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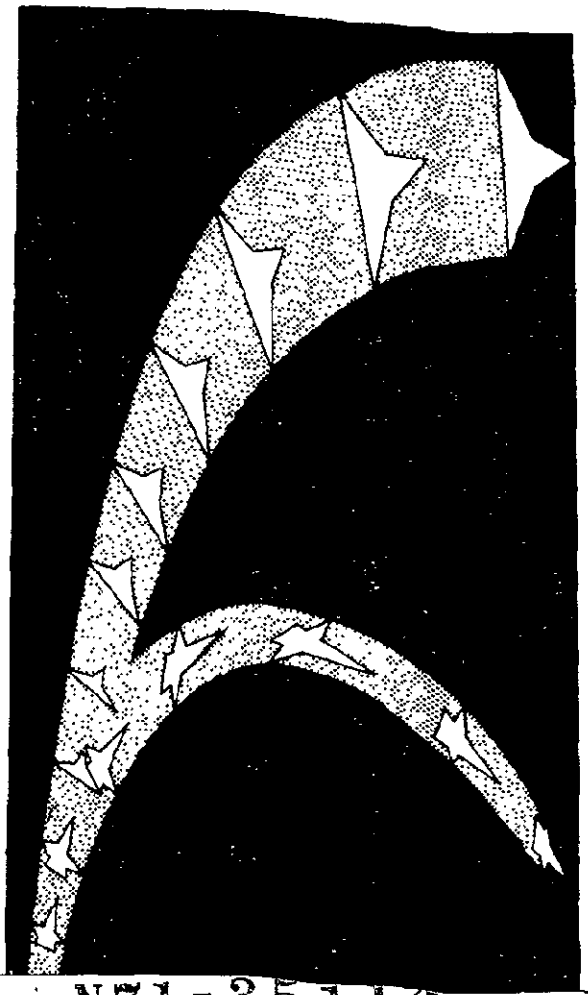

—SPACE SHUTTLE—

# S-IC BOOSTER/GRUMMAN C4 ORBITER DETERMINATION OF DOWNWASH ON 900 FT$^2$, 30° ORIENTED S-IC FINS AND OPTIMUM ORBITER BODY AND AERODYNAMIC SURFACE INCIDENCE ANGLES

MARSHALL
SPACE FLIGHT CENTER
TRISONIC
WIND TUNNEL TEST RESULTS
DATA REPORT

FEBRUARY 1971

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**16. ABSTRACT**

Experimental aerodynamic investigations were made during November 1970 in the MSFC 14 x 14 inch wind tunnel on a Saturn S-IC booster coupled to a Grumman C-4 orbiter for the purposes of:

a) Determining the downwash on 900 ft$^2$, 30 degree oriented S-IC fins
b) Determining the optimum attachment angle of orbiter to booster
c) Evaluating booster fin orientation
d) Determining directional stability
e) Determining orbiter wing loads and horizontal tail effectiveness
f) Determining the effectiveness of wing spoilers in reducing downwash
g) Evaluating effects of the strong back, and orbiter wing incidence angle.

Data were collected over a Mach number range from 0.6 to 1.96 at angles of attack varying from -13° to 13° at zero degrees sideslip and from -2° to 19° sideslip at zero degrees angle of attack. Six component force and moment data were recorded and are presented herein in plotted form.

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# SADSAC/SPACE SHUTTLE

# WIND TUNNEL TEST DATA REPORT

CONFIGURATION: S-IC BOOSTER/GRUMMAN ORBITER-C4; 0.003366 MODEL SCALE

TEST PURPOSE: DETERMINE DOWNWASH ON 900 $FT^2$, 30° ORIENTED S-IC FINS AND OPTIMUM ORBITER BODY AND AERODYNAMIC SURFACE INCIDENCE ANGLES

TEST FACILITY: NASA MSFC 14" TRISONIC WIND TUNNEL

TESTING AGENCY: THE BOEING COMPANY

TEST NO. & DATE: TWT 470; NOV. 4-14, 1970

TEST CONDUCTOR(S): L. C. SHROUT, M. Y. OIYE, R. M. MILLER

SADSAC COORDINATOR: J. WEAVER

## DATA MANAGEMENT SERVICES

LIAISON: N/A

DATA OPERATIONS: B. J. Fricken
B. J. Fricken

RELEASE APPROVAL: N. D. Kemp
N. D. Kemp, Supervisor
Aero Thermo Data Group

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.

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## SUMMARY

Experimental aerodynamic investigations were made during November 1970 in the MSFC 14 x 14 inch wind tunnel on a Saturn S-IC booster coupled to a Grumman C-4 orbiter for the purposes of:

a) determining the downwash on 900 $ft^2$, 30 degree oriented S-IC fins

b) determining the optimum attachment angle of orbiter to booster

c) evaluating booster fin orientation

d) determining directional stability

e) determining orbiter wing loads and horizontal tail effectiveness

f) determining the effectiveness of wing spoilers in reducing downwash

g) evaluating effects of the strong back, and orbiter wing incidence angle.

Data were collected over a Mach number range from 0.6 to 1.96 at angles of attack varying from $-13^{\circ}$ to $13^{\circ}$ at zero degrees sideslip and from $-2^{\circ}$ to $19^{\circ}$ sideslip at zero degrees angle of attack. Six component force and moment data were recorded and are presented herein in plotted form.

## 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 1). The nose of the orbiter has a trip strip .06 inch wide with #120 grit located 10% orbiter length aft of the nose tip.

The model was sting mounted in the tunnel as depicted in Figure 1. 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 13.

The orbiter was attached to the booster with an orbiter sting. The variable orbiter incidence settings of -4°, -2°, -1.05°, and 0° were obtained by pivoting the orbiter about a pin at the launch C.G. and setting the angle with pins through the body and orbiter sting.

Wing incidence changes of +4° and +2° were obtained using wedged shims and different bolt patterns.

Horizontal tail incidence settings of -5° and 0° were obtained using wedged shims and a loose fitting bolt pattern.

The strongback was attached to the orbiter by bolts. The gap between the orbiter and booster was faired with red wax.

The booster body fin combinations were varied using boosters with or without the fins brazed into permanent locations.

Spoilers were simulated by attaching 1/8 inch key stock pieces, 0.7 inch long to the top surface of the wing with epoxy. The leading edge of the spoilers was located on the 15 percent chord line and ran 40 percent of the distance from tip of the orbiter wing to the body.

TABLE I
TEST CONDITIONS
TEST MSFC TWT 470

| MACH NUMBER | REYNOLDS NUMBER per unit length | DYNAMIC PRESSURE (pounds/sq. inch) | STAGNATION TEMPERATURE (degrees Fahrenheit) |
|---|---|---|---|
| 0.60 | $8.5 \times 10^6$ | 7.3 | 100°F (Nominal) |
| 0.90 | $7.7 \times 10^6$ | 9.0 | |
| 1.00 | $7.2 \times 10^6$ | 9.0 | |
| 1.10 | $6.8 \times 10^6$ | 9.0 | |
| 1.20 | $6.6 \times 10^6$ | 9.0 | |
| 1.46 | $6.9 \times 10^6$ | 10.0 | |
| 1.96 | $6.9 \times 10^6$ | 10.0 | |
| 1.30 | $6.4 \times 10^6$ | 9.0 | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

BALANCE UTILIZED: MSFC #226

| | CAPACITY: | DATA ACCURACY: | COEFFICIENT TOLERANCE: |
|---|---|---|---|
| NF | 150 lbs | ± 0.5% | |
| SF | 50 lbs. | ± 2.0% | |
| AF | 30 lbs. | ± 7.5% | |
| PM | 317 in-lbs | ± 6.0% | |
| YM | | | |
| RM | 40 in-lbs | ± 2.0% | |

COMMENTS:

The above accuracies are based on repeatability of data runs and re-runs during this test.

* Data inaccuracies for this test were compounded by:

a. Location of both sets of balance gages aft of the configuration aerodynamic center.

b. Incomplete balance temperature compensation.

## DATA REDUCTION

A six component internal strain gage balance was utilized to measure the aerodynamic forces and moments acting on the model. The loads have been reduced to coefficient form using the following reference values:

$S_{ref}$ = booster body X-sectional area = 1.396 $in^2$

$\ell_{ref}$ = $b_{ref}$ = booster body diameter = 1.333 inches

$A_b$ = booster base area = 1.039 $in^2$

$A_{cav}$ = booster balance cavity area = 1.131 $in^2$

Moment data are reduced about a reference C.G. location which is on the longitudinal centerline at model station 5.264 (booster base is station 0.249 (REF).

Model base and balance cavity area pressures were recorded during these tests and are presented in the plots. Axial force coefficients are presented both uncorrected ($C_A$) and corrected ($C_{A_F}$) for the pressures.

## CONFIGURATIONS INVESTIGATED

### COMPONENT NOMENCLATURE

O = Orbiter Body Drawing No. 518MOD411 (Figure 3)

B = S-IC Body Drawing No. GDC 383-4 (Figure 9)

W = Orbiter Wing Drawing No. 518MOD412 (Figure 4)

$W_1$ = Orbiter Wing Drawing No. 518MOD412 with spoilers added (Figure 5)

H = Orbiter Horizontal Tail Drawing No. 518MOD413 (Figure 6)

V = Orbiter Vertical Tail Drawing No. 518MOD413 (Figure 6)

$F_1$ = S-IC 900 $ft^2$ Fins Each Mounted at $\pm 30^\circ$ Angle from horizontal Drawing GDC 383-12 (Figure 10)

$F_2$ = S-IC 900 $ft^2$ Fins Each Mounted at $\pm 45^\circ$ Angle from horizontal (PHIB = $0^\circ$) Drawing GDC 383-12 (Figure 11)

S = Strongback Drawing GDC 383-9 (Figure 12)

The immediately following pages give pertinent dimensional information on the above components.

### COMPONENT COMBINATIONS TESTED

BOHVS

BOWHVS

$BF_1OHVS$

$BF_1OWHV$

$BF_1OWHVS$

$BF_1OW_1HVS$

$BF_2OWHVS$, PHIB = $0^\circ$

$BF_2OWHVS$, PHIB = $45^\circ$

TABLE II

MODEL INSPECTION DATA

ORBITER INCIDENCE

| NOMINAL | MEASURED |
|---|---|
| 0° | 0° |
| -2° | -1°57' |
| -4° | -4°0' |

WING INCIDENCE

| NOMINAL | LEFT TIP | RIGHT TIP | BOTTOM |
|---|---|---|---|
| 2° | 1.2° | 0.6° | |
| 4° | 3.6° | 2.8° | 3°38' |

HORIZONTAL TAIL INCIDENCE

| NOMINAL | LEFT TIP | RIGHT TIP | BOTTOM |
|---|---|---|---|
| -5° | -4.6° | -5.5° | -5°56' |
| 0° | +0.2° | -0.2° | -59' |

NOTE: These angles were measured using an optical comparator. It was not possible to define a tip reference chord for the wing and horizontal tail.

MODEL COMPONENT: BODY - B

GENERAL DESCRIPTION: 0.003366 SCALE S-IC BOOSTER

DRAWING NUMBER: GDC383-4

| DIMENSIONS: | FULL-SCALE | MODEL SCALE |
|---|---|---|
| Length | 130.33 FT | 5.101 IN [1] / 5.264 IN [2] |
| Max. Width | 46.84 FT | 1.893 IN |
| Max. Depth | 46.84 FT | 1.893 IN |
| Fineness Ratio | .276 | .276 |
| BODY DIA | 33 FT | 1.333 IN |
| Area | | |
| Max. Cross-Sectional BODY | | 1.396 $IN^2$ |
| Planform | | |
| Wetted | | |
| Base TOTAL | | 2.170 $IN^2$ |
| CAVITY | | 1.131 $IN^2$ |
| SOLID BASE | | 1.039 $IN^2$ |

[1] TO END OF ENGINE FAIRING

[2] TO STATION 0.00

MODEL COMPONENT: BODY -0

GENERAL DESCRIPTION: .003366 SCALE GRUMMAN C-4 ORBITER

DRAWING NUMBER: B34L0190-504 518 MOD 411

| DIMENSIONS: | FULL-SCALE | MODEL SCALE |
|---|---|---|
| Length | 1460 IN | 5.150 IN |
| Max. Width | 402 IN | 1.23 IN |
| Max. Depth | 352 IN | 1.192 IN |
| Fineness Ratio | | |
| Area | | |
| Max. Cross-Sectional | | |
| Planform | | |
| Wetted | | |
| Base | | |

MODEL COMPONENT: WING - W

GENERAL DESCRIPTION: .003366 SCALE GRUMMAN ORBITER

DRAWING NUMBER: B34L0190-504 518 MOD 412

| DIMENSIONS: | FULL-SCALE | MODEL SCALE |
|---|---|---|
| **TOTAL DATA** | | |
| Area | | |
| Planform | 2280 FT² | 3.72 IN² |
| Wetted | | |
| Span (equivalent) | 117 FT | 4.726 IN |
| Aspect Ratio | 6.0 | 6.0 |
| Rate of Taper | .3298 | .3298 |
| Taper Ratio | .34 | .338 |
| Dihedral Angle, degrees | 7° | 7° |
| Incidence Angle, degrees | | |
| Aerodynamic Twist, degrees | 0.0 | 0.0 |
| Toe-In Angle | | |
| Cant Angle | | |
| Sweep Back Angles, degrees | | |
| Leading Edge | 18.25° | 18.25° |
| Trailing Edge | 0° | 0° |
| 0.25 Element Line | 14° | 13.88° |
| Chords: | | |
| Root (Wing Sta. 0.0) | 29.1 FT | 1.177 IN |
| Tip, (equivalent) | 9.85 FT | .398 IN |
| MAC | 21.05 FT | .852 IN |
| Fus. Sta. of .25 MAC | 1010.1 IN | 3.40 IN |
| W.P. of .25 MAC | | |
| B.L. of .25 MAC | 24.4 FT | .985 IN |
| Airfoil Section | | |
| Root | 0014-64 | 0014-64 |
| Tip | 0010-64 | 0010-64 |
| **EXPOSED DATA** | | |
| Area | 1510 FT² | 2.63 IN² |
| Span, (equivalent) | 86.6 FT | 3.726 IN |
| Aspect Ratio | 5.09 | 5.28 |
| Taper Ratio | .409 | .393 |
| Chords | | |
| Root | 24.1 FT | 1.012 IN |
| Tip | 9.85 FT | .398 IN |
| MAC | 18.0 FT | .750 IN |
| Fus. Sta. of .25 MAC | 1038 IN | 3.48 IN |
| W.P. of .25 MAC | | |
| B.L. of .25 MAC | 404 IN | 1.295 IN |

NOTE: FUS. STATION REFERENCE TO ORBITER

MODEL COMPONENT: H - HORIZONTAL TAIL

GENERAL DESCRIPTION: 0.003366 SCALE GRUMMAN C-4 ORBITER

DRAWING NUMBER: B34L0190-504 518 MOD 413

| DIMENSIONS: | FULL-SCALE | MODEL SCALE |
|---|---|---|
| **TOTAL DATA** | | |
| Area | | |
| Planform | 1032 FT² | |
| Wetted | | |
| Span (equivalent) | 75 FT | |
| Aspect Ratio | 5.45 | |
| Rate of Taper | | |
| Taper Ratio | .407 | |
| Diehedral Angle, degrees | 0° | |
| Incidence Angle, degrees | | |
| Aerodynamic Twist, degrees | 0° | |
| Toe-In Angle | | |
| Cant Angle | | |
| Sweep Back Angles, degrees | | |
| Leading Edge | 17° | 17° |
| Trailing Edge | 0° | 0° |
| 0.25 Element Line | | |
| Chords: | | |
| Root (Wing Sta. 0.0) | 19.583FT | |
| Tip, (equivalent) | 8.00 FT | .373 IN |
| MAC | 173" | |
| Fus. Sta. of .25 MAC | 1656 IN | |
| W.P. of .25 MAC | | |
| B.L. of .25 MAC | 195 IN | |
| Airfoil Section | | |
| Root | 0010-64 | 0010-64 |
| Tip | 0010-64 | 0010-64 |
| **EXPOSED DATA** | | |
| Area | 525 FT | .981 IN² |
| Span, (equivalent) | | 2.046 IN |
| Aspect Ratio | 3.86 | 4.27 |
| Taper Ratio | .533 | .500 |
| Chords | | |
| Root | 177 IN | .636 IN |
| Tip | 96 IN | .323 IN |
| MAC | 142 IN | .470 IN |
| Fus. Sta. of .25 MAC | 1680 IN | 4.551 IN |
| W.P. of .25 MAC | | |
| B.L. of .25 MAC | 303 IN | .956 IN |

NOTE: FUS. STATION REFERENCE TO ORBITER

MODEL COMPONENT: V - VERTICAL TAIL

GENERAL DESCRIPTION: 0.003366 SCALE GRUMMAN C-4 ORBITER

DRAWING NUMBER: B34L0190-504 518 MOD 413

| DIMENSIONS: | FULL-SCALE | MODEL SCALE |
|---|---|---|
| **TOTAL DATA** | | |
| Area | | |
| Planform | 925 FT$^2$ | |
| Wetted | | |
| Span (equivalent) | | |
| Aspect Ratio | 1.67 | |
| Rate of Taper | | |
| Taper Ratio | .33 | |
| Diehedral Angle, degrees | | |
| Incidence Angle, degrees | | |
| Aerodynamic Twist, degrees | | |
| Toe-In Angle | | |
| Cant Angle | | |
| Sweep Back Angles, degrees | | |
| Leading Edge | 47 | |
| Trailing Edge | | |
| 0.25 Element Line | | |
| Chords: | | |
| Root (Wing Sta. 0.0) | | |
| Tip, (equivalent) | 136 IN | |
| MAC | 293 IN | |
| Fus. Sta. of .25 MAC | 1567 | |
| W.P. of .25 MAC | 122 IN. ABOVE FRL | |
| B.L. of .25 MAC | 0.0 | |
| Airfoil Section | | |
| Root | | |
| Tip | | |
| **EXPOSED DATA** | | |
| Area | 535 FT$^2$ | .768 IN$^2$ |
| Span, (equivalent) | | 1.037 IN |
| Aspect Ratio | | .74 |
| Taper Ratio | .434 | .433 |
| Chords | | |
| Root | 308 IN | 1.037 IN |
| Tip | 136 IN | .448 IN |
| MAC | 230 IN | .774 IN |
| Fus. Sta. of .25 MAC | 1662 | 4.887 |
| W.P. of .25 MAC | 230 IN. ABOVE | .774 IN. ABOVE |
| B.L. of .25 MAC | 0.0 FRL | 0.0 FRL |

NOTE: FUS. STATION REFERENCE TO ORBITER

MODEL COMPONENT: FIN – $F_1$, $F_2$

GENERAL DESCRIPTION: 0.003366 SCALE 900 FT² FINS
$F_1$ MOUNTED AT 30° ; $F_2$ MOUNTED AT 45°

DRAWING NUMBER:

DIMENSIONS: EACH FIN 4 TOTAL

| | FULL-SCALE | MODEL SCALE |
|---|---|---|
| **TOTAL DATA** | | |
| Area | | |
| Planform | | 1.541 IN² |
| Wetted | | 1.381 IN² |
| Span (equivalent) | | |
| Aspect Ratio | | |
| Rate of Taper | | |
| Taper Ratio | | |
| Dihedral Angle, degrees | | |
| Incidence Angle, degrees | | |
| Aerodynamic Twist, degrees | | |
| Toe-In Angle | | |
| Cant Angle | | |
| Sweep Back Angles, degrees | | |
| Leading Edge | 30° | 30° |
| Trailing Edge | 0° | 0° |
| 0.25 Element Line | | |
| Chords: | | |
| Root (Wing Sta. 0.0) | | |
| Tip, (equivalent) | | |
| MAC | | |
| Fus. Sta. of .25 MAC | | |
| W.P. of .25 MAC | | |
| B.L. of .25 MAC | | |
| Airfoil Section | | |
| Root | | |
| Tip | | |
| **EXPOSED DATA** | | |
| Area | 154230 IN² | 1.541 IN² |
| Span, (equivalent) | 485 IN | 1.237 IN. |
| Aspect Ratio | 1.525 | 1.237 |
| Taper Ratio | | .474 |
| Chords | | |
| Root | 450 IN | 1.515 IN. |
| Tip | 186 IN | .717 IN. |
| MAC | | 1.242 IN |
| Fus. Sta. of .25 MAC | | .895 IN. |
| W.P. of .25 MAC | | 1.276 IN. |
| B.L. of .25 MAC | | 1.275 IN |

TEST MSFC TWT 470 DATA SET COLLATION SHEET

☐ PRETEST

☒ POSTTEST

| DATA SET IDENTIFIER | CONFIGURATION | SCHD. α | SCHD. β | PARAMETERS/VALUES $i_o$ | $i_{wo}$ | $i_{ho}$ | $Q_B$ | NO. of RUNS | MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE) 0.6 | 0.9 | 1.0 | 1.1 | 1.2 | 1.46 | 1.96 | 1.3 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| R24011 | BF, OWHVS | A | 0 | 0 | +4 | 0 | 0 | 7 | 001/1 | 002/2 | 003/1 | 004/0 | 005/0 | 006/0 | 007/0 | |
| R24021 | | A | | 0 | | | | 7 | 028/0 | 027/0 | 026/0 | 025/0 | 024/0 | 023/0 | 022/0 | |
| R24031 | | C | | -2 | | | | 7 | 029/0 | 030/0 | 031/0 | 032/0 | 033/0 | 034/0 | 035/0 | |
| R24041 | | | | -4 | | | | 7 | 036/0 | 037/0 | 038/0 | 039/0 | 040/0 | 041/0 | 042/0 | |
| R24051 | BOWHVS | | | 0 | | | | 7 | 043/0 | 044/0 | 045/0 | 046/0 | 047/0 | 048/0 | 049/0 | |
| R24061 | | | | -2 | | | | 7 | 050/0 | 051/0 | 052/0 | 053/0 | 054/0 | 055/0 | 056/0 | |
| R24071 | | | | -4 | | | | 7 | 057/0 | 058/0 | 059/0 | 060/0 | 061/0 | 062/0 | 063/0 | |
| R24081 | BF, OWHVS | | | -1.05 | | | | 8 | 064/0 | 065/0 | 066/0 | 067/0 | 068/2 | 069/1 | 070/0 | 170/0 |
| R24091 | | | | | -4 | -5 | | 7 | 071/0 | 072/0 | 073/0 | 074/0 | 075/0 | 076/0 | 077/0 | |
| R24101 | BOHVS | | | | — | 0 | | 1 | | | 171/0 | | | | | |
| R24111 | BF, OHVS | | | | — | | | 4 | | | 087/0 | 088/0 | 089/0 | 090/0 | | |
| R24121 | $BF_2$ OWHVS | | | | +4 | | 45 | 4 | | | 094/0 | | 096/0 | 097/0 | | 175/0 |
| R24131 | | ↓ | ↓ | | | | 0 | 4 | | | 101/0 | | 103/0 | 104/0 | | 174/0 |
| R24132 | | 0 | B | | | | | 7 | 106/0 | 107/0 | 108/0 | | 110/0 | 111/0 | 112/0 | 173/0 |
| R24022 | BF, OWHVS | 0 | B | | | | | 8 | 113/0 | 114/0 | 115/2 | 116/0 | 117/0 | 118/0 | 119/0 | 172/0 |
| R24141 | | C | 0 | | +2 | | | 4 | | | 143/0 | 144/0 | 145/0 | 146/0 | | |
| R24151 | BF, OWHV | | | | +4 | | | 4 | | | 150/0 | 151/0 | 152/0 | 153/0 | | |
| R24161 | BF, OW, HVS | ↓ | ↓ | ↓ | +4 | ↓ | ↓ | 8 | 162/0 | 163/0 | 164/0 | 165/0 | 166/0 | 167/0 | 168/0 | 169/0 |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

1 7 13 19 25 31 37 43 49 55 61 67 75 76

CLM, ICN, ICYN, ICY, ICBL, ICA, CAF, ICPB1, ICPB2, ICPCAV | 10

→ IDPVAR(1) | IDPVAR(2) | NDV

COEFFICIENTS:

α or β SCHEDULES

$\alpha A = -10, -8, -6, -4, -3, -2, -1, 0, 1, 2, 3, 4, 6, 8, 10$

$\alpha C = -8, -6, -4, -3, -2, -1, 0, 1, 2, 3, 4, 6, 8$

$\beta B = -1.5, -1.0, 0, 1, 2, 4, 6, 8, 10, 12, 14, 16$

TEST MSFC TWT 470 DATA SET DESCRIPTOR SHEET

| DATA SET IDENTIFIER | DATA SET DESCRIPTOR (1 / 11 / 21 / 31 / 41) | Mode Type | CURVE SLOPE RANGE (51) LOWER LIMIT | (61) UPPER LIMIT |
|---|---|---|---|---|
| R24011 | TWT470 S-IC/GAC ØREITER BF1ØWHVS NØ TRIP STRIP | 1,1 | | |
| R24021 | FINS ØN | 1,1 | | |
| R24031 | FINS ØN | 1,1 | | |
| R24041 | FINS ØN | 1,1 | | |
| R24051 | BØWHVS FINS ØFF | 1,1 | | |
| R24061 | FINS ØFF | 1,1 | | |
| R24071 | FINS ØFF | 1,1 | | |
| R24081 | BF1ØWHVS BASIC | 1,1 | | |
| R24091 | BASIC | 1,1 | | |
| R24101 | BØHVS WING, FINS ØFF | 1,1 | | |
| R24111 | BF1ØHVS WING ØFF | 1,1 | | |
| R24121 | BF2ØWHVS PHIB = 45 | 1,1 | | |
| R24131 | PHIB = 0 | 1,1 | | |
| R24132 | CRUCIFORM | 2,1 | | |
| R24082 | BF1ØWHVS BASIC | 2,1 | | |
| R24141 | WING INC = 2 | 1,1 | | |
| R24151 | BF1ØWHV STRONGBACK ØFF | 1,1 | | |
| R24161 | BF1ØW1HVS WING SPOILERS | 1,1 | | |
| | | | | |
| | | | | |

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

| YMRP(1) | YMRP(2) | ZMRP(1) | ZMRP(2) | SCALE(1) | SCALE(2) | FILREF |
|---|---|---|---|---|---|---|
| 0.0 | IN. | 0.0 | IN. | 0.3366 | PERCNT | |



NASA-MSFC-MAF

## TEST FACILITY DESCRIPTION

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

Air is supplied to a 6000 cubic foot storage tank at approximately $-40^{\circ}F$ 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 $180^{\circ}F$. 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 $20^{\circ}$ ( $\pm 10^{\circ}$ ). Sting offsets are available for obtaining various maximum angles of attack up to $25^{\circ}$.

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

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

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

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

## NOMENCLATURE

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

NOMENCLATURE (continued)

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

NOMENCLATURE (continued)

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

NOMENCLATURE (continued)

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

NOMENCLATURE (continued)

| SYMBOL | SADSAC SYMBOL | DEFINITION |
|---|---|---|
| $M_{x,w}$ | | rolling moment in the wind axis system; N-m, ft-lb |
| $M_y$ | | pitching moment in the body (or stability) axis system; N-m, ft-lb |
| $M_{y,w}$ | | pitching moment in the wind axis system; N-m, ft-lb |
| $M_z$ | | yawing moment in the body axis system; N-m, ft-lb |
| $M_{z,w}$ | | yawing moment in the wind axis system; N-m, ft-lb |
| p | | static pressure; $N/m^2$; psi |
| P | | total pressure; $N/m^2$; psi |
| q | Q(PSI)<br>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; $m^2$, $ft^2$, $in^2$ |
| T | | temperature; °K, °C, °R, °F |
| V | | speed of vehicle relative to surrounding atmosphere; m/sec, ft/sec |

## NOMENCLATURE (continued)

| SYMBOL | SADSAC SYMBOL | DEFINITION |
|---|---|---|
| $i_T$ | | tail incidence positive when trailing edge down, deg |
| $\overline{V}$ | | velocity of vehicle relative to surrounding atmosphere; m/sec, ft/sec |
| $\alpha$ | 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 |
| $\beta$ | BETA | sideslip angle, angle between the wind $X_W$-axis and the projection of this axis on the body X-Z-plane; deg |
| $\gamma$ | | ratio of specific heats |
| $\Gamma$ | DIHDRL | wing dihedral angle; deg |
| $\delta$ | | 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)

| SYMBOL | SADSAC SYMBOL | DEFINITION |
|---|---|---|
| $\theta$ | | pitch angle, angle of rotation about the body Y-axis, positive when the positive Z-axis is rotated toward the positive X-axis; deg |
| $\phi$ | 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 |
| $\psi$ | 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 |
| $\Phi_B$ | PHIB | roll angle of booster with respect to orbiter |

NOMENCLATURE (continued)

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

FIGURES

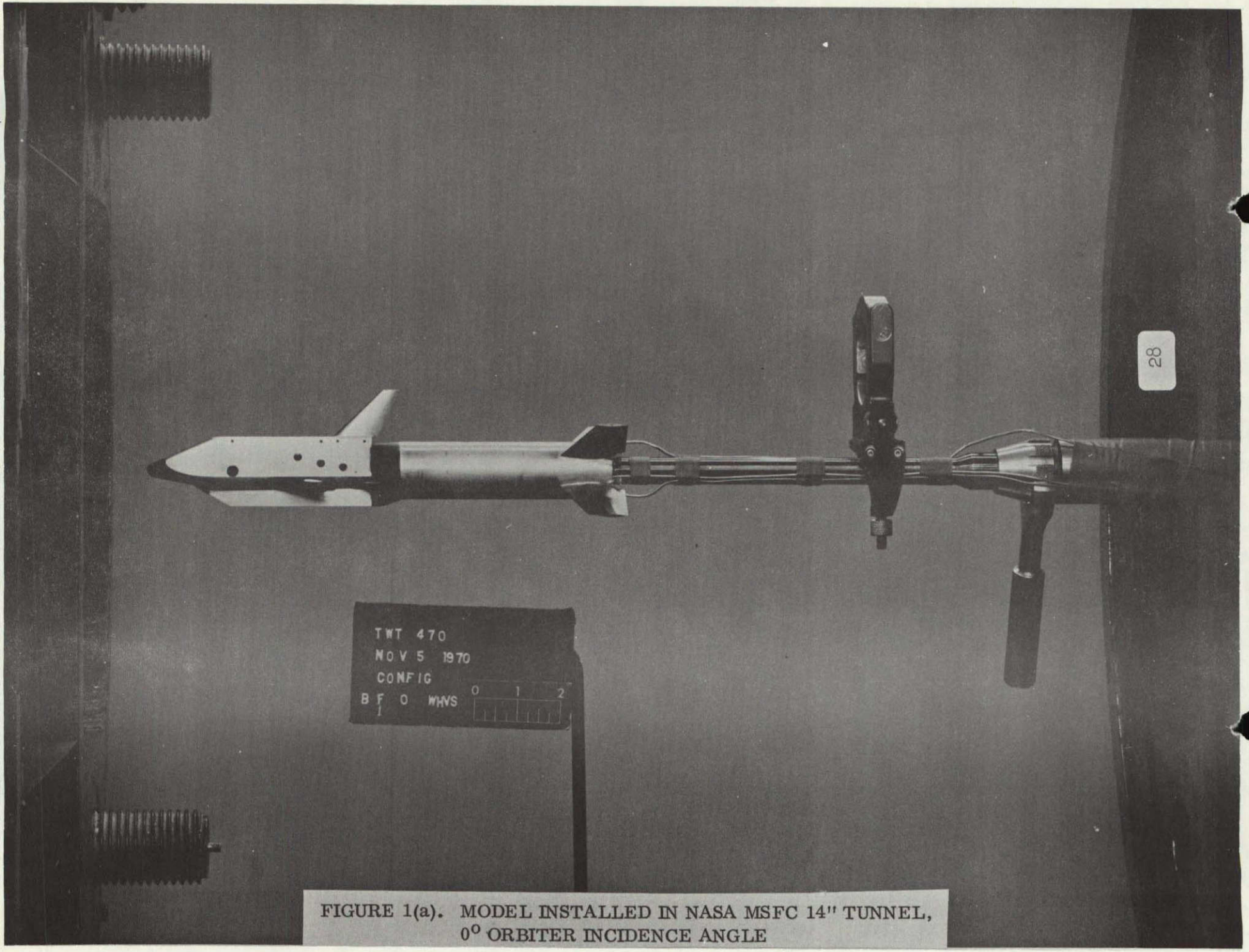



FIGURE 1(a). MODEL INSTALLED IN NASA MSFC 14" TUNNEL, $0^{o}$ ORBITER INCIDENCE ANGLE

NOT REPRODUCIBLE

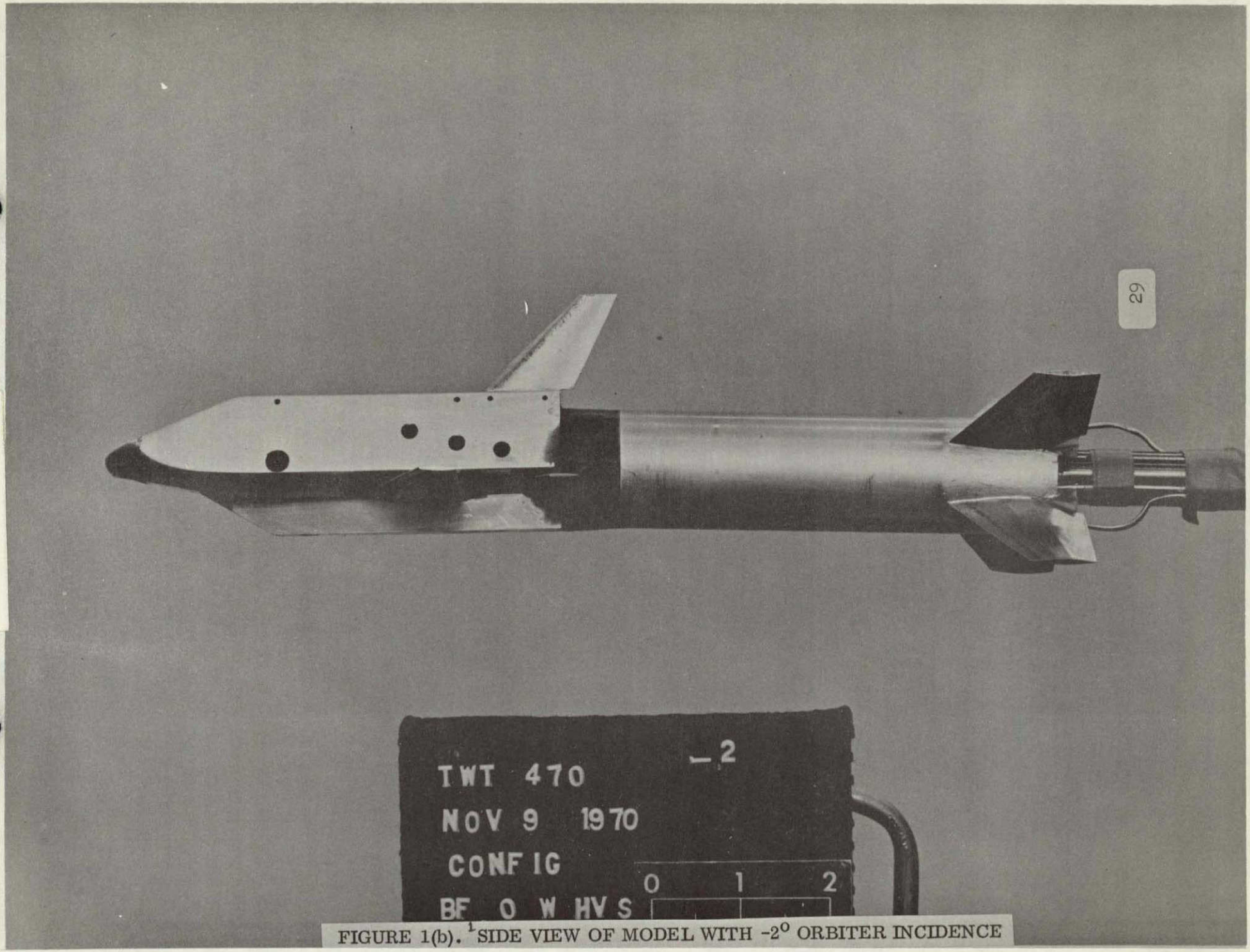



FIGURE 1(b). SIDE VIEW OF MODEL WITH $-2^{o}$ ORBITER INCIDENCE

FIGURE 1(c). TOP VIEW OF MODEL SHOWING TRIP STRIP DETAILS

NOT REPRODUCIBLE

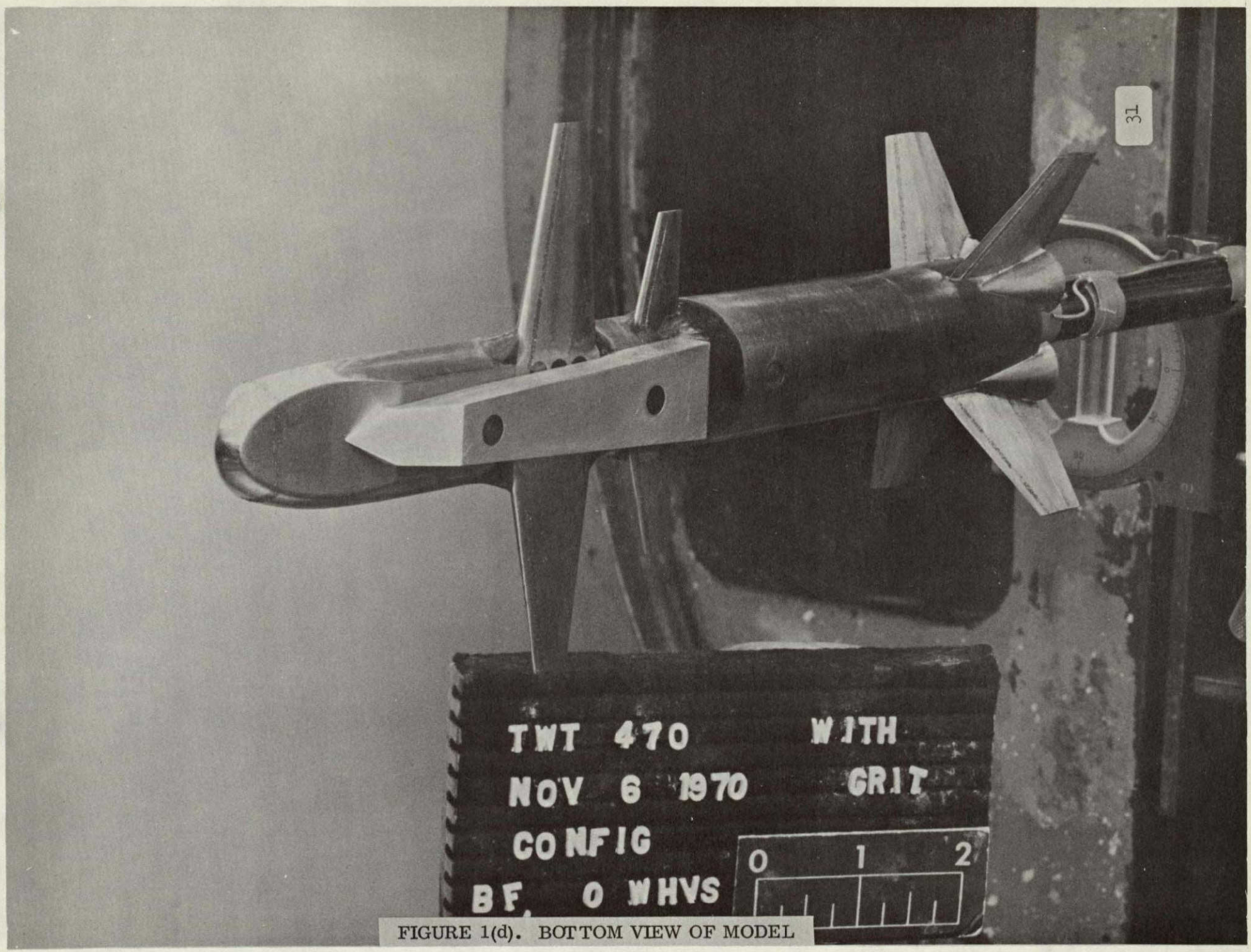



FIGURE 1(d). BOTTOM VIEW OF MODEL

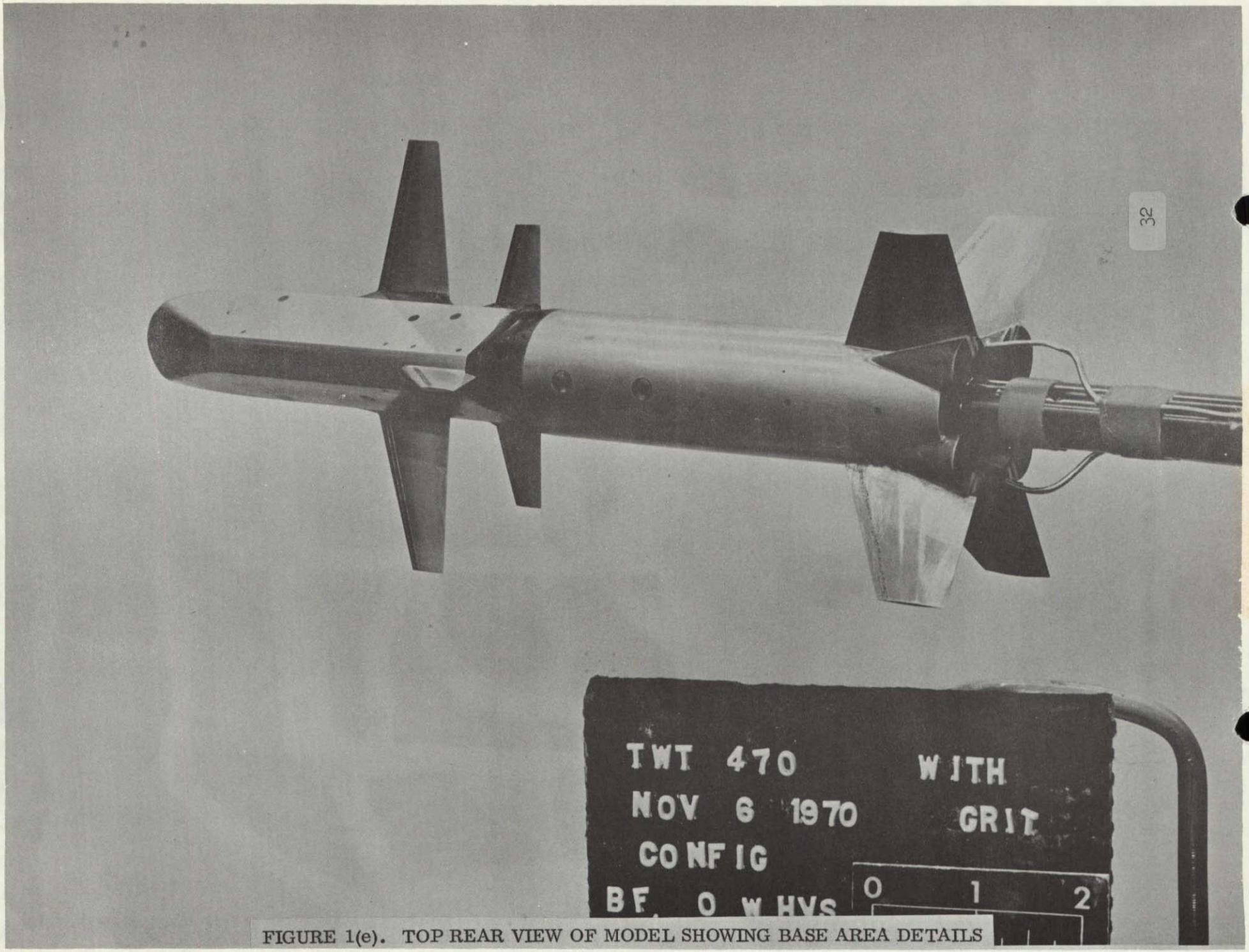
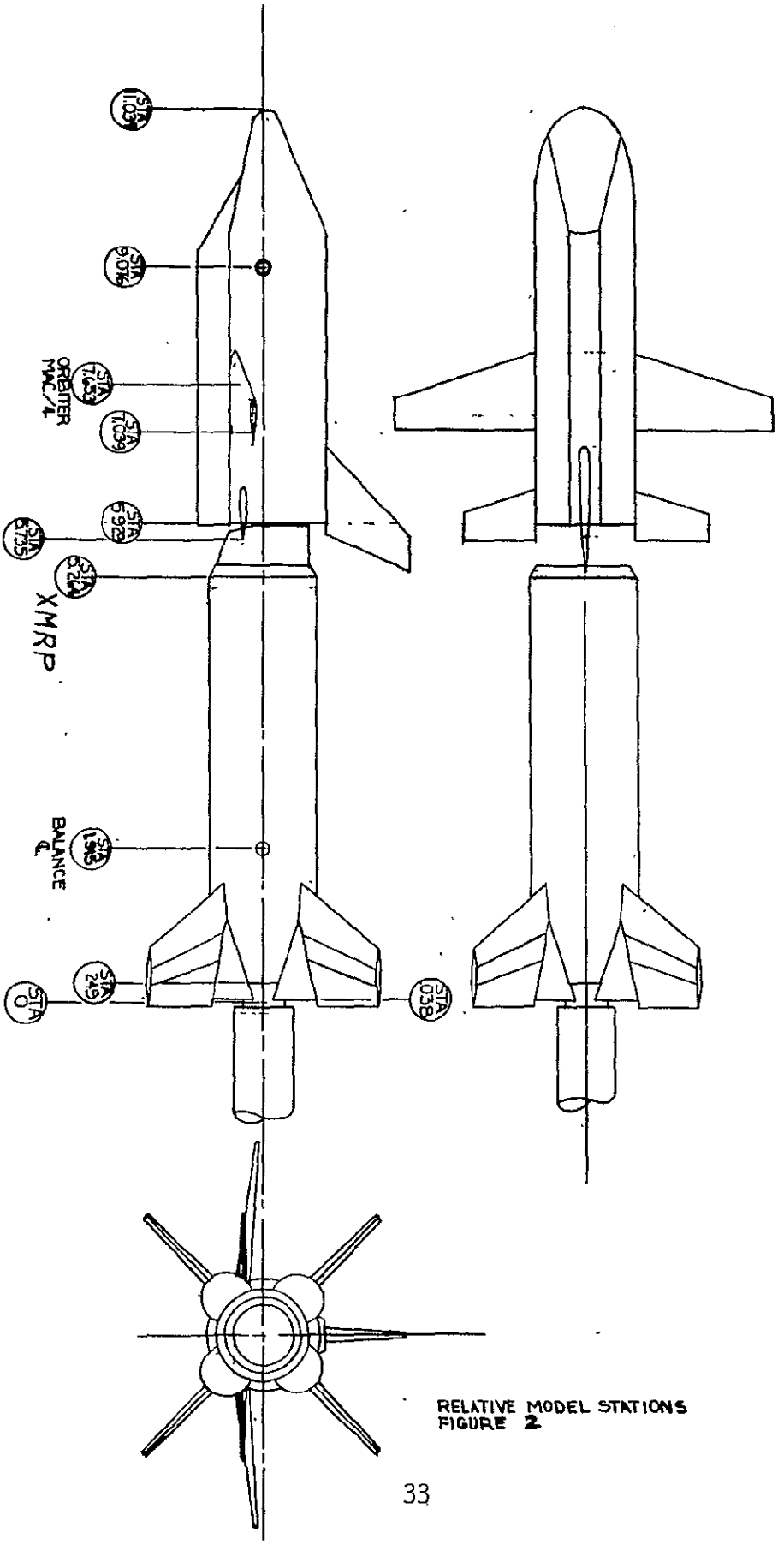
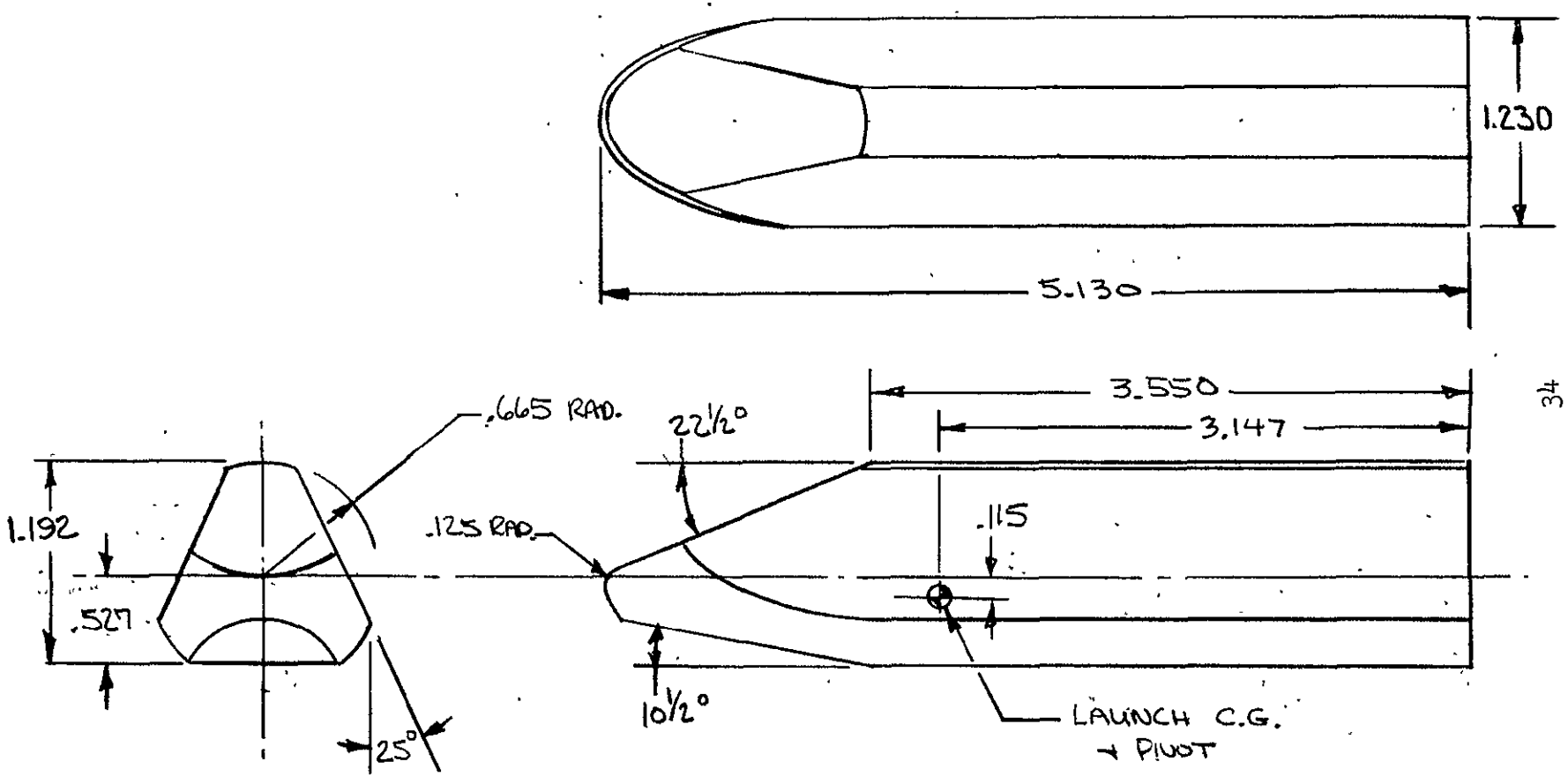


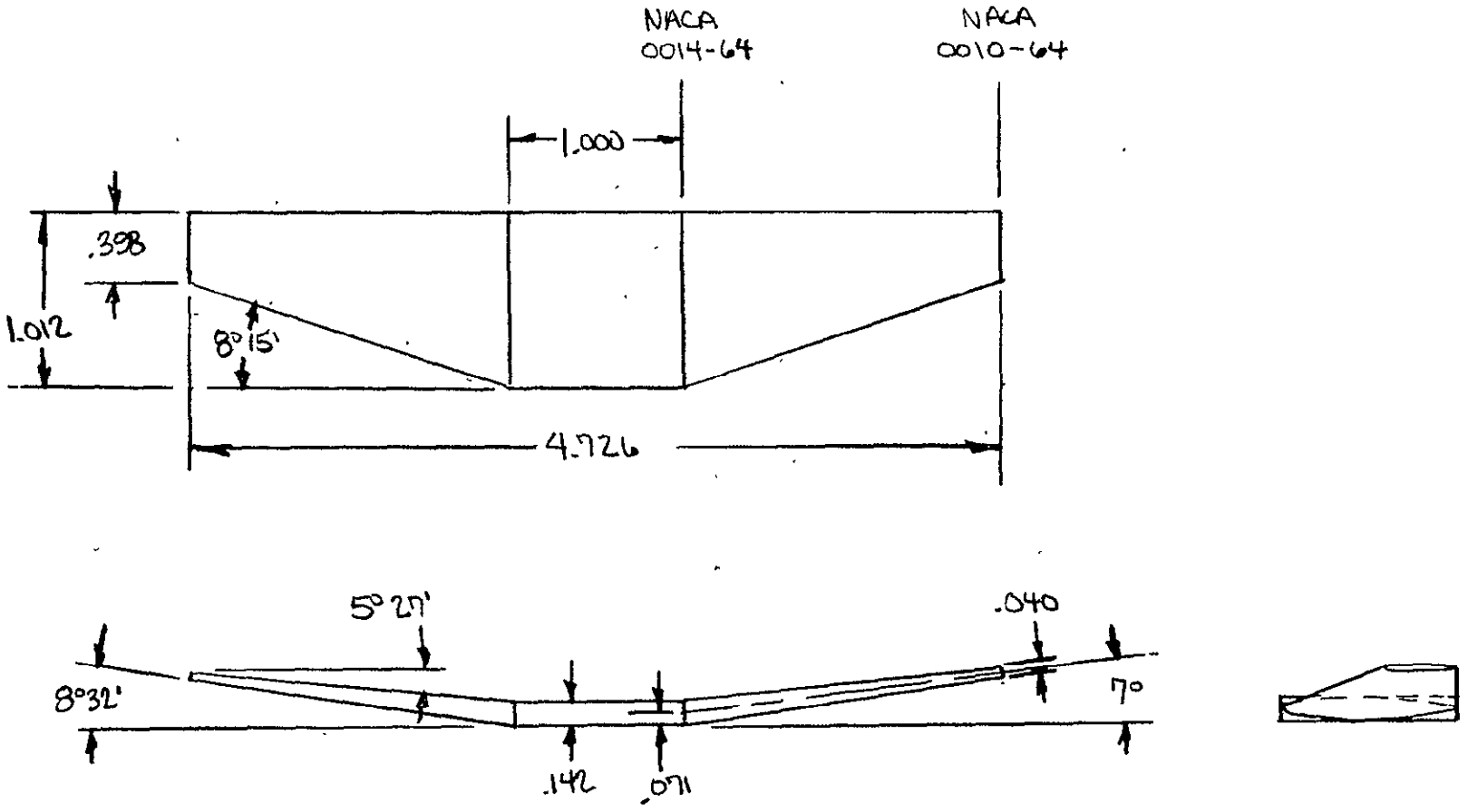

FIGURE 1(e). TOP REAR VIEW OF MODEL SHOWING BASE AREA DETAILS



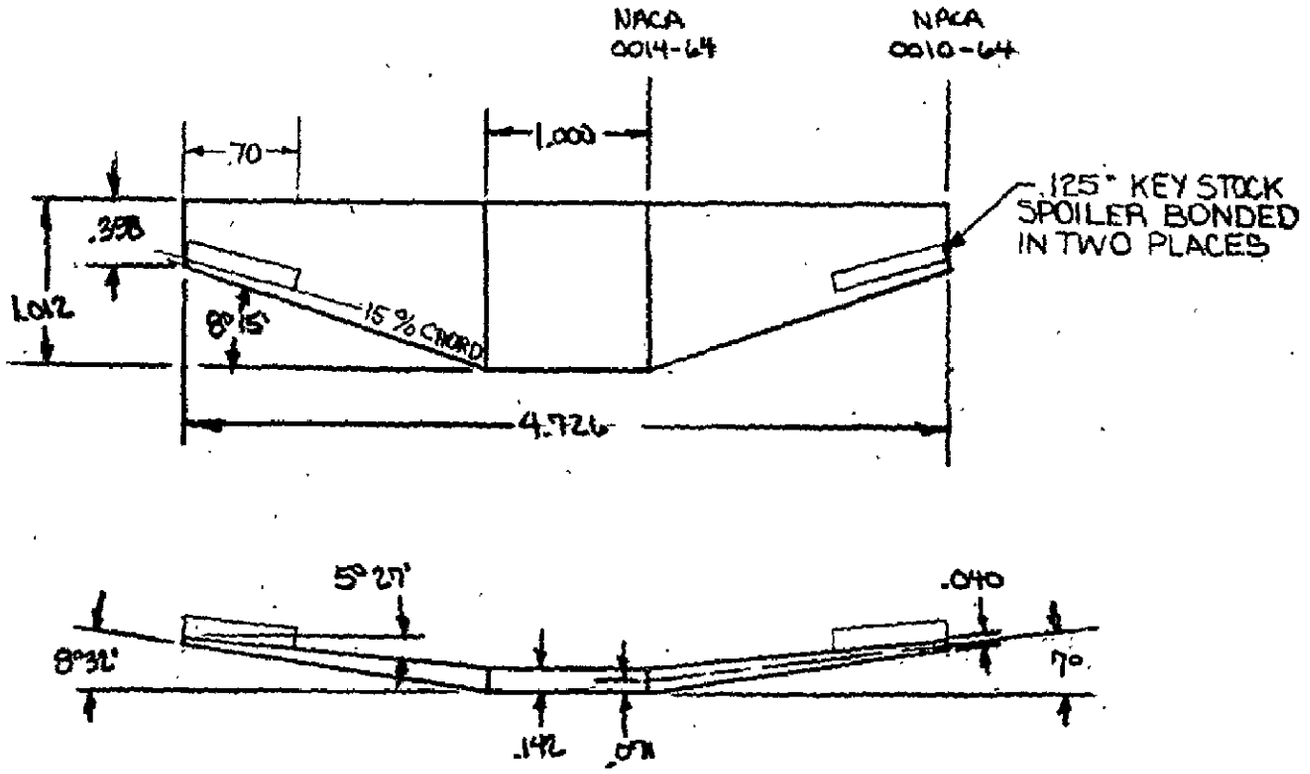

RELATIVE MODEL STATIONS
FIGURE 2



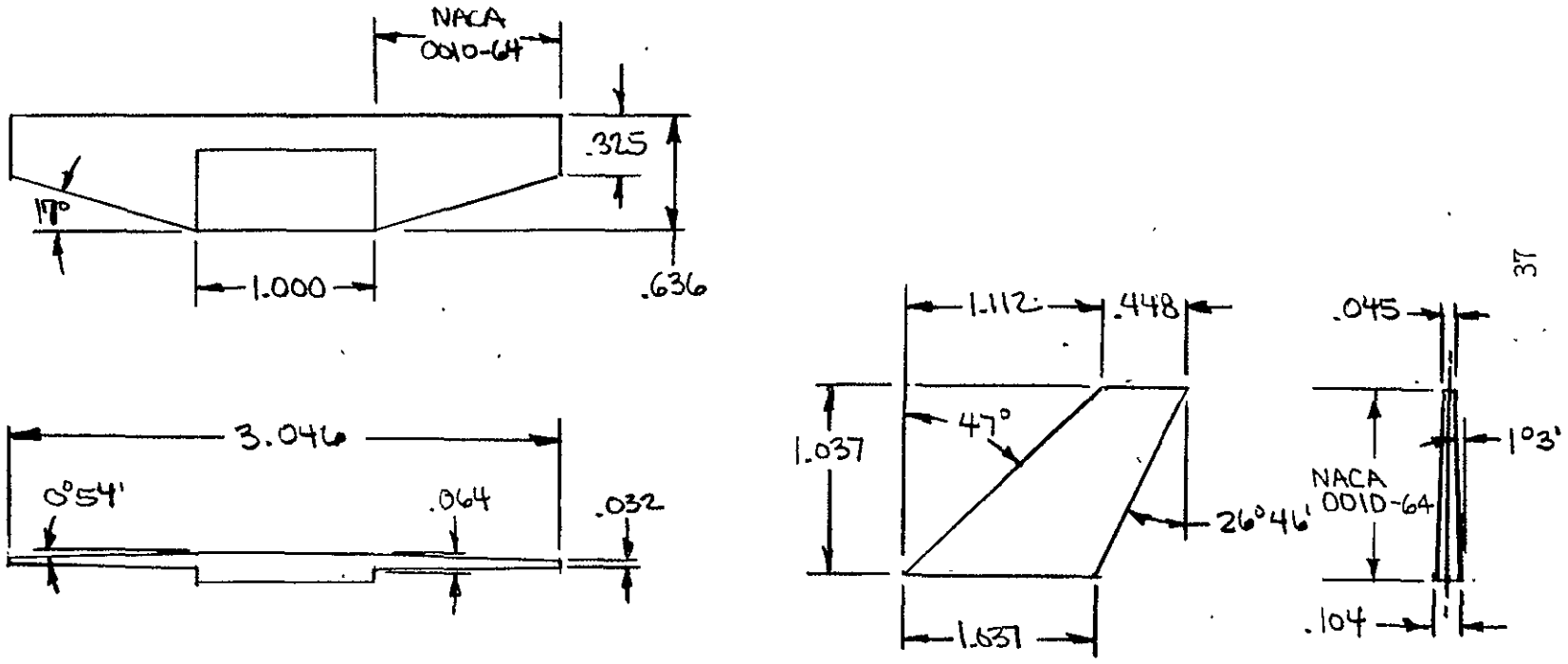

ORBITER BODY - 0
FIGURE 3



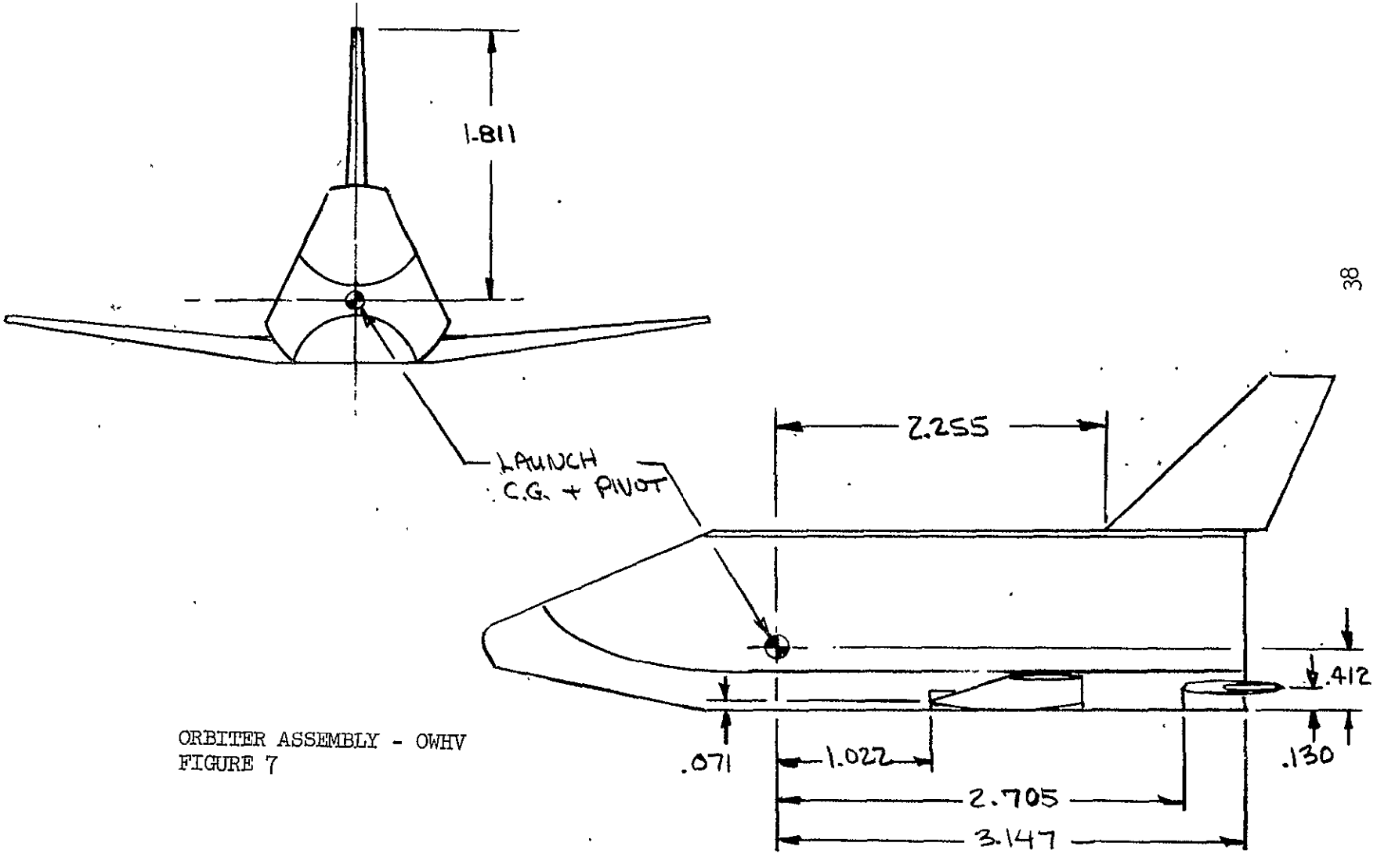

ORBITER WING - W
FIGURE 4



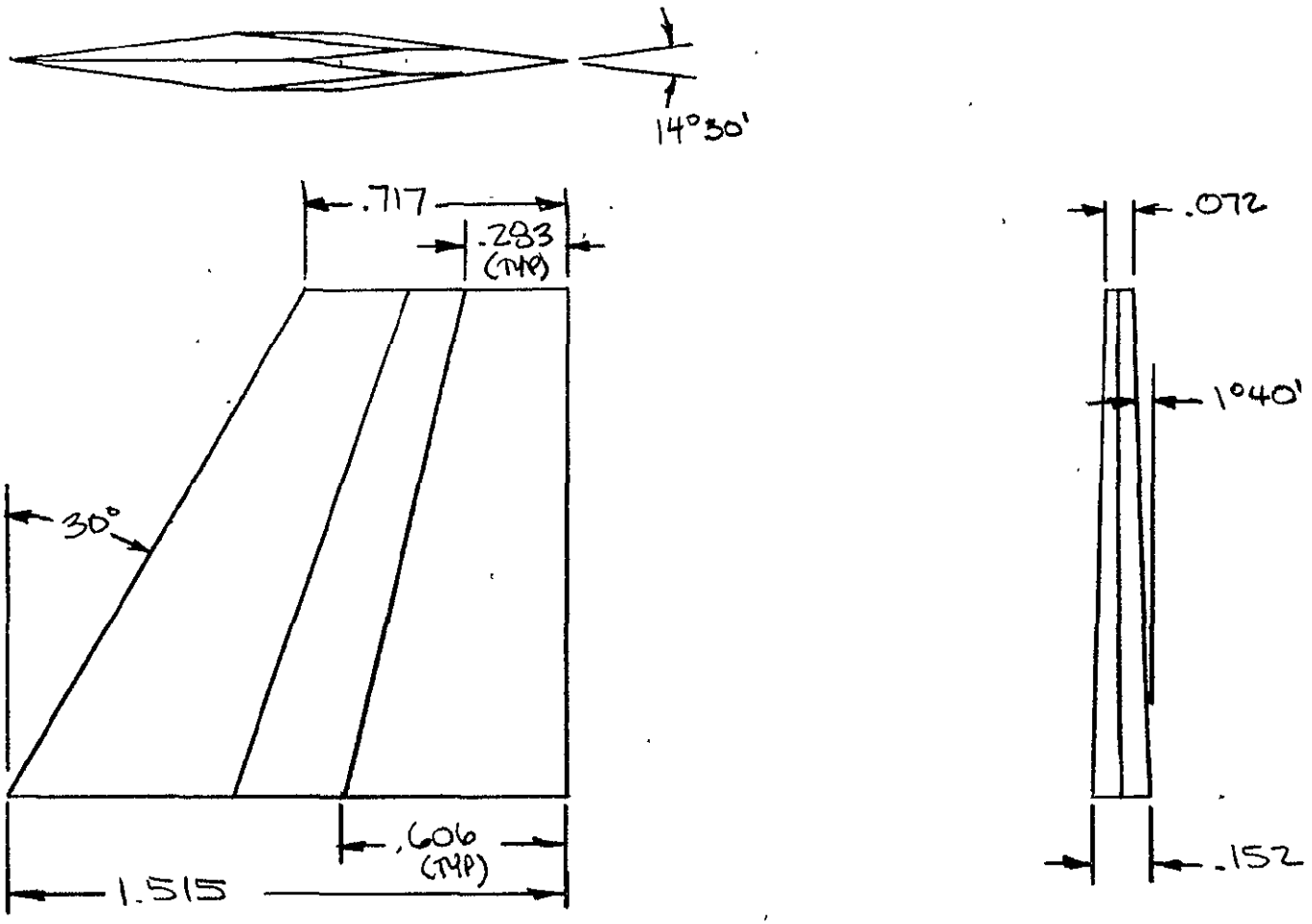

ORBITER WING WITH SPOILERS $W_1$
FIGURE 5



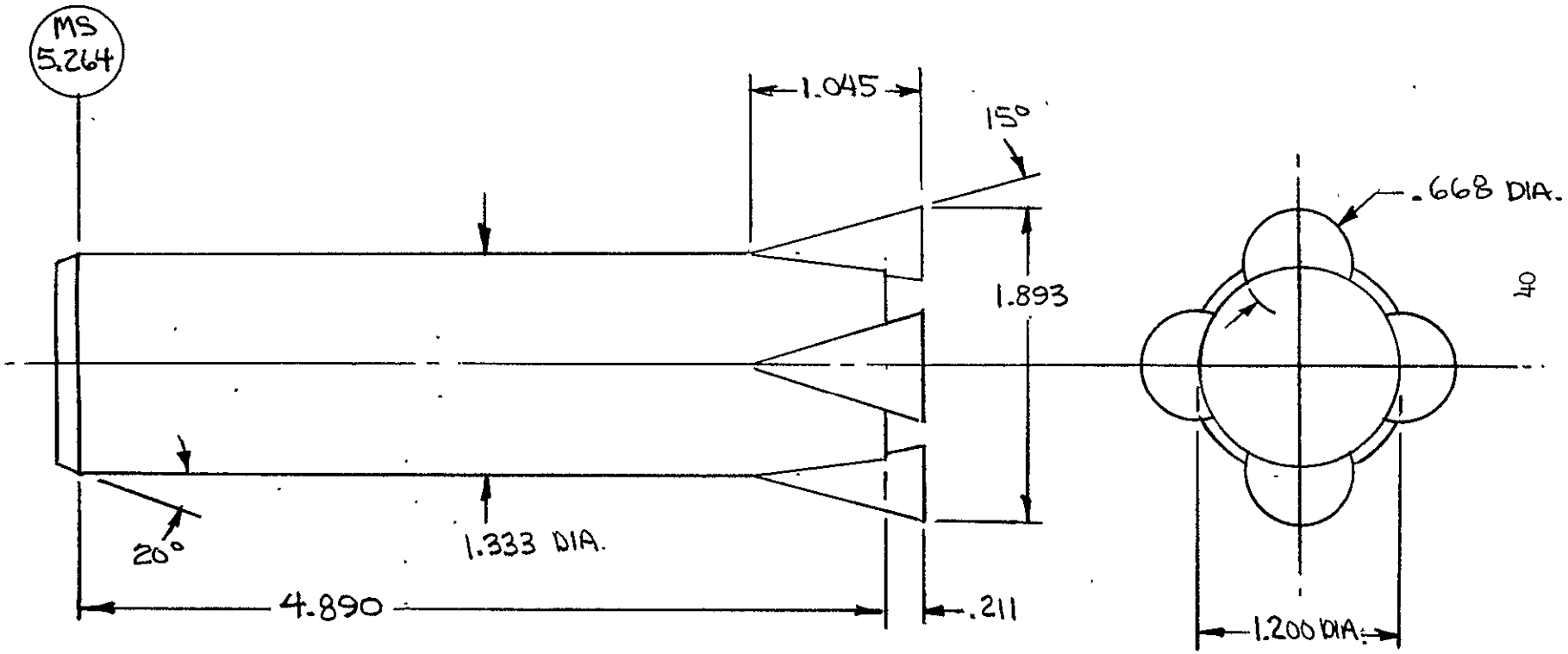

ORBITER HORIZONTAL TAIL H,
VERTICAL TAIL - V
FIGURE 6



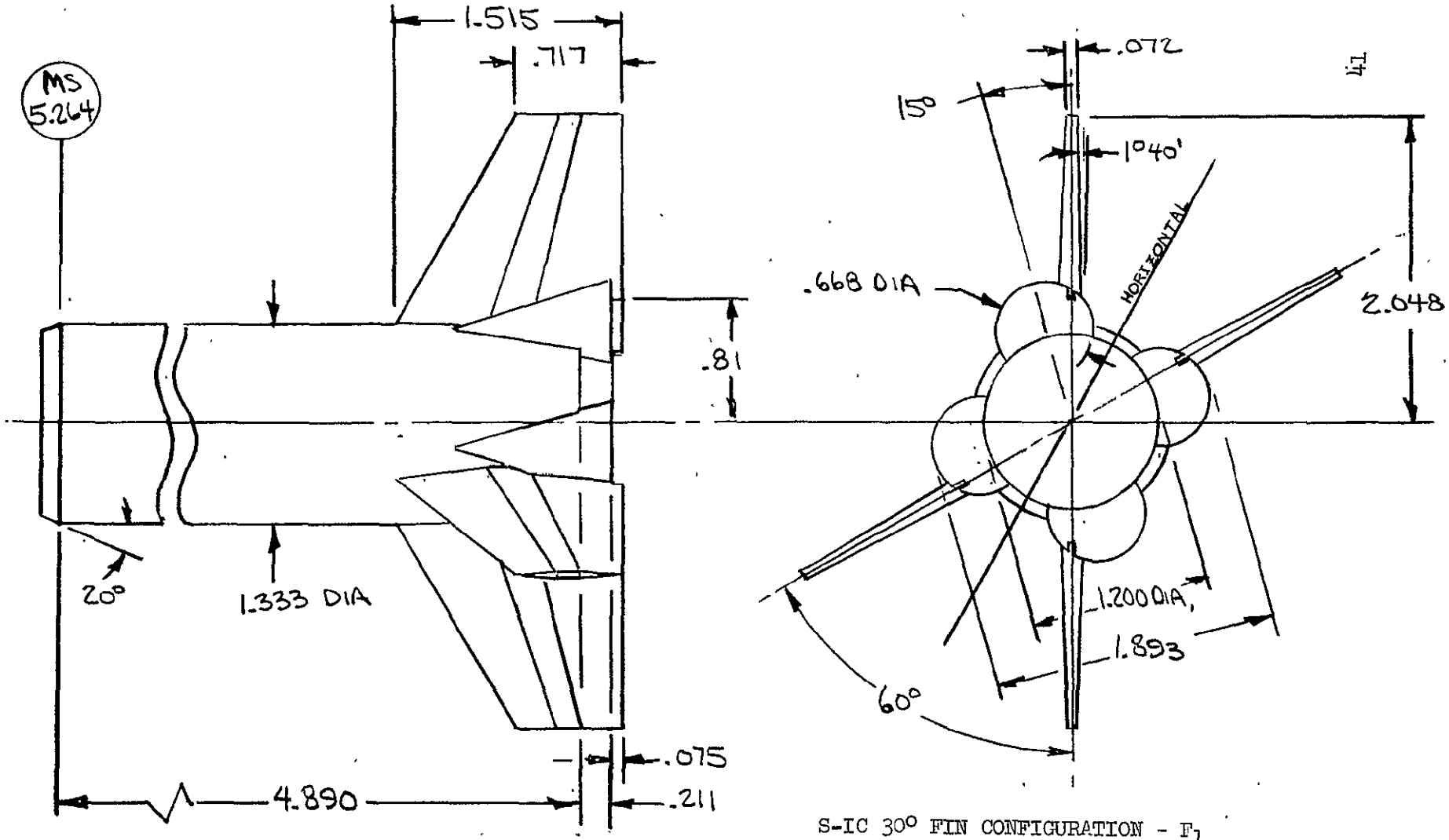

ORBITER ASSEMBLY - OWHV
FIGURE 7



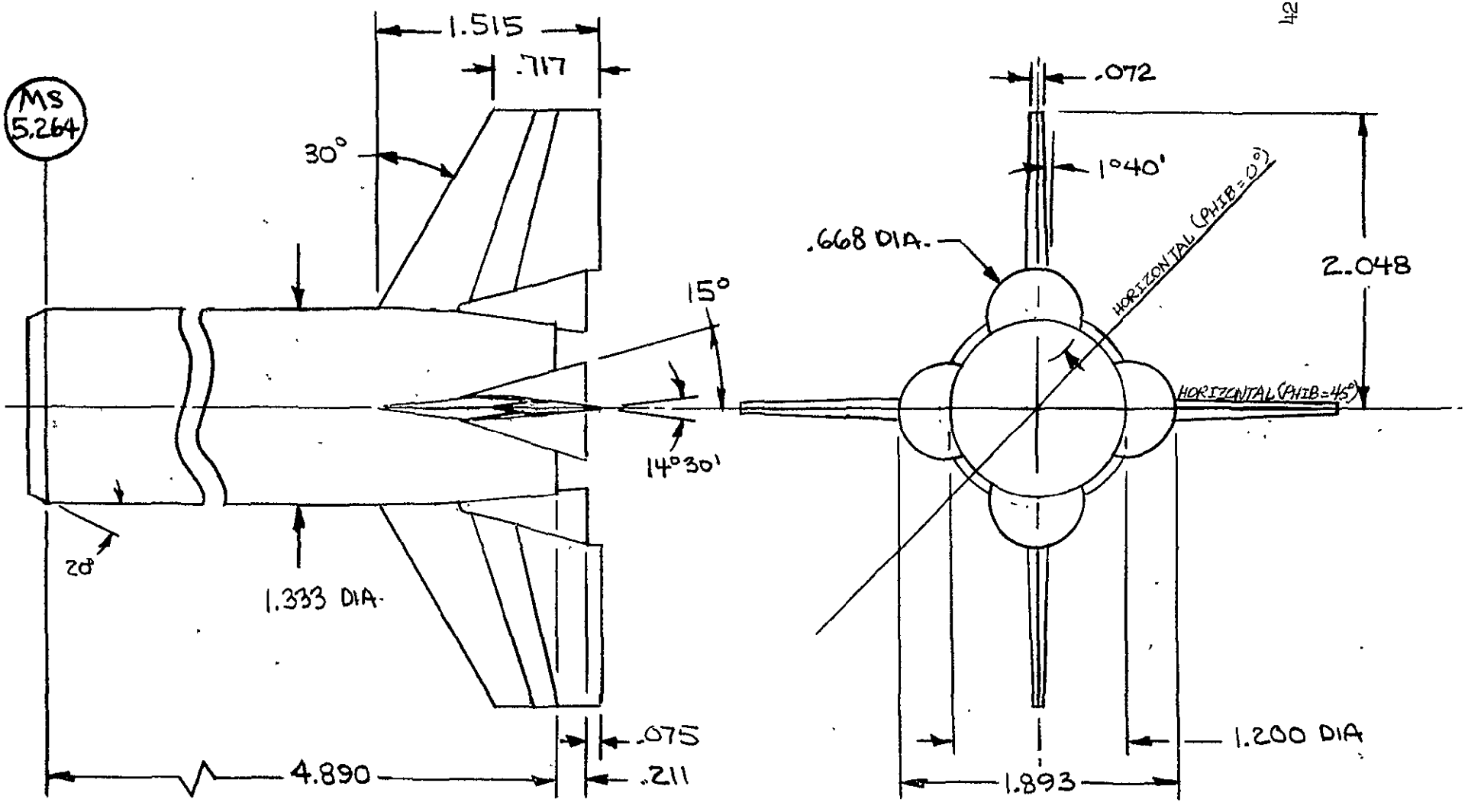

900 FT$^2$ S-IC FIN
FIGURE 8



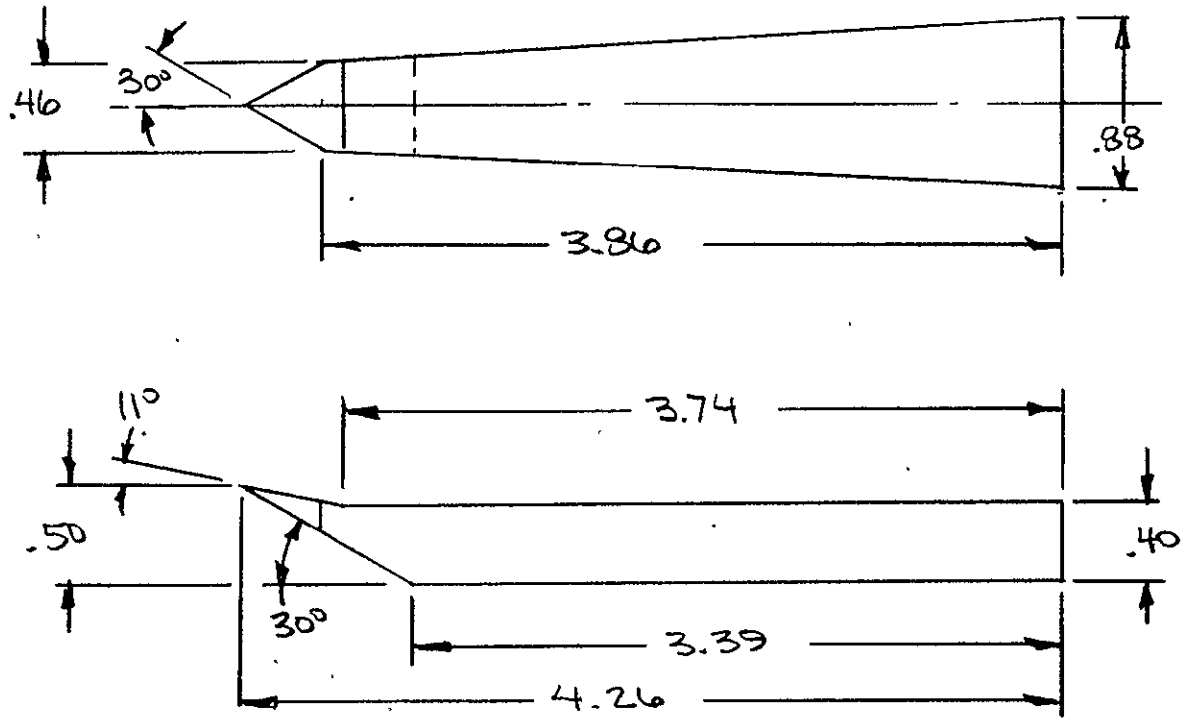

S-IC BODY - B
FIGURE 9



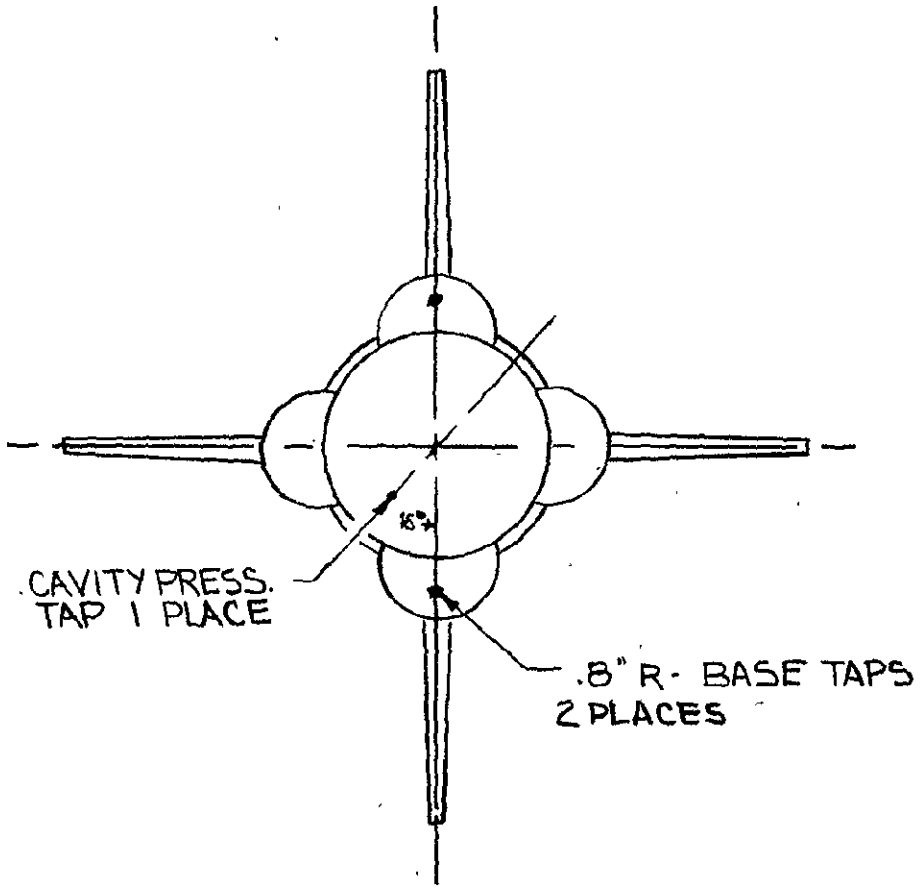

S-IC 30° FIN CONFIGURATION - $F_1$
FIGURE 10




S-IC 45° FIN CONFIGURATION - $F_2$
FIGURE 11




STRONGBACK - S
FIGURE 12




BASE PRESSURE TAP LOCATIONS
FIGURE 13

## DATA PLOT INDEX

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=0.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| J24011 | CN | ALPHA | 1 | 1 |
| J24011 | CLM | ALPHA | 2 | 2 |
| J24011 | CAF | ALPHA | 3 | 3 |
| J24021 | CN | ALPHA | 4 | 4 |
| J24021 | CLM | ALPHA | 5 | 5 |
| J24021 | CAF | ALPHA | 6 | 6 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=-2.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| J24031 | CN | ALPHA | 7 | 7 |
| J24031 | CLM | ALPHA | 8 | 8 |
| J24031 | CAF | ALPHA | 9 | 9 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=-4.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| J24041 | CN | ALPHA | 10 | 10 |
| J24041 | CLM | ALPHA | 11 | 11 |
| J24041 | CAF | ALPHA | 12 | 12 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS OFF, ORBINC=0.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| J24051 | CN | ALPHA | 13 | 13 |
| J24051 | CLM | ALPHA | 14 | 14 |
| J24051 | CAF | ALPHA | 15 | 15 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS OFF, ORBINC=-2.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| J24061 | CN | ALPHA | 16 | 16 |
| J24061 | CLM | ALPHA | 17 | 17 |
| J24061 | CAF | ALPHA | 18 | 18 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS OFF, ORBINC=-4.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| J24071 | CN | ALPHA | 19 | 19 |
| J24071 | CLM | ALPHA | 20 | 20 |
| J24071 | CAF | ALPHA | 21 | 21 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=-1.05

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| A24081 | CN | ALPHA | 22 | 23 |
| A24081 | CLM | ALPHA | 24 | 25 |
| A24081 | CAF | ALPHA | 26 | 27 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, HTAIL=-5.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
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| J24091 | CN | ALPHA | 28 | 28 |
| J24091 | CLM | ALPHA | 29 | 29 |
| J24091 | CAF | ALPHA | 30 | 30 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, WING AND FINS OFF

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| A24101 | CN | ALPHA | 31 | 31 |
| A24101 | CLM | ALPHA | 32 | 32 |
| A24101 | CAF | ALPHA | 33 | 33 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, WING OFF

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| A24111 | CN | ALPHA | 34 | 34 |
| A24111 | CLM | ALPHA | 35 | 35 |
| A24111 | CAF | ALPHA | 36 | 36 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, CRUCIFORM FINS, PHIB=45

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| A24121 | CN | ALPHA | 37 | 37 |
| A24121 | CLM | ALPHA | 38 | 38 |
| A24121 | CAF | ALPHA | 39 | 39 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, CRUCIFORM FINS, PHIB=0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| A24131 | CN | ALPHA | 40 | 40 |
| A24131 | CLM | ALPHA | 41 | 41 |
| A24131 | CAF | ALPHA | 42 | 42 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, WING INCIDENCE = 2.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| A24141 | CN | ALPHA | 43 | 43 |
| A24141 | CLM | ALPHA | 44 | 44 |
| A24141 | CAF | ALPHA | 45 | 45 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, STRONGBACK OFF

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| A24151 | CN | ALPHA | 46 | 46 |
| A24151 | CLM | ALPHA | 47 | 47 |
| A24151 | CAF | ALPHA | 48 | 48 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, WING SPOILERS

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| A24161 | CN | ALPHA | 49 | 50 |
| A24161 | CLM | ALPHA | 51 | 52 |
| A24161 | CAF | ALPHA | 53 | 54 |

MSFC TWT 470 LONGITUDINAL STABILITY, FINS ON, ORRINC=0.0

DEPENDENT VARIABLE VS DEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | DEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| J24011 | CN | CLM | 55 | 55 |
| J24021 | CN | CLM | 56 | 56 |

MSFC TWT 470 LONGITUDINAL STABILITY, FINS ON, ORRINC=-2.0

DEPENDENT VARIABLE VS DEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | DEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| J24031 | CN | CLM | 57 | 57 |

MSFC TWT 470 LONGITUDINAL STABILITY, FINS ON, ORRINC=-4.0

DEPENDENT VARIABLE VS DEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | DEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| J24041 | CN | CLM | 58 | 58 |

MSFC TWT 470 LONGITUDINAL STABILITY, FINS OFF, ORRINC=0.0

DEPENDENT VARIABLE VS DEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | DEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| J24051 | CN | CLM | 59 | 59 |

MSFC TWT 470 LONGITUDINAL STABILITY, FINS OFF, ORBINC=-2.0

DEPENDENT VARIABLE VS DEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | DEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| J24061 | CN | CLM | 60 | 60 |

MSFC TWT 470 LONGITUDINAL STABILITY, FINS OFF, ORBINC=-4.0

DEPENDENT VARIABLE VS DEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | DEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| J24071 | CN | CLM | 61 | 61 |

MSFC TWT 470 LONGITUDINAL STABILITY, FINS ON, ORBINC=-1.05

DEPENDENT VARIABLE VS DEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | DEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| A24081 | CN | CLM | 62 | 63 |

MSFC TWT 470 LONGITUDINAL STABILITY, FINS ON, HTAIL=-5.0

DEPENDENT VARIABLE VS DEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | DEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| J24091 | CN | CLM | 64 | 64 |

MSFC TWT 470 LONGITUDINAL STABILITY, WING AND FINS OFF

DEPENDENT VARIABLE VS DEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | DEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| A24101 | CN | CLM | 65 | 65 |

MSFC TWT 470 LONGITUDINAL STABILITY, WING OFF

DEPENDENT VARIABLE VS DEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | DEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| A24111 | CN | CLM | 66 | 66 |

MSFC TWT 470 LONGITUDINAL STABILITY, CRUCIFORM FINS, PHIB=45

DEPENDENT VARIABLE VS DEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | DEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| A24121 | CN | CLM | 67 | 67 |

MSFC TWT 470 LONGITUDINAL STABILITY, CRUCIFORM FINS, PHIB=0

DEPENDENT VARIABLE VS DEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | DEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| A24131 | CN | CLM | 68 | 68 |

MSFC TWT 470 LONGITUDINAL STABILITY, WING INCIDENCE = 2.0

DEPENDENT VARIABLE VS DEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | DEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| A24141 | CN | CLM | 69 | 69 |

MSFC TWT 470 LONGITUDINAL STABILITY, STRONGBACK OFF

DEPENDENT VARIABLE VS DEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | DEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| A24151 | CN | CLM | 70 | 70 |

MSFC TWT 470 LONGITUDINAL STABILITY, WING SPOILERS

DEPENDENT VARIABLE VS DEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | DEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| A24161 | CN | CLM | 71 | 72 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=0.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING / ENDING | |
|---|---|---|---|---|
| J24011 | CPB1 | ALPHA | 73 | 73 |
| J24011 | CPB2 | ALPHA | 74 | 74 |
| J24011 | CPCAV | ALPHA | 75 | 75 |
| J24021 | CPB1 | ALPHA | 76 | 76 |
| J24021 | CPB2 | ALPHA | 77 | 77 |
| J24021 | CPCAV | ALPHA | 78 | 78 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=-2.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING / ENDING | |
|---|---|---|---|---|
| J24031 | CPB1 | ALPHA | 79 | 79 |
| J24031 | CPB2 | ALPHA | 80 | 80 |
| J24031 | CPCAV | ALPHA | 81 | 81 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=-4.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING / ENDING | |
|---|---|---|---|---|
| J24041 | CPB1 | ALPHA | 82 | 82 |
| J24041 | CPB2 | ALPHA | 83 | 83 |
| J24041 | CPCAV | ALPHA | 84 | 84 |



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MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS OFF, ORBINC=0.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| J24051 | CPB1 | ALPHA | 85 | 85 |
| J24051 | CPB2 | ALPHA | 86 | 86 |
| J24051 | CPCAV | ALPHA | 87 | 87 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS OFF, ORBINC=-2.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| J24061 | CPB1 | ALPHA | 88 | 88 |
| J24061 | CPB2 | ALPHA | 89 | 89 |
| J24061 | CPCAV | ALPHA | 90 | 90 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS OFF, ORBINC=-4.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| J24071 | CPB1 | ALPHA | 91 | 91 |
| J24071 | CPB2 | ALPHA | 92 | 92 |
| J24071 | CPCAV | ALPHA | 93 | 93 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=-1.05

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| A24081 | CPB1 | ALPHA | 94 | 95 |
| A24081 | CPB2 | ALPHA | 96 | 97 |
| A24081 | CPCAV | ALPHA | 98 | 99 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, HTAIL=-5.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| J24091 | CPB1 | ALPHA | 100 | 100 |
| J24091 | CPB2 | ALPHA | 101 | 101 |
| J24091 | CPCAV | ALPHA | 102 | 102 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, WING AND FINS OFF

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| A24101 | CPB1 | ALPHA | 103 | 103 |
| A24101 | CPB2 | ALPHA | 104 | 104 |
| A24101 | CPCAV | ALPHA | 105 | 105 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, WING OFF

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| A24111 | CPB1 | ALPHA | 106 | 106 |
| A24111 | CPB2 | ALPHA | 107 | 107 |
| A24111 | CPCAV | ALPHA | 108 | 108 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, CRUCIFORM FINS, PHIB=45

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| A24121 | CPB1 | ALPHA | 109 | 109 |
| A24121 | CPB2 | ALPHA | 110 | 110 |
| A24121 | CPCAV | ALPHA | 111 | 111 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, CRUCIFORM FINS, PHIB=0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| A24131 | CPB1 | ALPHA | 112 | 112 |
| A24131 | CPB2 | ALPHA | 113 | 113 |
| A24131 | CPCAV | ALPHA | 114 | 114 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, WING INCIDENCE = 2.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| A24141 | CPB1 | ALPHA | 115 | 115 |
| A24141 | CPB2 | ALPHA | 116 | 116 |
| A24141 | CPCAV | ALPHA | 117 | 117 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, STRONGBACK OFF

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| A24151 | CPB1 | ALPHA | 118 | 118 |
| A24151 | CPB2 | ALPHA | 119 | 119 |
| A24151 | CPCAV | ALPHA | 120 | 120 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, WING SPOILERS

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| A24161 | CPB1 | ALPHA | 121 | 122 |
| A24161 | CPB2 | ALPHA | 123 | 124 |
| A24161 | CPCAV | ALPHA | 125 | 126 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, FINS ON, ORBINC=0.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| H24011 | CN | MACH | 127 | 127 |
| H24011 | CLM | MACH | 128 | 128 |
| H24011 | CAF | MACH | 129 | 129 |
| H24021 | CN | MACH | 130 | 130 |
| H24021 | CLM | MACH | 131 | 131 |
| H24021 | CAF | MACH | 132 | 132 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, FINS ON, ORBINC=-2.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| H24031 | CN | MACH | 133 | 133 |
| H24031 | CLM | MACH | 134 | 134 |
| H24031 | CAF | MACH | 135 | 135 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, FINS ON, ORBINC=-4.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| H24041 | CN | MACH | 136 | 136 |
| H24041 | CLM | MACH | 137 | 137 |
| H24041 | CAF | MACH | 138 | 138 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, FINS OFF, ORBINC=0.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| H24051 | CN | MACH | 139 | 139 |
| H24051 | CLM | MACH | 140 | 140 |
| H24051 | CAF | MACH | 141 | 141 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, FINS OFF, ORBINC=-2.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| H24061 | CN | MACH | 142 | 142 |
| H24061 | CLM | MACH | 143 | 143 |
| H24061 | CAF | MACH | 144 | 144 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, FINS OFF, ORBINC=-4.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| H24071 | CN | MACH | 145 | 145 |
| H24071 | CLM | MACH | 146 | 146 |
| H24071 | CAF | MACH | 147 | 147 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, FINS ON, ORBINC=-1.05

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| H24081 | CN | MACH | 148 | 148 |
| H24081 | CLM | MACH | 149 | 149 |
| H24081 | CAF | MACH | 150 | 150 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, FINS ON, HTAIL=-5.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| H24091 | CN | MACH | 151 | 151 |
| H24091 | CLM | MACH | 152 | 152 |
| H24091 | CAF | MACH | 153 | 153 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, WING AND FINS OFF

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| H24101 | CN | MACH | 154 | 154 |
| H24101 | CLM | MACH | 155 | 155 |
| H24101 | CAF | MACH | 156 | 156 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, WING OFF

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| H24111 | CN | MACH | 157 | 157 |
| H24111 | CLM | MACH | 158 | 158 |
| H24111 | CAF | MACH | 159 | 159 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, CRUCIFORM FINS, PHIB=45

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| H24121 | CN | MACH | 160 | 160 |
| H24121 | CLM | MACH | 161 | 161 |
| H24121 | CAF | MACH | 162 | 162 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, CRUCIFORM FINS, PHIB=0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| H24131 | CN | MACH | 163 | 163 |
| H24131 | CLM | MACH | 164 | 164 |
| H24131 | CAF | MACH | 165 | 165 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, WING INCIDENCE = 2.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| H24141 | CN | MACH | 166 | 166 |
| H24141 | CLM | MACH | 167 | 167 |
| H24141 | CAF | MACH | 168 | 168 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, STRONGBACK OFF

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| H24151 | CN | MACH | 169 | 169 |
| H24151 | CLM | MACH | 170 | 170 |
| H24151 | CAF | MACH | 171 | 171 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, WING SPOILERS

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| H24161 | CN | MACH | 172 | 172 |
| H24161 | CLM | MACH | 173 | 173 |
| H24161 | CAF | MACH | 174 | 174 |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, FINS ON, ORBINC=0.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASET PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE |
|---|---|---|---|
| V24011 | CN | MACH | 175 |
| V24011 | CLM | MACH | 176 |
| V24021 | CN | MACH | 177 |
| V24021 | CLM | MACH | 178 |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, FINS ON, ORBINC=-2.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASET PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE |
|---|---|---|---|
| V24031 | CN | MACH | 179 |
| V24031 | CLM | MACH | 180 |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, FINS ON, ORBINC=-4.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASET PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE |
|---|---|---|---|
| V24041 | CN | MACH | 181 |
| V24041 | CLM | MACH | 182 |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, FINS OFF, ORBINC=0.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASET PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE |
|---|---|---|---|
| V24051 | CN | MACH | 183 |
| V24051 | CLM | MACH | 184 |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, FINS OFF, ORBINC=-2.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASET PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE |
|---|---|---|---|
| V24061 | CN | MACH | 185 |
| V24061 | CLM | MACH | 186 |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, FINS OFF, ORBINC=-4.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASET PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE |
|---|---|---|---|
| V24071 | CN | MACH | 187 |
| V24071 | CLM | MACH | 188 |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, FINS ON, ORBINC=-1.05

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASET PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE |
|---|---|---|---|
| V24081 | CN | MACH | 189 |
| V24081 | CLM | MACH | 190 |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, FINS ON, HTAIL=-5.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASET PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE |
|---|---|---|---|
| V24091 | CN | MACH | 191 |
| V24091 | CLM | MACH | 192 |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, WING AND FINS OFF

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASET PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE |
|---|---|---|---|
| V24101 | CN | MACH | 193 |
| V24101 | CLM | MACH | 194 |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, WING OFF

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASET PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE |
|---|---|---|---|
| V24111 | CN | MACH | 195 |
| V24111 | CLM | MACH | 196 |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, CRUCIFORM FINS, PHIB=45

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASET PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE |
|---|---|---|---|
| V24121 | CN | MACH | 197 |
| V24121 | CLM | MACH | 198 |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, CRUCIFORM FINS, PHIB=0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASET PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE |
|---|---|---|---|
| V24131 | CN | MACH | 199 |
| V24131 | CLM | MACH | 200 |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, WING INCIDENCE = 2.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASET PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE |
|---|---|---|---|
| V24141 | CN | MACH | 201 |
| V24141 | CLM | MACH | 202 |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, STRONGBACK OFF

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASET PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE |
|---|---|---|---|
| V24151 | CN | MACH | 203 |
| V24151 | CLM | MACH | 204 |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, WING SPOILERS

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASET PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE |
|---|---|---|---|
| V24161 | CN | MACH | 205 |
| V24161 | CLM | MACH | 206 |

MSFC TWT 470 LONGITUDINAL AERODYNAMIC CENTER, FINS ON, ORBINC=0.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASET PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE |
|---|---|---|---|
| V24011 | CLM/CN | MACH | 207 |
| V24021 | CLM/CN | MACH | 208 |

MSFC TWT 470 LONGITUDINAL AERODYNAMIC CENTER, FINS ON, ORBINC=-2.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASET PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE |
|---|---|---|---|
| V24031 | CLM/CN | MACH | 209 |

MSFC TWT 470 LONGITUDINAL AERODYNAMIC CENTER, FINS ON, ORBINC=-4.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASET PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE |
|---|---|---|---|
| V24041 | CLM/CN | MACH | 210 |

MSFC TWT 470 LONGITUDINAL AERODYNAMIC CENTER, FINS OFF, ORBINC=0.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASET PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE |
|---|---|---|---|
| V24051 | CLM/CN | MACH | 211 |

MSFC TWT 470 LONGITUDINAL AERODYNAMIC CENTER, FINS OFF, ORBINC=-2.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASET PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE |
|---|---|---|---|
| V24061 | CLM/CN | MACH | 212 |

MSFC TWT 470 LONGITUDINAL AERODYNAMIC CENTER, FINS OFF, ORBINC=-4.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASET PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE |
|---|---|---|---|
| V24071 | CLM/CN | MACH | 213 |

MSFC TWT 470 LONGITUDINAL AERODYNAMIC CENTER, FINS ON, ORBINC=-1.05

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASET PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE |
|---|---|---|---|
| V24081 | CLM/CN | MACH | 214 |

MSFC TWT 470 LONGITUDINAL AERODYNAMIC CENTER, FINS ON, HTAIL=-5.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASET PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE |
|---|---|---|---|
| V24091 | CLM/CN | MACH | 215 |

MSFC TWT 470 LONGITUDINAL AERODYNAMIC CENTER, WING AND FINS OFF

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASET PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE |
|---|---|---|---|
| V24101 | CLM/CN | MACH | 216 |

MSFC TWT 470 LONGITUDINAL AERODYNAMIC CENTER, WING OFF

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASET PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE |
|---|---|---|---|
| V24111 | CLM/CN | MACH | 217 |

MSFC TWT 470 LONGITUDINAL AERODYNAMIC CENTER, CRUCIFORM FINS, PHIB=45

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASET PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE |
|---|---|---|---|
| V24121 | CLM/CN | MACH | 218 |

MSFC TWT 470 LONGITUDINAL AERODYNAMIC CENTER, CRUCIFORM FINS, PHIB=0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASET PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE |
|---|---|---|---|
| V24131 | CLM/CN | MACH | 219 |

MSFC TWT 470 LONGITUDINAL AERODYNAMIC CENTER, WING INCIDENCE = 2.0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASET PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE |
|---|---|---|---|
| V24141 | CLM/CN | MACH | 220 |

MSFC TWT 470 LONGITUDINAL AERODYNAMIC CENTER, STRONGBACK OFF

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASET PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE |
|---|---|---|---|
| V24151 | CLM/CN | MACH | 221 |

MSFC TWT 470 LONGITUDINAL AERODYNAMIC CENTER, WING SPOILERS

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASET PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE |
|---|---|---|---|
| V24161 | CLM/CN | MACH | 222 |

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, MULTIPLE DATASETS

DATASETS PLOTTED:
X24081 A24101 X24111 X24151

| DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|
| CN | ALPHA | 223 | 223 |

DATASETS PLOTTED:
B24081 B24111 B24151

| DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|
| CN | ALPHA | 224 | 226 |

DATASETS PLOTTED:
X24081 A24101 X24111 X24151

| DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|
| CLM | ALPHA | 227 | 227 |

DATASETS PLOTTED:
B24081 B24111 B24151

| DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|
| CLM | ALPHA | 228 | 230 |

DATASETS PLOTTED:
X24081 A24101 X24111 X24151

| DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|
| CAF | ALPHA | 231 | 231 |

DATASETS PLOTTED:
B24081 B24111 B24151

| DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|
| CAF | ALPHA | 232 | 234 |

MSFC TWT 470 MODEL BUILDUP

DEPENDENT VARIABLE VS DEPENDENT VARIABLE, MULTIPLE DATASETS

DATASETS PLOTTED:
X24081 A24101 X24111 X24151

| DEPENDENT VARIABLE | DEPENDENT VARIABLE | PLOT PAGE BEGINNING / ENDING | |
|---|---|---|---|
| CN | CLM | 235 | 235 |

DATASETS PLOTTED:
B24081 B24111 B24151

| DEPENDENT VARIABLE | DEPENDENT VARIABLE | PLOT PAGE BEGINNING / ENDING | |
|---|---|---|---|
| CN | CLM | 236 | 238 |

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
A24041 A24031 A24021

| DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING / ENDING | |
|---|---|---|---|
| CN | ALPHA | 239 | 245 |
| CLM | ALPHA | 246 | 252 |

DATASETS PLOTTED:
A24071 A24061 A24051

| DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING / ENDING | |
|---|---|---|---|
| CN | ALPHA | 253 | 259 |
| CLM | ALPHA | 260 | 266 |

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE

DEPENDENT VARIABLE VS DEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
A24041 A24031 A24021

| DEPENDENT VARIABLE | DEPENDENT VARIABLE | PLOT PAGE BEGINNING | PLOT PAGE ENDING |
|---|---|---|---|
| CN | $C_{LM}$ | 267 | 273 |

DATASETS PLOTTED:
A24071 A24061 A24051

| DEPENDENT VARIABLE | DEPENDENT VARIABLE | PLOT PAGE BEGINNING | PLOT PAGE ENDING |
|---|---|---|---|
| CN | $C_{LM}$ | 274 | 280 |

MSFC TWT 470 EFFECTS OF HORIZONTAL TAIL INCIDENCE

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
A24091 C24081

| DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | PLOT PAGE ENDING |
|---|---|---|---|
| CN | ALPHA | 281 | 287 |
| CLM | ALPHA | 288 | 294 |
| CAF | ALPHA | 295 | 301 |

MSFC TWT 470 EFFECTS OF HORIZONTAL TAIL INCIDENCE

DEPENDENT VARIABLE VS DEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
A2409-1 C24081

| DEPENDENT VARIABLE | DEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|
| CN | CLM | 302 | 308 |

MSFC TWT 470 HORIZONTAL TAIL EFFECTIVENESS

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| P24081 | CNIHO | MACH | 309 | 309 |
| P24081 | CMIHO | MACH | 310 | 310 |

MSFC TWT 470 EFFECTS OF ORBITER WING PARAMETERS

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, MULTIPLE DATASETS

DATASETS PLOTTED:
D24081 D24161

| DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|
| CN | ALPHA | 311 | 312 |

DATASETS PLOTTED:
E24081 E24141 E24111 E24161

| DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|
| CN | ALPHA | 313 | 315 |

DATASETS PLOTTED:
F24081 F24161

| DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|
| CN | ALPHA | 316 | 316 |

DATASETS PLOTTED:
G24081 G24141 G24111 G24161

| DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|
| CN | ALPHA | 317 | 317 |

DATASETS PLOTTED:
S24081 S24161

| DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|
| CN | ALPHA | 318 | 318 |

DATASETS PLOTTED:
D24081 D24161

| DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|
| CLM | ALPHA | 319 | 320 |

MSFC TWT 470 EFFECTS OF ORBITER WING PARAMETERS

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, MULTIPLE DATASETS

DATASETS PLOTTED:
E24081 E24141 E24111 E24161

| DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|
| CLM | ALPHA | 321 | 323 |

DATASETS PLOTTED:
F24081 F24161

| DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|
| CLM | ALPHA | 324 | 324 |

DATASETS PLOTTED:
G24081 G24141 G24111 G24161

| DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|
| CLM | ALPHA | 325 | 325 |

DATASETS PLOTTED:
S24081 S24161

| DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|
| CLM | ALPHA | 326 | 326 |

MSFC TWT 470 EFFECTS OF ORBITER WING PARAMETERS

DEPENDENT VARIABLE VS DEPENDENT VARIABLE, MULTIPLE DATASETS

DATASETS PLOTTED:
D24081 D24161

| DEPENDENT VARIABLE | DEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|
| CN | CLM | 327 | 328 |

DATASETS PLOTTED:
E24081 E24141 E24111 E24161

| DEPENDENT VARIABLE | DEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|
| CN | CLM | 329 | 331 |

DATASETS PLOTTED:
F24081 F24161

| DEPENDENT VARIABLE | DEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|
| CN | CLM | 332 | 332 |

DATASETS PLOTTED:
G24081 G24141 G24111 G24161

| DEPENDENT VARIABLE | DEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|
| CN | CLM | 333 | 333 |

DATASETS PLOTTED:
S24081 S24161

| DEPENDENT VARIABLE | DEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|
| CN | CLM | 334 | 334 |

MSFC TWT 470 EFFECTS OF FIN ORIENTATION

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, MULTIPLE DATASETS

DATASETS PLOTTED:
T24081 A24121 A24131

| DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|
| CN | ALPHA | 335 | 338 |
| CLM | ALPHA | 339 | 342 |

MSFC TWT 470 LATERAL-DIRECTIONAL CHARACTERISTICS, BASIC CONFIGURATION

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| A24082 | CY | BETA | 343 | 344 |
| A24082 | CYN | BETA | 345 | 346 |
| A24082 | CBL | BETA | 347 | 348 |

MSFC TWT 470 LATERAL-DIRECTIONAL CHARACTERISTICS, CRUCIFORM FINS, PHIB=0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| J24132 | CY | BETA | 349 | 349 |
| J24132 | CYN | BETA | 350 | 350 |
| J24132 | CBL | BETA | 351 | 351 |

MSFC TWT 470 DIRECTIONAL STABILITY, BASIC CONFIGURATION

DEPENDENT VARIABLE VS DEPENDENT VARIABLE, (FSDVAR)

| DATASETS PLOTTED | DEPENDENT VARIABLE | DEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| A24082 | CY | CYN | 352 | 353 |

MSFC TWT 470 DIRECTIONAL STABILITY, CRUCIFORM FINS, PHIB=0

DEPENDENT VARIABLE VS DEPENDENT VARIABLE, (FSDVAR)

| DATASETS PLOTTED | DEPENDENT VARIABLE | DEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| J24132 | CY | CYN | 354 | 354 |

MSFC TWT 470 LATERAL-DIRECTIONAL CHARACTERISTICS, BASIC CONFIGURATION

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, (FSALFA)

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| A24082 | CPB1 | BETA | 355 | 356 |
| A24082 | CPB2 | BETA | 357 | 358 |
| A24082 | CPCAV | BETA | 359 | 360 |

MSFC TWT 470 LATERAL-DIRECTIONAL CHARACTERISTICS, CRUCIFORM FINS, PHIB=0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASETS PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|---|
| J24132 | $CP_{B1}$ | BETA | 361 | 361 |
| J24132 | $CP_{B2}$ | BETA | 362 | 362 |
| J24132 | CPCAV | BETA | 363 | 363 |

MSFC TWT 470 LATERAL-DIRECTIONAL DERIVATIVES, BASIC CONFIGURATION

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASET PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE |
|---|---|---|---|
| J24082 | CY | MACH | 364 |
| J24082 | CYN | MACH | 365 |
| J24082 | CBL | MACH | 366 |

MSFC TWT 470 LATERAL-DIRECTIONAL DERIVATIVES, CRUCIFORM FINS, PHIB=0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASET PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE |
|---|---|---|---|
| J24132 | CY | MACH | 367 |
| J24132 | CYN | MACH | 368 |
| J24132 | CBL | MACH | 369 |

MSFC TWT 470 DIRECTIONAL AERODYNAMIC CENTER, BASIC CONFIGURATION

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASET PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE |
|---|---|---|---|
| V24082 | CYN/CY | MACH | 370 |

MSFC TWT 470 DIRECTIONAL AERODYNAMIC CENTER, CRUCIFORM FINS, PHIB=0

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

| DATASET PLOTTED | DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE |
|---|---|---|---|
| V24132 | CYN/CY | MACH | 371 |

MSFC TWT 470 EFFECTS OF FIN ORIENTATION ON LATERAL-DIRECTIONAL CHARACTERISTICS

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, MULTIPLE DATASETS

DATASETS PLOTTED:
A24132 J24082

| DEPENDENT VARIABLE | INDEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|
| CY | BETA | 372 | 378 |
| CYN | BETA | 379 | 385 |
| CBL | BETA | 386 | 392 |

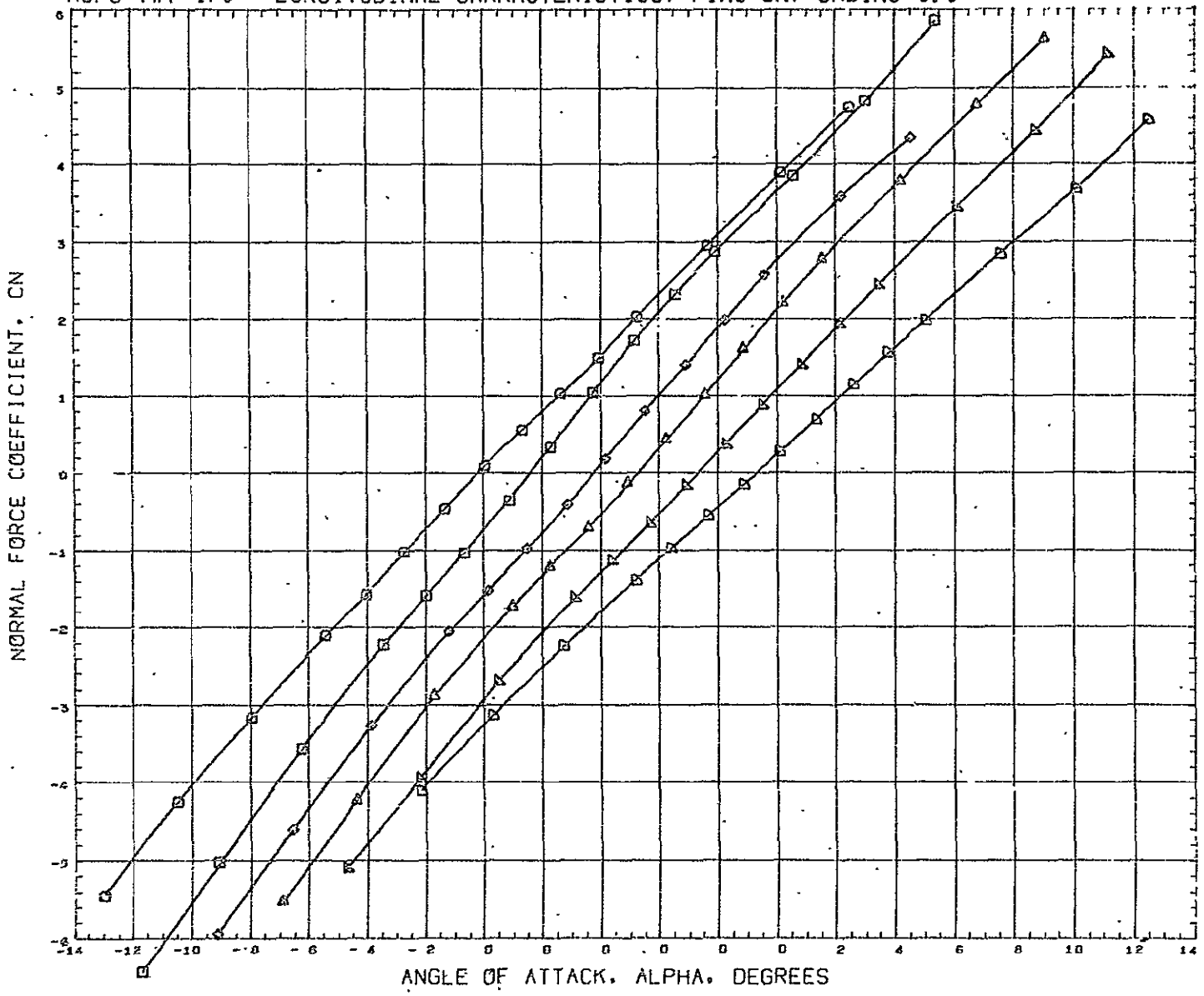
MSFC TWT 470 EFFECTS OF FIN ORIENTATION ON LATERAL-DIRECTIONAL CHARACTERISTICS

DEPENDENT VARIABLE VS DEPENDENT VARIABLE, MULTIPLE DATASETS

DATASETS PLOTTED:
A24132 J24082

| DEPENDENT VARIABLE | DEPENDENT VARIABLE | PLOT PAGE BEGINNING | / ENDING |
|---|---|---|---|
| CY | CYN | 393 | 399 |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=0.0

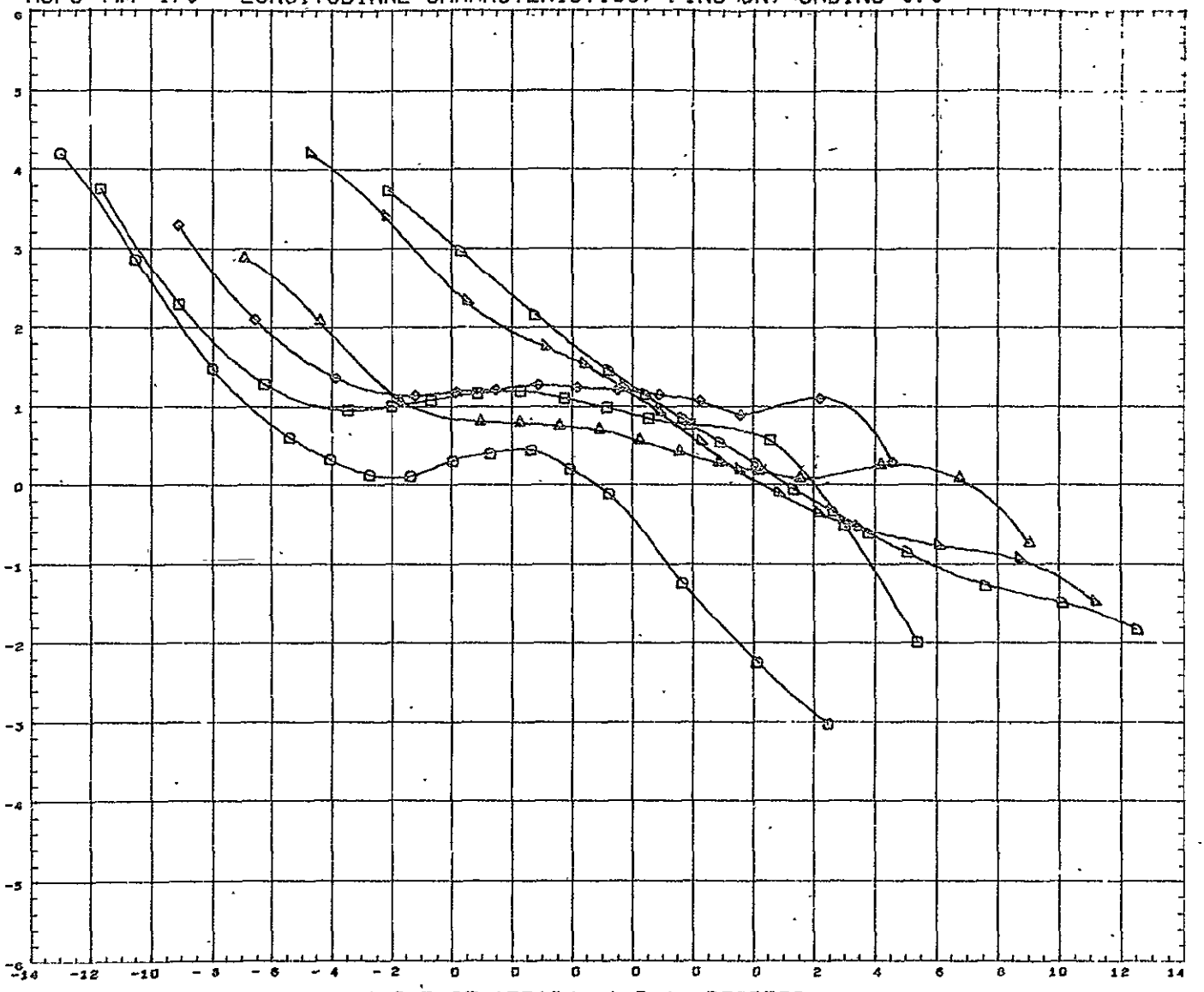



| SYMBOL | MACH | | PARAMETRIC VALUES | | |
|---|---|---|---|---|---|
| □ | 0.900 | BETA | 0.070 | ORBINC | 0.000 |
| □ | 1.002 | WNGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 1.105 | PHIB | 0.000 | | |
| △ | 1.197 | | | | |
| ▷ | 1.461 | | | | |
| □ | 1.964 | DATA HIST. CODE | *A | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

TWT470 S-IC/GAC ORBITER BF1OWHVS NO TRIP STRIP (J24011) 29 JAN 71 PAGE

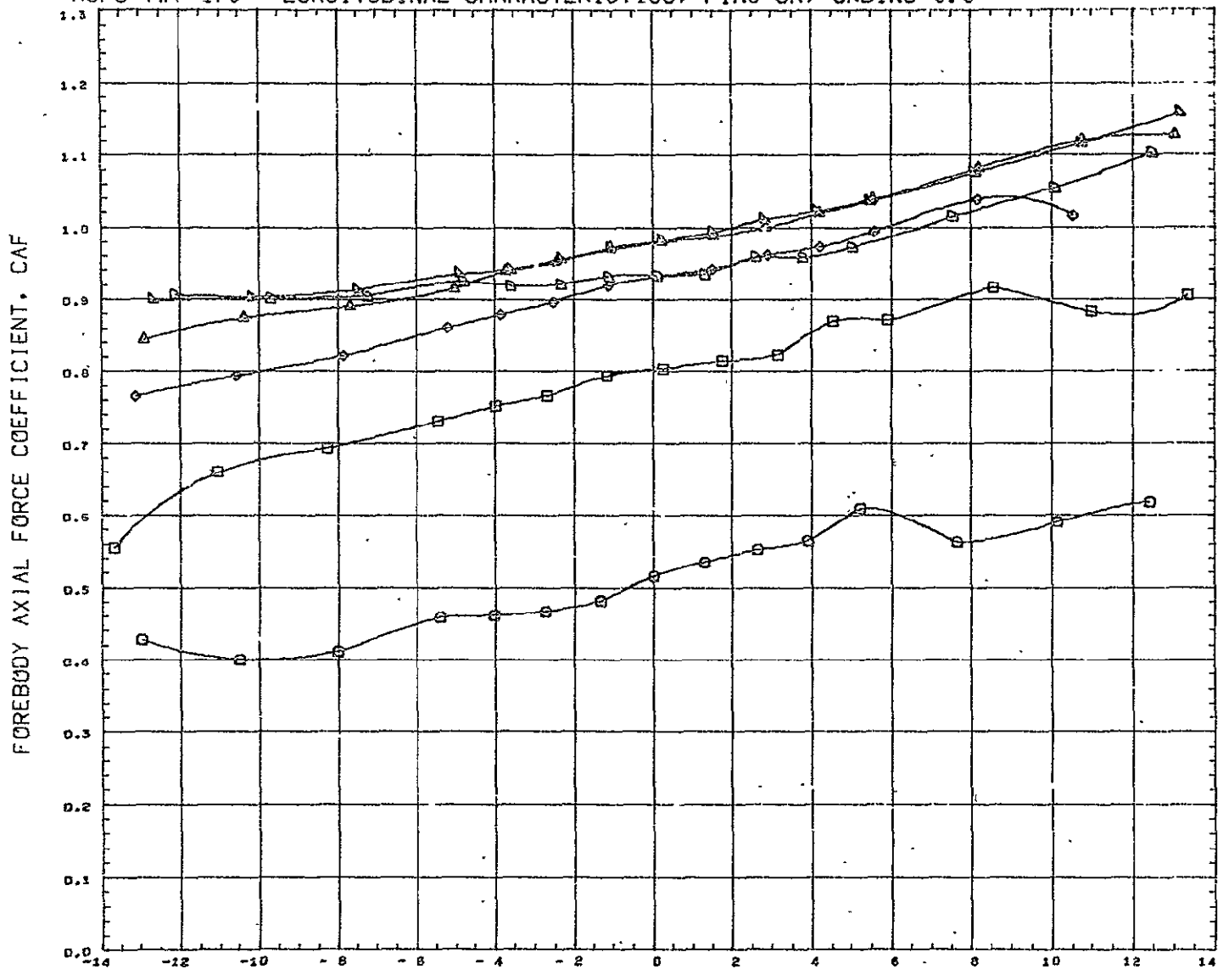
MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=0.0




| SYMBOL | MACH | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| ○ | 0.900 | BETA | 0.070 | ORBINC | 0.000 |
| □ | 1.002 | WNGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 1.103 | PHIB | 0.000 | | |
| △ | 1.197 | | | | |
| ▷ | 1.461 | | | | |
| D | 1.954 | DATA HIST. CODE | #A | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

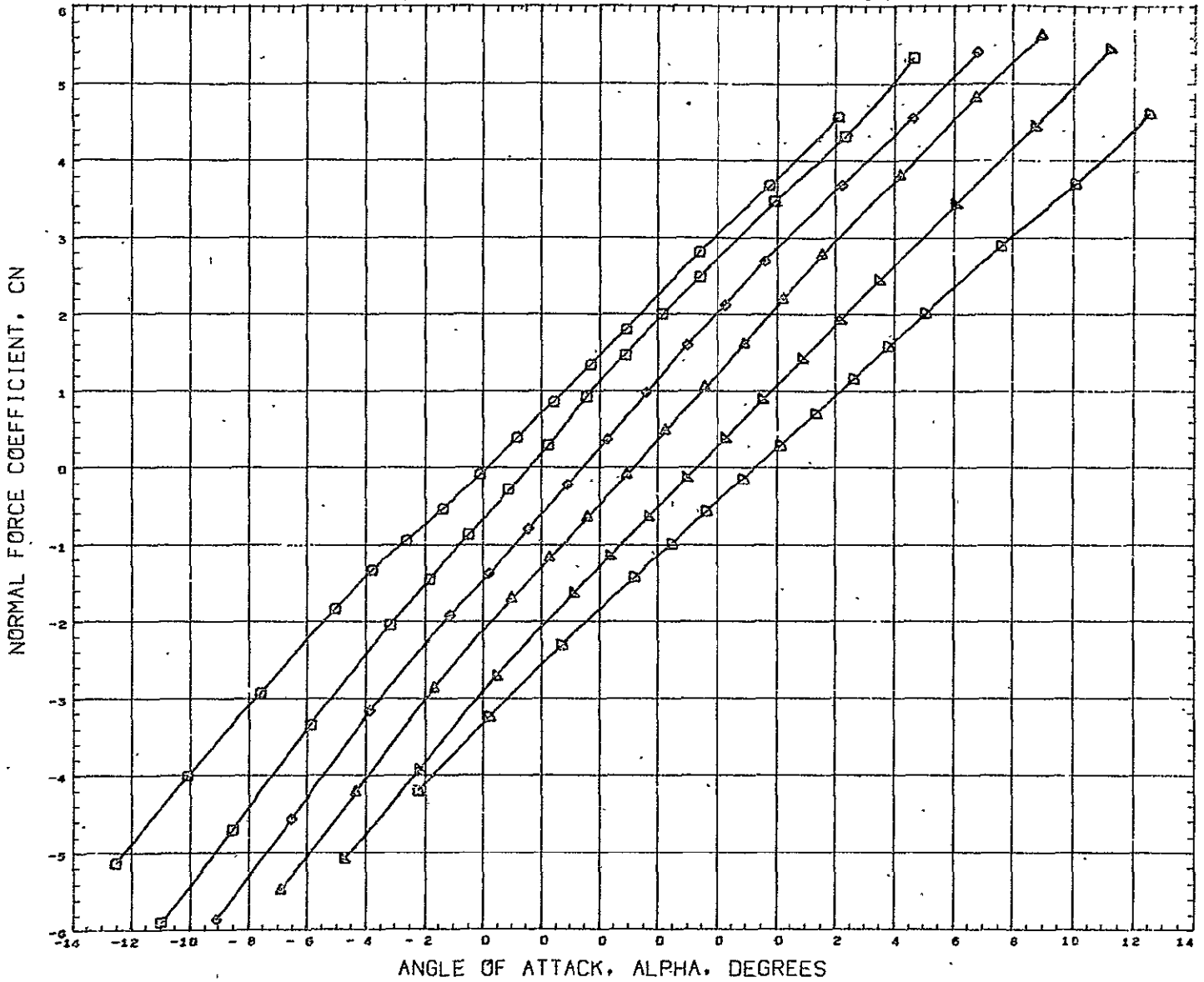
MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=0.0




| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 0.900 | BETA | 0.070 | ORBINC. | 0.000 | |
| □ | 1.002 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 1.105 | PHIB | 0.000 | | | |
| △ | 1.197 | | | | | |
| ▷ | 1.461 | | | | | |
| ▷ | 1.964 | DATA HIST. CODE | *A | | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

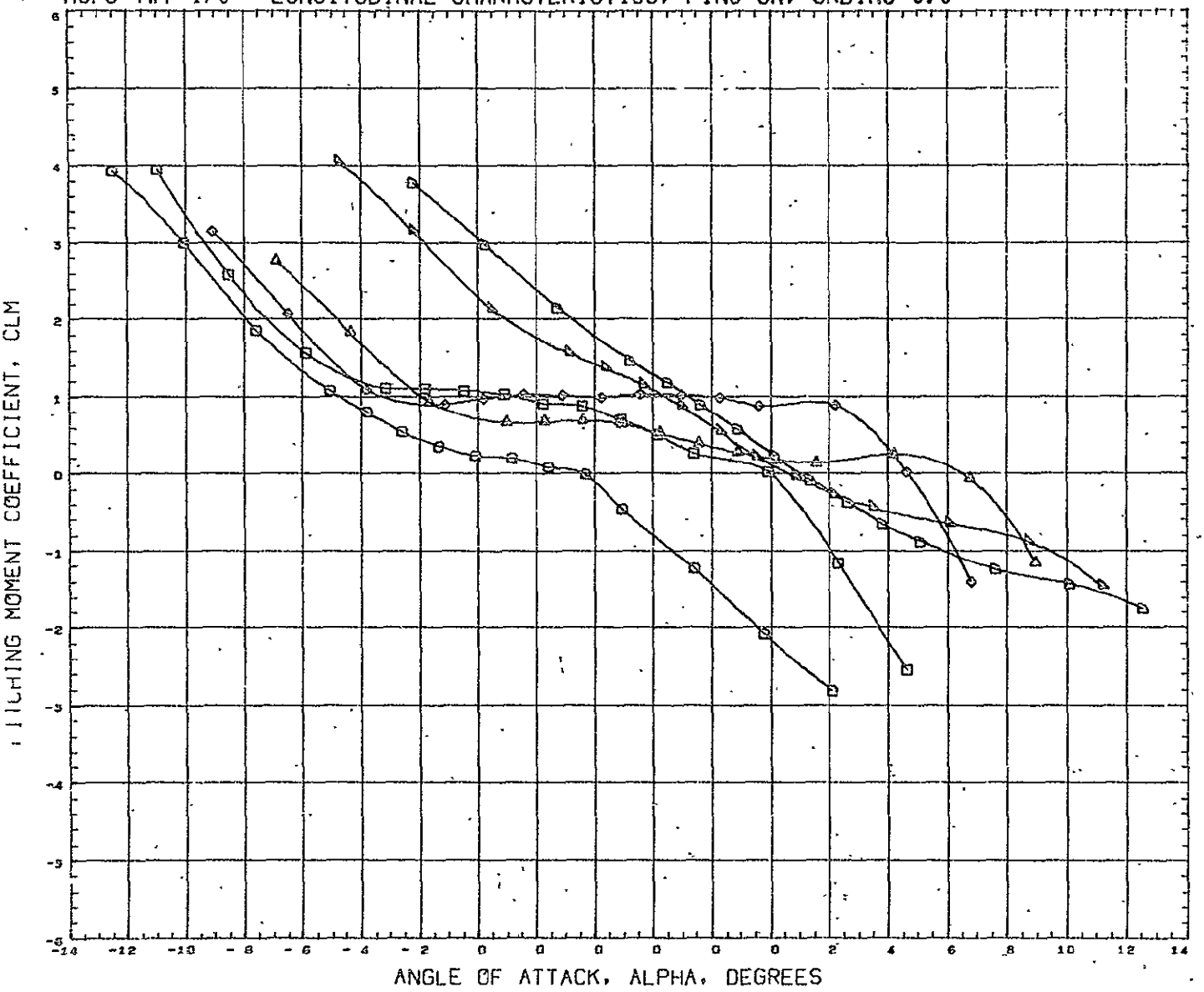
MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=0.0




| SYMBOL | MACH | | PARAMETRIC VALUES | | |
|---|---|---|---|---|---|
| ○ | 0.903 | BETA | - 0.090 | ORBINC | 0.000 |
| □ | 1.001 | WNGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 1.101 | FWIB | 0.000 | | |
| △ | 1.202 | | | | |
| ▷ | 1.456 | | | | |
| D | 1.965 | DATA HIST. CODE | *A | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

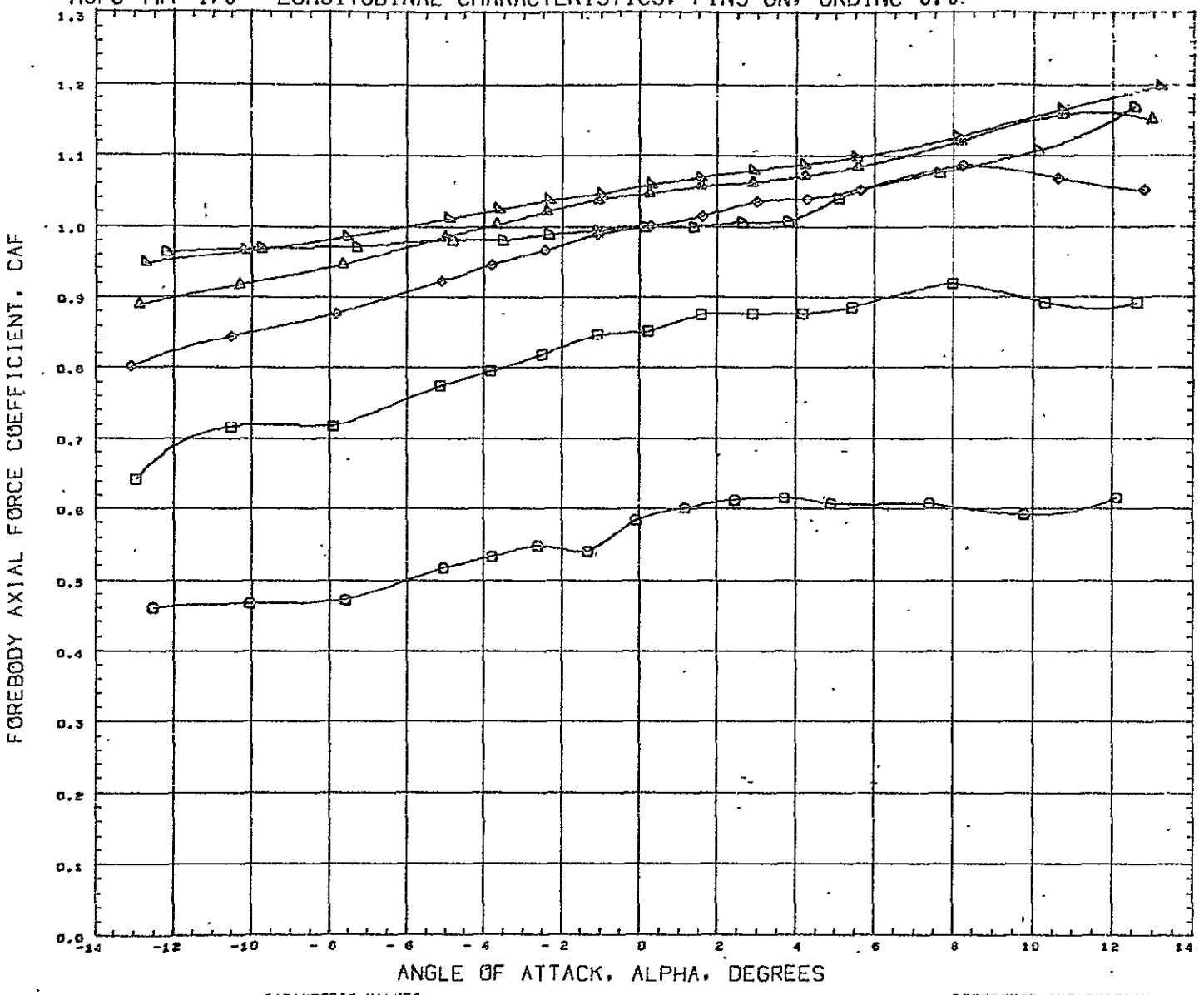
MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=0.0




| MODL | MACH | | PARAMETRIC VALUES | | |
|---|---|---|---|---|---|
| ○ | 0.903 | BETA | 0.090 | ORBINC | 0.000 |
| □ | 1.091 | WNGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 1.101 | PHIS | 0.000 | | |
| △ | 1.202 | | | | |
| ▽ | 1.456 | | | | |
| ○ | 1.965 | DATA HIST. CODE | #A | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

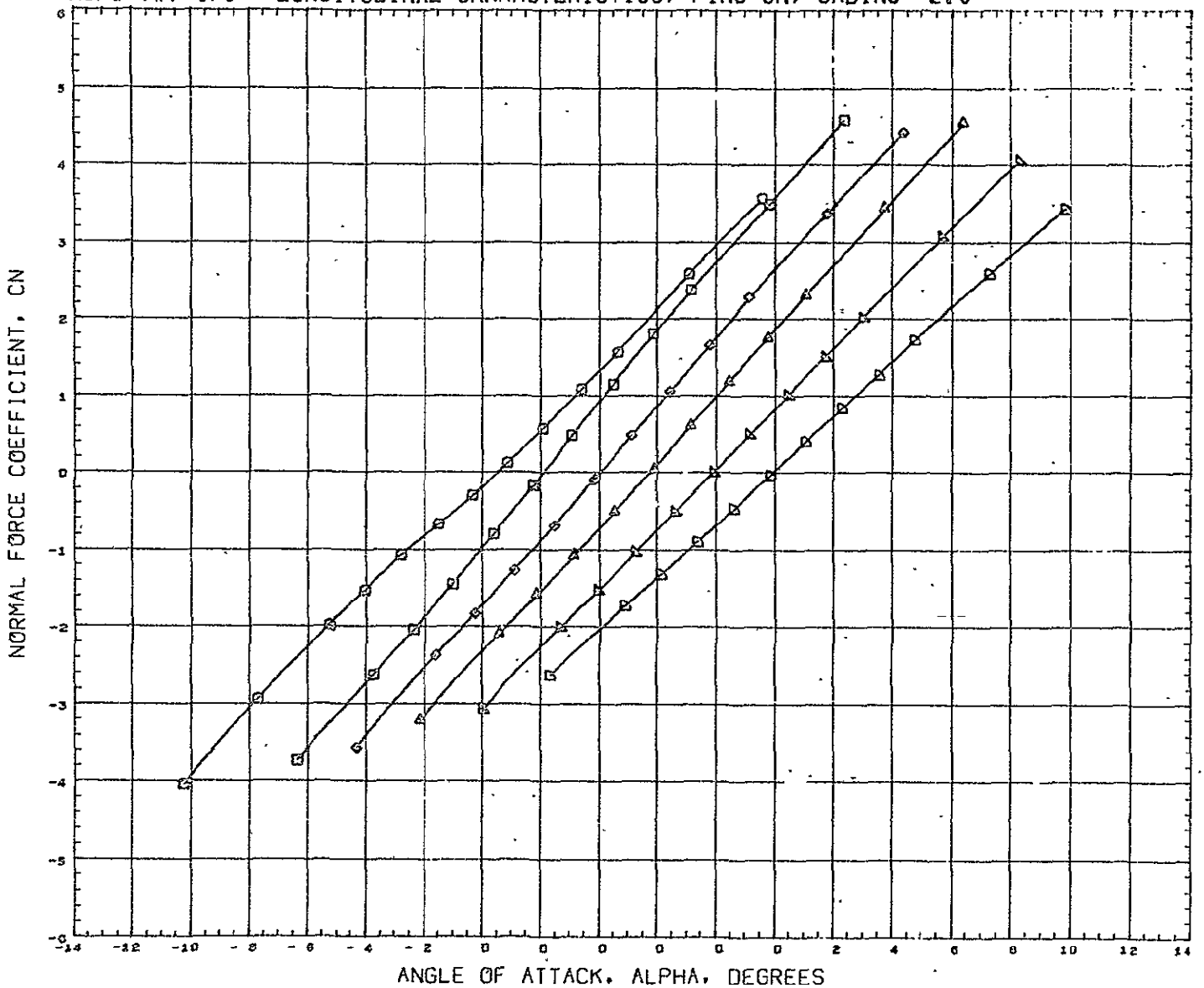
MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=0.0.




| SYMBOL | MACH | | PARAMETRIC VALUES | | |
|---|---|---|---|---|---|
| ○ | 0.903 | BETA | - 0.090 | ORBINC | 0.000 |
| □ | 1.001 | WNGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 1.101 | PHIB | 0.000 | | |
| △ | 1.202 | | | | |
| ▷ | 1.456 | | | | |
| ▷ | 1.965 | DATA HIST. CODE | *A | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

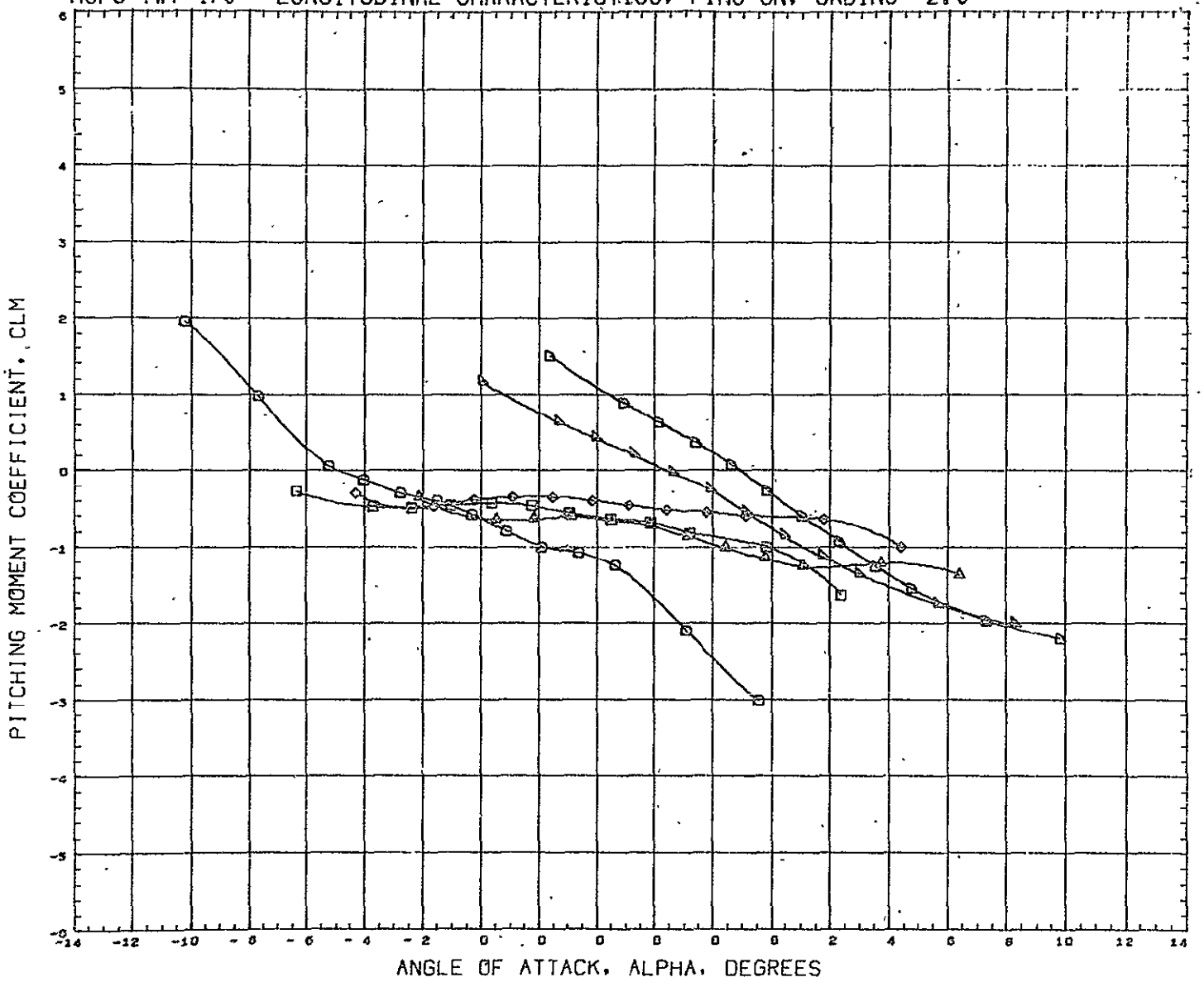
MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=-2.0




| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 0.699 | BETA | - 0.070 | ORBINC | - 2.000 | |
| □ | 0.995 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 1.105 | PHIB | 0.000 | | | |
| △ | 1.196 | | | | | |
| ▷ | 1.456 | | | | | |
| ▷ | 1.956 | DATA HIST. CODE | #A | | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

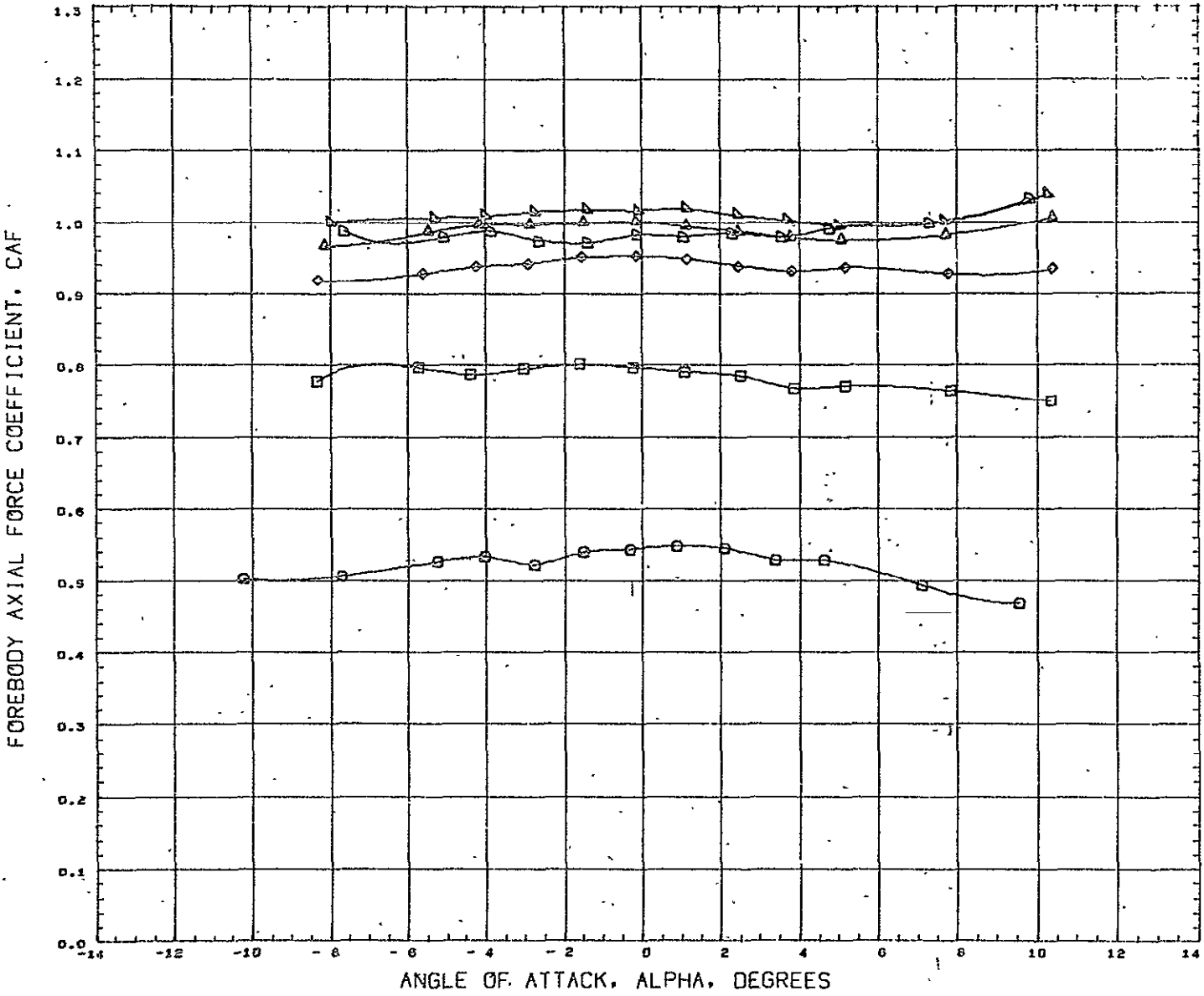
MSFC TWT 470 LØNGITUDINAL CHARACTERISTICS, FINS ØN, ØRBINC=-2.0




| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 0.899 | BETA | = 0.070 | ØRBINC | = 2.000 | |
| □ | 0.993 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 1.105 | PHIB | 0.000 | | | |
| △ | 1.196 | | | | | |
| ▷ | 1.453 | | | | | |
| ▽ | 1.938 | DATA HIST. CODE | #A | | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

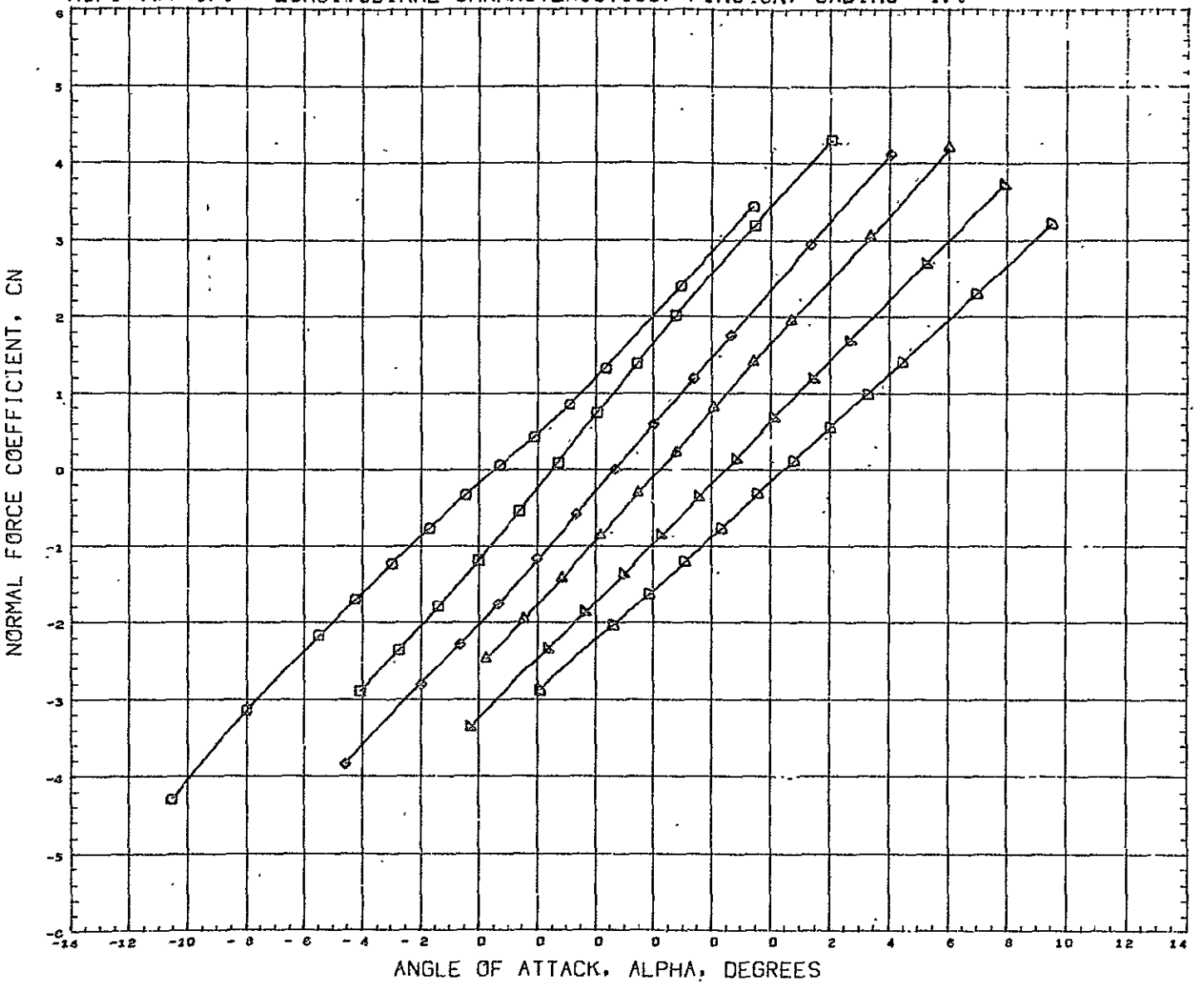
MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=-2.0




| SYMBOL | MACH | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| □ | 0.899 | BETA | - 0.070 | ORBINC | - 2.000 |
| □ | 0.993 | WINGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 1.105 | PHIB | 0.000 | | |
| △ | 1.196 | | | | |
| ▷ | 1.456 | | | | |
| ▷ | 1.956 | DATA HIST. CODE | #A | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

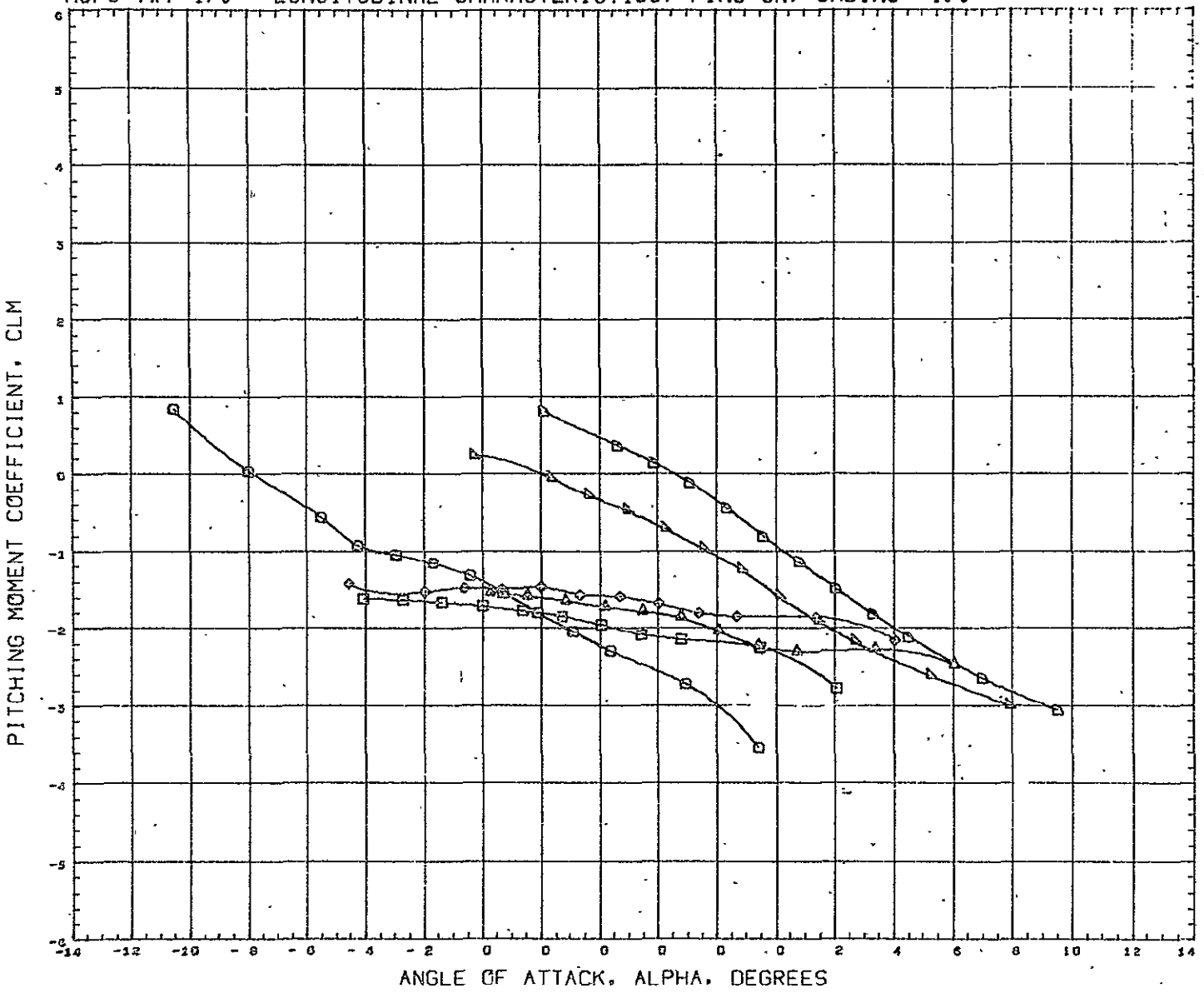
MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=-4.0




| SYMBOL | MACH | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| ○ | 0.901 | BETA | - 0.050 | ORBINC | - 4.000 |
| □ | 1.000 | WNGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 1.098 | PHIB | 0.000 | | |
| △ | 1.193 | | | | |
| ▷ | 1.450 | | | | |
| D | 1.950 | DATA HIST. CODE | #A | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

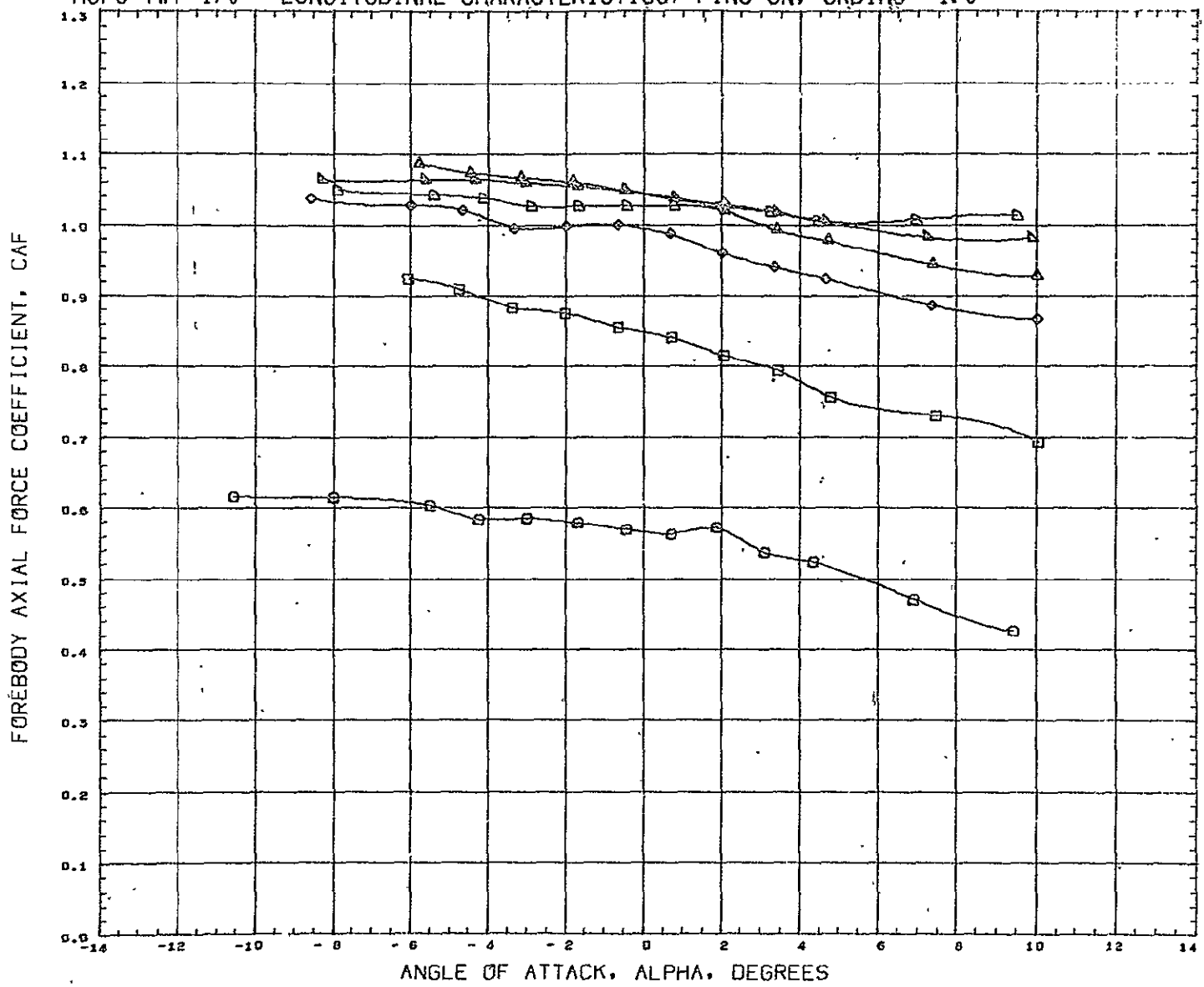
MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=-4.0




| SYMBOL | MACH | | PARAMETRIC VALUES | | |
|---|---|---|---|---|---|
| ○ | 0.901 | BETA | - 0.050 | ORBINC | - 4.000 |
| □ | 1.000 | WNGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 1.096 | PHIB | 0.000 | | |
| △ | 1.193 | | | | |
| ▷ | 1.450 | | | | |
| ▽ | 1.950 | DATA HIST. CODE | #A | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

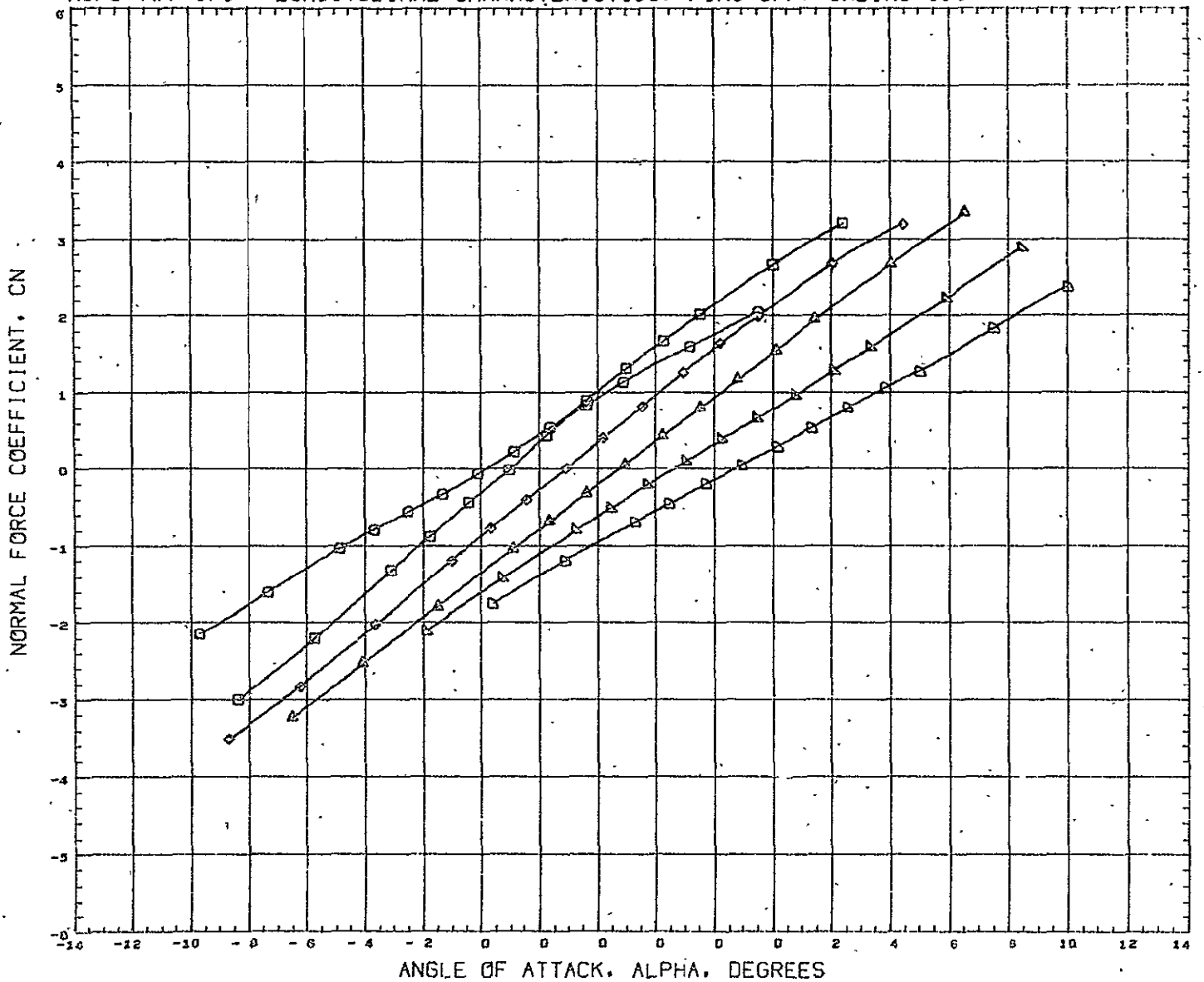
MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=-4.0




| SYMBOL | MACH | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| ○ | 0.901 | BETA = 0.050 | ORBINC = 4.000 | | |
| □ | 1.000 | WNGINC 4.000 | HTAIL 0.000 | | |
| ◇ | 1.096 | PHIB 0.000 | | | |
| △ | 1.193 | | | | |
| ▷ | 1.458 | | | | |
| D | 1.950 | DATA HIST. CODE *A | | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRF | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

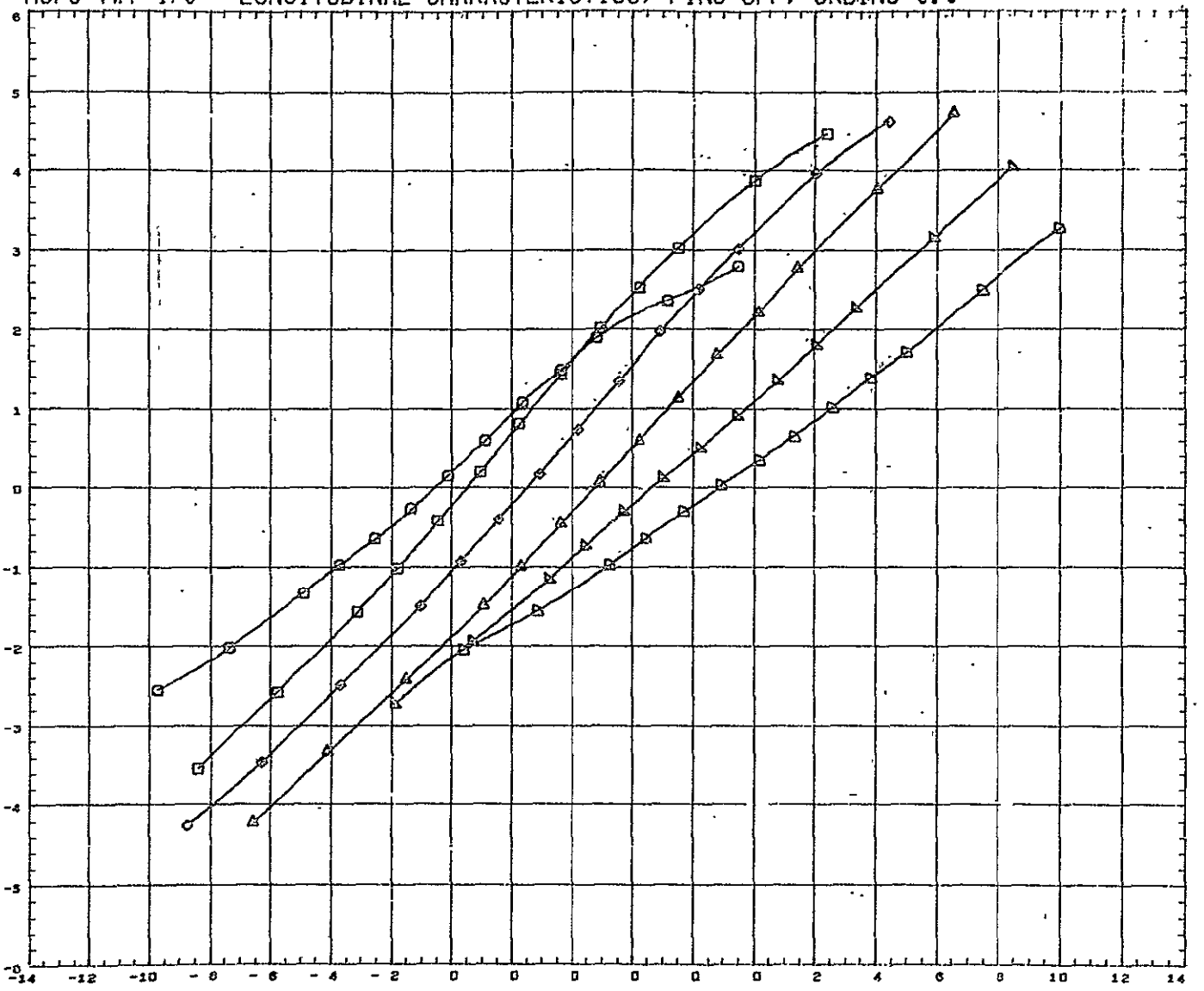
MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS OFF, ORBINC=0.0




| SYMBOL | MACH | PARAMETRIC VALUES | | | | | |
|---|---|---|---|---|---|---|---|
| ○ | 0.899 | BETA | = 0.050 | ORBINC | 0.000 | | |
| □ | 0.993 | WWGINC | 4.000 | HTAIL | 0.000 | | |
| ◇ | 1.101 | PHIB | 0.000 | | | | |
| △ | 1.201 | | | | | | |
| ▷ | 1.457 | | | | | | |
| D | 1.951 | DATA HIST. CODE | #A | | | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

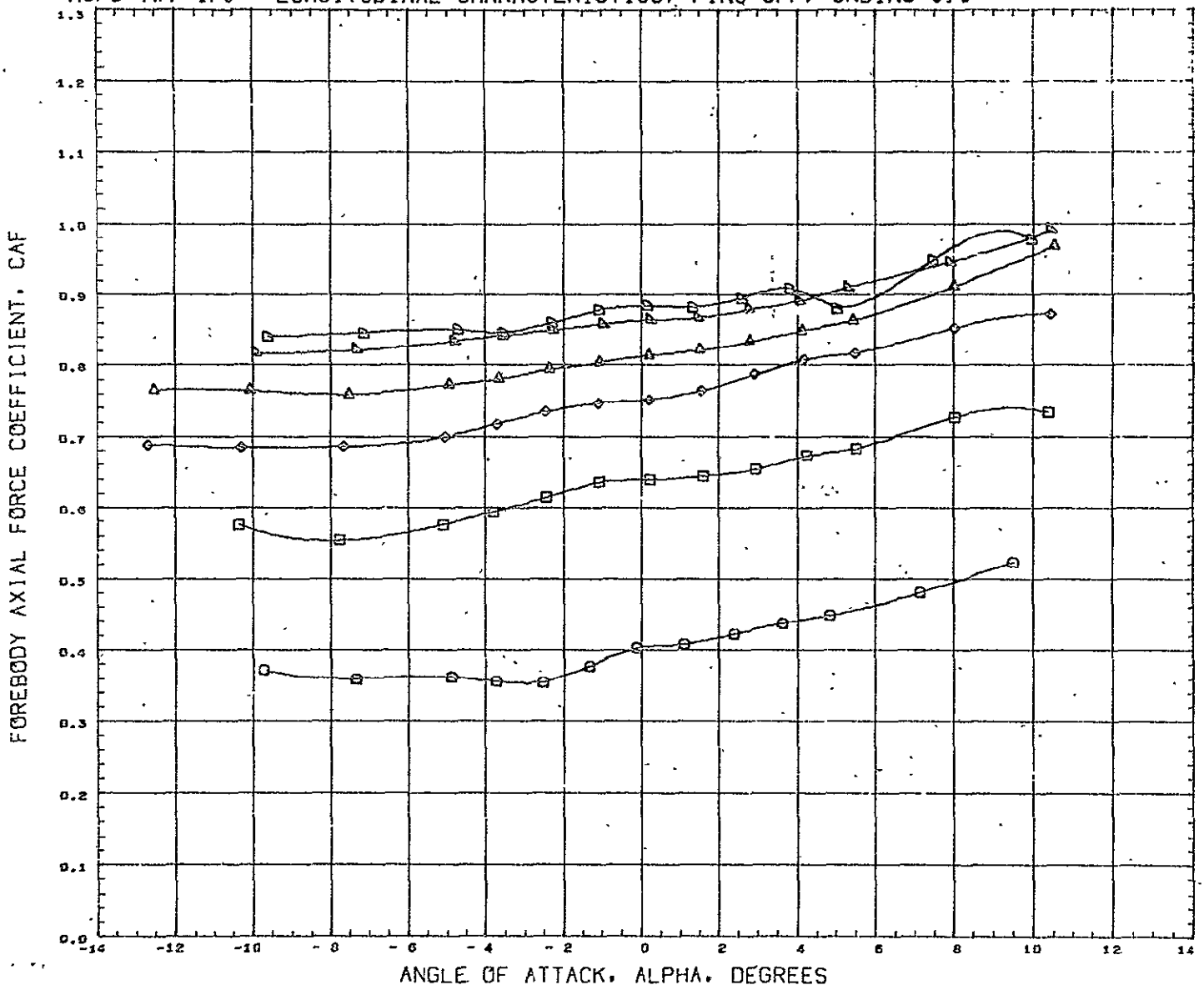
MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS OFF, ORBINC=0.0




| SYMBOL | MACH | | PARAMETRIC VALUES | | |
|---|---|---|---|---|---|
| ○ | 0.899 | BETA | - 0.050 | ORBINC | 0.000 |
| □ | 0.993 | WNGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 1.101 | PHIB | 0.000 | | |
| △ | 1.201 | | | | |
| ▷ | 1.457 | | | | |
| ▯ | 1.951 | DATA HIST. CODE | #A | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

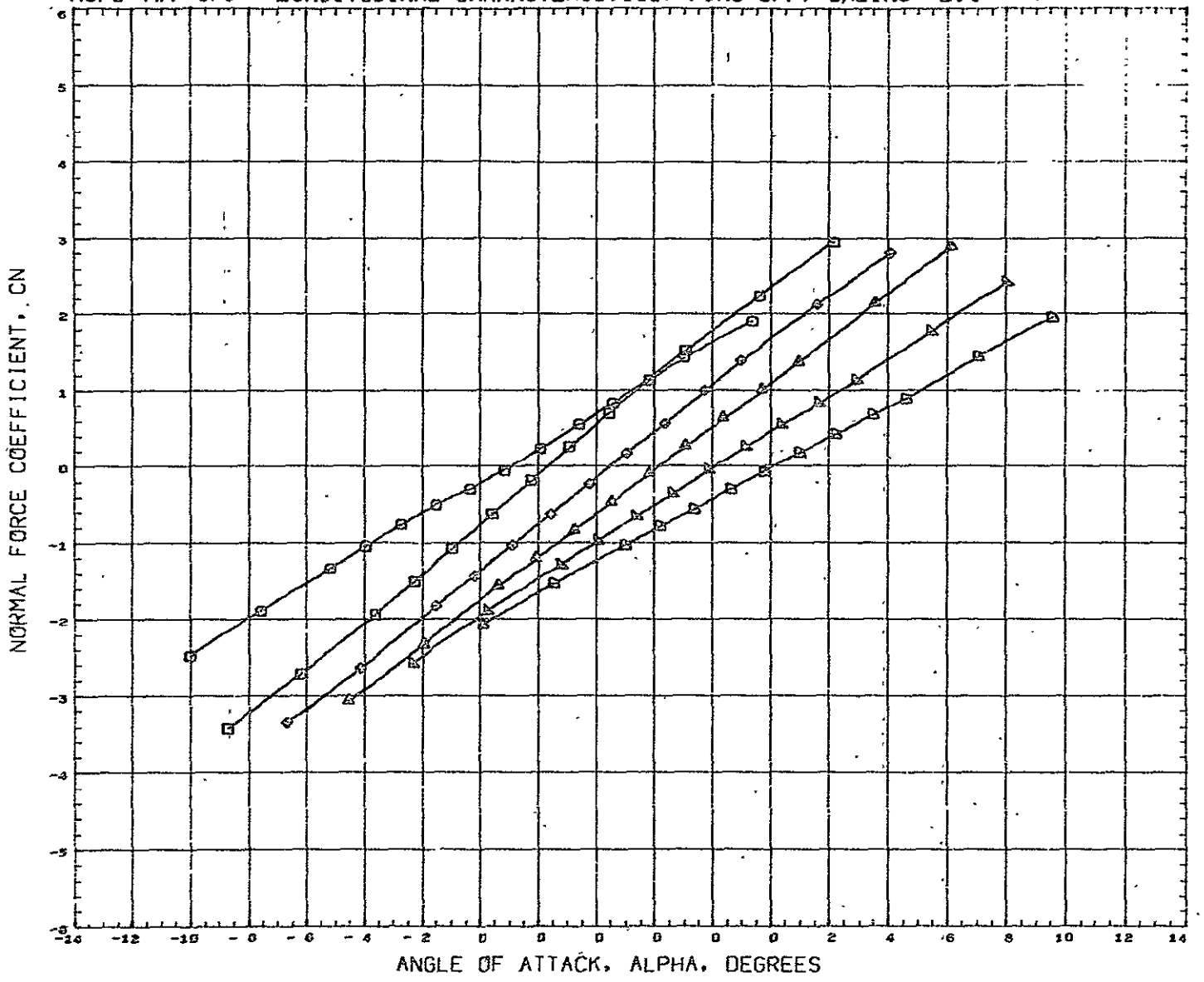
MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS OFF, ORBINC=0.0




| SYMBOL | MACH | | PARAMETRIC VALUES | | |
|---|---|---|---|---|---|
| ○ | 0.699 | BETA | - 0.050 | ORBINC | 0.000 |
| □ | 0.993 | WNGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 1.101 | PHIB | 0.000 | | |
| △ | 1.201 | | | | |
| ▷ | 1.457 | | | | |
| ▯ | 1.951 | DATA HIST. CODE | #A | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

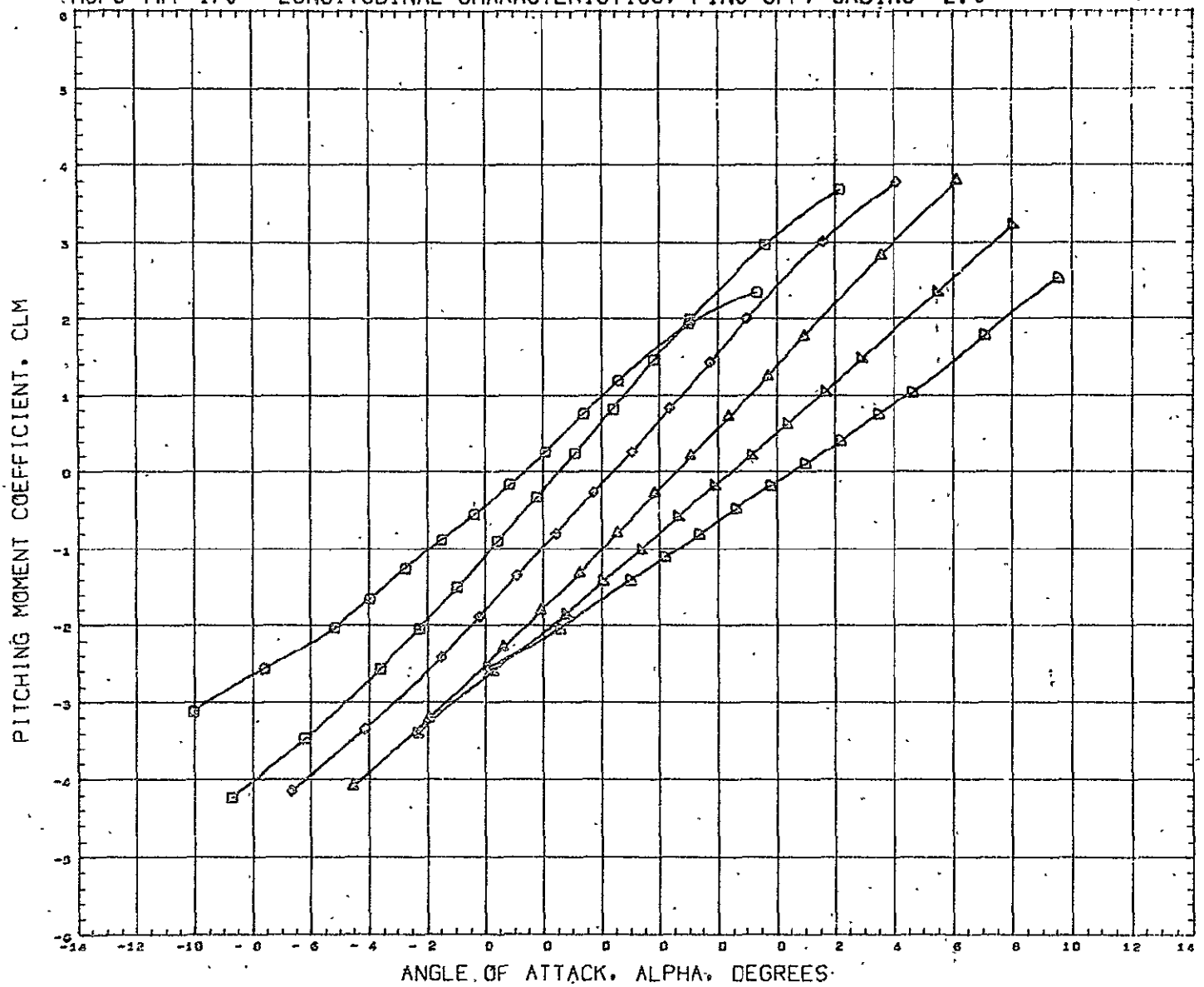
MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS OFF, ORBINC=-2.0




| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 0.905 | BETA | - 0.000 | ORBINC | - 2.000 | |
| □ | 0.994 | WINGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 1.100 | PHI3 | 0.000 | | | |
| △ | 1.203 | | | | | |
| ▷ | 1.454 | | | | | |
| ▷ | 1.960 | DATA HIST. CODE | *A | | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

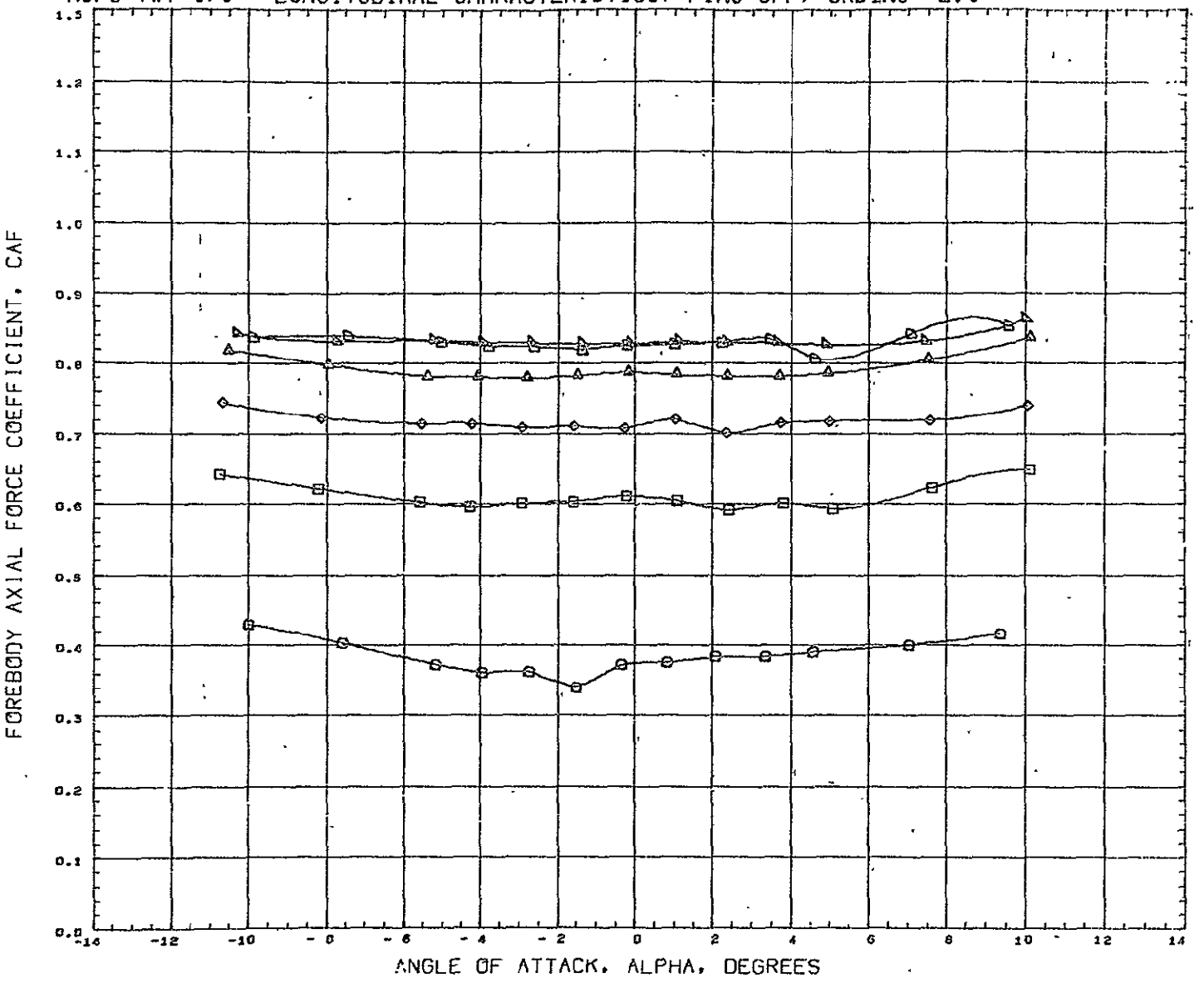
MSFC TWT 470 'LONGITUDINAL CHARACTERISTICS, FINS OFF, ORBINC=-2.0




| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| □ | 0.905 | BETA | = 0.000 | ORBINC | = 2.000 | |
| □ | 0.994 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 1.100 | PHIB | 0.000 | | | |
| △ | 1.203 | | | | | |
| ▷ | 1.454 | | | | | |
| ▷ | 1.960 | DATA HIST. CODE | 6A | | | |

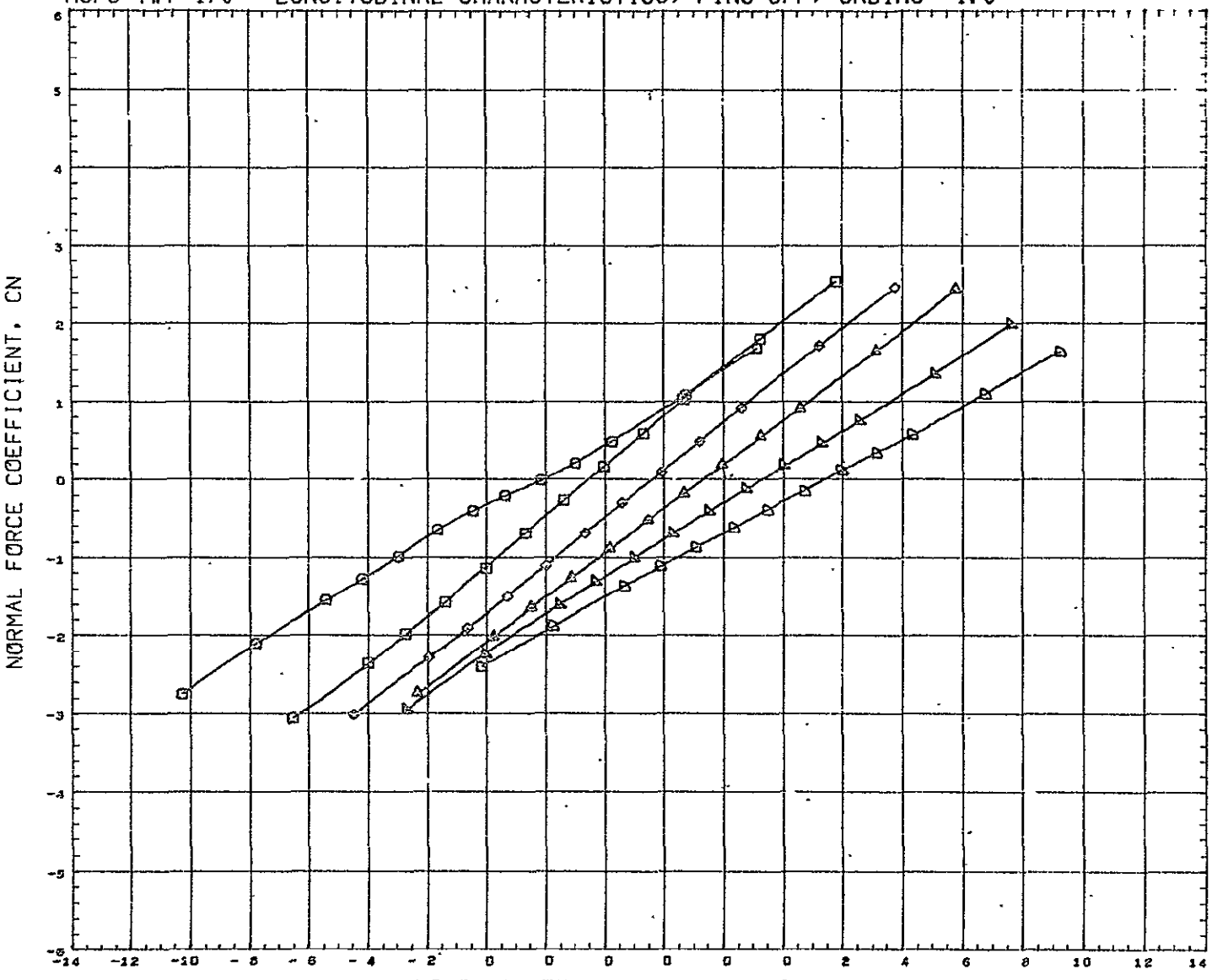
| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS OFF, ORBINC=-2.0



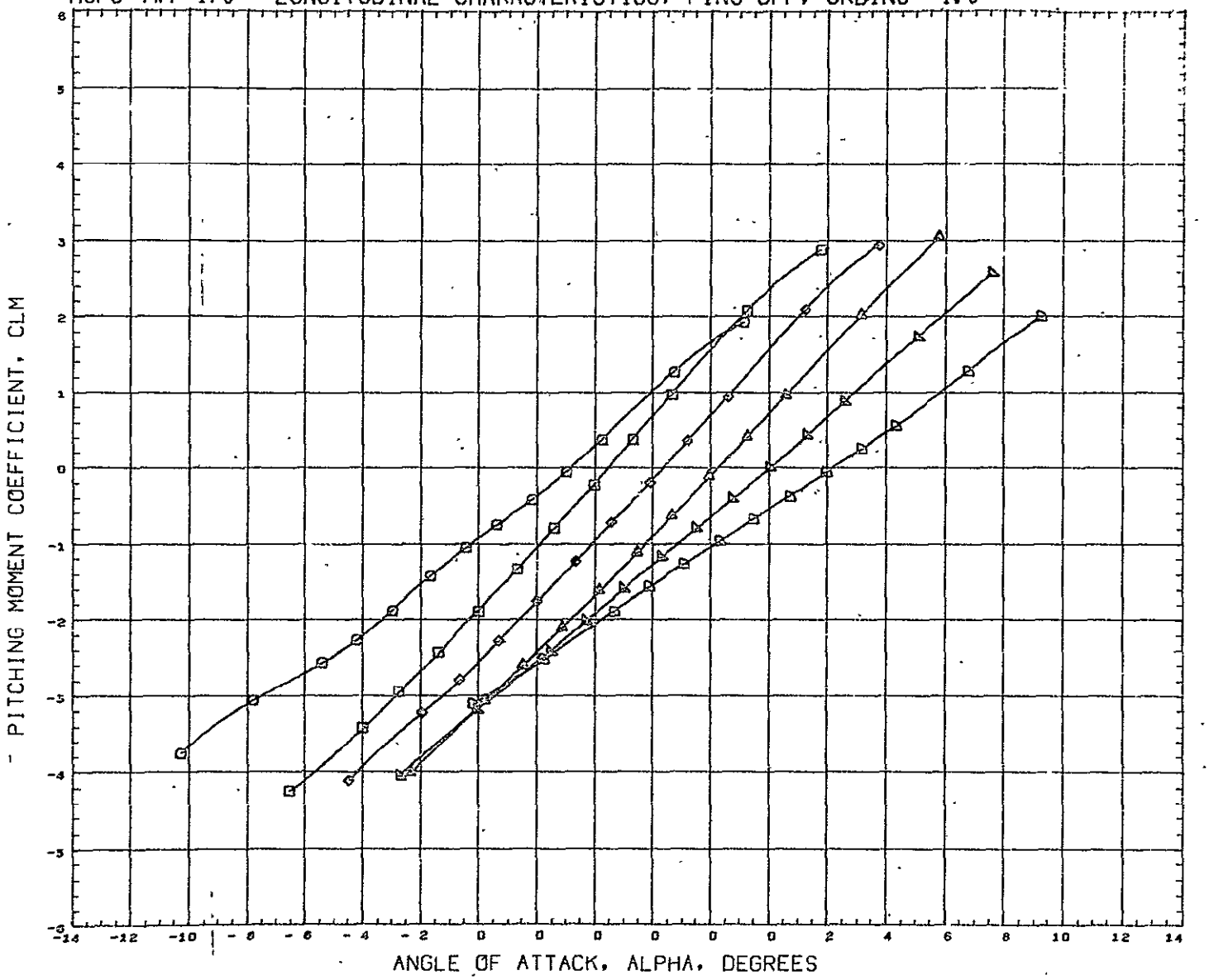

| SYMBOL | MACH | PARAMETRIC VALUES | | | | REFERENCE INFORMATION | | |
|---|---|---|---|---|---|---|---|---|
| ○ | 0.905 | BETA | = 0.000 | ORBINC | = 2.000 | REFS | 1.3960 | SQ.IN. |
| □ | 0.994 | WHGINC | 4.000 | HTAIL | 0.000 | REFL | 1.3330 | INCHES |
| ◇ | 1.100 | PHIB | 0.000 | | | REFB | 1.3330 | INCHES |
| △ | 1.203 | | | | | XMRP | 5.2640 | INCHES |
| ▷ | 1.454 | | | | | YMRP | 0.0000 | INCHES |
| ○ | 1.960 | DATA HIST. CODE | *A | | | ZMRP | 0.0000 | INCHES |
| | | | | | | SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS OFF, ORBINC=-4.0



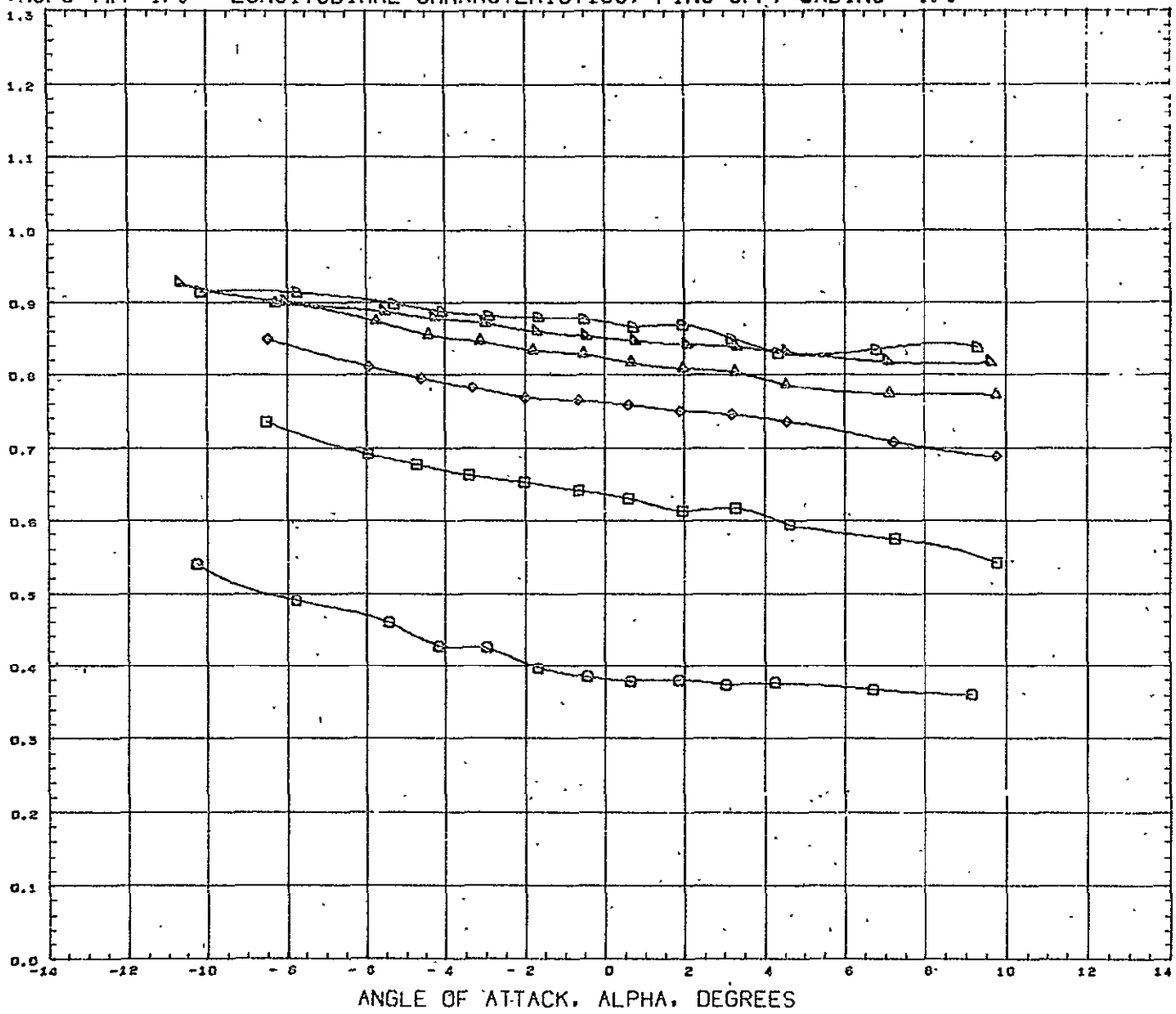

| SYMBOL | MACH | PARAMETRIC VALUES | | | | REFERENCE INFORMATION | | |
|---|---|---|---|---|---|---|---|---|
| ○ | 0.900 | BETA | - 0.040 | ORBINC | - 4.000 | REFS | 1.3960 | SQ.IN. |
| □ | 0.967 | WNGINC | 4.000 | HTAIL | 0.000 | REFL | 1.3330 | INCHES |
| ◇ | 1.100 | PHIB | 0.000 | | | REFB | 1.3330 | INCHES |
| △ | 1.199 | | | | | XMRP | 5.2640 | INCHES |
| ▷ | 1.460 | | | | | YMRP | 0.0000 | INCHES |
| ▷ | 1.952 | DATA MIST. CODE | #A | | | ZMRP | 0.0000 | INCHES |
| | | | | | | SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS OFF, ORBINC=-4.0




| SYMBOL | MACH | PARAMETRIC VALUES | | | | REFERENCE INFORMATION | | |
|---|---|---|---|---|---|---|---|---|
| ○ | 0.900 | BETA | 0.000 | ORBINC | 4.000 | REFS | 1.3960 | SQ.IN. |
| □ | 0.997 | WNGINC | 4.000 | HTAIL | 0.000 | REFL | 1.3330 | INCHES |
| ◇ | 1.100 | PHIB | 0.000 | | | REFB | 1.3330 | INCHES |
| △ | 1.199 | | | | | XMRP | 5.2640 | INCHES |
| ▷ | 1.460 | | | | | YMRP | 0.0000 | INCHES |
| D | 1.952 | DATA HIST. CODE | *A | | | ZMRP | 0.0000 | INCHES |
| | | | | | | SCALE | 0.3366 | PERCNT |

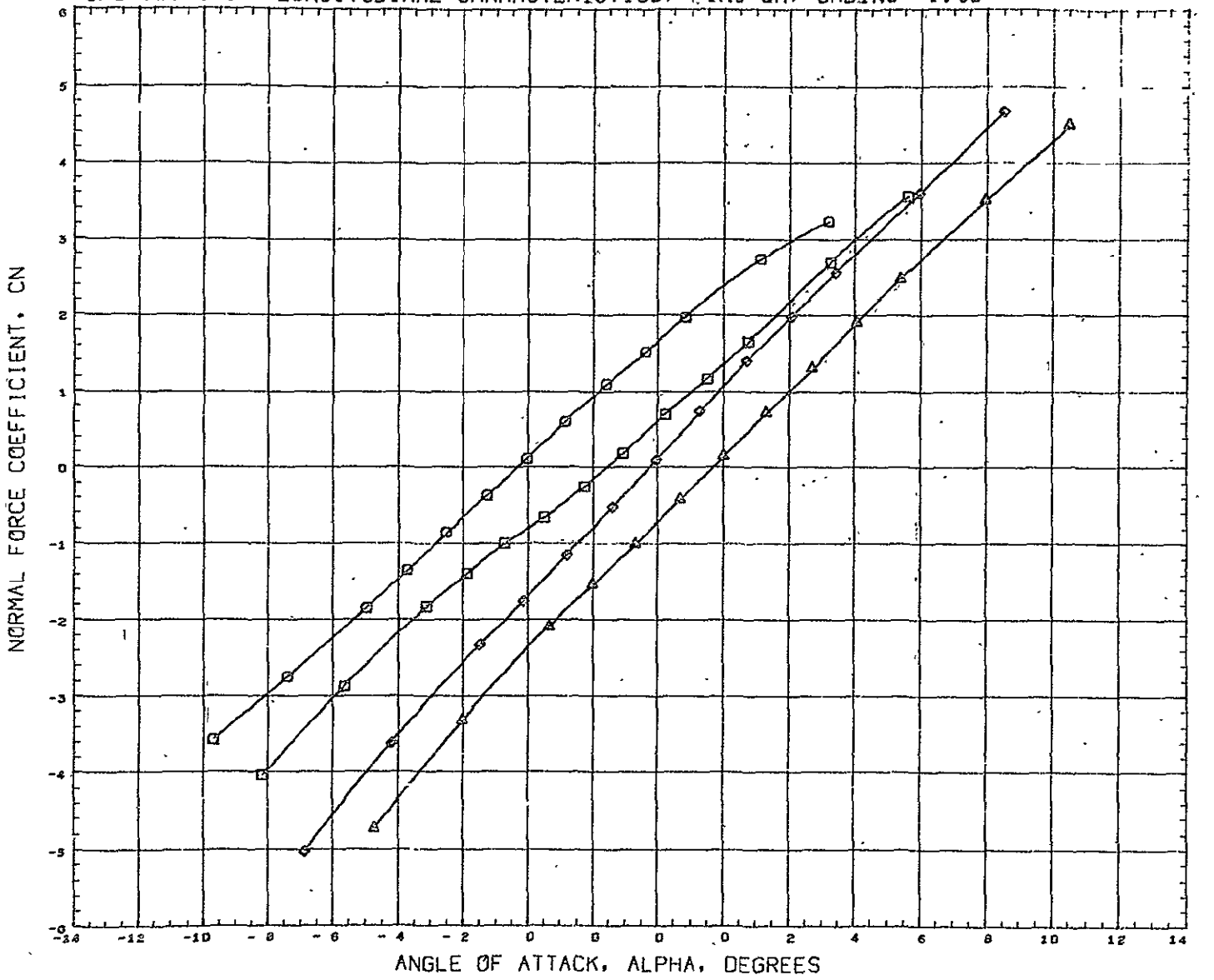
MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS OFF, ORBINC=-4.0




| SYMBOL | MACH | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| ○ | 0.900 | BETA = 0.040 | ORBINC = 4.000 | | |
| □ | 0.997 | WNGINC 4.000 | HTAIL 0.000 | | |
| ◇ | 1.100 | PHIB 0.000 | | | |
| △ | 1.199 | | | | |
| ▷ | 1.460 | | | | |
| ▯ | 1.952 | DATA HIST. CODE *A | | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=-1.05




| SYMBOL | MACH |
|---|---|
| ○ | 0.599 |
| □ | 0.899 |
| ◇ | 0.997 |
| △ | 1.095 |

PARAMETRIC VALUES

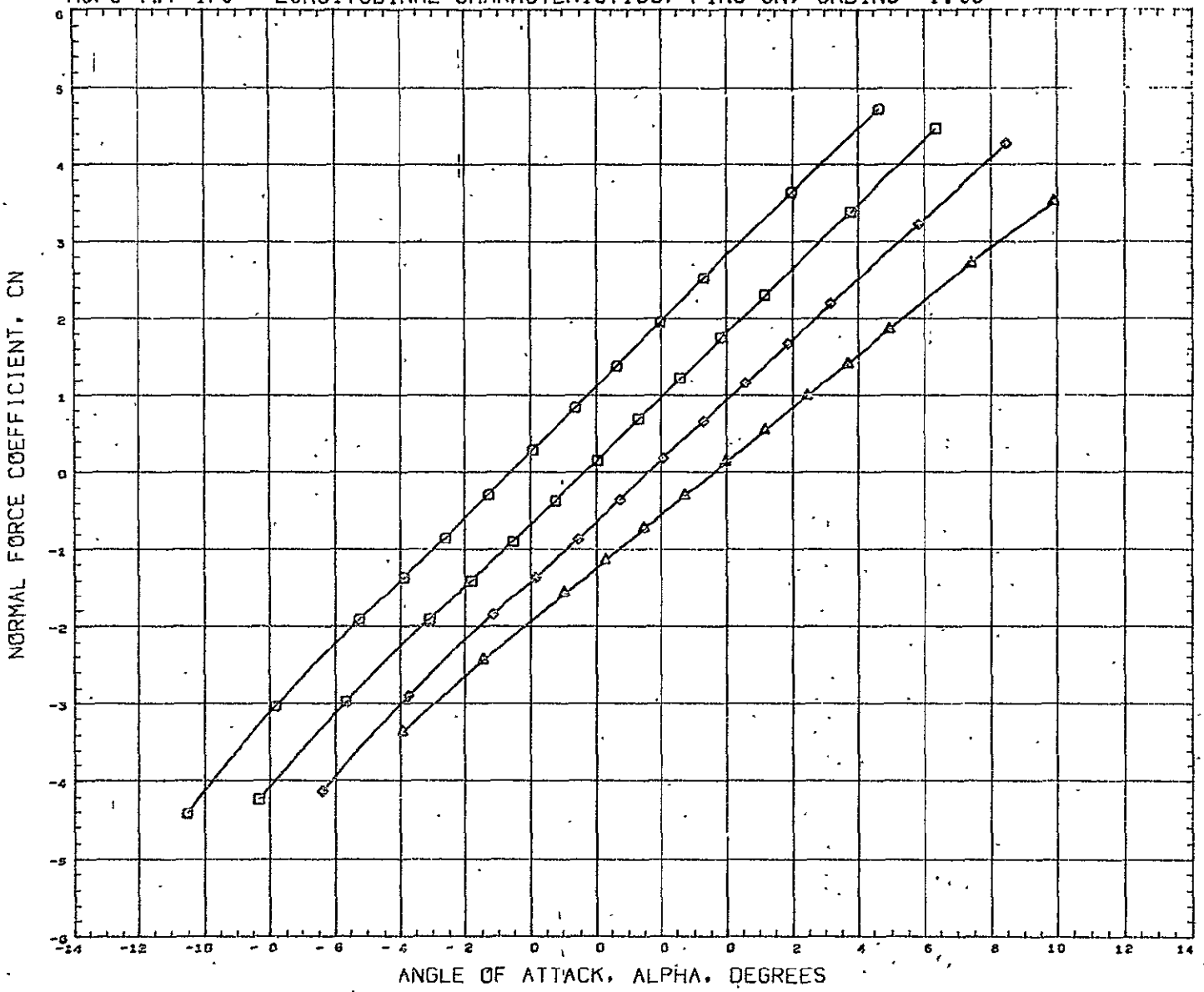
| | | | | | |
|---|---|---|---|---|---|
| BETA | - | 0.050 | ORBINC | - | 1.050 |
| WHGINC | | 4.000 | HTAIL | | 0.000 |
| PHIB | | 0.000 | | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

REFERENCE FILE

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=-1.05




| SYMBOL | MACH |
|---|---|
| ○ | 1.195 |
| □ | 1.393 |
| ◇ | 1.456 |
| △ | 1.967 |

PARAMETRIC VALUES

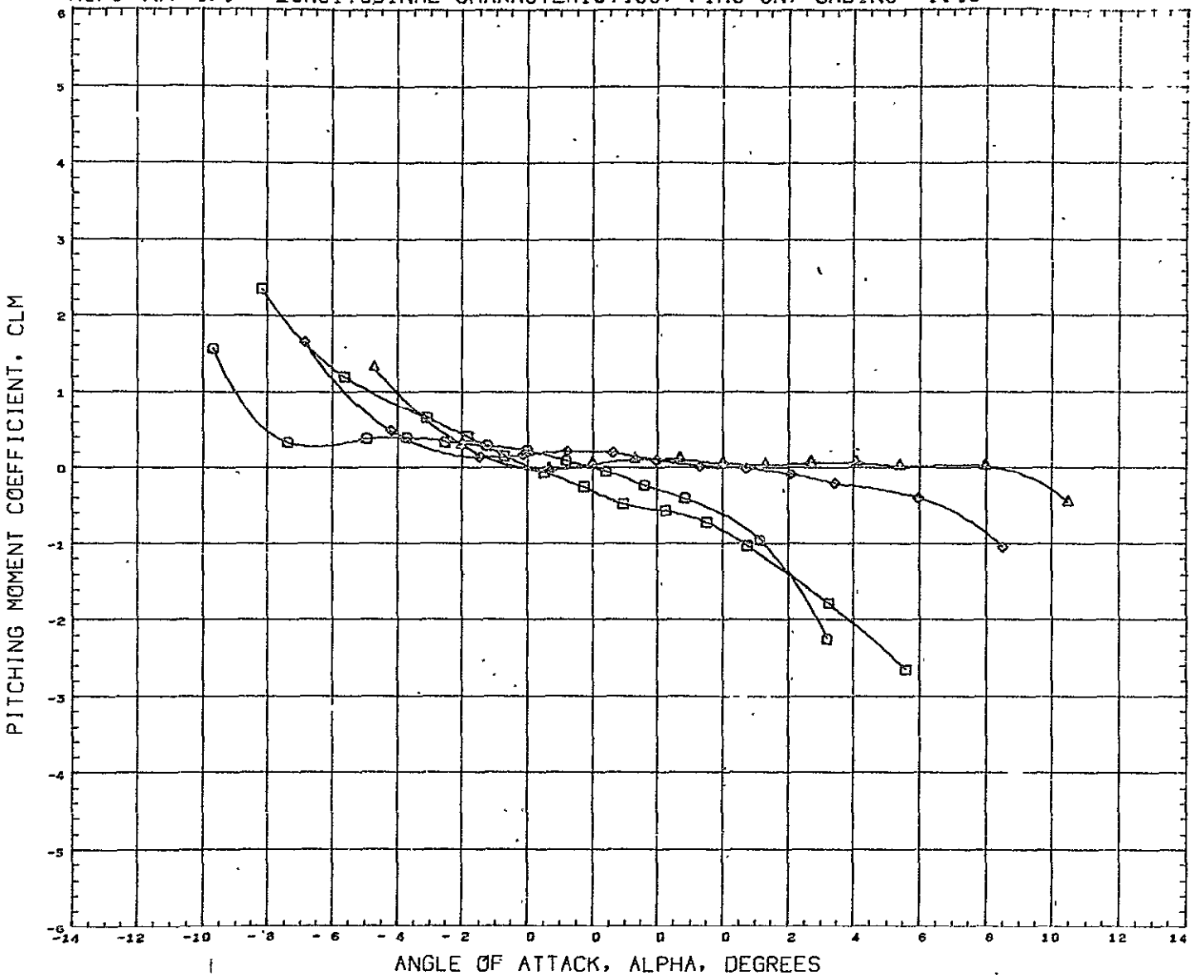
| | | | | | |
|---|---|---|---|---|---|
| BETA | = | 0.050 | ORBINC | = | 1.050 |
| WHGINC | | 4.000 | HTAIL | | 0.000 |
| PHIB | | 0.000 | | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

REFERENCE FILE

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=-1.05

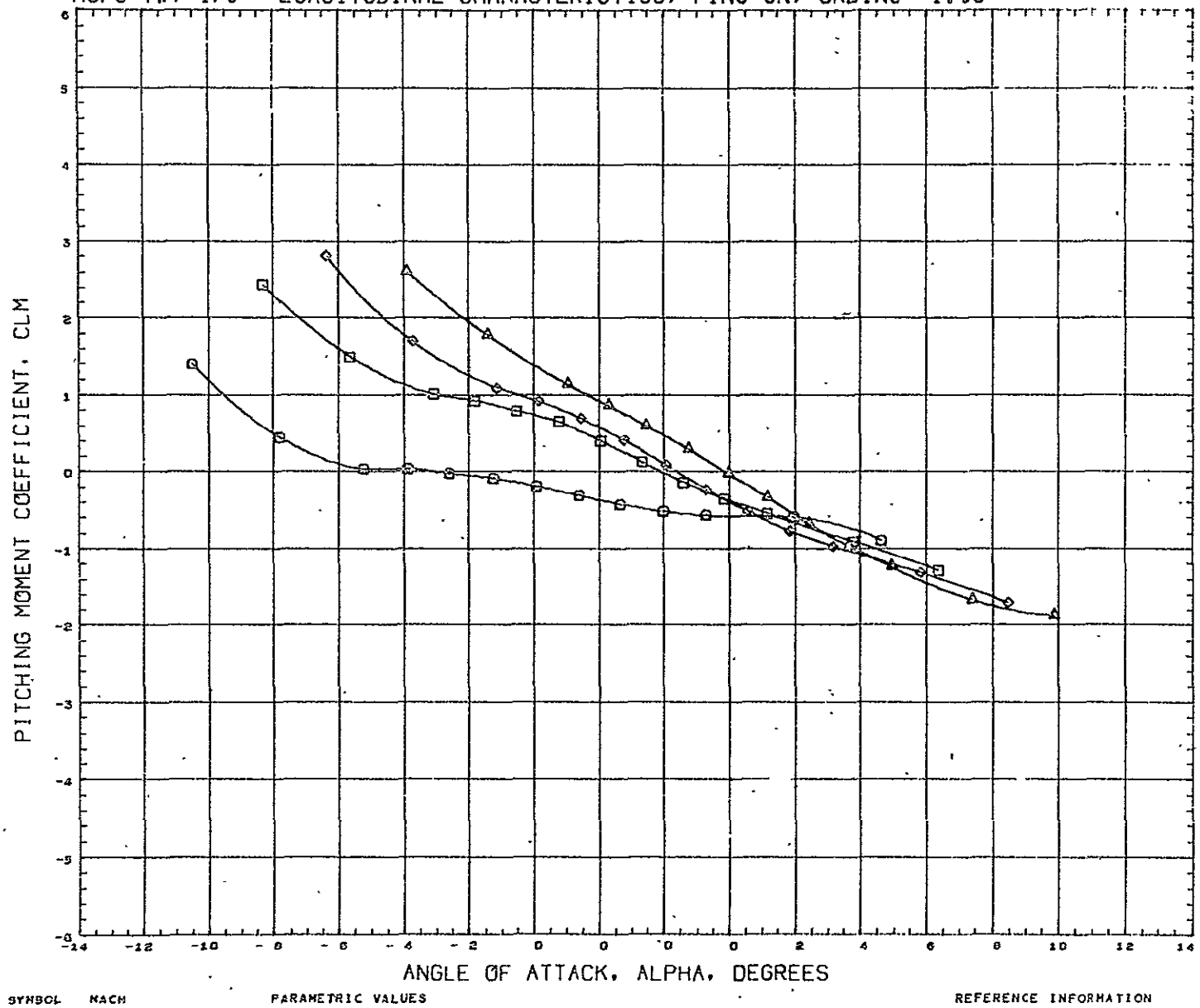



| SYMBOL | MACH | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| ○ | 0.599 | BETA | - 0.050 | ORBINC | - 1.050 | |
| □ | 0.699 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 0.997 | PHIB | 0.000 | | | |
| △ | 1.095 | | | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=-1.05

