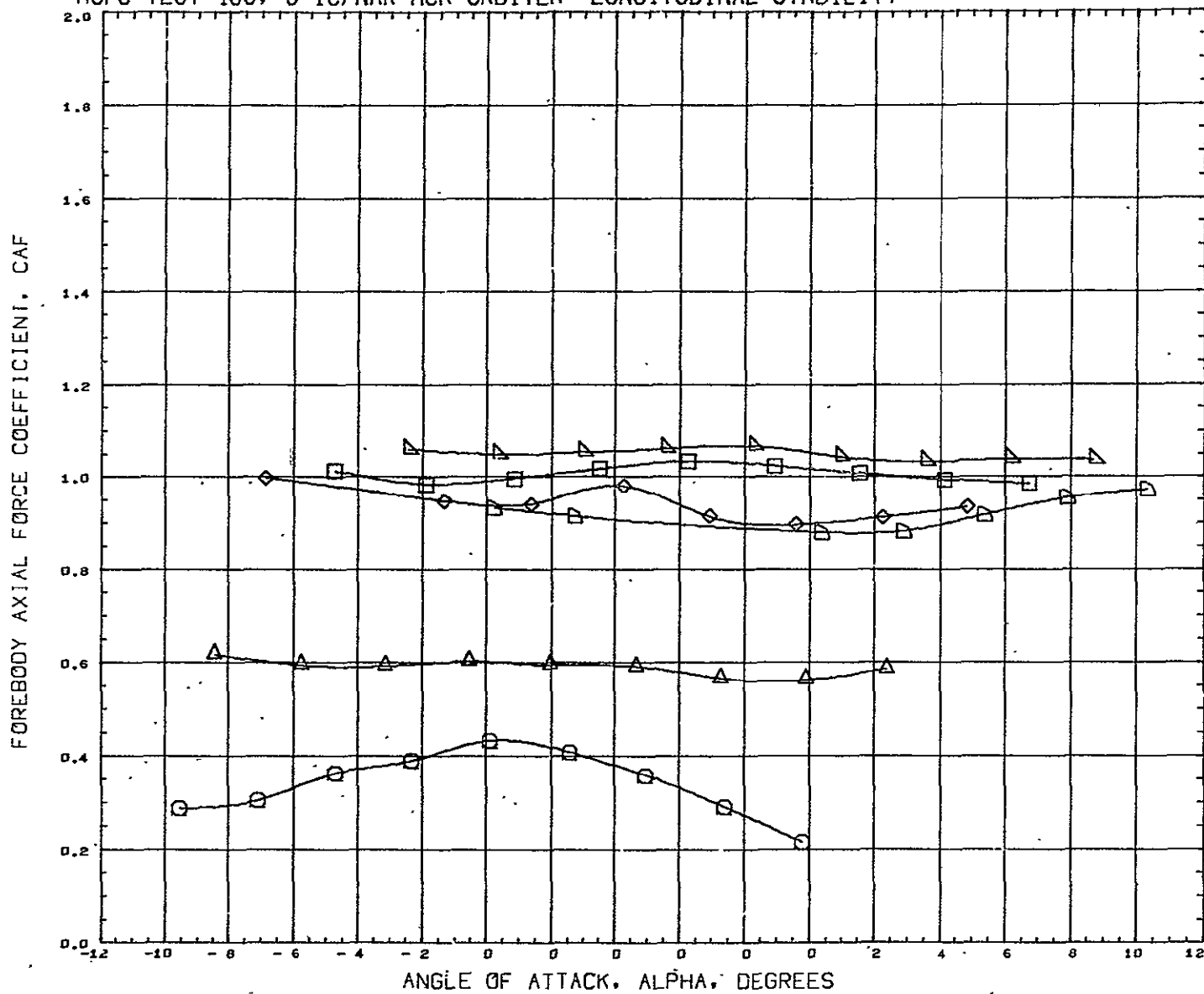
MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL MACH PARAMETRIC VALUES
 O 0.607 BETA 0.000
 Δ 0.903
 □ 1.005
 ◇ 1.102
 ○ 1.199
 ◊ 1.957 DATA HIST. CODE #E

REFERENCE INFORMATION
 REFS 1.3960 SO. IN.
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 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

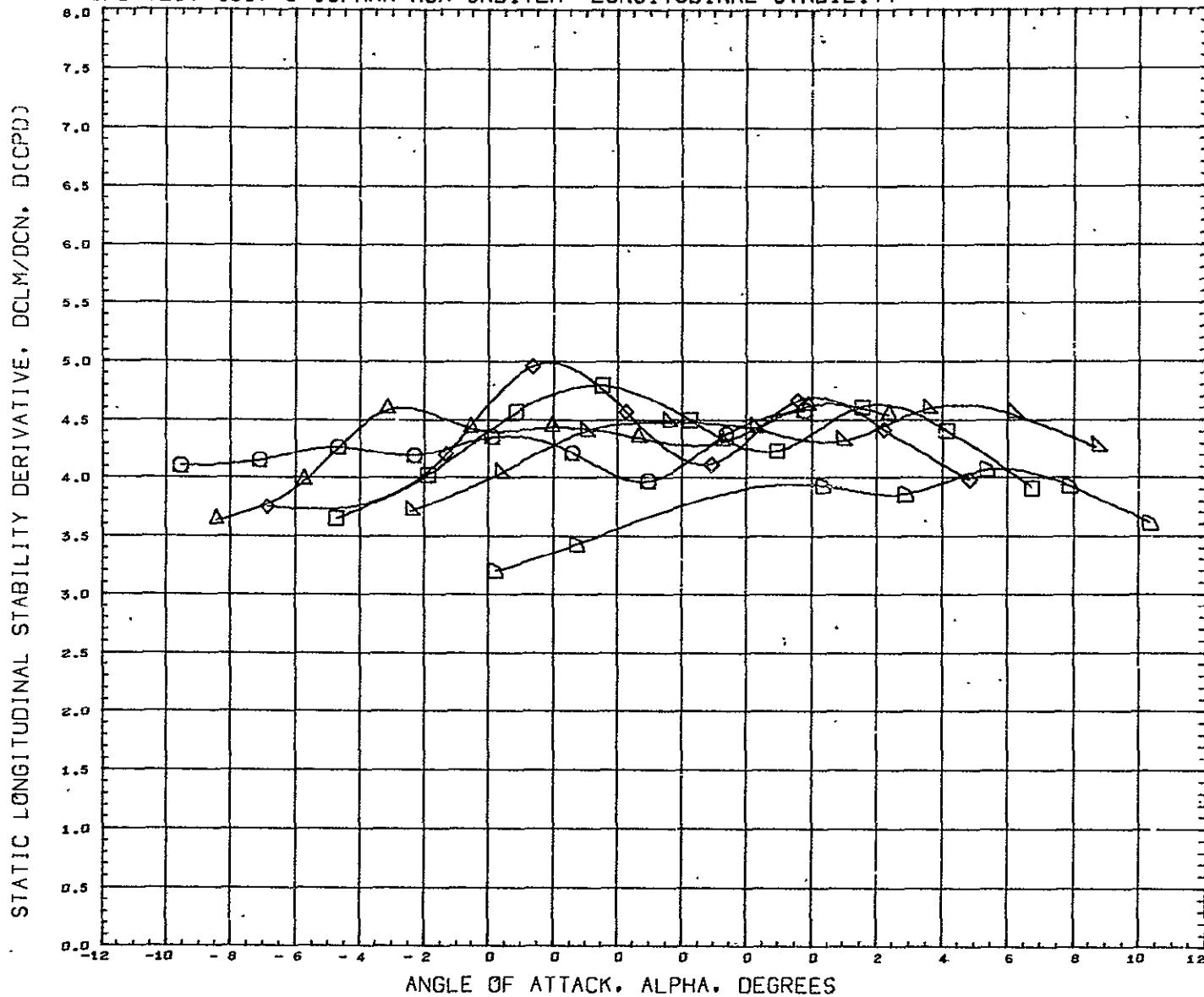
MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.607		0.000
□	0.903		
△	1.005		
◇	1.102		
▽	1.199		
◇	1.957	DATA HIST. CODE	*E

REFERENCE INFORMATION		
REFS	1.3960	50. IN.
REFL	1.3330	IN
REFS	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

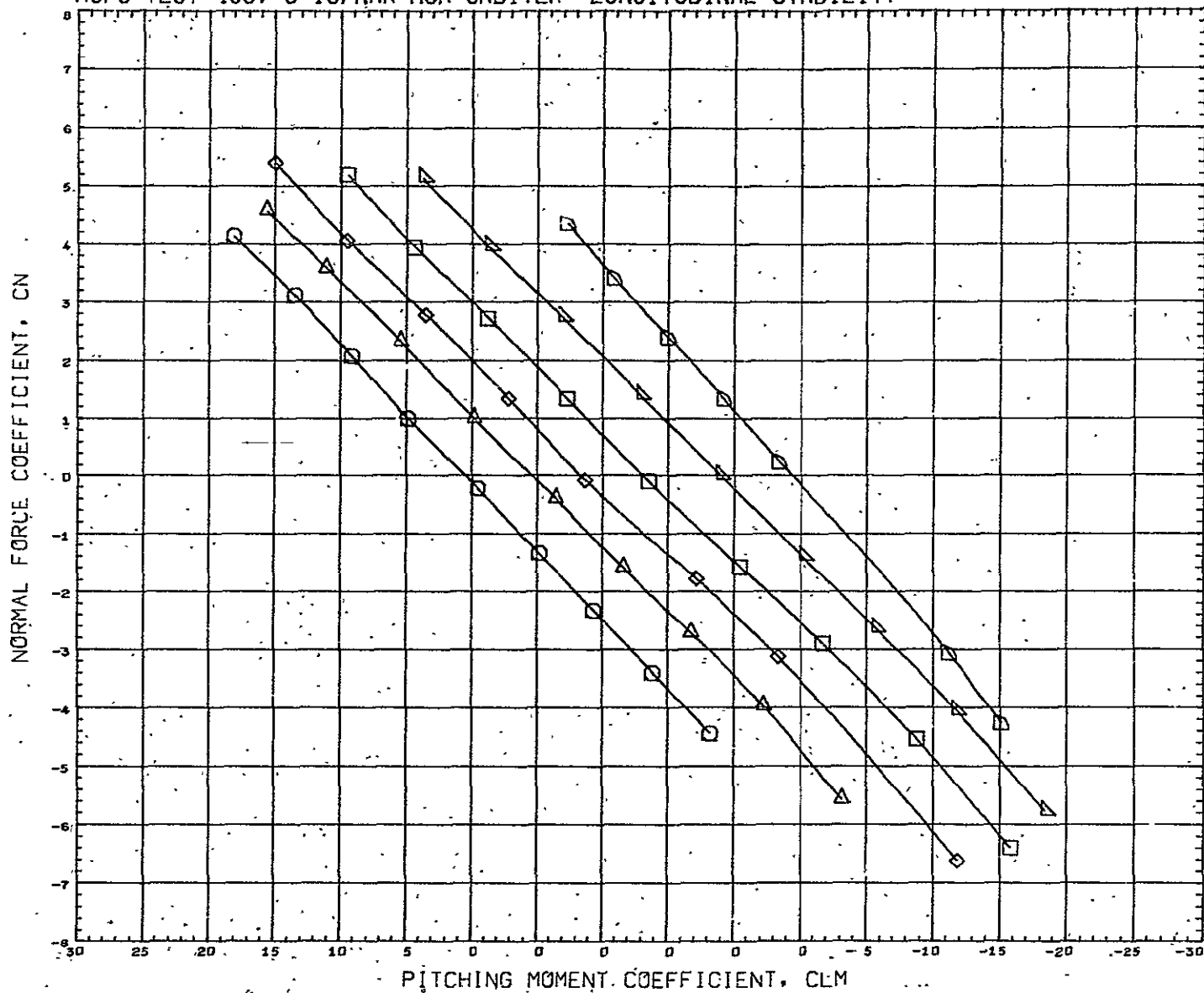
MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.607		0.000
△	0.903		
◇	1.005		
□	1.102		
▽	1.199		
◇	1.957	DATA HIST. CODE	#E

REFERENCE INFORMATION		
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REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	1.0500	IN
ZMRP	0.0000	IN
SCALE	0.0034	

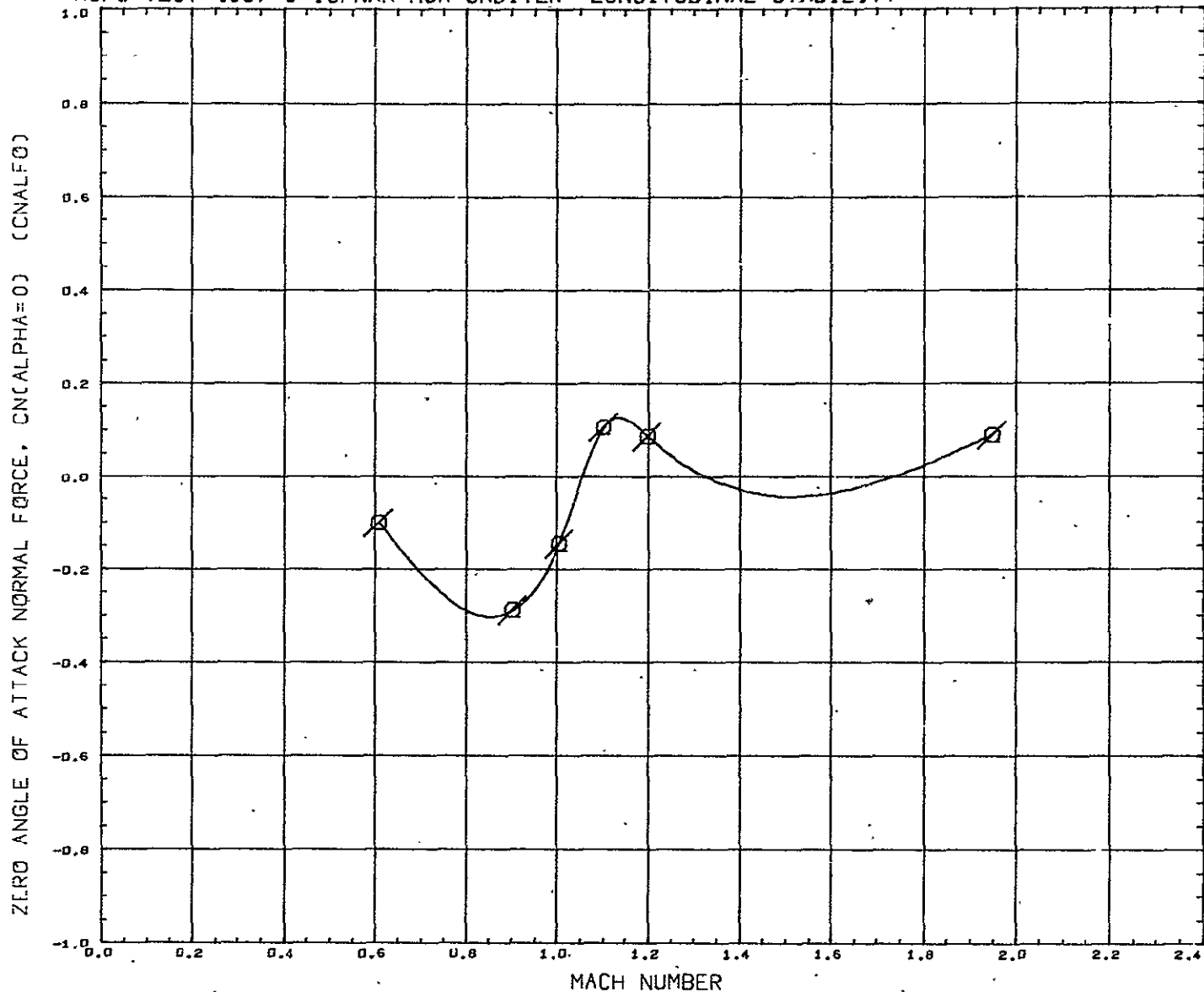
MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL MACH PARAMETRIC VALUES
 O 0.607 BETA 0.000
 □ 0.903
 △ 1.005
 ◇ 1.102
 ▽ 1.199
 ○ 1.957 DATA HIST. CODE #E

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



PARAMETRIC VALUES
BETA 0.030

REFERENCE INFORMATION.

REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EF

M485-MSFC-S1C NAR HCR ORBITER

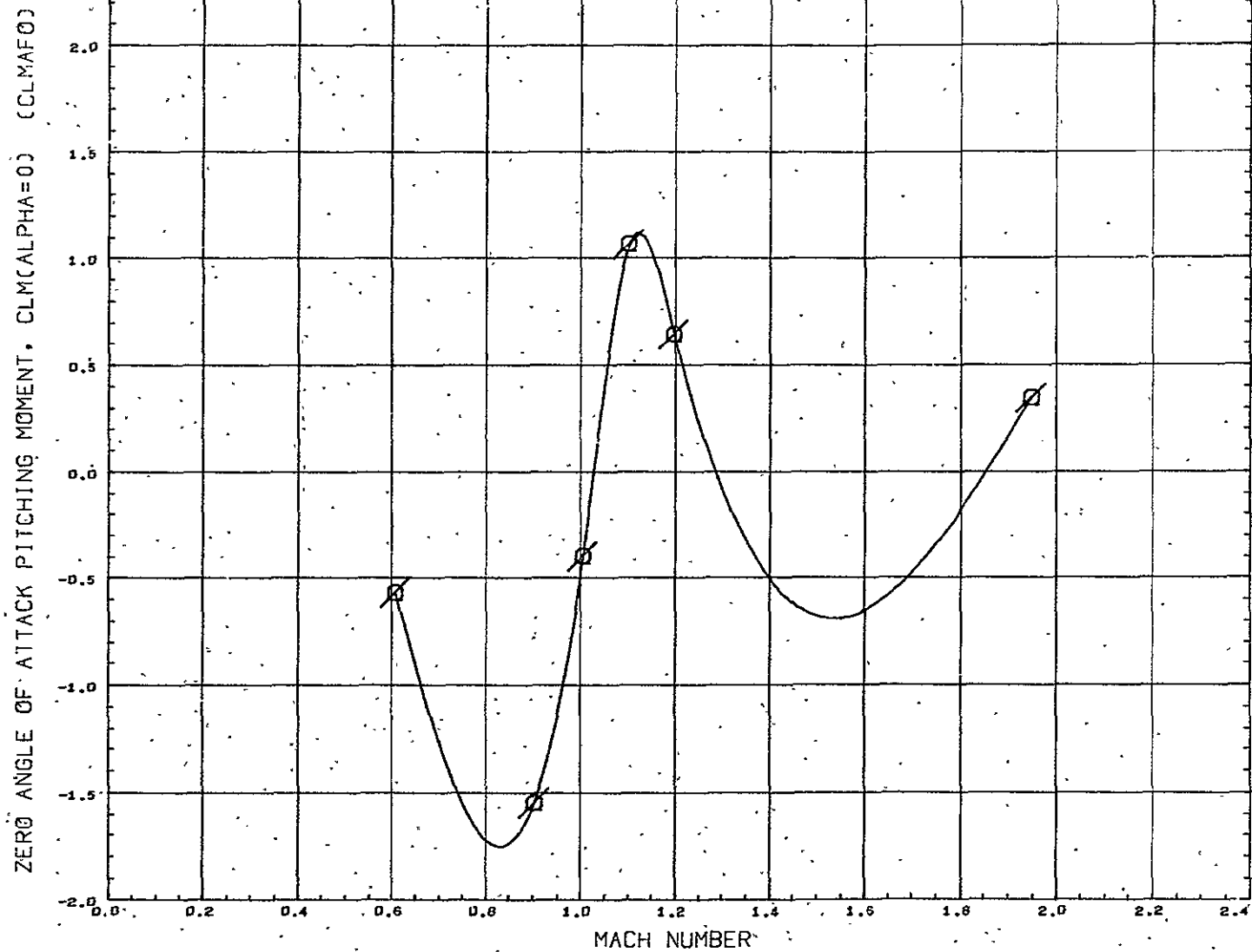
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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

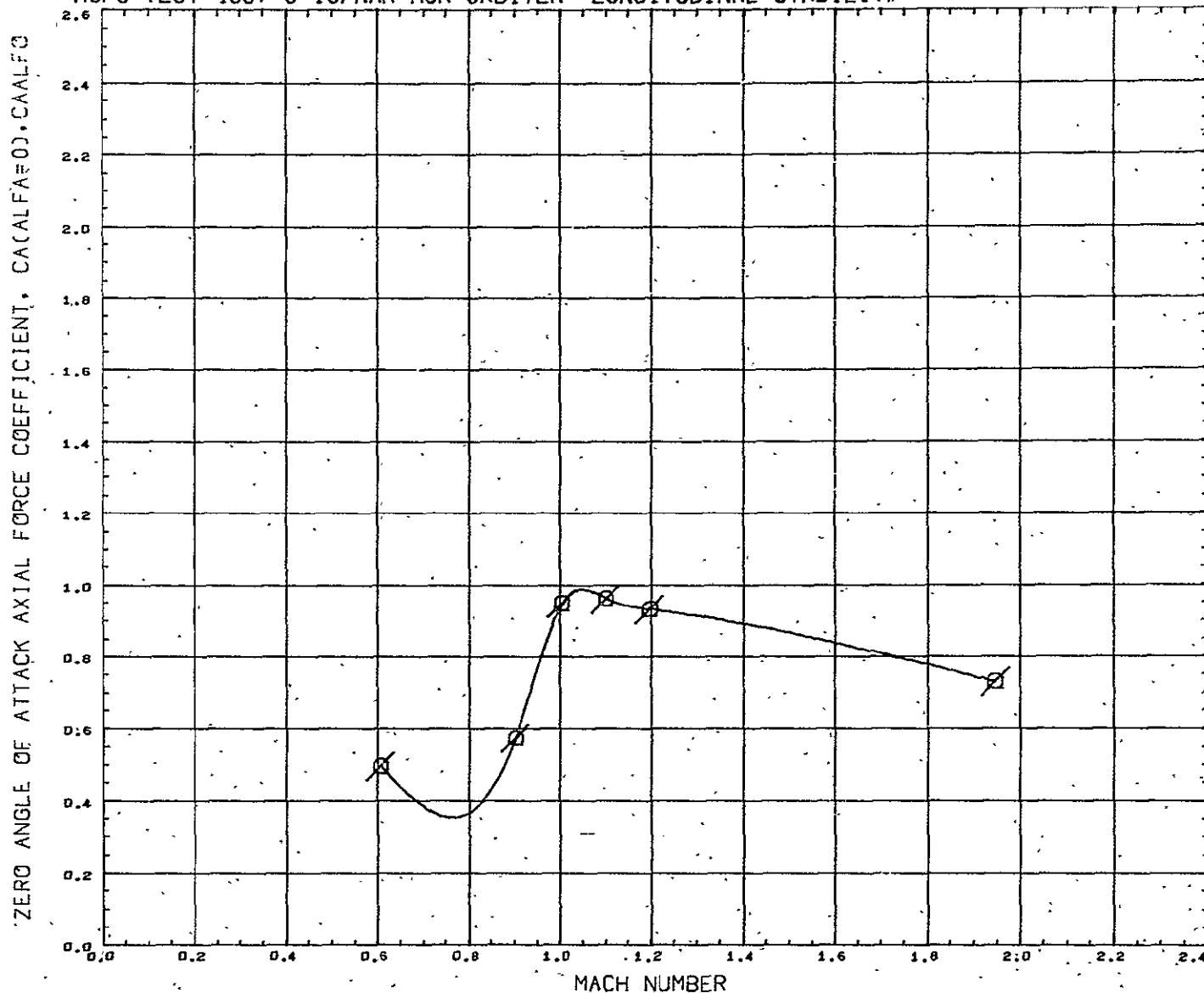


PARAMETRIC VALUES
BETA 0.030

REFERENCE INFORMATION
REFS 1.3960 SQ. IN.
REFL 1.3330 IN
REFB 1.3330 IN
XMRP 0.0370 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE *EF

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



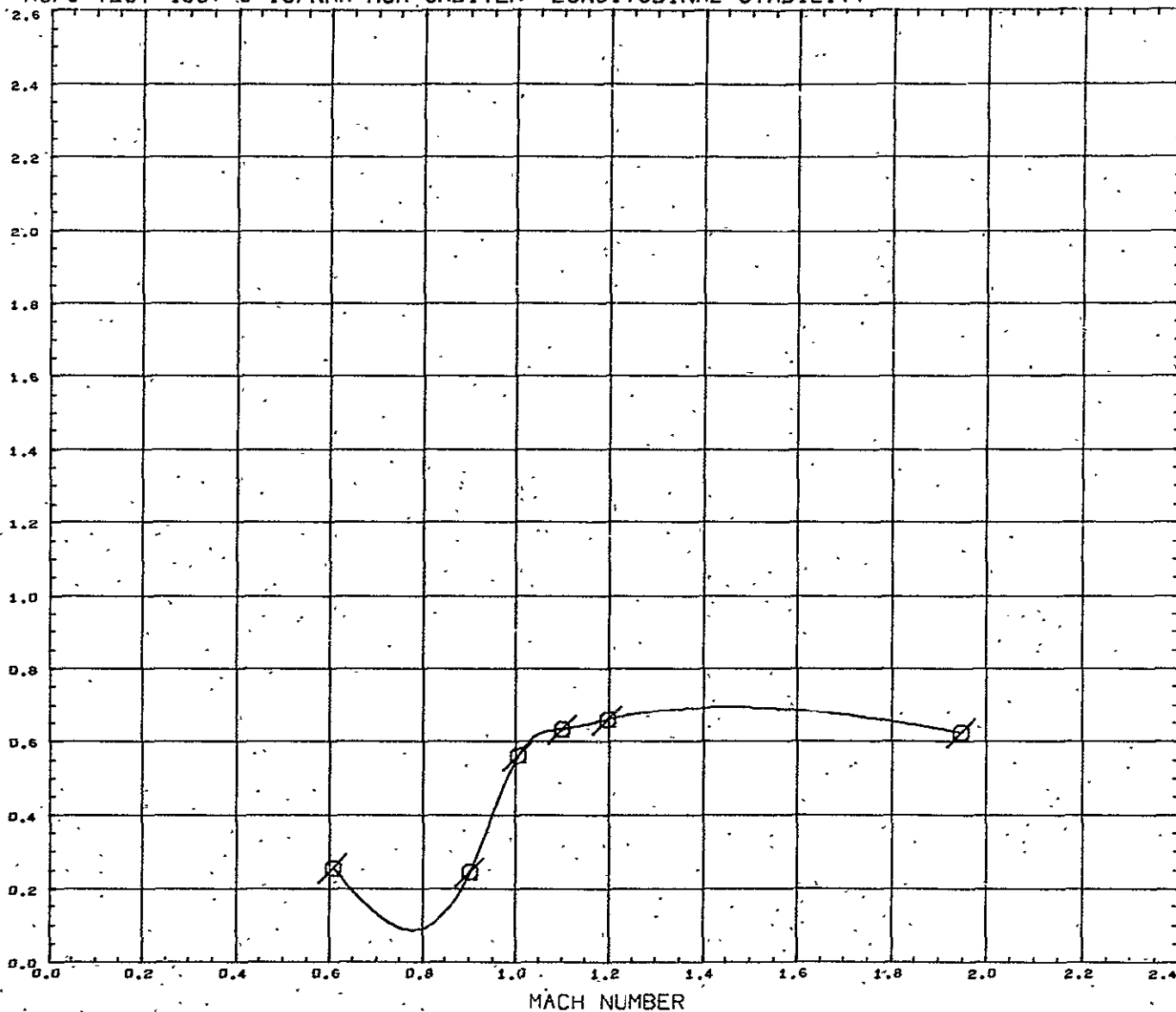
PARAMETRIC VALUES
BETA 0.030

REFERENCE INFORMATION
REFS 1.3960 SQ. IN.
REFL 1.3330 IN
REFB 1.3330 IN
XMRP 0.0370 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE #EF

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

ZERO ANGLE OF ATTACK FOREBODY AXIAL FORCE COEFF., $C_{AF}(\alpha=0)$, $C_{AF}(\alpha=0)$



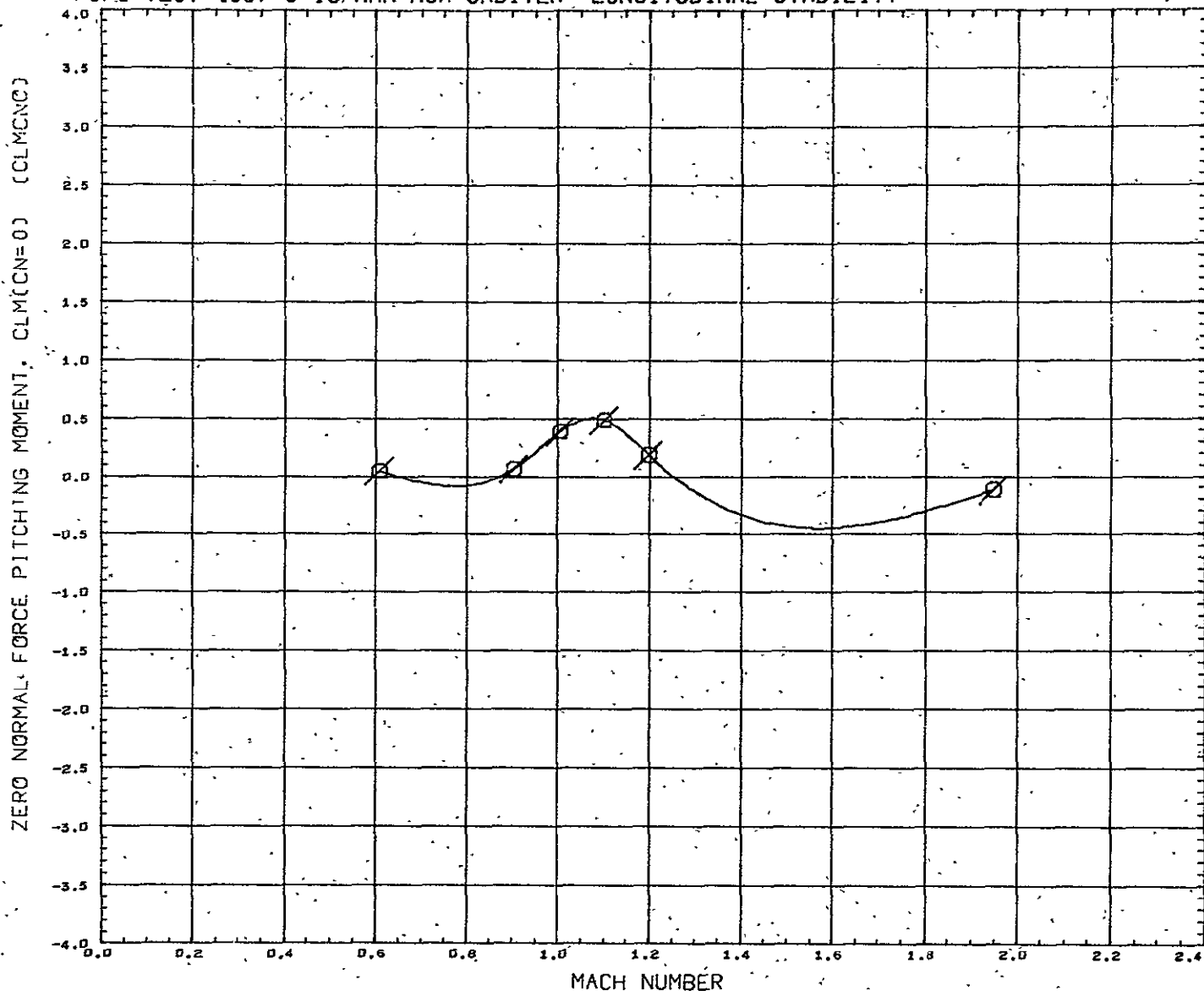
BETA 0.030

DATA HIST. CODE #EF

REFERENCE INFORMATION

REFS	1.3960	sq.in.
REFL	1.3330	in
REFB	1.3330	in
XMRP	0.0070	in
YMRP	0.0000	in
ZMRP	0.0000	in
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

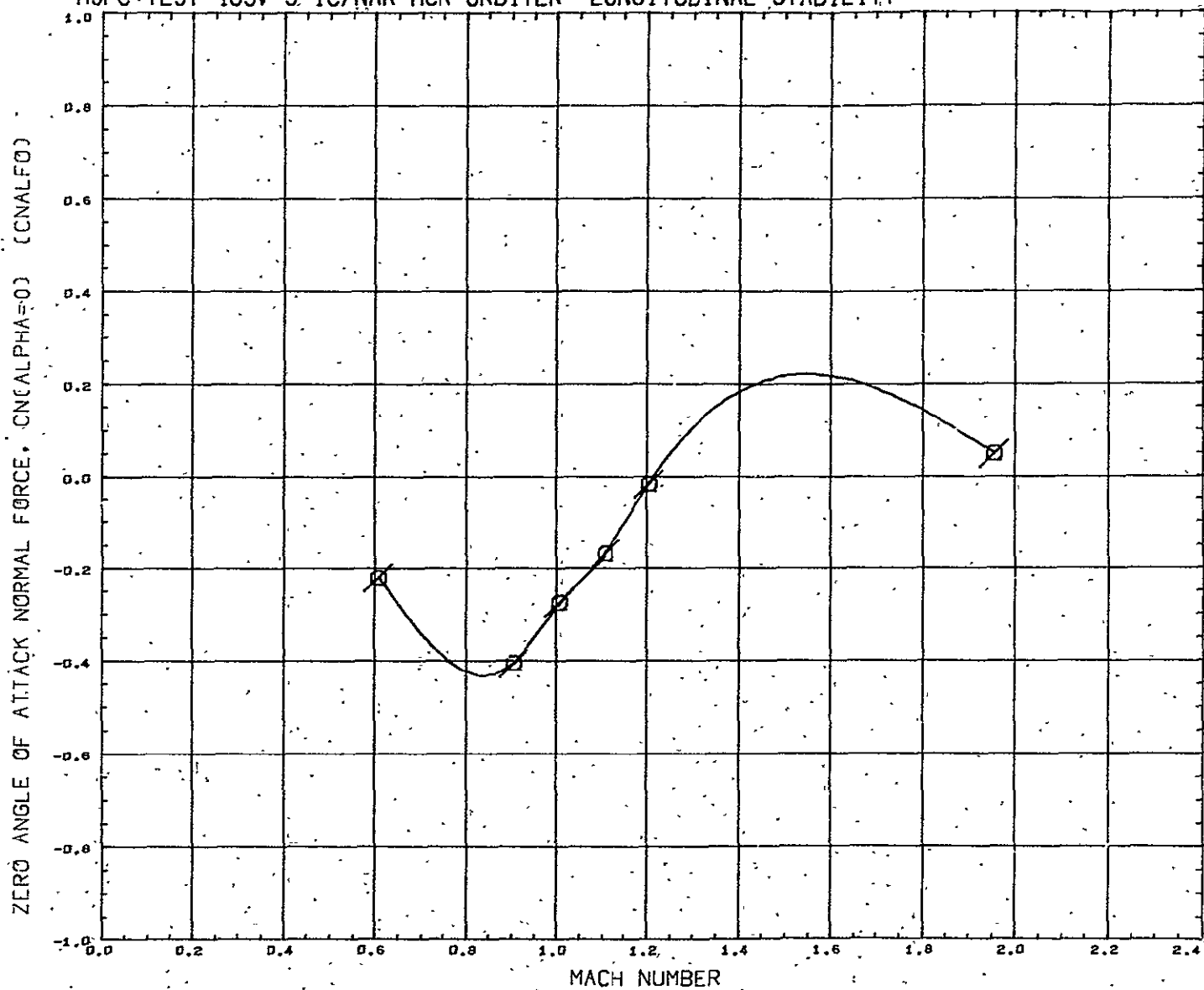


PARAMETRIC VALUES
BETA 0.030

REFERENCE INFORMATION
REFS 1.3960 SQ. IN.
REFL 1.3330 IN
REFB 1.3330 IN
XMRP 0.0370 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE #EF

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



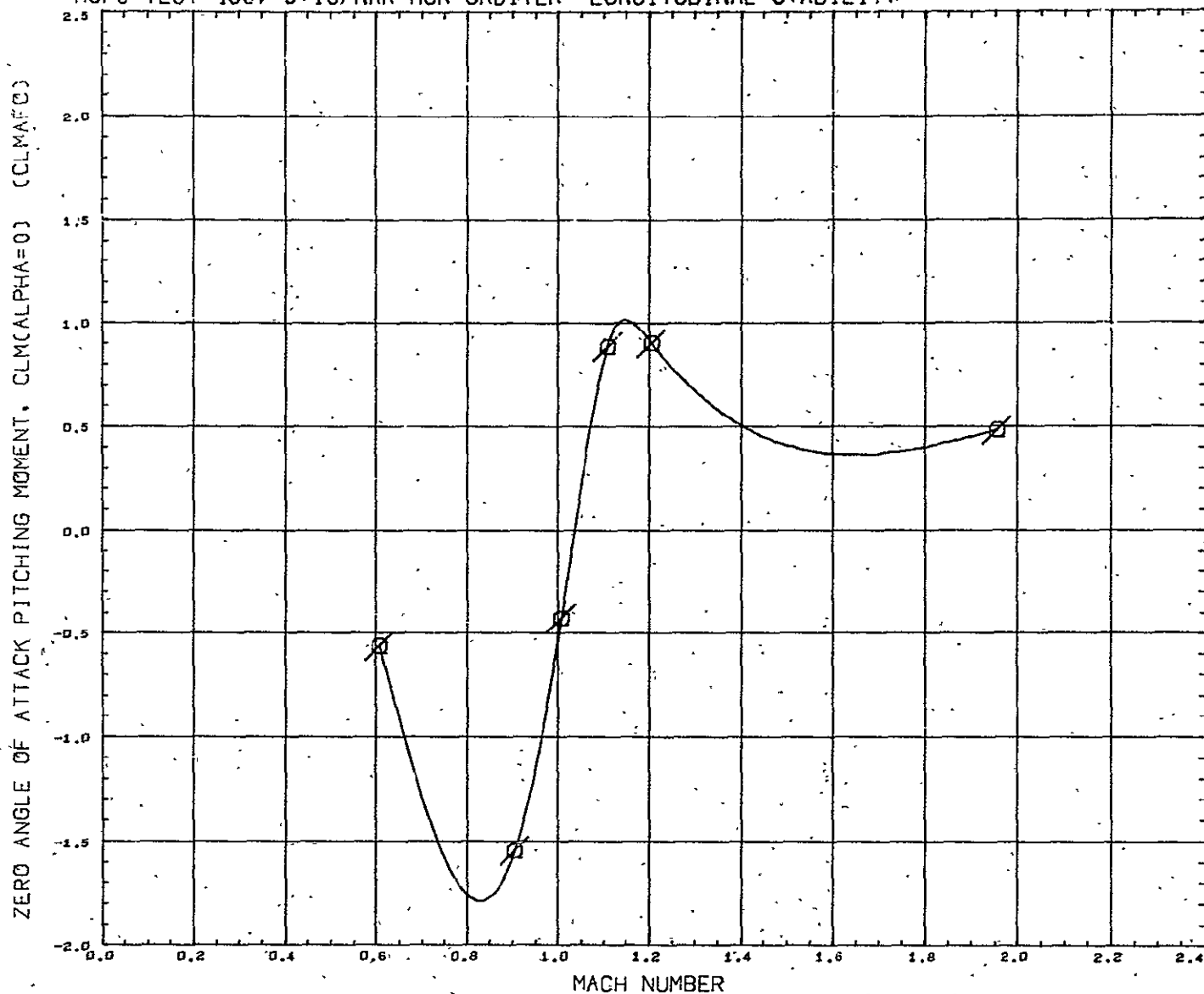
BETA 0.000
PARAMETRIC VALUES

DATA HIST. CODE *EF

REFERENCE INFORMATION

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REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0372	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



PARAMETRIC VALUES
BETA 0.000

DATA HIST. CODE #EF

REFERENCE INFORMATION

REFS	1.3960	SO.IN.
REFL	1.3330	IN
REFD	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

M485-MSFC-S1C NAR HCR ORBITER

OPF

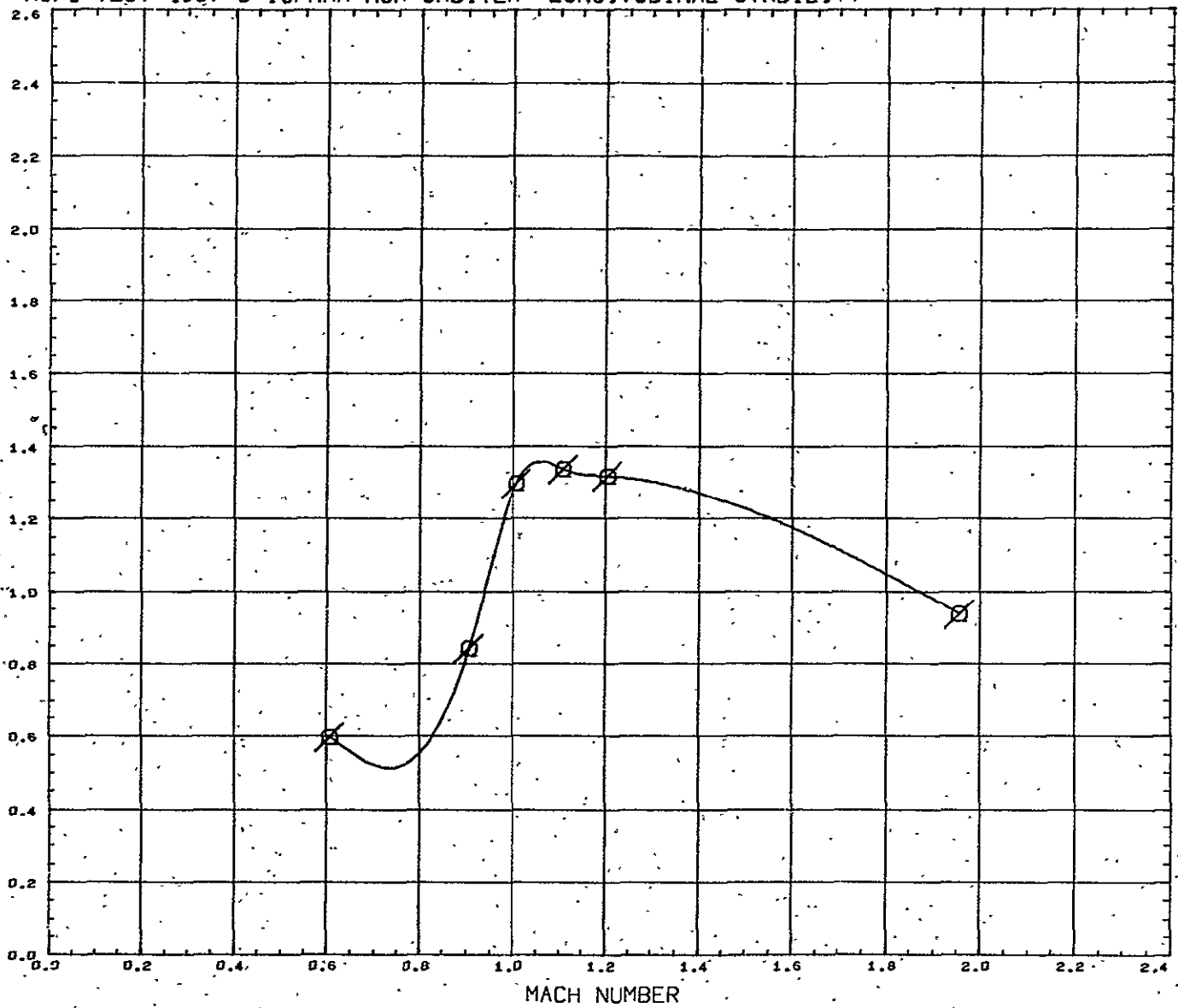
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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

ZERO ANGLE OF ATTACK AXIAL FORCE COEFFICIENT, CAXALFA=0.0, CAXALFC



BETA
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	SO. IN.
REFL	1.3330	IN
REFR	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EF

M485-MSFC-S1C NAR HCR ORBITER.

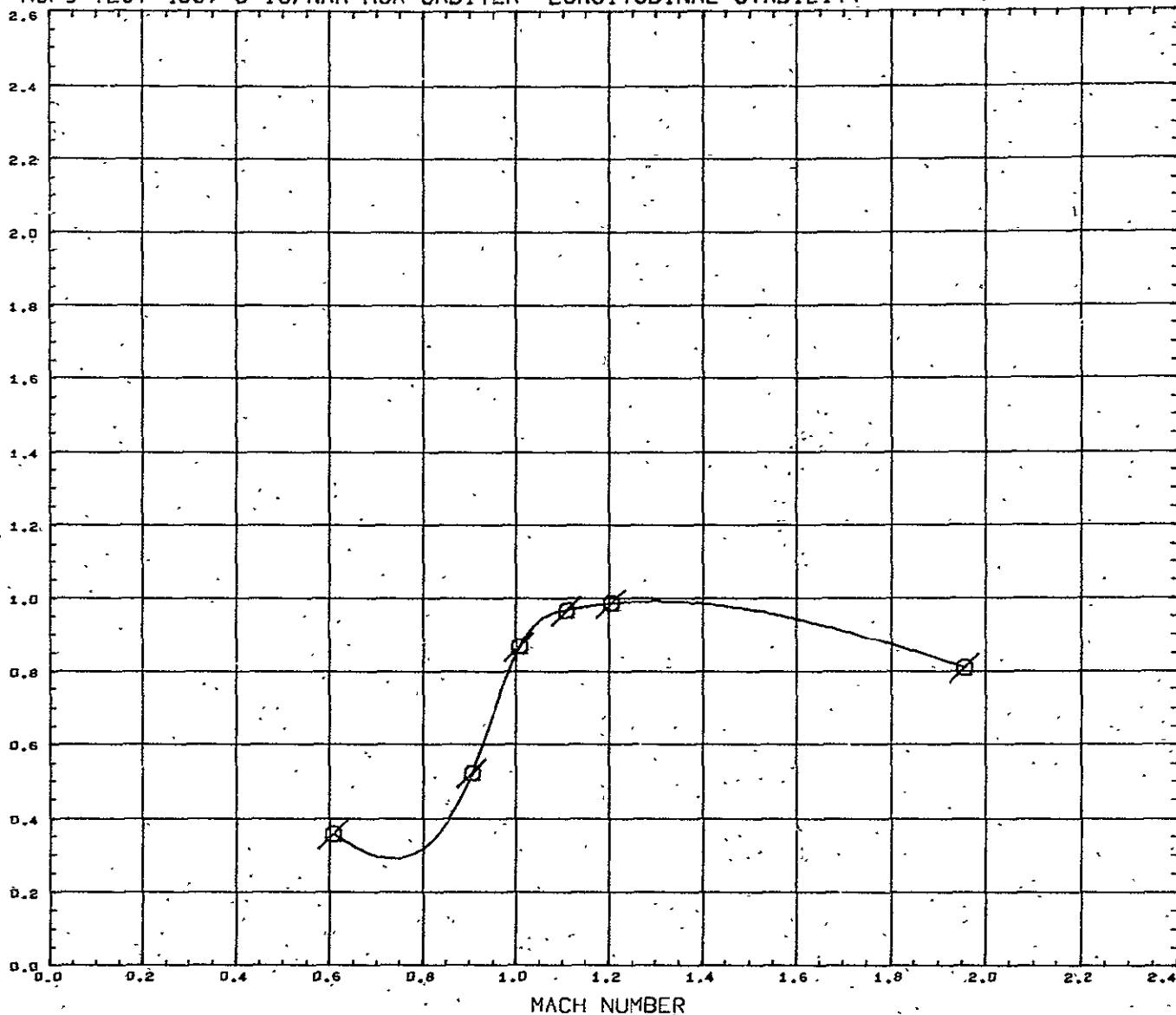
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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

ZERO ANGLE OF ATTACK FOREBODY AXIAL FORCE COEFF., $C_{AF}(\alpha=0)$, $C_{AF}(\alpha=0)$



PARAMETRIC VALUES
BETA 0.000

REFERENCE INFORMATION

REFS	1.3960	sq. in.
REFL	1.3330	in
REFB	1.3330	in
XMRP	0.0370	in
YMRP	0.0000	in
ZMRP	0.0000	in
SCALE	0.0034	

DATA HIST: CODE REF

M485-MSFC-S1C NAP HCR ORBITER

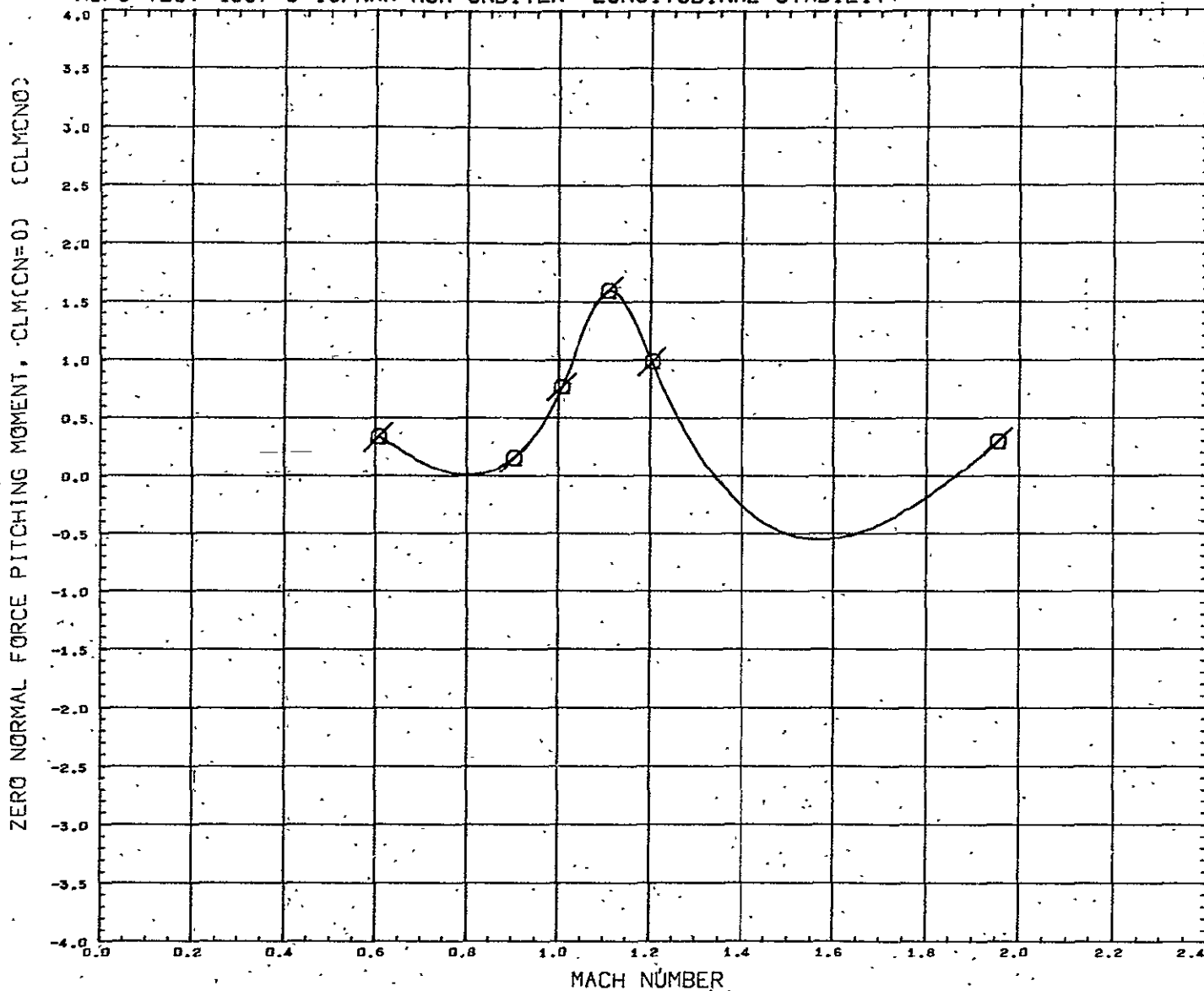
06F

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93

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



BETA PARAMETRIC VALUES
0.000

DATA HIST. CODE *EF

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0300	IN
ZMRP	0.0000	IN
SCALE	0.0034	

M485-MSFC-S1C NAR HCR ORBITER

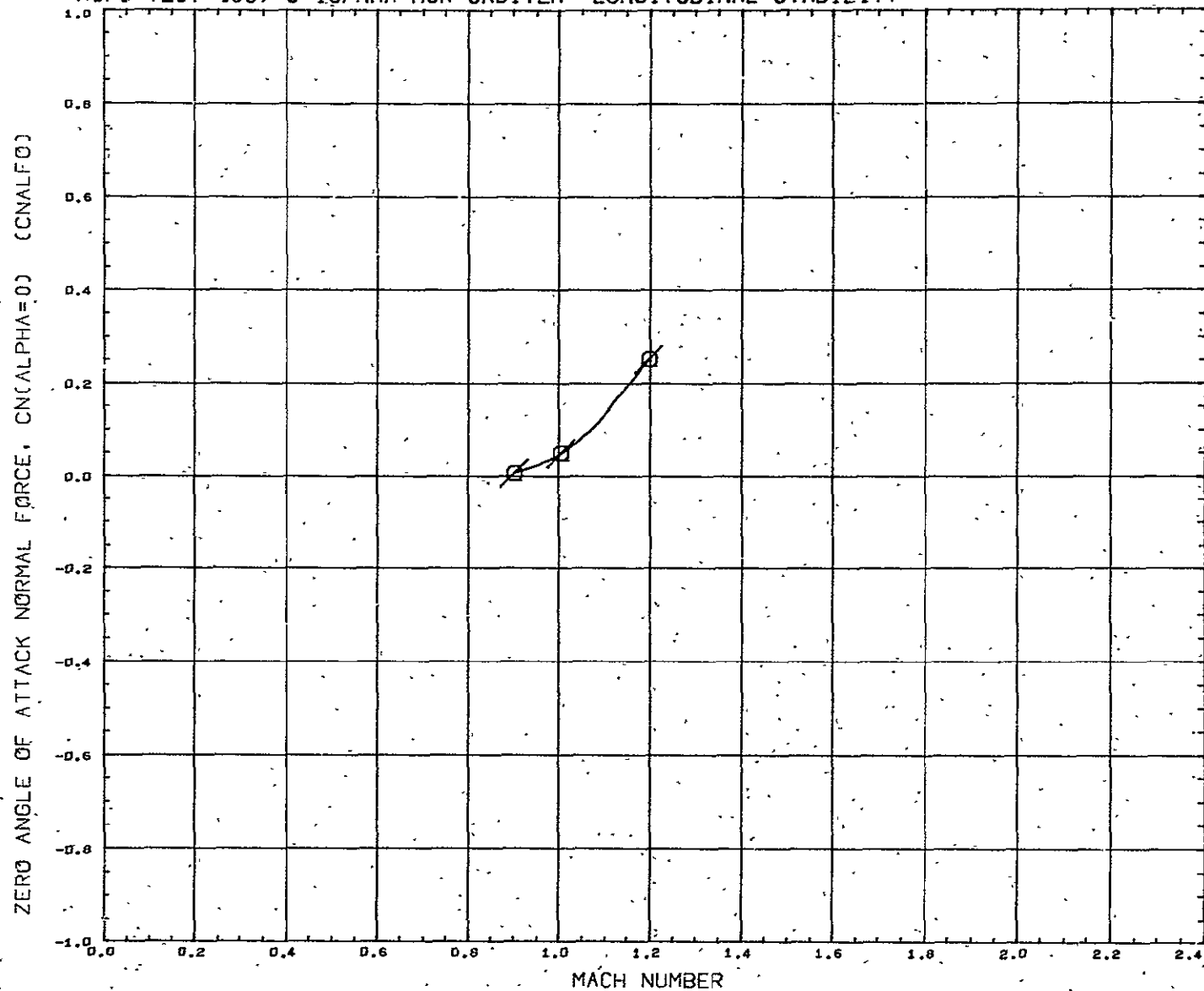
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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



BETA 0.040

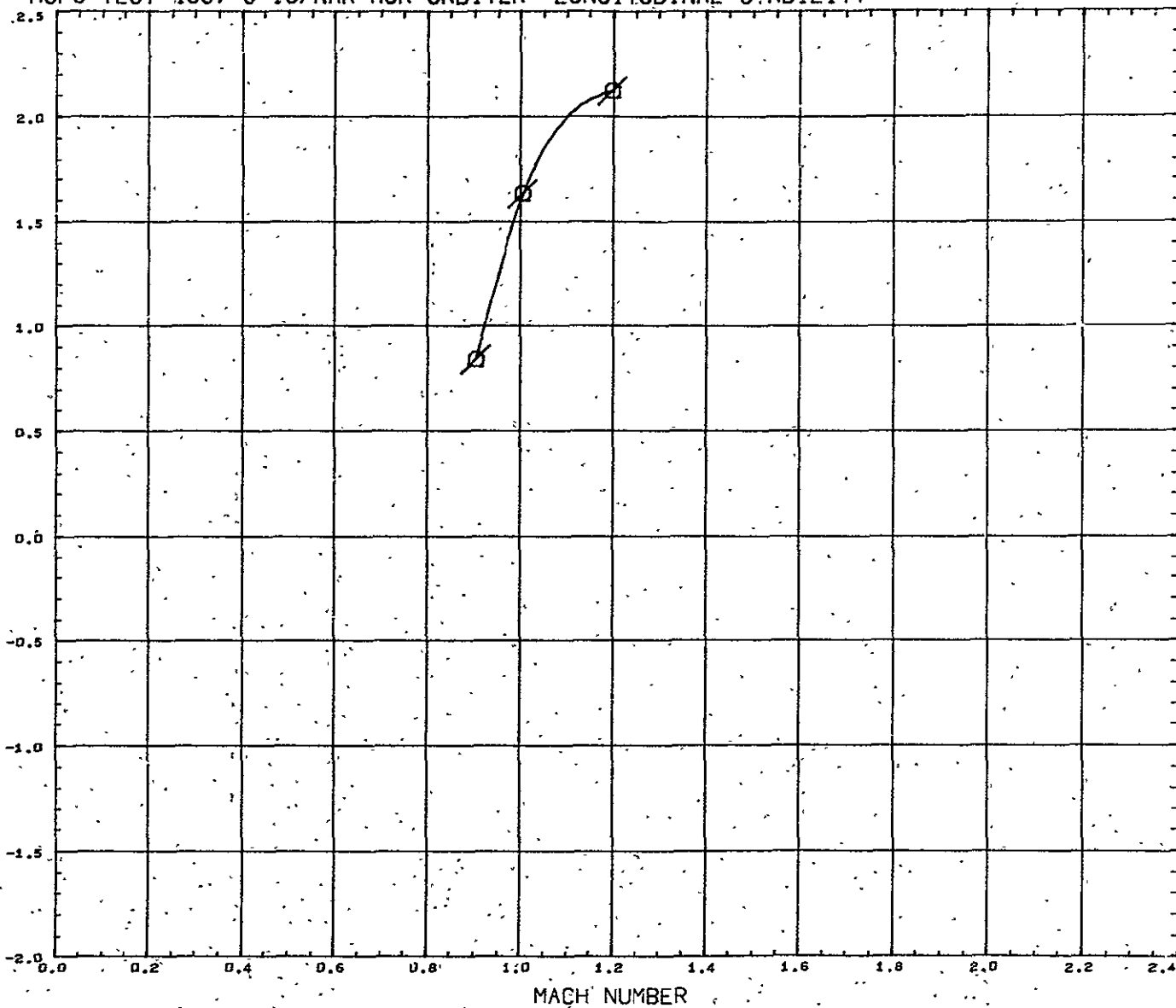
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REFL	1.3330	IN
REFB	1.3330	IN
XHRF	0.0370	IN
YHRF	0.0000	IN
ZHRF	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE #EF

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

ZERO ANGLE OF ATTACK PITCHING MOMENT, CLM α PH α =0) (CLMAF0)



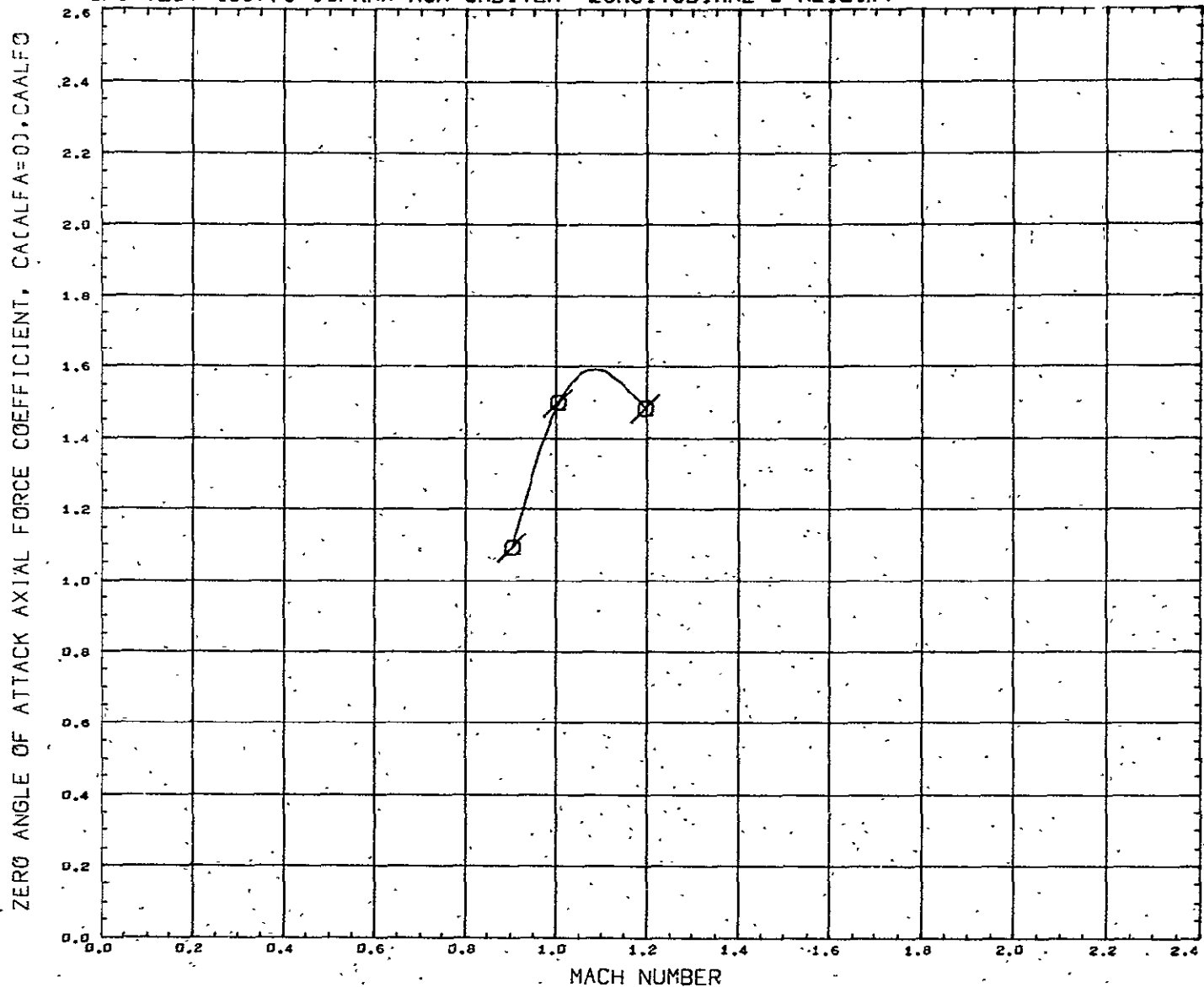
BETA
PARAMETRIC VALUES
0.040

DATA HIST. CODE *REF

REFERENCE INFORMATION

REFS	1.3960	SQ:IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



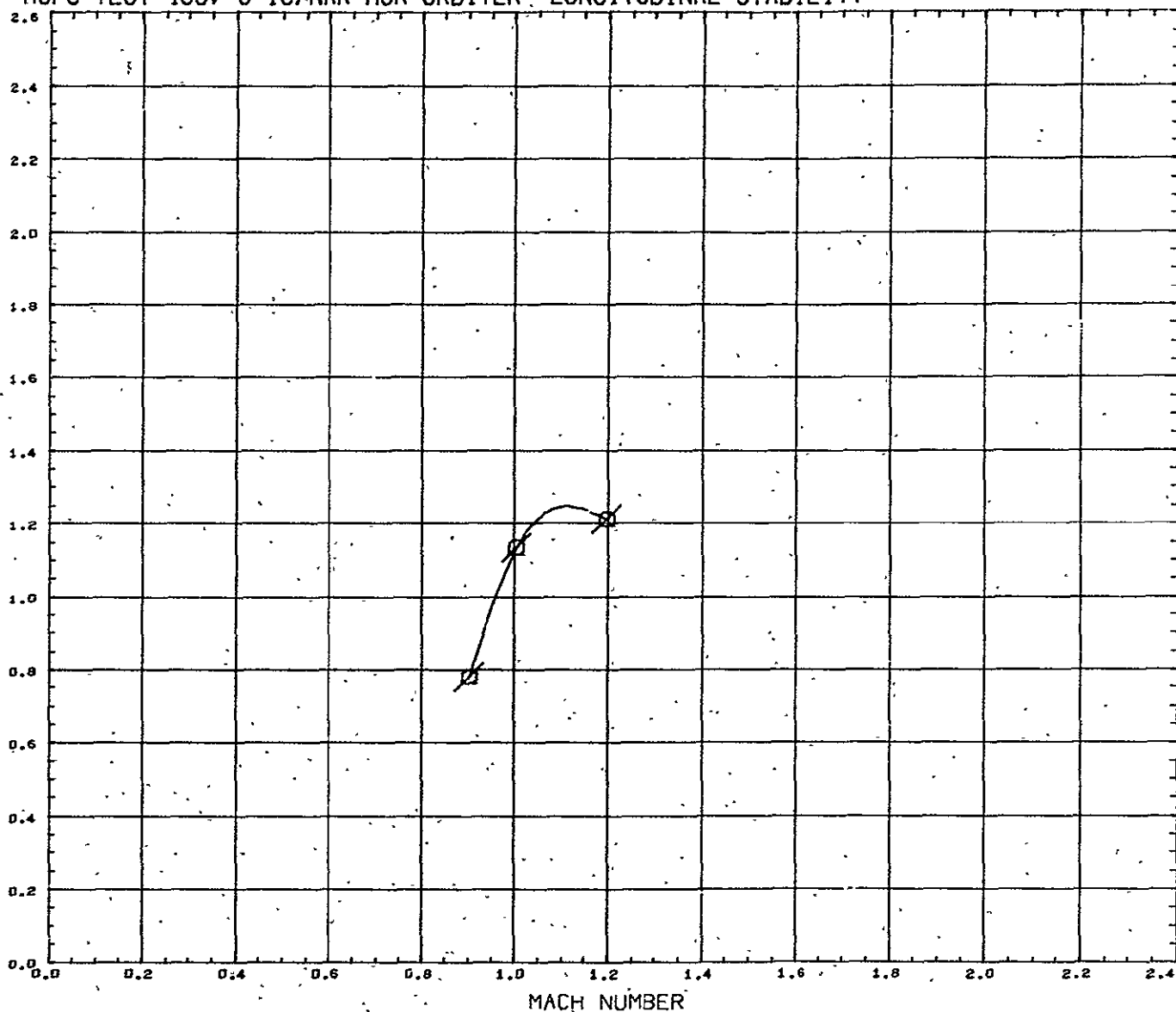
PARAMETRIC VALUES
BETA 0.040

REFERENCE INFORMATION
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REFL 1.3330 IN
REFD 1.3330 IN
XNRP 0.0270 IN
YNRP 0.0000 IN
ZNRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE *EF

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

ZERO ANGLE OF ATTACK FOREBODY AXIAL FORCE COEFF., $C_{AF}(\alpha=0)$, $C_{AF}(\alpha=0)$



BETA
PARAMETRIC VALUES
0.040

DATA HIST. CODE *EF

REFERENCE INFORMATION

REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFD	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

M485-MSFC-S1C NAR HCR ORBITER

OBS1

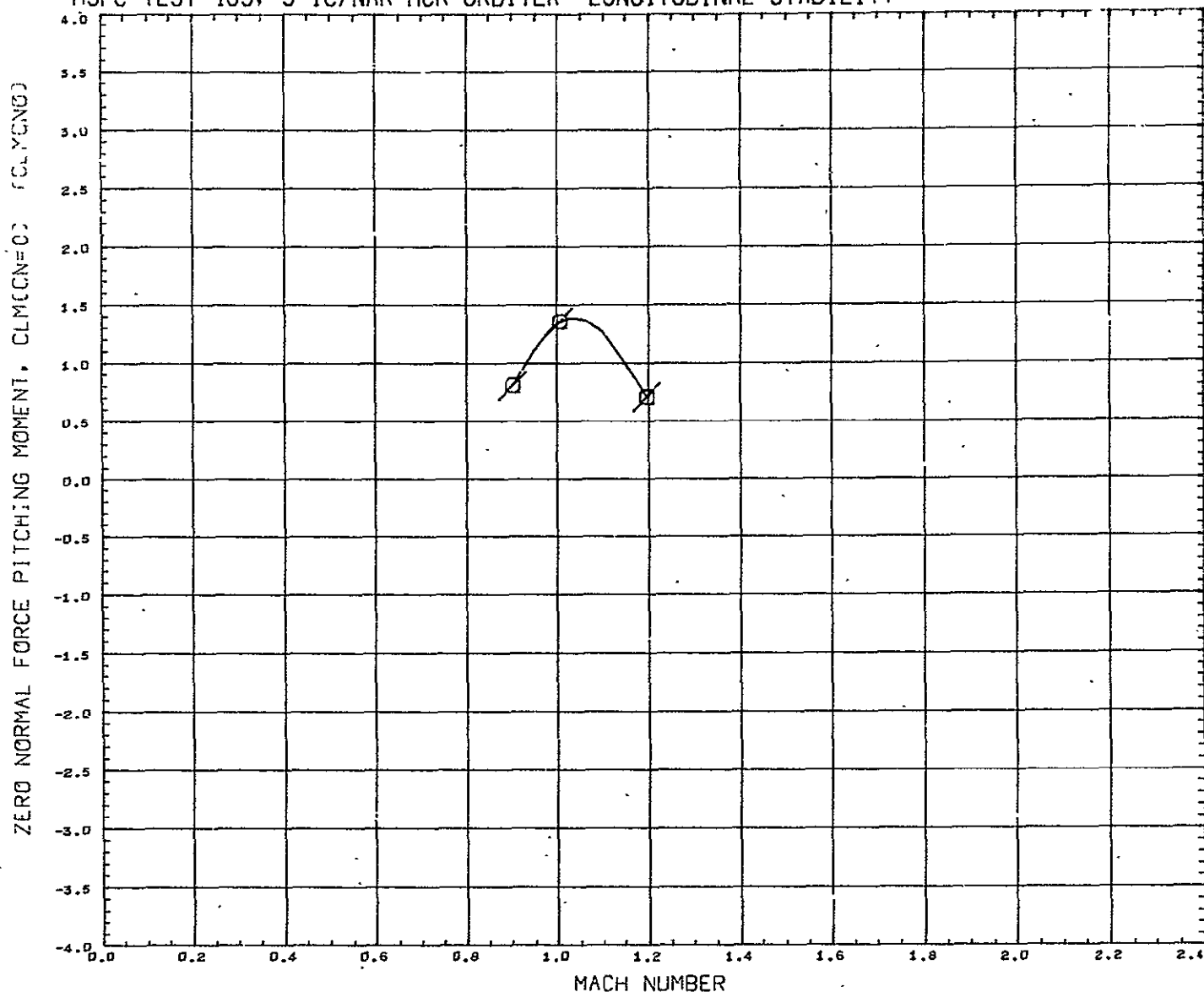
(B30031)

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98

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



PARAMETRIC VALUES
BETA 0.040

REFERENCE INFORMATION
REFS 1.3960 SQ. IN.
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REFB 1.3330 IN
XMRP 0.0370 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

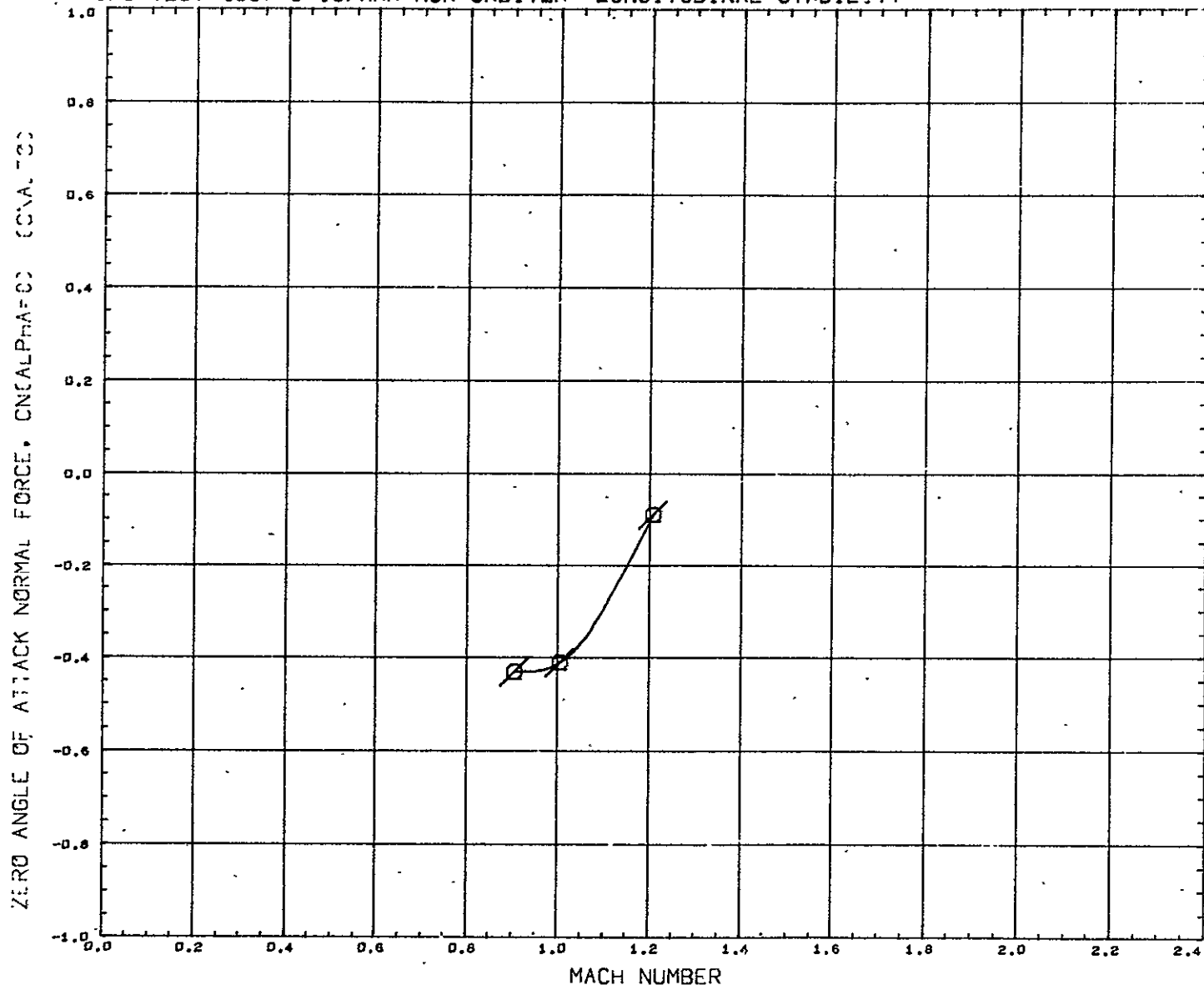
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Y485-MSFC-S1C NAR HCR ORBITER

08S1

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



PARAMETRIC VALUES
BETA 0.060

REFERENCE INFORMATION
REFS 1.3960 SQ. IN.
REFL 1.3330 IN
REFB 1.3330 IN
XMRP 0.0370 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE WEF

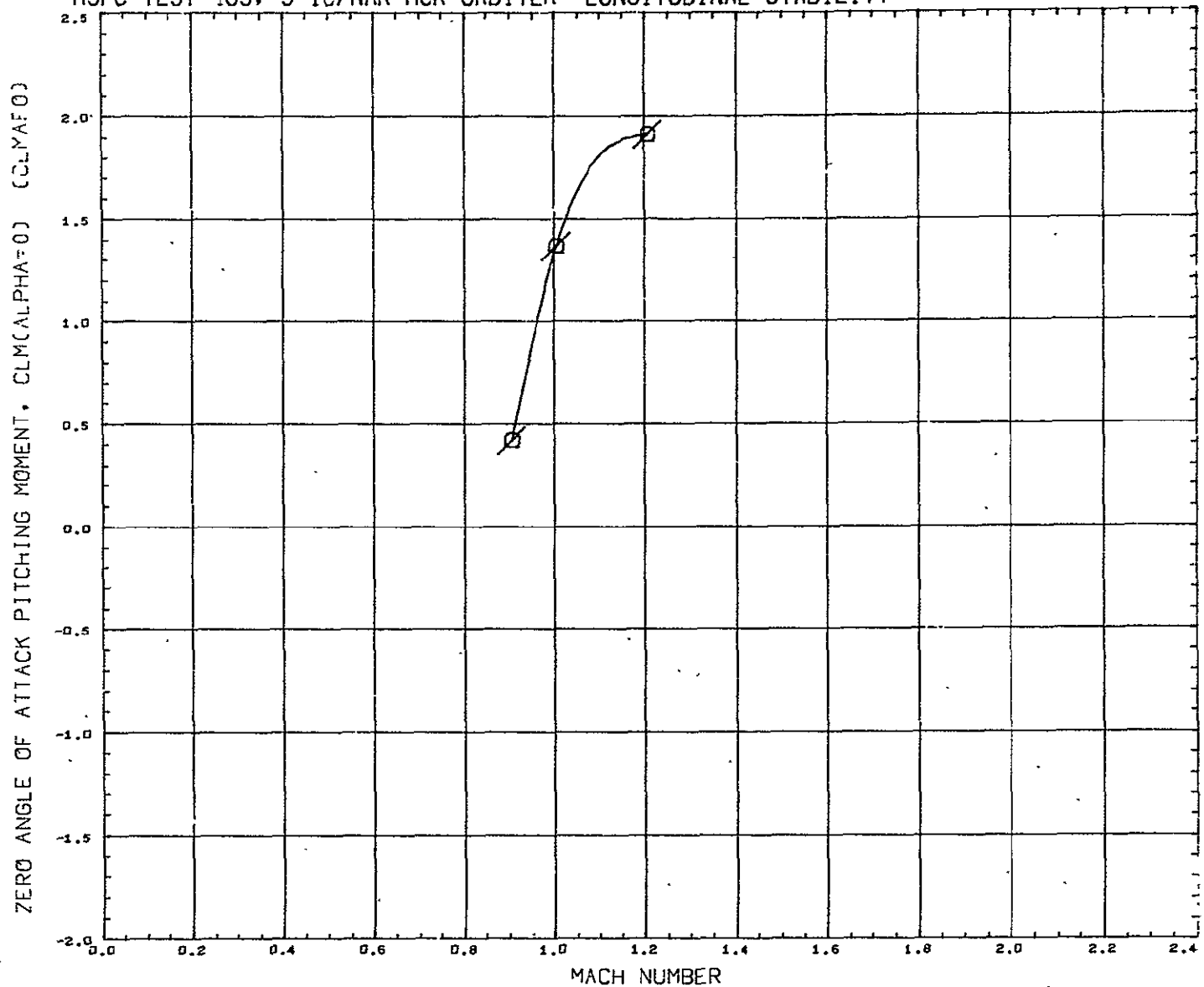
M485-MSFC-S1C NAR HCR ORBITER

GBFS1

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



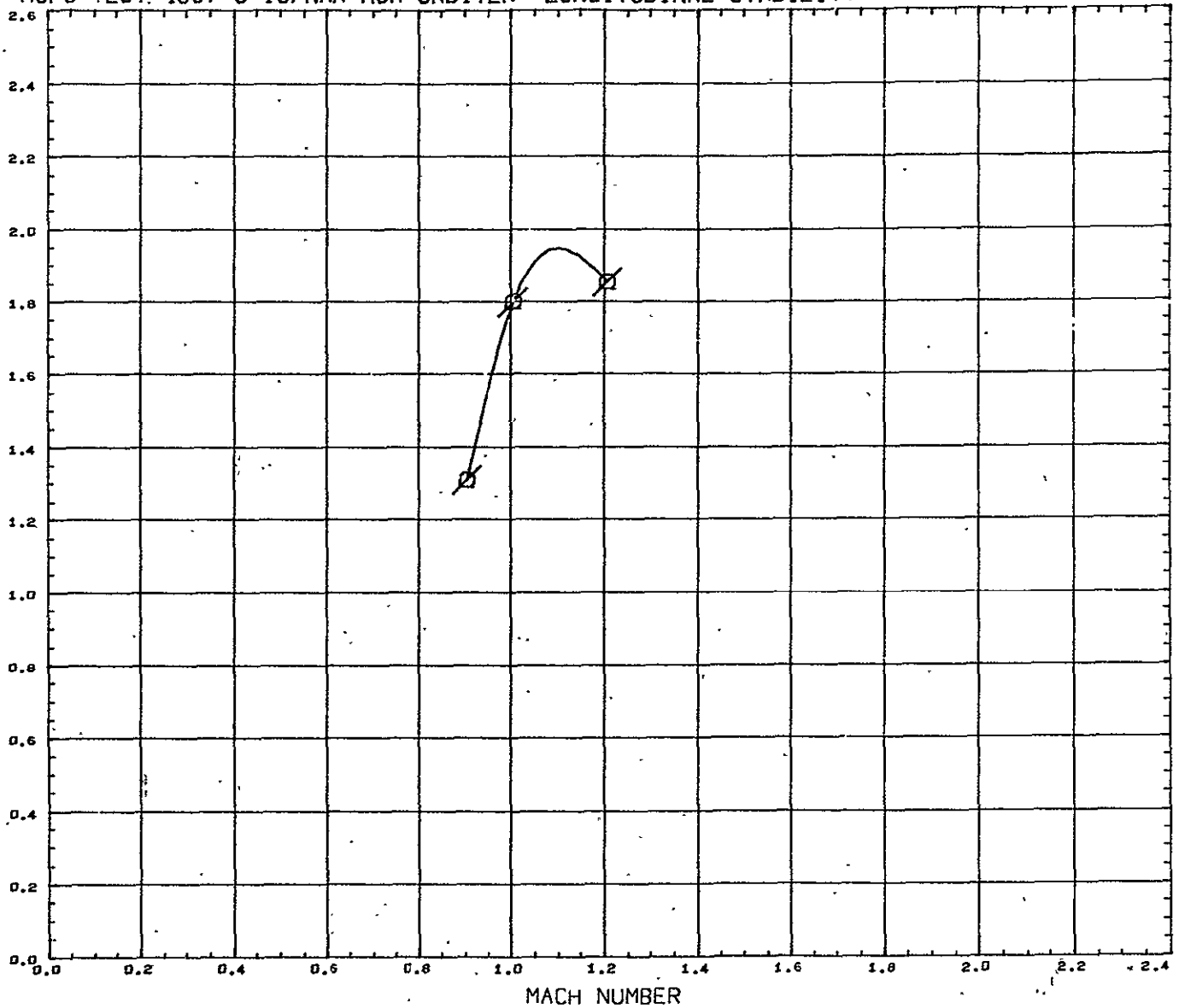
PARAMETRIC VALUES
BETA 0.060

REFERENCE INFORMATION
REFS 1.3960 50 IN.
REFL 1.3330 IN
REFB 1.3330 IN
XMRP 0.0170 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE *EF

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

ZERO ANGLE OF ATTACK AXIAL FORCE COEFFICIENT, $C_{AXALFA}=0.0, C_{ALFA}$



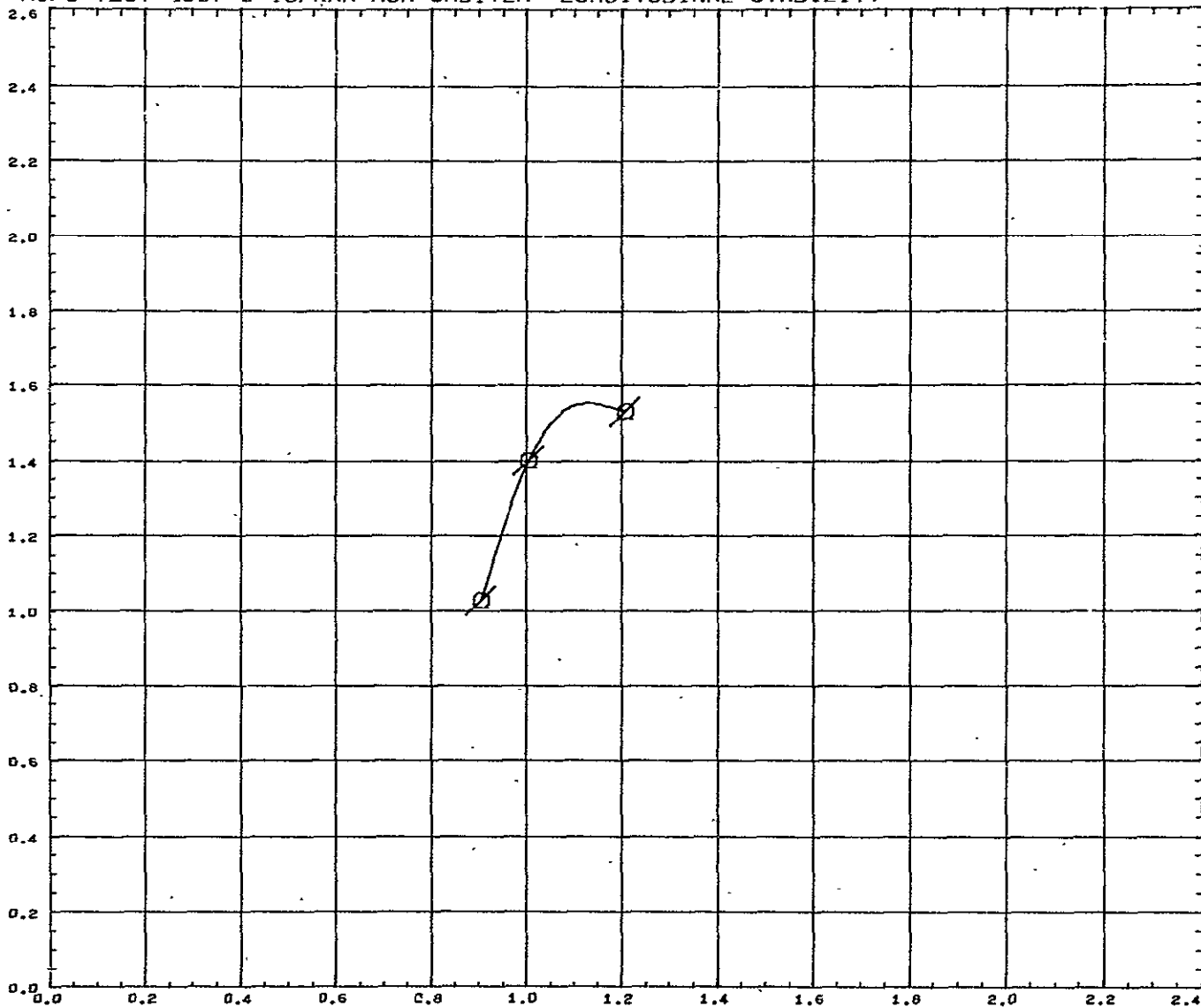
PARAMETRIC VALUES
BETA 0.060

REFERENCE INFORMATION
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REFB 1.3330 IN
XMRP 0.0370 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE *EF 2

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

ZERO ANGLE OF ATTACK FOREBODY AXIAL FORCE COEFF., $C_{AF}(\alpha=0)$, $C_{AF}(\alpha=0)$



MACH NUMBER

PARAMETRIC VALUES

BETA 0.060

REFERENCE INFORMATION

REFS	1.3960	50 IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

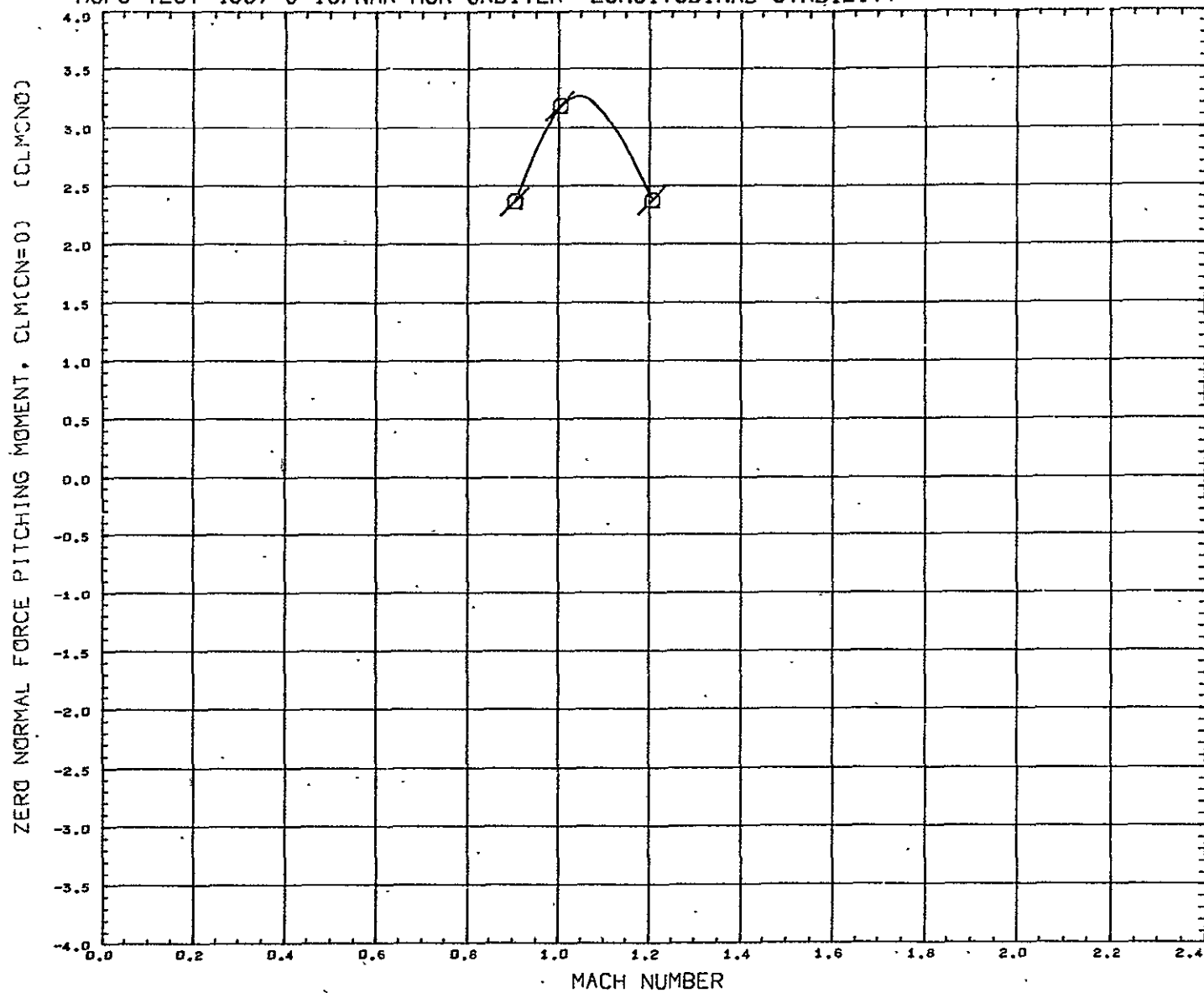
DATA HIST. CODE #EF

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OBFS1

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



PARAMETRIC VALUES
BETA 0.060

REFERENCE INFORMATION
REFS 1.3960 SQ. IN.
REFL 1.3330 IN
REFB 1.3330 IN
XMRP 0.0370 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE #EF

M485-MSFC-S1C NAR HCR ORBITER

0BF51

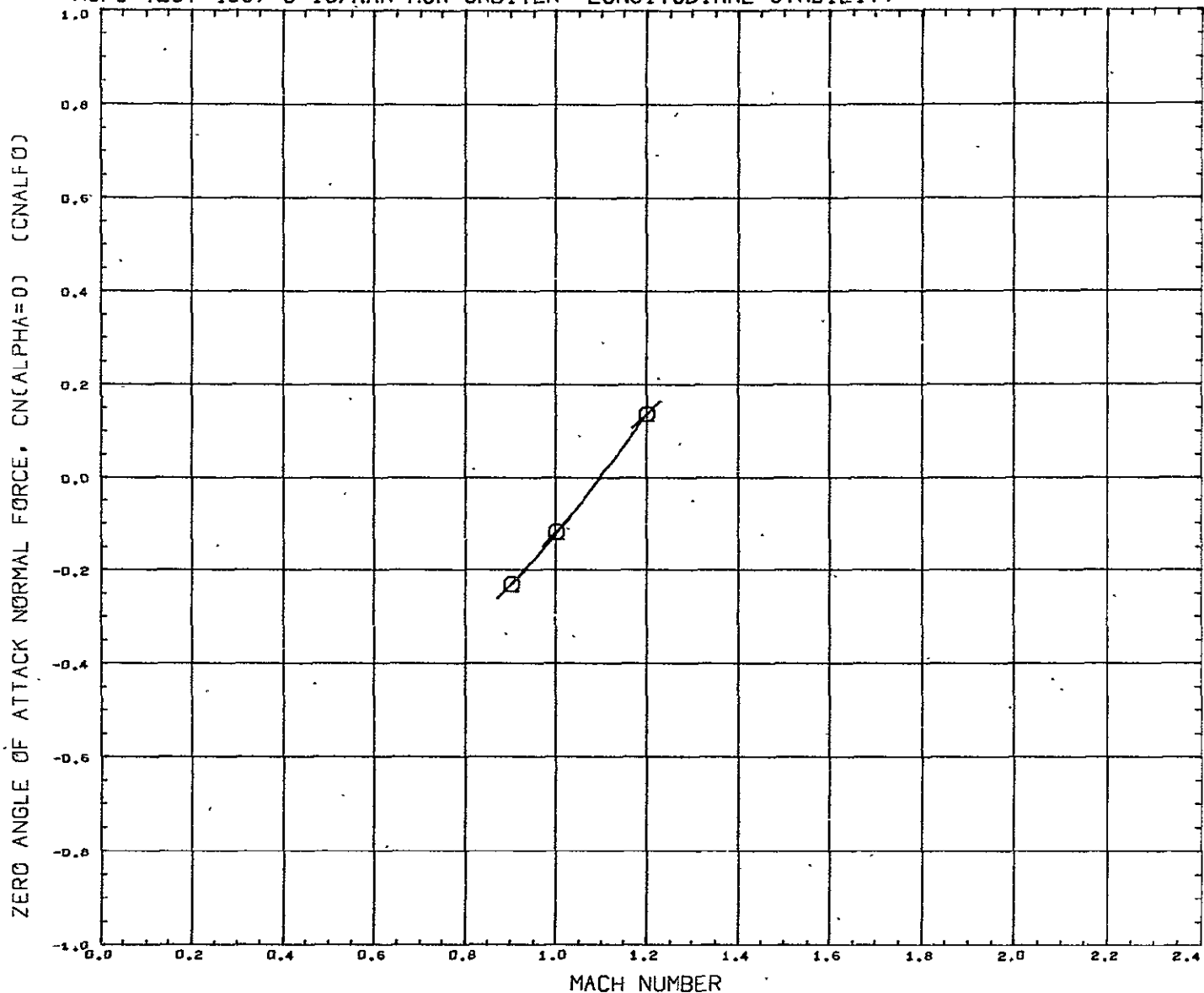
(B30041)

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104

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



PARAMETRIC VALUES
BETA 0.040

REFERENCE INFORMATION
REFS 1.3960 SQ. IN.
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REFB 1.3330 IN
XMRP - 0.0570 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE *EF

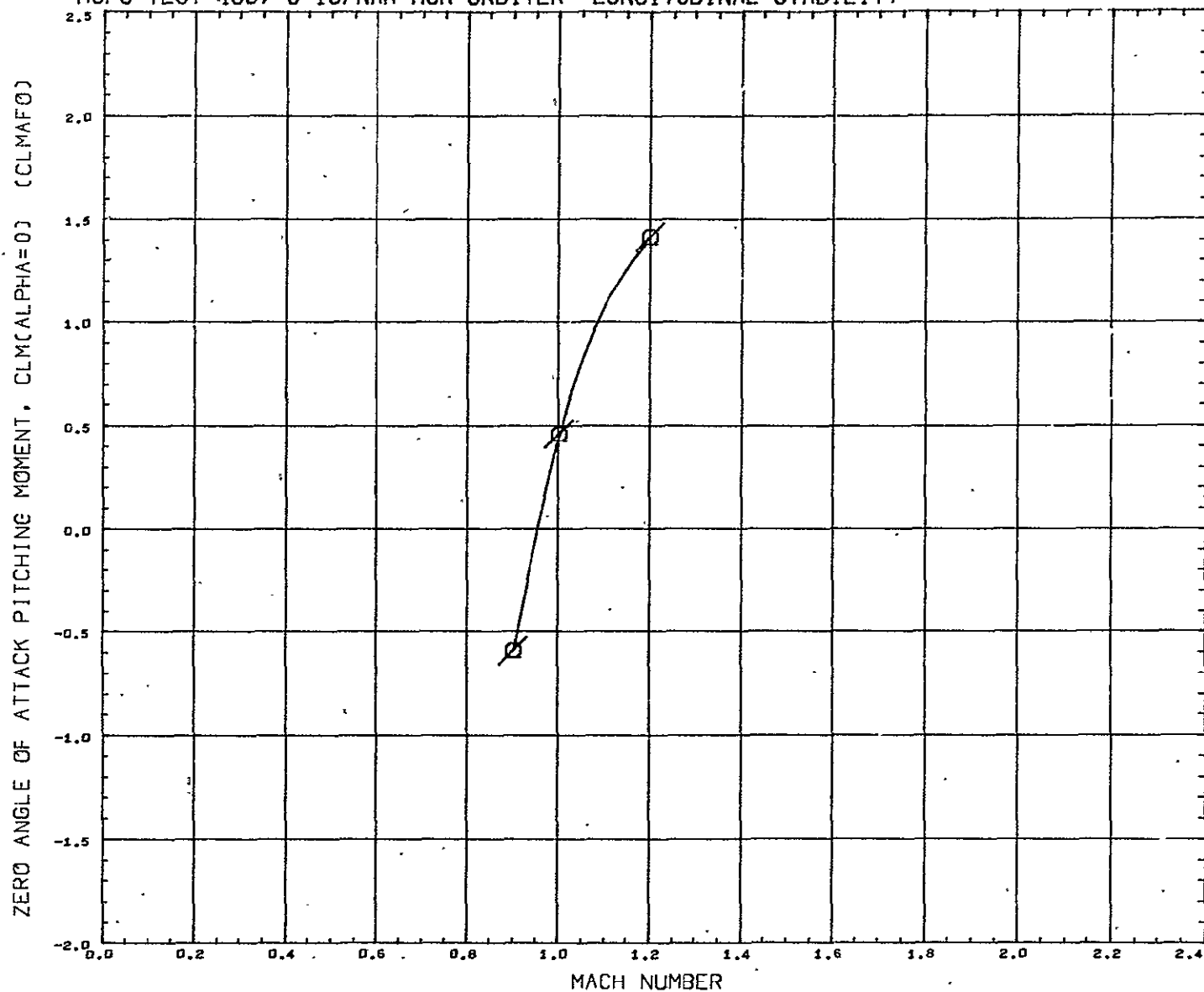
M485-MSFC-S1C NAR HCR ORBITER

OBS2

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



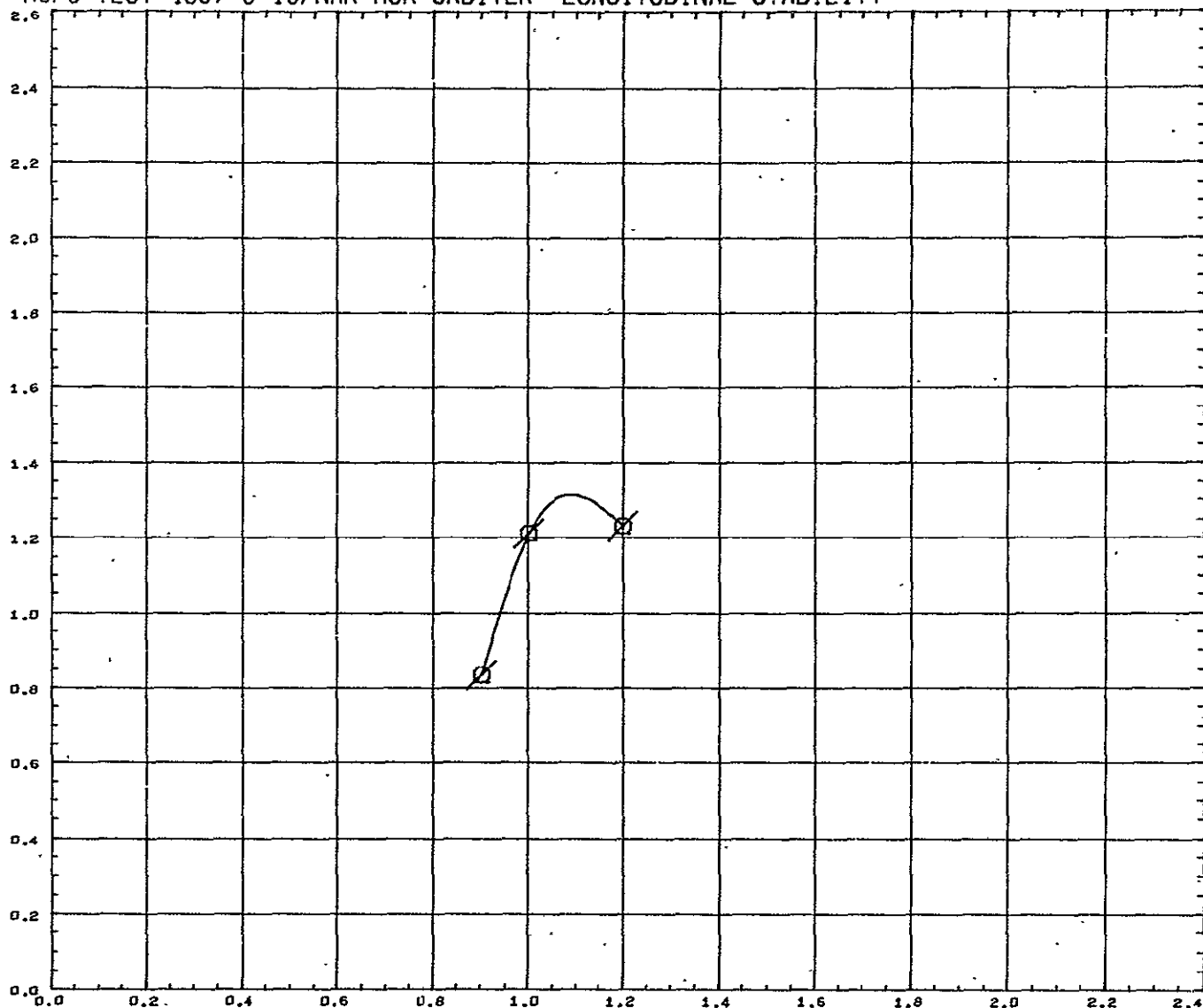
PARAMETRIC VALUES
BETA 0.040

REFERENCE INFORMATION
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REFL 1.3330 IN
REFB 1.3330 IN
XMRP - 0.0370 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE #EF

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

ZERO ANGLE OF ATTACK AXIAL FORCE COEFFICIENT, $C_{AXIAL}(\alpha=0)$, C_{AXIAL0}



MACH NUMBER

PARAMETRIC VALUES
BETA 0.040

REFERENCE INFORMATION

REFS	1.3960	50. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EF

M485-MSFC-S1C NAR HCR ORBITER

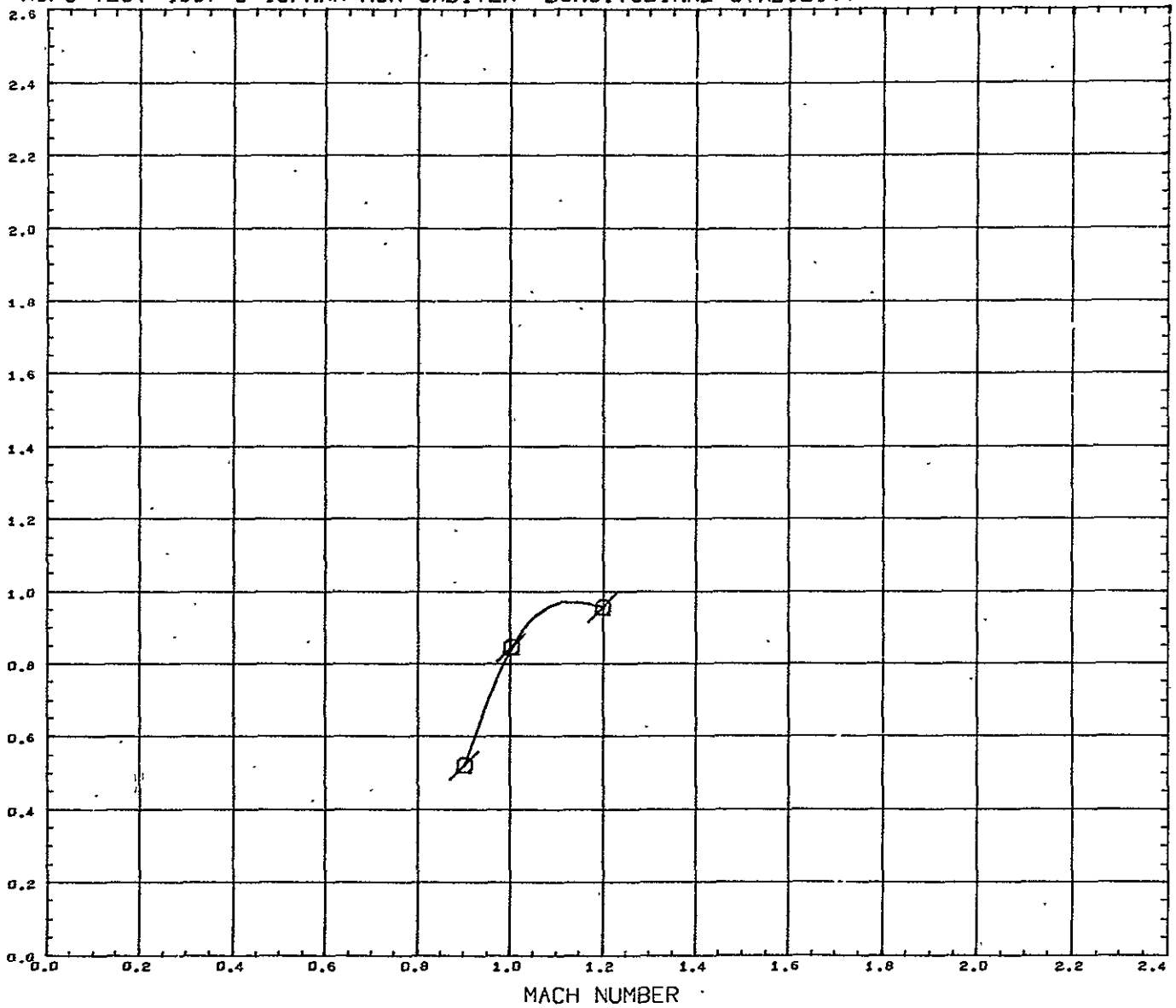
06S2

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

ZERO ANGLE OF ATTACK FOREBODY AXIAL FORCE COEFF., $C_{AF}(ALFA=0), C_{AF}AFO$



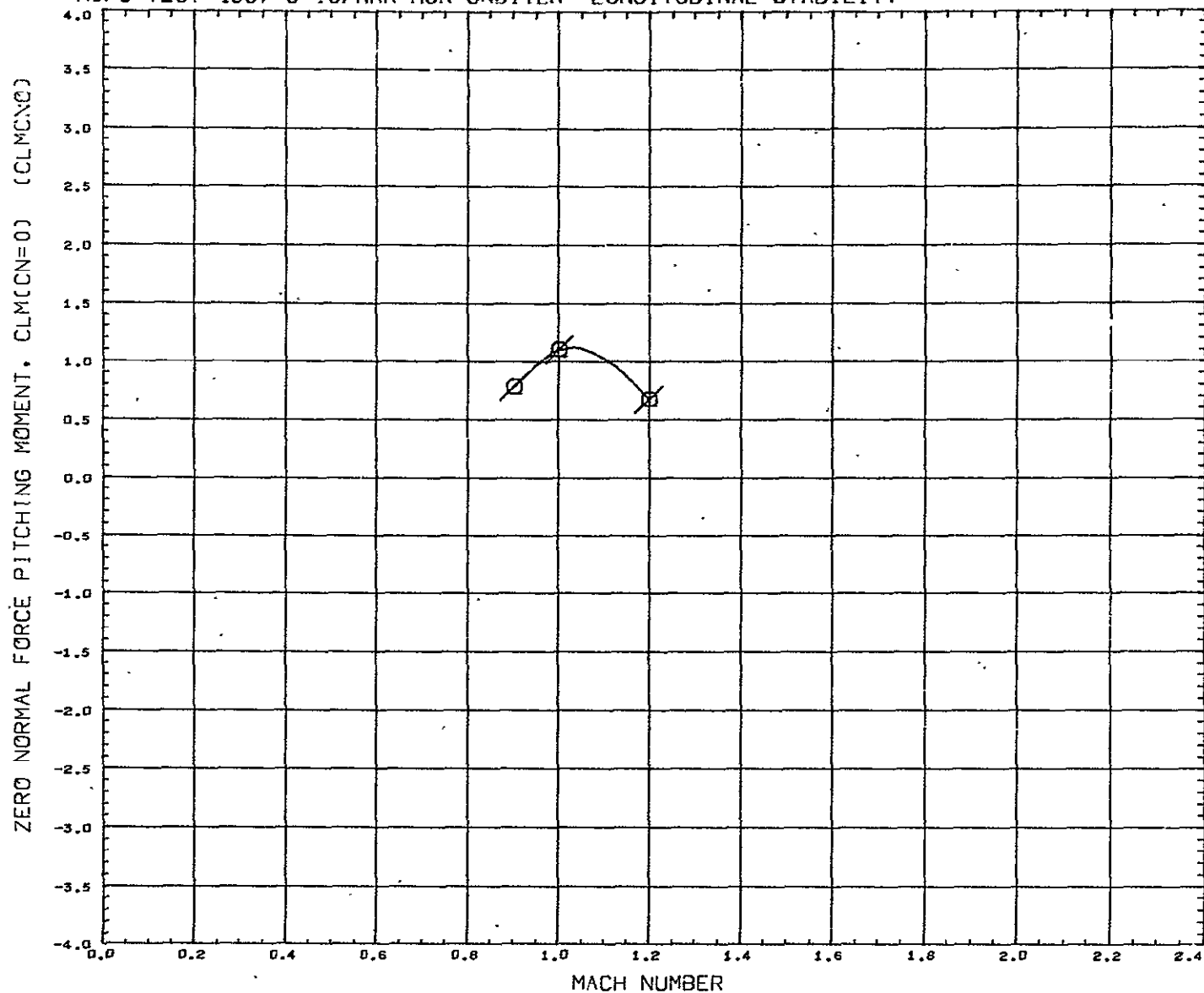
PARAMETRIC VALUES
BETA 0.040

DATA HIST. CODE *EF

REFERENCE INFORMATION

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REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0005	IN
ZMRP	0.0000	IN
SCALE	0.0934	

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

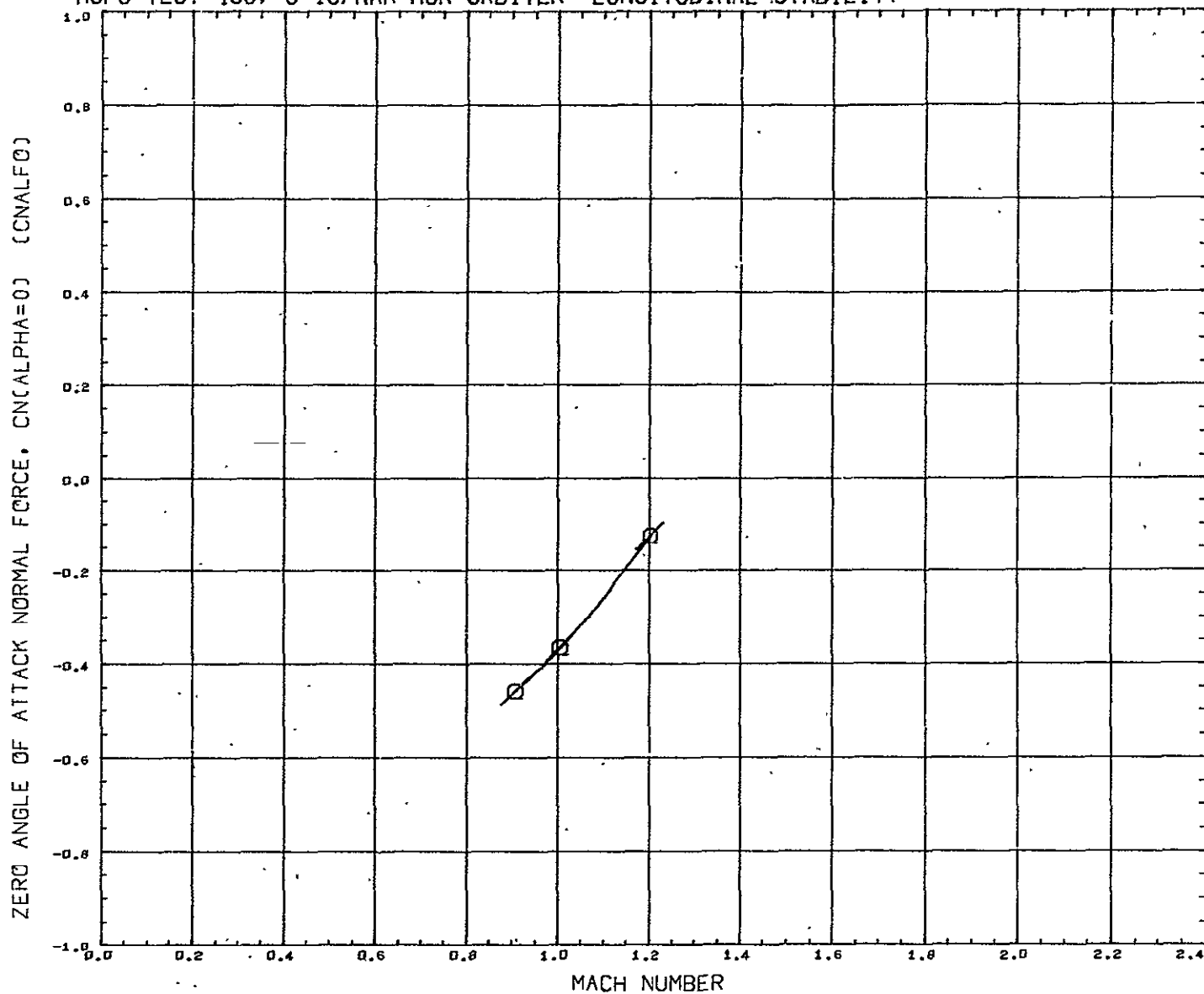


PARAMETRIC VALUES
BETA 0.040

DATA HIST. CODE *EF

REFERENCE INFORMATION
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REFL 1.3330 IN
REFB 1.3330 IN
XMRP - 0.0370 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



PARAMETRIC VALUES
BETA 0.050

REFERENCE INFORMATION
REFS 1.3960 SQ. IN.
REFL 1.3330 IN
REFB 1.3330 IN
XMRP 0.0370 IN
YMRP 0.0090 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE #EF

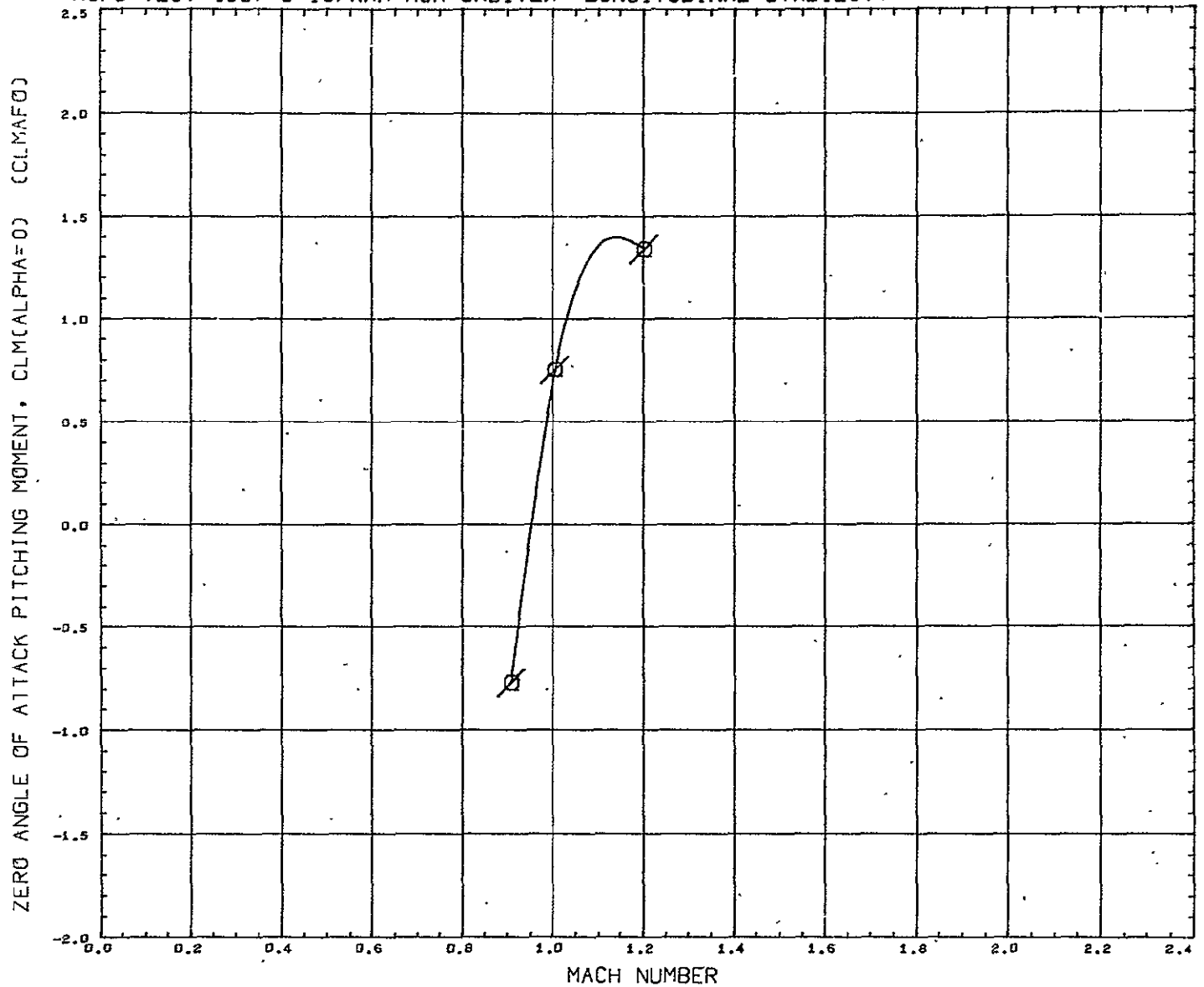
M485-MSFC-S1C NAR HCR ORBITER

00EFS2

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



PARAMETRIC VALUES
BETA 0.050

REFERENCE INFORMATION
REFS 1.3960 SQ. IN.
REFL 1.3330 IN
REFB 1.3330 IN
XMRP - 0.0370 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE #EF

M485-MSFC-S1C NAR HCR ORBITER

DEFS2

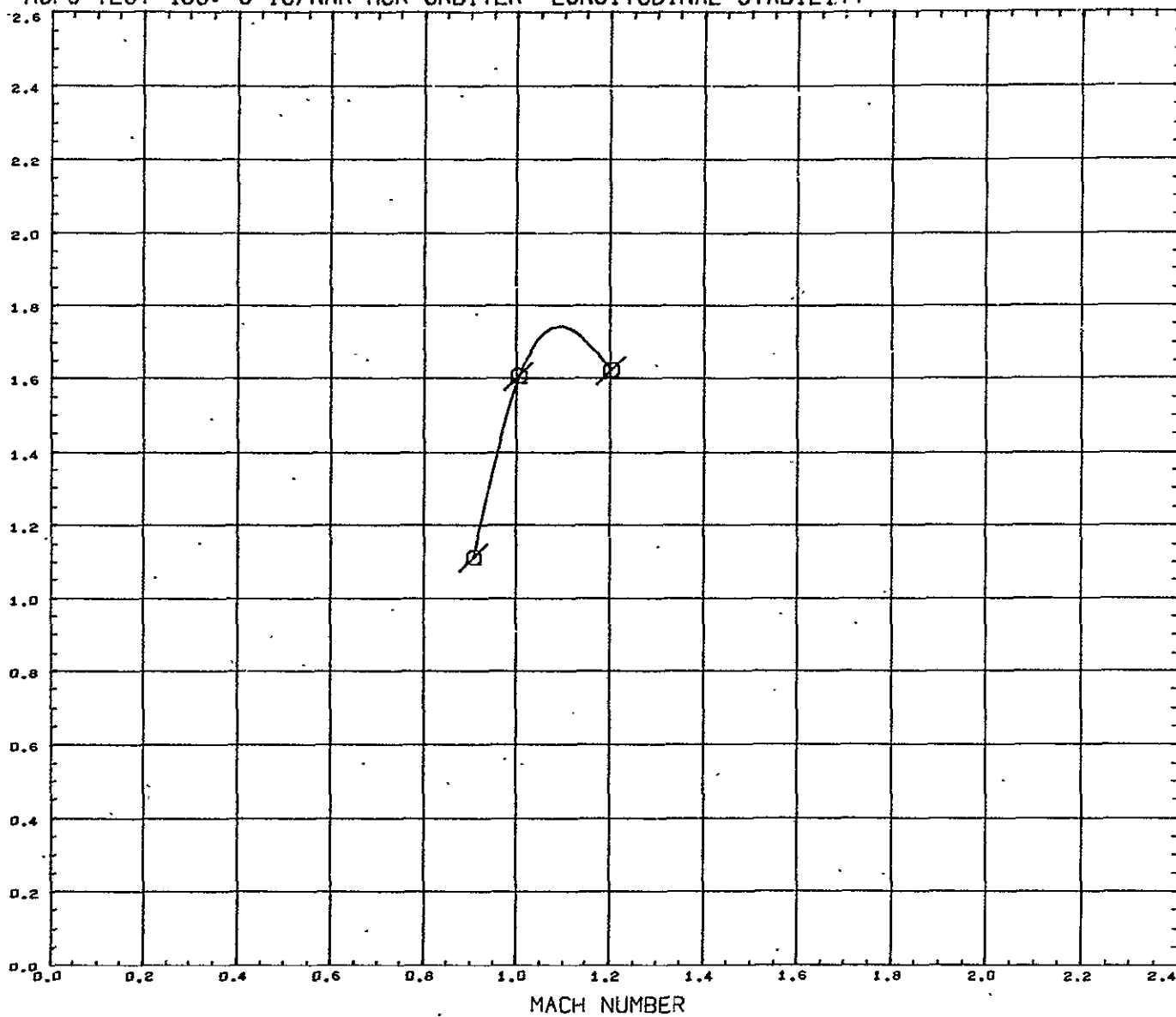
(B30061)

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MSFC TEST 485. S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

ZERO ANGLE OF ATTACK AXIAL FORCE COEFFICIENT, $C_{AXIALFO}$



PARAMETRIC VALUES
BETA 0.050

REFERENCE INFORMATION

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

DATA HIST. CODE #EF

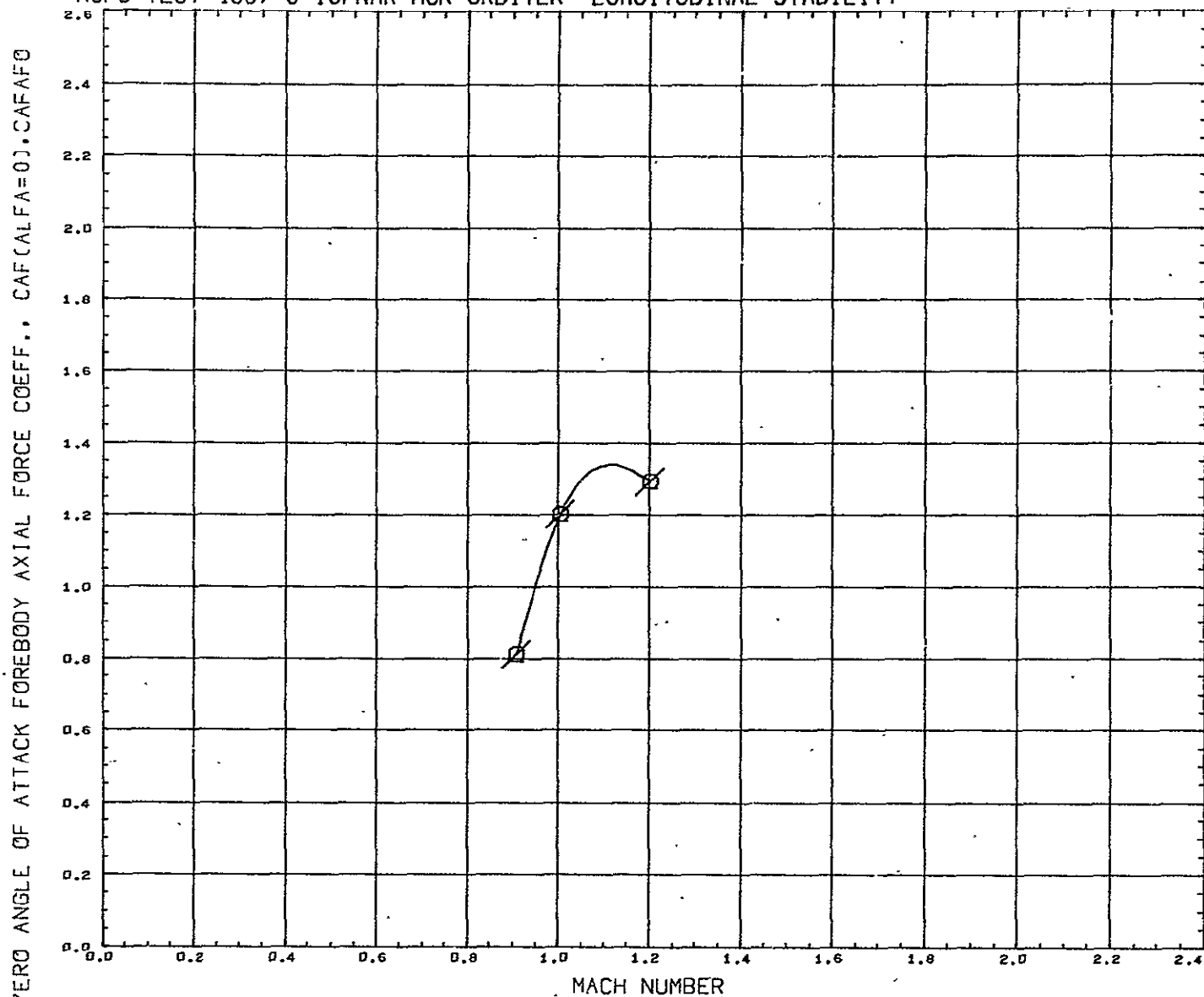
M485-MSFC-S1C NAR HCR ORBITER

0BFS2

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



BETA
PARAMETRIC VALUES
0.050

REFERENCE INFORMATION

REFS	1.3960	sq.in.
REFL	1.3350	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EF

M485-MSFC-S1C NAP HCR ORBITER

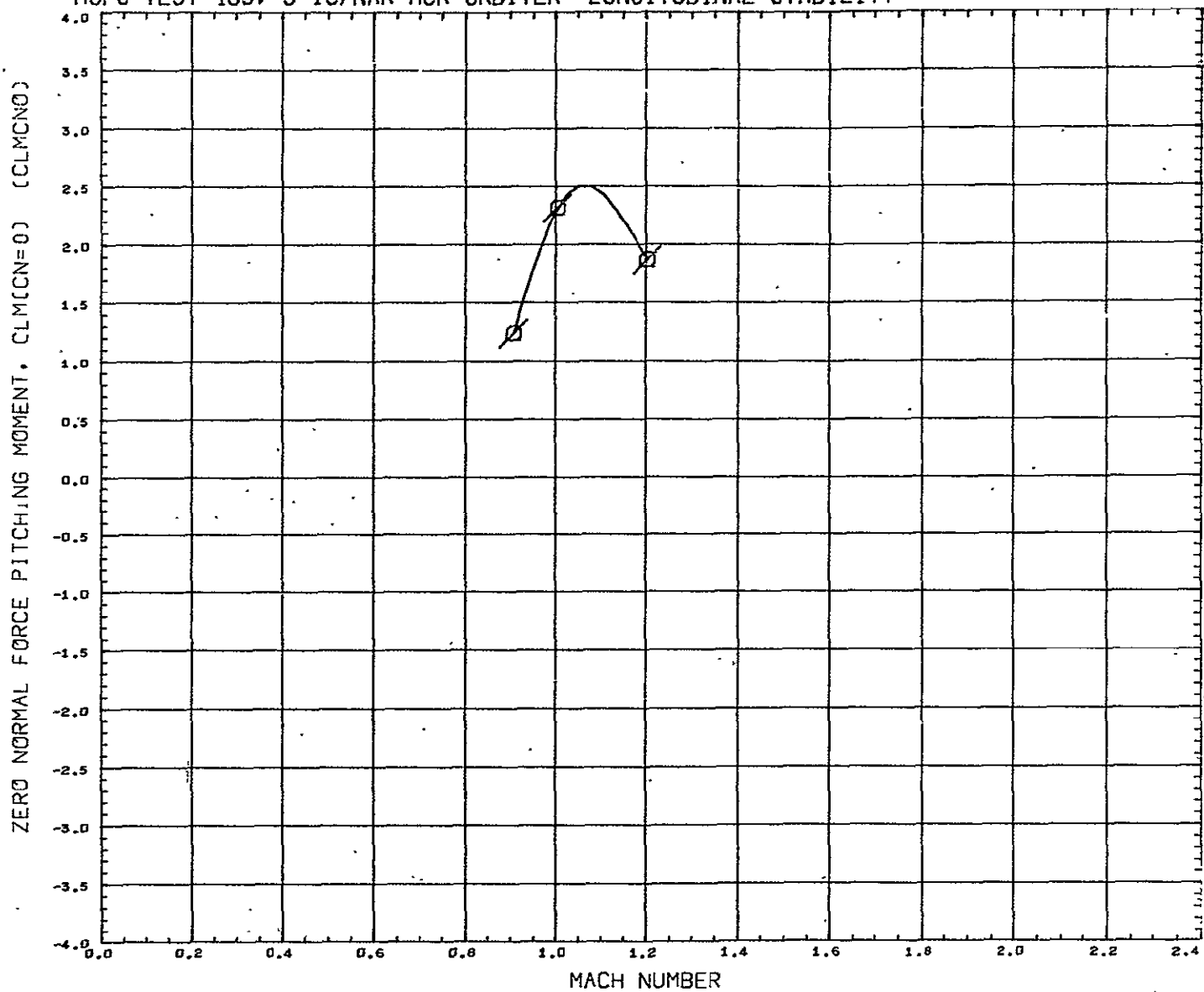
06FS2

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06 MAY 71

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

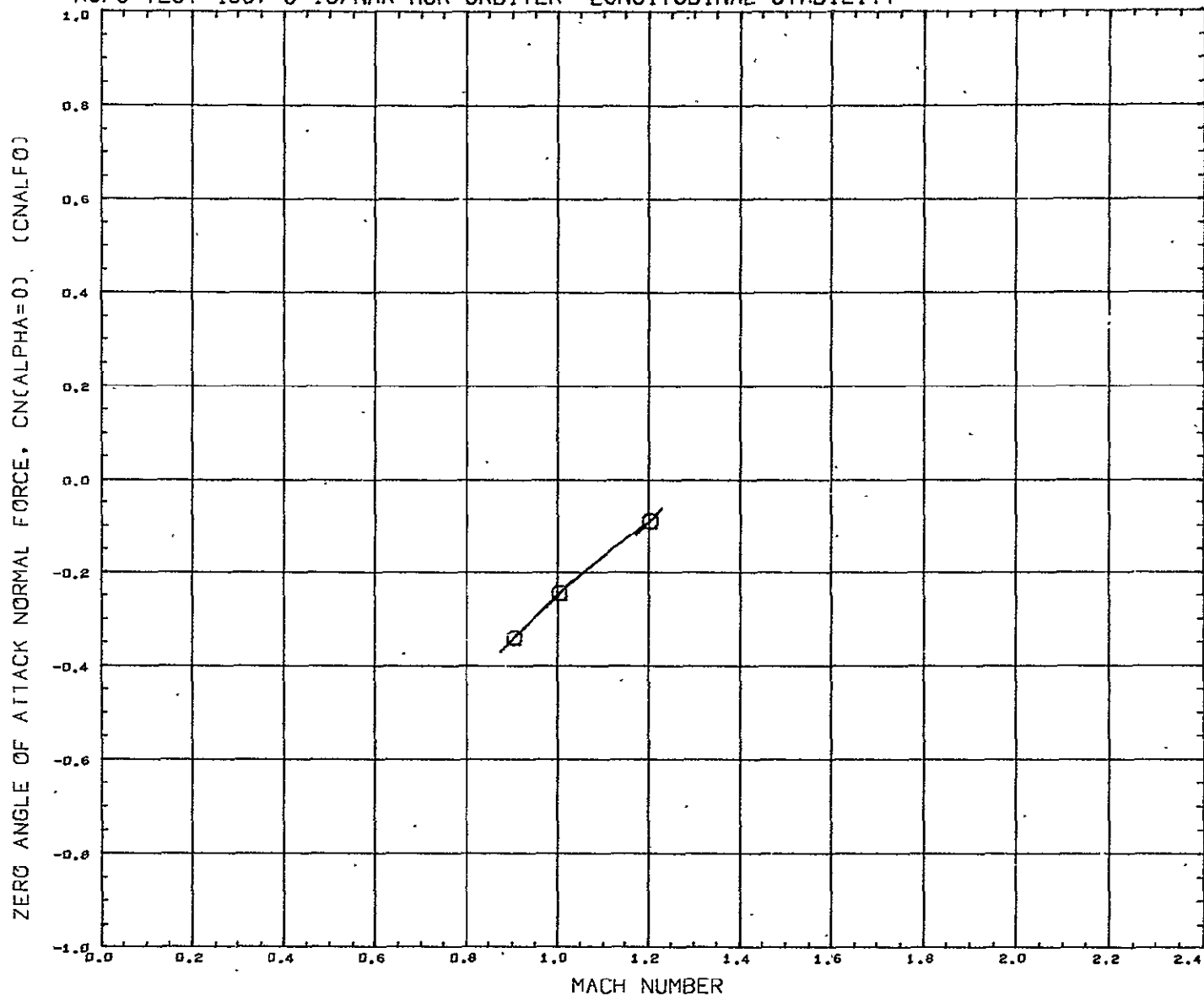


PARAMETRIC VALUES
BETA 0.050

REFERENCE INFORMATION
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REFL 1.3330 IN
REFB 1.3330 IN
XMRP 0.637L IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE *EF

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

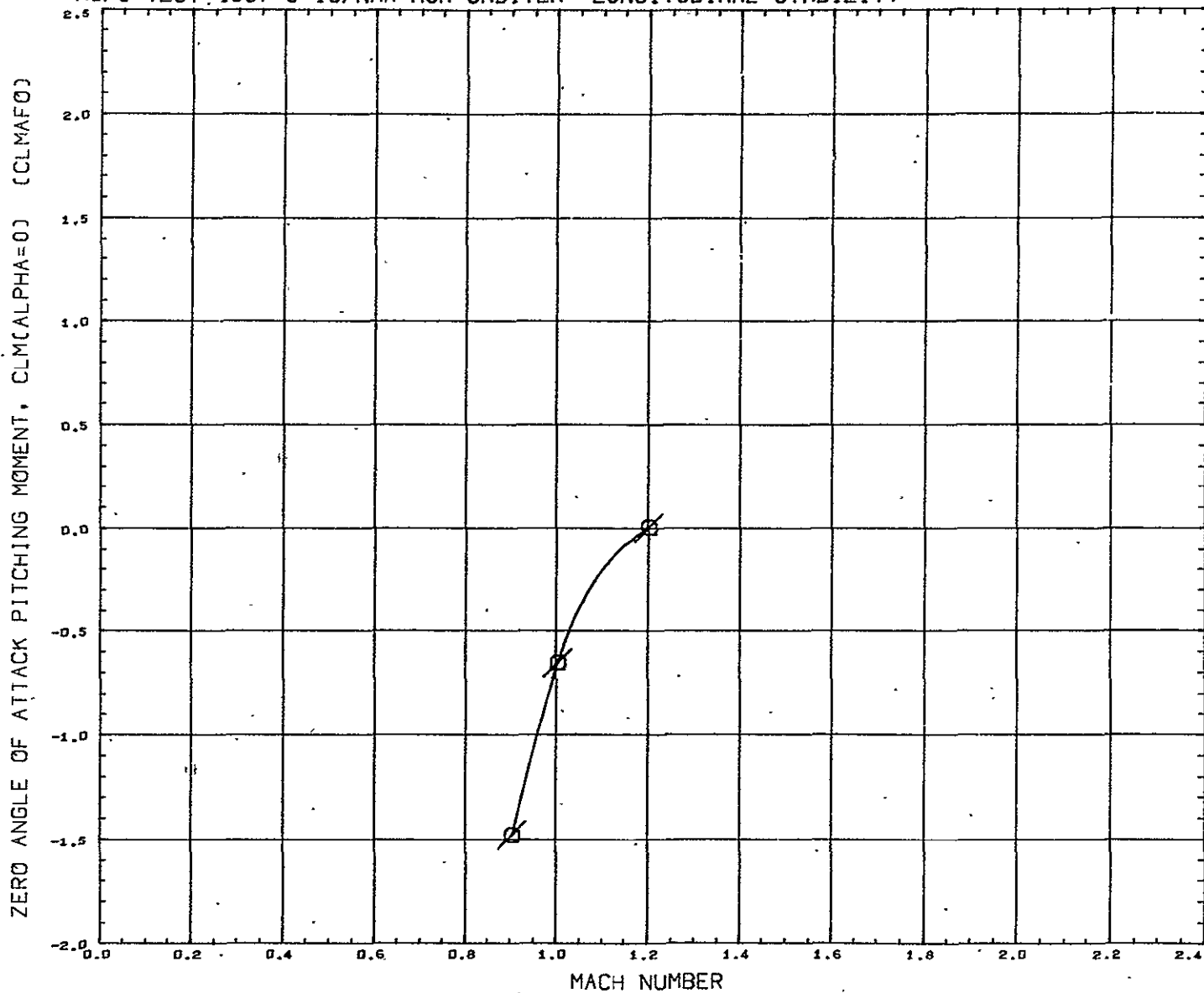


PARAMETRIC VALUES
BETA 0.060

DATA HIST. CODE REF

REFERENCE INFORMATION
REFS 1.3960 SQ. IN.
REFL 1.3530 IN
REFB 1.3350 IN
XMRF 0.0370 IN
YMRF 0.0000 IN
ZMRF 0.0000 IN
SCALE 0.0034

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



PARAMETRIC VALUES
BETA 0.060

REFERENCE INFORMATION
REFS 1.3960 SQ. IN.
REFL 1.3330 IN
REFB 1.3330 IN
XMRP 0.0370 IN
YMRP 0.0000 IN
ZMRP 3.0000 IN
SCALE 0.0034

DATA HIST. CODE *EF

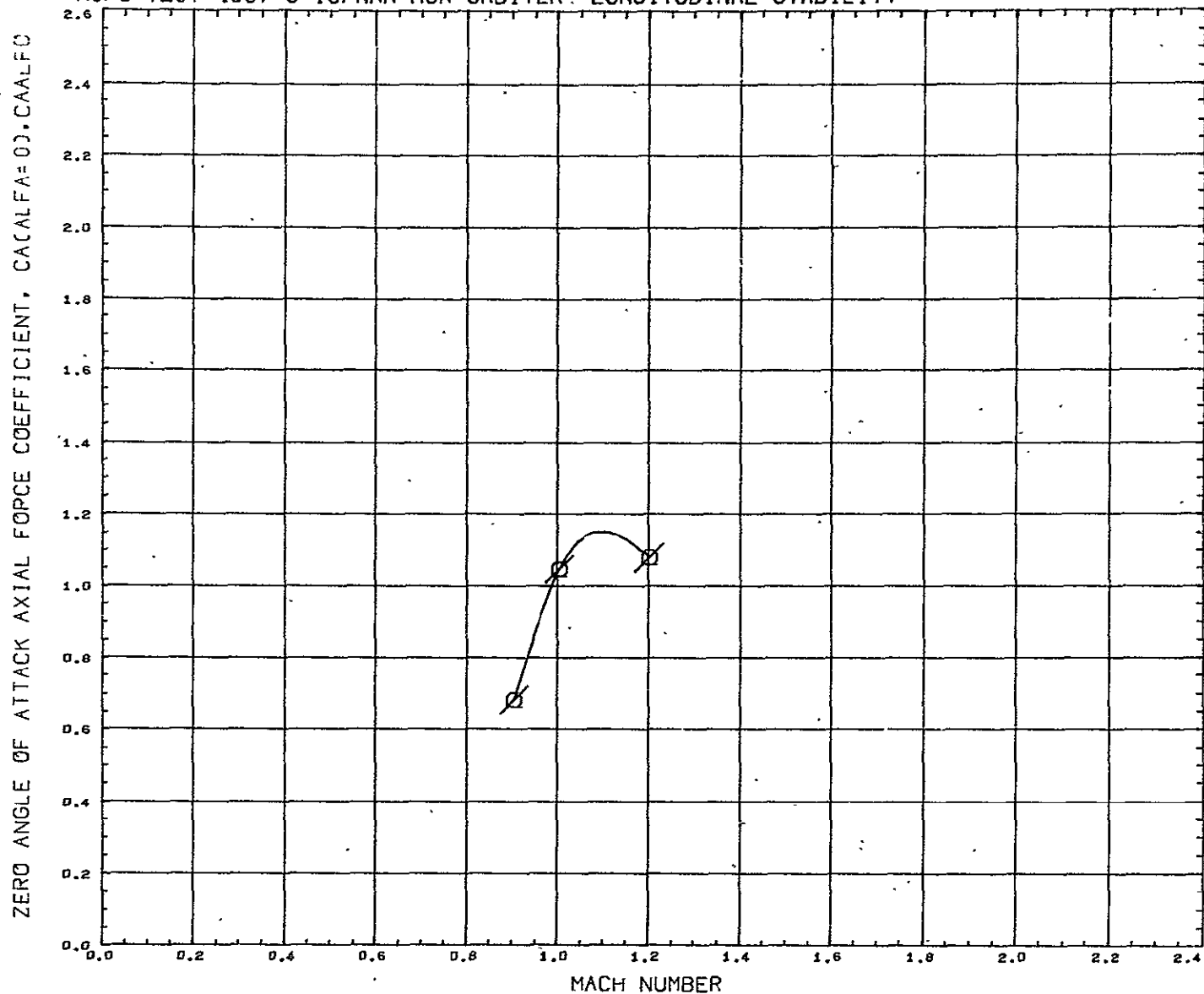
M485-MSFC-S1C-NAR HCR ORBITER

0EVD1

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MSEC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



BETA 0.060
PARAMETRIC VALUES

DATA HIST. CODE *EF.

