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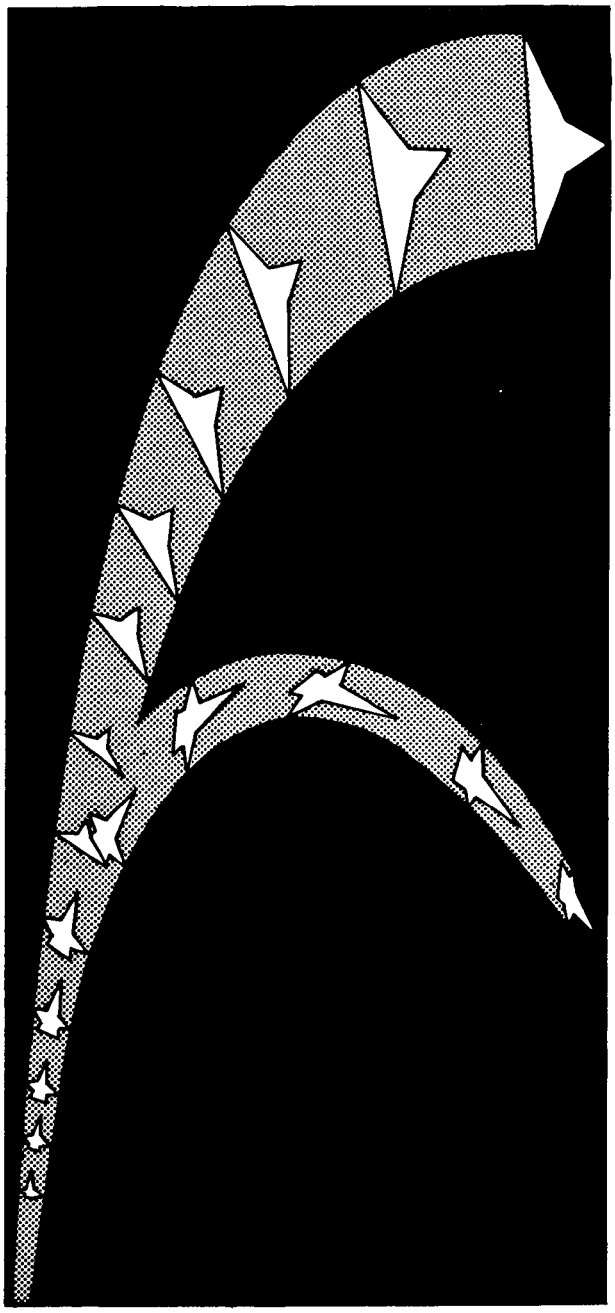

—SPACE SHUTTLE—

STATIC STABILITY CHARACTERISTICS AND CONTROL SURFACE EFFECTIVENESS OF THE BOEING .00435 SCALE MODEL SPACE SHUTTLE BOOSTER H-32

by
Jacque Houser, TBC
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CALSPAN 36 INCH
HYPERSONIC WIND TUNNEL

SADSAC SPACE SHUTTLE
AEROTHERMODYNAMIC
DATA MANAGEMENT SYSTEM

THIS DOCUMENT SHOULD
BE REFERENCED AS
NASA CR 120,002

CONTRACT NAS8-4016
MARSHALL SPACE FLIGHT CENTER

NASA Series Number: S-0605

DMS-DR-1158

SADSAC/SPACE SHUTTLE

WIND TUNNEL TEST DATA REPORT

CONFIGURATION: Boeing .00435 Scale Model Space Shuttle Booster H-32

TEST PURPOSE: To Determine Static Stability Characteristics and Control Surface Effectiveness

TEST FACILITY: Grumman 36-Inch Hypersonic Wind Tunnel

TESTING AGENCY: The Boeing Company

TEST NO. & DATE: GHWT-020; 6/1/71 through 6/18/71

FACILITY COORDINATOR: Mr. Mike Quan - GAC

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CONTRACT NAS 8-4016

AMENDMENT 153

DRL 184-58

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ABSTRACT

Experimental aerodynamic investigations were made in the Grumman Aerospace Corp. 36" Hypersonic Wind Tunnel on a .00435 scale model of the H-32 Reusable Space Shuttle Booster. The objectives of the test were to determine the static stability characteristics and control surface effectiveness at hypersonic speeds. Data were taken at M = 8.12 over a range of angles of attack between -5° and 85° at $\beta = 0^{\circ}$ and over a range of side slip angles between -10° and 10° at $\alpha = 0^{\circ}$ and 70°. Six component balance data and base-cavity pressure data were recorded.

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CONFIGURATIONS INVESTIGATED

Model Components Tested;

- B_5 - B_6 with upturned nose; no cab.
- B_6 - Basic booster body with axisymmetrical nose for high-angle testing. 55° sting adaptor coming out through top of body in place of vertical tail. After body complete with simulated thruster nozzles.
- B_7 - B_6 with slab sides and bottom aft of the wing.
- B_8 - Basic booster body with axisymmetrical nose for low-angle testing. Straight sting coming out base of body.
- B_9 - B_6 with droop nose; no cab.
- B_{11} - B_8 with up-turned nose; no cab.
- B_{12} - B_8 with droop nose; no cab.
- W_4 - Basic wing configuration with 4° dihedral.
- W_5 - W_4 moved aft 2% of body length.
- W_6 - W_4 with 6° dihedral angle.
- W_7 - W_3 with 8° dihedral angle.
- H_4 - Basic horizontal tail with elevator.
- H_5 - H_4 with elevator removed.
- V_3 - Basic vertical tail without rudder.

Model Component Combinations Tested;

$B_5W_5H_4$	B_8V_3
B_6	$B_8W_4V_3$
B_6W_4	$B_8H_4V_3$
$B_6W_4H_4$	$B_8W_4H_4V_3$
$B_6W_5H_5$	$B_8W_5H_4V_3$
$B_6W_5H_5$	$B_8W_6H_4V_3$
$B_6W_6H_4$	$B_8W_7H_4V_3$

CONFIGURATIONS INVESTIGATED
(CONTINUED)

Model Component Combinations Tested (Con't):

$B_6W_7H_4$	$B_9W_5H_4$
$B_7W_5H_4$	$B_{11}W_4H_4V_3$
B_8	$B_{12}W_4H_4V_3$
B_8W_4	

Control Surface Deflections Tested:

Horizontal Tail -

The incidence of the horizontal tail was set to -30°, -15°, and 0° with respect to the body centerline.

Elevator -

The elevator was set to -30°, -15°, and 0° with respect to the horizontal tail chord plane.

Sketches of the components are shown in Figures 3 through 6.

Pertinent dimensional information for each of the components tested is given in the "Model Component Description Sheets" which follow the figures.

TEST GAC HST-020 DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES S_s	PARAMETERS/VALUES S_e	NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE) 8.12
RCX011	B6	A	0°	—	—		5
021	B6 W4			—	—		6
031	B6 W4 H4			0°	0°		13
041				0°	-15°		14
061				-15°	-30°		9
071				-15°	-15°		8
081				-15°	0°		7
091				-30°	0°		12
101				-30°	-15°		11
111				-30°	-30°		10
131	B6 W5 H4			-15°	0°		15
311	B6 W5 H5			-15°	—		17
321	B5 W5 H4			-15°	0°		18
301	B9 W5 H4			-15°	0°		16
181	B7 W5 H4			-15°	0°		19
013	B6	70°	C	—	—		22
023	B6 W4			—	—		21
083	B6 W4 H4			-15°	0°		20
143	B6 W6 H4			-15°	0°		23
153	B6 W7 H4			-15°	0°		24

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

CN CAF CY CLM CBL CLN CDF CL CAB

IDPVAR(1) | IDPVAR(2) | NDV

COEFFICIENTS:
α or β SCHEDULES

α_A; +40° to +85°
α_B; -5° to +30°
β_C; -10° to +10°

NASA-MSFC-MAF

TEST GAC HST 020 DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES δ_s	PARAMETERS/VALUES δ_e	NO. of RUNS	MACH NUMBERS (OR ALTERNATE INDEPENDENT VARIABLE) 8.12
RCX 192	$B_8 V_3$	B	0°	—	—		37
202	$B_8 W_4 V_3$			—	—		30
222	$B_8 W_4 H_4 V_3$			-15°	0°		32
232	$B_8 W_4 H_4 V_3$			0°	0°		29
272	$B_8 H_4 V_3$			-15°	0°		36
332	$B_8 W_4 H_4 V_3$			-15°	-15°		31
342	$B_8 W_5 H_4 V_3$			-15°	0°		34
352	$B_{12} W_4 H_4 V_3$			-15°	0°		33
362	$B_{11} W_4 H_4 V_3$			-15°	0°		35
284	B_8	0°	C	—	—		38
294	$B_8 W_4$			—	—		39
204	$B_8 W_4 V_3$			—	—		40
224	$B_8 W_4 H_4 V_3$			-15°	0°		41
374	$B_8 W_6 H_4 V_3$			-15°	0°		42
384	$B_8 W_7 H_4 V_3$			-15°	0°		43

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

IDPVAR(1) | IDPVAR(2) | NDV

COEFFICIENTS:
α or β SCHEDULES
α_A; +40° to +85°
α_B; -5° to +30°
β_C; -10° to +10°

NASA-MSFC-MAF

TEST FACILITY DESCRIPTION

GRUMMAN 36-INCH HYPERSONIC TUNNEL

DESCRIPTION: This is an intermittent blowdown to vacuum type tunnel. The test section is 36 inches in diameter. High temperature air from a pebble bed heater is introduced to the test section through fixed contoured, axisymmetric nozzles.

PERFORMANCE PARAMETERS:

Mach Range:	8, 10, 14
Reynolds Number ($\times 10^6$/ft):	0.2 to 4.5
Stagnation Pressure (psia):	200 to 2200
Dynamic Pressure (psf):	100 to 1200
Stagnation Temperature ($^\circ$R):	1000 to 3500
Run Time (sec):	30 to 60

TESTING CAPABILITIES: Model mounting consists of a water-cooled, sting-balance sector rig which features a model injection system. Instrumentation for force, pressure, and heat transfer measurement is provided. A Schlieren system is available.

TEST CONDITIONS

The model was sting mounted by two different modes depending upon the range of angles of attack covered. For angles between -5° and 30° a conventional sting coming in the base of the model was used. At the higher angles of attack a sting entering the top of the body in the region normally occupied by the vertical tail was used. Force data were acquired by a 3/4" diameter Task Mk XLIII balance.

Yaw runs were made at $\alpha = 0^{\circ}$ and 70° by rolling the sting and model 90° and yawing the model in the tunnel pitch plane.

Base pressures were measured only on the low $-\alpha$ mounting configuration and cavity pressures only on the high $-\alpha$ mounting configuration. Base pressure corrections were applied to the axial force coefficient and cavity pressure corrections were applied to the normal force and pitching moment coefficients. All of the coefficients in the stability axes system reflect the base and cavity pressure corrections.

Schlieren photographs were taken on each run.

Configuration changes were accomplished through the use of interchangeable nose and afterbody sections, wing dihedral blocks, and preformed body fairings to produce the slab-sided body B_7.

Trip strips were not used on the model to fix or originate transition. However, the model was subjected to particle impingement from the pebble-bed heater which

caused serious deterioration of the model surface during a run. The damage to the model surface was especially severe at high angles of attack. The model surface was smoothed after each run by light filing or rubbing with emery cloth as required, but no effort was made to fill the depressions formed by the impact of the particles.

Values of the tunnel parameters used in the test program are summarized in Table I.

TABLE I

TEST CONDITIONS

TEST GAC-HST-020

MACH NUMBER	NOMINAL REYNOLDS NUMBER per unit length	NOMINAL DYNAMIC PRESSURE (pounds/sq. inch)	NOMINAL STAGNATION TEMPERATURE (degrees Fahrenheit)
8.12	2.9×10^6	3.58	1041

BALANCE UTILIZED: 3/4" DIA. TASK MK XLIII, 6-COMPONENT

	CAPACITY:	ACCURACY:	COEFFICIENT TOLERANCE:
NF	400#	±.8#	
SF	200#	±.4#	
AF	80#	±.16#	
PM	600 in-lbs	±1.2 in-lb	
YM	250 in-lbs	±.5 in-lb	
RM	80 in-lbs	±.16 in-lb	

COMMENTS:

Reynolds number was as high as 3.05×10^6 per foot and as low as 2.71×10^6 per foot but never changed by more than about 1.7% in any run.

DATA REDUCTION

The six-component aerodynamic forces and moments measured during the tests have been reduced to coefficient form using the following reference values:

S_{REF} = reference wing aera = 13.344 in^2

ℓ_{REF} = $\bar{c}$ = wing mean aerodynamic chord = 1.468 inches

b_{REF} = wing span = 9.652 inches

A_b = base area = 2.432 in^2

Moments are reduced about a reference c.g. location which is located at model station 7.812 on water line 1.587 and buttline 0.0 (see Figure 1).

High -α runs have corrections applied to the normal force (NF) and pitching moment (PM) balance readings to account for the pressure in the cavity around the end of the dog-leg sting. As a consequence of correcting the NF, CL and CD for the high -α runs are compensated for cavity pressures.

$(\Delta NF)_c$ due to cavity press = $(p_t - p_c)(.891)$

NF corrected = NF read - $(\Delta NF)_c$

$(\Delta PM)_c$ = -2.683 $(\Delta NF)_c$

PM corrected = PM read - $(\Delta PM)_c$

Low -α runs have an increment applied to the axial force (AF) balance reading to express the axial force as though free stream static pressure were acting on the base of the model. As a consequence of this operation on AF, C_L and C_D are also for a model with free stream static pressure acting on the base.

SUMMARY DATA PLOT INDEX

TITLE	PLOTTED COEFFICIENTS SCHEDULE	CONDITIONS VARYING	PAGES
Model Build-up in Pitch - No Vertical at High Alpha	(A)	Configuration	1-10
Effect of Stabilizer Deflection - No Vertical at High Alpha	(B)	Stabilizer Deflection	11-18
Effect of Elevator Deflection, HTAIL = 0. Deg.- No Vertical at High Alpha	(B)	Elevator Deflection	19-26
Effect of Elevator Deflection, HTAIL =-15. Deg.- No Vertical at High Alpha	(B)	Elevator Deflection	27-34
Effect of Elevator Deflection, HTAIL = -30. Deg.-	(C)	Elevator Deflection	35-41
Effect of Stabilizer Area	(C)	Configuration	42-48
Effect of Wing Fore and Aft Location in Pitch - No Vertical at High Alpha	(B)	Wing Location	49-56
Effect of Nose Shape	(B),(C)	Configuration	57-71
Effect of Aft Body Shape	(B)	Configuration	72-79
Model Build-Up in Yaw, Alpha = 70. Deg.	(D)	Configuration	80-89
Model Build-Up in Yaw, Alpha = 0. Deg.	(E)	Configuration	90-97
Effect of Wing Dihedral in Yaw, Alpha = 70. Deg.	(D)	Configuration	98-107
Effect of Wing Dihedral in Yaw, Alpha = 0. Deg.	(D),(F)	Configuration	108-118

Note: Plotted Coefficients Schedule on following page.

SUMMARY DATA PLOT INDEX
(CONTINUED)

PLOTTED COEFFICIENTS SCHEDULE:

(A) CL, CDF, CLM, CN, CAF, CDB, CAB vs. α,
CL vs. CDF, CL vs. CLM, CN vs. CLM

(B) CL, CDF, CLM, CN, CAF, CDB vs. α,
CL vs. CLM, CN vs. CLM

(C) CL, CDF, CLM, CN, CAF vs. α,
CL vs. CLM, CN vs. CLM

(D) CY, CLN, CSL, CYN, CBL, CL, CLM, CDF vs. β,
CY vs. CYN, CY vs. CLN

(E) CY, CYN, CBL, CL, CLM, CDF, CDB vs. β,
CY vs. CYN

(F) CDB vs. β

F I G U R E S

AX - 1205 I - 1

MODEL ASSEMBLY
DRAWING 1205-25

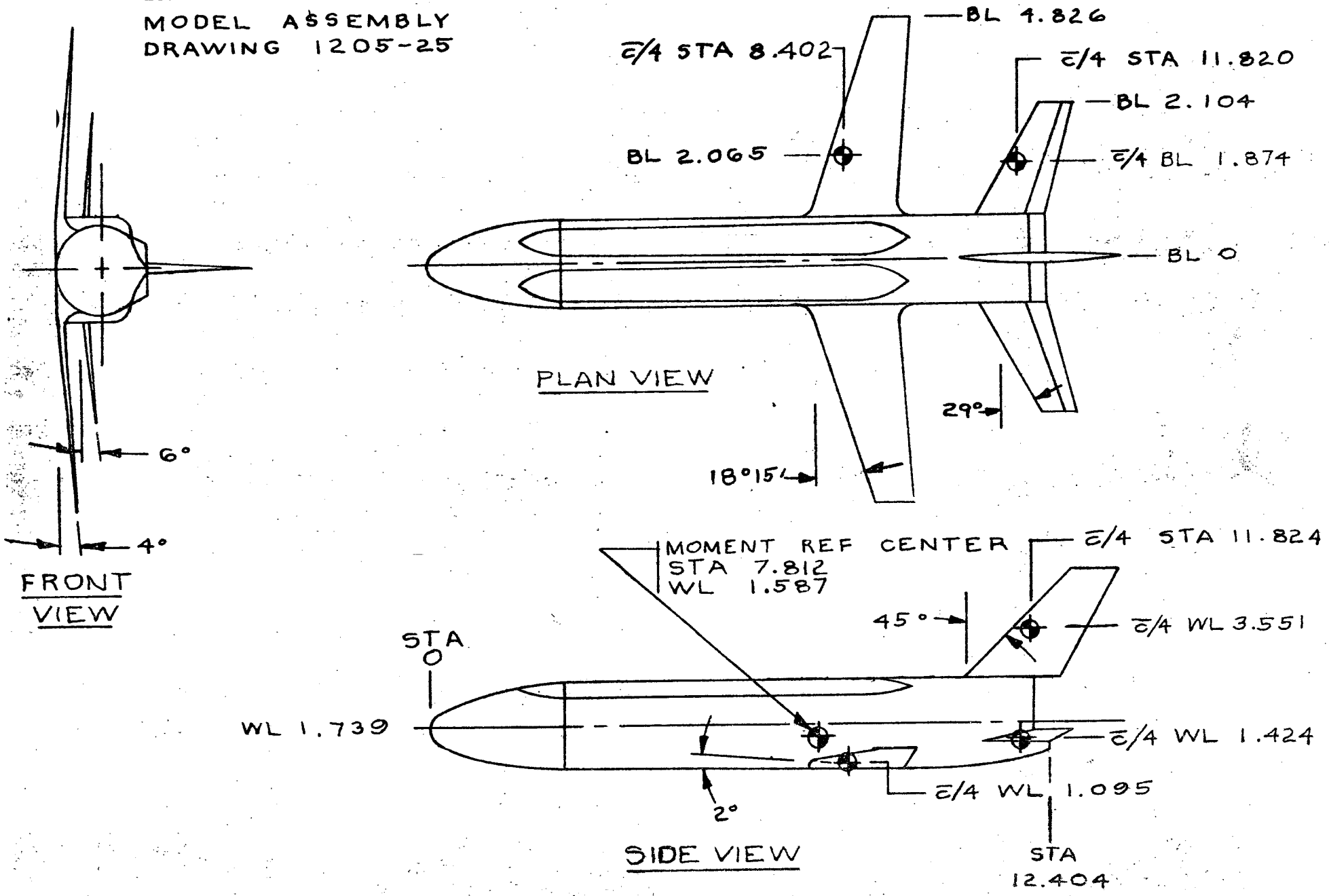


FIGURE 1. MODEL ASSEMBLY, BOOSTER H-32

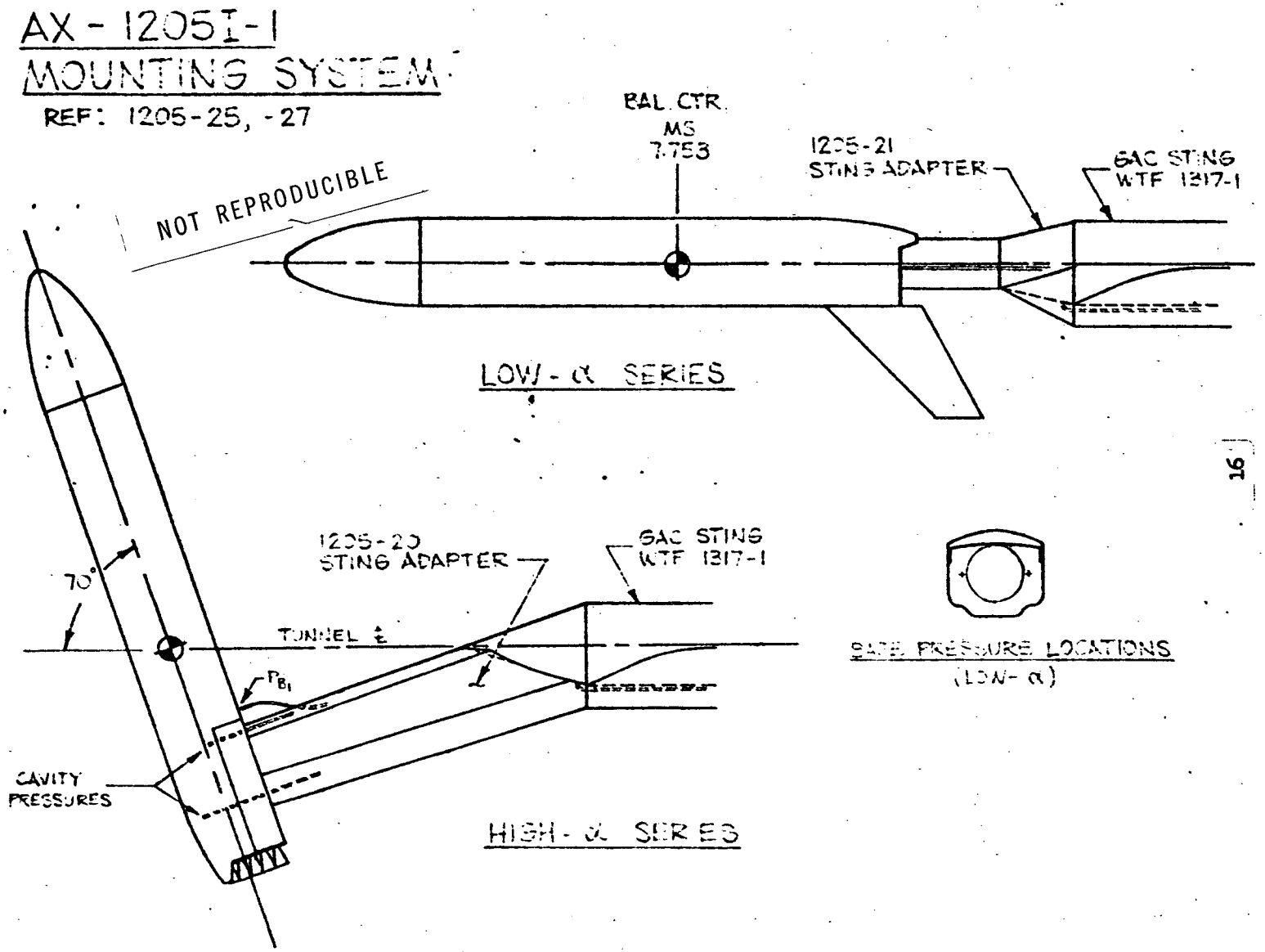


FIGURE 2. MODEL MOUNTING SYSTEM

AX 1205I-1
BODIES

REF: 1205-7 NOSE
1205-3 BODY

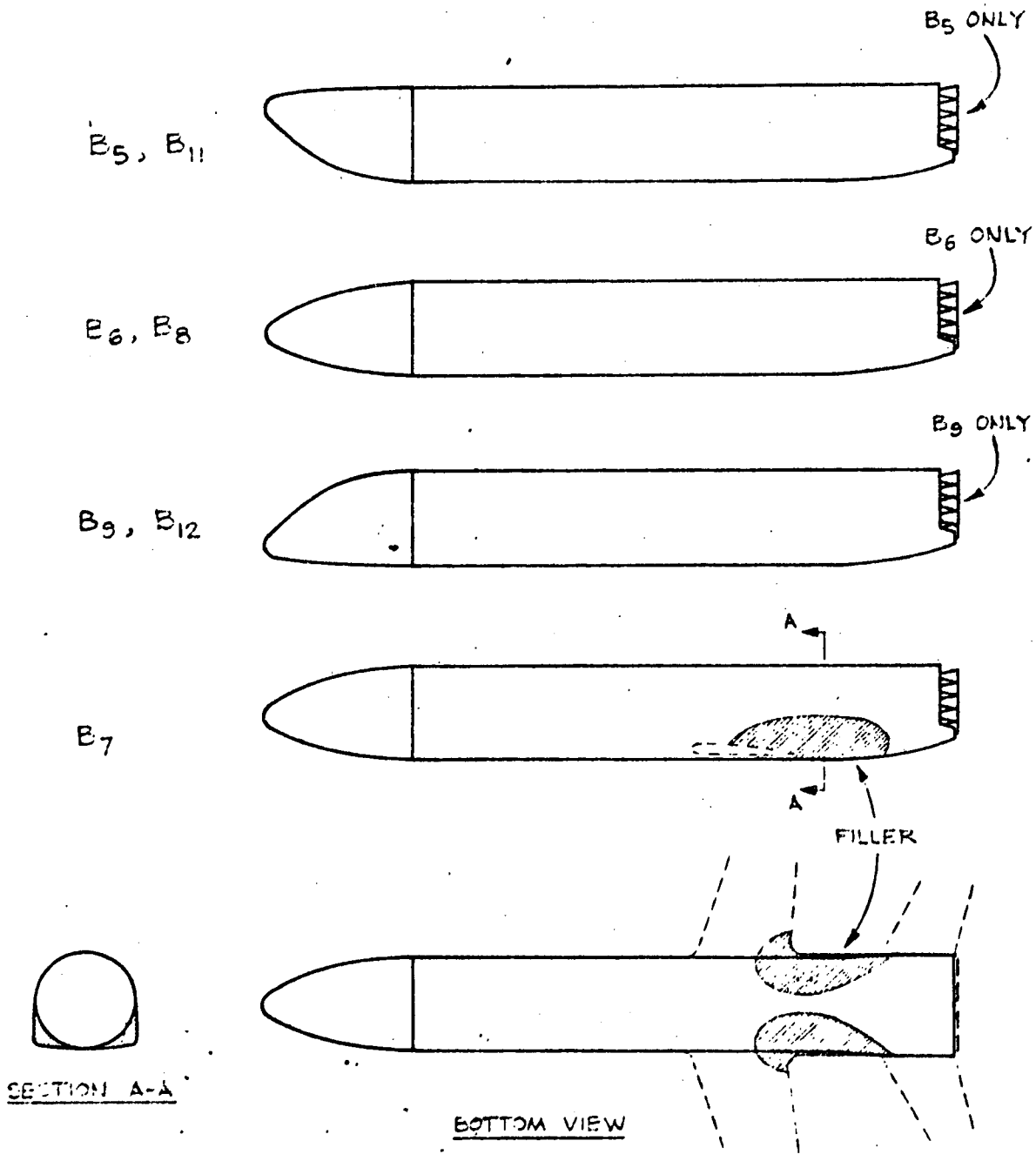
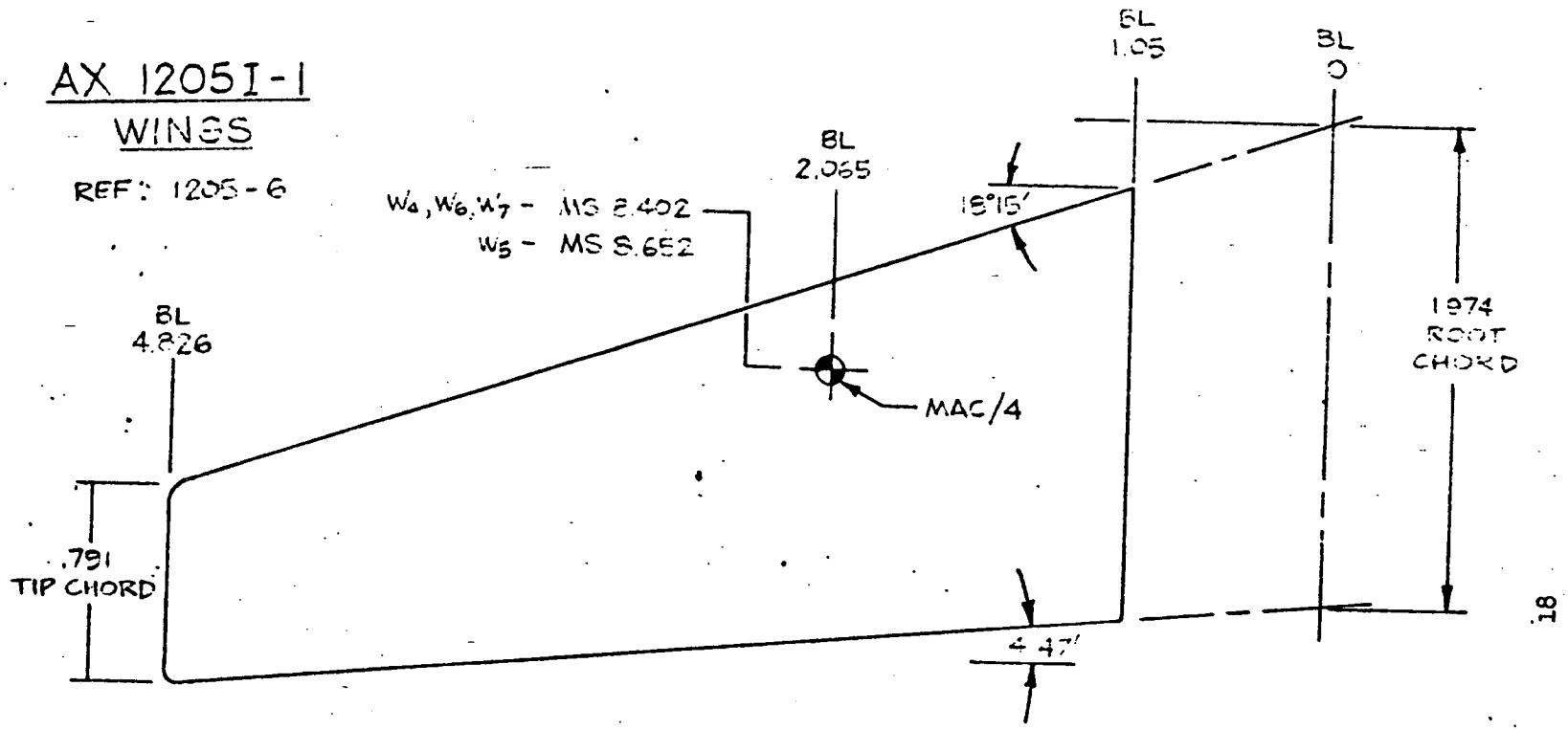
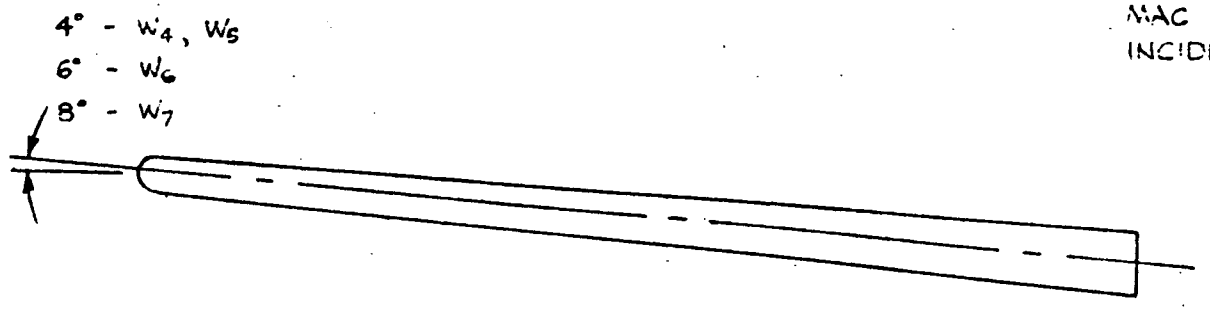


FIGURE 3. MODEL BODY CONFIGURATIONS



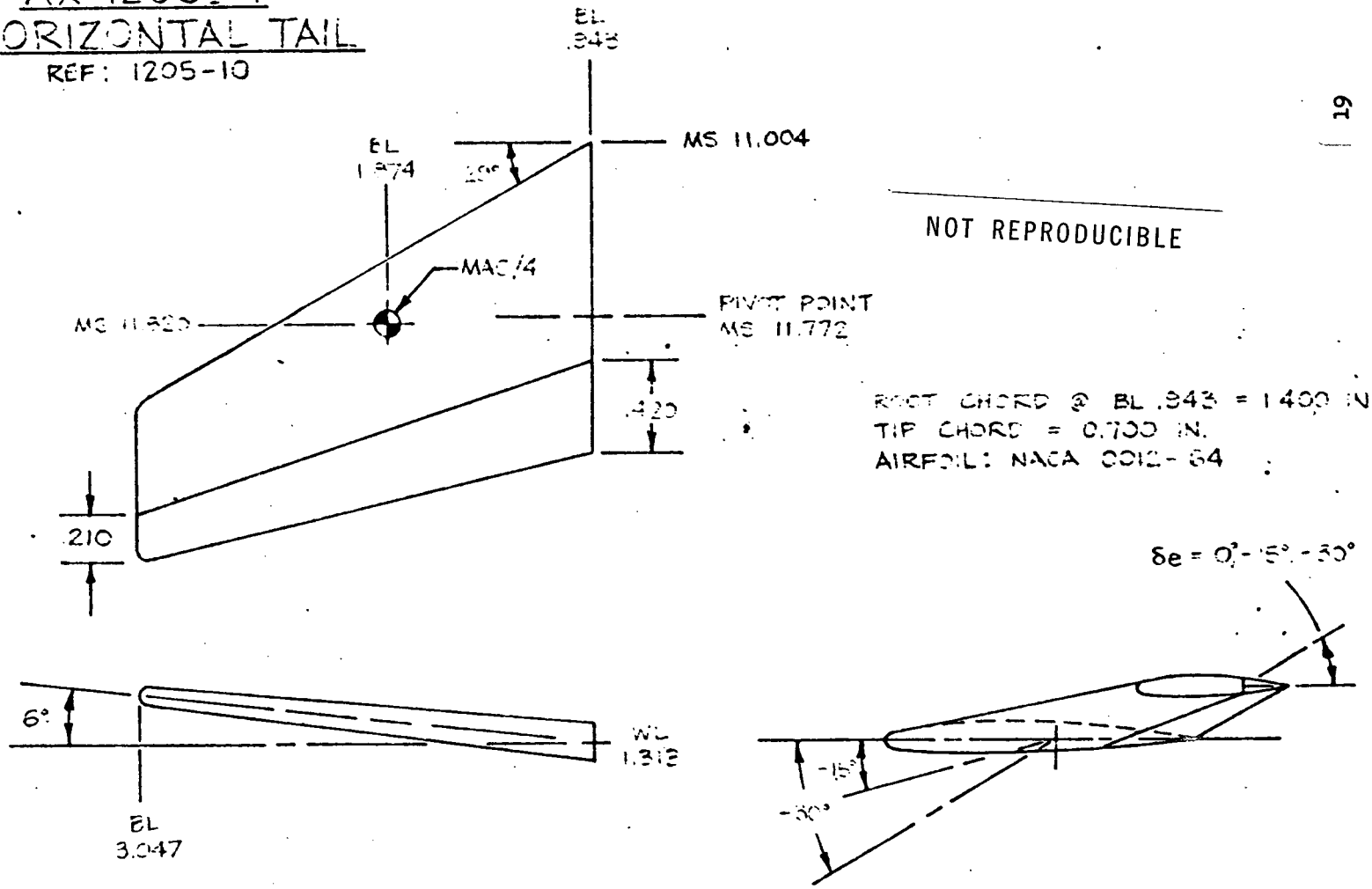


AIRFOIL: NACA 0015-64
MAC = 1.469 IN.
INCIDENCE ANGLE = 2°
(WRT BODY ℄)

FIGURE 4. BOOSTER WING

AX 1205I-1
HORIZONTAL TAIL

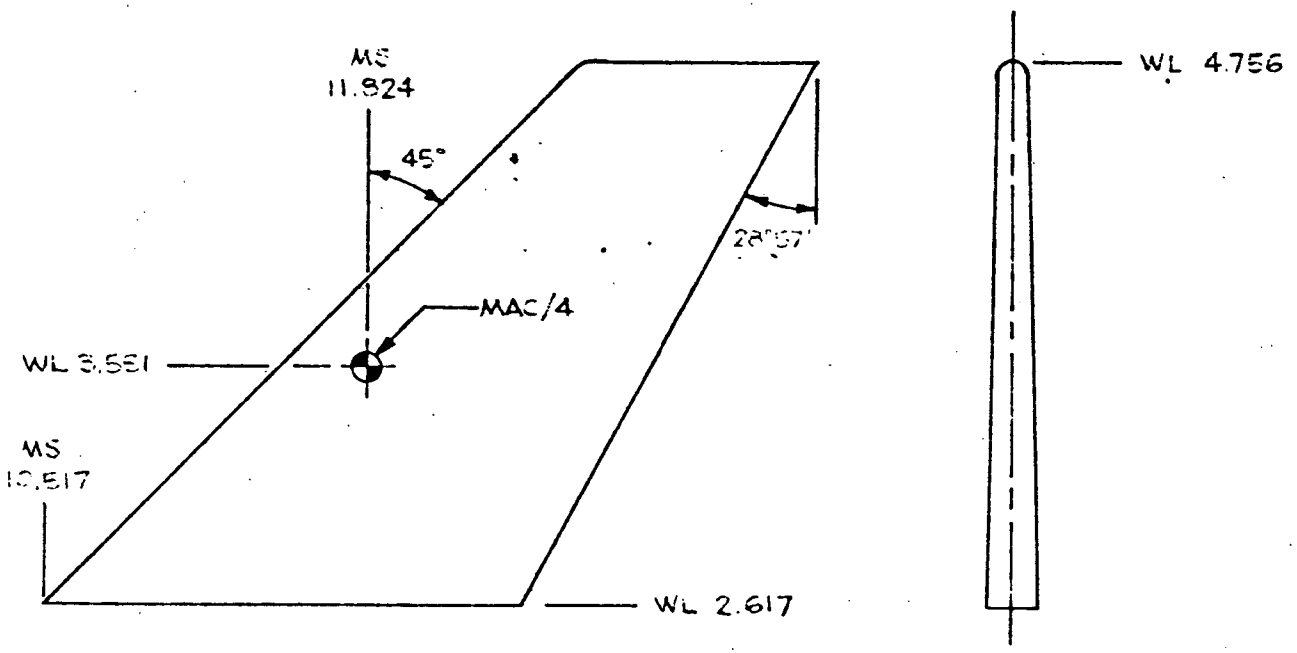
REF: 1205-10



ROOT CHORD @ BL .943 = 1.400 IN.
TIP CHORD = 0.700 IN.
AIRFOIL: NACA 0012-64

FIGURE 5. BOOSTER HORIZONTAL TAIL

AX 1205I-1
VERTICAL TAIL
REF: 1205E-1



ROOT CHORD = 1.913 IN.
TIP CHORD = 0.957 IN.
AIRFOIL: NACA 0012-64

FIGURE 6. BOOSTER VERTICAL TAIL

Notes:

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

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

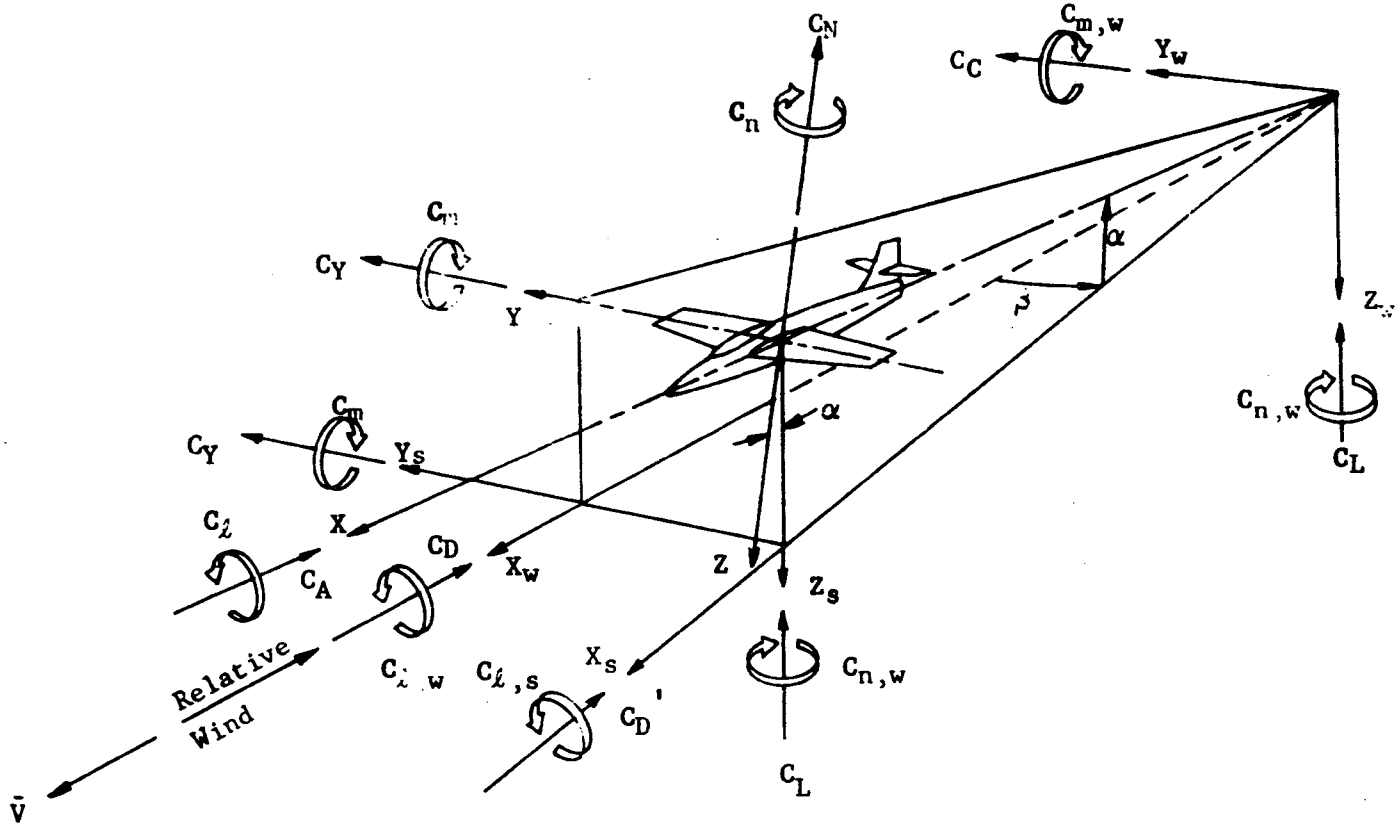


Figure 1. Axis systems, showing direction and sense of force and moment coefficients, angle of attack, and sideslip angle

MODEL COMPONENT DESCRIPTION SHEETS

MODEL COMPONENT: BODY — B5

GENERAL DESCRIPTION: Body based on the H-32 configuration with up-turned nose, no cab, and sting entering thru the top of the body. Simulated thruster nozzles.

DRAWING NUMBER Full scale: 164-10060
Model: 50.1205-27,-7

DIMENSION:	FULL SCALE	MODEL SCALE
Length	285.3 in	12.404 in
Max Width	43.4 in	1.88 in
Max Depth	40.4 in	1.757 in
Fineness Ratio	7.05	7.05
Area		
Max Cross-Sectional	1031 ft²	2.806 in²
Planform		
Wetted		
Base	866 ft²	2.432 in²

Balance center is at model B.S. 7.753, WL 1.739

Model nose is BS 0, ℄ is WL 1.739

Full scale nose is BS 1000, ℄ is WL 400

MODEL COMPONENT: BODY - B6

GENERAL DESCRIPTION: Body based on the H-3Z configuration with axisymmetrical nose and sting entering thru the top of the body. Simulated thruster nozzles.

DRAWING NUMBER Full scale: 164-10060
Model: S.O. 1205-27, -7

DIMENSION:	FULL SCALE	MODEL SCALE
Length	2853 in.	12.404 in.
Max Width	434 in.	1.88 in.
Max Depth	404 in.	7.757 in.
Fineness Ratio	7.05	7.05
Area		
Max Cross-Sectional	1031 ft^2	2.806 in^2
Planform		
Wetted		
Base	866 ft^2	2.432 in^2

Balance center at model BS 7.753, WL 1.739
Model nose is BS 0, ℄ is WL 1.739
Full scale nose is BS 1000, ℄ is WL 400

MODEL COMPONENT: BODY — B7

GENERAL DESCRIPTION: Body based on the H-32 configuration with axisymmetrical nose, slab sides and bottom aft of the wing, and sting entering thru the top of the body. Simulated thruster nozzles.

DRAWING NUMBER Full scale: 164-10060
Model: SD 1205-27, -7, -28

DIMENSION:	FULL SCALE	MODEL SCALE
Length	2853 in.	12.404 in.
Max Width	434 in.	1.88 in
Max Depth	404 in.	1.757 in.
Fineness Ratio	7.05	7.05
Area		
Max Cross-Sectional	1031 ft²	2.806 in.²
Planform		
Wetted		
Base	866 ft²	2.432 in.²

Balance center is at model BS 7.753, WL 1.739
Model nose is at BS 0, ℄ is at WL 1.739
Full scale nose is BS 1000, ℄ is at WL 400

MODEL COMPONENT: BODY — B6

GENERAL DESCRIPTION: Body based on the H-3C configuration with axisymmetrical nose and sting entering thru the base of the body.

DRAWING NUMBER Full scale: 164-10060
Model: 50 1205-25, -7

DIMENSION:	FULL SCALE	MODEL SCALE
Length	2853 in.	12.404 in
Max Width	434 in.	1.88 in.
Max Depth	404 in.	1.757 in.
Fineness Ratio	7.05	7.05
Area		
Max Cross-Sectional	1031 ft²	2.806 in²
Planform		
Wetted		
Base	866 ft²	2.432 in²

Balance center is at model BS 7.753, WL 1.739.
Model nose is at BS 0, ℄ is at WL 1.739.
Full scale nose is BS 1000, ℄ is at WL 400

MODEL COMPONENT: BODY Bq

GENERAL DESCRIPTION: Body based on the H-32 configuration with droop nose, no cab, and sting entering thru the top of the body. Simulated thruster nozzles.

DRAWING NUMBER: Full scale: 164-10060
Model: 50.1205-27.-7

DIMENSION:	FULL SCALE	MODEL SCALE
Length	2853 in.	12.404 in.
Max Width	434 in.	1.88 in.
Max Depth	404 in.	1.737 in
Fineness Ratio	7.05	7.05
Area		
Max Cross-Sectional	1031 ft²	2.806 in²
Planform		
Wetted		
Base	866 ft²	2.432 in²

Balance center is at model BS. 7.753, WL 1.734.
Model nose is at BS 0, ℄ is at WL 1.734.
Full scale nose is at BS 1000, ℄ is at WL 400

MODEL COMPONENT: BODY — B11

GENERAL DESCRIPTION: Body based on the H-32 configuration with turned up nose, no cab, and sting entering thru the base of the body.

DRAWING NUMBER Full scale: 164-10060
Model: 50.1205-25,-7

DIMENSION:	FULL SCALE	MODEL SCALE
Length	2853 in	12.404 in.
Max Width	434 in.	1.88 in.
Max Depth	404 in.	1.757 in.
Fineness Ratio	7.05	7.05
Area		
Max Cross-Sectional	1031 ft²	2.506 in.²
Planform		
Wetted		
Base	866 ft²	2.432 in.²

Balance center is at model BS 7.753, WL 1.739
Model nose is at BS 0, ℄ is at WL 1.739
Full scale nose is at BS 1000, ℄ is at WL 400

MODEL COMPONENT: BODY — B12

GENERAL DESCRIPTION: Body based on the H-32 configuration with droop nose, no cab, and sting entering thru the base of the body.

DRAWING NUMBER Full scale: 164-10060
Model: 50 1205-25, -7

DIMENSION:	FULL SCALE	MODEL SCALE
Length	2853 in.	12.404 in.
Max Width	434 in.	1.88 in.
Max Depth	404 in.	1.757 in.
Fineness Ratio	7.05	7.05
Area		
Max Cross-Sectional	1031 ft²	2.806 in.²
Planform		
Wetted		
Base	866 ft²	2.432 in.²

Balance center is at model BS 7.753, WL 1.739
Model nose is BS 0, ℄ is WL 1.739
Full scale nose is at BS 1000, ℄ is at WL 400

MODEL COMPONENT: Wing – W4

GENERAL DESCRIPTION: Wing based on the H-32 configuration with sweep angle changed.

Full scale: 164-10060

DRAWING NUMBER: Model 5.0. 1205-6

DIMENSIONS:	FULL-SCALE	MODEL SCALE
TOTAL DATA		
Area		
Planform	4900 ft.²	13.344 in.²
Wetted		
Span (equivalent)	185 ft.	9.652 in.
Aspect Ratio	7	7
Rate of Taper		
Taper Ratio	0.4	0.4
Dihedral Angle, degrees	4°	4°
Incidence Angle, degrees	2°	2°
Aerodynamic Twist, degrees	0°	0°
Toe-In Angle	—	—
Cant Angle	—	—
Sweep Back Angles, degrees		
Leading Edge	14°	18° 16'
Trailing Edge	0°	4° 47'
0.25 Element Line	11°	15°
Chords:		
Root (Wing Sta. 0.0)	453 in.	1.974 in.
Tip, (equivalent)	181 in.	0.791 in.
MAC	336 in.	1.466 in.
Fus. Sta. of .25 MAC	2912	8.902
W.P. of .25 MAC		
B.L. of .25 MAC	477	2.065
Airfoil Section		
Root	NACA-0015-64	NACA-0015-64
Tip	NACA-0015-64	NACA-0015-64
EXPOSED DATA		
Area		
Span, (equivalent)		
Aspect Ratio		
Taper Ratio		
Chords		
Root		
Tip		
MAC		
Fus. Sta. of .25 MAC		
W.P. of .25 MAC		
B.L. of .25 MAC		

Full scale nose is at BS 1000; model nose is at B.S. 0.
Full scale ℄ is at WL 400; model ℄ is at 1.739

MODEL COMPONENT: Wing – W5

GENERAL DESCRIPTION: Same as W4 except moved aft on body 2% of body length (.25 in.)

DRAWING NUMBER: _____

DIMENSIONS:

	FULL-SCALE	MODEL SCALE
TOTAL DATA		
Area		
Planform		
Wetted		
Span (equivalent)		
Aspect Ratio		
Rate of Taper		
Taper Ratio		
Diehedral Angle, degrees		
Incidence Angle, degrees		
Aerodynamic Twist, degrees		
Toe-In Angle		
Cant Angle		
Sweep Back Angles, degrees		
Leading Edge		
Trailing Edge		
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		
Span, (equivalent)		
Aspect Ratio		
Taper Ratio		
Chords		
Root		
Tip		
MAC		
Fus. Sta. of .25 MAC		
W.P. of .25 MAC		
B.L. of .25 MAC		

MODEL COMPONENT: Wing – W_6

GENERAL DESCRIPTION: Same as W_4 with 6° dihedral angle.

DRAWING NUMBER: _____

DIMENSIONS:	FULL-SCALE	MODEL SCALE
TOTAL DATA		
Area		
Planform		
Wetted		
Span (equivalent)		
Aspect Ratio		
Rate of Taper		
Taper Ratio		
Diehedral Angle, degrees		
Incidence Angle, degrees		
Aerodynamic Twist, degrees		
Toe-In Angle		
Cant Angle		
Sweep Back Angles, degrees		
Leading Edge		
Trailing Edge		
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		
Span, (equivalent)		
Aspect Ratio		
Taper Ratio		
Chords		
Root		
Tip		
MAC		
Fus. Sta. of .25 MAC		
W.P. of .25 MAC		
B.L. of .25 MAC		

MODEL COMPONENT: Wing – W7

GENERAL DESCRIPTION: Same as W6 with 8° dihedral angle.

DRAWING NUMBER: _____

DIMENSIONS:	FULL-SCALE	MODEL SCALE
TOTAL DATA		
Area		
Planform		
Wetted		
Span (equivalent)		
Aspect Ratio		
Rate of Taper		
Taper Ratio		
Diehedral Angle, degrees		
Incidence Angle, degrees		
Aerodynamic Twist, degrees		
Toe-In Angle		
Cant Angle		
Sweep Back Angles, degrees		
Leading Edge		
Trailing Edge		
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		
Airfojl Section		
Root		
Tip		
EXPOSED DATA		
Area		
Span, (equivalent)		
Aspect Ratio		
Taper Ratio		
Chords		
Root		
Tip		
MAC		
Fus. Sta. of .25 MAC		
W.P. of .25 MAC		
B.L. of .25 MAC		

MODEL COMPONENT: Horizontal Tail - H4

GENERAL DESCRIPTION: Horizontal stabilizer based on the H-32 configuration with adjustable incidence angle and adjustable angle elevator.

Full scale: 164-10060

DRAWING NUMBER: Model: 50.1205-10

DIMENSIONS:	FULL-SCALE	MODEL SCALE
Area (exposed)	1620 ft²	4.418 in.²
Span ~~(equivalent)~~ (exposed)	968 in.	4.208 in.
Inb'd equivalent chord	322 in.	1.40 in.
Outb'd equivalent chord	161 in	0.70 in
Ratio movable surface chord/ total surface chord		
At Inb'd equiv. chord	.297	.30
At Outb'd equiv. chord	.278	.30
Sweep Back Angles, degrees		
Leading Edge	29°	29°
Tailing Edge	12.5°	12.5°
Hingeline	18°	18°
Area Moment (Normal to hinge line)		
MAC	251 in	1.089 in.
BS $\frac{MAC}{4}$	3719	11.820
Air foil section	NACA-0012-64	NACA-0012-64

Full scale nose is at BS 1000; model nose is at BS 0
Full scale ℄ is at WL 408; model ℄ is at WL 1.739

MODEL COMPONENT: Horizontal Tail - H5

GENERAL DESCRIPTION: H4 with elevator removed.

DRAWING NUMBER: Model SD 1205-10

DIMENSIONS:	FULL-SCALE	MODEL SCALE
Area		3.093 in.²
Span ~~(equivalent)~~ (exposed)		4.208 in.
Inb'd equivalent chord		0.98 in.
Outb'd equivalent chord		0.49 in.
Ratio movable surface chord/ total surface chord		
At Inb'd equiv. chord		—
At Outb'd equiv. chord		—
Sweep Back Angles, degrees		
Leading Edge		29°
Tailing Edge		18°
Hingeline		—
Area Moment (Normal to hinge line)		—
MAC		0.762 in
BS for MAC/4		11.713

Full scale nose is at BS 1000, model nose is at BS 0
Full scale ℄ is at WL 400, model ℄ is at WL 1.739

MODEL COMPONENT: Vertical Tail — V3

GENERAL DESCRIPTION: Vertical without rudder based on the H-3E configuration.

Full scale: 164-10060

DRAWING NUMBER: Model: 5.0,1206-1

DIMENSIONS:	FULL-SCALE	MODEL SCALE
Area	1125 sq. ft.	3.069 in.²
Span ~~(equivalent)~~	492 in.	2.139 in.
Inb'd equivalent chord	440 in.	1.913 in.
Outb'd equivalent chord	220 in.	0.957 in.
Ratio movable surface chord/ total surface chord		
At Inb'd equiv. chord	.301	—
At Outb'd equiv. chord	.333	—
Sweep Back Angles, degrees		
Leading Edge	45°	45°
Tailing Edge	19°	19°
Hingeline	34°	—
Area Moment (Normal to hinge line)	—	—
Airfoil section	NACA-0012-64	NACA-0012-64
MAC	344 in.	1.446 in.
BS $\frac{MAC}{4}$	3720	11.825

Full scale nose is at BS 1000; model nose is at BS 0
Full scale ℄ is at WL 400; model ℄ is at WL 1.739

NOMENCLATURE

(General)

SYMBOL	SADSAC SYMBOL	DEFINITION
α	ALPHA	angle of attack, angle between the projection of the wind X_w-axis on the body X, Z-plane and the body X-axis; degrees
β	BETA	sideslip angle, angle between the wind X_w-axis and the projection of this axis on the body X-Z-plane; degrees
ψ	PSI	yaw angle, angle of rotation about the body Z-axis, positive when the positive X-axis is rotated toward the positive Y-axis; degrees
ϕ	PHI	roll angle, angle of rotation about the body X-axis, positive when the positive Y-axis is rotated toward the positive Z-axis; degrees
ρ		air density; K_g/m^3, slugs/ft^3
a		speed of sound; m/sec, ft/sec
V		speed of vehicle relative to surrounding atmosphere; m/sec, ft/sec
q	Q(PSI) Q(PSF)	dynamic pressure; $1/2\rho V^2$, psi, psf
M	MACH	Mach number; V/a
RN/L	RN/L	Reynolds number per unit length; million/ft
p		static pressure; psi
P		total pressure; psi
C_p	CP	pressure coefficient; $(p-p_\infty)/q$

NOMENCLATURE (Continued)

Reference & C. G. Definitions

SYMBOL	SADSAC SYMBOL	DEFINITION
S		wing area; m^2, ft^2
S	SREF	reference area; m^2, ft^2
$\bar{c}$		wing mean aerodynamic chord or reference chord; m, ft, in (see ℓ_{ref} or LREF)
ℓ_{ref}	LREF	reference length; m, ft, in.; (see $\bar{c}$)
b_{ref}	BREF	wing span or reference span; m, ft, in
A_b		base area; m^2, ft^2, in^2
c. g.		center of gravity
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

NOMENCLATURE (Continued)

Axis System General

SYMBOL	DEFINITION
F	force; F, lbs
M	moment; M, in-lb

Subscript	Definition
N	normal force
A	axial force
L	lift force
D	drag force
Y	force or moment about the Y axis
Z	moment about the Z axis
X	moment about the X axis
s	stability axis system
w	wind axis system
ref	reference conditions
∞	free stream conditions
t	total conditions
b	base

NOMENCLATURE (Continued)

Body & Stability Axis System

SYMBOL	SADSAC SYMBOL	DEFINITION
		Body Axis System
C_N	CN	normal force coefficient; F_N/qS
C_A	CA	axial force coefficient; F_A/qS
C_{A_b}	CAB	base axial force coefficient; $\left[-1\right]\ \left[(p_b - p_\infty)/q\right]\ (A_b/S)$
C_{A_f}	CAF	forebody axial force coefficient; $C_A - C_{A_b}$
C_n	CYN	yawing moment coefficient; $M_Z/qS\ b_{ref}$
C_ℓ	CBL	rolling moment coefficient; $M_X/qS\ b_{ref}$
		Common to Both Axis Systems
C_m	CLM	pitching moment coefficient; $M_Y/qS\ \ell_{ref}$
C_y	CY	side force coefficient; F_Y/qS
		Stability Axis System
C_L	CL	lift force coefficient; F_L/qS
C_D	CD	drag force coefficient; F_D/qS
C_{D_b}	CDB	base drag coefficient
C_{D_f}	CDF	forebody drag coefficient; $C_D - C_{D_b}$
C_n	CLN	yawing moment coefficient; $M_{Z,s}/qS\ b_{ref}$
C_ℓ	CSL	rolling moment coefficient; $M_{X,s}/qS\ b_{ref}$
L/D	L/D	lift-to-drag ratio; C_L/C_D
L/D_f	L/DF	lift to forebody drag ratio; C_L/C_{D_f}

NOMENCLATURE (Continued)

Surface Definitions

SYMBOL	SADSAC SYMBOL	DEFINITION
i_t	HORIZT	horizontal tail incidence; positive when trailing edge down; degrees
δ		symmetrical surface deflection angle; degrees; positive deflections are:
	AILRON	aileron - total aileron deflection; (left aileron - right aileron)/2
	CANARD	canard - trailing edge down
	ELEVON	elevon - trailing edge down
	ELEVTR	elevator - trailing edge down
	FLAP	flap - trailing edge down
	RUDDER	rudder - trailing edge to the left
	SPOILR	spoiler - trailing edge down
	TAB	tab - trailing edge down with respect to control surface
δ		antisymmetrical surface deflection angle, degrees; positive trailing edge down:
	AIL-L	left aileron - trailing edge down
	AIL-R	right aileron - trailing edge down
	ELVN-L	left elevon - trailing edge down
	ELVN-R	right elevon - trailing edge down
	SPLR-L	left spoiler - trailing edge down
	SPLR-R	right spoiler - trailing edge down

SURFACE SUBSCRIPTS	DEFINITION
a	aileron
b	base
c	canard
e	elevator or elevon
f	flap
r	rudder or ruddervator
s	horizontal tail
t	tail

TABULATED DATA LISTING

A tabulated data listing, consisting of all aero data sets, both original and those created in arriving at the plotted material to be presented subsequently, is available as an addendum to this report. The tabular listing is made up in two sections:

(a) a brief summary list of all data sets containing the identifier, the descriptor, and the resident dependent variables.

(b) a full list of all data sets containing all resident or selected aerodynamic coefficients of the data sets as well as the above mentioned information.

The listing is currently sent on limited distribution to the following organizations:

NASA AMES	Mr. V. Stevens
GAC	Mr. M. Quan

If copies of this listing are desired, please contact the above or the cognizant SADSAC personnel who, for this data, is:

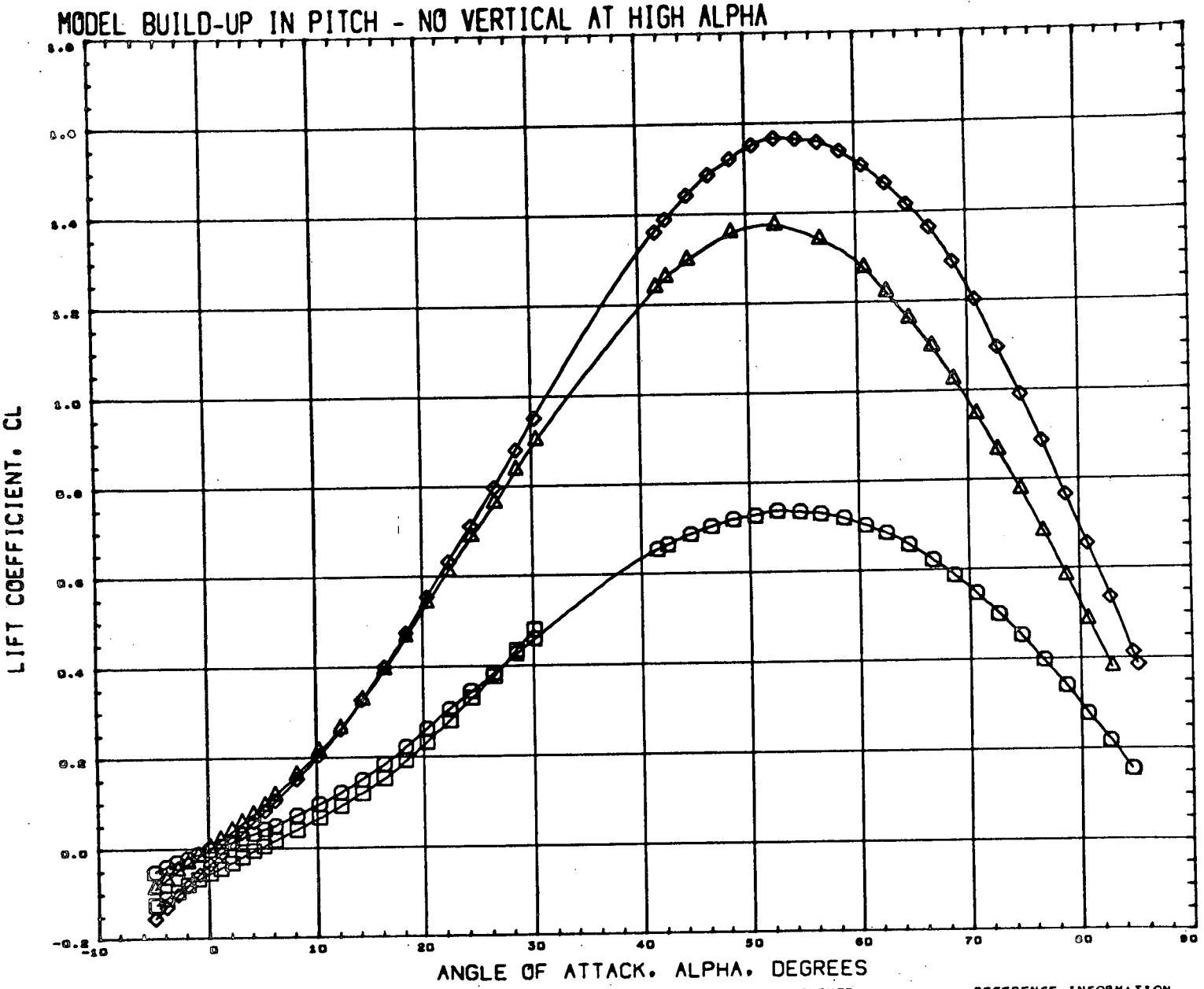
Miss B. J. Fricken
Department 2780
Chrysler Corporation Space Division
New Orleans, La. 70129

(504) 255-2304

P L O T T E D D A T A

Note: On plots where low and high alpha ranges are stacked, the CAF and CDF coefficients are in fact CA and CD for the high alpha range, i.e., these coefficients were not corrected for base pressures.