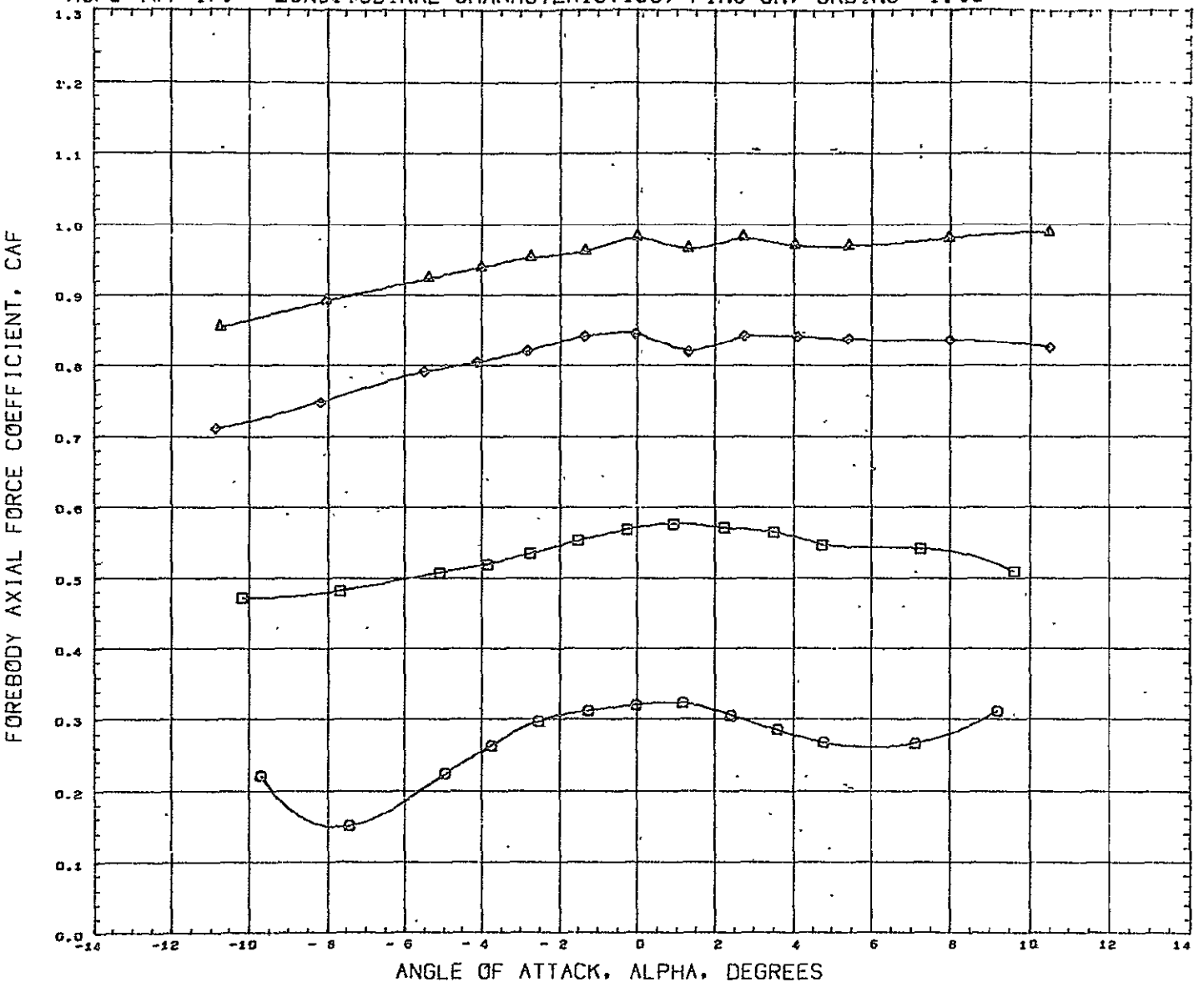



| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 1.195 | BETA | - 0.050 | ORBINC | - 1.050 | |
| □ | 1.303 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 1.456 | PHIB | 0.000 | | | |
| △ | 1.967 | | | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=-1.05




| SYMBOL | MACH |
|---|---|
| ○ | 0.599 |
| □ | 0.899 |
| ◇ | 0.997 |
| △ | 1.095 |

PARAMETRIC VALUES

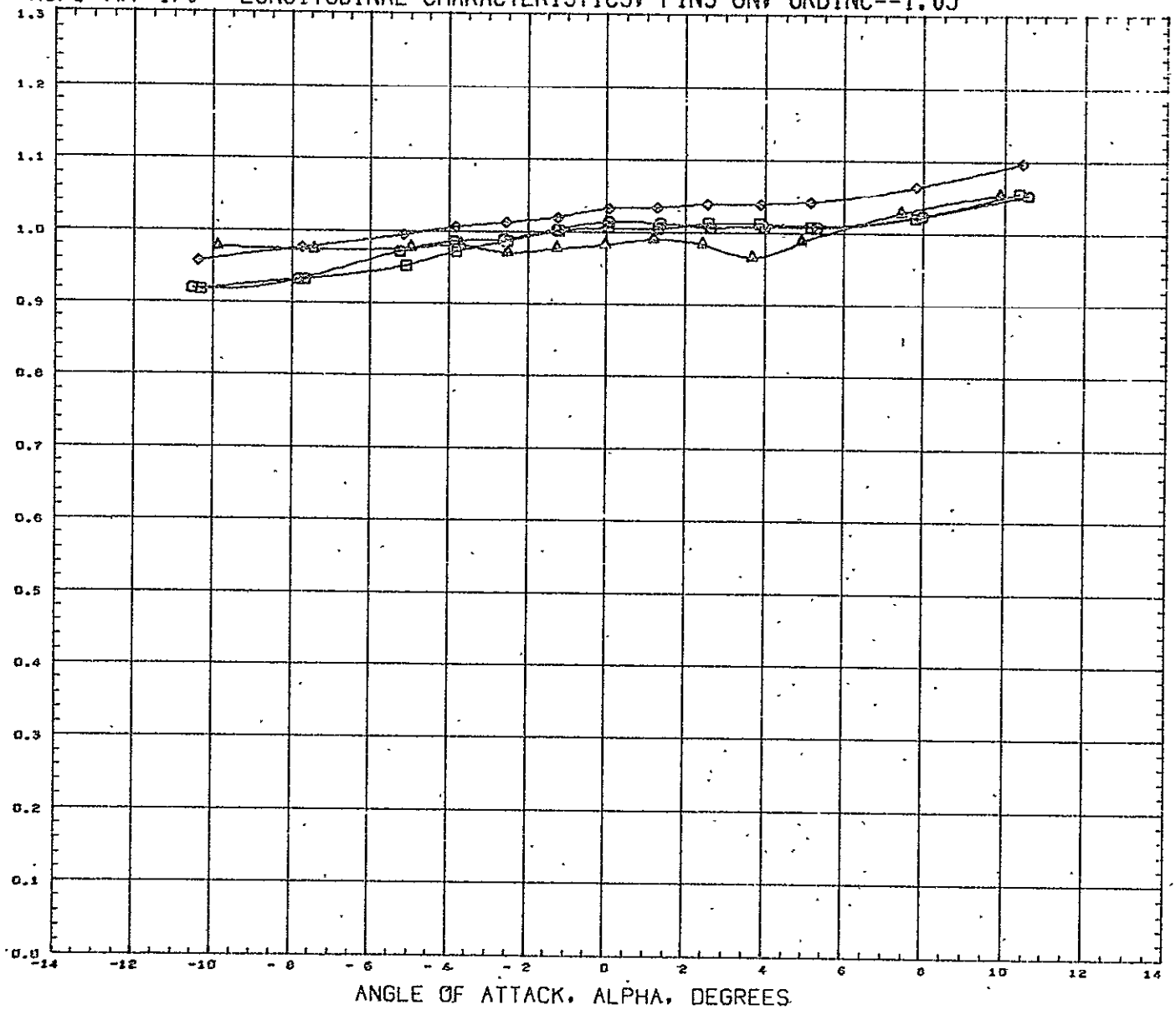
| | | | |
|---|---|---|---|
| BETA | - 0.050 | ORBINC | - 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

REFERENCE FILE

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=-1.05




| SYMBOL | MACH |
|---|---|
| ○ | 1.195 |
| □ | 1.303 |
| ◇ | 1.456 |
| △ | 1.987 |

PARAMETRIC VALUES

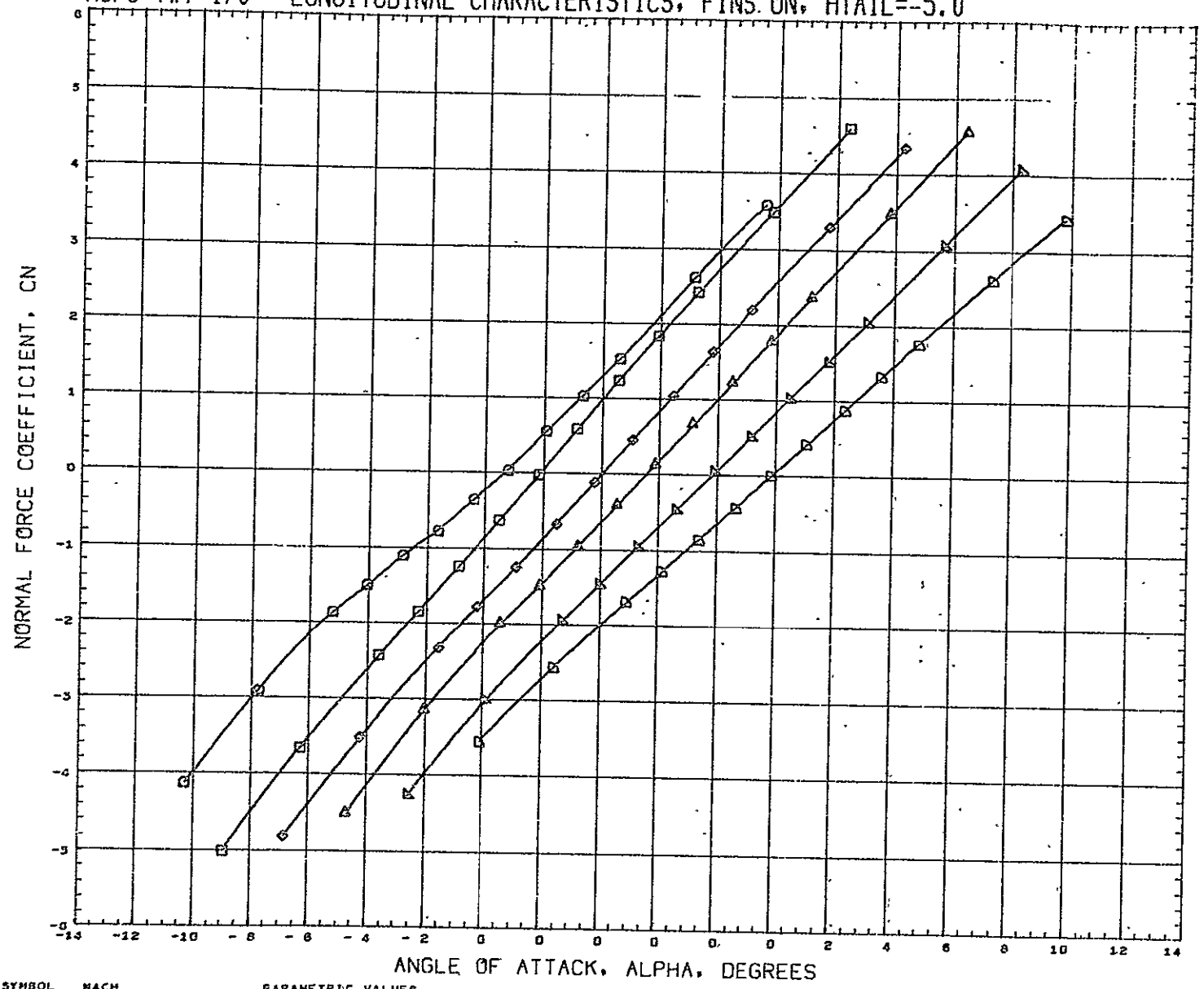
| | | | | | |
|---|---|---|---|---|---|
| BETA | - | 0.050 | ORBINC | - | 1.050 |
| WNGINC | | 4.000 | HTAIL | | 0.000 |
| PHIB | | 0.000 | | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, HTAIL=-5.0

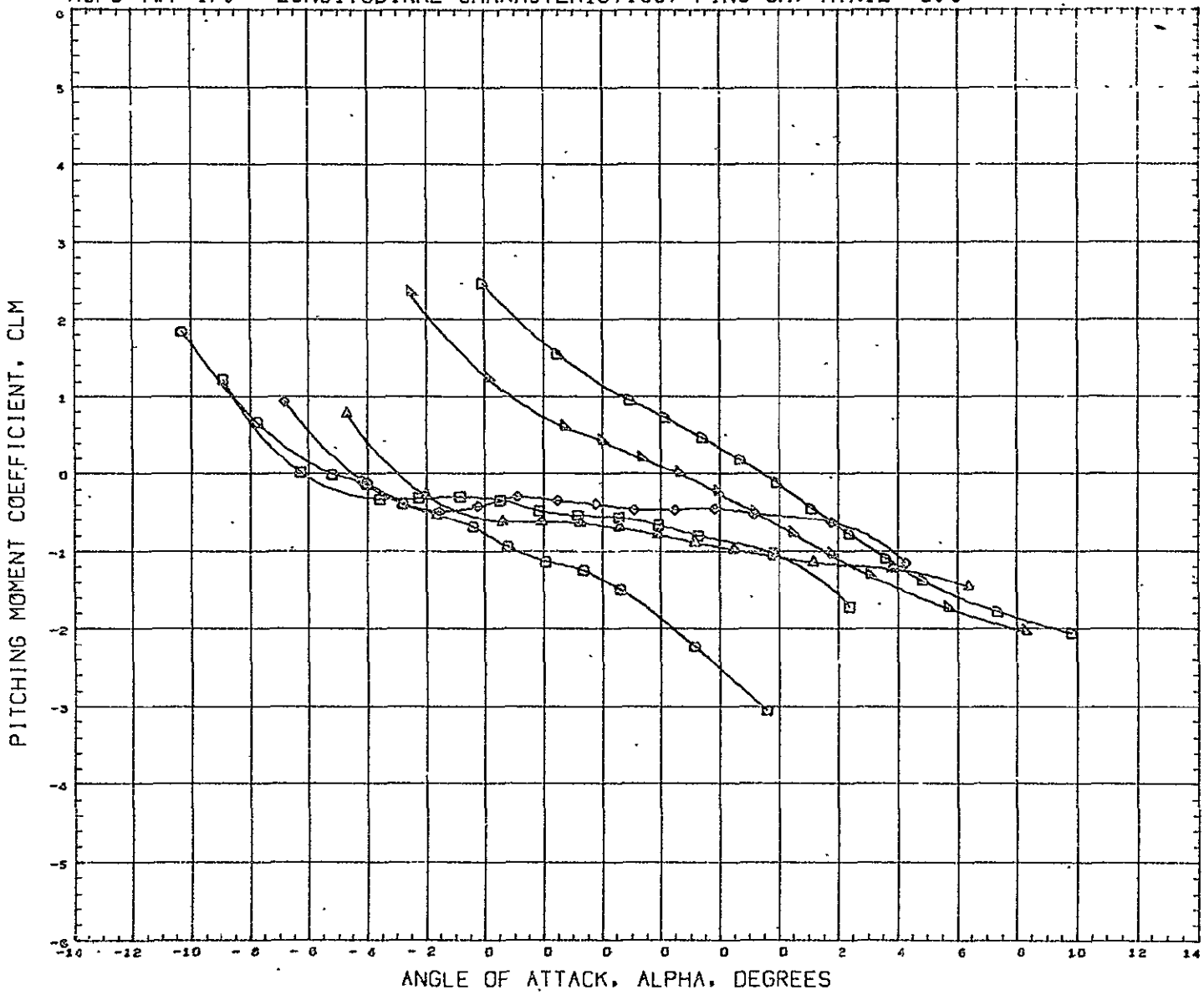



| SYMBOL | MACH | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| ○ | 0.693 | BETA | - 0.020 | ORBINC | - 1.050 | |
| □ | 0.995 | WNGINC | 4.000 | HTAIL | - 5.000 | |
| ◇ | 1.095 | PHIB | 0.000 | | | |
| △ | 1.199 | | | | | |
| ▷ | 1.454 | | | | | |
| ▽ | 1.961 | DATA HIST. CODE | *A | | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

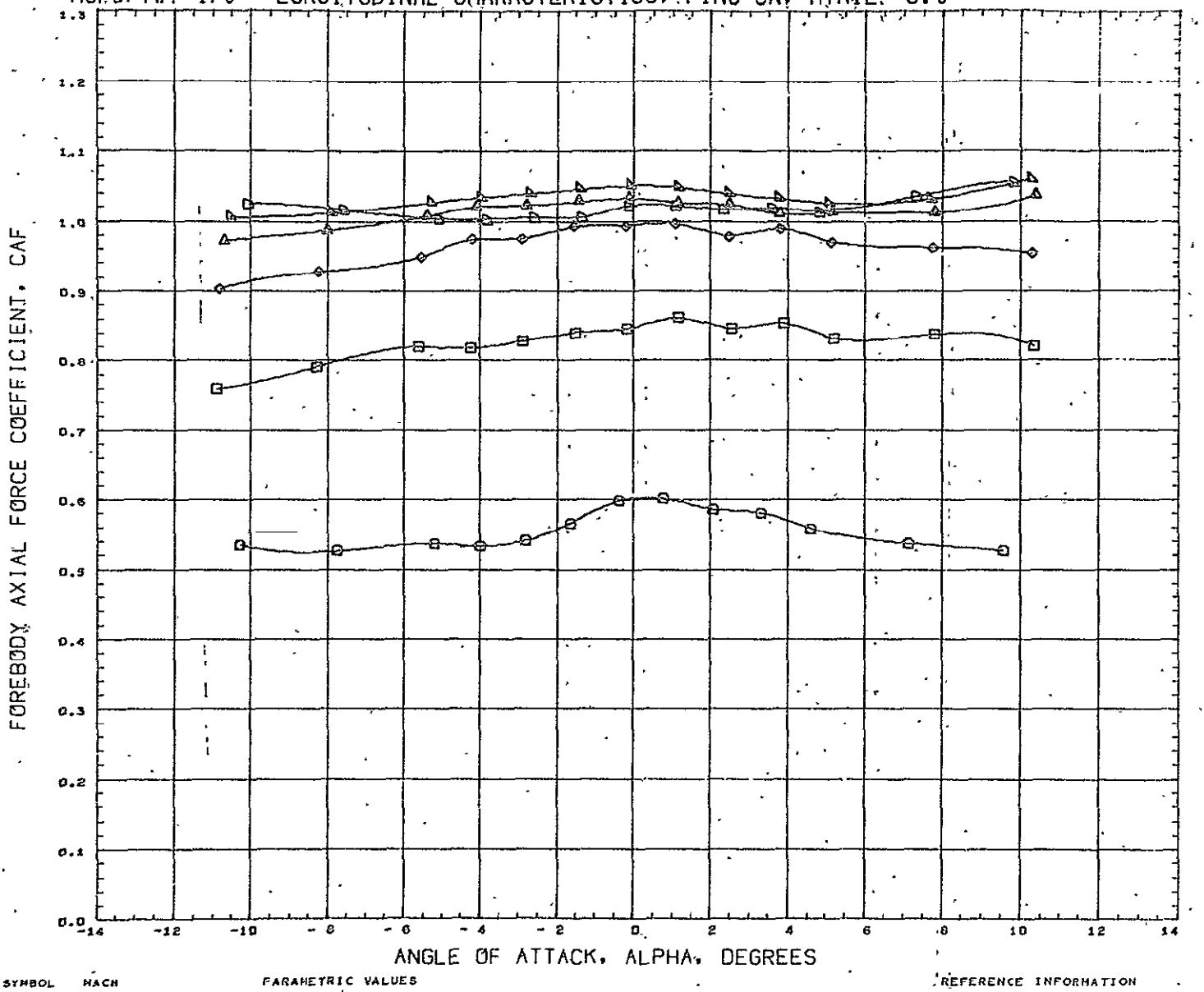
MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, HTAIL=-5.0




| SYMBOL | MACH | PARAMETRIC VALUES | | | | | |
|---|---|---|---|---|---|---|---|
| ○ | 0.893 | BETA | - 0.020 | ORDINC | - 1.050 | | |
| □ | 0.995 | WNGINC | 4.000 | HTAIL | - 5.000 | | |
| ◇ | 1.093 | PHIB | 0.000 | | | | |
| △ | 1.195 | | | | | | |
| ▷ | 1.454 | | | | | | |
| ▷ | 1.961 | DATA HIST. CODE | #A | | | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRF | 0.0000 | INCHES |
| ZMRF | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

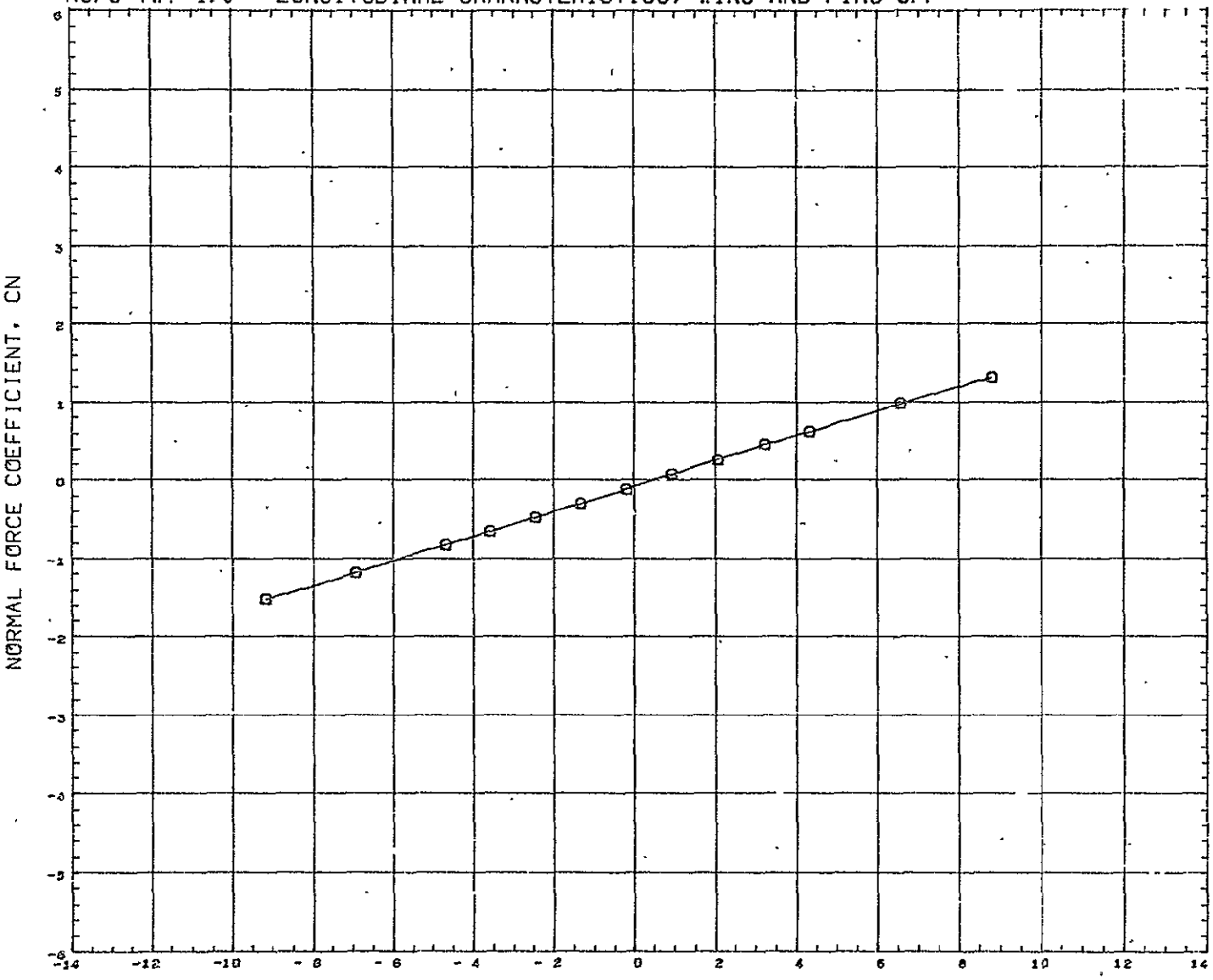
MSFC: TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, HTAIL=-5.0




| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 0.893 | BETA | - 0.020 | ORBINC | - 1.050 | |
| □ | 0.995 | WNGINC | 4.000 | HTAIL | - 5.000 | |
| ◇ | 1.093 | PHIB | 0.000 | | | |
| △ | 1.199 | | | | | |
| ▷ | 1.454 | | | | | |
| ▯ | 1.961 | DATA HIST. CODE | #A | | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, WING AND FINS OFF



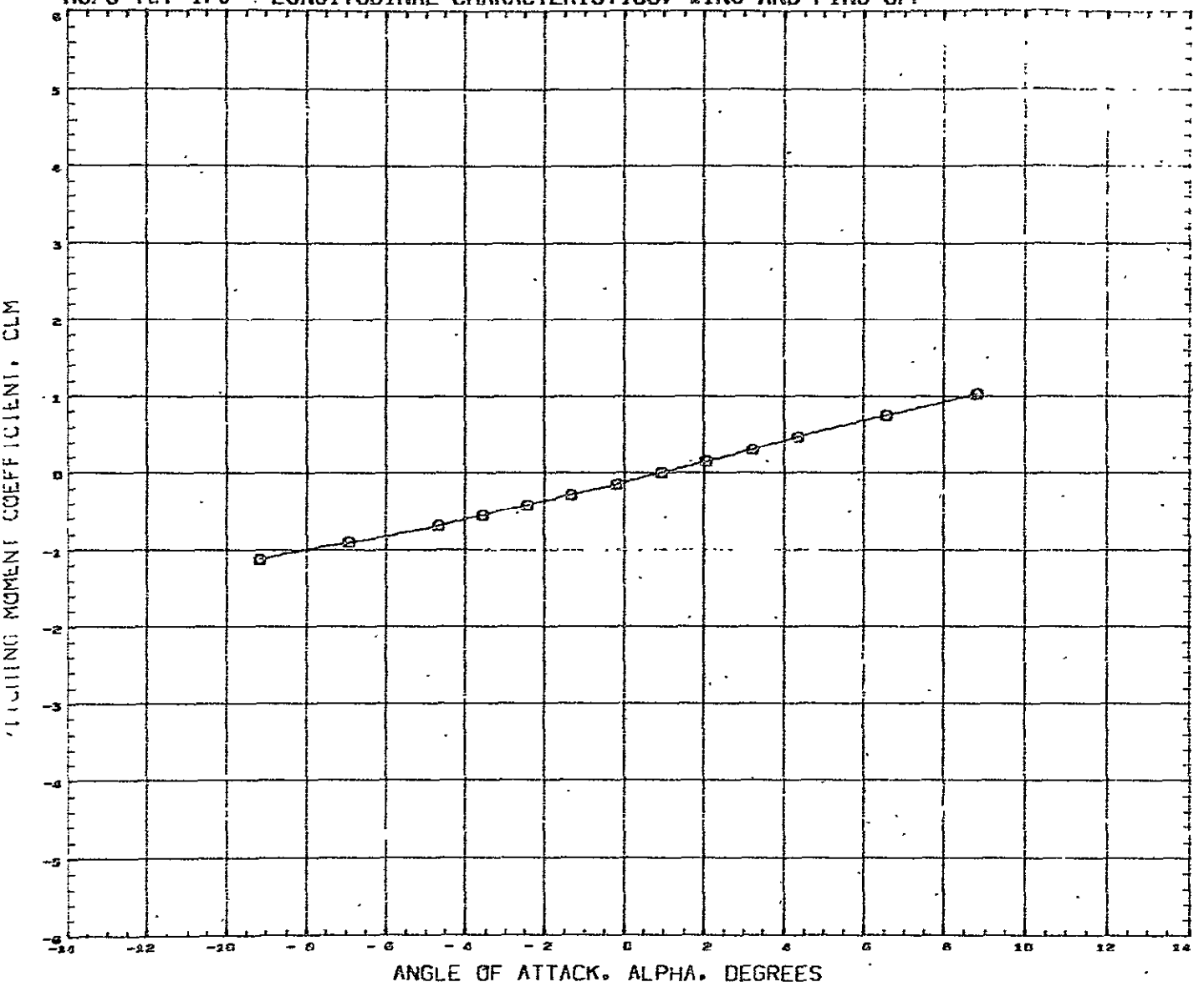

| SYMBOL | MACH | PARAMETRIC VALUES | | | | REFERENCE INFORMATION | | |
|---|---|---|---|---|---|---|---|---|
| O | 0.995 | BETA | - 0.100 | ORBINC | - 1.050 | REFS | 1.3960 | SQ.IN. |
| | | HTAIL | 0.000 | PHIB | 0.000 | REFL | 1.3330 | INCHES |
| | | | | | | REFB | 1.3330 | INCHES |
| | | | | | | XMRP | 5.2640 | INCHES |
| | | | | | | YMRP | 0.0000 | INCHES |
| | | | | | | ZMRP | 0.0000 | INCHES |
| | | | | | | SCALE | 0.3366 | PERCNT |

REFERENCE FILE



3

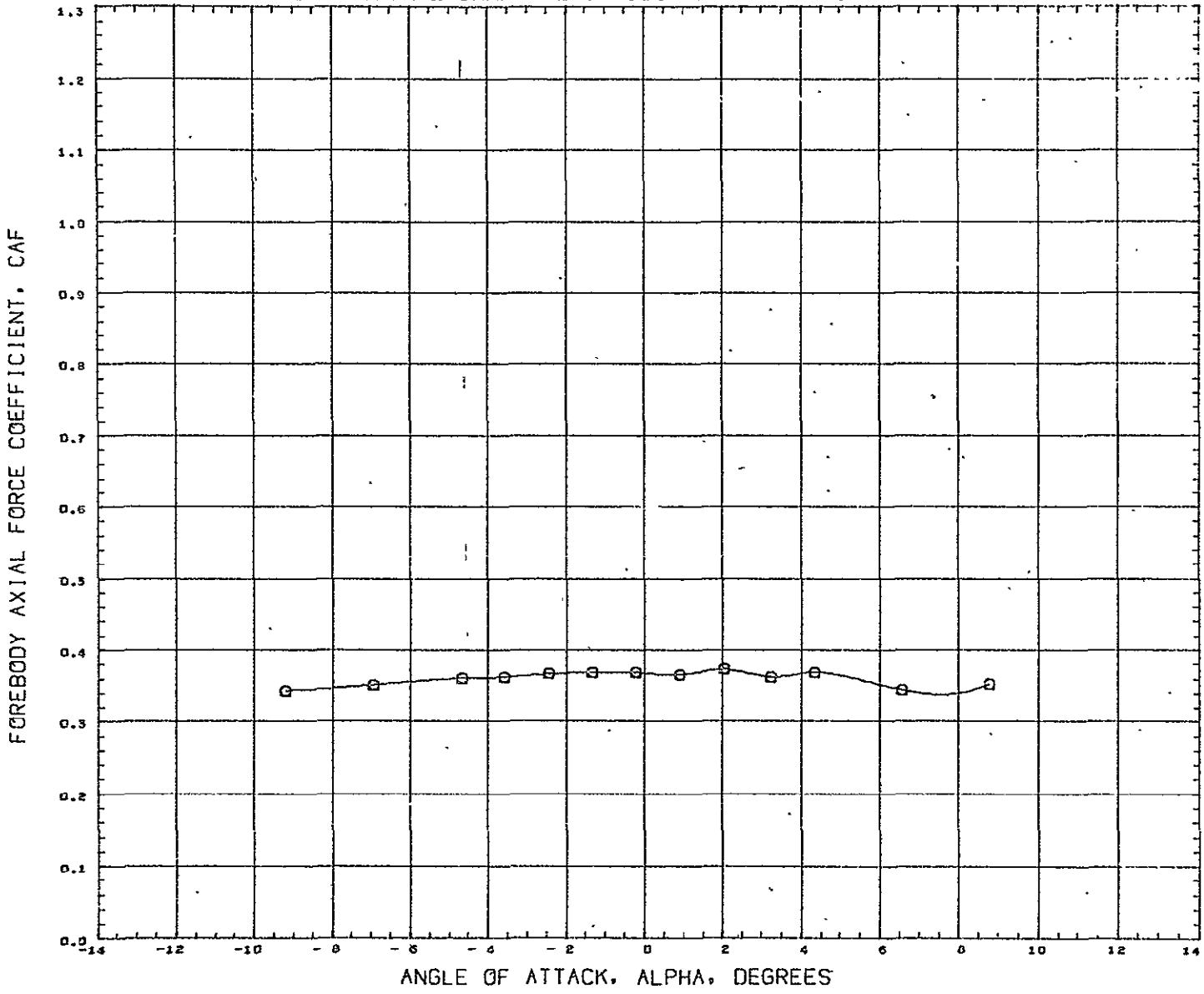
# MSFC TWT 470 . LONGITUDINAL CHARACTERISTICS, WING AND FINS OFF




| MSOL | MACH | PARAMETRIC VALUES | | | | REFERENCE INFORMATION | | |
|---|---|---|---|---|---|---|---|---|
| O | 0.995 | BETA | - 0.100 | ORBINC | - 1.050 | REFS | 1.3969 | SQ.IN. |
| | | MTAIL | 0.000 | FWIB | 0.000 | REFL | 1.3330 | INCHES |
| | | | | | | REFB | 1.3330 | INCHES |
| | | | | | | XMRP | 5.2640 | INCHES |
| | | | | | | YMRP | 0.0000 | INCHES |
| | | | | | | ZMRP | 0.0000 | INCHES |
| | | | | | | - SCALE | 0.3366 | PERCNT |

REFERENCE FILE

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, WING AND FINS OFF



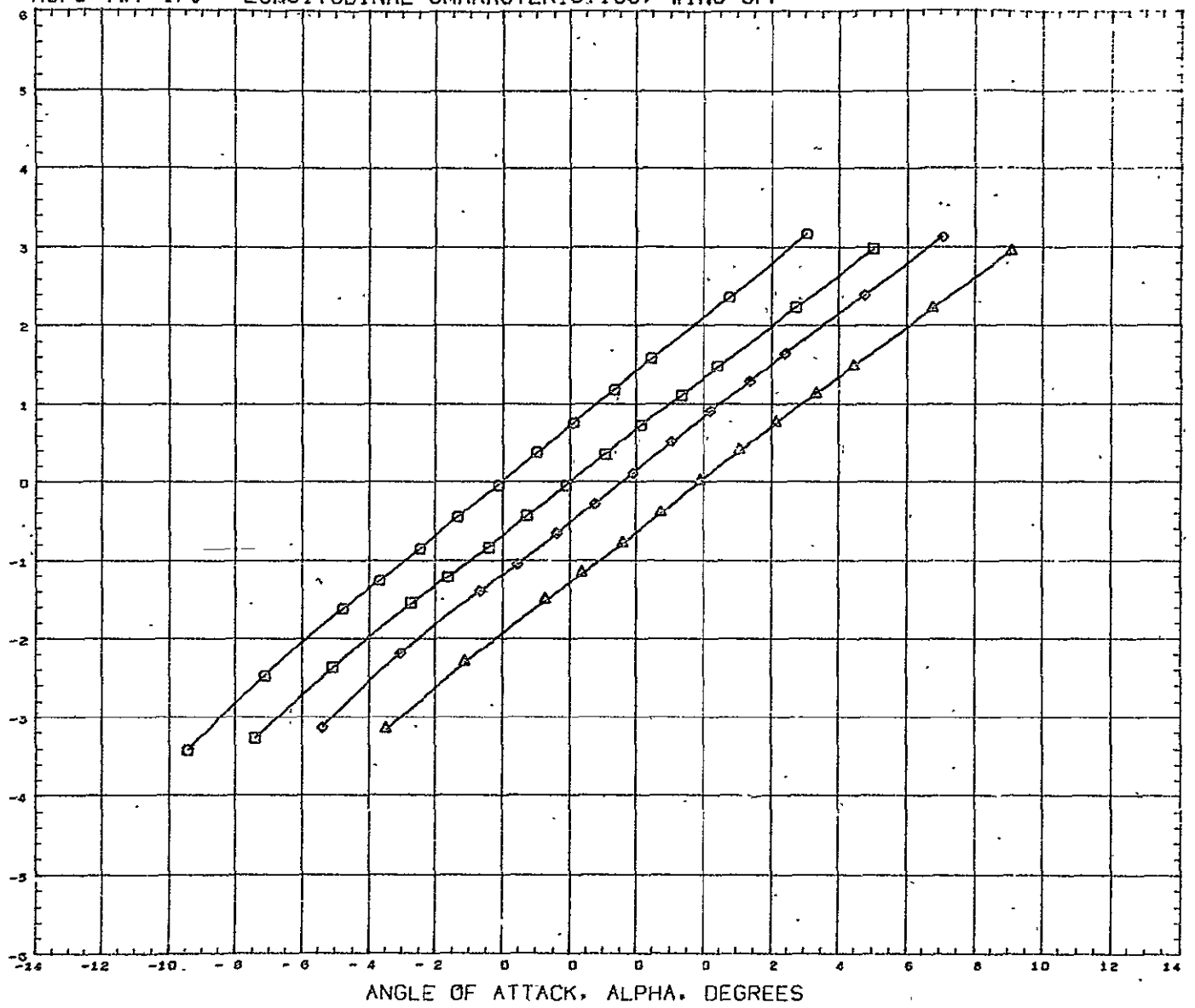

| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| O | 0.995 | BETA | - 0.100 | ORBINC | - 1.050 | |
| | | HTAIL | 0.000 | PHIB | 0.000 | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

REFERENCE FILE

# MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, WING OFF

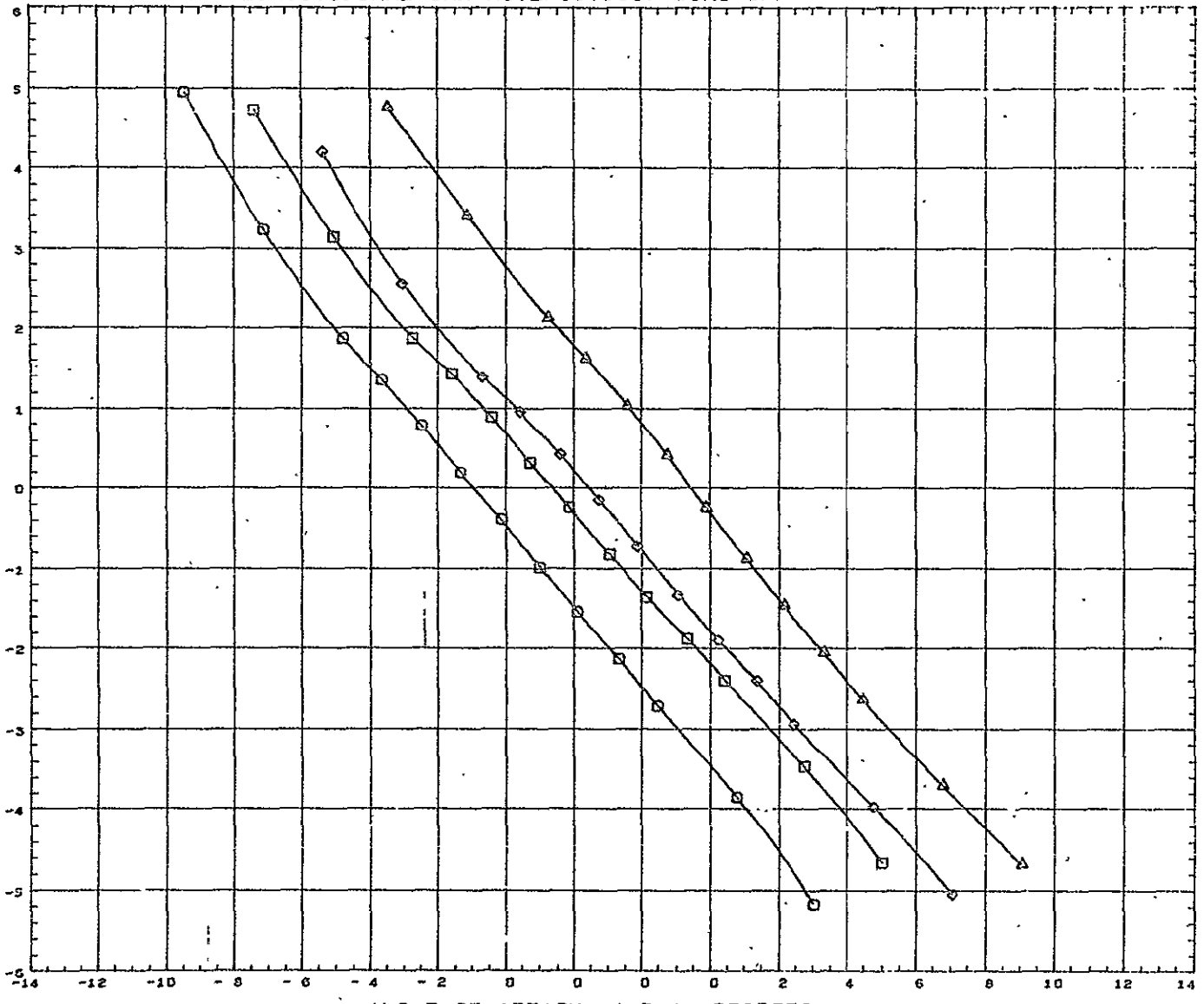



| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 0.999 | BETA | - 0.100 | ORBINC | - 1.050 | |
| □ | 1.102 | HTAIL | 0.000 | PHIB | 0.000 | |
| ◇ | 1.195 | | | | | |
| △ | 1.459 | | | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, WING OFF

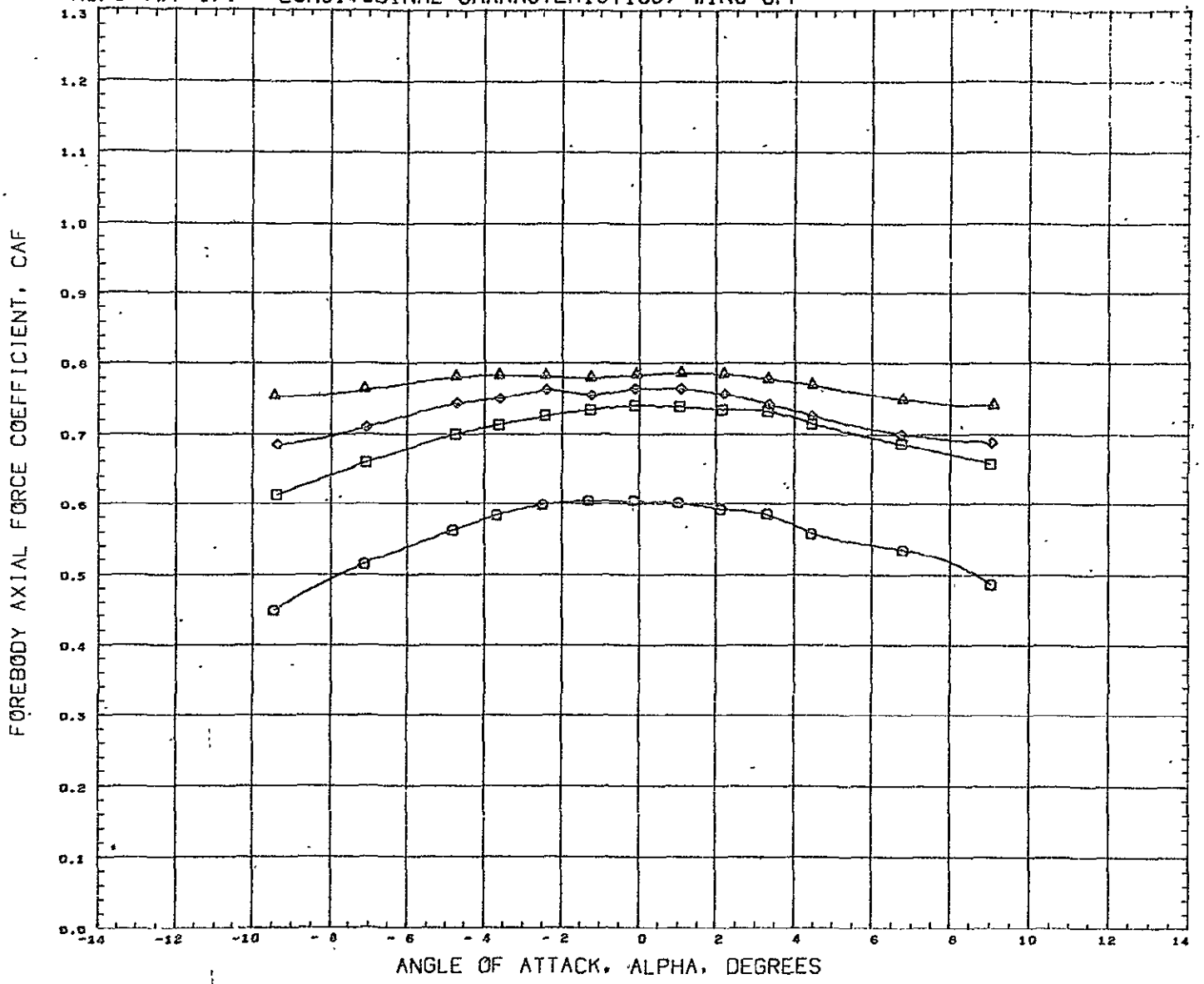



| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 0.999 | BETA | - 0.100 | ORBINC | - 1.050 | |
| □ | 1.102 | HTAIL | 0.000 | PHIB | 0.000 | |
| ◇ | 1.195 | | | | | |
| △ | 1.459 | | | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

# MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, WING OFF



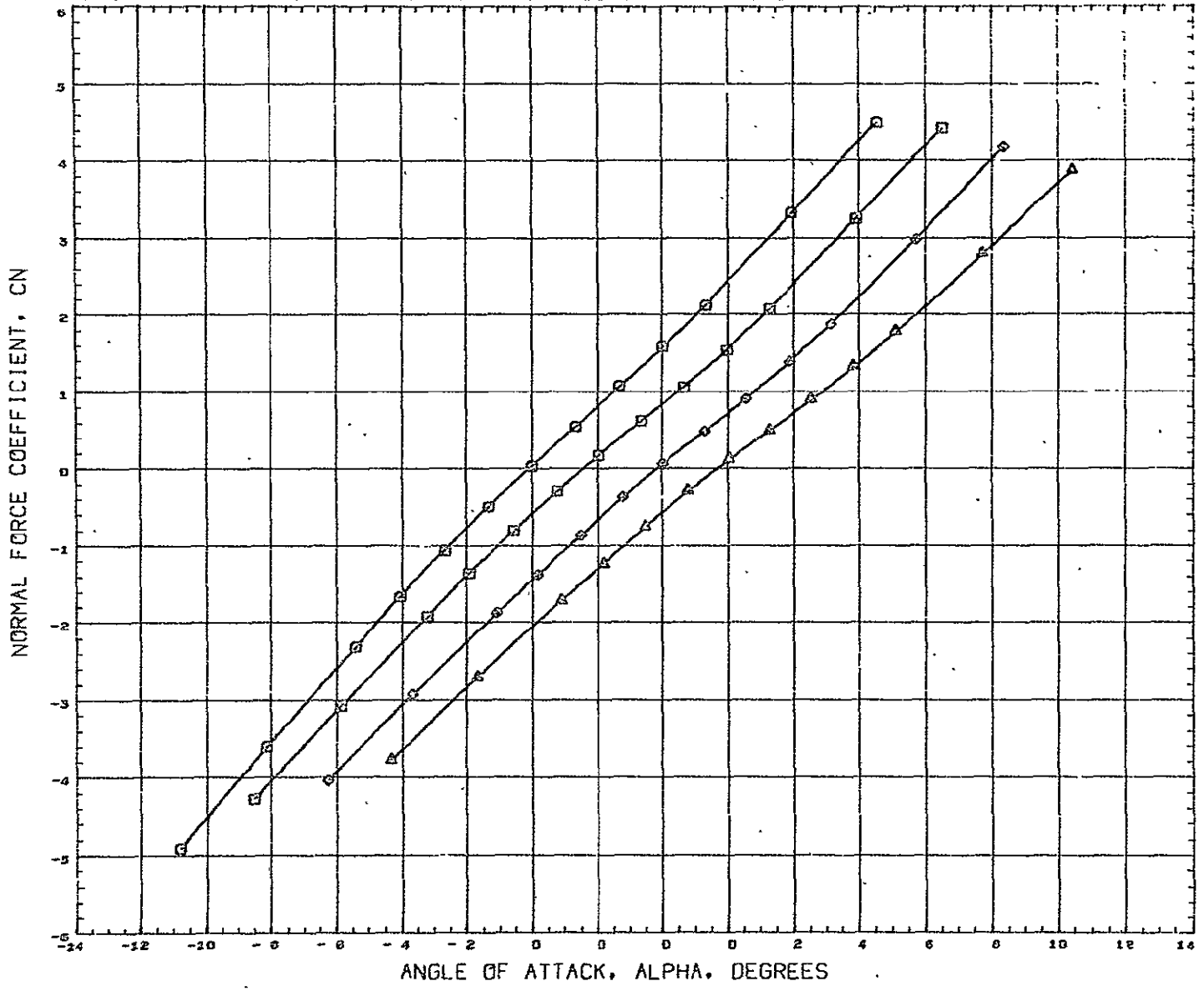

| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 0.999 | BETA | - 0.100 | ORBINC | - 1.050 | |
| □ | 1.102 | HTAIL | 0.000 | PHIB | 0.000 | |
| ◇ | 1.195 | | | | | |
| △ | 1.459 | | | | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, CRUCIFORM FINS, PHIB=45




| SYMBOL | MACH |
|---|---|
| ○ | 1.006 |
| □ | 1.195 |
| ◇ | 1.383 |
| △ | 1.463 |

PARAMETRIC VALUES

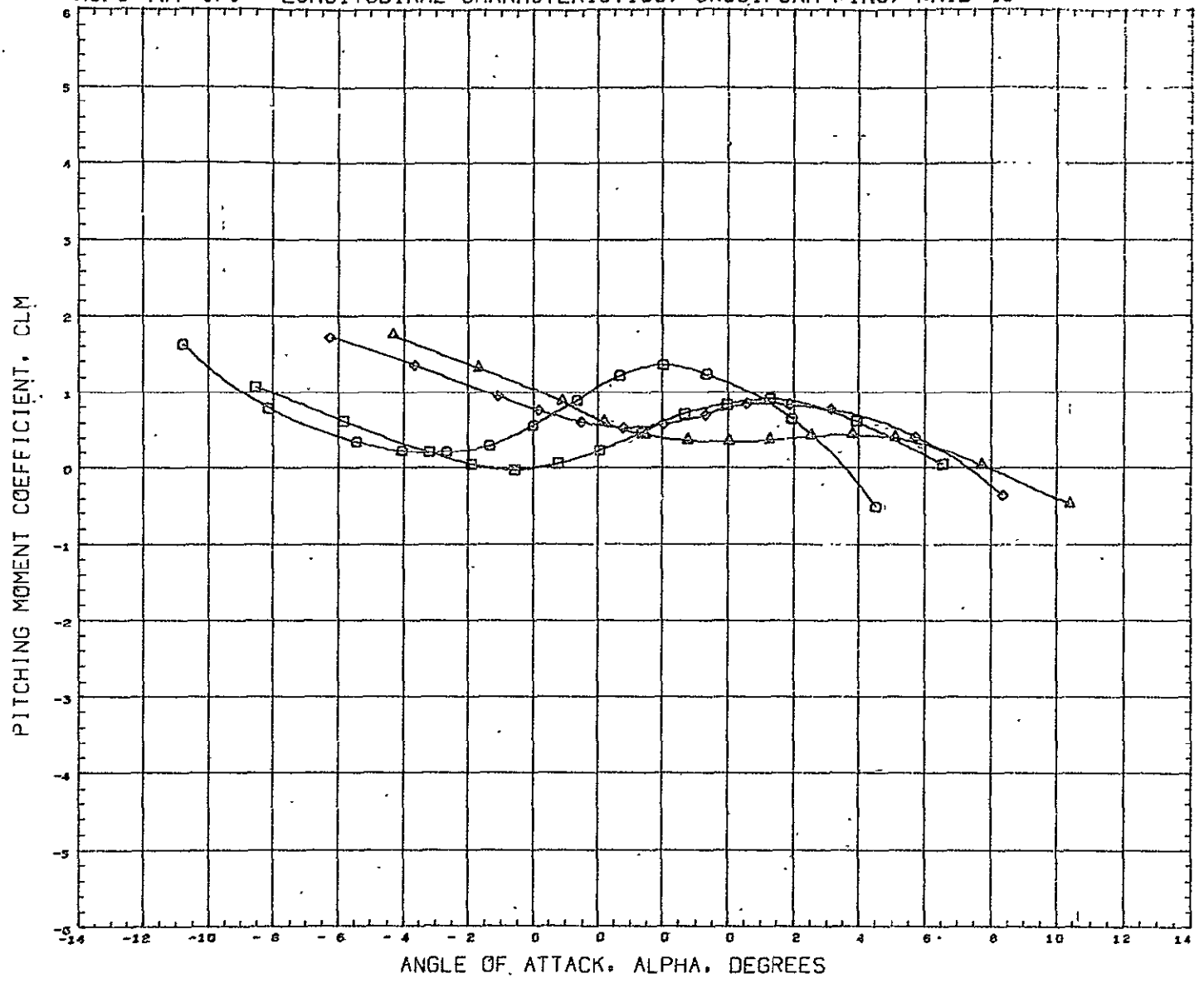
| | | | |
|---|---|---|---|
| BETA | - 0.070 | ORBINC | - 1.050 |
| WBGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 45.000 | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, CRUCIFORM FINS, PHIB=45




| SYMBOL | MACH |
|---|---|
| ○ | 1.006 |
| □ | 1.195 |
| ◇ | 1.303 |
| △ | 1.463 |

PARAMETRIC VALUES

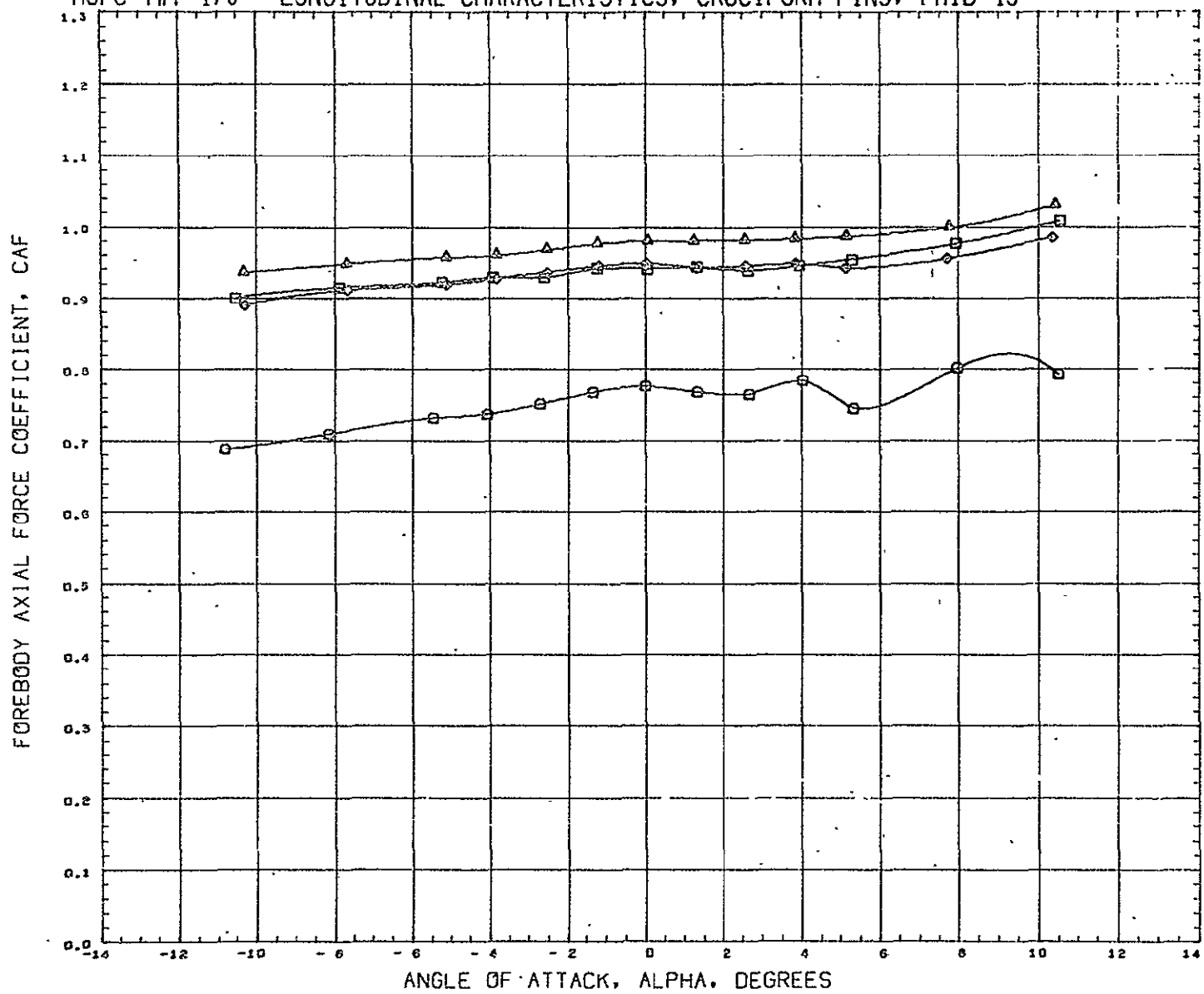
| | | | |
|---|---|---|---|
| BETA | - 0.070 | ORBINC | - 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 45.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

REFERENCE FILE

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, CRUCIFORM FINS, PHIB=45.




| SYMBOL | MACH |
|---|---|
| ○ | 1.006 |
| □ | 1.195 |
| ◇ | 1.303 |
| △ | 1.463 |

PARAMETRIC VALUES

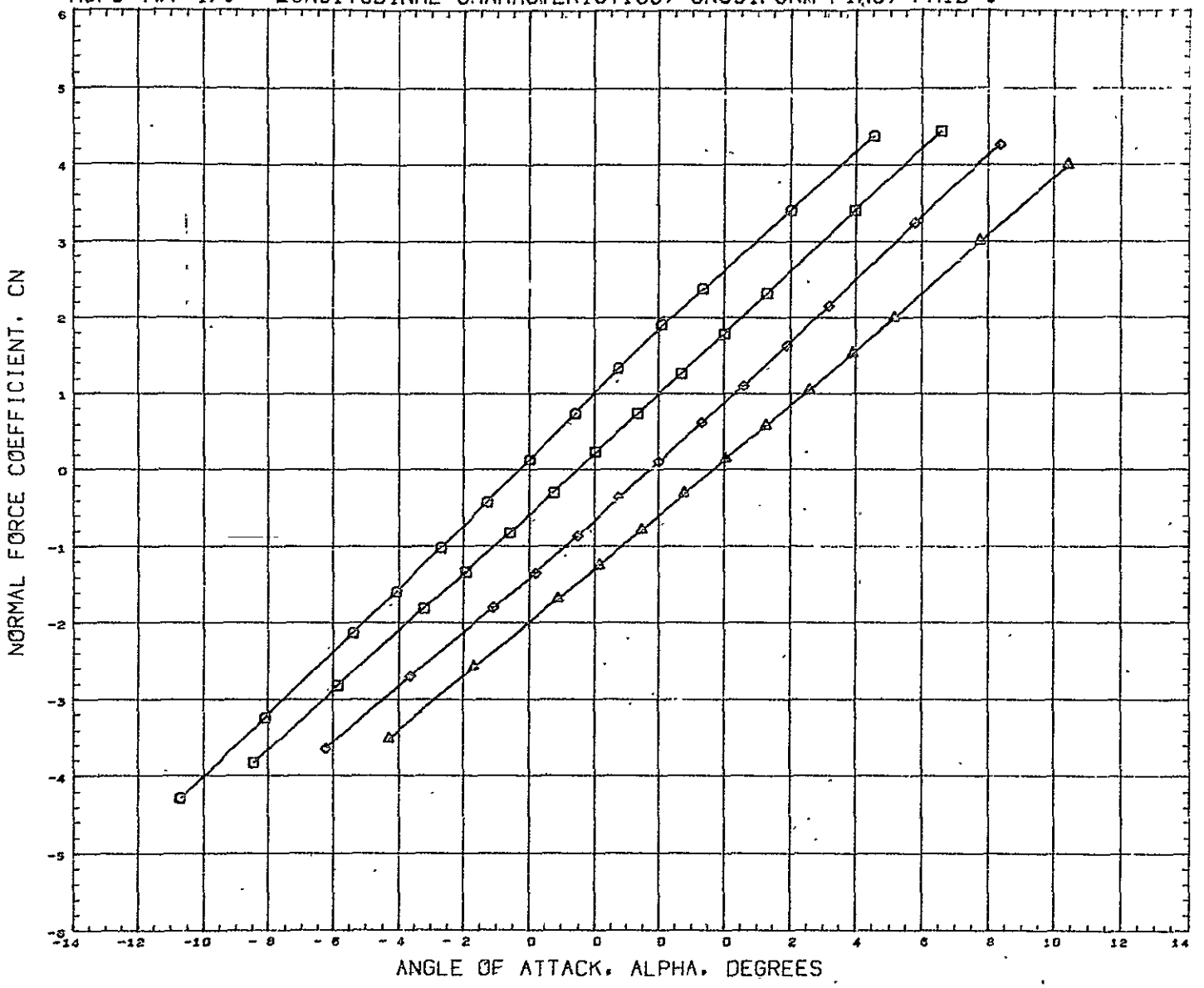
| | | | |
|---|---|---|---|
| BETA | - 0.070 | ORBINC | - 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 45.000 | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, CRUCIFORM FINS, PHIB=0




| SYMBOL | MACH |
|---|---|
| ○ | 0.997 |
| □ | 1.198 |
| ◇ | 1.303 |
| △ | 1.459 |

PARAMETRIC VALUES

| | | | | | |
|---|---|---|---|---|---|
| BETA | - | 0.060 | ORBINC | - | 1.050 |
| WNGINC | | 4.000 | HTAIL | | 0.000 |
| PHIB | | 0.000 | | | |

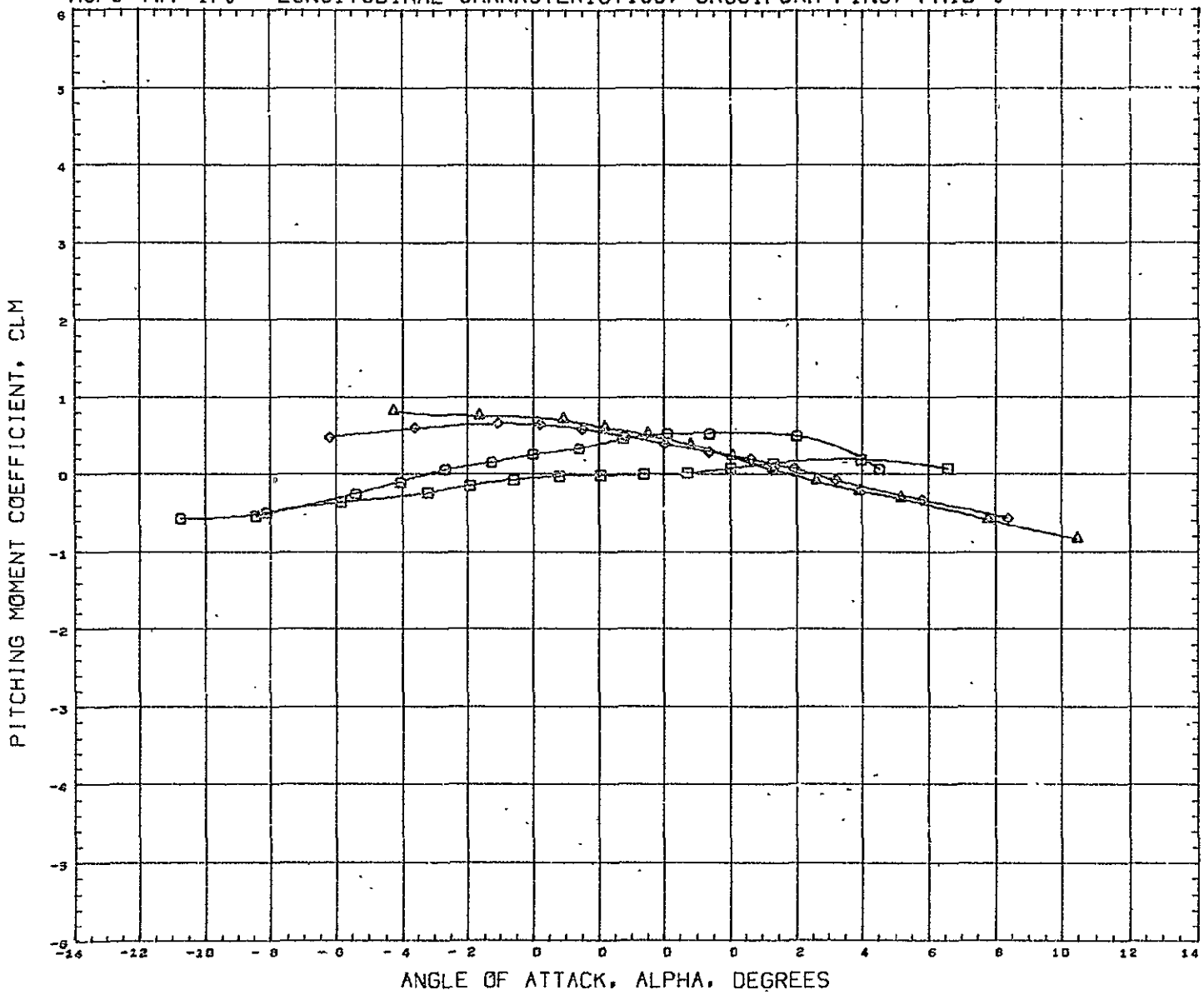
REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMPP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

REFERENCE FILE

TWT470 S-IC/GAC ORBITER BF20WHVS PHIB = 0 (A24131) 26 JAN 71 PAGE 40

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, CRUCIFORM FINS, PHIB=0

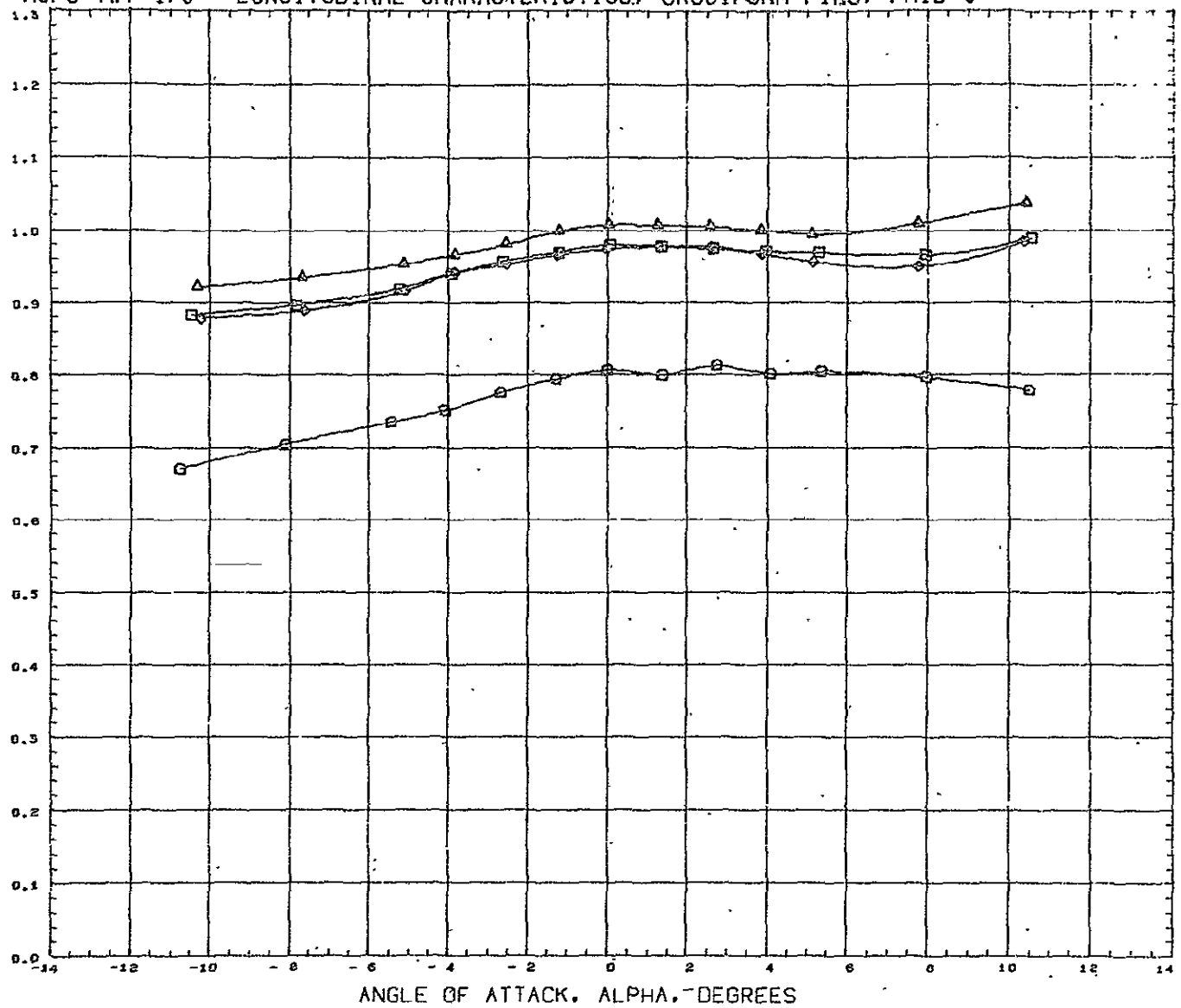



| SYMBOL | MACH | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| ○ | 0.997 | BETA | - 0.060 | ORBINC | - 1.050 | |
| □ | 1.196 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 1.303 | PHIB | 0.000 | | | |
| △ | 1.459 | | | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, CRUCIFORM FINS, PHIB=0




| SYMBOL | MACH |
|---|---|
| ○ | 0.997 |
| □ | 1.198 |
| ◇ | 1.303 |
| △ | 1.459 |

PARAMETRIC VALUES

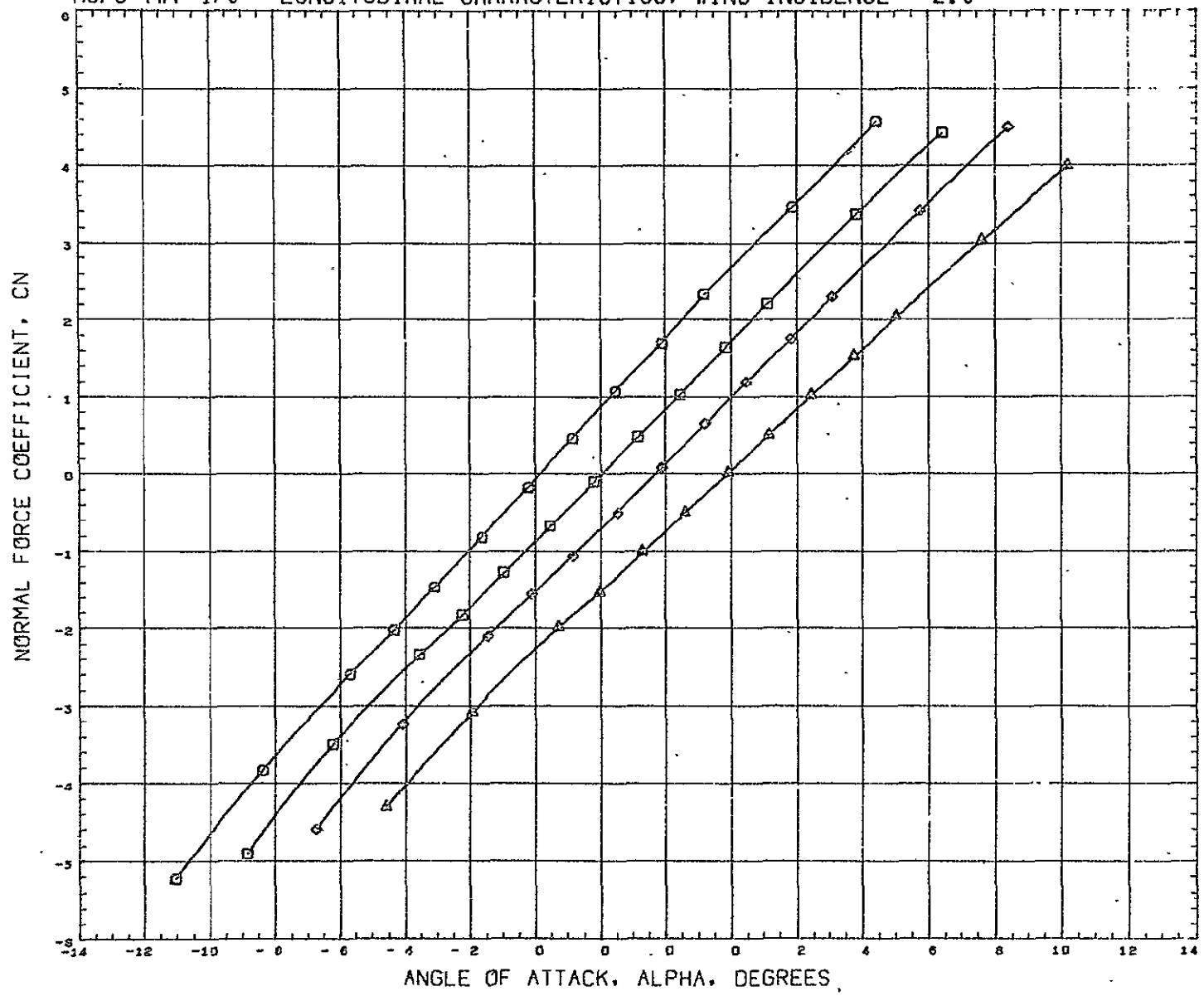
| | | | |
|---|---|---|---|
| BETA | - 0.060 | ORBINC | - 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

REFERENCE FILE

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, WING INCIDENCE = 2.0

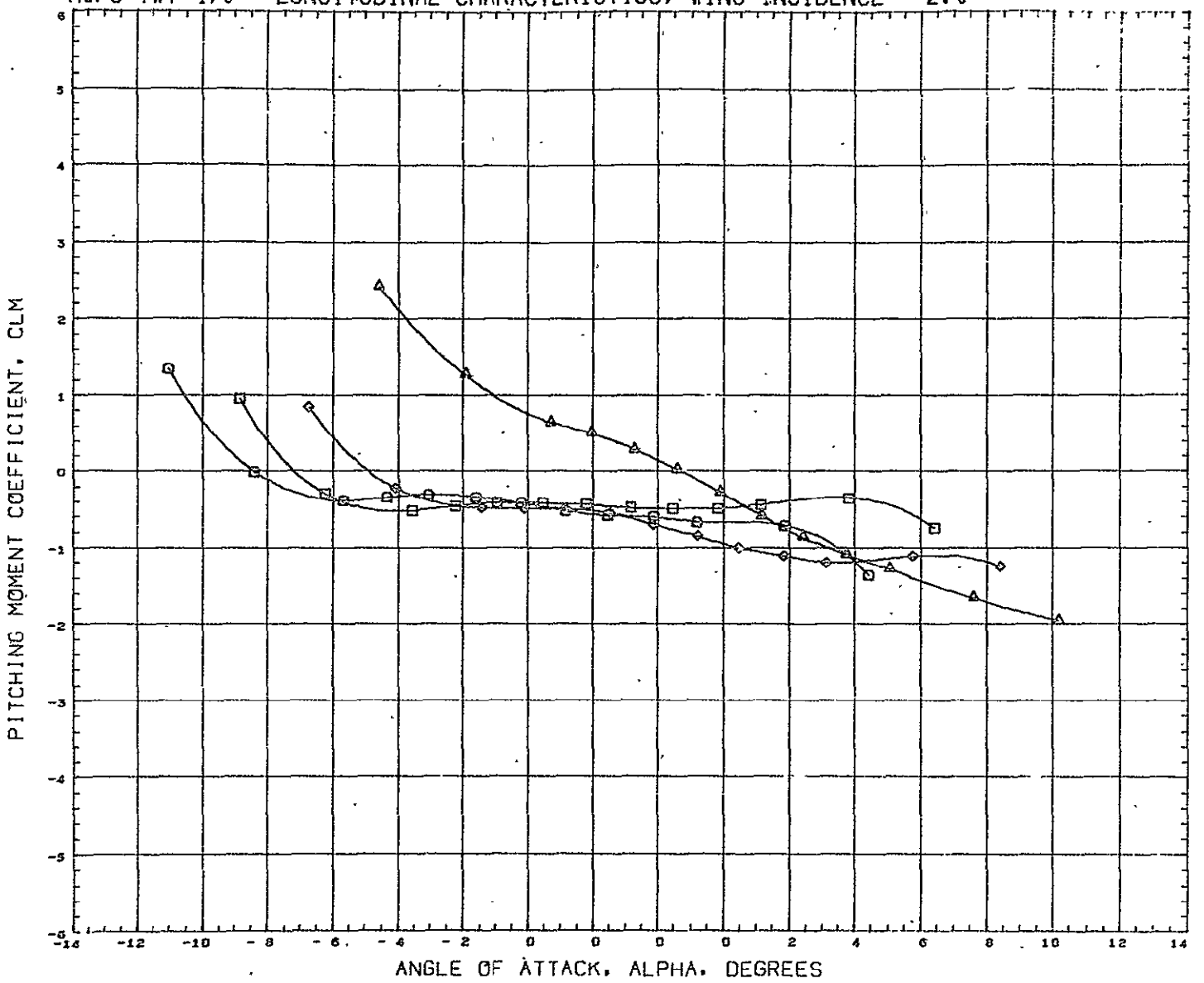



| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 1.001 | BETA | - 0.090 | ORBINC | - 1.050 | |
| □ | 1.091 | WNGINC | 2.000 | HTAIL | 0.000 | |
| ◇ | 1.202 | PHIB | 0.000 | | | |
| △ | 1.456 | | | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, WING INCIDENCE = 2.0



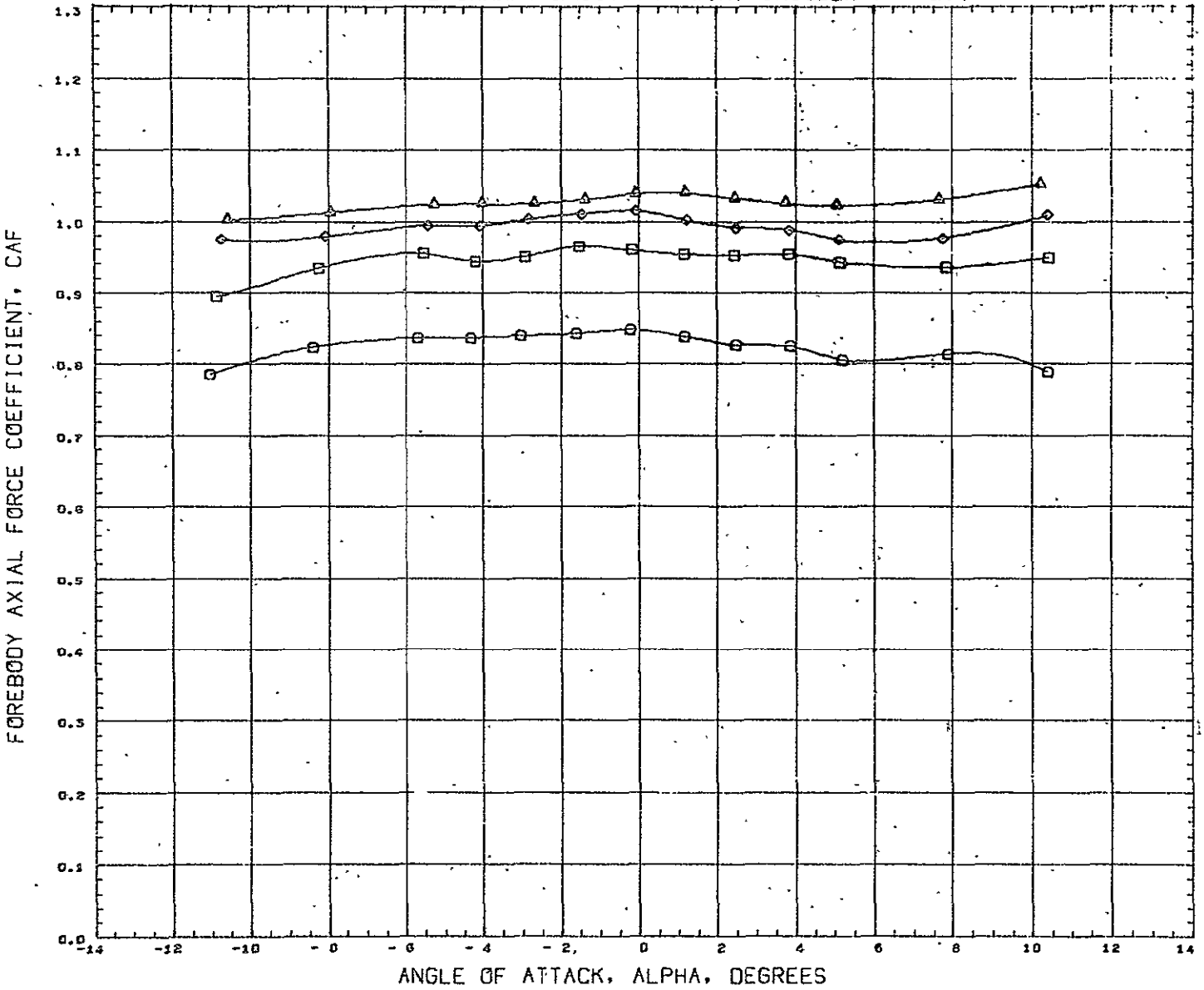

| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 1.001 | BETA | - 0.090 | ORBINC | - 1.050 | |
| □ | 1.091 | WNGINC | 2.000 | HTAIL | 0.000 | |
| ◇ | 1.202 | PHIB | 0.000 | | | |
| △ | 1.456 | | | | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, WING INCIDENCE = 2.0




| SYMBOL | MACH |
|---|---|
| □ | 1.001 |
| □ | 1.091 |
| ◇ | 1.202 |
| △ | 1.456 |

PARAMETRIC VALUES

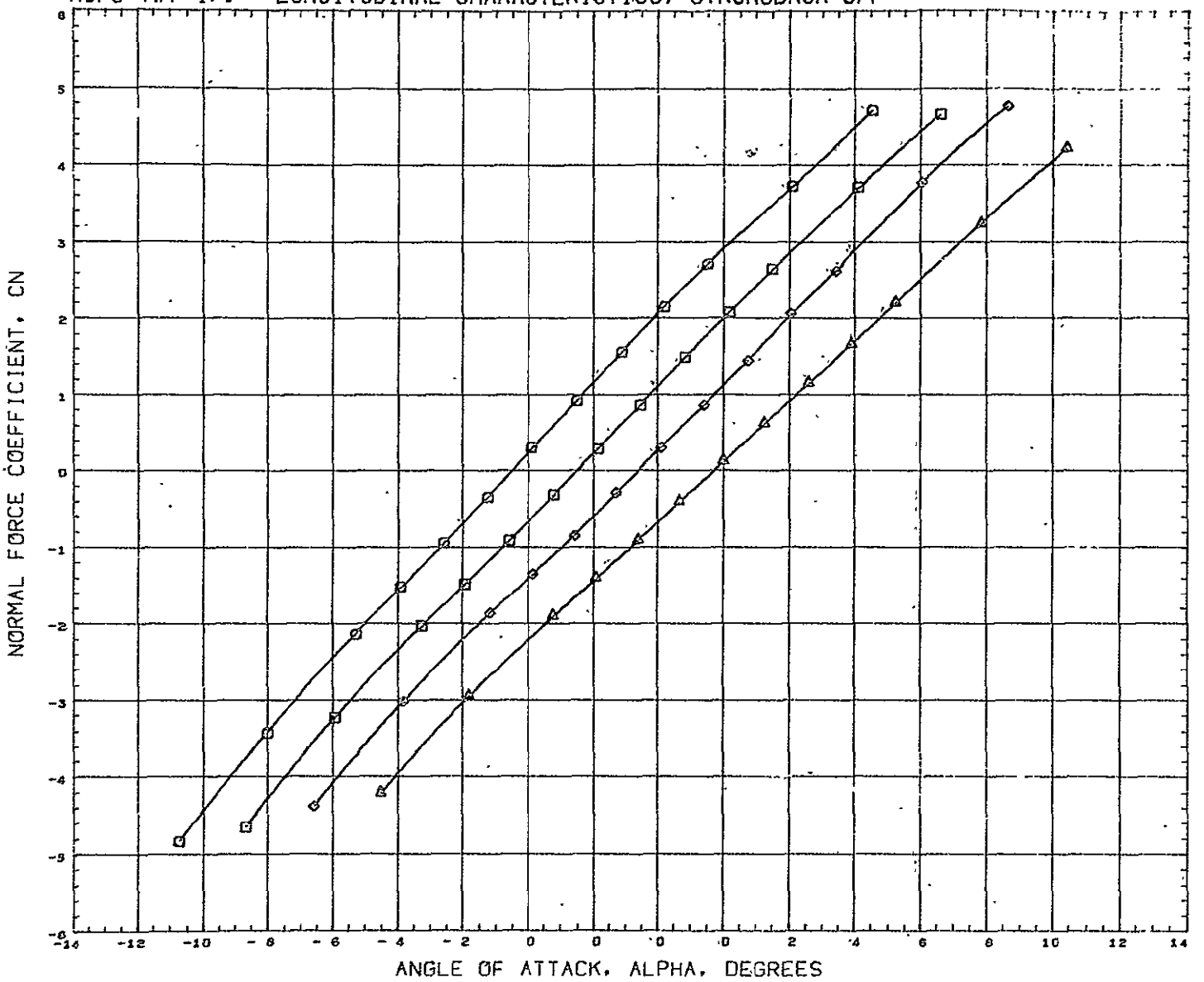
| | | | |
|---|---|---|---|
| BETA | - 0.090 | ORBINC | - 1.050 |
| WNGINC | 2.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, STRONGBACK OFF




| SYMBOL | MACH |
|---|---|
| ○ | 1.002 |
| □ | 1.099 |
| ◇ | 1.200 |
| △ | 1.400 |

PARAMETRIC VALUES

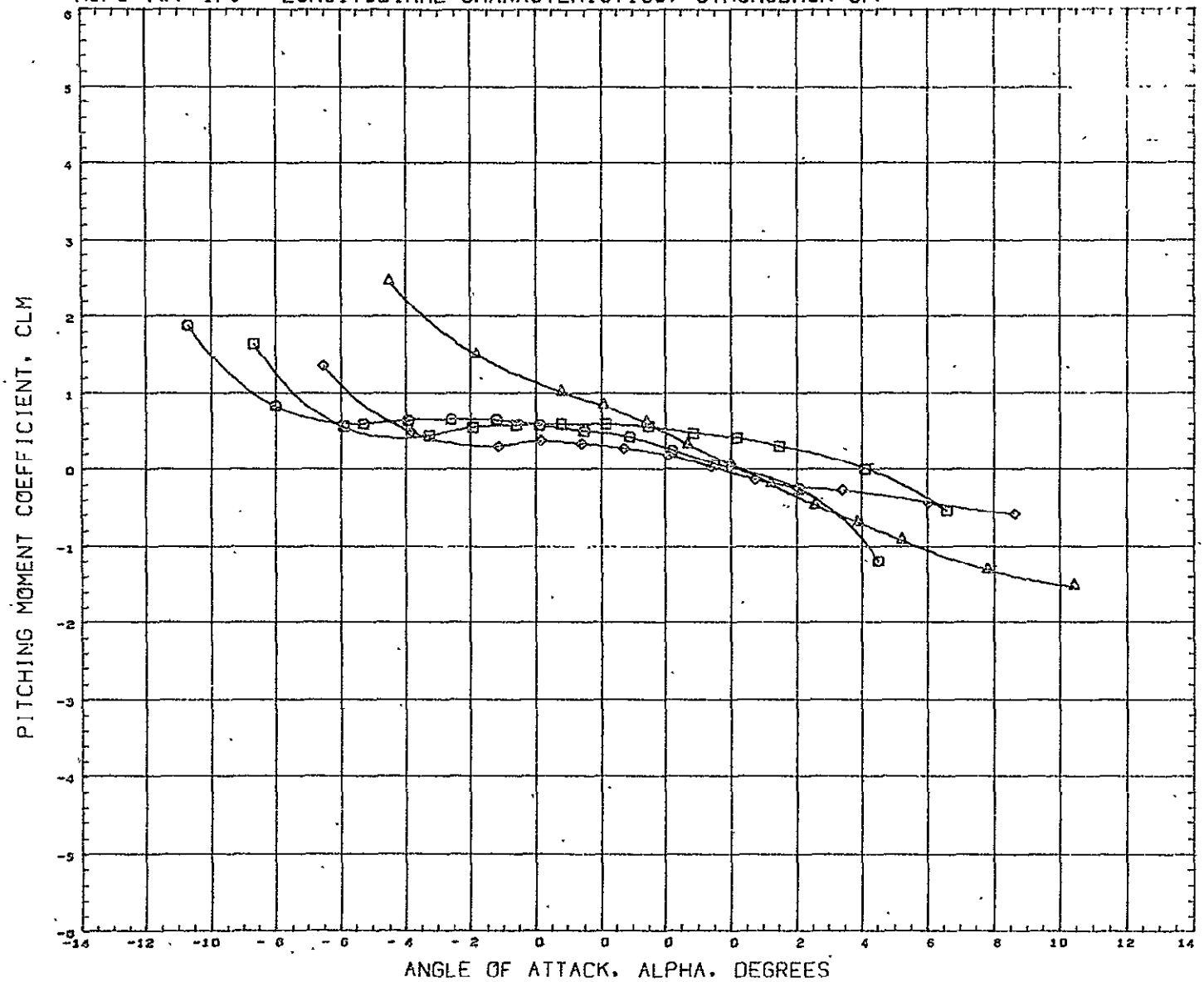
| | | | |
|---|---|---|---|
| BETA | 0.040 | ORBINC | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

REFERENCE FILE

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, STRONGBACK OFF

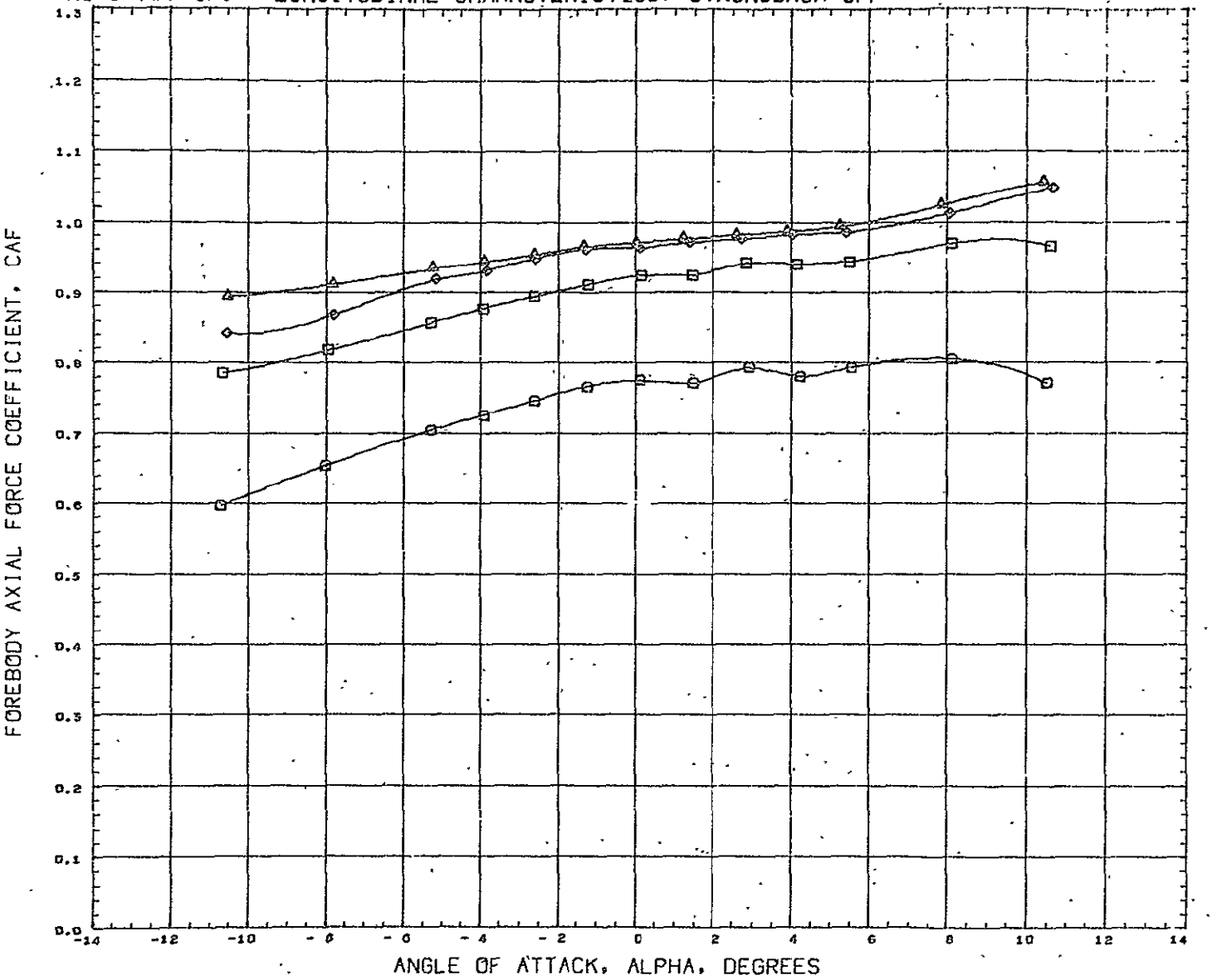



| SYMBOL | MACH | PARAMETRIC VALUES | | | | | |
|---|---|---|---|---|---|---|---|
| ○ | 1.002 | BETA | - 0.040 | ORBINC | - 1.050 | | |
| □ | 1.099 | WBGINC | 4.000 | HTAIL | 0.000 | | |
| ◇ | 1.200 | PHIB | 0.000 | | | | |
| △ | 1.460 | | | | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, STRONGBACK OFF

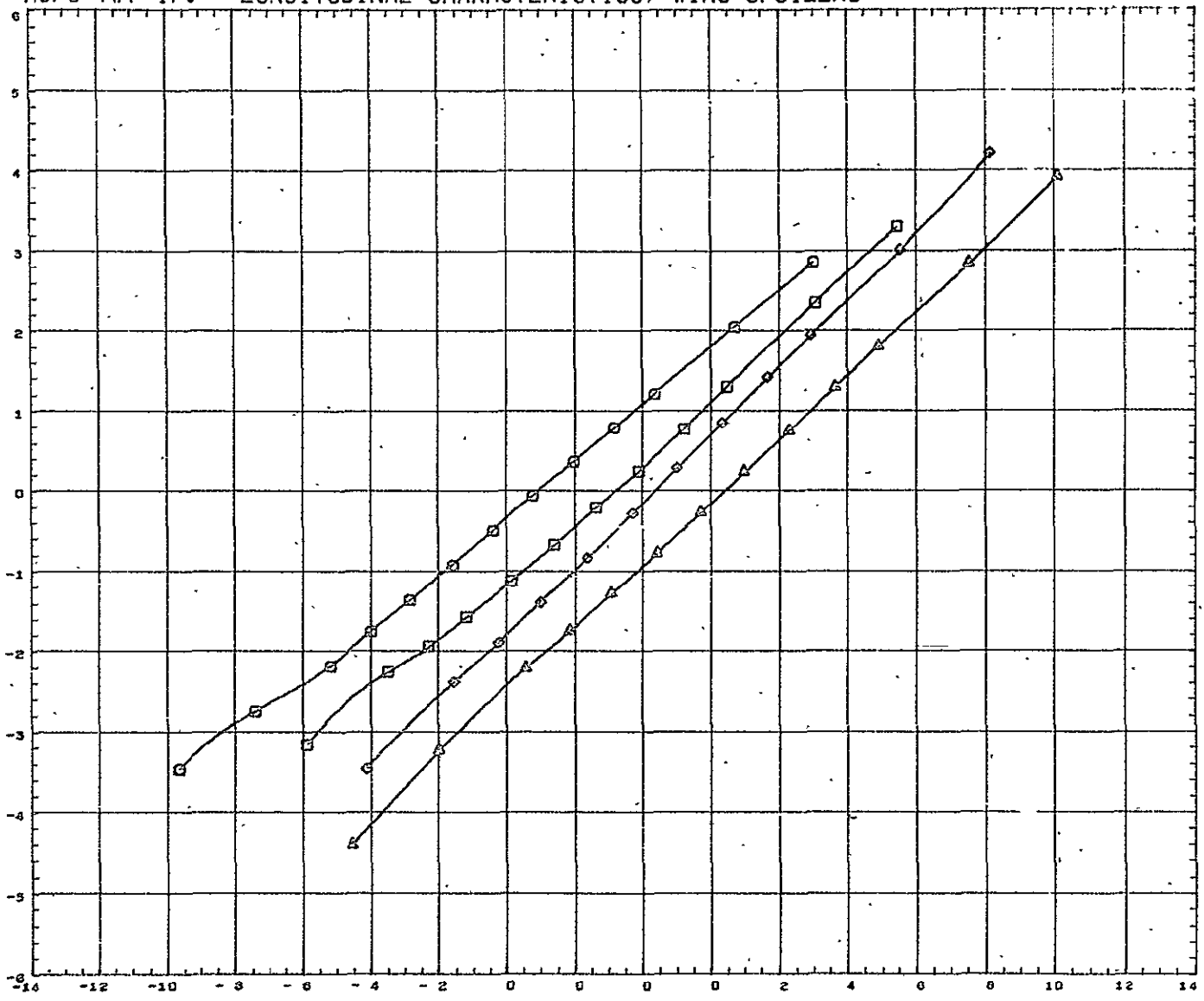



| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 1.002 | BETA | - 0.040 | ORBINC | - 1.950 | |
| □ | 1.099 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 1.200 | PHIB | 0.000 | | | |
| △ | 1.460 | | | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, WING SPOILERS

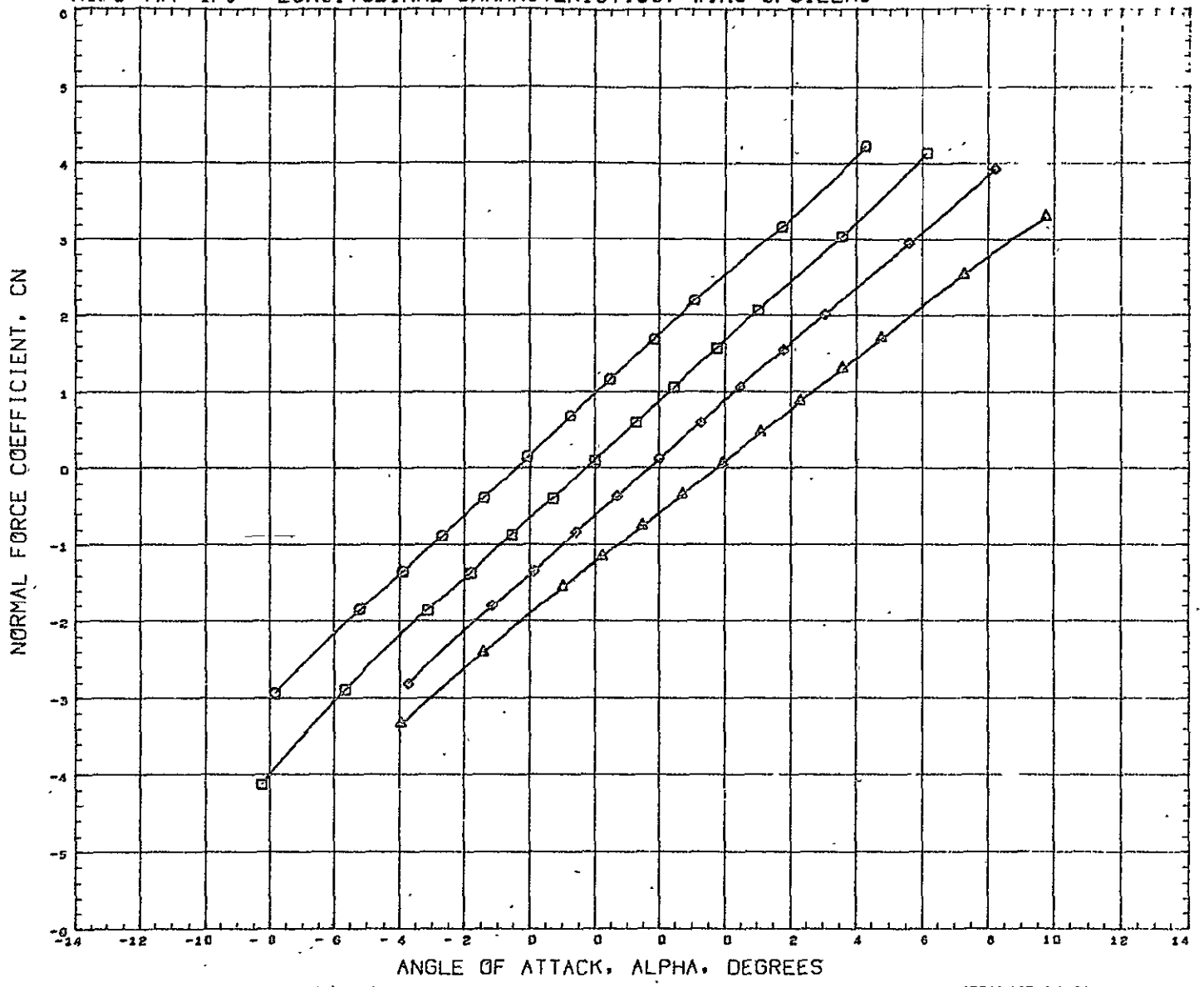



| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 0.599 | BETA | - 0.050 | ORBINC | - 1.050 | |
| □ | 0.904 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 0.998 | PHIB | 0.000 | | | |
| △ | 1.100 | | | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, WING SPOILERS



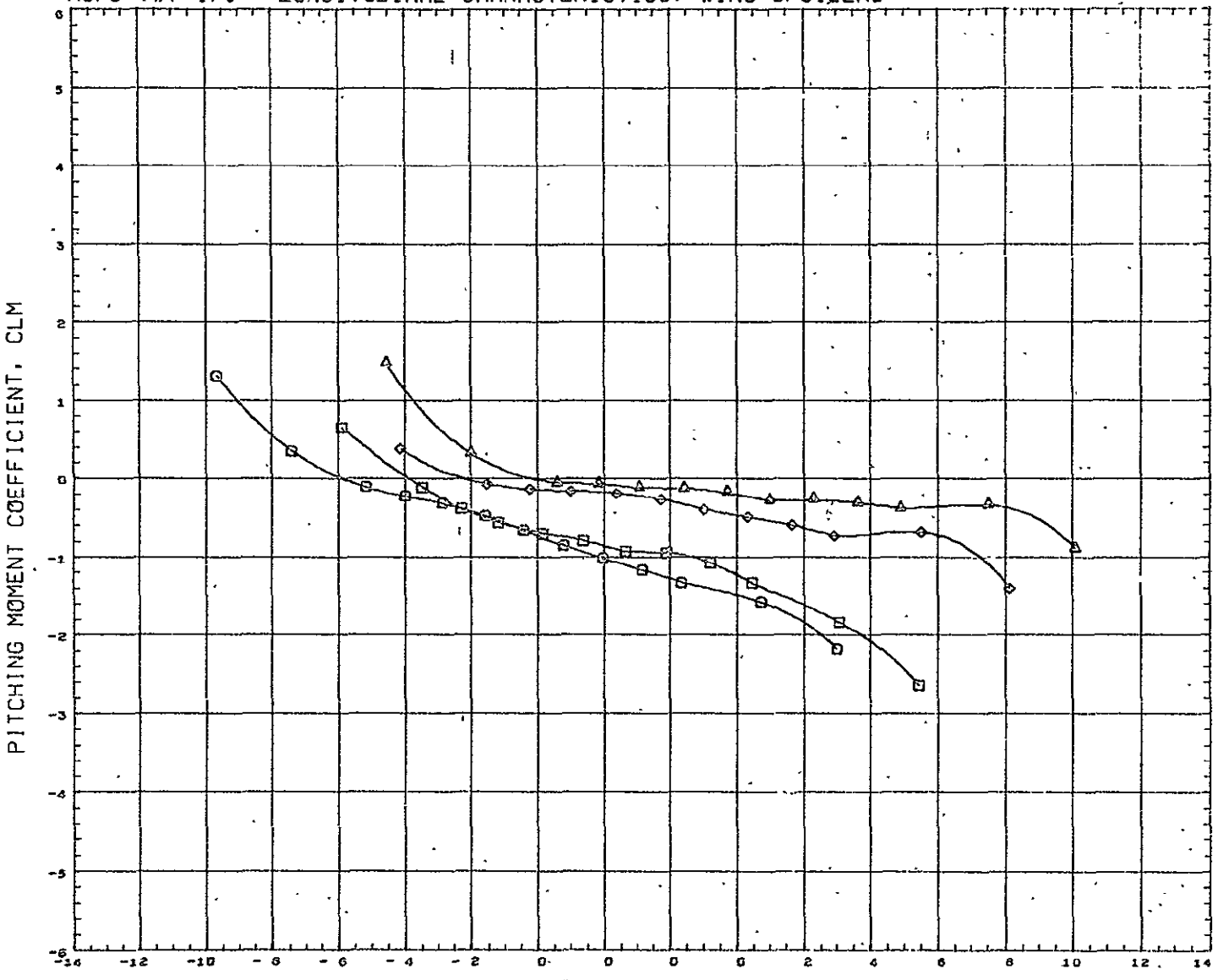

| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 1.200 | BETA | - 0.050 | ORBINC | - 1.050 | |
| □ | 1.302 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 1.457 | PHIB | 0.000 | | | |
| △ | 1.906 | | | | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, WING SPOILERS

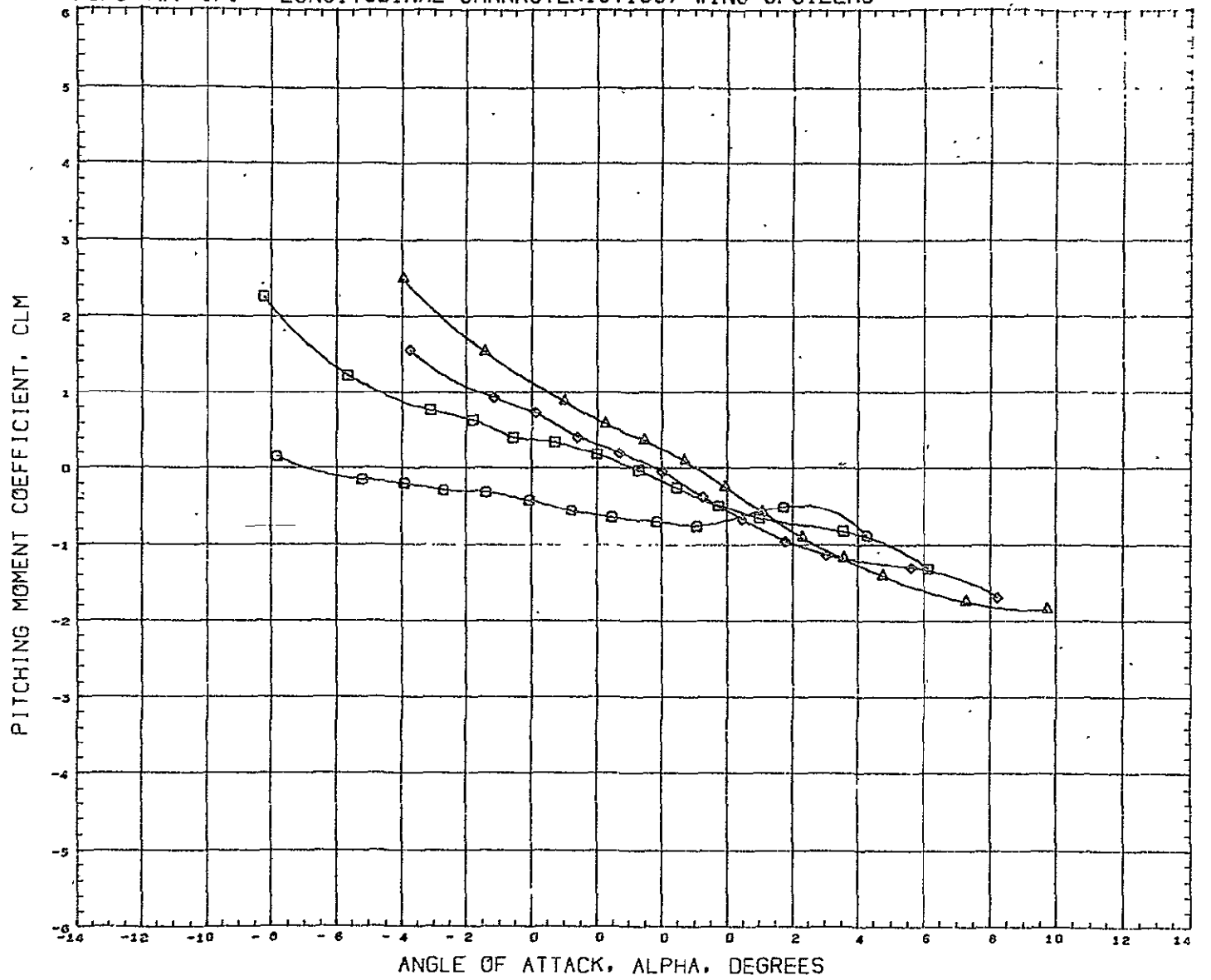



| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| □ | 0.599 | BETA | - 0.050 | ORBINC | - 1.050 | |
| □ | 0.904 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 0.990 | PHIB | 0.000 | | | |
| △ | 1.100 | | | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470. LONGITUDINAL CHARACTERISTICS, WING SPOILERS.



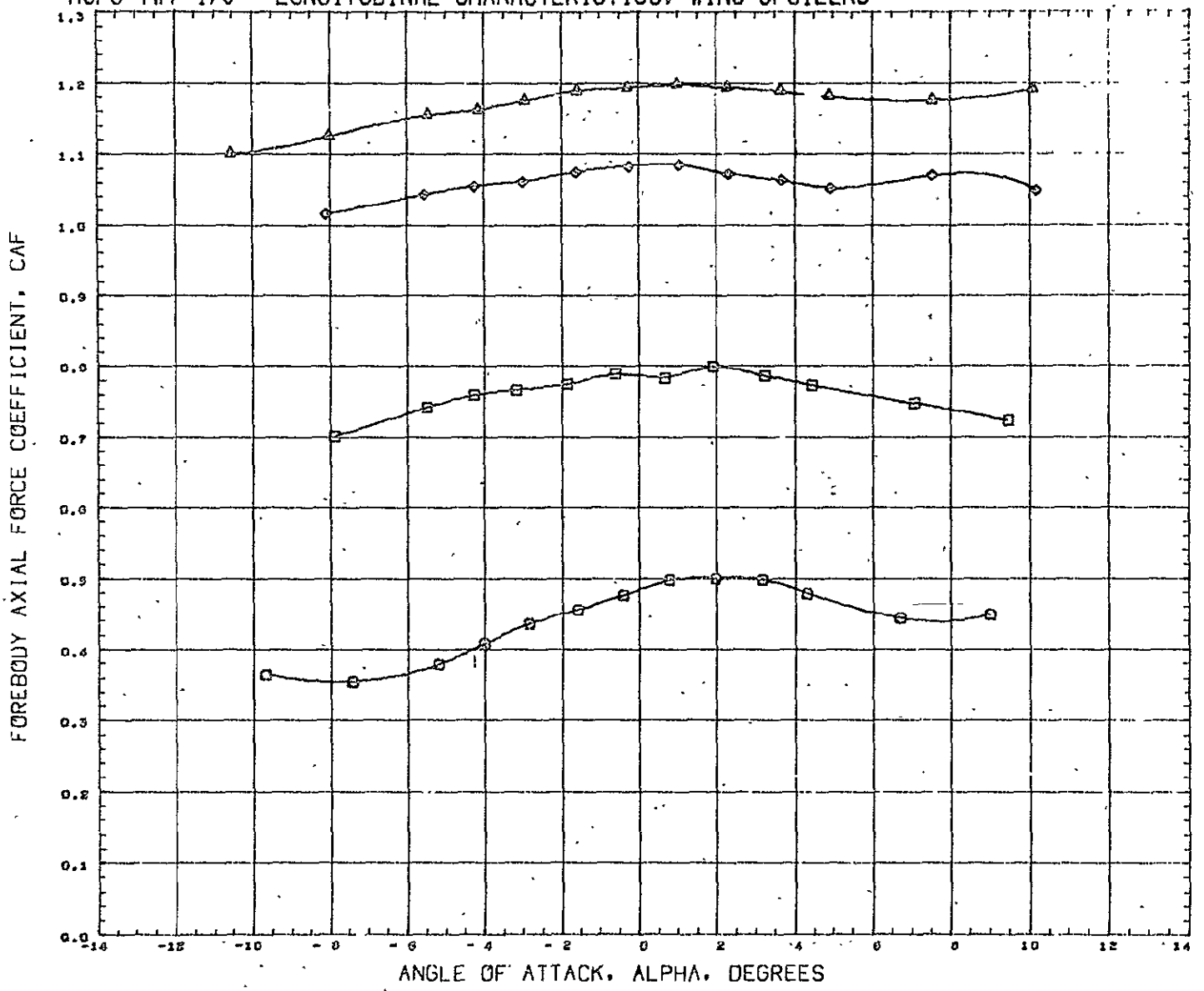

| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 1.200 | BETA | - 0.050 | ORBINC | - 1.050 | |
| □ | 1.302 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 1.457 | PHIB | 0.000 | | | |
| △ | 1.968 | | | | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, WING SPOILERS

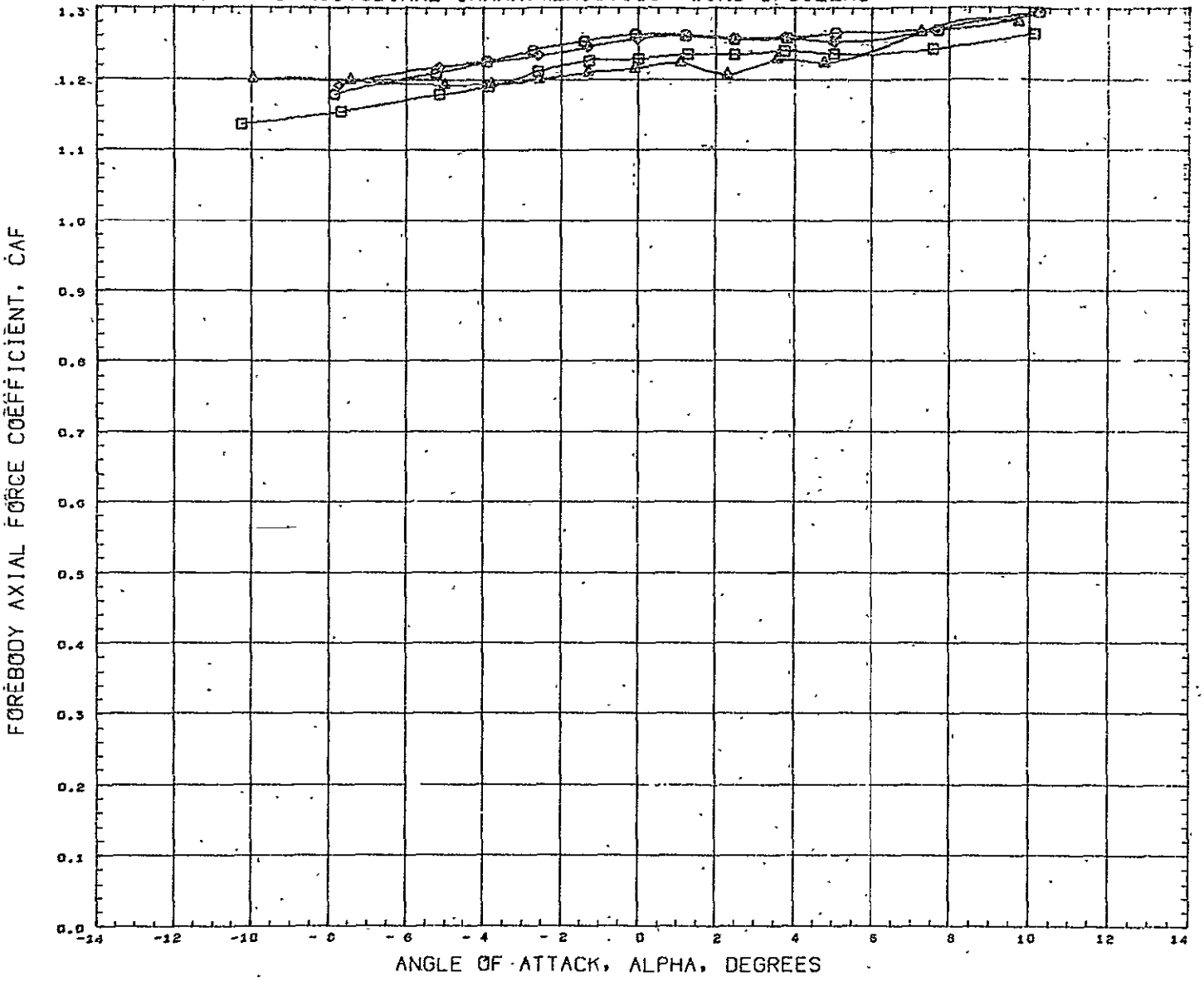



| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 0.599 | BETA | - 0.050 | ORBINC | - 1.050 | |
| □ | 0.904 | WHGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 0.998 | PHIB | 0.000 | | | |
| △ | 1.199 | | | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3386 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, WING SPOILERS

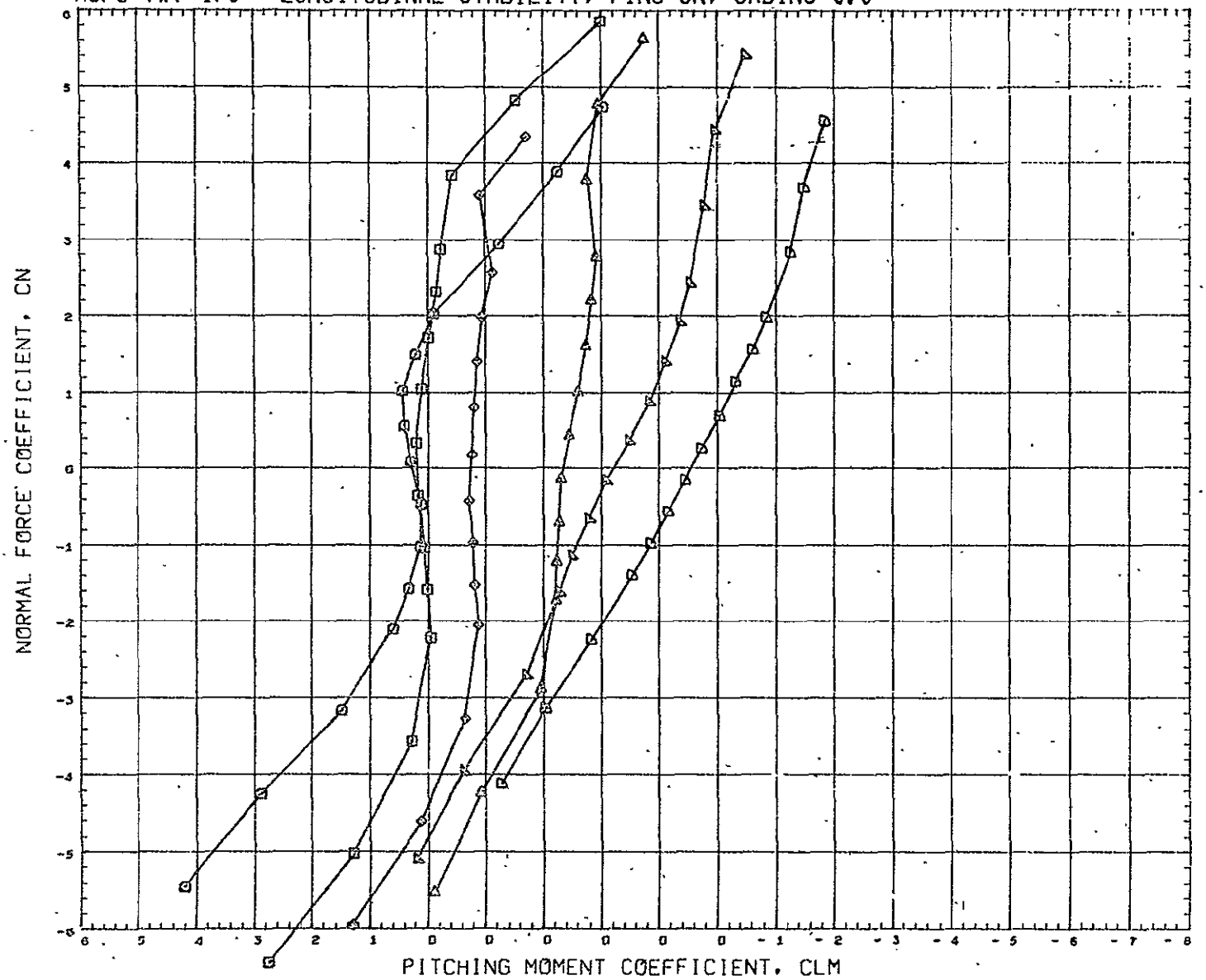



| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 1.200 | BETA | - 0.050 | ORBINC | - 1.050 | |
| □ | 1.302 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 1.457 | PHIB | 0.000 | | | |
| △ | 1.960 | | | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

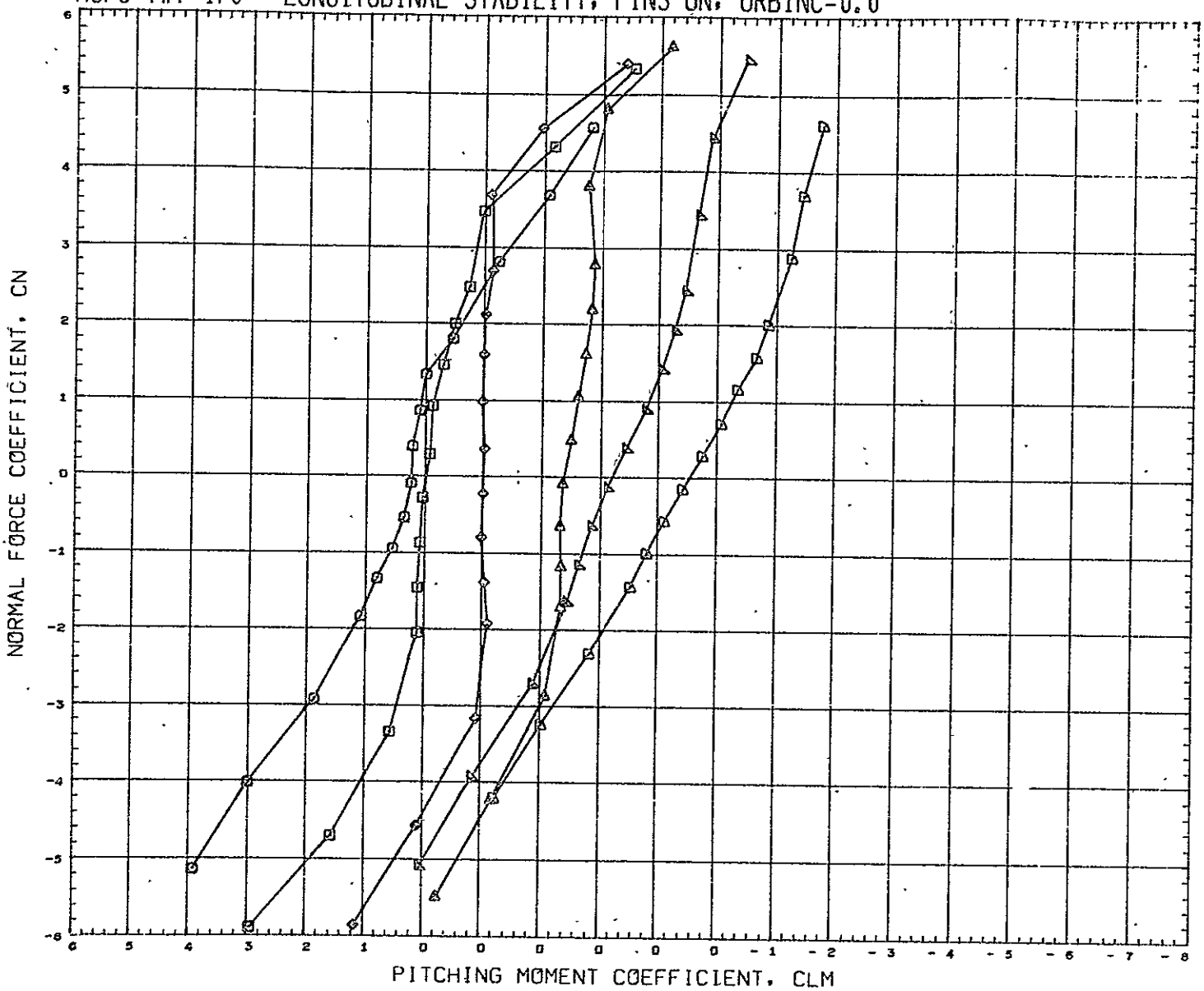
MSFC TWT 470 LONGITUDINAL STABILITY, FINS ON, ORBINC=0.0




| SYMBOL | MACH | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| ○ | 0.900 | BETA | 0.070 | ORBINC | 0.000 |
| □ | 1.002 | WNGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 1.103 | PHIB | 0.000 | | |
| △ | 1.197 | | | | |
| ▷ | 1.461 | | | | |
| ▷ | 1.964 | DATA HIST. CODE | #A | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3950 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL STABILITY, FINS ON, ORBINC=0.0

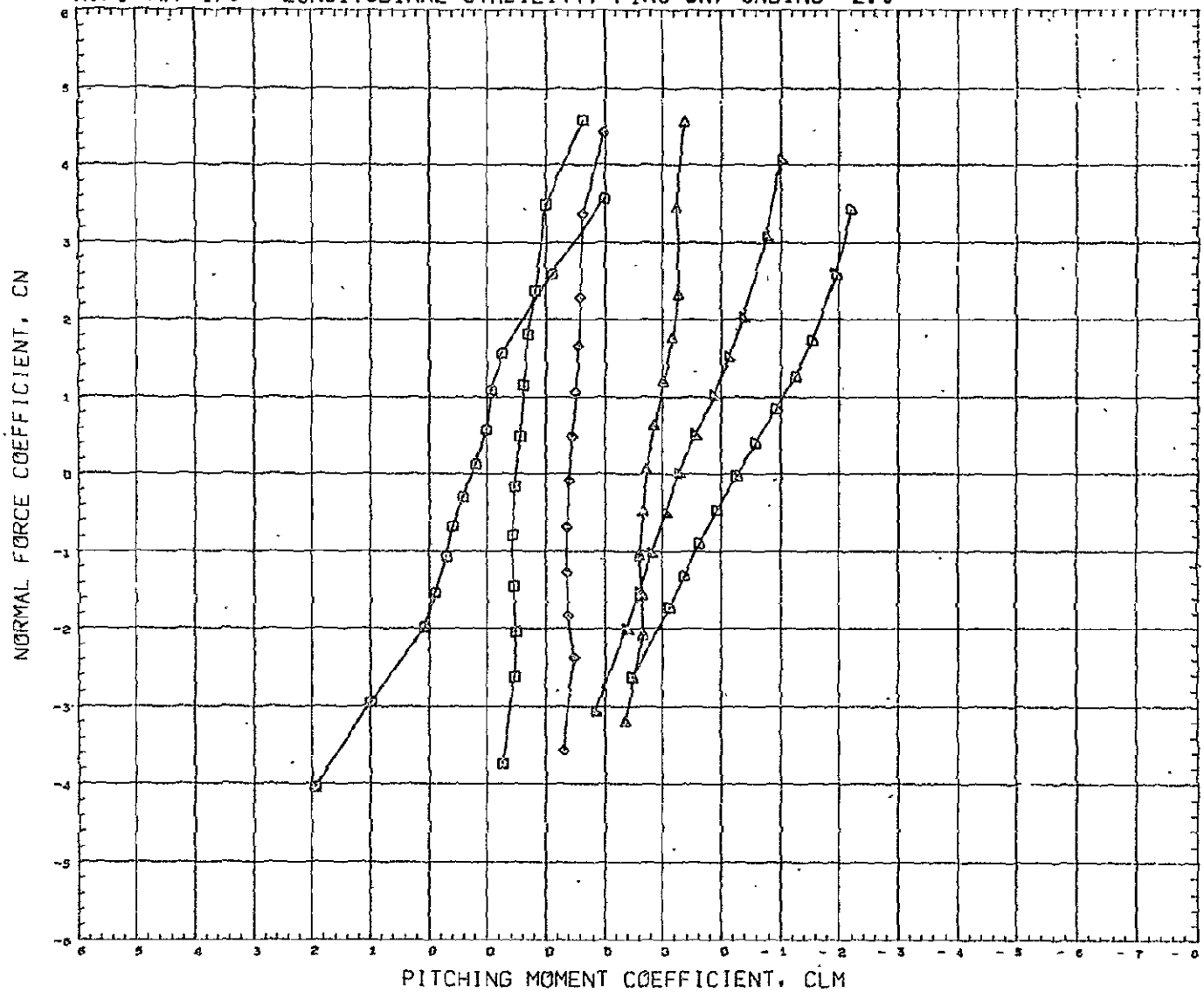



| SYMBOL | MACH | | PARAMETRIC VALUES | | |
|---|---|---|---|---|---|
| ○ | 0.903 | BETA | - 0.090 | ORBINC | 0.000 |
| □ | 1.001 | WNGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 1.101 | PHIB | 0.000 | | |
| △ | 1.202 | | | | |
| ▽ | 1.456 | | | | |
| ▷ | 1.965 | DATA HIST. CODE | #A | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

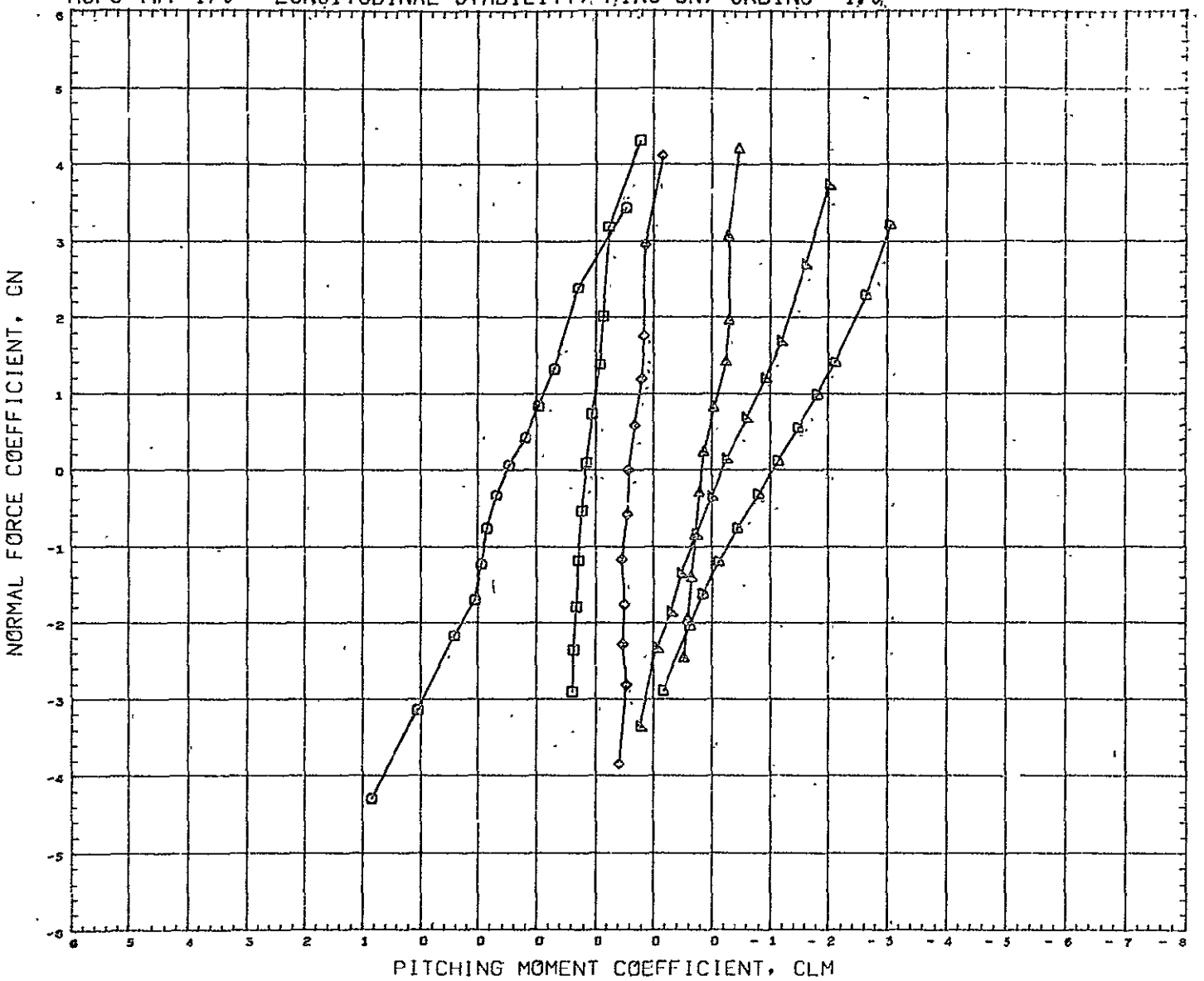
MSFC TWT 470 LONGITUDINAL STABILITY, FINS ON, ORBINC=-2.0




| SYMBOL | MACH | PARAMETRIC VALUES | | | | | |
|---|---|---|---|---|---|---|---|
| ○ | 0.899 | BETA | - 0.070 | ORBINC | - 2.000 | | |
| □ | 0.993 | WNGINC | 4.000 | HTAIL | 0.000 | | |
| ◇ | 1.109 | PHIB | 0.000 | | | | |
| △ | 1.198 | | | | | | |
| ▽ | 1.456 | | | | | | |
| ⬠ | 3.956 | DATA HIST. CODE | *A | | | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL STABILITY, FINS ON, ORBINC=-4.0

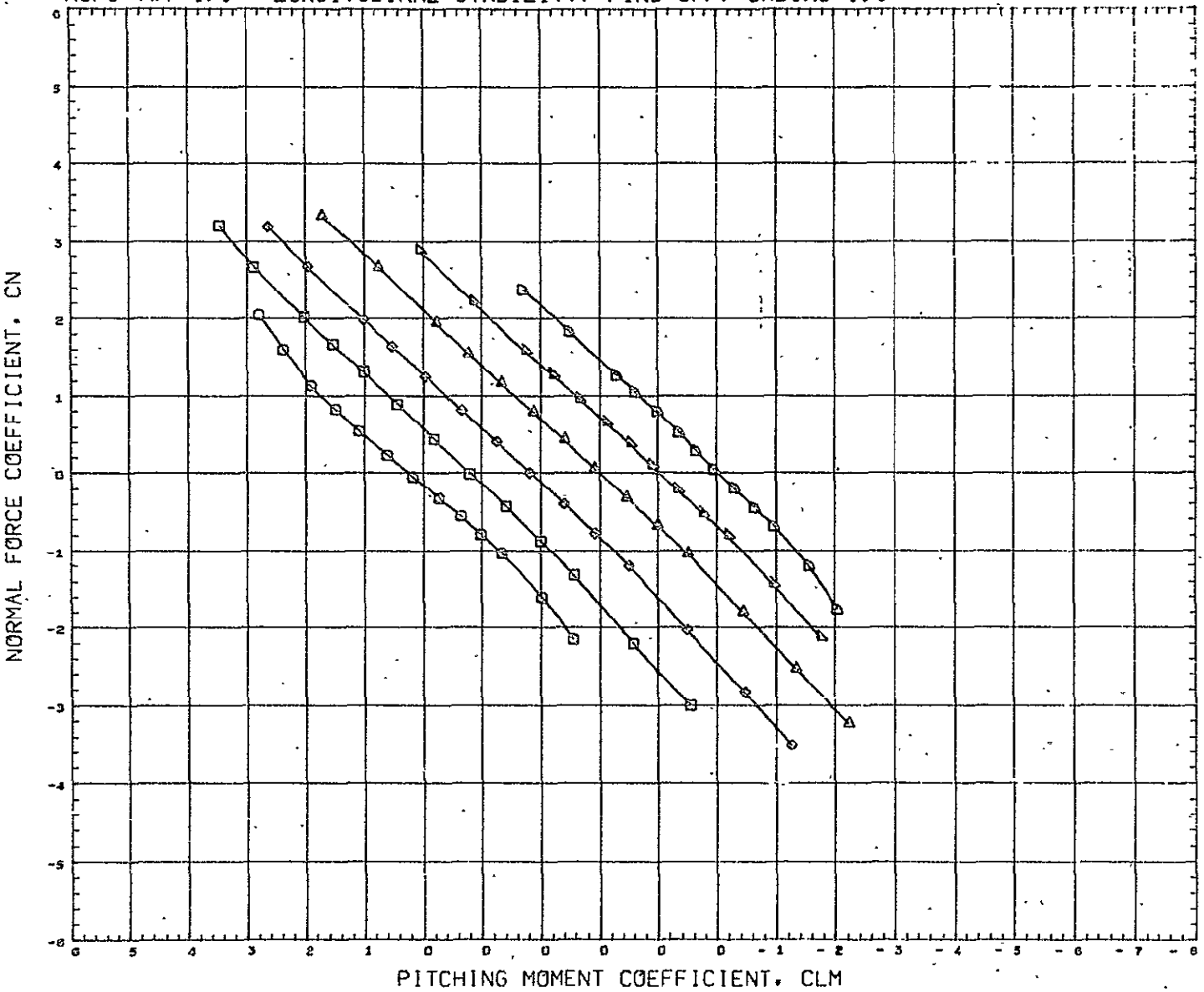



| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 0.901 | BETA | - 0.050 | ORBINC | - 4.000 | |
| □ | 1.000 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 1.090 | PHIB | 0.000 | | | |
| △ | 1.193 | | | | | |
| ▷ | 1.458 | | | | | |
| ▯ | 1.950 | DATA HIST. CODE | *A | | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

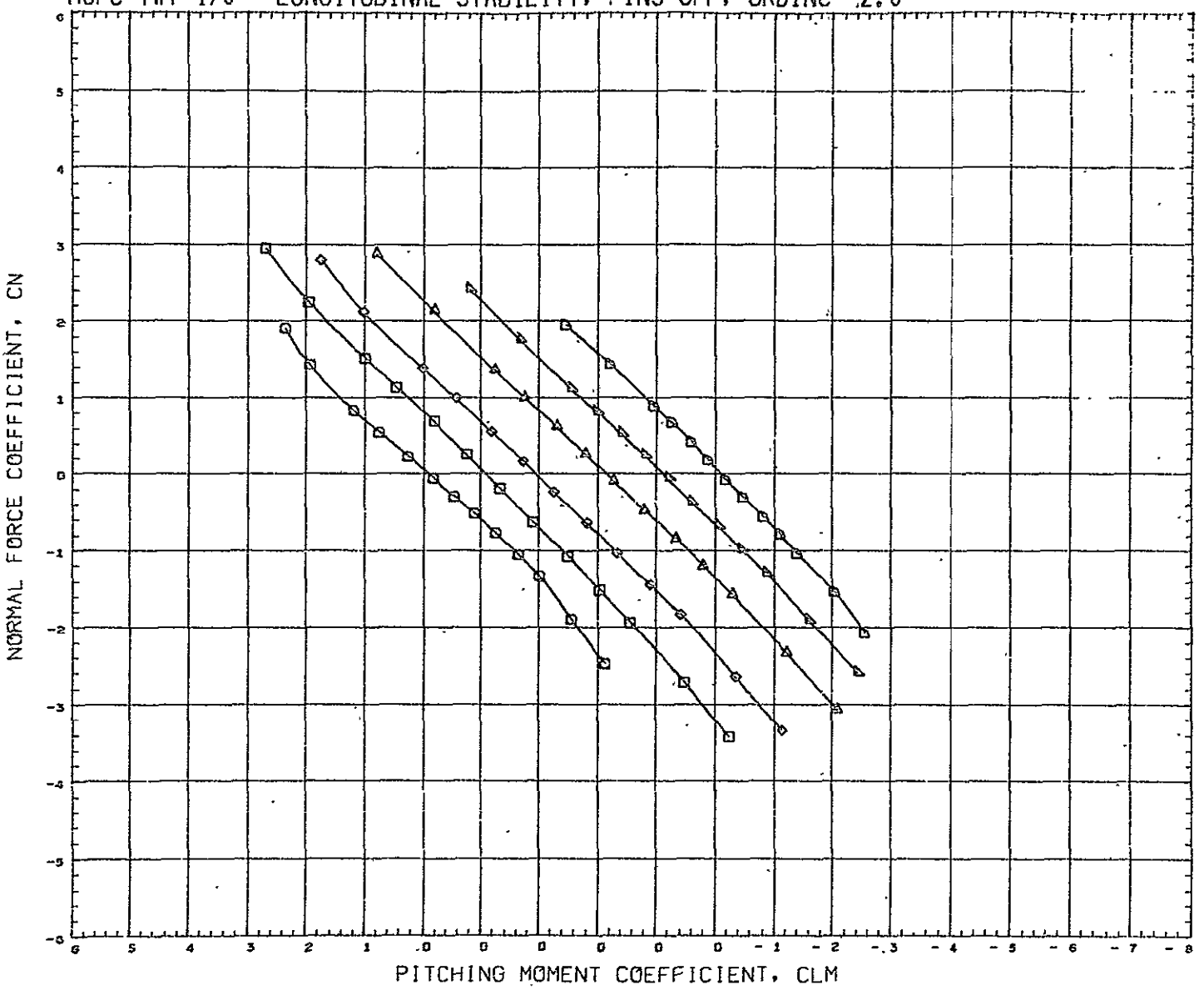
MSFC TWT 470 LONGITUDINAL STABILITY, FINS OFF, ORBINC=0.0




| SYMBOL | MACH | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| ○ | 0.699 | BETA | 0.000 | ORBINC | 0.000 |
| □ | 0.993 | WNGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 1.101 | PHIB | 0.000 | | |
| △ | 1.201 | | | | |
| ▷ | 1.457 | | | | |
| ▷ | 1.951 | DATA HIST. CODE | #A | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

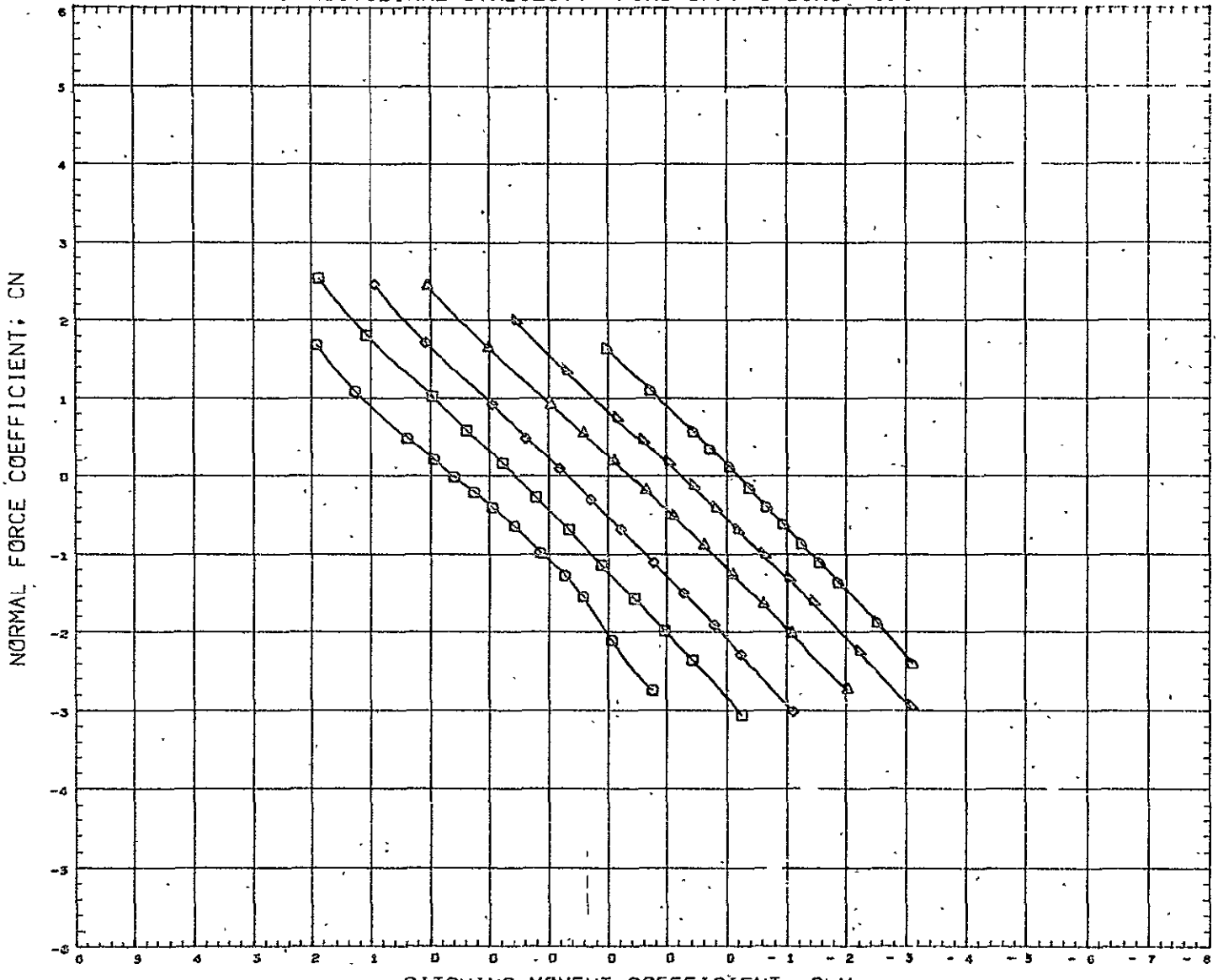
MSFC TWT 470 LONGITUDINAL STABILITY, FINS OFF; ORBINC=-2.0




| SYMBOL | MACH | PARAMETRIC VALUES | | | | | |
|---|---|---|---|---|---|---|---|
| ○ | 0.905 | BETA | - 0.080 | ORBINC | - 2.000 | | |
| □ | 0.994 | WNGINC | 4.000 | HTAIL | 0.000 | | |
| ◇ | 1.100 | PHIB | 0.000 | | | | |
| △ | 1.203 | | | | | | |
| ▷ | 1.454 | | | | | | |
| D | 1.960 | DATA HIST. CODE | *A | | | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

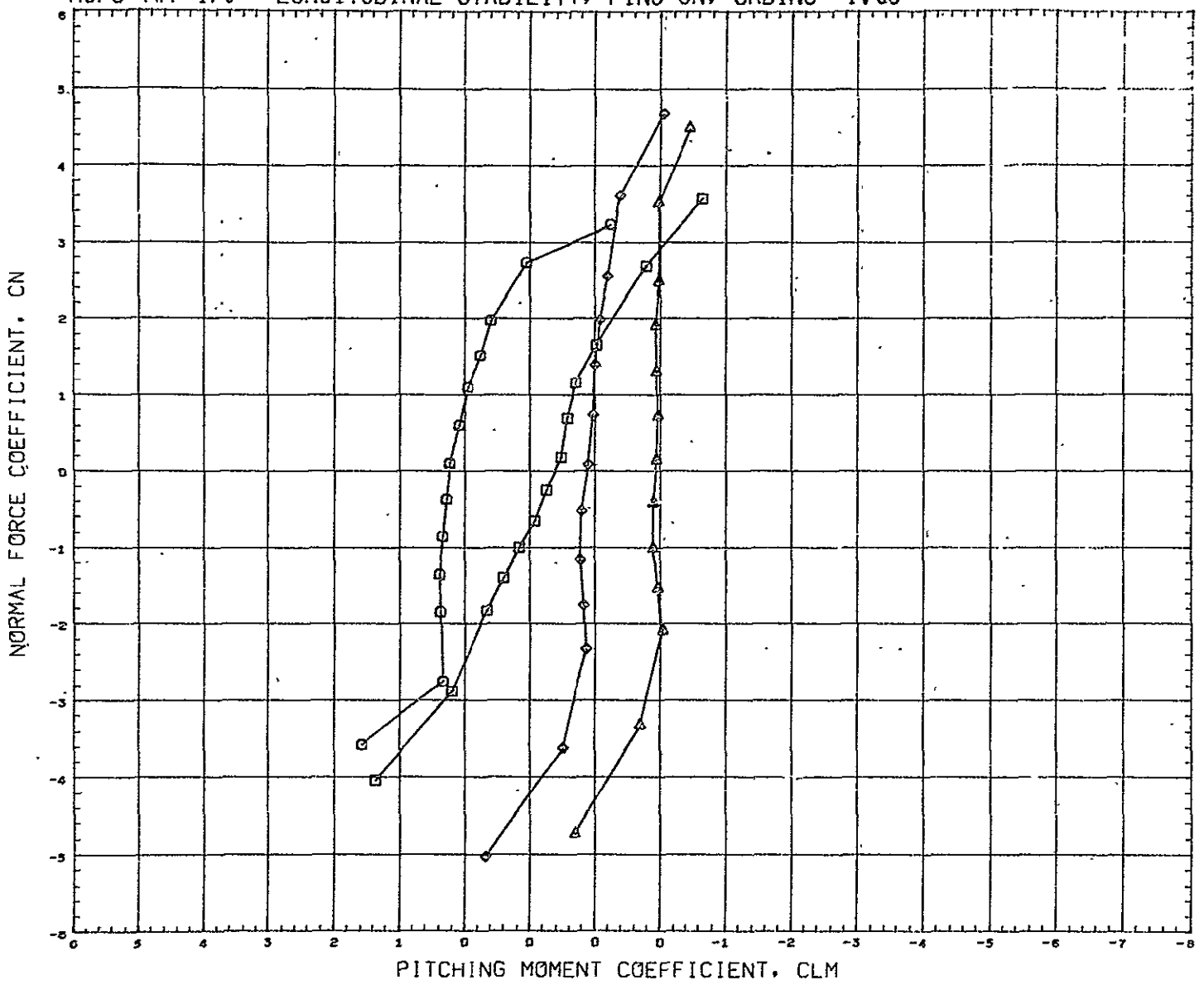
MSFC TWT 470 LONGITUDINAL STABILITY, FINS OFF, ORBINC=-4.0




| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 0.900 | BETA | - 0.040 | ORBINC | - 4.000 | |
| □ | 0.997 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 1.100 | PHIB | 0.000 | | | |
| △ | 1.199 | | | | | |
| ▷ | 1.460 | | | | | |
| D | 1.952 | DATA HIST. CODE | *A | | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL STABILITY, FINS ON, ORBINC=-1.05

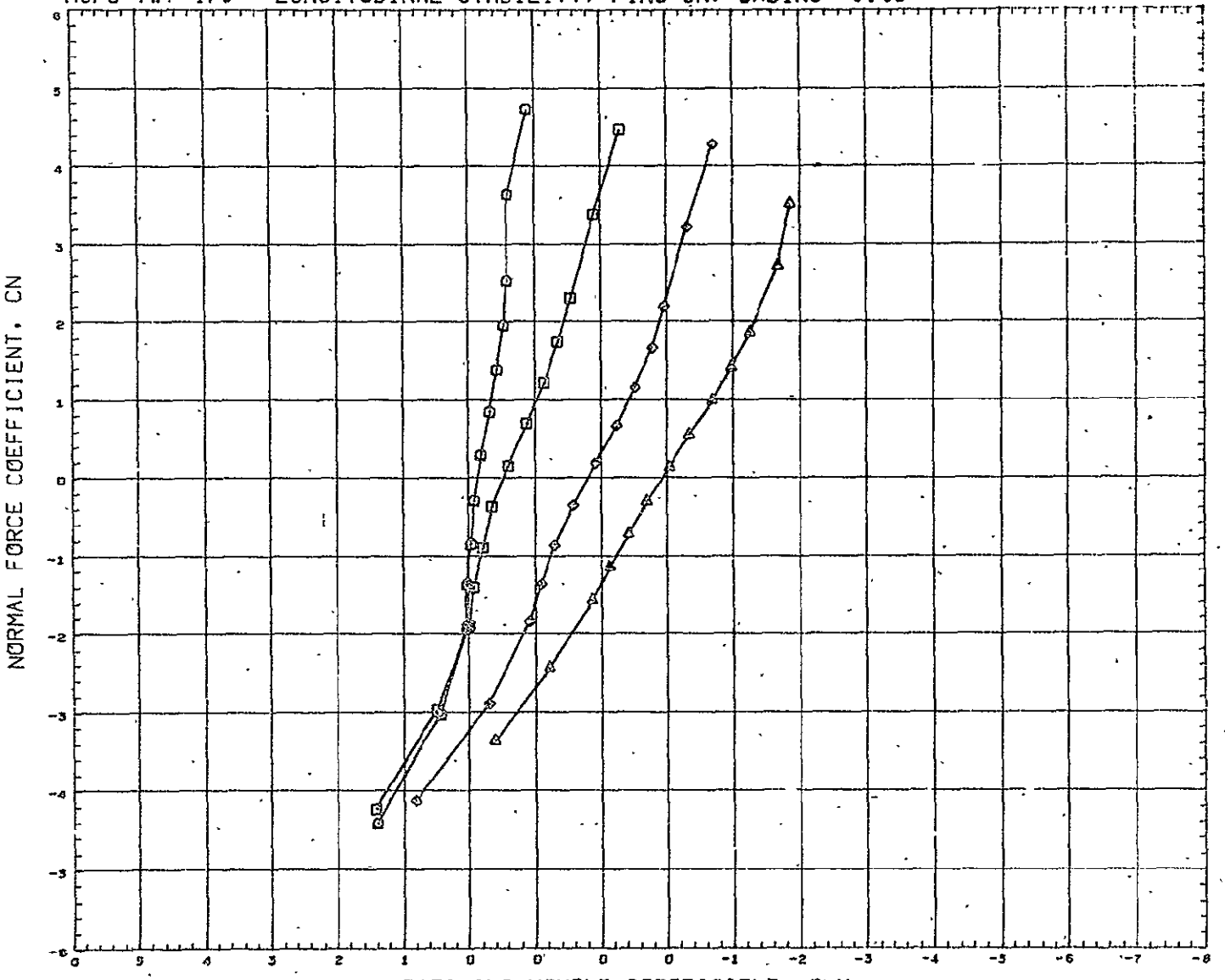



| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 0.599 | BETA | - 0.050 | ORBINC | - 1.050 | |
| □ | 0.899 | WHGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 0.997 | PHIB | 0.000 | | | |
| △ | 1.095 | | | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 · LONGITUDINAL STABILITY, FINS ON, ORBINC=-1.05

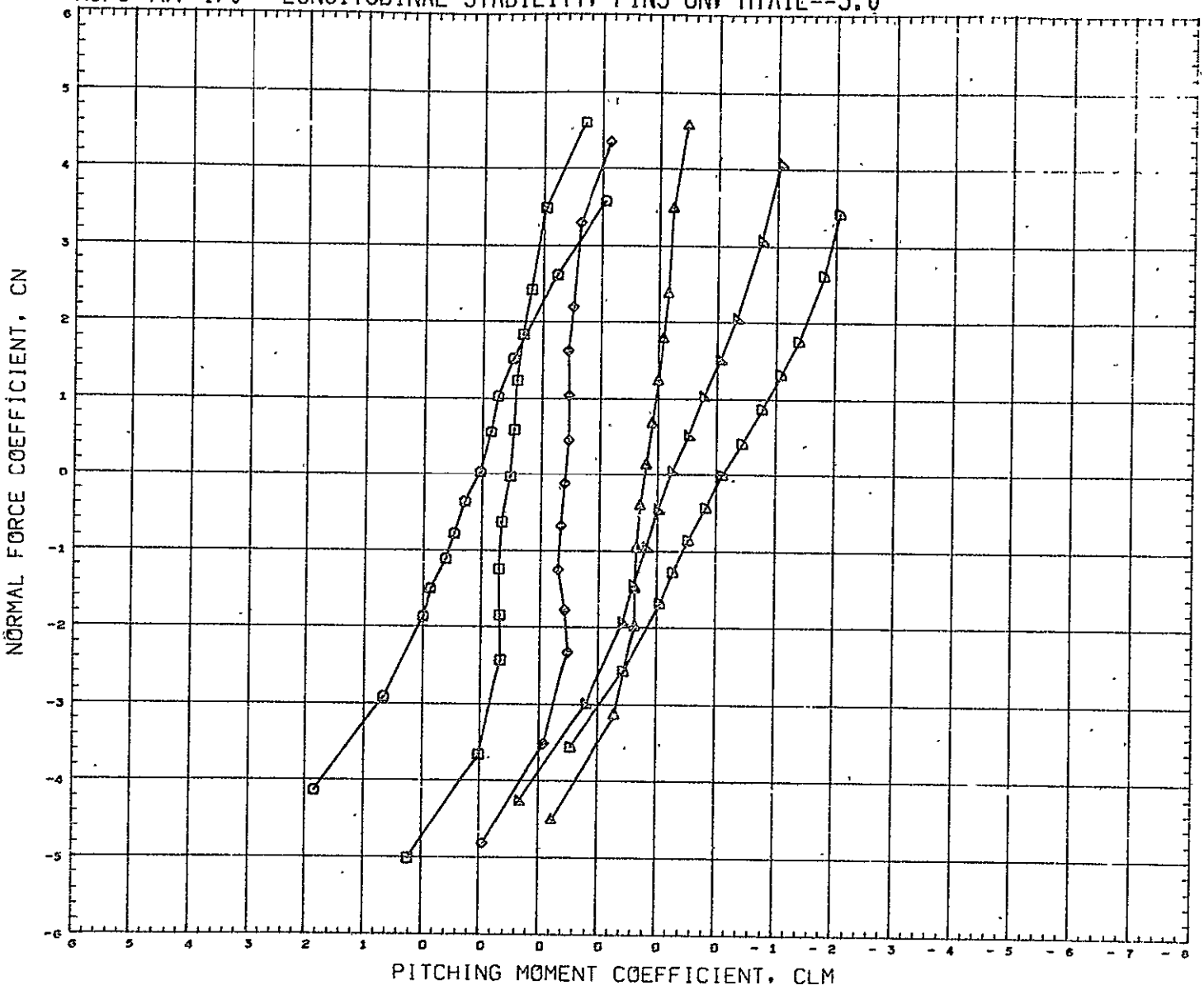



| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 1.195 | BETA | = 0.050 | ORBINC | = 1.050 | |
| □ | 1.303 | UNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 1.456 | PHIB | 0.000 | | | |
| △ | 1.967 | | | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL STABILITY, FINS ON, HTAIL=-5.0

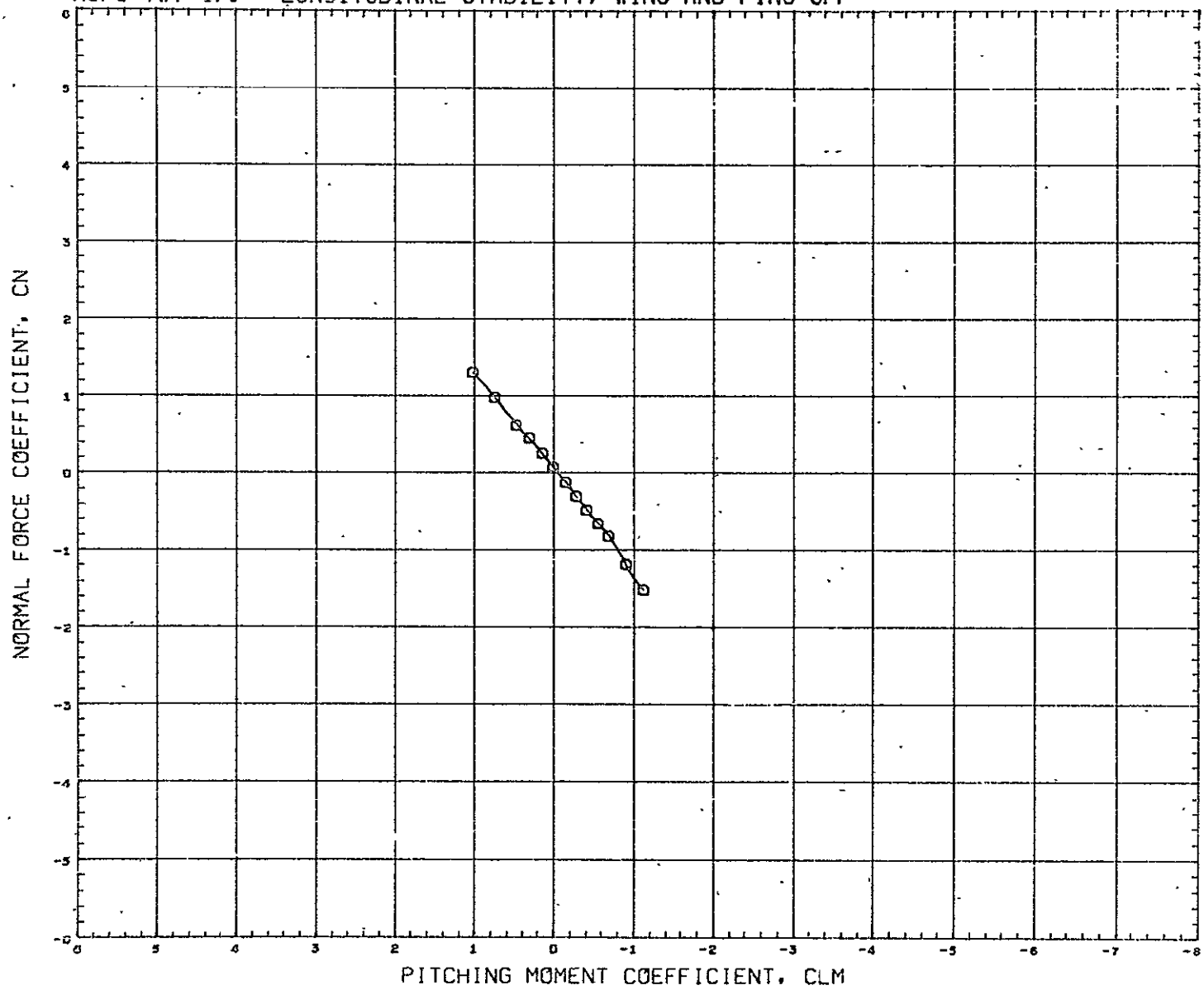



| SYMBOL | MACH | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| ○ | 0.693 | BETA | - 0.020 | ORBINC | - 1.050 | |
| □ | 0.995 | WNGINC | 4.000 | HTAIL | - 5.000 | |
| ◇ | 1.093 | PHIB | 0.000 | | | |
| △ | 1.199 | | | | | |
| ▷ | 1.454 | | | | | |
| ▯ | 1.961 | DATA MIST. CODE | *A | | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRF | 0.0000 | INCHES |
| ZMRF | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL STABILITY, WING AND FINS OFF




| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| O | 0.995 | BETA | - 0.100 | ORBINC | - 1.050 | |
| | | HTAIL | 0.000 | FHIB | 0.000 | |

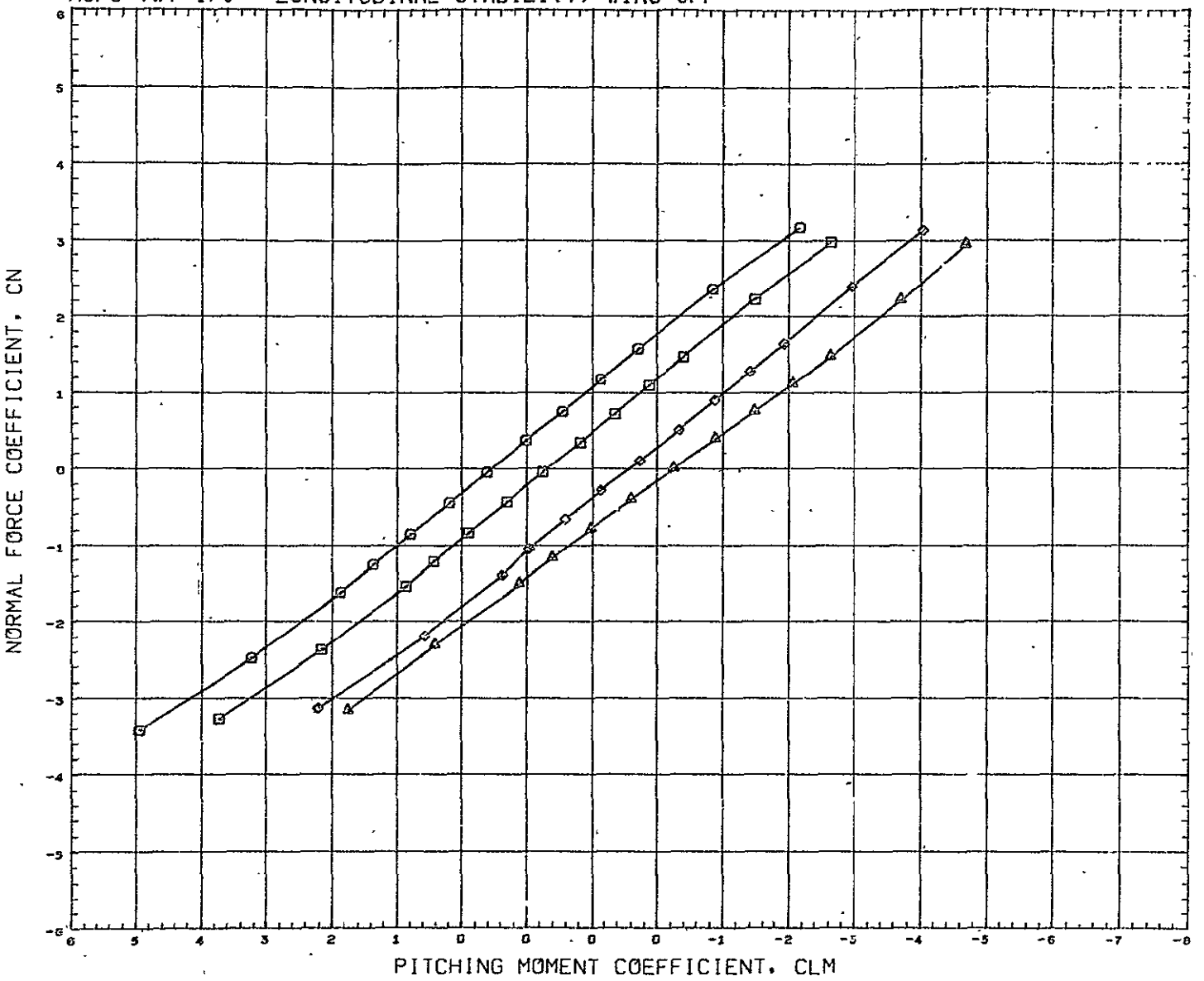
REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

REFERENCE FILE

TWT470 S-IC/GAC ORBITER BOHVS . WING,FINS OFF (A24101) 26 JAN 71 PAGE 65

MSFC TWT 470 LONGITUDINAL STABILITY, WING OFF

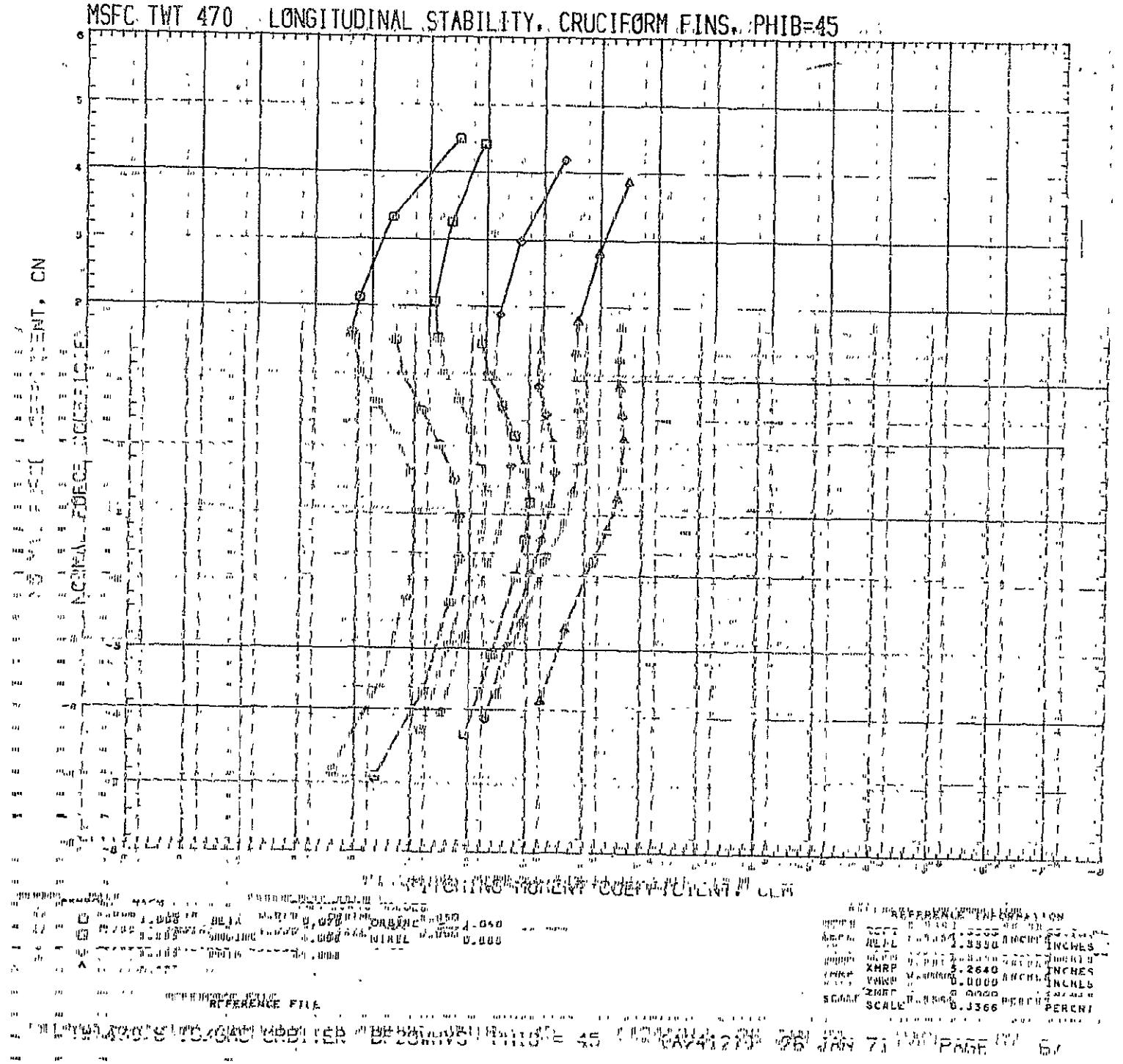



| SYMBOL | MACH | PARAMETRIC VALUES | | | | | |
|---|---|---|---|---|---|---|---|
| ○ | 0.999 | BETA | - | 0.100 | ORBINC | - | 1.050 |
| □ | 1.102 | HTAIL | | 0.000 | PHIB | | 0.000 |
| ◇ | 1.195 | | | | | | |
| △ | 1.459 | | | | | | |

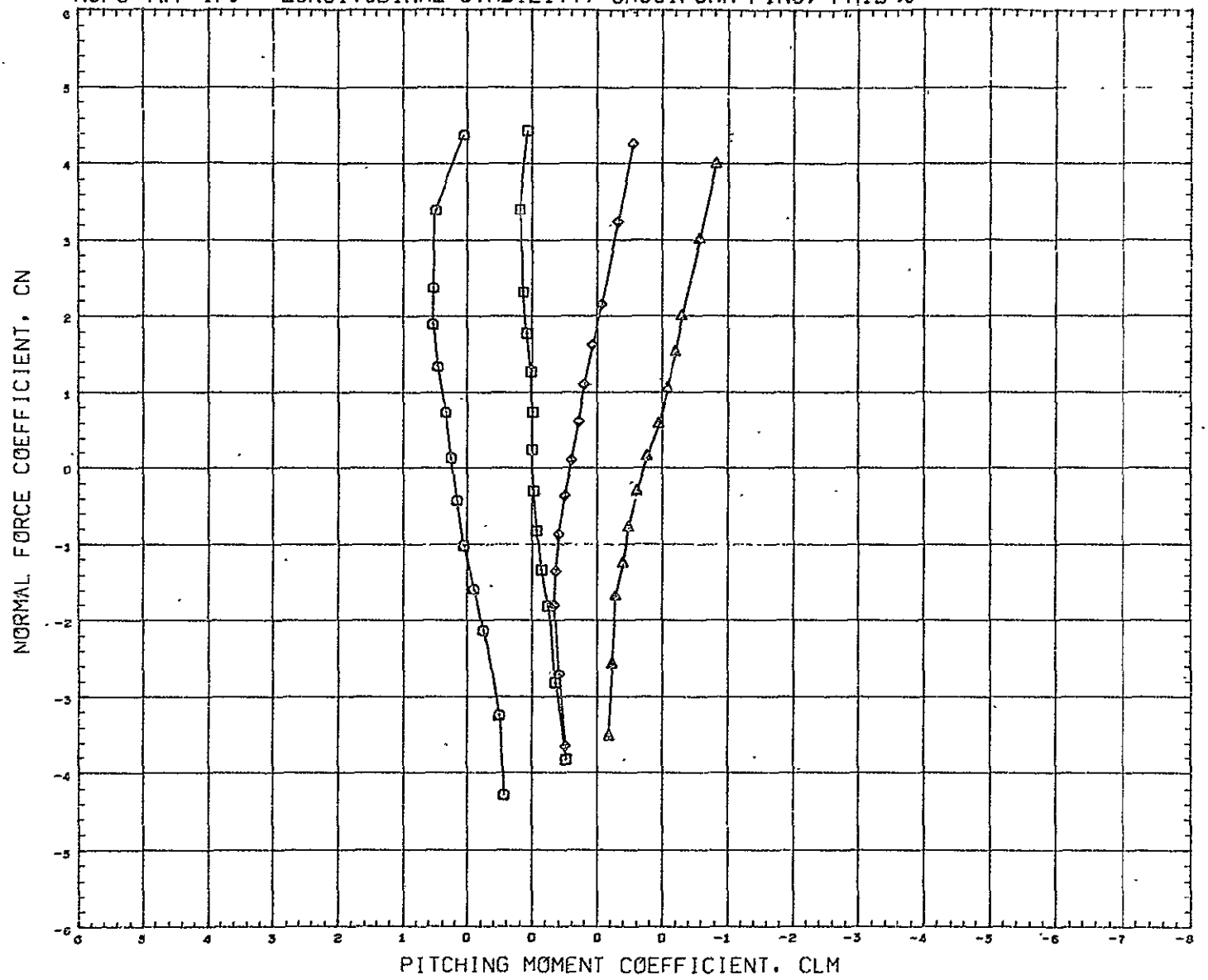
REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL STABILITY, CRUCIFORM FINS, PHIB=45



MSFC TWT 470 LONGITUDINAL STABILITY, CRUCIFORM FINS, PHIB=0




| SYMBOL | MACH |
|---|---|
| ○ | 0.997 |
| □ | 1.198 |
| ◇ | 1.303 |
| △ | 1.459 |

PARAMETRIC VALUES

| | | | |
|---|---|---|---|
| BETA | 0.060 | ORBINC | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

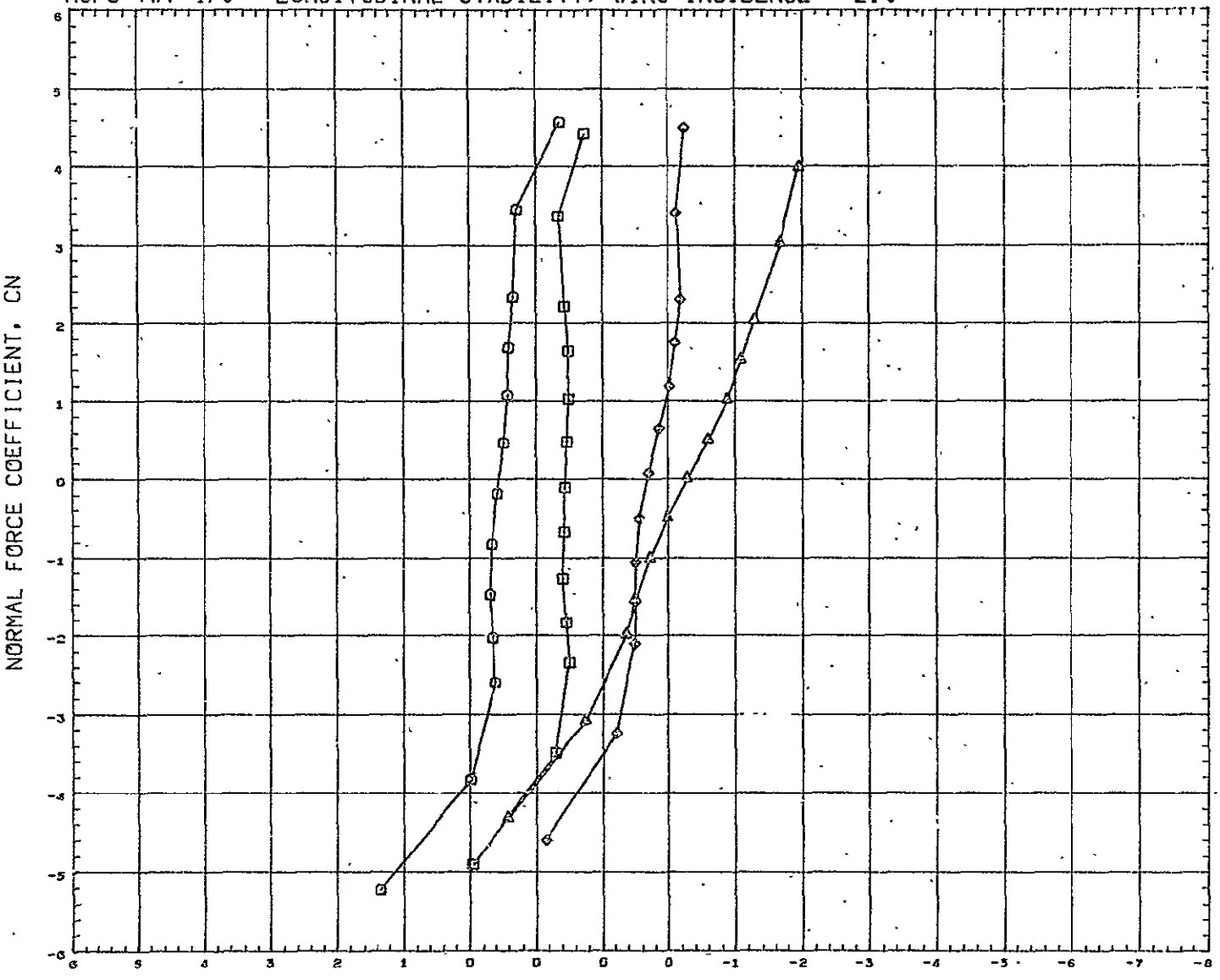
REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

REFERENCE FILE

TWT470 S-IC/GAC ORBITER BF20WHVS PHIB = 0 (A24131) 26 JAN 71 PAGE 68

MSFC TWT 470 LONGITUDINAL STABILITY, WING INCIDENCE = 2.0

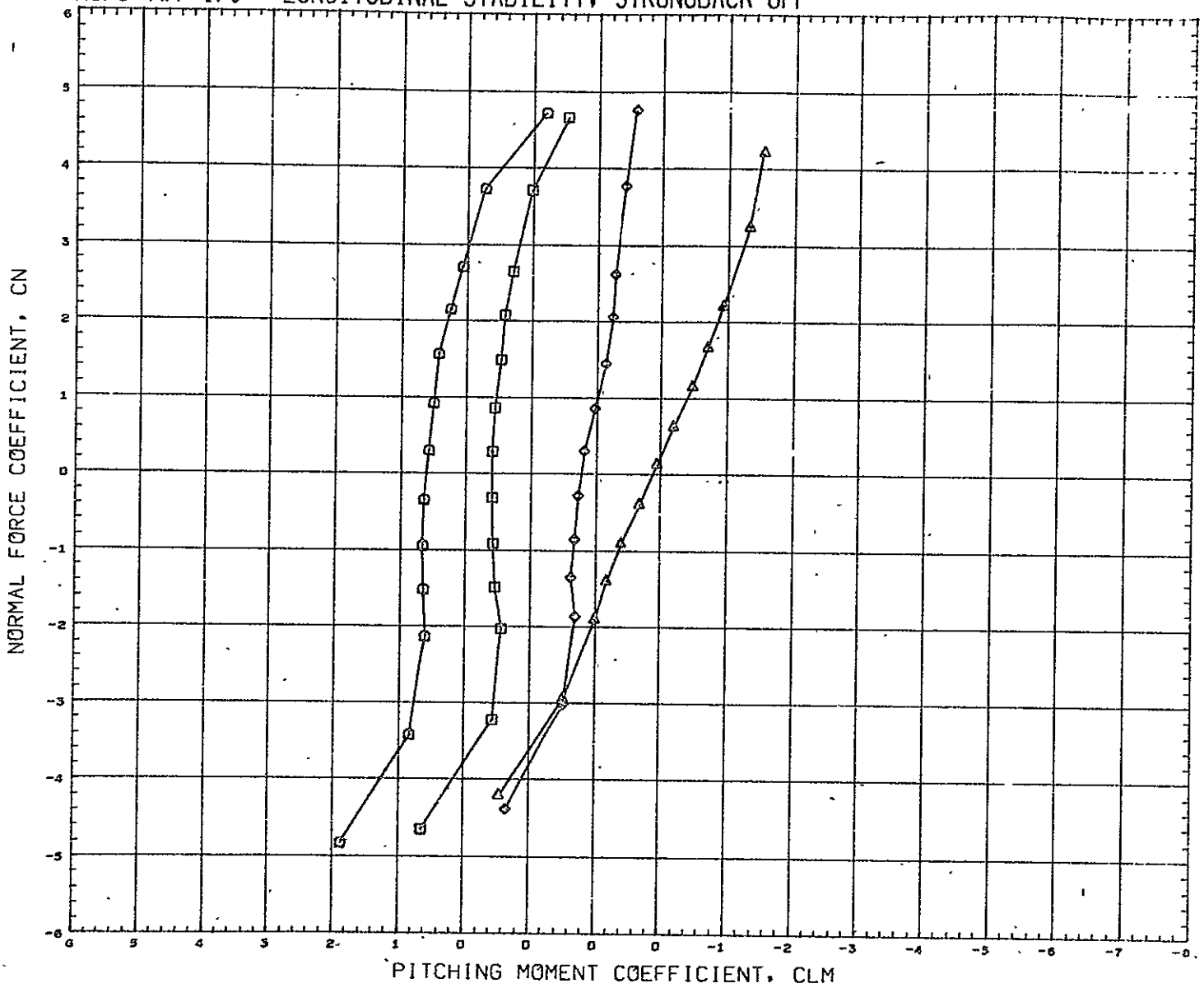



| SYMBOL | MACH | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| ○ | 1.001 | BETA | 0.090 | ORBINC | 1.050 |
| □ | 1.091 | WNGINC | 2.000 | HTAIL | 0.000 |
| ◇ | 1.202 | PHIB | 0.000 | | |
| △ | 1.455 | | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL STABILITY, STRONGBACK OFF



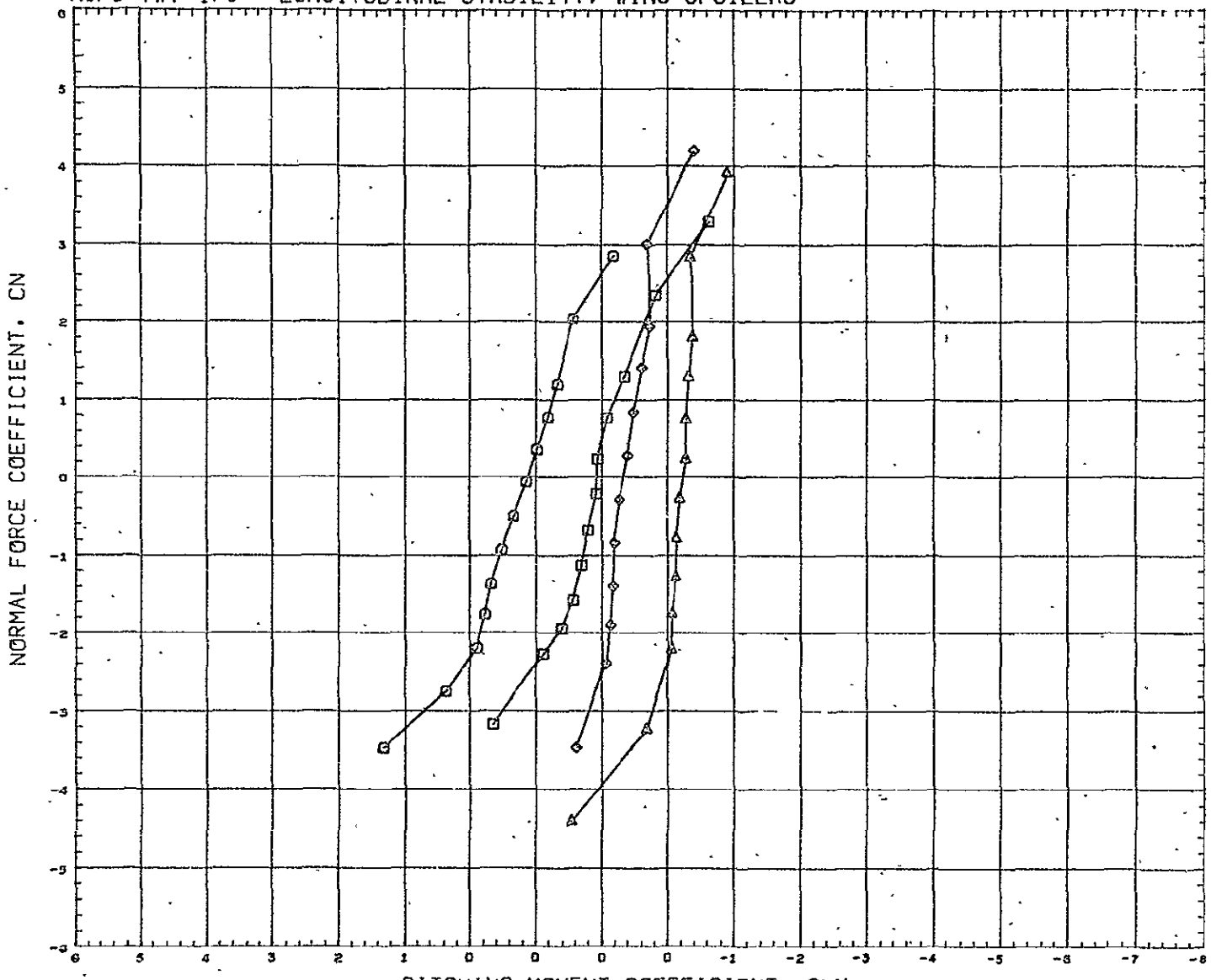

| SYMBOL | MACH | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| ○ | 1.002 | BETA | - 0.040 | ORBINC | - 1.050 |
| □ | 1.099 | WNGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 1.200 | PHIB | 0.000 | | |
| △ | 1.460 | | | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL STABILITY, WING SPOILERS




| SYMBOL | MACH |
|---|---|
| ○ | 0.599 |
| □ | 0.904 |
| ◇ | 0.998 |
| △ | 1.199 |

PARAMETRIC VALUES

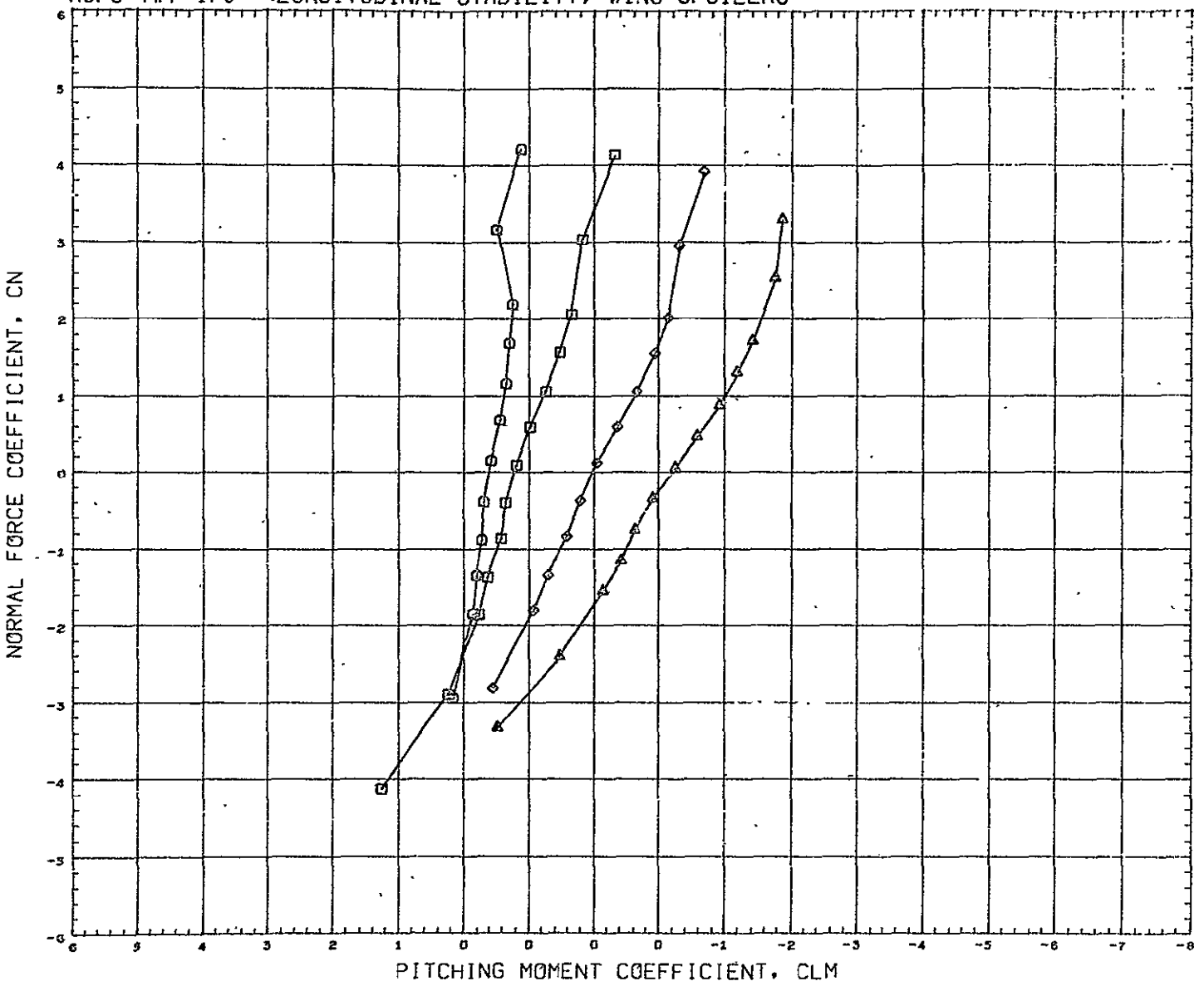
| | | | |
|---|---|---|---|
| BETA | - 0.050 | ORBINC | - 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL STABILITY, WING SPOILERS




| SYMBOL | MACH |
|---|---|
| ○ | 1.200 |
| □ | 1.302 |
| ◇ | 1.457 |
| △ | 1.969 |

PARAMETRIC VALUES

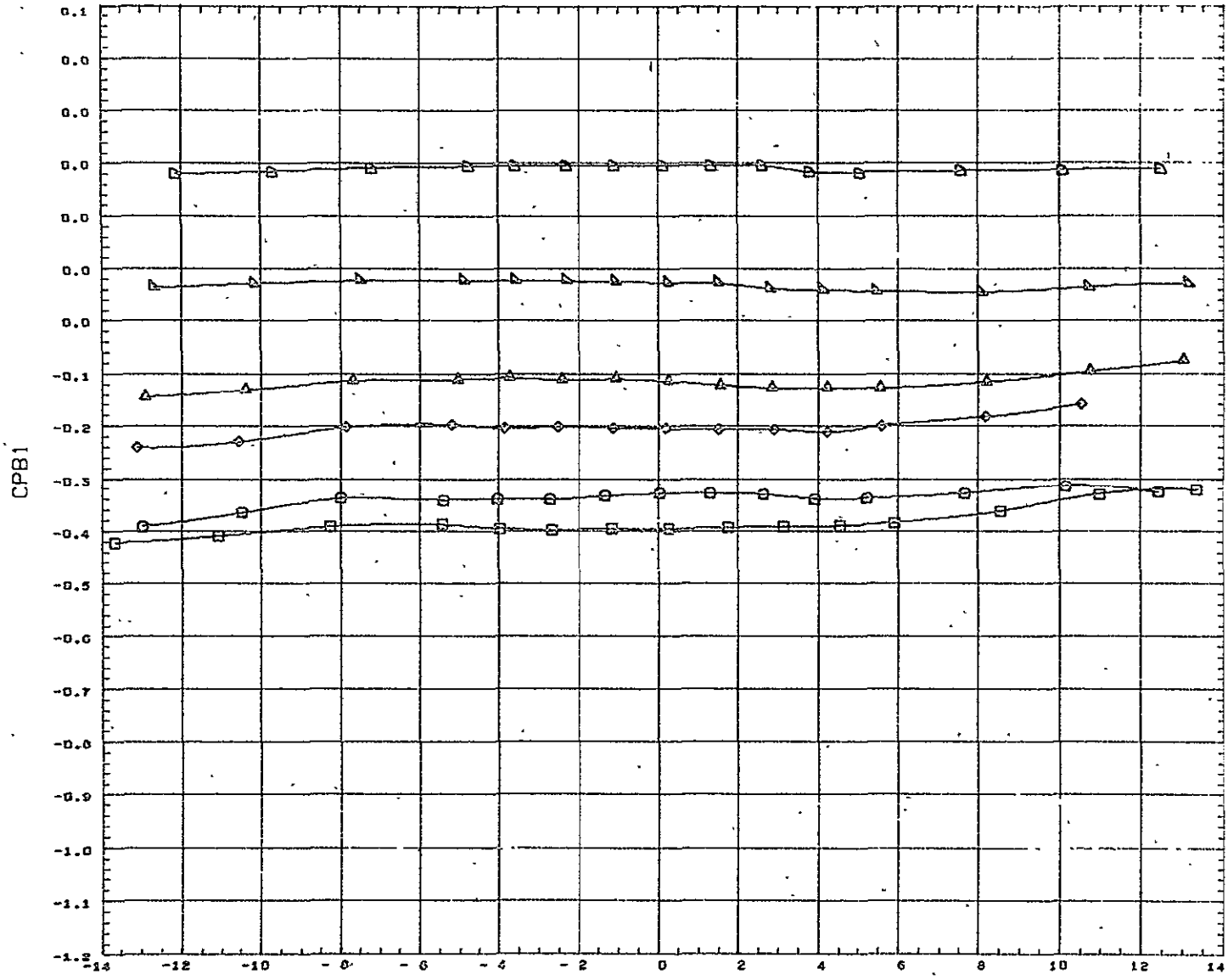
| | | | | | |
|---|---|---|---|---|---|
| BETA | - | 0.050 | ORBINC | - | 1.050 |
| WNGINC | | 4.000 | HTAIL | | 0.000 |
| PHIB | | 0.000 | | | |

REFERENCE FILE

REFERENCE INFORMATION

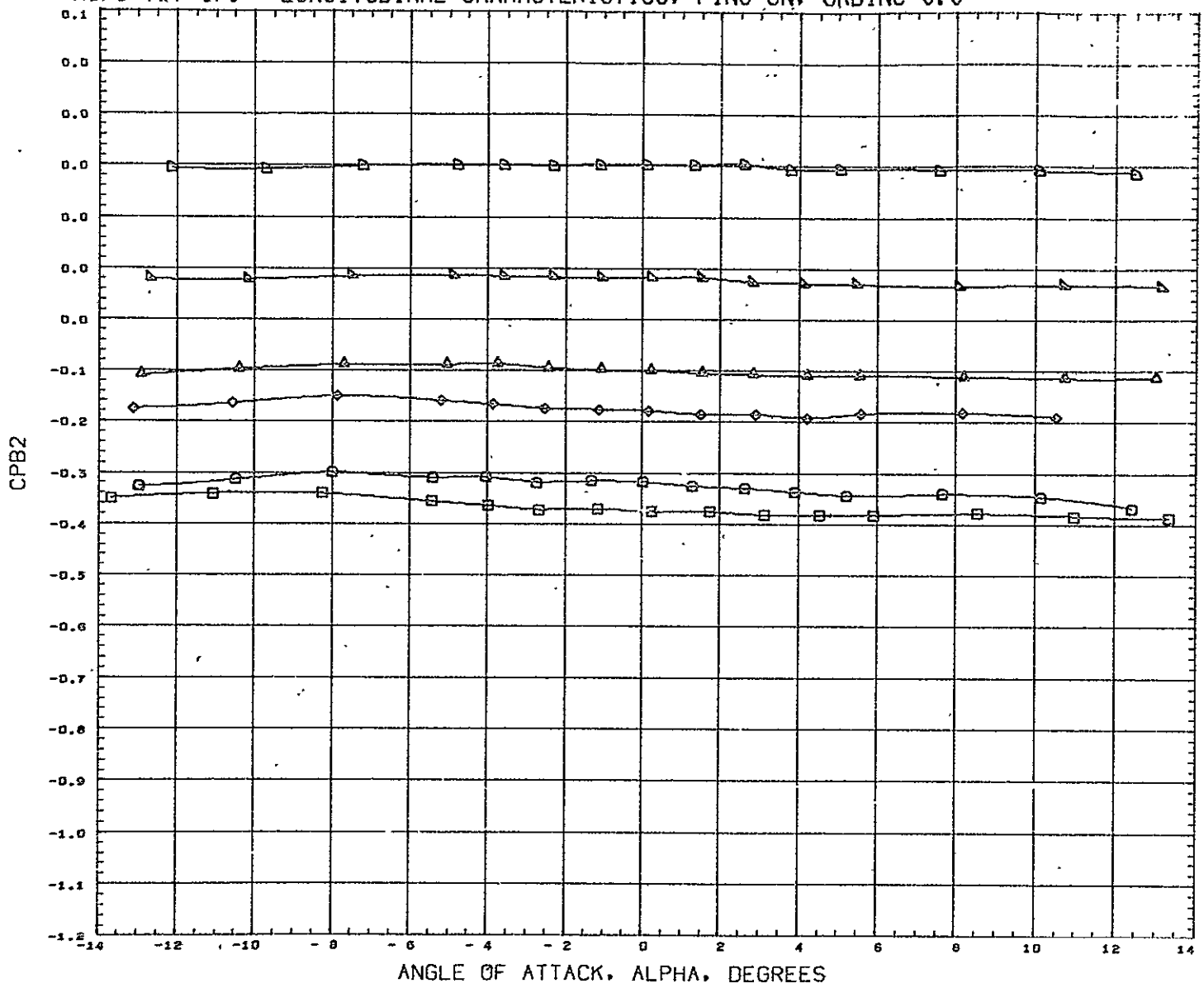
| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=0.0




| SYMBOL | MACH | PARAMETRIC VALUES | | | | REFERENCE INFORMATION | | |
|---|---|---|---|---|---|---|---|---|
| ○ | 0.900 | BETA | 0.070 | ORBINC | 0.000 | REFS | 1.3960 | SQ.IN. |
| □ | 1.002 | WNGINC | 4.000 | HTAIL | 0.000 | REFL | 1.3330 | INCHES |
| ◇ | 1.103 | PHIB | 0.000 | | | REFB | 1.3330 | INCHES |
| △ | 1.197 | | | | | XMRP | 5.2640 | INCHES |
| ▷ | 1.461 | | | | | YMRP | 0.0000 | INCHES |
| ▷ | 1.964 | DATA HIST. CODE | *A | | | ZMRP | 0.0000 | INCHES |
| | | | | | | SCALE | 0.3366 | PERCNT |

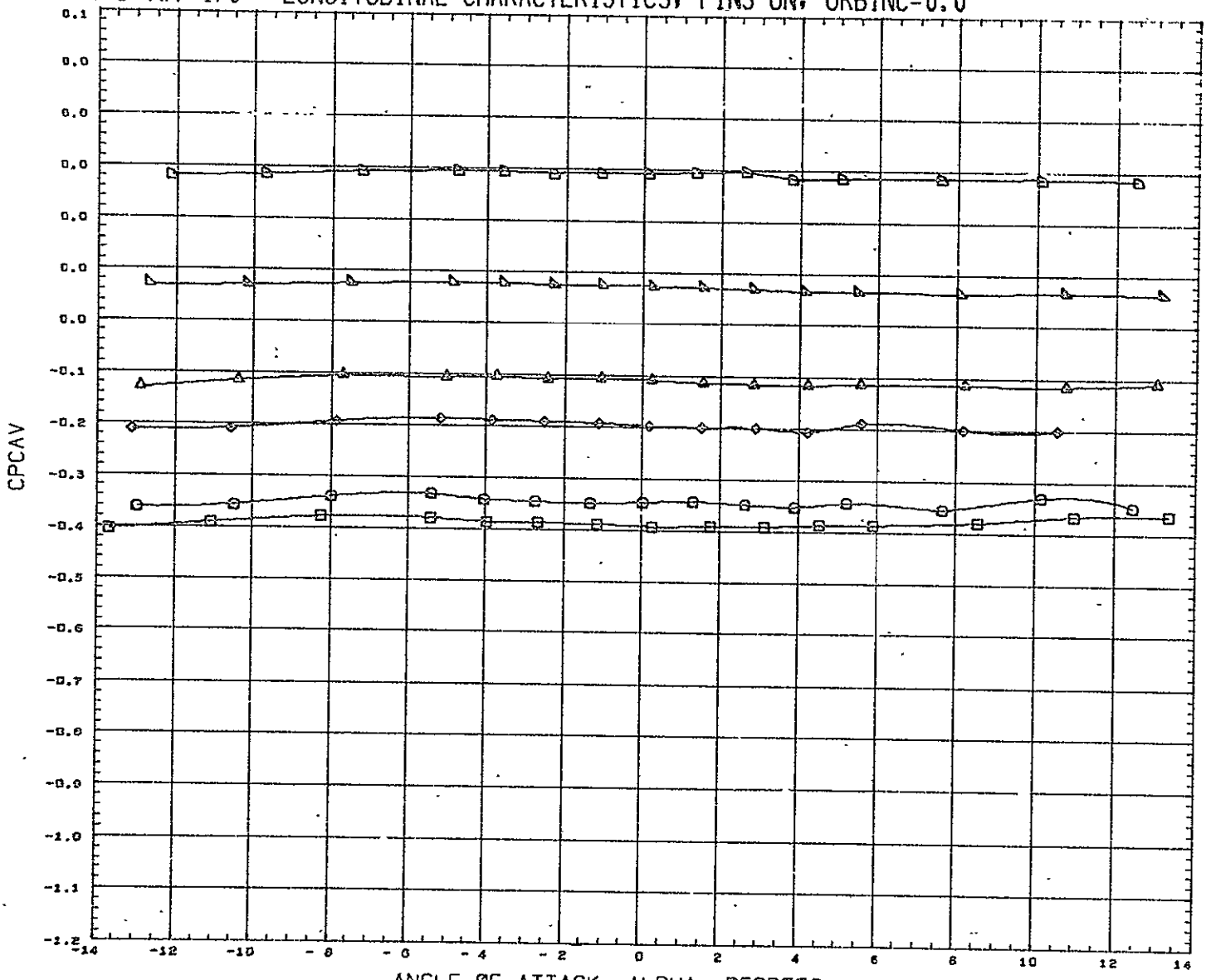
MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=0.0




| SYMBOL | MACH | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| ○ | 0.900 | BETA | - 0.070 | ORBINC | 0.000 |
| □ | 1.002 | WNGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 1.103 | PHIB | 0.000 | | |
| △ | 1.197 | | | | |
| ▷ | 1.461 | | | | |
| D | 1.964 | DATA HIST. CODE | *A | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

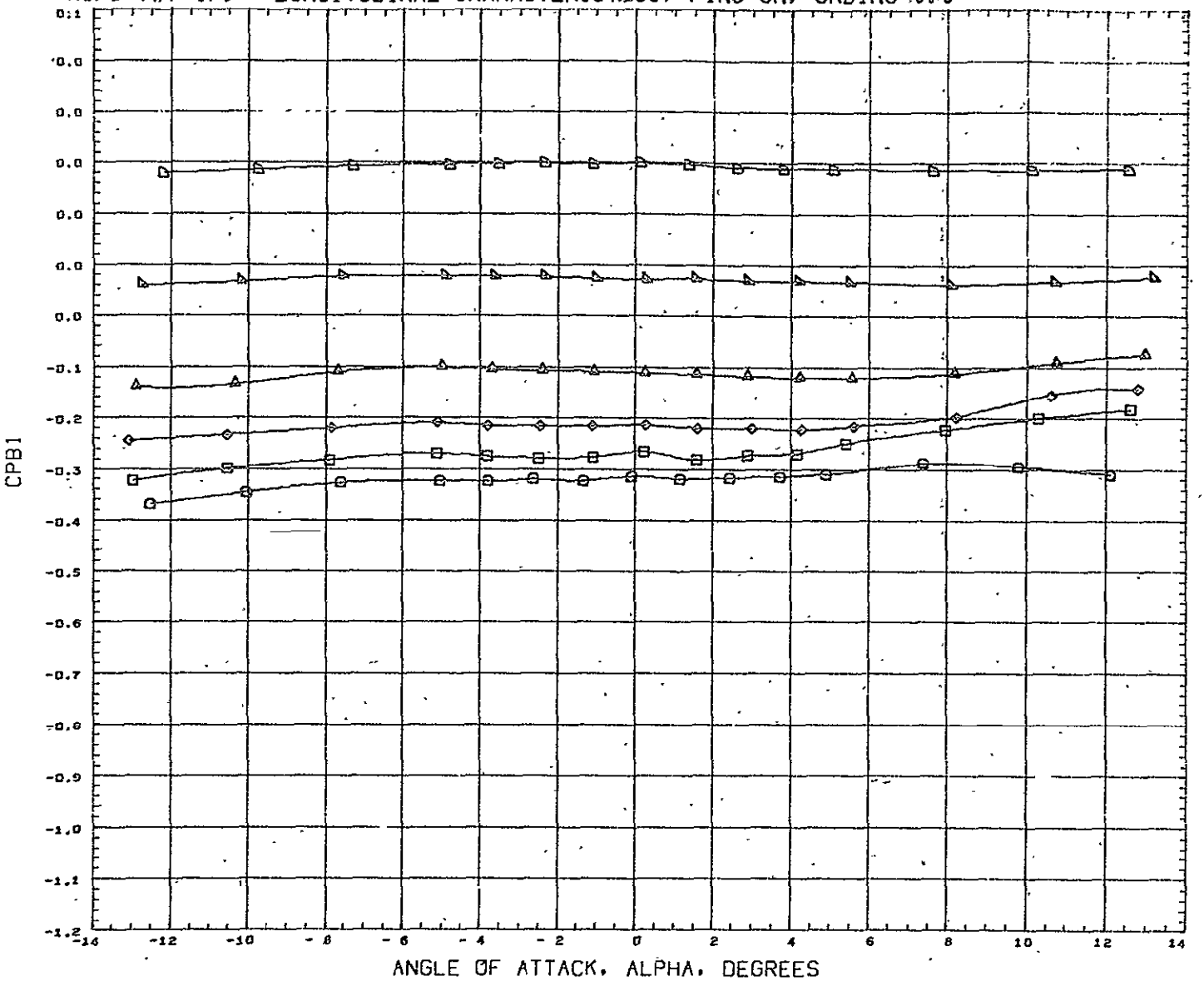
MSFC TWT 470 LØNGITUDINAL CHARACTERISTICS, FINS ØN, ØRBINC=0.0




| SYMBOL | MACH | | PARAMETRIC VALUES | | |
|---|---|---|---|---|---|
| ○ | 0.900 | BETA | - 0.070 | ORBINC | 0.000 |
| □ | 1.002 | WHGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 1.103 | PHIB | 0.000 | | |
| △ | 1.197 | | | | |
| ▽ | 1.461 | | | | |
| ▷ | 1.964 | DATA HIST. CODE | #A | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=0.0

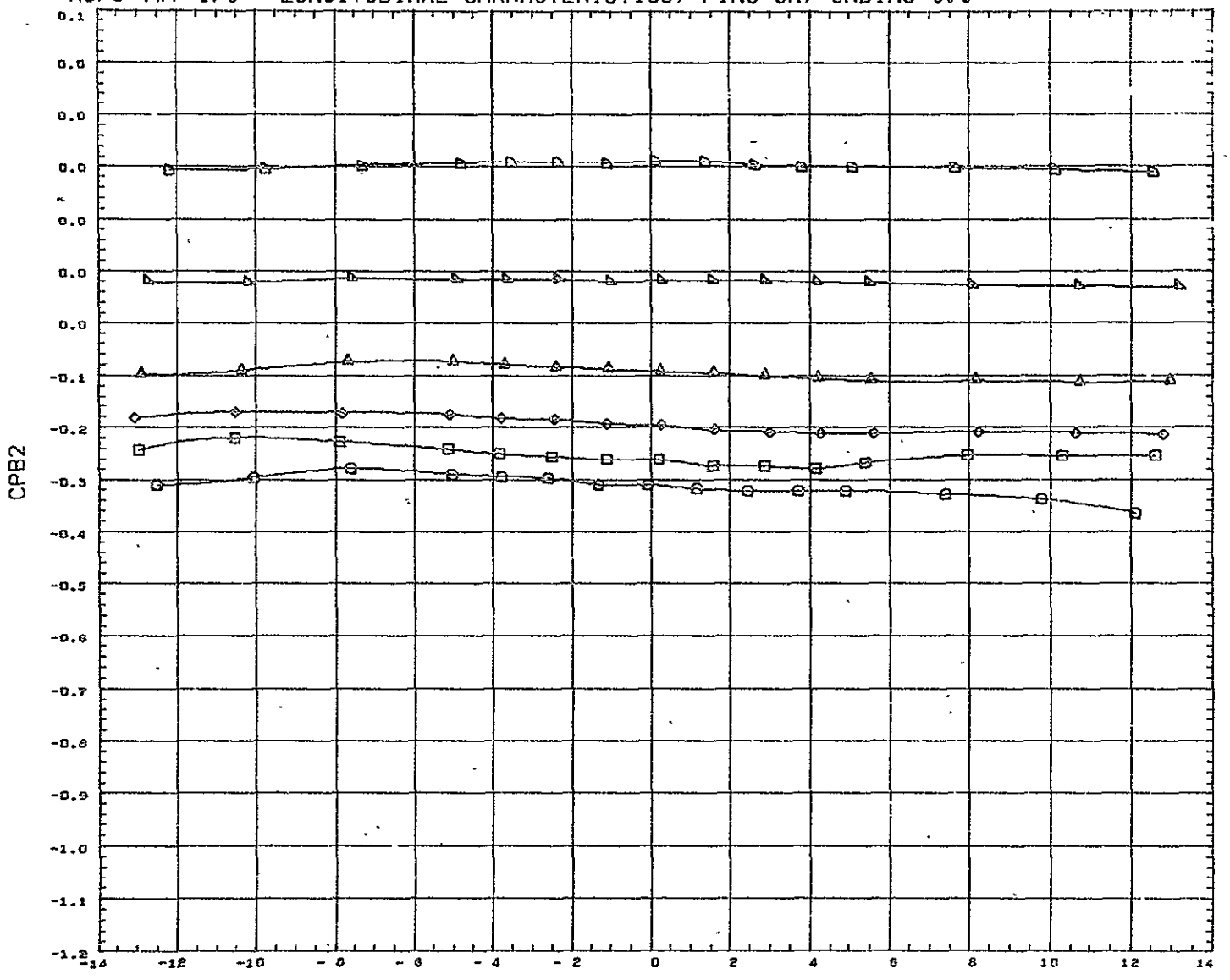



| MBOL | MACH | | PARAMETRIC VALUES | | |
|---|---|---|---|---|---|
| ○ | 0.903 | BETA | 0.000 | ORBINC | 0.000 |
| □ | 1.001 | WNGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 1.101 | PHIB | 0.000 | | |
| △ | 1.202 | | | | |
| ▽ | 1.456 | | | | |
| ▷ | 1.965 | DATA HIST. CODE | #A | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

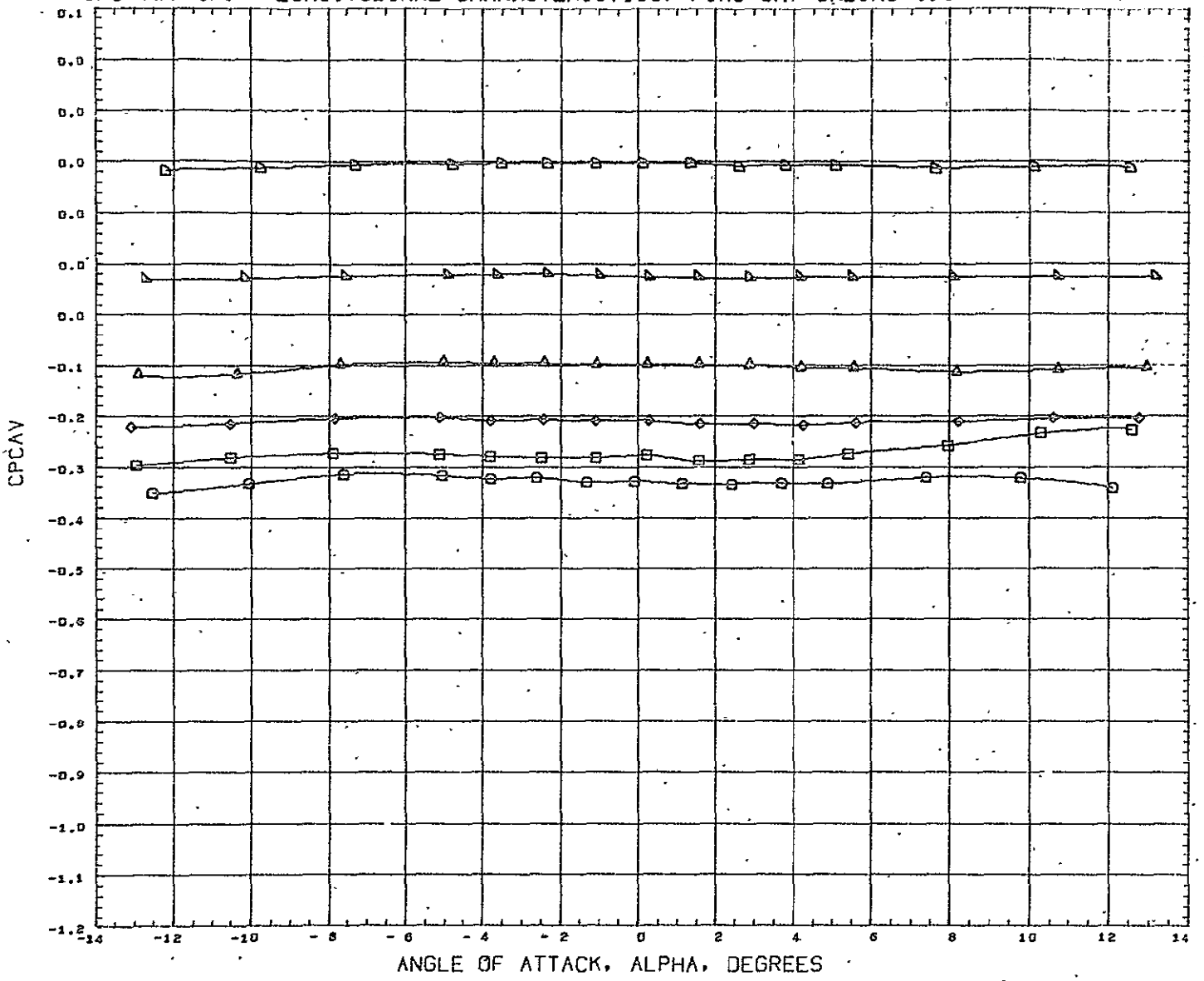
MSFC TWT 470 · LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=0.0




| SYMBOL | MACH | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| □ | 0.903 | BETA | 0.000 | ORBINC | 0.000 |
| □ | 1.001 | WNGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 1.101 | PHIB | 0.000 | | |
| △ | 1.202 | | | | |
| ▷ | 1.458 | | | | |
| ▷ | 1.965 | DATA HIST. CODE | *A | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=0.0