REFERENCE INFORMATION
REFS 1.3960 SQ. IN.
REFL 1.3330 IN
REFB 1.3330 IN
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YHRF 0.0000 IN
ZHRF 0.0000 IN
SCALE 0.0034

M485-MSFC-S1C NAR HCR ORBITER

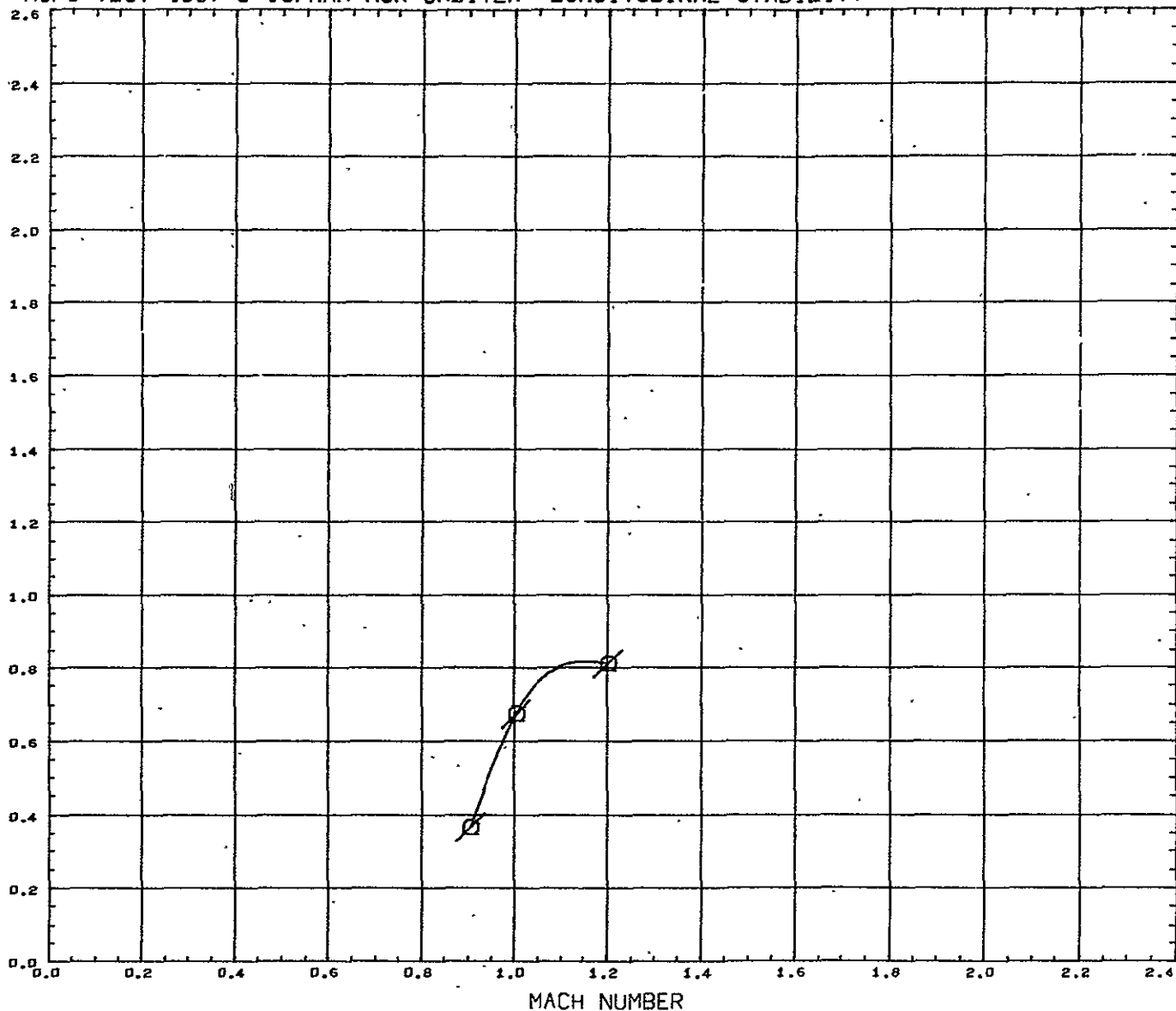
0EVD1

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

ZERO ANGLE OF ATTACK FOREBODY AXIAL FORCE COEFF., $C_{AF}(\alpha=0)$, $C_{AF}(\alpha=0)$



PARAMETRIC VALUES
BETA 0.060

REFERENCE INFORMATION
REFS 1.3960 SQ. IN.
REFL 1.3330 IN
REFB 1.3330 IN
XMRP - 0.0370 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE *EF

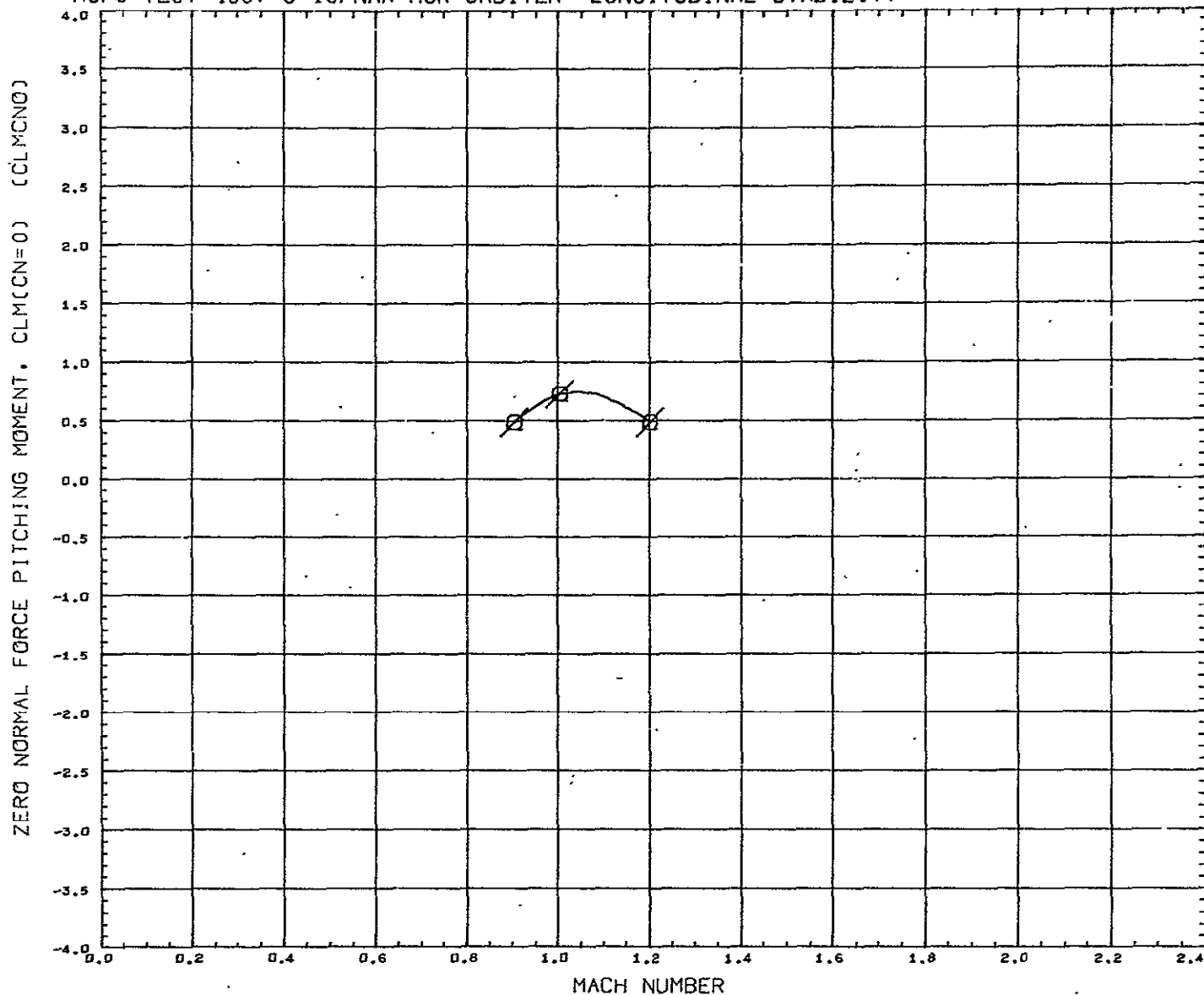
M485-MSFC-S1C NAR HCR ORBITER

OBVD1

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

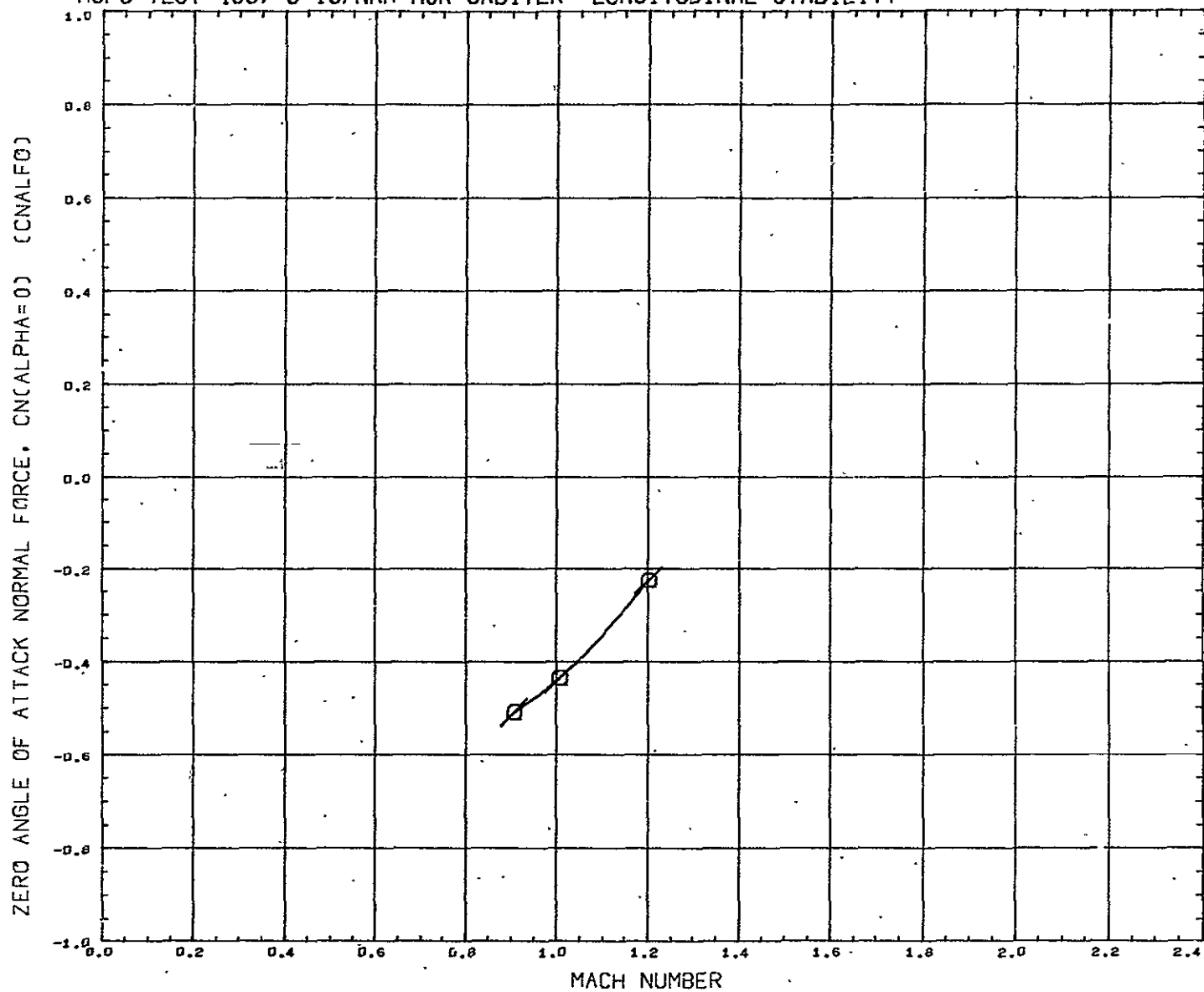


PARAMETRIC VALUES
BETA 0.060

REFERENCE INFORMATION
REFS 1.3960 SQ. IN.
REFL 1.3330 IN
REFB 1.3330 IN
XMRP - 0.0370 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE *EF

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

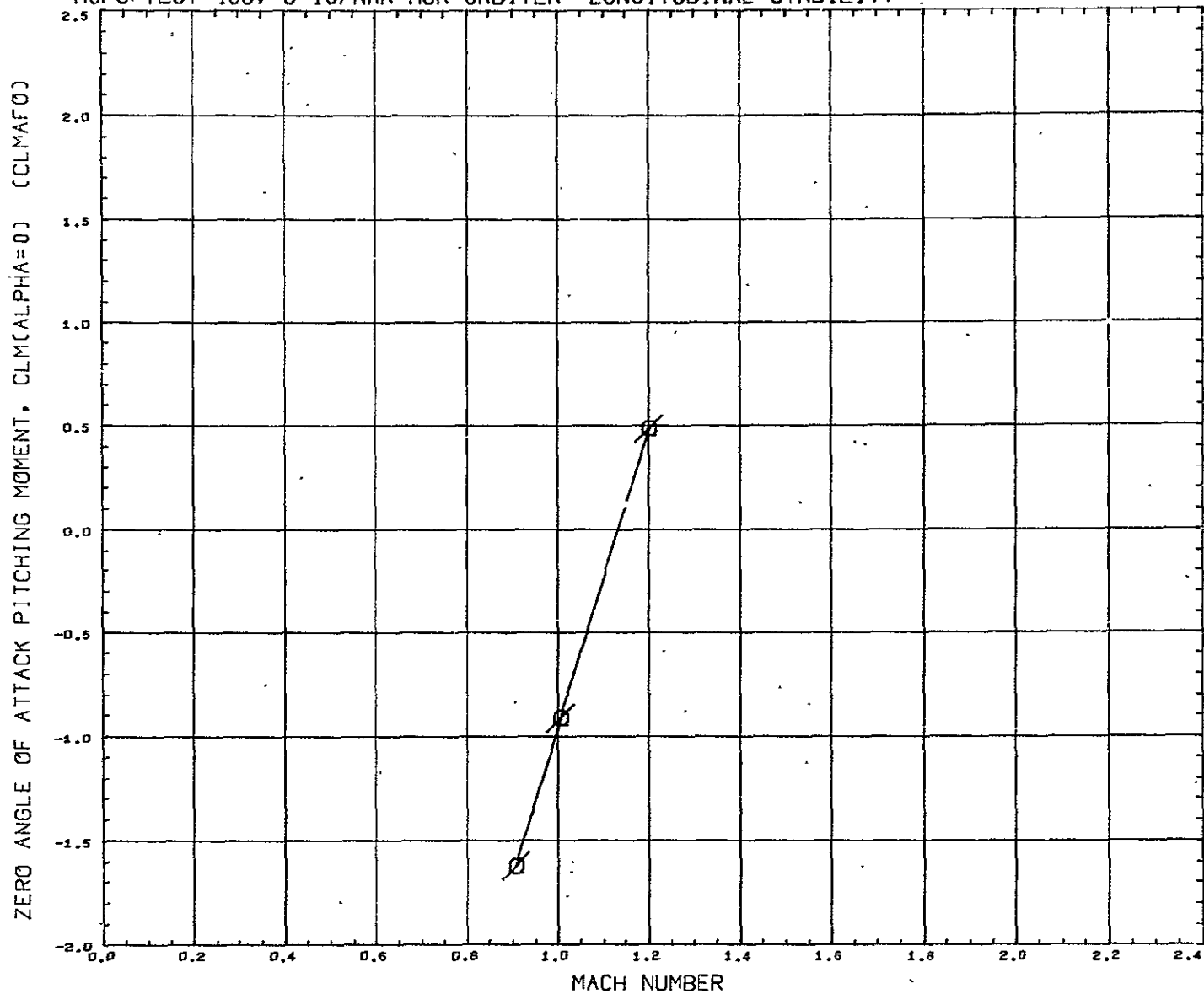


PARAMETRIC VALUES
BETA 0.040

REFERENCE INFORMATION
REFS 1.3960 SQ.IN.
REFL 1.3330 IN
REFB 1.3330 IN
XMRP - 0.0370 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE *EF

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



PARAMETRIC VALUES
BETA 0.040

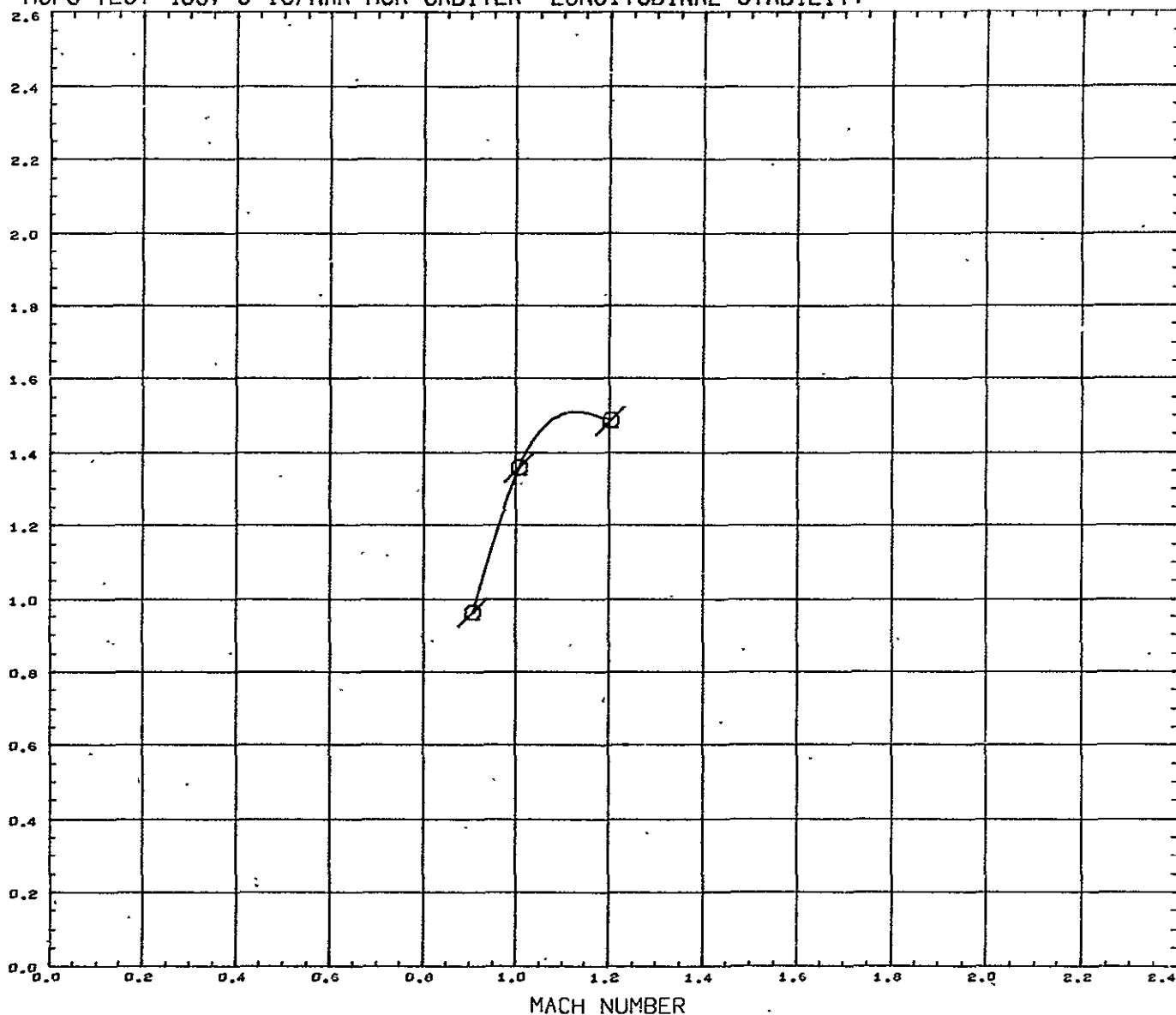
REFERENCE INFORMATION

REFS	1.3960	50 IN.
REFL	1.3350	IN
REFB	1.3350	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EF

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

ZERO ANGLE OF ATTACK AXIAL FORCE COEFFICIENT, $C_{AXIALFO}$



PARAMETRIC VALUES
BETA, 0.040

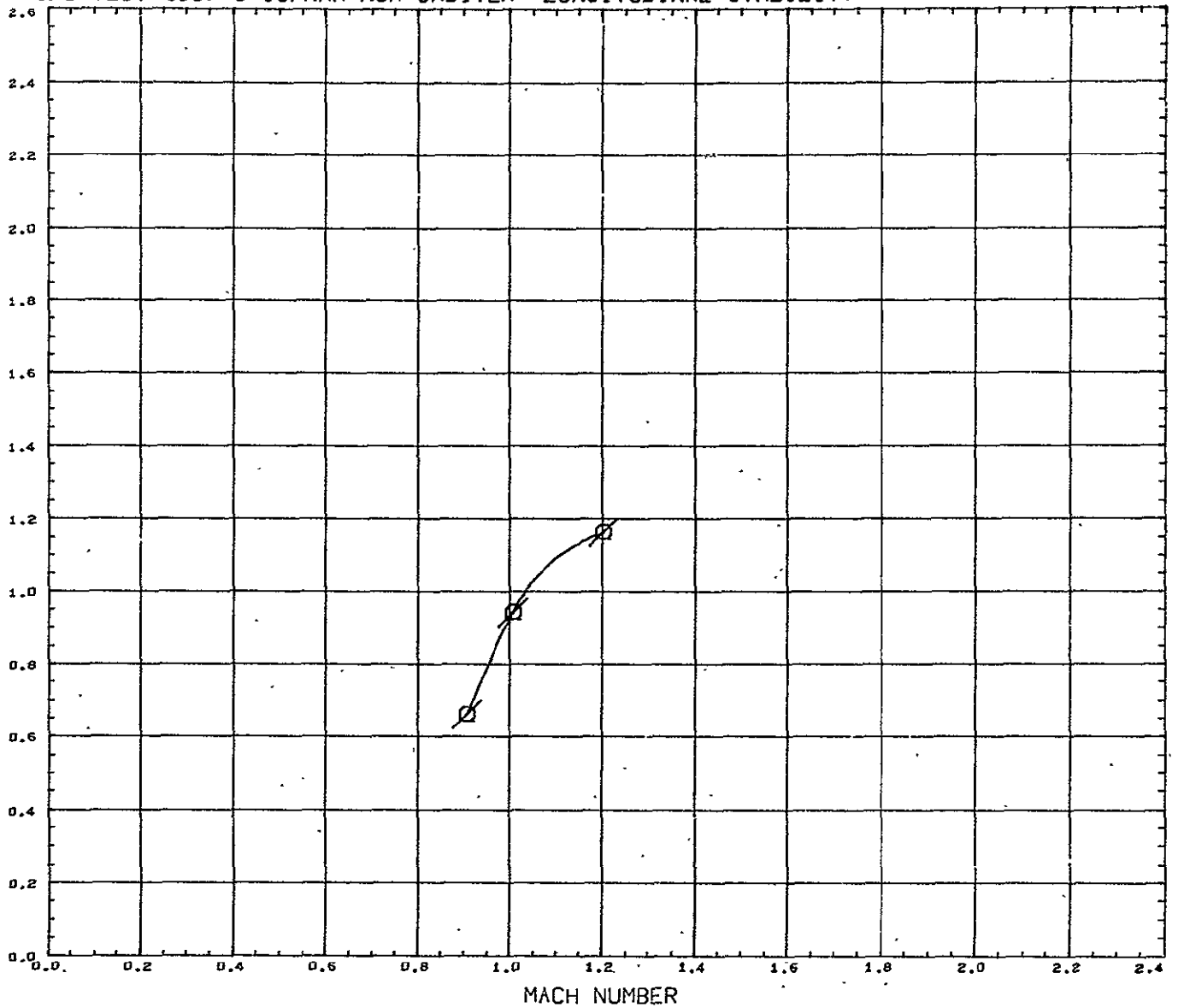
REFERENCE INFORMATION

REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EF

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

ZERO ANGLE OF ATTACK FOREBODY AXIAL FORCE COEFF., $C_{AF}(\alpha=0)$, $C_{AF}(\alpha=0)$



PARAMETRIC VALUES
BETA 0.040

REFERENCE INFORMATION
REFS 1.3960 SQ. IN.
REFL 1.3330 IN
REFB 1.3330 IN
XMRP 0.0370 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE *EF

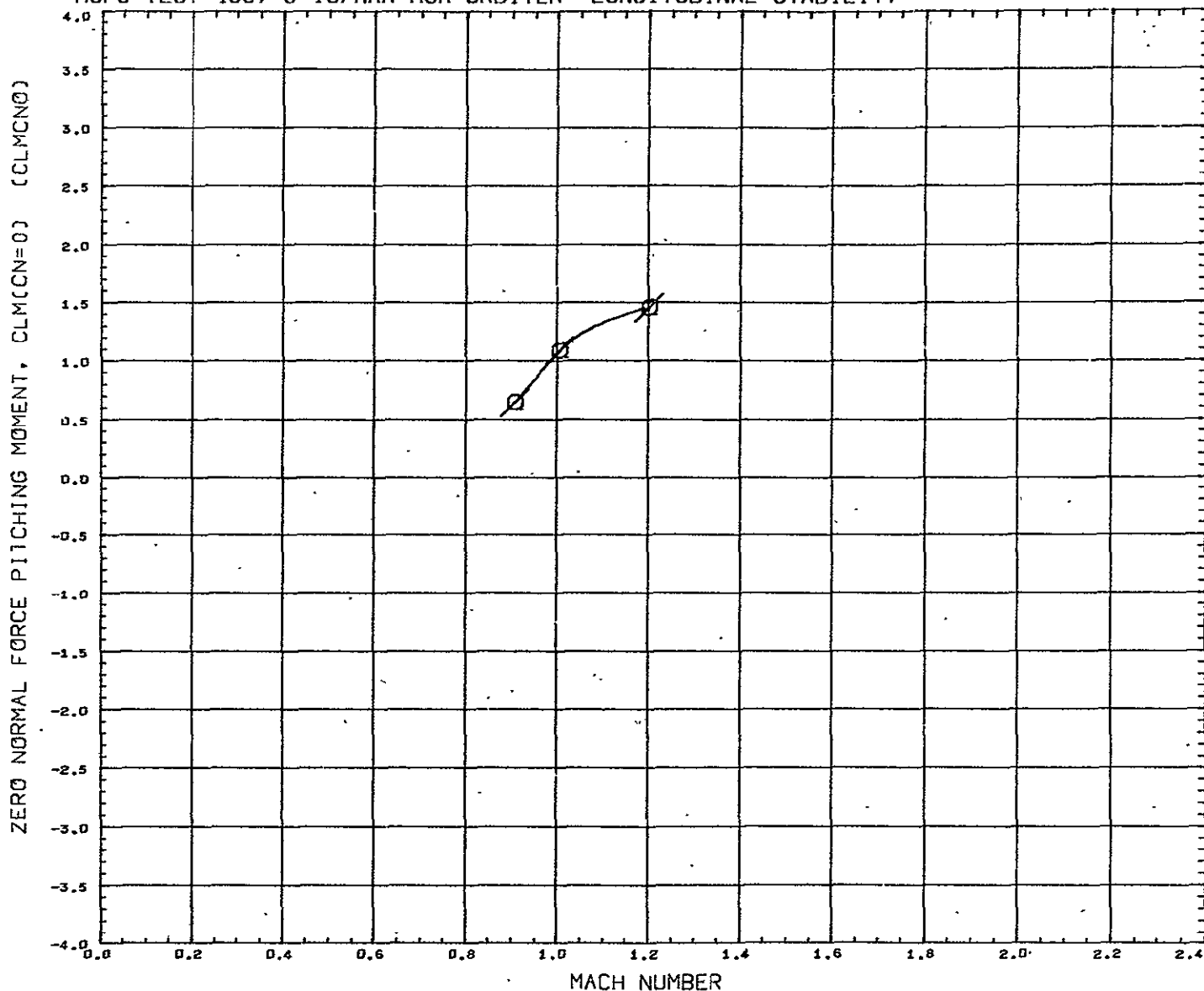
M485-MSFC-S1C NAR HCR ORBITER

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



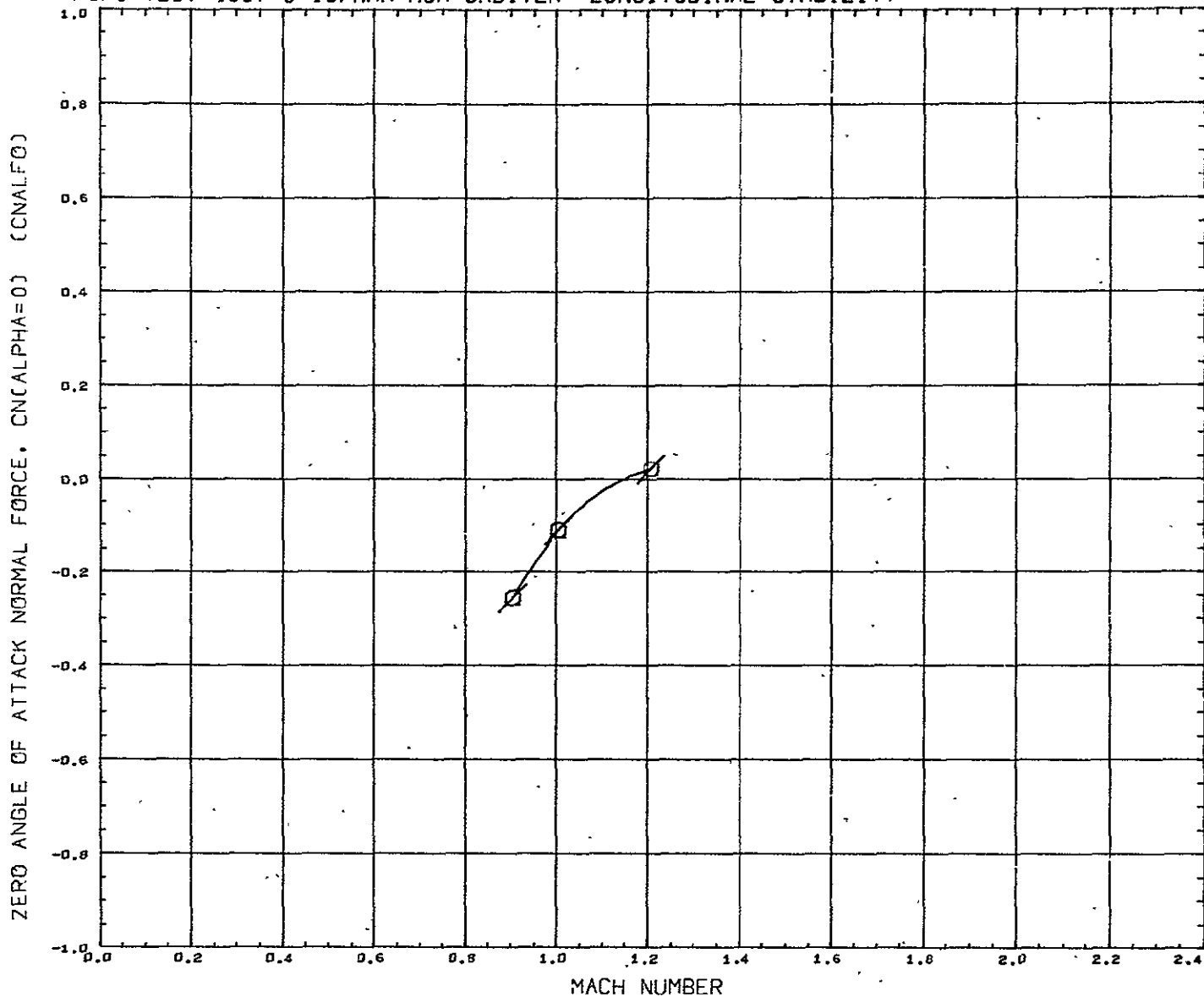
BETA PARAMETRIC VALUES
0.040

DATA HIST. CODE #EF

REFERENCE INFORMATION

REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



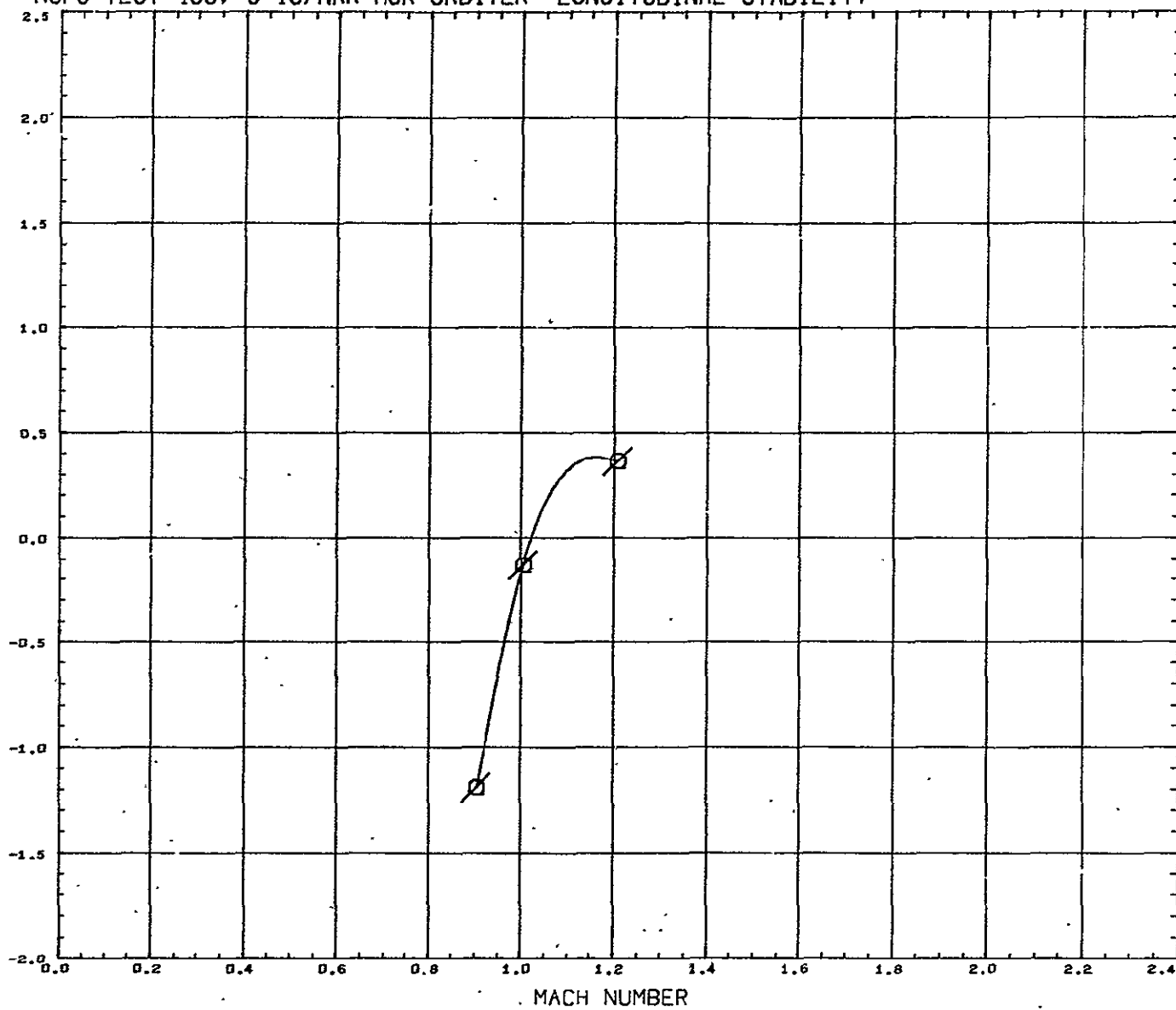
PARAMETRIC VALUES
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DATA HIST. CODE #EF

REFERENCE INFORMATION
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REFB 1.3330 IN
XNRP 0.0370 IN
YNRP 0.0000 IN
ZNRP 0.0000 IN
SCALE 0.0034

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

ZERO ANGLE OF ATTACK PITCHING MOMENT, $CLMAF0$



PARAMETRIC VALUES
BETA 0.040

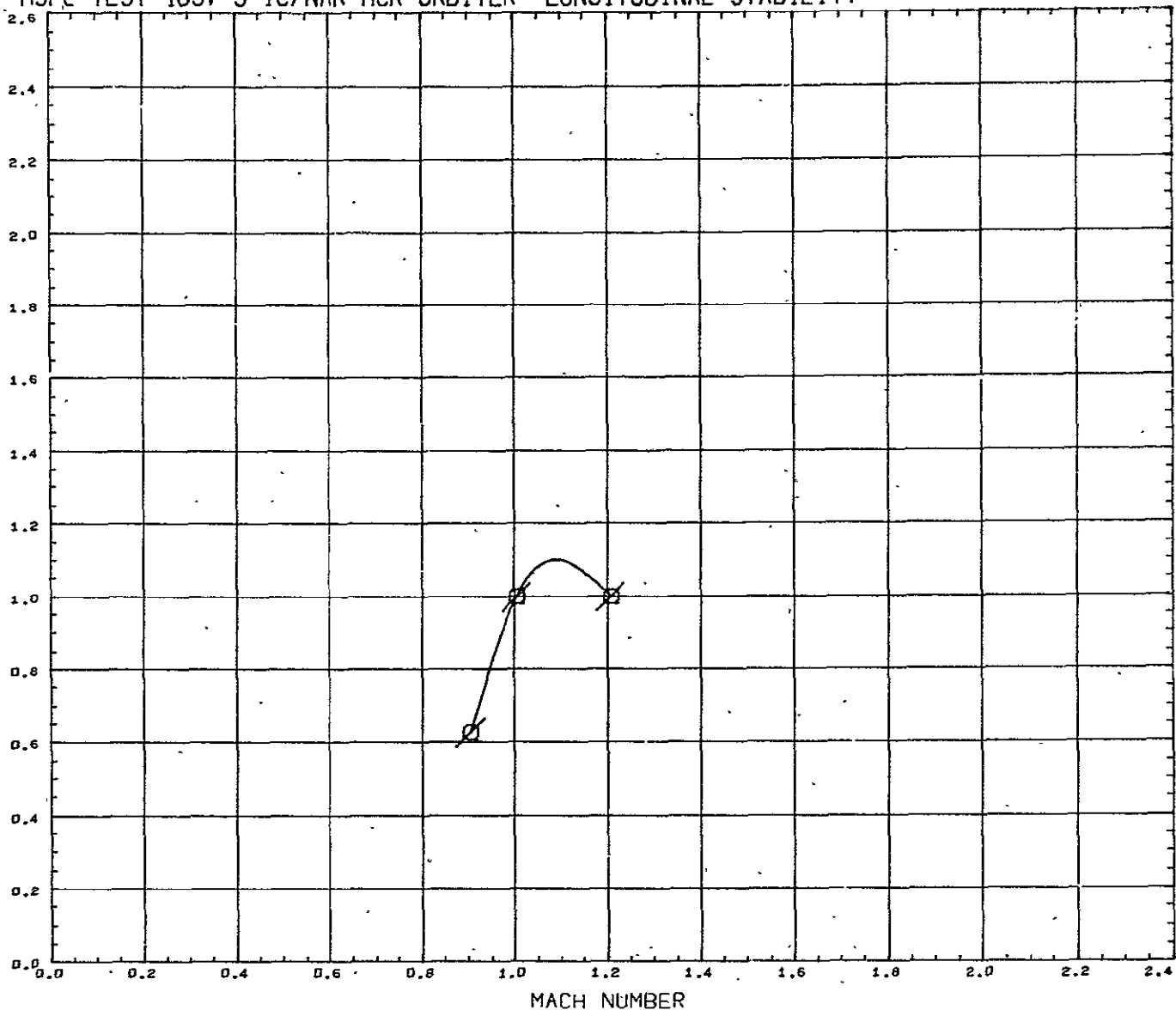
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REFERENCE INFORMATION

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YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

ZERO ANGLE OF ATTACK AXIAL FORCE COEFFICIENT, CACALFA=0J.CAALFO



PARAMETRIC VALUES
BETA 0.040

REFERENCE INFORMATION

REFS	1.3960	sq. in.
REFL	1.3330	in
REFB	1.3330	in
XMRF	0.0370	in
YMRF	0.0000	in
ZMRF	0.0000	in
SCALE	0.0034	

DATA HIST. CODE *EF

M485-MSFC-S1C NAR HCR ORBITER

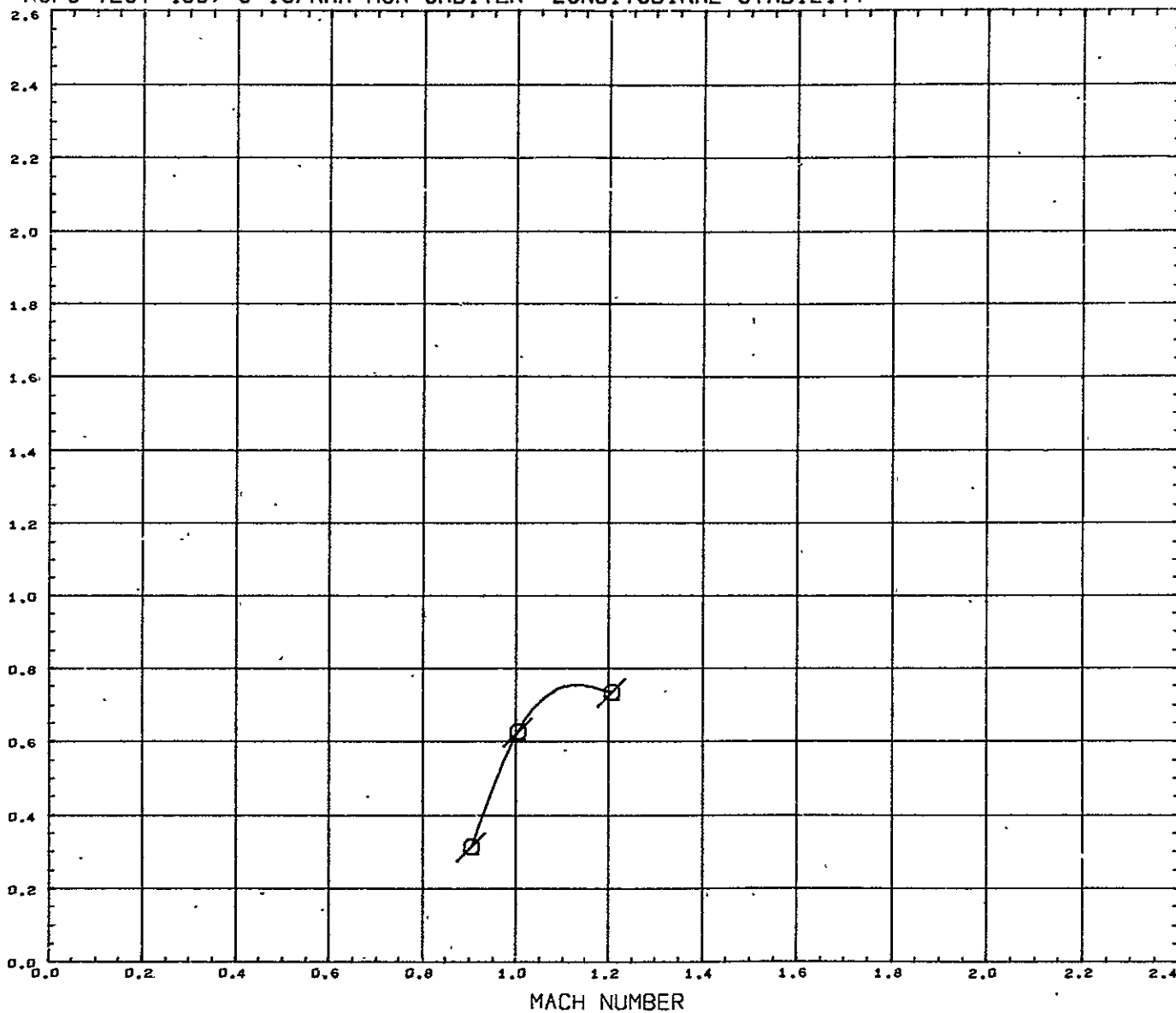
08J02

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

ZERO ANGLE OF ATTACK FOREBODY AXIAL FORCE COEFF., $C_{AF}(\alpha=0)$, C_{AFAF0}



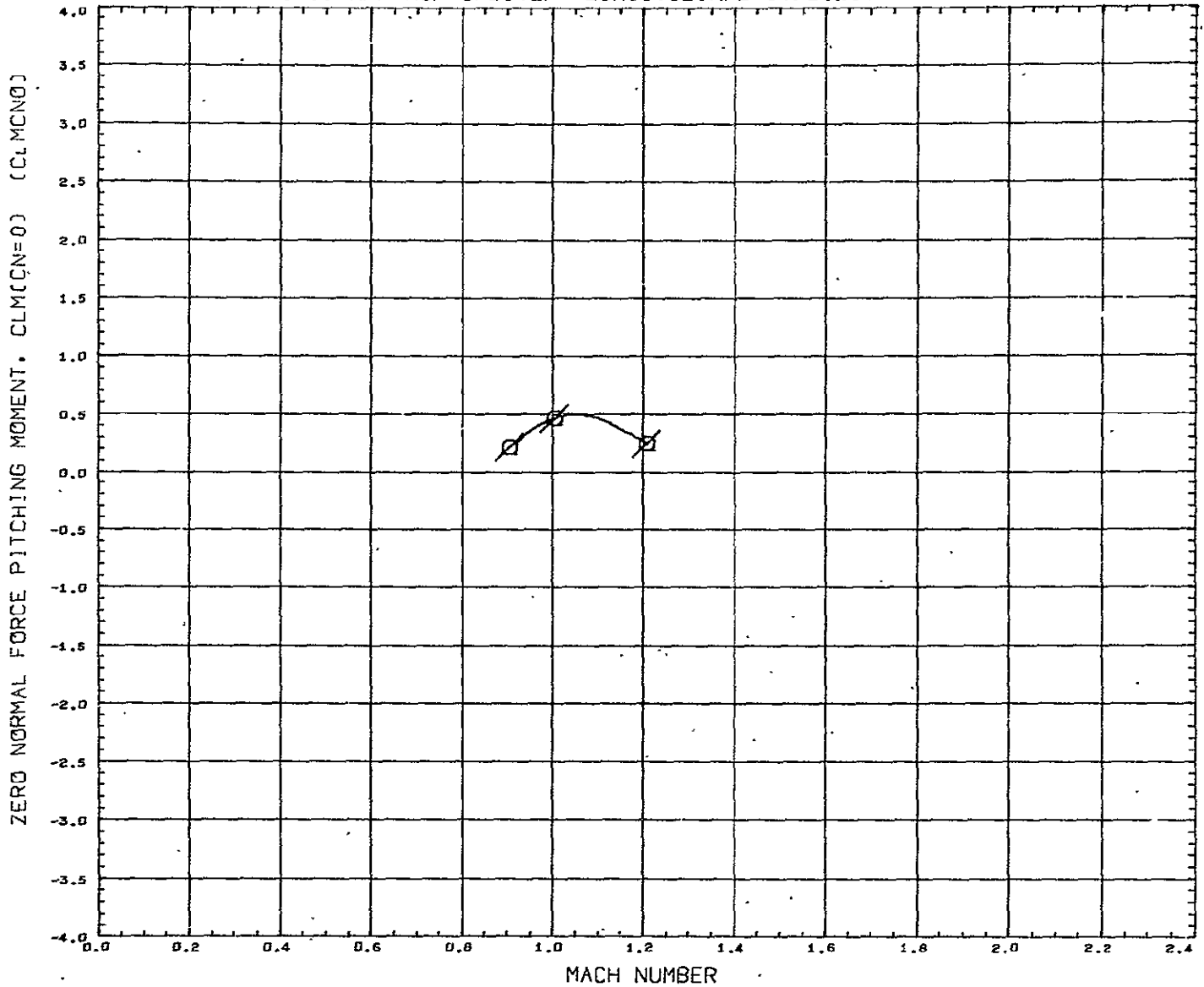
PARAMETRIC VALUES
BETA 0.040

DATA HIST. CODE #EF

REFERENCE INFORMATION

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REFB	1.3330	IN
XMRF	0.0370	IN
YMRF	0.0000	IN
ZMRF	0.0000	IN
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



PARAMETRIC VALUES
BETA 0.040

REFERENCE INFORMATION
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REFB 1.3330 IN
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ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE #EF

M485-MSFC-S1C NAR HCR ORBITER

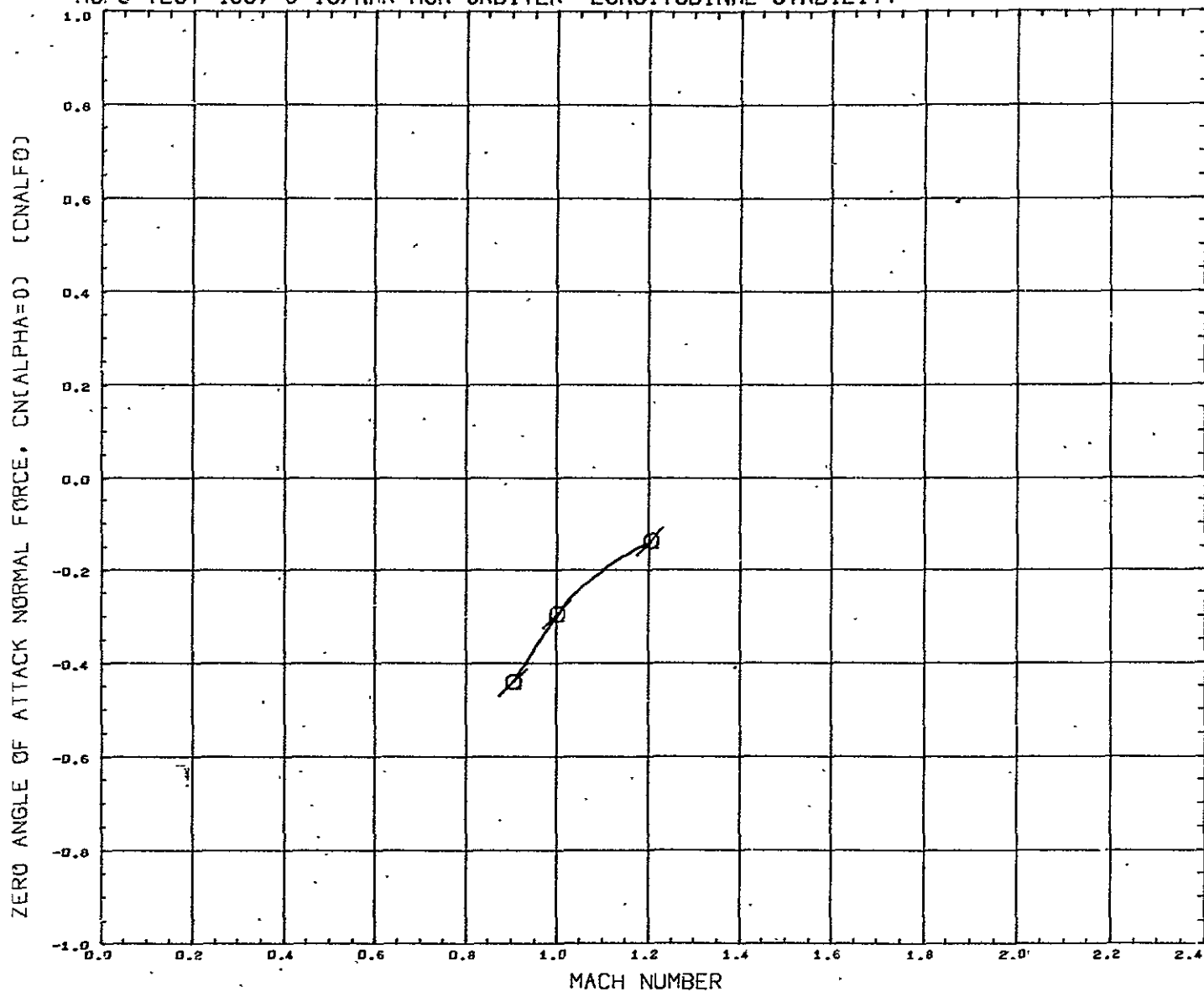
0BVD2

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



PARAMETRIC VALUES
BETA 0.050

REFERENCE INFORMATION
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REFB 1.3330 IN
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ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE *EF

M485-MSFC-S1C NAR HCR ORBITER

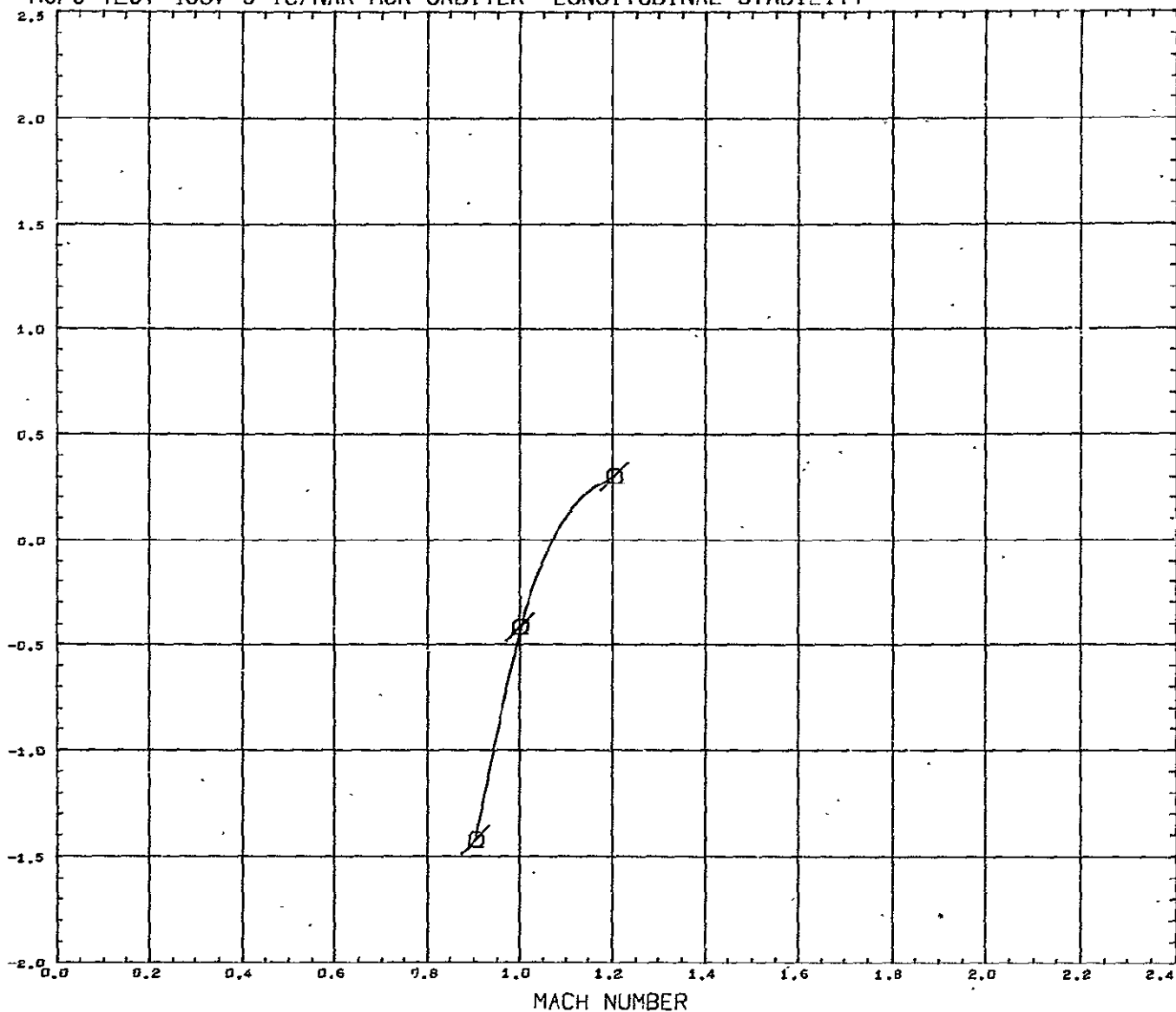
QBFDV2

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

ZERO ANGLE OF ATTACK PITCHING MOMENT, $CLM(\alpha=0)$ (CLMAF0)



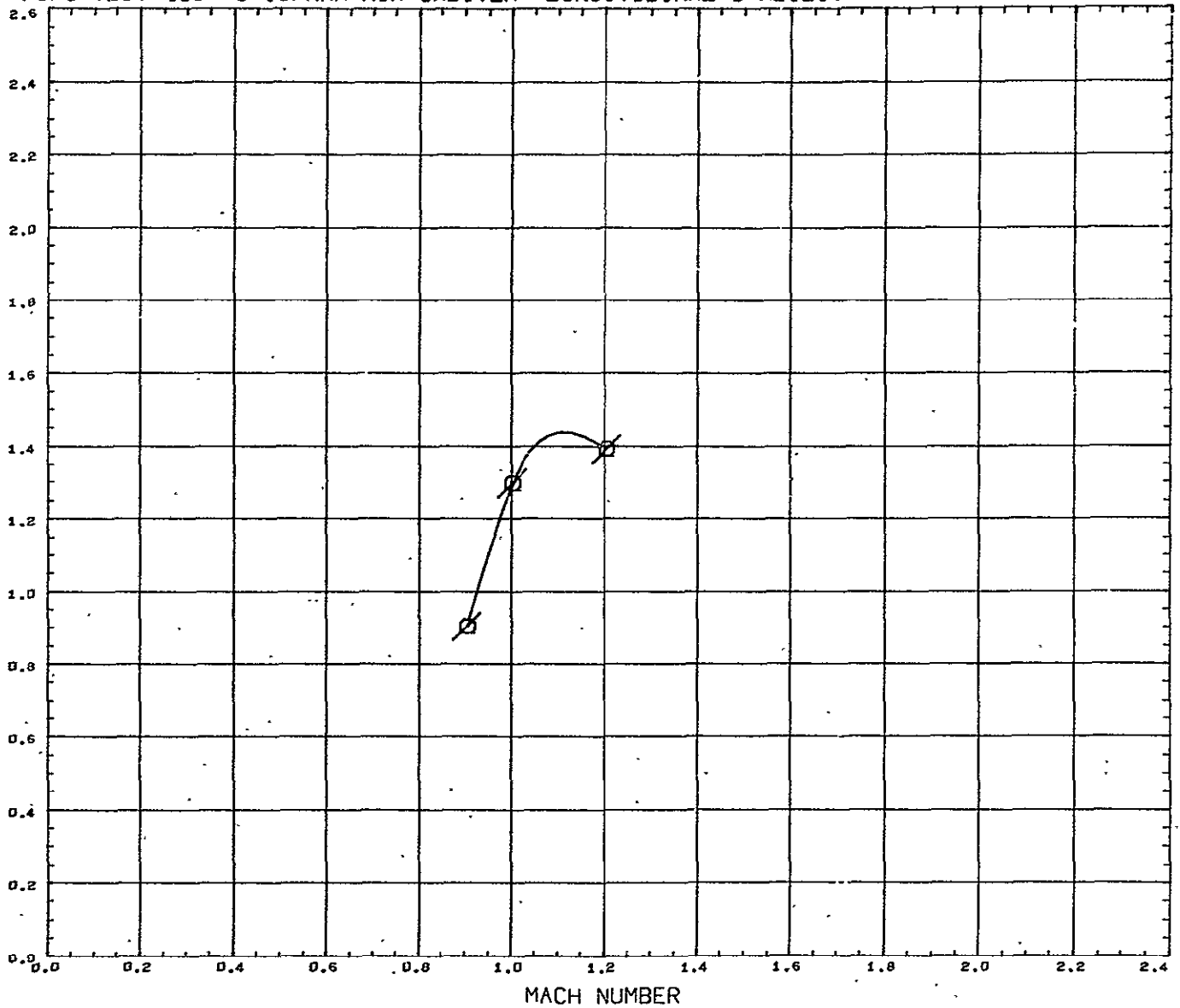
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REFERENCE INFORMATION
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YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE *EF

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

ZERO ANGLE OF ATTACK AXIAL FORCE COEFFICIENT, CACALFA=0, CAALF0



PARAMETRIC VALUES
BETA 0.050

REFERENCE INFORMATION
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REFL 1.3330 IN
REFB 1.3330 IN
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ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE *EF

M485-MSFC-S1C NAR HCR ORBITER

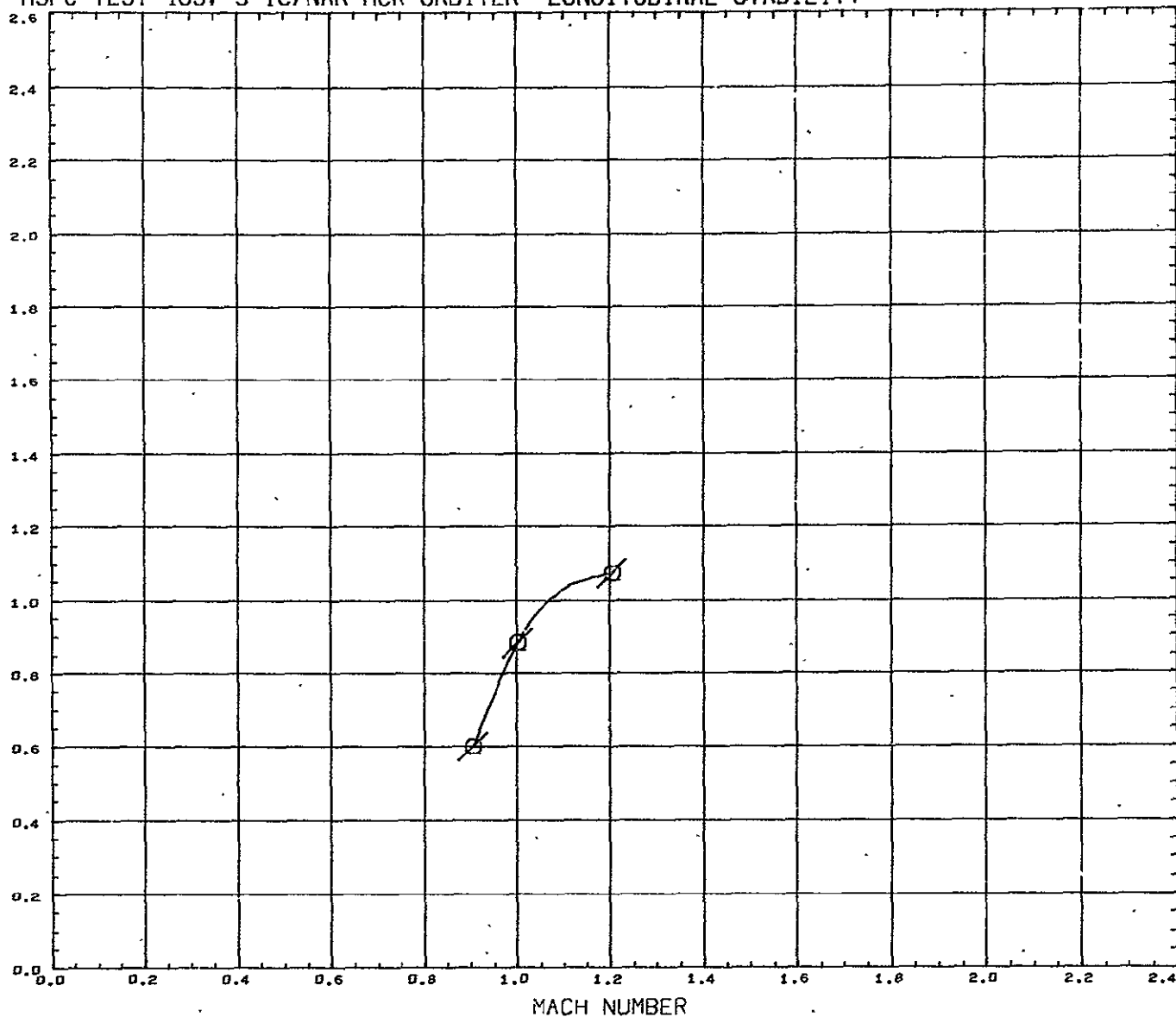
0BFVD2

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

ZERO ANGLE OF ATTACK FOREBODY AXIAL FORCE COEFF., $C_{AF}(\alpha=0), C_{AF}(\alpha=0)$



PARAMETRIC VALUES
BETA 0.050

REFERENCE INFORMATION
REFS 1.3960 SQ. IN.
REFL 1.3330 IN
REFB 1.3330 IN
XMRP 0.0370 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE *EF

M485-MSFC-S1C NAR HCR ORBITER

0BFVD2

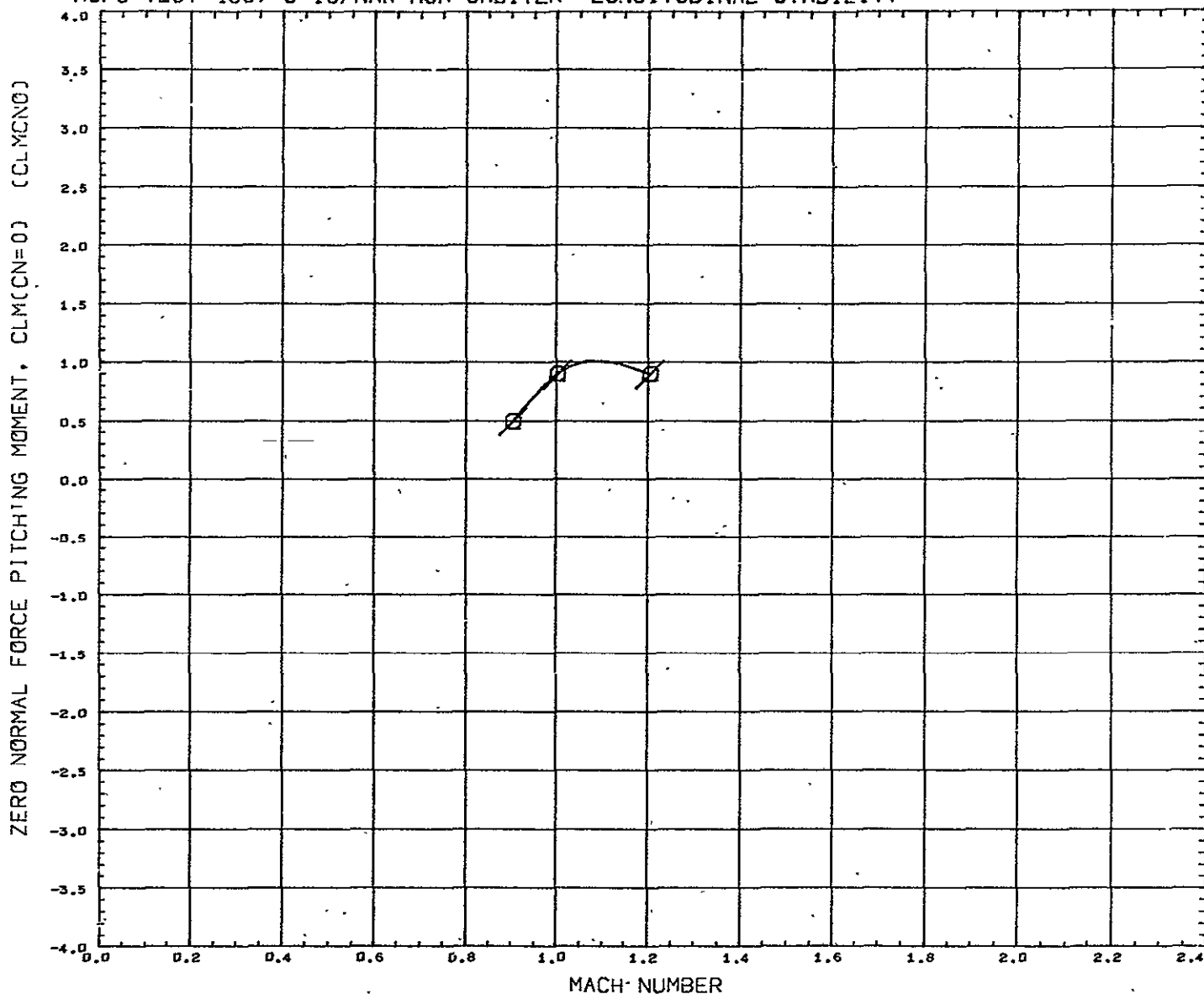
(B30101)

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



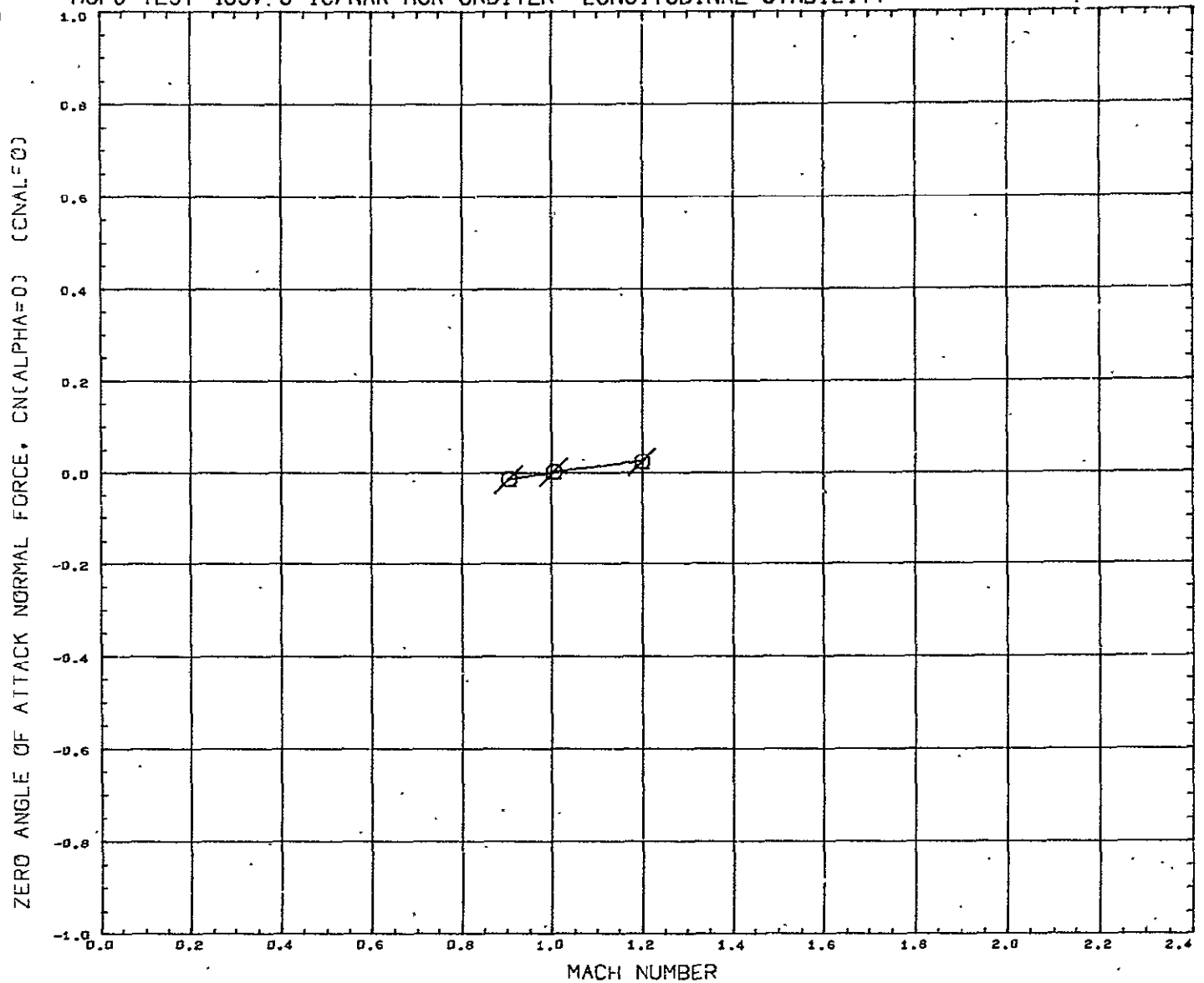
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REFERENCE INFORMATION

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REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



BETA 0.000
PARAMETRIC VALUES

REFERENCE INFORMATION
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REFL 1.3330 IN
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ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE *EF

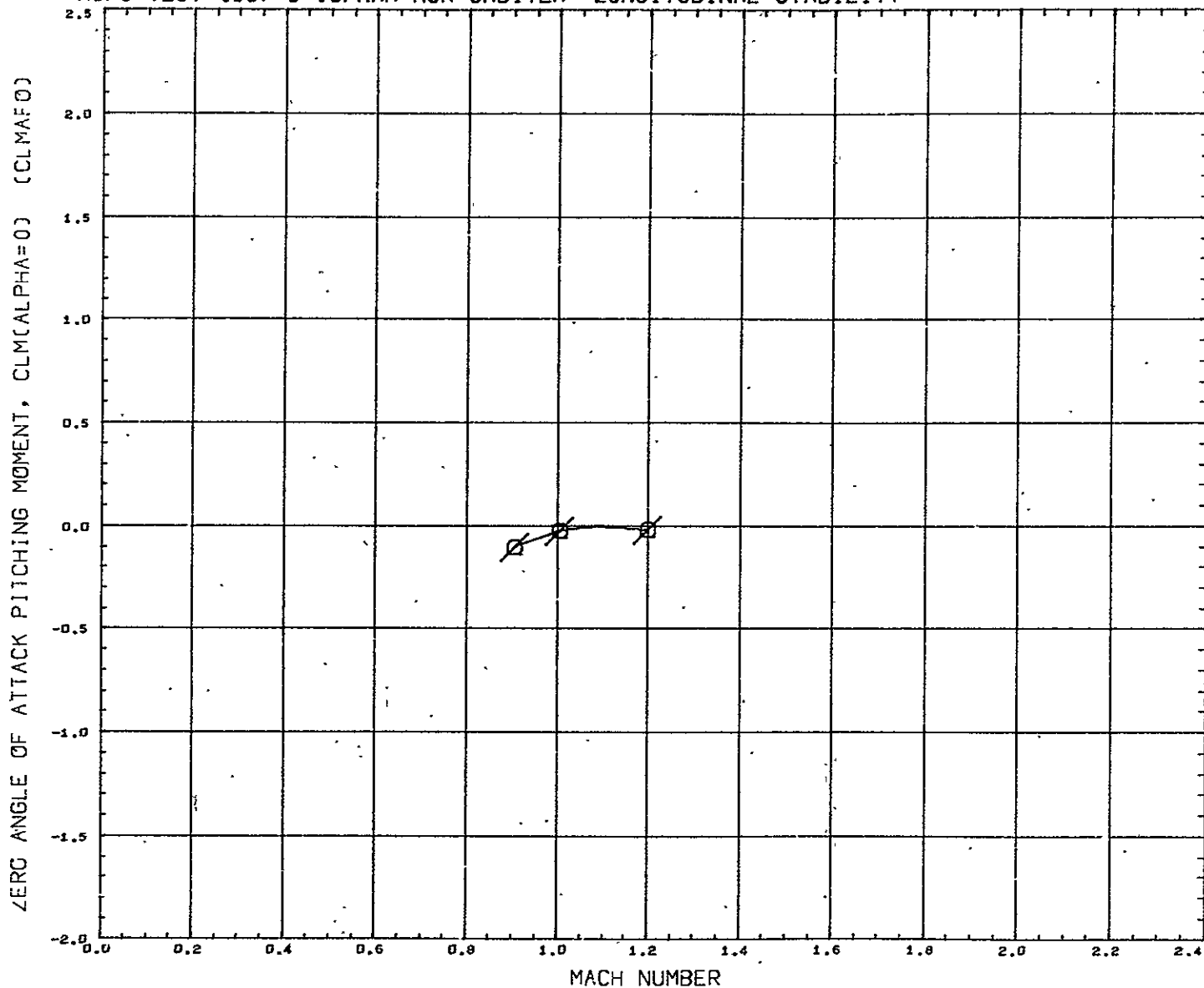
M485-MSFC-S1C NAR HCR ORBITER

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

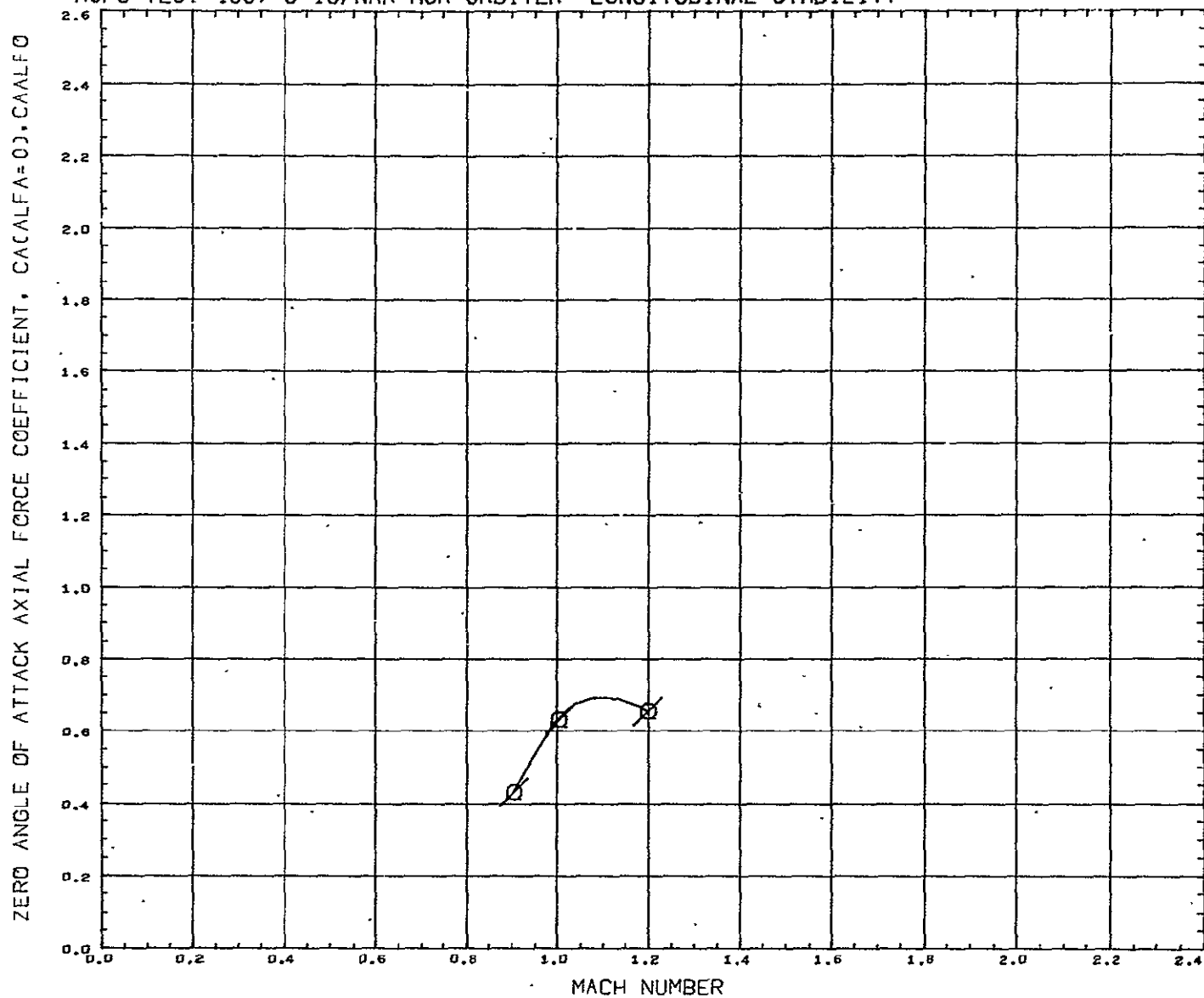


PARAMETRIC VALUES
BETA 0.000

DATA HIST. CODE *EF

REFERENCE INFORMATION
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REFB 1.3530 IN
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ZMRP 0.0000 IN
SCALE 0.0034

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



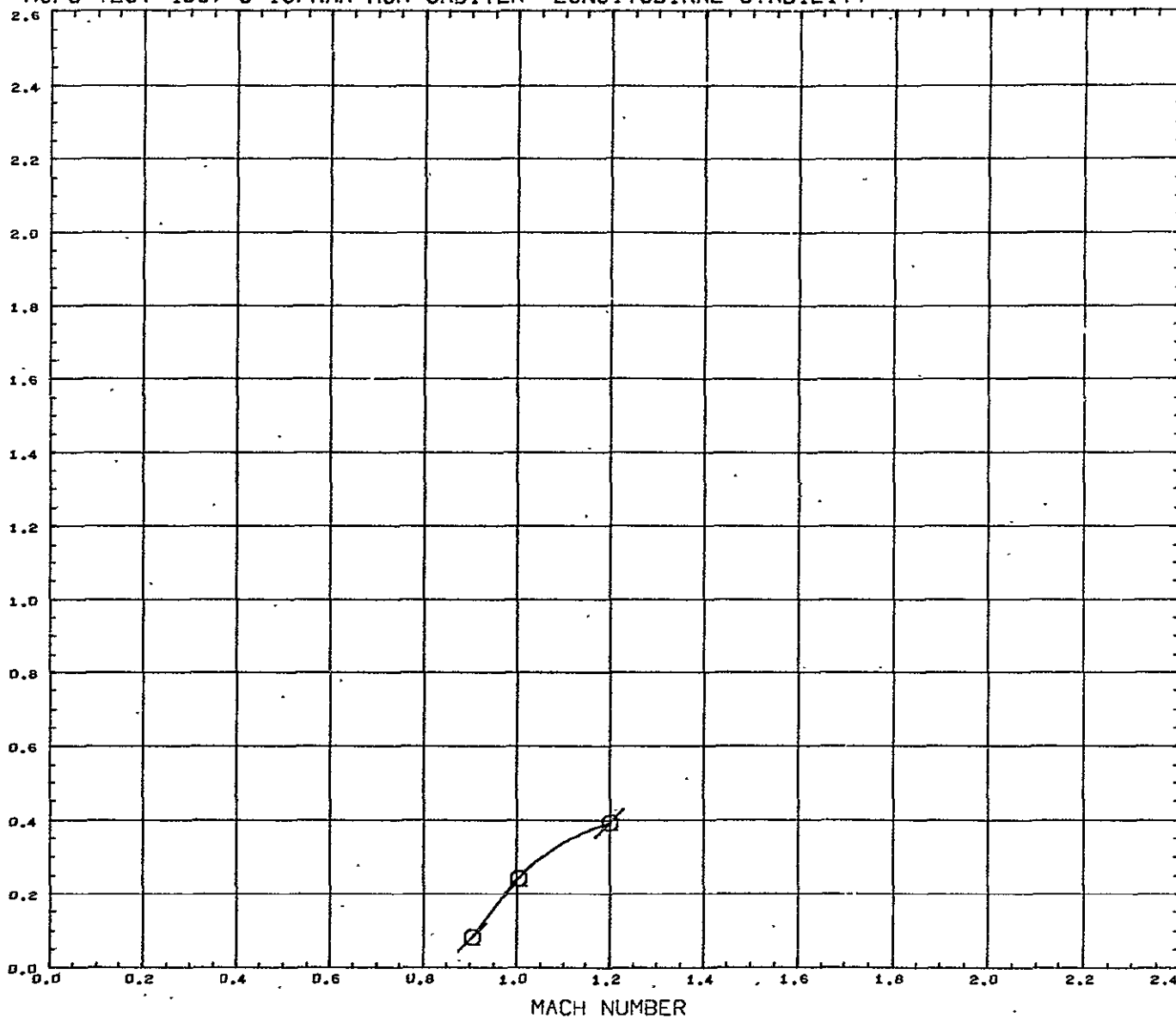
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REFERENCE INFORMATION
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YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

ZERO ANGLE OF ATTACK FOREBODY AXIAL FORCE COEFF., $C_{AF}(\alpha=0)$, $C_{AF}AFQ$



PARAMETRIC VALUES
BETA 0.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EF

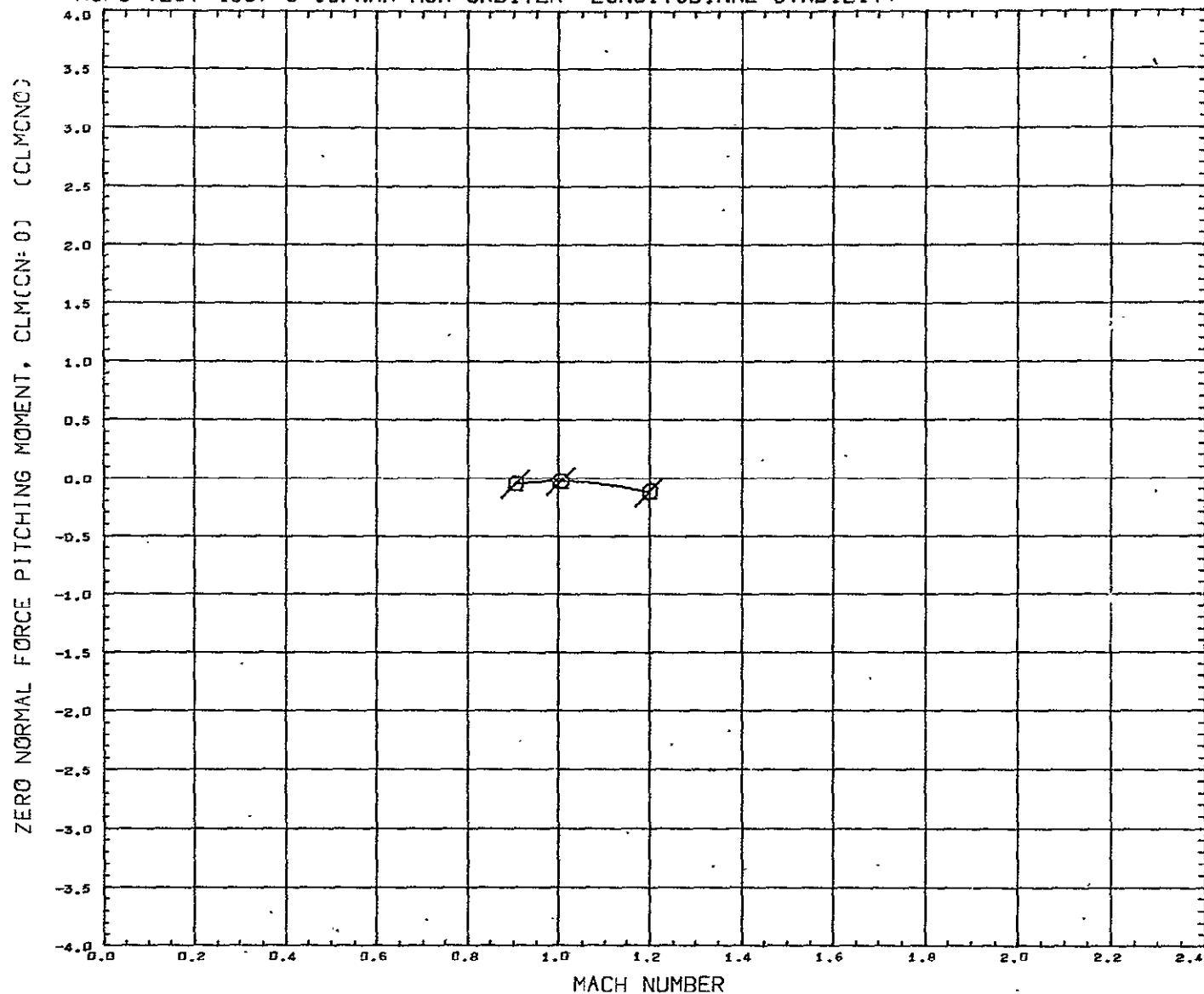
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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

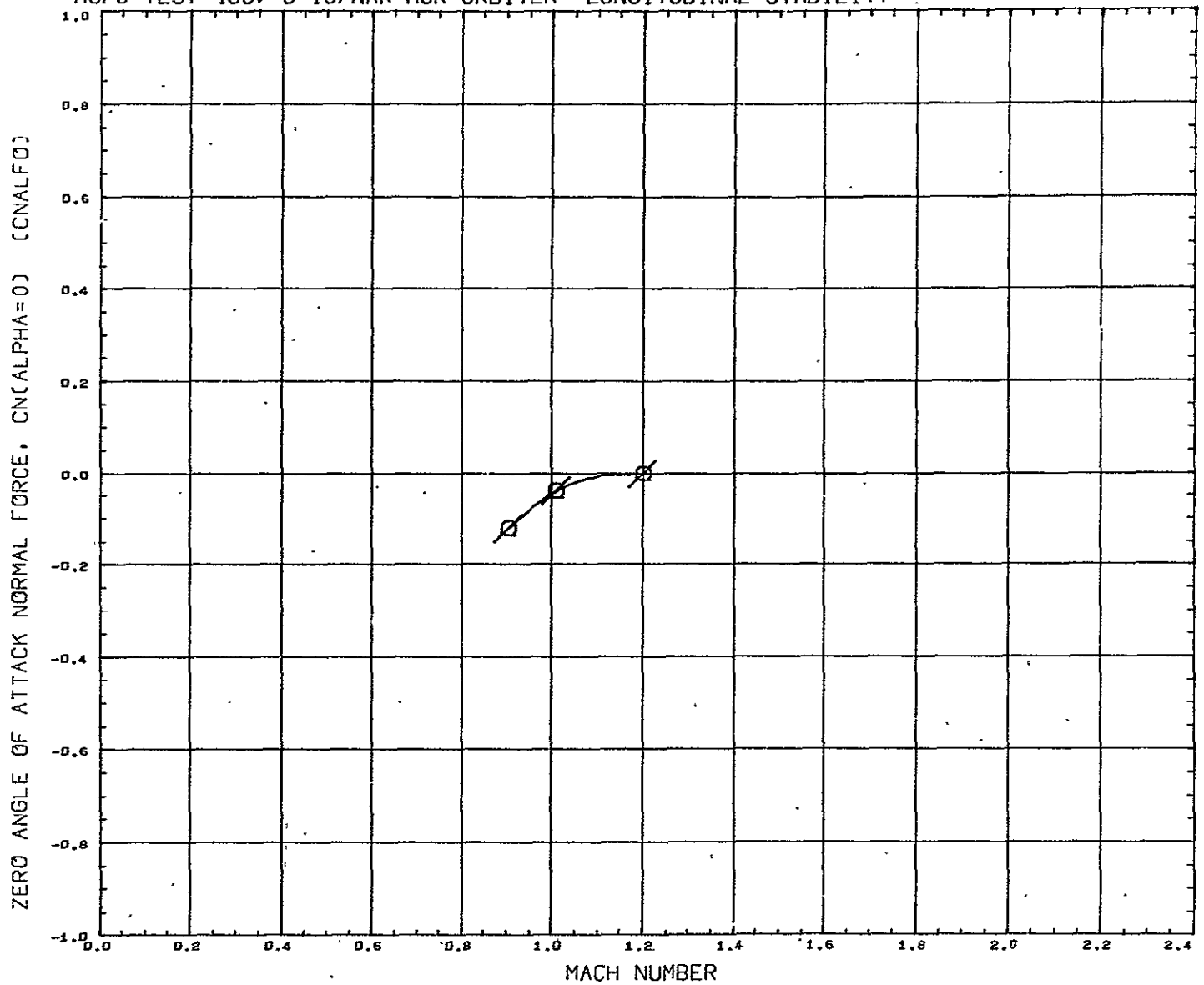


PARAMETRIC VALUES
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DATA HIST. CODE REF

REFERENCE INFORMATION
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REFB 1.3330 IN
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YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

MSFC TEST 485. S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

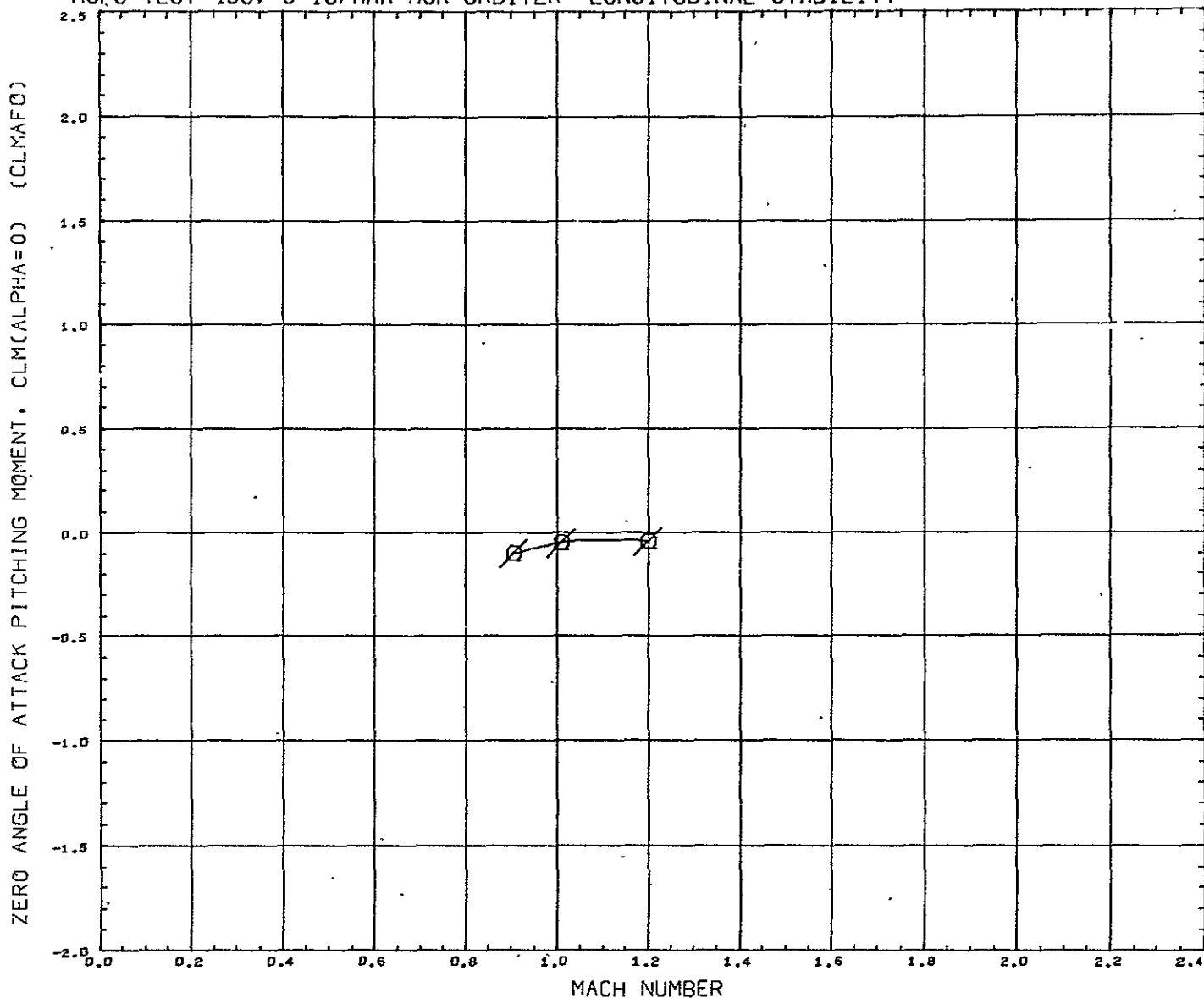


PARAMETRIC VALUES
BETA 0.000

REFERENCE INFORMATION
REFS 1.3960 SQ. IN.
REFL 1.3330 IN
REFB 1.3330 IN
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YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE #EF

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



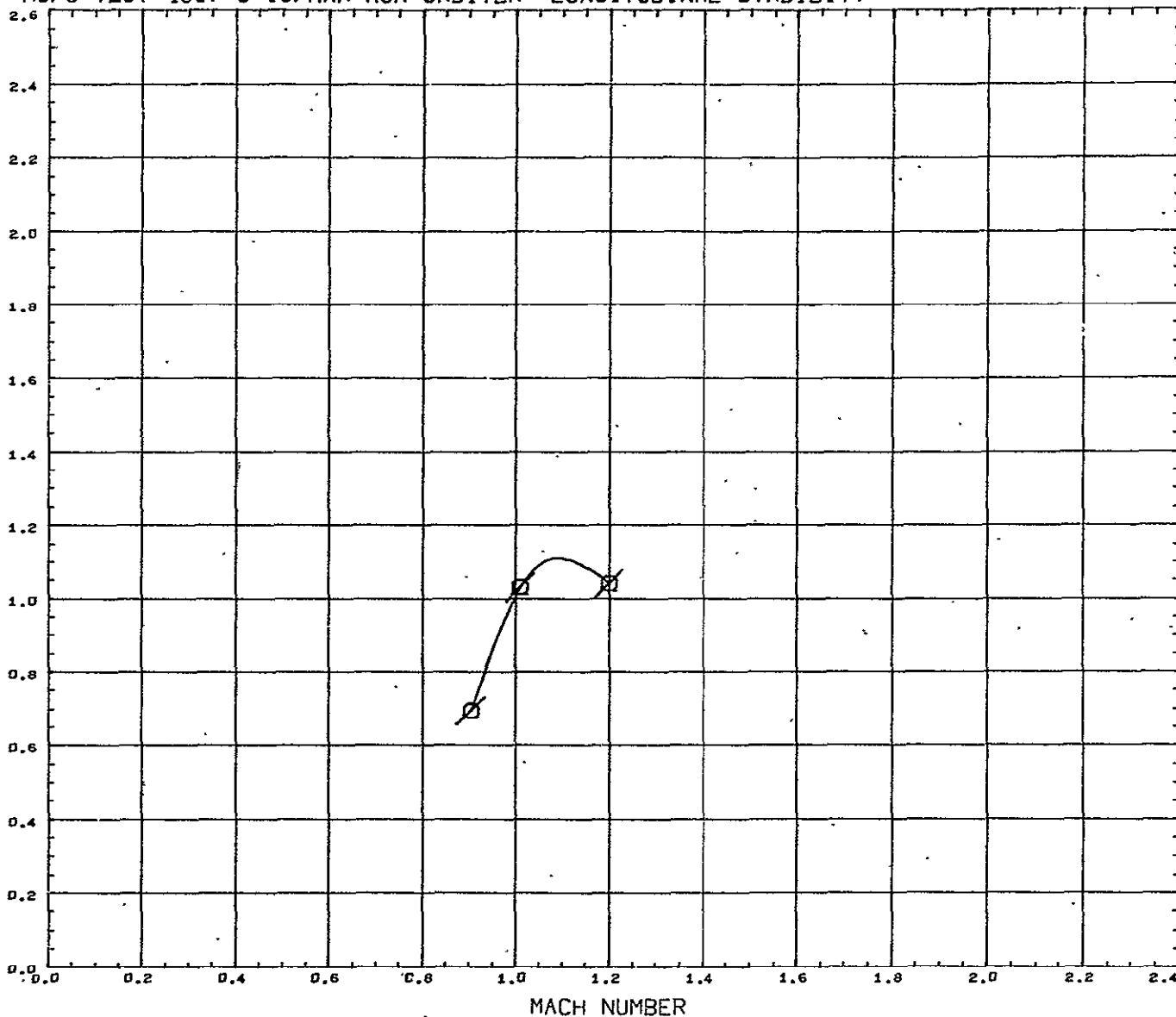
PARAMETRIC VALUES
BETA 0.000

DATA HIST. CODE REF

REFERENCE INFORMATION
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REFL 1.3330 IN
REFB 1.3330 IN
XMRP - 0.0370 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

ZERO ANGLE OF ATTACK AXIAL FORCE COEFFICIENT, $C_A(\alpha=0), C_{AA}(\beta=0)$



PARAMETRIC VALUES
BETA 0.000

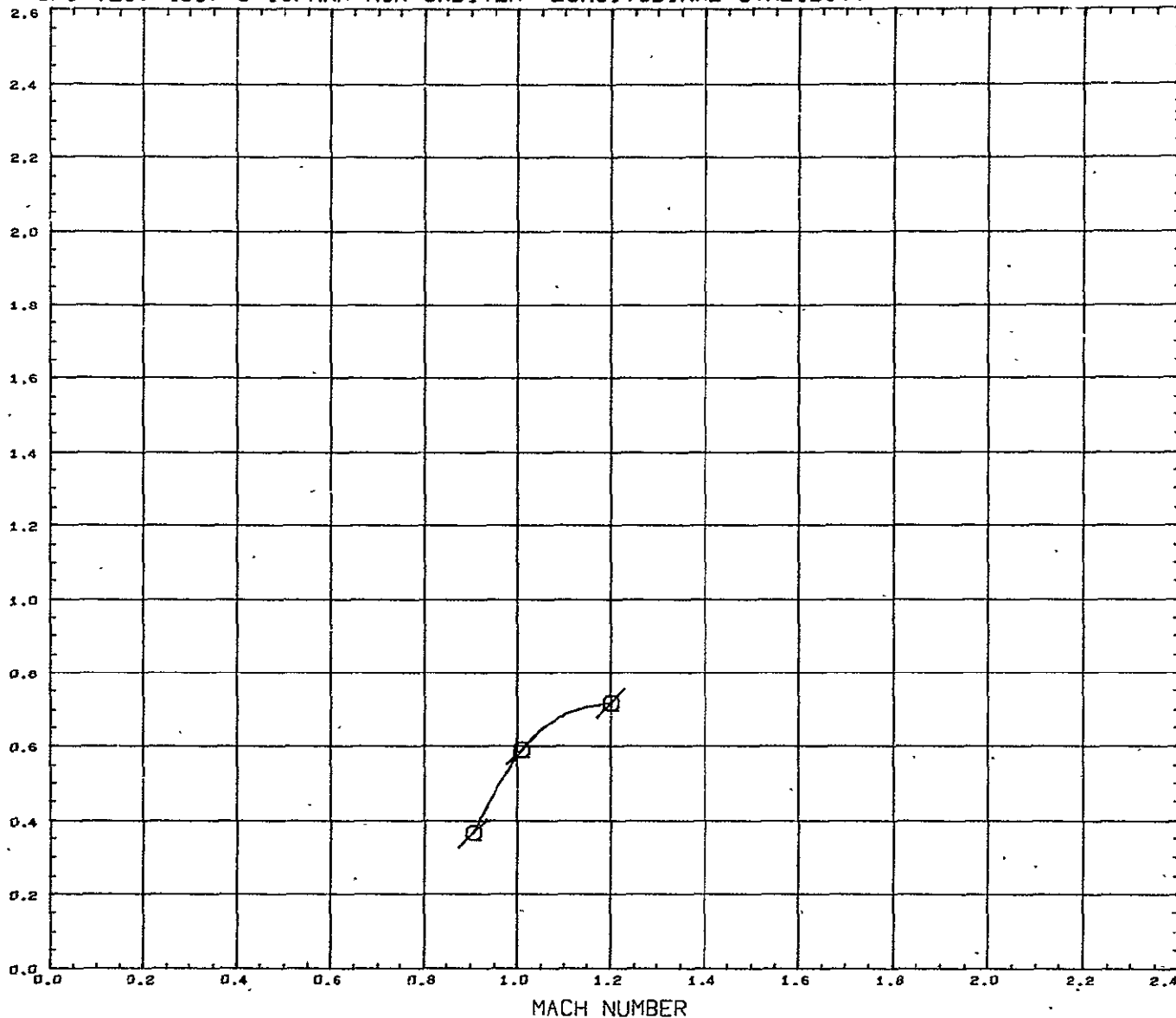
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REFERENCE INFORMATION

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REFB	1.3330	IN
XMRP	0.0570	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

ZERO ANGLE OF ATTACK FOREBODY AXIAL FORCE COEFF.. CAF(ALFA=0).CAF(AFO



PARAMETRIC VALUES
BETA 0.000

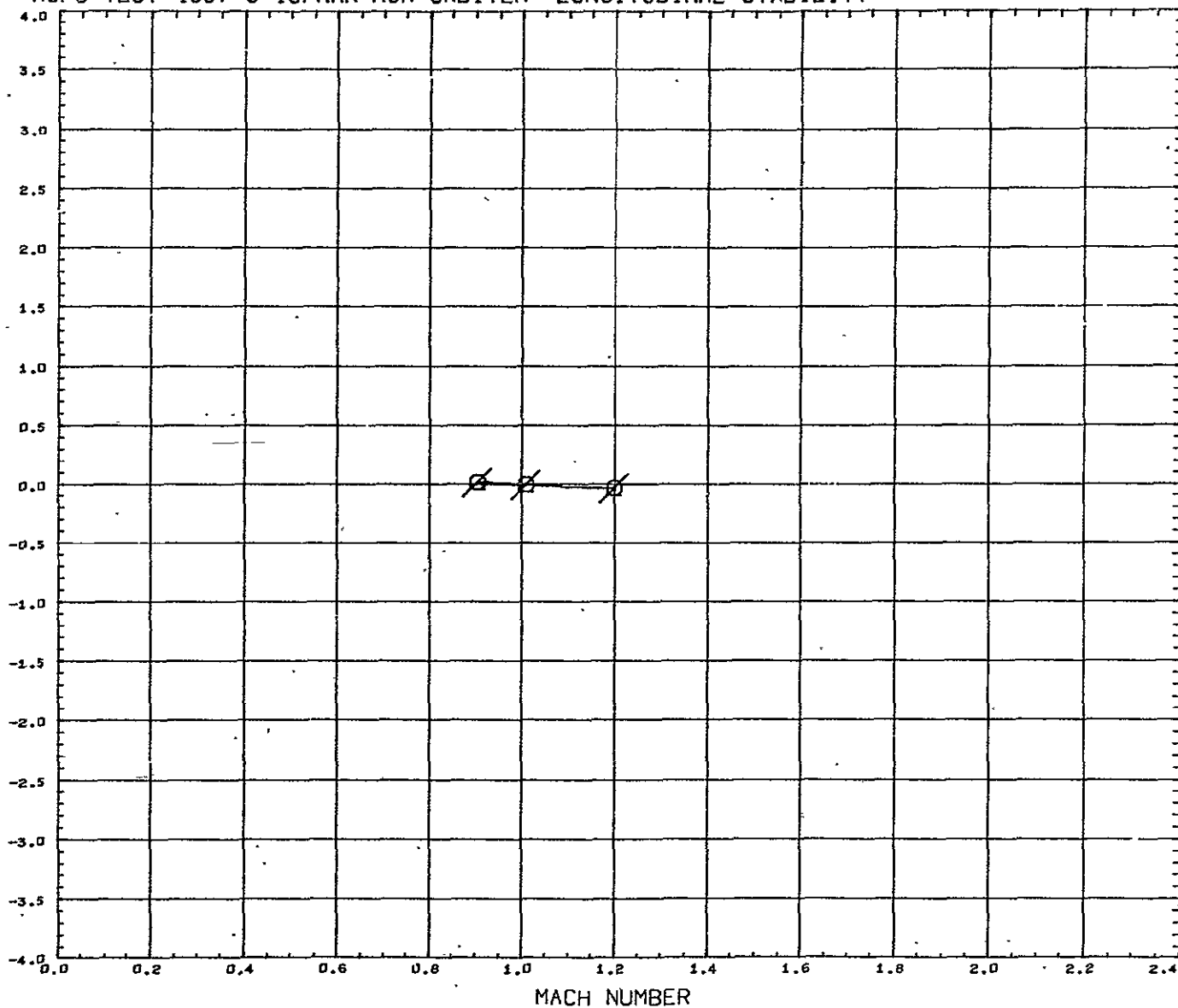
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REFERENCE INFORMATION

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REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

ZERO NORMAL FORCE PITCHING MOMENT, CLMCN=0 (CLMCN0)



PARAMETRIC VALUES
BETA 0.000

REFERENCE INFORMATION
REFS 1.3960 SQ. IN.
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REFB 1.3330 IN
XMRP 0.0000 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE #EF

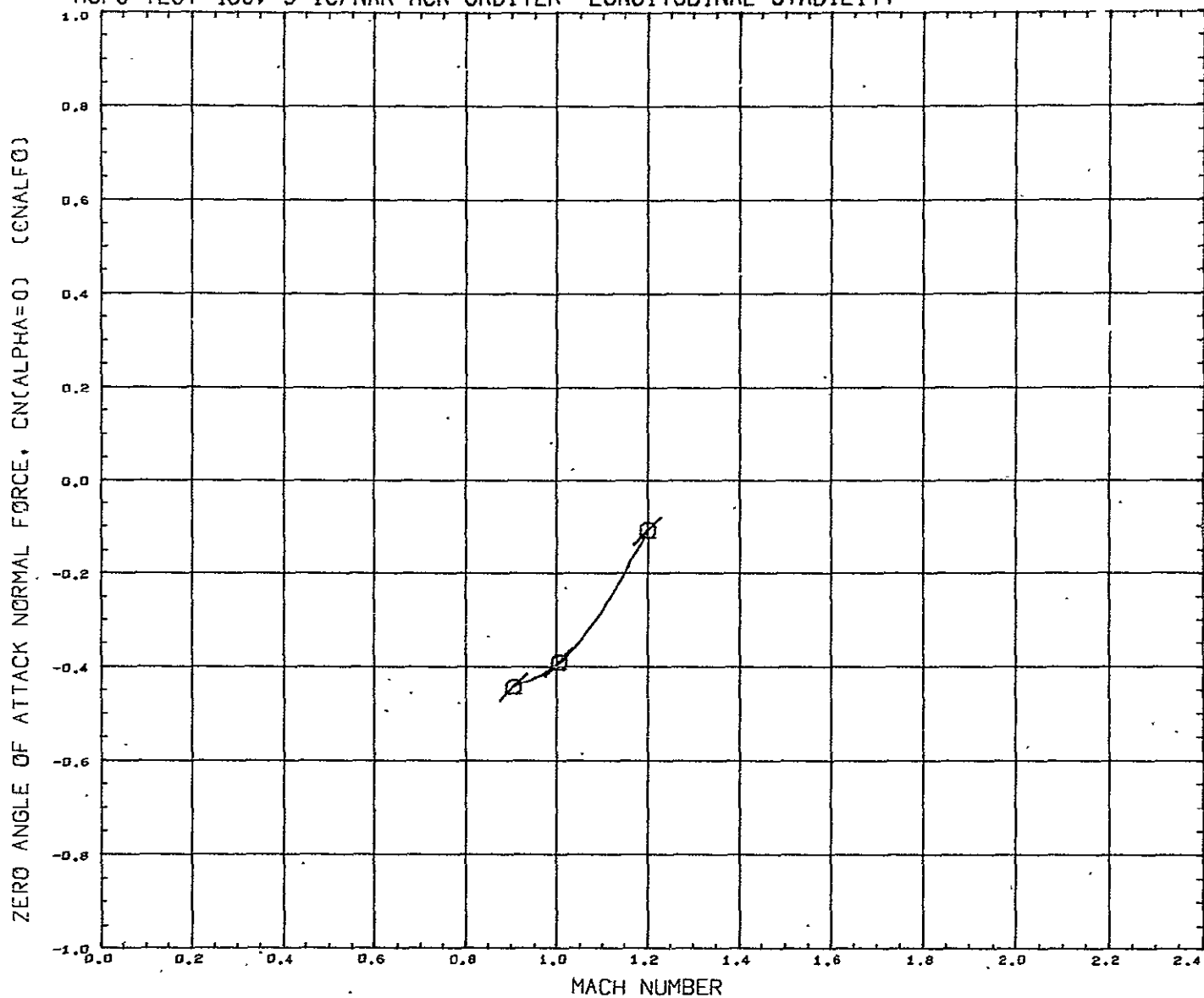
M485-MSFC-S1C NAR HCR ORBITER

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



PARAMETRIC VALUES
BETA 0.050

REFERENCE INFORMATION
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REFL 1.3330 IN
REFB 1.3330 IN
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YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE *EF

M485-MSFC-S1C NAR HCR ORBITER

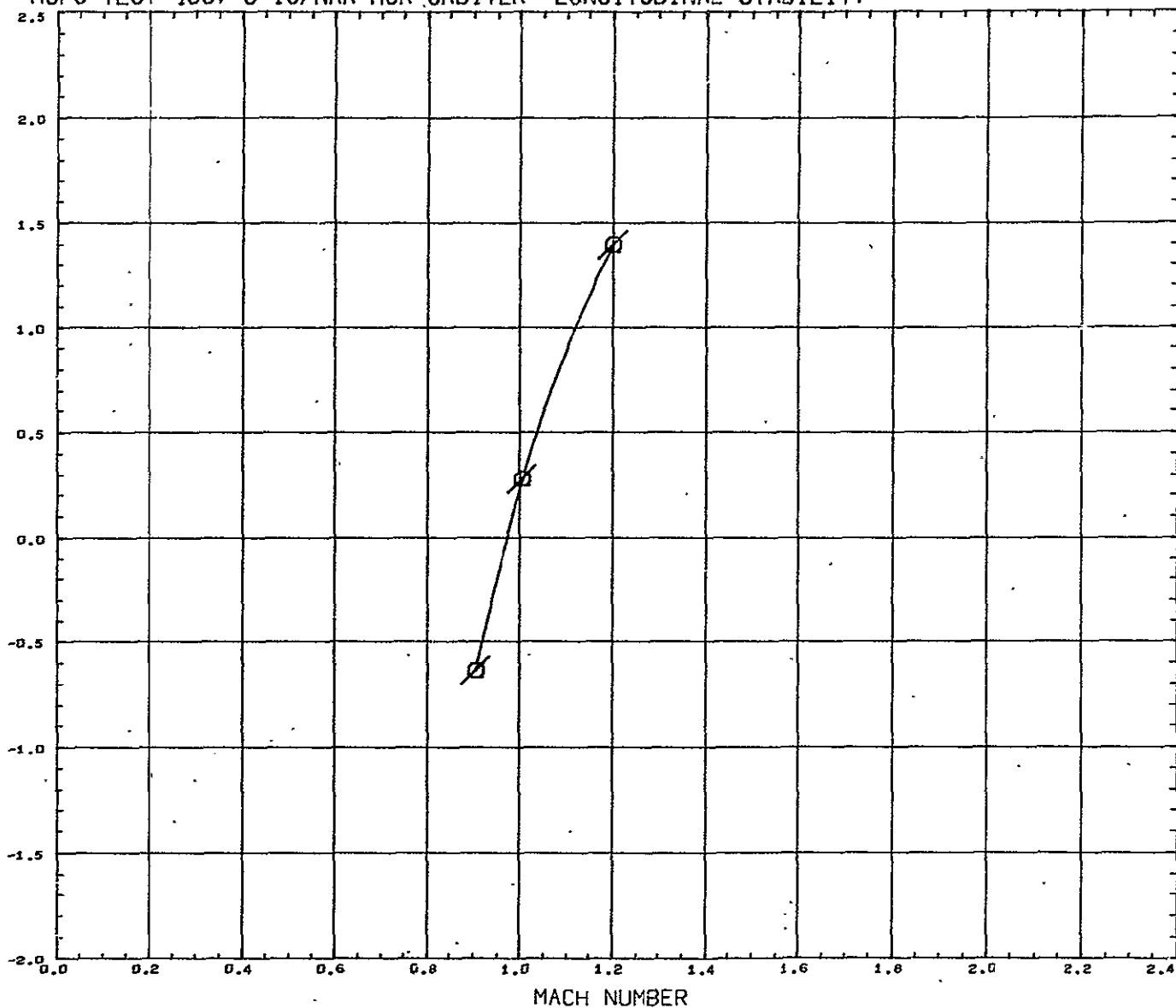
OPFS3

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

ZERO ANGLE OF ATTACK PITCHING MOMENT, CLM(ALPHA=0) (CLMAF0)



BETA
PARAMETRIC VALUES
0.050

REFERENCE INFORMATION

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REFL	1.3330	IN
REFB	1.3330	IN
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YMRF	0.5000	IN
ZMRF	0.0000	IN
SCALE	0.0034	

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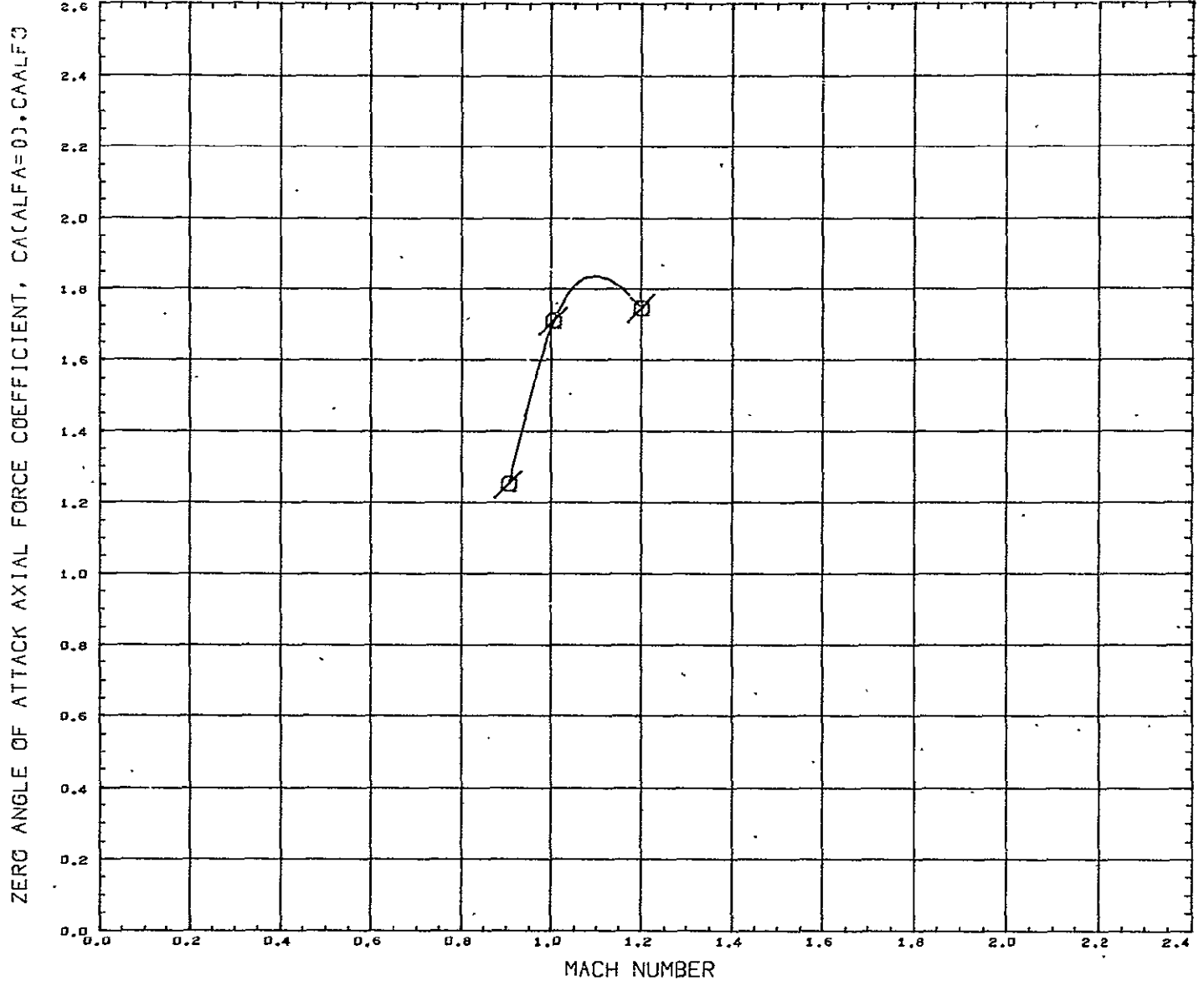
M485-MSFC-S1C NAR HCR ORBITER

OBFS3

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PAGE 146

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



PARAMETRIC VALUES
BETA 0.050

REFERENCE INFORMATION
REFS 1.3960 SQ. IN.
REFL 1.3330 IN
REFB 1.3330 IN
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YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE *EF

M485-MSFC-S1C NAR HCR ORBITER

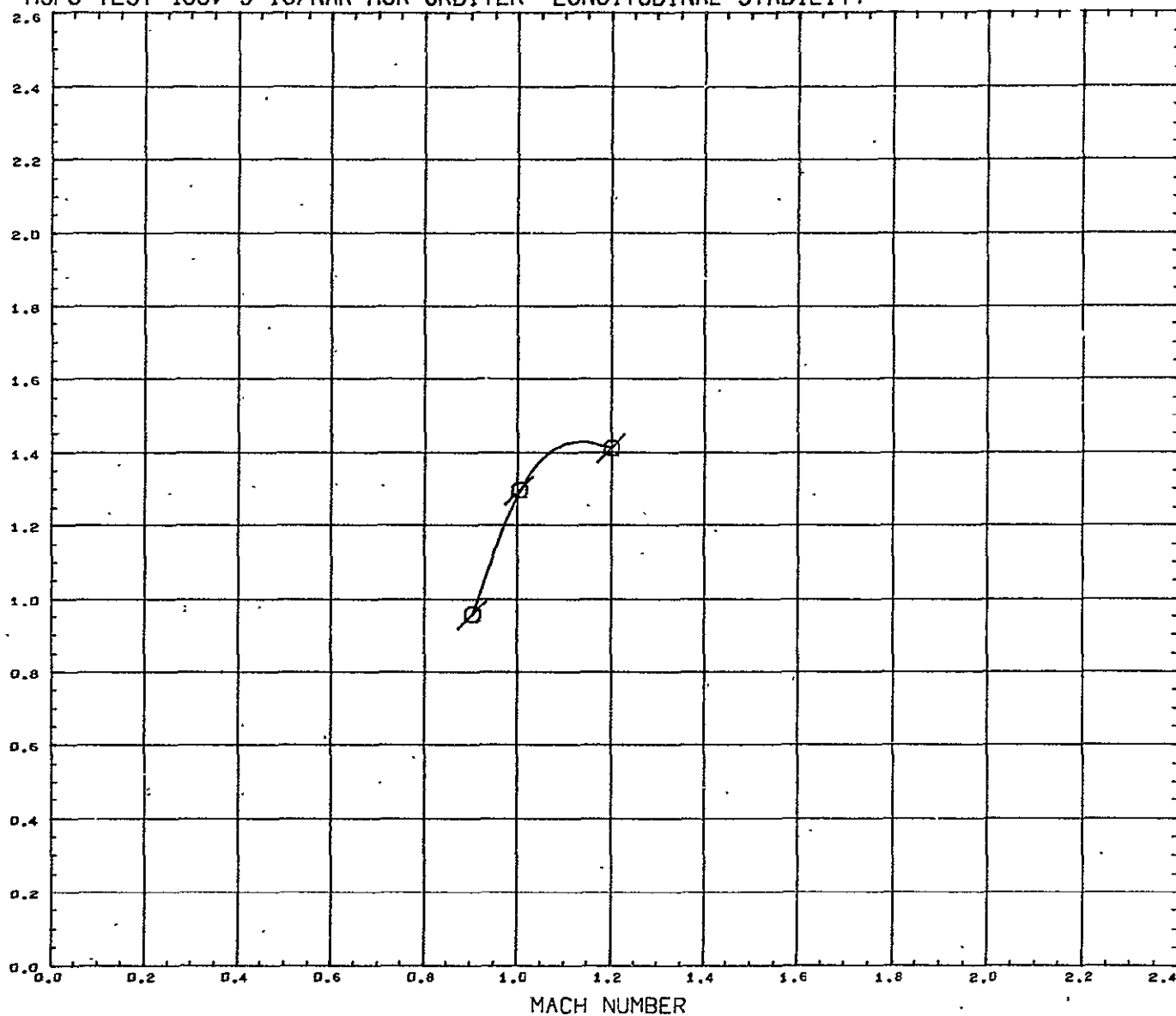
0BFS3

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

ZERO ANGLE OF ATTACK FOREBODY AXIAL FORCE COEFF., $C_{AF}(\alpha=0)$, $C_{AF}(\alpha=0)$

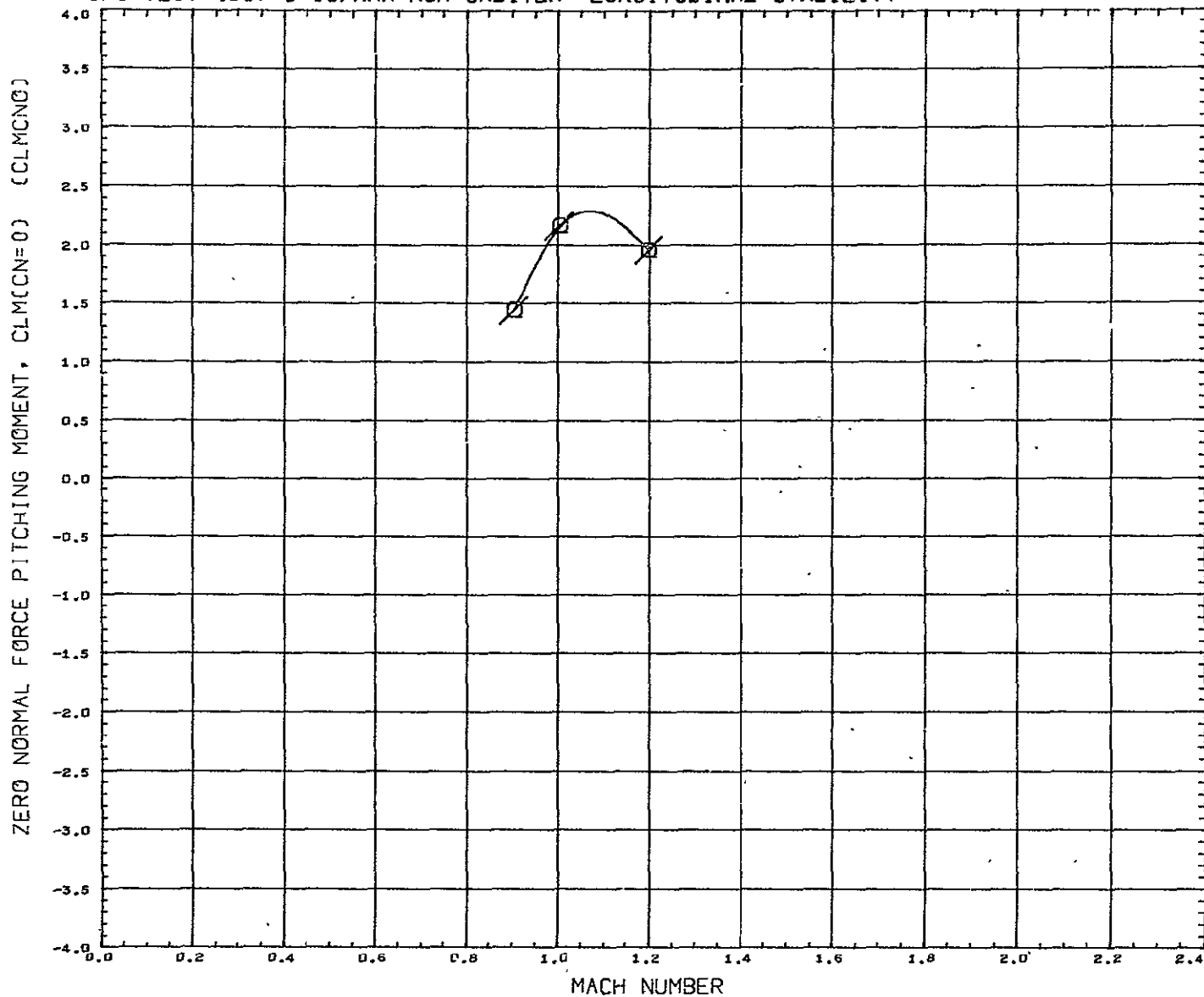


PARAMETRIC VALUES
BETA 0.050

REFERENCE INFORMATION
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REFB 1.3330 IN
XMRP 0.0370 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE *EF

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



PARAMETRIC VALUES
BETA 0.050

REFERENCE INFORMATION
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REFB 1.3330 IN
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YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

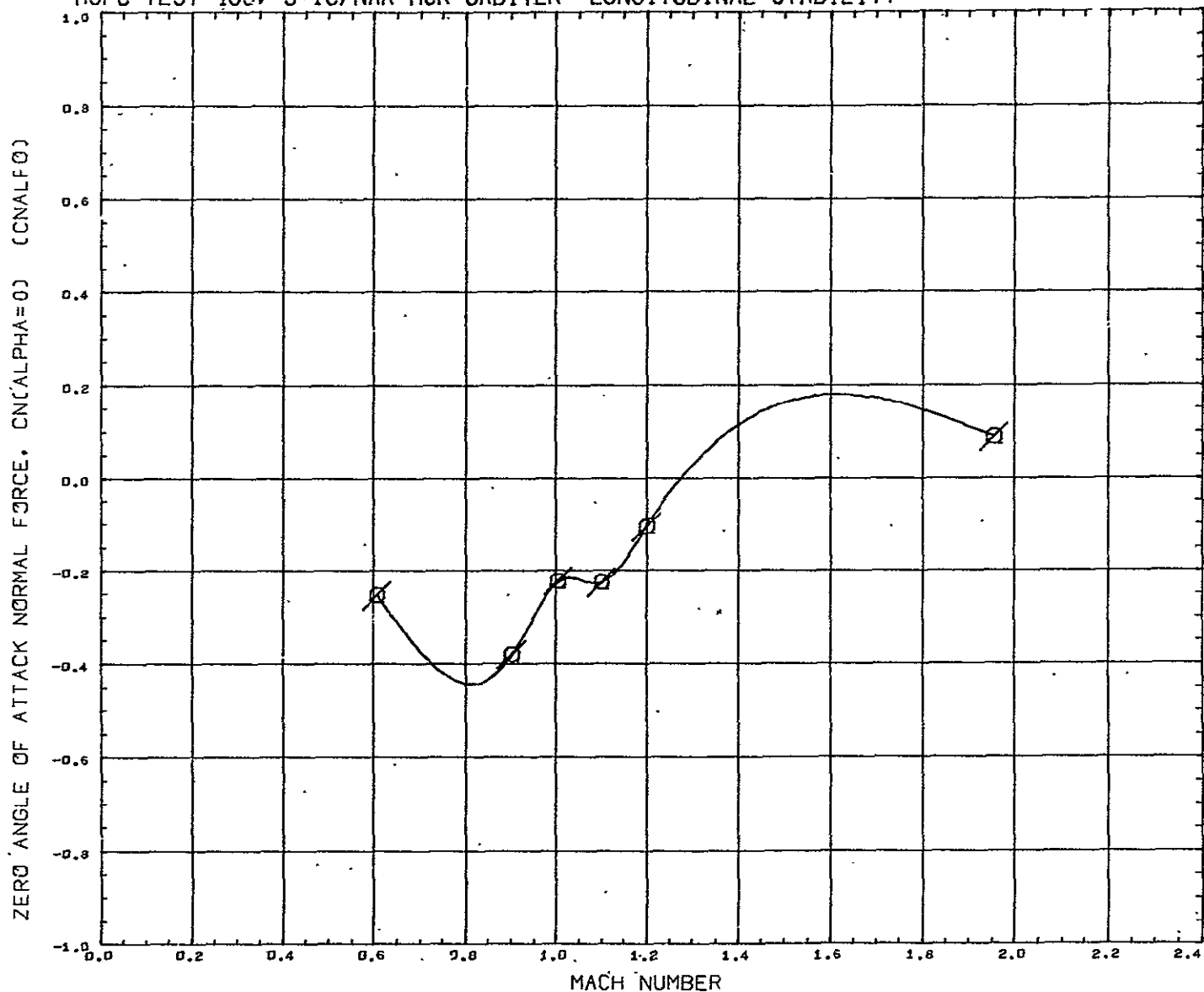
DATA HIST. CODE *EF

M485-MSFC-S1C NAR HCR ORBITER

0BFS3

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



PARAMETRIC VALUES
BETA 0.000

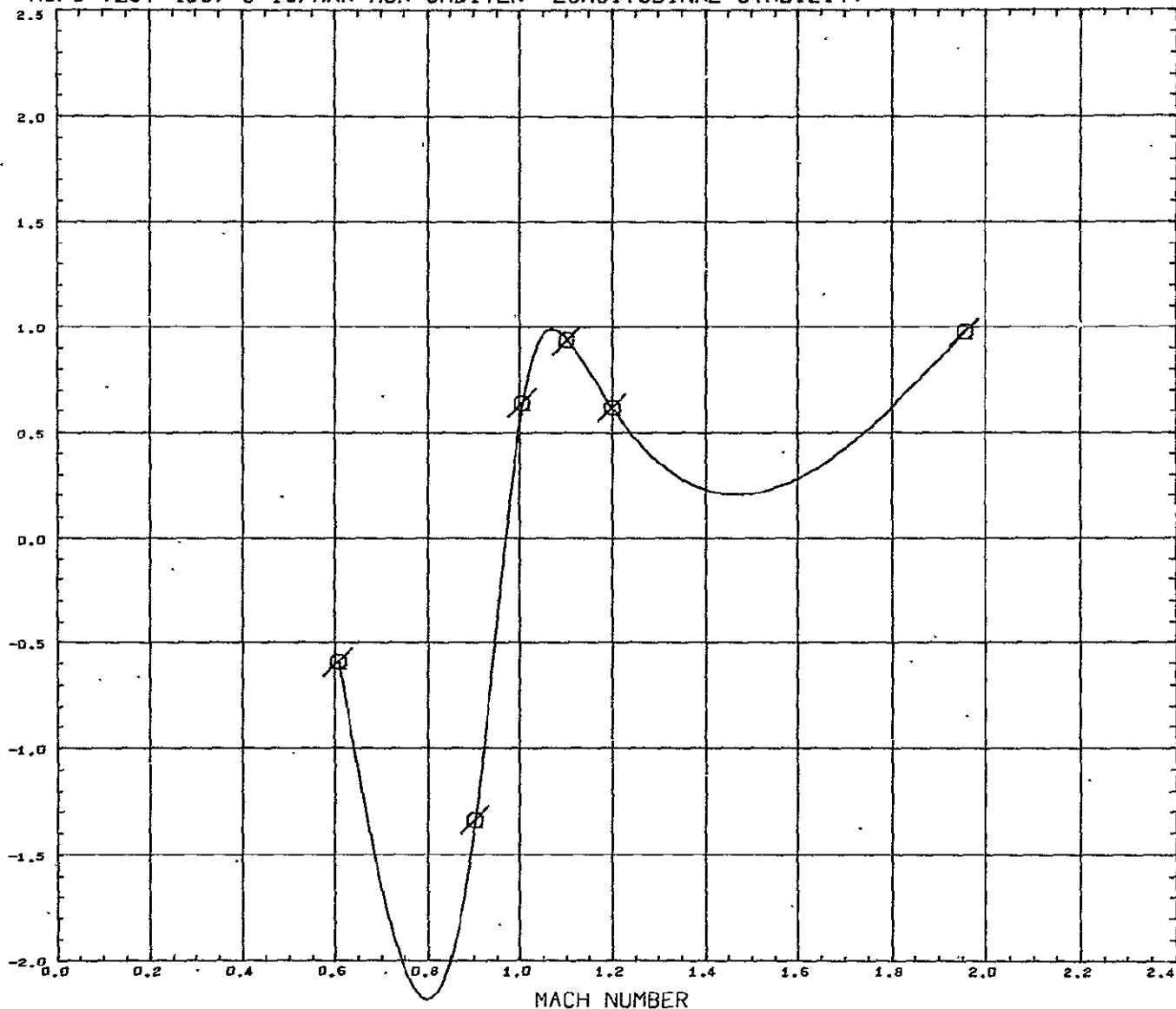
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REFERENCE INFORMATION

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REFB	1.3330	IN
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YNRF	0.0000	IN
ZNRF	0.0000	IN
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

ZERO ANGLE OF ATTACK PITCHING MOMENT, CLMCPH=0 (CLMCPH=0)



PARAMETRIC VALUES
BETA 0.000

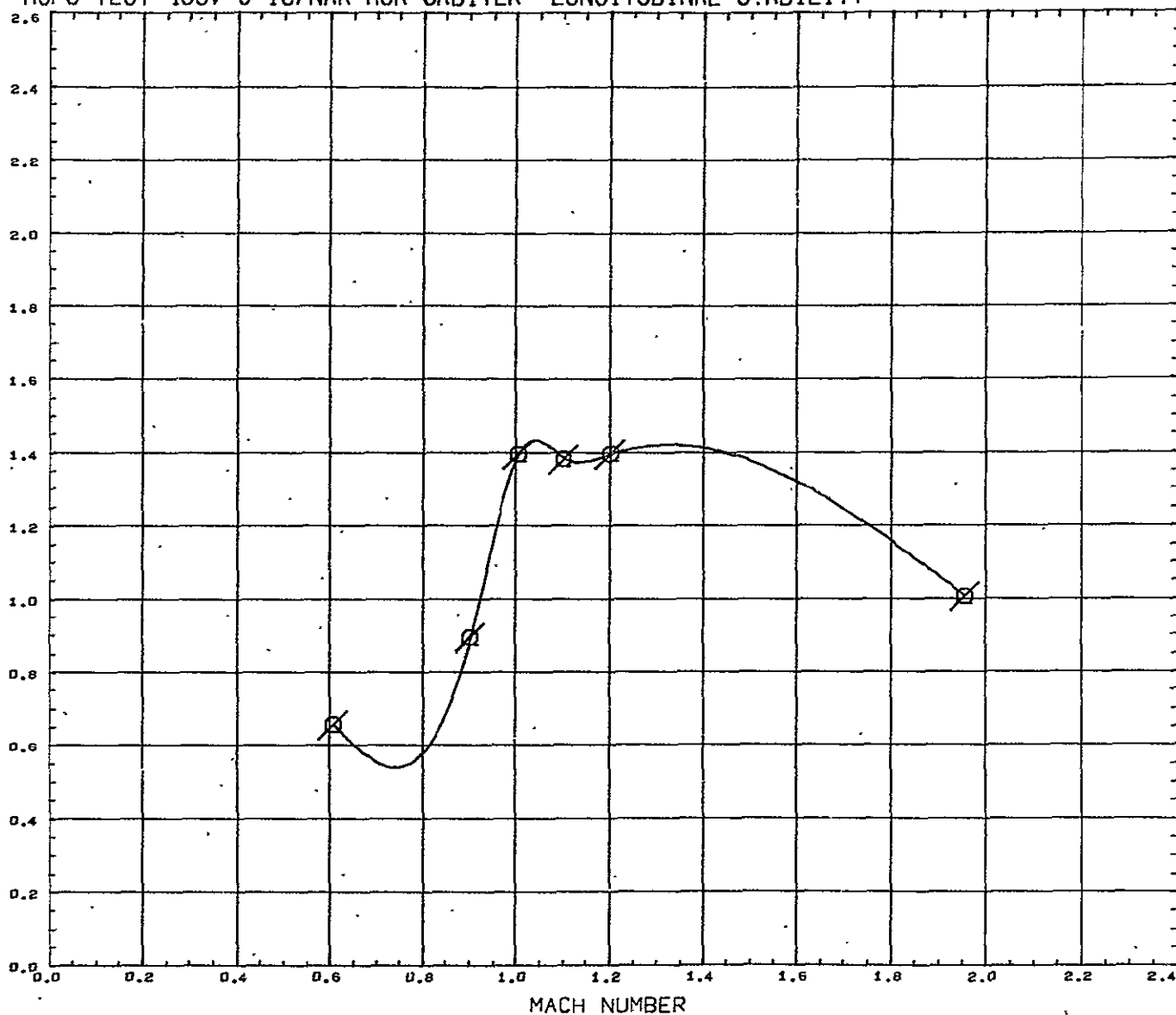
DATA HIST. CODE #EF

REFERENCE INFORMATION

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REFB	1.3330	IN
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YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	IN

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

ZERO ANGLE OF ATTACK AXIAL FORCE COEFFICIENT, $C_{AXIAL}(\alpha=0)$, C_{AXIAL0}



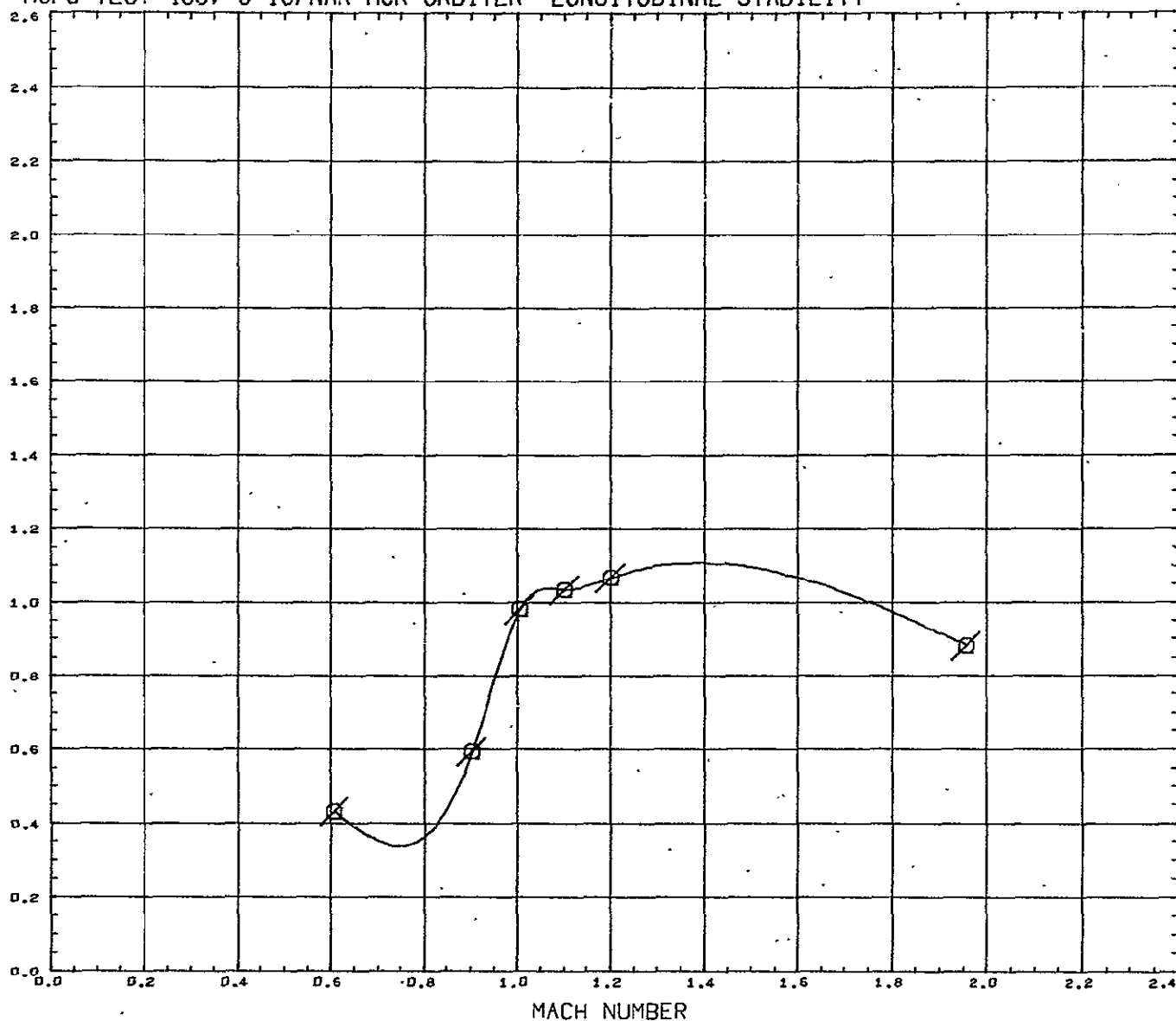
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DATA HIST. CODE #EF

REFERENCE INFORMATION
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REFB 1.3330 IN
XMRP 0.0370 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

ZERO ANGLE OF ATTACK FOREBODY AXIAL FORCE COEFF., $C_{AF}(\alpha=0)$, $C_{AF}(\alpha=0)$

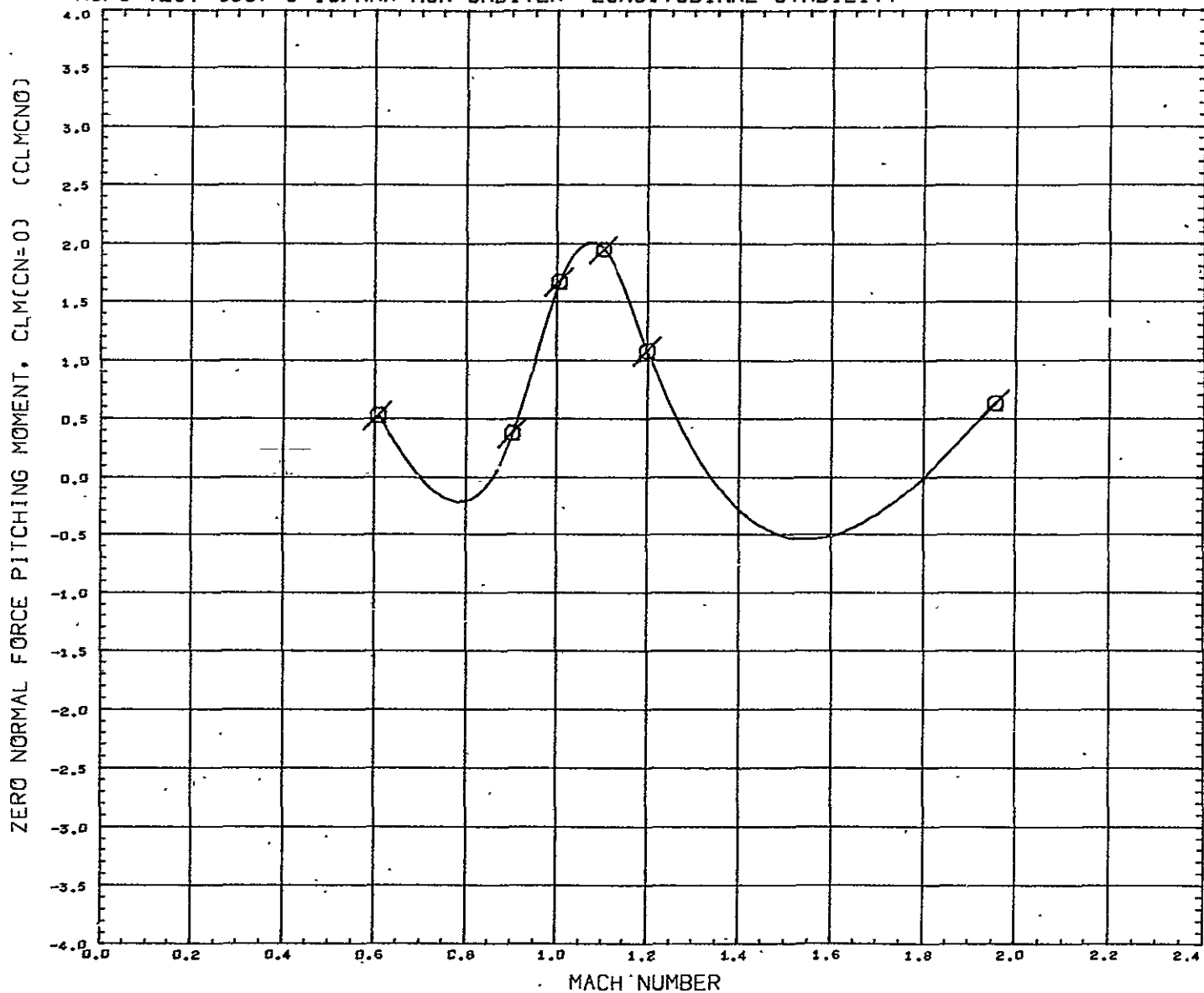


PARAMETRIC VALUES
BETA 0.000

REFERENCE INFORMATION
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REFB 1.3330 IN
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SCALE 0.0034

DATA HIST. CODE *EF

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



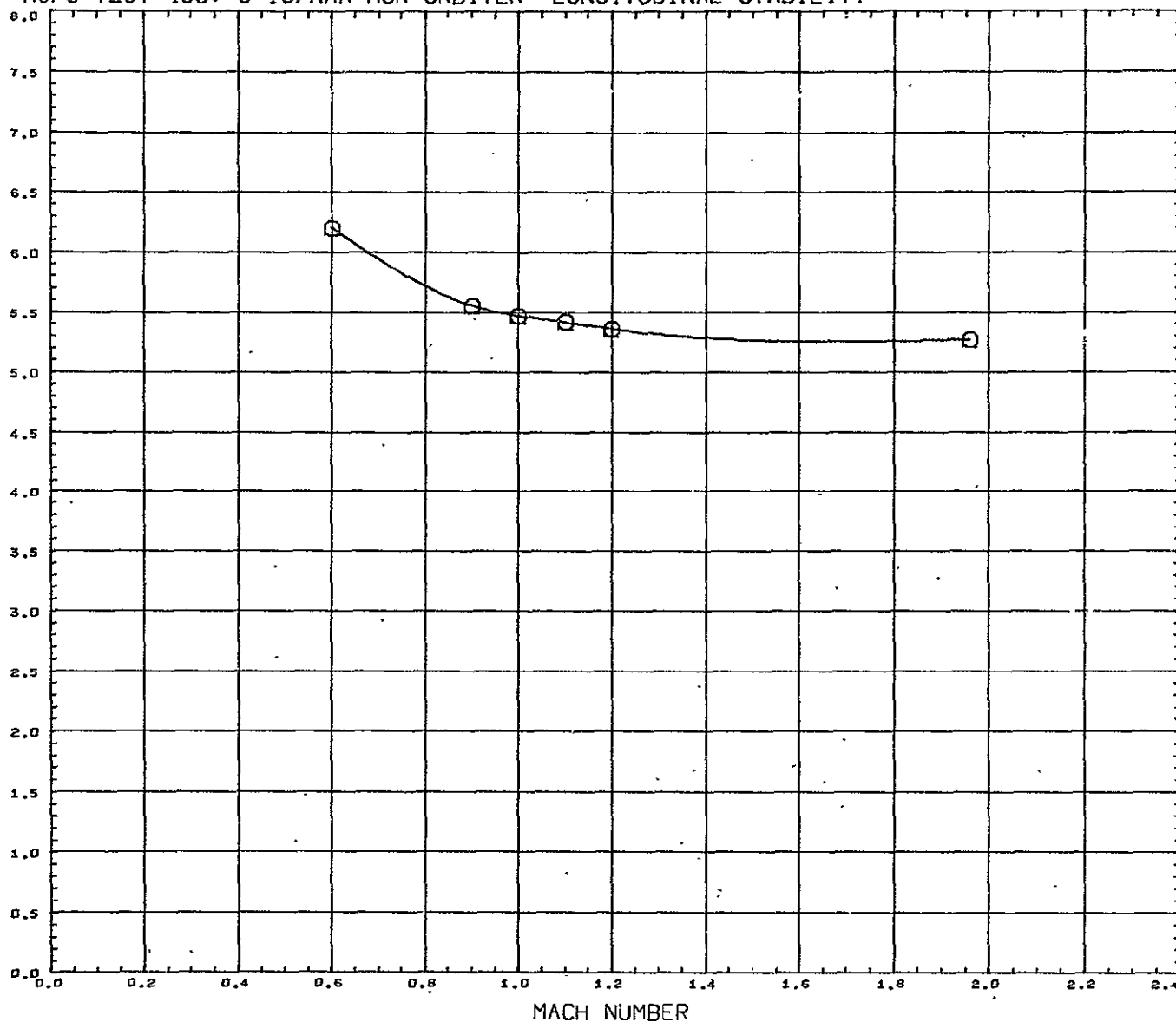
PARAMETRIC VALUES
BETA 0.000

REFERENCE INFORMATION
REFS 1.3960 SQ. IN.
REFL 1.3330 IN
REFB 1.3330 IN
XMRP 0.0370 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE *EF

MSFC TEST 485. S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

STATIC LONGITUDINAL STABILITY DERIVATIVE, DCLM/DCN , D(CPD)



SYMBOL ALPHA PARAMETRIC VALUES
 O 0.000 BETA 0.030

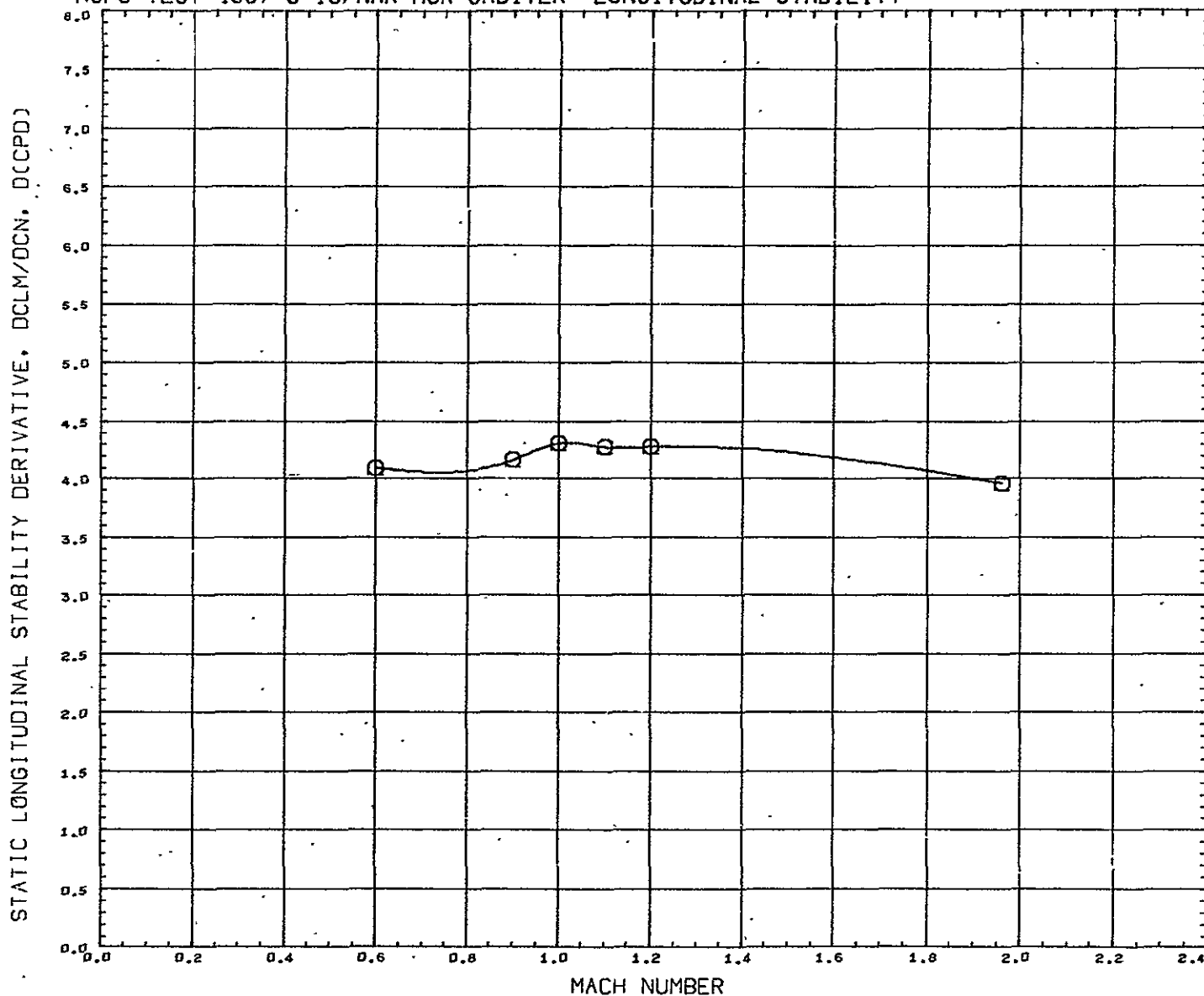
REFERENCE INFORMATION
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 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *EI

M485-MSFC-S1C NAR HCR ORBITER · 0B

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL ALPHA BETA PARAMETRIC VALUES
 O 0.000 0.000

DATA HIST. CODE #EI

REFERENCE INFORMATION
 REFS 1.3960 SQ.IN.
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 REFB 1.3330 IN
 XMRF - 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.7034

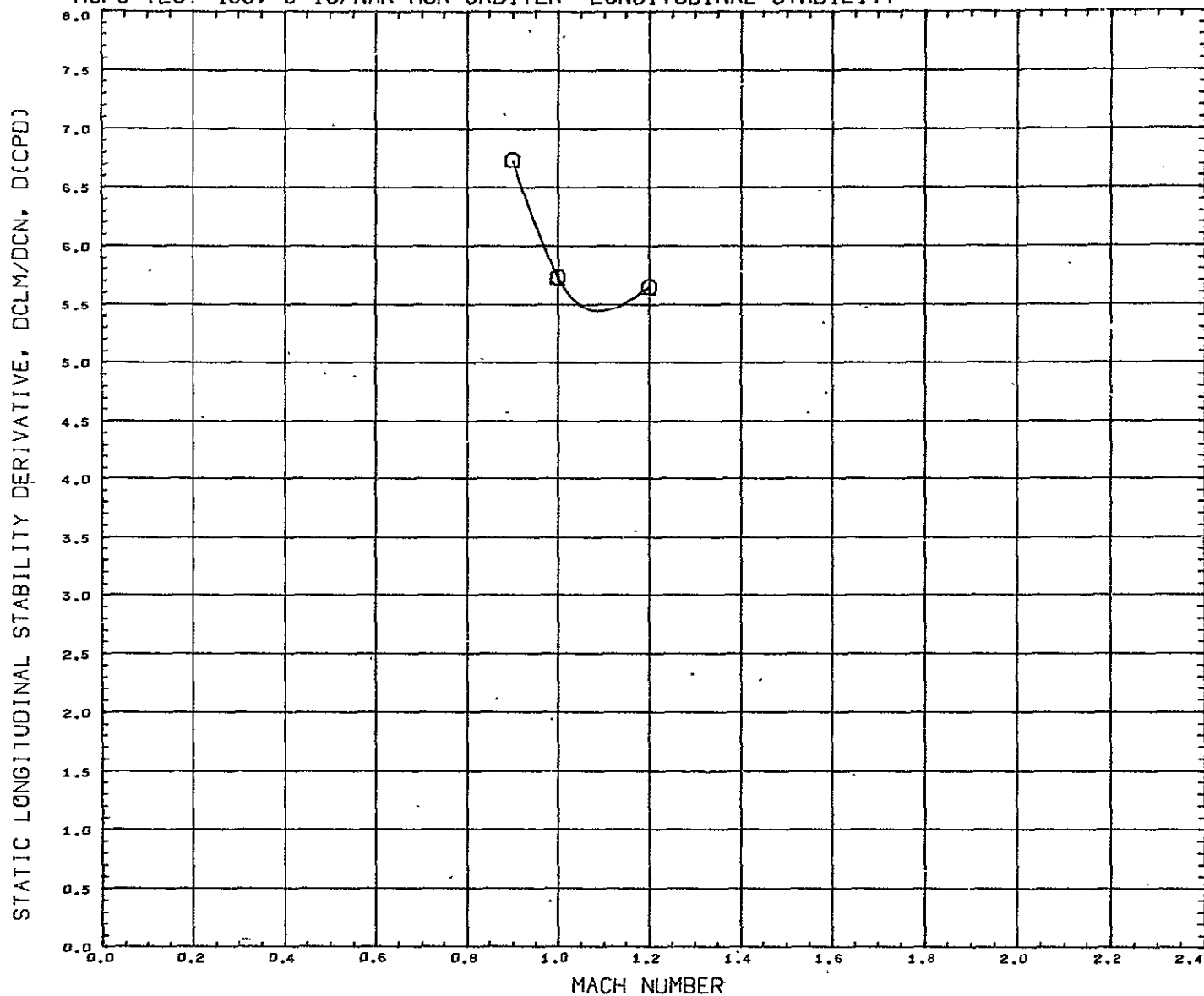
M485-MSFC-S1C NAR HCR ORBITER

0BF

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL ALPHA BETA PARAMETRIC VALUES
 O 0.000 0.040

REFERENCE INFORMATION .
 REFS 1.3960 SO.IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *E1

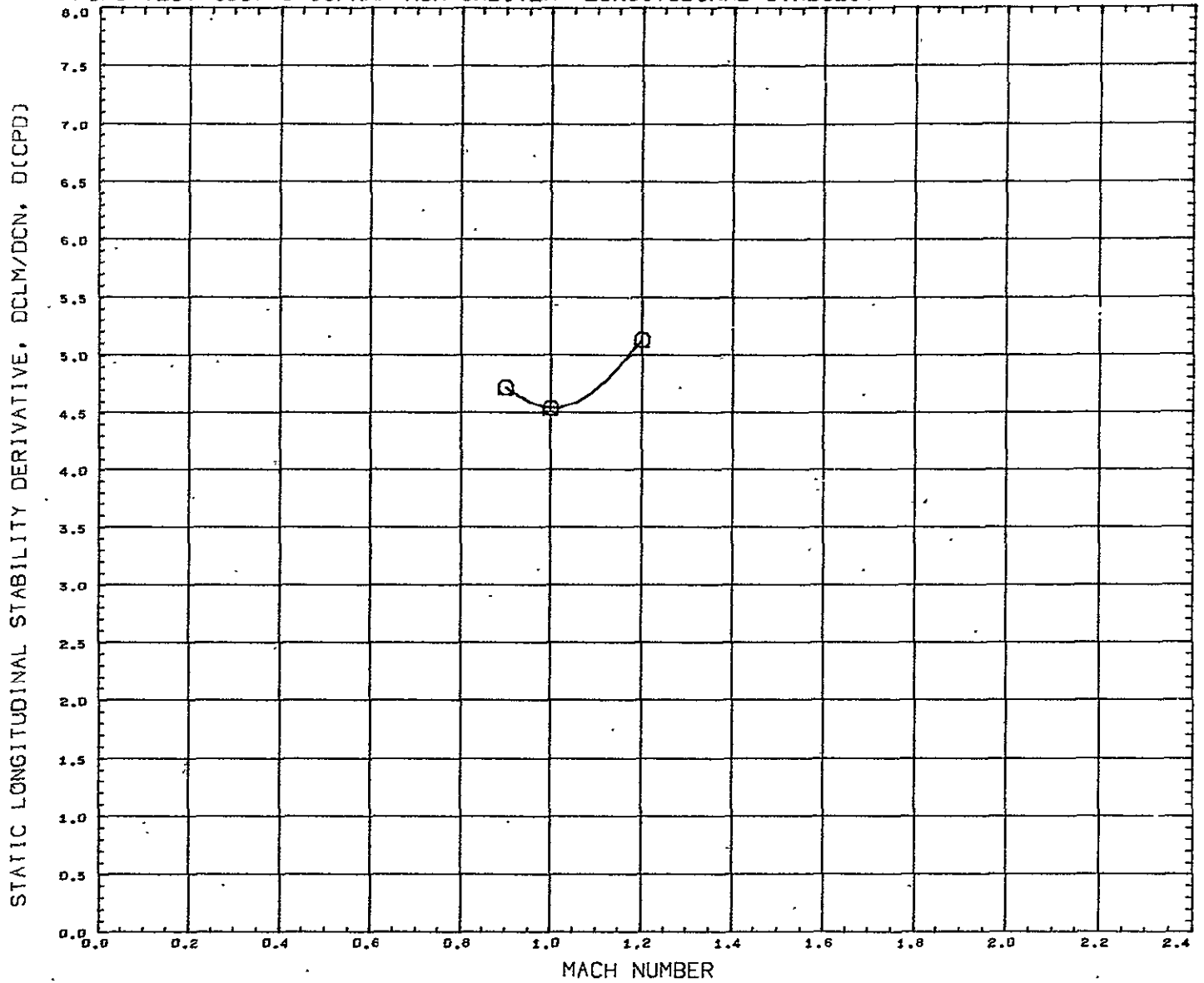
M485-MSFC-S1C NAR HCR ORBITER

OPS1

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL ALPHA PARAMETRIC VALUES
 O 0.000 BETA 0.060

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP - 0.0377 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *EI

M485-MSFC-S1C NAR HCR ORBITER

OBFS1

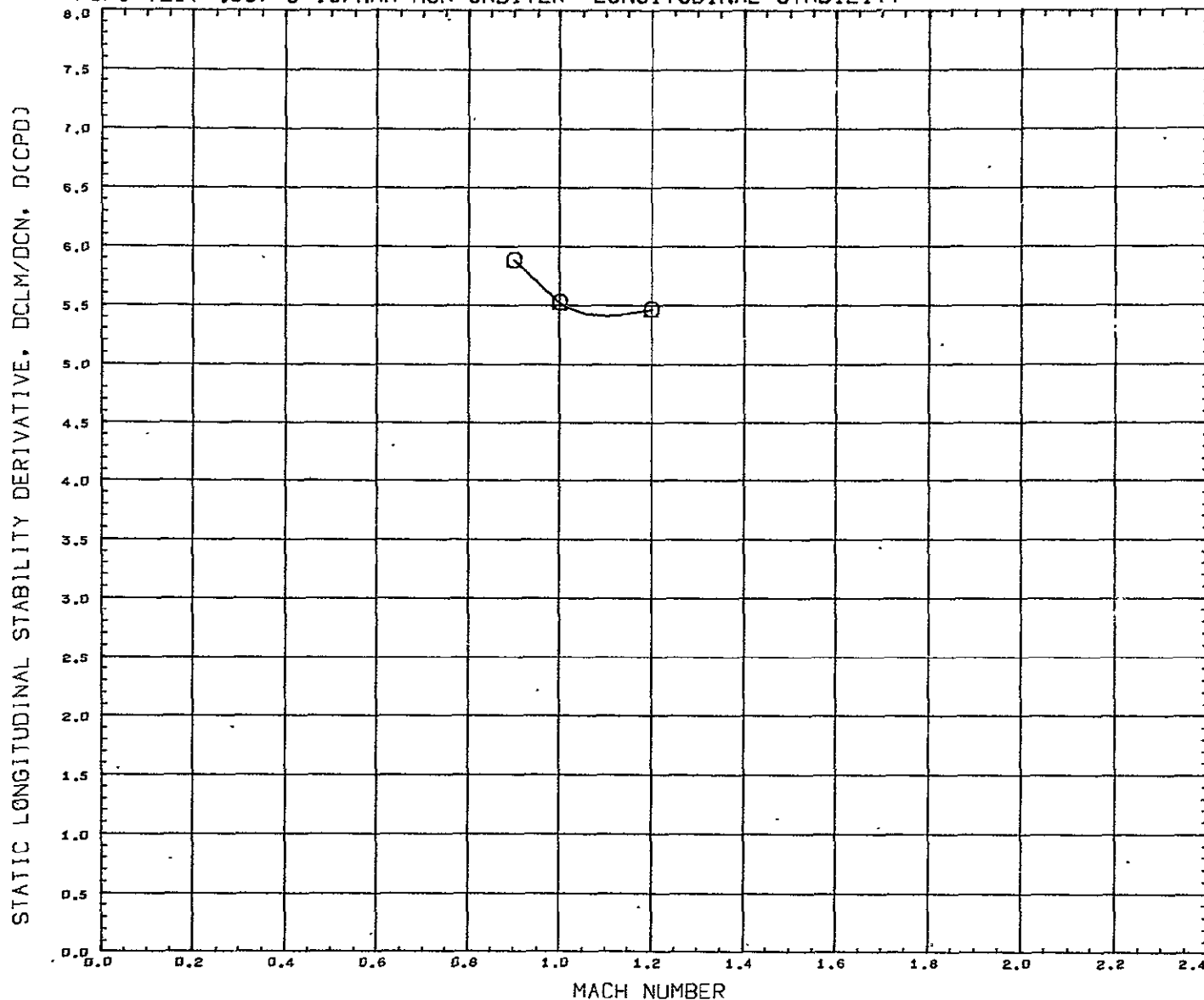
(P30041)

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158

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL ALPHA PARAMETRIC VALUES
 O 0.000 BETA 0.040

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP - 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE #EI

M485-MSFC-S1C NAR HCR ORBITER

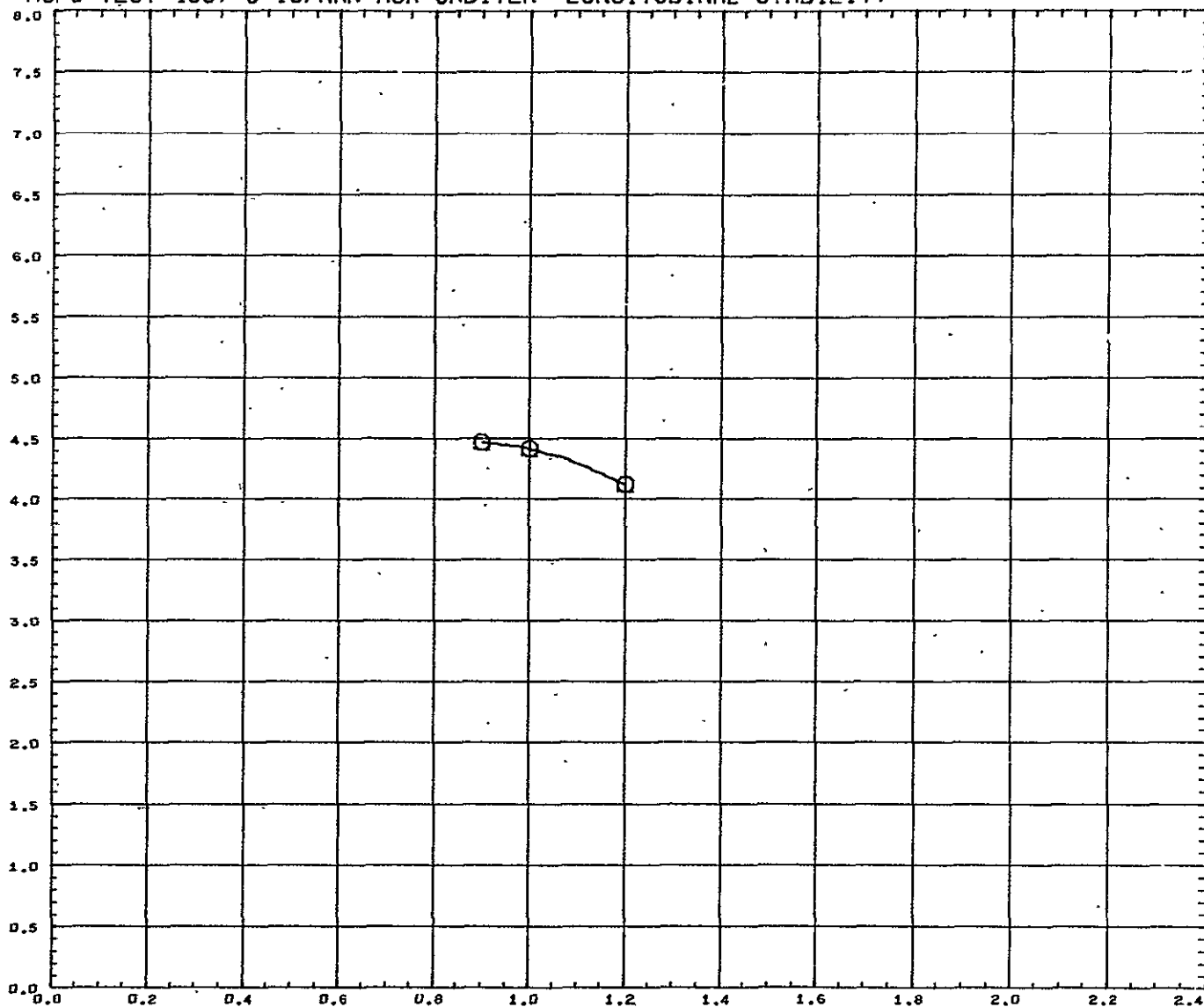
00S2

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

STATIC LONGITUDINAL STABILITY DERIVATIVE, DCLM/DCN, D(CPD)



MACH NUMBER

SYMBOL ALPHA BETA PARAMETRIC VALUES
 O 0.000 0.050

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP - 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *EI

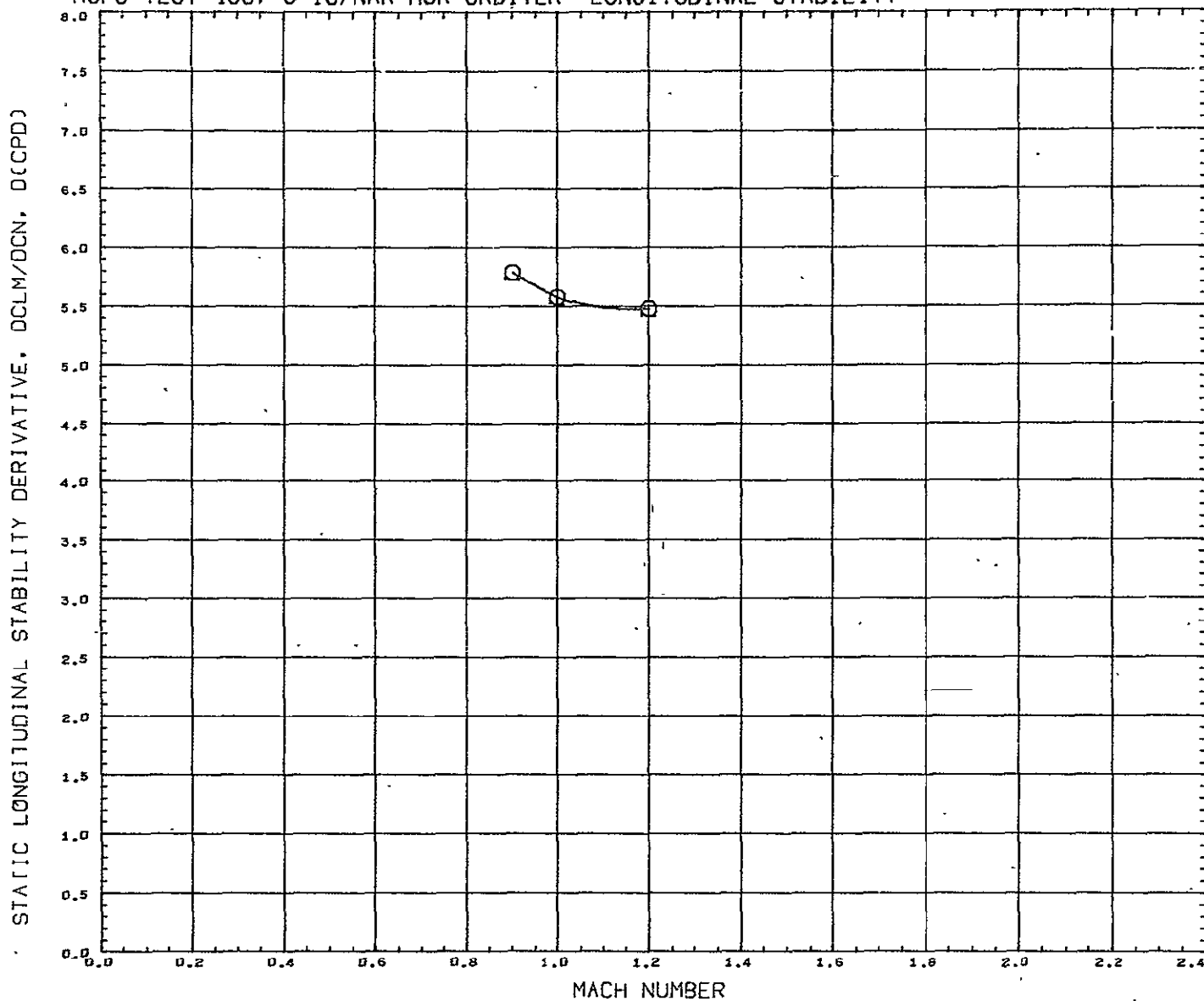
M485-MSFC-S1C NAR HCR ORBITER

00FS2

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL ALPHA BETA PARAMETRIC VALUES
 O 0.000 0.060

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN.
 REFB 1.3330 IN.
 XMRP 0.0370 IN.
 YMRP 0.0000 IN.
 ZMRP 0.0000 IN.
 SCALE 0.0034

DATA HIST. CODE #E1

M485-MSFC-S1C NAR HCR ORBITER

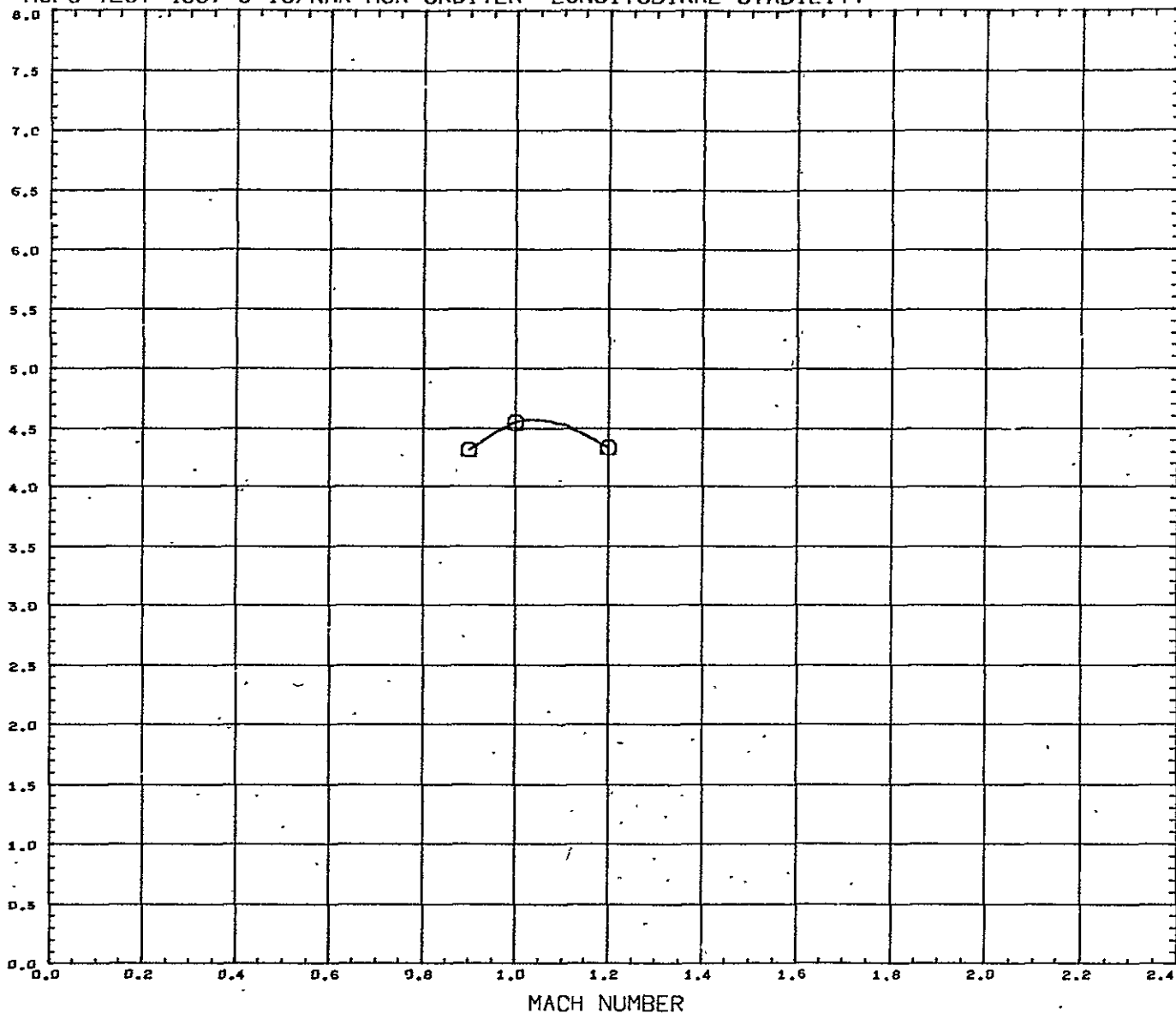
OBVD1

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

STATIC LONGITUDINAL STABILITY DERIVATIVE, $\dot{DCLM}/DCN$, $D(CPD)$



MACH NUMBER

SYMBOL ALPHA BETA PARAMETRIC VALUES
 O 0.000 0.040

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
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 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE #EI

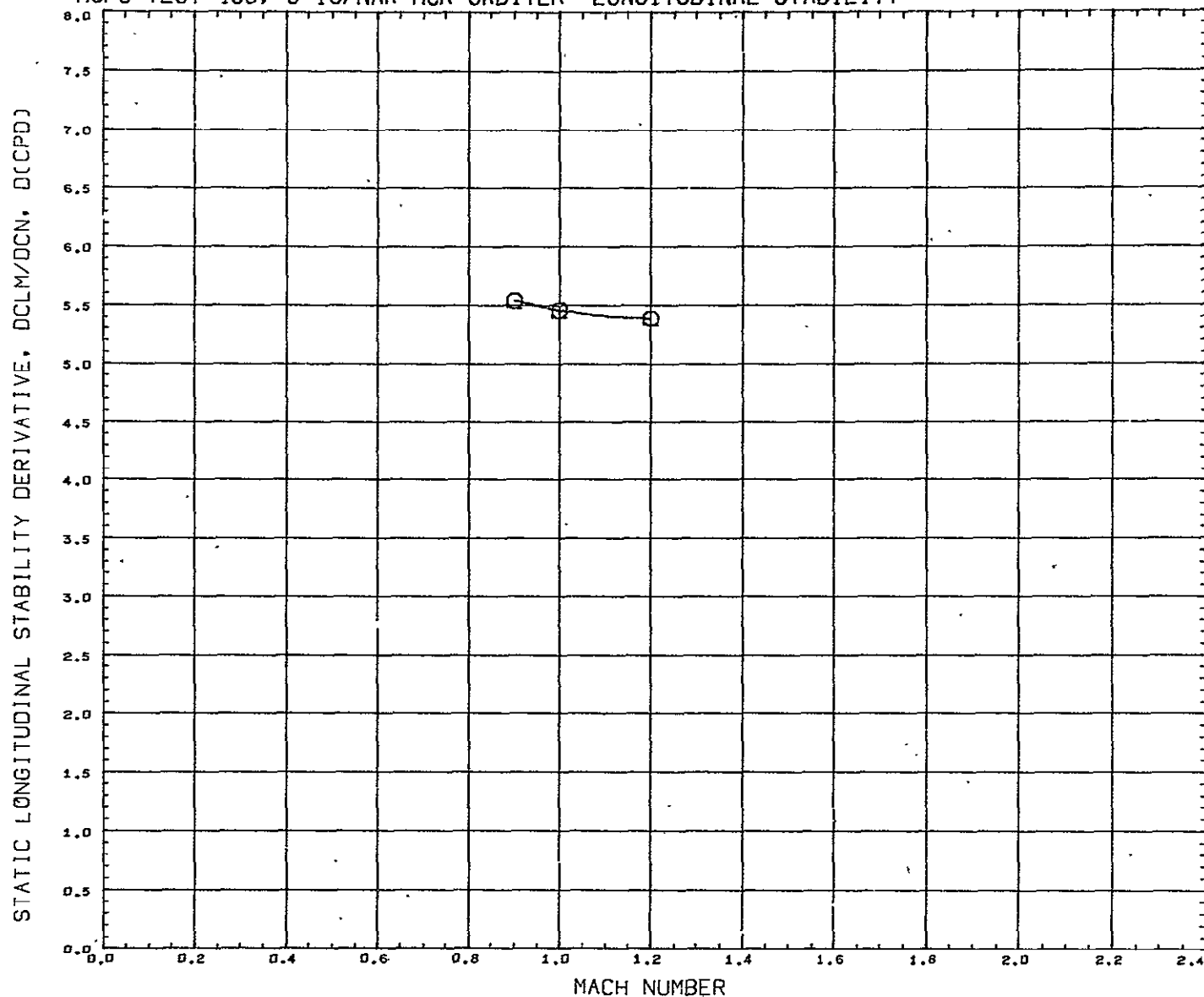
M485-MSFC-S1C NAR HCR ORBITER

ORFVD1

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL ALPHA 0.000 BETA 0.040 PARAMETRIC VALUES

REFERENCE INFORMATION

REFS	1.3960	59. IN.
REFL	1.3330	IN
REFB	1.3330	IN
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YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI

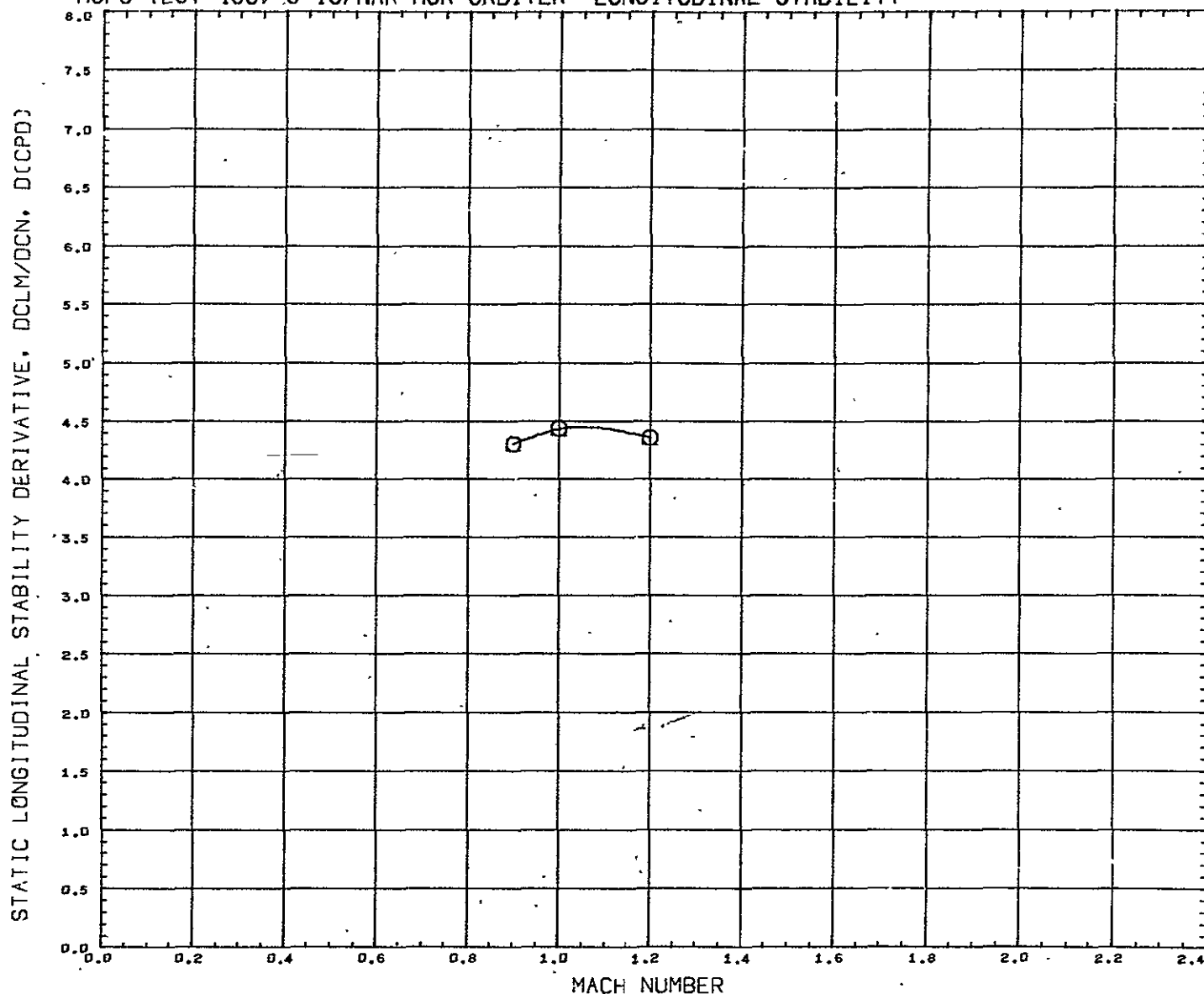
M485-MSFC-S1C NAR HCR ORBITER

ORVD2

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL ALPHA BETA PARAMETRIC VALUES
 O 0.000 0.050