MODEL BUILD-UP IN PITCH - NO VERTICAL AT HIGH ALPHA

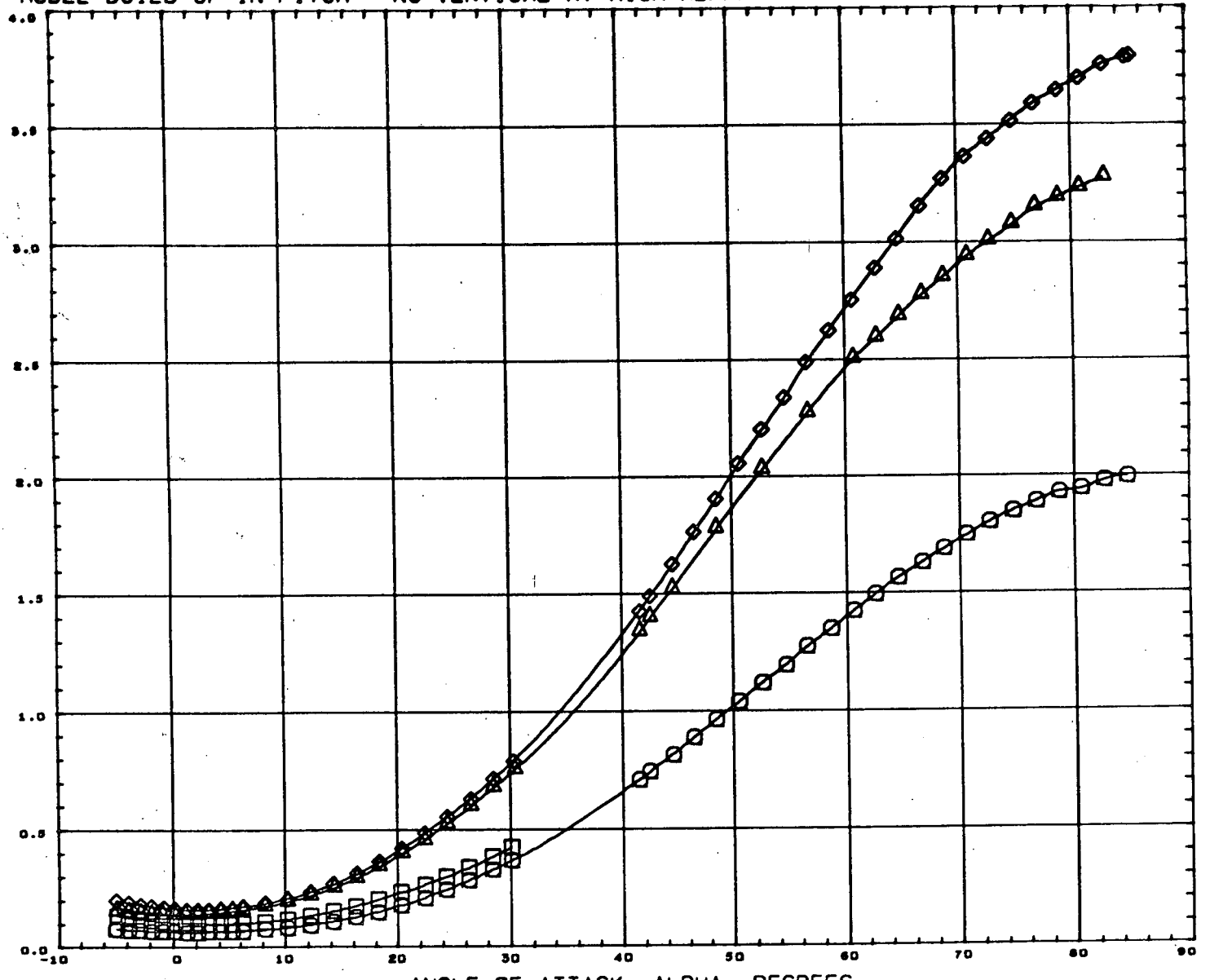


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	HTAIL	ELEVTR
(GCX011)	○	GAC HST-020 TBC H-32 BOOSTER B8V3	0.000		
(GCX021)	△	GAC HST-020 TBC H-32 BOOSTER B8W4V3	0.000		
(GCX061)	◇	GAC HST-020 TBC H-32 BOOSTER B8W4H4V3	0.000	-15.000	0.000
(RCX272)	□	GAC HST-020 TBC H-32 BOOSTER B8H4V3	0.000	-15.000	0.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4660	INCHES
BREF	9.6520	INCHES
XMRP	7.6210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4340	PERCNT

MODEL BUILD-UP IN PITCH - NO VERTICAL AT HIGH ALPHA



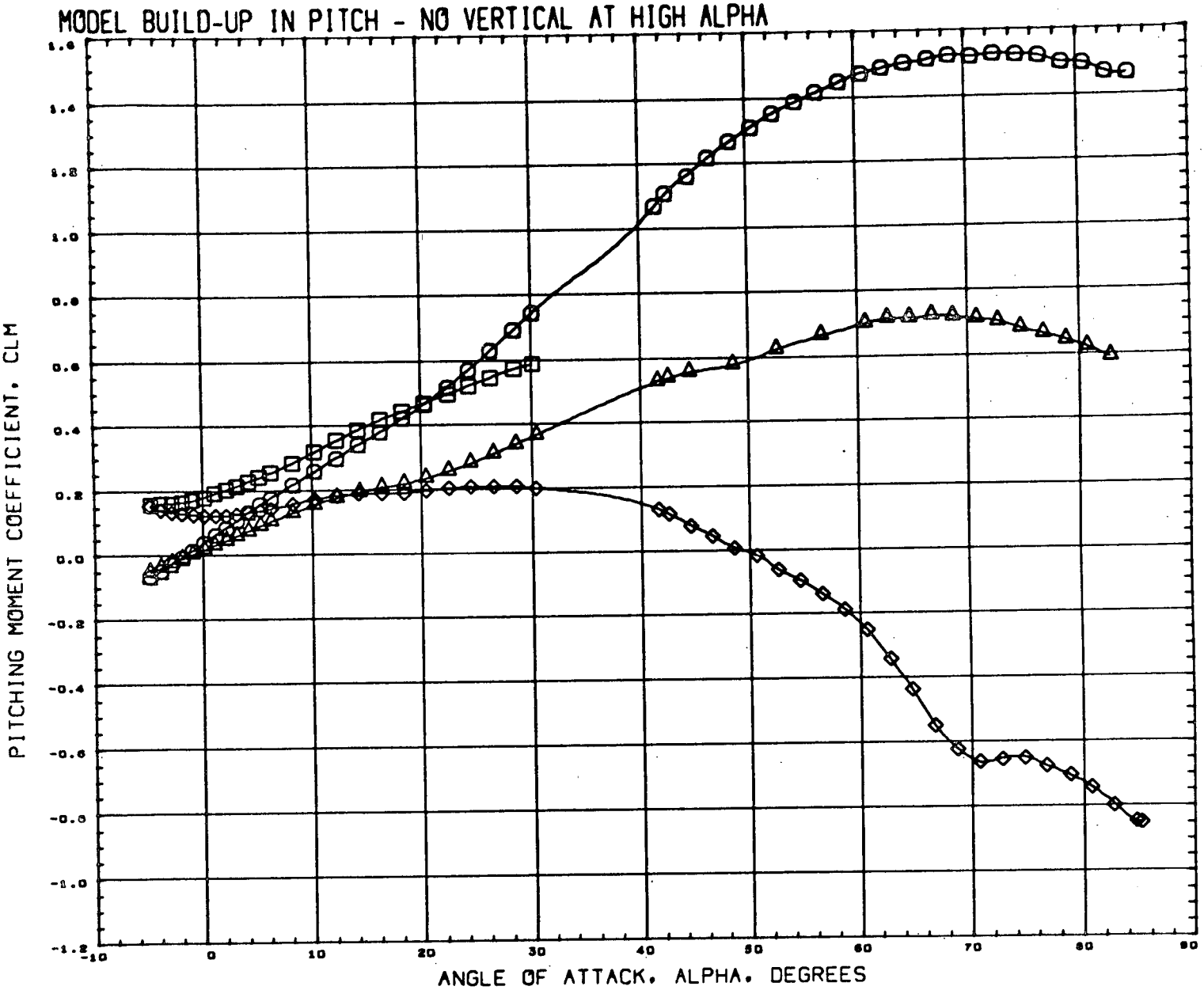
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	HTAIL	ELEVTR
(GCX011)	○	GAC HST-020 TBC H-32 BOOSTER B8V3	0.000		
(GCX021)	△	GAC HST-020 TBC H-32 BOOSTER B8W4V3	0.000		
(GCX081)	◇	GAC HST-020 TBC H-32 BOOSTER B8W4H4V3	0.000	-15.000	0.000
(RCX272)	□	GAC HST-020 TBC H-32 BOOSTER B8H4V3	0.000	-15.000	0.000

MACH 0.120

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4660	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.9870	INCHES
SCALE	0.4346	PERCNT

MODEL BUILD-UP IN PITCH - NO VERTICAL AT HIGH ALPHA

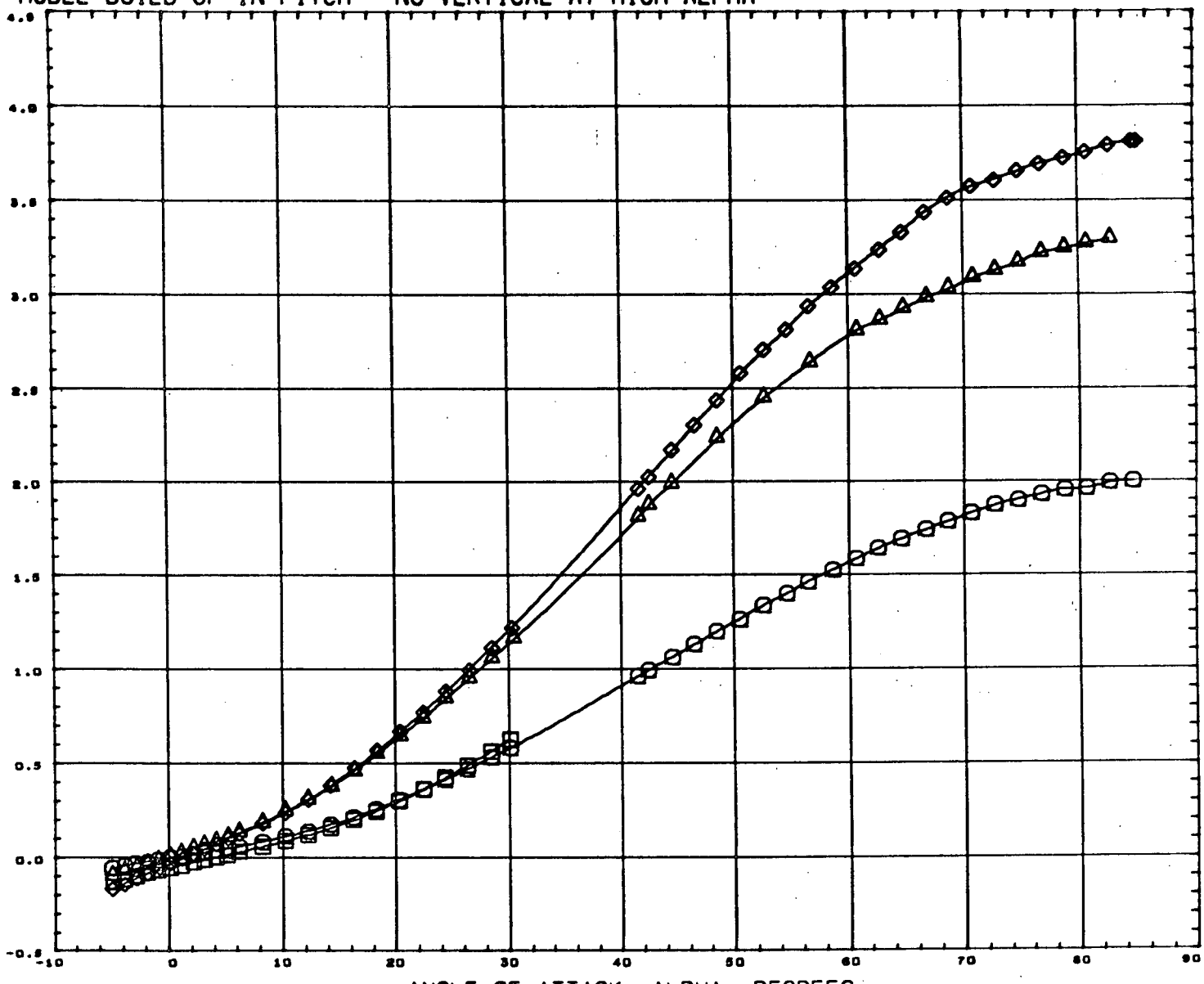


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	HTAIL	ELEVTR
(GCX011)	○	GAC HST-020 TBC H-32 BOOSTER B8V3	0.000		
(GCX021)	⋈	GAC HST-020 TBC H-32 BOOSTER B8W4V3	0.000		
(GCX081)	◇	GAC HST-020 TBC H-32 BOOSTER B8W4H4V3	0.000	-15.000	0.000
(RCX272)	□	GAC HST-020 TBC H-32 BOOSTER B8H4V3	0.000	-15.000	0.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

MODEL BUILD-UP IN PITCH - NO VERTICAL AT HIGH ALPHA



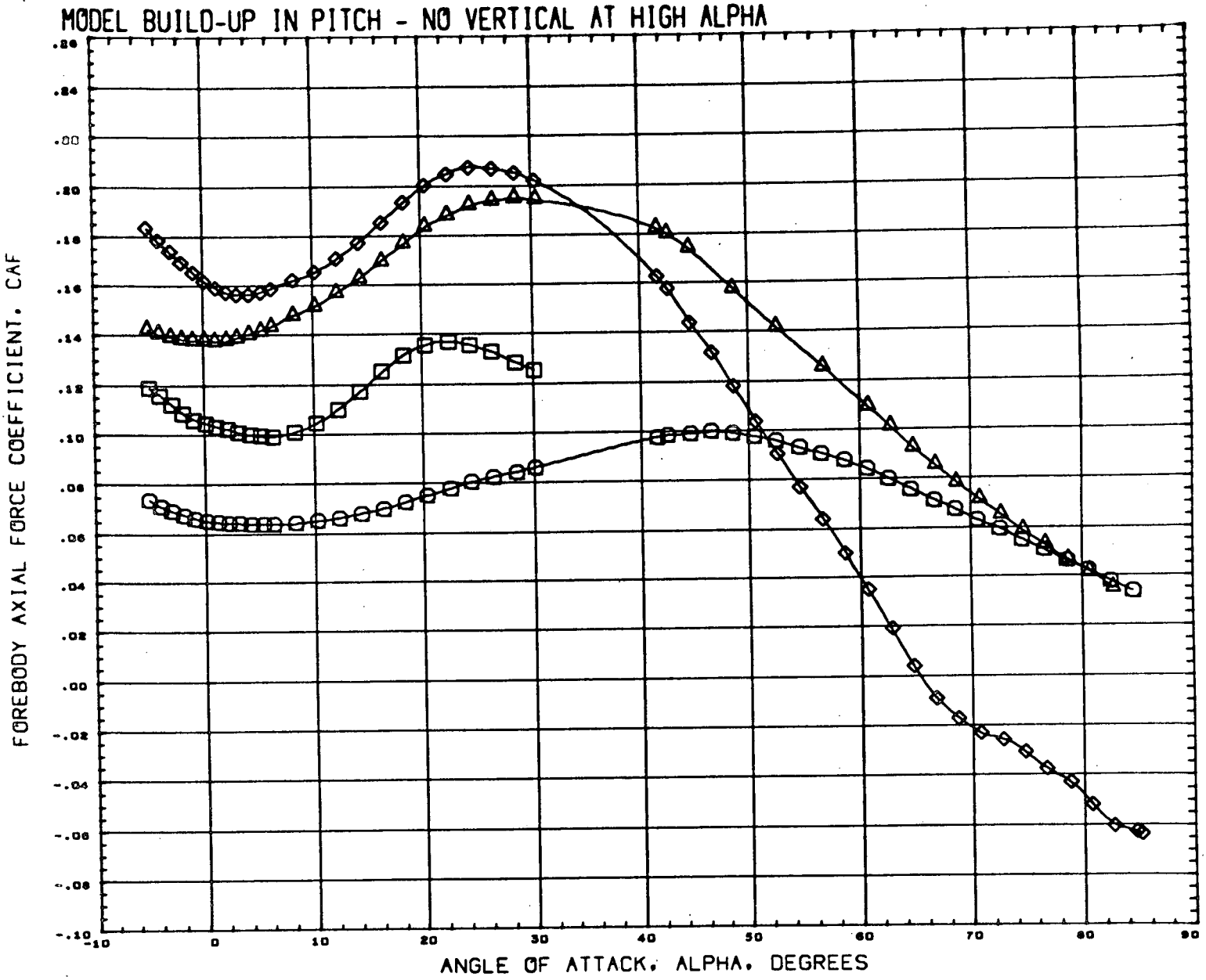
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	HTAIL	ELEVTR
(GCX011)		GAC HST-020 TBC H-32 BOOSTER B8V3	0.000		
(GCX021)		GAC HST-020 TBC H-32 BOOSTER B8W4V3	0.000		
(GCX061)		GAC HST-020 TBC H-32 BOOSTER B8W4H4V3	0.000	-15.000	0.000
(RCX272)		GAC HST-020 TBC H-32 BOOSTER B8H4V3	0.000	-15.000	0.000

MACH 6.120

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4660	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.9670	INCHES
SCALE	0.4346	PERCNT

MODEL BUILD-UP IN PITCH - NO VERTICAL AT HIGH ALPHA

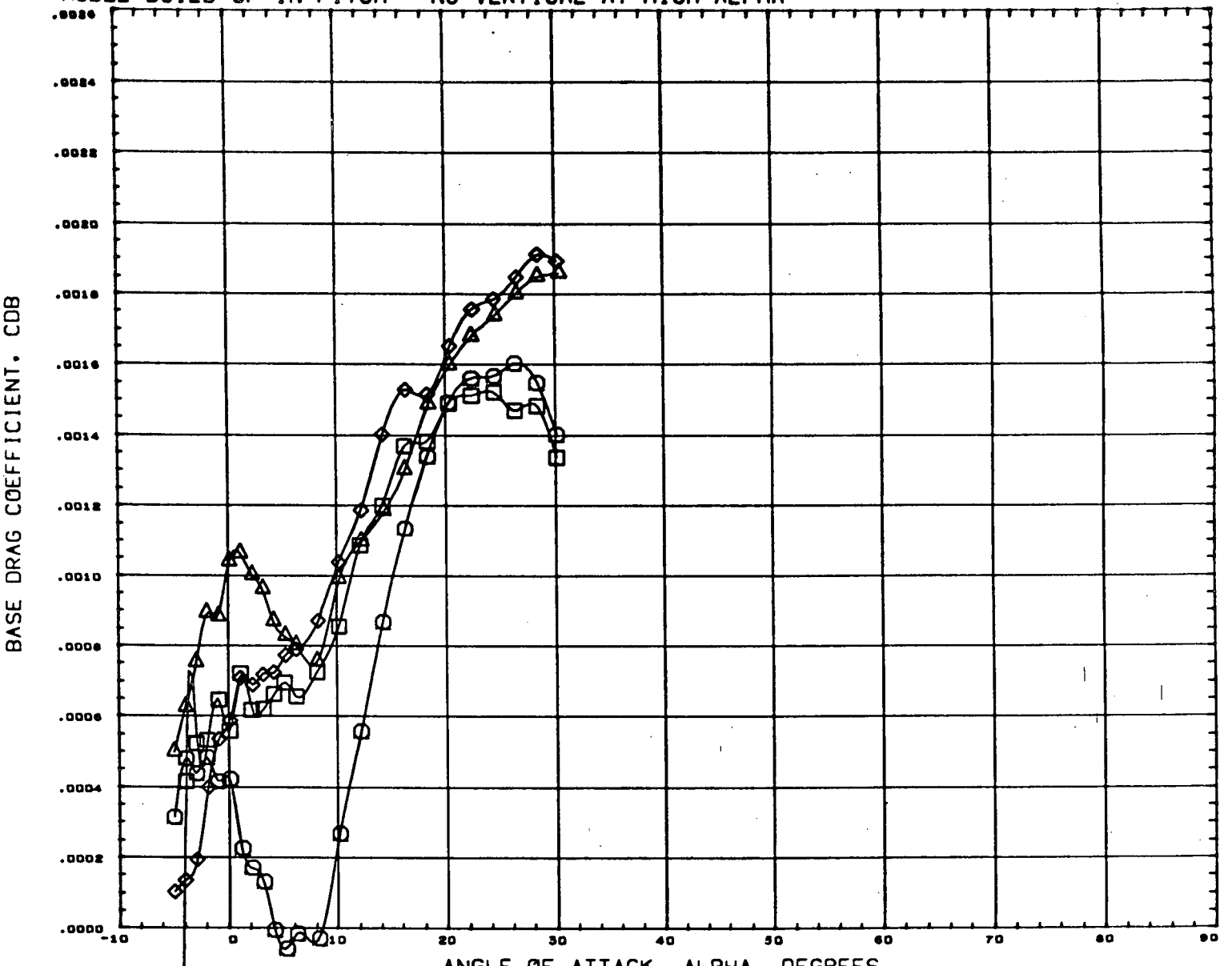


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	HTAIL	ELEVTR
(GCX011)	○	GAC HST-020 TBC H-32 BOOSTER B8V3	0.000		
(GCX021)	△	GAC HST-020 TBC H-32 BOOSTER B8W4V3	0.000		
(GCX061)	◇	GAC HST-020 TBC H-32 BOOSTER B8W4H4V3	0.000	-15.000	0.000
(RCX272)	□	GAC HST-020 TBC H-32 BOOSTER B8H4V3	0.000	-15.000	0.000

MACH 8.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

MODEL BUILD-UP IN PITCH - NO VERTICAL AT HIGH ALPHA

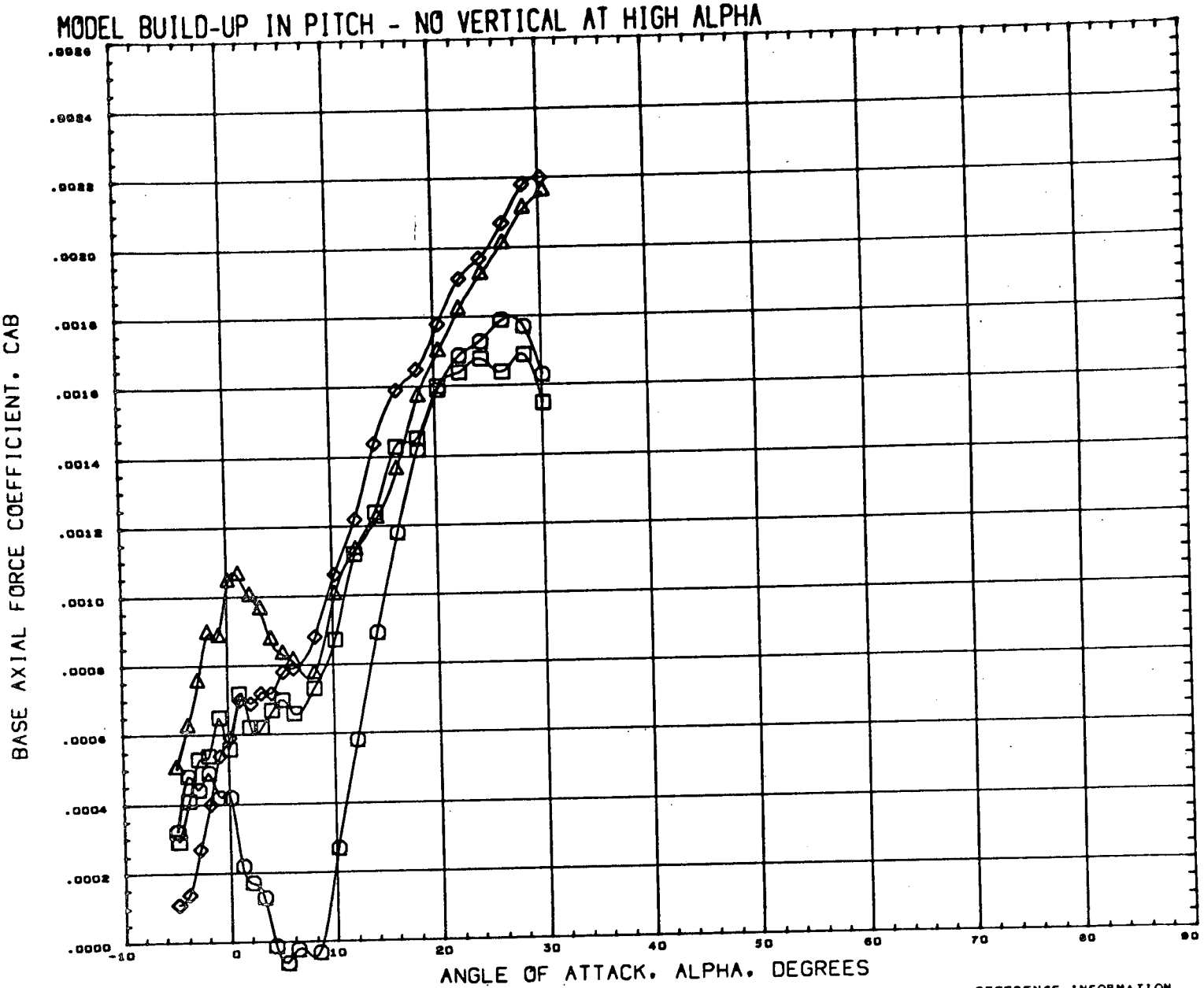


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			BETA	HTAIL	ELEVTR
(FCX192)	○	GAC HST-020	TBC H-32 BOOSTER	B8V3	0.000		
(FCX202)	△	GAC HST-020	TBC H-32 BOOSTER	B8W4V3	0.000		
(FCX222)	◇	GAC HST-020	TBC H-32 BOOSTER	B8W4H4V3	0.000	-15.000	0.000
(FCX272)	□	GAC HST-020	TBC H-32 BOOSTER	B8H4V3	0.000	-15.000	0.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4660	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5670	INCHES
SCALE	0.4348	PERCNT

MODEL BUILD-UP IN PITCH - NO VERTICAL AT HIGH ALPHA



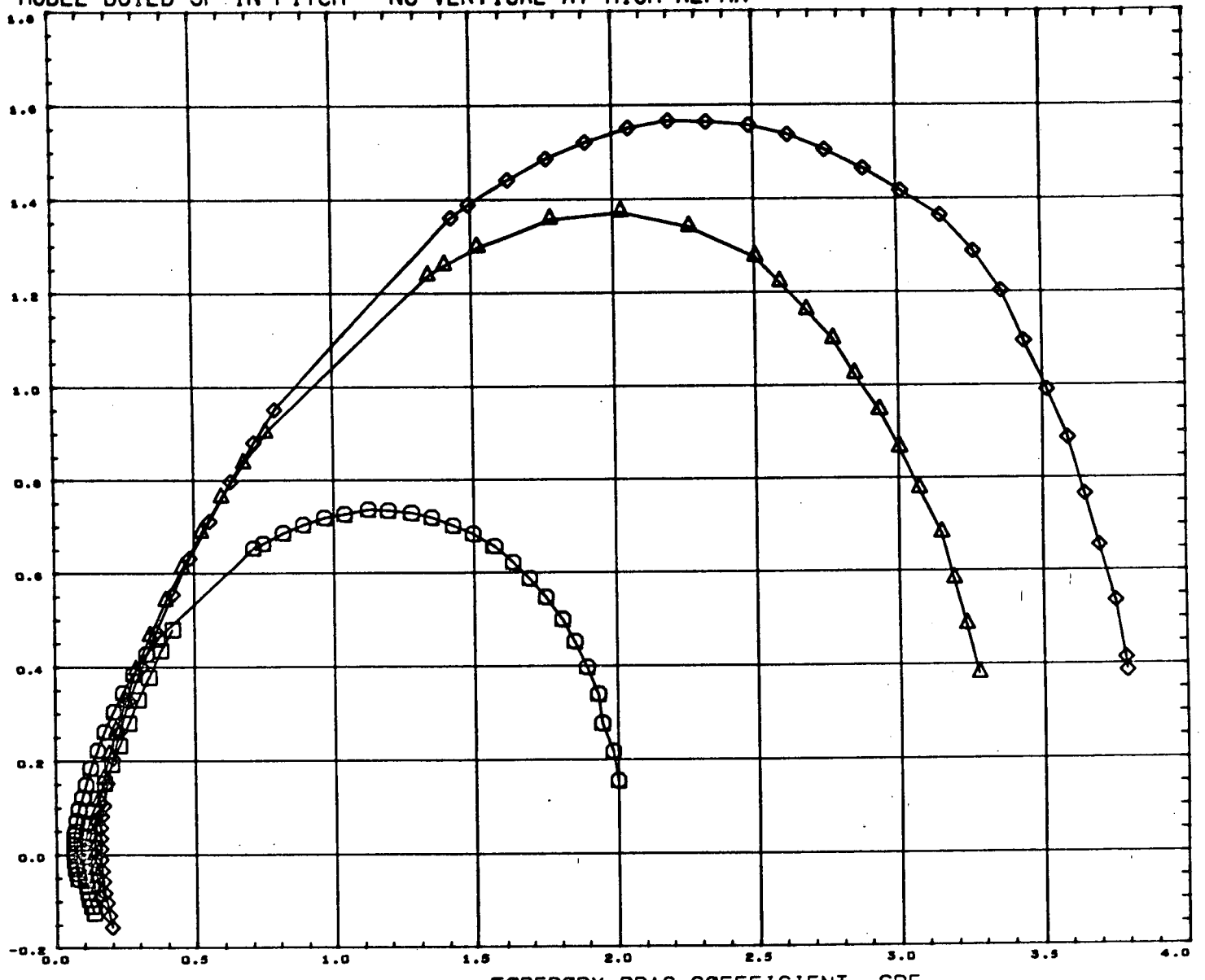
DATA SET SYMBOL	CONFIGURATION DESCRIPTION			BETA	HTAIL	ELEVTR
(FCX192) ○	GAC HST-020	TBC H-32 BOOSTER	B8V3	0.000		
(FCX202) △	GAC HST-020	TBC H-32 BOOSTER	B8W4V3	0.000		
(FCX222) ◇	GAC HST-020	TBC H-32 BOOSTER	B8W4H4V3	0.000	-15.000	0.000
(FCX272) □	GAC HST-020	TBC H-32 BOOSTER	B8H4V3	0.000	-15.000	0.000

MACH 0.120

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4660	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

MODEL BUILD-UP IN PITCH - NO VERTICAL AT HIGH ALPHA



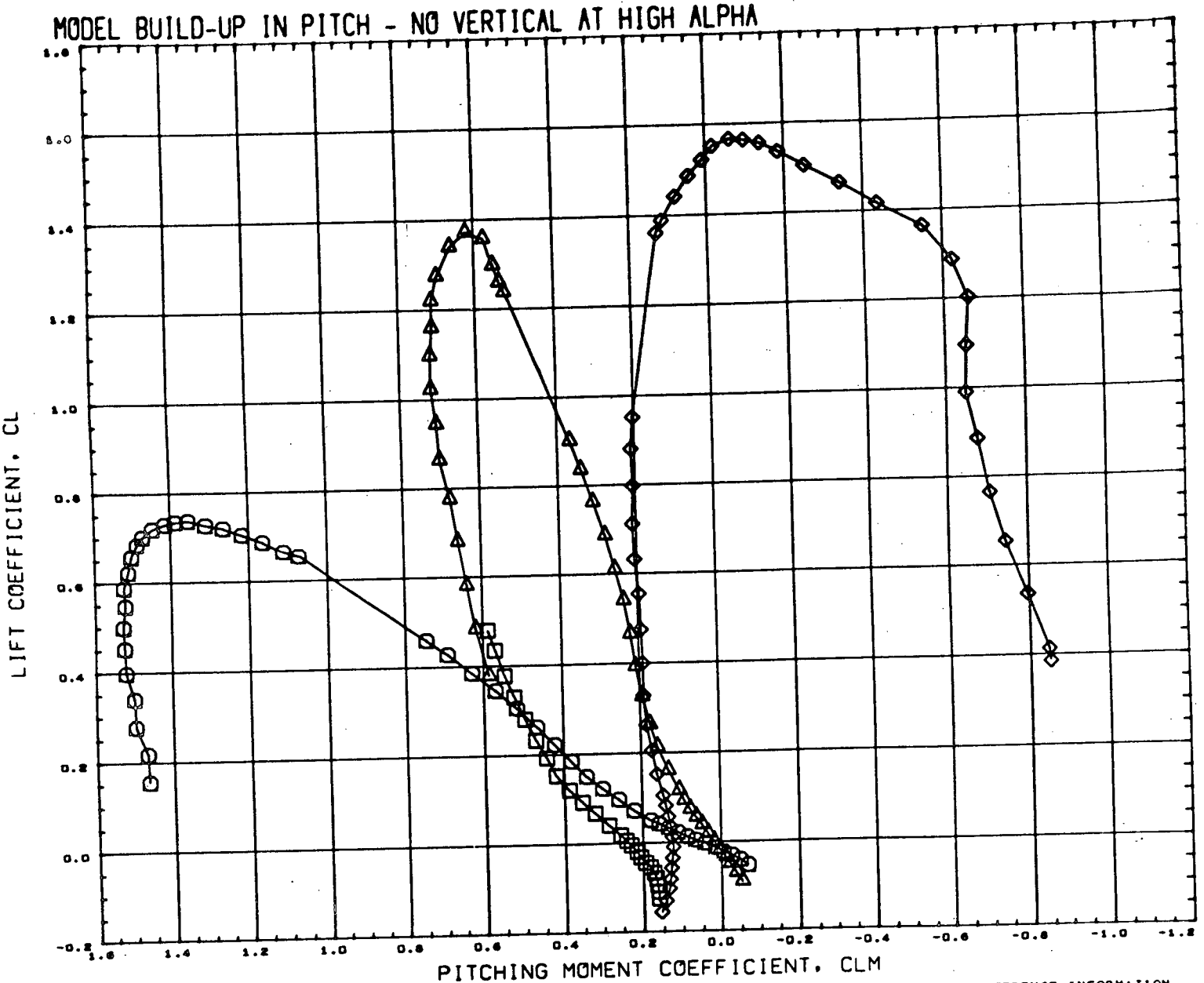
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	HTAIL	ELEVTR
(GCX011)	○	GAC HST-020 TBC H-32 BOOSTER B8V3	0.000		
(GCX021)	△	GAC HST-020 TBC H-32 BOOSTER B8W4V3	0.000		
(GCX081)	◇	GAC HST-020 TBC H-32 BOOSTER B8W4H4V3	0.000	-15.000	0.000
(RCX272)	□	GAC HST-020 TBC H-32 BOOSTER B8H4V3	0.000	-15.000	0.000

MACH 0.120

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.6210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4346	PERCNT

MODEL BUILD-UP IN PITCH - NO VERTICAL AT HIGH ALPHA



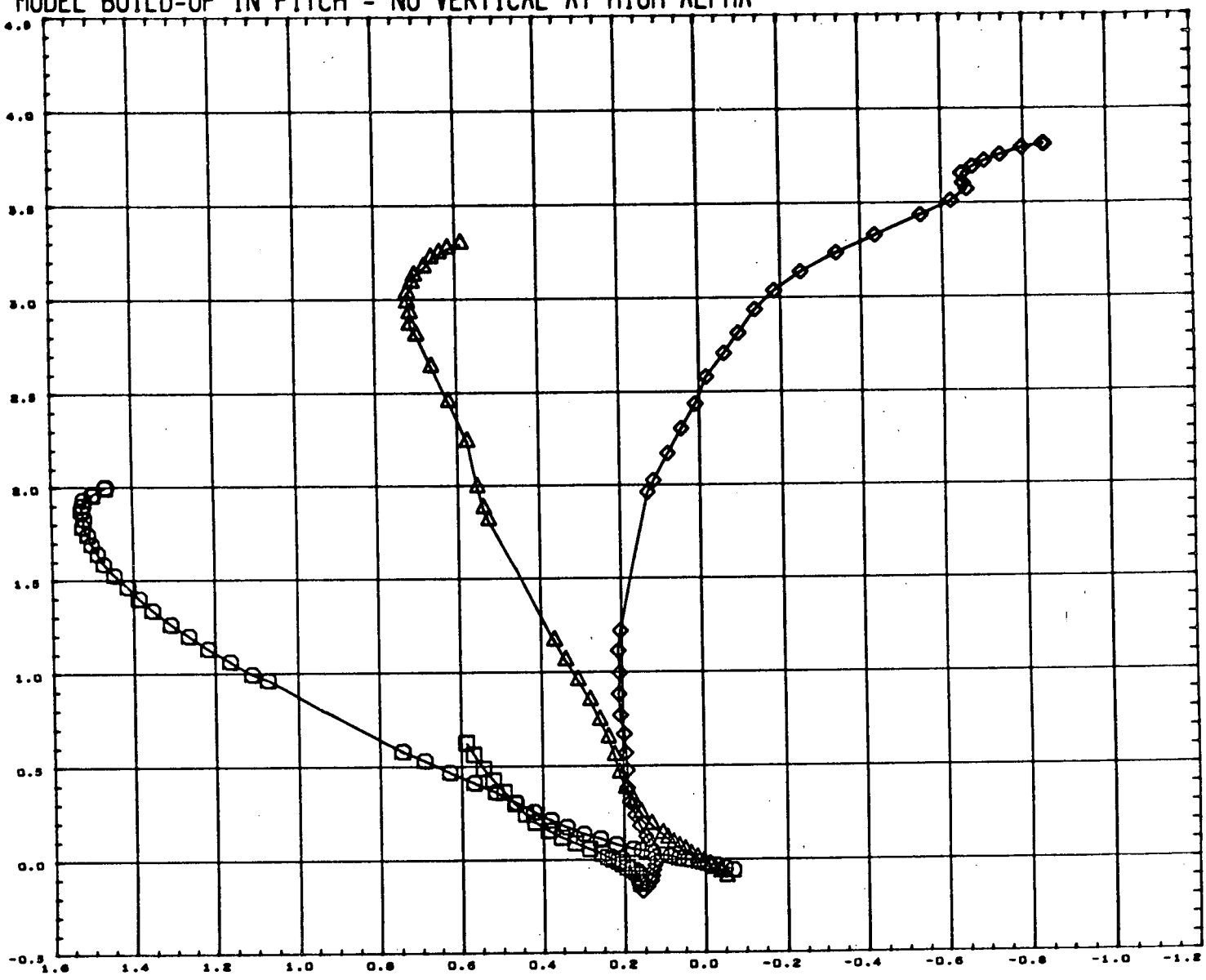
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	HTAIL	ELEVTR
(GCX011)		GAC HST-020 TBC H-32 BOOSTER B8V3	0.000		
(GCX021)		GAC HST-020 TBC H-32 BOOSTER B8W4V3	0.000		
(GCX081)		GAC HST-020 TBC H-32 BOOSTER B8W4H4V3	0.000	-15.000	0.000
(RCX272)		GAC HST-020 TBC H-32 BOOSTER B8H4V3	0.000	-15.000	0.000

MACH 0.120

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4660	INCHES
BREF	9.6520	INCHES
XMRP	7.6210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

MODEL BUILD-UP IN PITCH - NO VERTICAL AT HIGH ALPHA



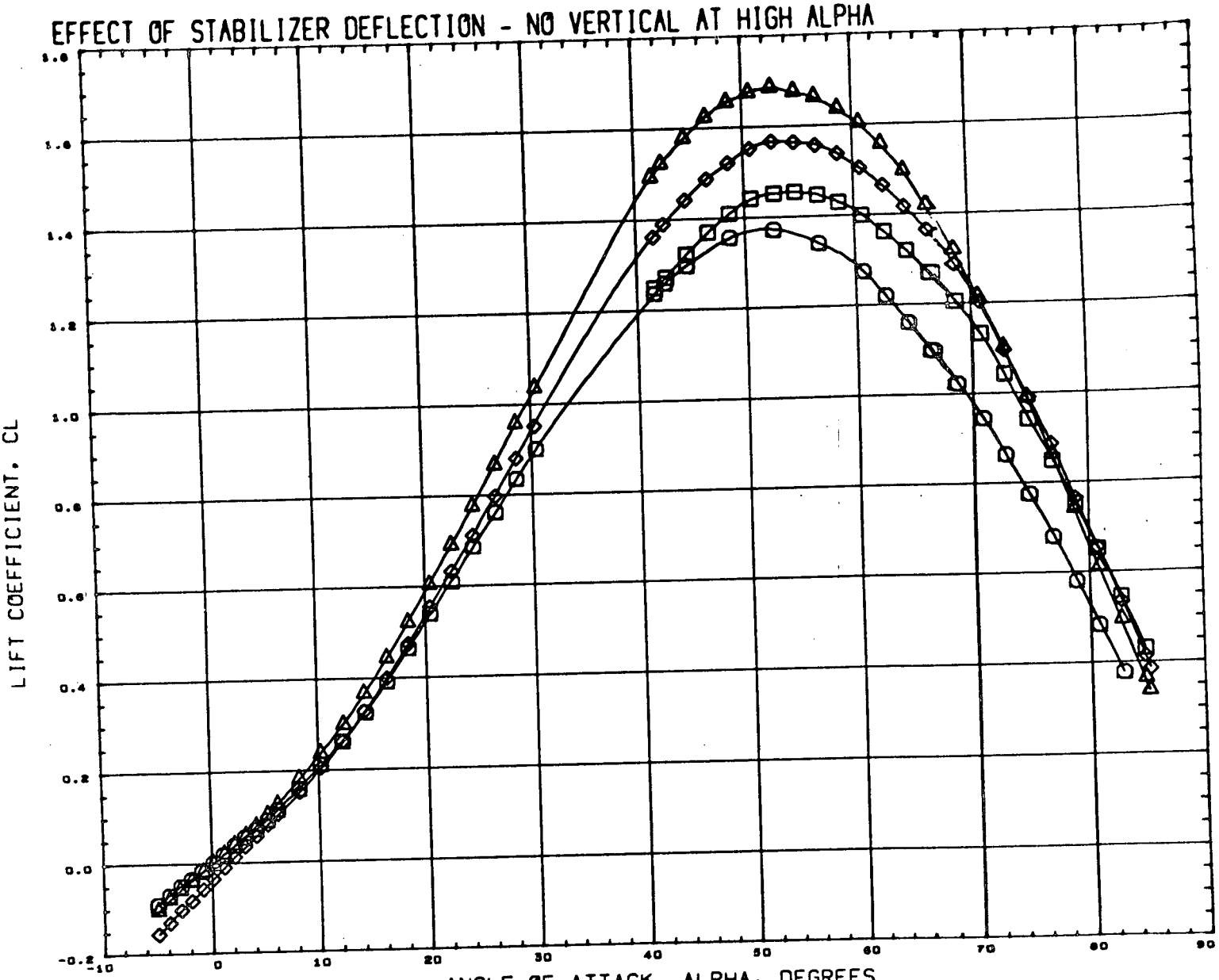
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	HTAIL	ELEVTR
(GCX011)		GAC HST-020 TBC H-32 BOOSTER B8V3	0.000		
(GCX021)		GAC HST-020 TBC H-32 BOOSTER B8W4V3	0.000		
(GCX081)		GAC HST-020 TBC H-32 BOOSTER B8W4H4V3	0.000	-15.000	0.000
(RCX272)		GAC HST-020 TBC H-32 BOOSTER B8H4V3	0.000	-15.000	0.000

MACH 0.120

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF STABILIZER DEFLECTION - NO VERTICAL AT HIGH ALPHA

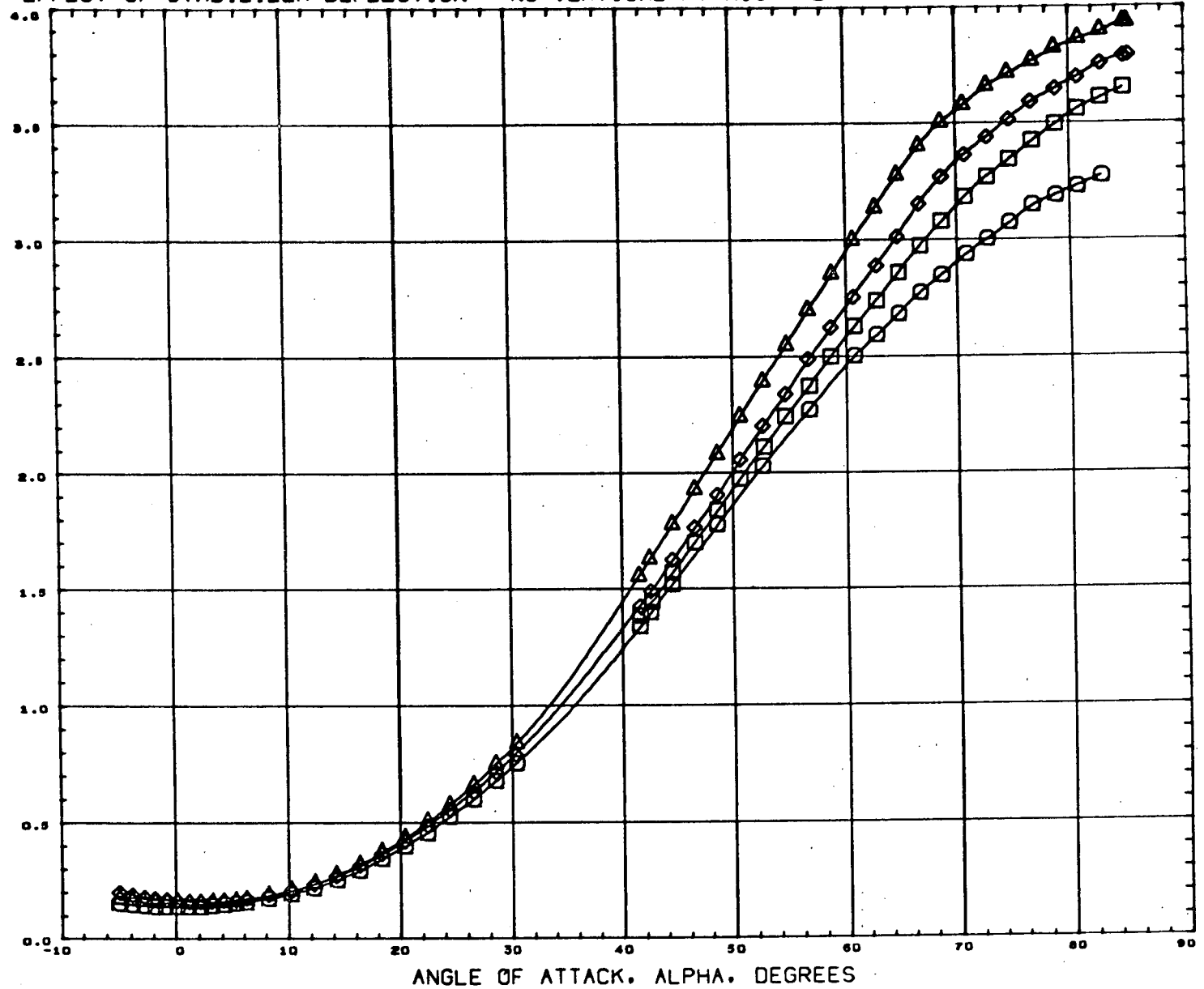


DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	HTAIL	ELEVTR
(GCX021)	GAC HST-020 TBC H-32 BOOSTER B8W4V3	0.000		
(GCX031)	GAC HST-020 TBC H-32 BOOSTER B8W4H4V3	0.000	0.000	0.000
(GCX081)	GAC HST-020 TBC H-32 BOOSTER B8W4H4V3	0.000	-15.000	0.000
(RCX091)	GAC HST-020 TBC H-32 BOOSTER B6W4H4	0.000	-30.000	0.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF STABILIZER DEFLECTION - NO VERTICAL AT HIGH ALPHA



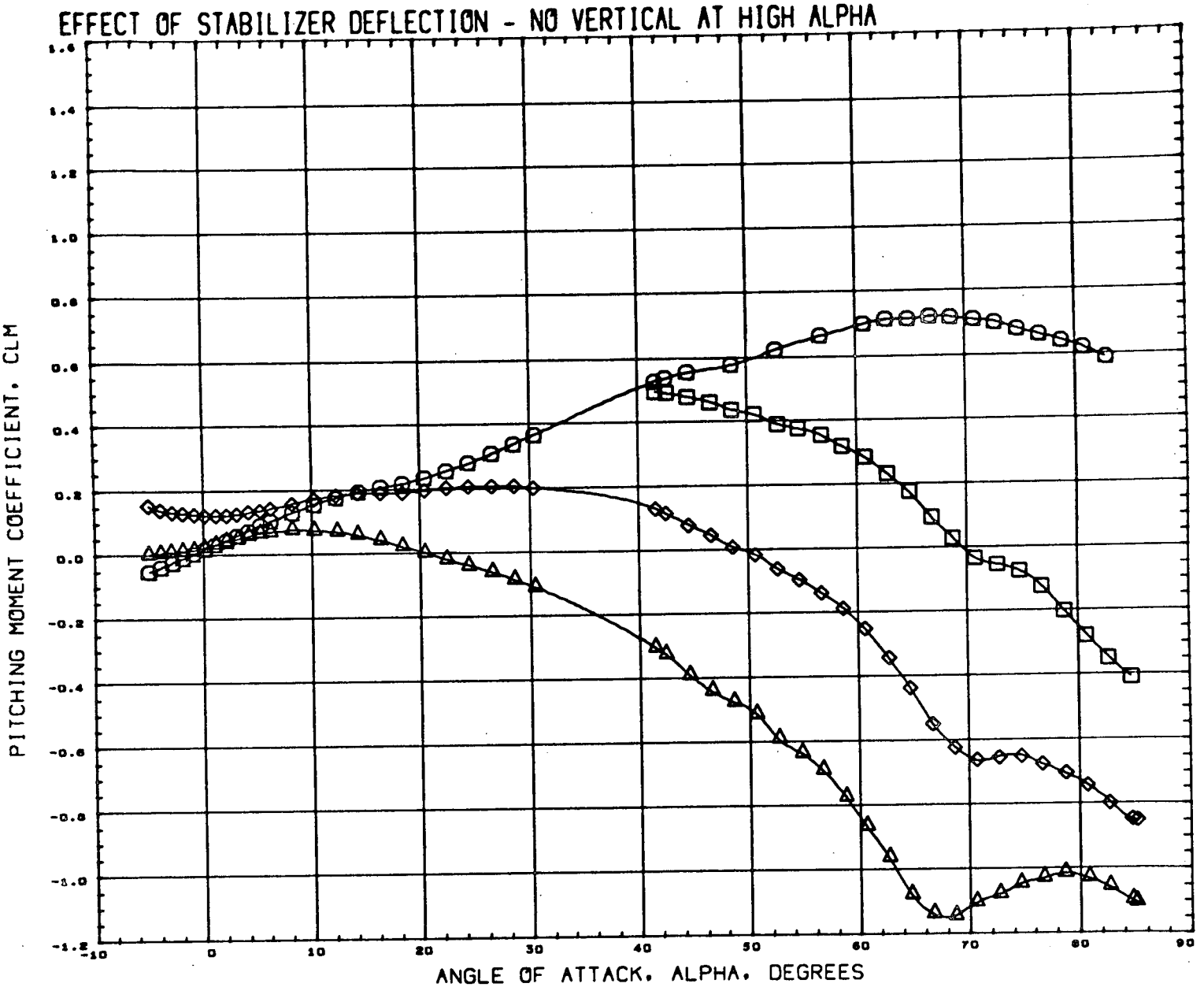
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	HTAIL	ELEVTR
(GCX021)		GAC HST-020 TBC H-32 BOOSTER B8W4V3	0.000		
(GCX031)		GAC HST-020 TBC H-32 BOOSTER B6W4H4V3	0.000	0.000	0.000
(GCX061)		GAC HST-020 TBC H-32 BOOSTER B6W4H4V3	0.000	-15.000	0.000
(RCX091)		GAC HST-020 TBC H-32 BOOSTER B6W4H4	0.000	-30.000	0.000

MACH 0.120

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.6210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.9670	INCHES
SCALE	0.4348	PERCNT

EFFECT OF STABILIZER DEFLECTION - NO VERTICAL AT HIGH ALPHA



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(GCX021)	○	GAC HST-020 TBC H-32 BOOSTER B6W4V3
(GCX031)	◇	GAC HST-020 TBC H-32 BOOSTER B6W4H4V3
(GCX081)	◇	GAC HST-020 TBC H-32 BOOSTER B6W4H4V3
(RCX091)	□	GAC HST-020 TBC H-32 BOOSTER B6W4H4

MACH 0.120

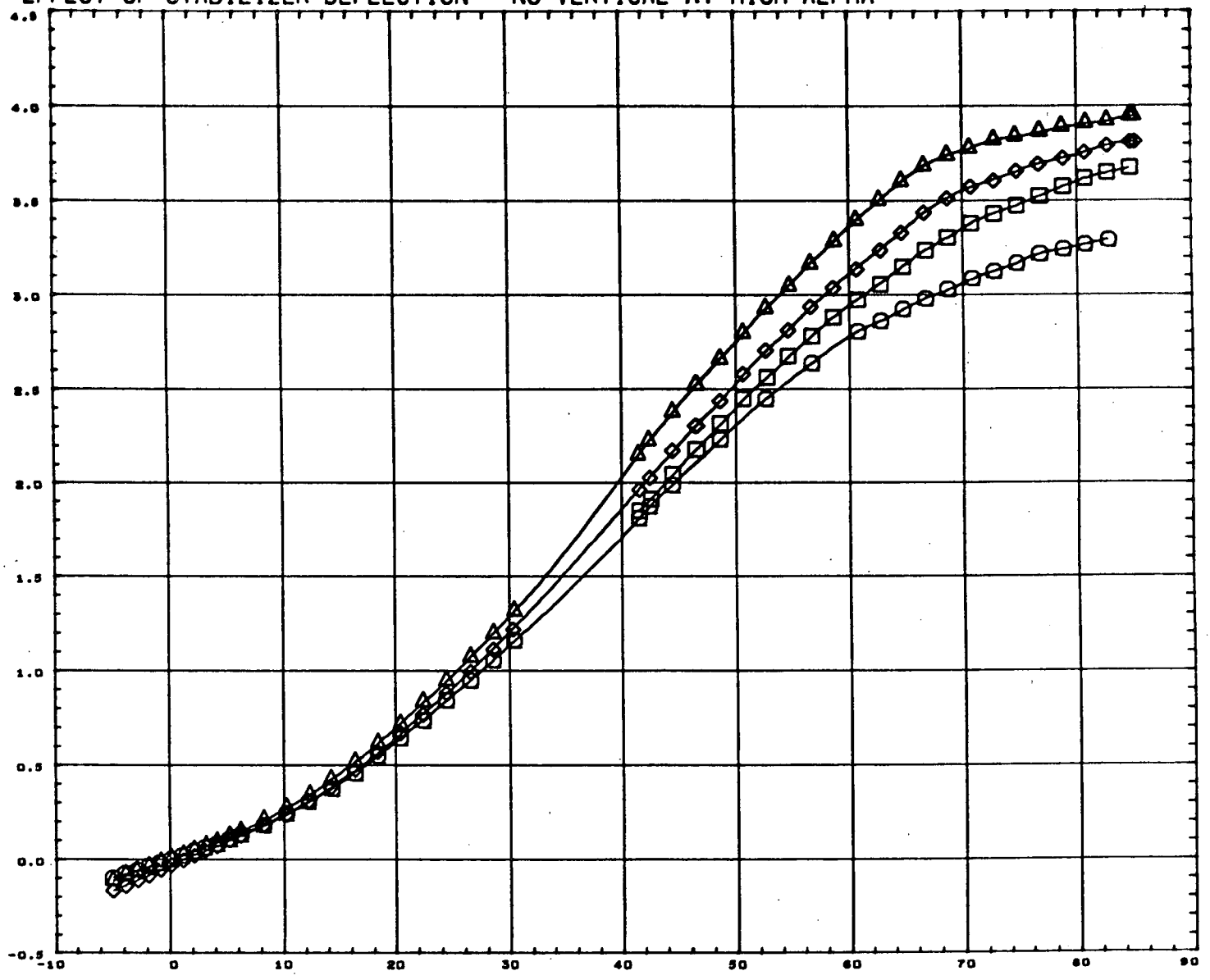
BETA	HTAIL	ELEVTR
0.000		
0.000	0.000	0.000
0.000	-15.000	0.000
0.000	-30.000	0.000

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.6210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4346	PERCNT

20

EFFECT OF STABILIZER DEFLECTION - NO VERTICAL AT HIGH ALPHA

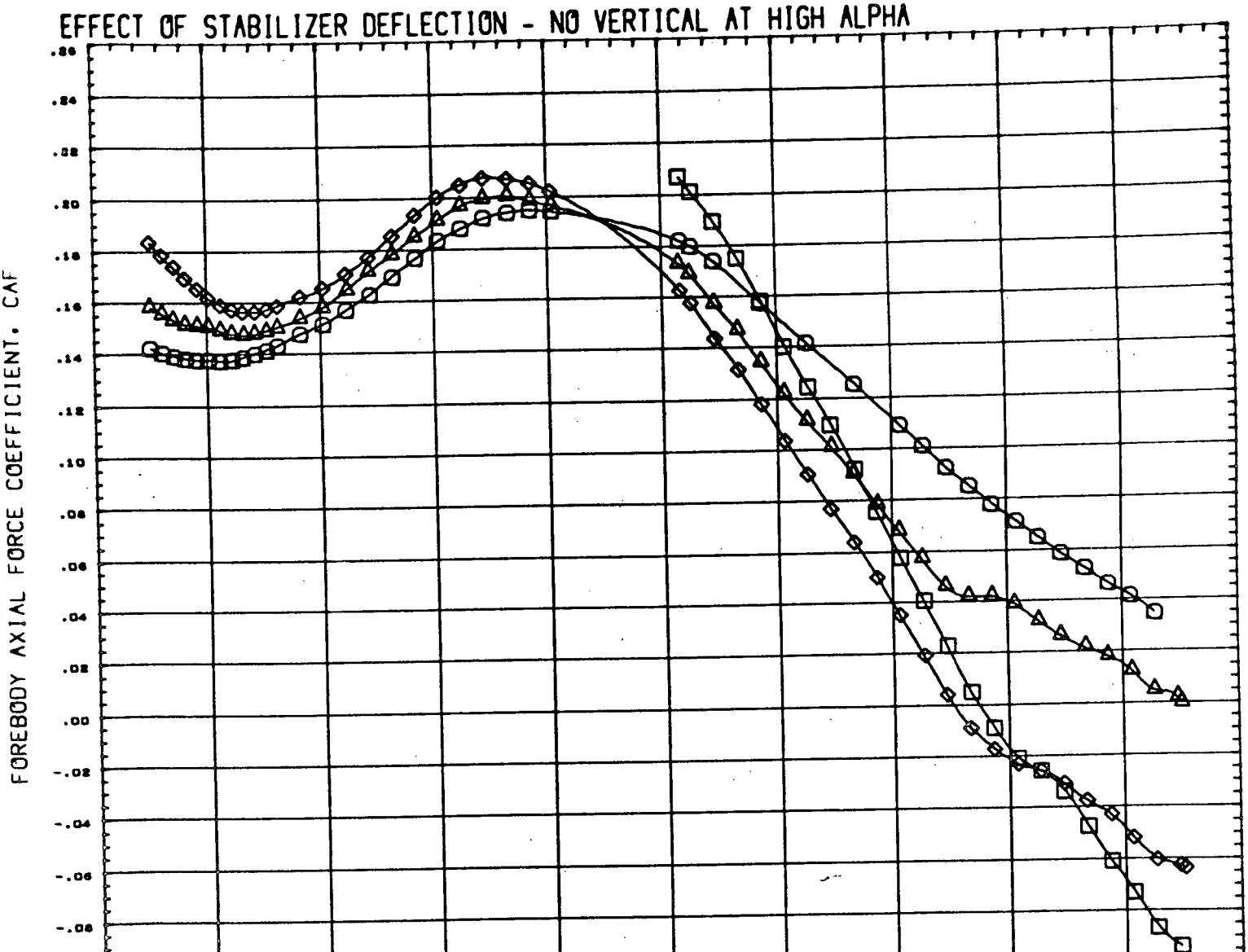


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	HTAIL	ELEVTR
(GCX021)	○	GAC HST-020 TBC H-32 BOOSTER B8W4V3	0.000		
(GCX031)	△	GAC HST-020 TBC H-32 BOOSTER B8W4H4V3	0.000	0.000	0.000
(GCX081)	◇	GAC HST-020 TBC H-32 BOOSTER B6W4H4V3	0.000	-15.000	0.000
(GCX091)	□	GAC HST-020 TBC H-32 BOOSTER B6W4H4	0.000	-30.000	0.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF STABILIZER DEFLECTION - NO VERTICAL AT HIGH ALPHA



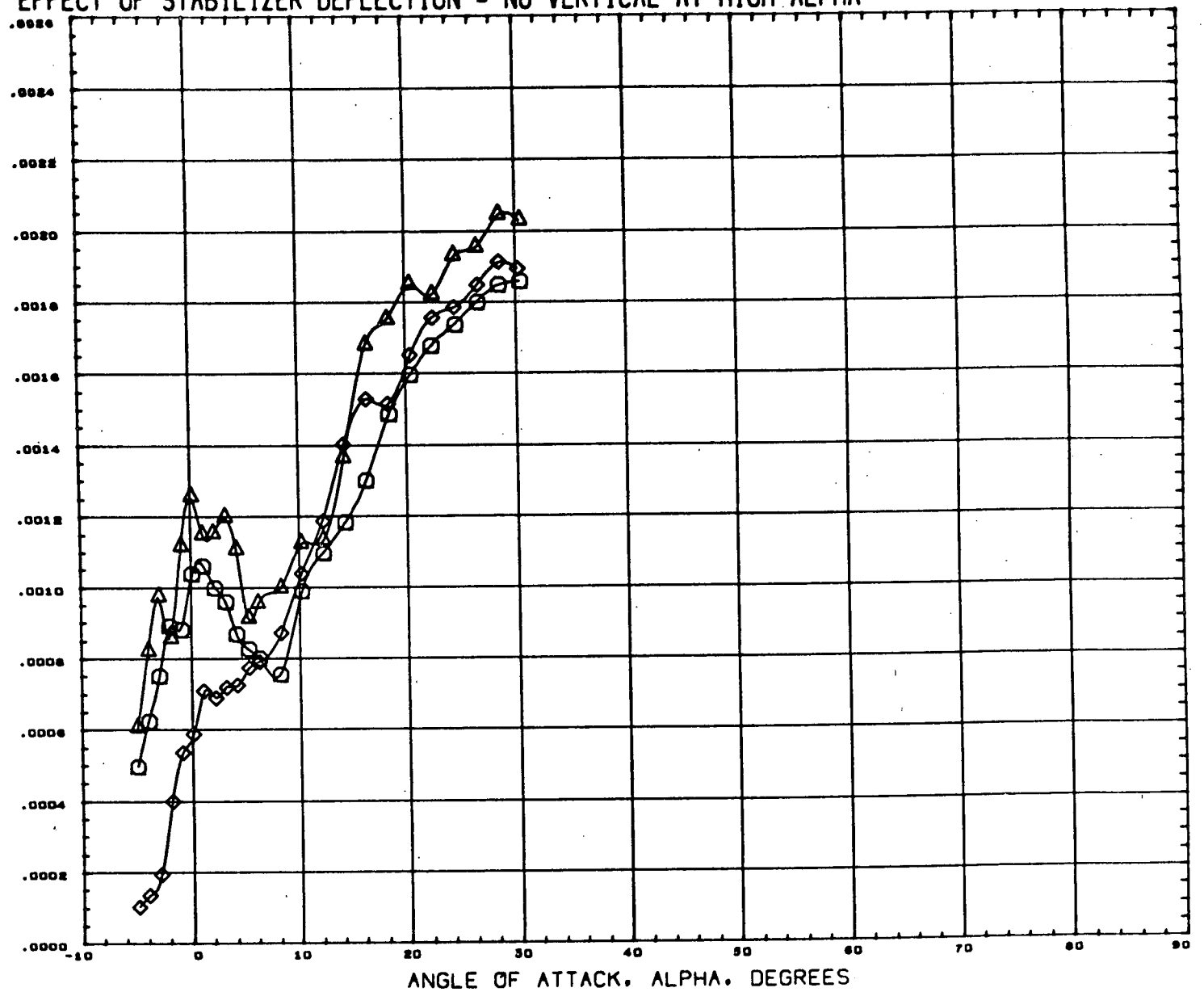
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	HTAIL	ELEVTR
(GCX021)	○	GAC HST-020 TBC H-32 BOOSTER B8W4V3	0.000		
(GCX031)	△	GAC HST-020 TBC H-32 BOOSTER B8W4H4V3	0.000	0.000	0.000
(GCX081)	◇	GAC HST-020 TBC H-32 BOOSTER B8W4H4V3	0.000	-15.000	0.000
(RCX091)	□	GAC HST-020 TBC H-32 BOOSTER B6W4H4	0.000	-30.000	0.000

MACH 0.120

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4660	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5670	INCHES
SCALE	0.4346	PERCNT

EFFECT OF STABILIZER DEFLECTION - NO VERTICAL AT HIGH ALPHA

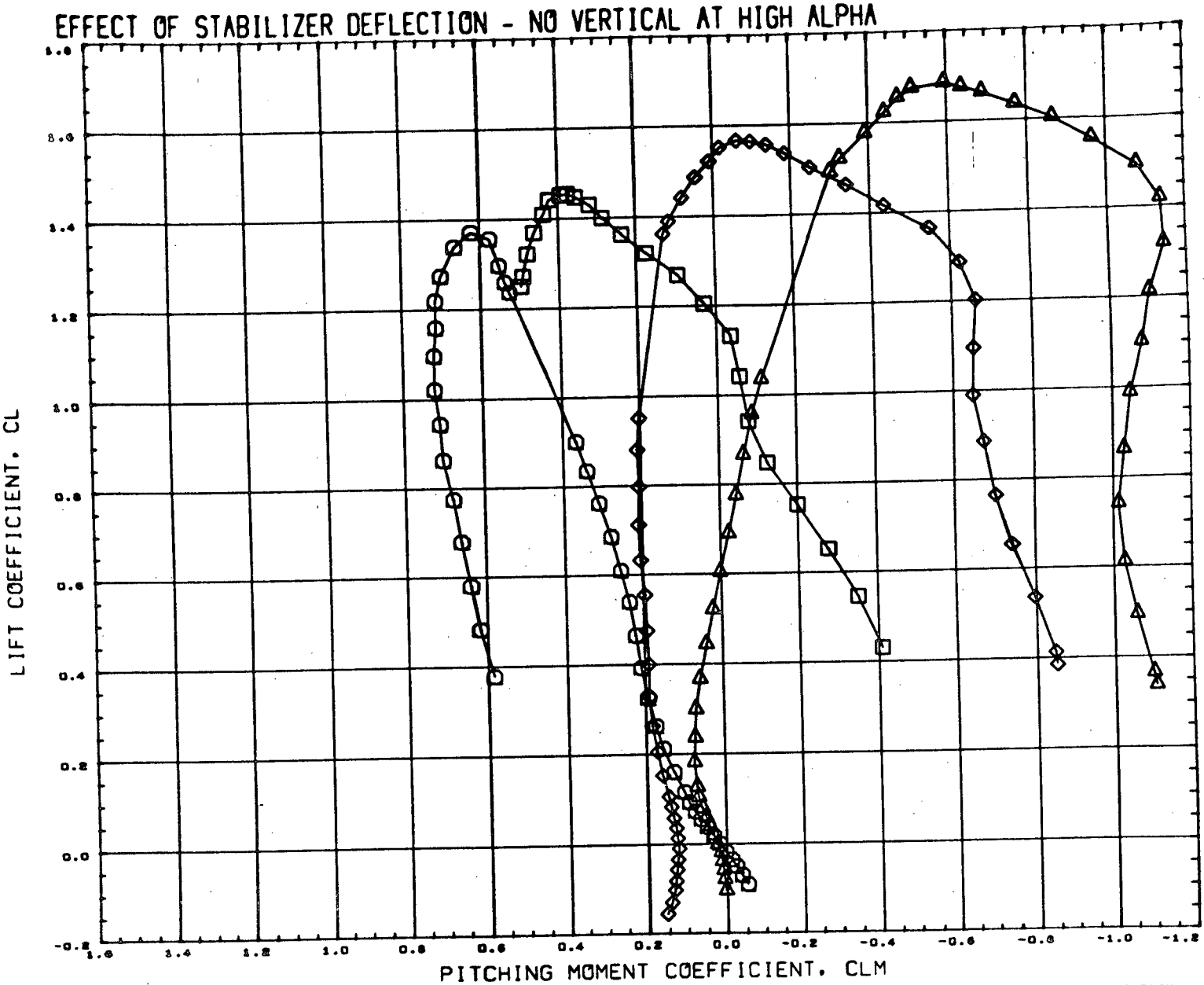


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			BETA	HTAIL	ELEVTR
(FCX202)	○	GAC MST-020	TBC H-32 BOOSTER	B8W4V3	0.000		
(FCX232)	△	GAC MST-020	TBC H-32 BOOSTER	B8W4H4V3	0.000	0.000	0.000
(FCX222)	◇	GAC MST-020	TBC H-32 BOOSTER	B8W4H4V3	0.000	-15.000	0.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4340	PERCNT

EFFECT OF STABILIZER DEFLECTION - NO VERTICAL AT HIGH ALPHA



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(GCX021)	○	GAC MST-020 TBC H-32 BOOSTER B8W4V3
(GCX031)	△	GAC MST-020 TBC H-32 BOOSTER B8W4H4V3
(GCX081)	◇	GAC MST-020 TBC H-32 BOOSTER B8W4H4V3
(RCX091)	□	GAC MST-020 TBC H-32 BOOSTER B6W4H4

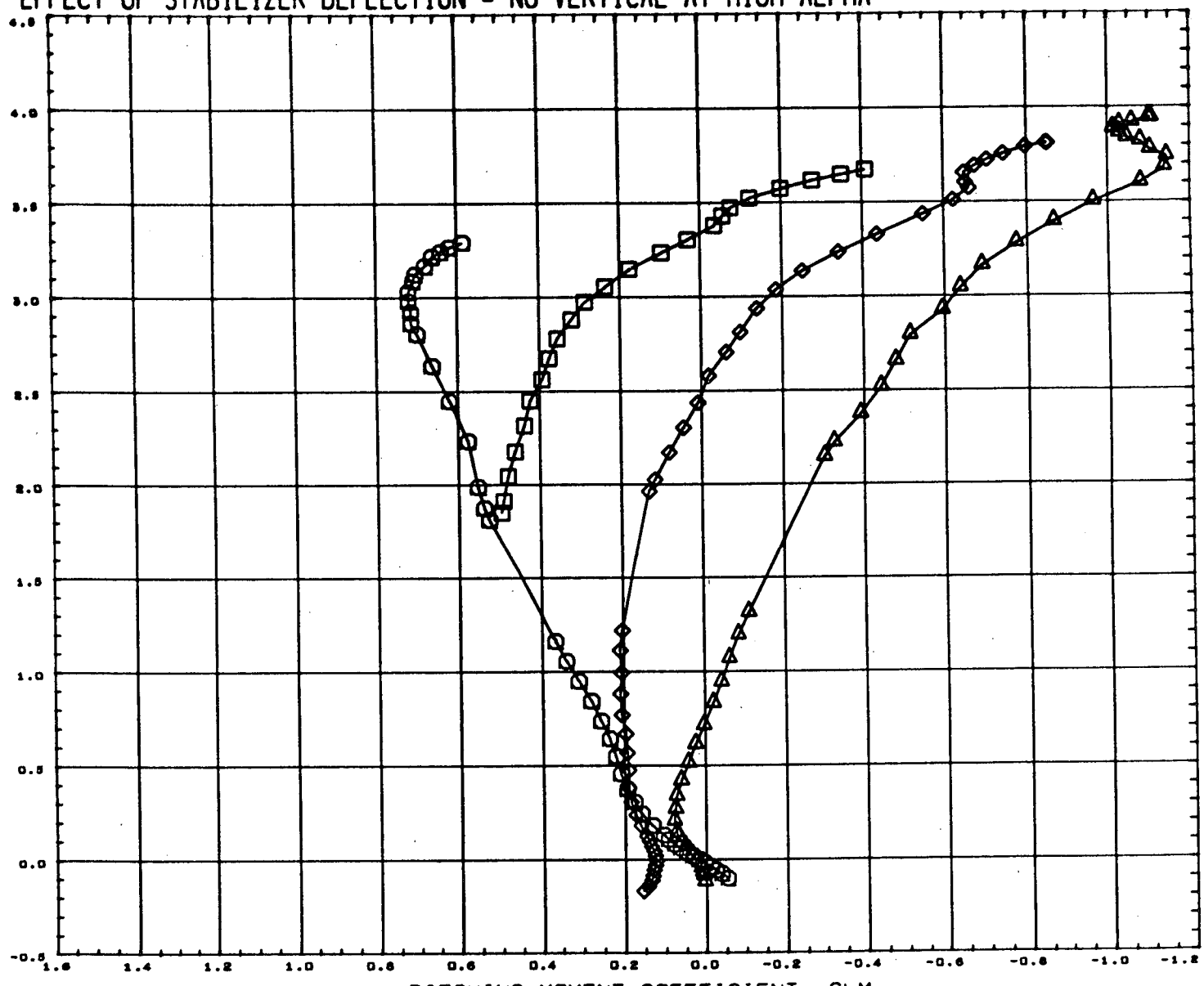
MACH 0.120

ALPHA	ELEVTR	HTAIL
0.000	0.000	
0.000	-15.000	
0.000	-30.000	

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4660	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF STABILIZER DEFLECTION - NO VERTICAL AT HIGH ALPHA