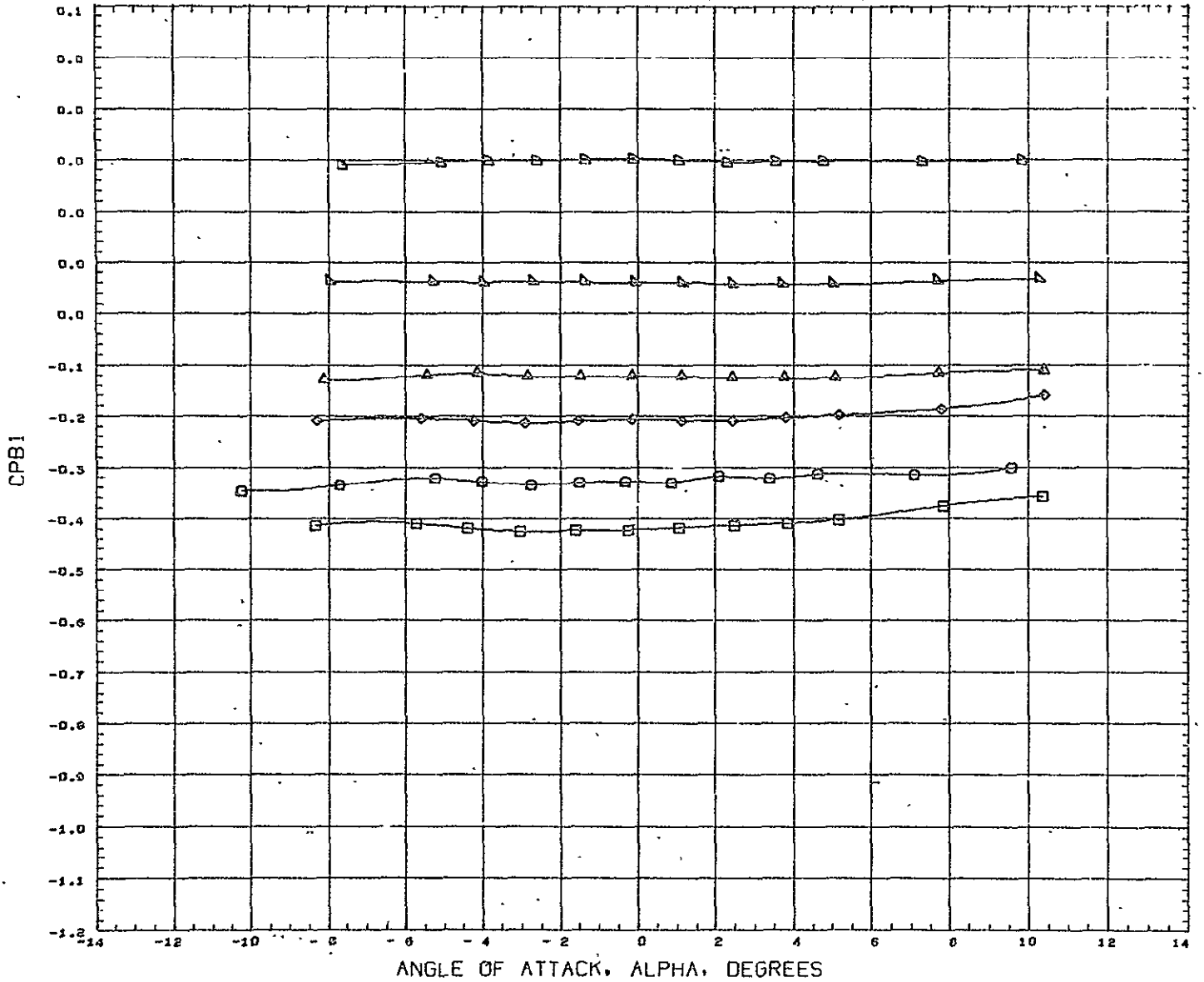



| MBOL | MACH | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| ○ | 0.903 | BETA | 0.090 | ORBINC | 0.000 |
| □ | 1.001 | WNGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 1.101 | PHIB | 0.000 | | |
| △ | 1.202 | | | | |
| ▷ | 1.456 | | | | |
| ⌒ | 1.965 | DATA HIST. CODE | #A | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

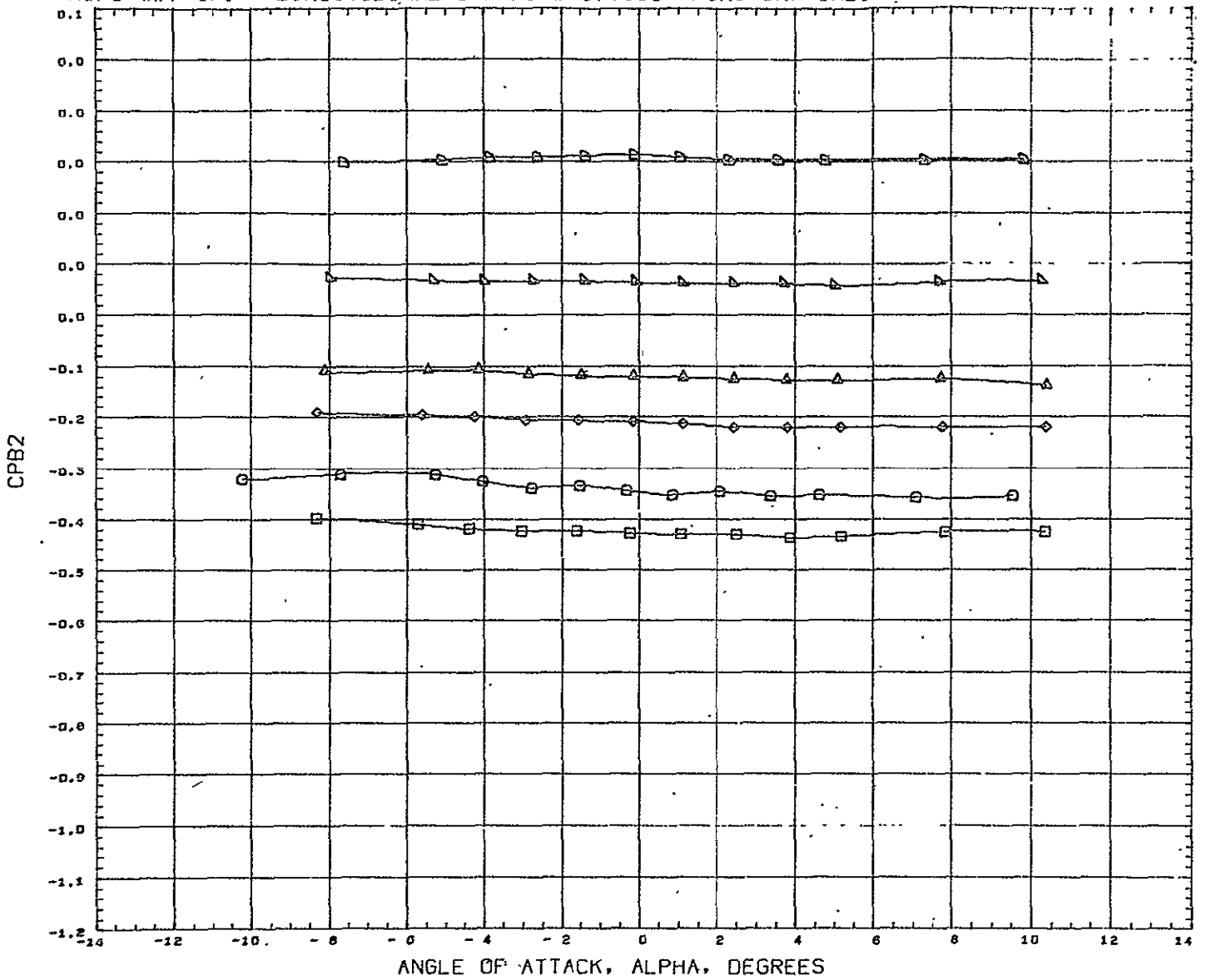
MSFC TWT 47.0 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=-2.0




| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 0.899 | BETA | - 0.070 | ORBINC | - 2.000 | |
| □ | 0.993 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 1.105 | PHIB | 0.000 | | | |
| △ | 1.196 | | | | | |
| ▷ | 1.456 | | | | | |
| ▷ | 1.956 | DATA HIST. CODE | *A | | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

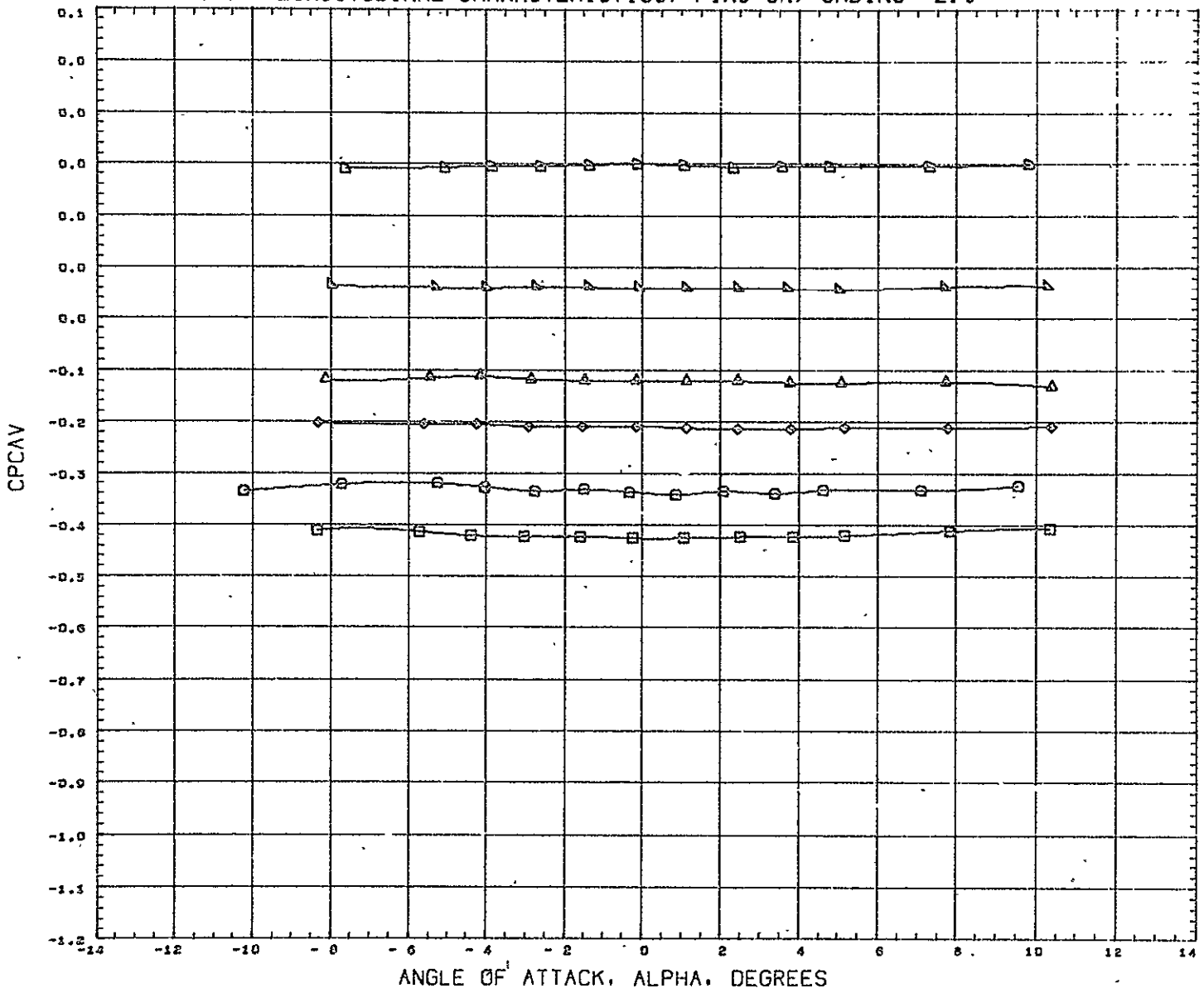
MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=-2.0




| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 0.899 | BETA | - 0.070 | ORBINC | - 2.000 | |
| □ | 0.903 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 1.105 | PHIB | 0.000 | | | |
| △ | 1.196 | | | | | |
| ▷ | 1.450 | | | | | |
| ▯ | 1.956 | DATA HIST. CODE | *A | | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

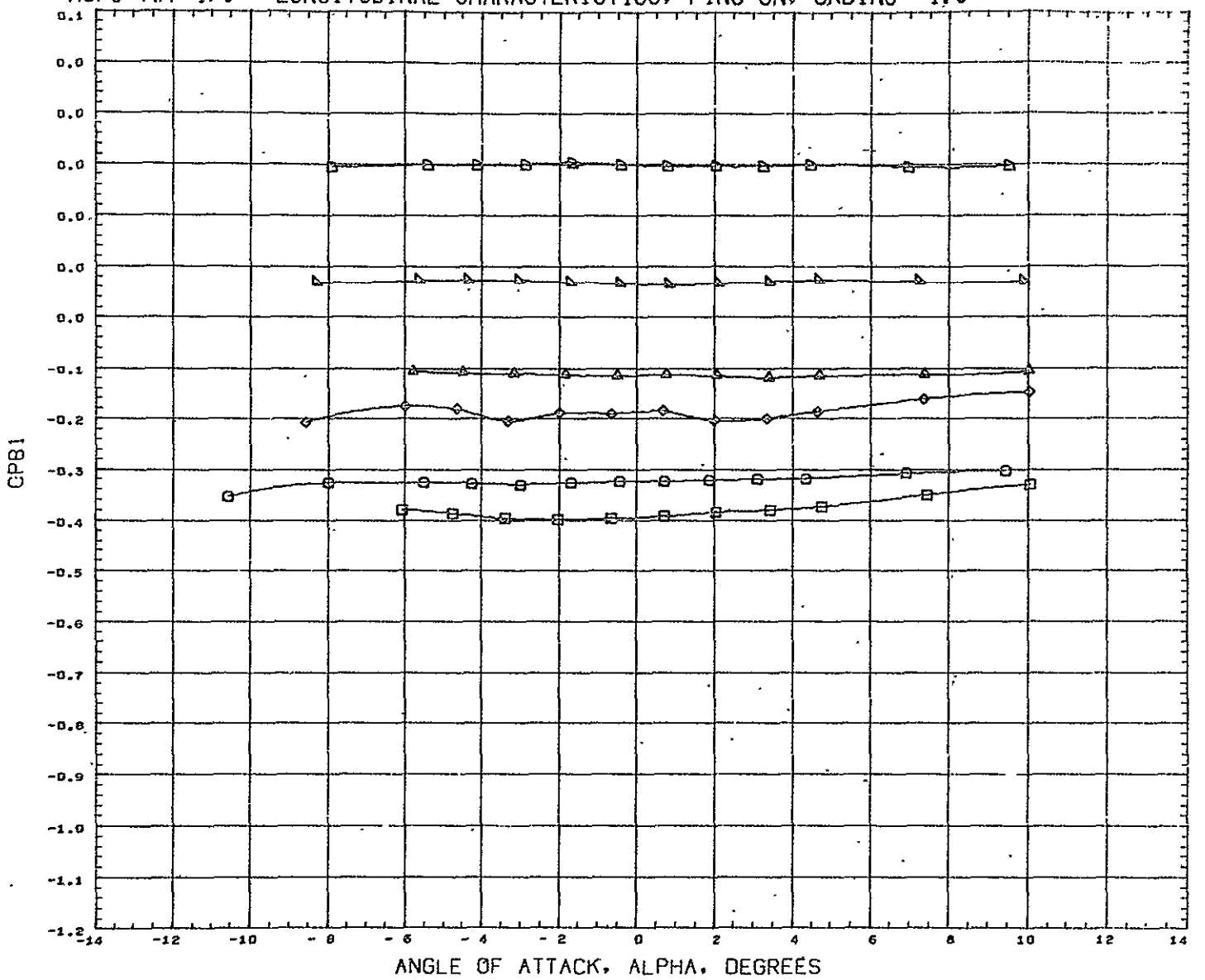
MSFC TWT 470 LØNGITUDINAL CHARACTERISTICS, FINS ØN; ØRBINC=-2.0




| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 0.899 | BETA | - 0.070 | ORBINC | - 2.000 |
| □ | 0.993 | WHGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 1.105 | PHIB | 0.000 | | |
| △ | 1.196 | | | | |
| ▷ | 1.656 | | | | |
| ▯ | 1.956 | DATA HIST. CODE | #A | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

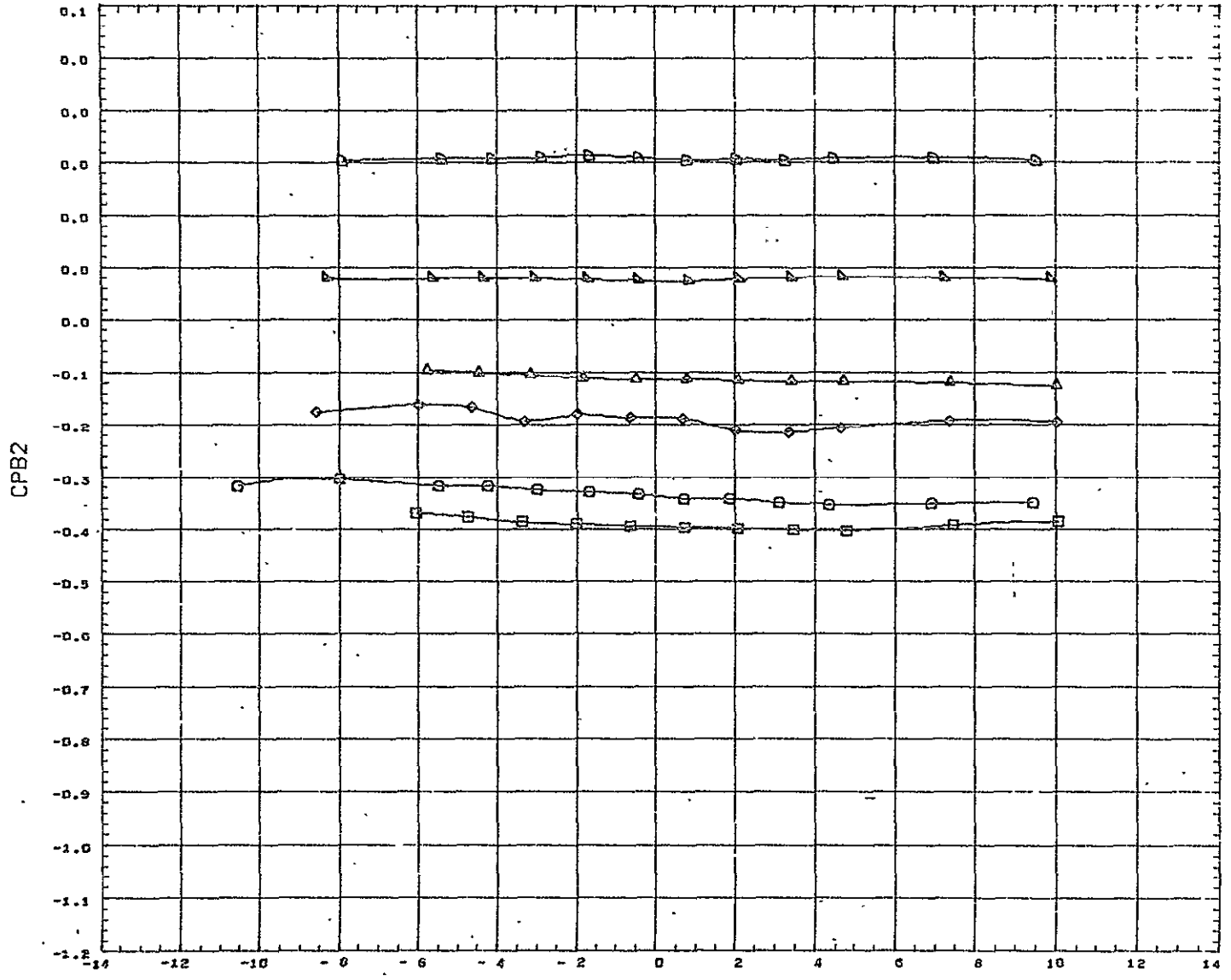
MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=-4.0




| MBOL | MACH | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| ○ | 0.901 | BETA | - 0.050 | ORBINC | - 4.000 | |
| □ | 1.000 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 1.098 | PHIB | 0.000 | | | |
| △ | 1.193 | | | | | |
| ▷ | 1.450. | | | | | |
| ⌒ | 1.950 | DATA HIST. CODE | #A | | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

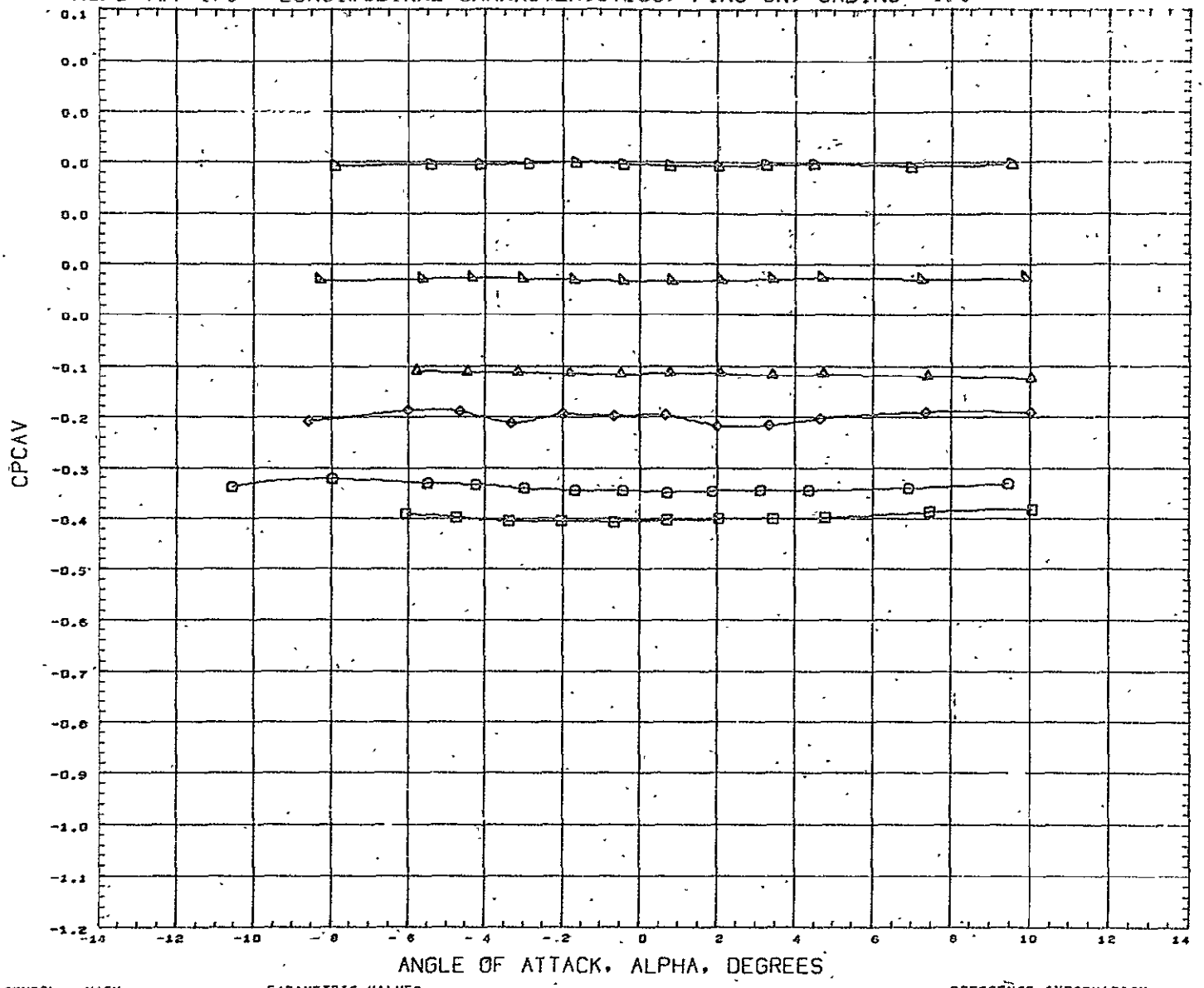
MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=-4.0




| SYMBOL | MACH | PARAMETRIC VALUES | | | | | |
|---|---|---|---|---|---|---|---|
| ○ | 0.901 | BETA | - 0.050 | ORBINC | - 4.000 | | |
| □ | 1.000 | WNGINC | 4.000 | HTAIL | 0.000 | | |
| ◇ | 1.098 | PHIB | 0.000 | | | | |
| △ | 1.193 | | | | | | |
| ▷ | 1.450 | | | | | | |
| D | 1.950 | DATA HIST. CODE | #A | | | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

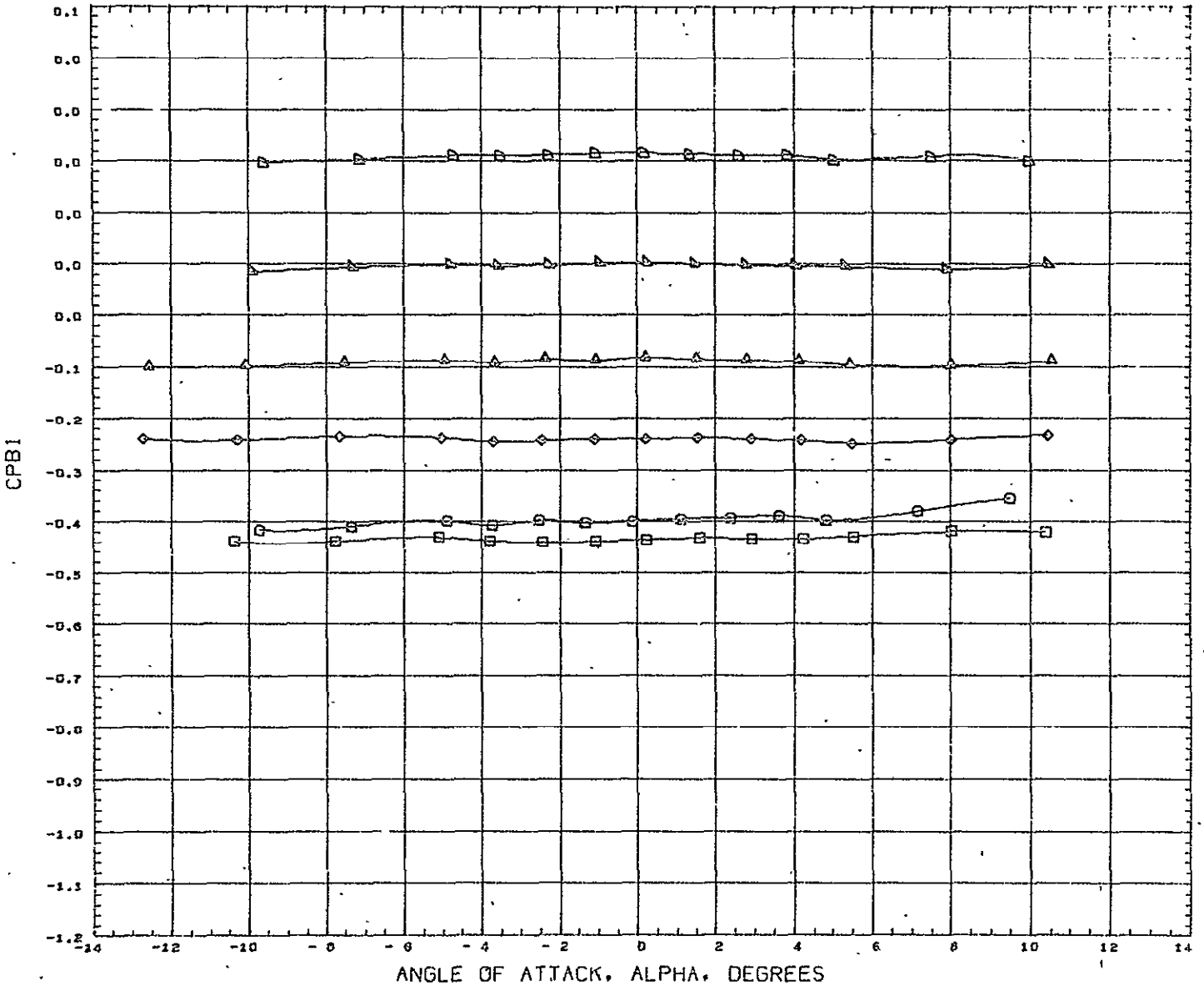
MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=-4.0




| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 0.901 | BETA | 0.030 | ORBINC | 4.000 | |
| □ | 1.000 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 1.098 | PHIB | 0.000 | | | |
| △ | 1.193 | | | | | |
| ▷ | 1.458 | | | | | |
| ▷ | 1.950 | DATA HIST. CODE | #A | | | |

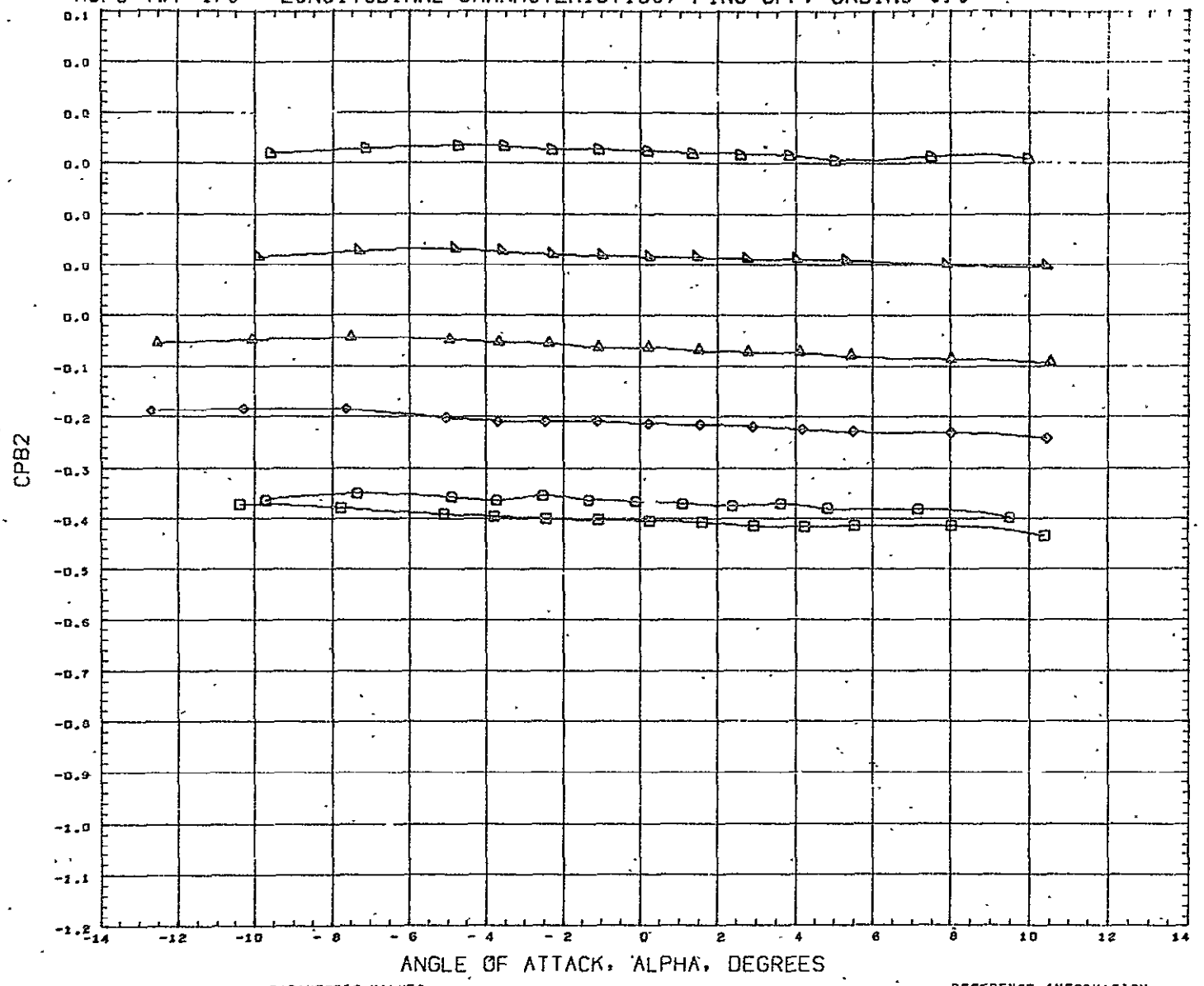
| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS OFF, ORBINC=0.0




| SYMBOL | MACH | PARAMETRIC VALUES | | | | REFERENCE INFORMATION | | |
|---|---|---|---|---|---|---|---|---|
| ○ | 0.699 | BETA | 0.050. | ORBINC | 0.000 | REFS | 1.3960 | SQ.IN. |
| □ | 0.993 | WBGINC | 4.000 | HTAIL | 0.000 | REFL | 1.3330 | INCHES |
| ◇ | 1.101 | PHIB | 0.000 | | | REFB | 1.3330 | INCHES |
| △ | 1.201 | | | | | XMRP | 5.2640 | INCHES |
| ▷ | 1.457 | | | | | YMRP | 0.0000 | INCHES |
| ○ | 1.951 | DATA HIST. CODE | *A | | | ZMRP | 0.0000 | INCHES |
| | | | | | | SCALE | 0.3366 | PERCNT |

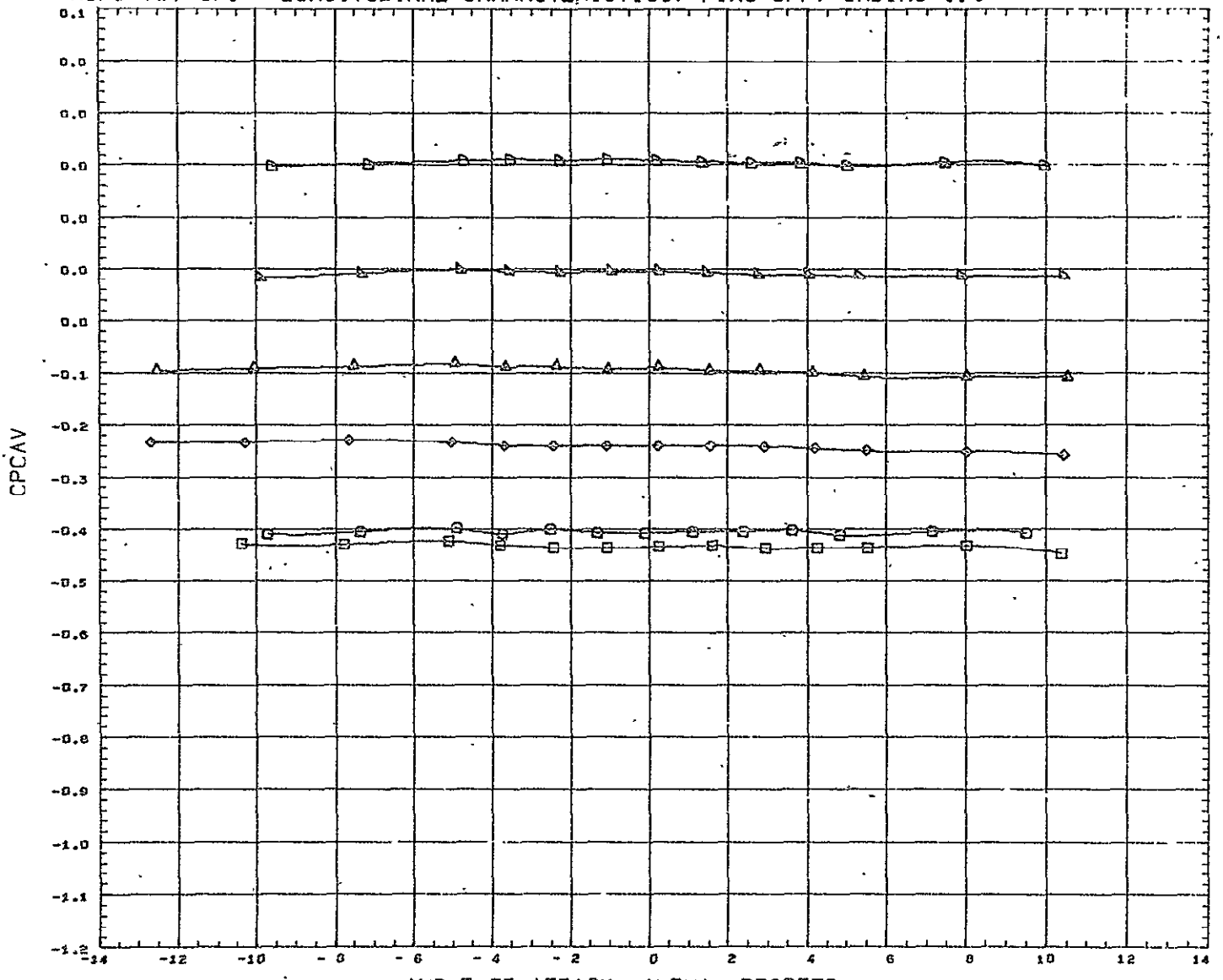
MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS OFF, ORBINC=0.0




| SYMBOL | MACH | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| ○ | 0.899 | BETA | - 0.050 | ORBINC. | 0.000 |
| □ | 0.993 | WNGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 1.101 | PHIB | 0.000 | | |
| △ | 1.201 | | | | |
| ▷ | 1.457 | | | | |
| ▯ | 1.951 | DATA HIST. CODE | *A | | |

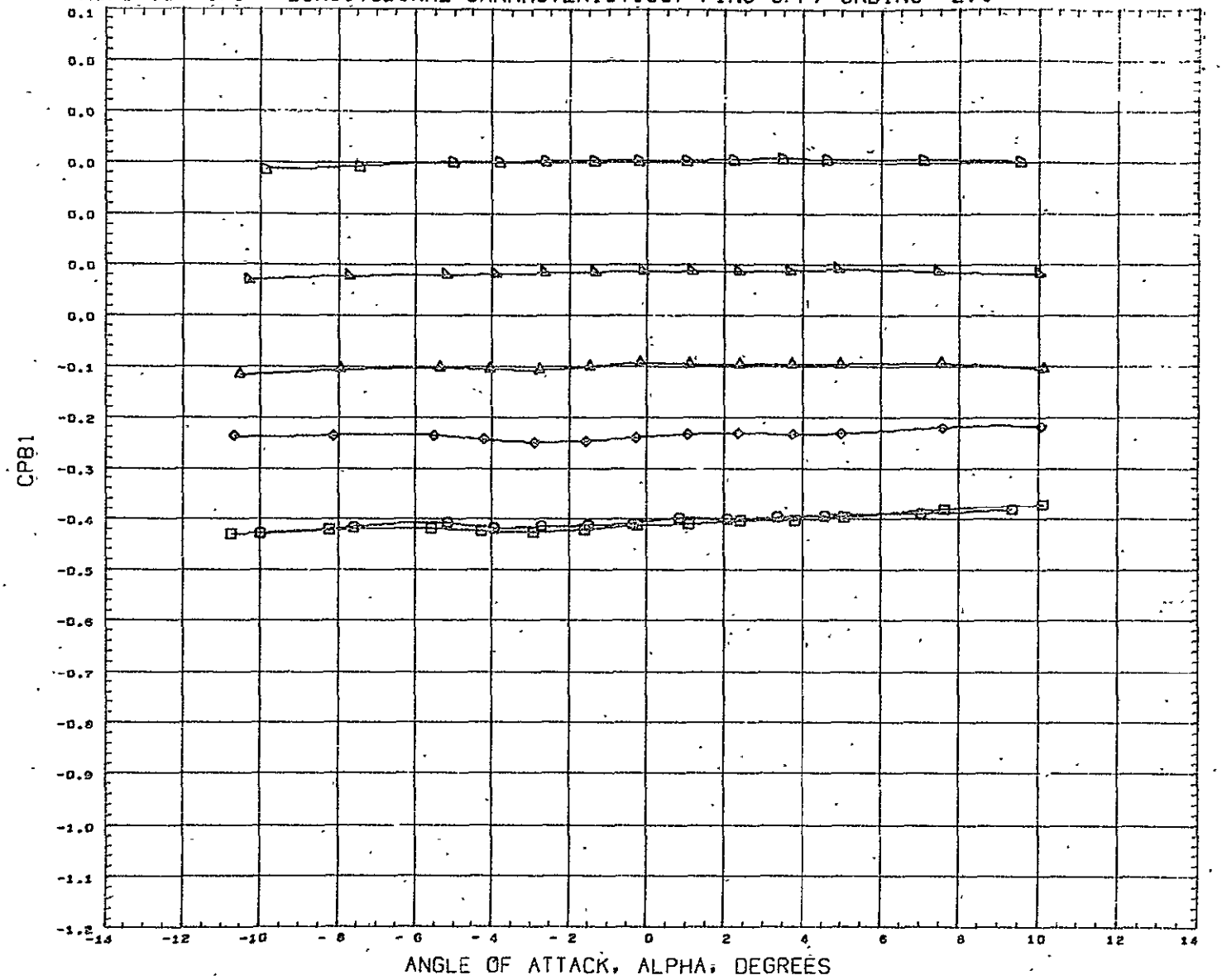
| REFERENCE INFORMATION | | |
|---|---|---|
| REFS. | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS OFF, ORBINC=0.0




| SYMBOL | MACH | PARAMETRIC VALUES | | | | REFERENCE INFORMATION | | |
|---|---|---|---|---|---|---|---|---|
| ○ | 0.699 | BETA | 0.050 | ORBINC | 0.000 | REFS | 1.3960 | SQ.IN. |
| □ | 0.993 | WNGINC | 4.000 | HTAIL | 0.000 | REFL | 1.3330 | INCHES |
| ◇ | 1.101 | PHIB | 0.000 | | | REFB | 1.3330 | INCHES |
| △ | 1.201 | | | | | XMRP | 5.2640 | INCHES |
| ▷ | 1.457 | | | | | YMRP | 0.0000 | INCHES |
| ▷ | 1.951 | DATA HIST. CODE | #A | | | ZMRP | 0.0000 | INCHES |
| | | | | | | SCALE | 0.3366 | PERCNT |

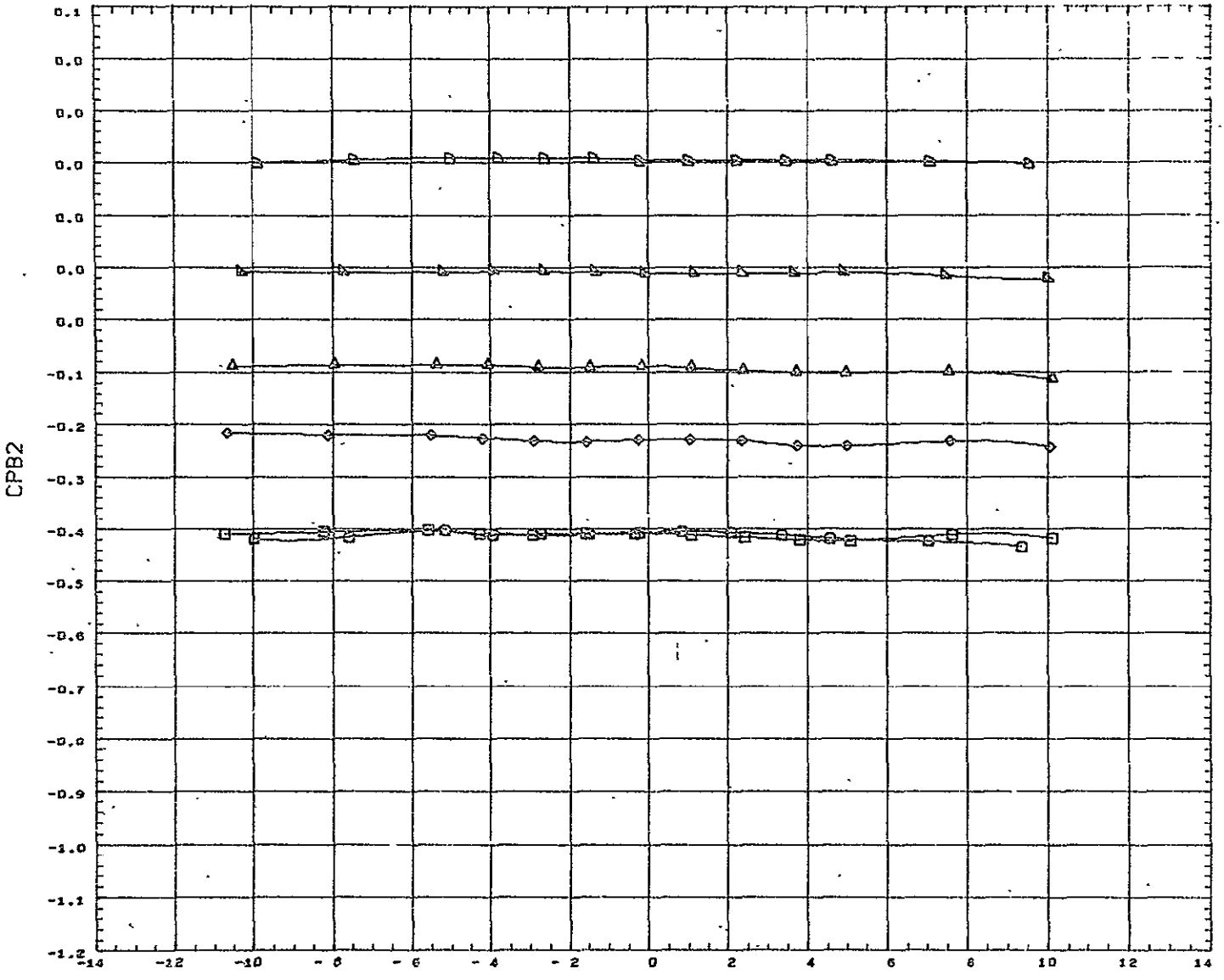
MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS OFF, ORBINC=-2.0




| SYMBOL | MACH | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| ○ | 0.905 | BETA | 0.000 | ORBINC | 2.000 |
| □ | 0.994 | WNGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 1.100 | PHIB | 0.000 | | |
| △ | 1.203 | | | | |
| ▷ | 1.454 | | | | |
| D | 1.960 | DATA HIST. CODE | *A | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS OFF, ORBINC=-2.0

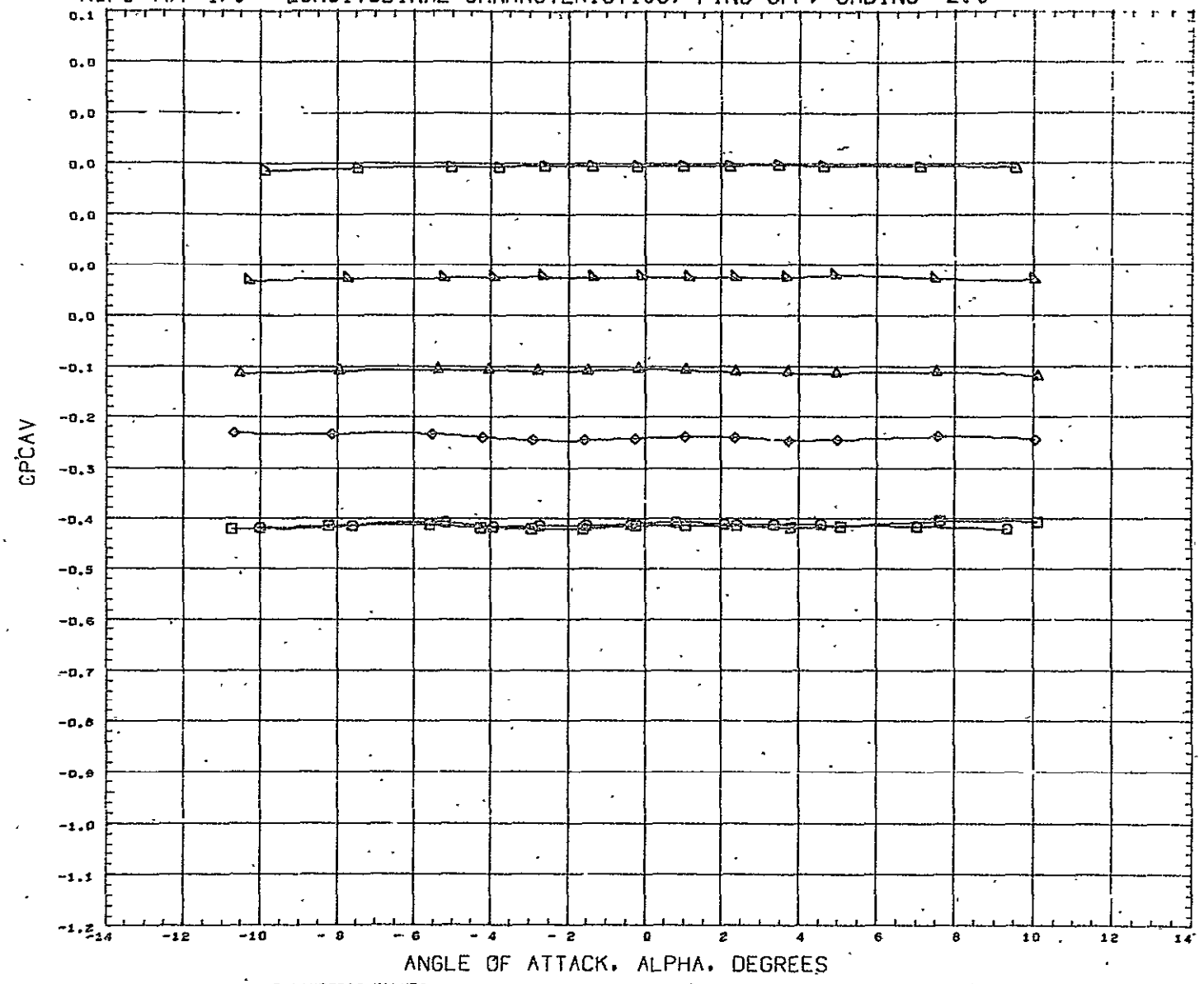



| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 0.905 | BETA | - 0.000 | ORBINC | - 2.000 | |
| □ | 0.994 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 1.100 | PHIB | 0.000 | | | |
| △ | 1.293 | | | | | |
| ▷ | 1.454 | | | | | |
| ▯ | 1.960 | DATA HIST. CODE | #A | | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRF | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

h

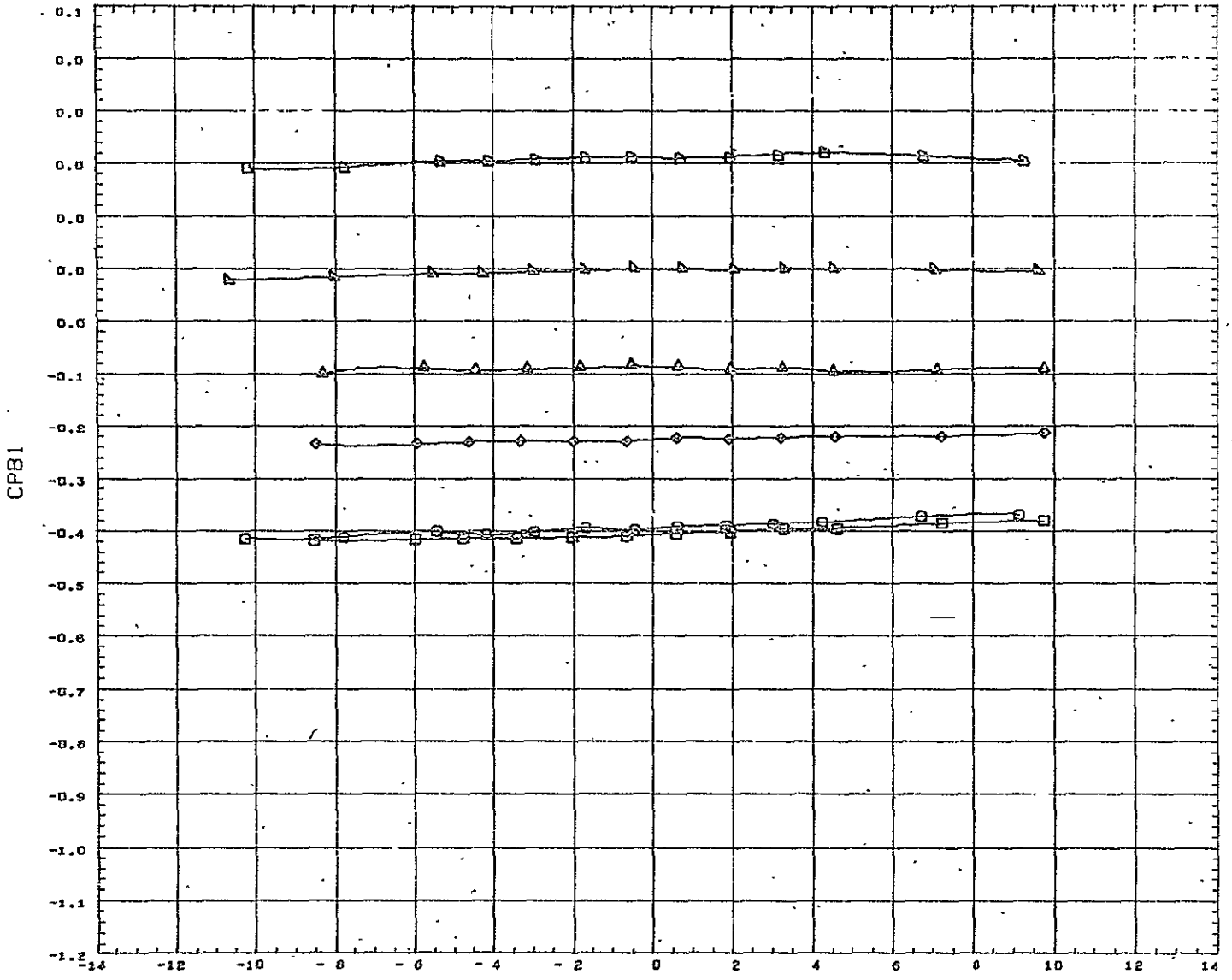
MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS OFF, ORBINC=-2.0




| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 0.905 | BETA | = 0.000 | ORBINC | = 2.000 | |
| □ | 0.994 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 1.100 | PHIB | 0.000 | | | |
| △ | 1.203 | | | | | |
| ▷ | 1.454 | | | | | |
| ▯ | 1.960 | DATA HIST. CODE | *A | | | |

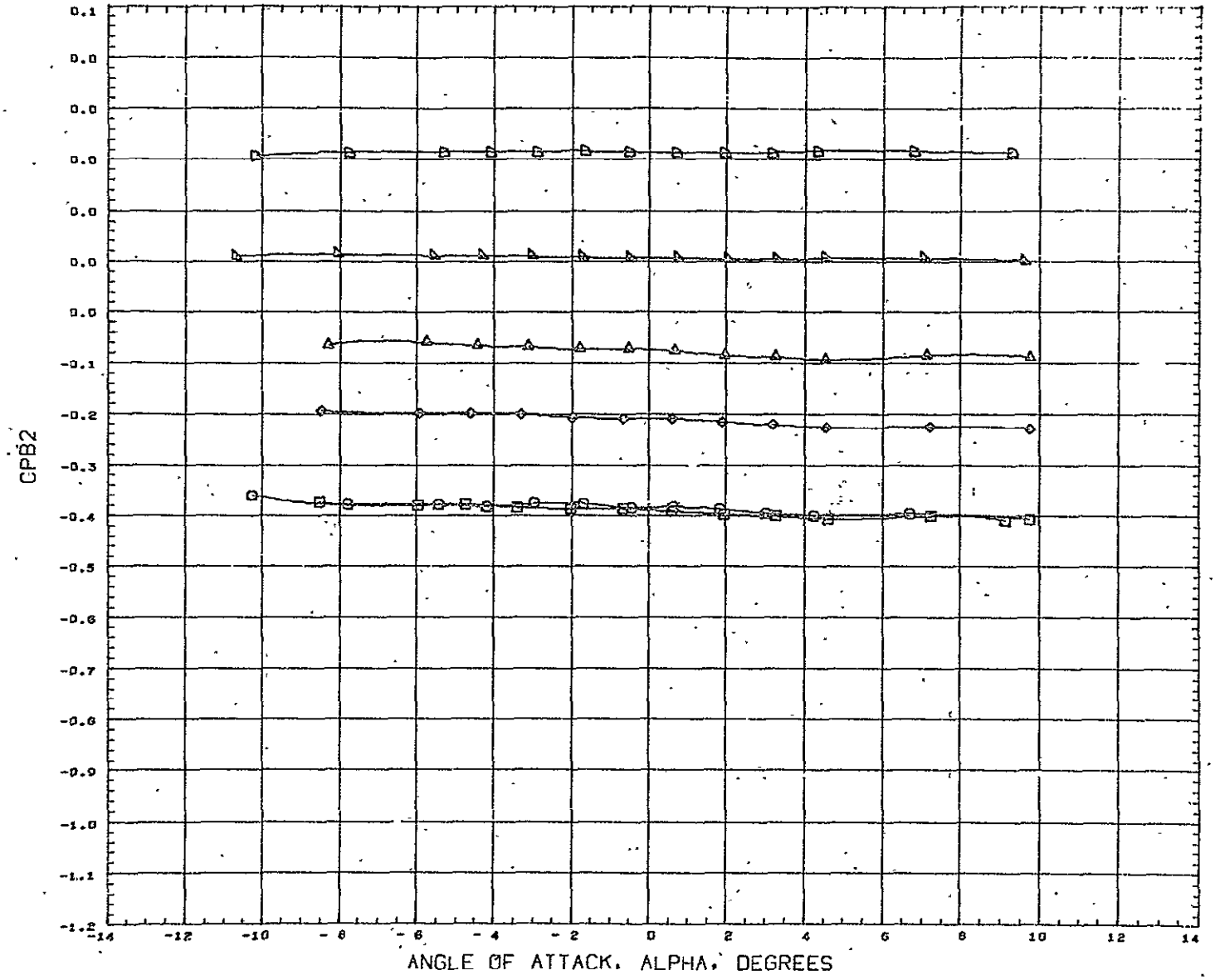
| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS OFF, ORBINC=-4.0




| SYMBOL | MACH | PARAMETRIC VALUES | | | | REFERENCE INFORMATION | | |
|---|---|---|---|---|---|---|---|---|
| ○ | 0.900 | BETA | - 0.040 | ORBINC | - 4.000 | REFS | 1.3960 | SQ.IN. |
| □ | 0.997 | WNGINC | 4.000 | HTAIL | 0.000 | REFL | 1.3330 | INCHES |
| ◇ | 1.100 | PHIB | 0.000 | | | REFB | 1.3330 | INCHES |
| △ | 1.199 | | | | | XMRP | 5.2640 | INCHES |
| ▷ | 1.460 | | | | | YMRP | 0.0000 | INCHES |
| ▷ | 1.952 | DATA HIST. CODE | *A | | | ZMRP | 0.0000 | INCHES |
| | | | | | | SCALE | 0.3366 | PERCNT |

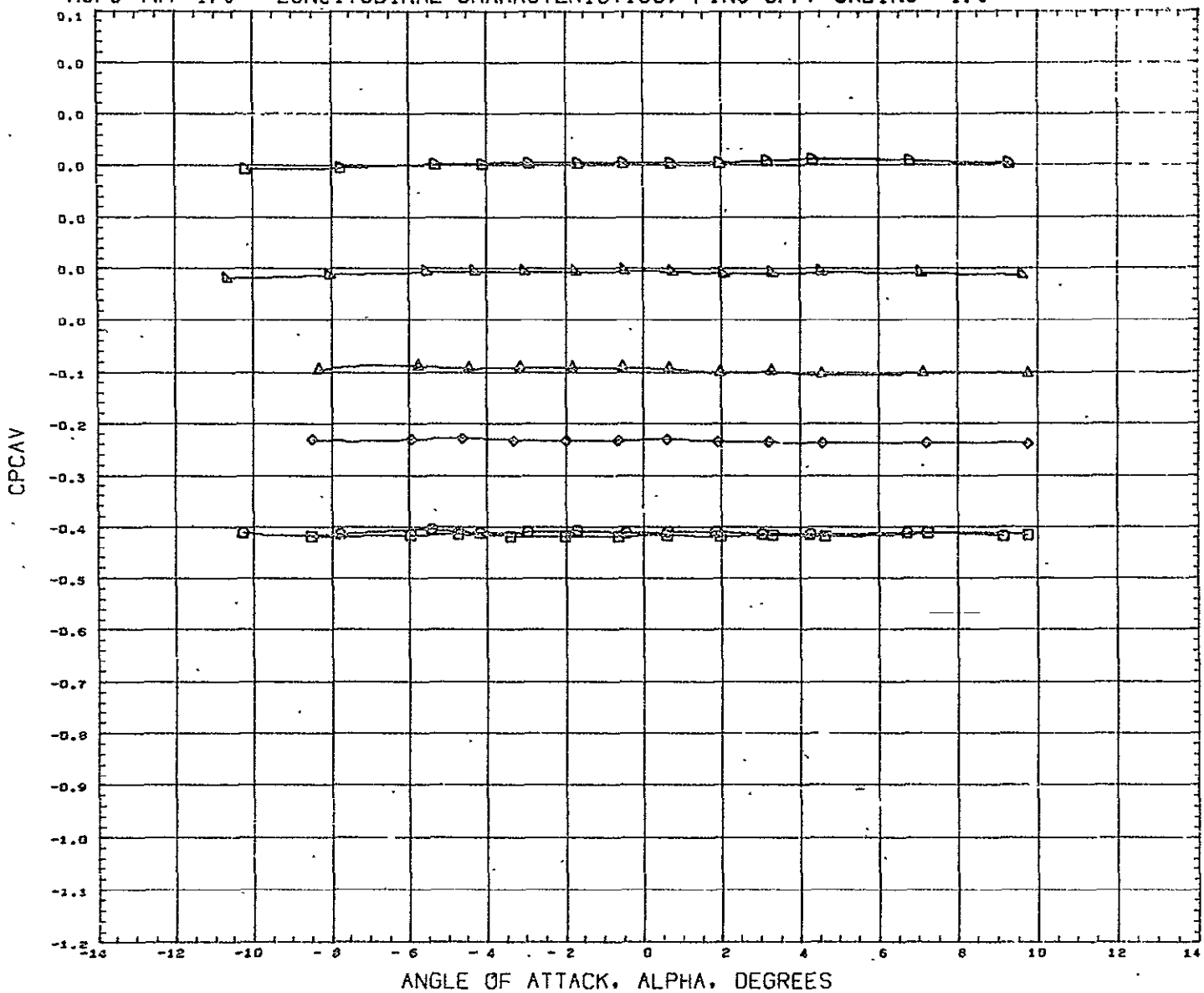
MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS OFF, ORBINC=-4.0




| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 0.900 | BETA | - 0.040 | ORBINC | - 4.000 | |
| □ | 0.997 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 1.100 | PHIB | 0.000 | | | |
| △ | 1.199 | | | | | |
| ▷ | 1.400 | | | | | |
| ▯ | 1.952 | DATA HIST. CODE | *A | | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

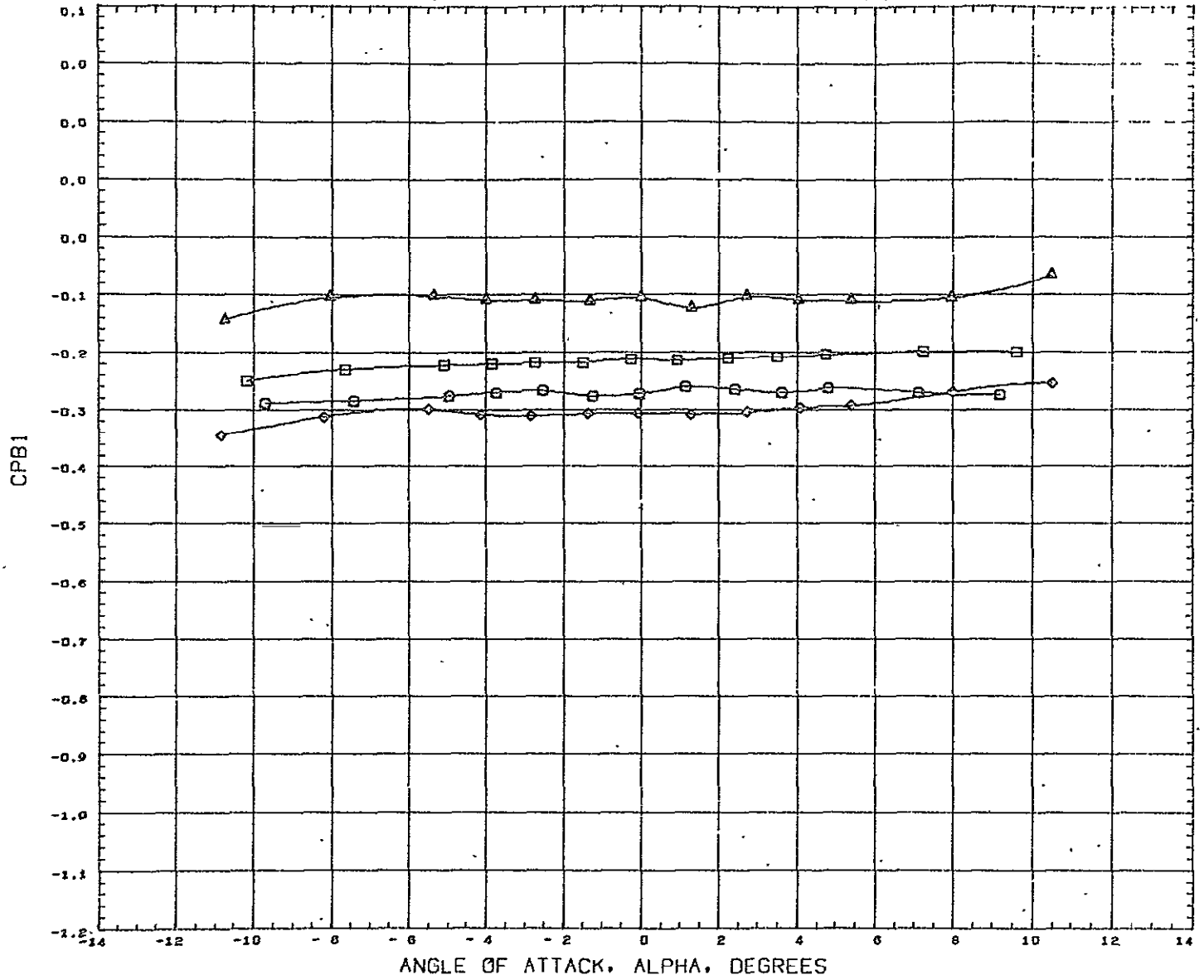
MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS OFF, ORBINC=-4.0




| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 0.900 | BETA | - 0.040 | ORBINC | - 4.000 | |
| □ | 0.997 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 1.100 | PHIB | 0.000 | | | |
| △ | 1.199 | | | | | |
| ▷ | 1.450 | | | | | |
| ▯ | 1.952 | DATA HIST. CODE | GA | | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=-1.05




| SYMBOL | MACH |
|---|---|
| ○ | 0.599 |
| □ | 0.899 |
| ◇ | 0.997 |
| △ | 1.095 |

PARAMETRIC VALUES

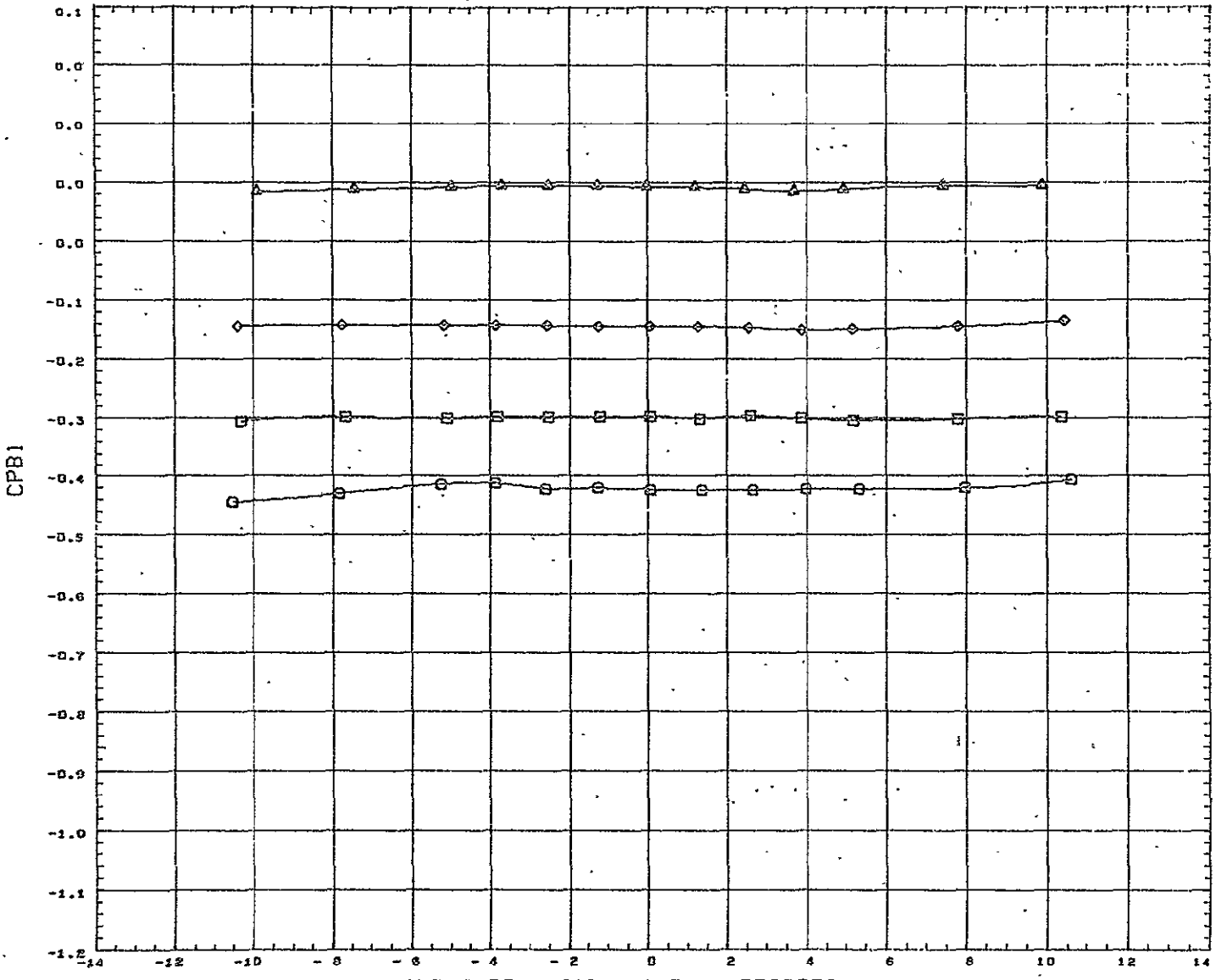
| | | | |
|---|---|---|---|
| BETA | - 0.050 | ORBINC | - 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

REFERENCE FILE

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=-1.05

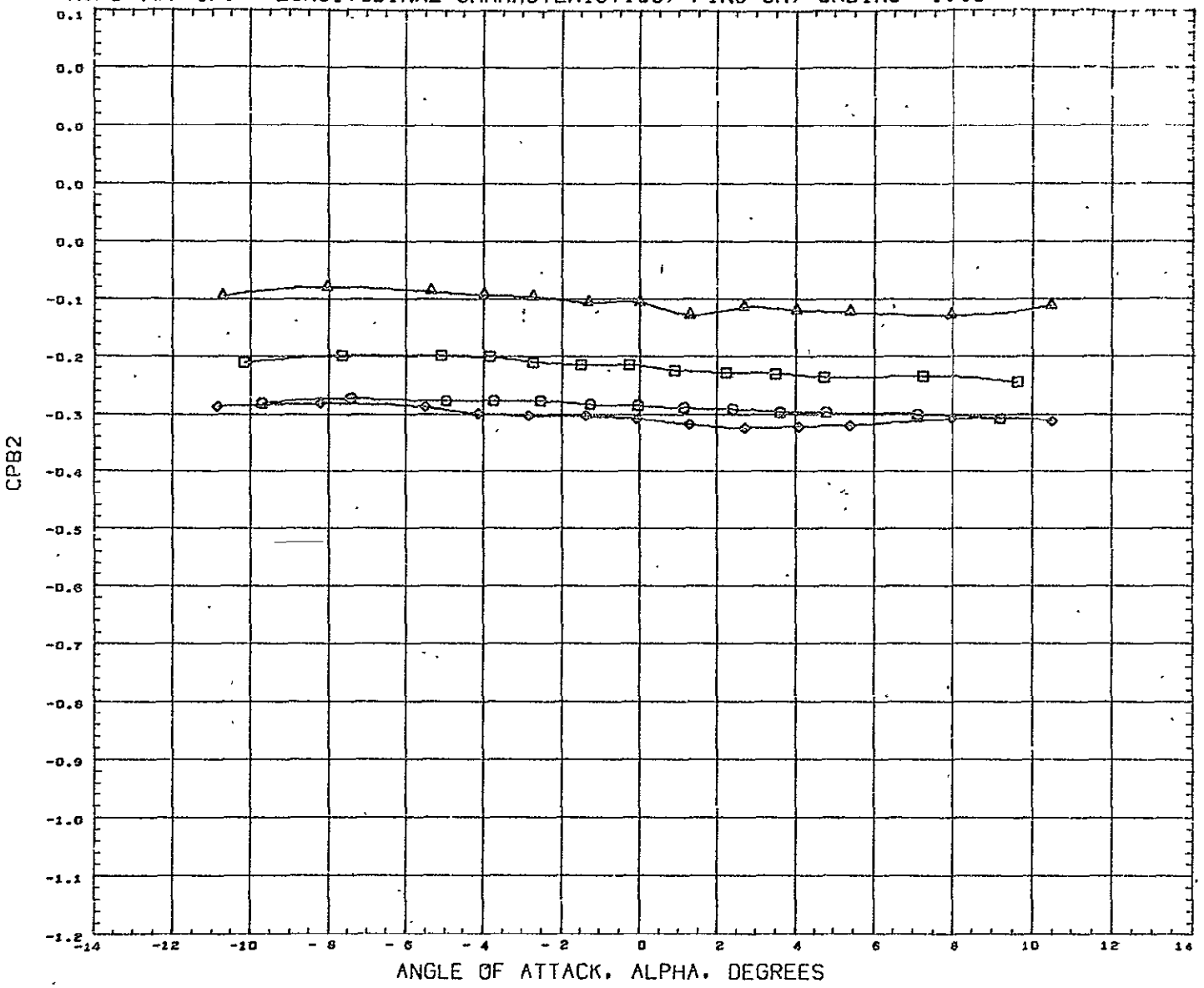



| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 1.195 | BETA | = 0.050 | ORBINC | = 1.050 | |
| □ | 1.303 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 1.456 | PHIB | 0.000 | | | |
| △ | 1.967 | | | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3969 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

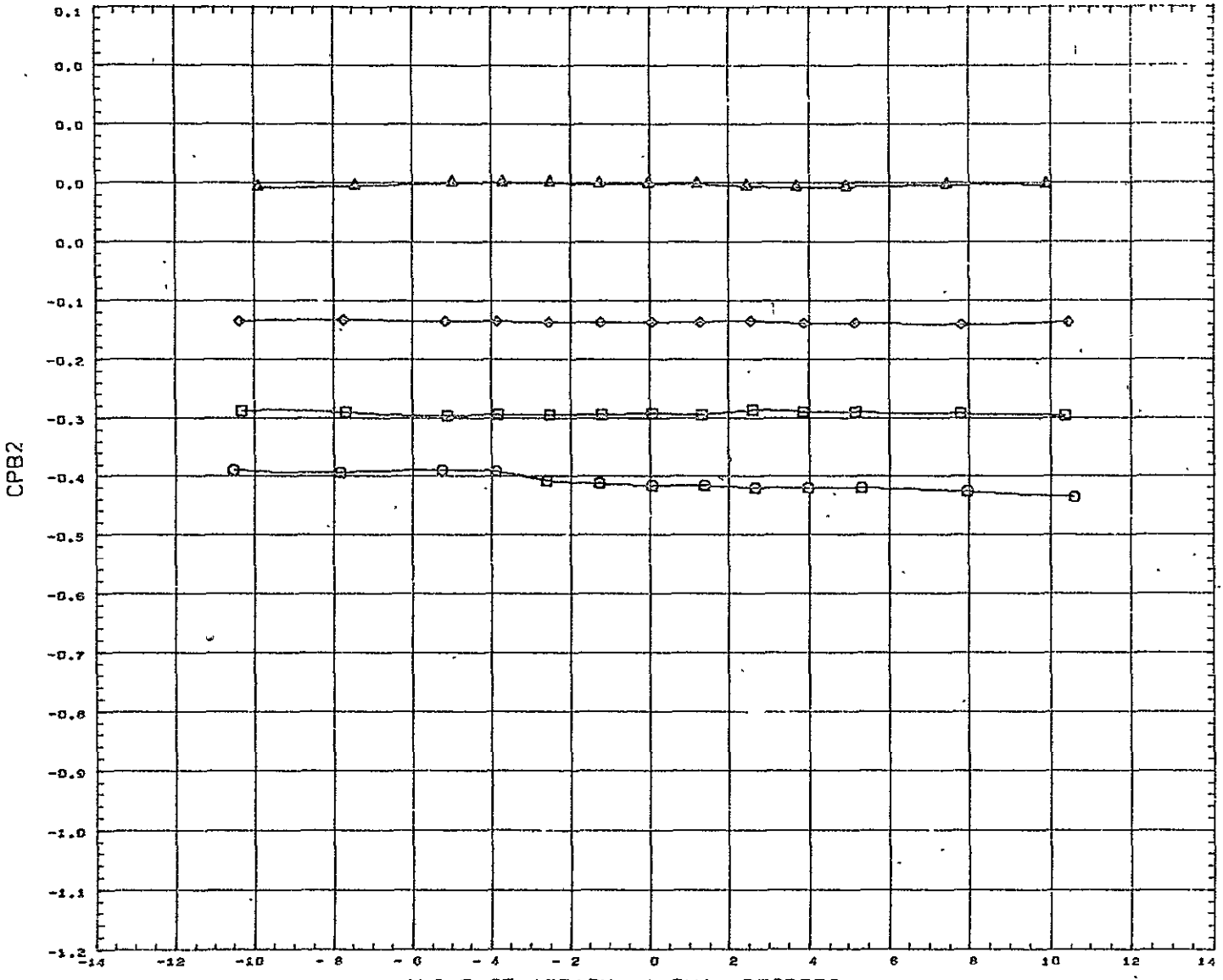
MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=-1.05




| SYMBOL | MACH | PARAMETRIC VALUES | | | | REFERENCE INFORMATION | | |
|---|---|---|---|---|---|---|---|---|
| ○ | 0.599 | BETA | - 0.050 | ORBINC | - 1.050 | REFS | 1.3960 | SQ.IN. |
| □ | 0.899 | WNGINC | 4.000 | HTAIL | 0.000 | REFL | 1.3330 | INCHES |
| ◇ | 0.997 | PHIB | 0.000 | | | REFB | 1.3330 | INCHES |
| △ | 1.095 | | | | | XMRP | 5.2640 | INCHES |
| | | | | | | YMRP | 0.0000 | INCHES |
| | | | | | | ZMRP | 0.0000 | INCHES |
| | | | | | | SCALE | 0.3366 | PERCNT |

REFERENCE FILE

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=-1.05

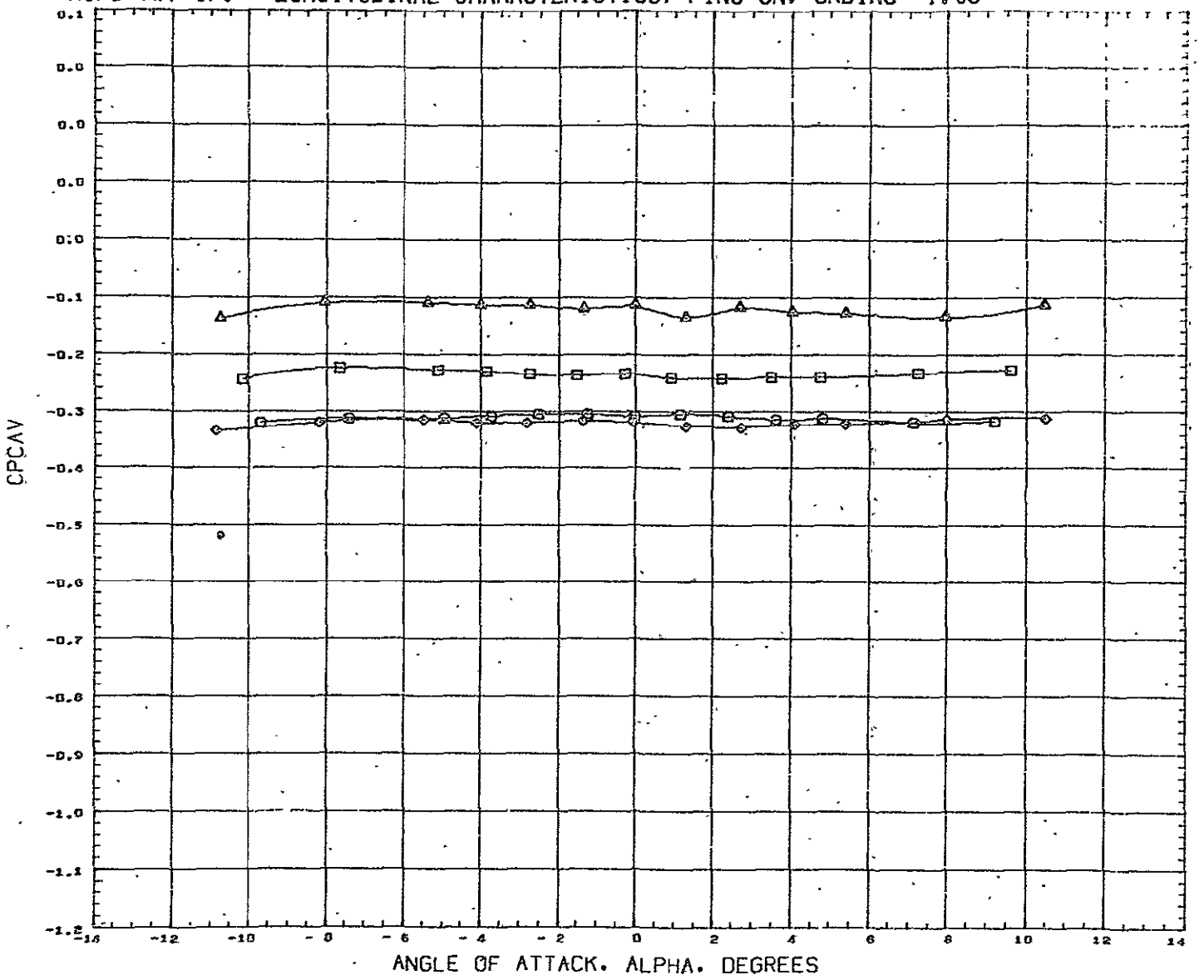



| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 1.195 | BETA | - 0.050 | ORBINC | - 1.050 | |
| □ | 1.303 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 1.456 | PHIB | 0.000 | | | |
| △ | 1.957 | | | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=-1.05

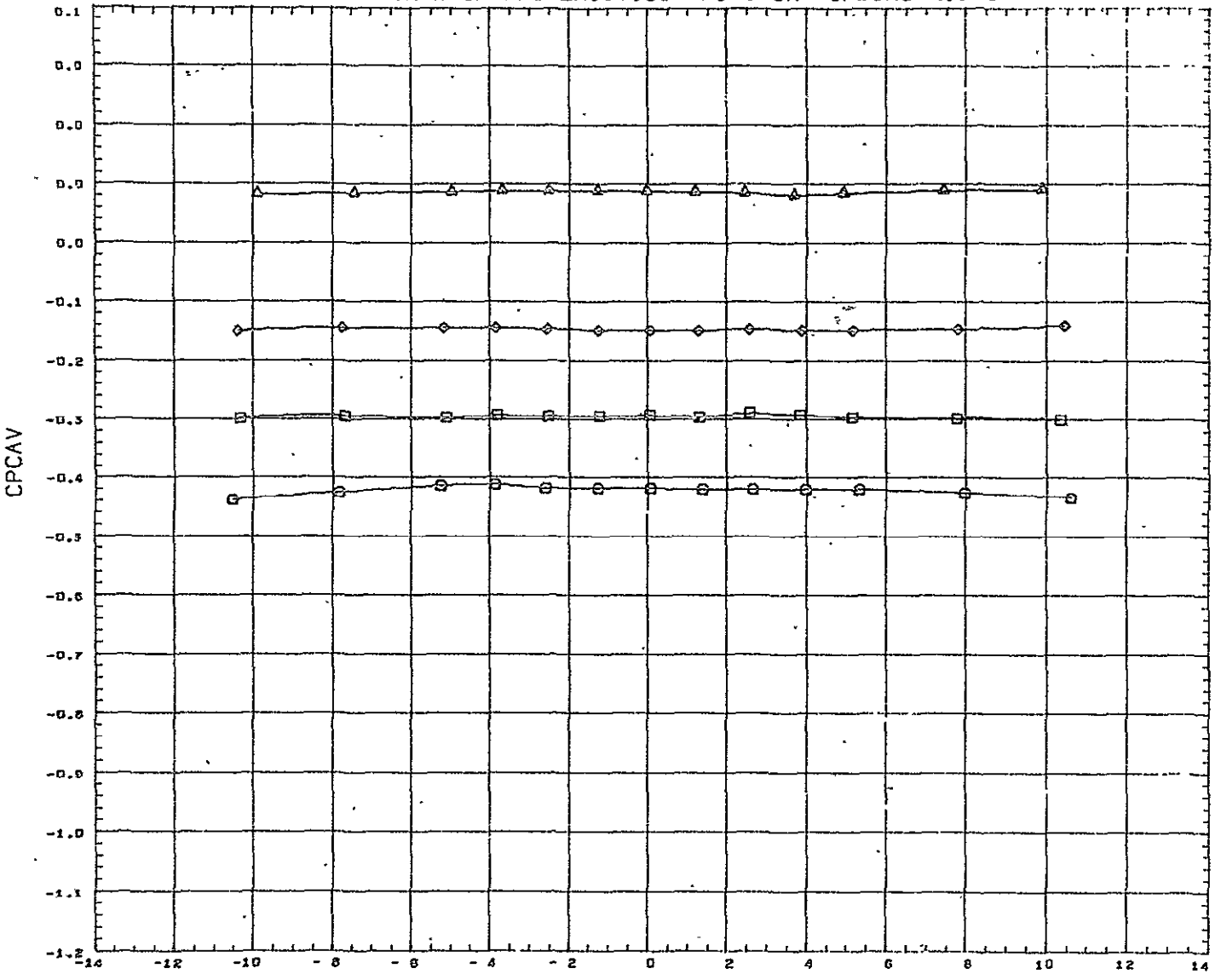



| SYMBOL | MACH | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| ○ | 0.599 | BETA | 0.050 | ORBINC | 1.050 |
| □ | 0.899 | WNGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 0.997 | PHID | 0.000 | | |
| △ | 1.095 | | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, ORBINC=-1.05




| SYMBOL | MACH |
|---|---|
| ○ | 1.195 |
| □ | 1.303 |
| ◇ | 1.456 |
| △ | 1.987 |

PARAMETRIC VALUES

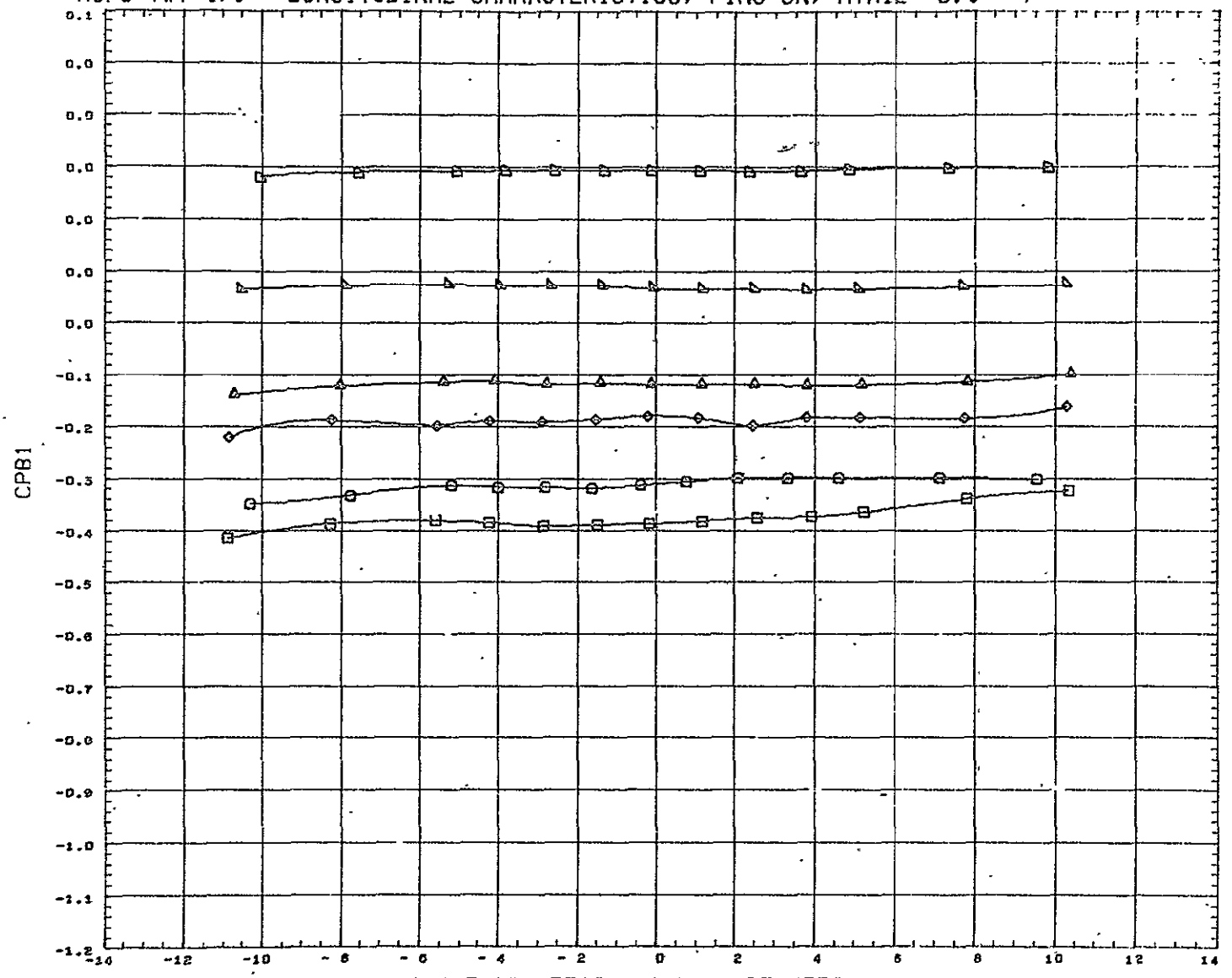
| | | | | | |
|---|---|---|---|---|---|
| BETA | - | 0.050 | ORBINC | - | 1.050 |
| WNGINC | | 4.000 | HTAIL | | 0.000 |
| PHIB | | 0.000 | | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

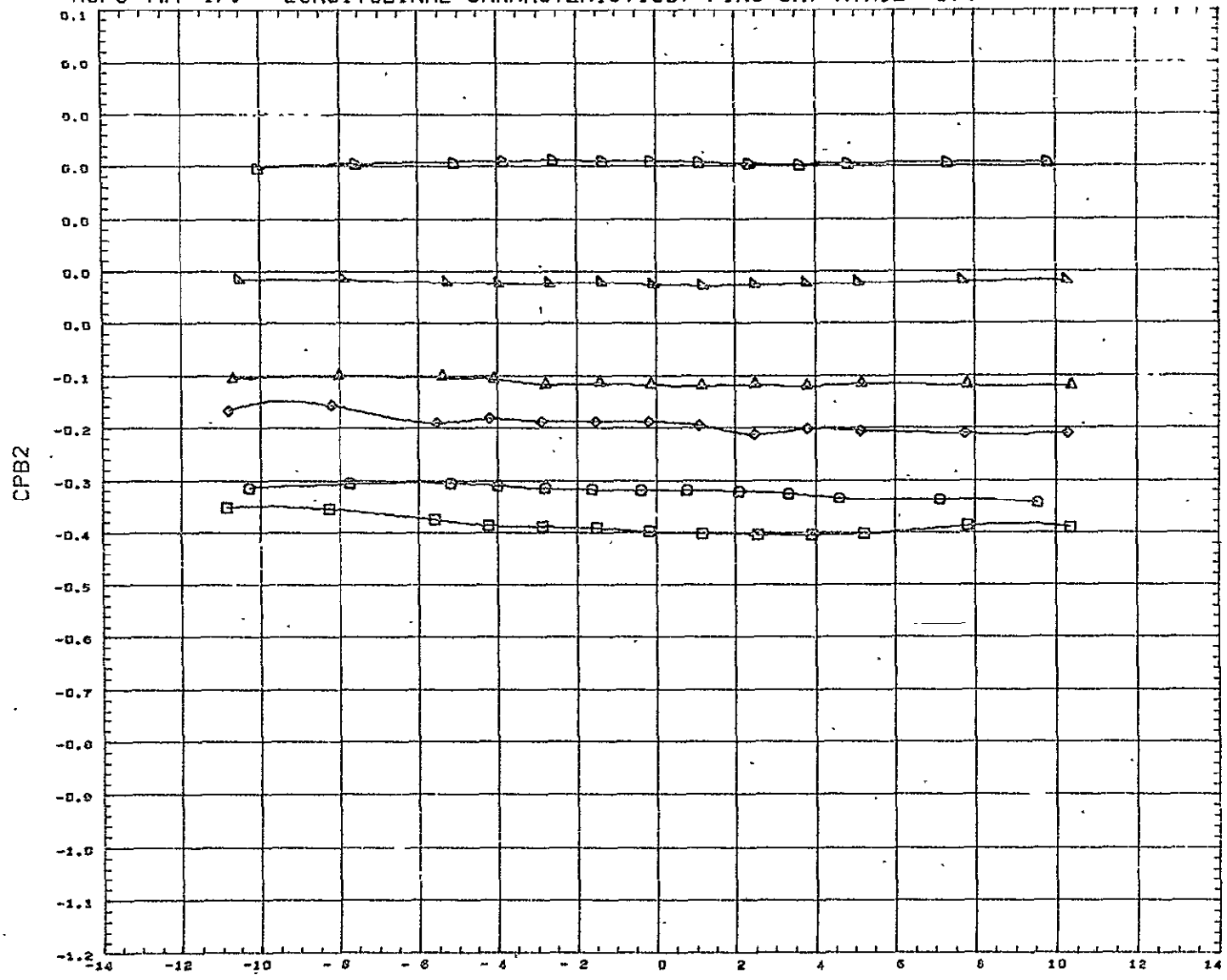
MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, HTAIL=-5.0




| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 0.693 | BETA | - 0.020 | ORBINC | - 1.050 | |
| □ | 0.995 | WNGINC | 4.000 | HTAIL | - 5.000 | |
| ◇ | 1.093 | PHIB | 0.000 | | | |
| △ | 1.199 | | | | | |
| ▽ | 1.454 | | | | | |
| ▷ | 1.961 | DATA HIST. CODE | *A | | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

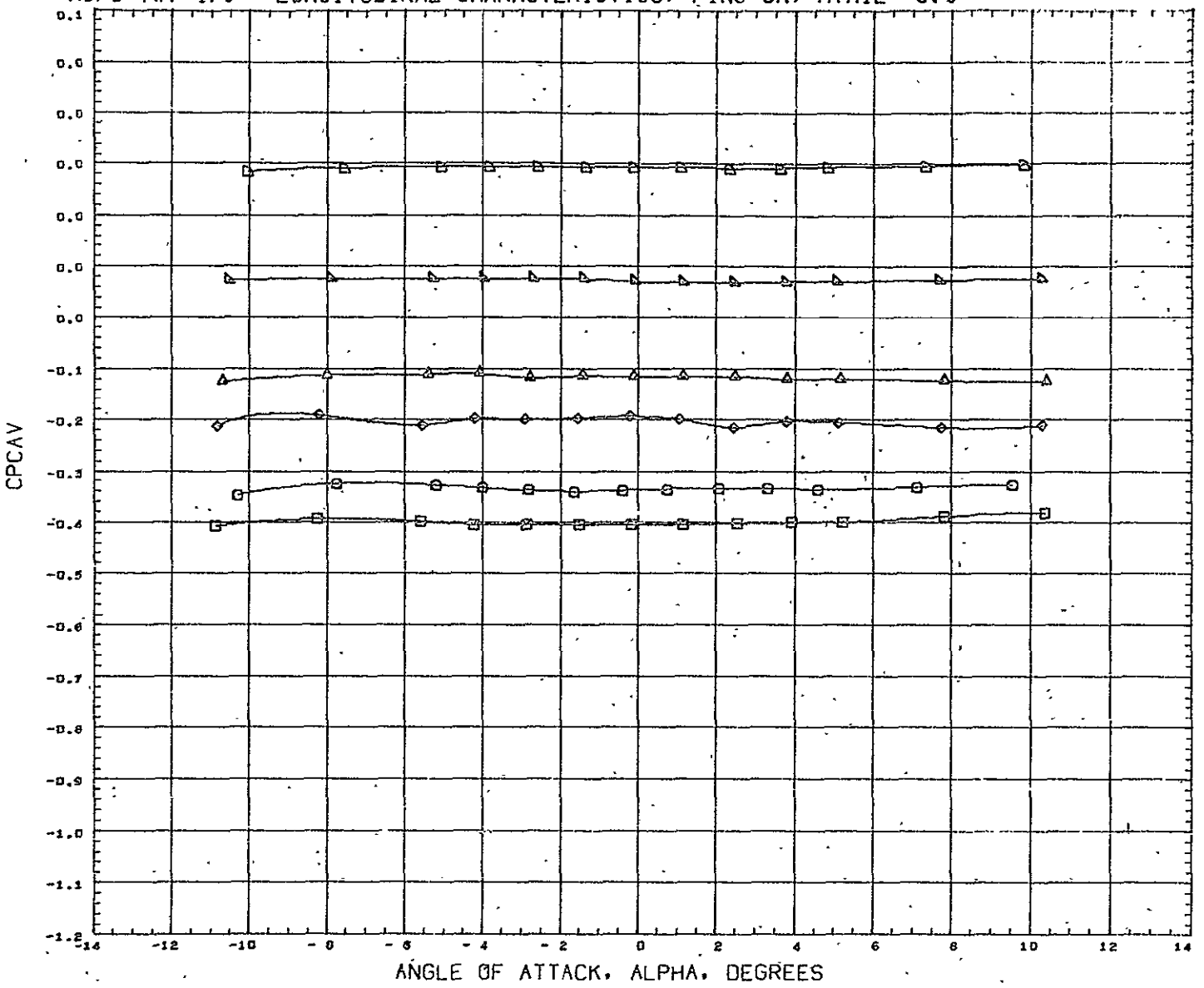
MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, HTAIL=-5.0




| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| □ | 0.693 | BETA | - 0.020 | ORBINC | - 1.050 | |
| □ | 0.995 | WNGINC | 4.000 | HTAIL | - 5.000 | |
| ◇ | 1.093 | PHIB | 0.000 | | | |
| △ | 1.199 | | | | | |
| ▷ | 1.454 | | | | | |
| ▷ | 1.901 | DATA HIST. CODE | *A | | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

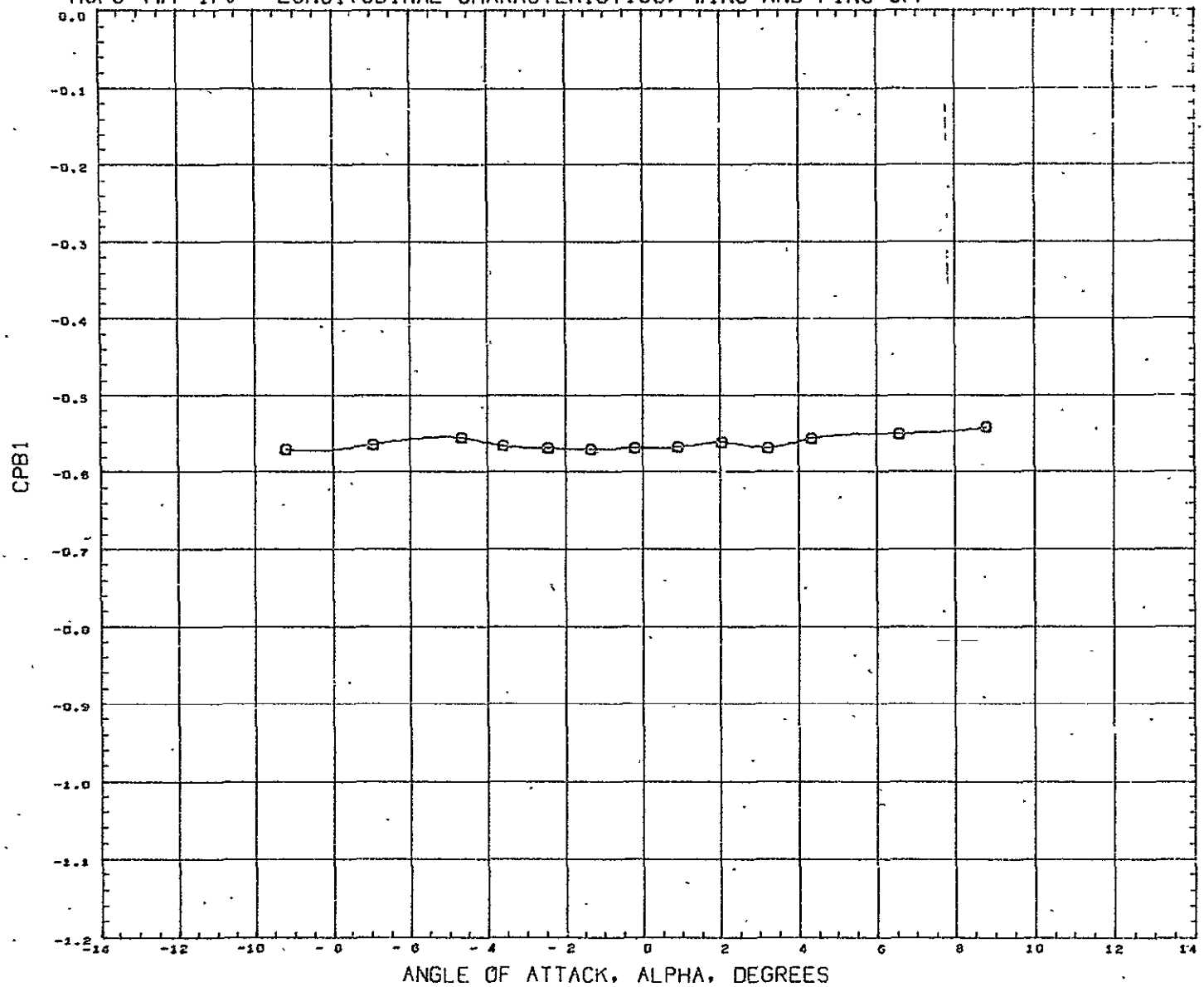
MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, FINS ON, HTAIL=-5.0




| SYMBOL | MACH | PARAMETRIC VALUES | | | | | |
|---|---|---|---|---|---|---|---|
| ○ | 0.893 | BETA | - 0.020 | ORBINC | - 1.050 | | |
| □ | 0.995 | WNGINC | 4.000 | HTAIL | - 5.000 | | |
| ◇ | 1.093 | PHIB | 0.000 | | | | |
| △ | 1.199 | | | | | | |
| ▷ | 1.454 | | | | | | |
| D | 1.961 | DATA HIST. CODE - *A | | | | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, WING AND FINS OFF



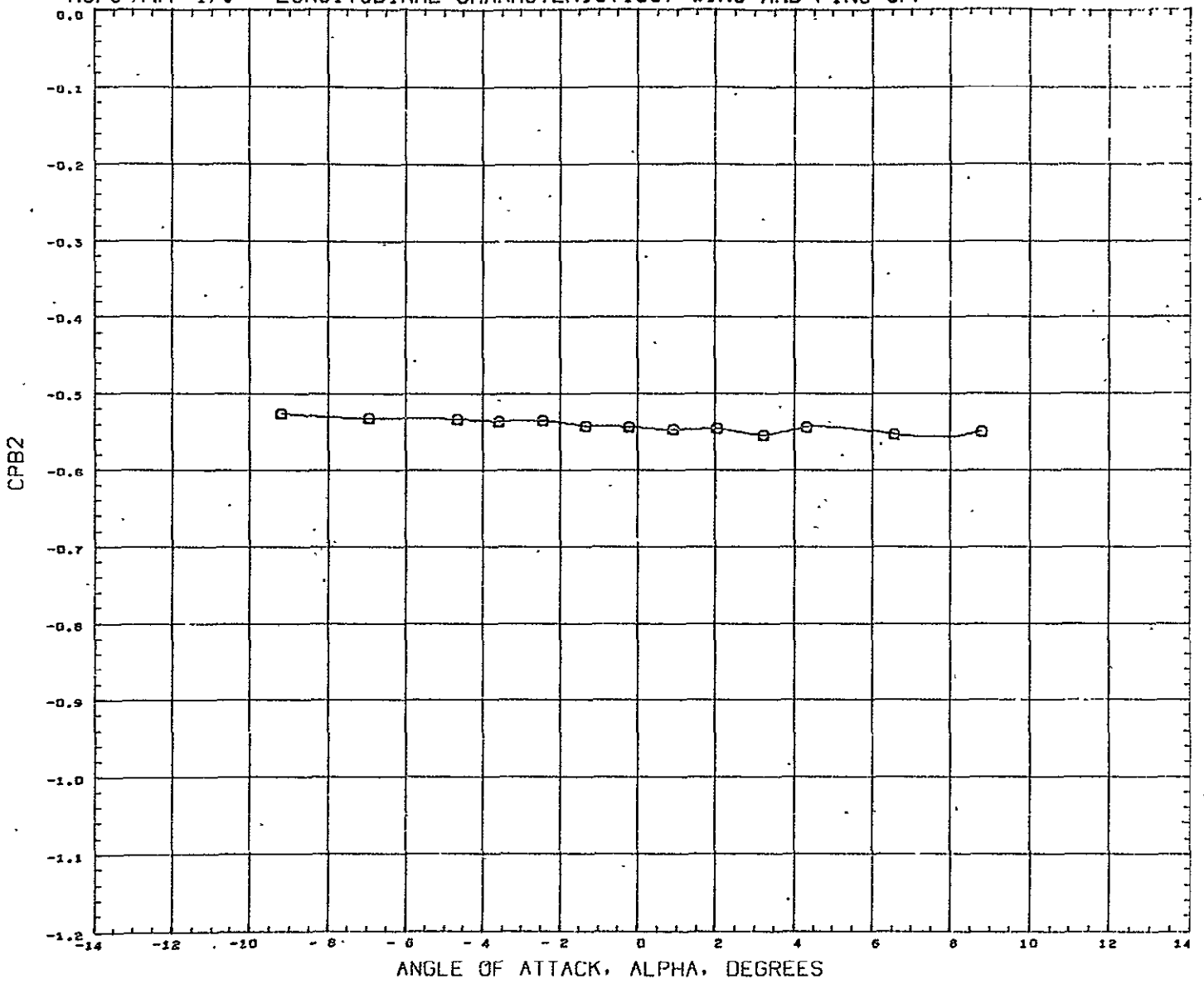

| SYMBOL | MACH | PARAMETRIC VALUES | | | | | |
|---|---|---|---|---|---|---|---|
| O | 0.995 | BETA | - 0.100 | ORBINC | - 1.050 | | |
| | | HTAIL | 0.000 | PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

REFERENCE FILE

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, WING AND FINS OFF



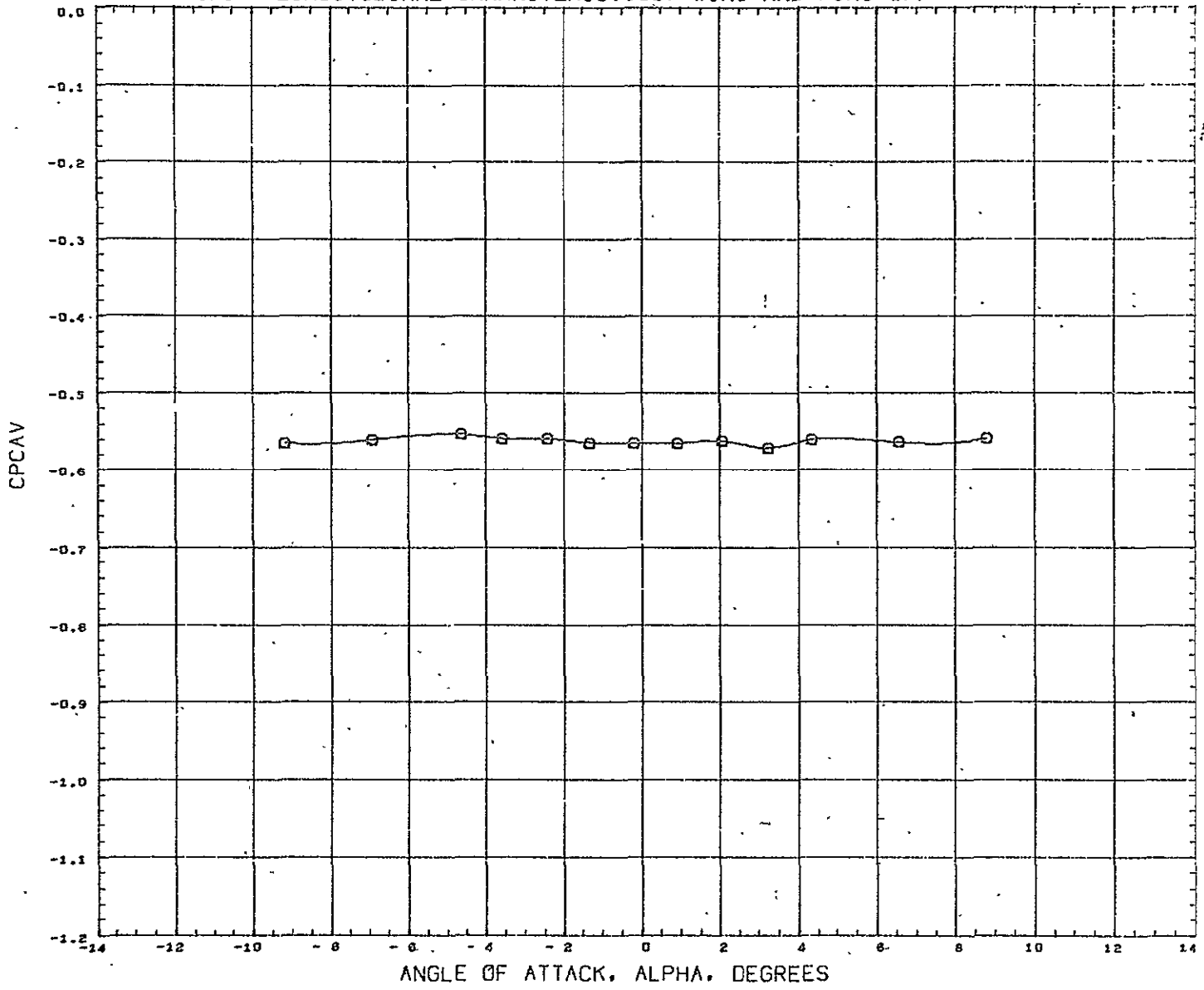

| SYMBOL | MACH | PARAMETRIC VALUES | | | | | |
|---|---|---|---|---|---|---|---|
| O | 0.995 | BETA | - | 0.100 | ORBINC | - | 1.050 |
| | | HTAIL | | 0.000 | PHIB | | 0.000 |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

REFERENCE FILE

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, WING AND FINS OFF



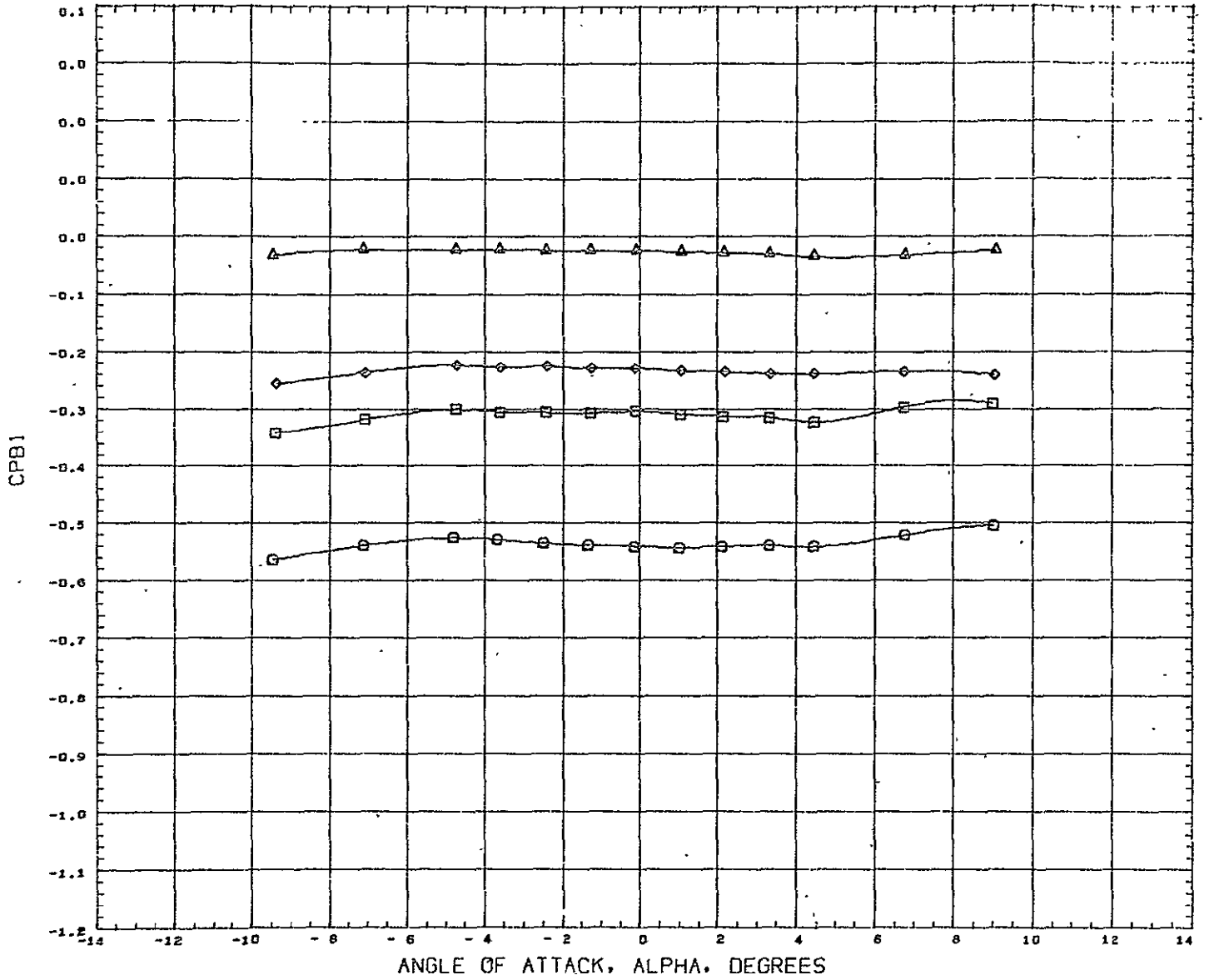

| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 0.995 | BETA | - 0.100 | ORBINC | - 1.050 |
| | | HTAIL | 0.000 | PHIB | 0.000 |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, WING OFF




| SYMBOL | MACH |
|---|---|
| ○ | 0.999 |
| □ | 1.192 |
| ◇ | 1.195 |
| △ | 1.459 |

PARAMETRIC VALUES

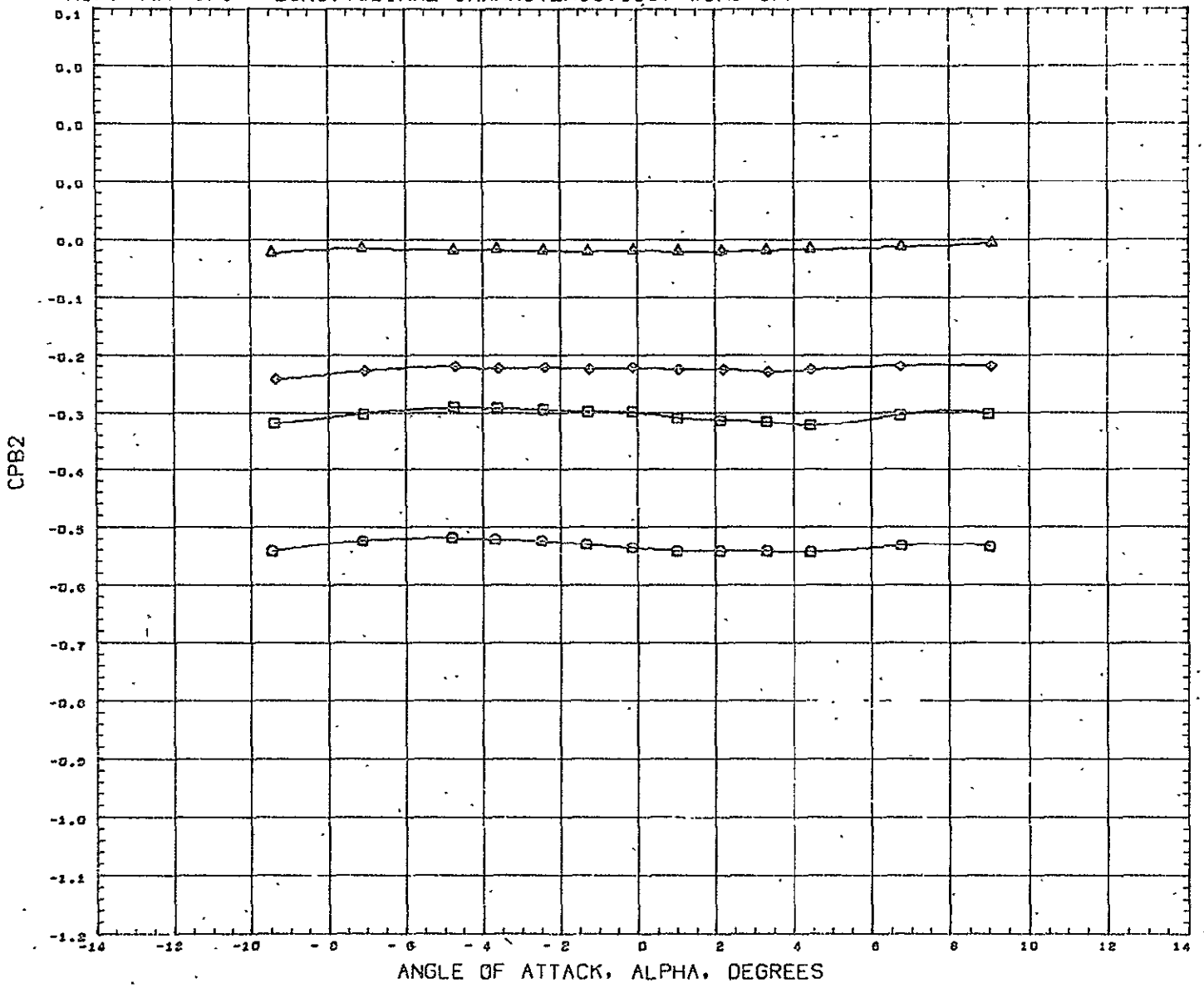
| | | | | | |
|---|---|---|---|---|---|
| BETA | - 9.100 | ORBINC | - 1.050 | | |
| HTAIL | 0.000 | PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

REFERENCE FILE

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, WING OFF

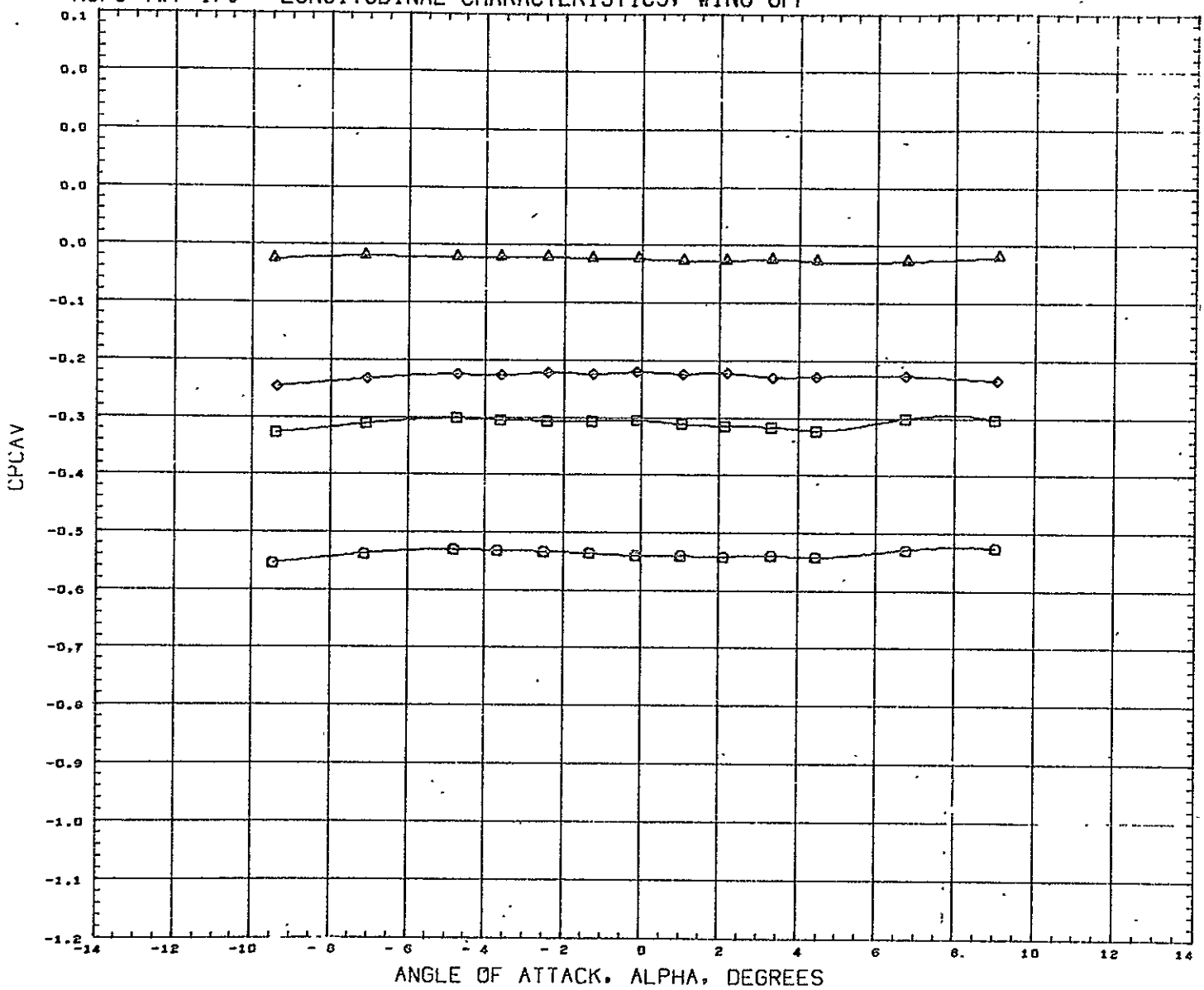



| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 0.999 | BETA | - 0.100 | ORBINC | - 1.050 | |
| □ | 1.102 | HTAIL | 0.000 | PHIB | 0.000 | |
| ◇ | 1.195 | | | | | |
| △ | 1.459 | | | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.5130 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, WING OFF

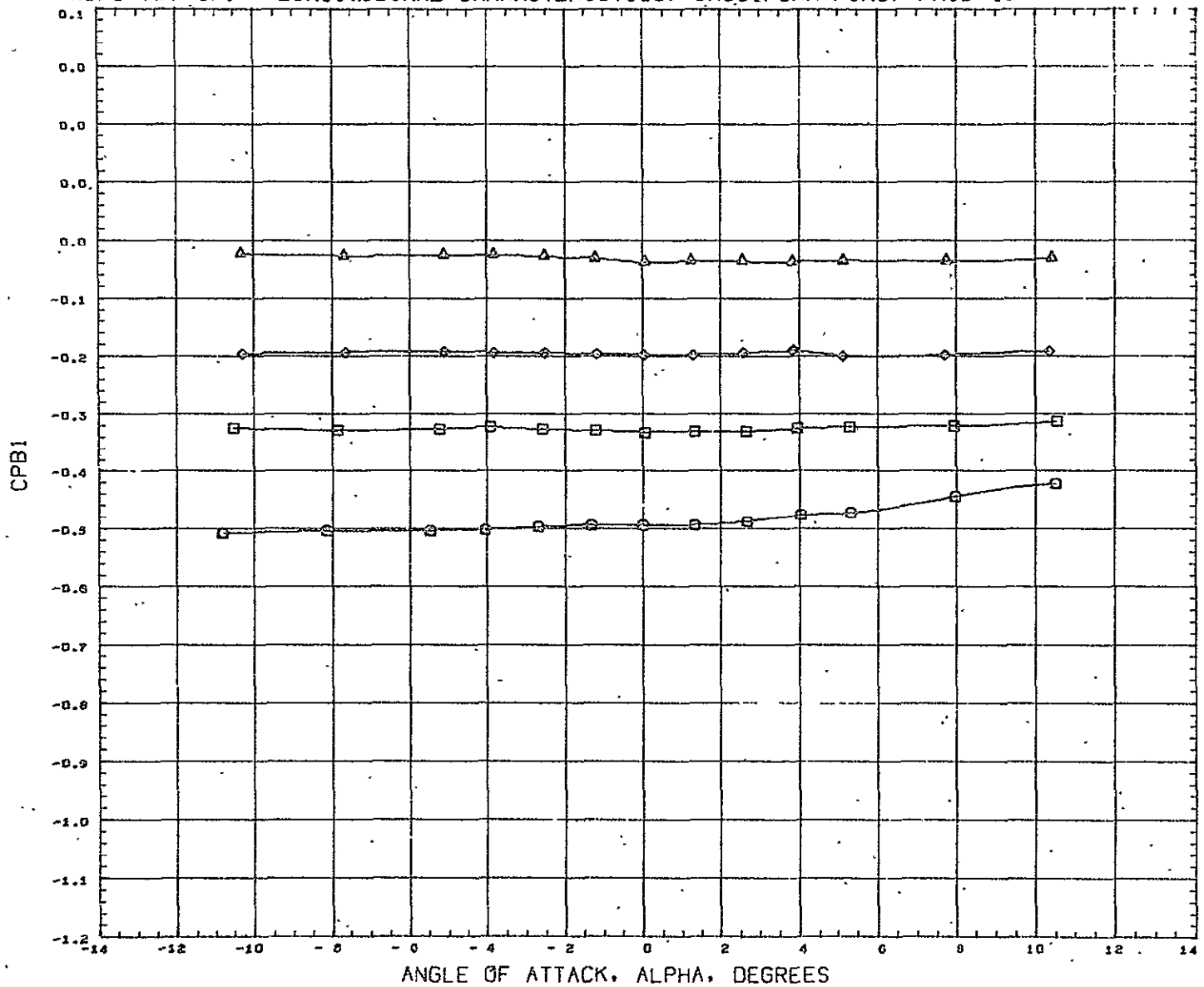



| SYBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 0.999 | BETA | - 0.100 | ORBINC | - 1.050 | |
| □ | 1.102 | HTAIL | 0.000 | PHIB | 0.000 | |
| ◇ | 1.195 | | | | | |
| △ | 1.459 | | | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, CRUCIFORM FINS, PHIB=45

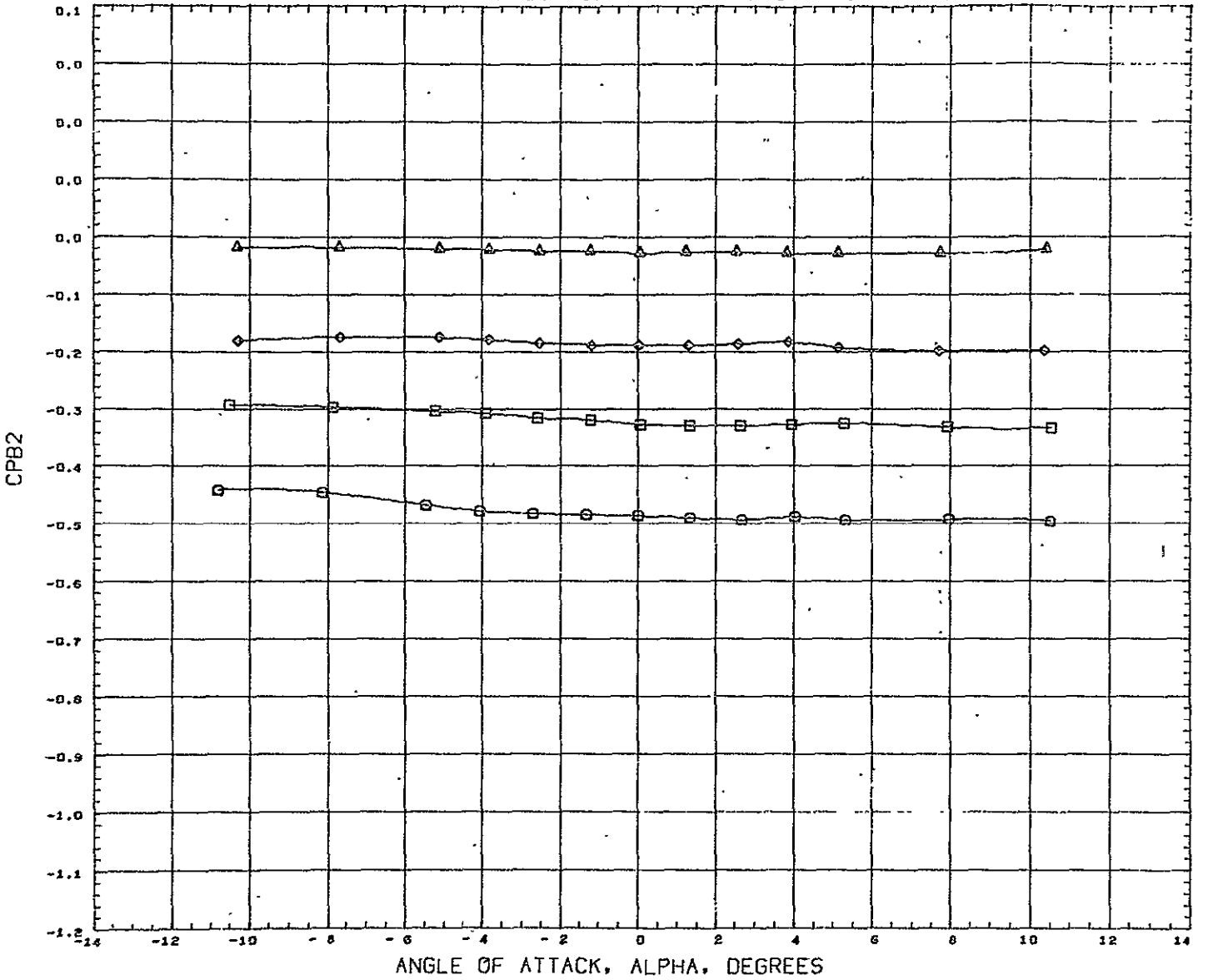



| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 1.006 | BETA | - 0.070 | ORBINC | - 1.050 | |
| □ | 1.195 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 1.303 | PHIB | 45.000 | | | |
| △ | 1.463 | | | | | |

PEFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, CRUCIFORM FINS, PHIB=45




| SYMBOL | MACH |
|---|---|
| ○ | 1.006 |
| □ | 1.195 |
| ◇ | 1.303 |
| △ | 1.463 |

PARAMETRIC VALUES

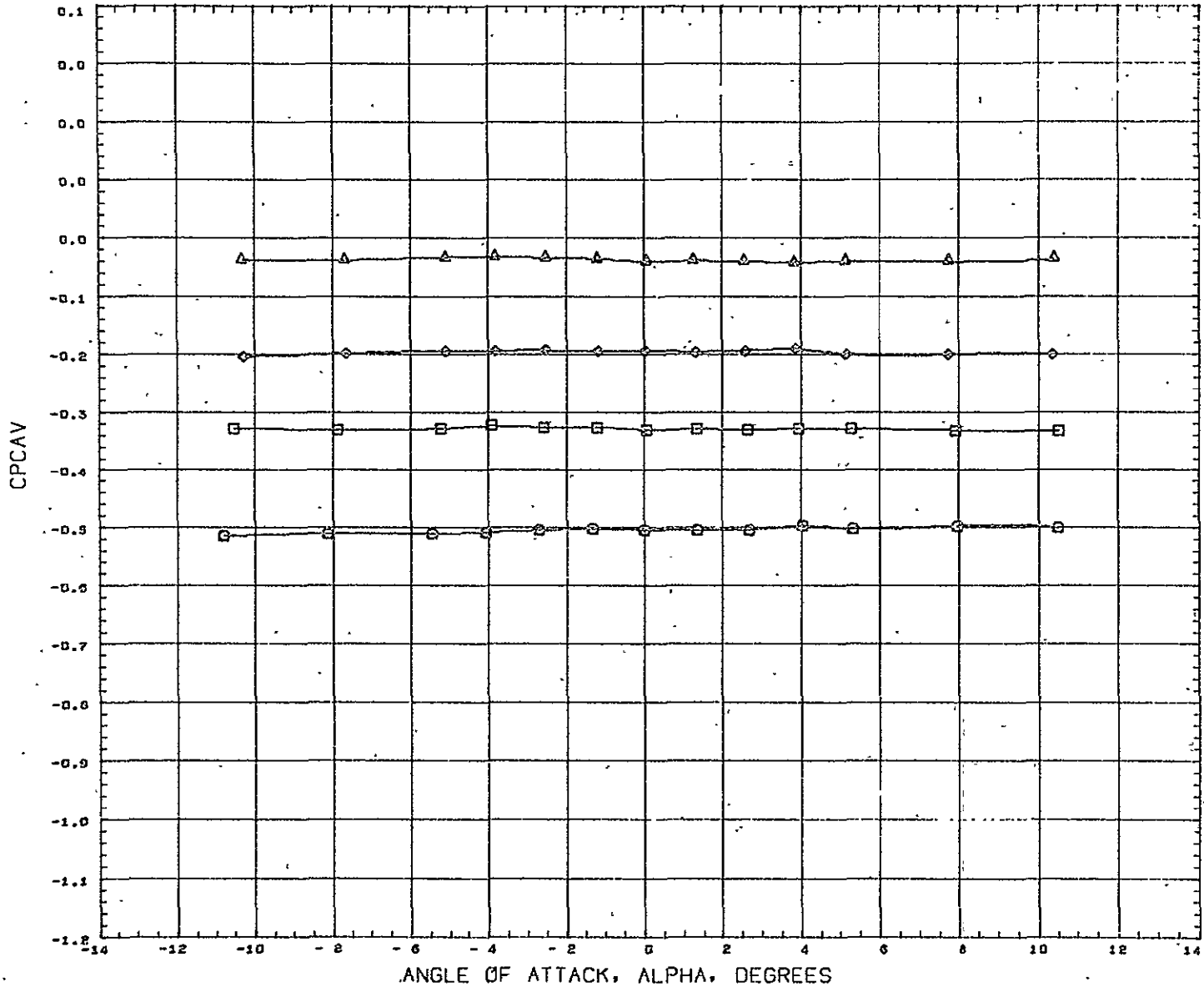
| | | | |
|---|---|---|---|
| BETA | - 0.070 | ORBINC | - 1.050 |
| WHGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 45.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

REFERENCE FILE

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, CRUCIFORM FINS, PHIB=45

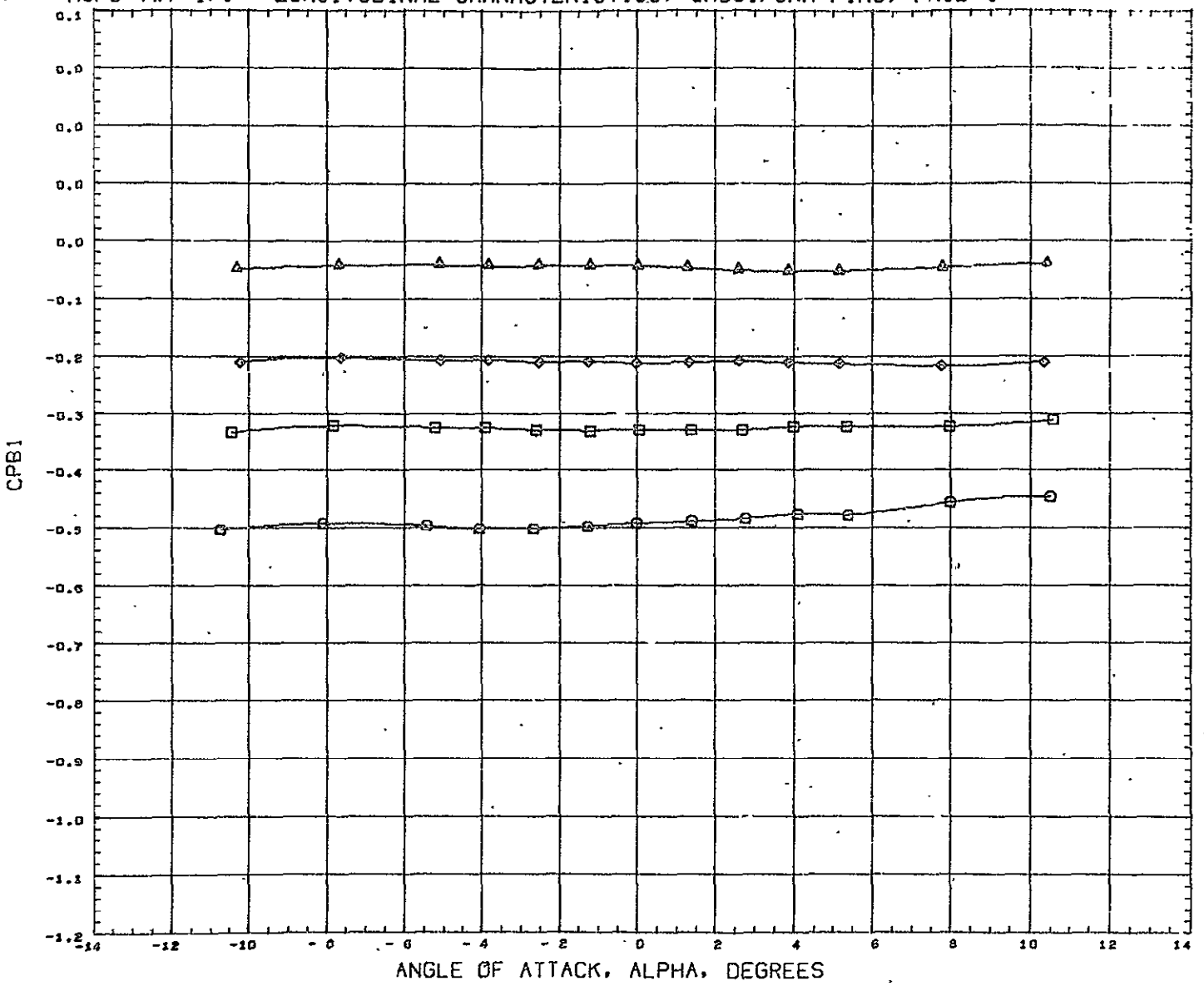



| SYMBOL | MACH | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| ○ | 1.006 | BETA | - 0.070 | ORBINC | - 1.030 |
| □ | 1.195 | WNGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 1.303 | PHIB | 45.000 | | |
| △ | 1.403 | | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, CRUCIFORM FINS, PHIB=0




| SYMBOL | MACH |
|---|---|
| ○ | 0.997 |
| □ | 1.198 |
| ◇ | 1.303 |
| △ | 1.459 |

PARAMETRIC VALUES

| | | | | | |
|---|---|---|---|---|---|
| BETA | - | 0.060 | ORBINC | - | 1.050 |
| WNGINC | | 4.000 | HTAIL | | 0.000 |
| PHIB | | 0.000 | | | |

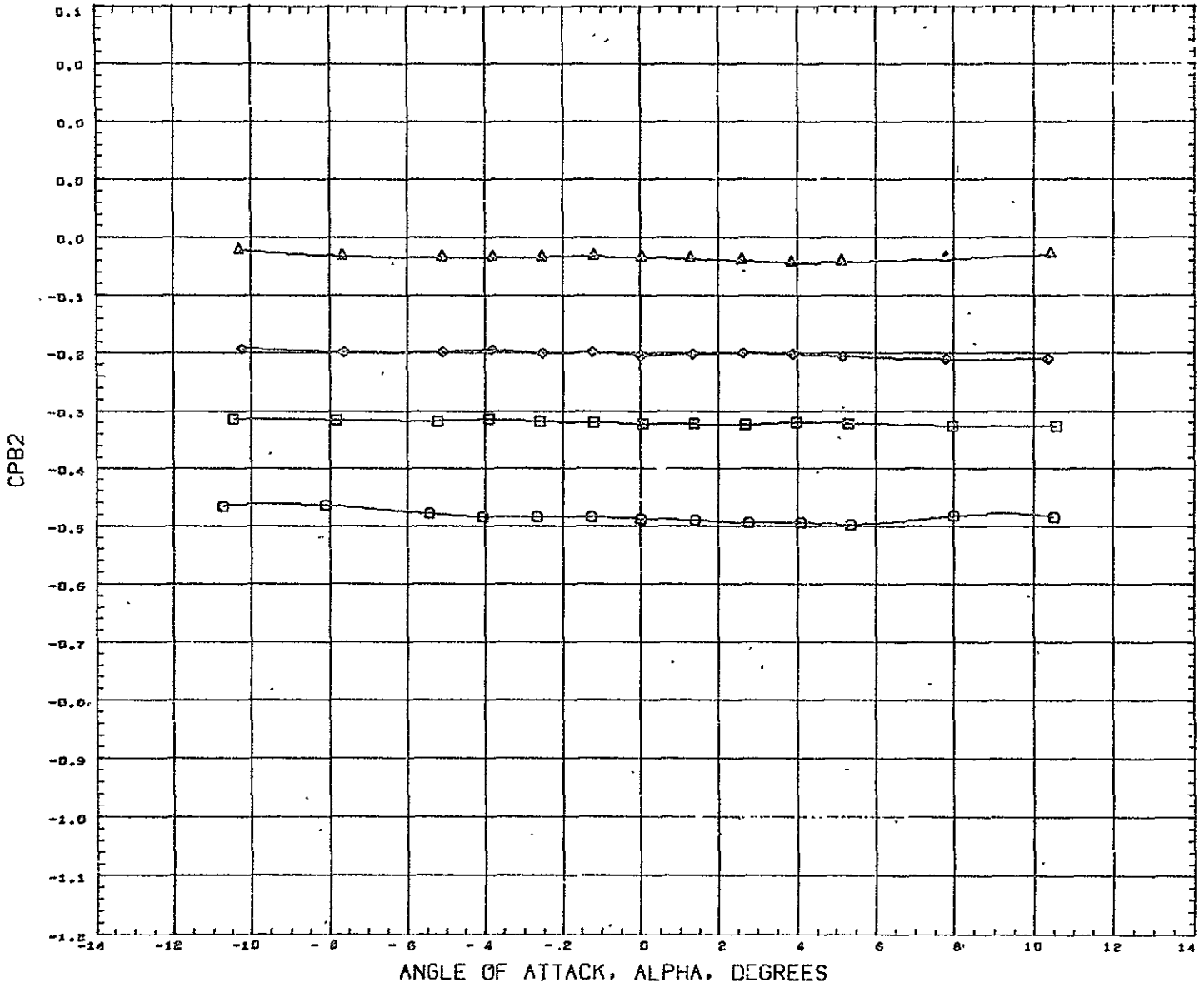
REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

REFERENCE FILE

WT470 S-IC/GAC ORBITER BF20WHVS. PHIB = 0 (A24131) 26 JAN 71 PAGE 112

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, CRUCIFORM FINS, PHIB=0




| SYMBOL | MACH |
|---|---|
| ○ | 0.997 |
| □ | 1.198 |
| ◇ | 1.303 |
| △ | 1.459 |

PARAMETRIC VALUES

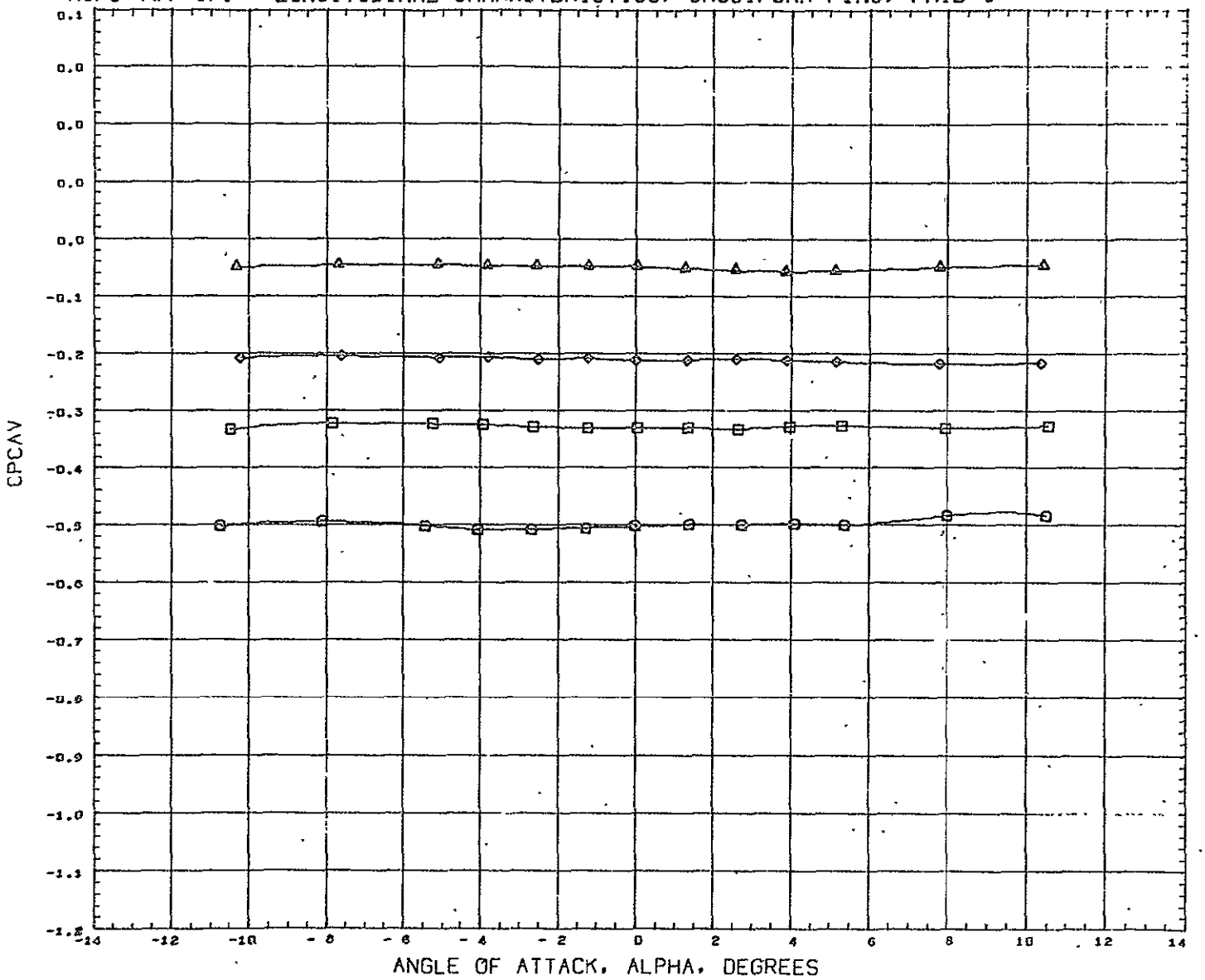
| | | | |
|---|---|---|---|
| BETA | 0.060 | ORBINC | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

REFERENCE FILE

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, CRUCIFORM FINS, PHIB=0




| SBOL. | MACH |
|---|---|
| ○ | 0.997 |
| □ | 1.198 |
| ◇ | 1.303 |
| △ | 1.459 |

PARAMETRIC VALUES

| | | | |
|---|---|---|---|
| BETA | 0.060 | ORBINC | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

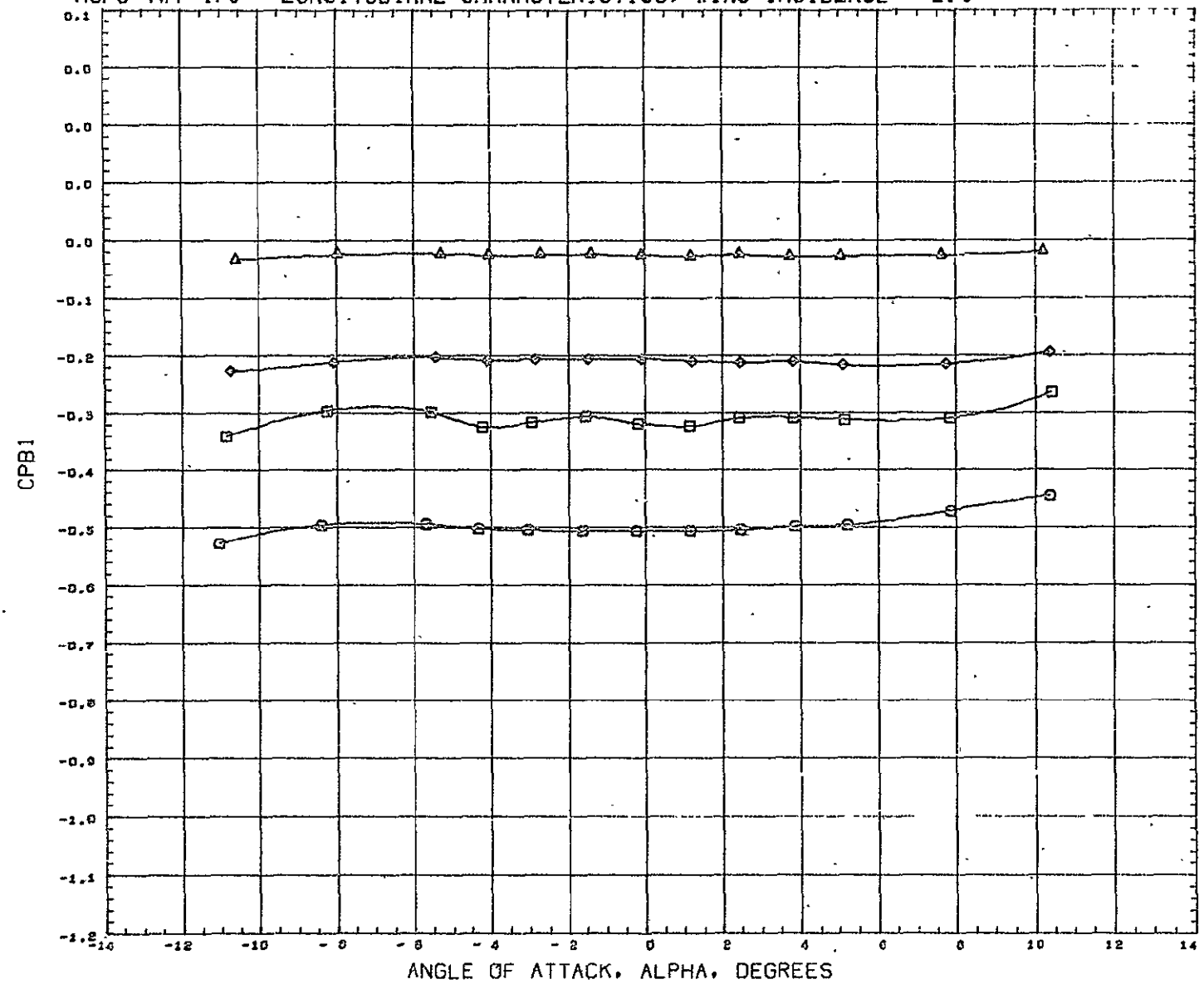
REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRF | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

REFERENCE FILE

WT470 S-IC/GAC ORBITER BF20WHVS. PHIB = 0 (A24131) 26 JAN 71 PAGE 114

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, WING INCIDENCE = 2.0

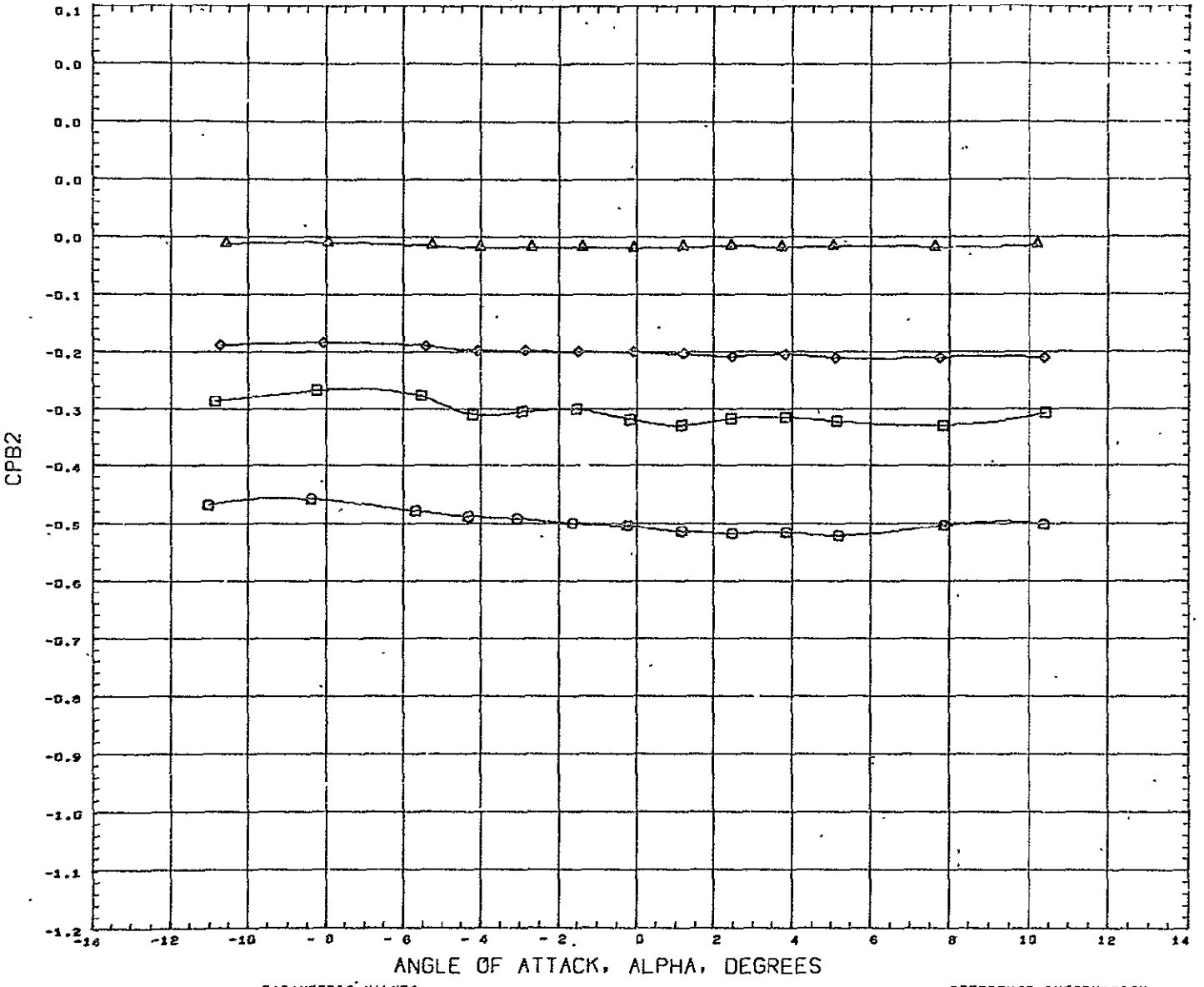



| SYMBOL | MACH | PARAMETRIC VALUES | | | | | |
|---|---|---|---|---|---|---|---|
| ○ | 1.001 | BETA | - 0.090 | ORBINC | - 1.050 | | |
| □ | 1.091 | WNGINC | 2.000 | HTAIL | 0.000 | | |
| ◇ | 1.202 | PHIB | 0.000 | | | | |
| △ | 1.456 | | | | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, WING INCIDENCE = 2.0




| SYMBOL | MACH |
|---|---|
| ○ | 1.001 |
| □ | 1.091 |
| ◇ | 1.202 |
| △ | 1.456 |

PARAMETRIC VALUES

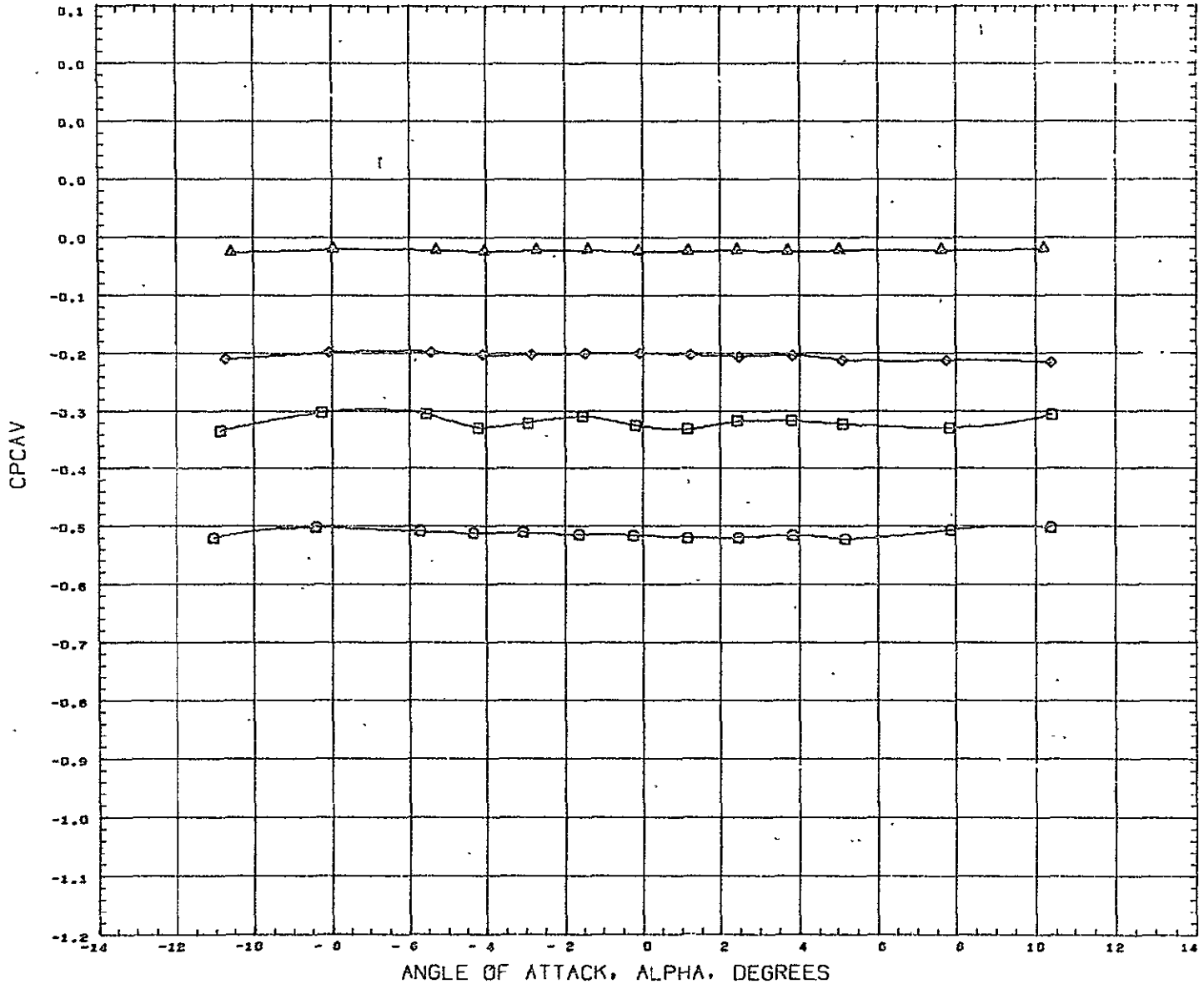
| | | | |
|---|---|---|---|
| BETA | 0.000 | ORBINC | 1.050 |
| WNGINC | 2.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

REFERENCE FILE

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, WING INCIDENCE = 2.0

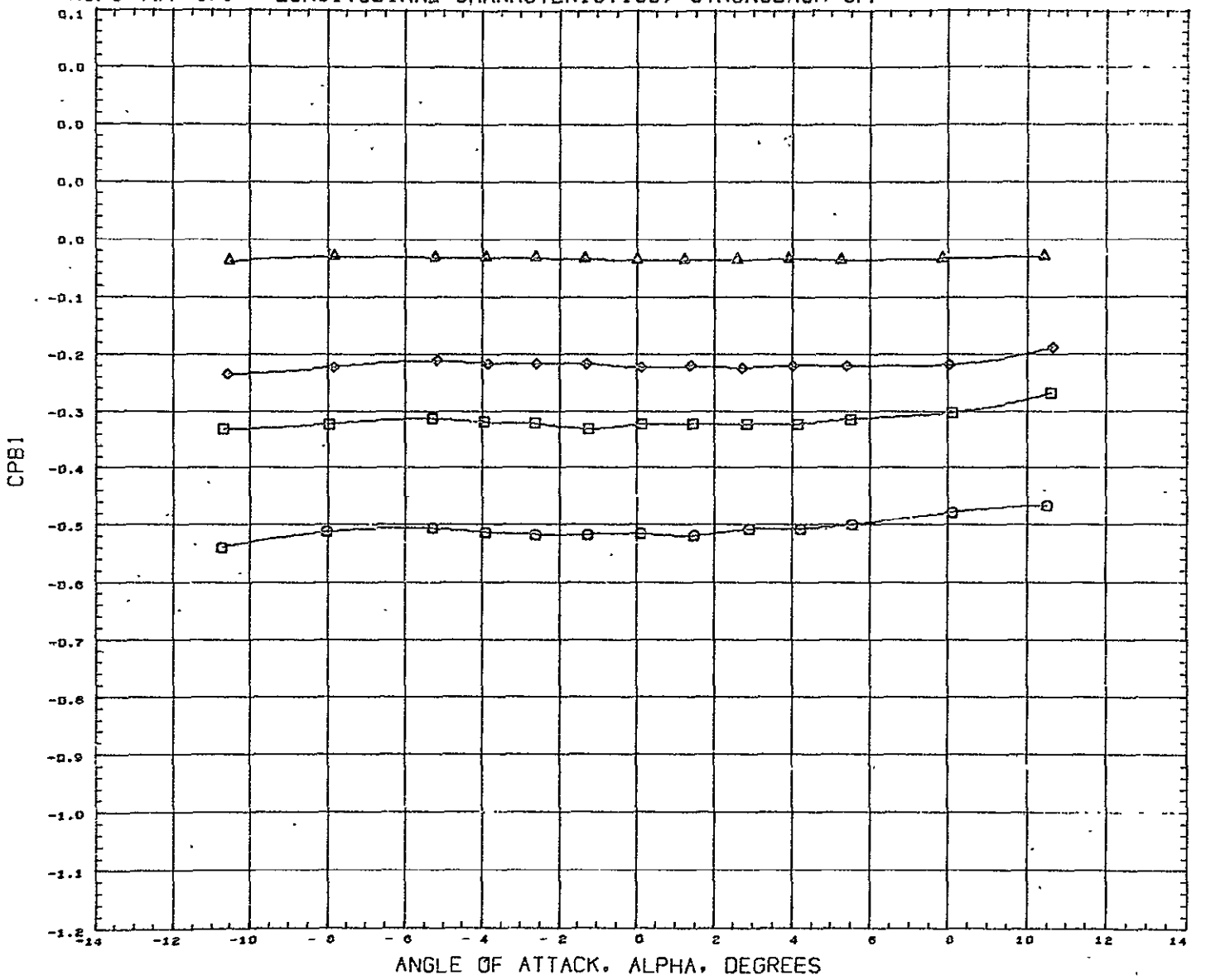



| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 1.001 | BETA | - 0.090 | ORBINC | - 1.050 | |
| □ | 1.091 | WNGINC | 2.000 | HTAIL | 0.000 | |
| ◇ | 1.202 | PHIB | 0.000 | | | |
| △ | 1.456 | | | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, STRONGBACK OFF

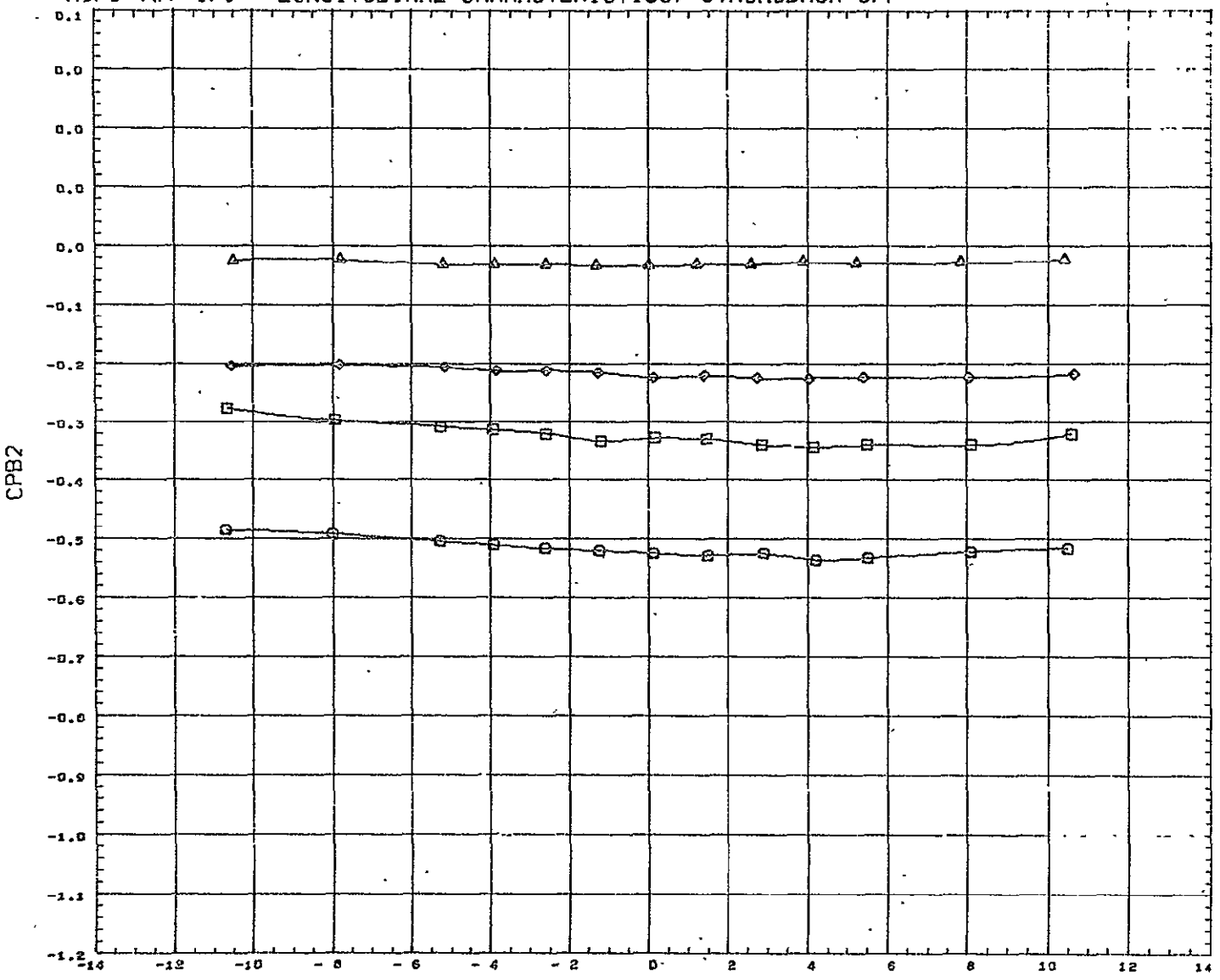



| SYMBOL | MACH | PARAMETRIC VALUES | | | | | |
|---|---|---|---|---|---|---|---|
| ○ | 1.002 | BETA | - 0.040 | ORBINC | - 1.050 | | |
| □ | 1.099 | WNGINC | 4.000 | HTAIL | 0.000 | | |
| ◇ | 1.200 | PHIB | 0.000 | | | | |
| △ | 1.460 | | | | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, STRONGBACK OFF



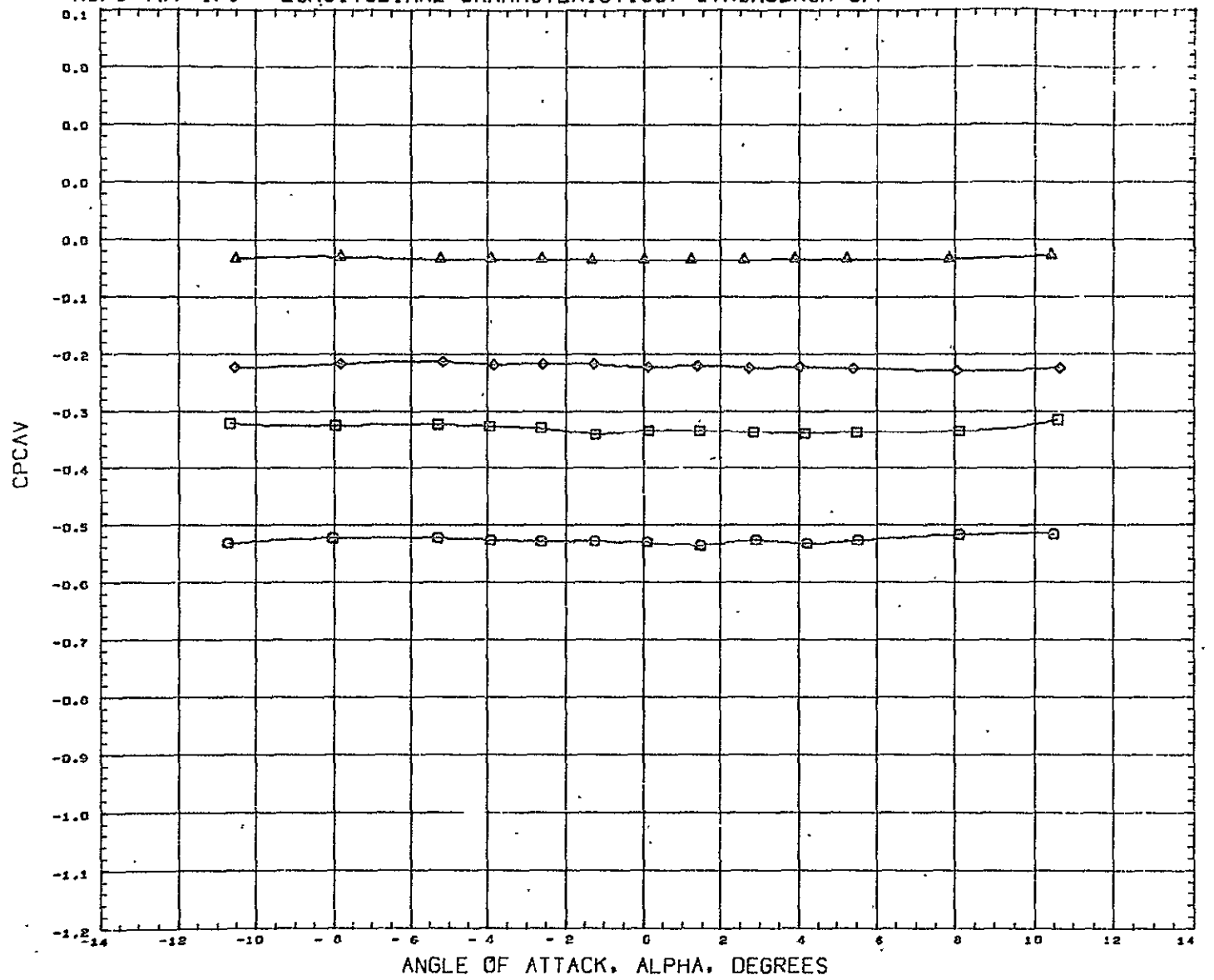

| SYMBOL | MACH | PARAMETRIC VALUES | | | | | |
|---|---|---|---|---|---|---|---|
| ○ | 1.002 | BETA | - 0.040 | ORBINC | - 1.050 | | |
| □ | 1.099 | WNGINC | 4.000 | HTAIL | 0.000 | | |
| ◇ | 1.200 | PHIB | 0.000 | | | | |
| △ | 1.400 | | | | | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, STRONGBACK OFF




| SYMBOL | MACH |
|---|---|
| ○ | 1.002 |
| □ | 1.099 |
| ◇ | 1.200 |
| △ | 1.460 |

PARAMETRIC VALUES

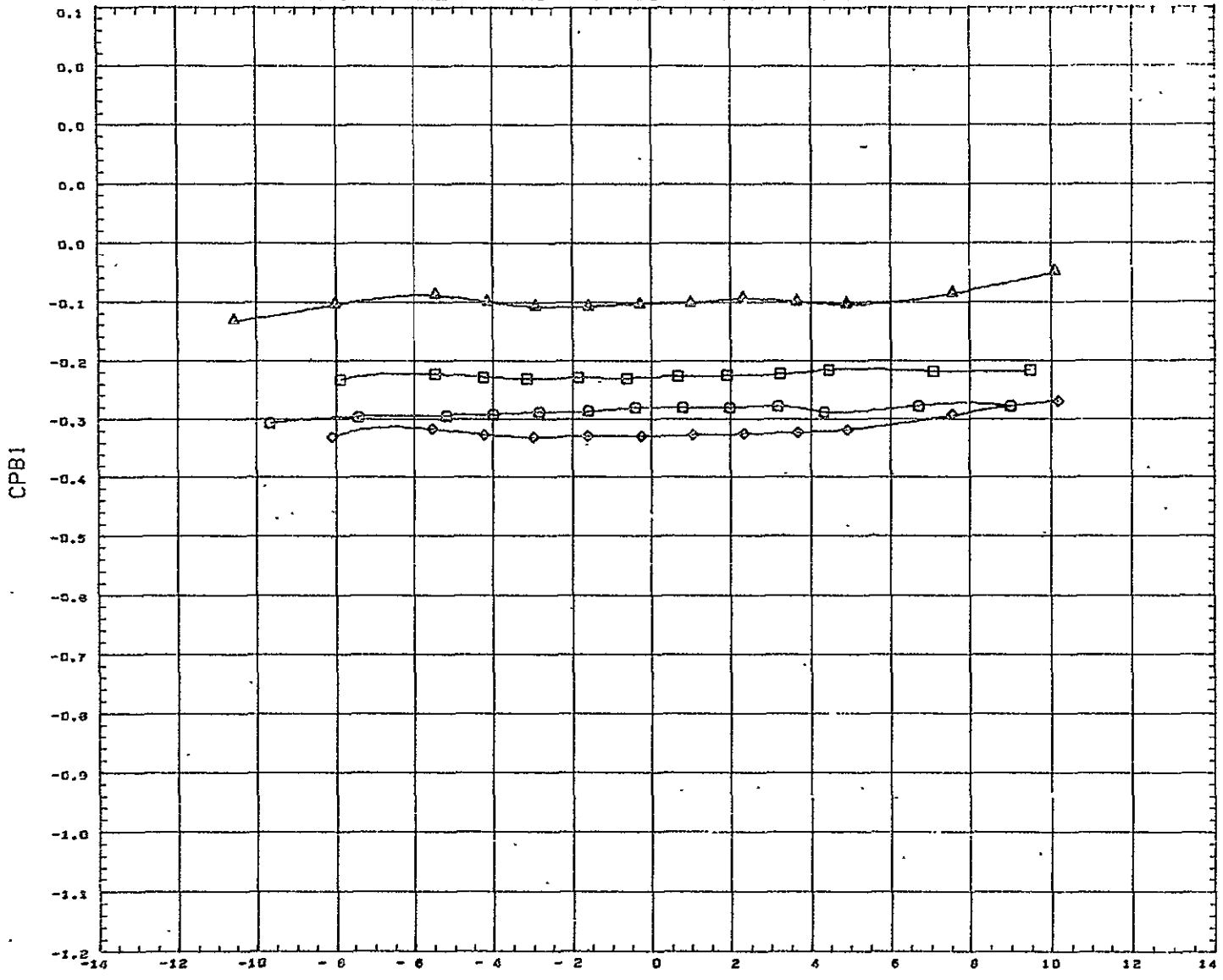
| | | | | | |
|---|---|---|---|---|---|
| BETA | - | 0.040 | ORBINC | - | 1.050 |
| WNGINC | | 4.000 | HTAIL | | 0.000 |
| PHIB | | 0.000 | | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

REFERENCE FILE

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, WING SPOILERS

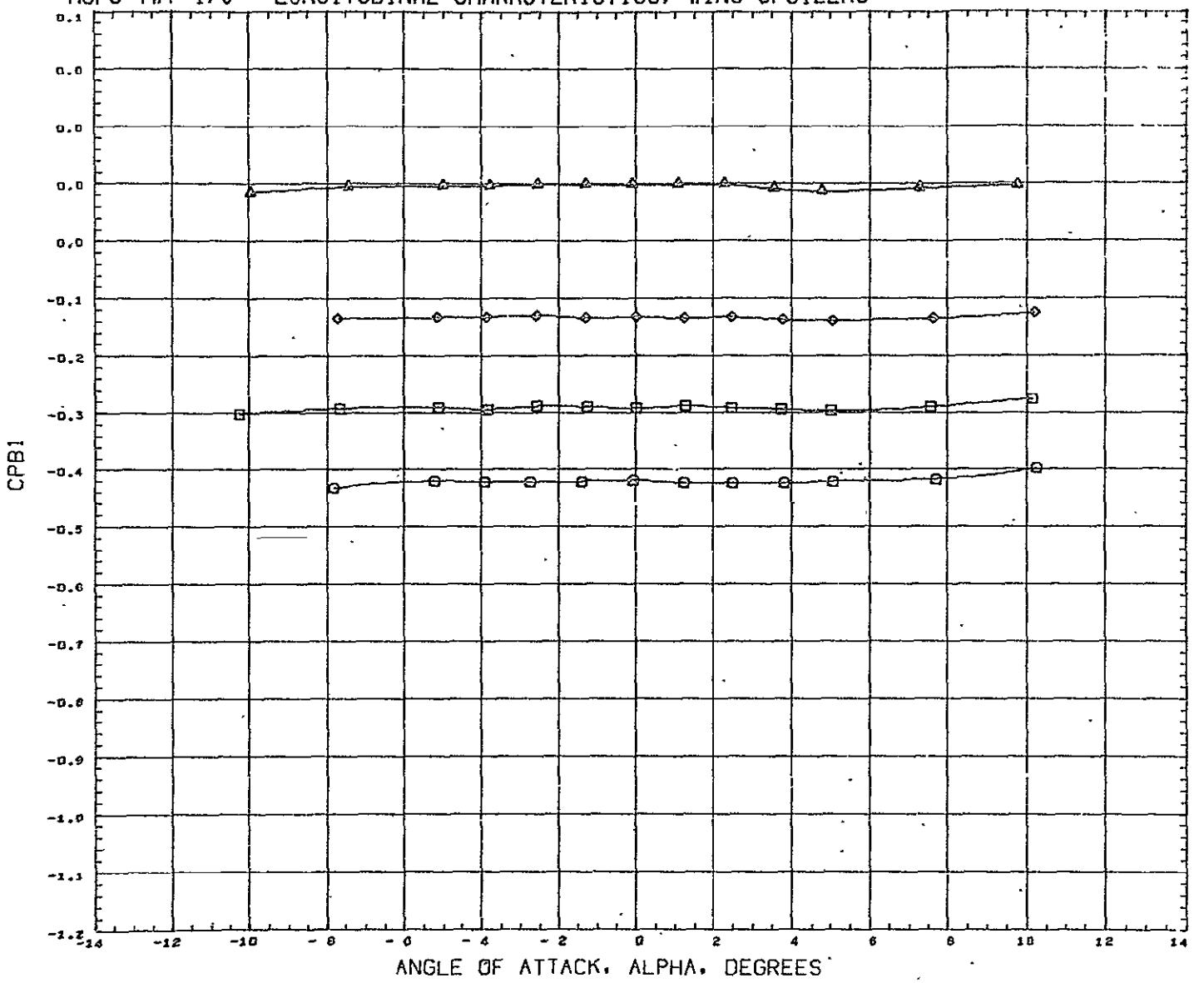



| SYMBOL | MACH | PARAMETRIC VALUES | | | | | |
|---|---|---|---|---|---|---|---|
| ○ | 0.599 | BETA | - 0.050 | ORBINC | - 1.050 | | |
| □ | 0.904 | WNGINC | 4.000 | HTAIL | 0.000 | | |
| ◇ | 0.998 | PHIB | 0.000 | | | | |
| △ | 1.199 | | | | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

# MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, WING SPOILERS




| SYMBOL | MACH |
|---|---|
| ○ | 1.200 |
| □ | 1.302 |
| ◇ | 1.457 |
| △ | 1.968 |

PARAMETRIC VALUES

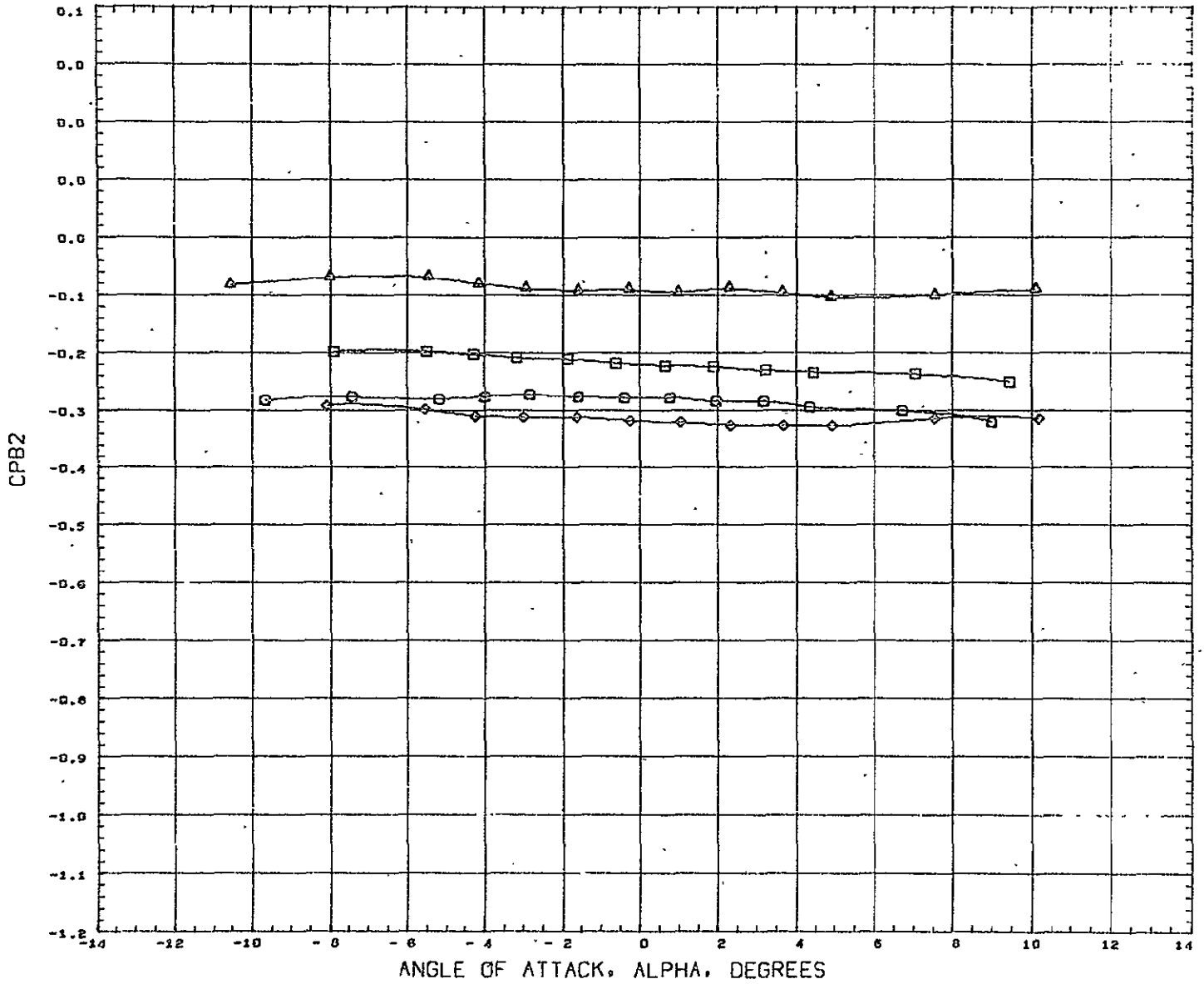
| | | | |
|---|---|---|---|
| BETA | - 0.050 | ORBINC | - 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, WING SPOILERS

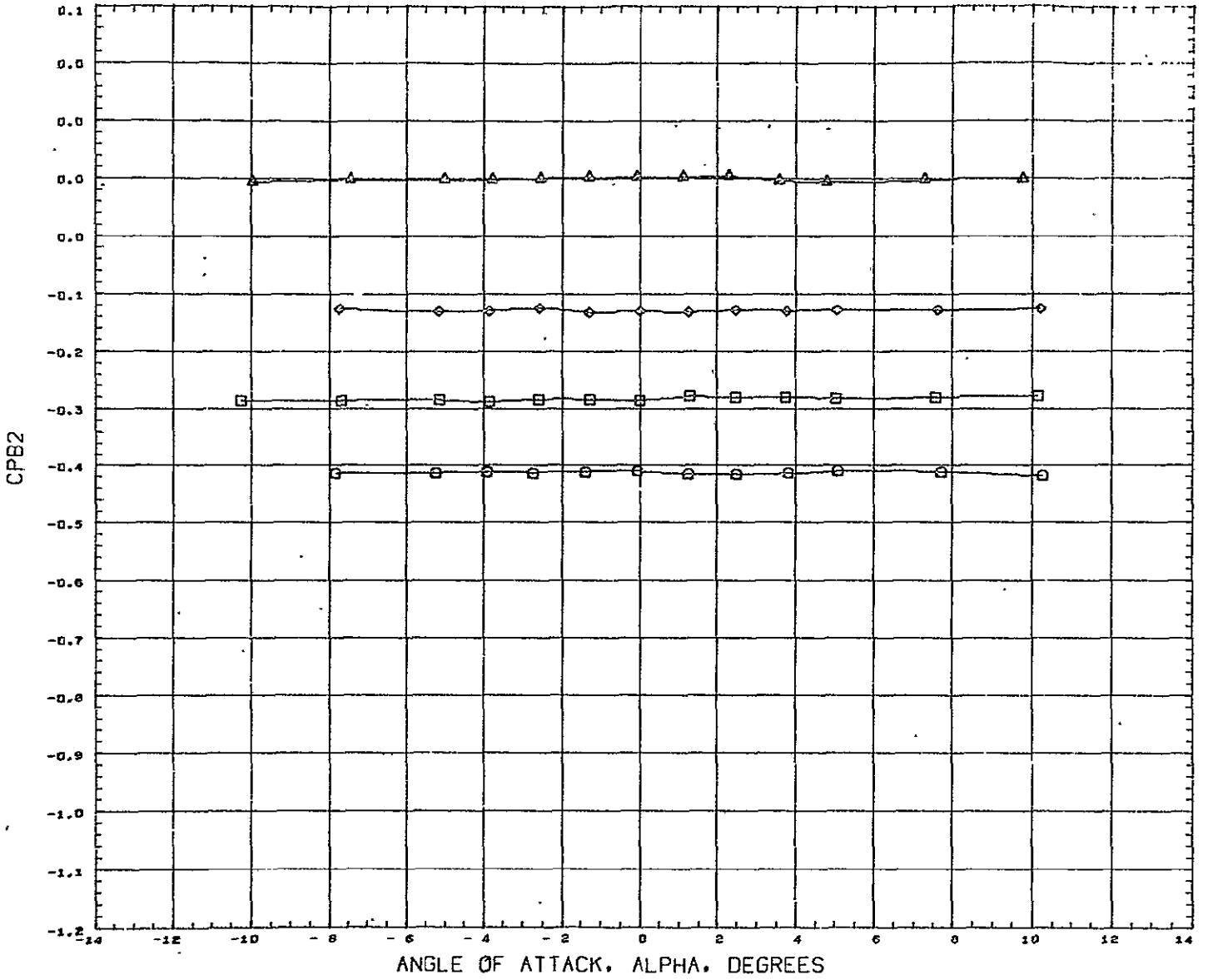



| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 0.599 | BETA | - 0.050 | ORBINC | - 1.050 | |
| □ | 0.904 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 0.998 | PHIB | 0.000 | | | |
| △ | 1.100 | | | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, WING SPOILERS




| SYMBOL | MACH |
|---|---|
| ○ | 1.200 |
| □ | 1.302 |
| ◇ | 1.457 |
| △ | 1.968 |

PARAMETRIC VALUES

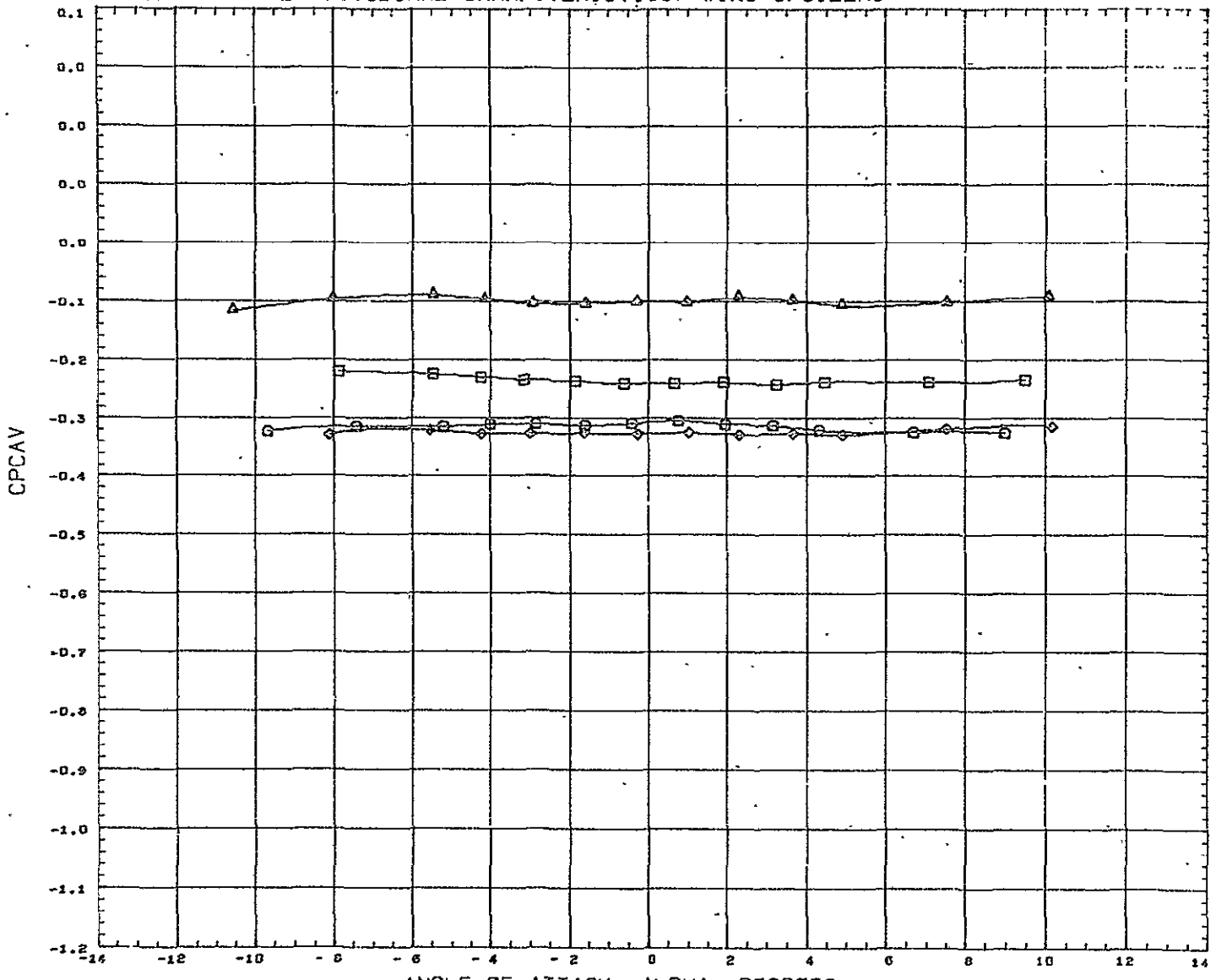
| | | | |
|---|---|---|---|
| BETA | - 0.050 | ORBINC | - 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

REFERENCE FILE

MSFC IWT 470  LONGITUDINAL CHARACTERISTICS, WING SPOILERS




| SYMBOL | MACH |
|---|---|
| ○ | 0.599 |
| □ | 0.904 |
| ◇ | 0.998 |
| △ | 1.100 |

PARAMETRIC VALUES

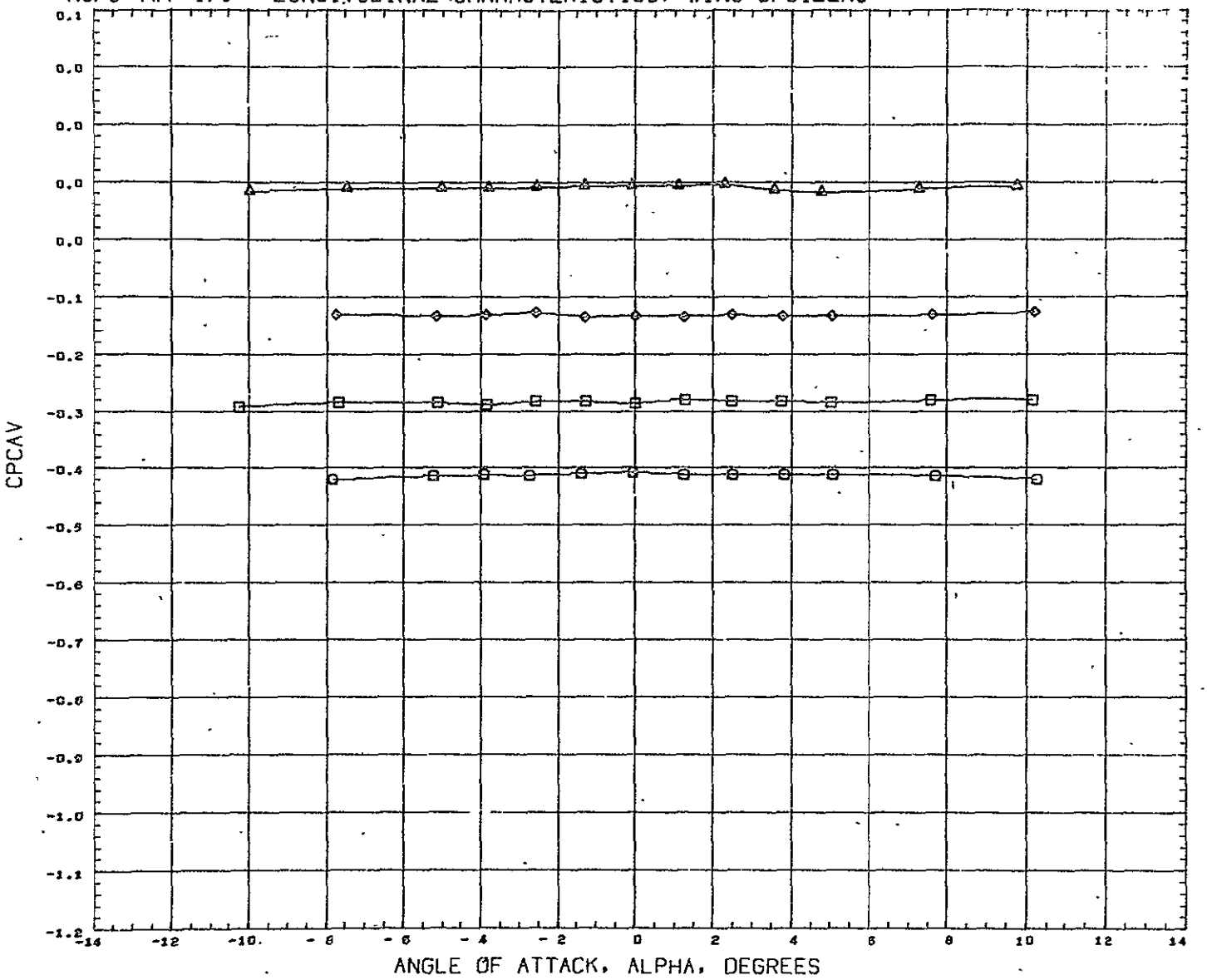
| | | | |
|---|---|---|---|
| BETA | - 0.050 | ORBINC | - 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3350 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

REFERENCE FILE

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS, WING SPOILERS



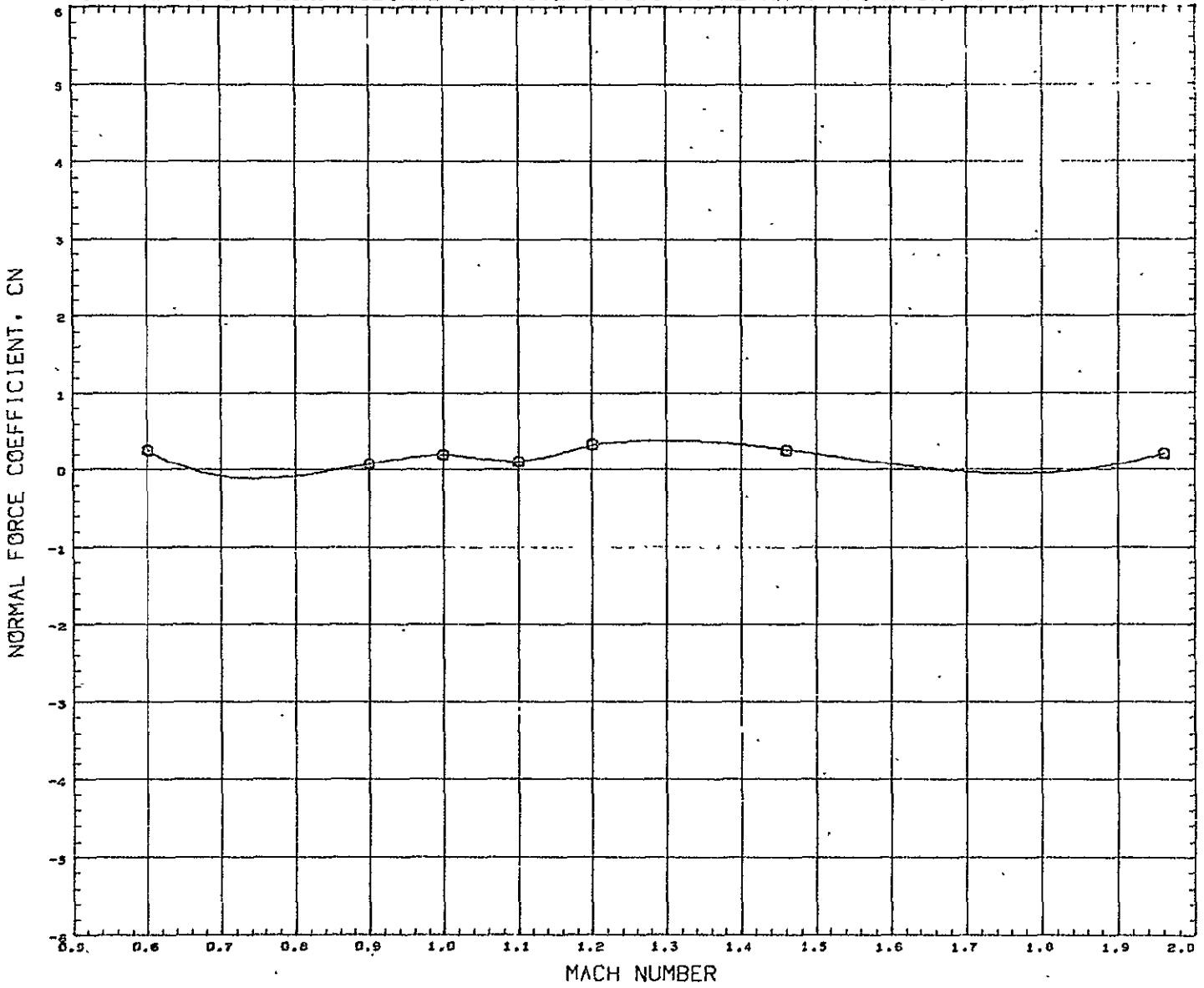

| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 1.200 | BETA | - 0.050 | ORBINC | - 1.050 | |
| □ | 1.302 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 1.457 | PHIB | 0.000 | | | |
| △ | 1.960 | | | | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, FINS ON, ORBINC=0.0

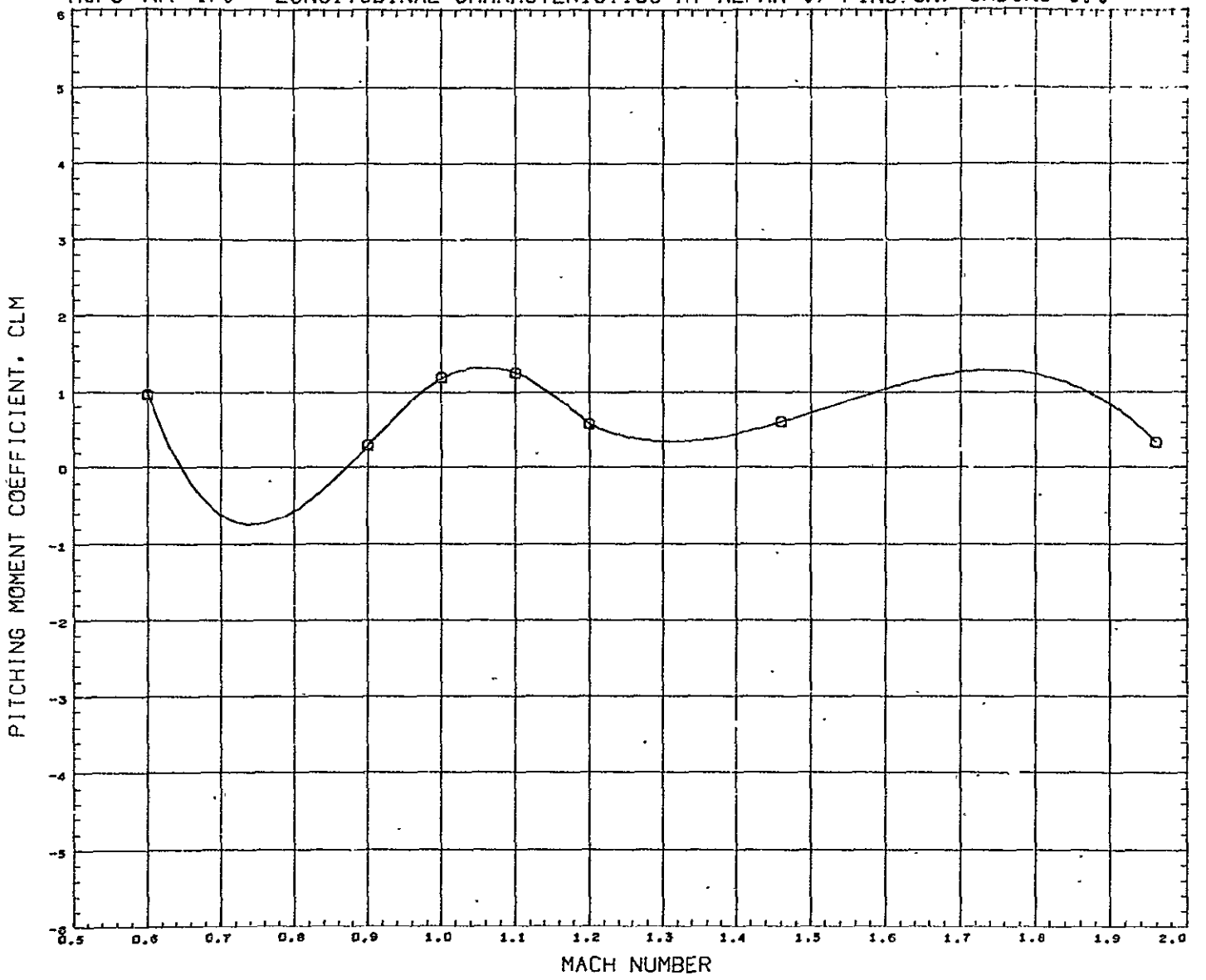



| SYMBOL | ALPHA | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| O | 0.000 | BETA | 0.070 | ORBINC | 0.000 |
| | | WNGINC | 4.000 | HTAIL | 0.000 |
| | | PHIB | 0.000 | | |

DATA HIST. CODE V1

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LØNGITUDINAL CHARACTERISTICS AT ALPHA=0, FINS ØN, ØRBINC=0.0




| SYMBOL | ALPHA |
|---|---|
| O | 0.000 |

PARAMETRIC VALUES

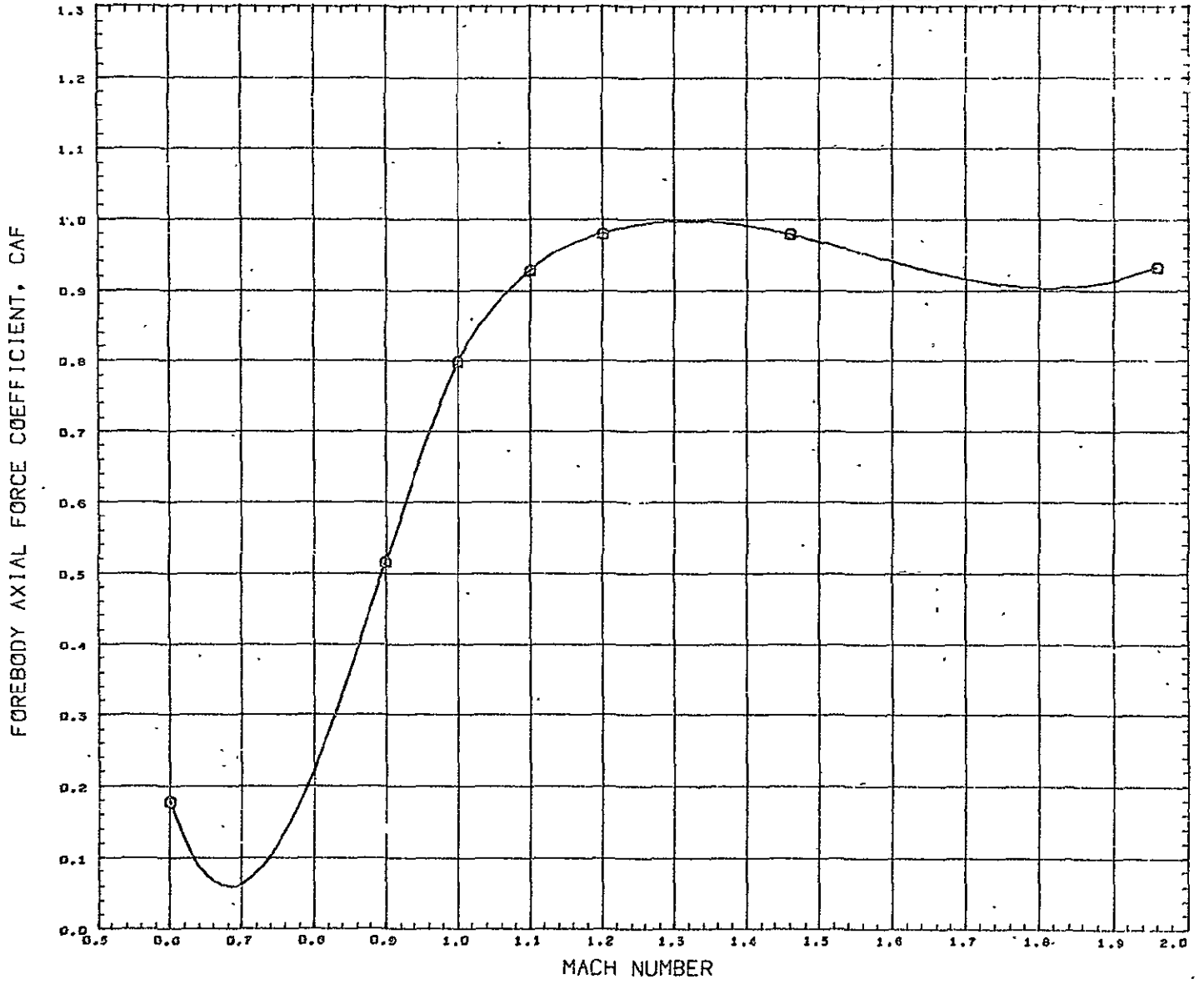
| | | | |
|---|---|---|---|
| BETA | 0.070 | ORBINC | 0.000 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE VI

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, FINS ON, ORBINC=0.0



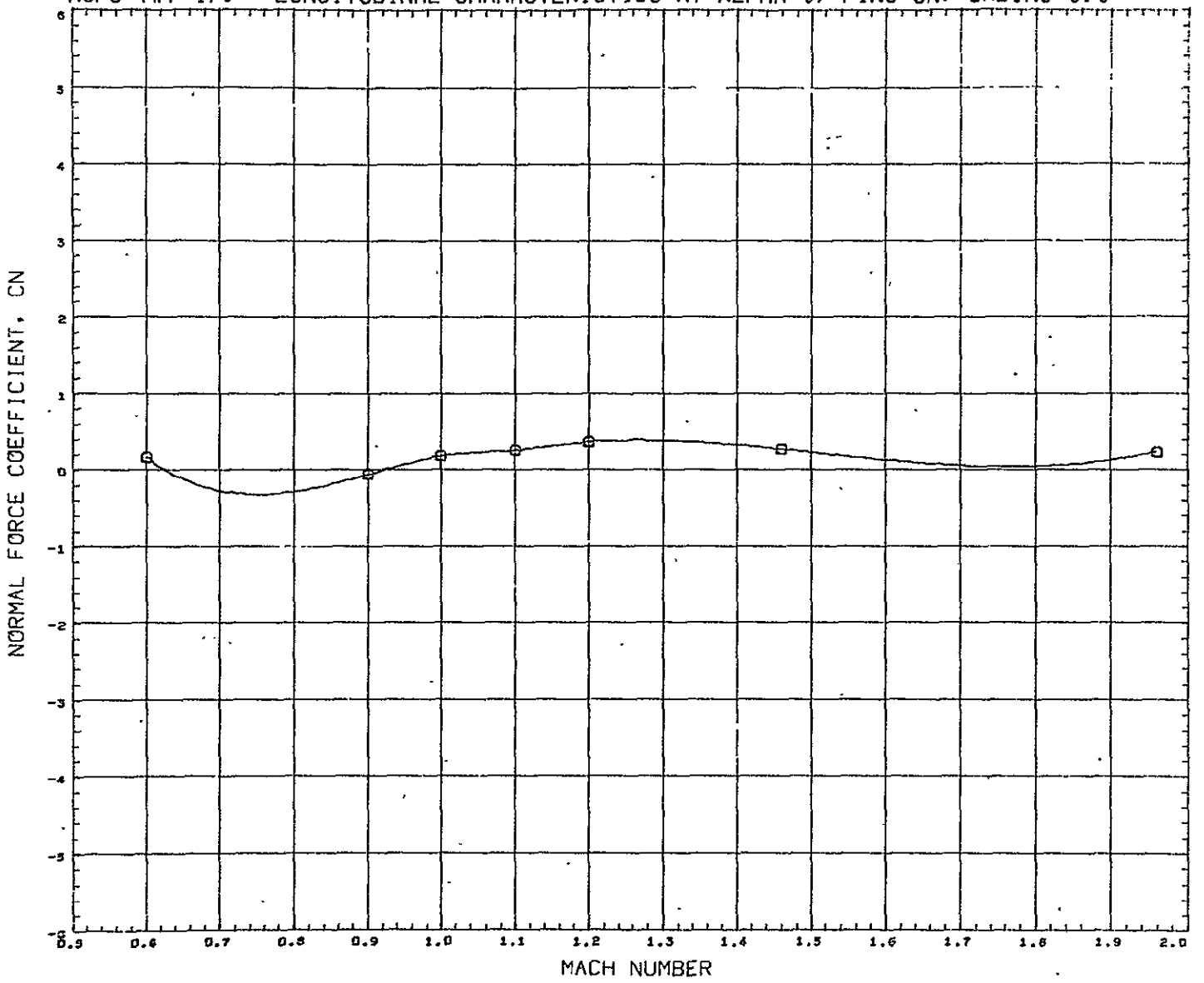

| SYMBOL | ALPHA | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| O | 0.000 | BETA | - 0.070 | ORBINC | 0.000 |
| | | WNGINC | 4.000 | HTAIL | 0.000 |
| | | PHIB | 0.000 | | |

DATA HIST. CODE VI

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, FINS ON, ORBINC=0.0




| SYMBOL | ALPHA |
|---|---|
| O | 0.000 |

PARAMETRIC VALUES

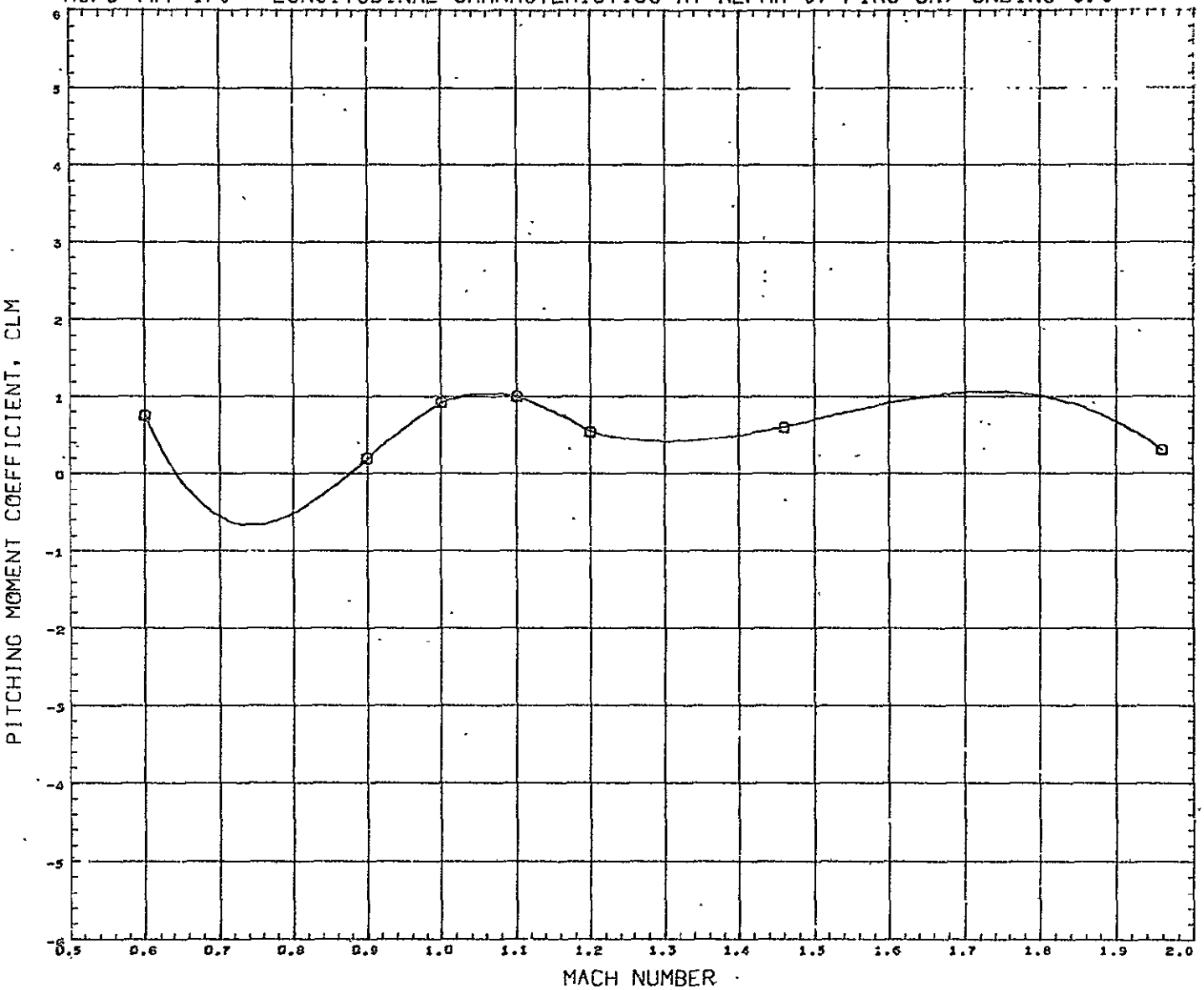
| | | | |
|---|---|---|---|
| BETA | - 0.090 | ORBINC | 0.000 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE VI