REFERENCE INFORMATION
 REFS 1.3960 SQ.IN.
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 REFB 1.3330 IN
 XHRF 0.0370 IN
 YHRF 0.0000 IN
 ZHRF 0.0000 IN
 SCALE 0.5034

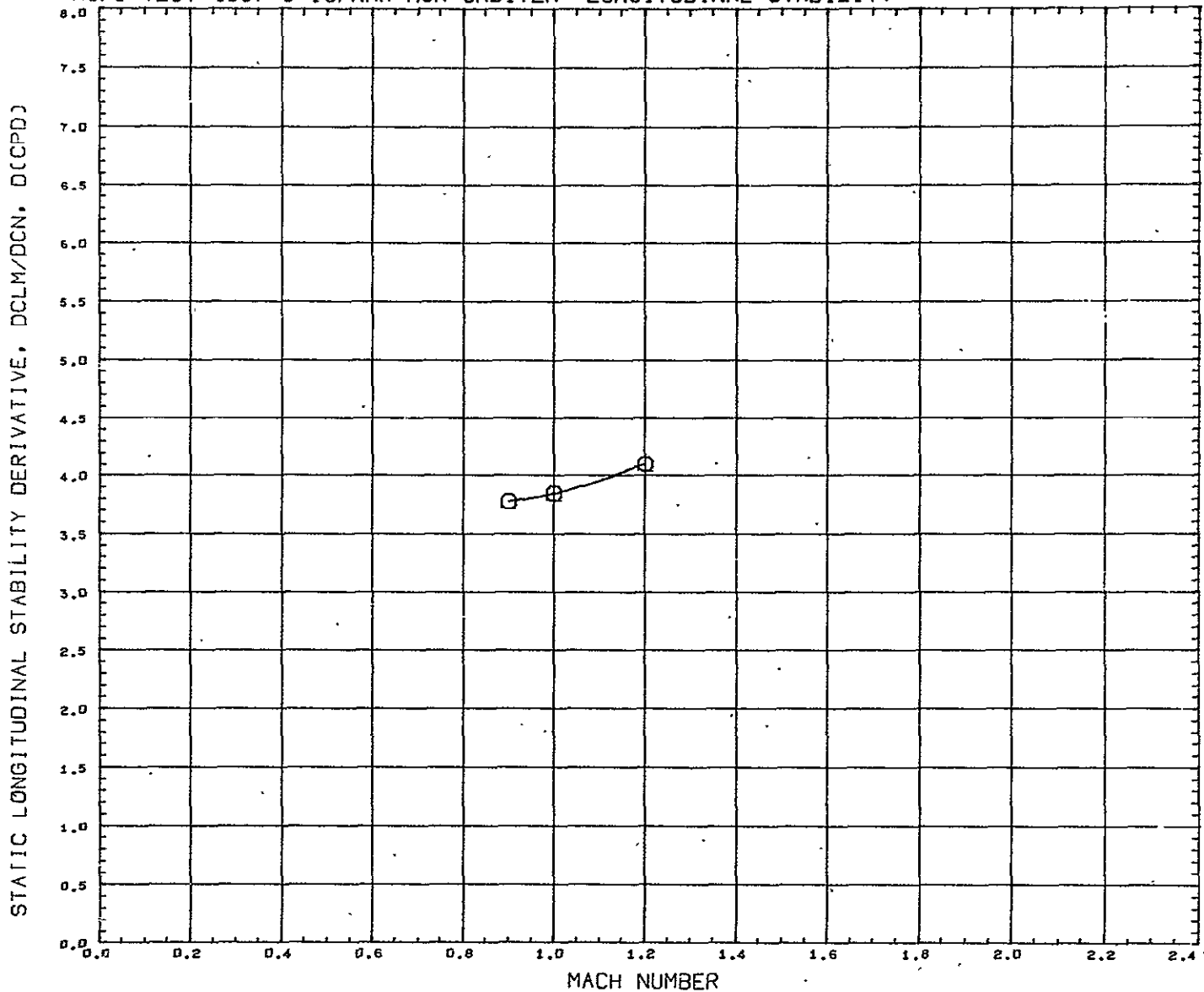
DATA HIST. CODE #EI

M485-MSFC-S1C NAR HCR ORBITER

0BFVD2

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL ALPHA PARAMETRIC VALUES
 Q 0.000 BETA 0.000

REFERENCE INFORMATION
 REFS 1.3960 SQ.IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE #EI

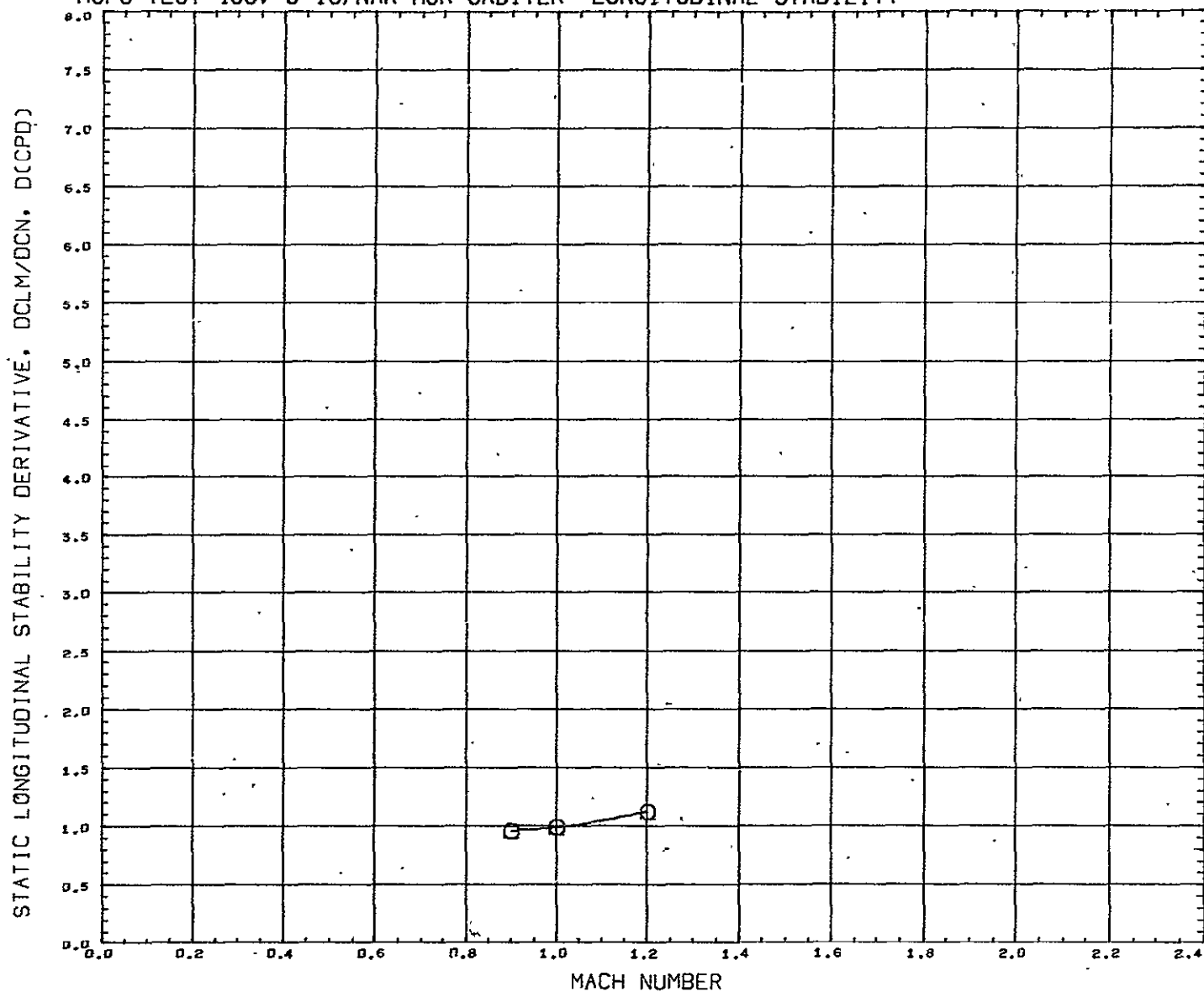
M485-MSFC-S1C NAR HCR ORBITER

GB

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL ALPHA BETA PARAMETRIC VALUES
 O 0.000 0.000

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE #E1

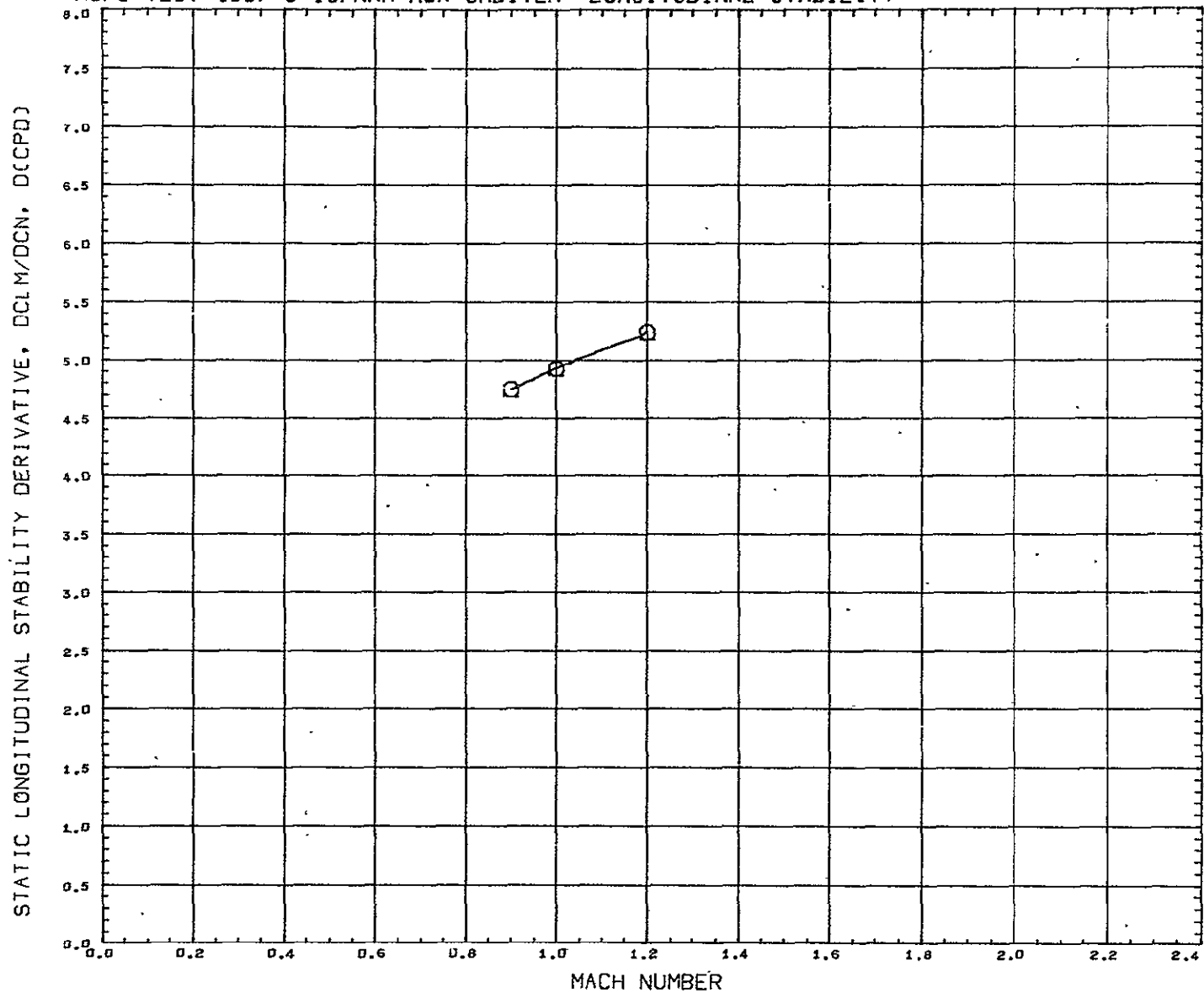
M485-MSFC-S1C NAR HCR ORBITER

GBF

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



SYMBOL ALPHA PARAMETRIC VALUES
 O 0.000 BETA 0.050

DATA HIST. CODE #EI

REFERENCE INFORMATION
 REFS 1.3960 SQ.IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP - 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

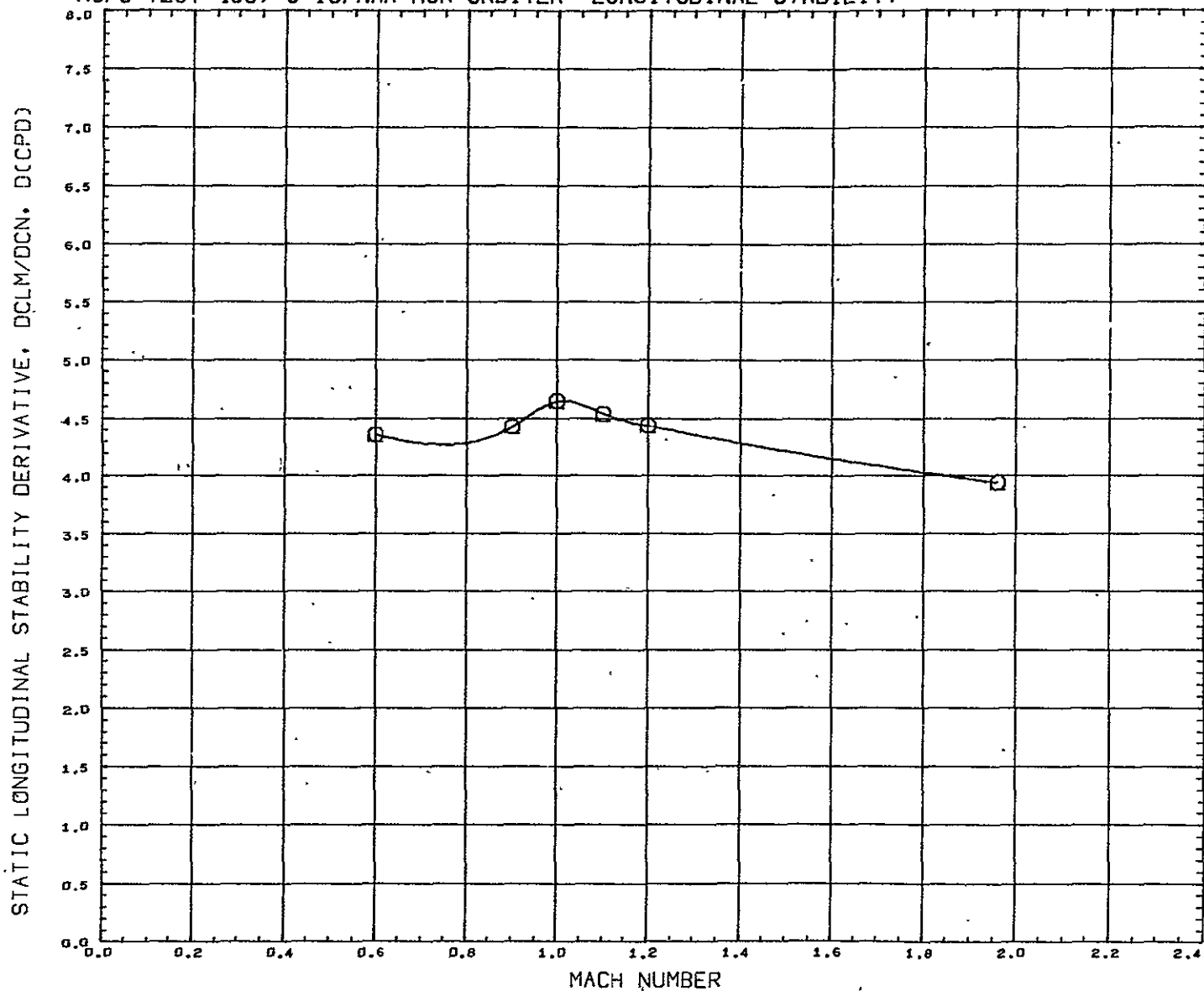
M485-MSFC-S1C NAR HCR ORBITER

0BFS3

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

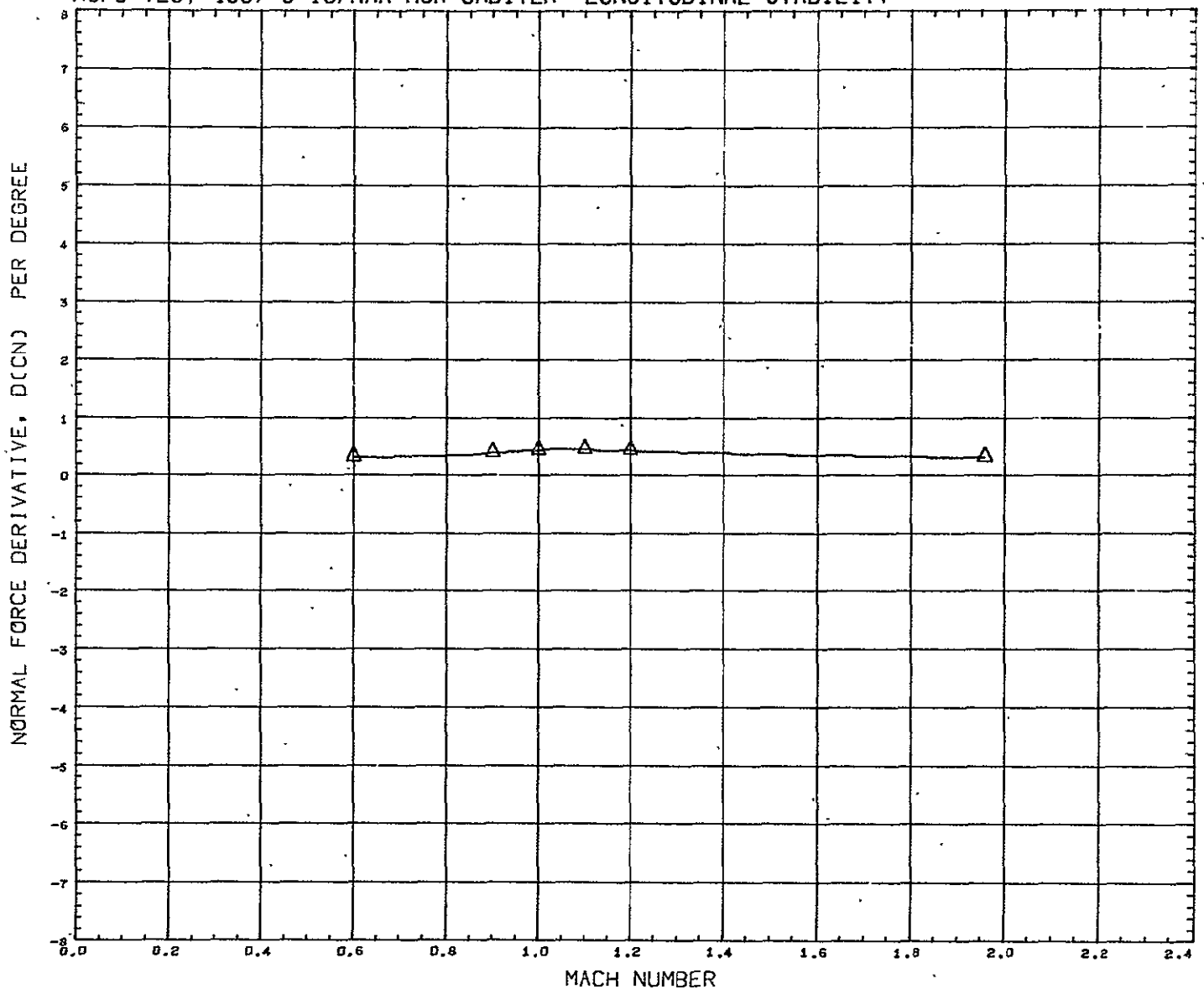


SYMBOL ALPHA BETA PARAMETRIC VALUES
 O 0.000 0.000

REFERENCE INFORMATION
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 REFL 1.3330 IN
 REFB 1.3330 IN
 XNRF 0.0370 IN
 YNRF 0.3000 IN
 ZNRF 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *EI

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



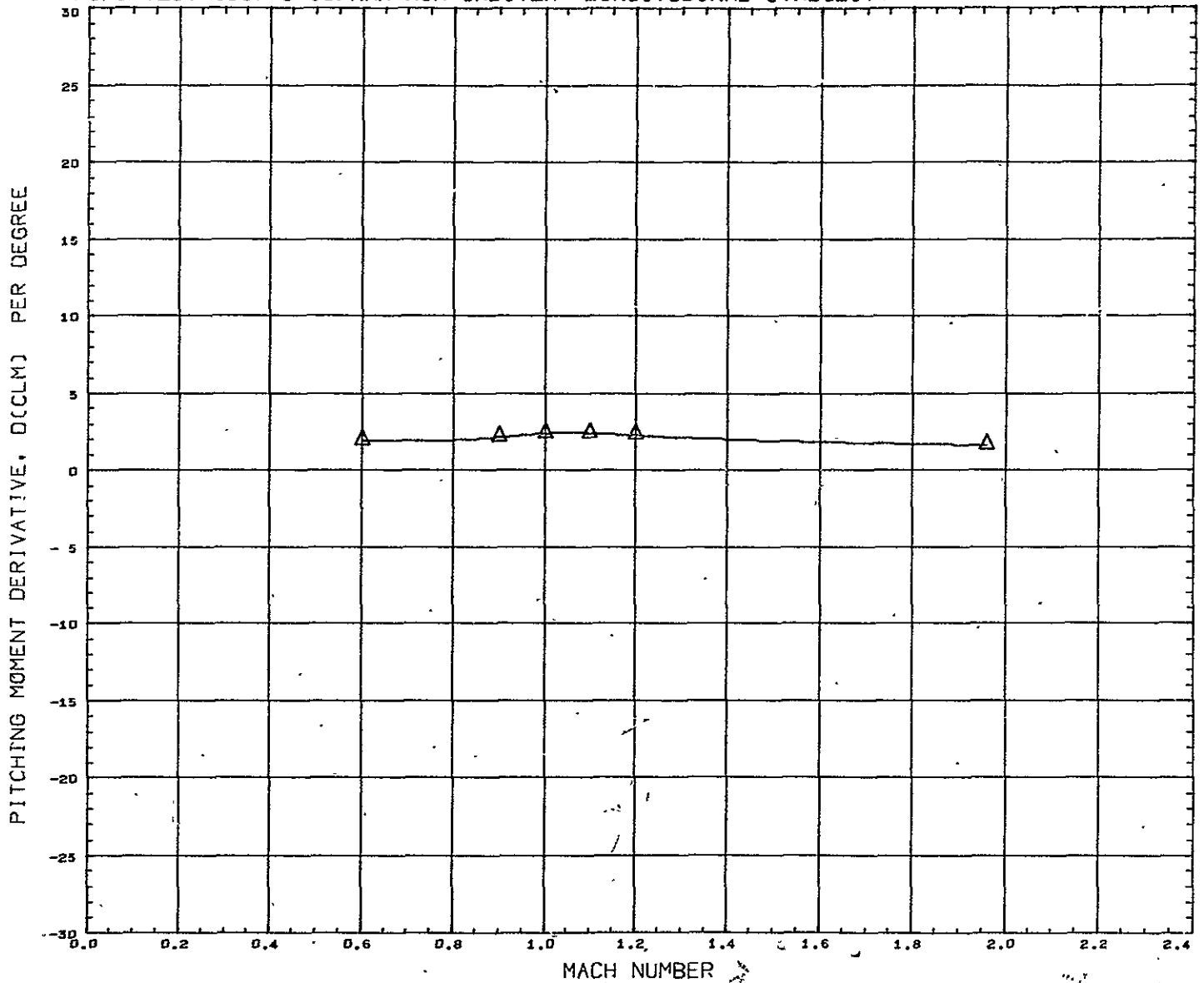
PARAMETRIC VALUES
BETA 0.030

DATA HIST. CODE *EI

REFERENCE INFORMATION

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REFB	1.3330	IN
XMRF	0.0570	IN
YMRF	0.0000	IN
ZMRF	0.0000	IN
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

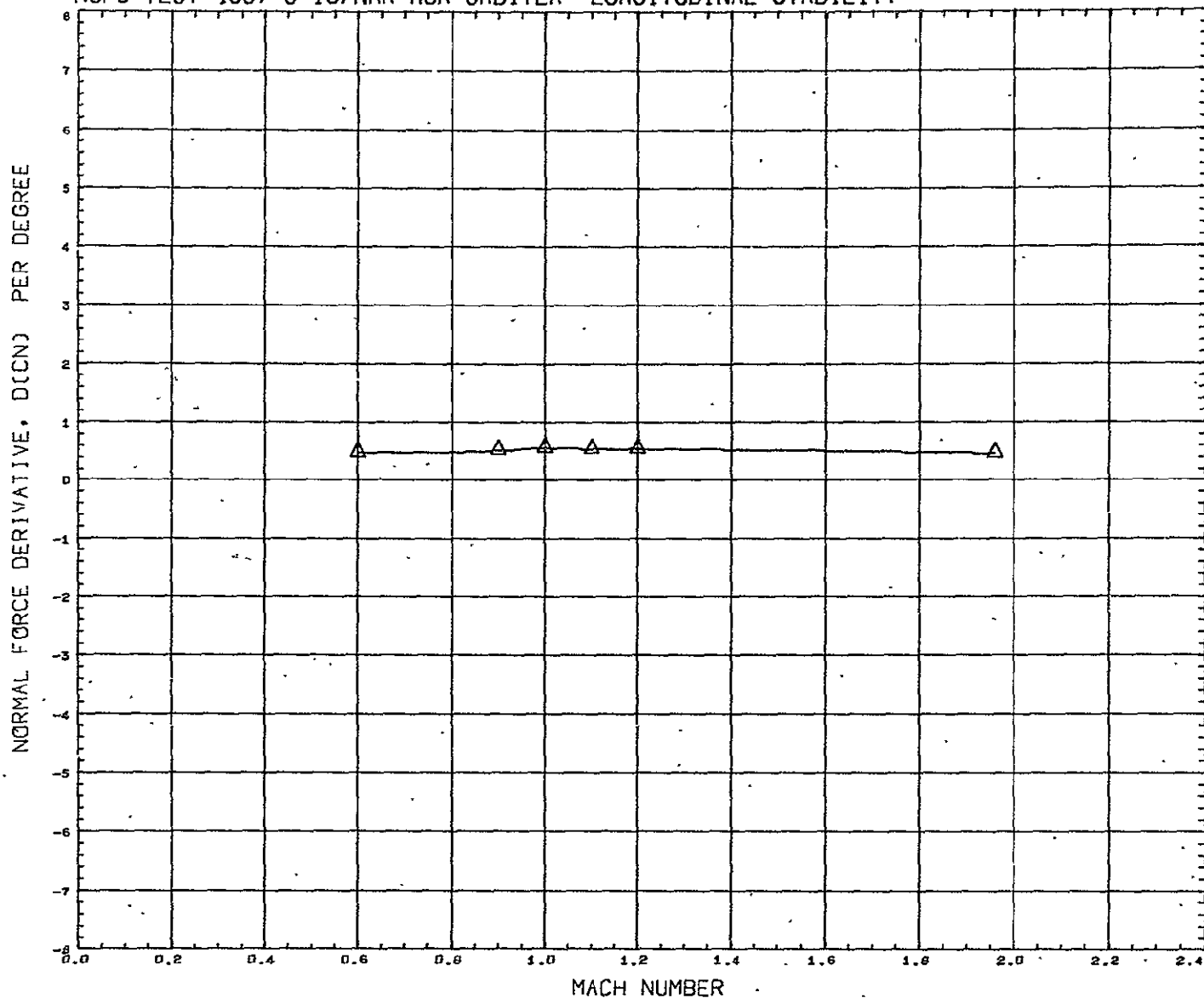


BETA 0.030
PARAMETRIC VALUES

REFERENCE INFORMATION
REFS 1.3960 SQ. IN.
REFL 1.3330 IN
REFB 1.3330 IN
XMRP 0.0370 IN
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ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE #E1

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

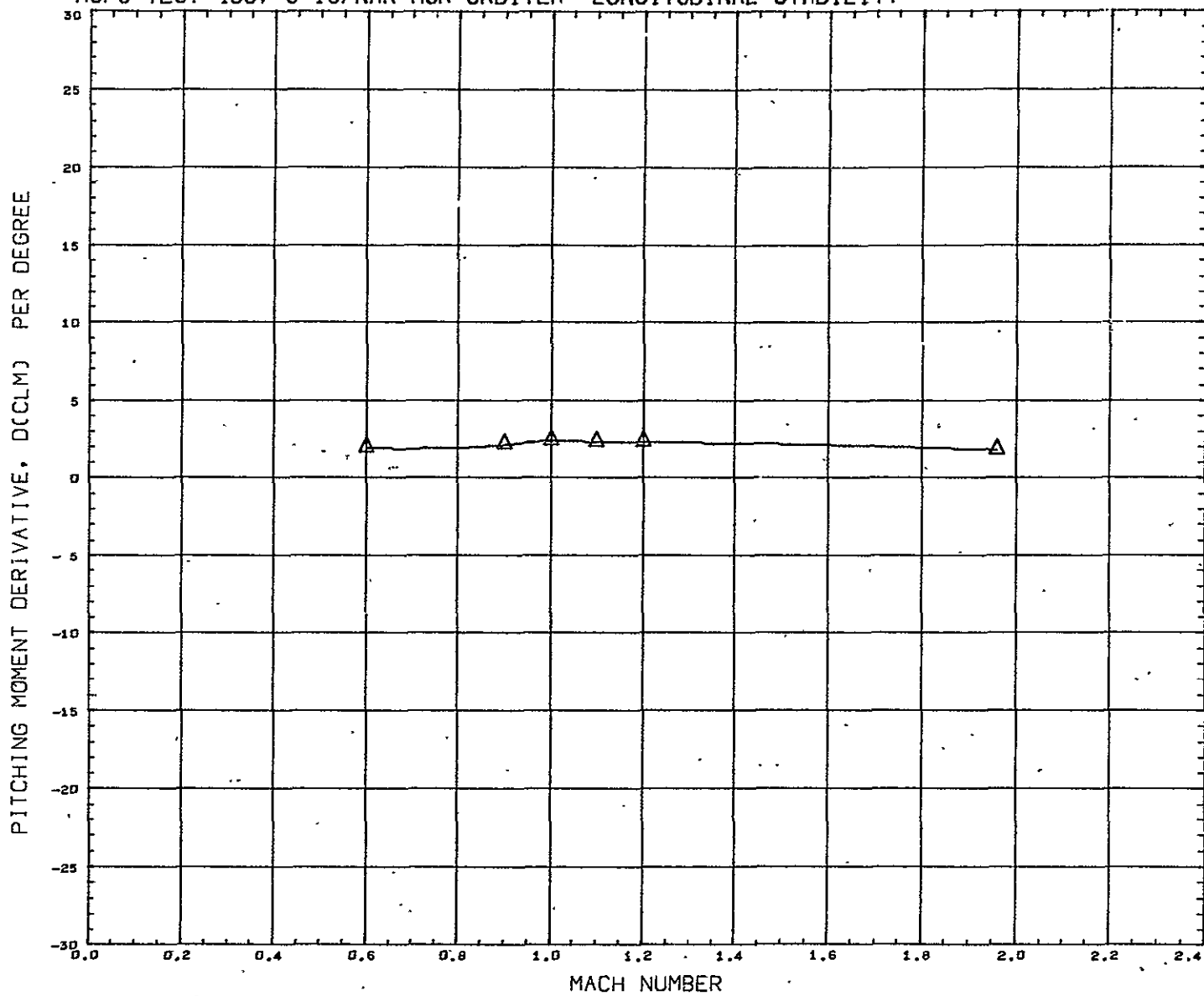


PARAMETRIC VALUES
BETA 0.000

DATA HIST. CODE *EI

REFERENCE INFORMATION
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REFB 1.3339 IN
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ZMRP 0.0000 IN
SCALE 9.0034

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

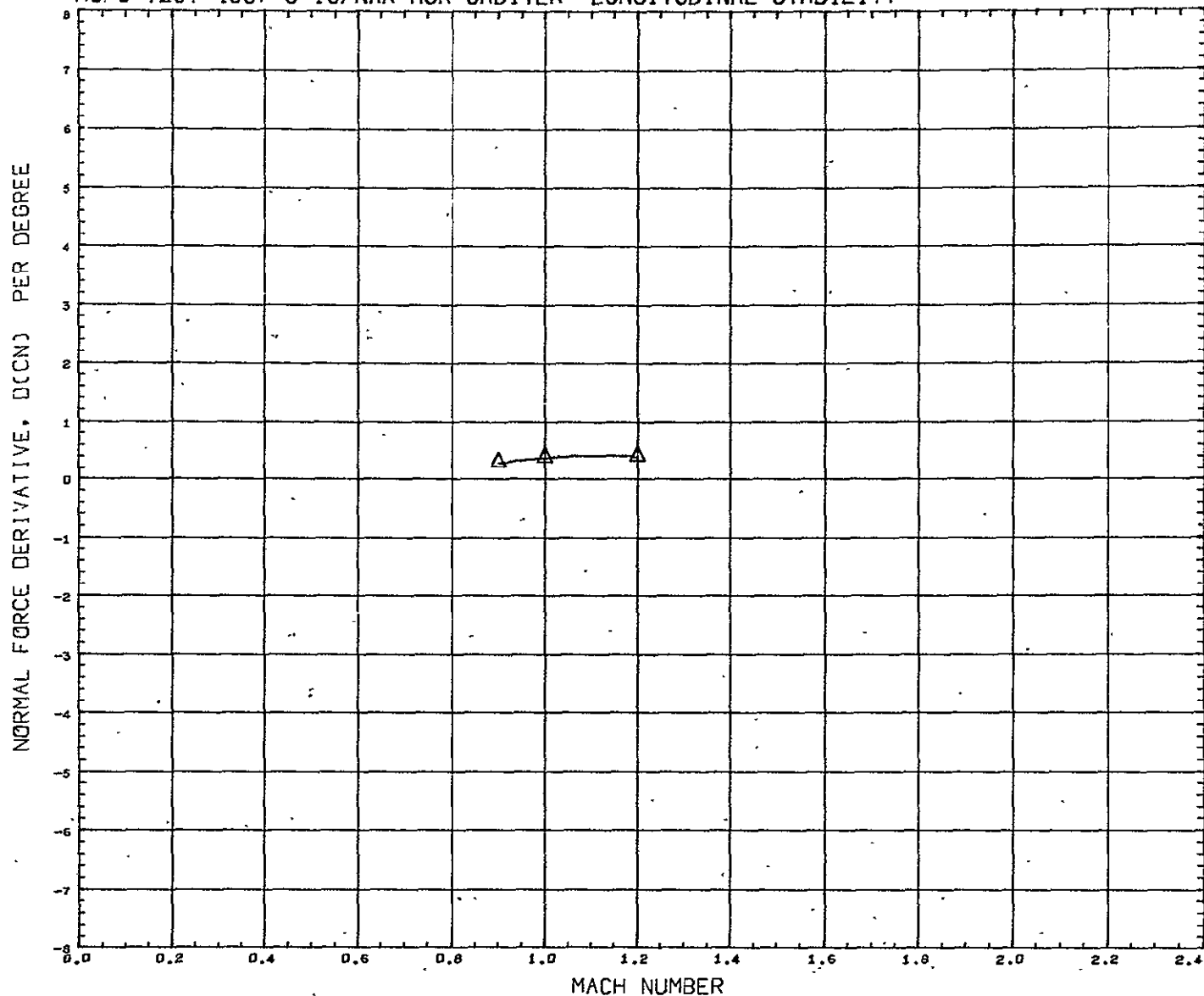


BETA 0.000
PARAMETRIC VALUES

DATA HIST. CODE *EI

REFERENCE INFORMATION
REFS 1.3960 SQ. IN.
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REFB 1.3330 IN
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YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

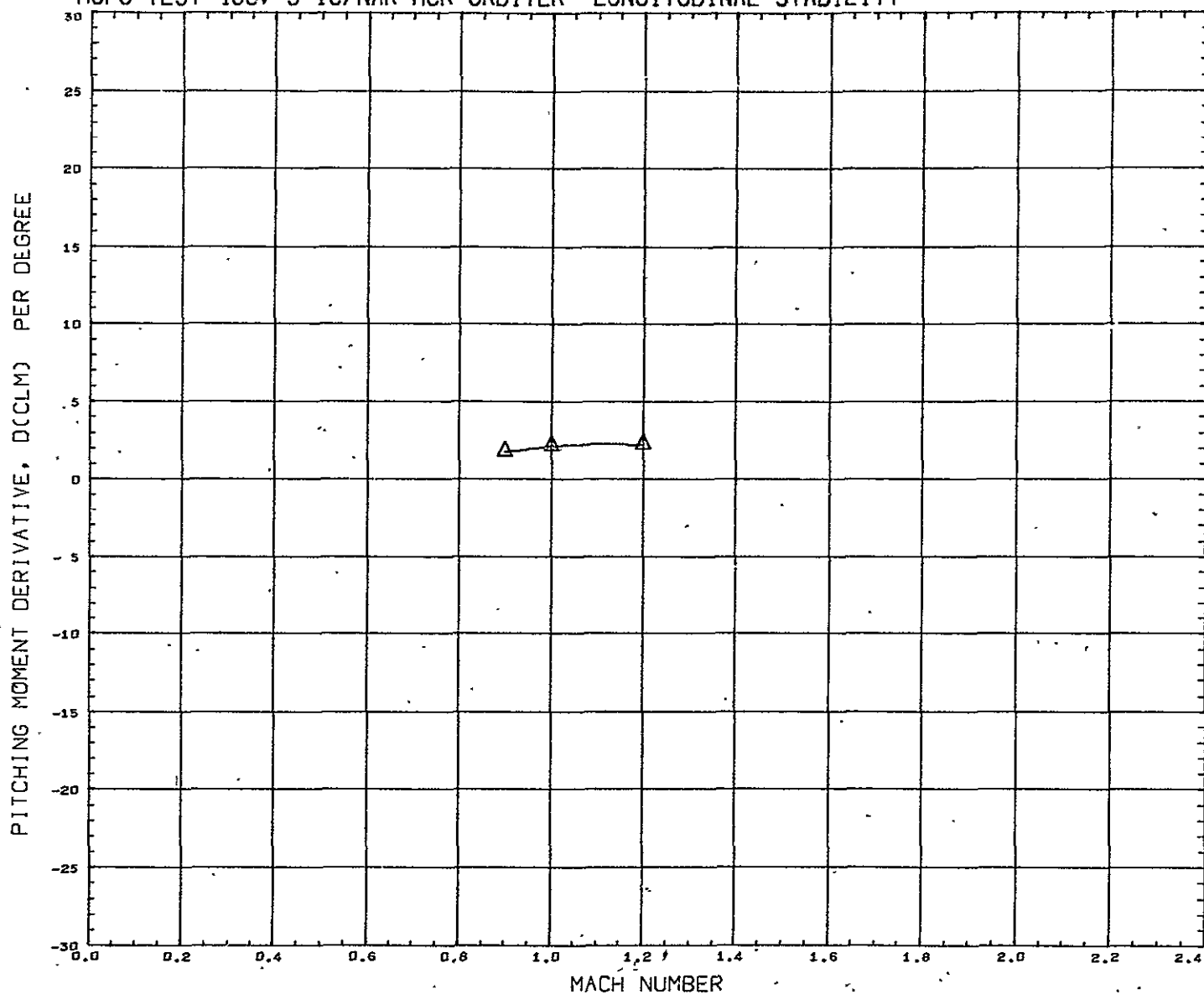


PARAMETRIC VALUES
BETA 0.040

DATA HIST. CODE *EI

REFERENCE INFORMATION
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REFL 1.3330 IN
REFB 1.3330 IN
XMRP - 0.0370 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

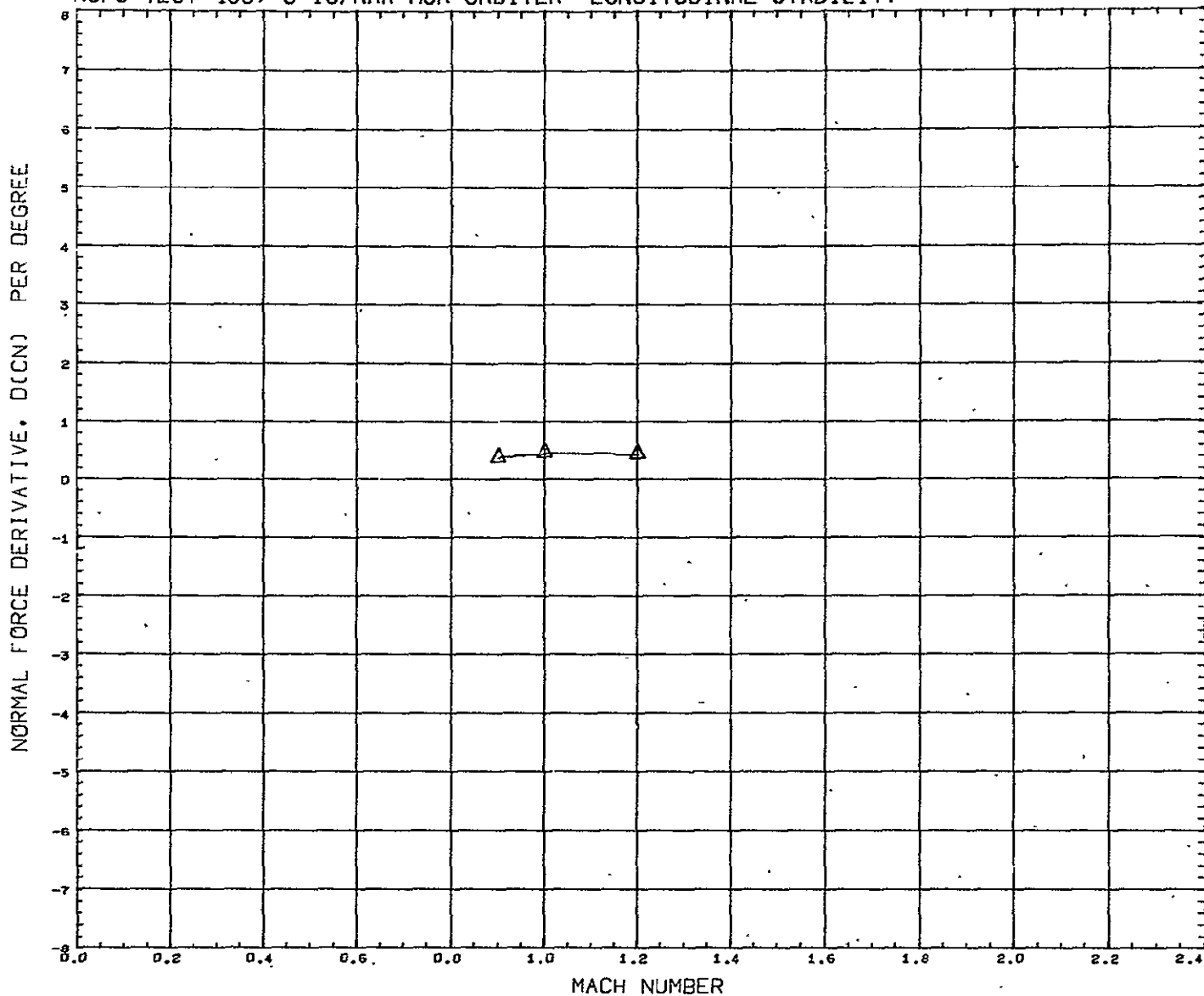


PARAMETRIC VALUES
BETA 0.040

REFERENCE INFORMATION
REFS 1.3960 SQ.IN.
REFL 1.3330 IN
REFB 1.3330 IN
XMRP 0.0370 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE *EI

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



PARAMETRIC VALUES

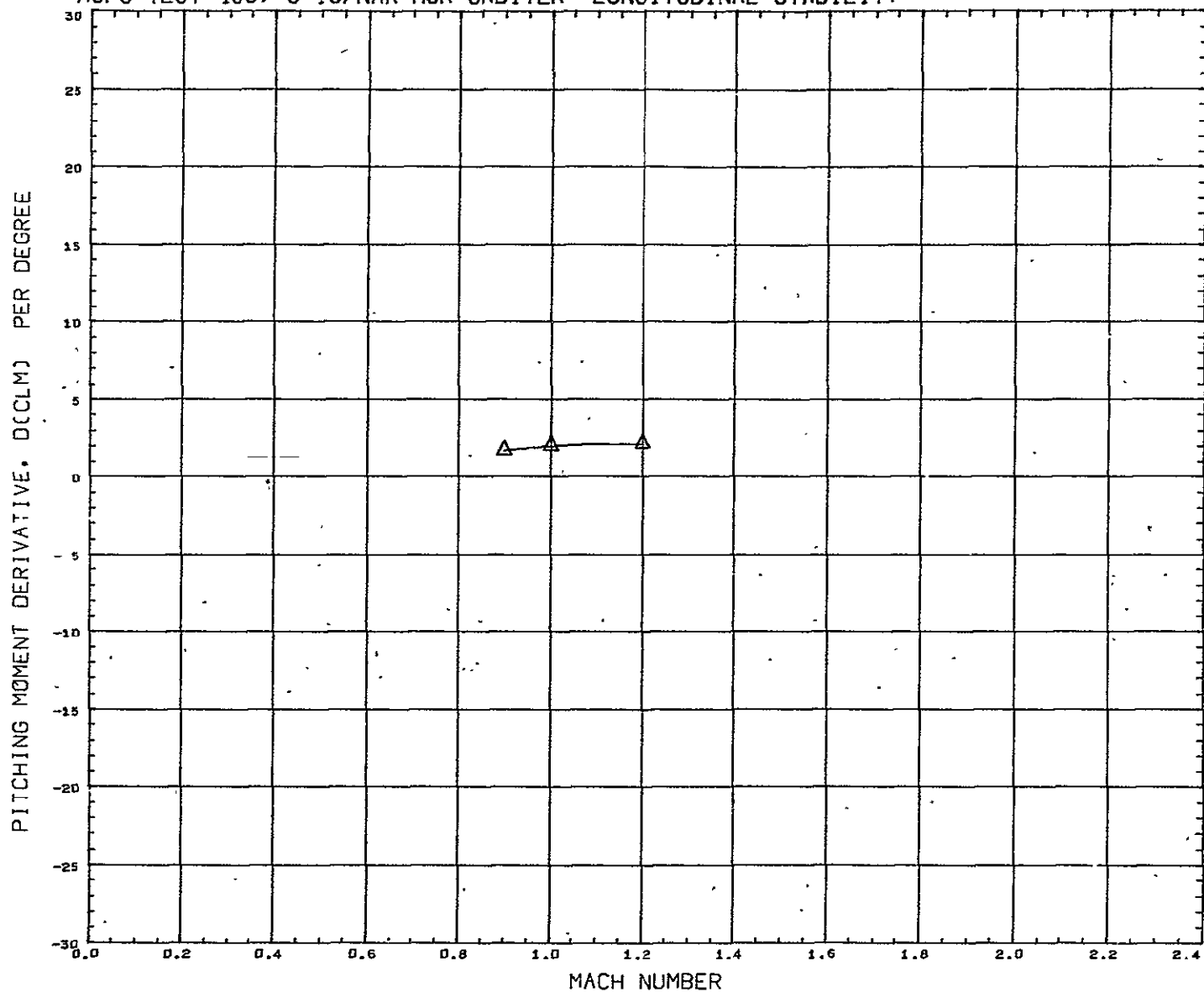
BETA 0.060

DATA HIST. CODE #EI

REFERENCE INFORMATION

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REFB	1.3330	IN
XMRC	0.0370	IN
YMRF	0.0000	IN
ZMRF	0.0000	IN
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



PARAMETRIC VALUES
BETA 0.060

REFERENCE INFORMATION
REFS 1.3960 90.IN.
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XMRP 0.0370 IN
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ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE *EI

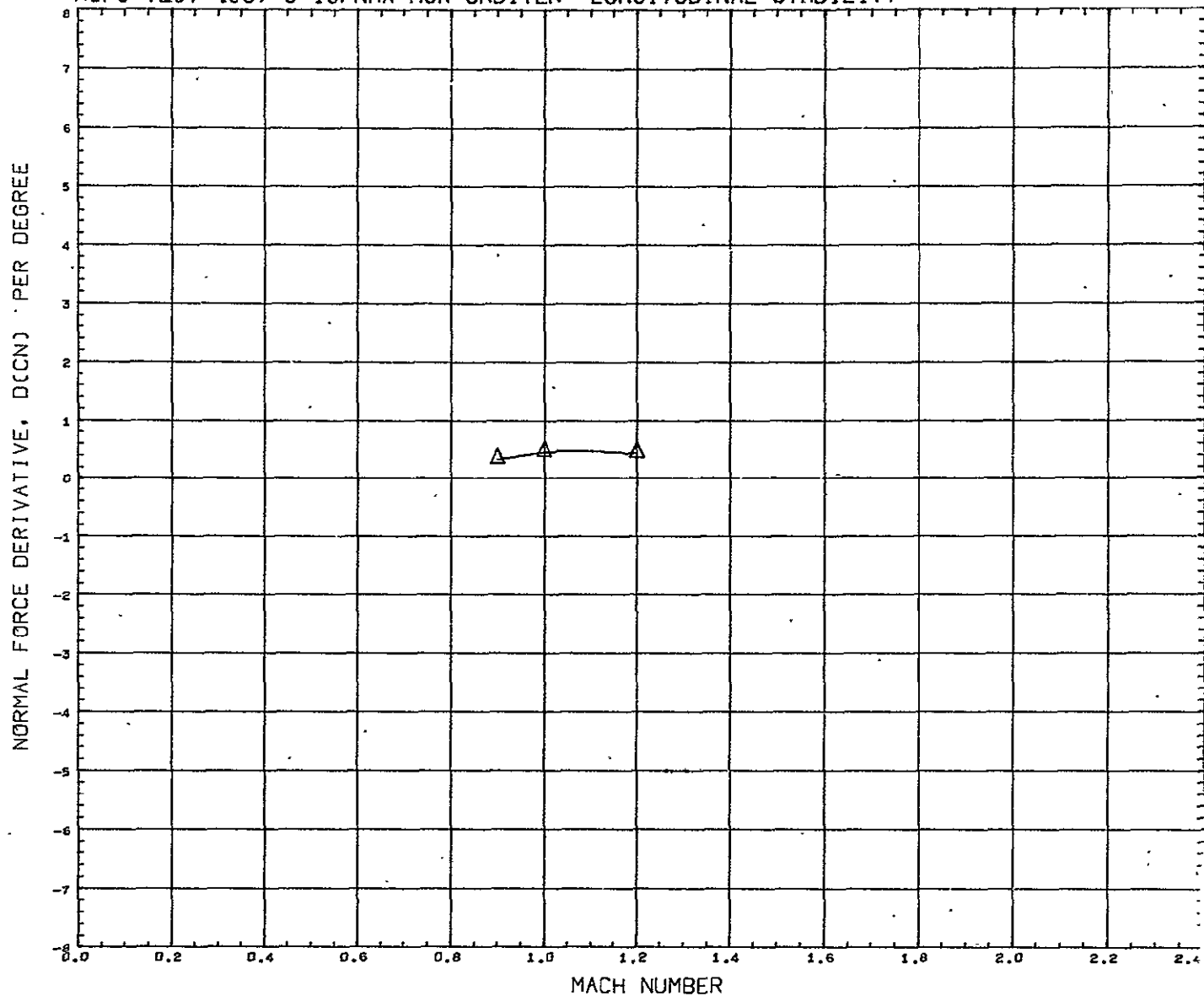
M485-MSFC-S1C NAR HCR ORBITER

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



PARAMETRIC VALUES
BETA 0.040

DATA HIST. CODE #EI.

REFERENCE INFORMATION

REFS	1.3960	SG.IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

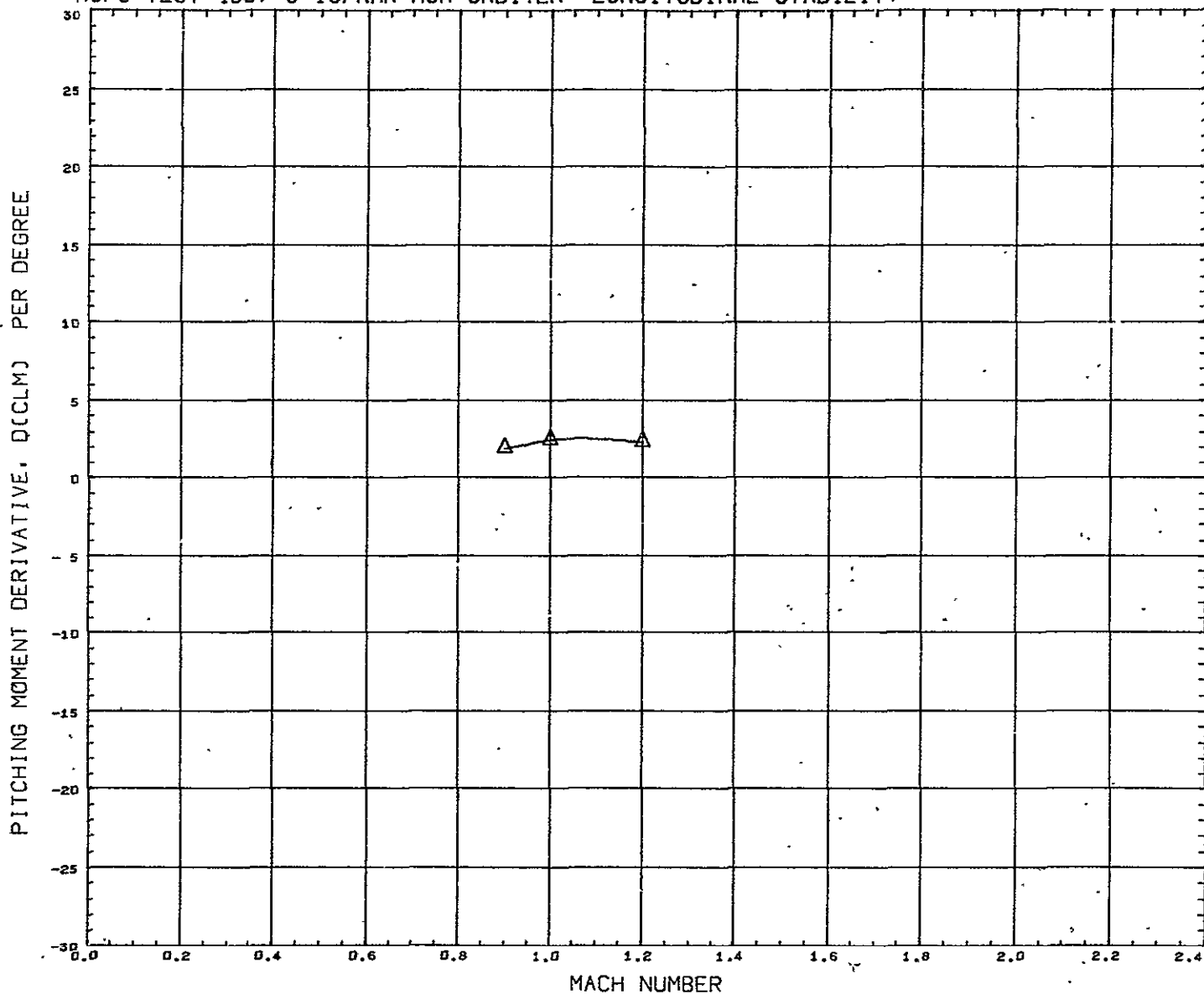
M485-MSFC-S1C NAR HCR ORBITER

0BS2

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



BETA 0.040

DATA HIST. CODE *EI

REFERENCE INFORMATION

REFS	1.3960	SG.IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	IN

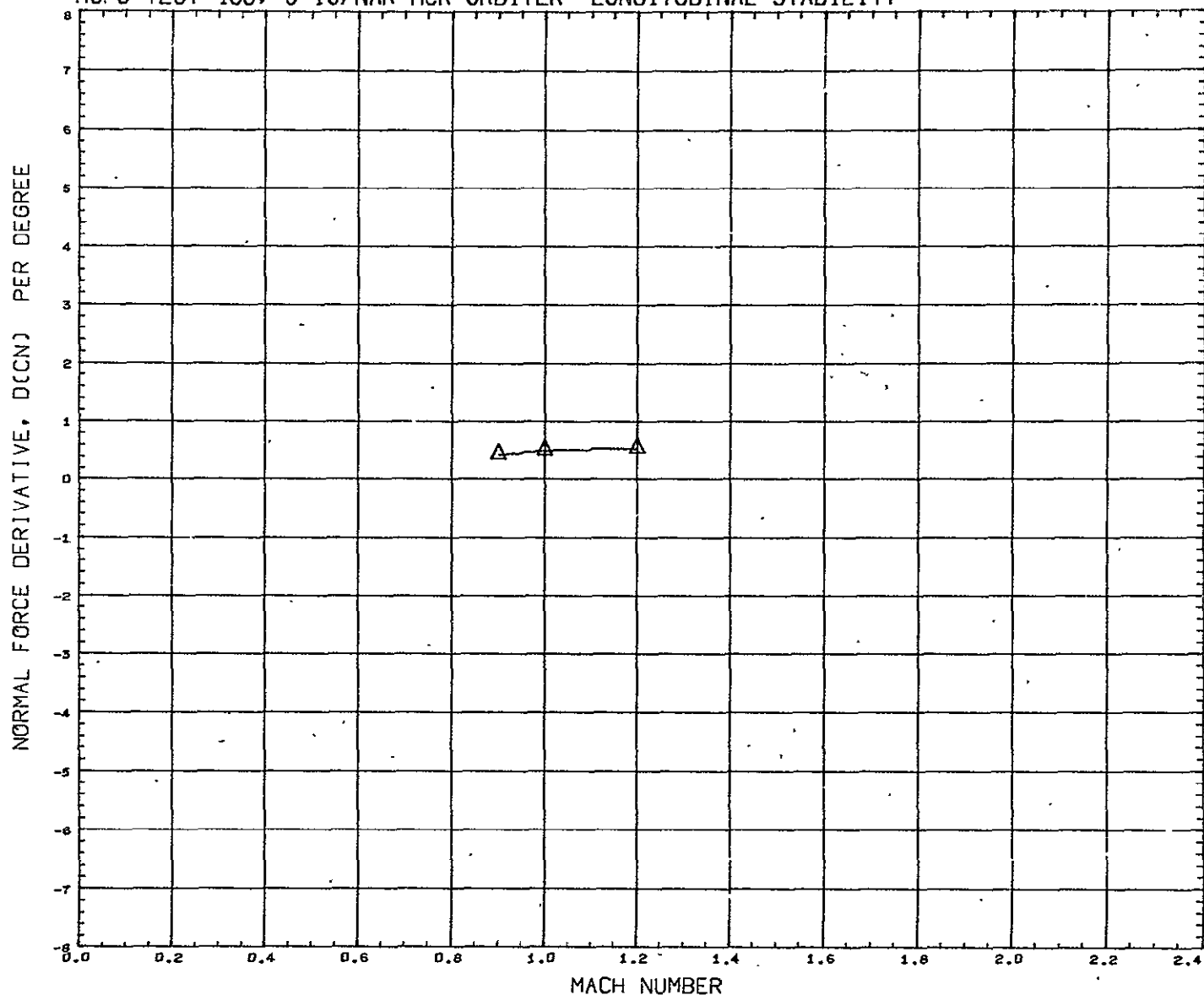
M485-MSFC-S1C NAR HCR ORBITER

OPS2

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



PARAMETRIC VALUES
BETA 0.050

REFERENCE INFORMATION
REFS 1.3960 SQ. IN.
REFL 1.3330 IN
REFB 1.3330 IN
XMRP 0.0370 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE #EI

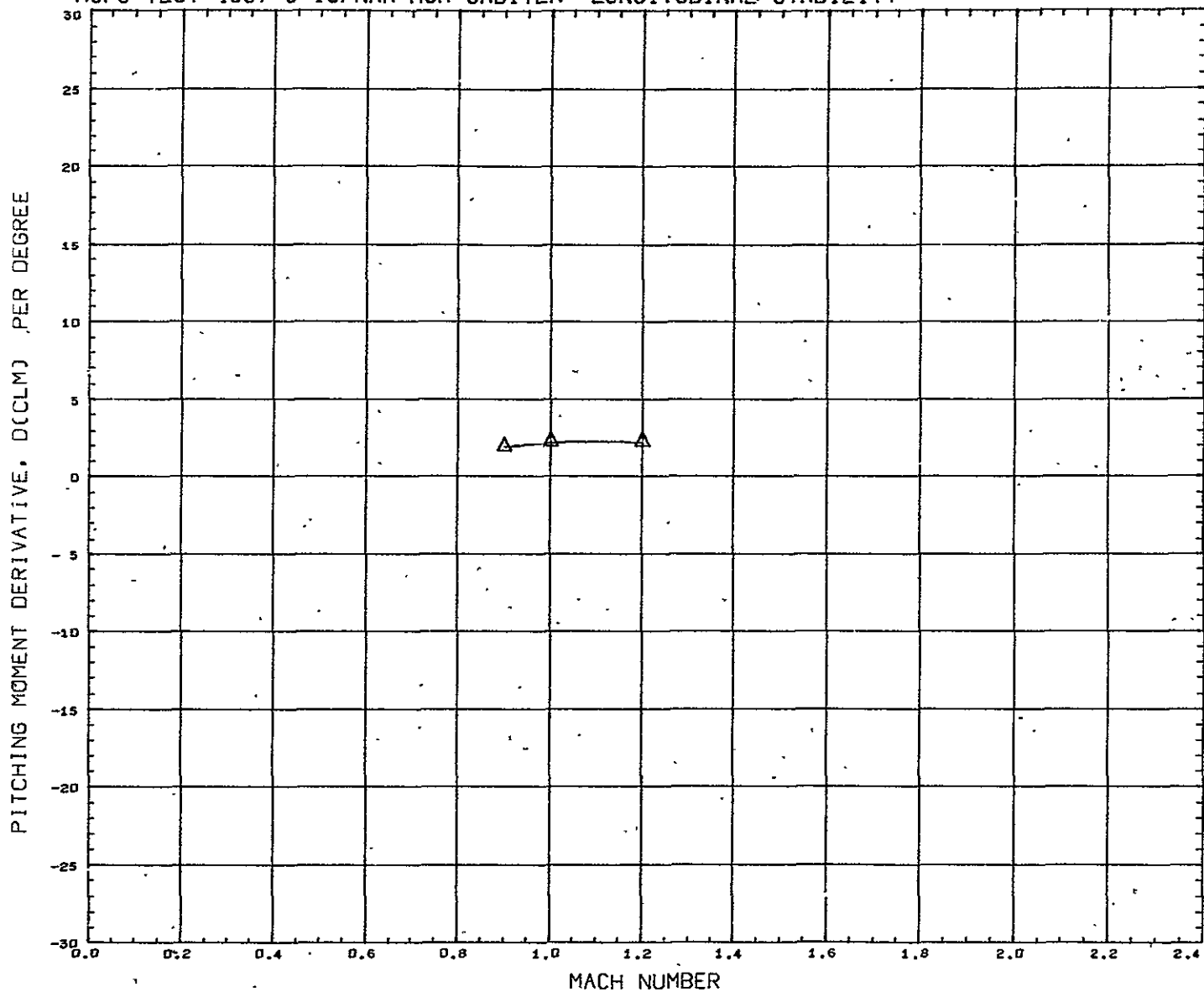
M485-MSFC-S1C NAR HCR ORBITER

OBFS2

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



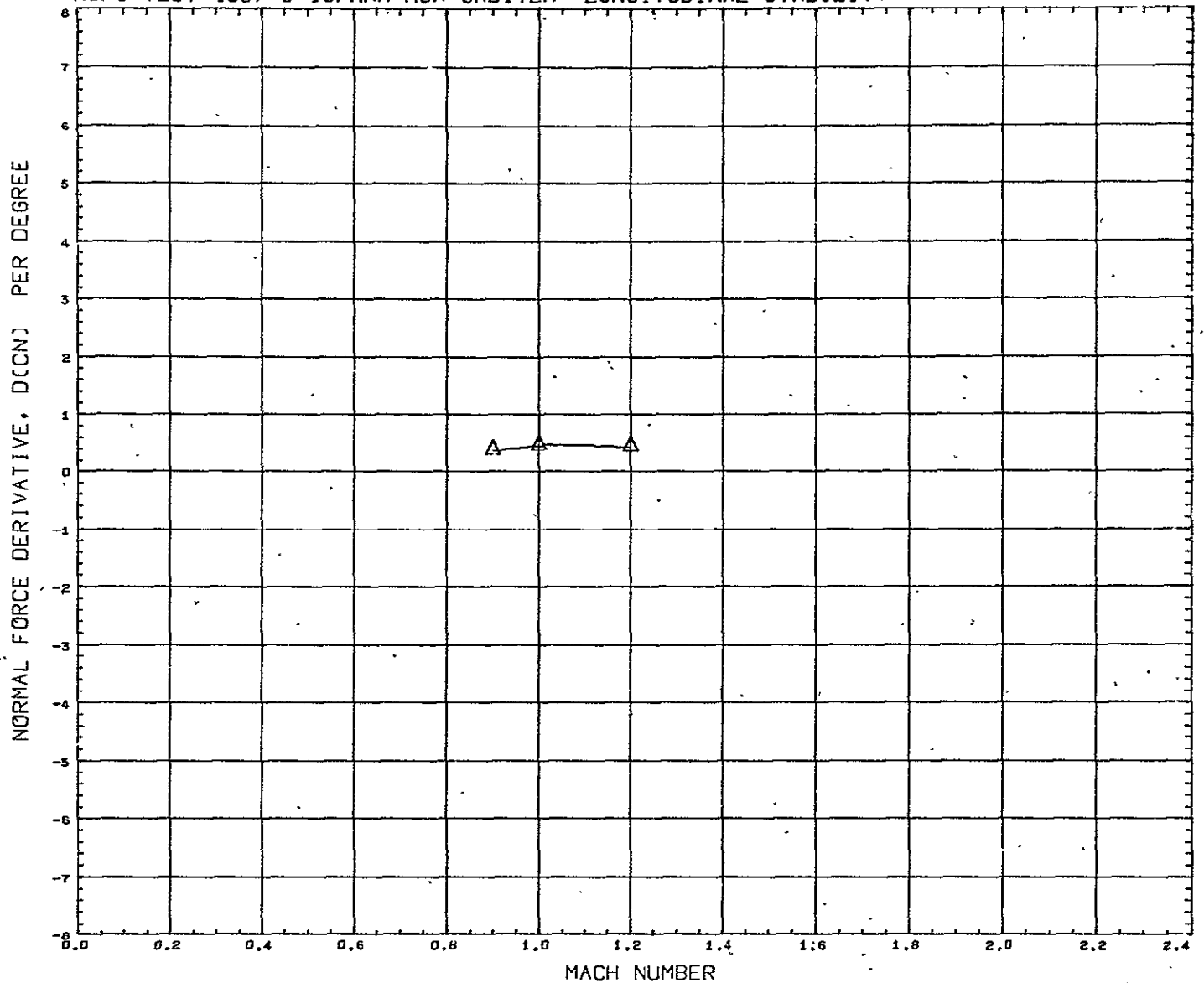
BETA 0.050
PARAMETRIC VALUES

DATA HIST. CODE #EI

REFERENCE INFORMATION

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REFL	1.3330	IN.
REFB	1.3330	IN.
XMRP	0.0370	IN.
YMRP	0.0030	IN.
ZMRP	0.0000	IN.
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



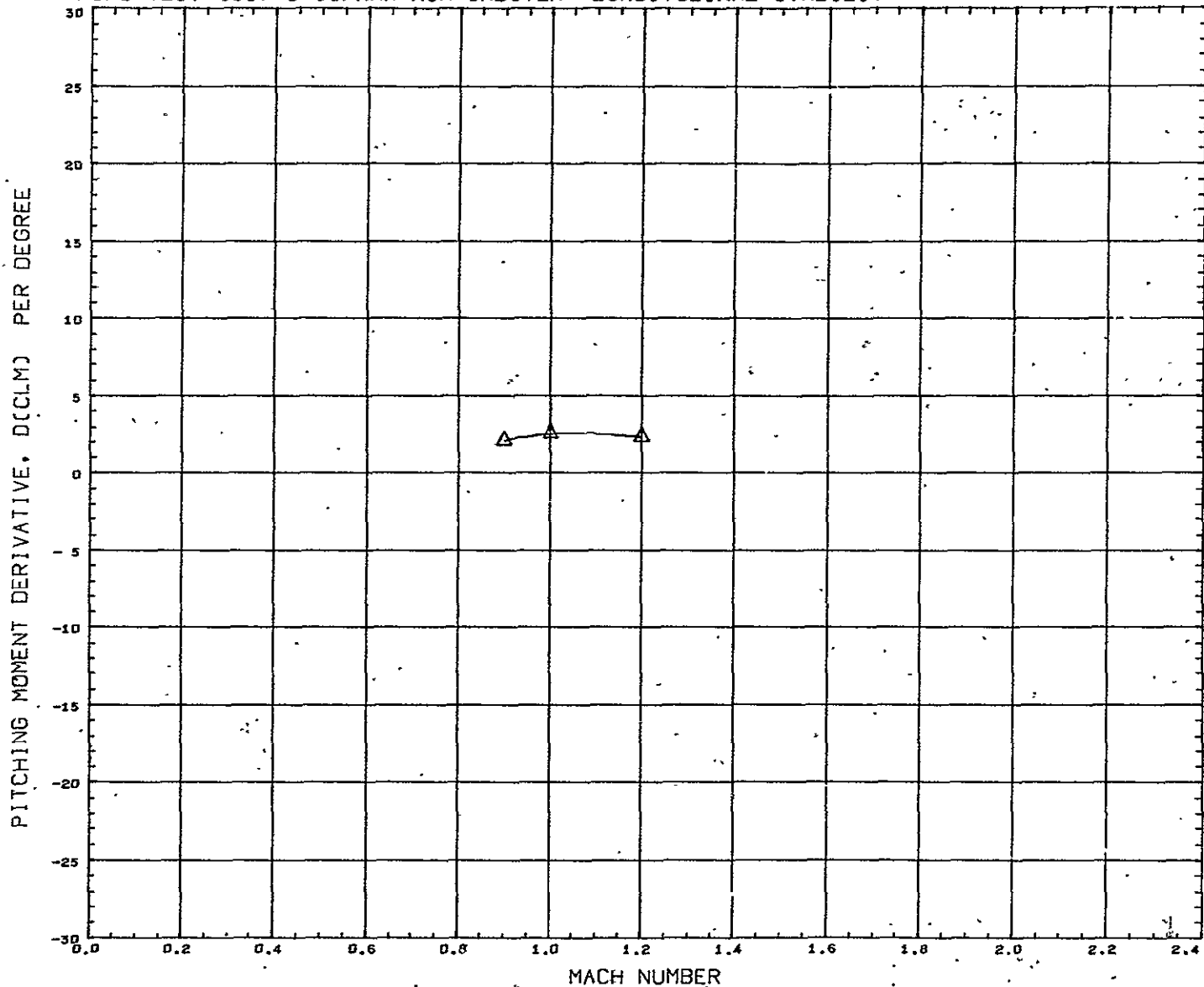
BETA PARAMETRIC VALUES
0.060

DATA HIST. CODE #EI

REFERENCE INFORMATION

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REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



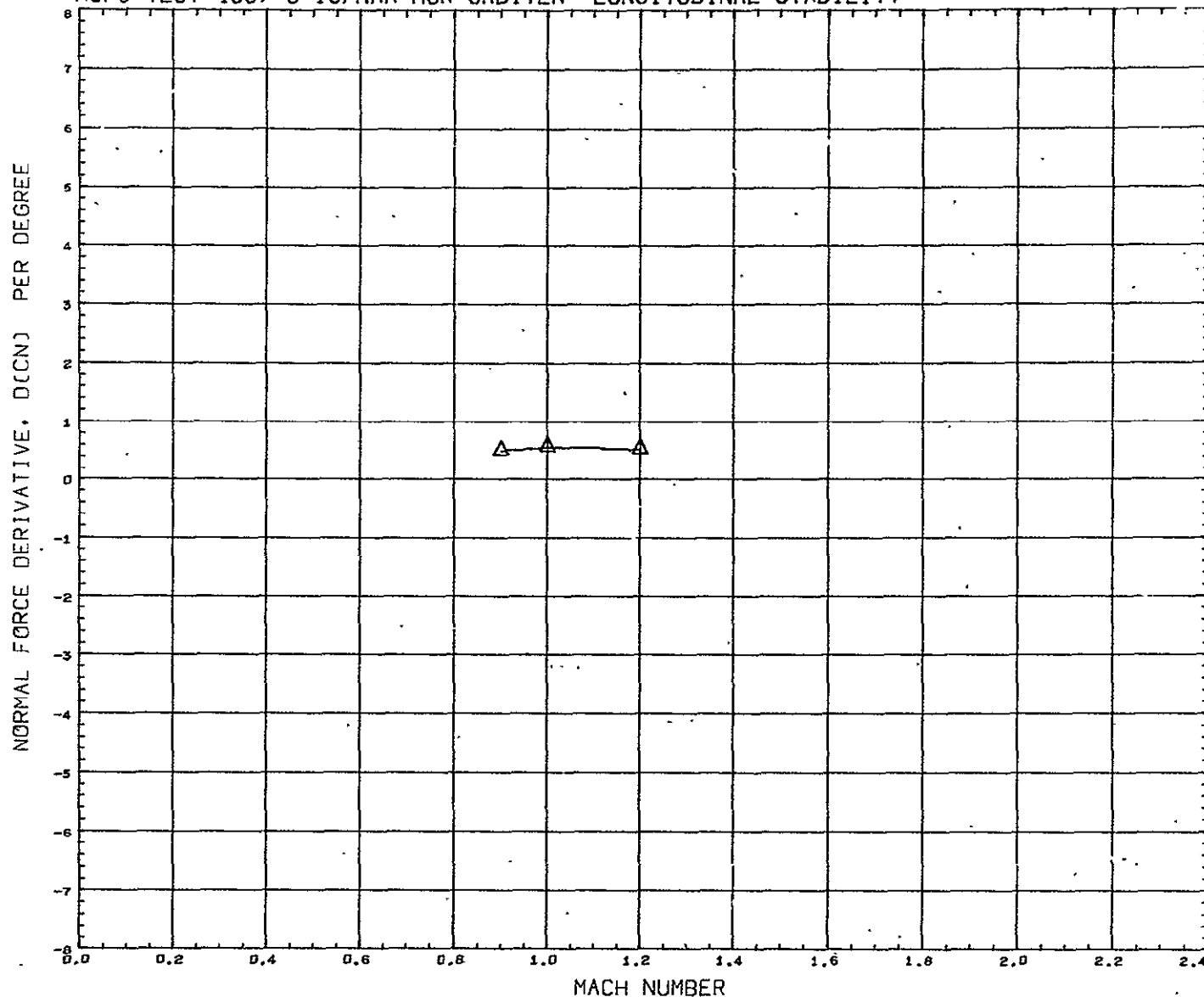
PARAMETRIC VALUES
BETA 0.060

DATA HIST. CODE #EI

REFERENCE INFORMATION

REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

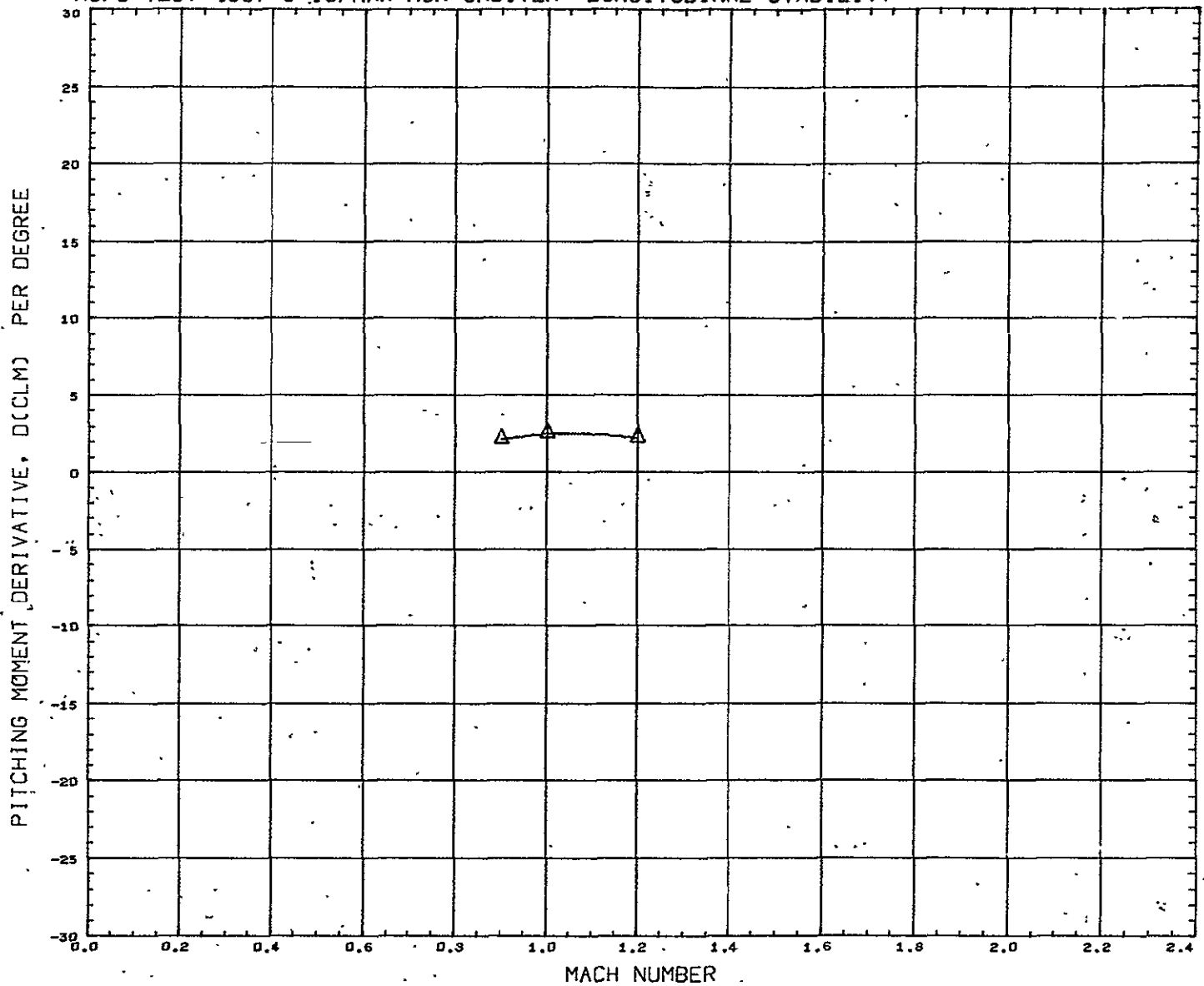


PARAMETRIC VALUES
BETA 0.040

DATA HIST. CODE #EI

REFERENCE INFORMATION
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REFL 1.3330 IN
REFB 1.3330 IN
XMRP 0.0370 IN
YMRP 0.0300 IN
ZMRP 0.0000 IN
SCALE 0.0034

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



BETA 0.040

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *E1

M485-MSFC-S1C NAR HCR ORBITER

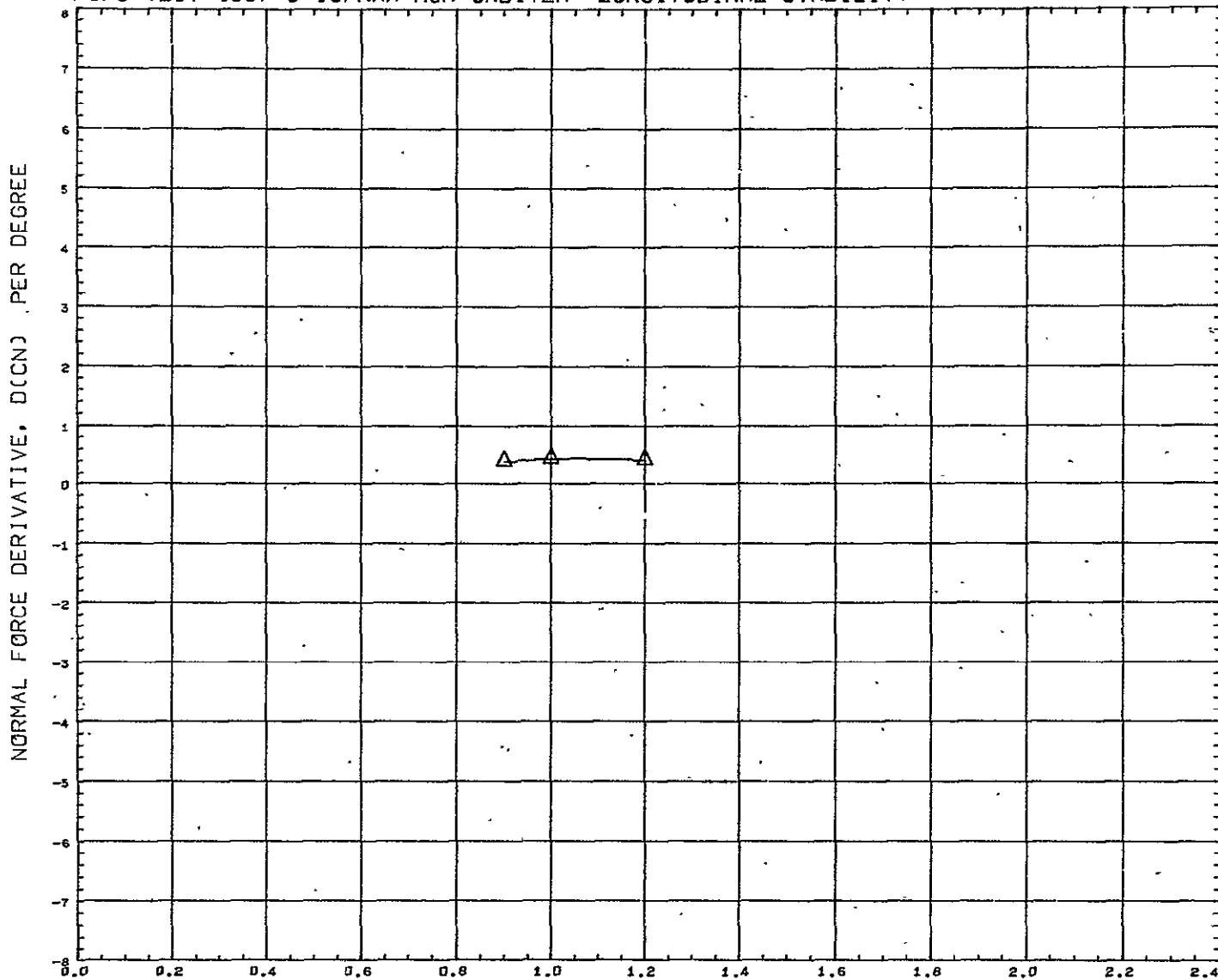
0BFVD1

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

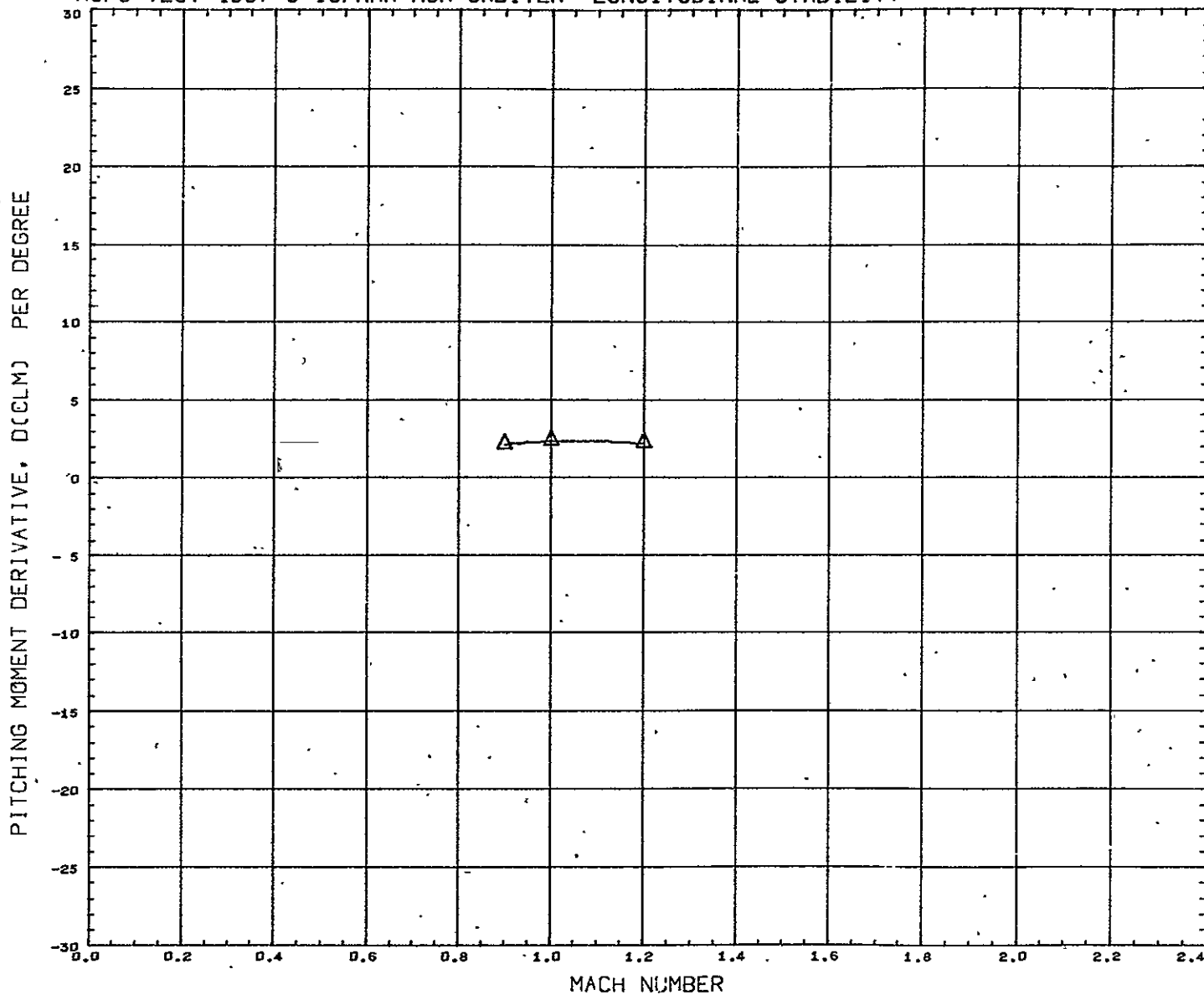


PARAMETRIC VALUES
BETA 0.040

REFERENCE INFORMATION
REFS 1.3960 SQ.IN.
REFL 1.3330 IN
REFB 1.3330 IN
XMRP 0.0370 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE *EI

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

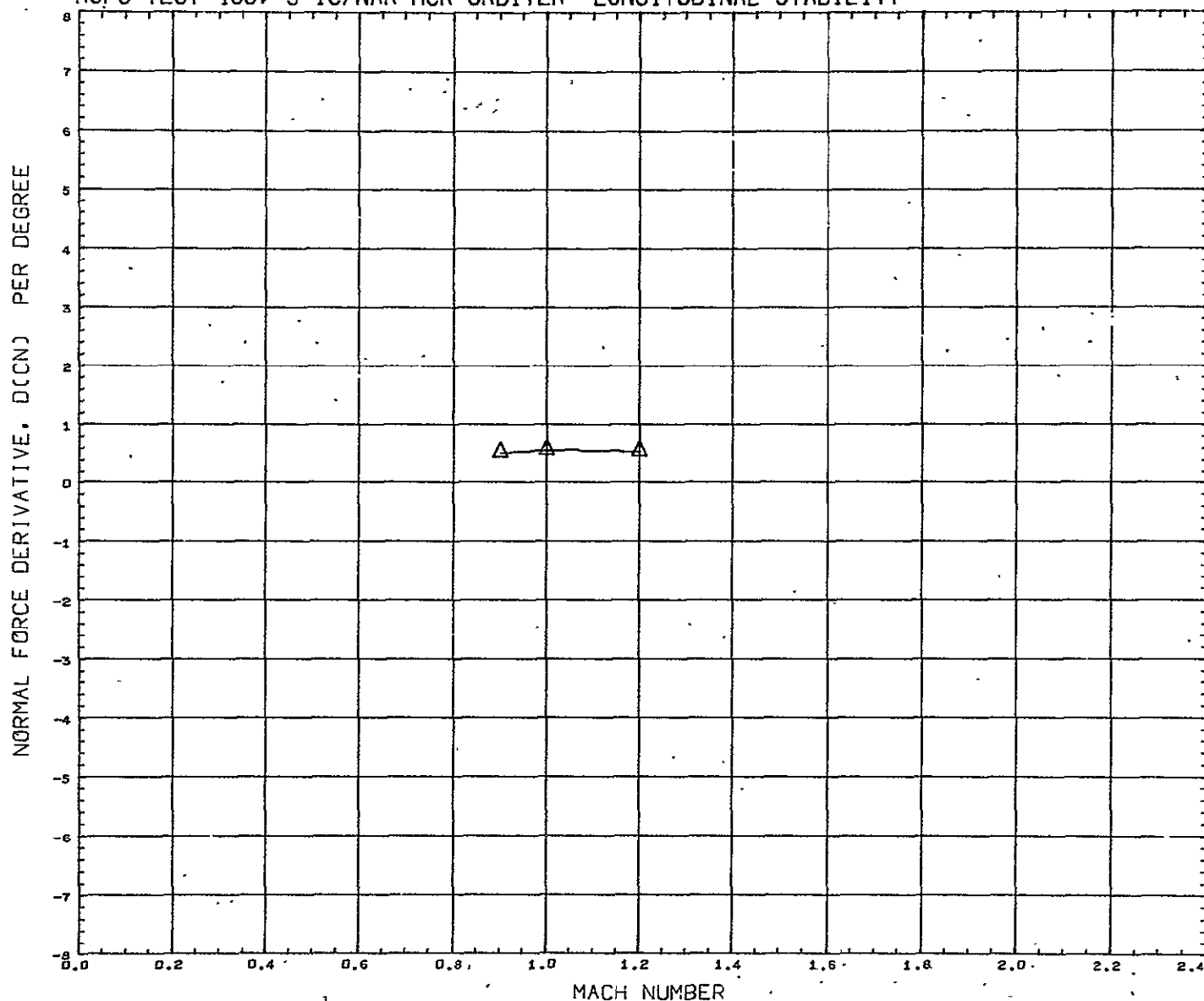


PARAMETRIC VALUES
BETA 0.040

REFERENCE INFORMATION
REFS 1.3960 SQ. IN.
REFL 1.3330 IN
REFB 1.3330 IN
XMRP 0.0370 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE *EI

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



PARAMETRIC VALUES
BETA 0.050

REFERENCE INFORMATION
REFS 1.3960 SQ.IN.
REFL 1.3330 IN
REFB 1.3930 IN
XMRP 0.0370 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE *EI

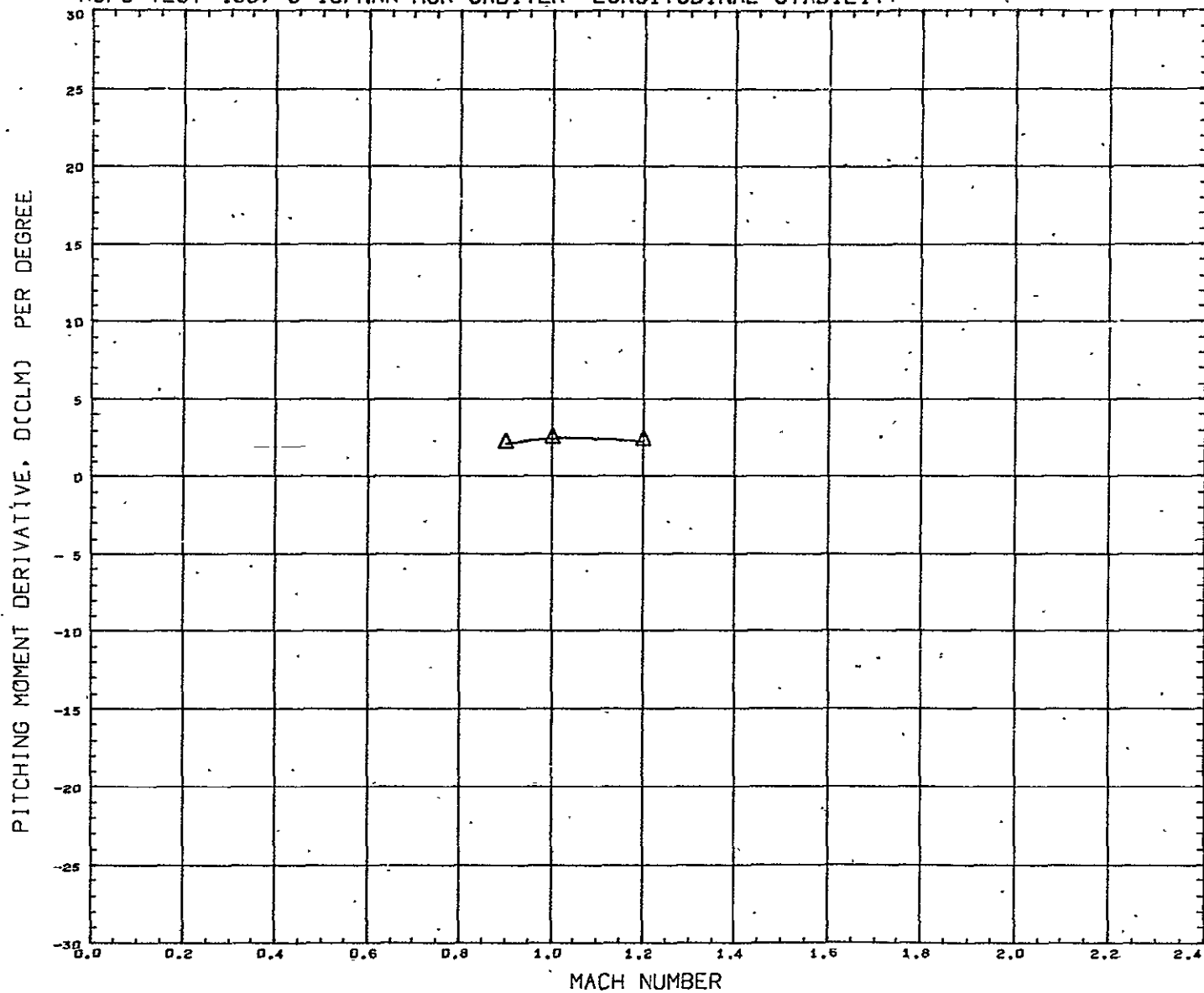
M485-MSFC-S1C NAR HCR ORBITER

0BFVD2

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

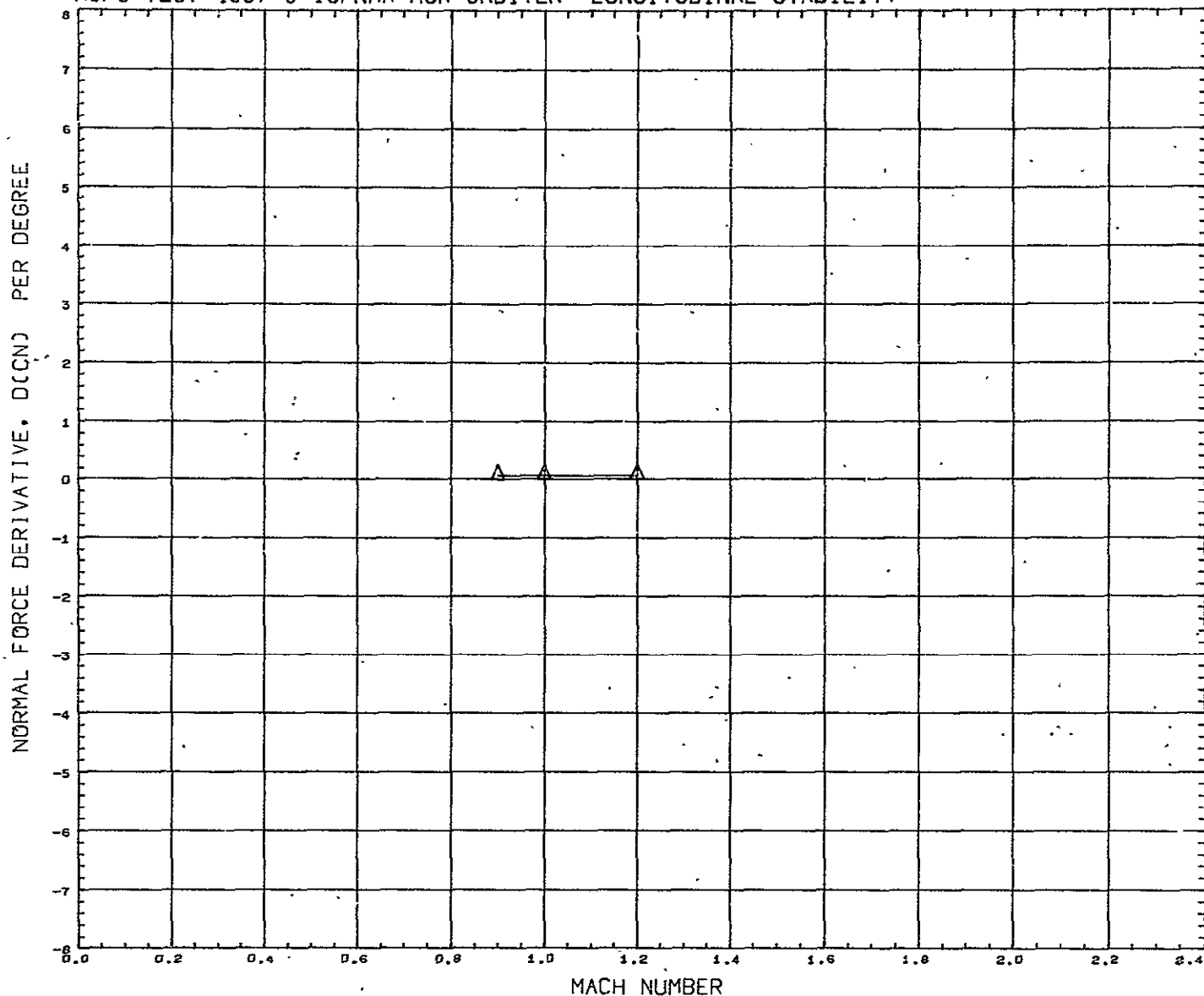


PARAMETRIC VALUES
BETA 0.050

REFERENCE INFORMATION
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REFL 1.3330 IN
REFB 1.3330 IN
XMRP 0.0370 IN
YMRP 0.0001 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE #EI

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

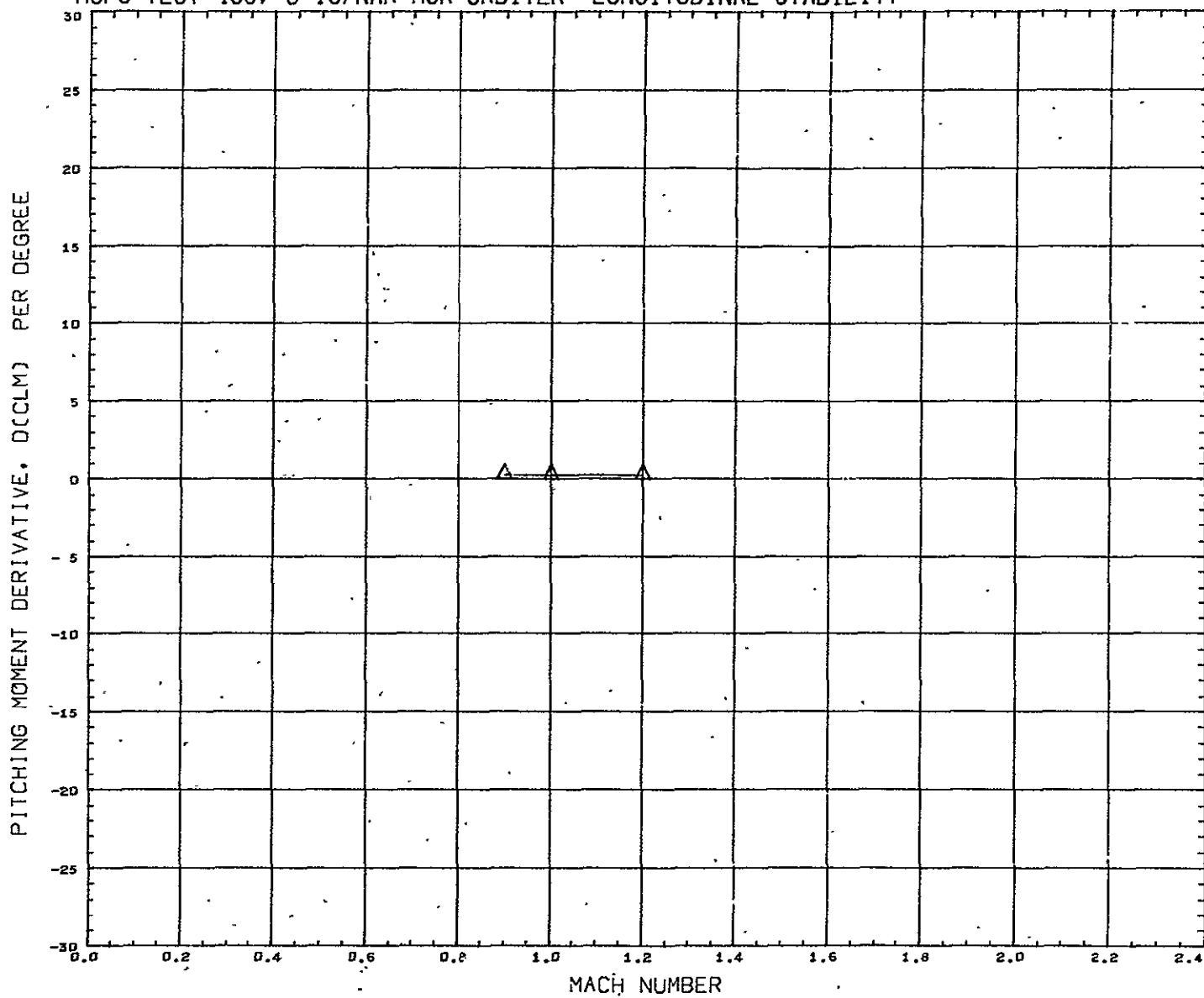


PARAMETRIC VALUES
BETA 0.000

DATA HIST. CODE *EI

REFERENCE INFORMATION
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REFL 1.3330 IN
REFB 1.3330 IN
XMRP 0.0370 IN
YMRP 0.0300 IN
ZMRP 0.0300 IN
SCALE 1.0034

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

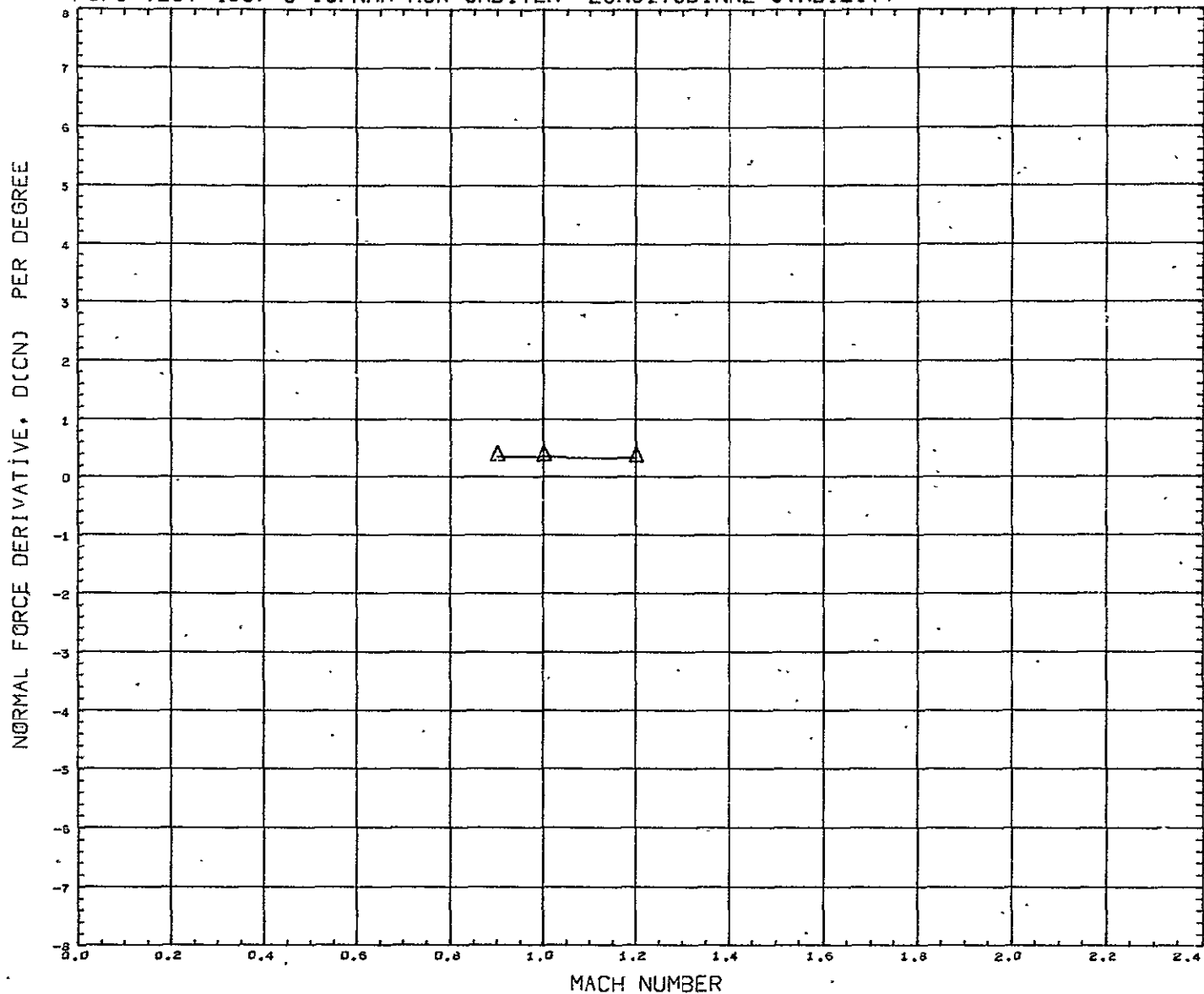


PARAMETRIC VALUES
BETA 0.000

REFERENCE INFORMATION
REFS 1.3960 SQ. IN.
REFL 1.3330 IN
REFB 1.3330 IN
XMRP 0.0370 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 3.0034

DATA HIST. CODE *EI

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

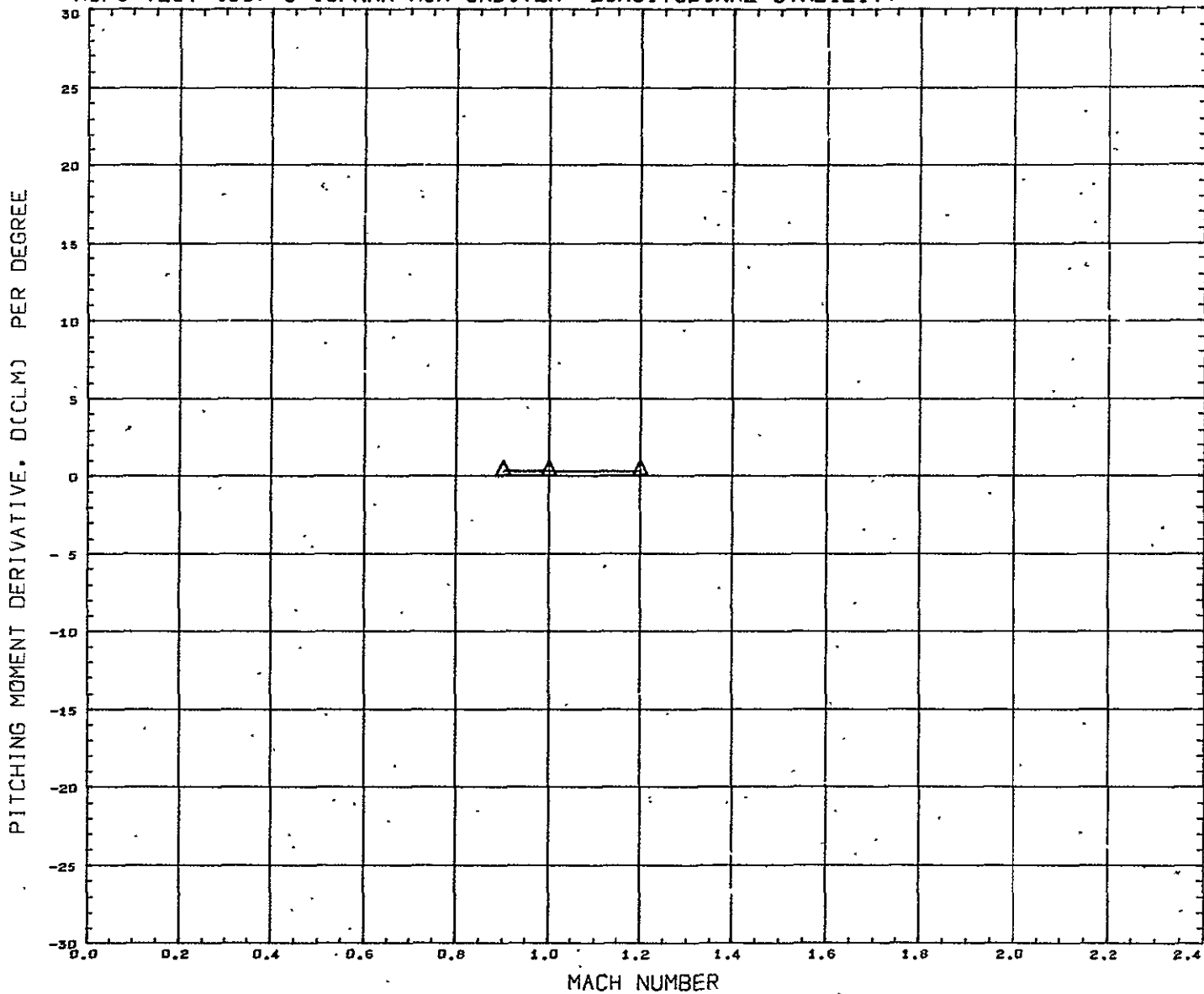


PARAMETRIC VALUES
BETA 0.000

DATA HIST. CODE #EI

REFERENCE INFORMATION
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REFL 1.3330 IN
REFB 1.3330 IN
XMRP - 0.0370 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

MSFC TEST 485. S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

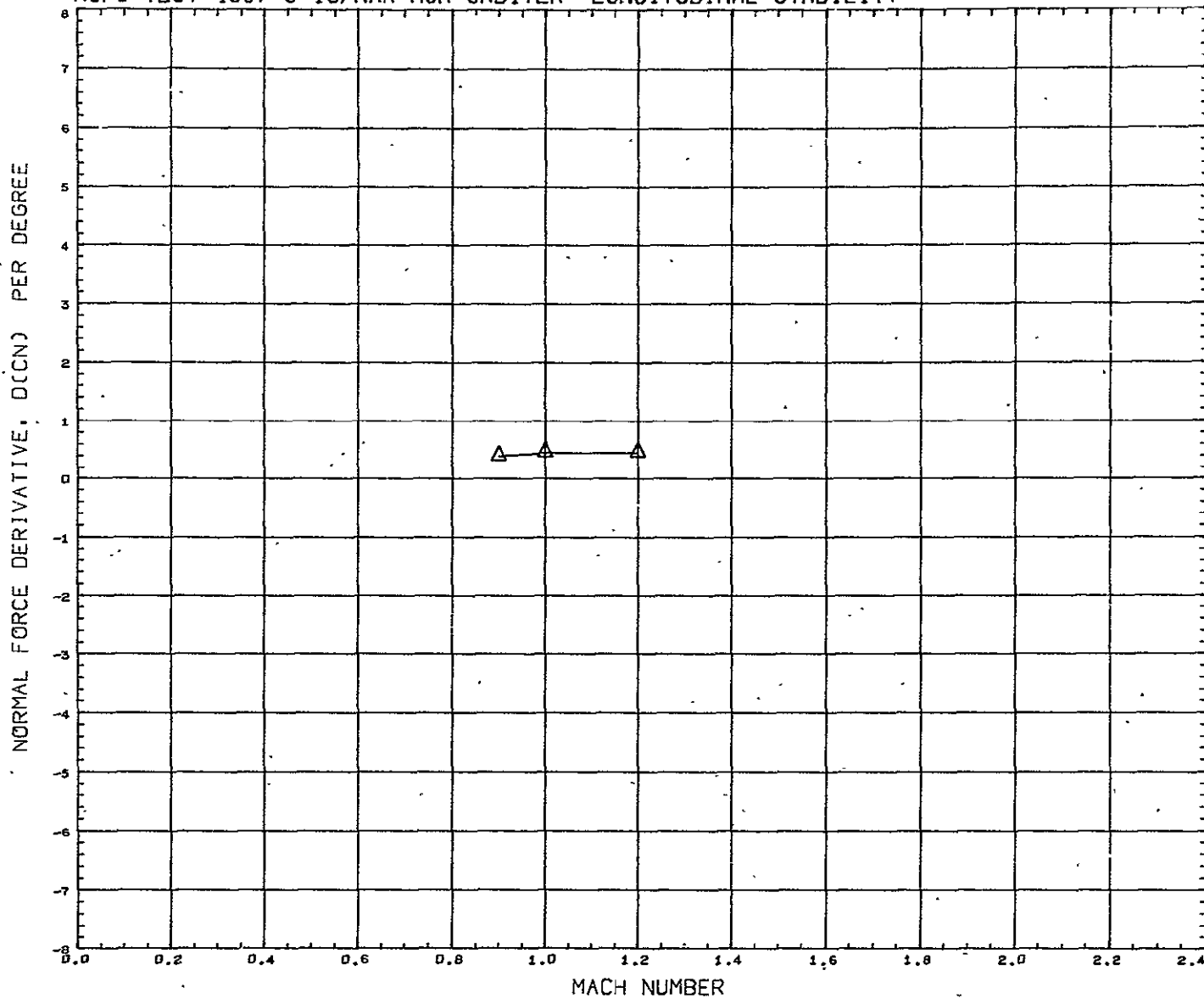


BETA 0.000
PARAMETRIC VALUES

DATA HIST. CODE #EI

REFERENCE INFORMATION
REFS 1.3960 SQ. IN.
REFL 1.3330 IN
REFB 1.3330 IN
XMRP 0.0370 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



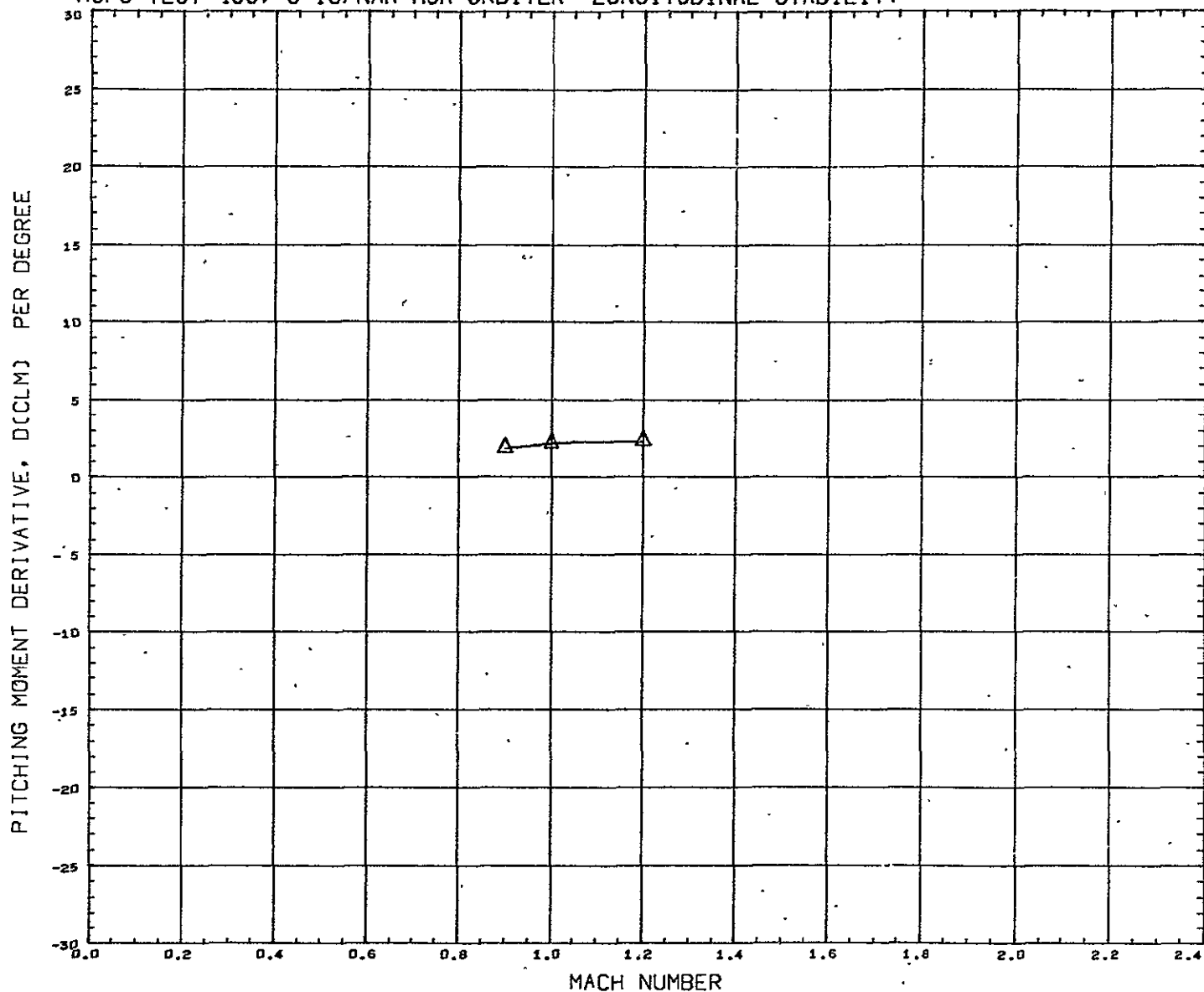
BETA 0.050

DATA HIST. CODE *EI

REFERENCE INFORMATION

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REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



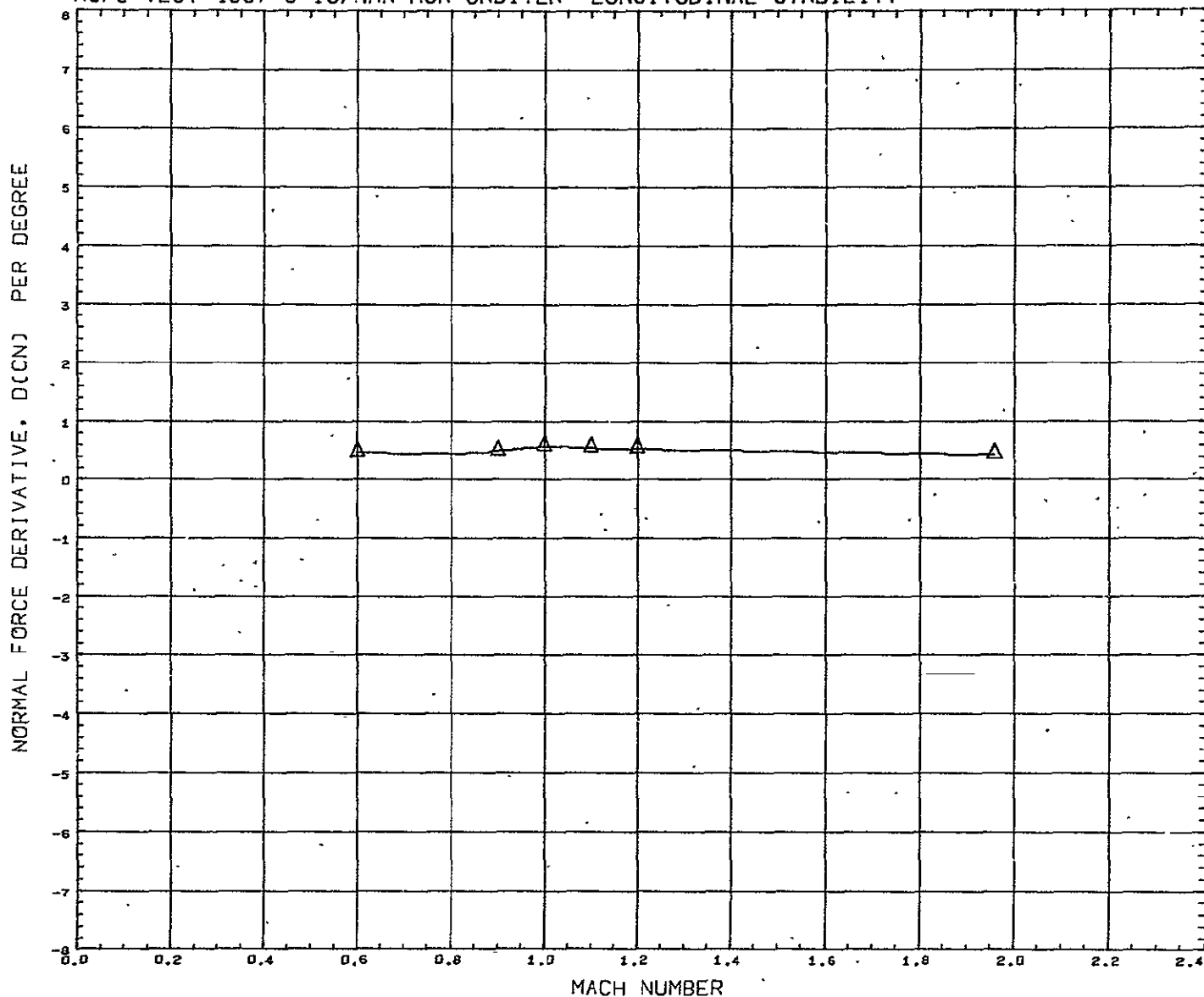
PARAMETRIC VALUES
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DATA HIST. CODE #E1

REFERENCE INFORMATION

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REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0373	IN
YMRP	0.3000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY



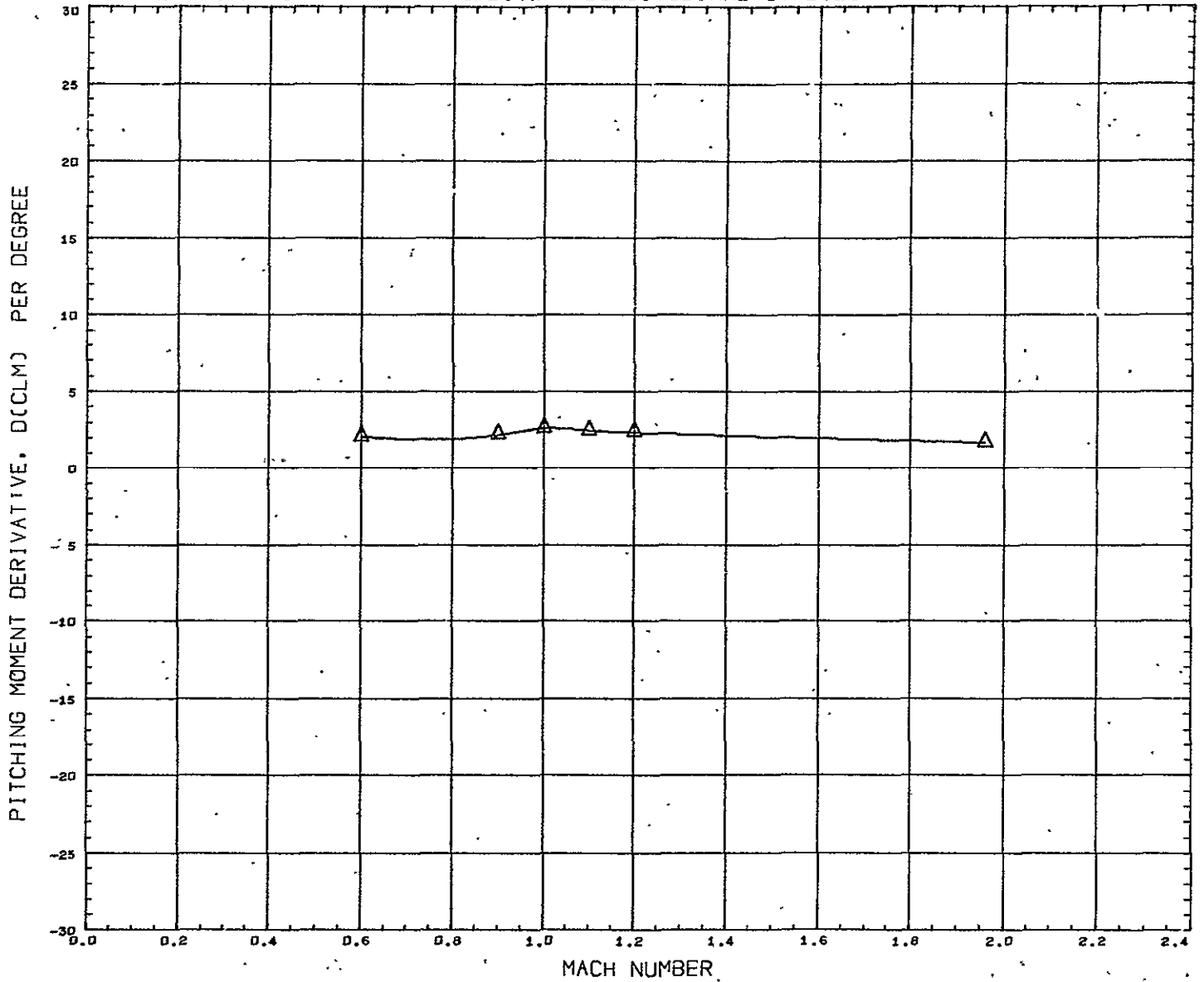
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DATA HIST. CODE *EI

REFERENCE INFORMATION

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SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- LONGITUDINAL STABILITY

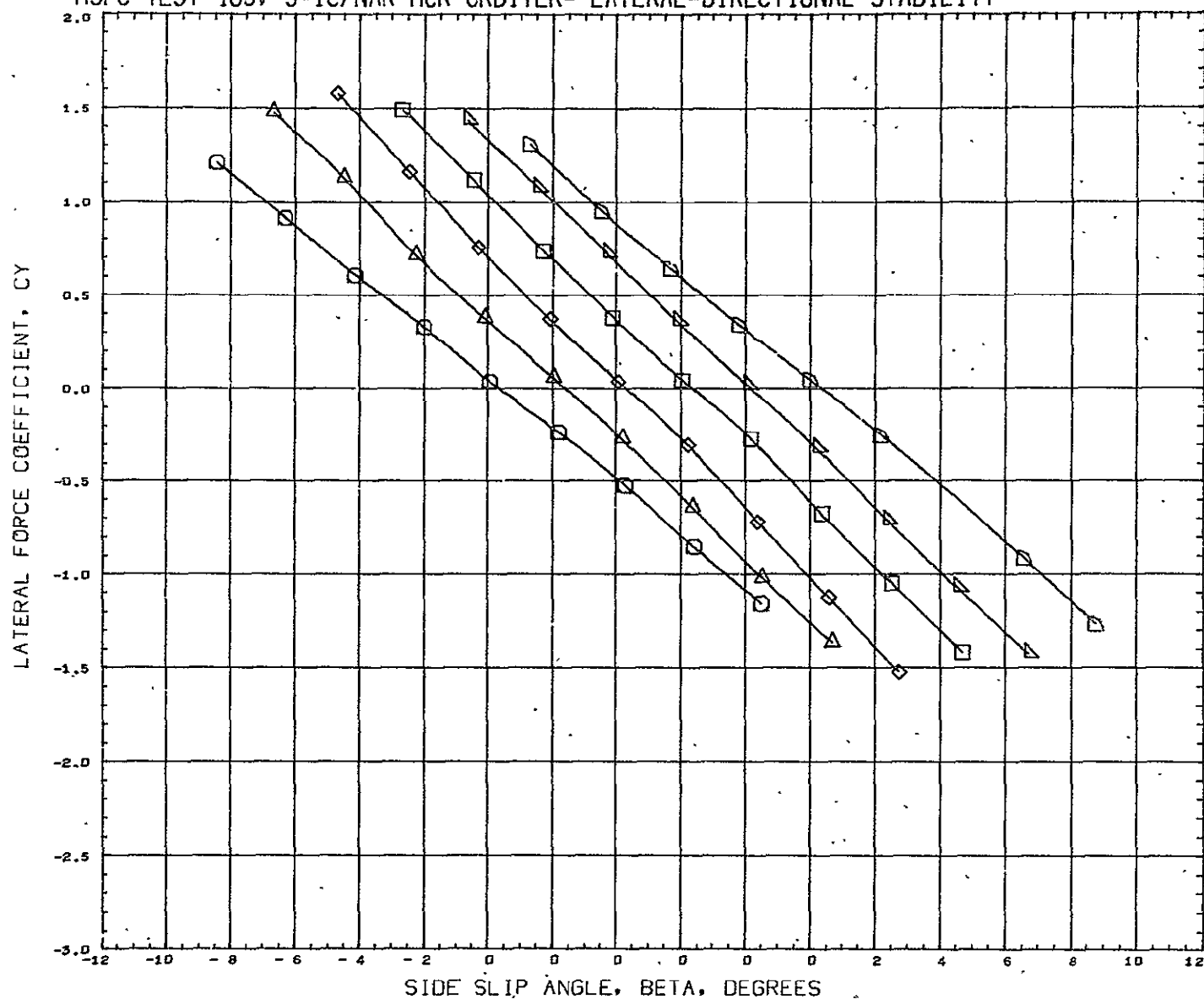


BETA 0.000
PARAMETRIC VALUES

REFERENCE INFORMATION
REFS 1.3960 SQ.IN.
REFL 1.3330 IN
REFB 1.3330 IN
XMRP 0.0370 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE *EI

MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY



SYMBOL	MACH	ALPHA	PARAMETRIC VALUES
○	0.606		0.060
△	0.903		
◇	1.001		
□	1.102		
▽	1.200		
+	1.959		

DATA HIST. CODE VE

REFERENCE INFORMATION		
REFS	1.3960	50-IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

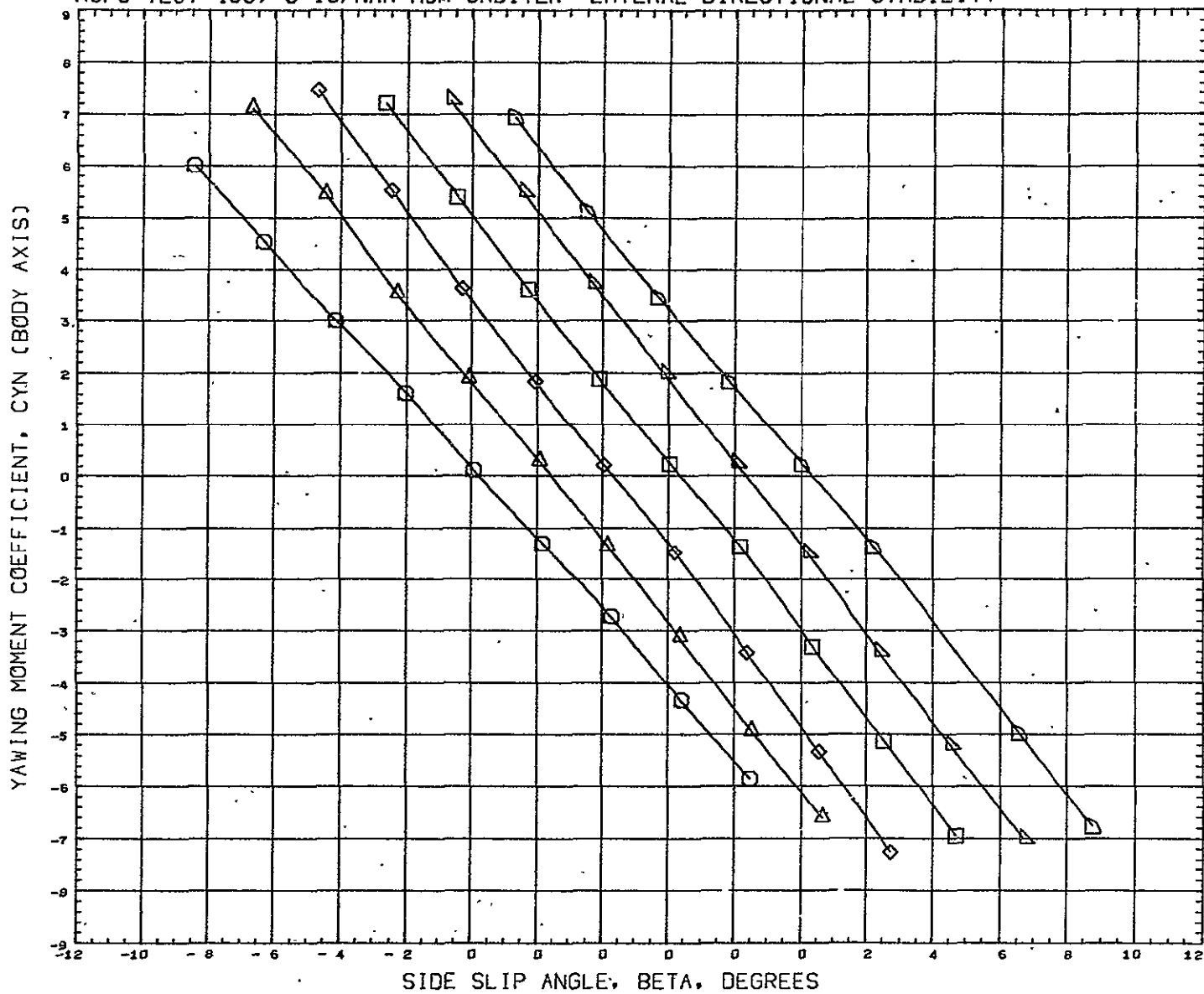
M485-MSFC-S1C NAR HCR ORBITER

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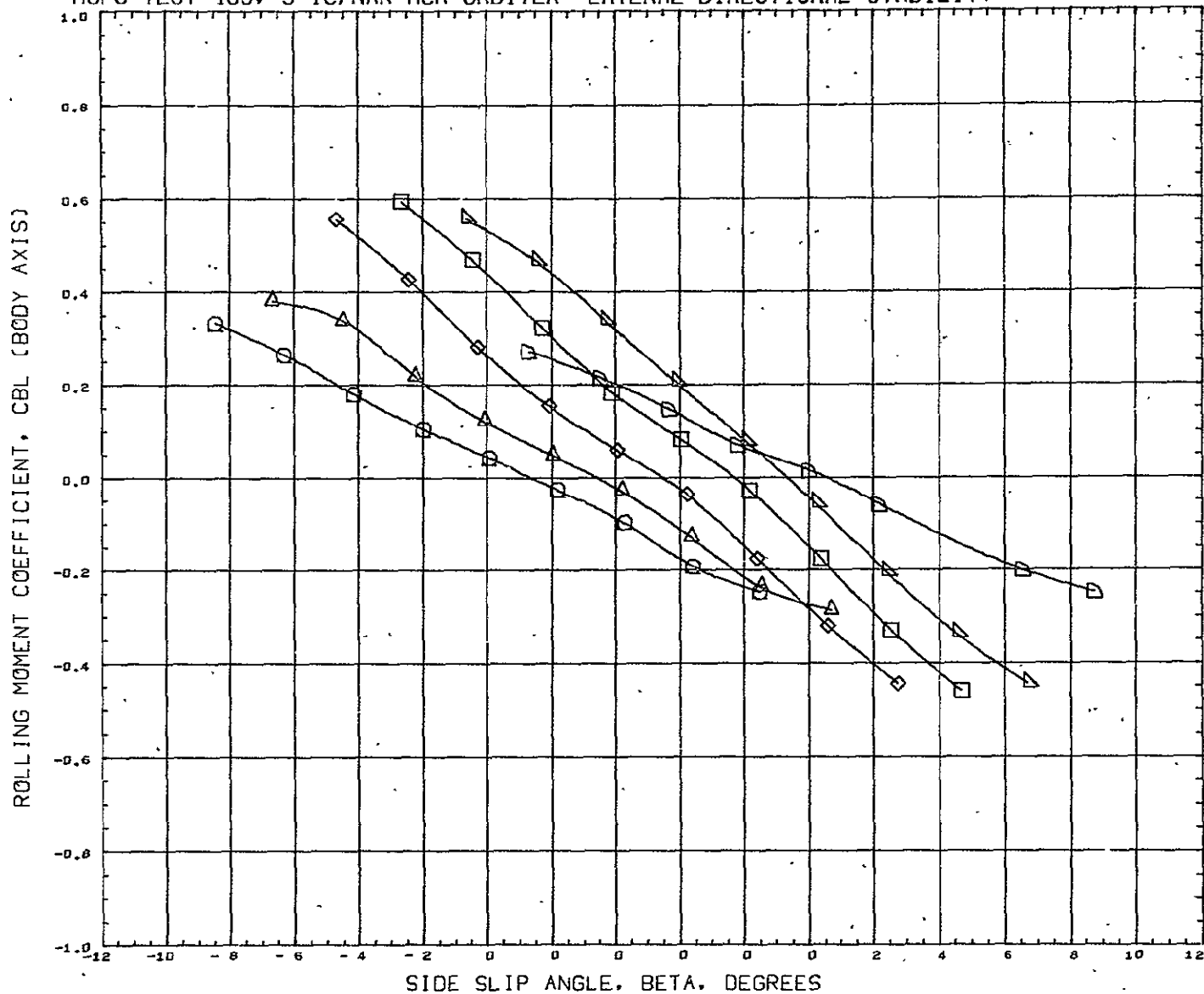
MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY



SYMBOL	MACH	ALPHA	PARAMETRIC VALUES
○	0.606	0.060	
◇	0.903		
□	1.001		
△	1.102		
▽	1.200		
◇	1.959		
	DATA HIST. CODE	*E	

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

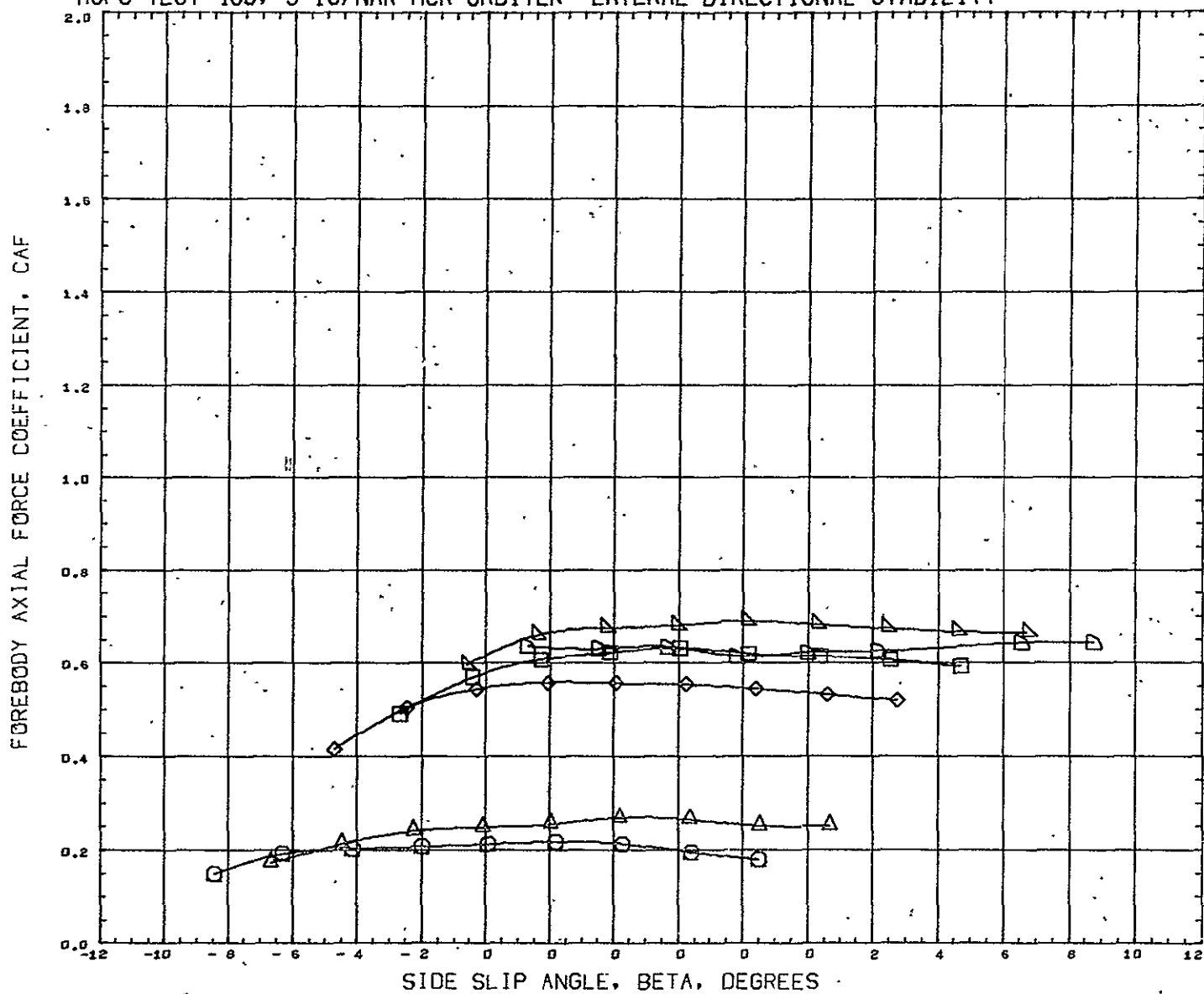
MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY



SYMBOL	MACH	ALPHA	PARAMETRIC VALUES
○	0.606		0.060
△	0.903		
◇	1.001		
□	1.102		
▽	1.200		
◇	1.959		
		DATA HIST. CODE	*E

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

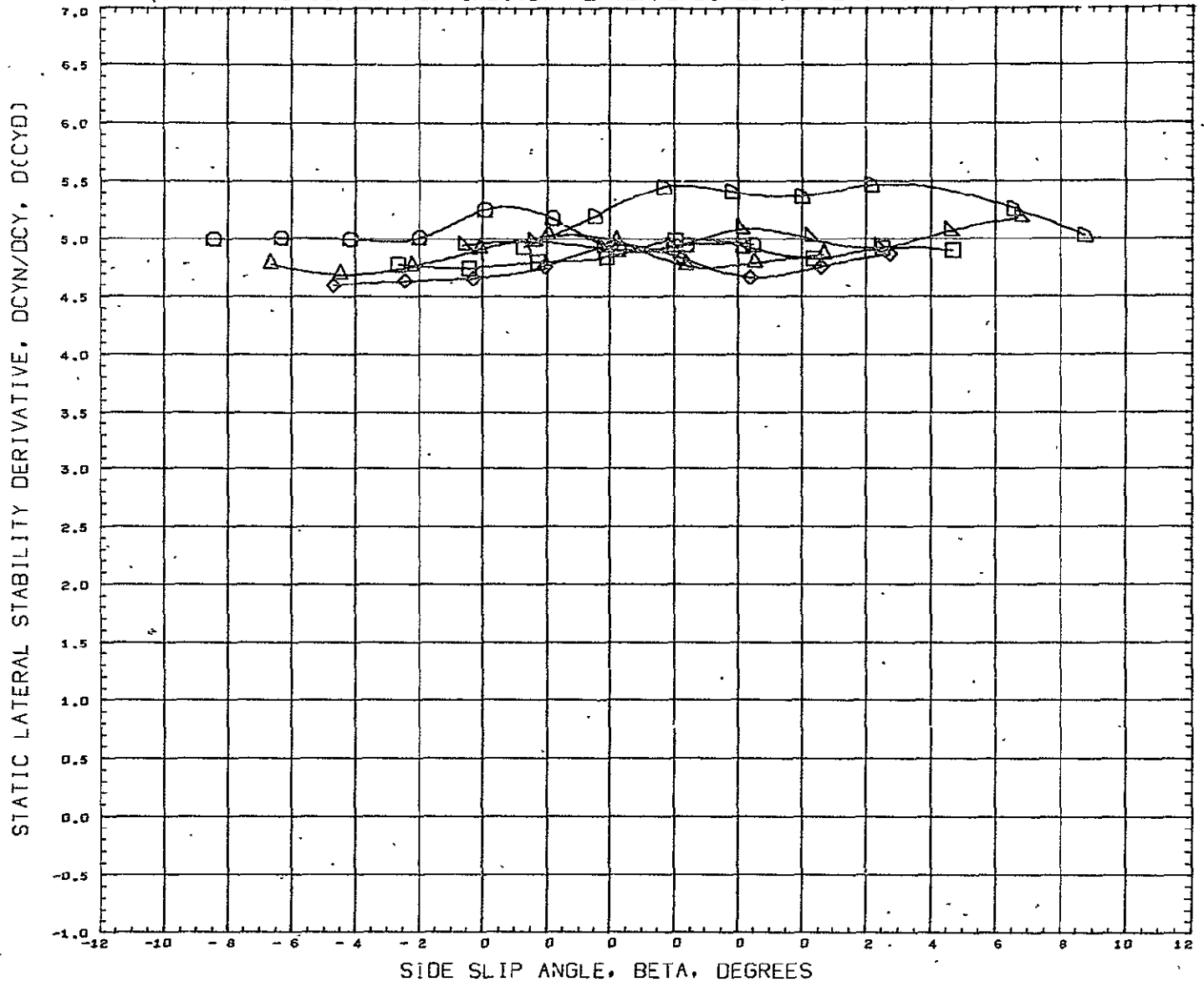
MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY



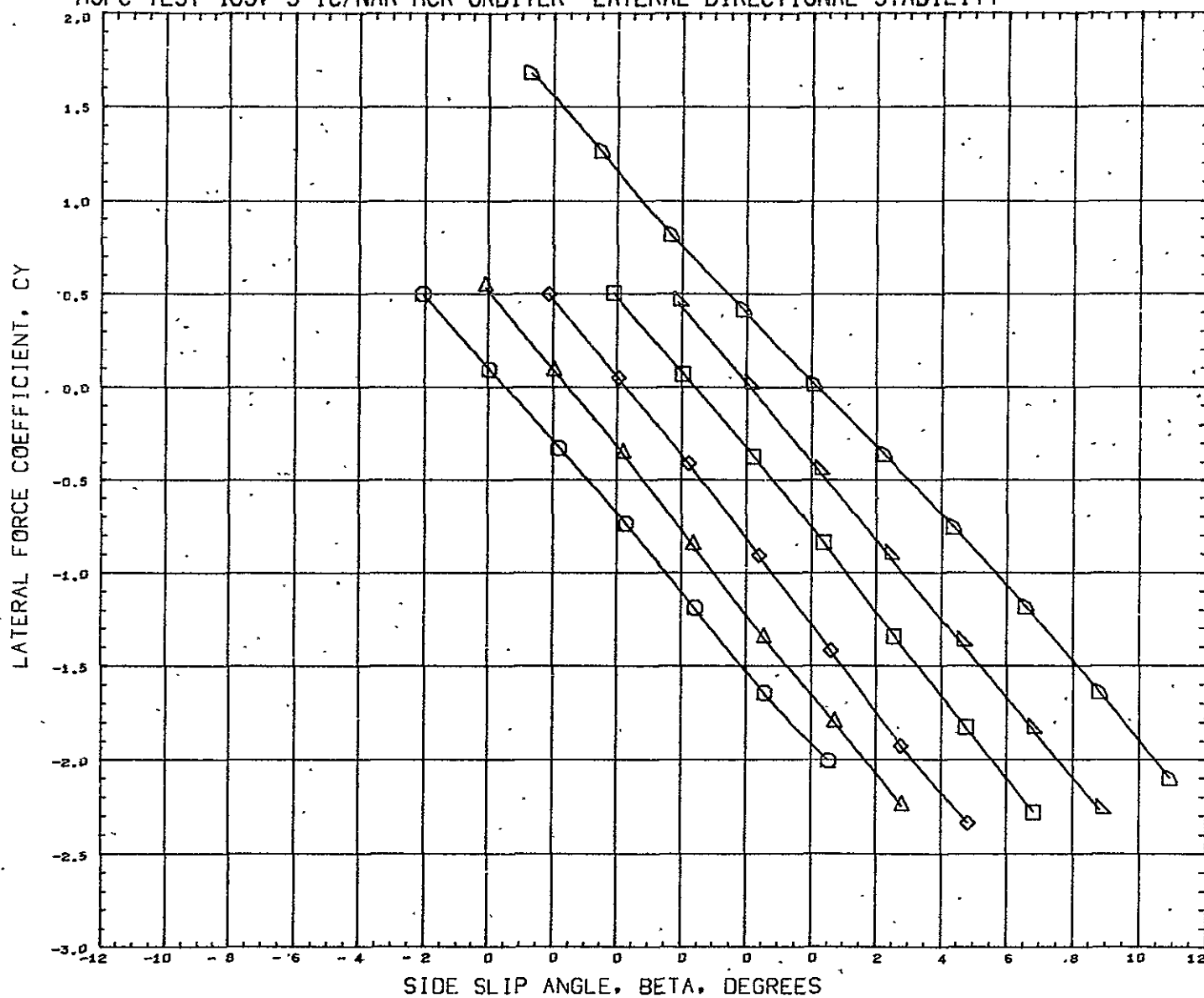
SYMBOL MACH ALPHA PARAMETRIC VALUES
 0.606 0.903 1.001 1.102 1.200 1.959
 DATA HIST. CODE #E

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 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0376 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY



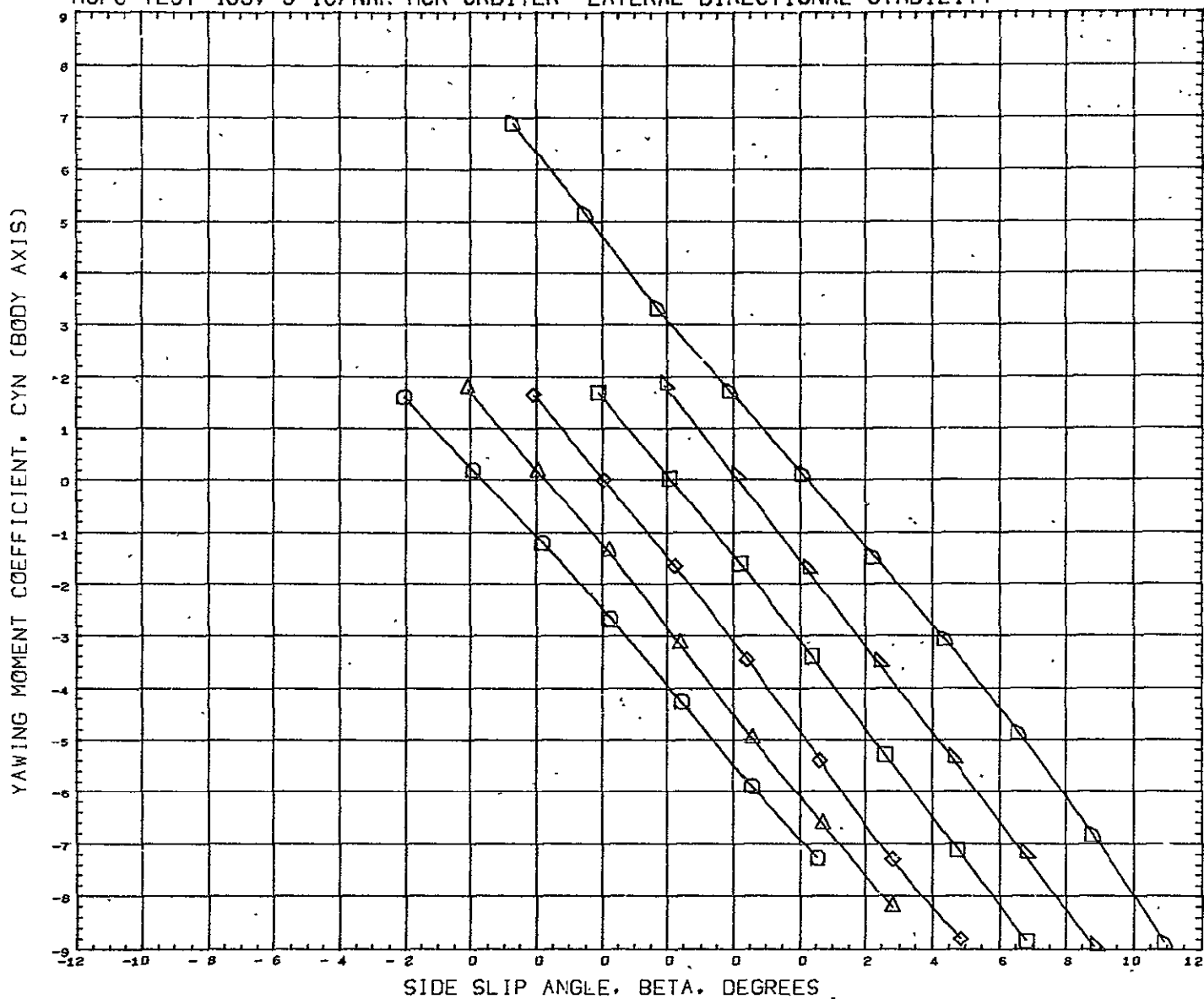
MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY



SYMBOL	MACH	ALPHA	PARAMETRIC VALUES
○	0.603	0.070	#E
◇	0.900		
△	1.004		
□	1.105		
▽	1.199		
◇	1.977		
DATA HIST. CODE			

REFERENCE INFORMATION		
REFS	1.3960	50.IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

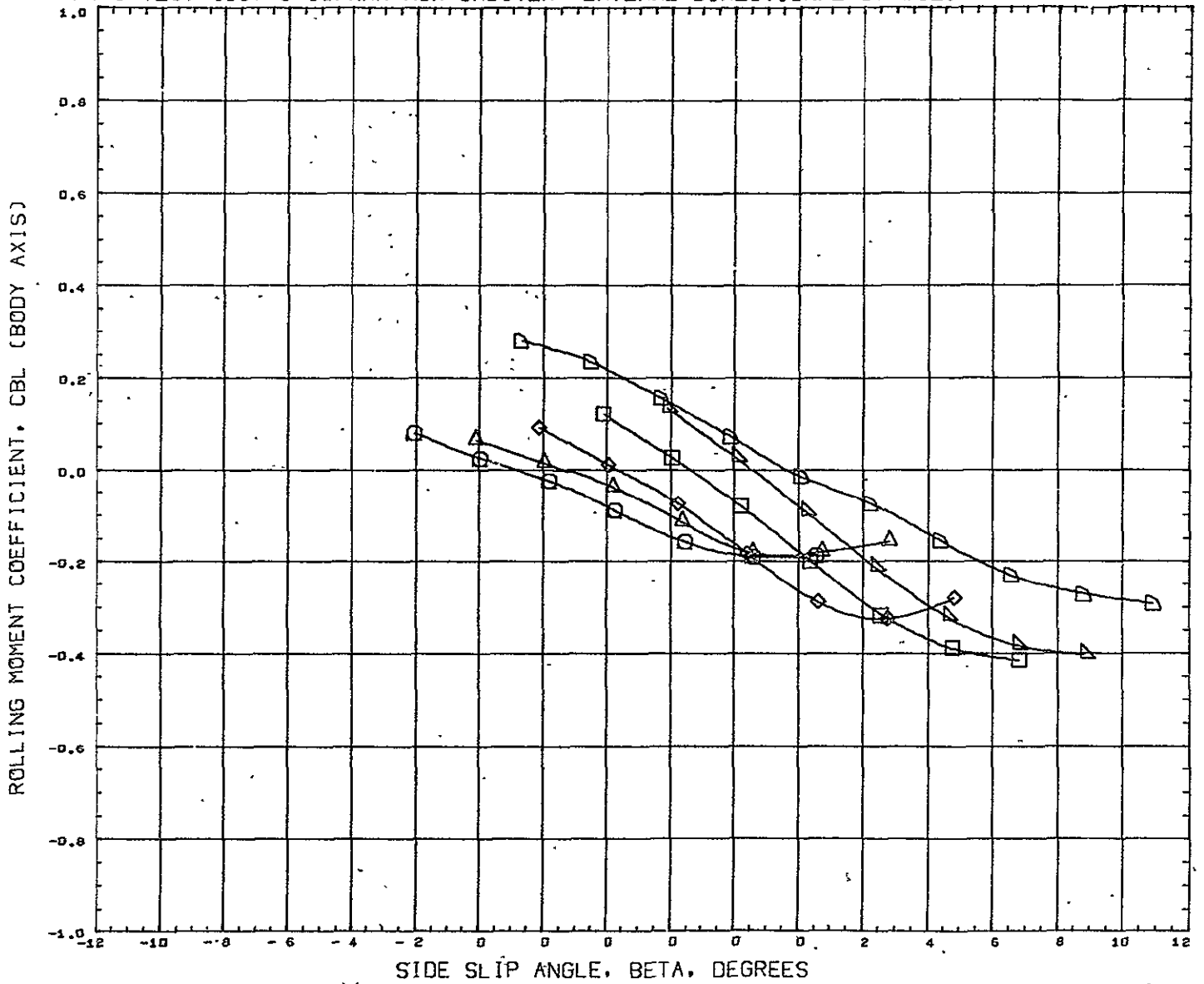
MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES
○	0.603	ALPHA 0.070
△	0.900	
◇	1.004	
□	1.105	
▽	1.199	
+	1.977	DATA HIST. CODE *E

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRF	0.0370	IN
YMRF	0.0000	IN
ZMRF	0.0000	IN
SCALE	0.0034	

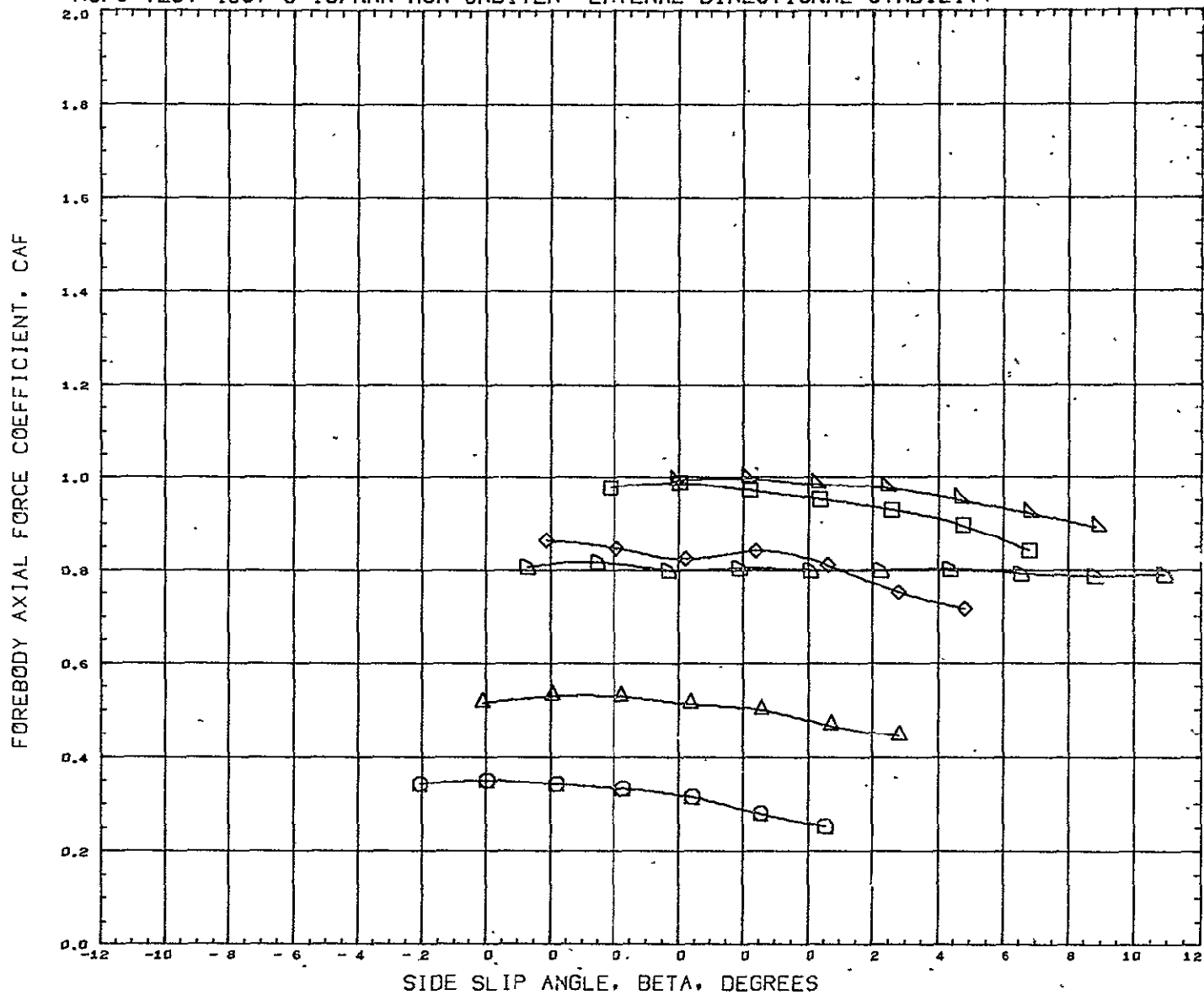
MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY



SYMBOL	MACH	ALPHA	PARAMETRIC VALUES
○	0.603		0.070
△	0.900		
◇	1.004		
◇	1.105		
◇	1.199		
◇	1.977		
		DATA HIST. CODE	#E

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0001	IN
ZMRP	0.0000	IN
SCALE	0.0034	

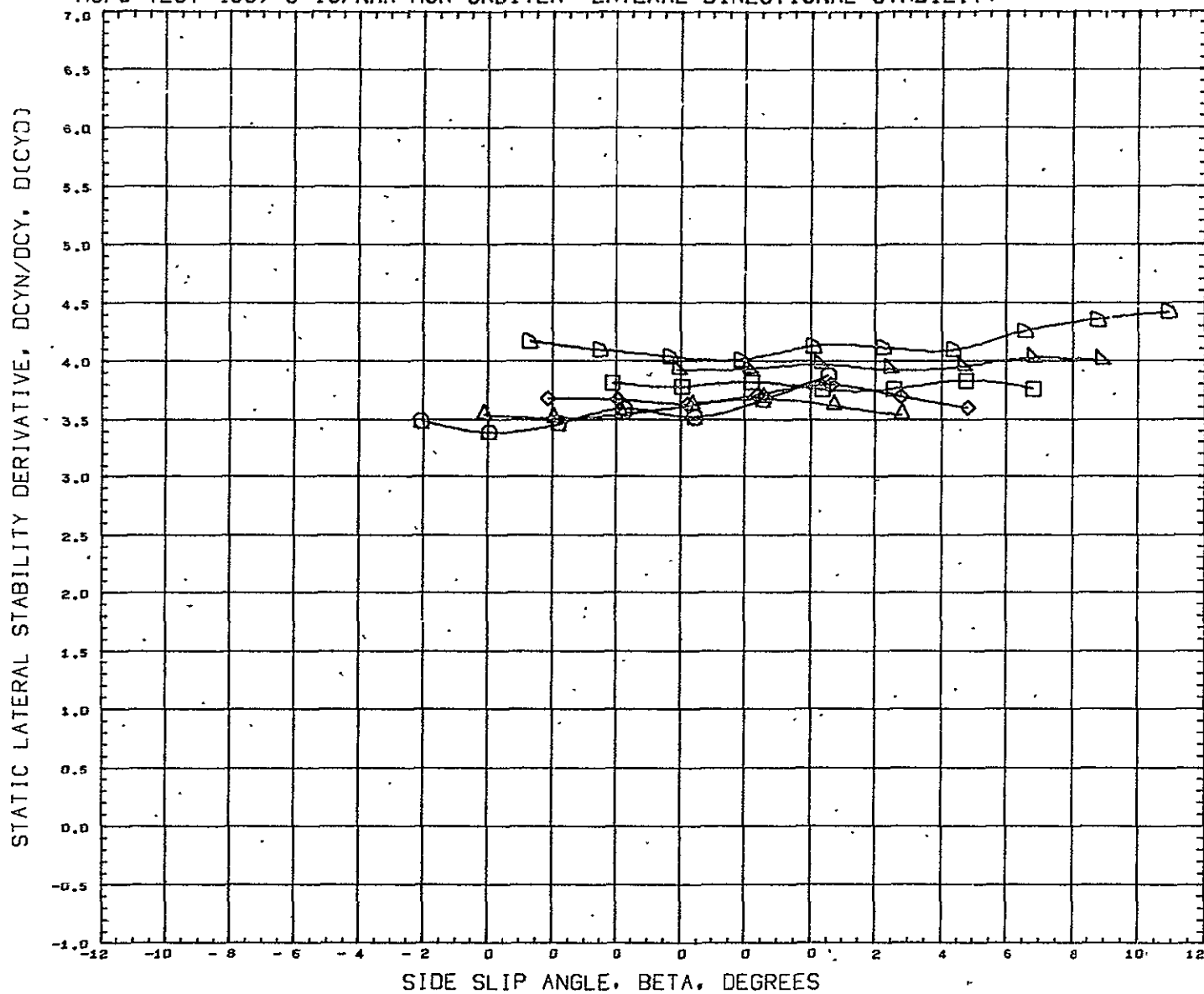
MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY



SYMBOL MACH PARAMETRIC VALUES
 0.603 ALPHA 0.070
 0.900
 1.004
 1.105
 1.199
 1.977 DATA HIST. CODE #E

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY



SYMBOL	MACH	ALPHA	PARAMETRIC VALUES
○	0.603		0.070
△	0.900		
□	1.004		
◇	1.105		
▽	1.199		
◇	1.977		

DATA HIST. CODE *E

REFERENCE INFORMATION		
REFS	1.3960	SQ.IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