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	HTAIL
(GCX021)	○	GAC HST-020 TBC H-32 BOOSTER B8W4V3			
(GCX031)	△	GAC HST-020 TBC H-32 BOOSTER B8W4H4V3		0.000	0.000
(GCX061)	◇	GAC HST-020 TBC H-32 BOOSTER B8W4H4V3		0.000	-15.000
(RCX091)	□	GAC HST-020 TBC H-32 BOOSTER B6W4H4		0.000	-30.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	30.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4340	PERCNT

EFFECT OF ELEVATOR DEFLECTION.HTAIL=0. DEG. - NO VERTICAL AT HIGH ALPHA

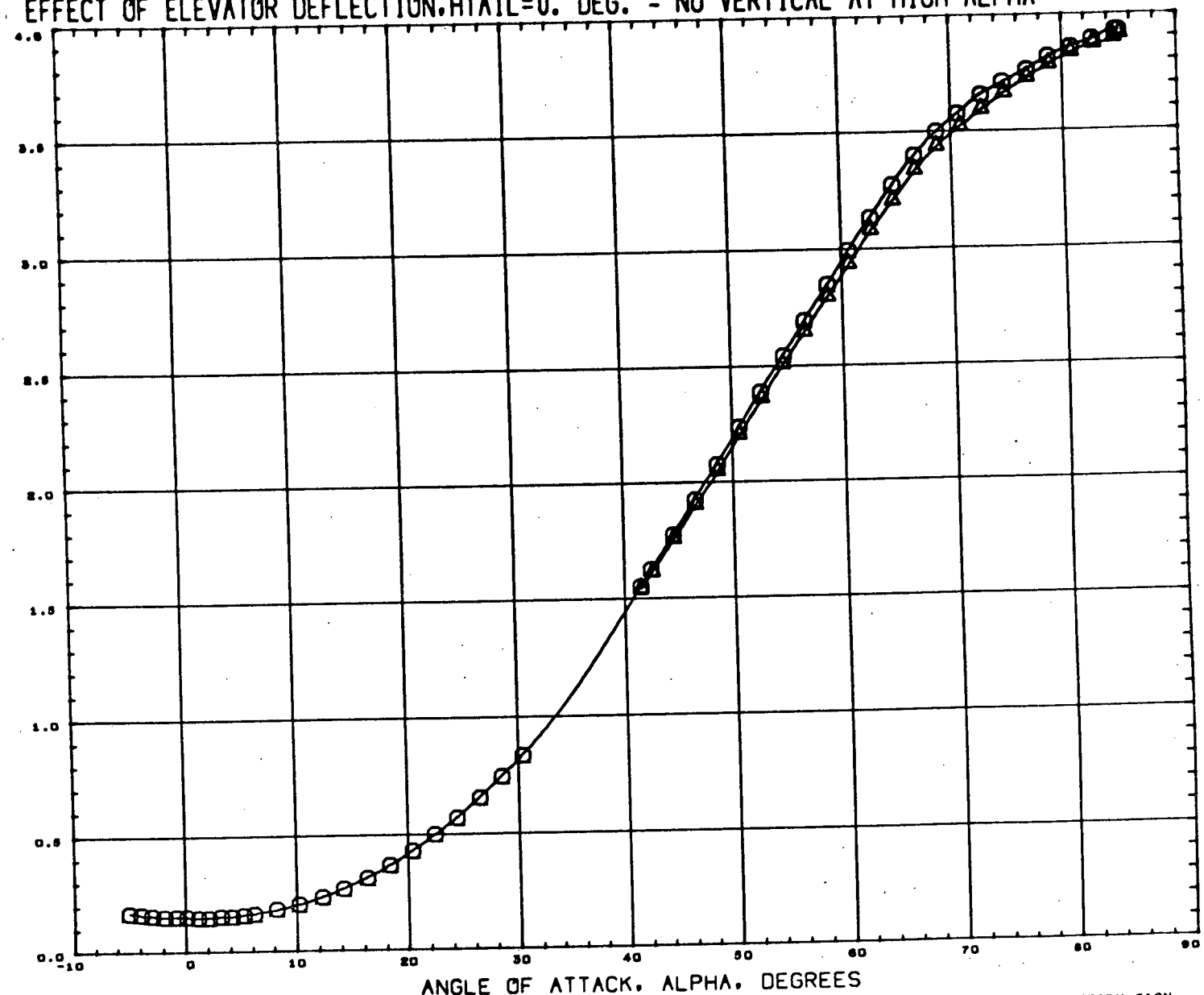
DATA SET SYMBOL		CONFIGURATION DESCRIPTION	BETA	HTAIL	ELEVTR
(GCX031)	○	GAC HST-020 TBC H-32 BOOSTER B8W4H4V3	0.000	0.000	0.000
(RCX041)	△	GAC HST-020 TBC H-32 BOOSTER B6W4H4	0.000	0.000	-15.000

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

MACH 0.120

EFFECT OF ELEVATOR DEFLECTION.HTAIL=0. DEG. - NO VERTICAL AT HIGH ALPHA



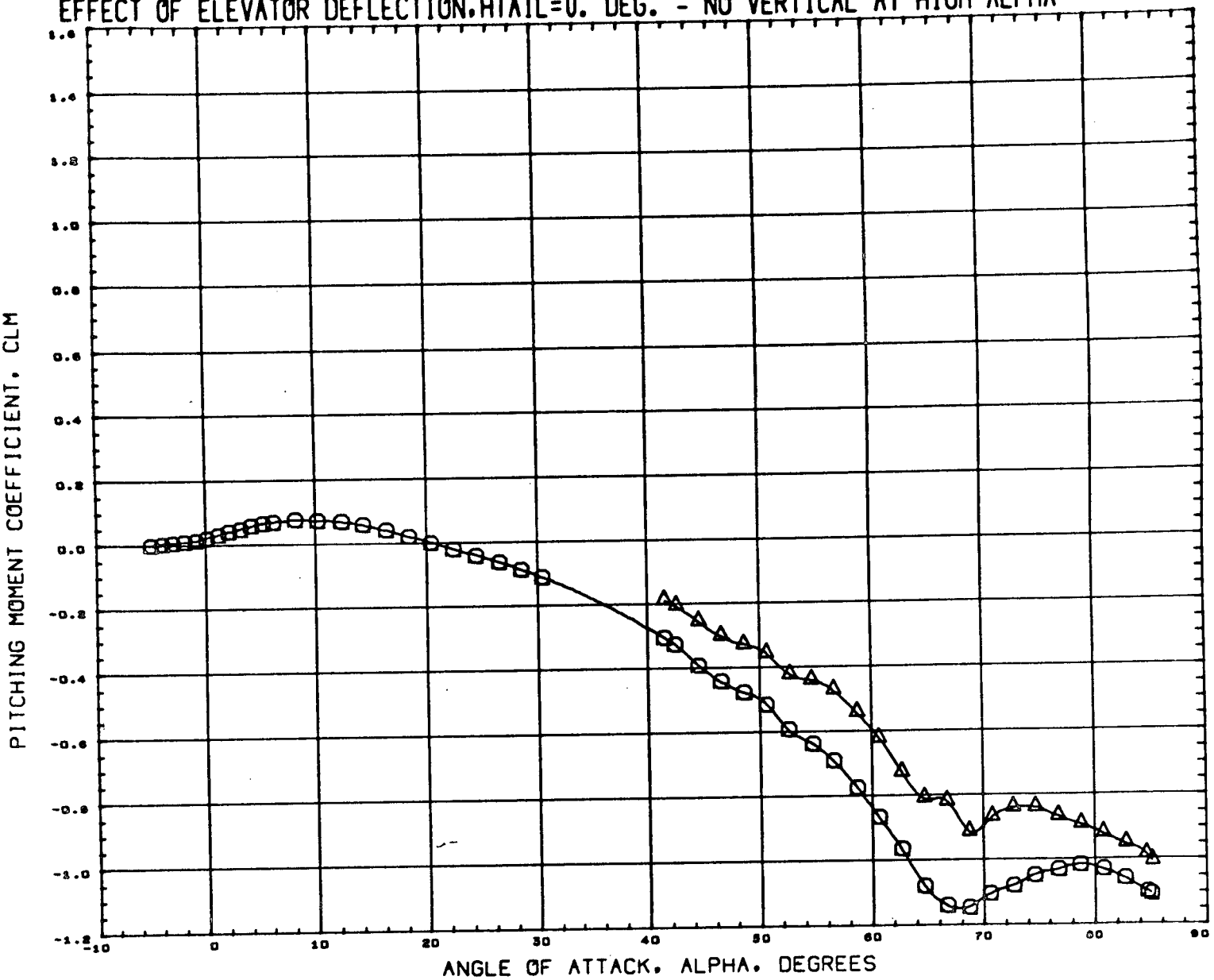
DATA SET SYMBOL		CONFIGURATION DESCRIPTION	BETA	HTAIL	ELEVTR
(GCX031)	○	GAC HST-020 TBC H-32 BOOSTER B6W4H4V3	0.000	0.000	0.000
(RCX041)	△	GAC HST-020 TBC H-32 BOOSTER B6W4H4	0.000	0.000	-15.000

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

MACH 0.120

EFFECT OF ELEVATOR DEFLECTION, HTAIL=0. DEG. - NO VERTICAL AT HIGH ALPHA



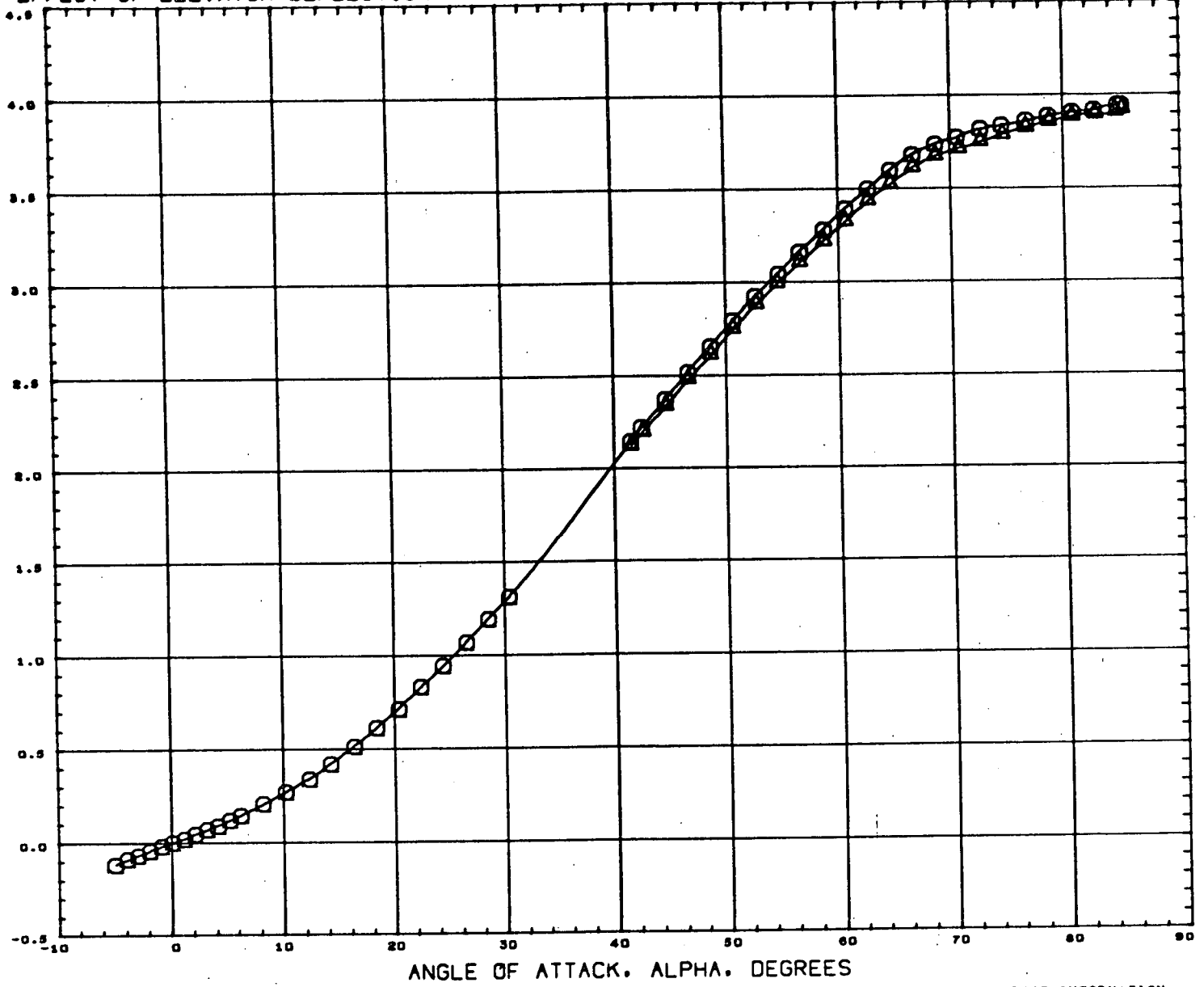
DATA SET SYMBOL		CONFIGURATION DESCRIPTION	BETA	HTAIL	ELEVTR
(GCX031)	○	GAC HST-020 TBC H-32 BOOSTER B8W4H4V3	0.000	0.000	0.000
(RCX041)	△	GAC HST-020 TBC H-32 BOOSTER B6W4H4	0.000	0.000	-15.000

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4660	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4340	PERCNT

MACH 0.120

EFFECT OF ELEVATOR DEFLECTION.HTAIL=0. DEG. - NO VERTICAL AT HIGH ALPHA

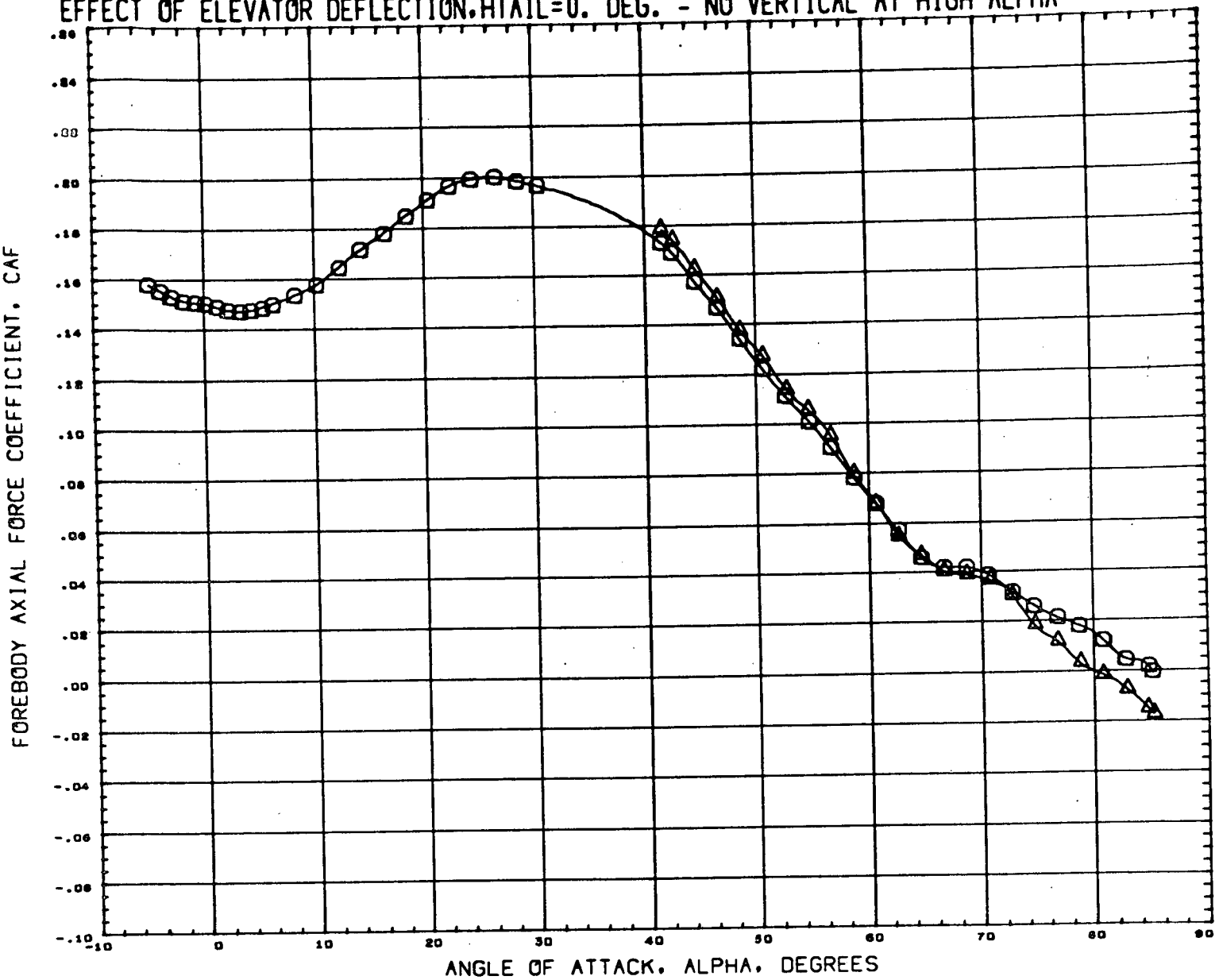


DATA SET SYMBOL		CONFIGURATION DESCRIPTION	BETA	HTAIL	ELEVTR
(GCX031)	○	GAC HST-020 TBC H-32 BOOSTER B8W4H4V3	0.000	0.000	0.000
(RCX041)	△	GAC HST-020 TBC H-32 BOOSTER B6W4H4	0.000	0.000	-15.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4660	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF ELEVATOR DEFLECTION, HTAIL=0. DEG. - NO VERTICAL AT HIGH ALPHA

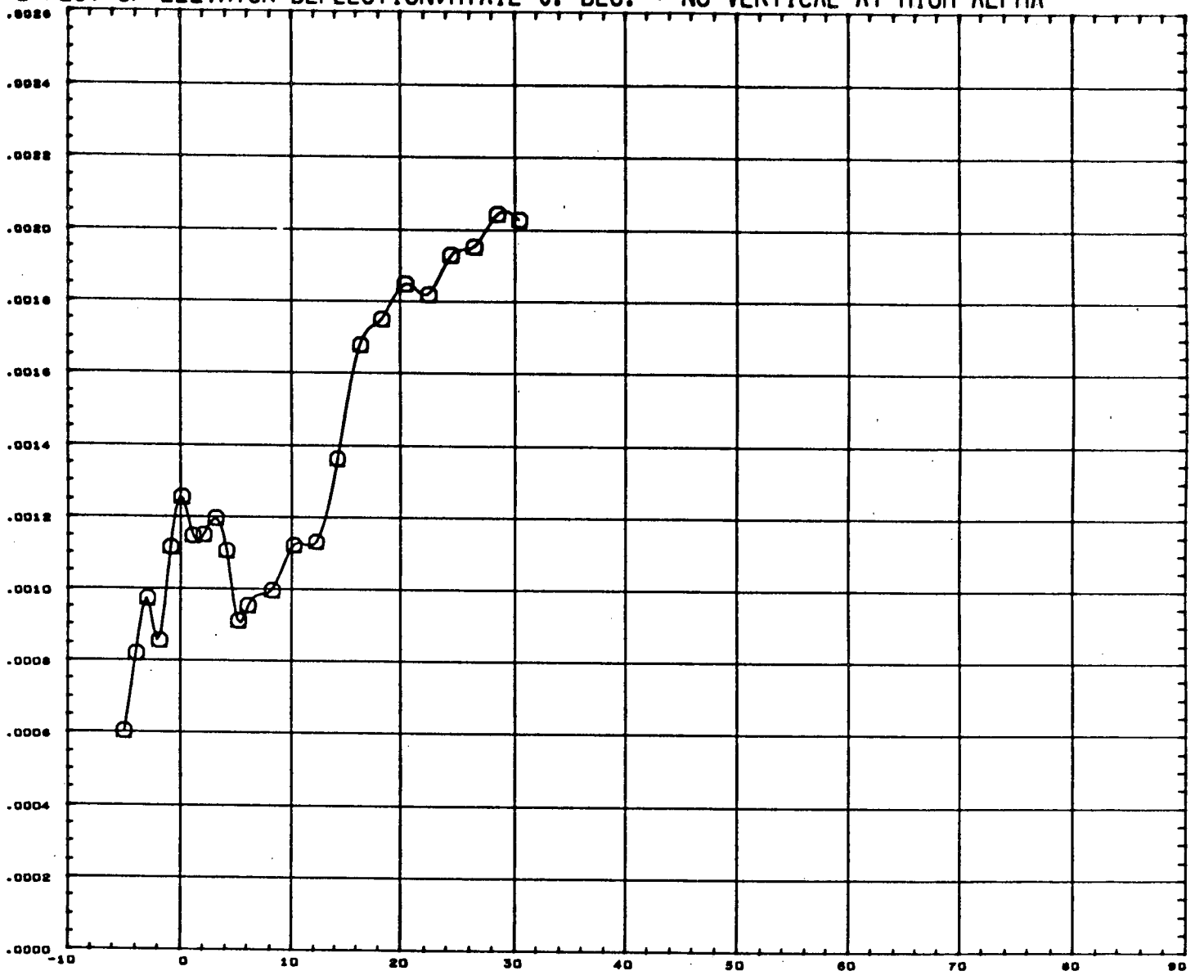


DATA SET SYMBOL		CONFIGURATION DESCRIPTION	BETA	HTAIL	ELEVTR
(GCX031)	○	GAC HST-020 TBC H-32 BOOSTER B6W4H4V3	0.000	0.000	0.000
(RCX041)	△	GAC HST-020 TBC H-32 BOOSTER B6W4H4	0.000	0.000	-15.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4340	PERCNT

EFFECT OF ELEVATOR DEFLECTION.HTAIL=0. DEG. - NO VERTICAL AT HIGH ALPHA



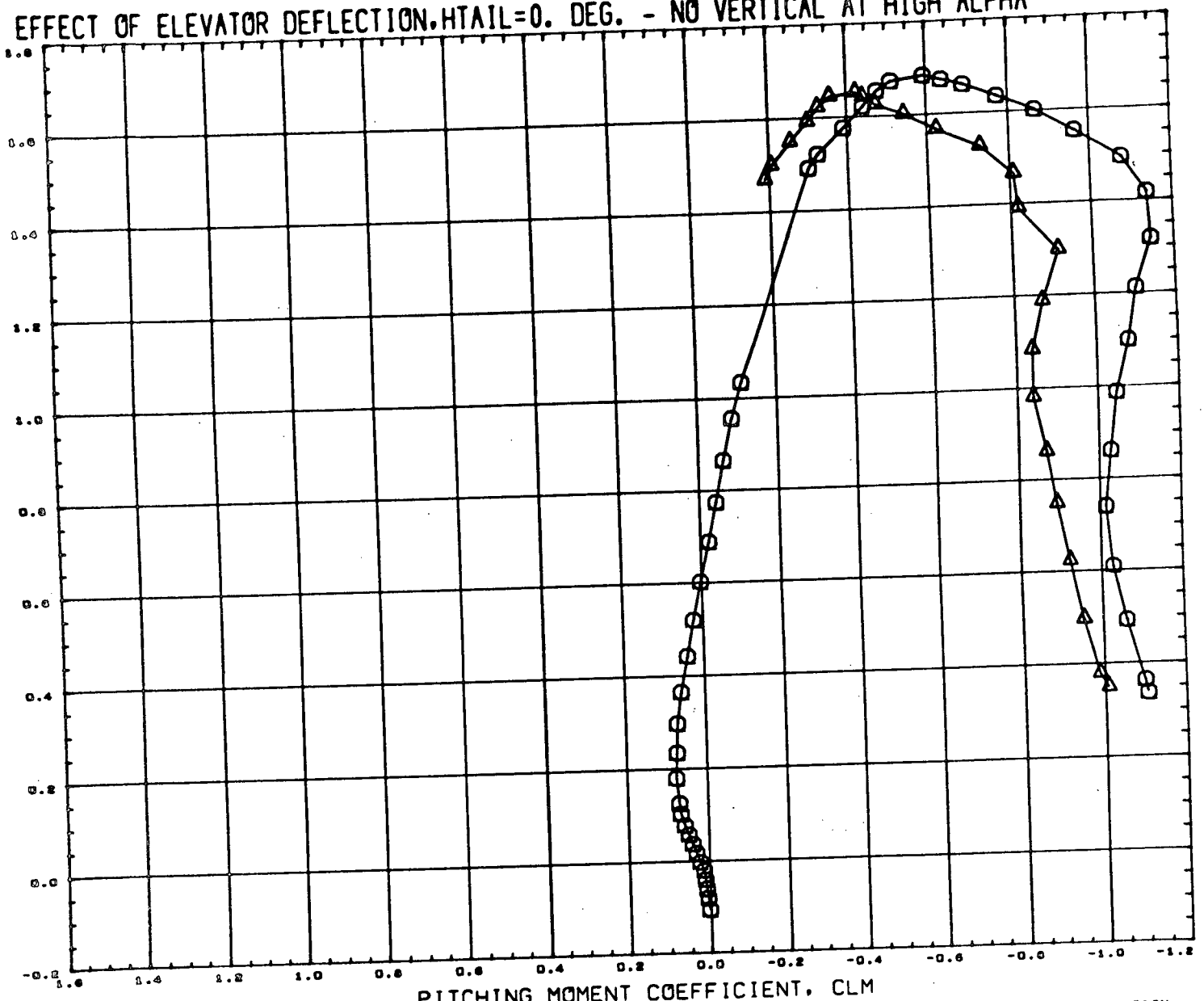
SYMBOL	MACH	PARAMETRIC VALUES			
O	0.120	BETA	0.000	HTAIL	0.000
		ELEVTR	0.000		

DATA HIST. CODE MVT*EV

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4660	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5070	INCHES
SCALE	0.4346	PERCNT

EFFECT OF ELEVATOR DEFLECTION, HTAIL=0. DEG. - NO VERTICAL AT HIGH ALPHA



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(GCX031)		GAC MST-020 TBC H-32 BOOSTER B6W4H4V3
(GCX041)		GAC MST-020 TBC H-32 BOOSTER B6W4H4

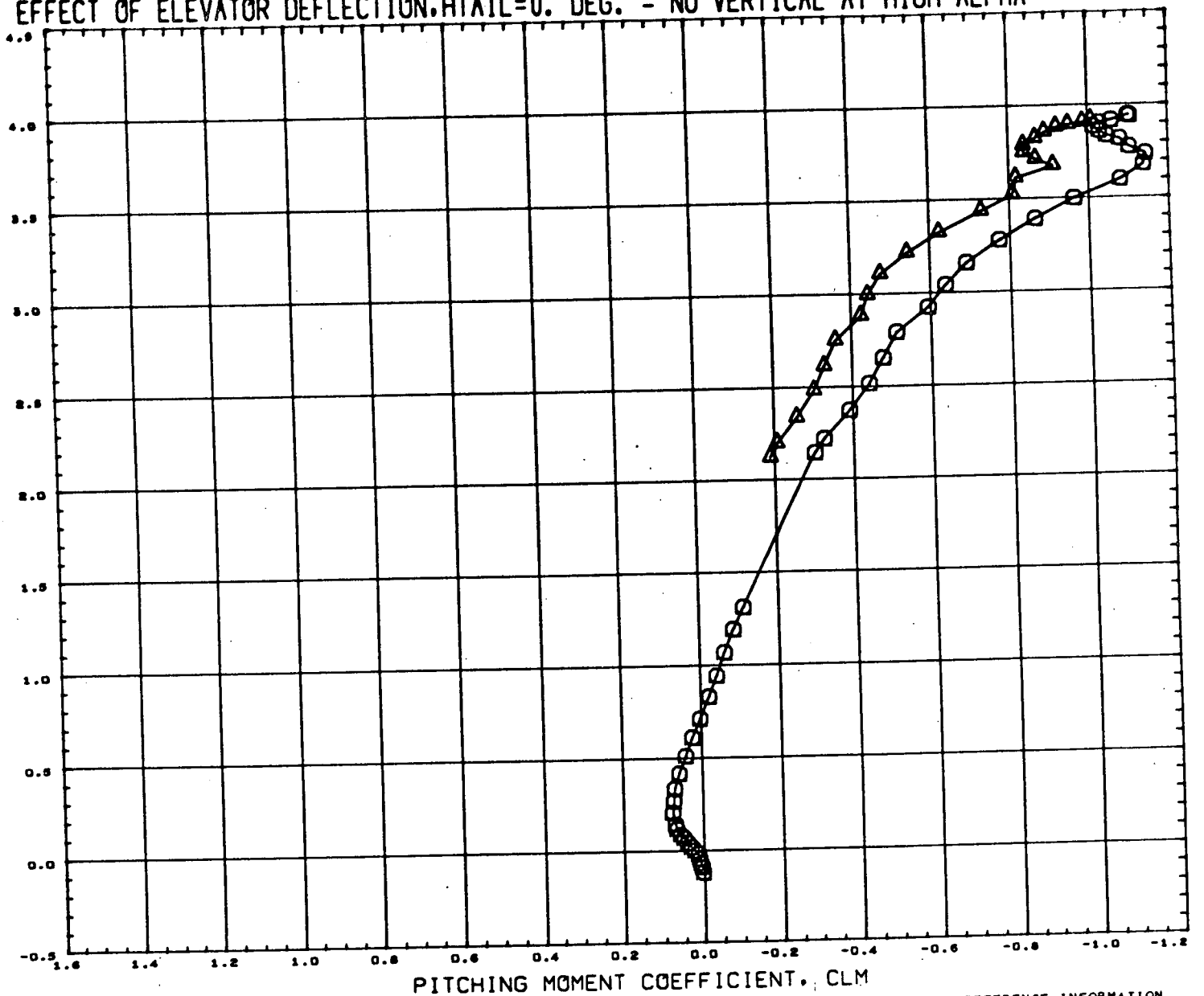
BETA	HTAIL	ELEVTR
0.000	0.000	0.000
0.000	0.000	-15.000

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

MACH 0.120

EFFECT OF ELEVATOR DEFLECTION.HTAIL=0. DEG. - NO VERTICAL AT HIGH ALPHA



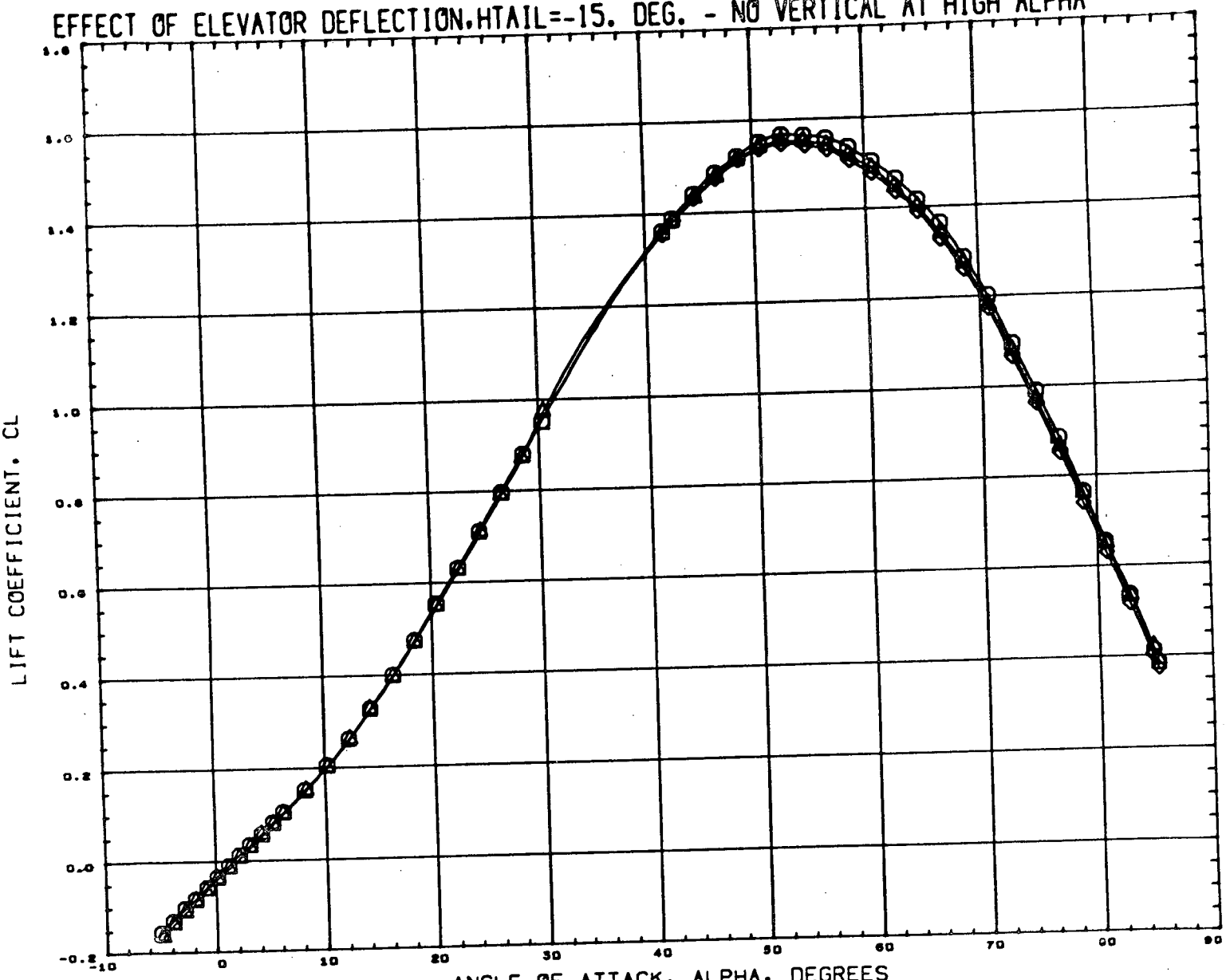
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	HTAIL	ELEVTR
(GCX031)		GAC HST-020 TBC H-32 BOOSTER B8W4H4V3	0.000	0.000	0.000
(RCX041)		GAC HST-020 TBC H-32 BOOSTER B6W4H4	0.000	0.000	-15.000

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

MACH 0.120

EFFECT OF ELEVATOR DEFLECTION, HTAIL=-15. DEG. - NO VERTICAL AT HIGH ALPHA



DATA SET SYMBOL		CONFIGURATION DESCRIPTION
(GCX061)	○	GAC HST-020 TBC H-32 BOOSTER B8W4H4V3
(GCX071)	△	GAC HST-020 TBC H-32 BOOSTER B6W4H4V3
(RCX061)	◇	GAC HST-020 TBC H-32 BOOSTER B6W4H4

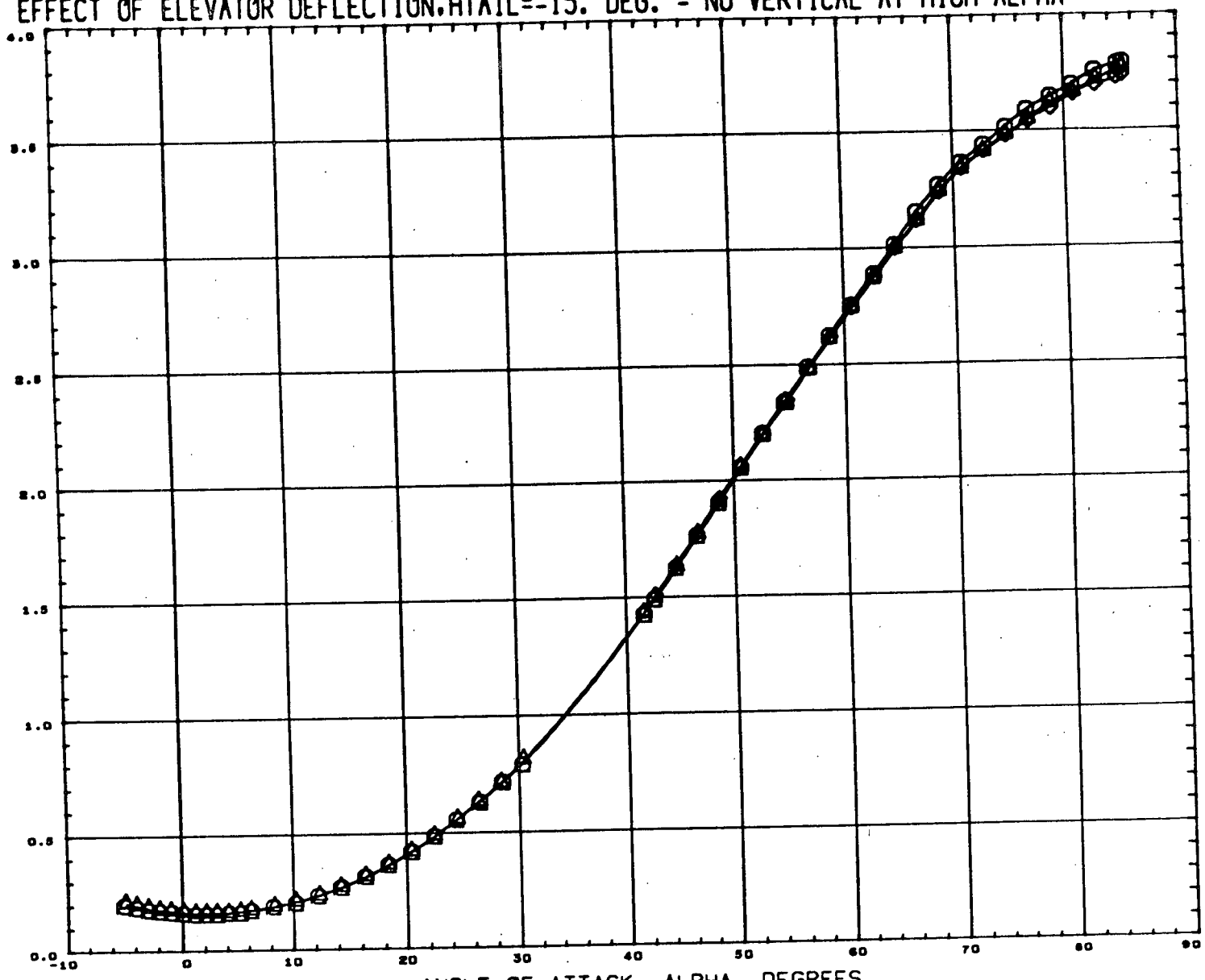
BETA	HTAIL	ELEVTR
0.000	-15.000	0.000
0.000	-15.000	-15.000
0.000	-15.000	-30.000

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5670	INCHES
SCALE	0.4346	PERCNT

MACH 0.120

EFFECT OF ELEVATOR DEFLECTION.HTAIL=-15. DEG. - NO VERTICAL AT HIGH ALPHA



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(GCX081)	○	GAC MST-020 TBC H-32 BOOSTER B8W4H4V3
(GCX071)	☒	GAC MST-020 TBC H-32 BOOSTER B8W4H4V3
(RCX061)	◇	GAC MST-020 TBC H-32 BOOSTER B6W4H4

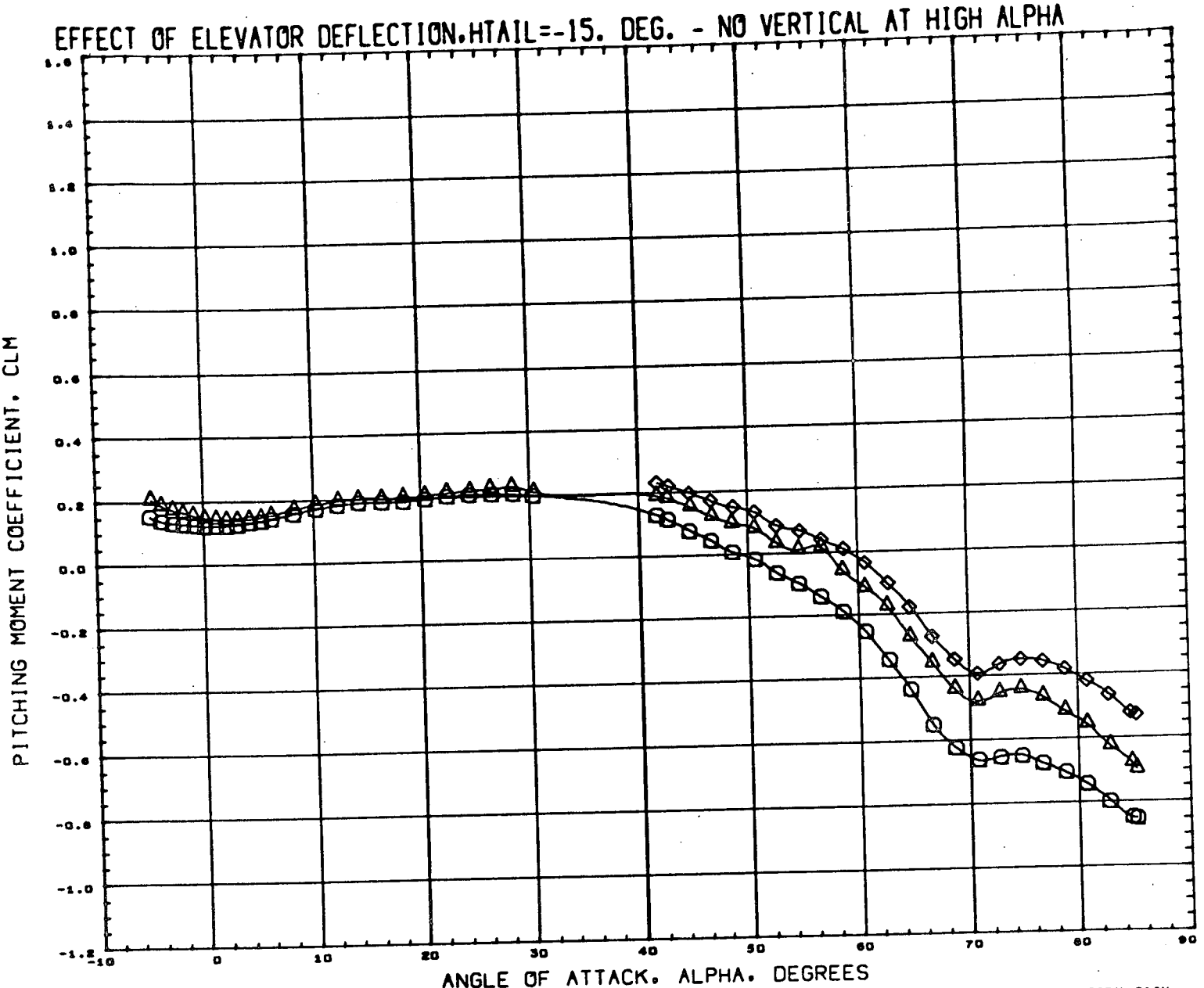
BETA	HTAIL	ELEVTR
0.000	-15.000	0.000
0.000	-15.000	-15.000
0.000	-15.000	-30.000

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4340	PERCNT

MACH 0.120

EFFECT OF ELEVATOR DEFLECTION.HTAIL=-15. DEG. - NO VERTICAL AT HIGH ALPHA



DATA SET SYMBOL		CONFIGURATION DESCRIPTION
(GCX061)	○	GAC HST-020 TBC H-32 BOOSTER B8W4H4V3
(GCX071)	△	GAC HST-020 TBC H-32 BOOSTER B8W4H4V3
(RCX061)	◇	GAC HST-020 TBC H-32 BOOSTER B6W4H4

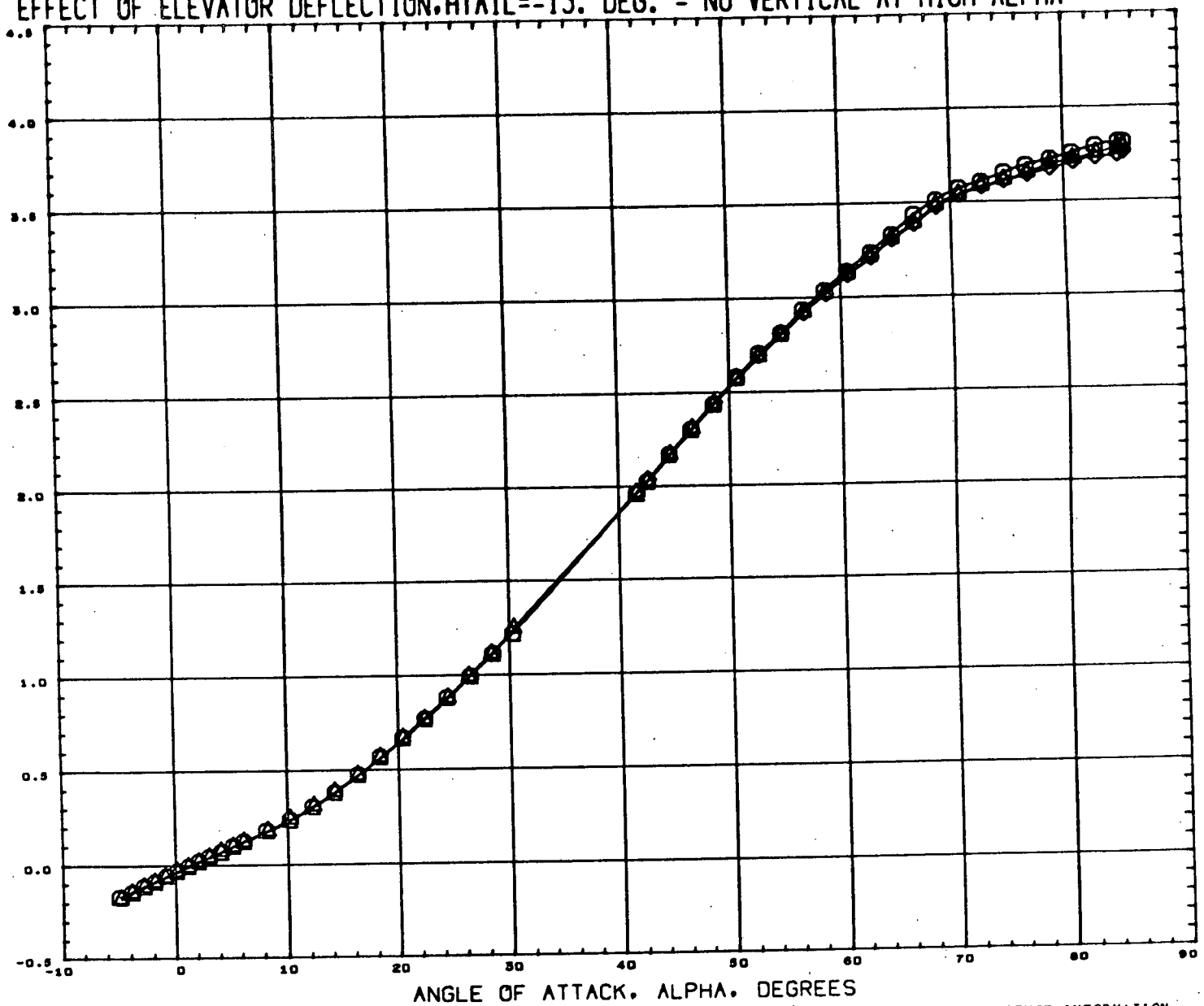
BETA	HTAIL	ELEVTR
0.000	-15.000	0.000
0.000	-15.000	-15.000
0.000	-15.000	-30.000

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4660	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.3670	INCHES
SCALE	0.4348	PERCNT

MACH 0.120

EFFECT OF ELEVATOR DEFLECTION.HTAIL=-15. DEG. - NO VERTICAL AT HIGH ALPHA



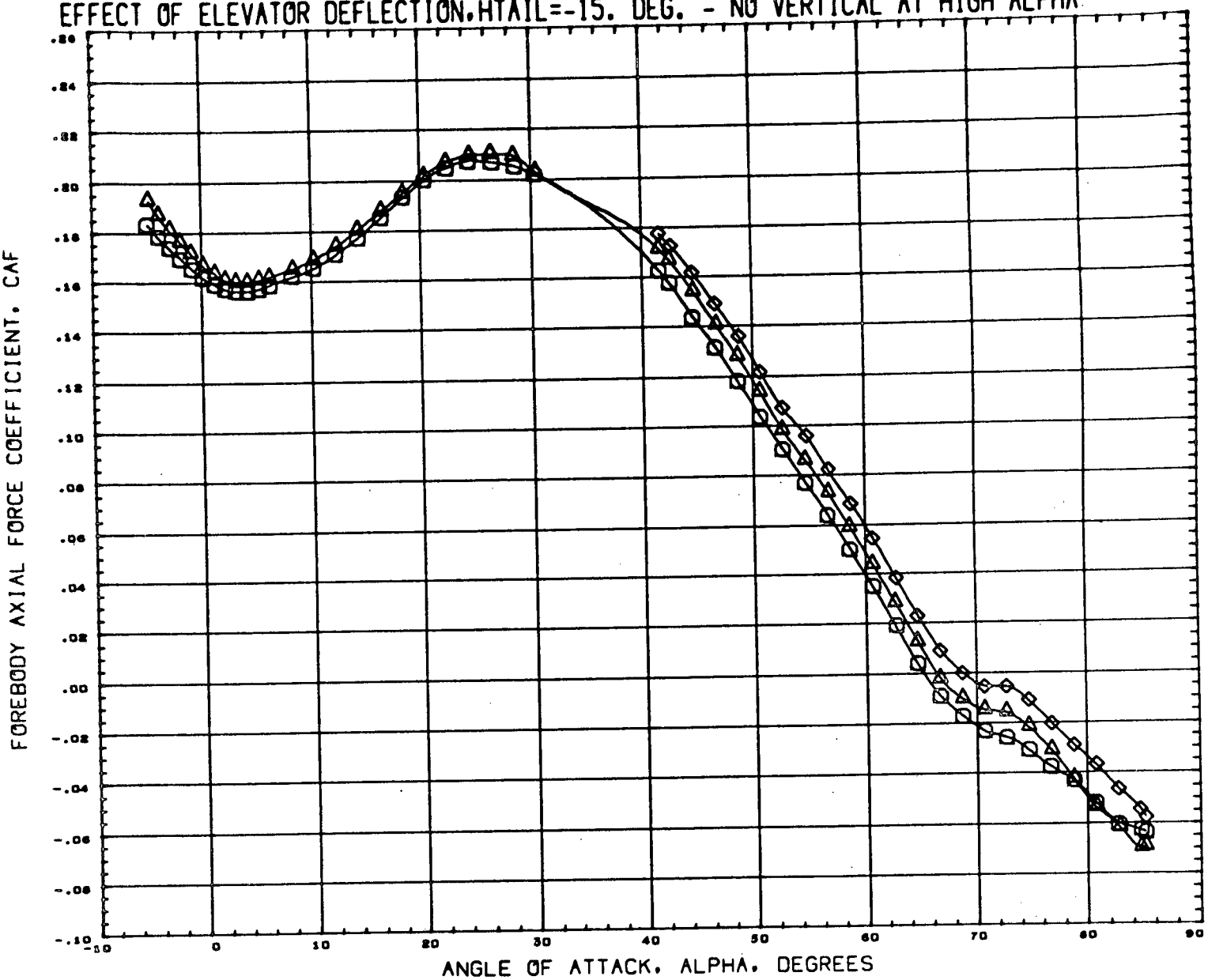
DATA SET SYMBOL		CONFIGURATION DESCRIPTION	BETA	HTAIL	ELEVTR
(GCX061)	○	GAC HST-020 TBC H-32 BOOSTER B8W4H4V3	0.000	-15.000	0.000
(GCX071)	☒	GAC HST-020 TBC H-32 BOOSTER B8W4H4V3	0.000	-15.000	-15.000
(RCX061)	◇	GAC HST-020 TBC H-32 BOOSTER B6W4H4	0.000	-15.000	-30.000

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

MACH 0.120

EFFECT OF ELEVATOR DEFLECTION, HTAIL=-15. DEG. - NO VERTICAL AT HIGH ALPHA



DATA SET SYMBOL		CONFIGURATION DESCRIPTION
(GCX081)	○	GAC MST-020 TBC H-32 BOOSTER B6W4H4V3
(GCX071)	△	GAC MST-020 TBC H-32 BOOSTER B6W4H4V3
(RCX061)	◇	GAC MST-020 TBC H-32 BOOSTER B6W4H4

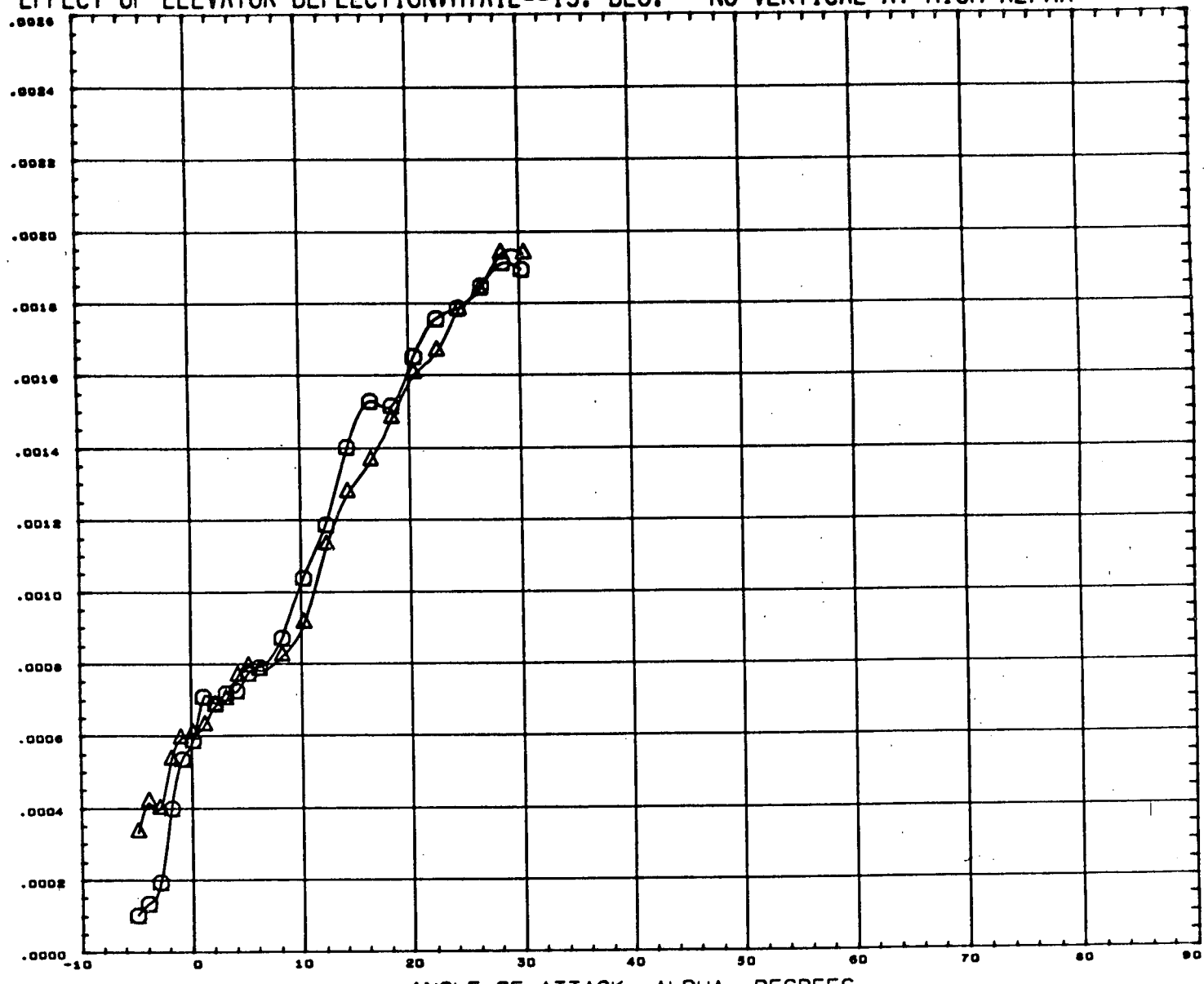
BETA	HTAIL	ELEVTR
0.000	-15.000	0.000
0.000	-15.000	-15.000
0.000	-15.000	-30.000

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4660	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

MACH 0.120

EFFECT OF ELEVATOR DEFLECTION.HTAIL=-15. DEG. - NO VERTICAL AT HIGH ALPHA



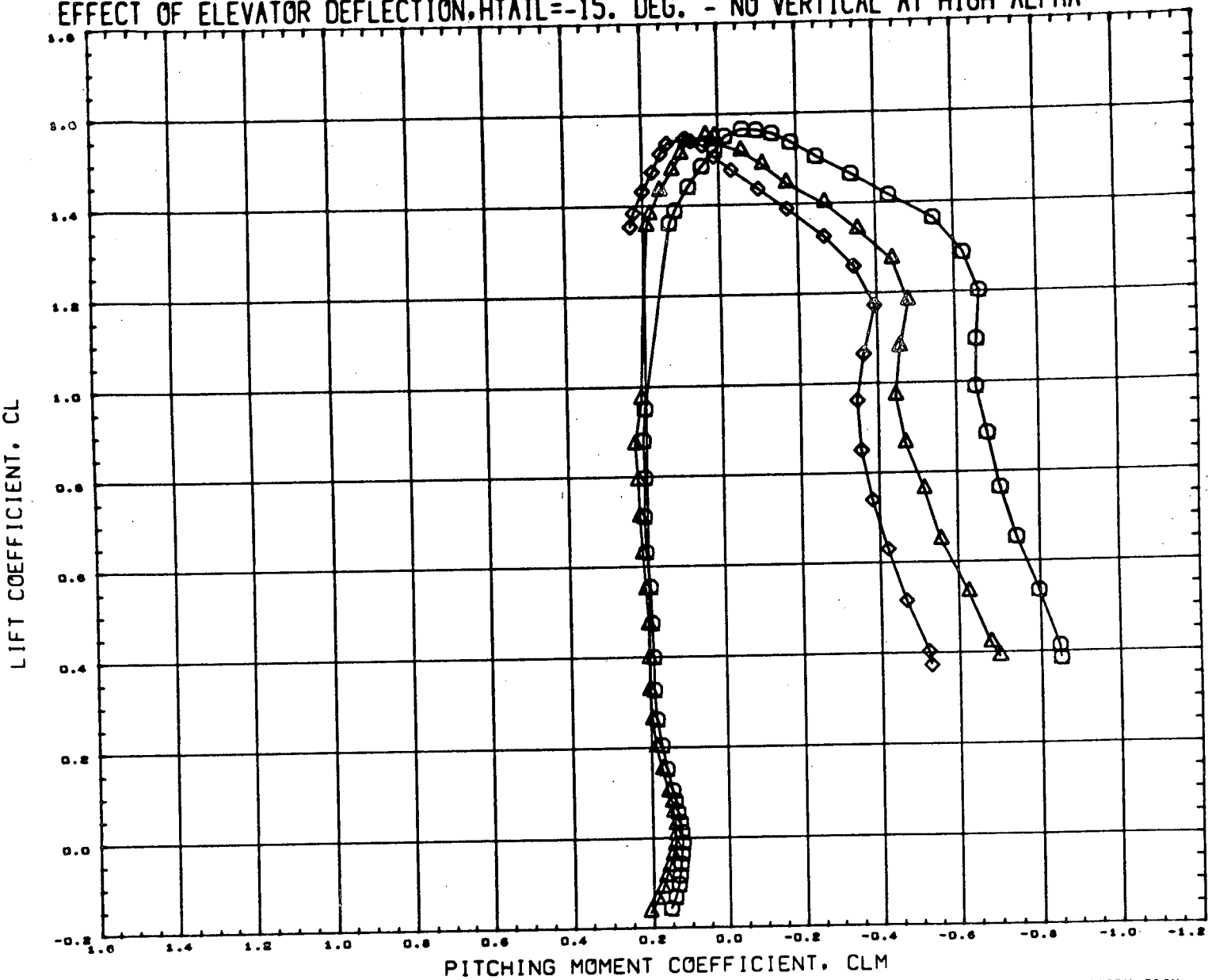
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			BETA	HTAIL	ELEVTR
(FCX222)	○	GAC HST-020	TBC H-32 BOOSTER	B8W4H4V3	0.000	-15.000	0.000
(FCX332)	△	GAC HST-020	TBC H-32 BOOSTER	B8W4H4V3	0.000	-15.000	-15.000

MACH 0.120

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4346	PERCNT

EFFECT OF ELEVATOR DEFLECTION, HTAIL=-15. DEG. - NO VERTICAL AT HIGH ALPHA



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(GCX061)	○	GAC HST-020 TBC H-32 BOOSTER B8W4H4V3
(GCX071)	△	GAC HST-020 TBC H-32 BOOSTER B8W4H4V3
(RCX061)	◇	GAC HST-020 TBC H-32 BOOSTER B6W4H4

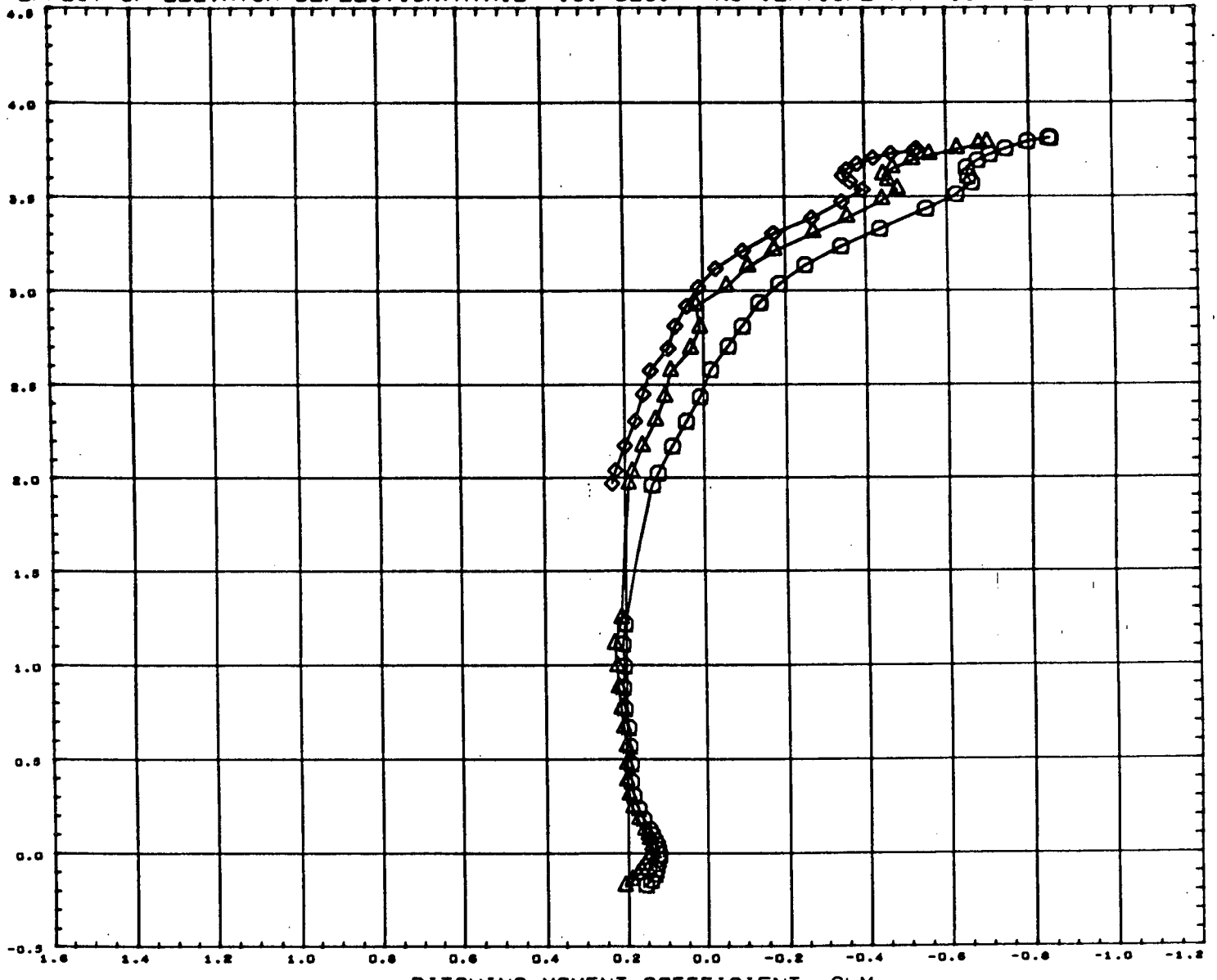
BETA	HTAIL	ELEVTR
0.000	-15.000	0.000
0.000	-15.000	-15.000
0.000	-15.000	-30.000

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

MACH 0.120

EFFECT OF ELEVATOR DEFLECTION, HTAIL=-15. DEG. - NO VERTICAL AT HIGH ALPHA

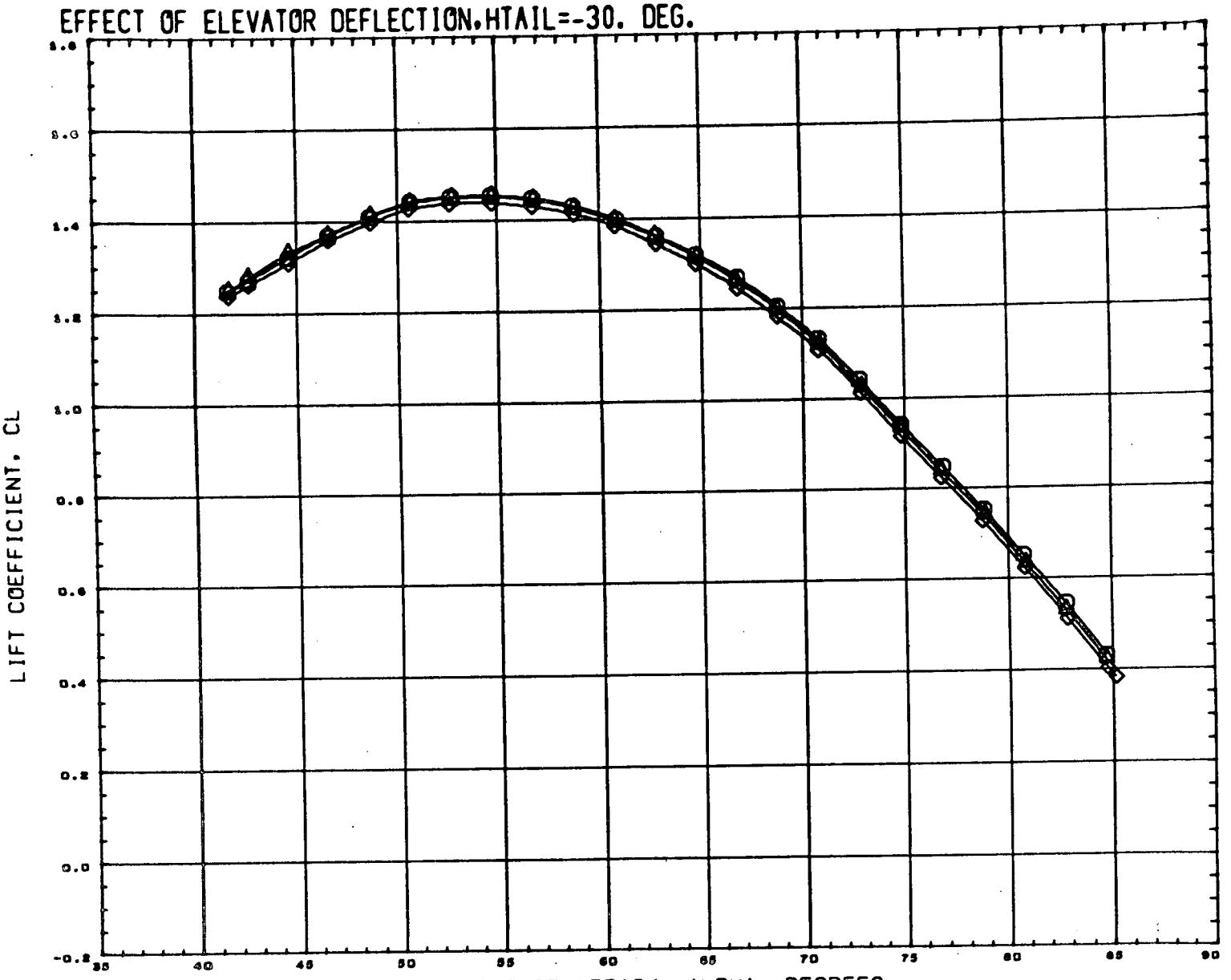


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	HTAIL	ELEVTR
(GCX081)	○	GAC HST-020 TBC H-32 BOOSTER B8W4H4V3	0.000	-15.000	0.000
(GCX071)	△	GAC HST-020 TBC H-32 BOOSTER B8W4H4V3	0.000	-15.000	-15.000
(RCX061)	◇	GAC HST-020 TBC H-32 BOOSTER B6W4H4	0.000	-15.000	-30.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF ELEVATOR DEFLECTION, HTAIL=-30. DEG.