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, FINS ON, ORBINC=0.0

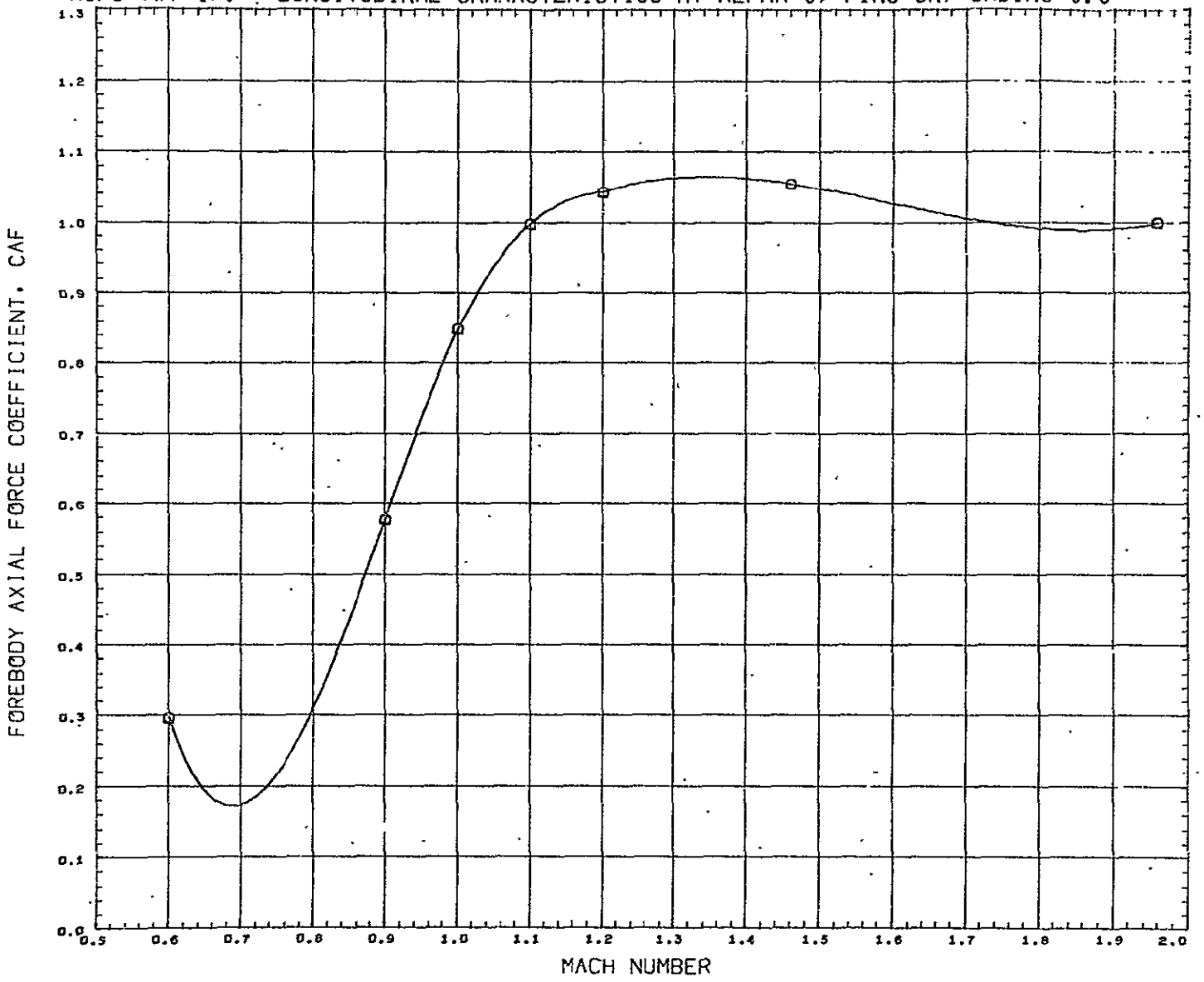



| SYMBOL | ALPHA | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| O | 0.000 | BETA | 0.000 | ORBINC | 0.000 |
| | | WNGINC | 4.000 | HTAIL | 0.000 |
| | | PHIB | 0.000 | | |

DATA HIST. CODE V1

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, FINS ON, ORBINC=0.0

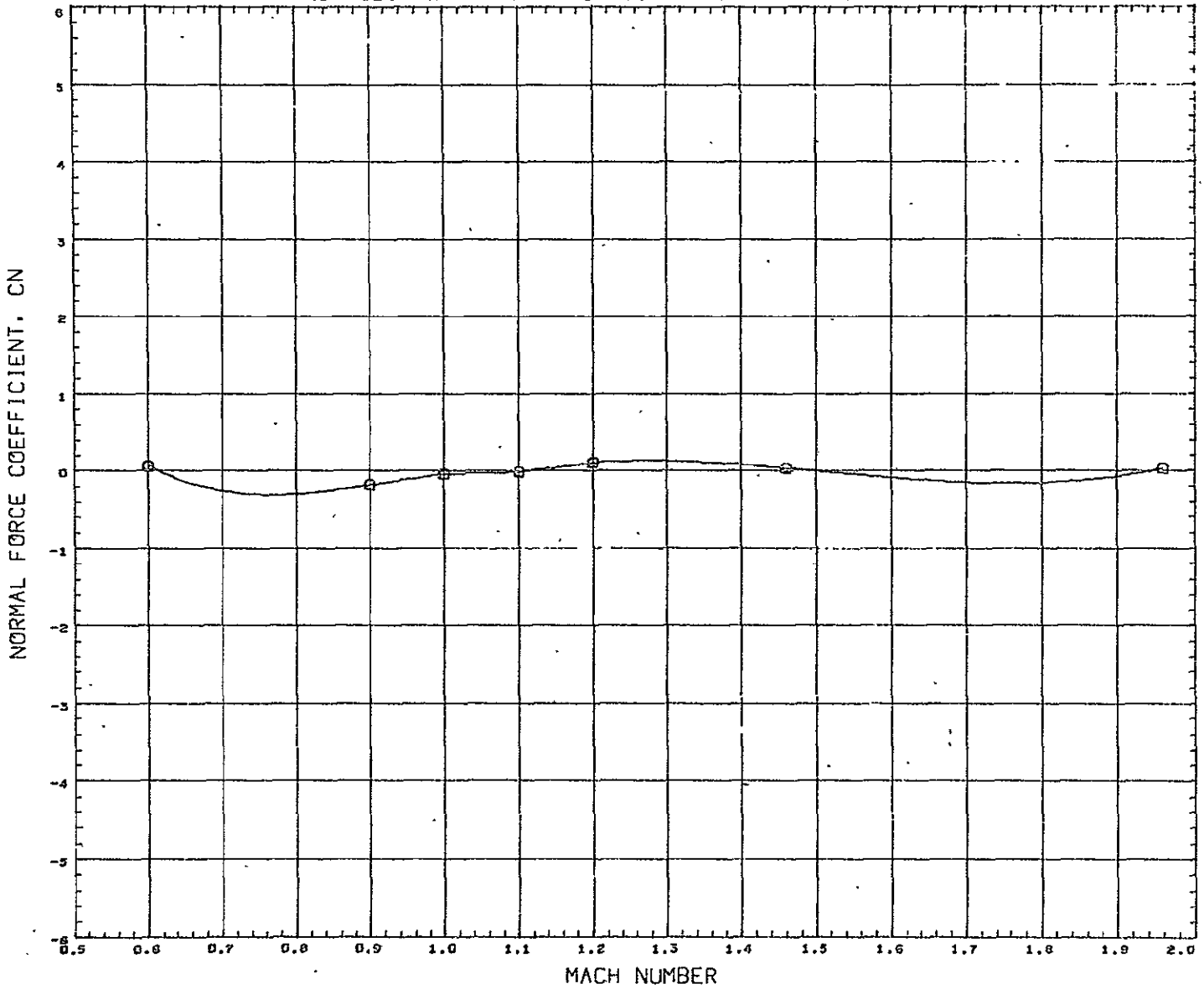



| SYMBOL | ALPHA | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| O | 0.000 | BETA | 0.000 | ORBINC | 0.000 |
| | | WNGINC | 4.000 | HTAIL | 0.000 |
| | | PHIB | 0.000 | | |

DATA HIST. CODE VI

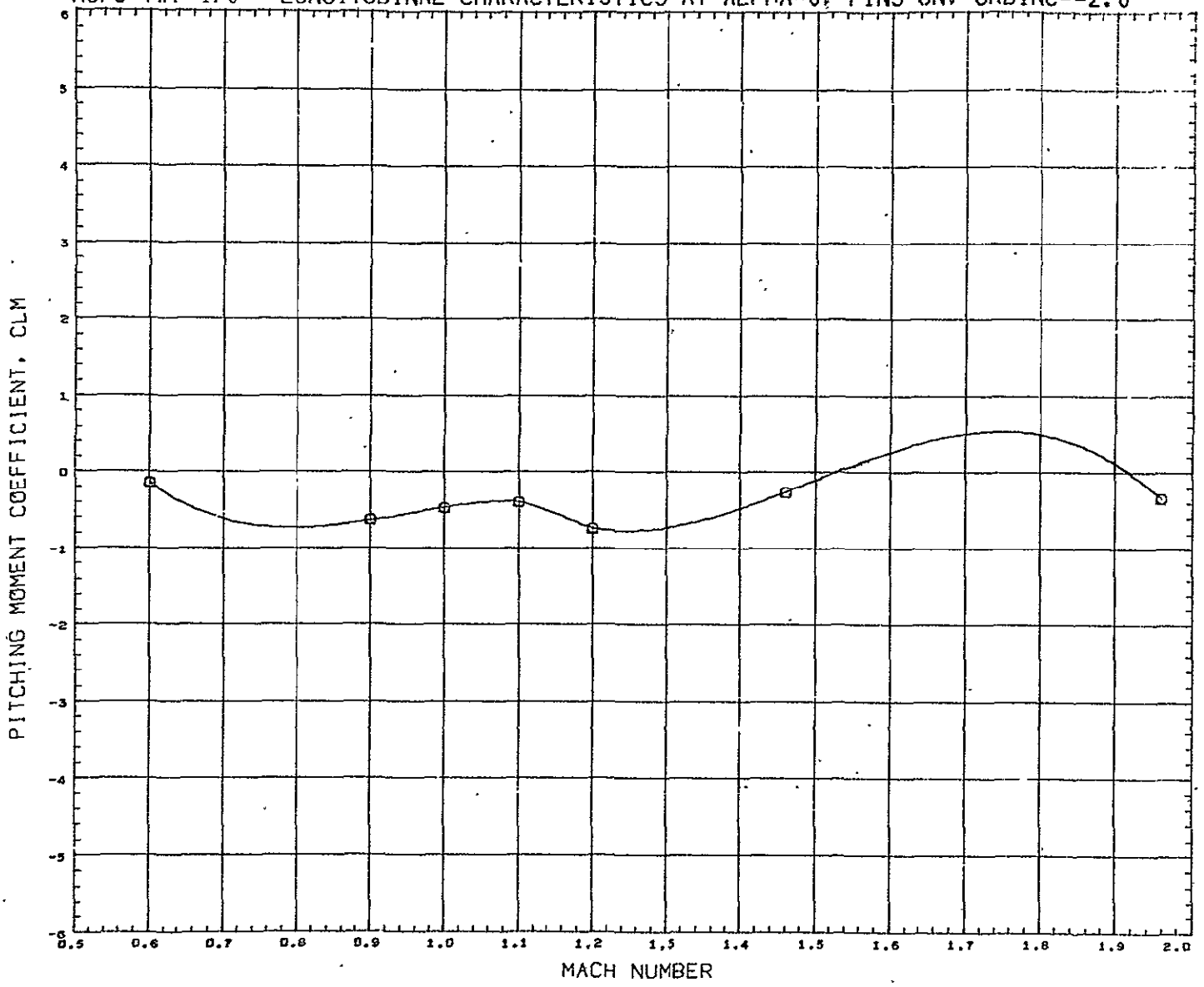
| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, FINS ON, ORBINC=-2.0




| SYMBOL | ALPHA | PARAMETRIC VALUES | | | | | REFERENCE INFORMATION | | |
|---|---|---|---|---|---|---|---|---|---|
| O | 0.000 | BETA | - 0.070 | ORBINC | - 2.000 | | REFS | 1.3960 | SQ.IN. |
| | | WNGINC | 4.000 | HTAIL | 0.000 | | REFL | 1.3330 | INCHES |
| | | PHIB | 0.000 | | | | REFB | 1.3330 | INCHES |
| | | | | | | | XMRP | 5.2640 | INCHES |
| | | | | | | | YMRP | 0.0000 | INCHES |
| | | | | | | | ZMRP | 0.0000 | INCHES |
| | | DATA HIST. CODE | VI | | | | SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, FINS ON, ORBINC=-2.0



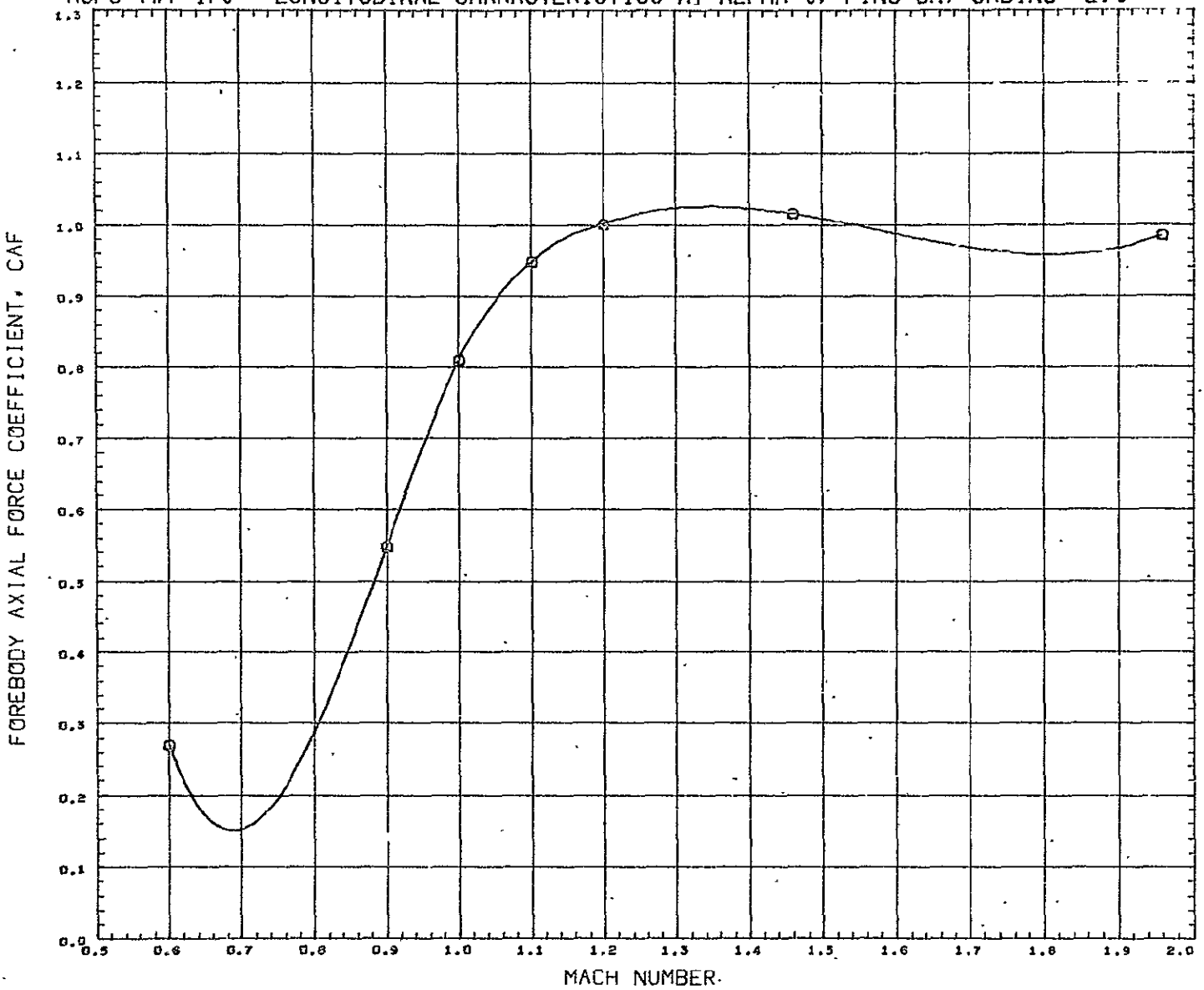

| SYMBOL | ALPHA | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| O | 0.000 | BETA | - 0.070 | ORBINC | - 2.000 | |
| | | WNGINC | 4.000 | HTAIL | 0.000. | |
| | | PHIB | 0.000 | | | |

DATA HIST. CODE VI

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3969 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, FINS ON, ORBINC=-2.0

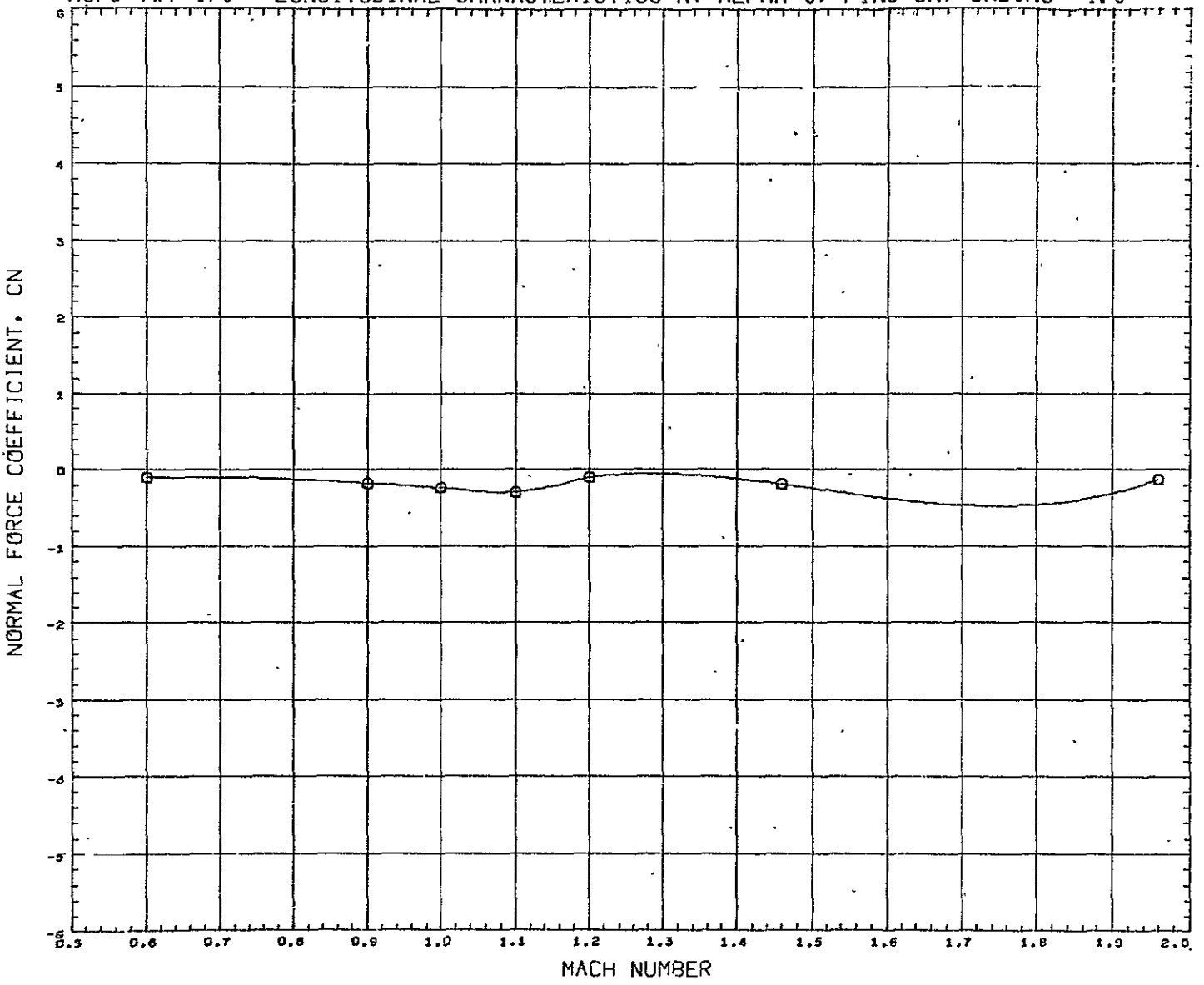



| SYMBOL | ALPHA | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| O | 0.000 | BETA | - 0.070 | ORBINC | - 2.000 | |
| | | WBGINC | 4.000 | HTAIL | 0.000 | |
| | | PHIB | 0.000 | | | |

DATA HIST. CODE VI

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, FINS ON, ORBINC=-4.0

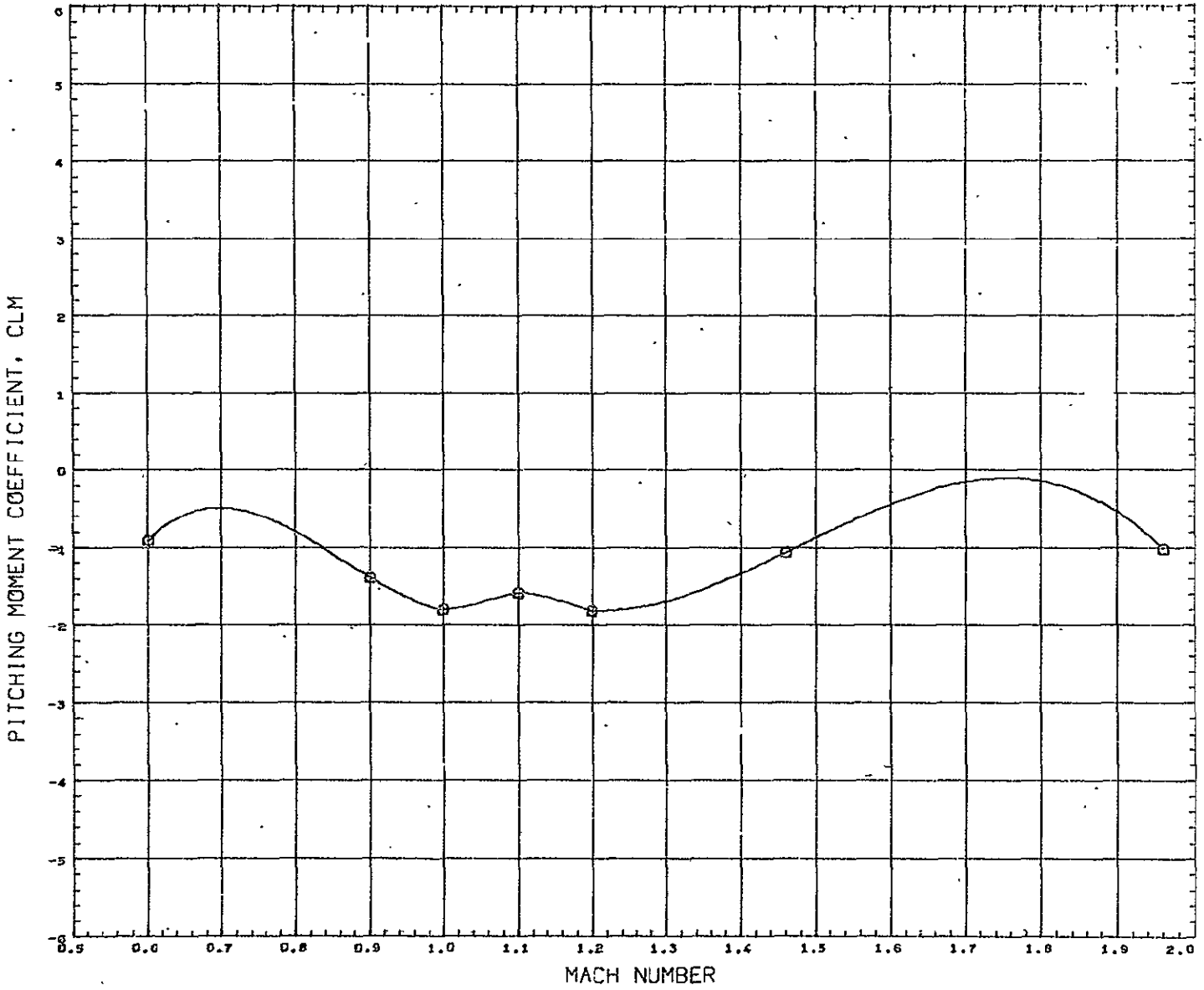



| SYMBOL | ALPHA | PARAMETRIC VALUES | | | | | |
|---|---|---|---|---|---|---|---|
| O | 0.000 | BETA | - | 0.050 | ORBINC | - | 4.000 |
| | | WNGINC | | 4.000 | HTAIL | | 0.000 |
| | | PHID | | 0.000 | | | |

DATA HIST. CODE VI

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, FINS ON, ORBINC=-4.0

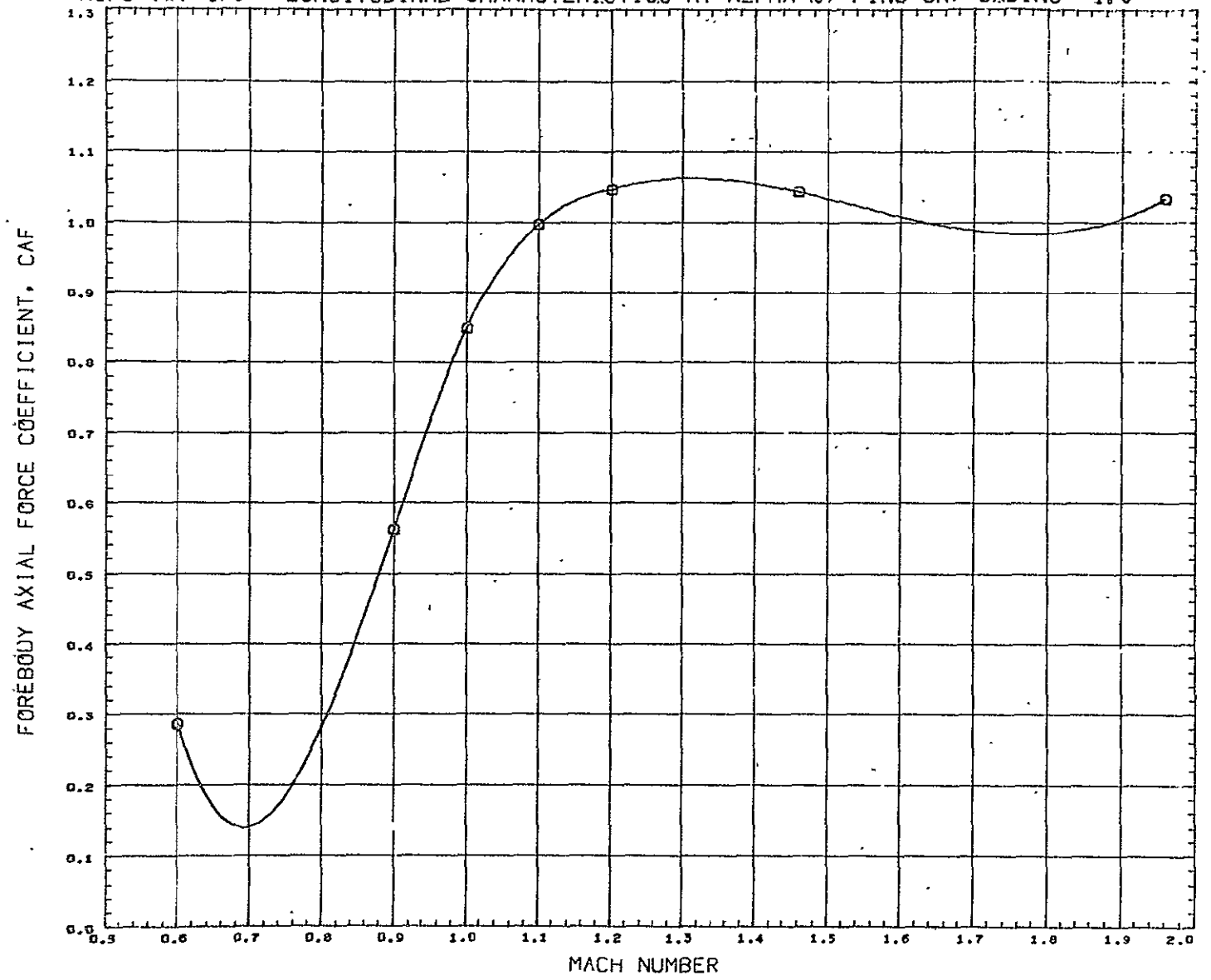



| SYMBOL | ALPHA | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| O | 0.000 | BETA | - 0.050 | ORBINC | - 4.000 | |
| | | WHGINC | 4.000 | HTAIL | 0.000 | |
| | | PHIB | 0.000 | | | |

DATA HIST. CODE VI

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, FINS ON, ORBINC=-4.0

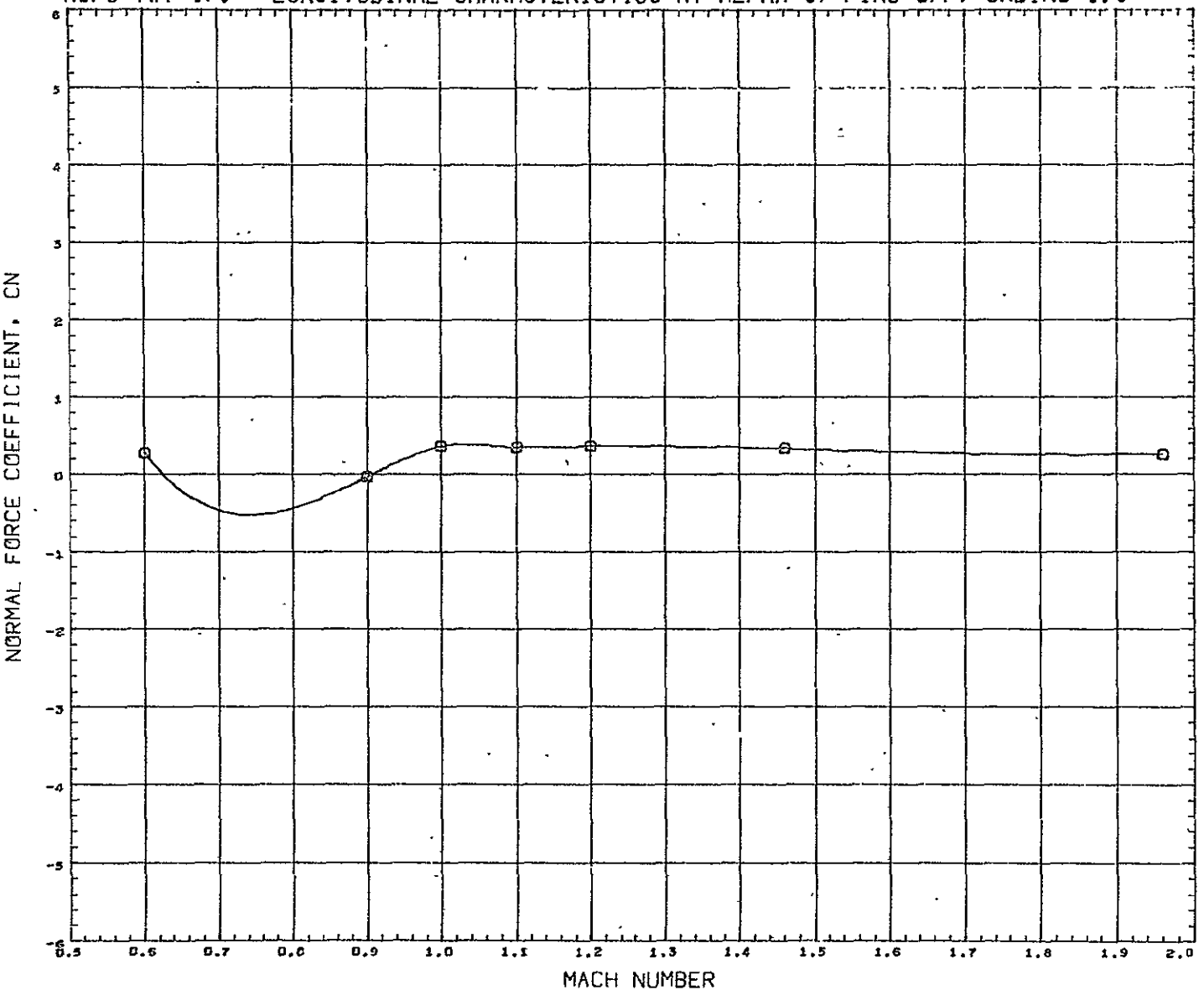



| SYMBOL | ALPHA | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| O | 0.000 | BETA | - 0.050 | ORBINC | - 4.000 |
| | | WNGINC | 4.000 | HTAIL | 0.000 |
| | | PHIB | 0.000 | | |

DATA HIST. CODE VI

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, FINS OFF, ORBINC=0.0

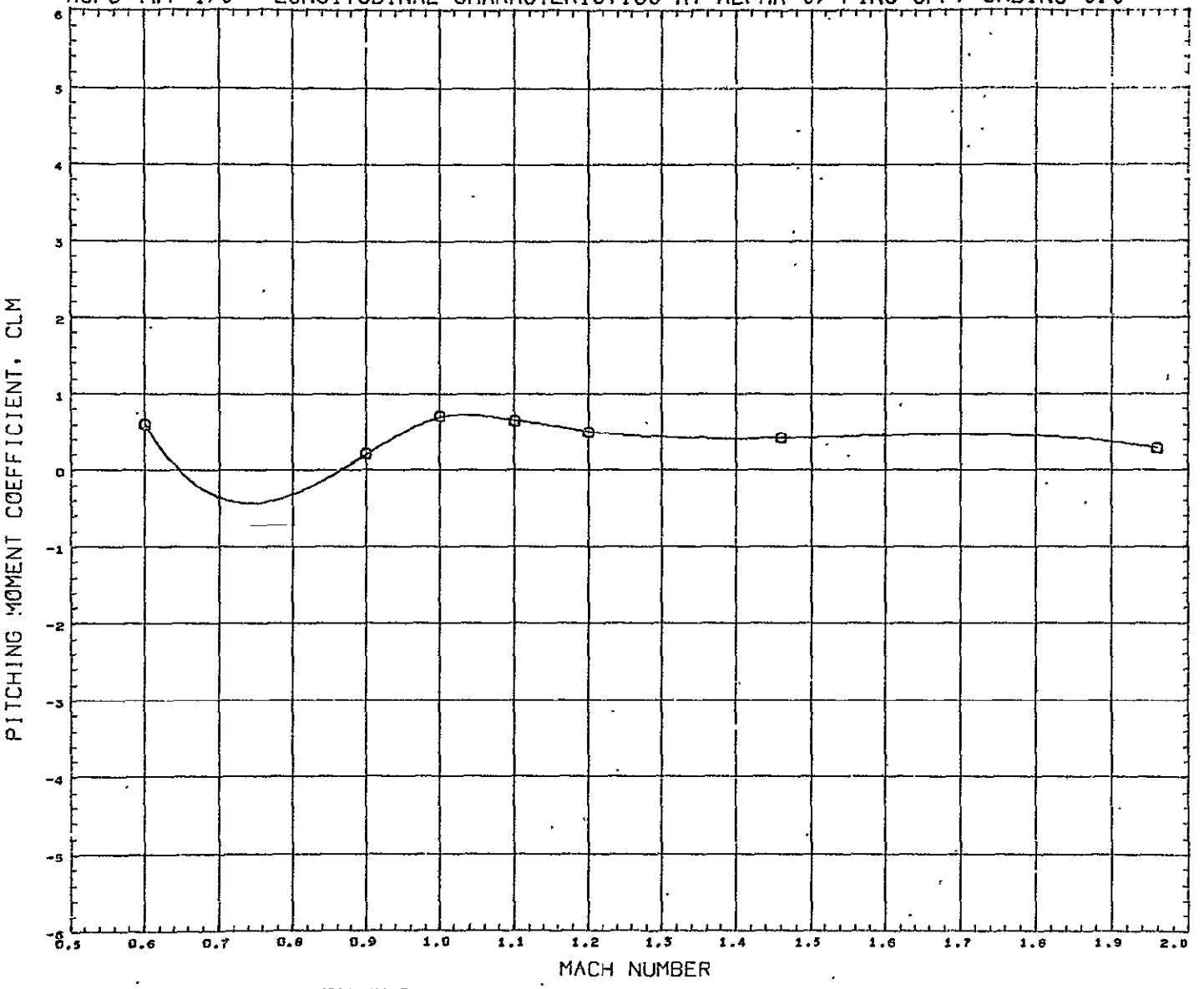



| SYMBOL | ALPHA | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| O | 0.000 | BETA | - 0.050 | ORBINC | 0.000 |
| | | WNGINC | 4.000 | HTAIL | 0.000 |
| | | PHIS | 0.000 | | |

DATA HIST. CODE VI

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3969 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, FINS OFF, ORBINC=0.0

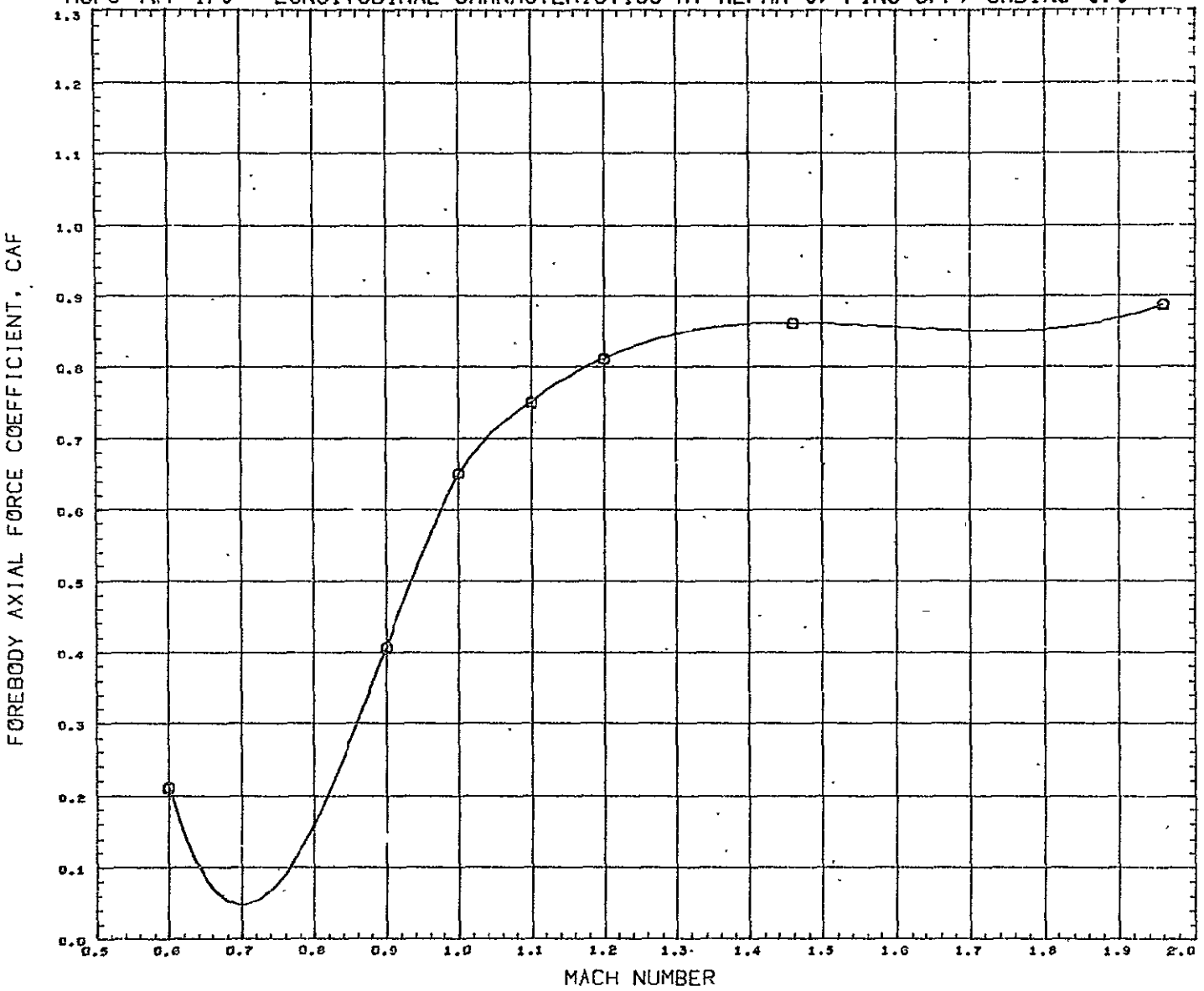



| SYMBOL | ALPHA | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| O | 0.000 | BETA | 0.050 | ORBINC | 0.000 |
| | | WNGINC | 4.000 | HTAIL | 0.000 |
| | | PHIB | 0.000 | | |

DATA HIST. CODE V1

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, FINS OFF, ORBINC=0.0

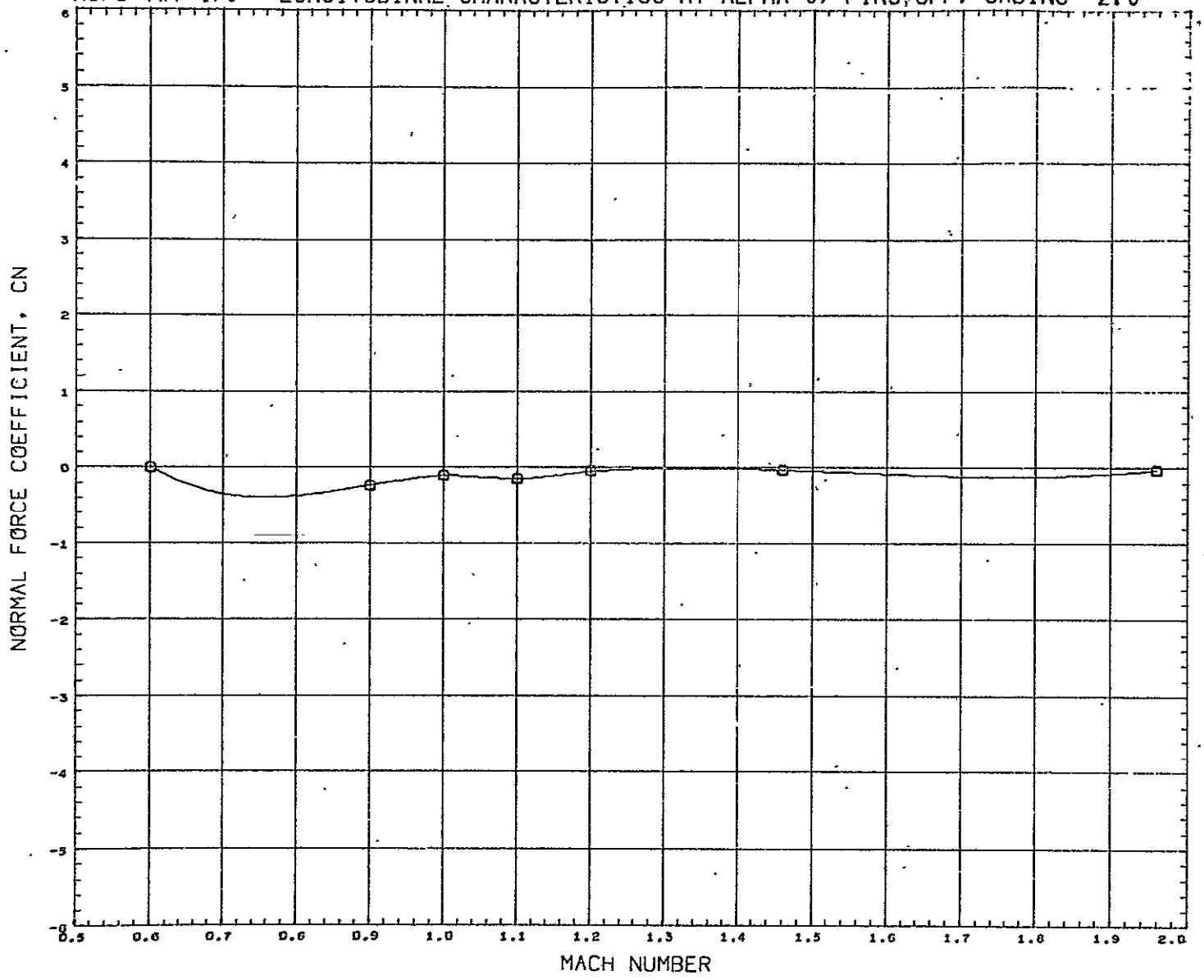



| SYMBOL | ALPHA | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| O | 0.000 | BETA | - 0.050 | ORBINC | 0.000 |
| | | WNGINC | 4.000 | HTAIL | 0.000 |
| | | PHIB | 0.000 | | |

DATA HIST. CODE VI

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, FINS OFF, ORBINC=-2.0



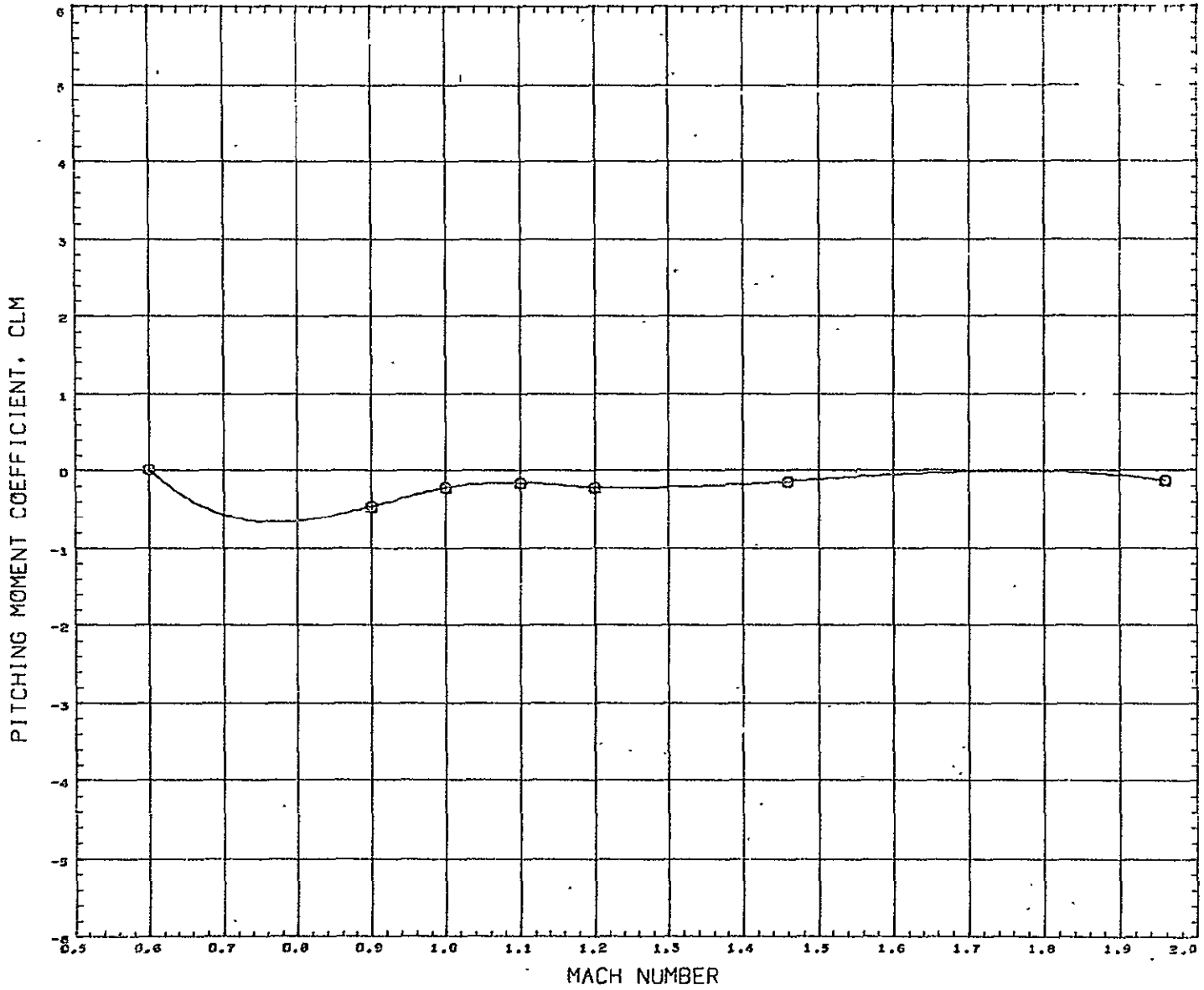

| SYMBOL | ALPHA | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| O | 0.000 | BETA | - 0.000 | ORBINC | - 2.000 |
| | | WNGINC | 4.000 | HTAIL | 0.000 |
| | | PHIB | 0.000 | | |

DATA HIST. CODE - VI

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, FINS OFF, ORBINC=-2.0




| SYMBOL | ALPHA |
|---|---|
| O | 0.000 |

PARAMETRIC VALUES

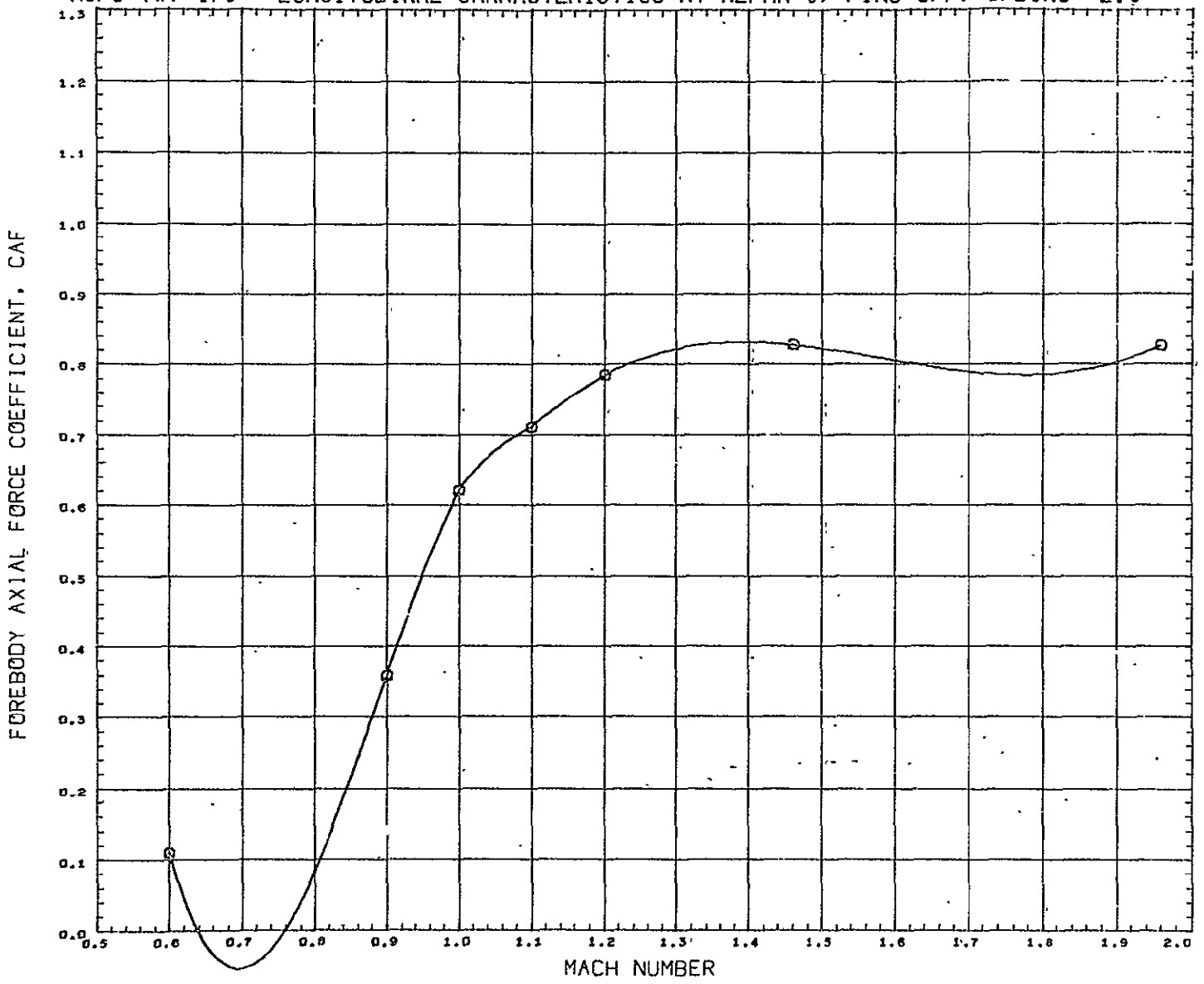
| | | | | | |
|---|---|---|---|---|---|
| DETA | - | 0.080 | ORBINC | - | 2.000 |
| WNGINC | | 4.000 | HTAIL | | 0.000 |
| PHIB | | 0.000 | | | |

DATA HIST. CODE VI

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, FINS OFF, ORBINC=-2.0



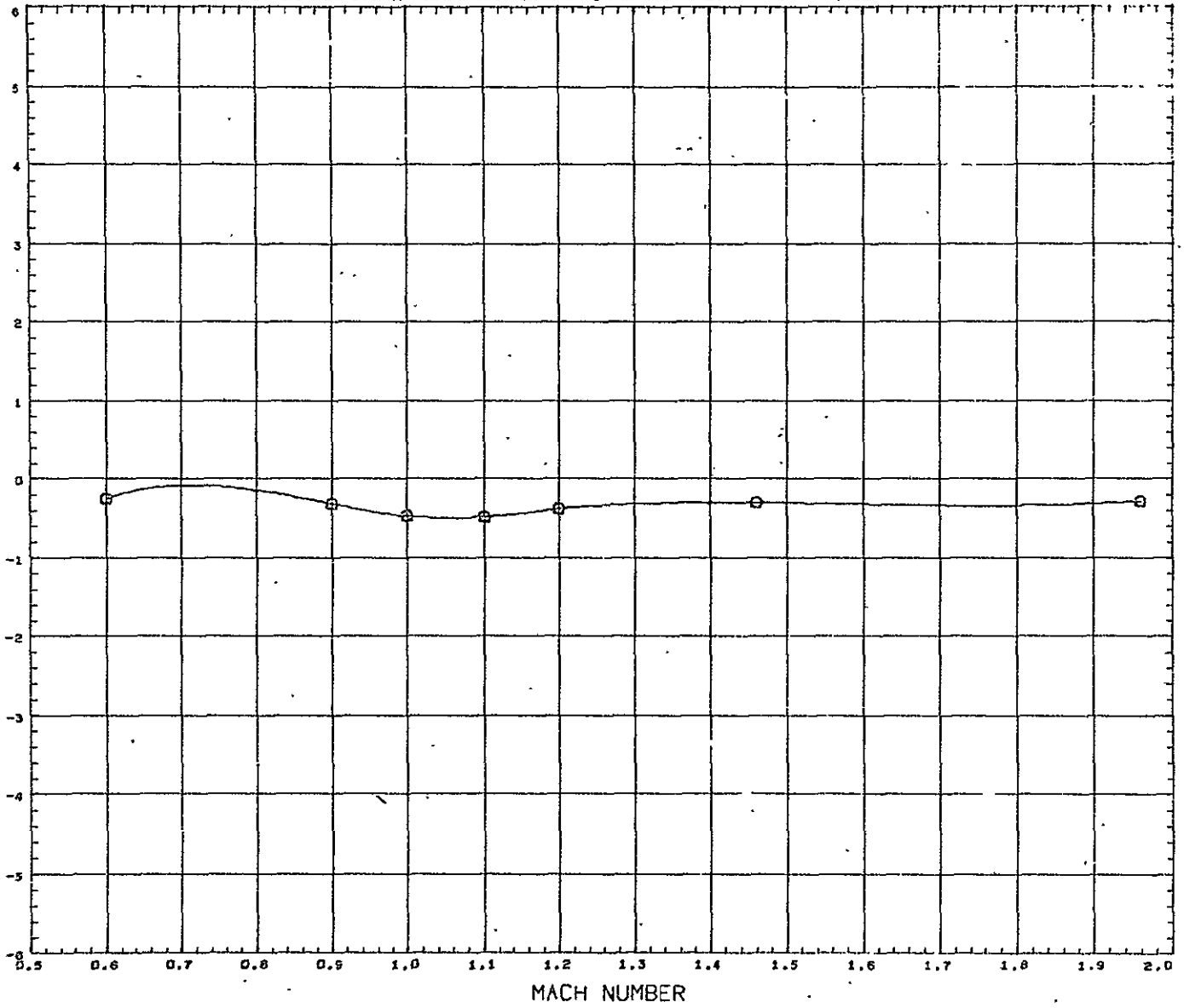

| SYMBOL | ALPHA | PARAMETRIC-VALUES | | | | |
|---|---|---|---|---|---|---|
| O | 0.000 | BETA | - 0.080 | ORBINC | - 2.000 | |
| | | WNGINC | 4.000 | HTAIL | 0.000 | |
| | | PHIB | 0.000 | | | |

DATA HIST. CODE - VI

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, FINS OFF, ORBINC=-4.0




| SYMBOL | ALPHA |
|---|---|
| O | 0.000 |

PARAMETRIC VALUES

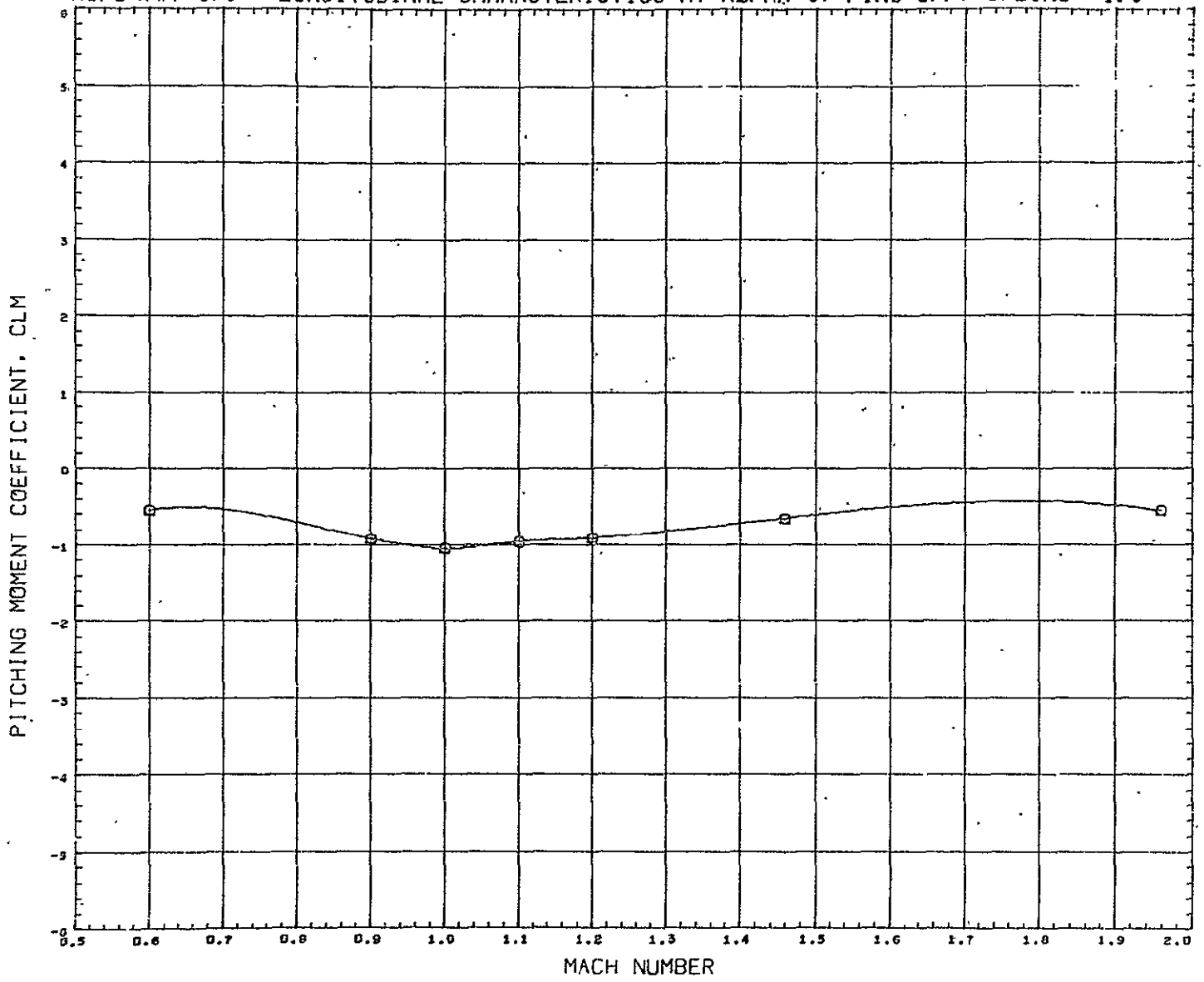
| | | | | | |
|---|---|---|---|---|---|
| BETA | - | 0.040 | ORBINC | - | 4.000 |
| WNGINC | | 4.000 | HTAIL | | 0.000 |
| PHID | | 0.000 | | | |

DATA HIST. CODE VI

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

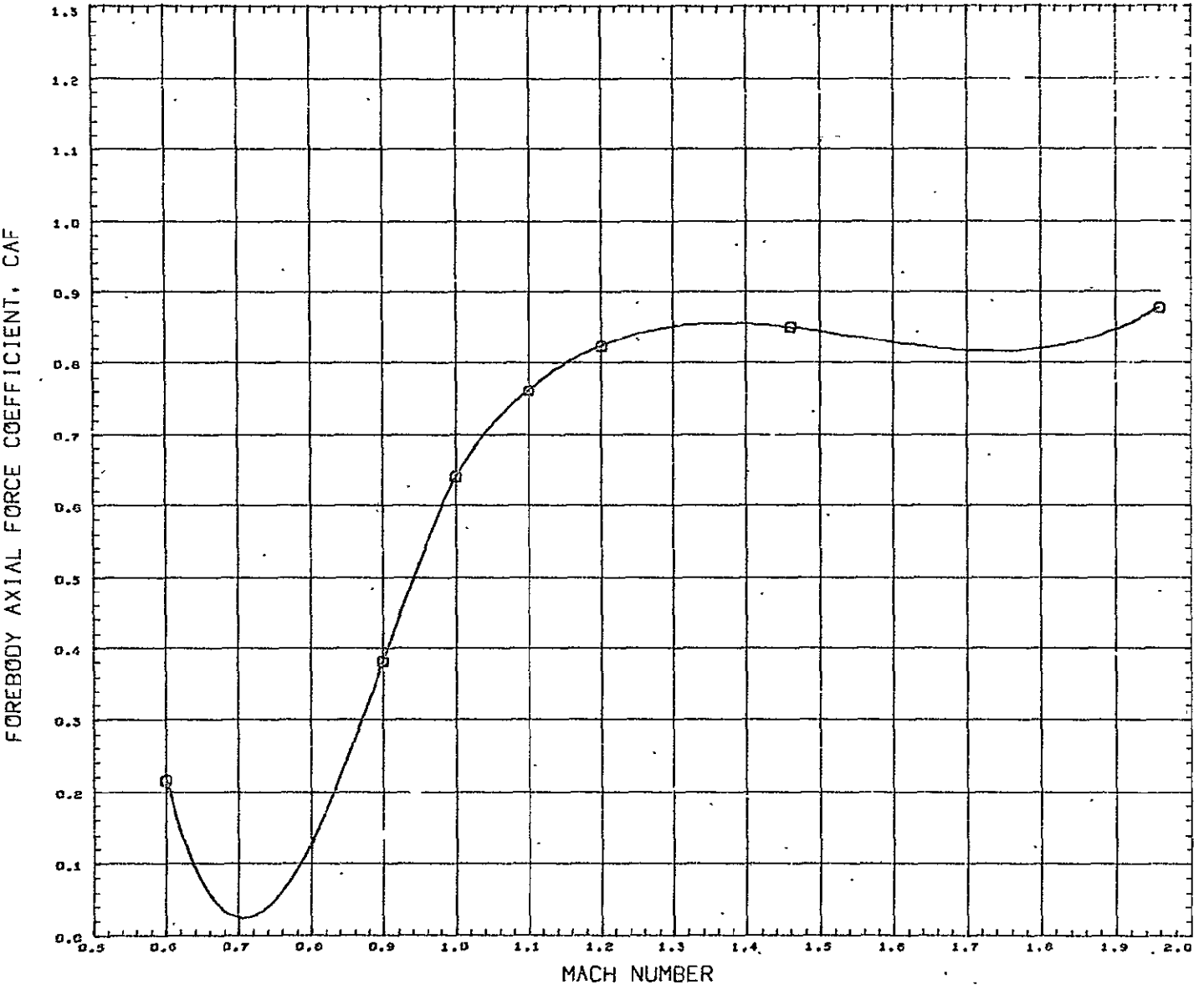
MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, FINS OFF, ORBINC=-4.0




| SYMBOL | ALPHA | PARAMETRIC VALUES | | | | REFERENCE INFORMATION | | |
|---|---|---|---|---|---|---|---|---|
| O | 0.000 | BETA | - 0.040 | ORBINC | - 4.000 | REFS | 1.3960 | SQ.IN. |
| | | WNGINC | 4.000 | HTAIL | 0.000 | REFL | 1.3330 | INCHES |
| | | PHIB | 0.000 | | | REFB | 1.3330 | INCHES |
| | | | | | | XMRP | 5.2640 | INCHES |
| | | | | | | YMRP | 0.0000 | INCHES |
| | | | | | | ZMRP | 0.0000 | INCHES |
| | | | | | | SCALE | 0.3366 | PERCNT |

DATA HIST. CODE VI

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, FINS OFF, ORBINC=-4.0

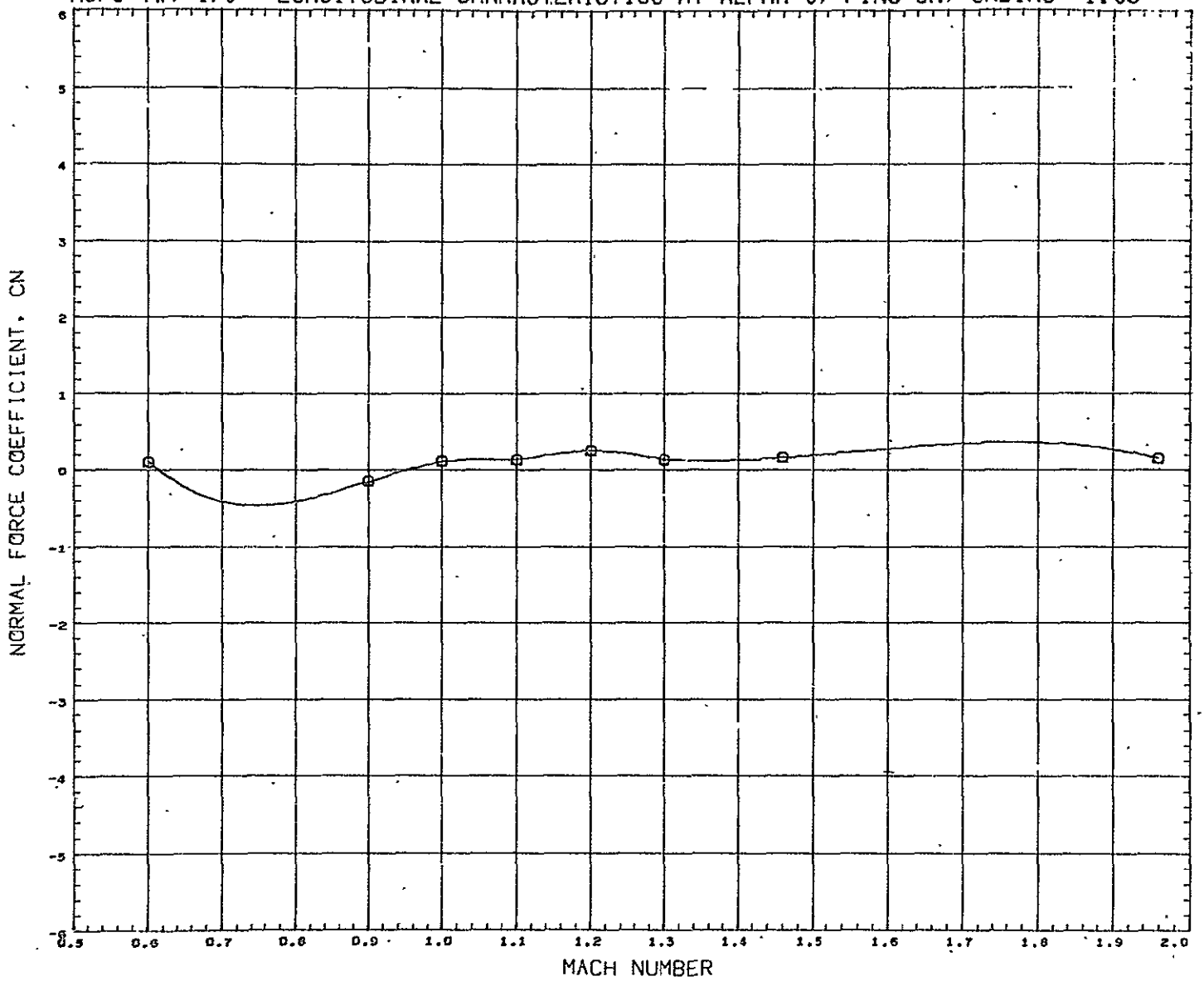



| SYMBOL | ALPHA | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| O | 0.000 | BETA | - 0.040 | ORBINC | - 4.000 |
| | | WNGINC | 4.000 | HTAIL | 0.000 |
| | | PHIB | 0.000 | | |

DATA HIST. CODE - VI

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, FINS ON, ORBINC=-1.05




| SYMBOL | ALPHA |
|---|---|
| O | 0.000 |

PARAMETRIC VALUES

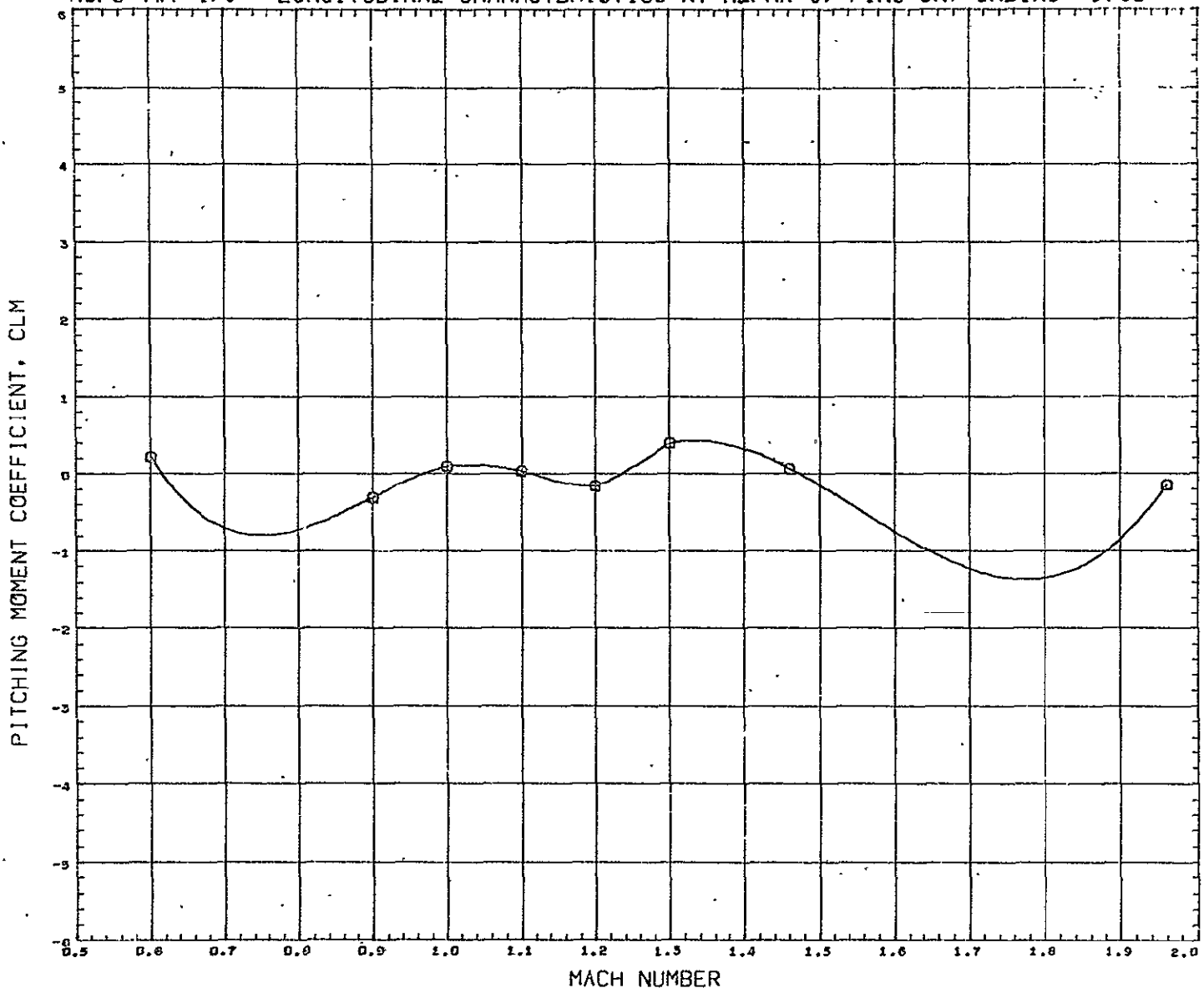
| | | | |
|---|---|---|---|
| BETA | - 0.050 | ORBINC | - 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE VI

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, FINS ON, ORBINC=-1.05

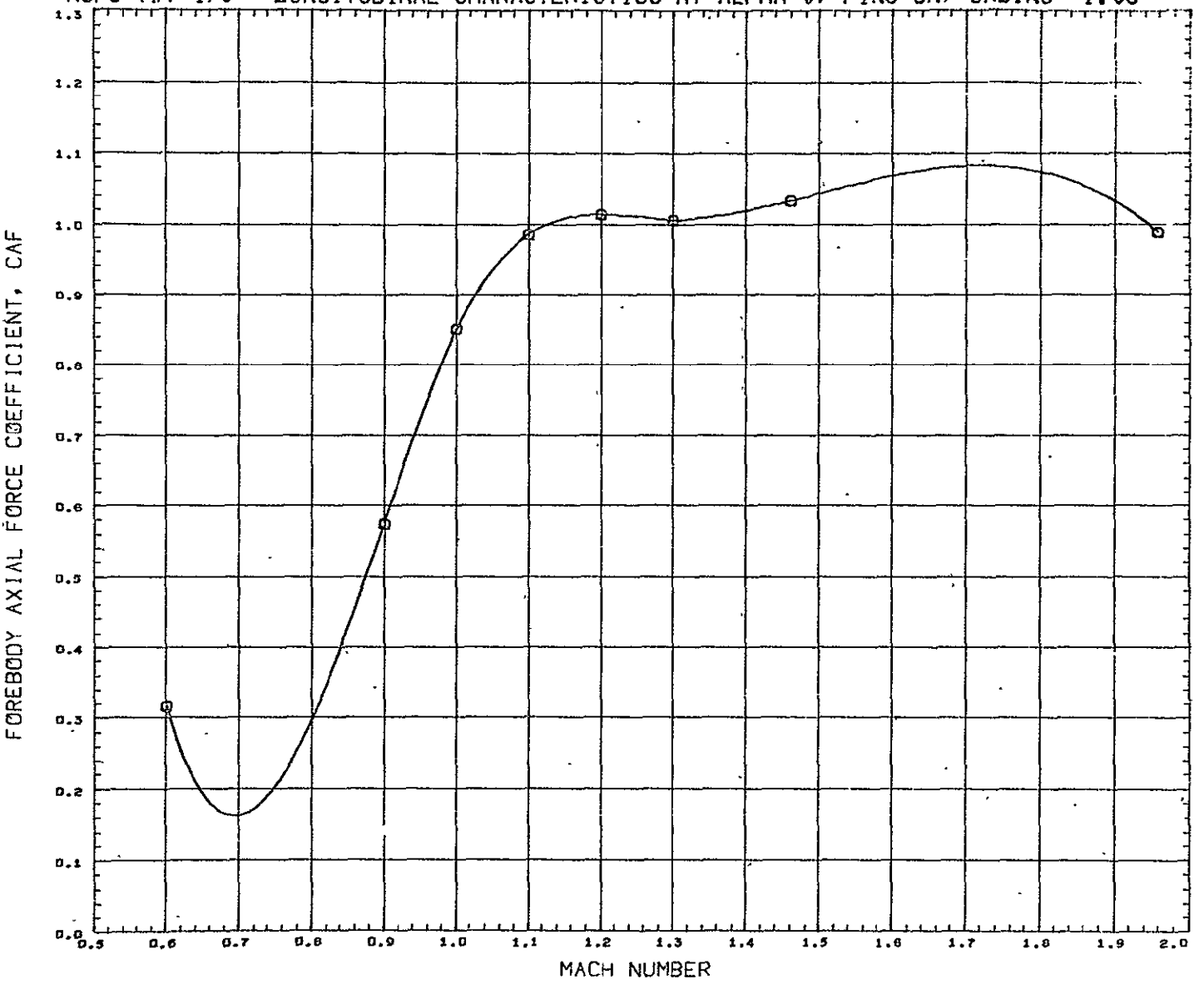



| SYMBOL | ALPHA | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| O | 0.000 | BETA | - 0.050 | ORBINC | - 1.050 | |
| | | WNGINC | 4.000 | HTAIL | 0.000 | |
| | | PHIB | 0.000 | | | |

DATA HIST. CODE VI

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, FINS ON, ORBINC=-1.05

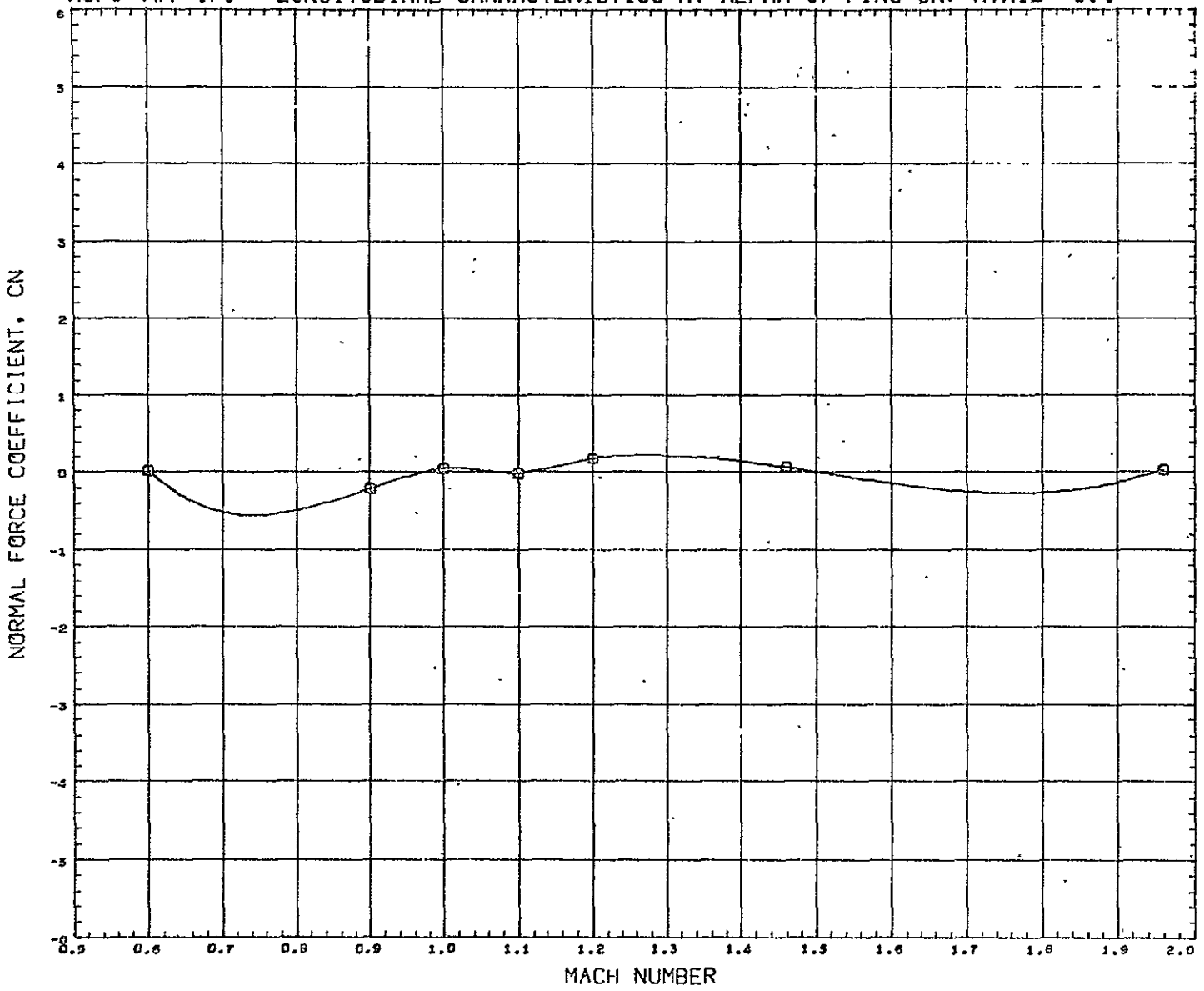



| SYMBOL | ALPHA | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| O | 0.000 | BETA | - 0.050 | ORBINC | - 1.050 |
| | | WHGINC | 4.000 | HTAIL | 0.000 |
| | | PHIB | 0.000 | | |

DATA HIST. CODE VI

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, FINS ON, HTAIL=-5.0

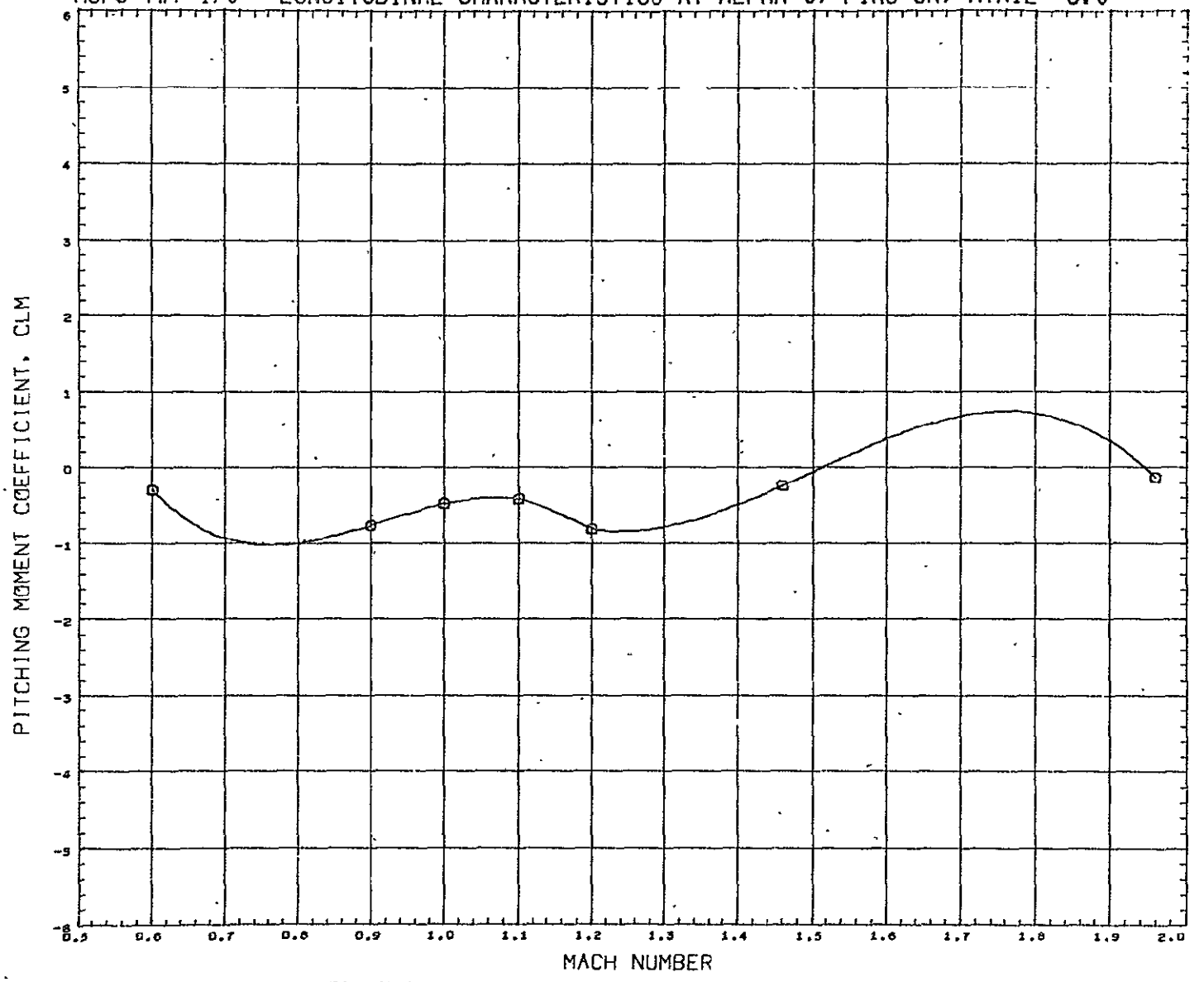



| SYMBOL | ALPHA | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| O | 0.000 | BETA | - 0.020 | ORBINC | - 1.050 | |
| | | WHGINC | 4.000 | HTAIL | - 5.000 | |
| | | PHIB | 0.000 | | | |

DATA HIST. CODE VI

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, FINS ON, HTAIL=-5.0




| SYMBOL | ALPHA |
|---|---|
| O | 0.000 |

PARAMETRIC VALUES

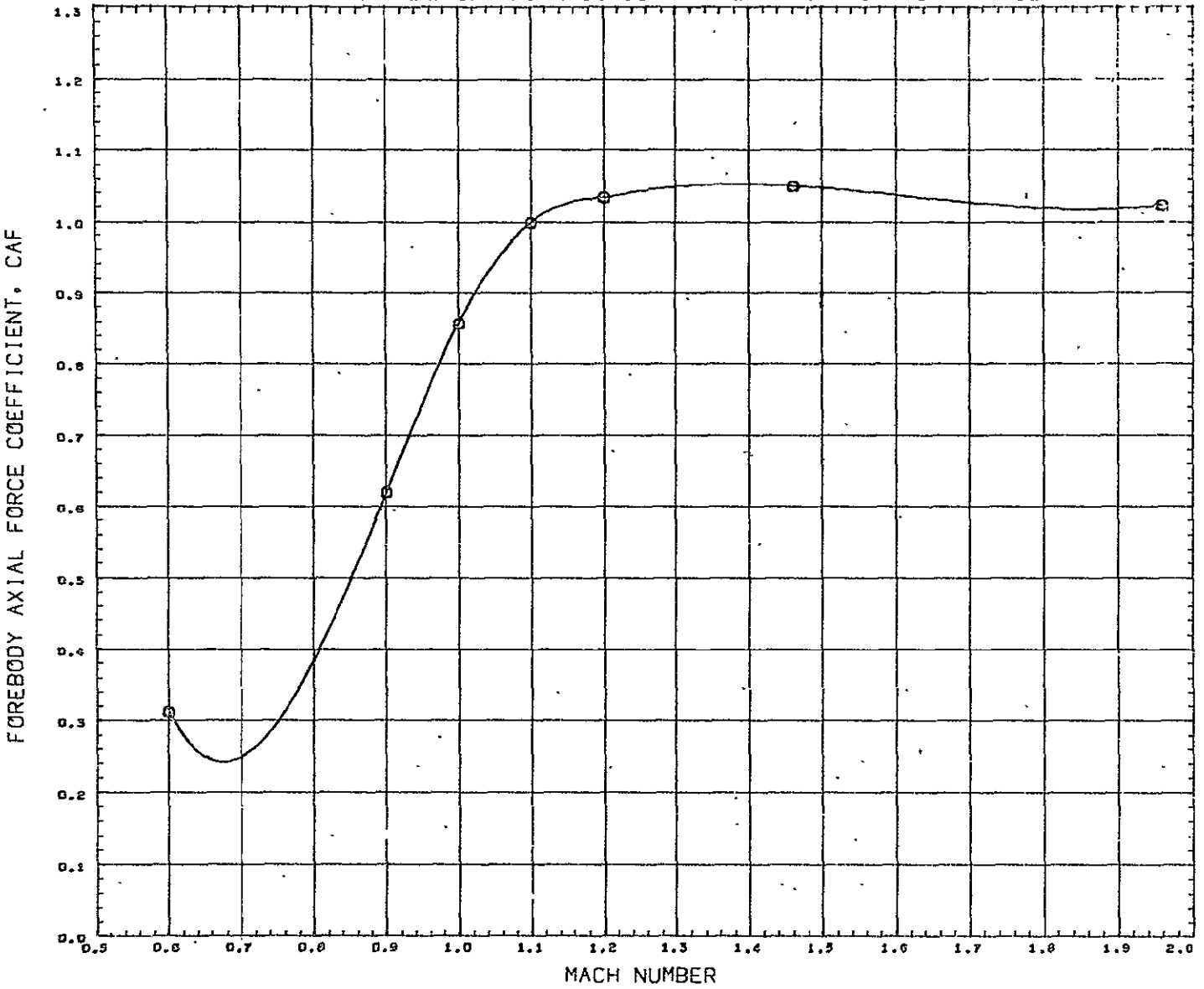
| | | | |
|---|---|---|---|
| BETA | - 0.020 | ORBINC | - 1.050 |
| WNGINC | 4.000 | HTAIL | -- 5.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE VI

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, FINS ON, HTAIL=-5.0

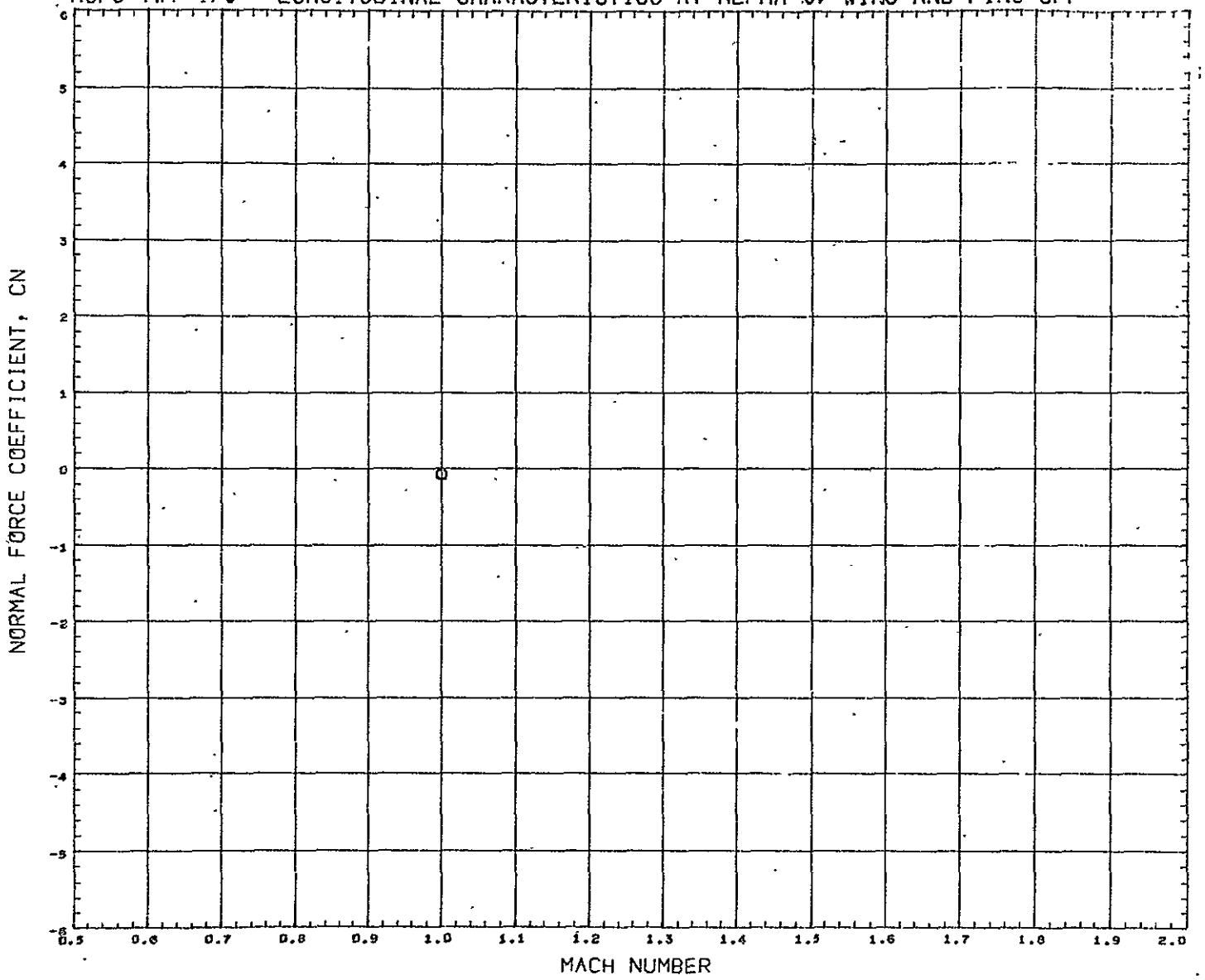



| SYMBOL | ALPHA | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| O | 0.000 | BETA | - 0.020 | ORBINC | - 1.050 | |
| | | WNGINC | 4.000 | HTAIL | - 5.000 | |
| | | PHIB | 0.000 | | | |

DATA HIST. CODE VJ

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, WING AND FINS OFF



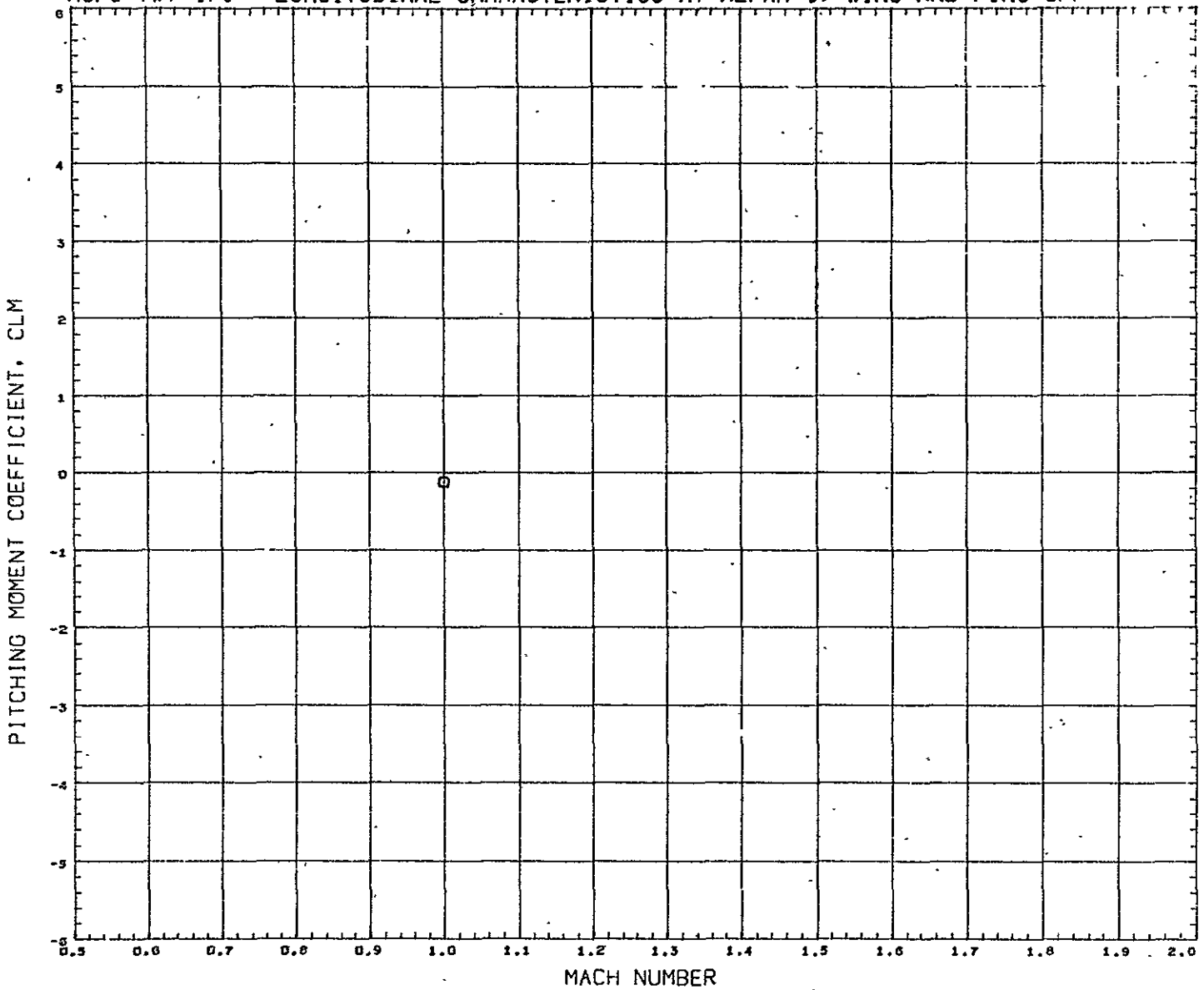

| SYMBOL | ALPHA | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| O | 0.000 | BETA | - 0.100 | ORBINC | - 1.050 | |
| | | HTAIL | 0.000 | PHIB | 0.000 | |

DATA HIST. CODE VI

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, WING AND FINS OFF

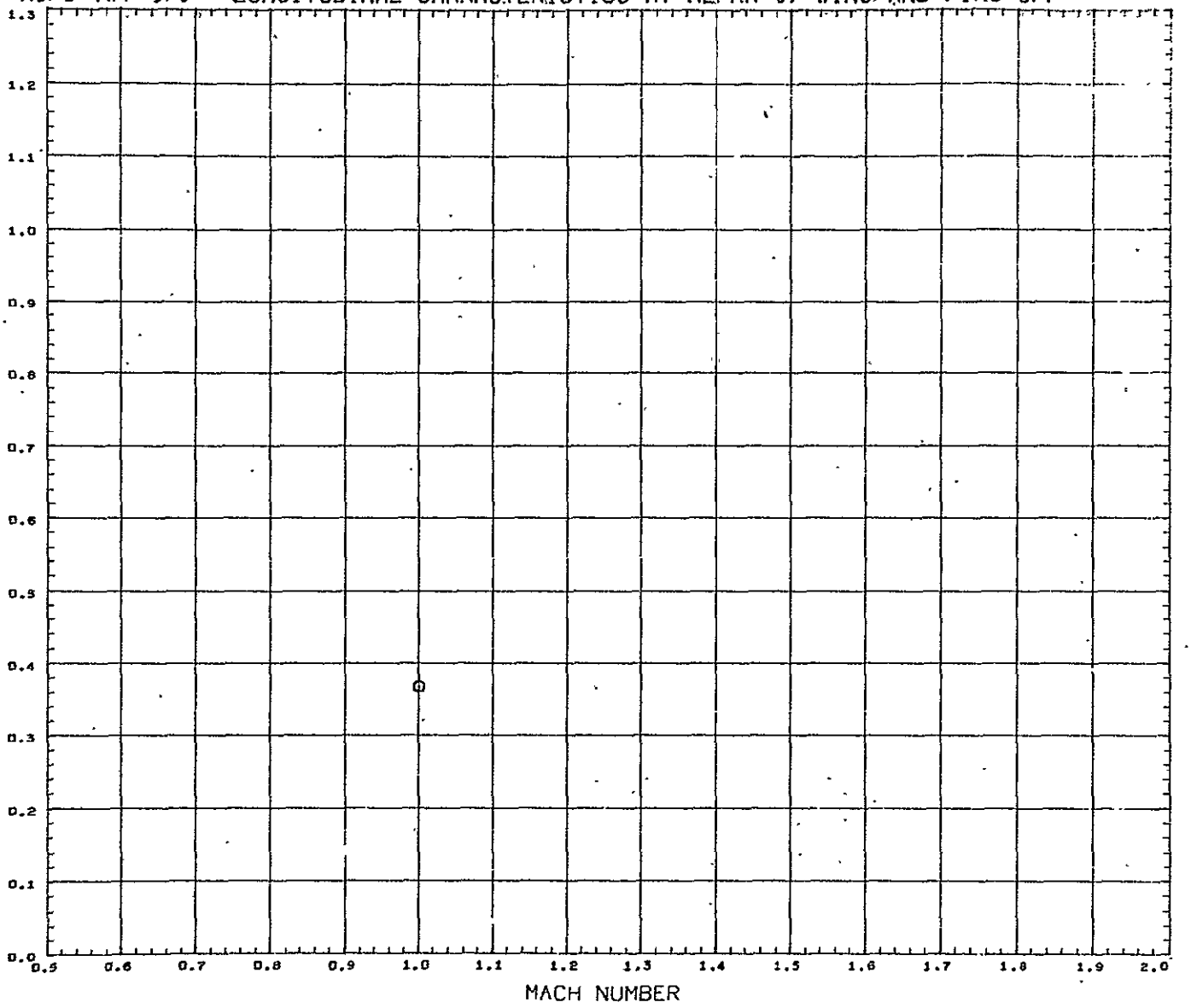



| SYMBOL | ALPHA | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| O | 0.000 | BETA | - 0.100 | ORBINC | - 1.050 | |
| | | HTAIL | 0.000 | PHIB | 0.000 | |

DATA HIST. CODE VI

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, WING AND FINS OFF



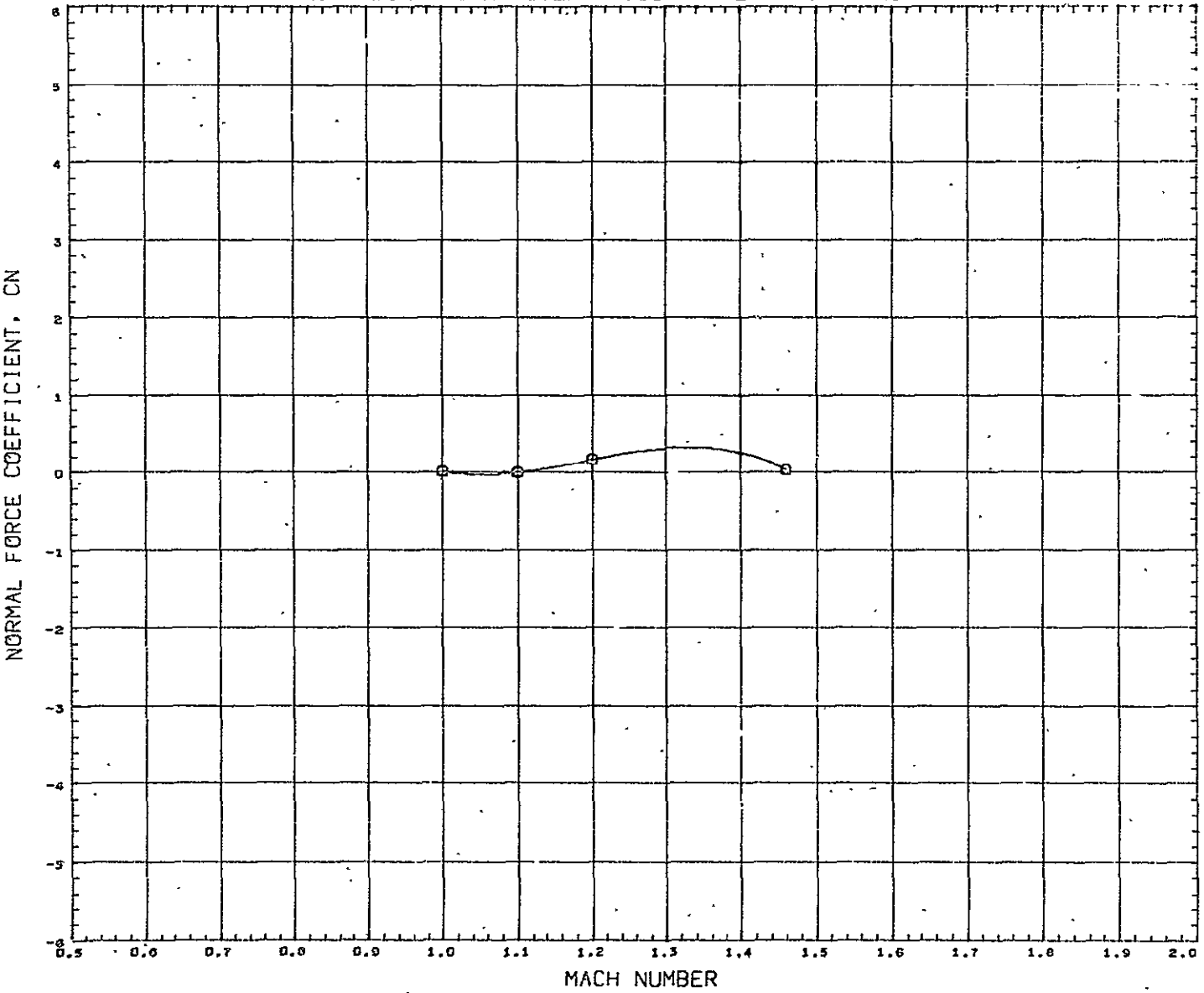

| SYMBOL | ALPHA | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| O | 0.000 | BETA | - 0.100 | ORBINC | - 1.050 |
| | | HTAIL | 0.000 | PHIB | 0.000 |

DATA HIST. CODE VI

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, WING OFF

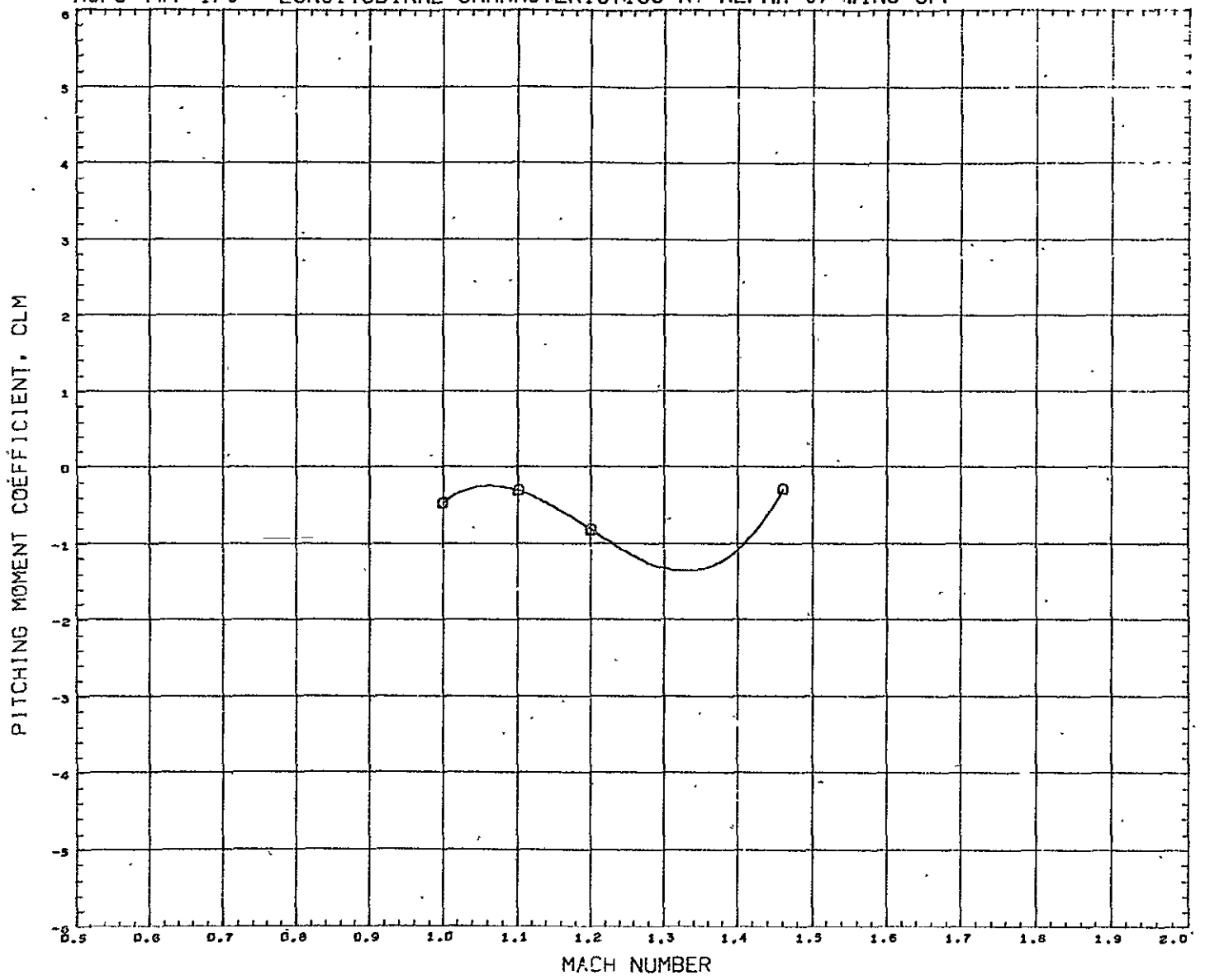



| SYMBOL | ALPHA | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| O | 0.000 | BETA | - | 0.100 | ORBINC | - 1.050 |
| | | HTAIL | | 0.000 | PHIB | 0.000 |

DATA HIST. CODE VI

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

# MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, WING OFF



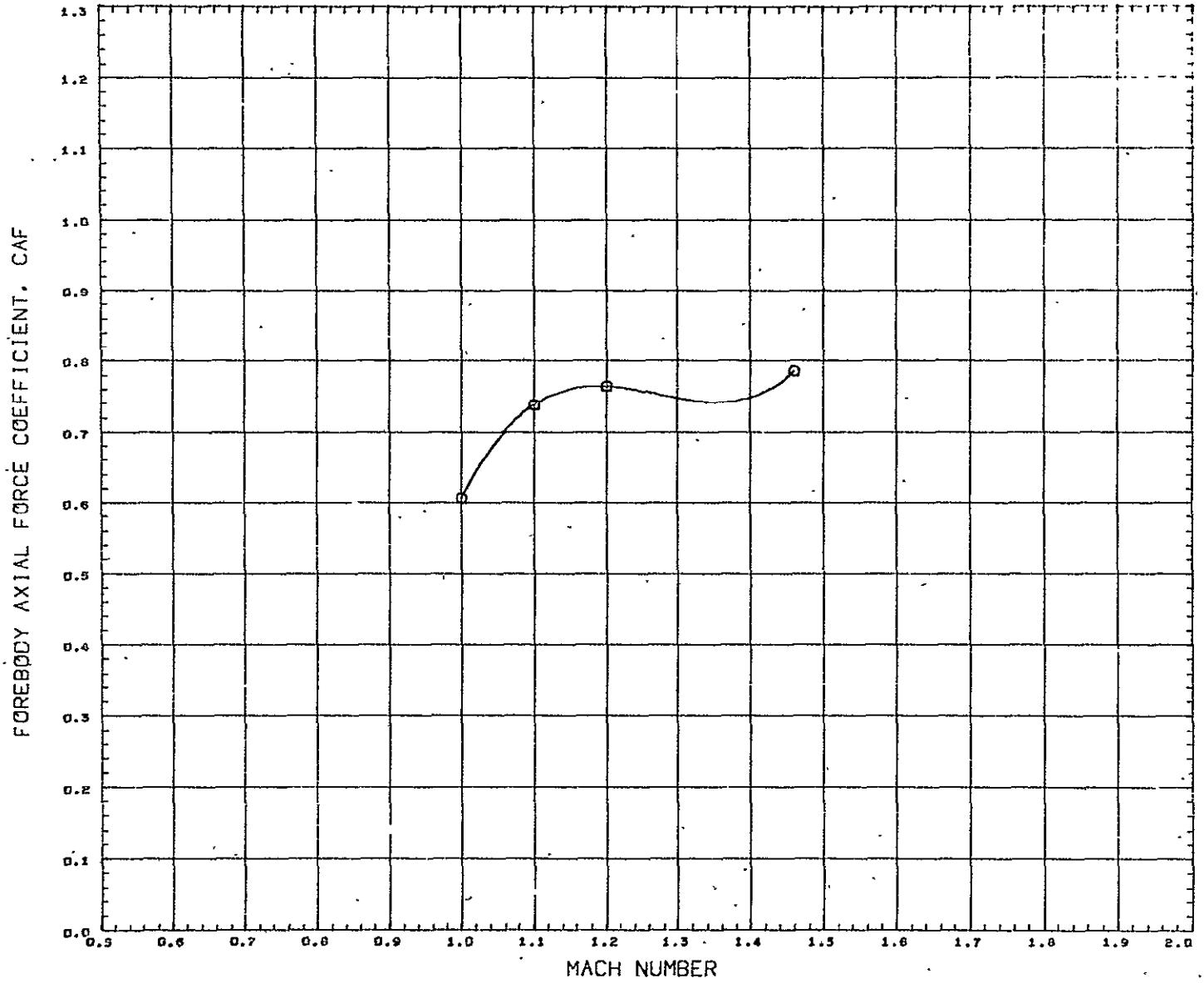

| SYMBOL | ALPHA | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| O | 0.000 | BETA | - 0.100 | ORBINC | - 1.050 |
| | | MTAIL | 0.000 | PHIB | 0.000 |

DATA HIST. CODE V1

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, WING OFF

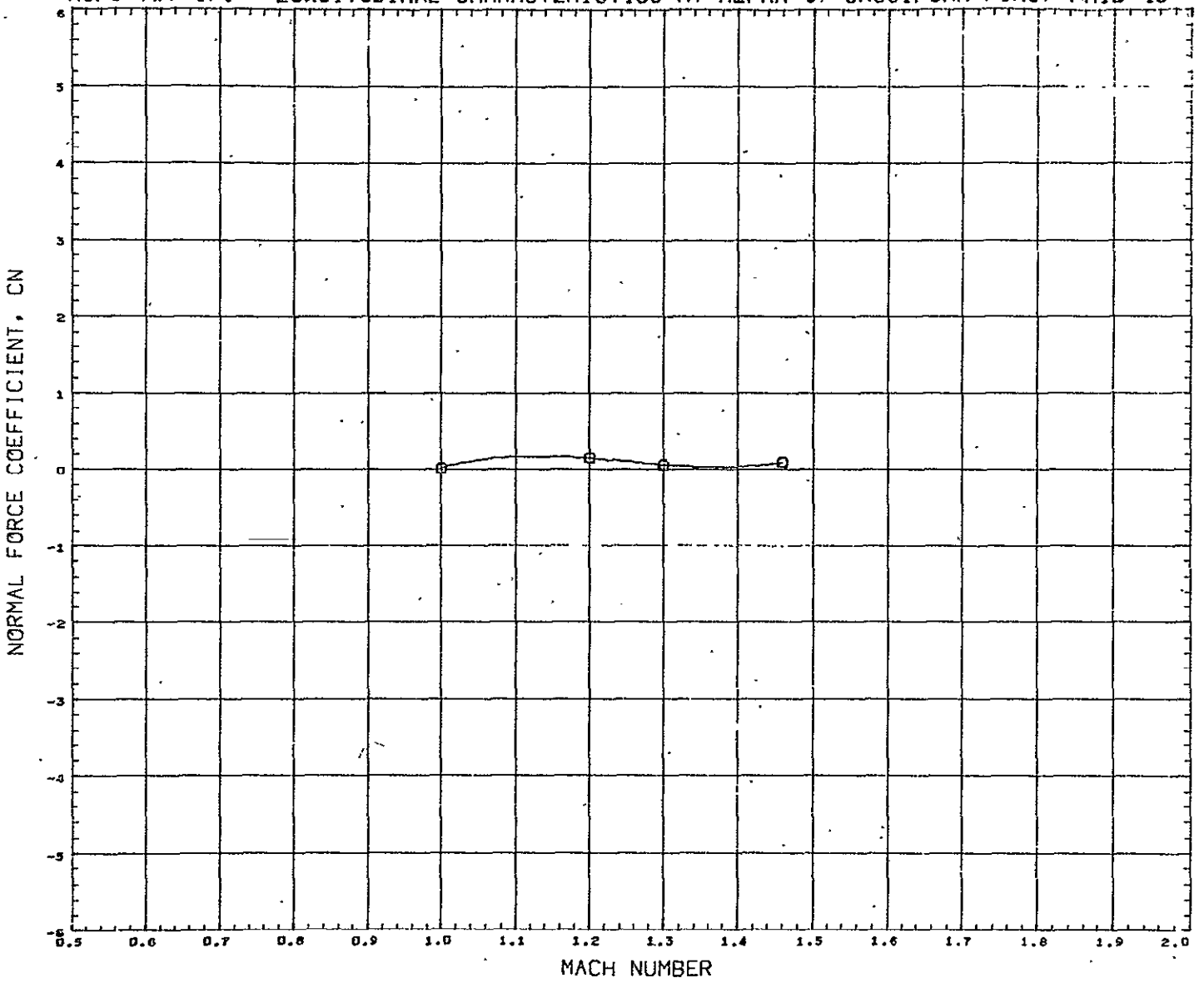



| SYMBOL | ALPHA | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| O | 0.000 | BETA | - 0.100 | ORBINC | - 1.050 |
| | | HTAIL | 0.000 | FNIB | 0.000 |

DATA HIST. CODE VI

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, CRUCIFORM FINS, PHIB=45

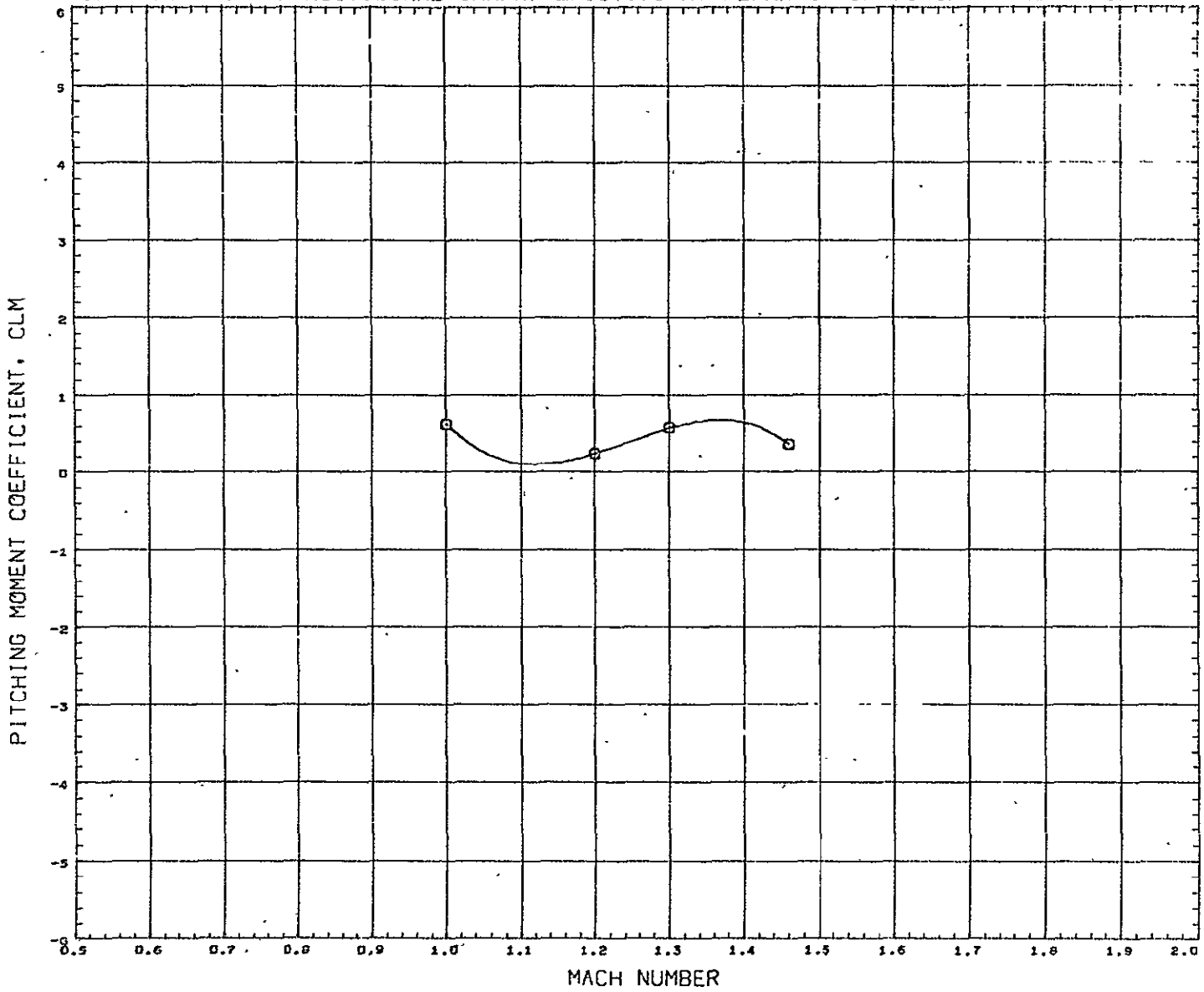



| SYMBOL | ALPHA | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| O | 0.000 | BETA | - 0.070 | ORBINC | - 1.050 |
| | | WNGINC | 4.000 | HTAIL | 0.000 |
| | | PHIB | 45.000 | | |

DATA HIST. CODE VI

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LØNGITUDINAL CHARACTERISTICS AT ALPHA=0, CRUCIFØRM FINS, PHIB=45

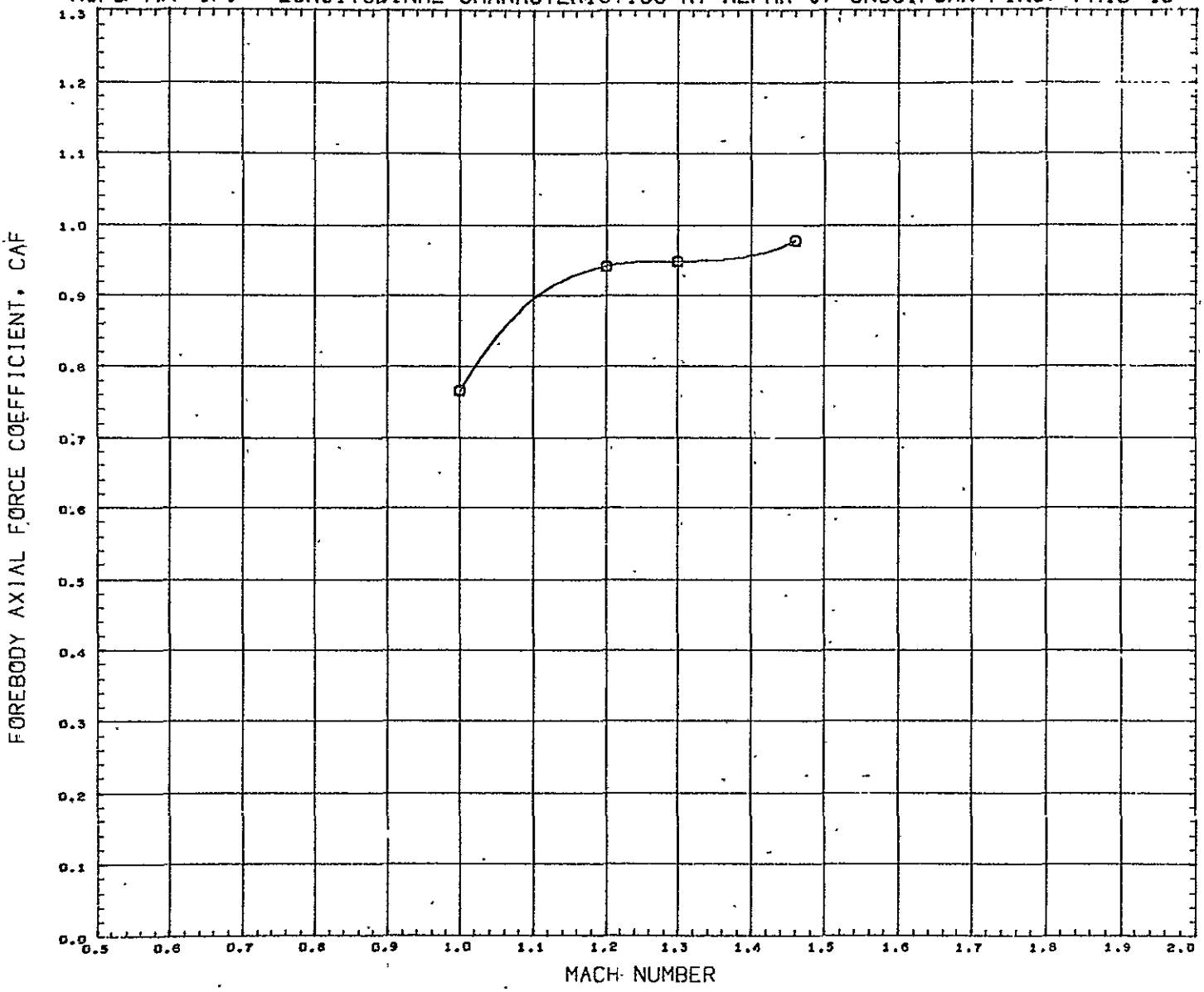



| SYMBOL | ALPHA | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| O | 0.000 | BETA | - 0.070 | ORBINC | - 1.050 |
| | | WNGINC | 4.000 | HTAIL | 0.000 |
| | | PHIB | 45.000 | | |

DATA HIST. CODE VI

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0; CRUCIFORM FINS, PHIB=45




| SYMBOL | ALPHA |
|---|---|
| O | 0.000 |

PARAMETRIC VALUES

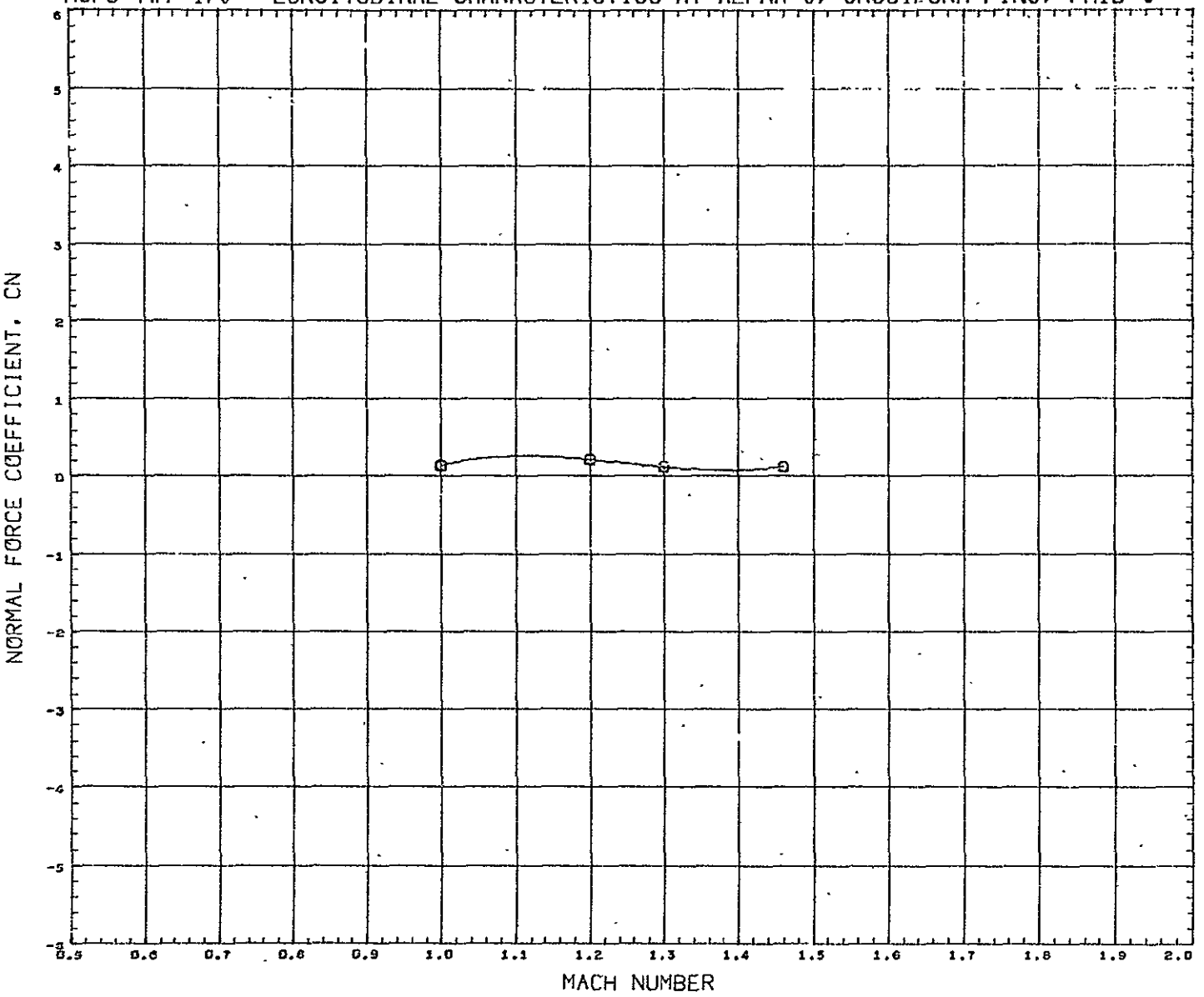
| | | | |
|---|---|---|---|
| BETA | - 0.070 | ORBINC | - 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 45.000 | | |

DATA HIST. CODE VI

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, CRUCIFORM FINS, PHIB=0

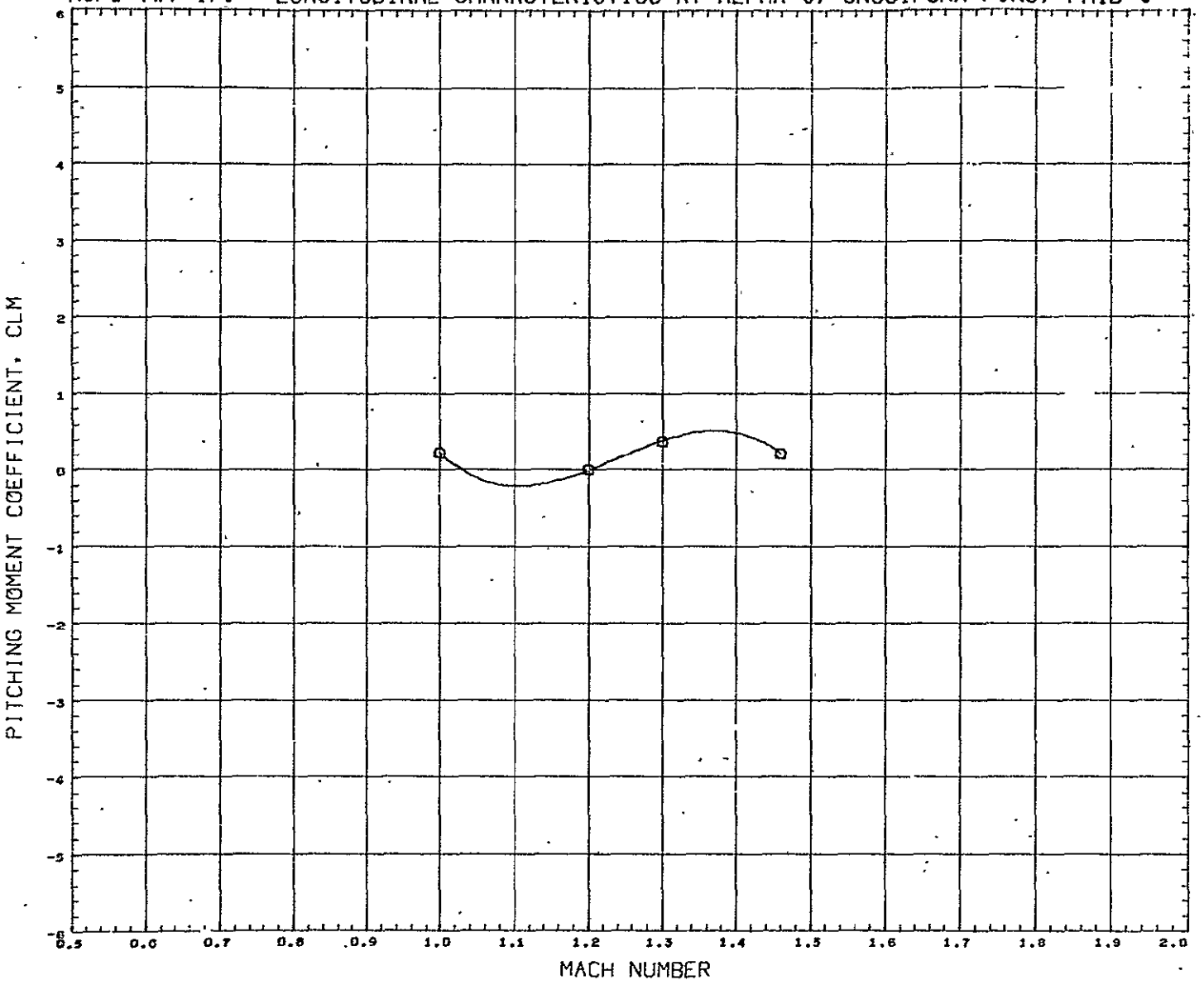



| SYMBOL | ALPHA | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| O | 0.000 | BETA | - 0.060 | ORBINC | - 1.050 | |
| | | WNGINC | 4.000 | HTAIL | 0.000 | |
| | | PHIB | 0.000 | | | |

DATA HIST. CODE VI

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, CRUCIFORM FINS, PHIB=0

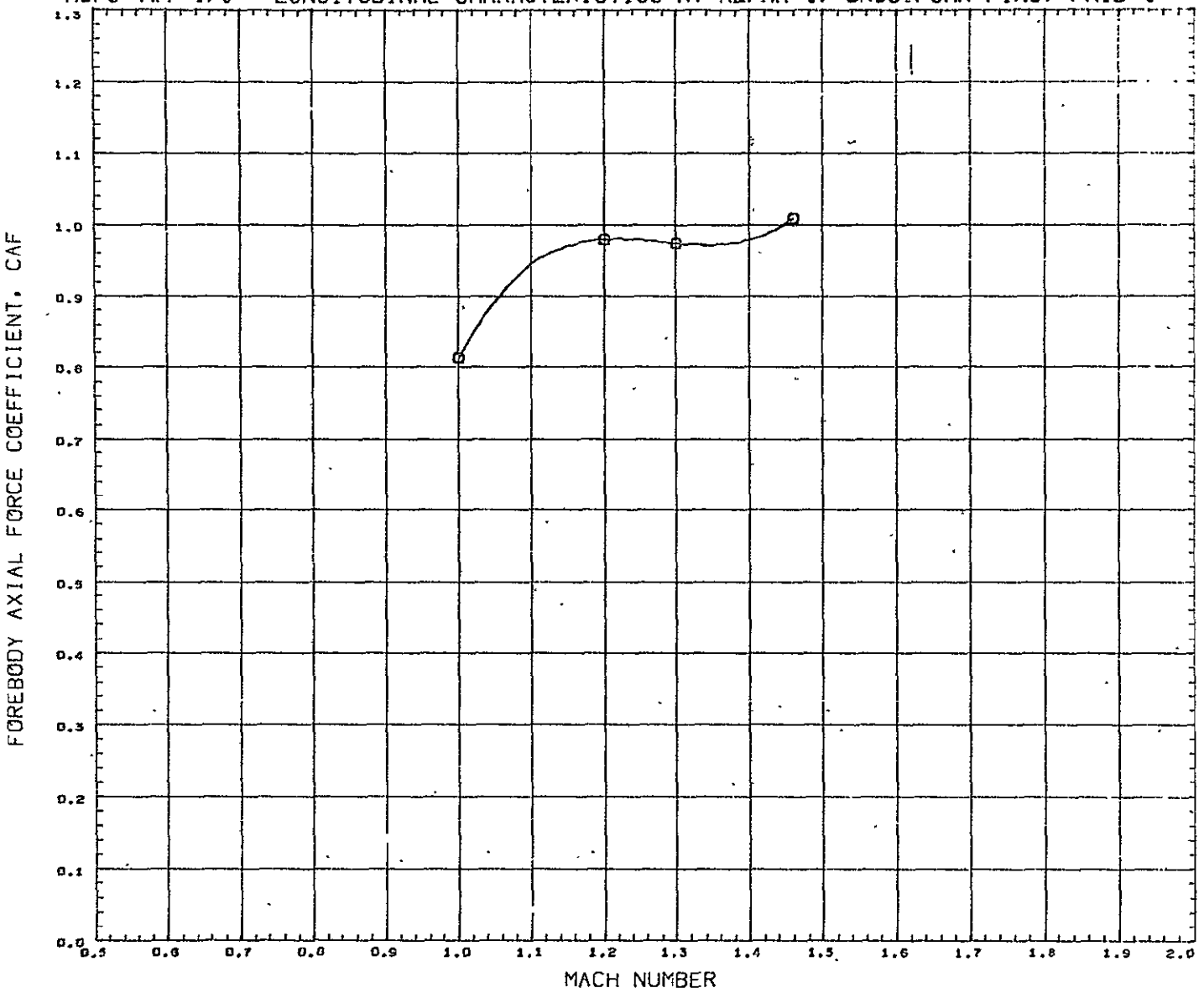



| SYMBOL | ALPHA | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| O | 0.000 | BETA | - 0.060 | ORBINC | - 1.050 | |
| | | WHGINC | 4.000 | HTAIL | 0.000 | |
| | | PHIB | 0.000 | | | |

DATA HIST. CODE VI

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, CRUCIFORM FINS, PHIB=0

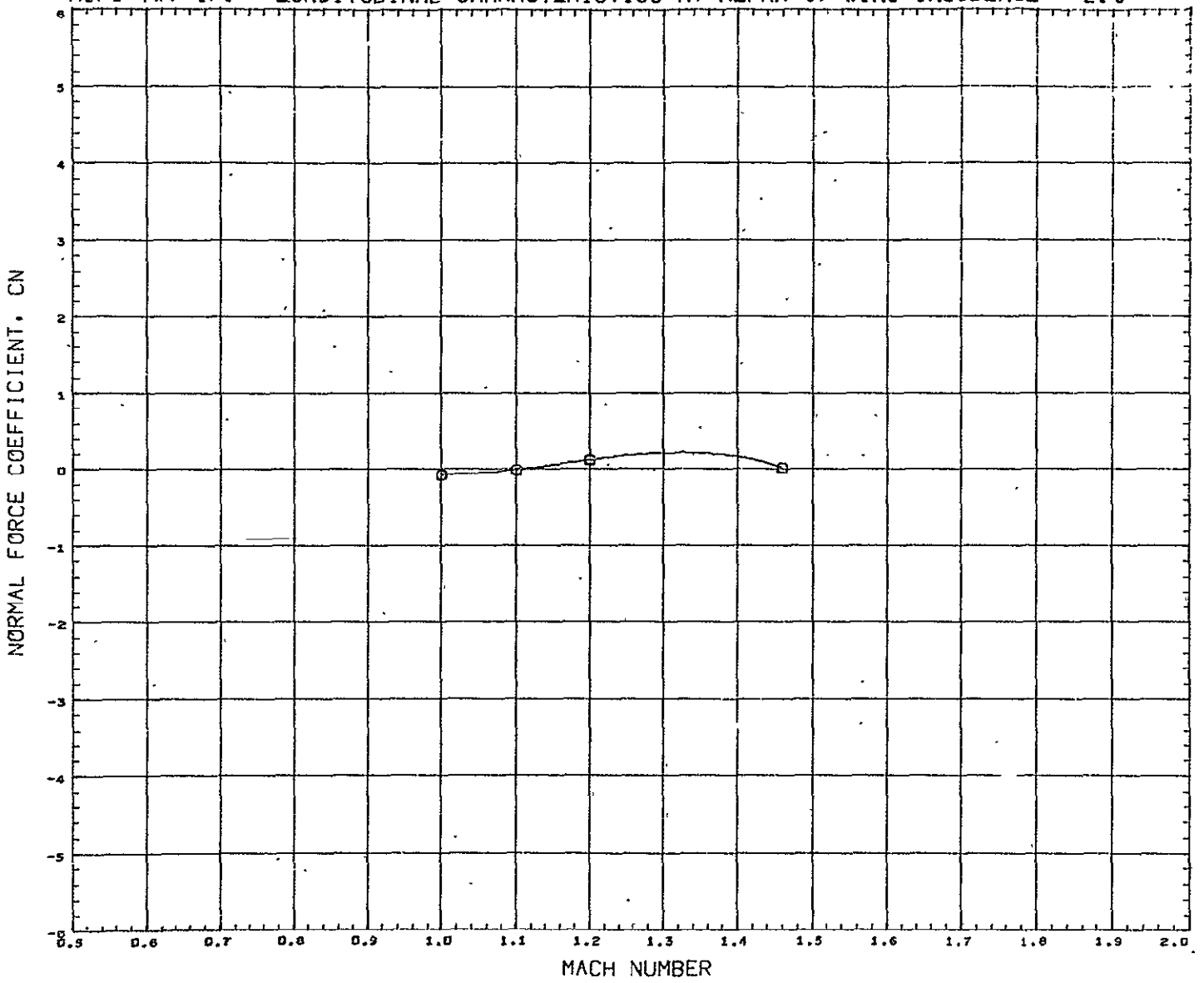



| SYMBOL | ALPHA | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| O | 0.000 | BETA | - 0.060 | ORBINC | - 1.050 |
| | | WNGINC | 4.000 | HTAIL | 0.000 |
| | | PHIB | 0.000 | | |

DATA HIST. CODE VI

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, WING INCIDENCE = 2.0




| SYMBOL | ALPHA |
|---|---|
| O | 0.000 |

PARAMETRIC VALUES

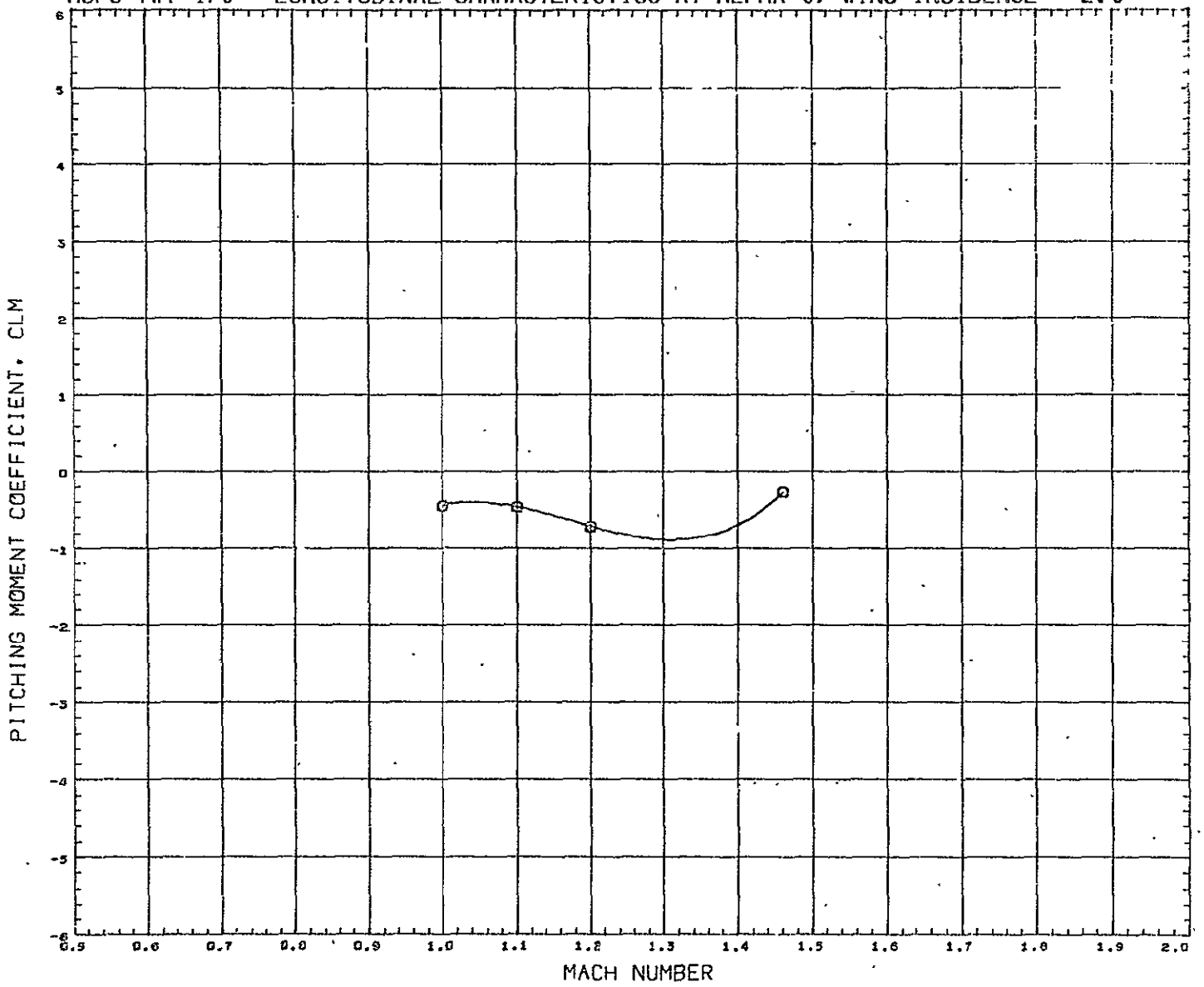
| | | | |
|---|---|---|---|
| BETA | - 0.090 | ORBINC | - 1.050 |
| WNGINC | 2.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE VI

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, WING INCIDENCE = 2.0

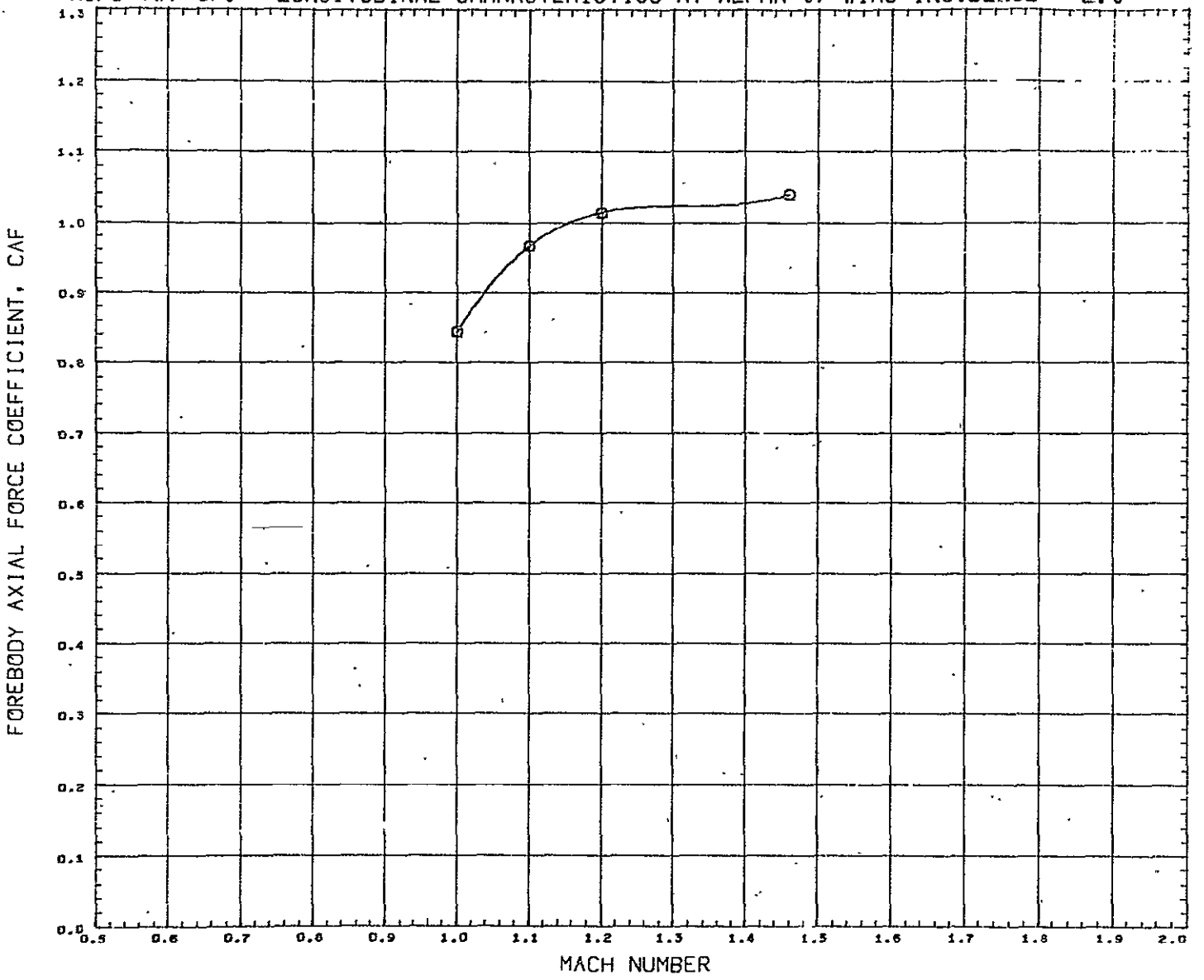



| SYMBOL | ALPHA | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| O | 0.000 | BETA | - 0.090 | ORDINC | - 1.050 |
| | | WNGINC | 2.000 | HTAIL | 0.000 |
| | | PHIB | 0.000 | | |

DATA HIST. CODE VI

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, WING INCIDENCE = 2.0




| SYMBOL | ALPHA |
|---|---|
| O | 0.000 |

PARAMETRIC VALUES

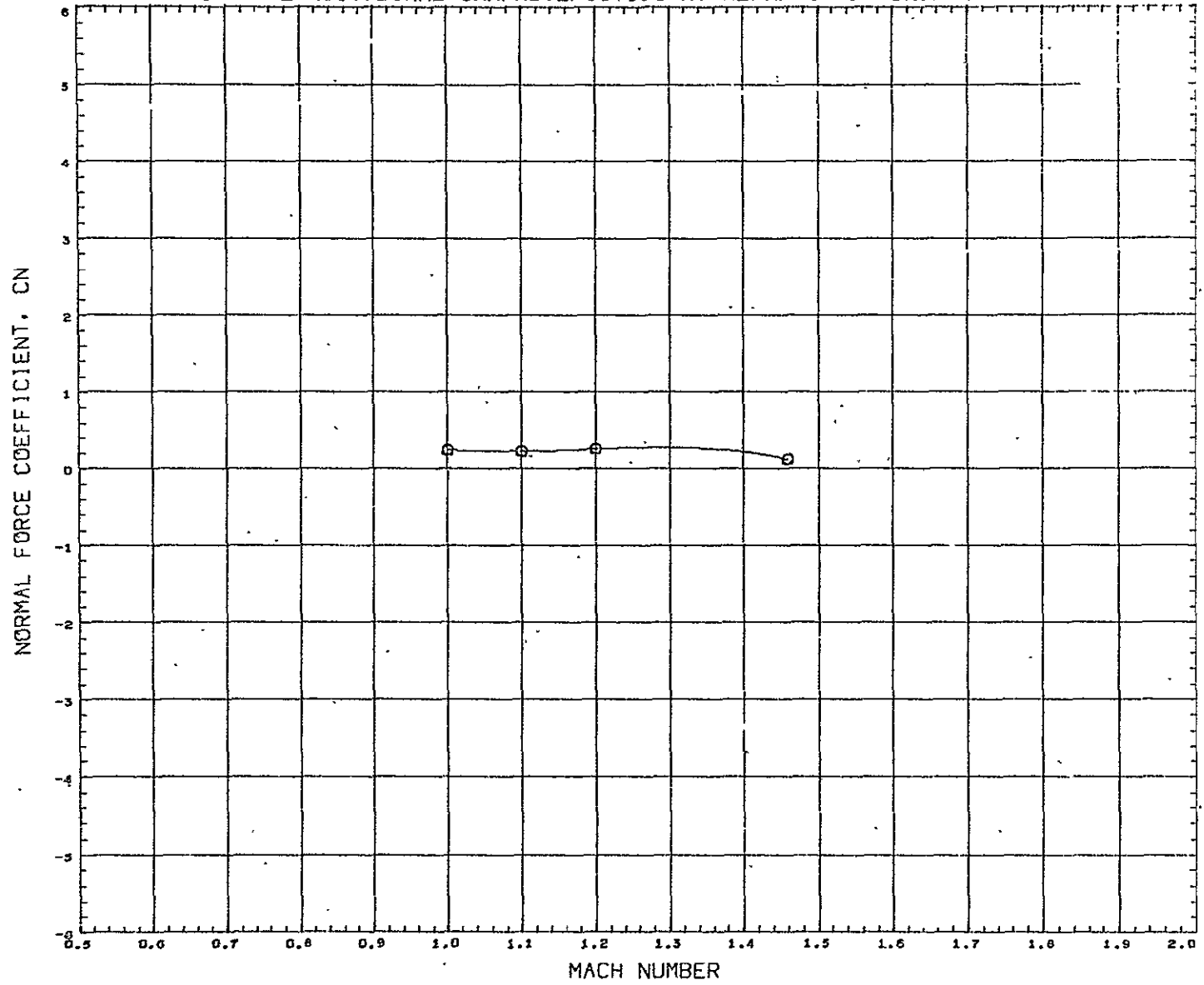
| | | | |
|---|---|---|---|
| BETA | - 0.090 | ORBINC | - 1.050 |
| WNGINC | 2.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE V1

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

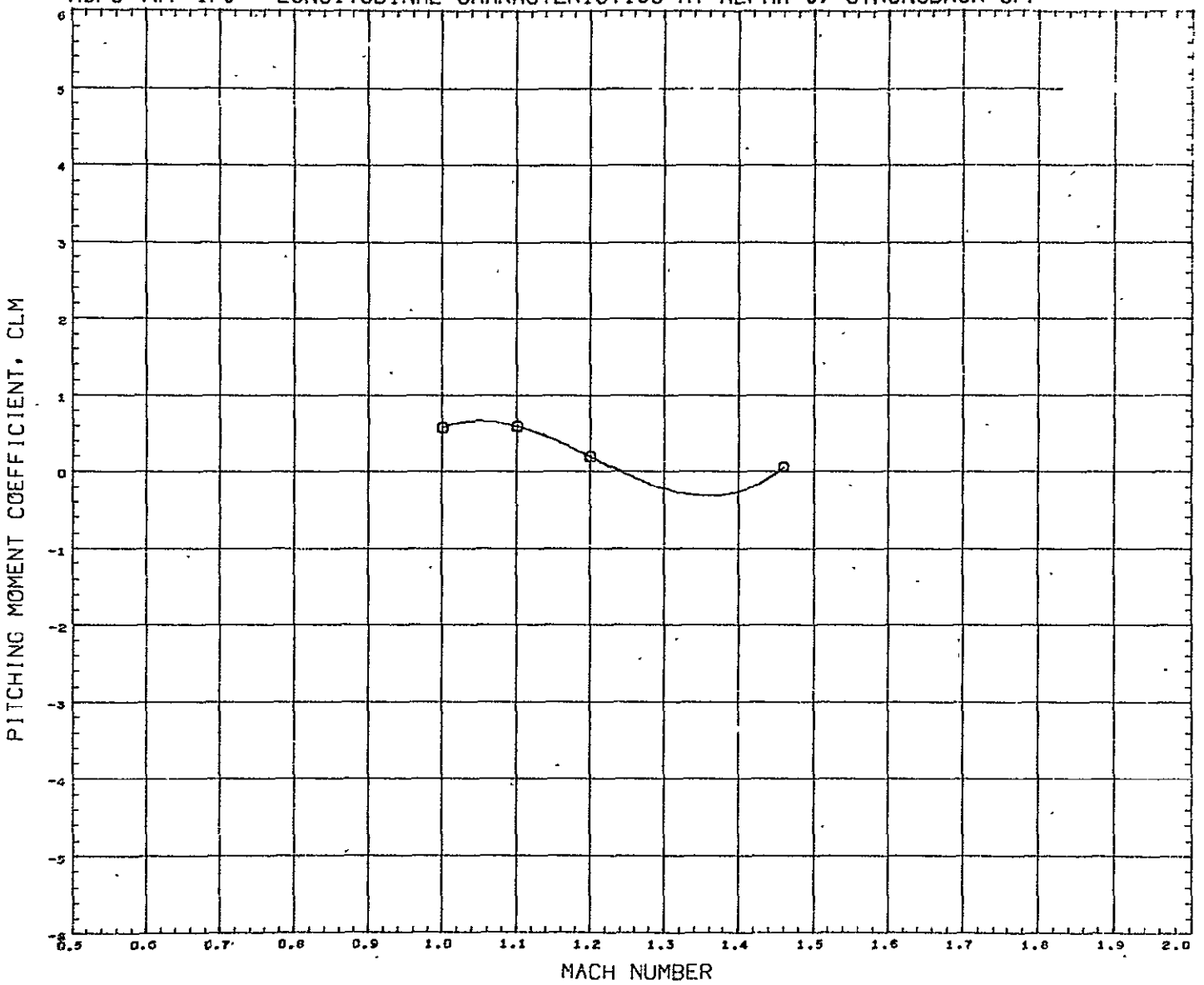
MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, STRONGBACK OFF




| SYMBOL | ALPHA | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| O | 0.000 | BETA | - 0.040 | ORBINC | - 1.050 | |
| | | WNGINC | 4.000 | HTAIL | 0.000 | |
| | | PHIB | 0.000 | | | |
| | | DATA HIST. CODE | VI | | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, STRONGBACK OFF




| SYMBOL | ALPHA |
|---|---|
| O | 0.000 |

PARAMETRIC VALUES

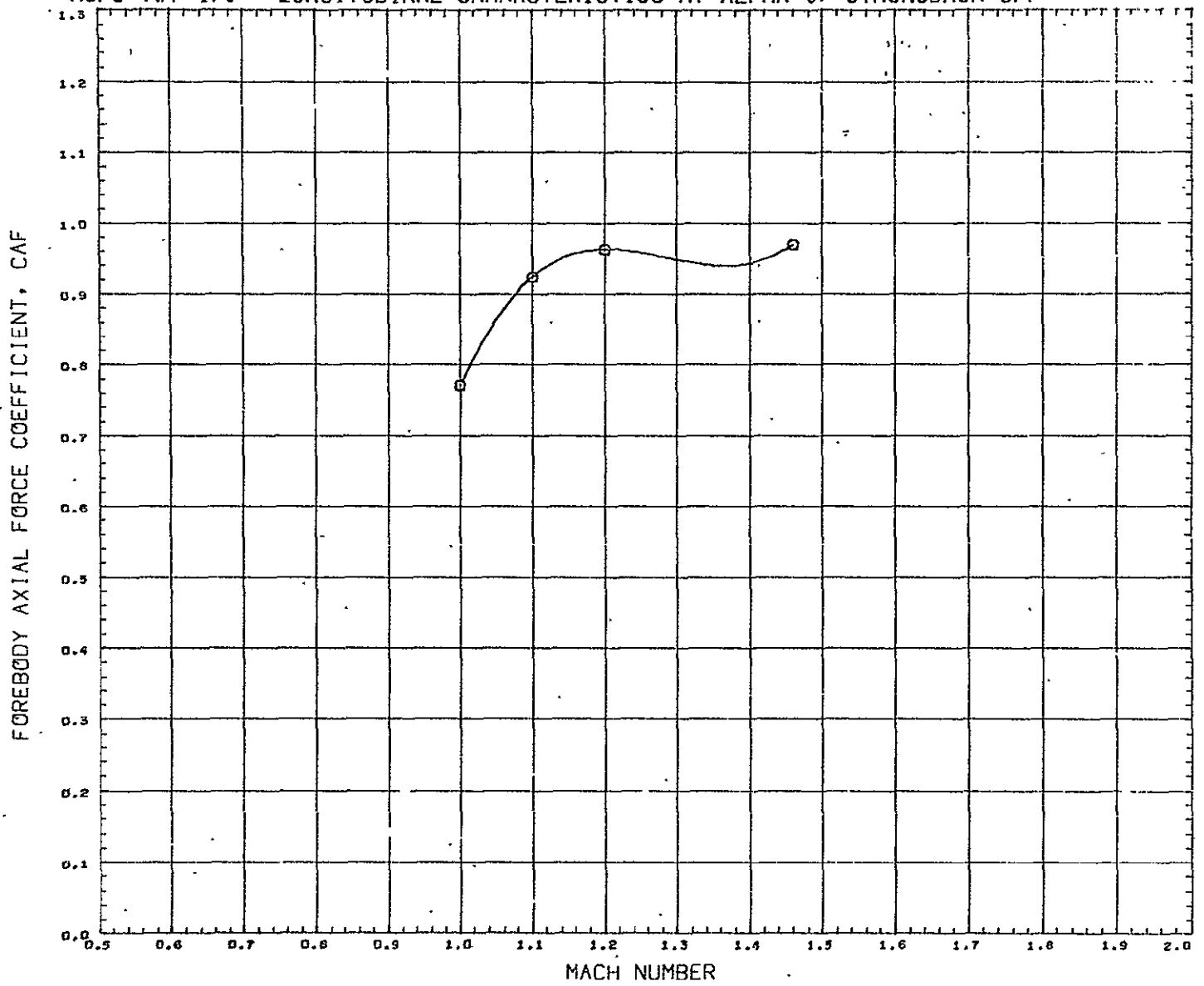
| | | | | | |
|---|---|---|---|---|---|
| BETA | - | 0.040 | ORBINC | - | 1.050 |
| WNGINC | | 4.000 | HTAIL | | 0.000 |
| PHIB. | | 0.000 | | | |

DATA HIST. CODE VI

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, STRONGBACK OFF

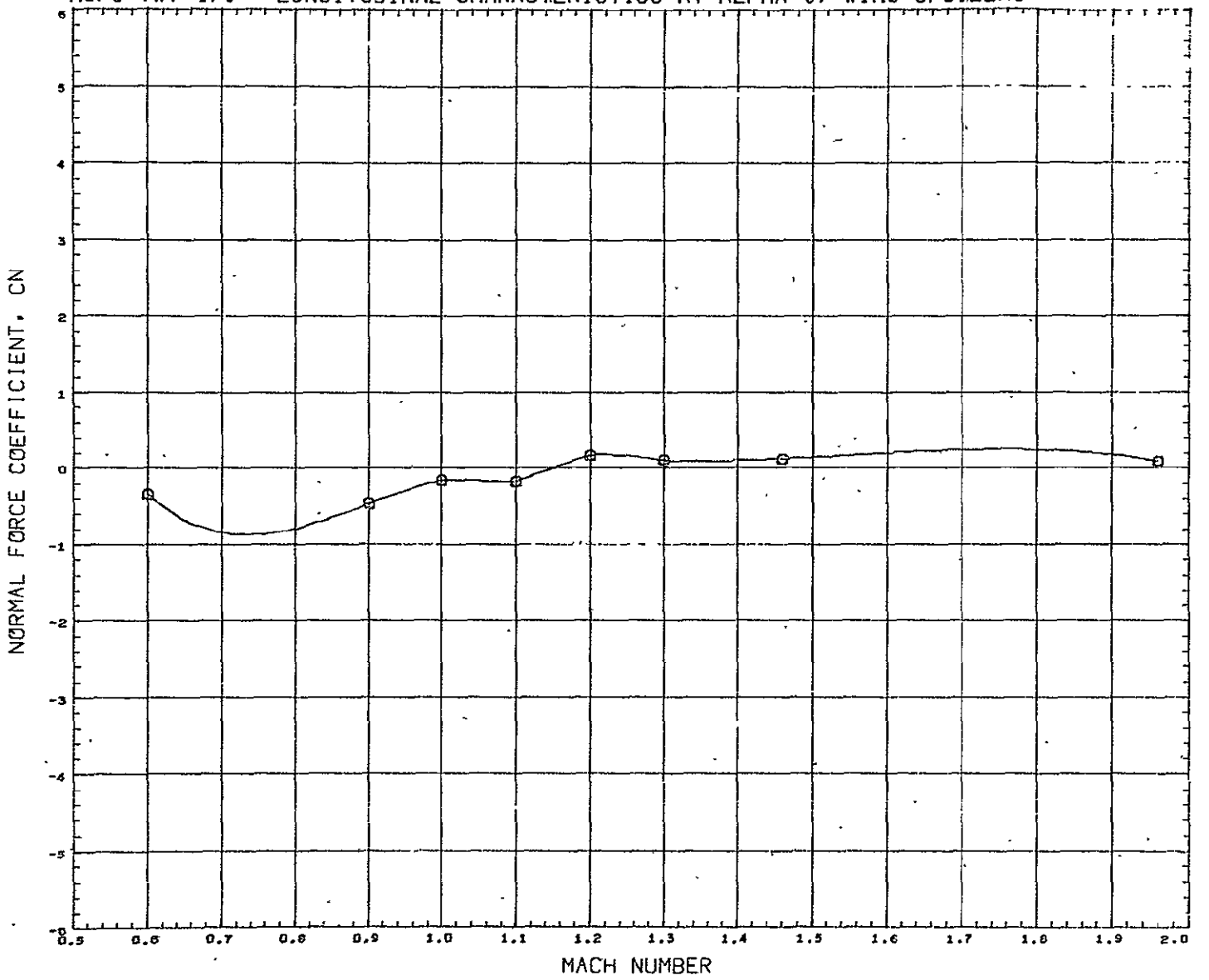



| SYMBOL | ALPHA | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| O | 0.000 | BETA | - 0.040 | ORBINC | - 1.050 |
| | | WNGINC | 4.000 | HTAIL | 0.000 |
| | | PHIB | 0.000 | | |

DATA HIST. CODE VI

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0, WING SPOILERS




| SYMBOL | ALPHA |
|---|---|
| O | 0.000 |

PARAMETRIC VALUES

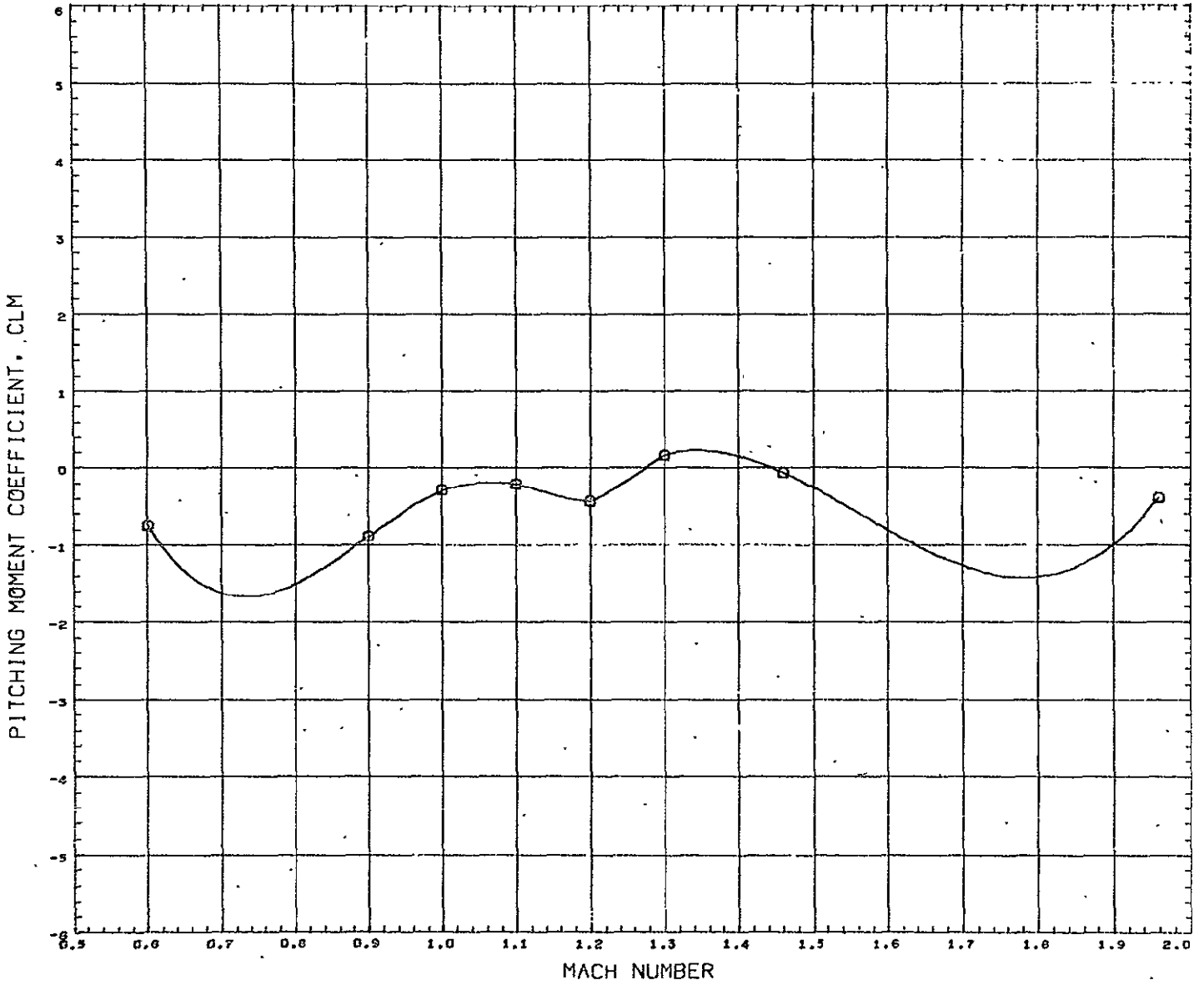
| | | | |
|---|---|---|---|
| BETA | 0.050 | ORBINC | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE VI

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

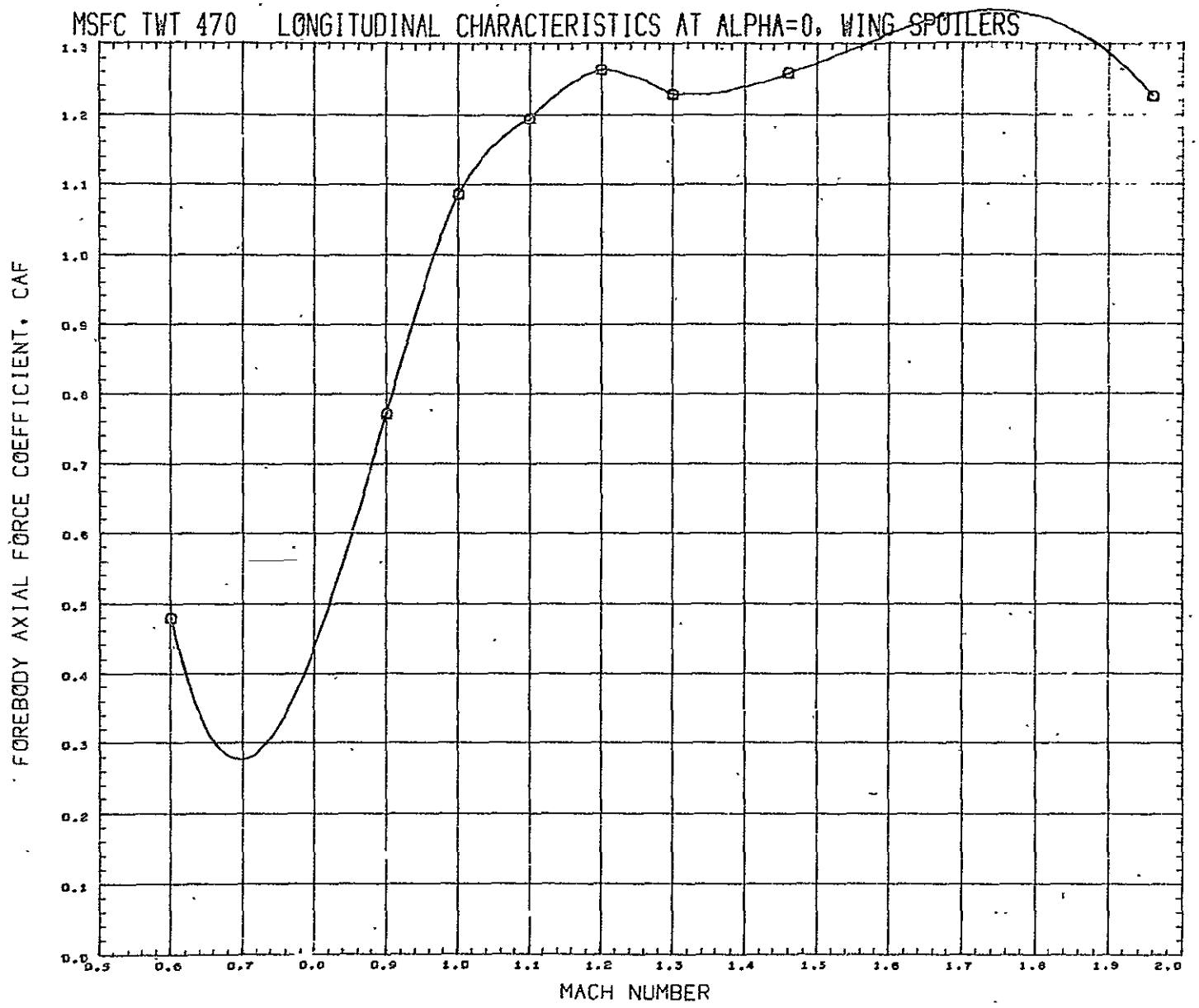
MSFC TWT 470 LONGITUDINAL CHARACTERISTICS AT ALPHA=0. WING SPOILERS




| SYMBOL | ALPHA | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| O | 0.000 | BETA | - 0.050 | ORBINC | - 1.050 |
| | | WNGINC | 4.000 | HTAIL | 0.000 |
| | | PHIB | 0.000 | | |

DATA HIST. CODE VI

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |




| SYMBOL | ALPHA |
|---|---|
| O | 0.000 |

PARAMETRIC VALUES

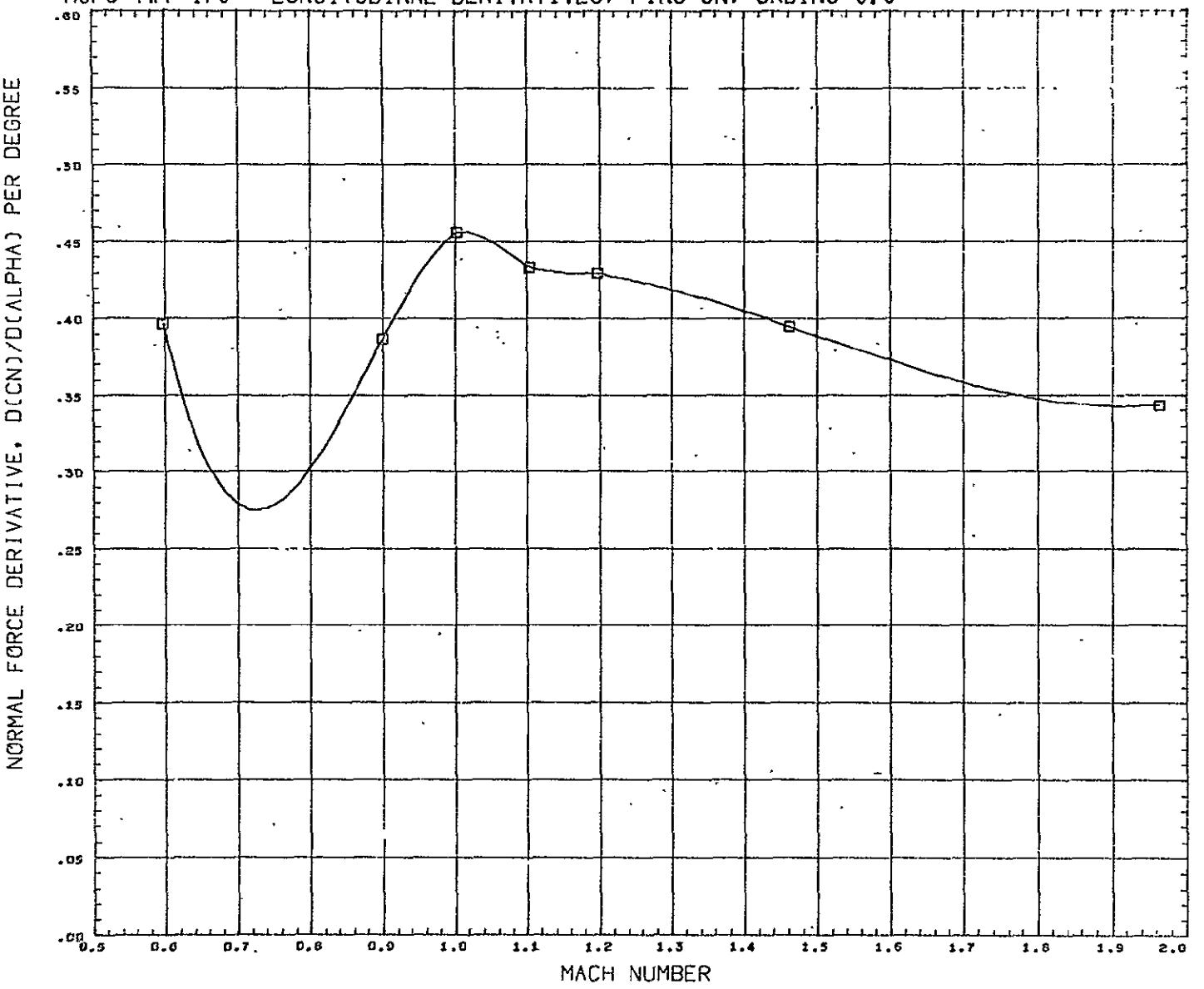
| | | | |
|---|---|---|---|
| BETA | - 0.050 | ORBINC | - 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE VI

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, FINS ON, ORBINC=0.0




PARAMETRIC VALUES

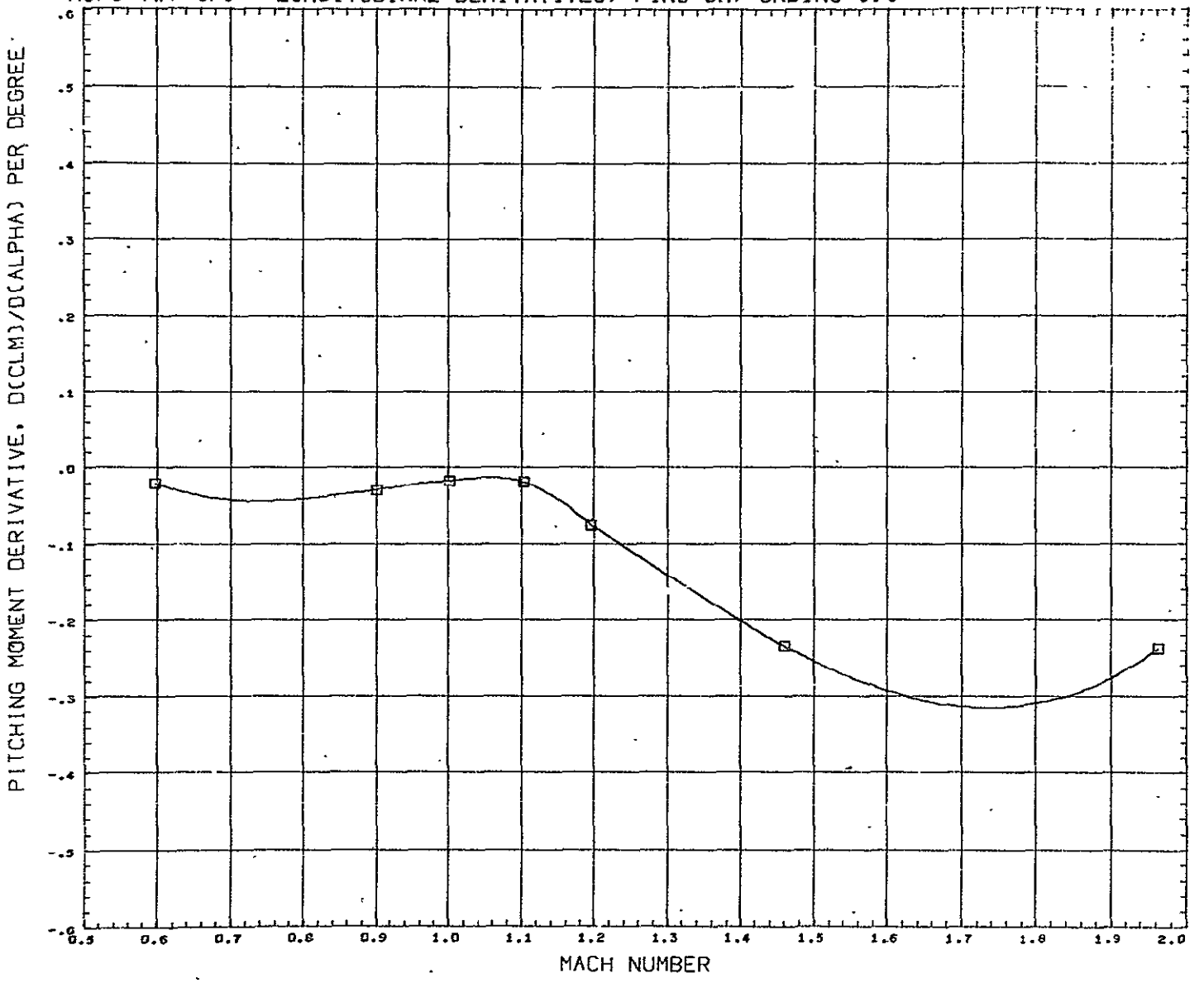
| | | | |
|---|---|---|---|
| BETA | 0.070 | ORBINC | 0.000 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3969 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, FINS ON, ORBINC=0.0




PARAMETRIC VALUES

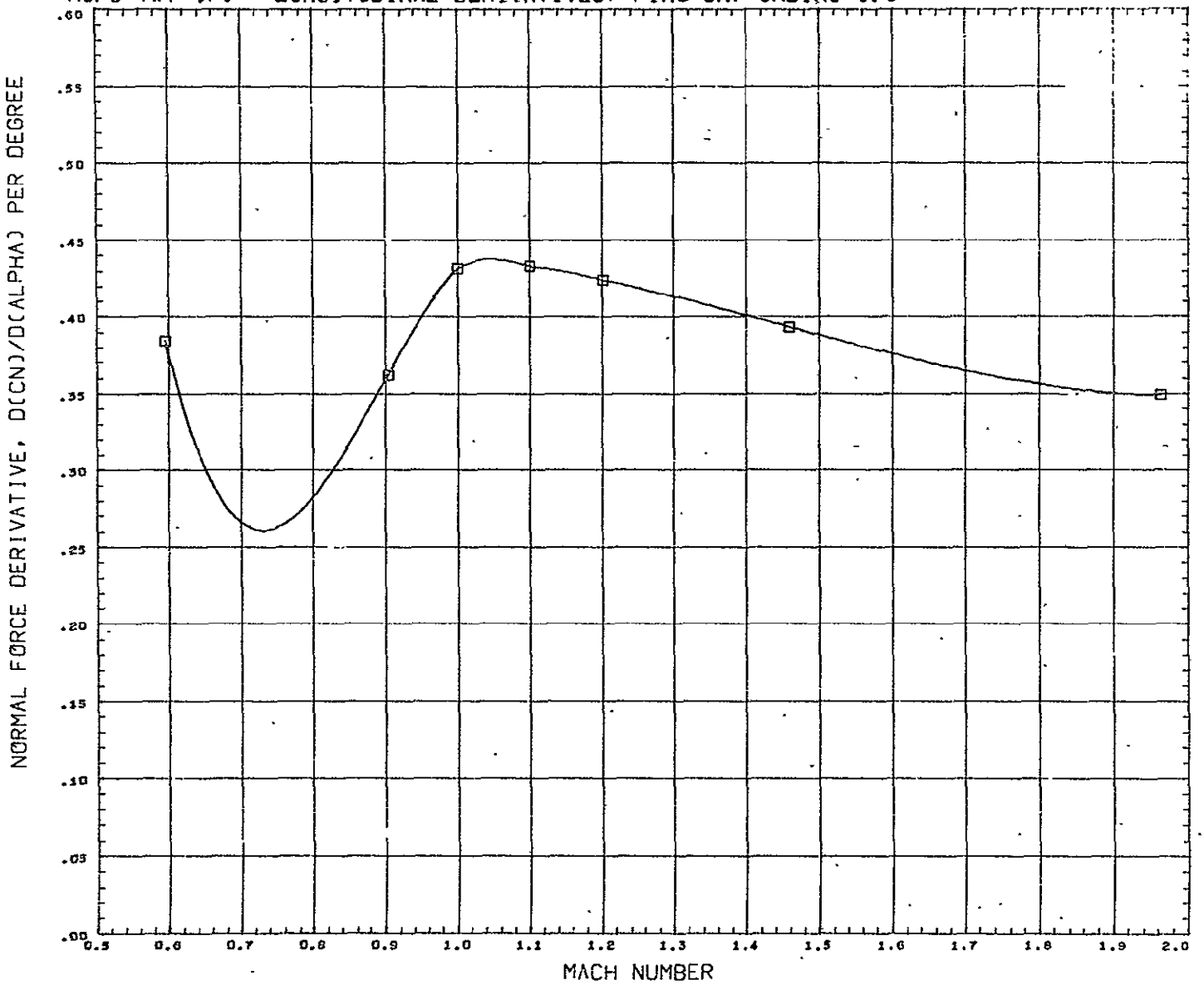
| | | | |
|---|---|---|---|
| BETA | 0.070 | ORBINC | 0.000 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, FINS ON, ORBINC=0.0




PARAMETRIC VALUES

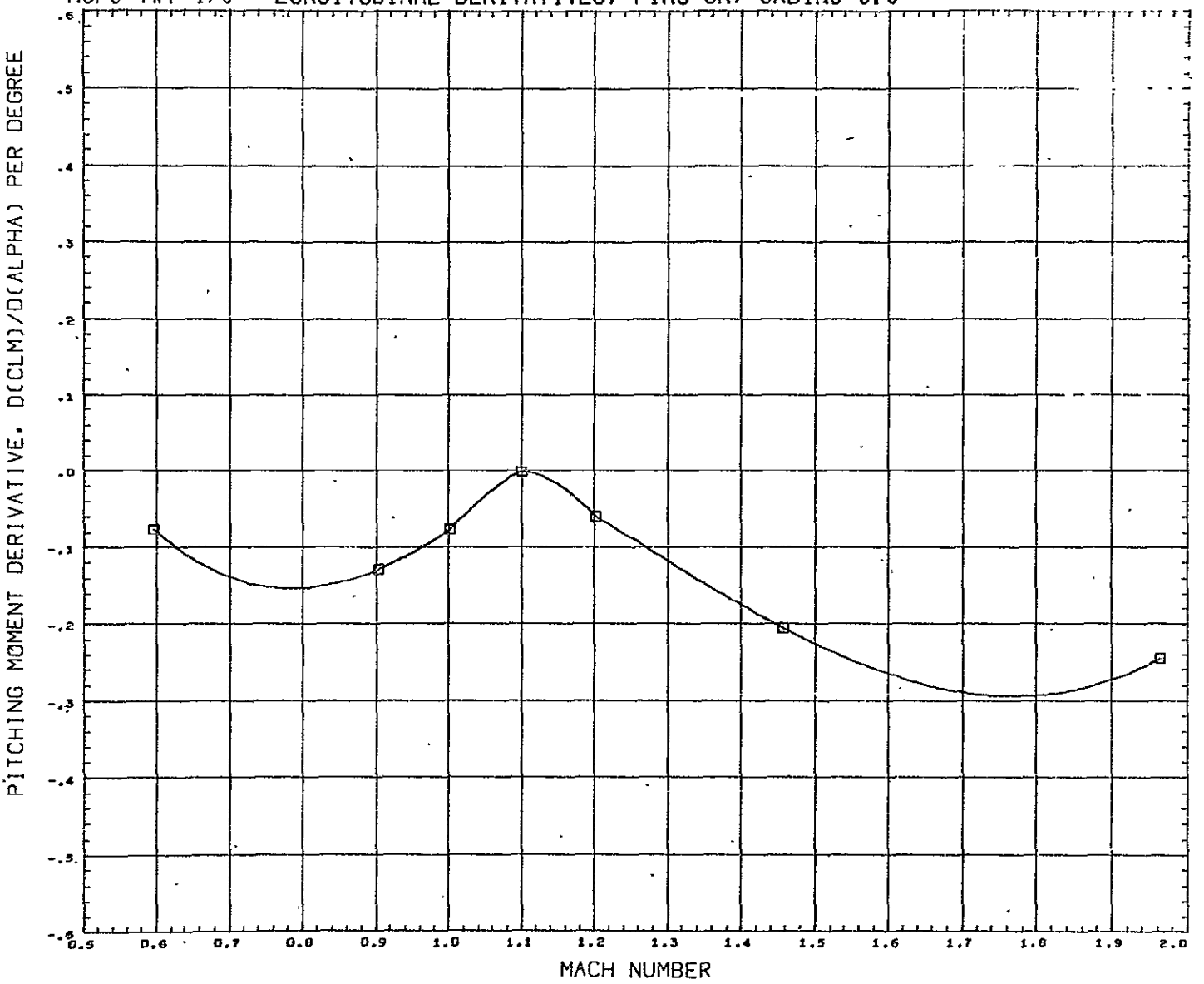
| | | | |
|---|---|---|---|
| BETA | 0.000 | ORBINC | 0.000 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, FINS ON, ORBINC=0.0




PARAMETRIC VALUES

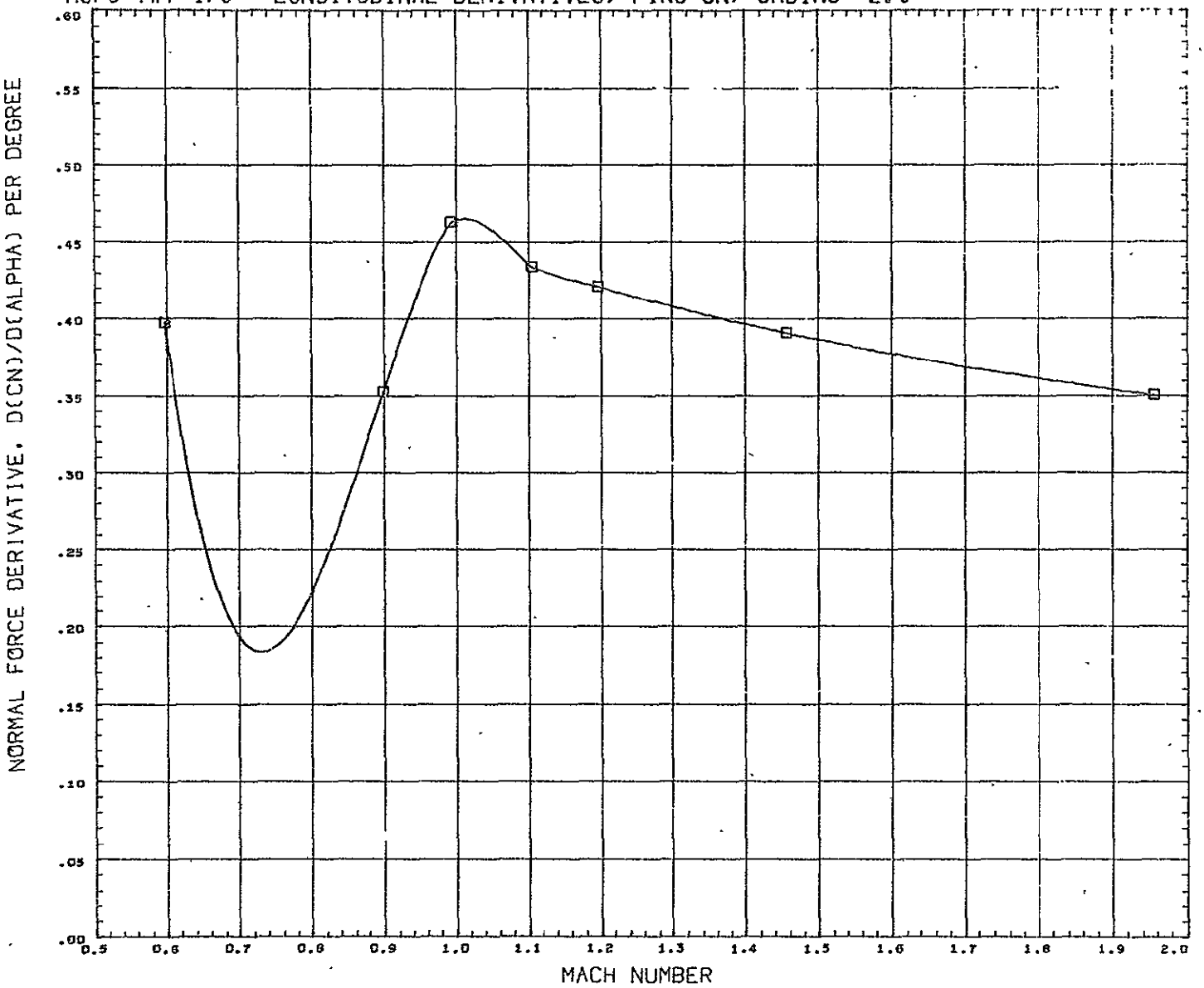
| | | | |
|---|---|---|---|
| BETA | 0.000 | ORBINC | 0.000 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | .SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, FINS ON, ORBINC=-2.0




PARAMETRIC VALUES

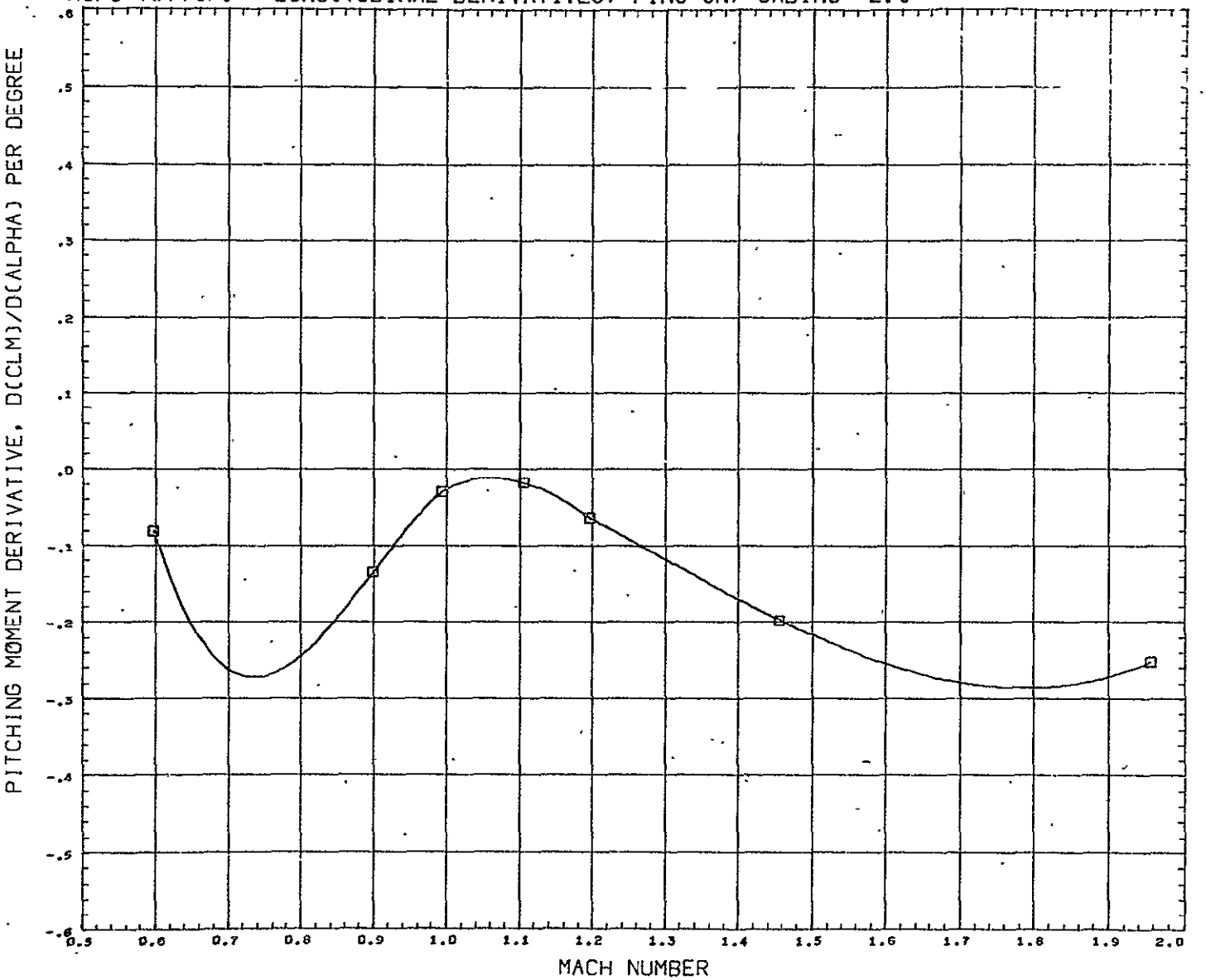
| | | | | |
|---|---|---|---|---|
| BETA | - | 0.070 | ORBINC | - 2.000 |
| WNGINC | | 4.000 | HTAIL | 0.000 |
| PHIB | | 0.000 | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT.470 LONGITUDINAL DERIVATIVES, FINS ON, ORBINC=-2.0




PARAMETRIC VALUES

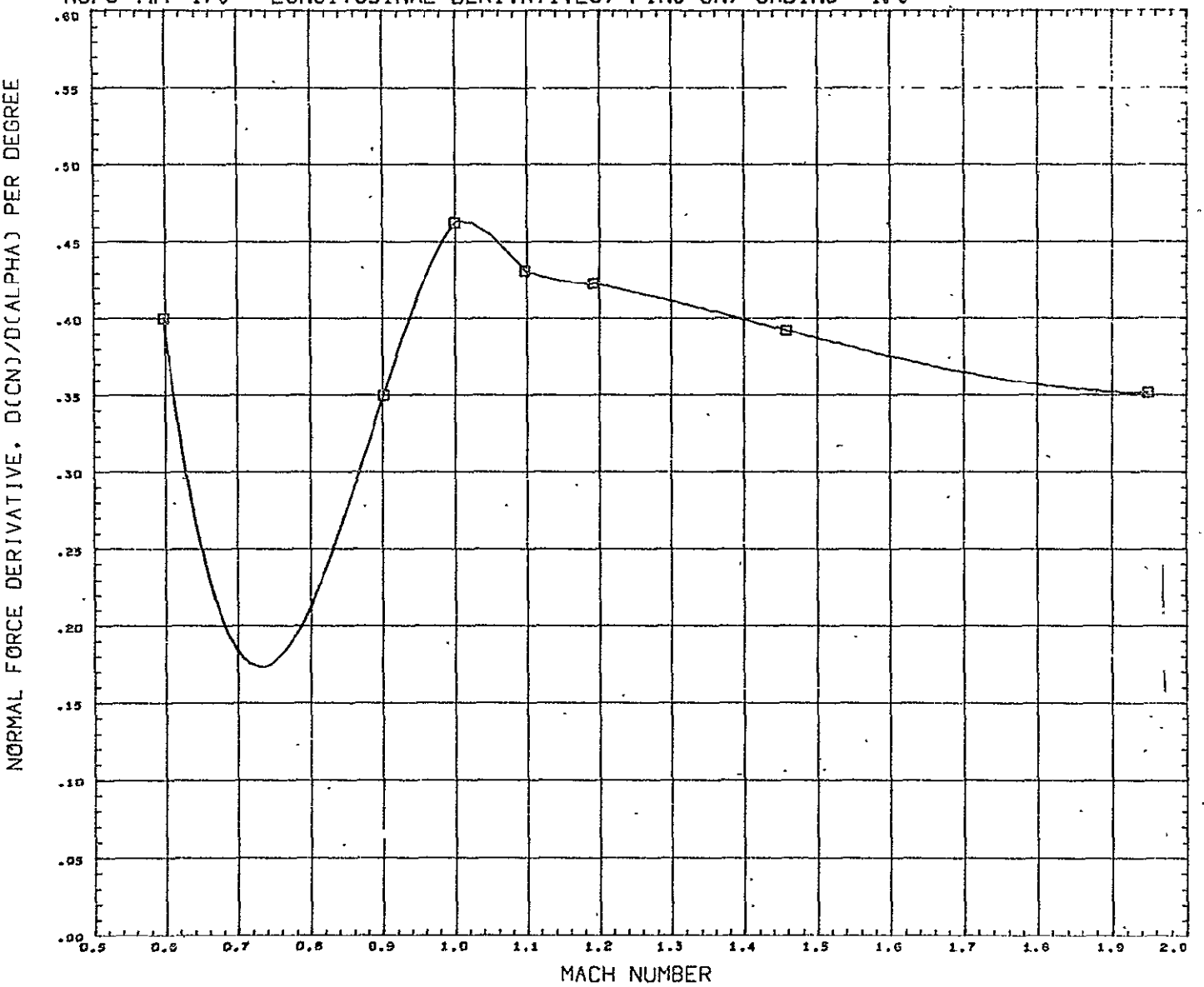
| | | | |
|---|---|---|---|
| BETA | - 0.070 | ORBINC | - 2.000 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, FINS ON, ORBINC=-4.0




PARAMETRIC VALUES

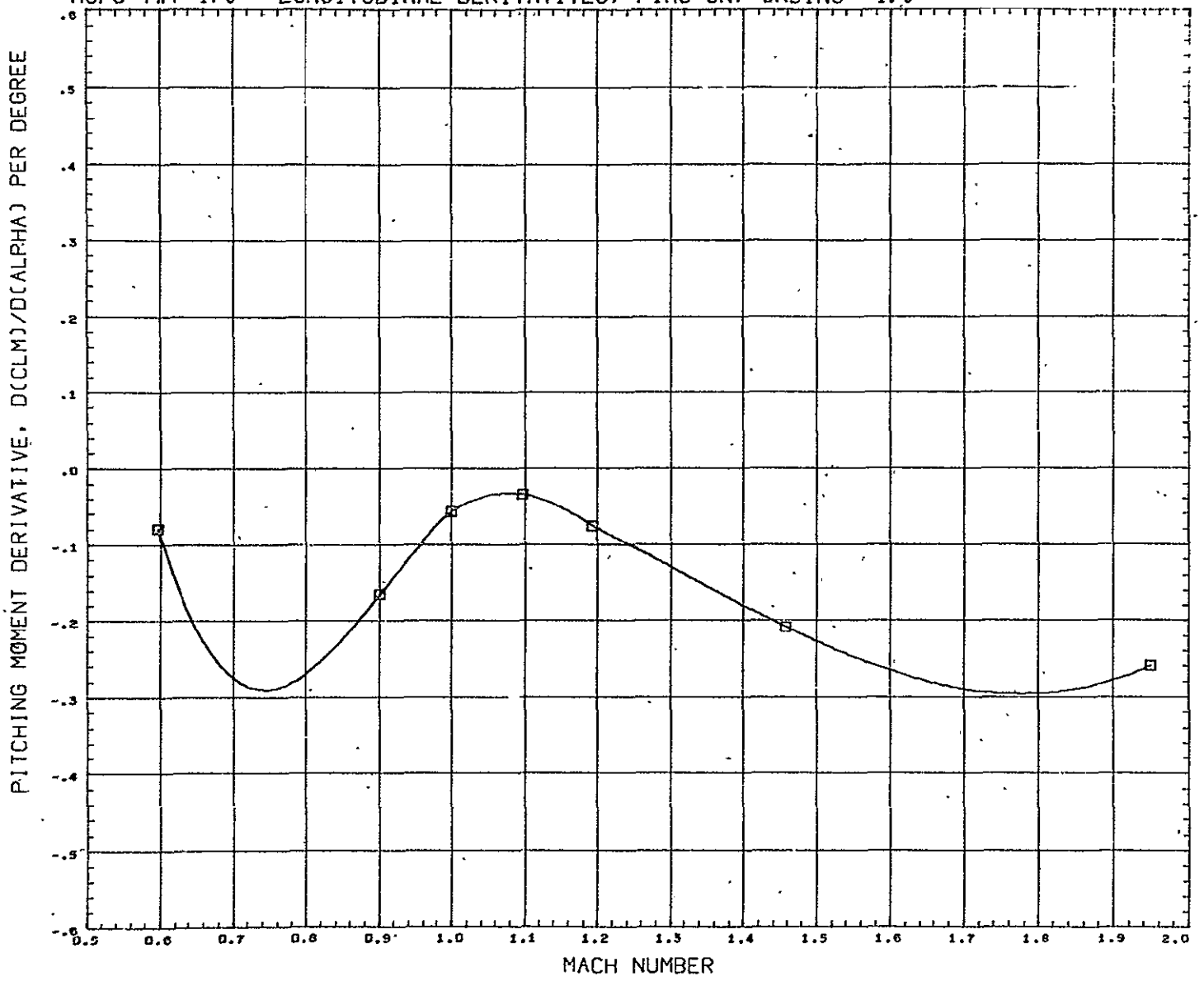
| | | | |
|---|---|---|---|
| BETA | - 0.050 | ORBINC | - 4.000 |
| WMGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, FINS ON, ORBINC=-4.0




PARAMETRIC VALUES

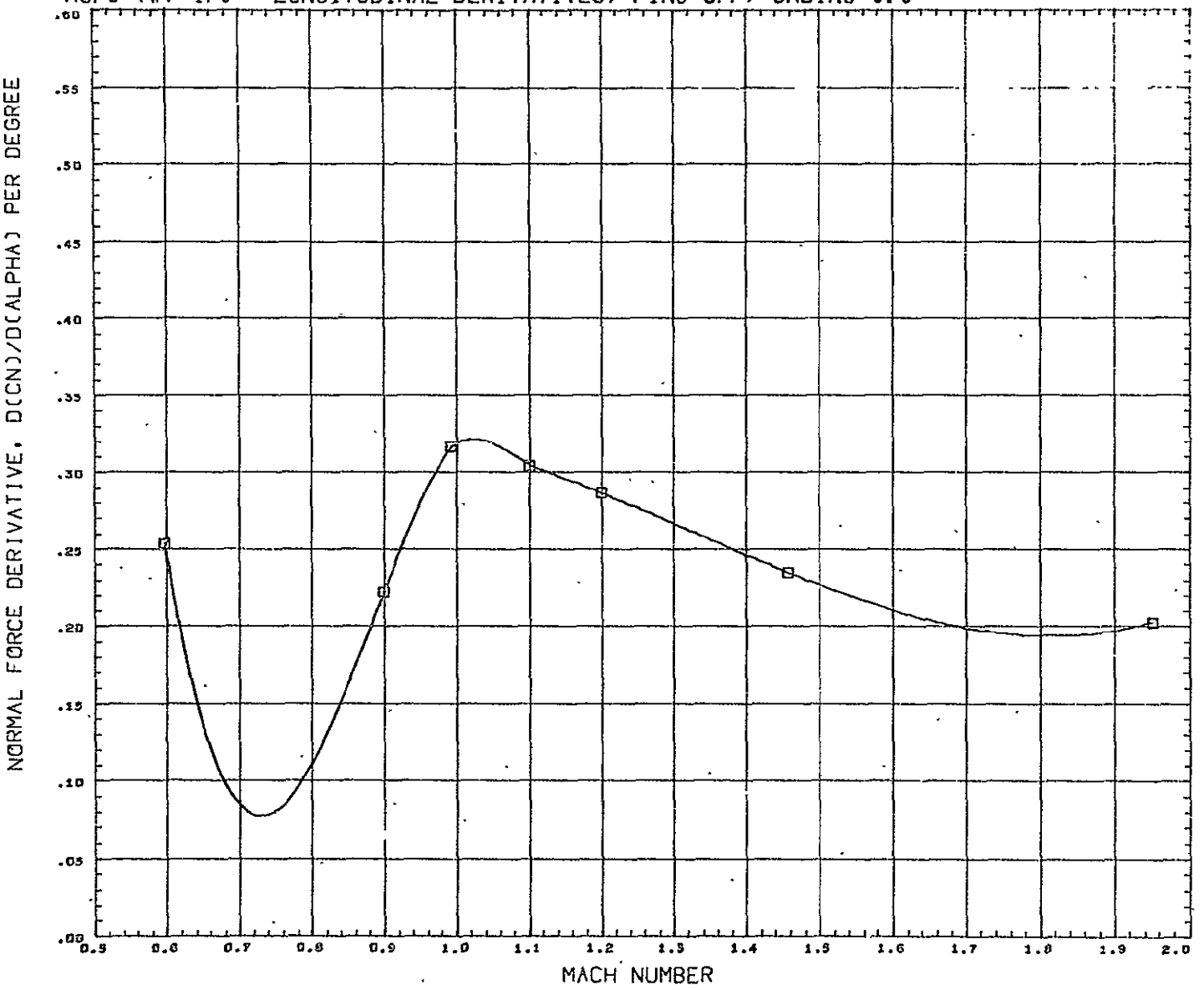
| | | | |
|---|---|---|---|
| BETA | - 0.050 | ORBINC | - 4.000 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, FINS OFF, ORBINC=0.0



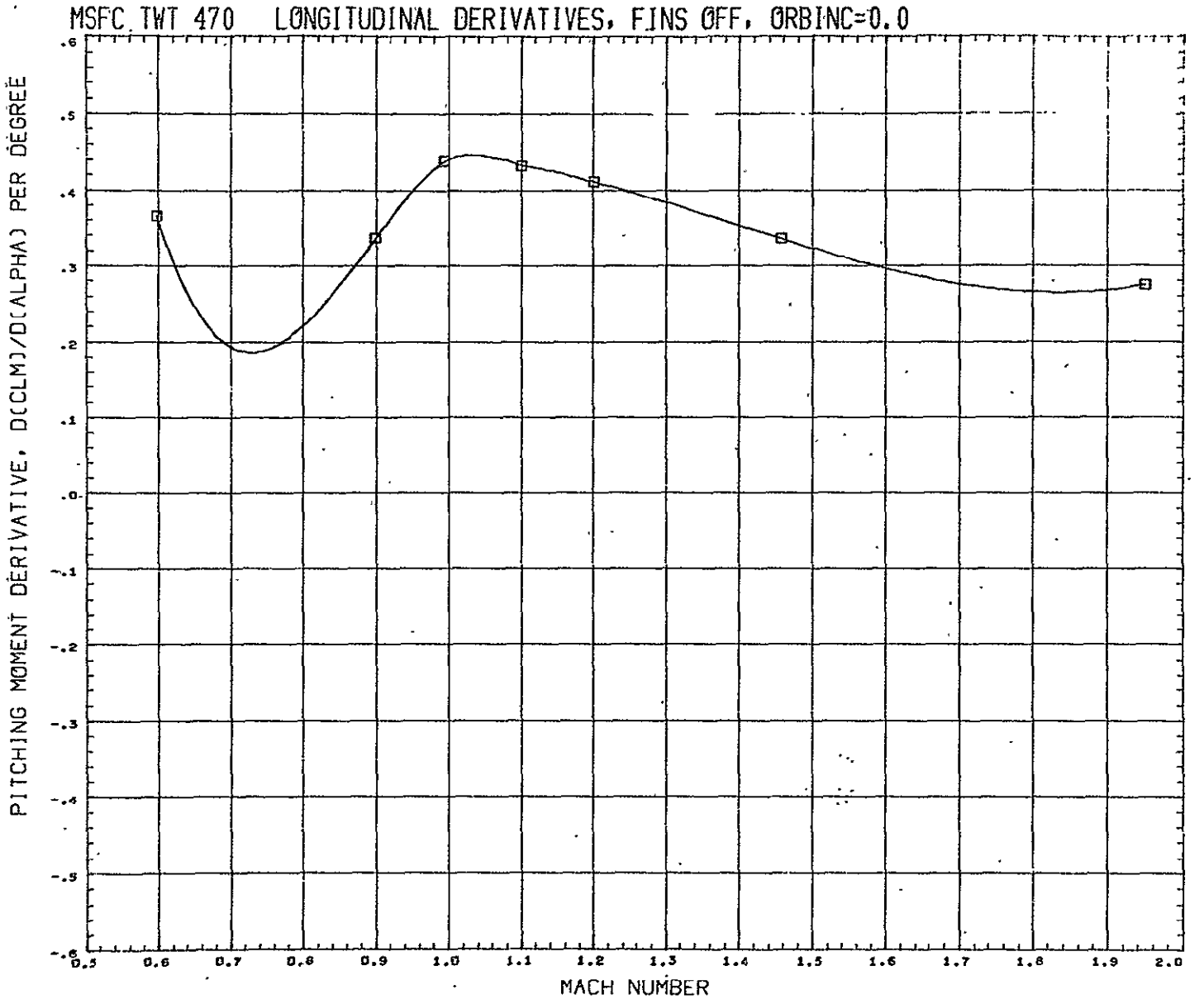

PARAMETRIC VALUES

| | | | |
|---|---|---|---|
| BETA | 0.050 | ORBINC | 0.000 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |




PARAMETRIC VALUES

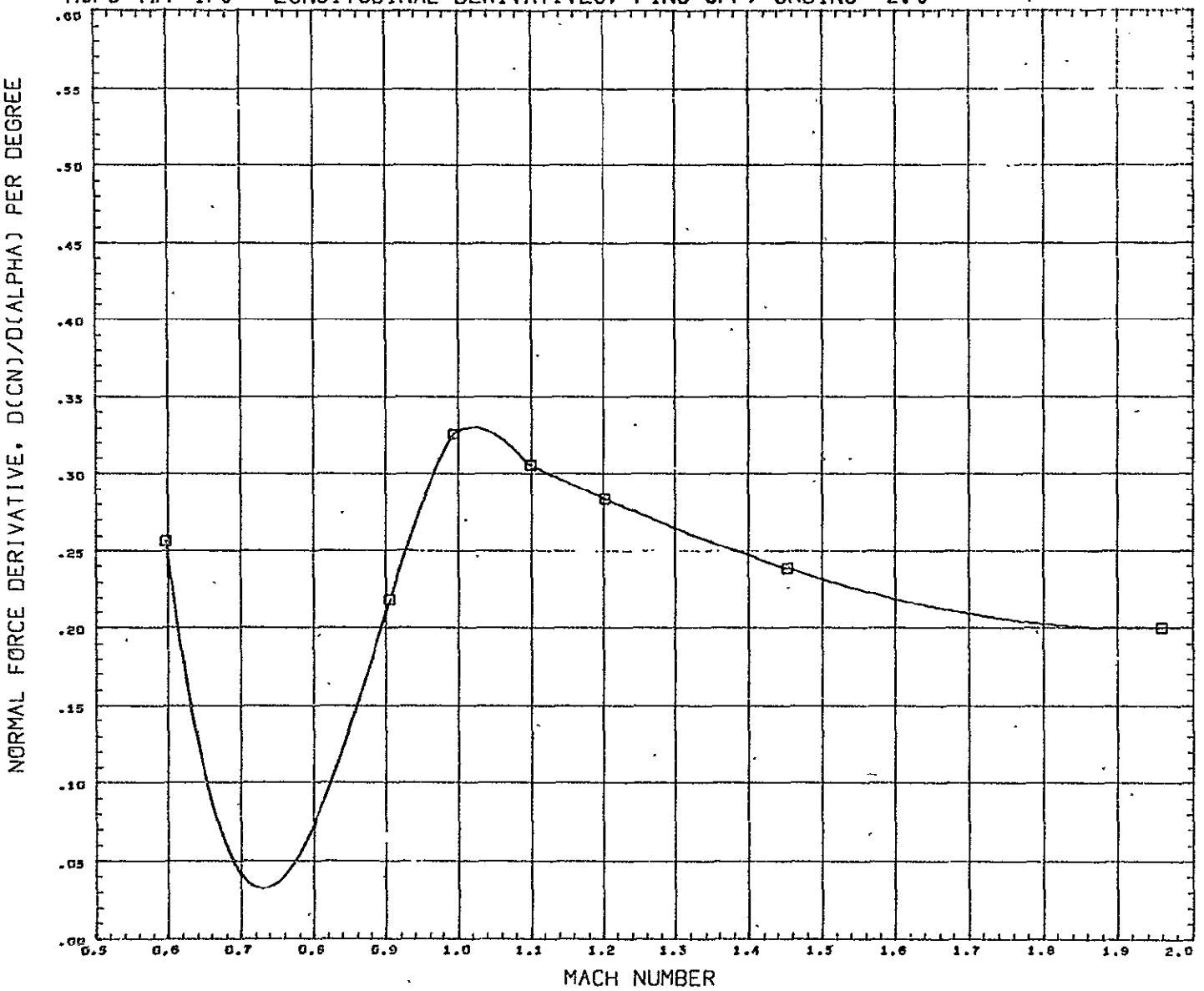
| | | | |
|---|---|---|---|
| BETA | - 0.050 | ORBINC | 0.000 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, FINS OFF, ORBINC=-2.0




PARAMETRIC VALUES

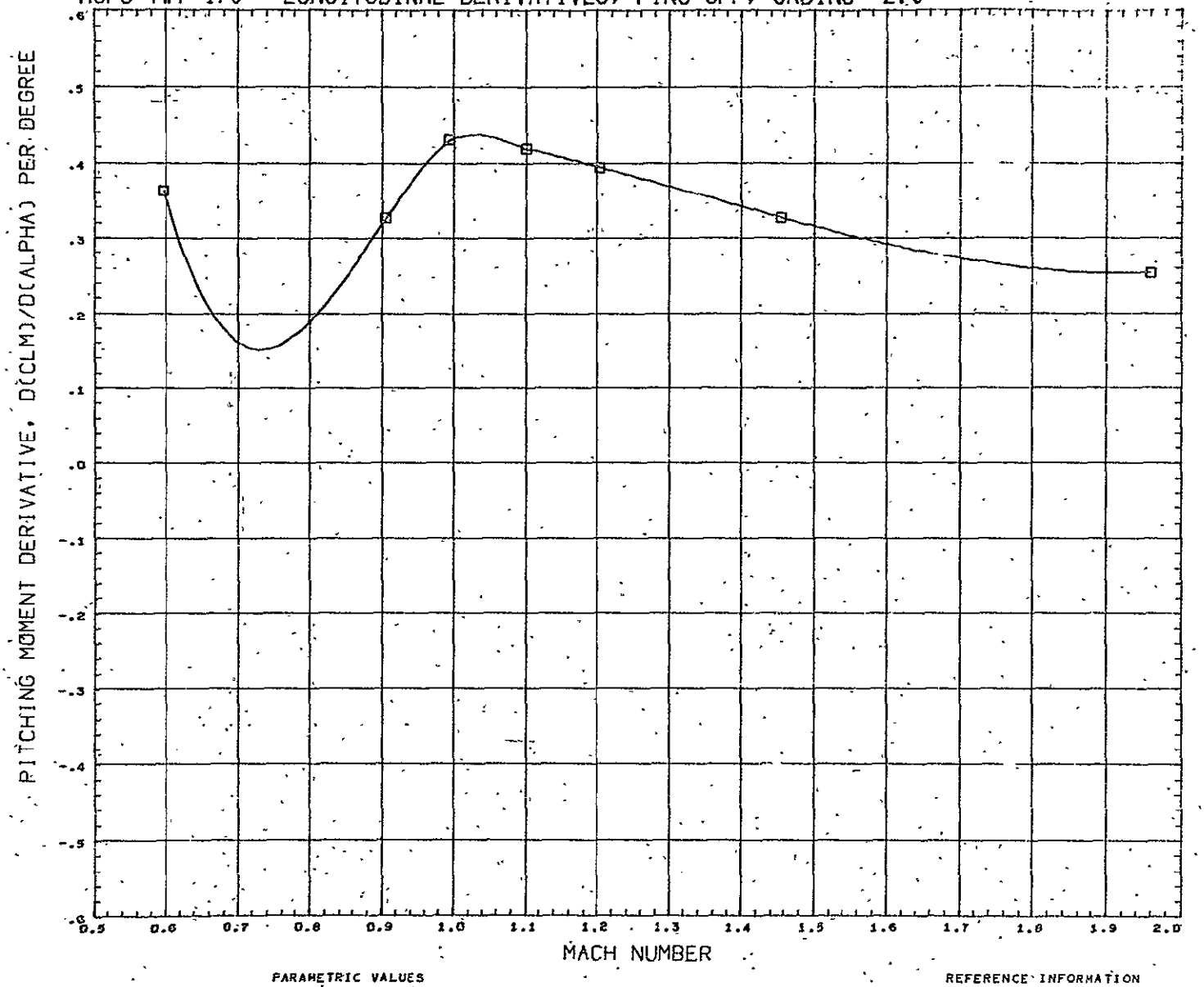
| | | | |
|---|---|---|---|
| BETA | - 0.000 | ORBINC | - 2.000 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, FINS OFF, ORBINC=-2.0