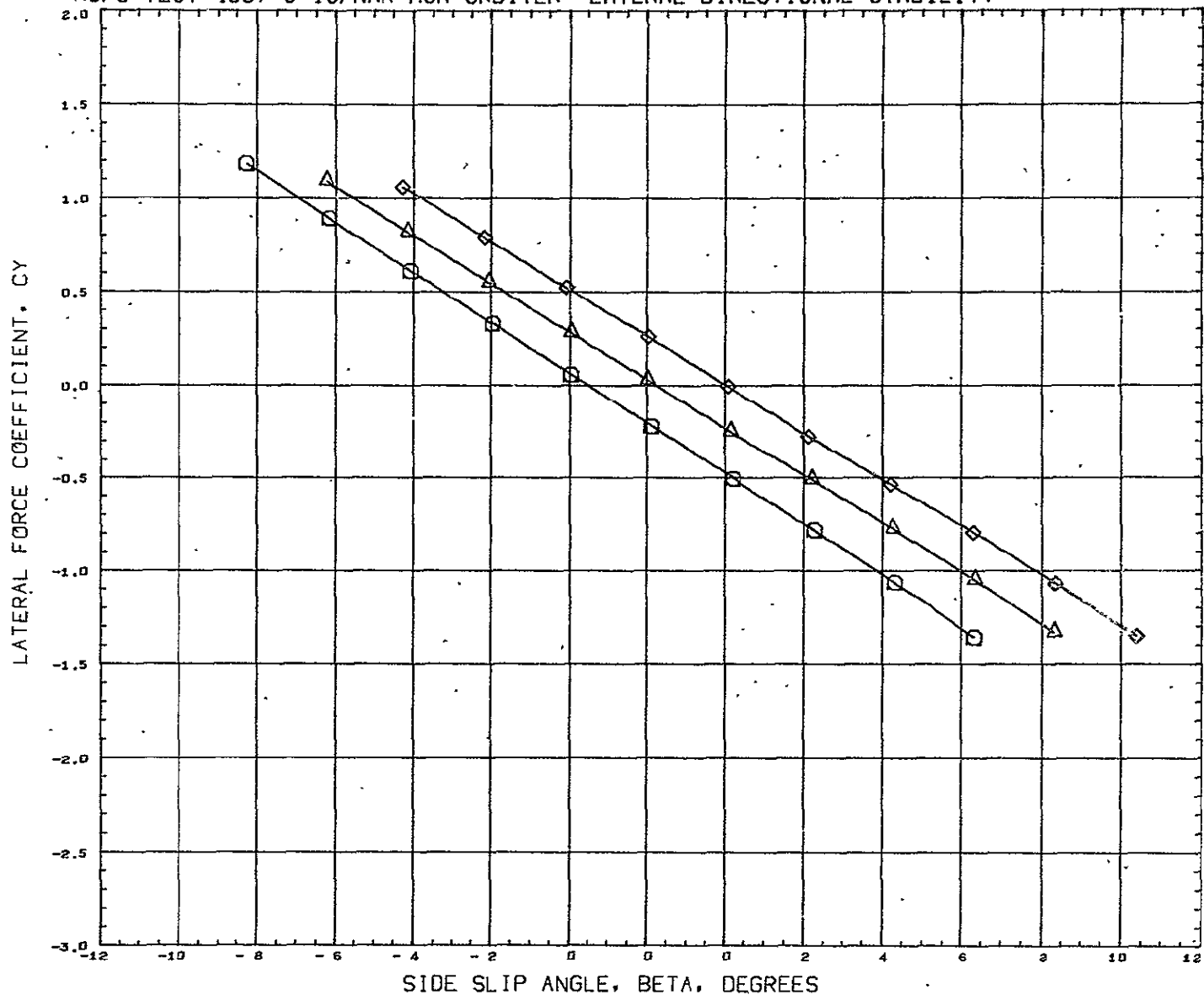
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MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY

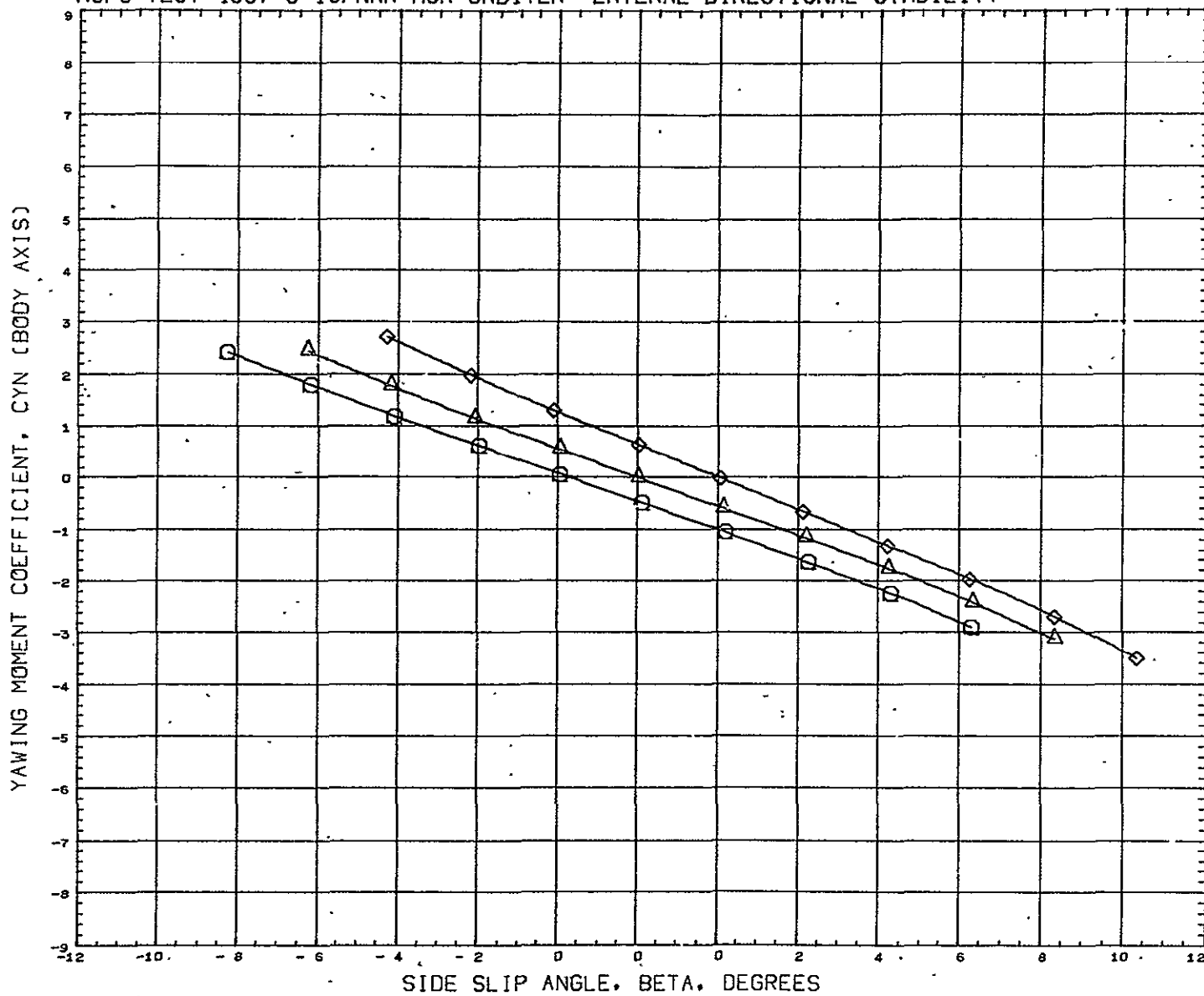


SYMBOL MACH ALPHA PARAMETRIC VALUES
 □ 0.902
 △ 1.005
 ◇ 1.203

DATA HIST. CODE #E

REFERENCE INFORMATION
 REFS 1.3960 SQ.IN.
 REFL 1.3330 IN-
 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY

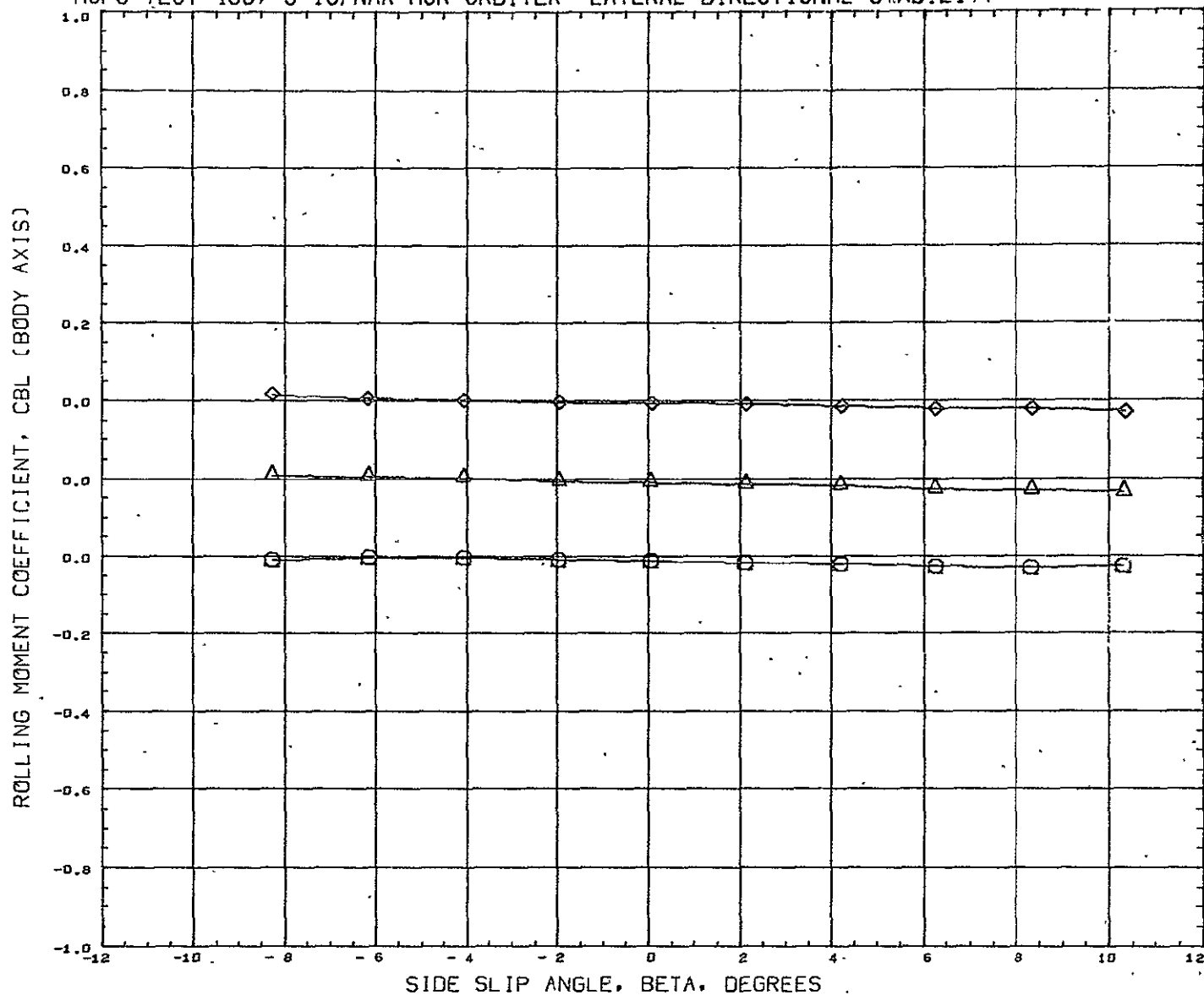


SYMBOL	MACH	ALPHA	PARAMETRIC VALUES
□	0.902		0.010
△	1.005		
◇	1.203		

DATA HIST. CODE #E

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY

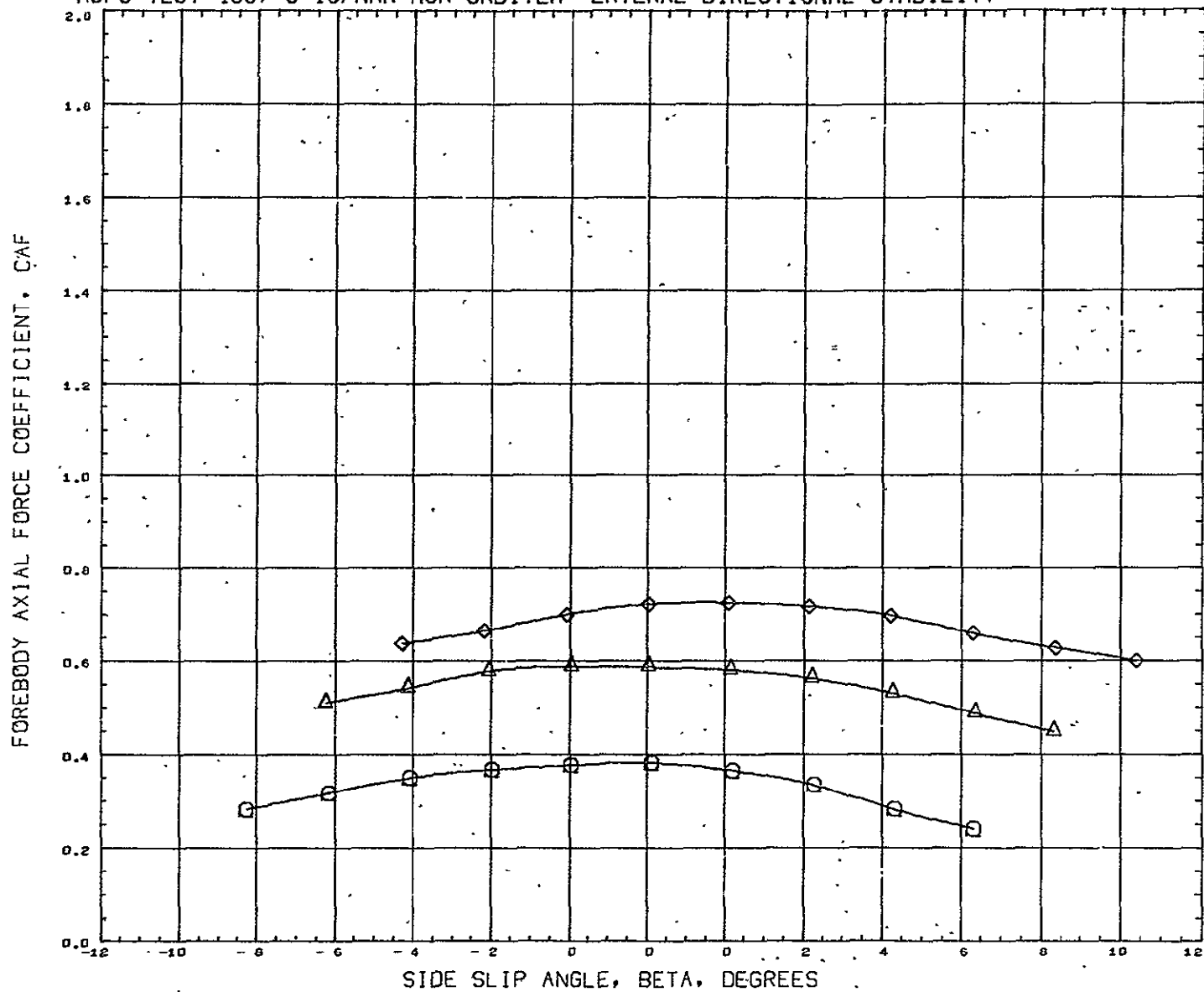


SYMBOL	MACH	ALPHA	PARAMETRIC VALUES
○	0.902		0.010
△	1.005		
◇	1.203		

REFERENCE INFORMATION		
REFS	1.3960	50 IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRF	-0.0370	IN
YMRF	0.0000	IN
ZMRF	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *E

MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES
○	0.902	ALPHA 0.010
△	1.005	
◇	1.203	

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0900	IN
ZMRP	0.0900	IN
SCALE	0.0034	

DATA HIST. CODE #E

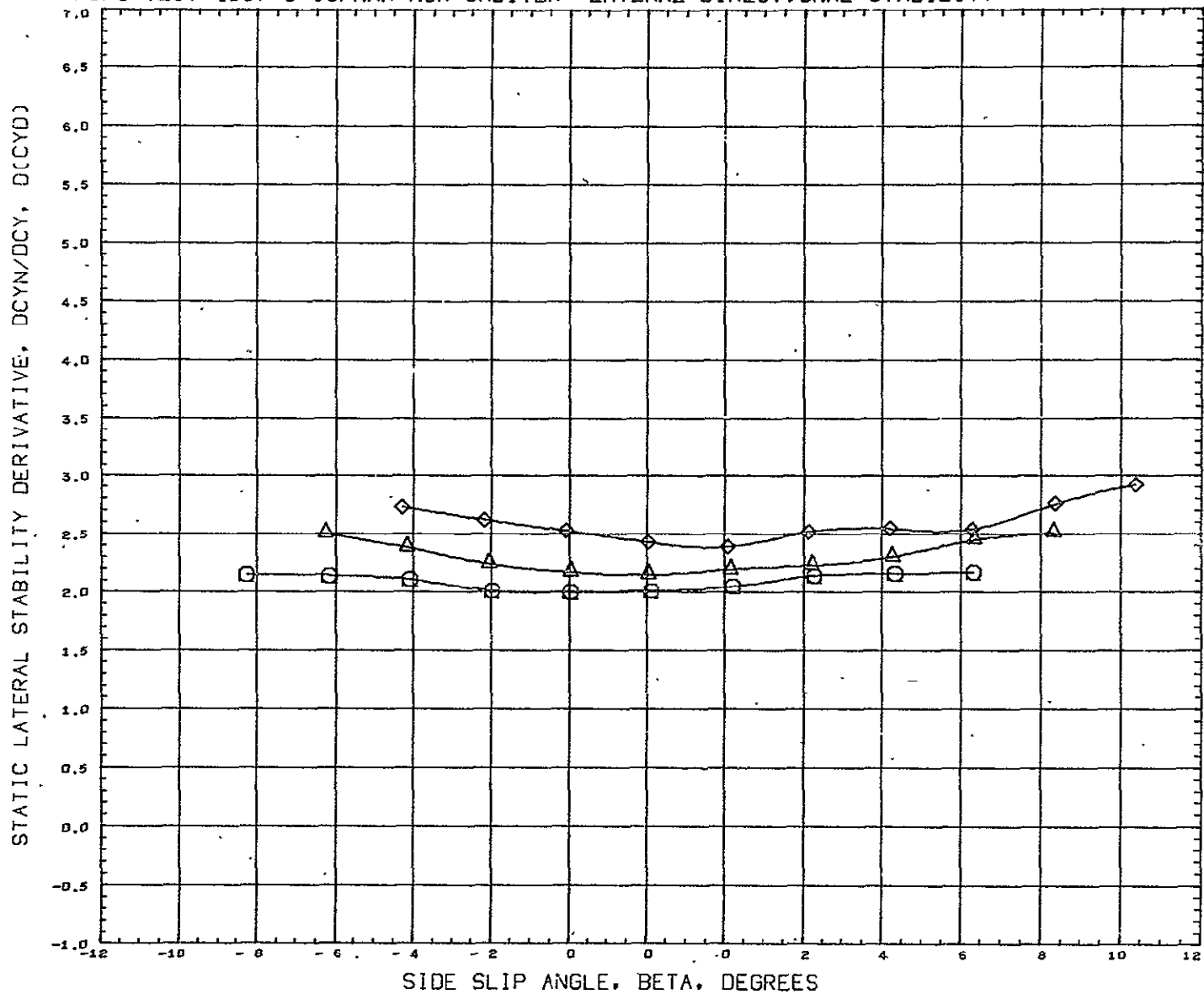
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MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY



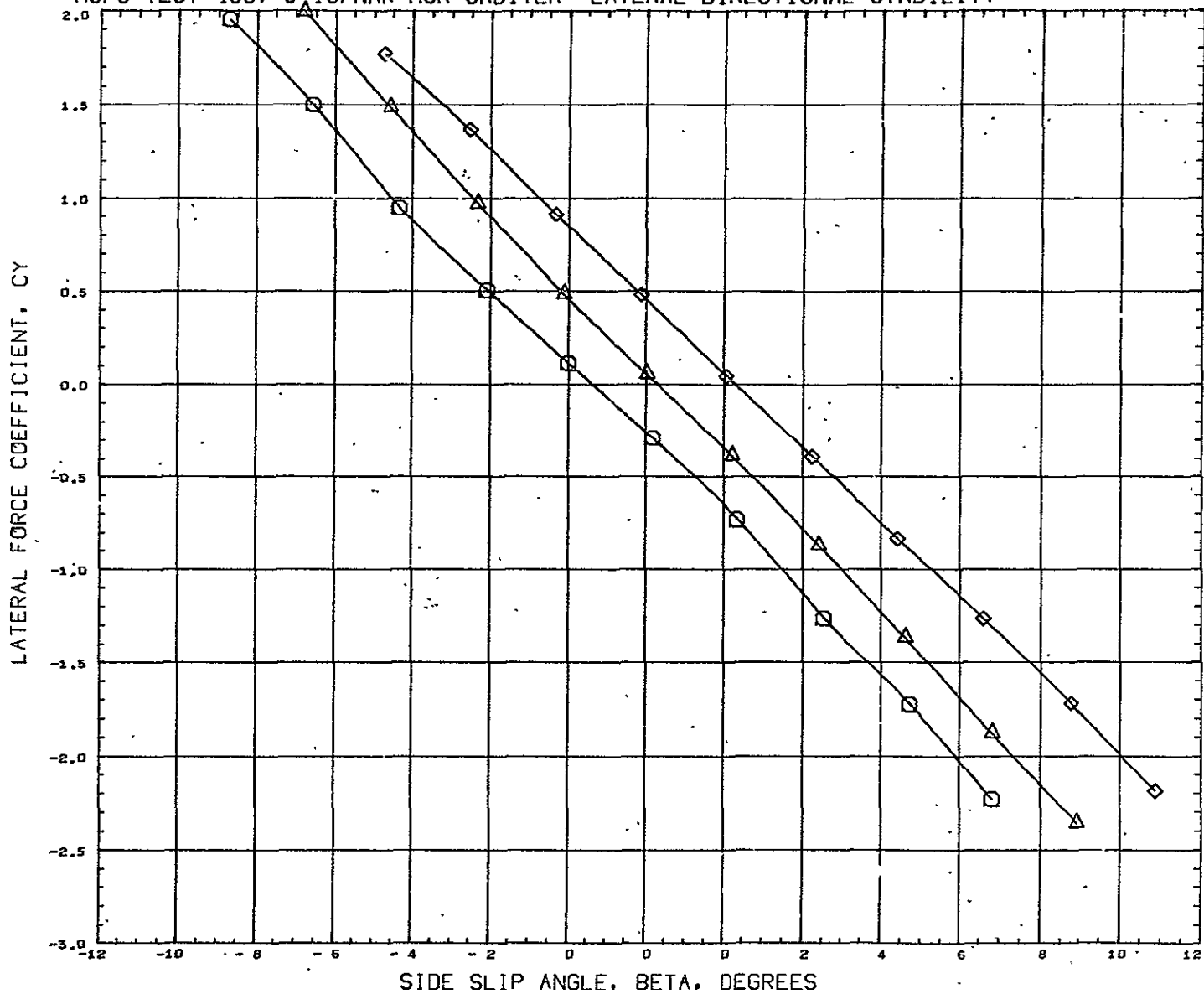
SYMBOL MACH PARAMETRIC VALUES
 ○ 0.902 ALPHA 0.010
 △ 1.005
 ◇ 1.203

REFERENCE INFORMATION

REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRF	0.0370	IN
YMRF	0.0000	IN
ZMRF	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE #E

MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY

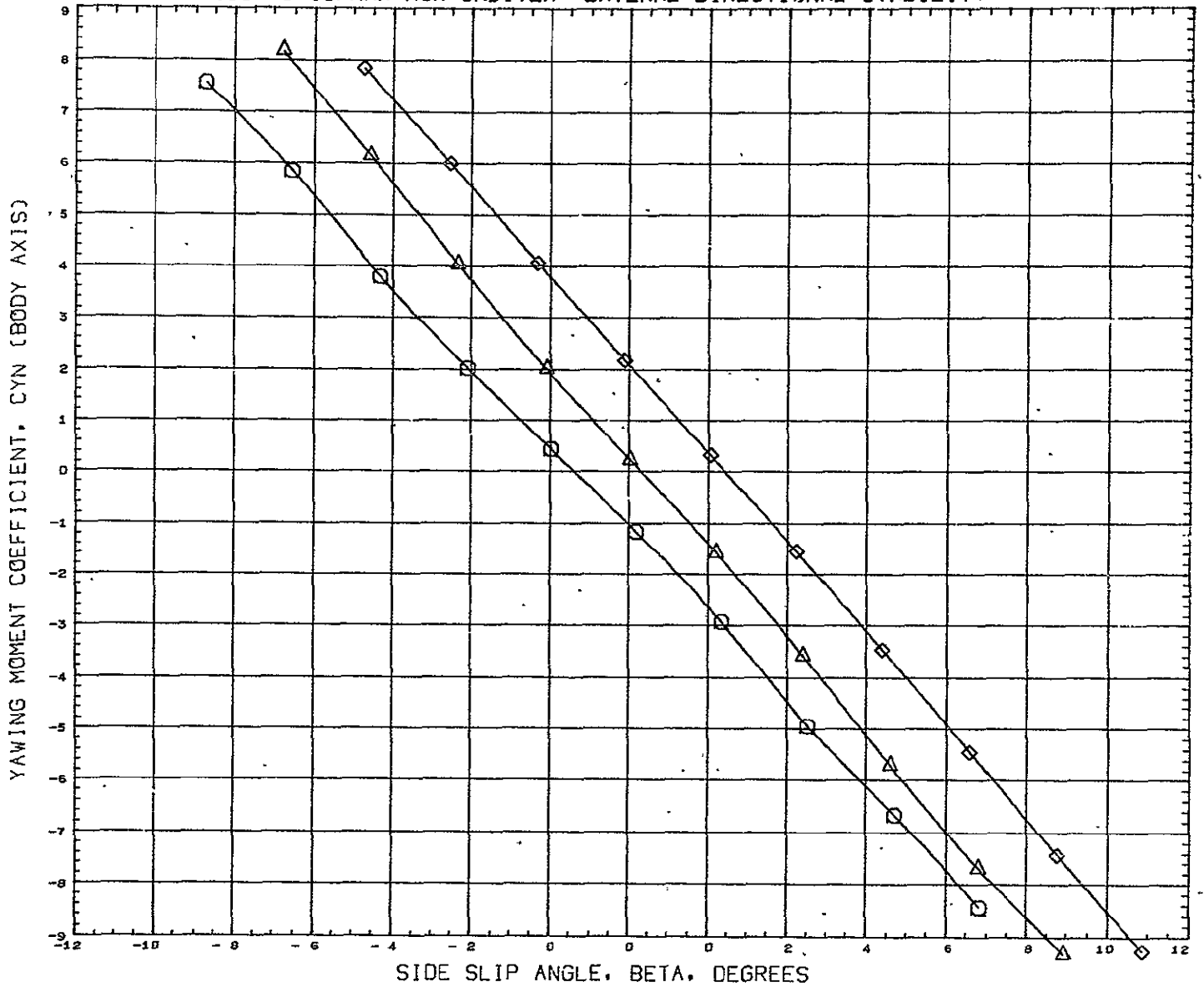


SYMBOL MACH ALPHA PARAMETRIC VALUES
 ○ 0.903
 △ 1.095
 ◇ 1.202

REFERENCE INFORMATION
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 REFB 1.3330 IN
 XMRP 0.0375 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *E

MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY



SYMBOL MACH ALPHA PARAMETRIC VALUES

○ 0.903 0.120

△ 1.005

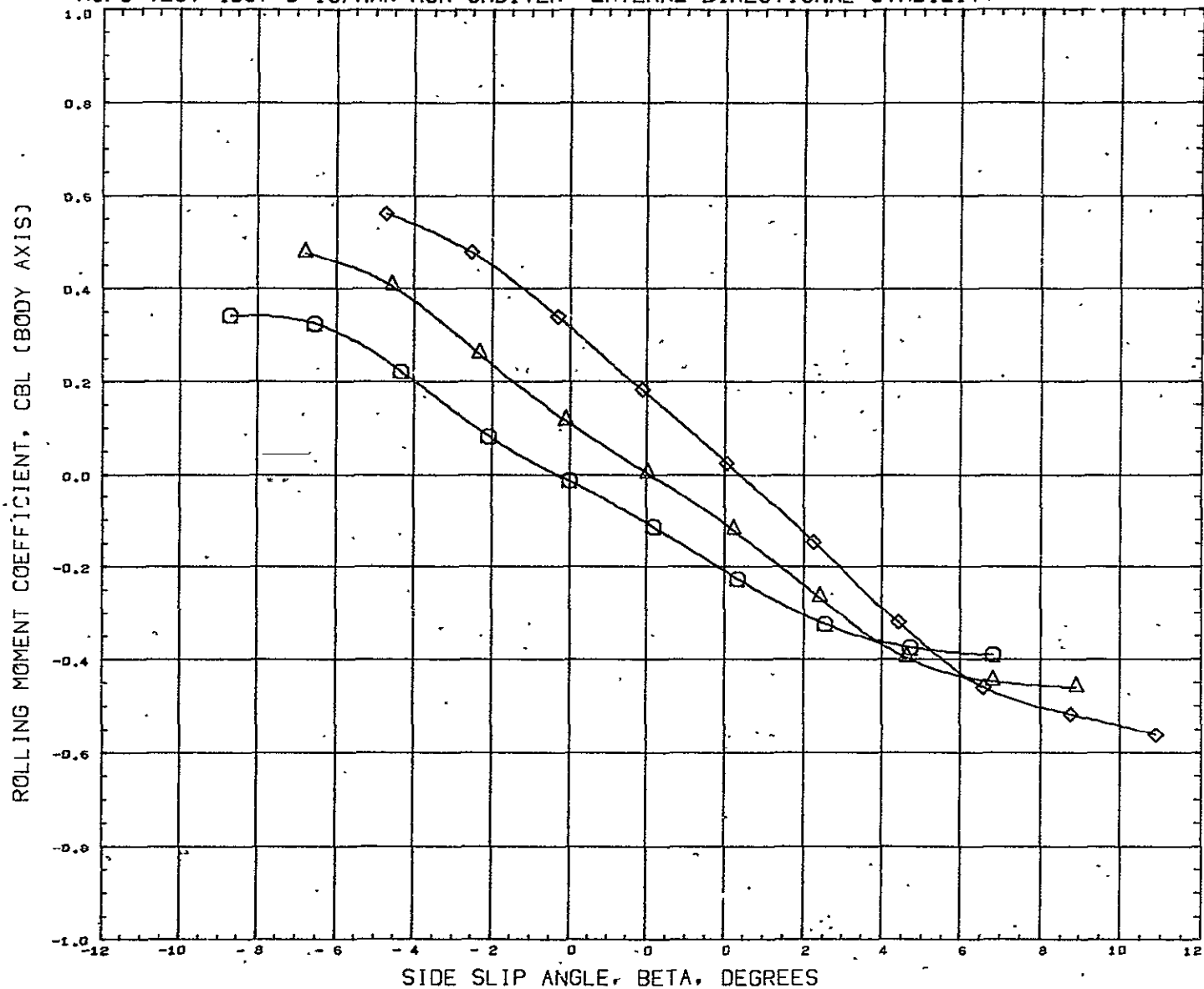
◇ 1.202

REFERENCE INFORMATION

REFS	1.3960	SO, IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0373	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	3.0034	

DATA HIST. CODE *E

MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY

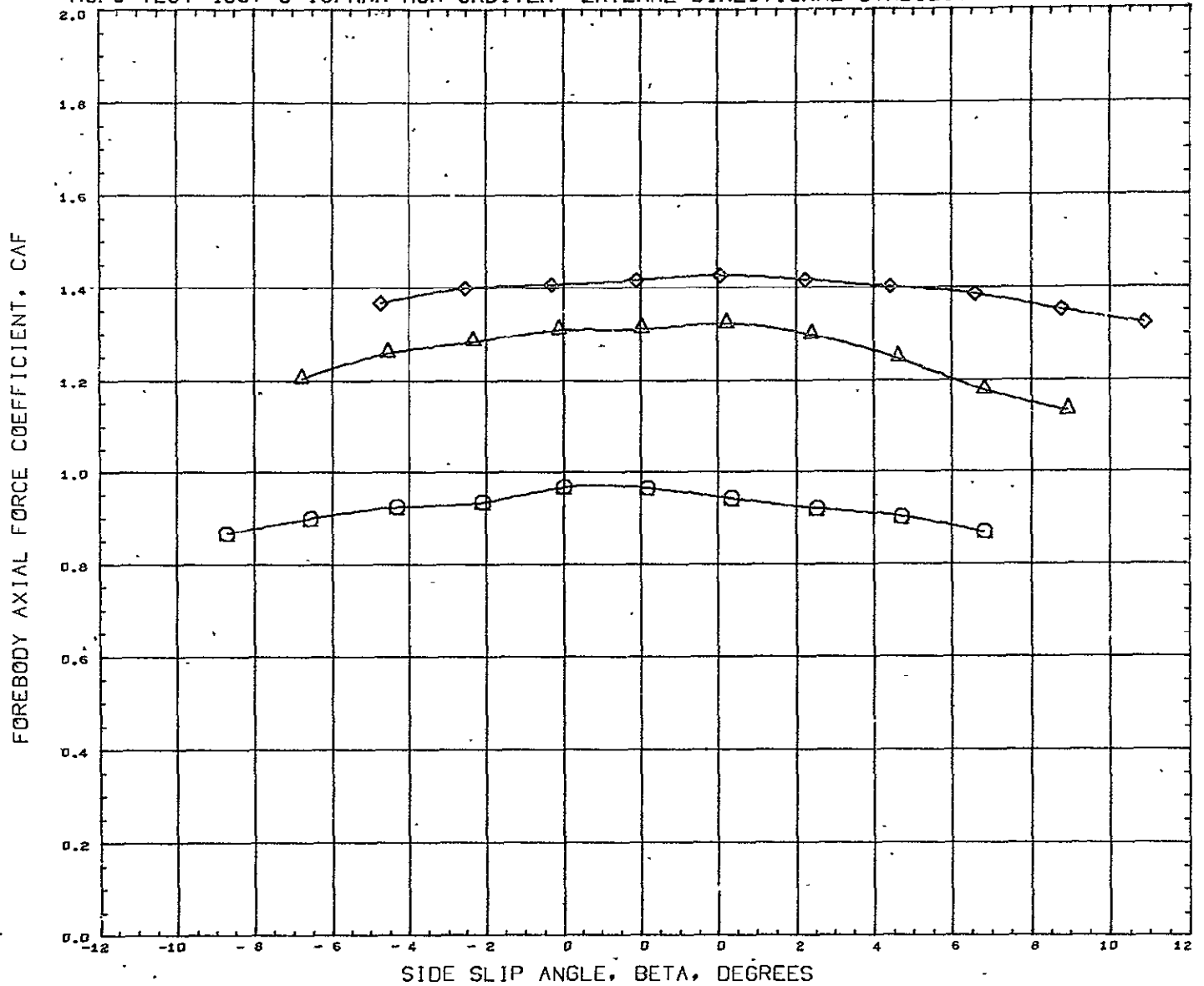


SYMBOL MACH . PARAMETRIC VALUES
 ○ 0.903 ALPHA 0.120
 △ 1.005
 ◇ 1.202

DATA HIST. CODE *E

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0090 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY

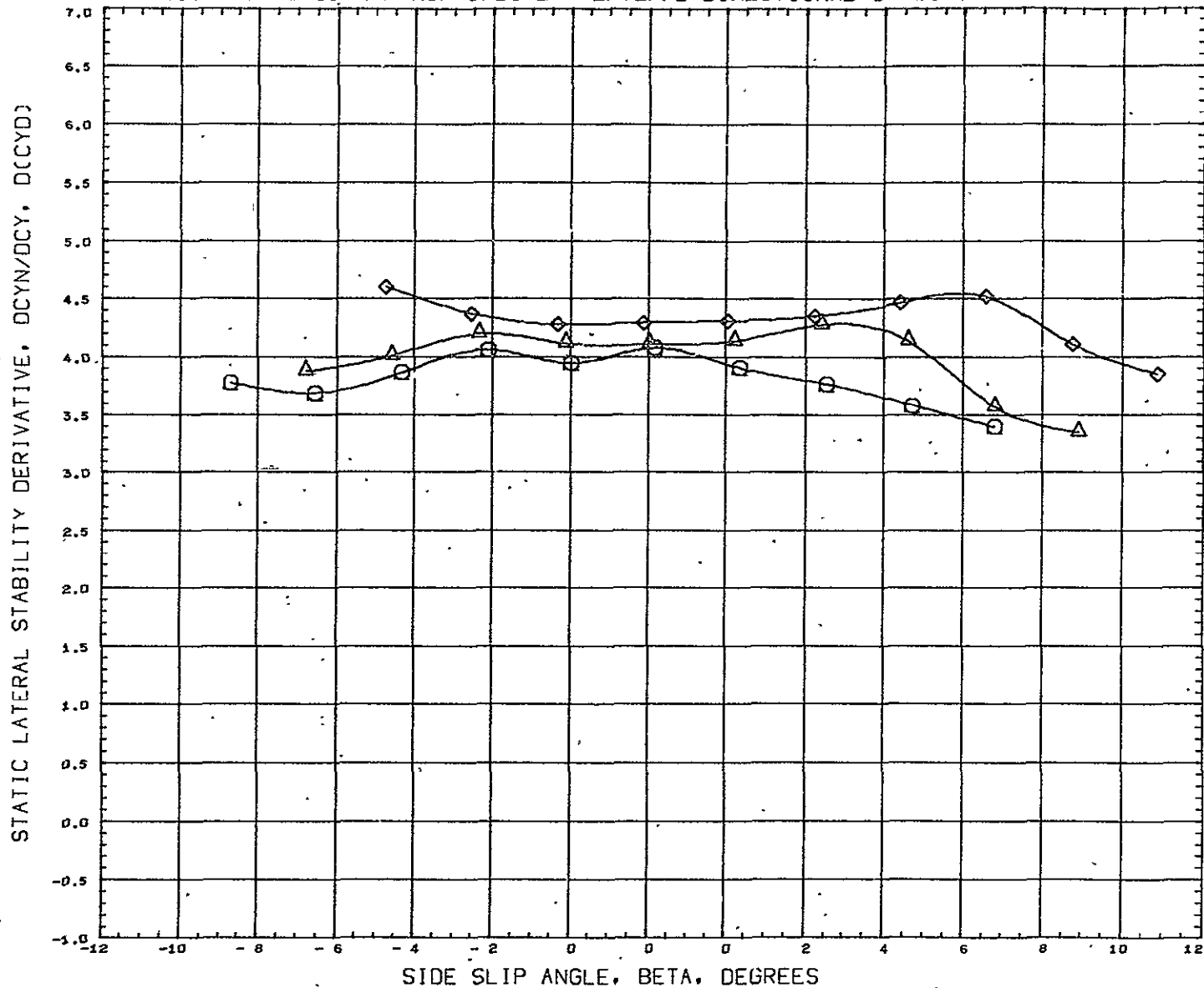


SYMBOL MACH ALPHA PARAMETRIC VALUES
 □ 0.903 ALPHA 0.120
 △ 1.005
 ◇ 1.202

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *E

MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY

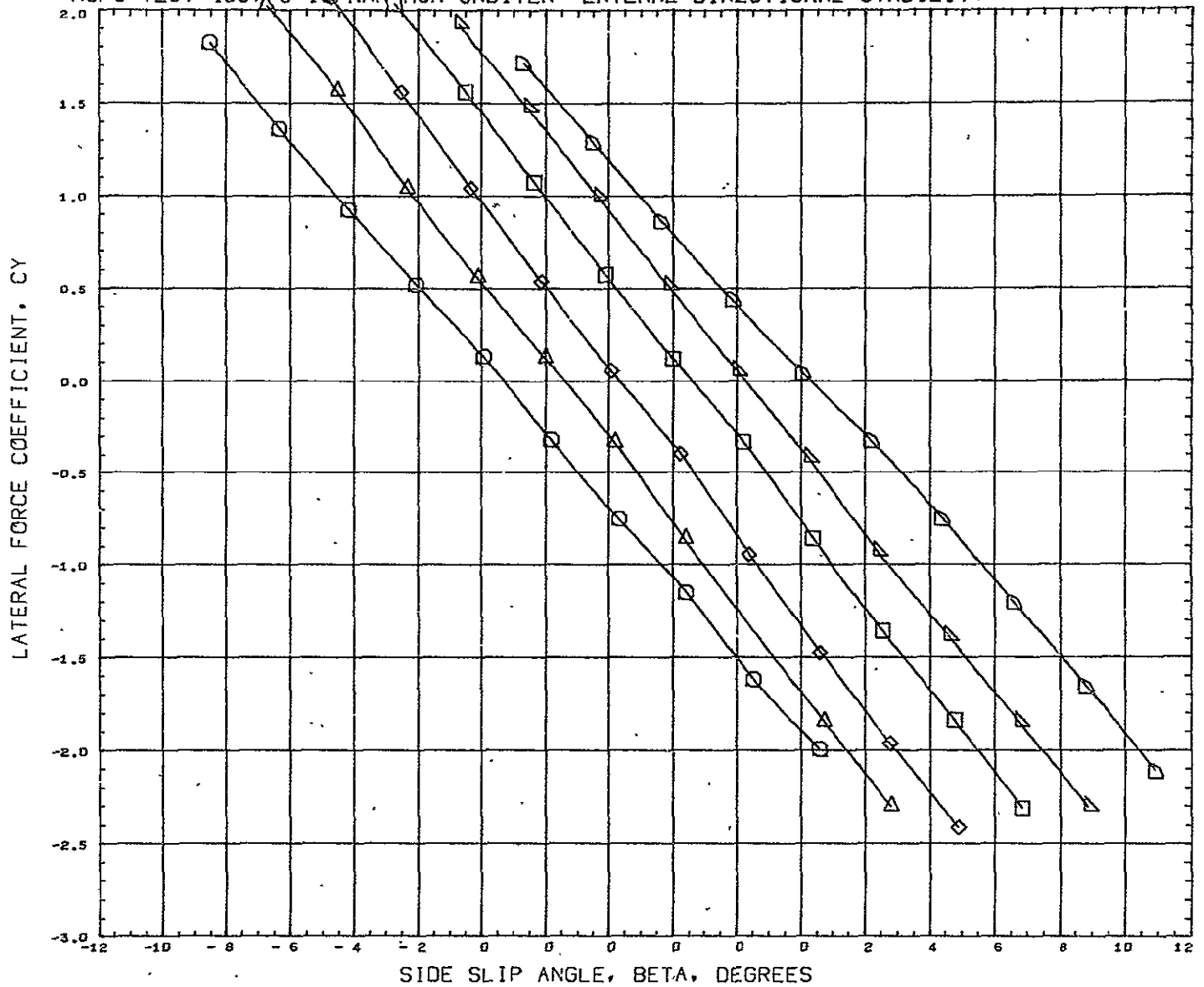


SYMBOL	MACH	ALPHA	PARAMETRIC VALUES
○	0.903		0.120
△	1.005		
◇	1.202		

REFERENCE INFORMATION		
REFS	1.3960	50. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *E

MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY



SYMBOL MACH PARAMETRIC VALUES
 $\square$ 0.607 ALPHA 0.070
 $\diamond$ 0.901
 $\triangle$ 1.003
 $\square$ 1.102
 $\diamond$ 1.201
 $\triangle$ 1.959 DATA HIST. CODE *E

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
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 REFB 1.3330 IN
 XMRP - 0.0270 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

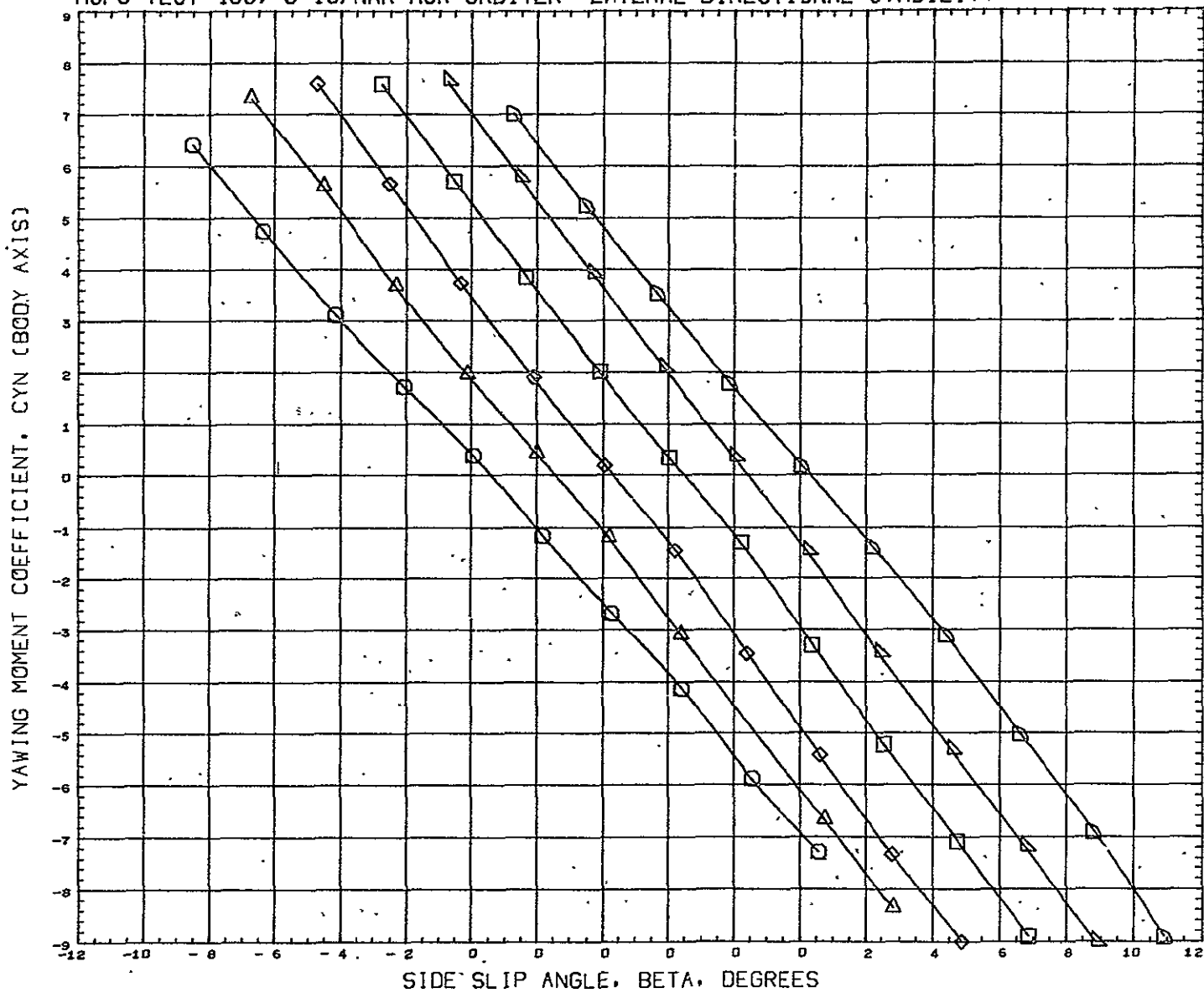
M485-MSFC-S1C NAR HCR ORBITER

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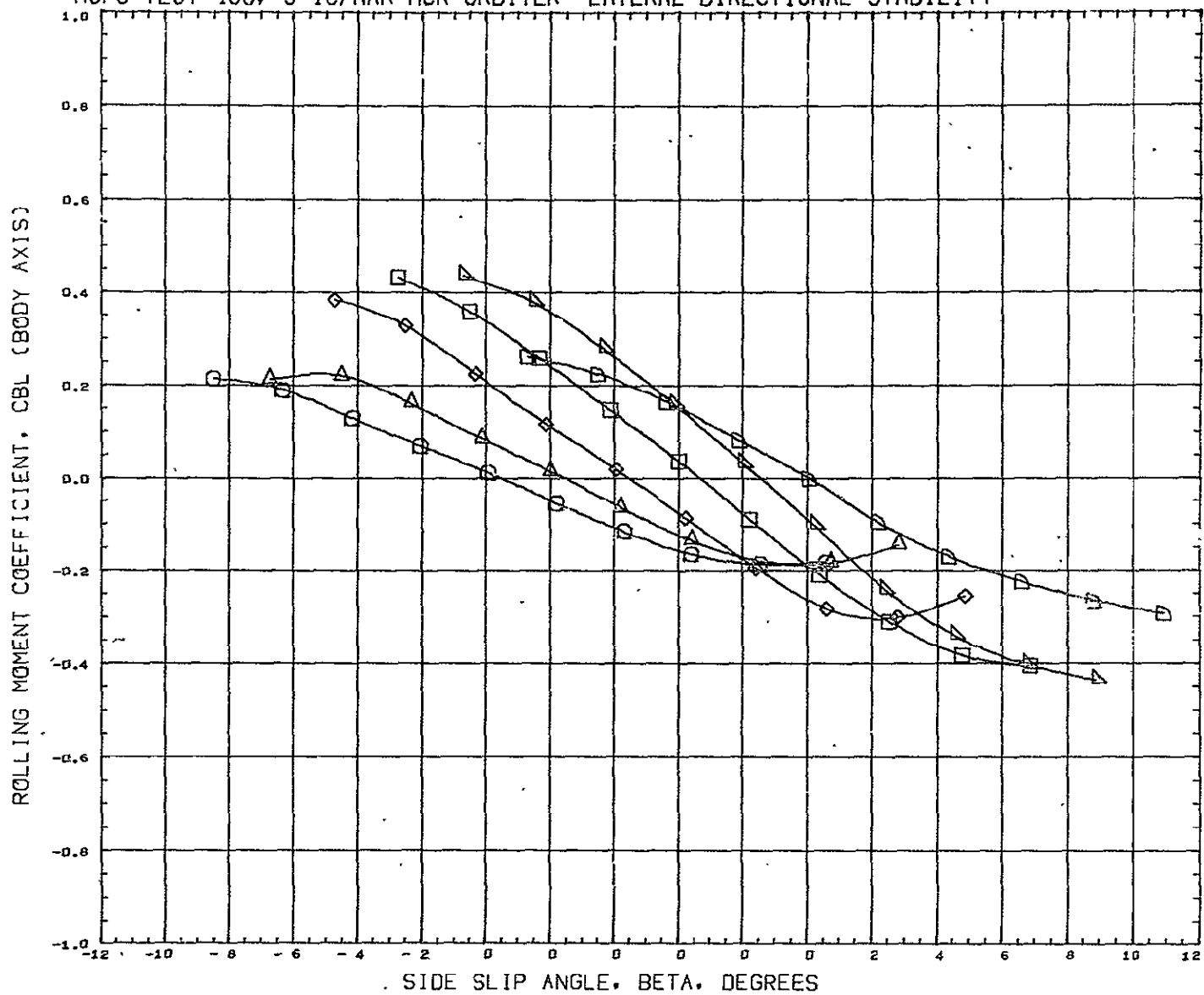
MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES
○	0.607	ALPHA 0.070
△	0.901	
◇	1.003	
□	1.102	
▽	1.201	
◇	1.959	DATA HIST. CODE *E

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.1300	IN
ZMRP	0.0000	IN
SCALE	0.0034	IN

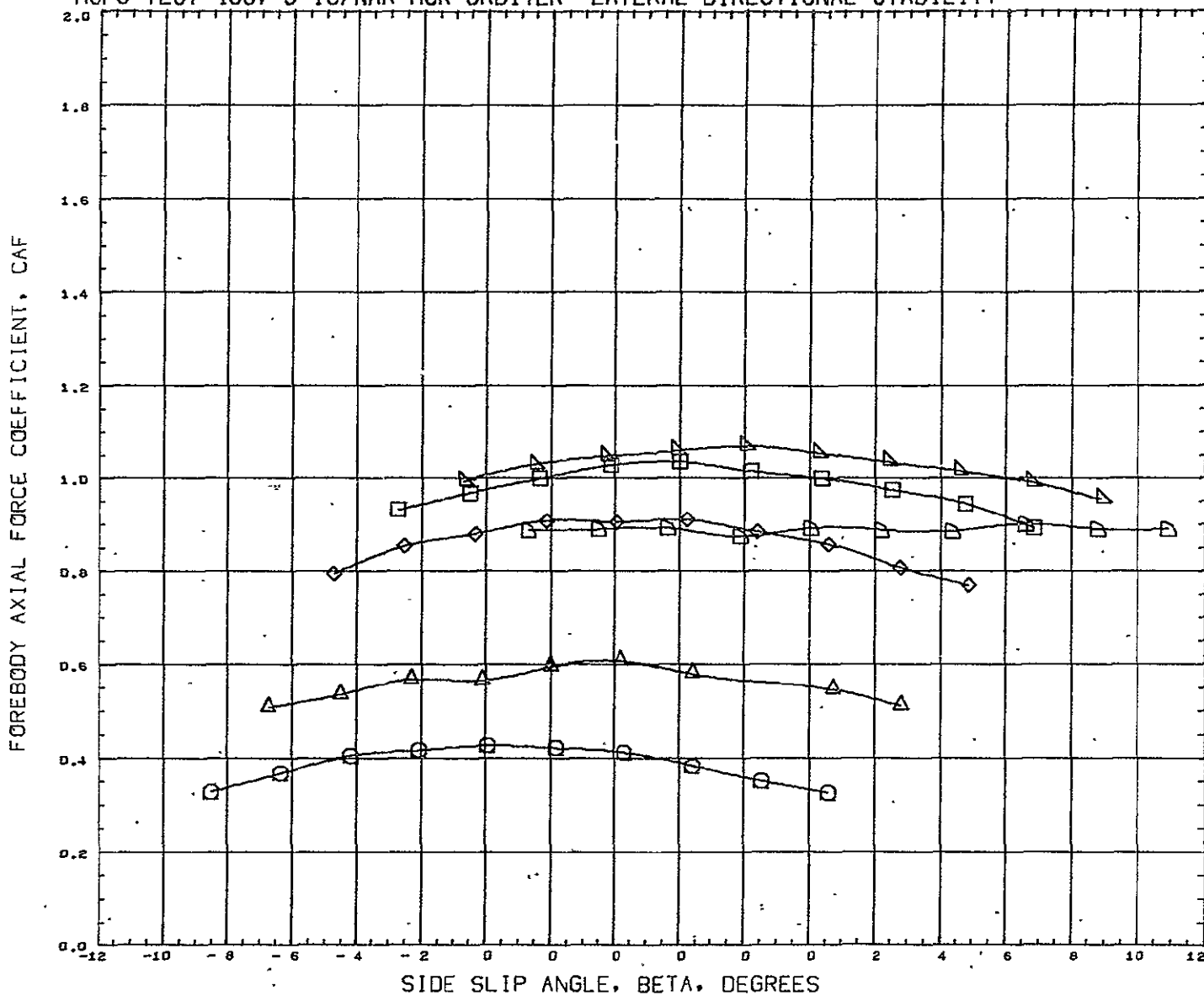
MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY



SYMBOL	MACH	ALPHA	PARAMETRIC VALUES
○	0.607		0.070
△	0.901		
◇	1.003		
□	1.102		
▽	1.201		
◇	1.959		
		DATA HIST. CODE	*E

REFERENCE INFORMATION		
REFS	1.3960	SQ.IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0770	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY



SYMBOL	MACH	ALPHA	PARAMETRIC VALUES
○	0.607		0.070
△	0.901		
◇	1.003		
□	1.102		
▤	1.201		
▥	1.959	DATA HIST. CODE	#E

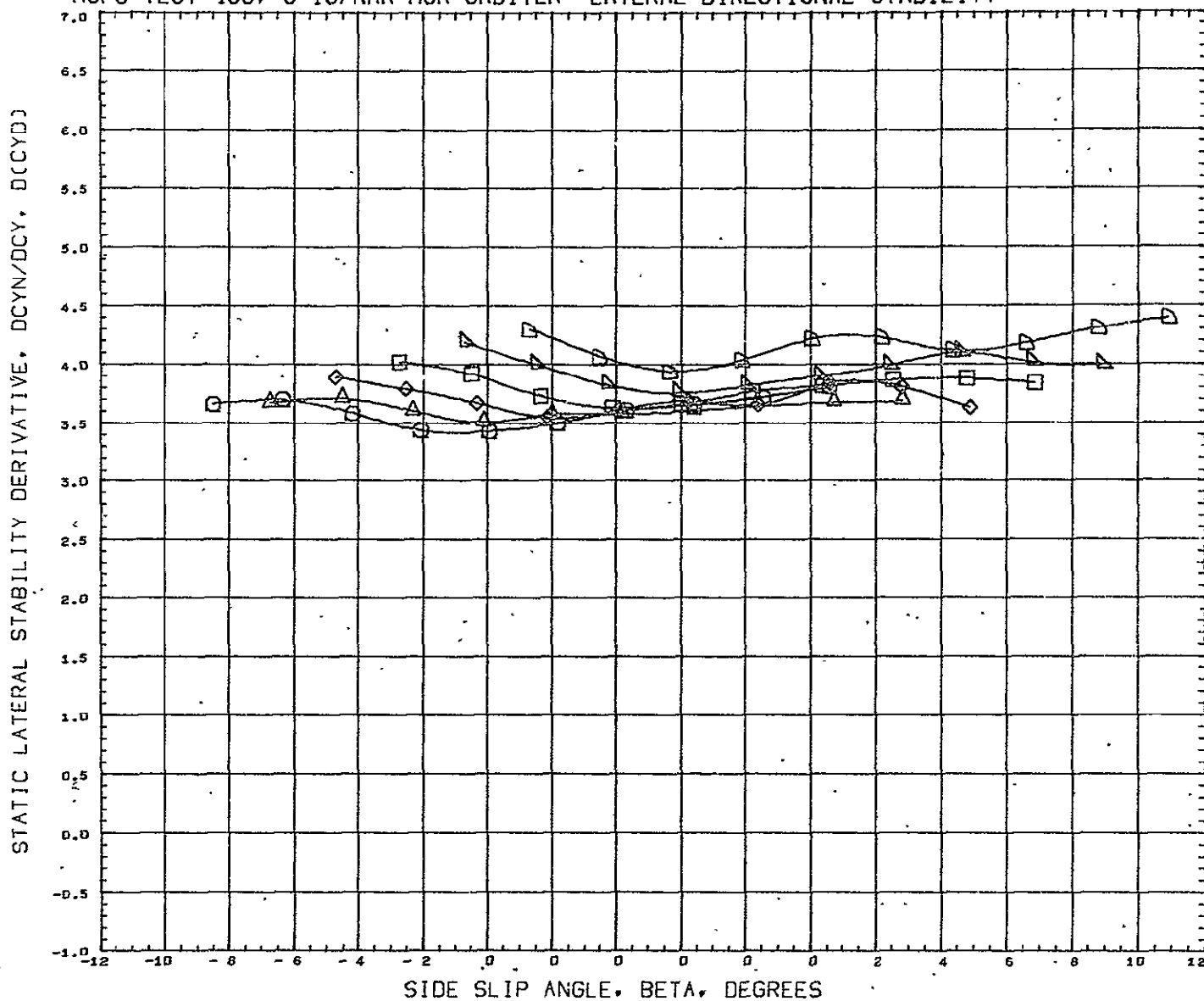
REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0300	IN
ZMRP	0.0000	IN
SCALE	0.0034	

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY



SYMBOL	MACH	ALPHA	PARAMETRIC VALUES
○	0.607	0.070	
◇	0.901		
□	1.003		
△	1.102		
▽	1.201		
	1.959	DATA HIST. CODE	*E

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	1.0034	

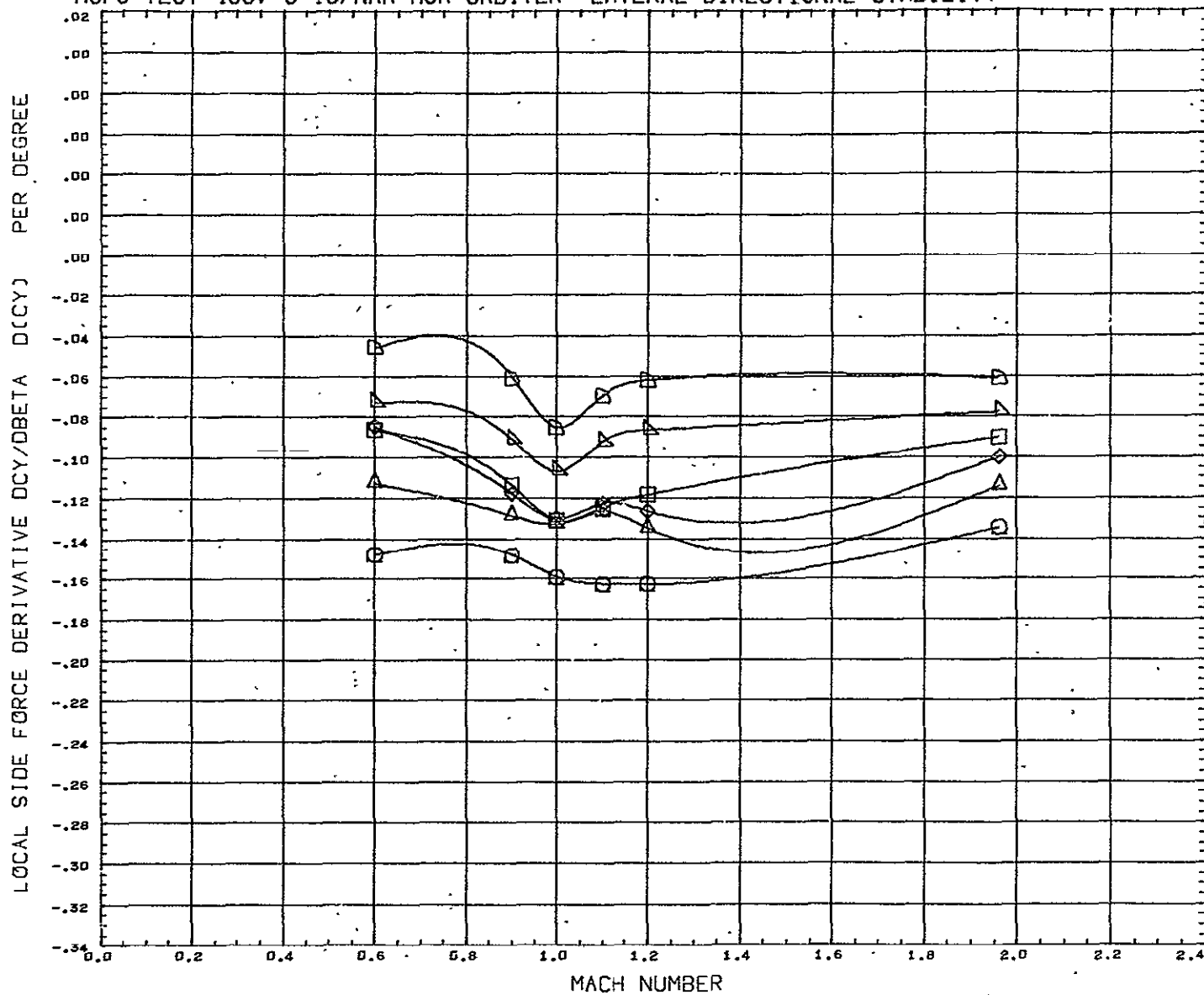
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MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY



SYMBOL BETA PARAMETRIC VALUES
 - 2.000 ALPHA 0.060
 0.000
 2.000
 4.000
 6.000
 8.000 DATA HIST. CODE #EIG

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.5000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

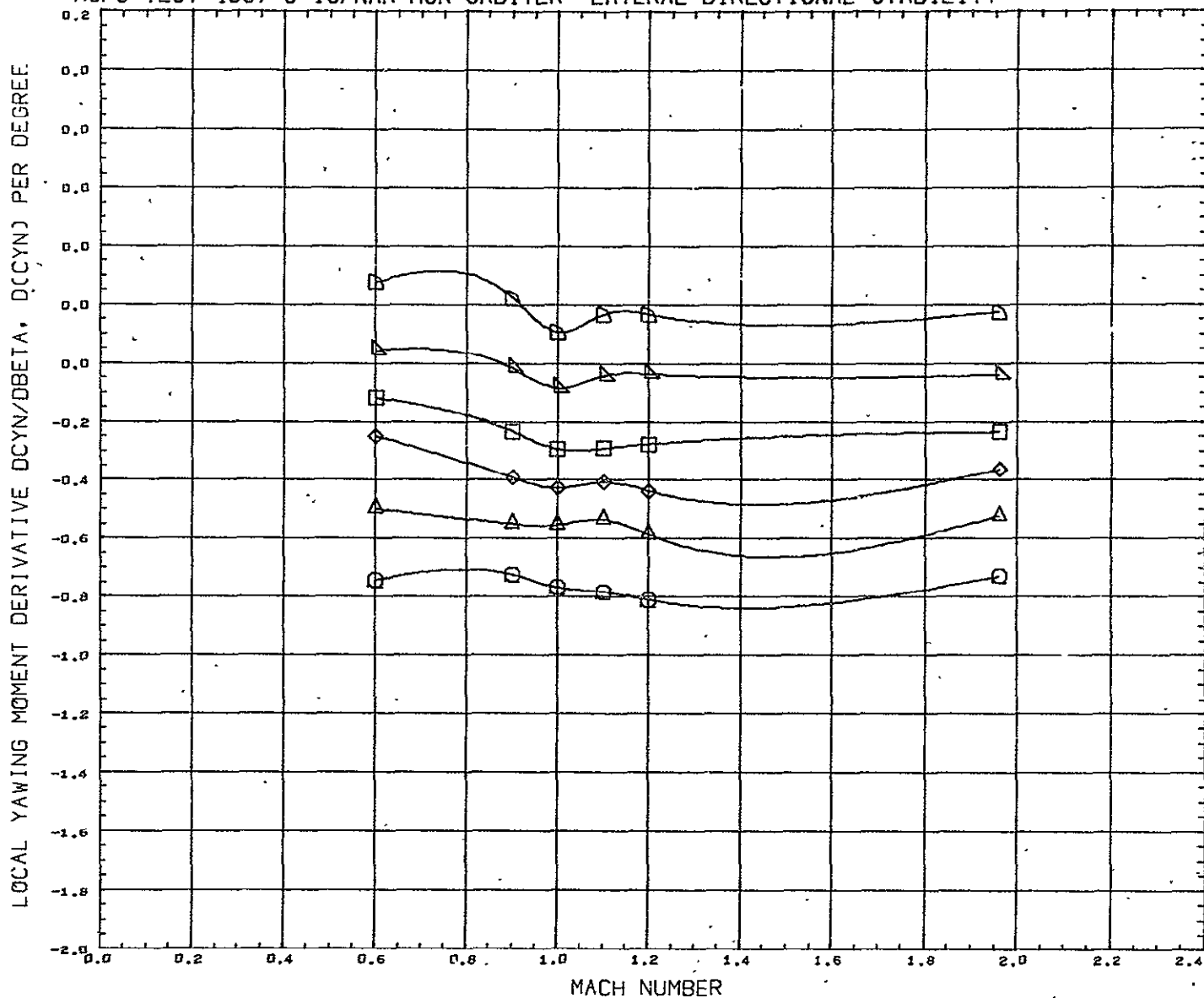
M485-MSFC-S1C NAR HCR ORBITER

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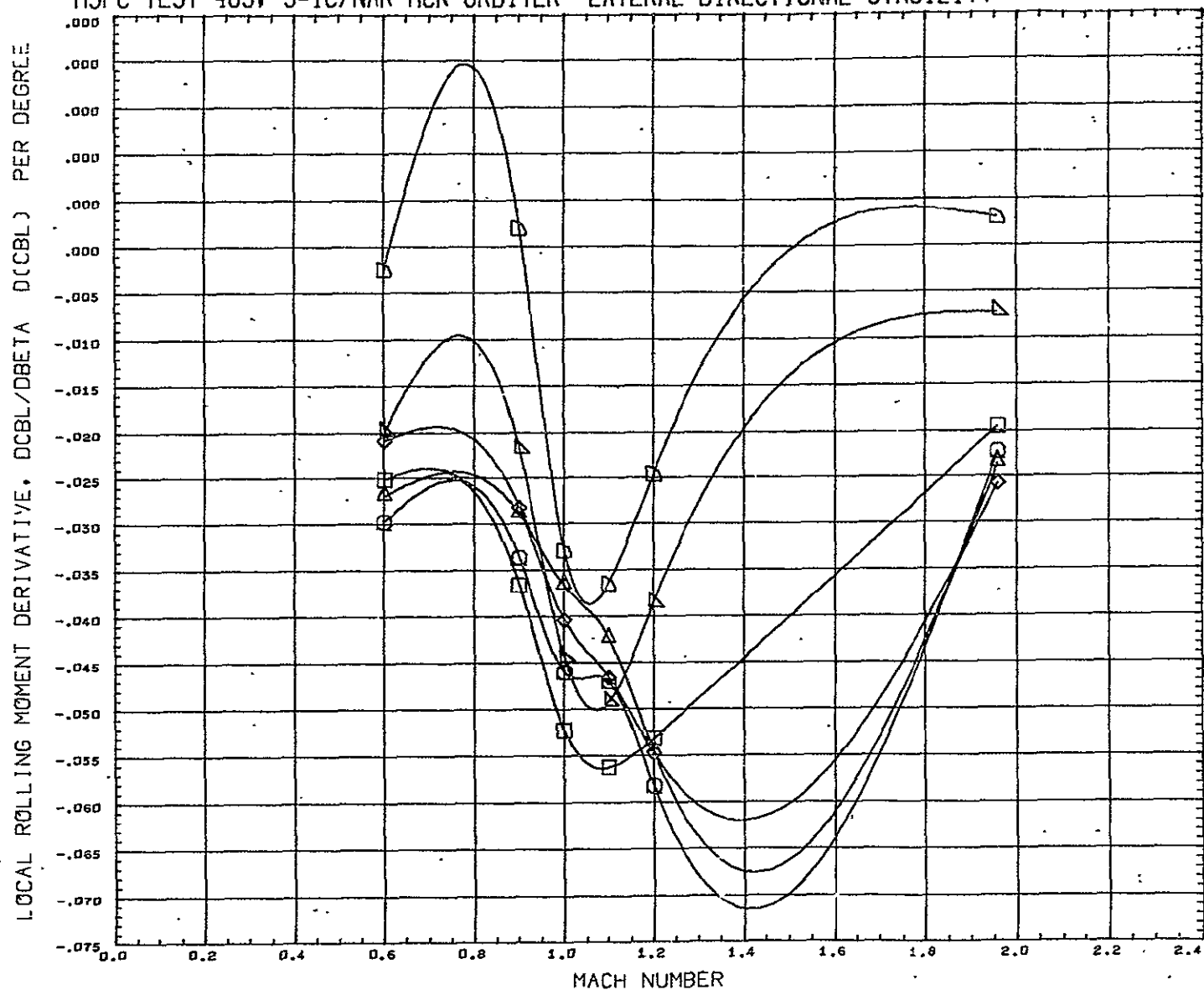
MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY



SYMBOL	BETA	PARAMETRIC VALUES
□	2.000	ALPHA 0.060
△	0.000	
◇	2.000	
□	4.000	
◇	6.000	
□	8.000	
DATA HIST. CODE *EIG		

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YNRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY



SYMBOL	BETA	ALPHA	PARAMETRIC VALUES
□	2.000	0.060	
△	0.000		
○	2.000		
◇	4.000		
□	6.000		
△	8.000		

DATA HIST. CODE #EIG

REFERENCE INFORMATION		
REFS	1.3960	50 IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

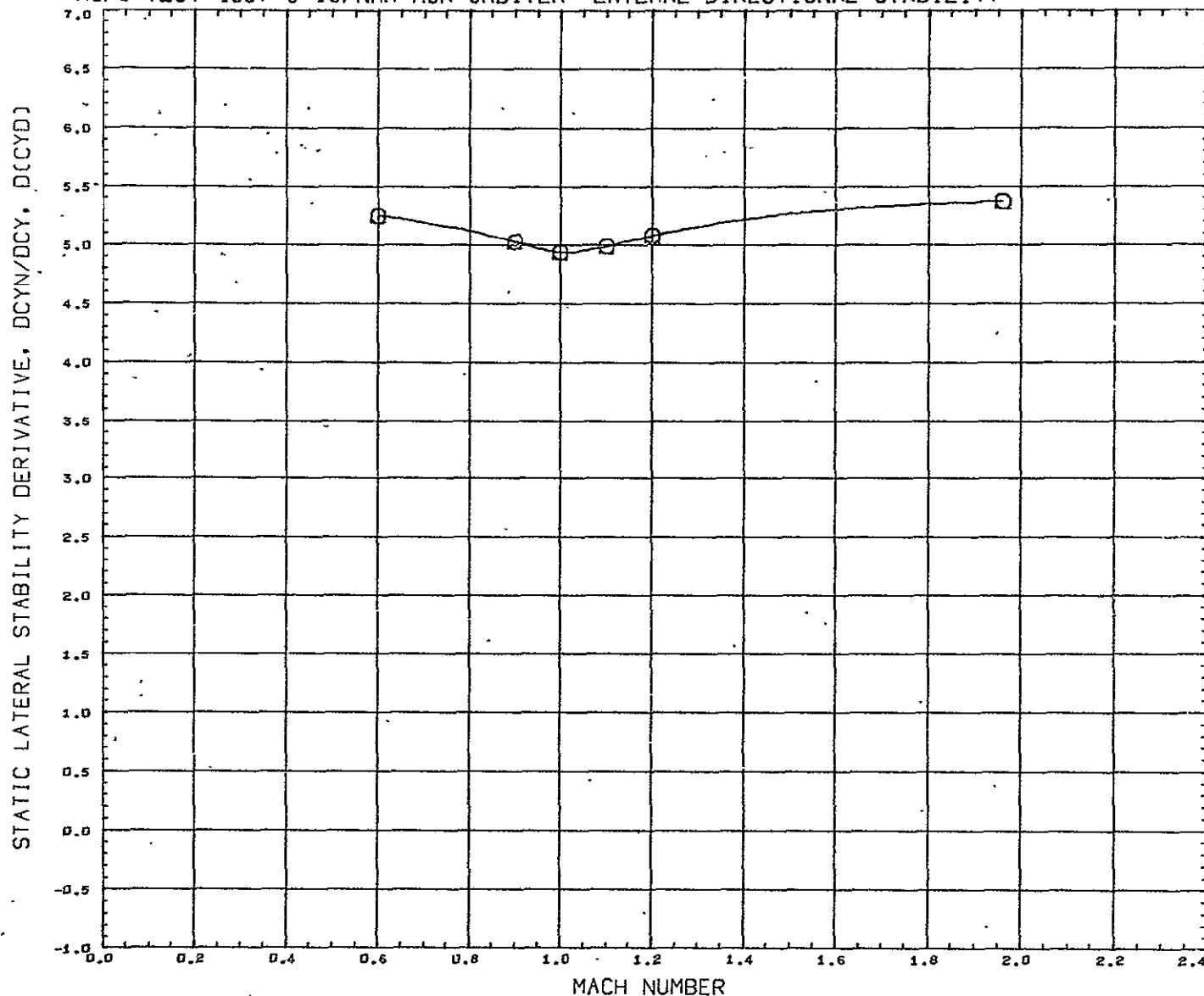
M485-MSFC-S1C NAR HCR ORBITER

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY

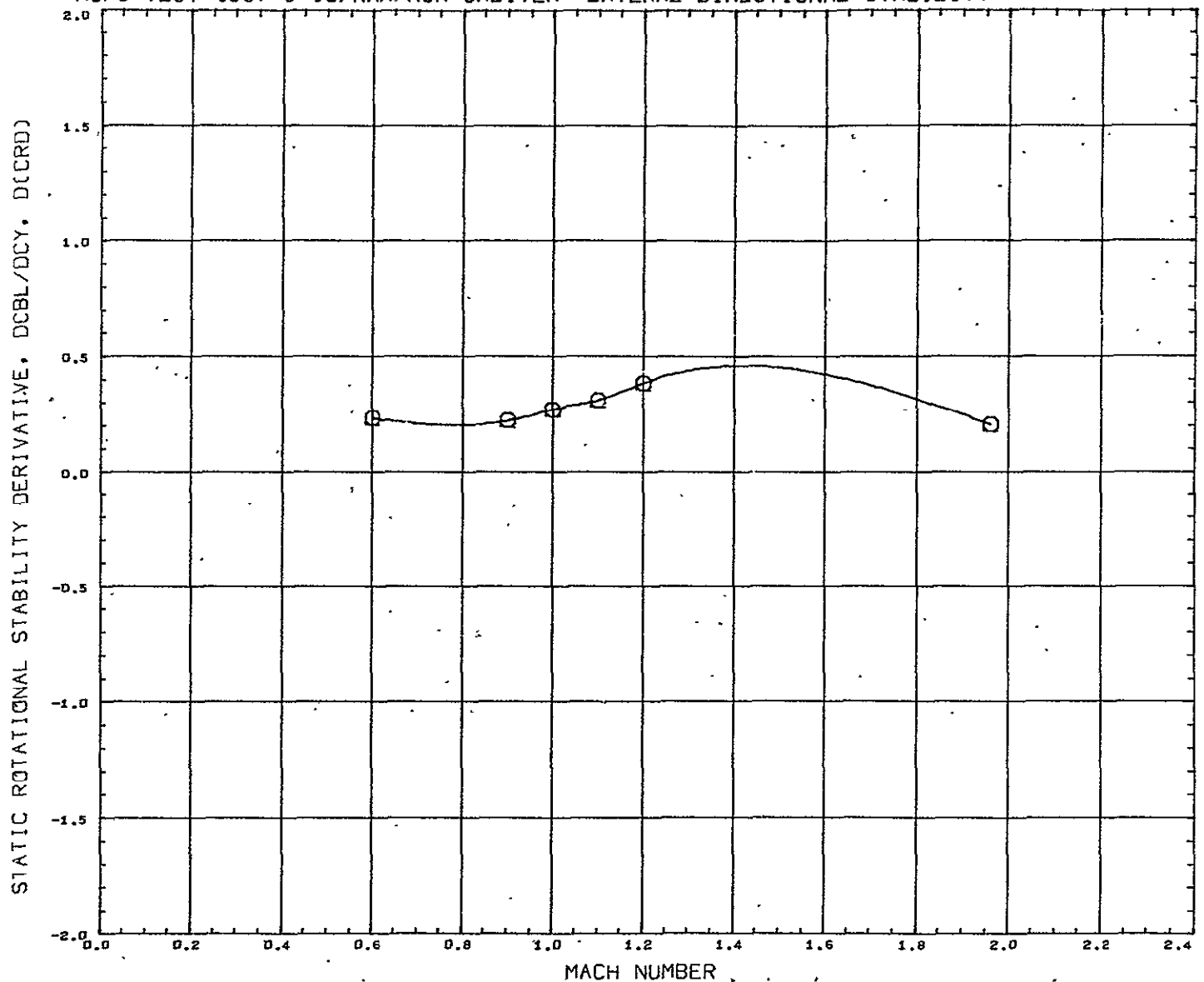


SYMBOL BETA PARAMETRIC VALUES
 O 0.000 ALPHA 0.060

REFERENCE INFORMATION
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 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *EI

MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY



SYMBOL BETA ALPHA PARAMETRIC VALUES
 O 0.000 0.060

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE #EI

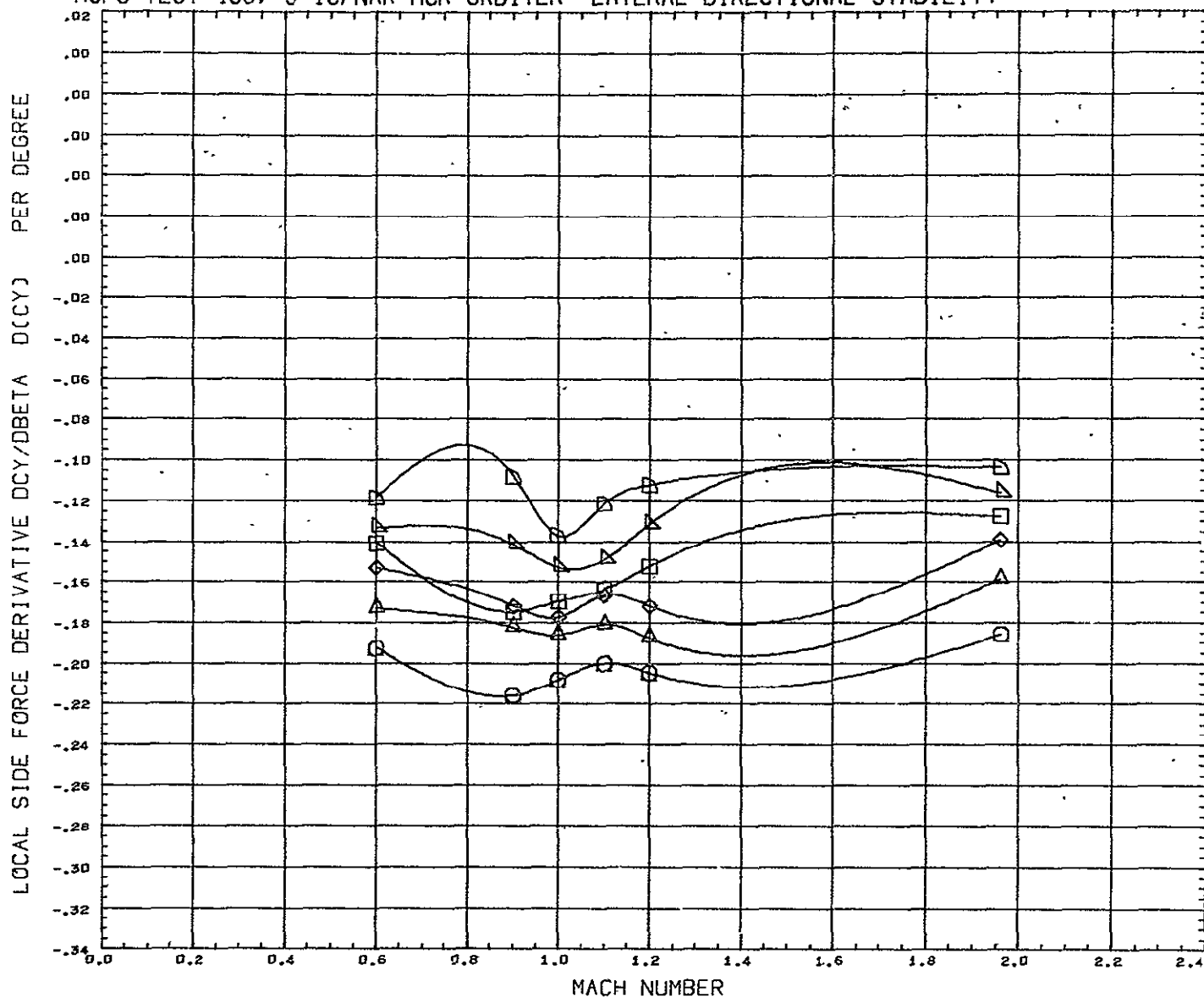
M485-MSFC-S1C NAR HCR ORBITER

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY



SYMBOL	BETA	PARAMETRIC VALUES
○	2.000	ALPHA 0.070
◇	4.000	
△	6.000	
□	8.000	

DATA HIST. CODE *EIG

REFERENCE INFORMATION		
REFS.	1.3960	SO. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

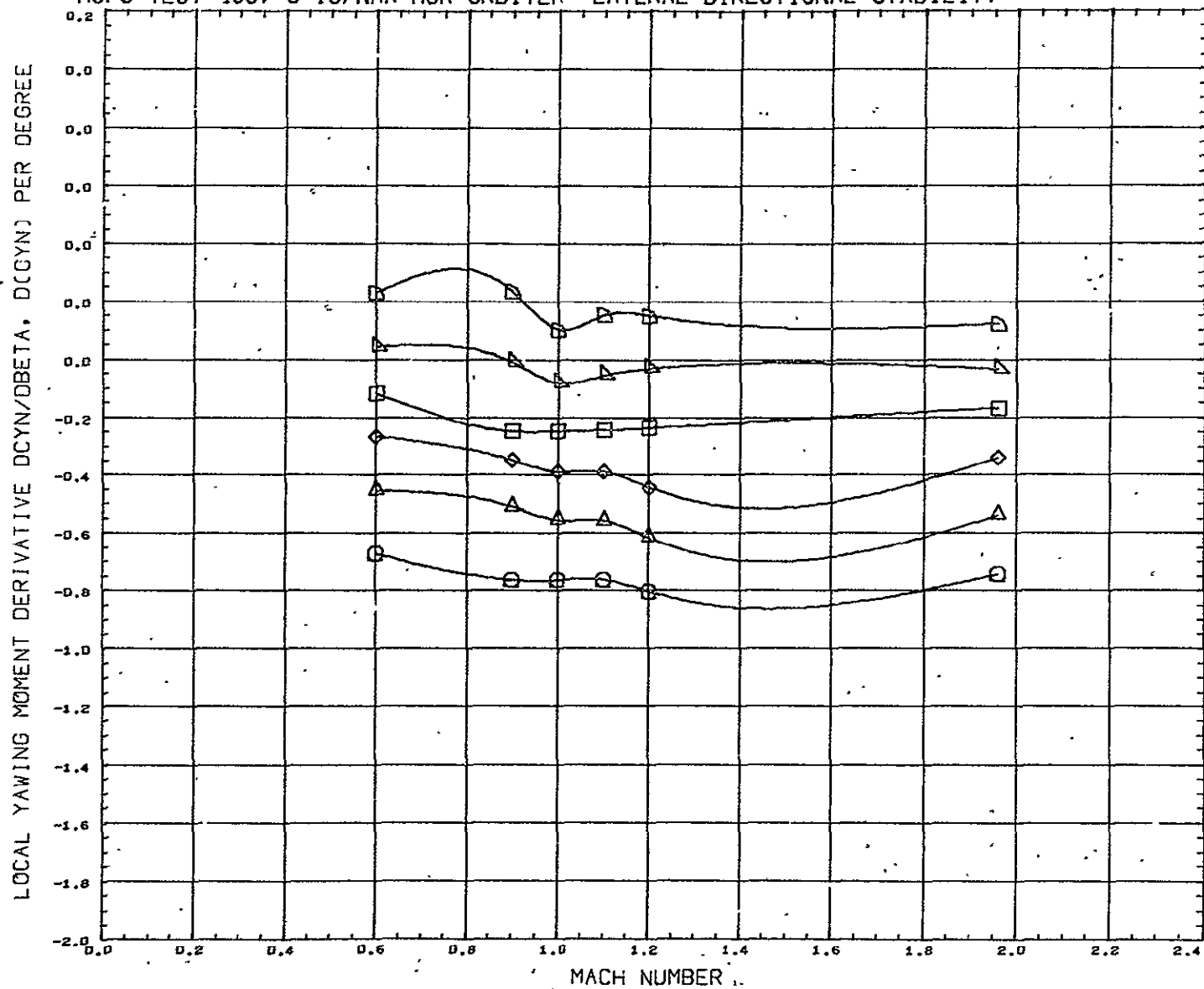
M485-MSFC-S1C MAR HCR ORBITER

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY

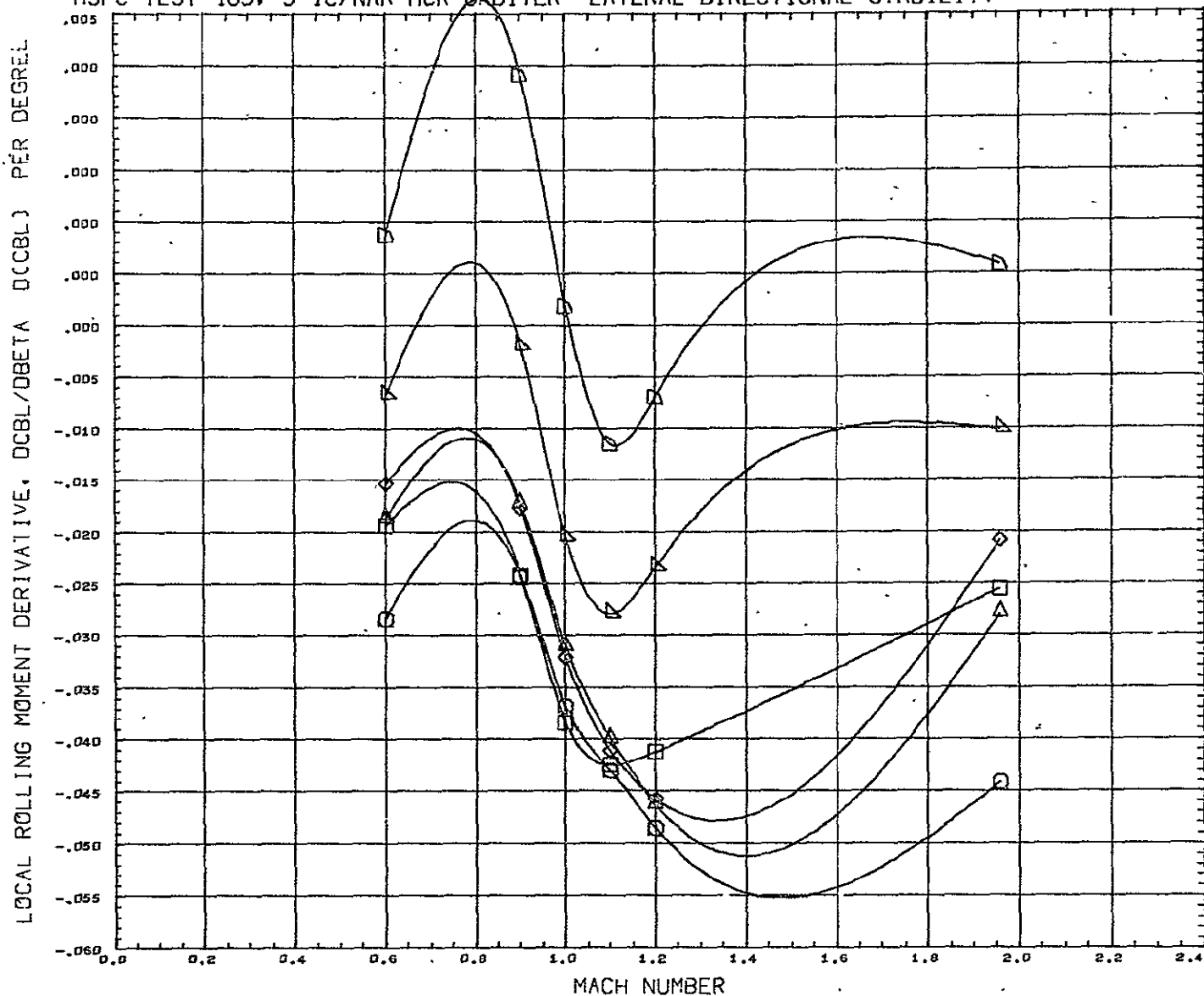


SYMBOL	BETA	PARAMETRIC VALUES
○	2.000	ALPHA 0.070
△	4.000	
◇	6.000	
□	8.000	
▽	10.000	
◇	12.000	

DATA HIST. CODE *EIG

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.9370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

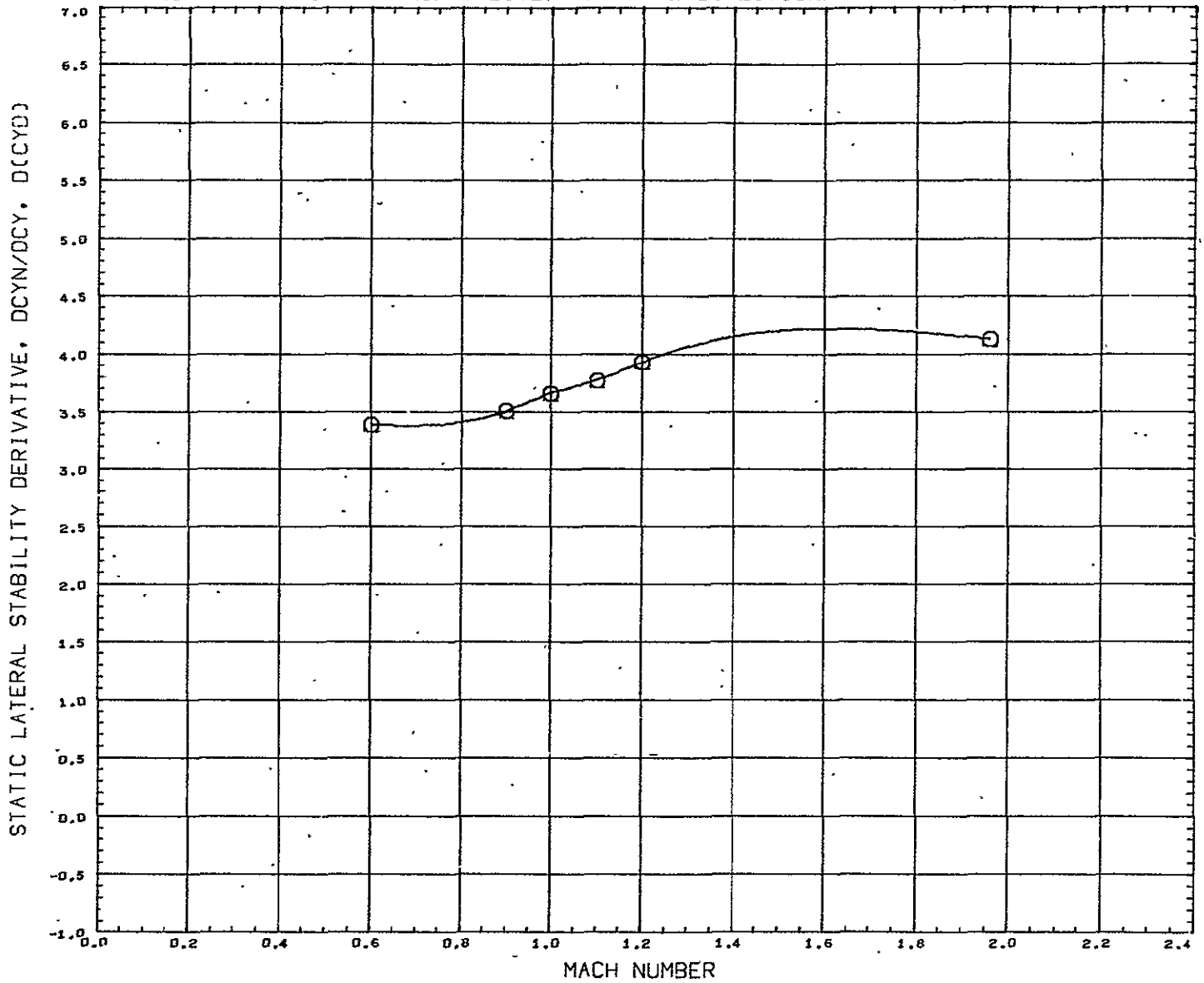
MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY



SYMBOL BETA PARAMETRIC VALUES
 - 2.000 ALPHA 0.070
 0.000
 2.000
 4.000
 6.000
 8.000 DATA HIST. CODE #EIG

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

MSFC TEST 485, S-1C/MAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY



SYMBOL BETA PARAMETRIC VALUES
 O 0.000 ALPHA 0.075

DATA HIST. CODE #EI

REFERENCE INFORMATION
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 REFL 1.3330 IN
 REFB 1.3330 IN
 XHRP 0.0374 IN
 YHRP 0.0000 IN
 ZHRP 0.0000 IN
 SCALE 0.0034

M485-MSFC-S1C MAR HCR ORBITER

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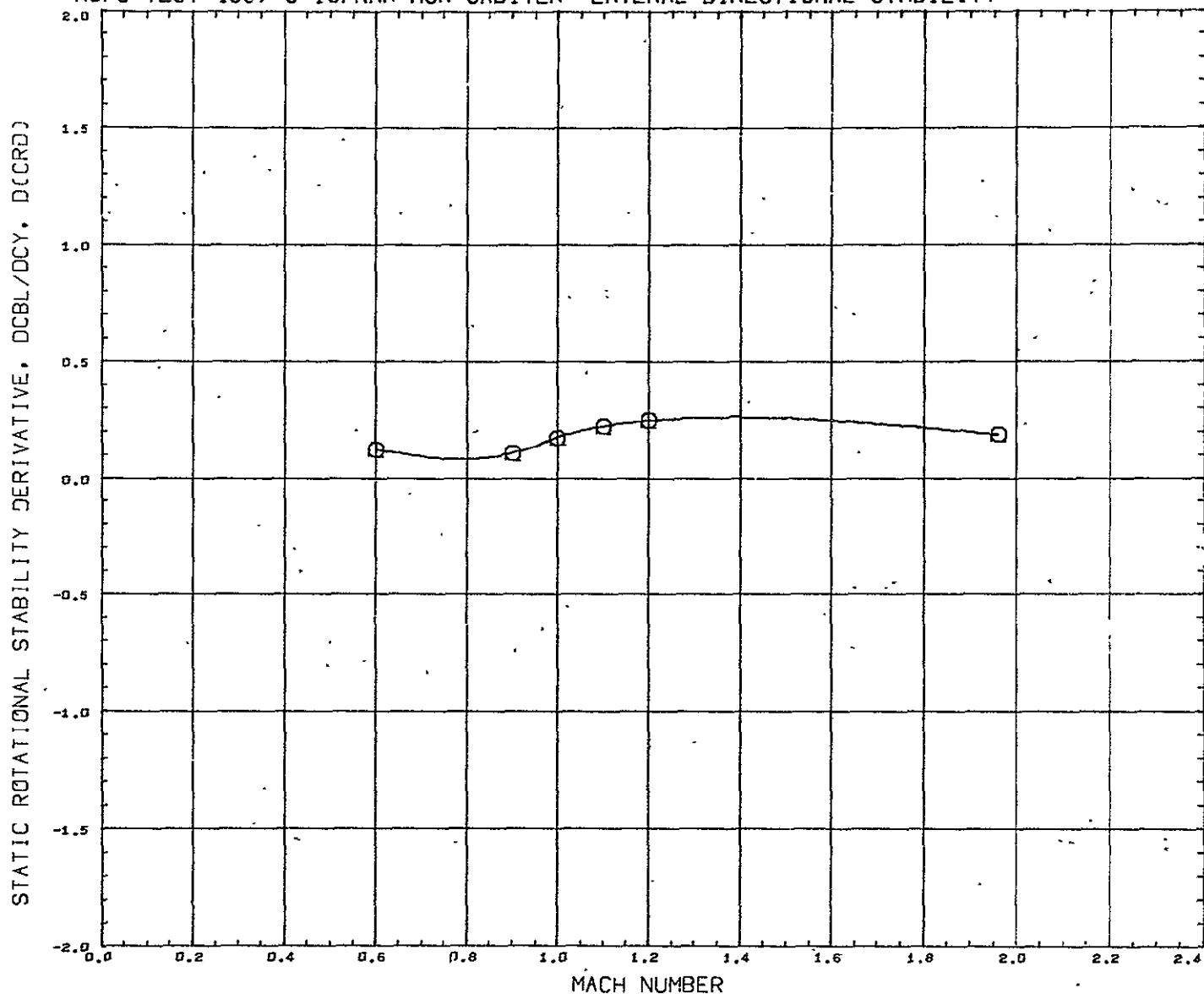
(P30022)

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PAGE

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY



SYMBOL BETA PARAMETRIC VALUES
 Q 0.000 ALPHA 0.070

REFERENCE INFORMATION
 REFS 1.3960 SQ.IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE . *EI

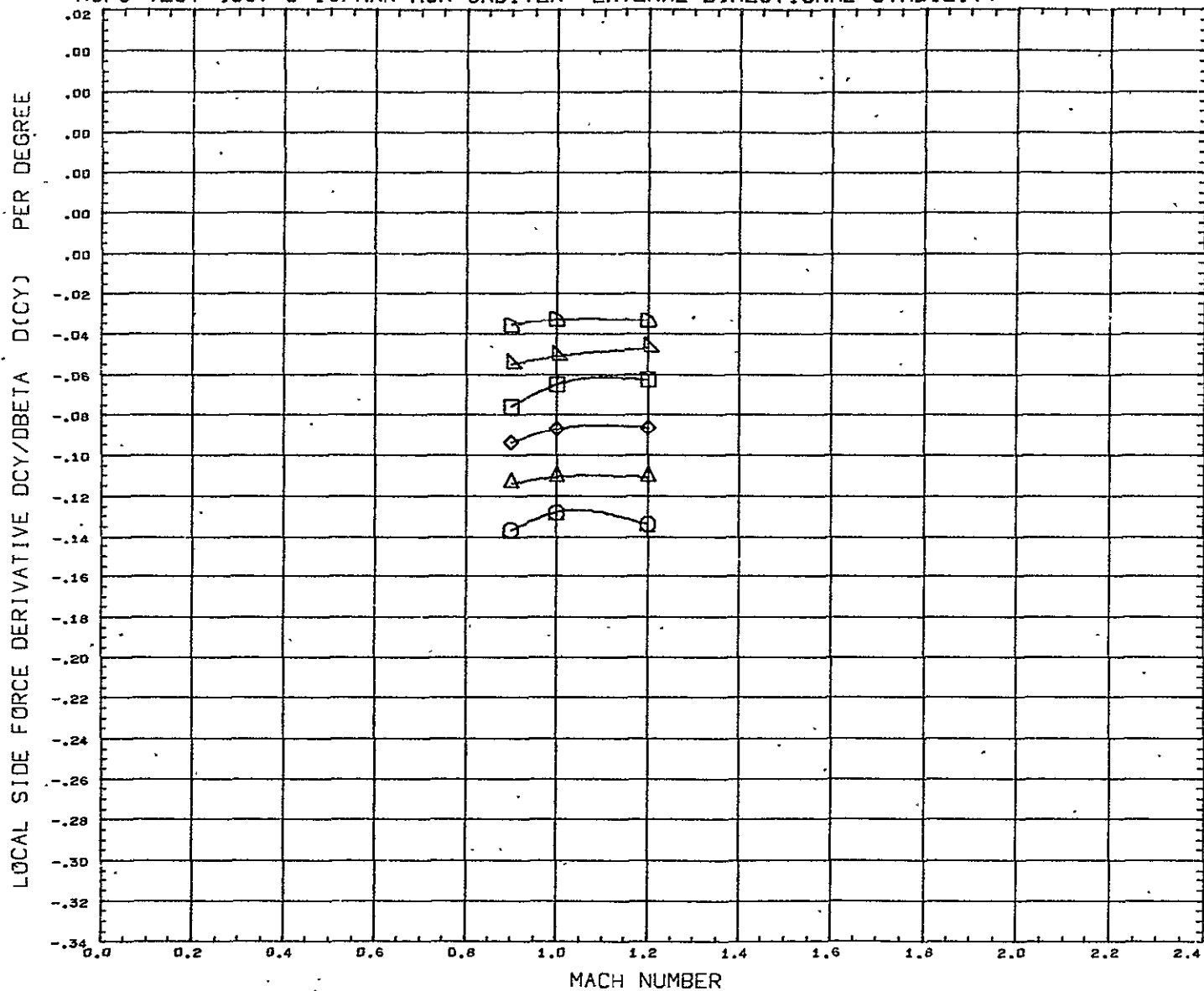
M485-MSFC-S1C MAR HCR ORBITER

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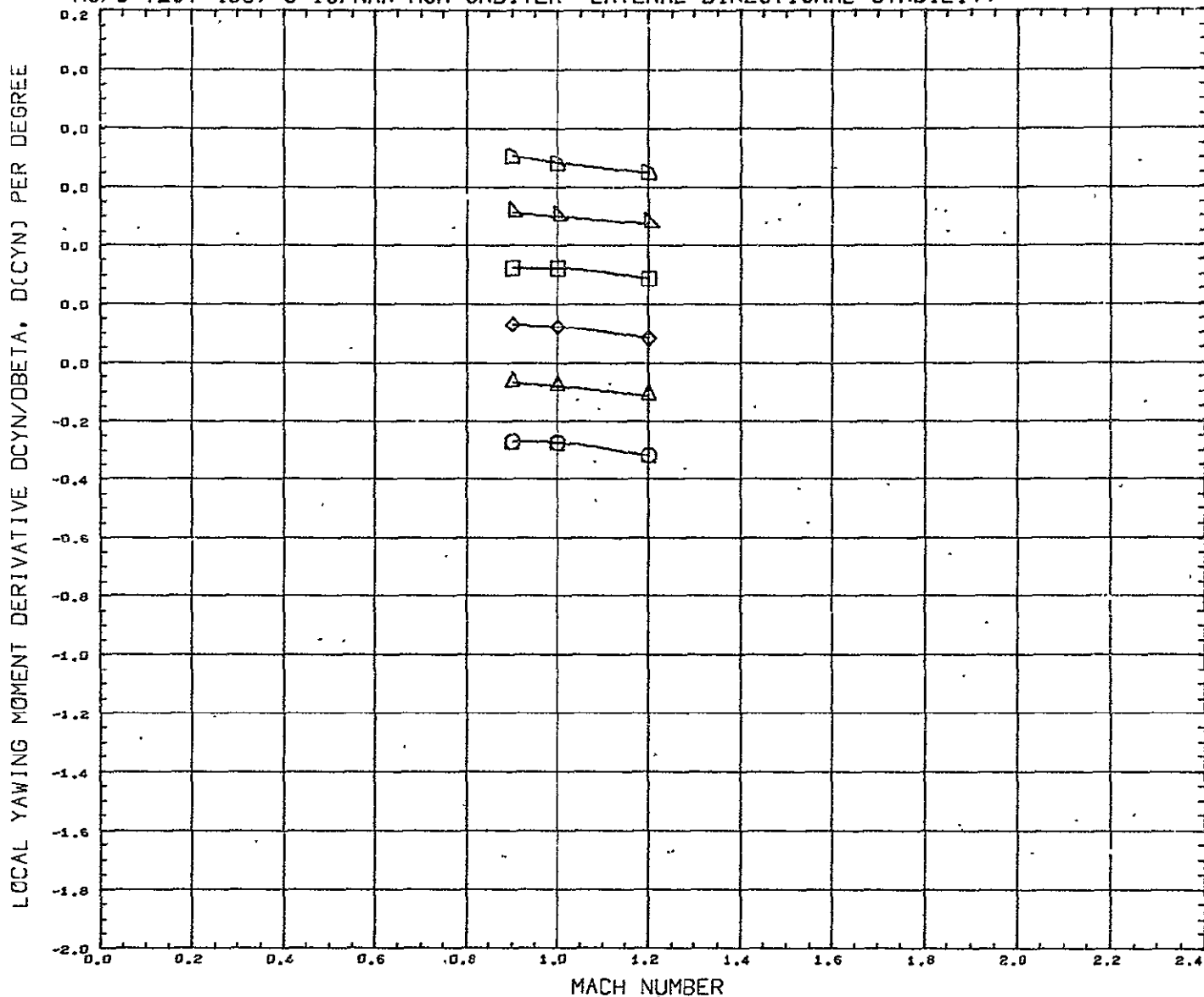
MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY



SYMBOL BETA ALPHA PARAMETRIC VALUES
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 4.000
 6.000
 8.000 DATA HIST. CODE #EIG

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

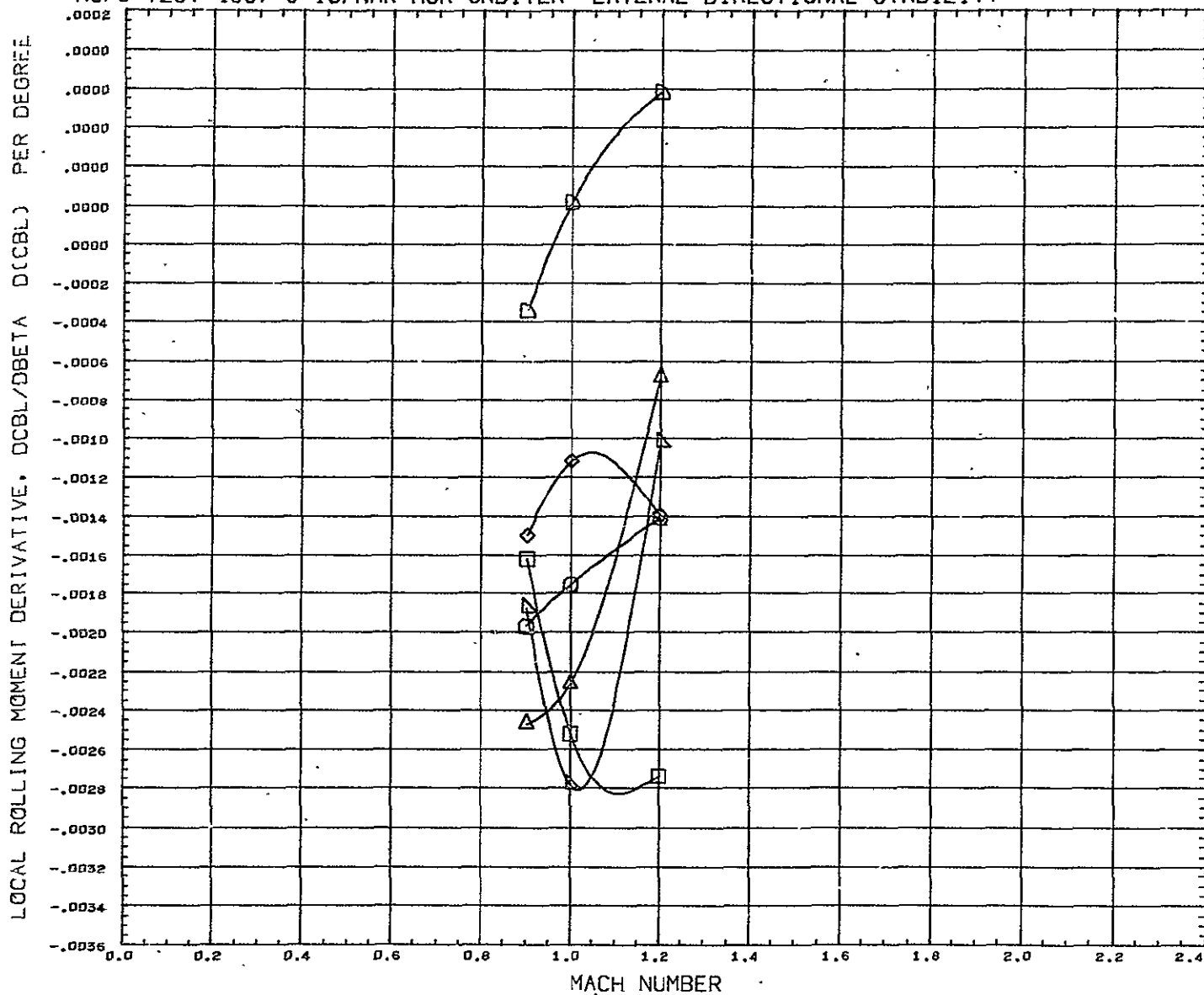
MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY



SYMBOL BETA PARAMETRIC VALUES
 O - 2.000 ALPHA 0.010
 △ 0.000
 ◇ 2.000
 □ 4.000
 ▣ 6.000
 ▤ 8.000 DATA HIST. CODE *EIG

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP - 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

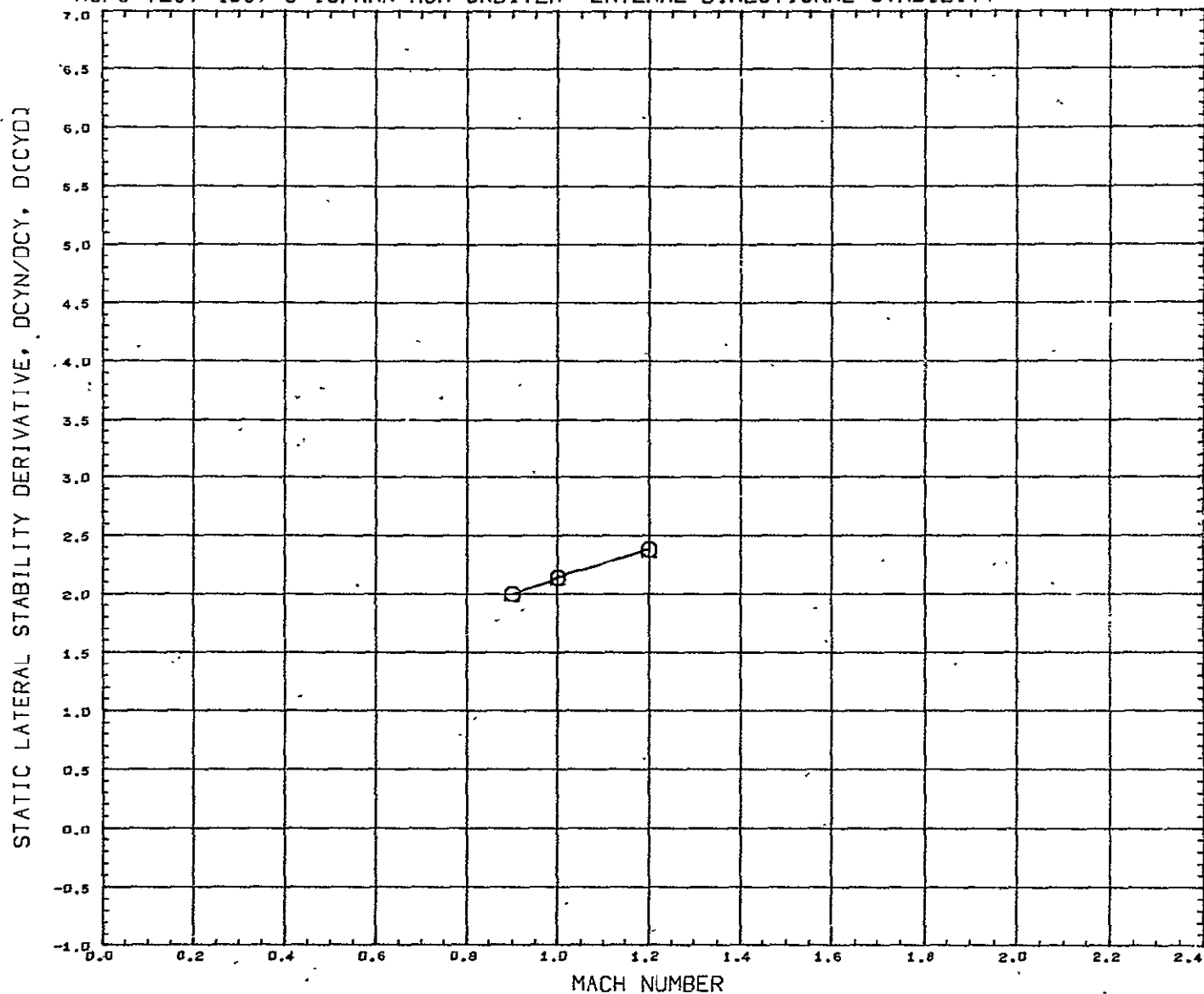
MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY



SYMBOL BETA PARAMETRIC VALUES
 - 2.000 ALPHA 0.010
 0.000
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 4.000
 6.000
 8.000 DATA HIST. CODE *EIG

REFERENCE INFORMATION
 REFS 1.3960 50-IN.
 REFL 1.3330 IN
 REFR 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY



SYMBOL $\bigcirc$ BETA 0.000 ALPHA 0.010 PARAMETRIC VALUES

REFERENCE INFORMATION
 REFS 1.3960 SQ.IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

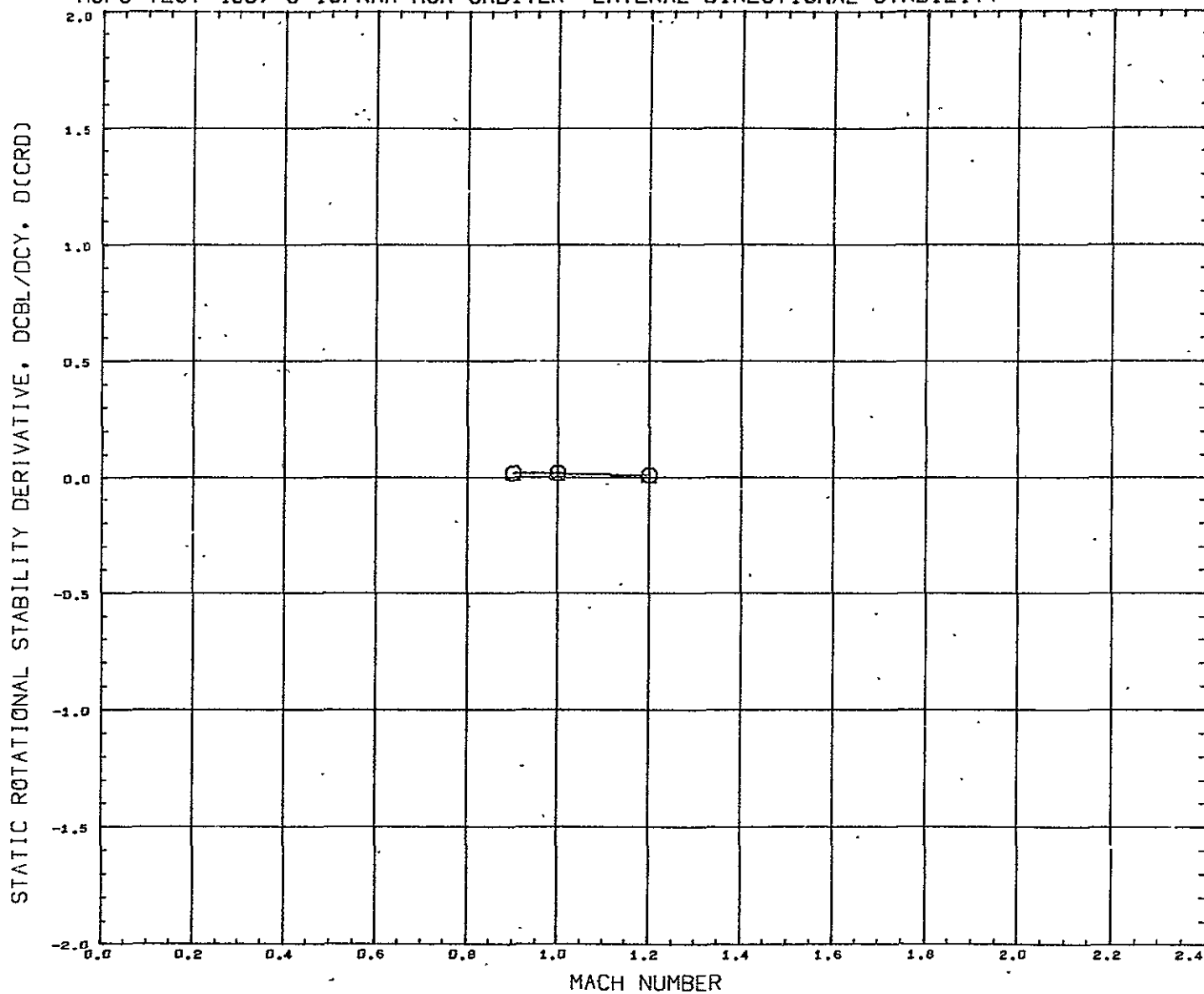
DATA HIST. CODE *EI

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY .



SYMBOL BETA PARAMETRIC VALUES
 O 0.000 ALPHA 0.010

REFERENCE INFORMATION
 REFS 1.3960 SQ.IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP - 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034 IN

DATA HIST. CODE *EI

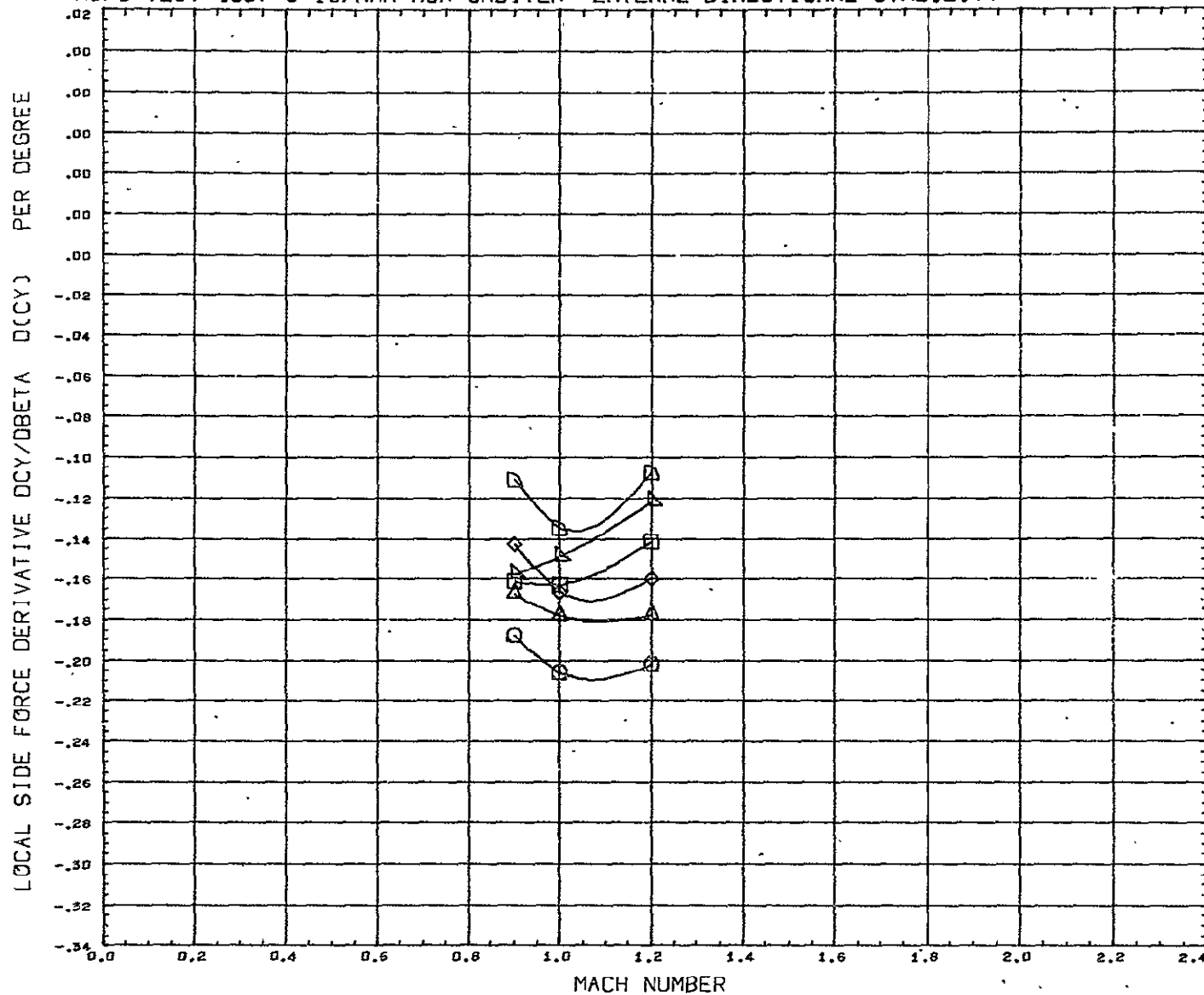
M485-MSFC-S1C NAR HCR ORBITER

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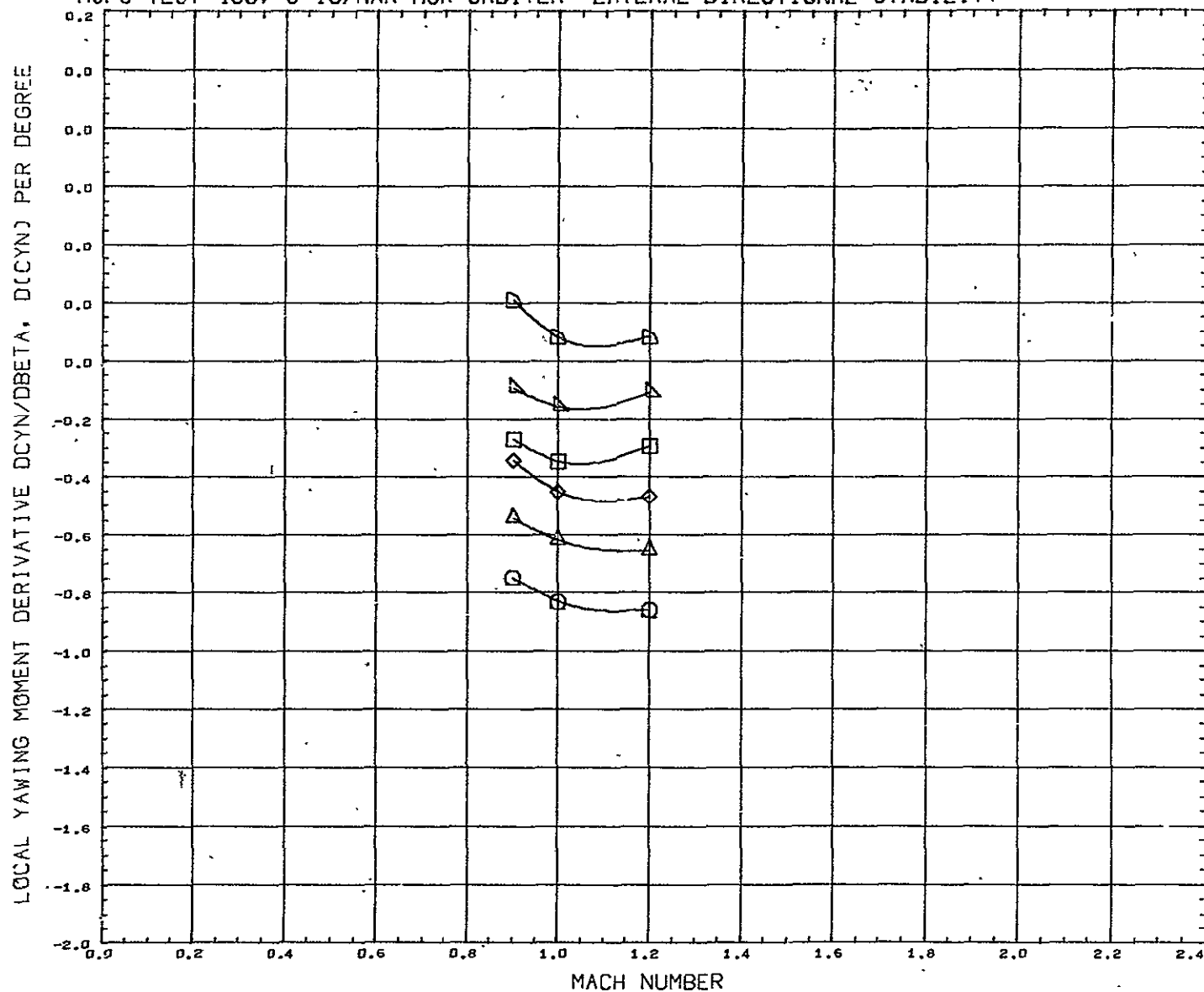
MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY



SYMBOL BETA PARAMETRIC VALUES
 - 2.000 ALPHA 0.120
 0.000
 2.000
 4.000
 6.000
 8.000 DATA HIST. CODE *EIG

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRF 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

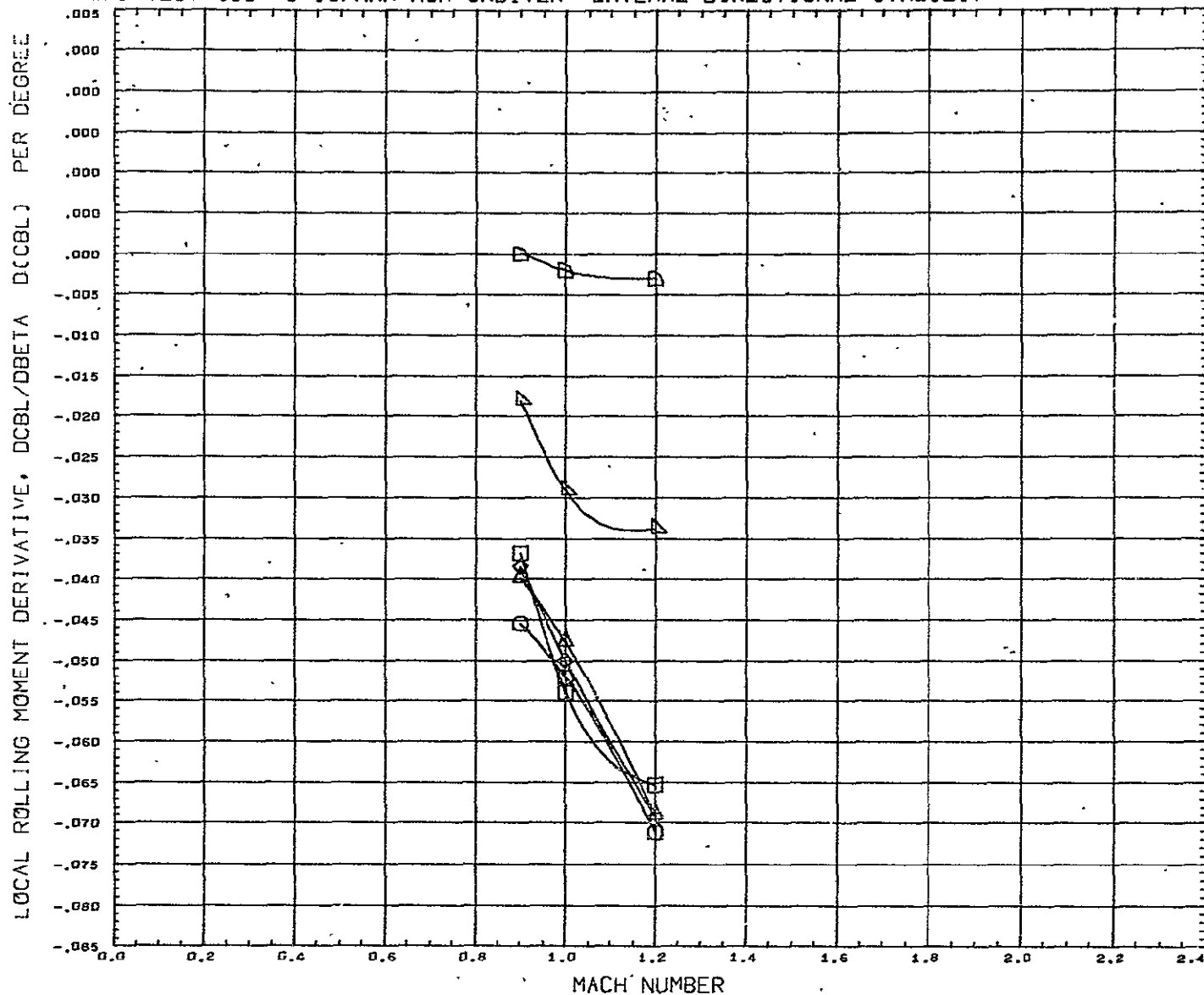
MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY



SYMBOL BETA
 - 2.000 ALPHA 0.120
 0.000
 2.000
 4.000
 6.000
 8.000 DATA HIST. CODE *EIG

REFERENCE INFORMATION
 REFS 1.3960 SQ.IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP - 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY

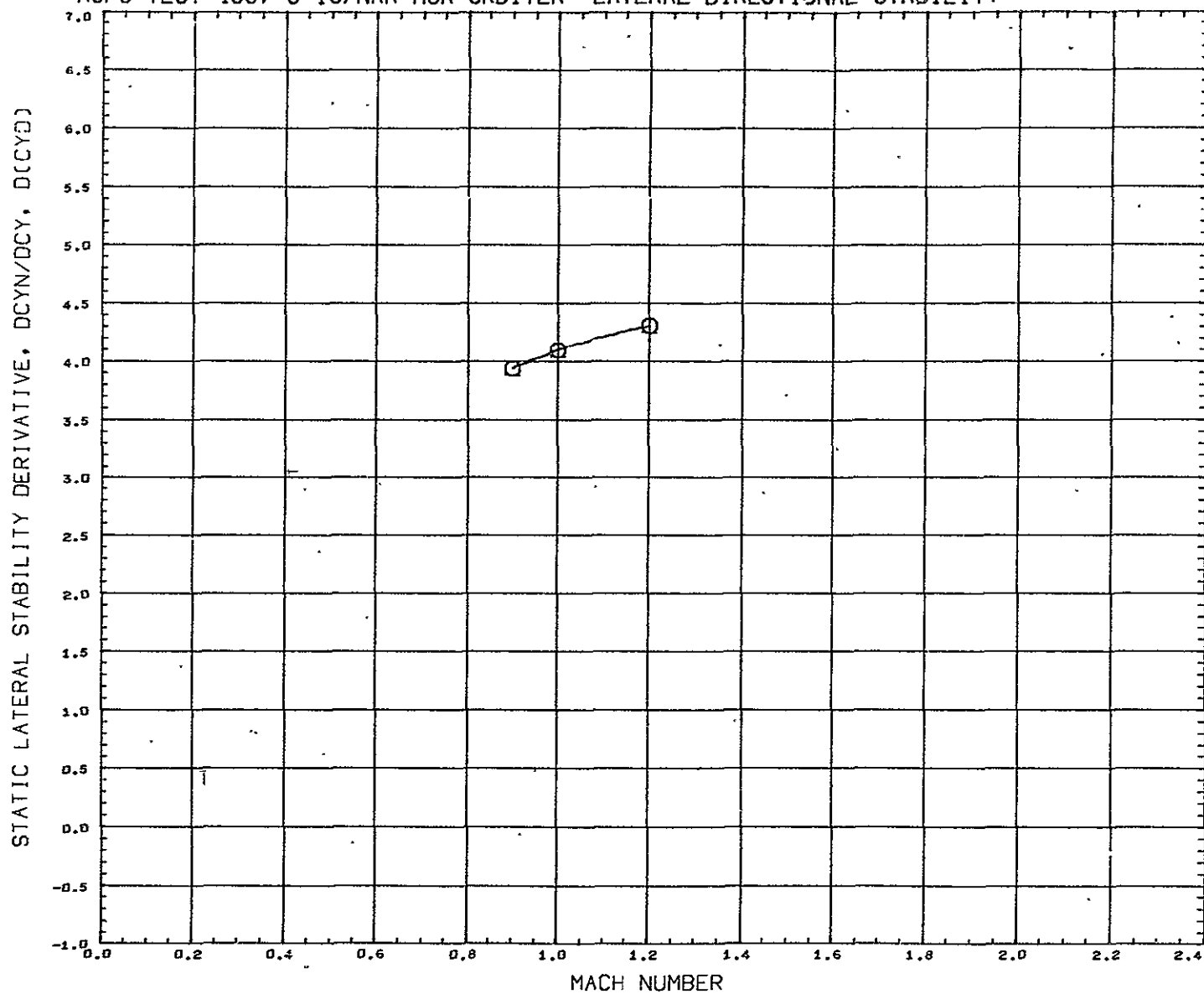


SYMBOL	BETA	ALPHA	PARAMETRIC VALUES
○	2.000	0.120	
△	0.000		
◇	2.000		
□	4.000		
▽	6.000		
◇	8.000		

DATA HIST. CODE #EIG

REFERENCE INFORMATION		
REFS	1.5960	SO.IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY



SYMBOL BETA PARAMETRIC VALUES
 O 0.000 ALPHA 0.120

REFERENCE INFORMATION
 REFS 1.3960 SQ.IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0300 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *E1

M485-MSFC-S1C NAR HCR ORBITER

OBFS3

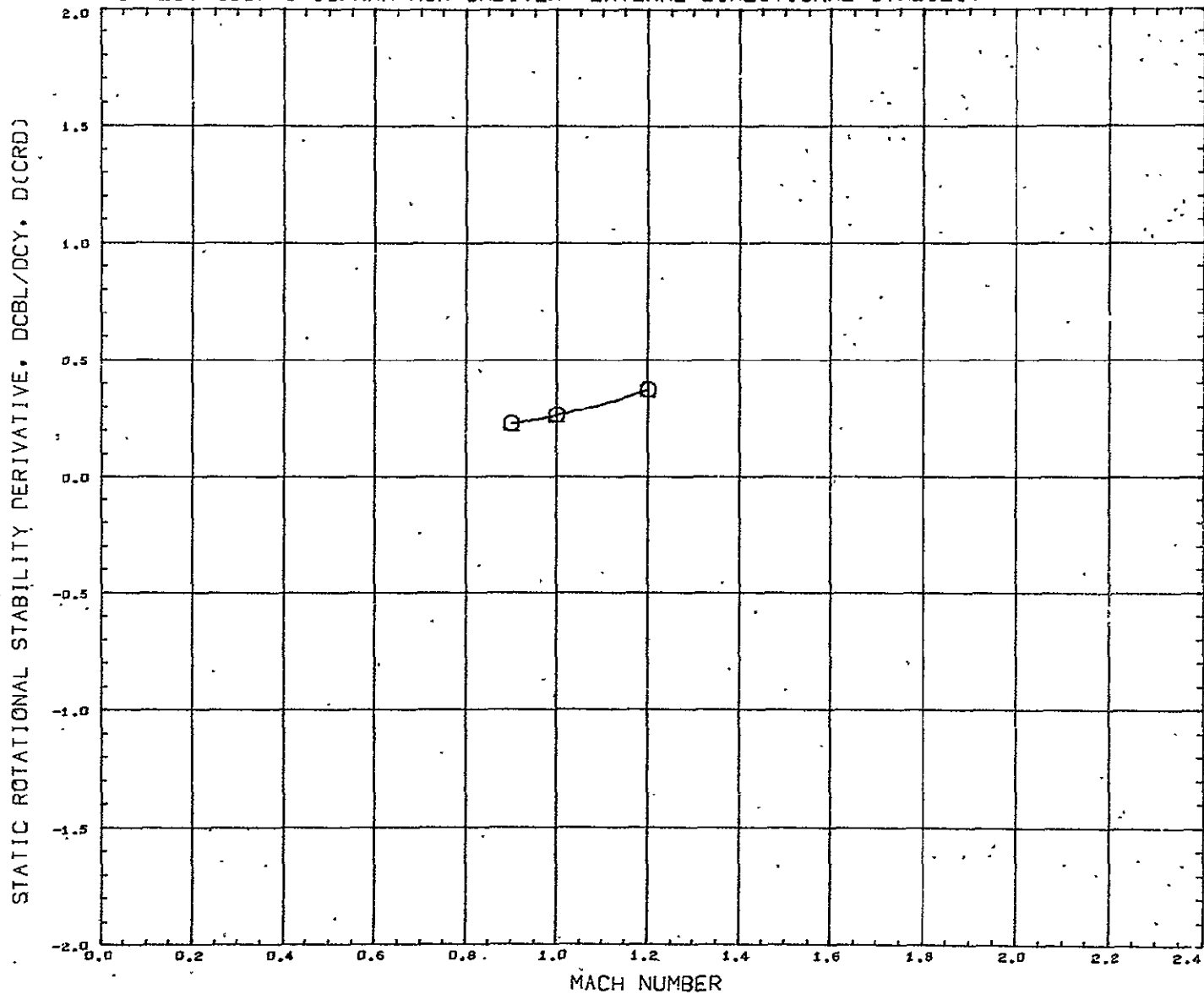
(P30132)

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240

MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY



SYMBOL: BETA 0.000 ALPHA 0.120
 PARAMETRIC VALUES

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE #EI

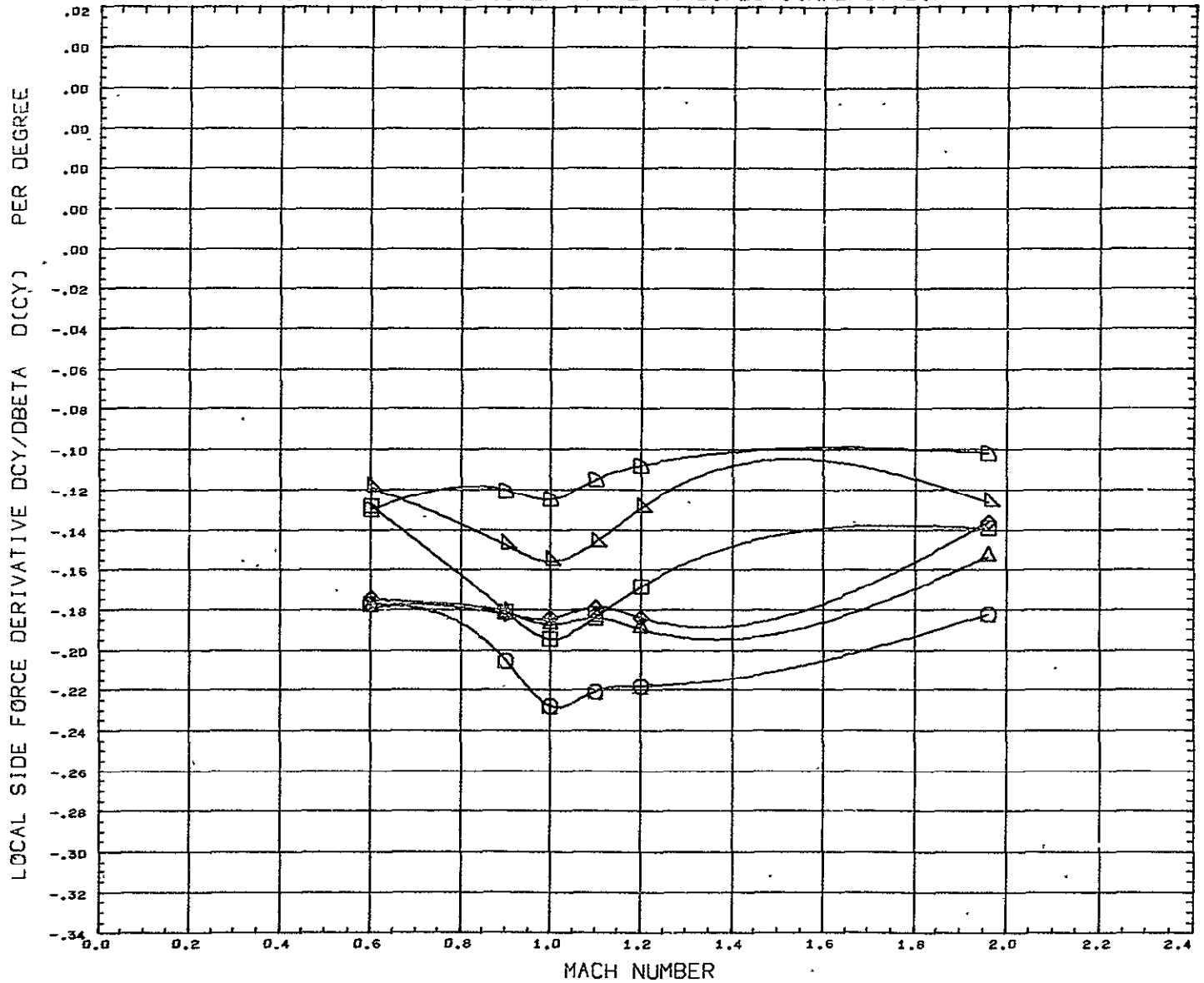
M485-MSFC-S1C NAR HCR ORBITER

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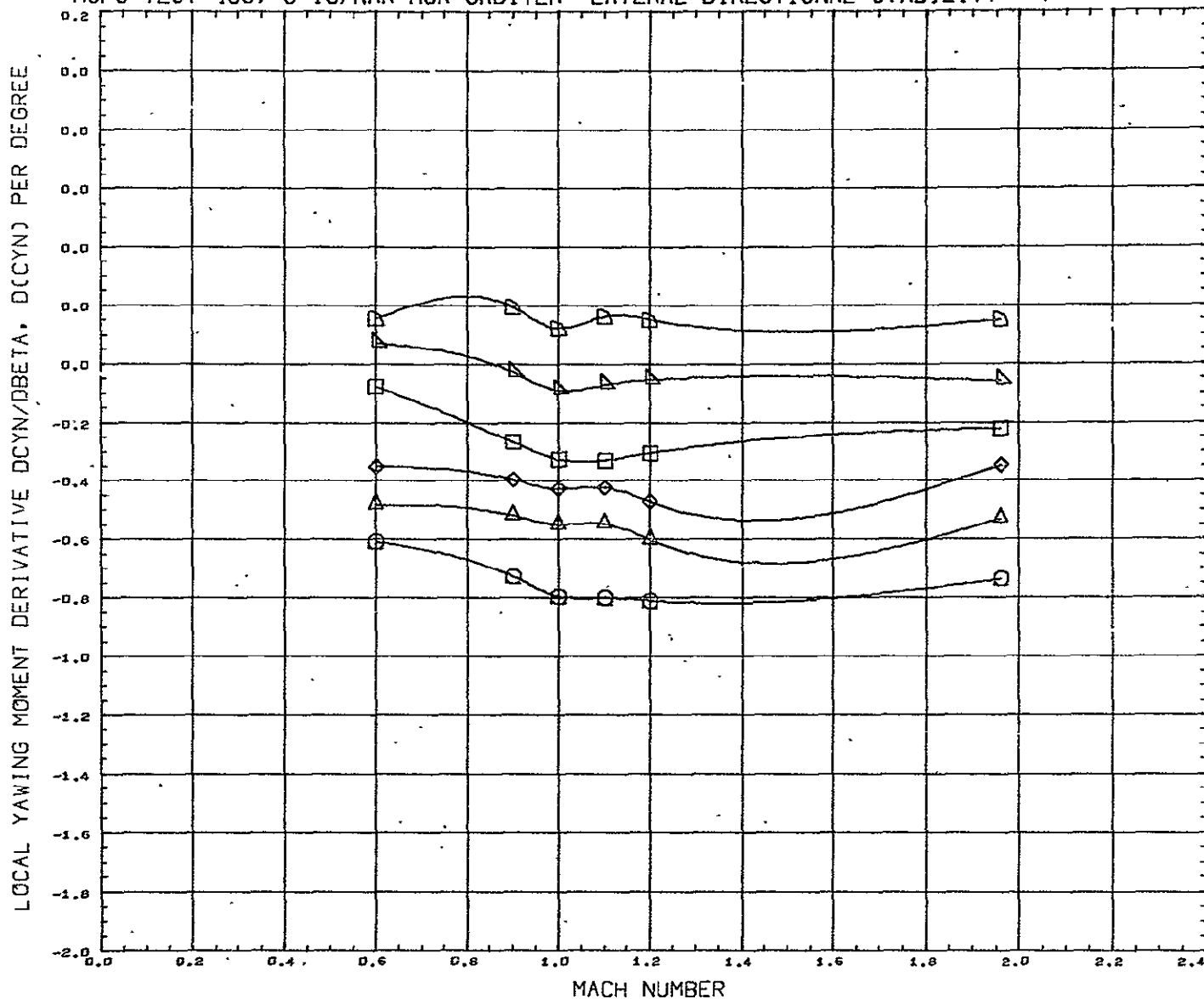
MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY



SYMBOL BETA ALPHA PARAMETRIC VALUES
 - 2.000 0.070
 0.000
 2.000
 4.000
 6.000
 8.000 DATA HIST. CODE #EIG

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0900 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY



SYMBOL	BETA	PARAMETRIC VALUES
○	2.000	ALPHA 0.070
△	4.000	
◇	6.000	
□	8.000	
◇	10.000	
△	12.000	

REFERENCE INFORMATION		
REFS	1.3960	50. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0003	IN
ZMRP	0.0000	IN
SCALE	0.0034	

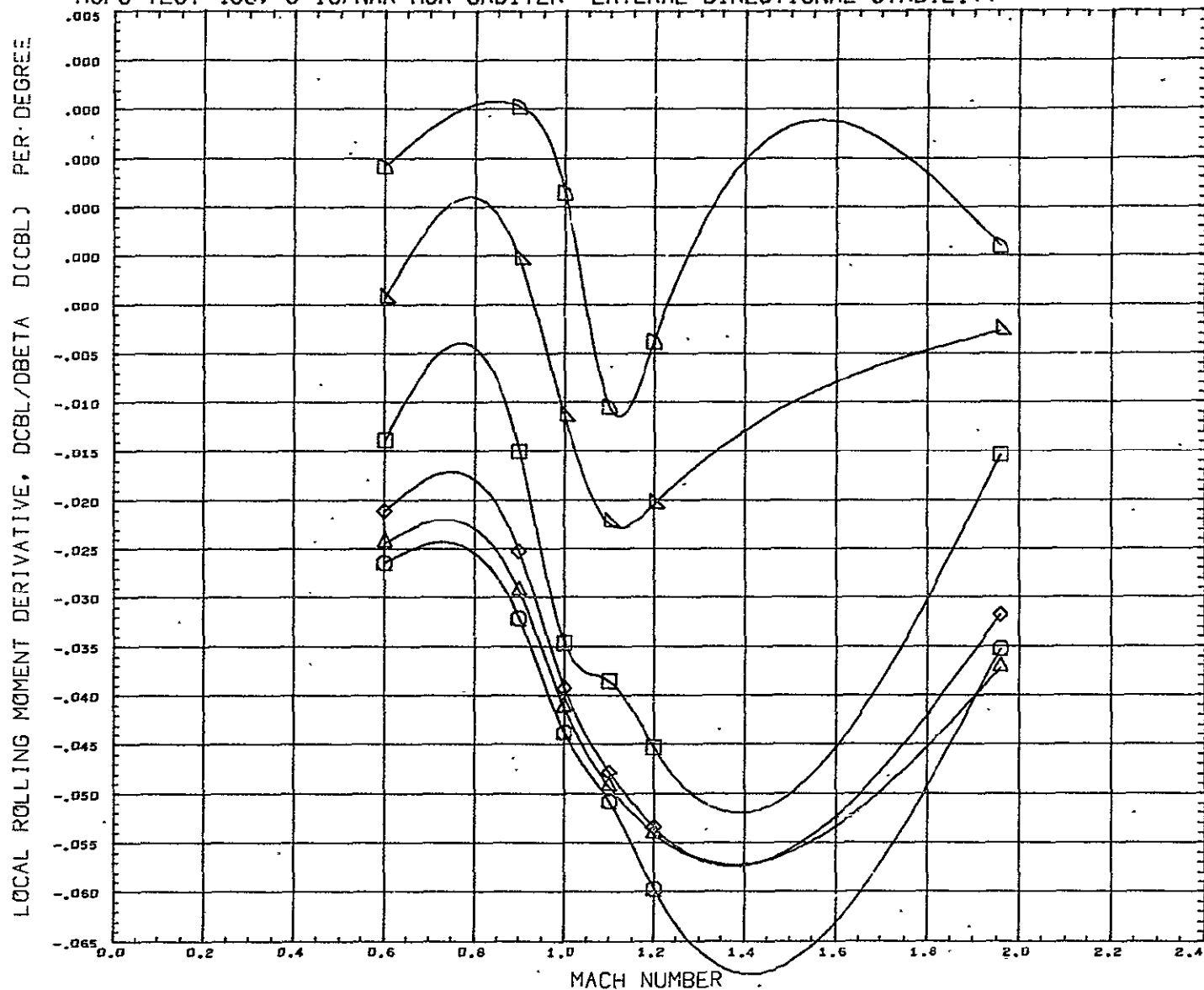
M485-MSFC-S1C NAR HCR ORBITER

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MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY

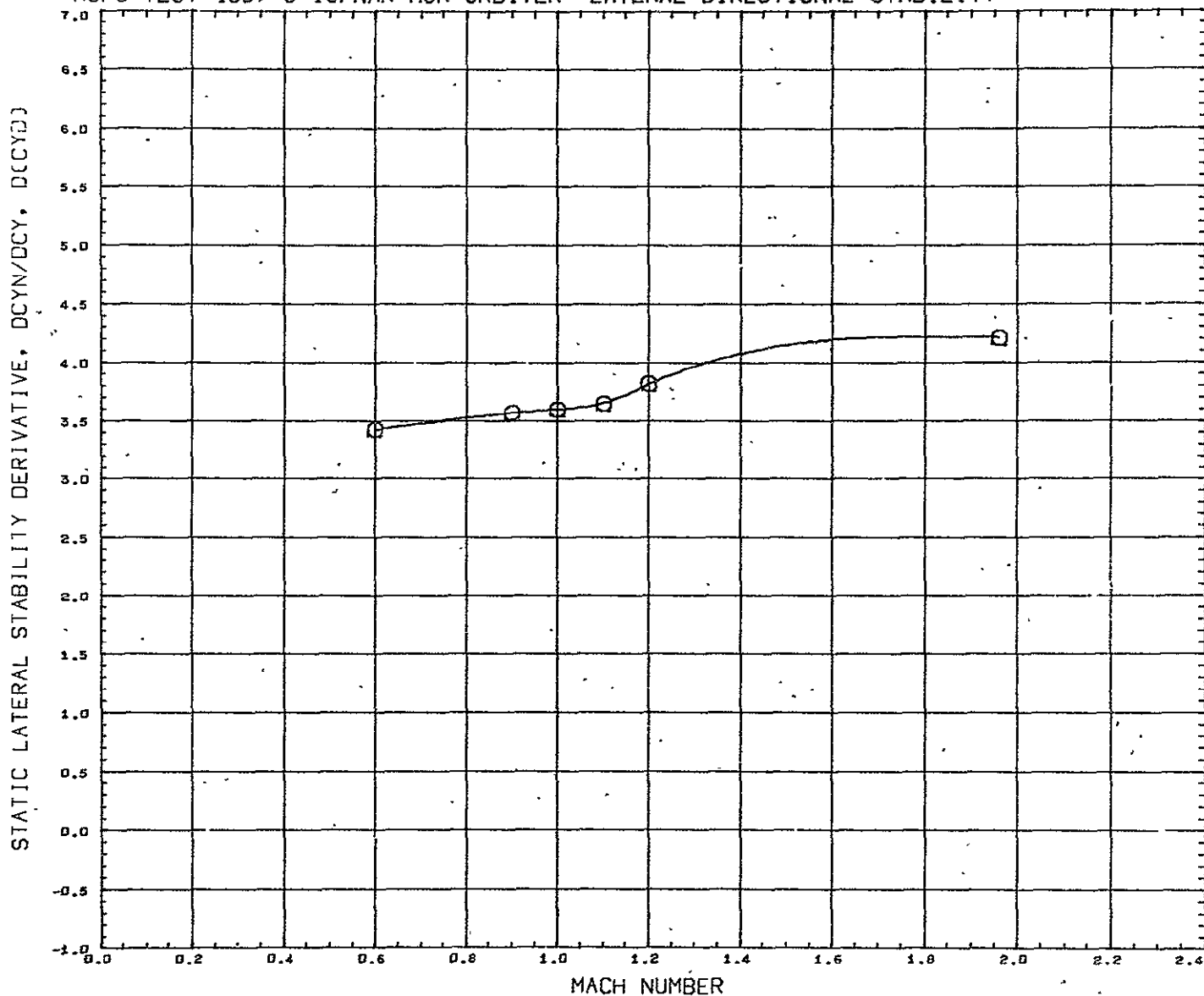


SYMBOL	BETA	ALPHA	PARAMETRIC VALUES
□	2.000	0.070	
△	0.000		
◇	2.000		
○	4.000		
◇	6.000		
◇	8.000		

DATA HIST. CODE *EIG

REFERENCE INFORMATION		
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REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.6370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY



SYMBOL BETA PARAMETRIC VALUES
 O 0.000 ALPHA 0.070

REFERENCE INFORMATION
 REFS 1.3960 SQ.IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034 IN

DATA HIST. CODE #EI

M485-MSFC-S1C NAR HCR ORBITER

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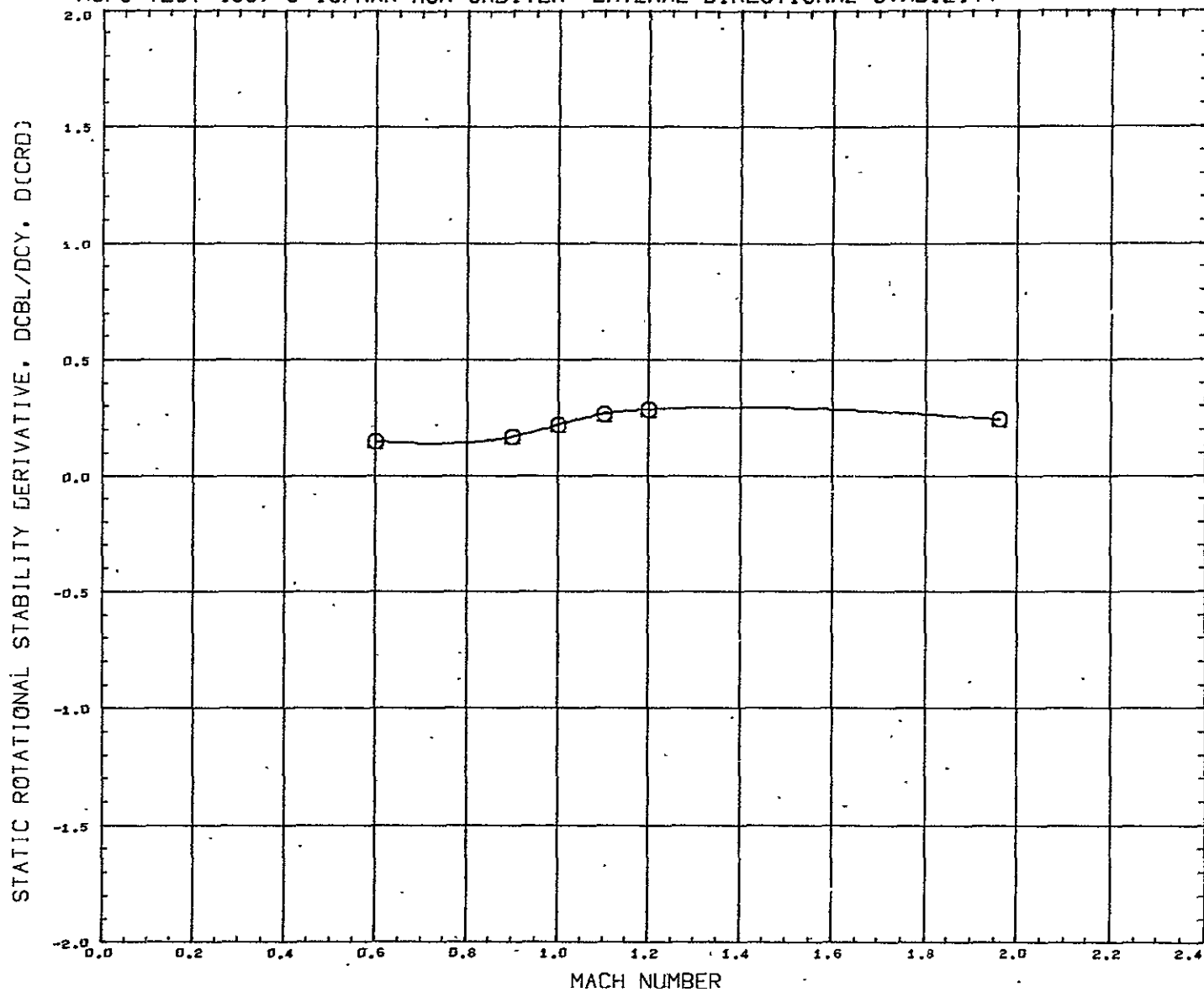
(P30202)

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245

MSFC TEST 485, S-1C/NAR HCR ORBITER- LATERAL-DIRECTIONAL STABILITY

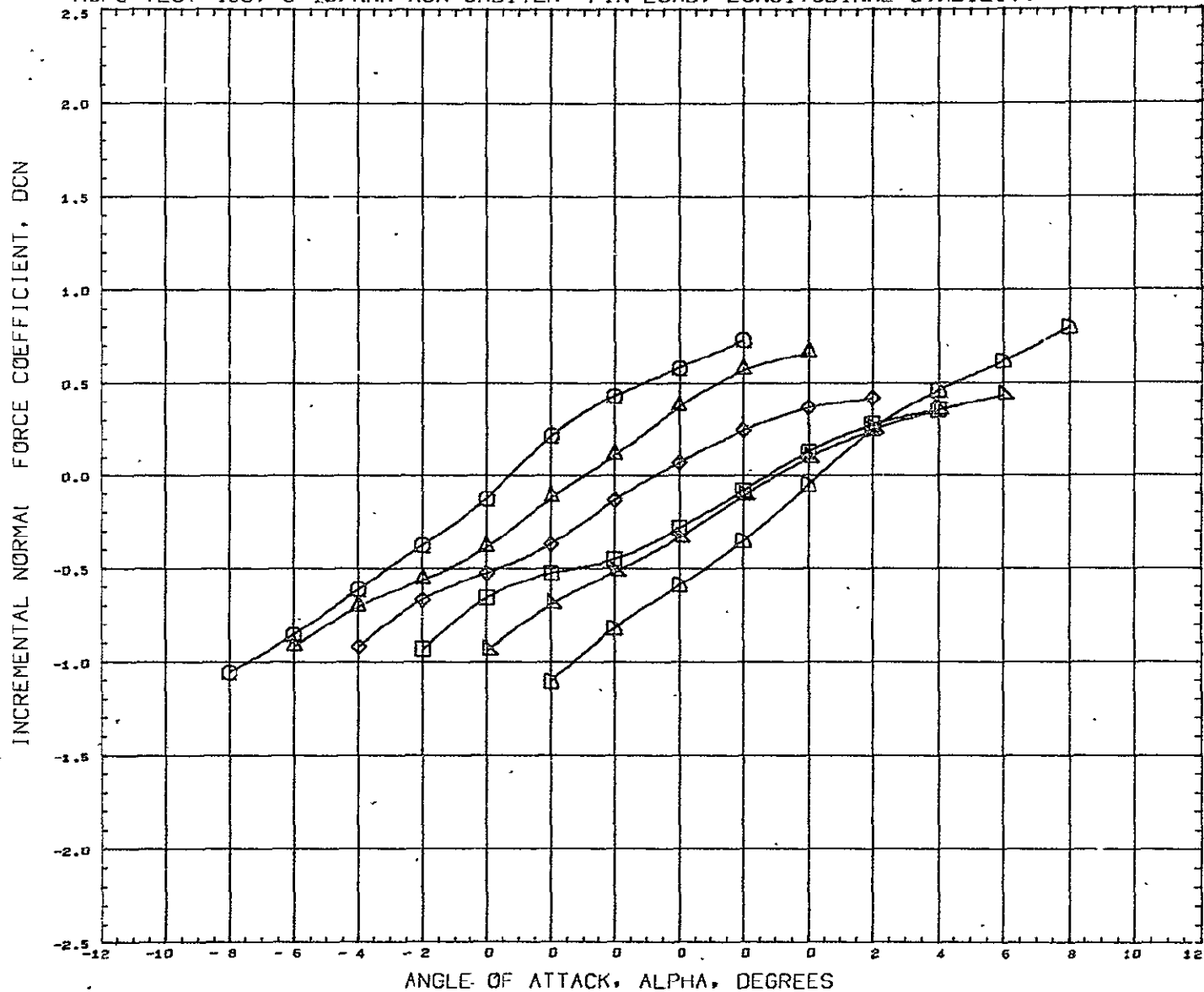


SYMBOL BETA PARAMETRIC VALUES
 O 0.000 ALPHA 0.070

REFERENCE INFORMATION
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 REFL 1.3330 IN
 REFB 1.3330 IN
 XHRP - 0.0270 IN
 YHRP 0.0000 IN
 ZHRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE #EI

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



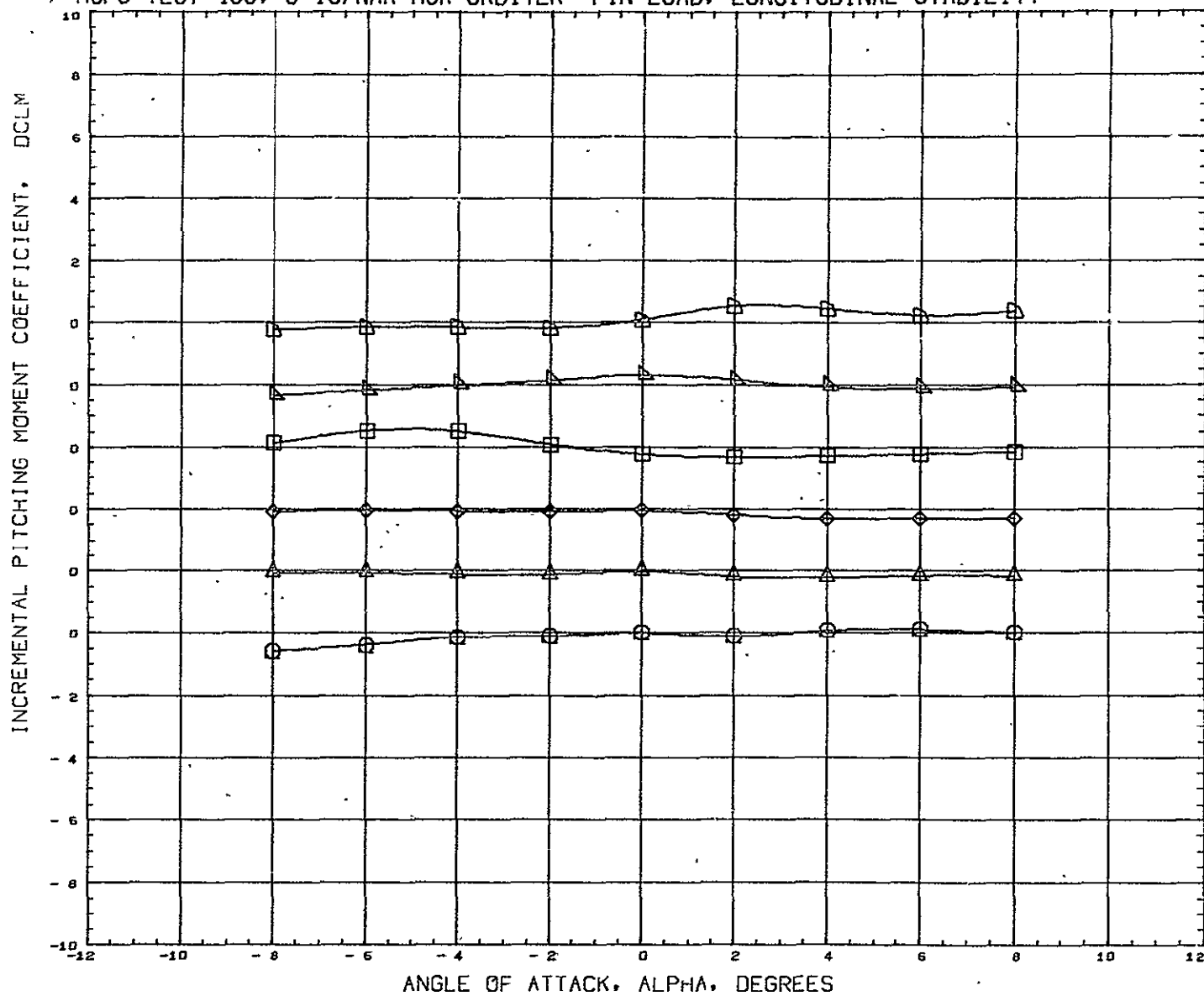
SYMBOL	MACH	PARAMETRIC VALUES
○	0.600	0.000
◇	0.900	
△	1.000	
□	1.100	
▽	1.200	
◇	1.960	

DATA HIST. CODE *EI*CH

REFERENCE INFORMATION

REFS	1.3960	50. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY

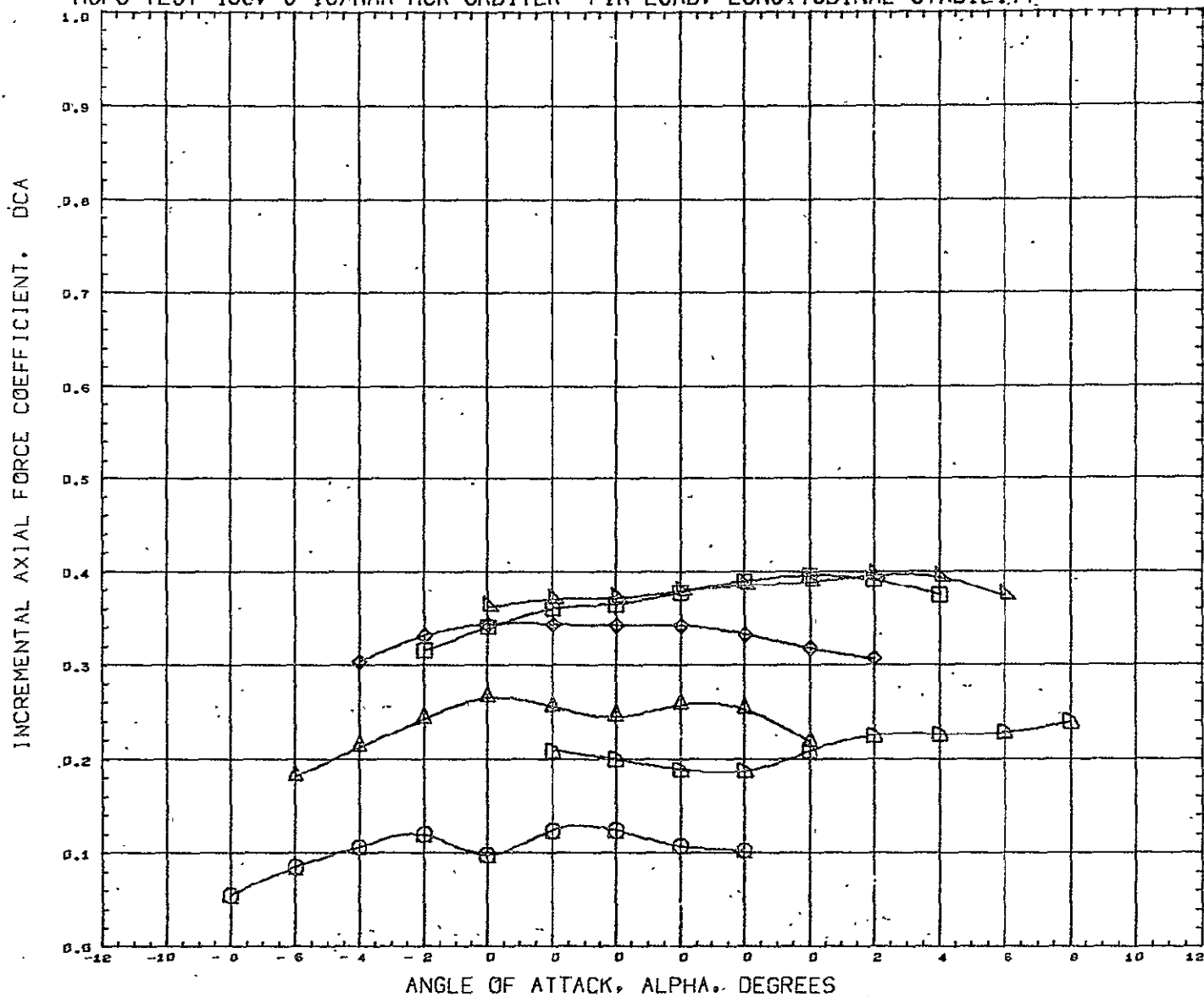


SYMBOL	MACH	PARAMETRIC VALUES
□	0.600	0.000
◇	0.900	
◇	1.000	
◇	1.100	
◇	1.200	
◇	1.960	

DATA HIST. CODE *EI#CM

REFERENCE INFORMATION		
REFS	1.3960	50. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XNRF	0.0370	IN
YNRF	0.0000	IN
ZNRF	0.0000	IN
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY.