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		
(RCX091)	○	GAC MST-020	TBC H-32 BOOSTER	B6W4H4
(RCX101)	△	GAC MST-020	TBC H-32 BOOSTER	B6W4H4
(RCX111)	◇	GAC MST-020	TBC H-32 BOOSTER	B6W4H4

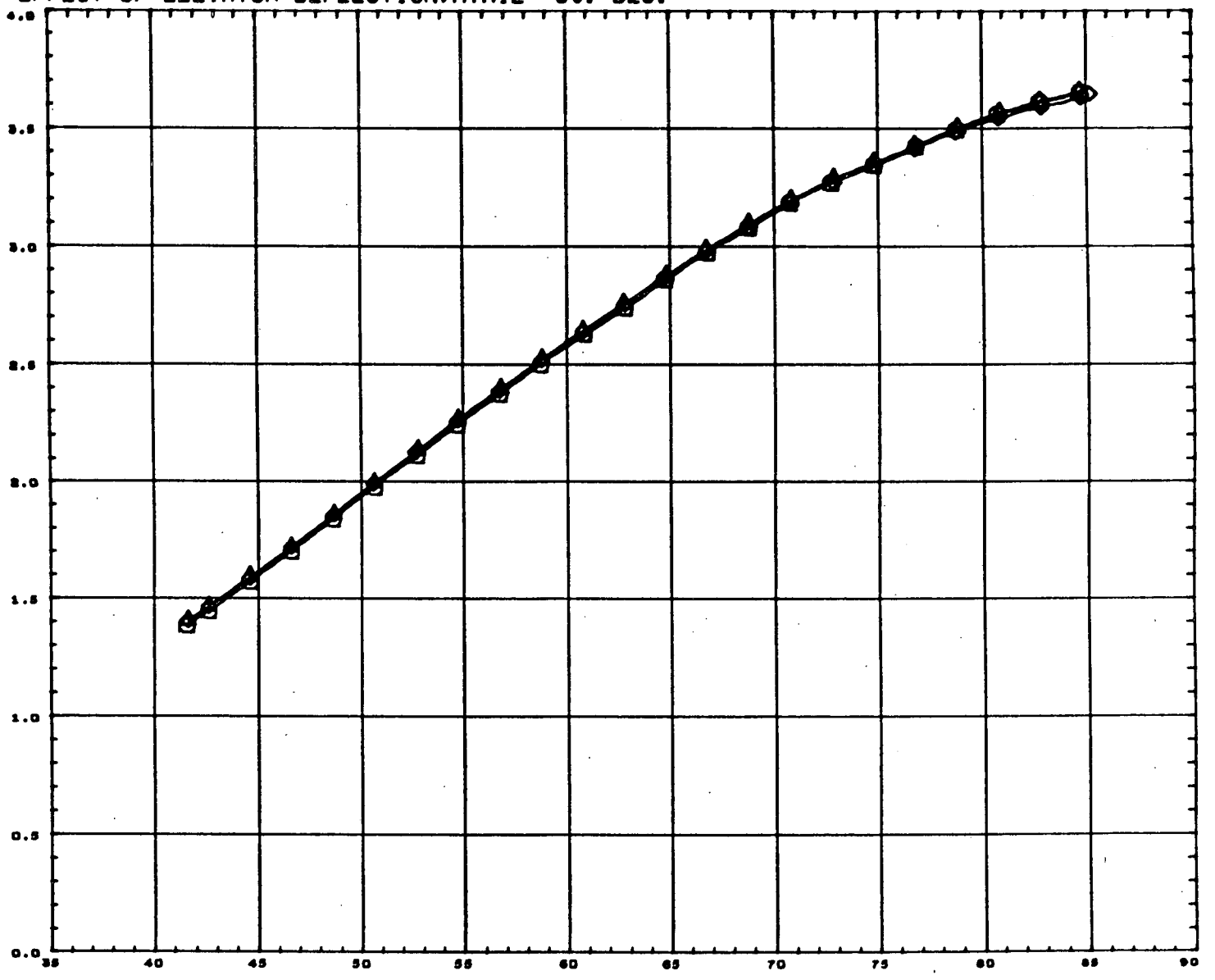
BETA	HTAIL	ELEVTR
0.000	-30.000	0.000
0.000	-30.000	-15.000
0.000	-30.000	-30.000

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4660	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.9870	INCHES
SCALE	0.4340	PERCNT

MACH 0.120

EFFECT OF ELEVATOR DEFLECTION.HTAIL=-30. DEG.

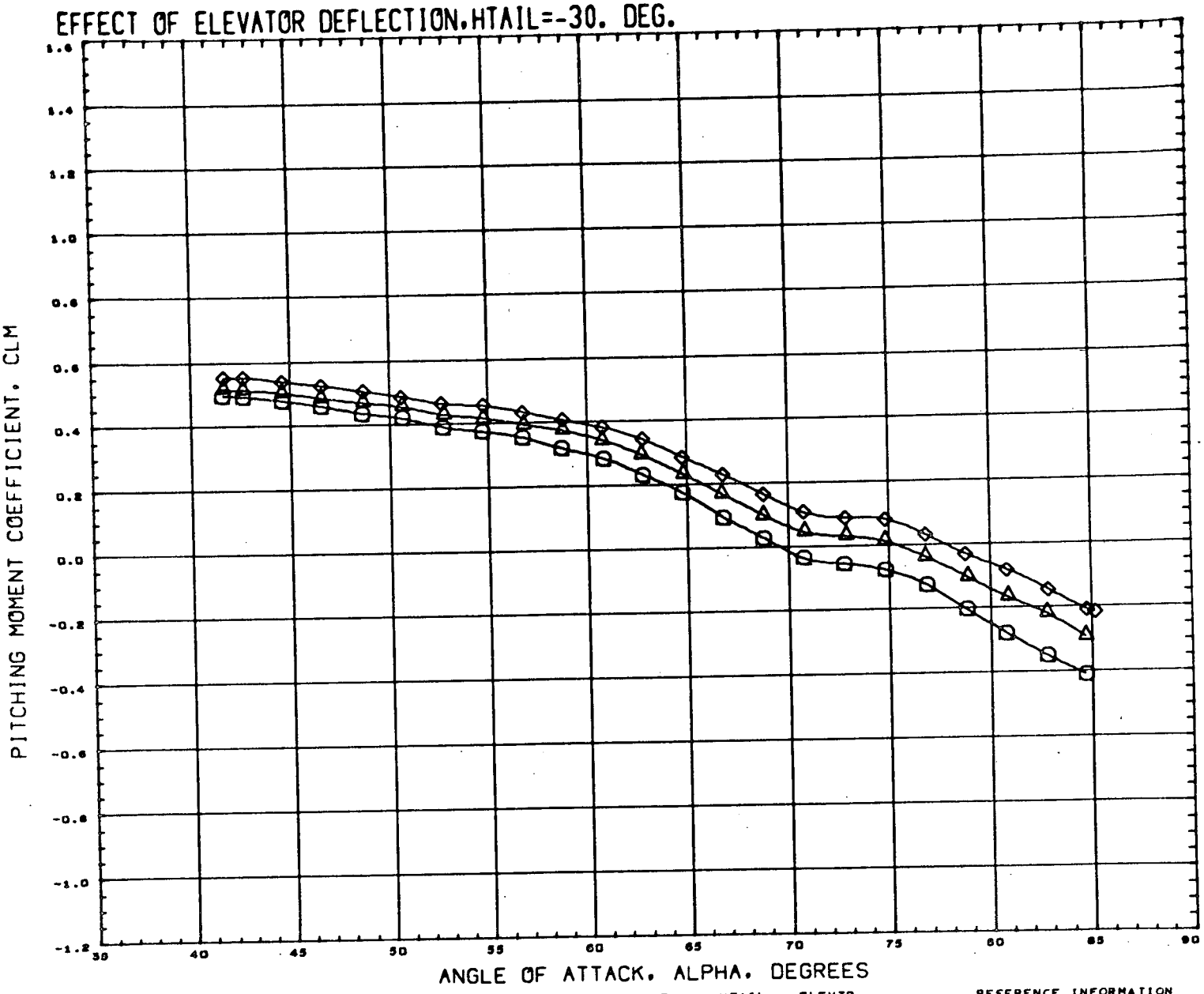


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			BETA	HTAIL	ELEVTR
(RCX091)	○	GAC HST-020	TBC H-32 BOOSTER	B6W4H4	0.000	-30.000	0.000
(RCX101)	⊠	GAC HST-020	TBC H-32 BOOSTER	B6W4H4	0.000	-30.000	-15.000
(RCX111)	◇	GAC HST-020	TBC H-32 BOOSTER	B6W4H4	0.000	-30.000	-30.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4340	PERCNT

EFFECT OF ELEVATOR DEFLECTION, HTAIL=-30. DEG.



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		
(RCX091)	○	GAC HST-020	TBC H-32 BOOSTER	B6W4H4
(RCX101)	△	GAC HST-020	TBC H-32 BOOSTER	B6W4H4
(RCX111)	◇	GAC HST-020	TBC H-32 BOOSTER	B6W4H4

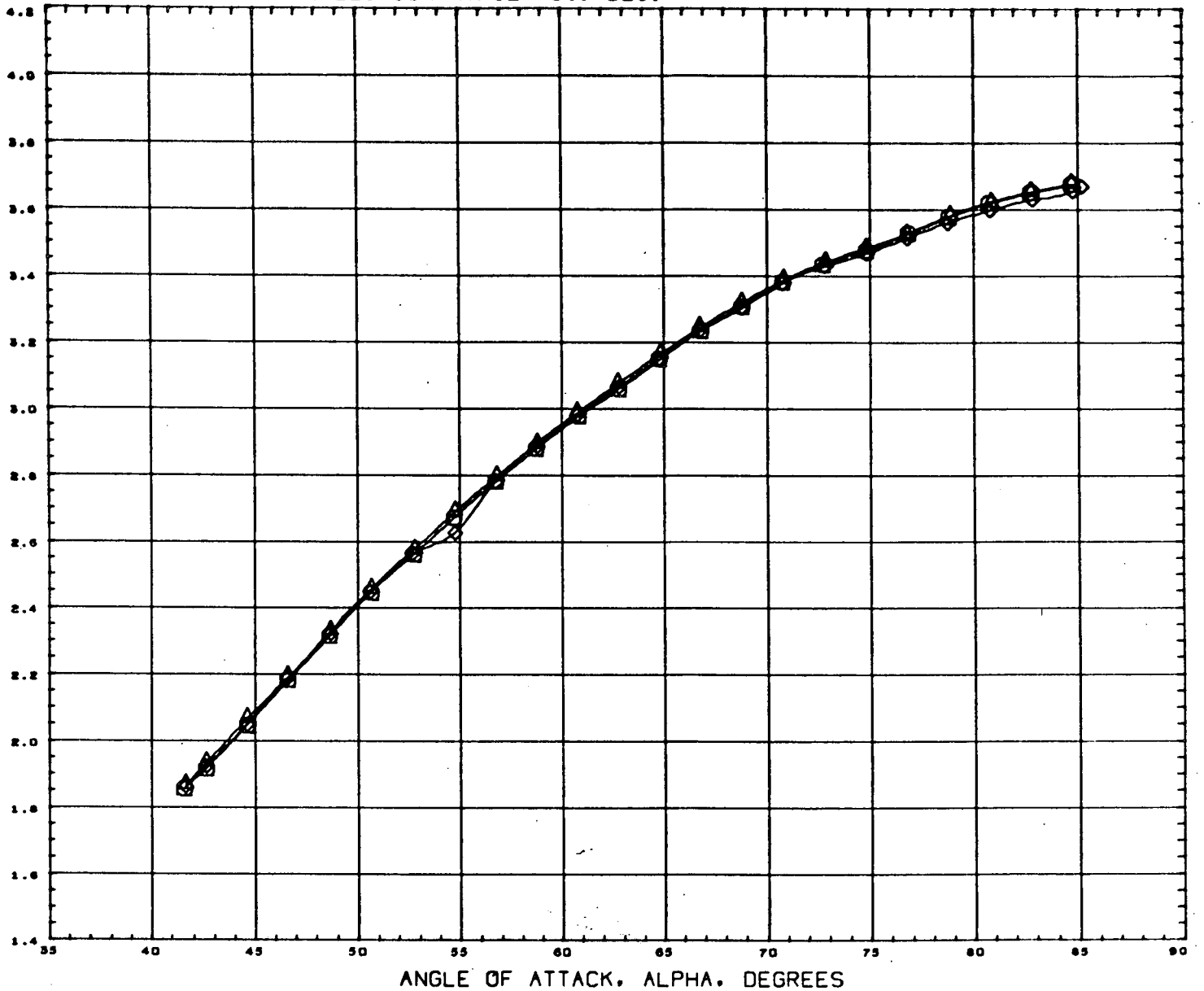
BETA	HTAIL	ELEVTR
0.000	-30.000	0.000
0.000	-30.000	-15.000
0.000	-30.000	-30.000

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4346	PERCNT

MACH 0.120

EFFECT OF ELEVATOR DEFLECTION, HTAIL=-30. DEG.

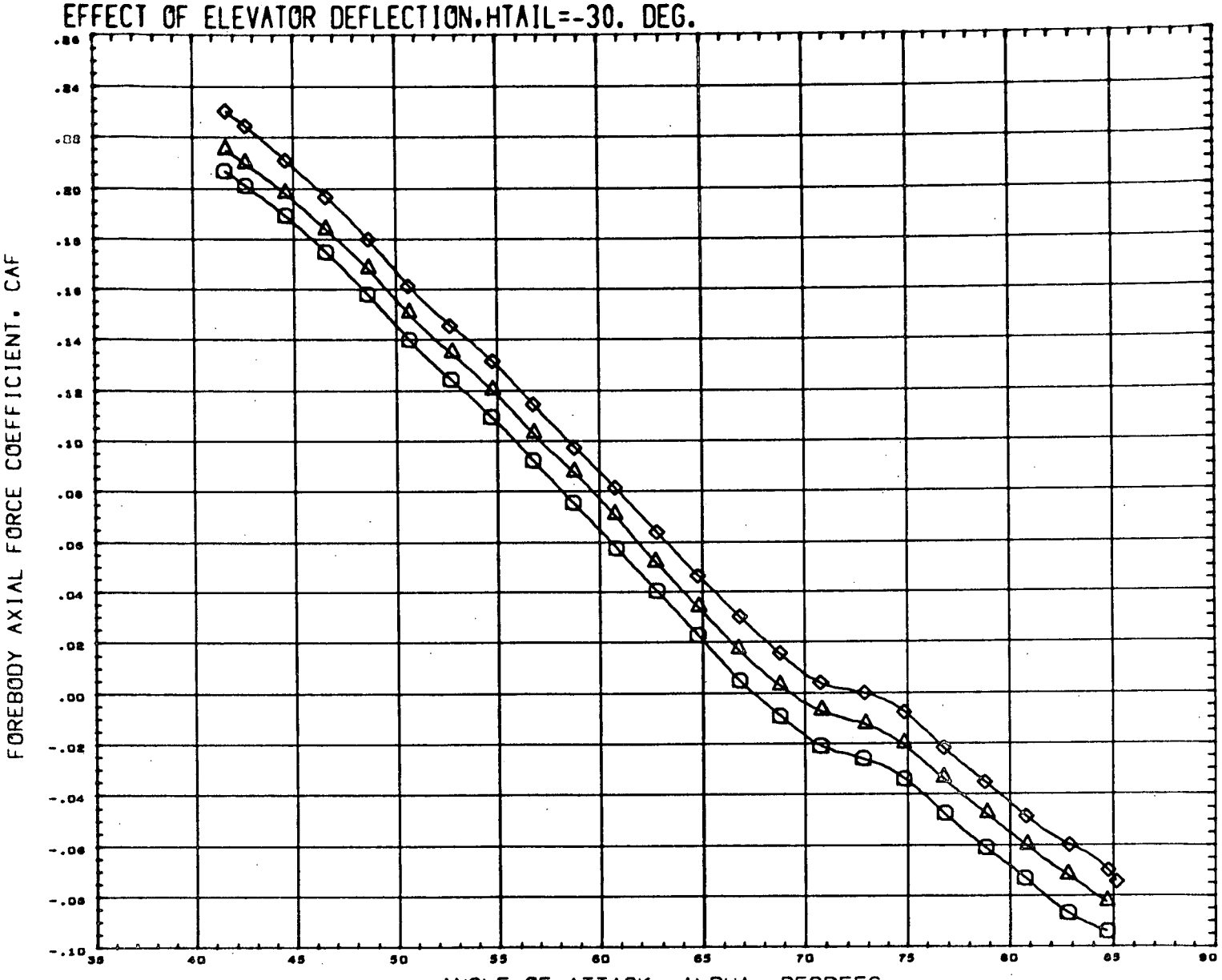


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			BETA	HTAIL	ELEVTR
(RCX091)	○	GAC HST-020	TBC H-32 BOOSTER	B6W4H4	0.000	-30.000	0.000
(RCX101)	△	GAC HST-020	TBC H-32 BOOSTER	B6W4H4	0.000	-30.000	-15.000
(RCX111)	◇	GAC HST-020	TBC H-32 BOOSTER	B6W4H4	0.000	-30.000	-30.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF ELEVATOR DEFLECTION, HTAIL=-30. DEG.

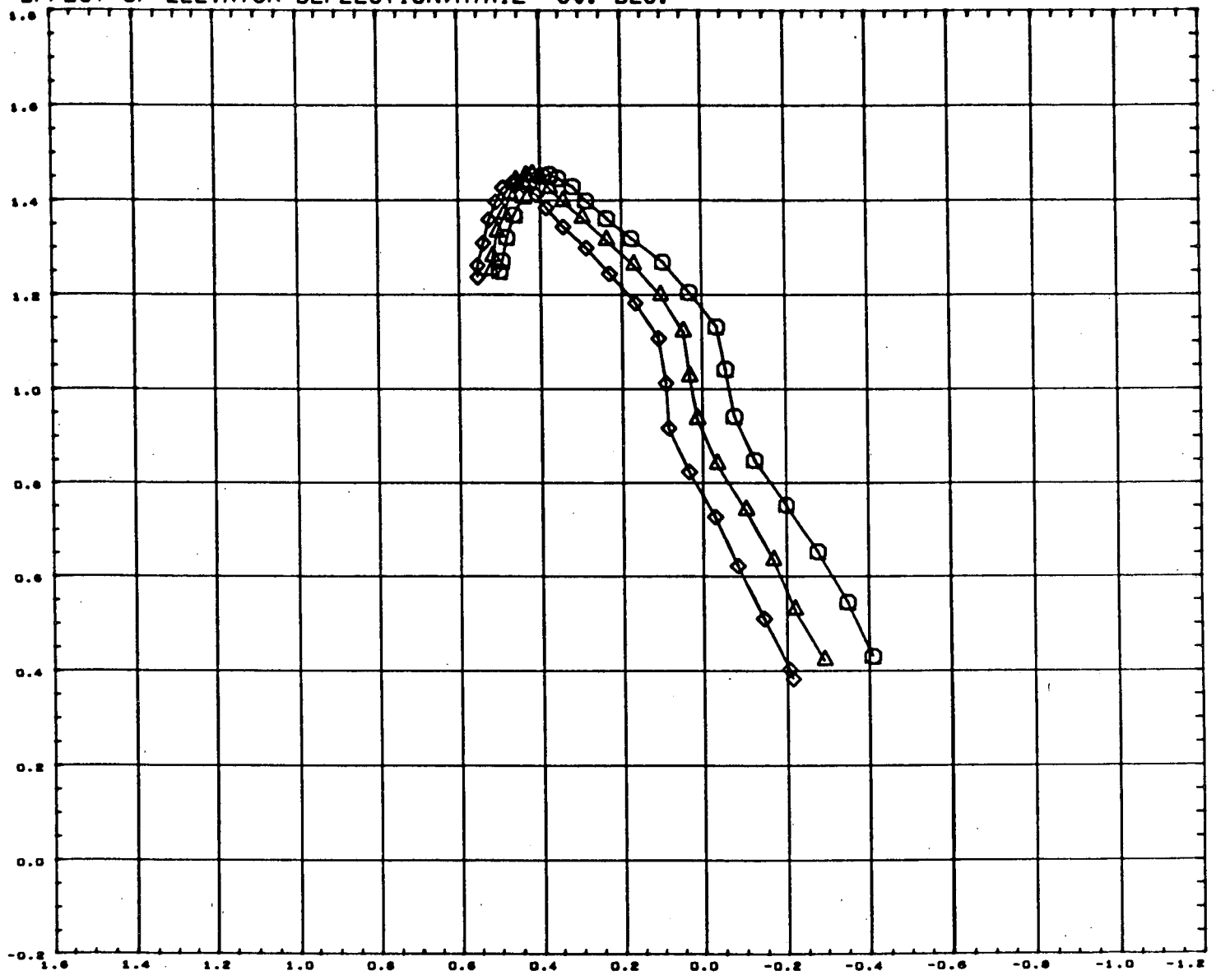


DATA SET SYMBOL		CONFIGURATION DESCRIPTION			BETA	HTAIL	ELEVTR
(RCX091)	○	GAC HST-020	TBC H-32 BOOSTER	B6W4H4	0.000	-30.000	0.000
(RCX101)	△	GAC HST-020	TBC H-32 BOOSTER	B6W4H4	0.000	-30.000	-15.000
(RCX111)	◇	GAC HST-020	TBC H-32 BOOSTER	B6W4H4	0.000	-30.000	-30.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4660	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF ELEVATOR DEFLECTION.HTAIL=-30. DEG.

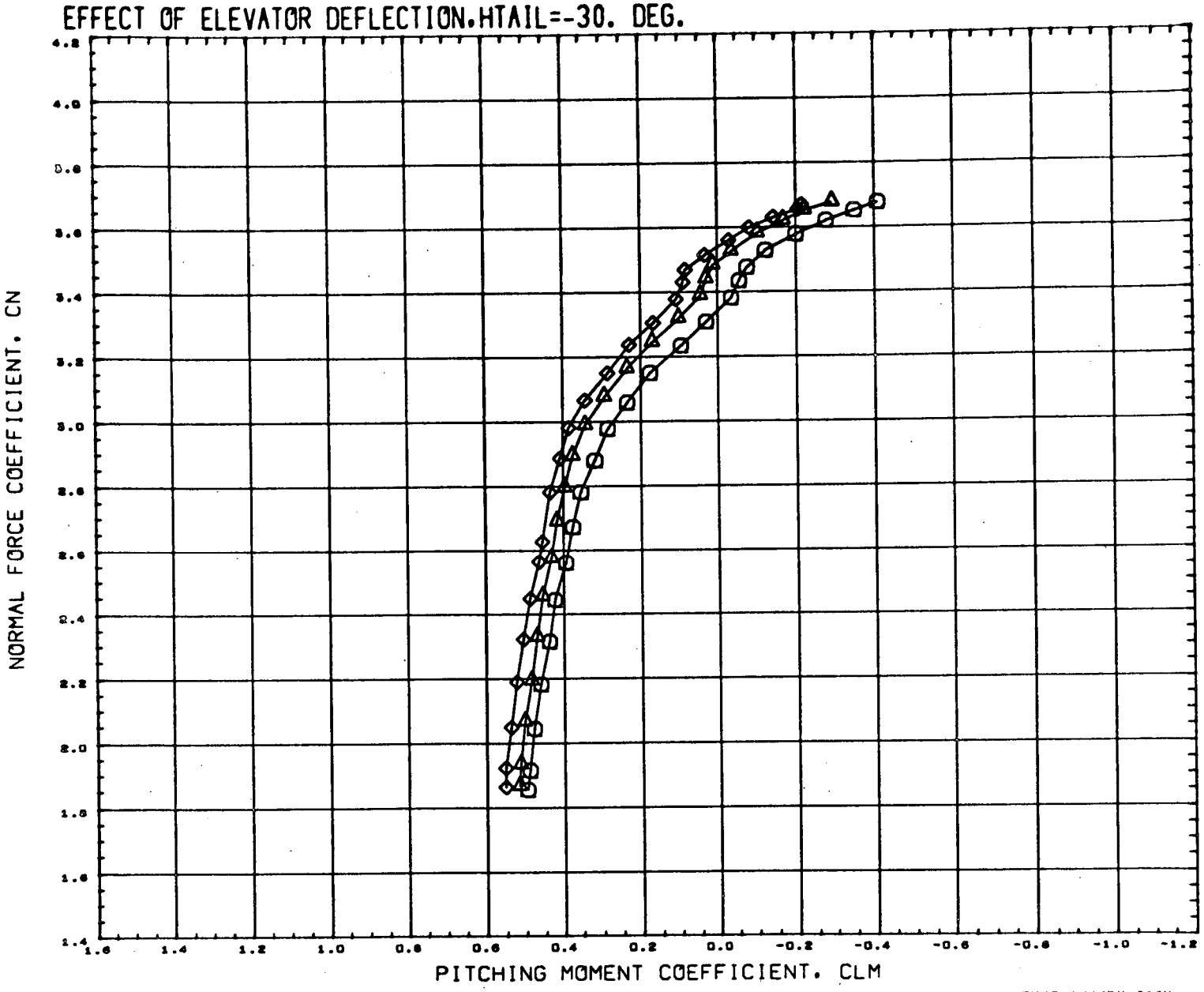


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			BETA	HTAIL	ELEVTR
(RCX091)	○	GAC HST-020	TBC H-32 BOOSTER	B6W4H4	0.000	-30.000	0.000
(RCX101)	△	GAC HST-020	TBC H-32 BOOSTER	B6W4H4	0.000	-30.000	-15.000
(RCX111)	◇	GAC HST-020	TBC H-32 BOOSTER	B6W4H4	0.000	-30.000	-30.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4660	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.3870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF ELEVATOR DEFLECTION.HTAIL=-30. DEG.



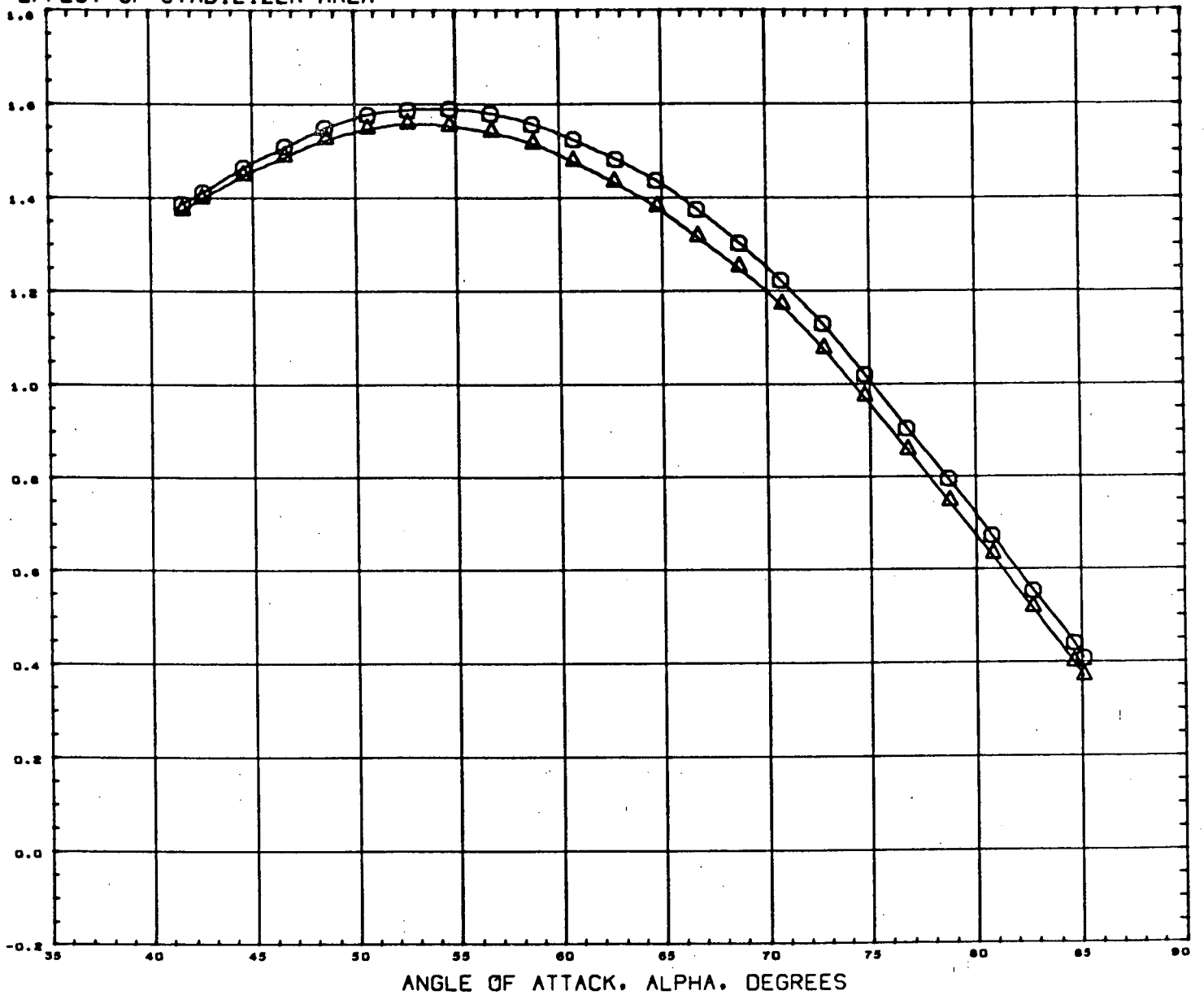
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			BETA	HTAIL	ELEVTR
(RCX091)	○	GAC HST-020	TBC H-32 BOOSTER	B6W4H4	0.000	-30.000	0.000
(RCX101)	△	GAC HST-020	TBC H-32 BOOSTER	B6W4H4	0.000	-30.000	-15.000
(RCX111)	◇	GAC HST-020	TBC H-32 BOOSTER	B6W4H4	0.000	-30.000	-30.000

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

MACH 0.120

EFFECT OF STABILIZER AREA

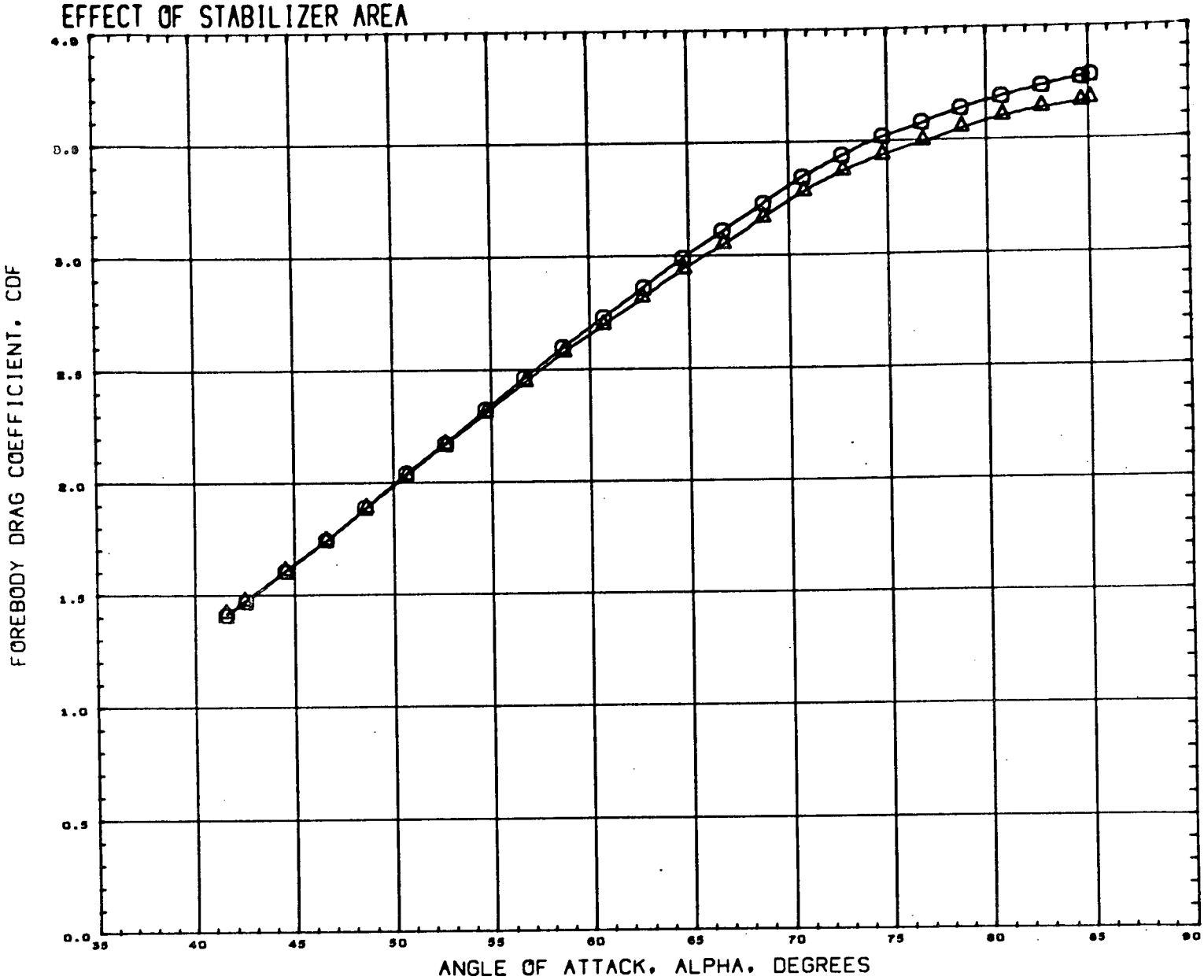


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			BETA	HTAIL	ELEVTR
(RCX131)	○	GAC HST-020	TBC H-32 BOOSTER	B6W5H4	0.000	-15.000	0.000
(RCX311)	△	GAC HST-020	TBC H-32 BOOSTER	B6W5H5	0.000	-15.000	

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4346	PERCNT

EFFECT OF STABILIZER AREA



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		
(RCX131)	○	GAC HST-020	TBC H-32 BOOSTER	B6W5H4
(RCX311)	△	GAC HST-020	TBC H-32 BOOSTER	B6W5H5

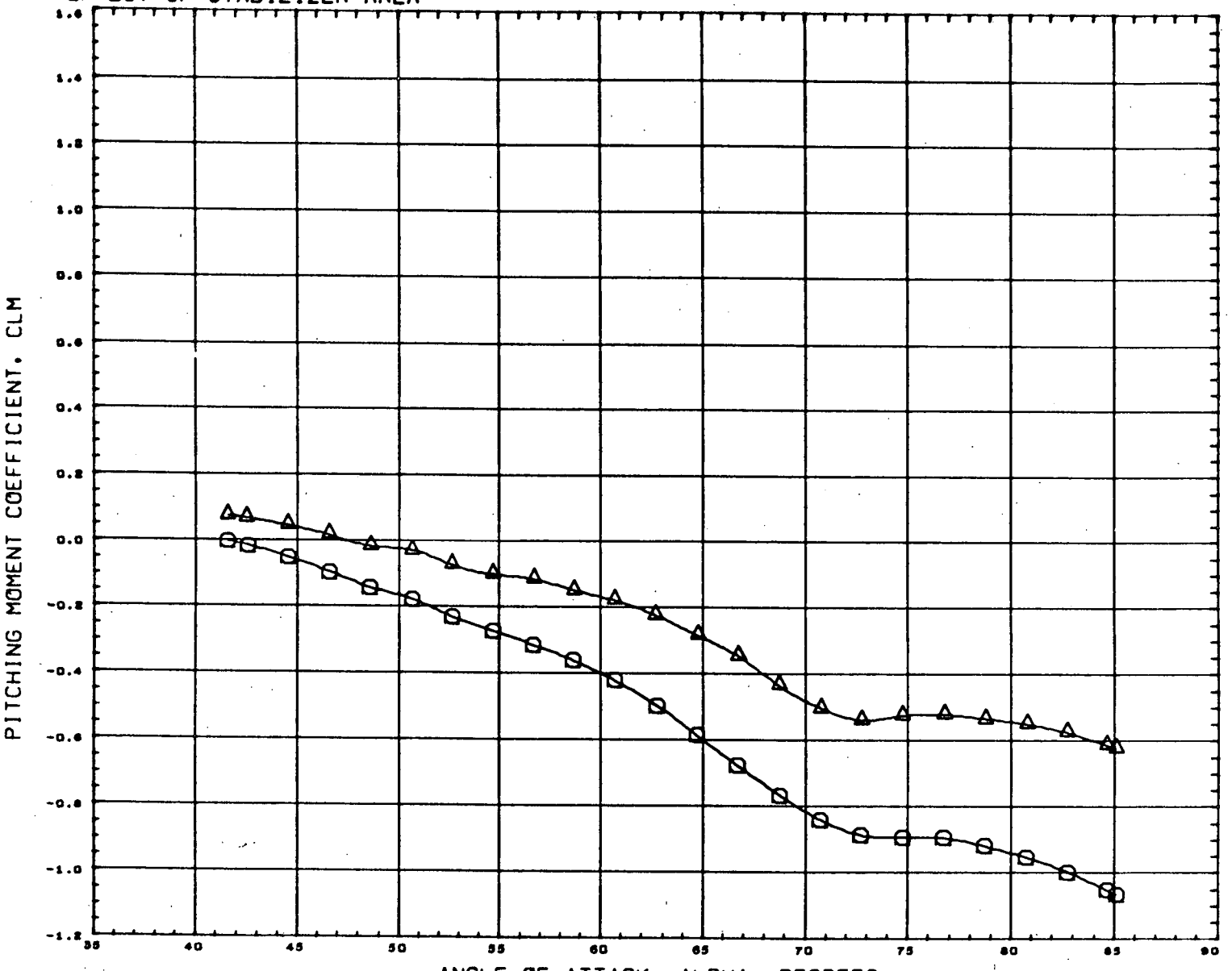
BETA	HTAIL	ELEVTR
0.000	-15.000	0.000
0.000	-15.000	

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.3870	INCHES
SCALE	0.4348	PERCNT

MACH 8.120

EFFECT OF STABILIZER AREA



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		
(RCX131)		GAC HST-020	TBC H-32 BOOSTER	B6W5H4
(RCX311)		GAC HST-020	TBC H-32 BOOSTER	B6W5H5

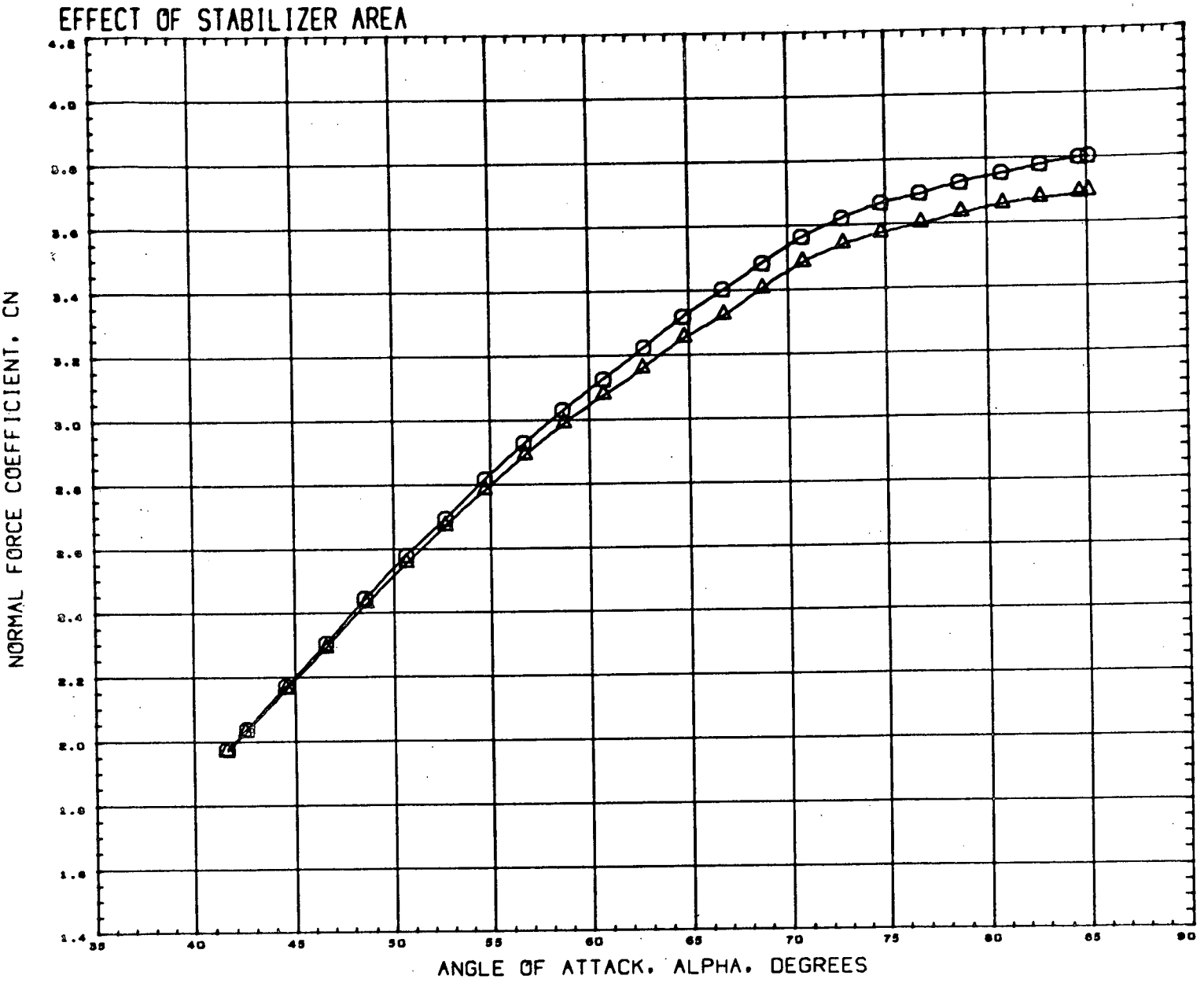
BETA	HTAIL	ELEVTR
0.000	-15.000	0.000
0.000	-15.000	

MACH 0.120

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4660	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5070	INCHES
SCALE	0.4346	PERCNT

EFFECT OF STABILIZER AREA

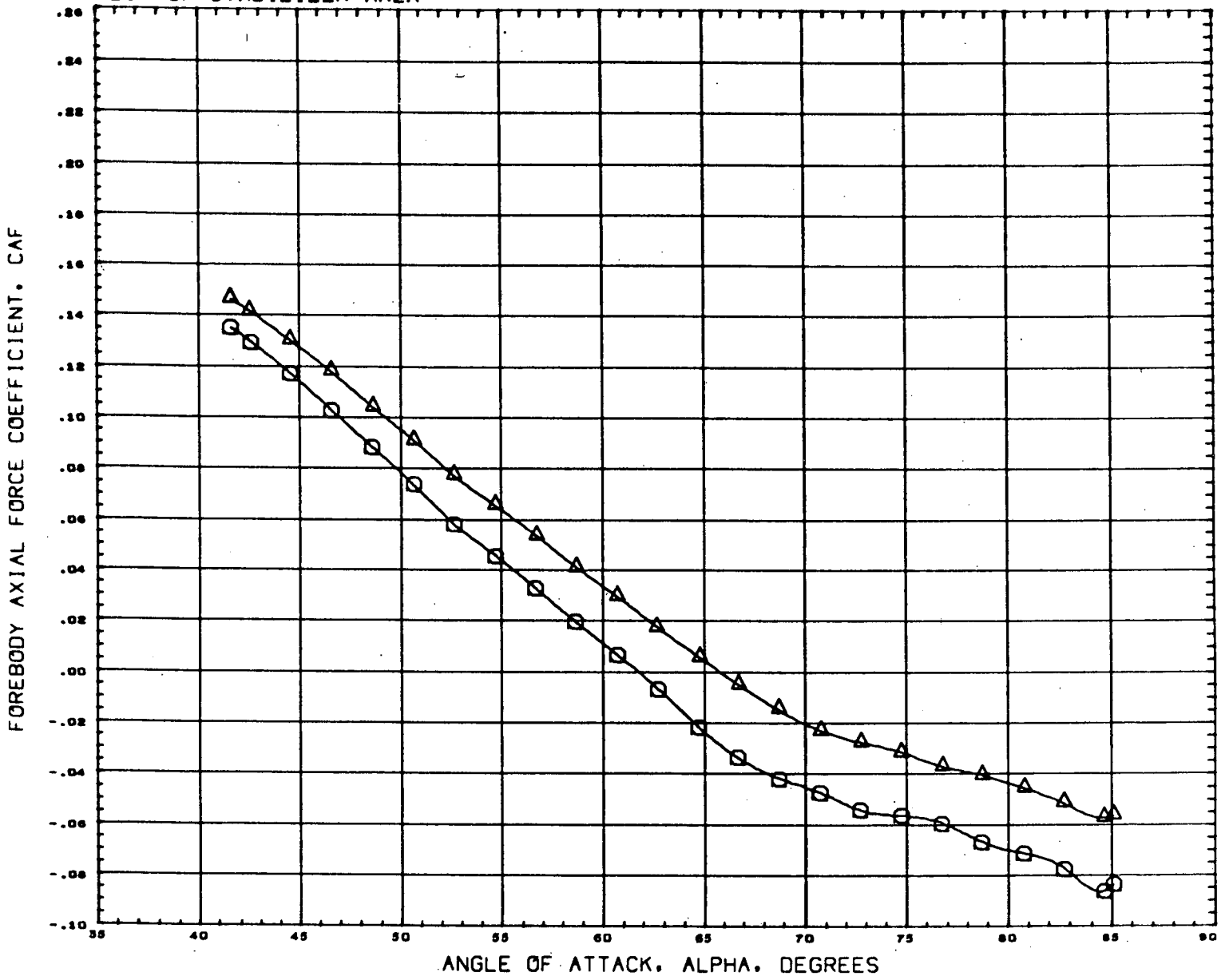


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			BETA	HTAIL	ELEVTR
(RCX131)	○	GAC HST-020	TBC H-32 BOOSTER	B6W5H4	0.000	-15.000	0.000
(RCX311)	△	GAC HST-020	TBC H-32 BOOSTER	B6W5H5	0.000	-15.000	

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5670	INCHES
SCALE	0.4348	PERCNT

EFFECT OF STABILIZER AREA

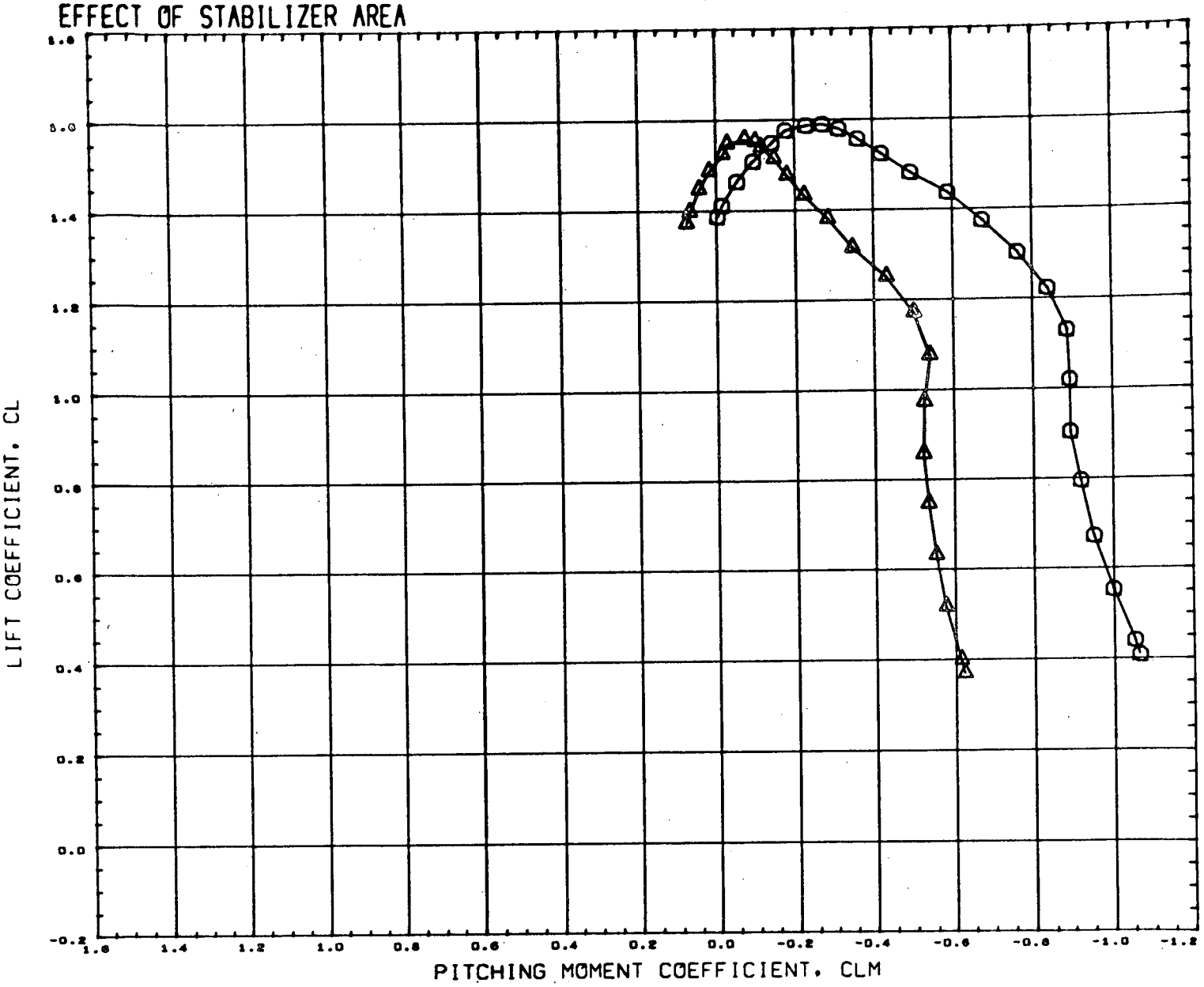


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			BETA	HTAIL	ELEVTR
(RCX131)		GAC HST-020	TBC H-32 BOOSTER	B6W5H4	0.000	-15.000	0.000
(RCX311)		GAC HST-020	TBC H-32 BOOSTER	B6W5H5	0.000	-15.000	

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4340	PERCNT

EFFECT OF STABILIZER AREA

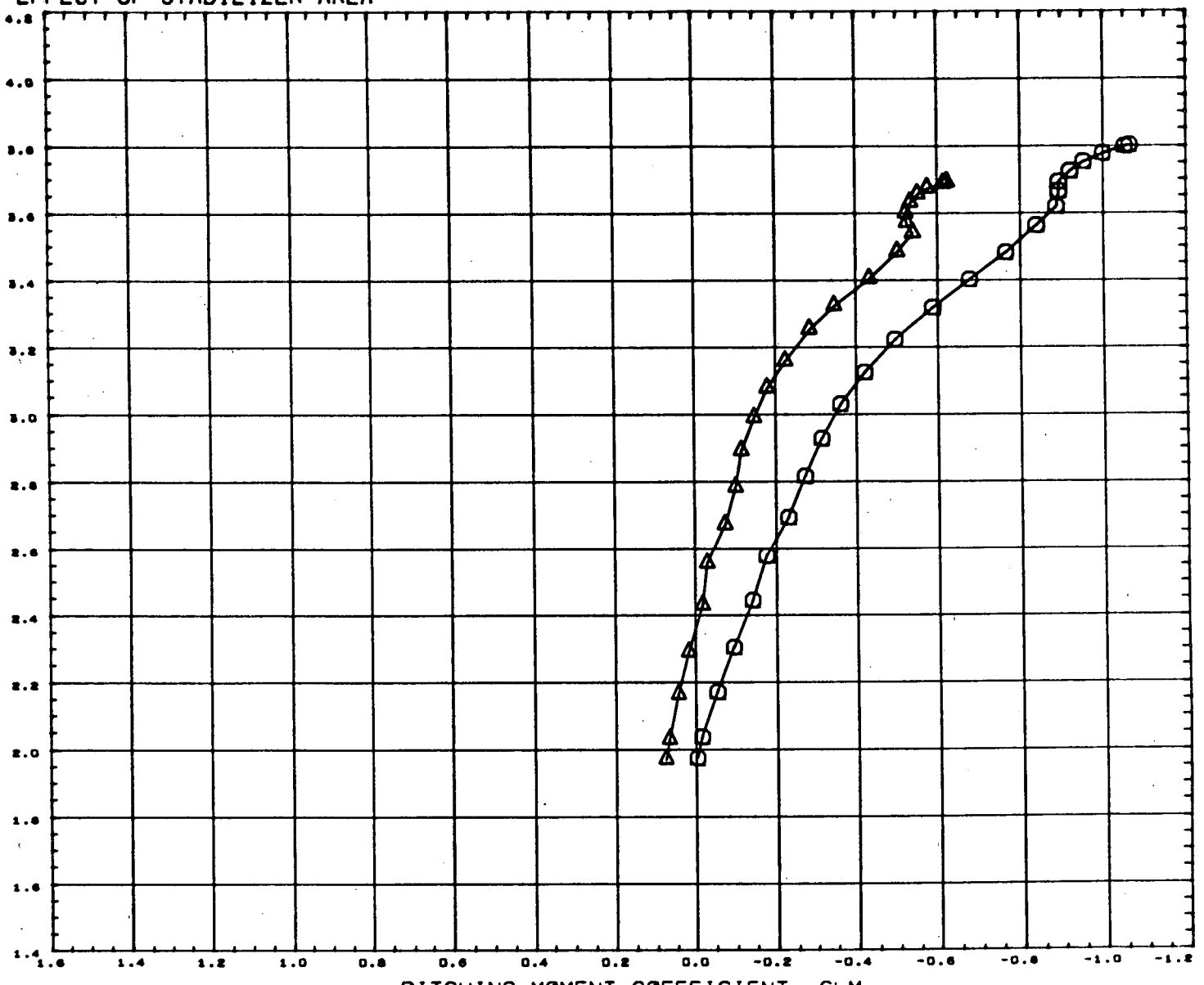


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			BETA	HTAIL	ELEVTR
(RCX131)		GAC MST-020	TBC H-32 BOOSTER	B6W5H4	0.000	-15.000	0.000
(RCX311)		GAC MST-020	TBC H-32 BOOSTER	B6W5H5	0.000	-15.000	

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.3870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF STABILIZER AREA

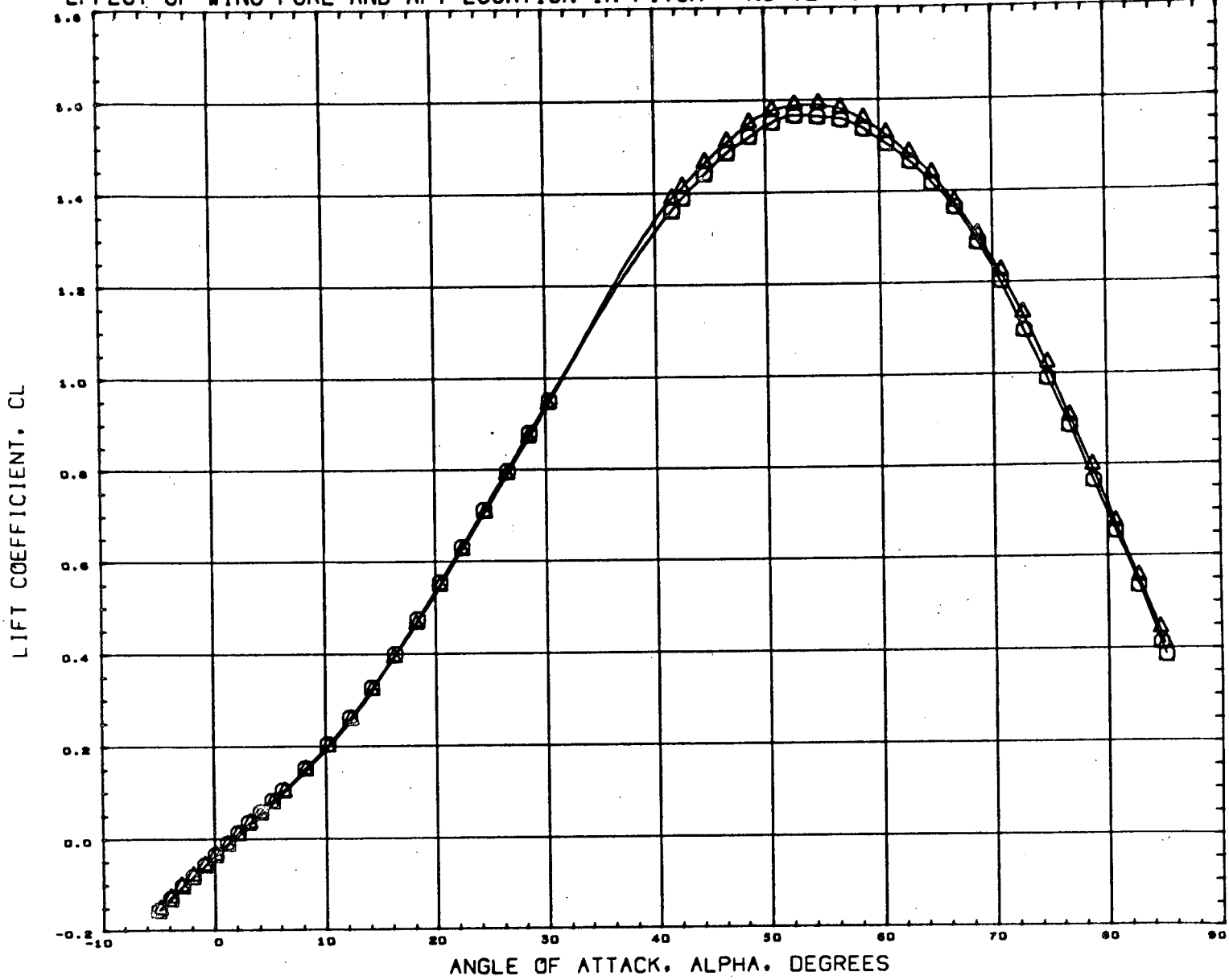


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			BETA	HTAIL	ELEVTR
(RCX131)		GAC HST-020	TBC H-32 BOOSTER	B6W5H4	0.000	-15.000	0.000
(RCX311)		GAC HST-020	TBC H-32 BOOSTER	B6W5H5	0.000	-15.000	

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF WING FORE AND AFT LOCATION IN PITCH - NO VERTICAL AT HIGH ALPHA

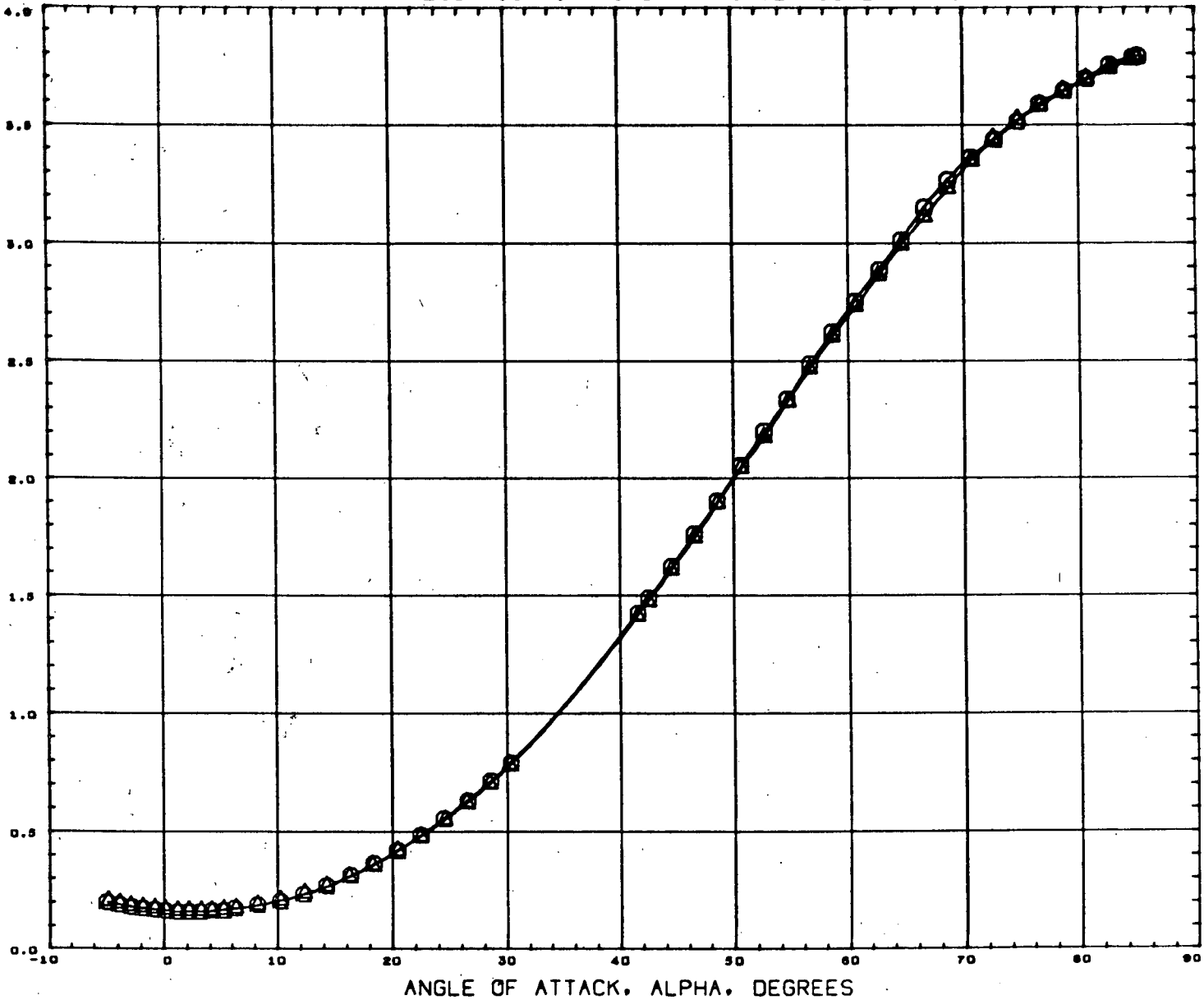


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		BETA	HTAIL	ELEVTR
(GCX061)		GAC HST-020 TBC H-32 BOOSTER	B8W4H4V3	0.000	-15.000	0.000
(GCX131)		GAC HST-020 TBC H-32 BOOSTER	B8W4H4V3	0.000	-15.000	0.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4340	PERCNT

EFFECT OF WING FORE AND AFT LOCATION IN PITCH - NO VERTICAL AT HIGH ALPHA

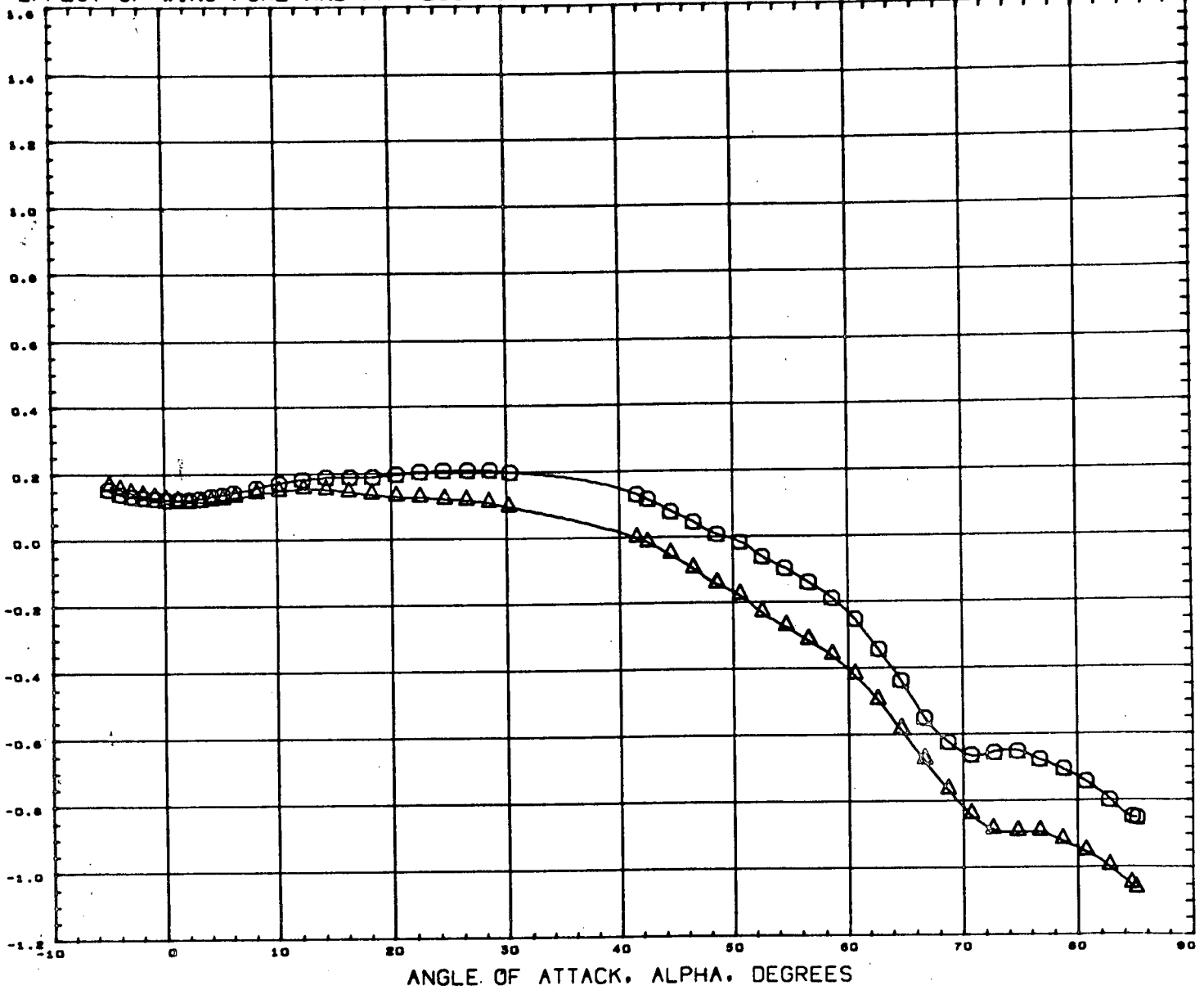


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		BETA	HTAIL	ELEVTR
(GCX061)		GAC HST-020 TBC H-32 BOOSTER	B8W4H4V3	0.000	-15.000	0.000
(GCX131)		GAC HST-020 TBC H-32 BOOSTER	B8W4H4V3	0.000	-15.000	0.000

MACH 8.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5070	INCHES
SCALE	0.4348	PERCNT