PARAMETRIC VALUES

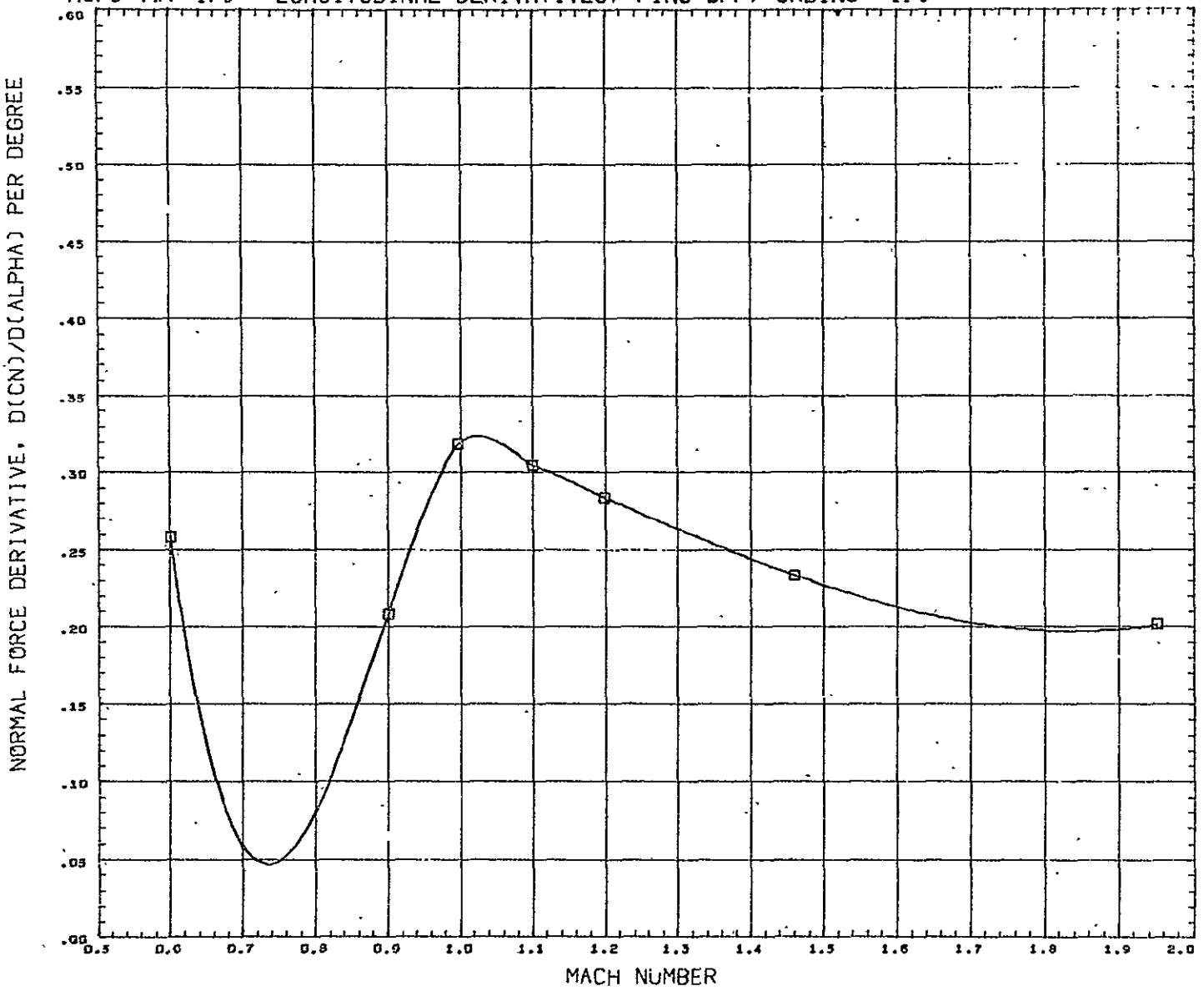
| | | | |
|---|---|---|---|
| BETA | 0.000 | ORBINC | 2.000 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE. V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, FINS OFF, ORBINC=-4.0




PARAMETRIC VALUES

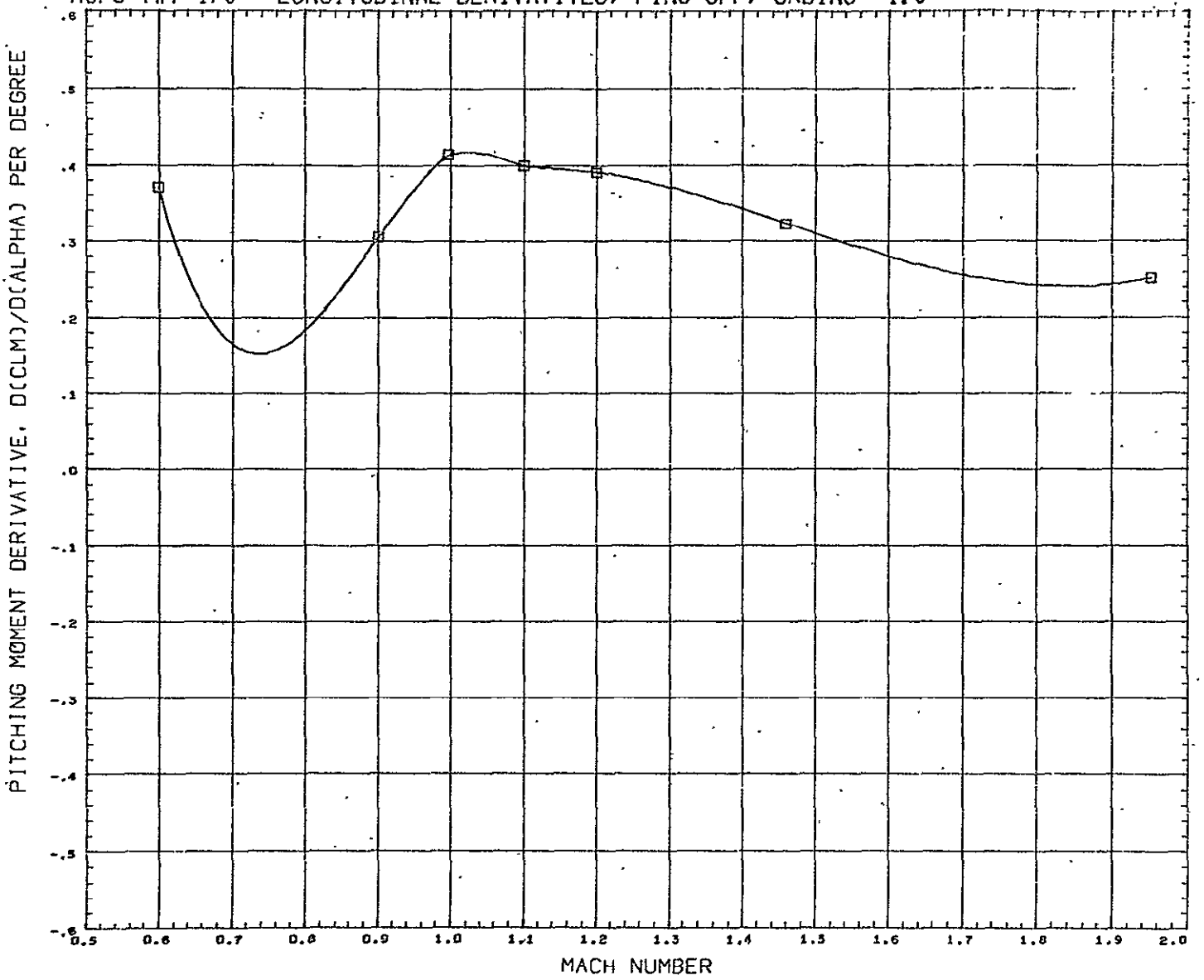
| | | | |
|---|---|---|---|
| BETA | 0.040 | ORBINC | 4.000 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, FINS OFF, ORBINC=-4.0




PARAMETRIC VALUES

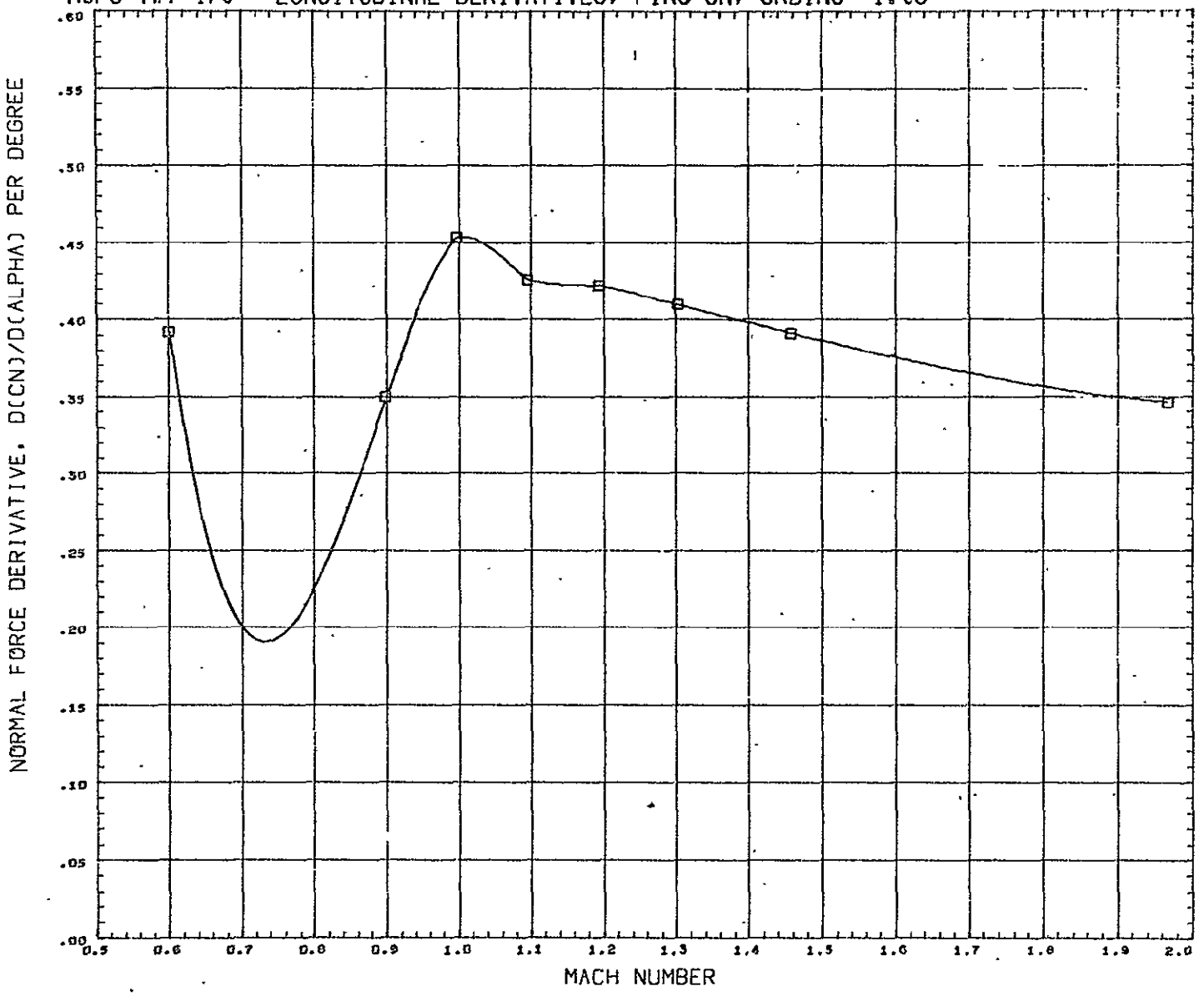
| | | | |
|---|---|---|---|
| BETA | - 0.040 | ORBINC | - 4.000 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, FINS ON, ORBINC=-1.05




PARAMETRIC VALUES

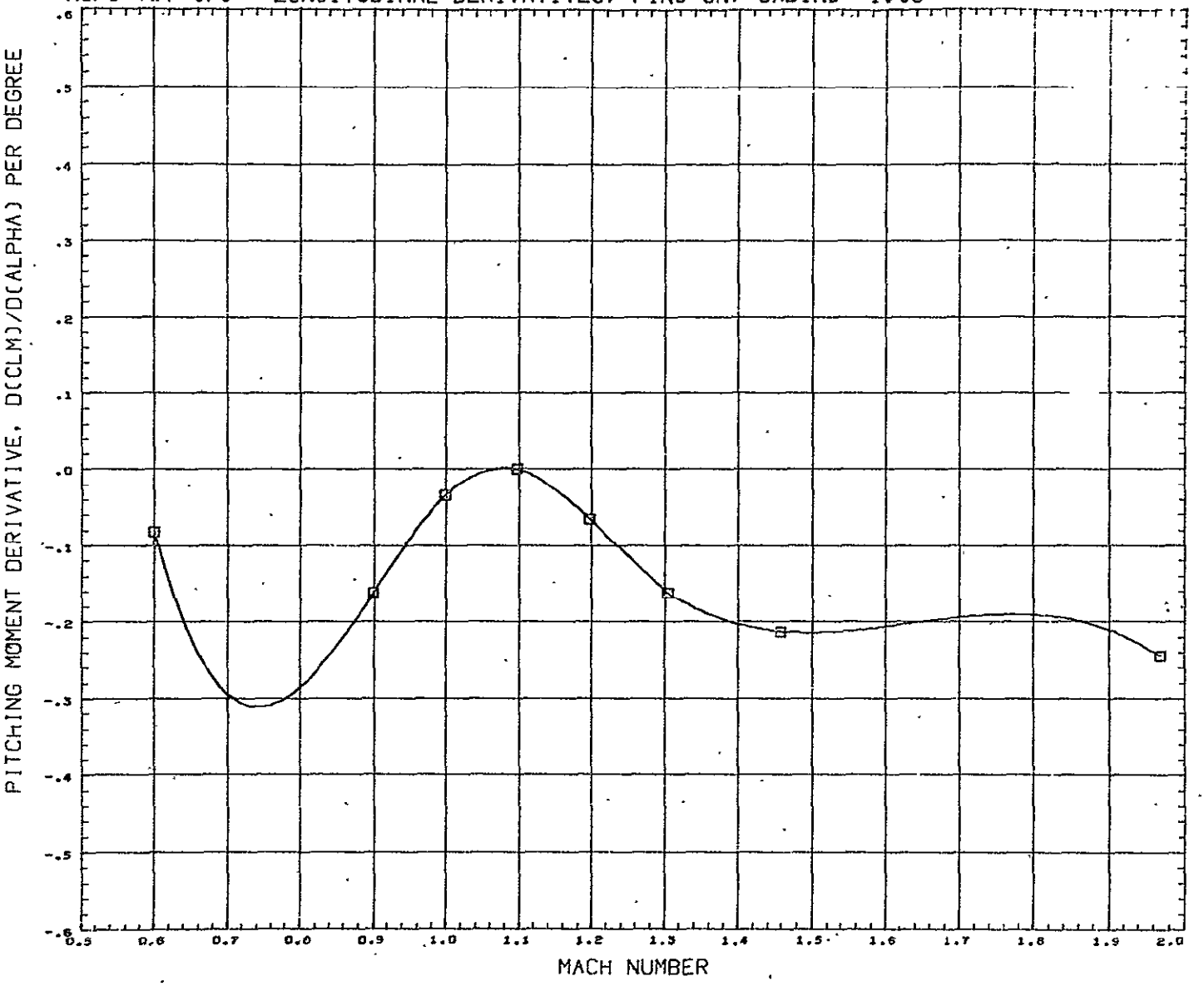
| | | | | | |
|---|---|---|---|---|---|
| BETA | - | 0.050 | ORBINC | - | 1.050 |
| WNGINC | | 4.000 | NTAIL | | 0.000 |
| PHIB | | 0.000 | | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, FINS ON, ORBINC=-1.05




PARAMETRIC VALUES

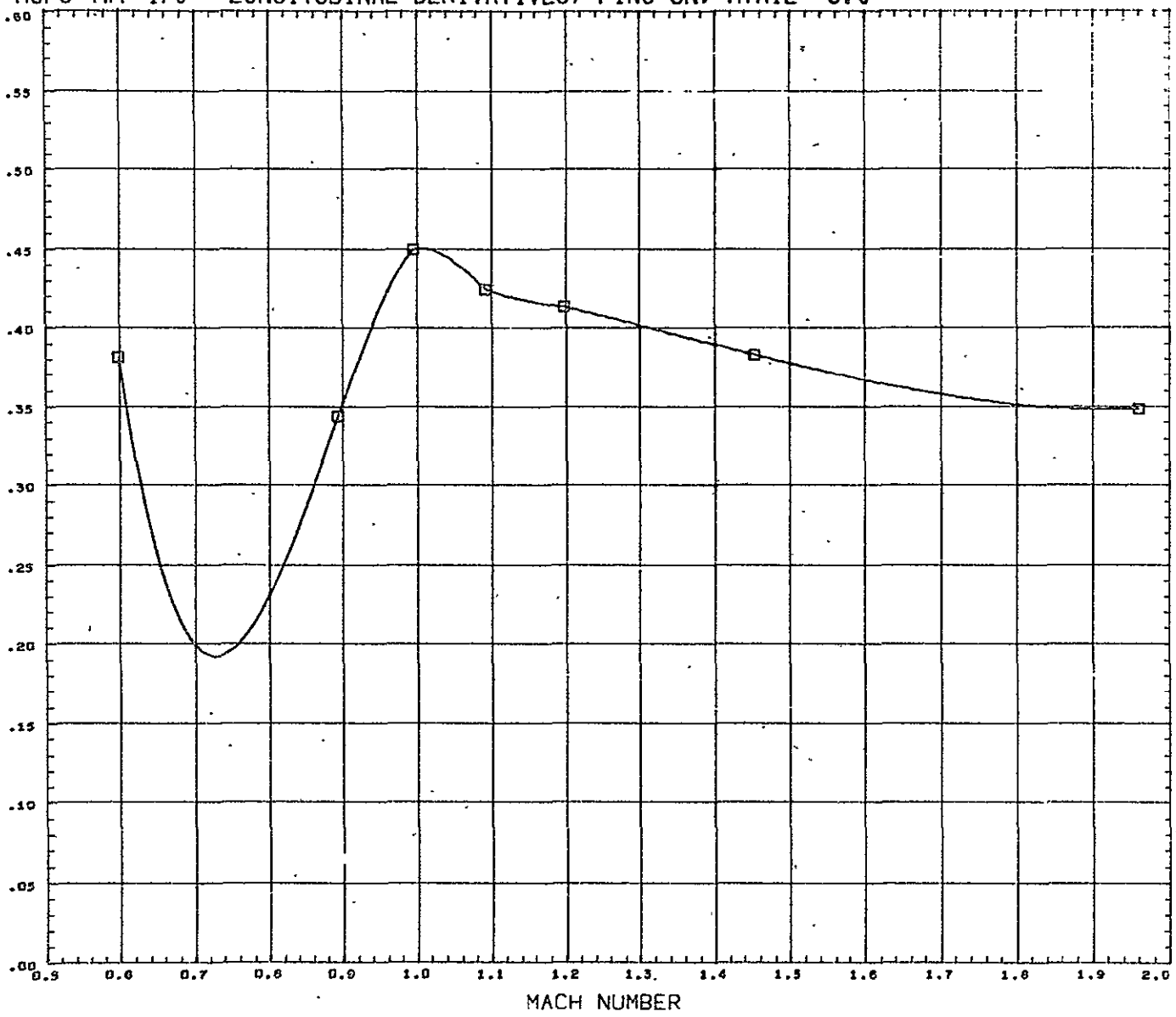
| | | | |
|---|---|---|---|
| BETA | 0.050 | ORBINC | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, FINS ON, HTAIL=-5.0




PARAMETRIC VALUES

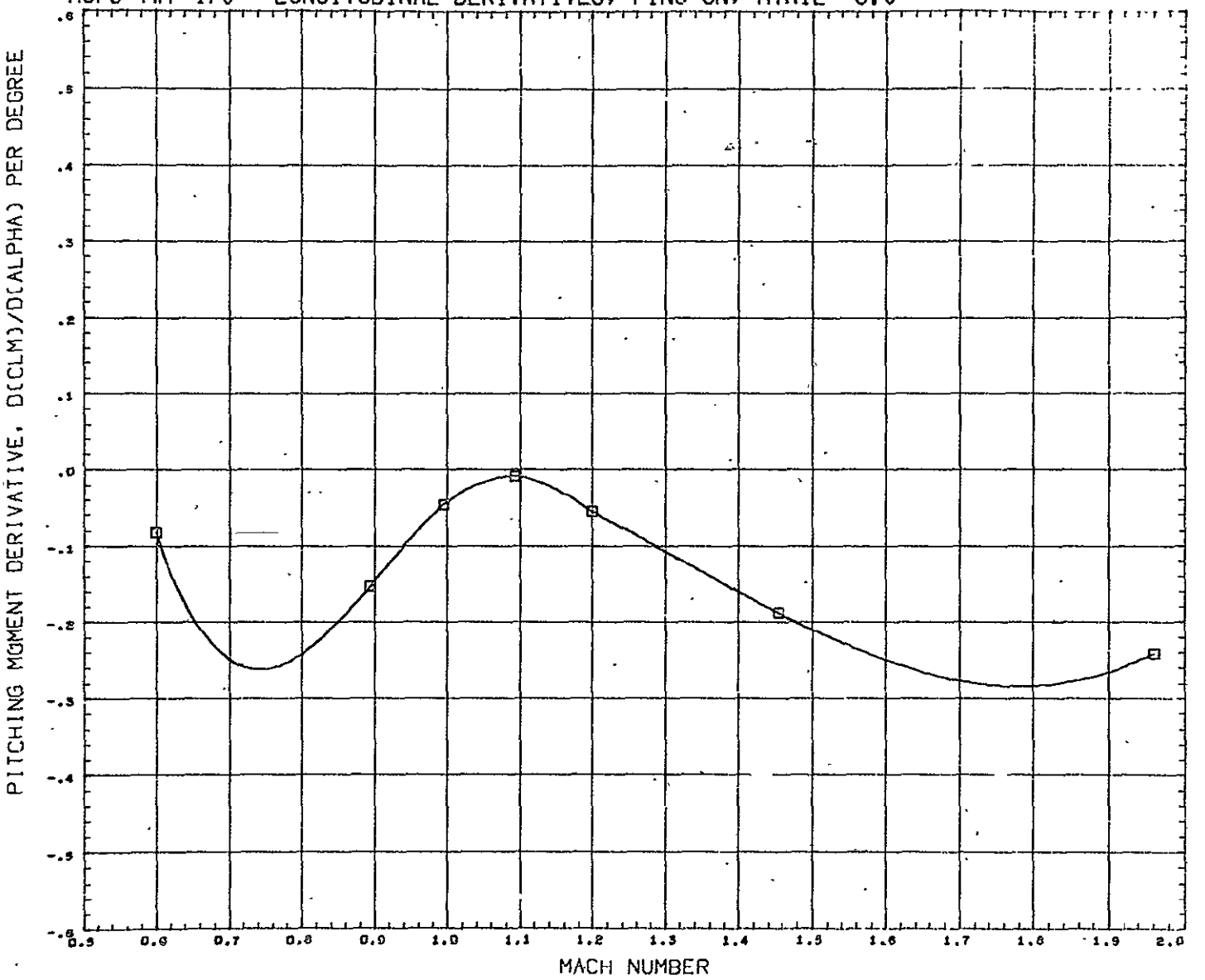
| | | | | | |
|---|---|---|---|---|---|
| BETA | - | 0.020 | ORBINC | - | 1.050 |
| WNGINC | | 4.000 | HTAIL | - | 5.000 |
| PHIB | | 0.000 | | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, FINS ON, HTAIL=-5.0




PARAMETRIC VALUES

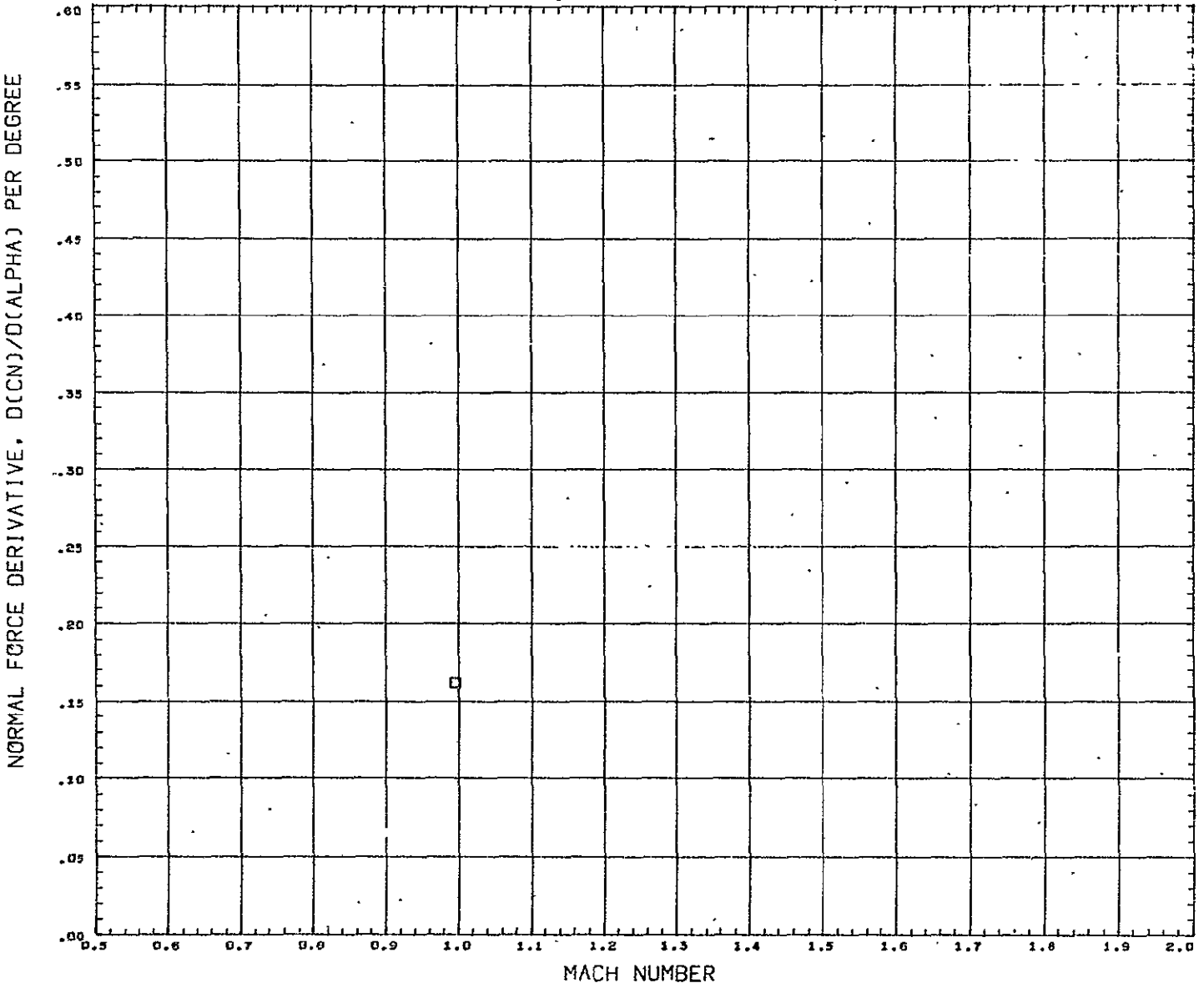
| | | | | | |
|---|---|---|---|---|---|
| BETA | - | 0.020 | ORBINC | - | 1.050 |
| WNGINC | | 4.000 | HTAIL | - | 5.000 |
| PHIB | | 0.000 | | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, WING AND FINS OFF




PARAMETRIC VALUES

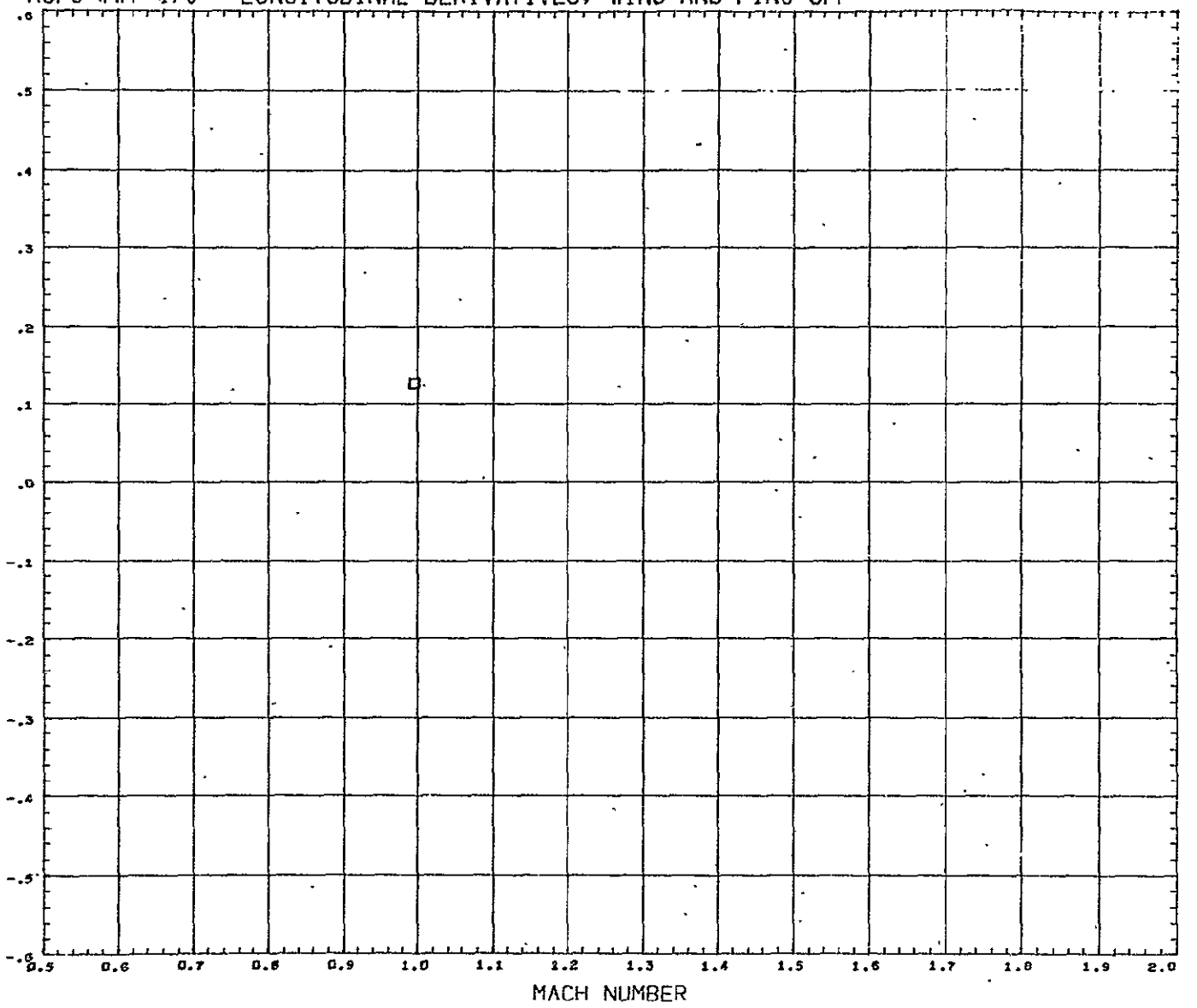
| | | | |
|---|---|---|---|
| BETA | - 0.100 | ORBINC | - 1.050 |
| HTAIL | 0.000 | PHIB | 0.000 |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, WING AND FINS OFF




PARAMETRIC VALUES

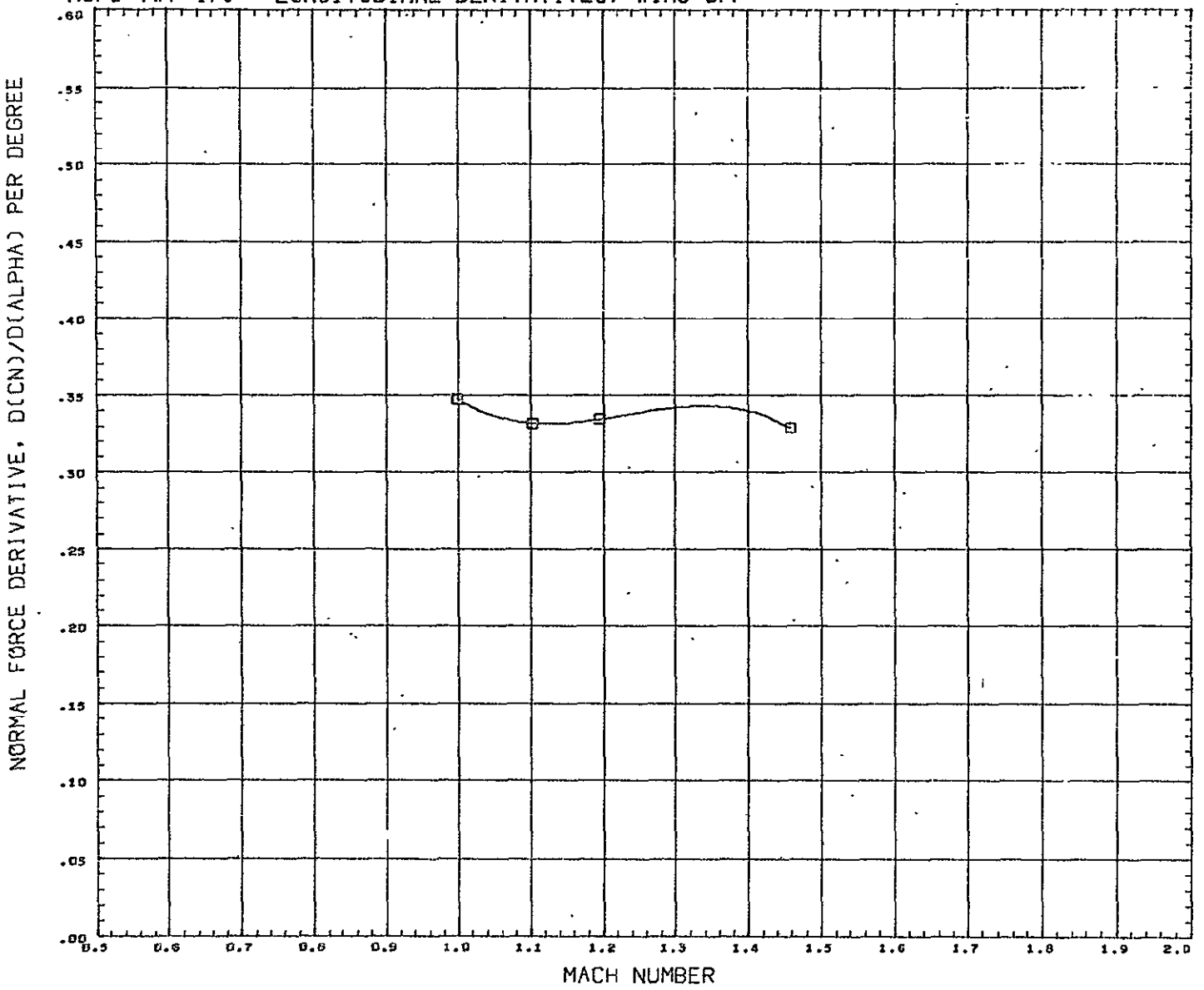
| | | | |
|---|---|---|---|
| BETA | - 0.100 | ORBINC | - 1.050 |
| HTAIL | 0.000 | PHIB | 0.000 |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, WING OFF




PARAMETRIC VALUES

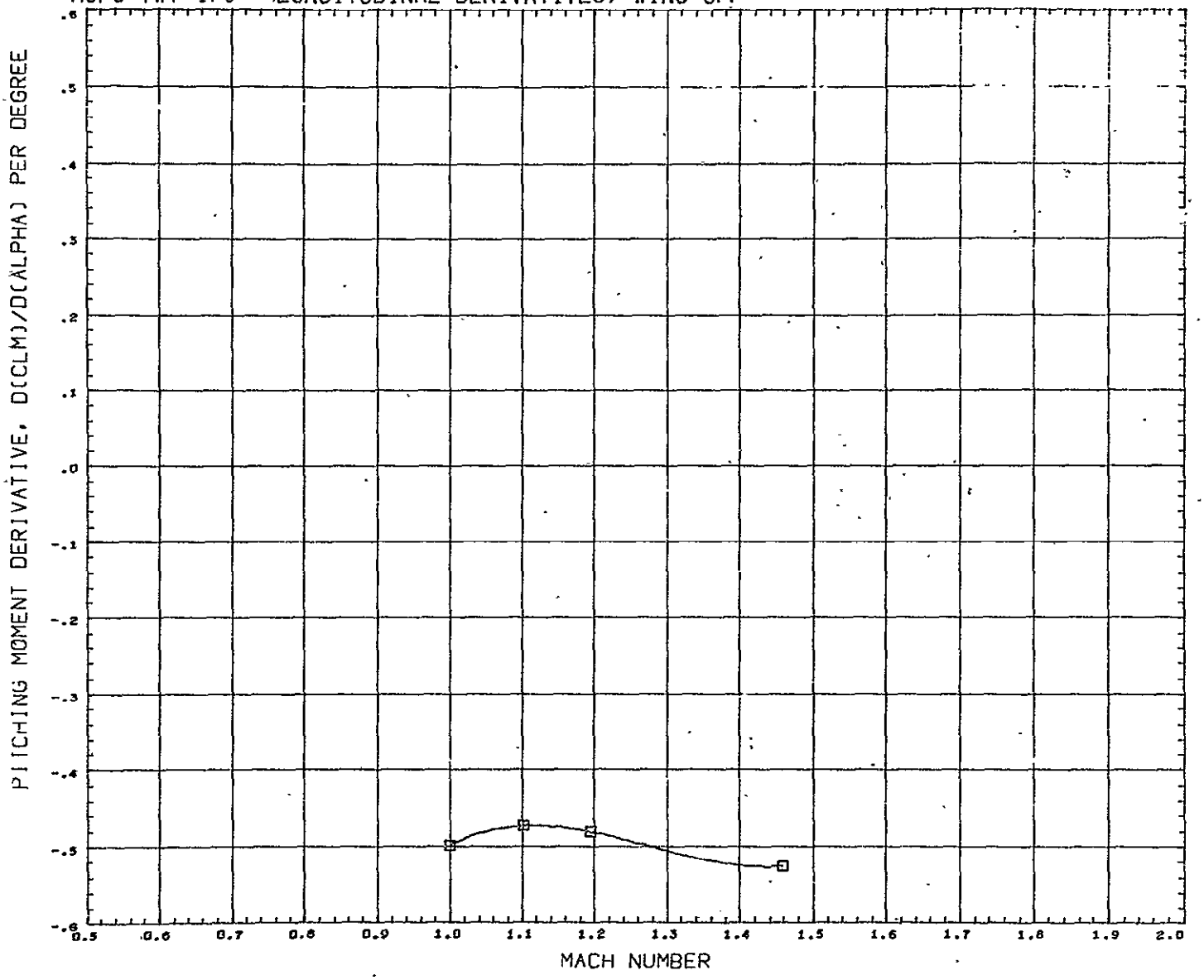
| | | | |
|---|---|---|---|
| BETA | - 0.100 | ORBINC | - 1.050 |
| HTAIL | 0.000 | PHIB | 0.000 |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, WING OFF




PARAMETRIC VALUES

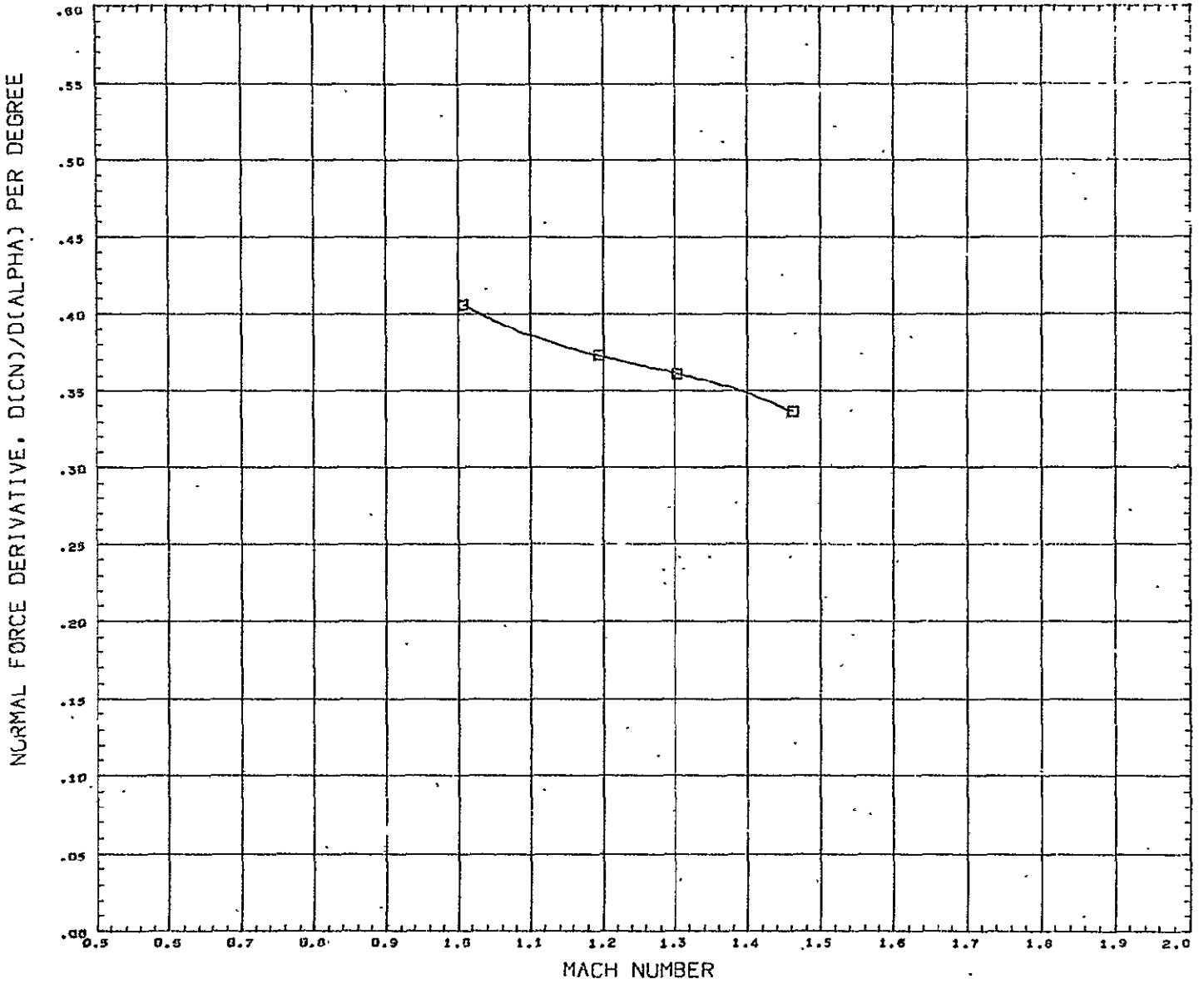
| | | | |
|---|---|---|---|
| BETA | - 0.100 | ORBINC | - 1.050 |
| HTAIL | 0.000 | PHIB | 0.000 |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

DATA HIST. CODE V

MSFC TWT 470 LONGITUDINAL DERIVATIVES, CRUCIFORM FINS, PHIB=45




PARAMETRIC VALUES

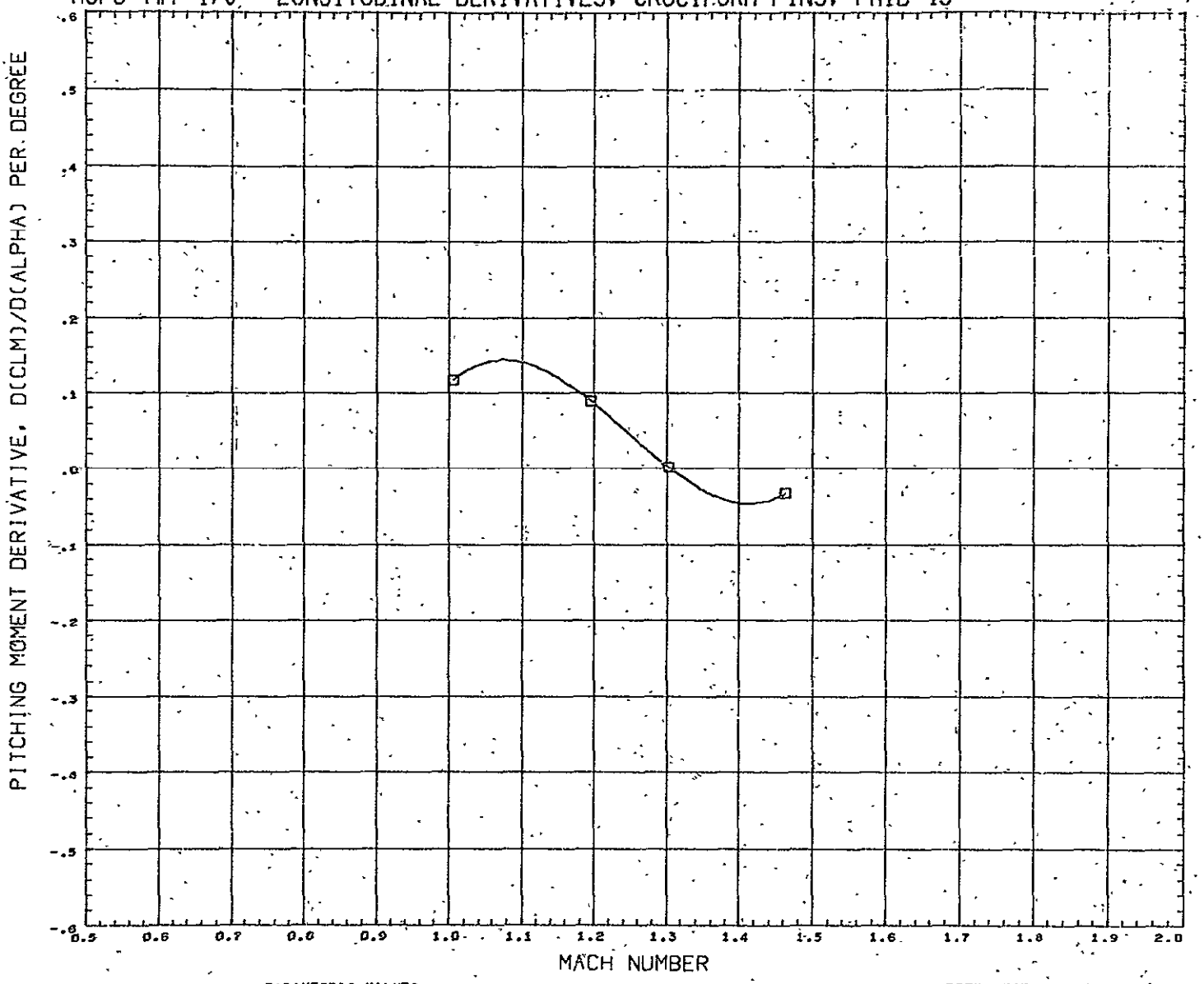
| | | | |
|---|---|---|---|
| BETA | - 0.070 | ORBINC | - 1.050 |
| WHGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 45.000 | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3950 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, CRUCIFORM FINS, PHIB=45




PARAMETRIC VALUES.

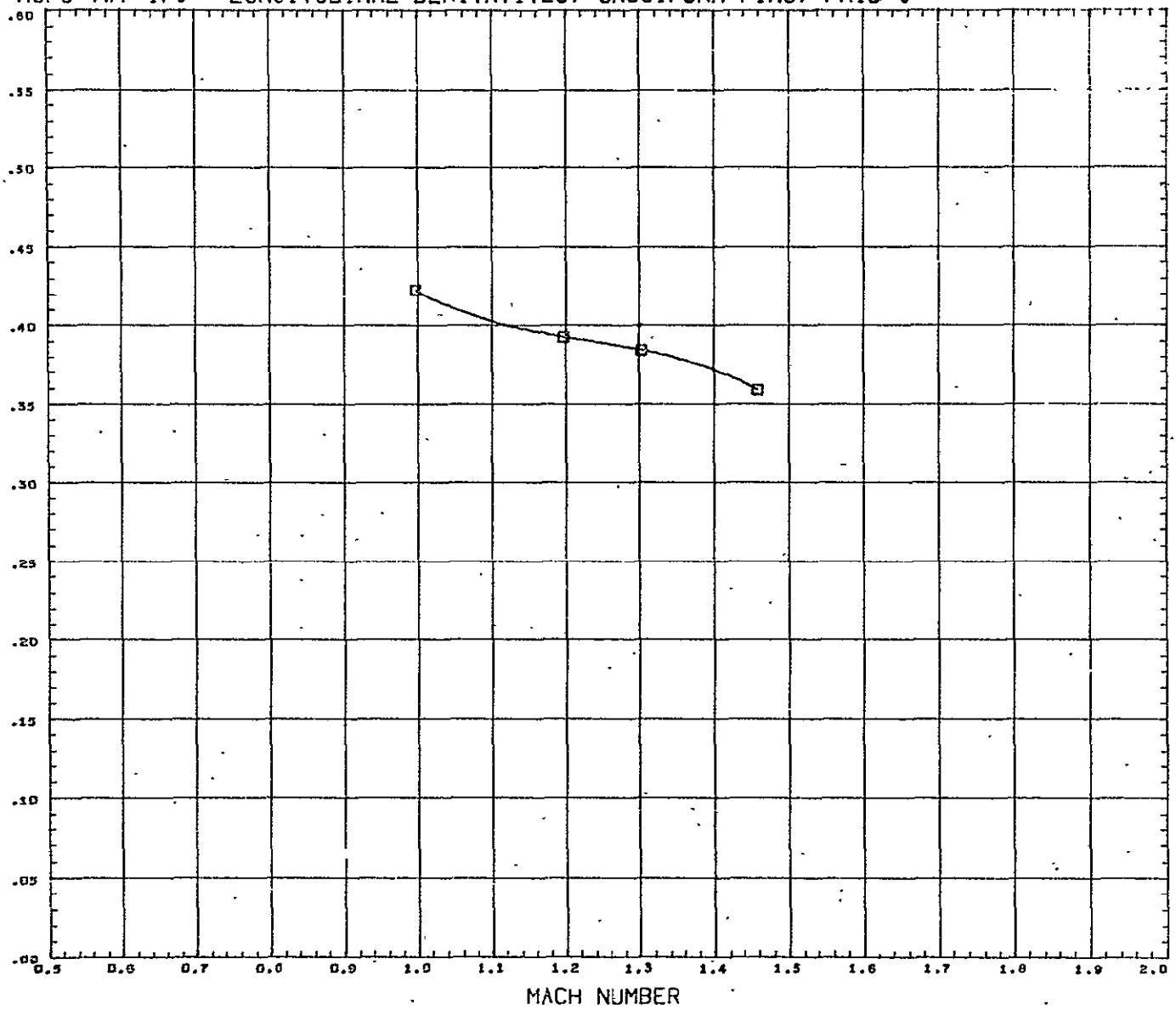
| | | | |
|---|---|---|---|
| BETA | 0.070 | ORBINC | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 45.000 | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, CRUCIFORM FINS, PHIB=0



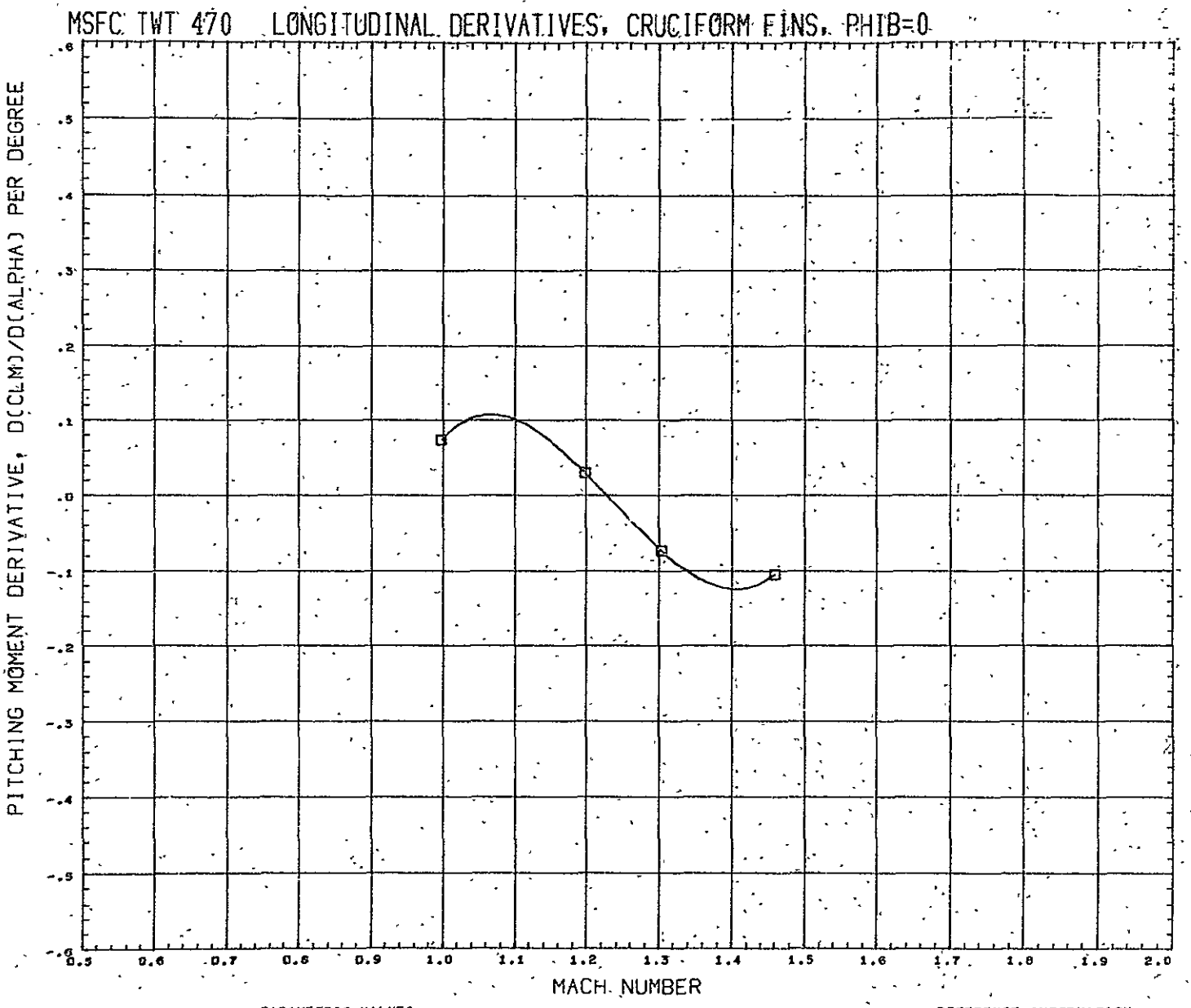

PARAMETRIC VALUES

| | | | |
|---|---|---|---|
| BETA | 0.000 | ORBINC | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |




PARAMETRIC VALUES

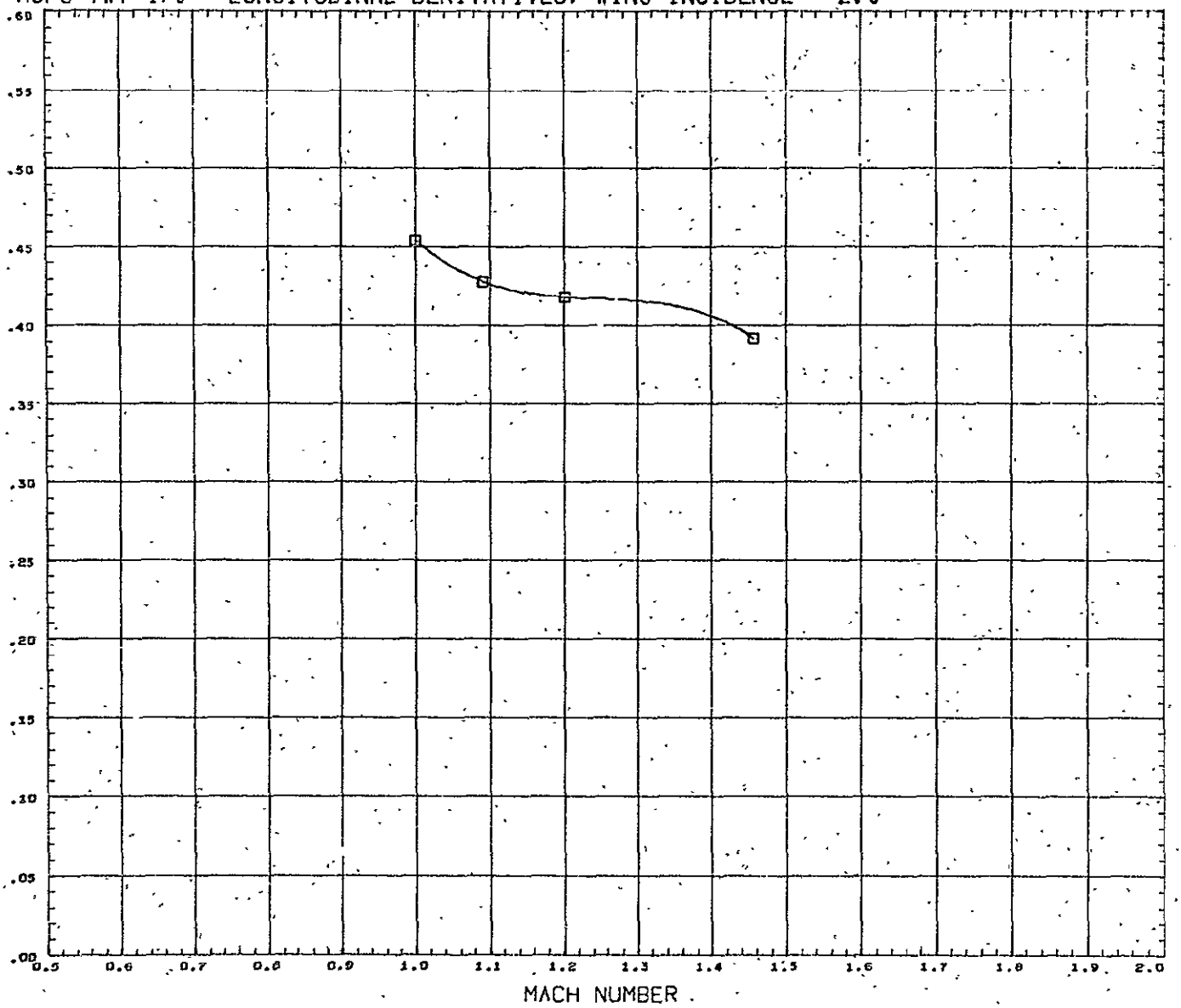
| | | | |
|---|---|---|---|
| BETA | 0.060 | ORBINC | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, WING INCIDENCE = 2.0




PARAMETRIC VALUES

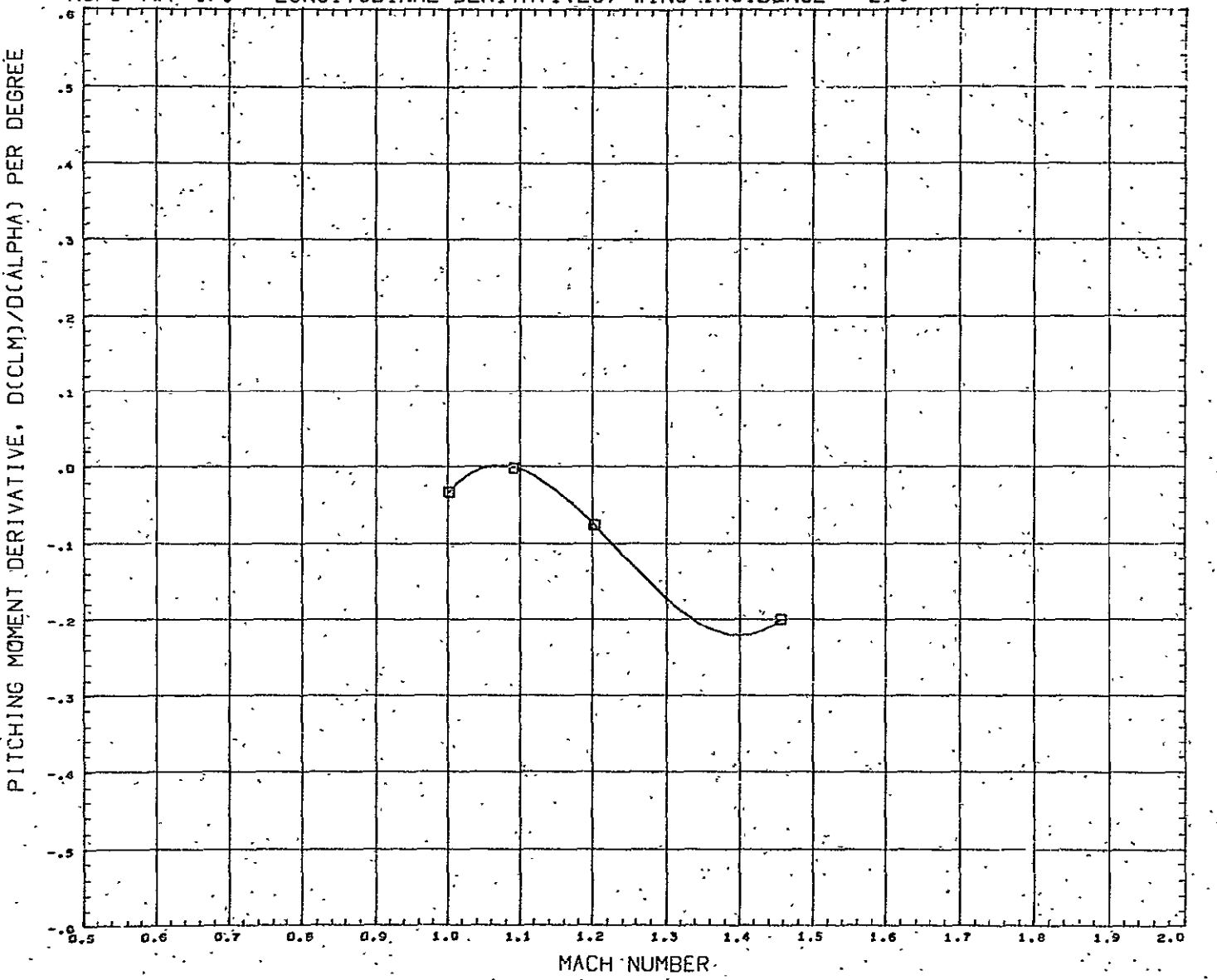
| | | | |
|---|---|---|---|
| BETA | 0.090 | ORBINC | 1.050 |
| WNGINC | 2.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3360 | PERCNT |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, WING INCIDENCE = 2.0




PARAMETRIC VALUES

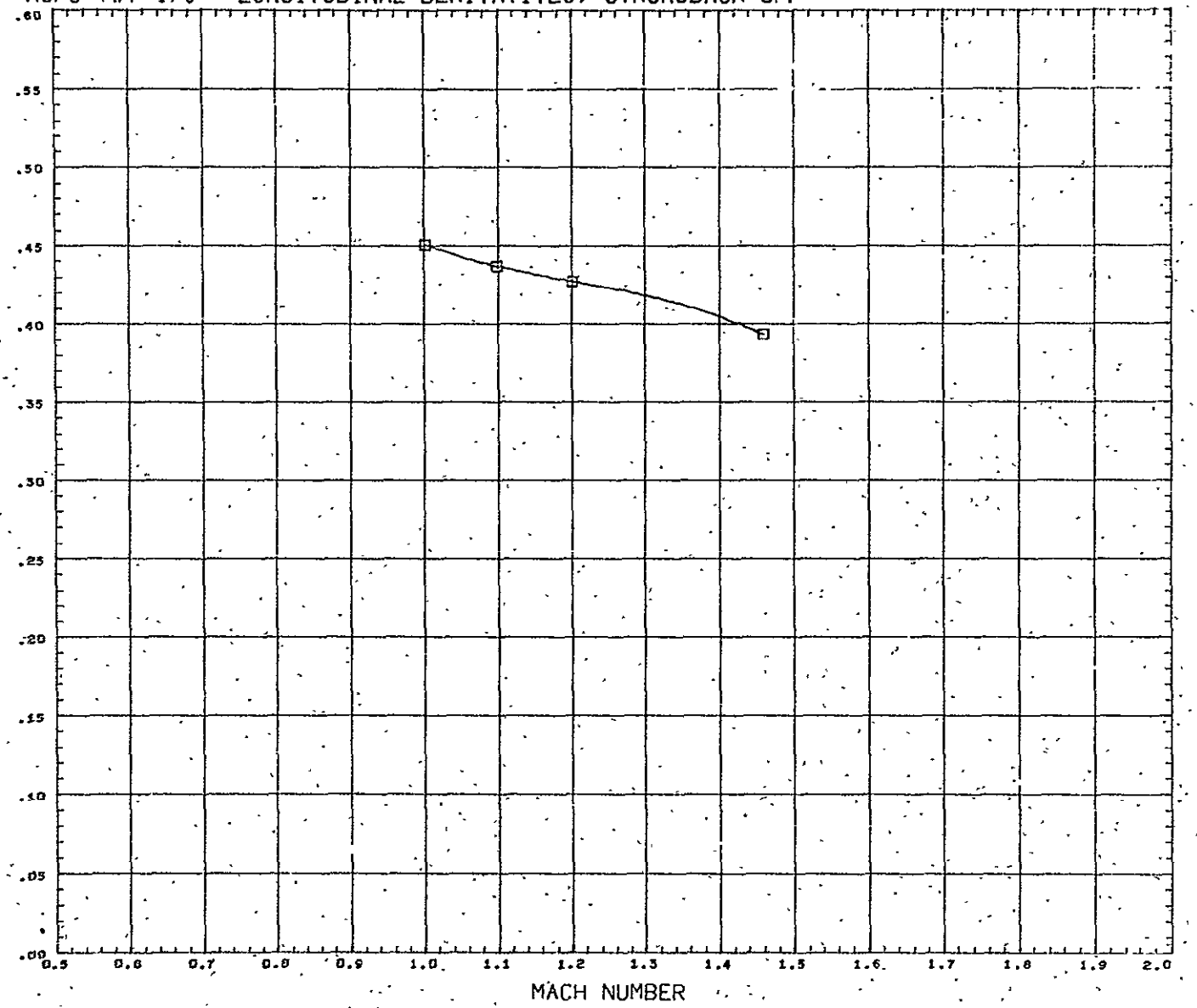
| | | | |
|---|---|---|---|
| BETA | 0.000 | ORBINC | 1.050 |
| WNGINC | 2.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, STRONGBACK OFF




PARAMETRIC VALUES

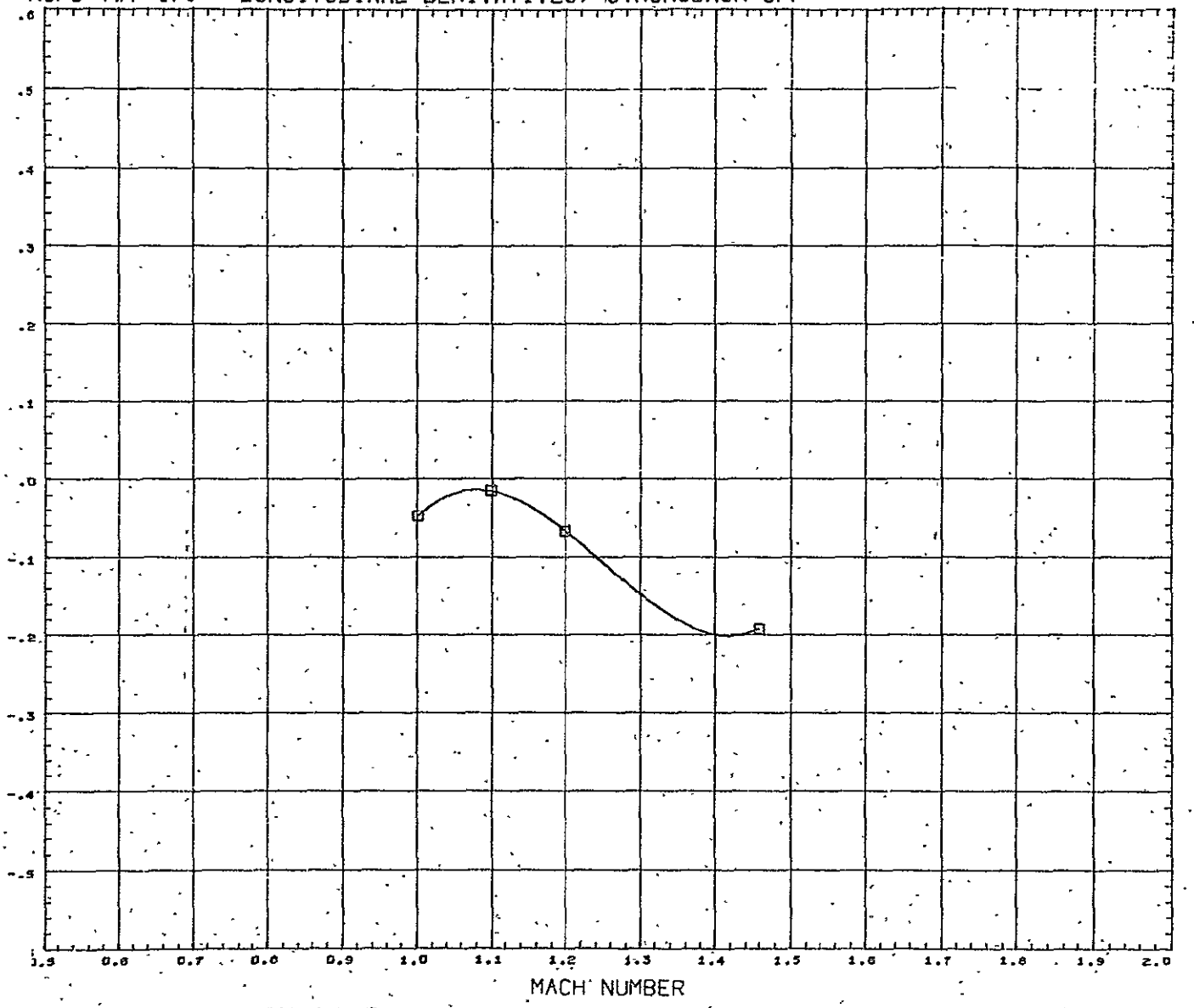
| | | | |
|---|---|---|---|
| BETA | 0.040 | ORBINC | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, STRONGBACK OFF




PARAMETRIC VALUES

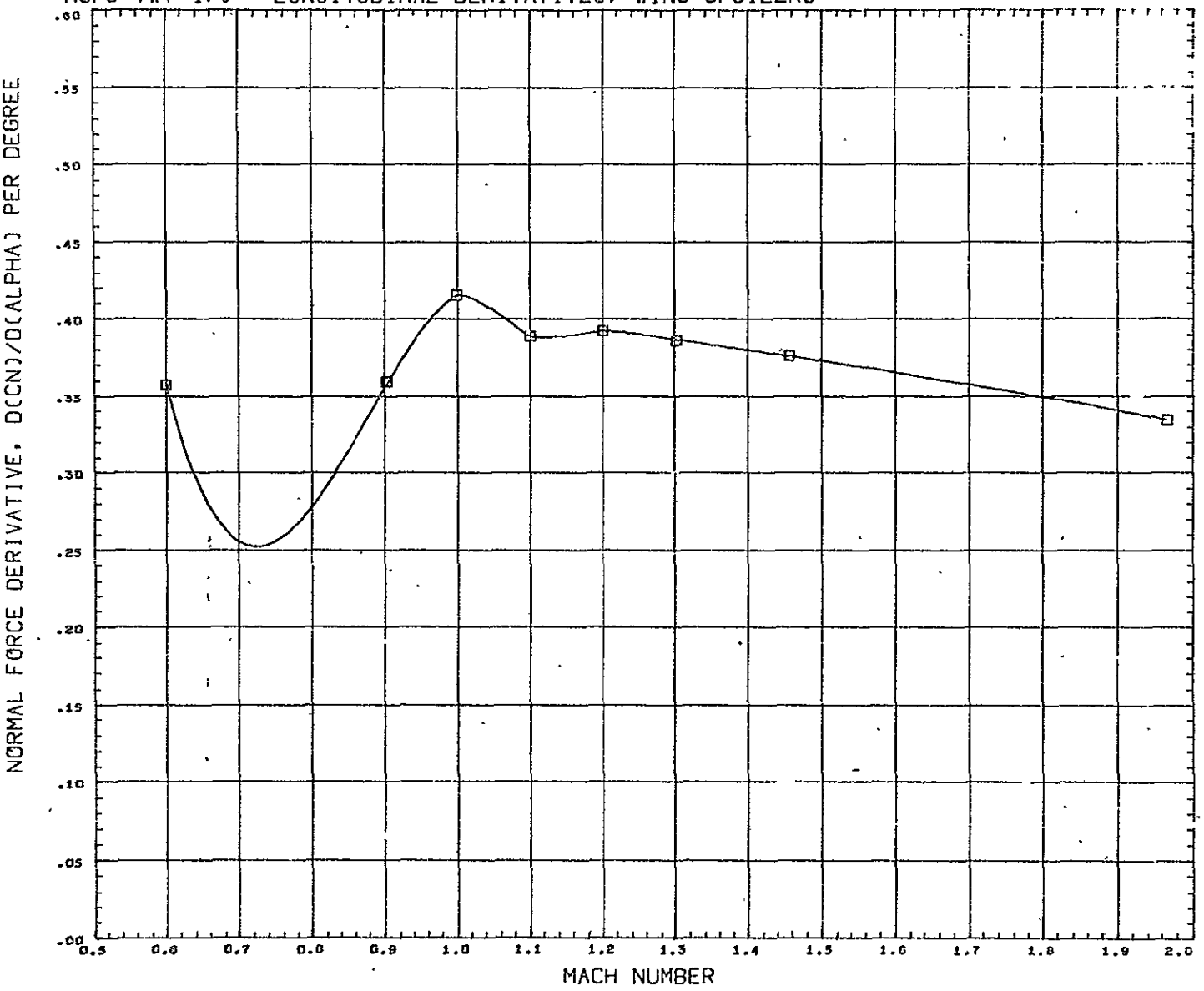
| | | | |
|---|---|---|---|
| BETA | 0.040 | ORBINC | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, WING SPOILERS




PARAMETRIC VALUES

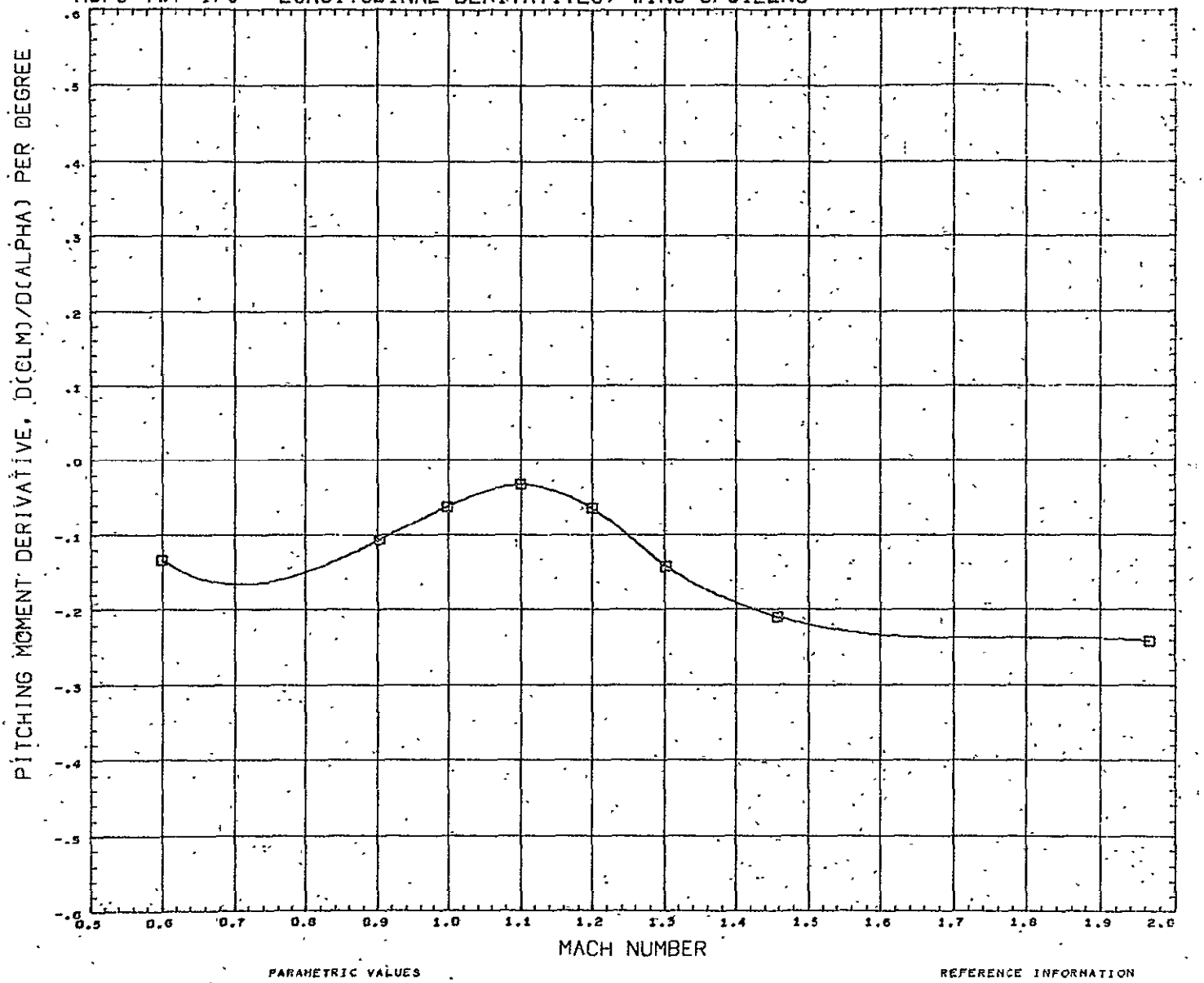
| | | | |
|---|---|---|---|
| BETA | 0.050 | ORBINC | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL DERIVATIVES, WING SPOILERS




PARAMETRIC VALUES

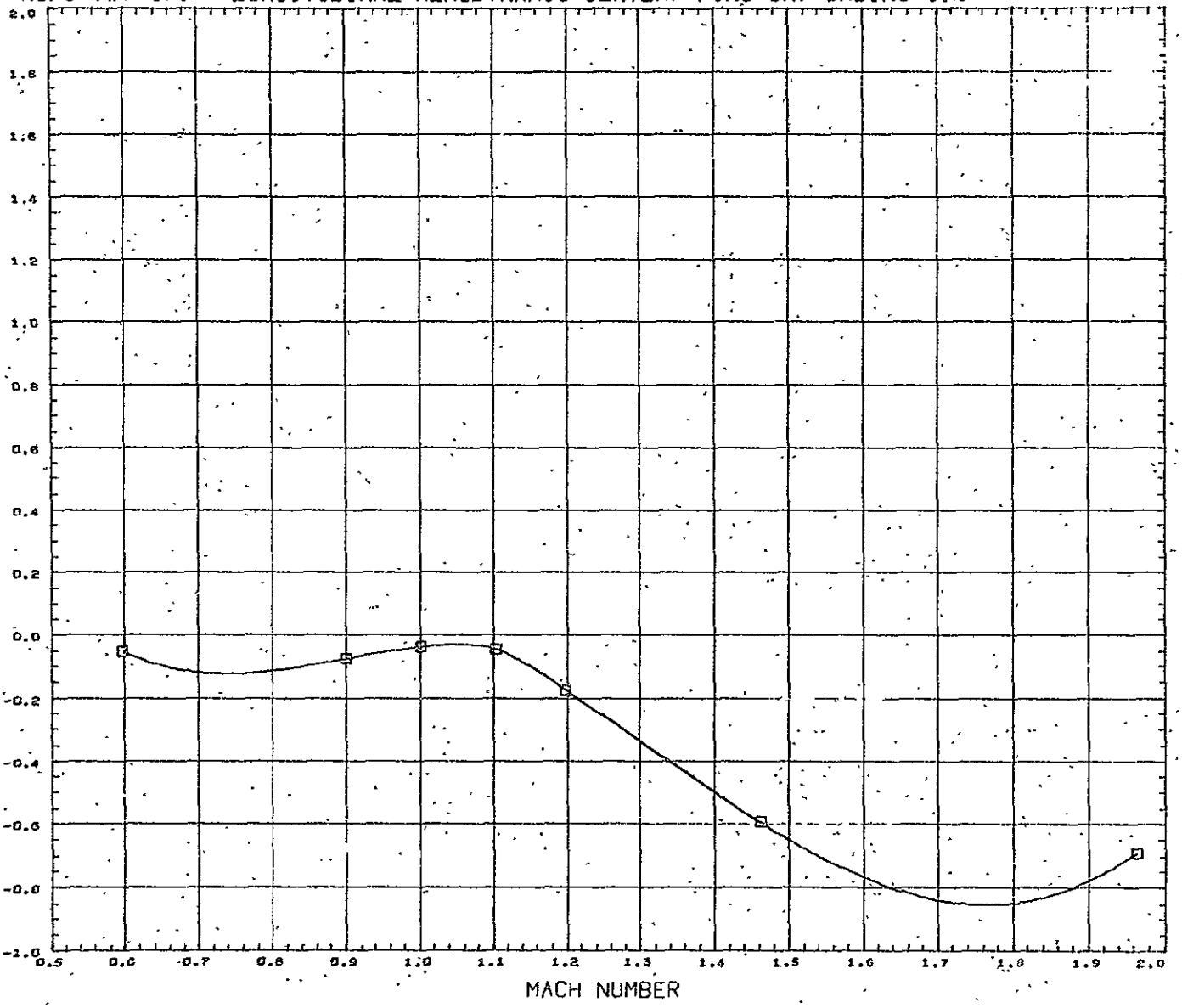
| | | | |
|---|---|---|---|
| BETA | 0.050 | ORBINC | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL AERODYNAMIC CENTER, FINS ON, ORBINC=0.0




PARAMETRIC VALUES

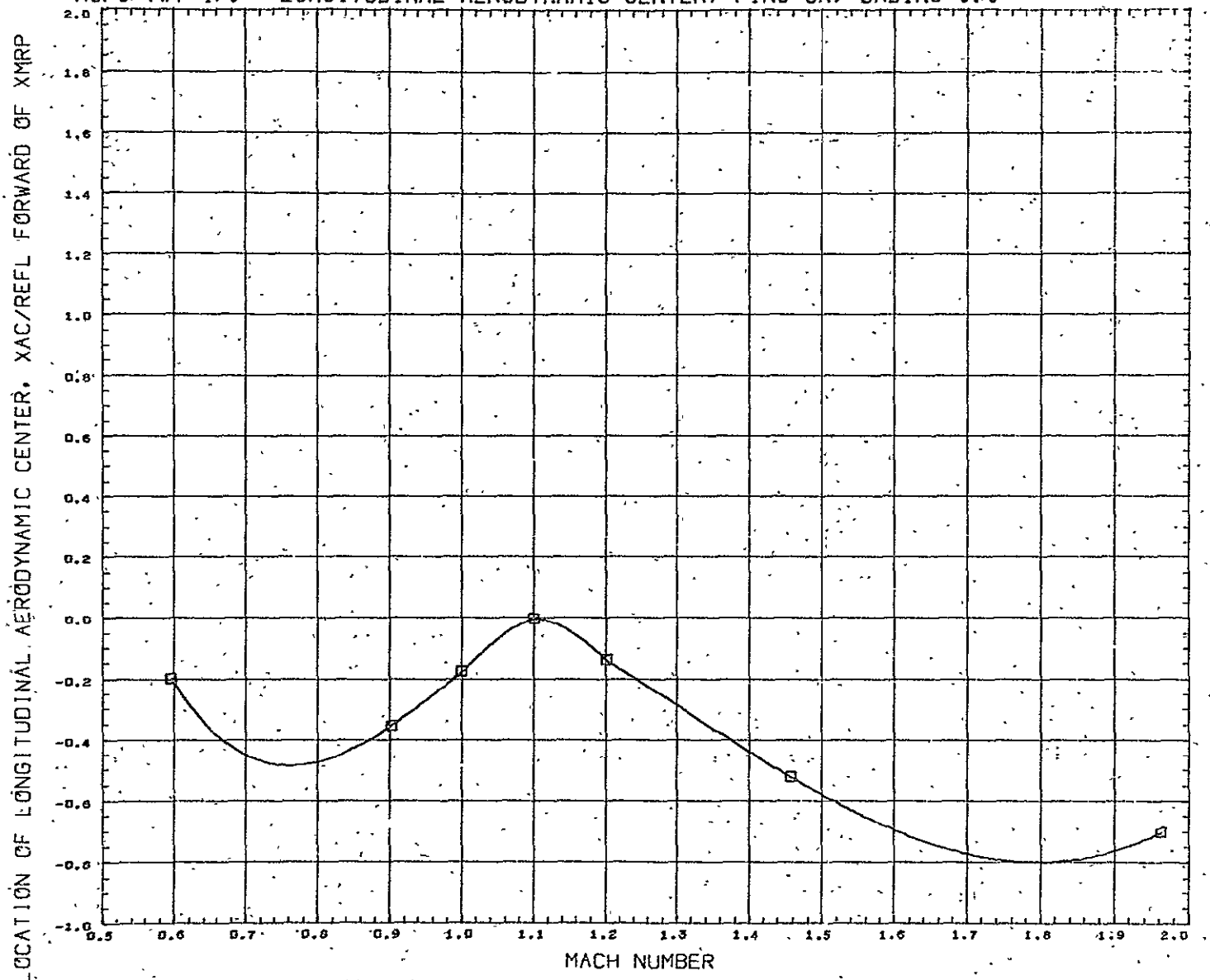
| | | | |
|---|---|---|---|
| BETA | 0.070 | ORBINC | 0.000 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL AERODYNAMIC CENTER, FINS ON, ORBINC=0.0




PARAMETRIC VALUES

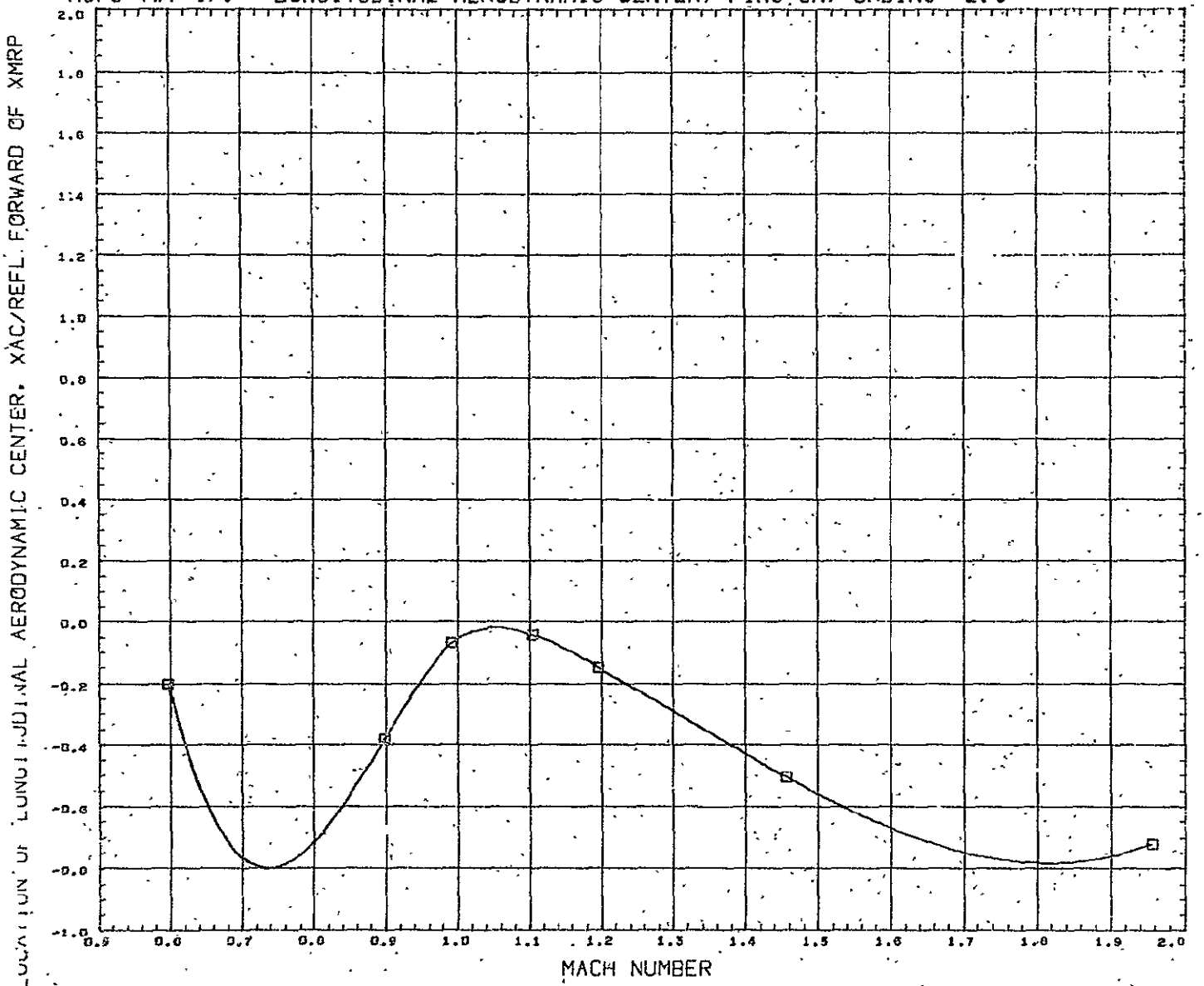
| | | | |
|---|---|---|---|
| BETA | 0.090 | ORBINC | 0.000 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL AERODYNAMIC CENTER, FINS ON, ORBINC=-2.0




PARAMETRIC VALUES

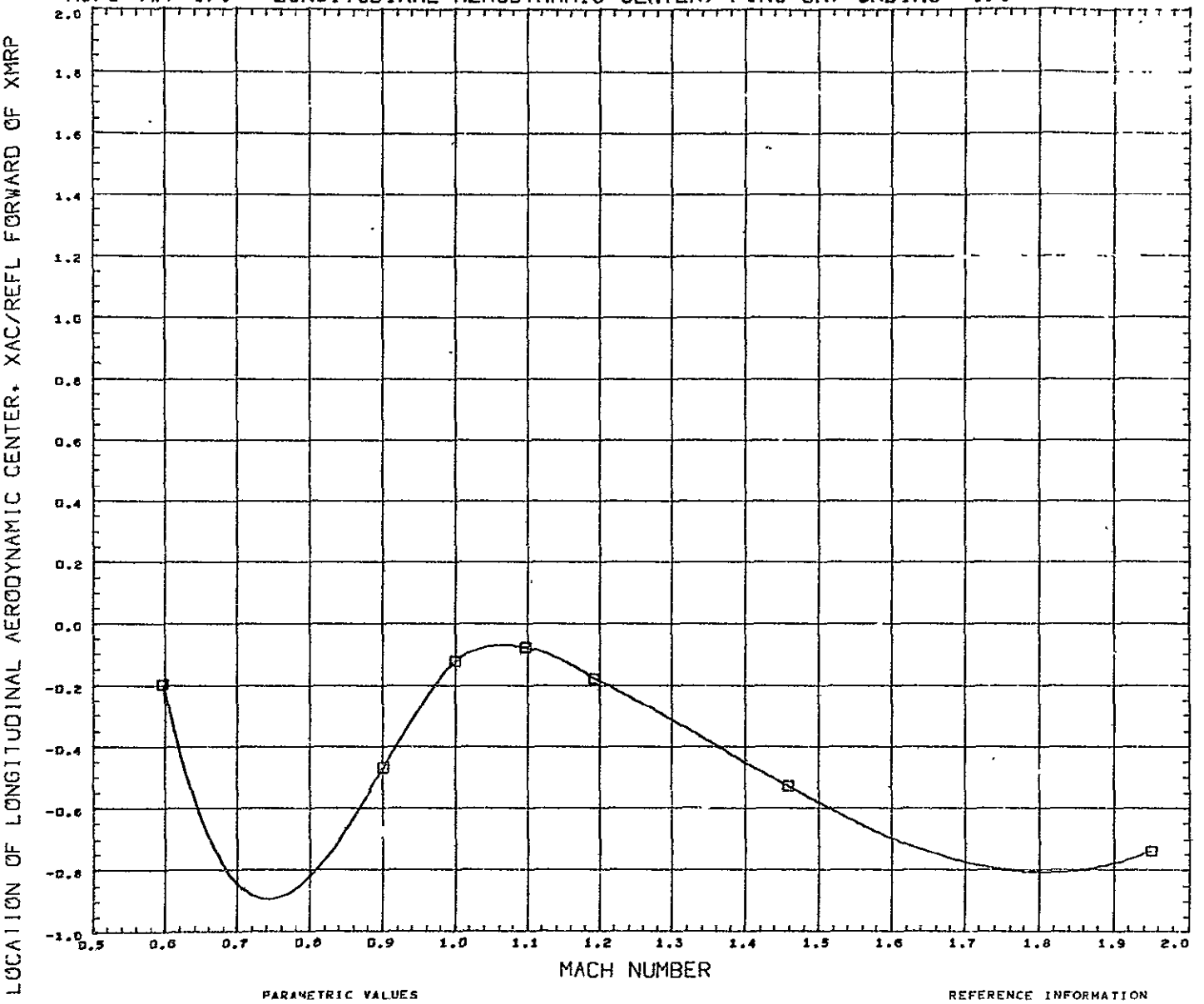
| | | | | | |
|---|---|---|---|---|---|
| BETA | - | 0.070 | ORBINC | - | 2.000 |
| WNGINC | | 4.000 | HTAIL | | 0.000 |
| PHIB | | 0.000 | | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3950 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL AERODYNAMIC CENTER, FINS ON, ORBINC=-4.0




PARAMETRIC VALUES

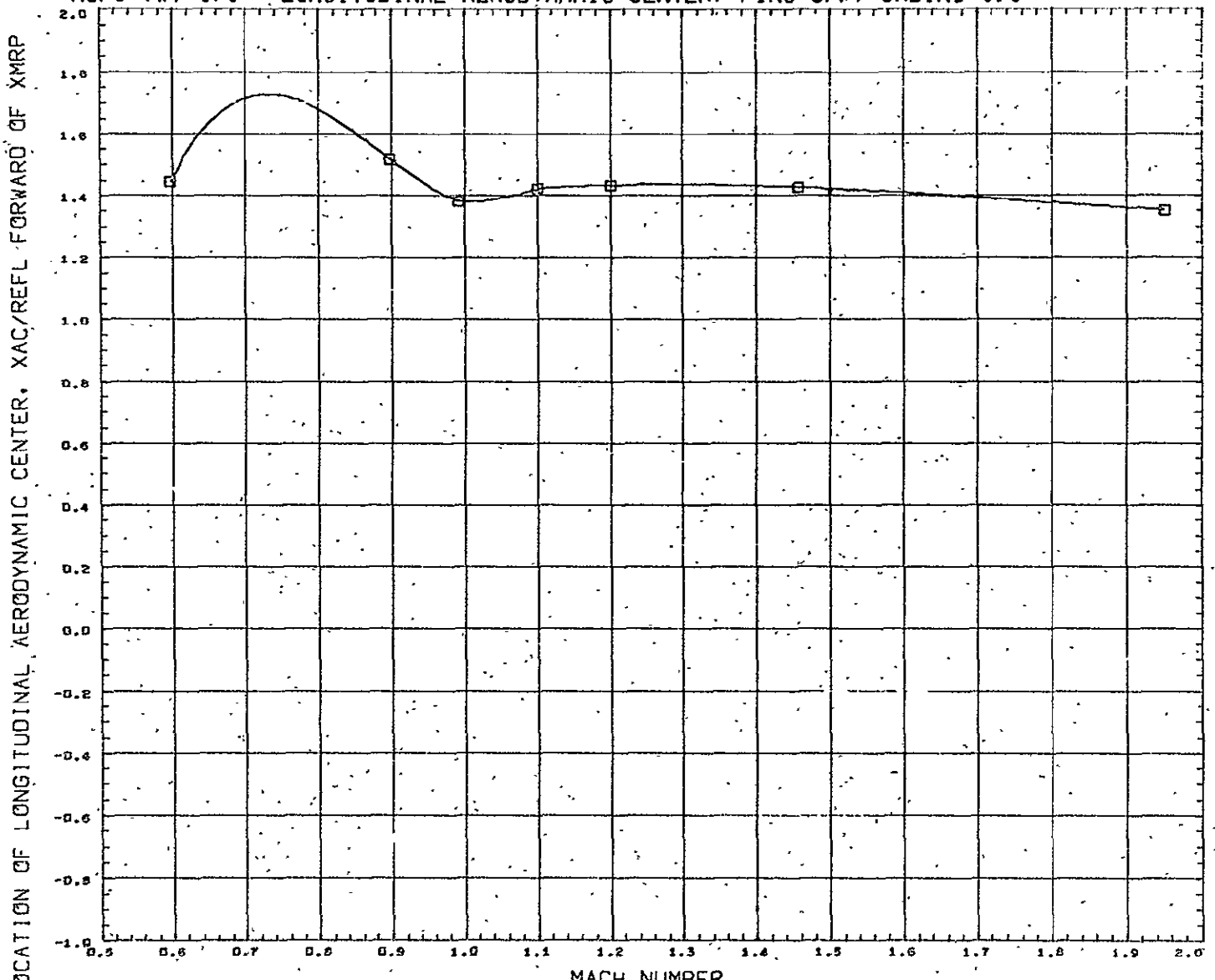
| | | | |
|---|---|---|---|
| BETA | - 0.050 | ORBINC | - 4.000 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL AERODYNAMIC CENTER, FINS OFF, ORBINC=0.0




PARAMETRIC VALUES

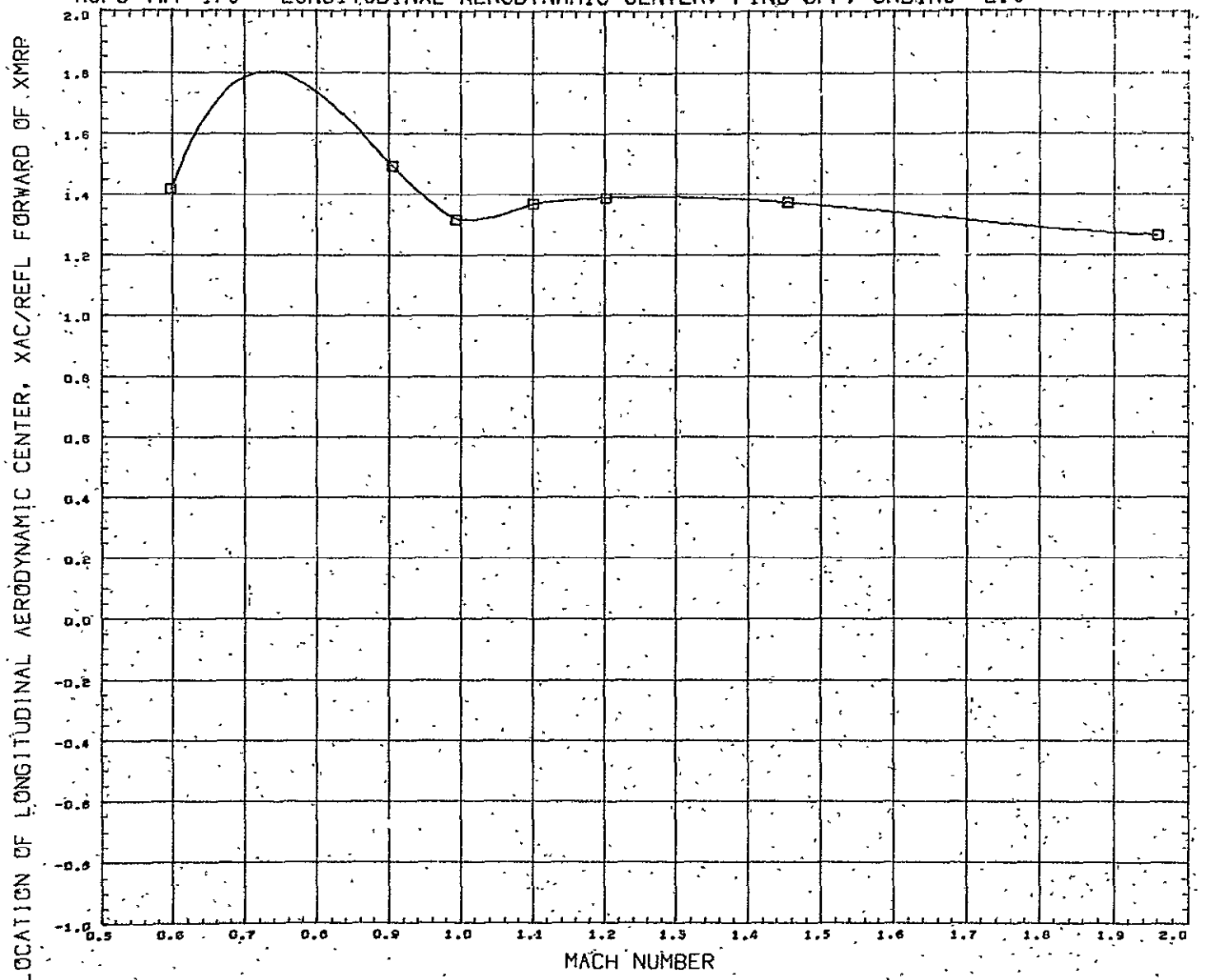
| | | | |
|---|---|---|---|
| BETA | 0.050 | ORBINC | 0.000 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE = V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL AERODYNAMIC CENTER, FINS OFF, ORBINC=-2.0




PARAMETRIC VALUES

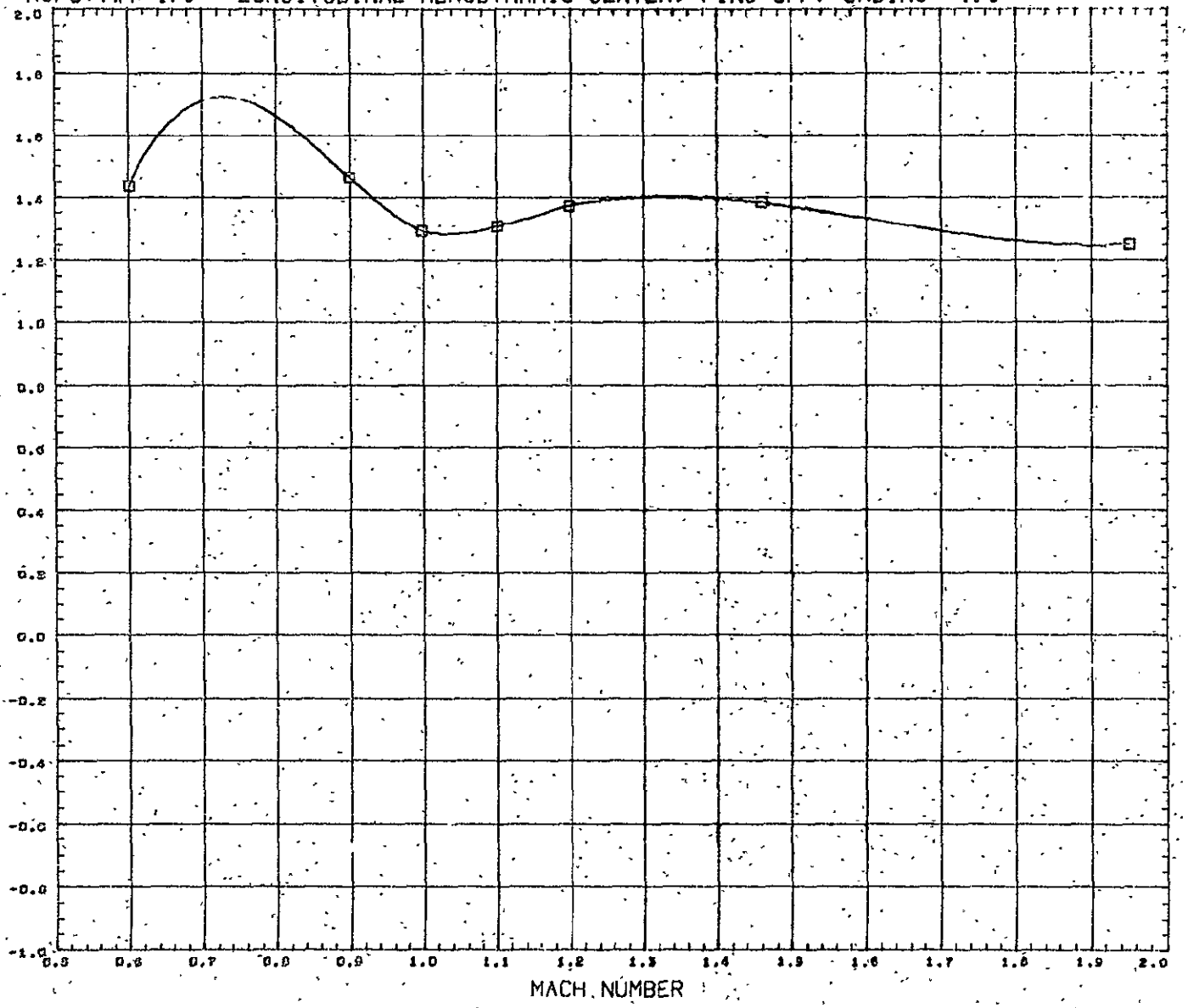
| | | | |
|---|---|---|---|
| BETA | 0.000 | ORBINC | 2.000 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC PWT 470 LONGITUDINAL AERODYNAMIC CENTER, FINS OFF, ØRBINC=-4.0




PARAMETRIC VALUES

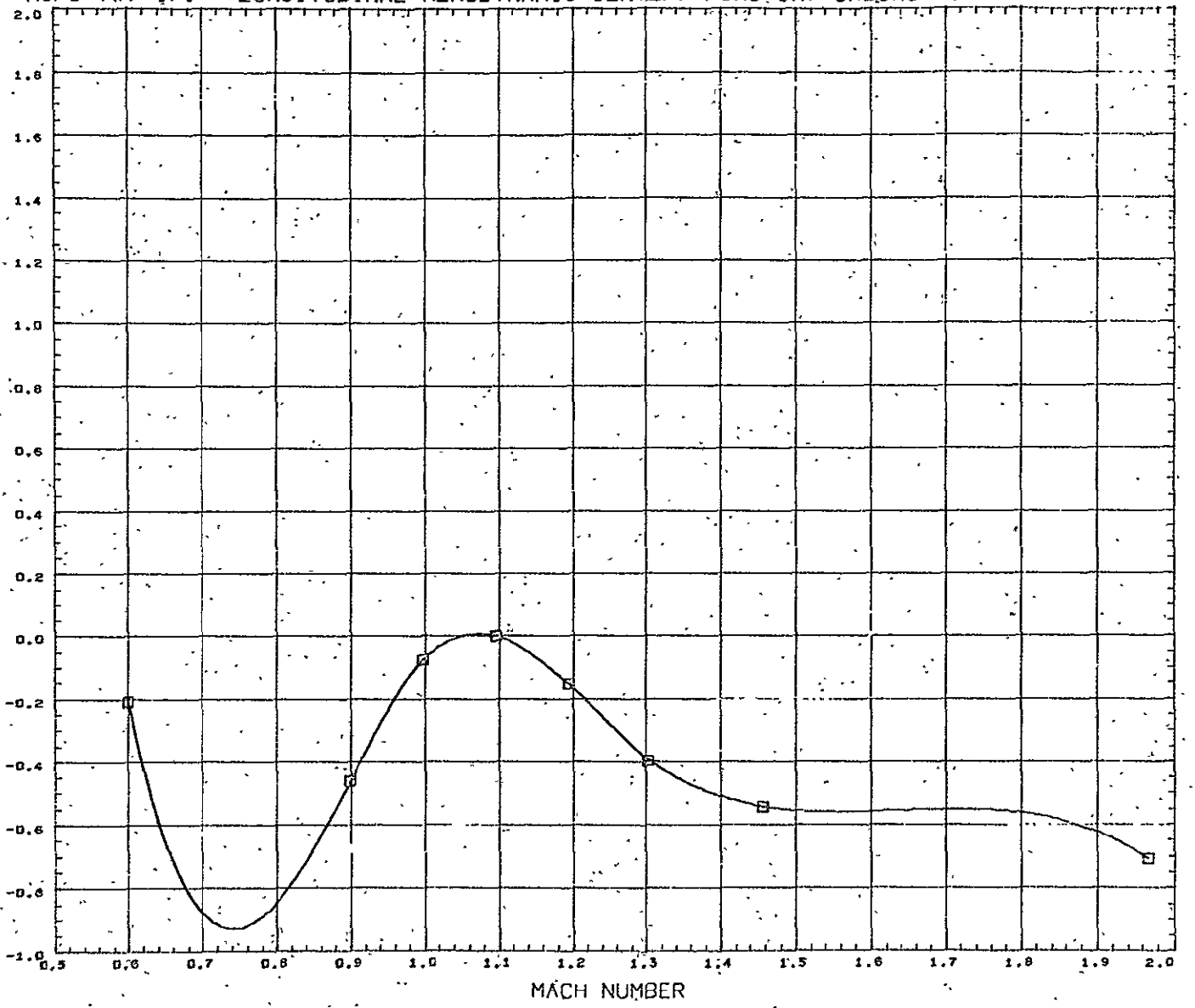
| | | | |
|---|---|---|---|
| BETA | 0.040 | ORBINC | 4.000 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL AERODYNAMIC CENTER, FINS ON, ORBINC=-1.05




PARAMETRIC VALUES

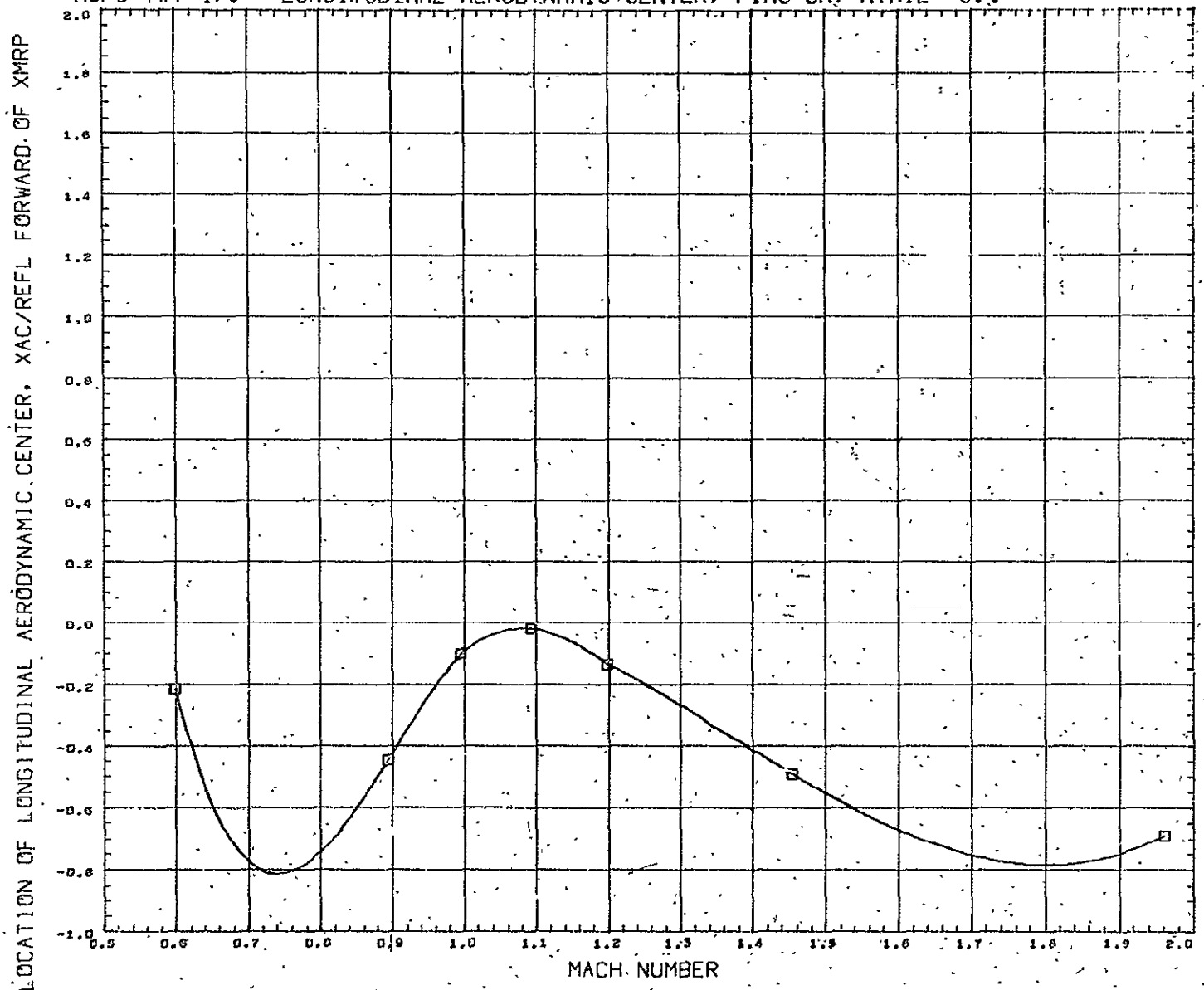
| | | | |
|---|---|---|---|
| BETA | - 0.050 | ORBINC | - 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 - LONGITUDINAL AERODYNAMIC CENTER, FINS ON, HTAIL=-5.0




PARAMETRIC VALUES

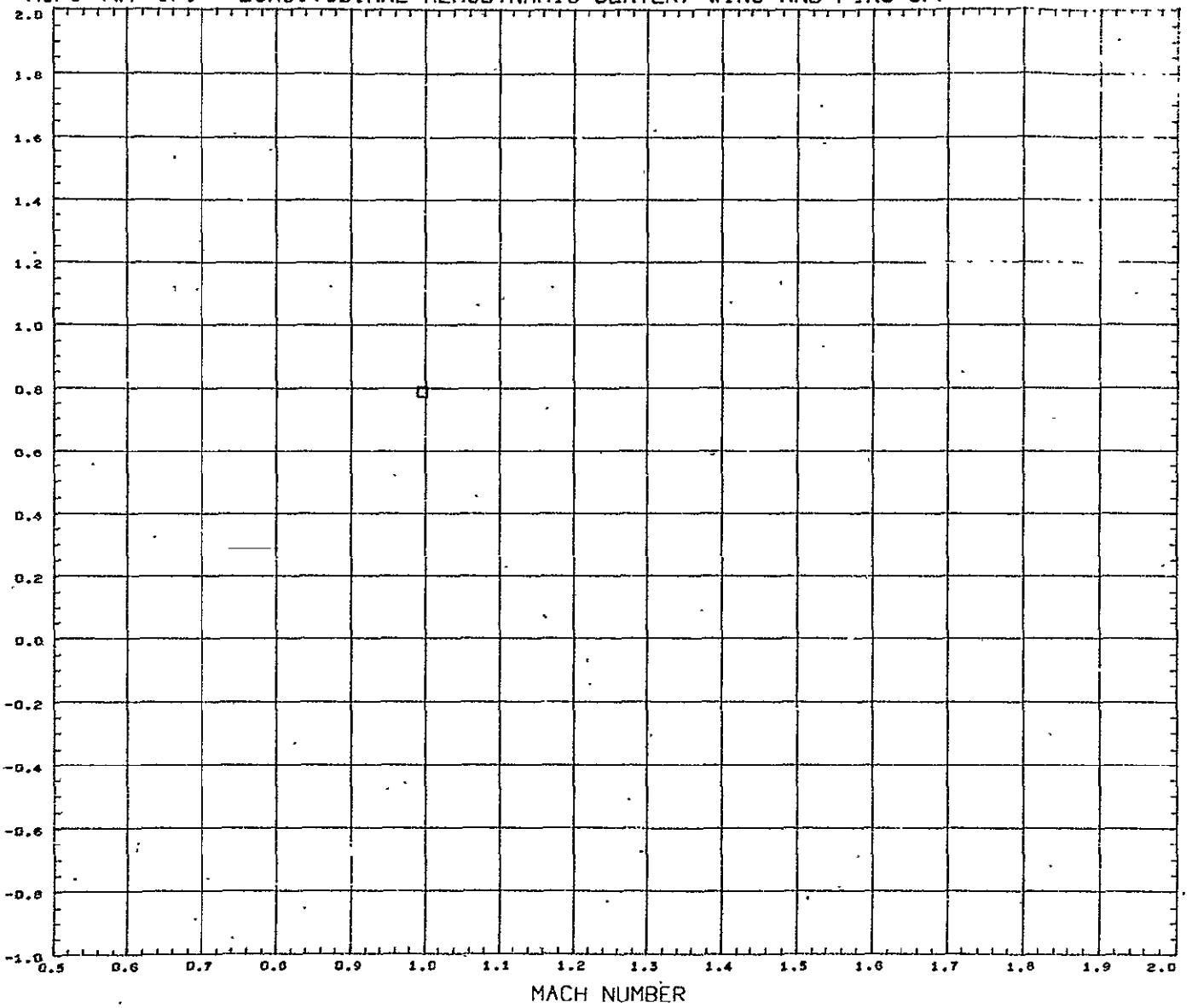
| | | | |
|---|---|---|---|
| BETA | 0.020 | ORBINC | 1.050 |
| WNGINC | 4.000 | HTAIL | 5.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE V.

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL AERODYNAMIC CENTER, WING AND FINS OFF




PARAMETRIC VALUES

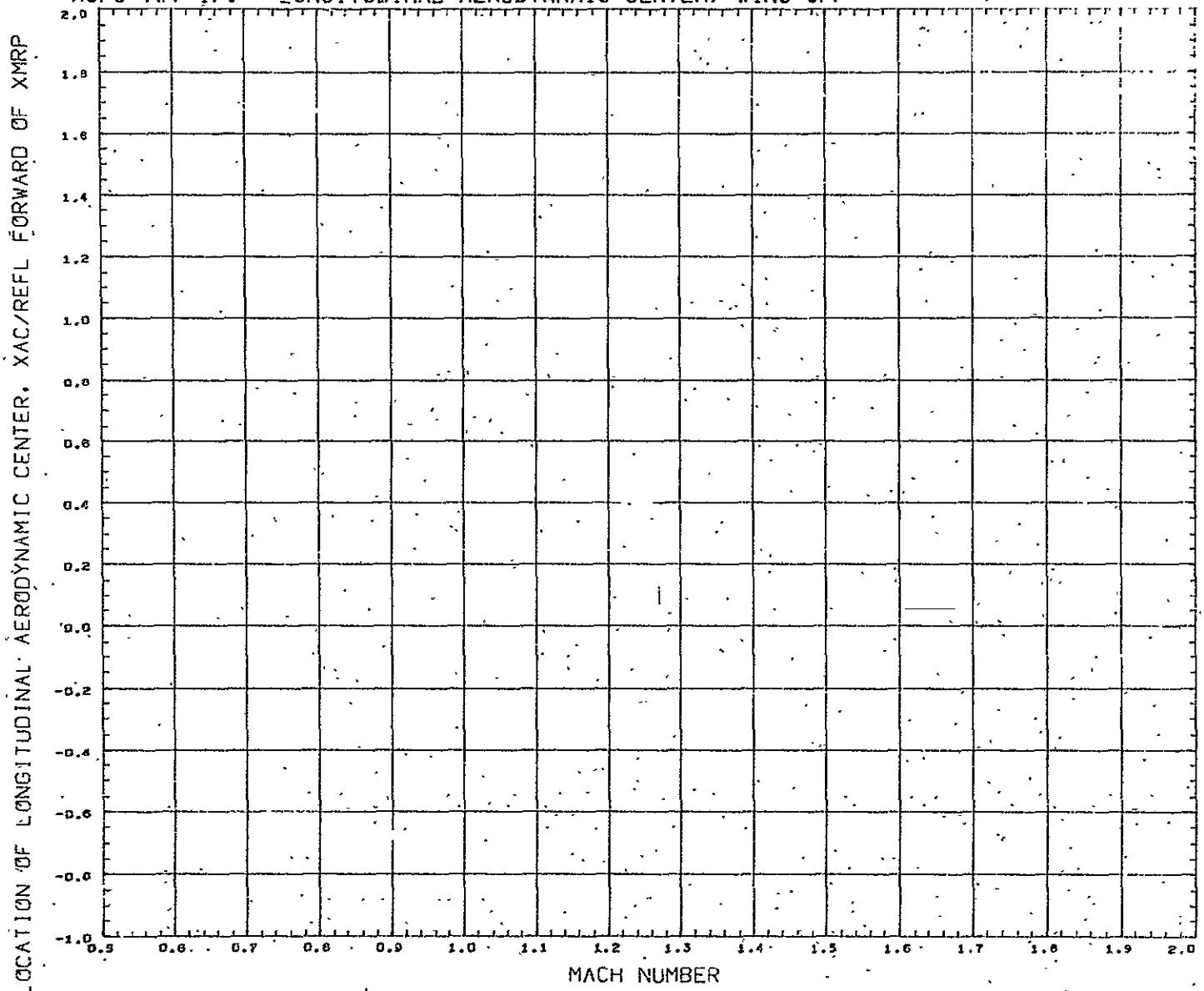
| | | | |
|---|---|---|---|
| BETA | 0.100 | ORBINC | 1.050 |
| HTAIL | 0.000 | PHIB | 0.000 |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRF | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.5366 | PERCNT |

DATA HIST. CODE Y

MSFC TWT 470 - LONGITUDINAL AERODYNAMIC CENTER, WING OFF




PARAMETRIC VALUES

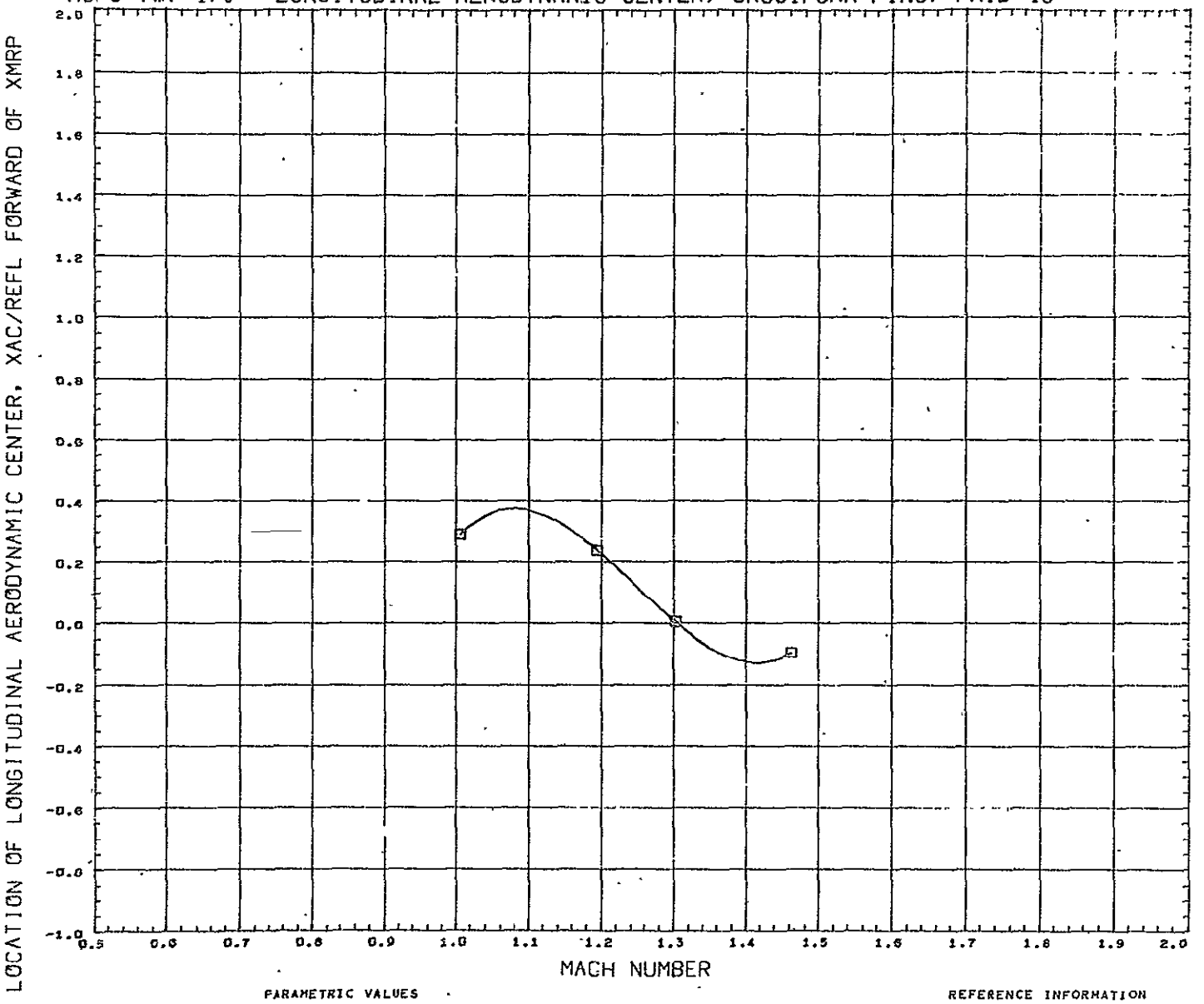
| | | | |
|---|---|---|---|
| BETA | 0.100 | ORBINC | 1.050 |
| HTAIL | 0.000 | PHIB | 0.000 |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL AERODYNAMIC CENTER, CRUCIFORM FINS, PHIB=45




PARAMETRIC VALUES

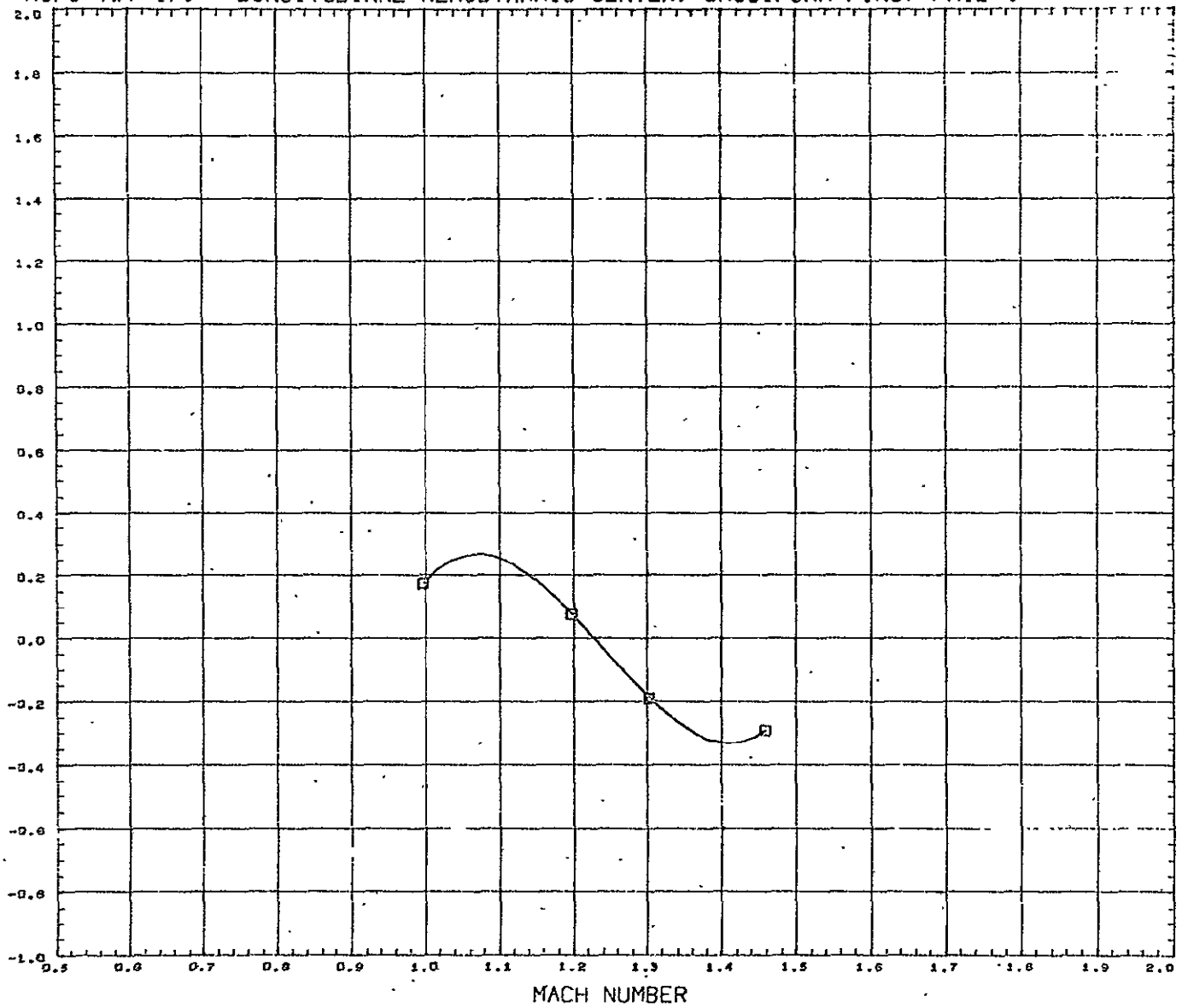
| | | | |
|---|---|---|---|
| BETA | - 0.070 | ORBINC | - 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 45.000 | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL AERODYNAMIC CENTER, CRUCIFORM FINS, PHIB=0




PARAMETRIC VALUES

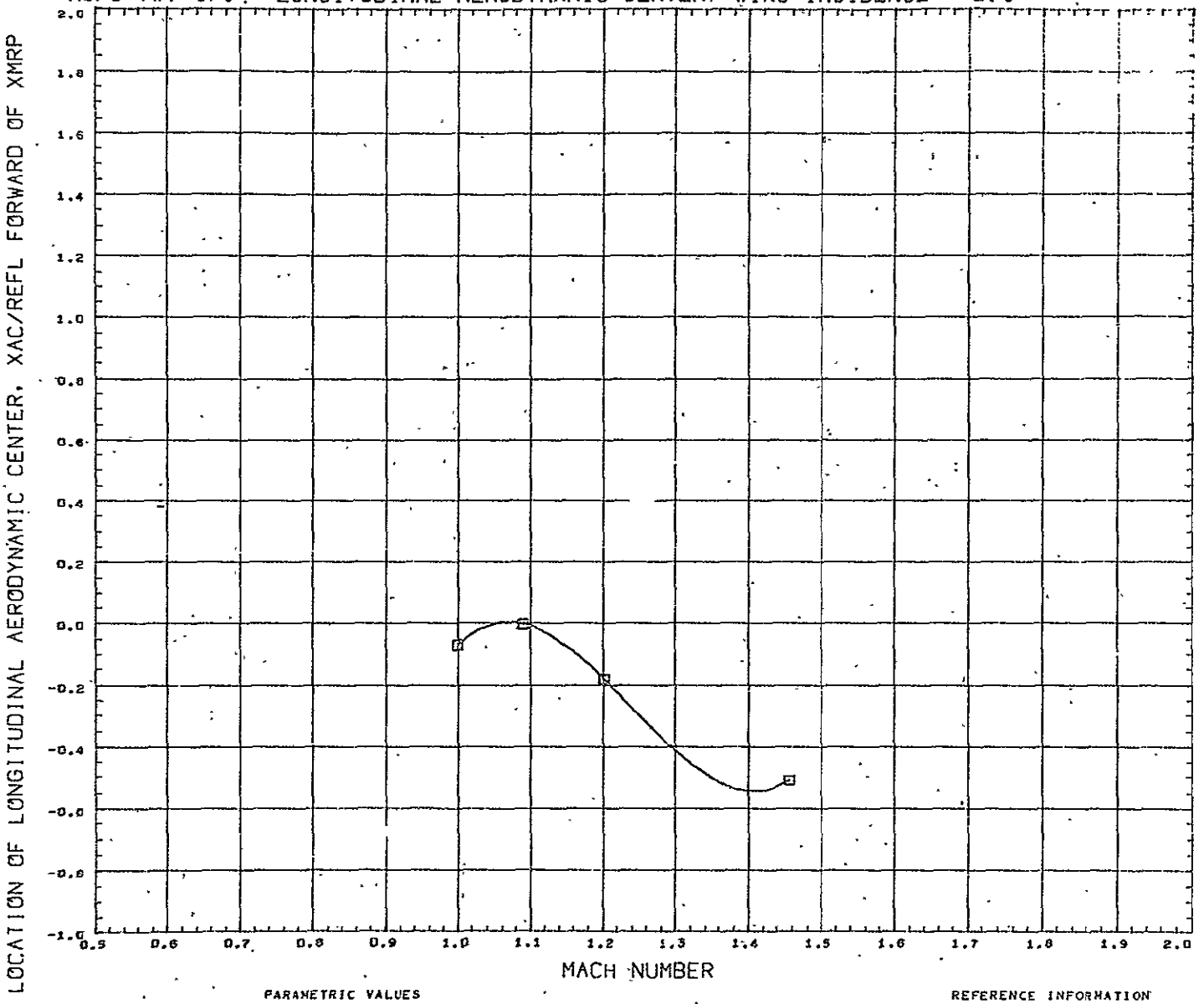
| | | | |
|---|---|---|---|
| BETA | 0.060 | ORBINC | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470. LONGITUDINAL AERODYNAMIC CENTER, WING INCIDENCE = 2.0




PARAMETRIC VALUES

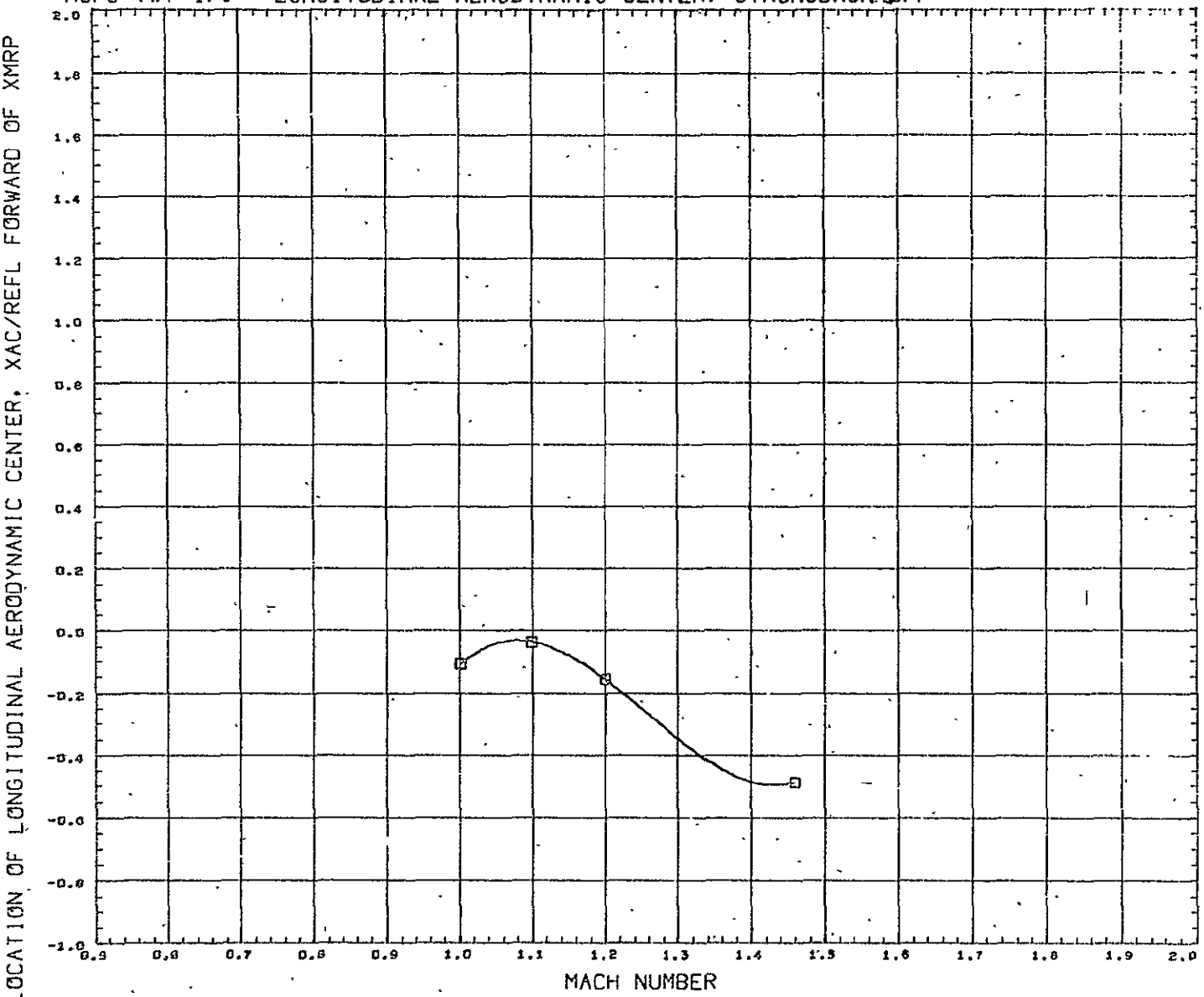
| | | | |
|---|---|---|---|
| BETA | 0.000 | ORBINC | 1.050 |
| WNGINC | 2.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LØNGITUDINAL AERØDYNAMIC CENTER, STRØNGBACK ØFF




PARAMETRIC VALUES

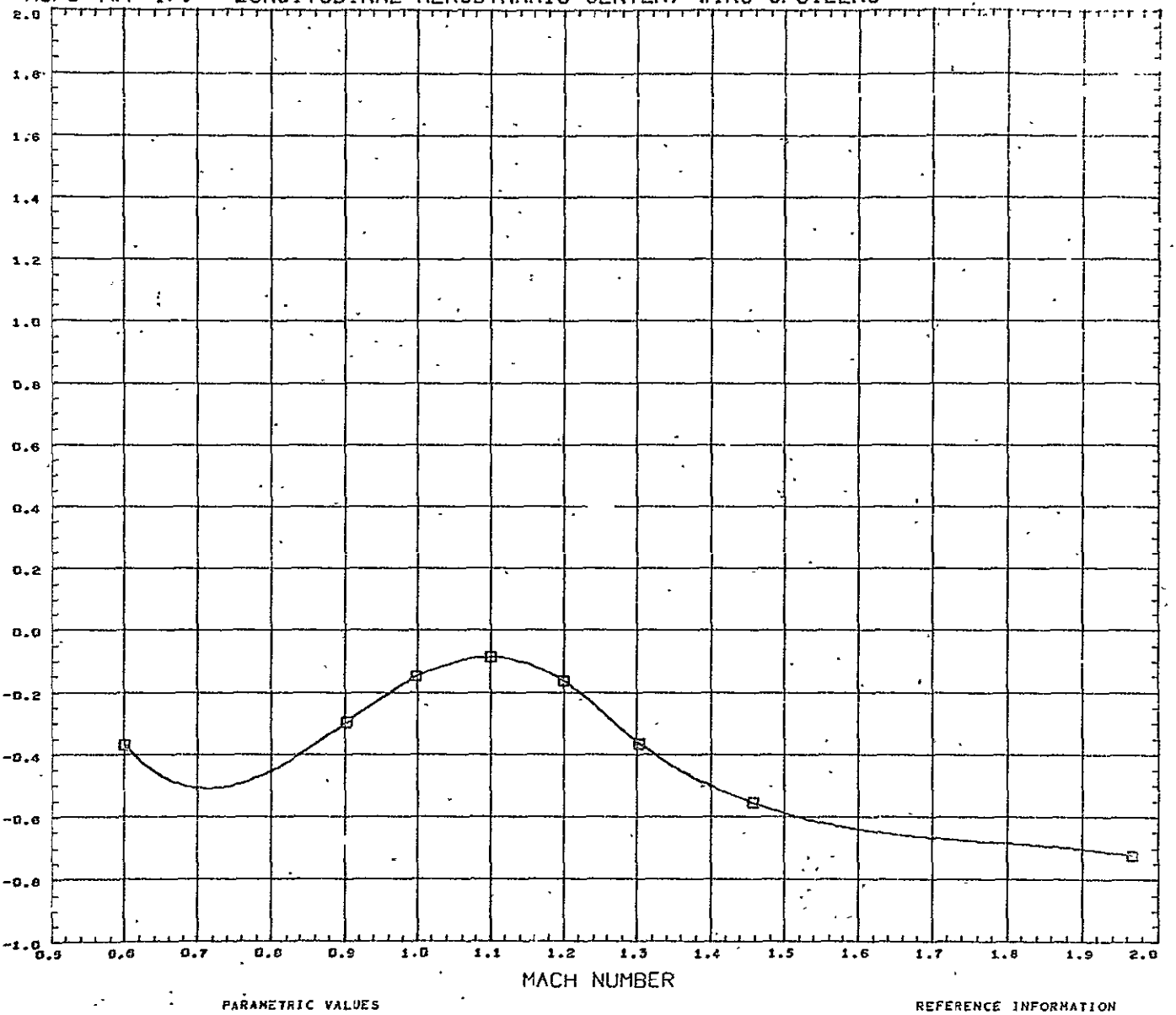
| | | | | | |
|---|---|---|---|---|---|
| BETA | - | 0.040 | ORBINC | - | 1.050 |
| WNGINC | | 4.000 | HTAIL | | 0.000 |
| PHIB | | 0.000 | | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LONGITUDINAL AERODYNAMIC CENTER, WING SPOILERS




PARAMETRIC VALUES

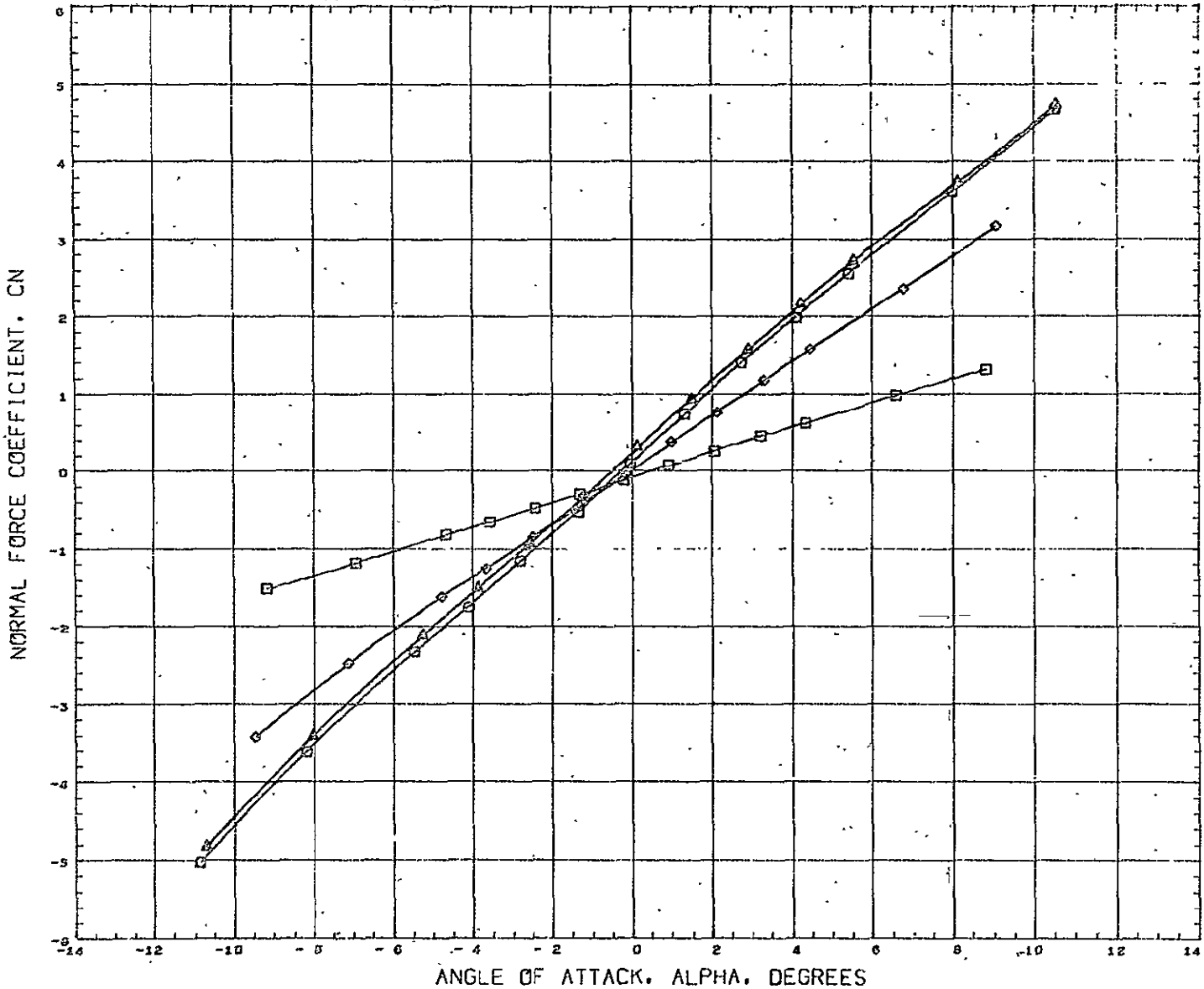
| | | | |
|---|---|---|---|
| BETA | - 0.050 | ORBINC | - 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 MODEL BUILDUP




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (X24061) | ○ | TWT470 S-IC/GAC ORBITER BF1OWHVS |
| (X24101) | □ | TWT470 S-IC/GAC ORBITER BONVS WING,FINS OFF |
| (X24111) | ◇ | TWT470 S-IC/GAC ORBITER BF1OHVS WING OFF |
| (X24151) | △ | TWT470 S-IC/GAC ORBITER BF1OWHV |

MACH 0.997

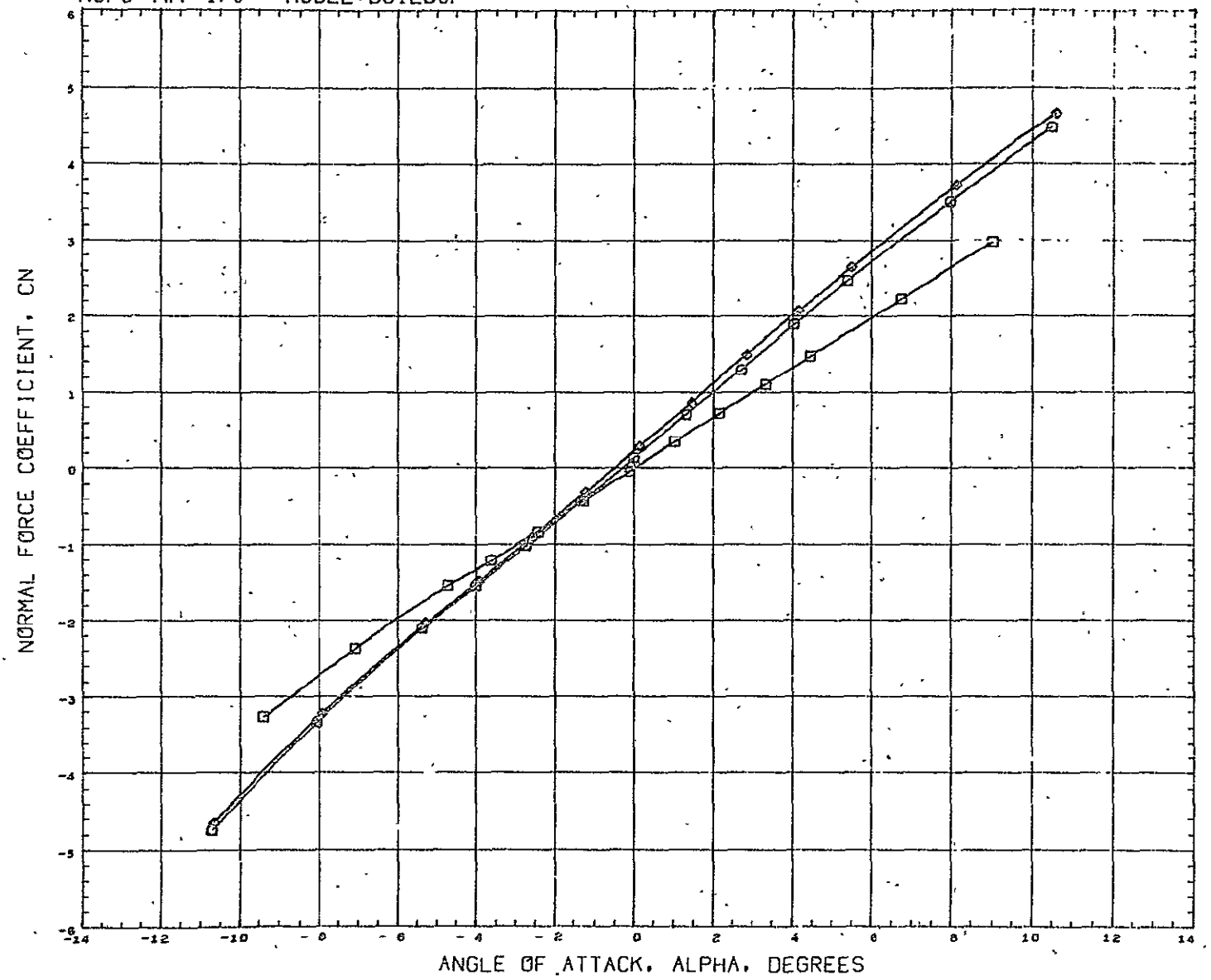
PARAMETRIC VALUES

| | | | |
|---|---|---|---|
| BETA | 0.050 | ORBINC | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 MODEL BUILDUP




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (824061) | ○ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |
| (824111) | □ | TWT470 S-IC/GAC ORBITER BF1OHVS WING OFF |
| (824151) | ◇ | TWT470 S-IC/GAC ORBITER BF1OWHV STRONGBACK OFF |

MACH 1.095

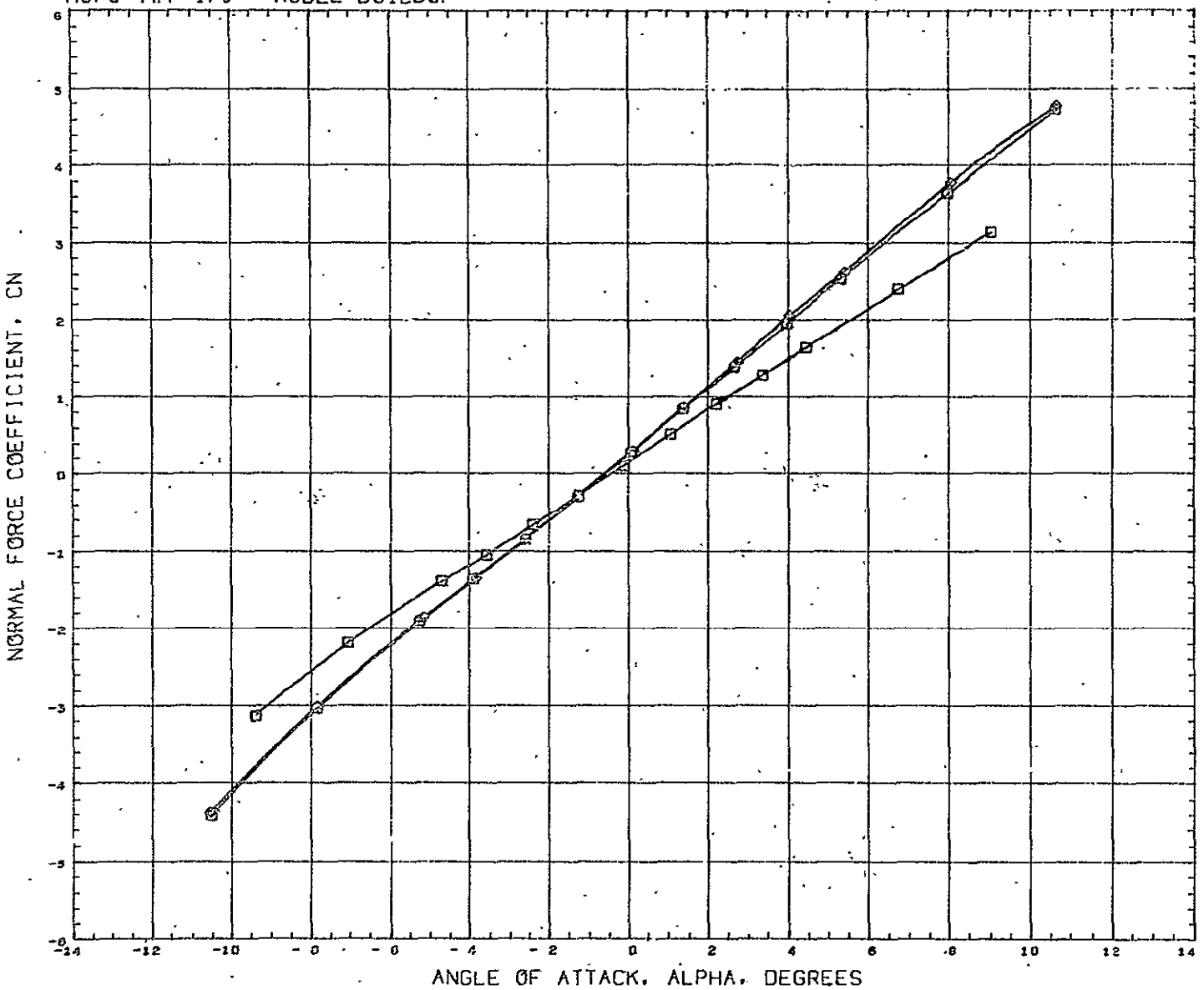
PARAMETRIC VALUES

| | | | | | |
|---|---|---|---|---|---|
| BETA | - 0.050 | ORBINC - | 1.050 | | |
| WNGINC | 4.000 | HTAIL | 0.000 | | |
| PHIB | 0.000 | | | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 MODEL BUILDUP




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (B24081) | ○ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |
| (B24111) | □ | TWT470 S-IC/GAC ORBITER BF1OHVS WING OFF |
| (B24131) | ◇ | TWT470 S-IC/G4C ORBITER BF1OWHV STRONGBACK OFF |

MACH 1.195

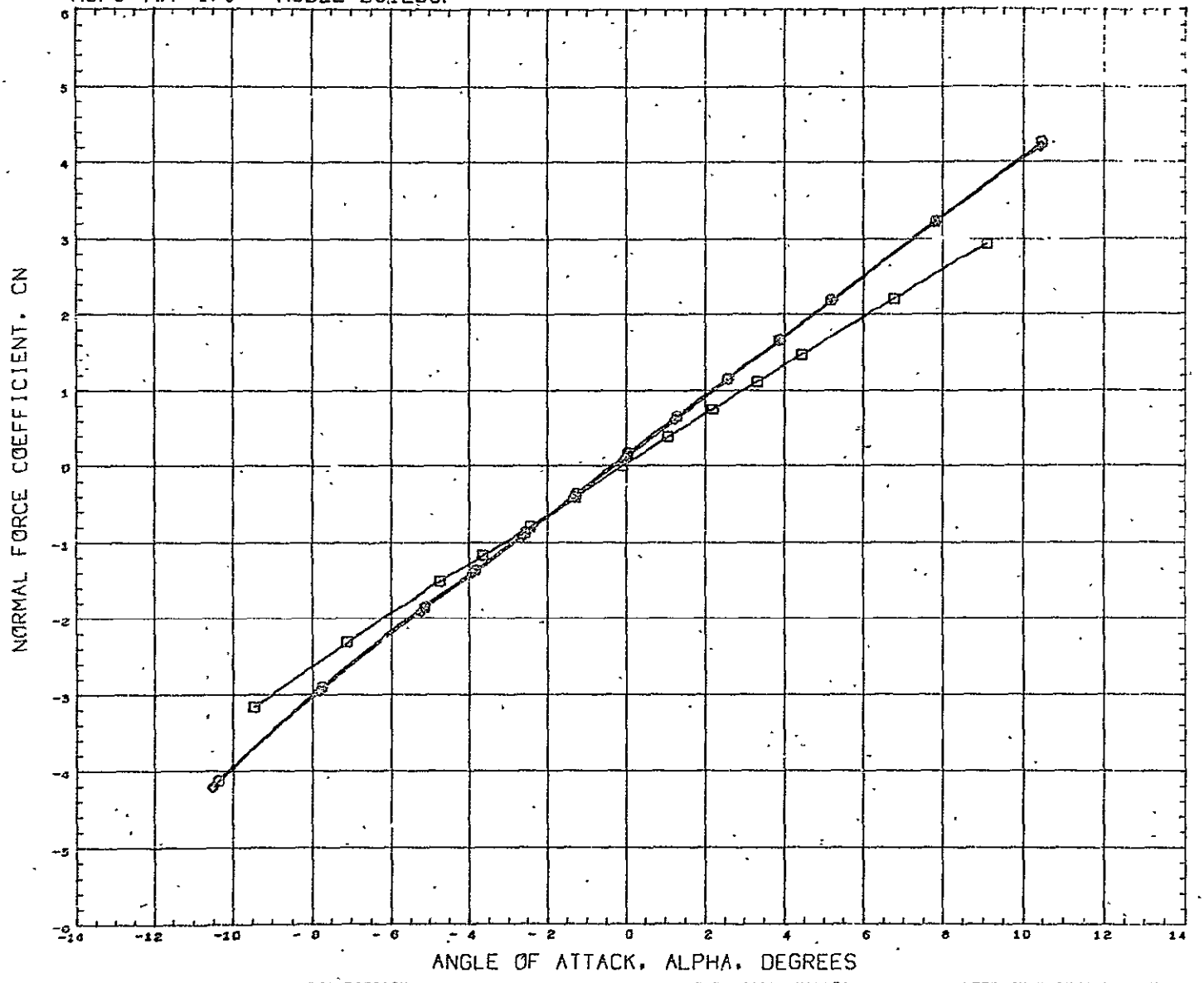
PARAMETRIC VALUES

| | | | |
|---|---|---|---|
| BETA | 0.050 | ORBINC | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 MODEL BUILDUP




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (BZ4081) | ○ | TWT47D S-IC/GAC ORBITER BF1OWHVS BASIC |
| (BZ4111) | □ | TWT47D S-IC/GAC ORBITER BF1OHVS WING OFF |
| (BZ4151) | ◇ | TWT47D S-IC/GAC ORBITER BF1OWHV STRONGBACK OFF |

PARAMETRIC VALUES

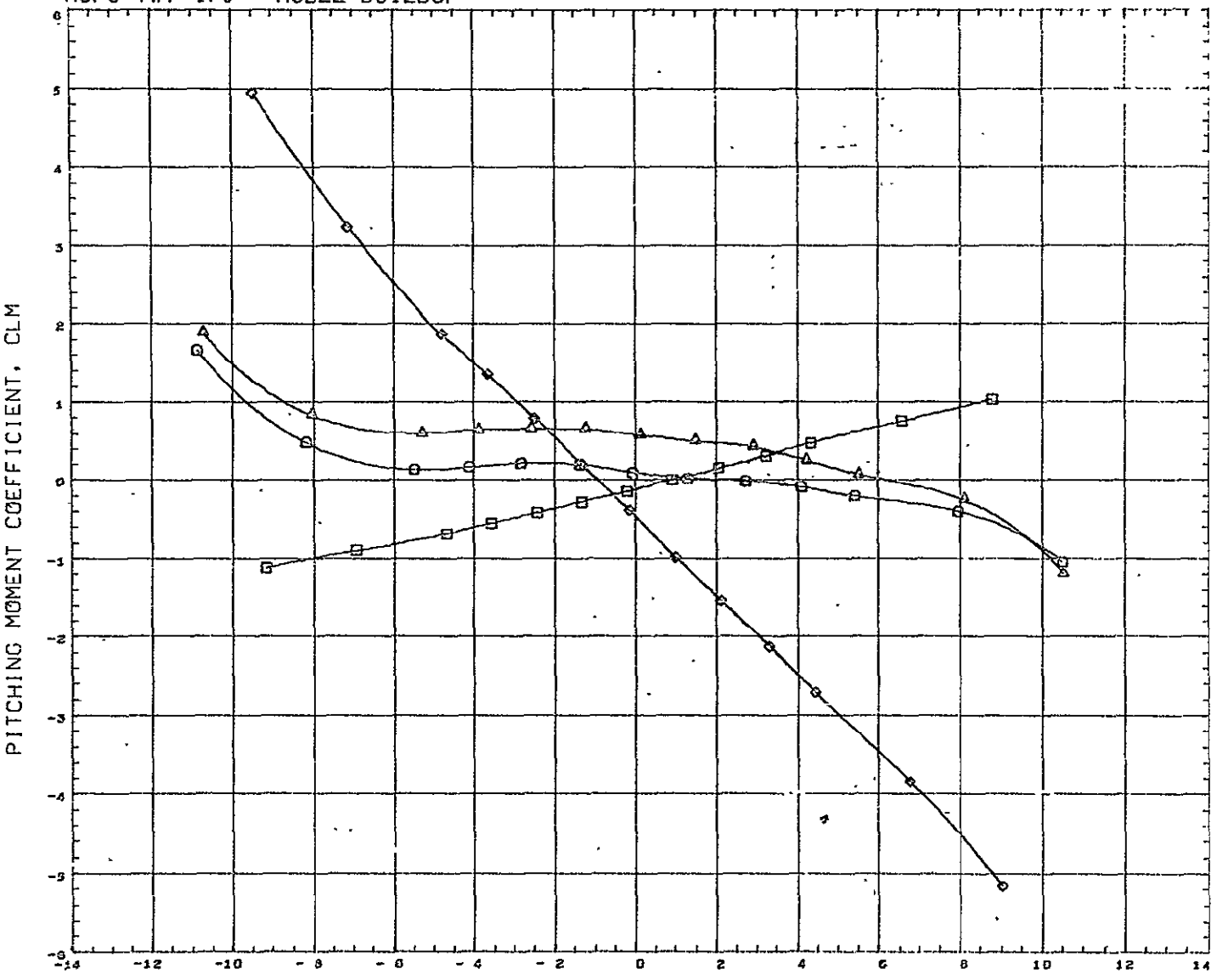
| | | | | | |
|---|---|---|---|---|---|
| BETA | - | 0.050 | ORBINC - | 1.050 | |
| WNGINC | | 4.000 | HTAIL | 0.000 | |
| PHIB | | 0.000 | | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MACH 1.456

MSFC TWT 470 MODEL BUILDUP




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (X24081) | ○ | TWT470 S-IC/GAC ORBITER BF1OWHVS |
| (AZ4101) | □ | TWT470 S-IC/GAC ORBITER BOHVS WING,FINS OFF |
| (X24111) | ◇ | TWT470 S-IC/GAC ORBITER BF1OHVS WING OFF |
| (X24151) | △ | TWT470 S-IC/GAC ORBITER BF1OWHV |

MACH 0.997

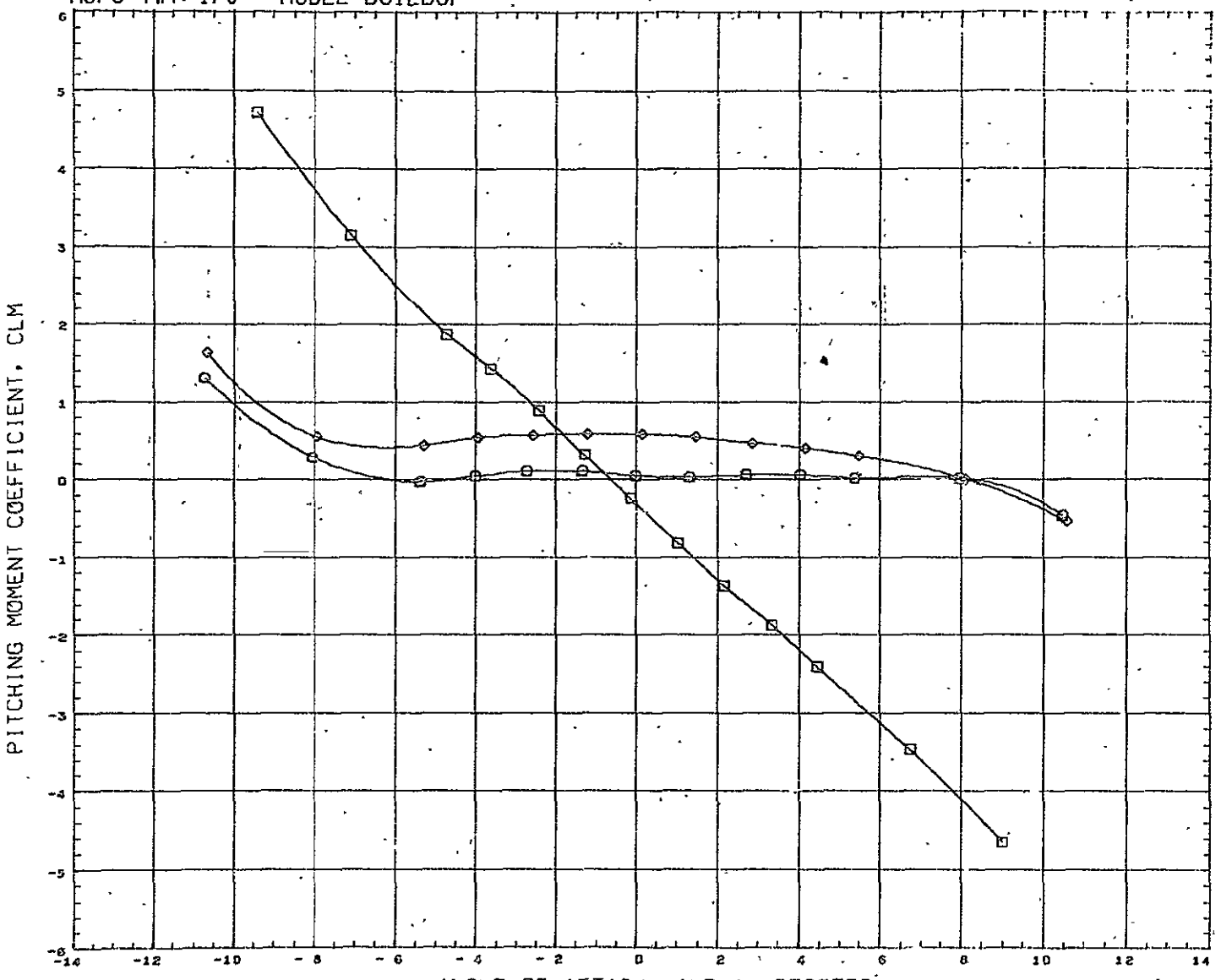
PARAMETRIC VALUES.

| | | | |
|---|---|---|---|
| BETA | 0.050 | ORBINC | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT. 470 MODEL BUILDUP




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (824081) | ○ | TWT470 S-IC/GAC ORBITER BF1OWHV5 BASIC |
| (824111) | □ | TWT470 S-IC/GAC ORBITER BF1OHVS WING OFF |
| (824151) | ◇ | TWT470 S-IC/GAC ORBITER BF1OWHV STRONGBACK OFF |

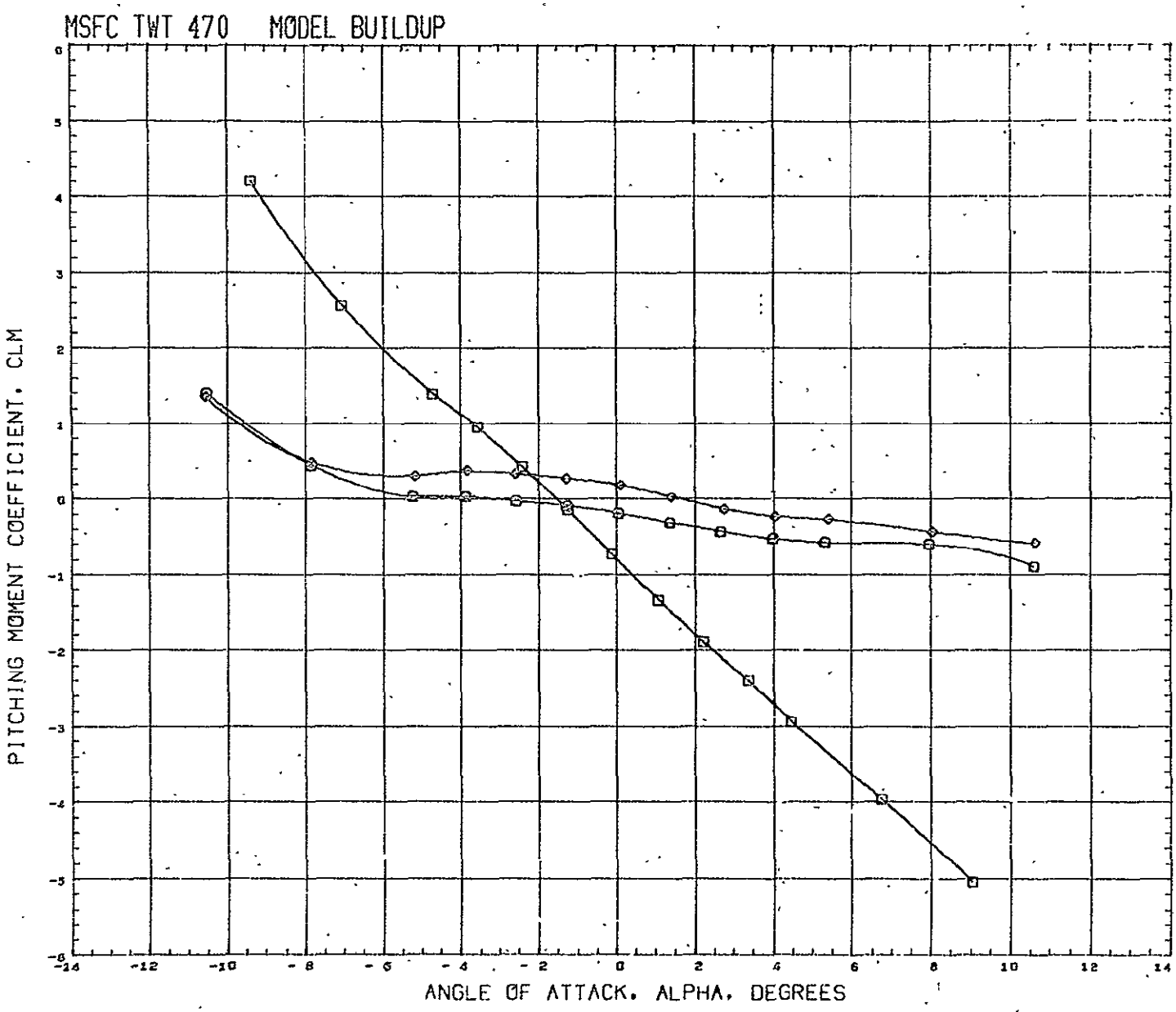
MACH 1.095

PARAMETRIC VALUES

| | | | |
|---|---|---|---|
| BETA | - 0.050 | ORBINC - | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| FHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |



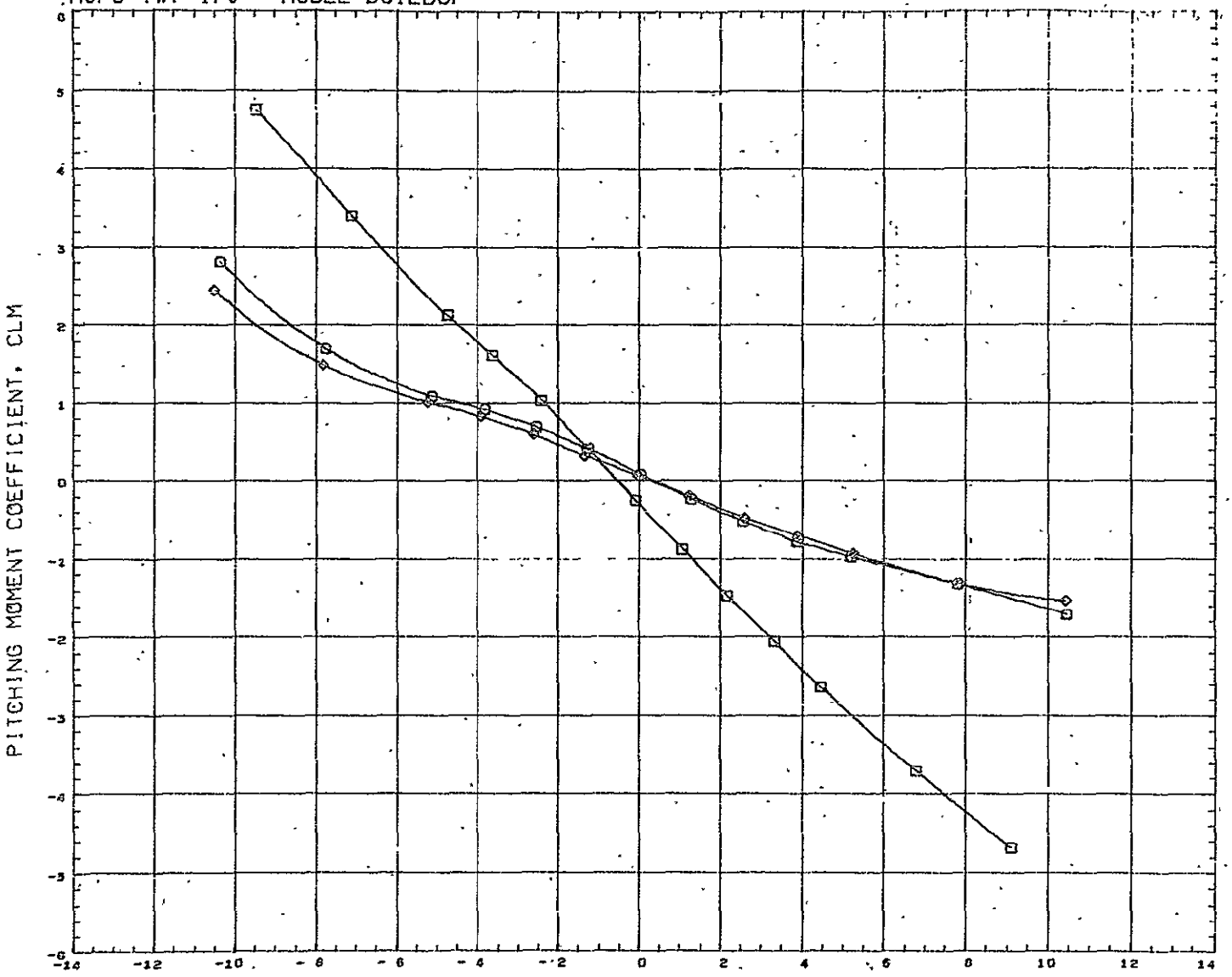

| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (824081) | ○ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |
| (824111) | □ | TWT470 S-IC/GAC ORBITER BF1OHVS WING OFF |
| (824151) | ◇ | TWT470 S-IC/GAC ORBITER BF1OWHV STRONGBACK OFF |

MACH 1.195

| PARAMETRIC VALUES | | | |
|---|---|---|---|
| BETA | 0.050 | ORBINC | 1.050 |
| WNGINC | 4.090 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 MODEL BUILDUP




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (824081) | ○ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |
| (824111) | □ | TWT470 S-IC/GAC ORBITER BF1OHVS WING OFF |
| (824151) | ◇ | TWT470 S-IC/GAC ORBITER BF1OWHV STRONGBACK OFF |

PARAMETRIC VALUES

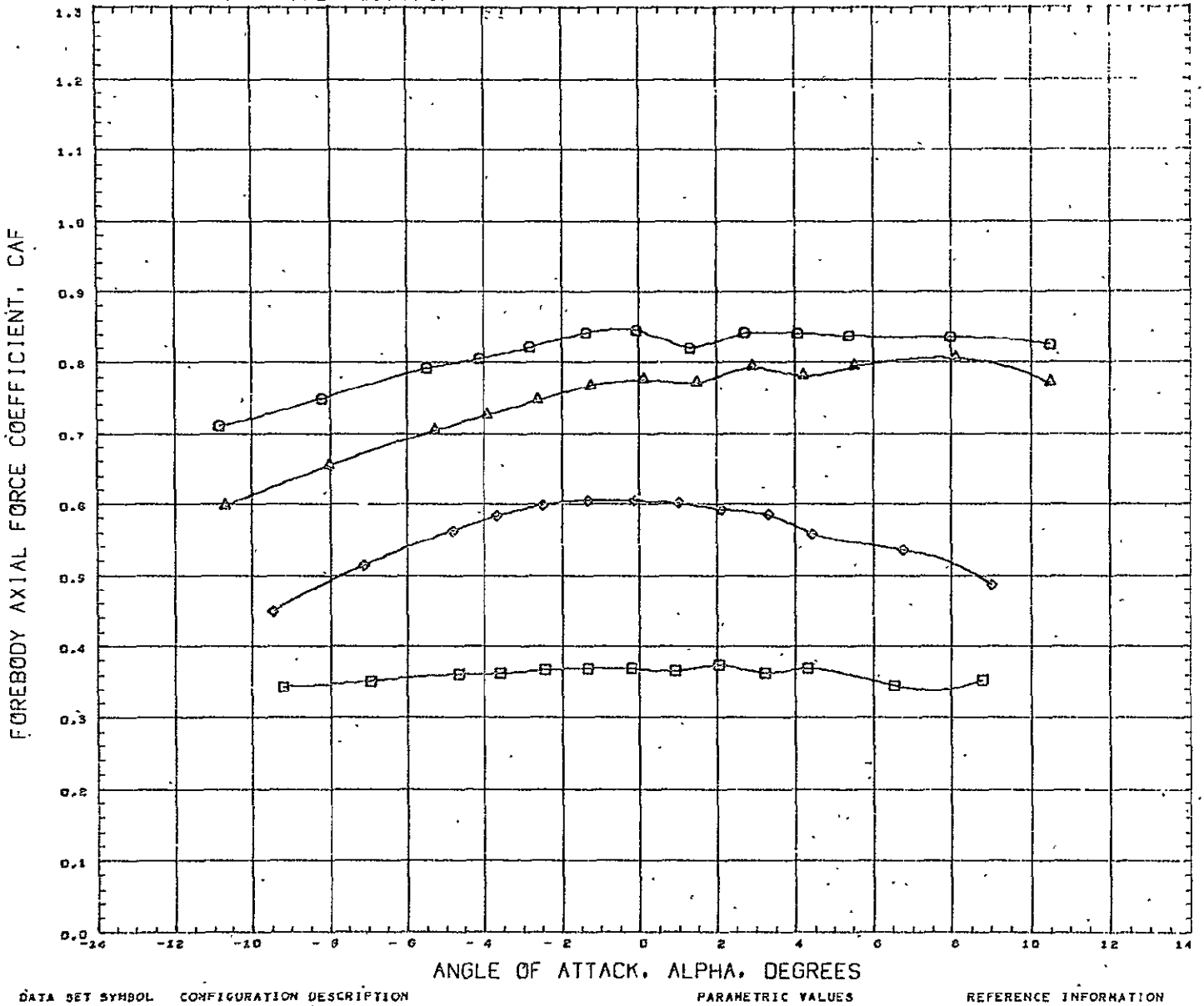
| | | | |
|---|---|---|---|
| BETA | - 0.050 | ORBINC - | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MACH 1.456

MSFC TWT 470 MODEL BUILDUP




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (X24081) | ○ | TWT470 S-IC/GAC ORBITER BFIOWHVS |
| (X24101) | □ | TWT470 S-IC/GAC ORBITER BOHVS WING,FINS OFF |
| (X24111) | ◇ | TWT470 S-IC/GAC ORBITER BFIOHVS WING OFF |
| (X24151) | △ | TWT470 S-IC/GAC ORBITER BFIOWHV |

MACH 0.997

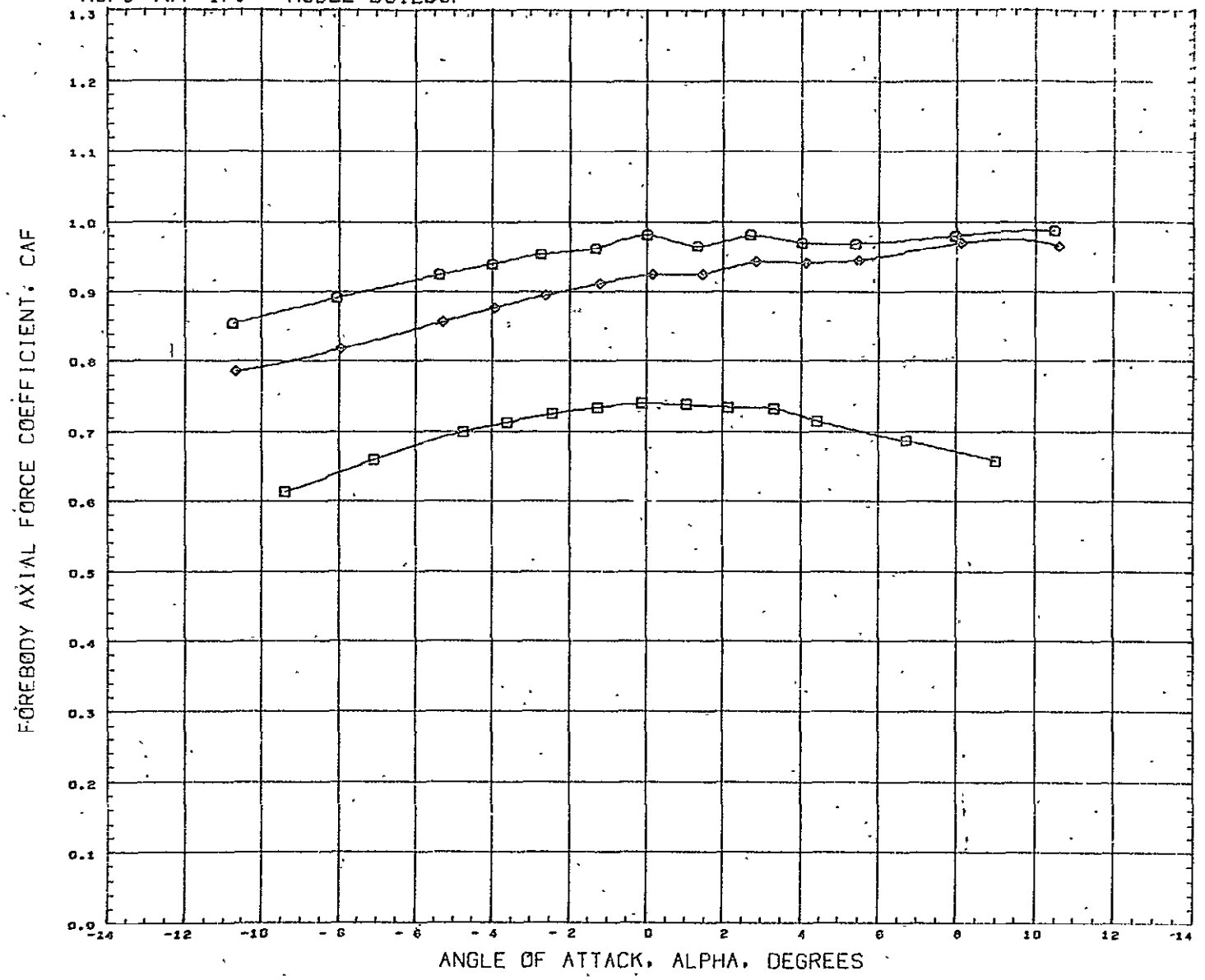
PARAMETRIC VALUES

| | | | | | |
|---|---|---|---|---|---|
| BETA | - 0.050 | ORBINC - | 1.050 | | |
| WNGINC | 4.000 | HTAIL | 0.000 | | |
| PHIB | 0.000 | | | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

# MSFC TWT 470 MODEL BUILDUP

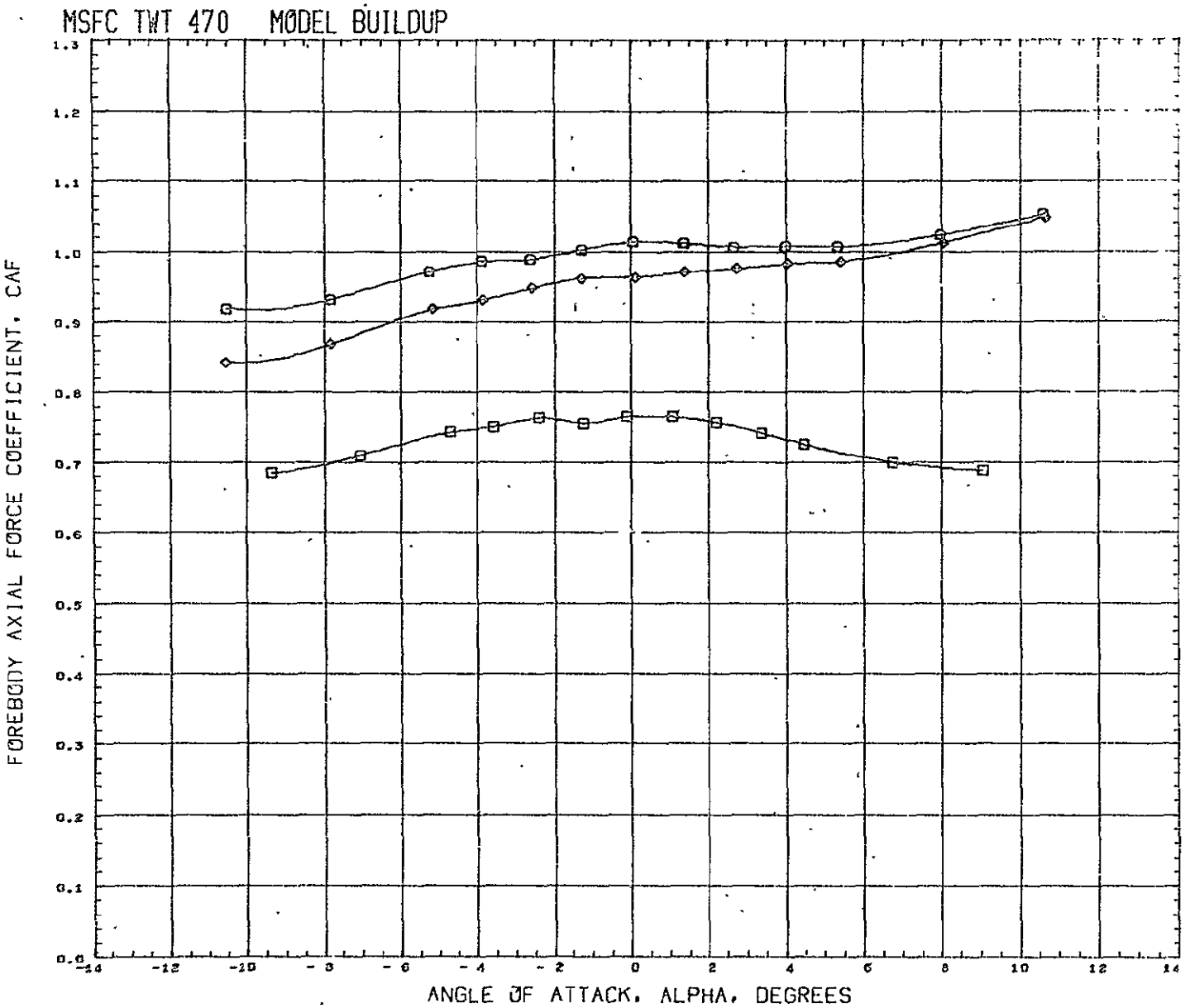



| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (824081) | ○ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |
| (824111) | □ | TWT470 S-IC/GAC ORBITER BF1OHVS WING OFF |
| (824151) | ◇ | TWT470 S-IC/GAC ORBITER BF1OWHV STRONGBACK OFF |

MACH 1.095

| PARAMETRIC VALUES | | | | | |
|---|---|---|---|---|---|
| BETA | - 0.050 | ORBINC - | 1.050 | | |
| WNGINC | 4.000 | HTAIL | 0.000 | | |
| PHIB | 0.000 | | | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (B24081) | ○ | TWT470 S-IC/GAC ORBITER BFIOWHVS BASIC |
| (B24111) | □ | TWT470 S-IC/GAC ORBITER BFIOHVS WING OFF |
| (B24131) | ◇ | TWT470 S-IC/GAC ORBITER BFIOWHV STRONGBACK OFF |

MACH 1.195

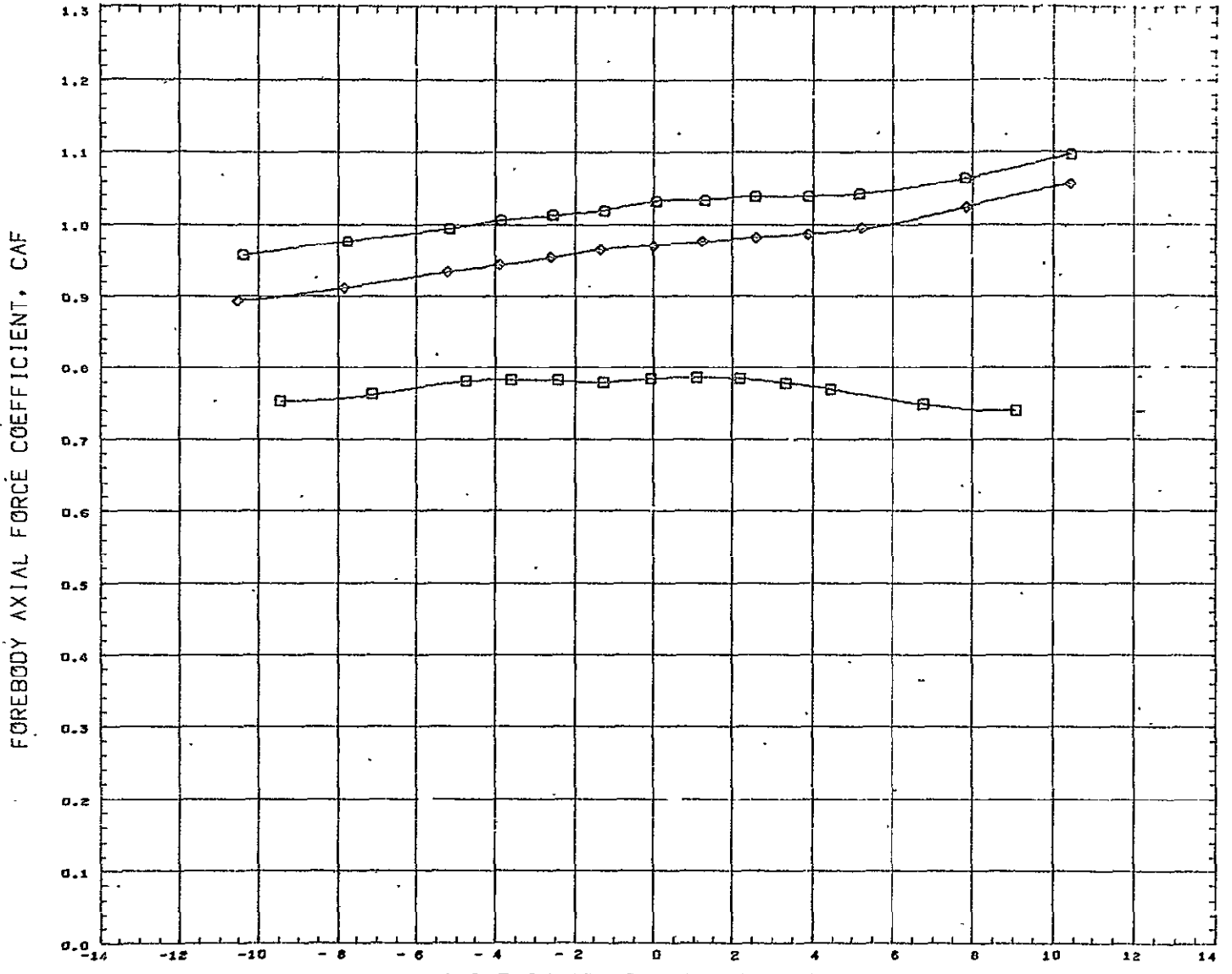
PARAMETRIC VALUES

| | | | | | |
|---|---|---|---|---|---|
| BETA | - 0.050 | ORBINC - | 1.050 | | |
| WNGINC | 4.000 | HTAIL | 0.000 | | |
| PHIB | 0.000 | | | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 MODEL BUILDUP




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (824051) | ○ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |
| (824111) | □ | TWT470 S-IC/GAC ORBITER BF1OHVS WING OFF |
| (824151) | ◇ | TWT470 S-IC/GAC ORBITER BF1OWHV STRONGBACK OFF |

MACH 1.456

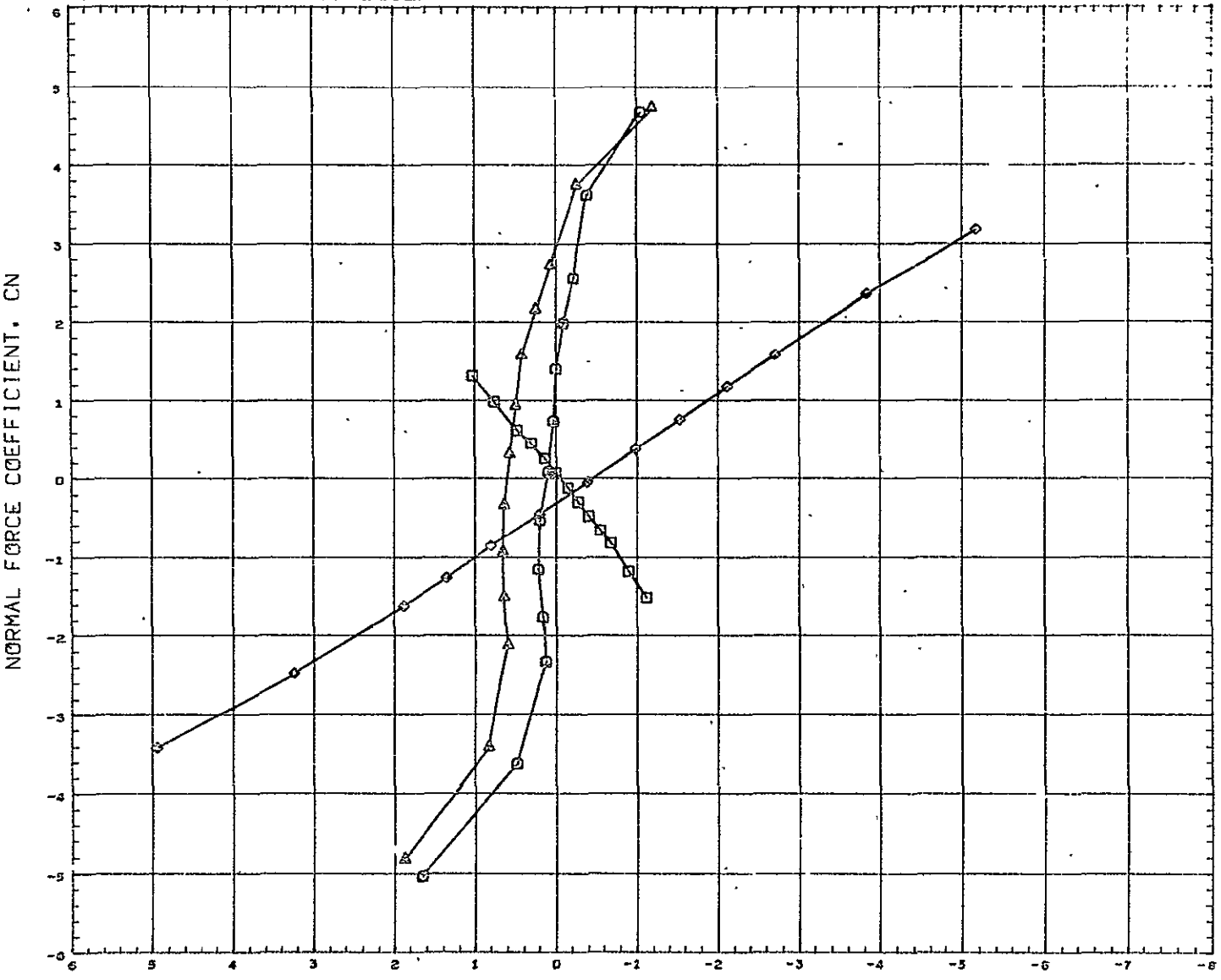
PARAMETRIC VALUES

| | | | | | |
|---|---|---|---|---|---|
| BETA | 0.050 | ORBINC | 1.050 | | |
| WNGINC | 4.000 | HTAIL | 0.000 | | |
| PHIB | 0.000 | | | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 MODEL BUILDUP




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (X24081) | ○ | TWT470 S-IC/GAC ORBITER BF1OWHVS |
| (X24101) | □ | TWT470 S-IC/GAC ORBITER BOHVS WING,FINS OFF |
| (X24111) | ◇ | TWT470 S-IC/GAC ORBITER BF1OHVS WING OFF |
| (X24151) | △ | TWT470 S-IC/GAC ORBITER BF1OHHV |

MACH 0.997

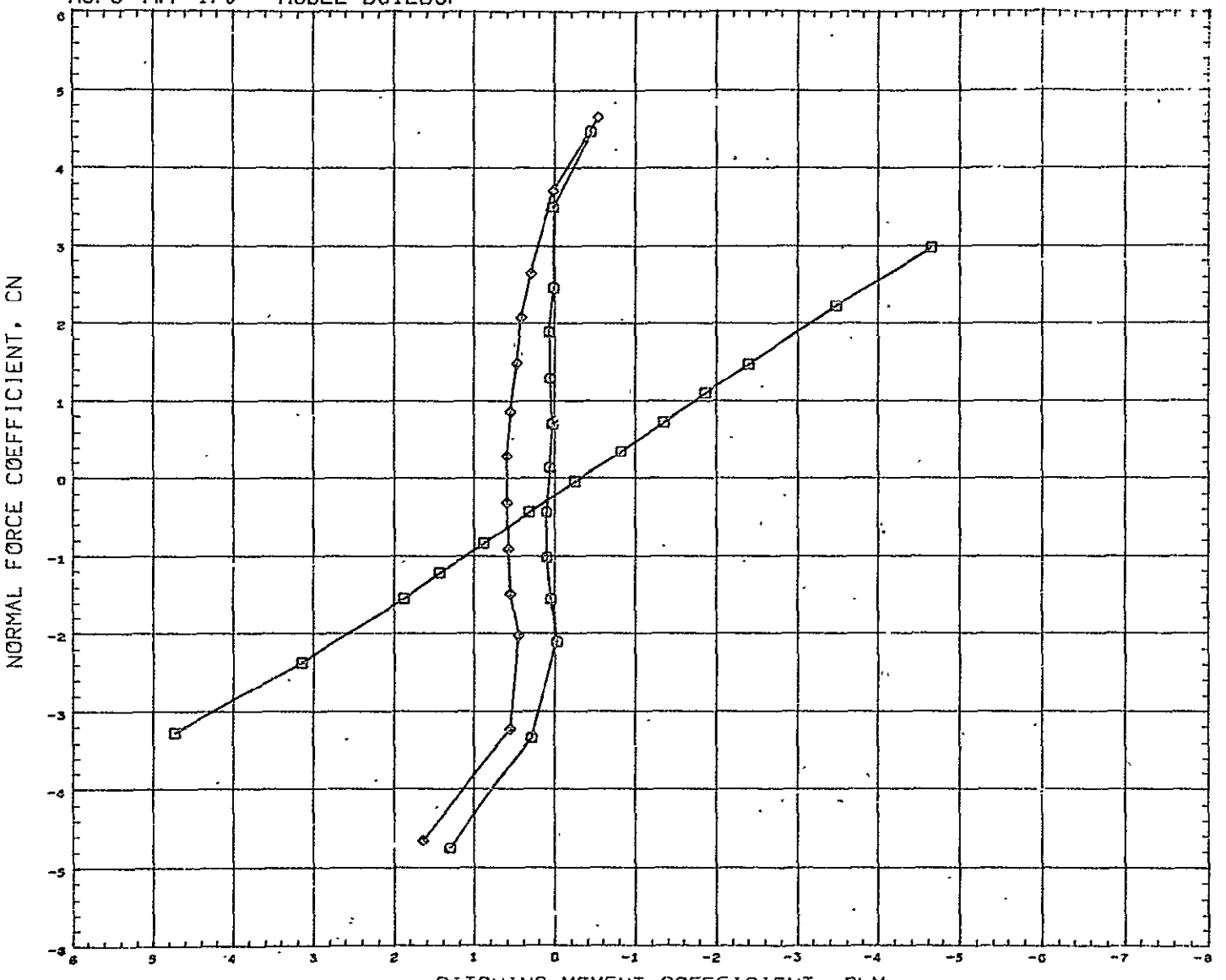
PARAMETRIC VALUES

| | | | | | |
|---|---|---|---|---|---|
| BETA | - 0.050 | ORBINC | - 1.050 | | |
| WNGINC | 4.000 | HTAIL | 0.000 | | |
| PHIB | 0.000 | | | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 MODEL BUILDUP




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (824081) | ○ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |
| (824111) | □ | TWT470 S-IC/GAC ORBITER BF1OHVS WING OFF |
| (824151) | ◇ | TWT470 S-IC/GAC ORBITER BF1OWHV STRONGBACK OFF |

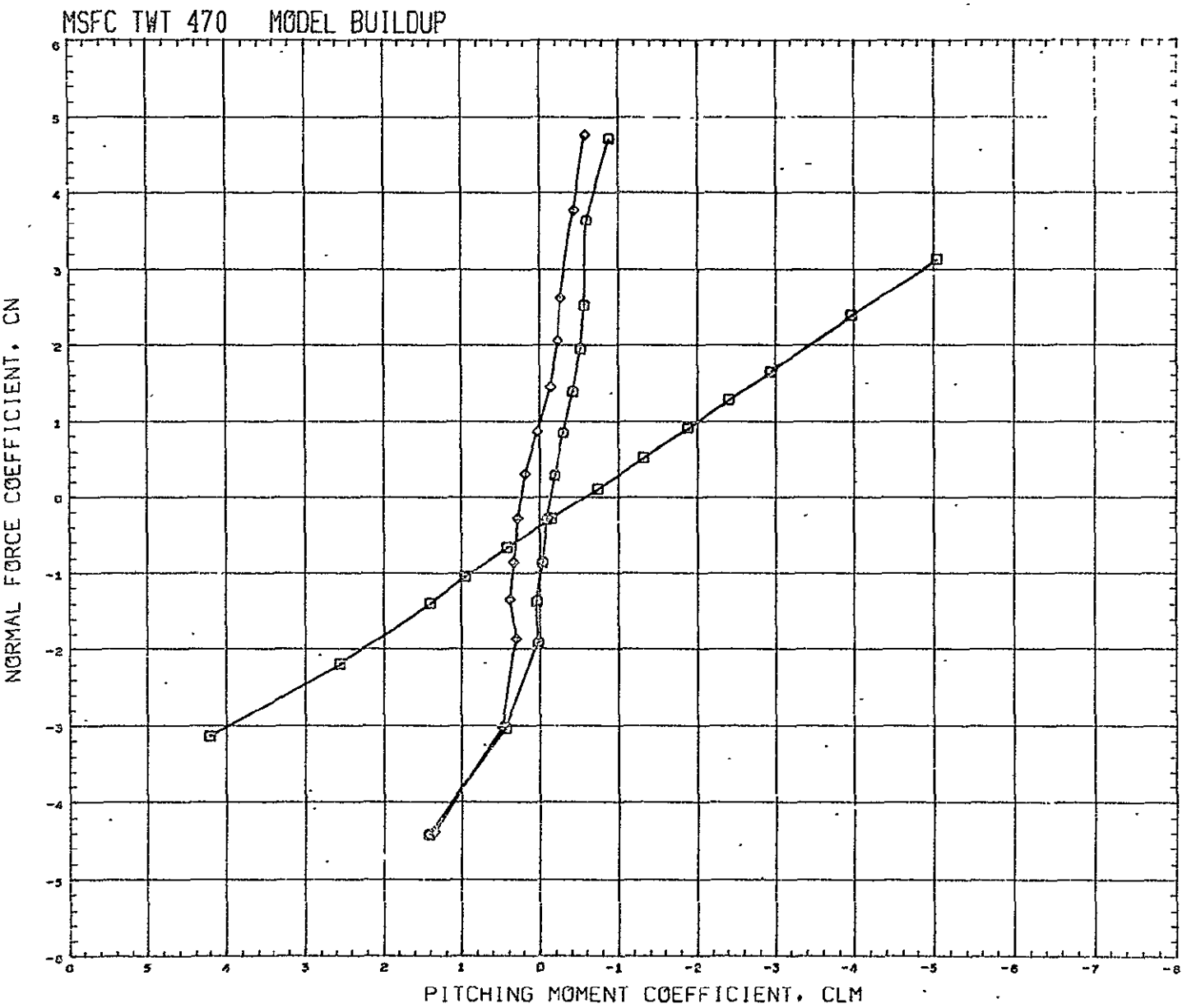
PARAMETRIC VALUES

| | | | | | |
|---|---|---|---|---|---|
| BETA | - 0.050 | ORBINC | - 1.050 | | |
| WNGINC | 4.000 | HTAIL | 0.000 | | |
| FHIB | 0.000 | | | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MACH 1.095




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (824081) | □ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |
| (824111) | □ | TWT470 S-IC/GAC ORBITER BF1OHVS WING OFF |
| (824151) | ◇ | TWT470 S-IC/GAC ORBITER BF1OWHV STRONGBACK OFF |

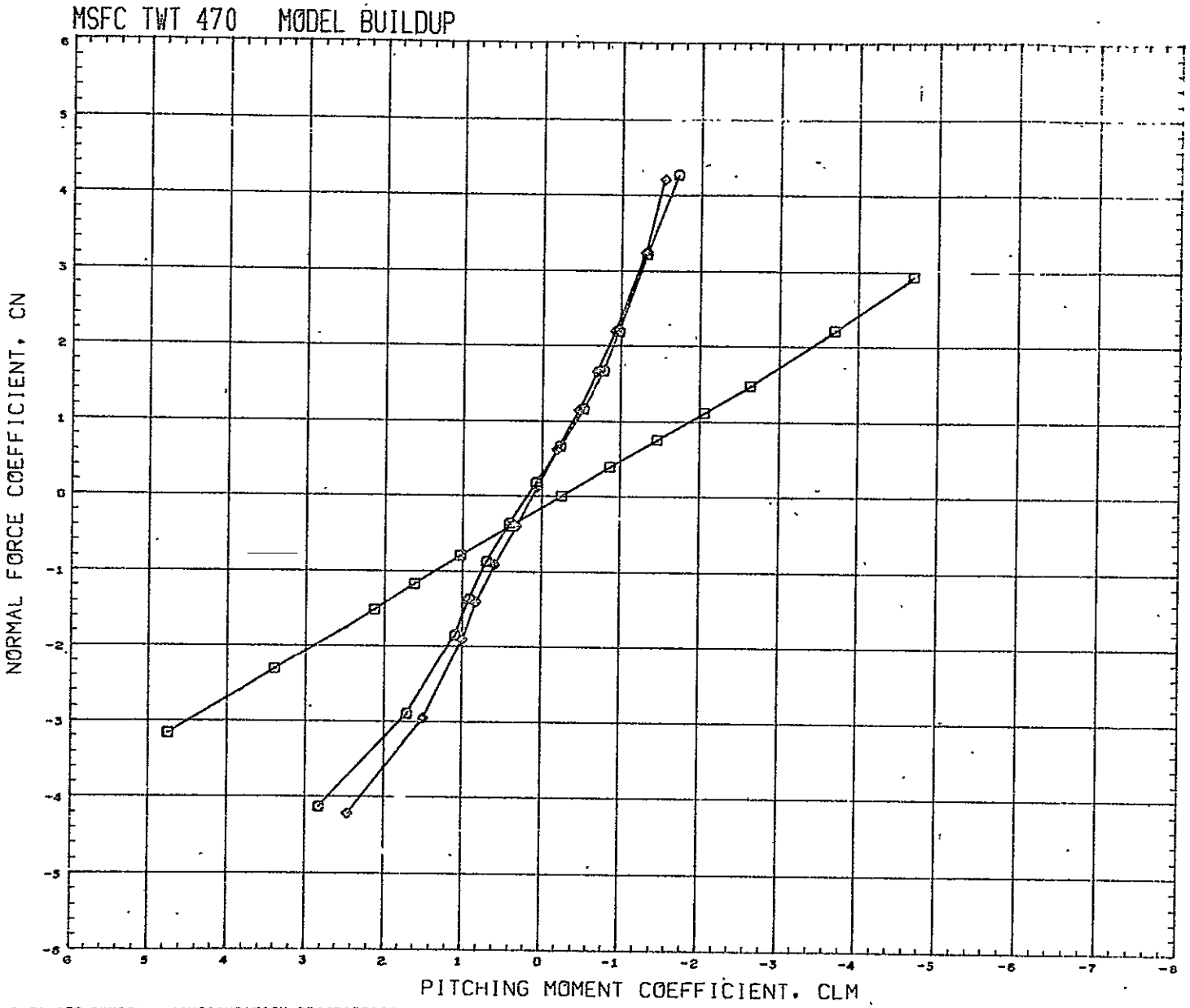
MACH 1.195

PARAMETRIC VALUES

| | | | | | |
|---|---|---|---|---|---|
| BETA | - 0.050 | ORBINC - | 1.050 | | |
| WNGINC | 4.000 | HTAIL | 0.000 | | |
| PHIB | 0.000 | | | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMPP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (824091) | ○ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC. |
| (824111) | □ | TWT470 S-IC/GAC ORBITER BF1OHVS WING OFF |
| (824151) | ◇ | TWT470 S-IC/GAC ORBITER BF1OWHV STRONGBACK OFF |

MACH 1.456

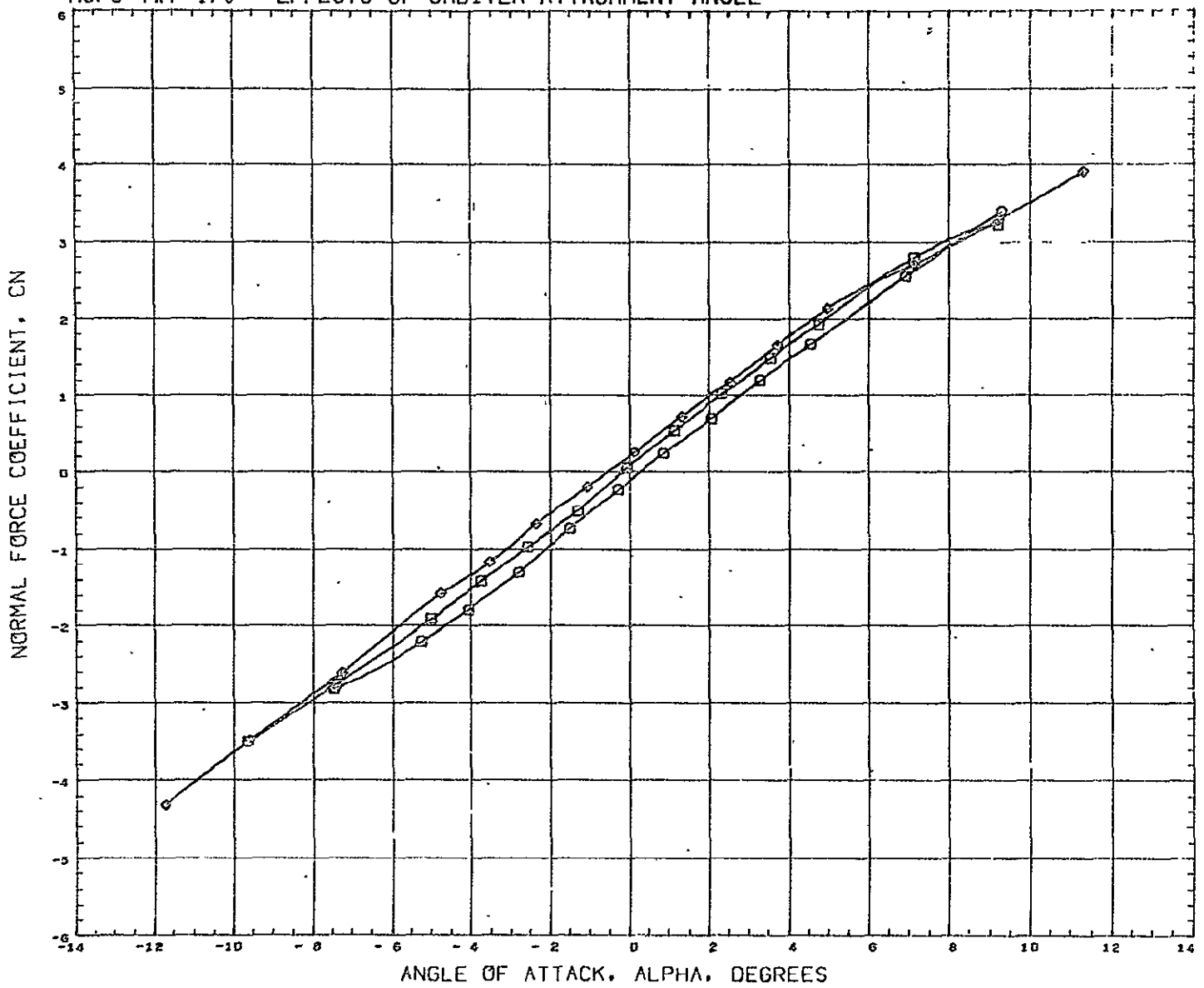
PARAMETRIC VALUES

| | | | | | |
|---|---|---|---|---|---|
| BETA | - | 0.050 | ORBINC - | 1.050 | |
| WNGINC | | 4.000 | HTAIL | 0.000 | |
| PHIB | | 0.000 | | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE



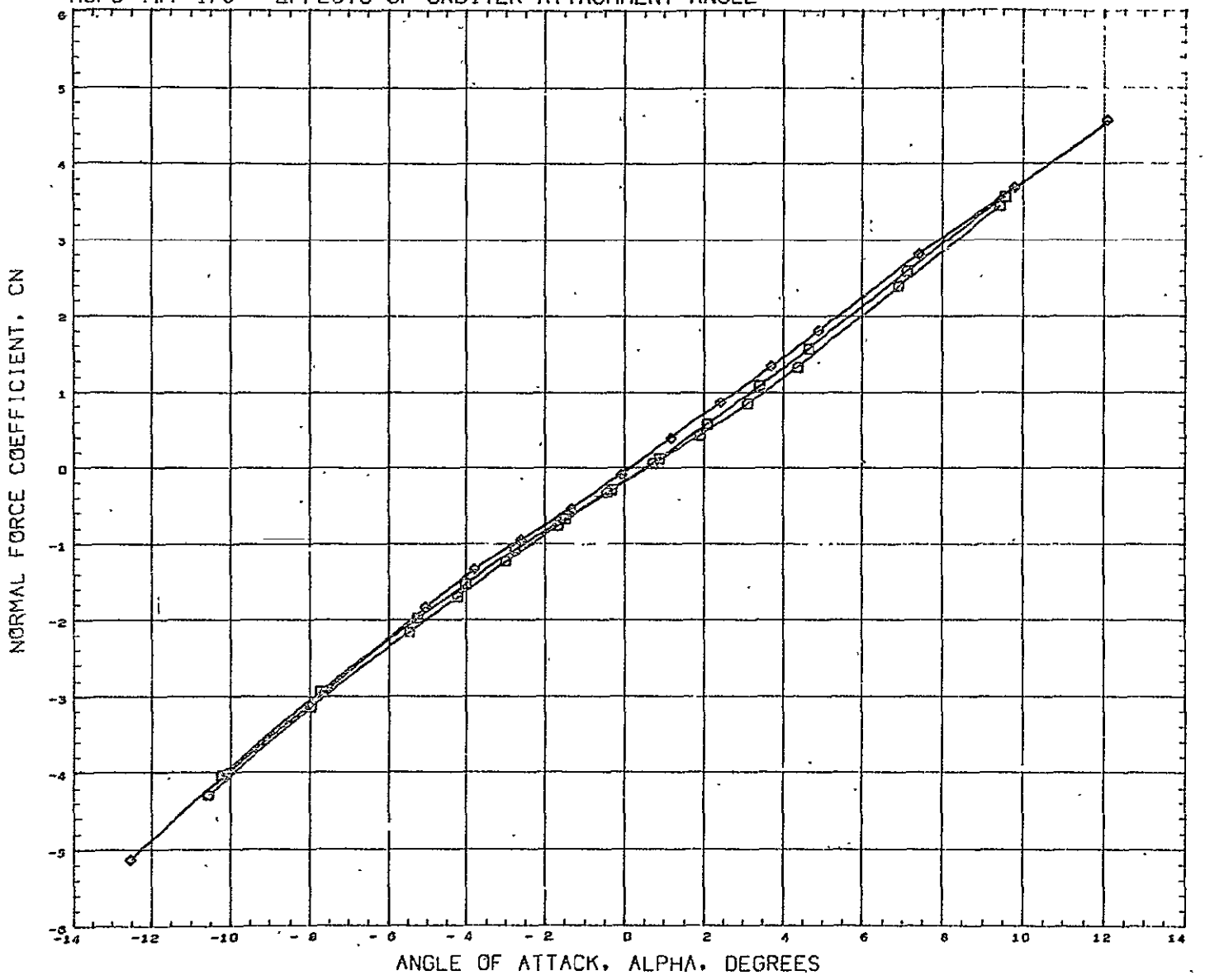

| SYMBOL | ORBINC | | PARAMETRIC VALUES | | |
|---|---|---|---|---|---|
| ○ | - 4.000 | MACH | 0.597 | BETA | - 0.050 |
| □ | - 2.000 | WNGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 0.000 | PHIB | 0.000 | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE

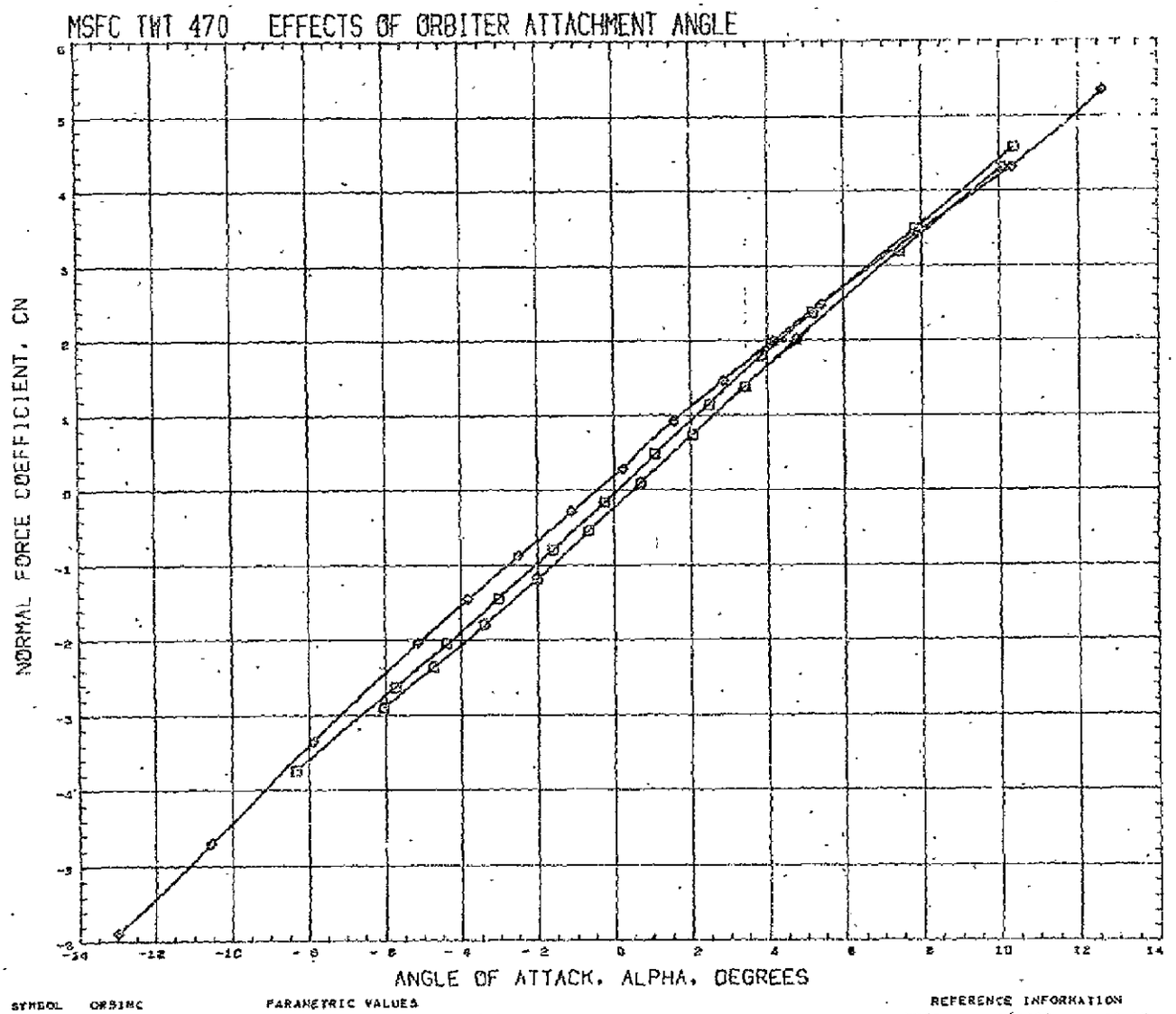



| SYMBOL | ORBINC | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| □ | 4.000 | MACH | 0.901 | BETA | 0.050 | |
| □ | 2.000 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 0.000 | PHIB | 0.000 | | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |



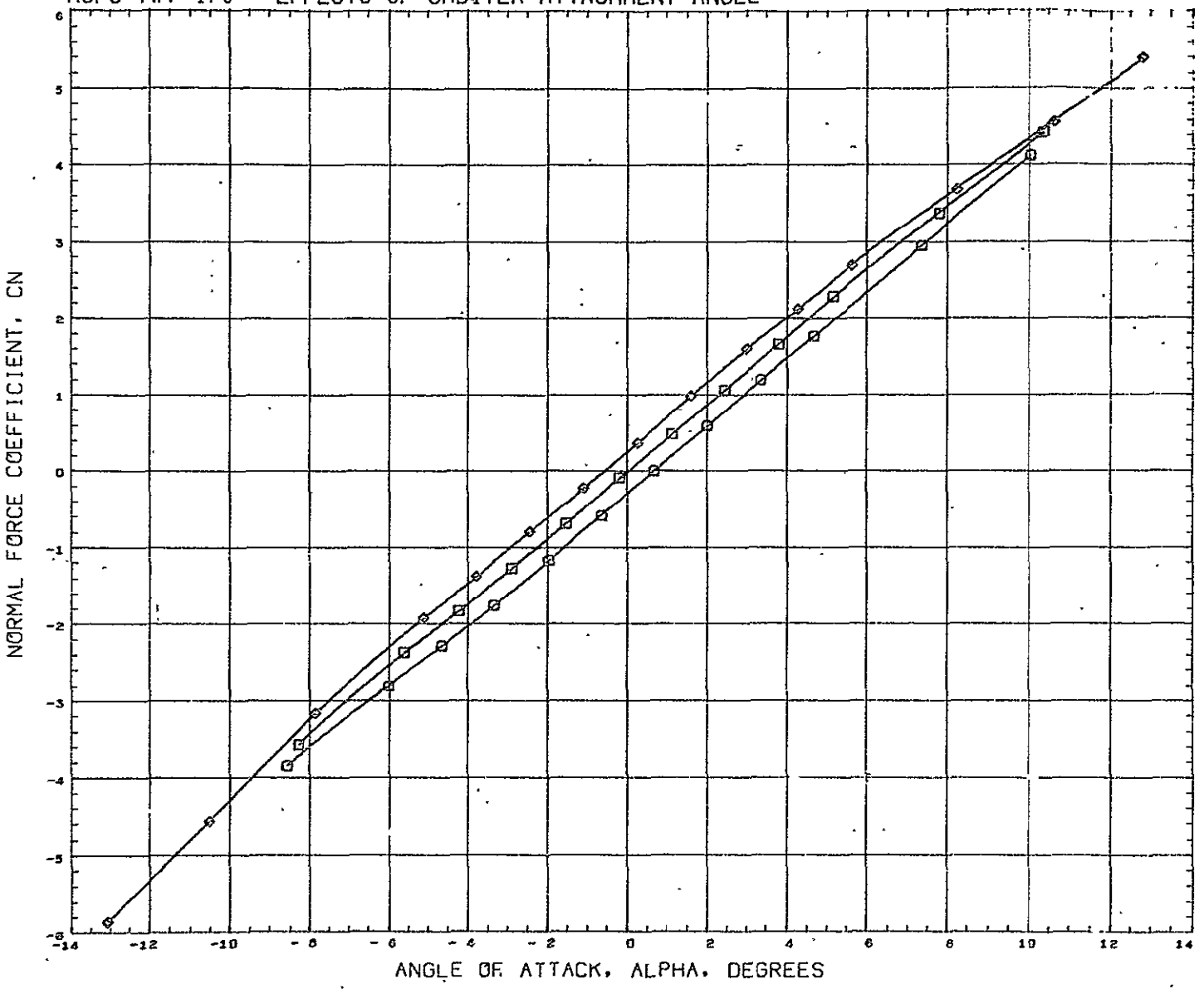

| SYMBOL | ORBINC | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| □ | 4.000 | MACH | 1.000 | BETA | 0.050 |
| □ | 2.000 | WBGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 0.000 | FWIB | 0.000 | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3365 | PERCNT |

TWT470 S-IC/GAC ORBITER BF1OWHVS FINS ON [A24041] 26 JAN 71 PAGE 241

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE

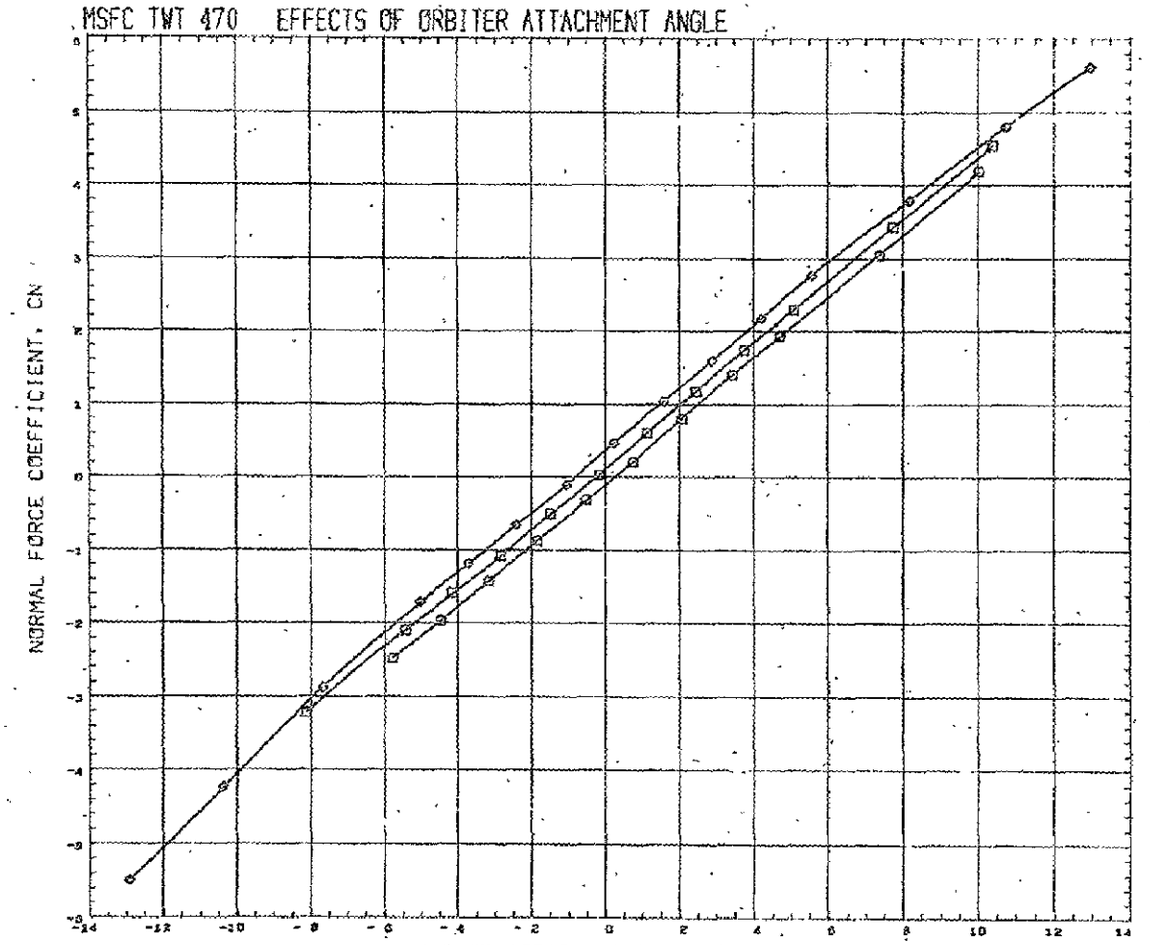



| SYMBOL | ORBINC | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| □ | - 4.000 | MACH | 1.098 | BETA | - 0.050 | |
| □ | - 2.000 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 0.000 | PHIB | 0.000 | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE



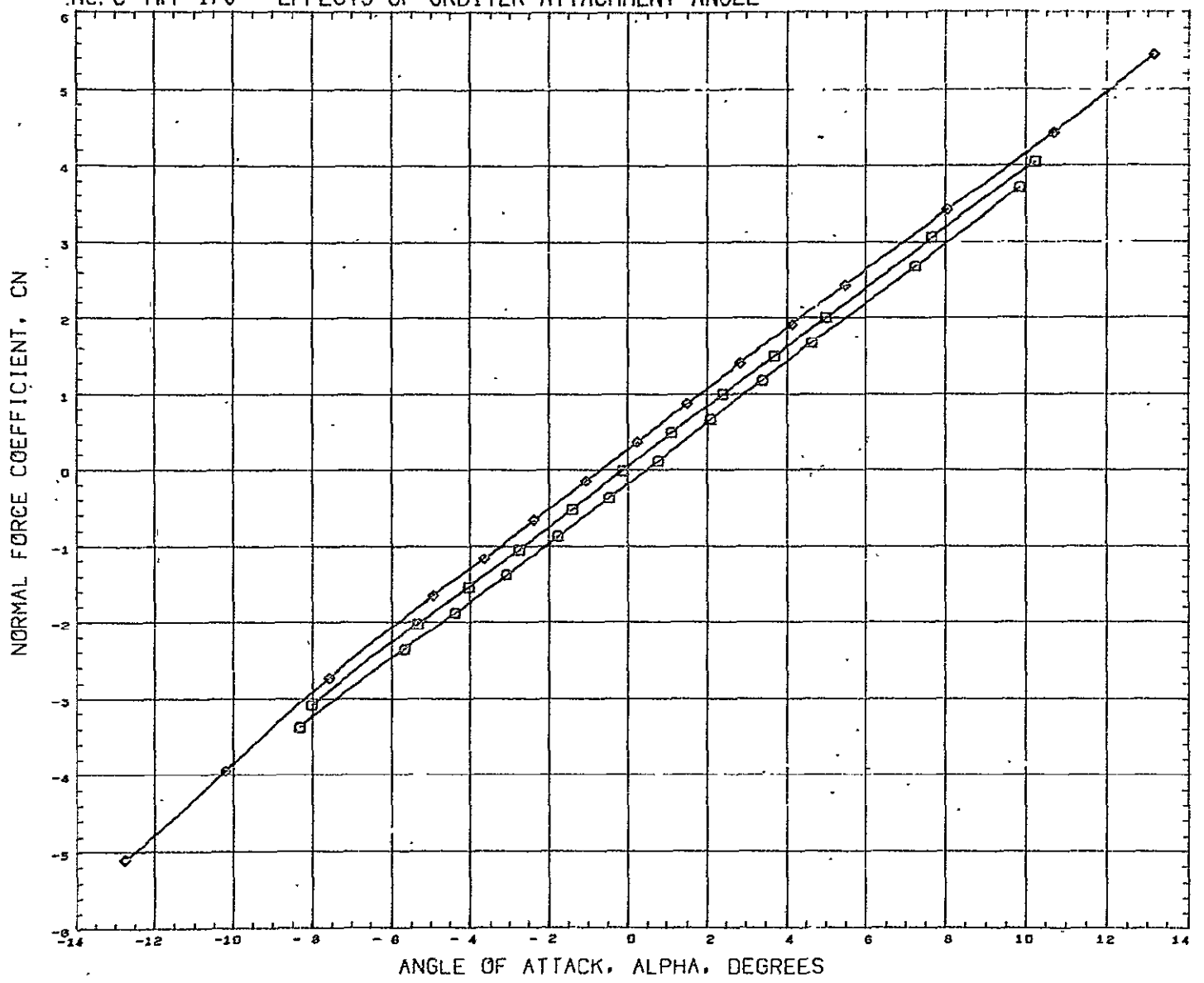

| SYMBOL | ORBINC | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| □ | - 4.000 | MACH | 1.193 | BETA | - 0.000 | |
| □ | - 2.000 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 0.000 | FNIB | 0.000 | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.5960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCENT |

TWT470 S-IC/GAC ORBITER BF10WHVS FINS ON (A24041) 26 JAN 71 

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE



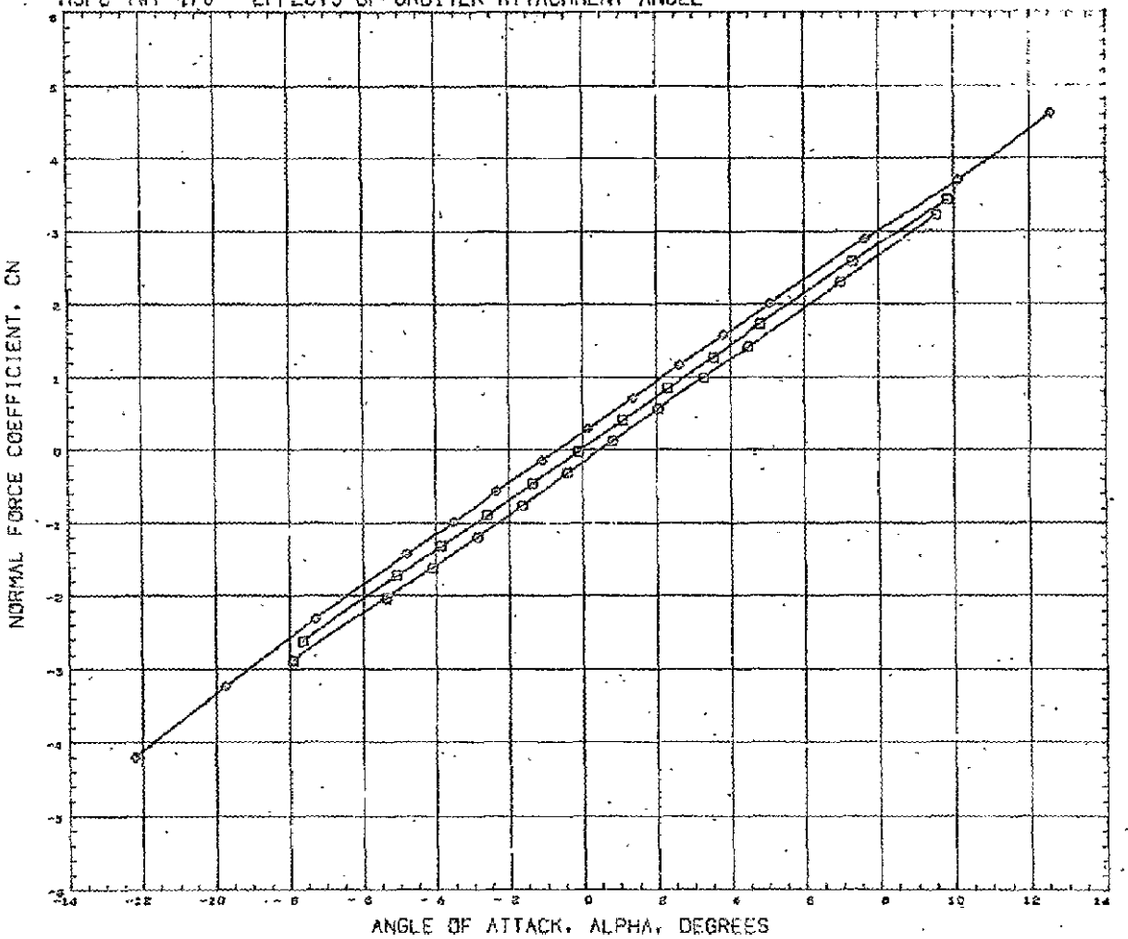

| SYMBOL | ORBINC | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| ○ | - 4.000 | MACH | 1.456 | BETA | - 0.050 | |
| □ | - 2.000 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 0.000 | PHIB | 0.000 | | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE

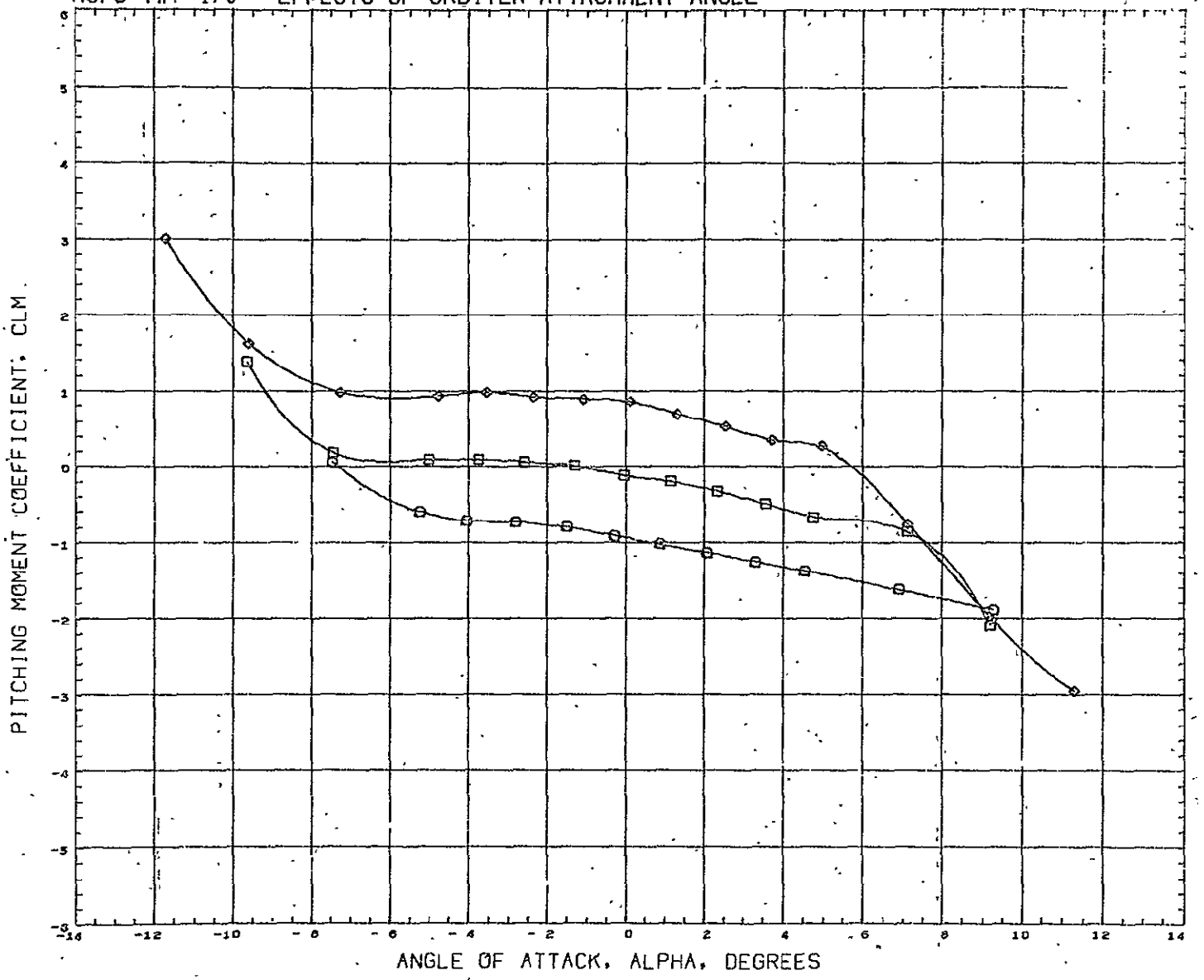



| SYMBOL | ORBINC | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| □ | 4.000 | MACH | 1.850 | BETA | 0.050 | |
| □ | 2.000 | WBINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 0.000 | PHIB | 0.000 | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.5366 | PERCENT |

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE

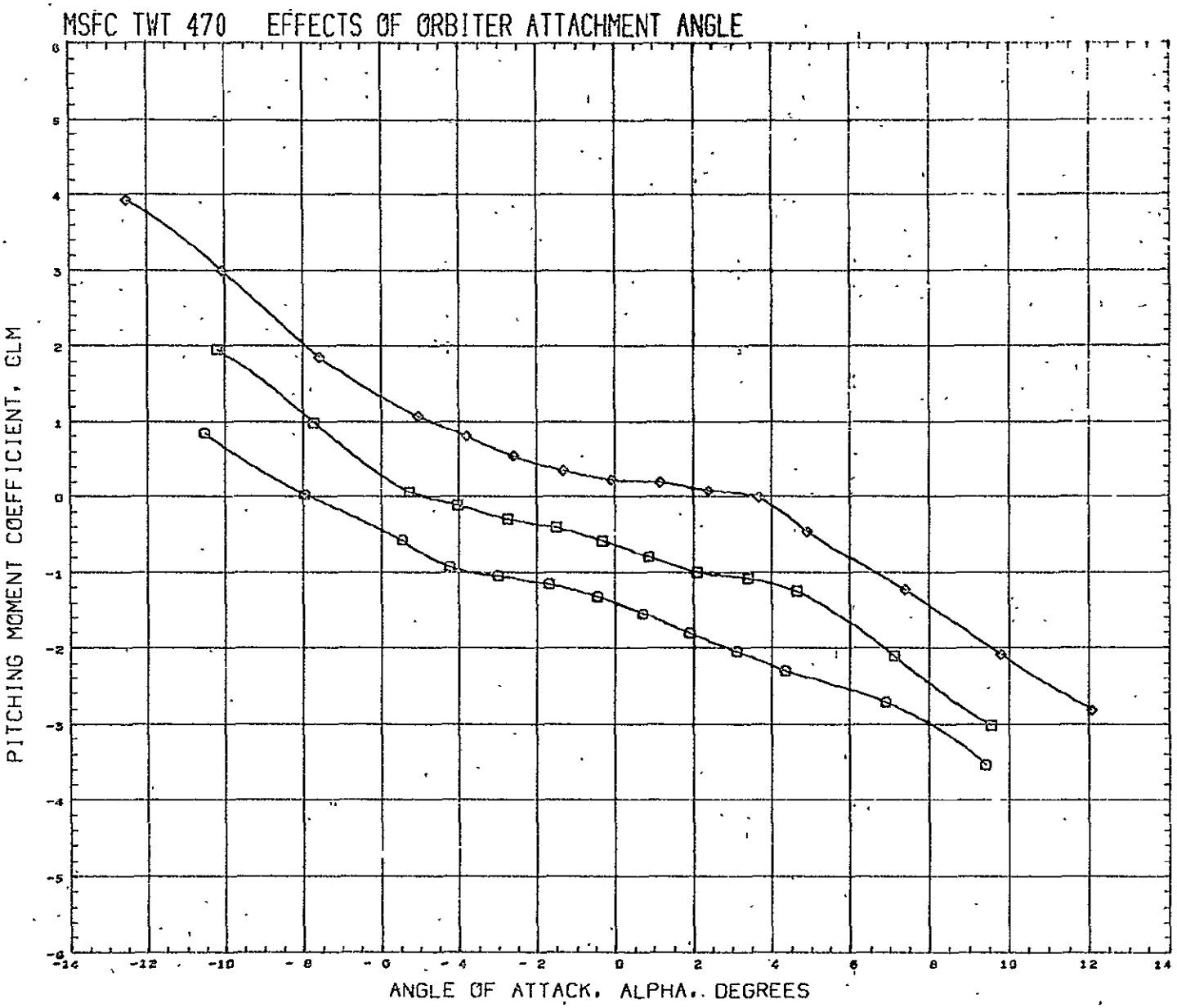



| SYMBOL | ORBINC | | PARAMETRIC VALUES | | |
|---|---|---|---|---|---|
| ○ | - 4.000 | MACH | 0.597 | BETA | ----0.050 |
| □ | - 2.000 | WNGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 0.000 | PHIB | 0.000 | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |



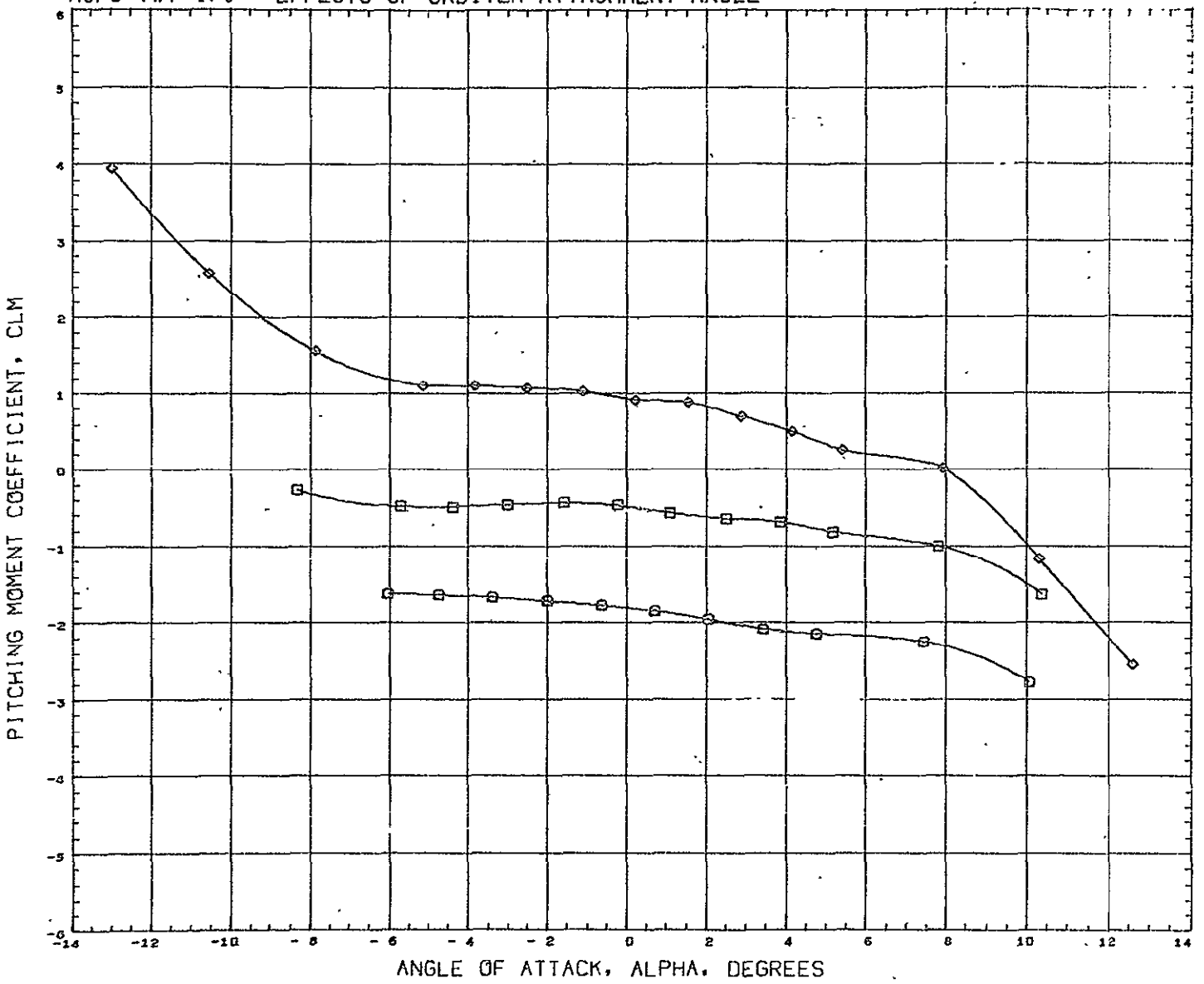

| SYMBOL | ORBINC | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| ○ | - 4.000 | MACH | 0.901 | BETA | - 0.050 | |
| □ | - 2.000 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 0.000 | PHIB | 0.000 | | | |

REFERENCE FILE -

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE




| SYMBOL | ORBINC | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| □ | - 4.000 | MACH | 1.000 | BETA | - 0.050 | |
| □ | - 2.000 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 0.000 | PHIB | 0.000 | | | |

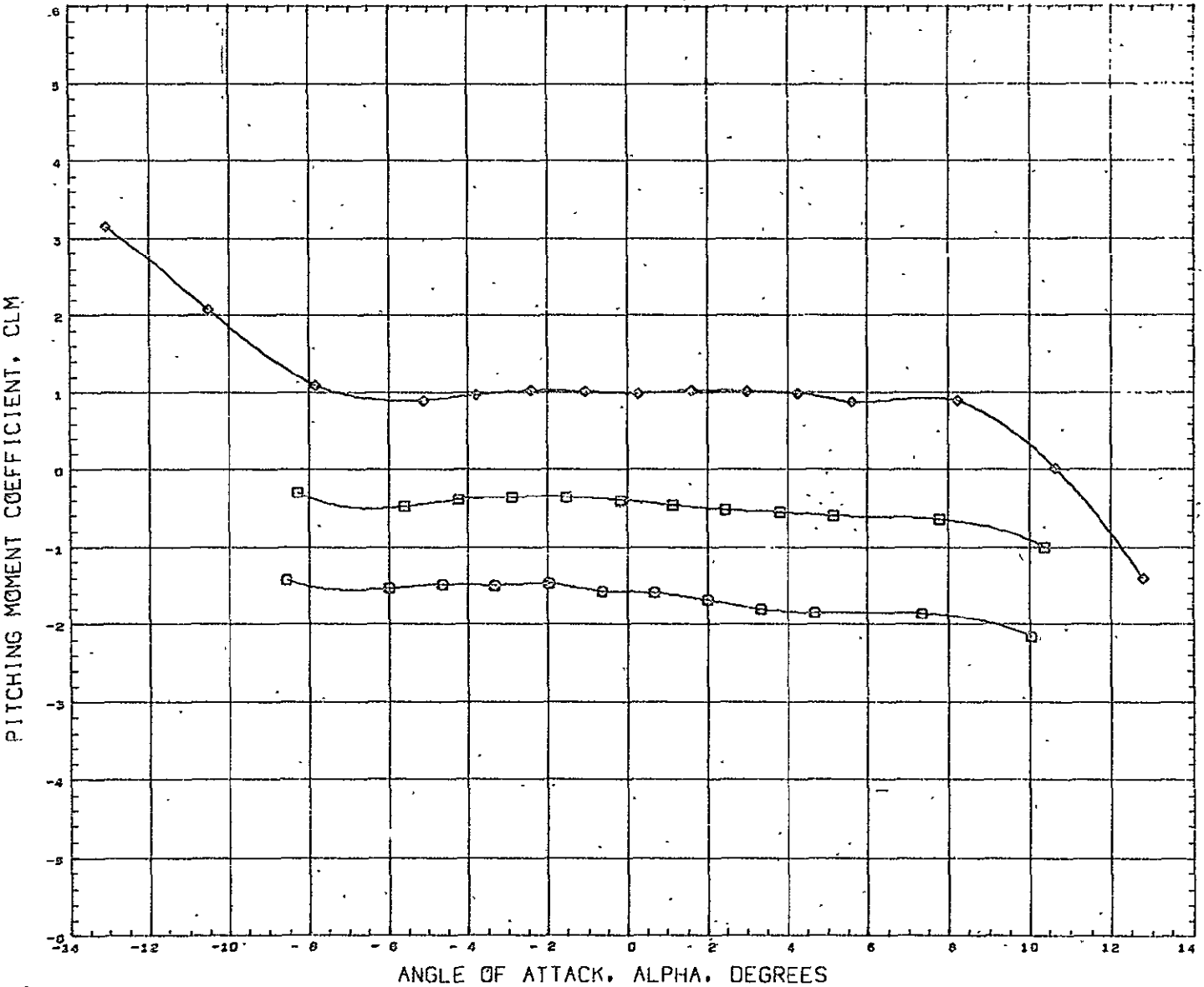
REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | -5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

REFERENCE FILE

TWT470 S-IC/GAC ORBITER BF10WHVS FINS ON (A24041) 26 JAN 71 PAGE 248

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE



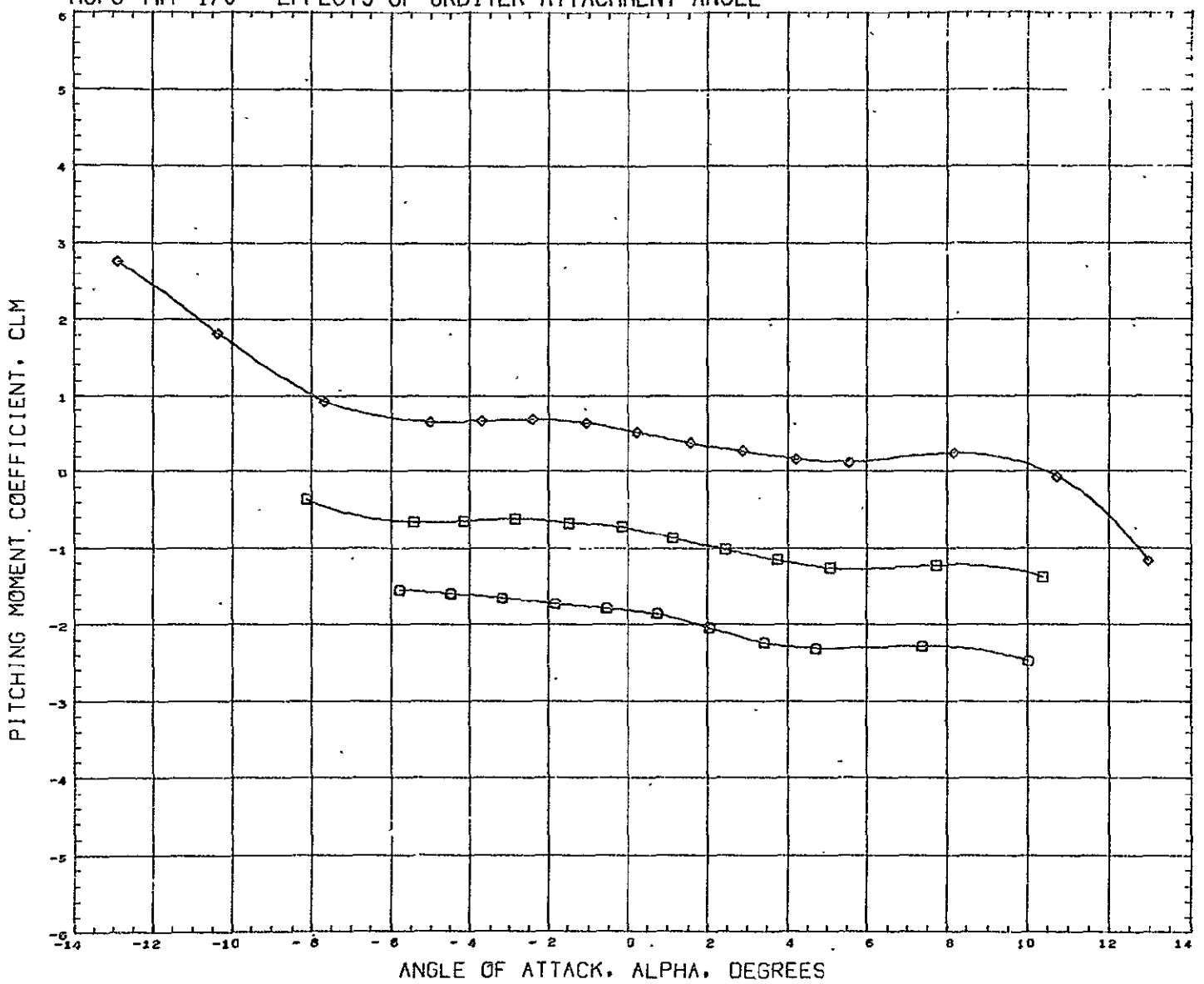

| SYMBOL | ORBINC | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| ○ | 4.000 | MACH | 1.098 | BETA | 0.050 | |
| □ | 2.000 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 0.000 | PHIB | 0.000 | | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE

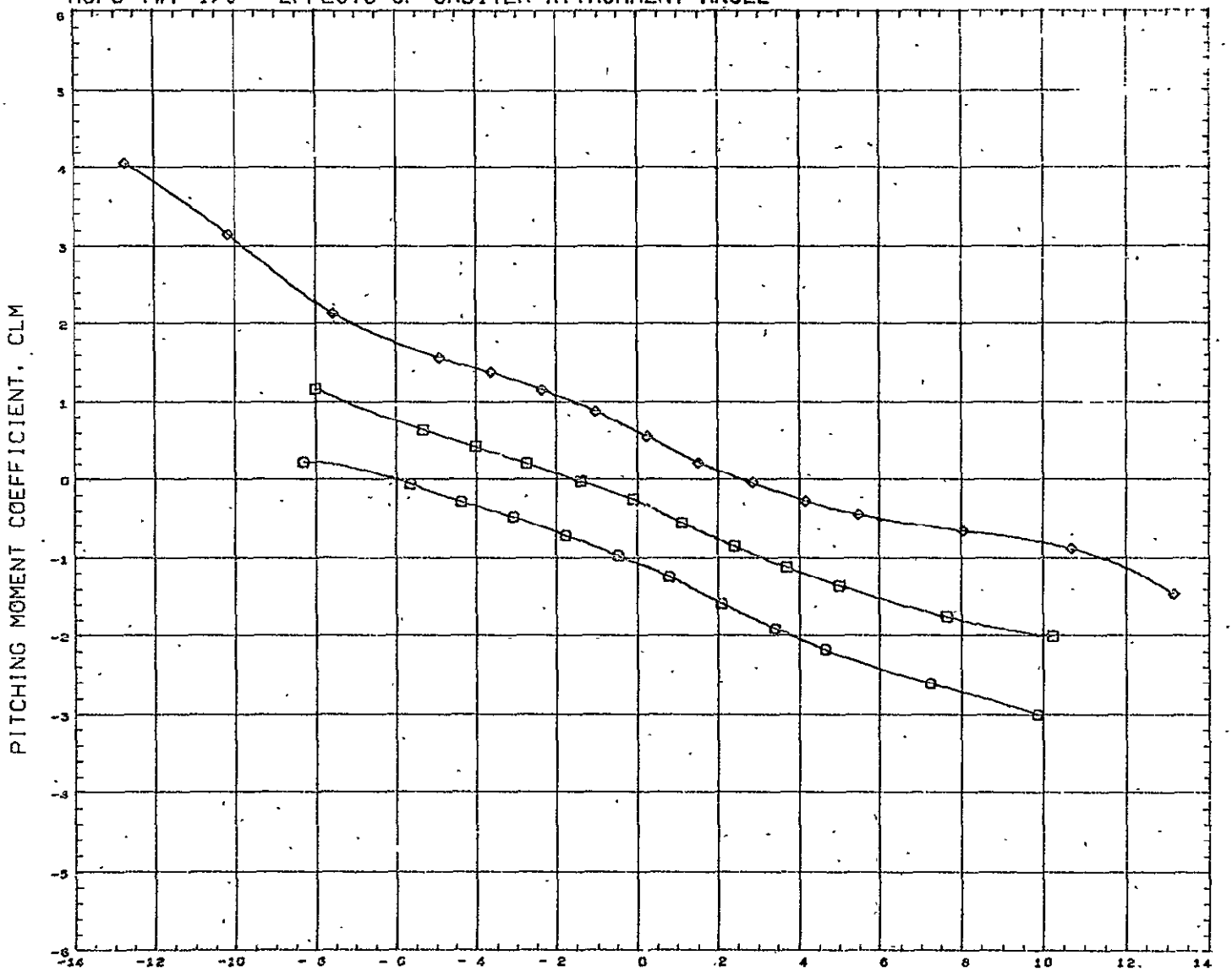



| SYMBOL | ORBINC | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| ○ | - 4.000 | MACH | 1.193 | BETA | - 0.050 | |
| □ | - 2.000 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 0.000 | PHIB | 0.000 | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE

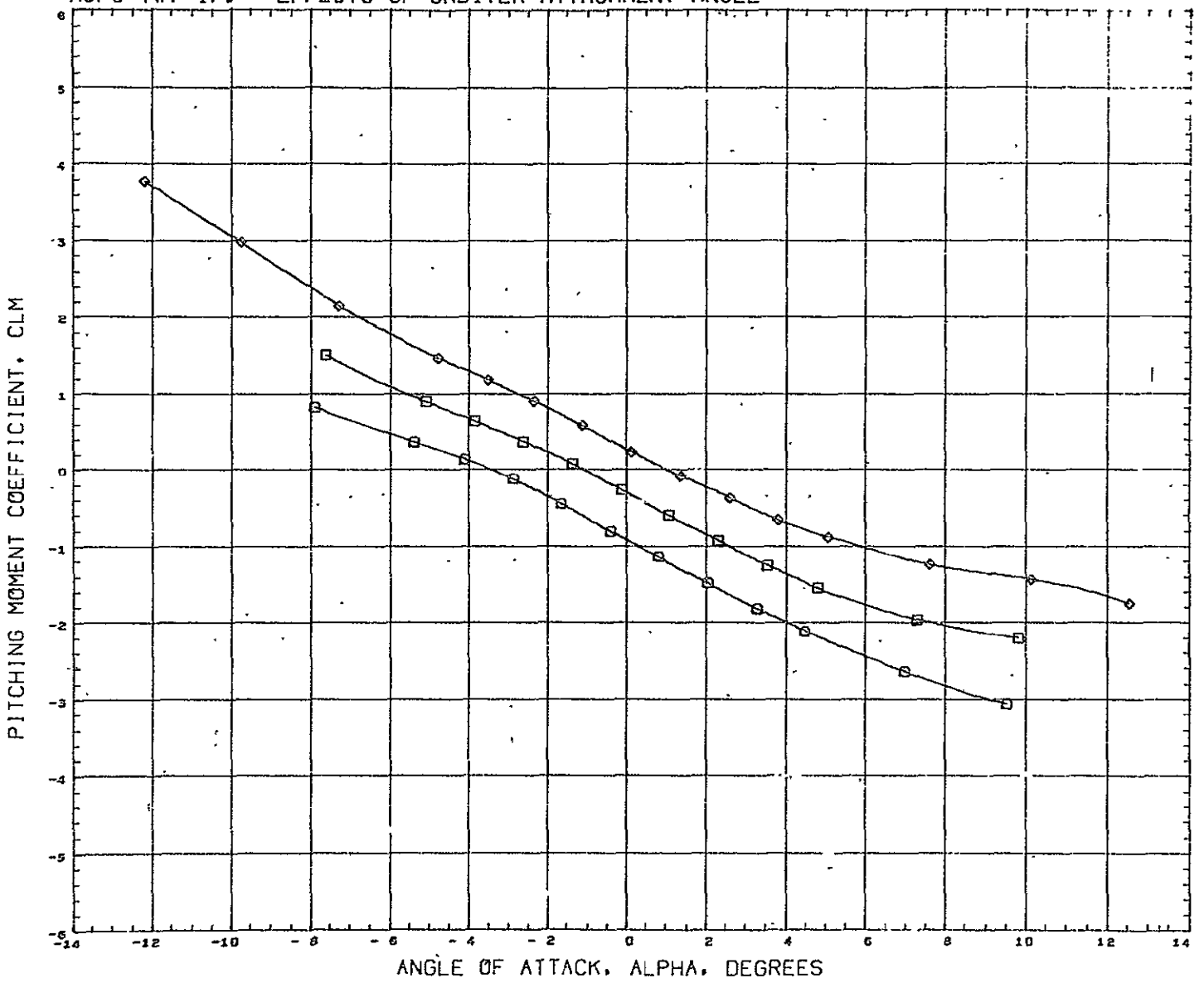



| SYMBOL | | ORBINC | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|---|
| ○ | - | 4.000 | MACH | 1.450 | BETA | - 0.050 | |
| □ | - | 2.000 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | | 0.000 | PHIB | 0.000 | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE




| SYMBOL | ORBINC | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | - 4.000 | MACH | 1.950 | BETA | - 0.050 | |
| □ | - 2.000 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 0.000 | PHIB | 0.000 | | | |

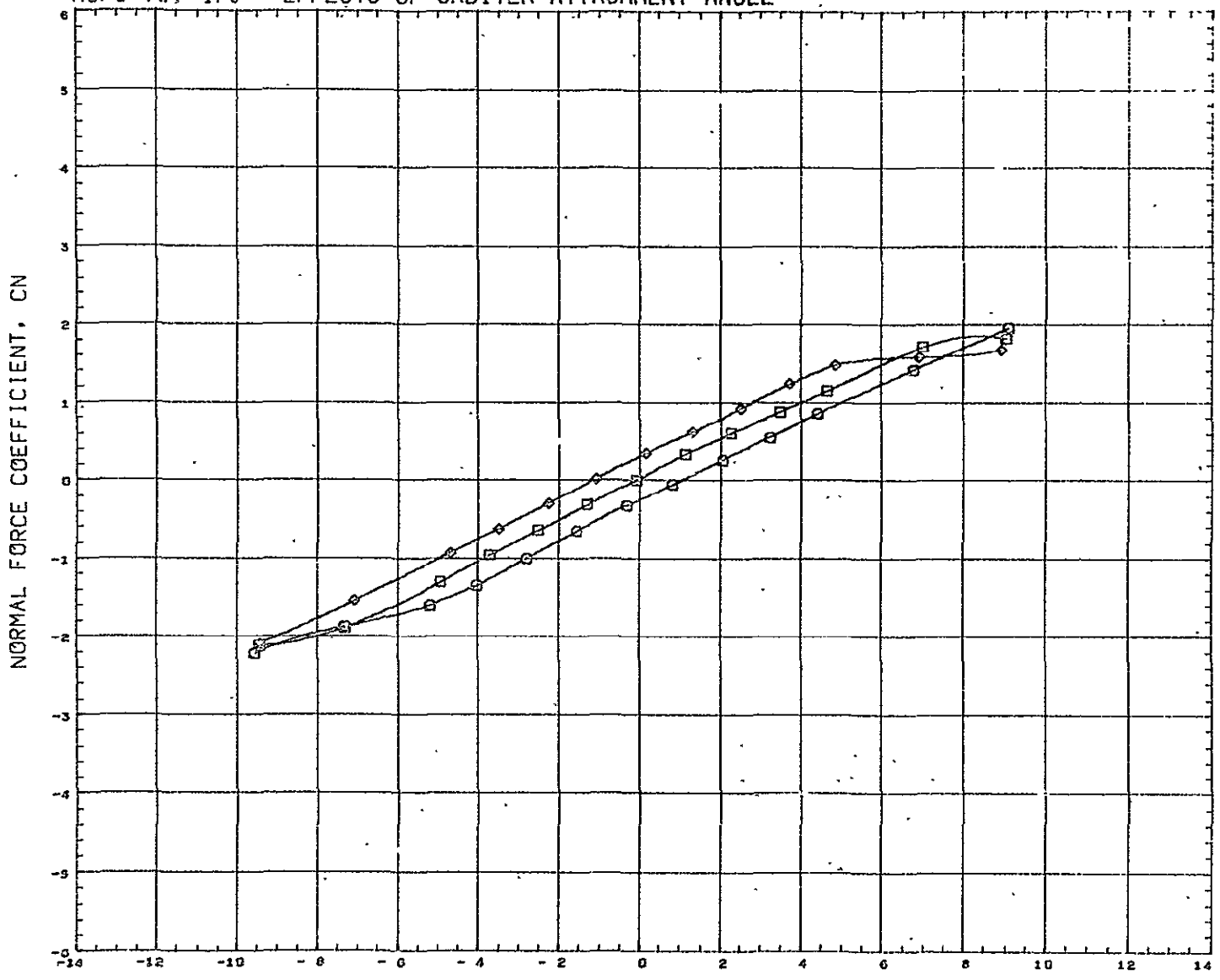
REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

REFERENCE FILE

TWT470 S-IC/GAC ORBITER BF10WHVS FINS ON (A24041) 26 JAN 71 

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE



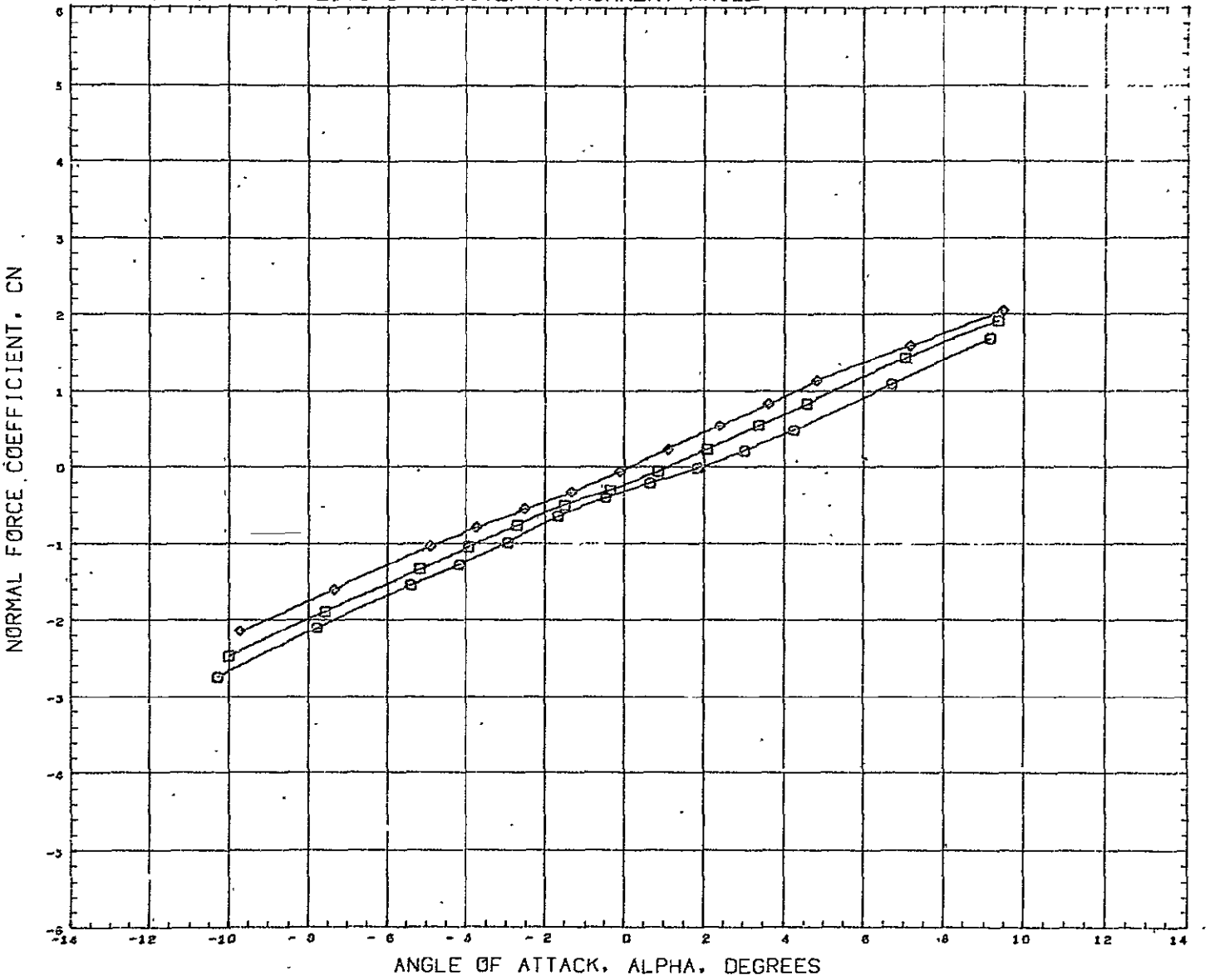

| SYMBOL | ORBINC | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| ○ | - 4.000 | MACH | 0.599 | BETA | - 0.040 | |
| □ | - 2.000 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 0.000 | PHIB | 0.000 | | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3356 | PERCNT |

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE



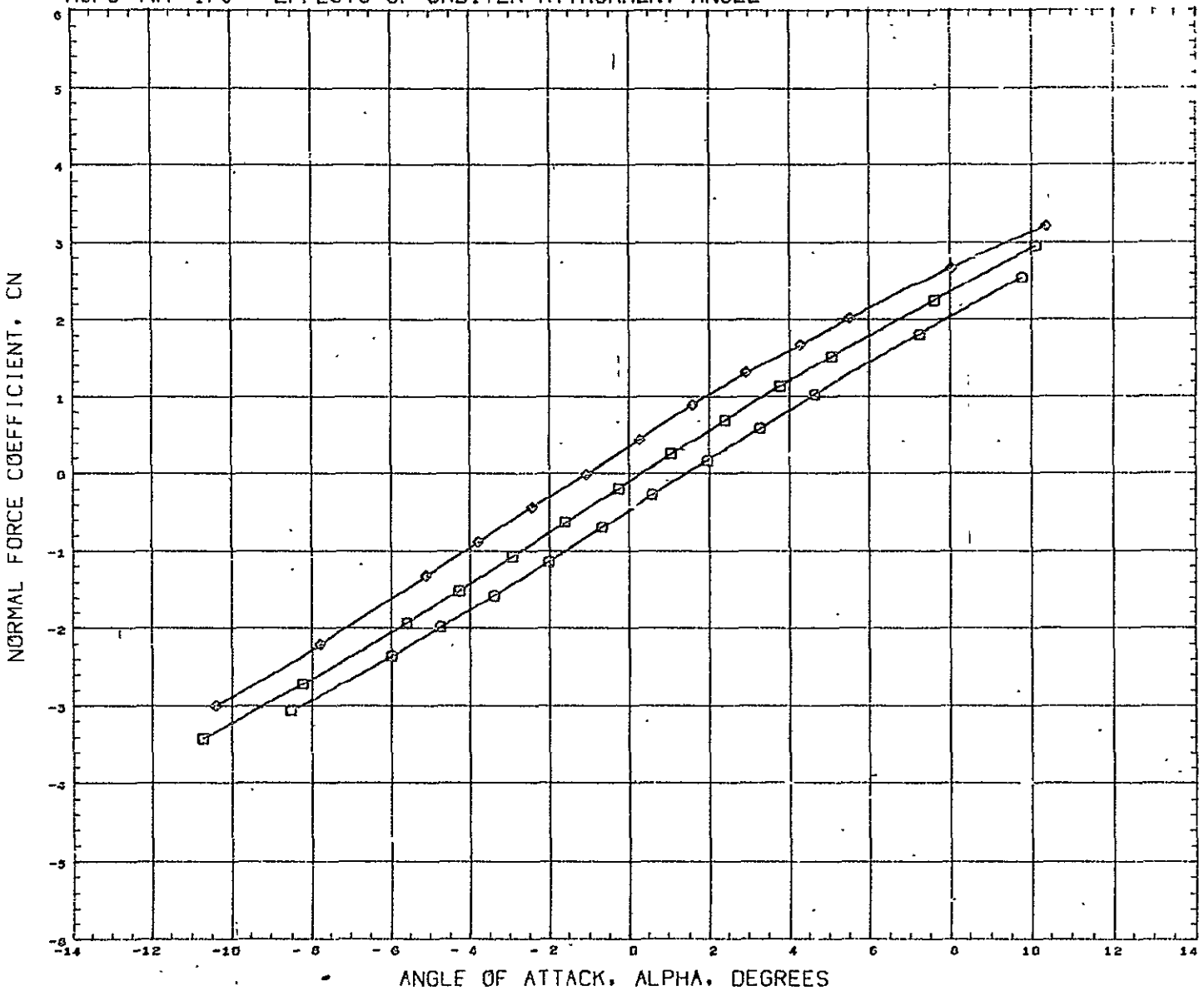

| SYMBOL | ORBINC | | PARAMETRIC VALUES | | |
|---|---|---|---|---|---|
| ○ | - 4.000 | MACH | 0.900 | BETA | - 0.040 |
| □ | - 2.000 | WNGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 0.000 | PHIO | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

REFERENCE FILE

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE

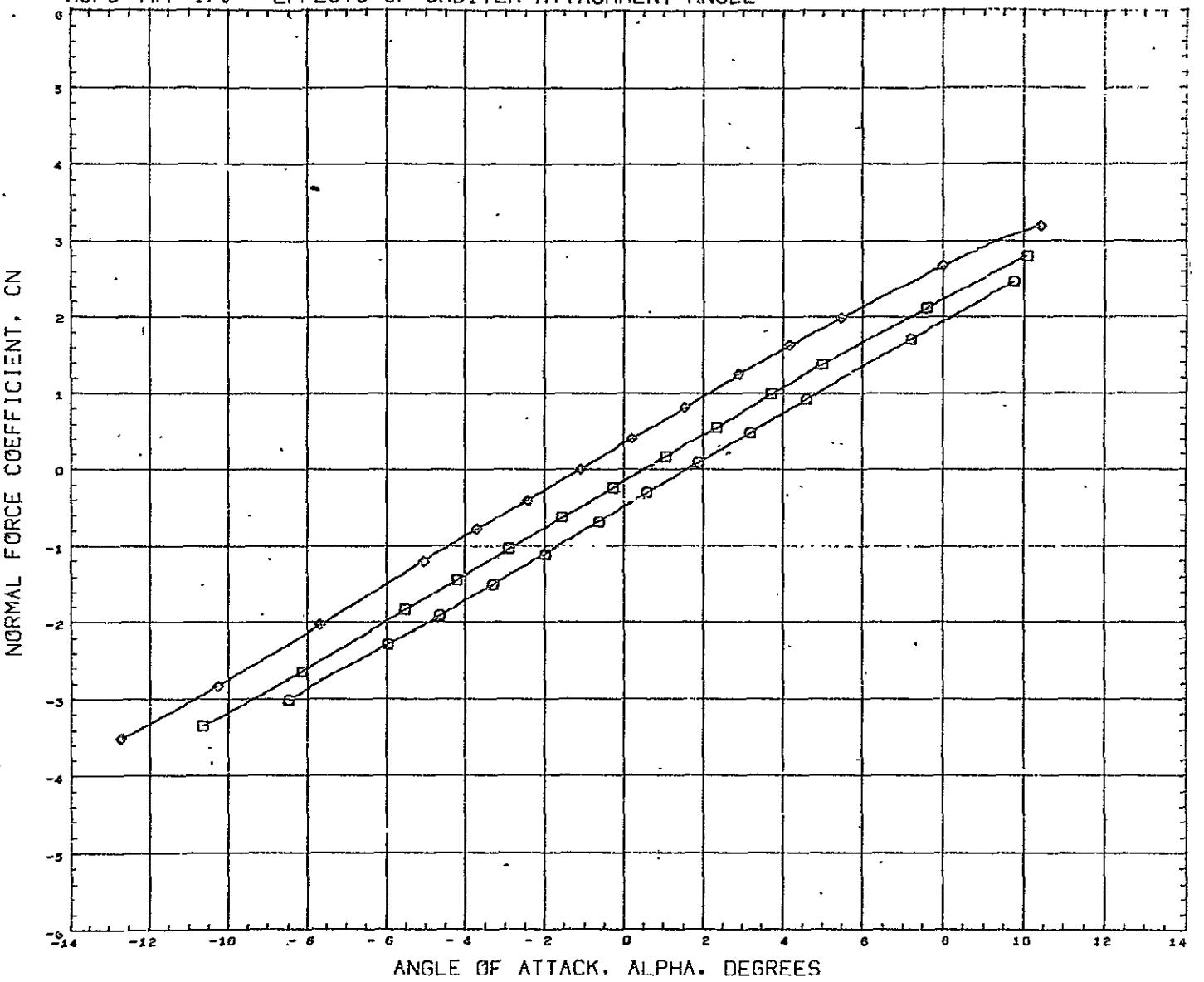



| SYMBOL | ORBINC | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| □ | - 4.000 | MACH | 0.997 | BETA | - 0.040 | |
| □ | - 2.000 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 0.000 | PHIB | 0.000 | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE

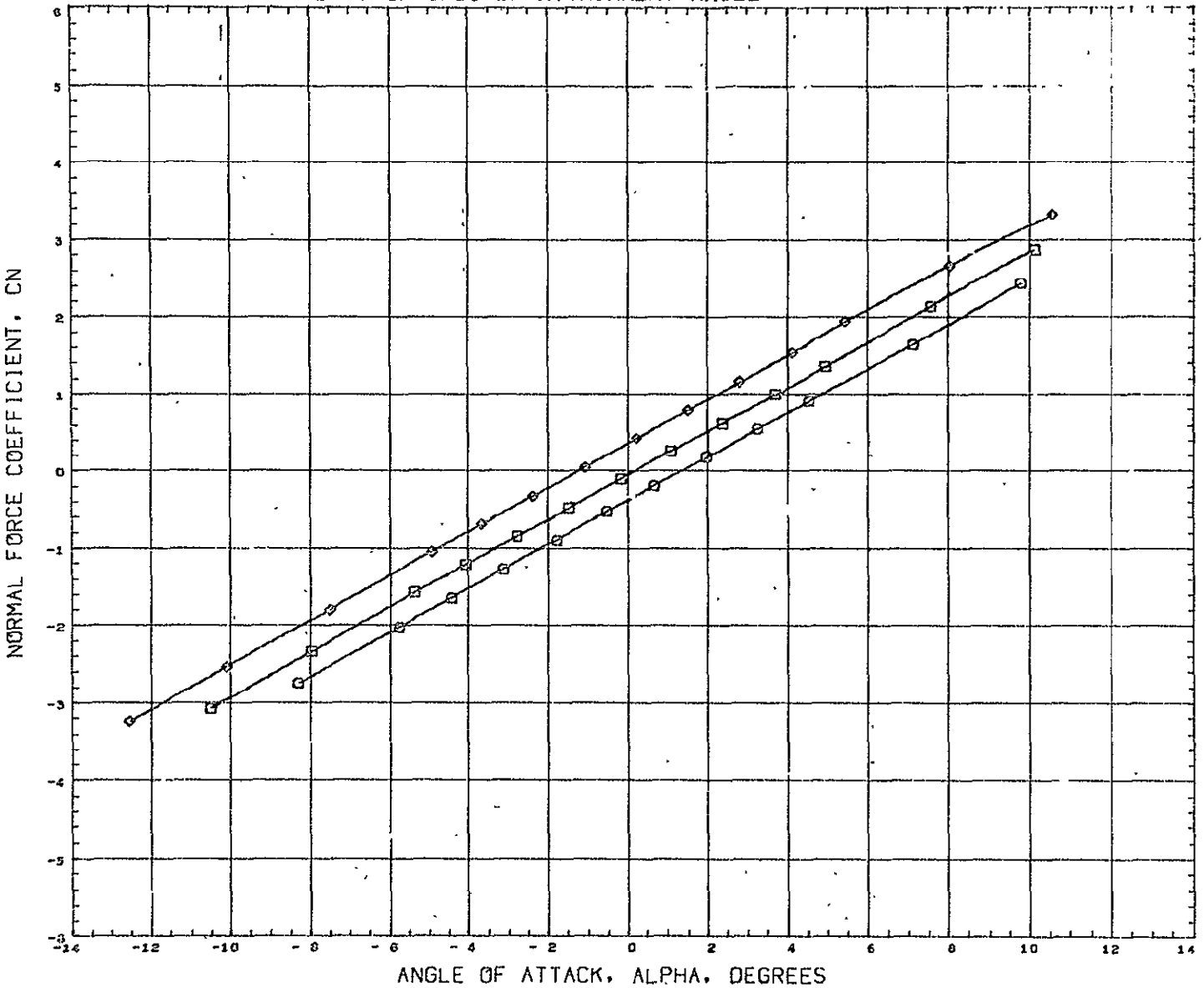



| SYMBOL | ORBINC | PARAMETRIC VALUES | | | | REFERENCE INFORMATION | | |
|---|---|---|---|---|---|---|---|---|
| ○ | - 4.000 | MACH | 1.100 | BETA | - 0.040 | REFS | 1.3960 | SQ.IN. |
| □ | - 2.000 | WINGINC | 4.000 | HTAIL | 0.000 | REFL | 1.3330 | INCHES |
| ◇ | 0.000 | PHIB | 0.000 | | | REFB | 1.3330 | INCHES |
| | | | | | | XMRP | 5.2640 | INCHES |
| | | | | | | YMRP | 0.0000 | INCHES |
| | | | | | | ZMRP | 0.0000 | INCHES |
| | | | | | | SCALE | 0.3366 | PERCNT |

REFERENCE FILE

TWT470 S-IC/GAC ORBITER BOWHVS FINS OFF (A24071) 26 JAN 71 PAGE 256

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE



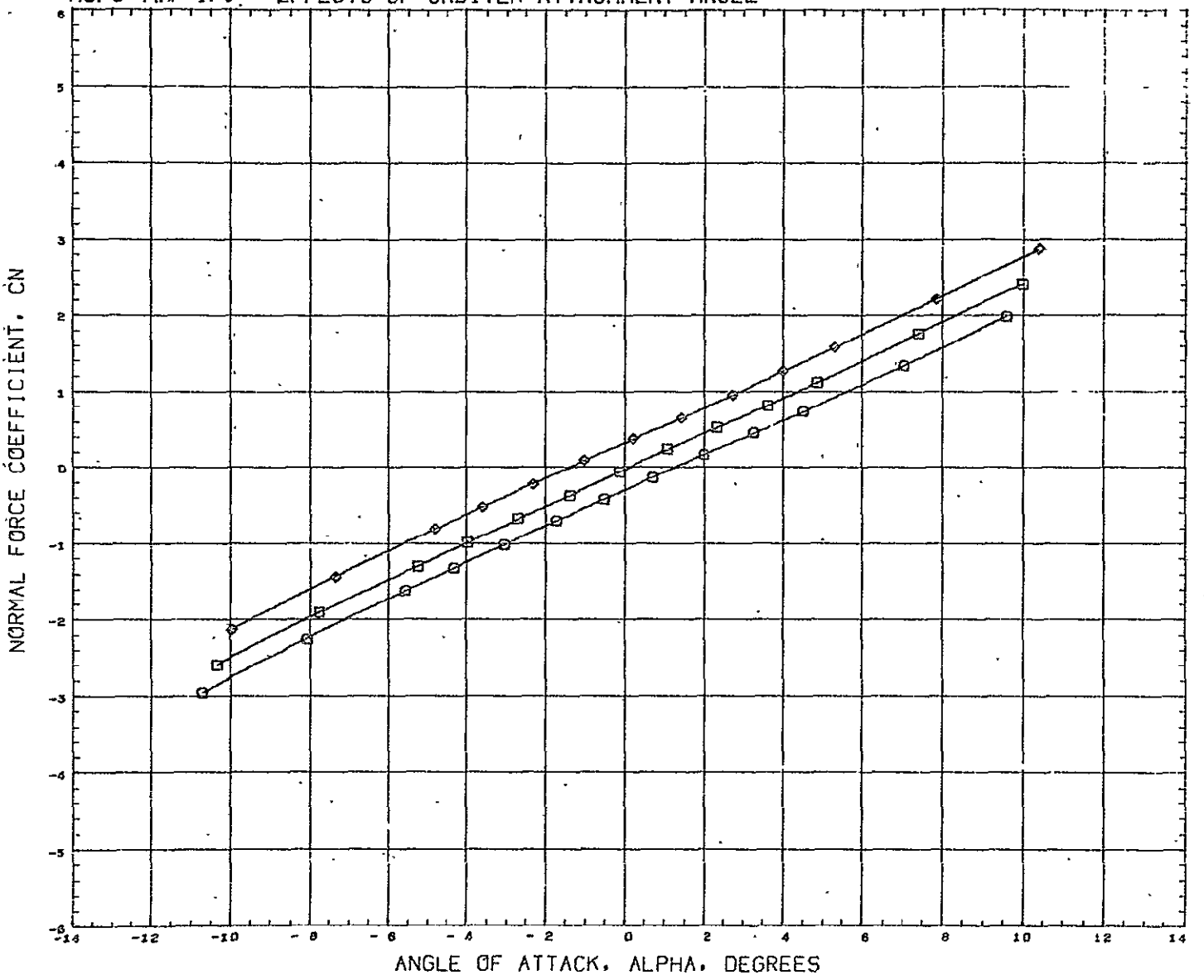

| SYMBOL | ORDINC | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| ○ | - 4.000 | MACH | 1.199 | BETA | - 0.040 | |
| □ | - 2.000 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 0.000 | PHIB | 0.000 | | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE



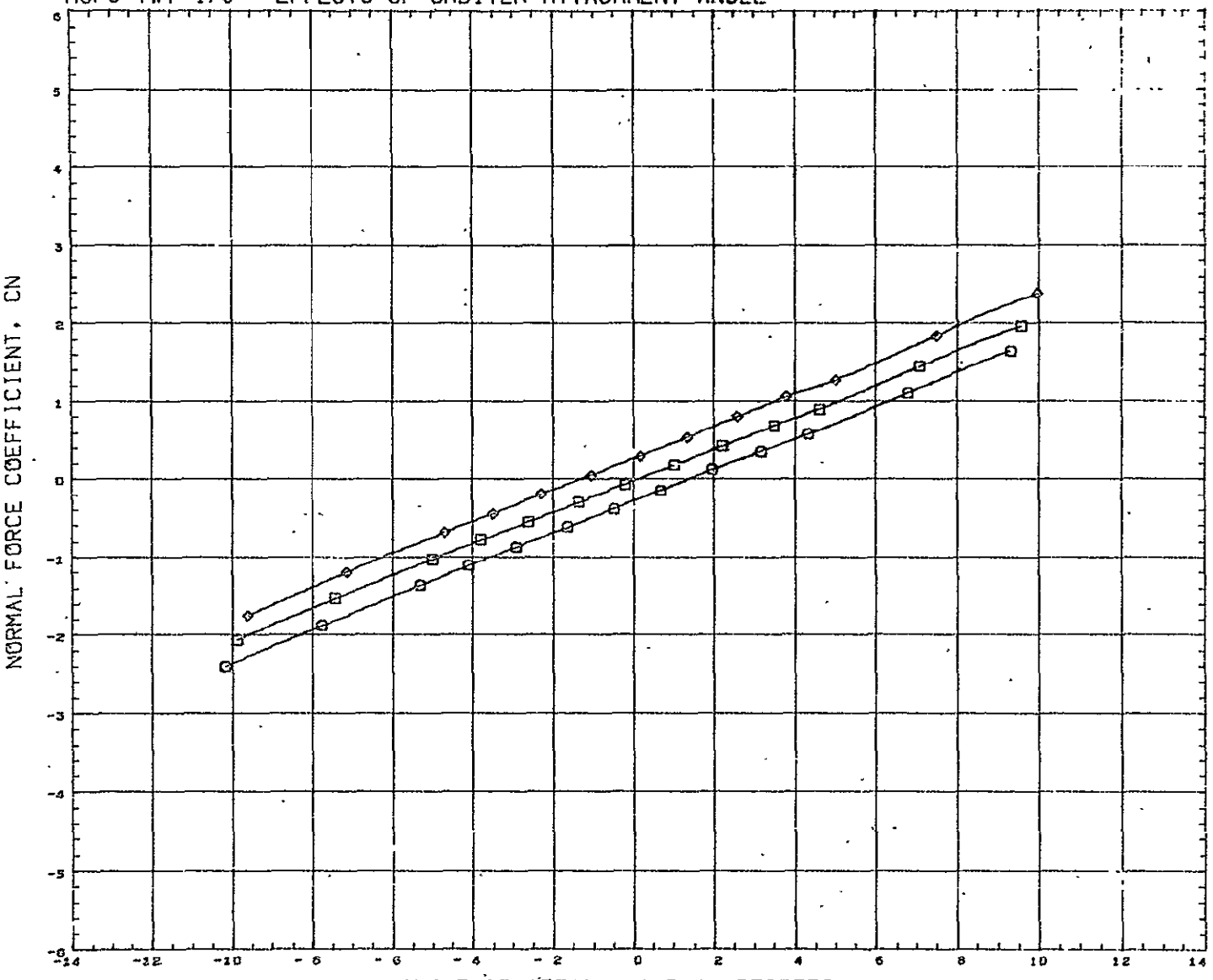

| SYMBOL | ORBINC | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | - 4.000 | MACH | 1.460 | BETA | - 0.040 | |
| □ | - 2.000 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 0.000 | PHIB | 0.000 | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

TWT470 S-IC/GAC ORBITER BOWHVS FINS OFF (A24071) 26 JAN 71 PAGE 258

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE



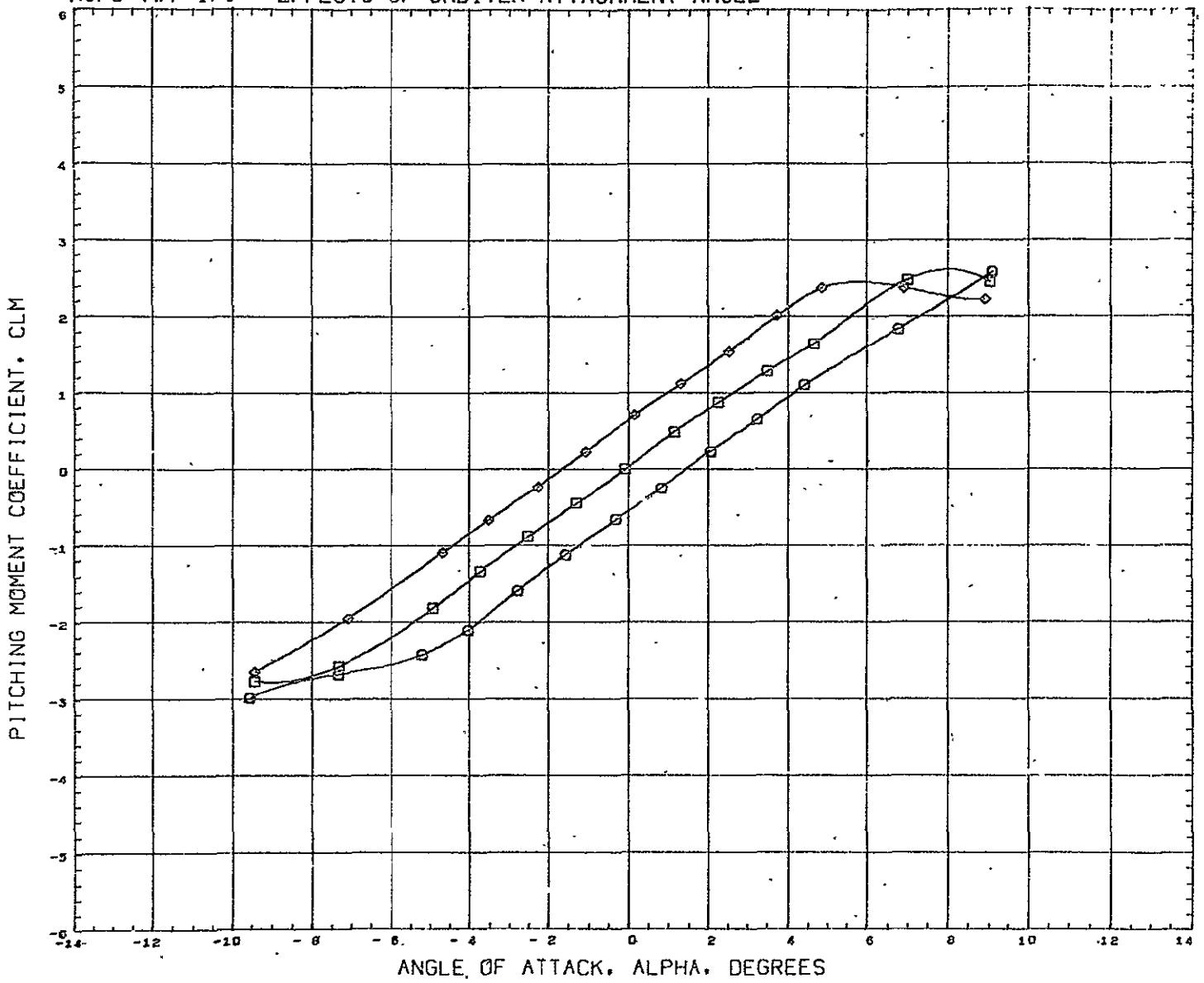

| SYMBOL | ORBINC | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| ○ | - 4.000 | MACH | 1.952 | BETA | - 0.040 | |
| □ | - 2.000 | WNGINC | 4.000 | HTAIL | - 0.009 | |
| ◇ | 0.000 | PHIB | 0.000 | | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE

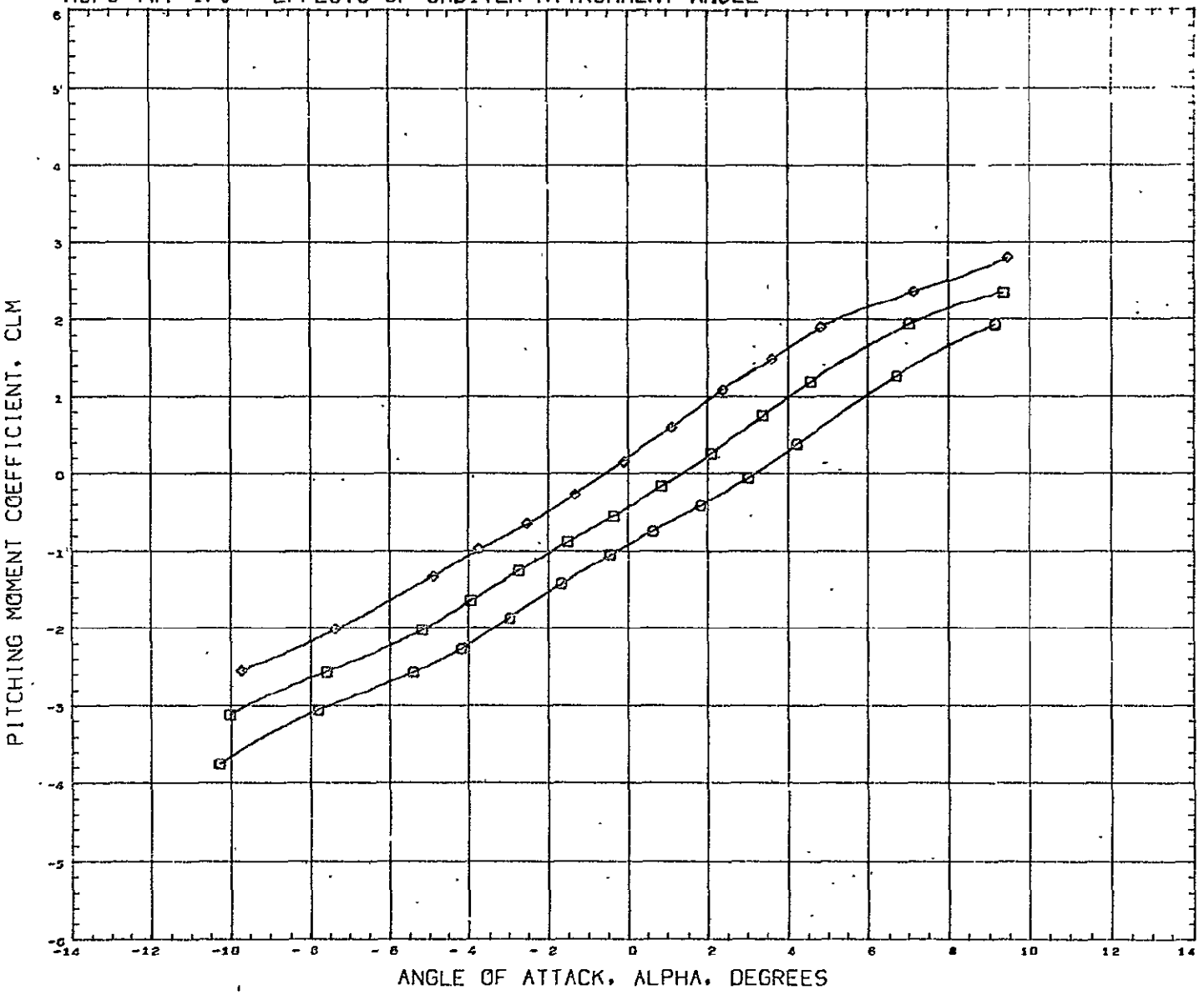



| SYMBOL | ORBINC | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| □ | - 4.000 | MACH | 0.599 | BETA | - 0.040 | |
| □ | - 2.000 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 0.000 | PHIB | 0.000 | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE



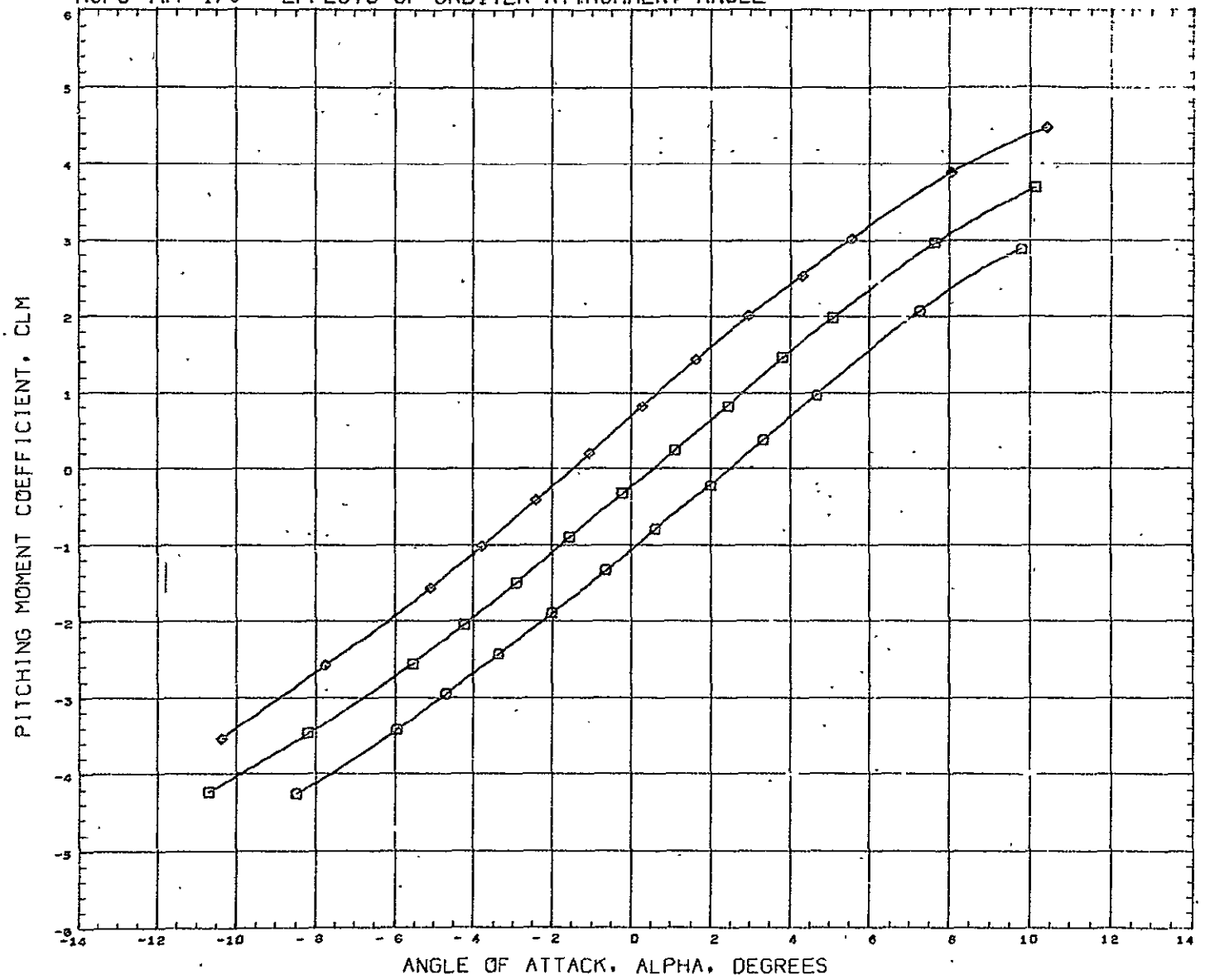

| SYMBOL | ORBINC | | PARAMETRIC VALUES | | |
|---|---|---|---|---|---|
| □ | = 4.000 | MACH | 0.900 | BETA | = 0.040 |
| □ | = 2.000 | WNGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 0.000 | PHIB | 0.000 | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE



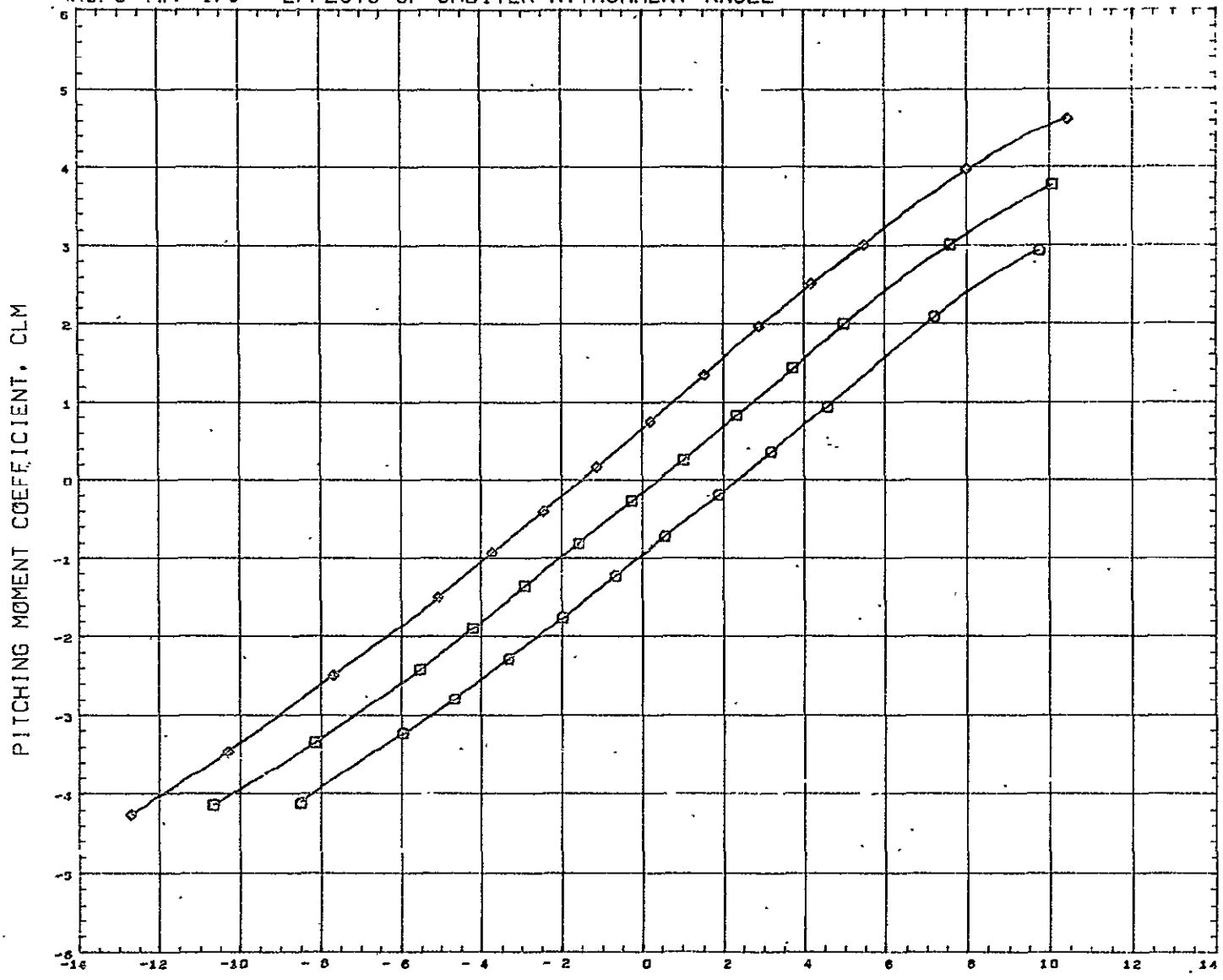

| SYMBOL | ORBINC | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| ○ | - 4.000 | MACH | 0.997 | BETA | - 0.040 | |
| □ | - 2.000 | WHGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 0.000 | PHIB | 0.000 | | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE

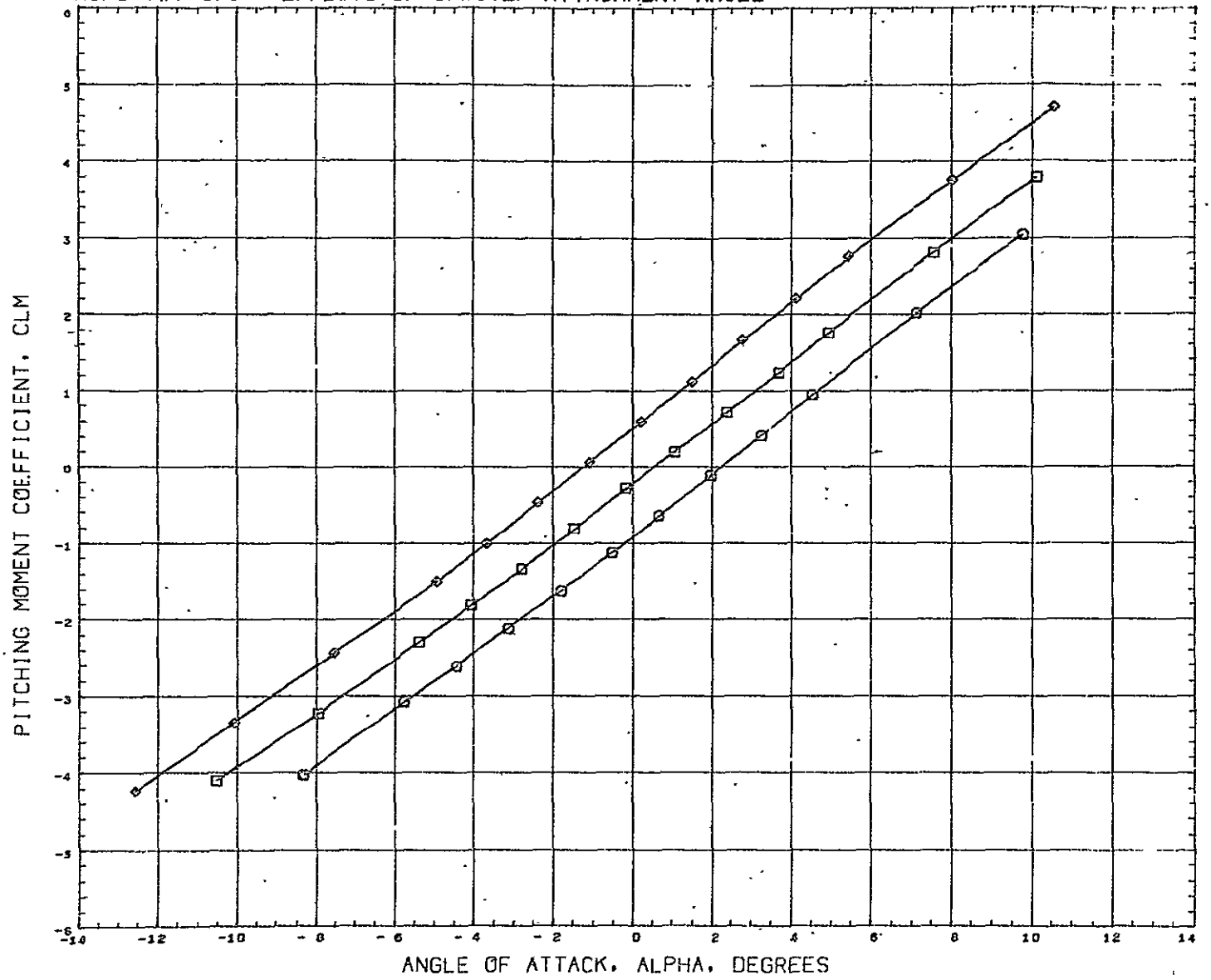



| SYMBOL | ORBINC | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| ○ | - 4.000 | MACH | 1.100 | BETA | - 0.040 | |
| □ | - 2.000 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 0.000 | PHIB | 0.000 | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE

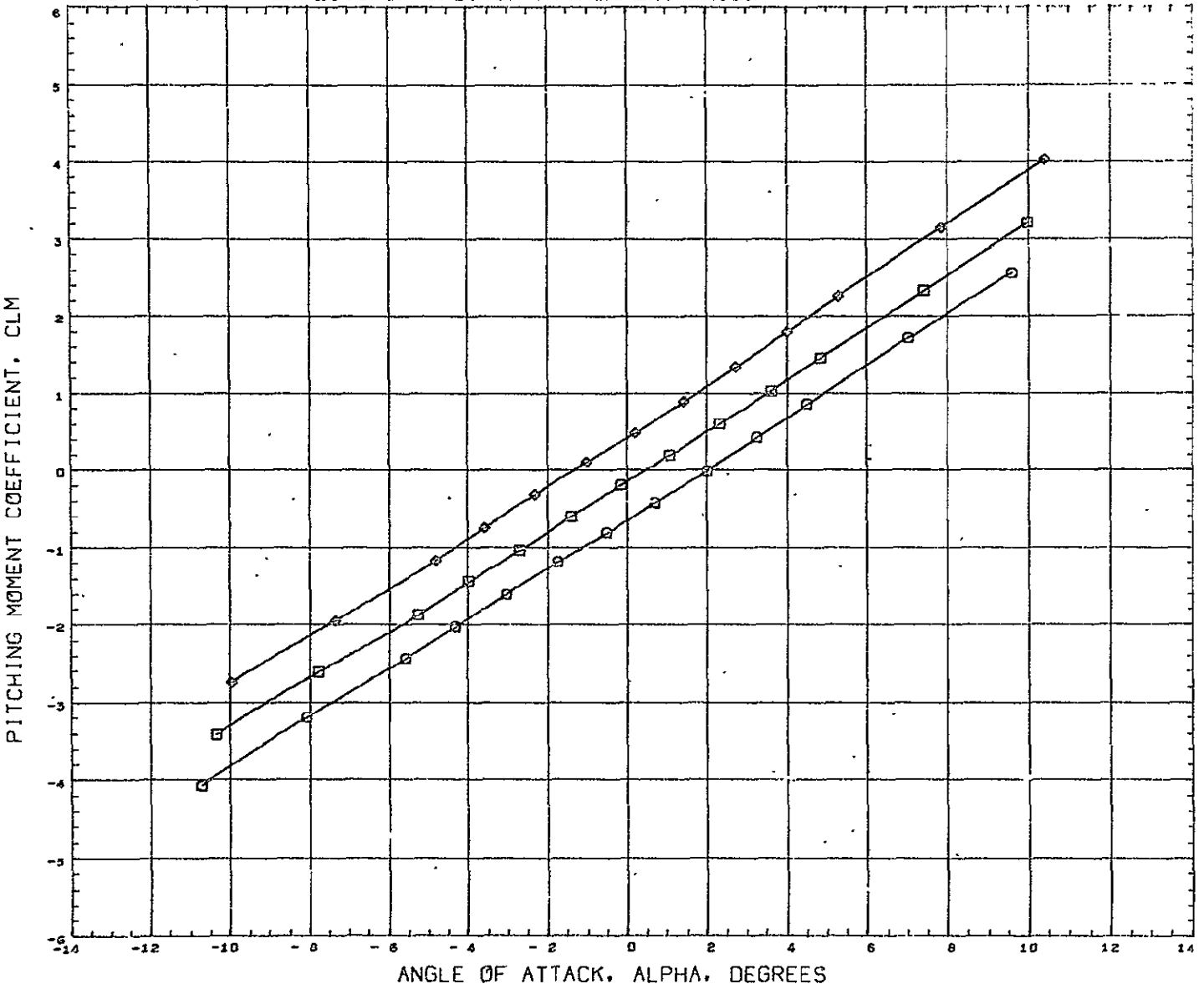



| SYMBOL | ORBINC | | PARAMETRIC VALUES | | |
|---|---|---|---|---|---|
| ○ | - 4.000 | MACH | 1.199 | BETA | - 0.040 |
| □ | - 2.000 | WNGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 0.000 | PHIB | 0.000 | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE



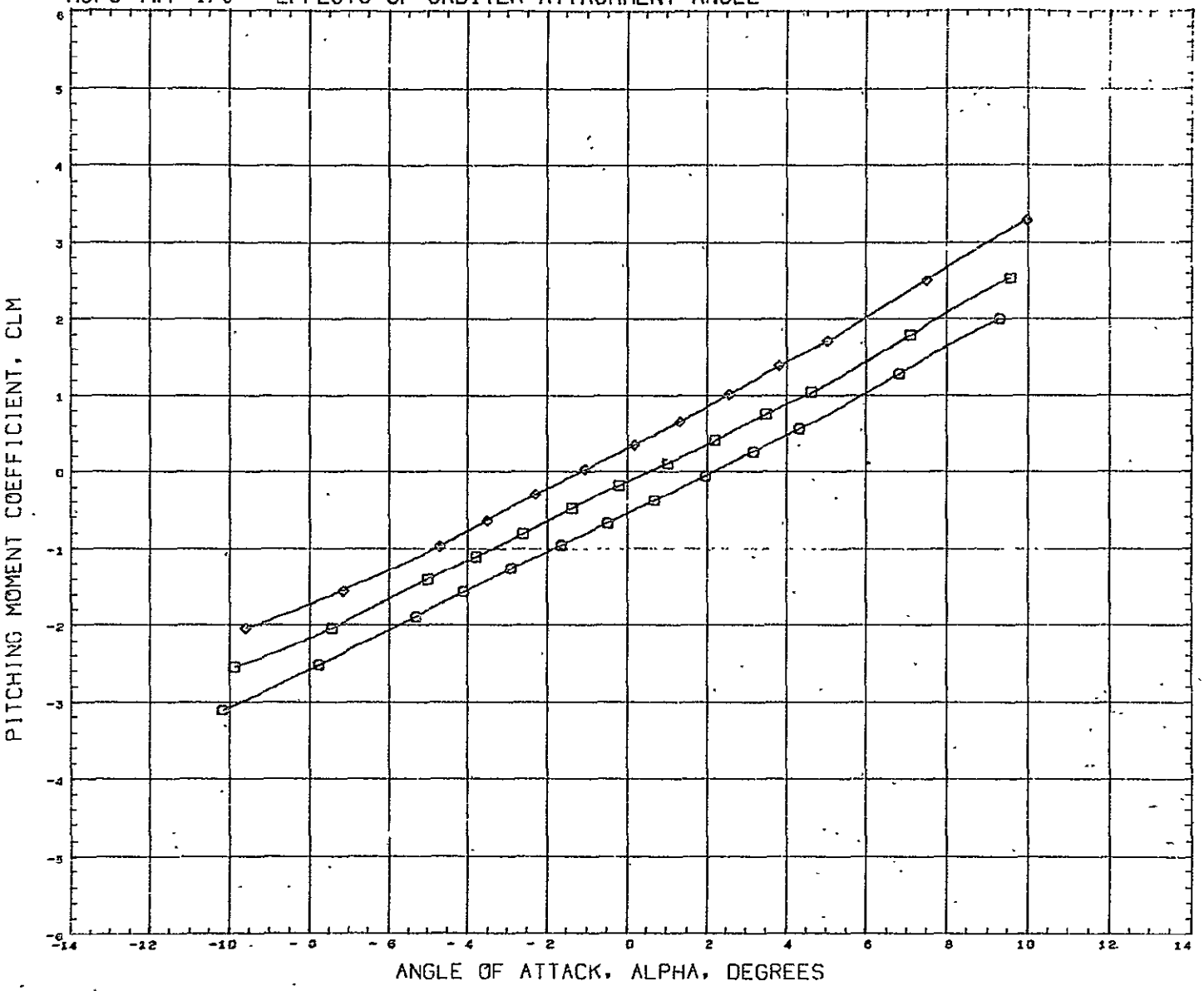

| SYMBOL | ORBINC | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| ○ | - 4.000 | MACH | 1.460 | BETA | - 0.040 | |
| □ | - 2.000 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 0.000 | PHIB | 0.000 | | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE




| SYMBOL | ORBINC | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| ○ | - 4.000 | MACH | 1.952 | BETA | - | 0.040 |
| □ | - 2.000 | WNGINC | 4.000 | HTAIL | | 0.000 |
| ◇ | 0.000 | PHIB | 0.000 | | | |

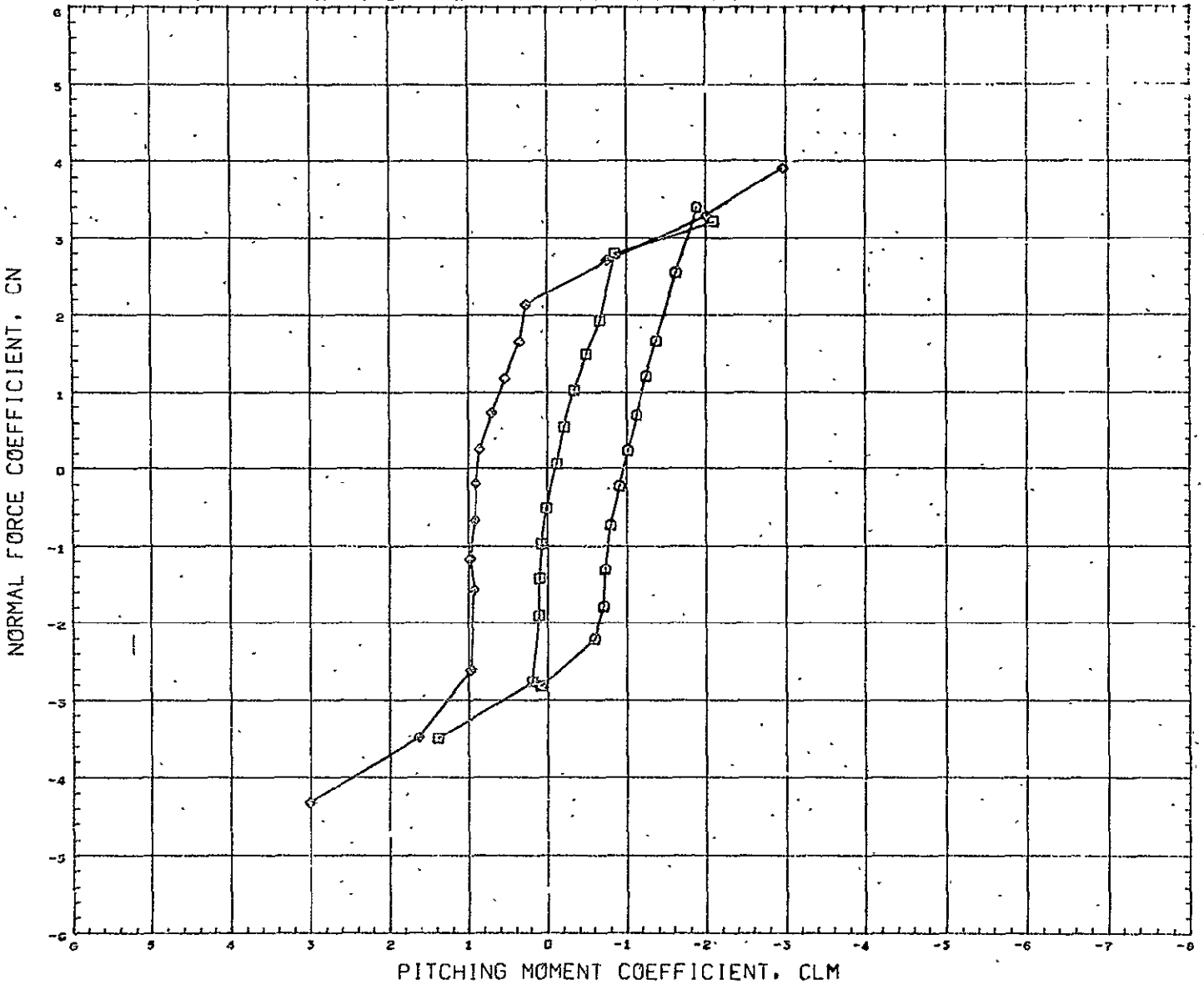
REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

TWT470 S-IC/GAC ORBITER BOWHVS FINS OFF (A24071) 26 JAN 71 PAGE 266

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE



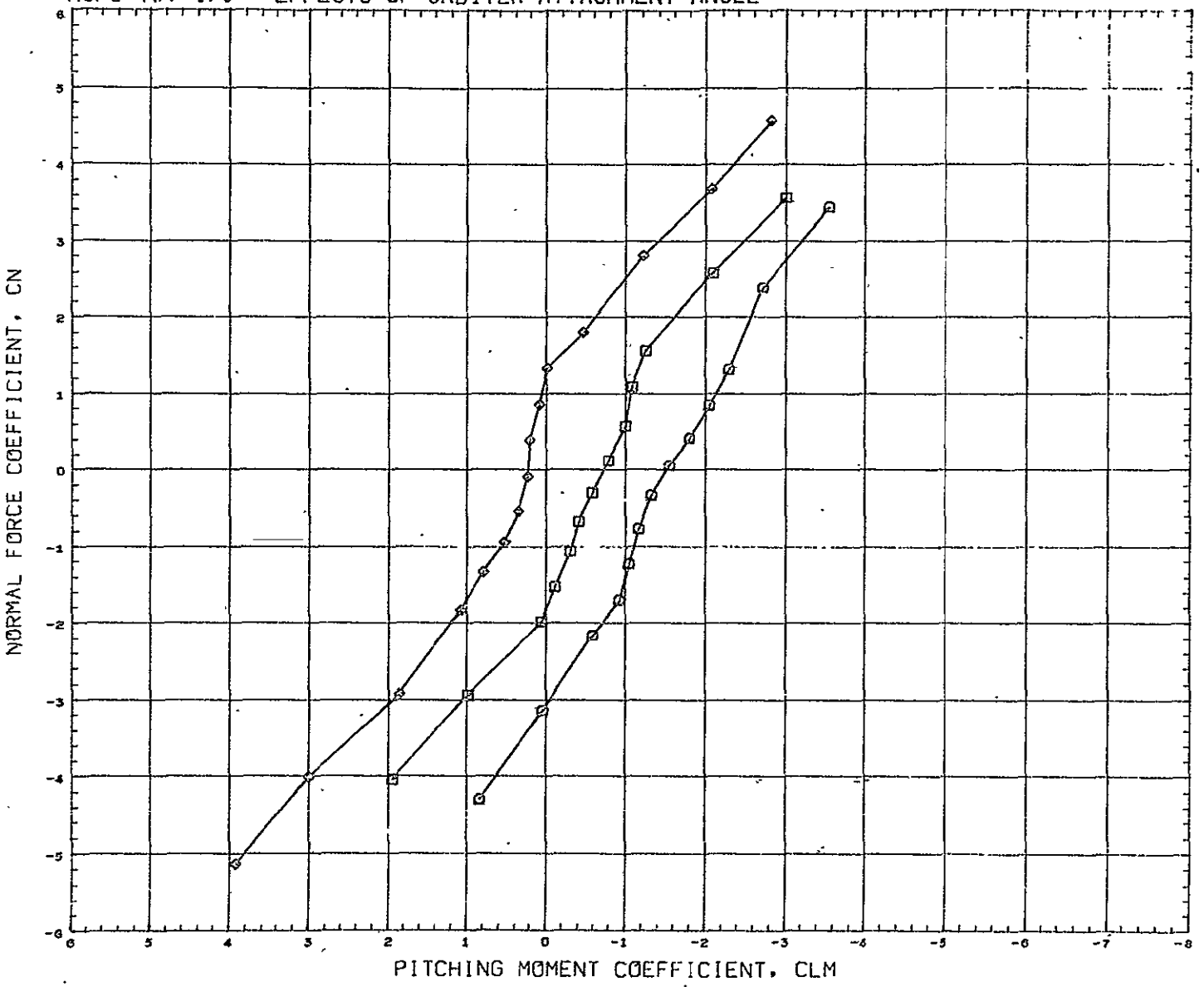

| SYMBOL | ORDINC | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| ○ | - 4.000 | MACH | 0.597 | BETA | - 0.050 | |
| □ | - 2.000 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 0.000 | PHIB | 0.000 | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFD | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

TWT470 S-IC/GAC ORBITER BF10WHVS FINS ON (A24041) 26 JAN 71 PAGE 267

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE



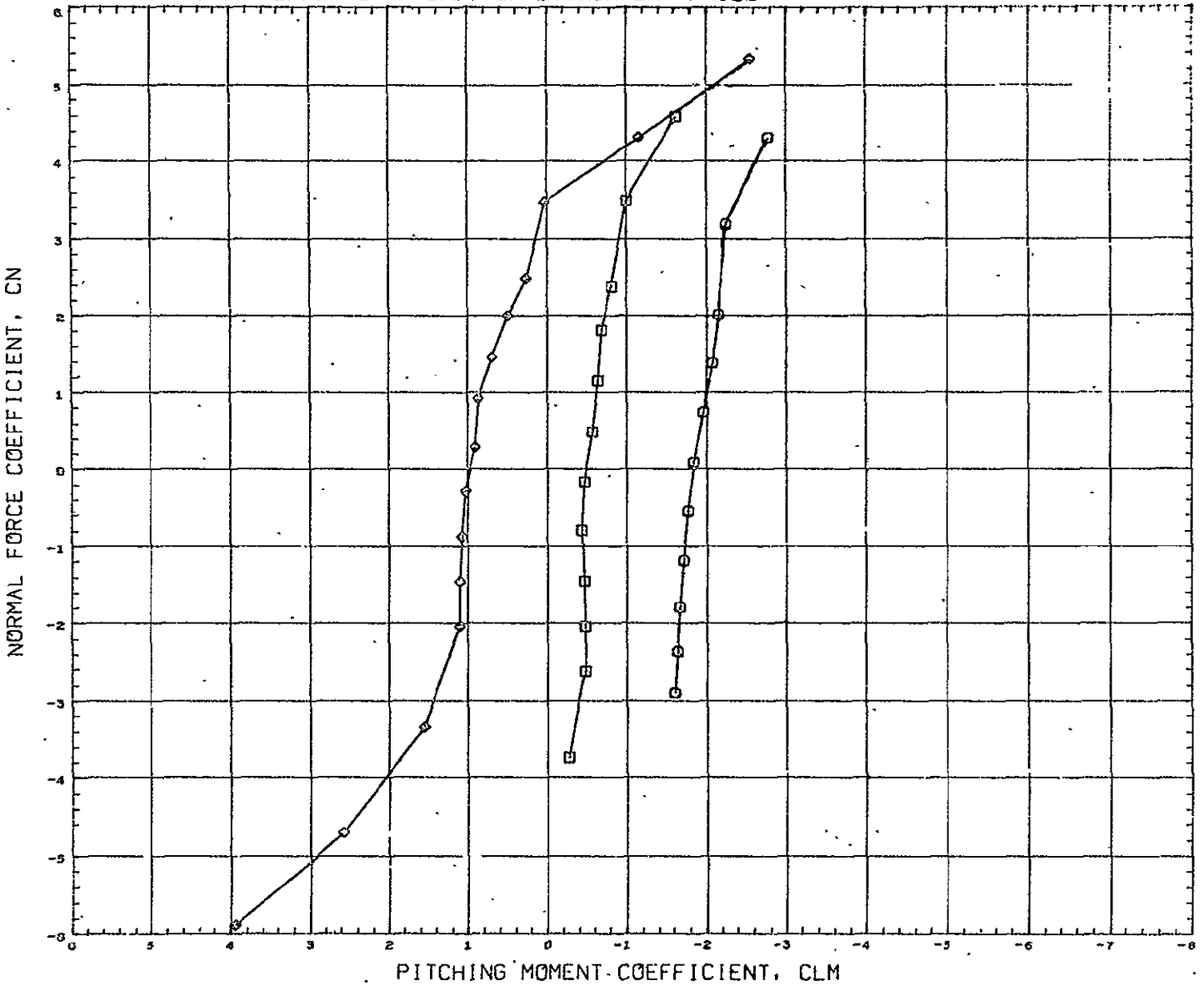

| SYMBOL | ORBINC | | PARAMETRIC VALUES | | |
|---|---|---|---|---|---|
| ○ | - 4.000 | MACH | 0.901 | BETA | - 0.050 |
| □ | - 2.000 | WNGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 0.000 | PHIB | 0.000 | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE

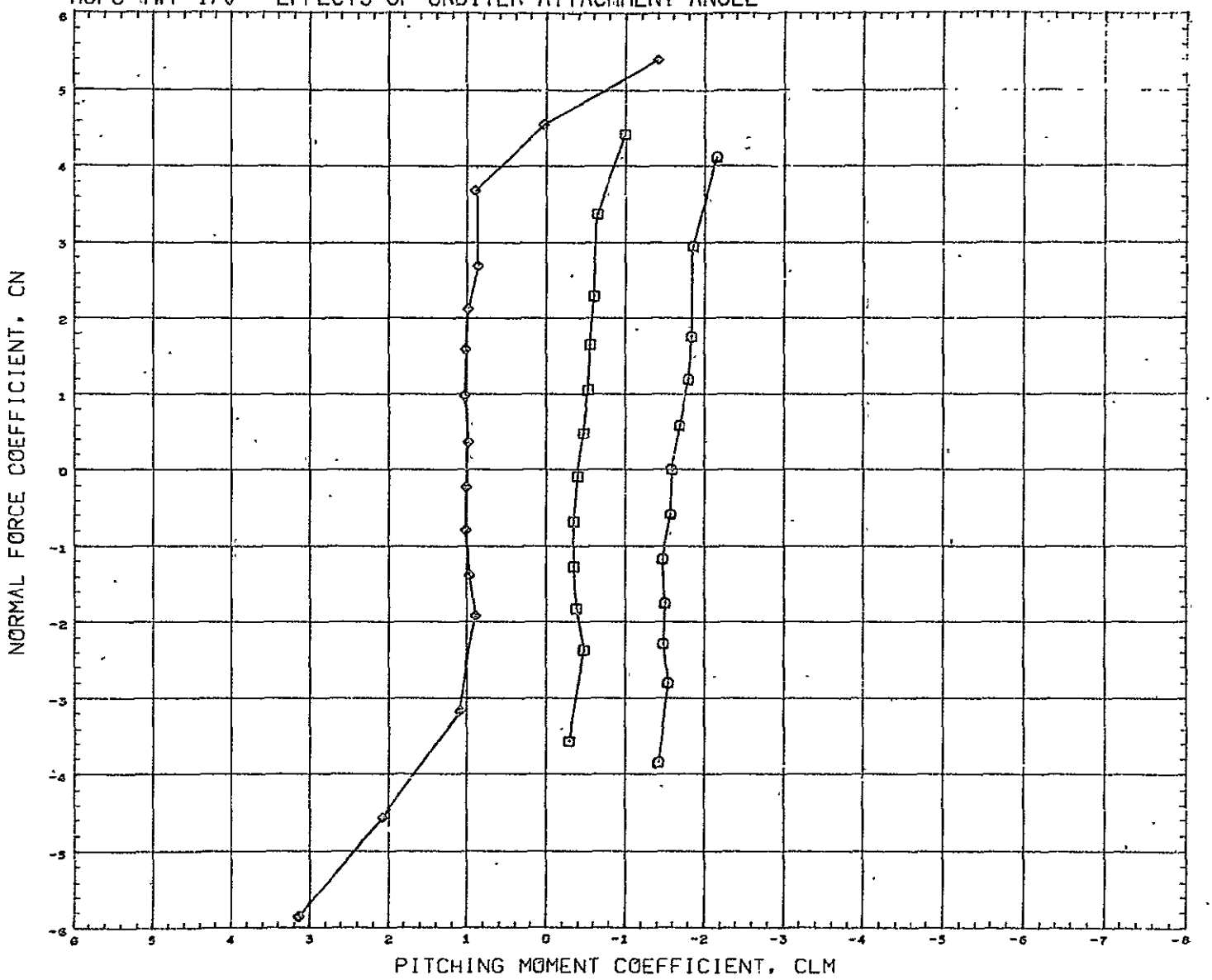



| SYMBOL | ORBINC | | PARAMETRIC VALUES | | |
|---|---|---|---|---|---|
| ○ | - 4.000 | MACH | 1.000 | BETA | - 0.050 |
| □ | - 2.000 | WNGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 0.000 | PHIB | 0.000 | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE

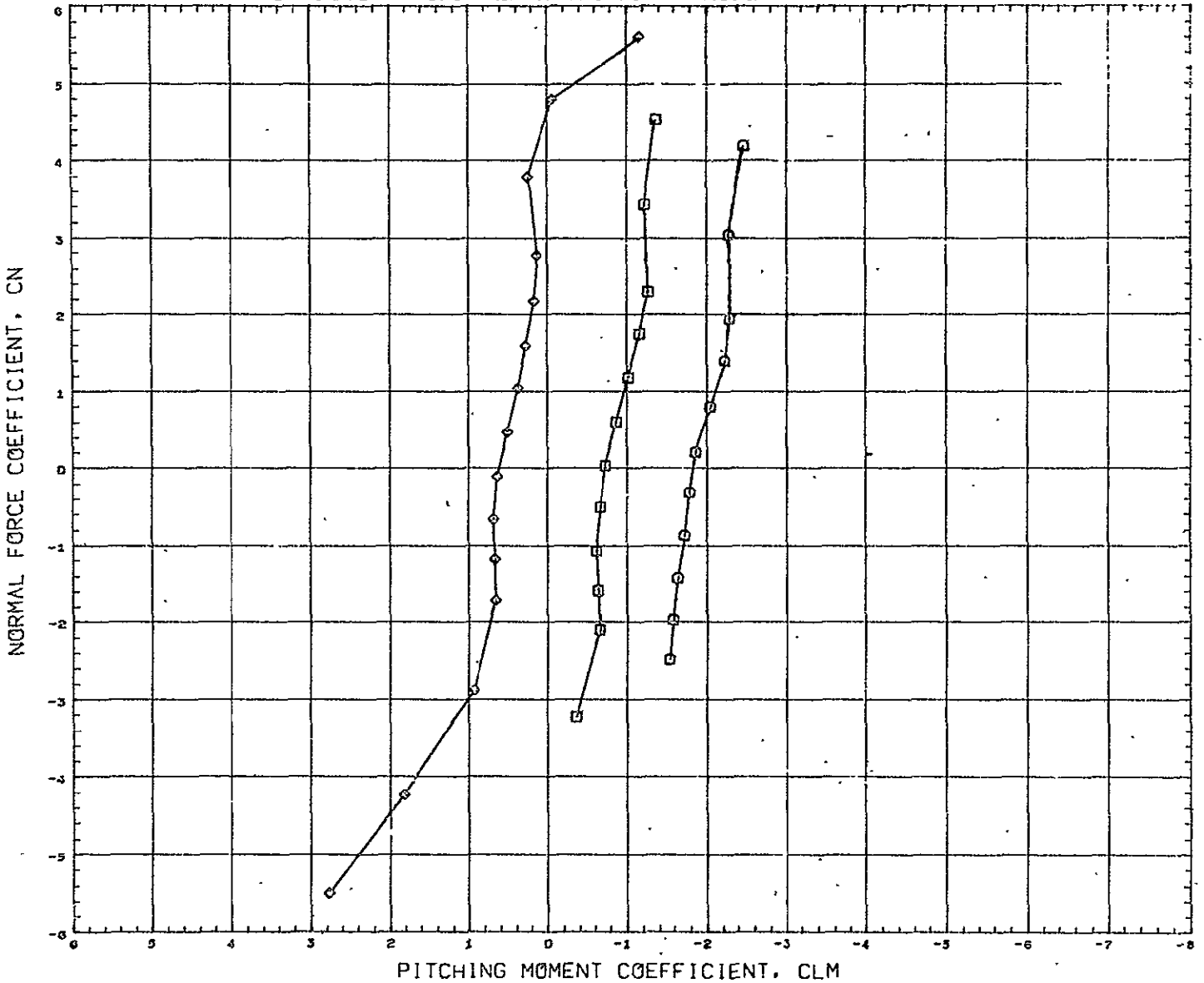



| SYMBOL | ORBINC | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| ○ | - 4.000 | MACH | 1.098 | BETA | - 0.050 | |
| □ | - 2.000 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 0.000 | PHIB | 0.000 | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE

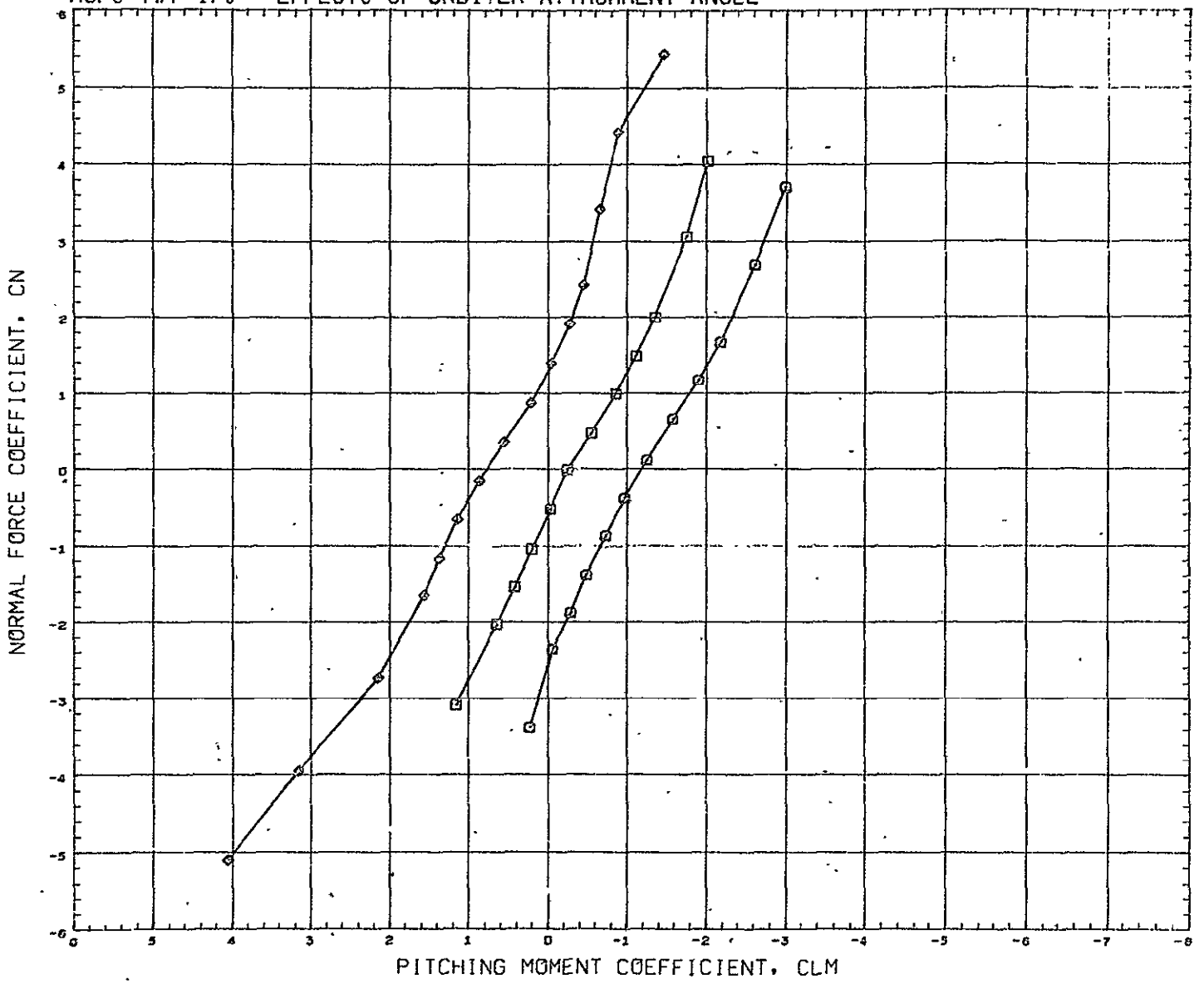



| SYMBOL | ORBINC | | PARAMETRIC VALUES | | |
|---|---|---|---|---|---|
| □ | - 4.000 | MACH | 1.193 | BETA | - 0.050 |
| ◻ | - 2.000 | WBGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 0.000 | PHIB | 0.000 | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE



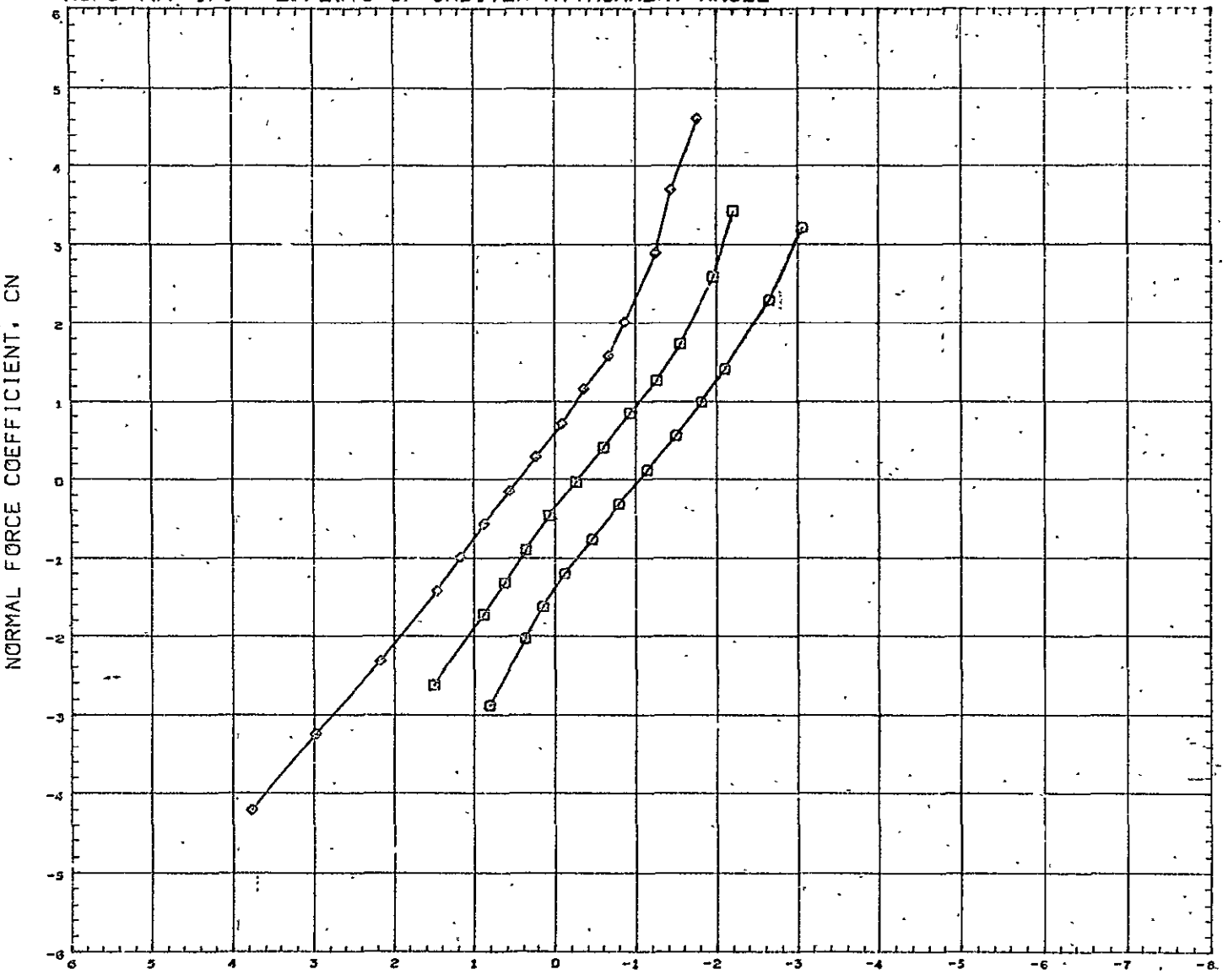

| SYMBOL | ORBINC | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| ○ | 4.000 | MACH | 1.458 | BETA | 0.050 | |
| □ | 2.000 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 0.000 | PHIB | 0.000 | | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE




| SYMBOL | ORBINC | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| ○ | - 4.000 | MACH | 1.950 | BETA | - 0.050 | |
| □ | - 2.000 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 0.000 | PHIB | 0.000 | | | |

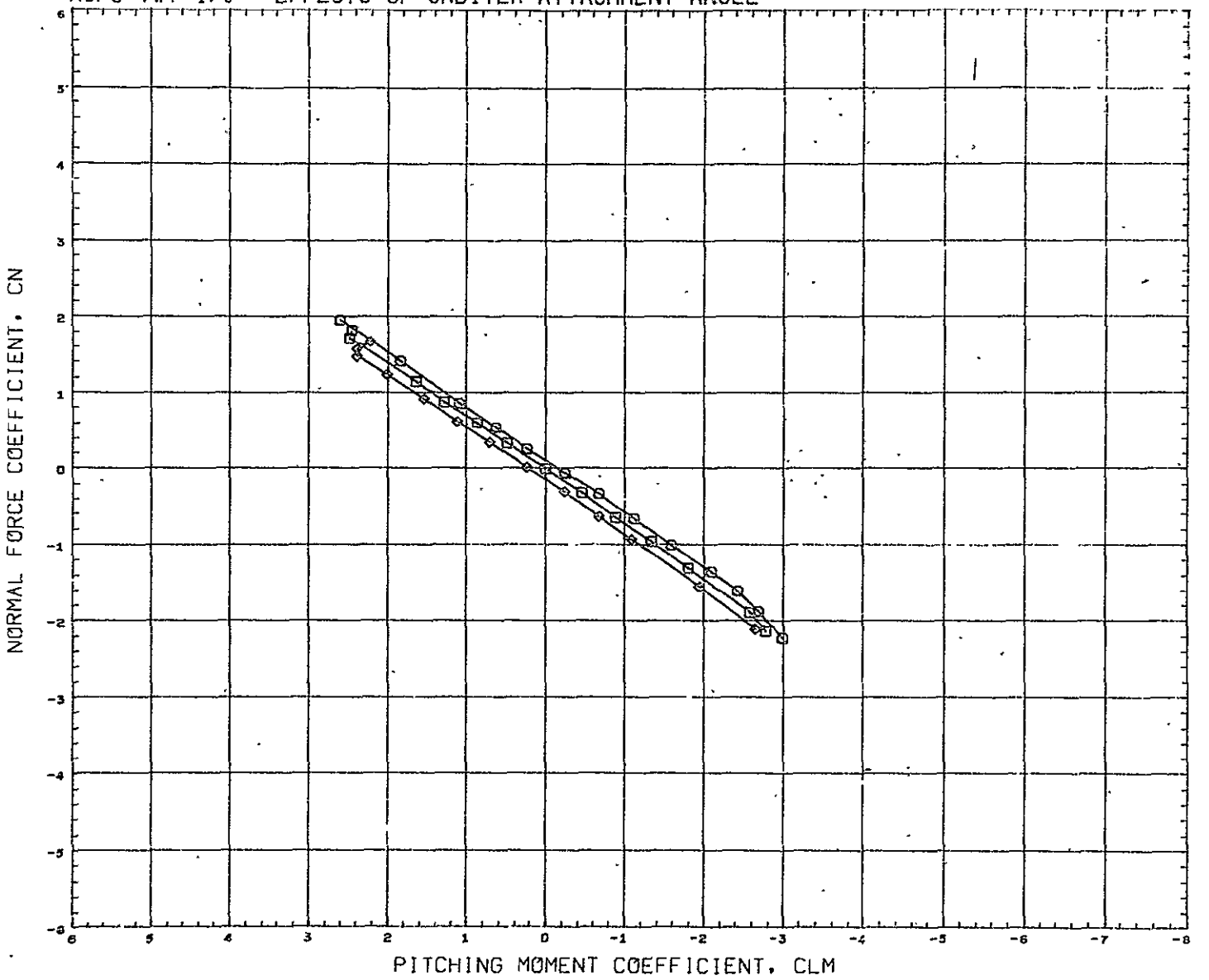
REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

REFERENCE FILE

TWT470 S-IC/GAC ORBITER BF10WHVS FINS ON (A2404I) 26 JAN 71 PAGE 273

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE




| SYMBOL | ORBINC | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| ○ | 4.000 | MACH, | 0.599 | BETA | - | 0.040 |
| □ | 2.000 | WNGINC | 4.000 | HTAIL | | 0.000 |
| ◇ | 0.000 | PHIB | 0.000 | | | |

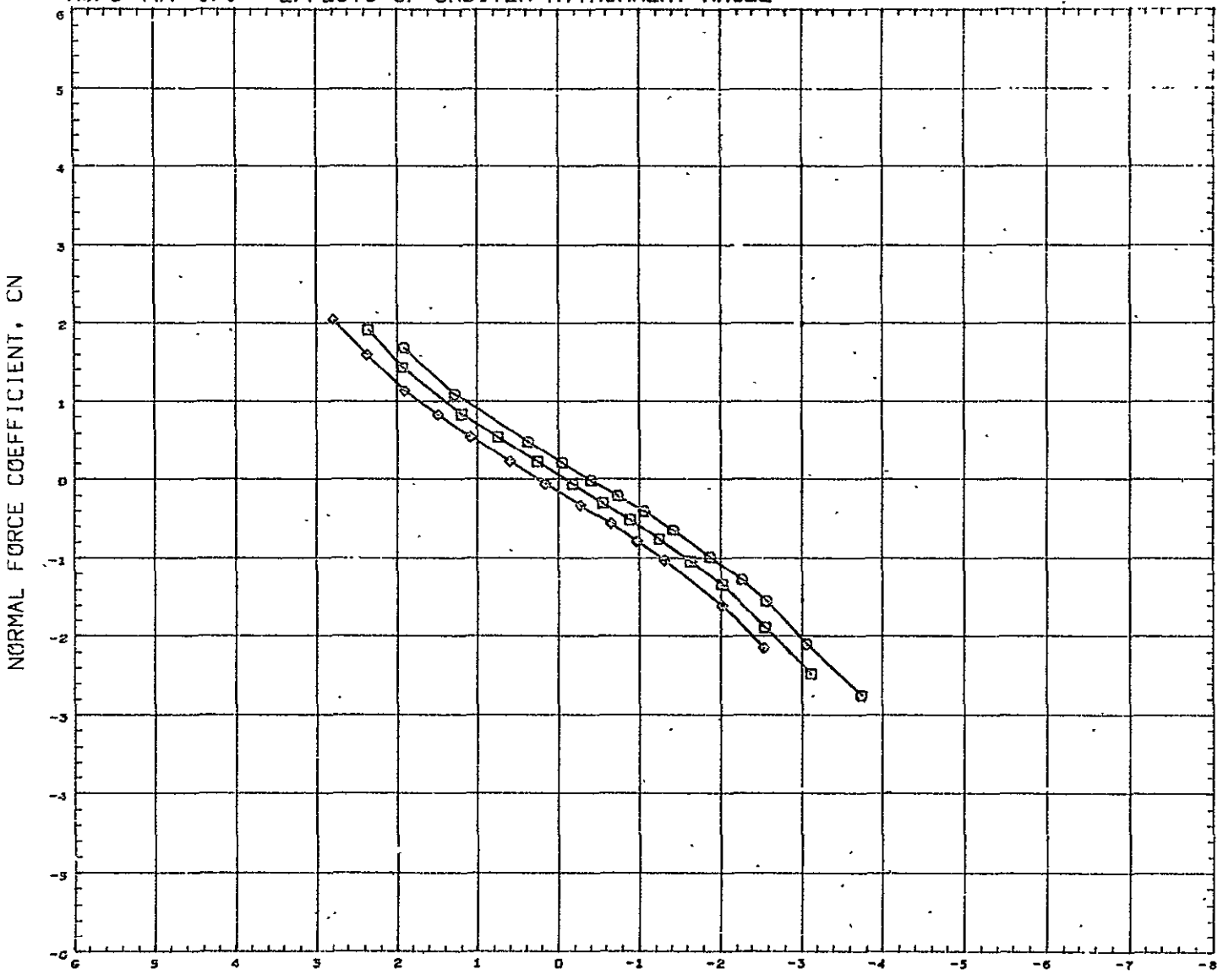
REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

TWT470-S-IC/GAC ORBITER BOWHVS FINS OFF (A24071) 26 JAN 71 PAGE 274

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE

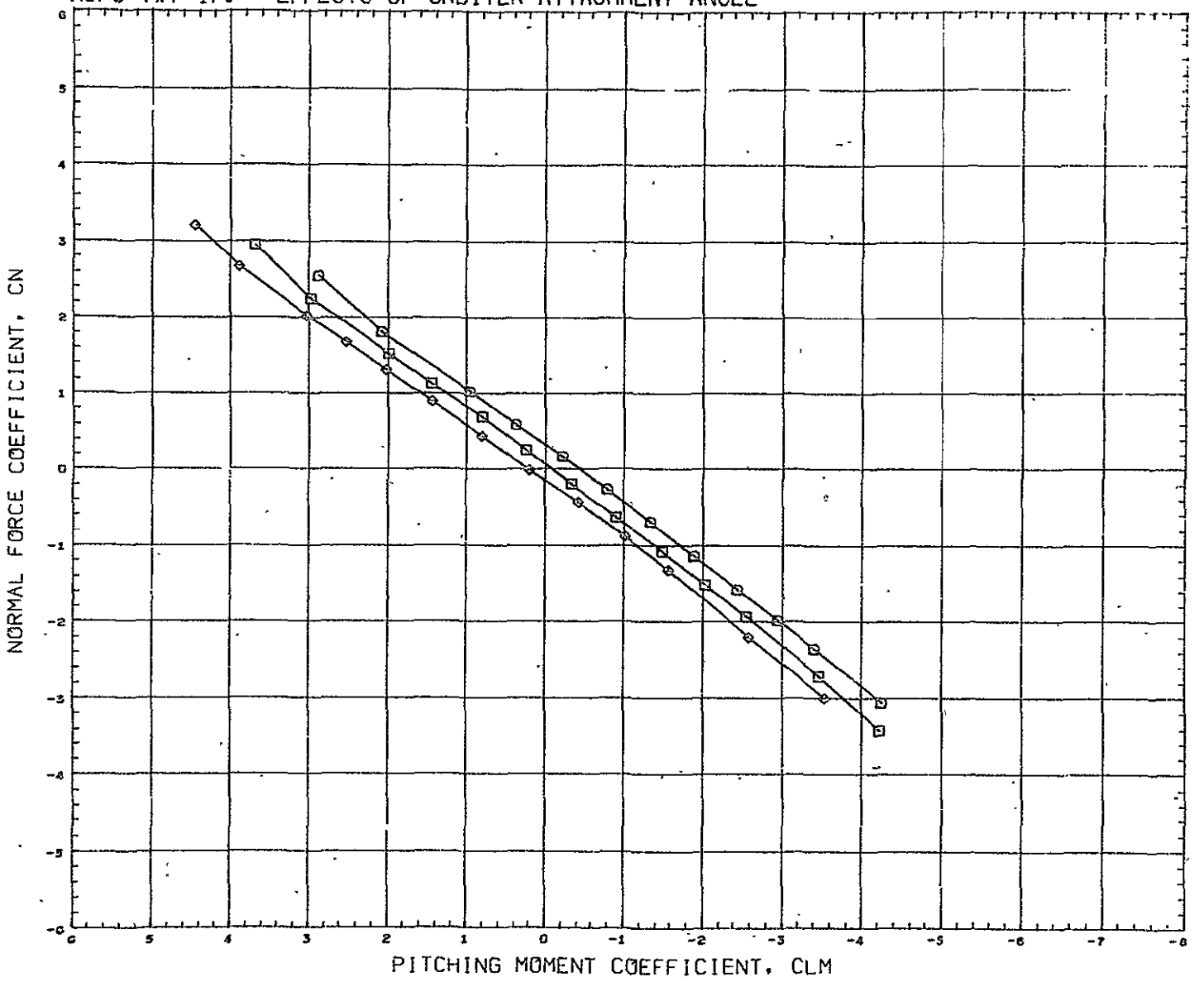



| SYMBOL | ORBINC | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | - 4.000 | MACH | 0.900 | BETA | - 0.040 | |
| □ | - 2.000 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 0.000 | PHIB | 0.000 | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE

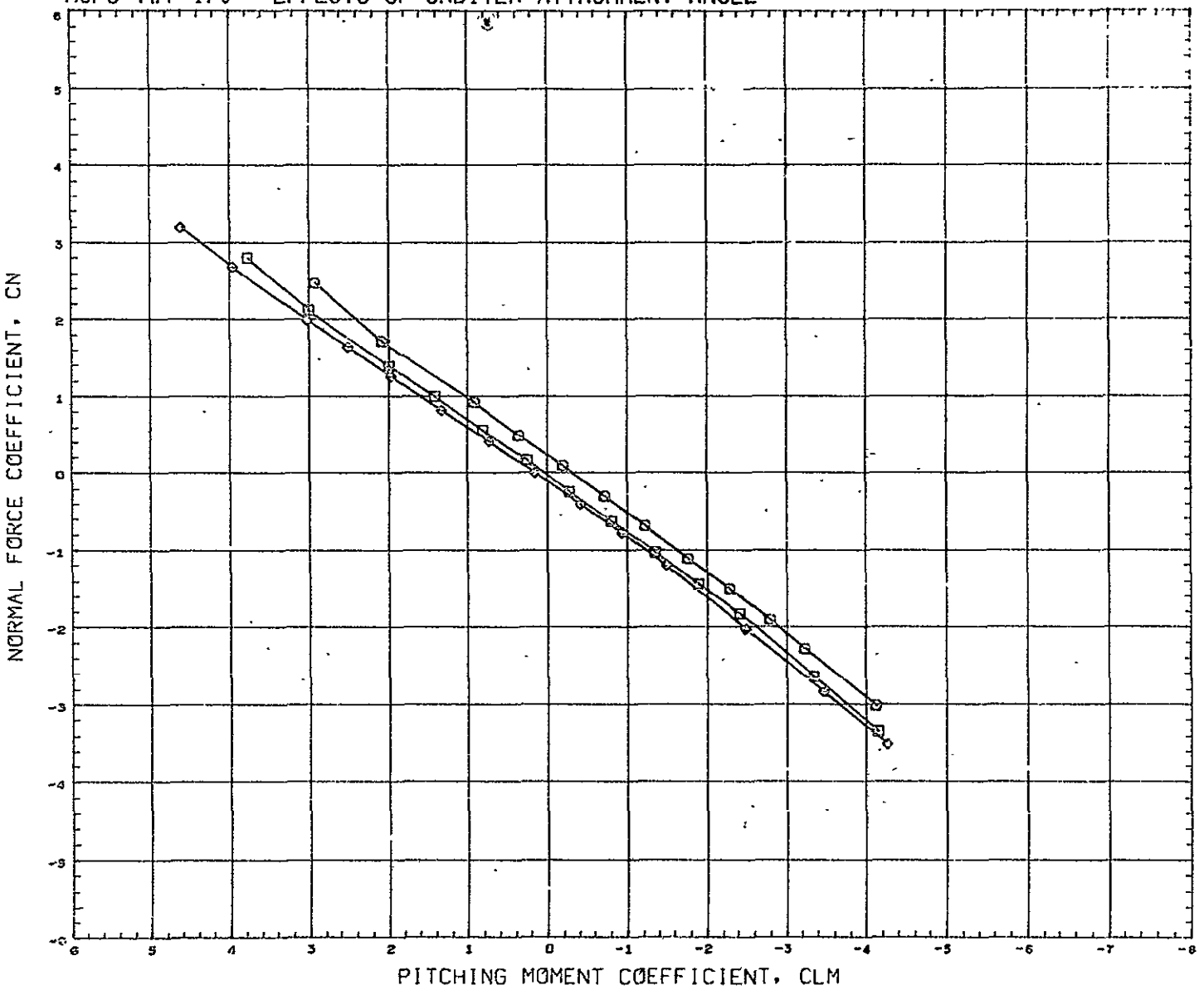



| SYMBOL | ORBINC | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| ○ | - 4.000 | MACH | 0.997 | BETA | - 0.040 | |
| □ | - 2.000 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 0.000 | PHIB | 0.000 | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE

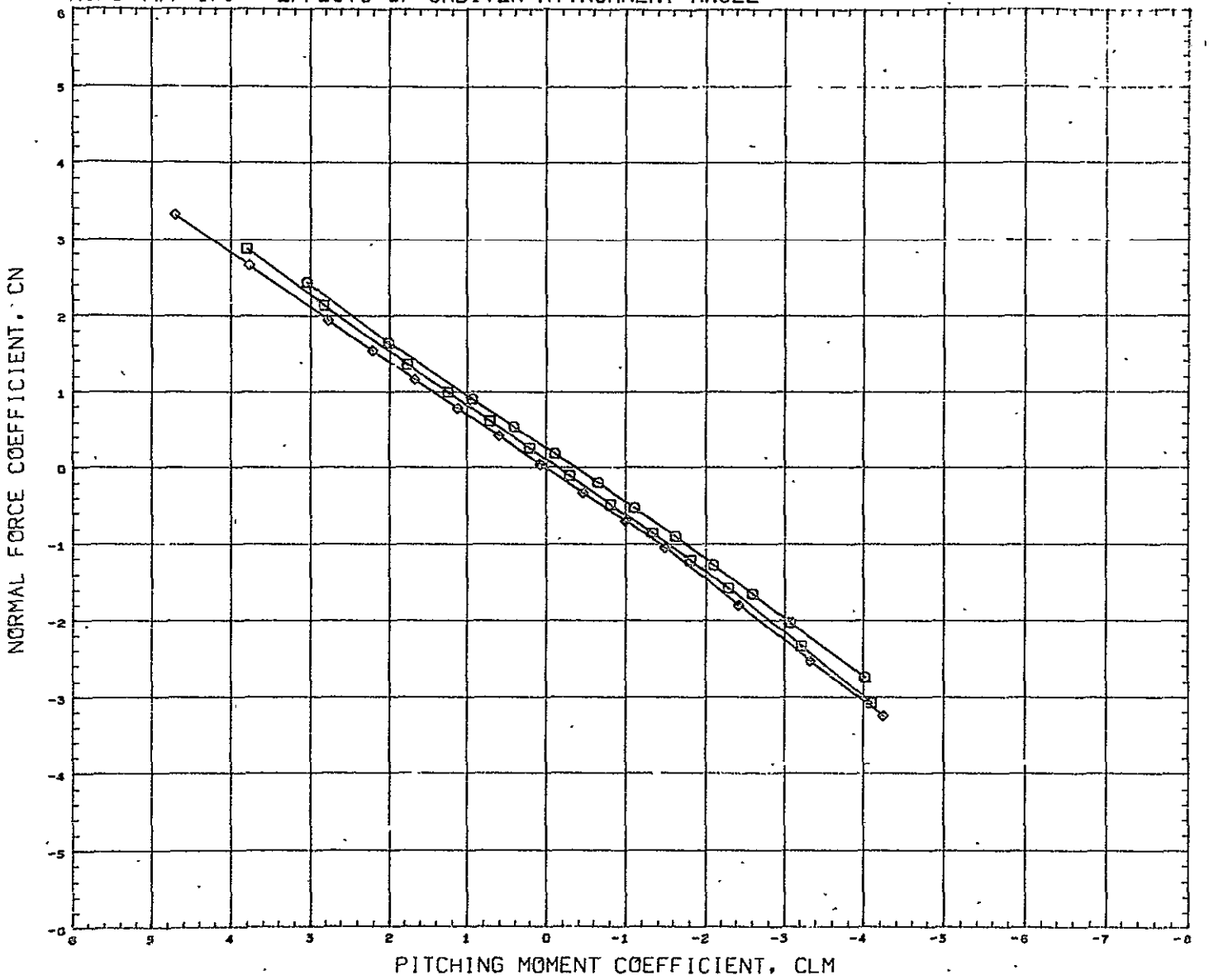



| SYMBOL | ORBINC | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| ○ | - 4.000 | MACH | 1.100 | BETA | - | 0.040 |
| □ | - 2.000 | WNGINC | 4.000 | HTAIL | | 0.000 |
| ◇ | 0.000 | PHIB | 0.000 | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE

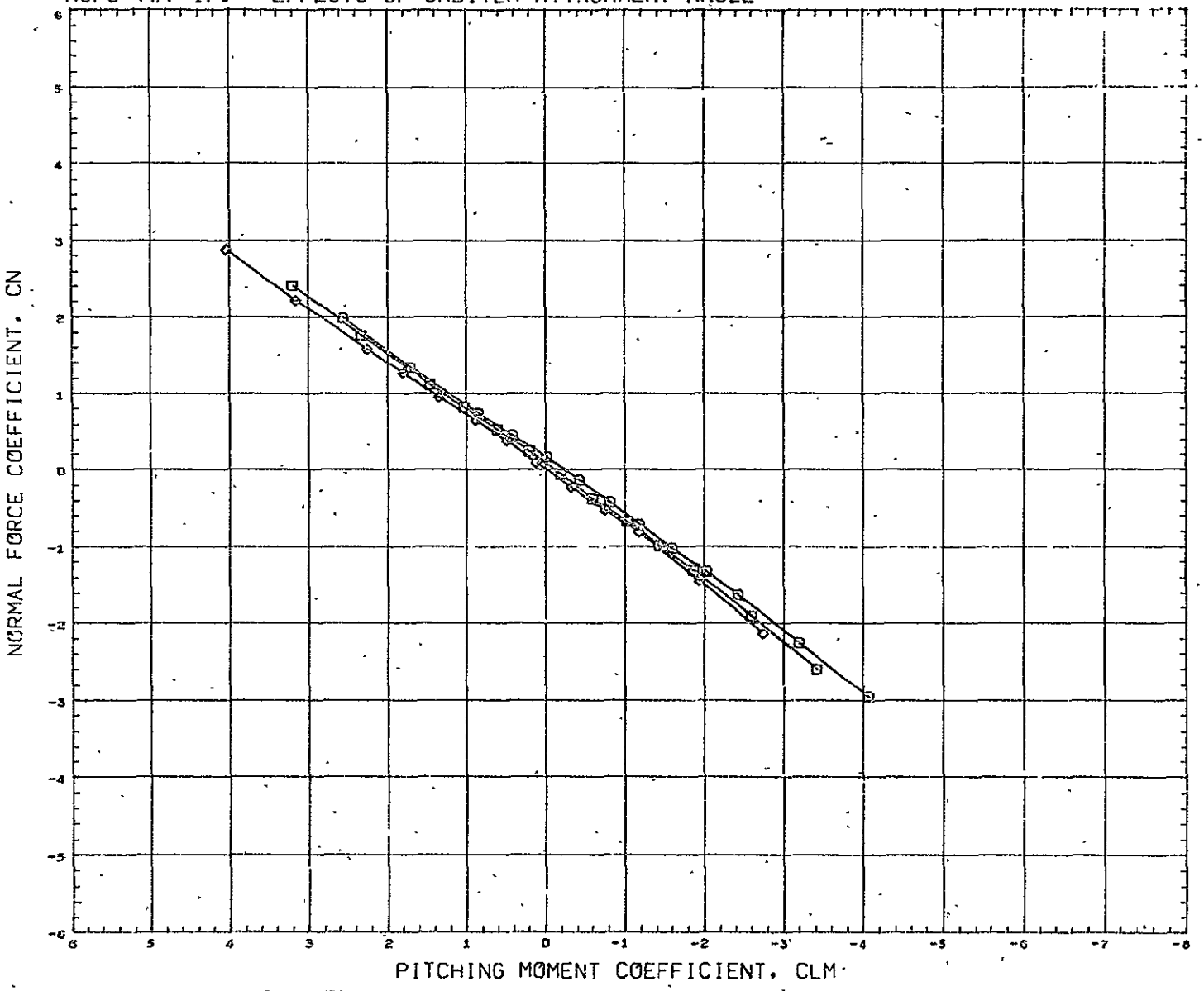



| SYMBOL | ORBINC | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| □ | - 4.000 | MACH | 1.199 | BETA | - 0.040 | |
| □ | - 2.000 | WINGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 0.000 | PHIP | 0.000 | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE



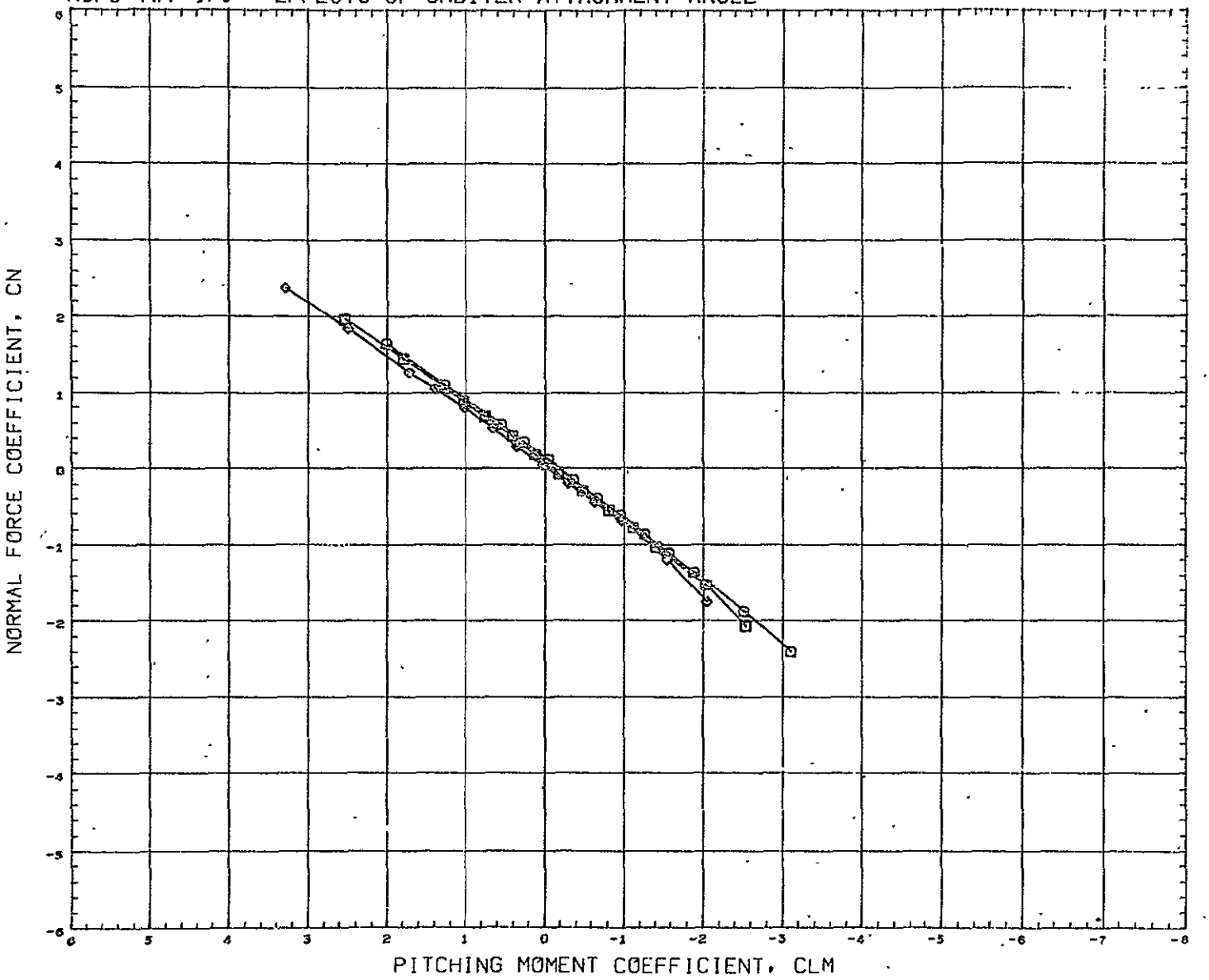

| SYMBOL | ORBINC | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| ○ | - 4.000 | MACH | 1.460 | BETA | - 0.040 |
| □ | - 2.000 | WBGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 0.000 | PHIB | 0.000 | | |

REFERENCE FILE 1

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF ORBITER ATTACHMENT ANGLE




| SYMBOL | ORBINC | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| ○ | - 4.000 | MACH | 1.952 | BETA | - 0.060 | |
| □ | - 2.000 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 0.000 | PHIB | 0.000 | | | |

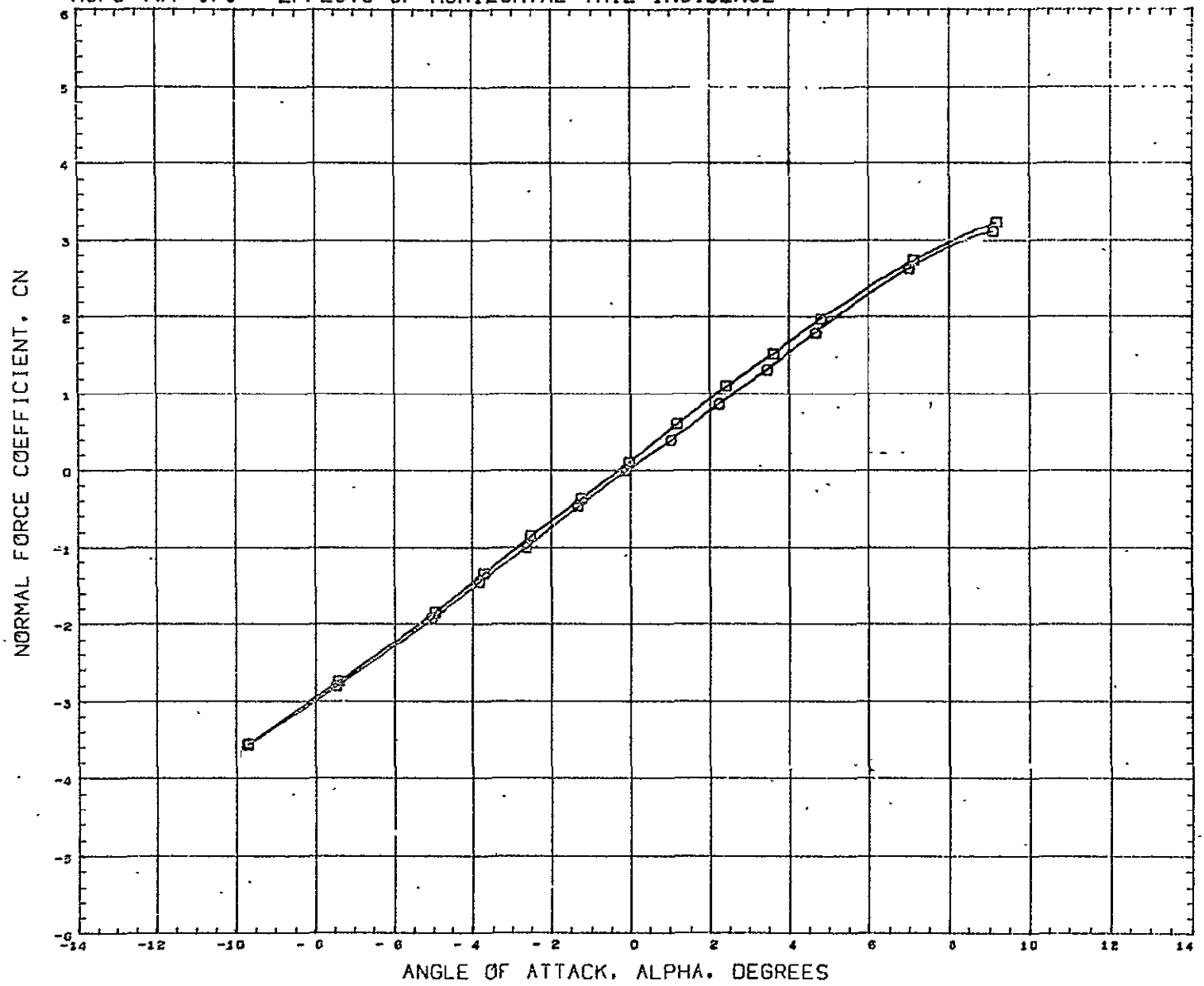
REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

REFERENCE FILE

TWT470 S-IC/GAC ORBITER B0WHVS FINS OFF (A24071) 26 JAN 71 PAGE 280

MSFC TWT 470 EFFECTS OF HORIZONTAL TAIL INCIDENCE

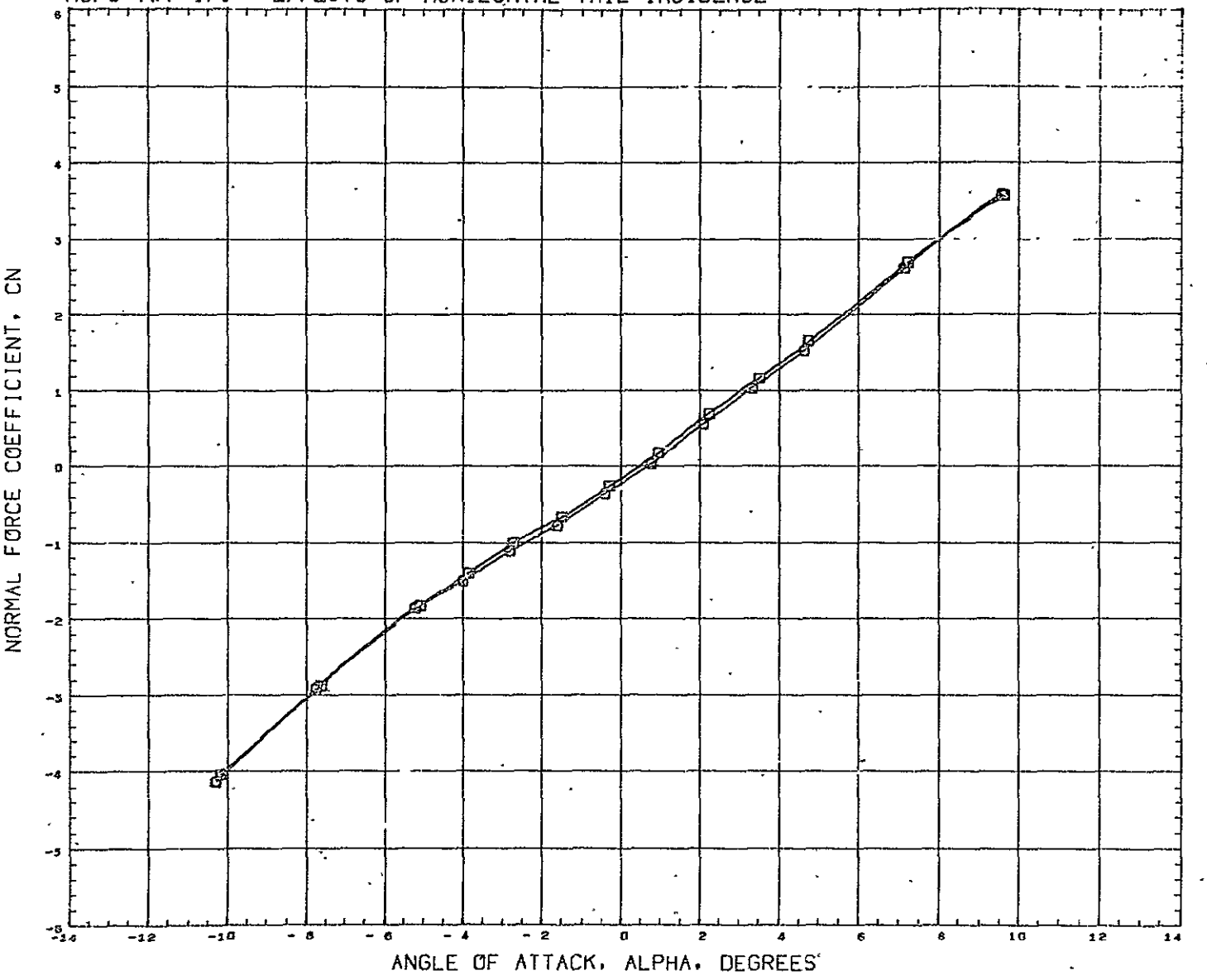



| SYMBOL | HTAIL | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| O | - 5.000 | MACH | 0.598 | BETA | - 0.020 | |
| □ | 0.000 | ORBINC | 1.050 | WNGINC | 4.000 | |
| | | PHIB | 0.000 | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF HORIZONTAL TAIL INCIDENCE

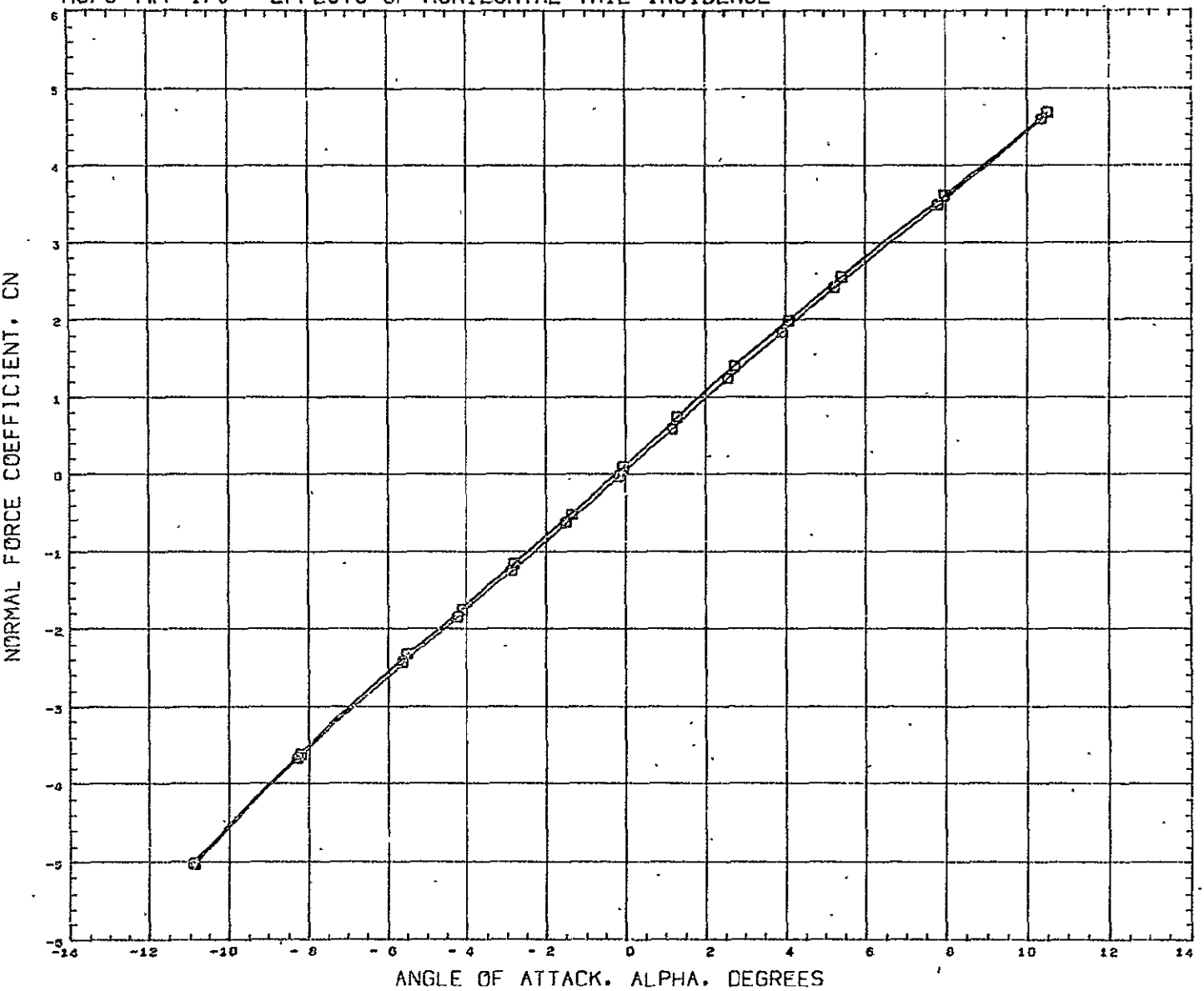



| SYMBOL | HTAIL | PARAMETRIC VALUES | | | | | |
|---|---|---|---|---|---|---|---|
| O | - 5.000 | MACH | 0.993 | BETA | - 0.020 | | |
| □ | 0.000 | ORBINC | - 1.050 | WNGINC | 4.000 | | |
| | | PHIB | 0.000 | | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF HORIZONTAL TAIL INCIDENCE

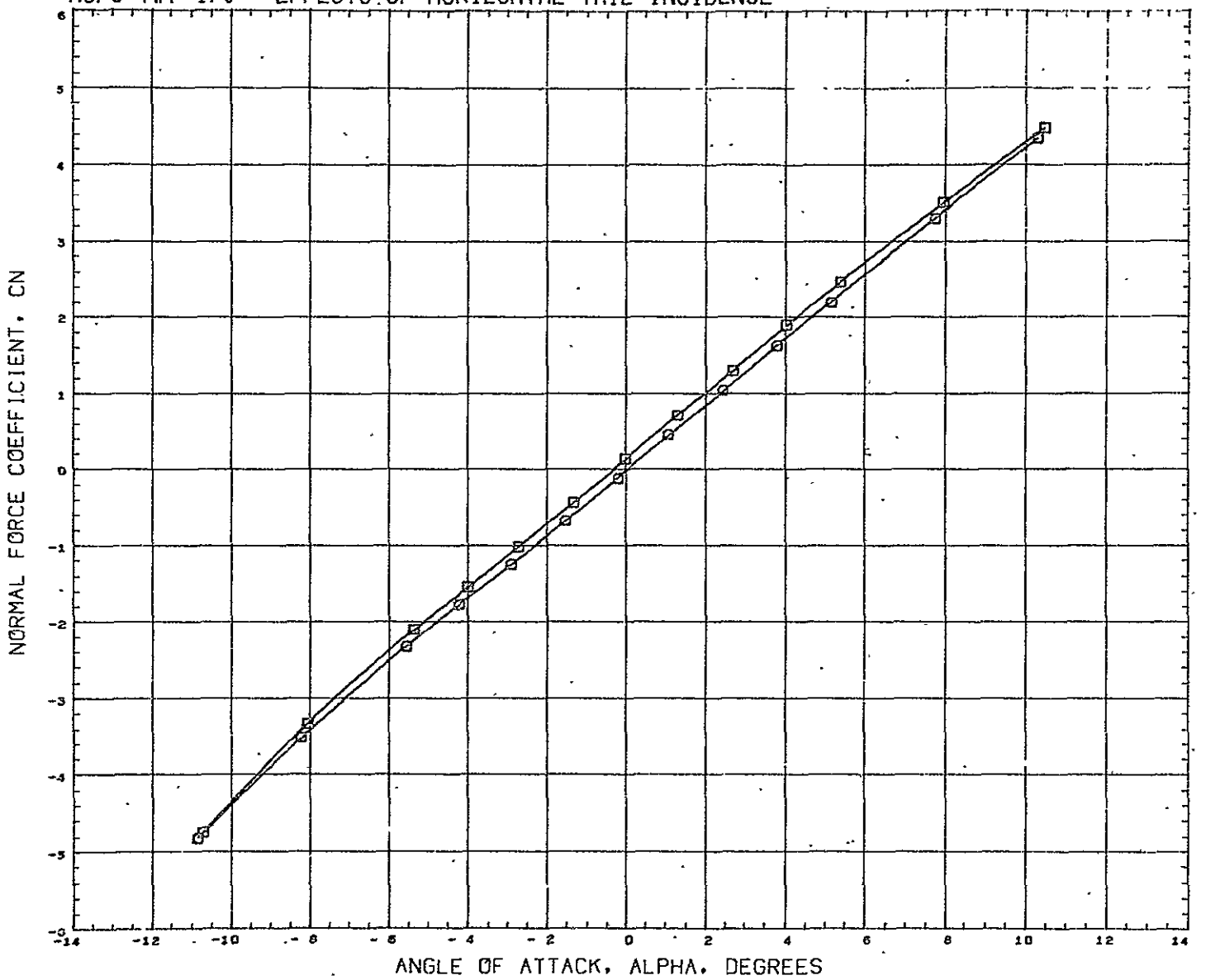



| SYMBOL | HTAIL | PARAMETRIC VALUES | | | | | |
|---|---|---|---|---|---|---|---|
| ○ | - 5.000 | MACH | 0.995 | BETA | - 0.020 | | |
| □ | 0.000 | ORBINC | - 1.050 | WNGINC | 4.000 | | |
| | | PHIB | 0.000 | | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF HORIZONTAL TAIL INCIDENCE



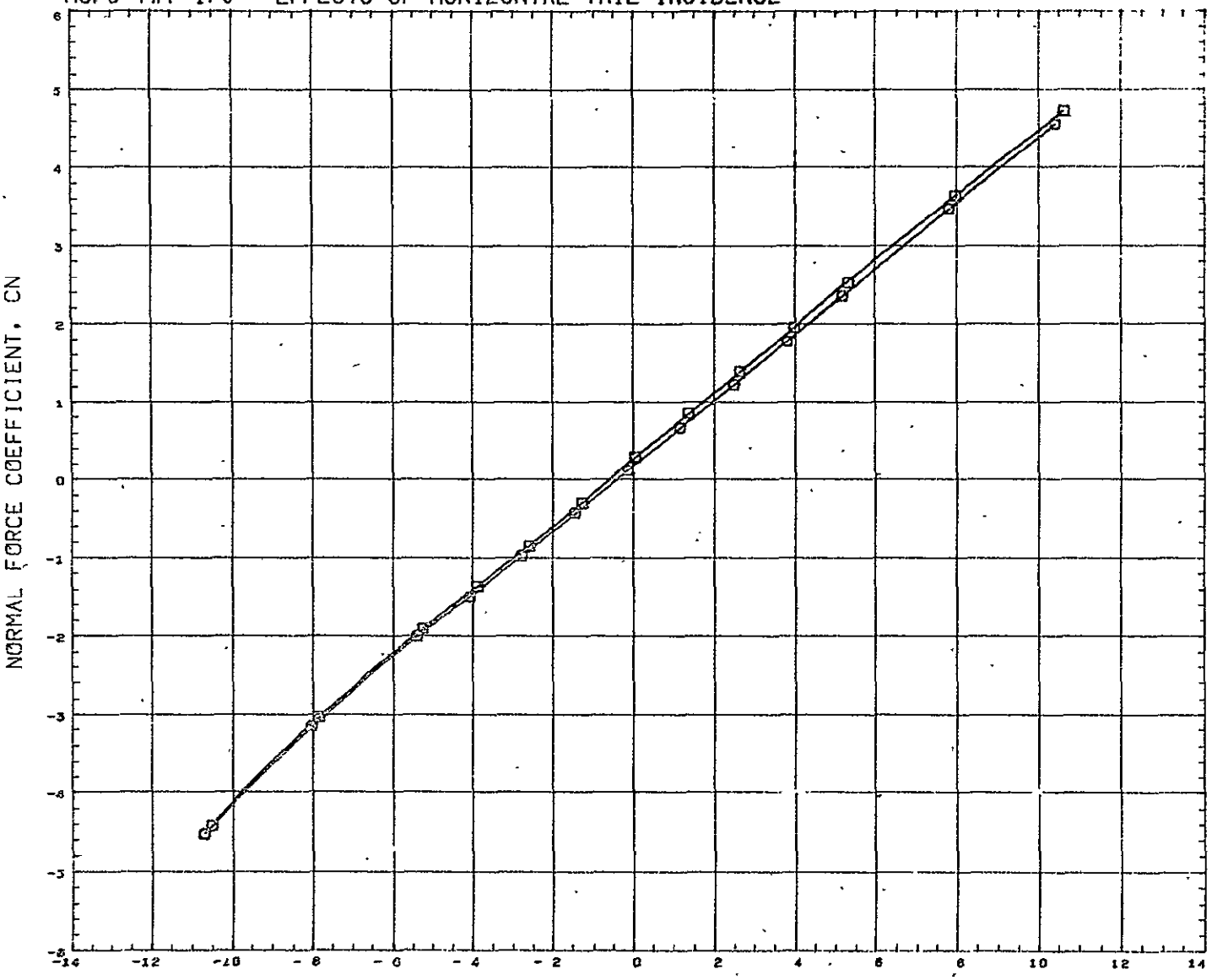

| SYMBOL | NTAIL | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | - 5.000 | MACH | 1.093 | BETA | - 0.020 | |
| □ | 0.000 | ORBINC | - 1.050 | WNGINC | 4.000 | |
| | | PHIB | 0.000 | | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

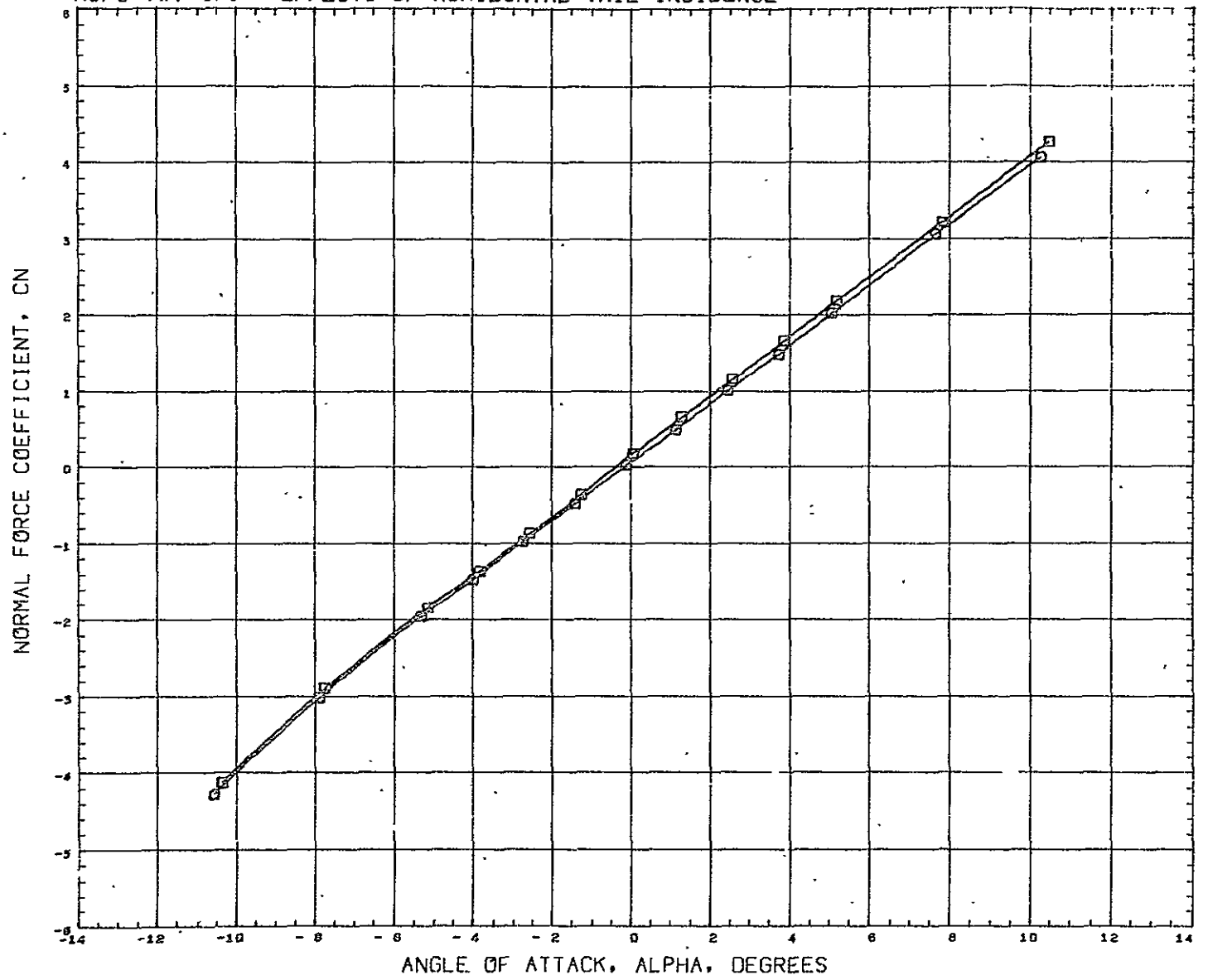
MSFC TWT 470 EFFECTS OF HORIZONTAL TAIL INCIDENCE




| SYMBOL | HTAIL | PARAMETRIC VALUES | | | | REFERENCE INFORMATION | | |
|---|---|---|---|---|---|---|---|---|
| O | - 5.000 | MACH | 1.199 | BETA | - 0.020 | REFS | 1.3960 | SQ.IN. |
| □ | 0.000 | ORBINC | - 1.050 | WNGINC | 4.000 | REFL | 1.3330 | INCHES |
| | | PHIB | 0.000 | | | REFB | 1.3330 | INCHES |
| | | | | | | XMRP | 5.2640 | INCHES |
| | | | | | | YMRP | 0.0000 | INCHES |
| | | | | | | ZMRP | 0.0000 | INCHES |
| | | | | | | SCALE | 0.3366 | PERCNT |

REFERENCE FILE

MSFC TWT 470 EFFECTS OF HORIZONTAL TAIL INCIDENCE

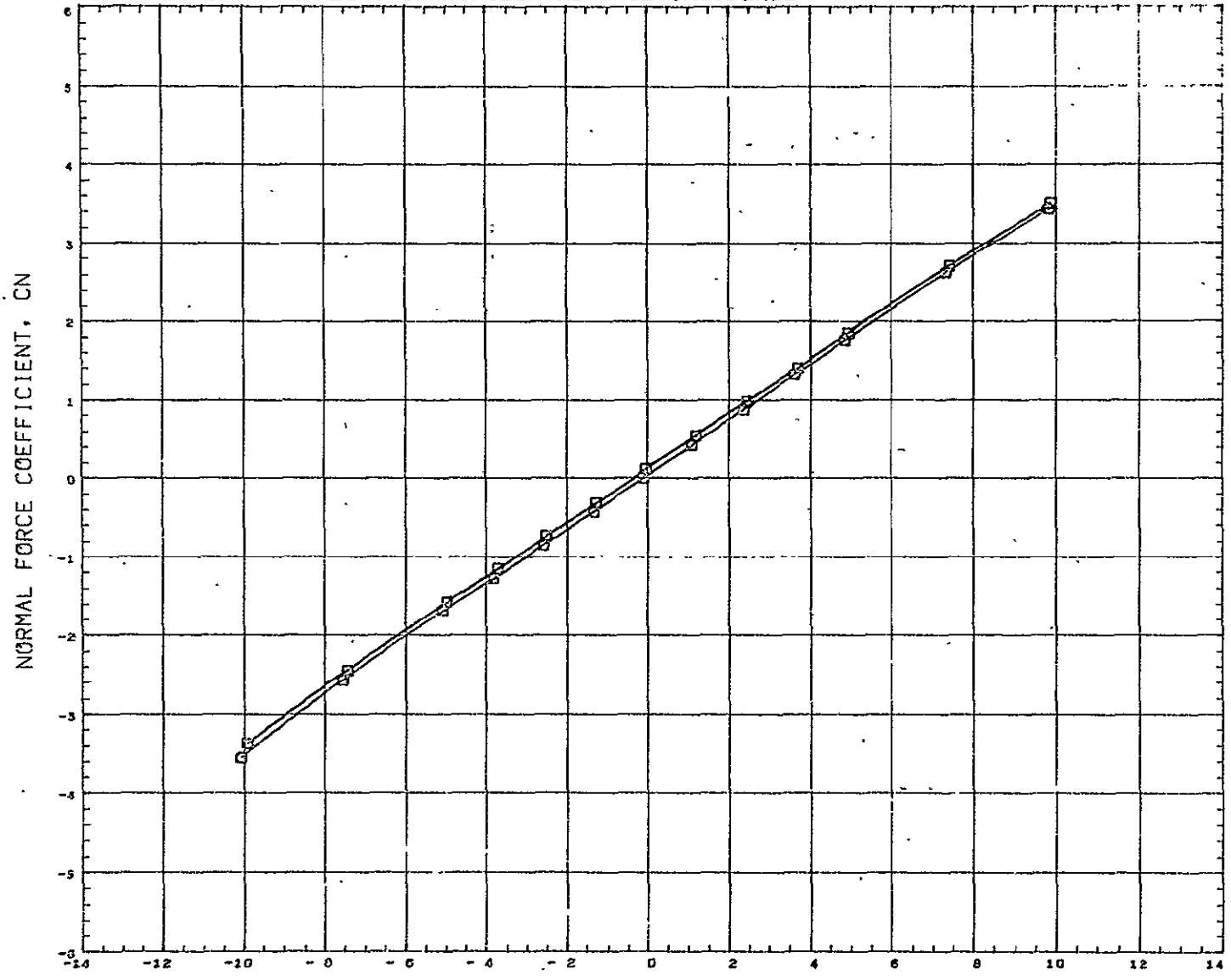



| SYMBOL | HTAIL | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | - 5.000 | MACH | 1.454 | BETA | - 0.020 | |
| □ | 0.000 | ORBINC | - 1.050 | WNGINC | 4.000 | |
| | | PHIB | 0.000 | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF HORIZONTAL TAIL INCIDENCE

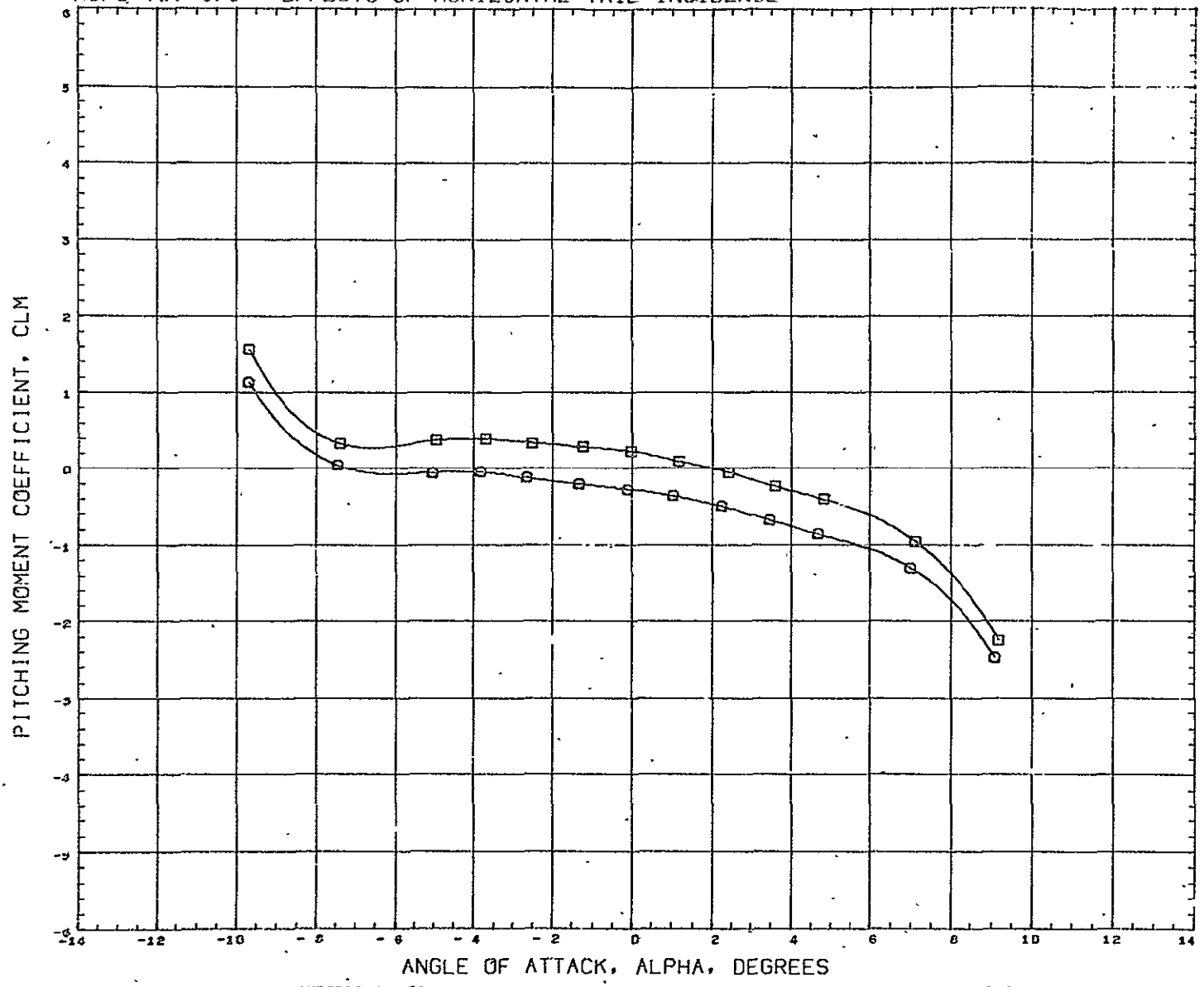



| SYMBOL | HTAIL | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| O | - 5.000 | MACH | 1.961 | BETA | - 0.020 | |
| □ | 0.000 | ORBINC | - 1.050 | WNGINC | 4.000 | |
| | | PHIB | 0.000 | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF HORIZONTAL TAIL INCIDENCE

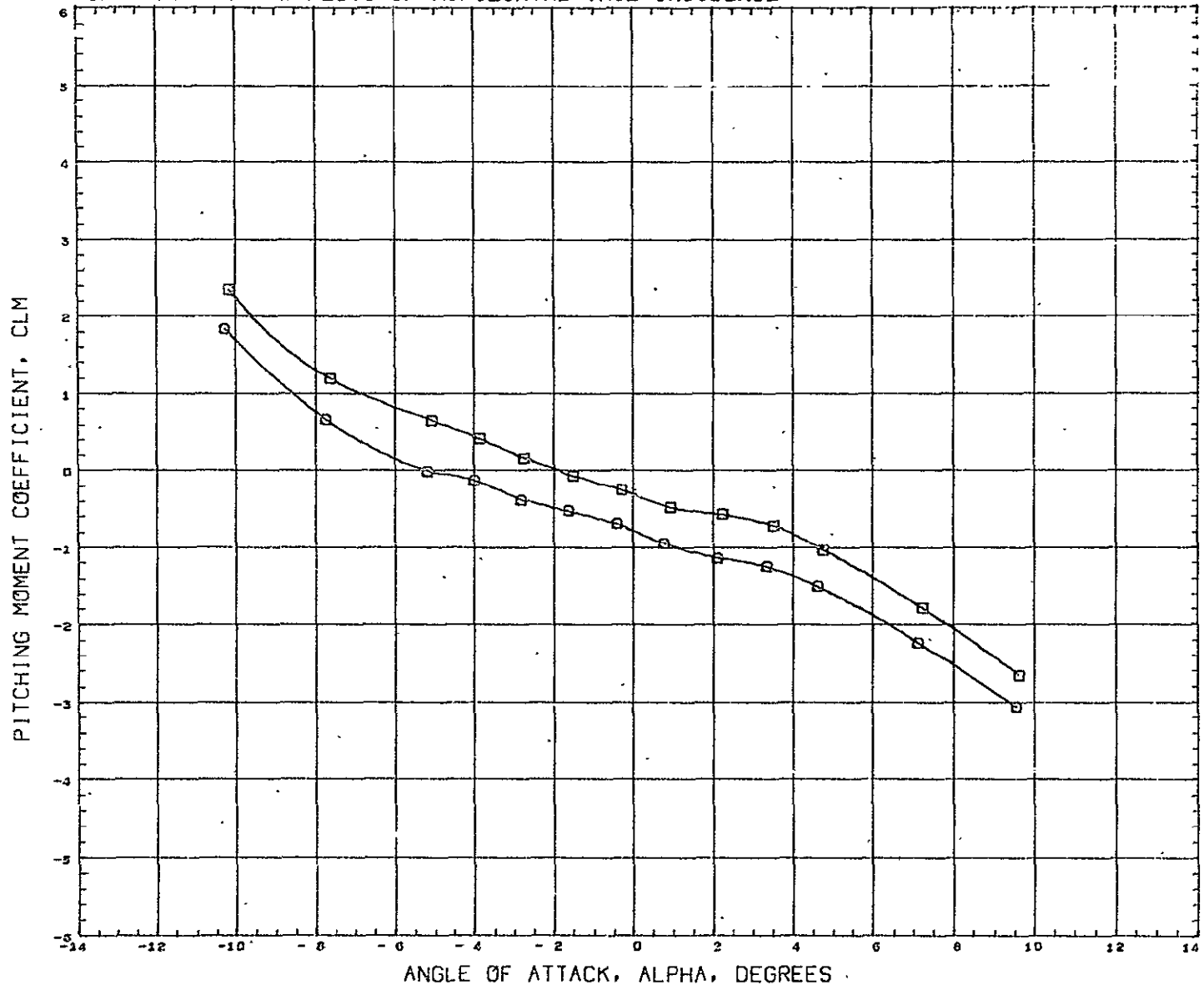



| SYMBOL | HTAIL | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| O | - 5.000 | MACH | 0.598 | BETA | - 0.020 | |
| □ | 0.000 | ORBINC | - 1.050 | WNGINC | 4.000 | |
| | | PHIB | 0.000 | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRF | 5.2640 | INCHES |
| YMRF | 0.0000 | INCHES |
| ZMRF | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF HORIZONTAL TAIL INCIDENCE

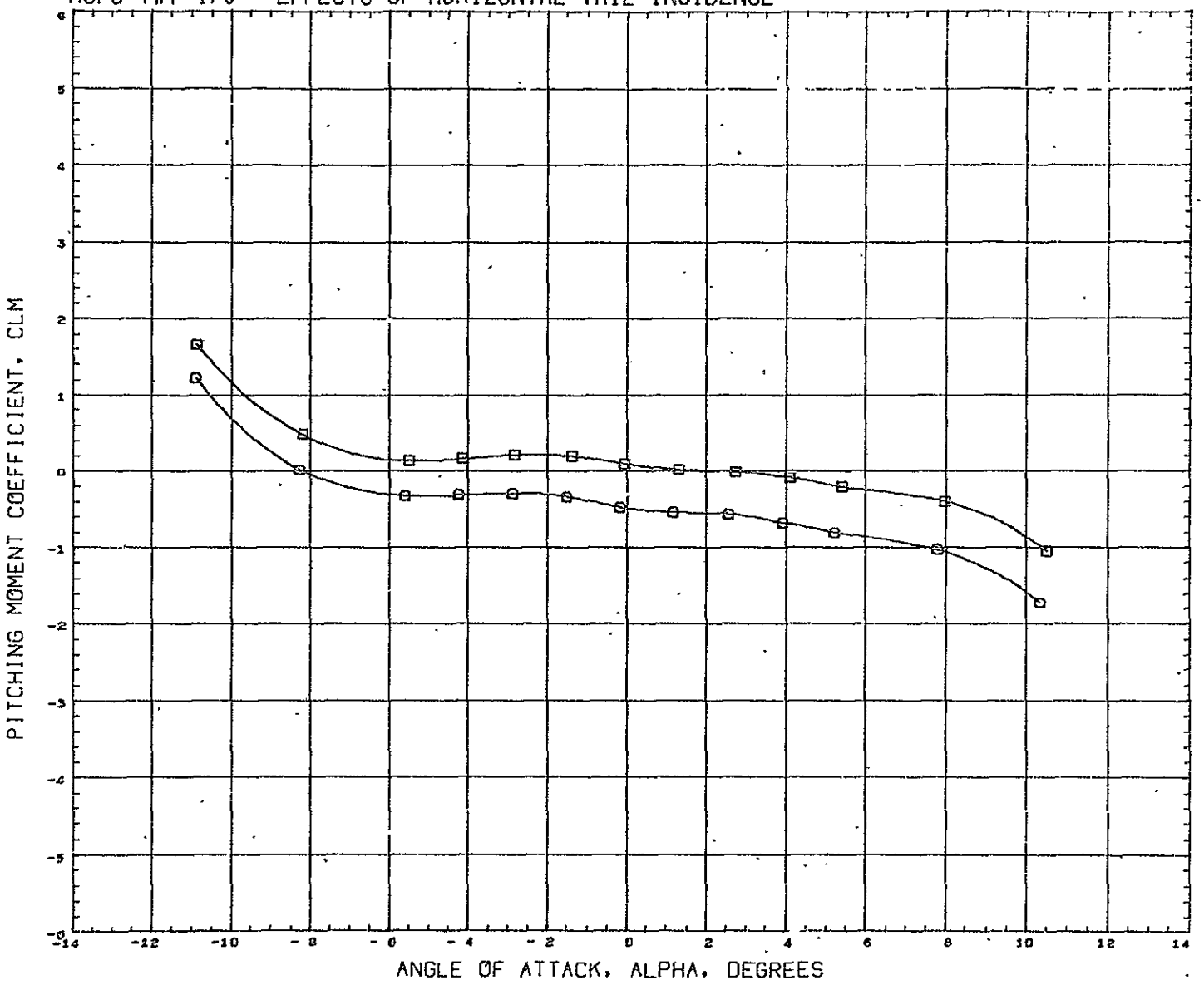



| SYMBOL | HTAIL | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| O | 5.000 | MACH | 0.693 | BETA | 0.020 | |
| □ | 0.000 | ORBINC | 1.050 | WNGINC | 4.000 | |
| | | PHIB | 0.000 | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF HORIZONTAL TAIL INCIDENCE

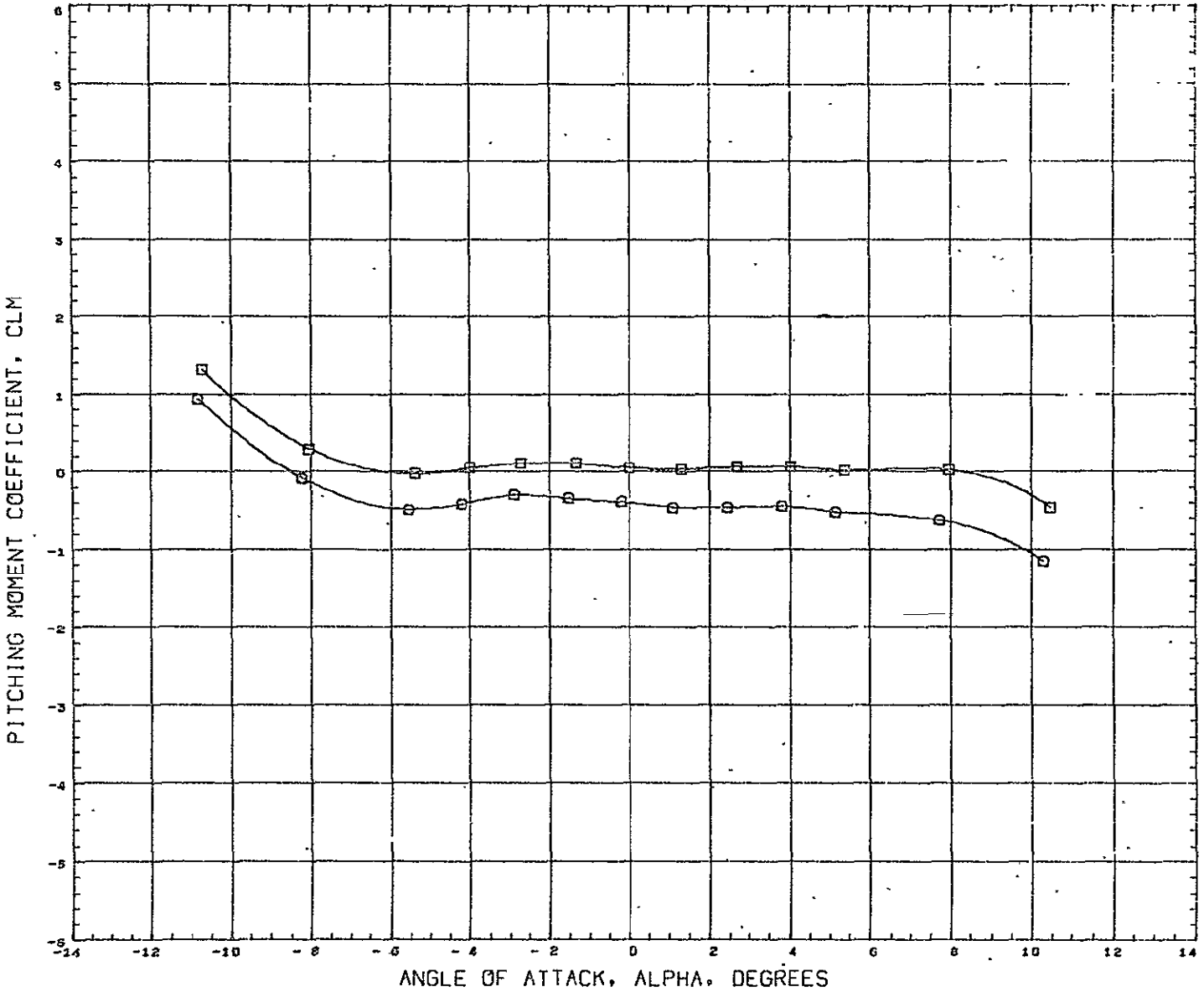



| SYMBOL | HTAIL | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| O | - 5.000 | MACH | 0.995 | BETA | - 0.020 | |
| □ | 0.000 | ORBINC | - 1.050 | WNGINC | 4.000 | |
| | | PHIB | 0.000 | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF HORIZONTAL TAIL INCIDENCE



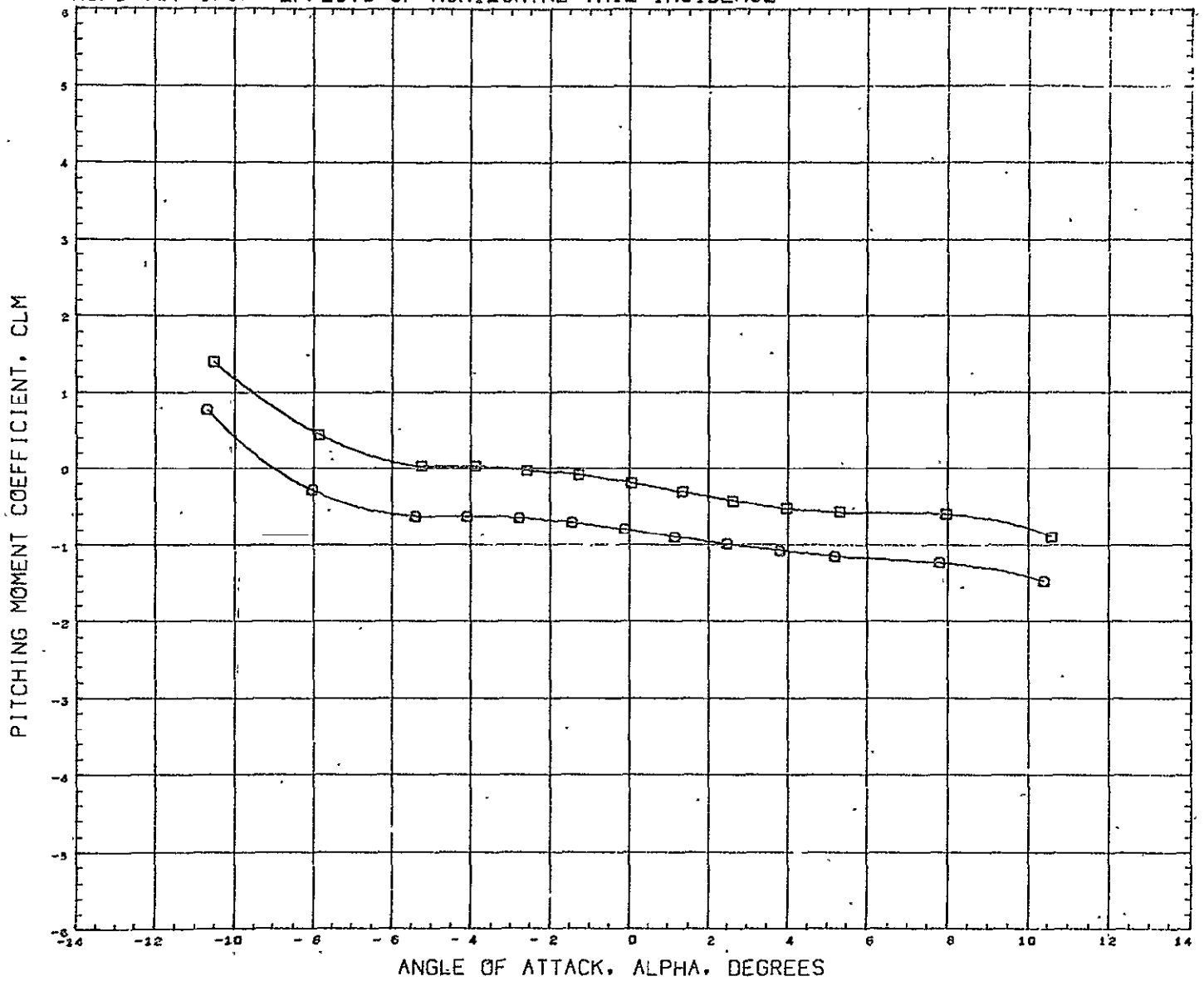

| SYMBOL | HTAIL | PARAMETRIC VALUES | | | | | |
|---|---|---|---|---|---|---|---|
| O | - 5.000 | MACH | 1.093 | BETA | - 0.020 | | |
| □ | 0.000 | ORBINC | - 1.050 | WNGINC | 4.000 | | |
| | | PHIB | 0.000 | | | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470. EFFECTS OF HORIZONTAL TAIL INCIDENCE

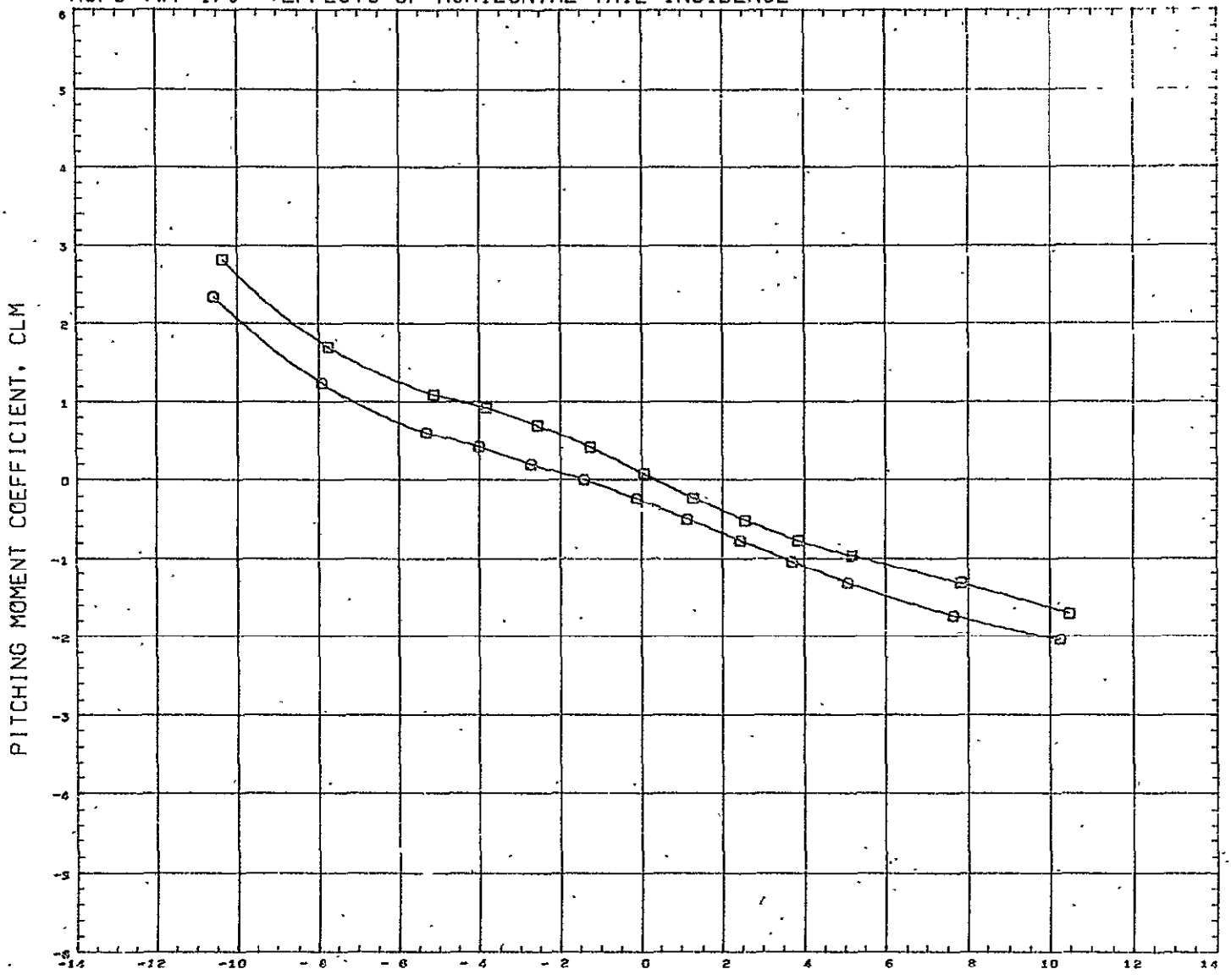



| SYMBOL | HTAIL | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | - 5.000 | MACH | 1.199 | BETA | - 0.020 | |
| □ | 0.000 | ORBINC | - 1.050 | WHGINC | 4.000 | |
| | | PHIB | 0.000 | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000. | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF HORIZONTAL TAIL INCIDENCE

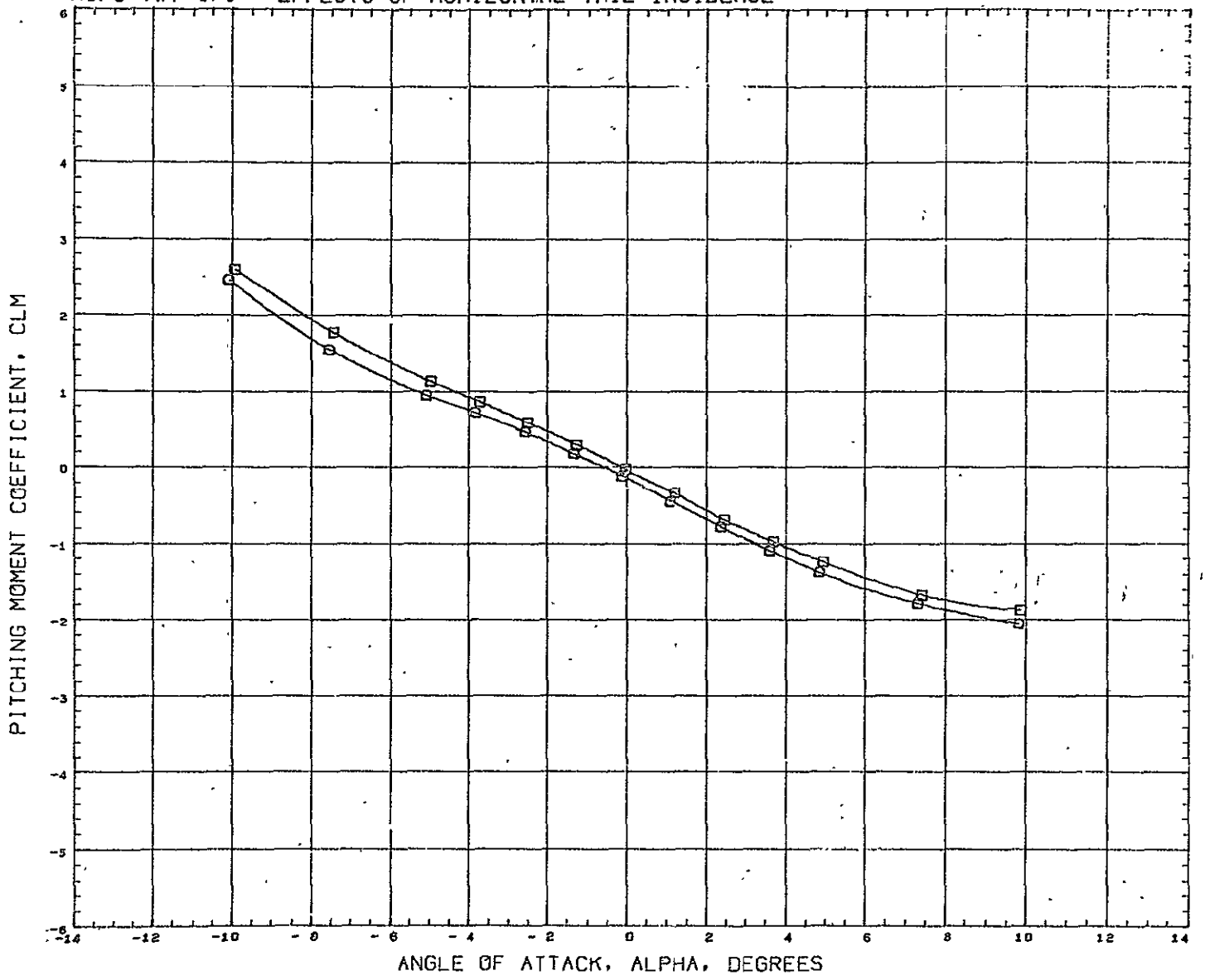



| SYMBOL | HTAIL | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| O | - 5.000 | MACH | 1.454 | BETA | - 0.920 | |
| □ | 0.000 | ORBINC | - 1.050 | WNGINC | 4.000 | |
| | | PHIB | 0.000 | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF HORIZONTAL TAIL INCIDENCE



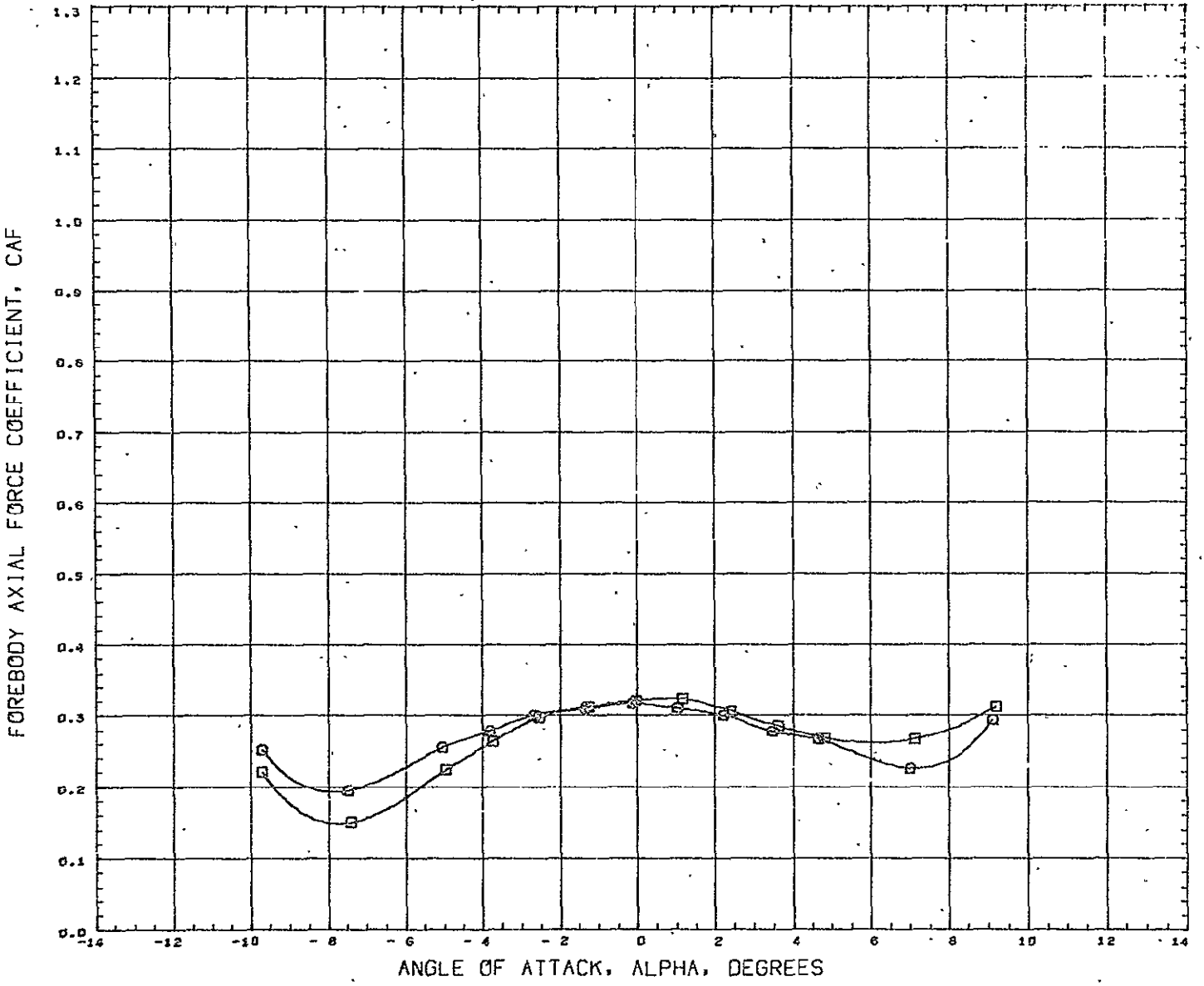

| SYMBOL | HTAIL | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| O | - 5.000 | NACH | 1.961 | BETA | - 0.020 | |
| □ | 0.000 | ORBINC | - 1.030 | WNGINC | 4.000 | |
| | | FHIB | 0.000 | | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF HORIZONTAL TAIL INCIDENCE