SYMBOL MACH PARAMETRIC VALUES

0.600 0.000

0.900

1.000

1.100

1.200

1.960 DATA HIST. CODE *EI*CH

REFERENCE INFORMATION

REFS 1.3960 SQ. IN.

REFL 1.3330 IN

REFB 1.3330 IN

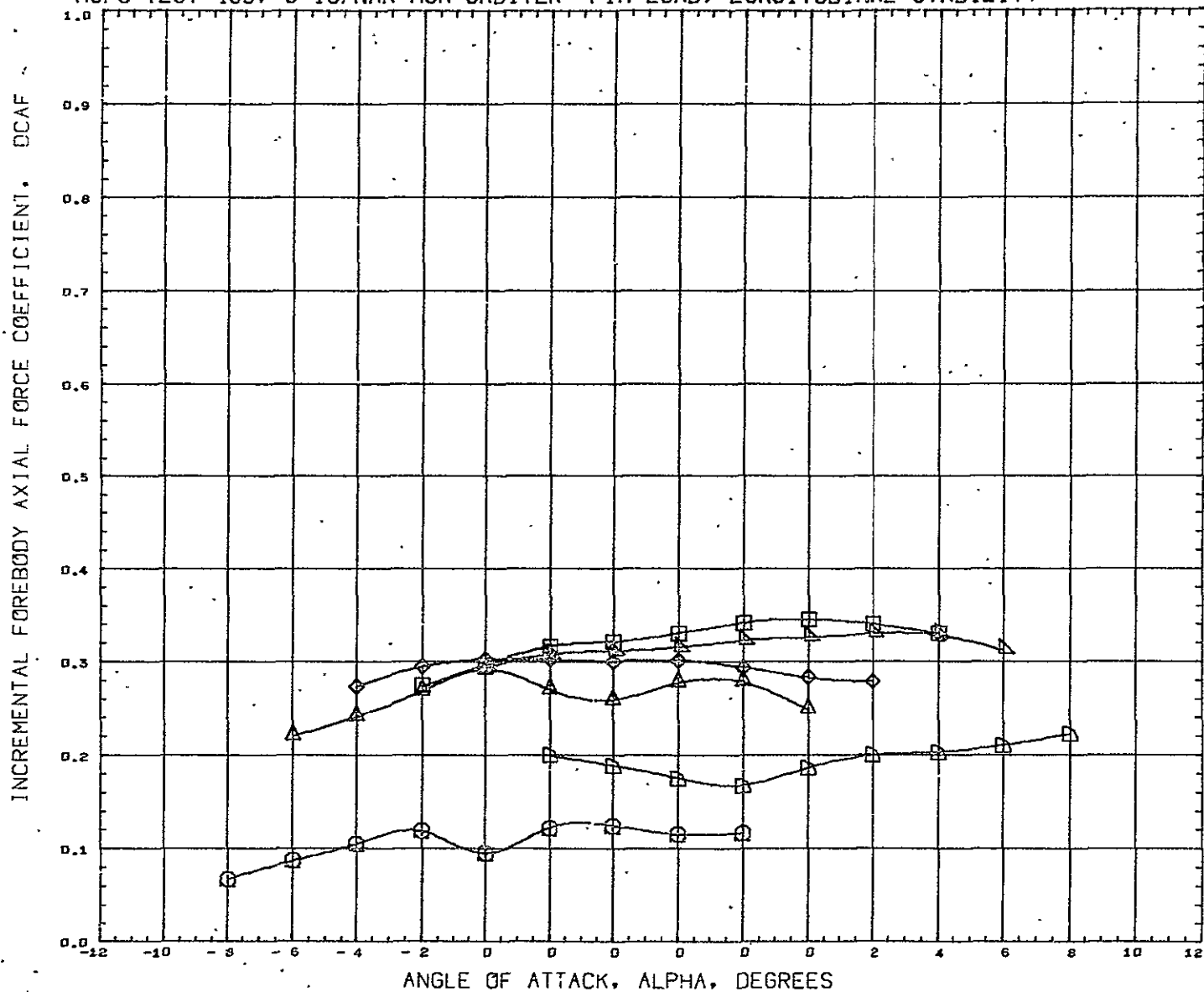
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YMRP 0.0000 IN

ZMRP 0.0000 IN

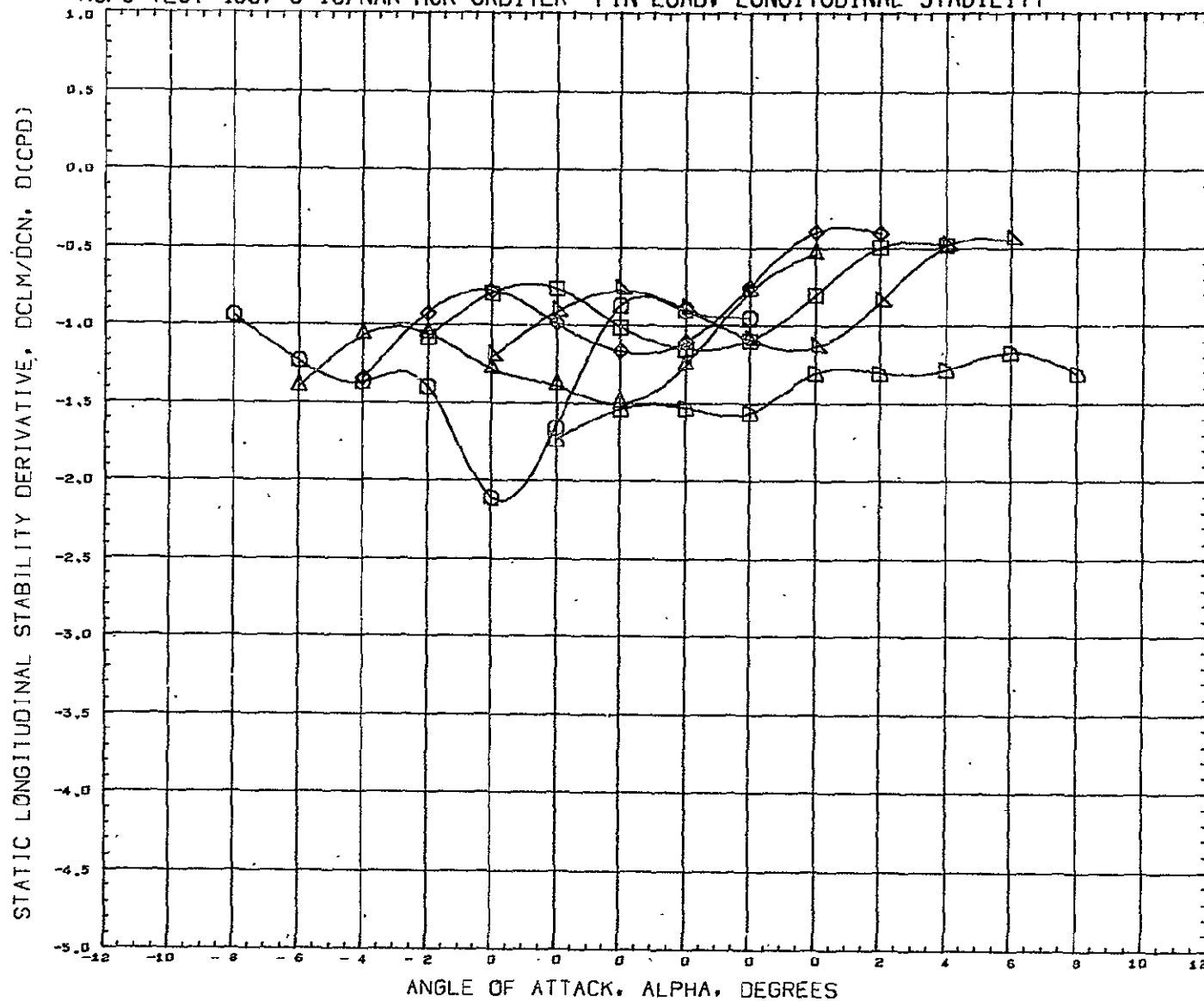
SCALE 0.0034

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES	REFERENCE INFORMATION
○	0.600	0.000	REFS 1.3960 SQ. IN.
◇	0.900		REFL 1.3330 IN
△	1.000		REFB 1.3330 IN
□	1.100		XMRP 0.0370 IN
+	1.200		YMRP 0.0000 IN
×	1.960		ZMRP 0.0000 IN
		DATA HIST. CODE #EI#CH	SCALE 0.0034

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY

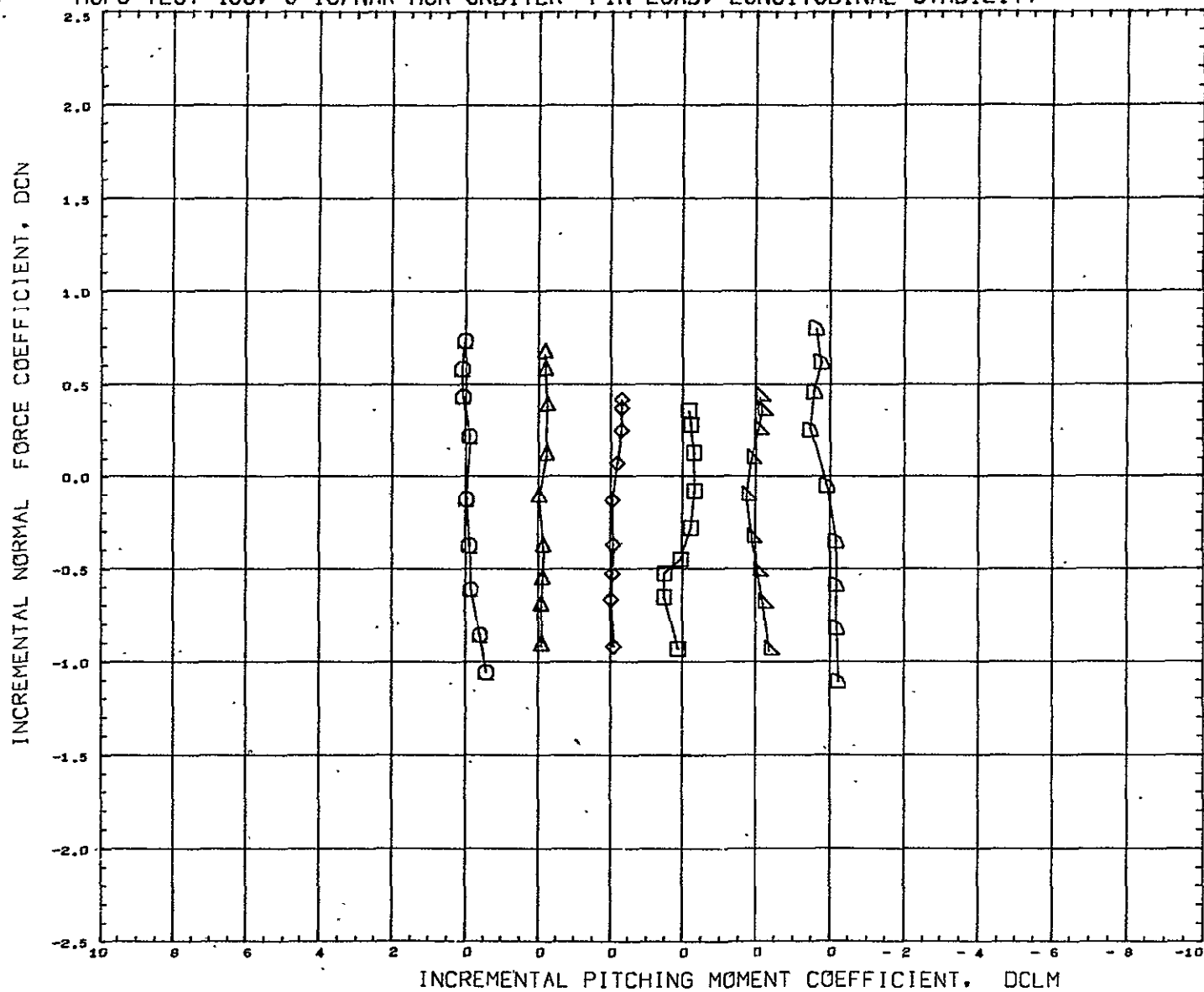


SYMBOL	MACH	PARAMETRIC VALUES
○	0.600	0.000
◇	0.900	
◇	1.000	
◇	1.100	
◇	1.200	
◇	1.960	

DATA HIST. CODE #EI#CM

REFERENCE INFORMATION		
REFS	1.3960	SG.IN.
REFL	1.3330	IN
REF6	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY

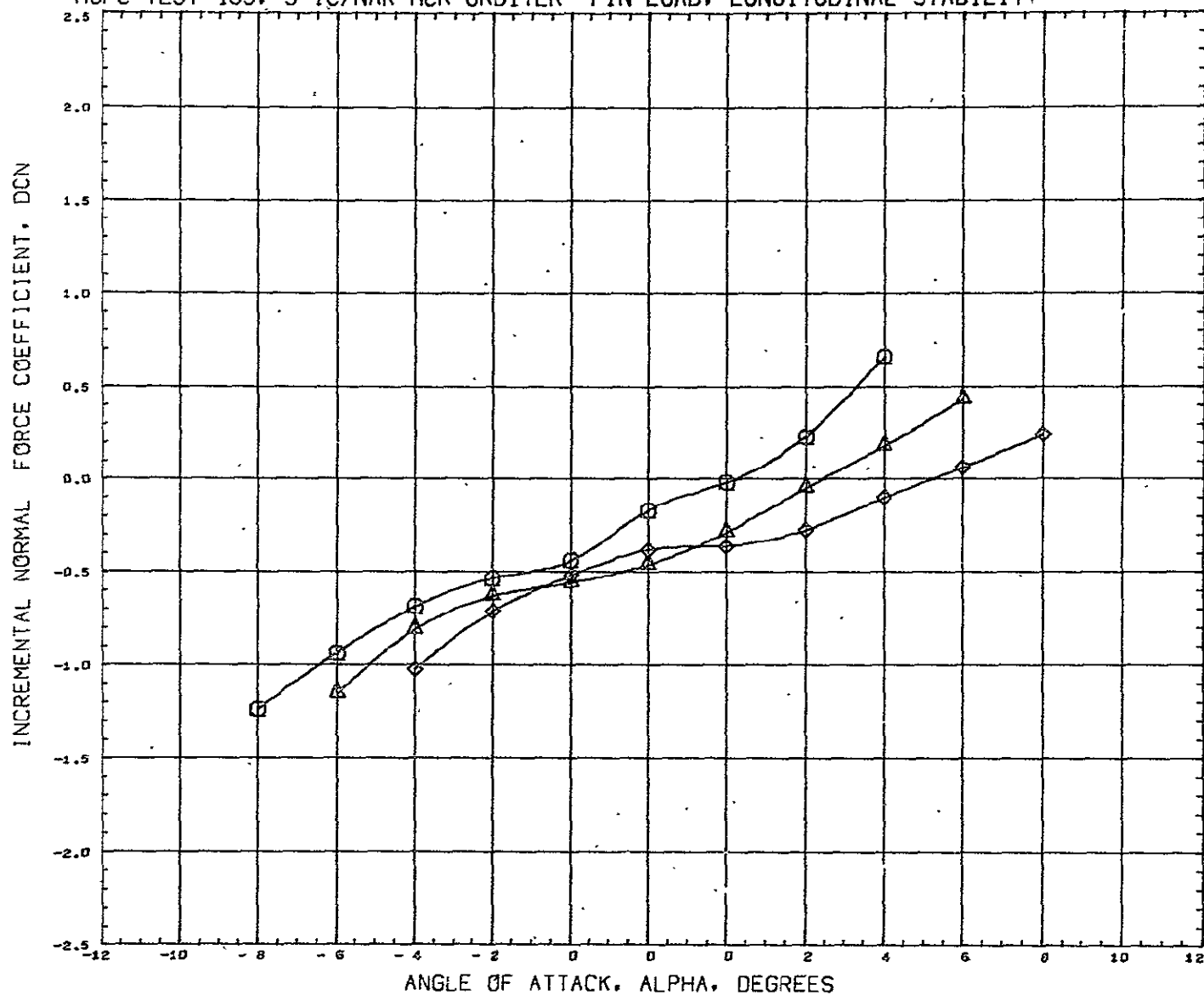


SYMBOL	MACH	PARAMETRIC VALUES
○	0.600	0.000
◇	0.900	
△	1.000	
□	1.100	
▽	1.200	
◇	1.960	

DATA HIST. CODE *EI*CH

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

MSFC TEST 485. S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



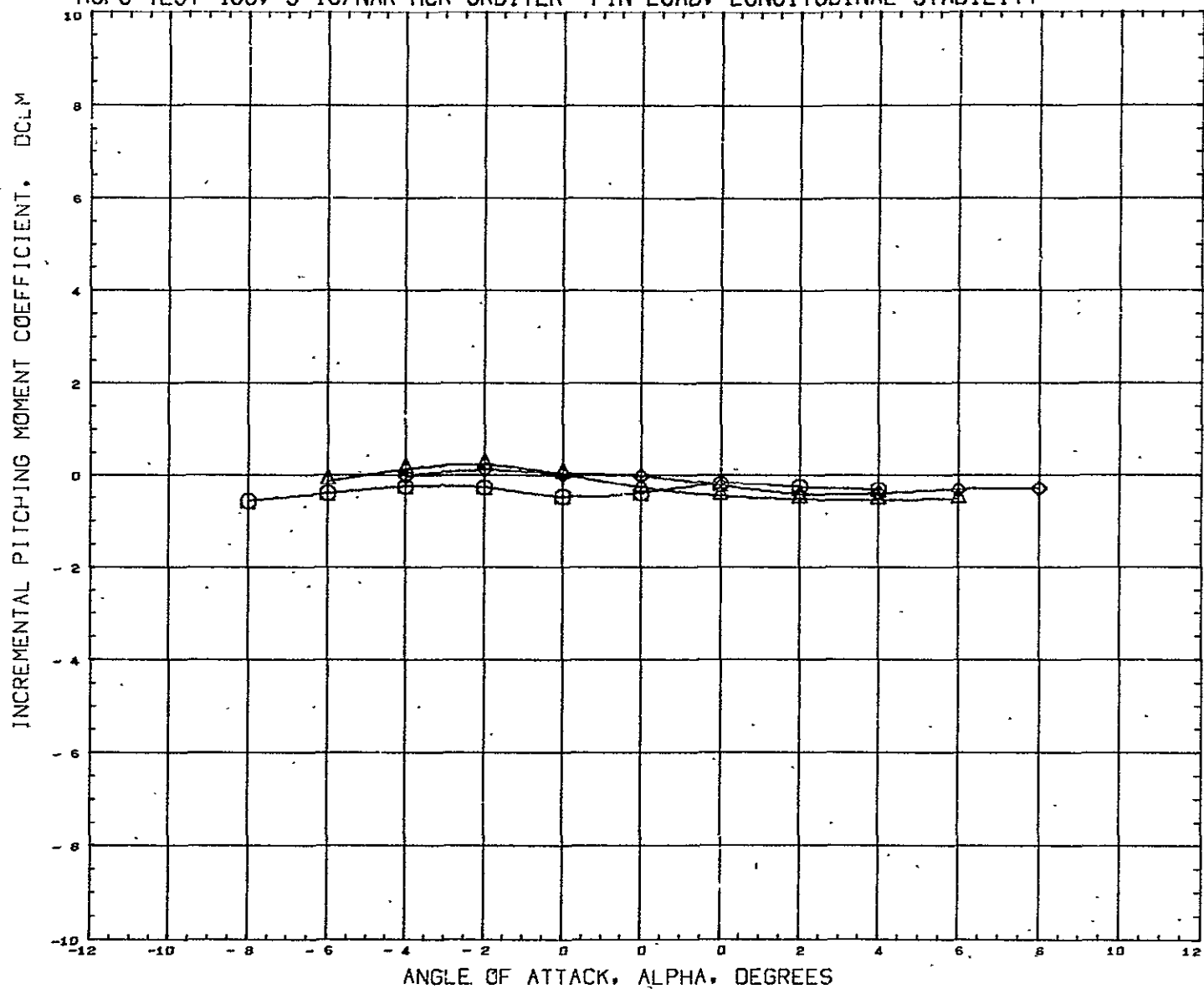
SYMBOL MACH
 ○ 0.900
 △ 1.000
 ◇ 1.200

PARAMETRIC VALUES
 0.000

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP - 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *EI*CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY

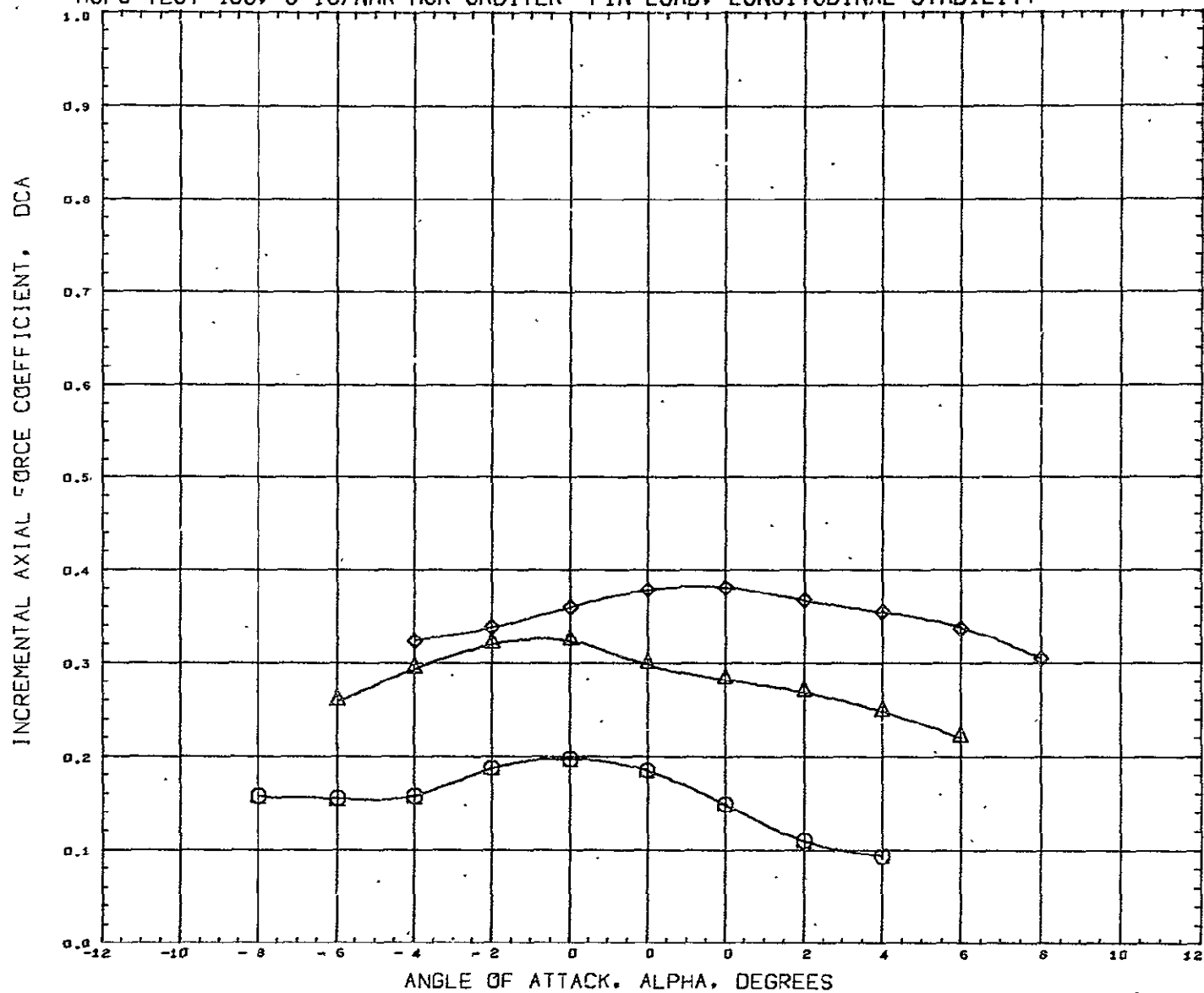


SYMBOL MACH PARAMETRIC VALUES
 ○ 0.900 0.000
 △ 1.000
 ◇ 1.200

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *EI*CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY

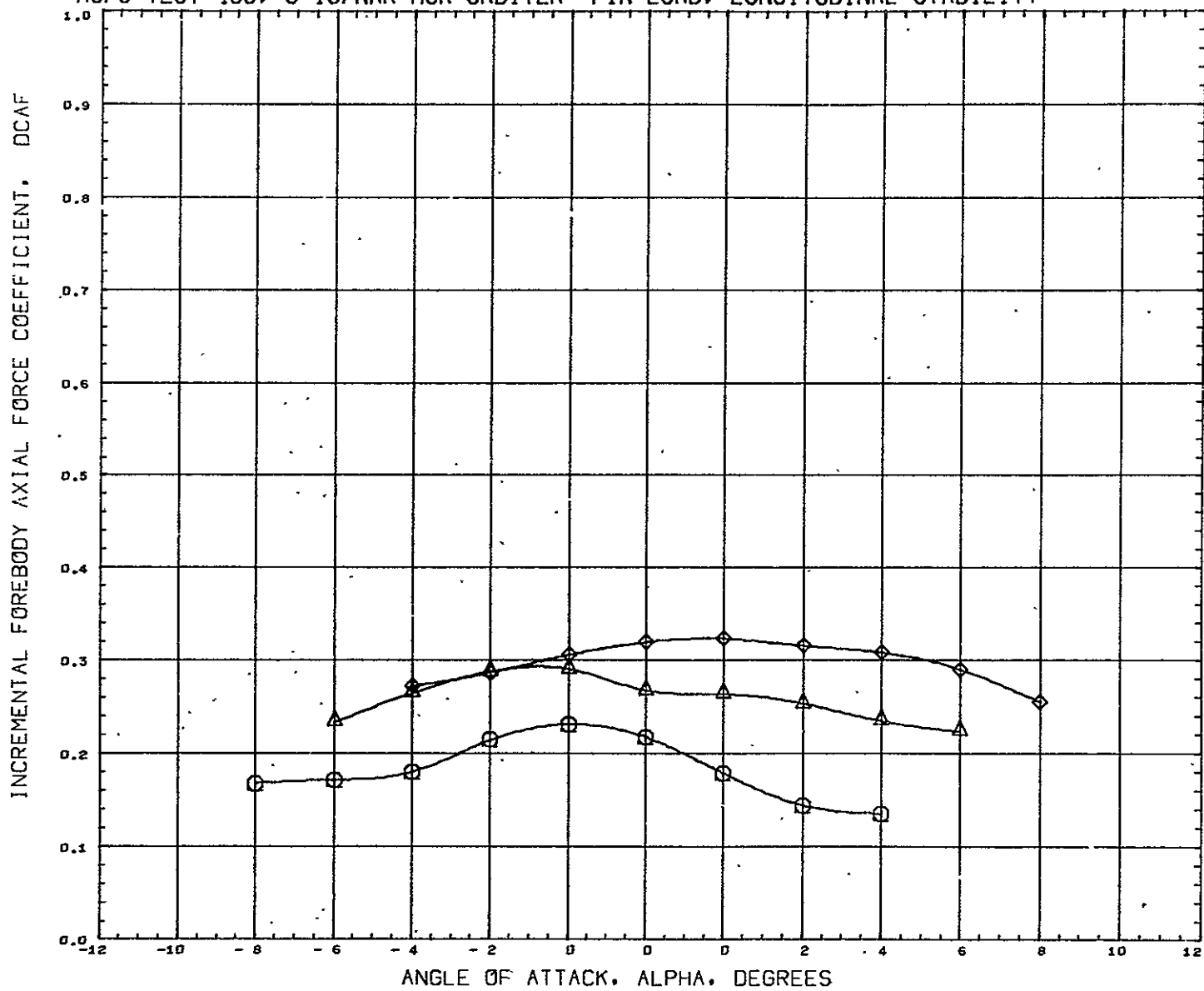


SYMBOL MACH PARAMETRIC VALUES
 ○ 0.900 0.000
 △ 1.000
 ◇ 1.200

REFERENCE INFORMATION
 REFS 1.3960 SO.IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *EI*CM

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



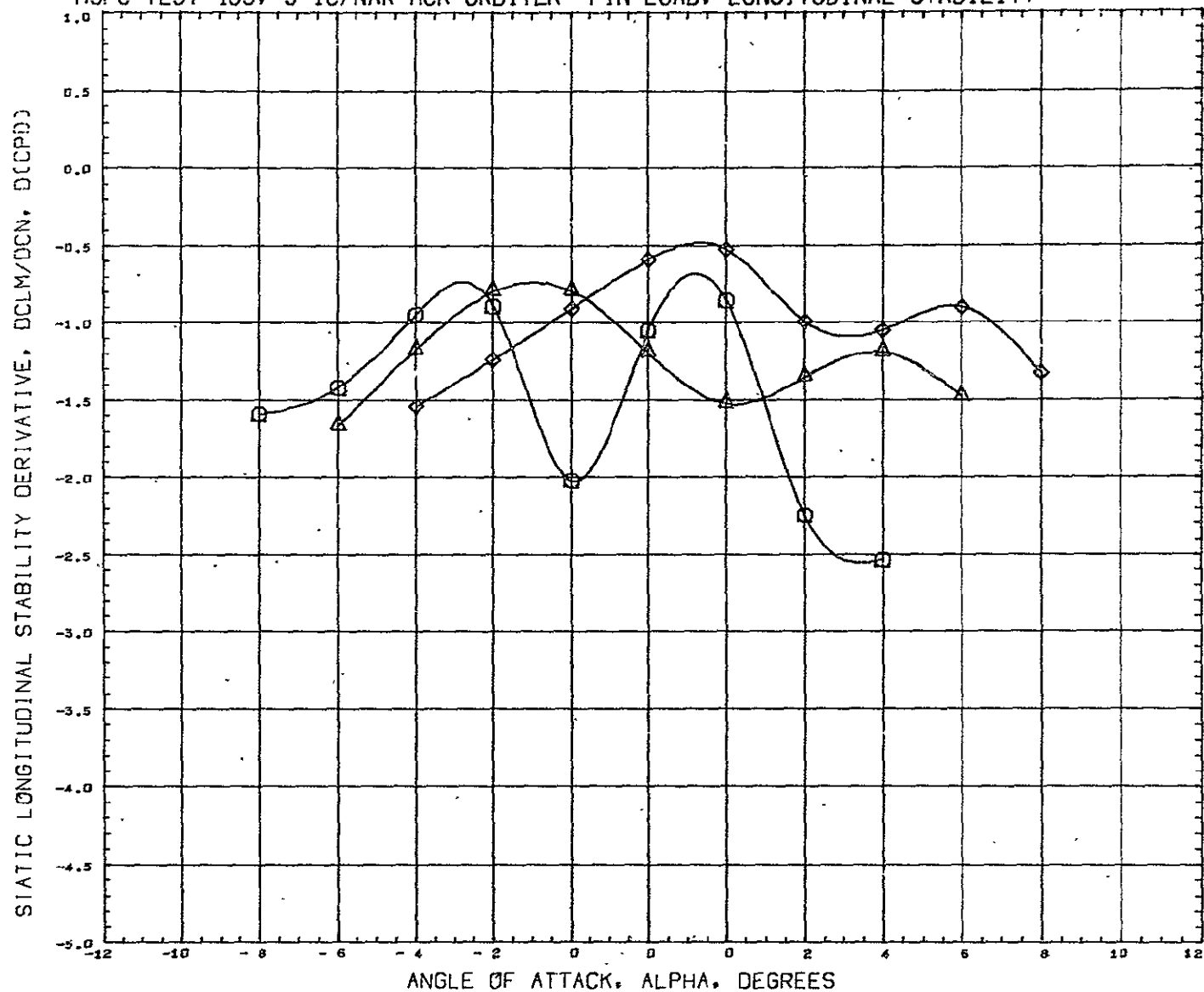
SYMBOL MACH
 ○ 0.900
 △ 1.000
 ◇ 1.200

PARAMETRIC VALUES
 0.000

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP - 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *EI*CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY

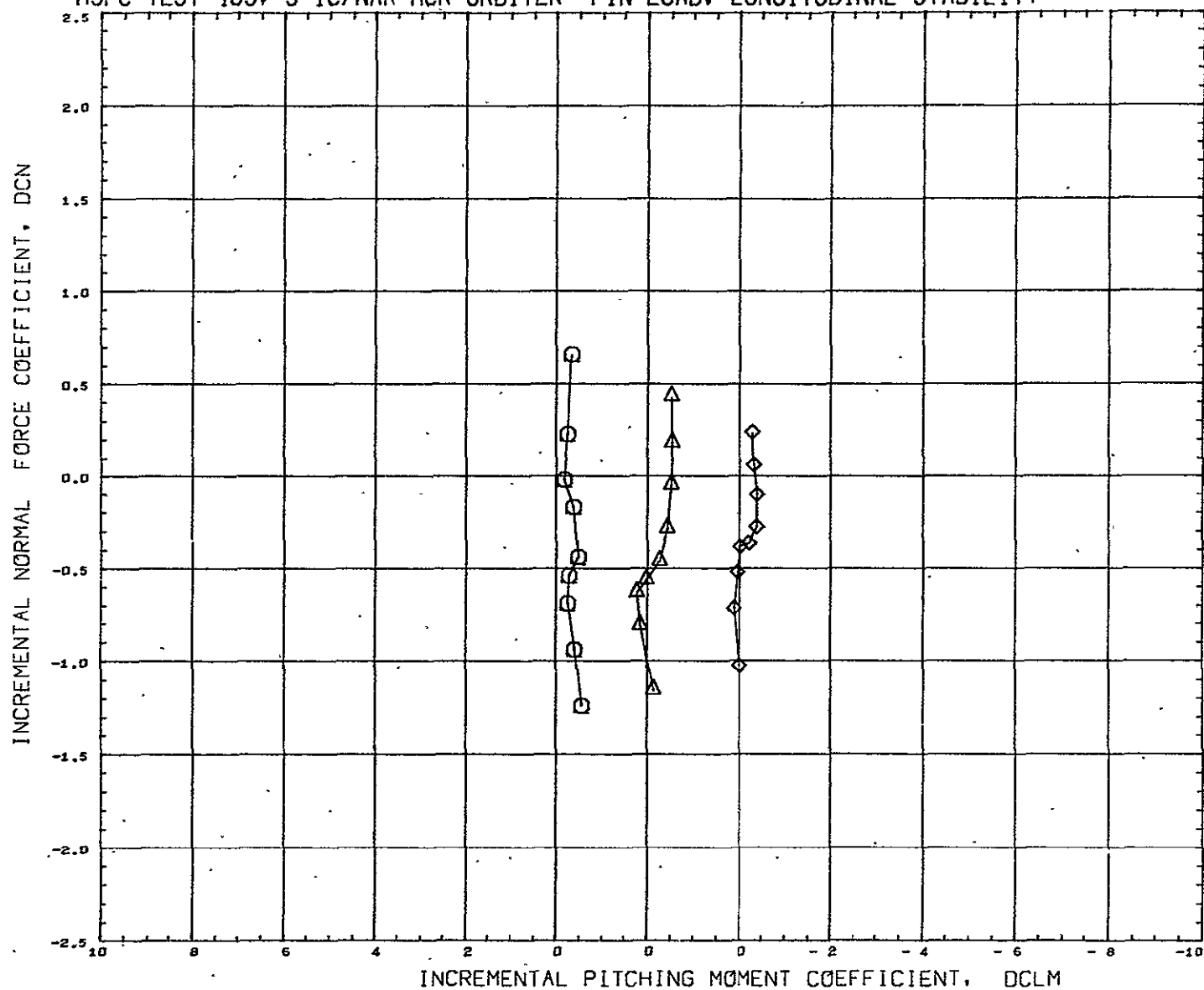


SYMBOL	MACH	PARAMETRIC VALUES
$\square$	0.900	0.000
$\triangle$	1.000	
$\diamond$	1.200	

DATA HIST. CODE *EI*CM

REFERENCE INFORMATION		
REFS	1.3960	SO. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



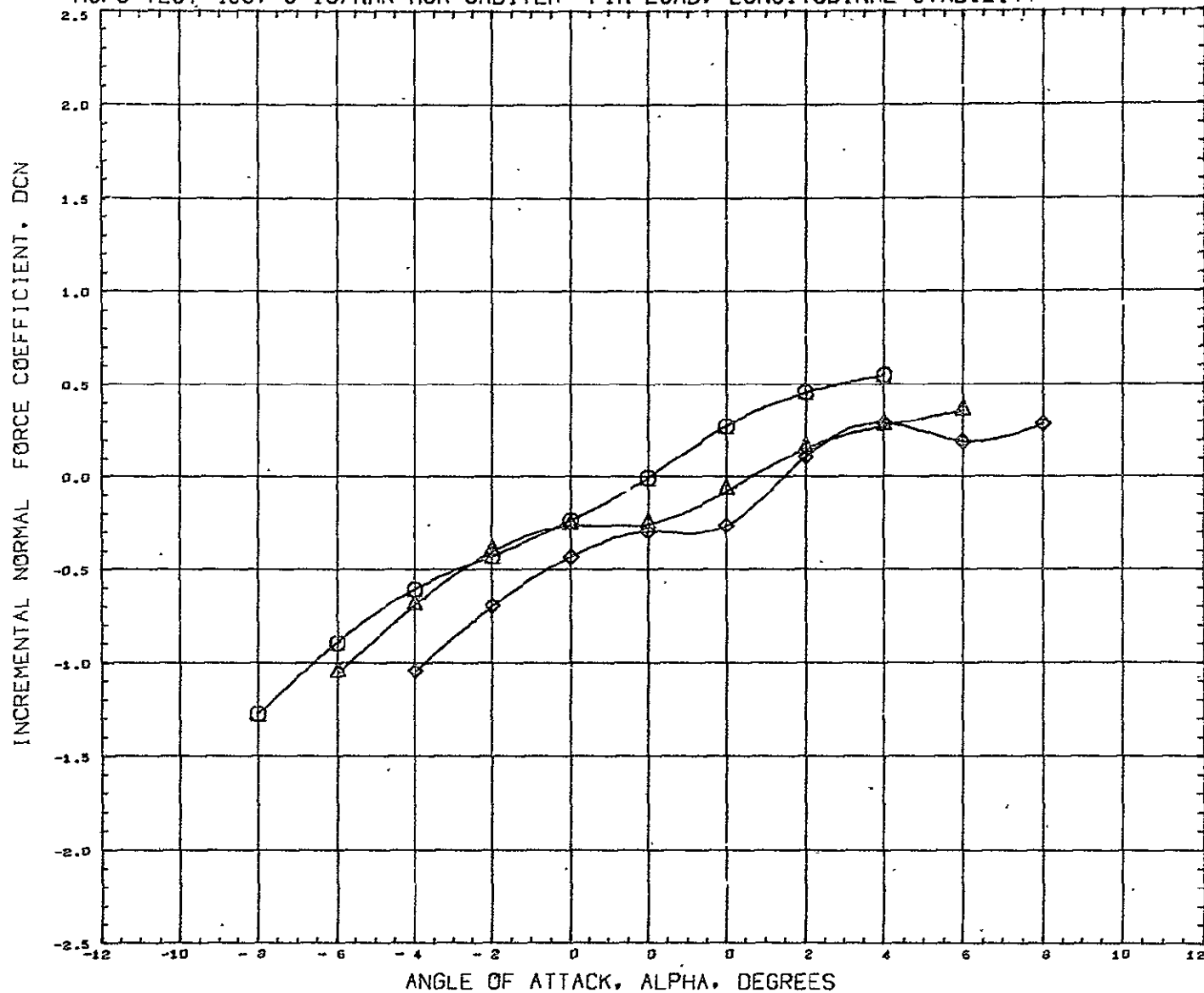
SYMBOL MACH
 ○ 0.900
 △ 1.000
 ◇ 1.200

PARAMETRIC VALUES
 0.000

REFERENCE INFORMATION
 REFS 1.3960 SQ.IN.
 REFL 1.3330 IN
 REFD 1.3330 IN
 XHRF - 0.0370 IN
 YHRF 0.0000 IN
 ZHRF 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE #EI*CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



SYMBOL MACH PARAMETRIC VALUES

○ 0.900 0.000

△ 1.000

◇ 1.200

REFERENCE INFORMATION

REFS 1.3960 SQ. IN.

REFL 1.3330 IN

REFS 1.3330 IN

XHRF 0.035C IN

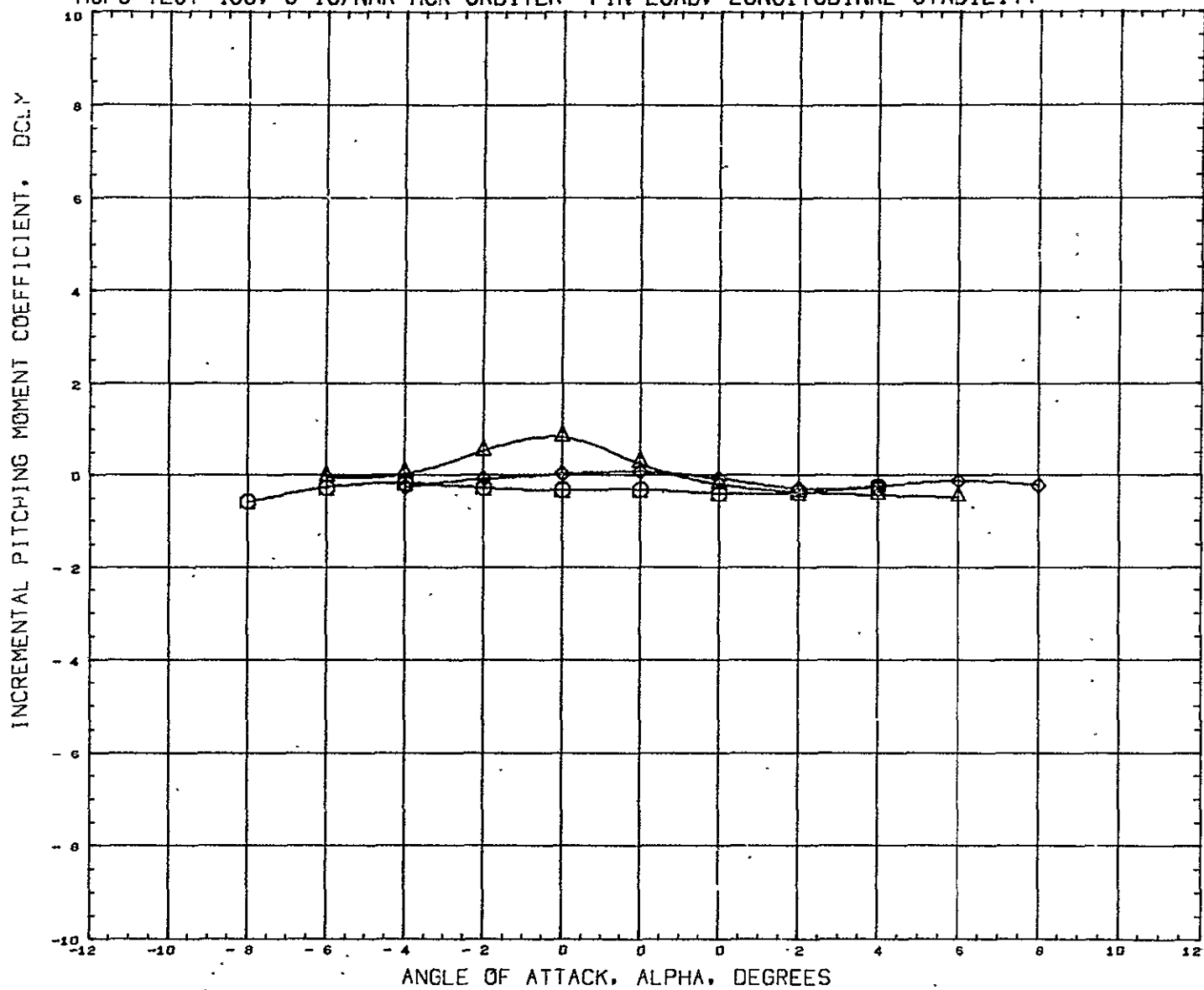
YHRF 0.0000 IN

ZHRF 0.0000 IN

SCALE 0.0034 IN

DATA HIST. CODE *EI*CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



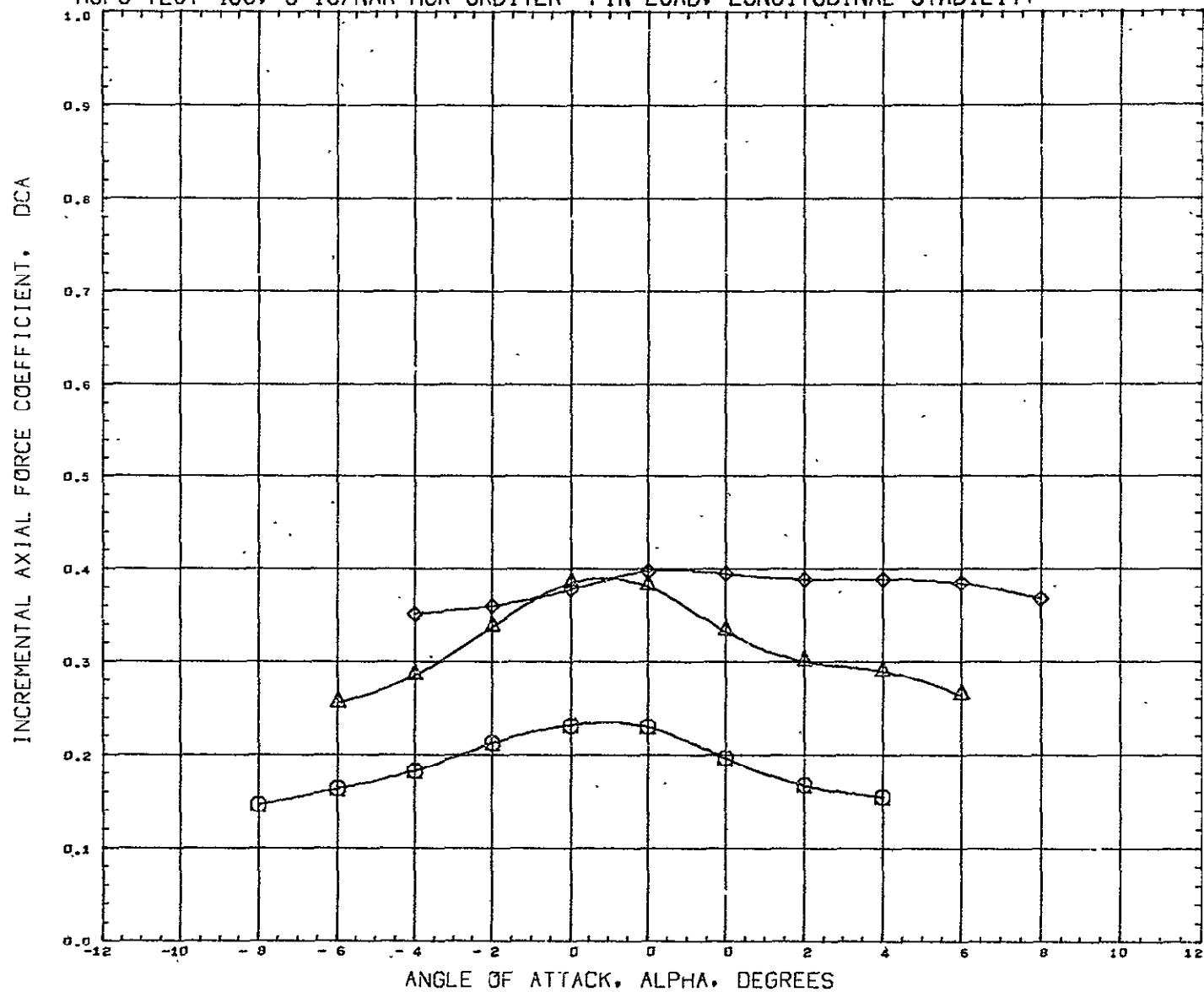
SYMBOL MACH
 □ 0.900
 △ 1.000
 ◇ 1.200

PARAMETRIC VALUES
 0.000

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL -1.3330 IN
 REFB 1.3330 IN
 XMRP - 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *EI*CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



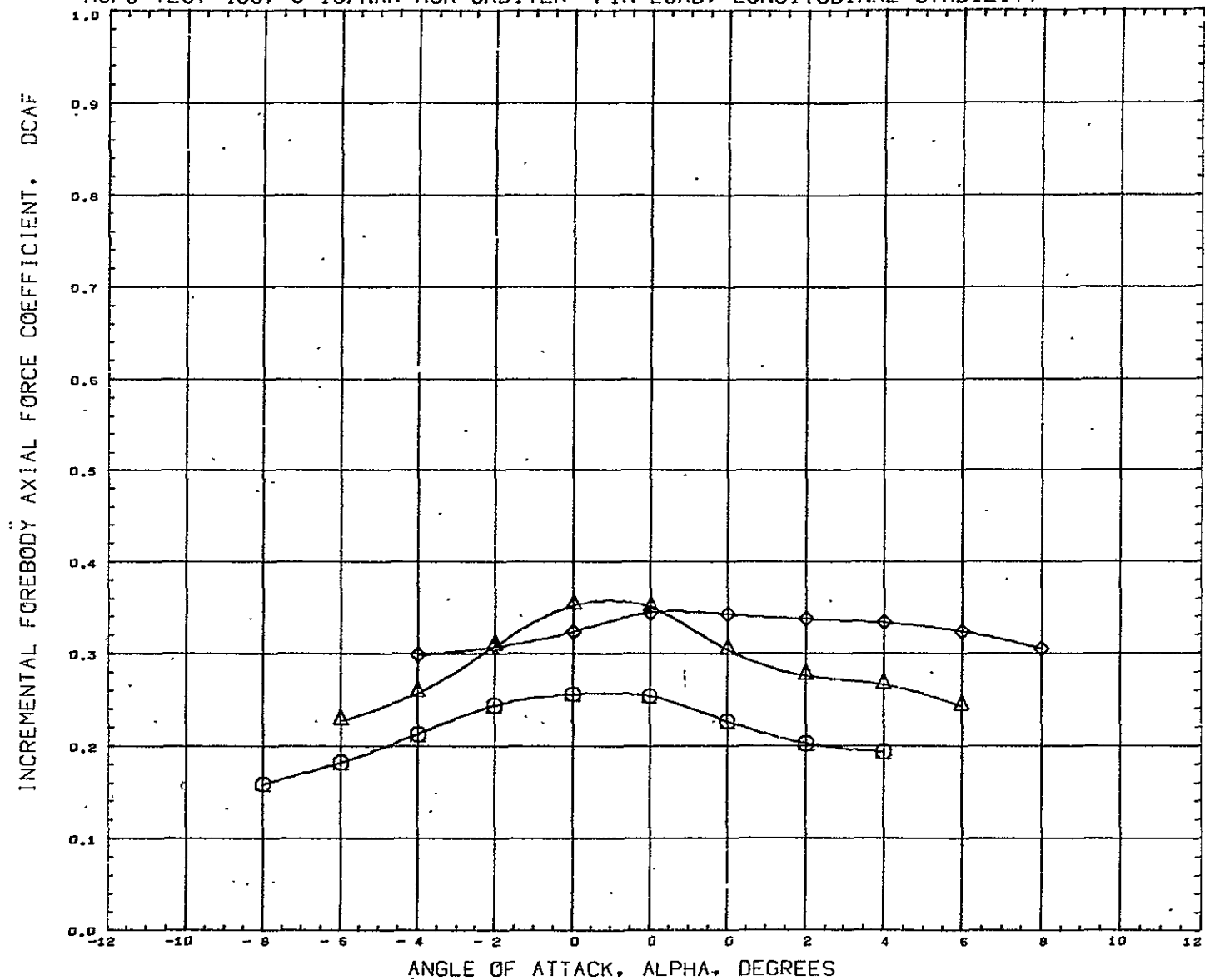
SYMBOL MACH
 ○ 0.900
 △ 1.000
 ◇ 1.200

PARAMETRIC VALUES
 0.000

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP - 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE #EI#CM

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



SYMBOL MACH PARAMETRIC VALUES

○ 0.900 0.000

△ 1.000

◇ 1.200

DATA HIST. CODE #EI#CM

REFERENCE INFORMATION

REFS 1.3960 SQ.IN.

REFL 1.3330 IN

REFB 1.3330 IN

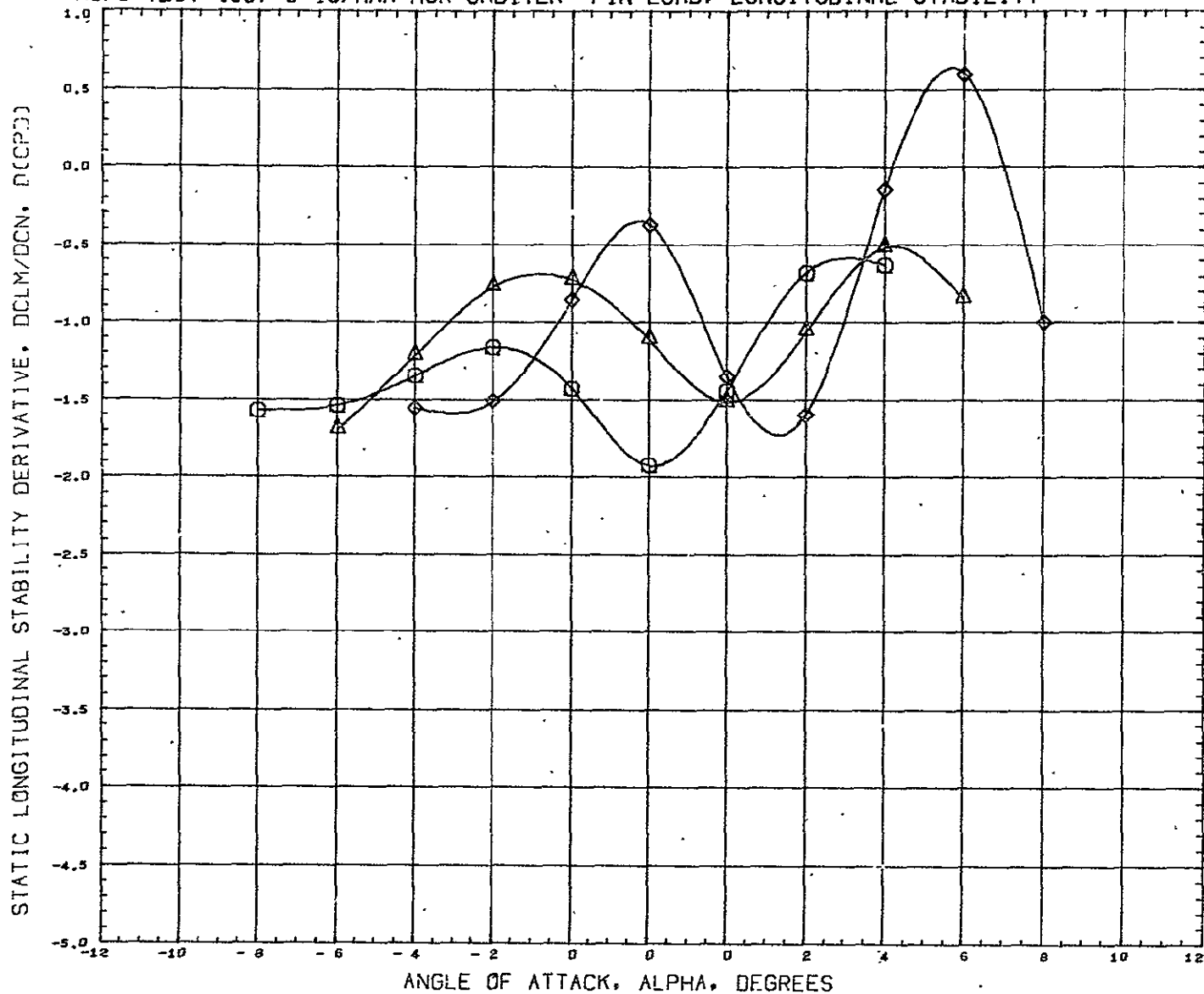
XMRF - 0.0370 IN

YMRF 0.0000 IN

ZMRF 0.0000 IN

SCALE 0.0034

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



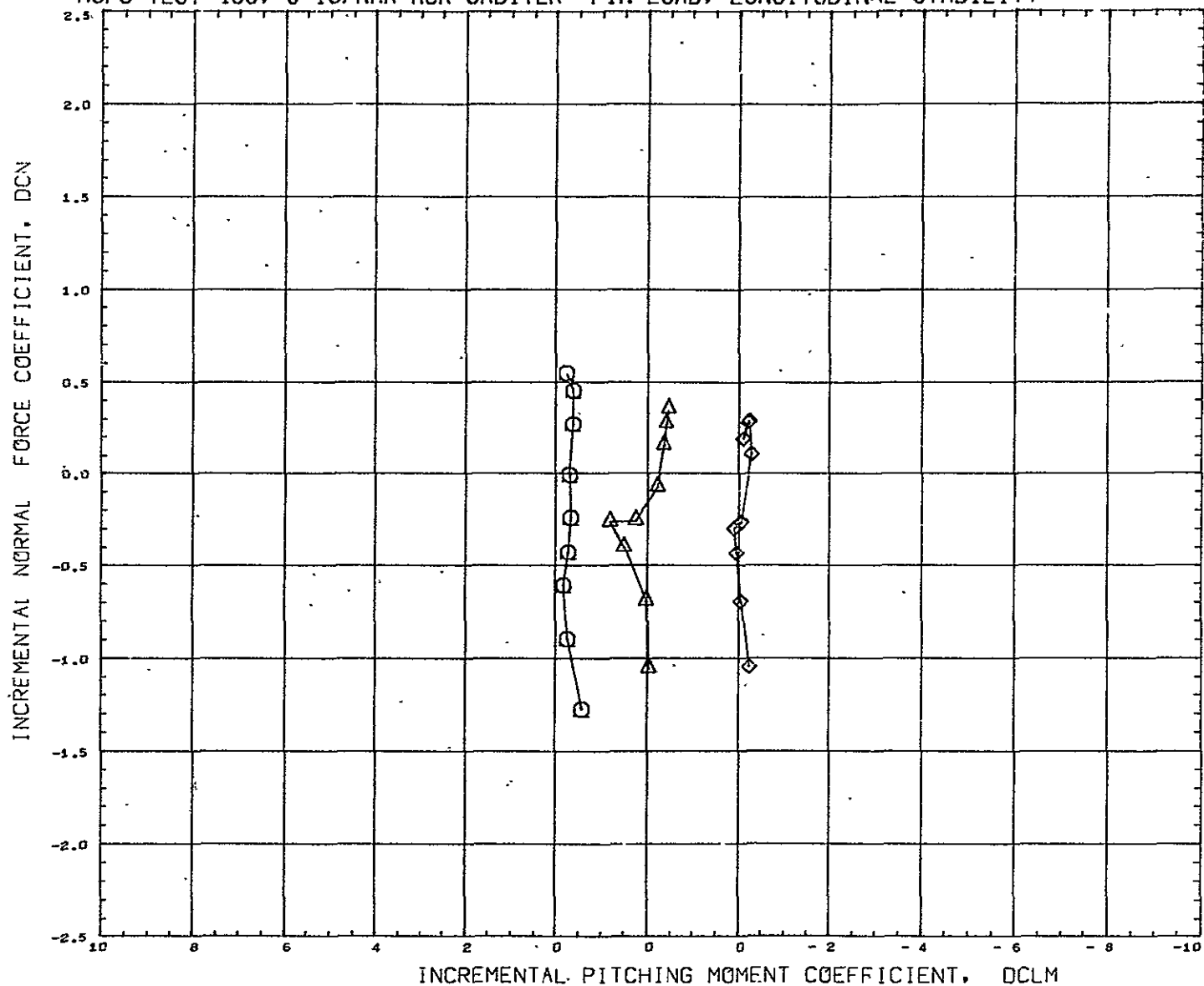
SYMBOL MACH
 ○ 0.900
 △ 1.000
 ◇ 1.200

PARAMETRIC VALUES
 0.000

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *EI*CM

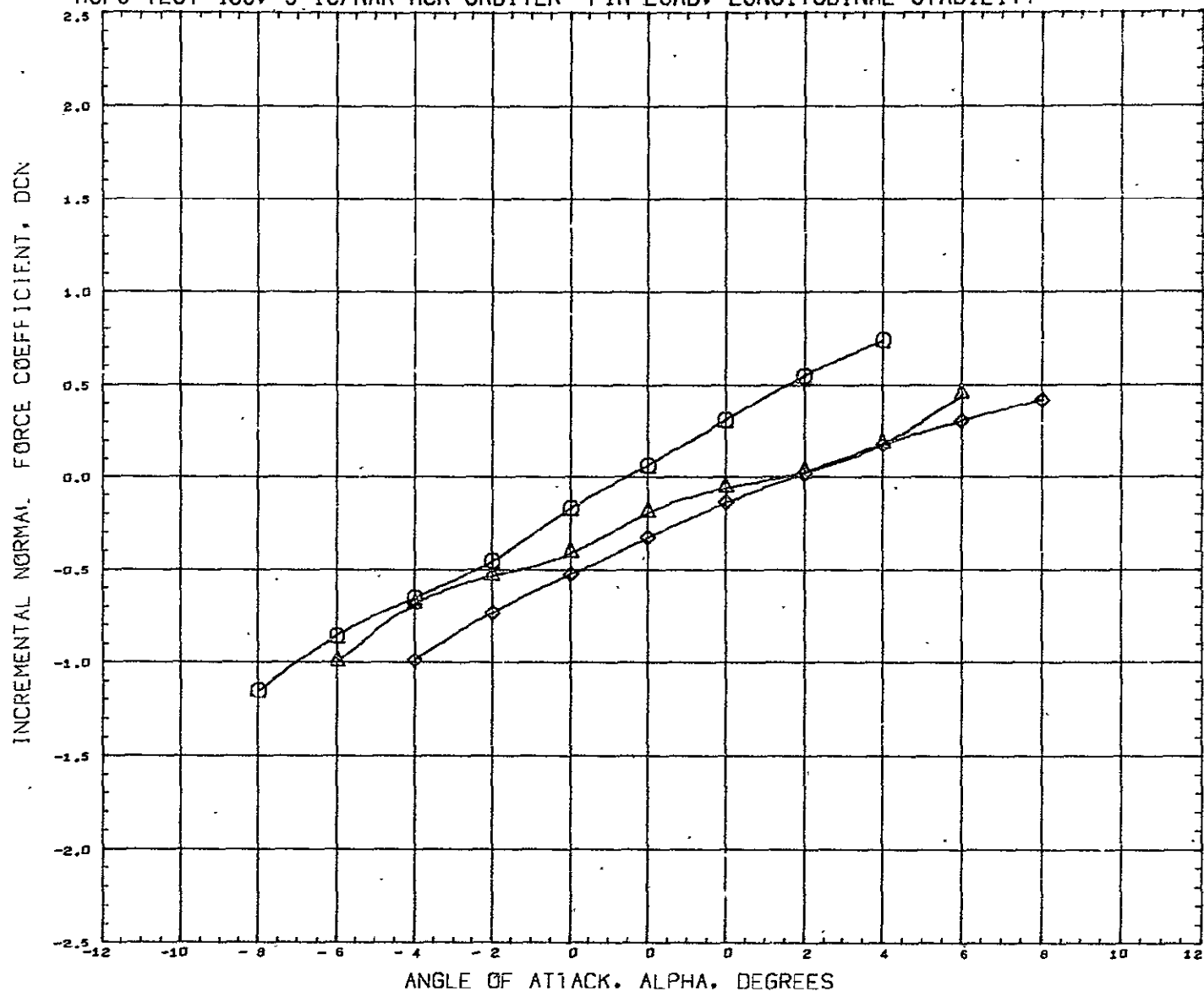
MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



SYMBOL	MACH	PARAMETRIC VALUES	REFERENCE INFORMATION		
○	0.900	0.000	REFS	1.3960	50. IN.
△	1.000		REFL	1.3330	IN
◇	1.200		REFE	1.3330	IN
			XMRP	0.0370	IN
			YMRP	0.0000	IN
			ZMRP	0.0000	IN
			SCALE	0.0034	

DATA HIST. CODE *EI*CM

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY

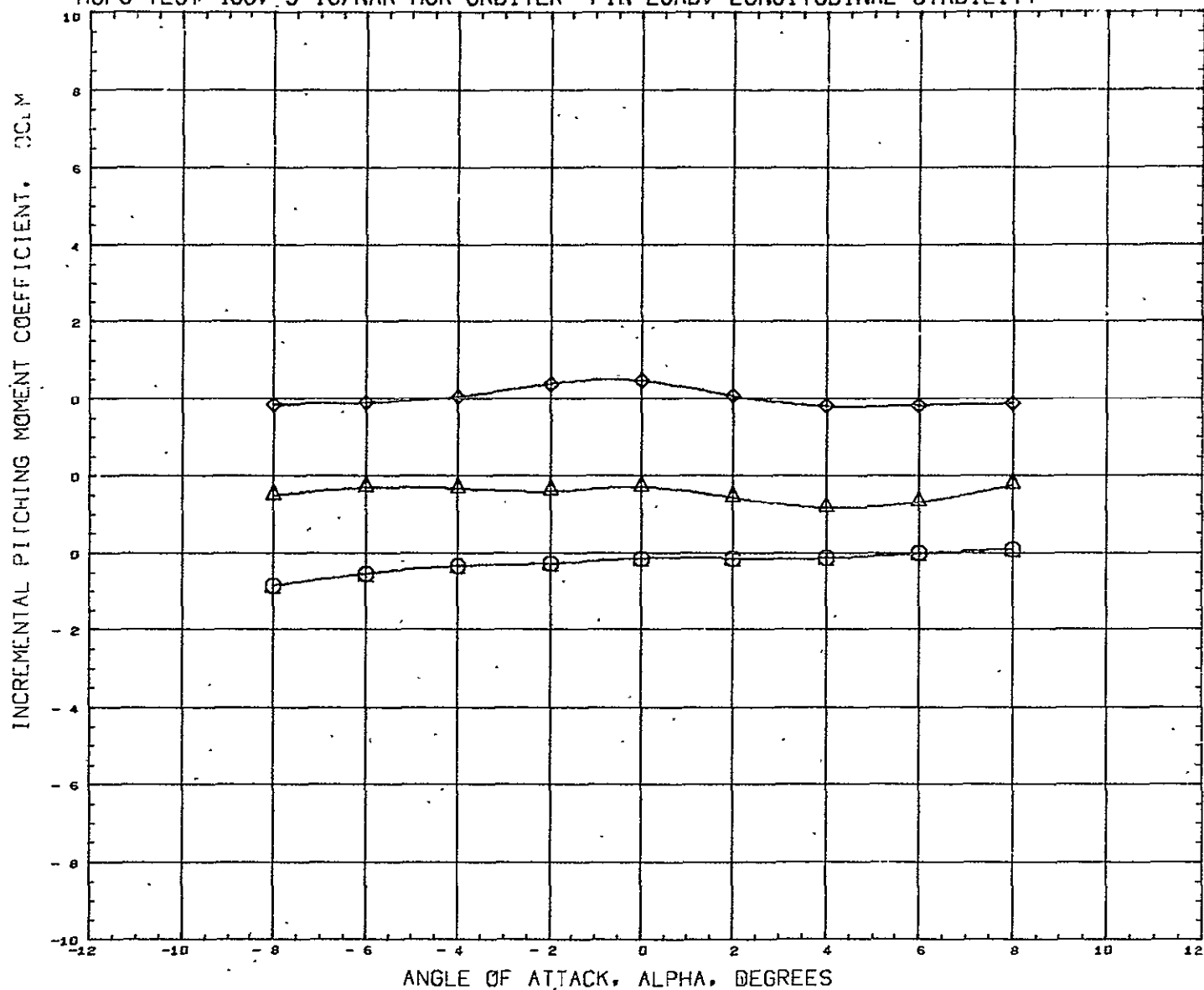


SYMBOL	MACH	PARAMETRIC VALUES
○	0.900	0.000
△	1.000	
◇	1.200	

REFERENCE INFORMATION		
REFS	1.3960	SO. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0375	IN
YMRP	0.3900	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *E14CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



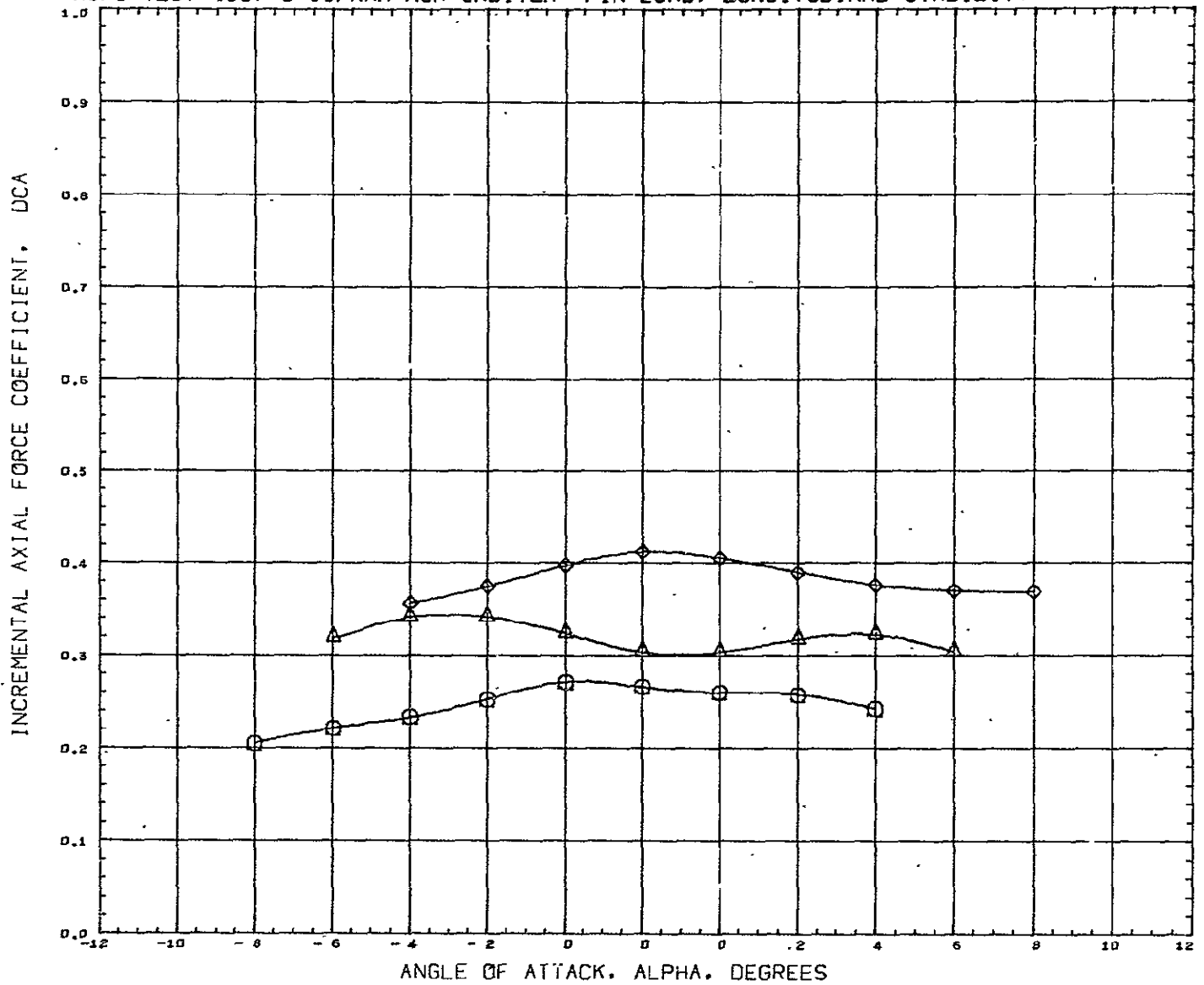
SYMBOL MACH
 ○ 0.900
 △ 1.000
 ◇ 1.200

PARAMETRIC VALUES
 0.000

REFERENCE INFORMATION
 REFS 1.3960 SQ-IN.
 REFL 1.3330 IN
 REF0 1.3340 IN
 XMRP - 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *EI*CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



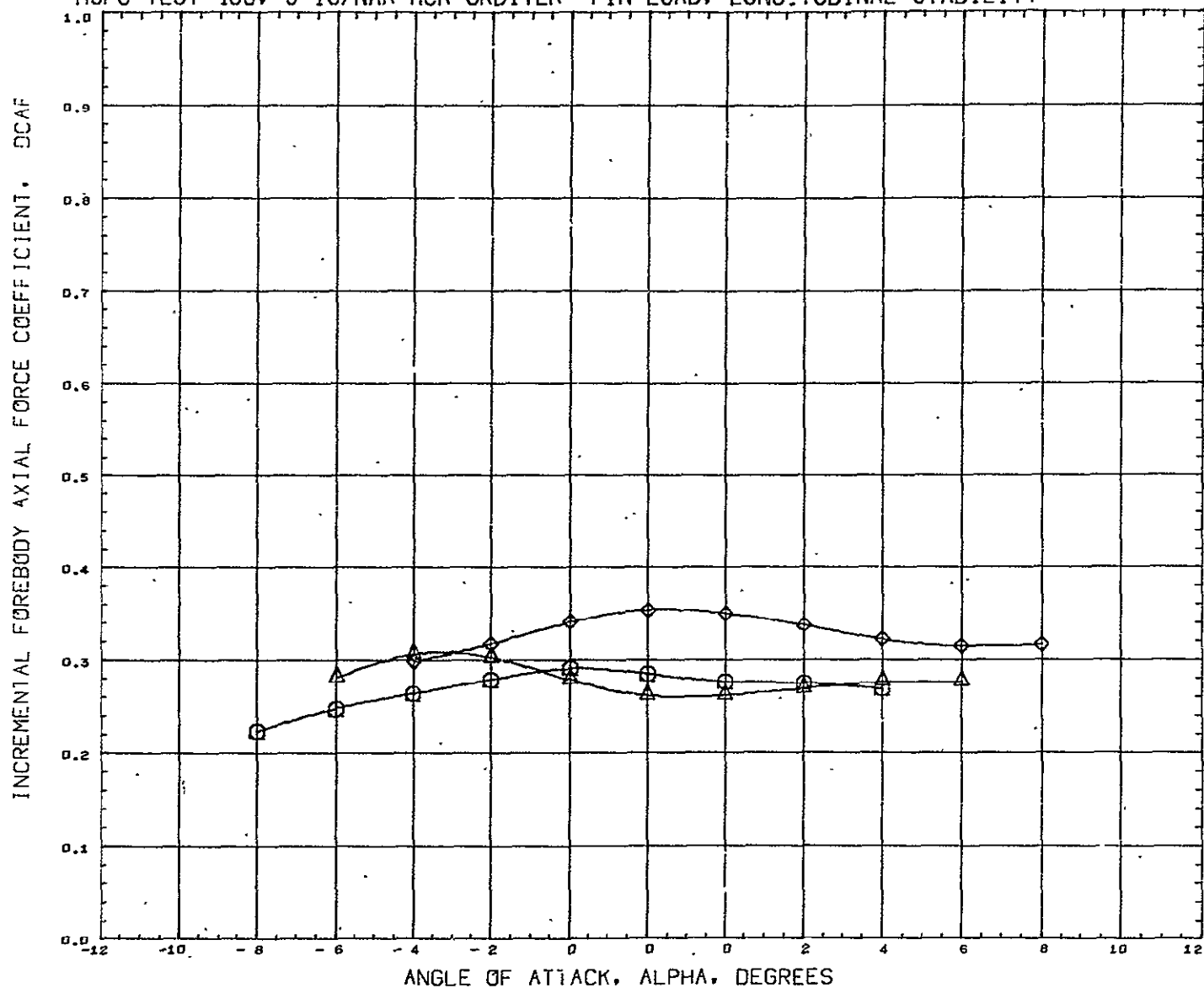
SYMBOL MACH
 ○ 0.900
 △ 1.000
 ◇ 1.200

PARAMETRIC VALUES
 0.000

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFL 1.3330 IN
 XMRP - 0.0375 IN
 YMRP 0.0500 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE #EI#CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



SYMBOL MACH PARAMETRIC VALUES

○ 0.900 0.000

△ 1.000

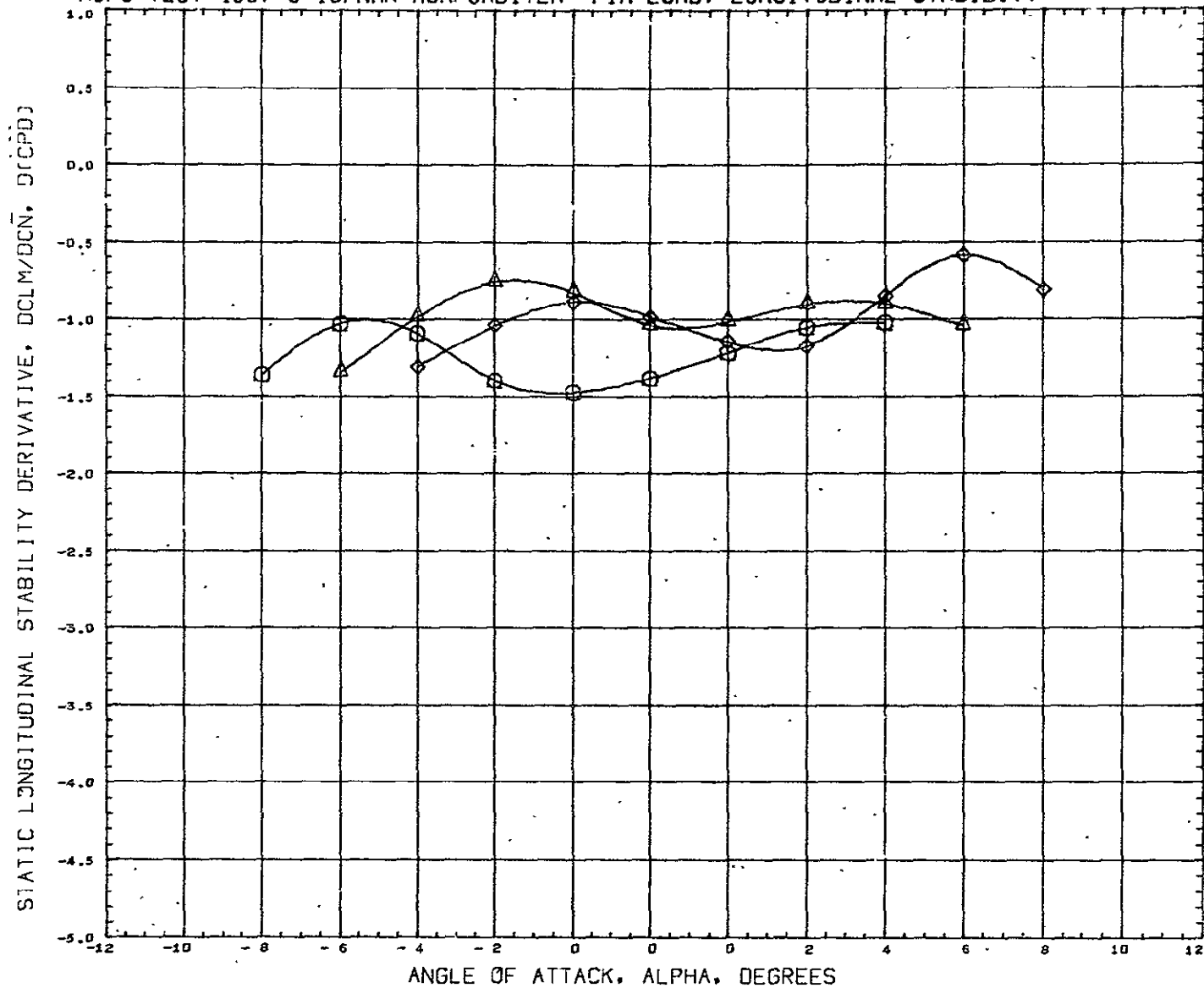
◇ 1.200

REFERENCE INFORMATION

REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3350	IN
XMRP	0.0375	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE #EI#CM

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY

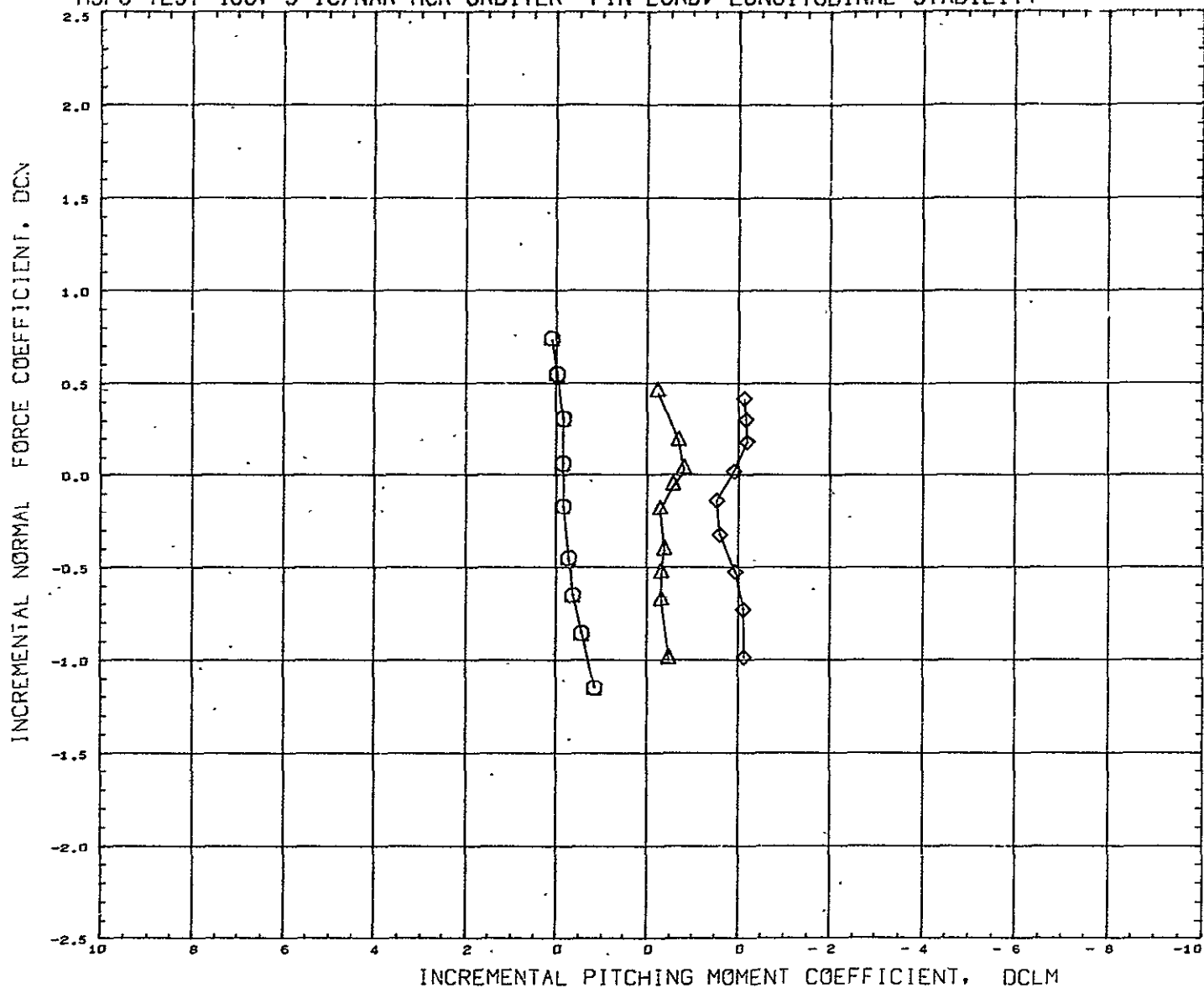


SYMBOL	HACH	PARAMETRIC VALUES
○	0.900	0.000
□	1.000	
◇	1.200	

DATA MIST. CODE *EI*CM

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0570	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY

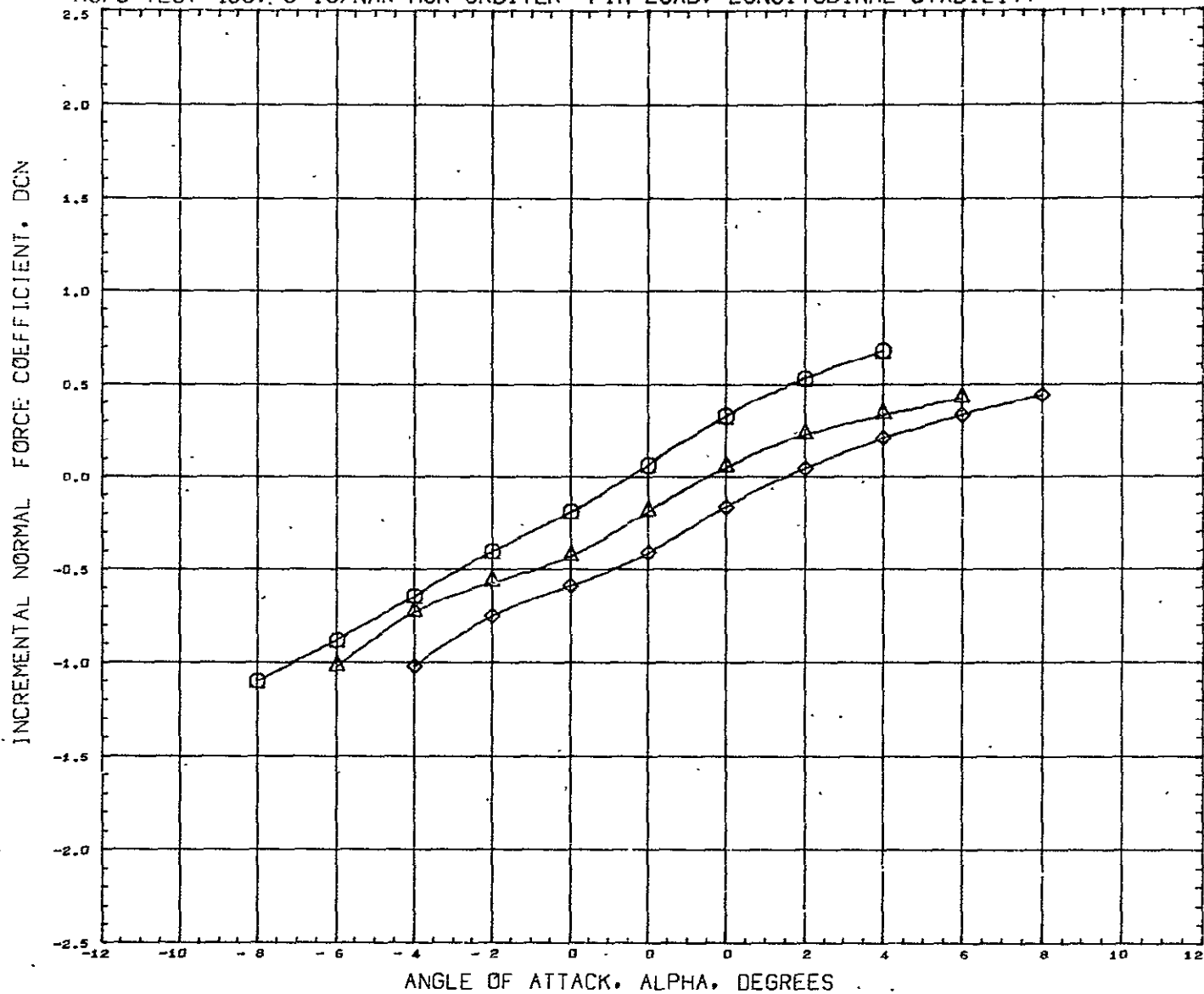


SYMBOL	MACH	PARAMETRIC VALUES
○	0.900	0.000
△	1.000	
◇	1.200	

REFERENCE INFORMATION		
REFS	1.3960	50. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI*CM

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY

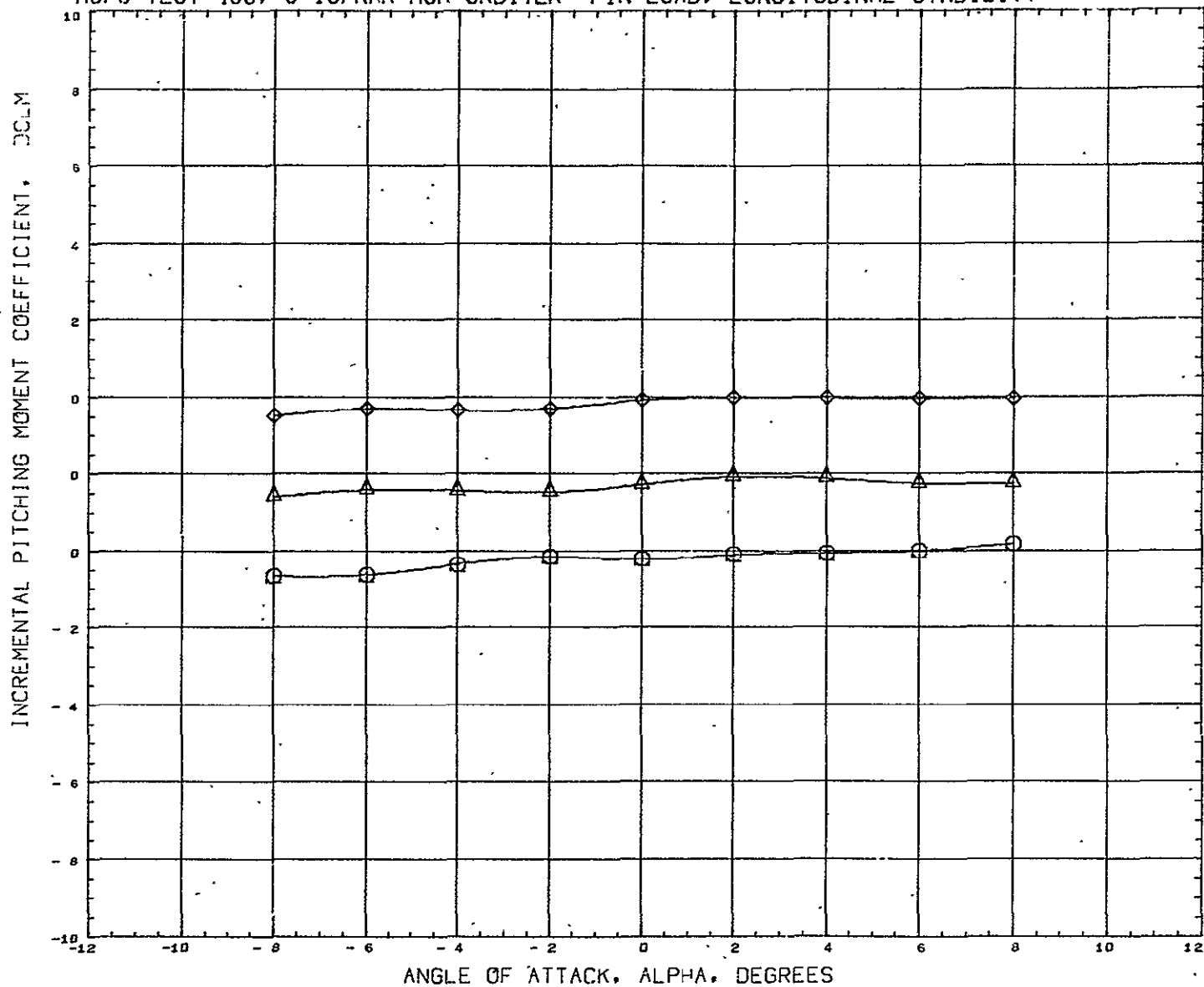


SYMBOL MACH PARAMETRIC VALUES
 □ 0.900 0.000
 △ 1.000
 ◇ 1.200

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP - 0.0373 IN
 YMRP 0.3000 IN
 ZMRP 0.3000 IN
 SCALE 0.0034

DATA HIST. CODE *EI*CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



SYMBOL MACH PARAMETRIC VALUES

○ 0.900 0.000

△ 1.000

◇ 1.200

REFERENCE INFORMATION

REFS 1.3960 SQ. IN.

REFL 1.3330 IN

REFB 1.3330 IN

XMRP 0.0370 IN

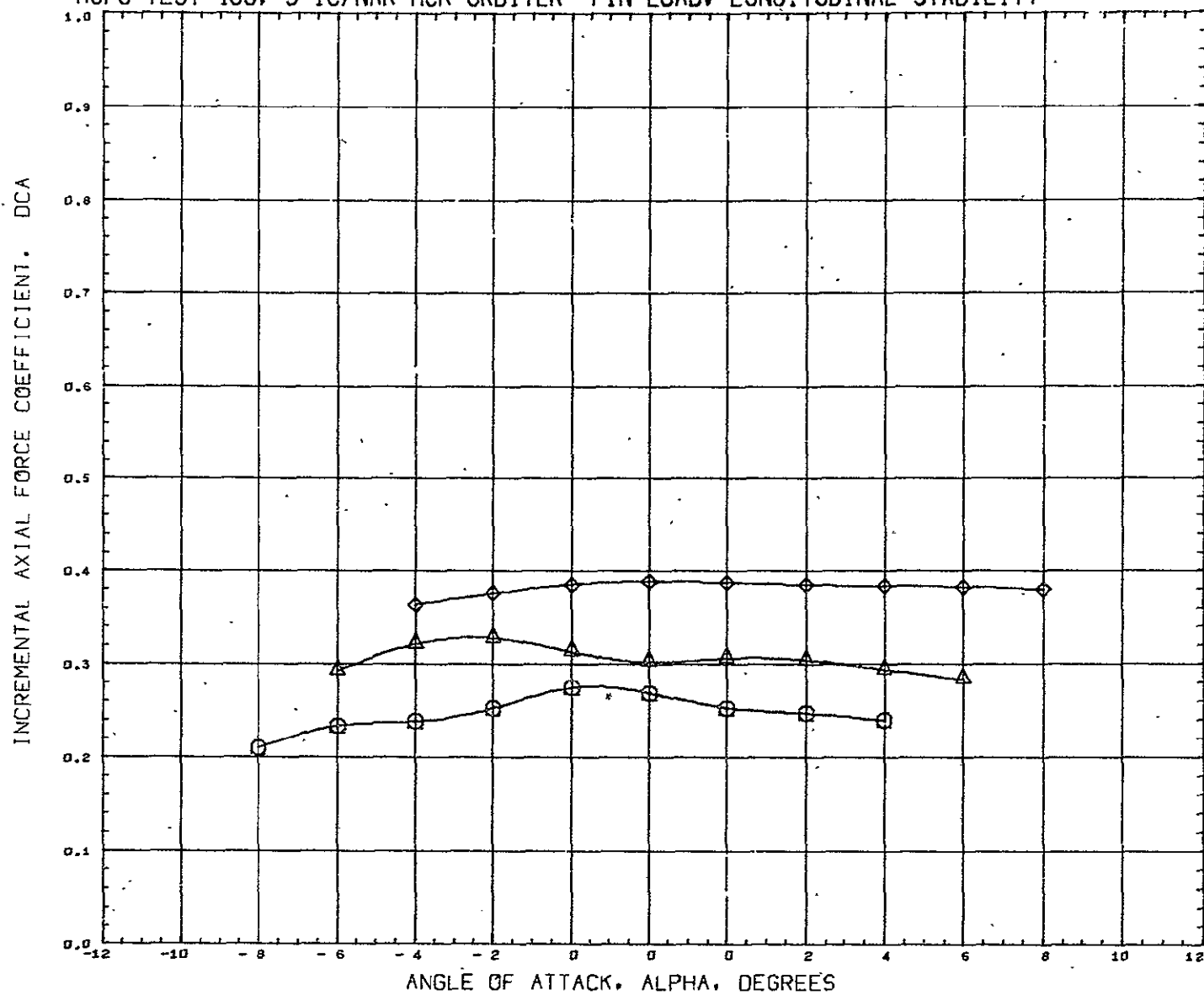
YMRP 0.0000 IN

ZMRP 0.0000 IN

SCALE 0.0034

DATA HIST. CODE *EI*CM

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



SYMBOL

MACH

PARAMETRIC VALUES

REFERENCE INFORMATION

○
△
◇

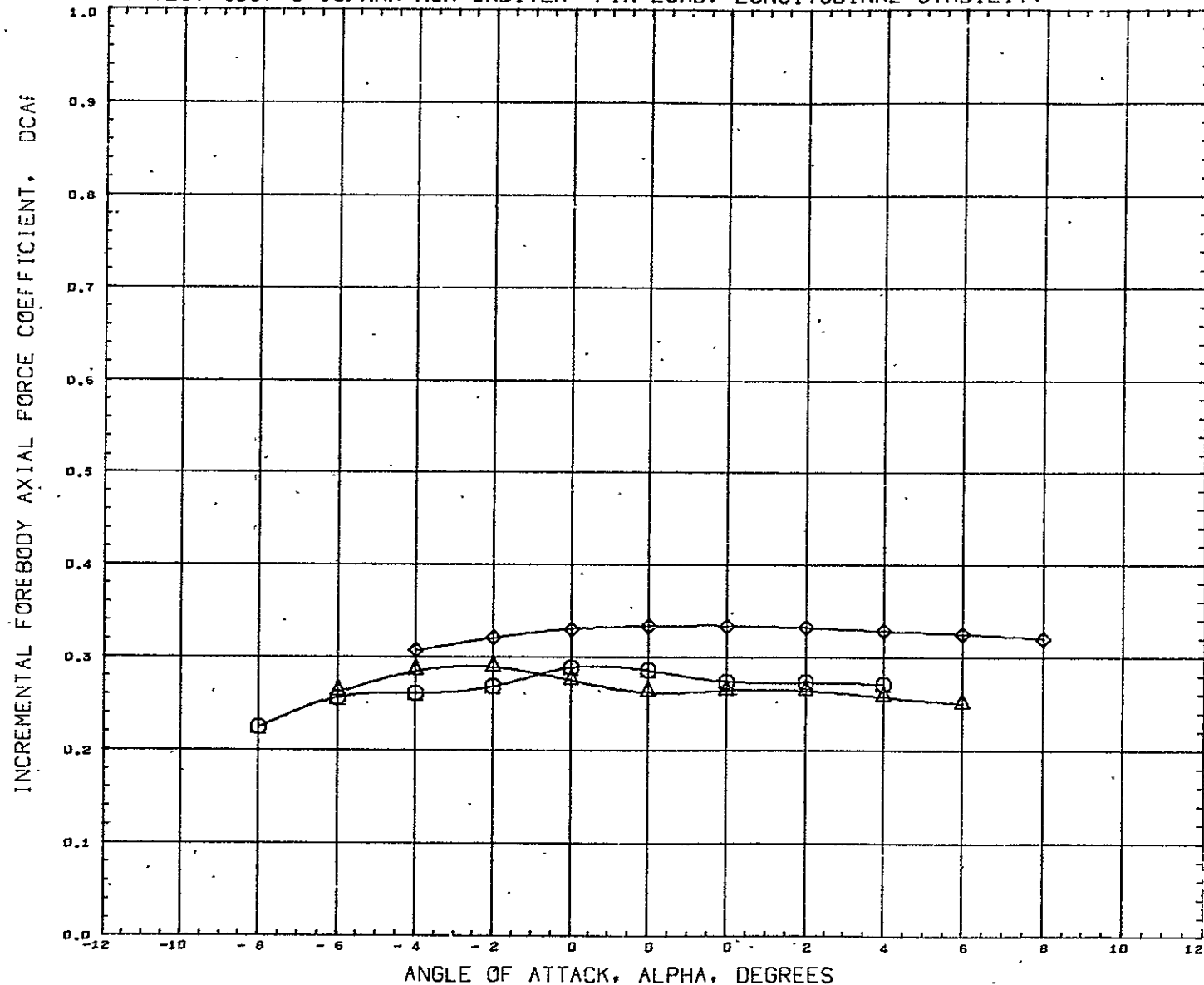
0.900
1.000
1.200

0.000

REFS 1.3980 SQ. IN.
REFL 1.3330 IN
REFB 1.3330 IN
XHRP - 0.0370 IN
YHRF 0.0000 IN
ZHRF 0.0000 IN
SCALE 0.0034

DATA HIST. CODE #EI*CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY

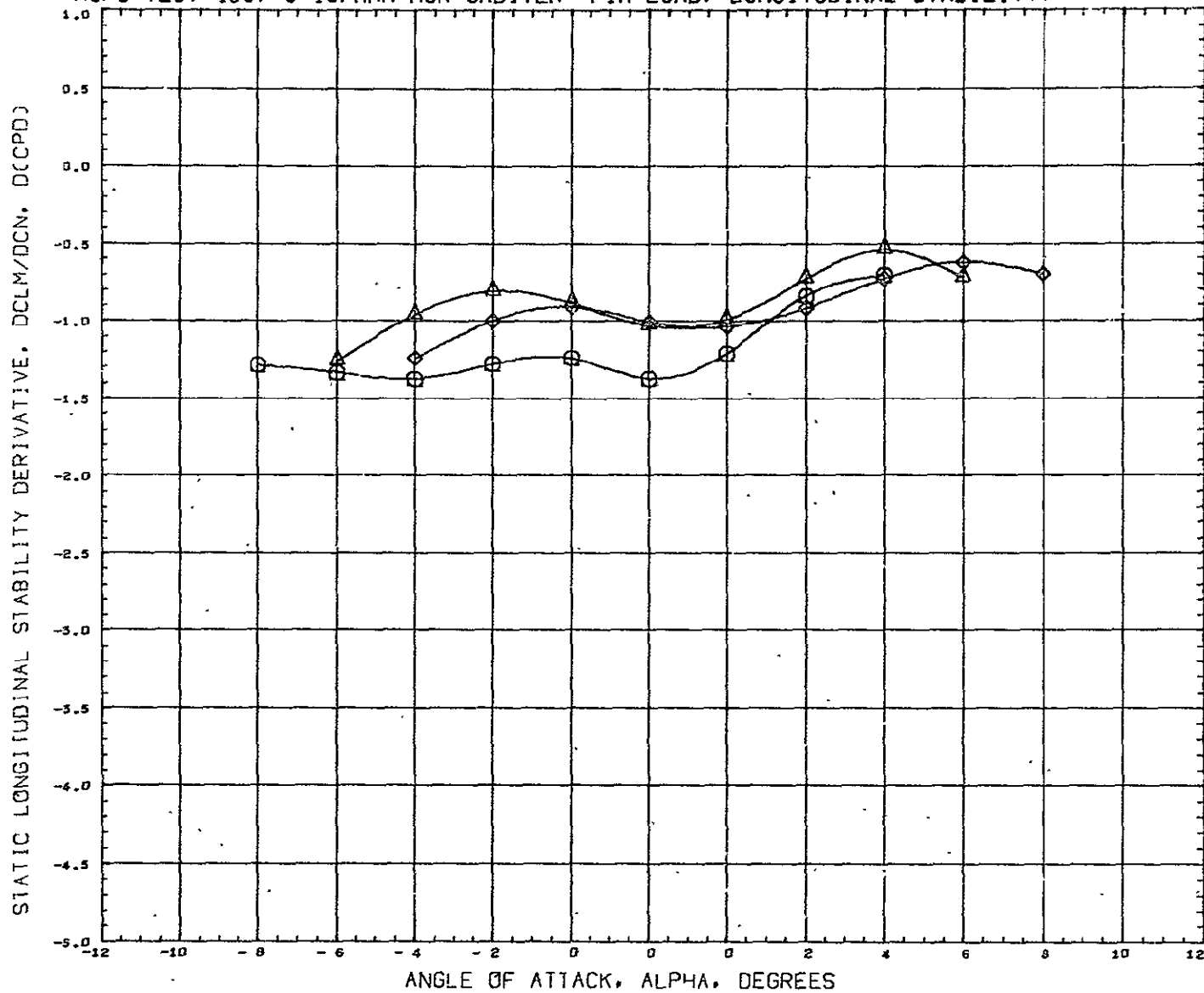


SYMBOL	MACH	PARAMETRIC VALUES
○	0.900	0.000
△	1.000	
◇	1.200	

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0570	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI*CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY.



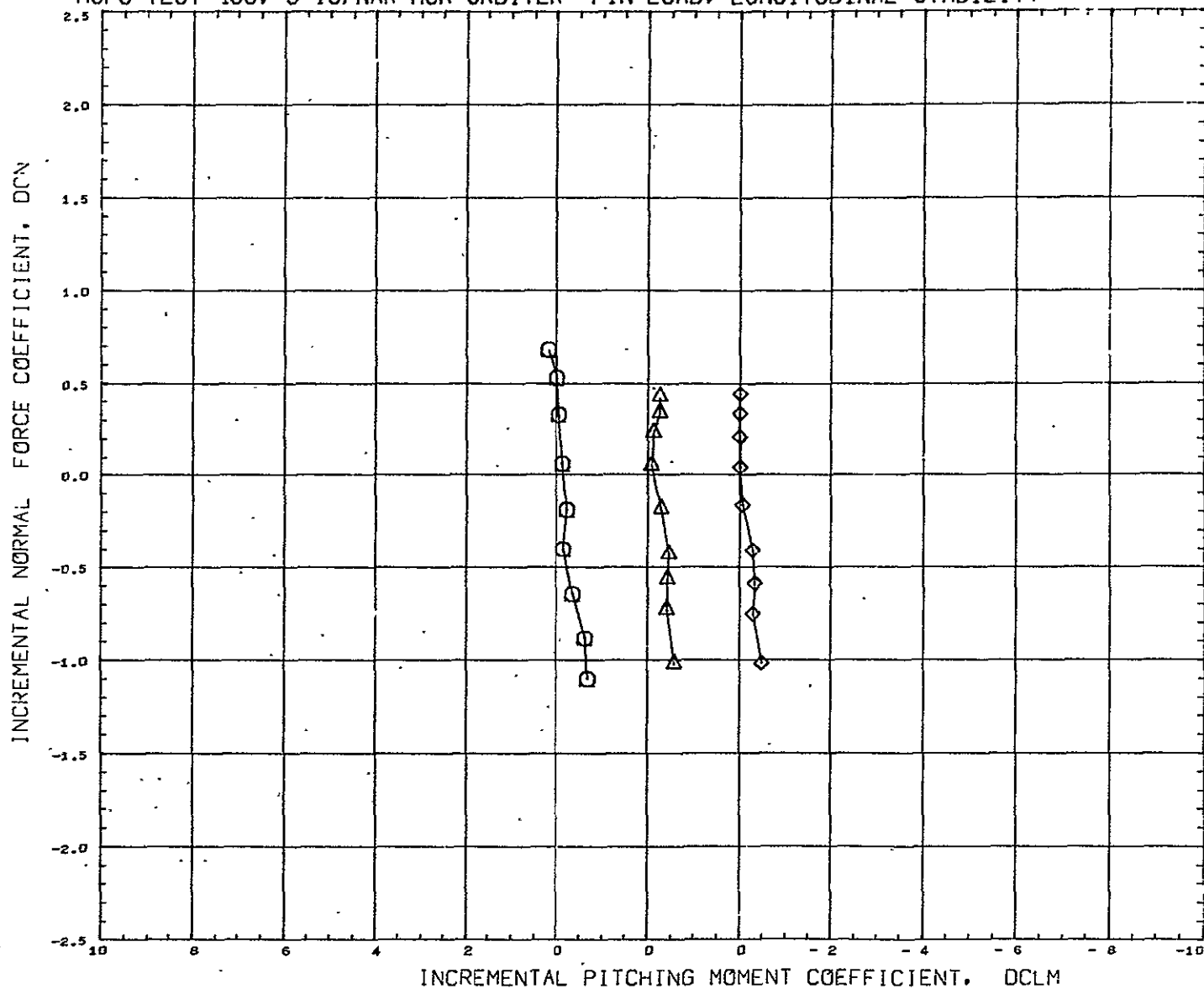
SYMBOL MACH
 ○ 0.900
 ◇ 1.000
 ◇ 1.200

PARAMETRIC VALUES
 0.000

REFERENCE INFORMATION
 REFS 1.3960 SQ.IN.
 REFL 1.3330 IN
 REFB 1.3335 IN
 XMRF - 0.0370 IN
 YMRF 0.0000 IN
 ZMRF 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *E1*CM

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



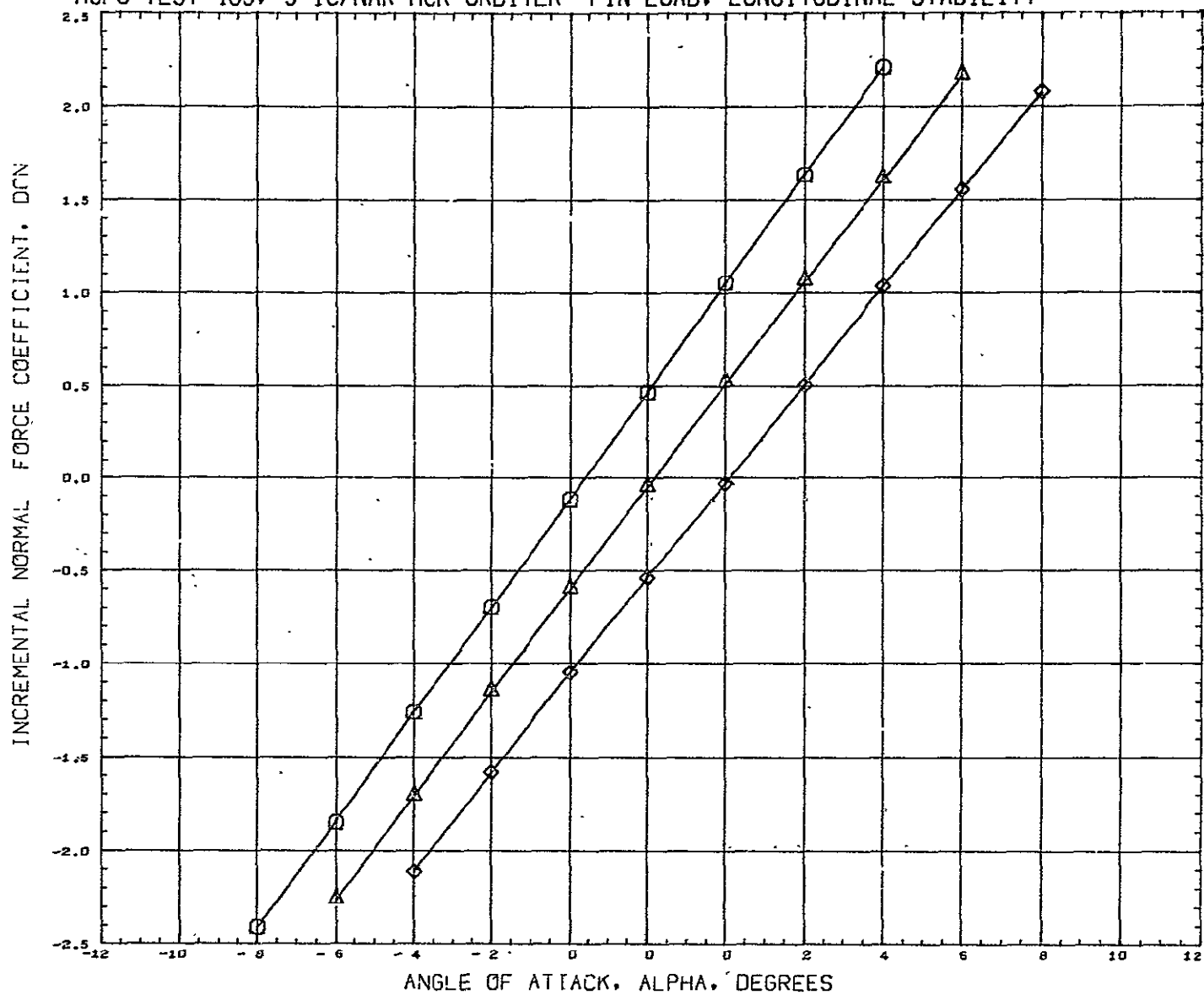
SYMBOL MACH
 ○ 0.900
 △ 1.000
 ◇ 1.200

PARAMETRIC VALUES
 0.000

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFS 1.3330 IN
 XMRP - 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 3.0034

DATA HIST. CODE *EI*CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY

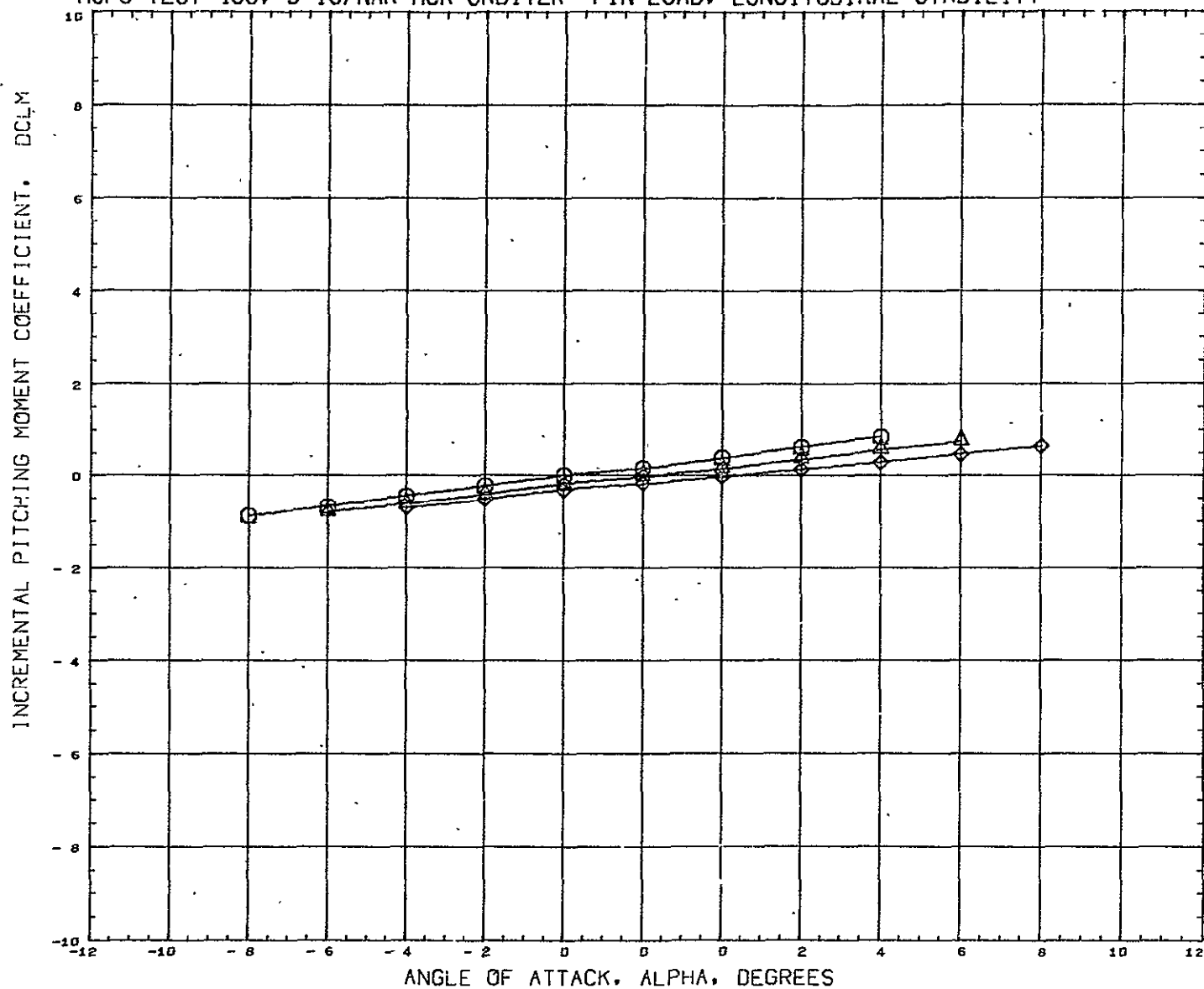


SYMBOL MACH BETA PARAMETRIC VALUES
 ○ 0.900
 △ 1.000
 ◇ 1.200

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3530 IN
 XMRP - 0.0373 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *EI#C

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



SYMBOL MACH BETA PARAMETRIC VALUES

○ 0.900 0.000 0.000

△ 1.000

◇ 1.200

REFERENCE INFORMATION

REFS 1.3960 SQ. IN.

REFL 1.3330 IN

REFB 1.3330 IN

XMRP 0.0371 IN

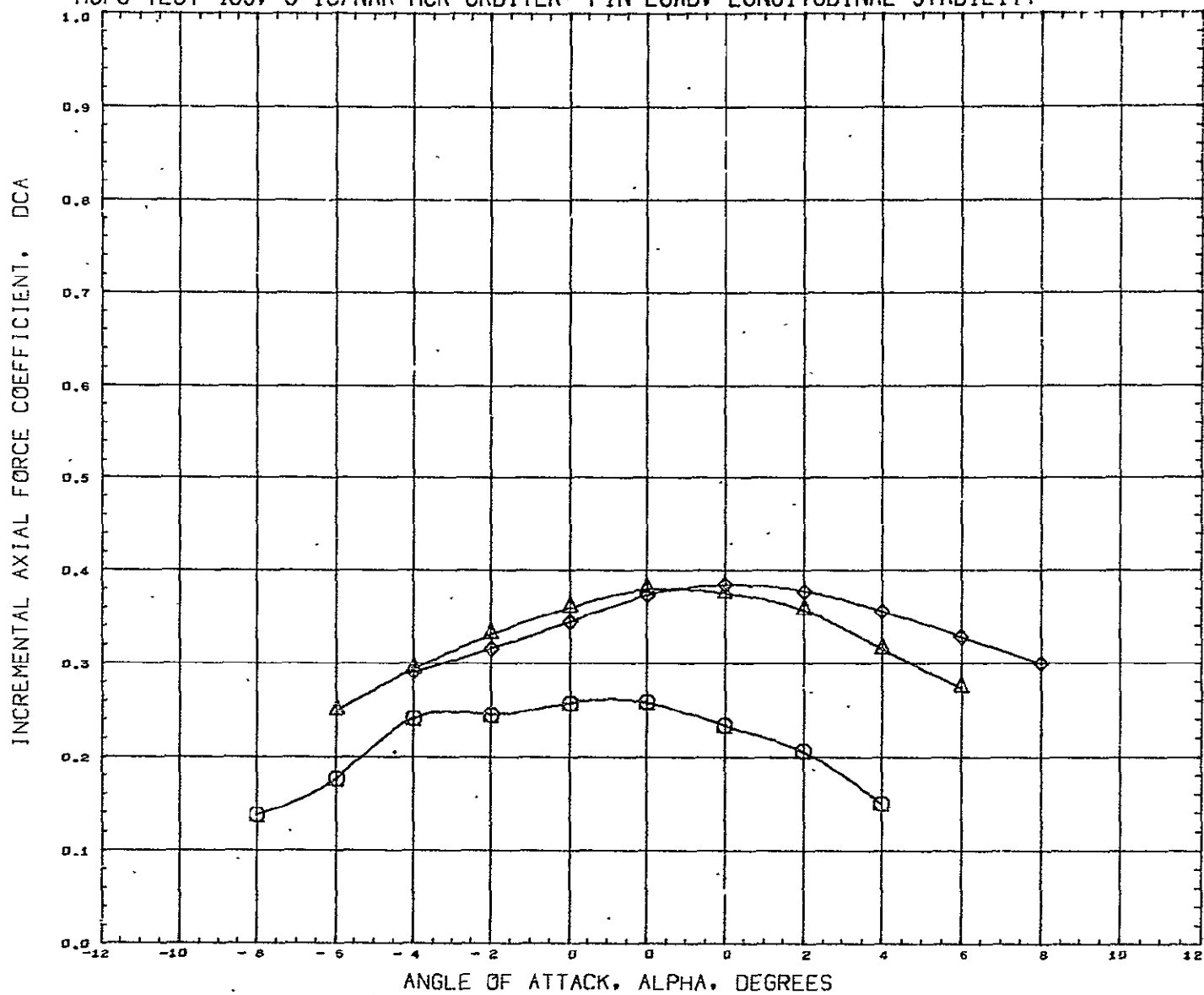
YMRP 0.0000 IN

ZMRP 0.0000 IN

SCALE 0.0034

DATA HIST. CODE *EI#C

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY

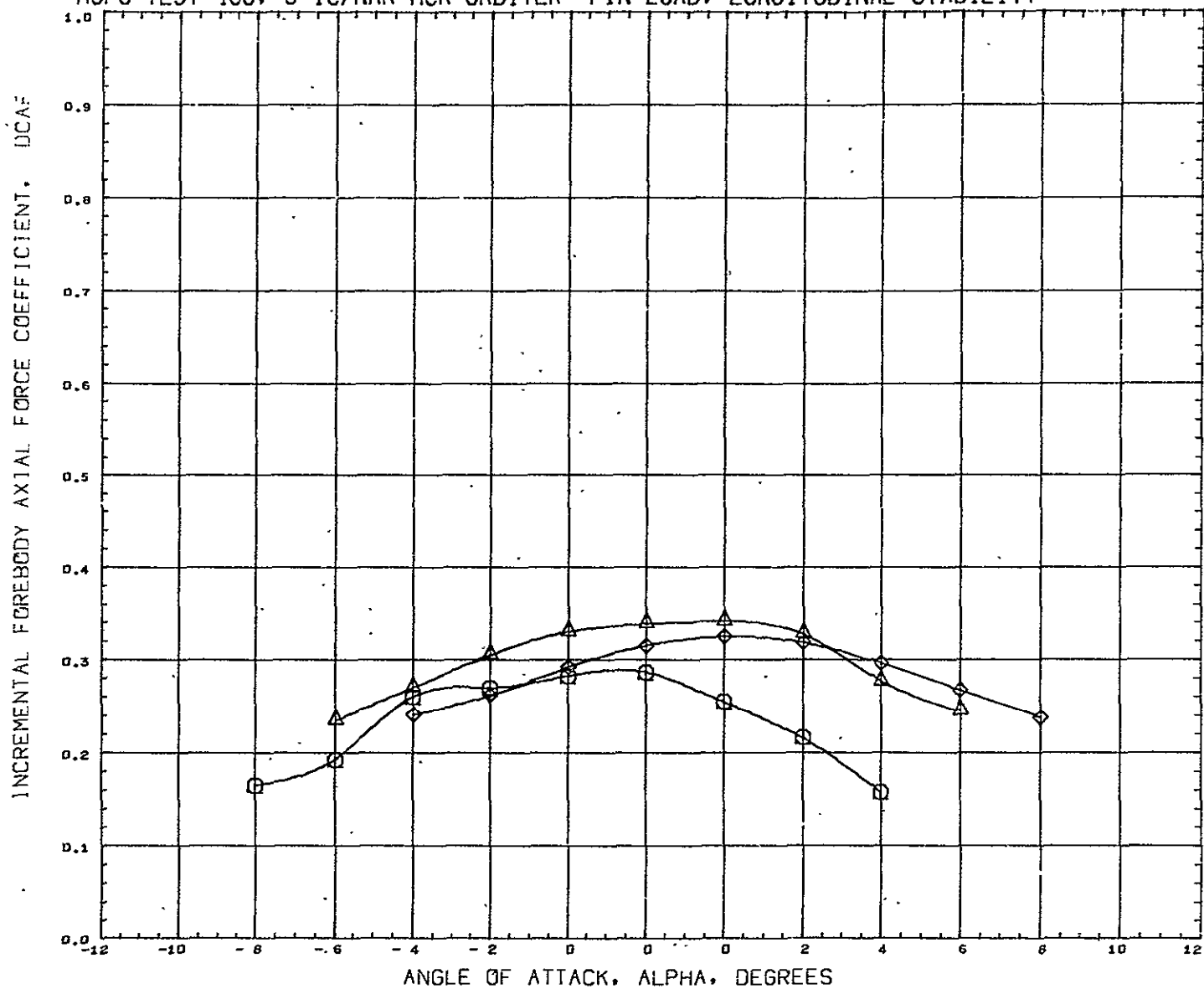


SYMBOL MACH BETA PARAMETRIC VALUES
 ○ 0.900
 △ 1.000
 ◇ 1.200

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFR 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE #EI#C

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY

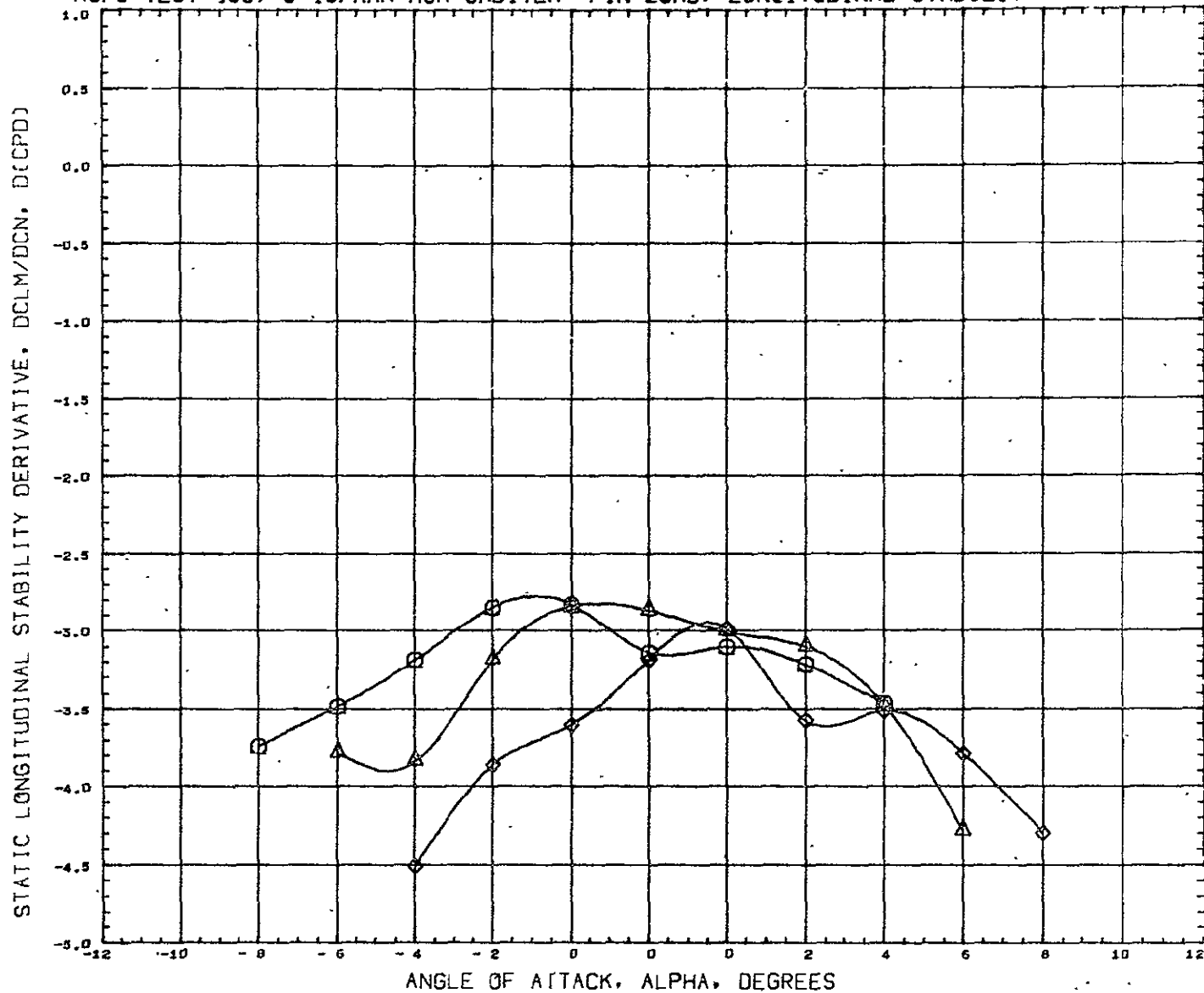


SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.900		0.000
△	1.000		
◇	1.200		

REFERENCE INFORMATION		
REFS	1.3960	SO-IN.
REFL	1.3330	IN
REFB	1.3350	IN
XMRP	0.0370	IN
YMRP	0.1000	IN
ZMRP	0.1000	IN
SCALE	0.0034	

DATA HIST. CODE #EI#C

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY

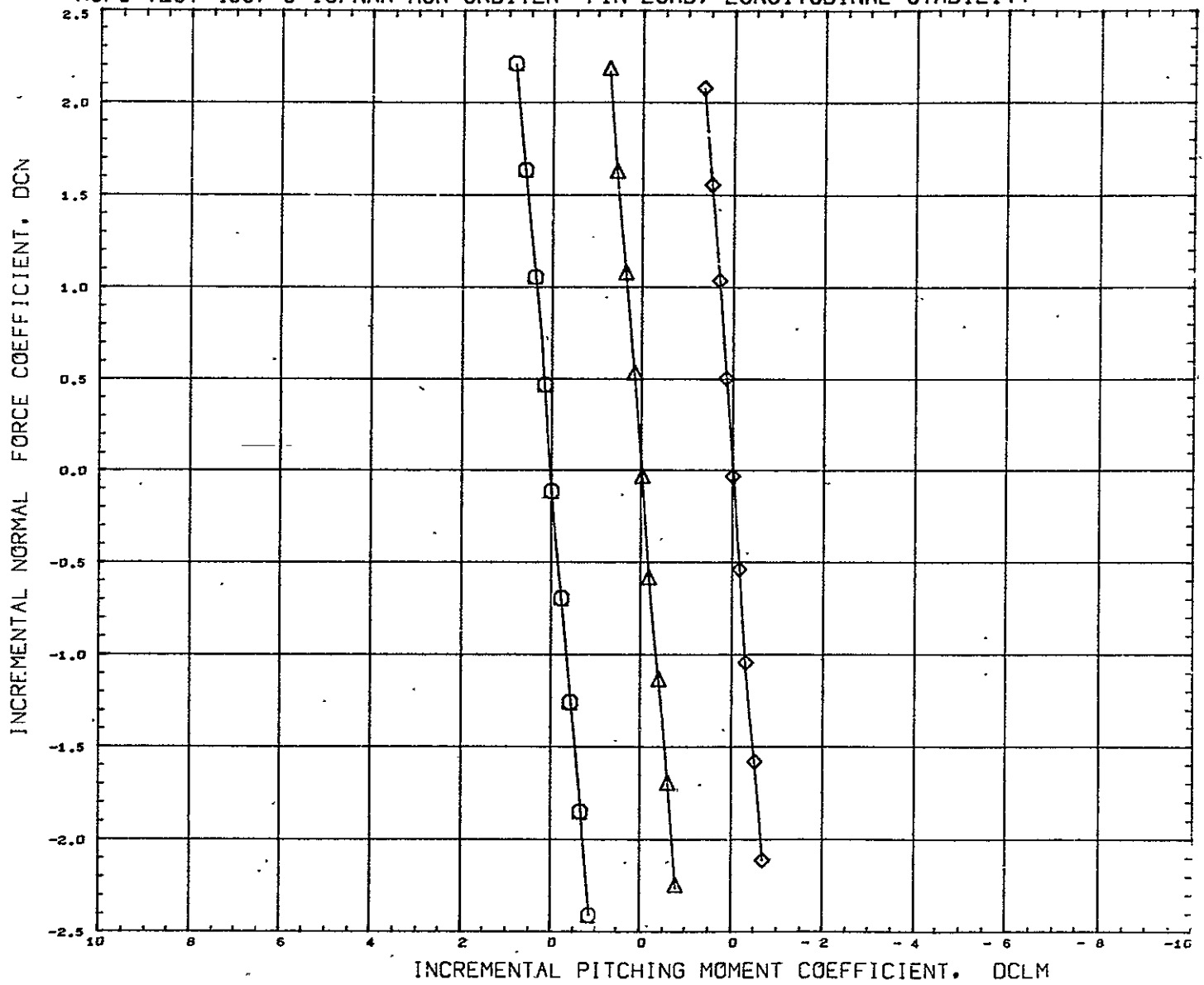


SYMBOL MACH BETA PARAMETRIC VALUES
 ○ 0.900 0.000
 △ 1.000
 ◇ 1.200

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *EI#C

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY

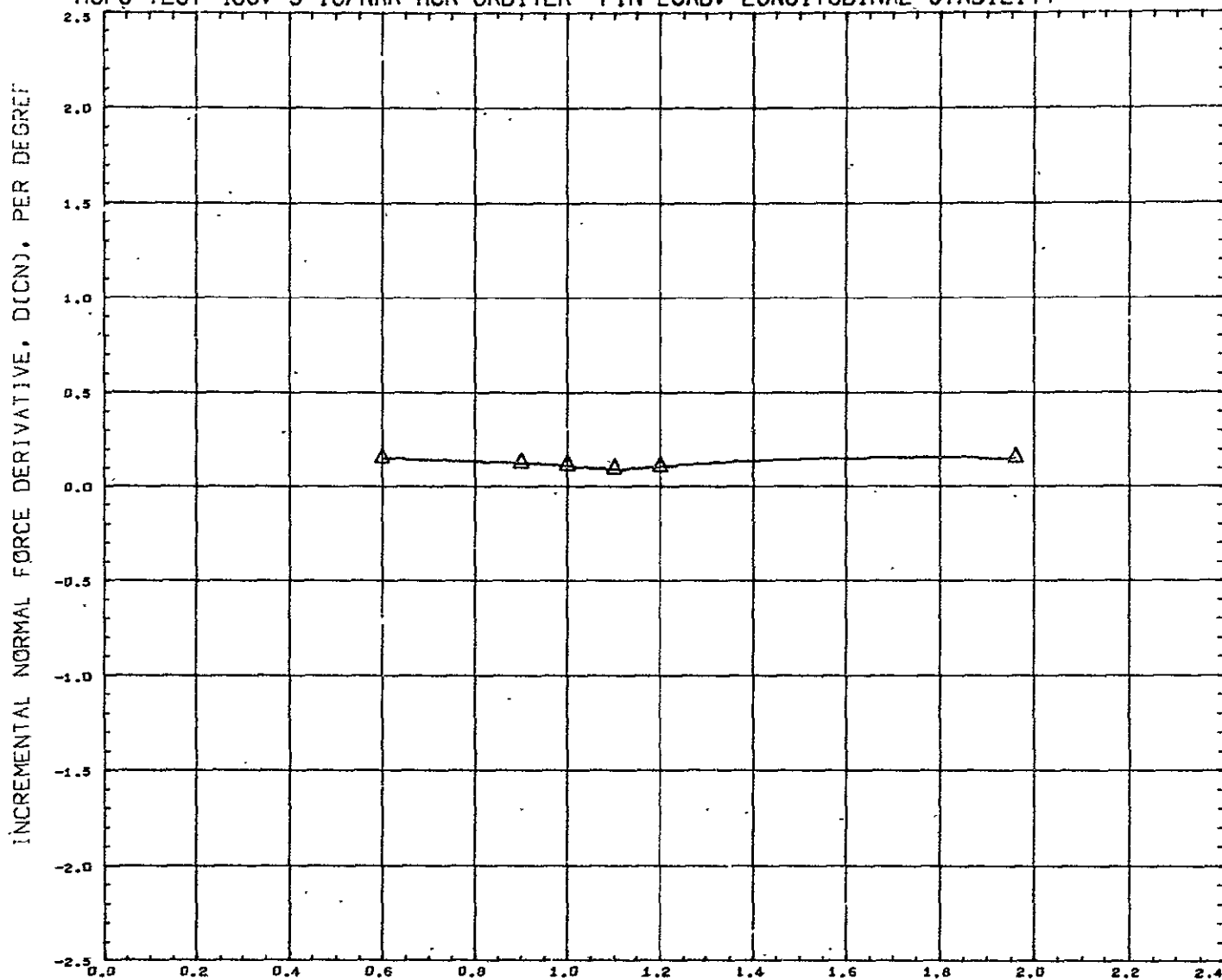


SYMBOL MACH PARAMETRIC VALUES
 O 0.900 BETA 0.000
 Δ 1.000
 ◇ 1.200

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP - 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

. DATA HIST. CODE #EI*C

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



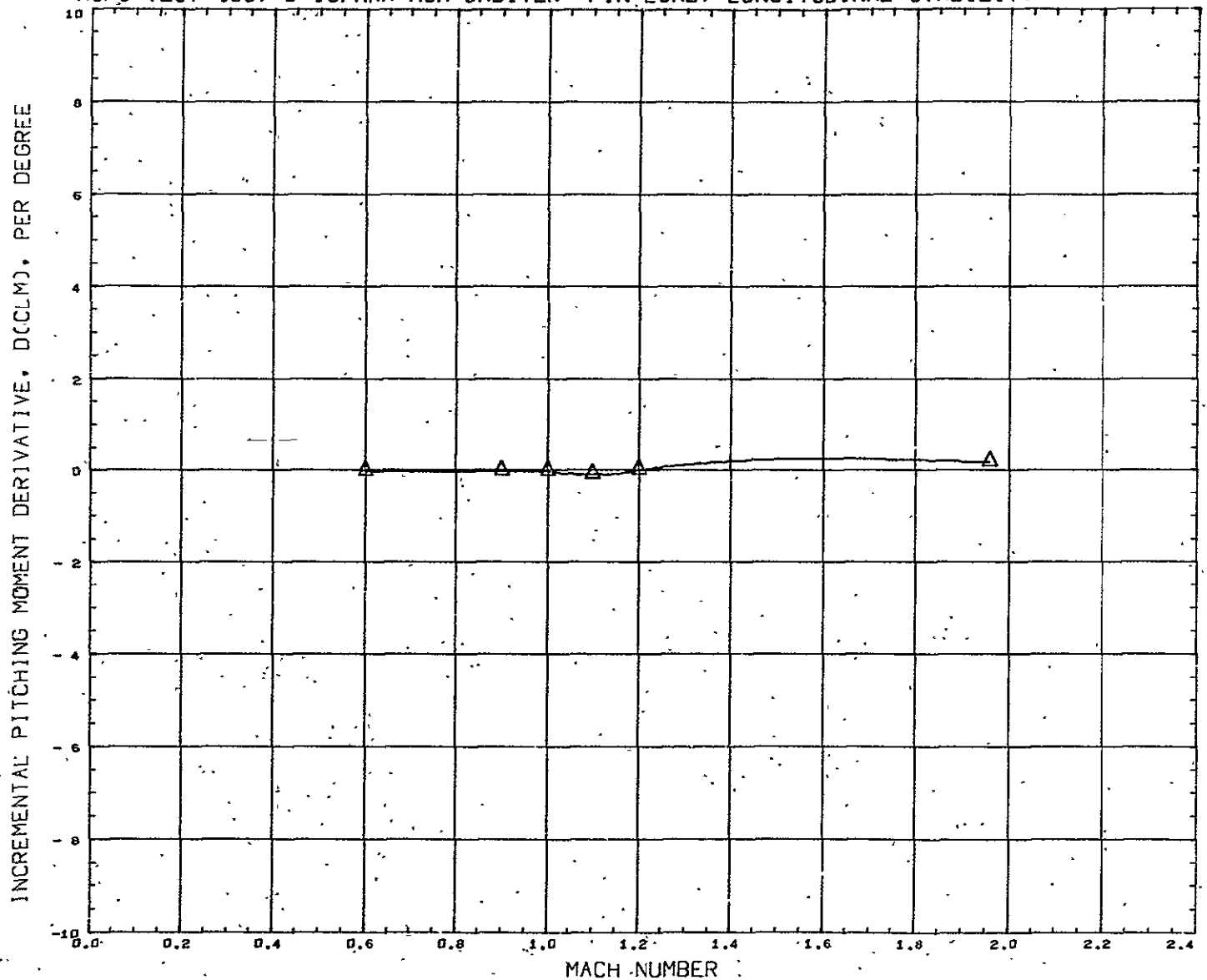
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	50. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EIWCM

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



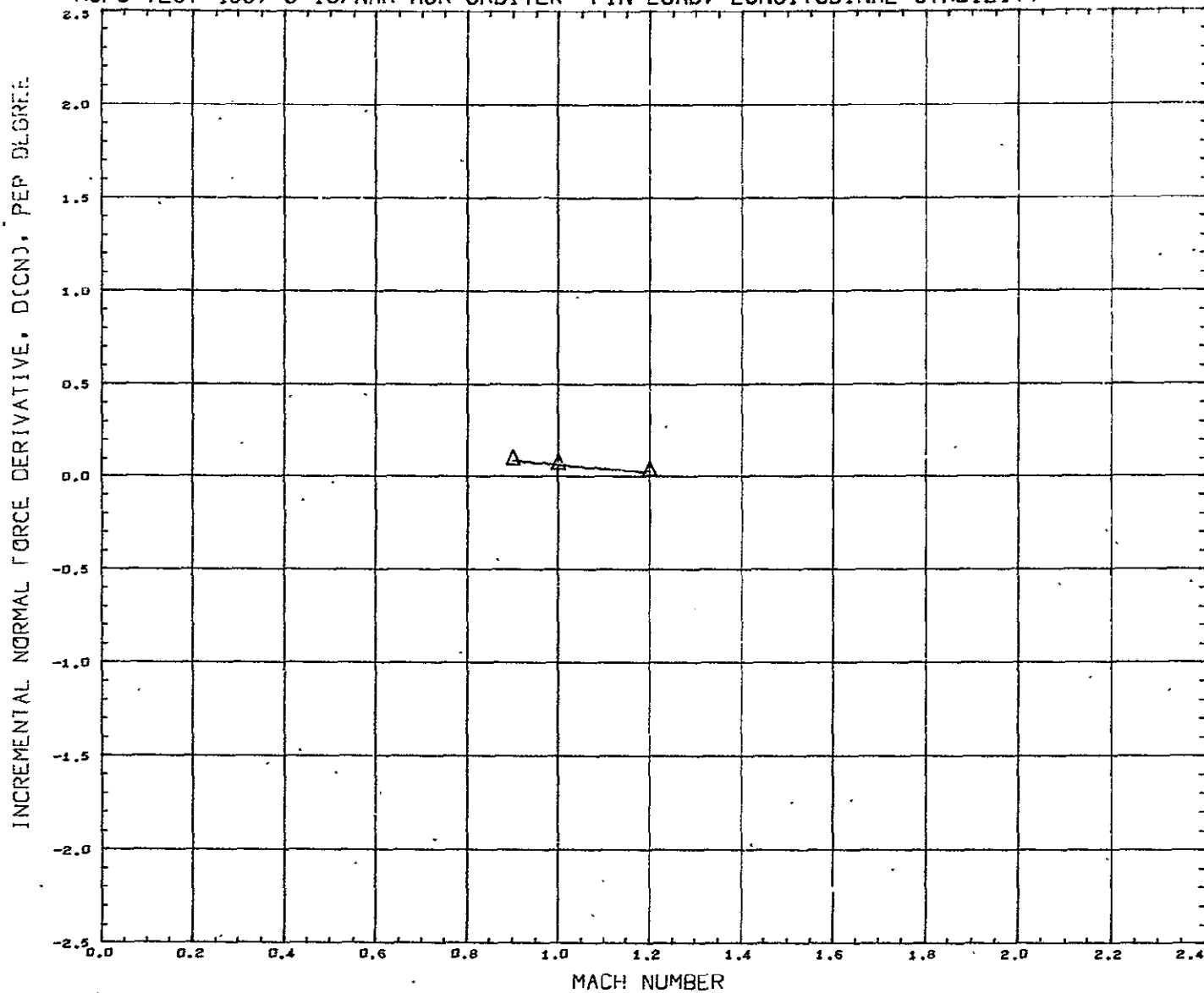
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRF	0.0370	IN
YMRF	0.0000	IN
ZMRF	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI*CM

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



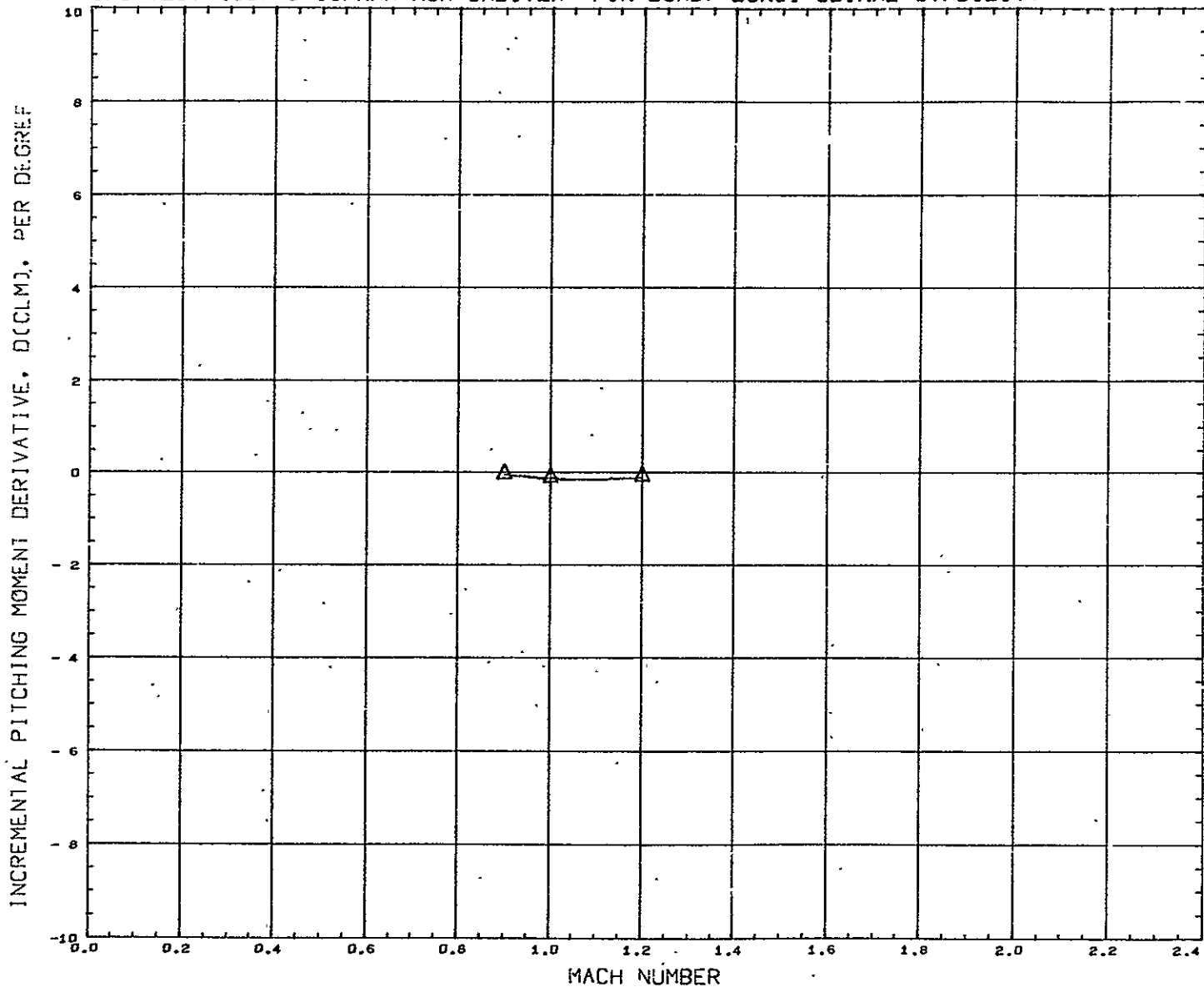
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	SQ. IN.
REFL	1.3550	IN
REFB	1.3330	IN
XMRP	0.0570	IN
YMRP	1.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI*CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



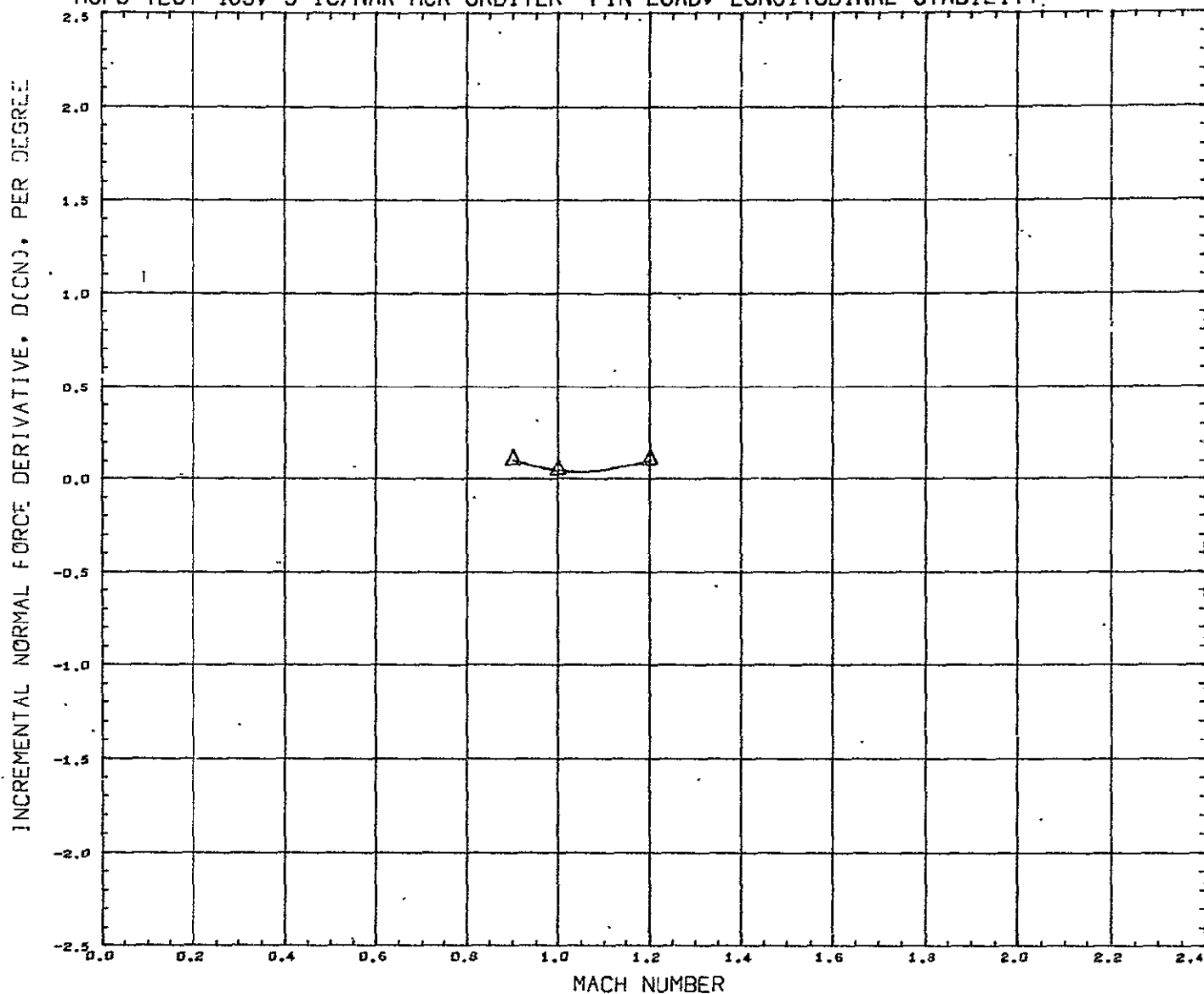
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	SO.IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	2.0034	

DATA HIST. CODE *EI*CM

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY.