EFFECT OF WING FORE AND AFT LOCATION IN PITCH - NO VERTICAL AT HIGH ALPHA

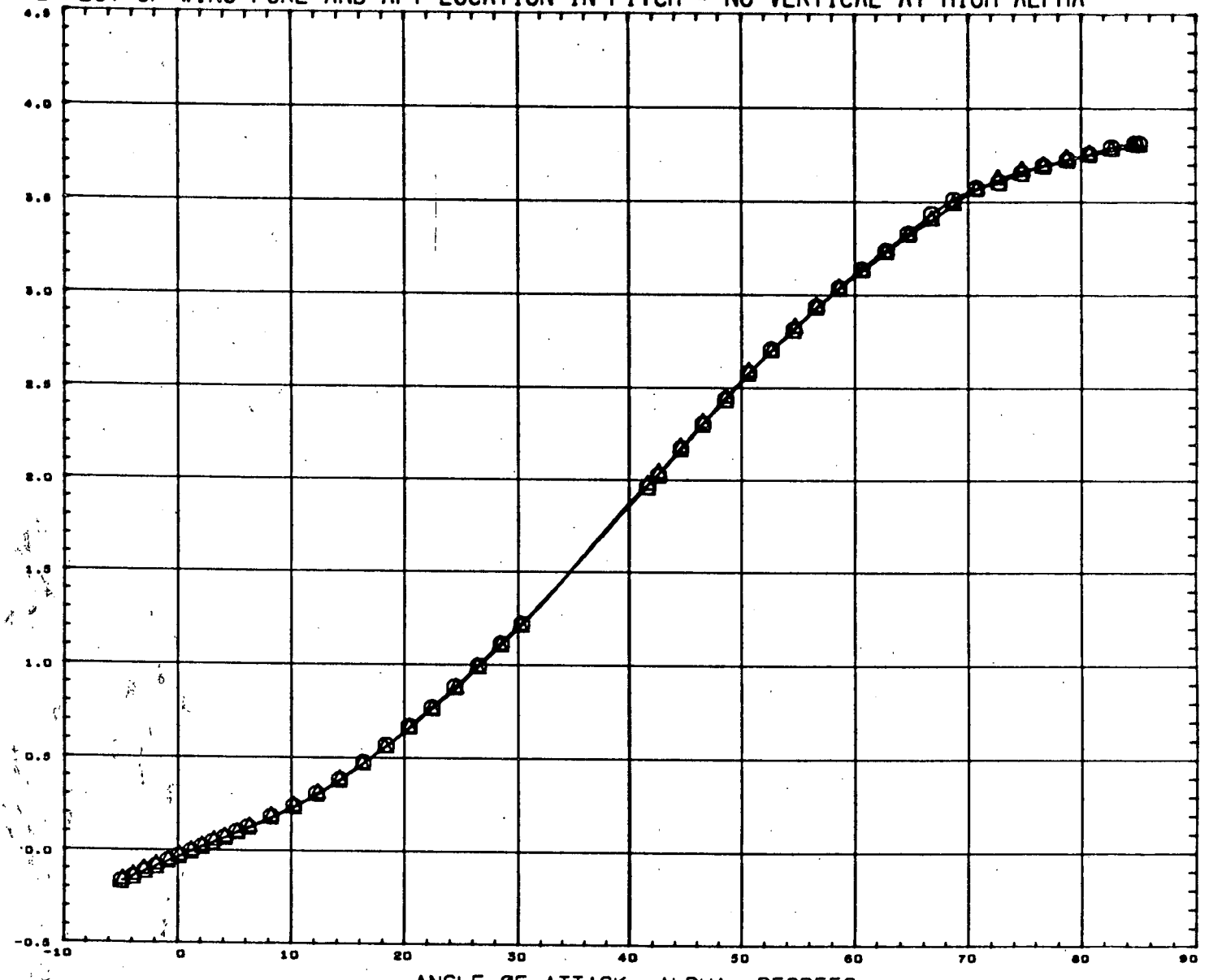


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		BETA	HTAIL	ELEVTR
(GCX081)	○	GAC HST-020 TBC H-32 BOOSTER	B8W4H4V3	0.000	-15.000	0.000
(GCX131)	△	GAC HST-020 TBC H-32 BOOSTER	B8W4H4V3	0.000	-15.000	0.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4346	PERCNT

EFFECT OF WING FORE AND AFT LOCATION IN PITCH - NO VERTICAL AT HIGH ALPHA

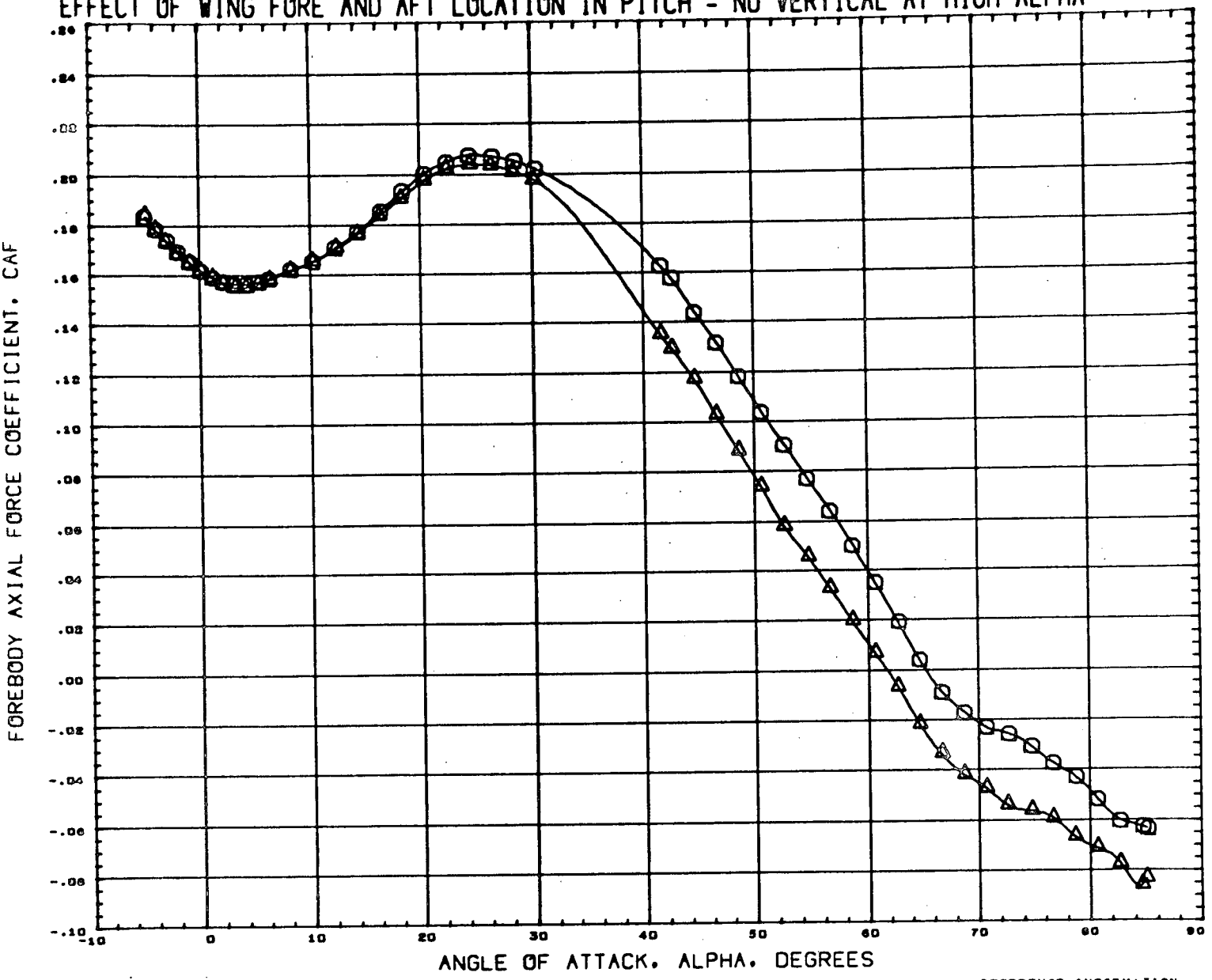


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		BETA	HTAIL	ELEVTR
(GCX061)		GAC HST-020 TBC H-32 BOOSTER	B8W4H4V3	0.000	-15.000	0.000
(GCX131)		GAC HST-020 TBC H-32 BOOSTER	B8W4H4V3	0.000	-15.000	0.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4340	PERCNT

EFFECT OF WING FORE AND AFT LOCATION IN PITCH - NO VERTICAL AT HIGH ALPHA

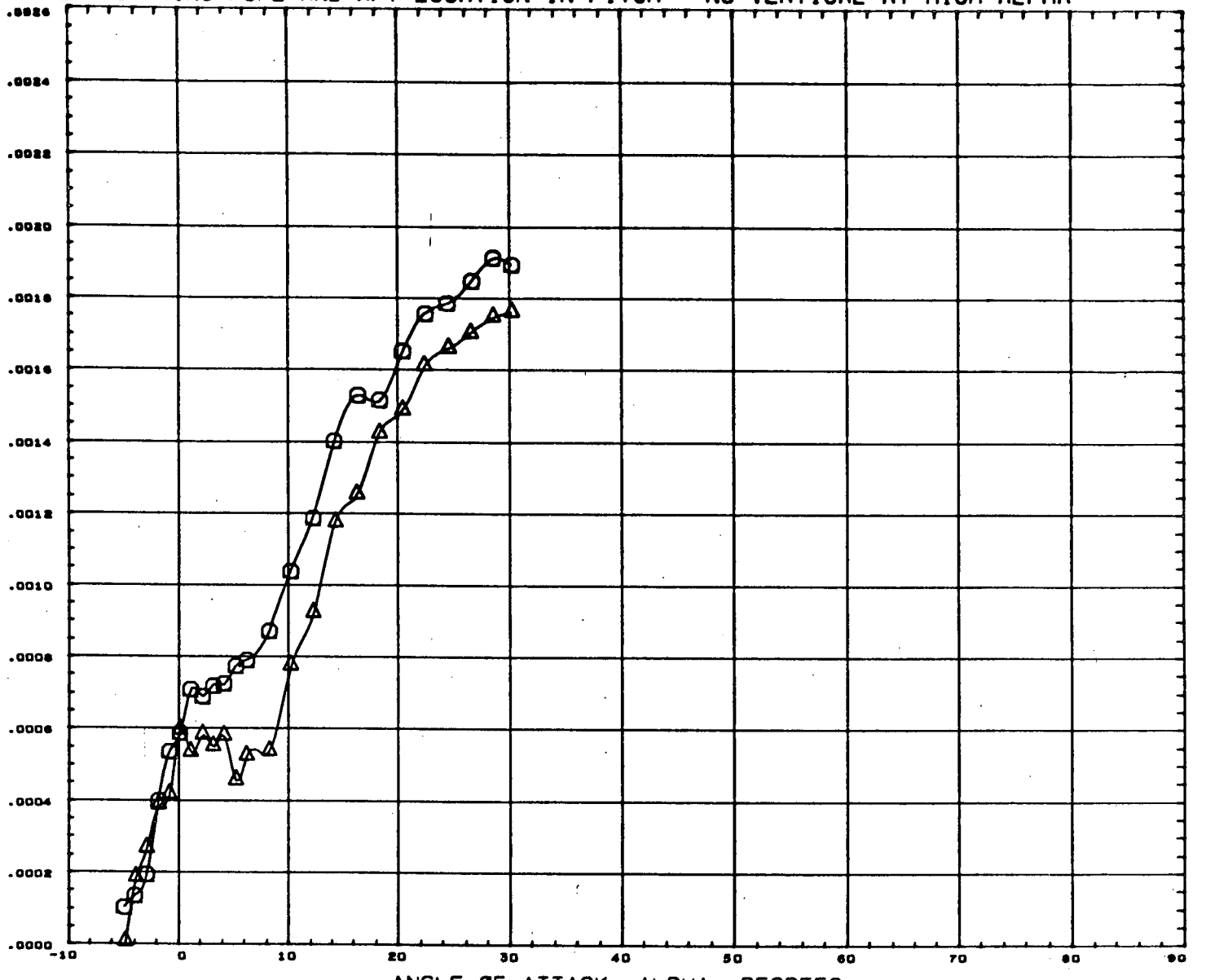


DATA SET SYMBOL		CONFIGURATION DESCRIPTION		BETA	HTAIL	ELEVTR
(GCX081)	○	GAC HST-020 TBC H-32 BOOSTER	B8W4H4V3	0.000	-15.000	0.000
(GCX131)	△	GAC HST-020 TBC H-32 BOOSTER	B8W4H4V3	0.000	-15.000	0.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	50.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF WING FORE AND AFT LOCATION IN PITCH - NO VERTICAL AT HIGH ALPHA

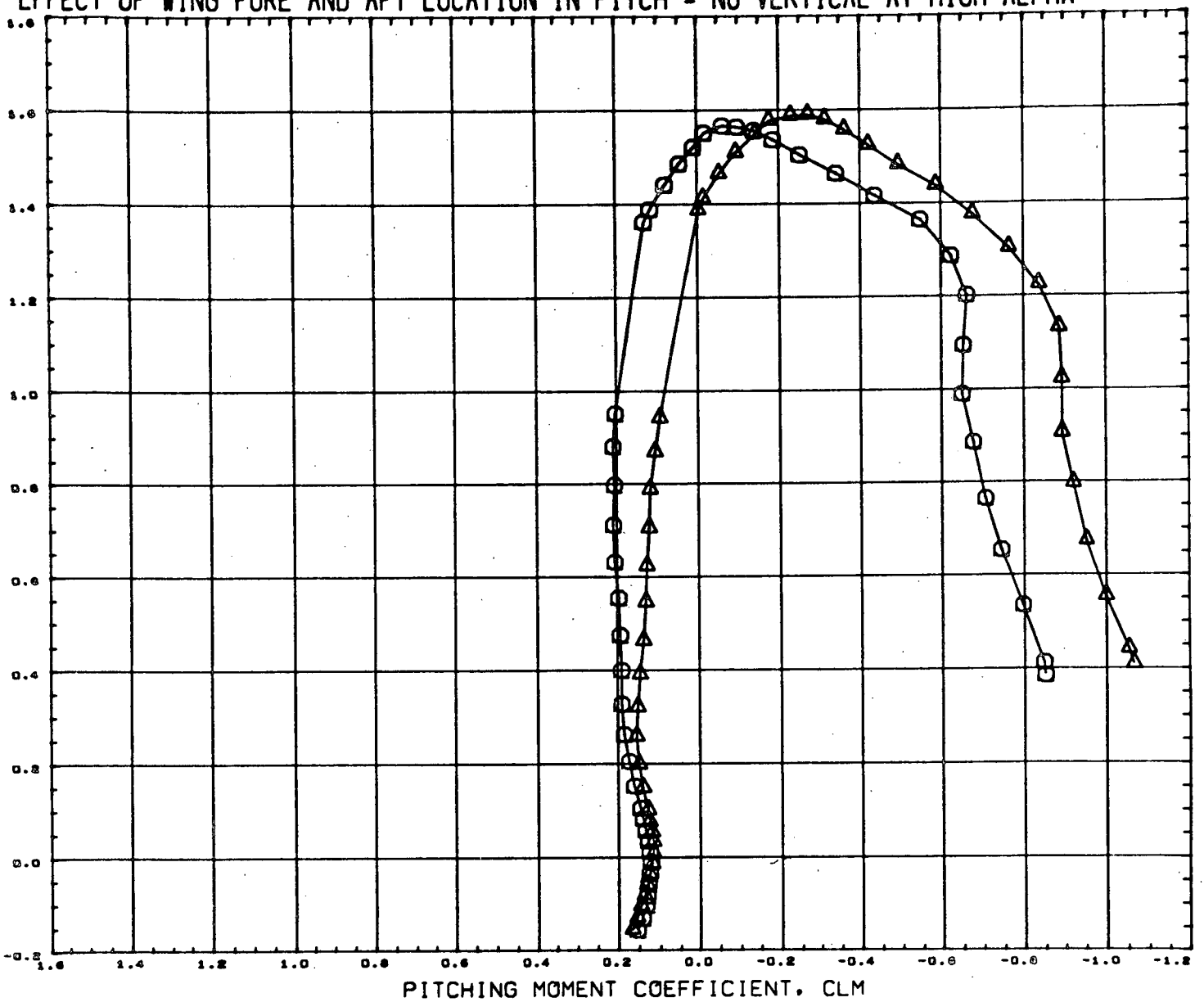


DATA SET SYMBOL		CONFIGURATION DESCRIPTION			BETA	MTAIL	ELEVTR
(FCX222)	○	GAC HST-020	TBC H-32 BOOSTER	B8W4H4V3	0.000	-15.000	0.000
(FCX342)	△	GAC HST-020	TBC H-32 BOOSTER	B8W5H4V3	0.000	-15.000	0.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF WING FORE AND AFT LOCATION IN PITCH - NO VERTICAL AT HIGH ALPHA

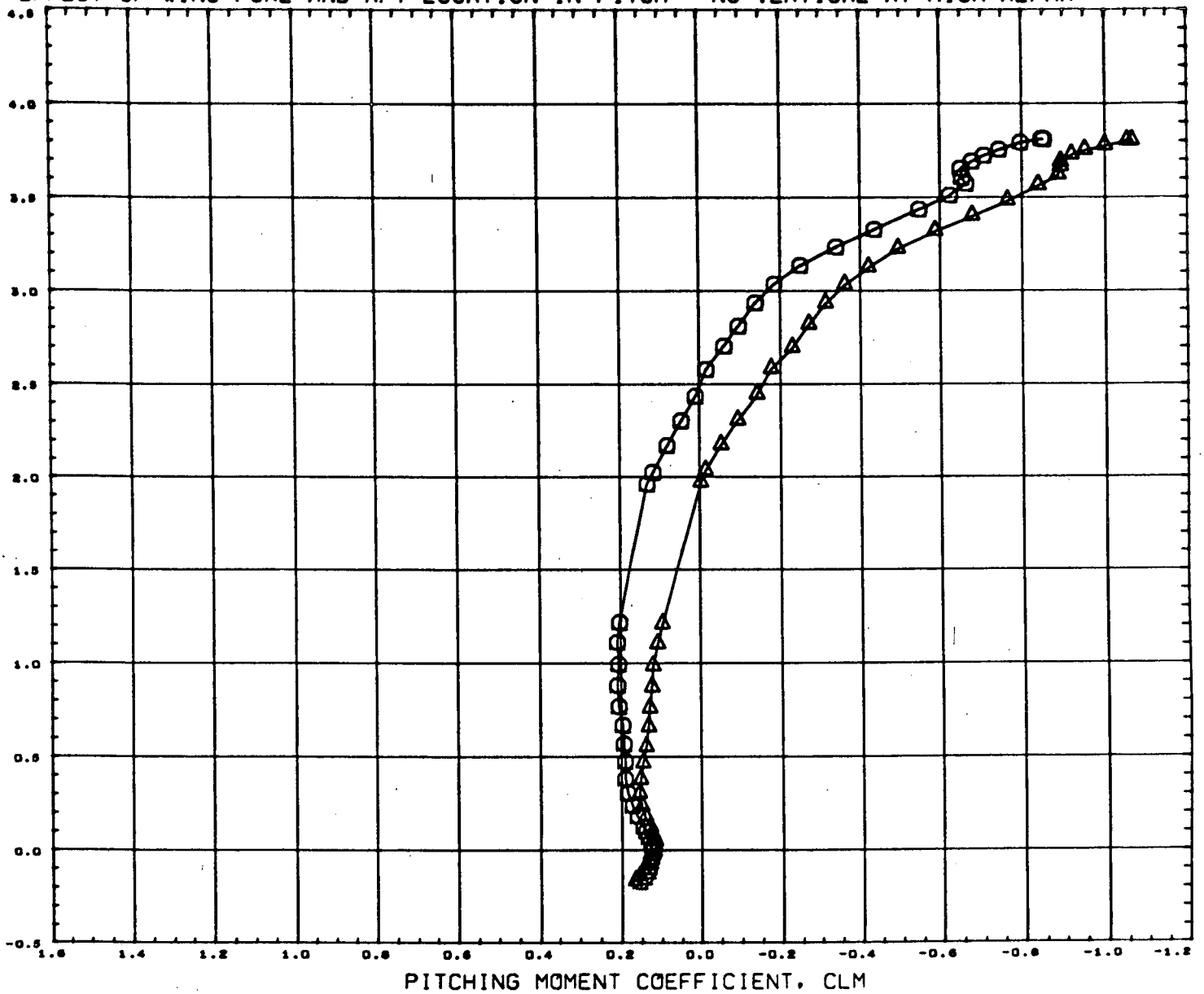


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		BETA	HTAIL	ELEVTR
(GCX081)		GAC HST-020 TBC H-32 BOOSTER	B8W4H4V3	0.000	-15.000	0.000
(GCX131)		GAC HST-020 TBC H-32 BOOSTER	B8W4H4V3	0.000	-15.000	0.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF WING FORE AND AFT LOCATION IN PITCH - NO VERTICAL AT HIGH ALPHA

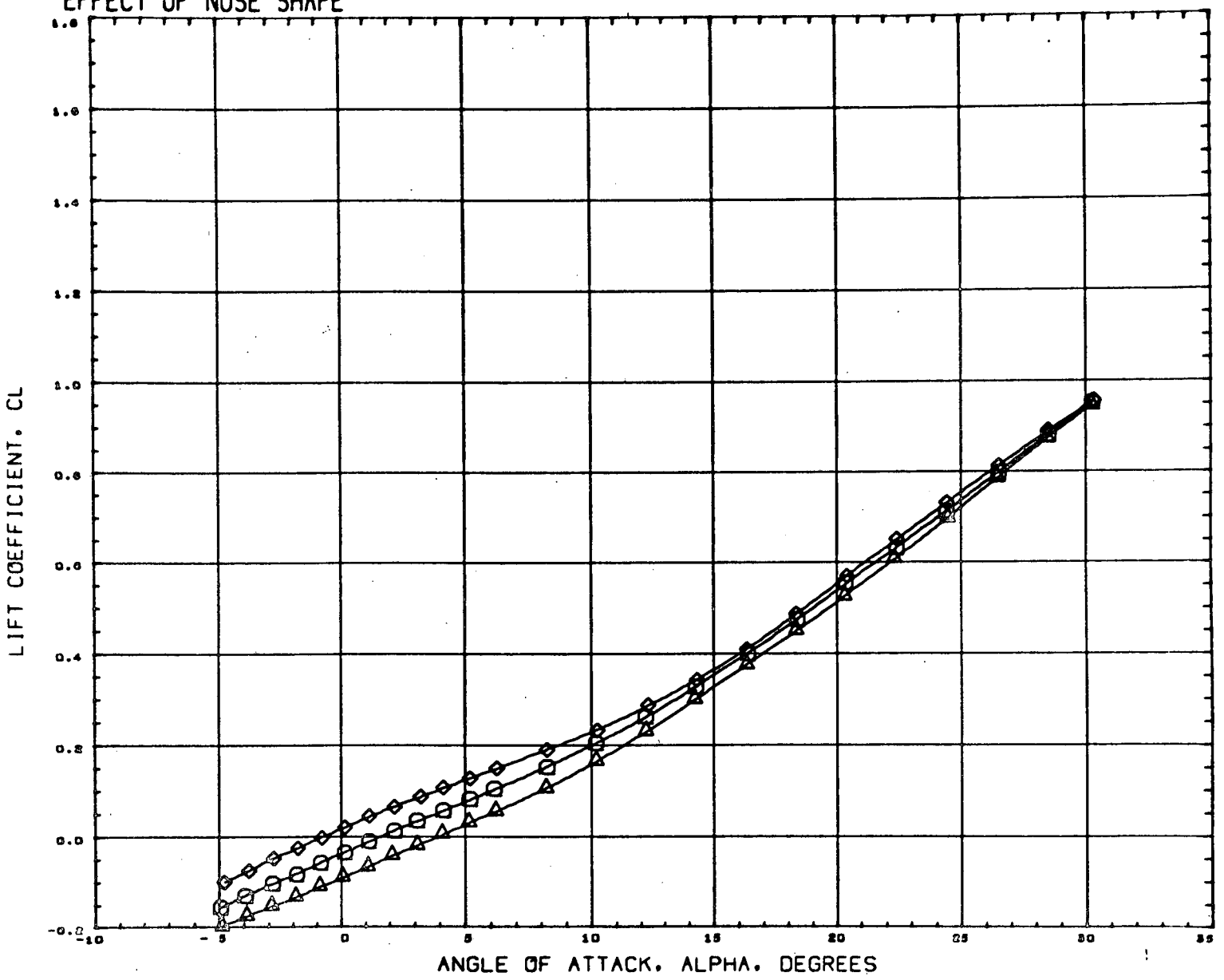


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		BETA	HTAIL	ELEVTR
(GCX081)		GAC HST-020 TBC H-32 BOOSTER	B8W4H4V3	0.000	-15.000	0.000
(GCX131)		GAC HST-020 TBC H-32 BOOSTER	B8W4H4V3	0.000	-15.000	0.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.3870	INCHES
SCALE	0.4340	PERCNT

EFFECT OF NOSE SHAPE



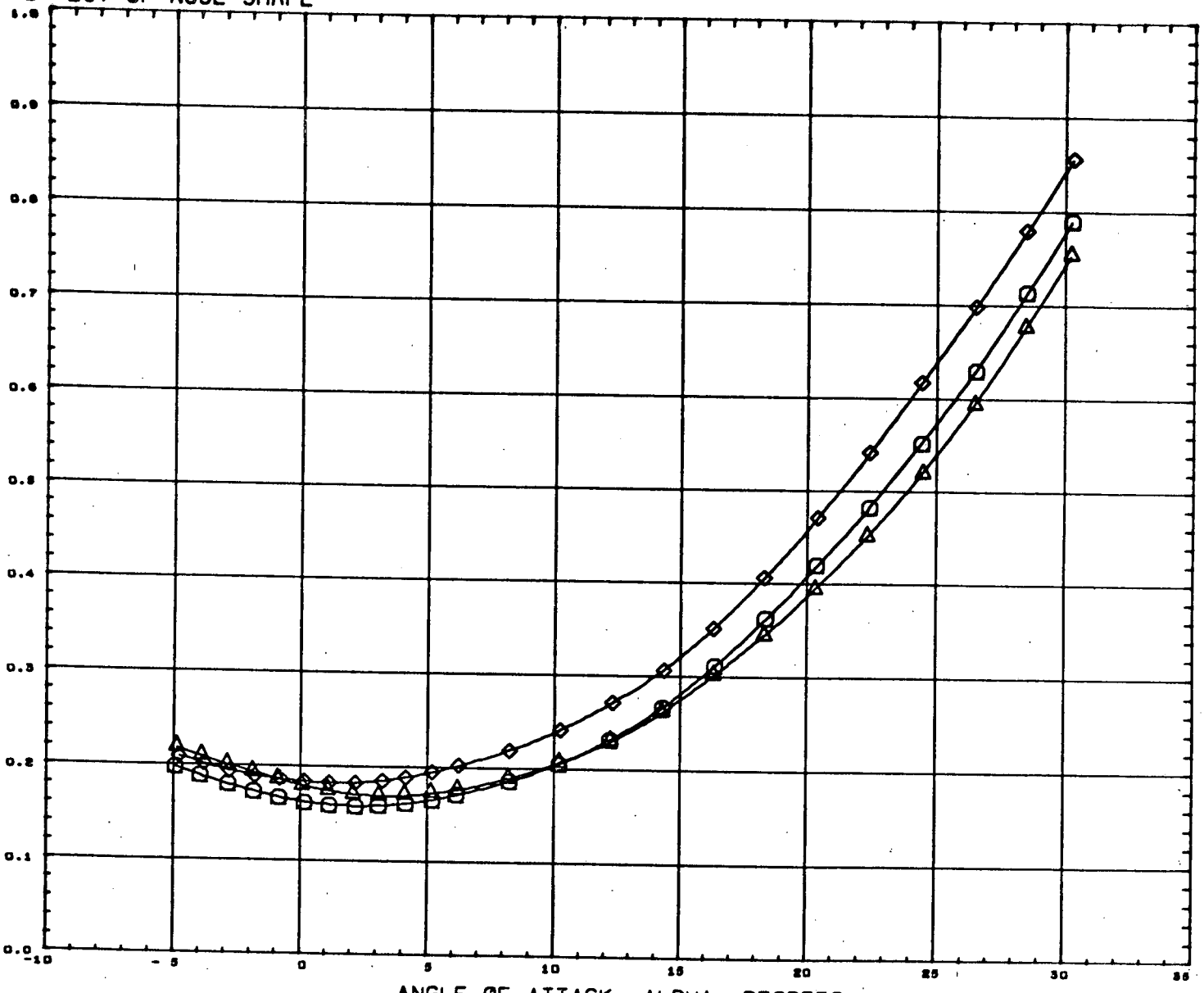
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			BETA	HTAIL	ELEVTR
(FCX222)	○	GAC HST-020	TBC H-32 BOOSTER	B8W4H4V3	0.000	-15.000	0.000
(FCX352)	△	GAC HST-020	TBC H-32 BOOSTER	B12W4H4V3	0.000	-15.000	0.000
(FCX362)	◇	GAC HST-020	TBC H-32 BOOSTER	B11W4H4V3	0.000	-15.000	0.000

MACH 0.120

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4660	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF NOSE SHAPE



DATA SET SYMBOL		CONFIGURATION DESCRIPTION		
(FCX222)	○	GAC HST-02D	TBC H-32 BOOSTER	B8W4H4V3
(FCX352)	△	GAC HST-02D	TBC H-32 BOOSTER	B12W4H4V3
(FCX362)	◇	GAC HST-02D	TBC H-32 BOOSTER	B11W4H4V3

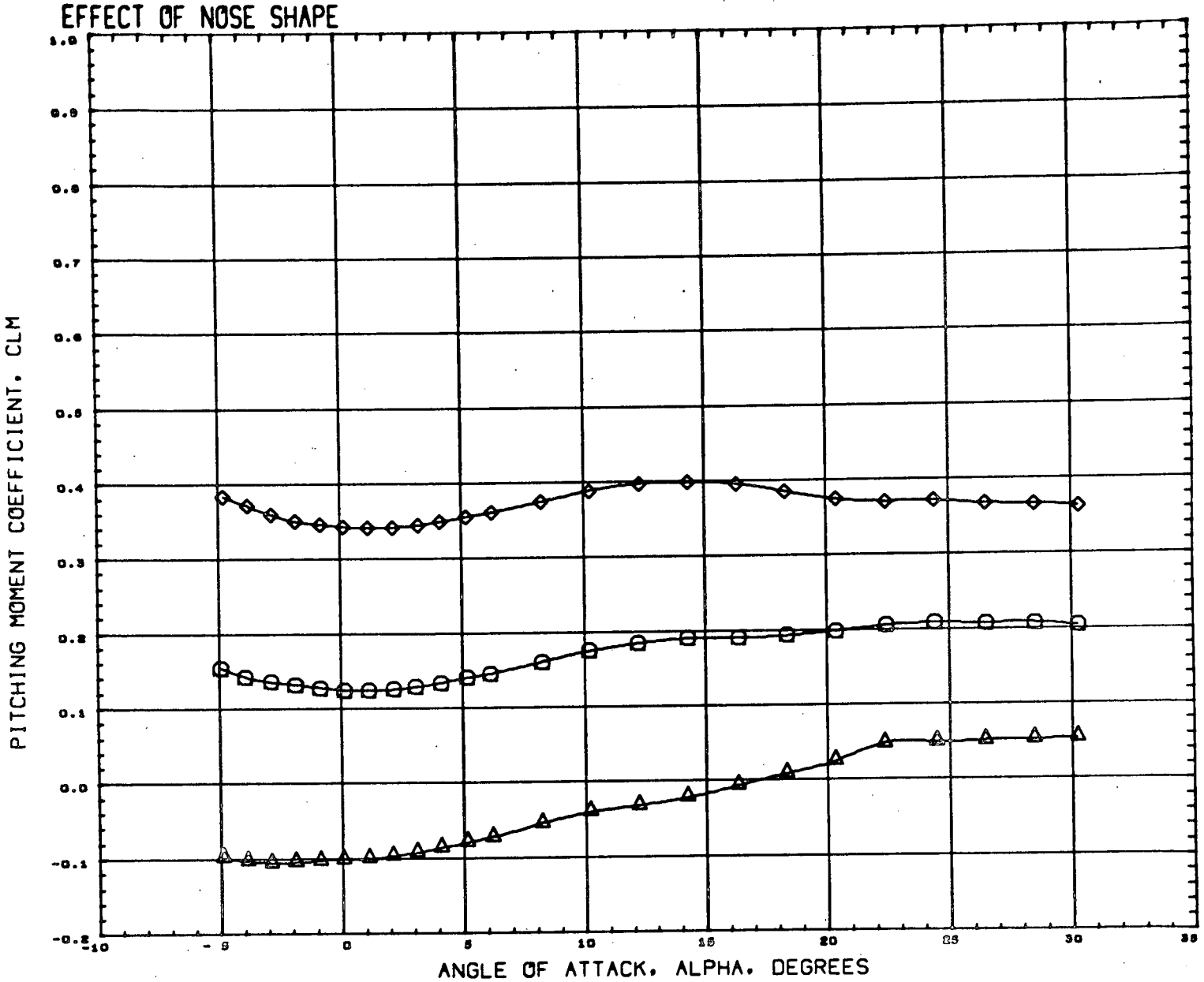
BETA	HTAIL	ELEVTR
0.000	-15.000	0.000
0.000	-15.000	0.000
0.000	-15.000	0.000

MACH 0.120

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF NOSE SHAPE

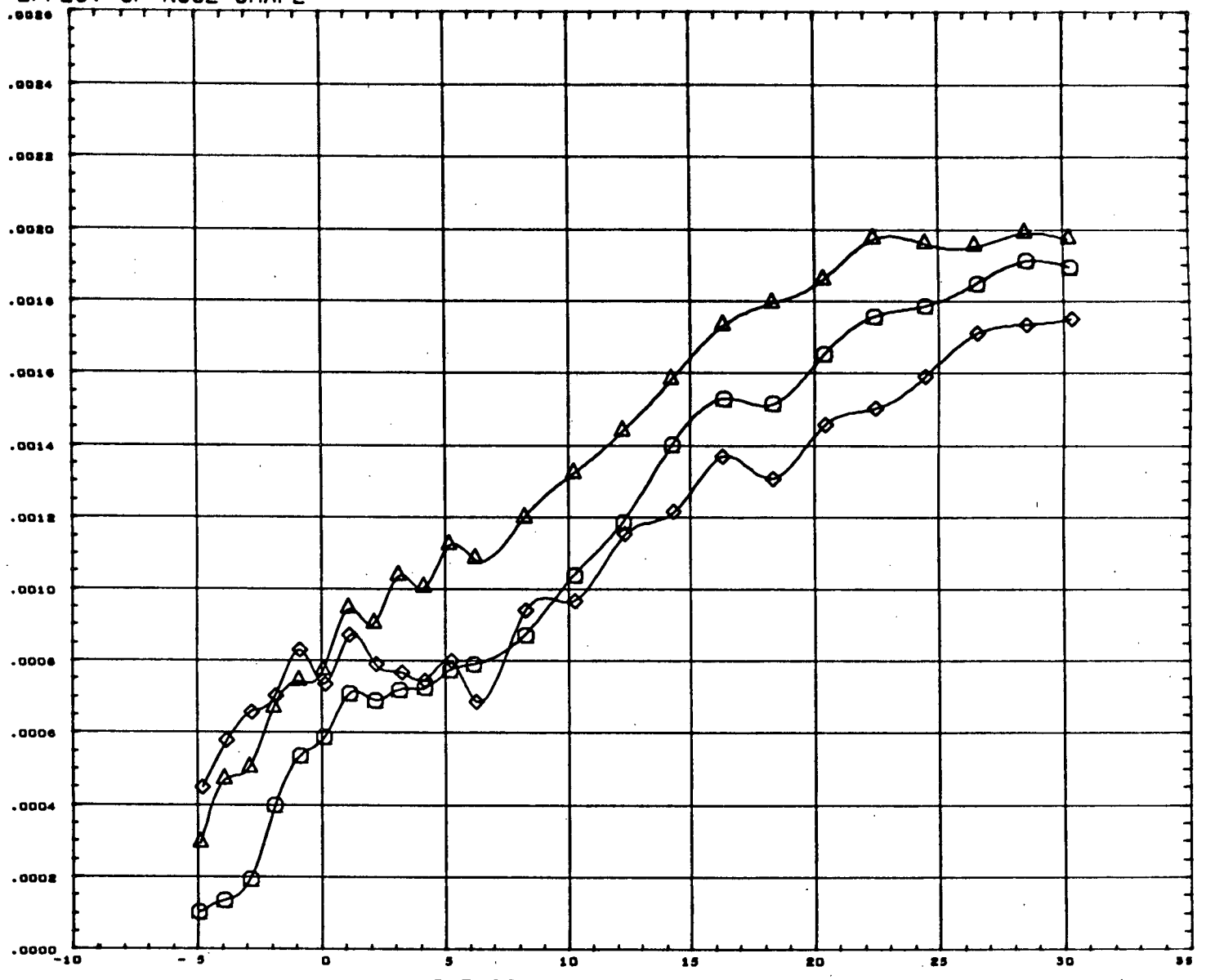


DATA SET SYMBOL		CONFIGURATION DESCRIPTION			BETA	HTAIL	ELEVTR
(FCX222)	○	GAC HST-020	TBC H-32 BOOSTER	B8W4H4V3	0.000	-15.000	0.000
(FCX352)	△	GAC HST-020	TBC H-32 BOOSTER	B12W4H4V3	0.000	-15.000	0.000
(FCX362)	◇	GAC HST-020	TBC H-32 BOOSTER	B11W4H4V3	0.000	-15.000	0.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4660	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF NOSE SHAPE

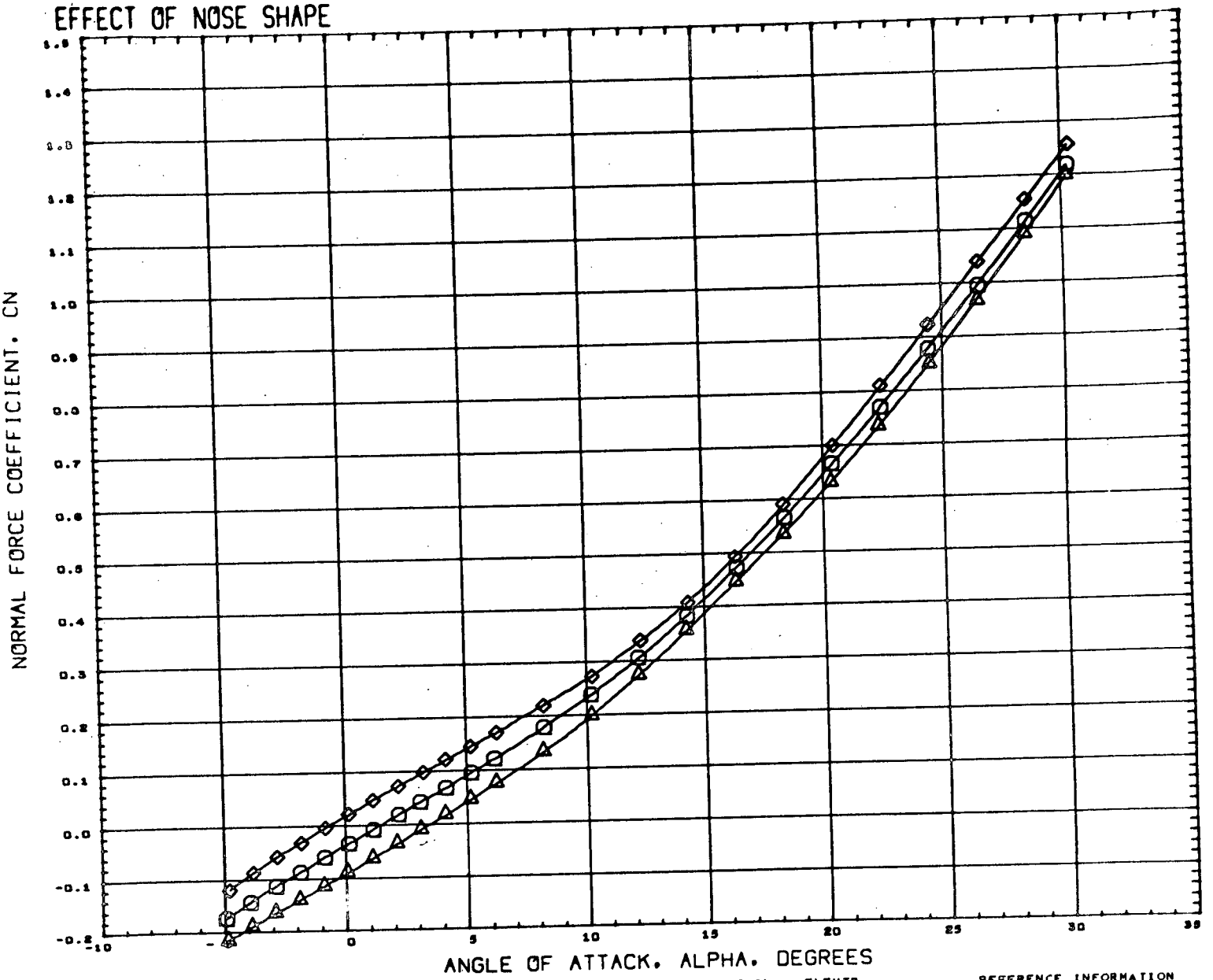


DATA SET SYMBOL		CONFIGURATION DESCRIPTION			BETA	HTAIL	ELEVTR
(FCX222)	○	GAC HST-020	TBC H-32 BOOSTER	B8W4H4V3	0.000	-15.000	0.000
(FCX352)	△	GAC HST-020	TBC H-32 BOOSTER	B12W4H4V3	0.000	-15.000	0.000
(FCX362)	◇	GAC HST-020	TBC H-32 BOOSTER	B11W4H4V3	0.000	-15.000	0.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.3870	INCHES
SCALE	0.4340	PERCNT

EFFECT OF NOSE SHAPE



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		
(FCX222)	○	GAC HST-020	TBC H-32 BOOSTER	B8W4H4V3
(FCX352)	△	GAC HST-020	TBC H-32 BOOSTER	B12W4H4V3
(FCX362)	◇	GAC HST-020	TBC H-32 BOOSTER	B11W4H4V3

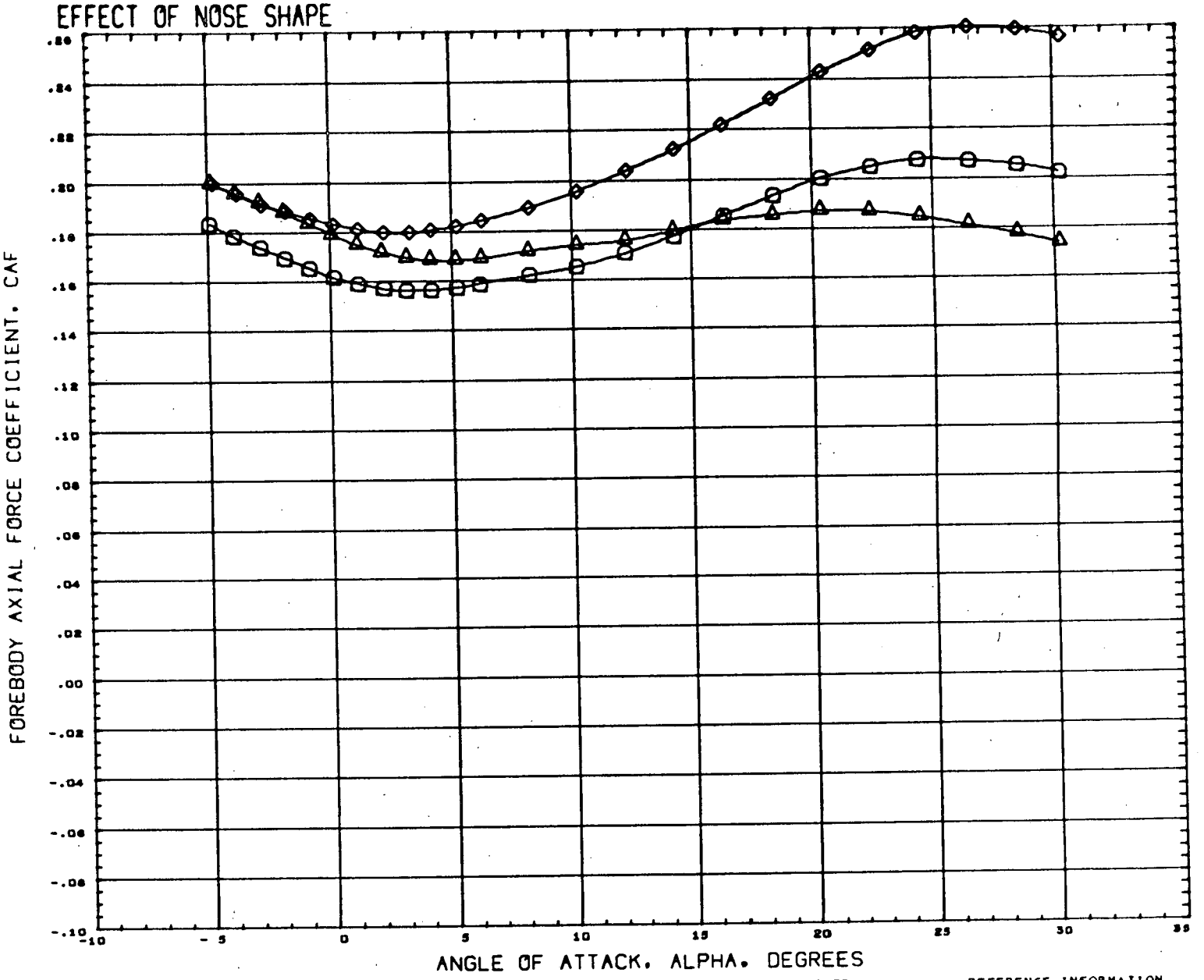
BETA	HTAIL	ELEVTR
0.000	-15.000	0.000
0.000	-15.000	0.000
0.000	-15.000	0.000

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.3670	INCHES
SCALE	0.4348	PERCNT

MACH 0.120

EFFECT OF NOSE SHAPE

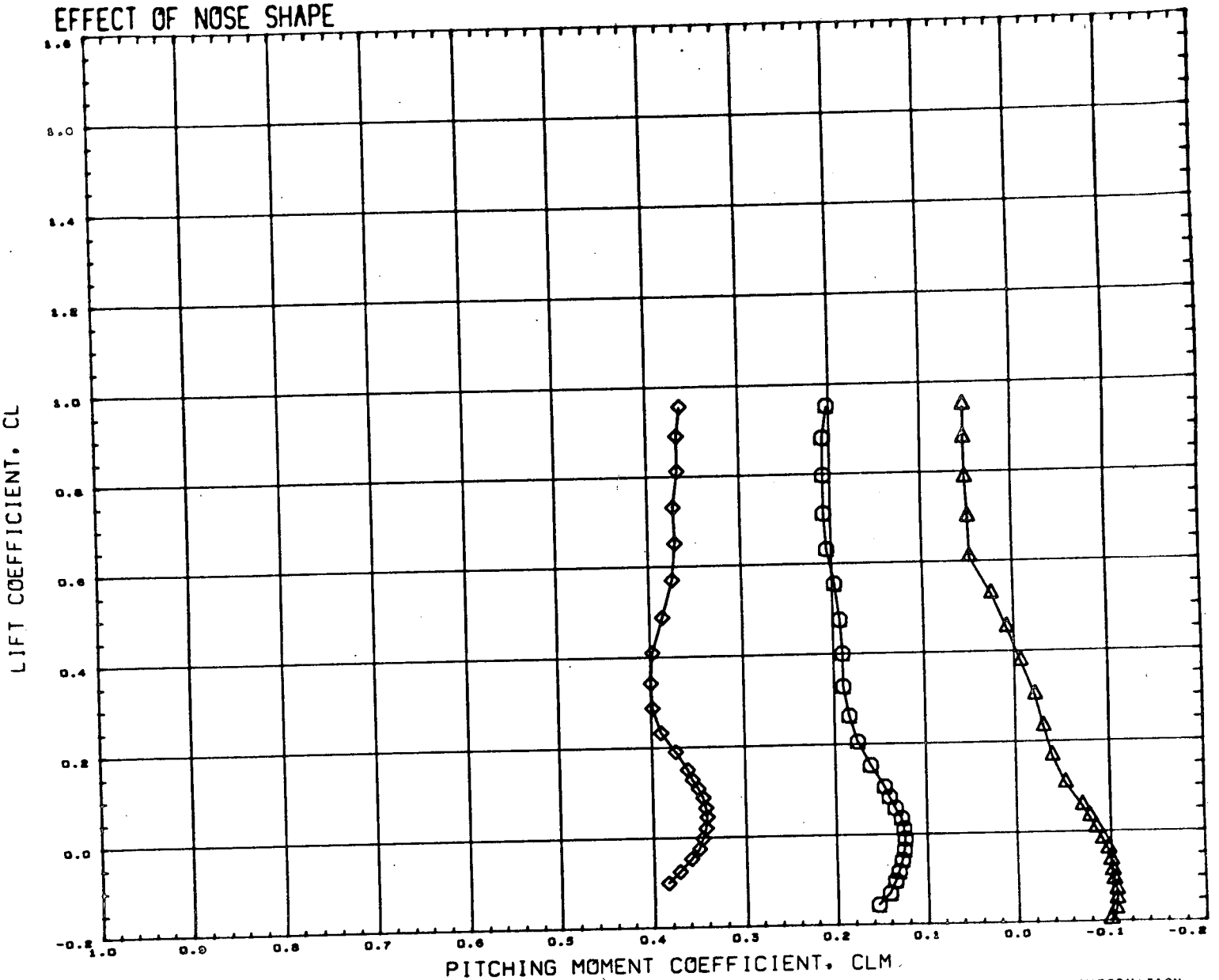


DATA SET SYMBOL		CONFIGURATION DESCRIPTION			BETA	HTAIL	ELEVTR
(FCX222)	○	GAC HST-020	TBC H-32 BOOSTER	B8W4H4V3	0.000	-15.000	0.000
(FCX352)	△	GAC HST-020	TBC H-32 BOOSTER	B12W4H4V3	0.000	-15.000	0.000
(FCX362)	◇	GAC HST-020	TBC H-32 BOOSTER	B11W4H4V3	0.000	-15.000	0.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4660	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5670	INCHES
SCALE	0.4346	PERCNT

EFFECT OF NOSE SHAPE



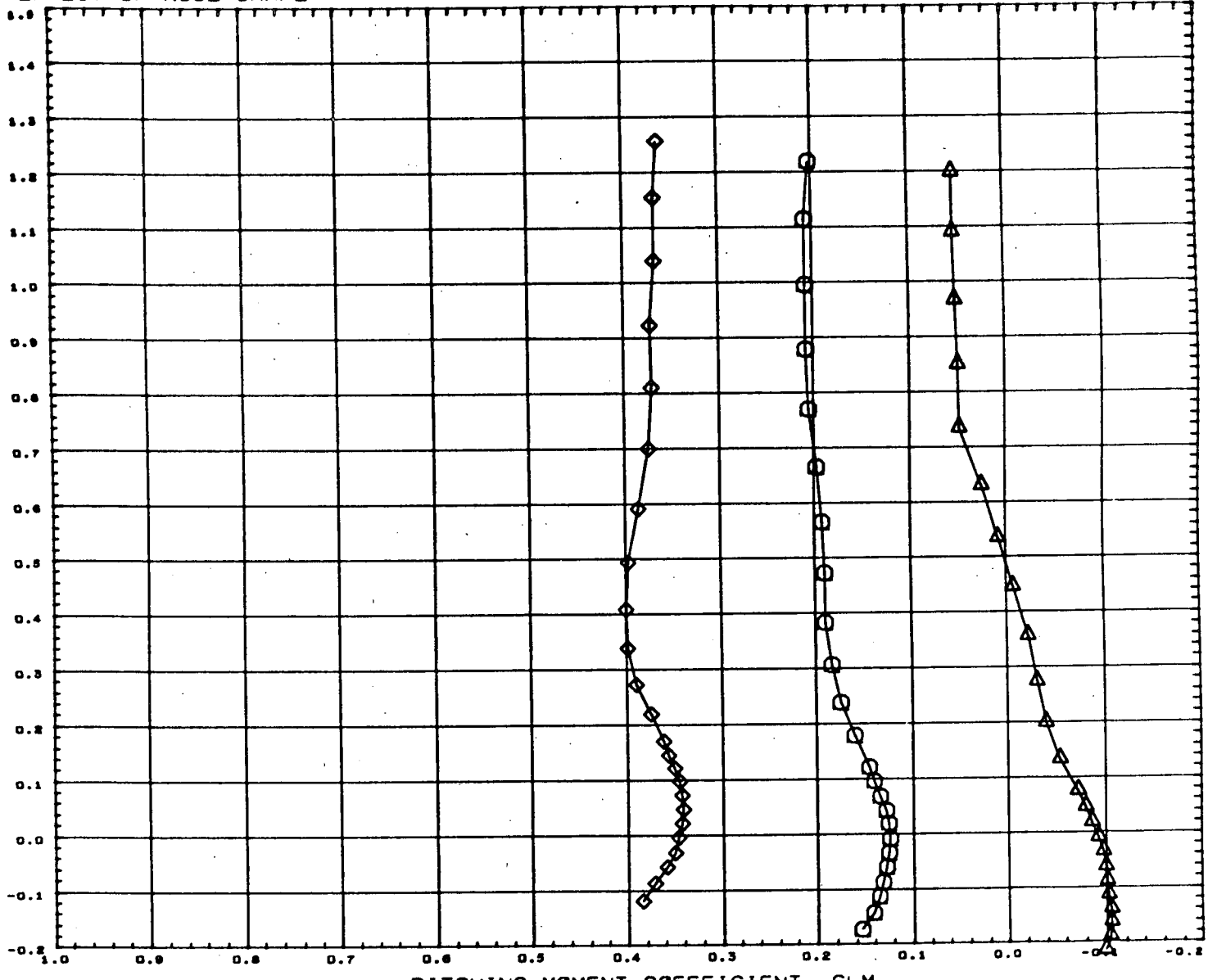
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			BETA	HTAIL	ELEVTR
(FCX222)	○	GAC HST-020	TBC H-32 BOOSTER	B8W4H4V3	0.000	-15.000	0.000
(FCX352)	⊠	GAC HST-020	TBC H-32 BOOSTER	B12W4H4V3	0.000	-15.000	0.000
(FCX362)	◇	GAC HST-020	TBC H-32 BOOSTER	B11W4H4V3	0.000	-15.000	0.000

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

MACH 0.120

EFFECT OF NOSE SHAPE



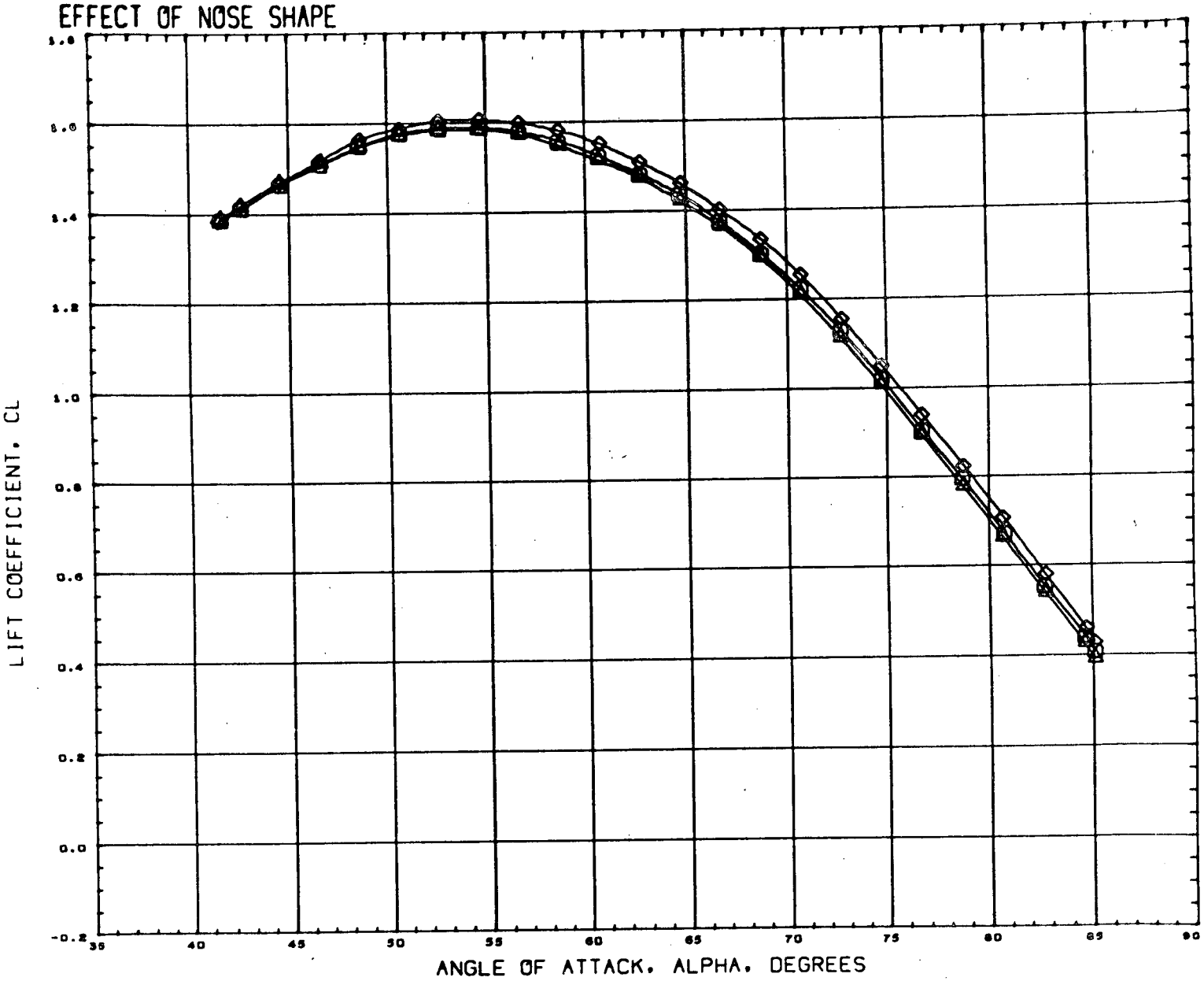
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			BETA	HTAIL	ELEVTR
(FCX222)	○	GAC HST-020	TBC H-32 BOOSTER	B8W4H4V3	0.000	-15.000	0.000
(FCX352)	△	GAC HST-020	TBC H-32 BOOSTER	B12W4H4V3	0.000	-15.000	0.000
(FCX362)	◇	GAC HST-020	TBC H-32 BOOSTER	B11W4H4V3	0.000	-15.000	0.000

MACH 0.120

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4660	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF NOSE SHAPE

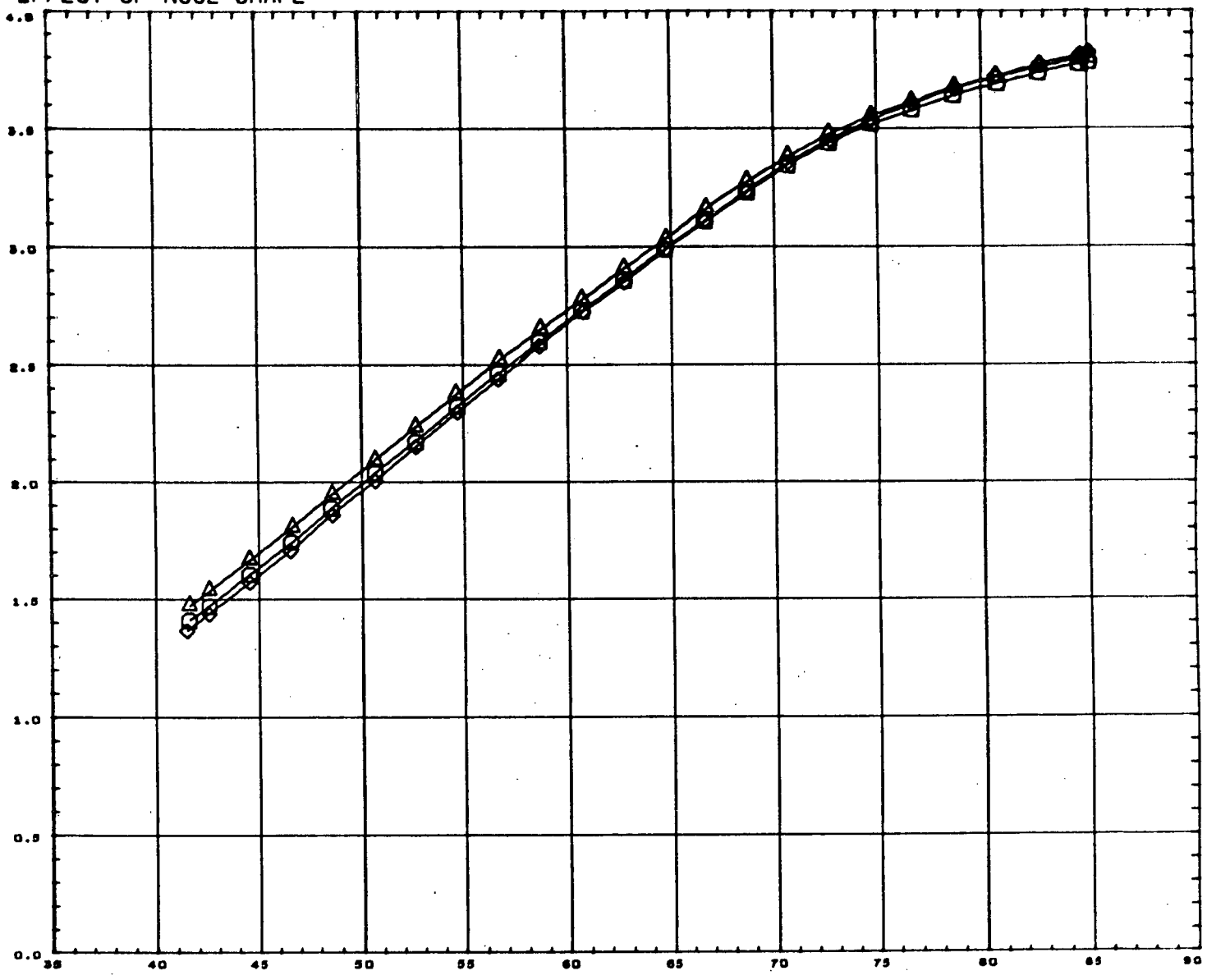


DATA SET SYMBOL		CONFIGURATION DESCRIPTION			BETA	HTAIL	ELEVTR
(RCX131)	○	GAC HST-020	TBC H-32 BOOSTER	B6W5H4	0.000	-15.000	0.000
(RCX321)	△	GAC HST-020	TBC H-32 BOOSTER	B5W5H4	0.000	-15.000	0.000
(RCX301)	◇	GAC HST-020	TBC H-32 BOOSTER	B9W5H4	0.000	-15.000	0.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF NOSE SHAPE

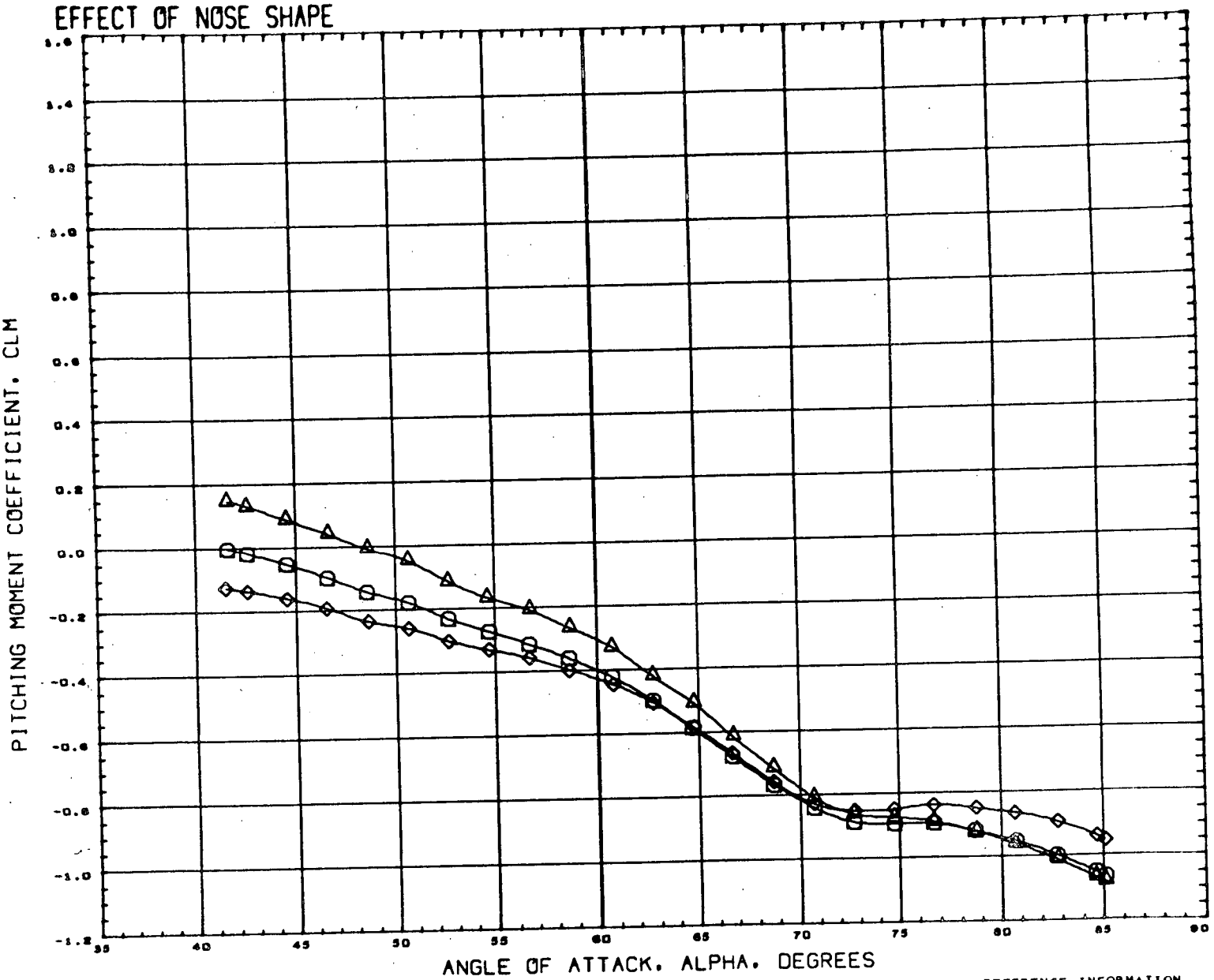


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			BETA	HTAIL	ELEVTR
(RCX131)	○	GAC HST-020	TBC H-32 BOOSTER	B6W5H4	0.000	-15.000	0.000
(RCX321)	△	GAC HST-020	TBC H-32 BOOSTER	B5W5H4	0.000	-15.000	0.000
(RCX301)	◇	GAC HST-020	TBC H-32 BOOSTER	B9W5H4	0.000	-15.000	0.000

MACH 6.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF NOSE SHAPE



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		
(RCX131)	○	GAC HST-020	TBC H-32 BOOSTER	96W5H4
(RCX321)	△	GAC HST-020	TBC H-32 BOOSTER	85W5H4
(RCX301)	◇	GAC HST-020	TBC H-32 BOOSTER	89W5H4

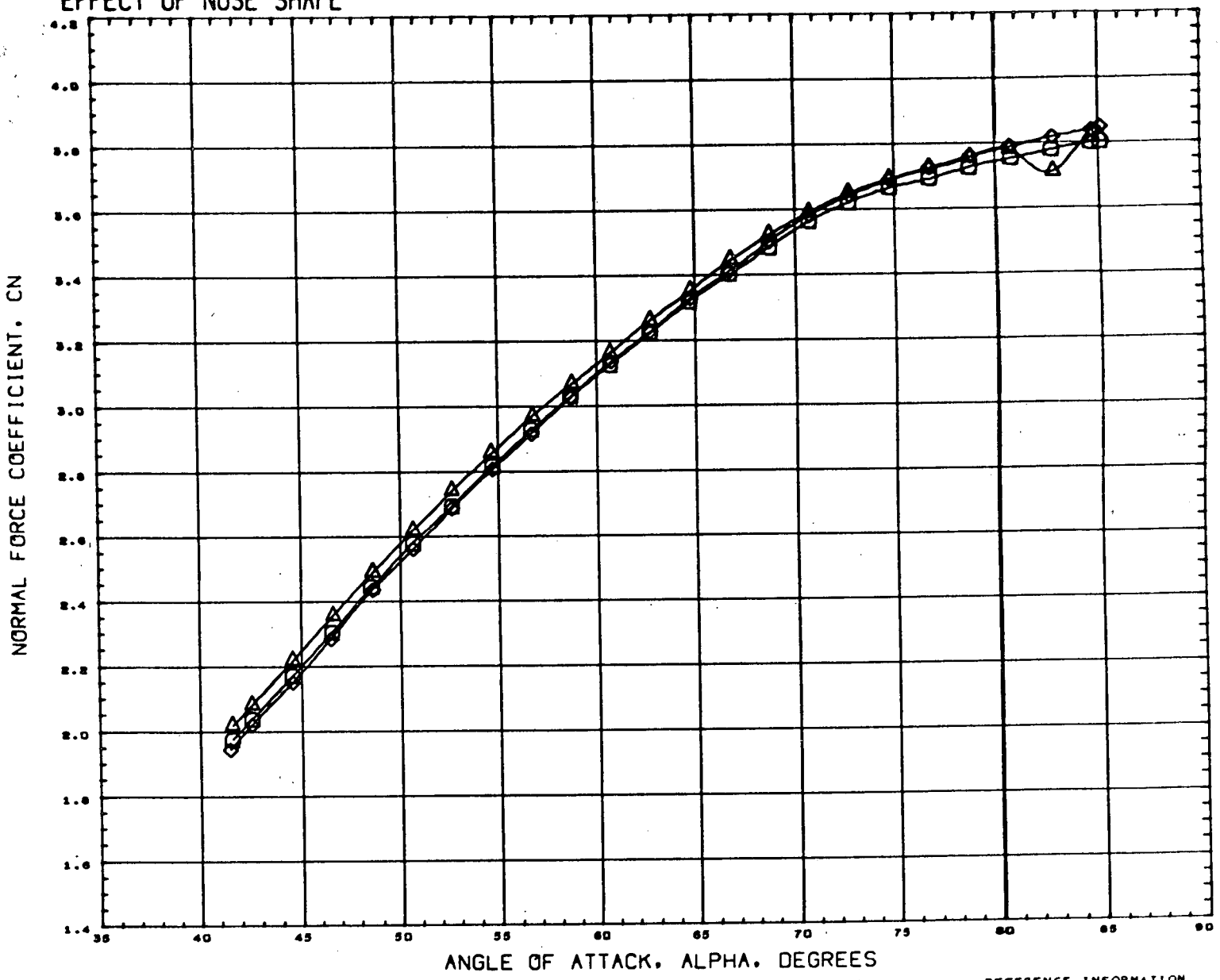
BETA	HTAIL	ELEVTR
0.000	-15.000	0.000
0.000	-15.000	0.000
0.000	-15.000	0.000