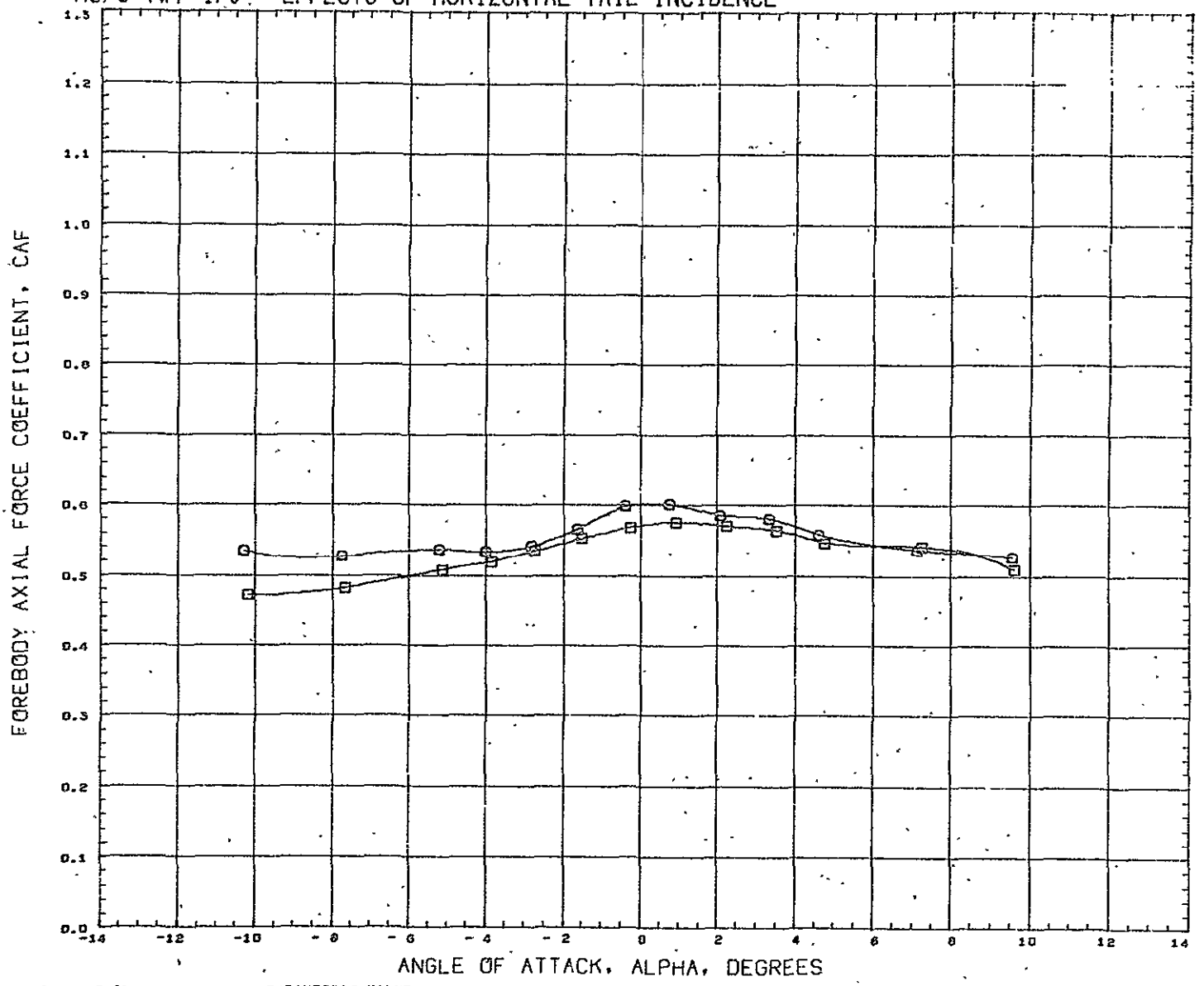



| SYMBOL | HTAIL | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | - 5.000 | MACH | 0.598 | BETA | - 0.020 | |
| □ | 0.000 | ORBINC | - 1.050 | WNGINC | 4.000 | |
| | | PHIB | 0.000 | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470. EFFECTS OF HORIZONTAL TAIL INCIDENCE



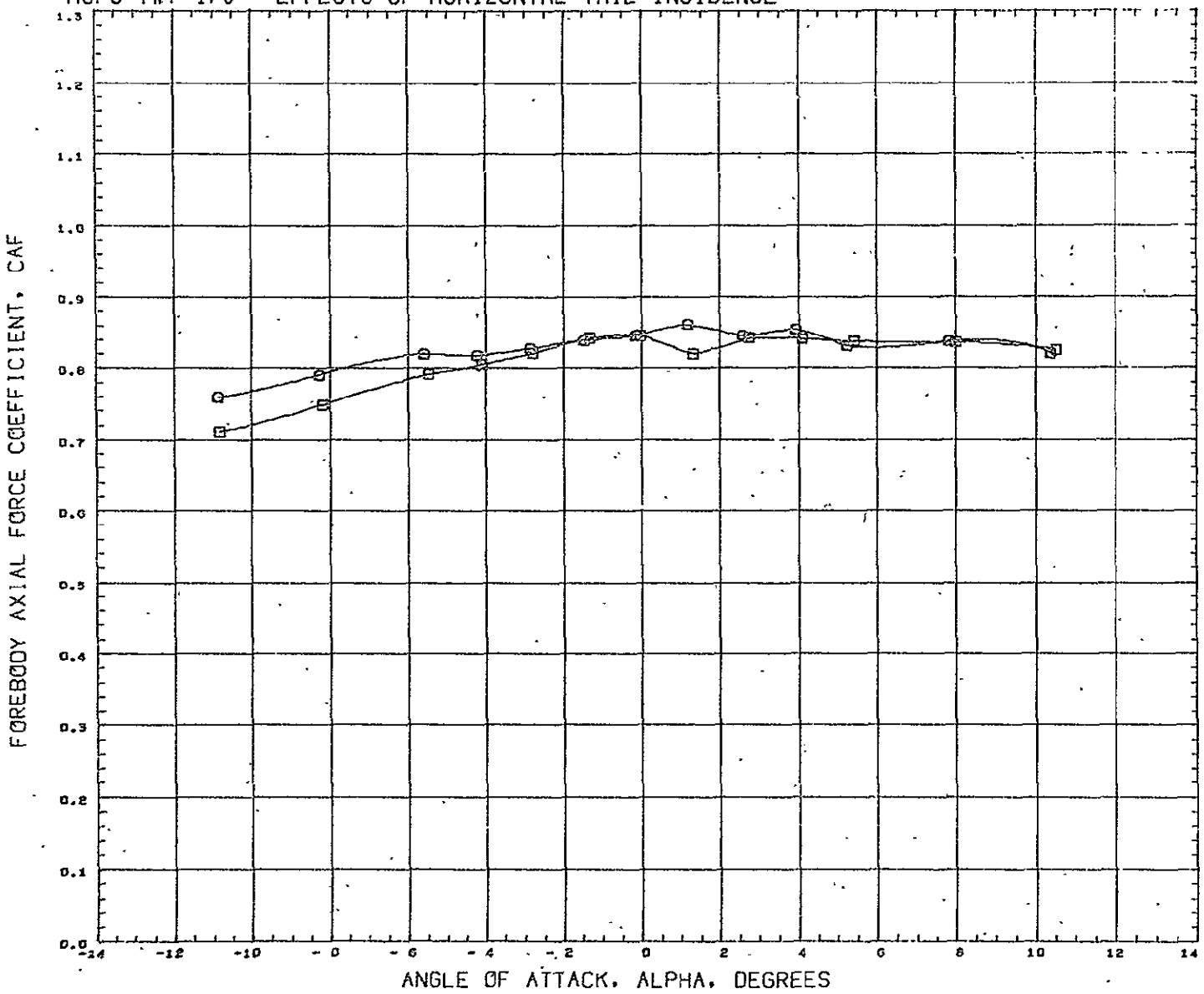

| SYMBOL | HTAIL | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| ○ | 5.000 | MACH | 0.893 | BETA | 0.020 | |
| □ | 0.000 | ORBINC | 1.050 | WNGINC | 4.000 | |
| | | PHIB | 0.000 | | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF HORIZONTAL TAIL INCIDENCE

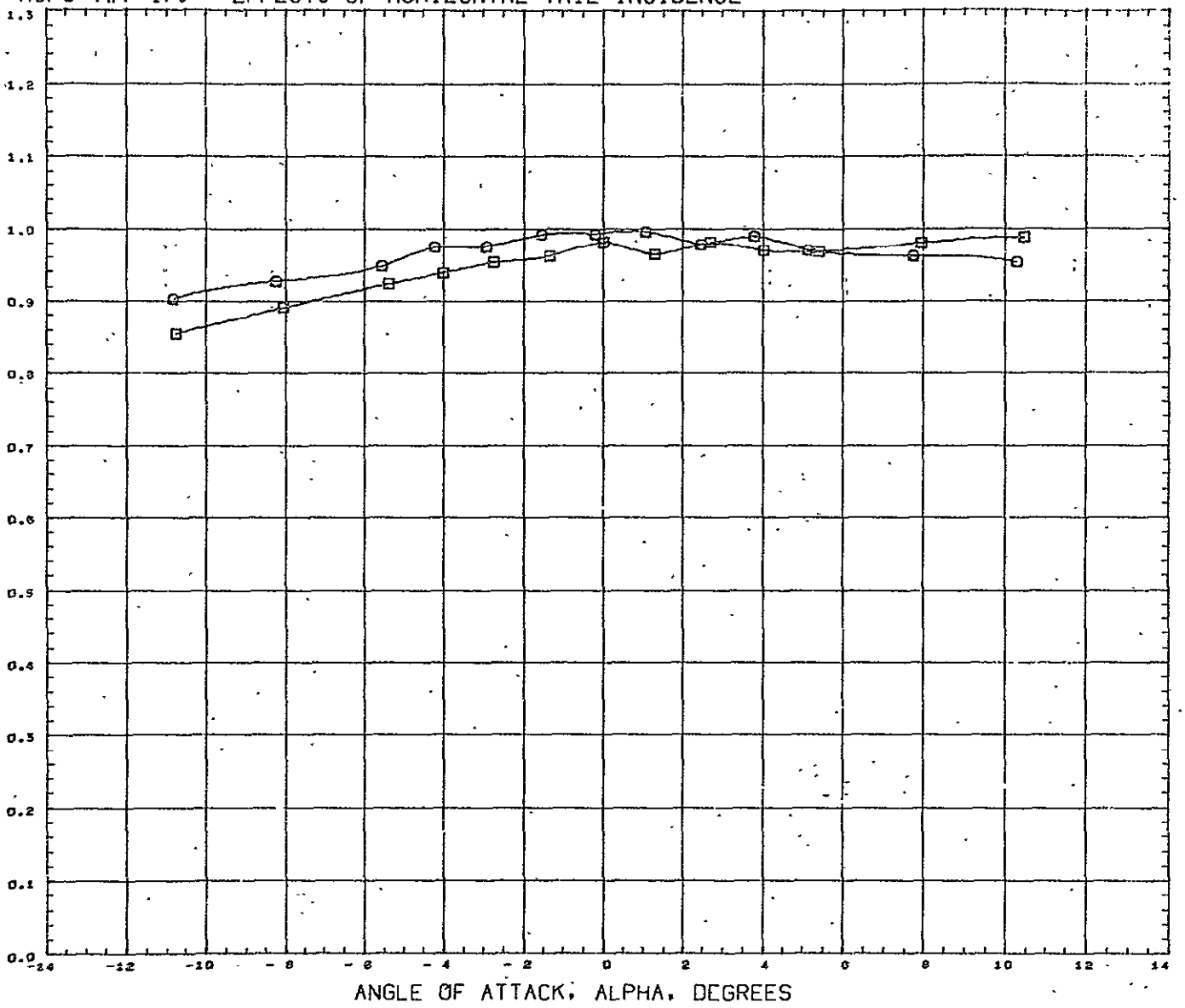



| SYMBOL | HTAIL | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| ○ | 5.000 | MACH | 0.995 | BETA | -0.020 | |
| □ | 0.000 | ORBINC | 1.050 | WNGINC | 4.000 | |
| | | PHIB | 0.000 | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF HORIZONTAL TAIL INCIDENCE




| SYMBOL | HTAIL |
|---|---|
| ○ | 5.000 |
| □ | 0.000 |

PARAMETRIC VALUES

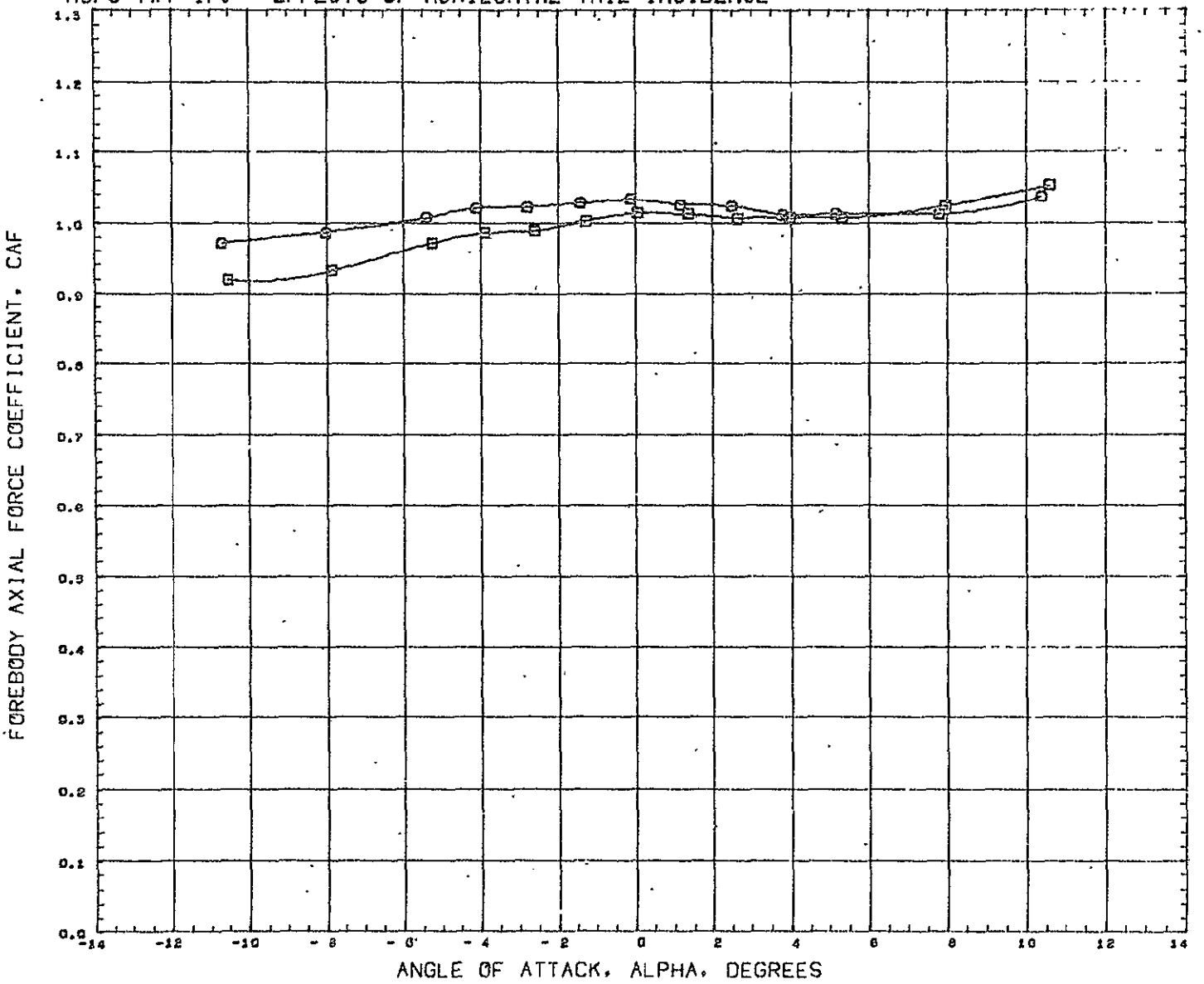
| | | | | | |
|---|---|---|---|---|---|
| MACH | | 1.093 | BETA | - | 0.020 |
| ORBINC | - | 1.050 | WNGINC | | 4.000 |
| PHIB | | 0.000 | | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

REFERENCE FILE

MSFC TWT 470 EFFECTS OF HORIZONTAL TAIL INCIDENCE

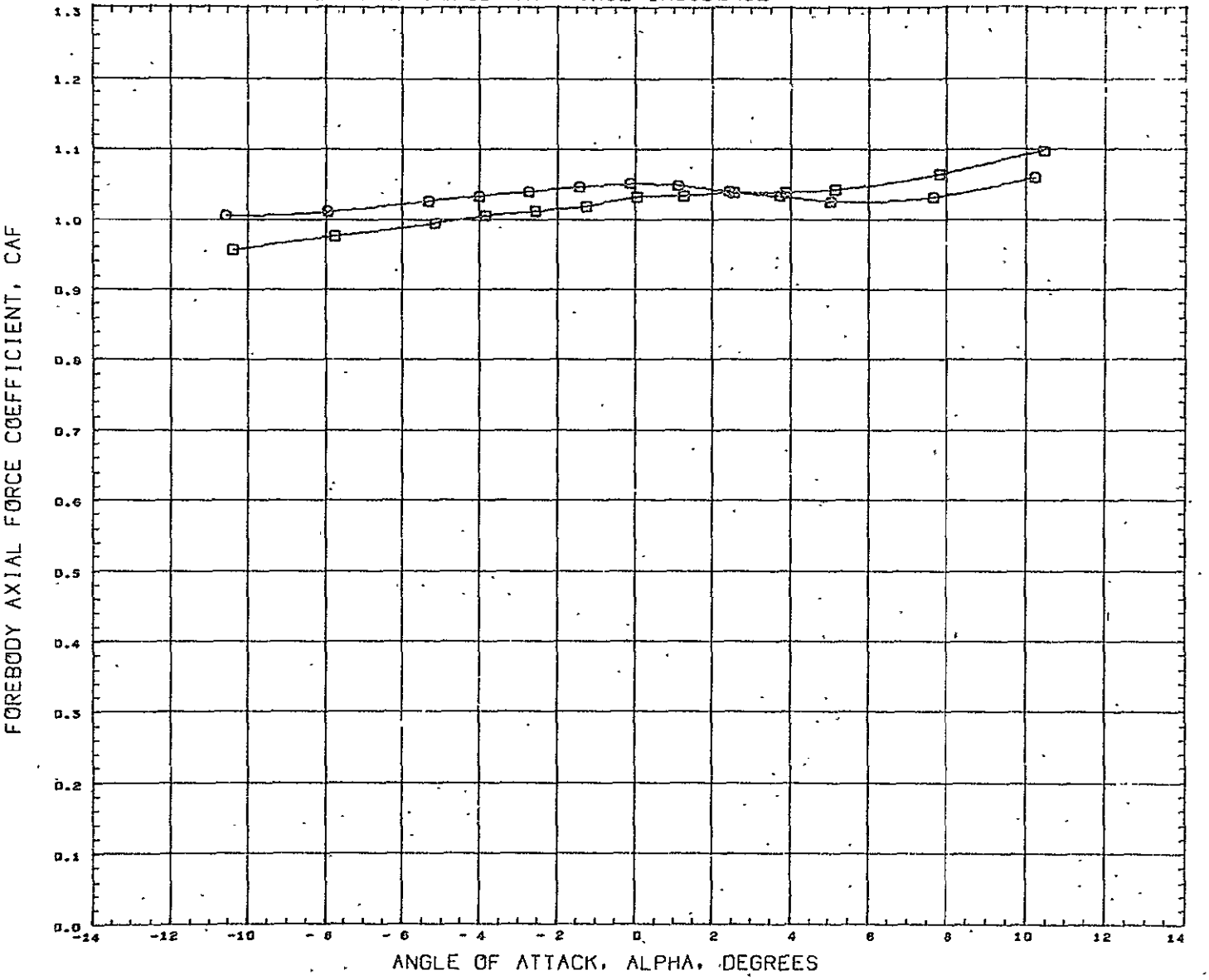



| SYMBOL | HTAIL | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| ○ | 5.000 | MACH | 1.199 | BETA | 0.020 | |
| □ | 0.000 | ORBINC | 1.050 | WNGINC | 4.000 | |
| | | PHIB | 0.000 | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3305 | PERCNT |

MSFC TWT 470 EFFECTS OF HORIZONTAL TAIL INCIDENCE



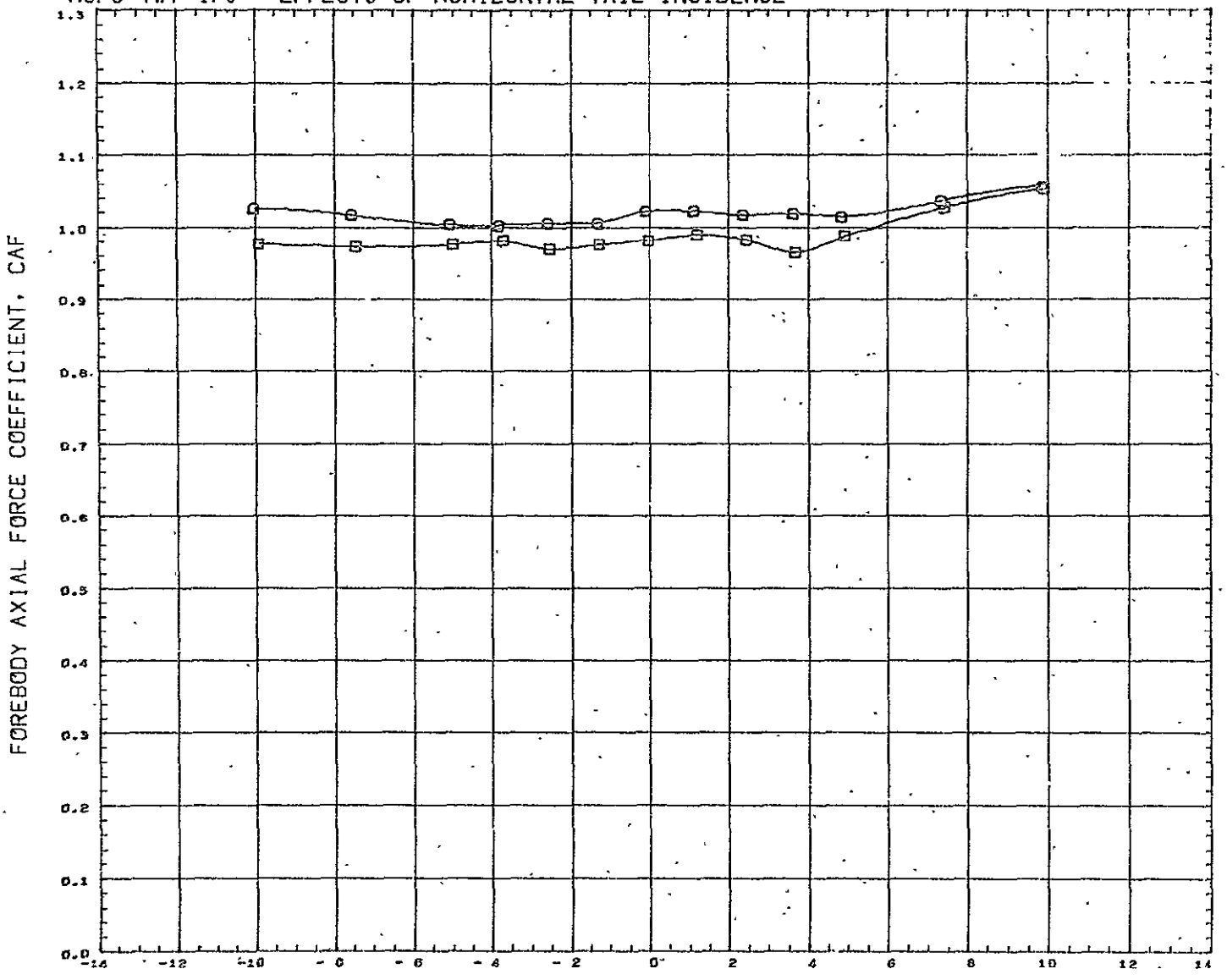

| SYMBOL | HTAIL | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| O | - 5.000 | MACH | 1.454 | BETA | - 0.020 | |
| □ | 0.000 | ORBINC | - 1.050 | WNGINC | 4.000 | |
| | | PHIB | 0.000 | | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF HORIZONTAL TAIL INCIDENCE

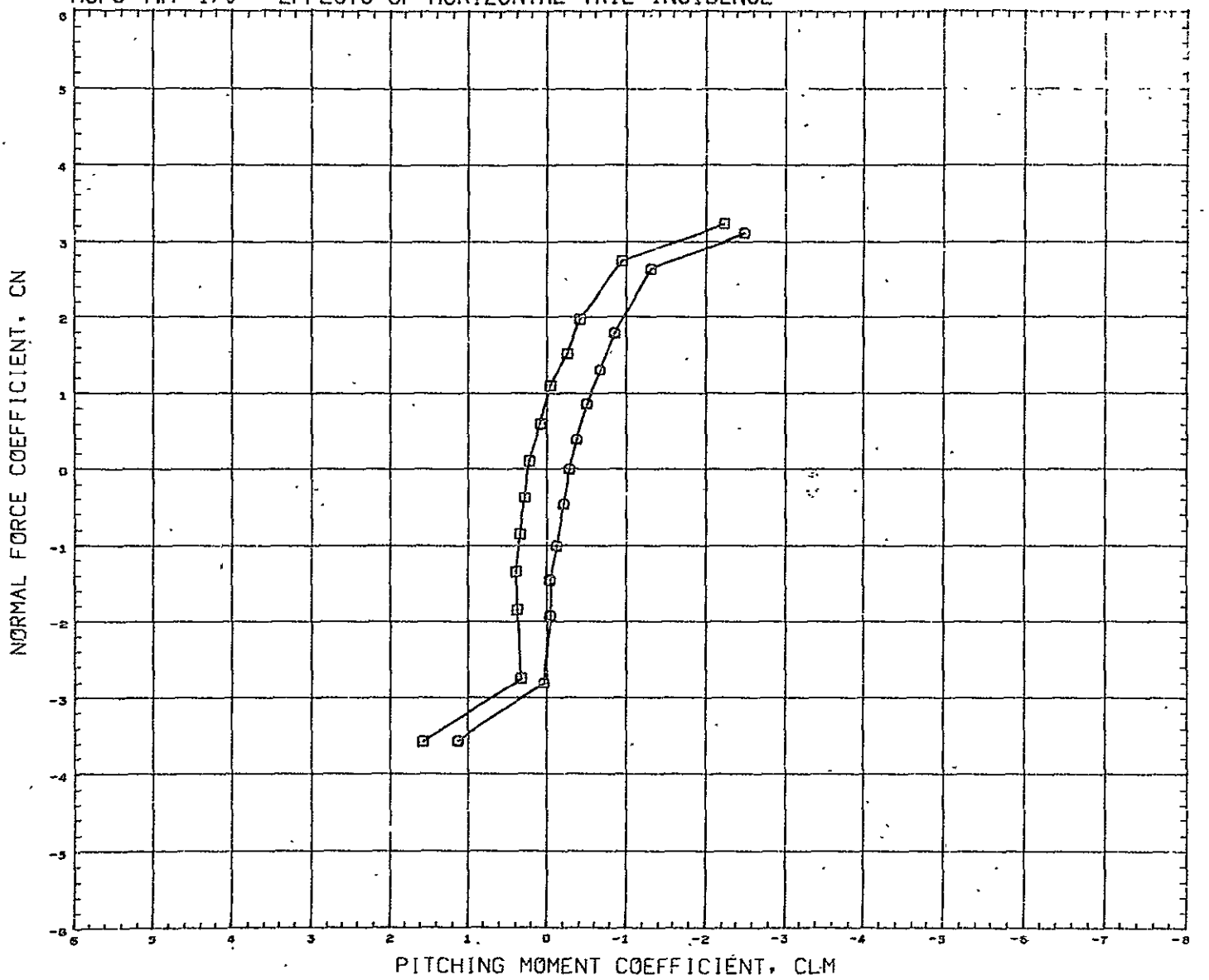



| SYMBOL | HTAIL | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 5.000 | MACH | 1.961 | BETA | 0.020 | |
| □ | 0.000 | ORBINC | 1.050 | WNGINC | 4.000 | |
| | | PNIB | 0.000 | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF HORIZONTAL TAIL INCIDENCE




| SYMBOL | HTAIL |
|---|---|
| ○ | 5.000 |
| □ | 0.000 |

PARAMETRIC VALUES

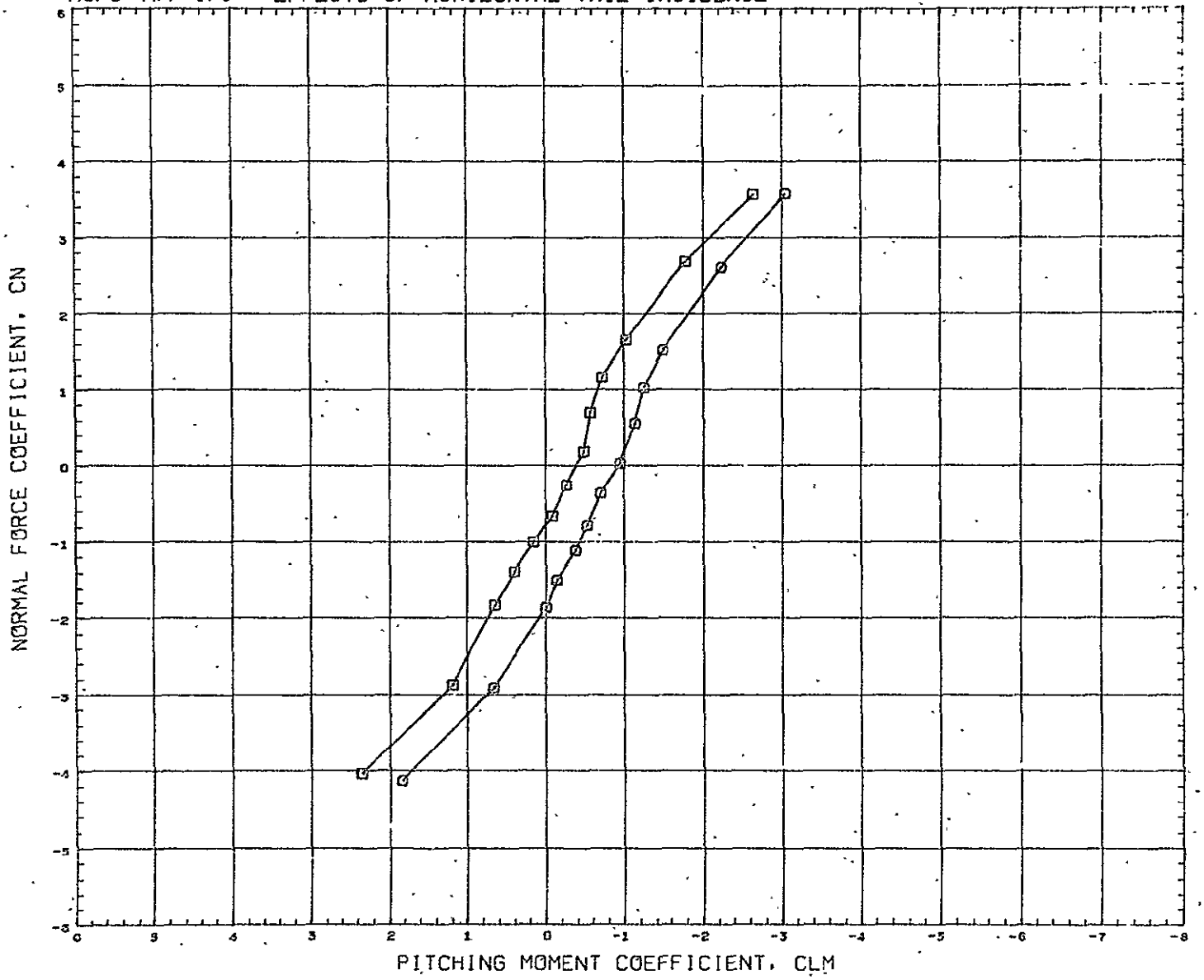
| | | | | | |
|---|---|---|---|---|---|
| MACH | | 0.598 | BETA | = | 0.020 |
| ORBINC | = | 1.050 | WNGINC | | 4.000 |
| PHIB | | 0.000 | | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRF | 0.0000 | INCHES |
| ZMRF | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

REFERENCE FILE

MSFC TWT 470 EFFECTS OF HORIZONTAL TAIL INCIDENCE



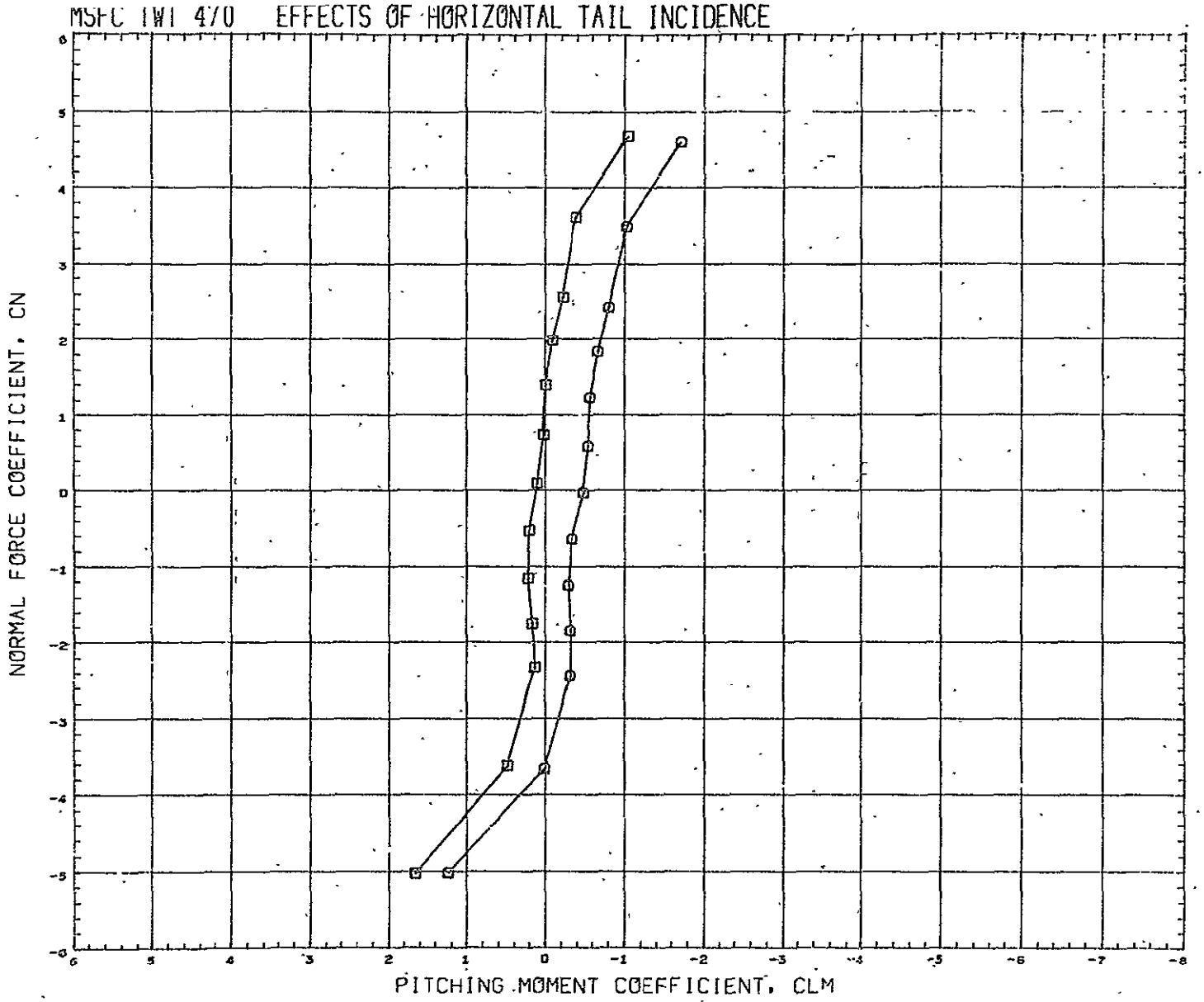

| SYMBOL | HTAIL | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| ○ | - 5.000 | MACH | 0.895 | BETA | - 0.020 | |
| □ | 0.000 | ORBINC | - 1.050 | WNGINC | 4.000 | |
| | | PHIB | 0.000 | | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC IWT 470 EFFECTS OF HORIZONTAL TAIL INCIDENCE

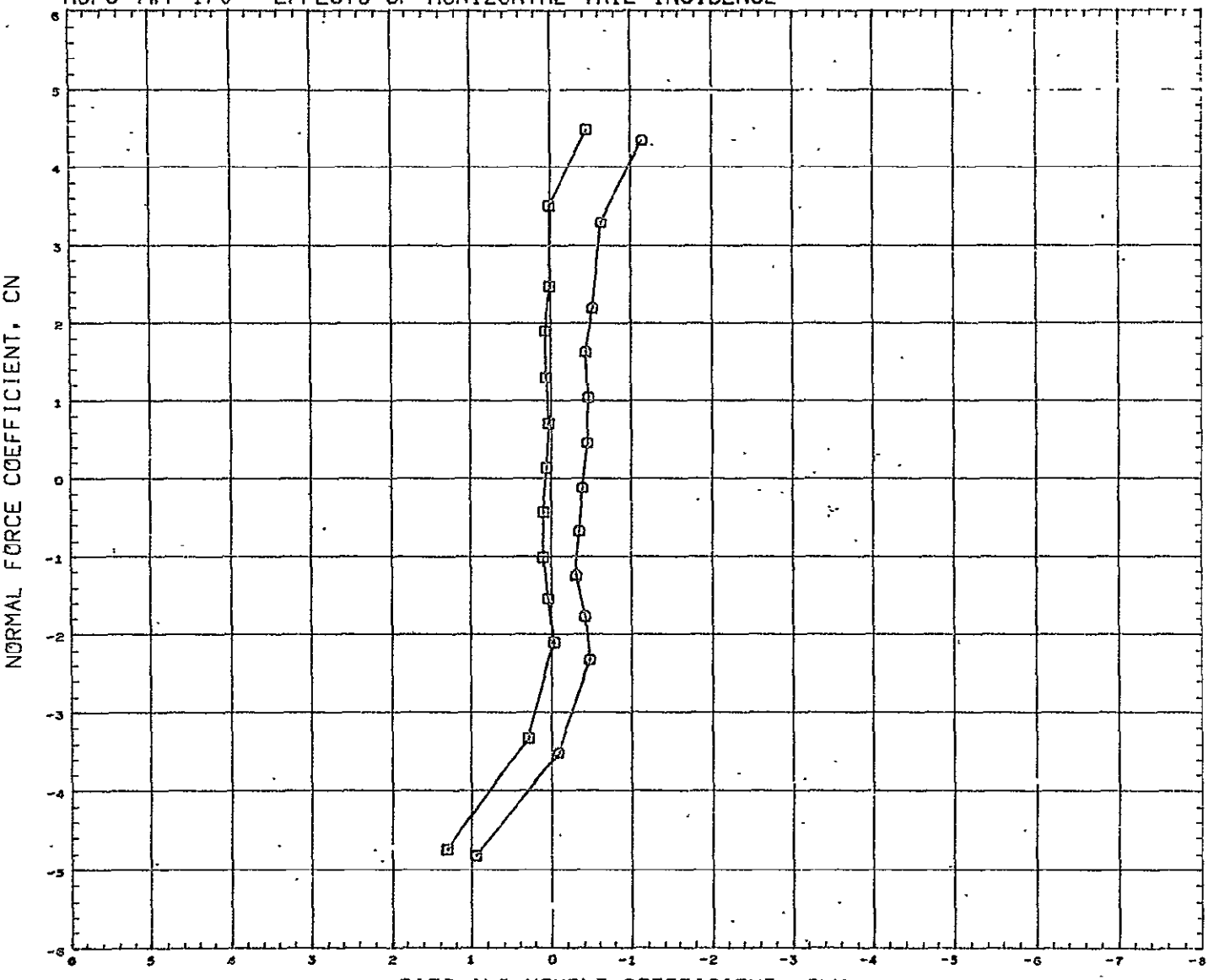



| SYMBOL | HTAIL | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | - 5.000 | MACH | 0.995 | BETA | - 0.020 | |
| □ | 0.000 | ORBINC | - 1.050 | WNGINC | 4.000 | |
| | | PHIB | 0.000 | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF HORIZONTAL TAIL INCIDENCE

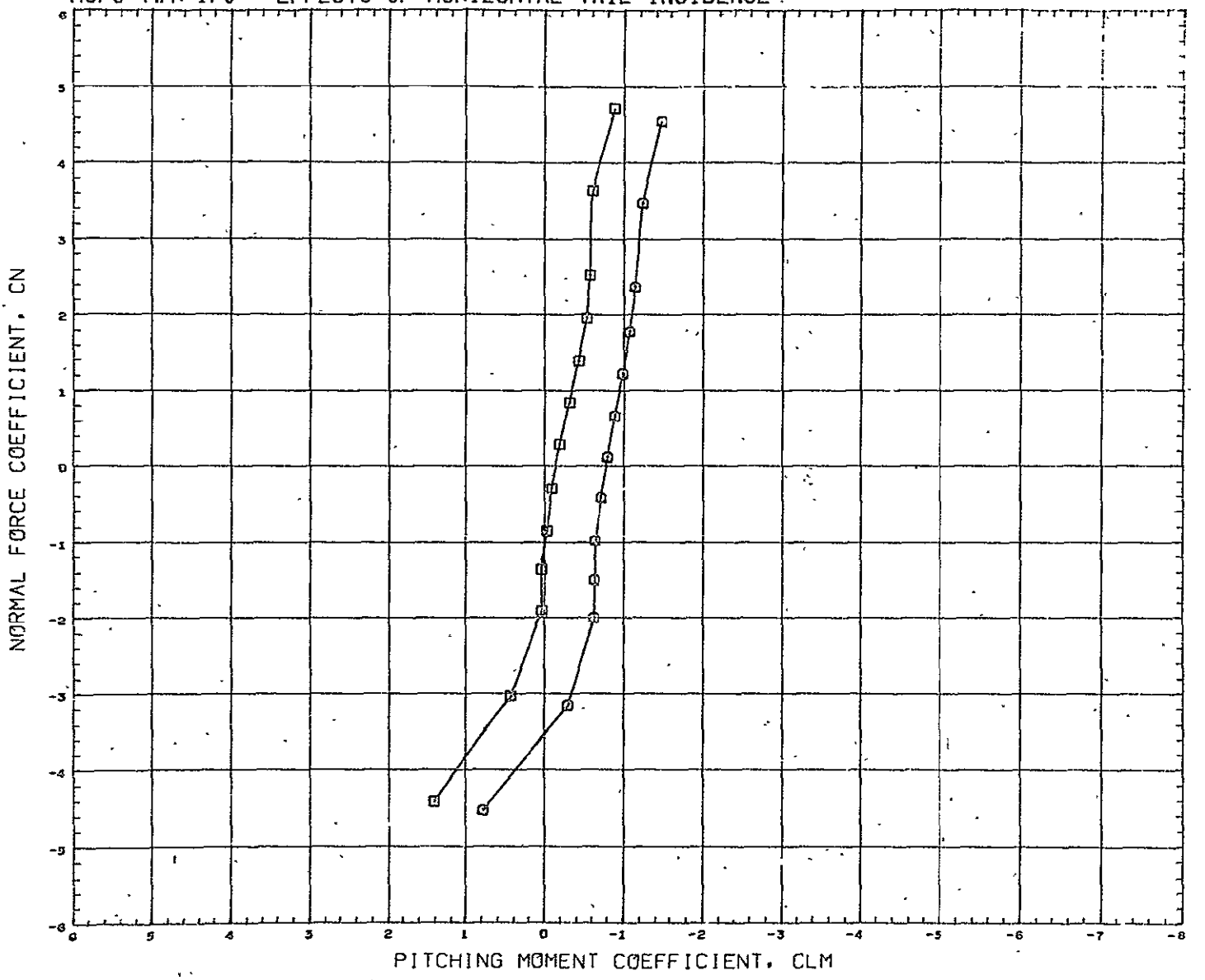



| SYMBOL | HTAIL | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| ○ | - 5.000 | MACH | 1.093 | BETA | - 0.020 |
| □ | 0.000 | ORBINC | - 1.050 | WNGINC | 4.000 |
| | | PHIB | 0.000 | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF HORIZONTAL TAIL INCIDENCE

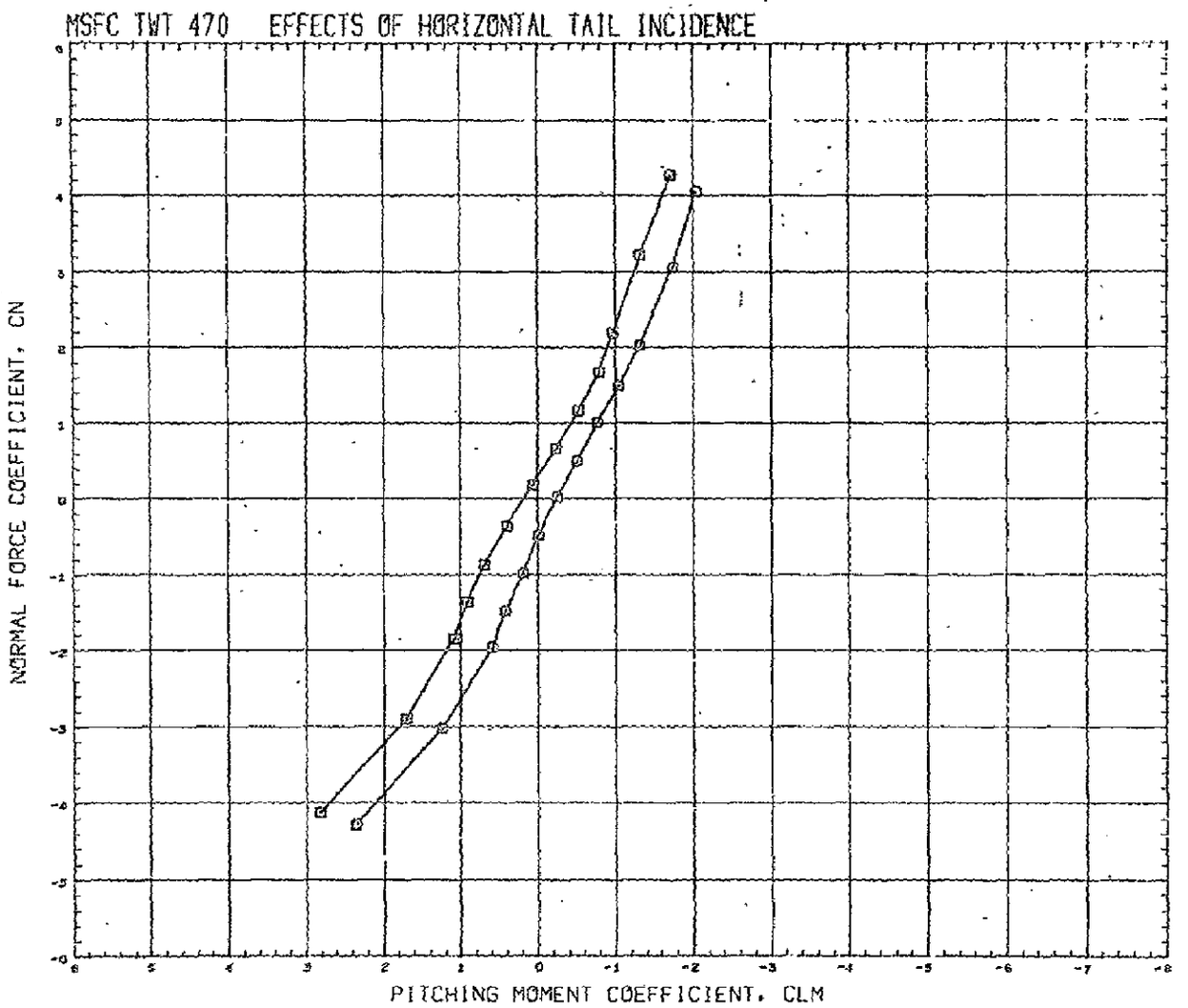



| SYMBOL | HTAIL | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| □ | - 5.000 | MACH | 1.199 | BETA | - 0.020 | |
| □ | 0.000 | ORBINC | - 1.050 | WNGINC | 4.000 | |
| | | PHIB | 0.000 | | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

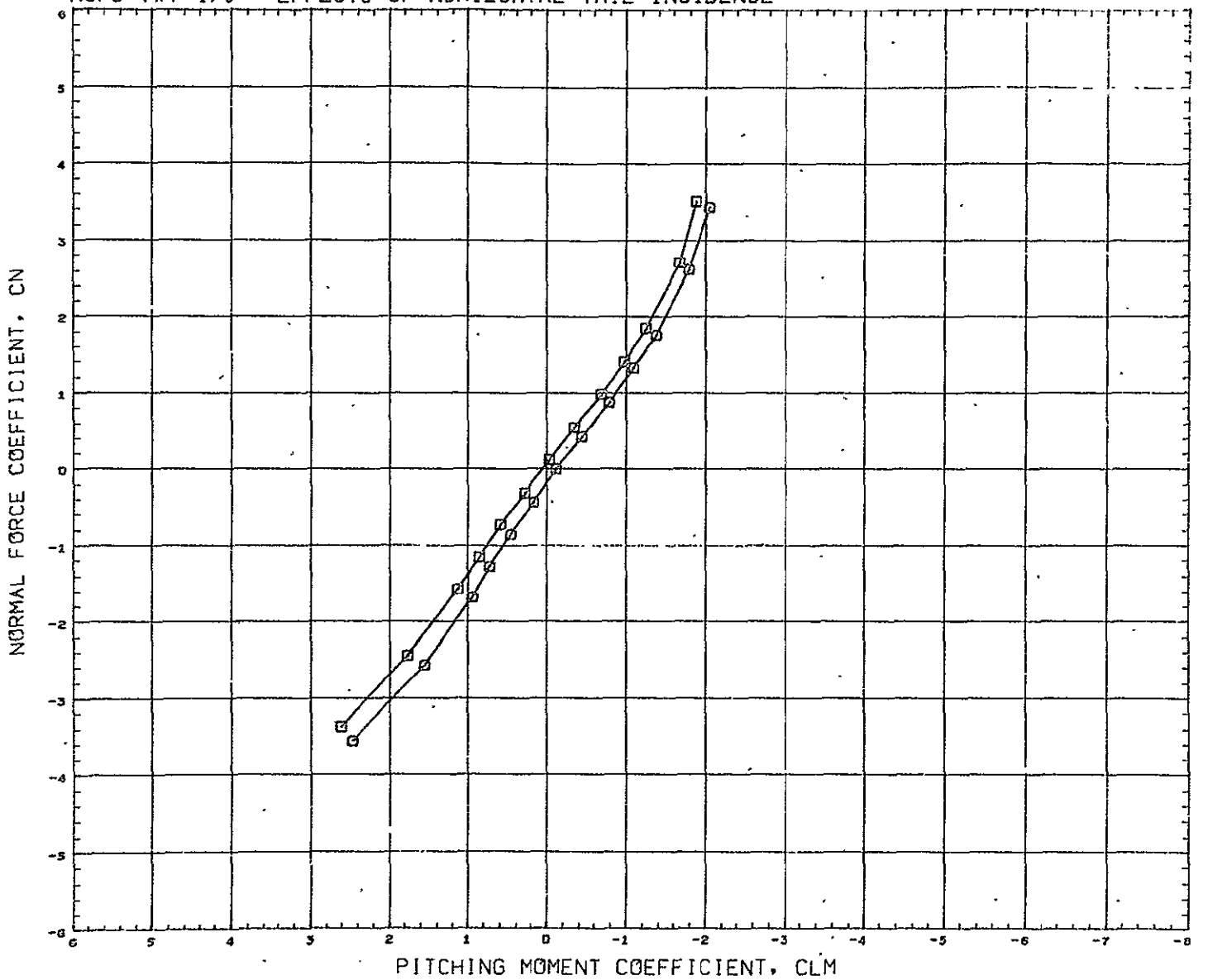



| SYMBOL | HTAIL | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| O | = 5.000 | MACH | 2.454 | BETA | = 0.020 |
| □ | 2.000 | ORBINC | = 1.059 | WRGINC | 4.000 |
| | | PHIB | 0.000 | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 3.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF HORIZONTAL TAIL INCIDENCE

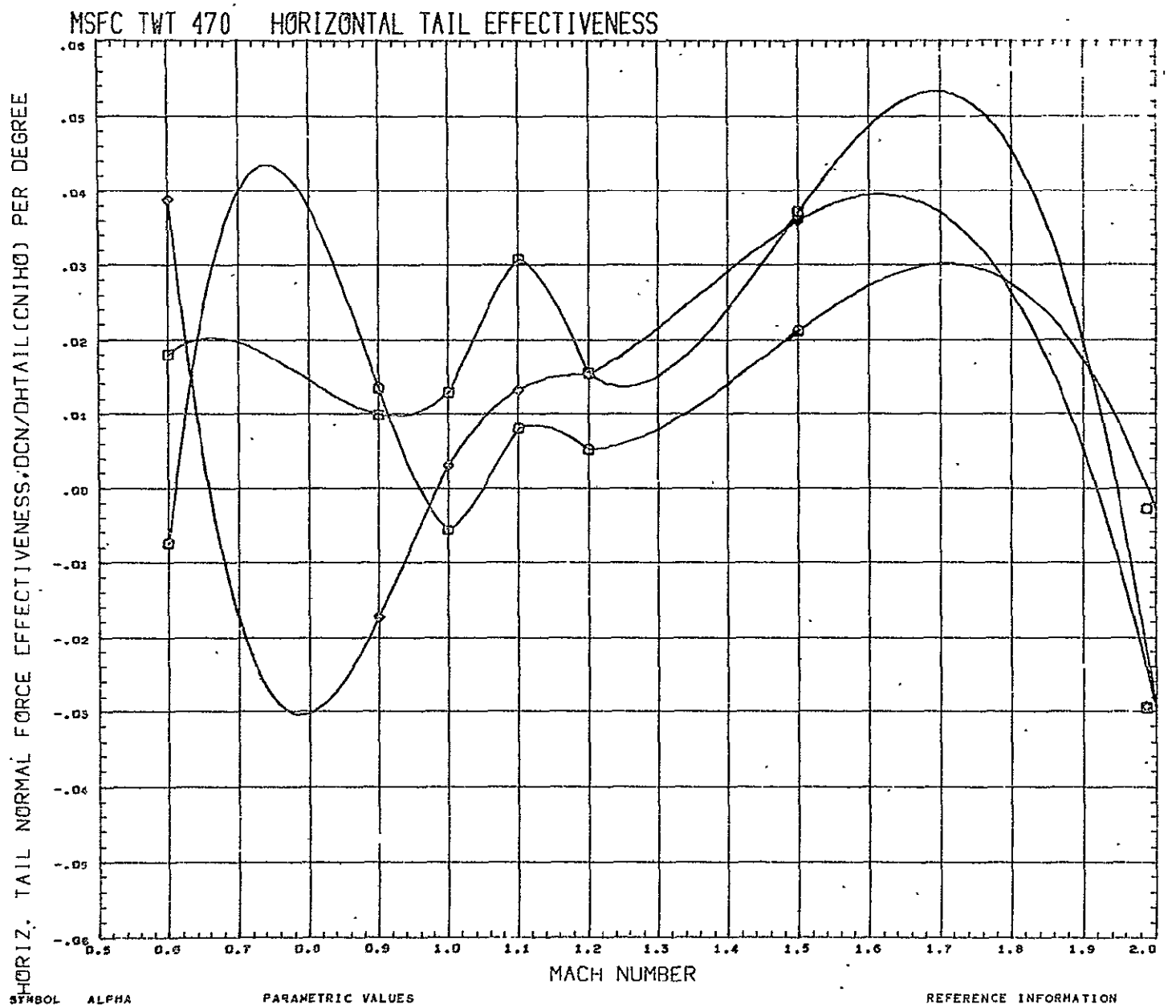



| SYMBOL | HTAIL | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| ○ | - 5.000 | MACH | 1.961 | BETA | - 0.020 | |
| □ | 0.000 | ORBINC | - 1.050 | WNGINC | 4.000 | |
| | | PHIB | 0.000 | | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRF | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |




| SYMBOL | ALPHA |
|---|---|
| ○ | - 10.000 |
| □ | 0.000 |
| ◇ | 10.000 |

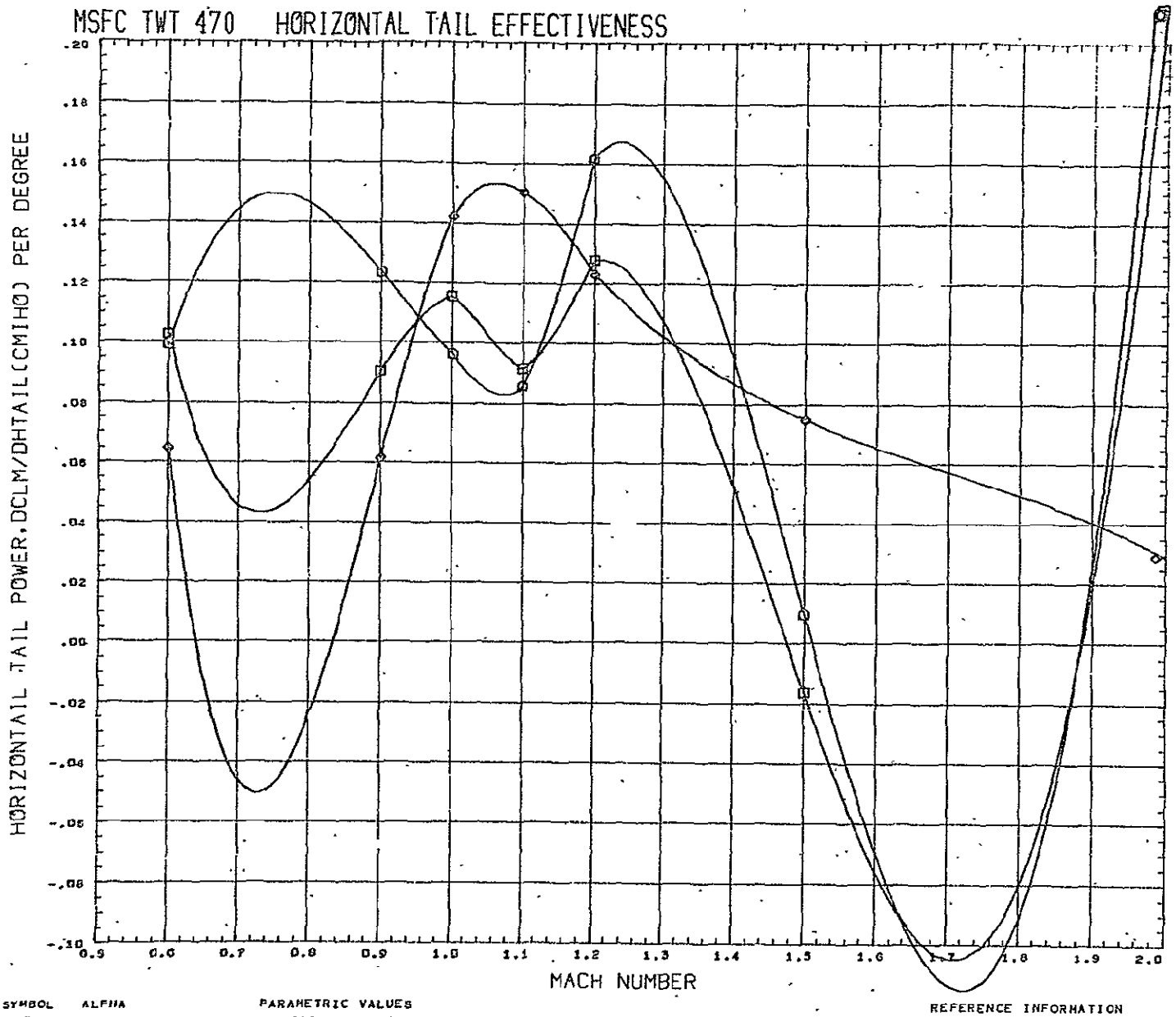
PARAMETRIC VALUES

| | | | | | |
|---|---|---|---|---|---|
| ORBINC | - | 1.050 | WNGINC | | 4.000 |
| HTAIL | | 0.000 | PHIB | | 0.000 |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

DATA HIST. CODE #F

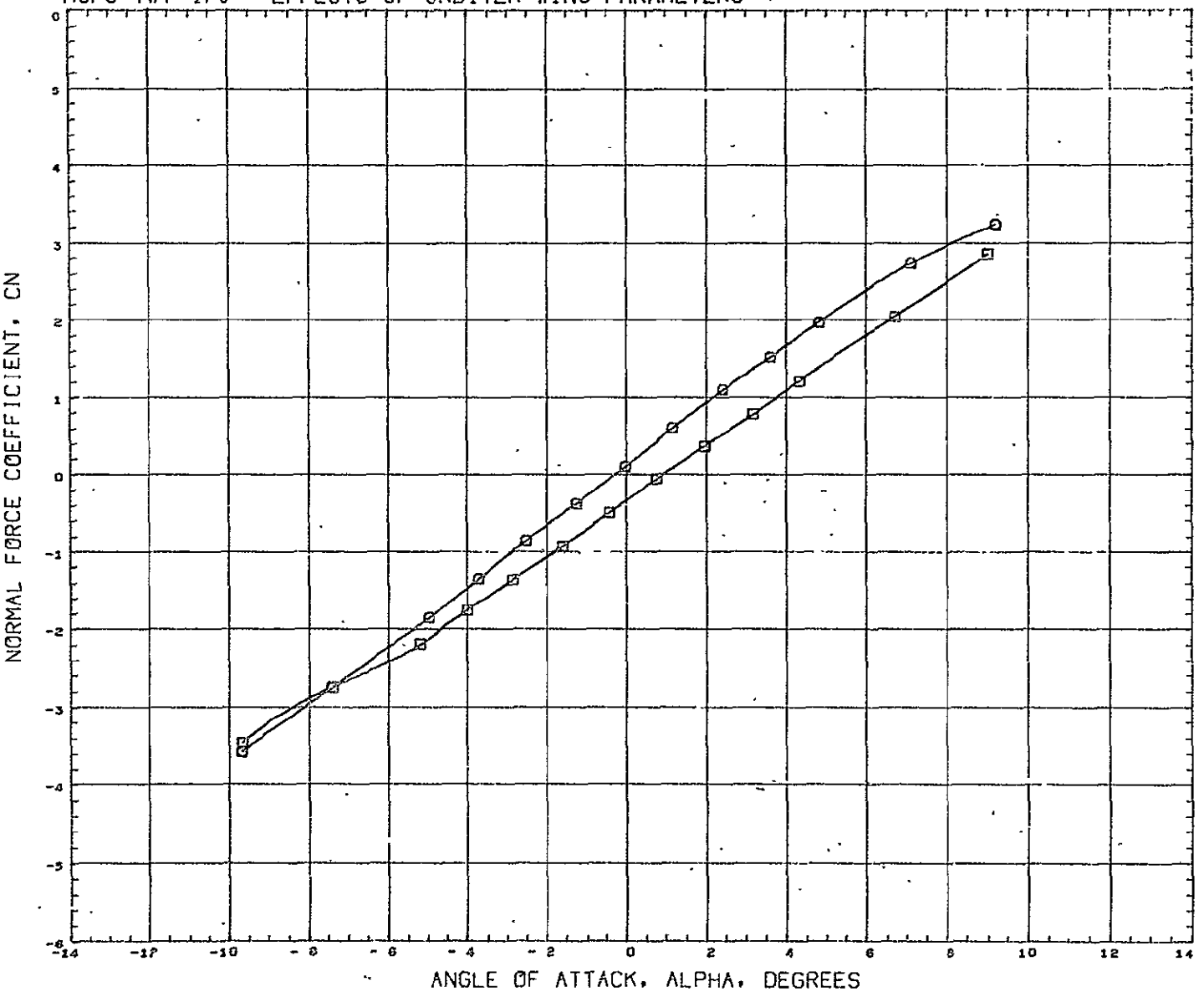



| SYMBOL | ALPHA | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | - 10.000 | ORBINC | - 1.050 | WHGINC | 4.000 |
| □ | 0.000 | HTAIL | 0.000 | PHIB | 0.000 |
| ◇ | 10.000 | | | | |

DATA HIST. CODE #P

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

# MSFC TWT 470 EFFECTS OF ORBITER WING PARAMETERS




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (D24001) | ○ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |
| (D24161) | □ | TWT470 S-IC/GAC ORBITER BF1OWIHVS WING SPOILERS |

PARAMETRIC VALUES

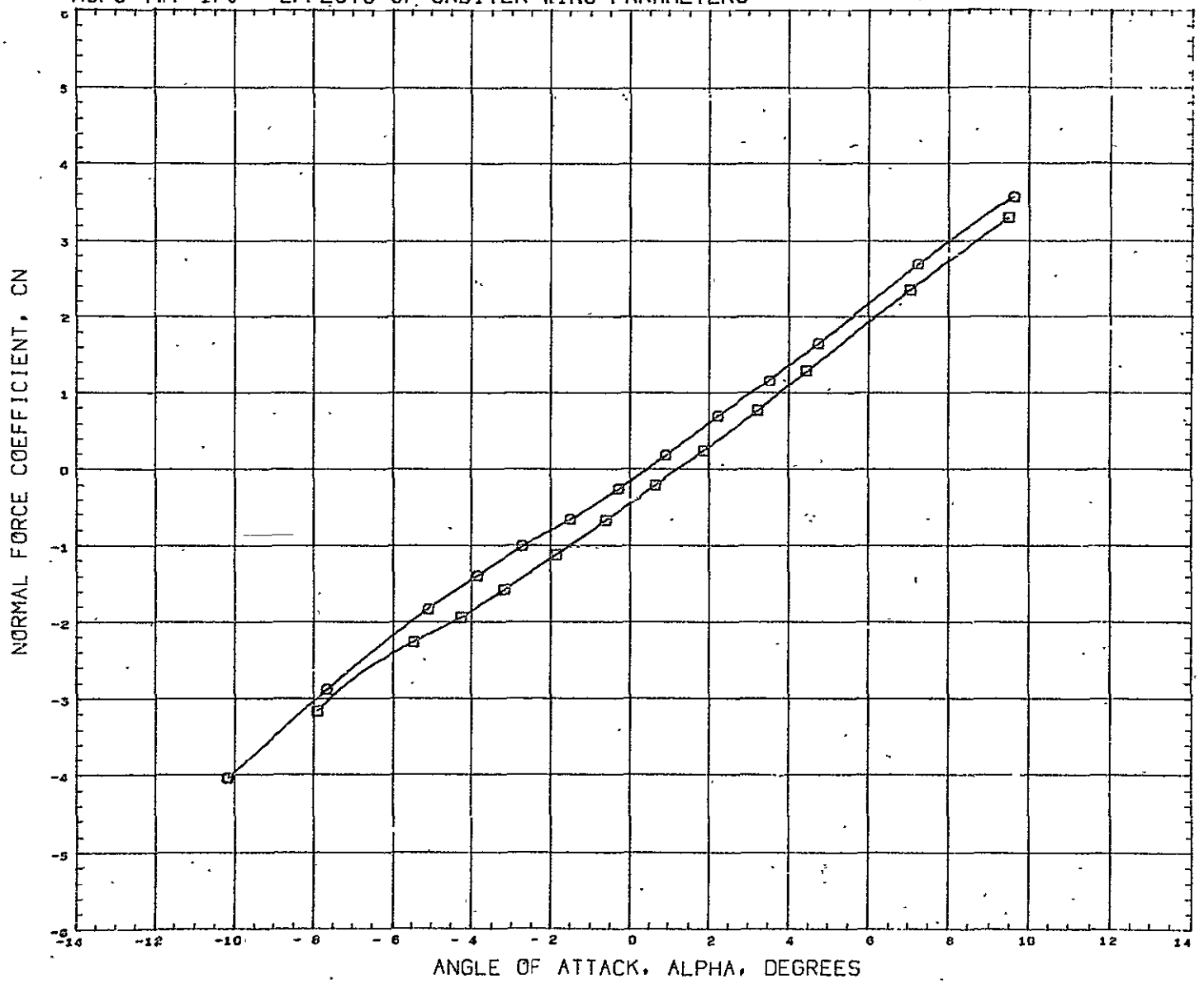
| | | | | | |
|---|---|---|---|---|---|
| BETA | = | 0.050 | ORBINC = | 1.050 | |
| WNGINC | | 4.000 | HTAIL | 0.000 | |
| PHIB | | 0.000 | | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MACH 0.599

MSFC TWT 470 EFFECTS OF ORBITER WING PARAMETERS




| DATA SET SYMBOL | | CONFIGURATION DESCRIPTION |
|---|---|---|
| (D24081) | ○ | TWT470 S-IC/GAC ORBITER 9F10WHVS BASIC |
| (D24161) | □ | TWT470 S-IC/GAC ORBITER-BF10W1HVS WING SPOILERS |

PARAMETRIC VALUES

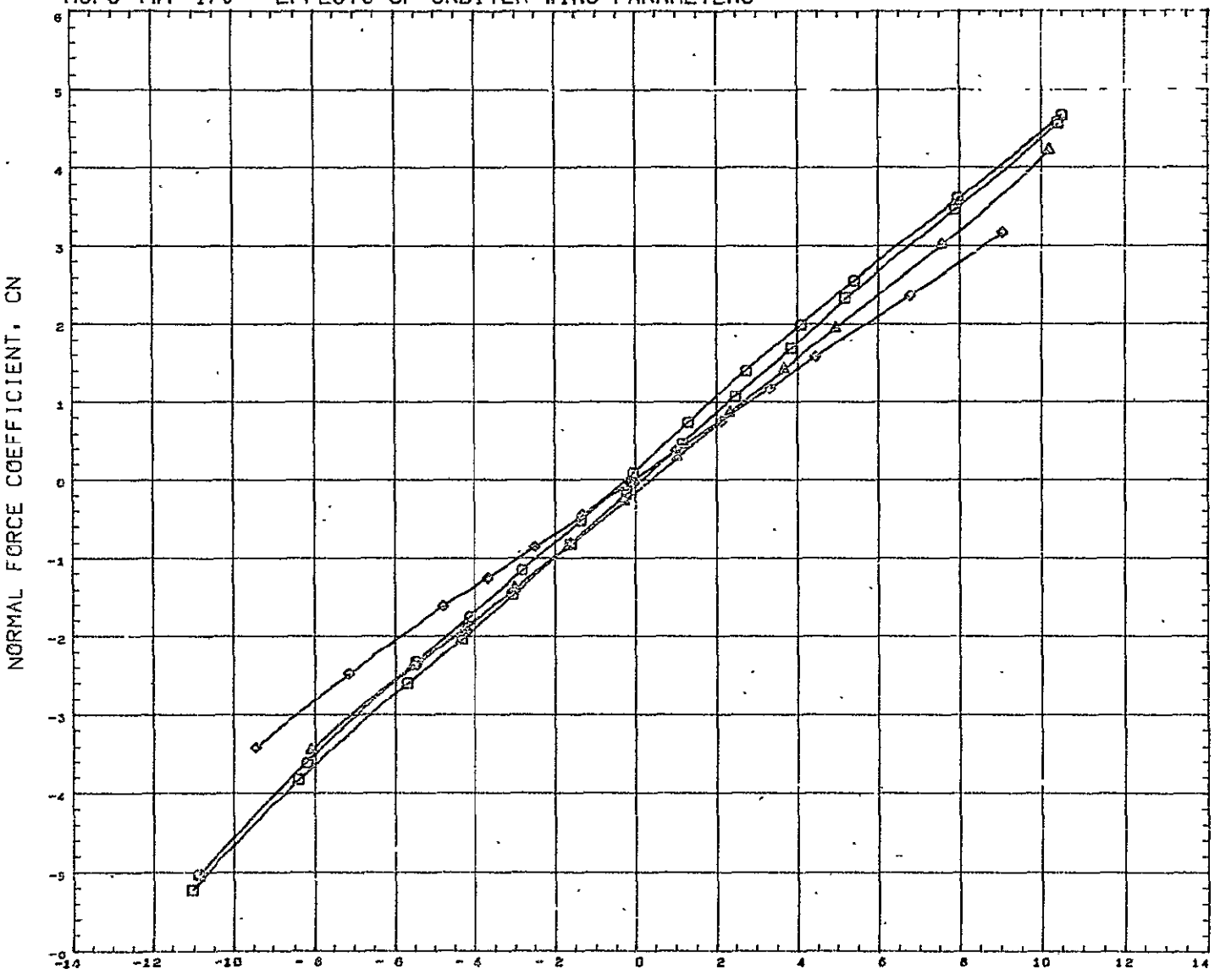
| | | | |
|---|---|---|---|
| BETA | - 0.050 | ORBINC - | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB- | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MACH 0.899

MSFC TWT 470 EFFECTS OF ORBITER WING PARAMETERS




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (E24081) | ○ | TWT470 S-IC/GAC ORBITER BF1OHVS BASIC |
| (E24141) | □ | TWT470 S-IC/GAC ORBITER BF1OWHVS WING INC = 2 |
| (E24111) | ◇ | TWT470 S-IC/GAC ORBITER BF1OHVS WING OFF |
| (E24101) | △ | TWT470 S-IC/GAC ORBITER BF1OWIHVS WING SPOILERS |

MACH 0.997

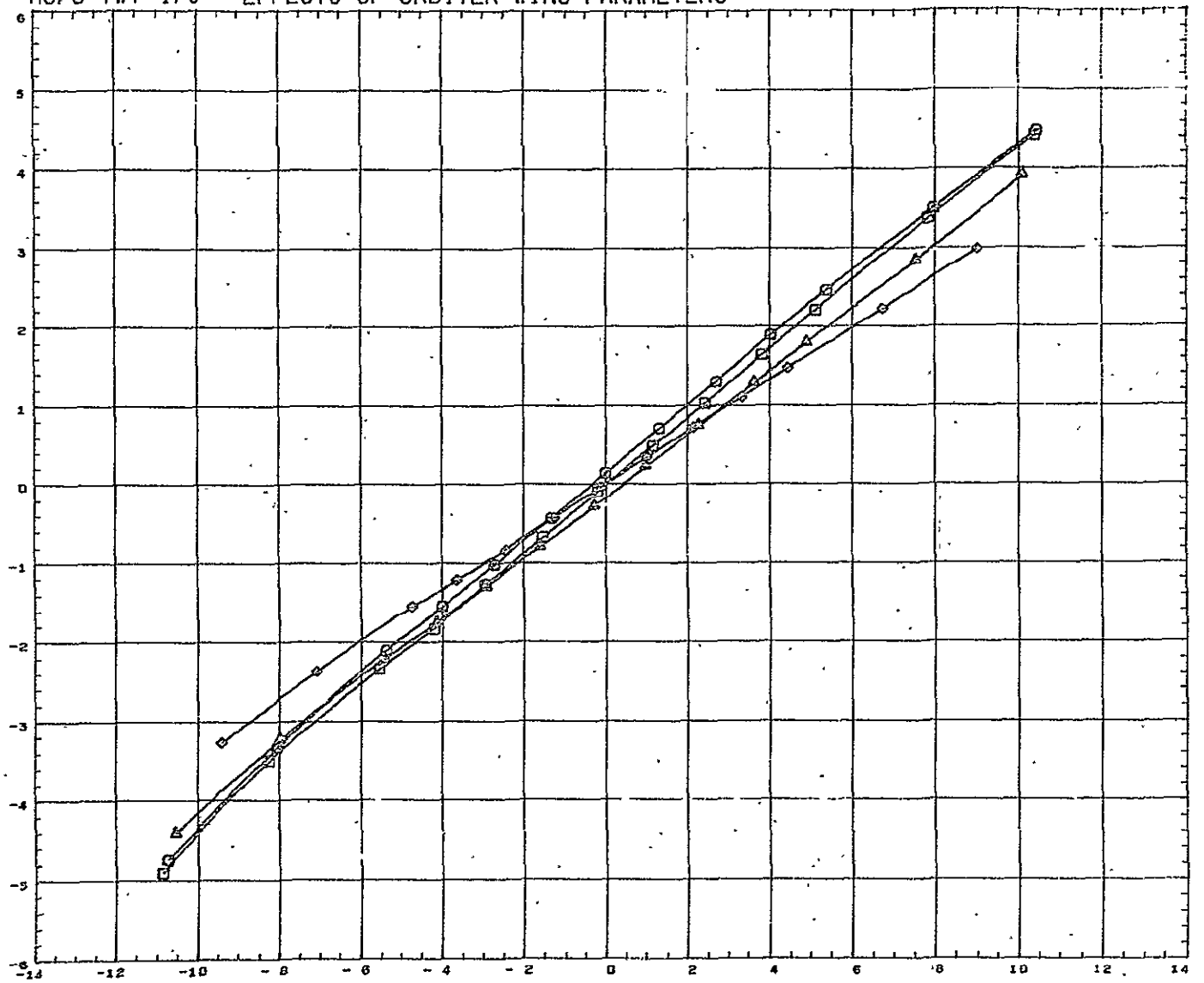
PARAMETRIC VALUES

| | | | |
|---|---|---|---|
| BETA | - 0.050 | ORBINC. - | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| FHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF ORBITER WING PARAMETERS




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (E24081) | ○ | TWT470 S-IC/GAC ORBITER BF1OHVS BASIC |
| (E24141) | □ | TWT470 S-IC/GAC ORBITER BF1OWHVS WING INC = 2 |
| (E24111) | ◇ | TWT470 S-IC/GAC ORBITER BF1OHVS WING OFF |
| (E24161) | △ | TWT470 S-IC/GAC ORBITER BF1OWIHVS WING SPOILERS |

MACH 1.095

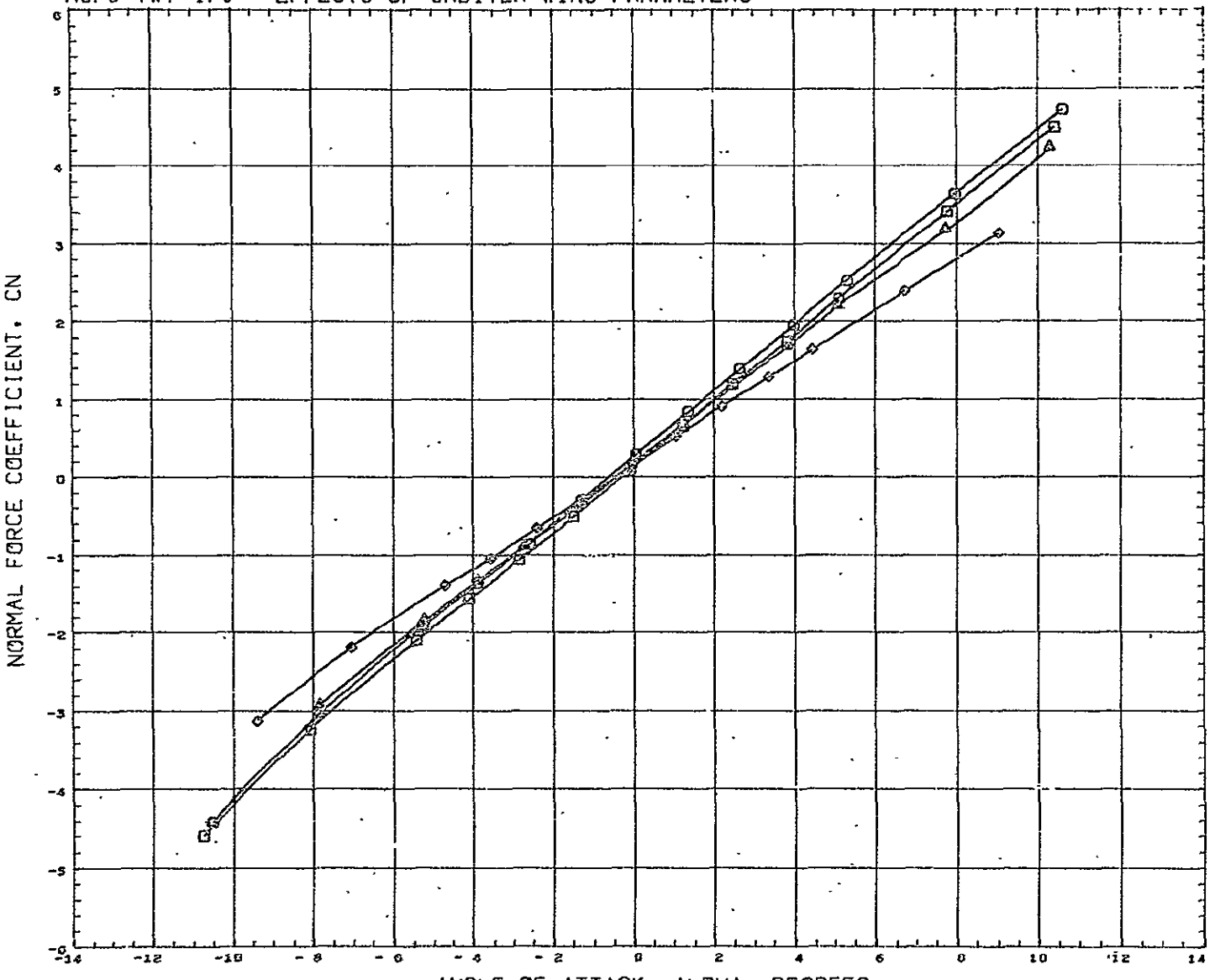
PARAMETRIC VALUES

| | | | |
|---|---|---|---|
| BETA | 0.050 | ORBINC | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES. |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF ORBITER WING PARAMETERS




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (E24081) | ○ | TWT470 S-IC/GAC ORBITER BF1OHVS BASIC |
| (E24141) | □ | TWT470 S-IC/GAC ORBITER BF1OWHVS WING INC = 2 |
| (E24111) | ◇ | TWT470 S-IC/GAC ORBITER BF1OHVS WING OFF |
| (E24161) | △ | TWT470 S-IC/GAC ORBITER BF1OWIHVS WING SPOILERS |

MACH 1.195

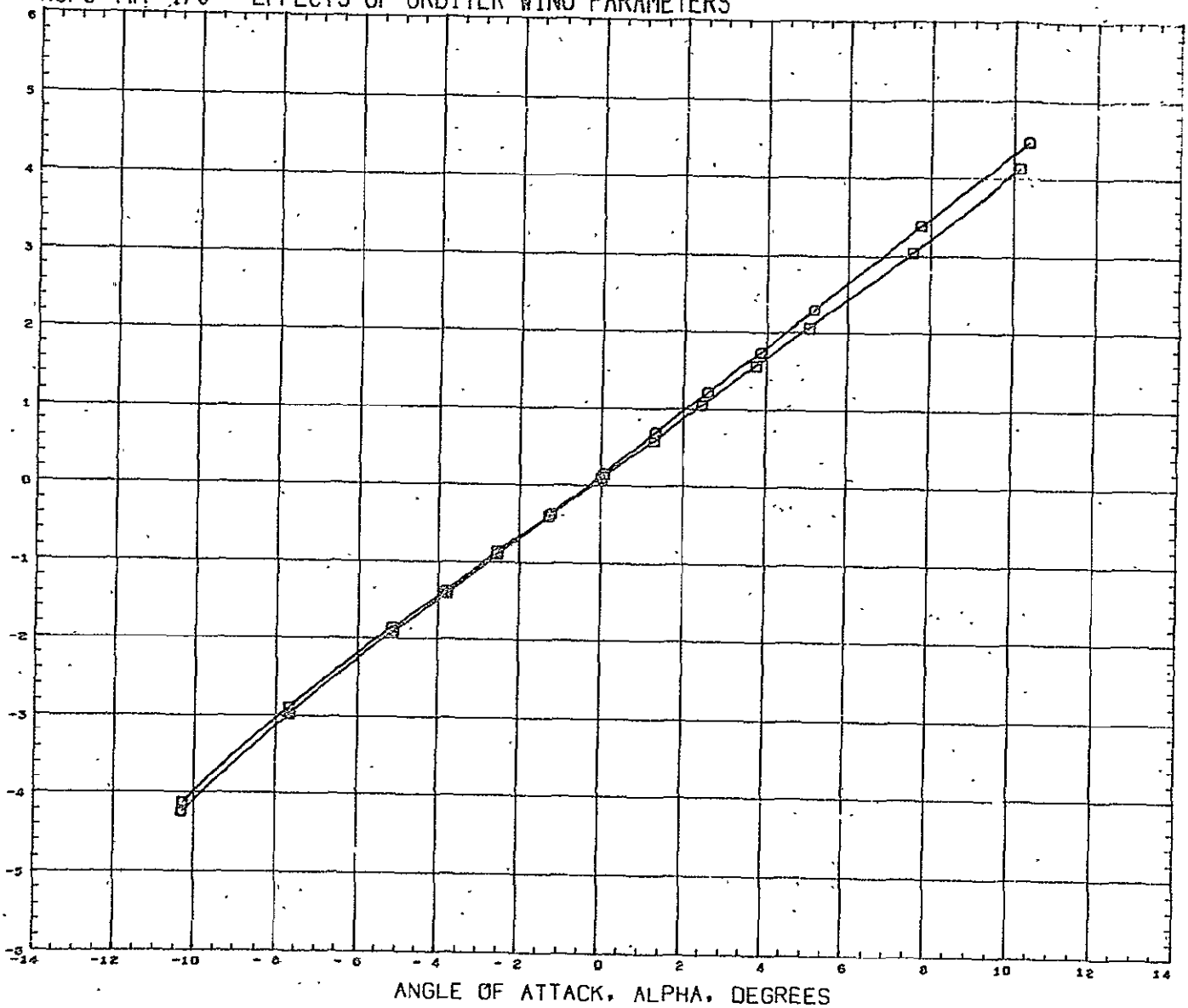
PARAMETRIC VALUES

| | | | |
|---|---|---|---|
| BETA | 0.050 | ORBINC | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF ORBITER WING PARAMETERS




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (F24081) | ○ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |
| (F24161) | □ | TWT470 S-IC/GAC ORBITER BF1OW1HVS WING SPOILERS |

MACH 1.303

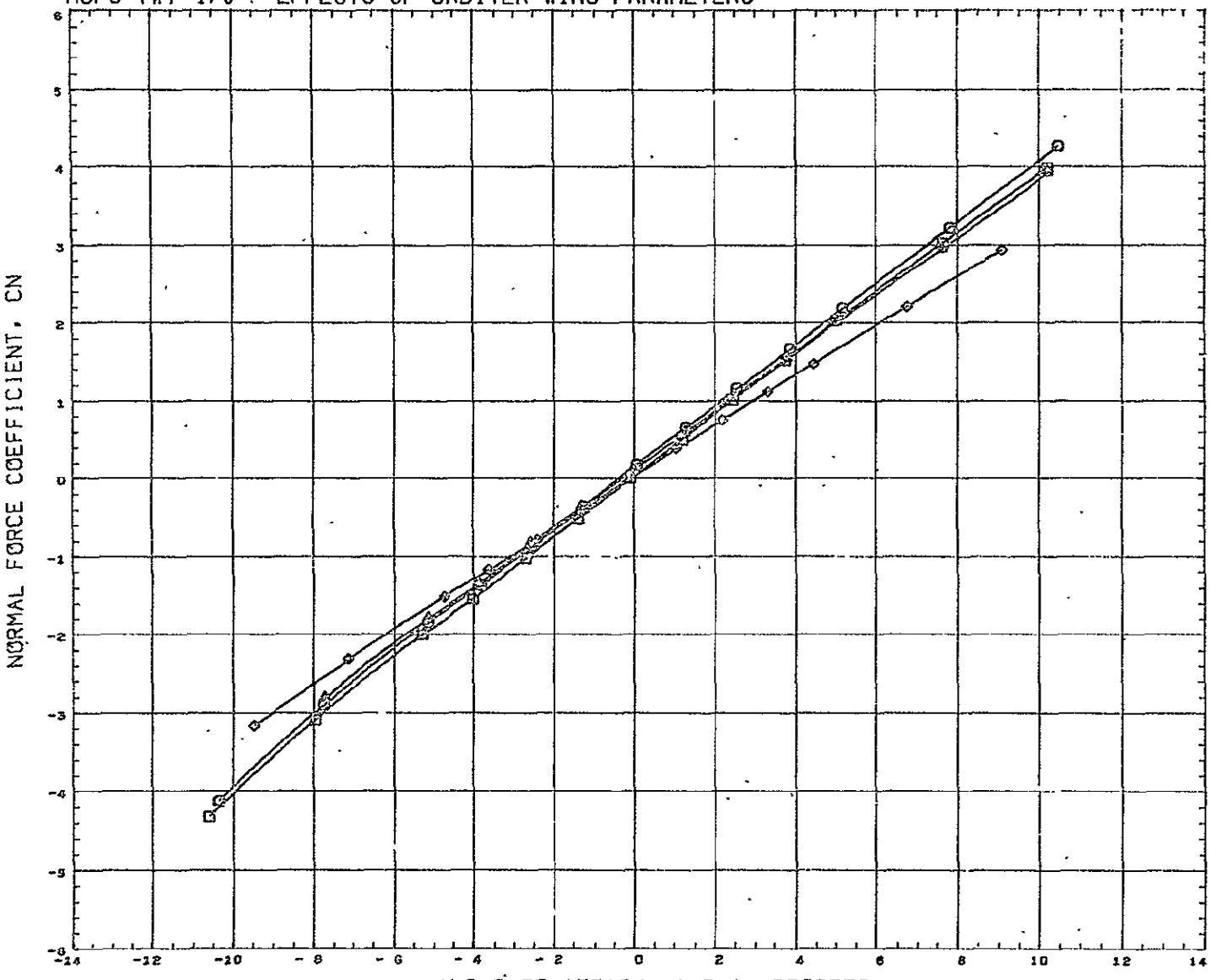
PARAMETRIC VALUES

| | | | |
|---|---|---|---|
| BETA | 0.050 | ORBINC | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.7360 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 . EFFECTS OF ORBITER WING PARAMETERS




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (G24001) | ○ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |
| (G24141) | □ | TWT470 S-IC/GAC ORBITER BF1OWHVS WING INC = 2 |
| (G24111) | ◇ | TWT470 S-IC/GAC ORBITER BF1OHVS WING OFF |
| (G24161) | △ | TWT470 S-IC/GAC ORBITER BF1OWIHVS WING SPOILERS |

MACH 1.456

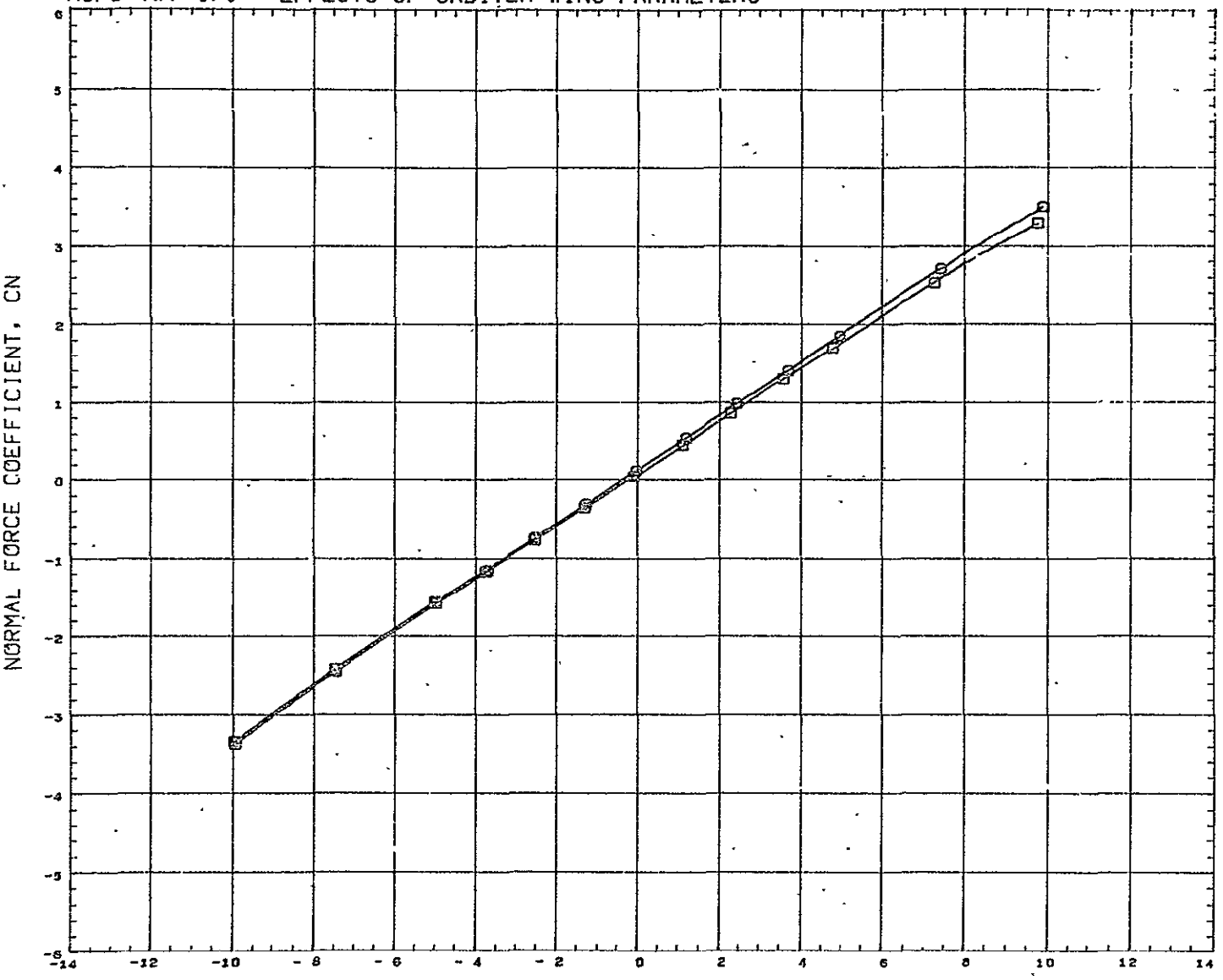
PARAMETRIC VALUES

| | | | |
|---|---|---|---|
| BETA | 0.050 | ORBINC | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF ORBITER WING PARAMETERS




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (S24061) | ○ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |
| (S24161) | □ | TWT470 S-IC/GAC ORBITER BF1OW1HVS WING SPOILERS |

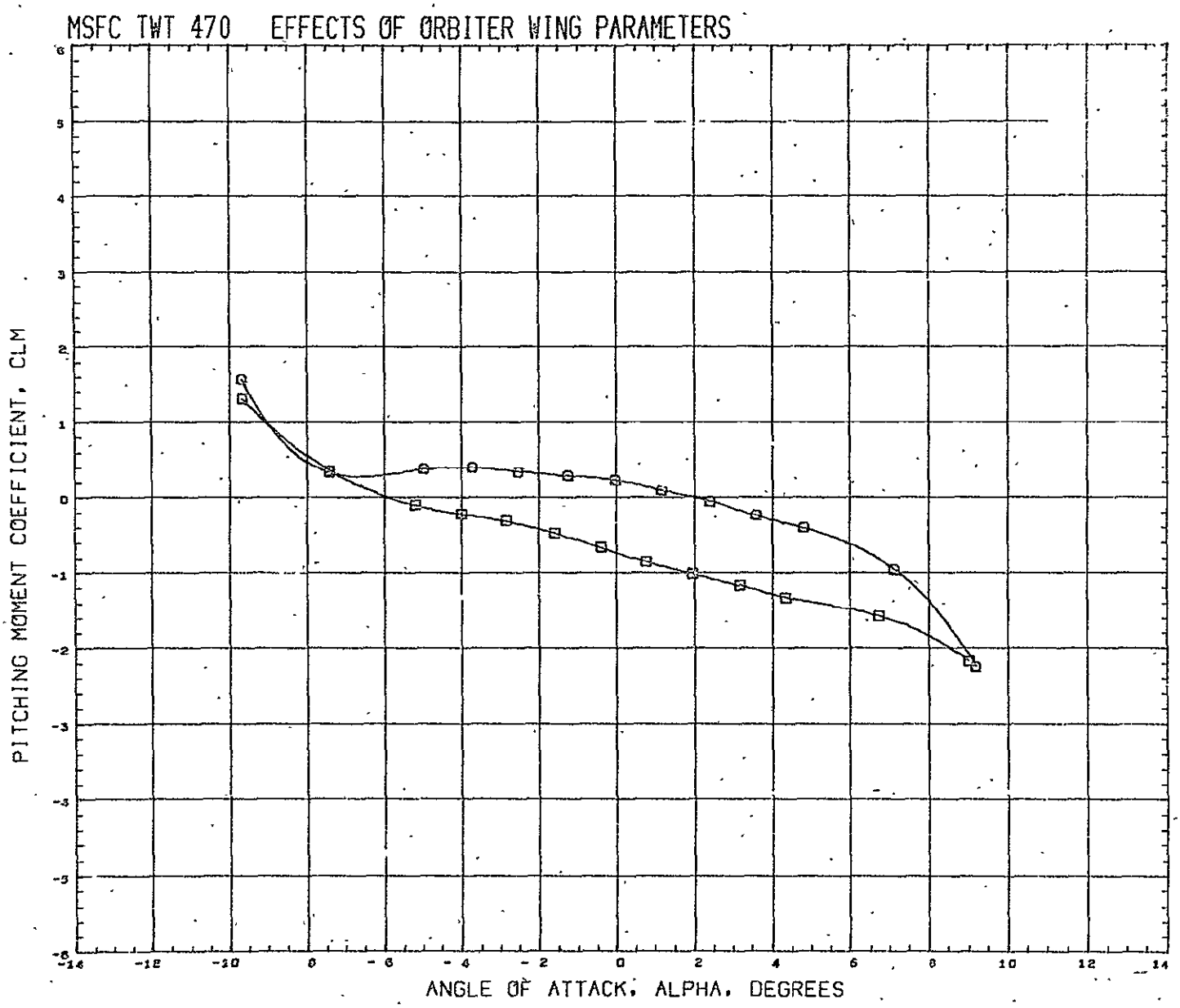
PARAMETRIC VALUES

| | | | | | |
|---|---|---|---|---|---|
| BETA | - 0.050 | ORBINC - | 1.050 | | |
| WNGINC | 4.000 | HTAIL | 0.000 | | |
| PHIB | 0.000 | | | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MACH 1.967




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (D24081) | ○ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |
| (D24101) | □ | TWT470 S-IC/GAC ORBITER BF1OWIHVS WING SPOILERS |

PARAMETRIC VALUES

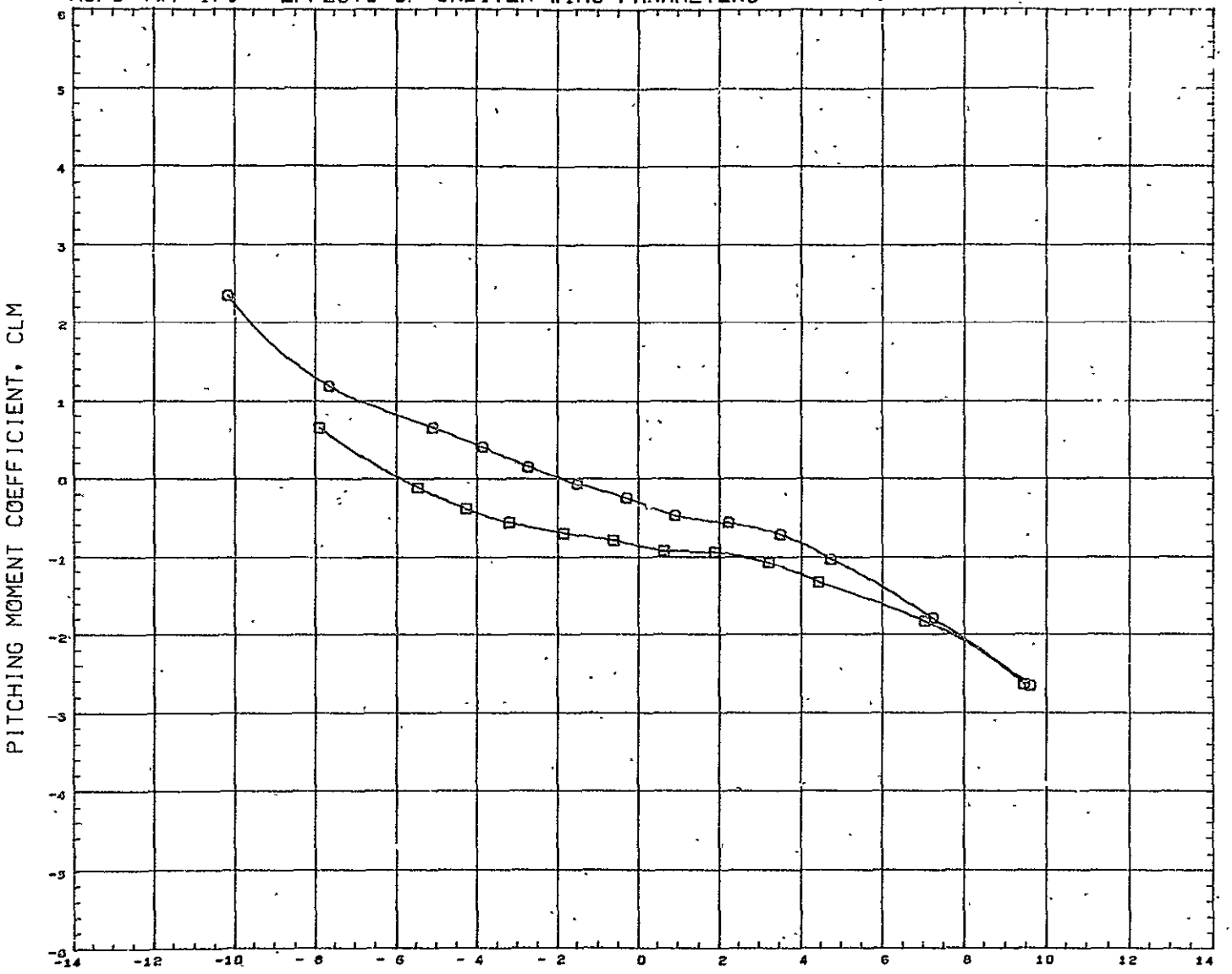
| | | | |
|---|---|---|---|
| BETA | - 0.050 | ORBINC - | 1.050 |
| WNGINC | 4.000 | HTAIL - | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MACH 0.599

MSFC TWT 470 EFFECTS OF ORBITER WING PARAMETERS




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (D24061) | ○ | TWT470 S-IC/GAC ORBITER BF1OWMVS BASIC |
| (D24151) | □ | TWT470 S-IC/GAC ORBITER BF1OW1MVS WING SPOILERS |

PARAMETRIC VALUES

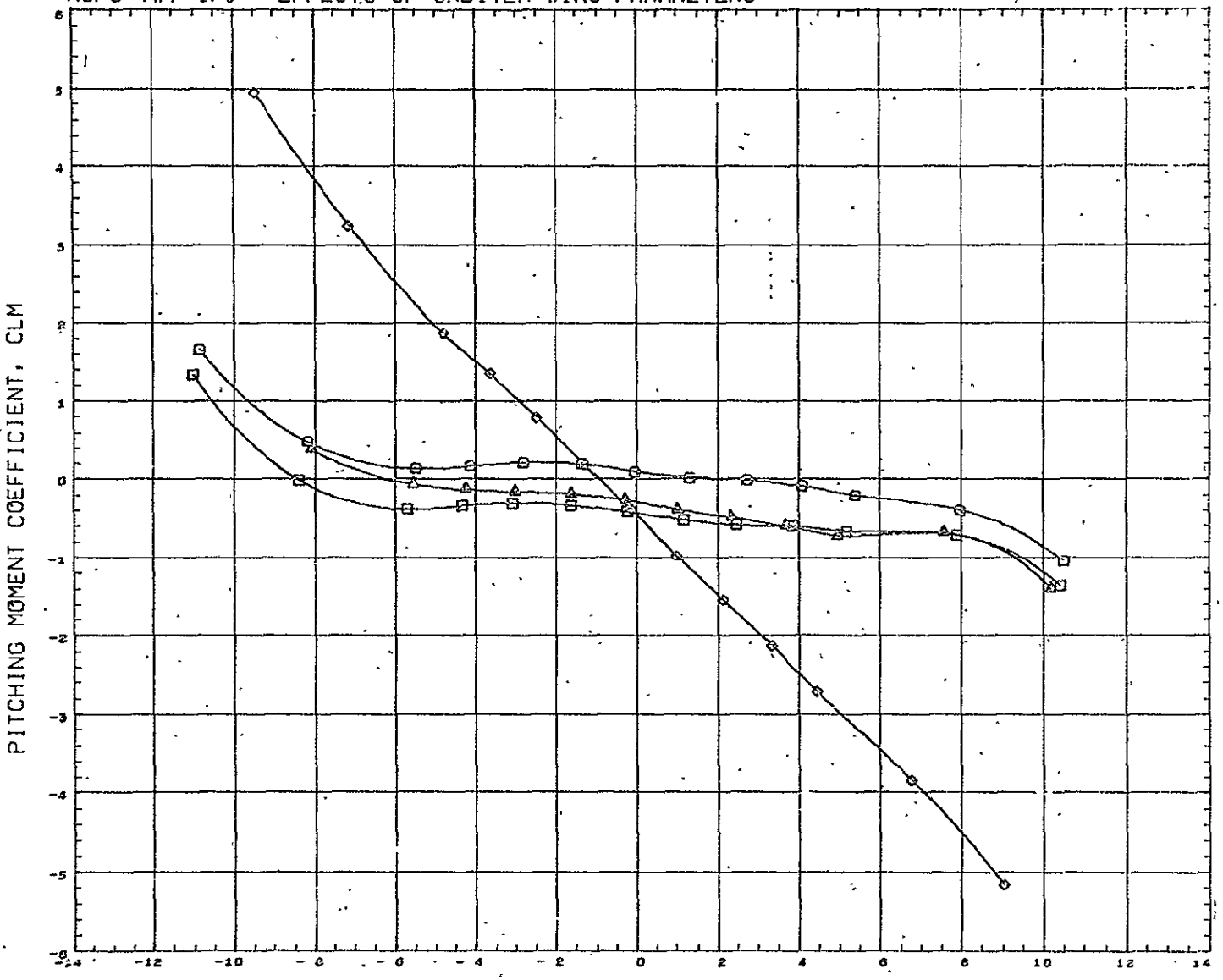
| | | | | | |
|---|---|---|---|---|---|
| BETA | - 0.050 | ORBINC - | 1.050 | | |
| WNSINC | 4.000 | HTAIL | 0.000 | | |
| PHIB | 0.000 | | | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MACH 0.699

MSFC TWT 470 EFFECTS OF ORBITER WING PARAMETERS




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (E24081) | ○ | TWT470 S-IC/GAC ORBITER BF1OHVS BASIC |
| (E24141) | □ | TWT470 S-IC/GAC ORBITER BF1OWHVS WING INC = 2 |
| (E24111) | ◇ | TWT470 S-IC/GAC ORBITER BF1OHVS WING OFF |
| (E24161) | △ | TWT470 S-IC/GAC ORBITER BF1OWIHVS WING SPOILERS |

MACH 0.997

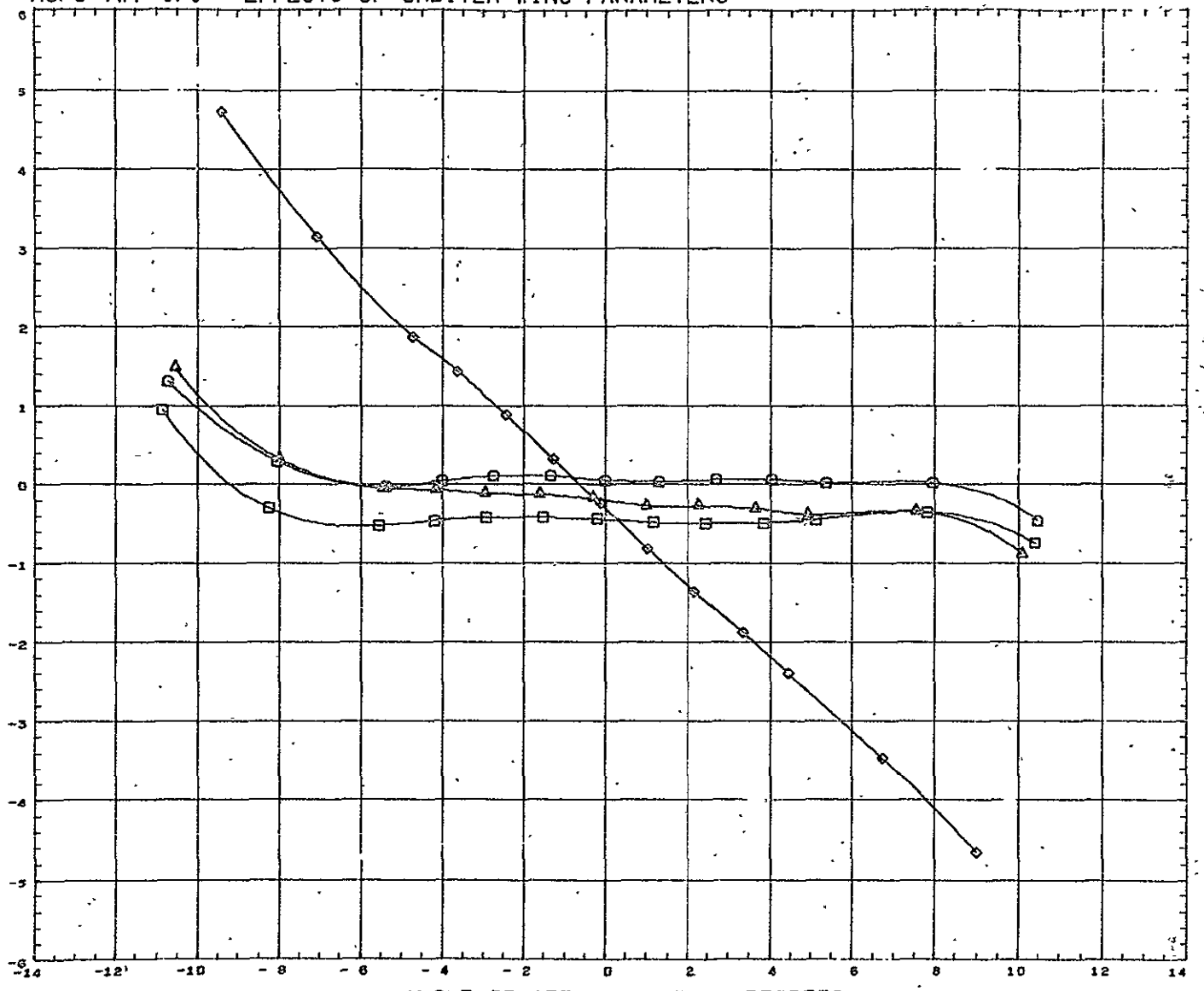
PARAMETRIC VALUES

| | | | |
|---|---|---|---|
| BETA | 0.050 | ORBINC | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF ORBITER WING PARAMETERS




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (E24081) | ○ | TWT470 S-IC/GAC ORBITER BF1OHVS BASIC. |
| (E24141) | □ | TWT470 S-IC/GAC ORBITER BF1OWHVS WING INC = 2 |
| (E24111) | ◇ | TWT470 S-IC/GAC ORBITER BF1OHVS WING OFF |
| (E24161) | △ | TWT470 S-IC/GAC ORBITER BF1OW1HVS WING SPOILERS |

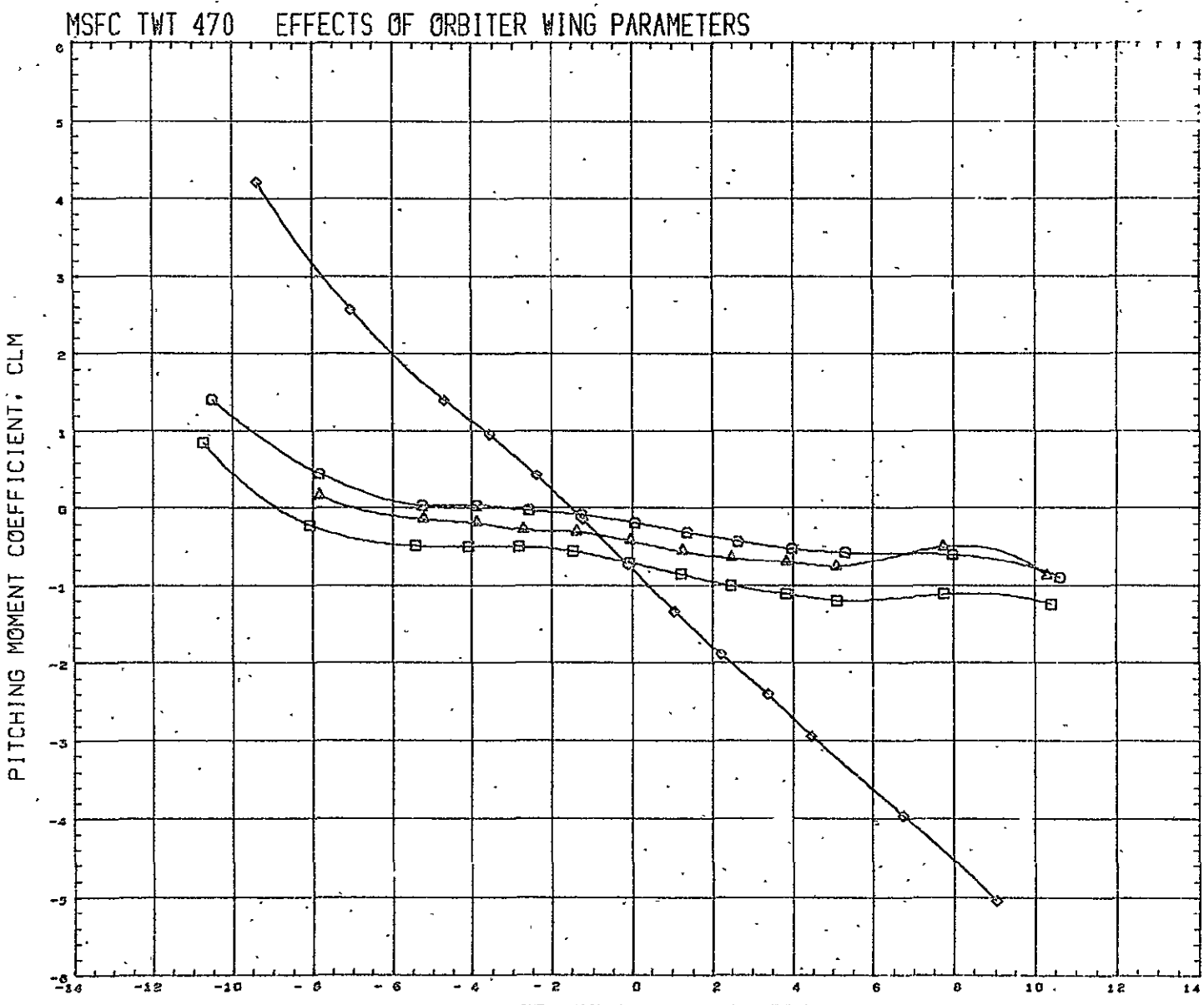
PARAMETRIC VALUES

| | | | |
|---|---|---|---|
| BETA | 0.050 | ORBINC | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MACH 1.095



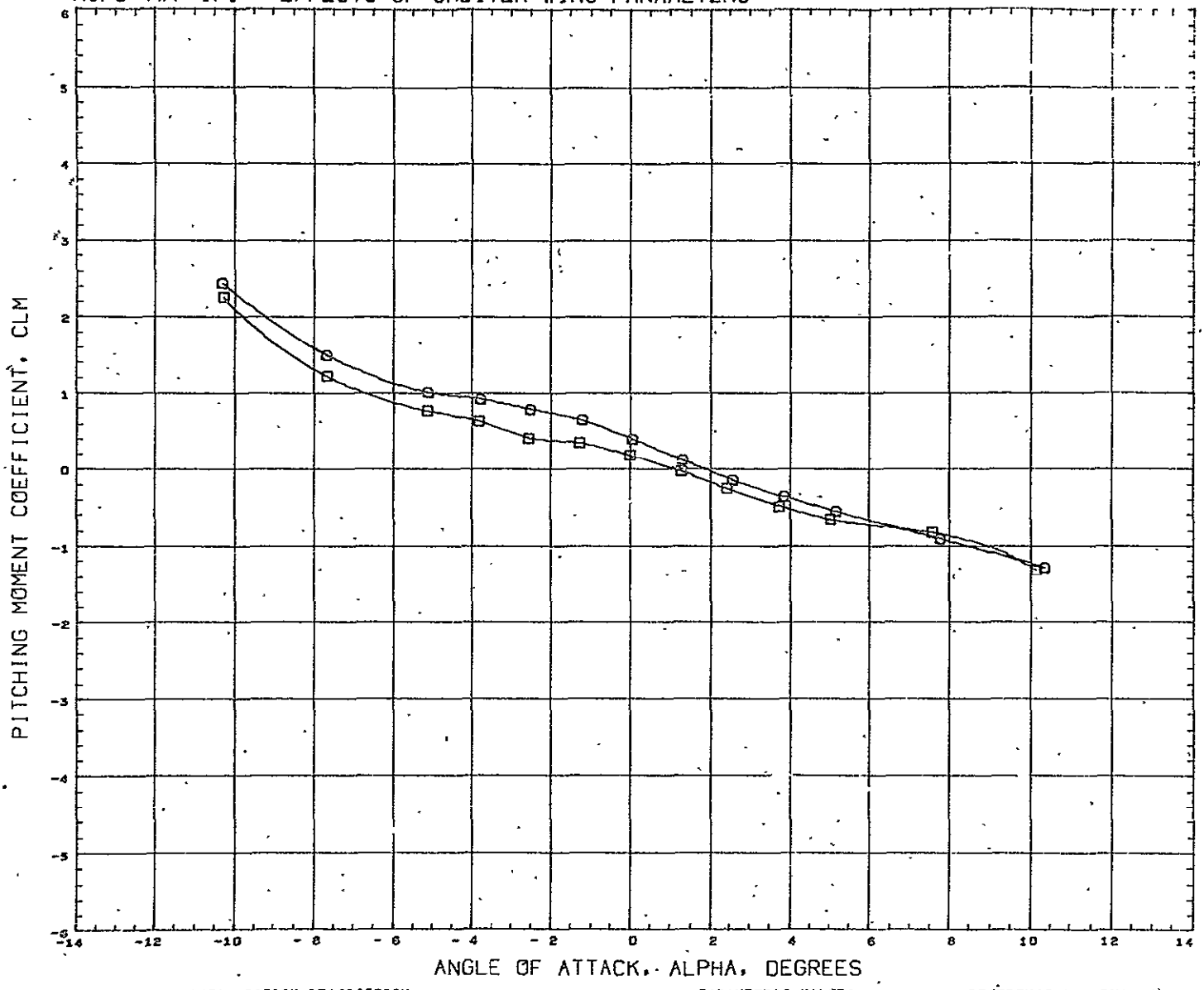

| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (E24081) | □ | TWT470 S-IC/GAC ORBITER BF1OHVS BASIC |
| (E24141) | □ | TWT470 S-IC/GAC ORBITER BF1OWHVS WING INC = 2 |
| (E24111) | ◇ | TWT470 S-IC/GAC ORBITER BF1OHVS WING OFF |
| (E24161) | △ | TWT470 S-IC/GAC ORBITER BF1OW1HVS WING SPOILERS |

MACH 1.195

| PARAMETRIC VALUES | | | |
|---|---|---|---|
| BETA | - 0.050 | ORBINC - | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XHRP | 5.2640 | INCHES |
| YHRP | 0.0000 | INCHES |
| ZHRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF ORBITER WING PARAMETERS




| DATA SET SYMBOL | | CONFIGURATION DESCRIPTION |
|---|---|---|
| (F24081) | ○ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |
| (F24161) | □ | TWT470 S-IC/GAC ORBITER BF1OWIHVS WING SPOILERS |

MACH 1.303

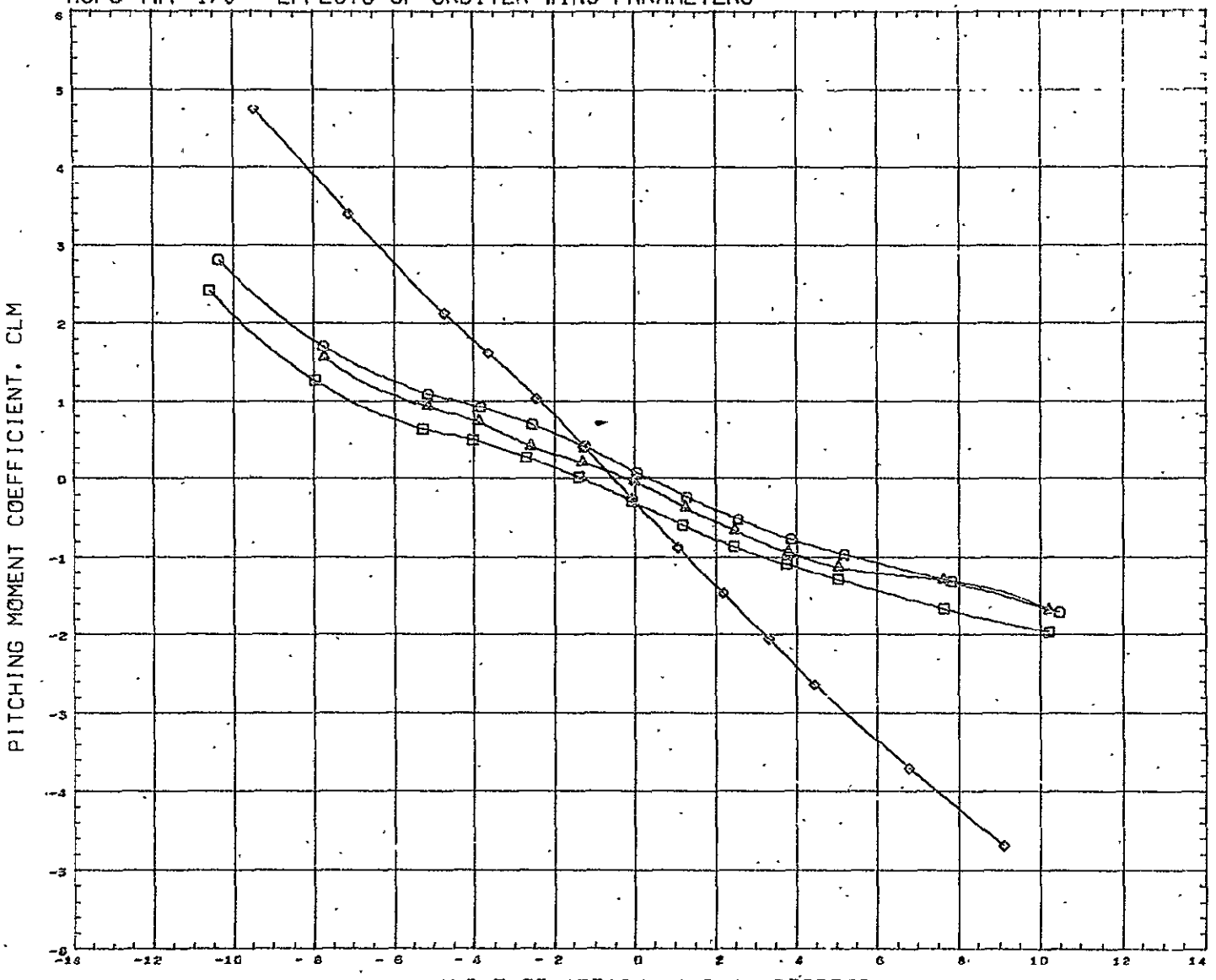
PARAMETRIC VALUES

| | | | | | |
|---|---|---|---|---|---|
| BETA | 0.050 | ORBINC | 1.050 | | |
| WNGINC | 4.000 | HTAIL | 0.000 | | |
| FNIB | 0.000 | | | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF ORBITER WING PARAMETERS



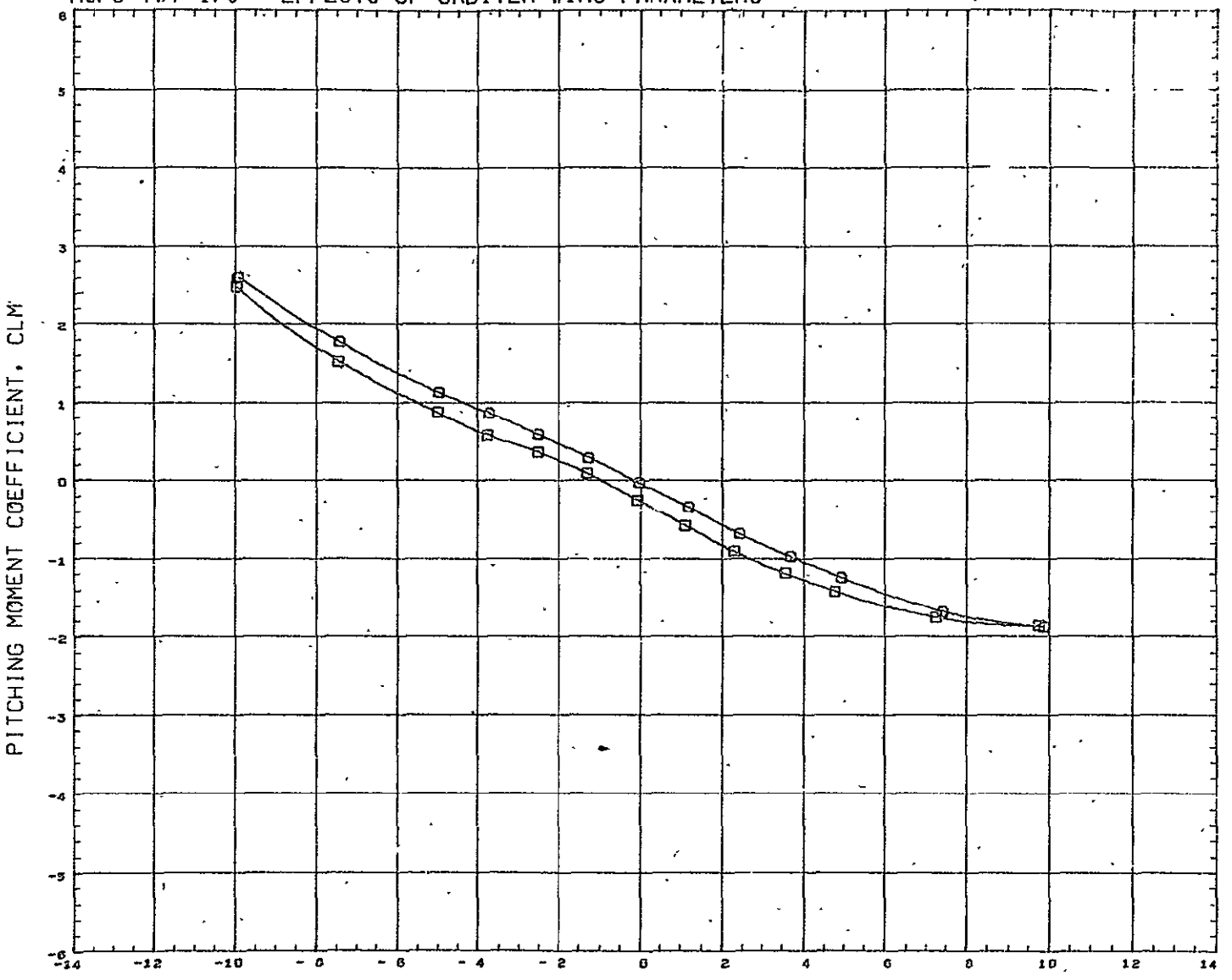

| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (G24061) | □ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |
| (G24141) | □ | TWT470 S-IC/GAC ORBITER BF1OWHVS WING INC = 2 |
| (G24111) | ◇ | TWT470 S-IC/GAC ORBITER BF1OHVS WING OFF |
| (G24161) | △ | TWT470 S-IC/GAC ORBITER BF1OWIHVS WING SPOILERS |

MACH 1.456

| PARAMETRIC VALUES | | | |
|---|---|---|---|
| BETA | 0.050 | ORBINC | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 . EFFECTS OF ORBITER WING PARAMETERS




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (824061) | O | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |
| (824161) | □ | TWT470 S-IC/GAC ORBITER BF1OW1HVS WING SPOILERS |

PARAMETRIC VALUES

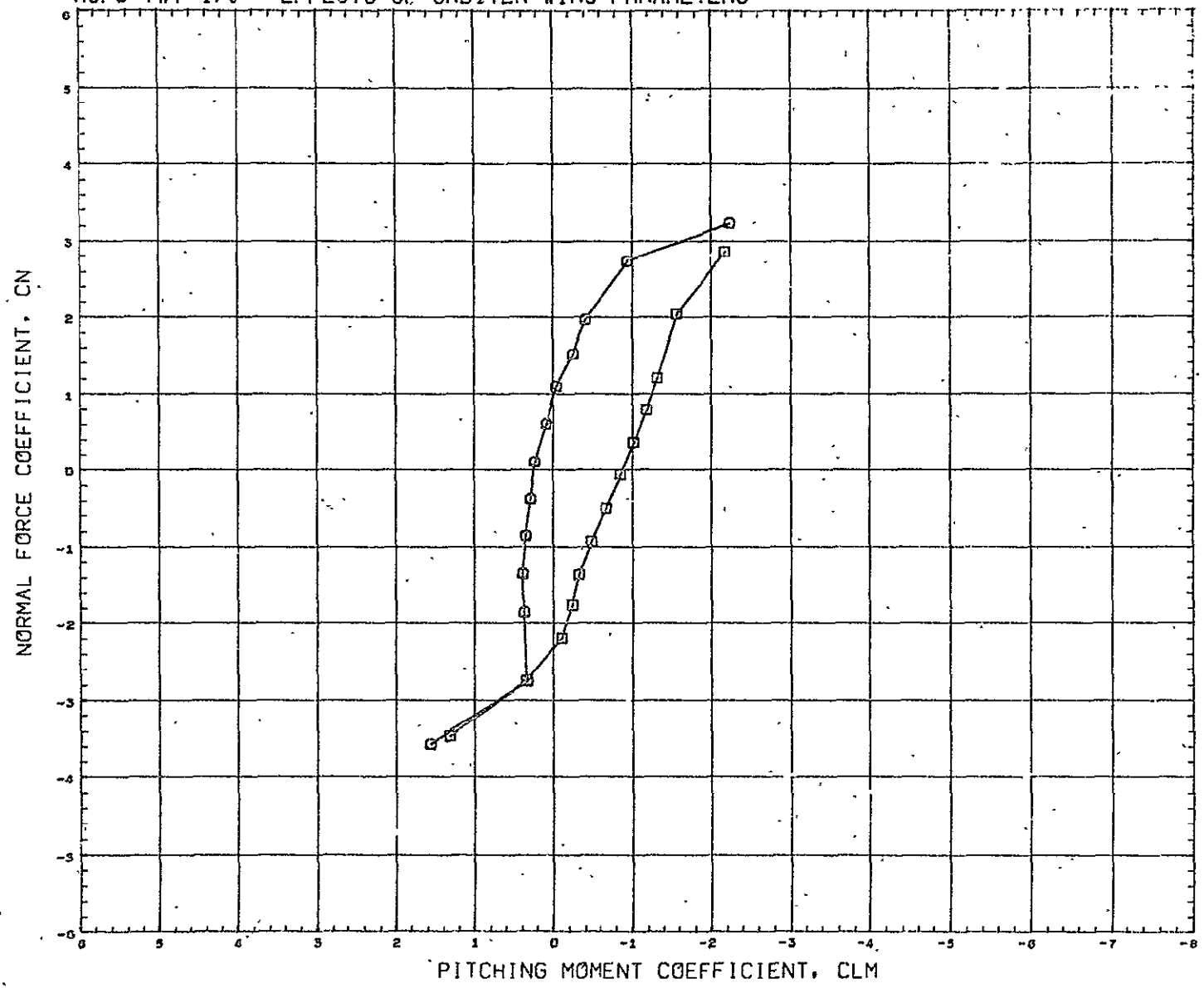
| | | | | | |
|---|---|---|---|---|---|
| BETA | - 0.050 | ORBINC | - 1.050 | | |
| WNGINC | 4.000 | HTAIL | 0.000 | | |
| PHIB | 0.000 | | | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MACH 1.967

MSFC TWT 470 EFFECTS OF ORBITER WING PARAMETERS




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (D24081) | O | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |
| (D24161) | □ | TWT470 S-IC/GAC ORBITER BF1OW1HVS WING SPOILERS |

PARAMETRIC VALUES

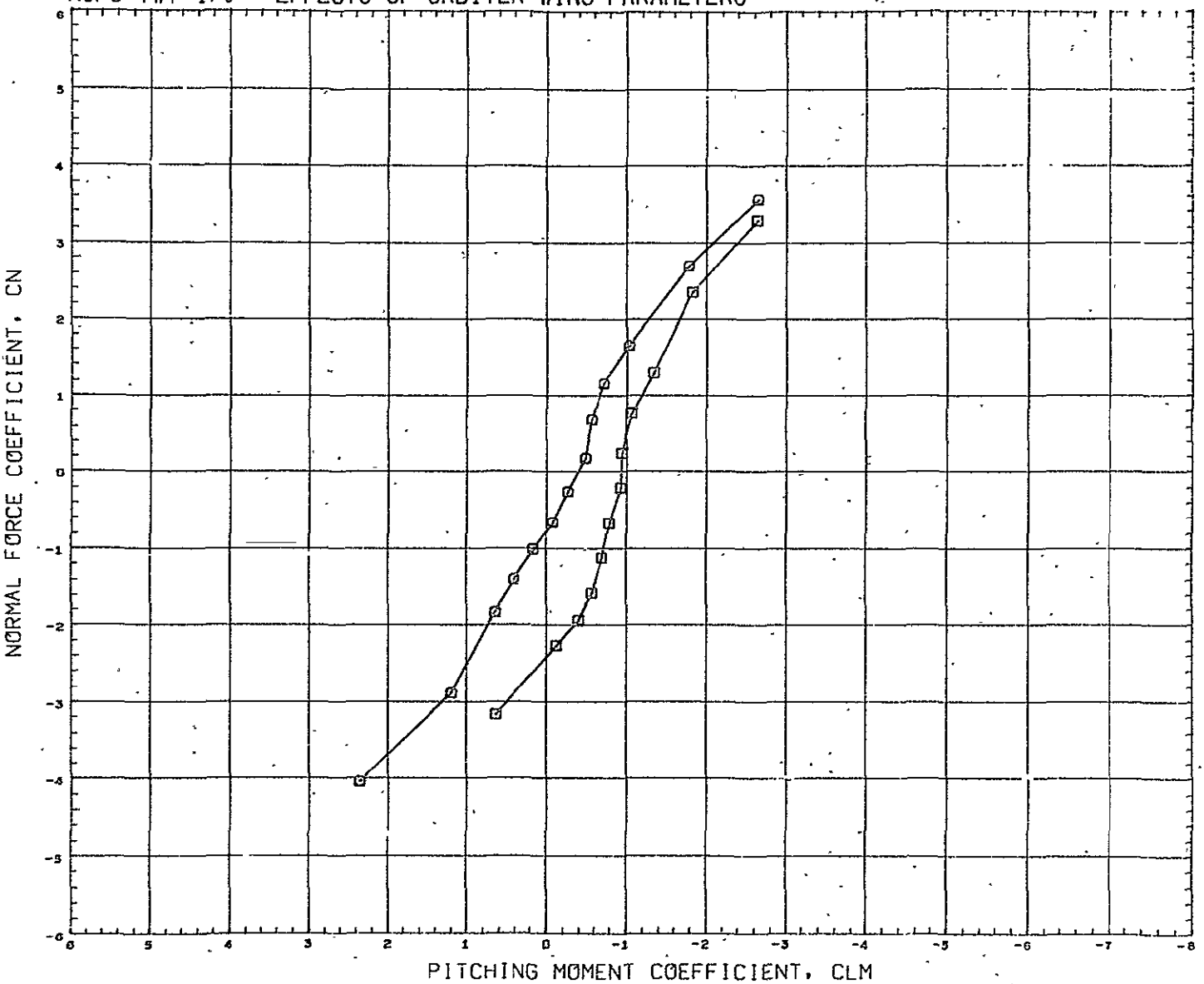
| | | | | | |
|---|---|---|---|---|---|
| BETA | - | 0.050 | ORBINC - | 1.050 | |
| WNGINC | | 4.000 | HTAIL | 0.000 | |
| PHIB | | 0.000 | | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MACH 0.599

MSFC TWT 470 EFFECTS OF ORBITER WING PARAMETERS




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (D24081) | ☐ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |
| (D24161) | ☐ | TWT47D S-IC/GAC ORBITER BF1OW1HVS WING SPOILERS |

PARAMETRIC VALUES

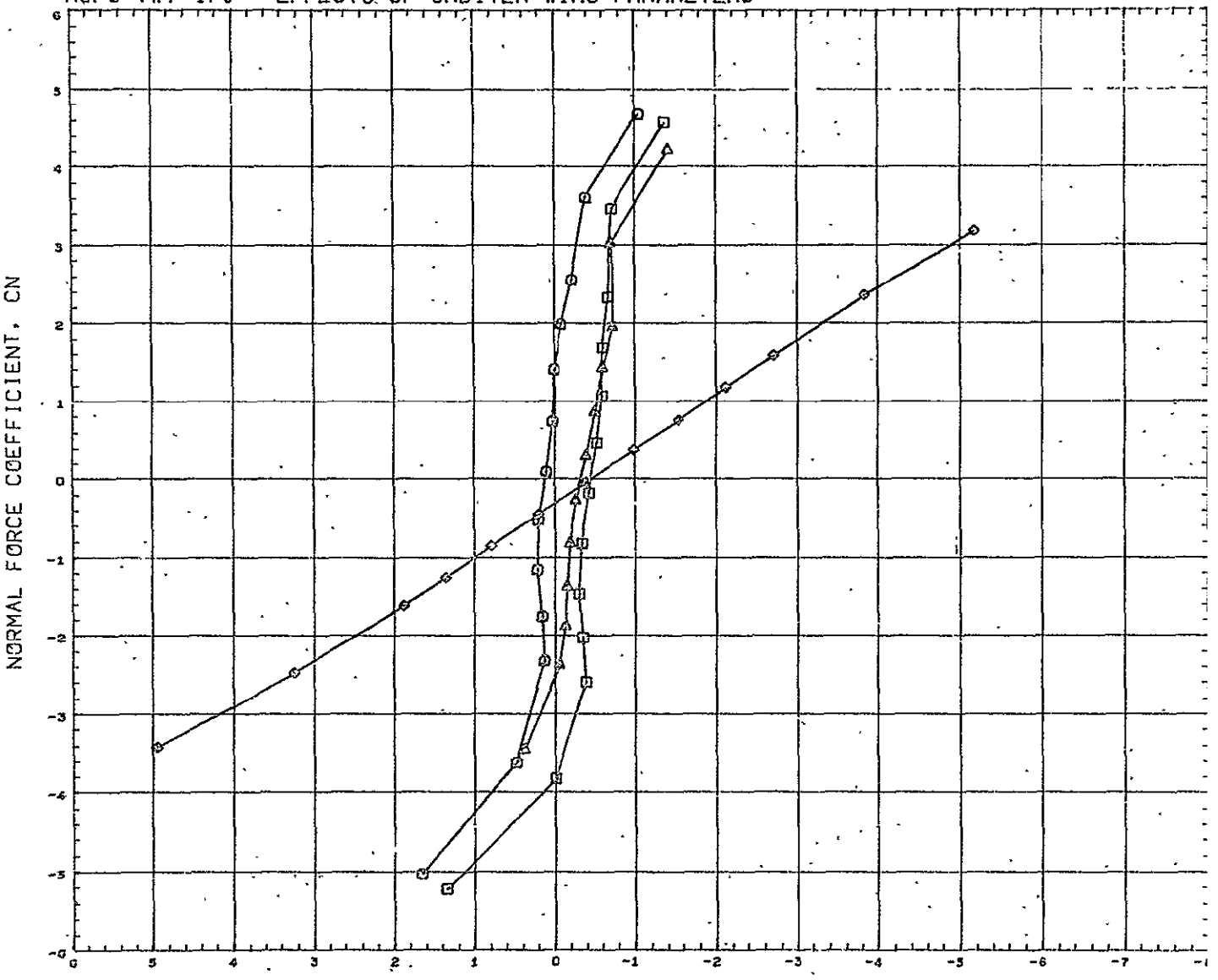
| | | | | | |
|---|---|---|---|---|---|
| BETA | - 0.050 | ORBINC - | 1.050 | | |
| WNGINC | 4.000 | HTAIL | 0.000 | | |
| PHIB | 0.000 | | | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MACH 0.899

# MSFC TWT 470 EFFECTS OF ORBITER WING PARAMETERS




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (E24001) | ○ | TWT470 S-IC/GAC ORBITER BF1OHVS BASIC |
| (E24141) | □ | TWT470 S-IC/GAC ORBITER BF1OWHVS WING INC = 2 |
| (E24111) | ◇ | TWT470 S-IC/GAC ORBITER BF1OHVS WING OFF |
| (E24161) | △ | TWT470 S-IC/GAC ORBITER BF1OWIHVS WING SPOILERS |

MACH 0.997

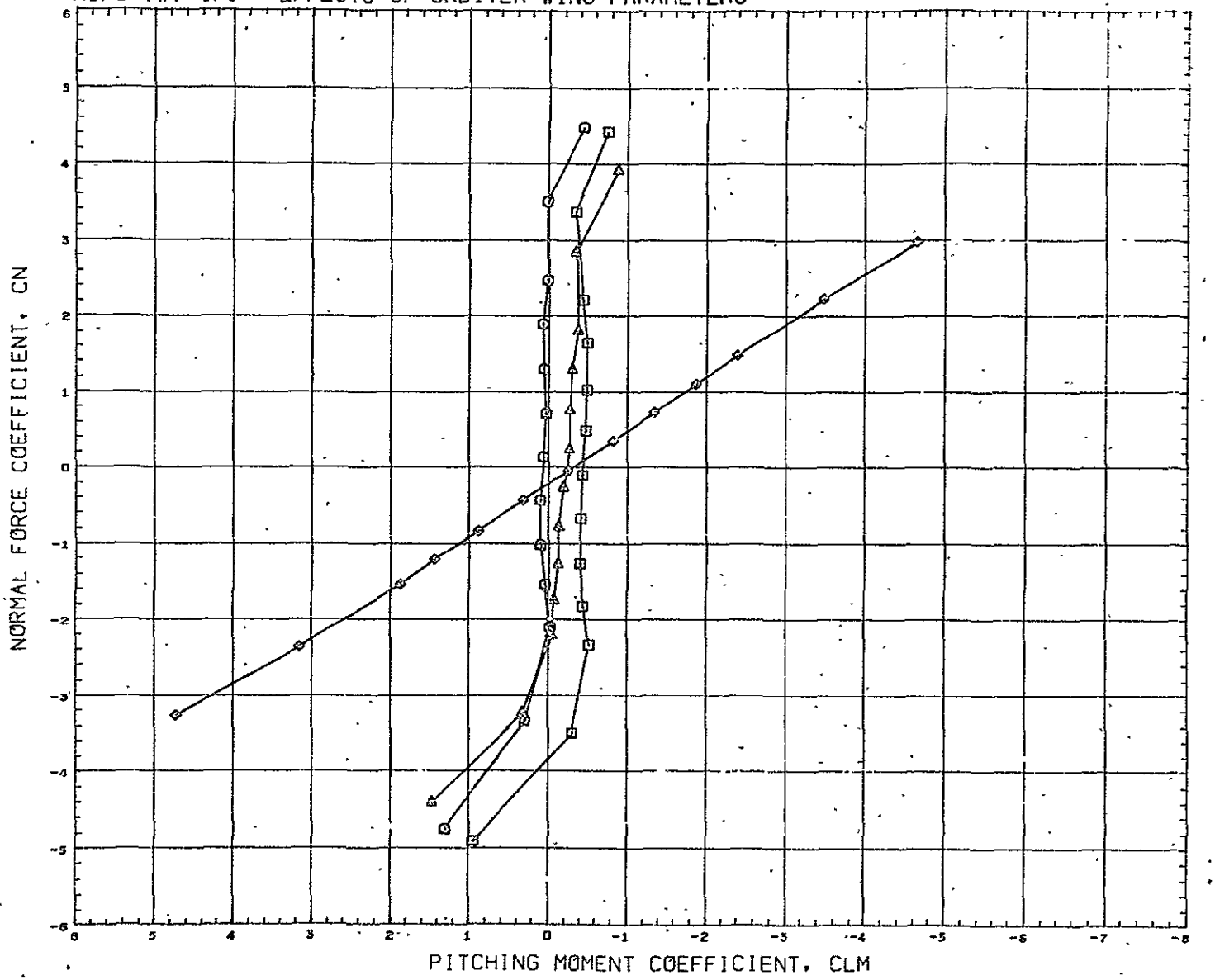
PARAMETRIC VALUES

| | | | | | |
|---|---|---|---|---|---|
| BETA | - | 0.050 | ORBINC - | 1.050 |
| WNGINC | | 4.000 | HTAIL | 0.000 |
| PHIB | | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

# MSFC TWT 470 EFFECTS OF ORBITER WING PARAMETERS




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (E24081) | ○ | TWT470 S-IC/GAC ORBITER BF1OHVS BASIC |
| (E24141) | □ | TWT470 S-IC/GAC ORBITER BF1OWHVS WING INC = 2 |
| (E24111) | ◇ | TWT470 S-IC/GAC ORBITER BF1OHVS WING OFF |
| (E24161) | △ | TWT470 S-IC/GAC ORBITER BF1OWIHVS WING SPOILERS |

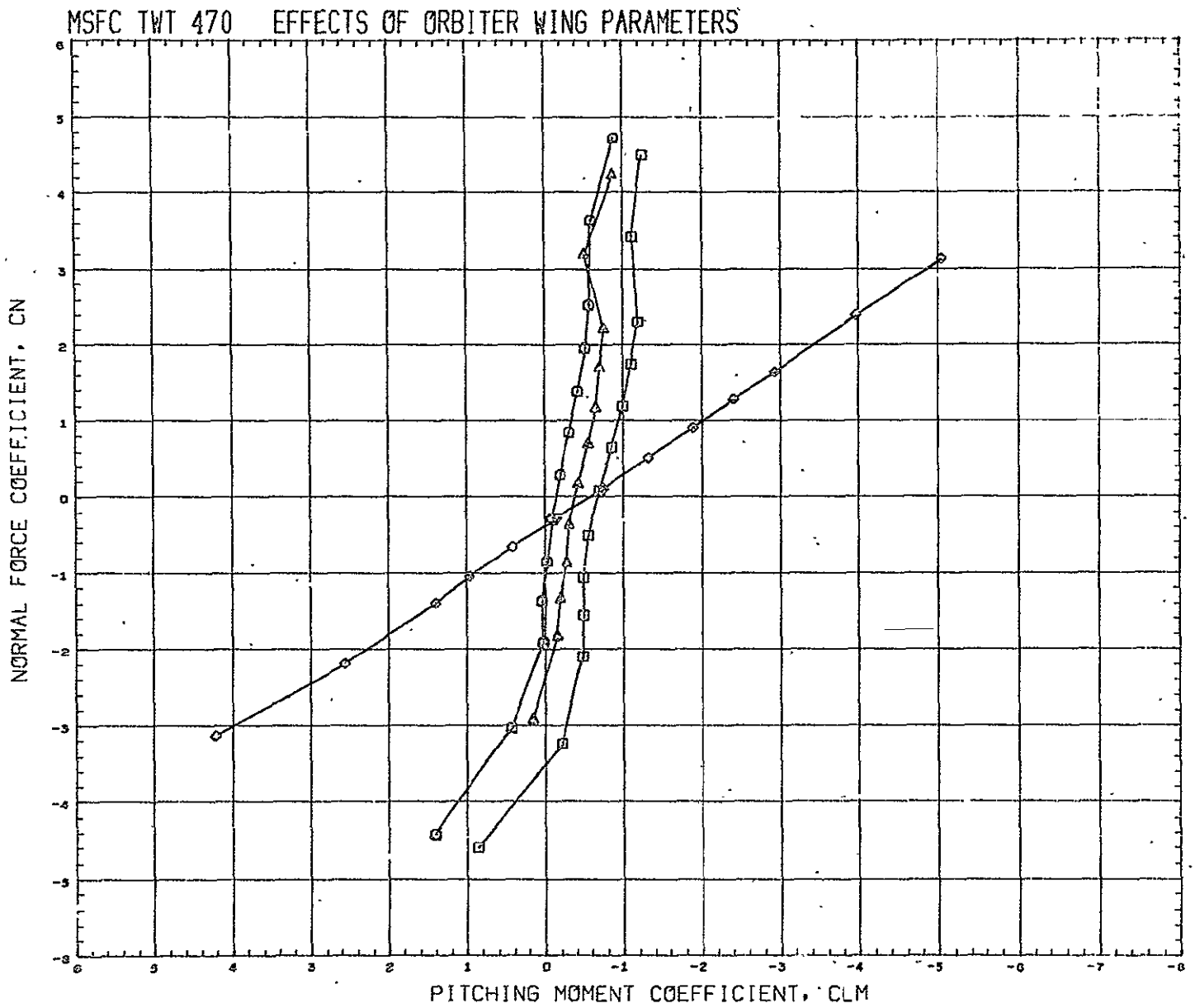
PARAMETRIC VALUES

| | | | | | |
|---|---|---|---|---|---|
| BETA | - 0.050 | ORBINC - | 1.050 | | |
| WNGINC | 4.000 | HTAIL | 0.000 | | |
| PHIB | 0.000 | | | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MACH - 1.095

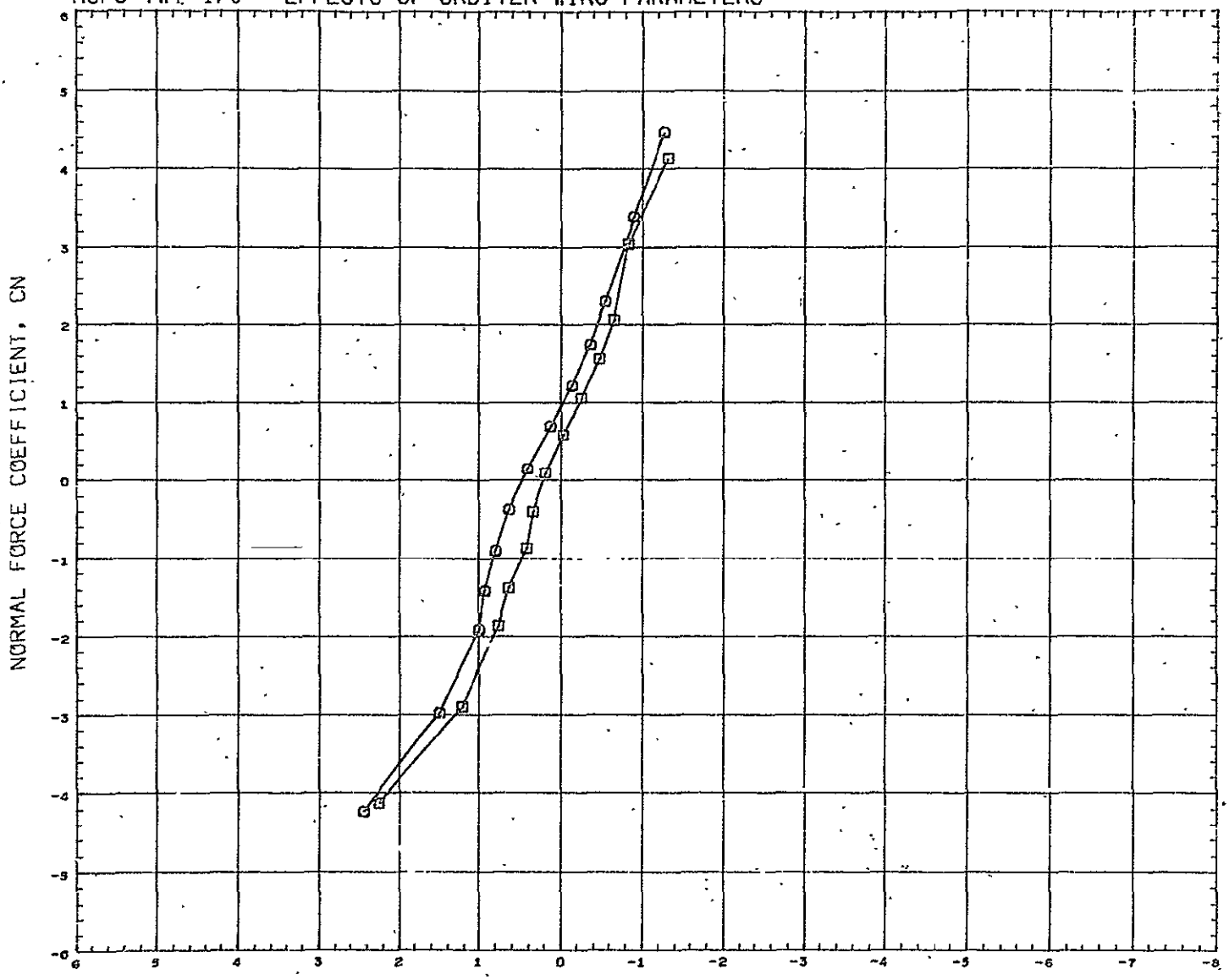



| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (E24081) | ○ | TWT470 S-IC/GAC ORBITER BF1OHVS BASIC |
| (E24141) | □ | TWT470 S-IC/GAC ORBITER BF1OWHVS WING INC = 2 |
| (E24111) | ◇ | TWT470 S-IC/GAC ORBITER BF1OHVS WING OFF |
| (E2416I) | △ | TWT470 S-IC/GAC ORBITER BF1OWIHVS WING SPOILERS |

MACH 1.195

| PARAMETRIC VALUES | | | | REFERENCE INFORMATION | | |
|---|---|---|---|---|---|---|
| BETA | 0.050 | ORBINC | 1.050 | REFS | 1.3960 | SQ.IN. |
| WNGINC | 4.000 | HTAIL | 3.000 | REFL | 1.3330 | INCHES |
| PHIB | 0.000 | | | REFB | 1.3330 | INCHES |
| | | | | XMRP | 5.2640 | INCHES |
| | | | | YMRP | 0.0000 | INCHES |
| | | | | ZMRP | 0.0000 | INCHES |
| | | | | SCALE | 0.3366 | PERCN |

MSFC TWT 470 EFFECTS OF ORBITER WING PARAMETERS




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (F24081) | ○ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |
| (F24161) | □ | TWT470 S-IC/GAC ORBITER BF1OW1HVS WING SPOILERS |

PARAMETRIC VALUES

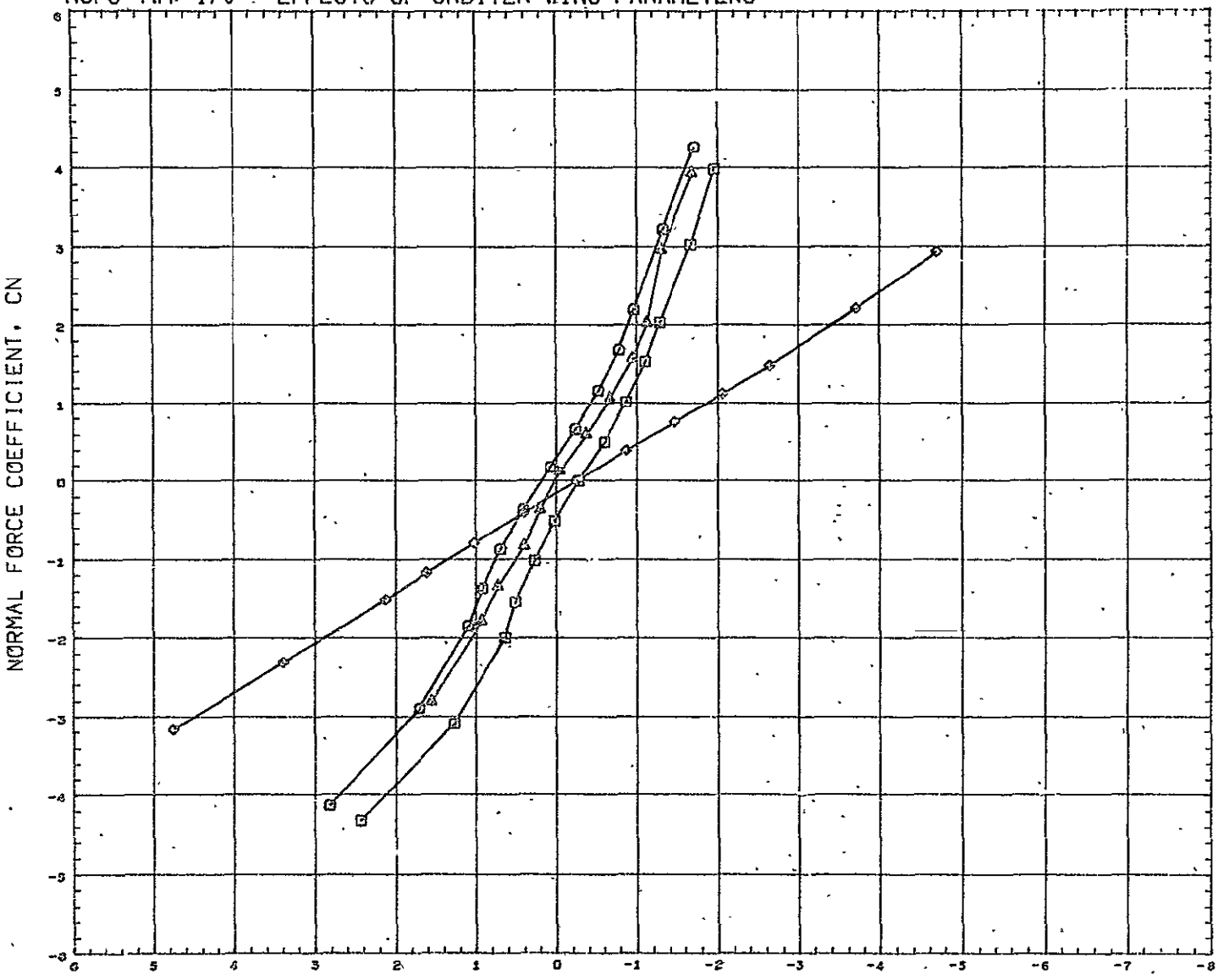
| | | | | | |
|---|---|---|---|---|---|
| BETA | - 0.050 | ORBINC - | 1.050 | | |
| WNGINC | 4.000 | HTAIL | 0.000 | | |
| PHIB | 0.000 | | | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MACH 1.303

MSFC TWT 470 . EFFECTS OF ORBITER WING PARAMETERS




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (G24U61) | ○ | TWT470 S-IC/GAC ORBITER BF10WHVS BASIC |
| (G24161) | □ | TWT470 S-IC/GAC ORBITER BF10WHVS WING INC = 2 |
| (G24111) | ◇ | TWT470 S-IC/GAC ORBITER BF10HVS WING OFF |
| (G24161) | △ | TWT470 S-IC/GAC ORBITER BF10WIHVS WING SPOILERS |

MACH 1.456

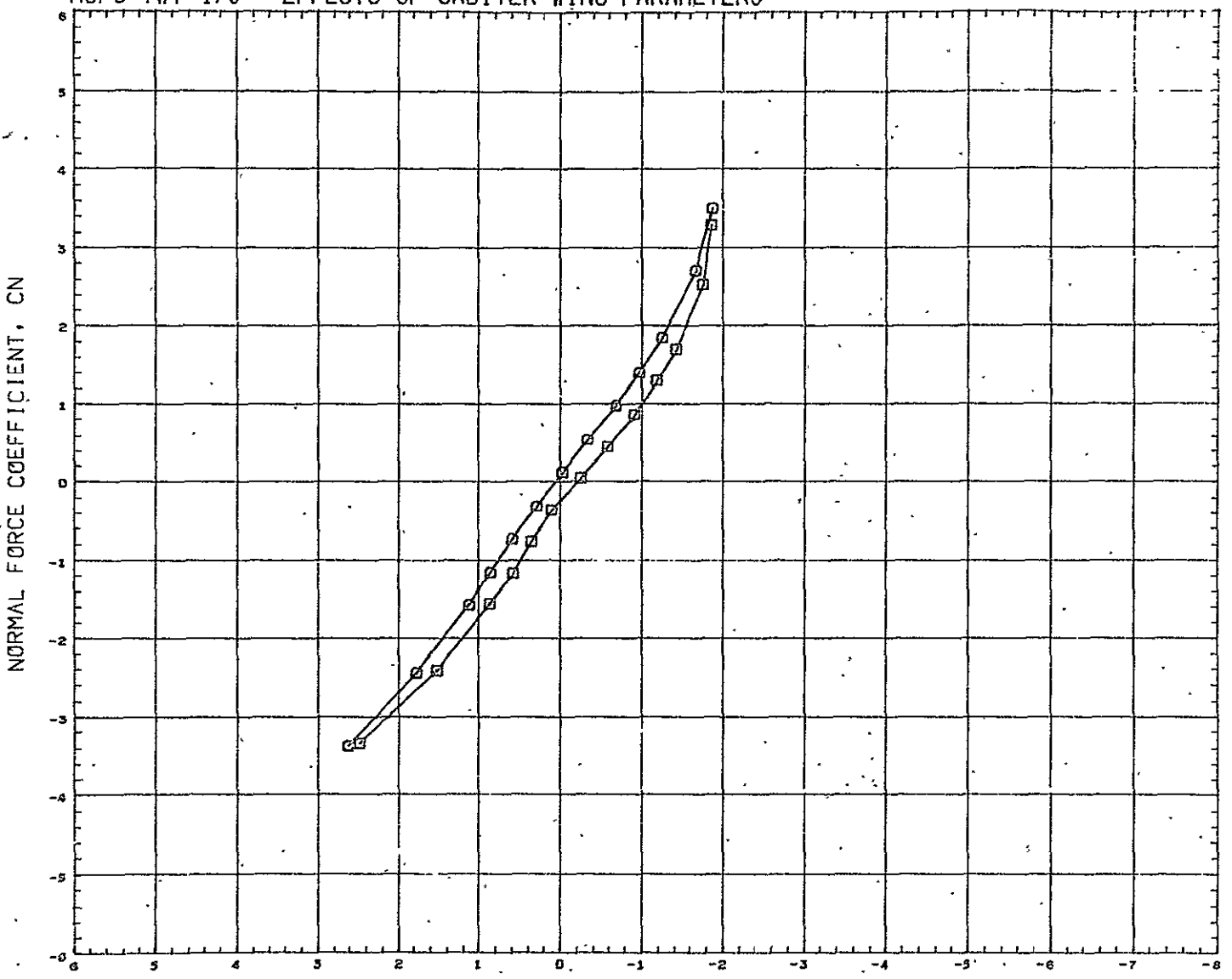
PARAMETRIC VALUES

| | | | | | |
|---|---|---|---|---|---|
| BETA | - 0.050 | ORBINC - | 1.050 | | |
| WNGINC | 4.000 | HTAIL | 0.000 | | |
| PHIB | 0.000 | | | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF ORBITER WING PARAMETERS




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (524081) | ○ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |
| (524151) | □ | TWT470 S-IC/GAC ORBITER BF1OWIHVS WING SPOILERS |

PARAMETRIC VALUES

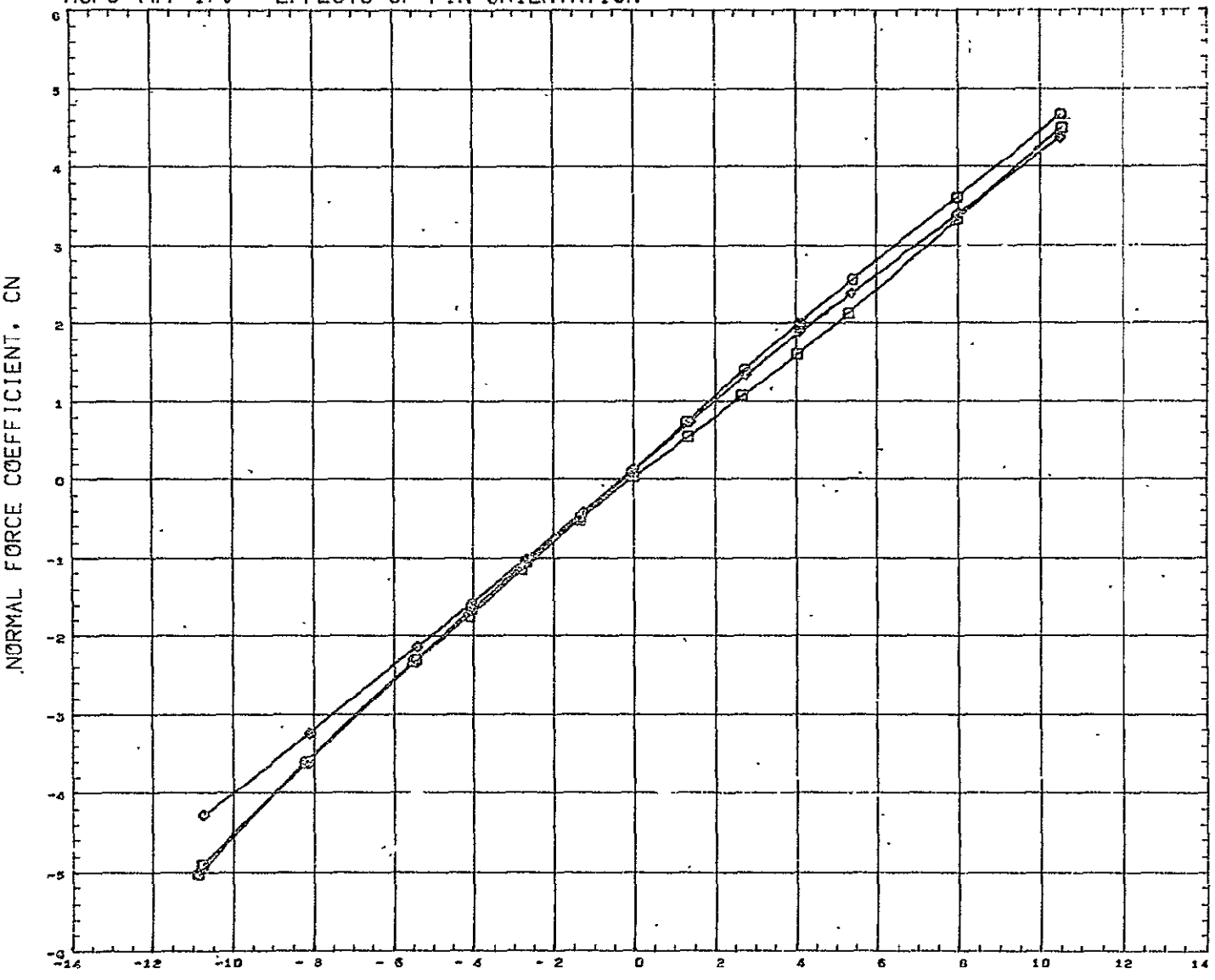
| | | | |
|---|---|---|---|
| BETA | 0.050 | ORBINC | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MACH 1.967

MSFC TWT 470 EFFECTS OF FIN ORIENTATION




| DATA SET SYMBOL | | CONFIGURATION DESCRIPTION |
|---|---|---|
| (T24061) | ○ | TWT47D S-IC/GAC ORBITER BF1OWHVS BASIC |
| (A24121) | □ | TWT47D S-IC/GAC ORBITER BF2OWHVS PHIB = 45 |
| (A24131) | ◇ | TWT47D S-IC/GAC ORBITER BF2OWHVS PHIB = 0 |

MACH 0.997

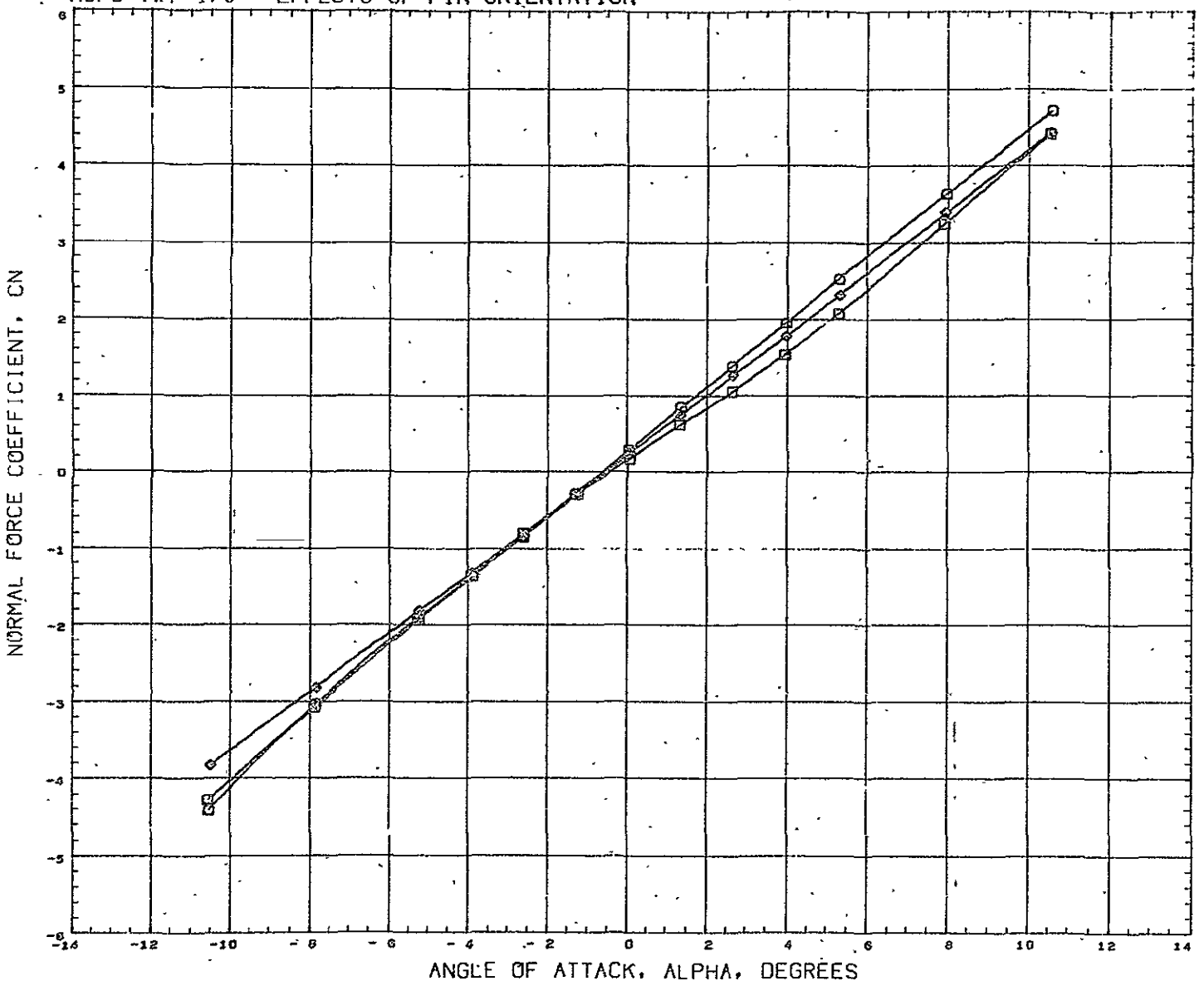
PARAMETRIC VALUES

| | | | |
|---|---|---|---|
| BETA | 0.050 | ORBINC | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF FIN ORIENTATION




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (T24D51) | ○ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |
| (A24121) | □ | TWT470 S-IC/GAC ORBITER BF2OWHVS PHIB = 45 |
| (A24131) | ◇ | TWT470 S-IC/GAC ORBITER BF2OWHVS PHIB = 0 |

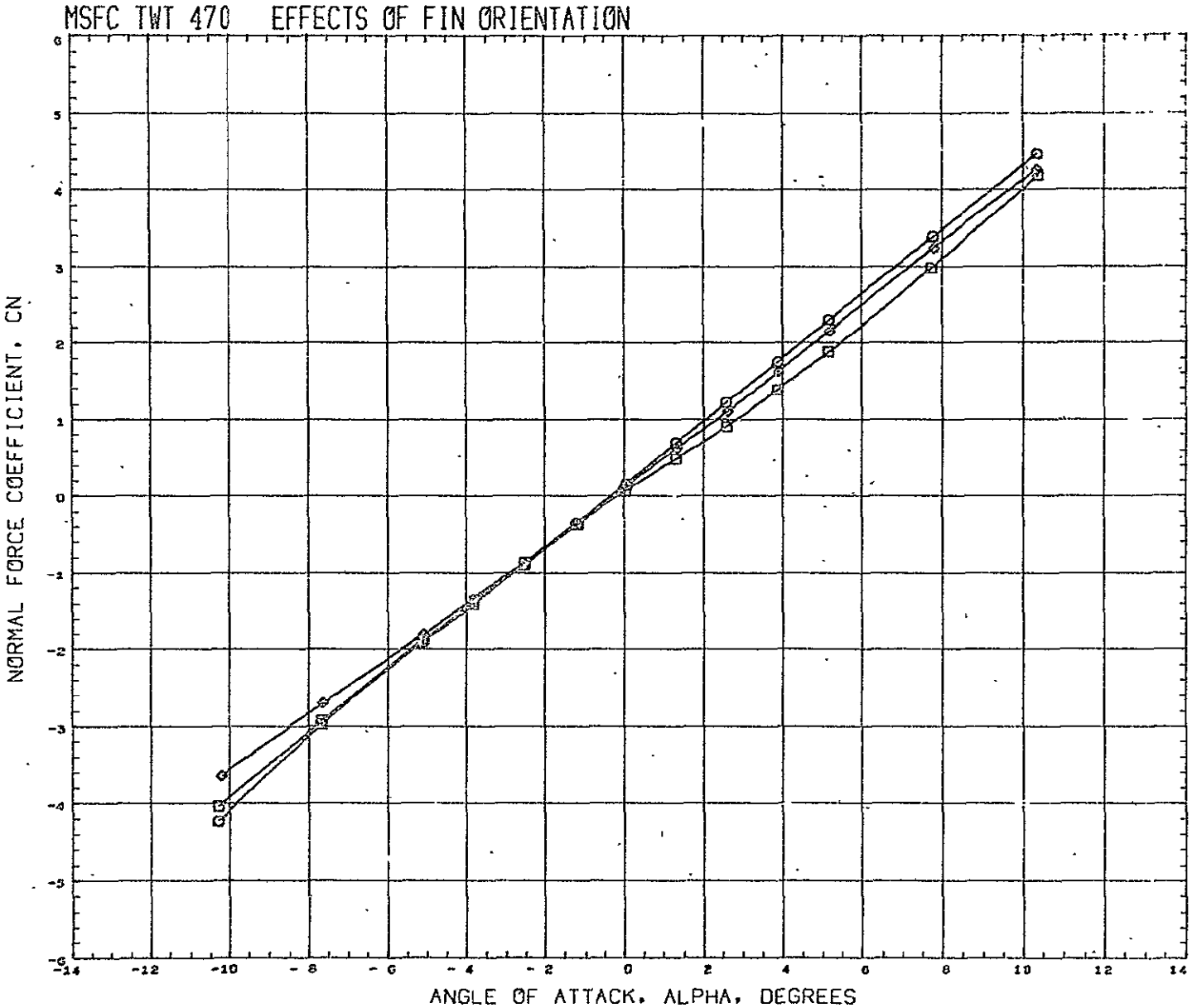
PARAMETRIC VALUES

| | | | | | |
|---|---|---|---|---|---|
| BETA | - 0.050 | ORBINC | - 1.050 | | |
| WNGINC | 4.000 | HTAIL | 0.000 | | |
| PHIB | 0.000 | | | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MACH 1.195




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (T24081) | ○ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |
| (A24121) | □ | TWT470 S-IC/GAC ORBITER BF2OWHVS PHIB = 45 |
| (A24131) | ◇ | TWT470 S-IC/GAC ORBITER BF2OWHVS PHIB = 0 |

MACH 1.303

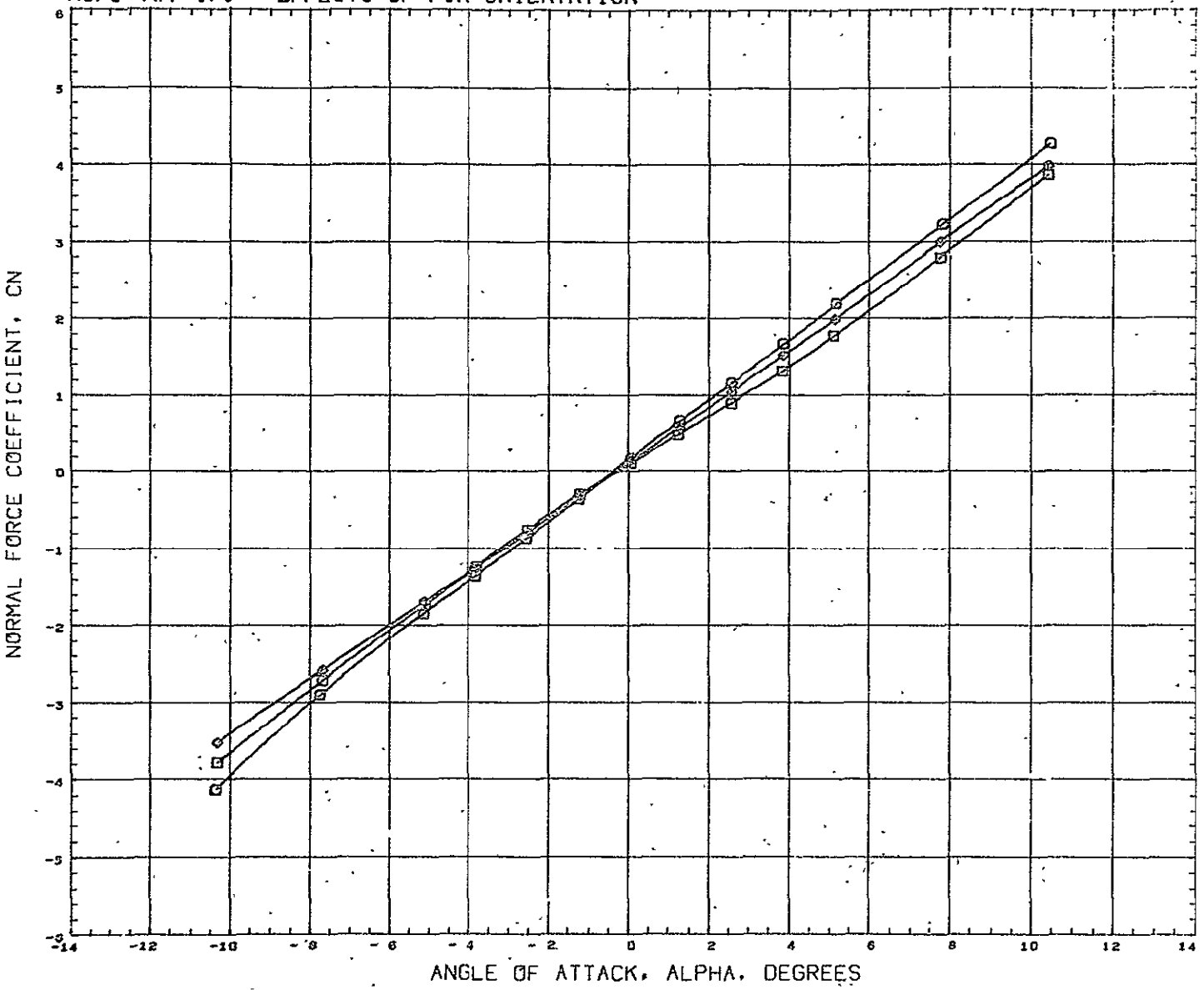
PARAMETRIC VALUES

| | | | | | |
|---|---|---|---|---|---|
| BETA | - 0.050 | ORBINC - | 1.050 | | |
| WNGINC | 4.000 | HTAIL | 0.000 | | |
| PHIB | 0.000 | | | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF FIN ORIENTATION



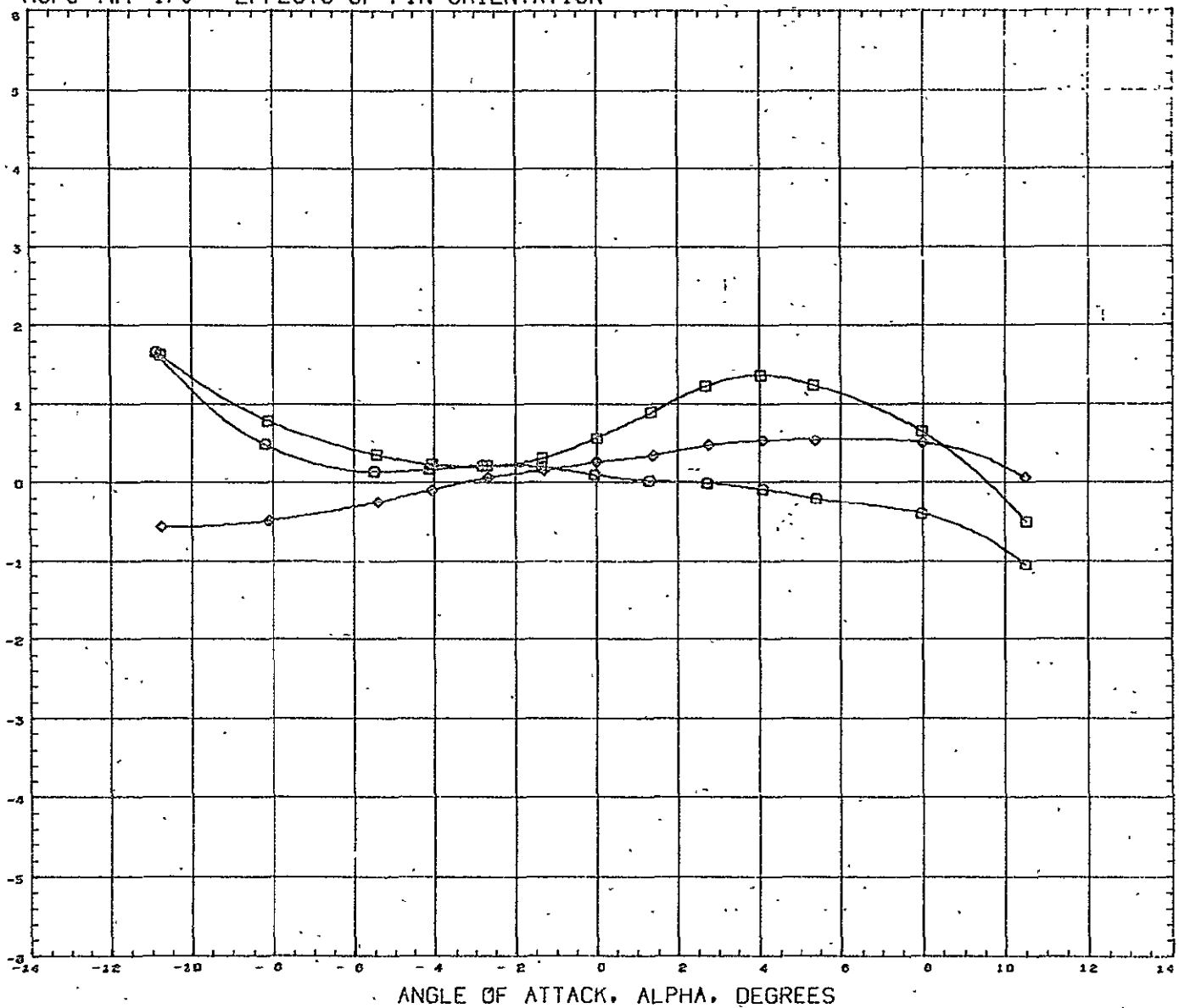

| DATA SET SYMBOL | | CONFIGURATION DESCRIPTION |
|---|---|---|
| (T24081) | ○ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |
| (A24121) | □ | TWT470 S-IC/GAC ORBITER BF2OWHVS PHIB = 45 |
| (A24131) | ◇ | TWT470 S-IC/GAC ORBITER BF2OWHVS PHIB = 0 |

MACH 1.456

| PARAMETRIC VALUES | | | |
|---|---|---|---|
| BETA | 0.050 | ORBINC | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF FIN ORIENTATION




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (T24081) | ○ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |
| (A24121) | □ | TWT470 S-IC/GAC ORBITER BF2OWHVS PHIB = 45 |
| (A24131) | ◇ | TWT470 S-IC/GAC ORBITER BF2OWHVS PHIB = 0 |

MACH 0.997

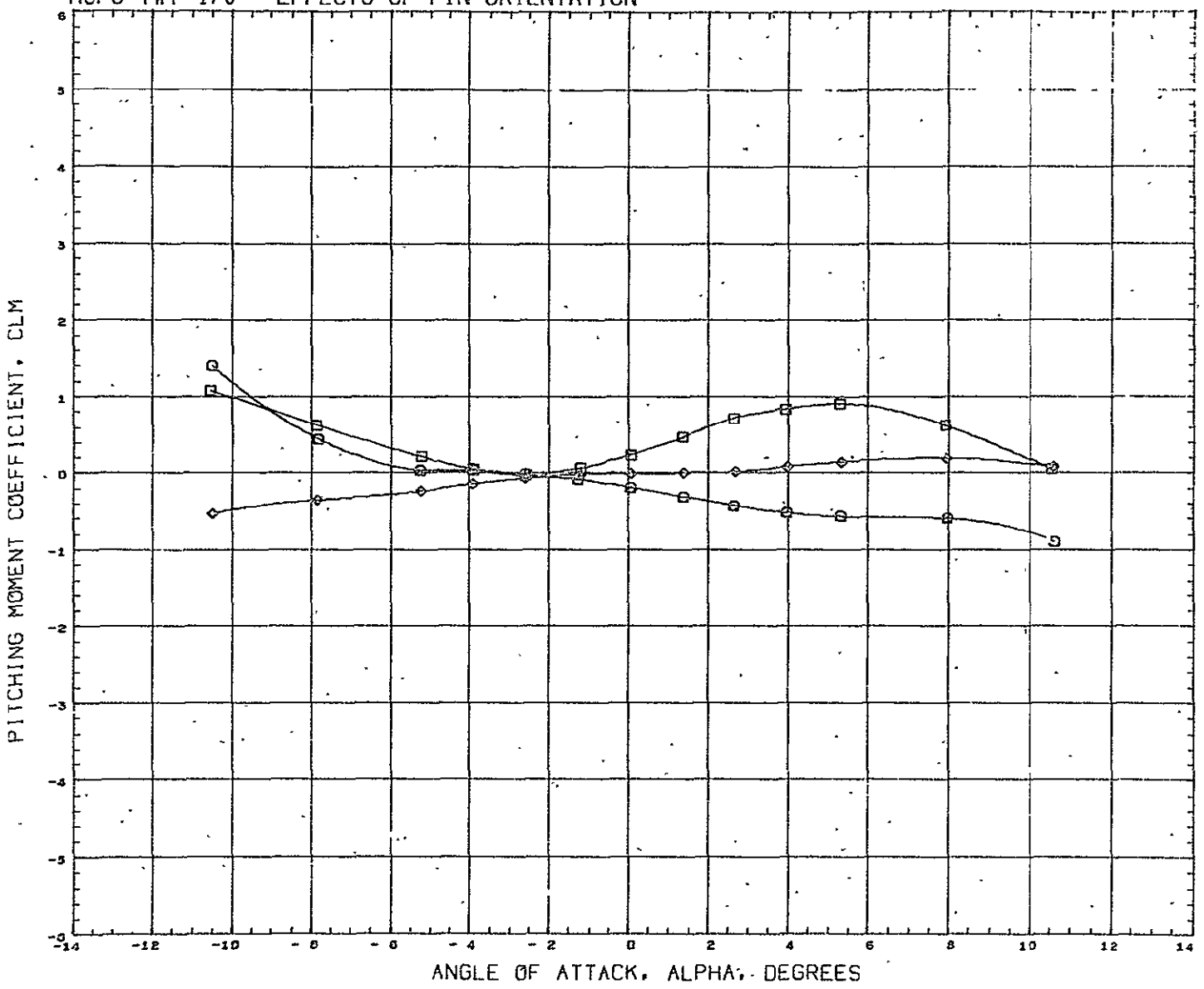
PARAMETRIC VALUES

| | | | |
|---|---|---|---|
| BETA | 0.050 | ORBINC | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

# MSFC TWT 470 EFFECTS OF FIN ORIENTATION




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (T24001) | ○ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |
| (A24121) | □ | TWT470 S-IC/GAC ORBITER BF2OWHVS PHIB = 45 |
| (A24131) | ◇ | TWT470 S-IC/GAC ORBITER BF2OWHVS PHIB = 0 |

MACH 1.195

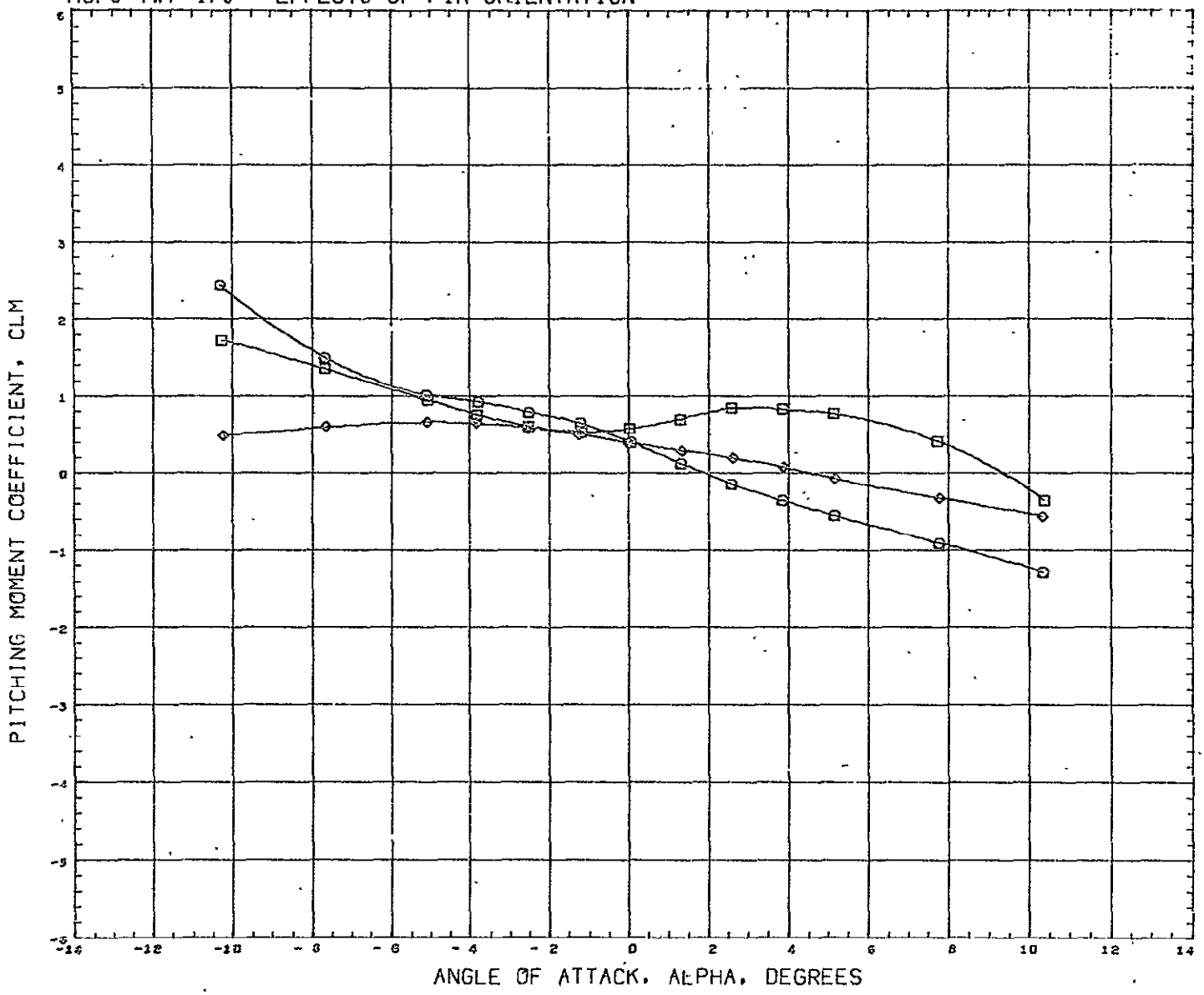
PARAMETRIC VALUES

| | | | |
|---|---|---|---|
| BETA | 0.050 | ORBINC | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF FIN ORIENTATION




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (T24081) | ○ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |
| (A24121) | □ | TWT470 S-IC/GAC ORBITER BF2OWHVS PHIB = 45 |
| (A24131) | ◇ | TWT470 S-IC/GAC ORBITER BF2OWHVS PHIB = 0 |

MACH 1.303

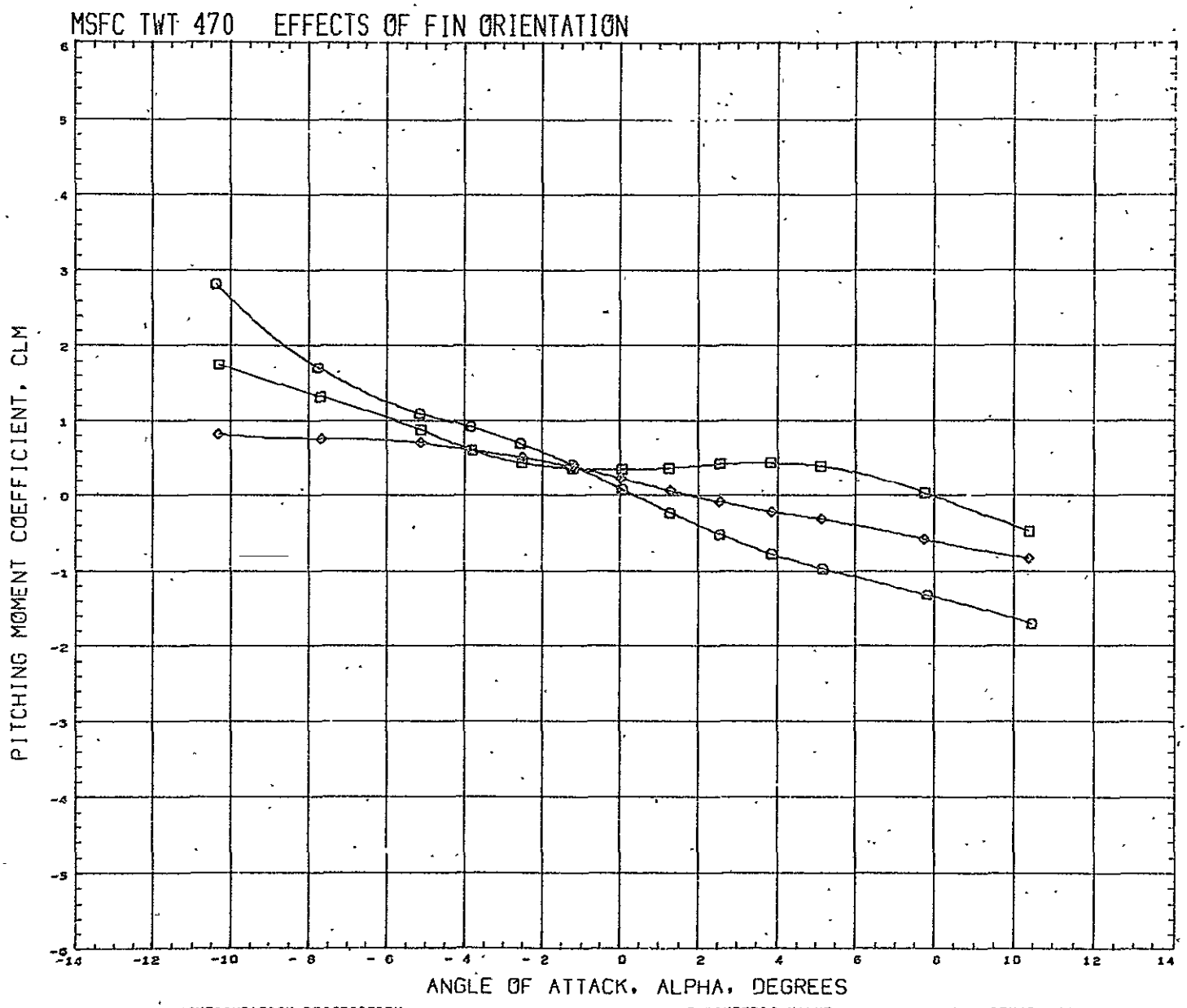
PARAMETRIC VALUES

| | | | | | |
|---|---|---|---|---|---|
| BETA | - 0.050 | ORBINC - | 1.030 | | |
| WNGINC | 4.000 | HTAIL | 0.000 | | |
| PHIB | 0.000 | | | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF FIN ORIENTATION




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (T24081) | ○ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |
| (A24121) | □ | TWT470 S-IC/GAC ORBITER BF2OWHVS PHIB = 45 |
| (A24131) | ◇ | TWT470 S-IC/GAC ORBITER BF2OWHVS PHIB = 0 |

MACH 1.456

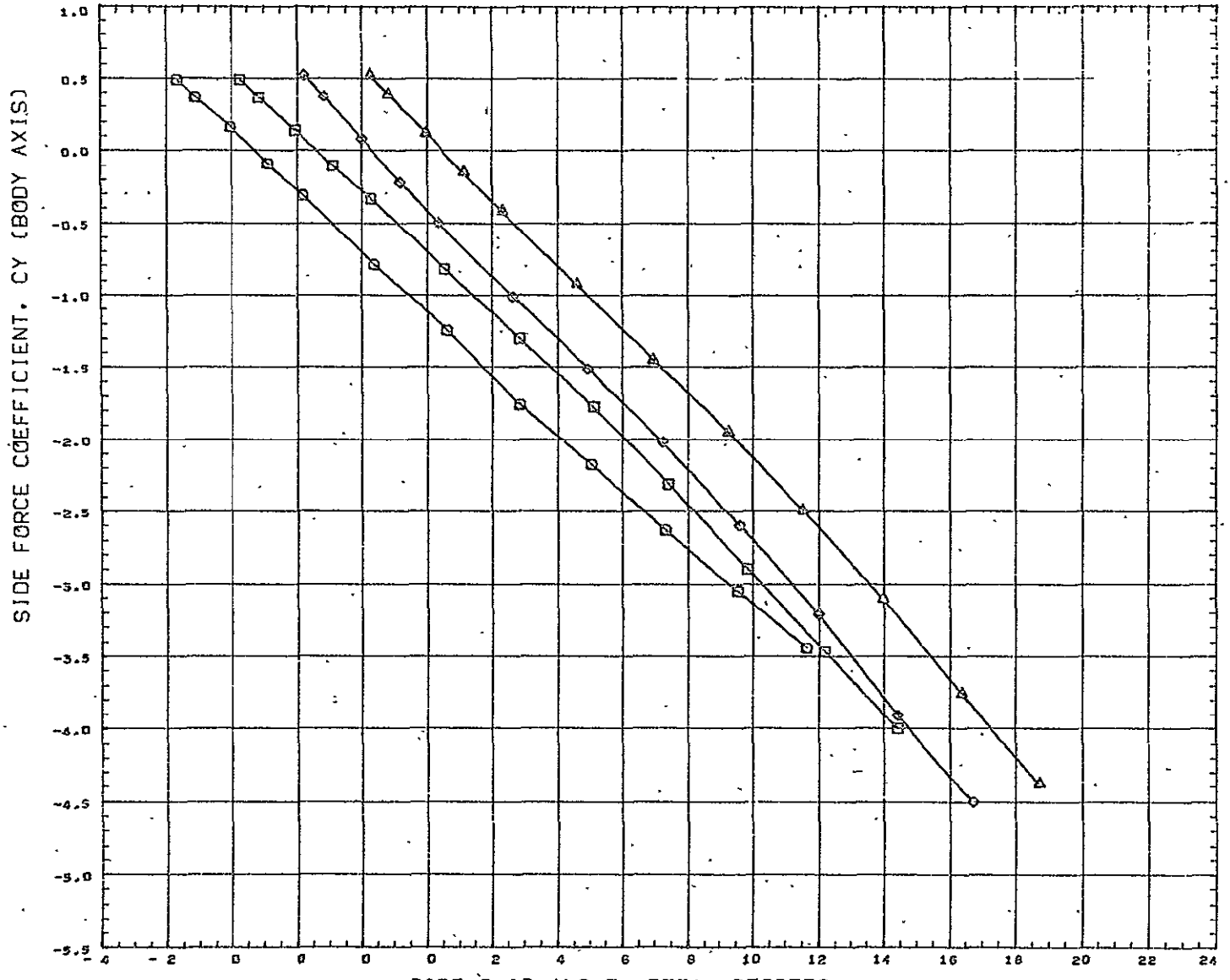
PARAMETRIC VALUES

| | | | |
|---|---|---|---|
| BETA | - 0.050 | ORBINC | - 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LATERAL-DIRECTIONAL CHARACTERISTICS, BASIC CONFIGURATION

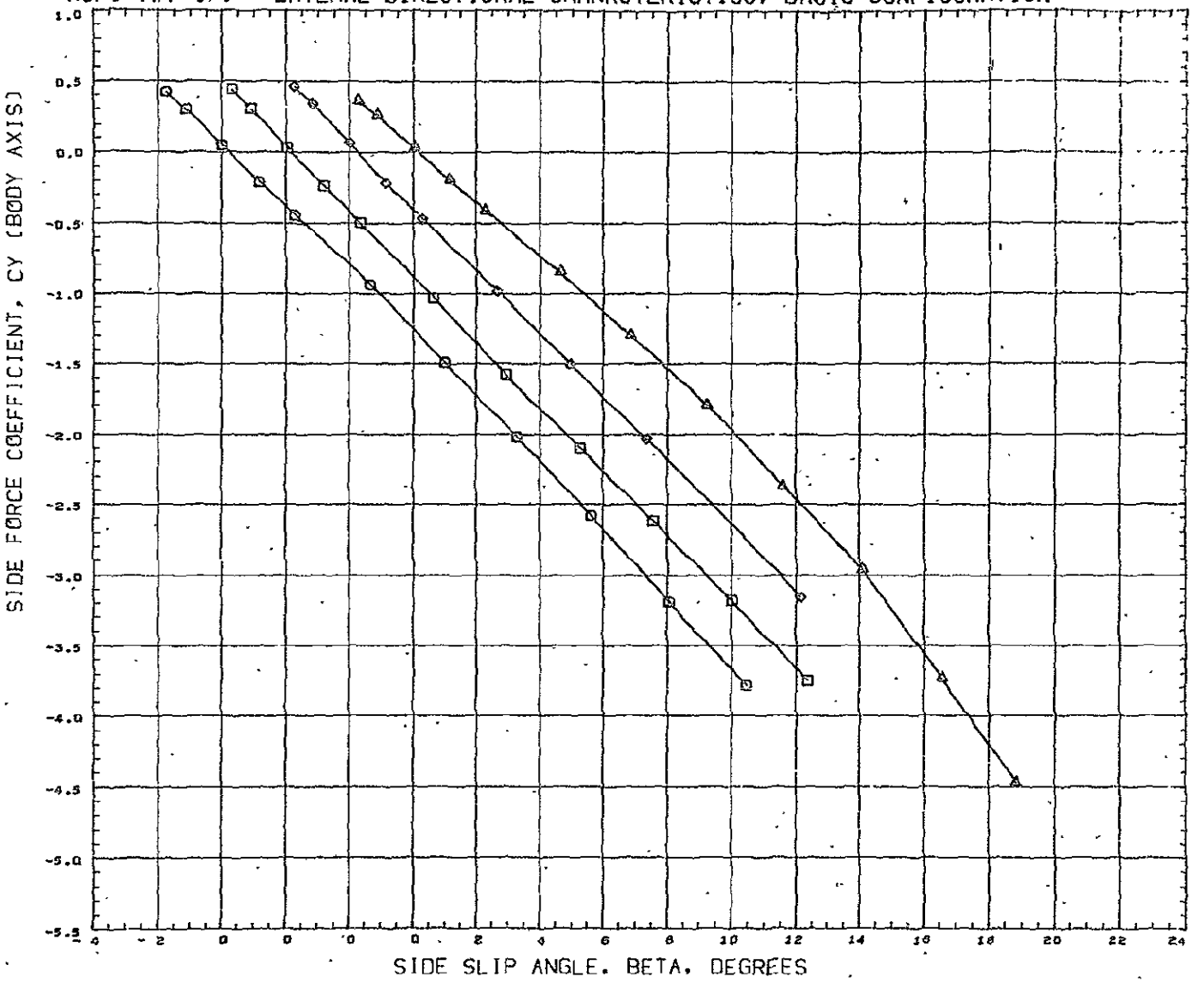



| SYMBOL | MACH | | PARAMETRIC VALUES | | |
|---|---|---|---|---|---|
| ○ | 0.596 | ALPHA | 0.360 | ORBINC - | 1.050 |
| □ | 0.691 | WNGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 0.997 | PHIB | 0.000 | | |
| △ | 1.093 | | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LATERAL-DIRECTIONAL CHARACTERISTICS, BASIC CONFIGURATION

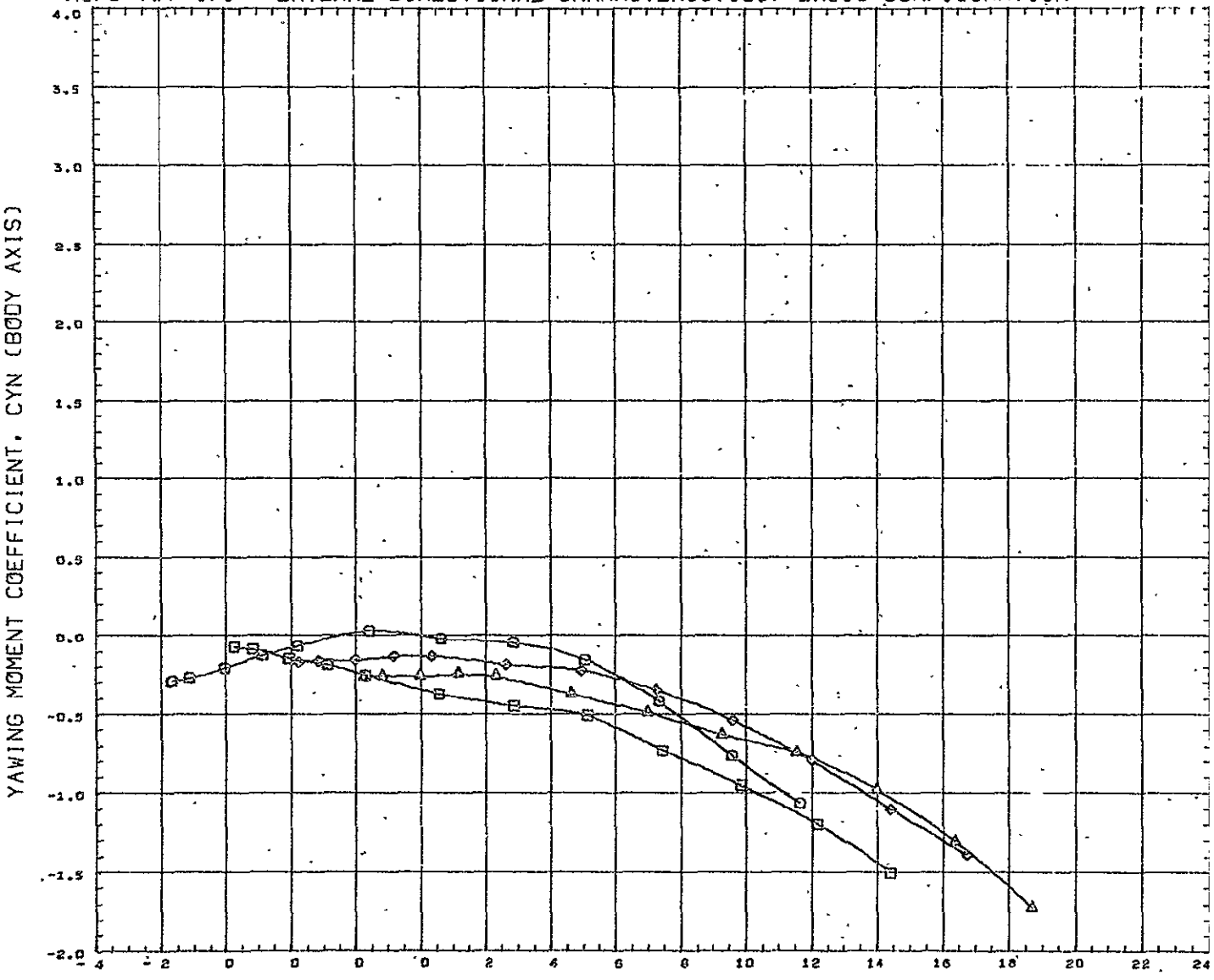



| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 1.196 | ALPHA | 0.360 | ORBINC | - 1.050 | |
| □ | 1.299 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 1.459 | PHIB | 0.000 | | | |
| △ | 1.954 | | | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3386 | PERCNT |

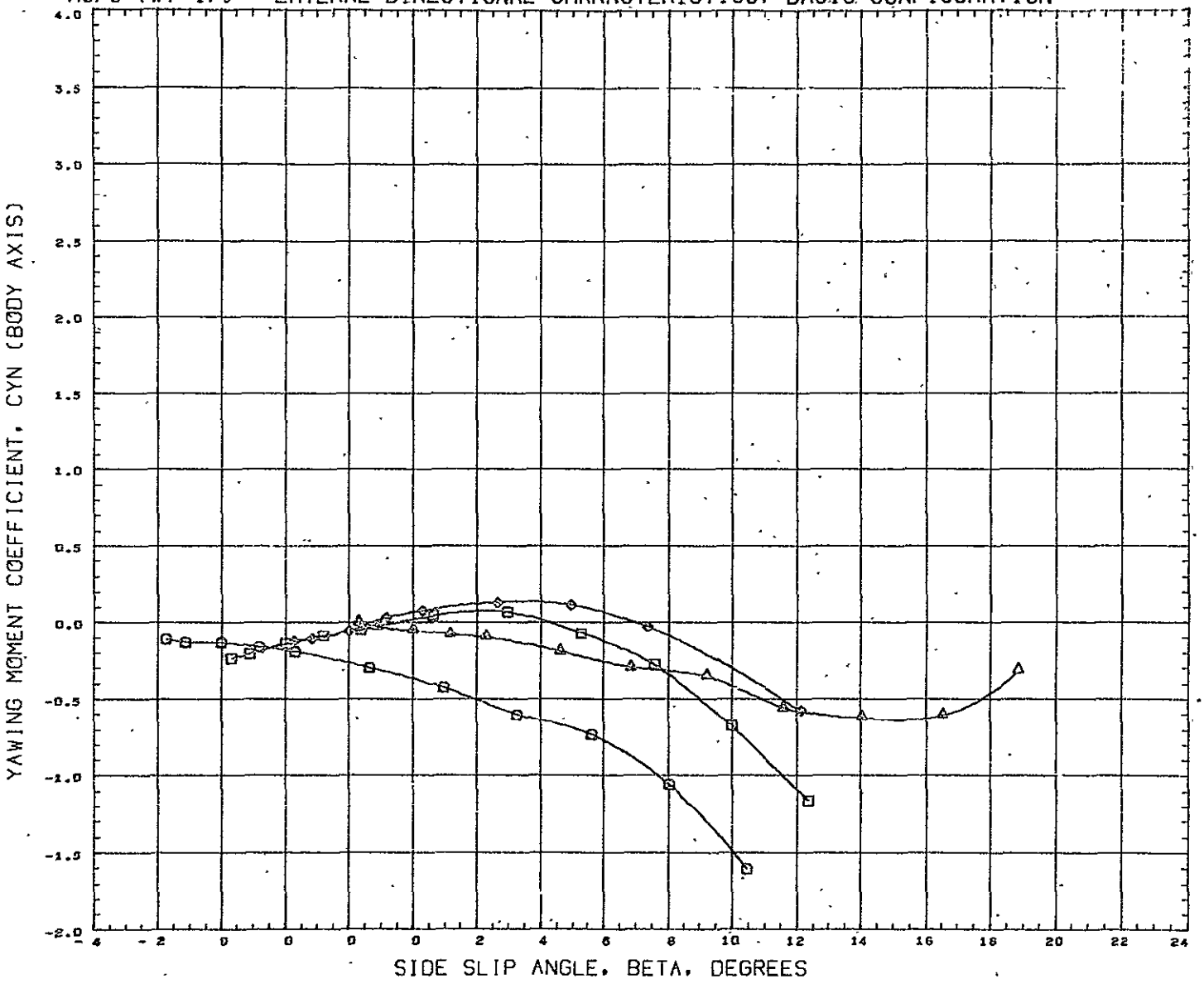
MSFC TWT 470 LATERAL-DIRECTIONAL CHARACTERISTICS, BASIC CONFIGURATION




| SYMBOL | MACH | PARAMETRIC VALUES | | | | REFERENCE INFORMATION | | |
|---|---|---|---|---|---|---|---|---|
| ○ | 0.596 | ALPHA | 0.360 | ORBINC | - 1.050 | REFS | 1.3960 | SQ.IN. |
| □ | 0.891 | WNGINC | 4.000 | HTAIL | 0.000 | REFL | 1.3330 | INCHES |
| ◇ | 0.997 | PHIB | 0.000 | | | REFB | 1.3330 | INCHES |
| △ | 1.093 | | | | | XMRP | 5.2640 | INCHES |
| | | | | | | YMRP | 0.0000 | INCHES |
| | | | | | | ZMRP | 0.0000 | INCHES |
| | | | | | | SCALE | 0.3366 | PERCNT |

REFERENCE FILE

MSFC TWT 470 LATERAL-DIRECTIONAL CHARACTERISTICS, BASIC CONFIGURATION

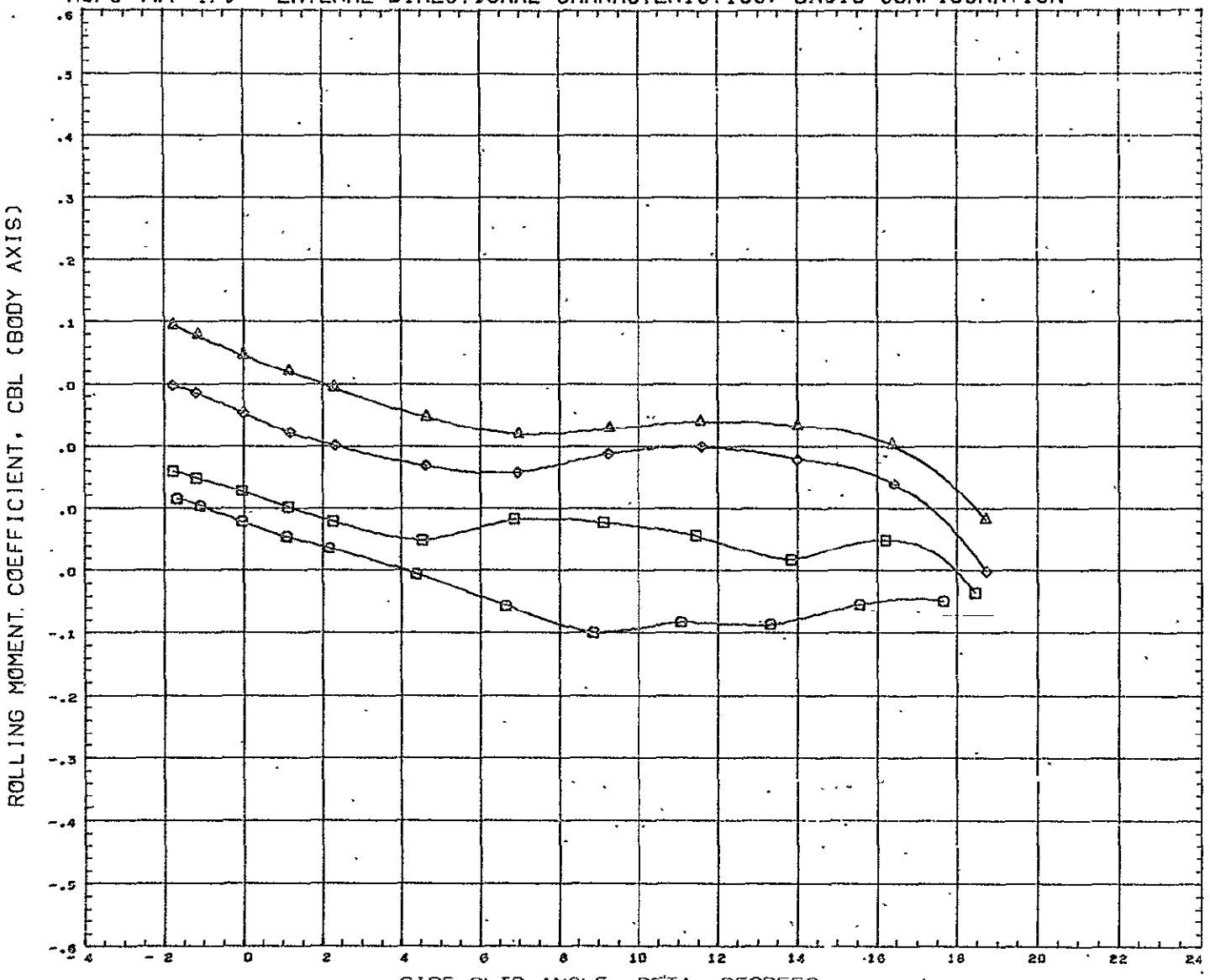



| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 1.196 | ALPHA | 0.360 | ORBINC | - 1.050 | |
| □ | 1.299 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 1.459 | PHIB | 0.000 | | | |
| △ | 1.954 | | | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LATERAL-DIRECTIONAL CHARACTERISTICS, BASIC CONFIGURATION