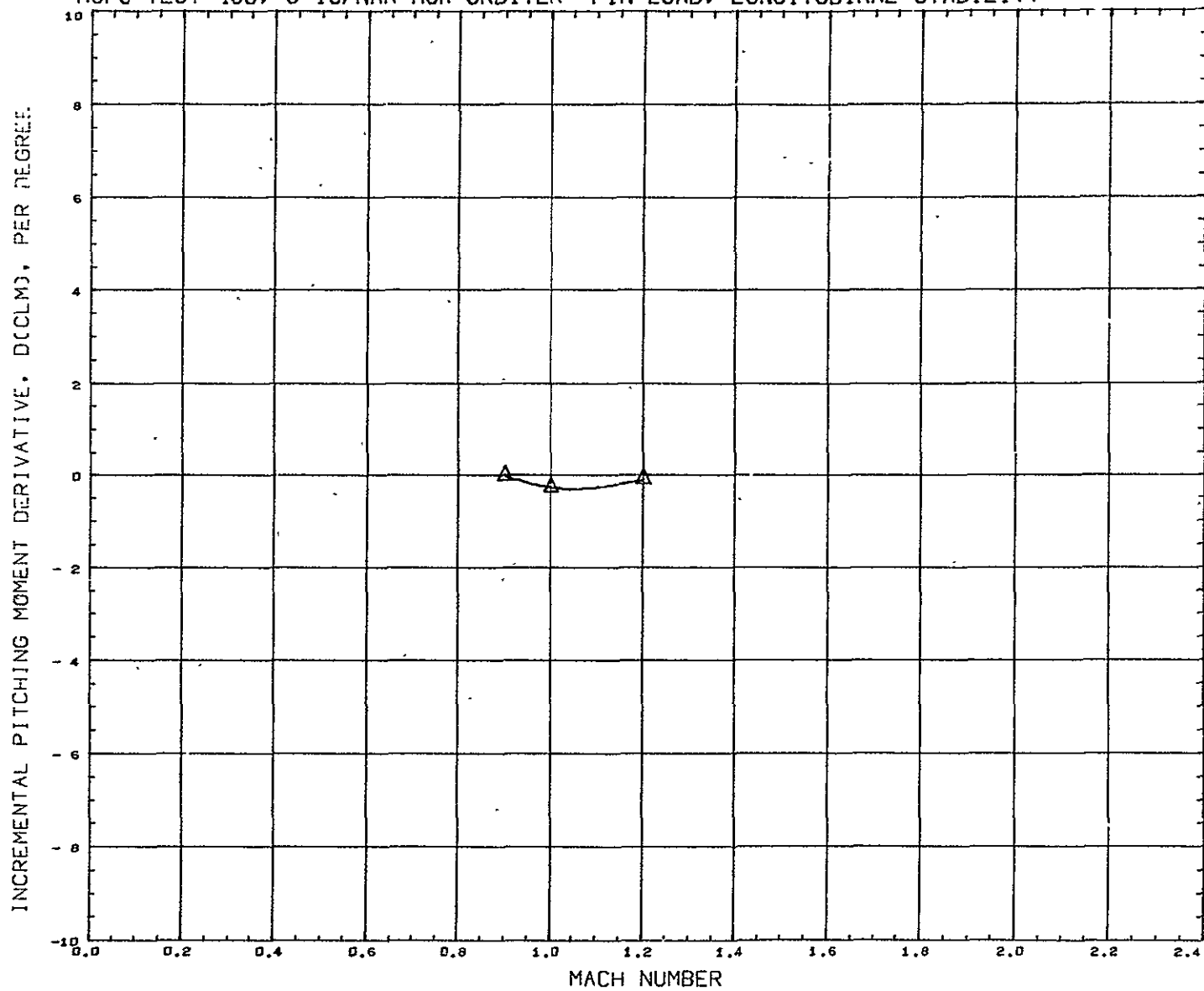
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	SO. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMR°	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI*CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



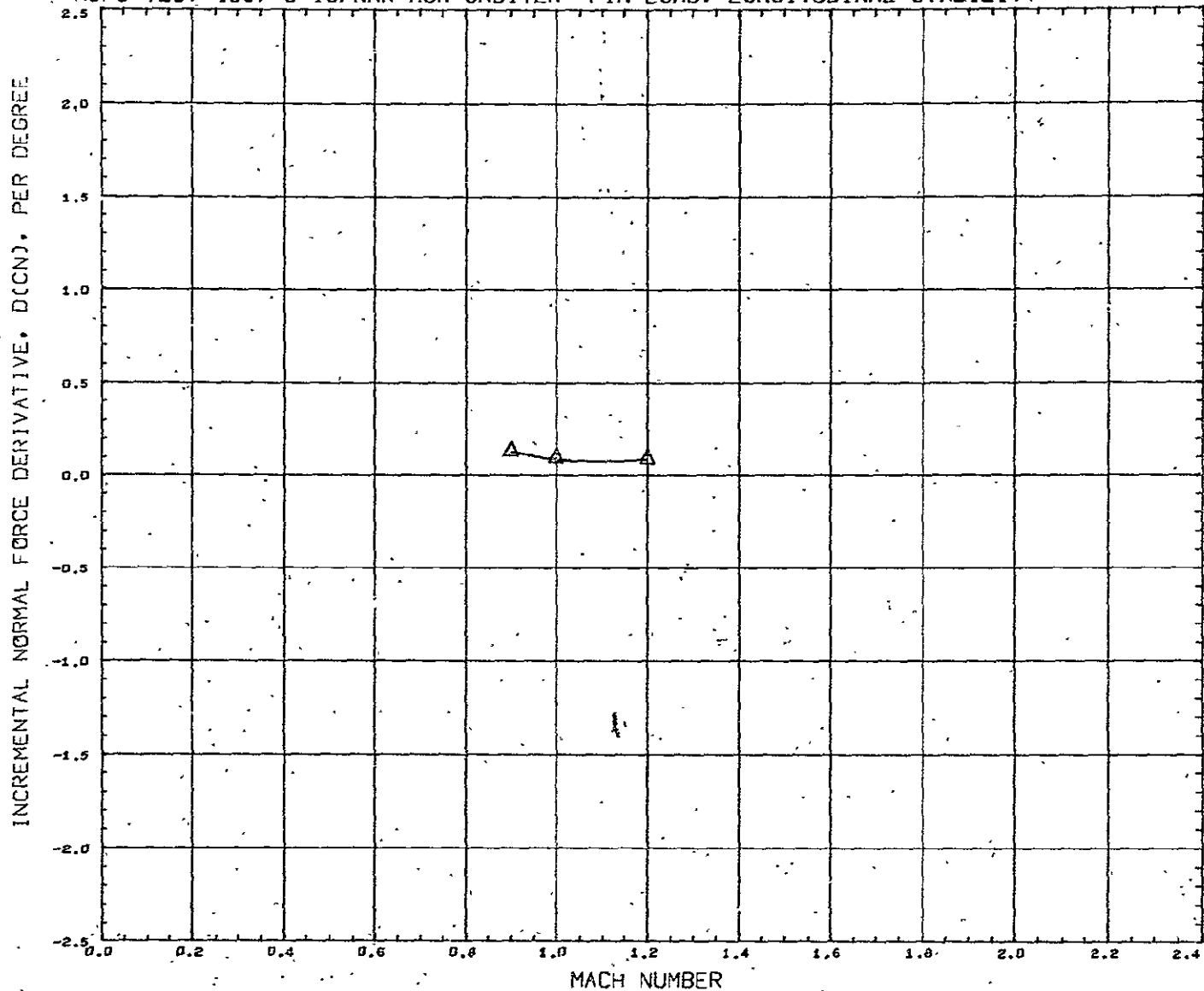
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	50. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI#CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



PARAMETRIC VALUES
D,000

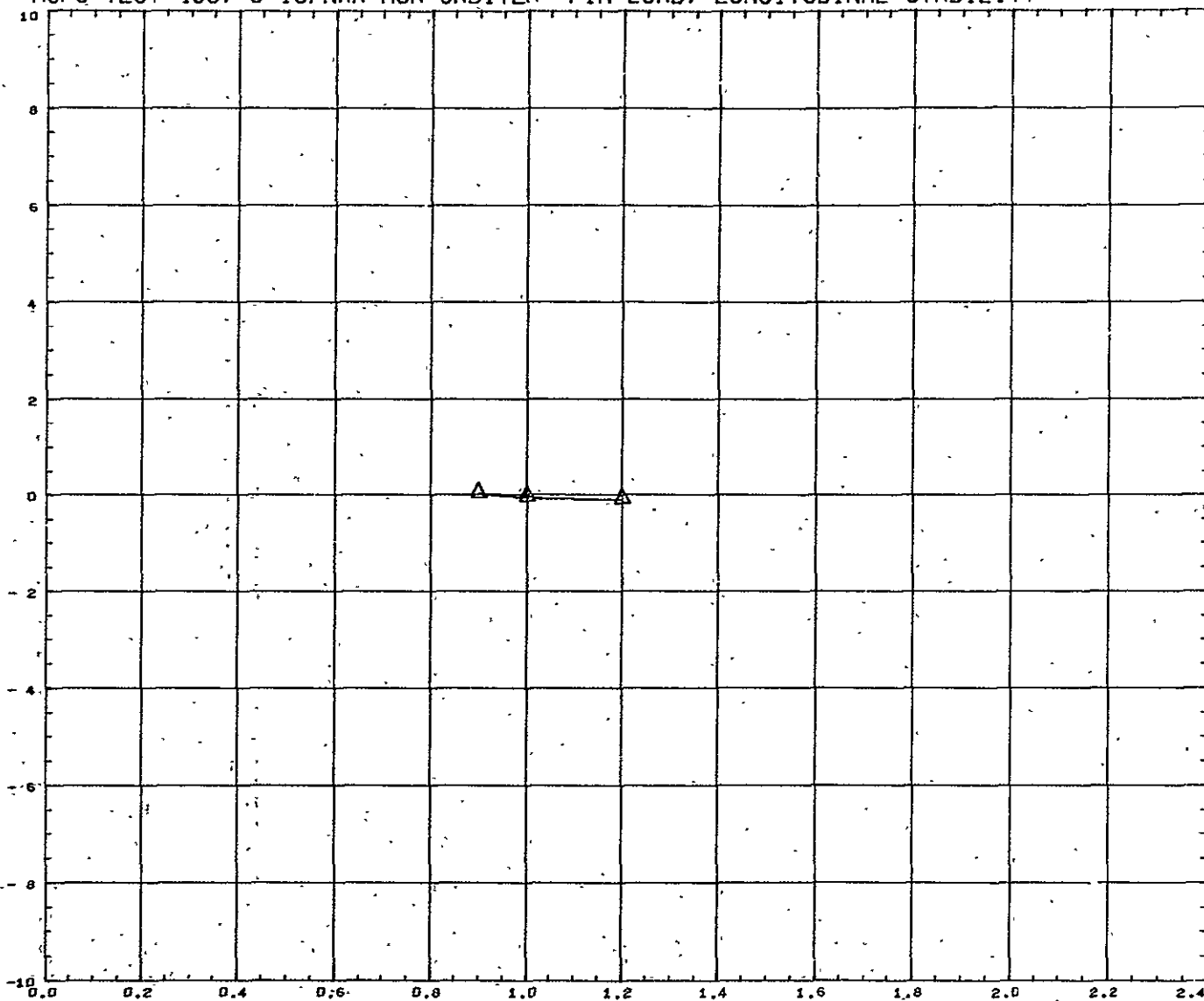
REFERENCE INFORMATION

REFS	1.3960	50 IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.3370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE #E1XCH

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY

INCREMENTAL PITCHING MOMENT DERIVATIVE, DCCLM, PER DEGREE



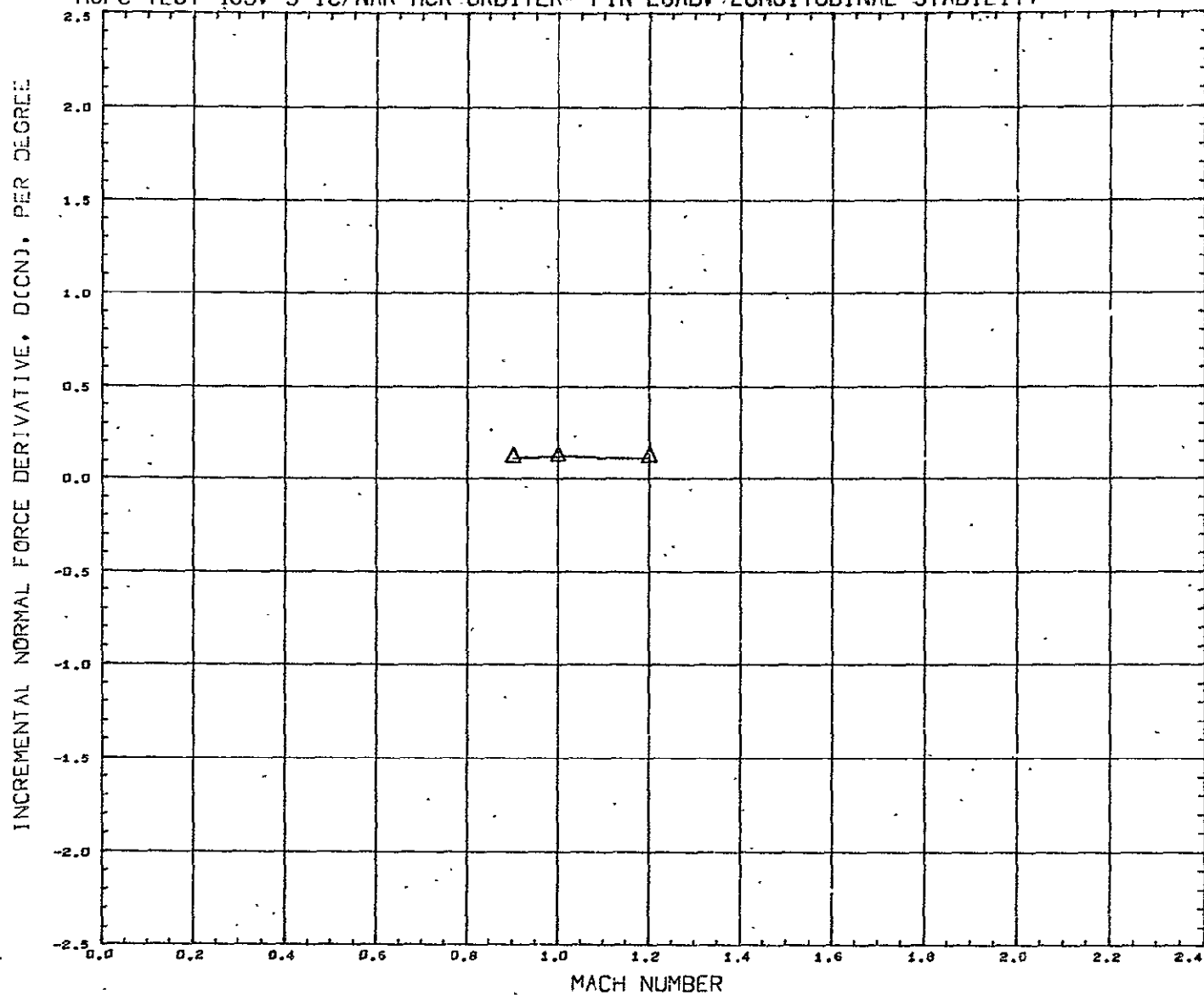
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0570	IN
YMRP	0.0060	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE #EI#CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



PARAMETRIC VALUES
0.000

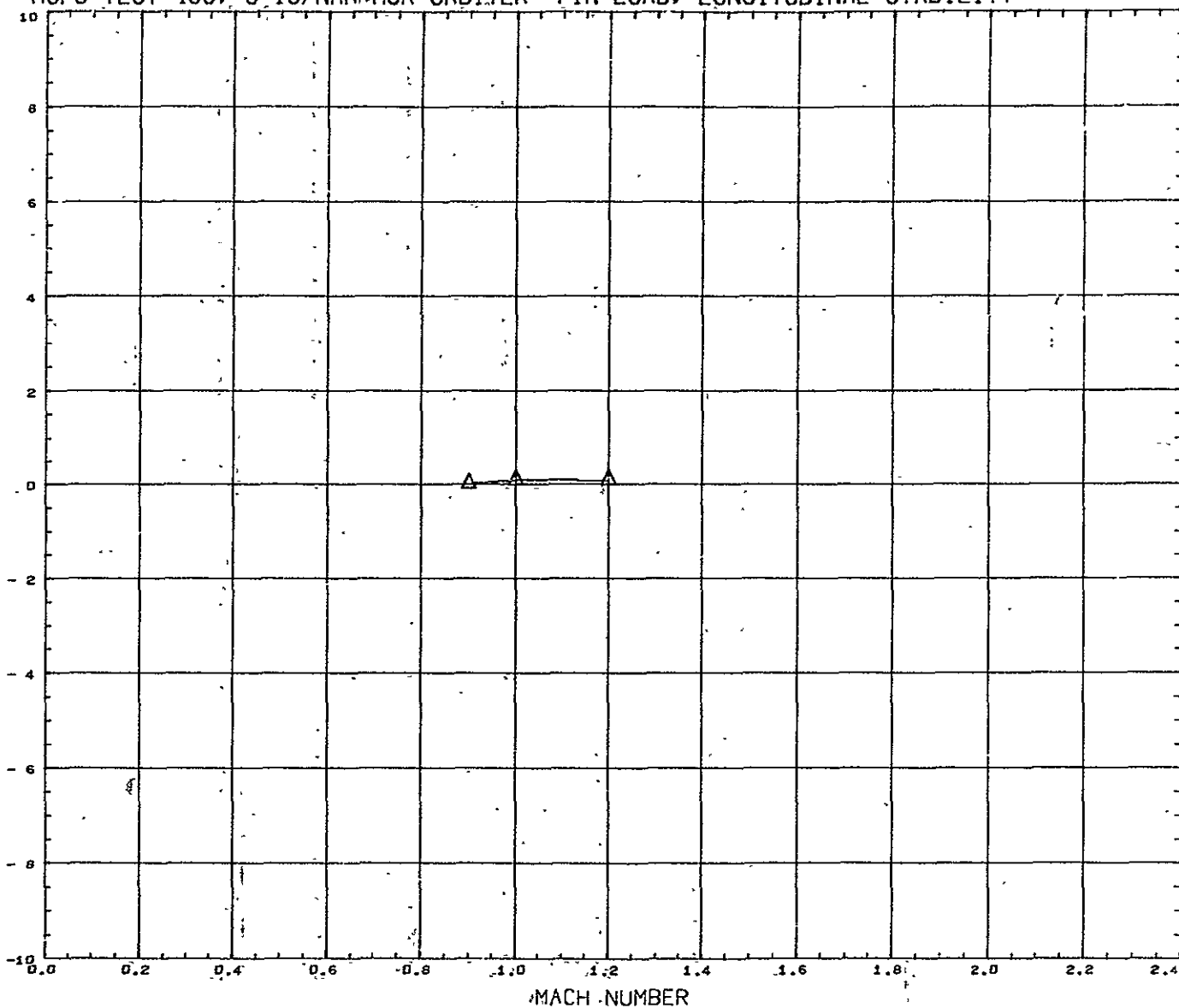
REFERENCE INFORMATION

REFS	1.3960	SG.IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	1.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI*CM

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY

INCREMENTAL PITCHING MOMENT DERIVATIVE, D(CLM), PER DEGREE



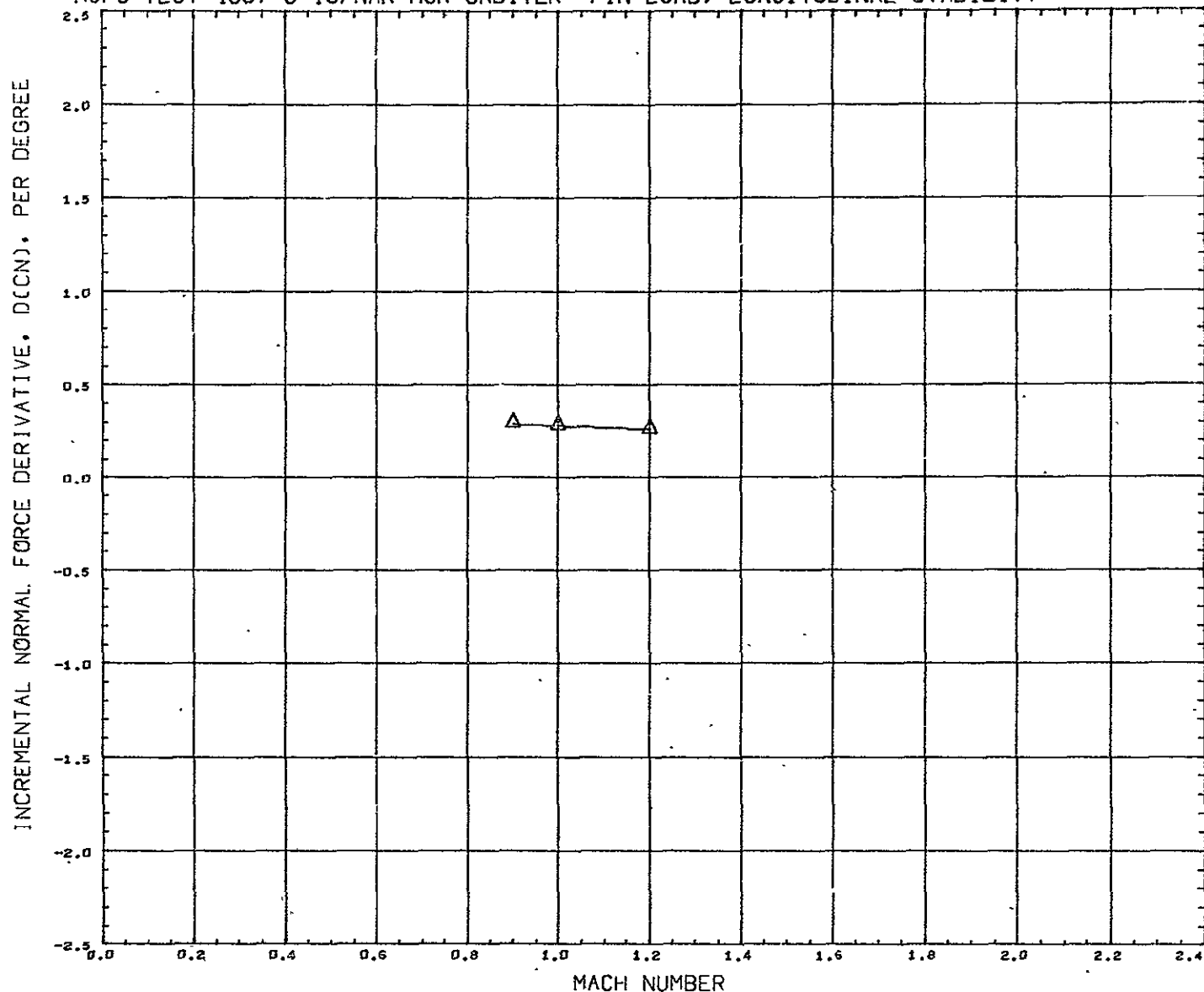
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	SO. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *E14CM

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY

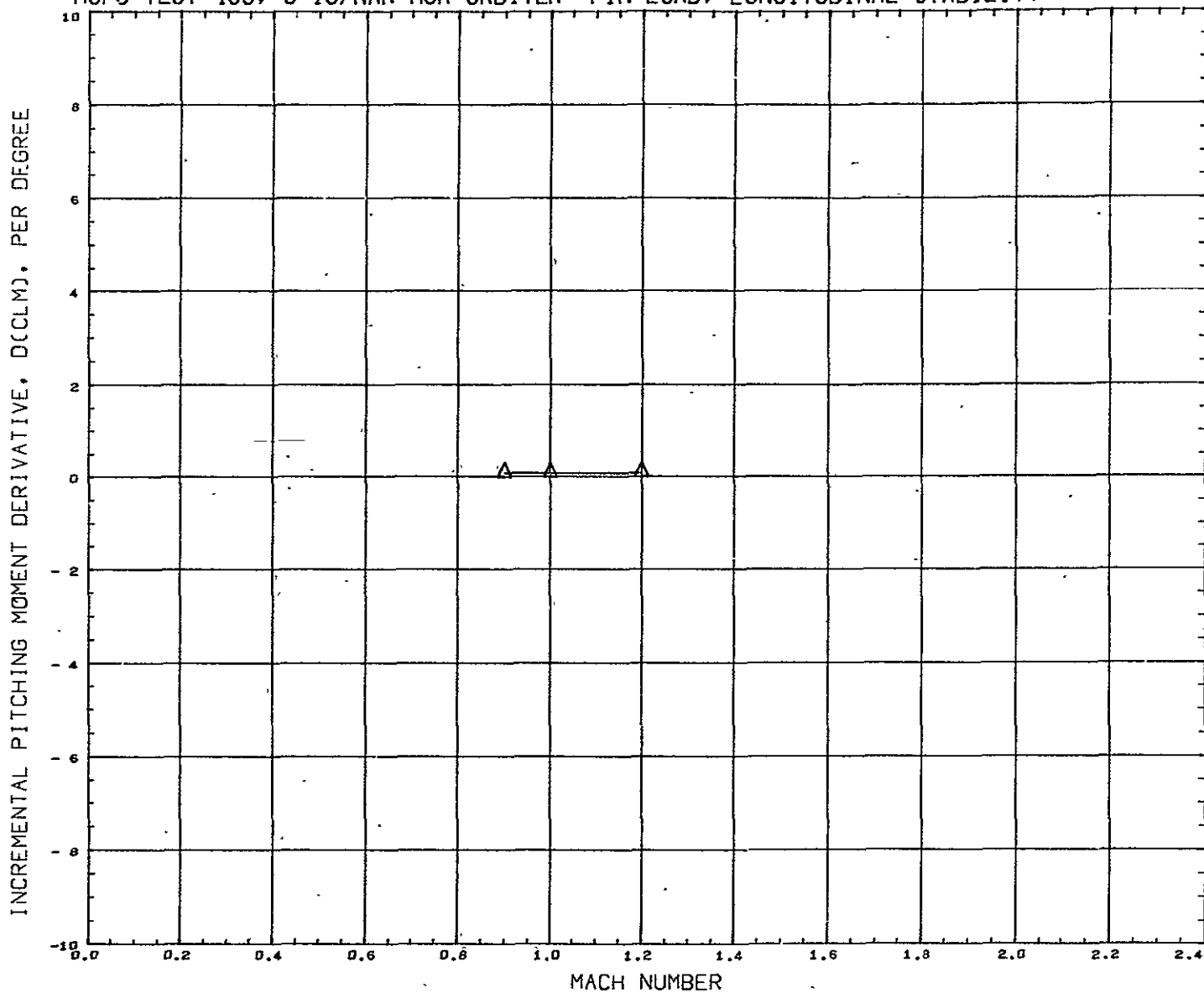


PARAMETRIC VALUES
BETA 0.000

REFERENCE INFORMATION
REFS 1.3860 SQ.IN.
REFL 1.3330 IN
REFB 1.3330 IN
XMRP 0.0370 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE #E1#C

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



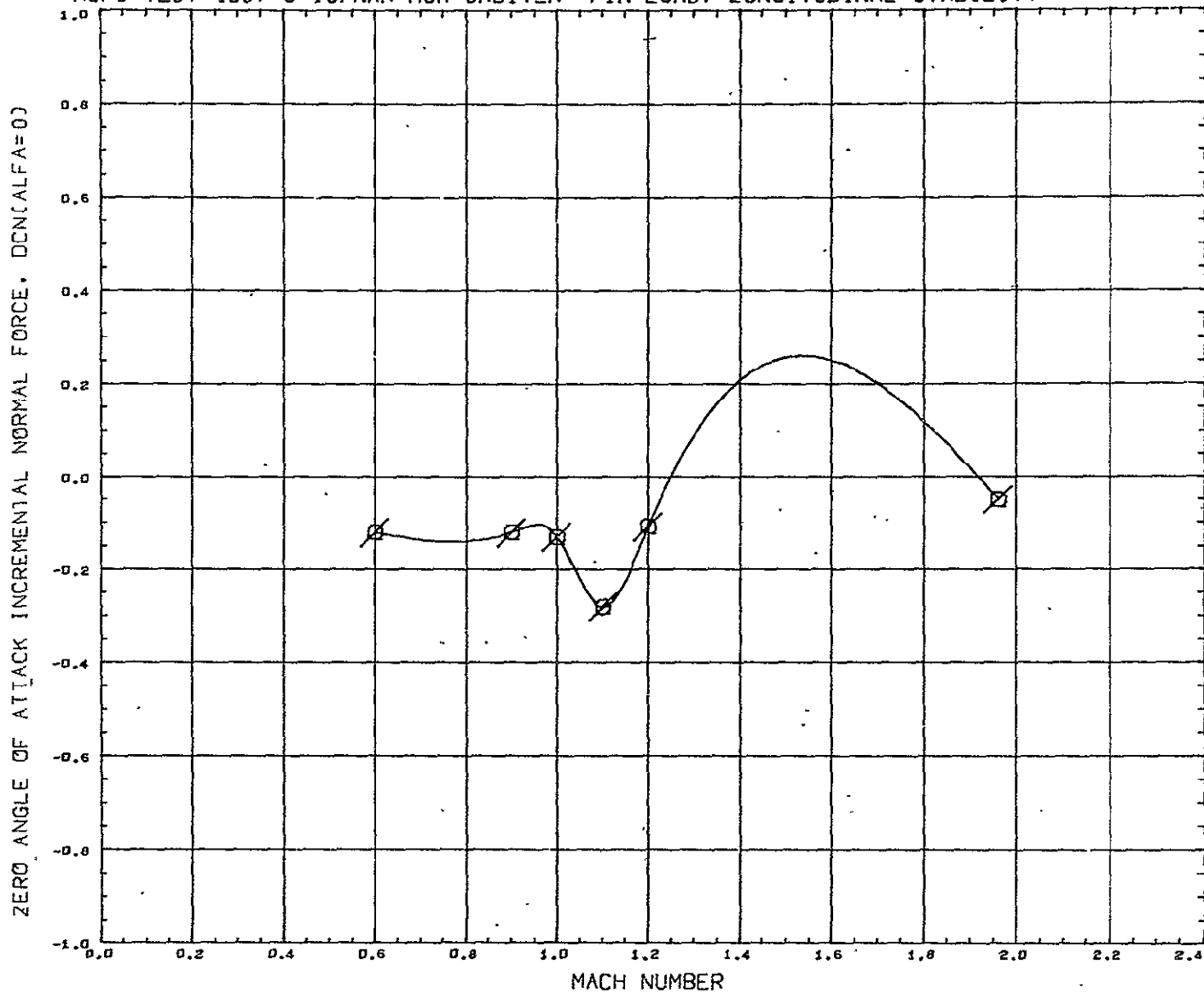
PARAMETRIC VALUES
BETA 0.000

REFERENCE INFORMATION

REFS	1.3960	SQ. IN.
REFL	1.3336	IN
REFD	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI#C

MSFC TEST 485, S-1C/NAR HCR ORBITER-FIN LOAD, LONGITUDINAL STABILITY



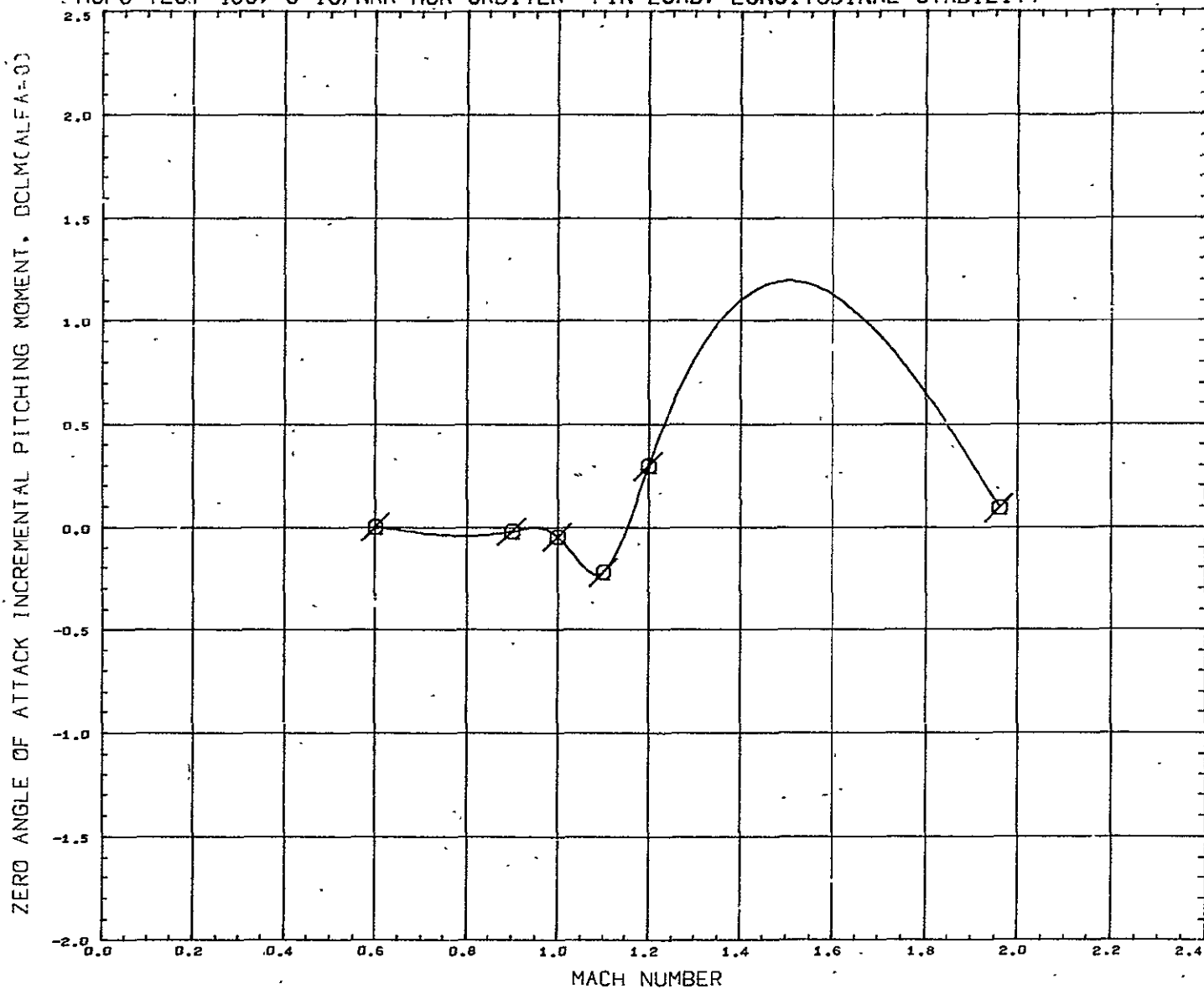
PARAMETRIC VALUES
3.000

REFERENCE INFORMATION

REFS	1.3960	SG, IN.
REFL	1.3530	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE #EI#CHF

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



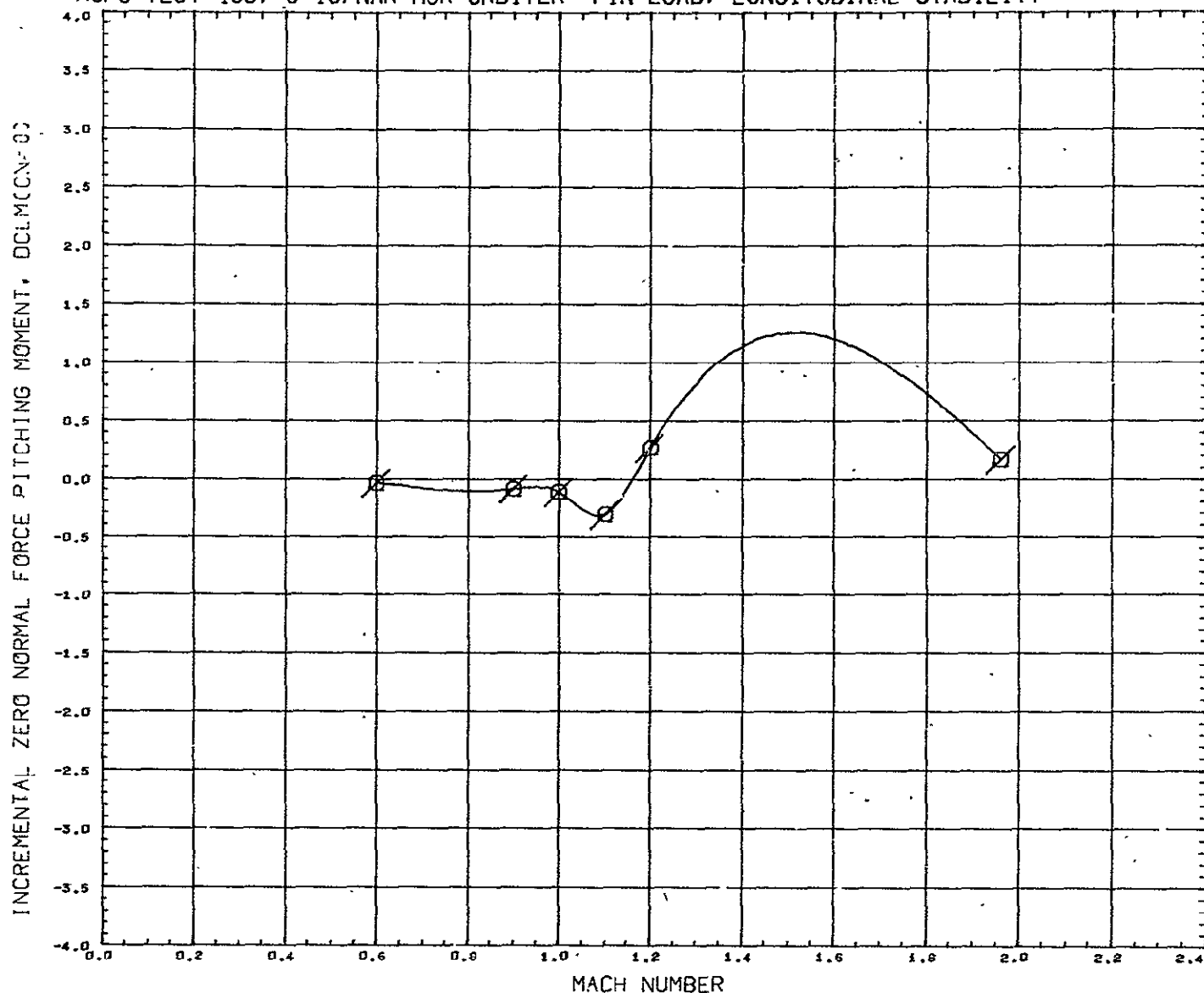
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	SO. IN.
REFL	1.3330	IN
REFB	1.3130	IN
XHRF	0.0370	IN
YHRF	0.0000	IN
ZHRF	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI*CHF

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



PARAMETRIC VALUES -
0.000

REFERENCE INFORMATION

REFS	1.3960	90 IN.
REFL	1.3330	IN
REFS	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI*CMF

M485-MSFC-S1C NAR HCR ORB. FIN INCREMENT OB

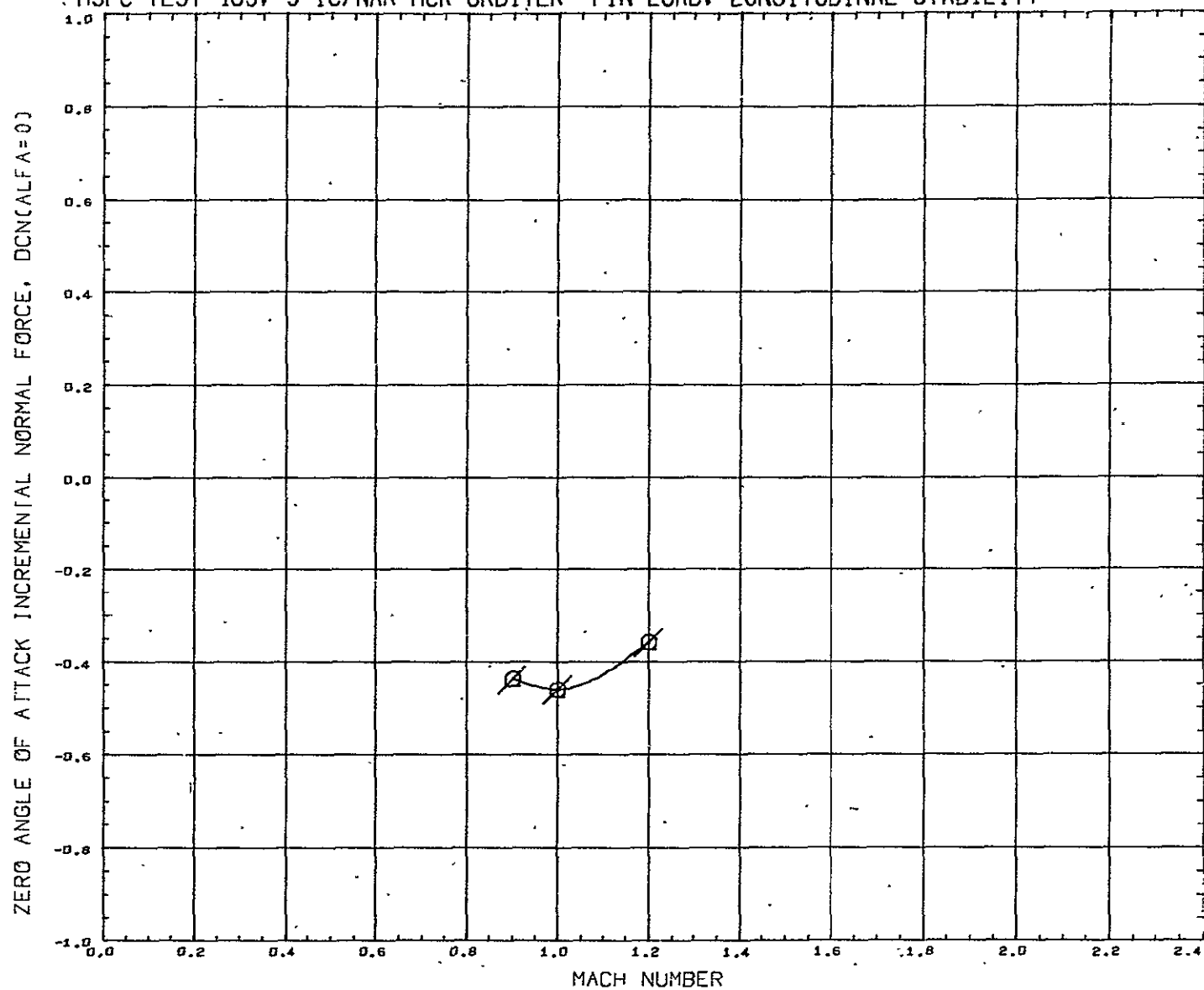
(B30010)

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MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



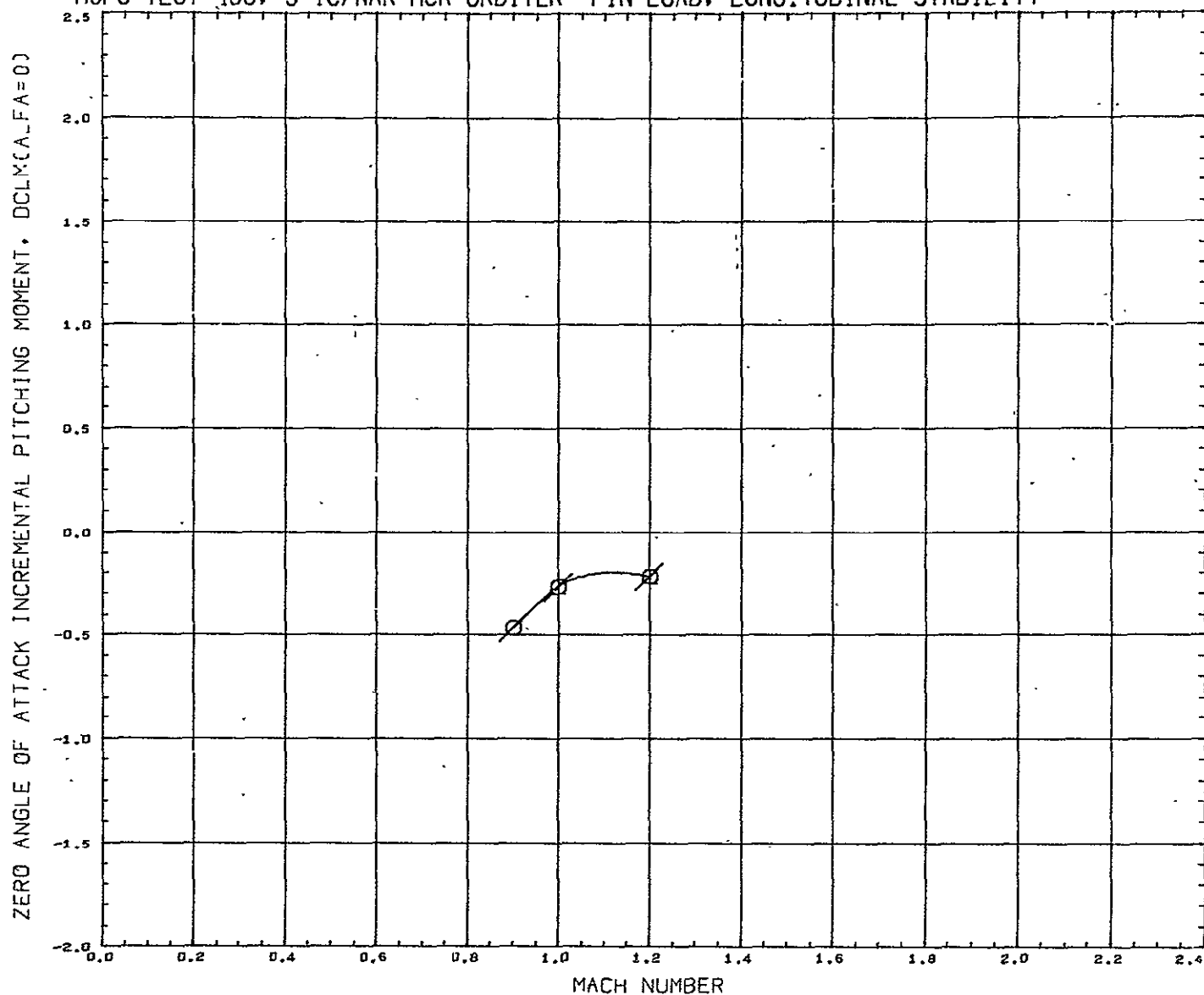
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	50. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE #EI*CMF

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



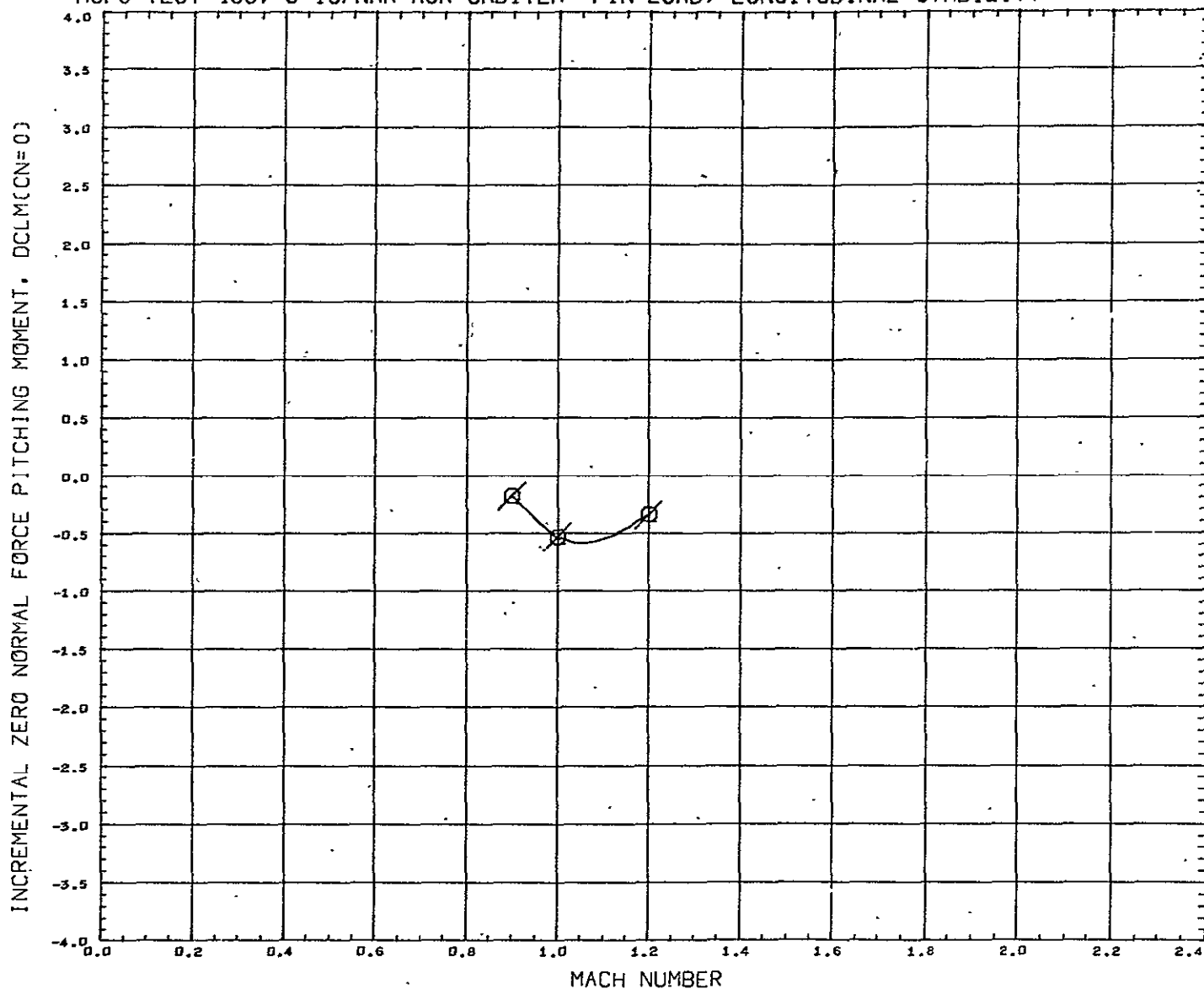
PARAMETRIC VALUES
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REFERENCE INFORMATION

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

DATA HIST. CODE *EI*CHF

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



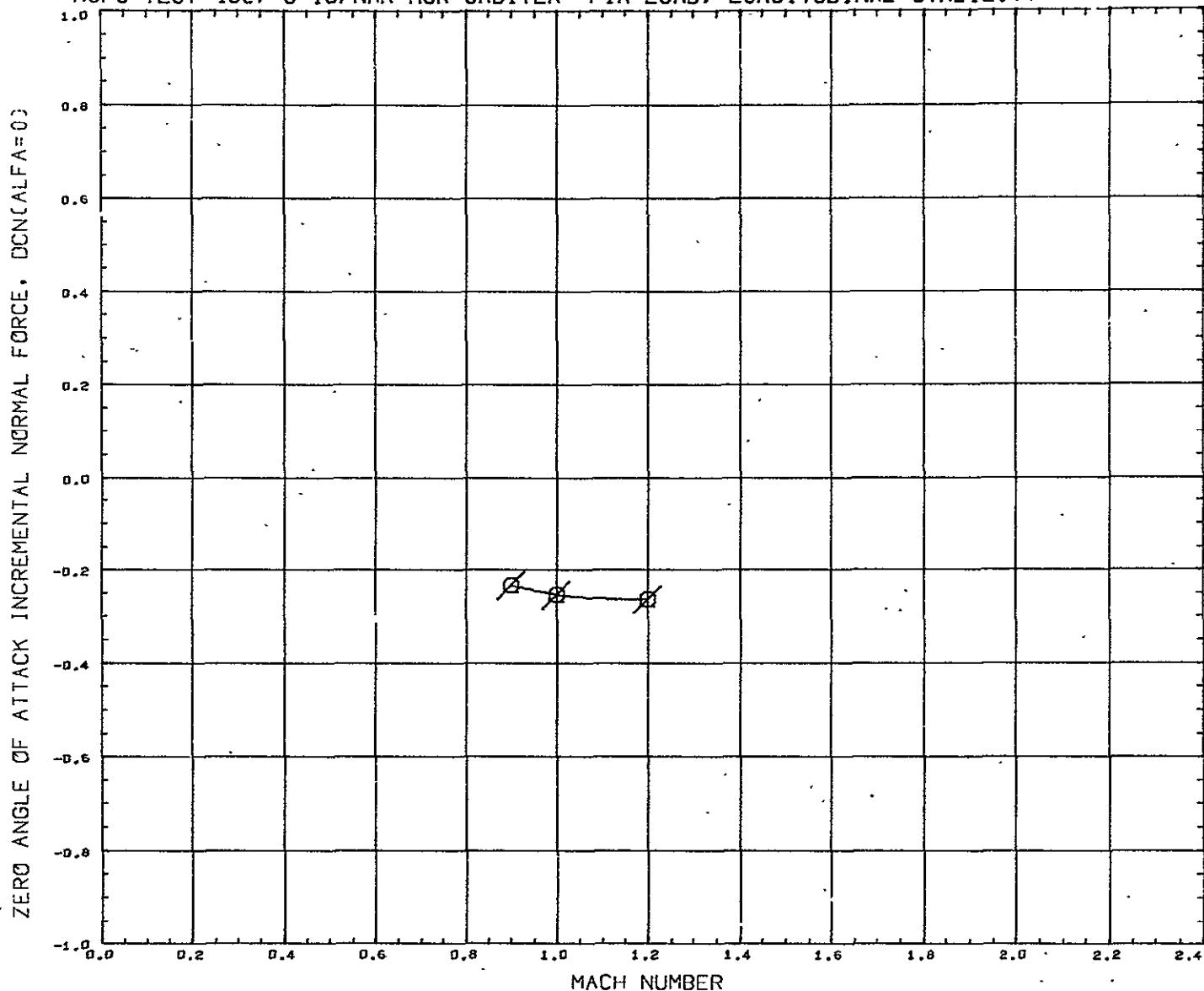
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI*CHF

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



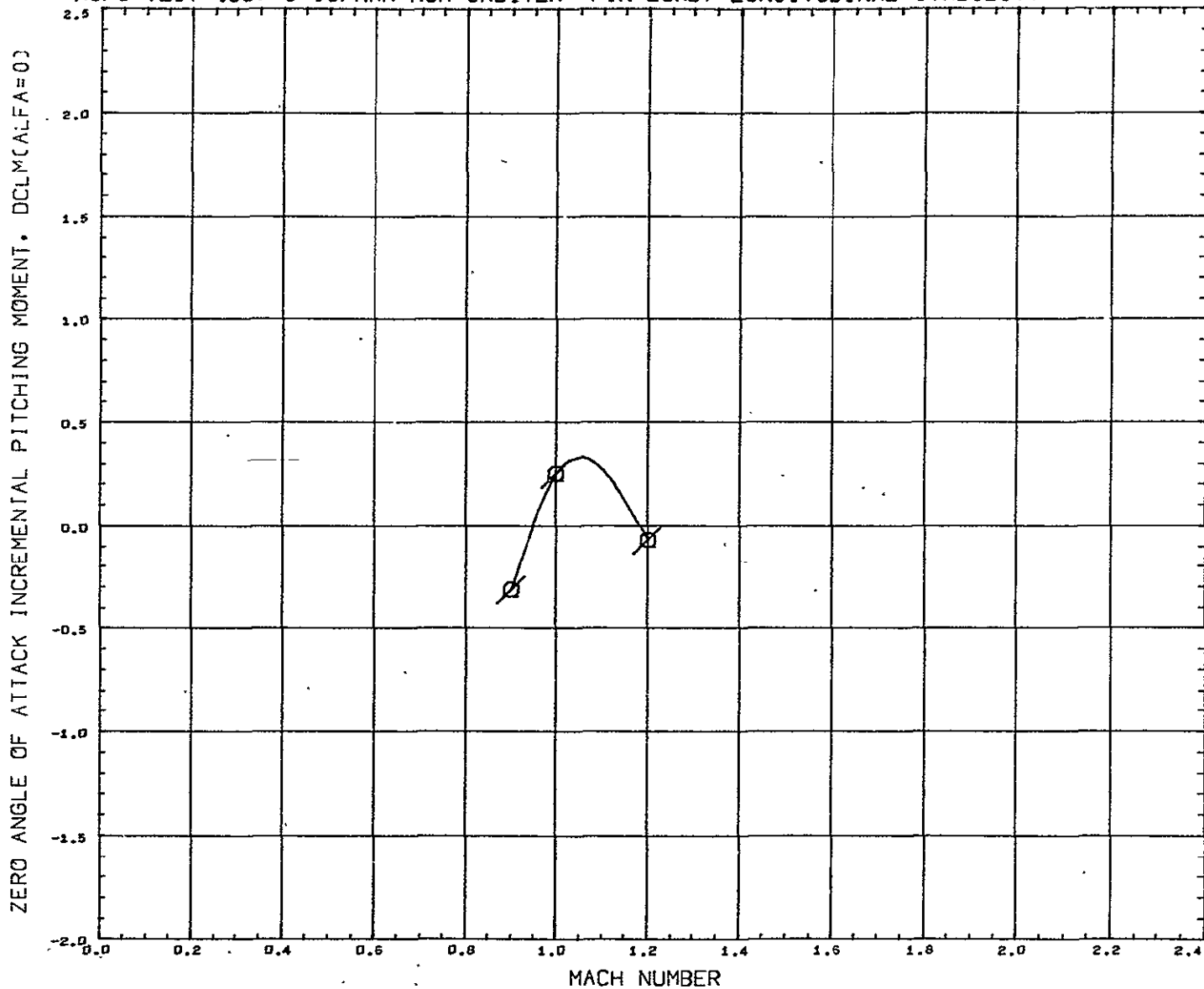
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	50. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE #EI*CMF

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



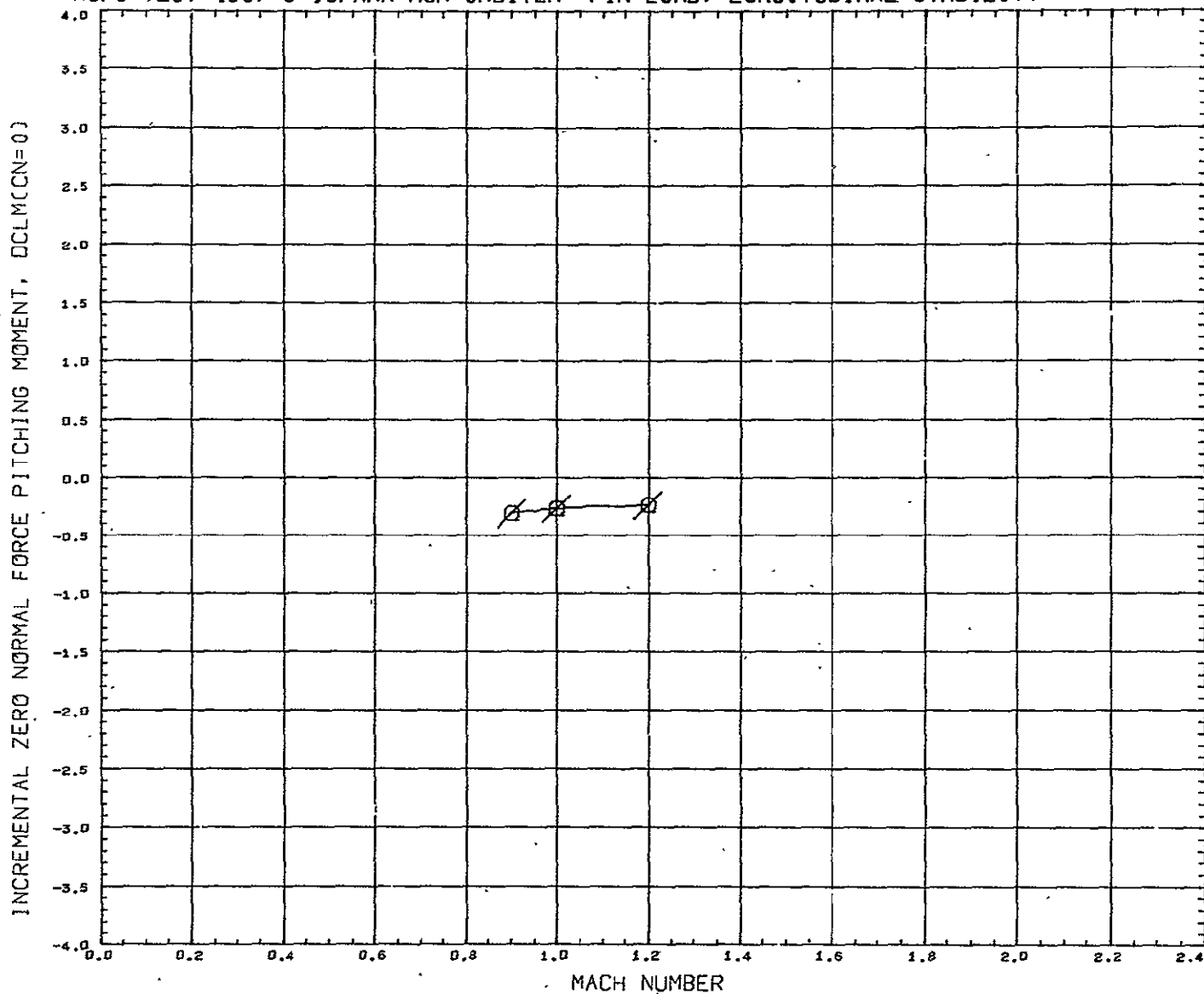
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	SG.IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI#CHF

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



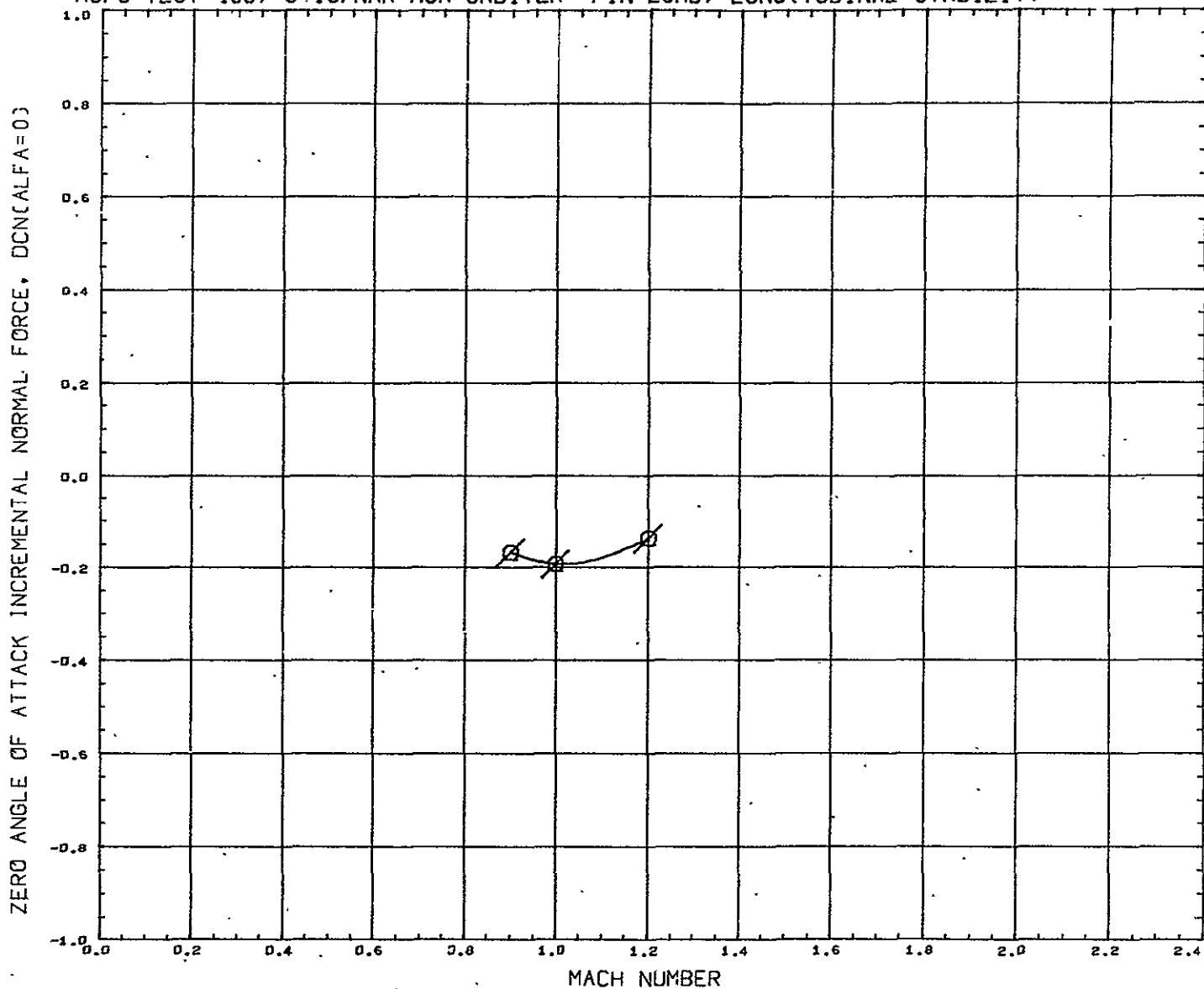
PARAMETRIC VALUES
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REFERENCE INFORMATION

REFS	1.3960	59 IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI*CMF

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



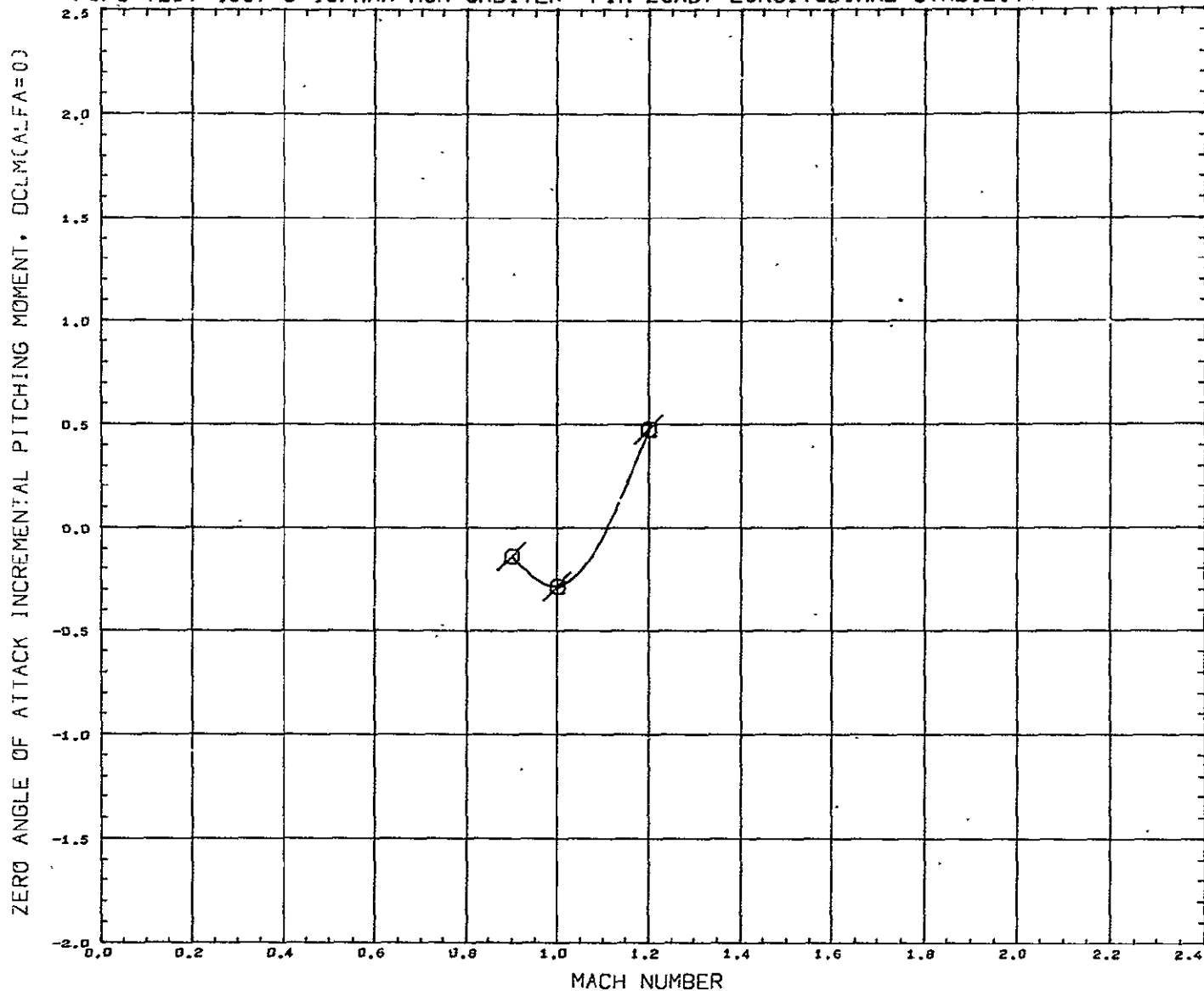
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	50. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI*CMF

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



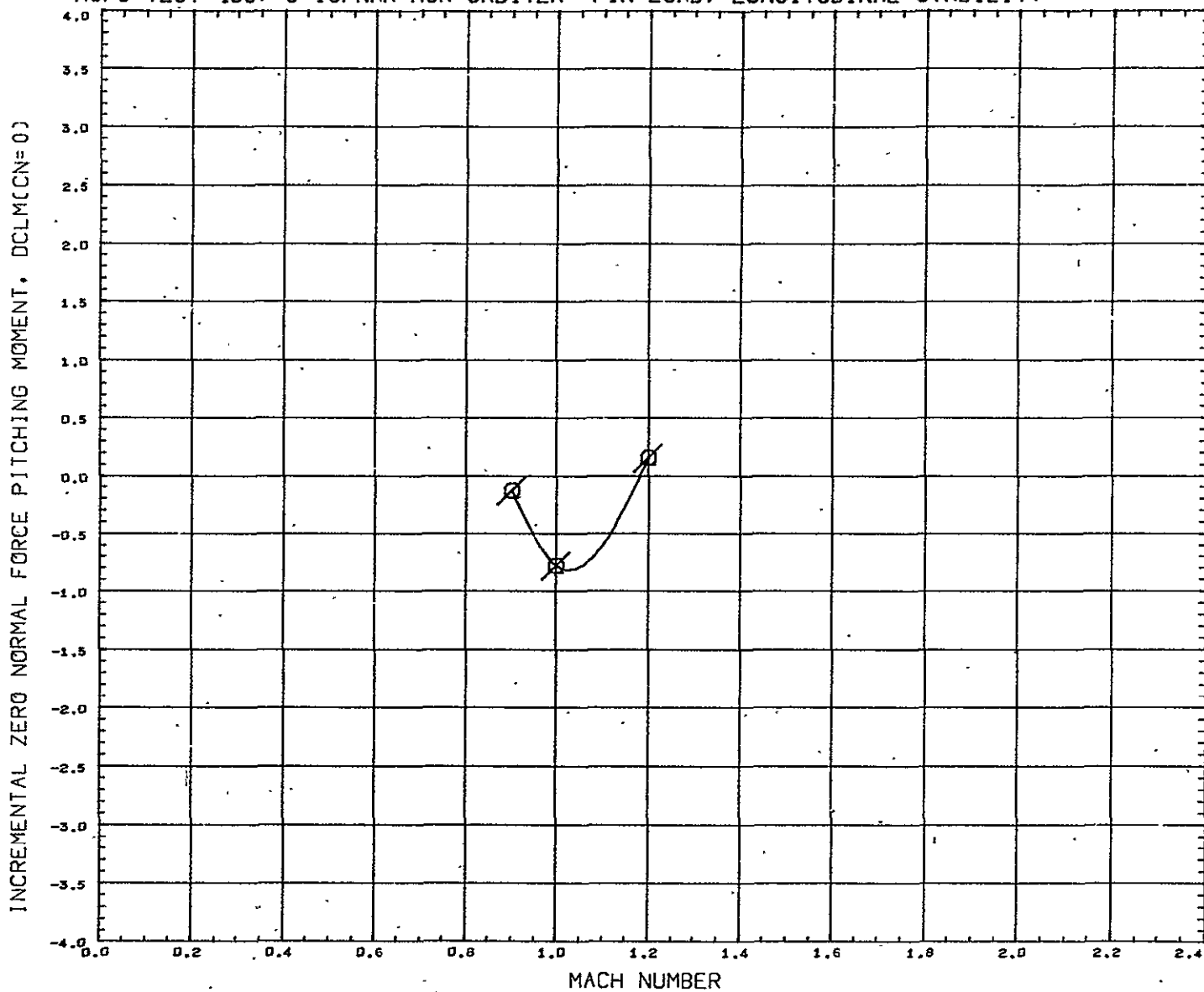
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	SG.IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YNRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI*CMF

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



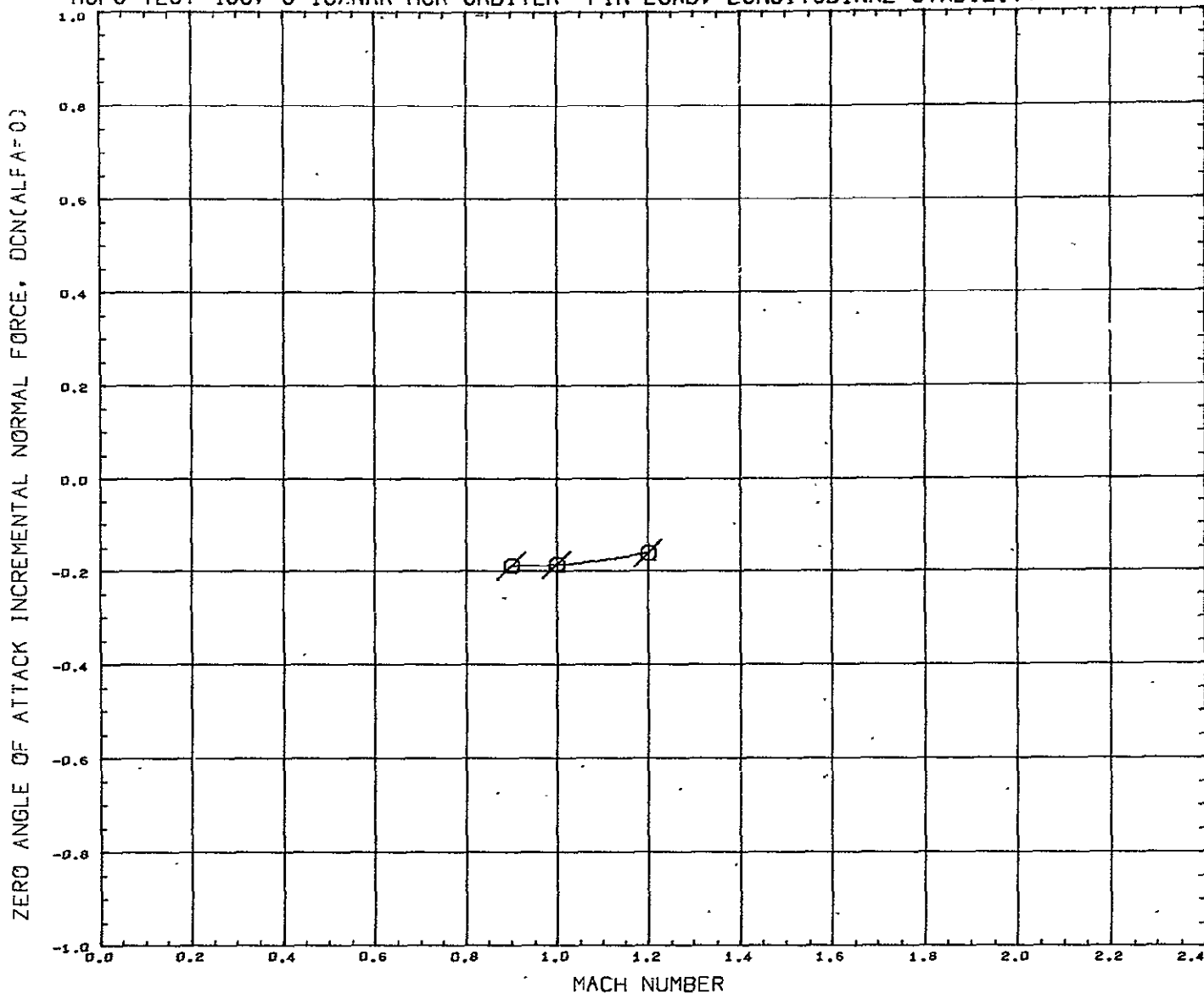
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE #EI*CHF

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



PARAMETRIC VALUES
0.000

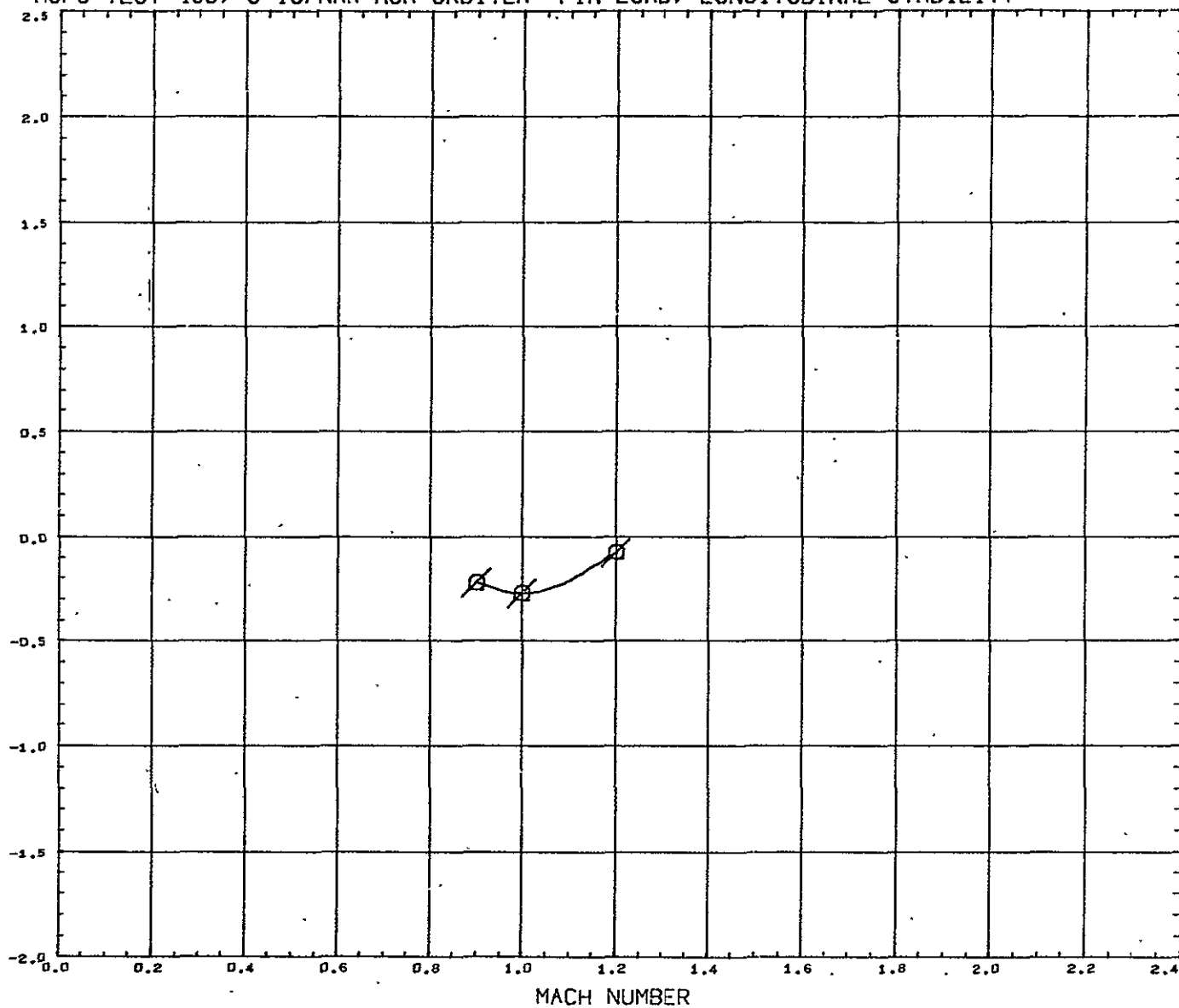
REFERENCE INFORMATION

REFS	1.3960	50. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	1.0034	

DATA HIST. CODE *EI*CMF

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY

ZERO ANGLE OF ATTACK INCREMENTAL PITCHING MOMENT, DCLM/CALFA=00



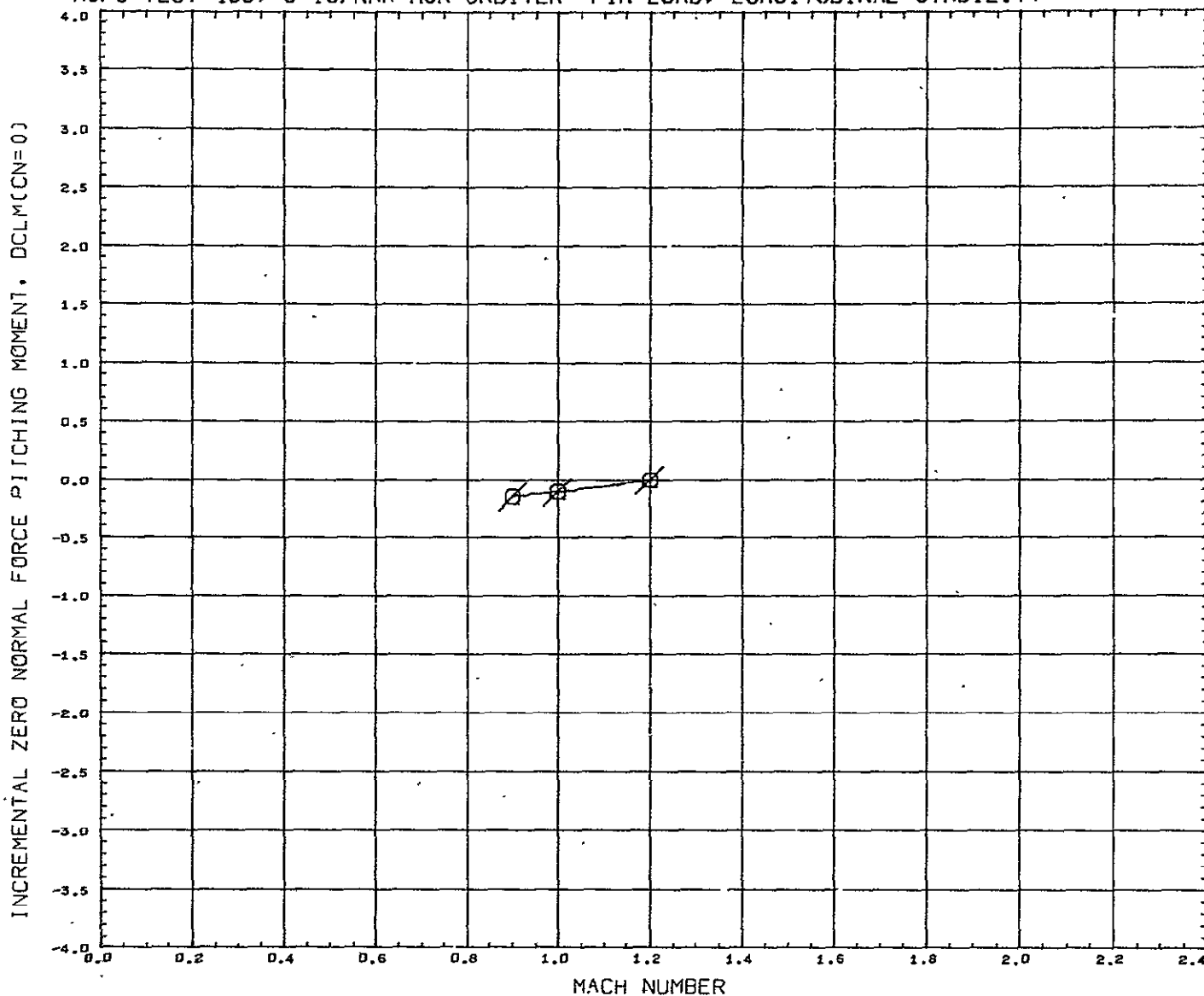
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	50. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	IN

DATA HIST. CODE *EI*CMF

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



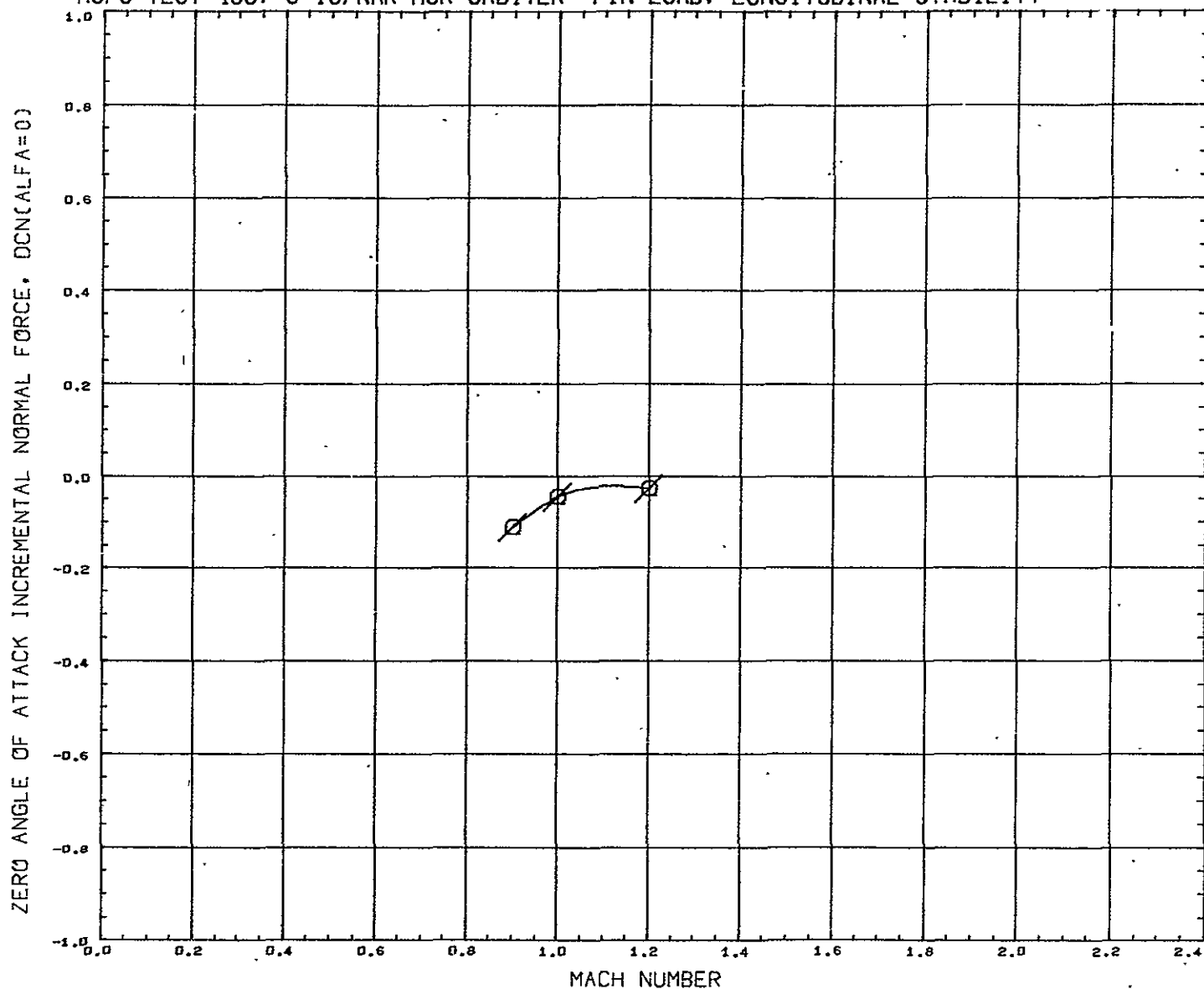
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	sq.in.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI*CHF

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



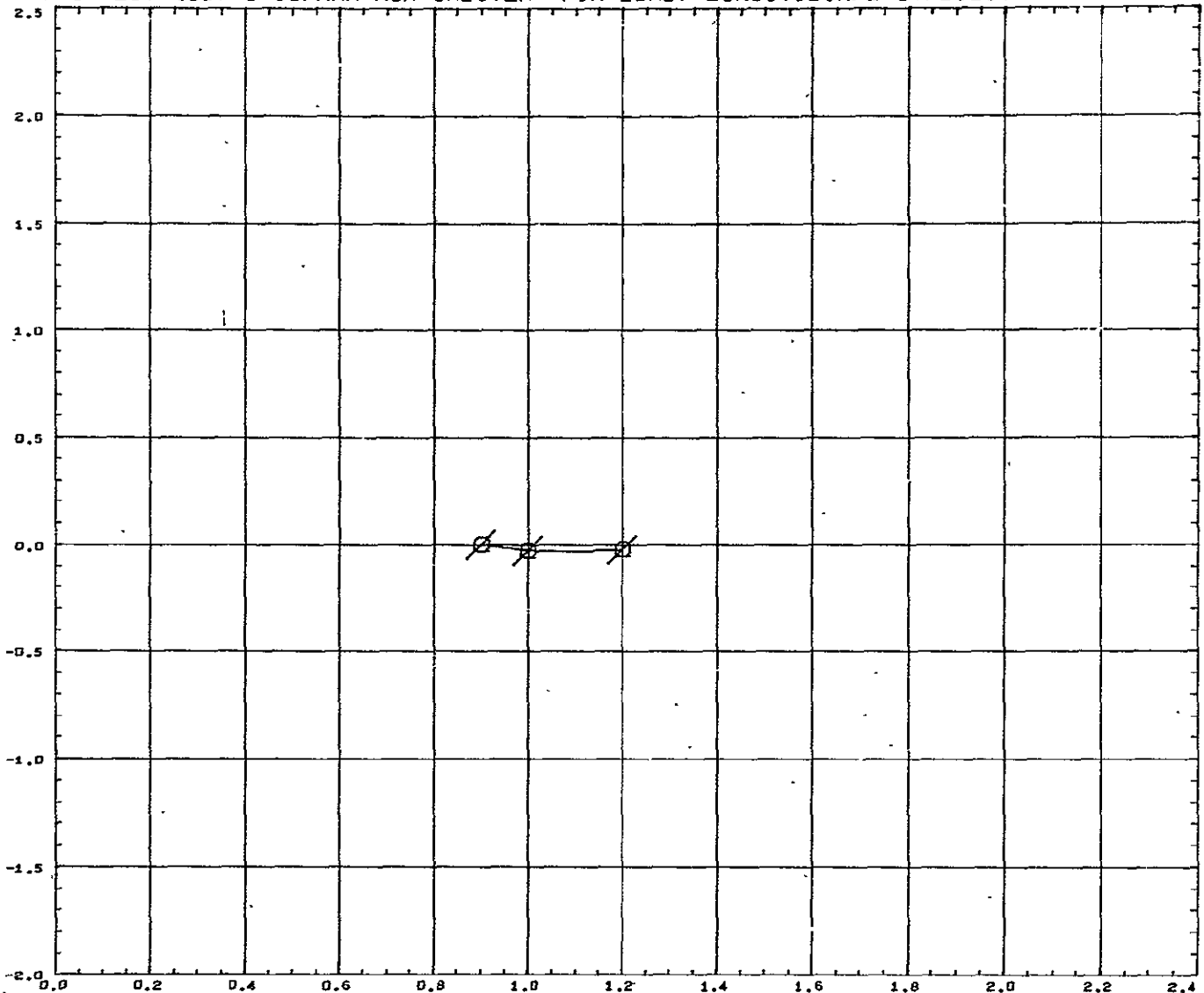
PARAMETRIC VALUES
BETA 0.000

REFERENCE INFORMATION
REFS 1.3960 SQ. IN.
REFL 1.3330 IN
REFB 1.3330 IN
XMRP - 0.0370 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE *EI*CF

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY

ZERO ANGLE OF ATTACK INCREMENTAL PITCHING MOMENT, $DC_{LM}(\alpha=0)$



MACH NUMBER

PARAMETRIC VALUES

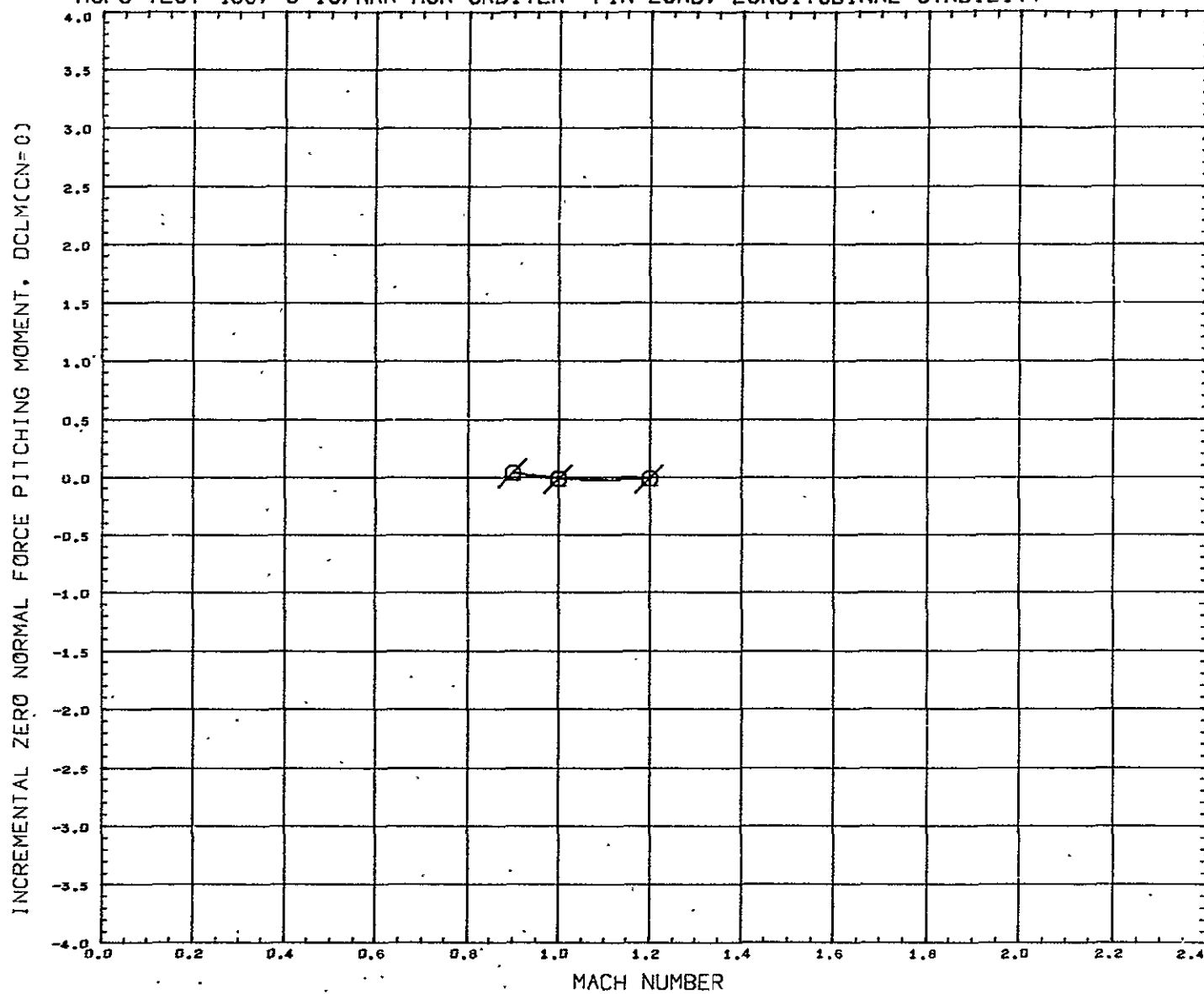
BETA 0.000

REFERENCE INFORMATION

REFS	1.3960	50. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE #EI*CF

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LONGITUDINAL STABILITY



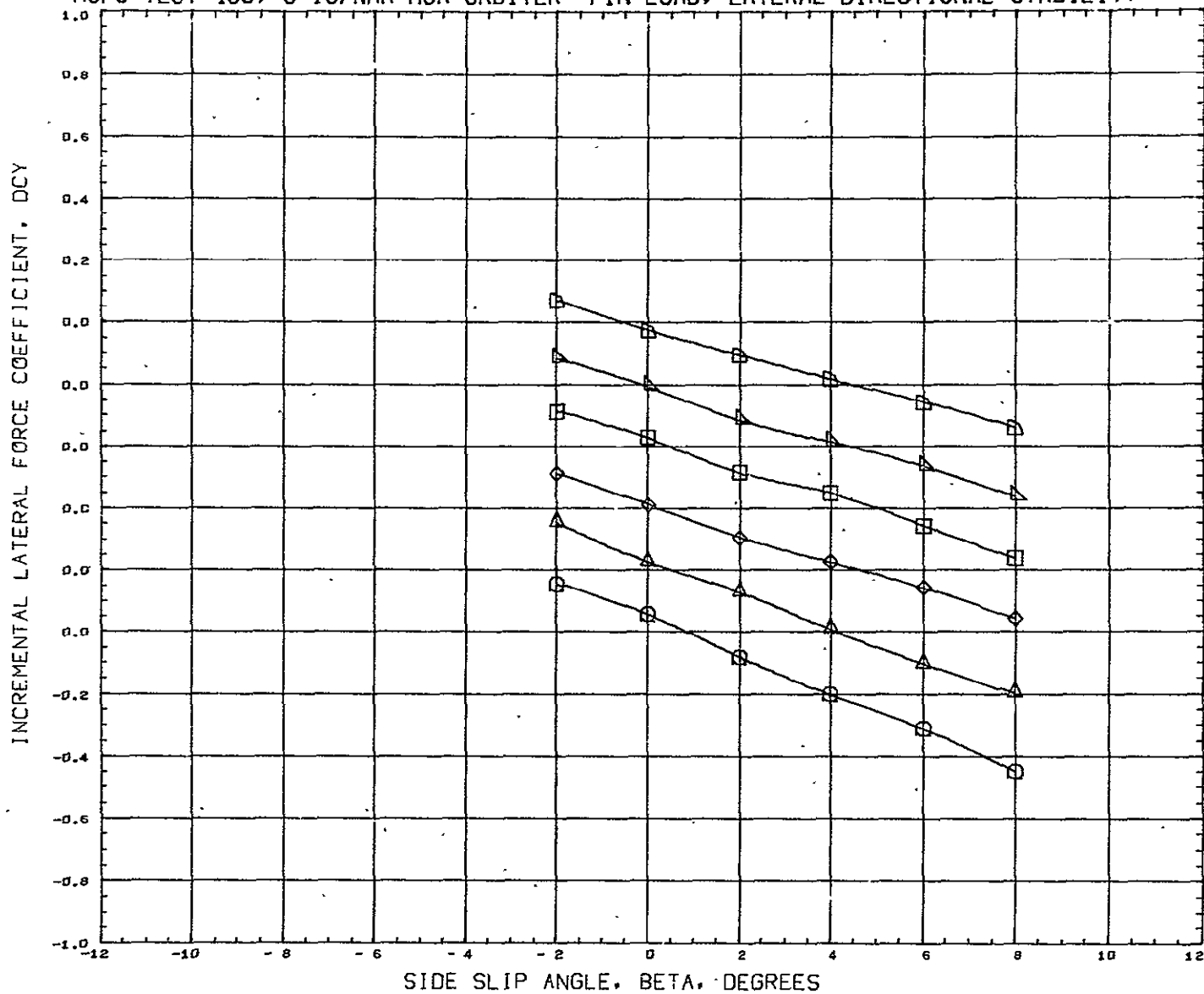
PARAMETRIC VALUES
BETA 0.000

DATA HIST. CODE *E1*CF

REFERENCE INFORMATION

REFS	1.3960	SG.IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

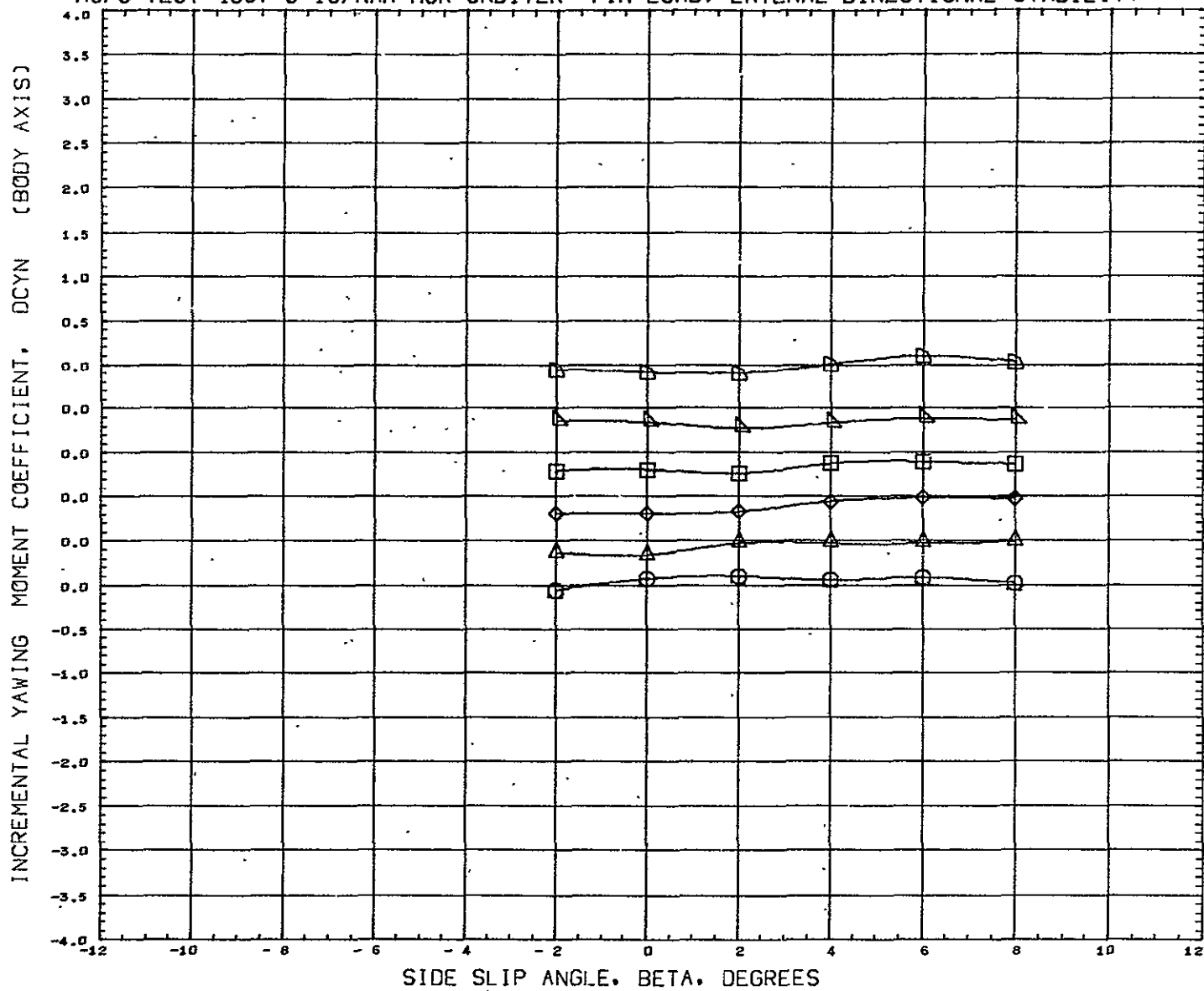
MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LATERAL-DIRECTIONAL STABILITY



SYMBOL MACH PARAMETRIC VALUES
 0.600
 0.800
 1.000
 1.100
 1.200
 1.960 DATA HIST. CODE *EI*CM.

REFERENCE INFORMATION
 REFS 1.3960 SQ.IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRF 0.0370 IN
 YMRP 0.0070 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LATERAL-DIRECTIONAL STABILITY

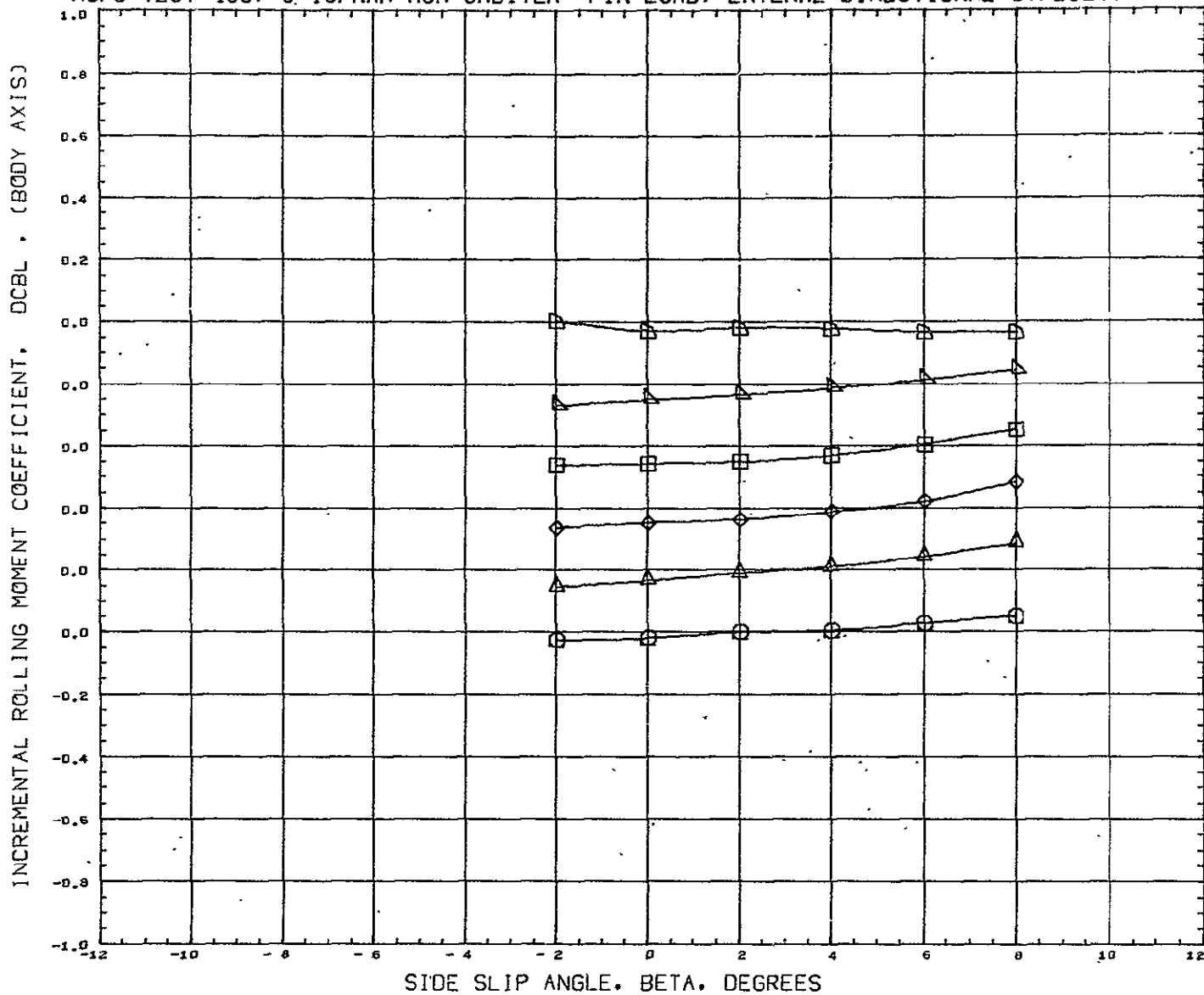


SYMBOL	MACH	PARAMETRIC VALUES
□	0.600	0.000
△	0.900	
◇	1.000	
○	1.100	
×	1.200	
+	1.960	

DATA HIST. CODE #EI#CH

REFERENCE INFORMATION		
REFS	1.3960	SG. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LATERAL-DIRECTIONAL STABILITY

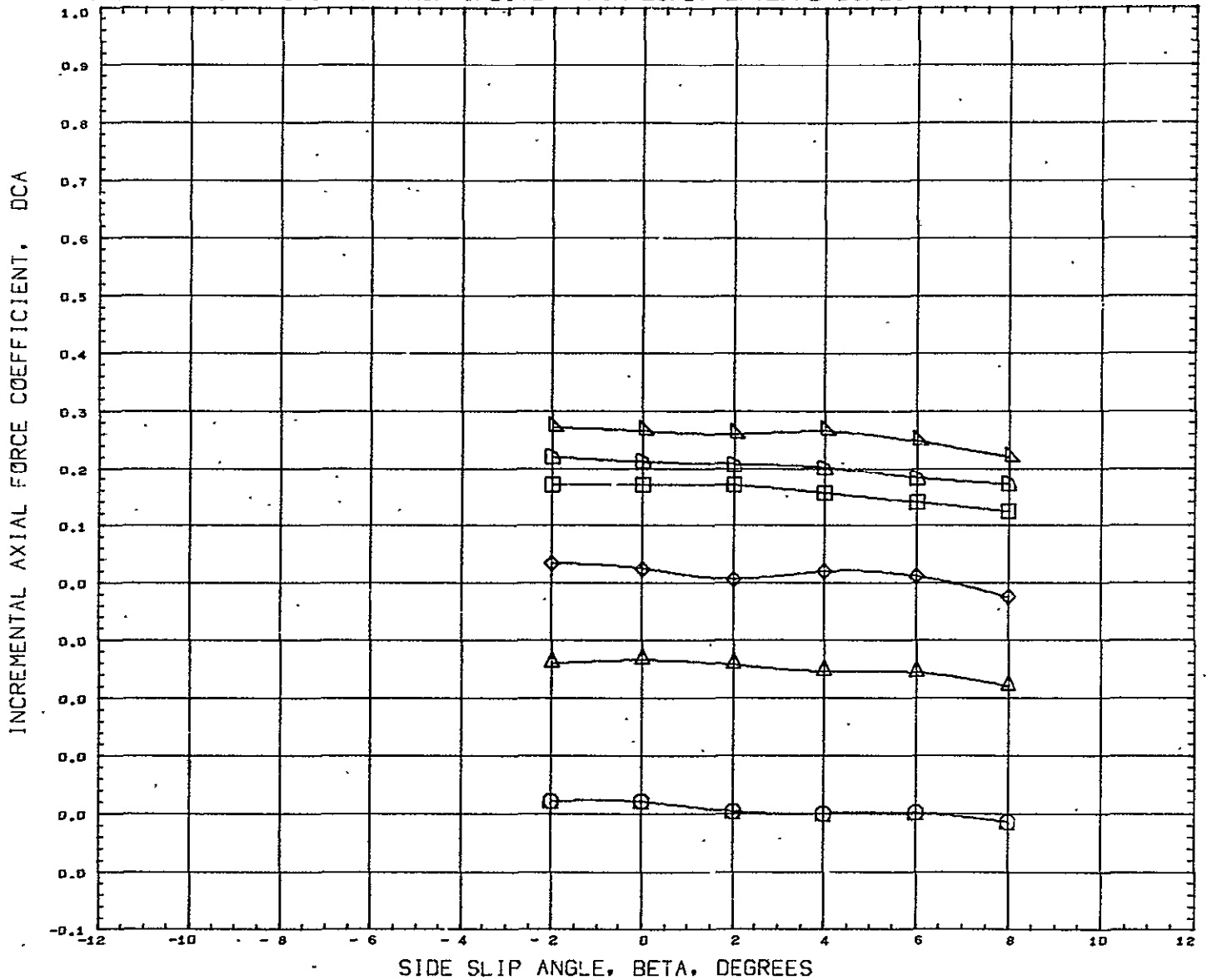


SYMBOL	MACH	PARAMETRIC VALUES
□	0.600	0.000
◇	0.900	
△	1.000	
▽	1.100	
◊	1.200	
○	1.960	

DATA HIST. CODE *EI*CM

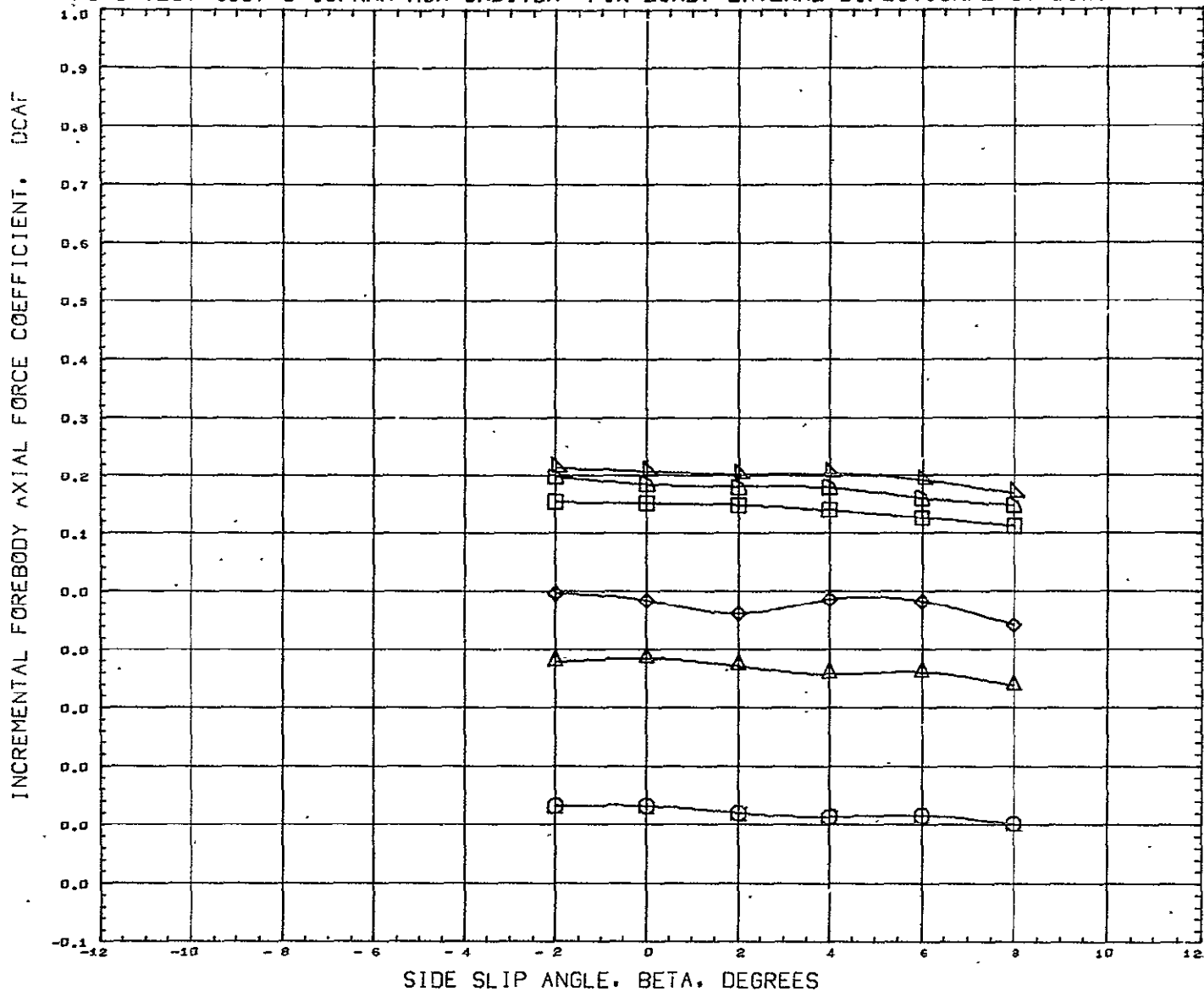
REFERENCE INFORMATION		
REFS	1.3960	50 IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LATERAL-DIRECTIONAL STABILITY



SYMBOL	MACH.	PARAMETRIC VALUES	REFERENCE INFORMATION
◇	0.600	0.000	REFS 1.3960 SQ.IN.
◇	0.900		REFL 1.3330 IN
◇	1.000		REFB 1.5330 IN
◇	1.100		XMRP - 0.0370 IN
◇	1.200		YMRP 0.0000 IN
◇	1.960		ZMRP 0.0000 IN
		DATA HIST. CODE #EI*CM	SCALE 0.0034

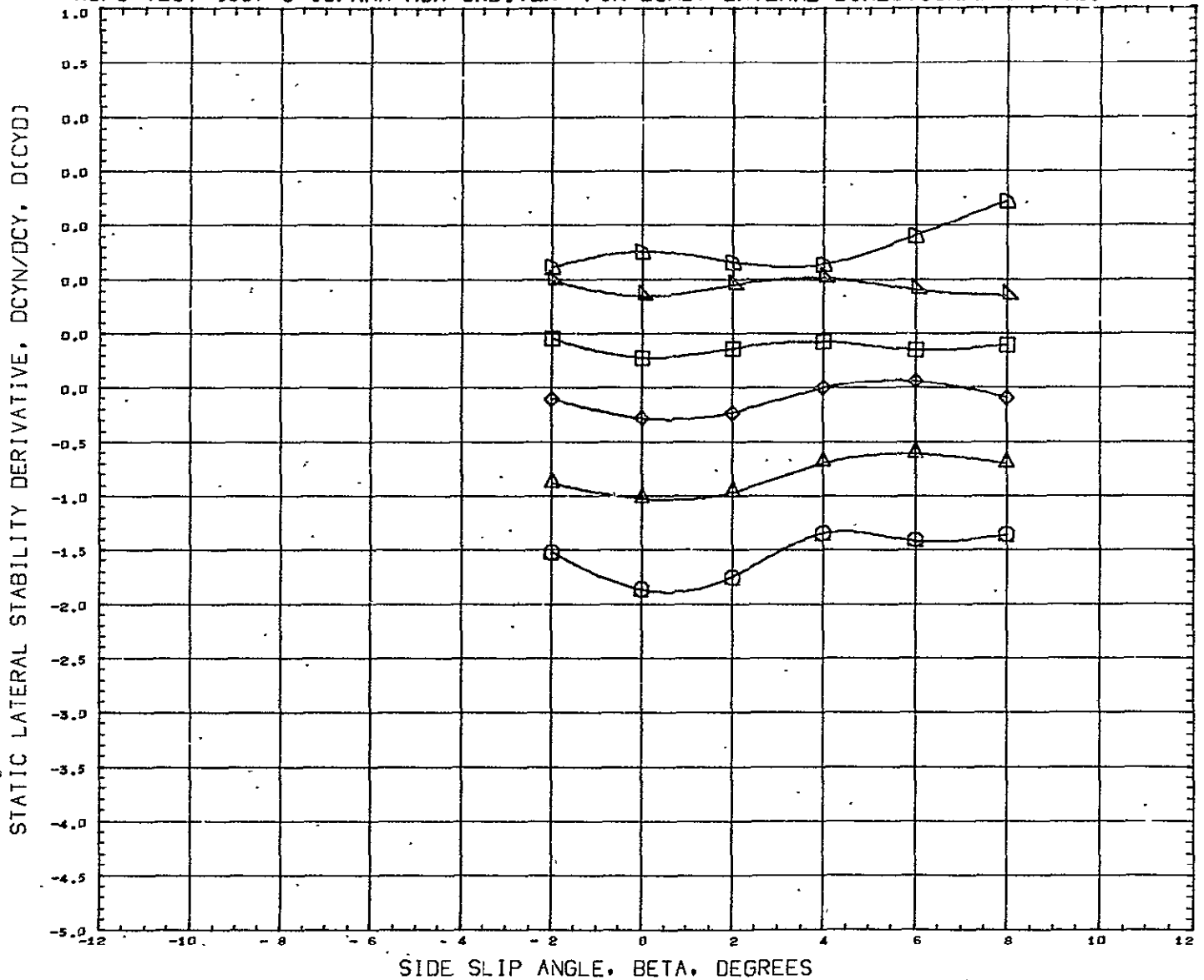
MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LATERAL-DIRECTIONAL STABILITY



SYMBOL MACH PARAMETRIC VALUES
 0.600 0.000
 0.900 0.000
 1.000 0.000
 1.100 0.000
 1.200 0.000
 1.960 DATA HIST. CODE *EI*CM

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

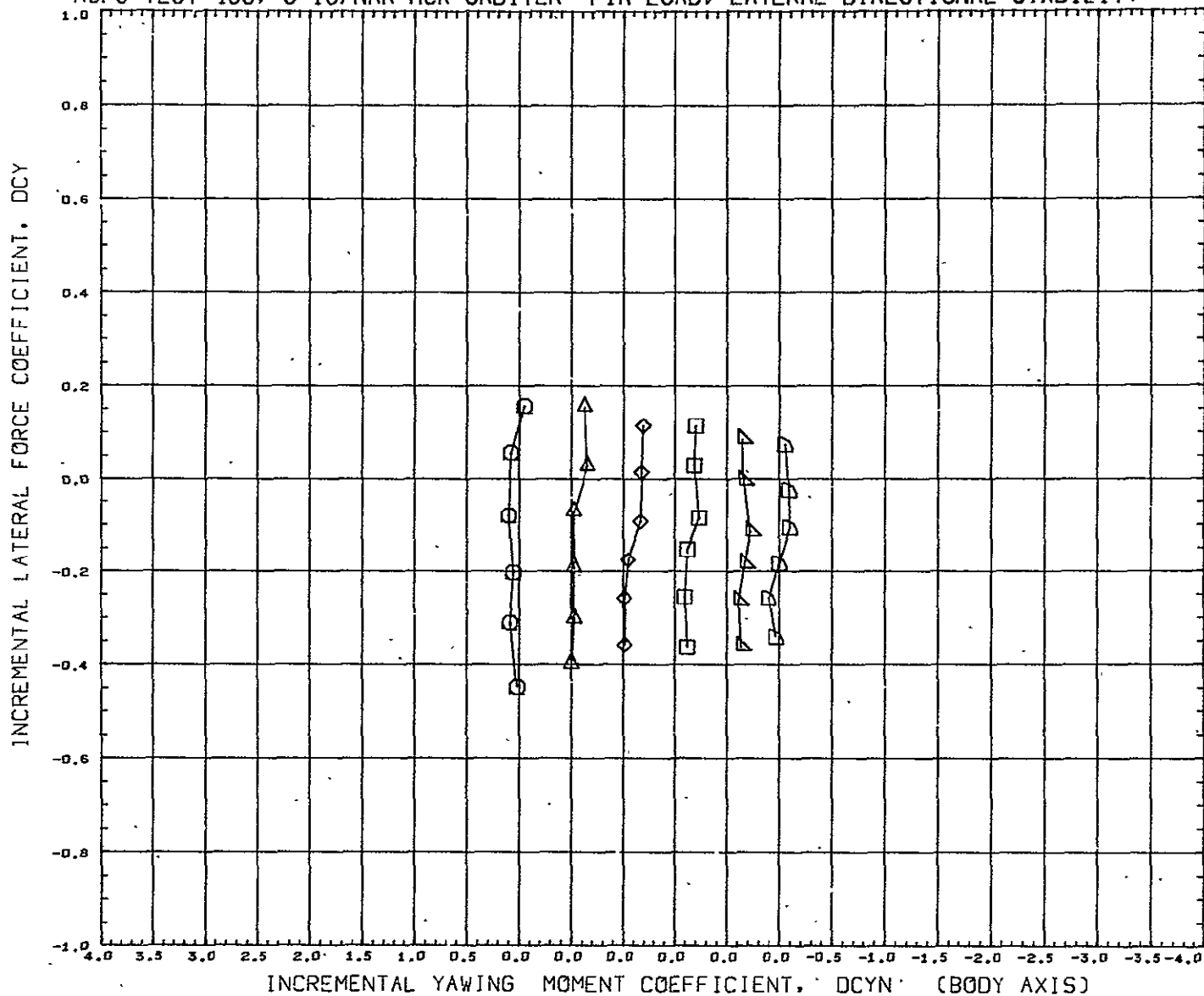
MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LATERAL-DIRECTIONAL STABILITY



SYMBOL MACH PARAMETRIC VALUES
 0.600 0.900 1.000 1.100 1.200 1.960
 DATA HIST. CODE *EI*CH

REFERENCE INFORMATION
 REFS 1.3960 SQ.IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0270 IN
 YMRP 0.3000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LATERAL-DIRECTIONAL STABILITY



SYMBOL MACH
 0.600
 0.900
 1.000
 1.100
 1.200
 1.960

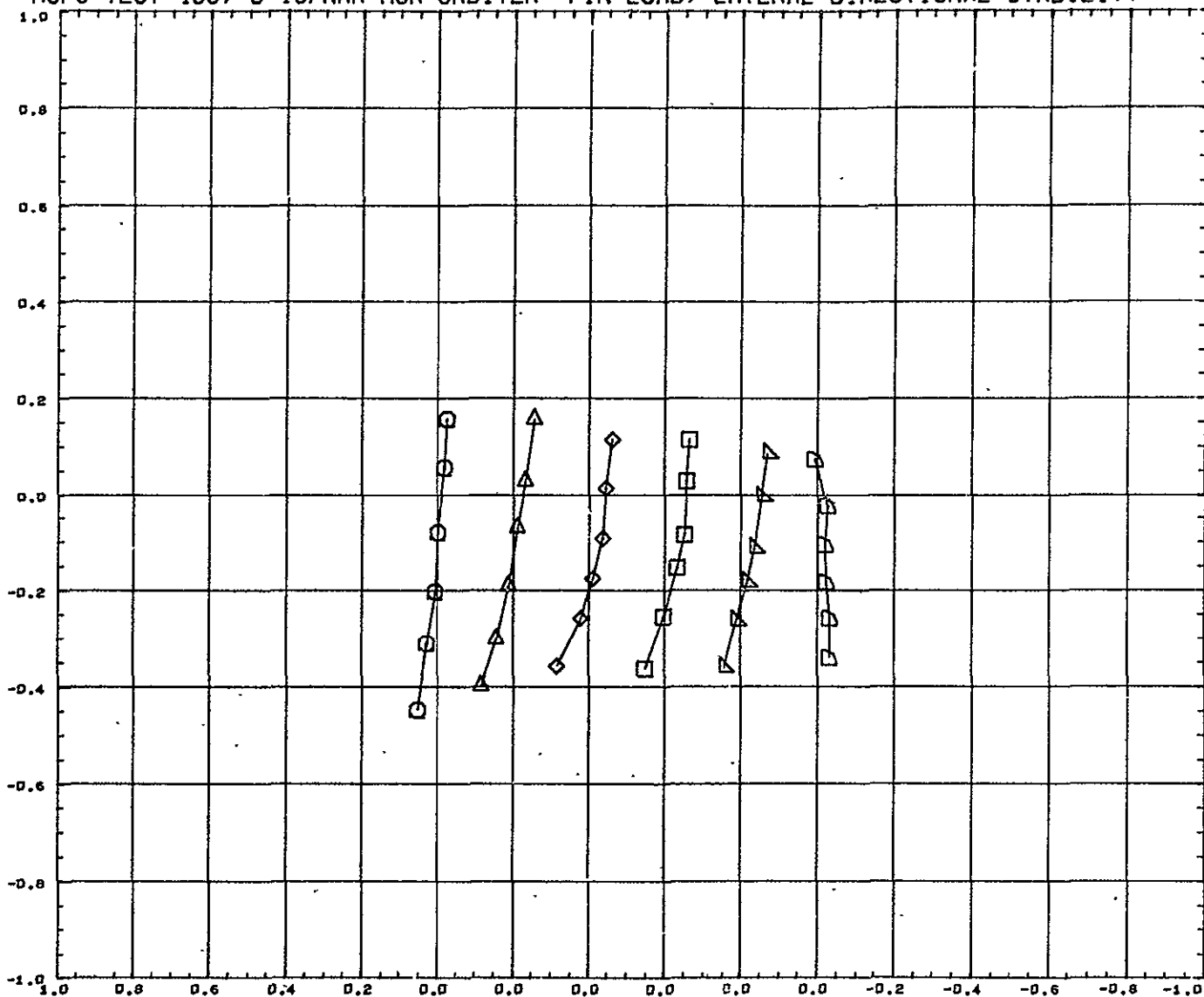
PARAMETRIC VALUES
 0.000

DATA HIST. CODE *EI*CH

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

INCREMENTAL LATERAL FORCE COEFFICIENT, DCY

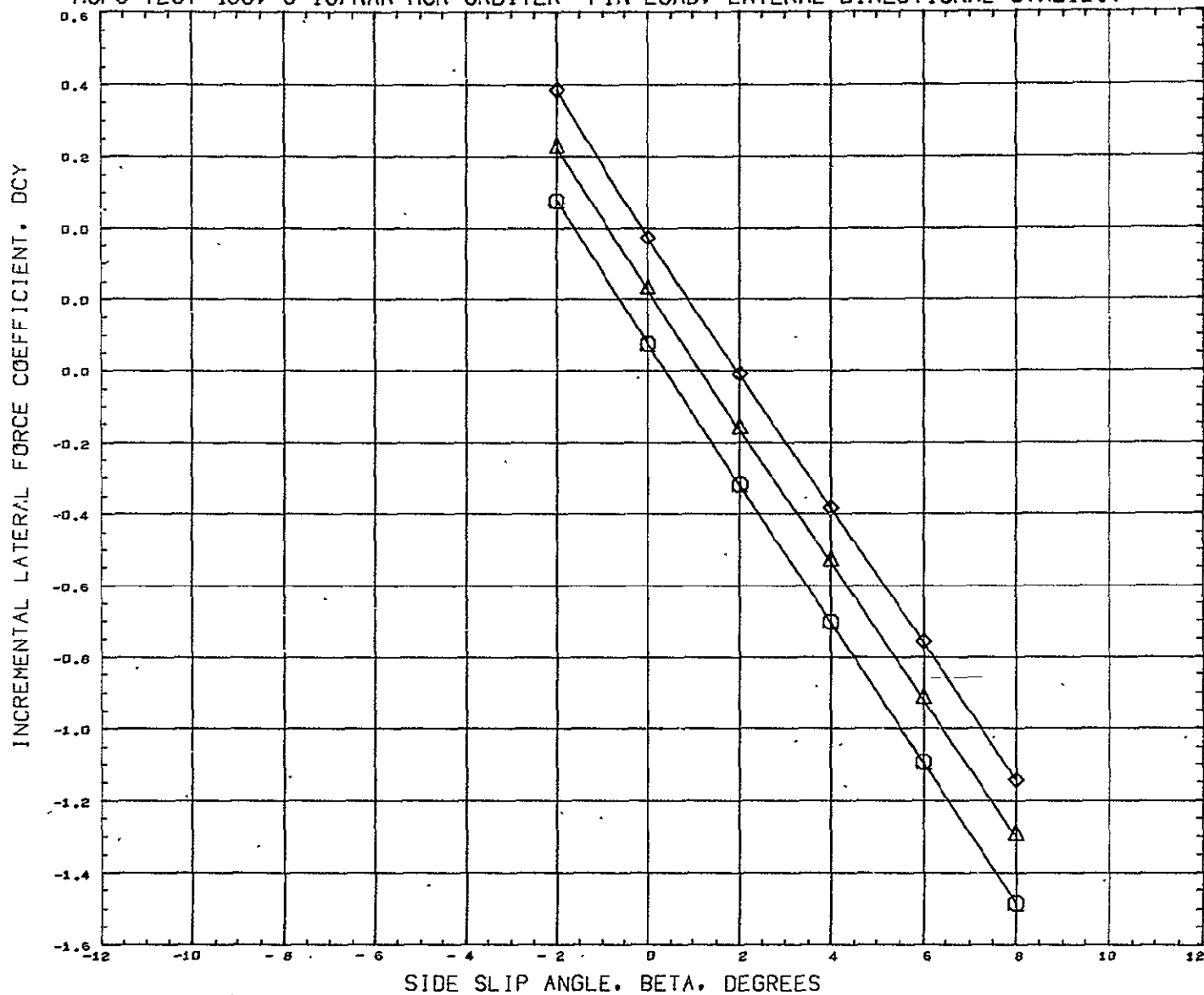


INCREMENTAL ROLLING MOMENT COEFFICIENT, DCBL, (BODY AXIS)

SYMBOL	MACH	PARAMETRIC VALUES	
○	0.600	0.000	
◇	0.900		
◇	1.000		
□	1.100		
▧	1.200		
▨	1.960	DATA HIST. CODE	*EI*CH

REFERENCE INFORMATION		
CF5	1.3960	50. IN.
CF1	1.3330	IN
CFB	1.333C	IN
CRP -	0.0370	IN
CRF	0.0000	IN
CRP.	0.0000	IN
CALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LATERAL-DIRECTIONAL STABILITY

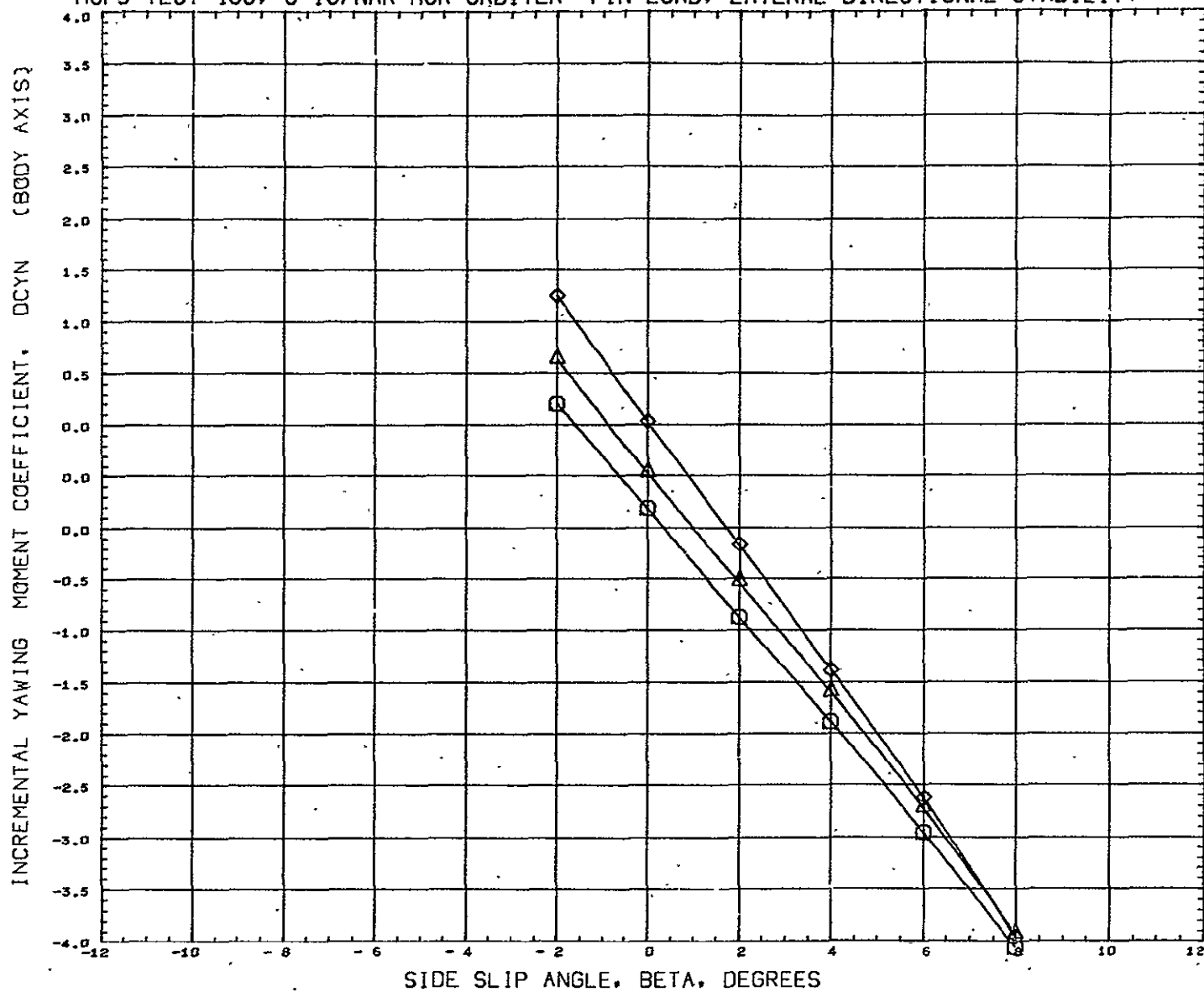


SYMBOL	MACH	PARAMETRIC VALUES
○	0.900	0.000
△	1.000	
◇	1.200	

REFERENCE INFORMATION		
REFS	1.3960	50. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE M*EI*CM

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LATERAL-DIRECTIONAL STABILITY



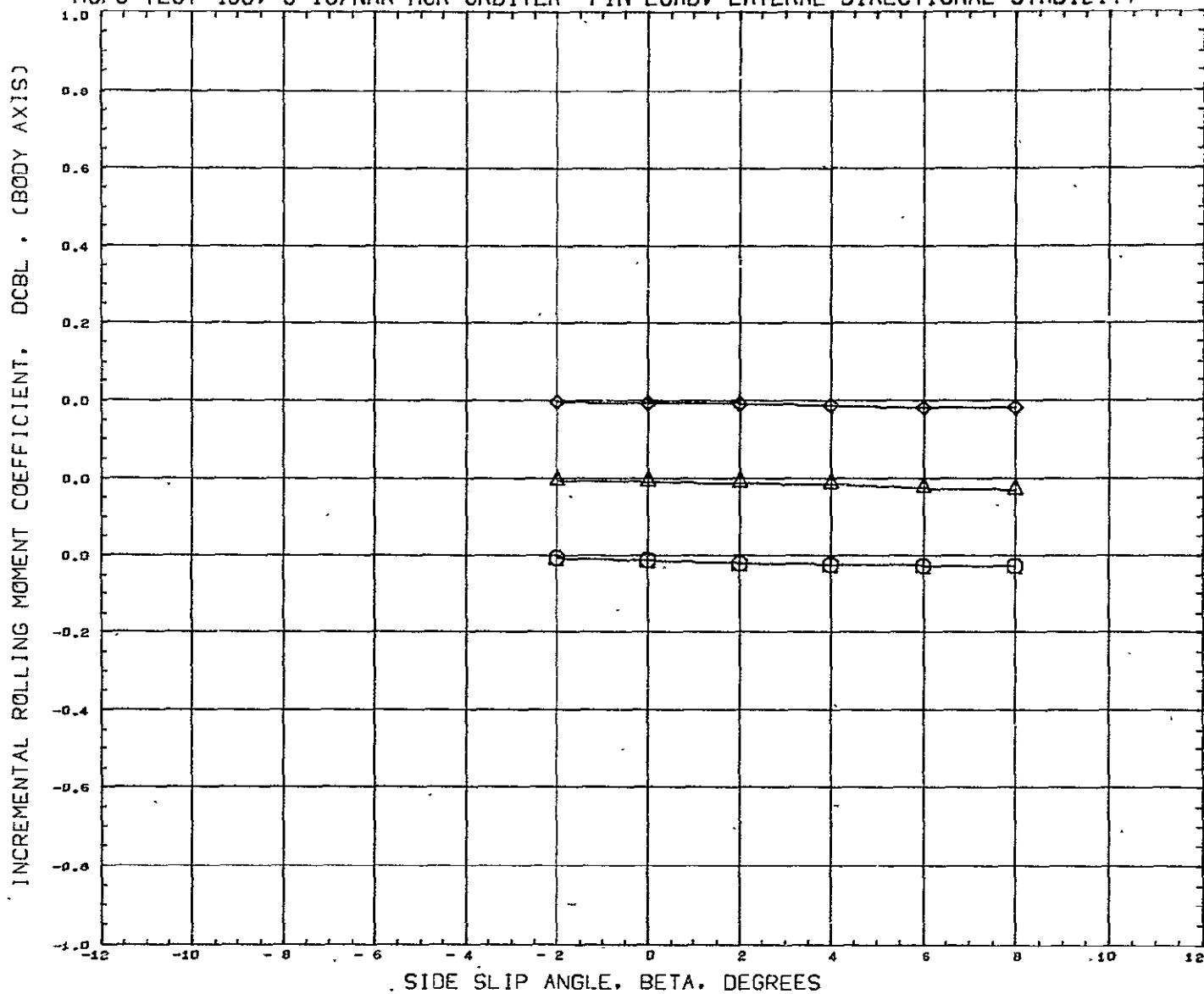
SYMBOL MACH
 ○ 0.900
 △ 1.000
 ◇ 1.200

PARAMETRIC VALUES
 0.000

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE M*EI*CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LATERAL-DIRECTIONAL STABILITY



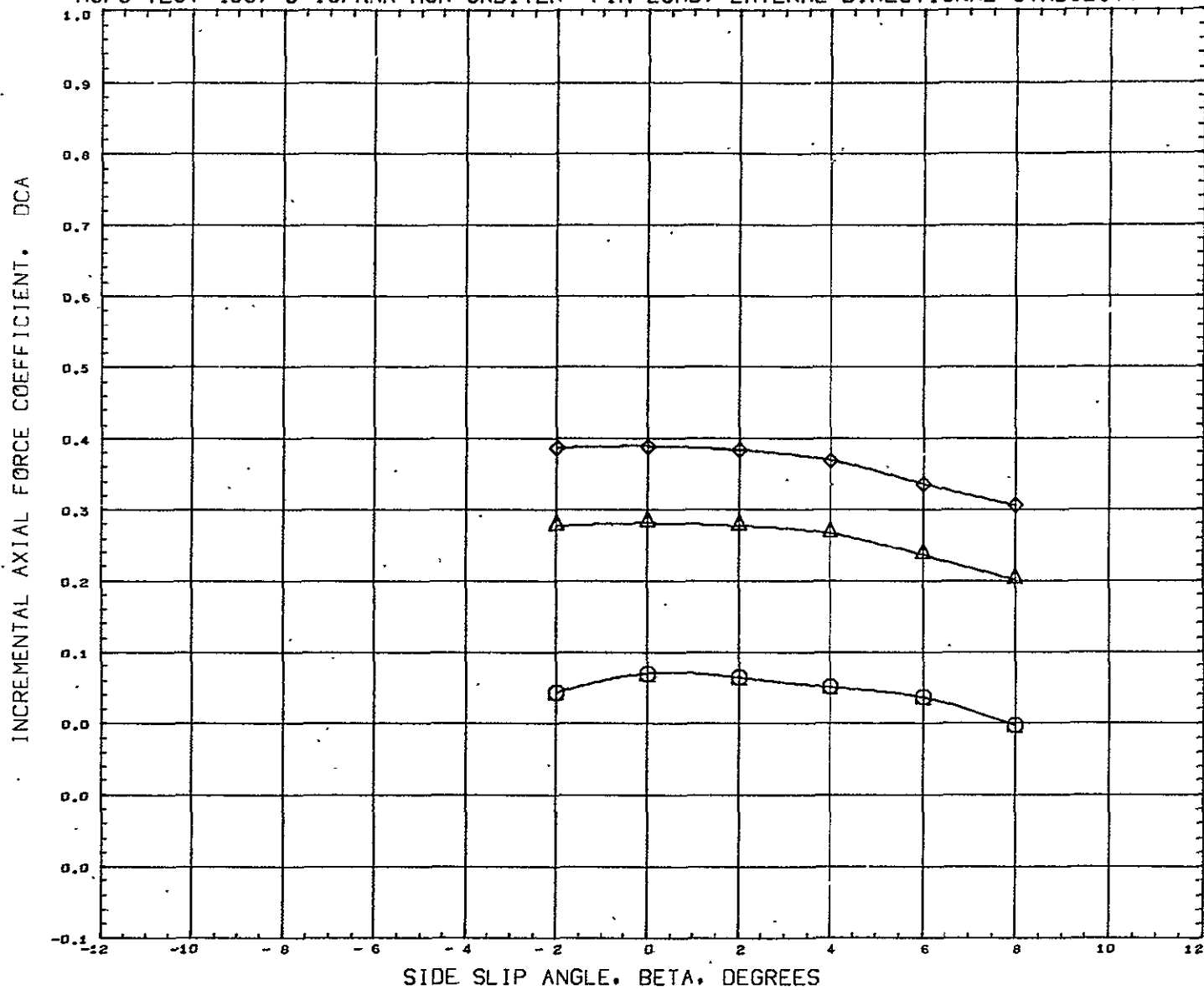
SYMBOL MACH
 ○ 0.900
 △ 1.000
 ◇ 1.200

PARAMETRIC VALUES
 0.000

REFERENCE INFORMATION
 REFS 1.3960 99.IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP - 0.0379 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE M#EI#CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LATERAL-DIRECTIONAL STABILITY

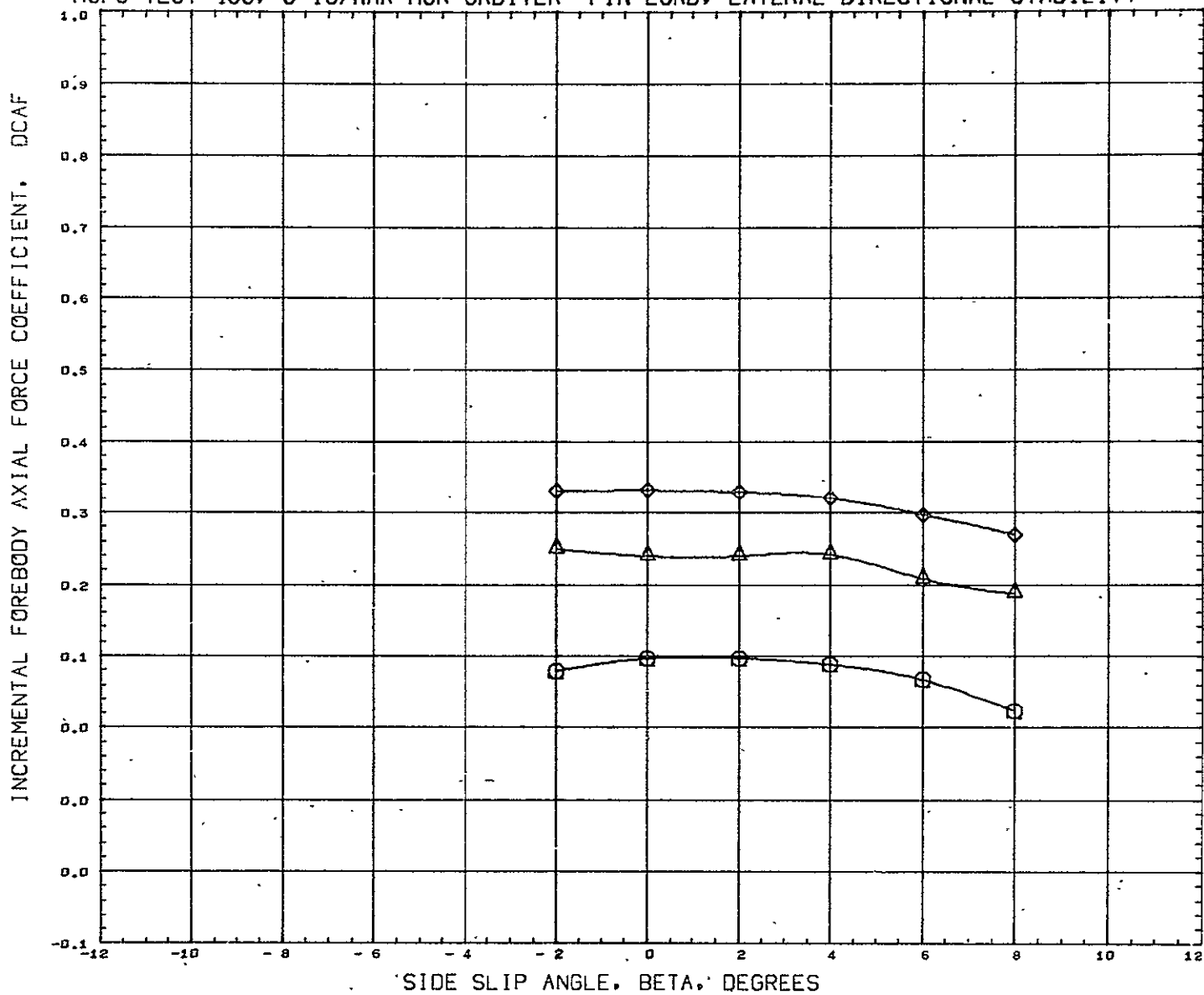


SYMBOL MACH PARAMETRIC VALUES
 ○ 0.900 0.000
 △ 1.000
 ◇ 1.200

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XHRF - 0.0570 IN
 YHRF 0.0000 IN
 ZHRF 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE M*EI*CM

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LATERAL-DIRECTIONAL STABILITY



SYMBOL MACH
 ○ 0.900
 △ 1.000
 ◇ 1.200

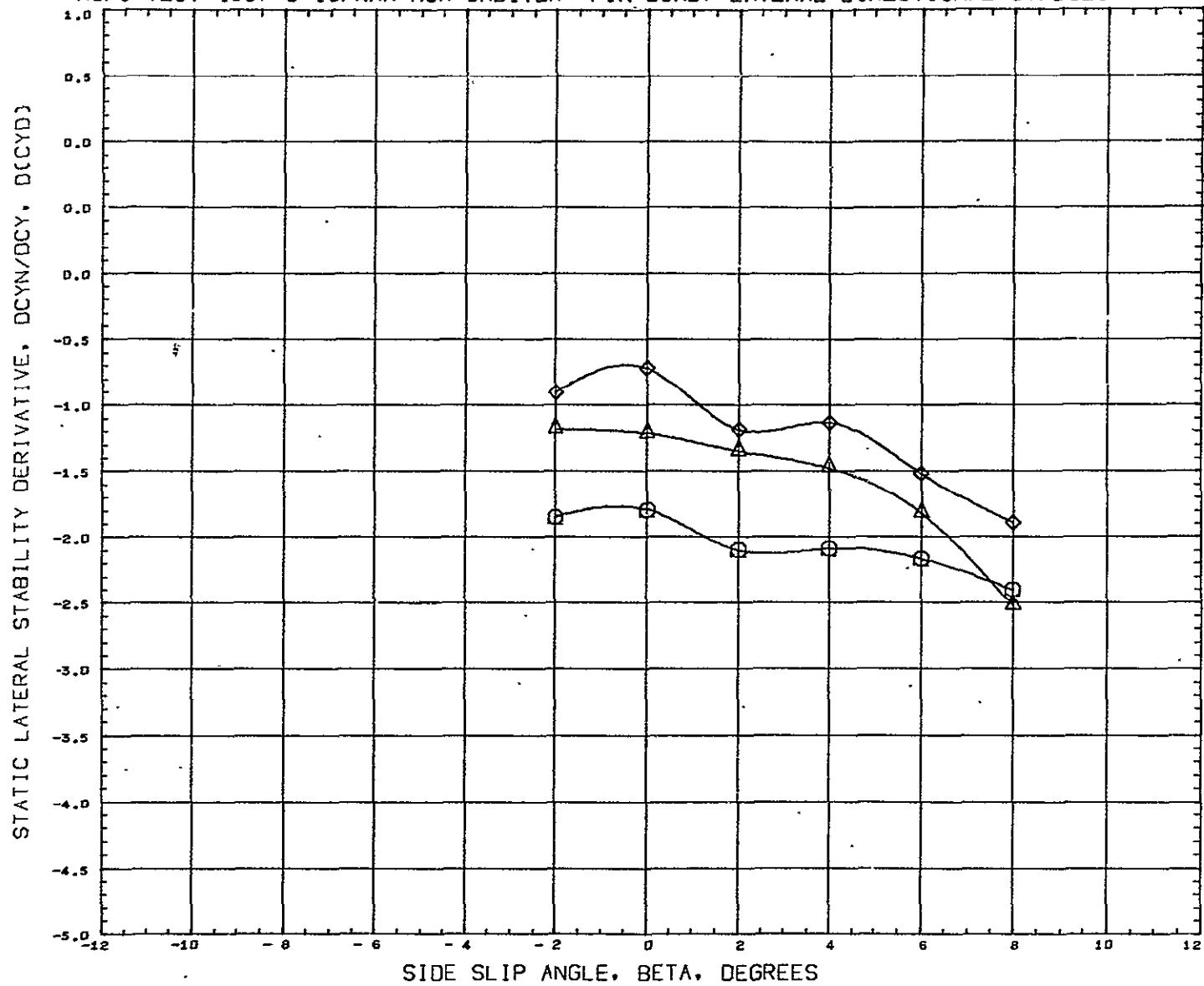
PARAMETRIC VALUES
 0.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	IN
REFB	1.3330	IN
XHRF	0.0370	IN
YHRF	0.0000	IN
ZHRF	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE M*EI*CM

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LATERAL-DIRECTIONAL STABILITY



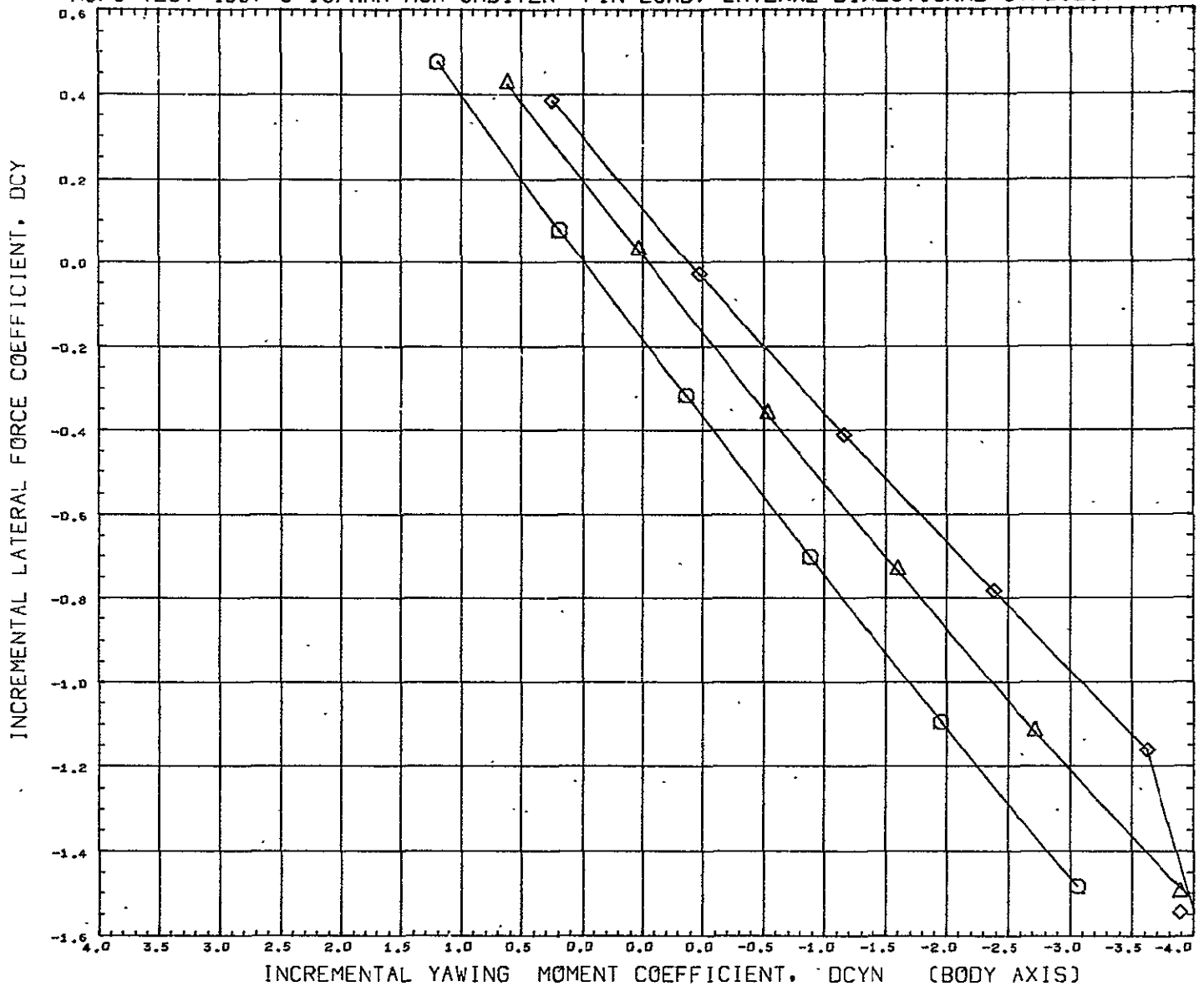
SYMBOL MACH
 ○ 0.900
 △ 1.000
 ◇ 1.200

PARAMETRIC VALUES
 0.000

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP - 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE M*EI*CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LATERAL-DIRECTIONAL STABILITY



SYMBOL MACH
 ○ 0.900
 △ 1.000
 ◇ 1.200

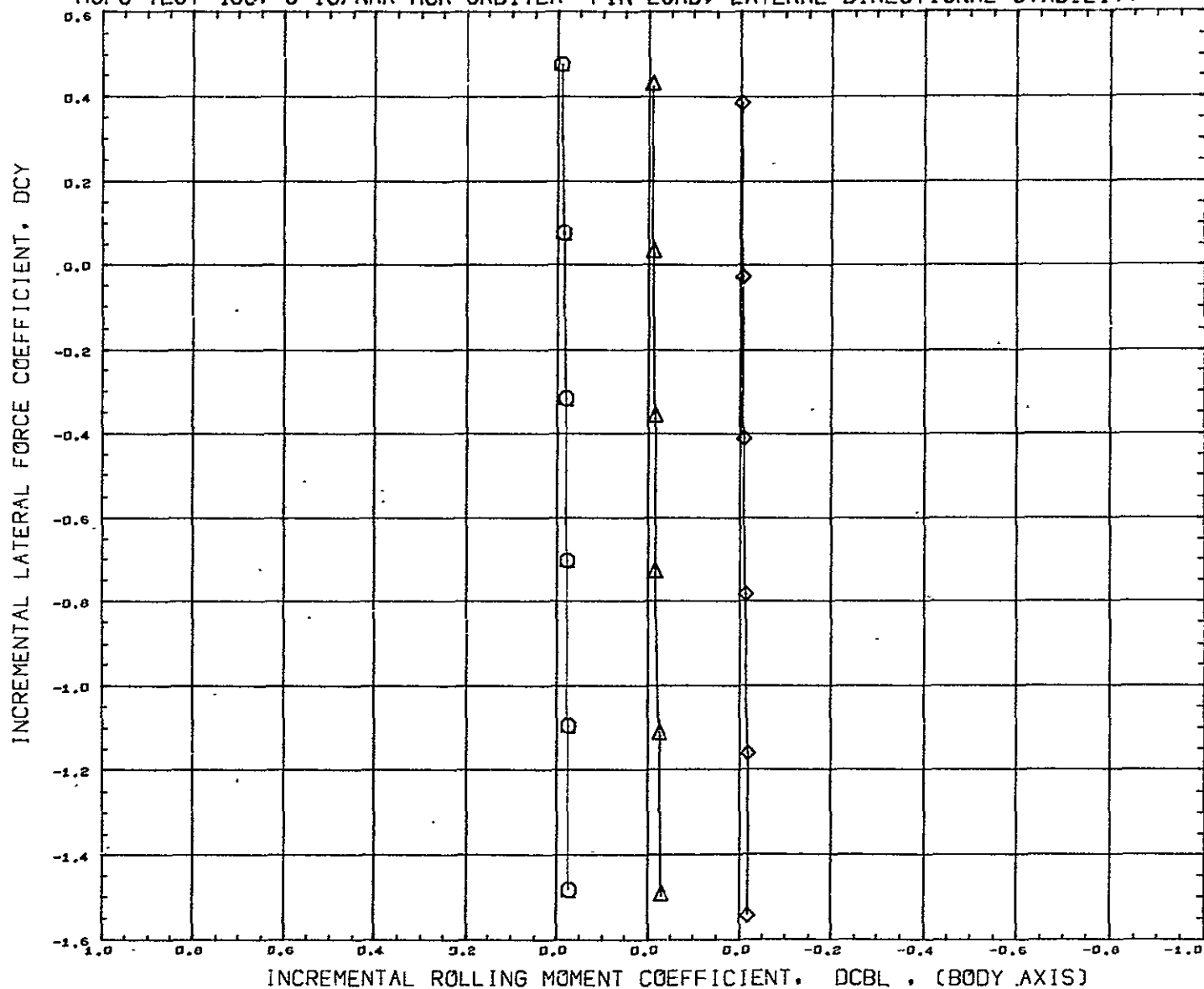
PARAMETRIC VALUES
 0.000

REFERENCE INFORMATION

REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFS	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE M#EI*CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LATERAL-DIRECTIONAL STABILITY



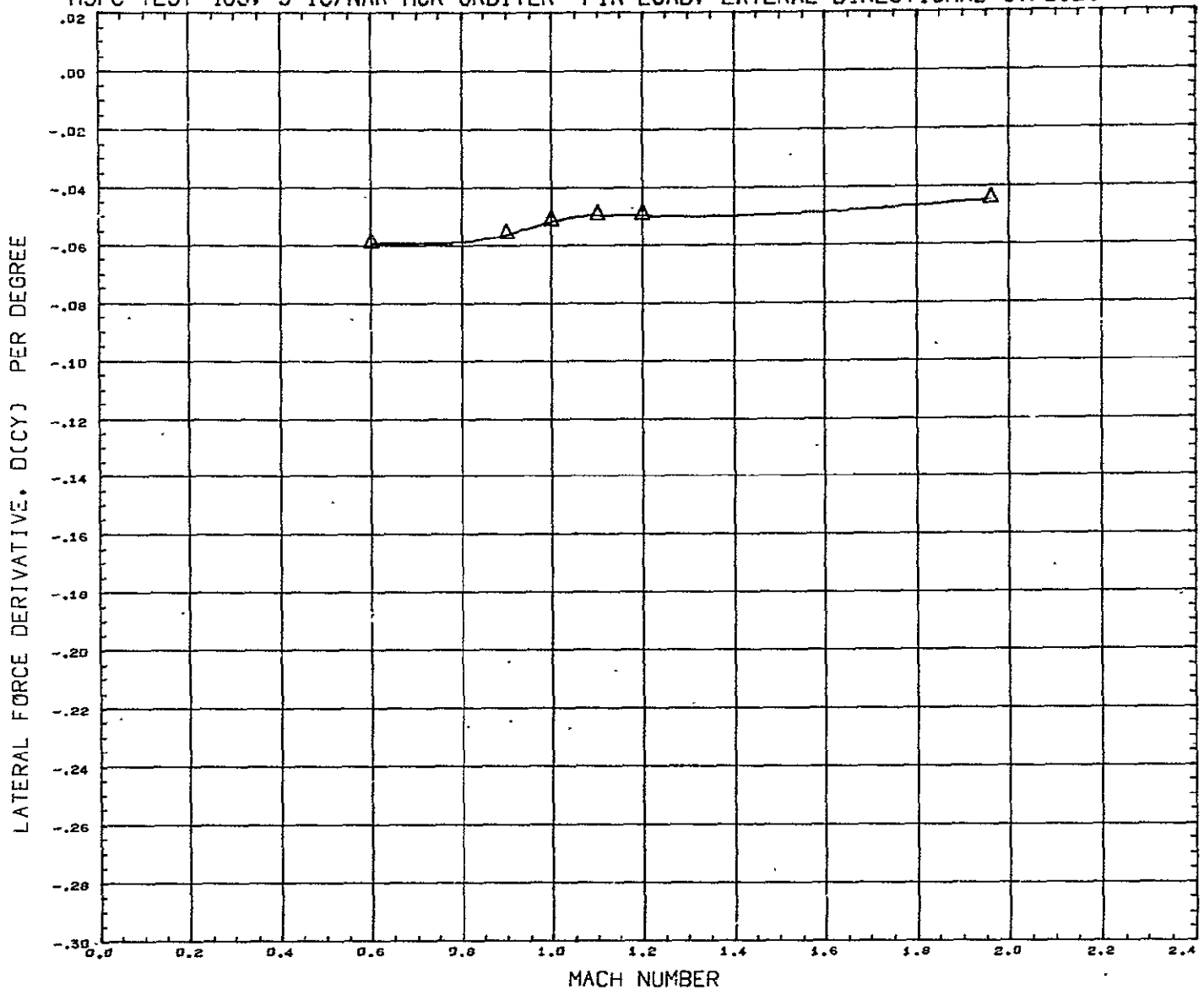
SYMBOL MACH
 ○ 0.900
 △ 1.000
 ◇ 1.200

PARAMETRIC VALUES
 0.000

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE M#EI#CM

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LATERAL-DIRECTIONAL STABILITY



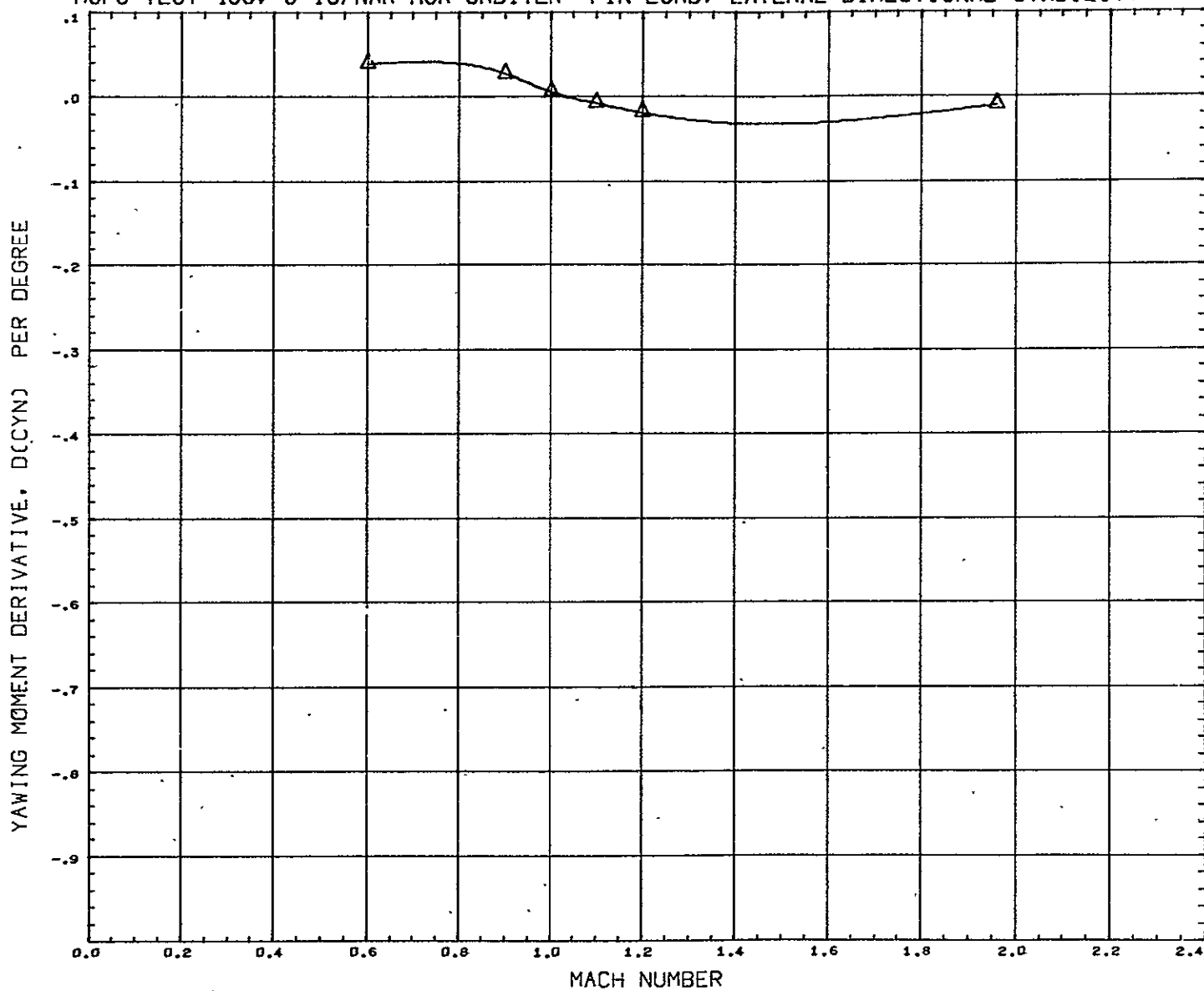
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	SO.IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI*CM

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LATERAL-DIRECTIONAL STABILITY



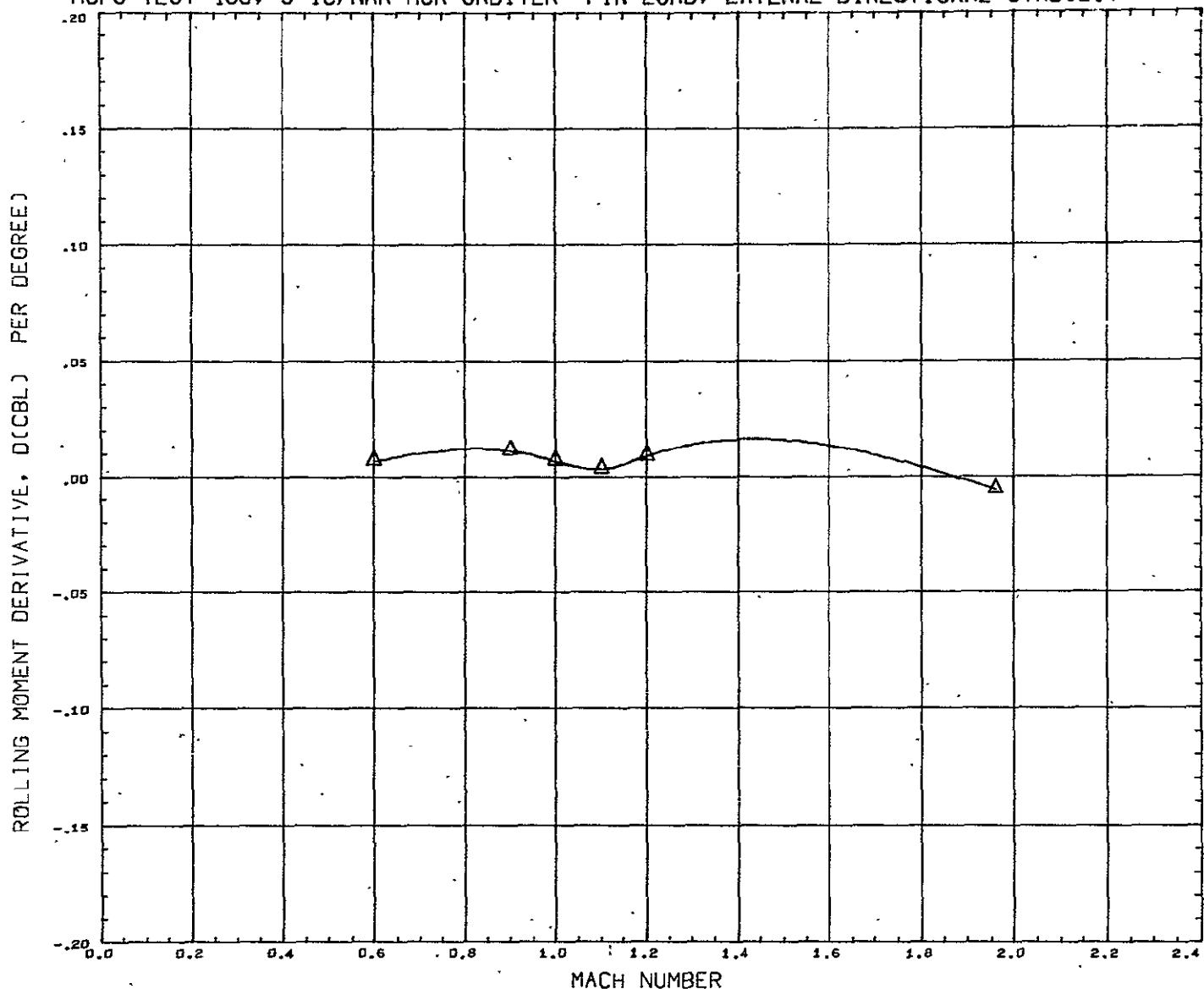
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	SG. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI*CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LATERAL-DIRECTIONAL STABILITY



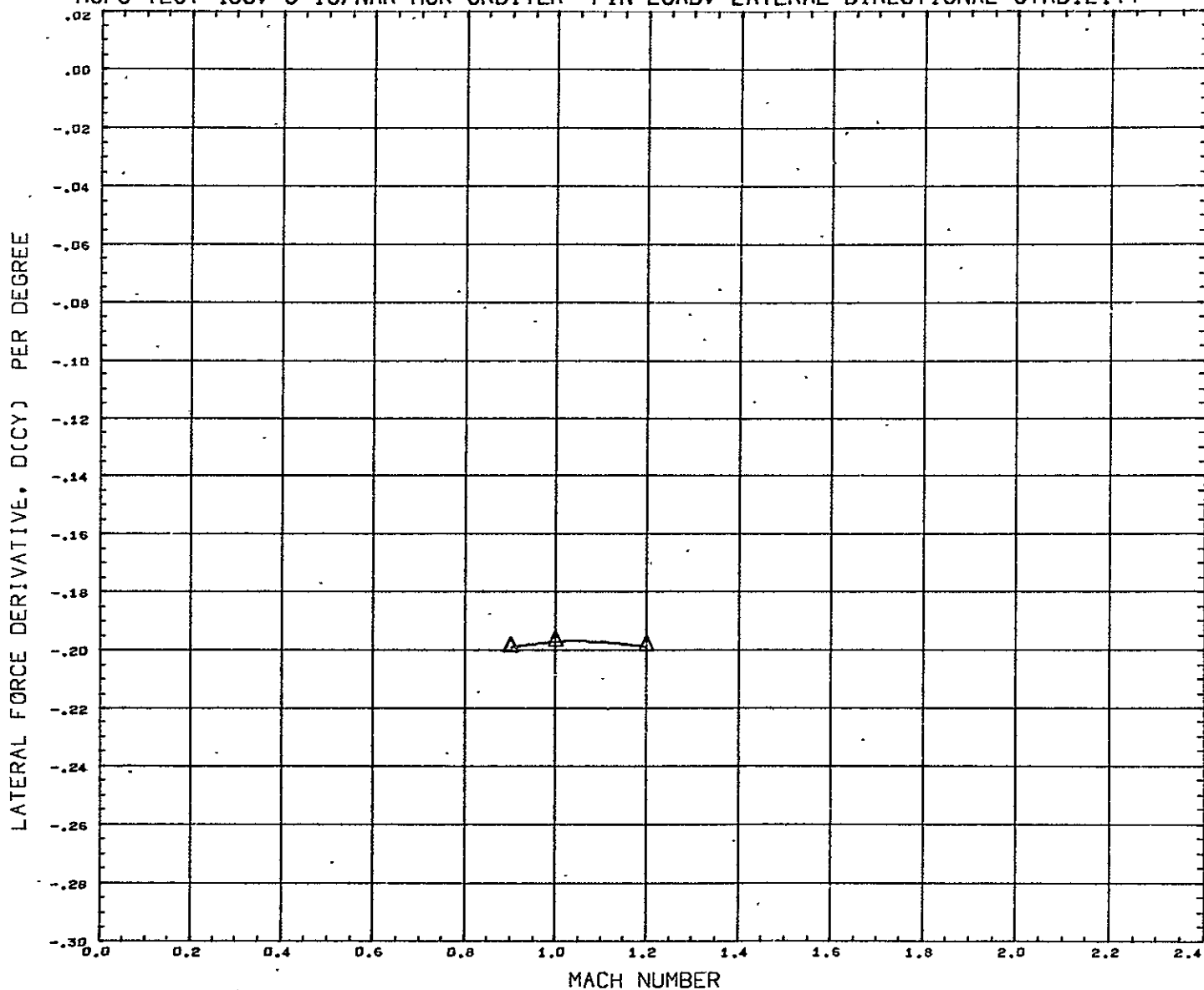
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE #EI*CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LATERAL-DIRECTIONAL STABILITY



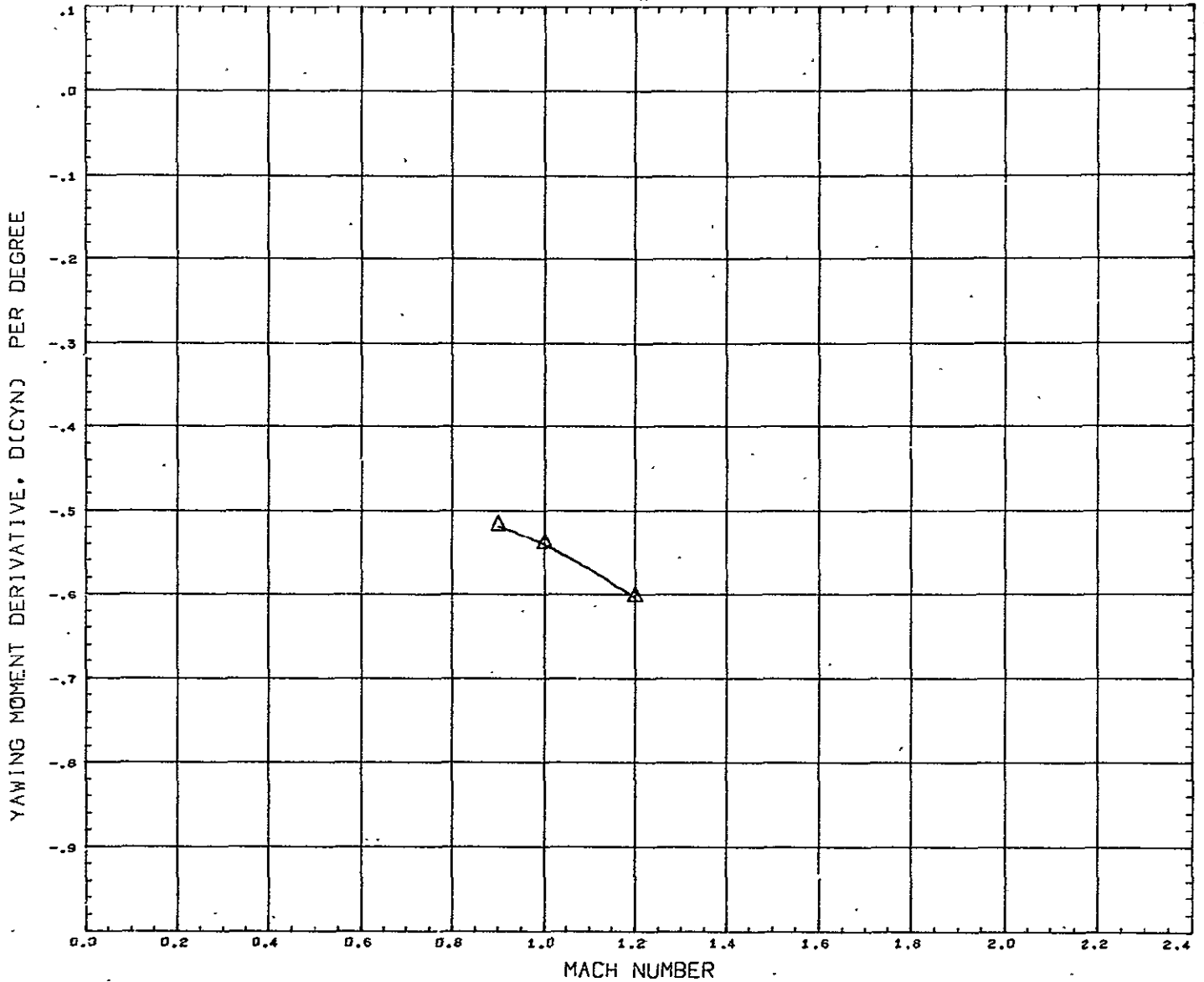
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFD	1.3330	IN
XMRP	0.0570	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE M#EI*CM

MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LATERAL-DIRECTIONAL STABILITY



PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

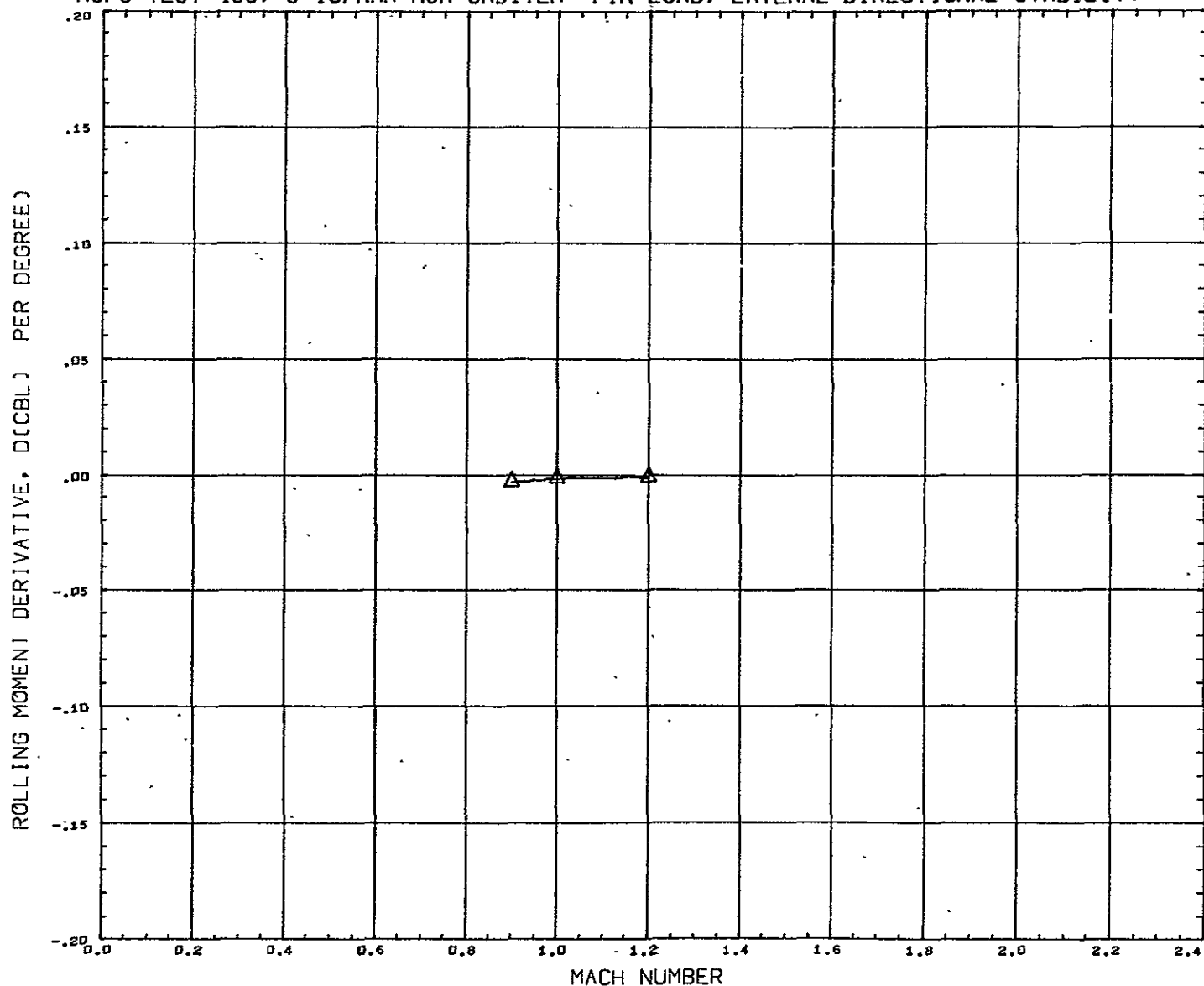
REFS	1.3960	50. IN.
REFL	1.3330	IN
RECB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE M#EI#CH

M485-MSFC-S1C NAR HCR ORB. FIN INCREMENT GB

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MSFC TEST 485, S-1C/NAR HCR ORBITER- FIN LOAD, LATERAL-DIRECTIONAL STABILITY



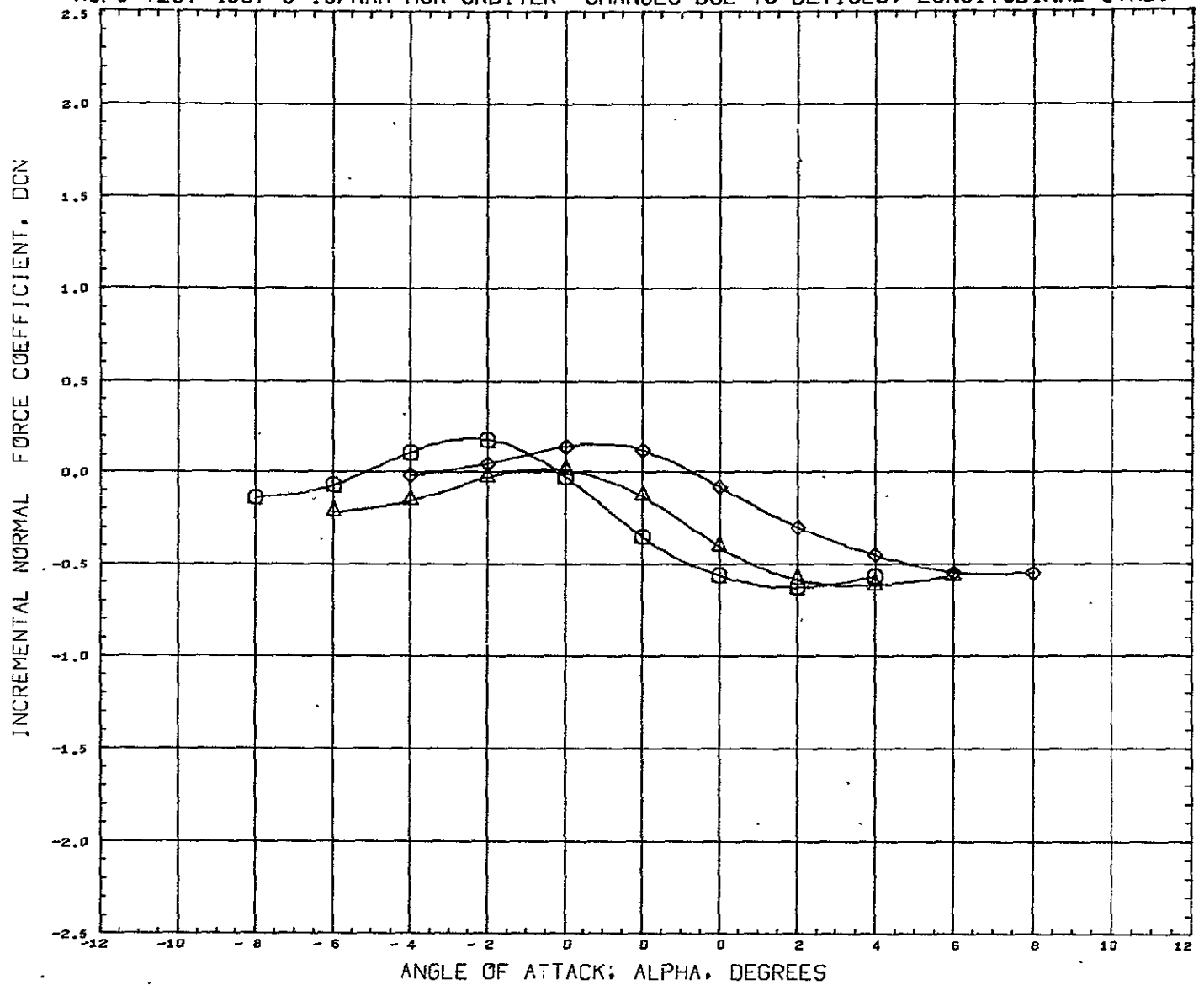
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE H*EI*CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.