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

MACH 0.120

EFFECT OF NOSE SHAPE

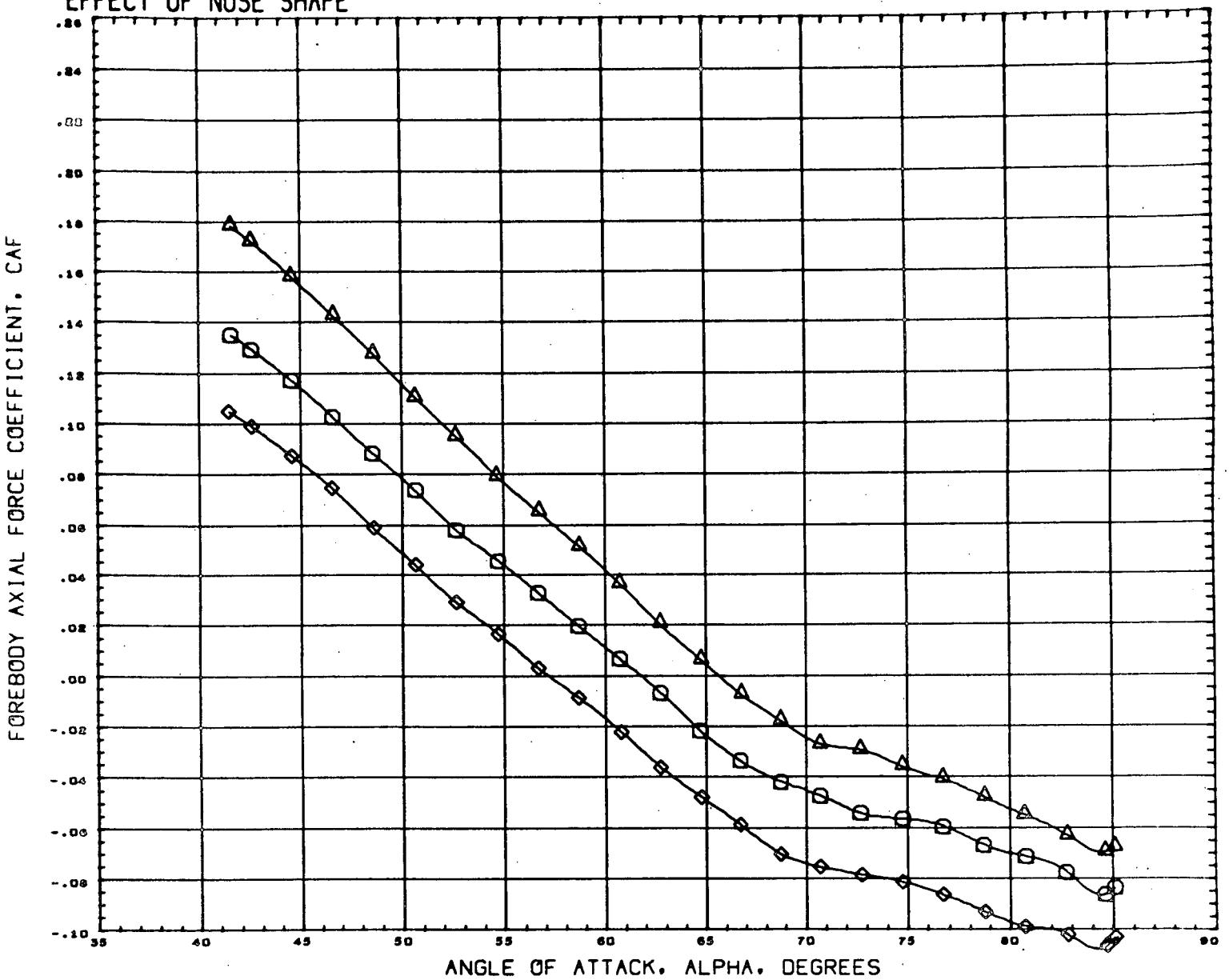


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			BETA	HTAIL	ELEVTR
(RCX131)	○	GAC HST-020	TBC H-32 BOOSTER	B6W5H4	0.000	-15.000	0.000
(RCX321)	△	GAC HST-020	TBC H-32 BOOSTER	B5W5H4	0.000	-15.000	0.000
(RCX301)	◇	GAC HST-020	TBC H-32 BOOSTER	B9W5H4	0.000	-15.000	0.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4660	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF NOSE SHAPE

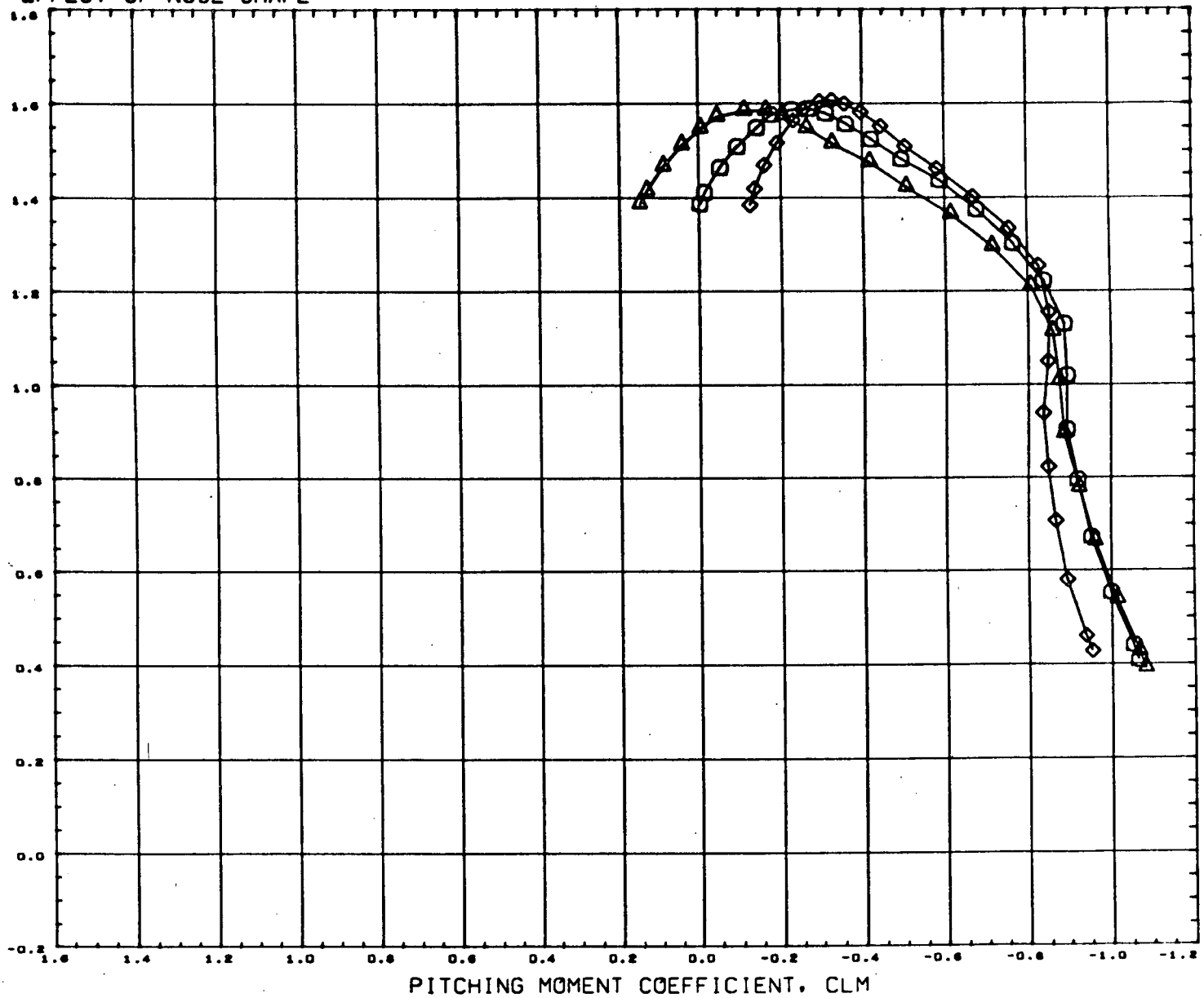


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			BETA	HTAIL	ELEVTR
(RCX131)	○	GAC HST-02G	TBC H-32 BOOSTER	B6W5H4	0.000	-15.000	0.000
(RCX321)	△	GAC HST-02D	TBC H-32 BOOSTER	B5W5H4	0.000	-15.000	0.000
(RCX301)	◇	GAC HST-02D	TBC H-32 BOOSTER	B9W5H4	0.000	-15.000	0.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4340	PERCNT

EFFECT OF NOSE SHAPE

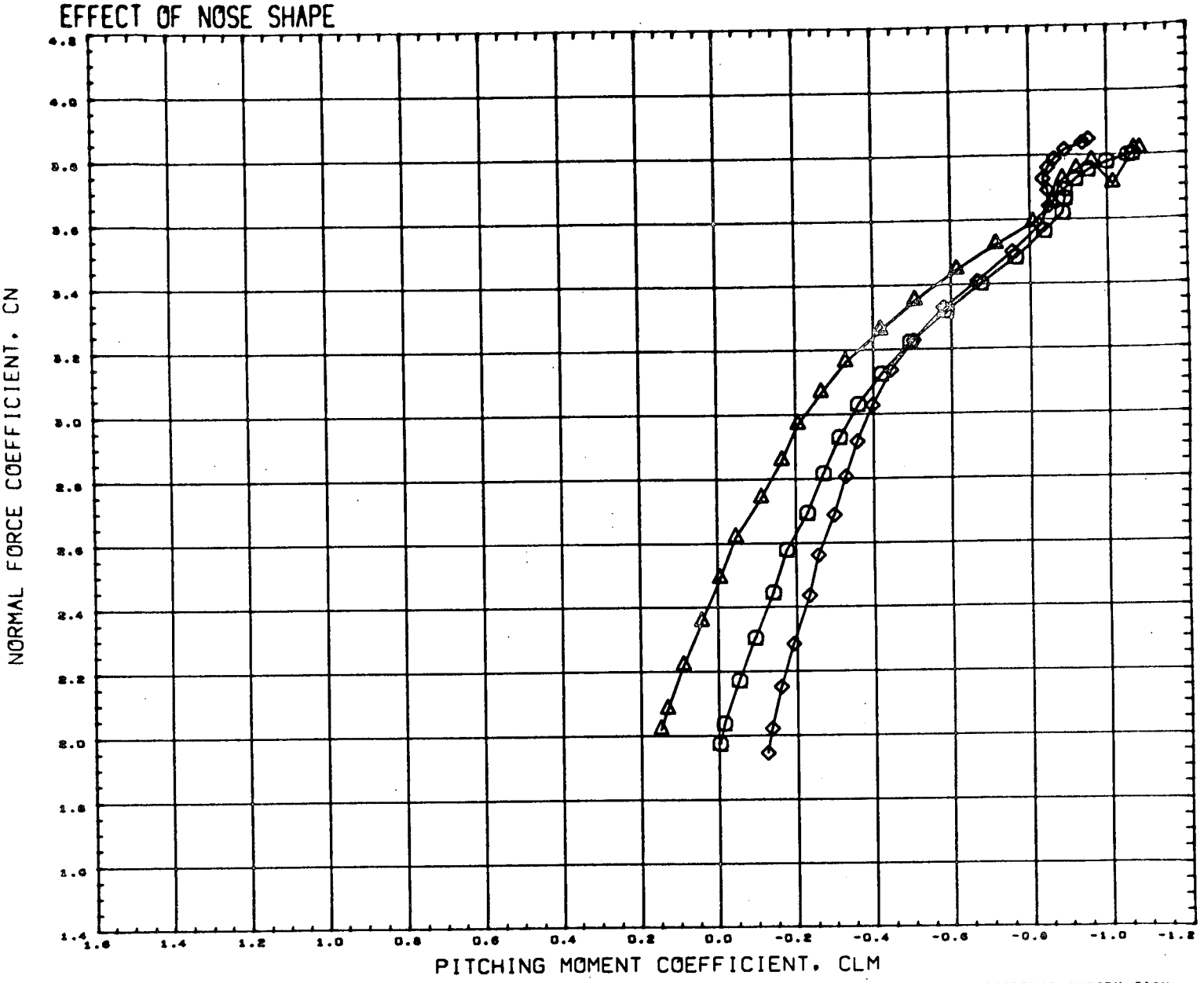


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			BETA	HTAIL	ELEVTR
(RCX131)	○	GAC HST-020	TBC H-32 BOOSTER	B6W5H4	0.000	-15.000	0.000
(RCX321)	☒	GAC HST-020	TBC H-32 BOOSTER	B5W5H4	0.000	-15.000	0.000
(RCX301)	◇	GAC HST-020	TBC H-32 BOOSTER	B9W5H4	0.000	-15.000	0.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF NOSE SHAPE



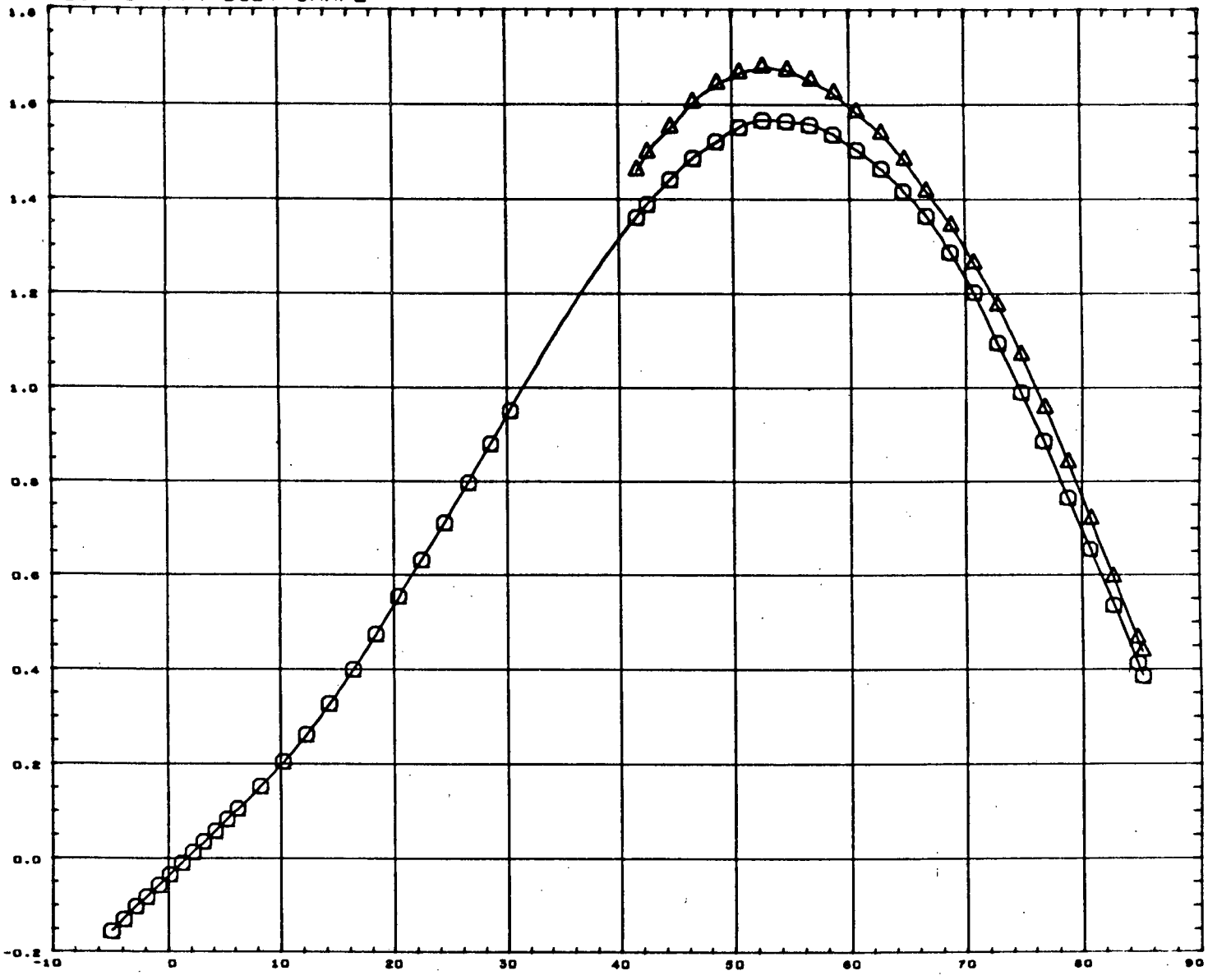
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			BETA	MTAIL	ELEVTR
(RCX131)	○	GAC HST-020	TBC H-32 BOOSTER	B6W5H4	0.000	-15.000	0.000
(RCX321)	△	GAC HST-020	TBC H-32 BOOSTER	B5W5H4	0.000	-15.000	0.000
(RCX301)	◇	GAC HST-020	TBC H-32 BOOSTER	B9W5H4	0.000	-15.000	0.000

MACH 0.120

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF AFT BODY SHAPE



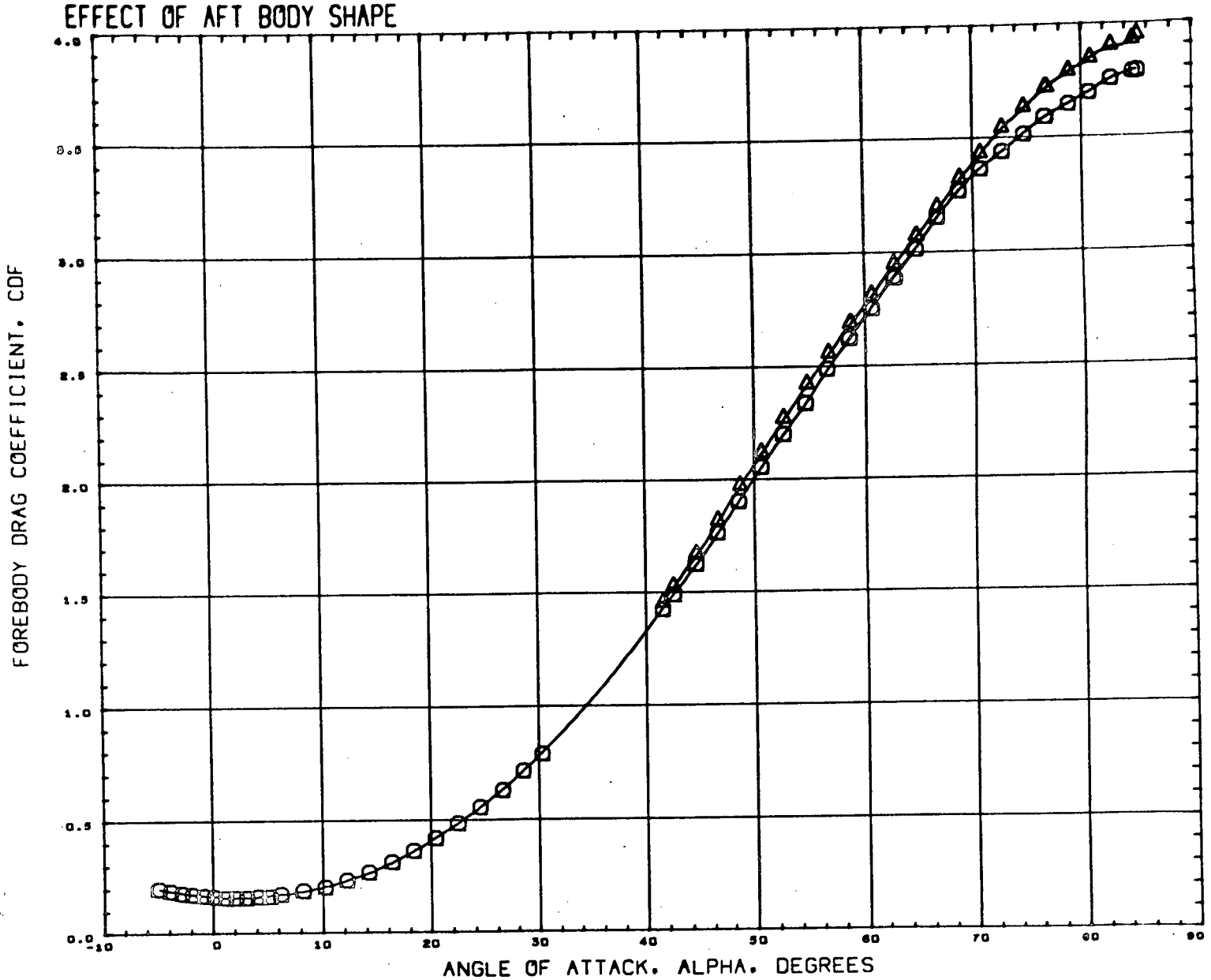
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	HTAIL	ELEVTR
(GCX081)		GAC HST-020 TBC H-32 BOOSTER B8W4H4V3	0.000	-15.000	0.000
(RCX181)		GAC HST-020 TBC H-32 BOOSTER B7W4H4	0.000	-15.000	0.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

30

EFFECT OF AFT BODY SHAPE

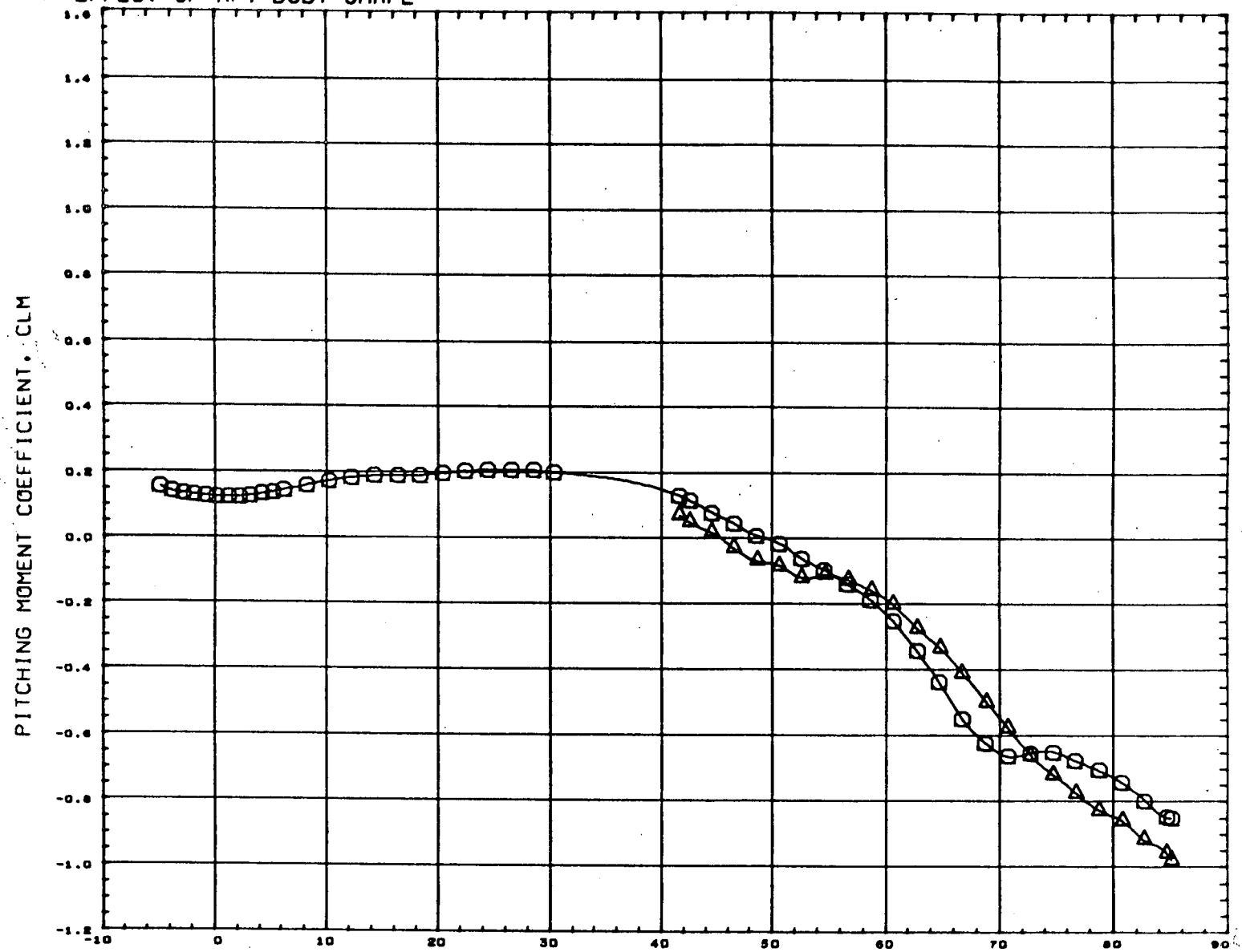


DATA SET SYMBOL		CONFIGURATION DESCRIPTION	BETA	HTAIL	ELEVTR
(GCX081)	○	GAC HST-020 TBC H-32 BOOSTER B8W4H4V3	0.000	-15.000	0.000
(RCX181)	△	GAC HST-020 TBC H-32 BOOSTER B7W4H4	0.000	-15.000	0.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF AFT BODY SHAPE



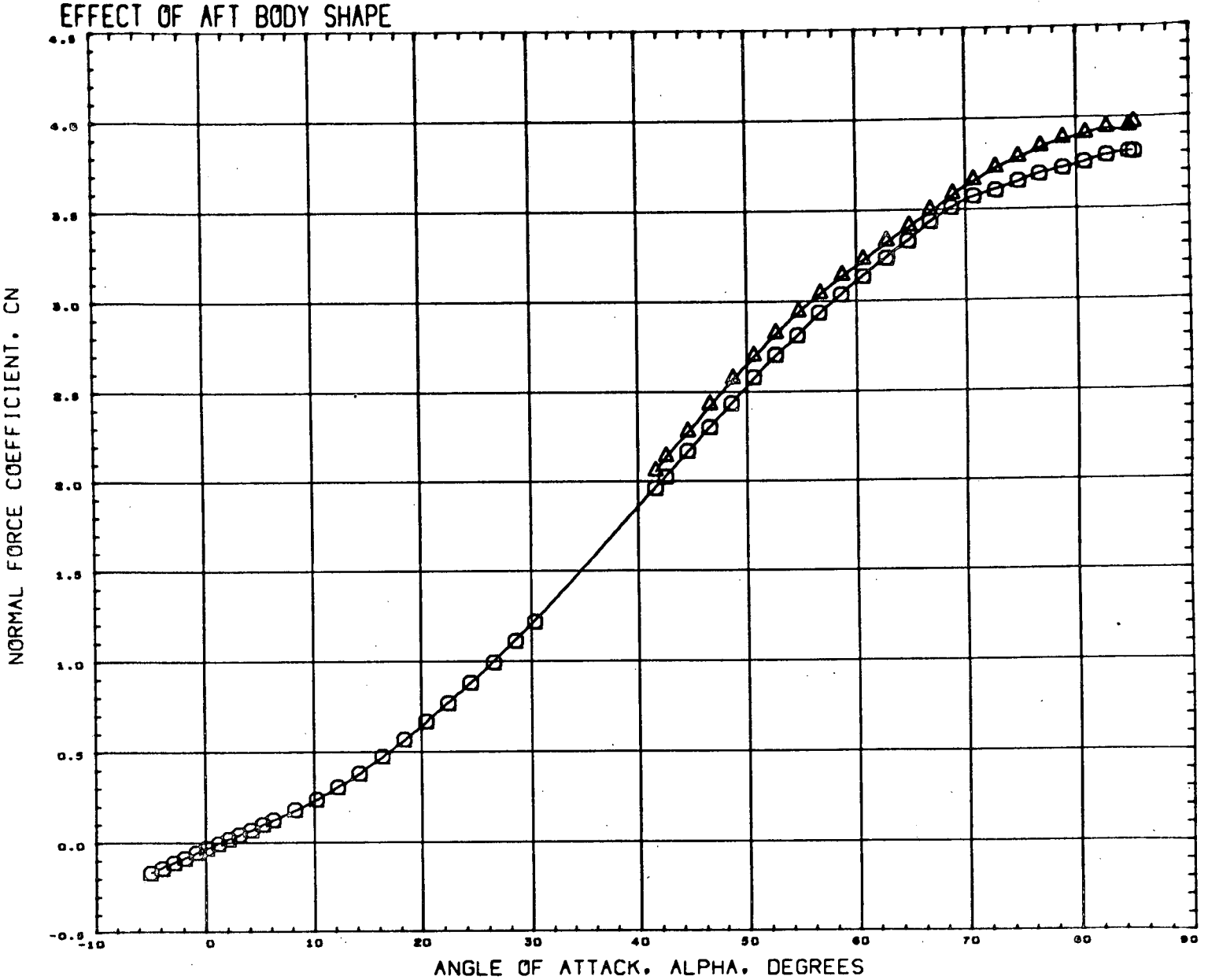
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	HTAIL	ELEVTR
(GCX081)	○	GAC HST-020 TBC H-32 BOOSTER B8W4H4V3	0.000	-15.000	0.000
(RCX181)	△	GAC HST-020 TBC H-32 BOOSTER B7W4H4	0.000	-15.000	0.000

MACH 0.120

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4340	PERCNT

EFFECT OF AFT BODY SHAPE

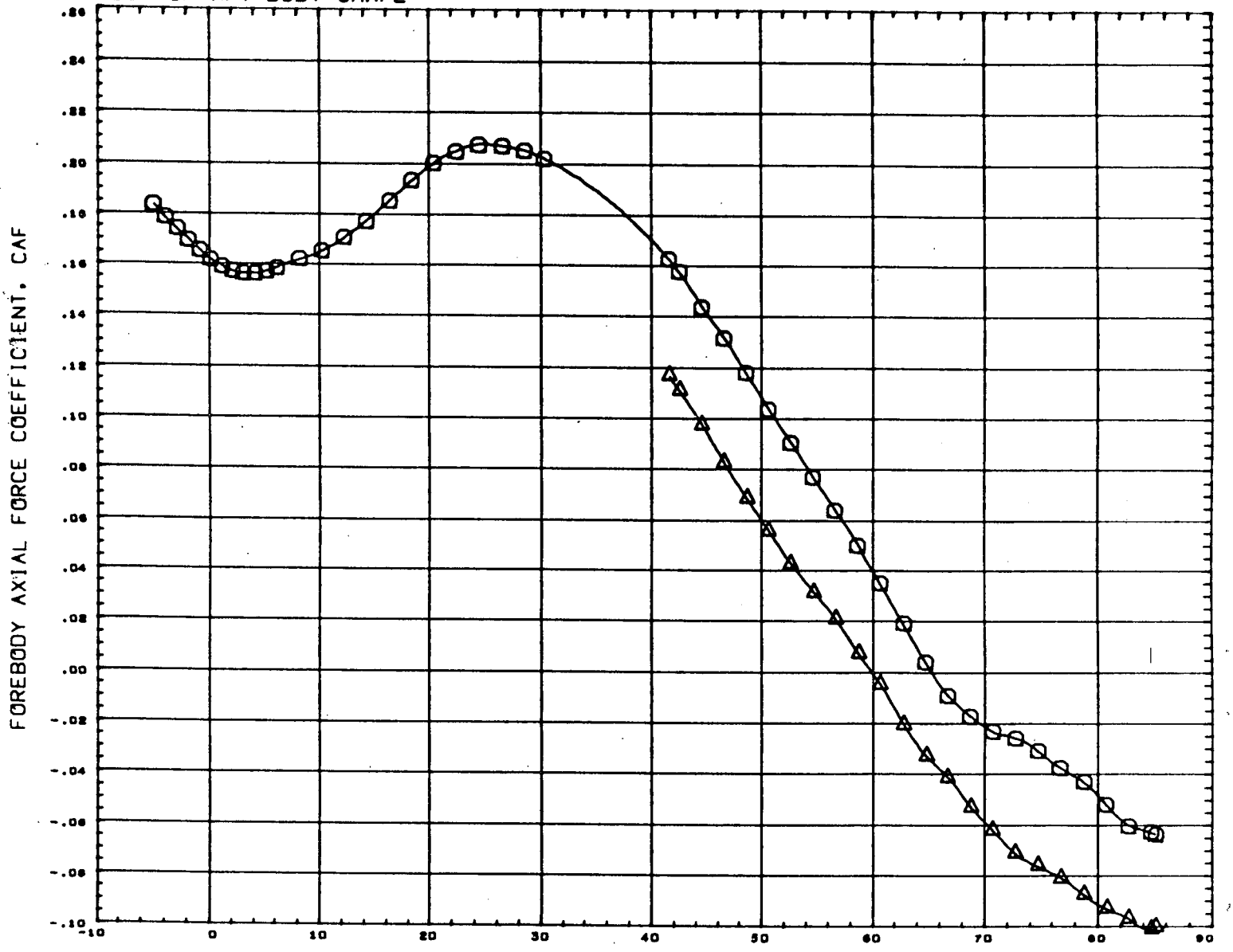


DATA SET SYMBOL		CONFIGURATION DESCRIPTION	BETA	HTAIL	ELEVTR
(GCX081)	○	GAC HST-020 TBC H-32 BOOSTER B8W4H4V3	0.000	-15.000	0.000
(RCX101)	△	GAC HST-020 TBC H-32 BOOSTER B7W4H4	0.000	-15.000	0.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4660	INCHES
BREF	9.6520	INCHES
XMRP	7.0210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.9870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF AFT BODY SHAPE

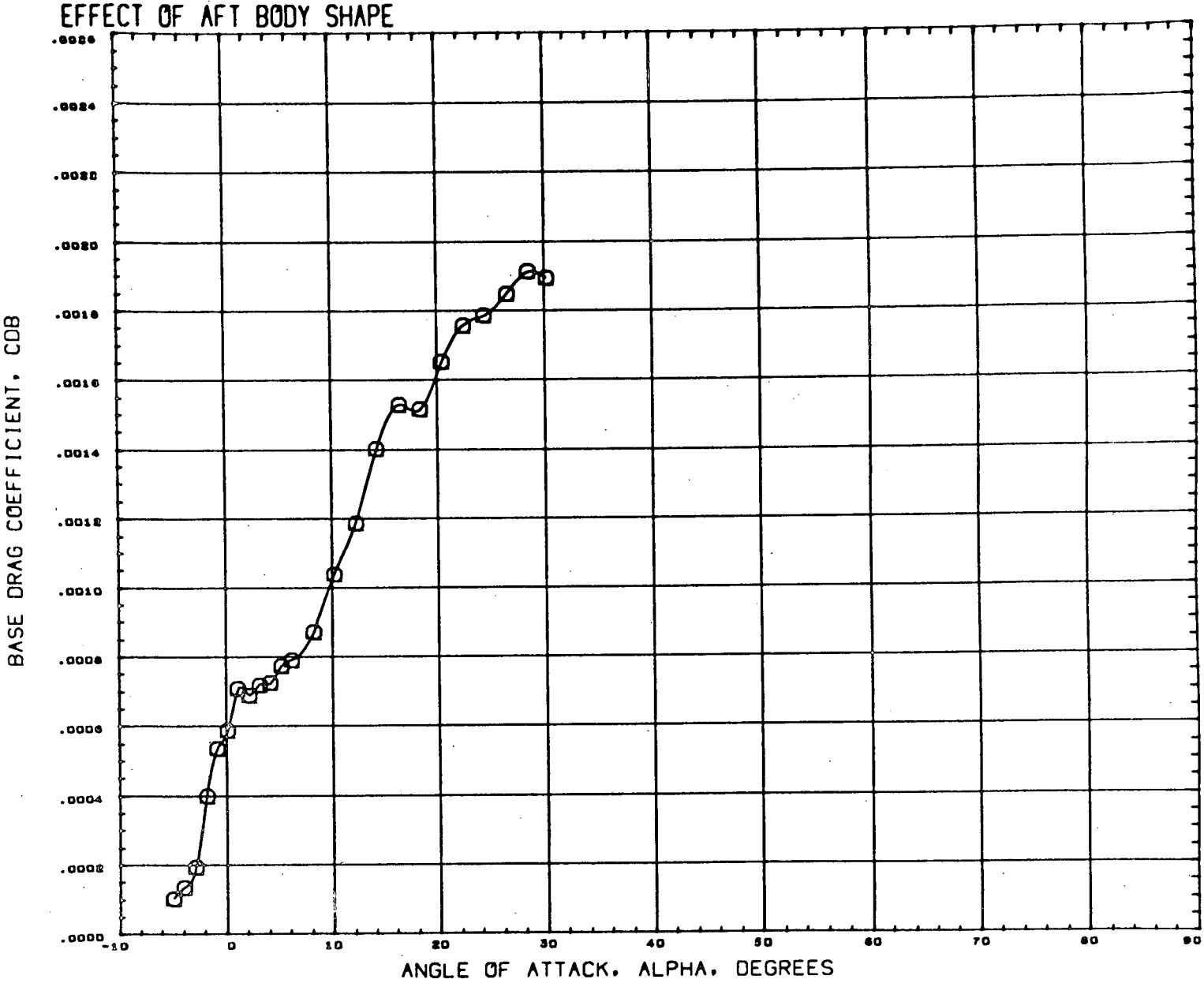


DATA SET SYMBOL		CONFIGURATION DESCRIPTION	BETA	HTAIL	ELEVTR
(GCX081)	○	GAC HST-020 TBC H-32 BOOSTER B8W4H4V3	0.000	-15.000	0.000
(RCX181)	△	GAC HST-020 TBC H-32 BOOSTER B7W4H4	0.000	-15.000	0.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF AFT BODY SHAPE



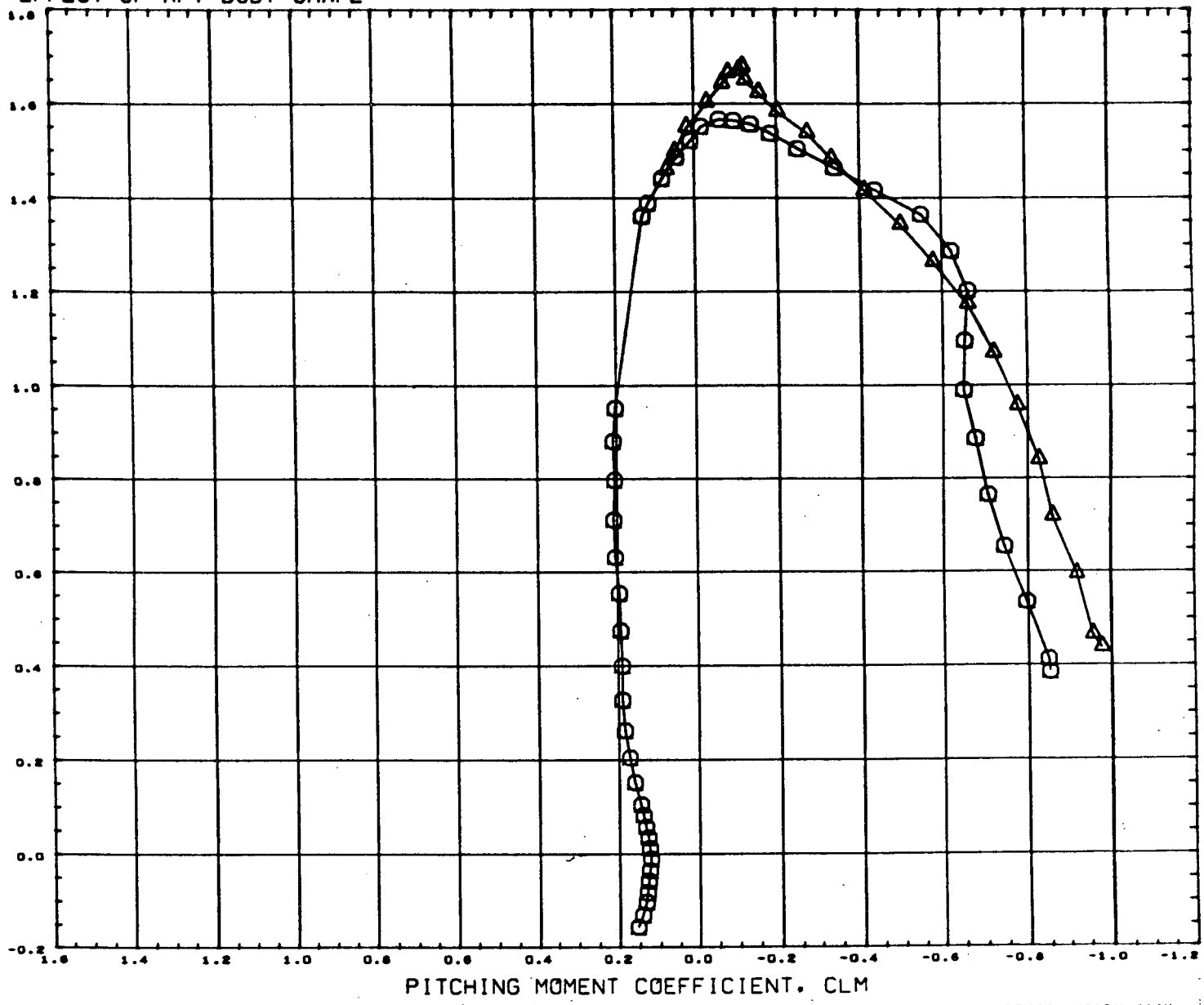
SYMBOL	MACH	PARAMETRIC VALUES			
○	8.120	BETA	0.000	HTAIL	- 15.000
		ELEVTR	0.000		

DATA HIST. CODE MVT*EV

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF AFT BODY SHAPE

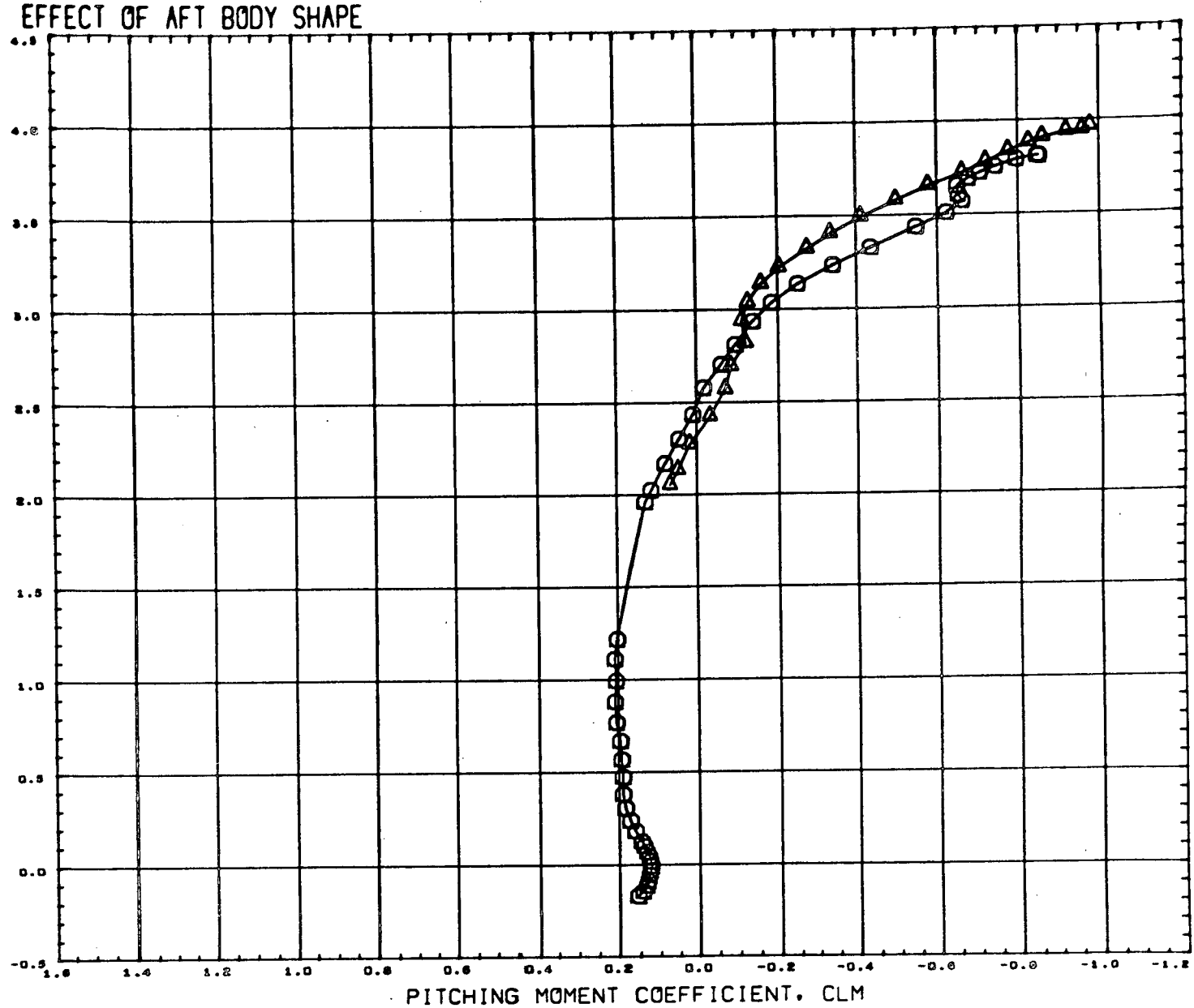


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	HTAIL	ELEVTR
(GCX001)		GAC HST-020 TBC H-32 BOOSTER B8W4H4V3	0.000	-15.000	0.000
(RCX101)		GAC HST-020 TBC H-32 BOOSTER B7W4H4	0.000	-15.000	0.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4660	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4340	PERCNT

EFFECT OF AFT BODY SHAPE

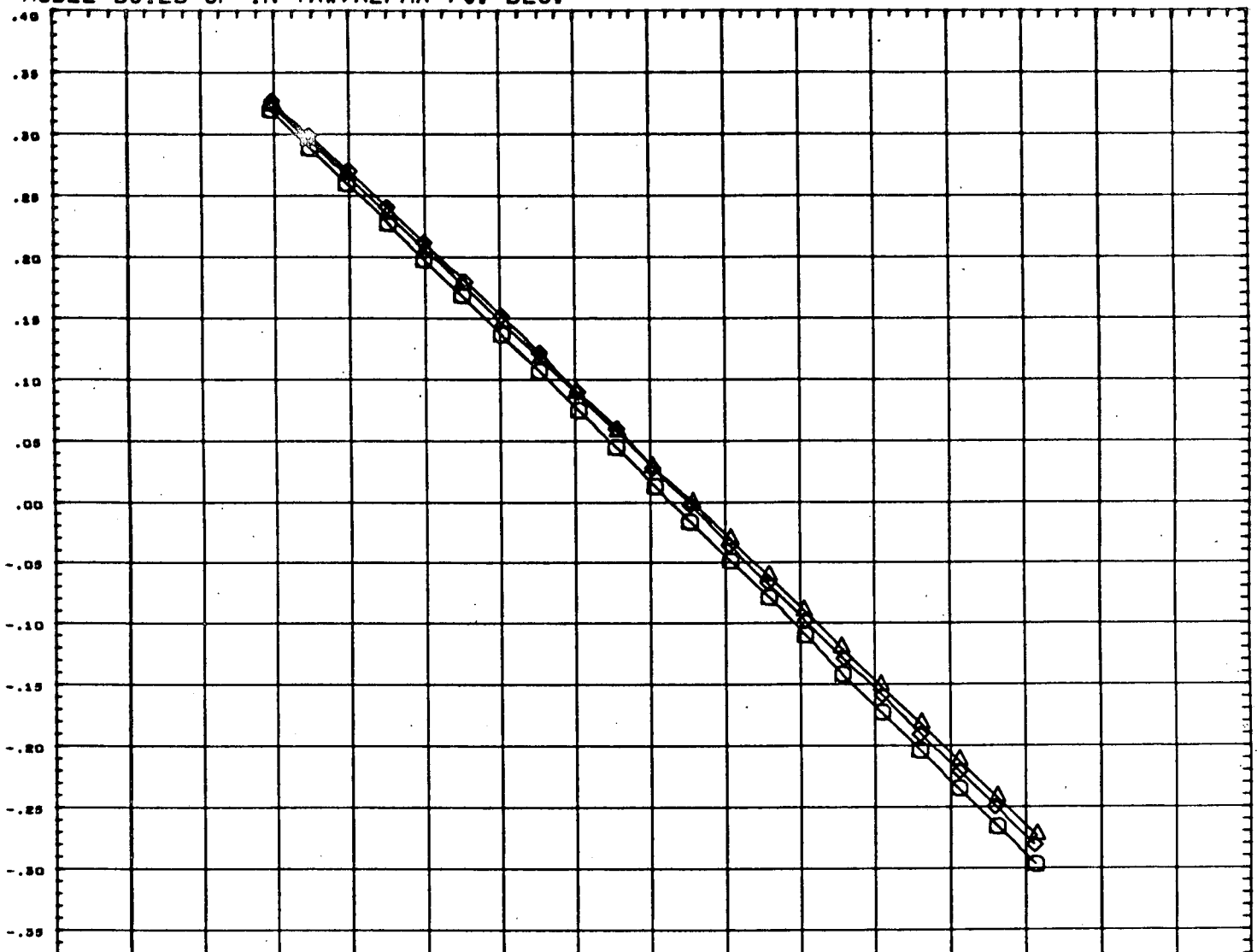


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	HTAIL	ELEVTR
(GCX061)		GAC HST-020 TBC H-32 BOOSTER B8W4H4V3	0.000	-15.000	0.000
(RCX161)		GAC HST-020 TBC H-32 BOOSTER B7W4H4	0.000	-15.000	0.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

MODEL BUILD-UP IN YAW. ALPHA=70. DEG.

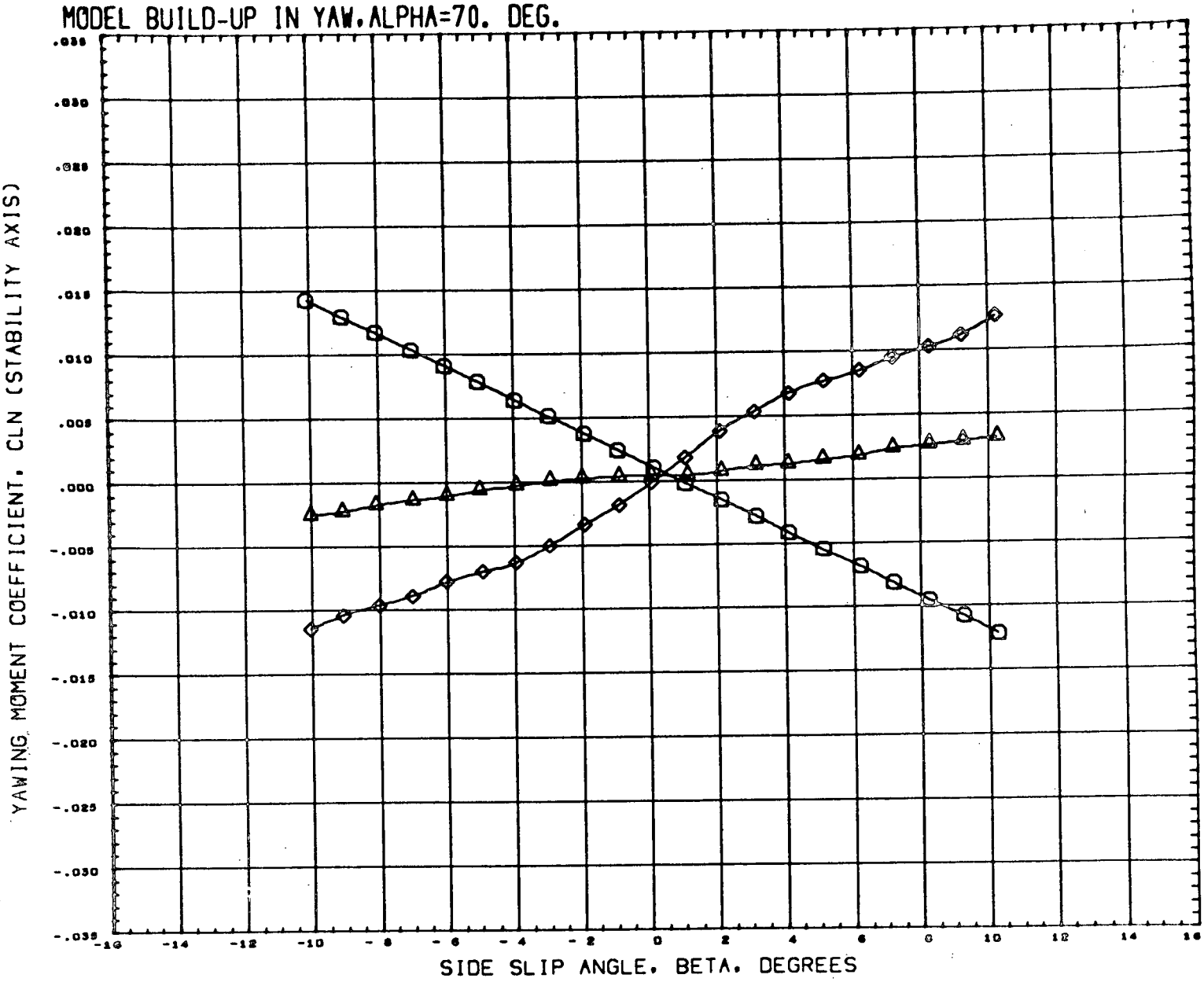


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			ALPHA	ELEVTR	HTAIL
(FCX013)	○	GAC HST-020	TBC H-32 BOOSTER	B6	70.000		
(FCX023)	△	GAC HST-020	TBC H-32 BOOSTER	B6W4	70.000		
(FCX063)	◇	GAC HST-020	TBC H-32 BOOSTER	B6W4H4	70.000	0.000	-15.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

MODEL BUILD-UP IN YAW, ALPHA=70. DEG.



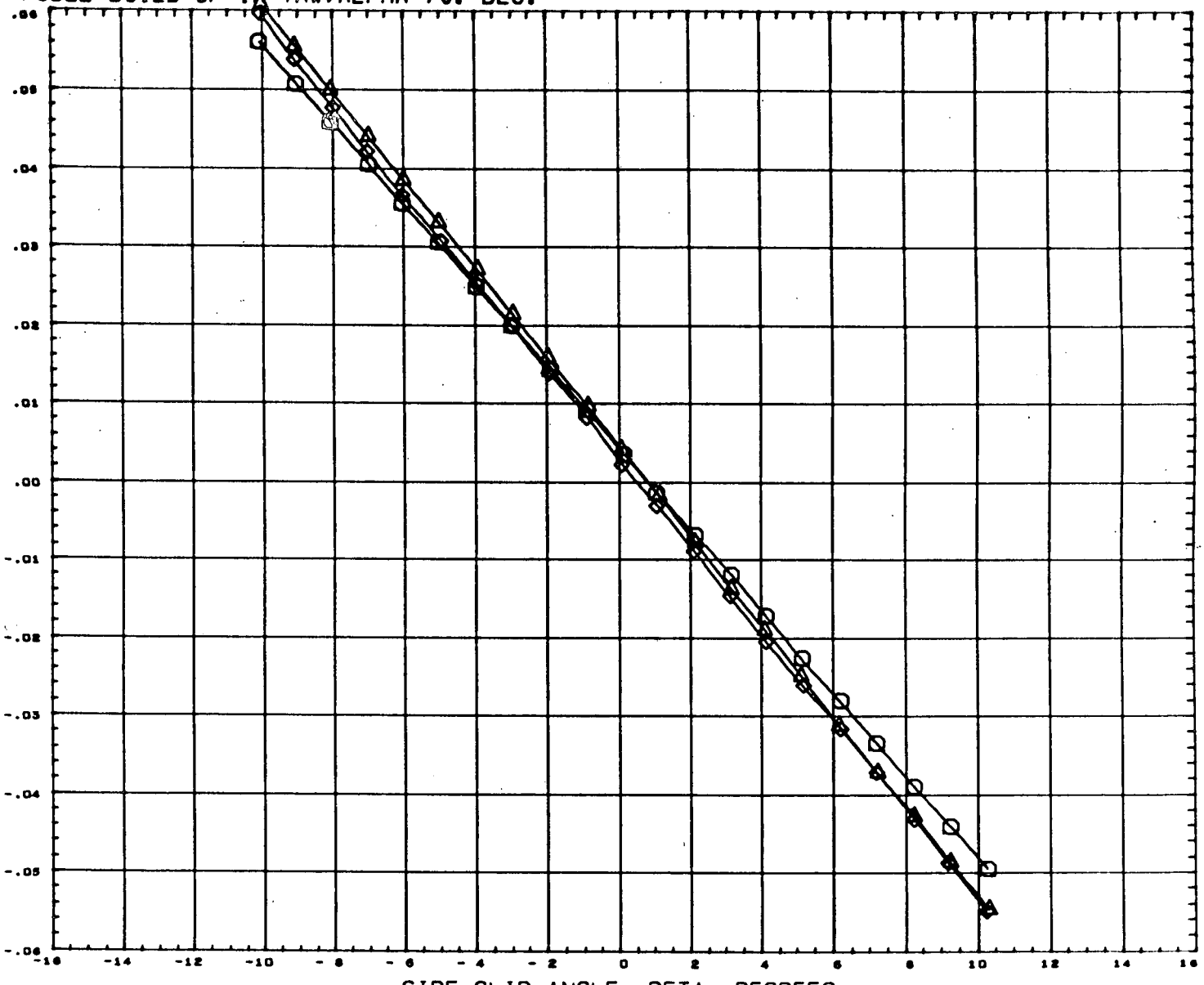
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			ALPHA	ELEVTR	HTAIL
(FCX013)	○	GAC MST-020	TBC H-32 BOOSTER	B6	70.000		
(FCX023)	△	GAC MST-020	TBC H-32 BOOSTER	B6W4	70.000		
(FCX083)	◇	GAC MST-020	TBC H-32 BOOSTER	B6W4H4	70.000	0.000	-15.000

MACH 0.120

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4660	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4346	PERCNT

MODEL BUILD-UP IN YAW. ALPHA=70. DEG.

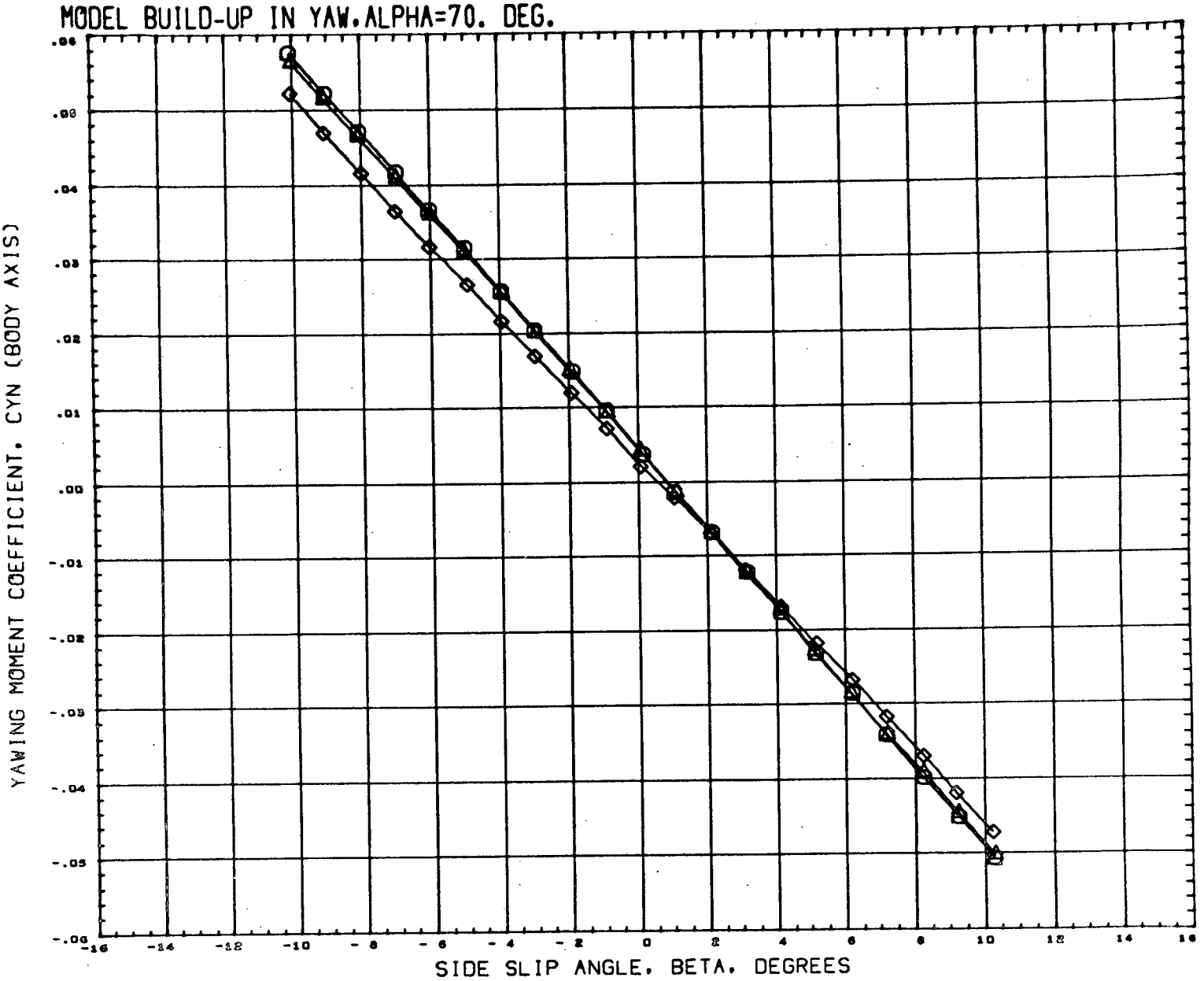


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			ALPHA	ELEVTR	HTAIL
(FCX013)	○	GAC HST-020	TBC H-32 BOOSTER	B6	70.000		
(FCX023)	△	GAC HST-020	TBC H-32 BOOSTER	B6W4	70.000		
(FCX083)	◇	GAC HST-020	TBC H-32 BOOSTER	B6W4H4	70.000	0.000	-15.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

MODEL BUILD-UP IN YAW. ALPHA=70. DEG.



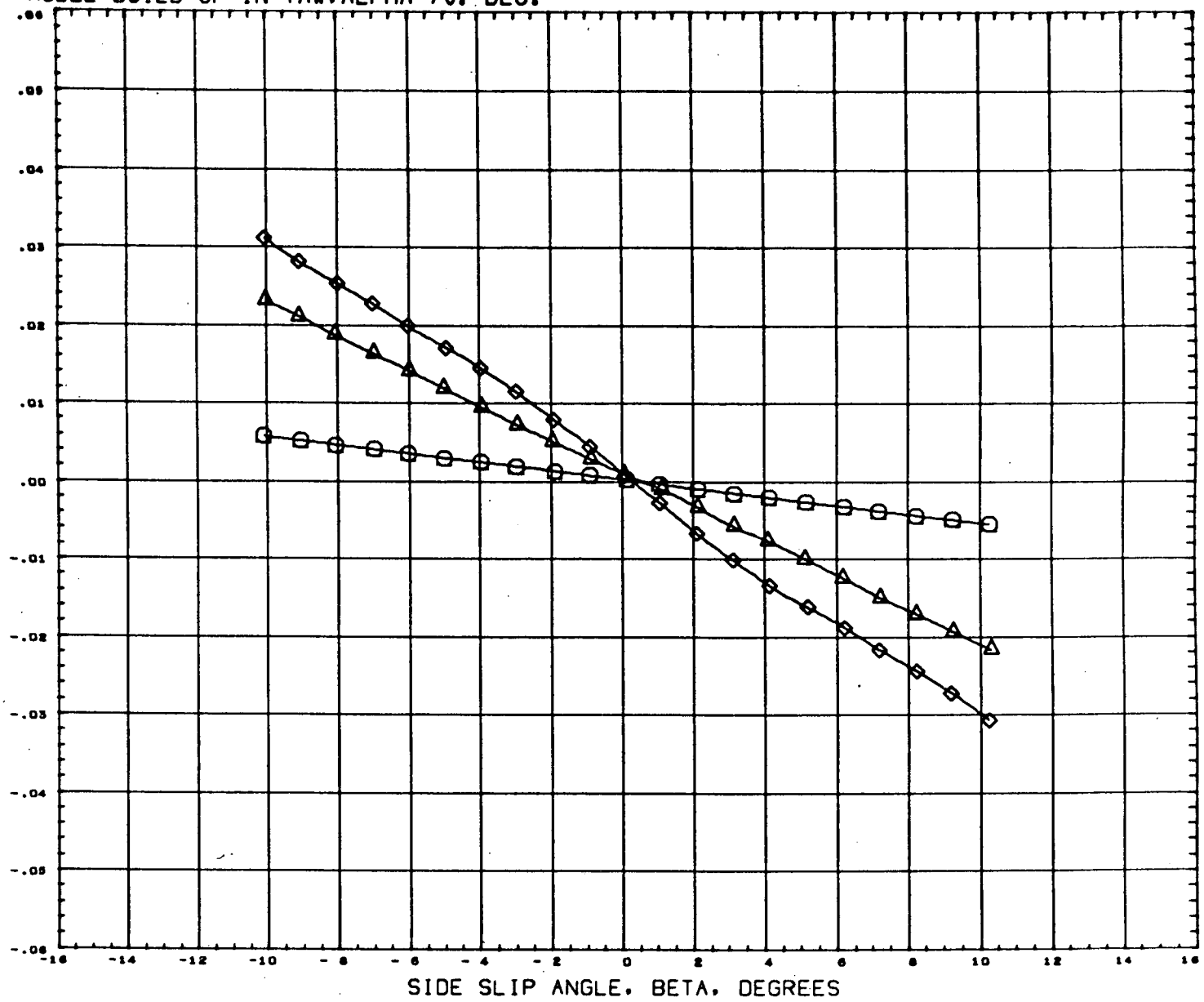
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			ALPHA	ELEVTR	HTAIL
(FCX013)	○	GAC HST-020	TBC H-32 BOOSTER	B6	70.000		
(FCX023)	⊠	GAC HST-020	TBC H-32 BOOSTER	B6W4	70.000		
(FCX063)	◇	GAC HST-020	TBC H-32 BOOSTER	B6W4H4	70.000	0.000	-15.000

MACH 0.120

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4660	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

MODEL BUILD-UP IN YAW, ALPHA=70. DEG.

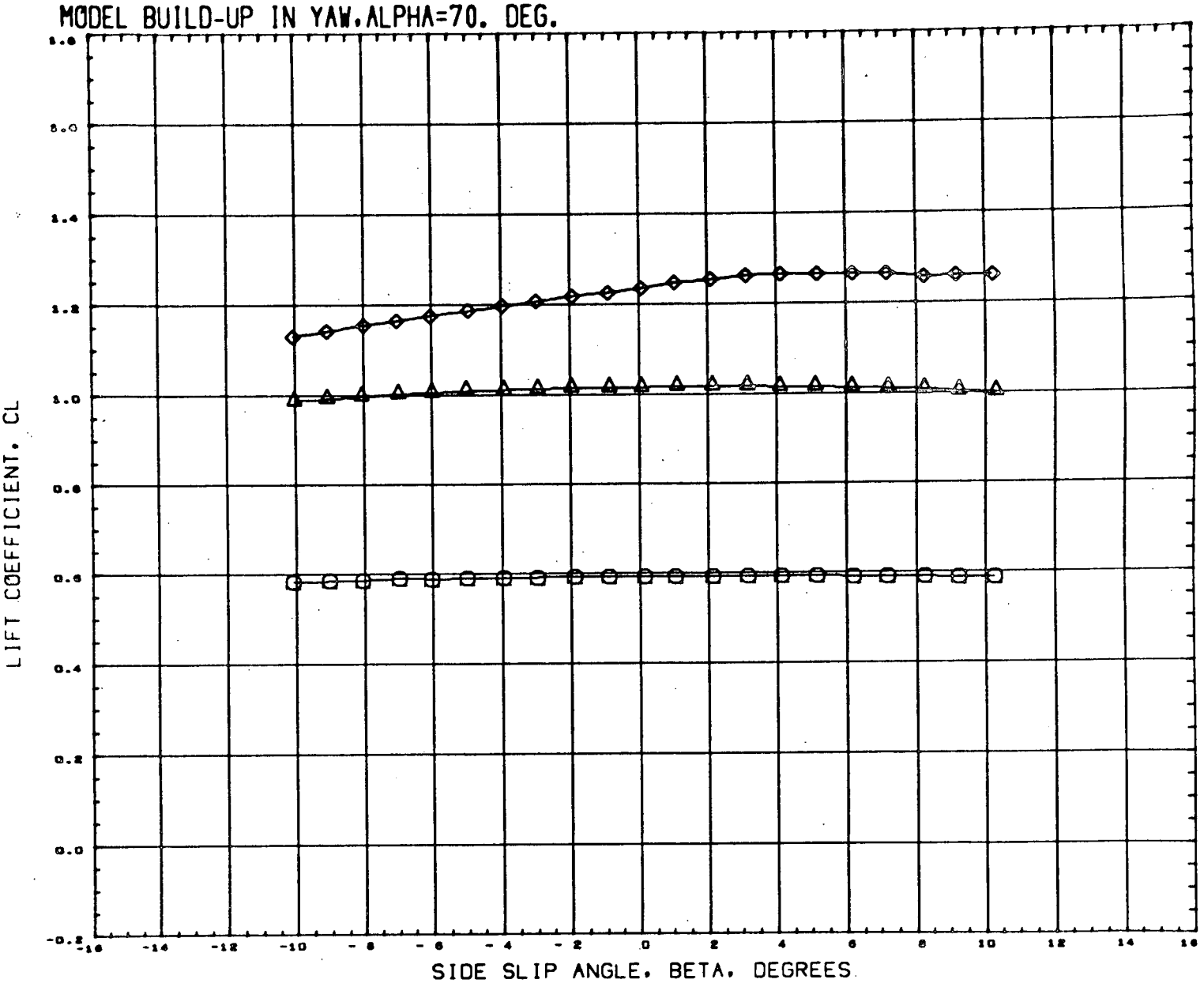


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			ALPHA	ELEVTR	HTAIL
(FCX013)	○	GAC HST-020	TBC H-32 BOOSTER	B6	70.000		
(FCX023)	△	GAC HST-020	TBC H-32 BOOSTER	B6W4	70.000		
(FCX063)	◇	GAC HST-020	TBC H-32 BOOSTER	B6W4H4	70.000	0.000	-15.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

MODEL BUILD-UP IN YAW, ALPHA=70. DEG.