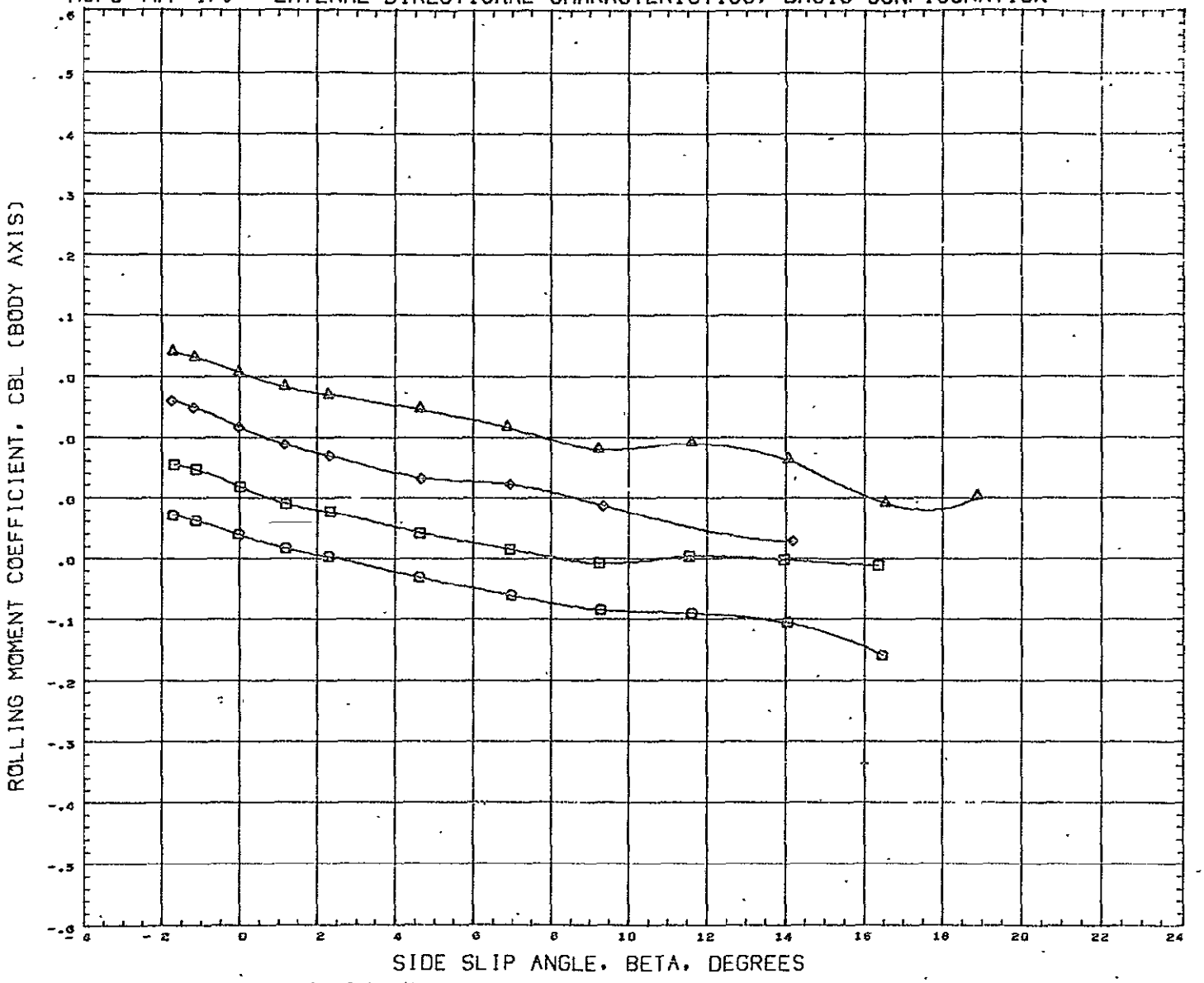



| SYMBOL | MACH | | PARAMETRIC VALUES | | |
|---|---|---|---|---|---|
| ○ | 0.598 | ALPHA | 0.360 | ORBINC | - 1.050 |
| □ | 0.891 | WHGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 0.997 | PHIB | 0.000 | | |
| △ | 1.093 | | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LATERAL-DIRECTIONAL CHARACTERISTICS, BASIC CONFIGURATION



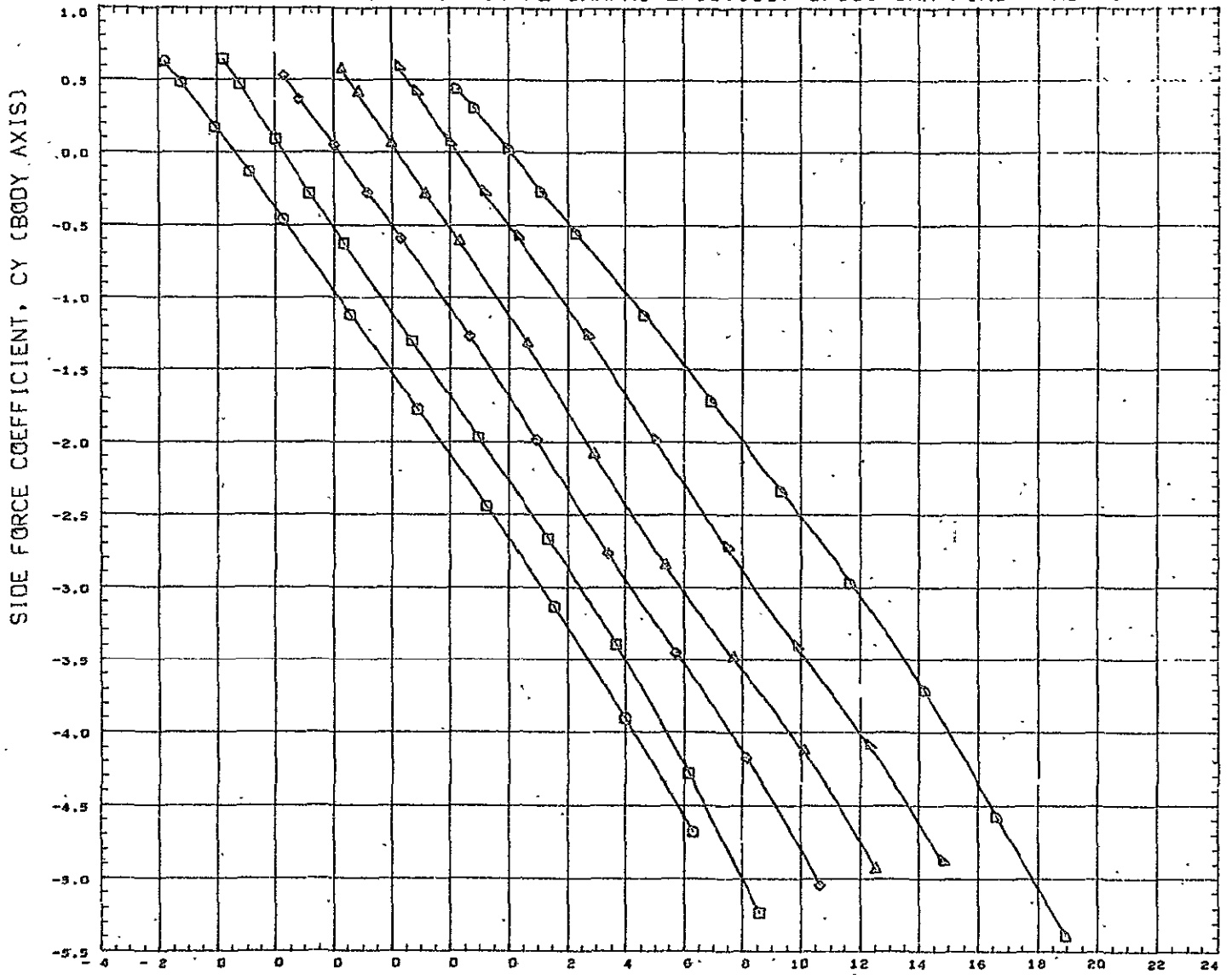

| SYMBOL | MACH | | PARAMETRIC VALUES | | |
|---|---|---|---|---|---|
| □ | 1.196 | ALPHA | 0.360 | ORBINC | - 1.050 |
| □ | 1.299 | WNGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 1.459 | PHIB | 0.000 | | |
| △ | 1.954 | | | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

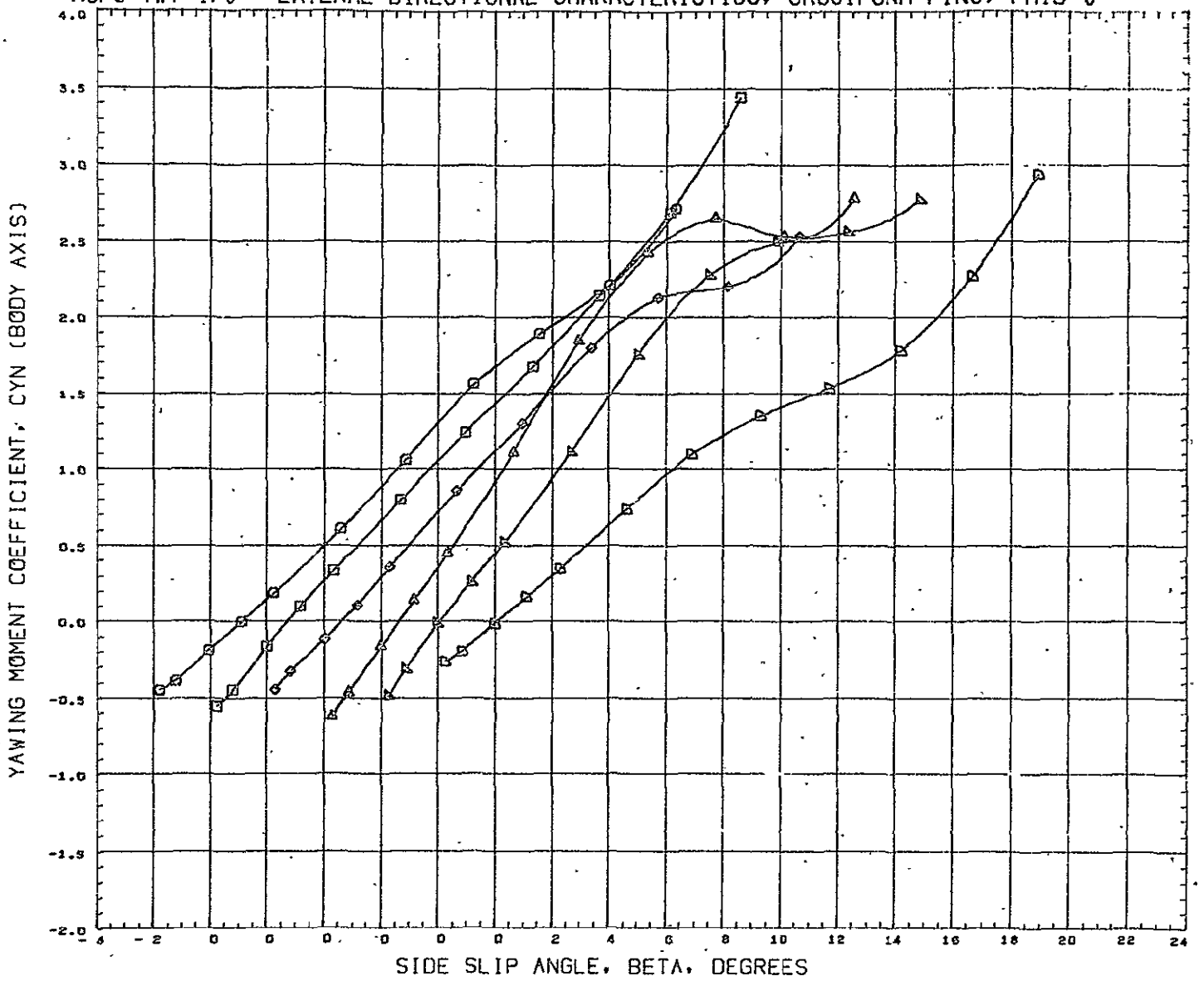
MSFC TWT 470 LATERAL-DIRECTIONAL CHARACTERISTICS, CRUCIFORM FINS, PHIB=0




| SYMBOL | MACH | | PARAMETRIC VALUES | | |
|---|---|---|---|---|---|
| ○ | 0.696 | ALPHA | 0.340 | ORBINC | 1.050 |
| □ | 0.990 | WNGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 1.196 | PHIB | 0.000 | | |
| △ | 1.302 | | | | |
| ▷ | 1.460 | | | | |
| ▽ | 1.953 | DATA HIST. CODE | *A | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

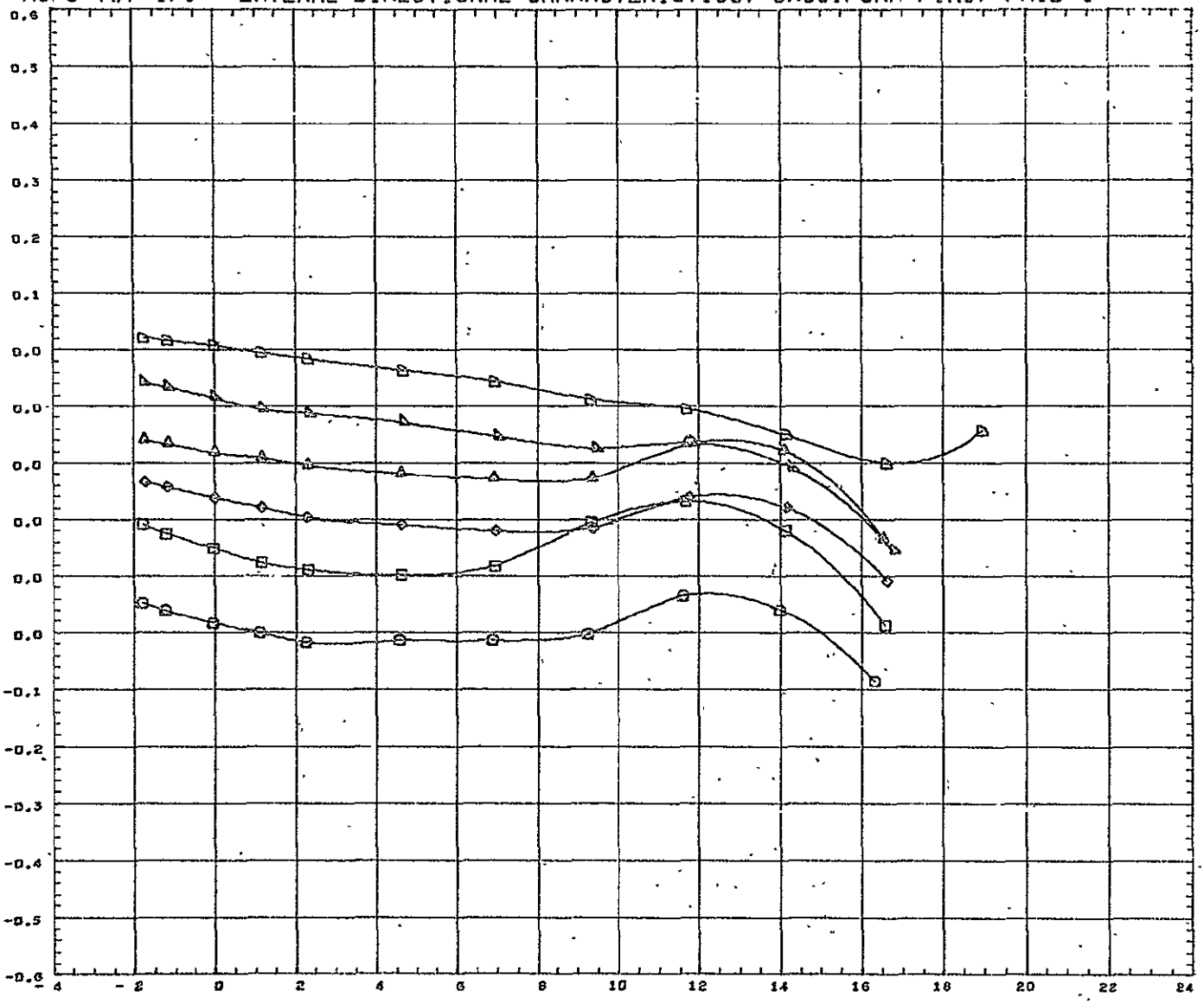
MSFC TWT 470 LATERAL-DIRECTIONAL CHARACTERISTICS, CRUCIFORM FINS, PHIB=0




| SYMBOL | MACH | | PARAMETRIC VALUES | | |
|---|---|---|---|---|---|
| ○ | 0.896 | ALPHA | 0.340 | ORBINC | - 1.050 |
| □ | 0.990 | WNGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 1.196 | PHIB | 0.000 | | |
| △ | 1.302 | | | | |
| ▷ | 1.400 | | | | |
| ▯ | 1.953 | DATA HIST. CODE | *A | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

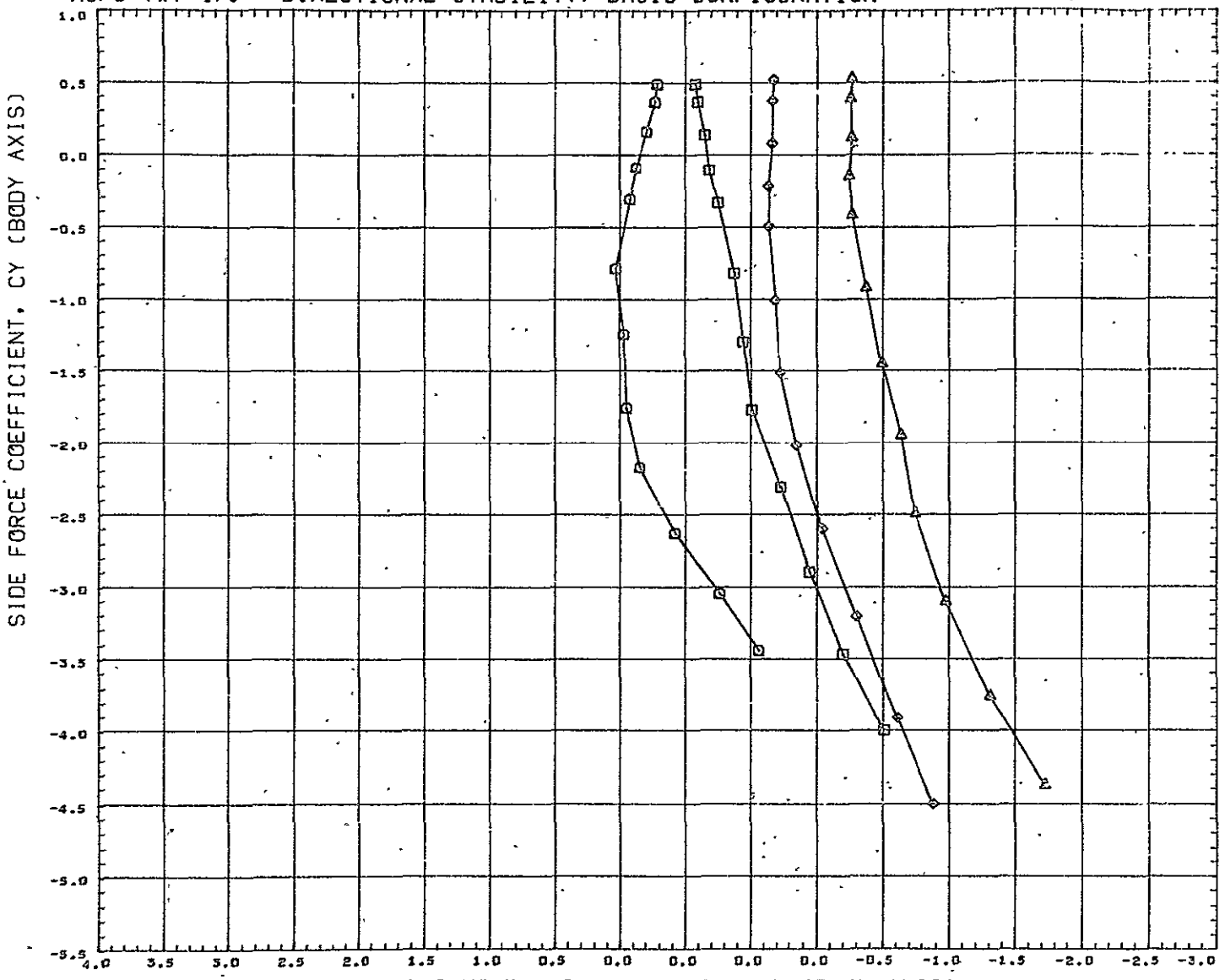
MSFC TWT 470 LATERAL-DIRECTIONAL CHARACTERISTICS, CRUCIFORM FINS, PHIB=0




| SYMBOL | MACH | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|
| ○ | 0.696 | ALPHA | 0.340 | ORBINC | - 1.050 |
| □ | 0.990 | WNGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 1.196 | PHIB | 0.000 | | |
| △ | 1.302 | | | | |
| ▷ | 1.460 | | | | |
| ▯ | 1.953 | DATA HIST. CODE | #A | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3365 | PERCNT |

MSFC TWT 470 DIRECTIONAL STABILITY, BASIC CONFIGURATION




| SYMBOL | MACH |
|---|---|
| ○ | 0.596 |
| □ | 0.891 |
| ◇ | 0.997 |
| △ | 1.093 |

PARAMETRIC VALUES

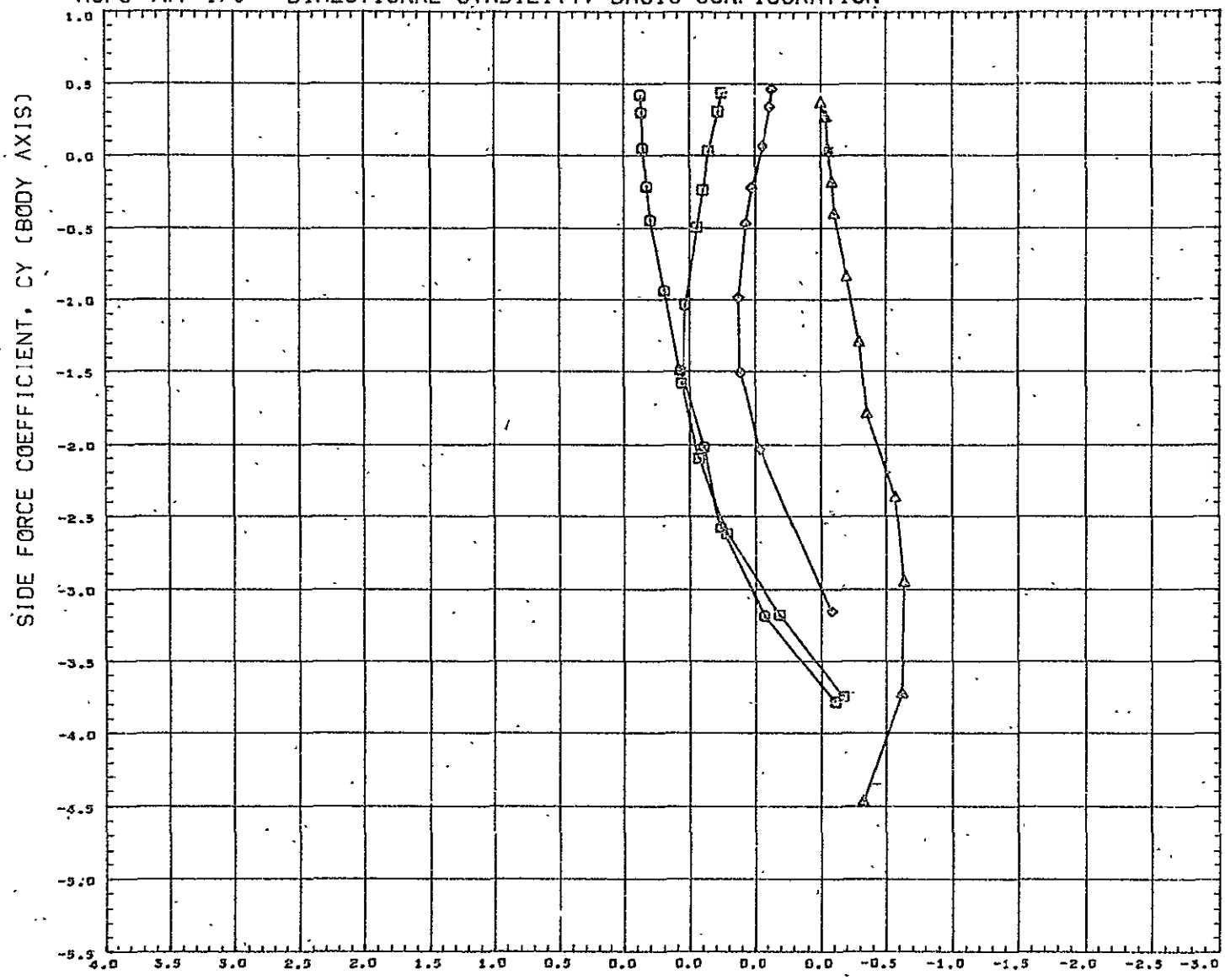
| | | | | | |
|---|---|---|---|---|---|
| ALPHA | 0.360 | ORBINC | - | 1.050 |
| WHGINC | 4.000 | HTAIL | | 0.000 |
| PHIB | 0.000 | | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

REFERENCE FILE

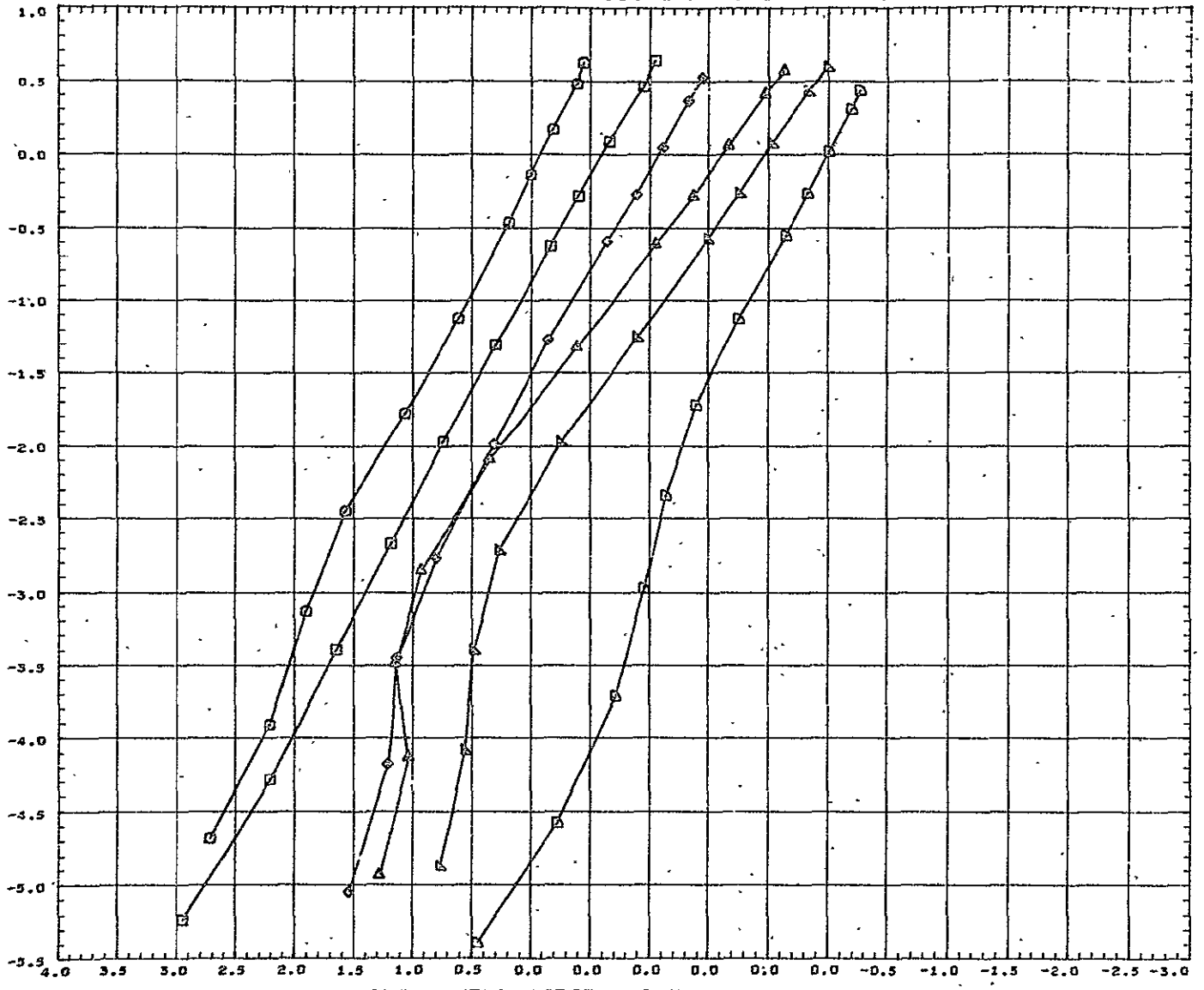
MSFC TWT 470 DIRECTIONAL STABILITY, BASIC CONFIGURATION




| SYMBOL | MACH | PARAMETRIC VALUES | | | | | REFERENCE INFORMATION | | |
|---|---|---|---|---|---|---|---|---|---|
| ○ | 1.196 | ALPHA | 0.360 | ORBINC | - | 1.050 | REFS | 1.3960 | SQ.IN. |
| □ | 1.299 | WNGINC | 4.000 | HTAIL | | 0.000 | REFL | 1.3330 | INCHES |
| ◇ | 1.459 | PHIB | 0.000 | | | | REFB | 1.3330 | INCHES |
| △ | 1.954 | | | | | | XMRP | 5.2640 | INCHES |
| | | | | | | | YMRP | 0.0000 | INCHES |
| | | | | | | | ZMRP | 0.0000 | INCHES |
| | | | | | | | SCALE | 0.3366 | PERCNT |

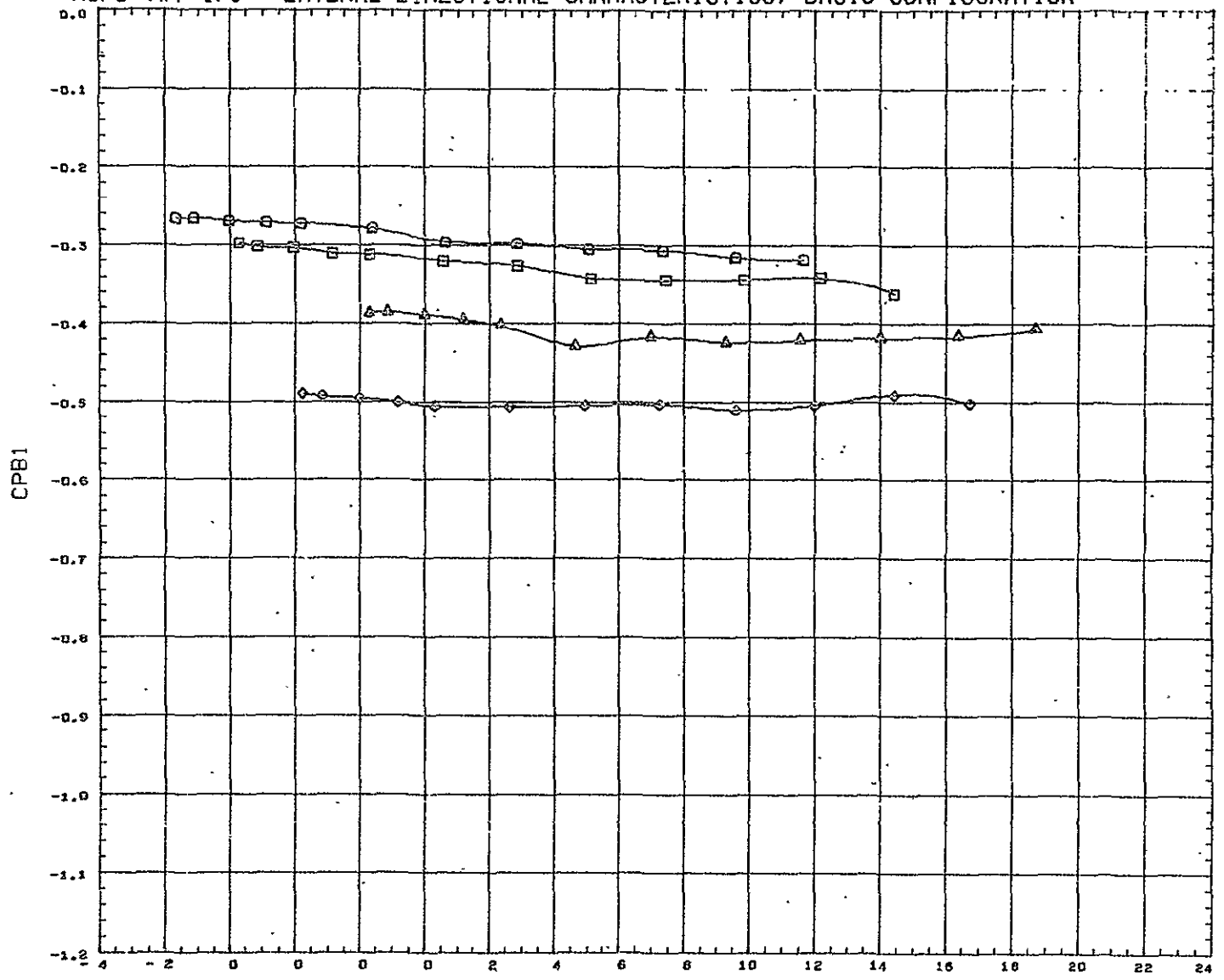
REFERENCE FILE

MSFC TWT 470 DIRECTIONAL STABILITY, CRUCIFORM FINS, PHIB=0




| SYMBOL | MACH | | PARAMETRIC VALUES | | | REFERENCE INFORMATION | | |
|---|---|---|---|---|---|---|---|---|
| ○ | 0.696 | ALPHA | 0.340 | ORBINC | - 1.050 | REFS | 1.3960 | SQ.IN. |
| □ | 0.950 | WNGINC | 4.000 | HTAIL | 0.000 | REFL | 1.3330 | INCHES |
| ◇ | 1.196 | PHIB | 0.000 | | | REFB | 1.3330 | INCHES |
| △ | 1.302 | | | | | XMRP | 5.2640 | INCHES |
| ▽ | 1.460 | | | | | YMRP | 0.0000 | INCHES |
| ⬡ | 1.953 | DATA HIST. CODE | *A | | | ZMRP | 0.0000 | INCHES |
| | | | | | | SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LATERAL-DIRECTIONAL CHARACTERISTICS, BASIC CONFIGURATION



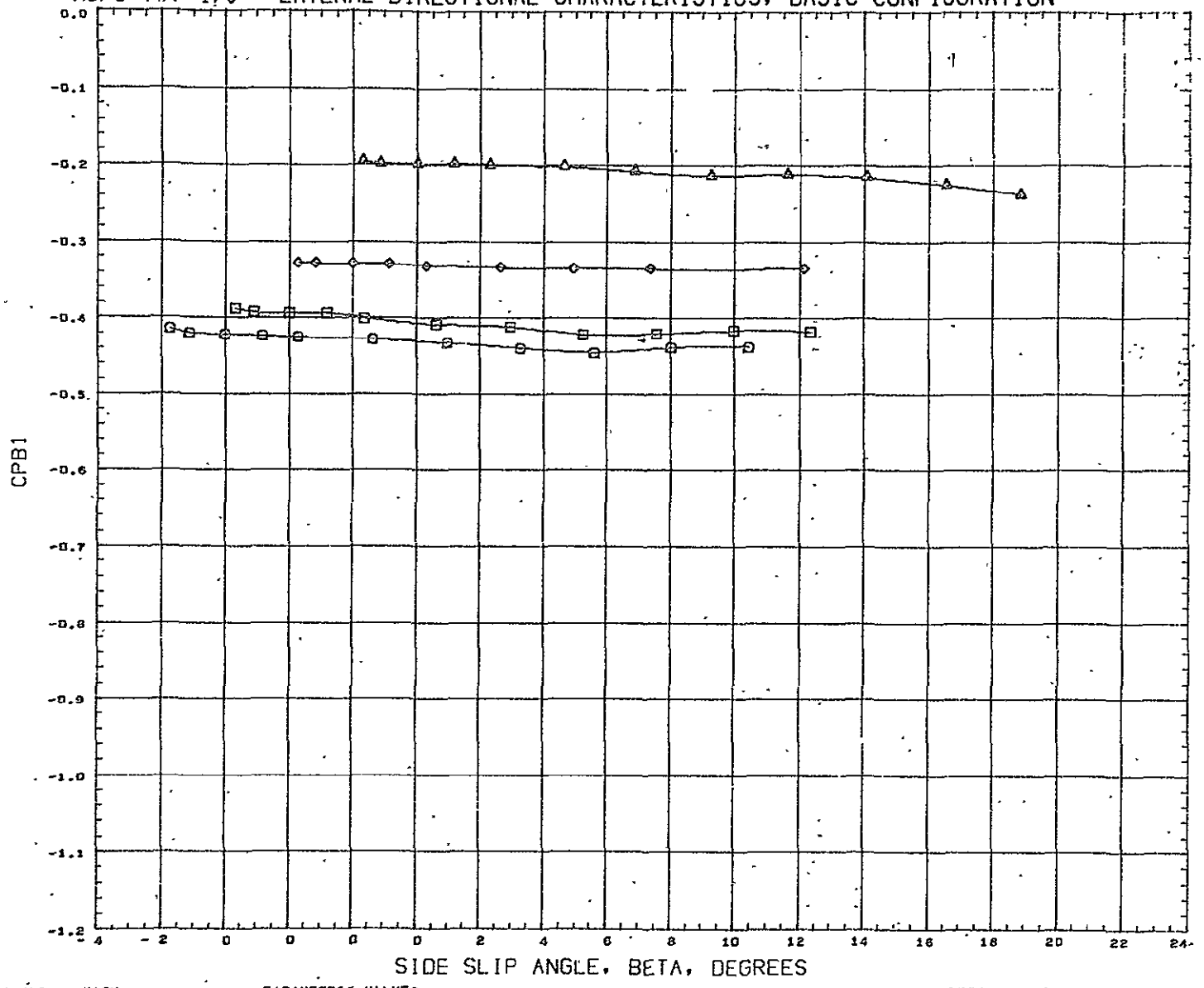

| SYMBOL | MACH | | PARAMETRIC VALUES | | | |
|---|---|---|---|---|---|---|
| ○ | 0.596 | ALPHA | 0.360 | ORBINC | - | 1.050 |
| □ | 0.891 | WNGINC | 4.000 | HTAIL | | 0.000 |
| ◇ | 0.997 | PHIB | 0.000 | | | |
| △ | 1.093 | | | | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LATERAL-DIRECTIONAL CHARACTERISTICS, BASIC CONFIGURATION



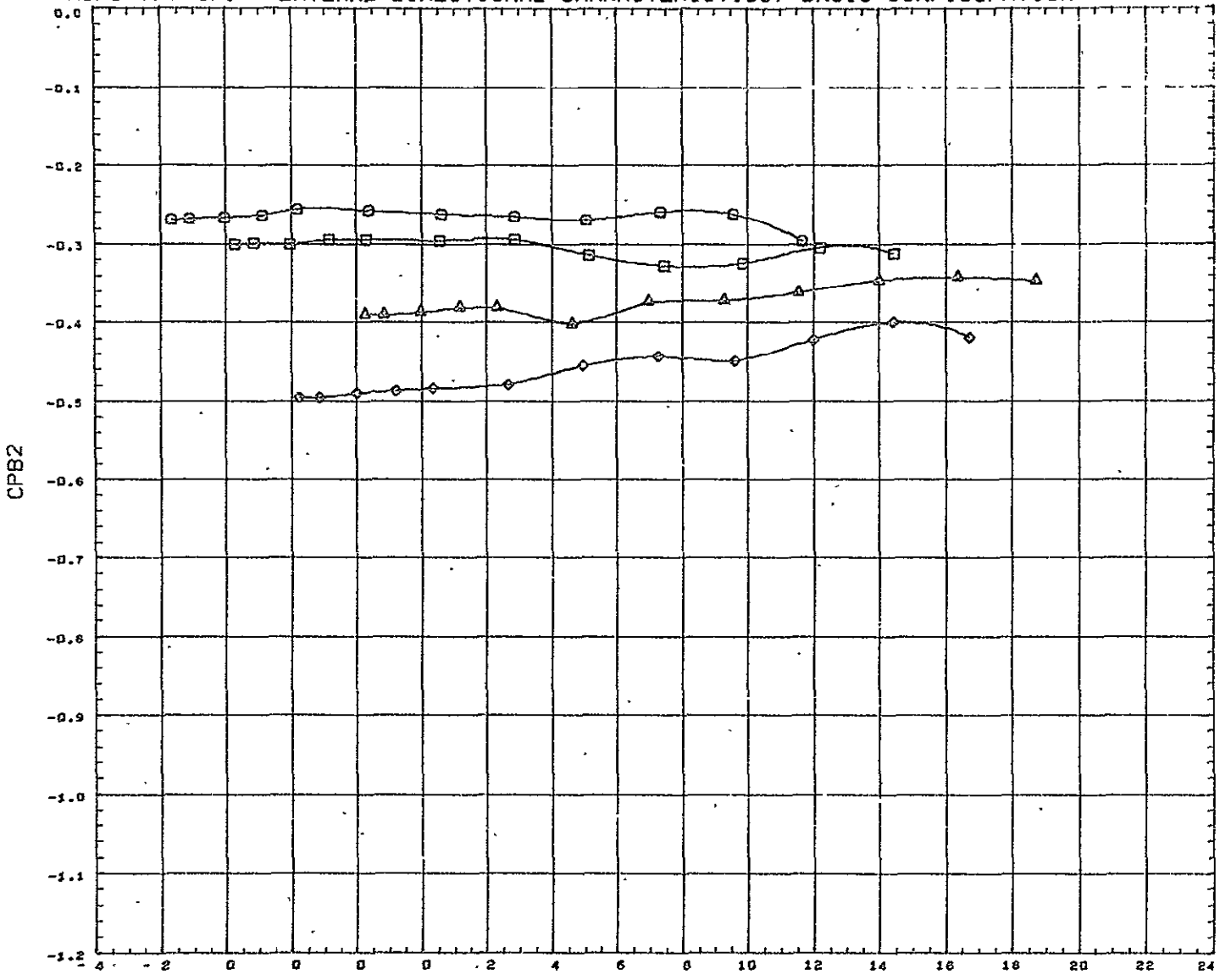

| SYMBOL | MACH | | PARAMETRIC VALUES | | |
|---|---|---|---|---|---|
| ○ | 1.196 | ALPHA | 0.360 | ORBINC - | 1.050 |
| □ | 1.299 | WNGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 1.459 | PHIB | 0.000 | | |
| △ | 1.954 | | | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LATERAL-DIRECTIONAL CHARACTERISTICS, BASIC CONFIGURATION

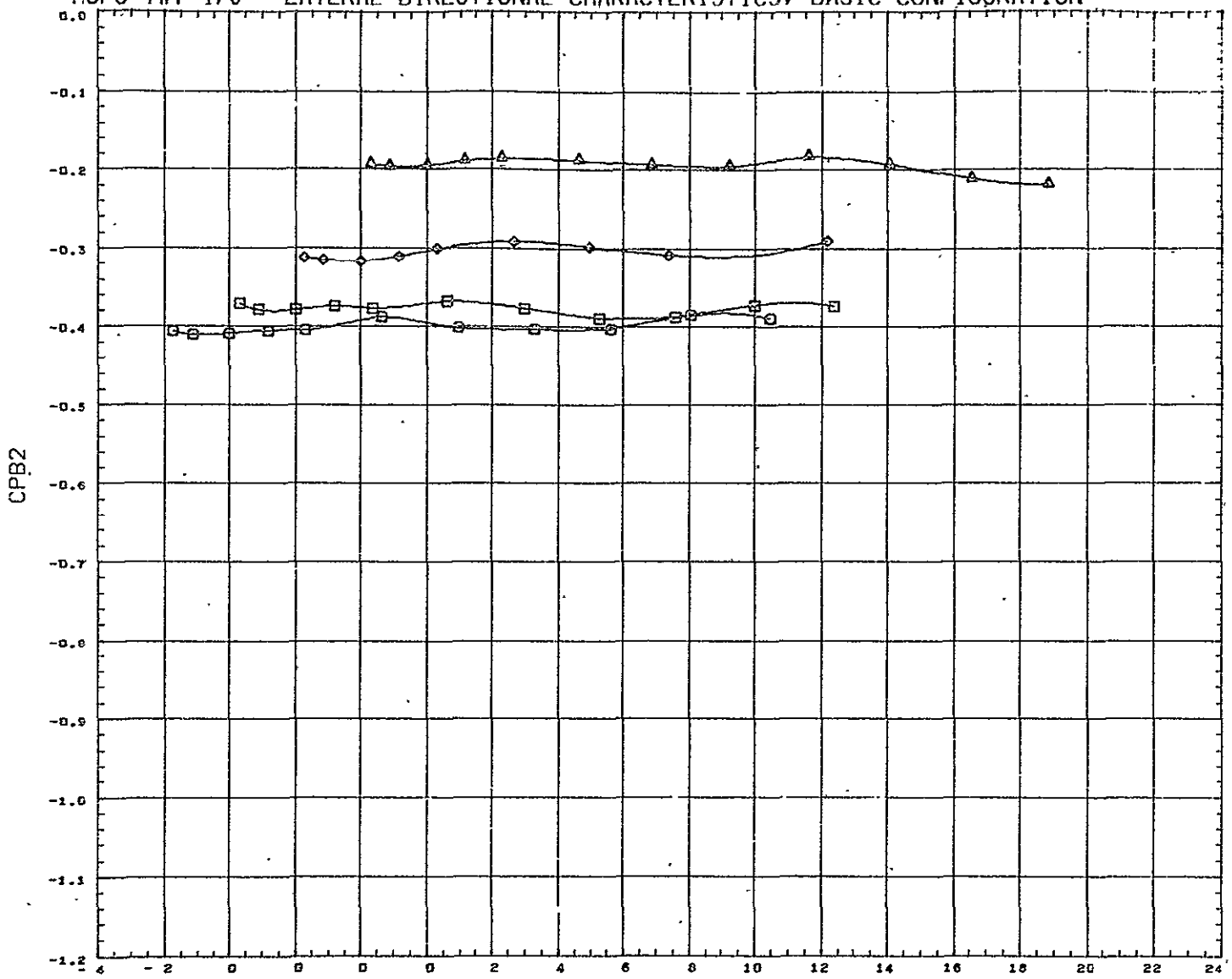



| SYMBOL | MACH | PARAMETRIC VALUES | | | | |
|---|---|---|---|---|---|---|
| ○ | 0.598 | ALPHA | 0.360 | ORBINC | - 1.050 | |
| □ | 0.891 | WNGINC | 4.000 | HTAIL | 0.000 | |
| ◇ | 0.997 | PHIB | 0.000 | | | |
| △ | 1.093 | | | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LATERAL-DIRECTIONAL CHARACTERISTICS, BASIC CONFIGURATION

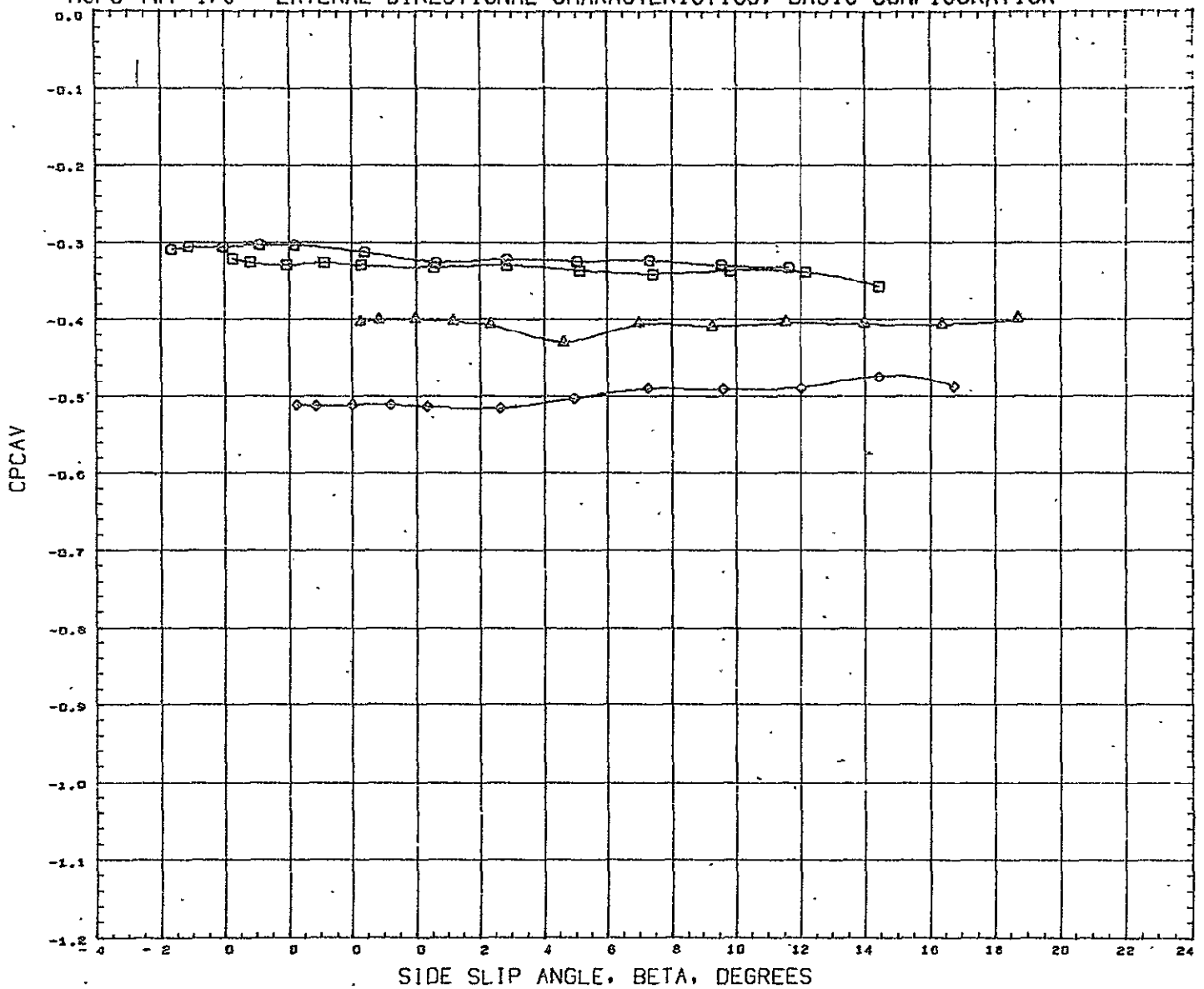



| SYMBOL | MACH | | PARAMETRIC VALUES | | |
|---|---|---|---|---|---|
| ○ | 1.196 | ALPHA | 0.360 | ORBINC | 1.050 |
| □ | 1.299 | WNGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 1.459 | PHIB | 0.000 | | |
| △ | 1.954 | | | | |

REFERENCE FILE

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LATERAL-DIRECTIONAL CHARACTERISTICS, BASIC CONFIGURATION



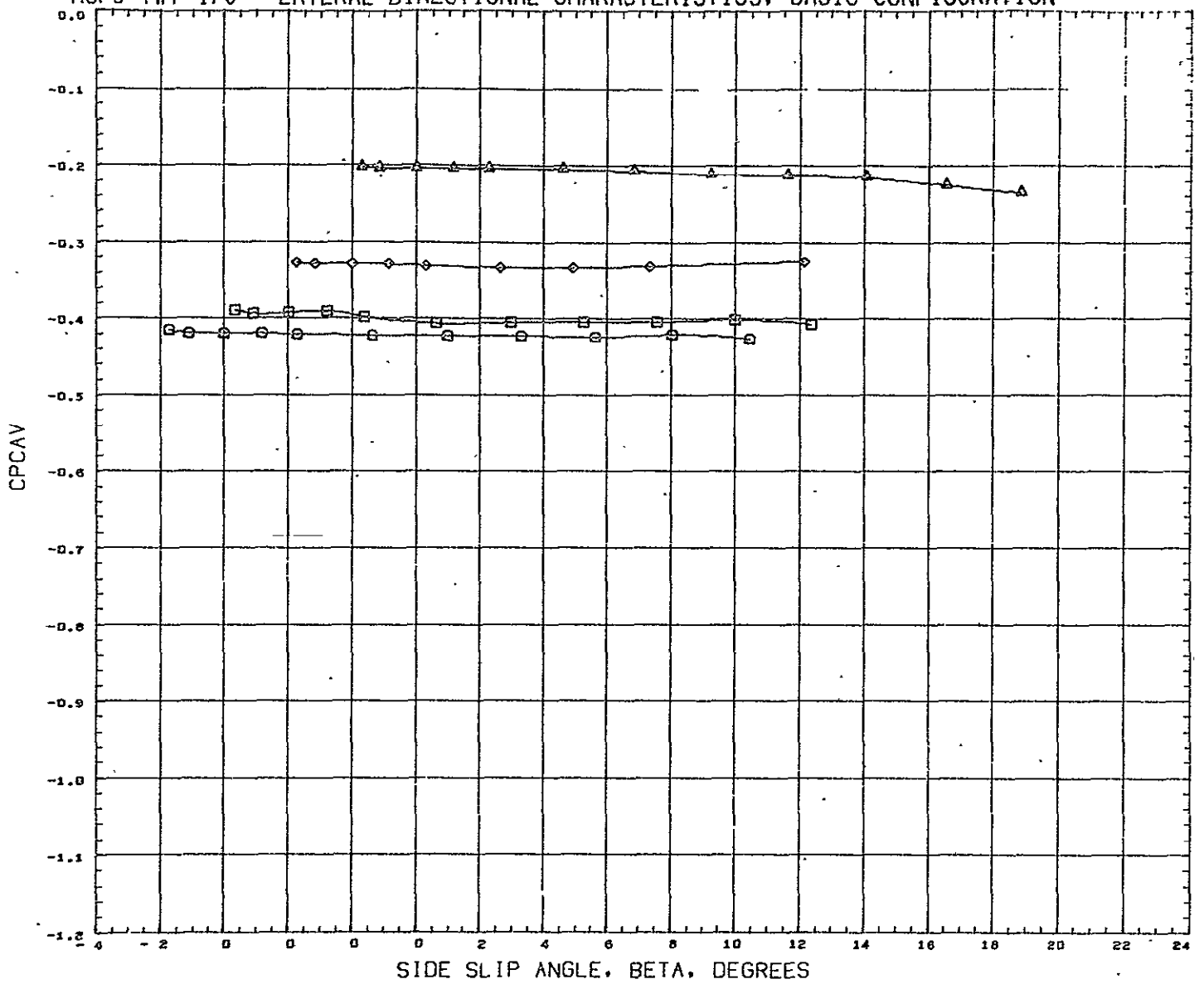

| SYMBOL | MACH | | PARAMETRIC VALUES | | |
|---|---|---|---|---|---|
| ○ | 0.596 | ALPHA | 0.360 | ORBINC | - 1.050 |
| □ | 0.691 | WNGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 0.997 | PHIB | 0.000 | | |
| △ | 1.093 | | | | |

REFERENCE FILE

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LATERAL-DIRECTIONAL CHARACTERISTICS, BASIC CONFIGURATION




| SYMBOL | MACH |
|---|---|
| ○ | 1.196 |
| □ | 1.299 |
| ◇ | 1.459 |
| △ | 1.954 |

PARAMETRIC VALUES

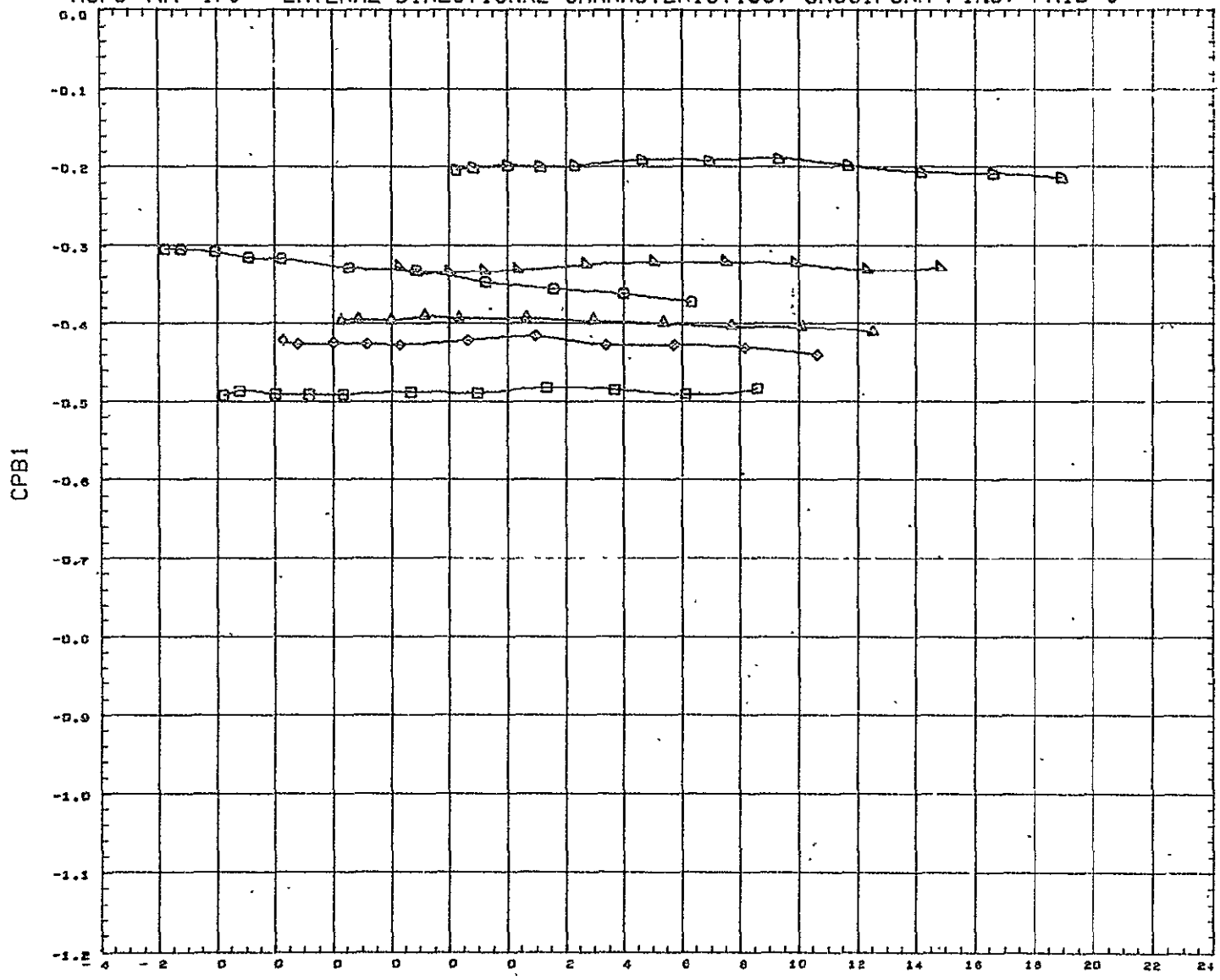
| | | | | |
|---|---|---|---|---|
| ALPHA | 0.360 | ORBINC | - | 1.050 |
| WNGINC | 4.000 | HTAIL | | 0.000 |
| PHIB | 0.000 | | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

REFERENCE FILE

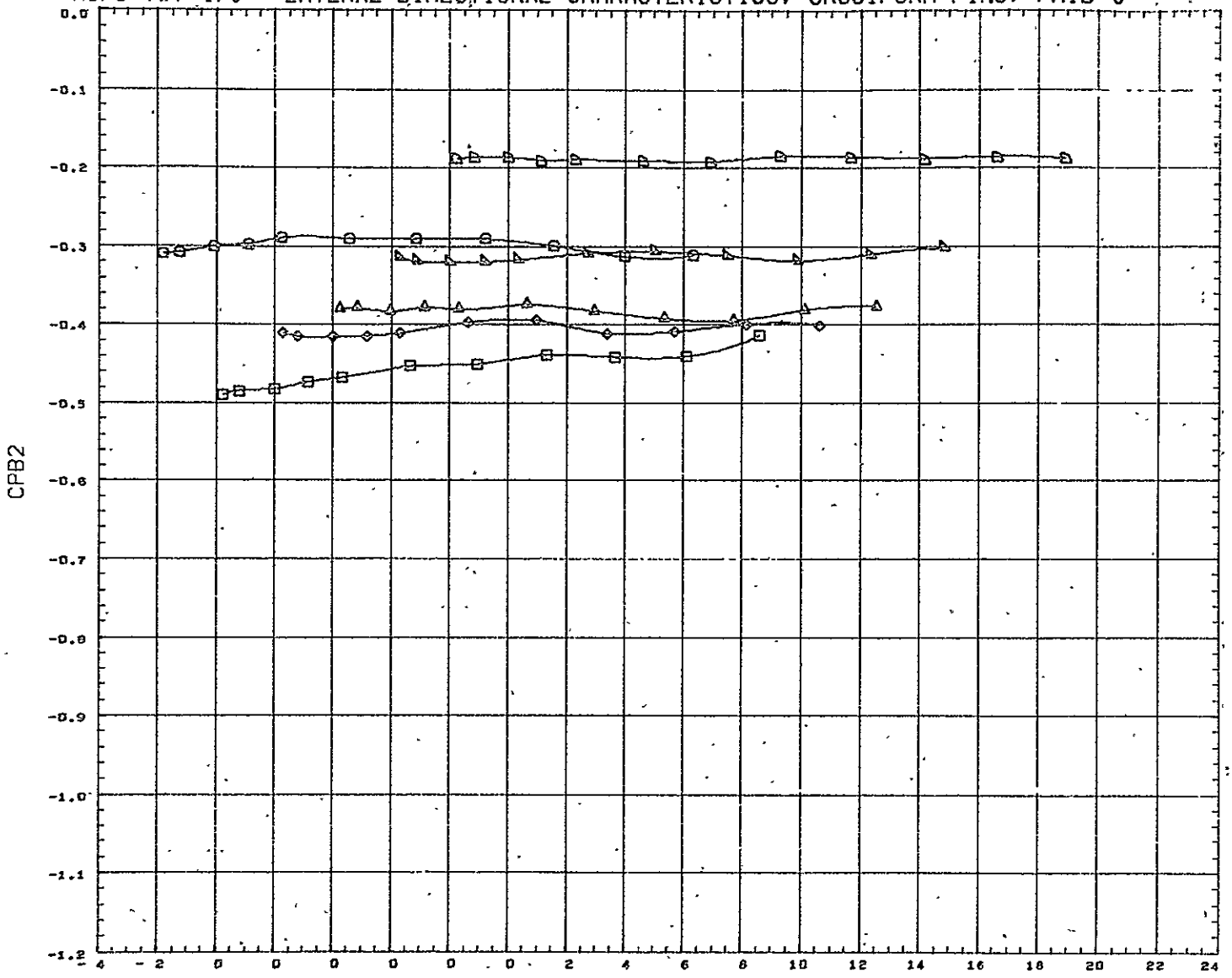
MSFC TWT 470 LATERAL-DIRECTIONAL CHARACTERISTICS, CRUCIFORM FINS, PHIB=0




| SYMBOL | MACH | | PARAMETRIC VALUES | | |
|---|---|---|---|---|---|
| ○ | 0.895 | ALPHA | 0.340 | ORBINC | - 1.050 |
| □ | 0.990 | WNGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 1.196 | PHIB | 0.000 | | |
| △ | 1.302 | | | | |
| ▷ | 1.460 | | | | |
| ⬠ | 1.953 | DATA HIST. CODE | 6A | | |

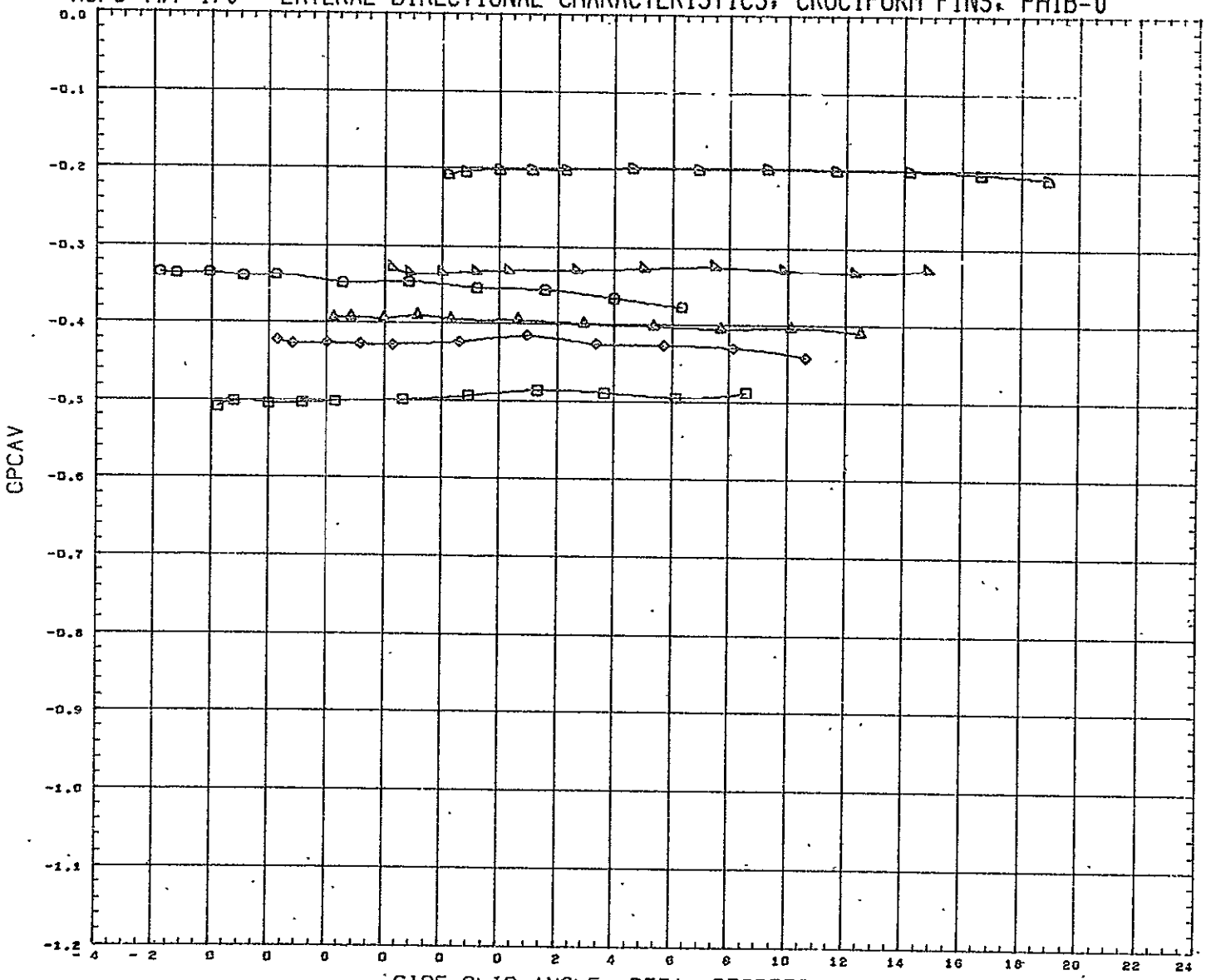
| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LATERAL-DIRECTIONAL CHARACTERISTICS, CRUCIFORM FINS, PHIB=0




| SYMBOL | MACH | PARAMETRIC VALUES | | | | REFERENCE INFORMATION | | |
|---|---|---|---|---|---|---|---|---|
| ○ | 0.696 | ALPHA | 0.340 | ORBINC | - 1.050 | REFS | 1.3960 | SQ.IN. |
| □ | 0.990 | WNGINC | 4.000 | HTAIL | 0.000 | REFL | 1.3330 | INCHES |
| ◇ | 1.196 | PHIB | 0.000 | | | REFB | 1.3330 | INCHES |
| △ | 1.302 | | | | | XHRP | 5.2640 | INCHES |
| ▷ | 1.460 | | | | | YHRP | 0.0000 | INCHES |
| ⬠ | 1.953 | DATA HIST. CODE | #A | | | ZHRP | 0.0000 | INCHES |
| | | | | | | SCALE | 0.3366 | PERCNT |

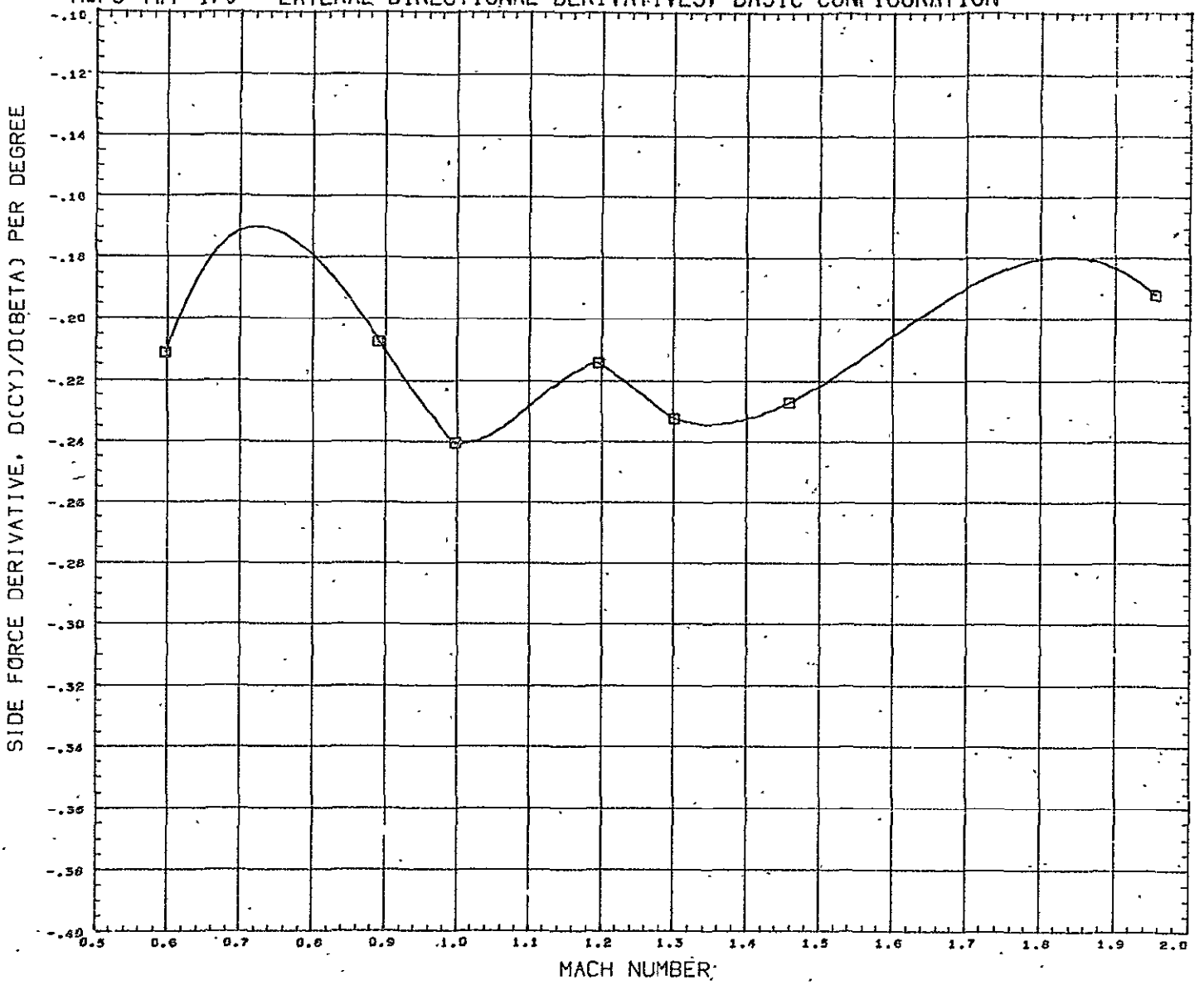
MSFC TWT 470 LATERAL-DIRECTIONAL CHARACTERISTICS, CRUCIFORM FINS, PHIB=0




| SYMBOL | MACH | | PARAMETRIC VALUES | | |
|---|---|---|---|---|---|
| ○ | 0.895 | ALPHA | 0.340 | ORBINC - | 1.050 |
| □ | 0.990 | WNGINC | 4.000 | HTAIL | 0.000 |
| ◇ | 1.196 | PHIB | 0.000 | | |
| △ | 1.302 | | | | |
| ▷ | 1.460 | | | | |
| ▯ | 1.953 | DATA HIST. CODE | *A | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LATERAL-DIRECTIONAL DERIVATIVES, BASIC CONFIGURATION




PARAMETRIC VALUES

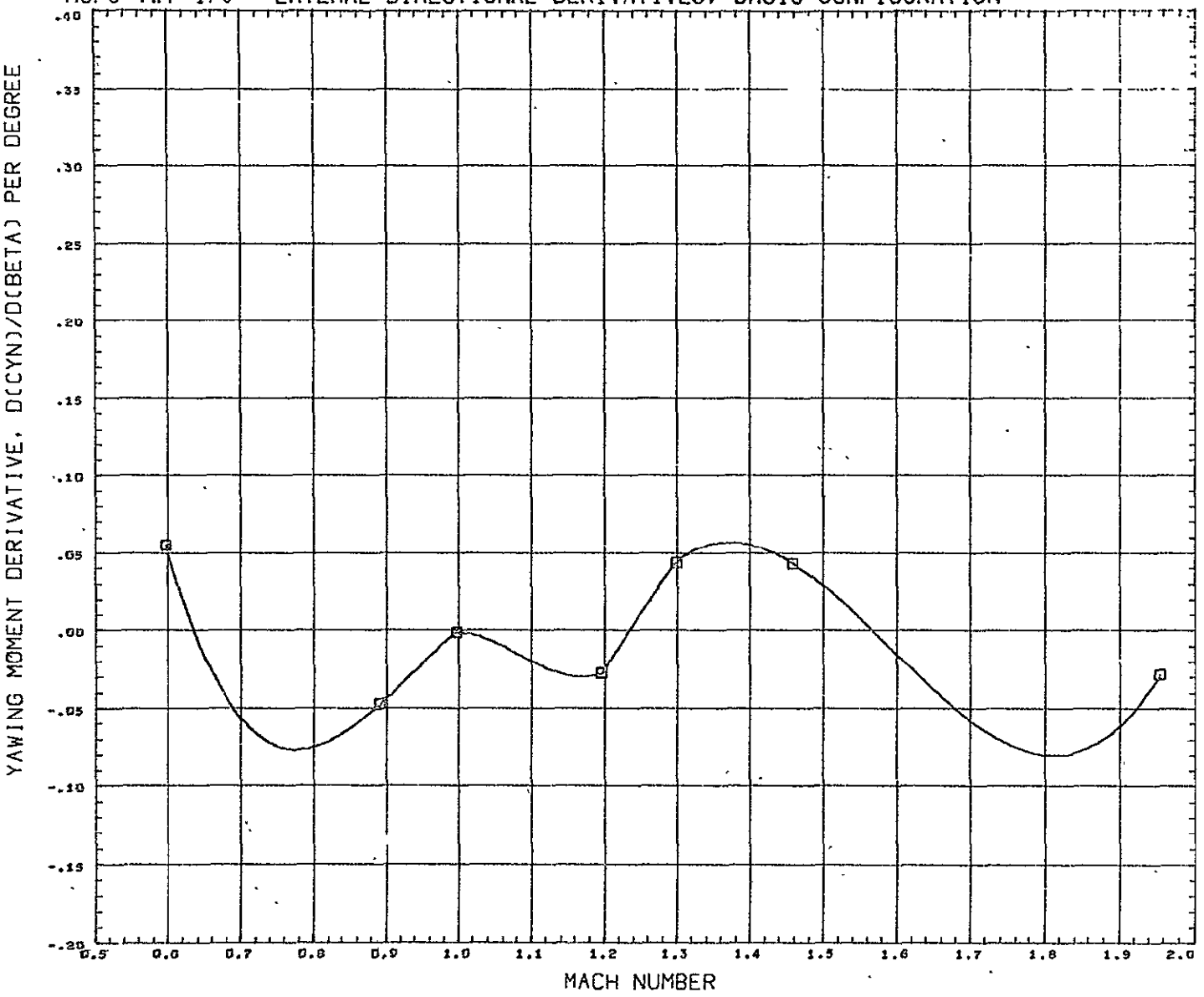
| | | | |
|---|---|---|---|
| ALPHA | 0.360 | ORBINC | - 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE *A

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LATERAL-DIRECTIONAL DERIVATIVES, BASIC CONFIGURATION




PARAMETRIC VALUES

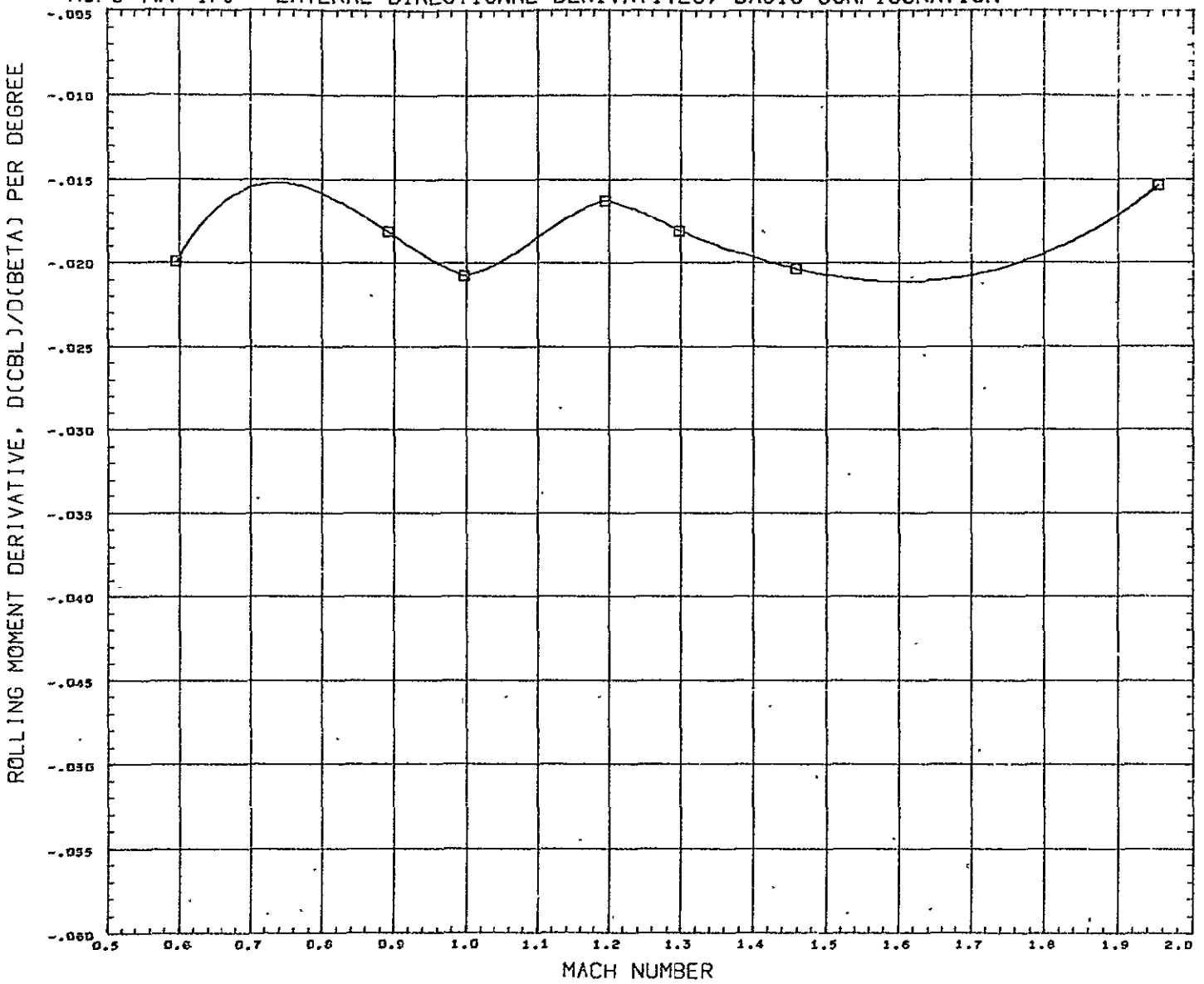
| | | | |
|---|---|---|---|
| ALPHA | 8.360 | ORBINC - | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE *A

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LATERAL-DIRECTIONAL DERIVATIVES, BASIC CONFIGURATION




PARAMETRIC VALUES

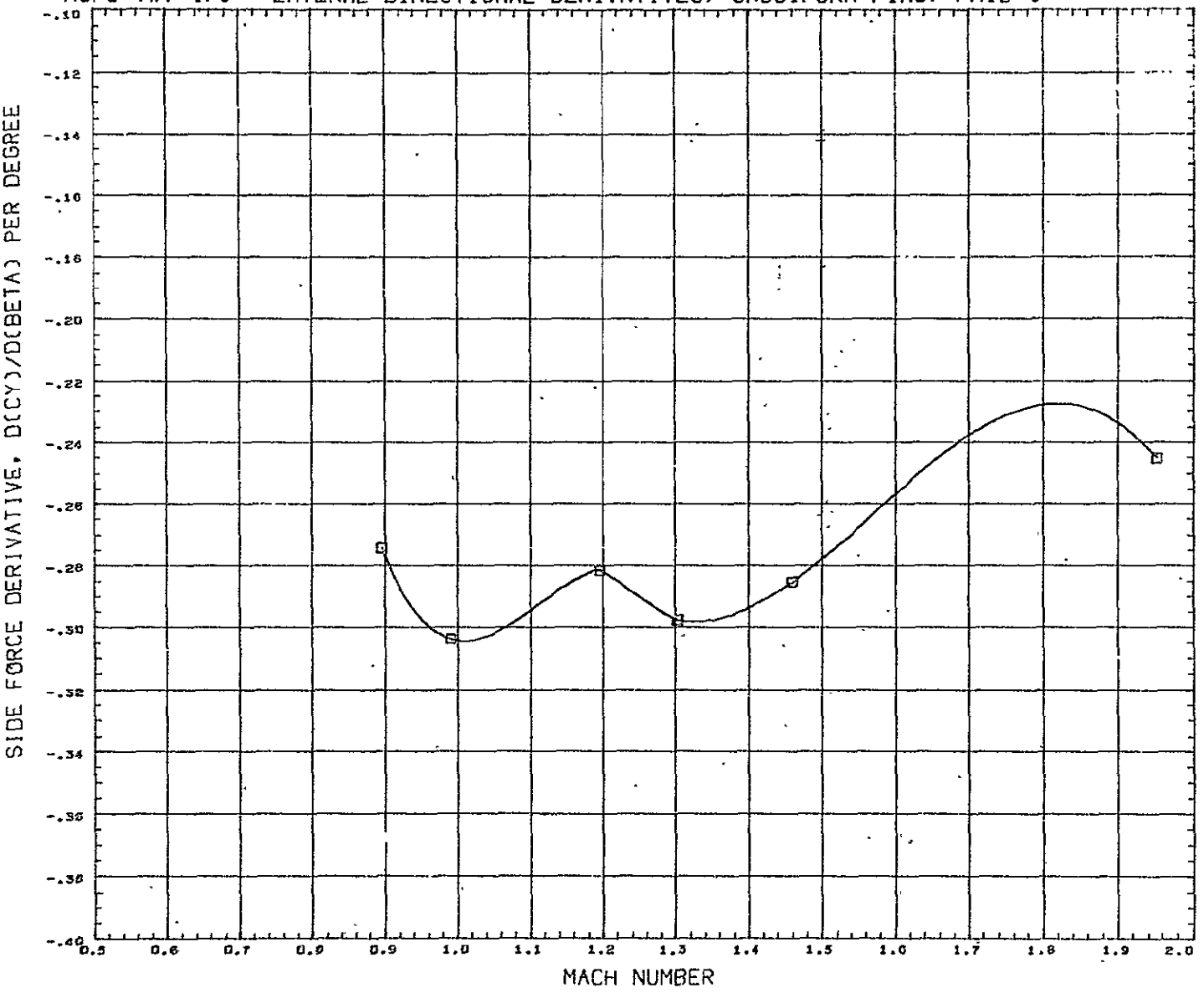
| | | | |
|---|---|---|---|
| ALPHA | 0.360 | ORBINC - | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE *A

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LATERAL-DIRECTIONAL DERIVATIVES, CRUCIFORM FINS, PHIB=0




PARAMETRIC VALUES .

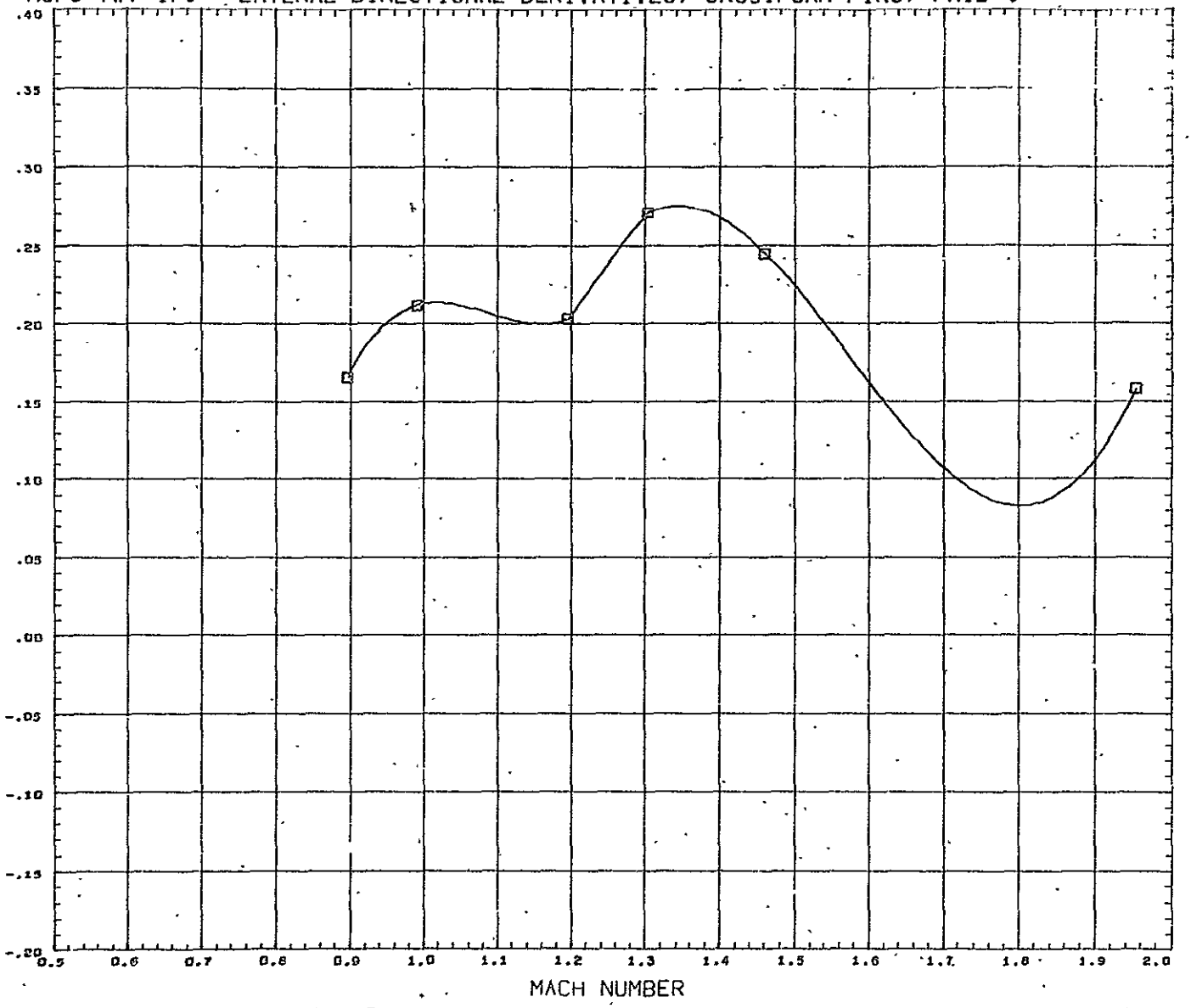
| | | | |
|---|---|---|---|
| ALPHA | 0.340 | ORBINC | = 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE *A

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 LATERAL-DIRECTIONAL DERIVATIVES, CRUCIFORM FINS, PHIB=0



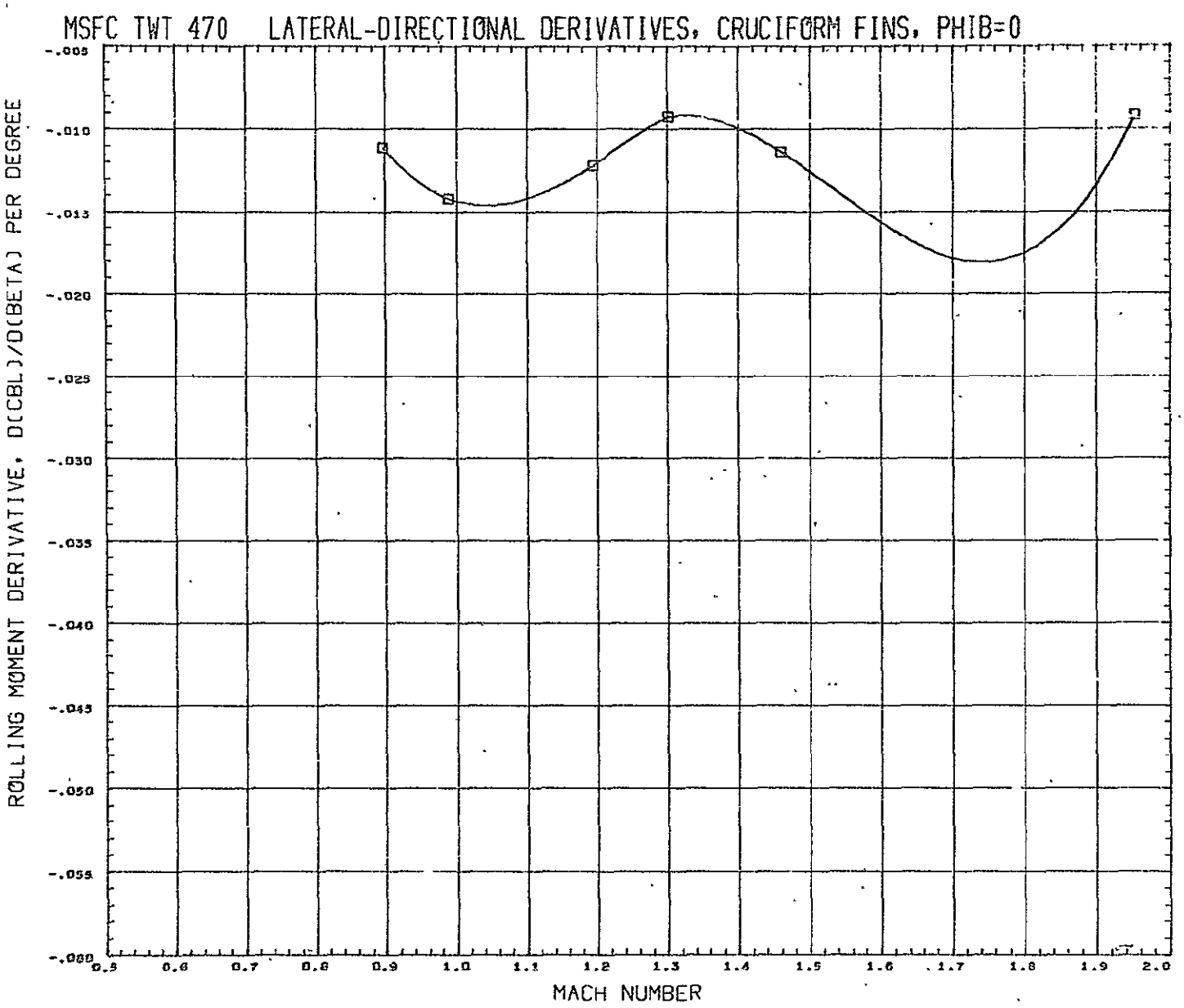

PARAMETRIC VALUES

| | | | |
|---|---|---|---|
| ALPHA | 0.340 | ORBINC | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE #A

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |




PARAMETRIC VALUES

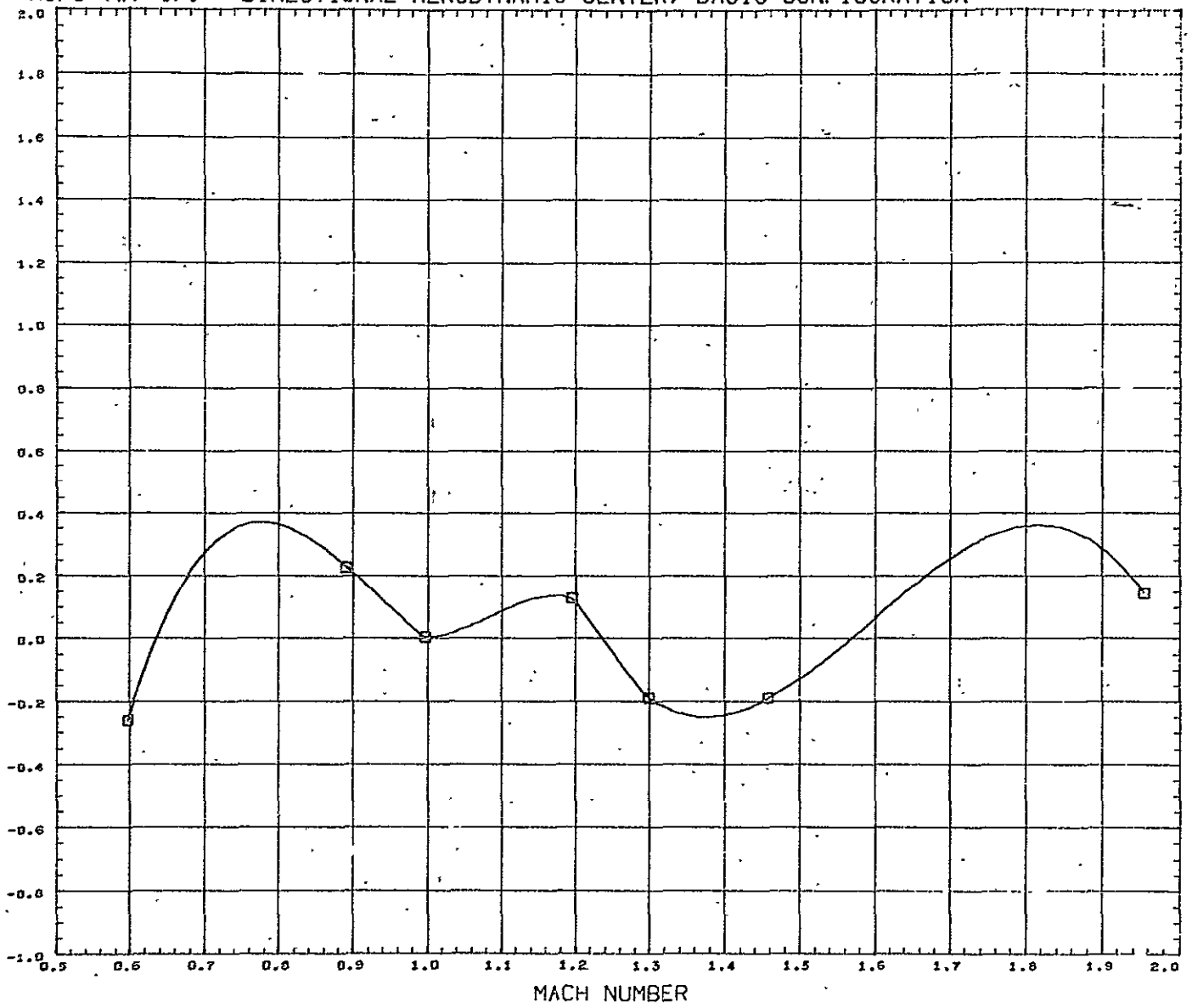
| | | | |
|---|---|---|---|
| ALPHA | 0.340 | ORBINC | 1.050 |
| WINGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE *A

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 DIRECTIONAL AERODYNAMIC CENTER, BASIC CONFIGURATION




PARAMETRIC VALUES

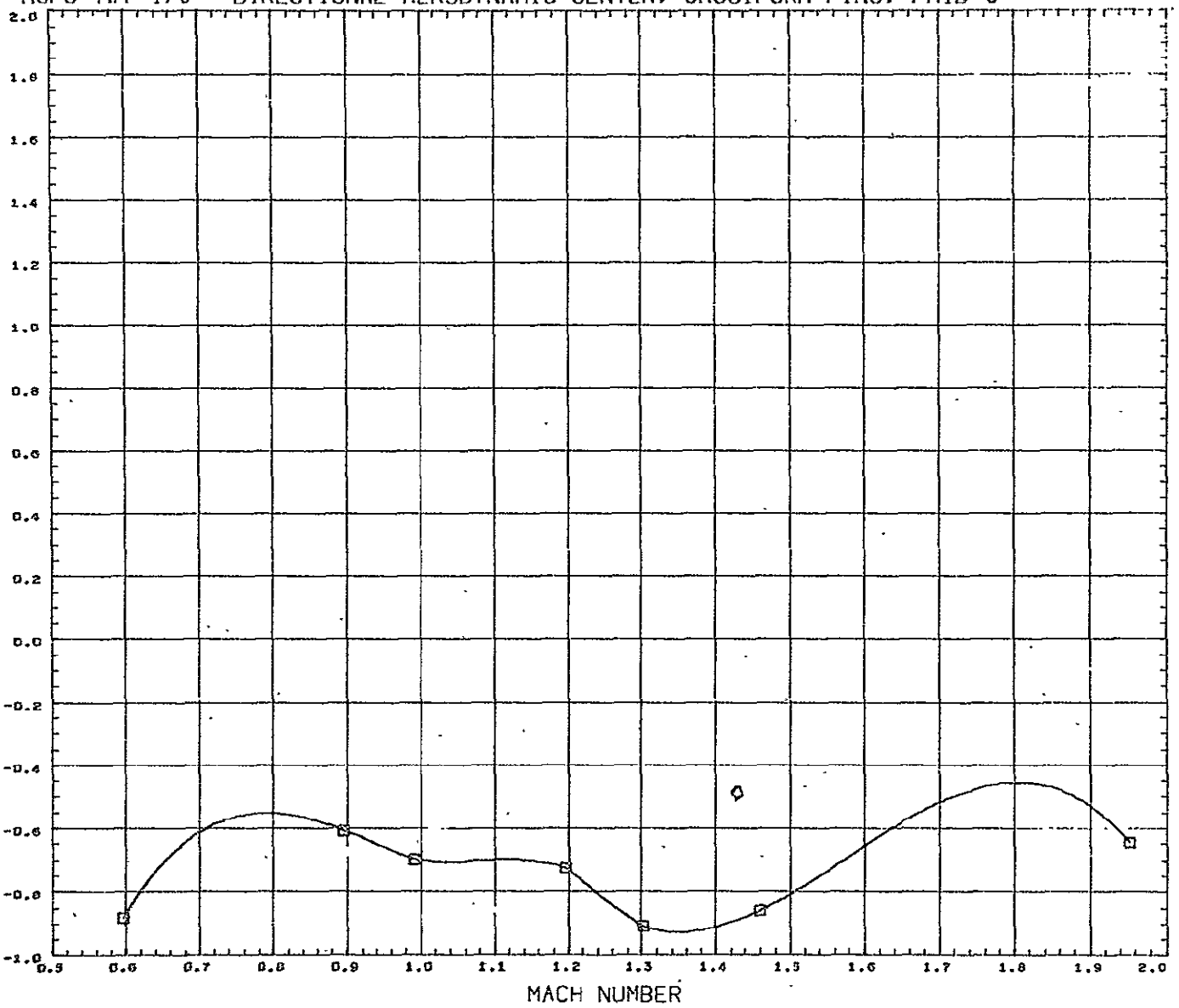
| | | | |
|---|---|---|---|
| ALPHA | 0.360 | ORBINC | - 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE *AV

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1:3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 DIRECTIONAL AERODYNAMIC CENTER, CRUCIFORM FINS, PHIB=0




PARAMETRIC VALUES

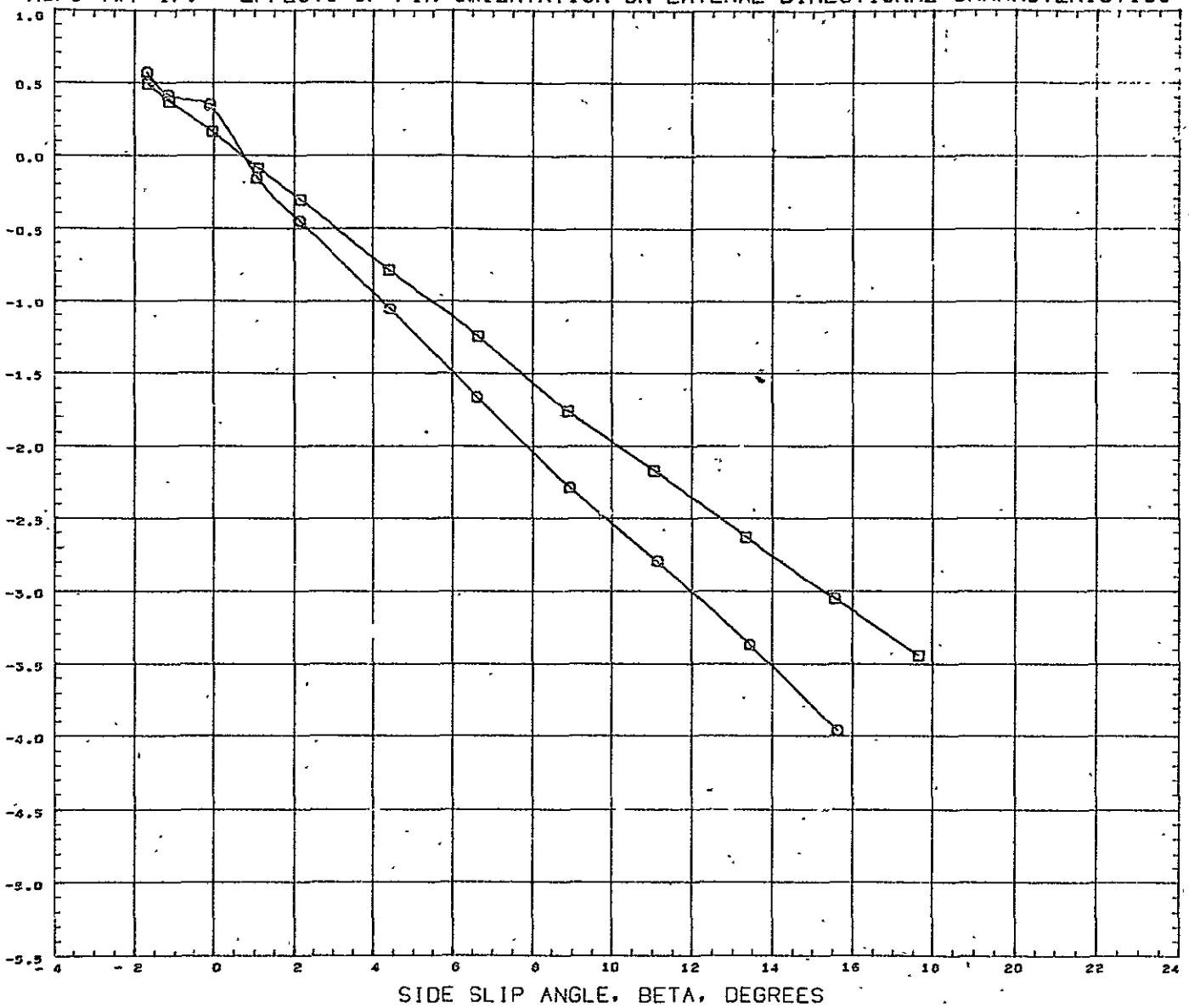
| | | | |
|---|---|---|---|
| ALPHA | 0.340 | ORBINC | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

DATA HIST. CODE V

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

# MSFC TWT 470 EFFECTS OF FIN ORIENTATION ON LATERAL-DIRECTIONAL CHARACTERISTICS



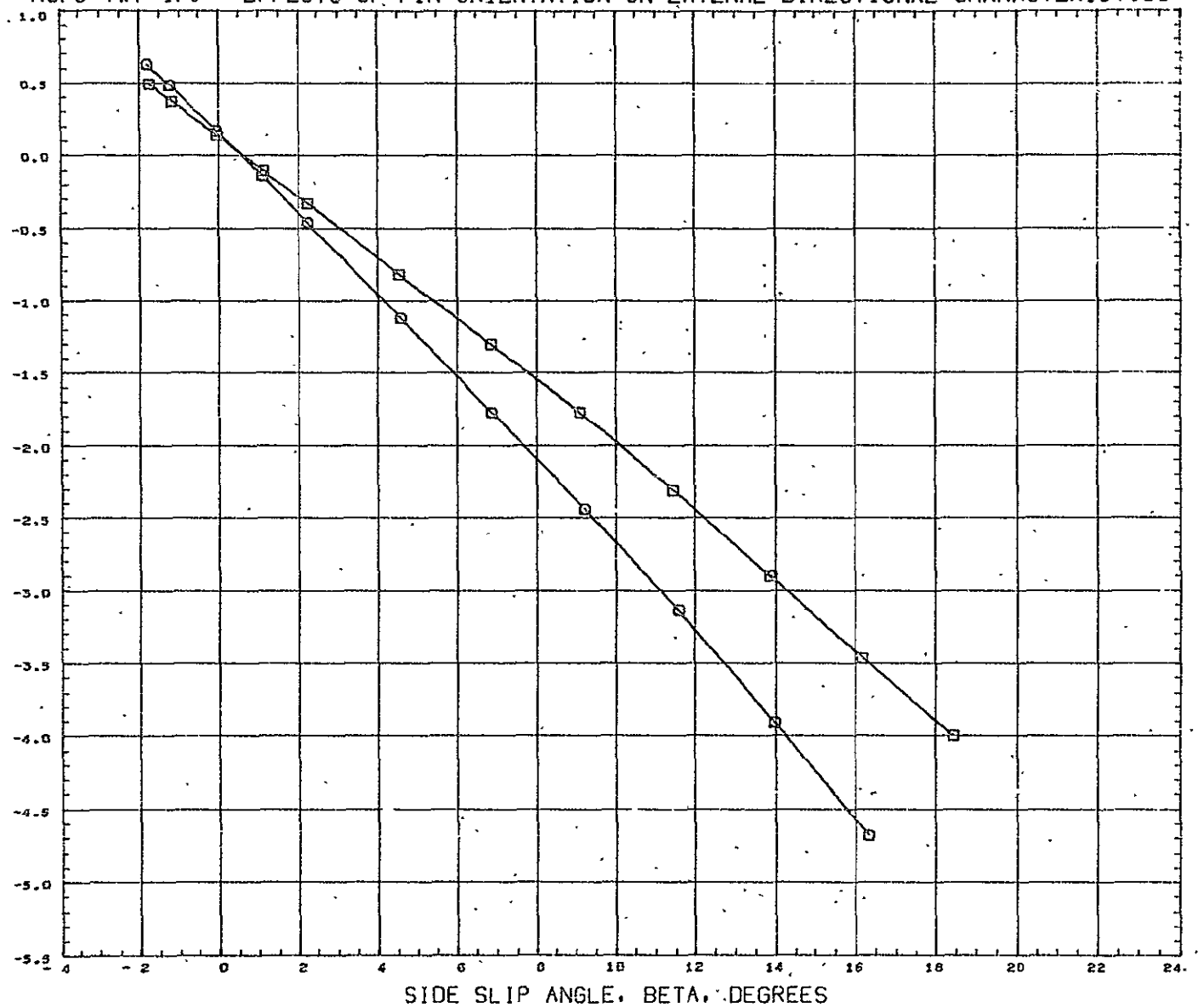

| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (AZ4132) | ○ | TWT470 S-IC/GAC ORBITER BF2OWHVS CRUCIFORM |
| (J24062) | □ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |

MACH 0.595

| PARAMETRIC VALUES | | | |
|---|---|---|---|
| ALPHA | 0.340 | ORBINC | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF FIN ORIENTATION ON LATERAL-DIRECTIONAL CHARACTERISTICS



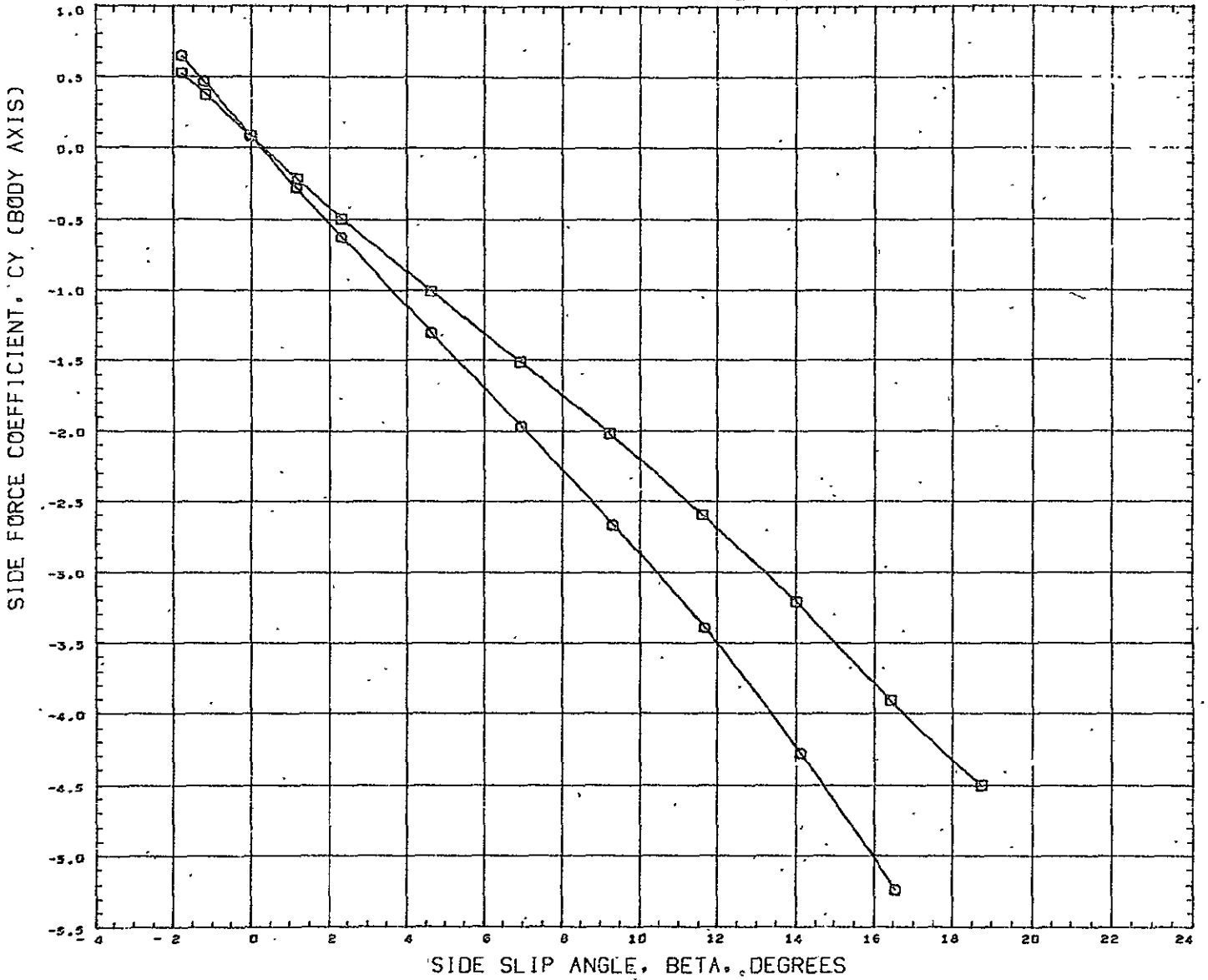

| DATA SET SYMBOL | | CONFIGURATION DESCRIPTION |
|---|---|---|
| (AZ4132) | ○ | TWT470 S-IC/GAC ORBITER BF2OWHVS CRUCIFORM |
| (JZ4002) | □ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |

| PARAMETRIC VALUES | | | |
|---|---|---|---|
| ALPHA | 0.340 | ORBINC - | 1.050 |
| WNGINC. | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | 36.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MACH 0.896

MSFC TWT 470 EFFECTS OF FIN ORIENTATION ON LATERAL-DIRECTIONAL CHARACTERISTICS




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (A24132) | ○ | TWT470 S-IC/GAC ORBITER BF2OWHVS CRUCIFORM |
| (J24082) | □ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |

MACH 0.990

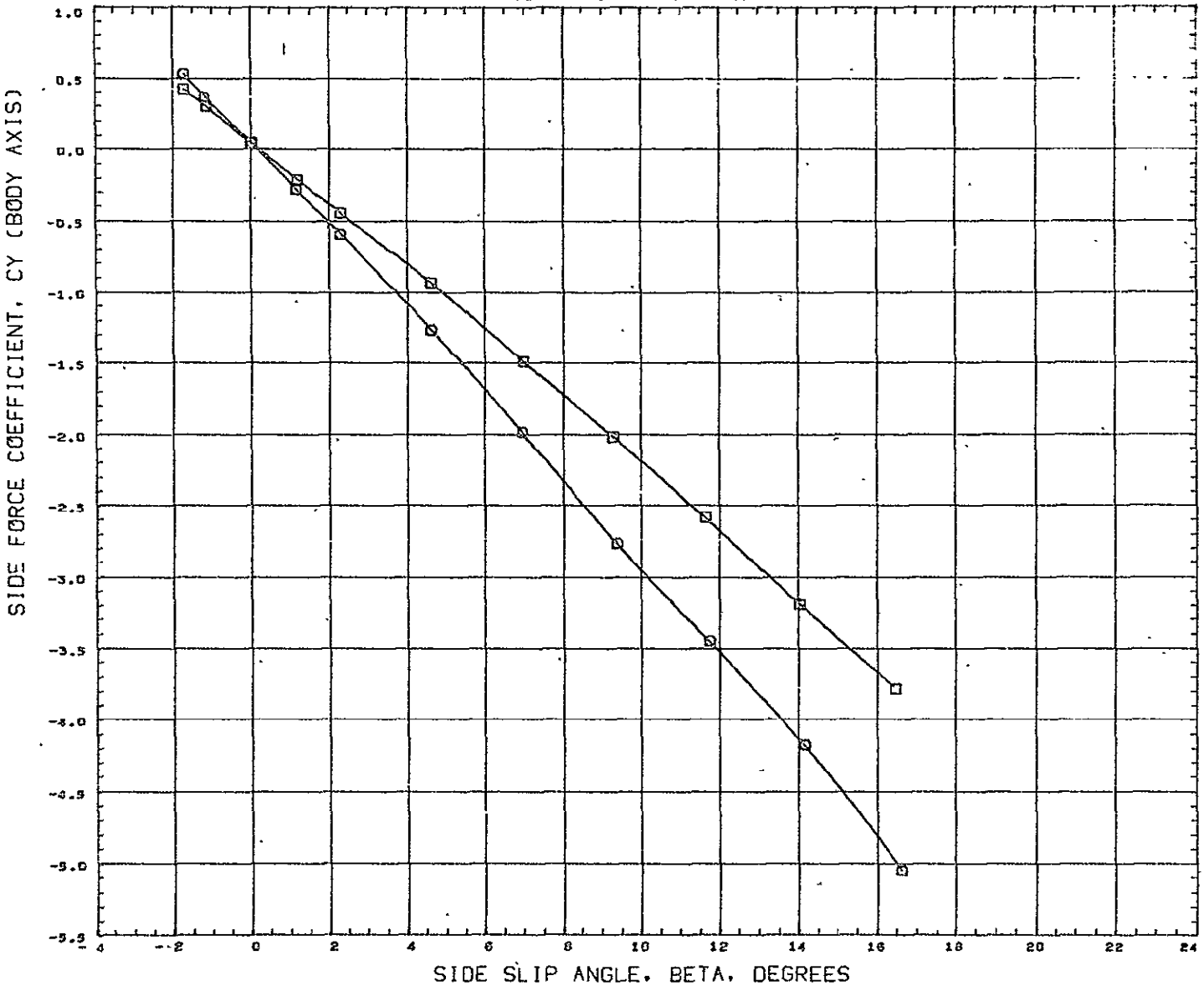
PARAMETRIC VALUES

| | | | |
|---|---|---|---|
| ALPHA | 0.340 | ORBINC - | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| FHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF FIN ORIENTATION ON LATERAL-DIRECTIONAL CHARACTERISTICS




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (A24132) | O | TWT470 S-IC/GAC ORBITER BF2OWHVS CRUCIFORM |
| (J24982) | □ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |

PARAMETRIC VALUES

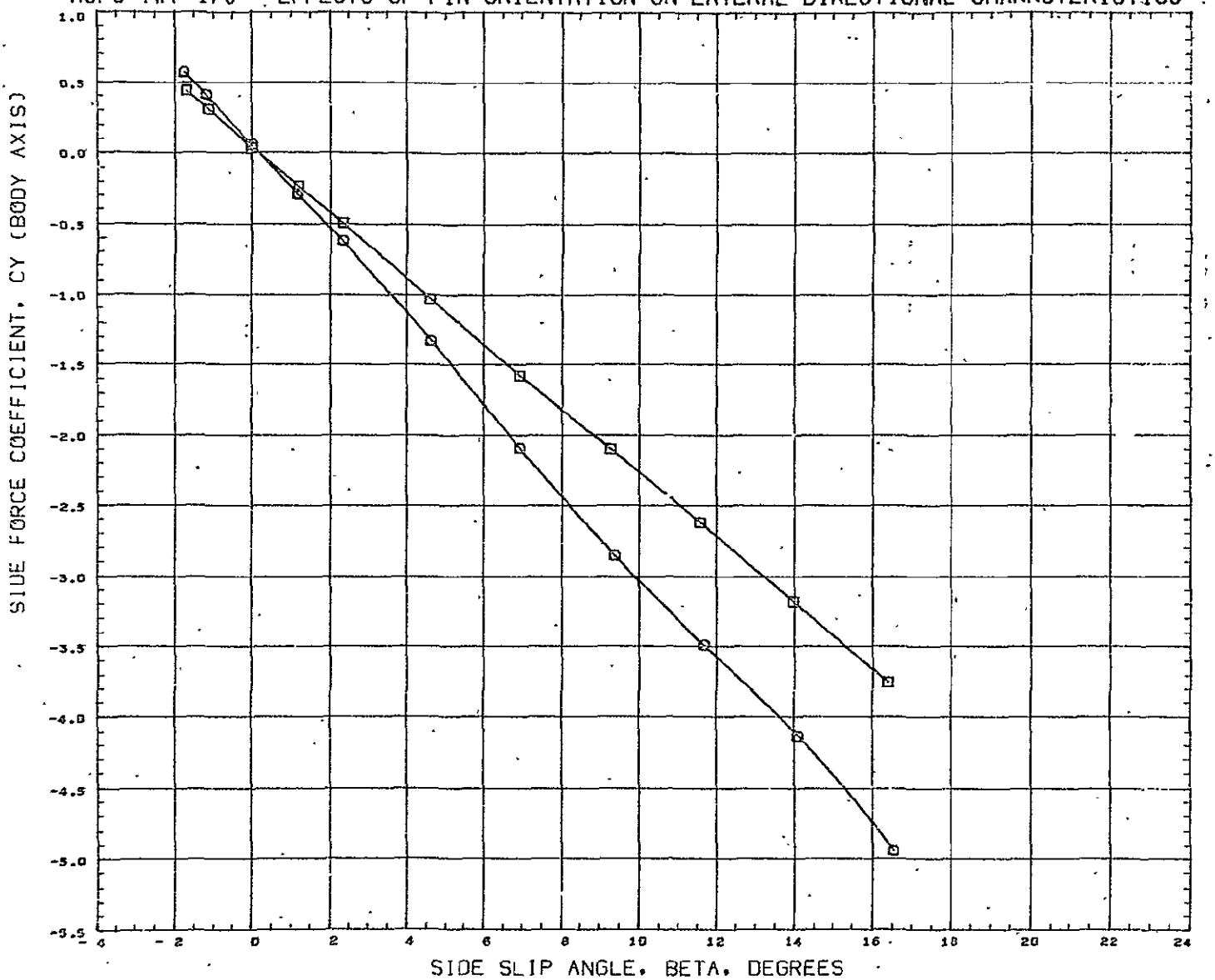
| | | | |
|---|---|---|---|
| ALPHA | 0.340 | ORBINC - | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MACH 1.196

MSFC TWT 470 EFFECTS OF FIN ORIENTATION ON LATERAL-DIRECTIONAL CHARACTERISTICS




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| A24132) | □ | TWT470 S-IC/GAC ORBITER BF2OWHVS CRUCIFORM |
| J24002) | □ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |

PARAMETRIC VALUES

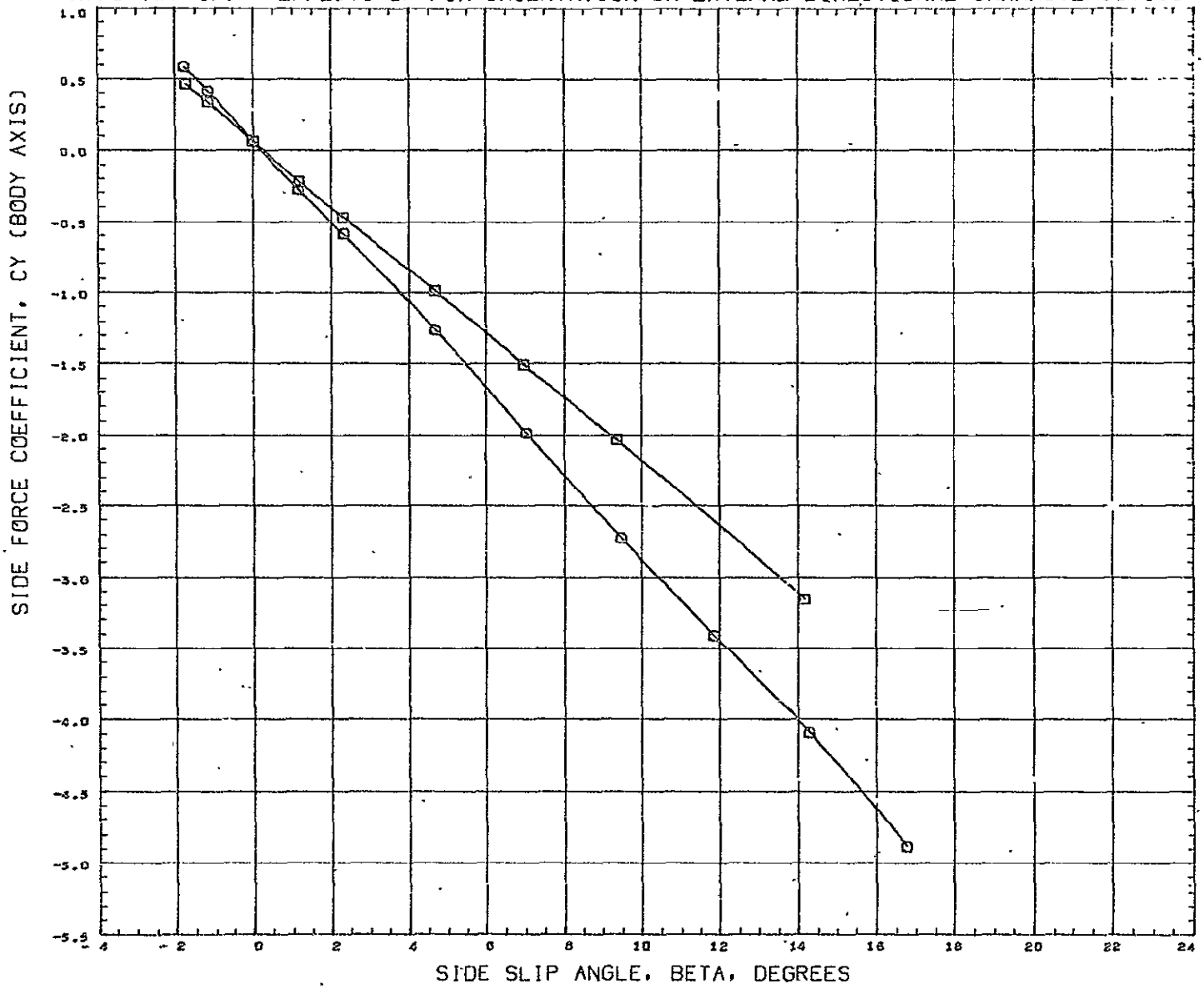
| | | | |
|---|---|---|---|
| ALPHA | 0.340 | ORBINC - | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MACH 1.302

MSFC TWT 470 EFFECTS OF FIN ORIENTATION ON LATERAL-DIRECTIONAL CHARACTERISTICS




| DATA SET SYMBOL | | CONFIGURATION DESCRIPTION |
|---|---|---|
| (A24132) | □ | TWT470 S-IC/GAC ORBITER BF2OWHVS CRUCIFORM |
| (J24002) | □ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |

PARAMETRIC VALUES

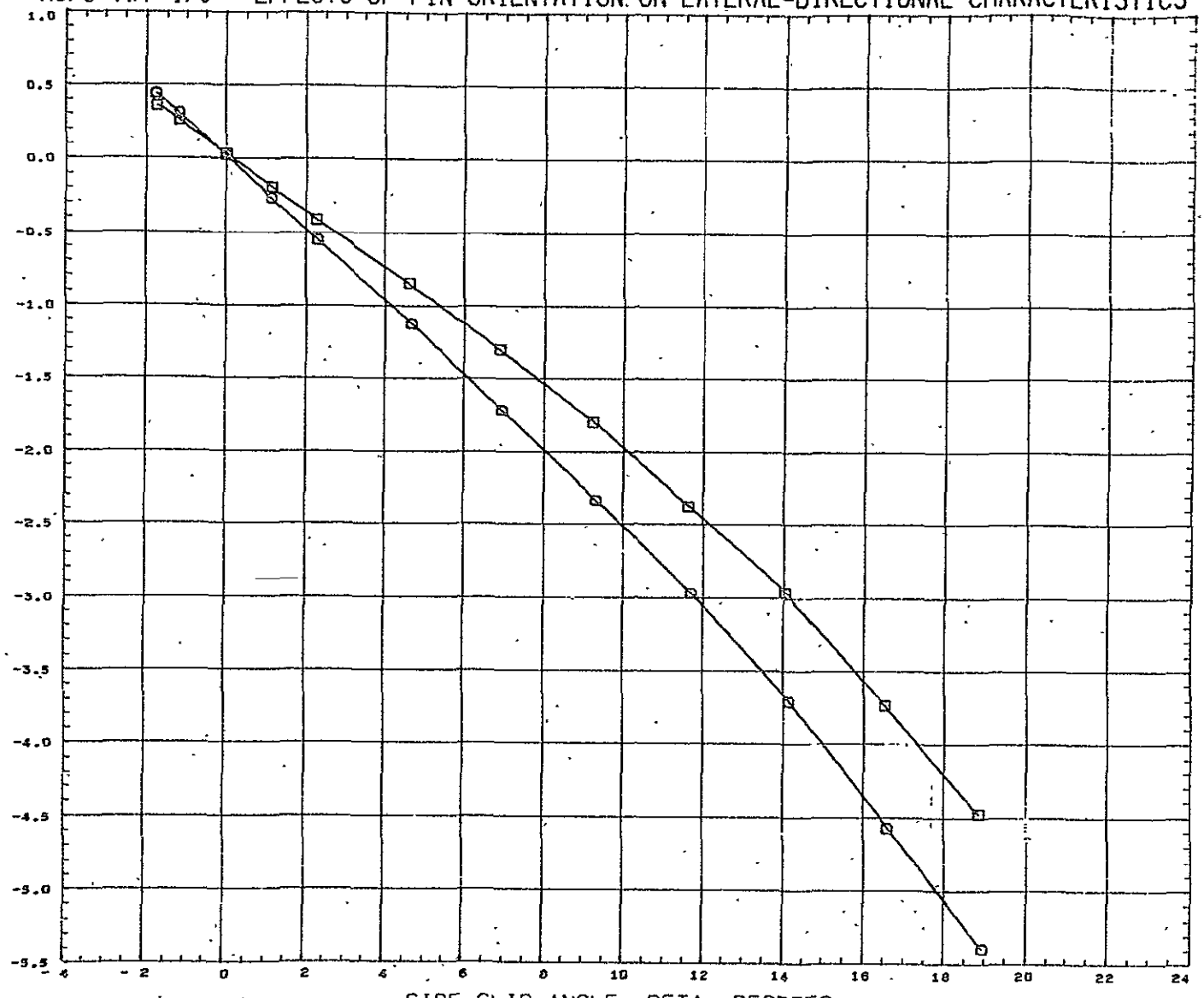
| | | | |
|---|---|---|---|
| ALPHA | 0.340 | ORBINC - | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MACH 1.460

MSFC TWT 470 EFFECTS OF FIN ORIENTATION ON LATERAL-DIRECTIONAL CHARACTERISTICS




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (A24132) | ○ | TWT470 S-IC/GAC ORBITER BF2OWHVS CRUCIFORM |
| (J24062) | □ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |

MACH 1.953

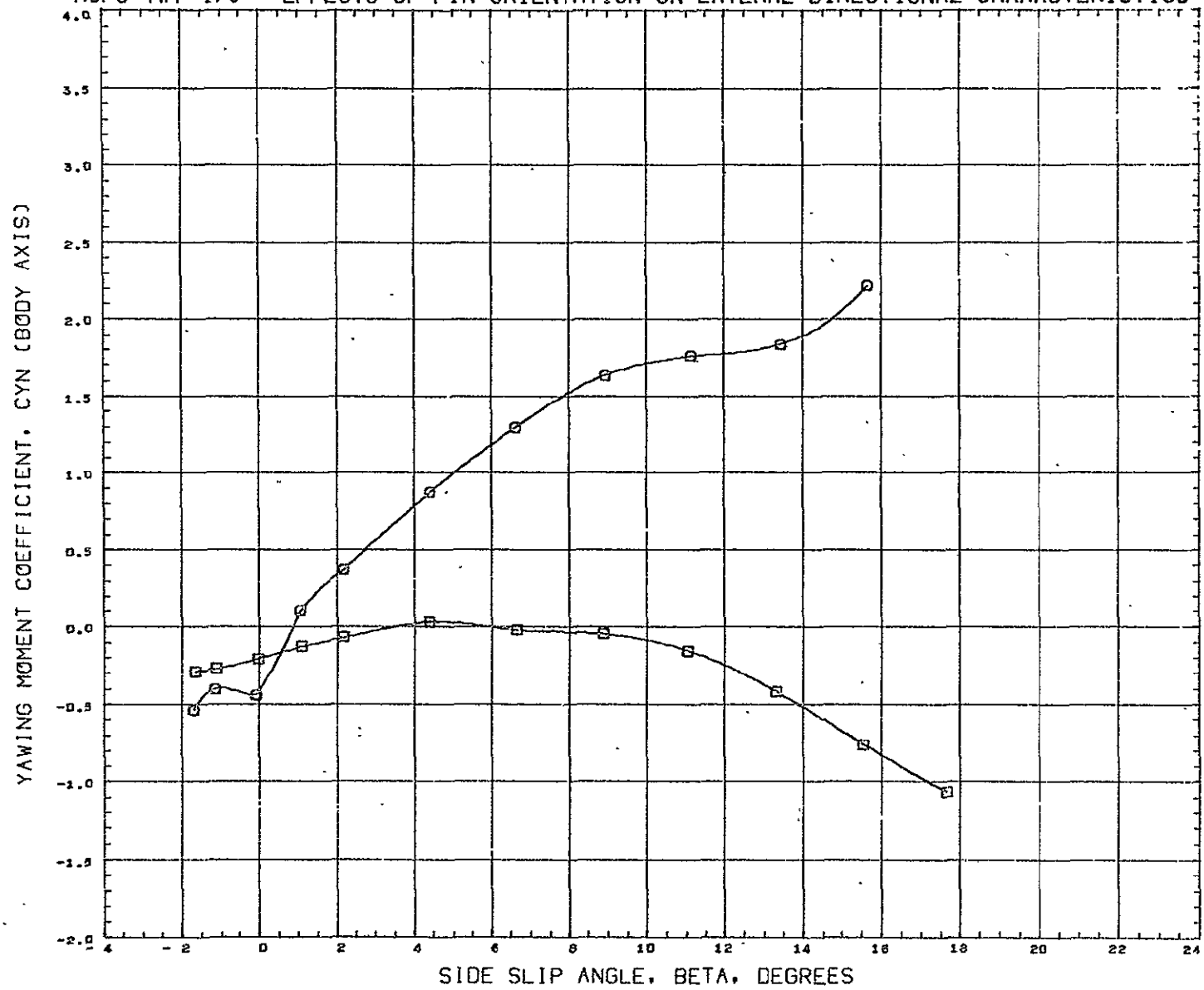
PARAMETRIC VALUES

| | | | |
|---|---|---|---|
| ALPHA | 0.340 | ORBINC | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF FIN ORIENTATION ON LATERAL-DIRECTIONAL CHARACTERISTICS



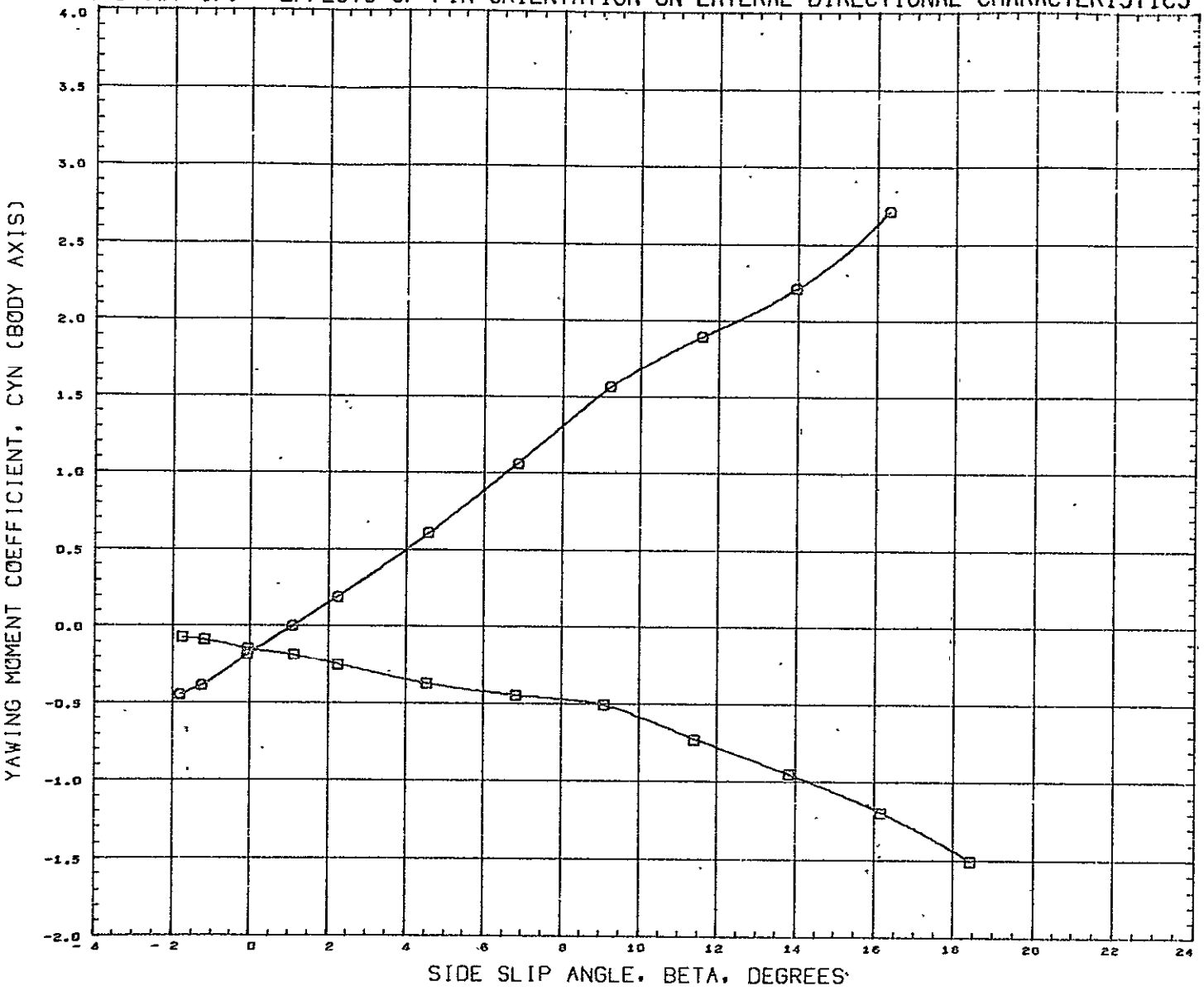

| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (A24132) | ○ | TWT470 S-IC/GAC ORBITER BF20WHVS CRUCIFORM |
| (J24002) | □ | TWT470 S-IC/GAC ORBITER BF10WHVS BASIC |

MACH 0.595

| PARAMETRIC VALUES | | | |
|---|---|---|---|
| ALPHA | 0.340 | ORBINC - | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF FIN ORIENTATION ON LATERAL-DIRECTIONAL CHARACTERISTICS




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (A24132) | ○ | TWT47D S-IC/GAC ORBITER BF2OWHVS CRUCIFORM |
| (J24082) | □ | TWT47D S-IC/GAC ORBITER BF1OWHVS BASIC |

PARAMETRIC VALUES

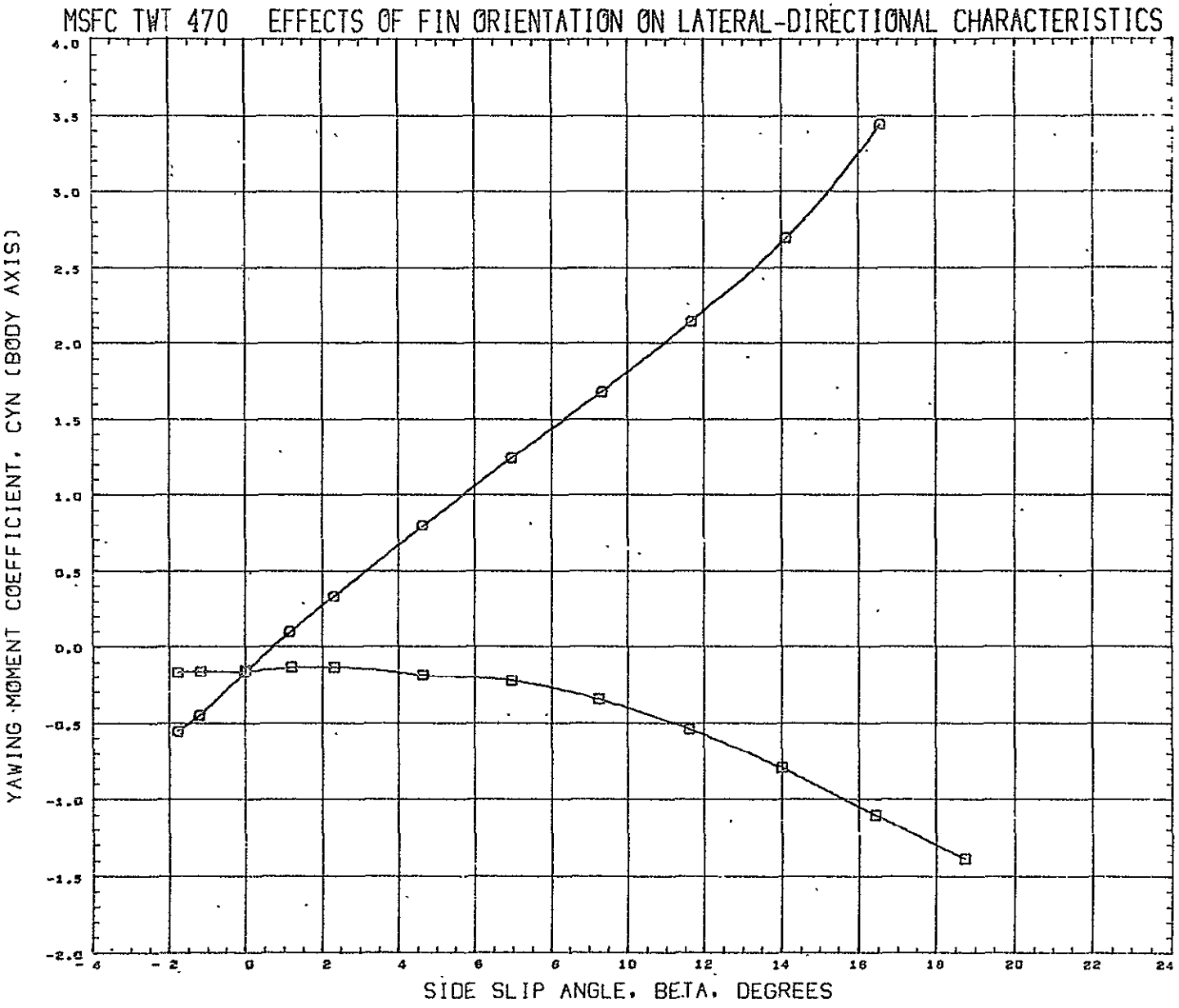
| | | | |
|---|---|---|---|
| ALPHA | 0.340 | ORBINC - | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MACH 0.896

MSFC TWT 470 EFFECTS OF FIN ORIENTATION ON LATERAL-DIRECTIONAL CHARACTERISTICS




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (A24132) | ○ | TWT470 S-IC/GAC ORBITER BF2OWHVS CRUCIFORM |
| (J24082) | □ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |

MACH 0.990

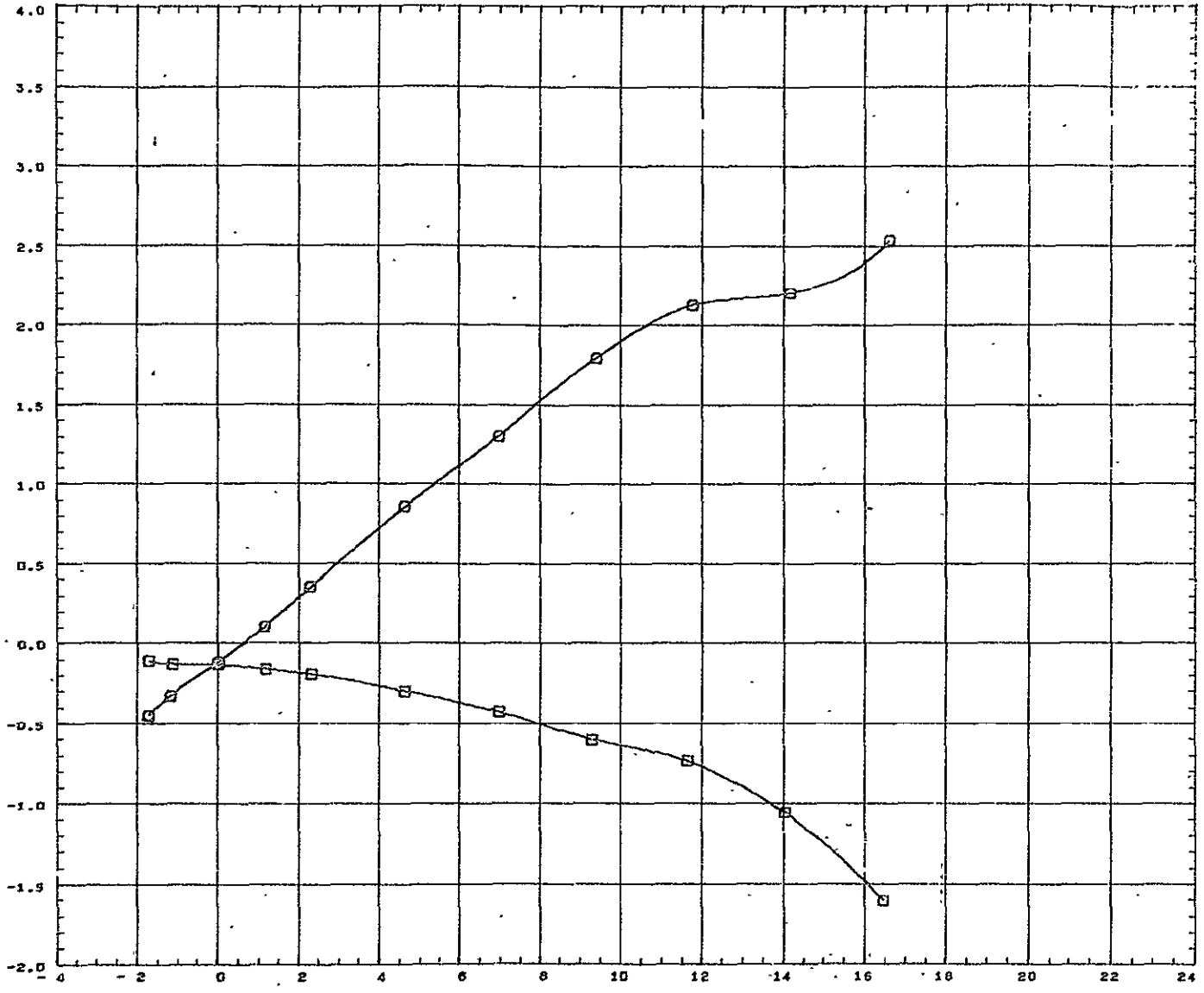
PARAMETRIC VALUES

| | | | |
|---|---|---|---|
| ALPHA | 0.340 | ORBINC - | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

# MSFC TWT 470 EFFECTS OF FIN ORIENTATION ON LATERAL-DIRECTIONAL CHARACTERISTICS




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (A24132) | □ | TWT470 S-IC/GAC ORBITER BF2OWHVS CRUCIFORM |
| (J24092) | □ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |

MACH 1.196

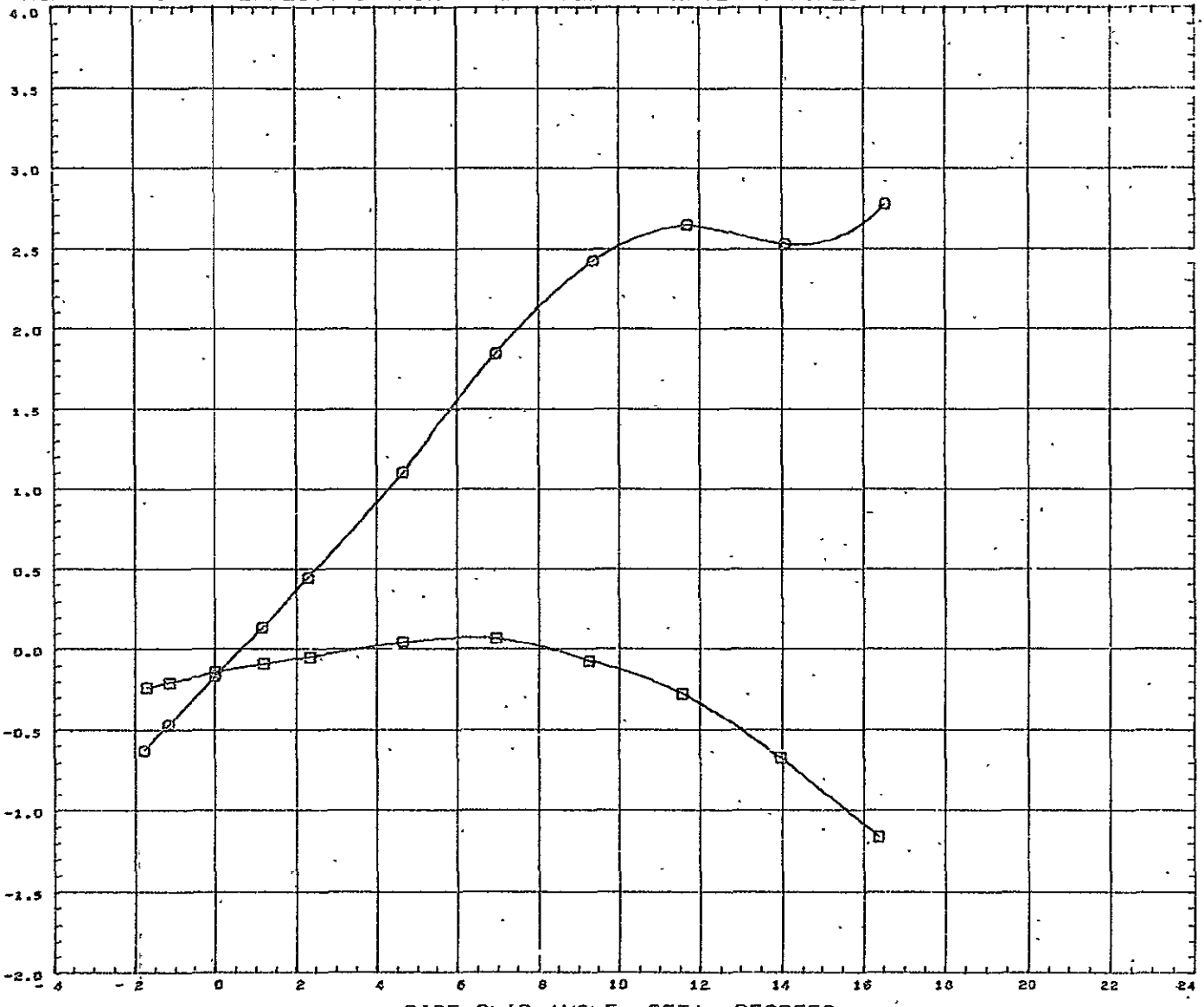
PARAMETRIC VALUES

| | | | |
|---|---|---|---|
| ALPHA | 0.340 | ORBINC - | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF FIN ORIENTATION ON LATERAL-DIRECTIONAL CHARACTERISTICS




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (A24132) | ☐ | TWT470 S-IC/GAC ORBITER BF2OWHVS CRUCIFORM |
| (J24002) | ☐ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |

PARAMETRIC VALUES

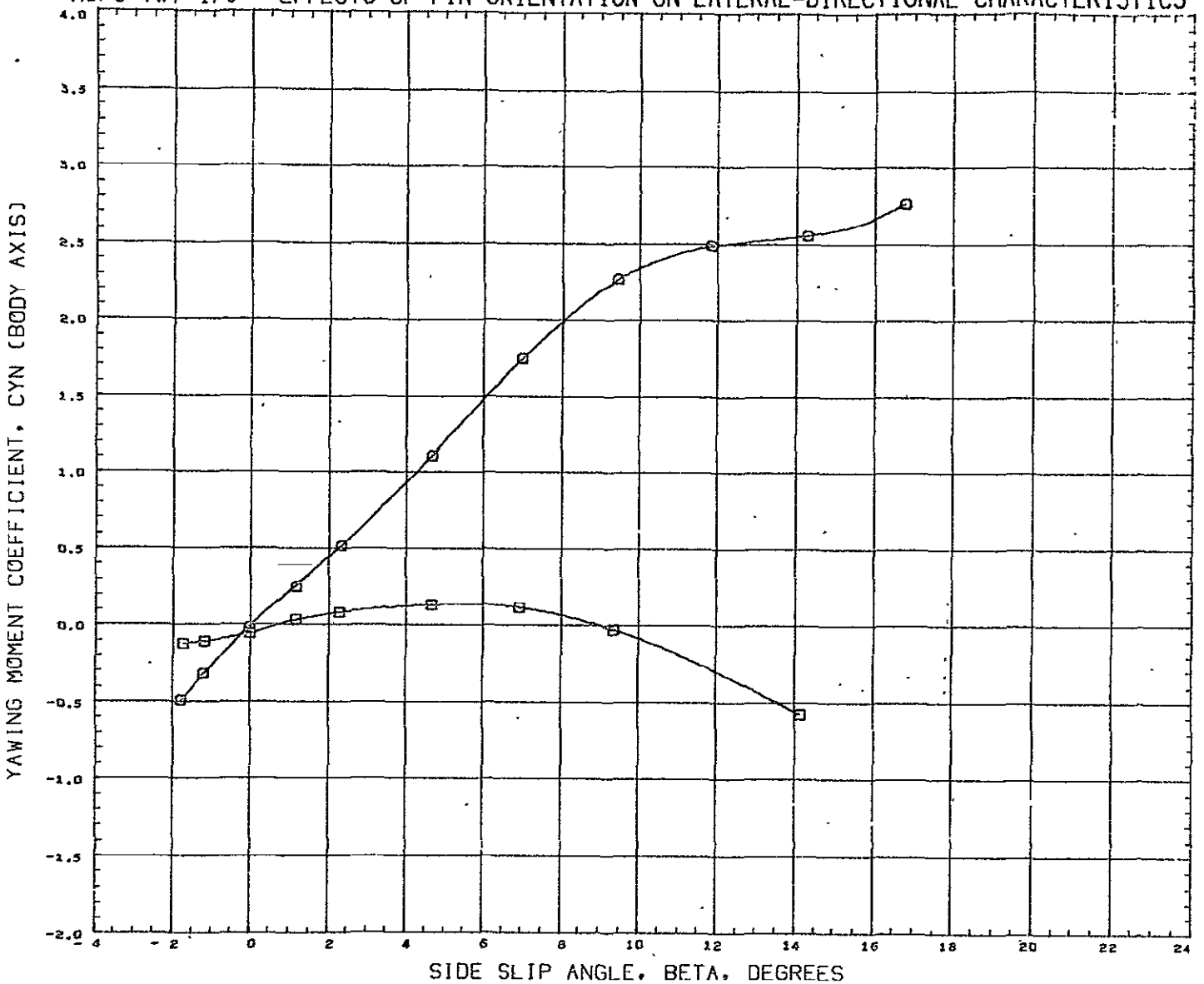
| | | | |
|---|---|---|---|
| ALPHA | 0.340 | ORBINC - | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MACH 1.302

MSFC TWT 470 EFFECTS OF FIN ORIENTATION ON LATERAL-DIRECTIONAL CHARACTERISTICS




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (A24132) | ○ | TWT470 S-IC/GAC ORBITER BF2OWHVS CRUCIFORM |
| (J24082) | □ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |

MACH 1.460

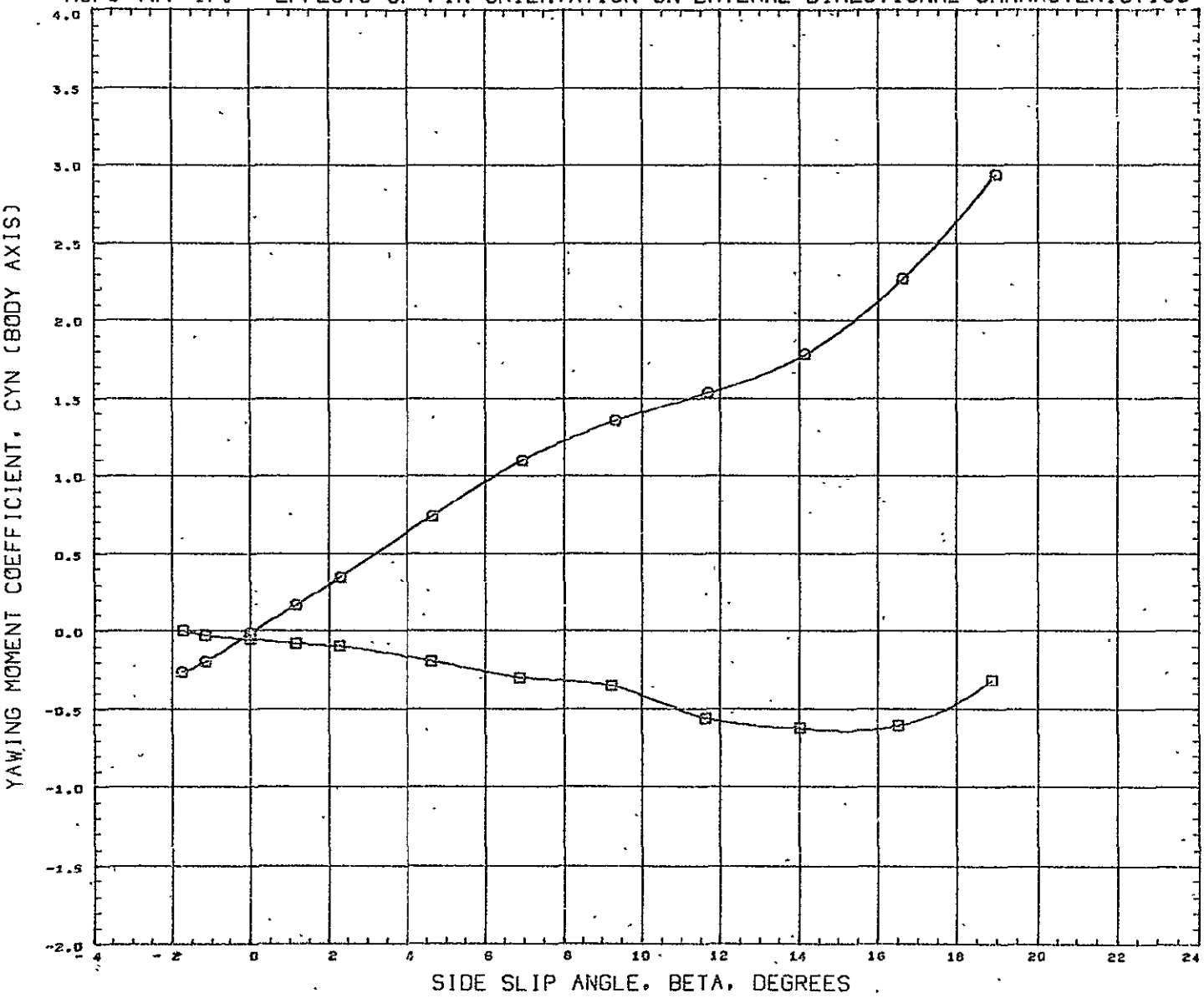
PARAMETRIC VALUES

| | | | |
|---|---|---|---|
| ALPHA | 0.340 | ORBINC - | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF FIN ORIENTATION ON LATERAL-DIRECTIONAL CHARACTERISTICS




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (A24132) | ○ | TWT470 S-IC/GAC ORBITER BF2OWHVS CRUCIFORM |
| (J24062) | □ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |

MACH 1.953

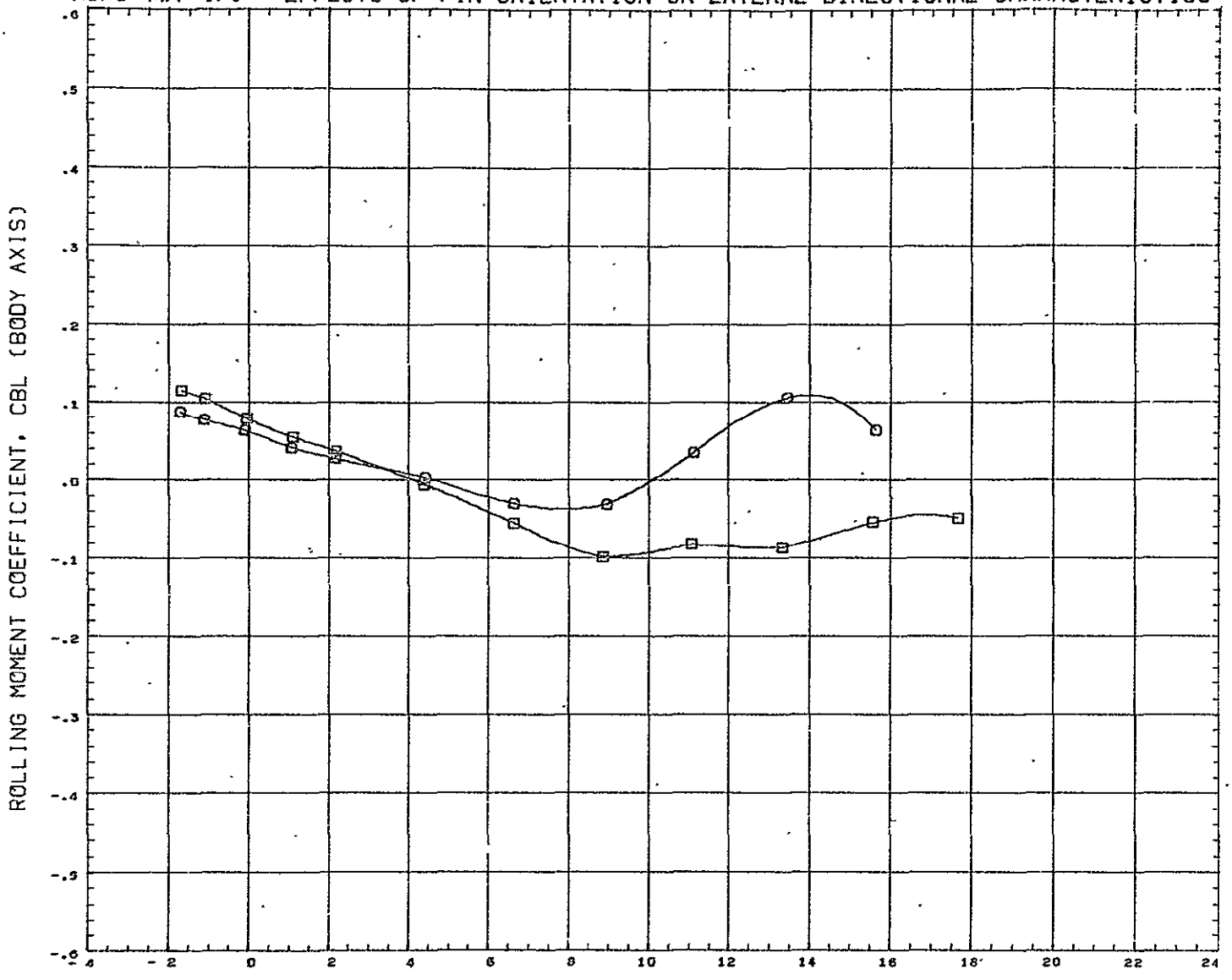
PARAMETRIC VALUES

| | | | |
|---|---|---|---|
| ALPHA | 0.340 | ORBINC | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF FIN ORIENTATION ON LATERAL-DIRECTIONAL CHARACTERISTICS



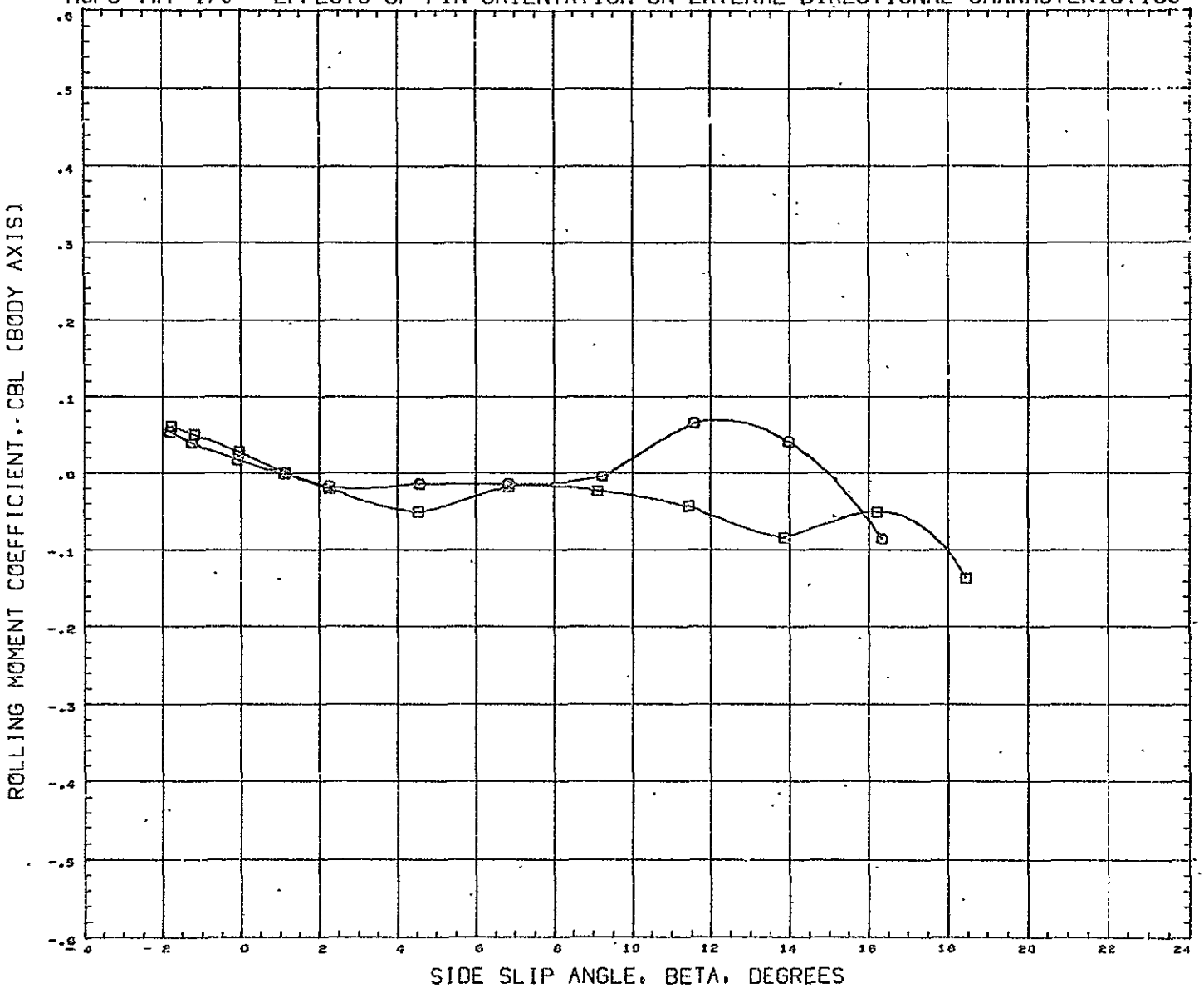

| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (A24132) | ○ | TWT470 S-IC/GAC ORBITER BF2OWHVS CRUCIFORM |
| (J24082) | □ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |

MACH 0.596

| PARAMETRIC VALUES | | | |
|---|---|---|---|
| ALPHA | 0.340 | ORBINC - | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.5366 | PERCNT |

# MSFC TWT 470- EFFECTS OF FIN ORIENTATION ON LATERAL-DIRECTIONAL CHARACTERISTICS




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (A24132) | ○ | TWT470 S-IC/GAC ORBITER BF2OWHVS CRUCIFORM |
| (J24082) | □ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |

MACH 0.896

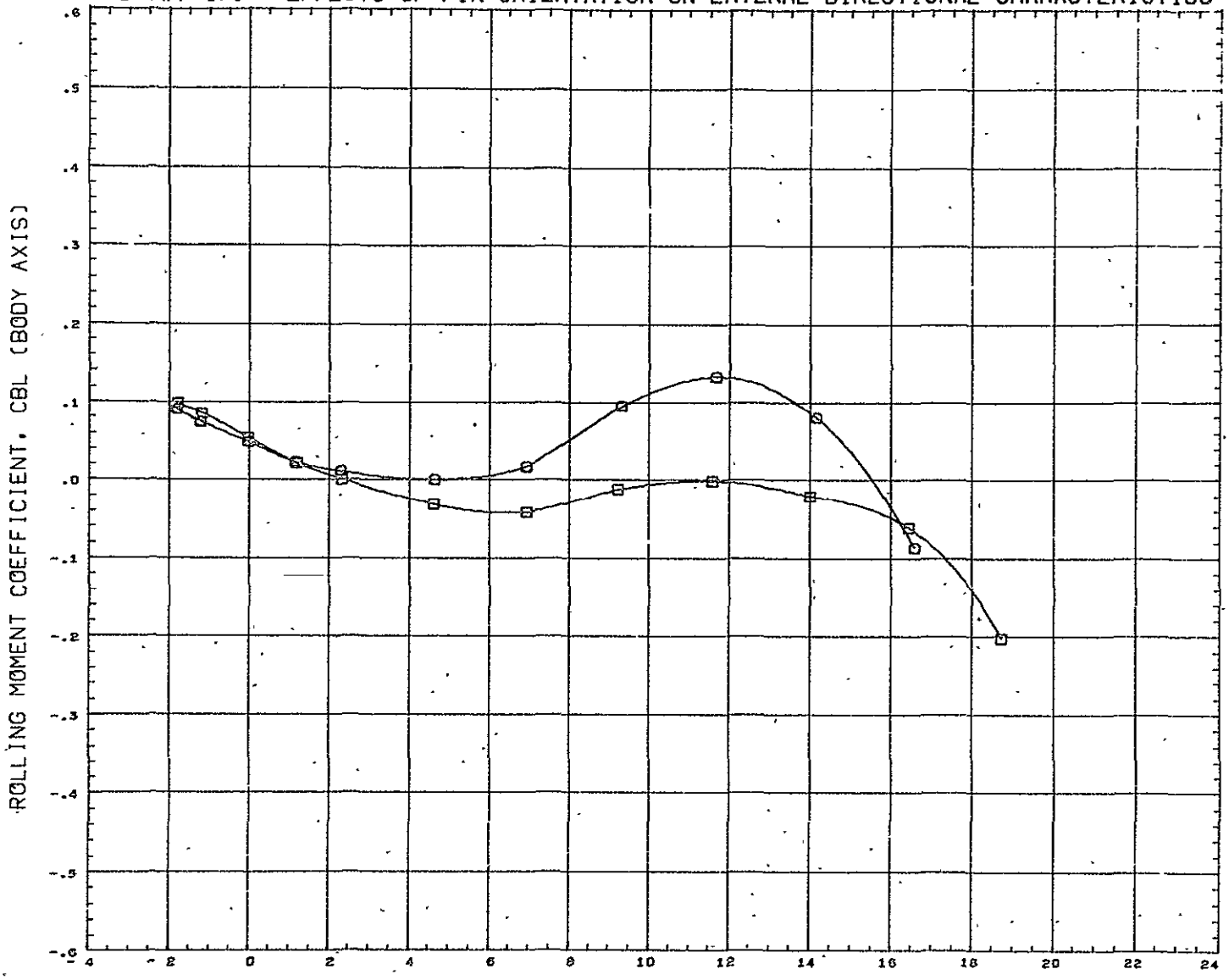
PARAMETRIC VALUES

| | | | |
|---|---|---|---|
| ALPHA | 0.340 | ORBINC - | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

# MSFC TWT 470 EFFECTS OF FIN ORIENTATION ON LATERAL-DIRECTIONAL CHARACTERISTICS



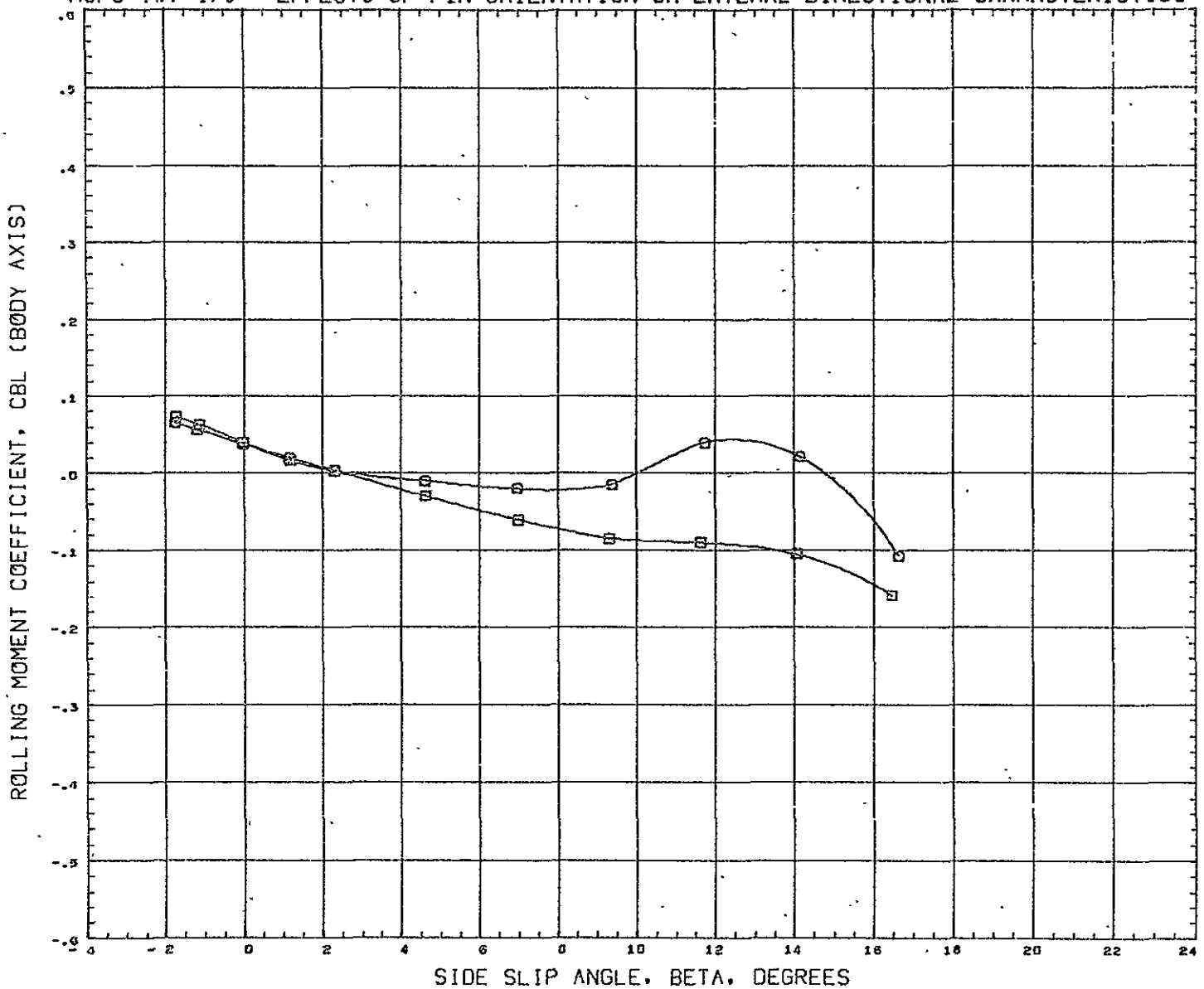

| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (A24132) | □ | TWT470 S-IC/GAC ORBITER BF2OWHVS CRUCIFORM |
| (J24022) | □ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |

MACH 0.990

| PARAMETRIC VALUES | | | |
|---|---|---|---|
| ALPHA | 0.340 | ORBINC - | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

# MSFC TWT 470 EFFECTS OF FIN ORIENTATION ON LATERAL-DIRECTIONAL CHARACTERISTICS




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (A24132) | ○ | TWT470 S-IC/GAC ORBITER BF20WHVS CRUCIFORM |
| (J24082) | □ | TWT470 S-IC/GAC ORBITER BF10WHVS BASIC |

PARAMETRIC VALUES

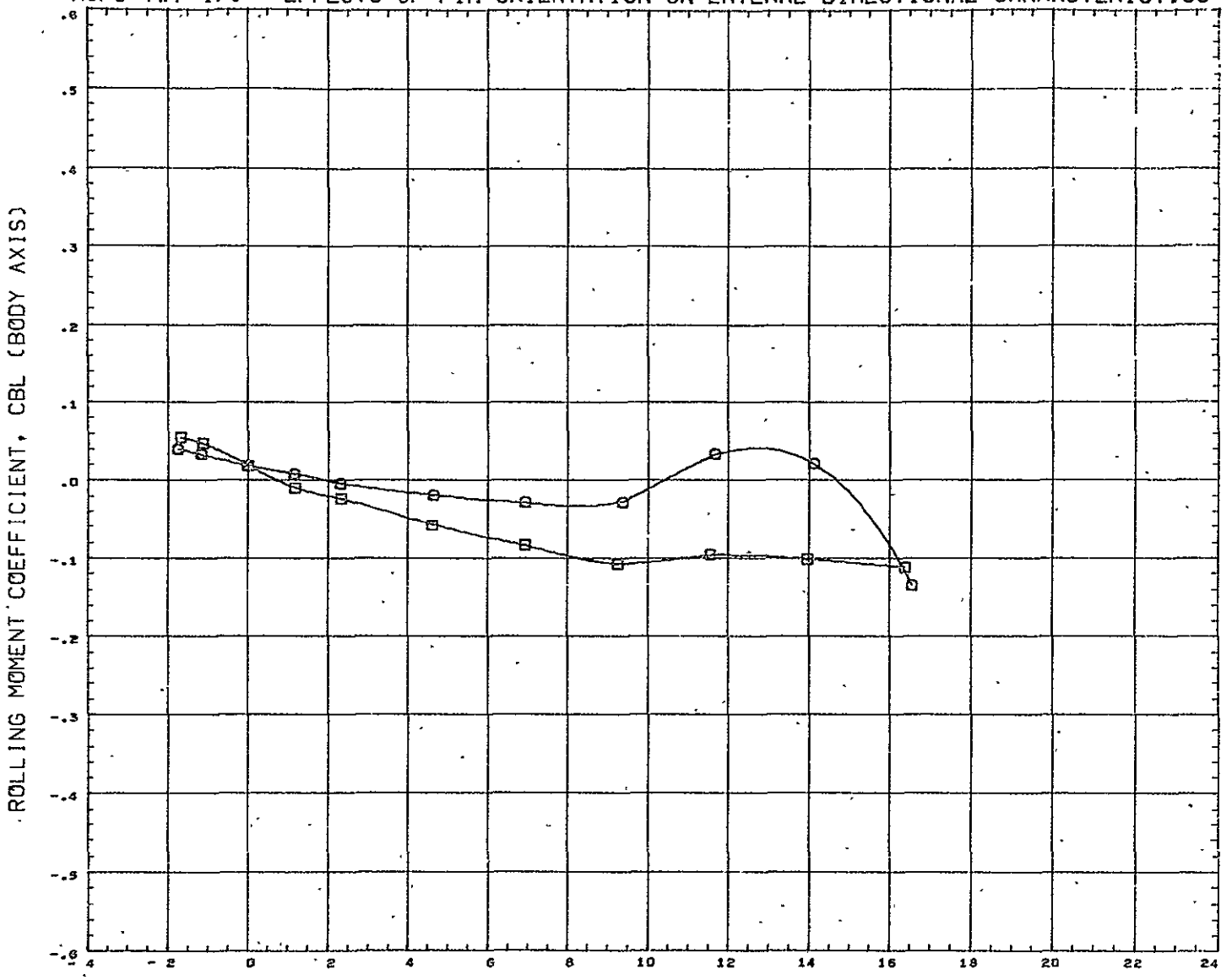
| | | | |
|---|---|---|---|
| ALPHA | 0.340 | ORBINC - | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3365 | PERCNT |

MACH 1.196

MSFC TWT 470 EFFECTS OF FIN ORIENTATION ON LATERAL-DIRECTIONAL CHARACTERISTICS




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (A24132) | ○ | TWT470 S-IC/GAC ORBITER BF2OWHVS CRUCIFORM |
| (J24002) | □ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |

PARAMETRIC VALUES

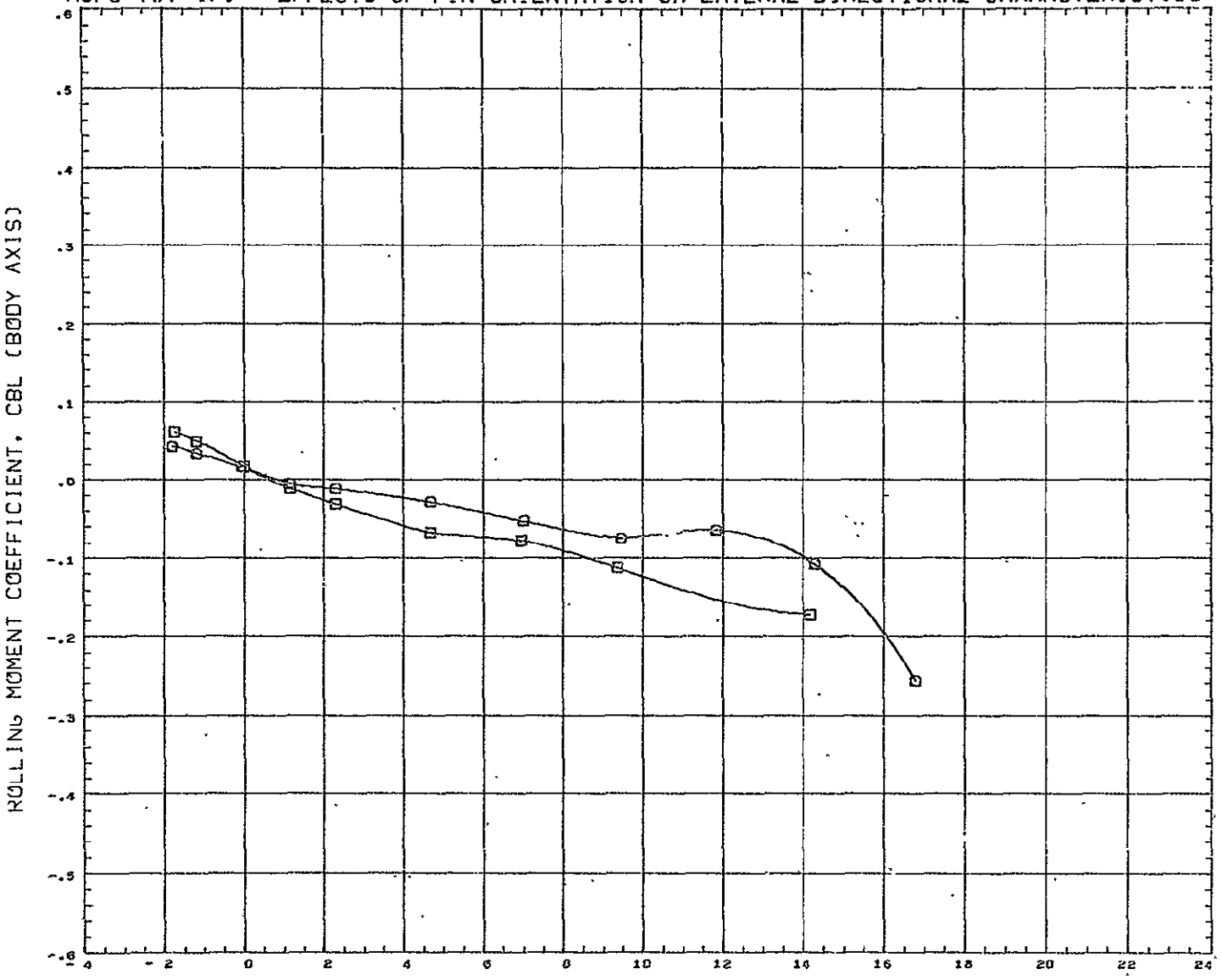
| | | | |
|---|---|---|---|
| ALPHA | 0.340 | ORBINC - | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MACH 1.302

# MSFC TWT 470 EFFECTS OF FIN ORIENTATION ON LATERAL-DIRECTIONAL CHARACTERISTICS




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (A24132) | ○ | TWT470, S-IC/GAC ORBITER BF2OWHVS CRUCIFORM |
| (J24082) | □ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |

PARAMETRIC VALUES

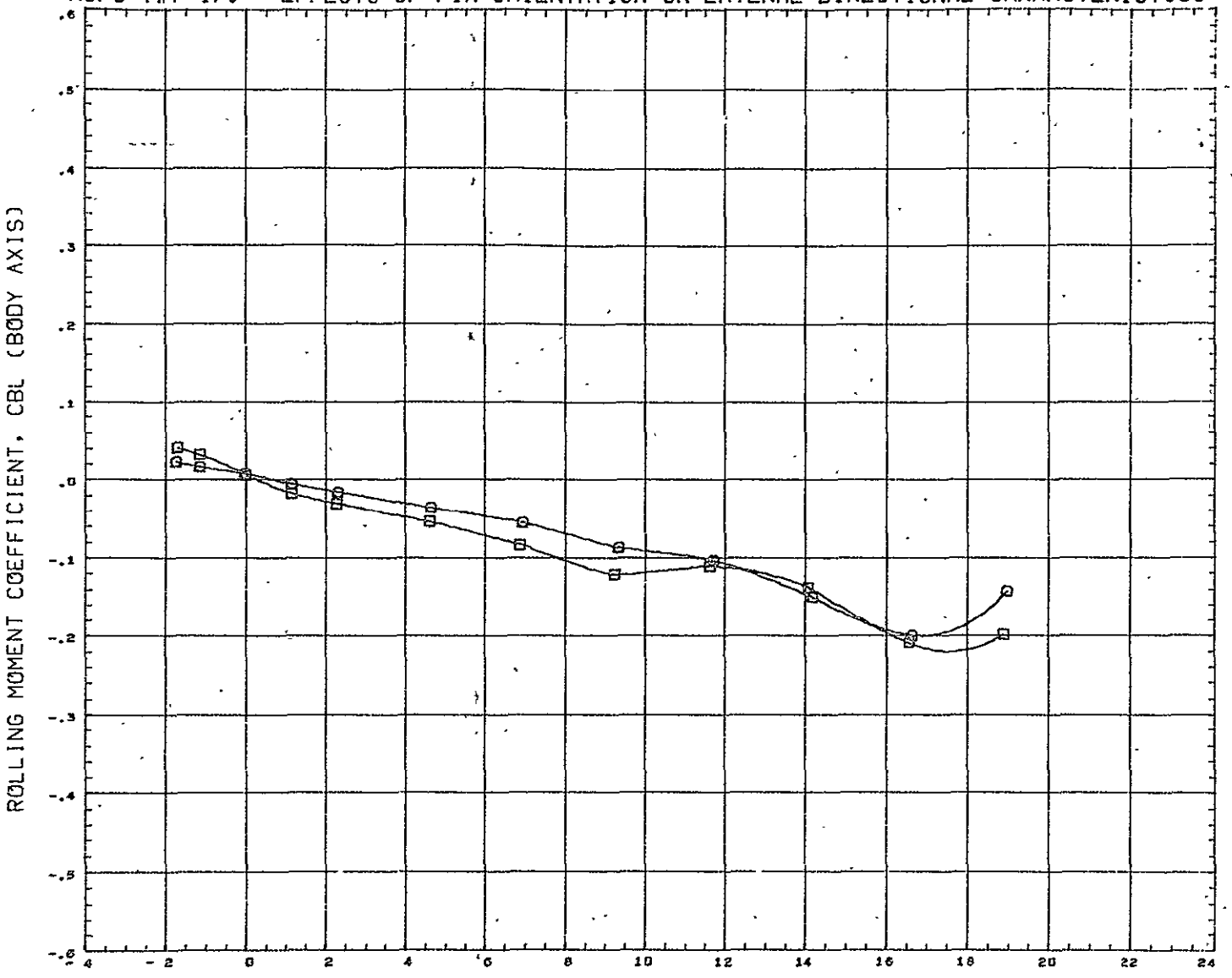
| | | | |
|---|---|---|---|
| ALPHA | 0.340 | ORBINC = | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MACH 1.460

# MSFC TWT 470 EFFECTS OF FIN ORIENTATION ON LATERAL-DIRECTIONAL CHARACTERISTICS



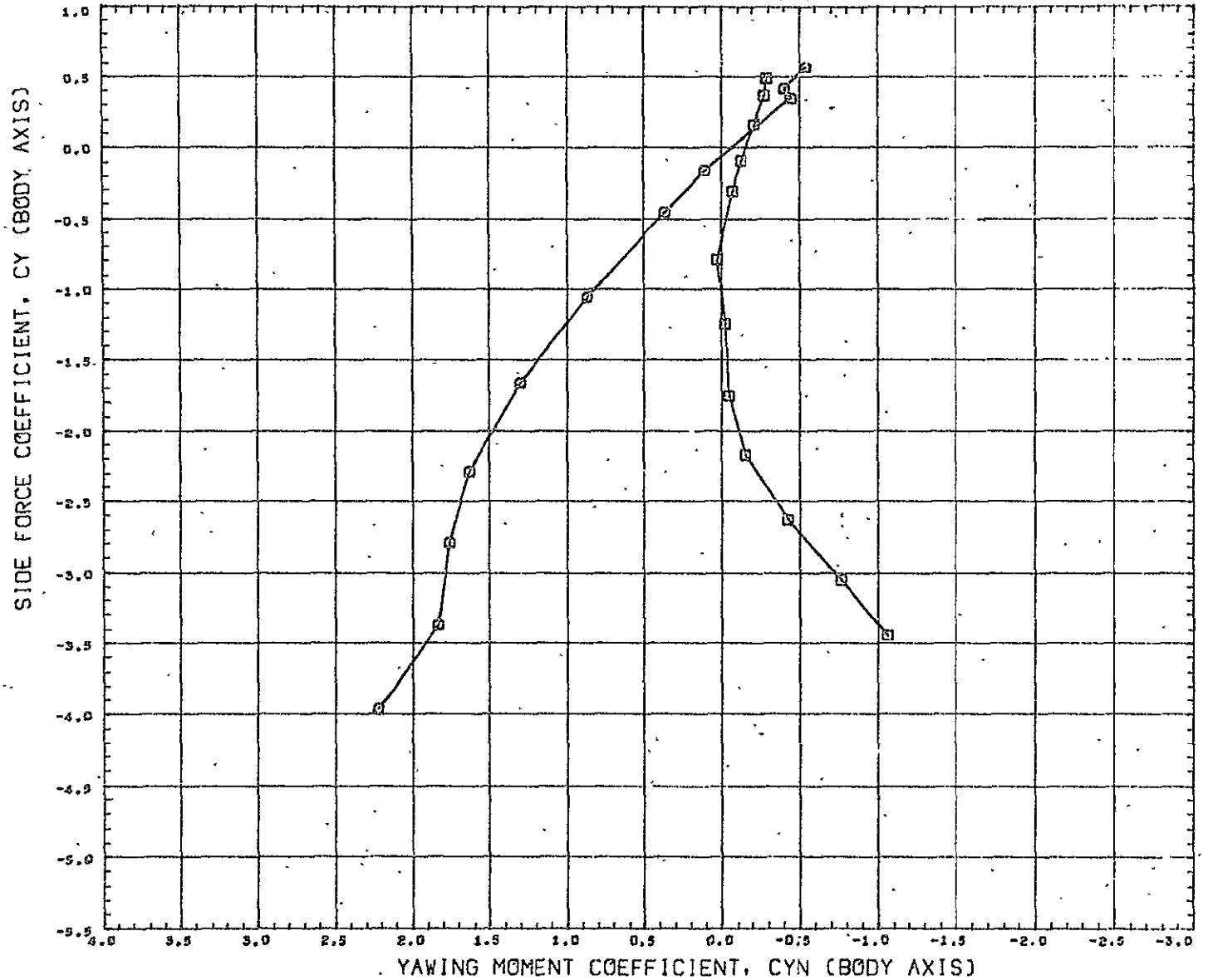

| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (A24132) | ○ | TWT470 S-IC/GAC ORBITER BF2OWHVS CRUCIFORM |
| (J24082) | □ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |

MACH 1.955

| PARAMETRIC VALUES | | | |
|---|---|---|---|
| ALPHA | 0.340 | ORBINC | -1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

# MSFC TWT 470 · · EFFECTS OF FIN ORIENTATION ON LATERAL-DIRECTIONAL CHARACTERISTICS



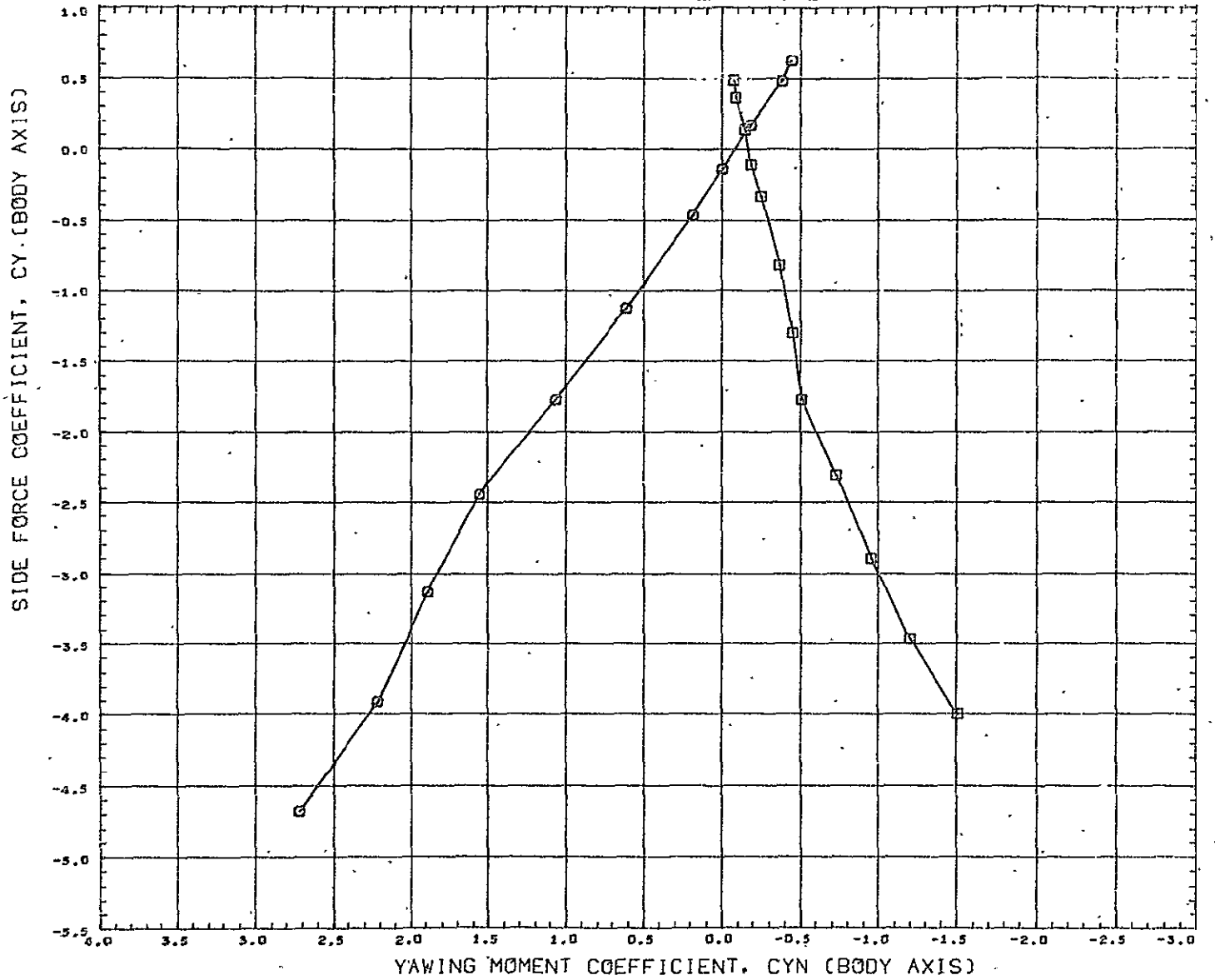

| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (A24132) | ○ | TWT470 S-IC/GAC ORBITER BF20WHVS CRUCIFORM |
| (J24082) | □ | TWT470 S-IC/GAC ORBITER BF10WHVS BASIC |

MACH 0.596

| PARAMETRIC VALUES | | | |
|---|---|---|---|
| ALPHA | 0.340 | ORBINC - | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF FIN ORIENTATION ON LATERAL-DIRECTIONAL CHARACTERISTICS



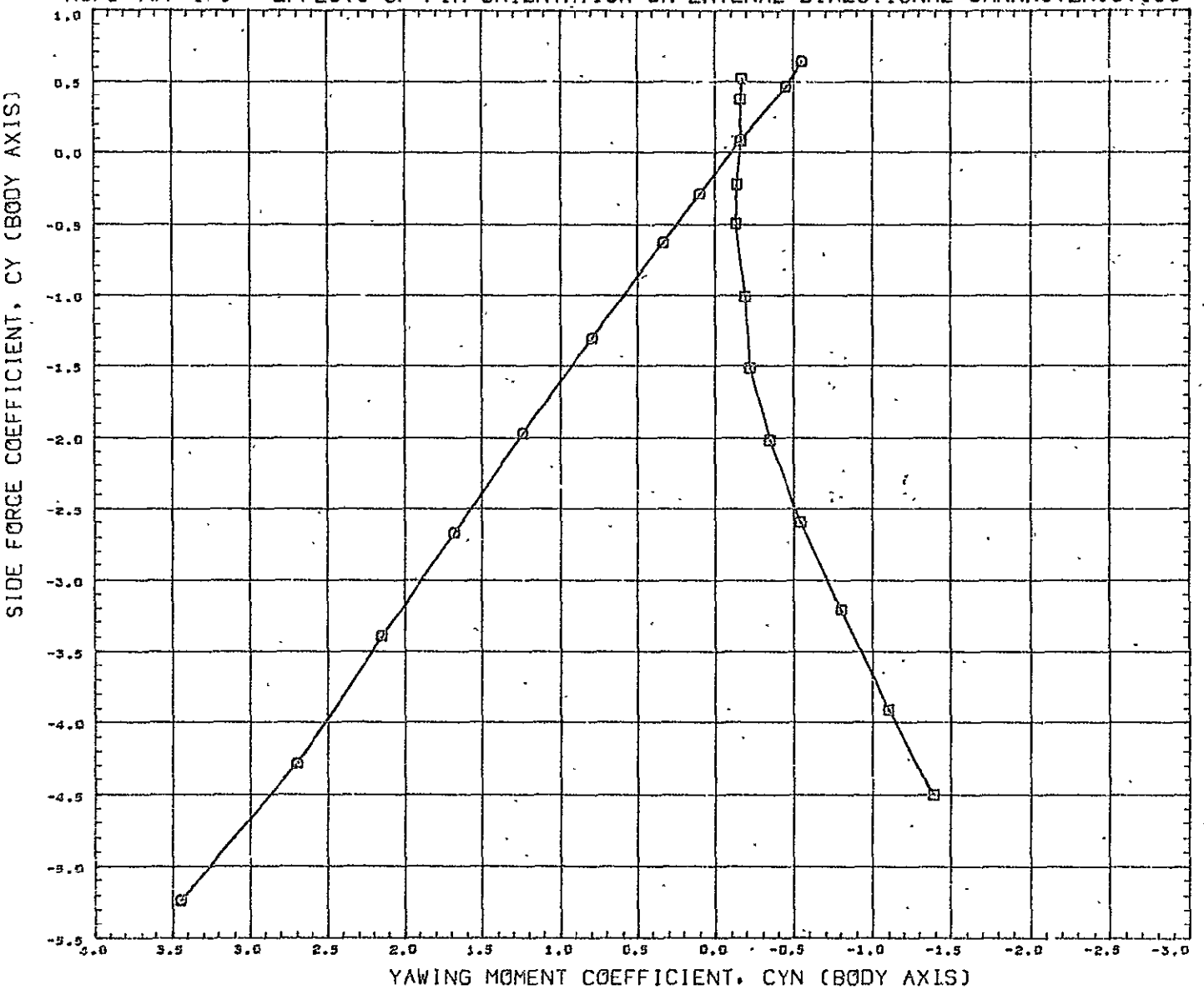

| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (A24132) | ○ | TWT470 S-IC/GAC ORBITER BF2OWHVS CRUCIFORM |
| (J24062) | □ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |

MACH 0.896

| PARAMETRIC VALUES | | | |
|---|---|---|---|
| ALPHA | 0.340 | ORBINC | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF FIN ORIENTATION ON LATERAL-DIRECTIONAL CHARACTERISTICS



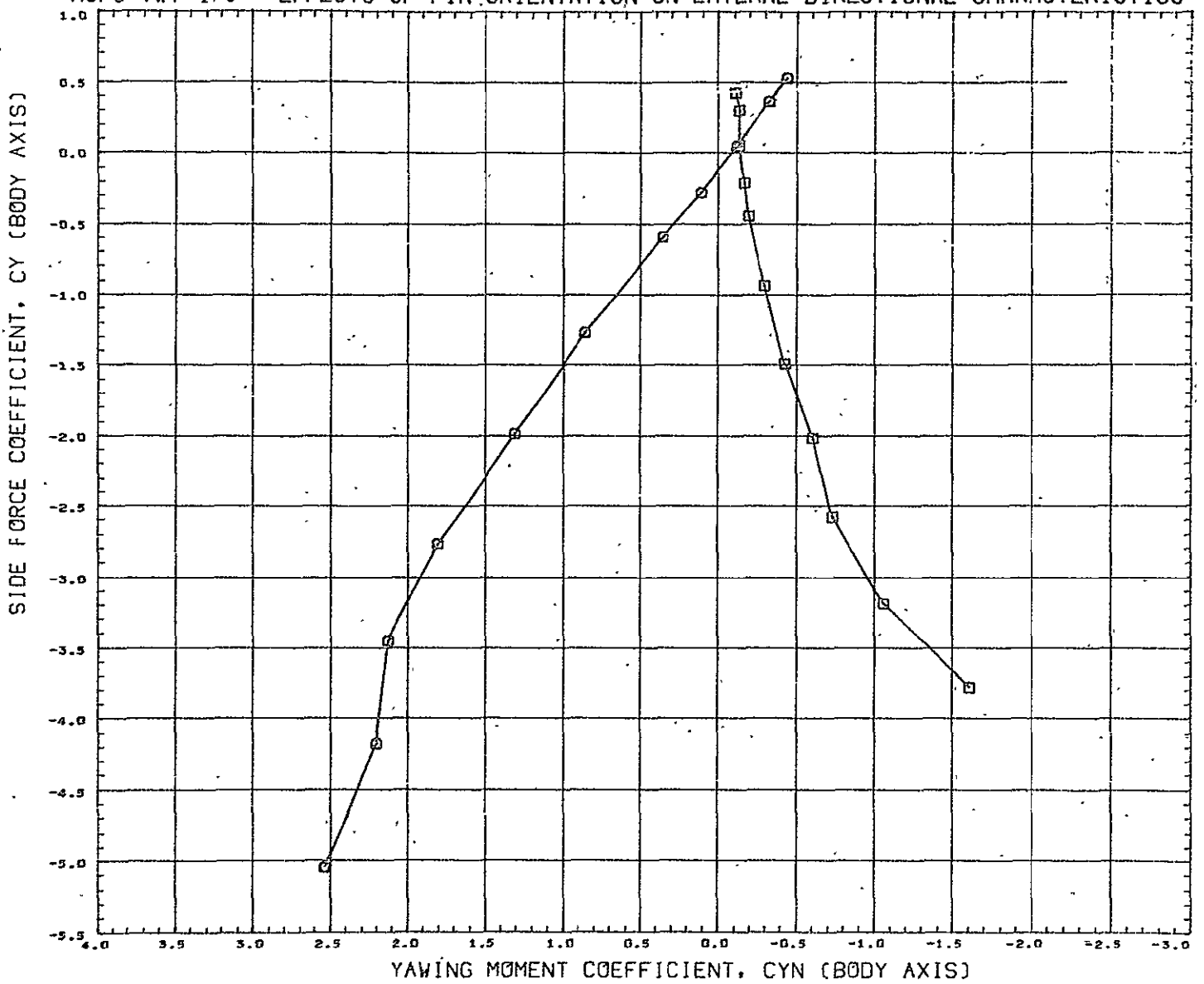

| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (A24132) | ○ | TWT470 S-IC/GAC ORBITER BF2OWHVS CRUCIFORM |
| (J24002) | □ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |

MACH 0.990

| PARAMETRIC VALUES | | | |
|---|---|---|---|
| ALPHA | 0.340 | ORBINC - | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF FIN ORIENTATION ON LATERAL-DIRECTIONAL CHARACTERISTICS




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (A24132) | O | TWT470 S-IC/GAC ORBITER BF2OWHVS CRUCIFORM |
| (J24002) | □ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |

MACH 1.196

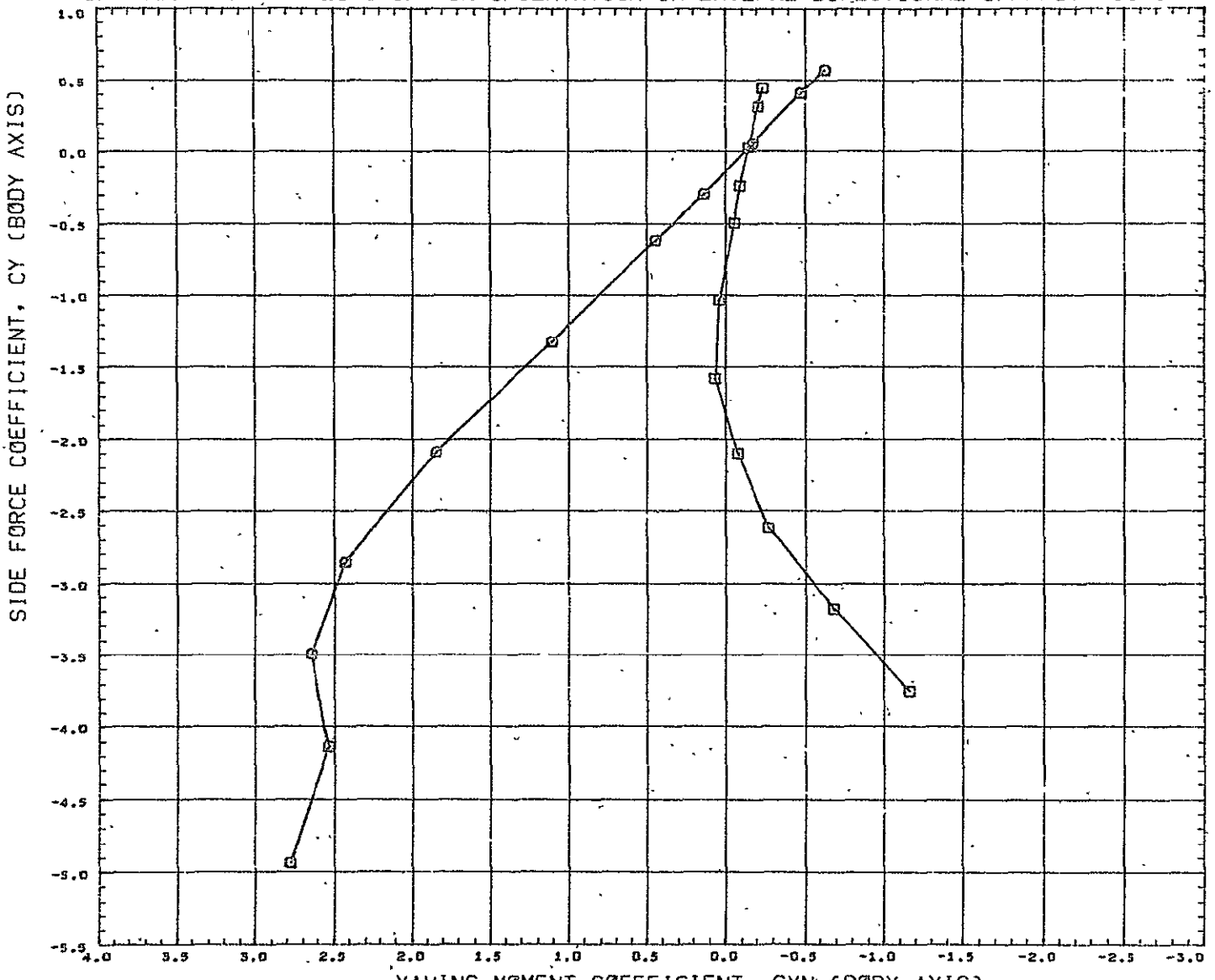
PARAMETRIC VALUES

| | | | |
|---|---|---|---|
| ALPHA | 0.349 | ORBINC | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MSFC TWT 470 EFFECTS OF FIN ORIENTATION ON LATERAL-DIRECTIONAL CHARACTERISTICS




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (A24132) | ○ | TWT470 S-IC/GAC ORBITER BF2OWHVS CRUCIFORM |
| (J24082) | □ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |

PARAMETRIC VALUES

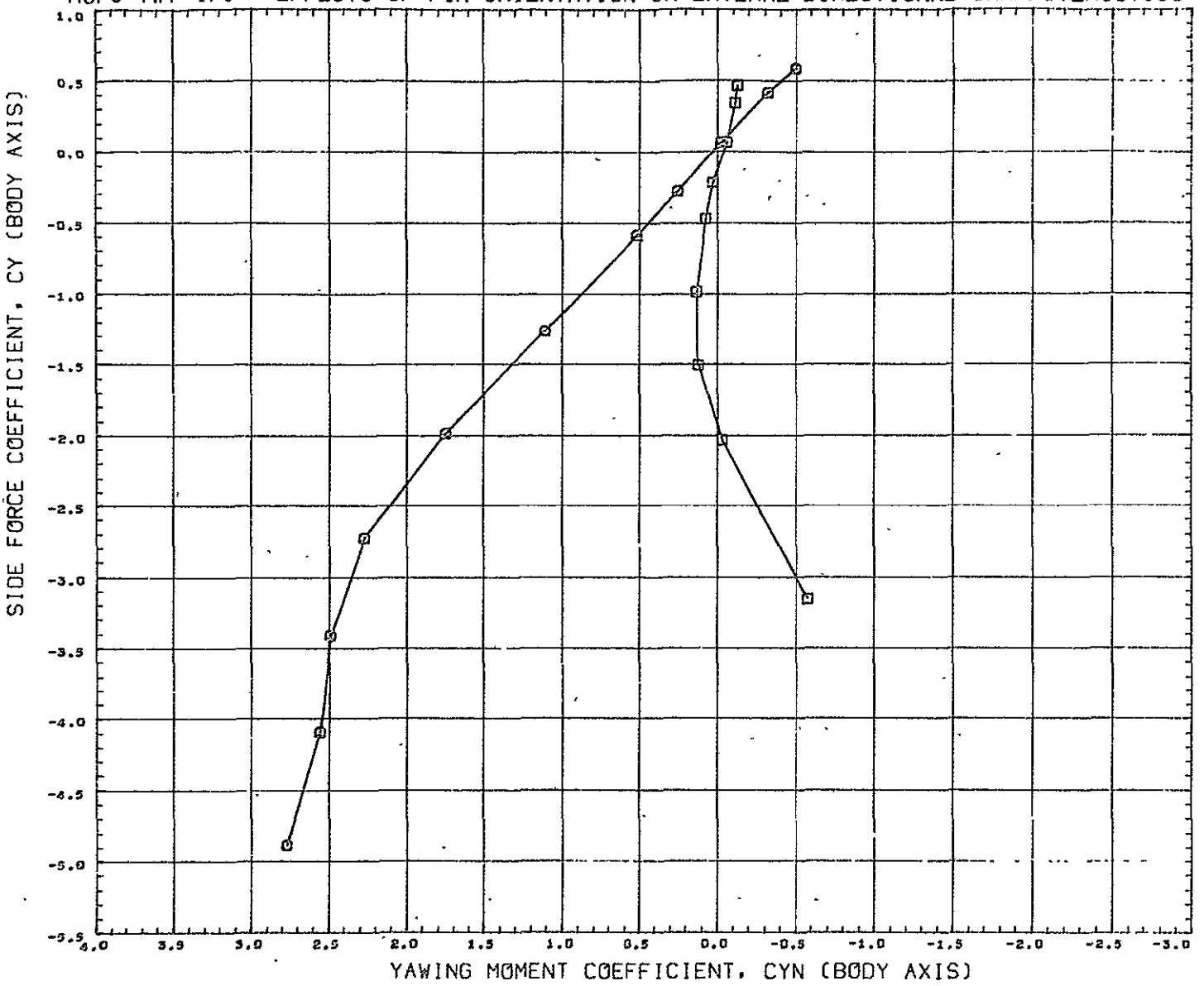
| | | | |
|---|---|---|---|
| ALPHA | 0.340 | ORBINC | 1.050 |
| WNGINC | 4.000 | HTAIL | 0.000 |
| PHIB | 0.000 | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

MACH 1.302

MSFC TWT 470 EFFECTS OF FIN ORIENTATION ON LATERAL-DIRECTIONAL CHARACTERISTICS




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (A20132) | ○ | TWT470 S-IC/GAC ORBITER BF2OWHVS CRUCIFORM |
| (J20002) | □ | TWT470 S-IC/GAC ORBITER BF1OWHVS BASIC |

MACH 1.460

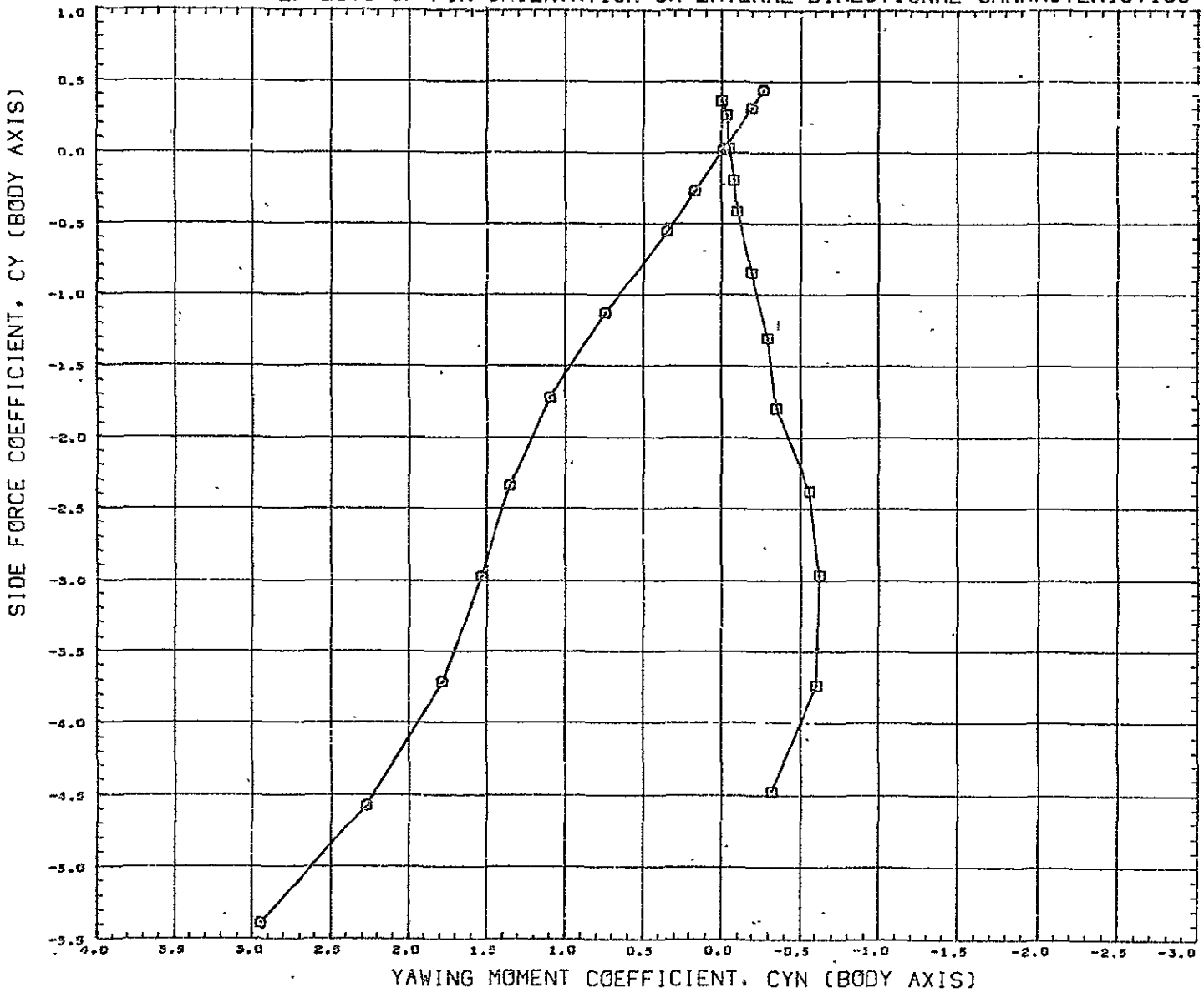
PARAMETRIC VALUES

| | | | | | |
|---|---|---|---|---|---|
| ALPHA | 0.340 | ORBINC - | 1.050 | | |
| WNGINC | 4.000 | HTAIL | 0.000 | | |
| PHIB | 0.000 | | | | |

REFERENCE INFORMATION

| | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |

# MSFC TWT 470 EFFECTS OF FIN ORIENTATION ON LATERAL-DIRECTIONAL CHARACTERISTICS




| DATA SET | SYMBOL | CONFIGURATION DESCRIPTION |
|---|---|---|
| (A24132) | ○ | TWT470 S-1C/GAC ORBITER BF2OWHVS CRUCIFORM |
| (J24062) | □ | TWT470 S-1C/GAC ORBITER BF1OWHVS BASIC |

MACH 1.953

| PARAMETRIC VALUES | | | |
|---|---|---|---|
| ALPHA | 0.340 | ORBINC - | 1.050 |
| WNGINC | 4.000 | hTAIL | 0.000 |
| PHIB | 0.000 | | |

| REFERENCE INFORMATION | | |
|---|---|---|
| REFS | 1.3960 | SQ.IN. |
| REFL | 1.3330 | INCHES |
| REFB | 1.3330 | INCHES |
| XMRP | 5.2640 | INCHES |
| YMRP | 0.0000 | INCHES |
| ZMRP | 0.0000 | INCHES |
| SCALE | 0.3366 | PERCNT |