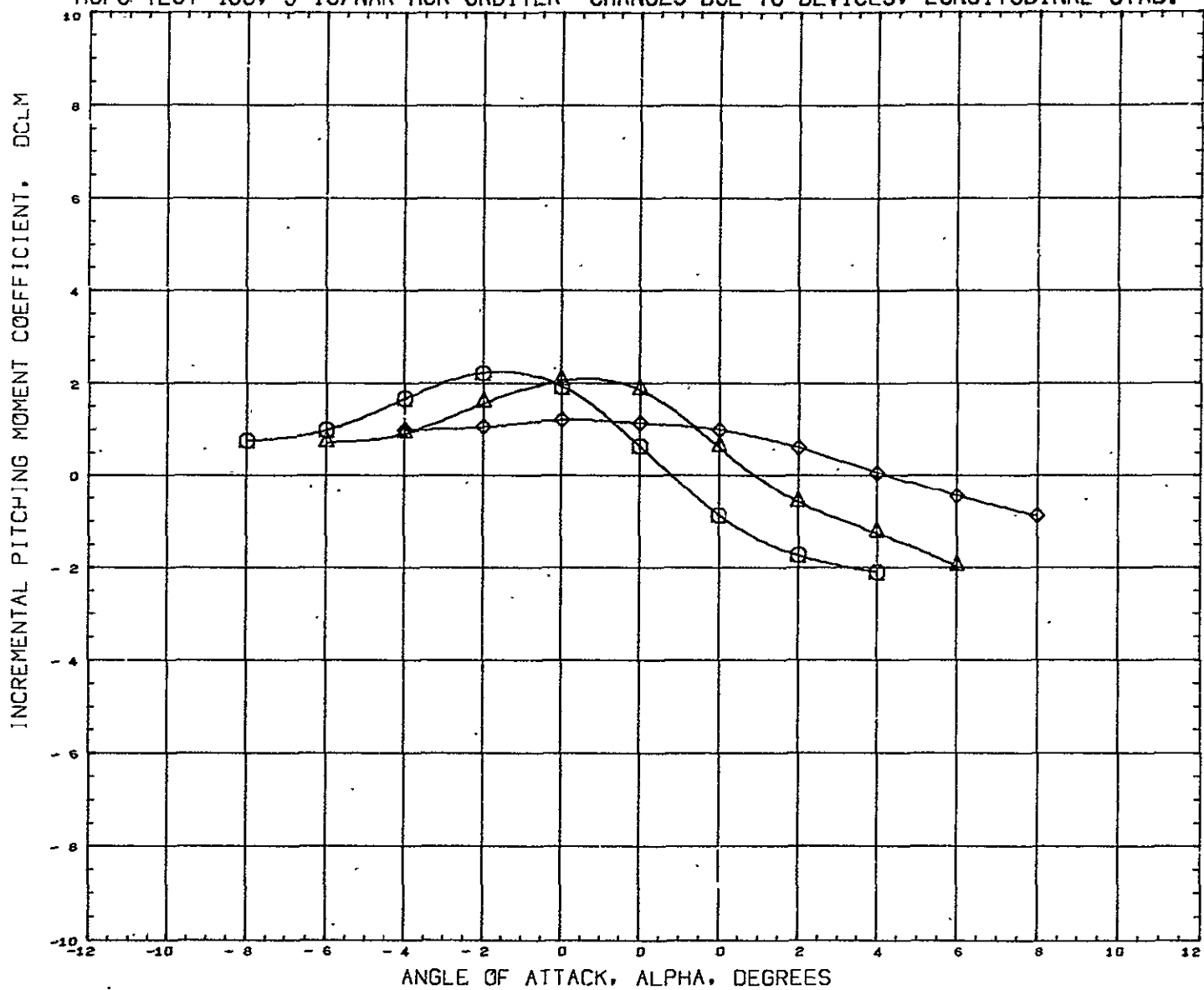


SYMBOL MACH PARAMETRIC VALUES
 ○ 0.900 0.000
 △ 1.000
 ◇ 1.200

REFERENCE INFORMATION
 REFS 1.3960 50. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *EI#A*CM

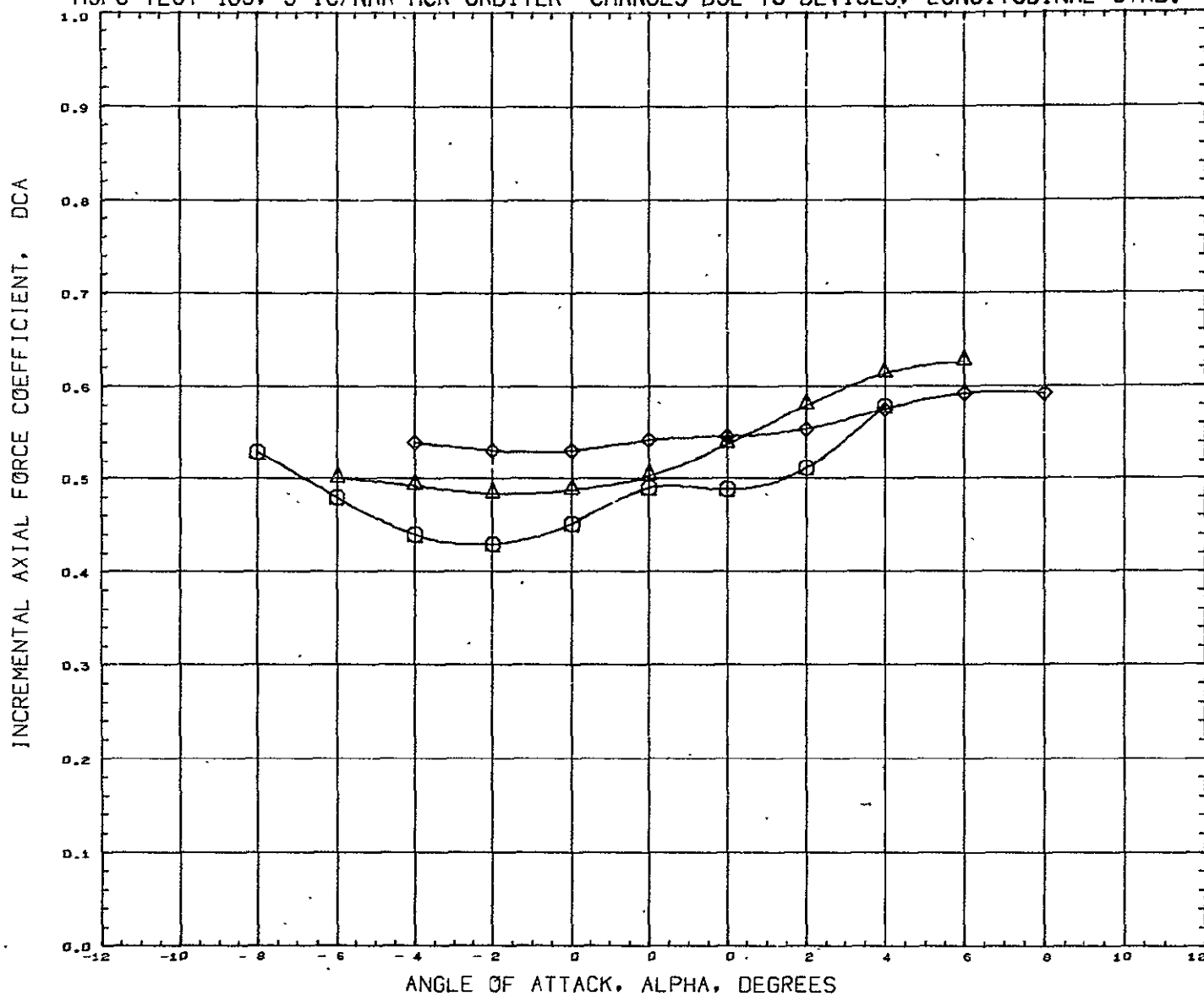
MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



SYMBOL	MACH	PARAMETRIC VALUES	REFERENCE INFORMATION	
○	0.900	0.000	REFS	1.3960 SQ. IN.
△	1.000		REFL	1.3330 IN
◇	1.200		REFB	1.3530 IN
			XMRP	0.0370 IN
			YMRP	0.0000 IN
			ZMRP	0.0000 IN
			SCALE	0.0034

DATA HIST. CODE *EI*A*CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



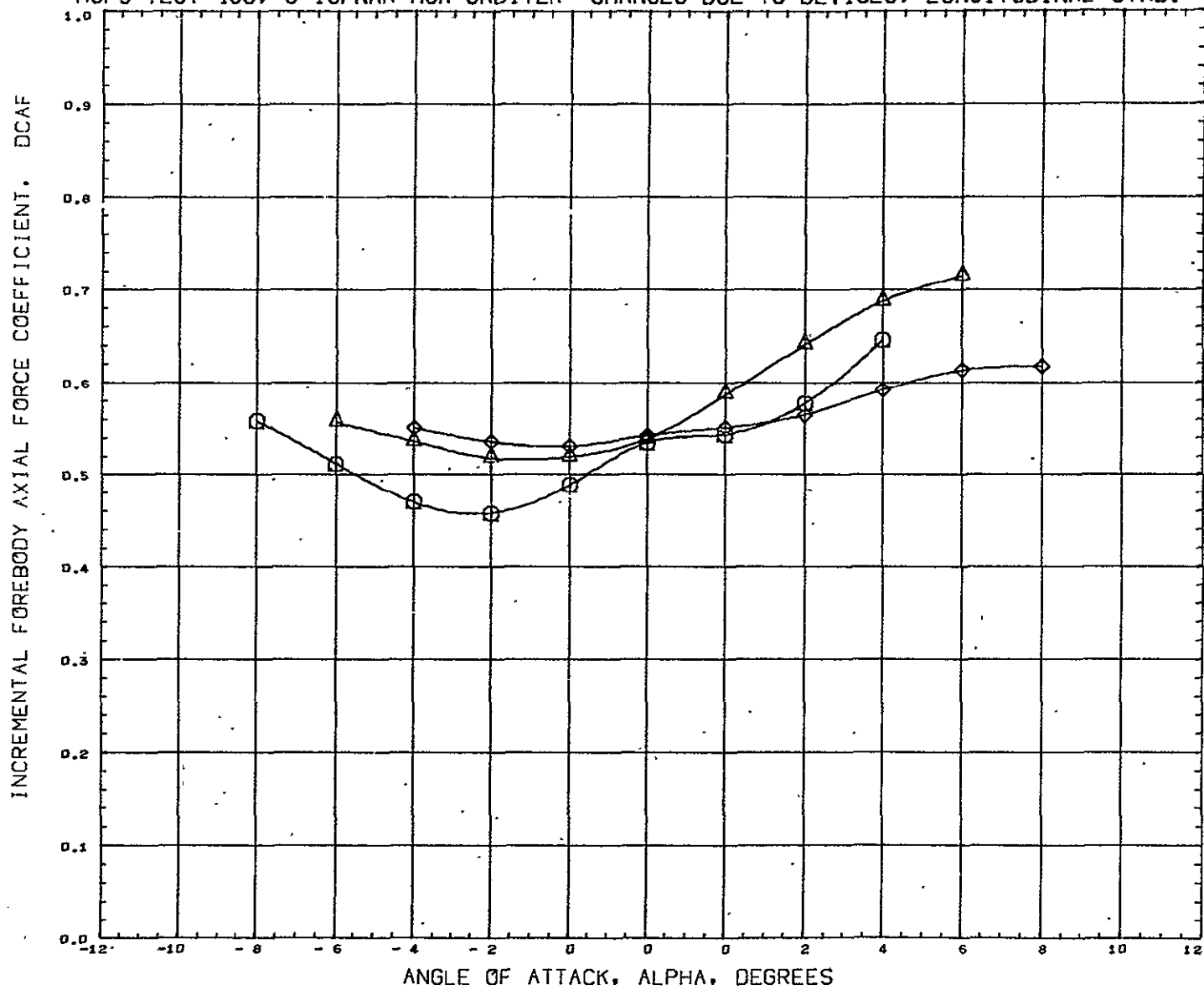
SYMBOL MACH
 ○ 0.900
 △ 1.000
 ◇ 1.200

PARAMETRIC VALUES
 0.000

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0570 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE #EI#A#CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



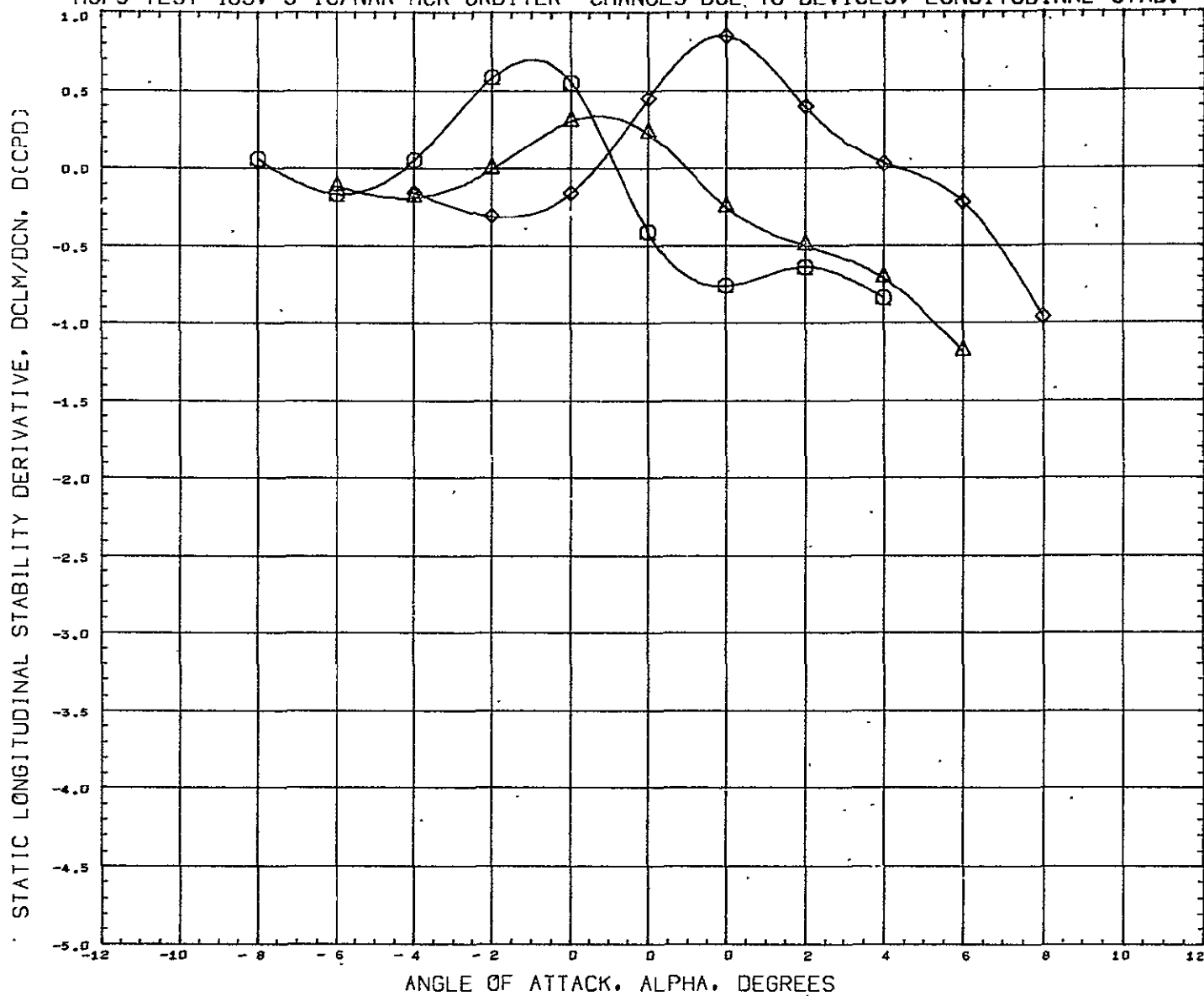
SYMBOL MACH
 ○ 0.900
 △ 1.000
 ◇ 1.200

PARAMETRIC VALUES
 0.000

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP - 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *EI*A*CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



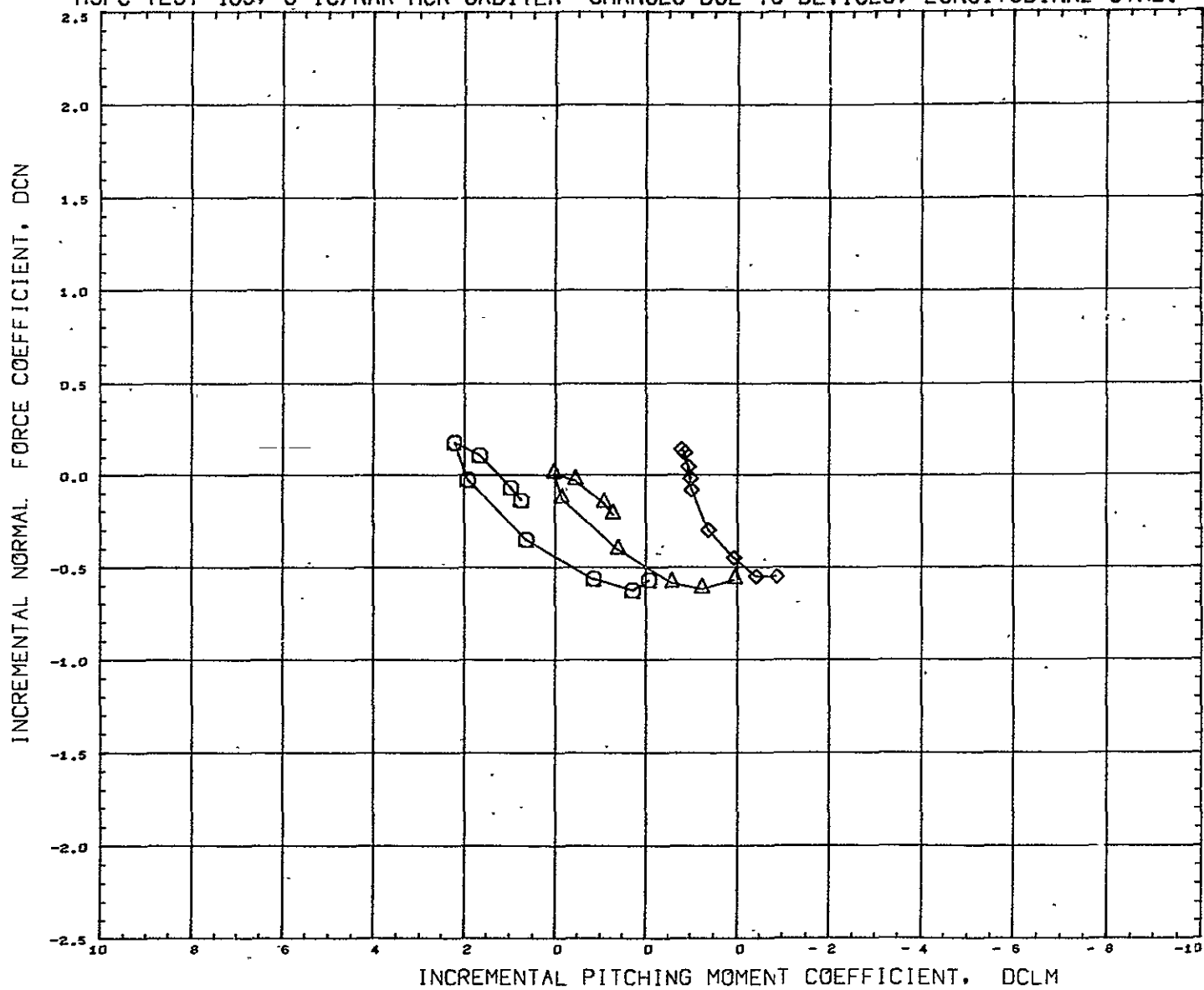
SYMBOL MACH
 ○ 0.900
 △ 1.000
 ◇ 1.200

PARAMETRIC VALUES
 0.000

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRF 0.0370 IN
 YMRF 0.0000 IN
 ZMRF 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *EI*A*CM

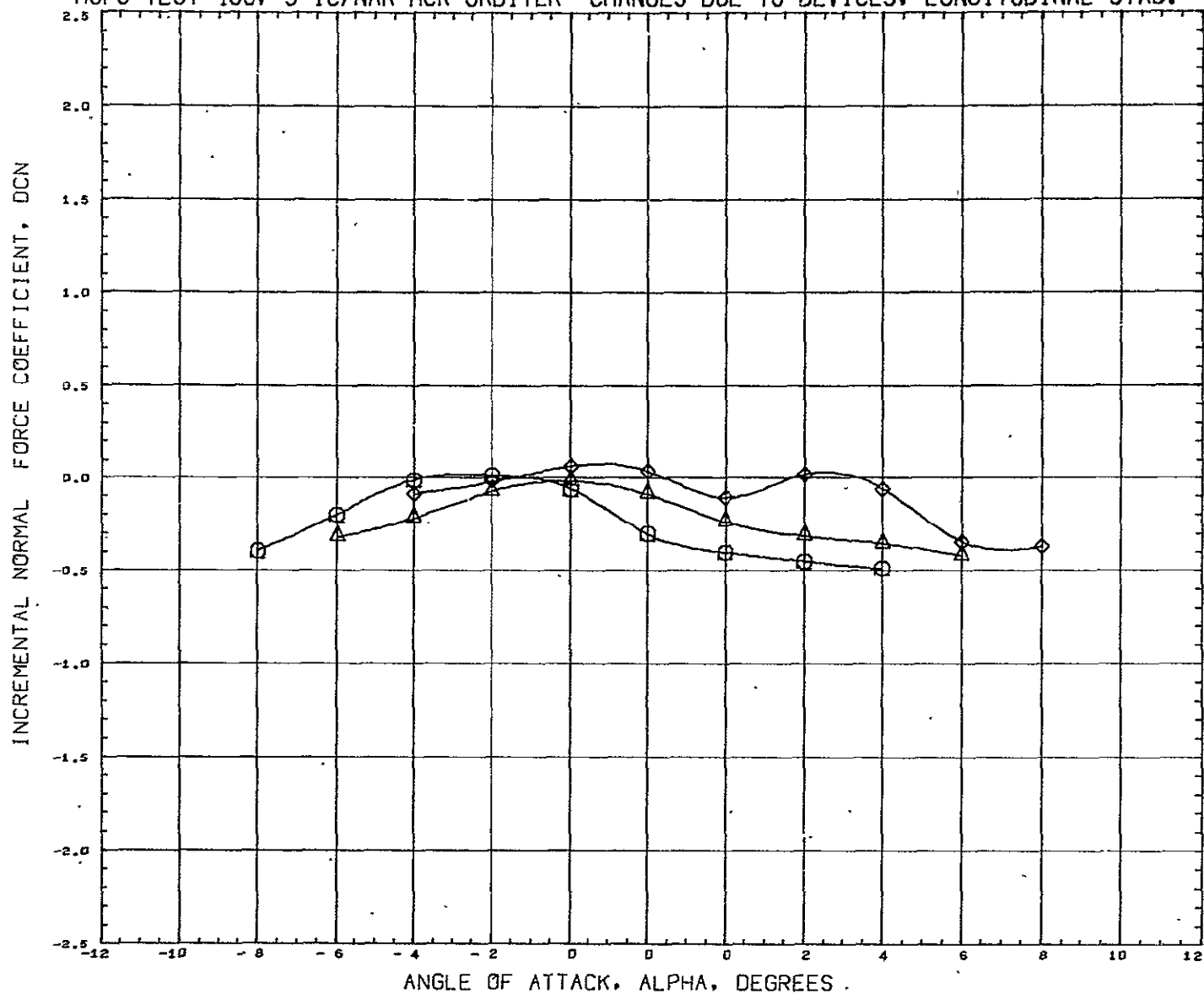
MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



SYMBOL	MACH	PARAMETRIC VALUES	REFERENCE INFORMATION
○	0.900	0.000	REFS 1.3960 SQ. IN.
△	1.000		REFL 1.3330 IN
◇	1.200		REFB 1.3330 IN
			XMRP 0.0370 IN
			YMRP 0.0000 IN
			ZMRP 0.0000 IN
			SCALE 0.0034

DATA HIST. CODE #EI#A*CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.

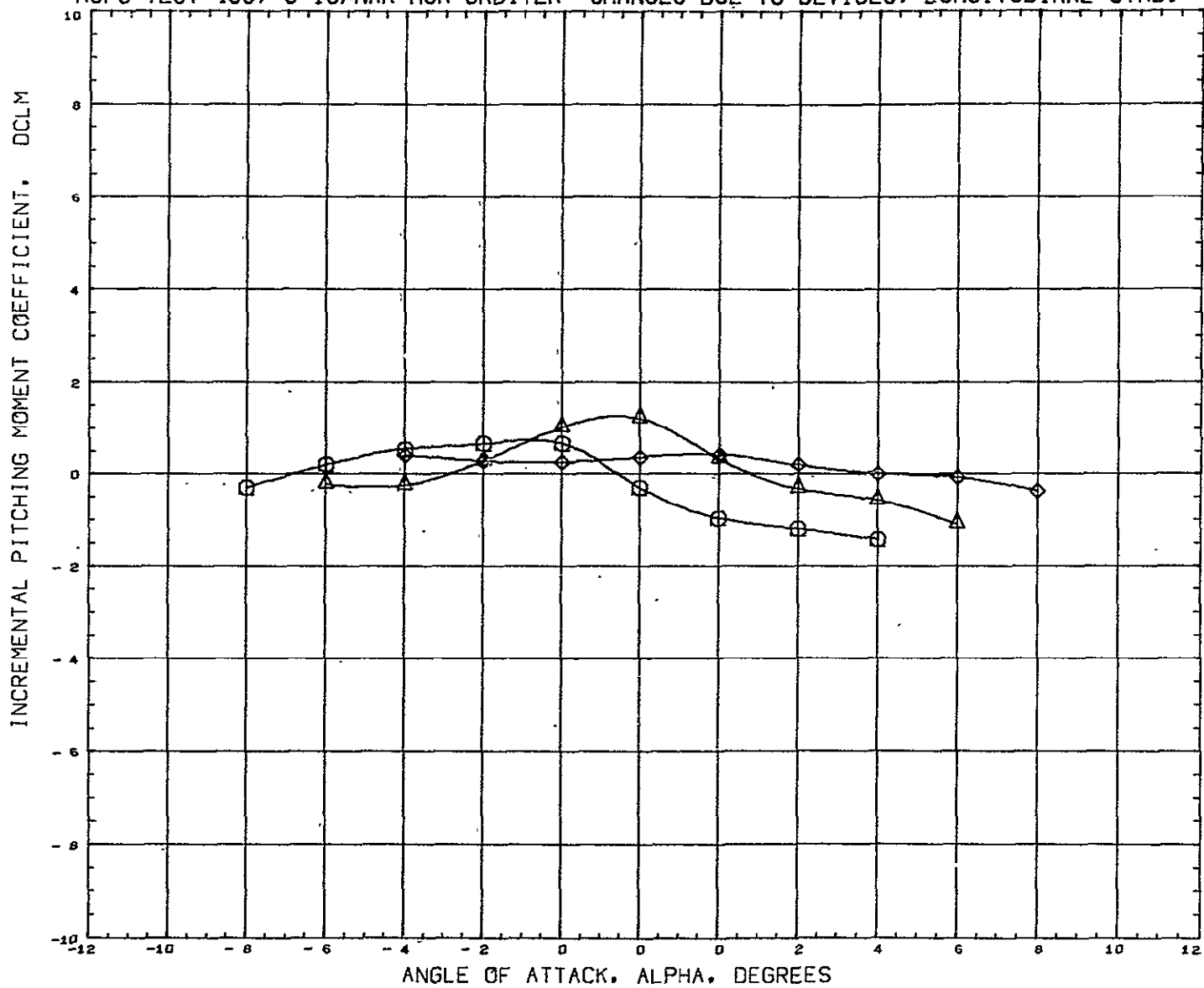


SYMBOL MACH PARAMETRIC VALUES
 ○ 0.900 0.000
 △ 1.000
 ◇ 1.200

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRF 0.0370 IN
 YMRF 0.0000 IN
 ZMRF 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE #EI#A#CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



SYMBOL

MACH

PARAMETRIC VALUES

REFERENCE INFORMATION

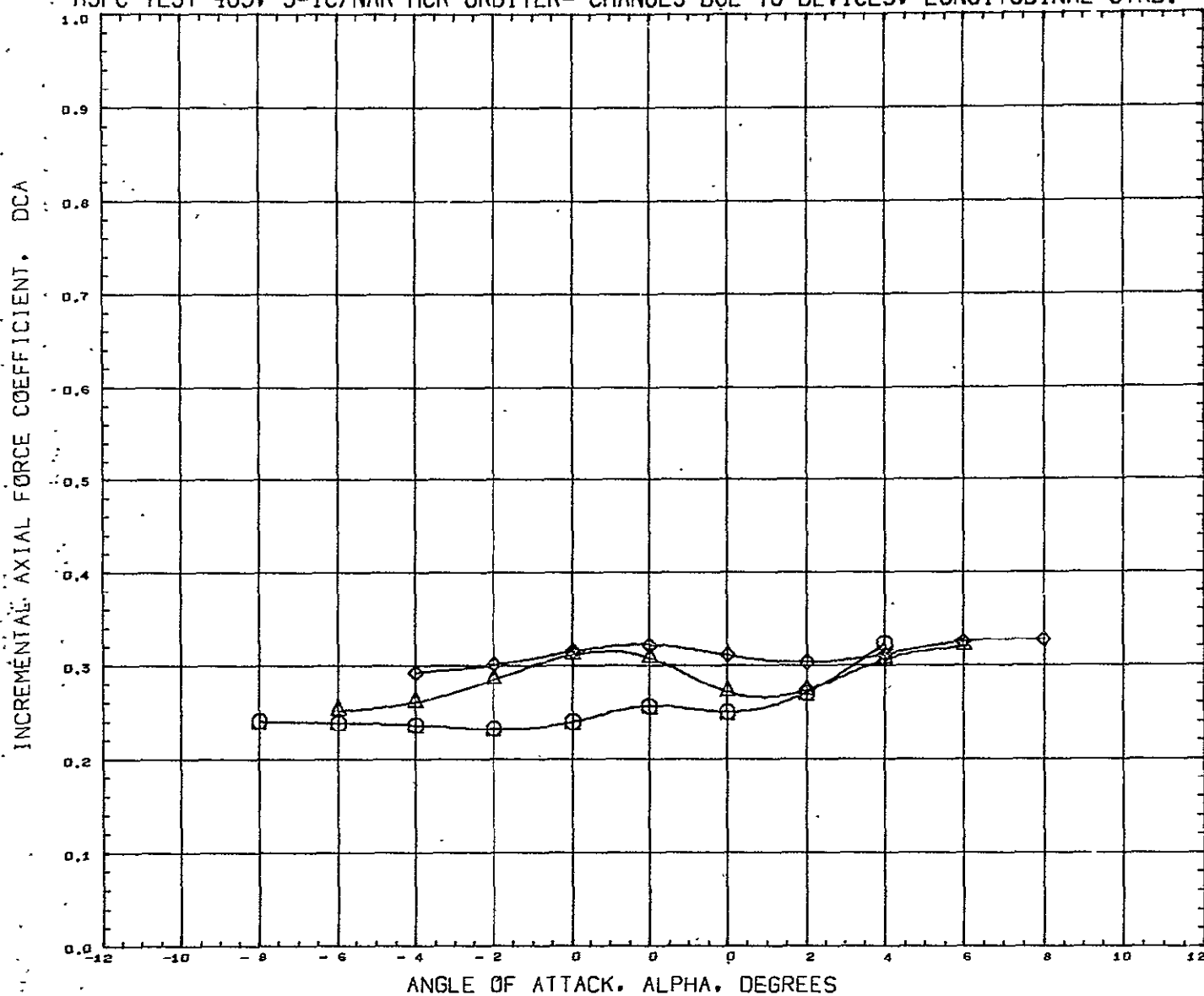
○ 0.900
△ 1.000
◇ 1.200

0.000

REFS 1.3960 SQ. IN.
REFL 1.3330 IN
RETB 1.3330 IN
XMRP - 0.0300 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE *EI#A*CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



SYMBOL MACH
 ○ 0.900
 △ 1.000
 ◇ 1.200

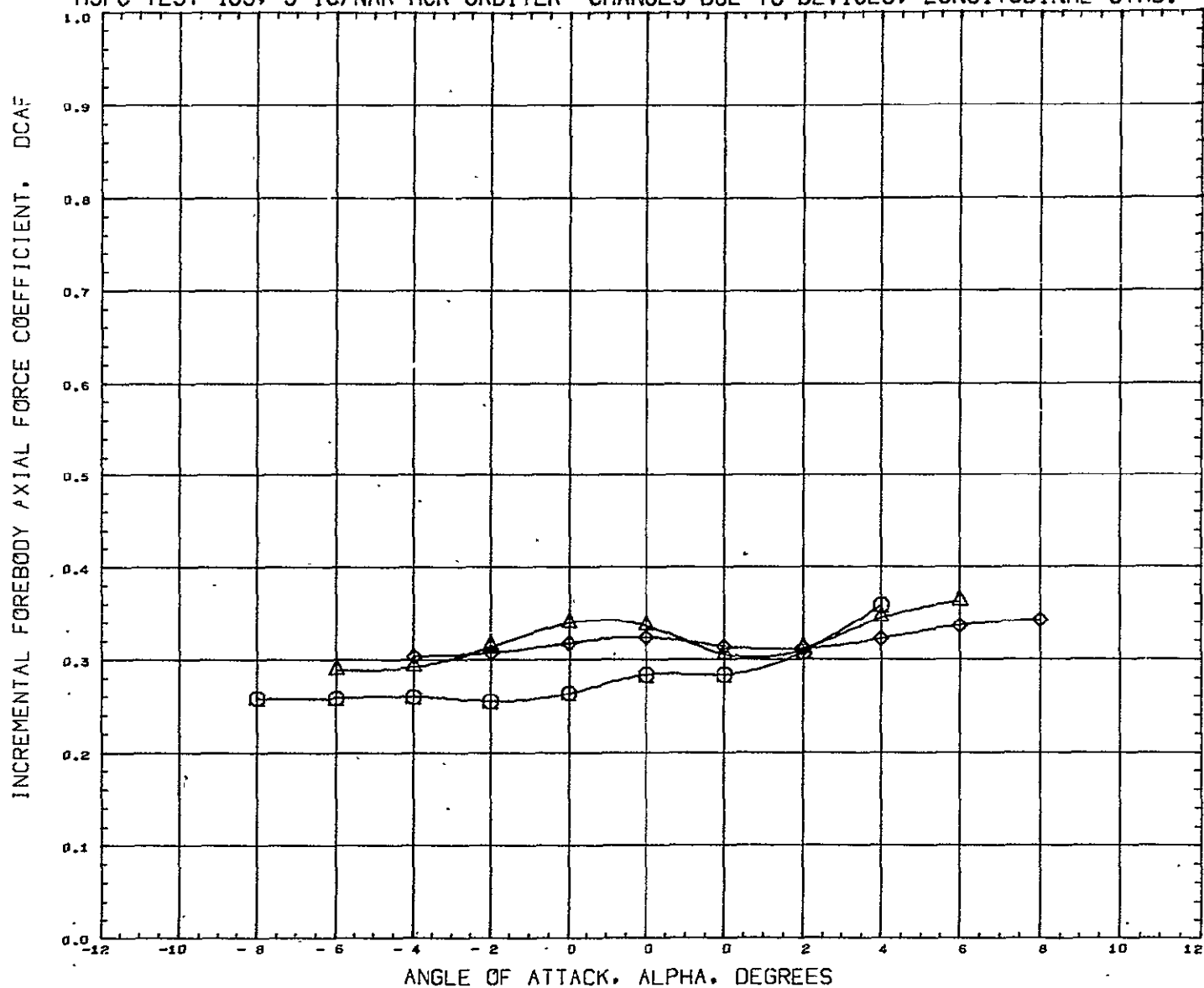
PARAMETRIC VALUES
 0.000

REFERENCE INFORMATION

REFS	1.3960	50. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRF	0.0370	IN
YMRF	0.0000	IN
ZMRF	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EJWA*CM

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



SYMBOL MACH
 ○ 0.900
 △ 1.000
 ◇ 1.200

PARAMETRIC VALUES
 0.000

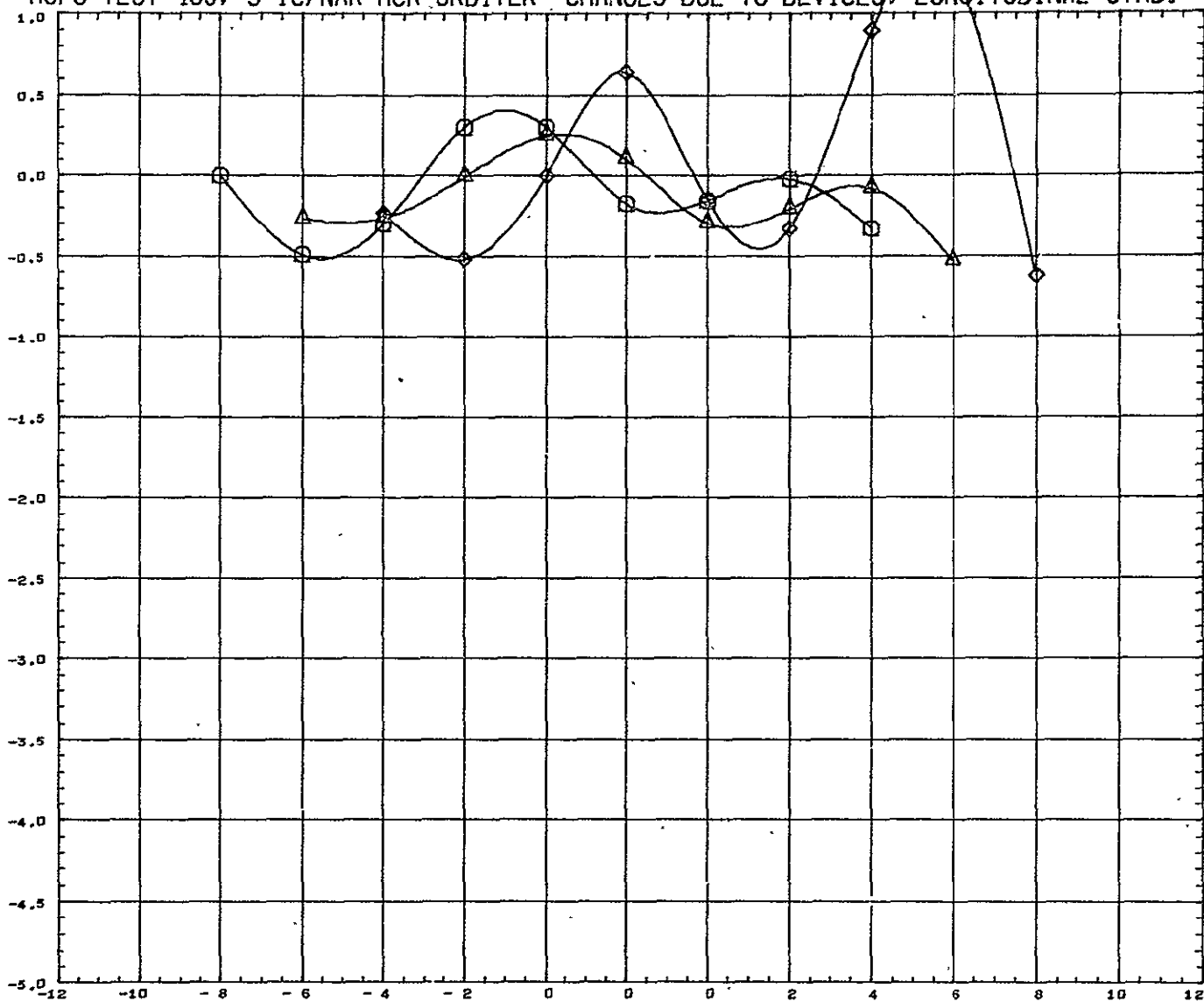
REFERENCE INFORMATION

REFS	1.3960	SO. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI*A*CM

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.

STATIC LONGITUDINAL STABILITY DERIVATIVE, DCLM/DCN, DCCPD)



ANGLE OF ATTACK, ALPHA, DEGREES

SYMBOL
 ○
 △
 ◇

MACH
 0.900
 1.000
 1.200

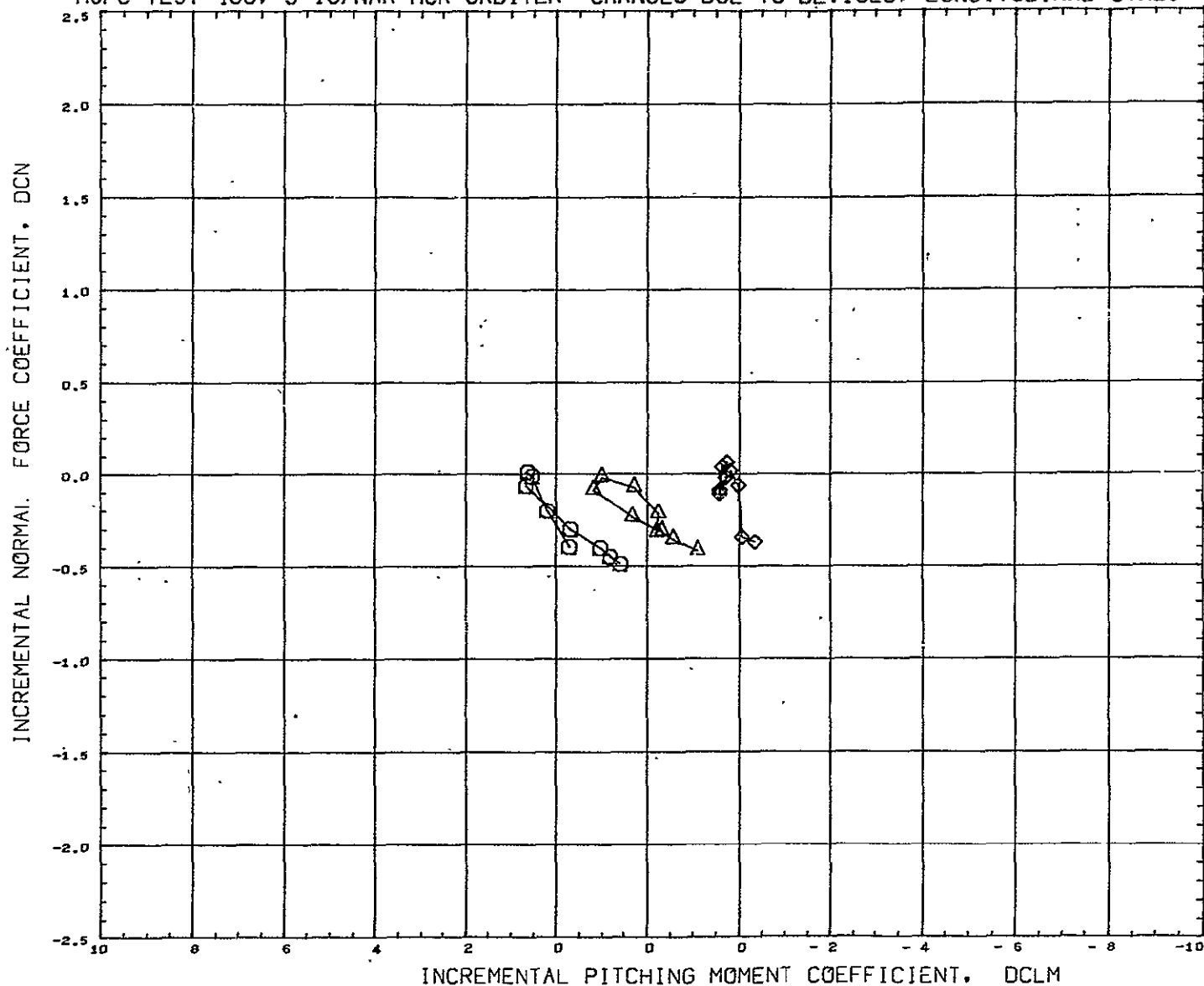
PARAMETRIC VALUES
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REFERENCE INFORMATION

REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFS	1.3550	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI*A*CM

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.

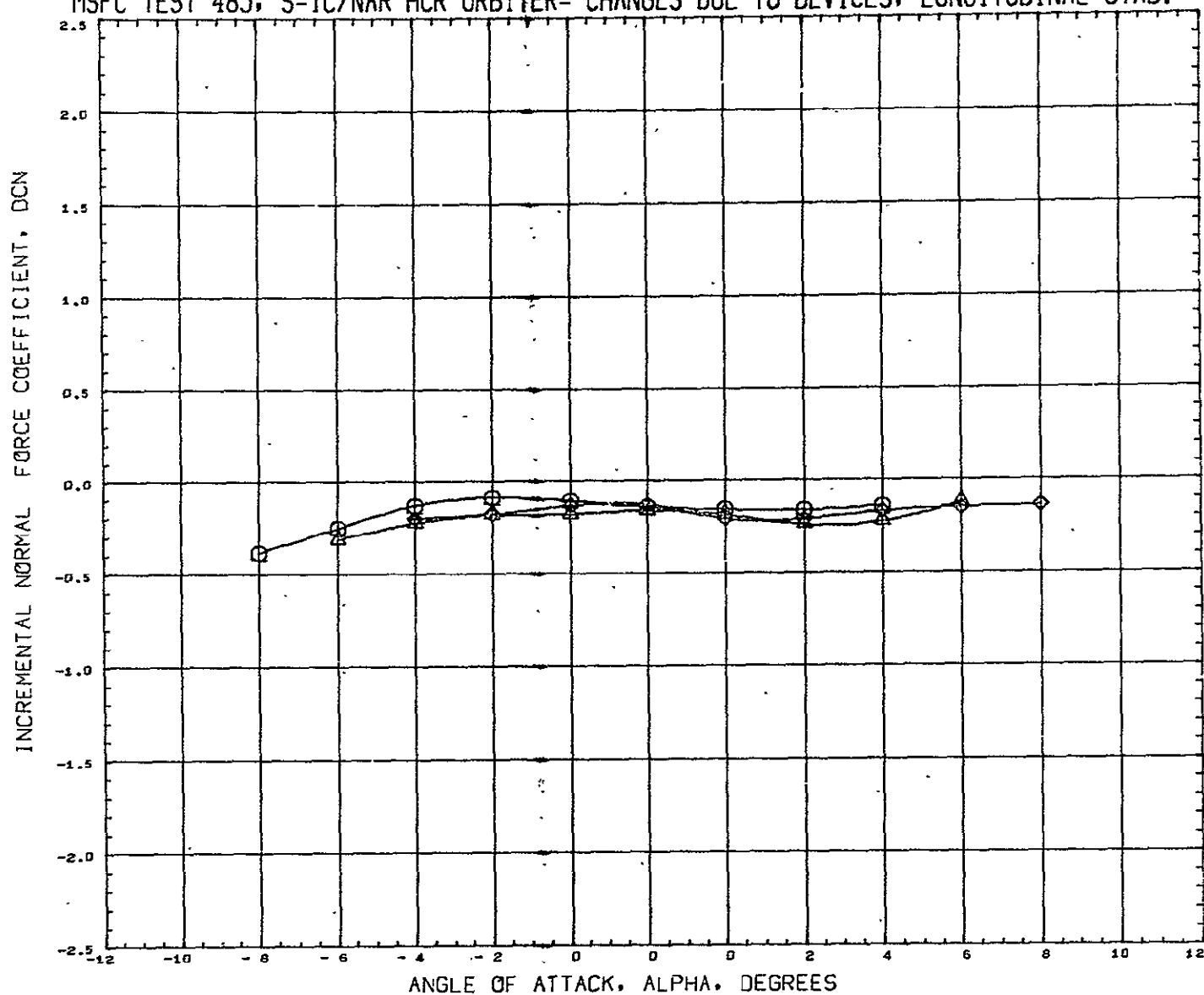


SYMBOL	MACH	PARAMETRIC VALUES
○	0.900	0.000
△	1.000	
◇	1.200	

REFERENCE INFORMATION		
REFS	1.3960	50. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI#A*CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



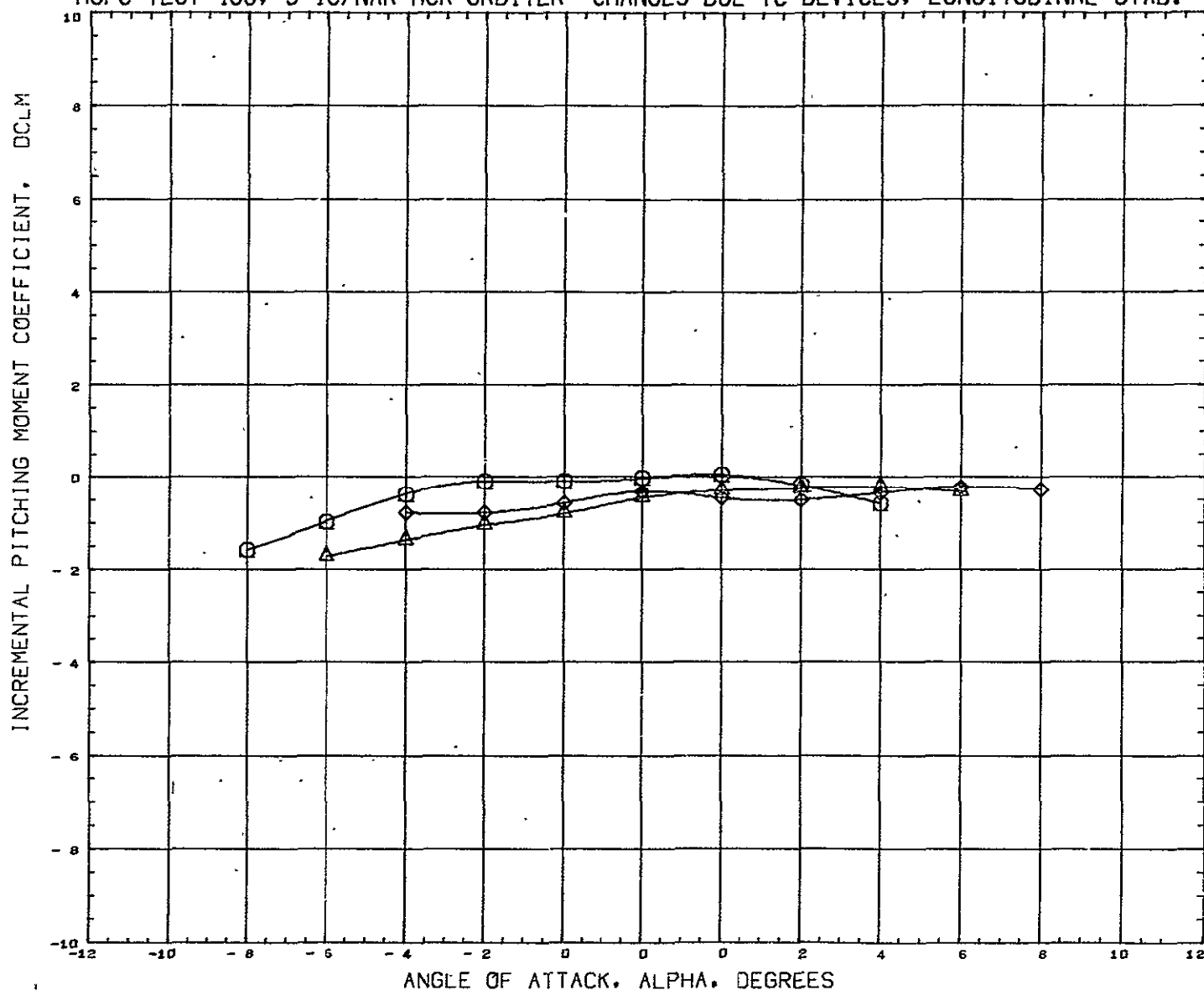
SYMBOL MACH
 ○ 0.900
 △ 1.000
 ◇ 1.200

PARAMETRIC VALUES
 0.000

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *EI#A*CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



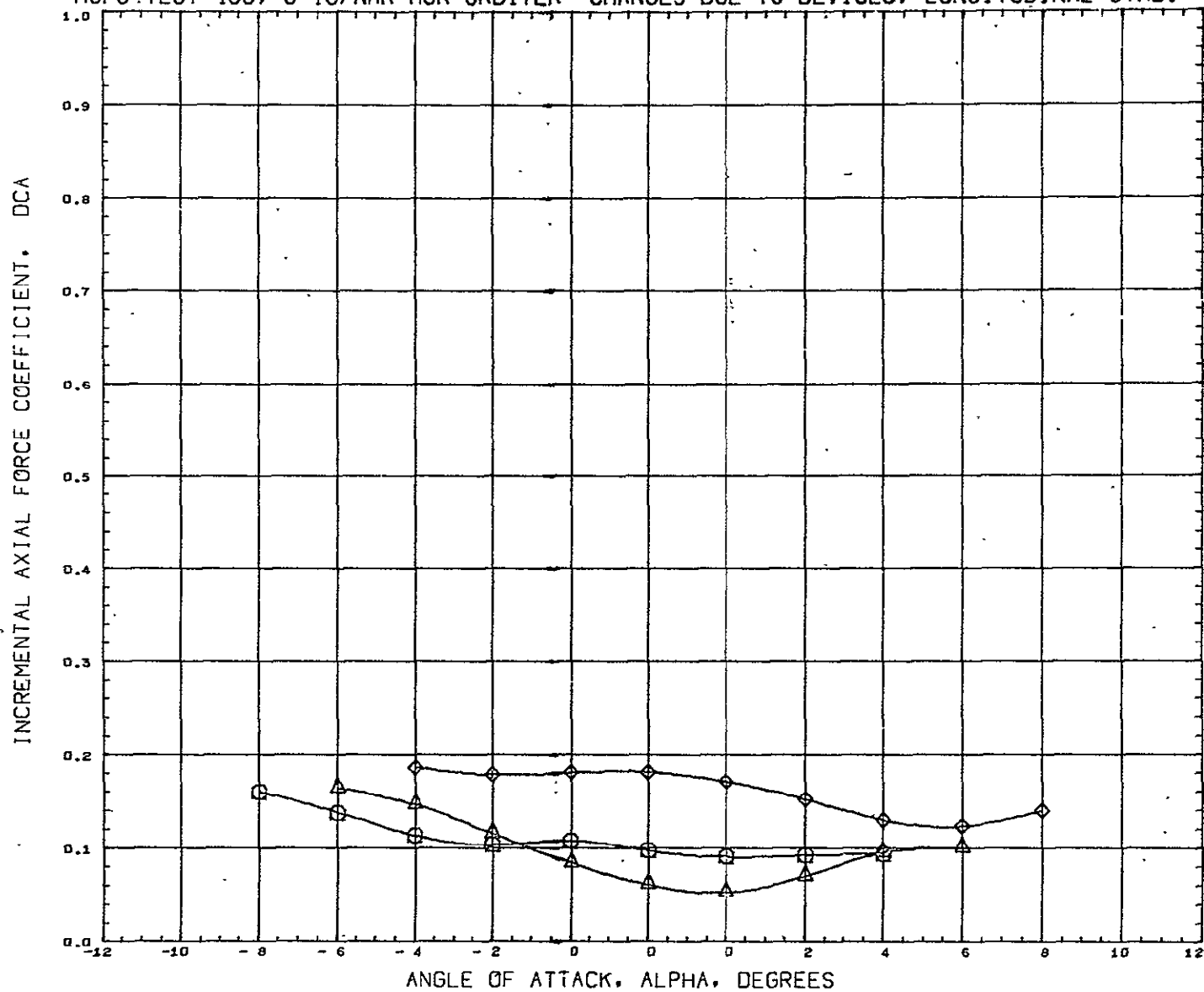
SYMBOL MACH
 ○ 0.900
 △ 1.000
 ◇ 1.200

PARAMETRIC VALUES
 0.000

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP - 0.0370 IN
 YMRP 3.0000 IN
 ZMRP 3.0000 IN
 SCALE 0.0034

DATA HIST. CODE *EI*A*CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



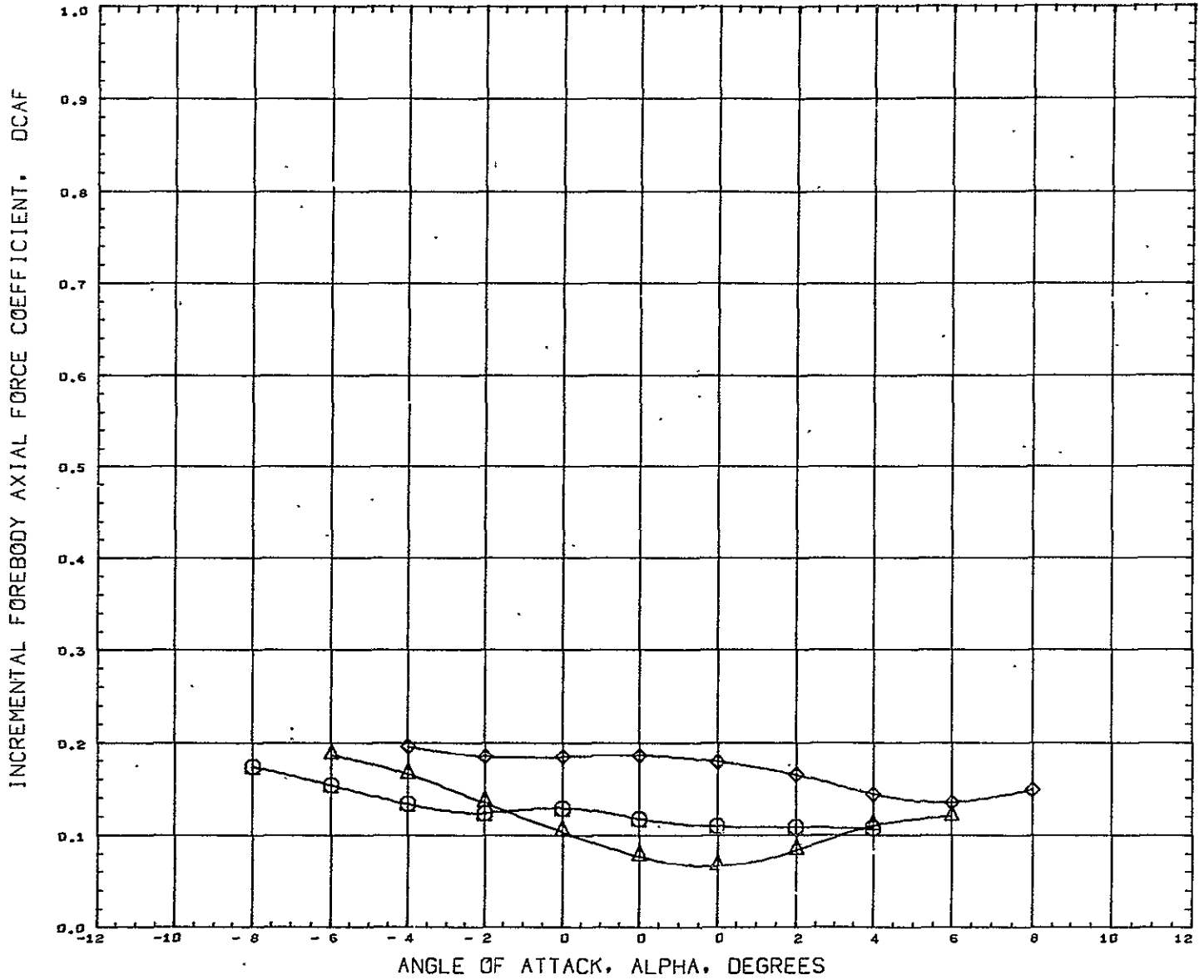
SYMBOL MACH
 ○ 0.900
 △ 1.000
 ◇ 1.200

PARAMETRIC VALUES
 0.000

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRF 0.0370 IN
 YMRF 0.0000 IN
 ZMRF 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *EI*ACH

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



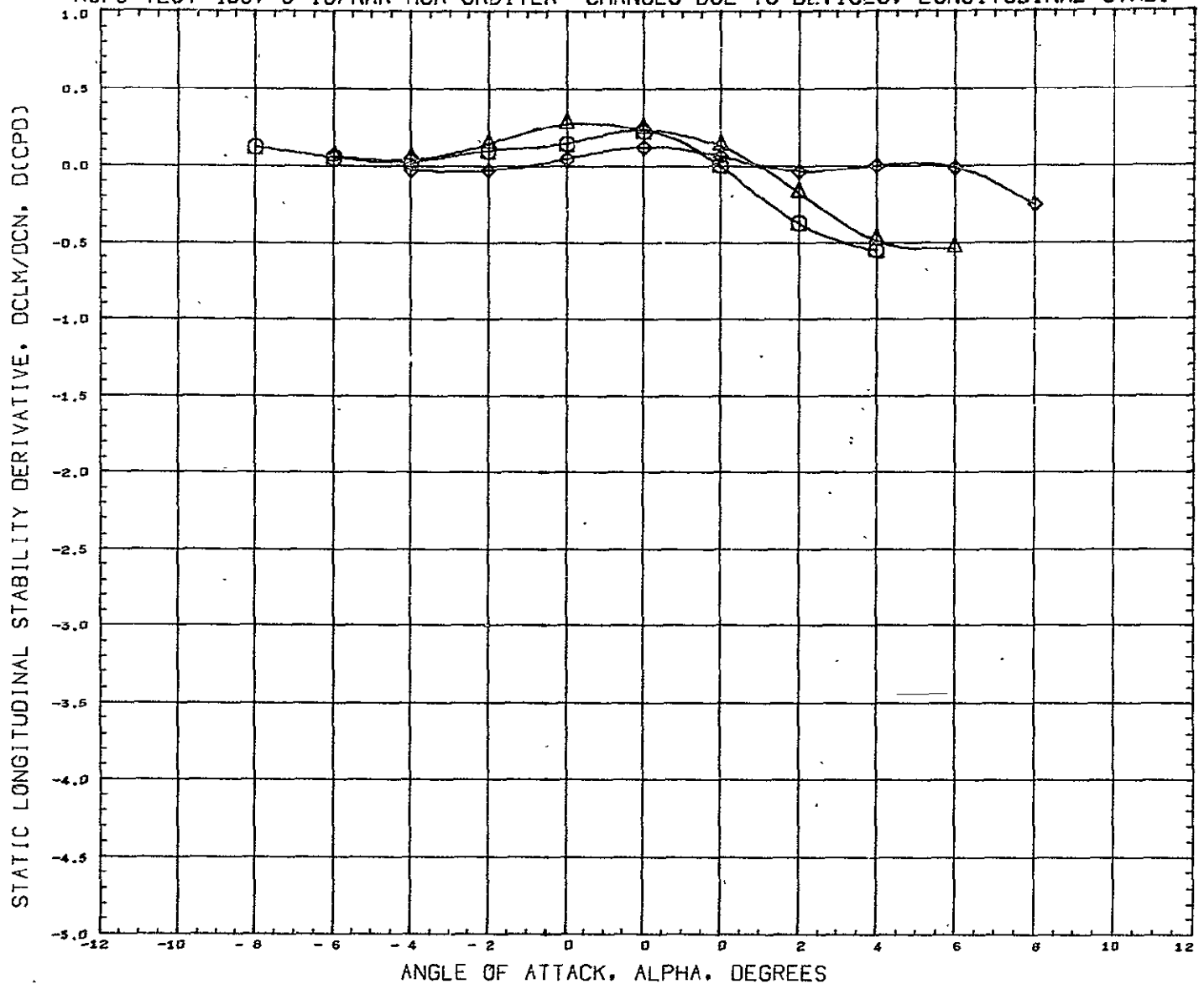
SYMBOL MACH
 ○ 0.900
 △ 1.000
 ◇ 1.200

PARAMETRIC VALUES
 0.000

REFERENCE INFORMATION
 REFS 1.3960 SQ.IN.
 REEL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034 IN

DATA HIST. CODE *EI*A*CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



SYMBOL MACH PARAMETRIC VALUES

○ 0.900 0.000

△ 1.000

◇ 1.200

REFERENCE INFORMATION

REFS 1.3960 SQ. IN.

REFL 1.3330 IN

REFS 1.3330 IN

XMRP 0.0375 IN

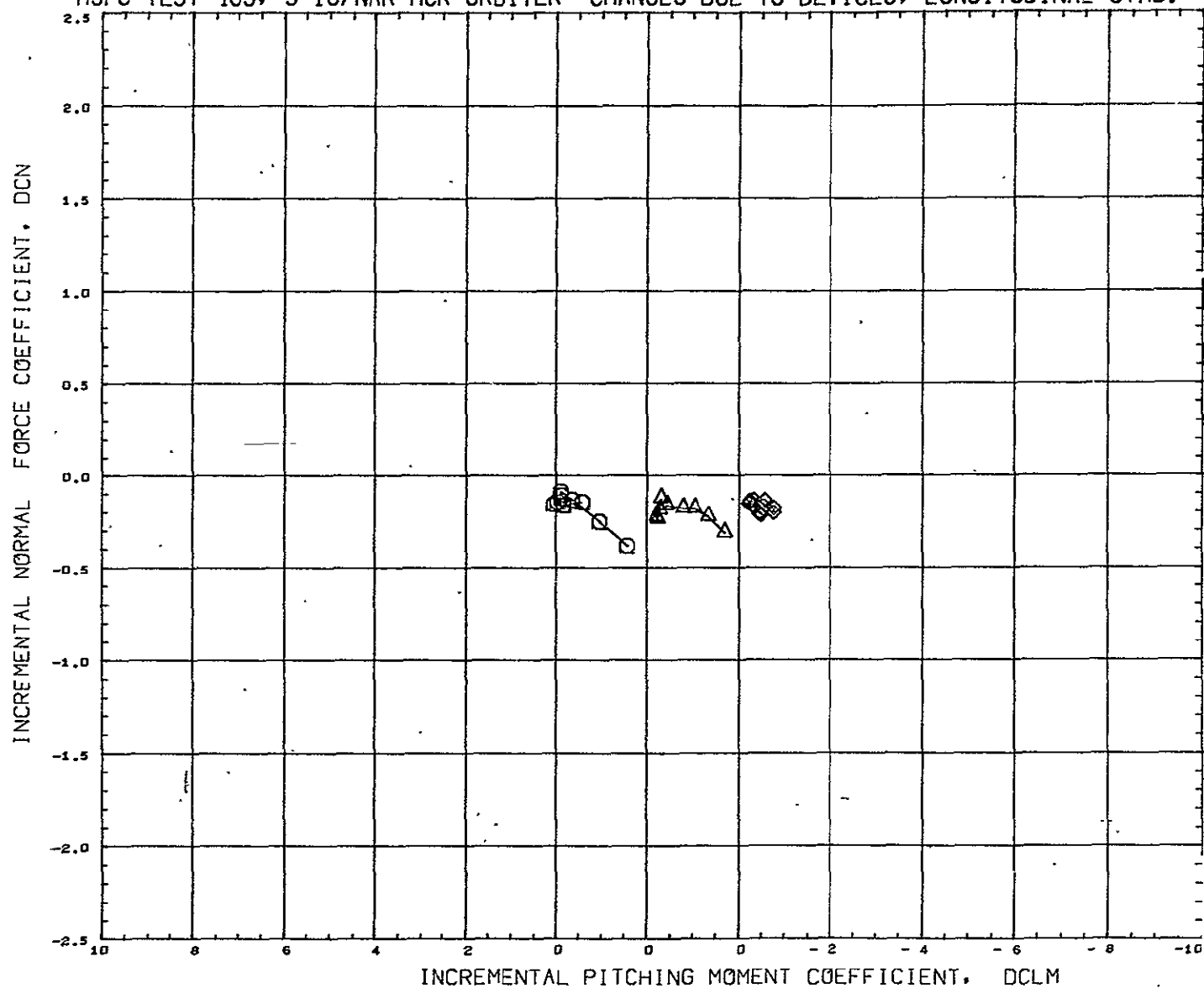
YMRP 0.0000 IN

ZMRP 0.0000 IN

SCALE 0.0034

DATA HIST. CODE *EI*#*CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



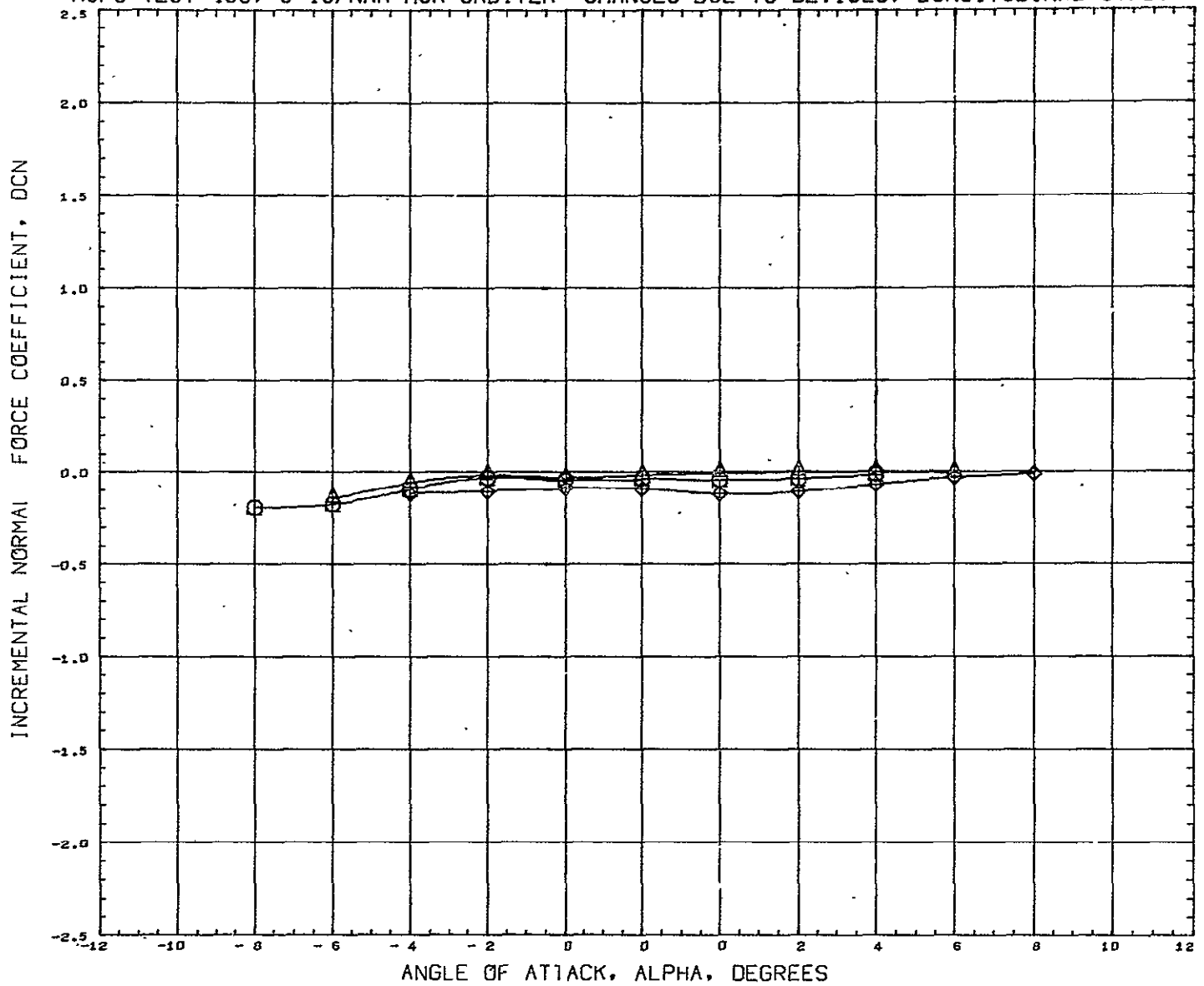
SYMBOL MACH
 ○ 0.900
 △ 1.000
 ◇ 1.200

PARAMETRIC VALUES
 0.000

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0030 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *EI*CM

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.

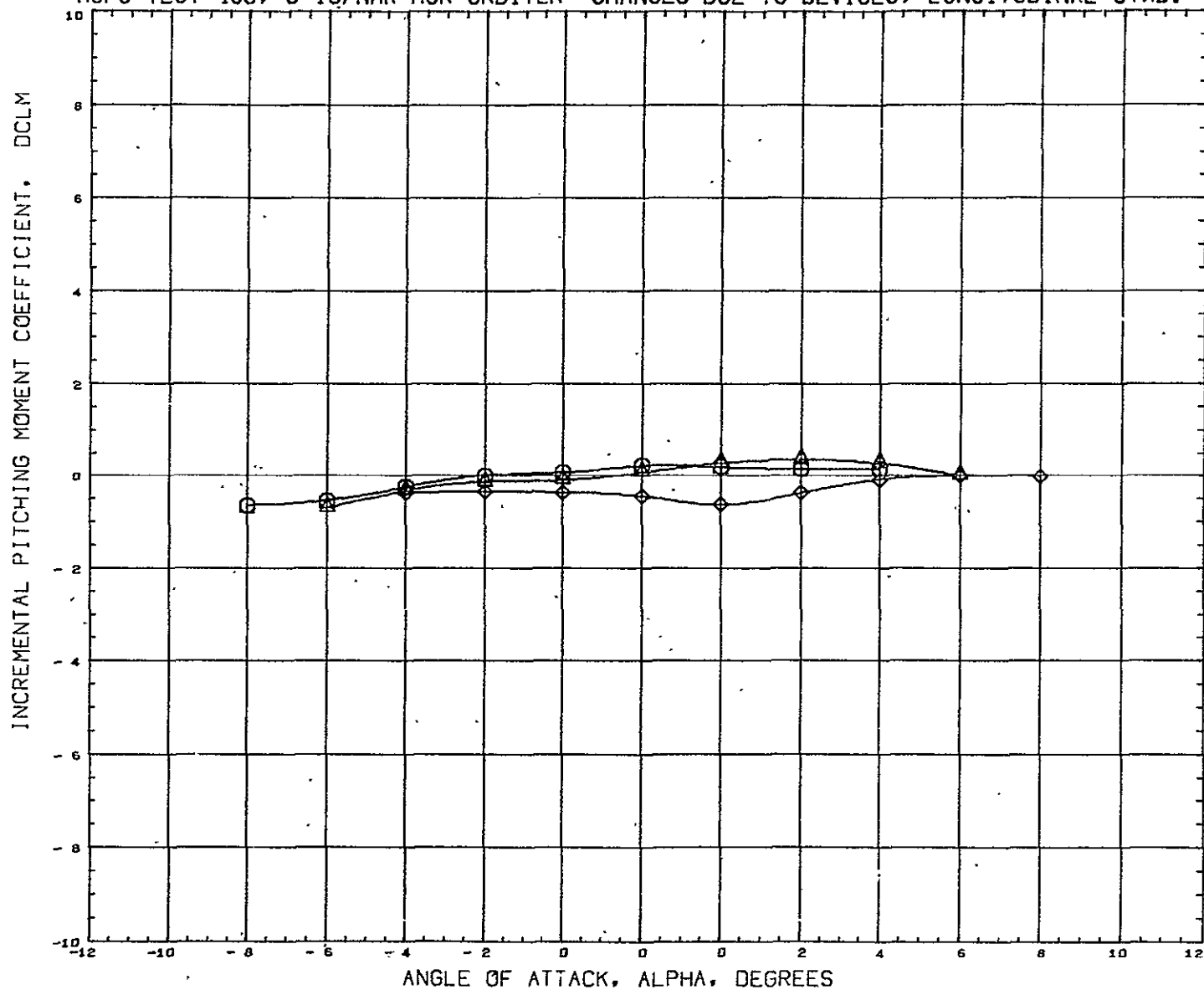


SYMBOL	MACH	PARAMETRIC VALUES
○	0.900	0.000
△	1.000	
◇	1.200	

REFERENCE INFORMATION		
REFS	1.3960	SO.IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI*A*CM

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



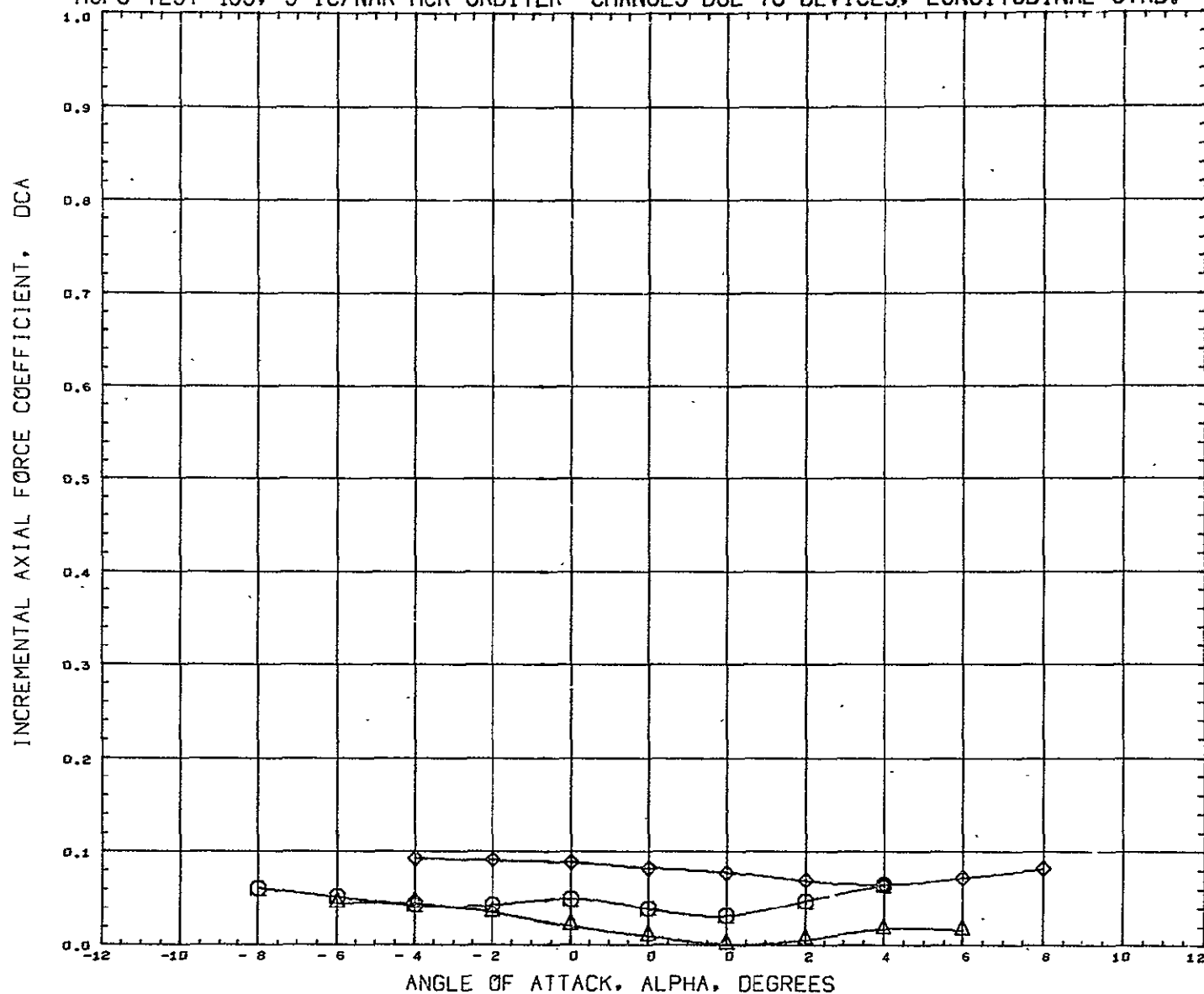
SYMBOL MACH
 ○ 0.900
 △ 1.000
 ◇ 1.200

PARAMETRIC VALUES
 0.000

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRT - 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *EI*A*CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



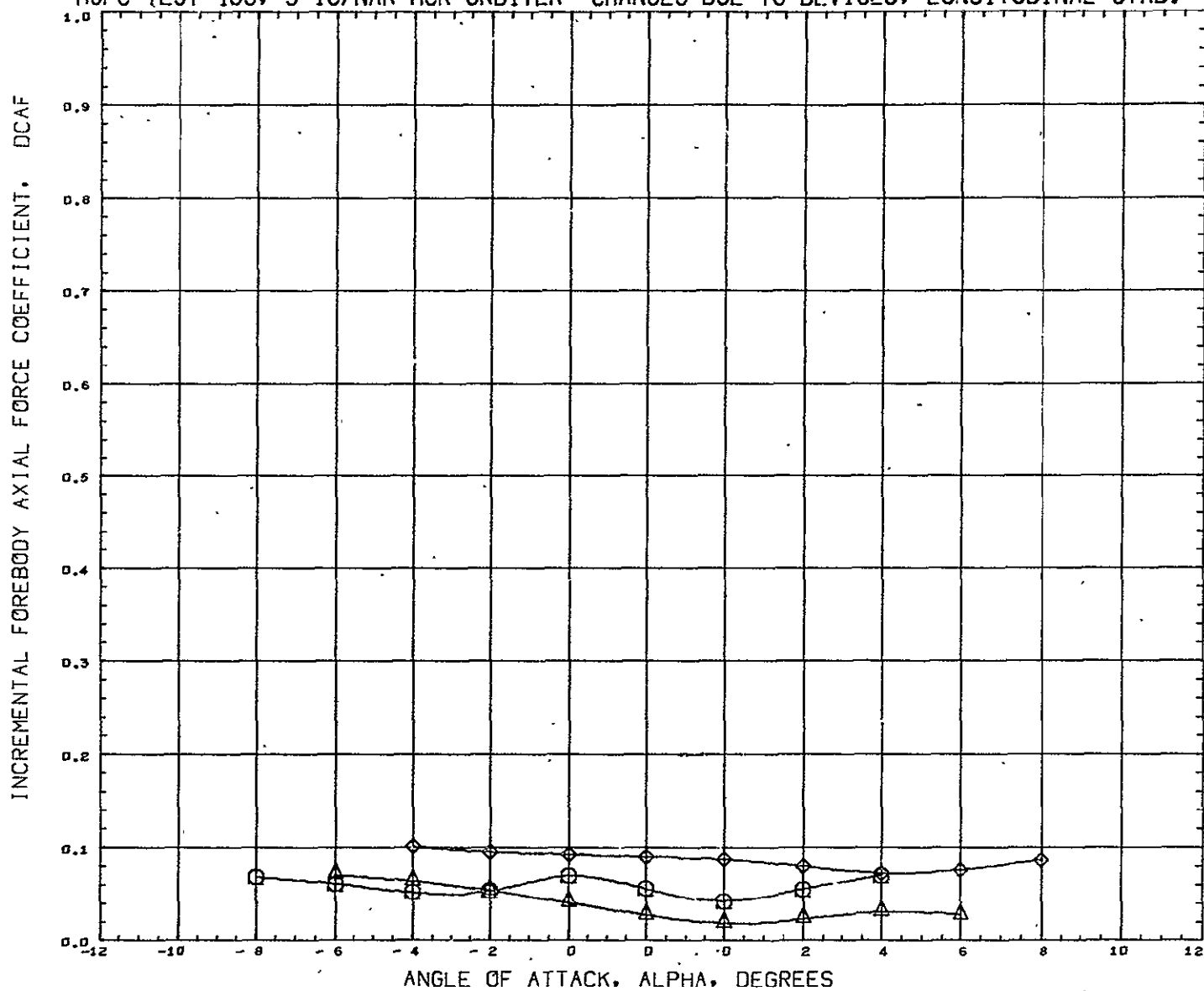
SYMBOL MACH
 ○ 0.900
 □ 1.000
 ◇ 1.200

PARAMETRIC VALUES
 0.000

REFERENCE INFORMATION
 REFS 1.3960 SQ.IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP - 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *EI*A*CM

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



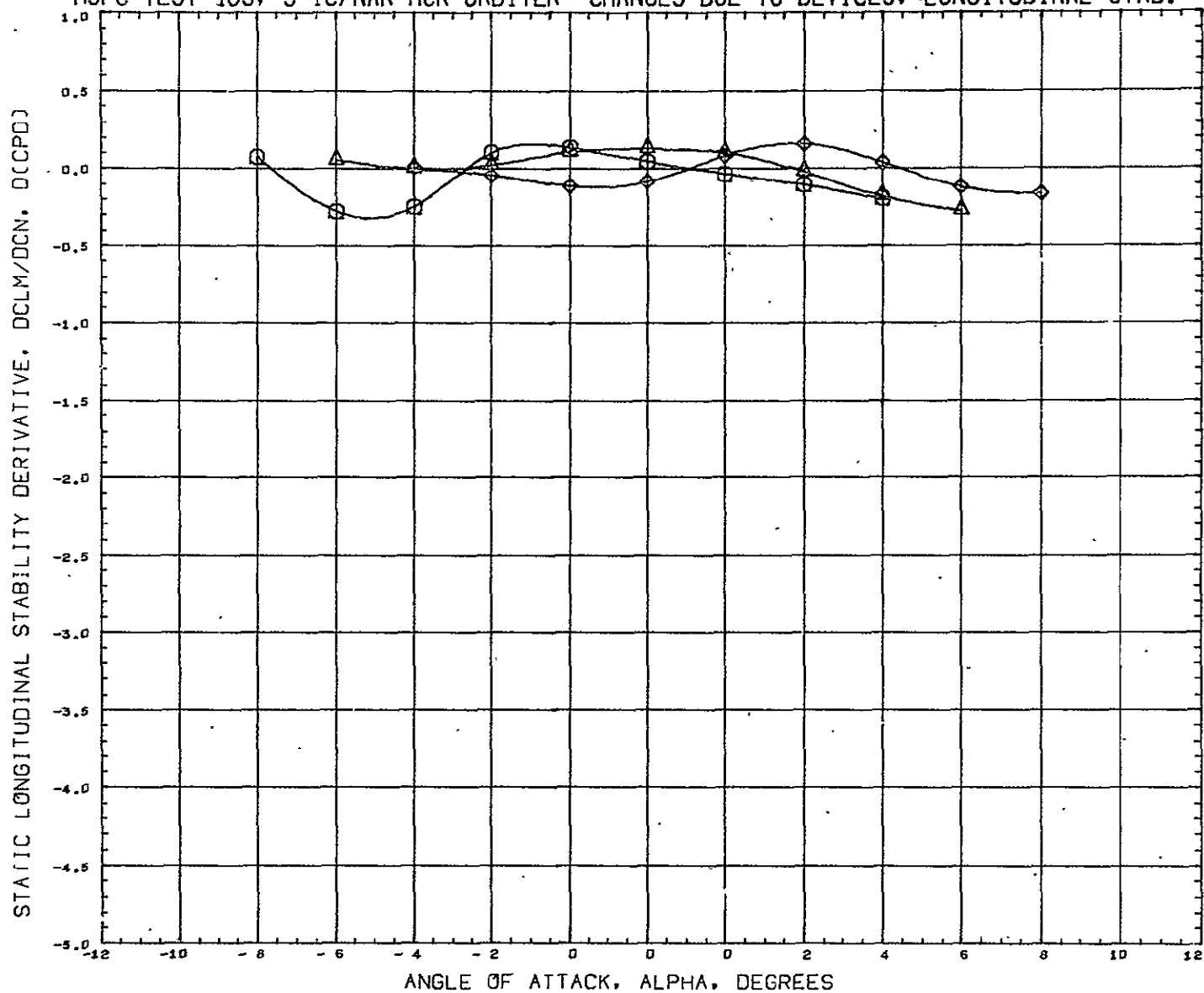
SYMBOL MACH
 ○ 0.900
 △ 1.000
 ◇ 1.200

PARAMETRIC VALUES
 0.000

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0376 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *EI#A*CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



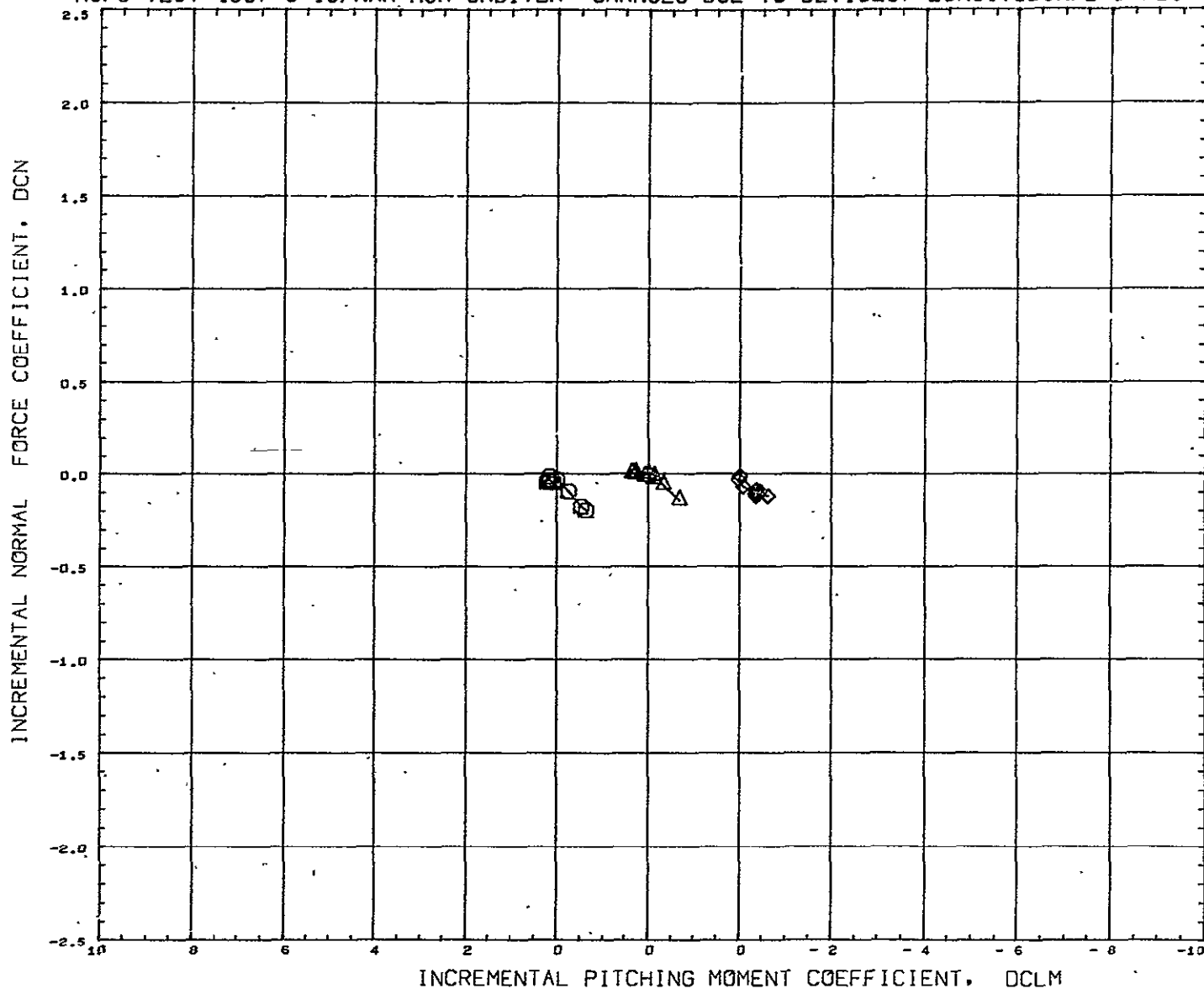
SYMBOL MACH
 ○ 0.900
 △ 1.000
 ◇ 1.200

PARAMETRIC VALUES
 0.000

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XNRF 0.0370 IN
 YNRF 0.0000 IN
 ZNRF 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *EI*A*CM

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.

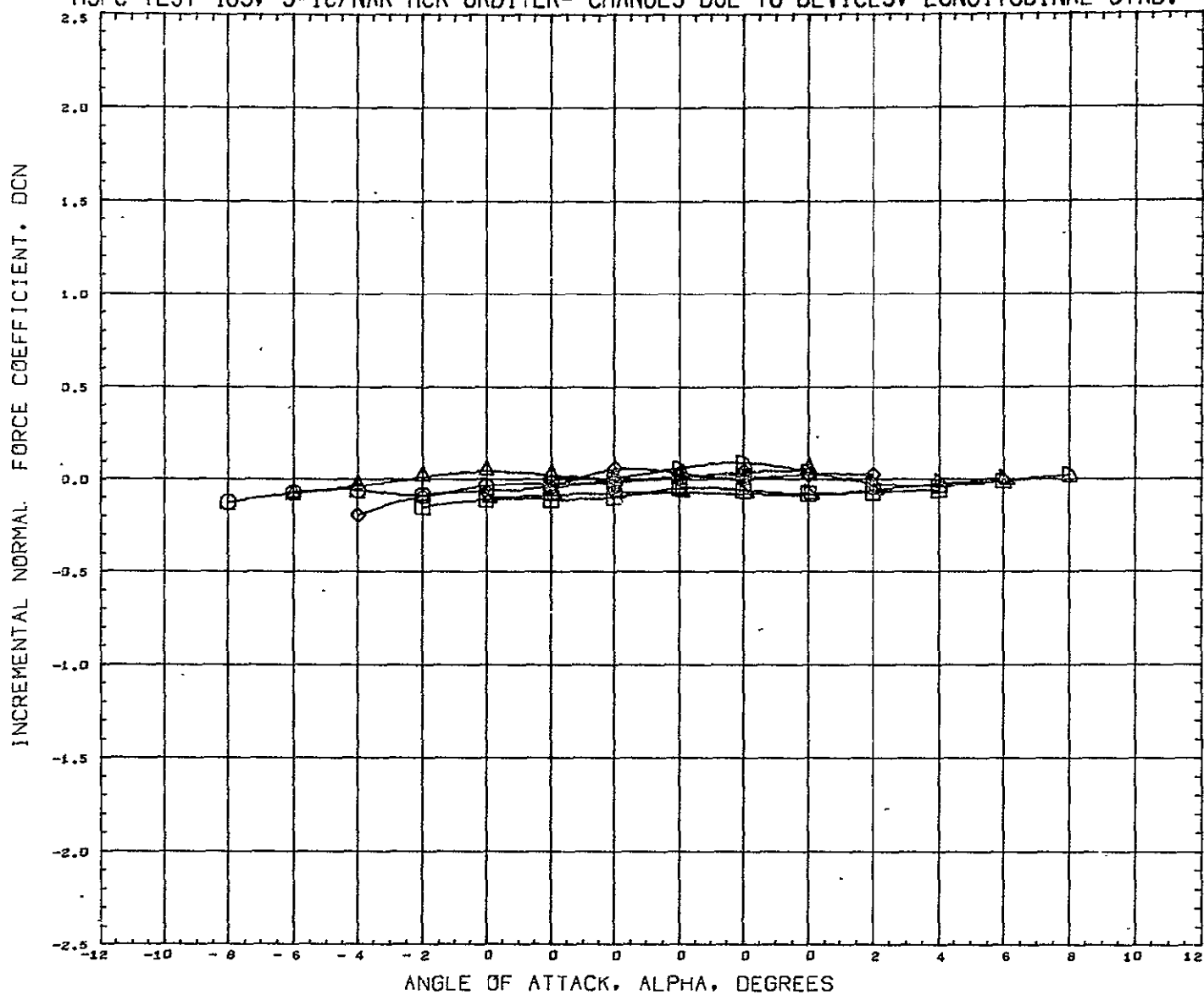


SYMBOL	MACH	PARAMETRIC VALUES
○	0.900	0.000
△	1.000	
◇	1.200	

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0379	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI#A*CH

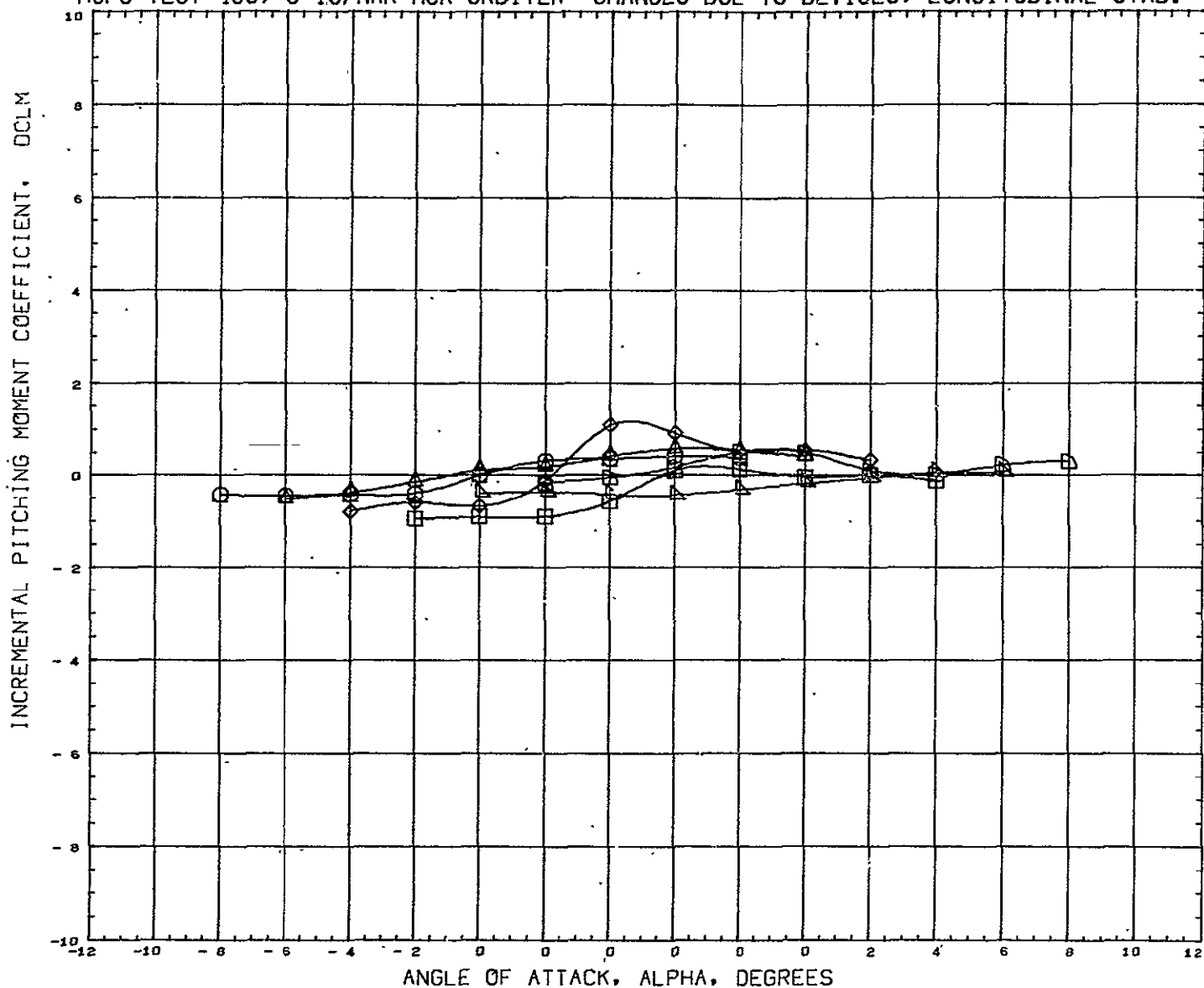
MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



SYMBOL MACH PARAMETRIC VALUES
 0.600 BETA 0.000
 0.900
 1.000
 1.100
 1.200
 1.960 DATA HIST. CODE *EI#C

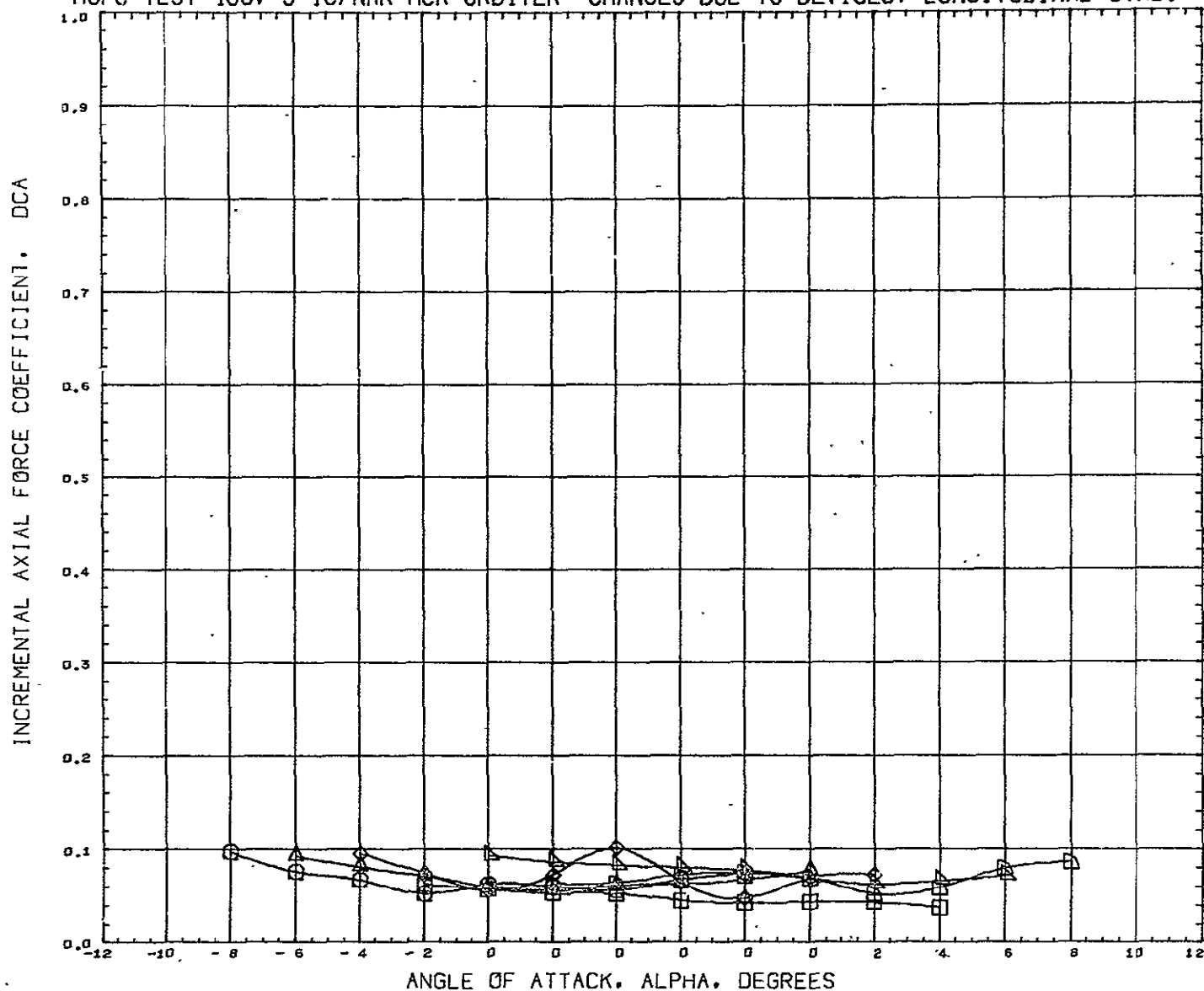
REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0375 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



SYMBOL	MACH	BETA	PARAMETRIC VALUES	REFERENCE INFORMATION
0.600		0.000		REFS 1.3960 SQ. IN.
0.900				REFL 1.3330 IN
1.000				REFB 1.3130 IN
1.100				XMRP - 0.0370 IN
1.200				YMRP 0.0000 IN
1.960				ZMRP 0.0000 IN
				SCALE 0.0034

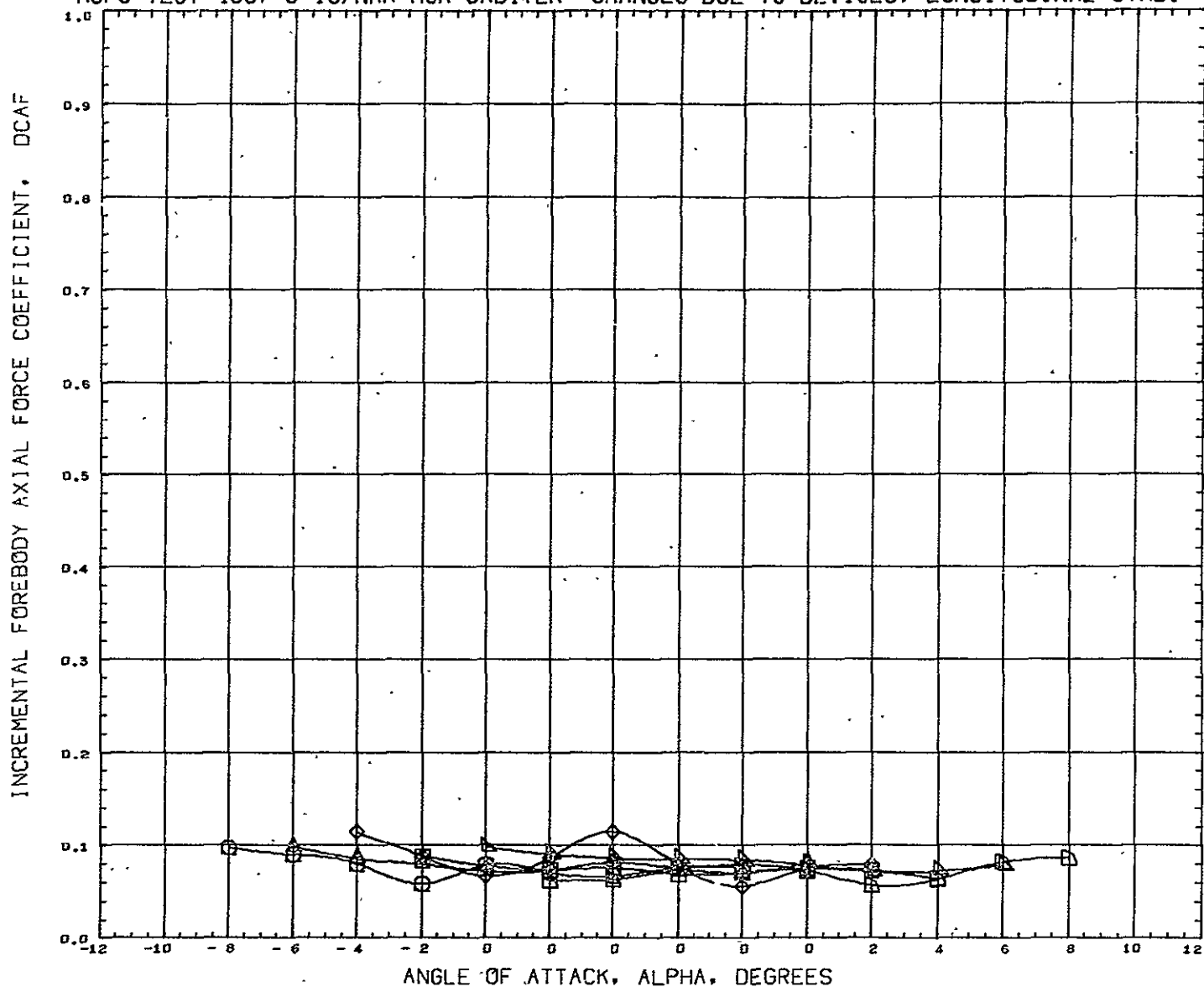
MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.600	0.000	
△	0.900		
◇	1.000		
□	1.100		
▽	1.200		
◇	1.960		
	DATA HIST. CODE	*EI* C	

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0375	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.

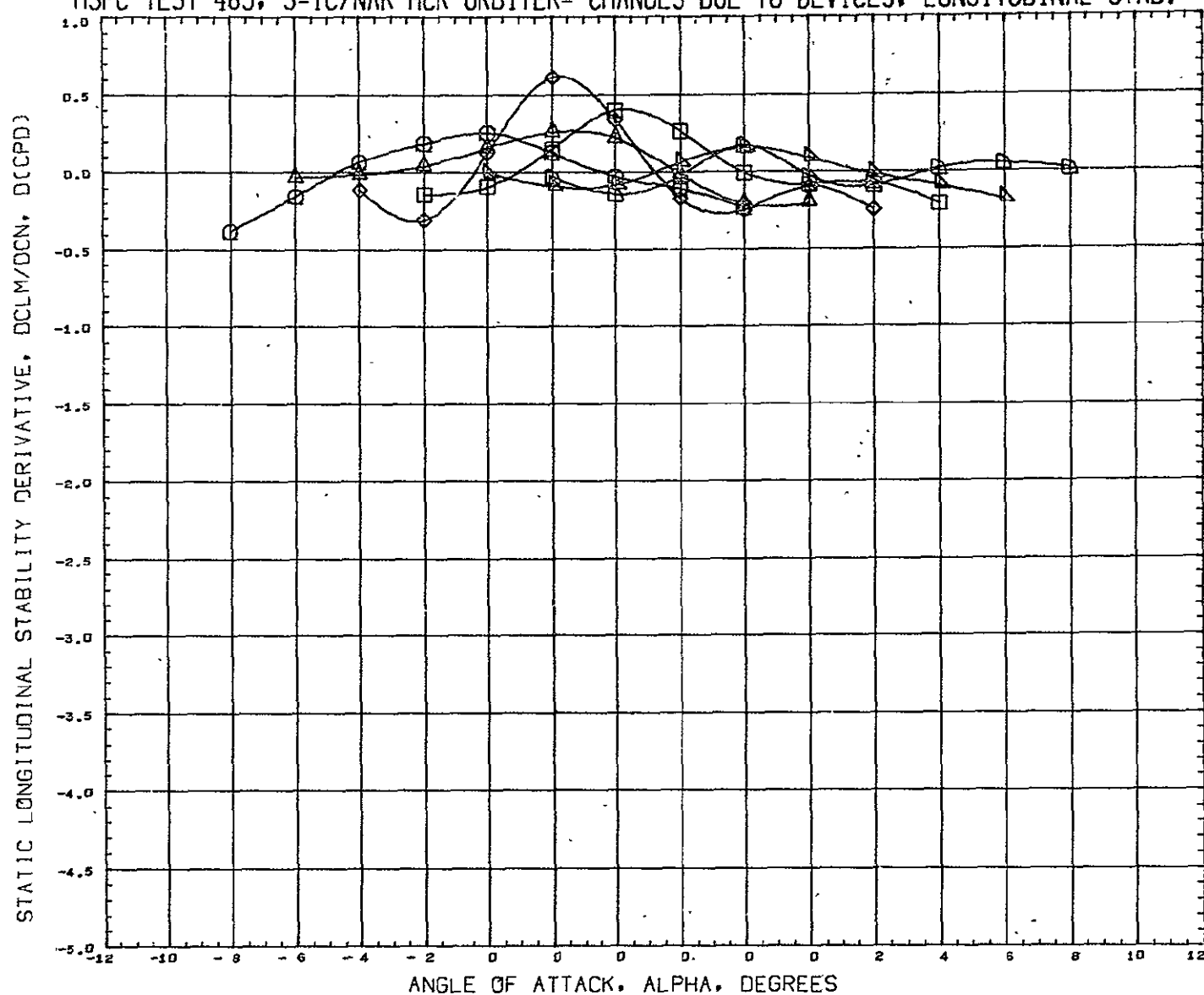


SYMBOL	MACH	BETA	PARAMETRIC VALUES
◇	0.600	0.000	
◇	0.900		
◇	1.000		
◇	1.100		
◇	1.200		
◇	1.960		

DATA HIST. CODE *EI#C

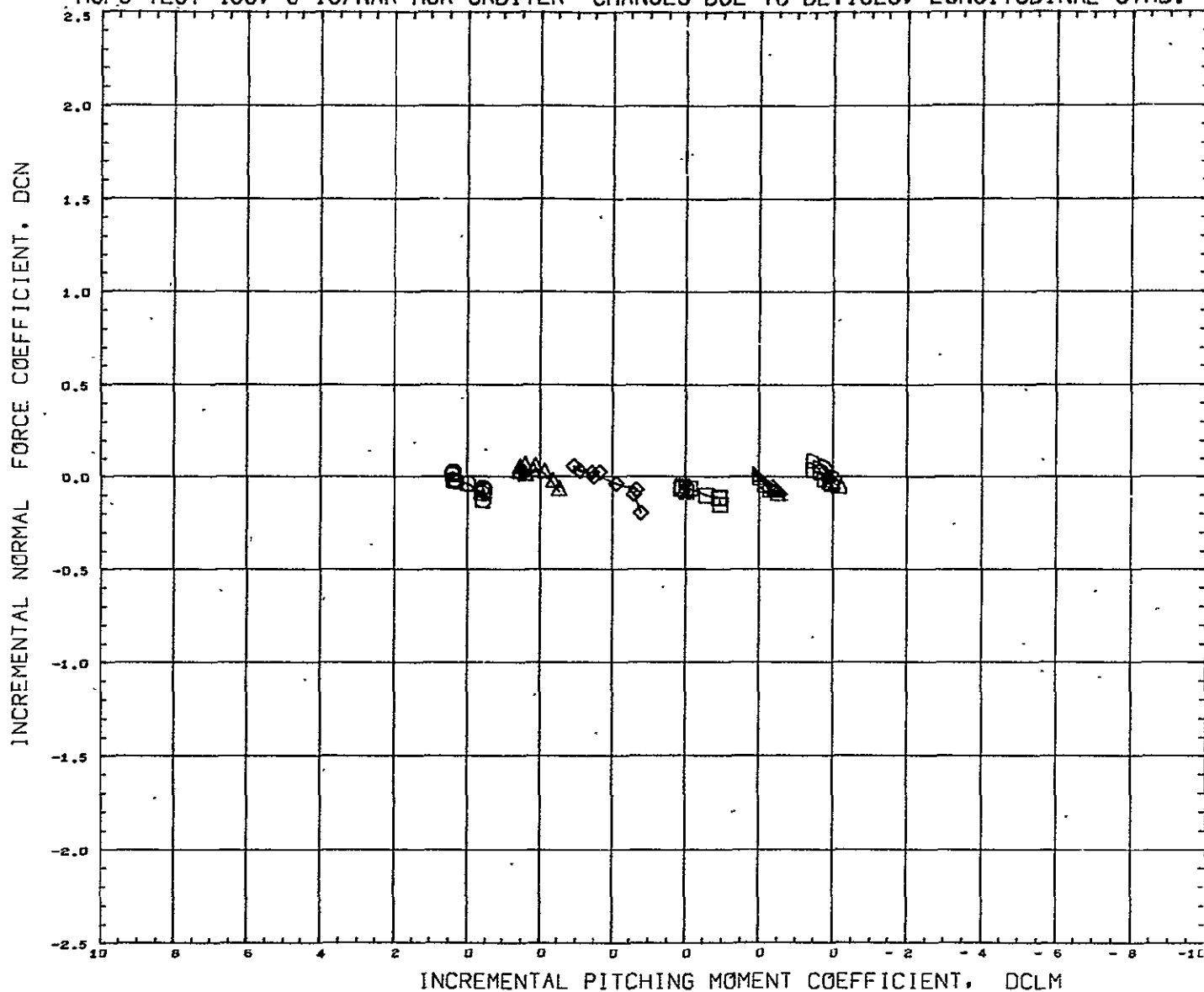
REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0310	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



SYMBOL	MACH	BETA	PARAMETRIC VALUES	REFERENCE INFORMATION
0.600	0.600	0.000		REFS 1.3960 SQ. IN.
0.900	0.900	0.000		REFL 1.3330 IN
1.000	1.000	0.000		REFB 1.3330 IN
1.100	1.100	0.000		XMRP 0.0370 IN
1.200	1.200	0.000		YMRP 0.0000 IN
1.960	1.960	0.000		ZMRP 0.0000 IN
				SCALE 0.0034

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.

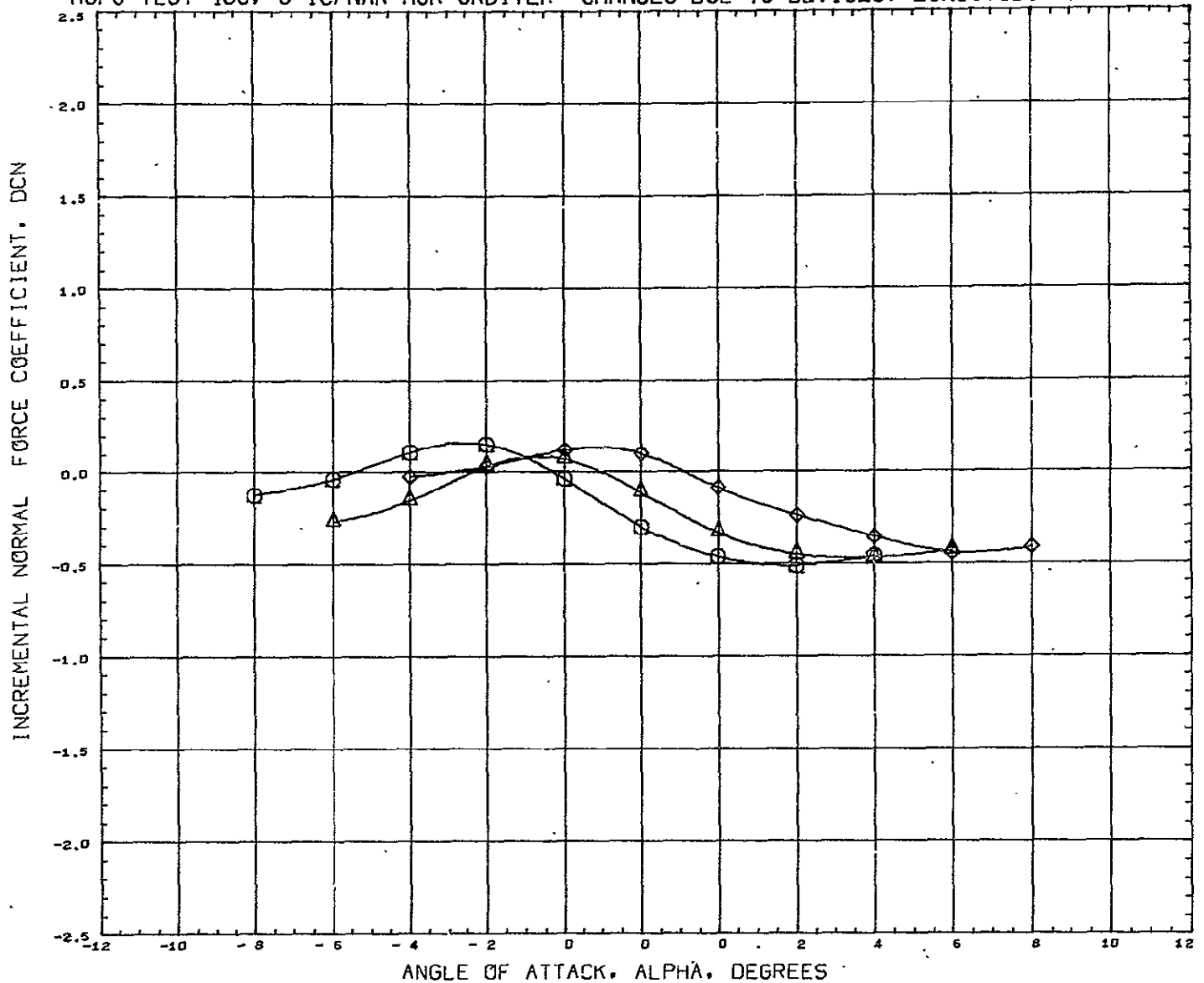


SYMBOL	MACH	BETA	PARAMETRIC VALUES
○	0.600		0.000
◇	0.900		
△	1.000		
□	1.100		
◻	1.200		
◼	1.960		

DATA HIST. CODE *EI#C

REFERENCE INFORMATION		
REFS	1.3960	50.IN.
REFL	1.3330	IN
REFB	1.3330	IN
XHRP	0.3370	IN
YHRP	0.0000	IN
ZHRP	0.0000	IN
SCALE	0.0034	

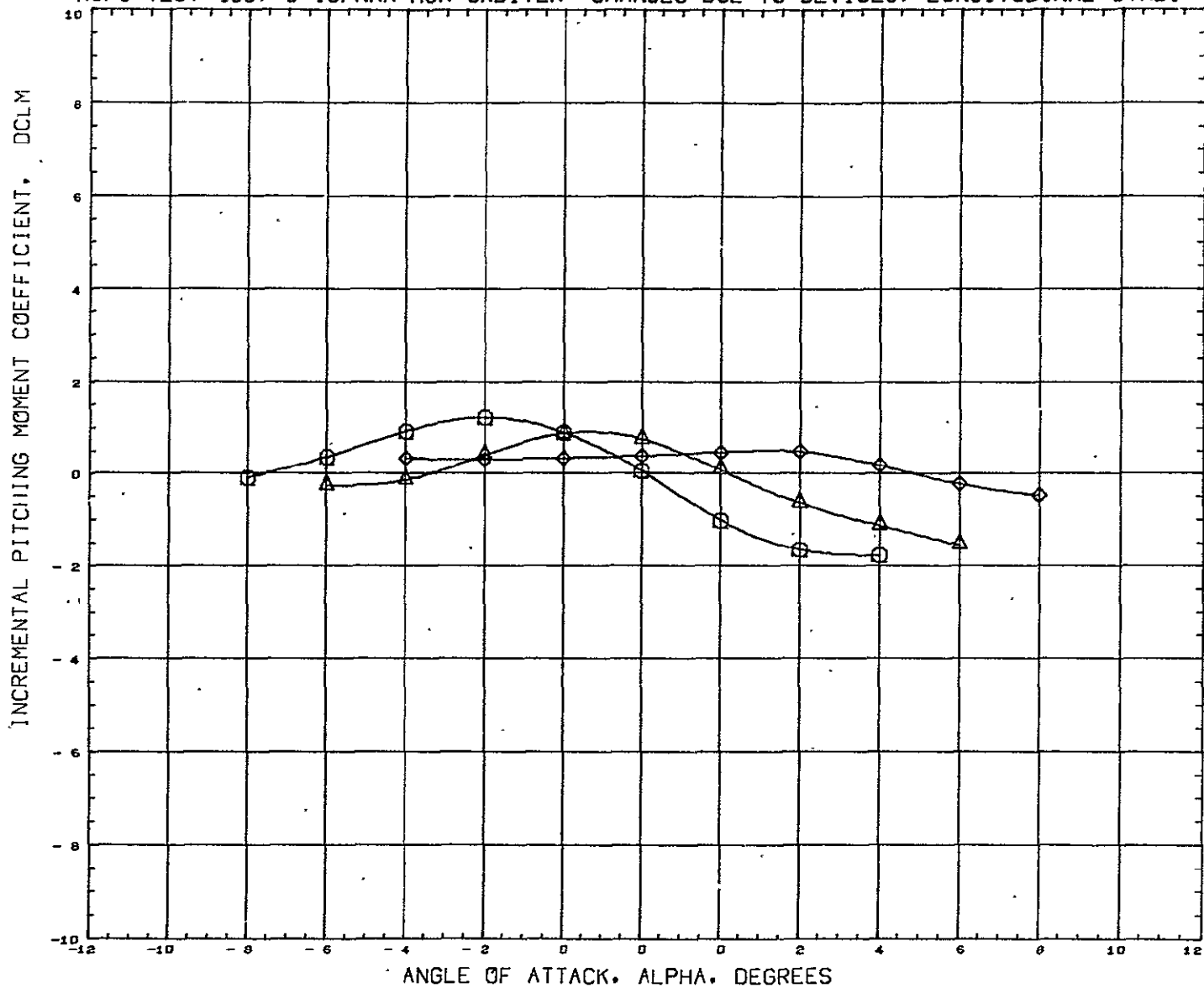
MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



SYMBOL	MACH	PARAMETRIC VALUES	REFERENCE INFORMATION		
○	0.900	0.000	REFS	1.3960	50. IN.
△	1.000		REFL	1.3330	IN
◇	1.200		REFB	1.3330	IN
			XMRP	0.0370	IN
			YMRP	0.0000	IN
			ZMRP	0.0000	IN
			SCALE	0.0034	

DATA HIST. CODE #EI#A#CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.

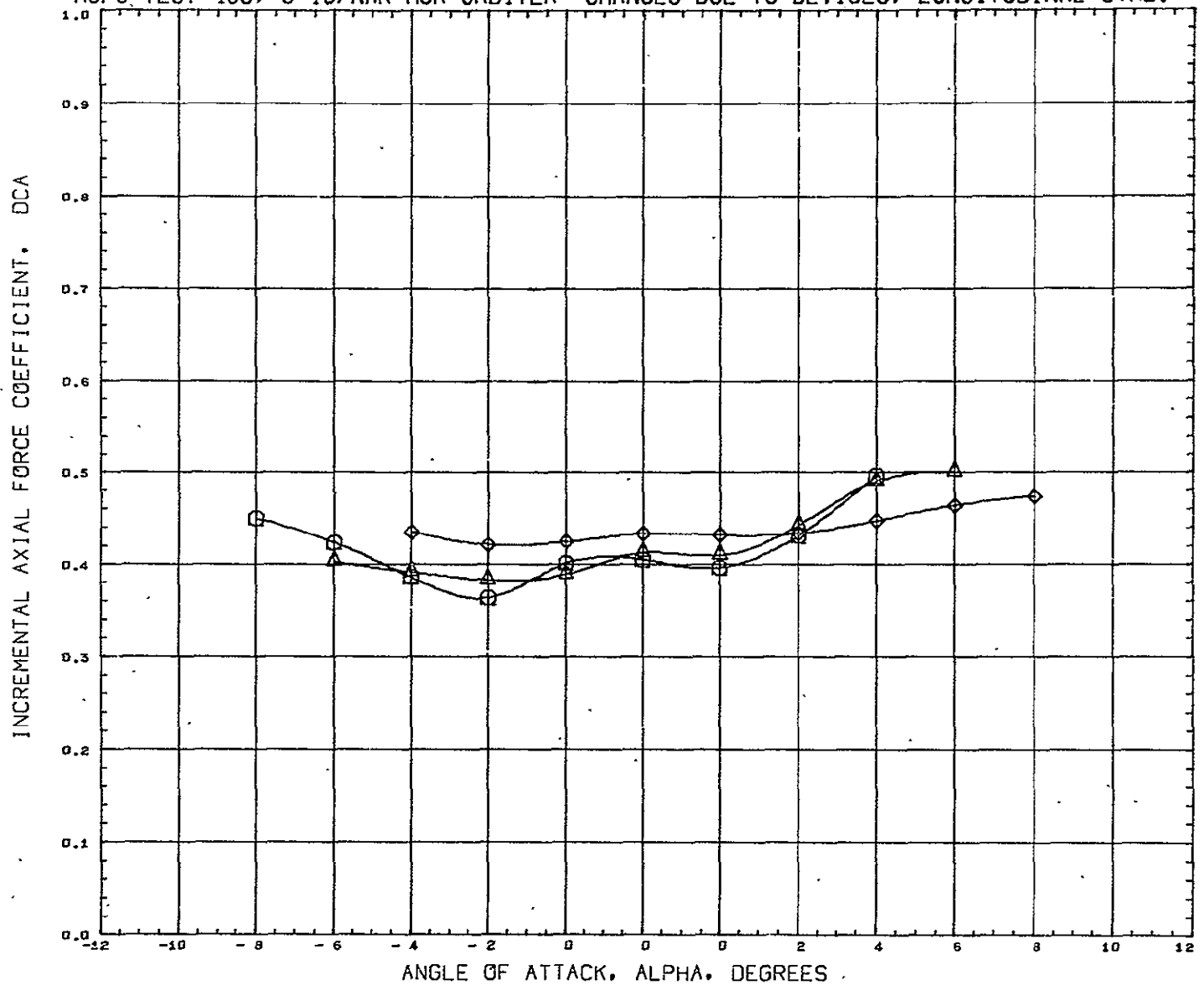


SYMBOL	MACH	PARAMETRIC VALUES
□	0.900	0.000
△	1.000	
◇	1.200	

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI*A*CM

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



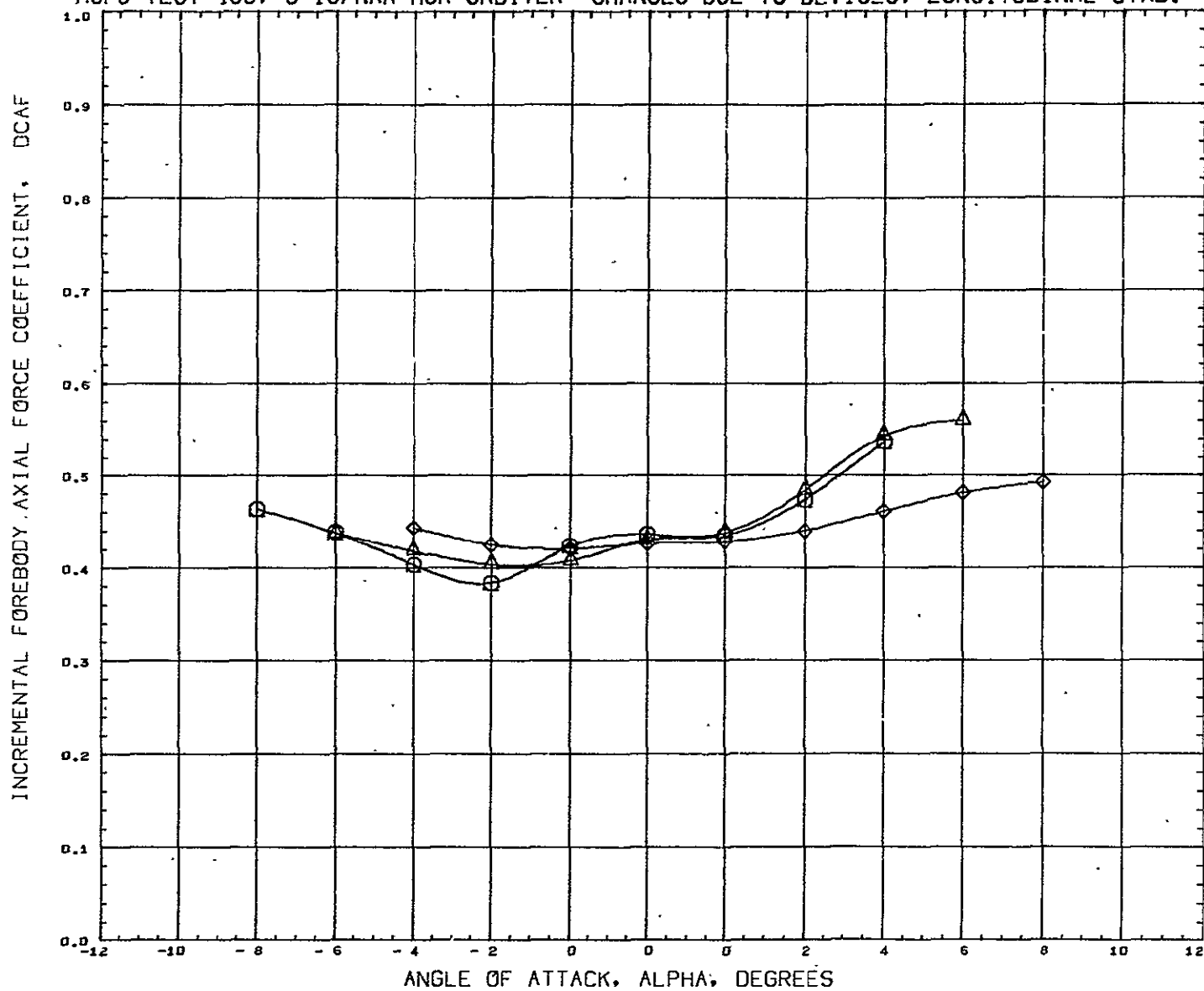
SYMBOL MACH
 ○ 0.900
 △ 1.000
 ◇ 1.200

PARAMETRIC VALUES
 0.000

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRF 0.0370 IN
 YMRF 1.0000 IN
 ZMRF 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *EI*A*CM

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



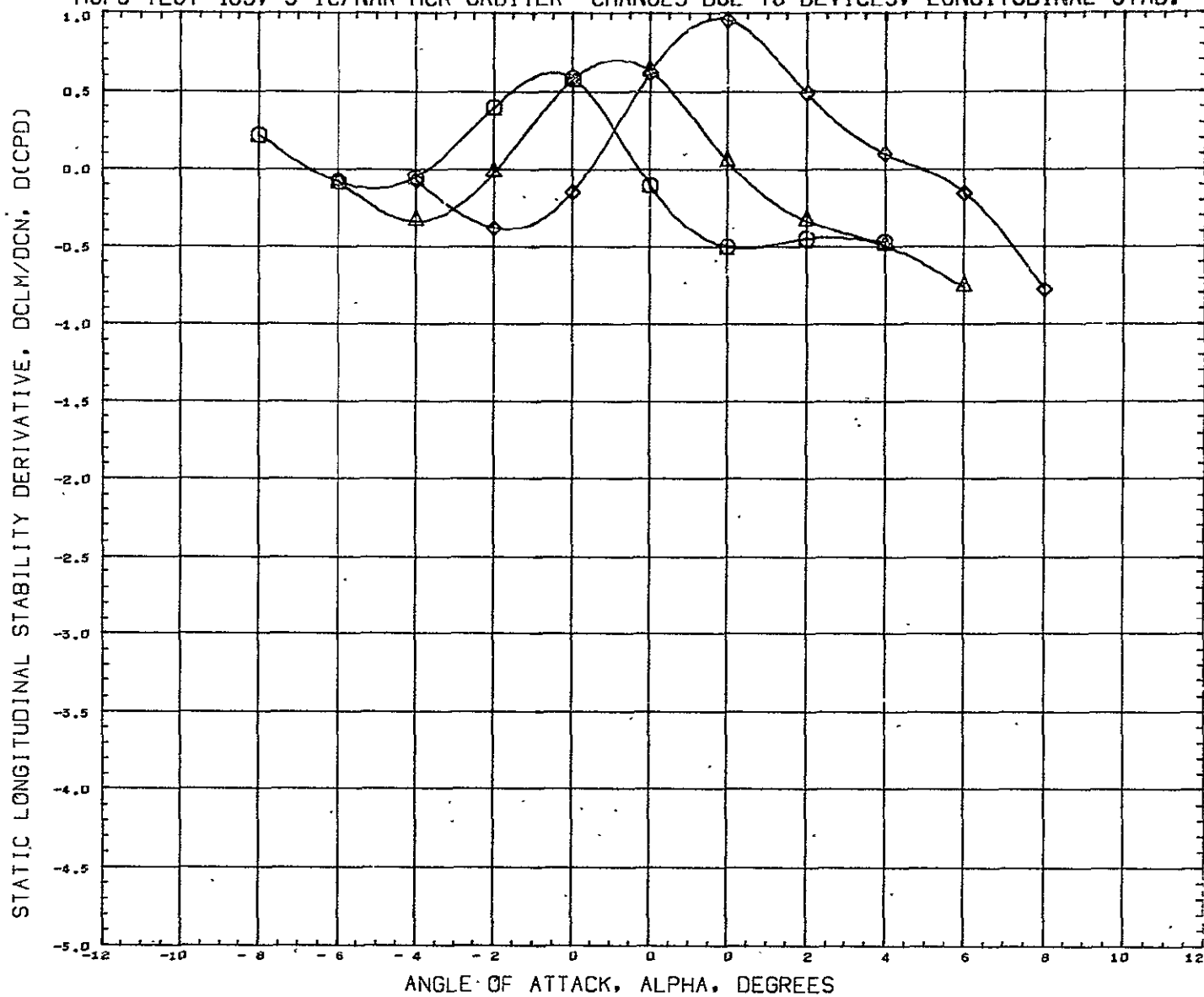
SYMBOL MACH
 ○ 0.900
 △ 1.000
 ◇ 1.200

PARAMETRIC VALUES
 0.000

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REF9 1.3330 IN
 XMRF - 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *EI*A*CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



SYMBOL
○
△
◇

MACH
0.900
1.000
1.200

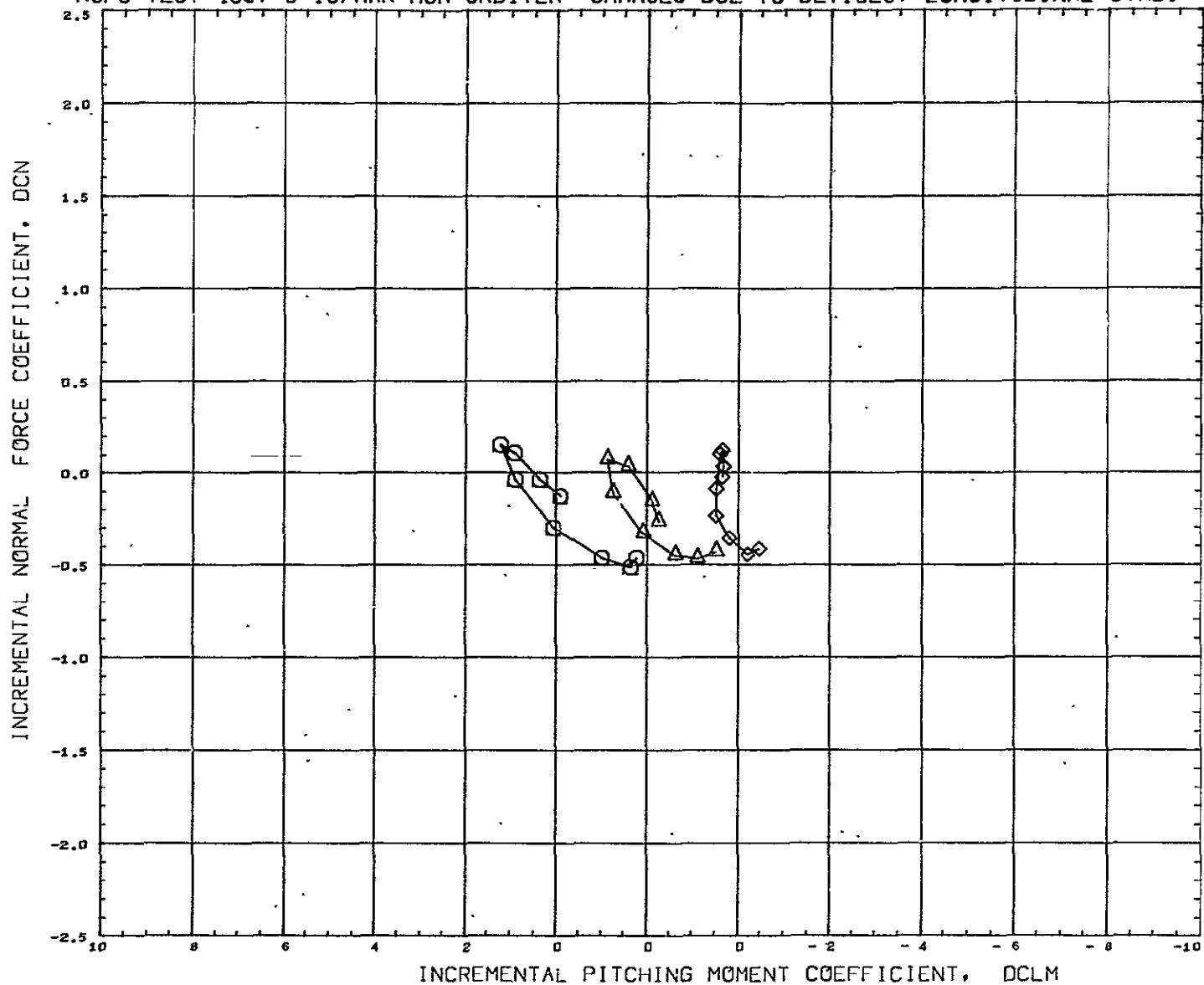
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	SO.IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI#A*CM

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.