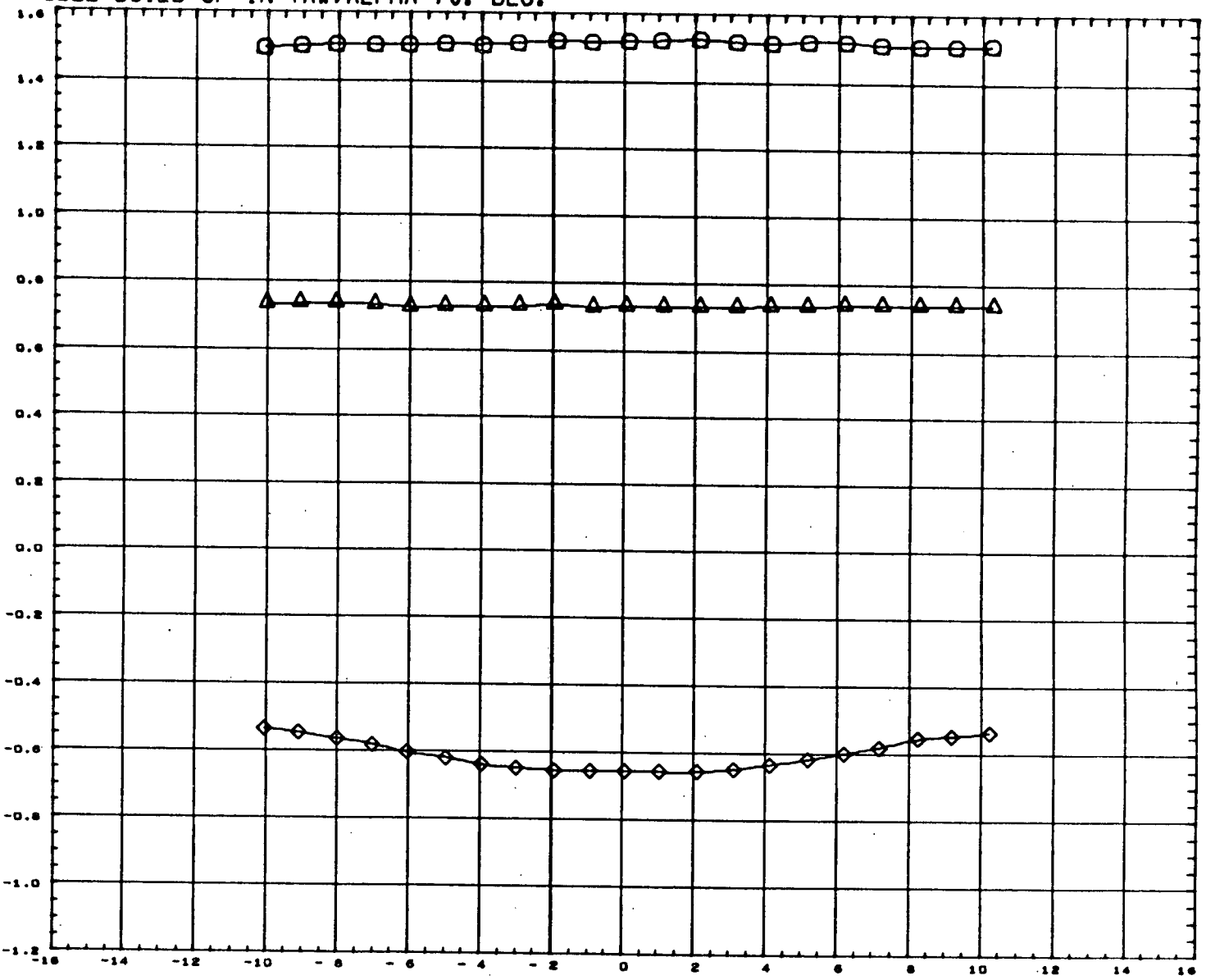


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			ALPHA	ELEVTR	HTAIL
(FCX013)	○	GAC HST-020	TBC H-32 BOOSTER	B6	70.000		
(FCX023)	△	GAC HST-020	TBC H-32 BOOSTER	B6W4	70.000		
(FCX063)	◇	GAC HST-020	TBC H-32 BOOSTER	B6W4H4	70.000	0.000	-15.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4660	INCHES
BREF	9.6520	INCHES
XMRP	7.6210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4346	PERCNT

MODEL BUILD-UP IN YAW. ALPHA=70. DEG.



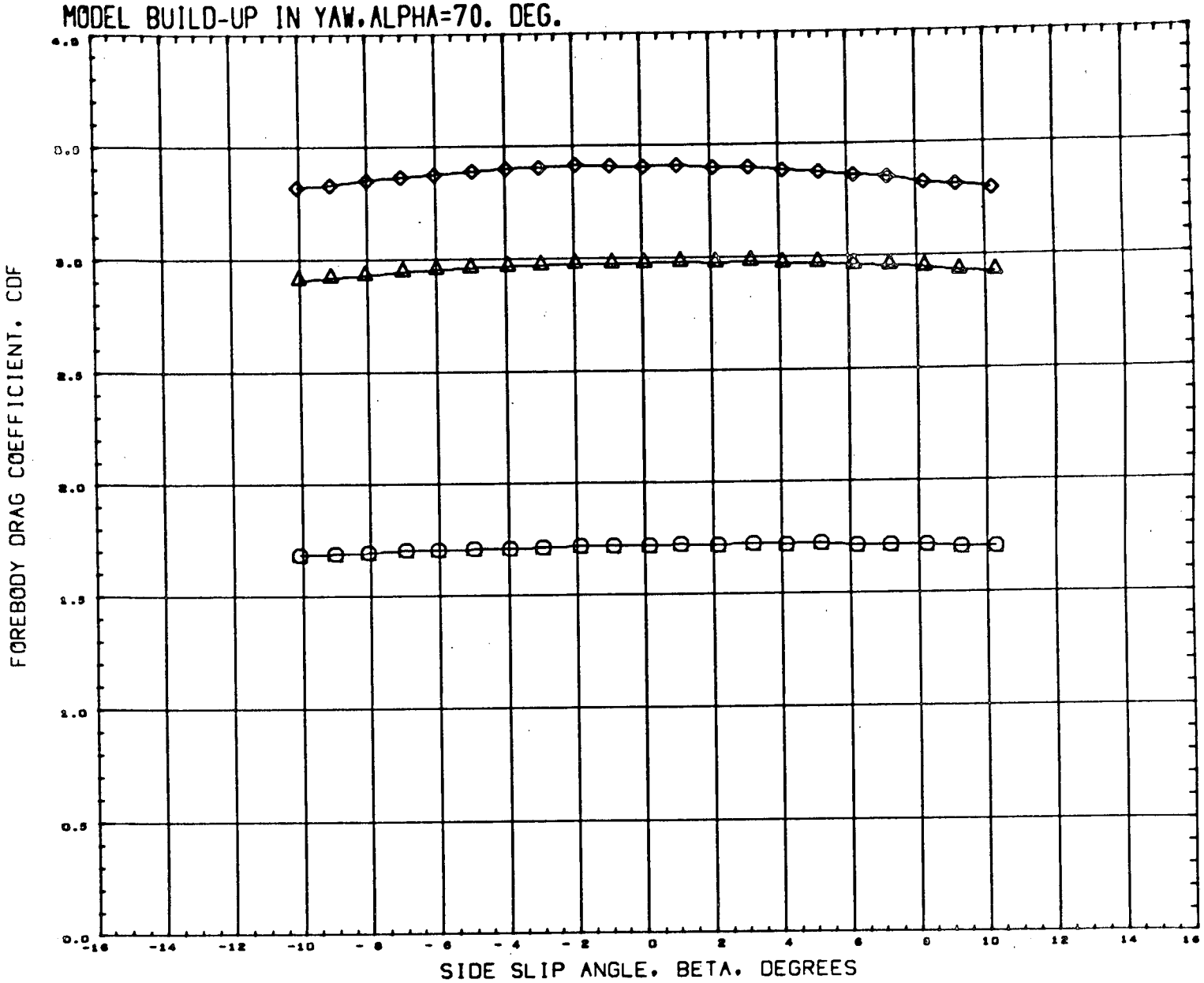
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		
(FCX013)	○	GAC HST-020	TBC H-32 BOOSTER	B6
(FCX023)	△	GAC HST-020	TBC H-32 BOOSTER	B6W4
(FCX083)	◇	GAC HST-020	TBC H-32 BOOSTER	B6W4H4

ALPHA	ELEVTR	HTAIL
70.000		
70.000		
70.000	0.000	-15.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4660	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

MODEL BUILD-UP IN YAW, ALPHA=70. DEG.



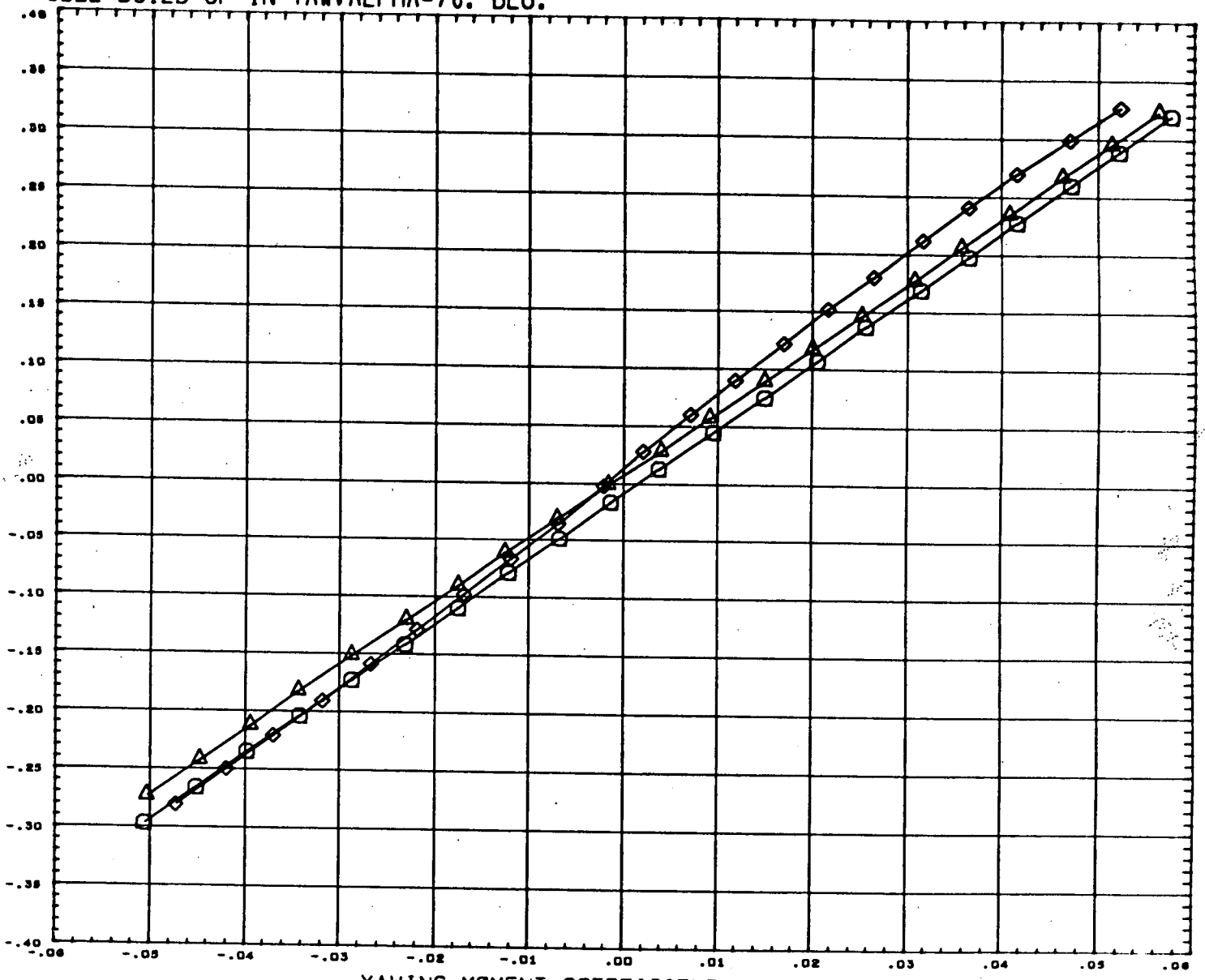
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			ALPHA	ELEVTR	HTAIL
(FCX013)	○	GAC HST-020	TBC H-32 BOOSTER	B6	70.000		
(FCX023)	△	GAC HST-020	TBC H-32 BOOSTER	B6W4	70.000		
(FCX063)	◇	GAC HST-020	TBC H-32 BOOSTER	B6W4H4	70.000	0.000	-15.000

MACH 0.120

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.3870	INCHES
SCALE	0.4348	PERCNT

MODEL BUILD-UP IN YAW. ALPHA=70. DEG.



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		
(FCX013)	○	GAC HST-020	TBC H-32 BOOSTER	B6
(FCX023)	△	GAC HST-020	TBC H-32 BOOSTER	B6W4
(FCX063)	◇	GAC HST-020	TBC H-32 BOOSTER	B6W4H4

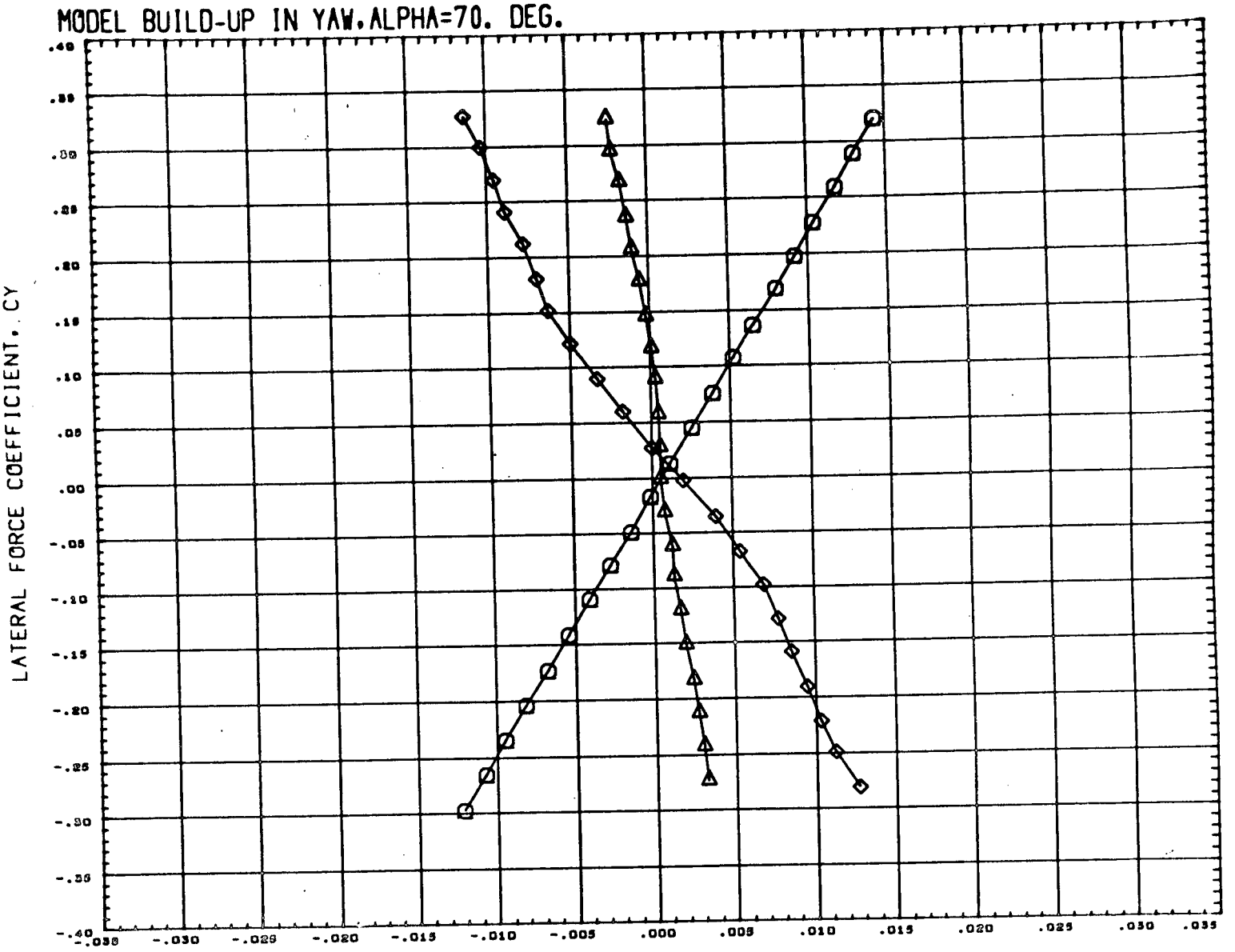
ALPHA	ELEVTR	HTAIL
70.000		
70.000		
70.000	0.000	-15.000

MACH 0.120

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

MODEL BUILD-UP IN YAW. ALPHA=70. DEG.



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		
(FCX013)	○	GAC HST-020	TBC H-32 BOOSTER	B6
(FCX023)	△	GAC HST-020	TBC H-32 BOOSTER	B6W4
(FCX063)	◇	GAC HST-020	TBC H-32 BOOSTER	B6W4H4

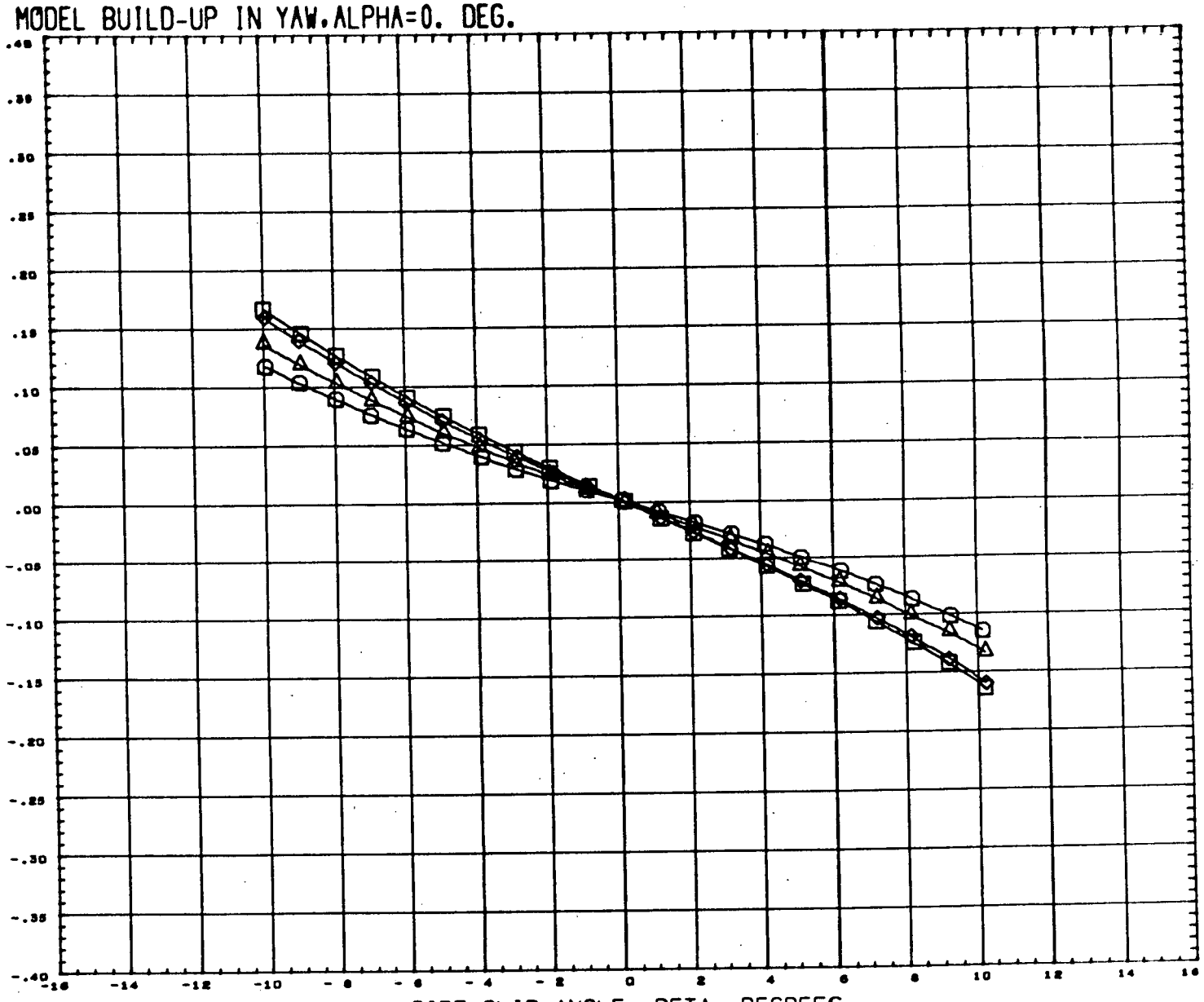
ALPHA	ELEVTR	HTAIL
70.000		
70.000		
70.000	0.000	-15.000

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4660	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

MACH 8.120

MODEL BUILD-UP IN YAW. ALPHA=0. DEG.



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		
(FCX284)	○	GAC HST-020	TBC H-32 BOOSTER	B8
(FCX294)	△	GAC HST-020	TBC H-32 BOOSTER	B8W4
(FCX204)	◇	GAC HST-020	TBC H-32 BOOSTER	B8W4V3
(FCX224)	□	GAC HST-020	TBC H-32 BOOSTER	B8W4H4V3

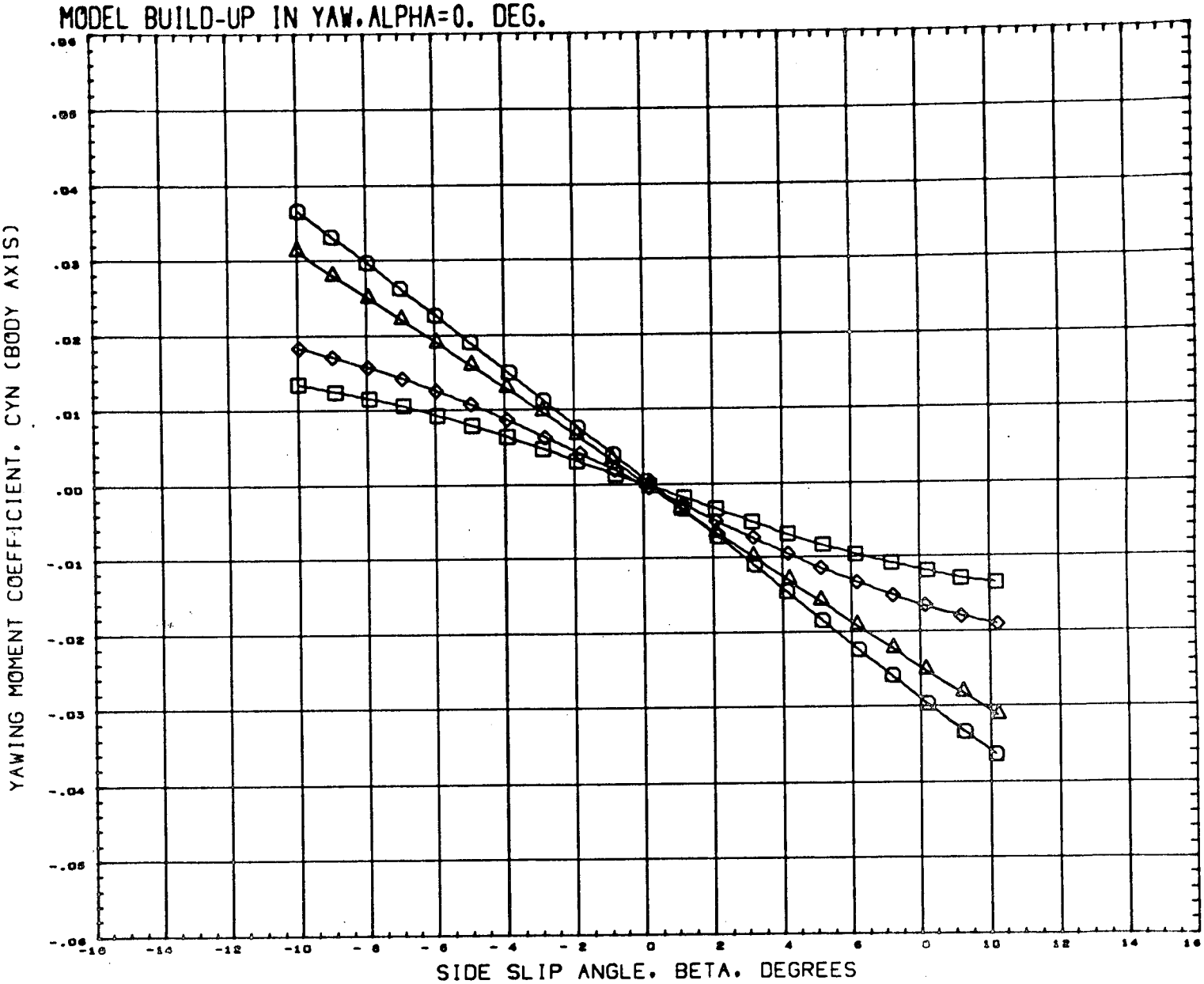
ALPHA	ELEVTR	HTAIL
0.000		
0.000		
0.000		
	0.000	-15.000

MACH 0.120

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.3870	INCHES
SCALE	0.4340	PERCNT

MODEL BUILD-UP IN YAW, ALPHA=0. DEG.

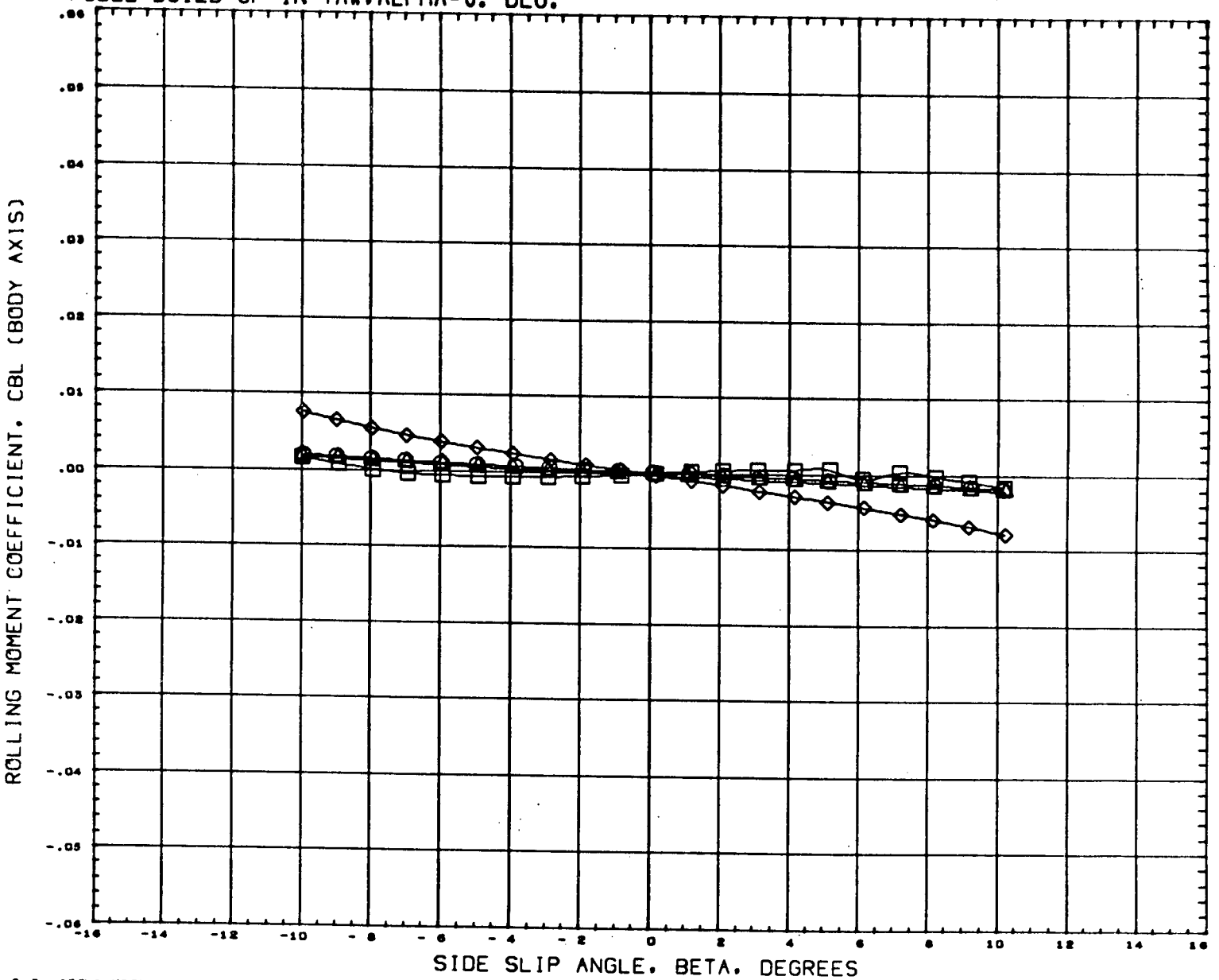


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			ALPHA	ELEVTR	HTAIL
(FCX204)	○	GAC HST-020	TBC H-32 BOOSTER	B0	0.000		
(FCX294)	△	GAC HST-020	TBC H-32 BOOSTER	B0W4	0.000		
(FCX204)	◇	GAC HST-020	TBC H-32 BOOSTER	B0W4V3	0.000		
(FCX224)	□	GAC HST-020	TBC H-32 BOOSTER	B0W4H4V3		0.000	-15.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.3870	INCHES
SCALE	0.4348	PERCNT

MODEL BUILD-UP IN YAW. ALPHA=0. DEG.



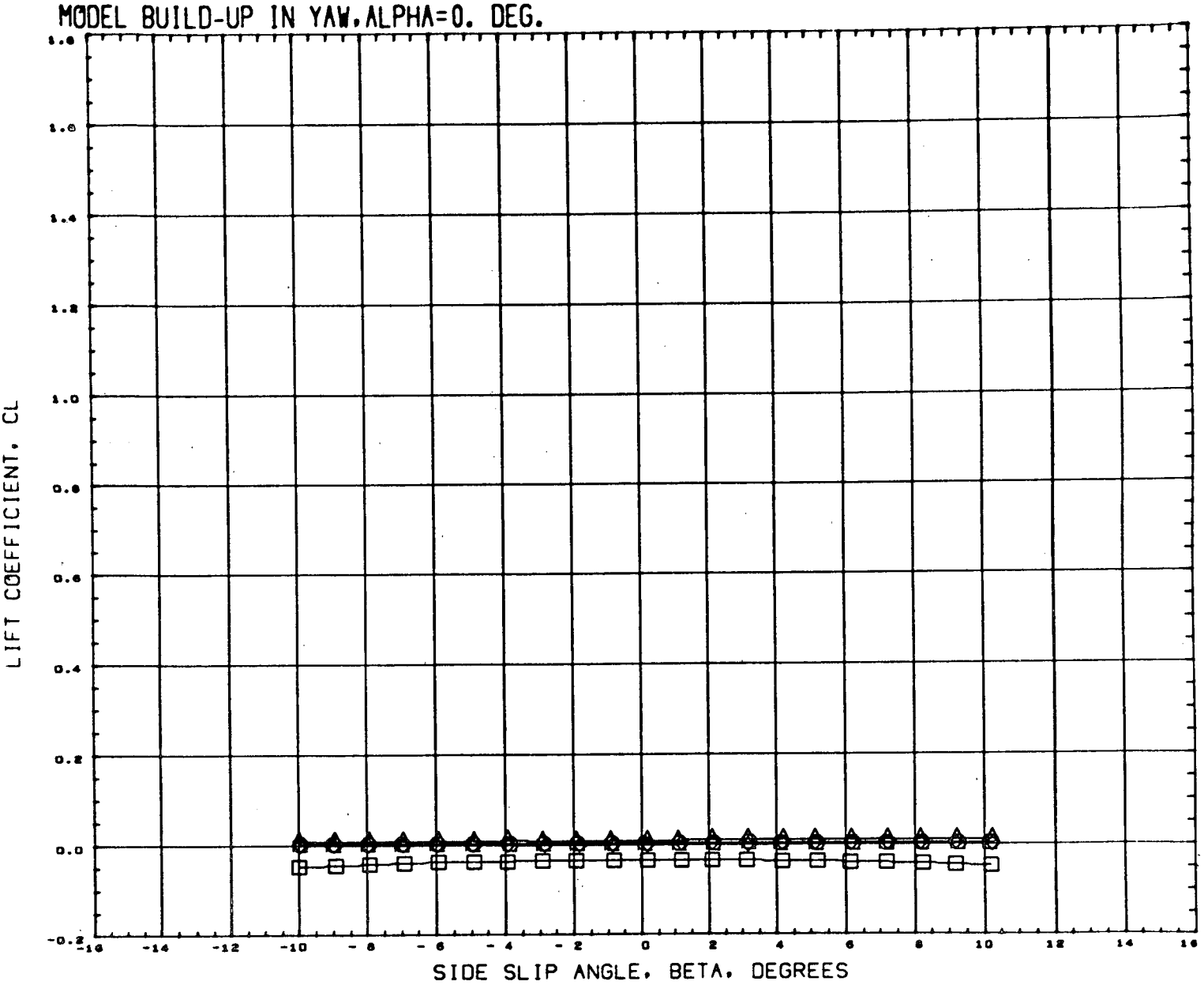
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		
(FCX284)	○	GAC HST-020	TBC H-32 BOOSTER	B8
(FCX294)	△	GAC HST-020	TBC H-32 BOOSTER	B8W4
(FCX204)	◇	GAC HST-020	TBC H-32 BOOSTER	B8W4V3
(FCX224)	□	GAC HST-020	TBC H-32 BOOSTER	B8W4H4V3

MACH 0.120

ALPHA	ELEVTR	HTAIL
0.000		
0.000		
0.000		
	0.000	-15.000

REFERENCE INFORMATION		
SREF	13.3440	80.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.3870	INCHES
SCALE	0.4348	PERCNT

MODEL BUILD-UP IN YAW, ALPHA=0. DEG.

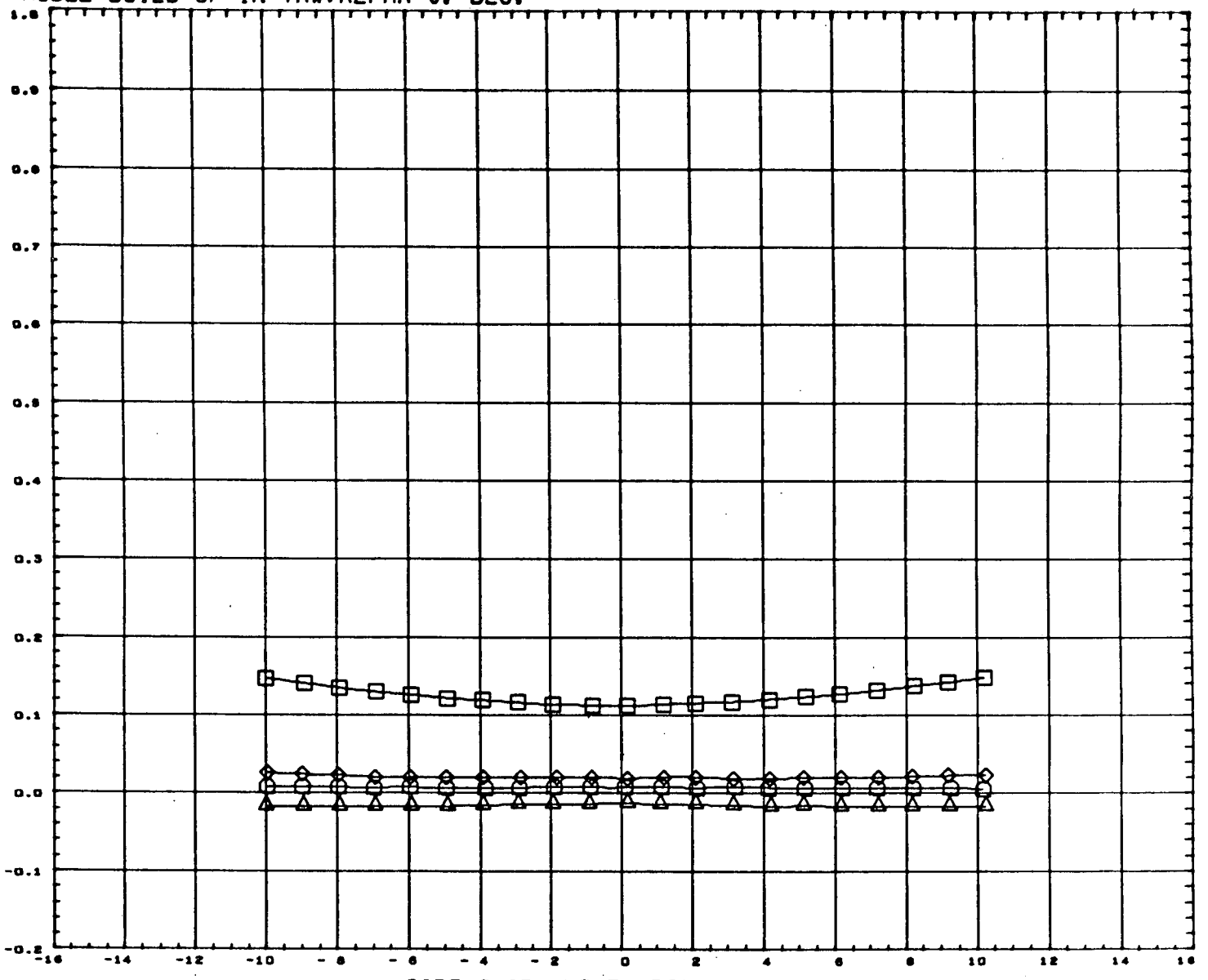


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			ALPHA	ELEVTR	HTAIL
(FCX204)	○	GAC HST-020	TBC H-32 BOOSTER	B8	0.000		
(FCX294)	△	GAC HST-020	TBC H-32 BOOSTER	B8W4	0.000		
(FCX204)	◇	GAC HST-020	TBC H-32 BOOSTER	B8W4V3	0.000		
(FCX224)	□	GAC HST-020	TBC H-32 BOOSTER	B8W4H4V3		0.000	-15.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

MODEL BUILD-UP IN YAW. ALPHA=0. DEG.

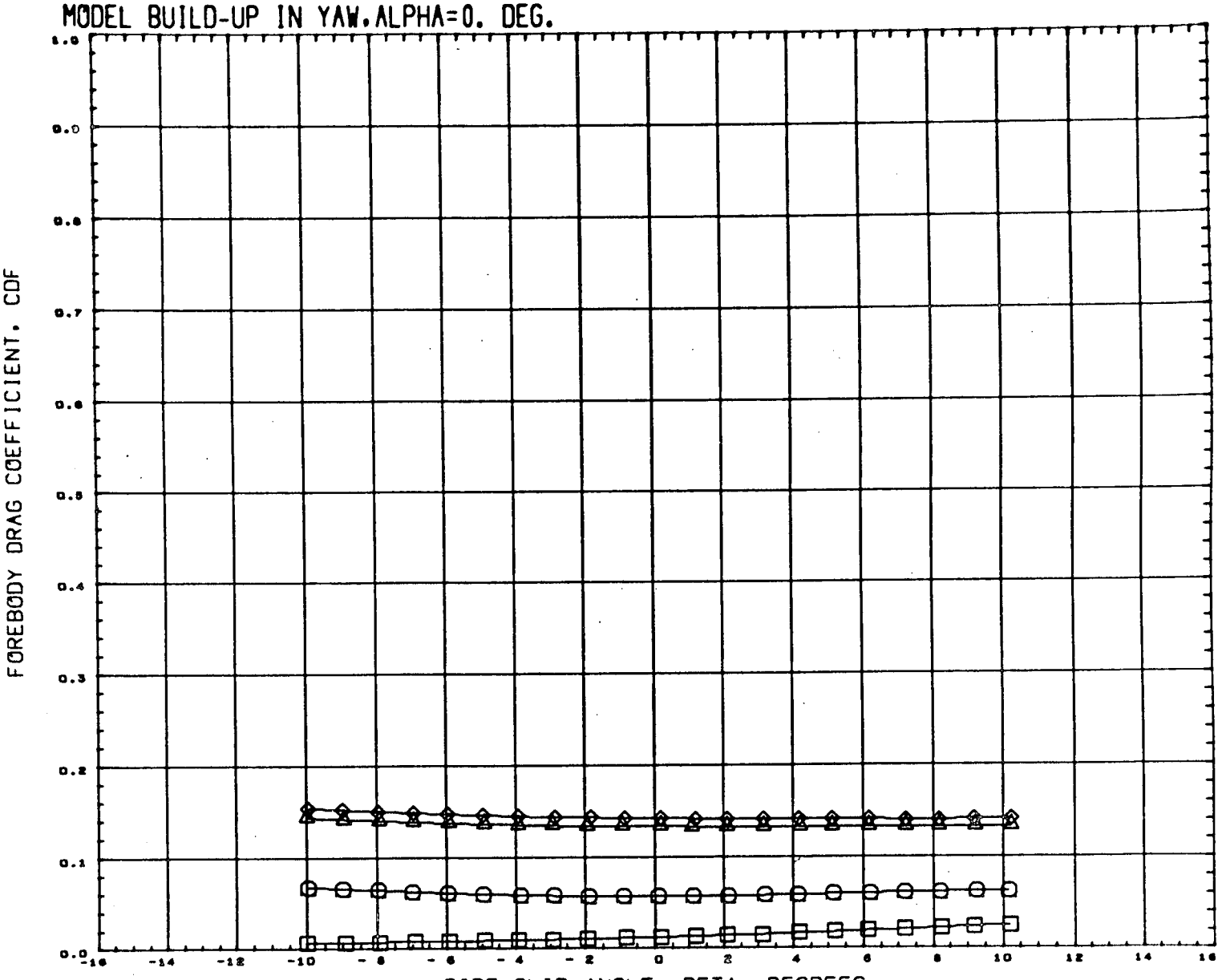


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			ALPHA	ELEVTR	HTAIL
(FCX284)	○	GAC HST-020	TBC H-32 BOOSTER	B8	0.000		
(FCX294)	△	GAC HST-020	TBC H-32 BOOSTER	B8W4	0.000		
(FCX204)	◇	GAC HST-020	TBC H-32 BOOSTER	B8W4V3	0.000		
(FCX224)	□	GAC HST-020	TBC H-32 BOOSTER	B8W4H4V3		0.000	-15.000

MACH 8.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4660	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.3870	INCHES
SCALE	0.4348	PERCNT

MODEL BUILD-UP IN YAW, ALPHA=0. DEG.

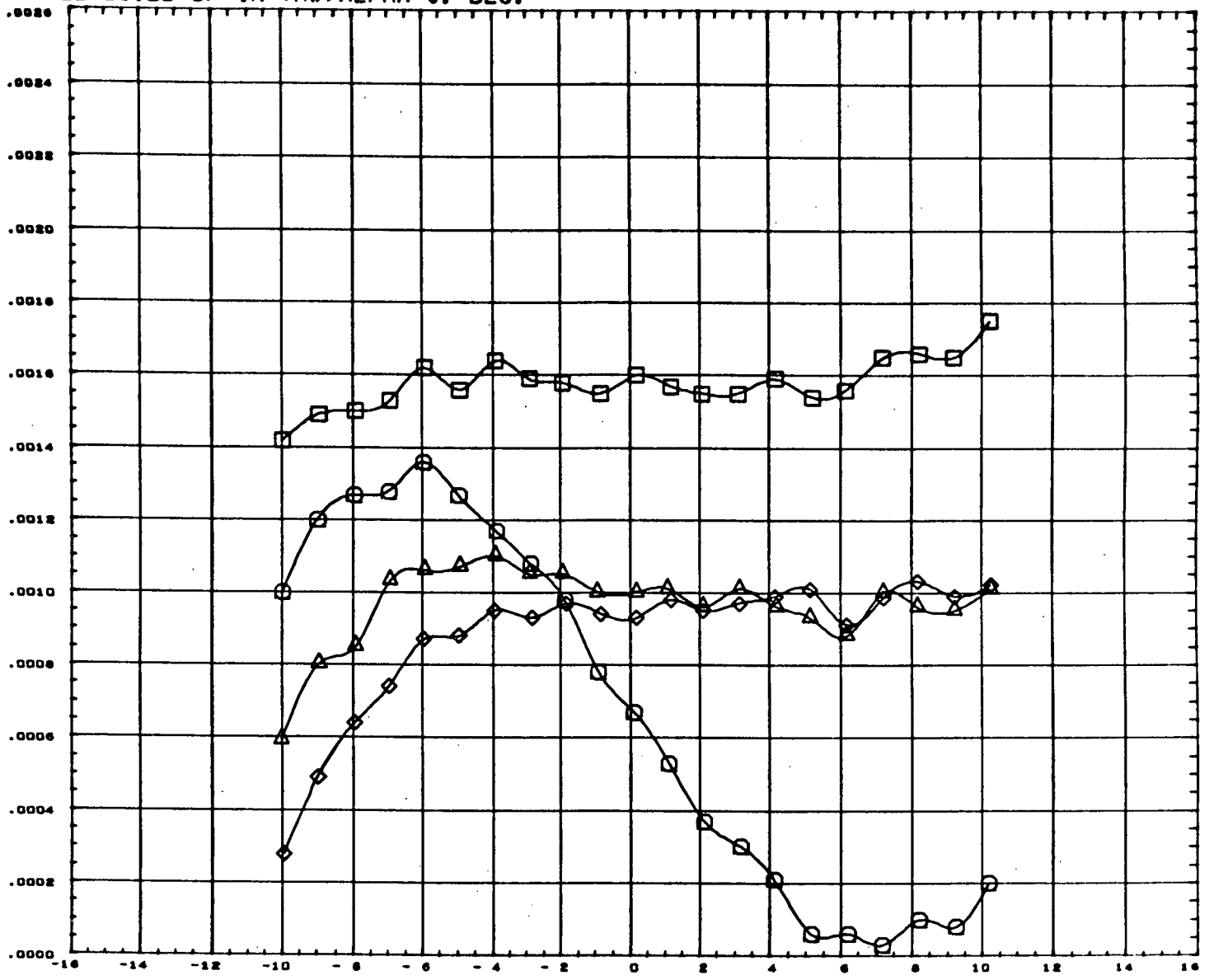


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			ALPHA	ELEVTR	HTAIL
(FCX284)	○	GAC HST-020	TBC H-32 BOOSTER	B8	0.000		
(FCX294)	△	GAC HST-020	TBC H-32 BOOSTER	B8W4	0.000		
(FCX204)	◇	GAC HST-020	TBC H-32 BOOSTER	B8W4V3	0.000		
(FCX224)	□	GAC HST-020	TBC H-32 BOOSTER	B8W4H4V3		0.000	-15.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.3670	INCHES
SCALE	0.4346	PERCNT

MODEL BUILD-UP IN YAW. ALPHA=0. DEG.

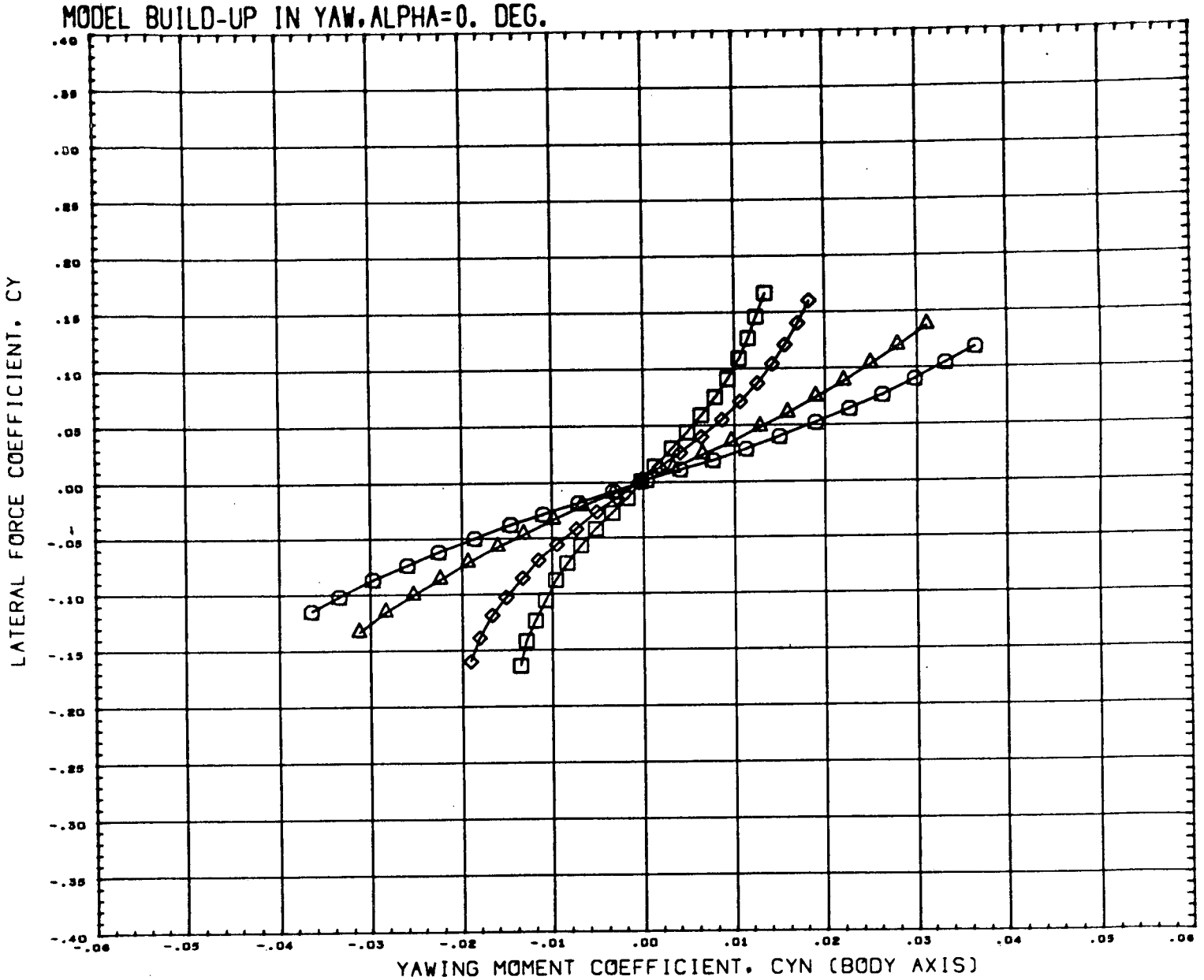


DATA SET SYMBOL	CONFIGURATION DESCRIPTION			ALPHA	ELEVTR	HTAIL
(FCX284) ○	GAC HST-020	TBC H-32 BOOSTER	B8	0.000		
(FCX294) △	GAC HST-020	TBC H-32 BOOSTER	B8W4	0.000		
(FCX204) ◇	GAC HST-020	TBC H-32 BOOSTER	B8W4V3	0.000		
(FCX224) □	GAC HST-020	TBC H-32 BOOSTER	B8W4H4V3		0.000	-15.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.0210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4340	PERCNT

MODEL BUILD-UP IN YAW, ALPHA=0. DEG.

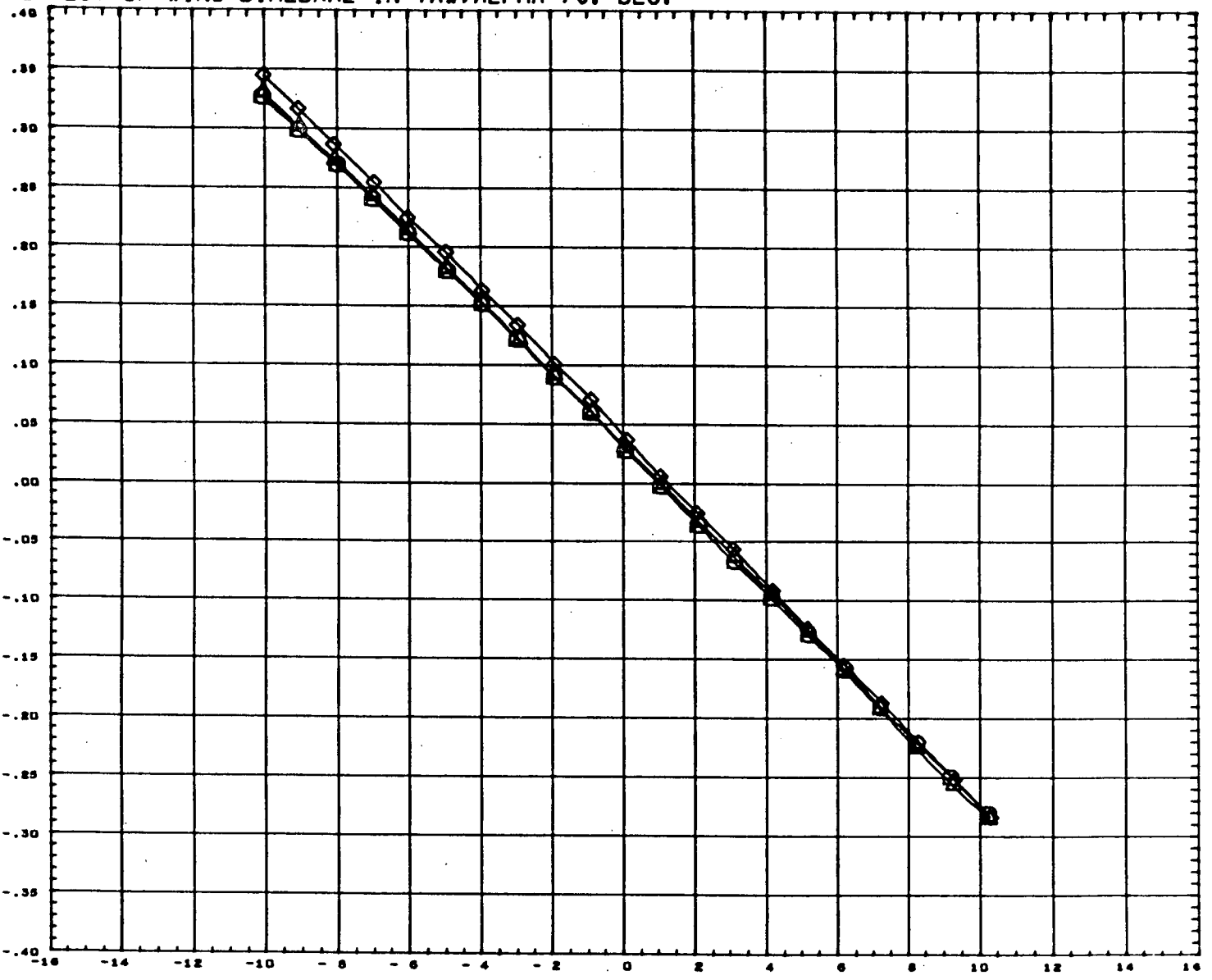


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			ALPHA	ELEVTR	HTAIL
(FCX284)	○	GAC HST-020	TBC H-32 BOOSTER	B8	0.000		
(FCX294)	△	GAC HST-020	TBC H-32 BOOSTER	B8W4	0.000		
(FCX204)	◇	GAC HST-020	TBC H-32 BOOSTER	B8W4V3	0.000		
(FCX224)	□	GAC HST-020	TBC H-32 BOOSTER	B8W4H4V3		0.000	-15.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF WING DIHEDRAL IN YAW, ALPHA=70. DEG.



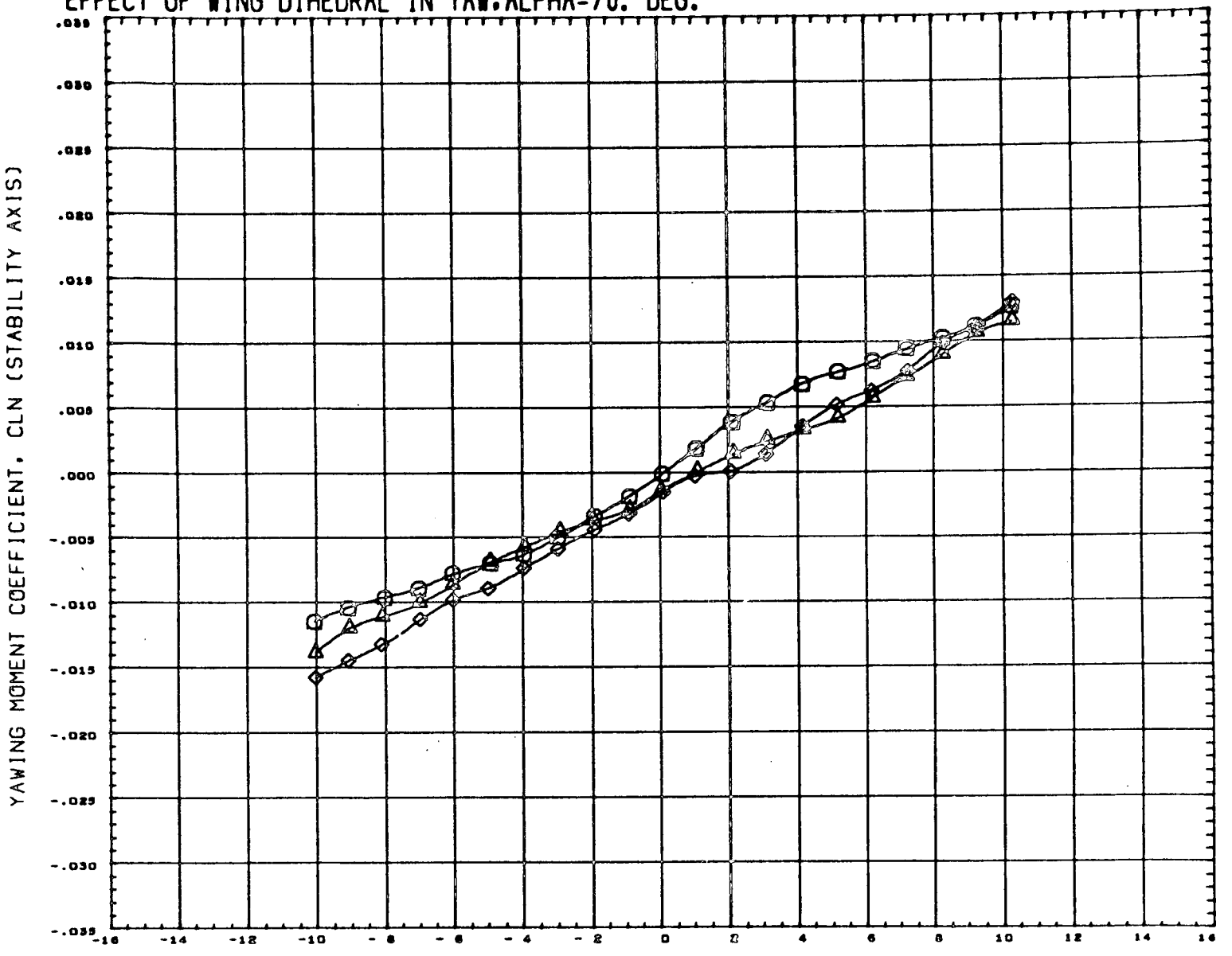
DATA SET SYMBOL		CONFIGURATION DESCRIPTION		
(FCX083)	○	GAC HST-020	TBC H-32 BOOSTER	B6W4H4
(FCX143)	△	GAC HST-020	TBC H-32 BOOSTER	B6W6H4
(FCX153)	◇	GAC HST-020	TBC H-32 BOOSTER	B6W7H4

ALPHA	ELEVTR	HTAIL
70.000	0.000	-15.000
70.000	0.000	-15.000
70.000	0.000	-15.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF WING DIHEDRAL IN YAW, ALPHA=70. DEG.

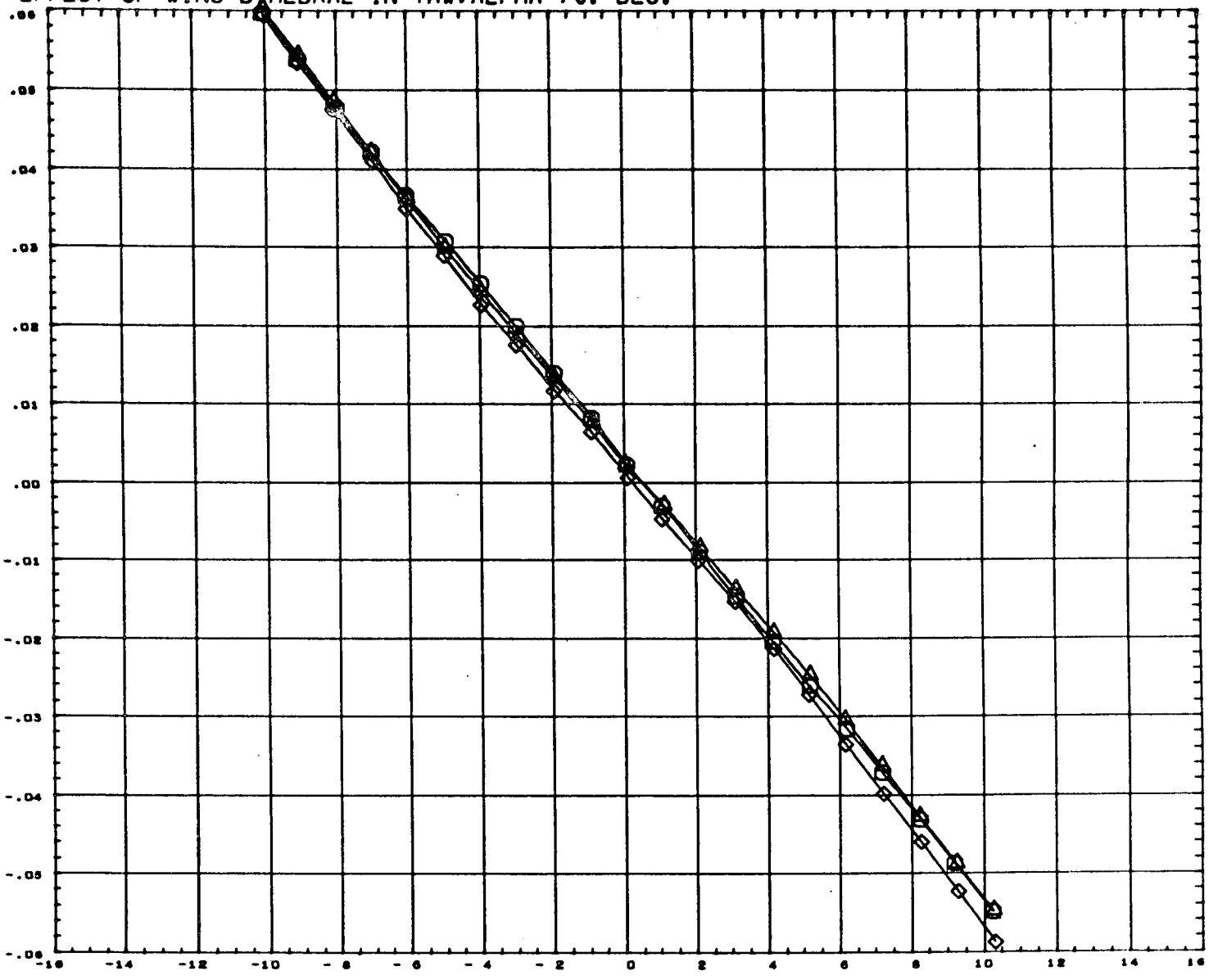


DATA SET	SYMBOL	CONFIGURATION	DESCRIPTION		ALPHA	ELEVTR	HTAIL
(FCX083)	○	GAC HST-020	TBC H-32 BOOSTER	B6W4H4	70.000	0.000	-15.000
(FCX143)	△	GAC HST-020	TBC H-32 BOOSTER	B6W6H4	70.000	0.000	-15.000
(FCX153)	◇	GAC HST-020	TBC H-32 BOOSTER	B6W7H4	70.000	0.000	-15.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF WING DIHEDRAL IN YAW. ALPHA=70. DEG.