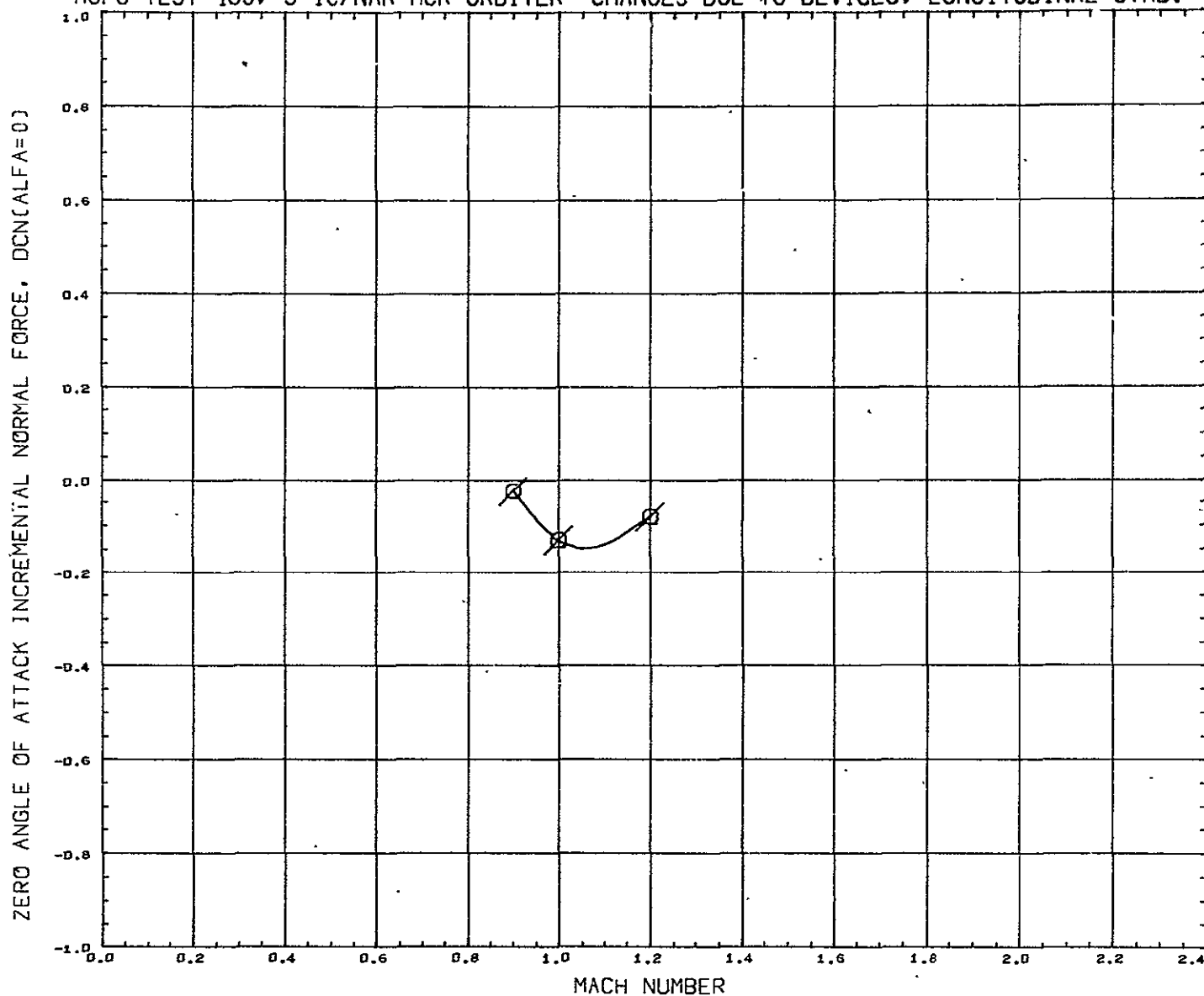


SYMBOL	MACH	PARAMETRIC VALUES
○	0.900	0.000
△	1.000	
◇	1.200	

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.6270	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI*A#CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



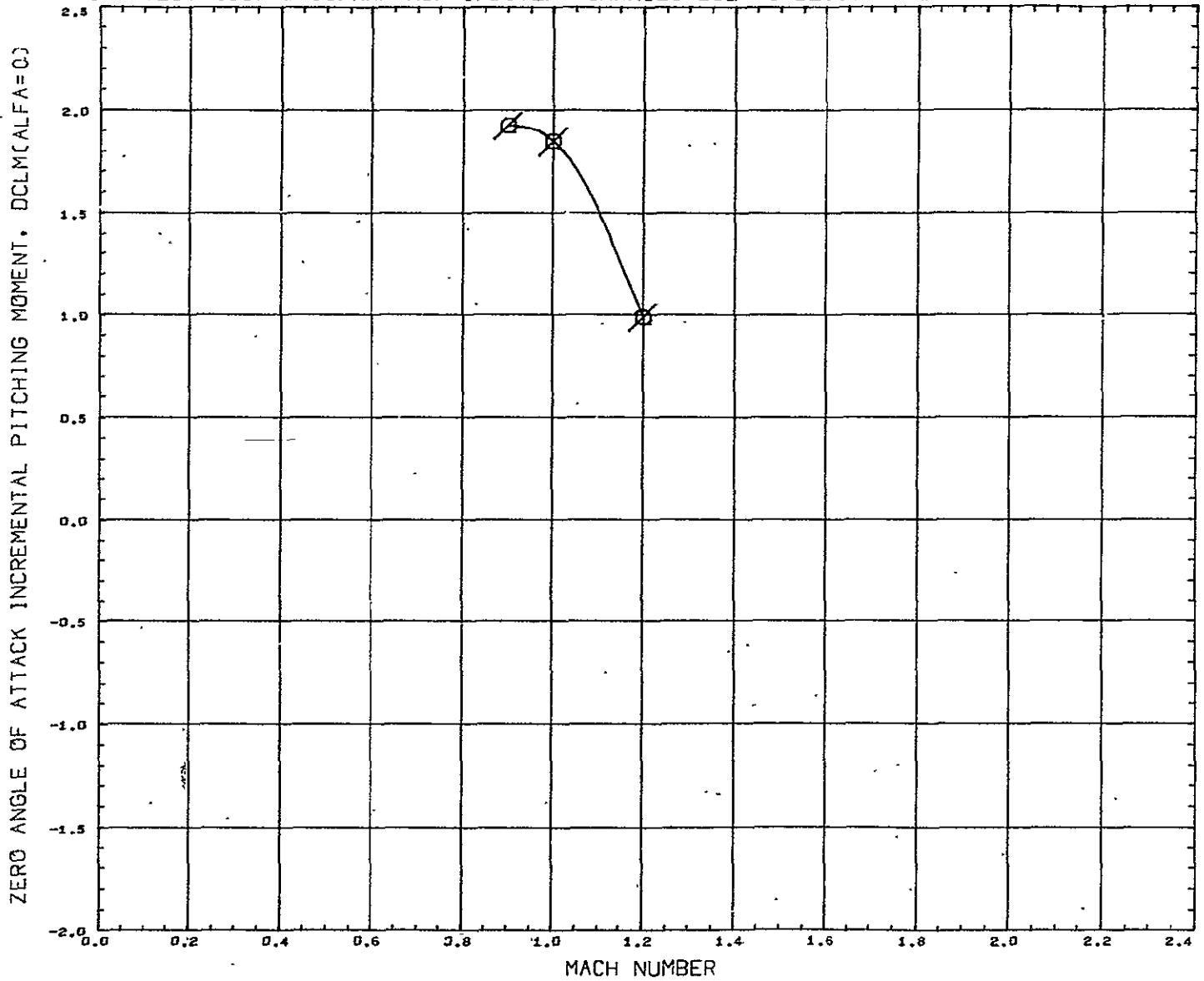
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	SO. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI#A*CMF

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



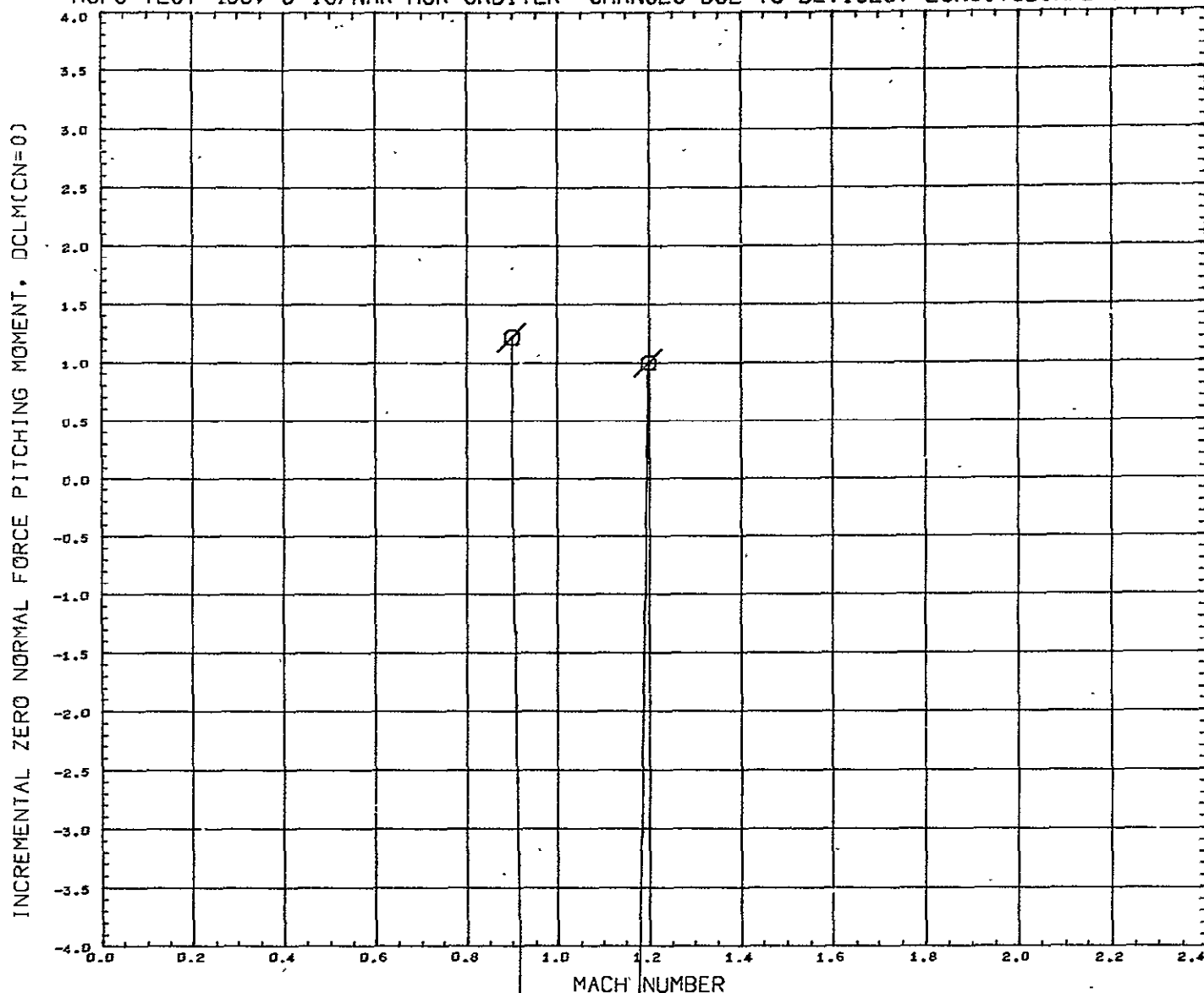
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YNRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE #EI#A*CHF

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



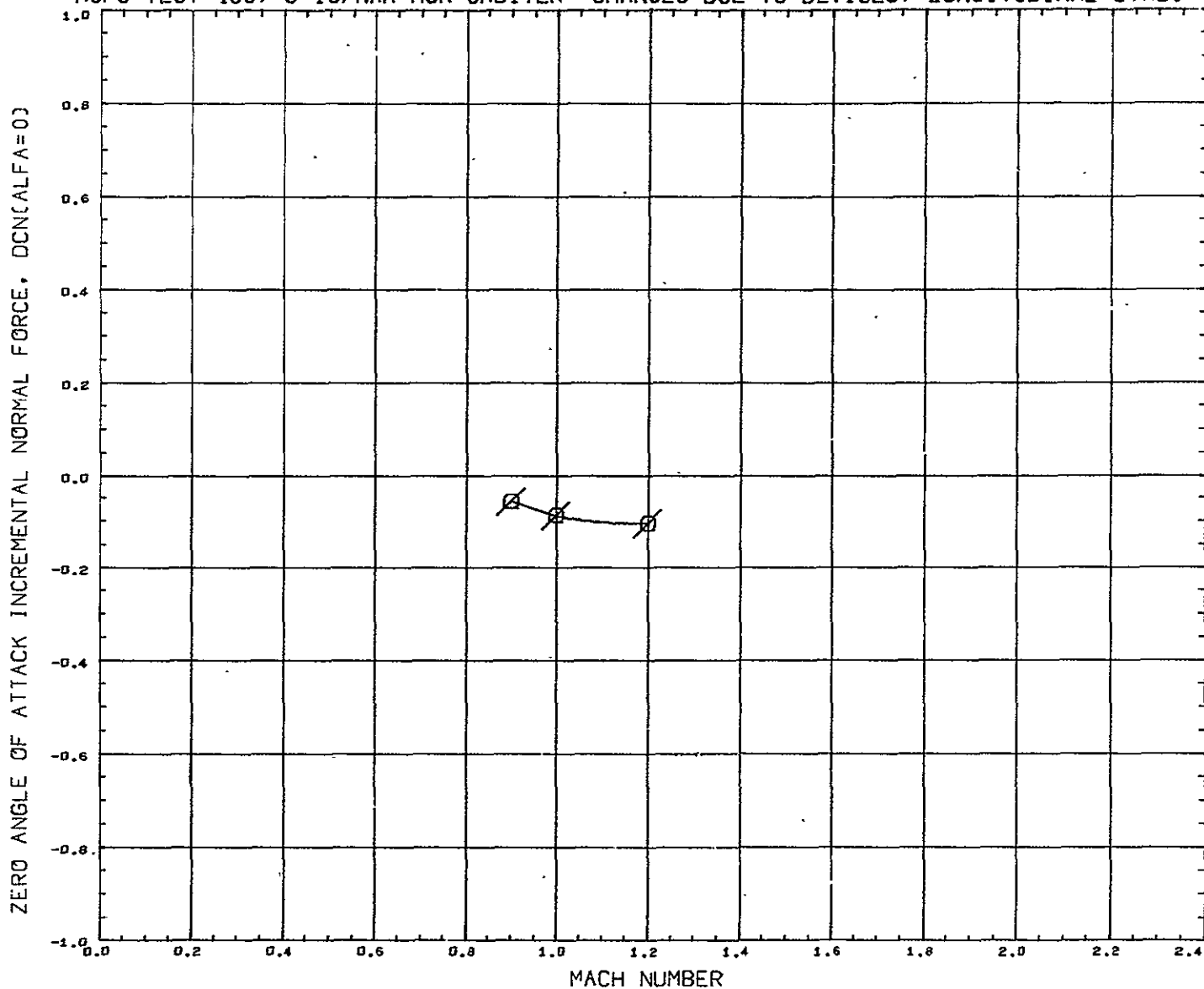
PARAMETRIC VALUES
0.000

DATA HIST. CODE *E1*A*CHF

REFERENCE INFORMATION

REFS	1.3960	SO. IN.
REFL	1.3330	IN
REFS	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



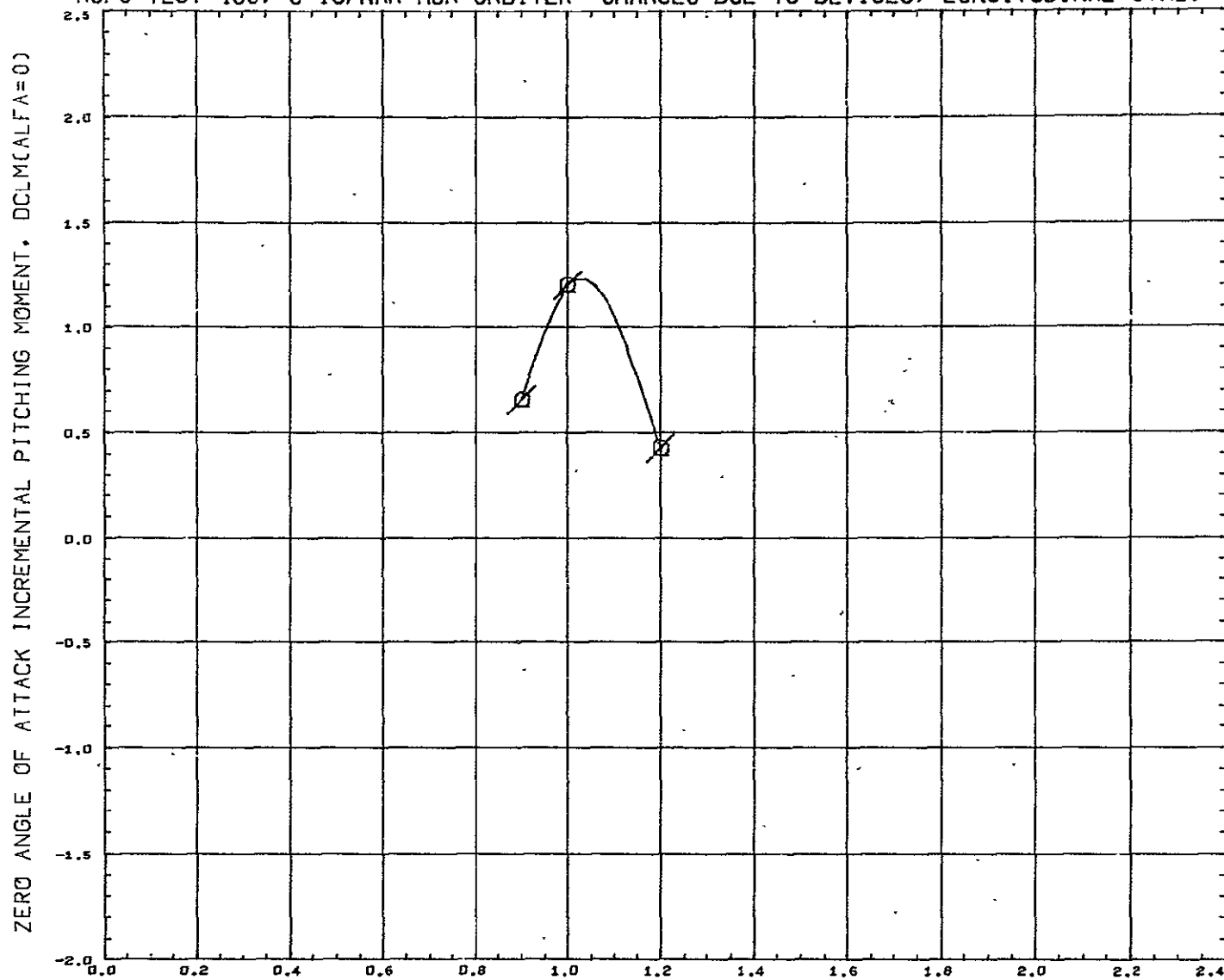
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EIWA*CHF

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



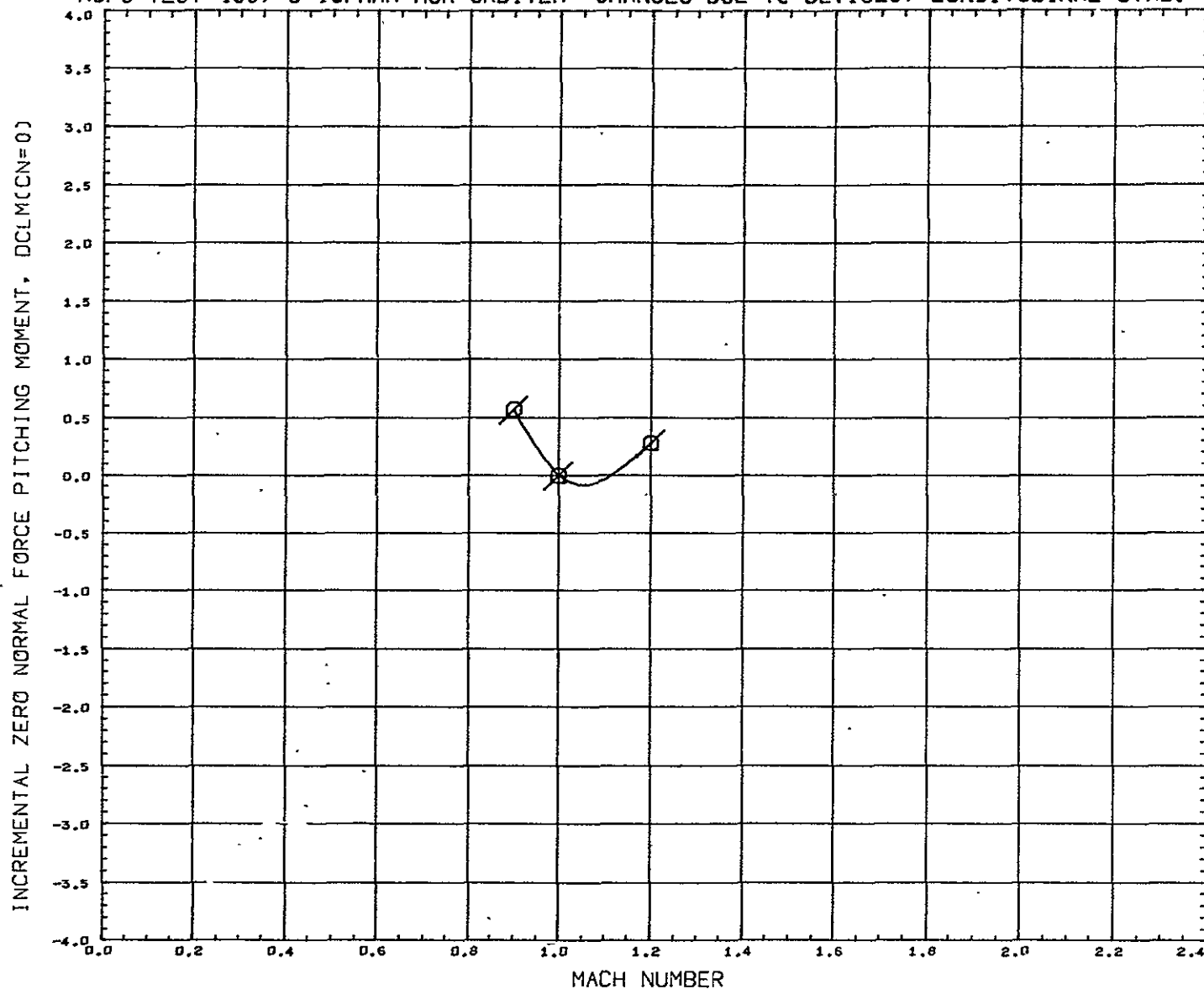
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	SG. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0379	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI*A*CHF

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



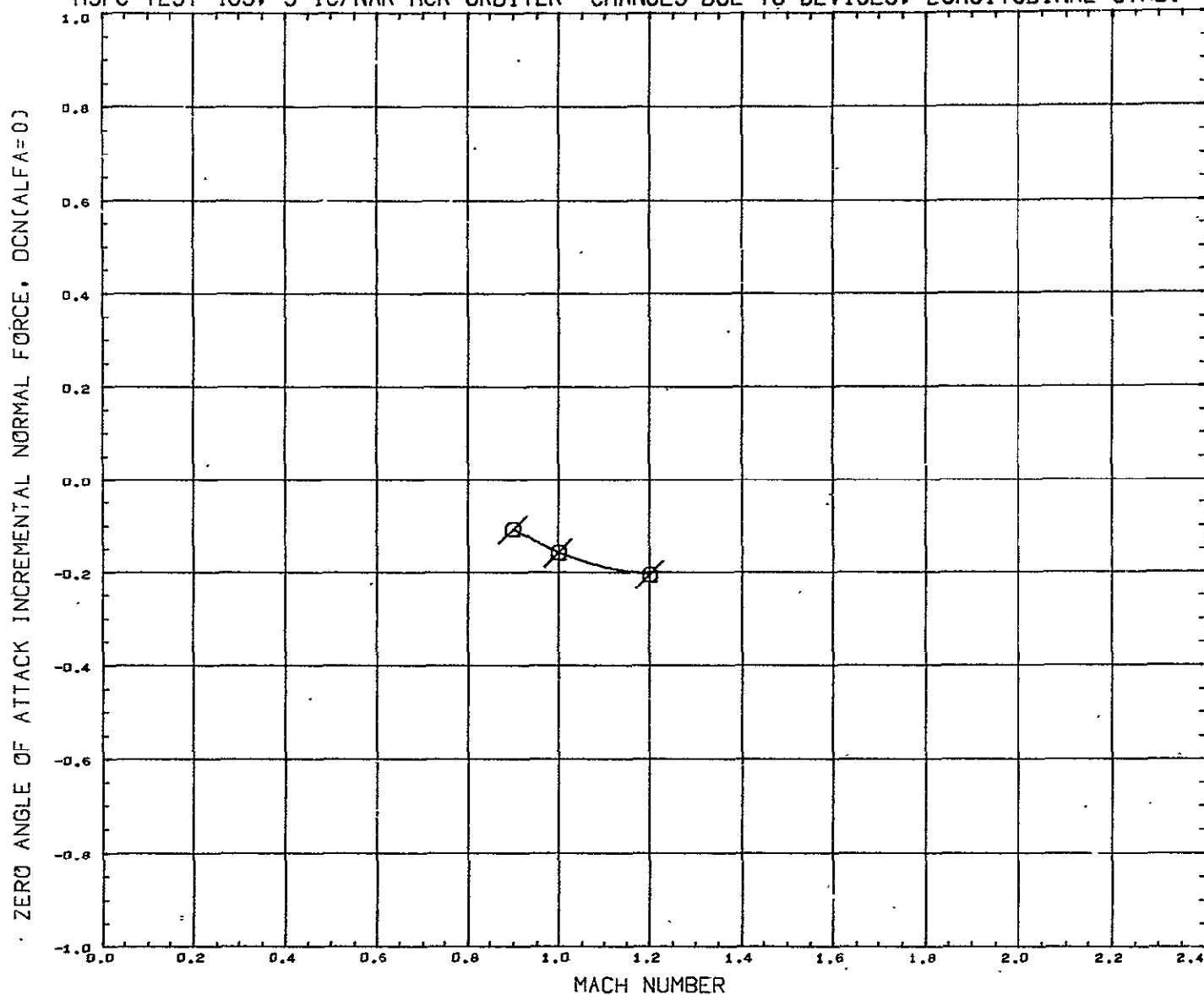
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	50. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI*A*CMF

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



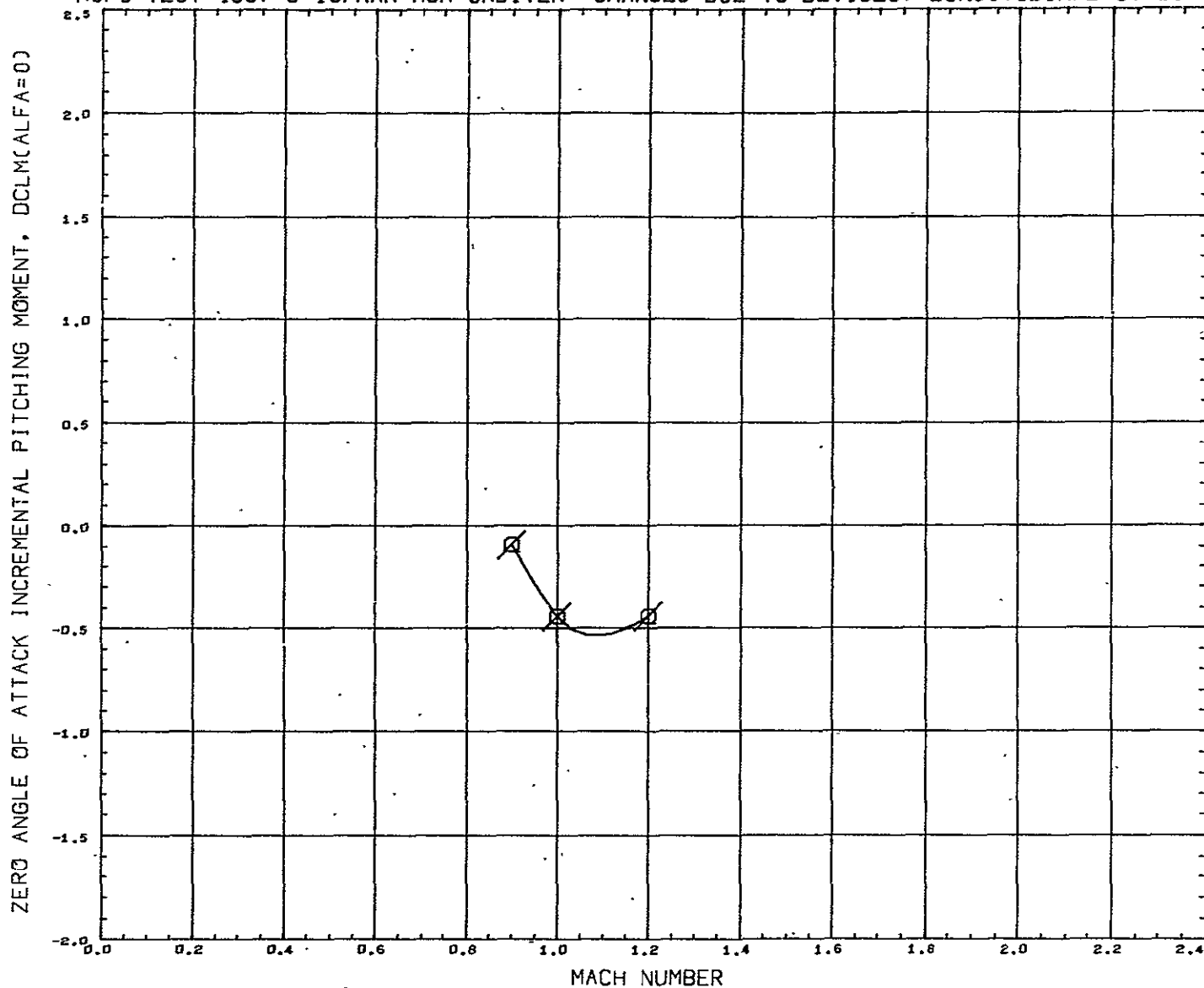
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	50. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI#A*CMF

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



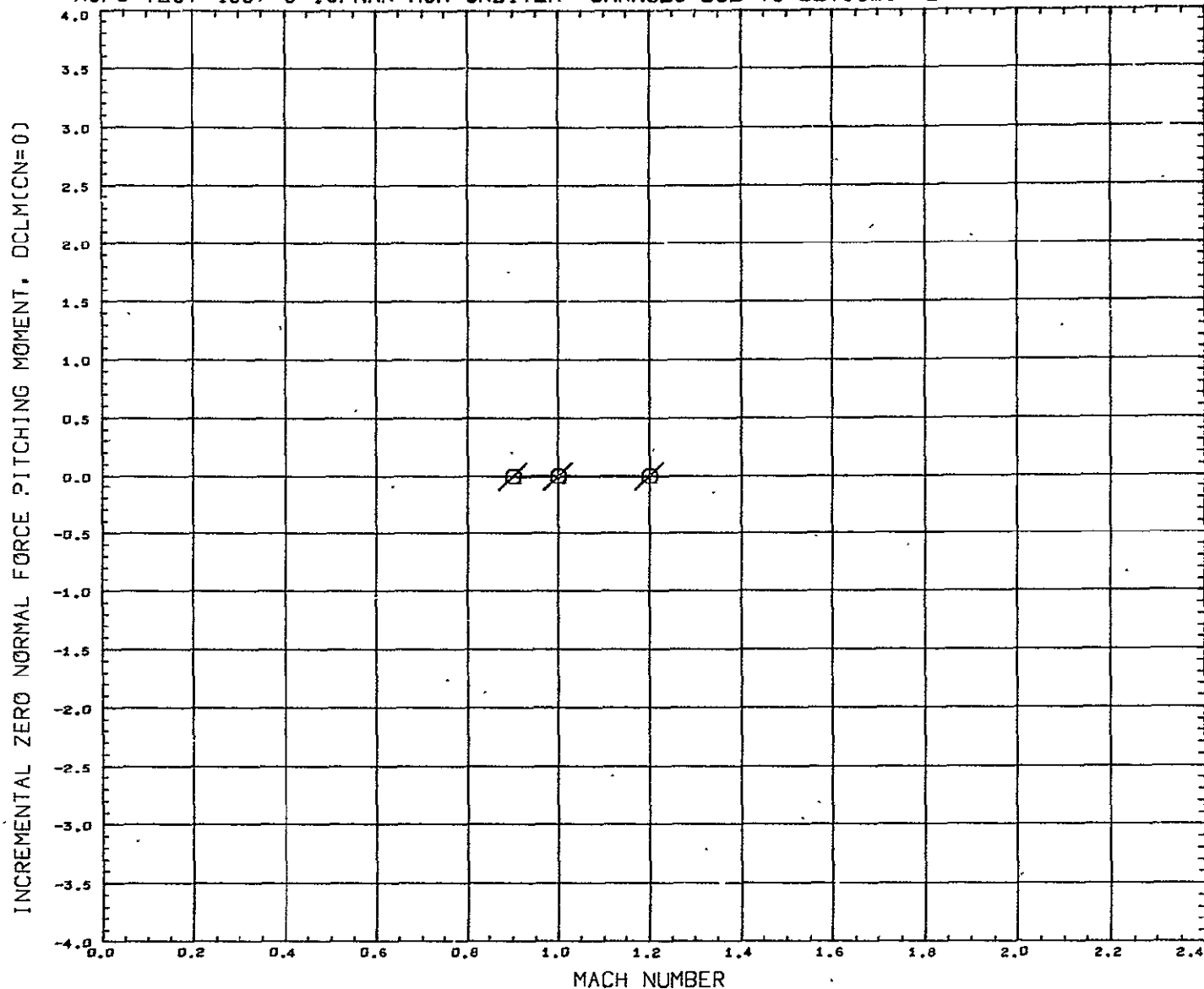
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	SQ.IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0379	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI#A*CHF

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.

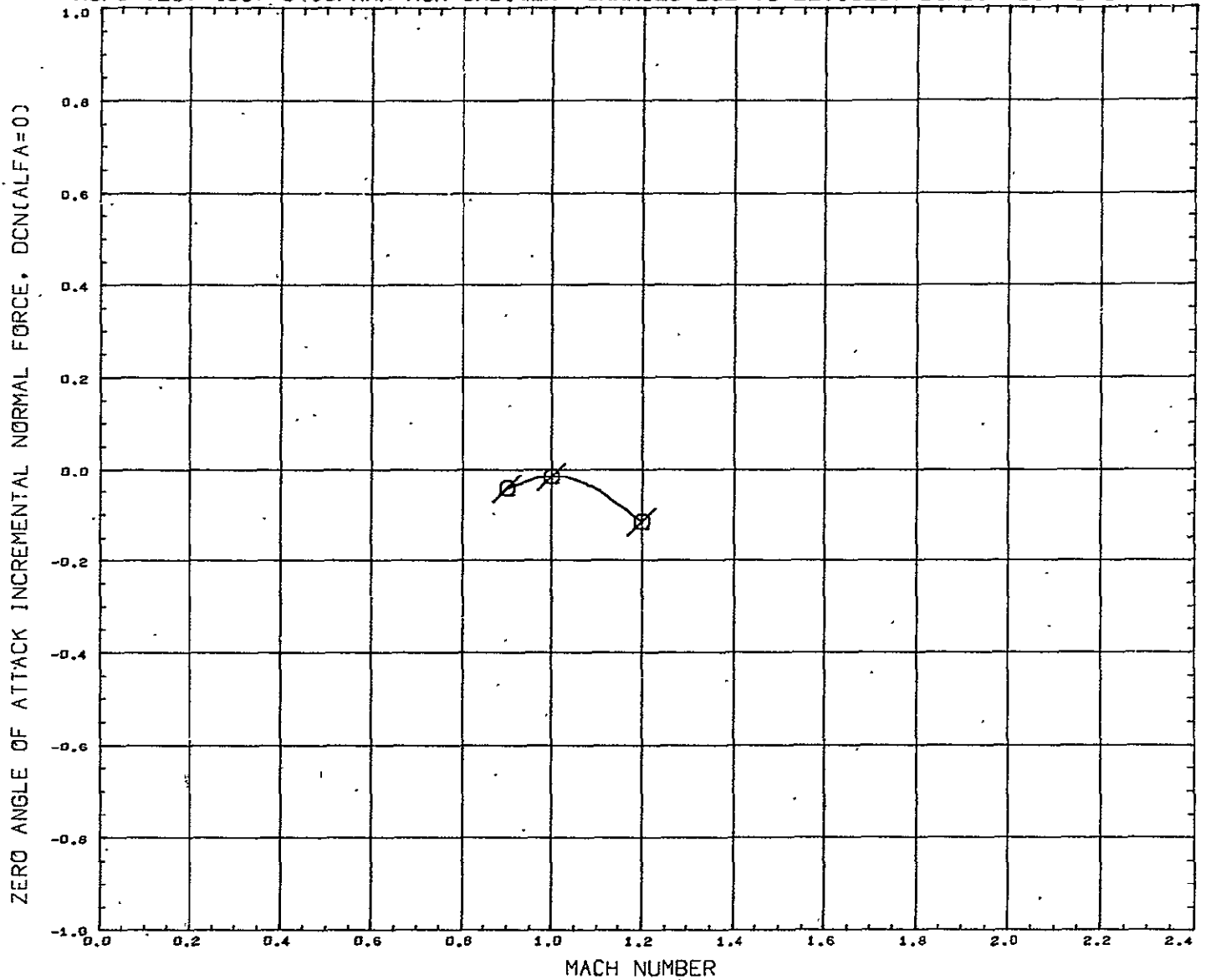


PARAMETRIC VALUES
0.000

REFERENCE INFORMATION
REFS 1.3960 SQ. IN.
REFL 1.3330 IN
REFB 1.3330 IN
XMRP - 0.0370 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE *EI*A*CMF

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



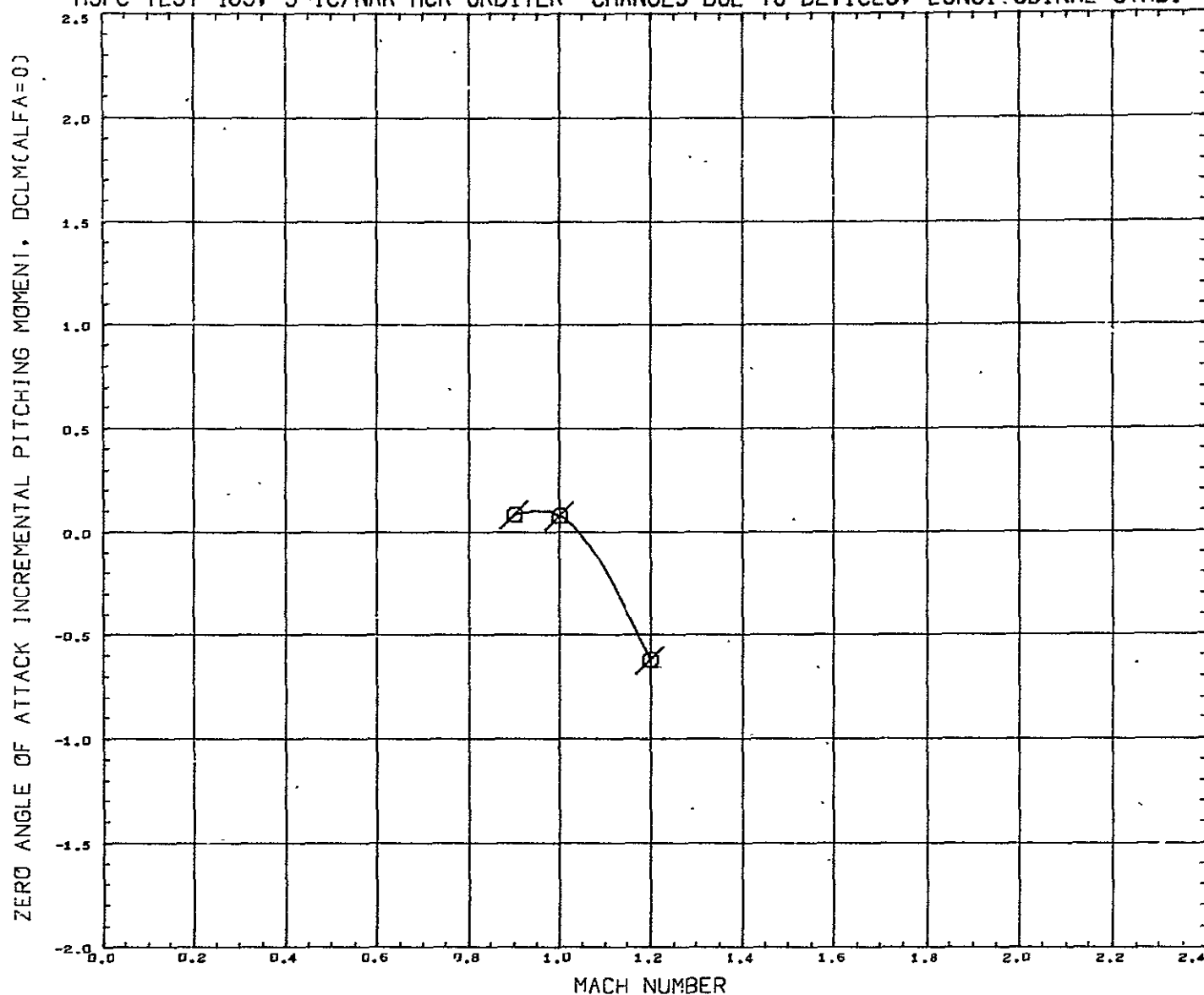
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	SO. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0379	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI*A*CHF

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



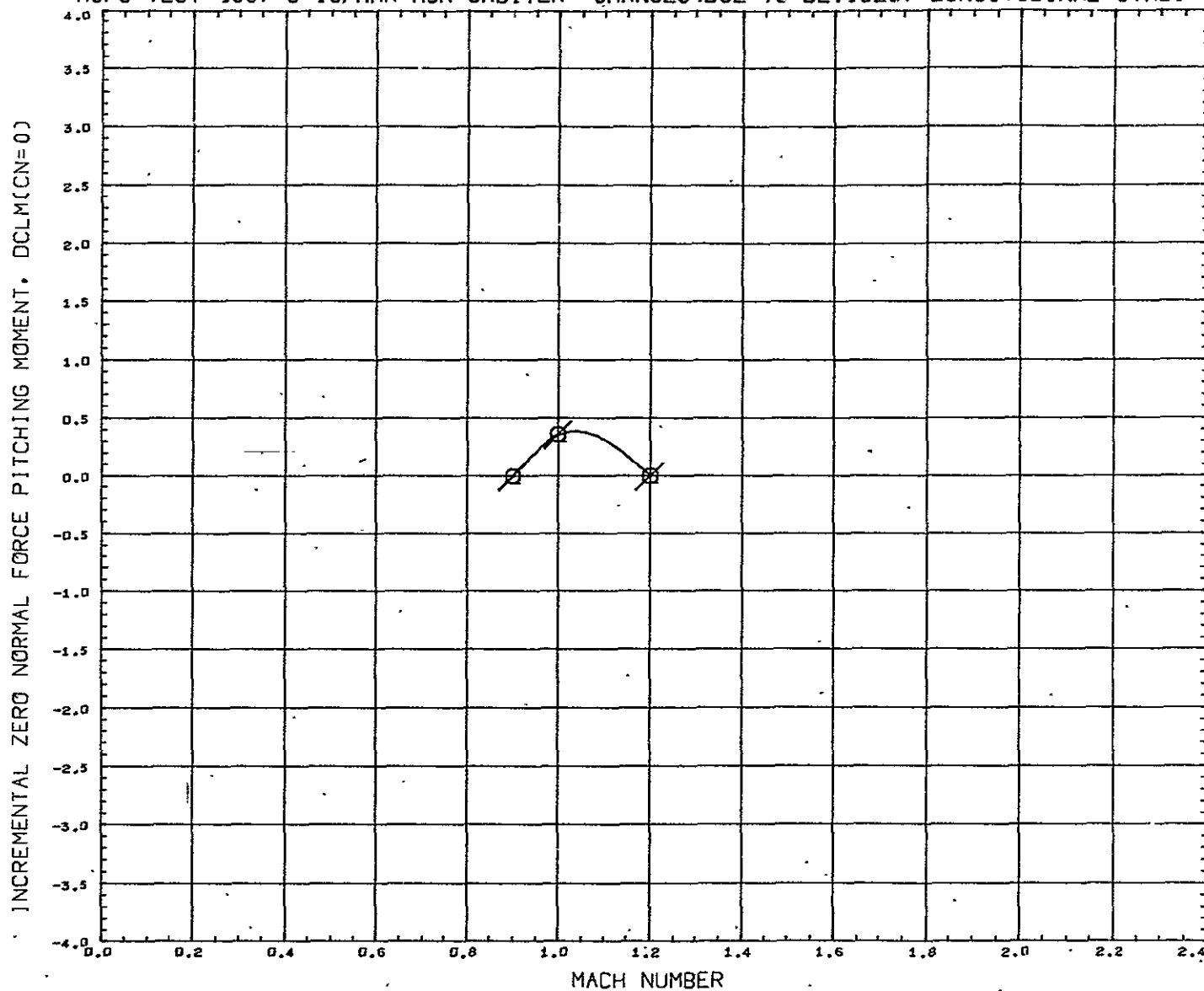
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI*A*CMF

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



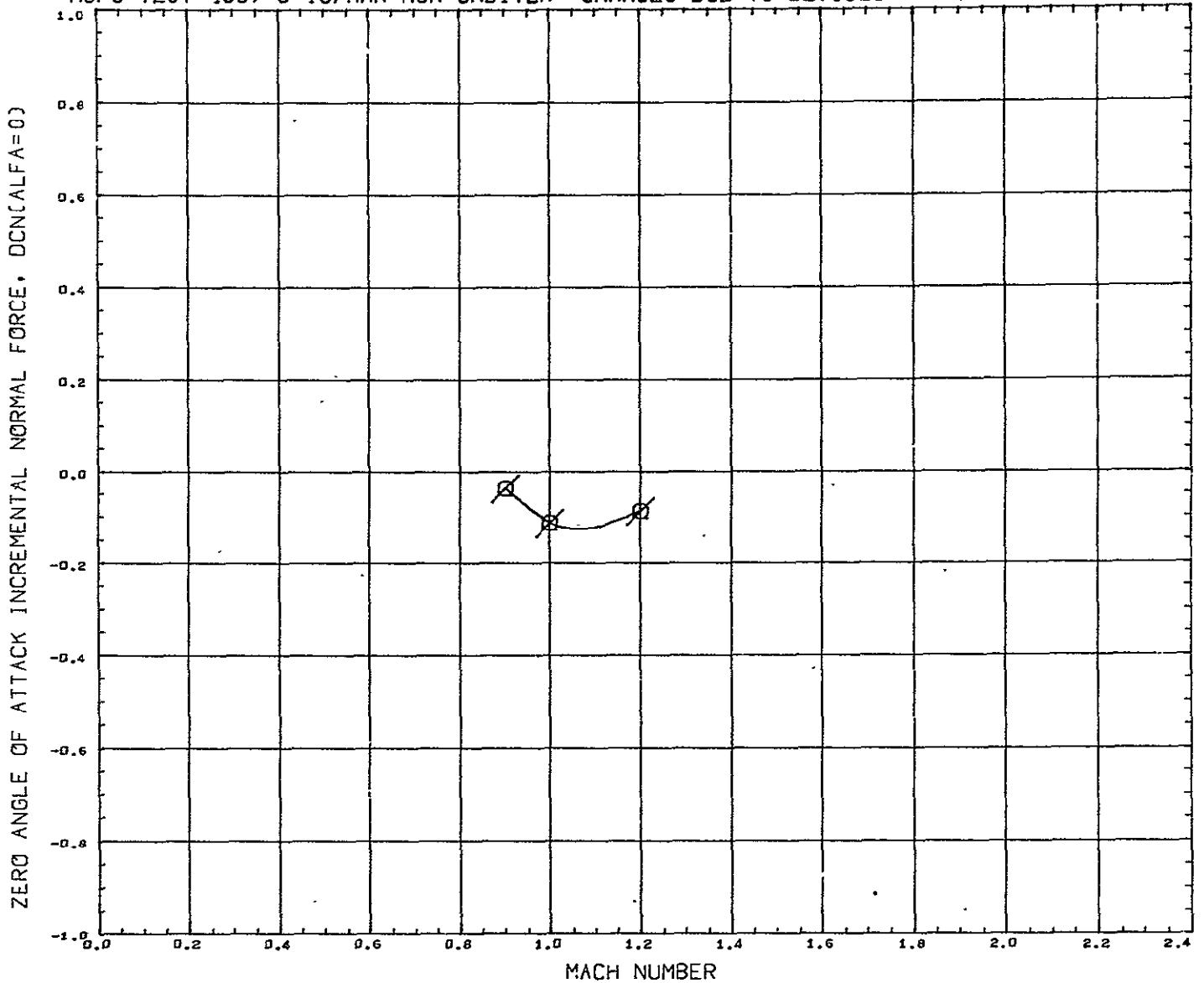
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI#A*CMF

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



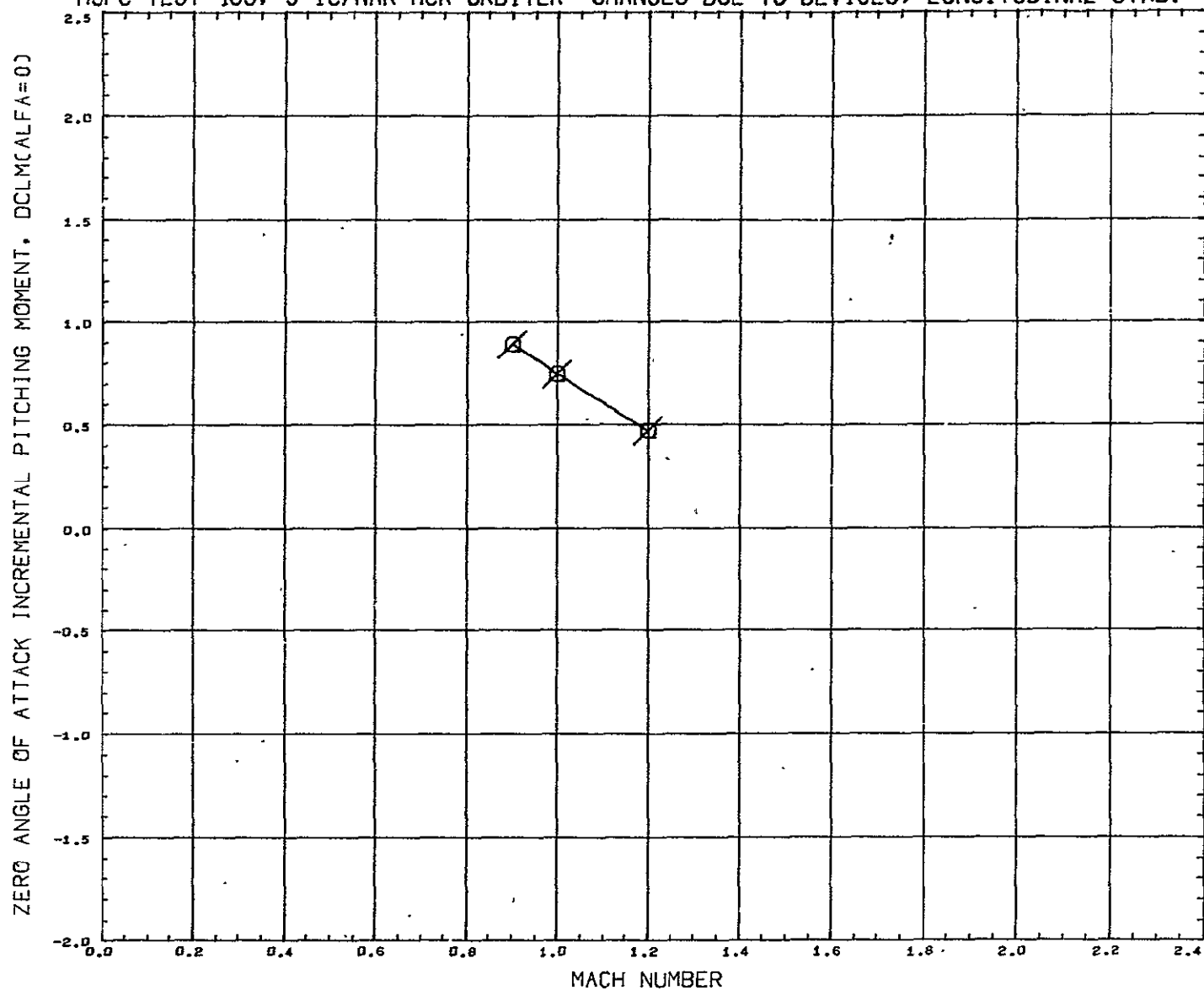
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	50. IN.
REFL	1.3330	IN
RETB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI#A*CMF

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



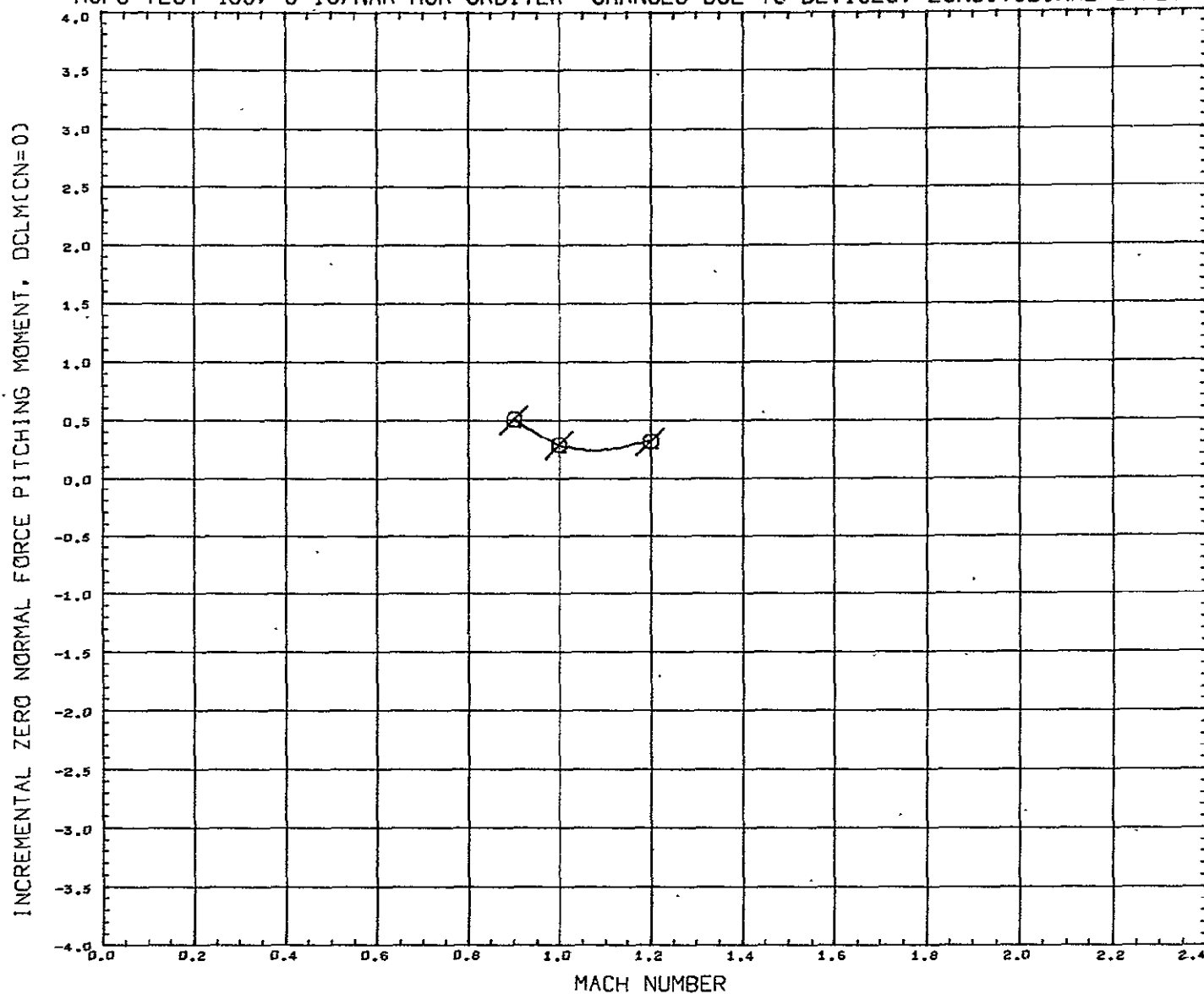
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	SG. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI*A*CHF

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



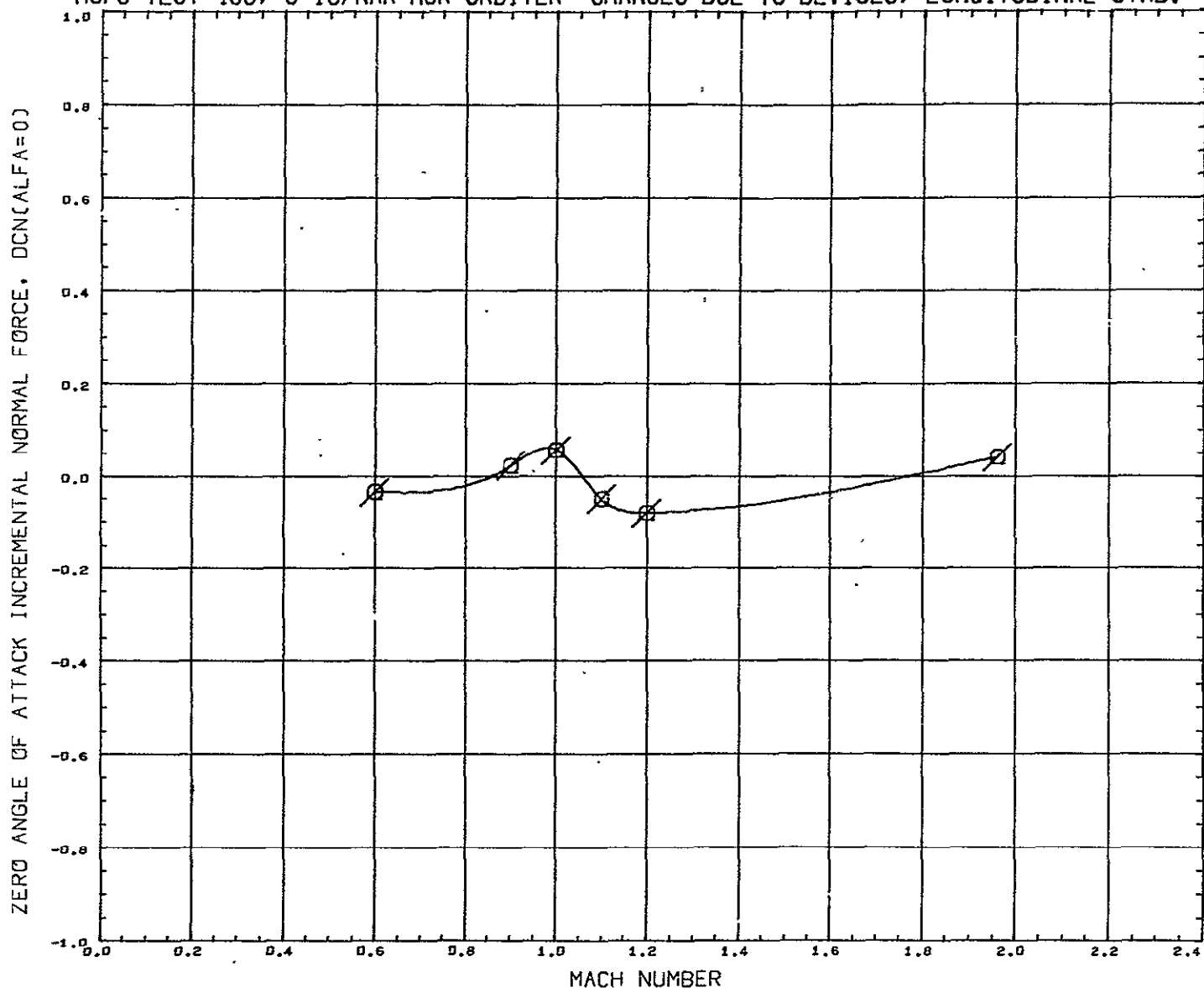
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	SO. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE #EI#A#CHF

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.

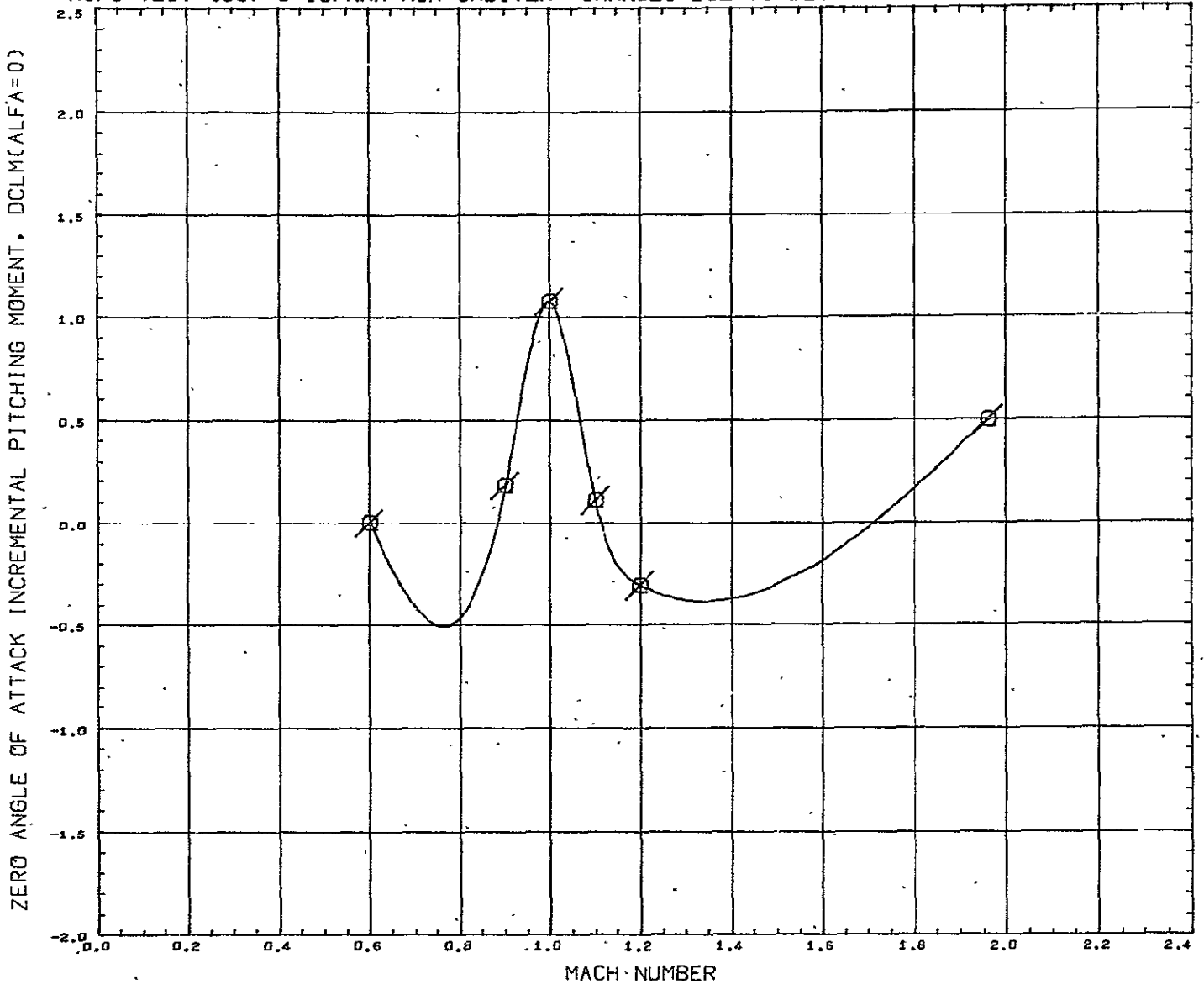


PARAMETRIC VALUES
BETA 0.000

REFERENCE INFORMATION
REFS 1.3960 SQ.IN.
REFL 1.3330 IN
REFB 1.3330 IN
XMRP - 0.0370 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE #EI*CF

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES. LONGITUDINAL STAB.



PARAMETRIC VALUES
BETA 0.000

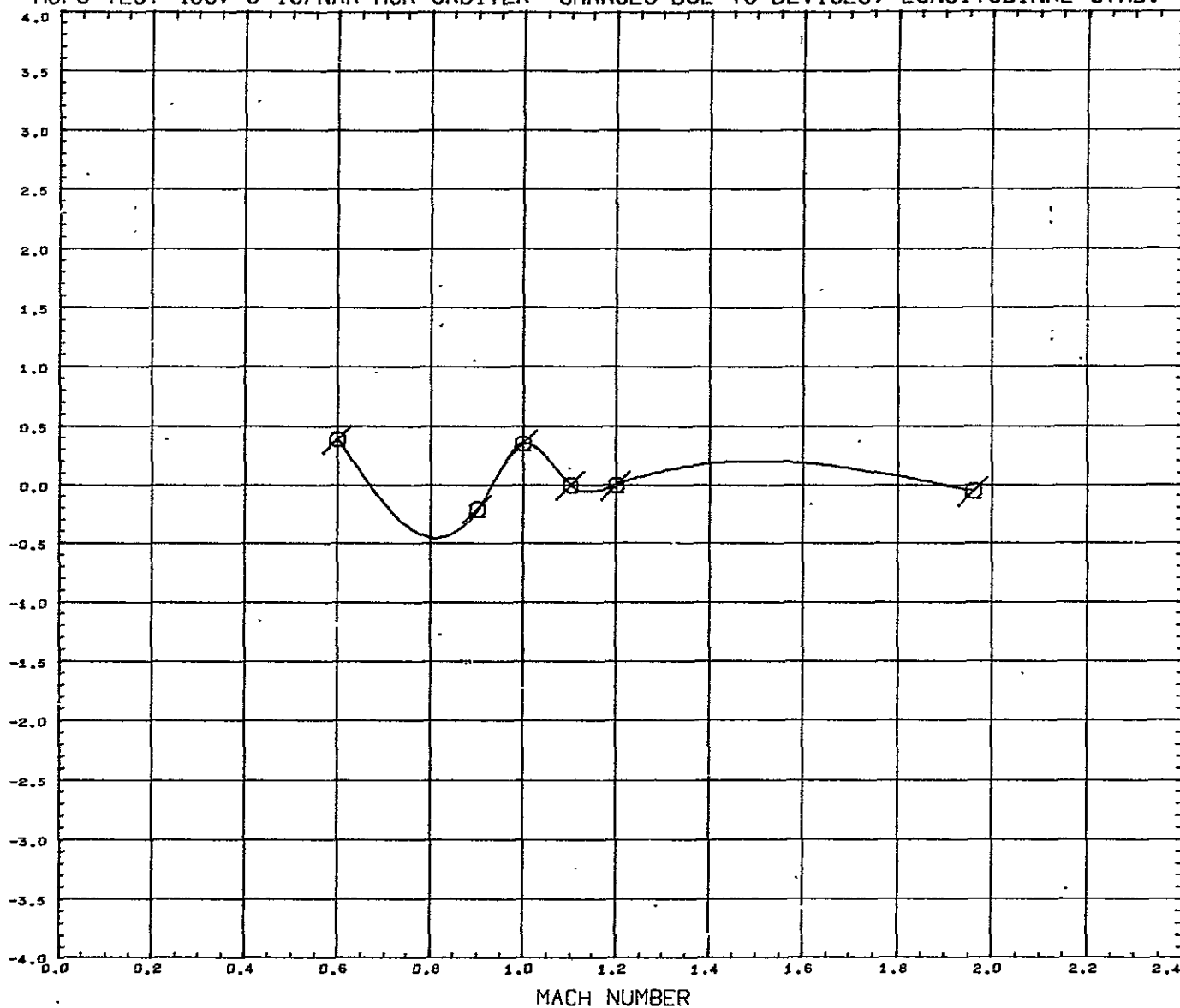
REFERENCE INFORMATION

REFS	1.3960	sq. in.
REFL	1.3330	in
REFB	1.3330	in
XMRP	0.0376	in
YMRP	0.0000	in
ZMRP	0.0000	in
SCALE	0.0034	

DATA HIST. CODE #E14CF

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.

INCREMENTAL ZERO NORMAL FORCE PITCHING MOMENT, DCLMCCN=0)

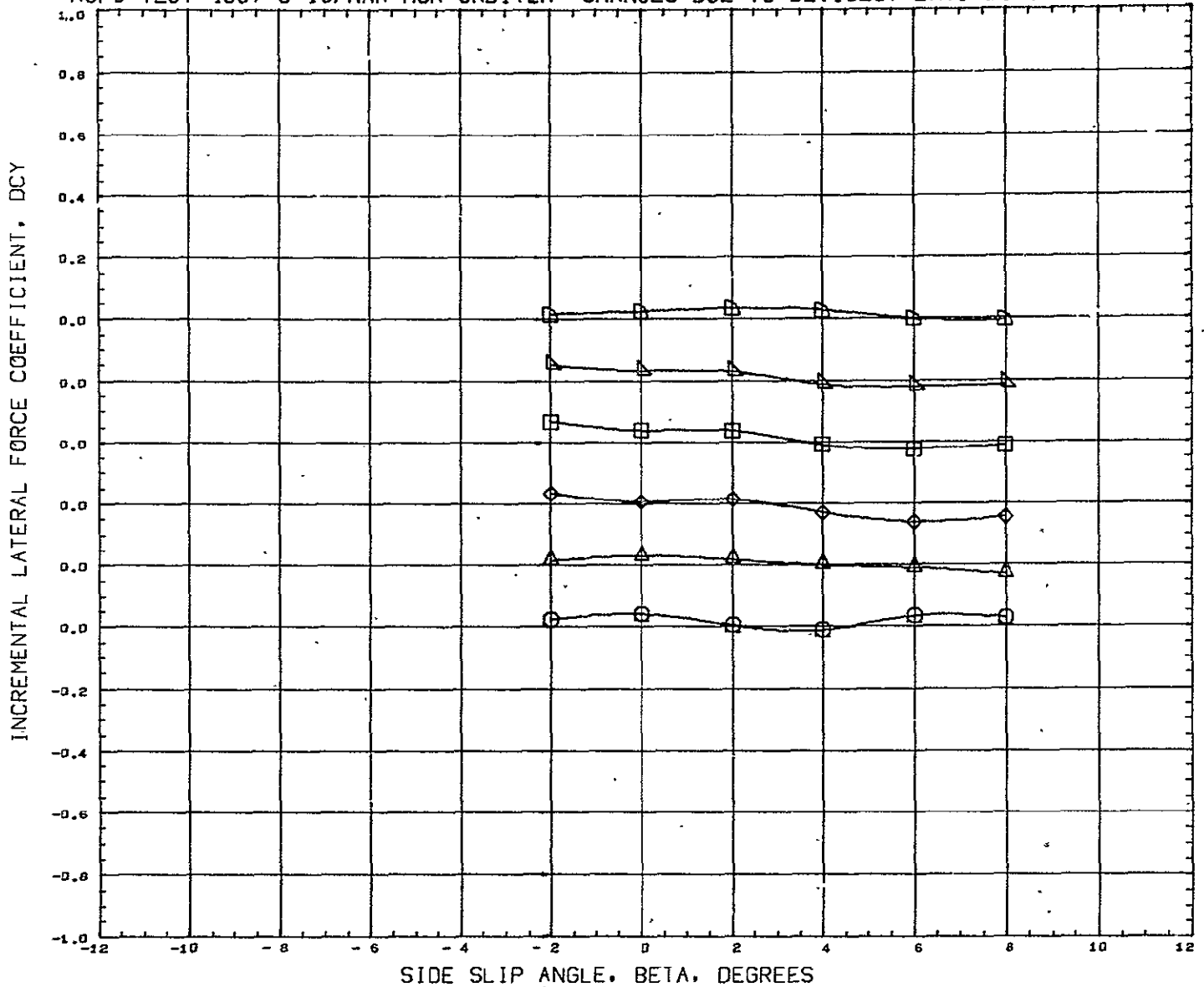


PARAMETRIC VALUES
BETA 0.000

REFERENCE INFORMATION
REFS 1.3960 SQ. IN.
REFL 1.3330 IN
REFB 1.3330 IN
XMRP 0.0370 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE *EI*CF

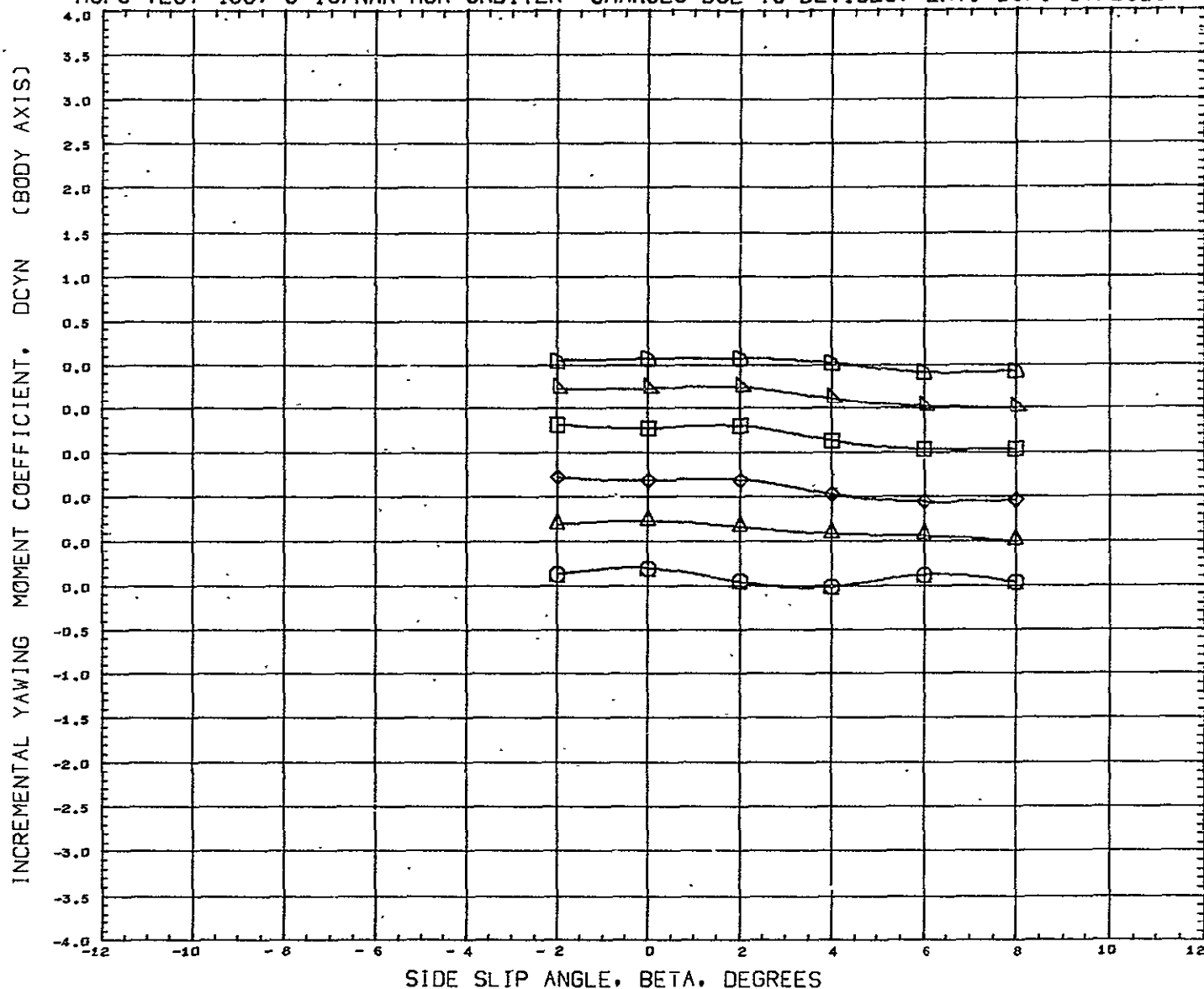
MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LAT.-DIR. STABILITY



SYMBOL MACH PARAMETRIC VALUES
 0.600 ALPHA 0.070
 0.900
 1.000
 1.100
 1.200
 1.960 DATA HIST. CODE *EI#C

REFERENCE INFORMATION
 REFS 1.3960 SQ.IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

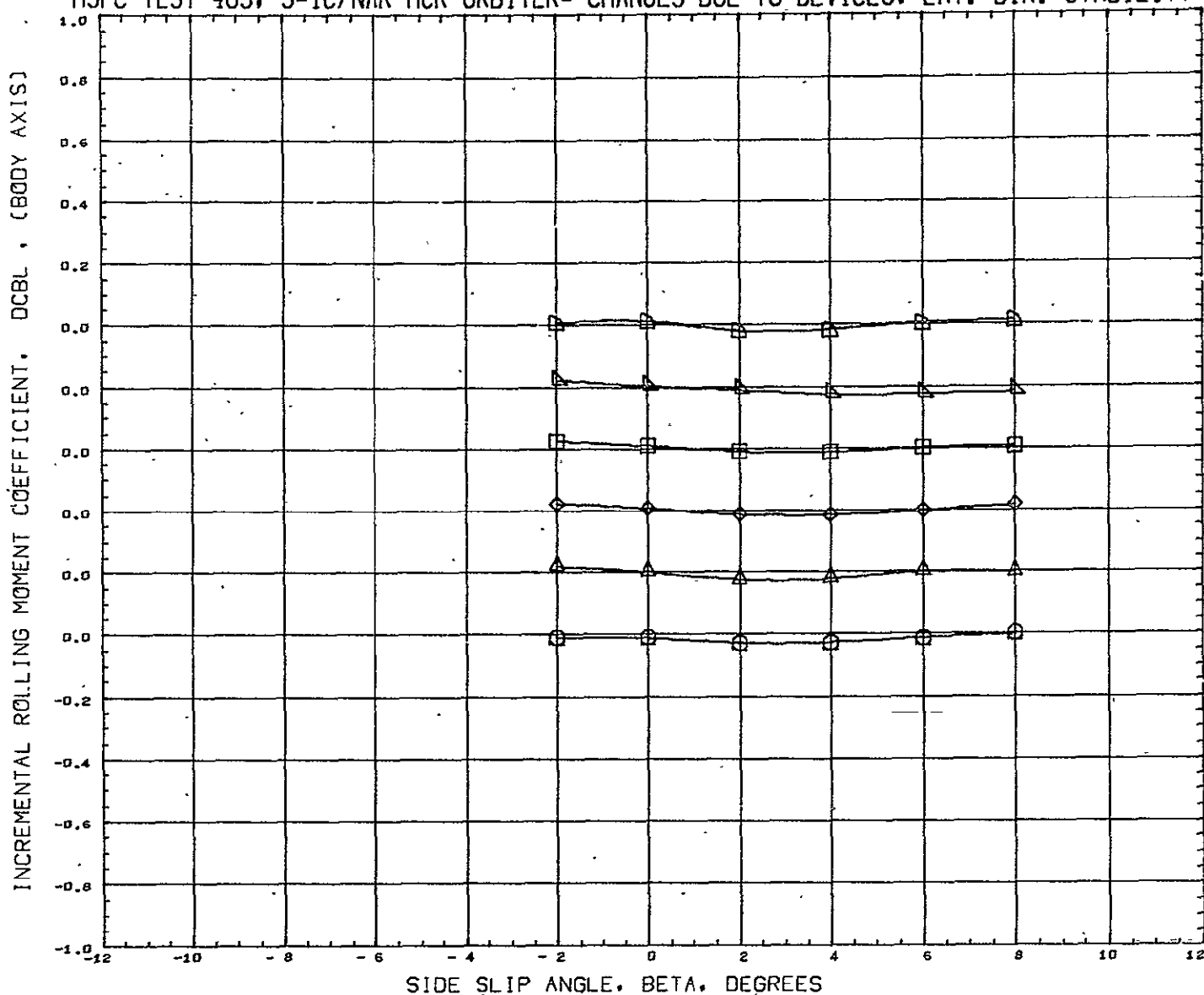
MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LAT.-DIR. STABILITY



SYMBOL MACH ALPHA PARAMETRIC VALUES
 0.600 0.900 1.000 1.100 1.200 1.960
 DATA HIST. CODE #EI#C

REFERENCE INFORMATION
 REFS 1.3960 SQ.IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LAT.-DIR. STABILITY



SYMBOL MACH ALPHA PARAMETRIC VALUES

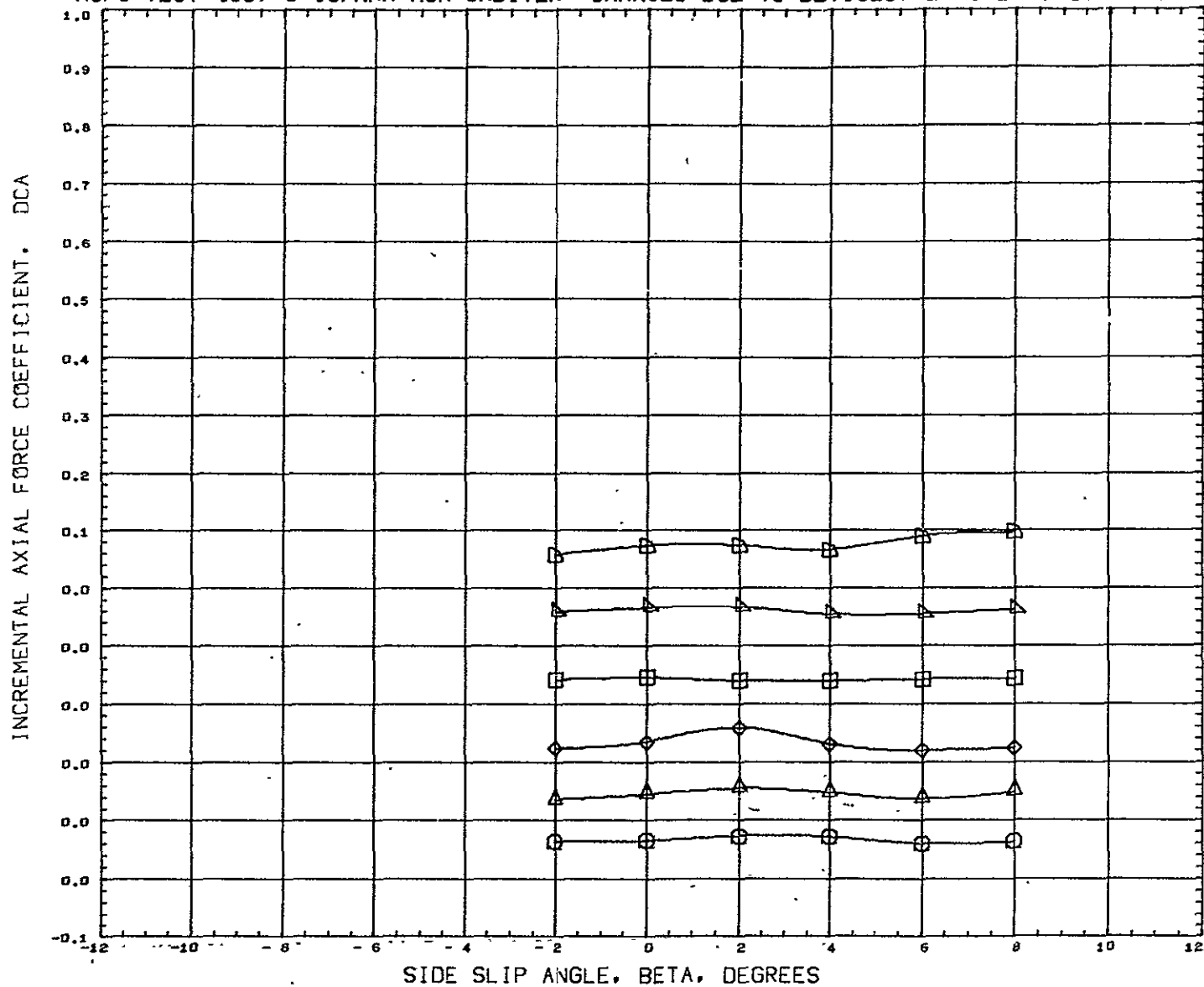
$\square$ 0.600
 $\diamond$ 0.900
 $\square$ 1.000
 $\diamond$ 1.100
 $\square$ 1.200
 $\diamond$ 1.960

DATA HIST. CODE *EI*C

REFERENCE INFORMATION

REFS	1.3960	SO.IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

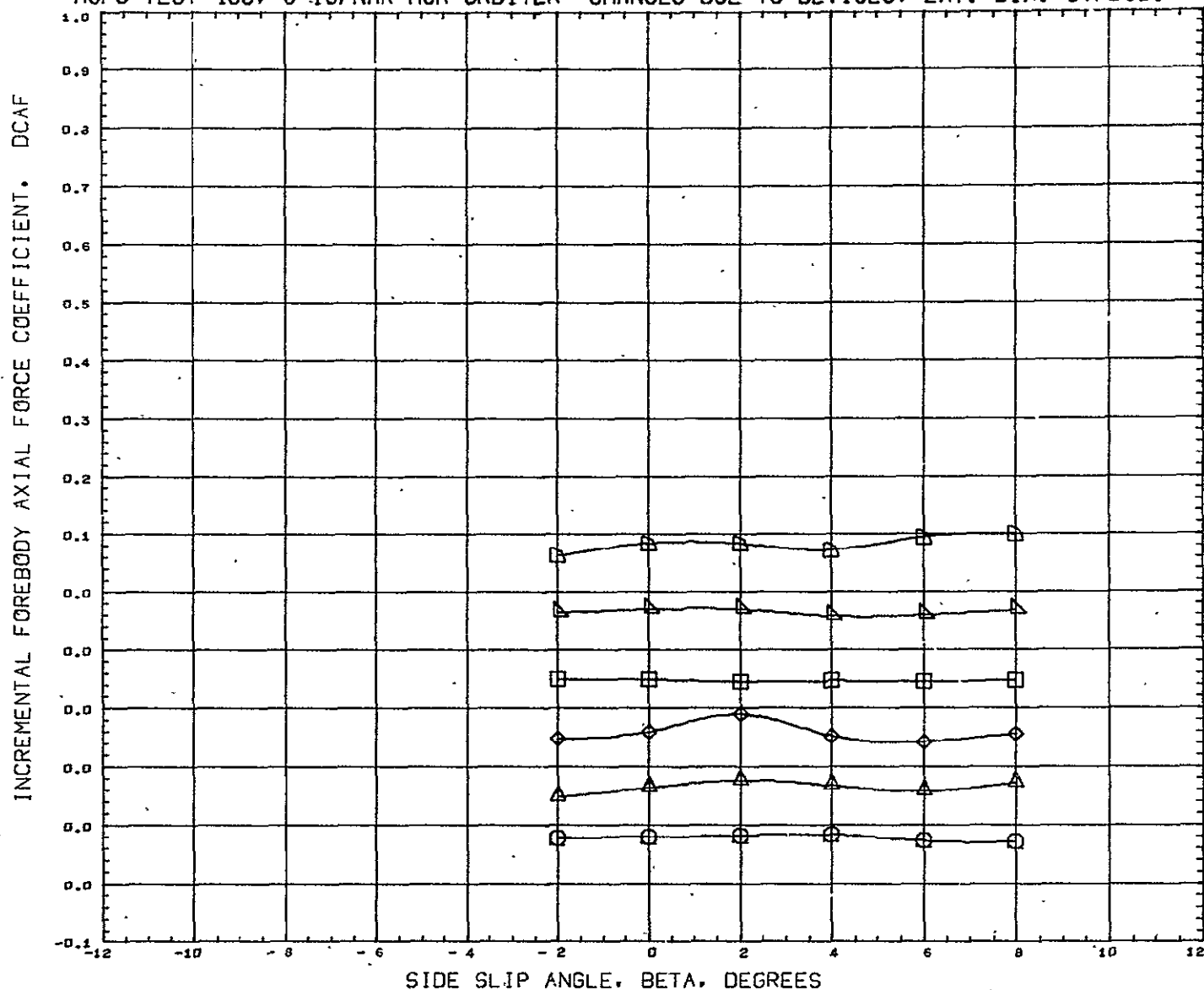
MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LAT.-DIR. STABILITY



SYMBOL MACH ALPHA PARAMETRIC VALUES
 0.600 0.070
 0.900
 1.000
 1.100
 1.200
 1.960 DATA HIST. CODE *EI#C

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

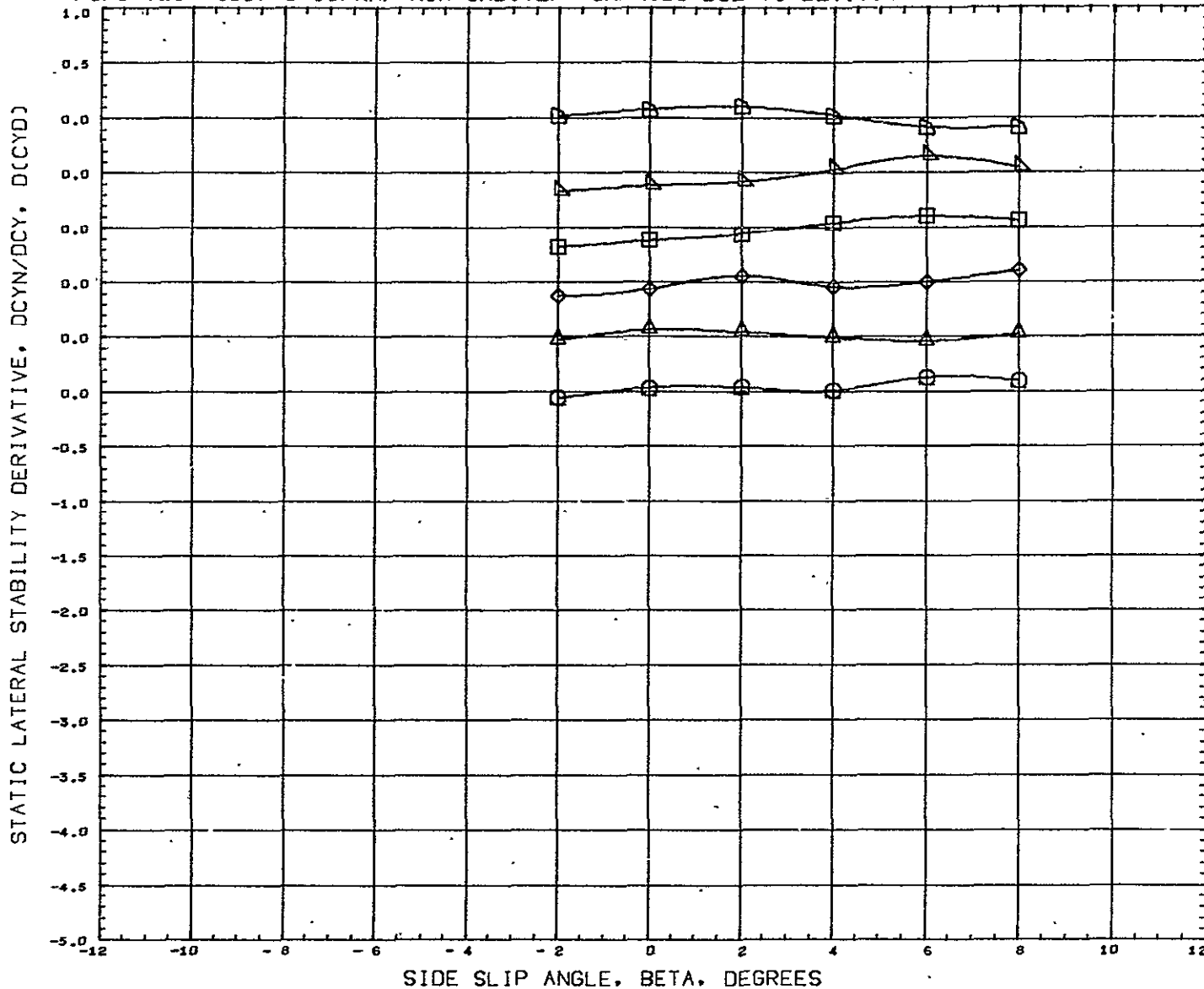
MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LAT.-DIR. STABILITY



SYMBOL	MACH	PARAMETRIC VALUES
○	0.600	ALPHA 0.070
△	0.900	
◇	1.000	
□	1.100	
◇	1.200	
◇	1.960	
	DATA HIST. CODE	*EI#C

REFERENCE INFORMATION		
REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.537L	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	J.0034	

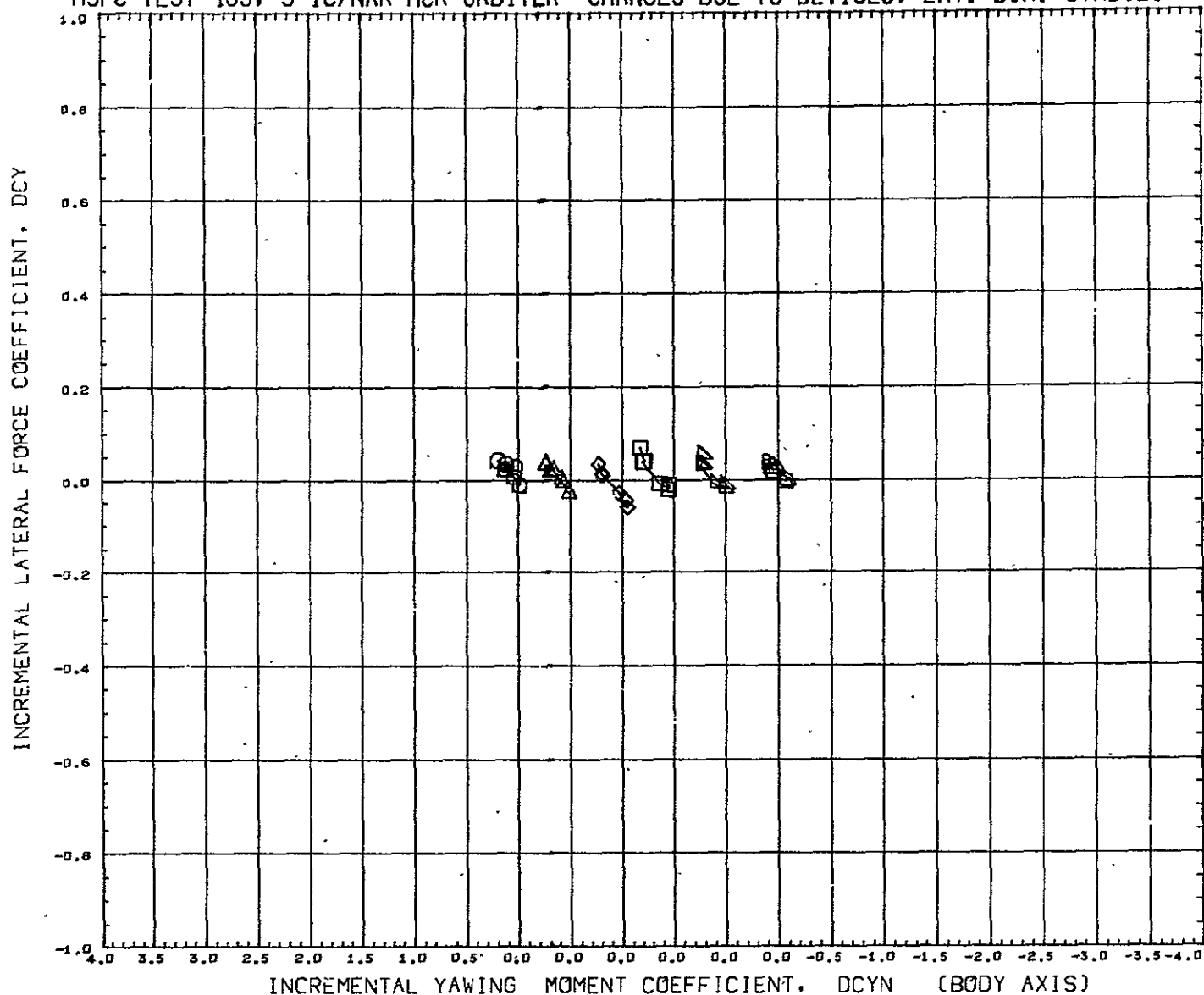
MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LAT.-DIR. STABILITY



SYMBOL	HACH	ALPHA	PARAMETRIC VALUES
◇	0.600		0.070
□	0.900		
△	1.000		
▽	1.100		
○	1.200		
●	1.960	DATA HIST. CODE	*EI* C

REFERENCE INFORMATION		
REFS	1.3960	SQ.IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LAT.-DIR. STABILITY



SYMBOL MACH ALPHA PARAMETRIC VALUES

DATA HIST. CODE *EI*#C

REFERENCE INFORMATION

REFS 1.3960 SQ. IN.

REFL 1.3330 IN

REFB 1.3330 IN

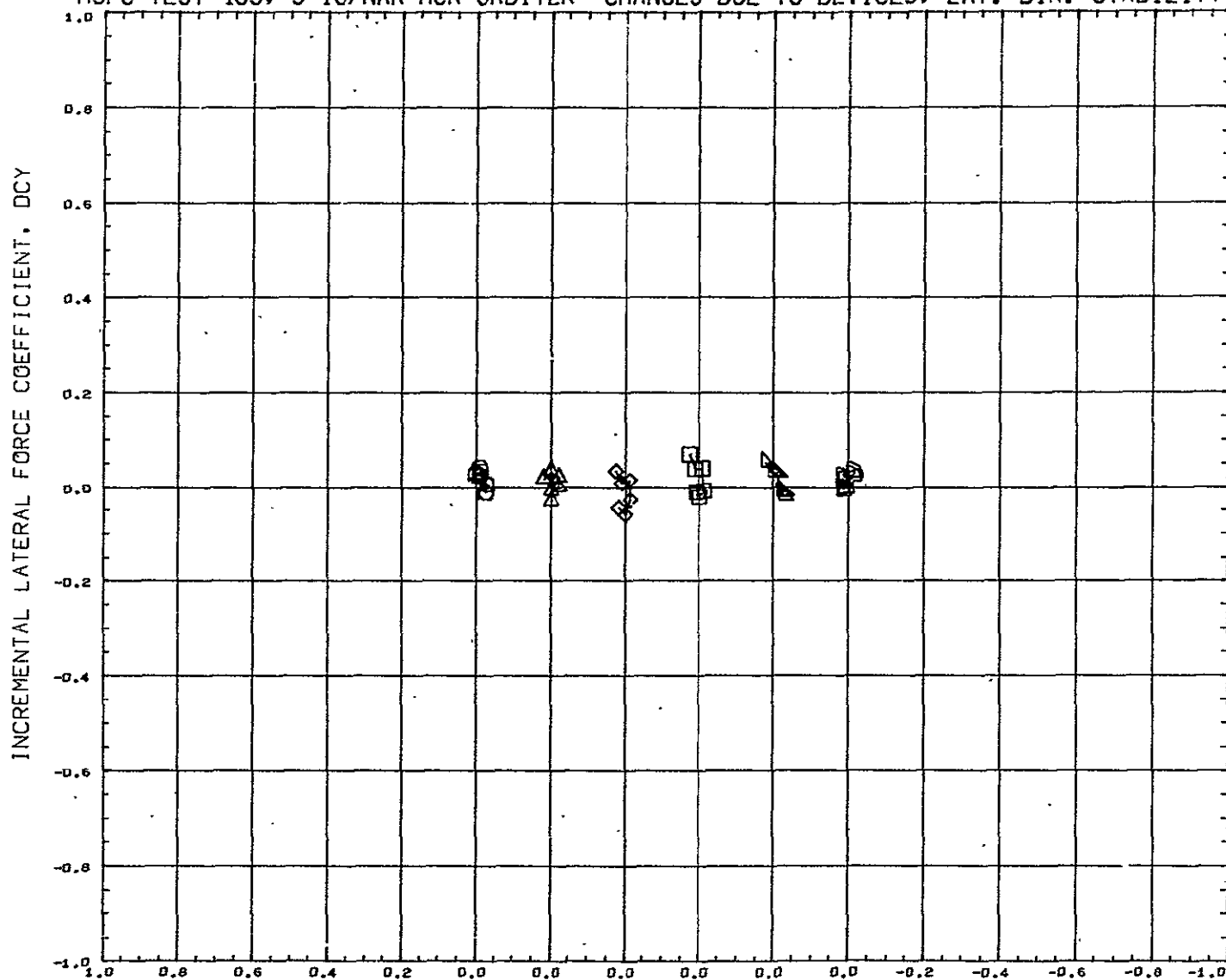
XMRP - 0.0370 IN

YMRP 0.0000 IN

ZMRP 0.0000 IN

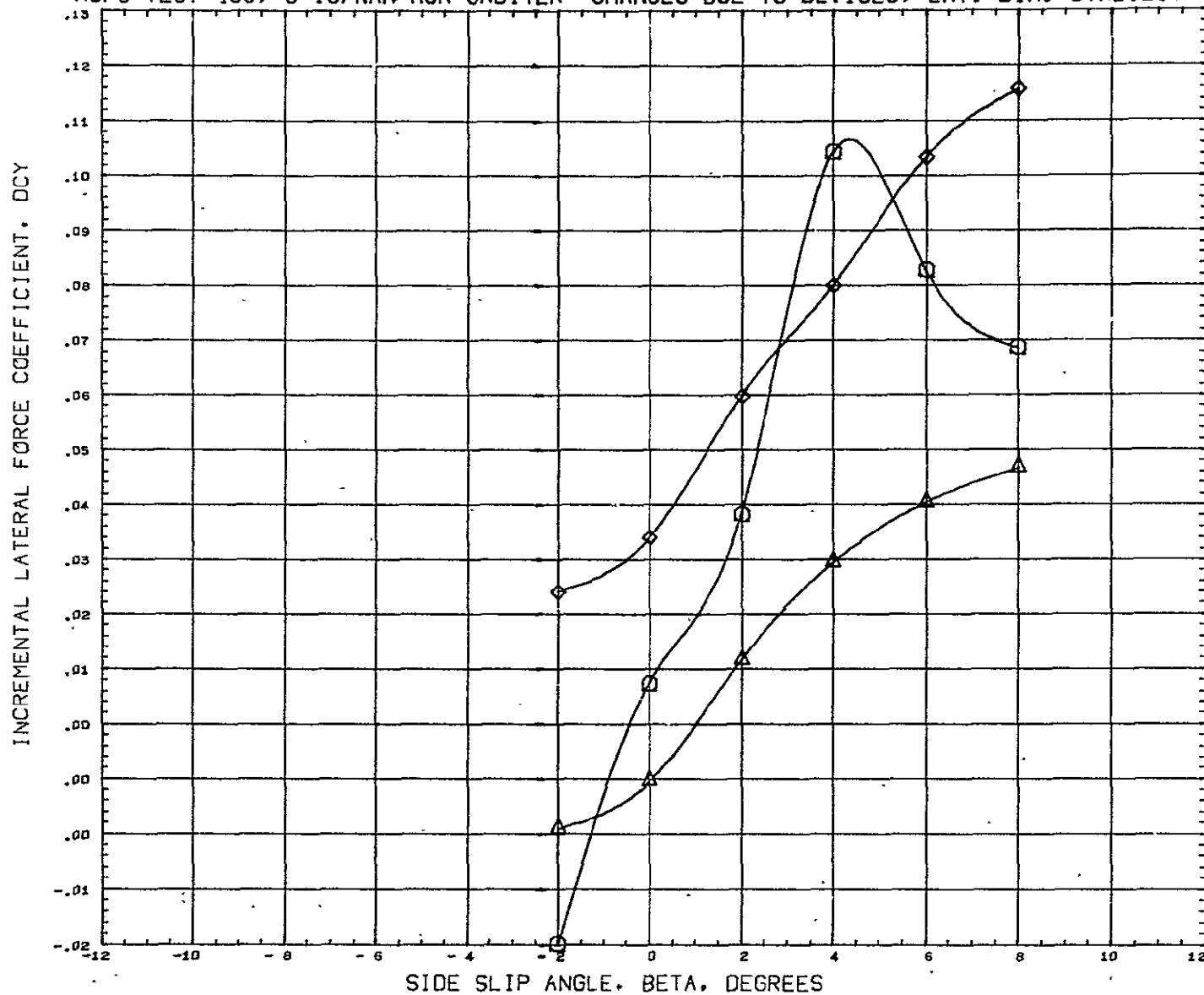
SCALE 0.0034

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LAT.-DIR. STABILITY



SYMBOL	MACH	ALPHA	PARAMETRIC VALUES	REFERENCE INFORMATION
○	0.600		0.070	REFS 1.3980 SQ.IN.
◇	0.900			REFL 1.3330 IN
△	1.000			REFB 1.3330 IN
□	1.100			XMRP - 0.0370 IN
◇	1.200			YMRP 0.0000 IN
△	1.200			ZMRP 0.0000 IN
□	1.960	DATA HIST. CODE	#EI#C	SCALE 0.0034

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LAT.-DIR. STABILITY



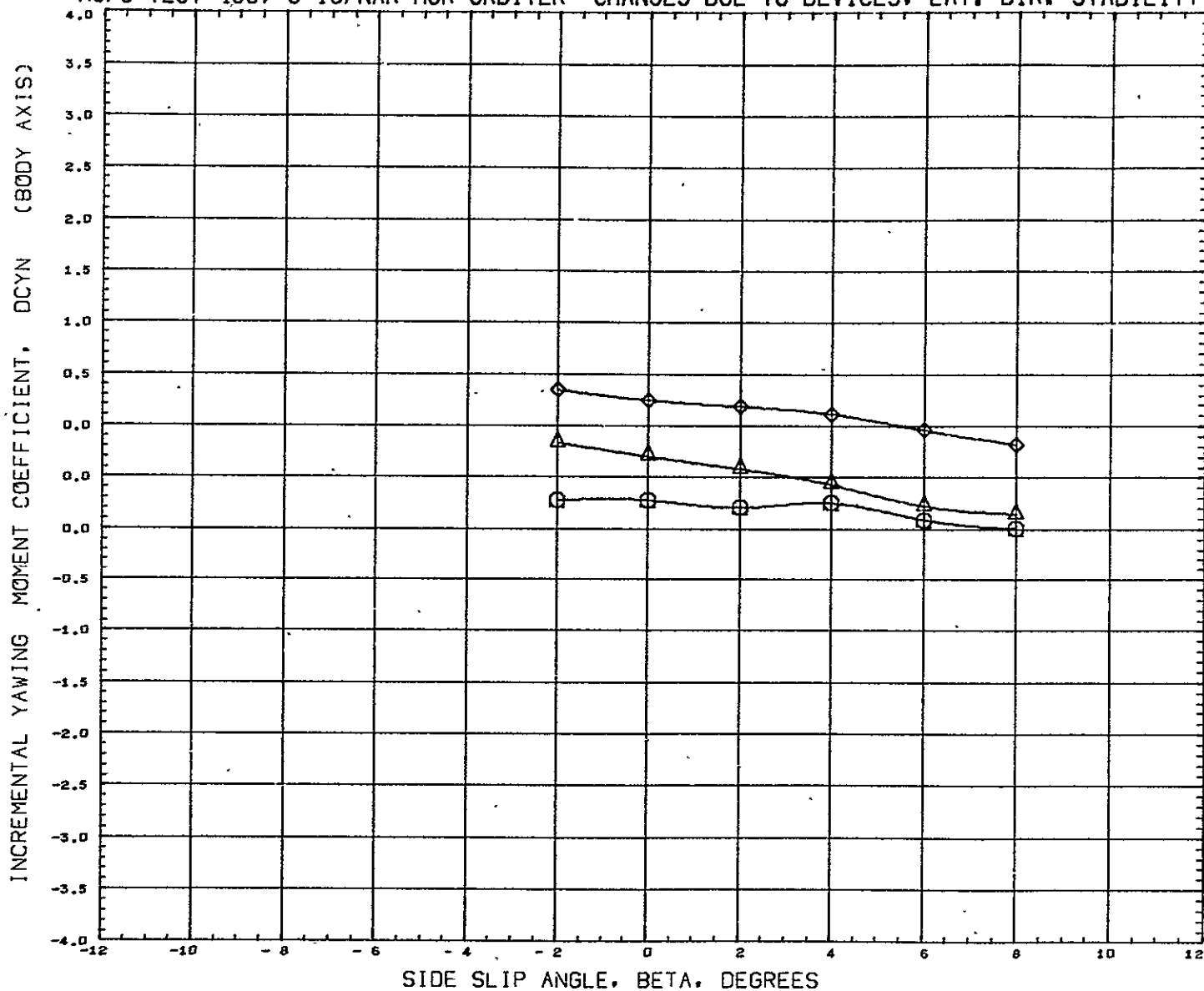
SYMBOL MACH
 ○ 0.900
 △ 1.000
 ◇ 1.200

PARAMETRIC VALUES
 0.000

REFERENCE INFORMATION
 REFS 1.3960 SQ.IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0090 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *EI*A*CM

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LAT.-DIR. STABILITY



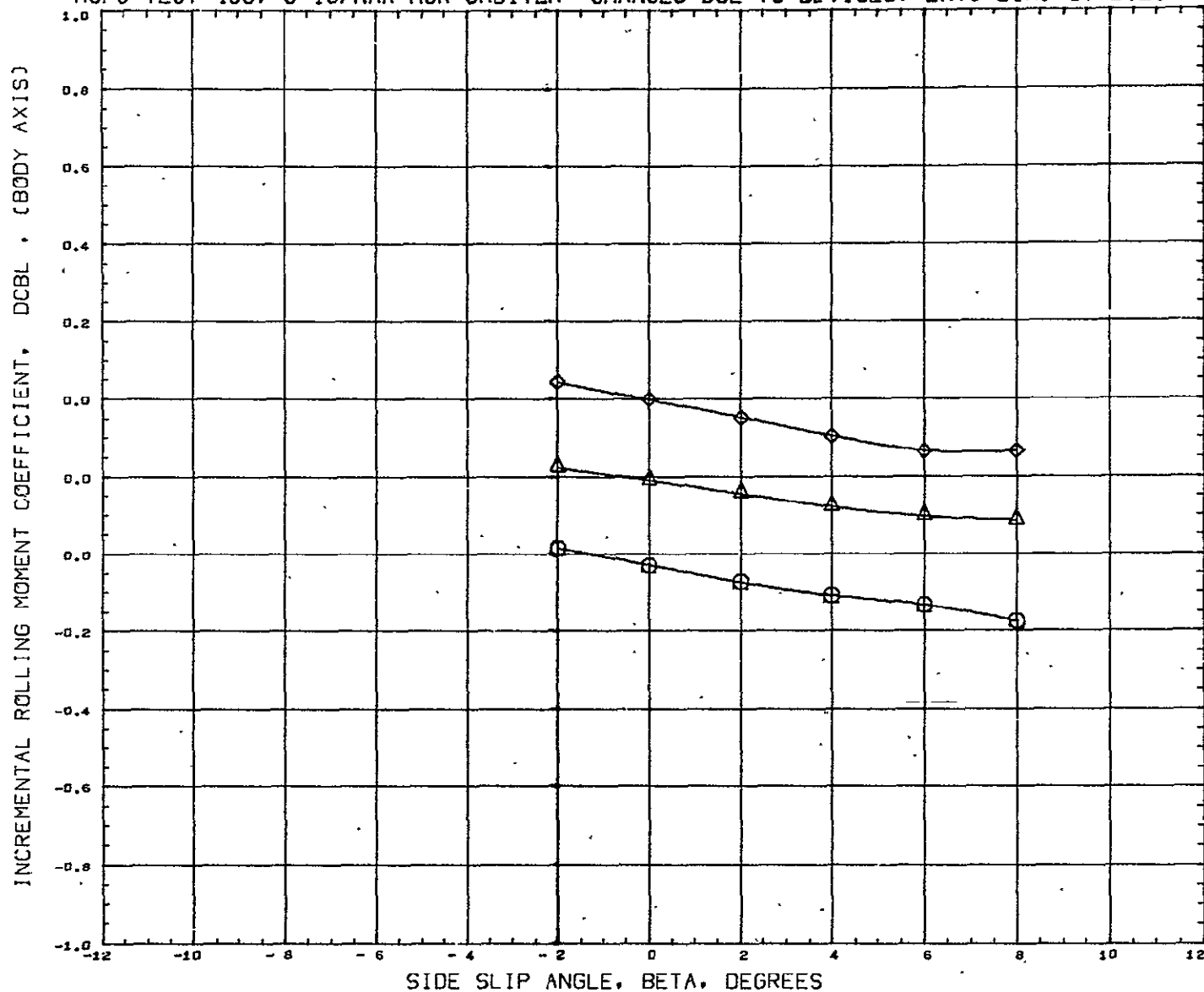
SYMBOL
 ○ 0.900
 △ 1.000
 ◇ 1.200

PARAMETRIC VALUES
 0.000

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *EI#A*CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LAT.-DIR. STABILITY



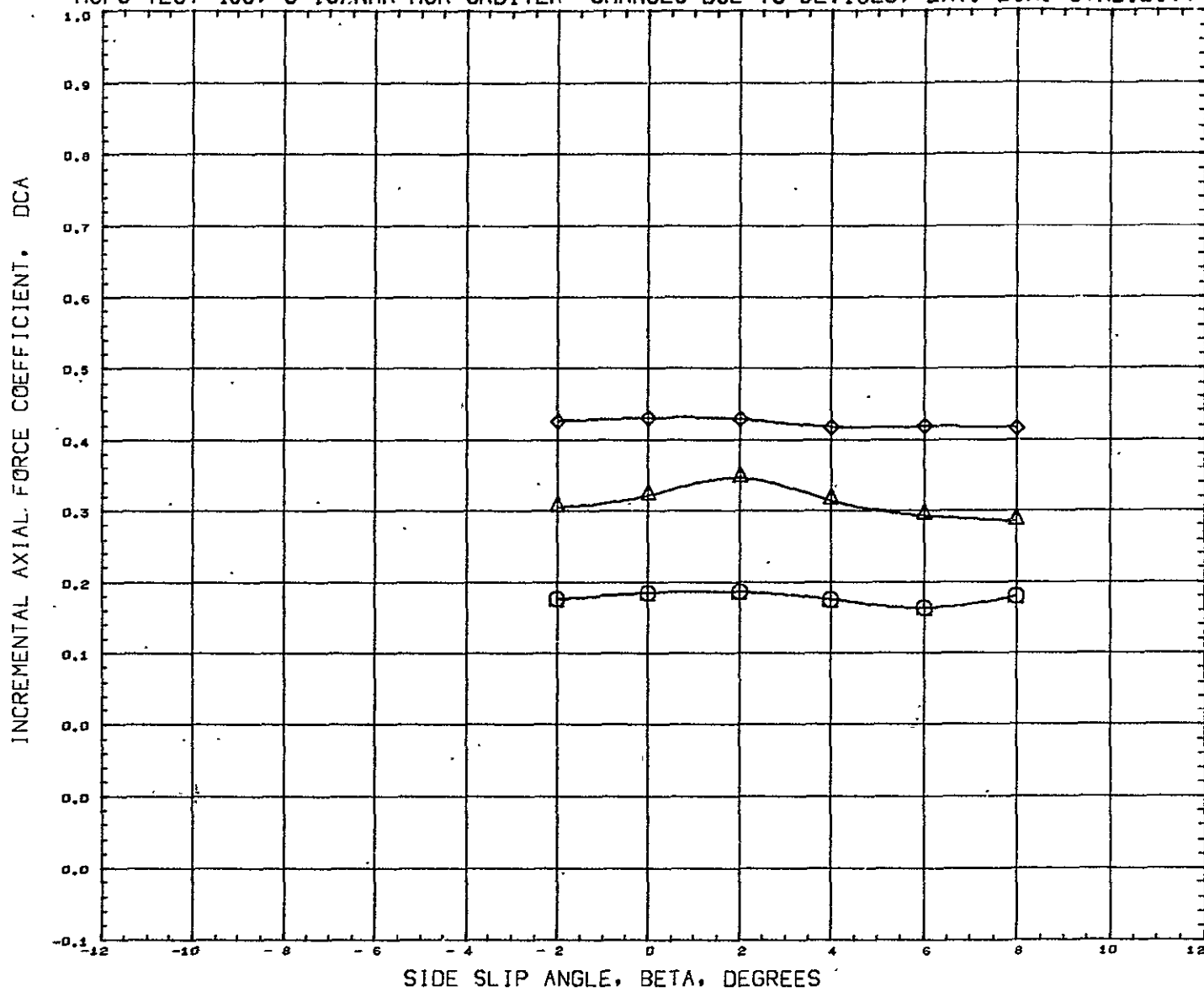
SYMBOL MACH
 ○ 0.900
 △ 1.000
 ◇ 1.200

PARAMETRIC VALUES
 0.000

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFS 1.3330 IN
 XMRP - 0.9370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *EI*A*CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LAT.-DIR. STABILITY



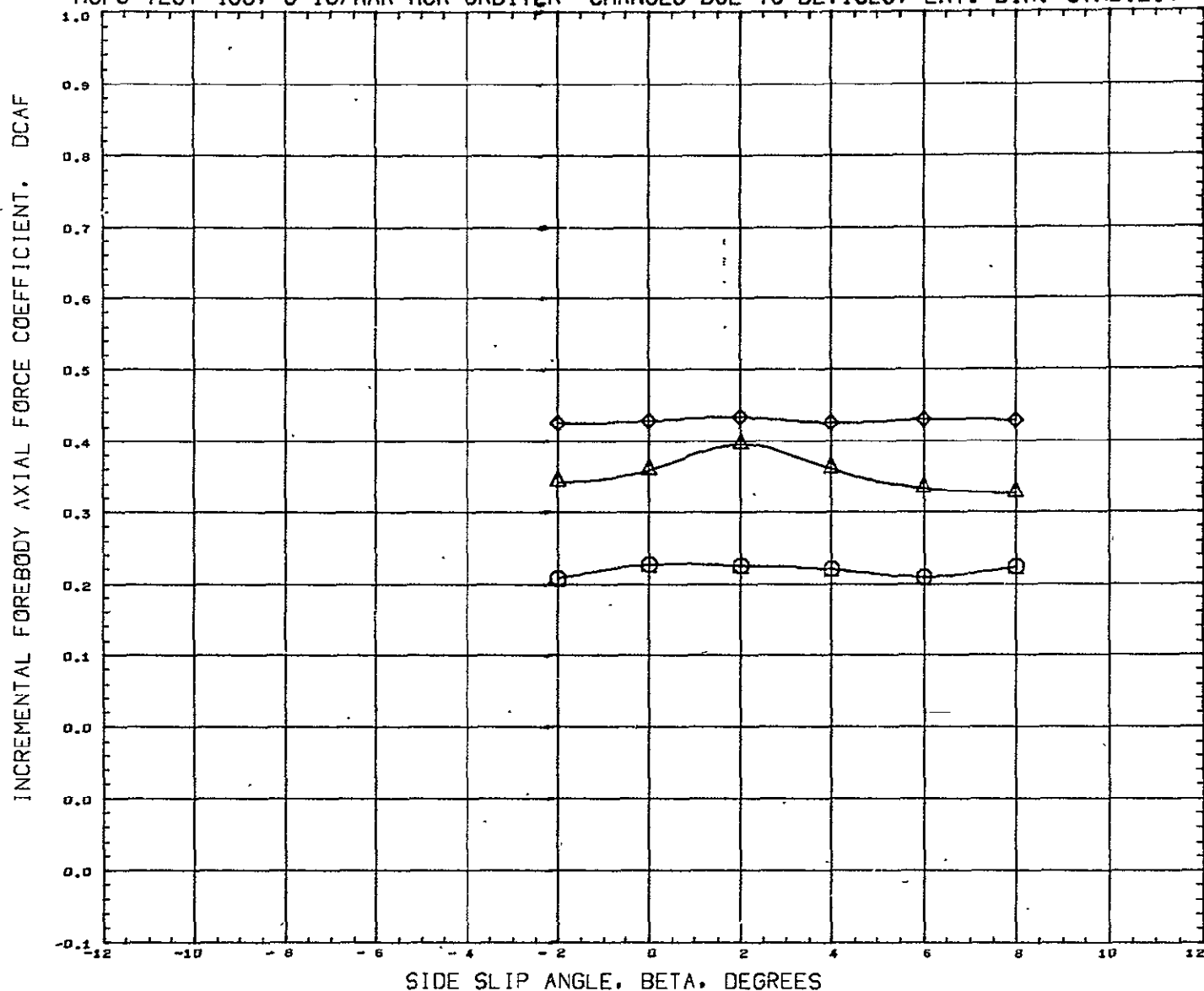
SYMBOL MACH
 ◊ 0.900
 △ 1.000
 ○ 1.200

PARAMETRIC VALUES
 0.000

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP - 0.0070 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *EI#A*CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LAT.-DIR. STABILITY

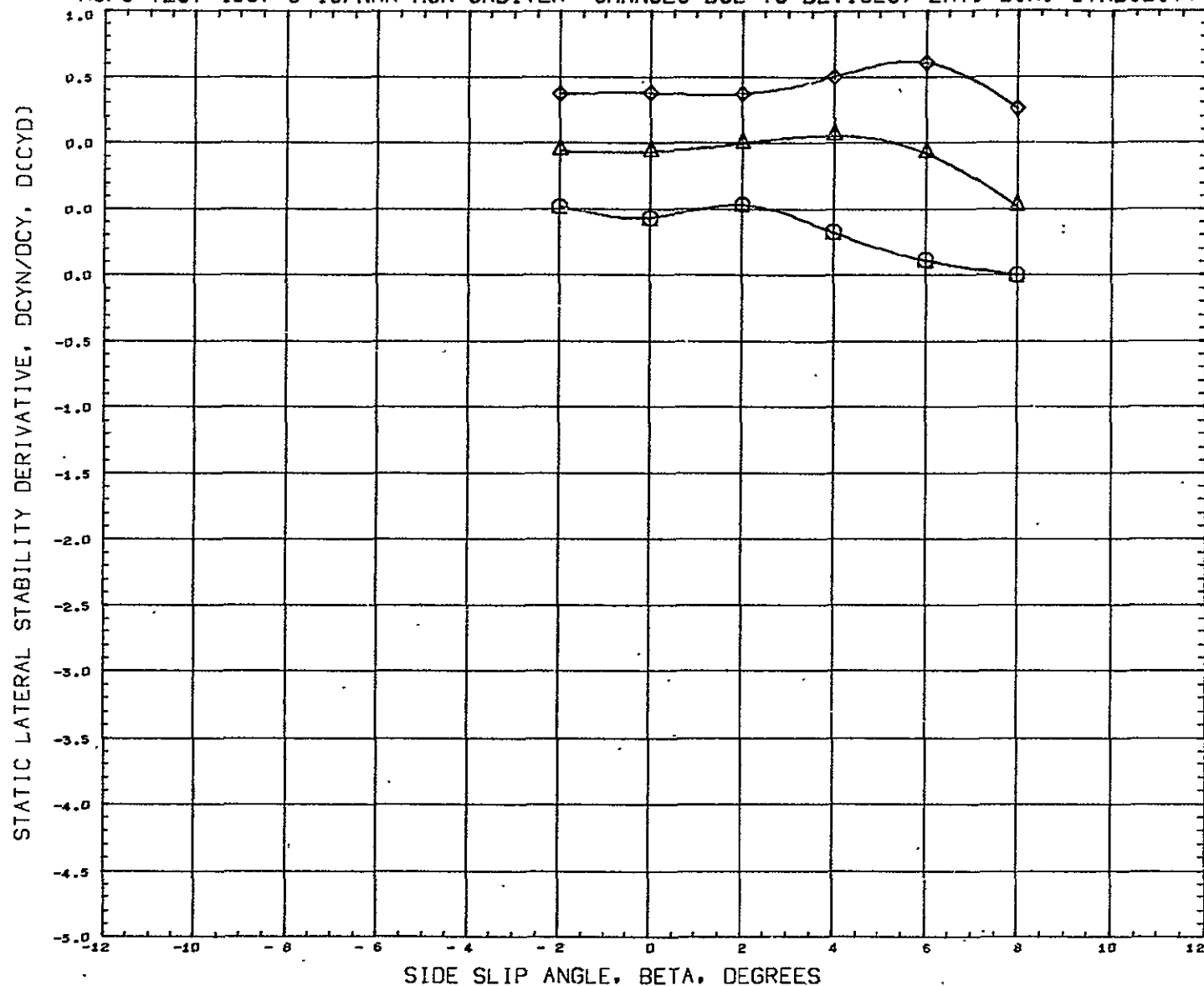


SYMBOL MACH PARAMETRIC VALUES
 ◊ 0.900 0.000
 △ 1.000
 ○ 1.200

REFERENCE INFORMATION
 REFS 1.3960 SQ.IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XHRP - 0.0370 IN
 YHRP 0.0000 IN
 ZHRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *EI*A*CM

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LAT.-DIR. STABILITY



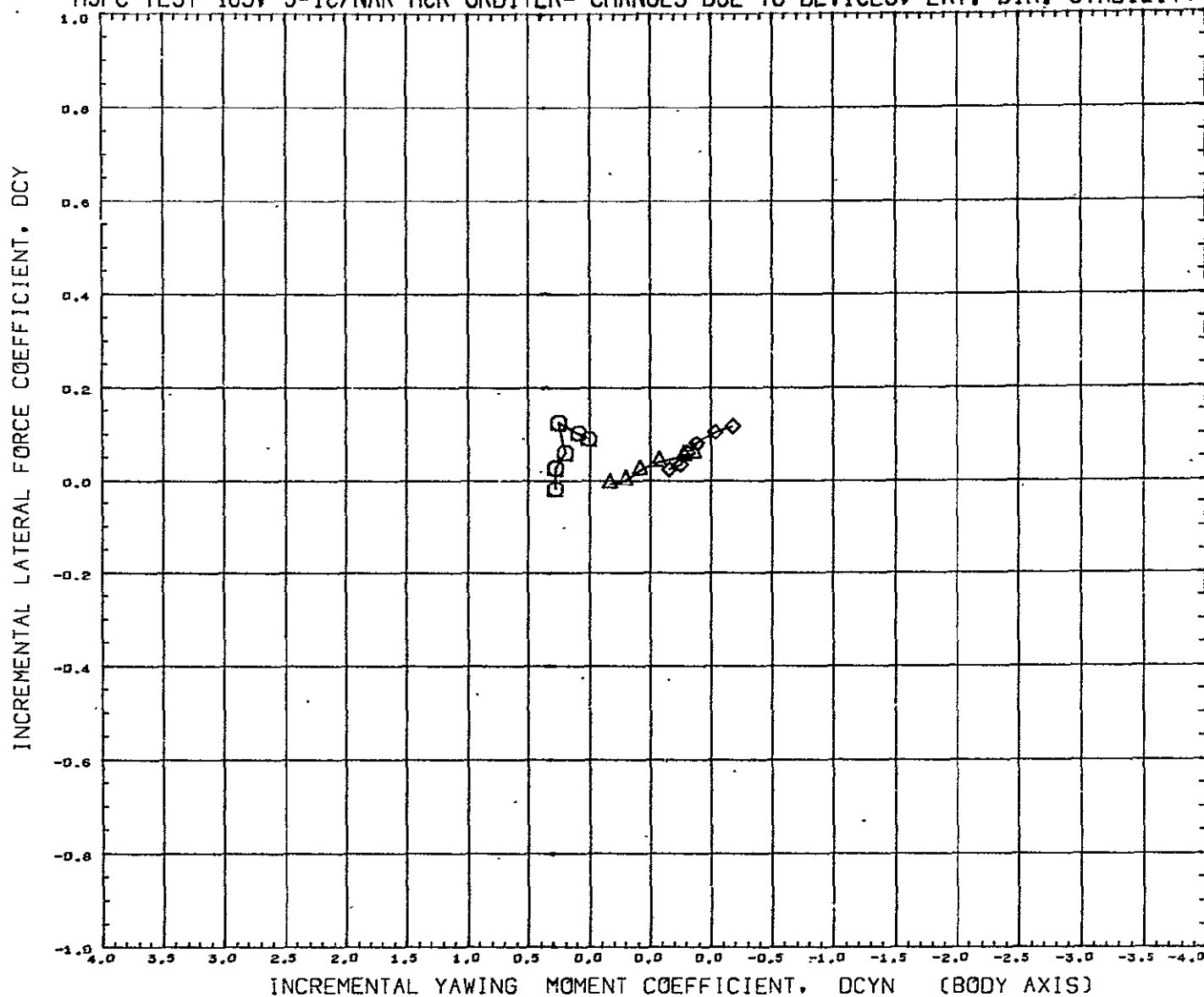
SYMBOL MACH
 ○ 0.900
 △ 1.000
 ◇ 1.200

PARAMETRIC VALUES
 0.000

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE #EI#A#CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LAT.-DIR. STABILITY



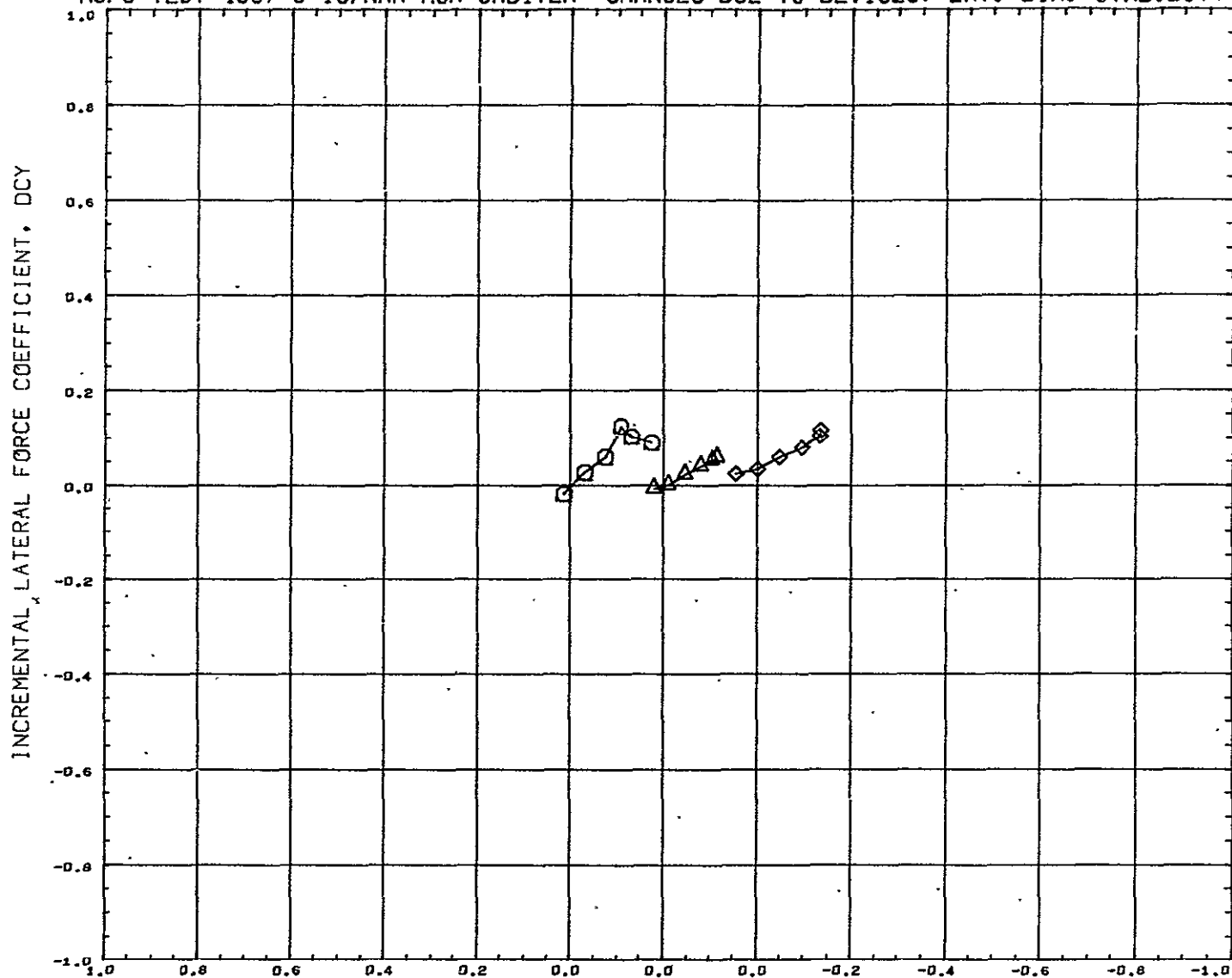
SYMBOL MACH
 ○ 0.900
 △ 1.000
 ◇ 1.200

PARAMETRIC VALUES
 0.000

REFERENCE INFORMATION
 REFS 1.3960 SQ. IN.
 REFL 1.3330 IN
 REFB 1.3330 IN
 XMRP 0.0370 IN
 YMRP 0.0000 IN
 ZMRP 0.0000 IN
 SCALE 0.0034

DATA HIST. CODE *EI#A#CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LAT.-DIR. STABILITY



INCREMENTAL ROLLING MOMENT COEFFICIENT, DCBL , (BODY AXIS)

SYMBOL

MACH

PARAMETRIC VALUES

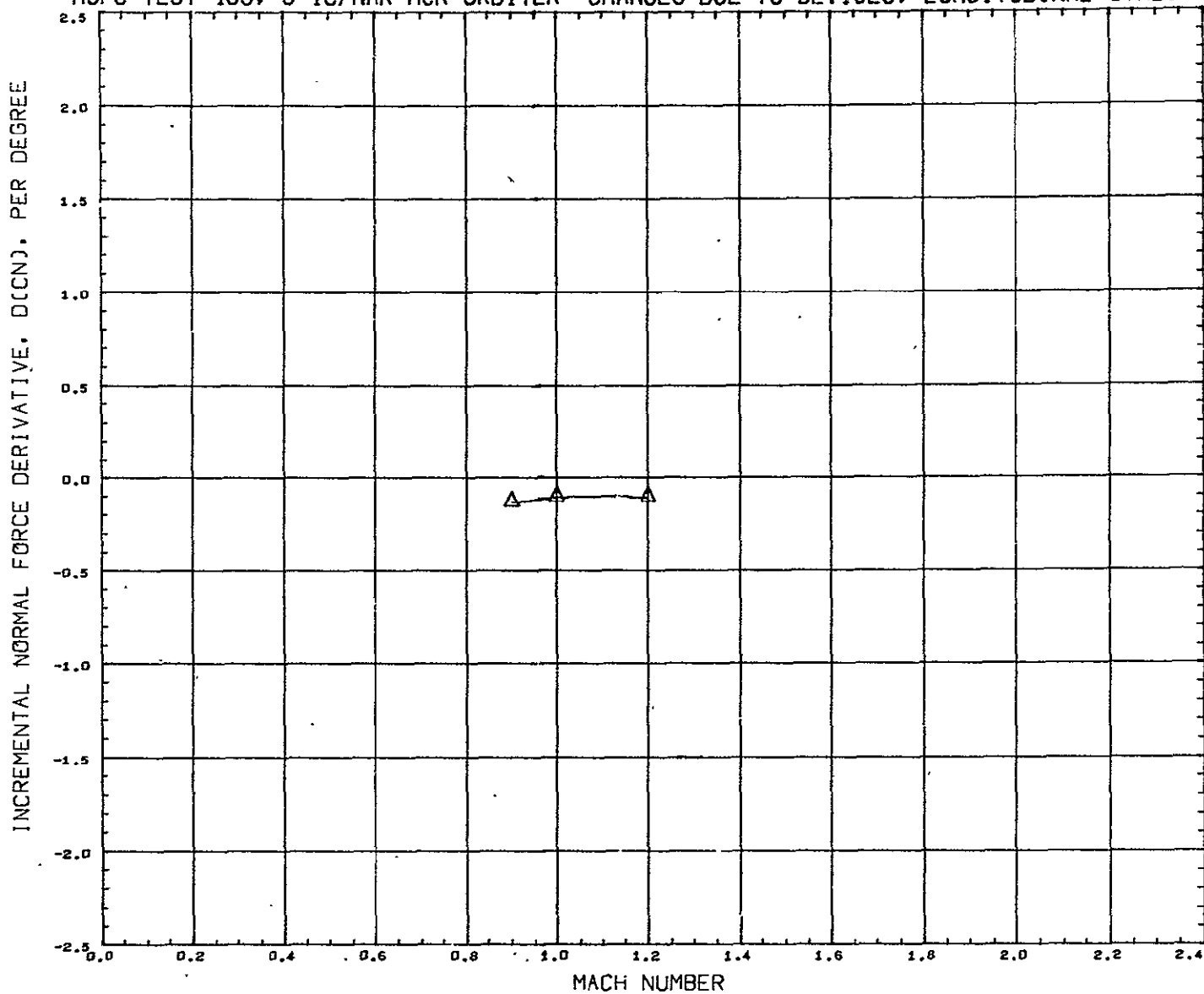
REFERENCE INFORMATION

○ 0.900
△ 1.000
◇ 1.200

REFS 1.3960 SQ. IN.
REFL 1.3330 IN
REFB 1.3330 IN
XMRP 0.0370 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE *EI*A*CM

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



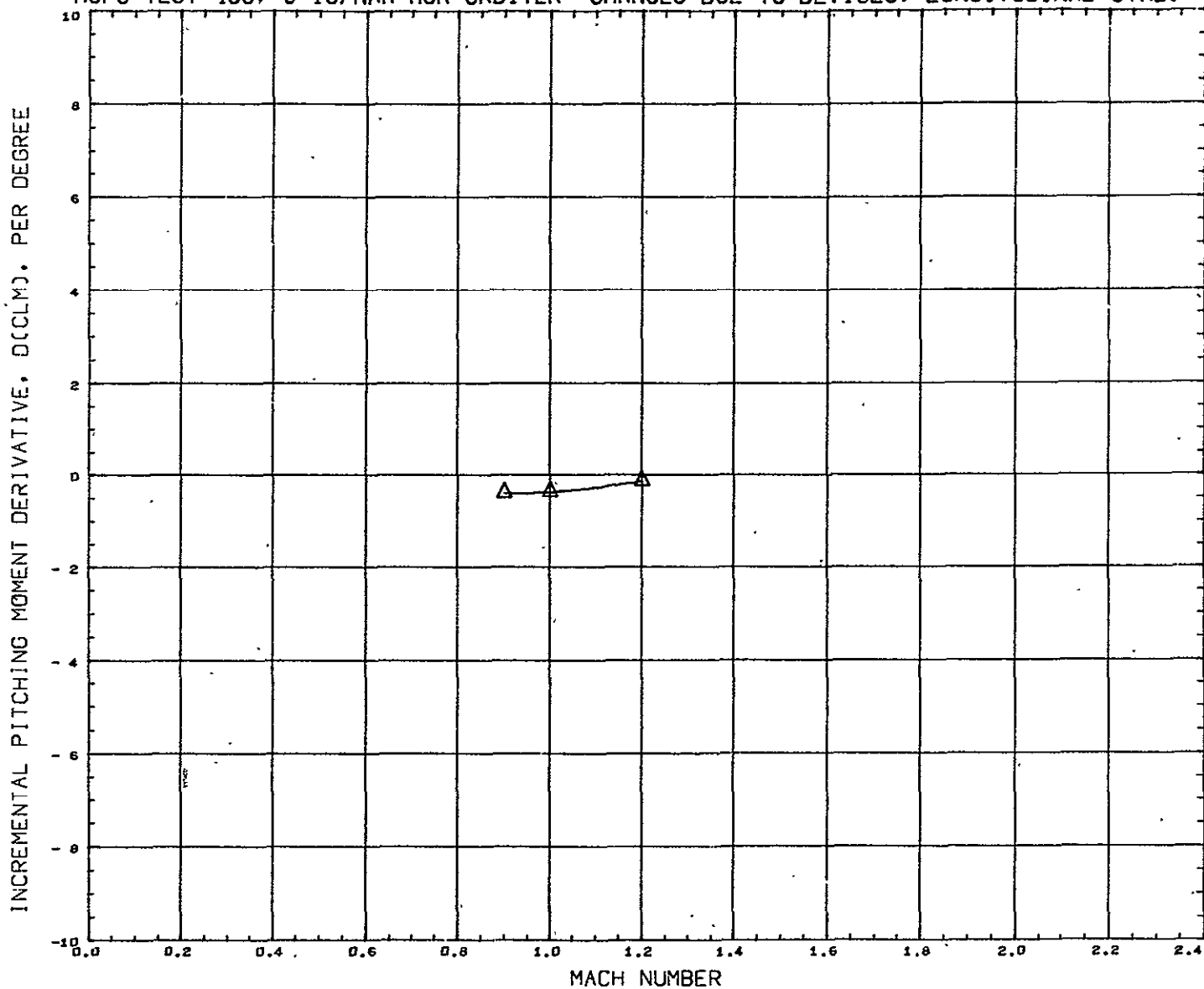
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	50.1N.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE #EI#A#CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



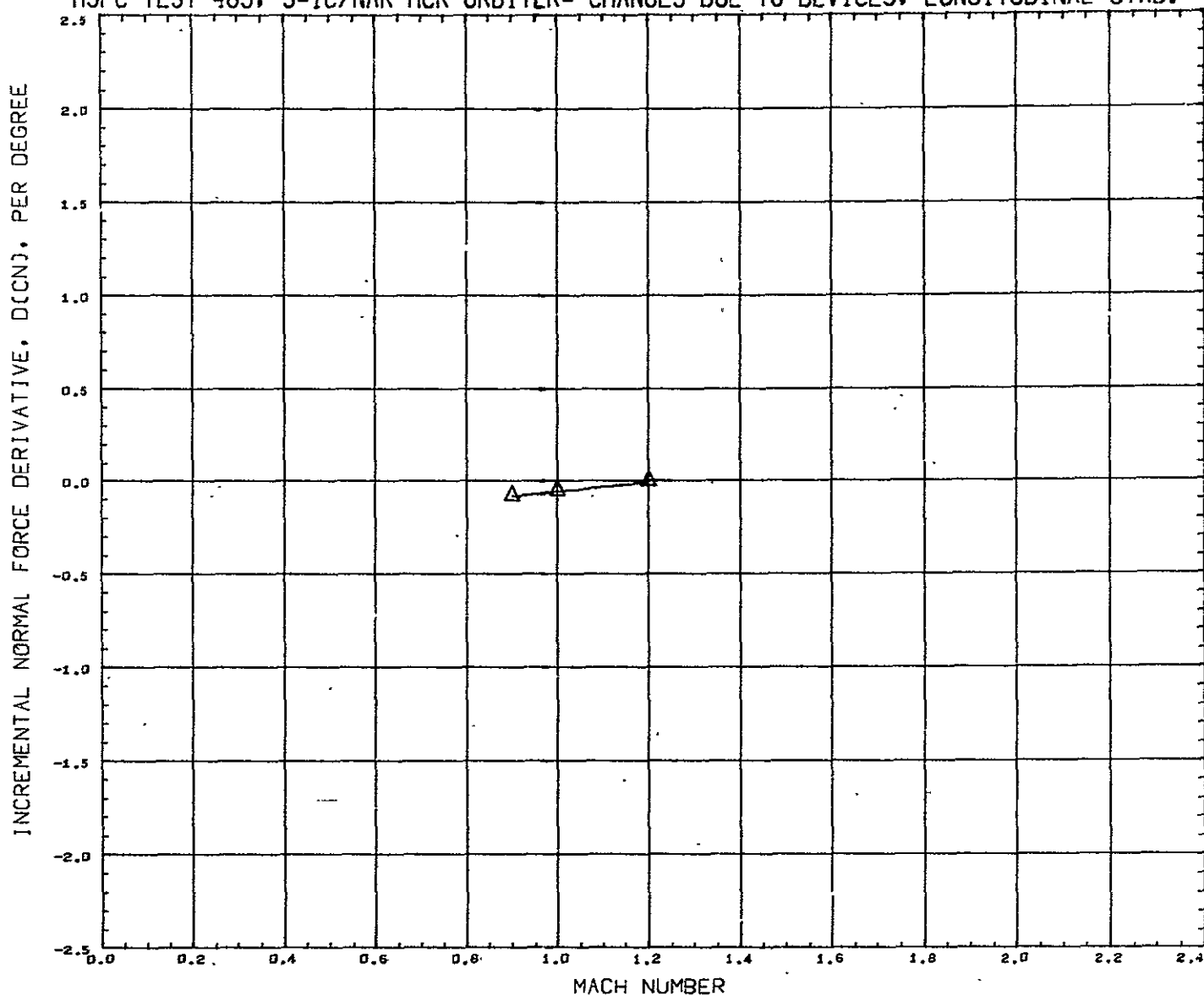
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	sq.in.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI#A*CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



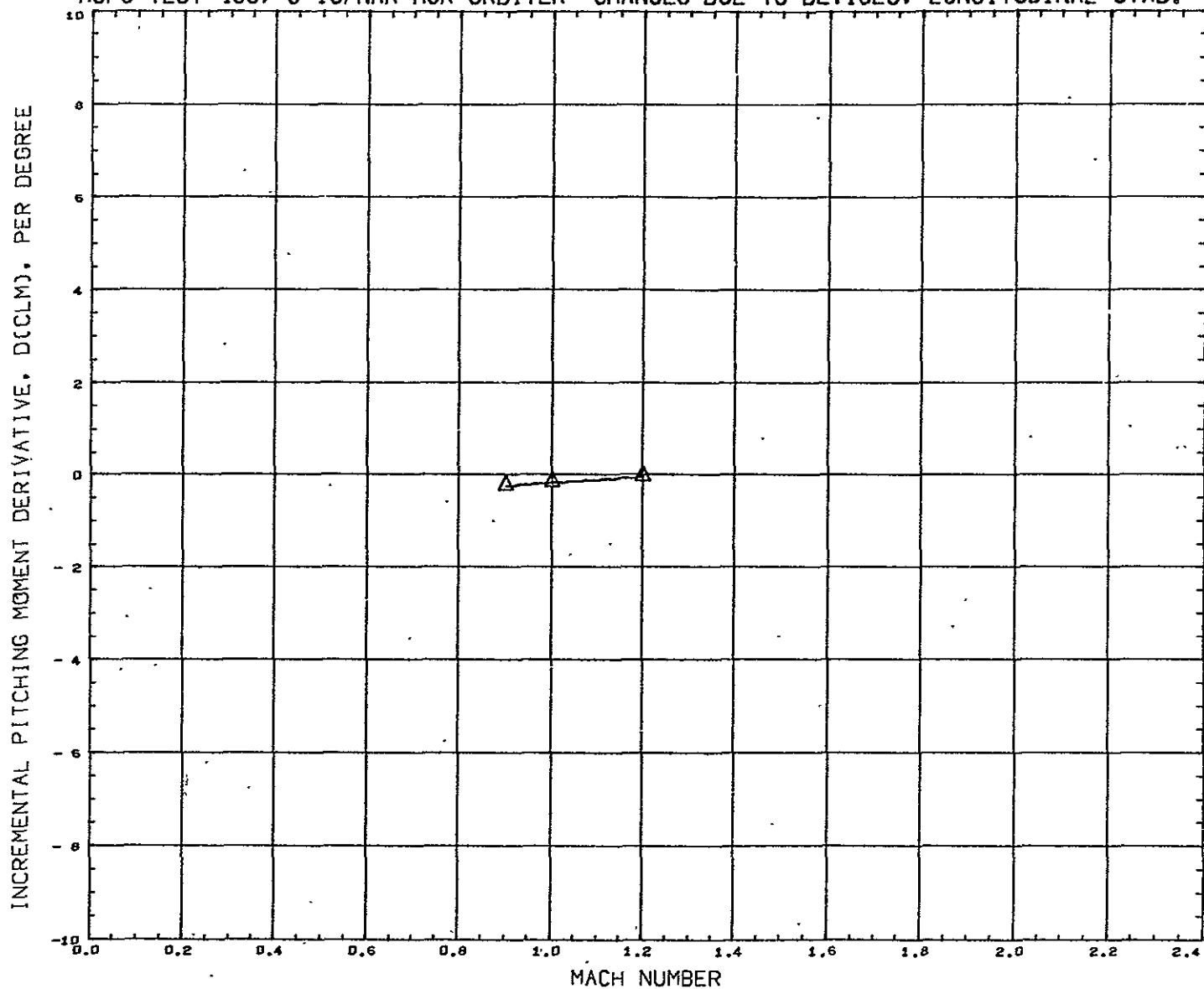
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0470	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE #EI#A*CM

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



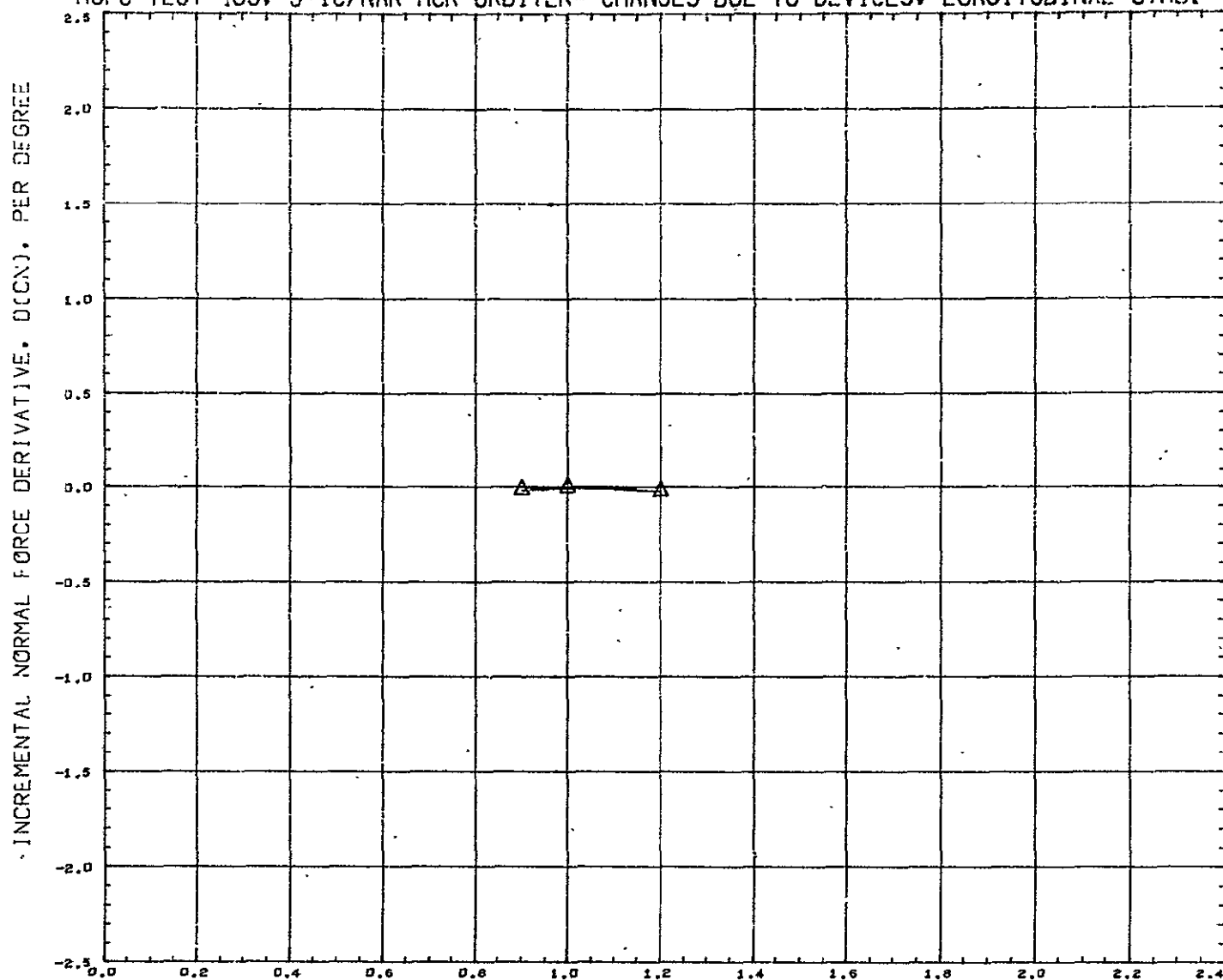
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XNRP	0.0370	IN
YNRP	0.0000	IN
ZNRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE #EI#A*CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.

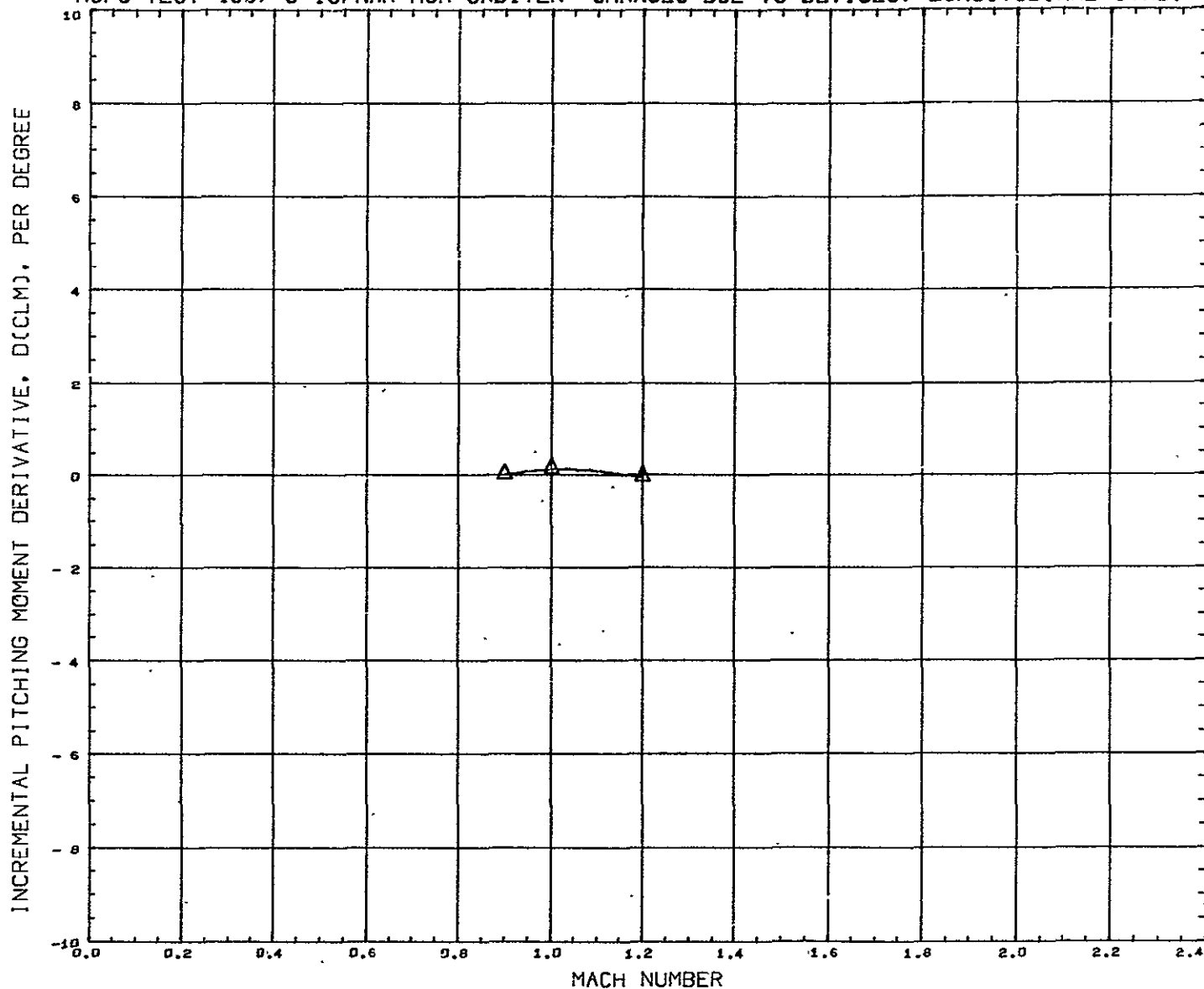


PARAMETRIC VALUES
0.000

REFERENCE INFORMATION
REFS 1.3960 SQ. IN.
REFL 1.3330 IN
REFB 1.3330 IN
XMRP 0.0370 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

DATA HIST. CODE *EI*A*CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



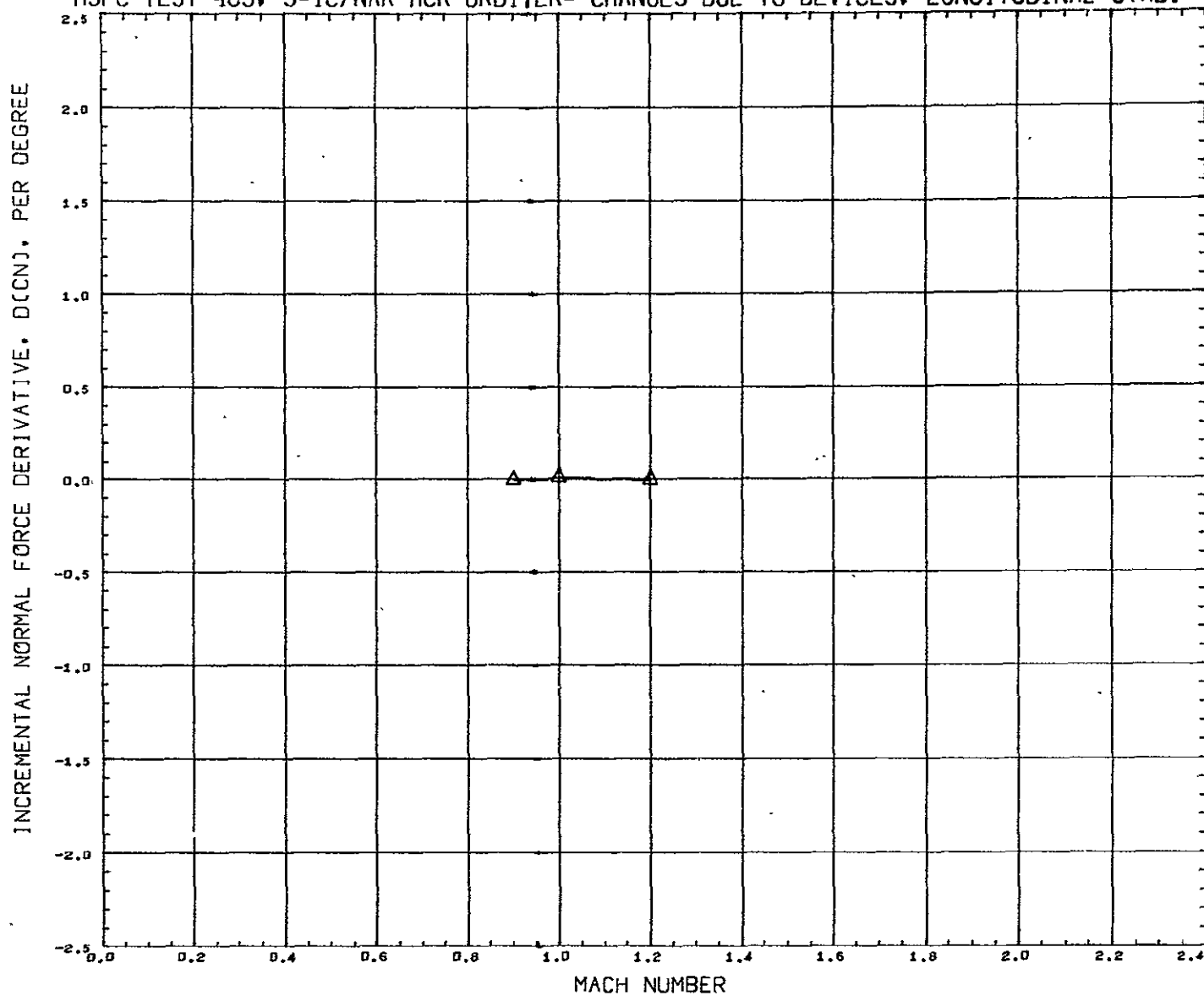
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	SO. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XHRP	0.0370	IN
YHRP	0.0000	IN
ZHRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI#A*CM

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



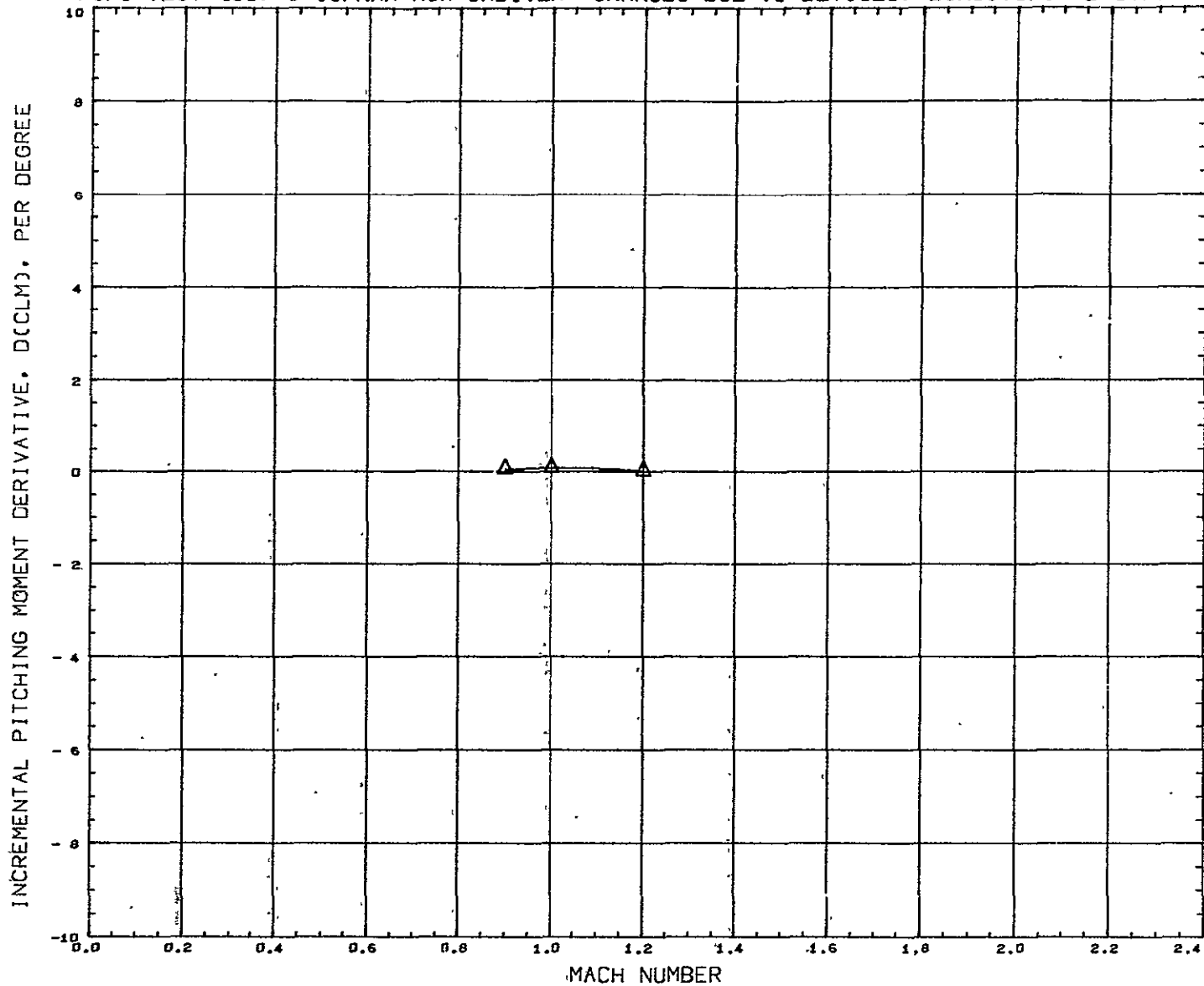
PARAMETRIC VALUES:
0.000

REFERENCE INFORMATION

REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.3370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI#A*CH

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



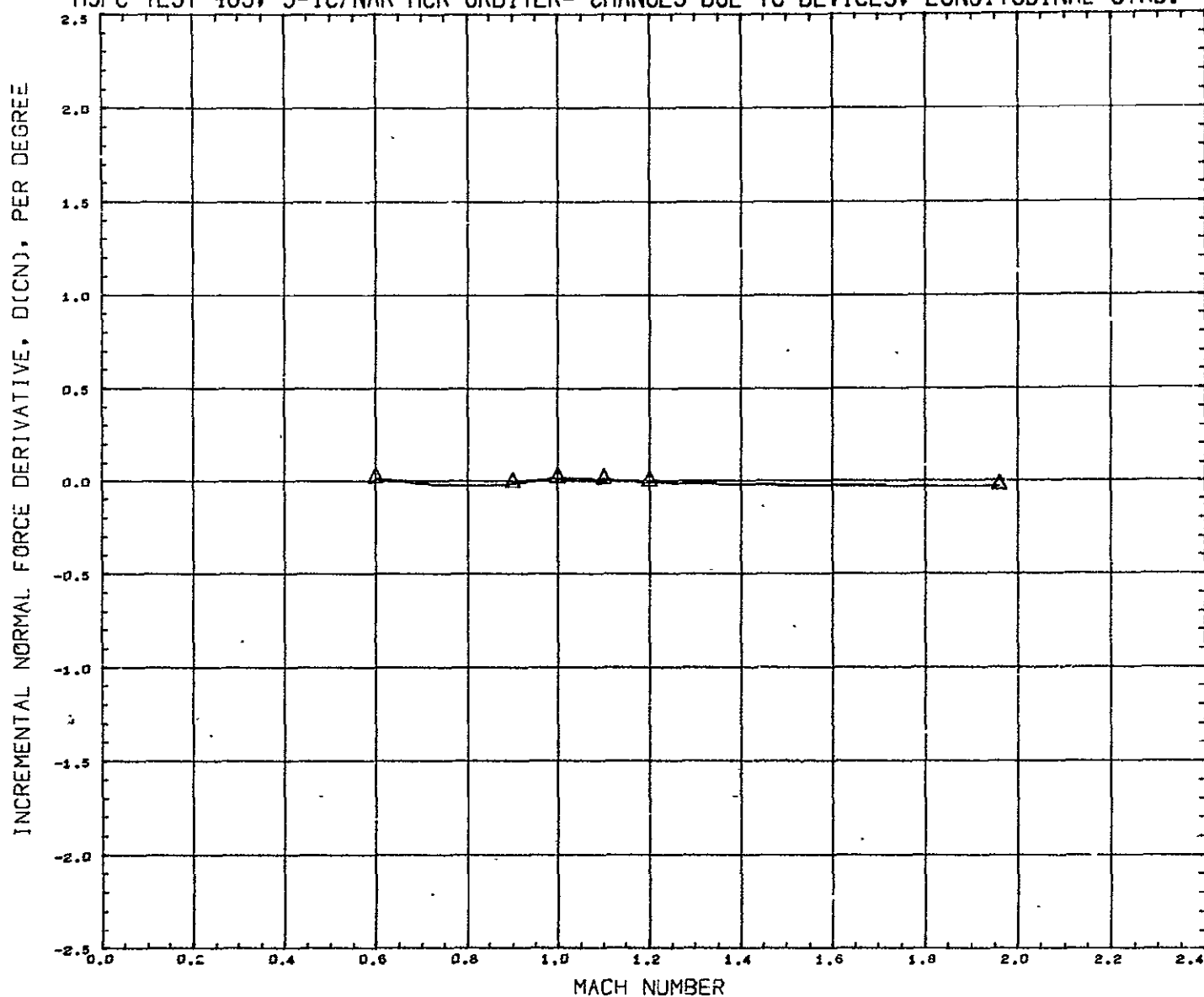
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YNRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI*A*CM

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.

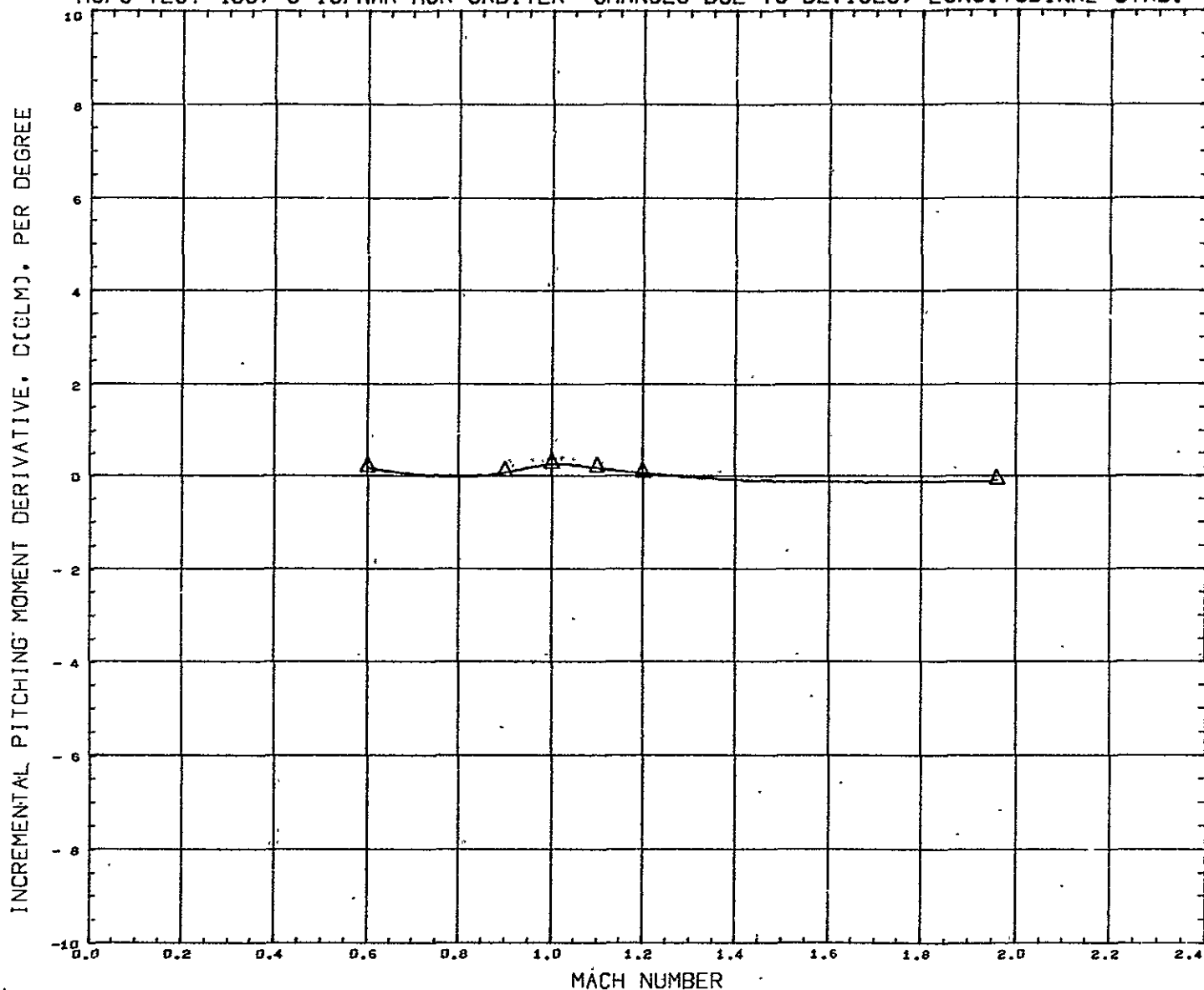


PARAMETRIC VALUES
BETA 0.000

DATA HIST. CODE *EI*C

REFERENCE INFORMATION
REFS 1.3960 SQ.IN.
REFL 1.3330 IN
REFB 1.3330 IN
XMRP 0.0370 IN
YMRP 0.0000 IN
ZMRP 0.0000 IN
SCALE 0.0034

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



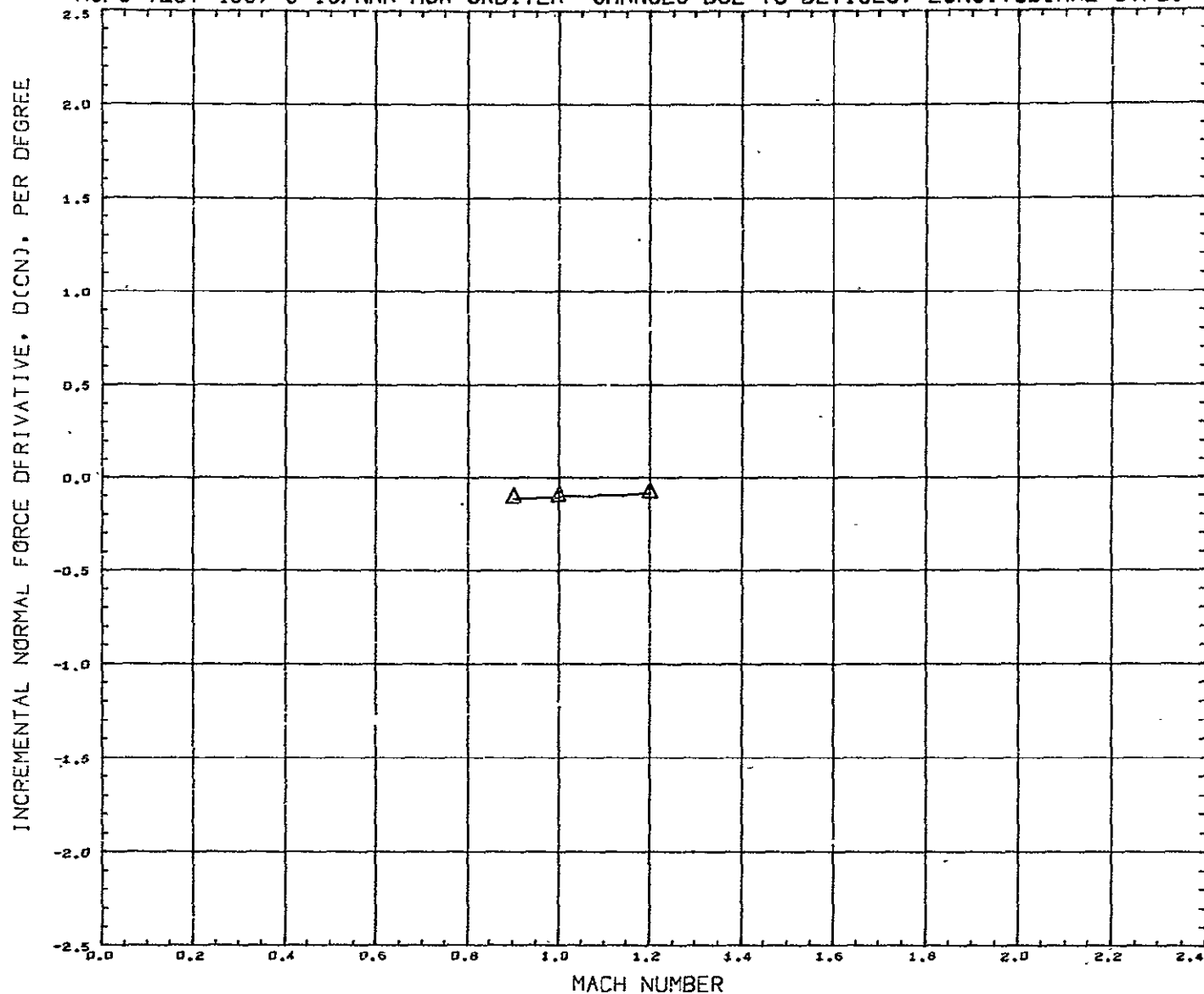
PARAMETRIC VALUES
BETA 0.000

DATA HIST. CODE *EI+C

REFERENCE INFORMATION

REFS	1.3960	50 IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0630	IN
ZMRP	0.0000	IN
SCALE	0.0034	

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



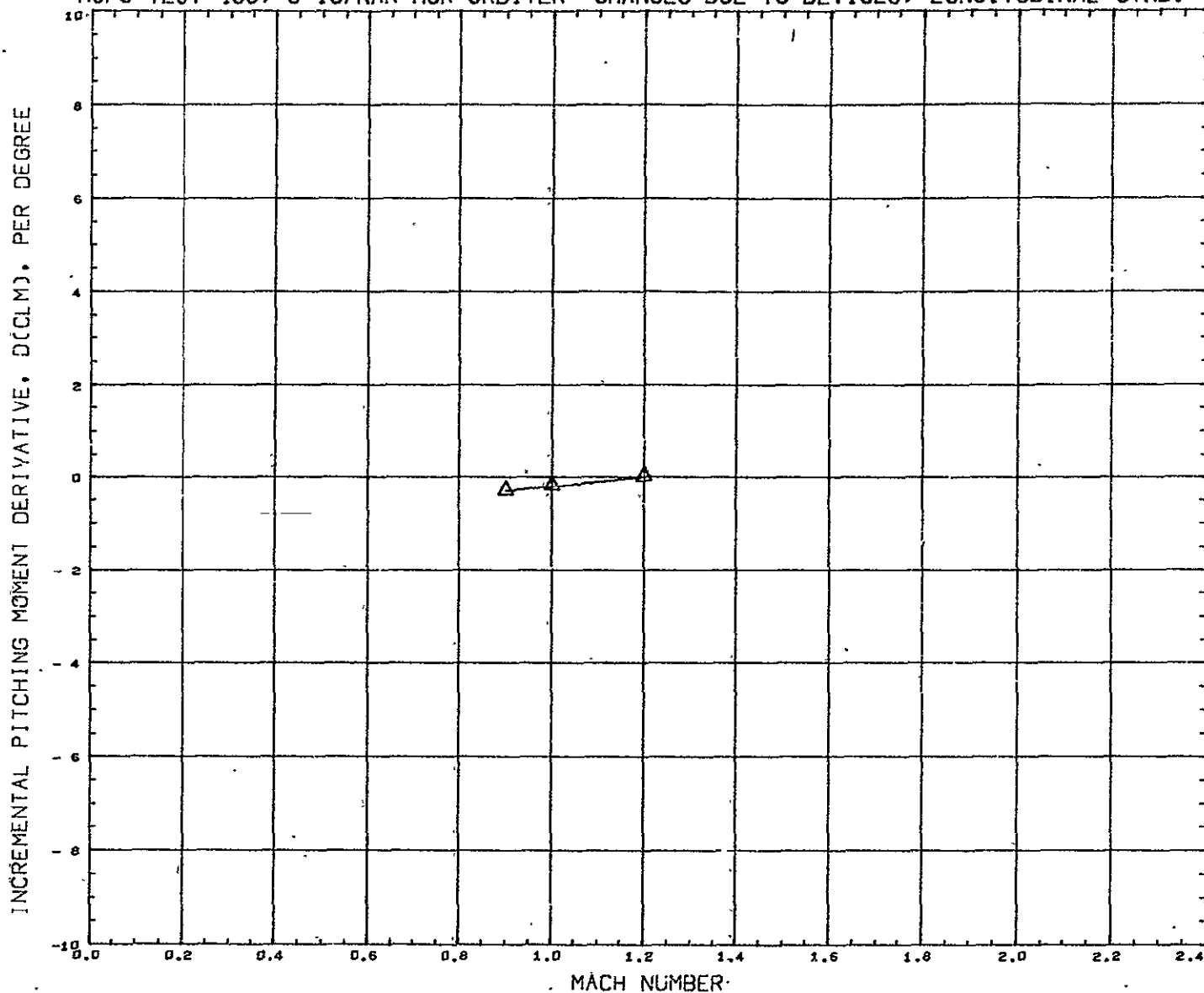
PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3900	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XNRP	0.0370	IN
YNRP	0.0000	IN
ZNRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI%*CM

MSFC TEST 485, S-1C/NAR HCR ORBITER- CHANGES DUE TO DEVICES, LONGITUDINAL STAB.



PARAMETRIC VALUES
0.000

REFERENCE INFORMATION

REFS	1.3960	SQ. IN.
REFL	1.3330	IN
REFB	1.3330	IN
XMRP	0.0370	IN
YMRP	0.0000	IN
ZMRP	0.0000	IN
SCALE	0.0034	

DATA HIST. CODE *EI*A*CH