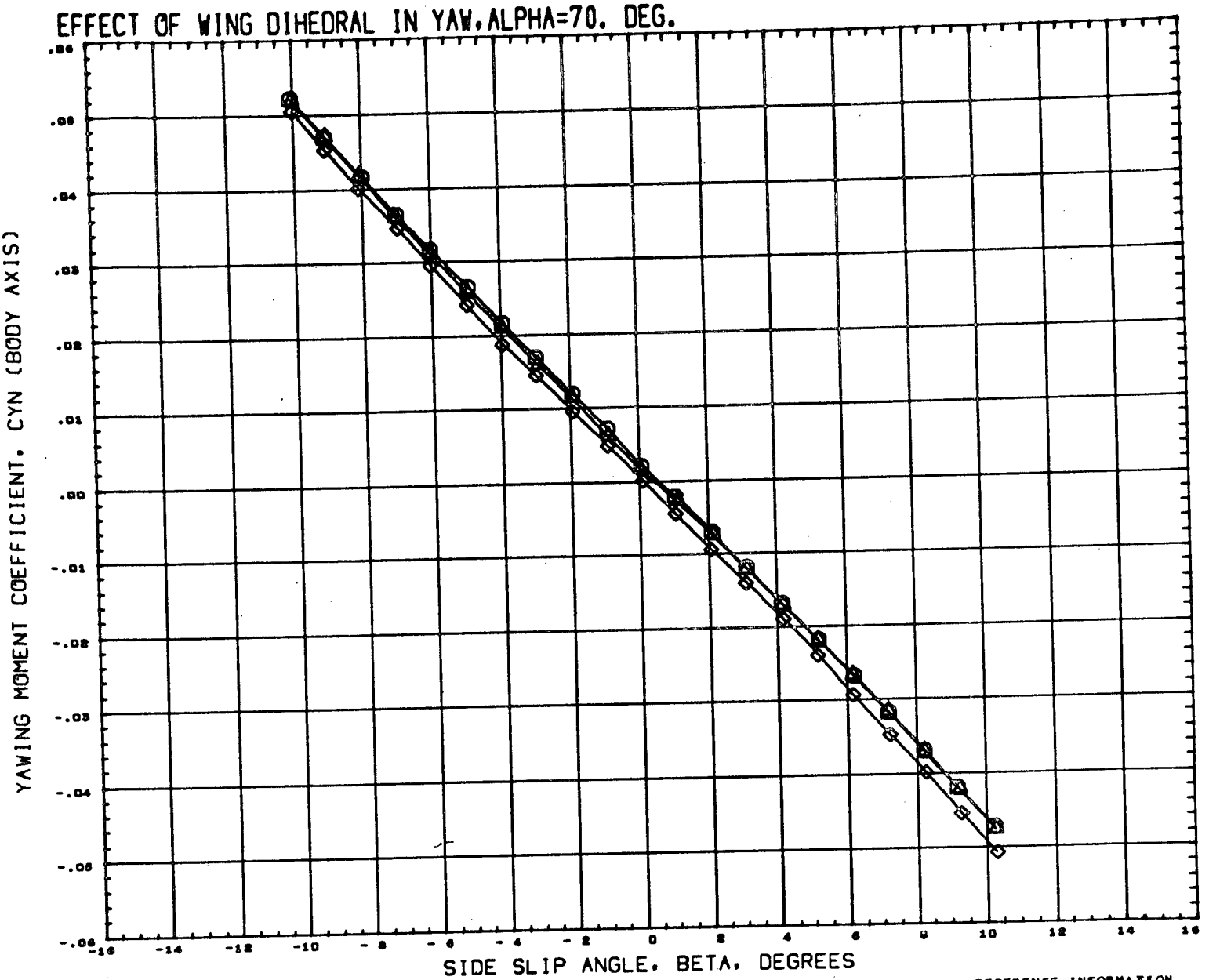


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			ALPHA	ELEVTR	HTAIL
(FCX083)	○	GAC HST-020	TBC H-32 BOOSTER	B6W4H4	70.000	0.000	-15.000
(FCX143)	△	GAC HST-020	TBC H-32 BOOSTER	B6W6H4	70.000	0.000	-15.000
(FCX153)	◇	GAC HST-020	TBC H-32 BOOSTER	B6W7H4	70.000	0.000	-15.000

MACH 0.120

REFERENCE INFORMATION

SREF	15.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		
(FCX083)	○	GAC HST-020	TBC H-32 BOOSTER	B6W4H4
(FCX143)	△	GAC HST-020	TBC H-32 BOOSTER	B6W6H4
(FCX153)	◇	GAC HST-020	TBC H-32 BOOSTER	B6W7H4

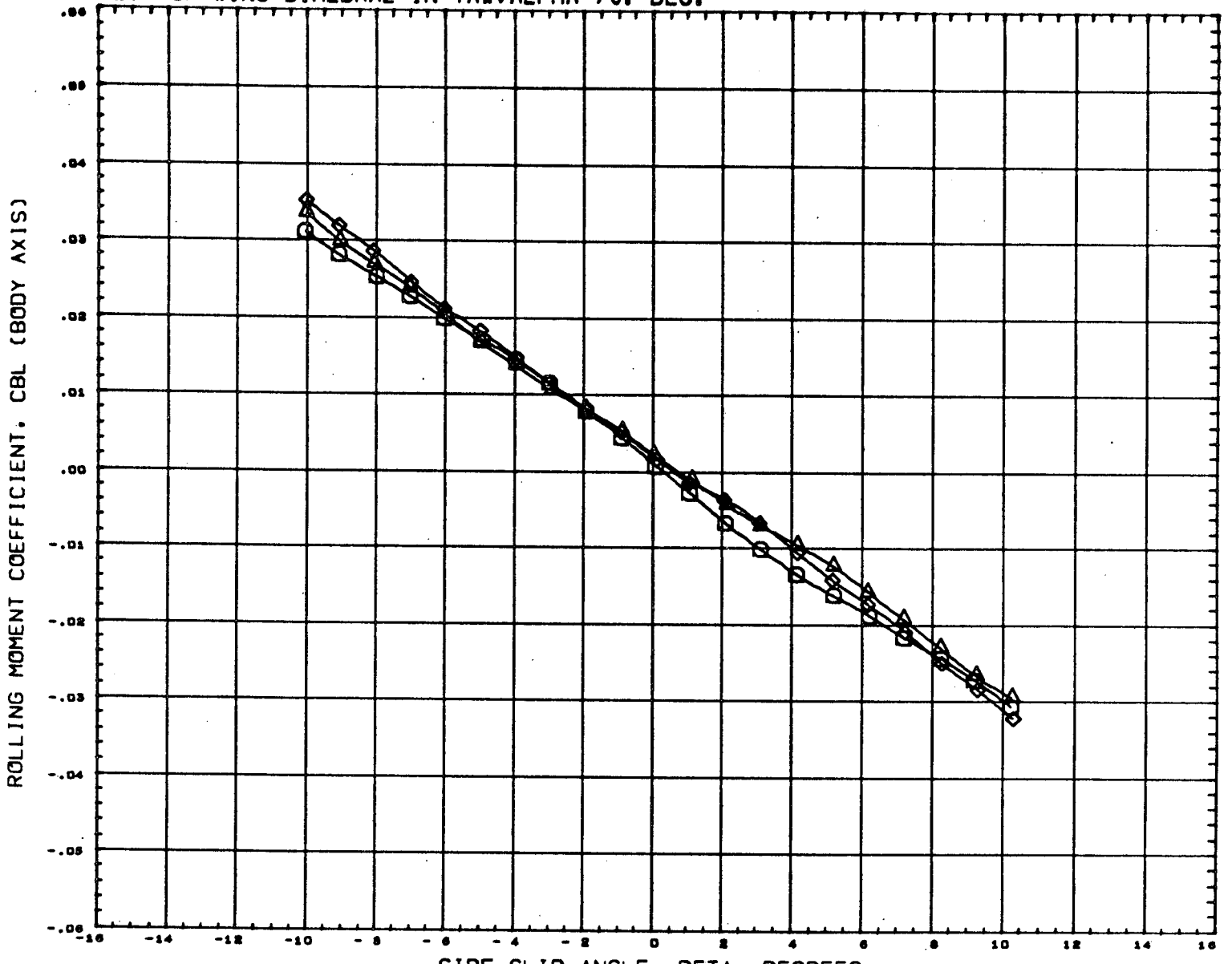
ALPHA	ELEVTR	HTAIL
70.000	0.000	-15.000
70.000	0.000	-15.000
70.000	0.000	-15.000

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

MACH 0.120

EFFECT OF WING DIHEDRAL IN YAW. ALPHA=70. DEG.



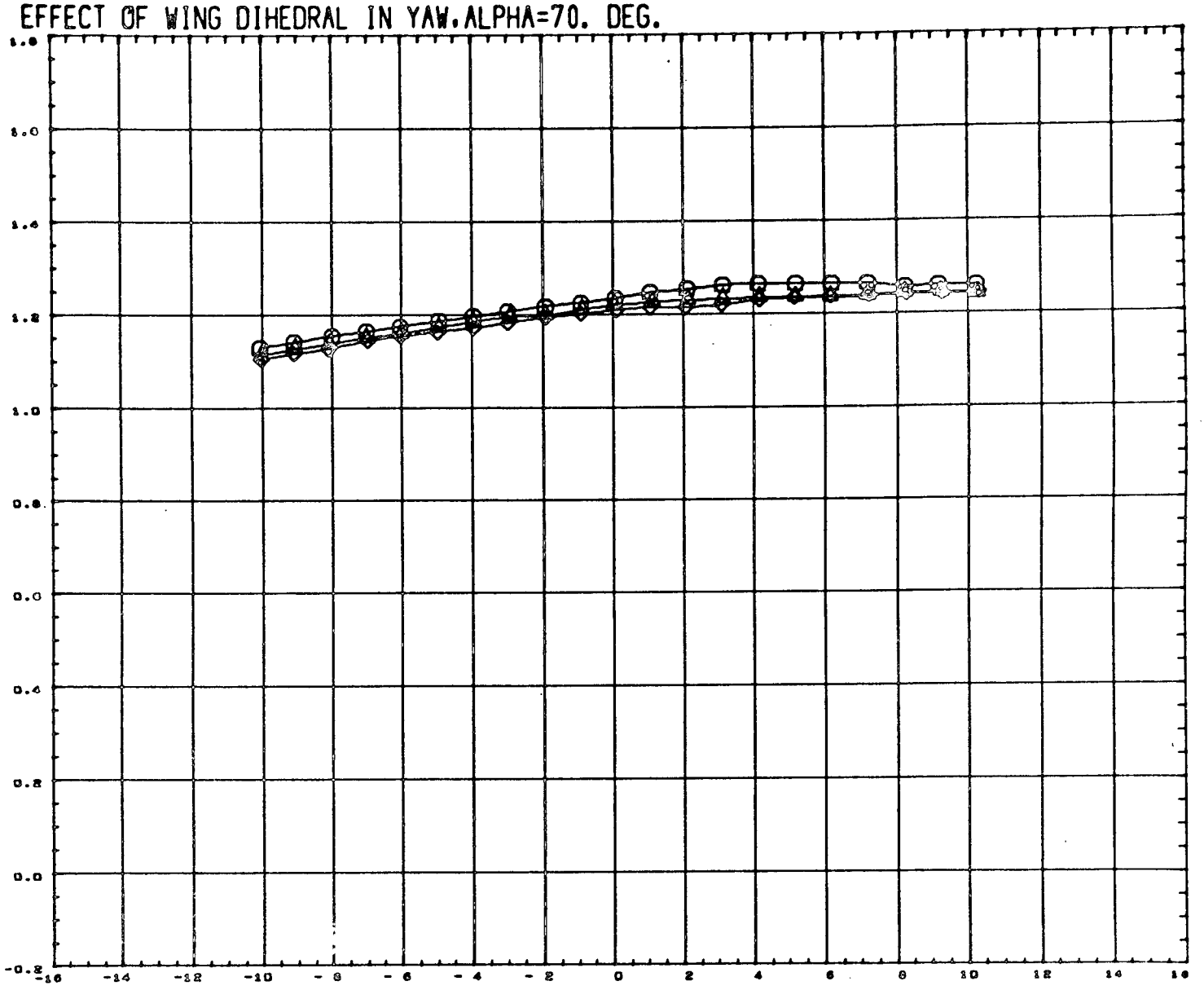
DATA SET SYMBOL		CONFIGURATION DESCRIPTION		
(FCX083)	○	GAC HST-020	TBC H-32 BOOSTER	B6W4H4
(FCX143)	△	GAC HST-020	TBC H-32 BOOSTER	B6W6H4
(FCX153)	◇	GAC HST-020	TBC H-32 BOOSTER	B6W7H4

ALPHA	ELEVTR	HTAIL
70.000	0.000	-15.000
70.000	0.000	-15.000
70.000	0.000	-15.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4340	PERCNT

EFFECT OF WING DIHEDRAL IN YAW, ALPHA=70. DEG.

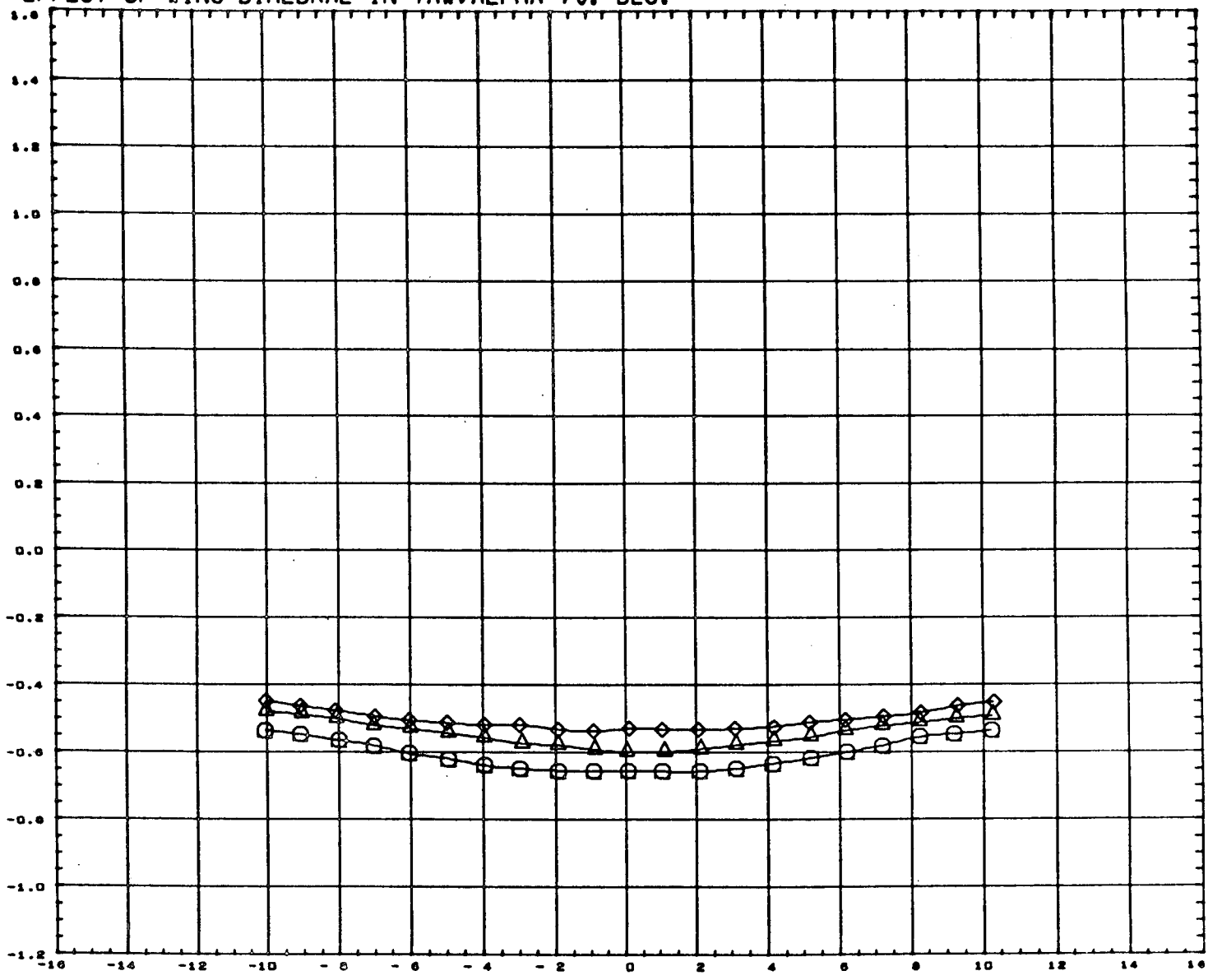


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			ALPHA	ELEVTR	HTAIL
(FCX083)	○	GAC HST-020	TBC H-32 BOOSTER	B6W4H4	70.000	0.000	-15.000
(FCX143)	△	GAC HST-020	TBC H-32 BOOSTER	B6W6H4	70.000	0.000	-15.000
(FCX153)	◇	GAC HST-020	TBC H-32 BOOSTER	B6W7H4	70.000	0.000	-15.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4600	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.3870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF WING DIHEDRAL IN YAW. ALPHA=70. DEG.

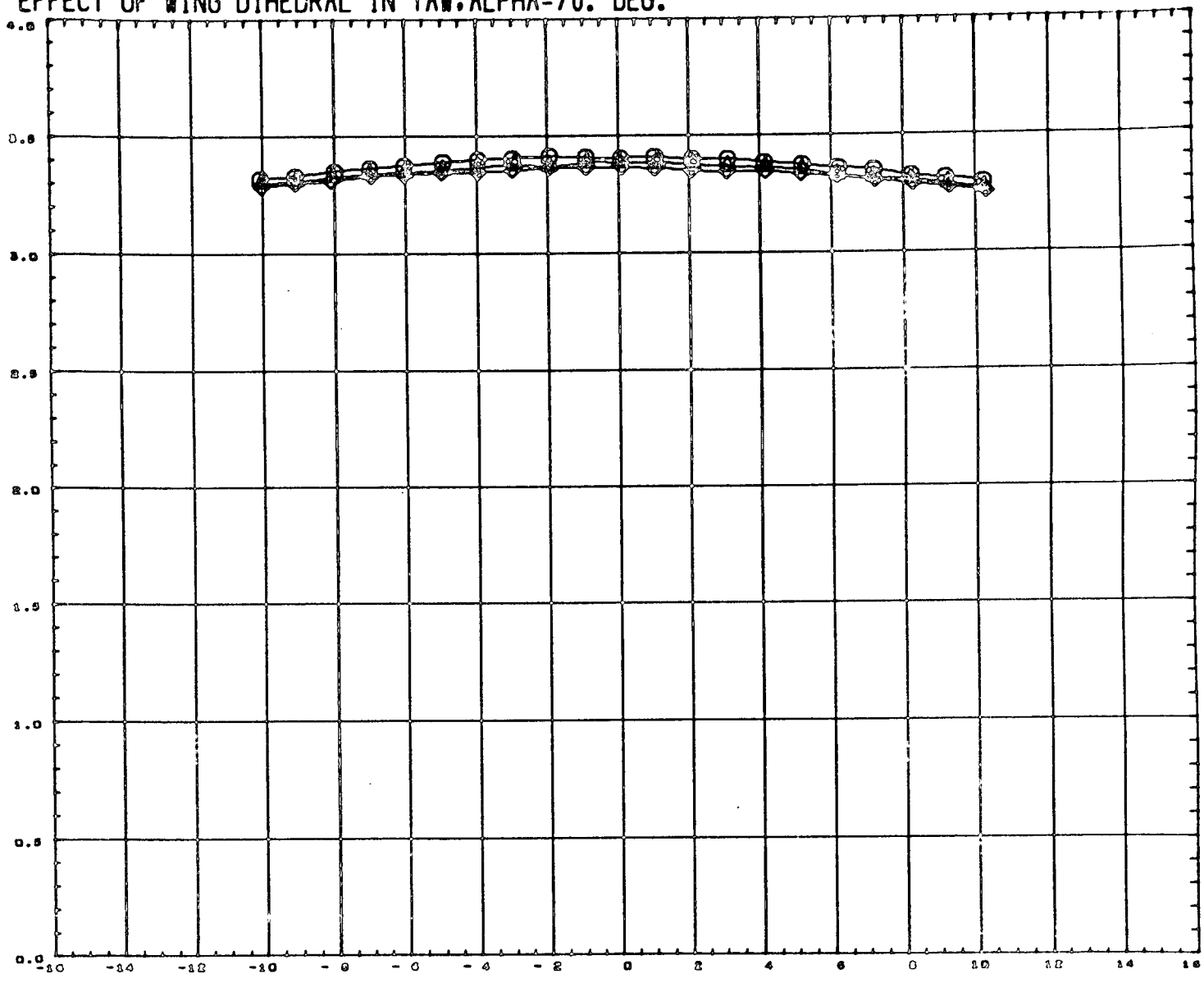


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			ALPHA	ELEVTR	HTAIL
(FCX063)	○	GAC HST-020	TBC H-32 BOOSTER	B6W4H4	70.000	0.000	-15.000
(FCX143)	△	GAC HST-020	TBC H-32 BOOSTER	B6W6H4	70.000	0.000	-15.000
(FCX153)	◇	GAC HST-020	TBC H-32 BOOSTER	B6W7H4	70.000	0.000	-15.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4340	PERCNT

EFFECT OF WING DIHEDRAL IN YAW. ALPHA=70. DEG.

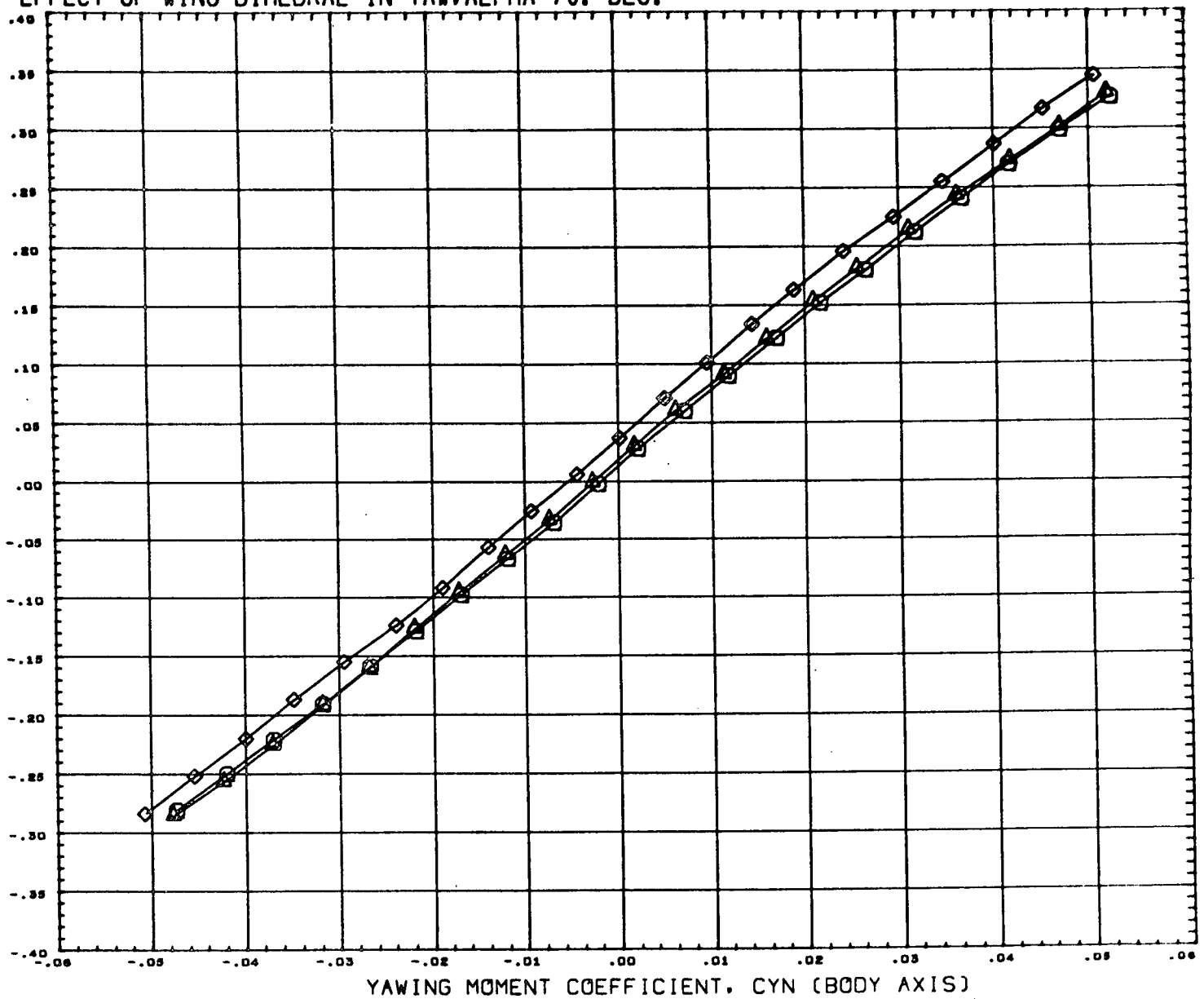


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			ALPHA	ELEVTR	HTAIL
(FCX083)	○	GAC HST-020	TBC H-32 BOOSTER	B6W4H4	70.000	0.000	-15.000
(FCX143)	△	GAC HST-020	TBC H-32 BOOSTER	B6W6H4	70.000	0.000	-15.000
(FCX153)	◇	GAC HST-020	TBC H-32 BOOSTER	B6W7H4	70.000	0.000	-15.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.3870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF WING DIHEDRAL IN YAW, ALPHA=70. DEG.



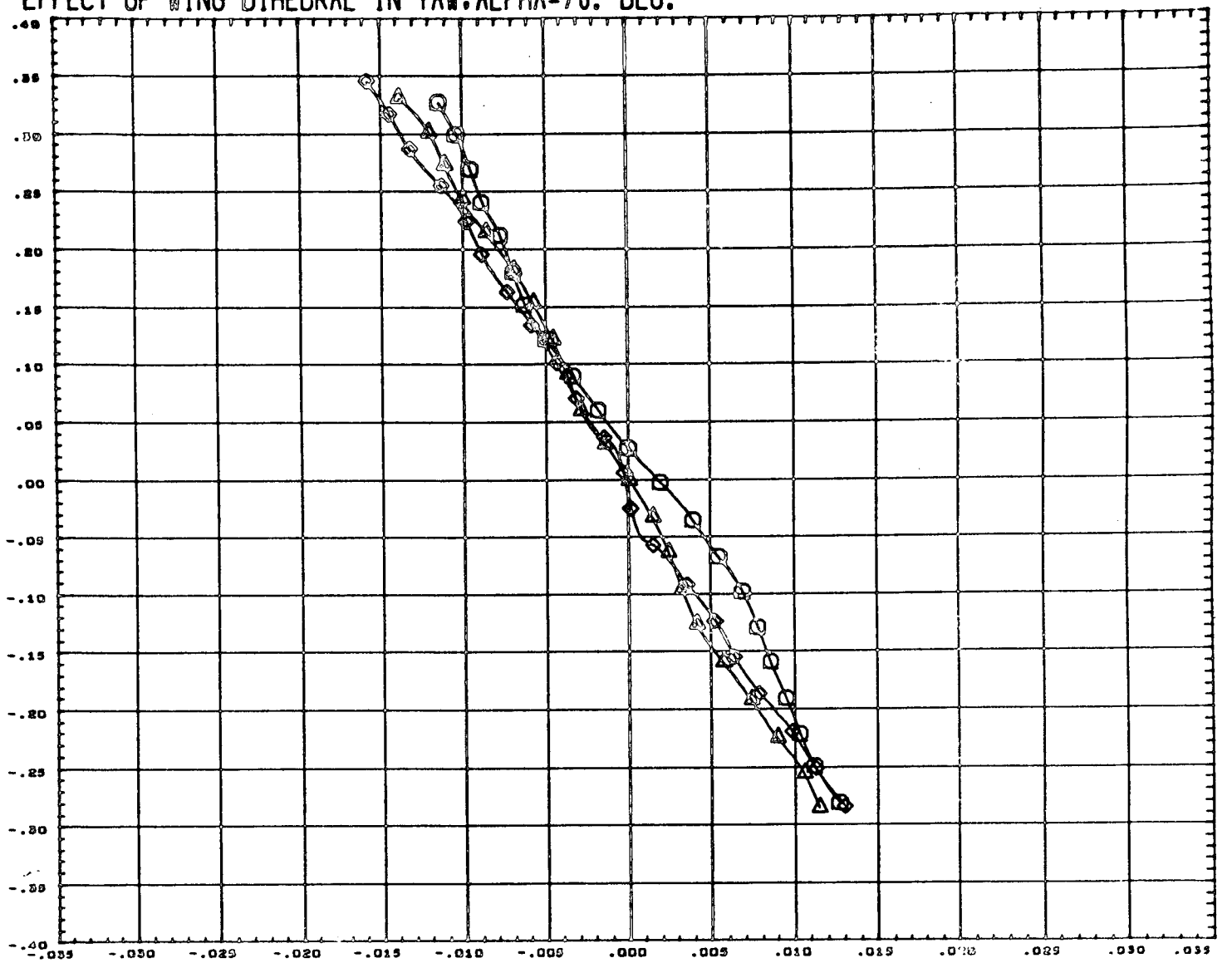
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			ALPHA	ELEVTR	HTAIL
(FCX063)	○	GAC HST-020	TBC H-32 BOOSTER	B6W4H4	70.000	0.000	-15.000
(FCX143)	△	GAC HST-020	TBC H-32 BOOSTER	B6W6H4	70.000	0.000	-15.000
(FCX153)	◇	GAC HST-020	TBC H-32 BOOSTER	B6W7H4	70.000	0.000	-15.000

MACH 0.120

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4346	PERCNT

EFFECT OF WING DIHEDRAL IN YAW. ALPHA=70. DEG.



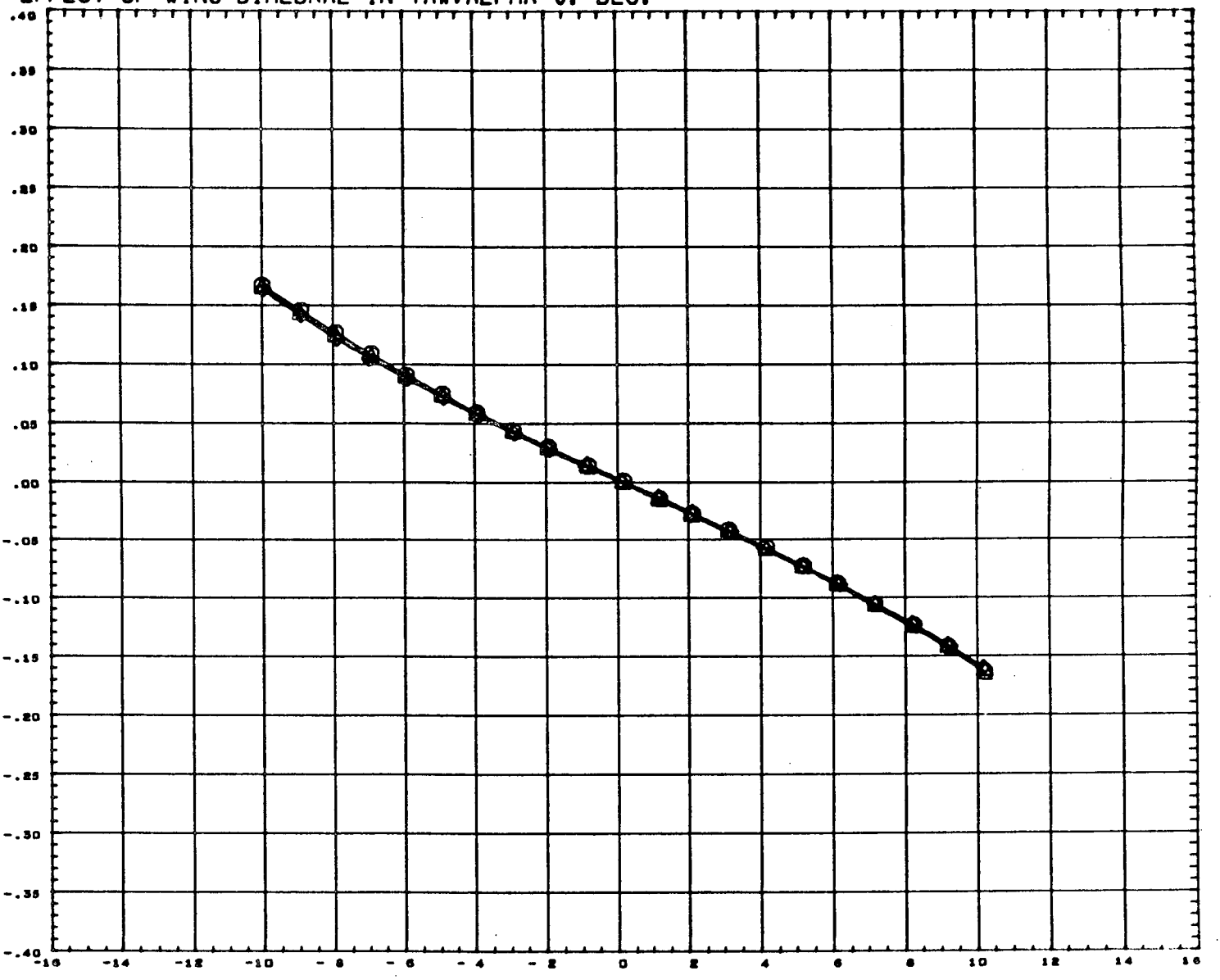
YAWING MOMENT COEFFICIENT, CLN (STABILITY AXIS)

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			ALPHA	ELEVTR	HTAIL
(FCX083)	○	GAC HST-020	TBC H-32 BOOSTER	B6W4H4	70.000	0.000	-15.000
(FCX143)	△	GAC HST-020	TBC H-32 BOOSTER	B6W6H4	70.000	0.000	-15.000
(FCX153)	◇	GAC HST-020	TBC H-32 BOOSTER	B6W7H4	70.000	0.000	-15.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	0.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF WING DIHEDRAL IN YAW. ALPHA=0. DEG.



LATERAL FORCE COEFFICIENT, CY

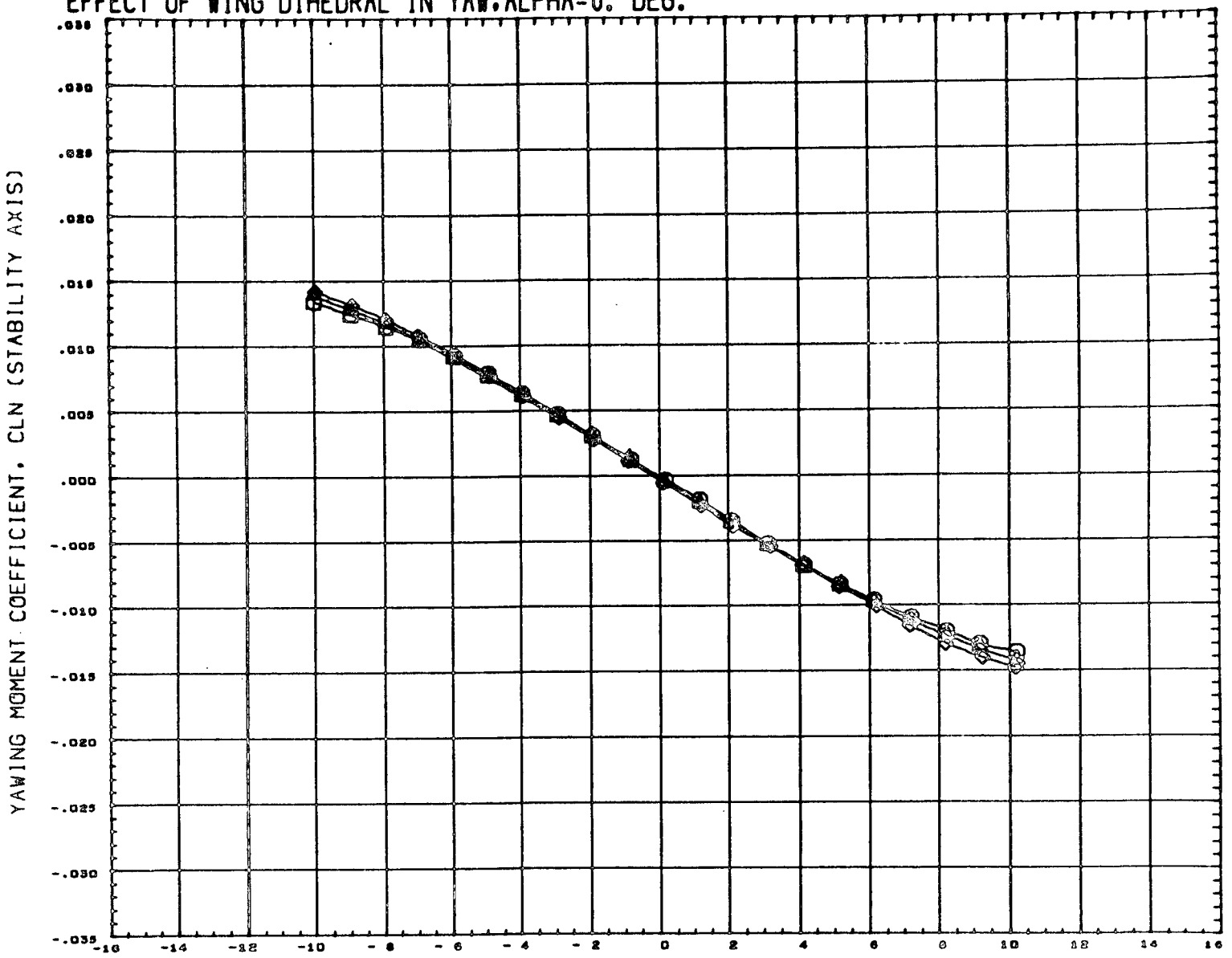
SIDE SLIP ANGLE, BETA, DEGREES

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			ALPHA	ELEVTR	HTAIL
(FCX224)	○	GAC HST-020	TBC H-32 BOOSTER	B8W4H4V3		0.000	-15.000
(FCX374)	△	GAC HST-020	TBC H-32 BOOSTER	B8W6H4V3	0.000	0.000	-15.000
(FCX384)	◇	GAC HST-020	TBC H-32 BOOSTER	B8W7H4V3	0.000	0.000	-15.000

MACH 8.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4660	INCHES
BREF	9.6520	INCHES
XMRP	7.8810	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF WING DIHEDRAL IN YAW. ALPHA=0. DEG.

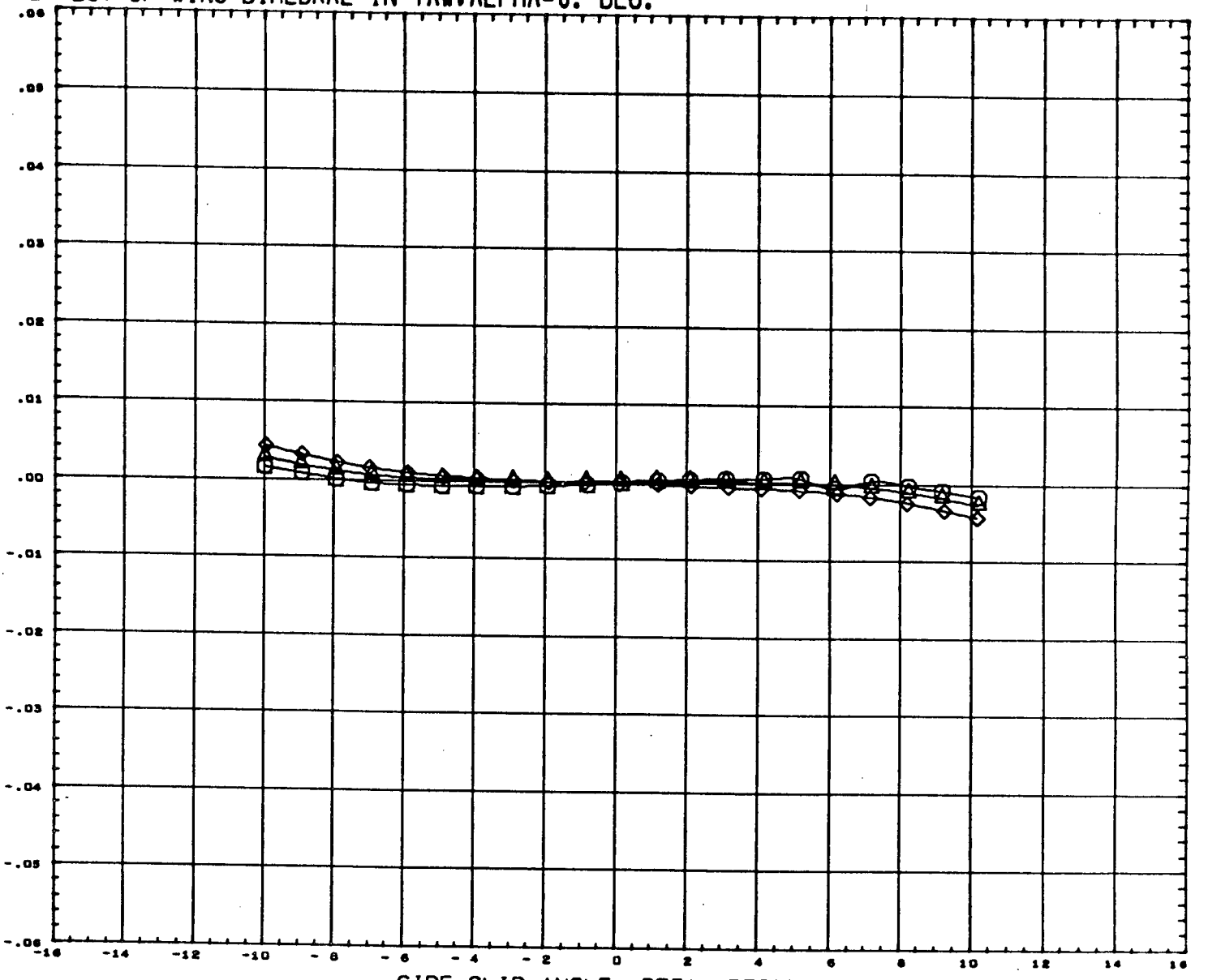


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			ALPHA	ELEVTR	HTAIL
(FCX224)	○	GAC HST-020	TBC H-32 BOOSTER	B8W4H4V3		0.000	-15.000
(FCX374)	△	GAC HST-020	TBC H-32 BOOSTER	B8W6H4V3	0.000	0.000	-15.000
(FCX384)	◇	GAC HST-020	TBC H-32 BOOSTER	B8W7H4V3	0.000	0.000	-15.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF WING DIHEDRAL IN YAW, ALPHA=0. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION		
(FCX224)	GAC HST-020	TBC H-32 BOOSTER	B8W4H4V3
(FCX374)	GAC HST-020	TBC H-32 BOOSTER	B8W6H4V3
(FCX364)	GAC HST-020	TBC H-32 BOOSTER	B8W7H4V3

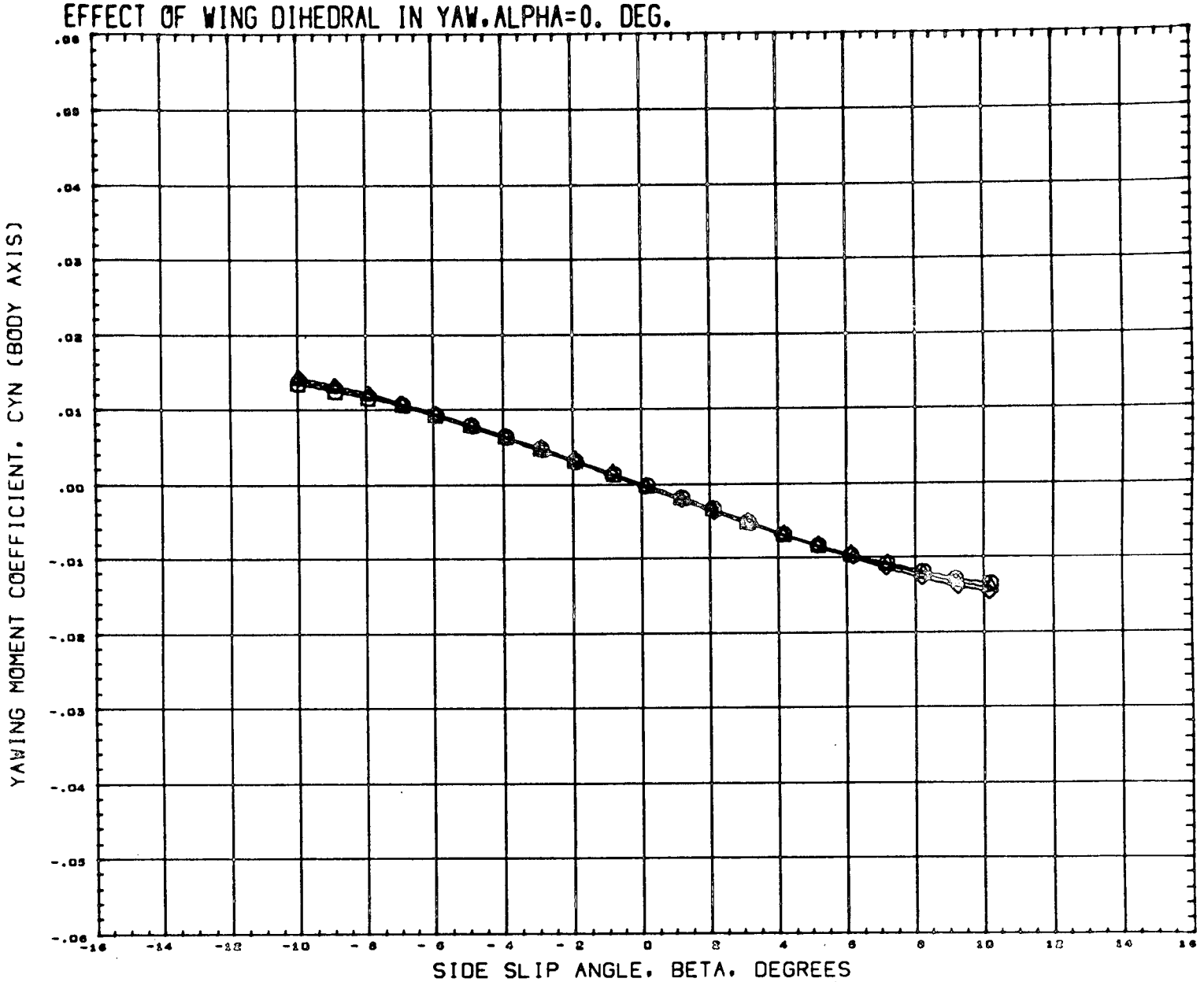
ALPHA	ELEVTR	HTAIL
	0.000	-15.000
0.000	0.000	-15.000
0.000	0.000	-15.000

MACH 0.120

REFERENCE INFORMATION

SREF	13.3440	SQ.IN.
LREF	1.4660	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF WING DIHEDRAL IN YAW. ALPHA=0. DEG.

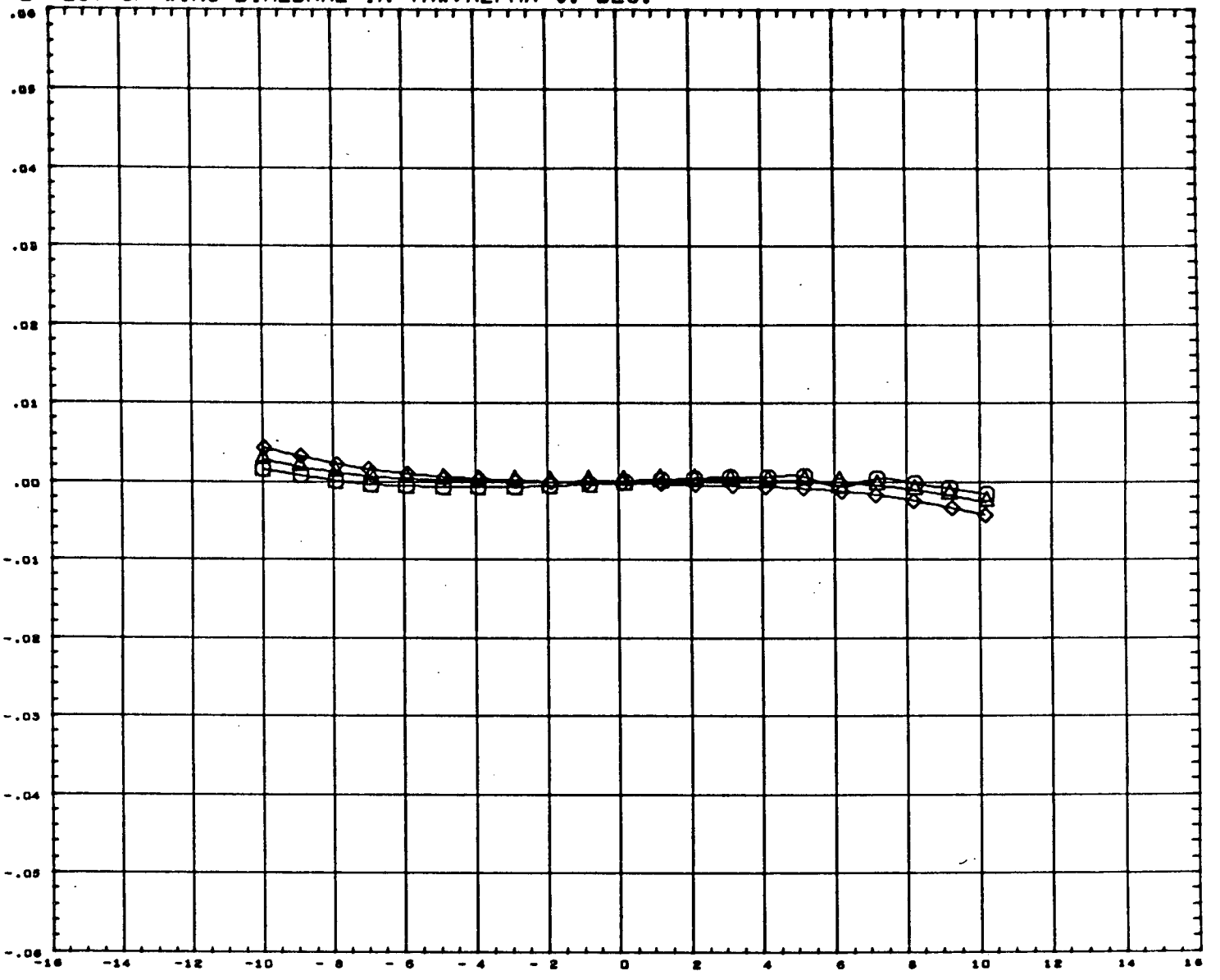


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			ALPHA	ELEVTR	HTAIL
(FCX224)	○	GAC HST-020	TBC H-32 BOOSTER	B8W4H4V3		0.000	-15.000
(FCX374)	☒	GAC HST-020	TBC H-32 BOOSTER	B8W6H4V3	0.000	0.000	-15.000
(FCX384)	◇	GAC HST-020	TBC H-32 BOOSTER	B8W7H4V3	0.000	0.000	-15.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4340	PERCNT

EFFECT OF WING DIHEDRAL IN YAW. ALPHA=0. DEG.



ROLLING MOMENT COEFFICIENT, CBL (BODY AXIS)

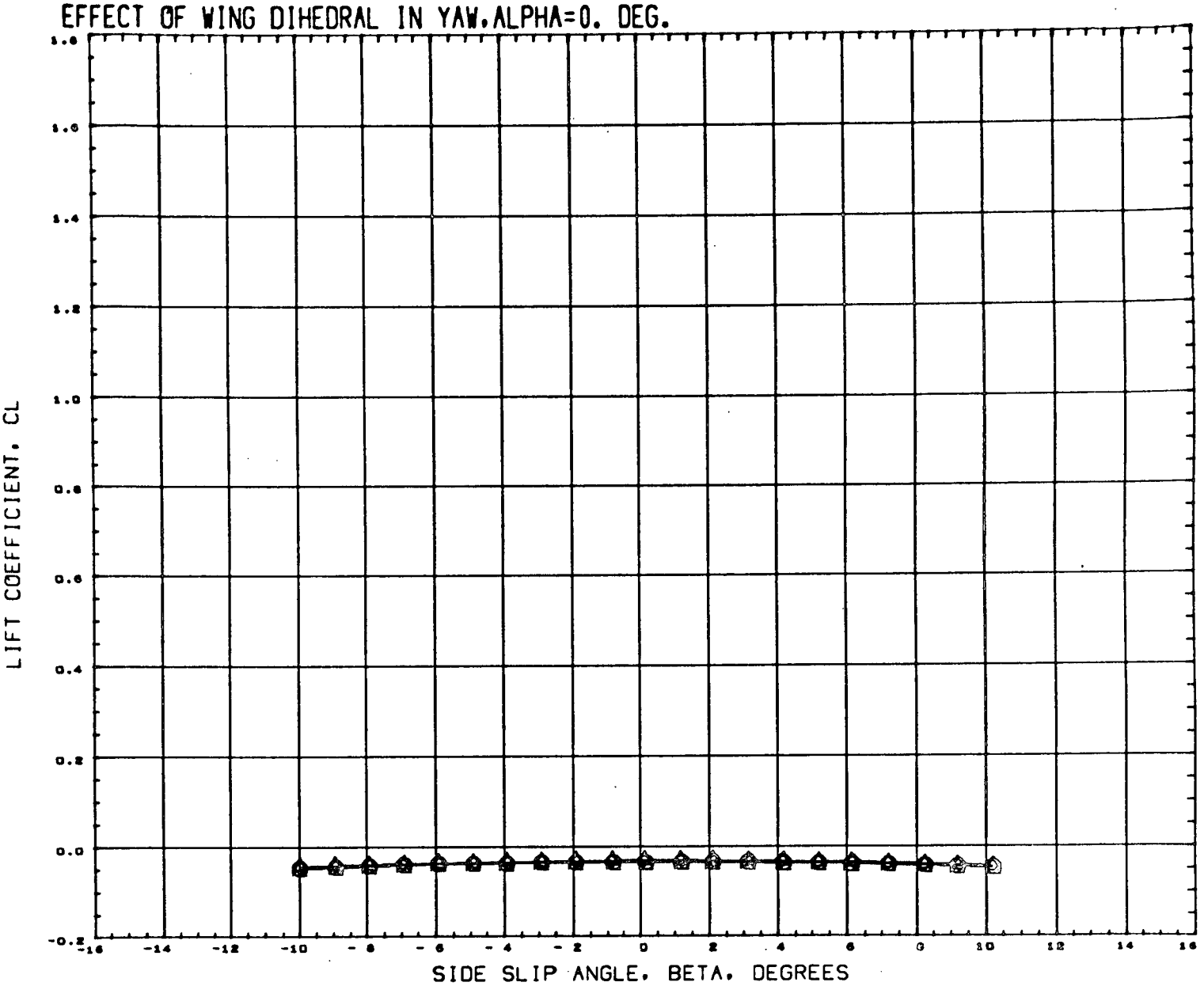
SIDE SLIP ANGLE, BETA, DEGREES

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			ALPHA	ELEVTR	HTAIL
(FCX224)	○	GAC HST-020	TBC H-32 BOOSTER	B8W4H4V3		0.000	-15.000
(FCX374)	△	GAC HST-020	TBC H-32 BOOSTER	B8W6H4V3	0.000	0.000	-15.000
(FCX364)	◇	GAC HST-020	TBC H-32 BOOSTER	B8W7H4V3	0.000	0.000	-15.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF WING DIHEDRAL IN YAW, ALPHA=0. DEG.

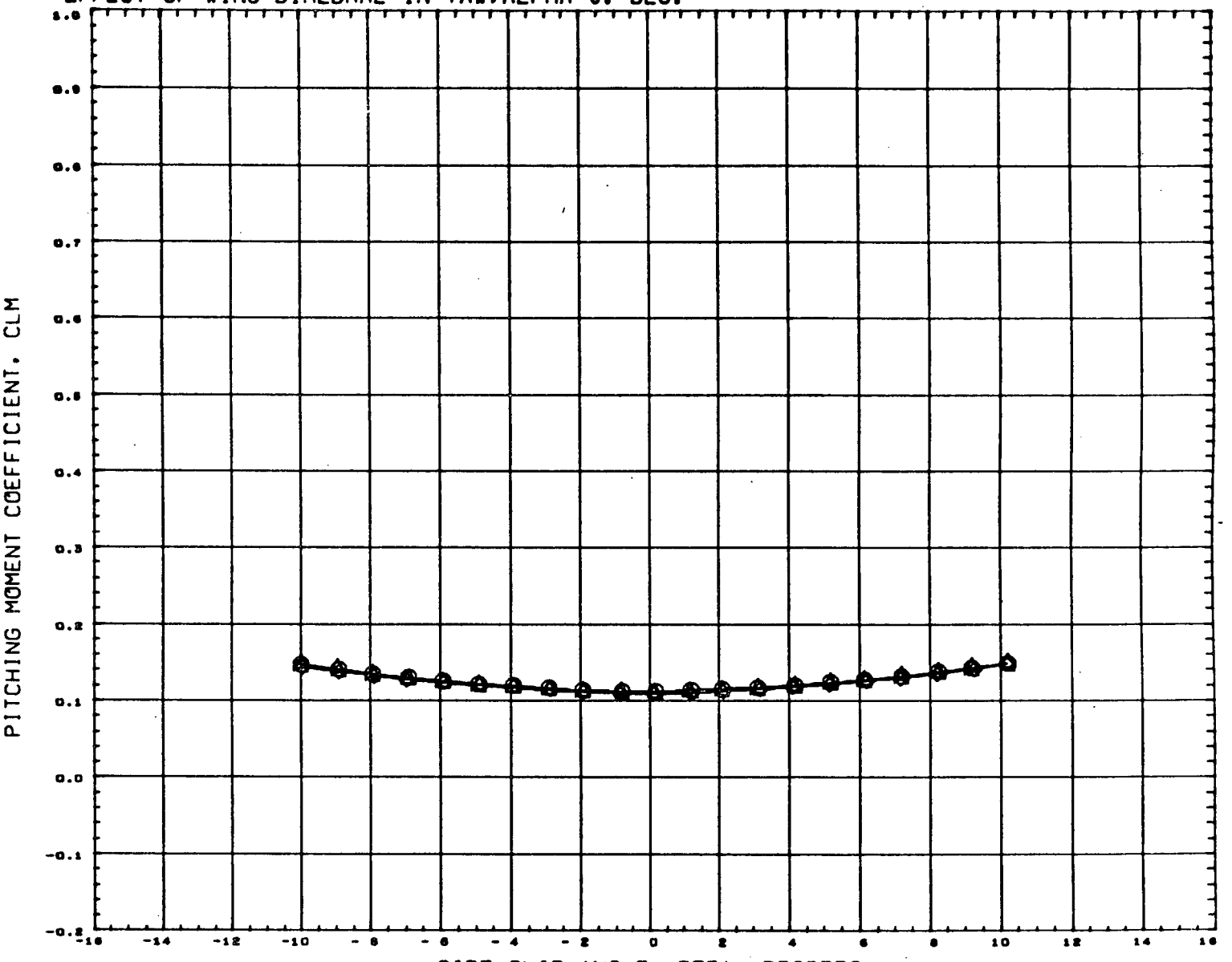


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			ALPHA	ELEVTR	HTAIL
(FCX224)	○	GAC HST-020	TBC H-32 BOOSTER	B8W4H4V3		0.000	-15.000
(FCX374)	△	GAC HST-020	TBC H-32 BOOSTER	B8W6H4V3	0.000	0.000	-15.000
(FCX384)	◇	GAC HST-020	TBC H-32 BOOSTER	B8W7H4V3	0.000	0.000	-15.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.3870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF WING DIHEDRAL IN YAW, ALPHA=0. DEG.

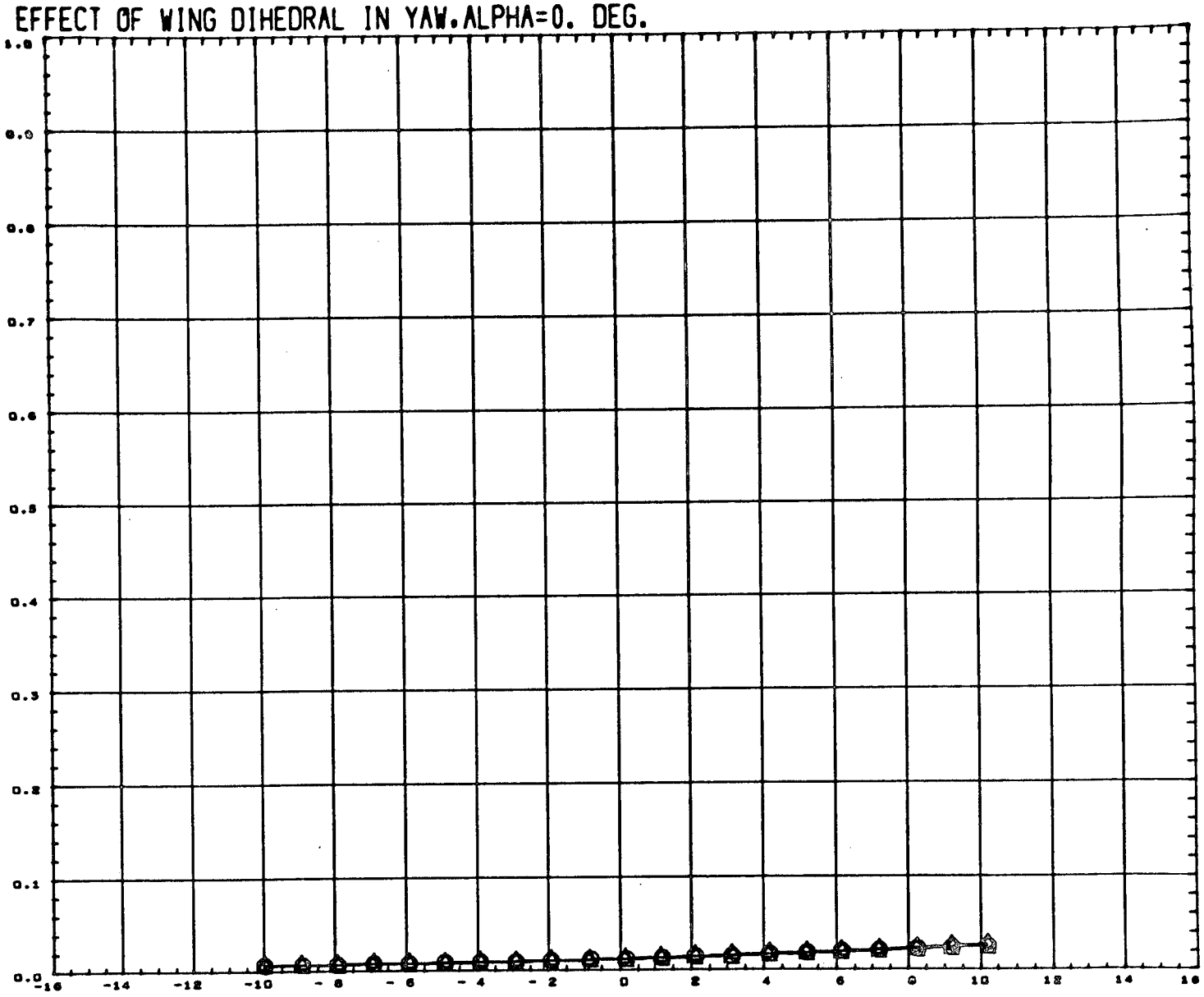


DATA SET SYMBOL	CONFIGURATION DESCRIPTION			ALPHA	ELEVTR	HTAIL
(FCX224) ○	GAC HST-020	TBC H-32 BOOSTER	B8W4H4V3		0.000	-15.000
(FCX374) △	GAC HST-020	TBC H-32 BOOSTER	B8W6H4V3	0.000	0.000	-15.000
(FCX364) ◇	GAC HST-020	TBC H-32 BOOSTER	B8W7H4V3	0.000	0.000	-15.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4340	PERCNT

EFFECT OF WING DIHEDRAL IN YAW. ALPHA=0. DEG.

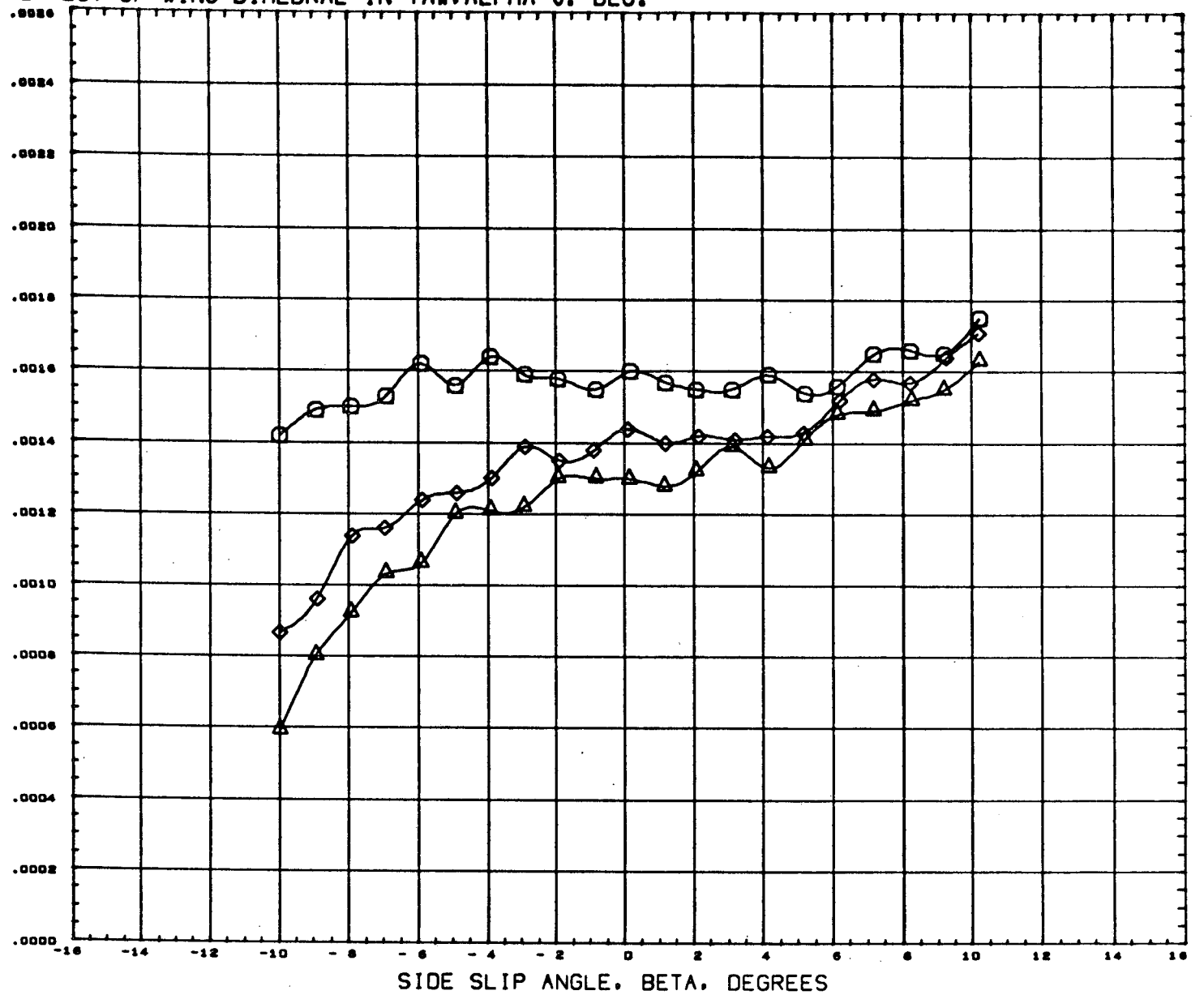


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			ALPHA	ELEVTR	HTAIL
(FCX224)	○	GAC HST-020	TBC H-32 BOOSTER	B8W4H4V3		0.000	-15.000
(FCX374)	△	GAC HST-020	TBC H-32 BOOSTER	B8W6H4V3	0.000	0.000	-15.000
(FCX384)	◇	GAC HST-020	TBC H-32 BOOSTER	B8W7H4V3	0.000	0.000	-15.000

MACH 8.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF WING DIHEDRAL IN YAW, ALPHA=0. DEG.

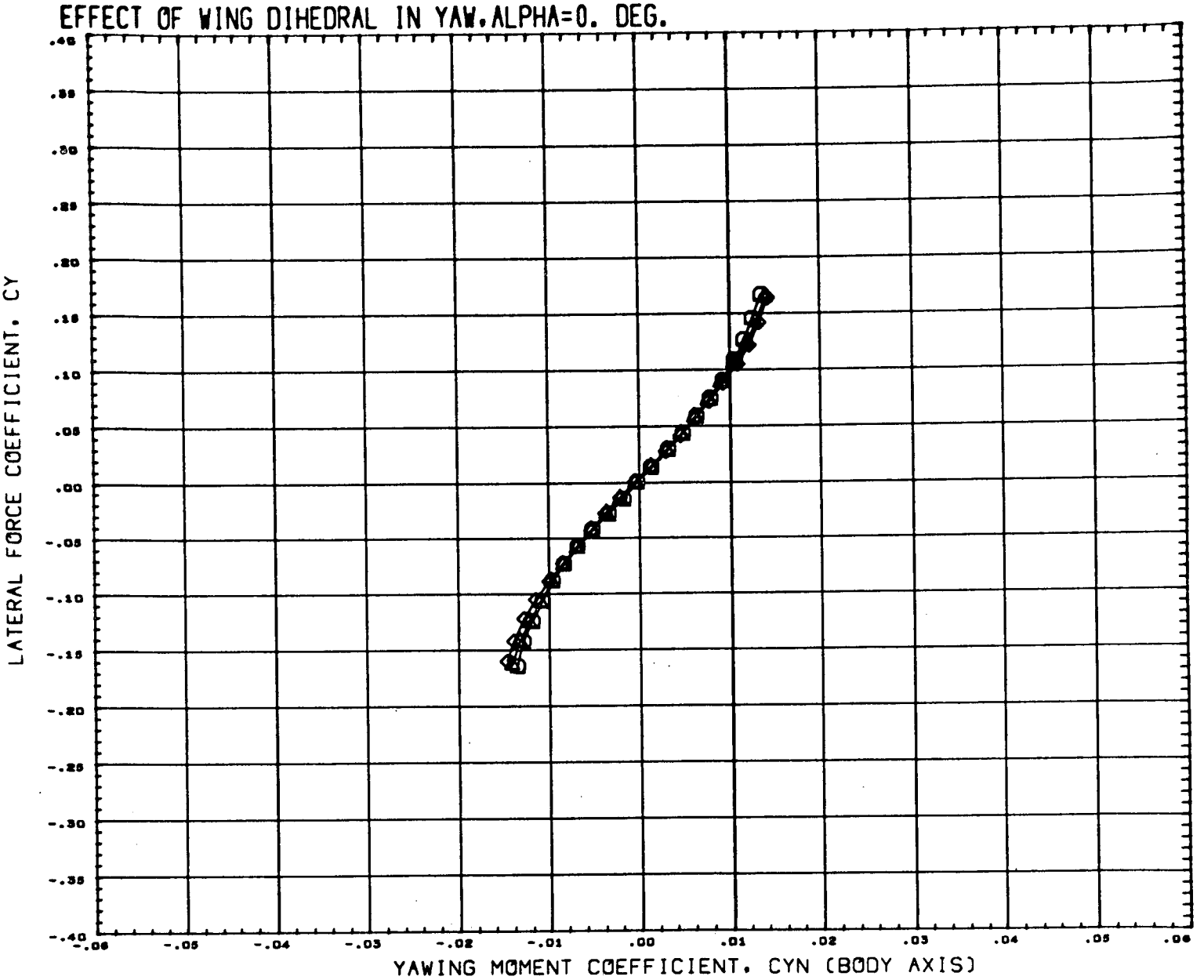


DATA SET SYMBOL	CONFIGURATION DESCRIPTION			ALPHA	ELEVTR	HTAIL
(FCX224)	GAC HST-020	TBC H-32 BOOSTER	B8W4H4V3		0.000	-15.000
(FCX374)	GAC HST-020	TBC H-32 BOOSTER	B8W6H4V3	0.000	0.000	-15.000
(FCX384)	GAC HST-020	TBC H-32 BOOSTER	B8W7H4V3	0.000	0.000	-15.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF WING DIHEDRAL IN YAW, ALPHA=0. DEG.

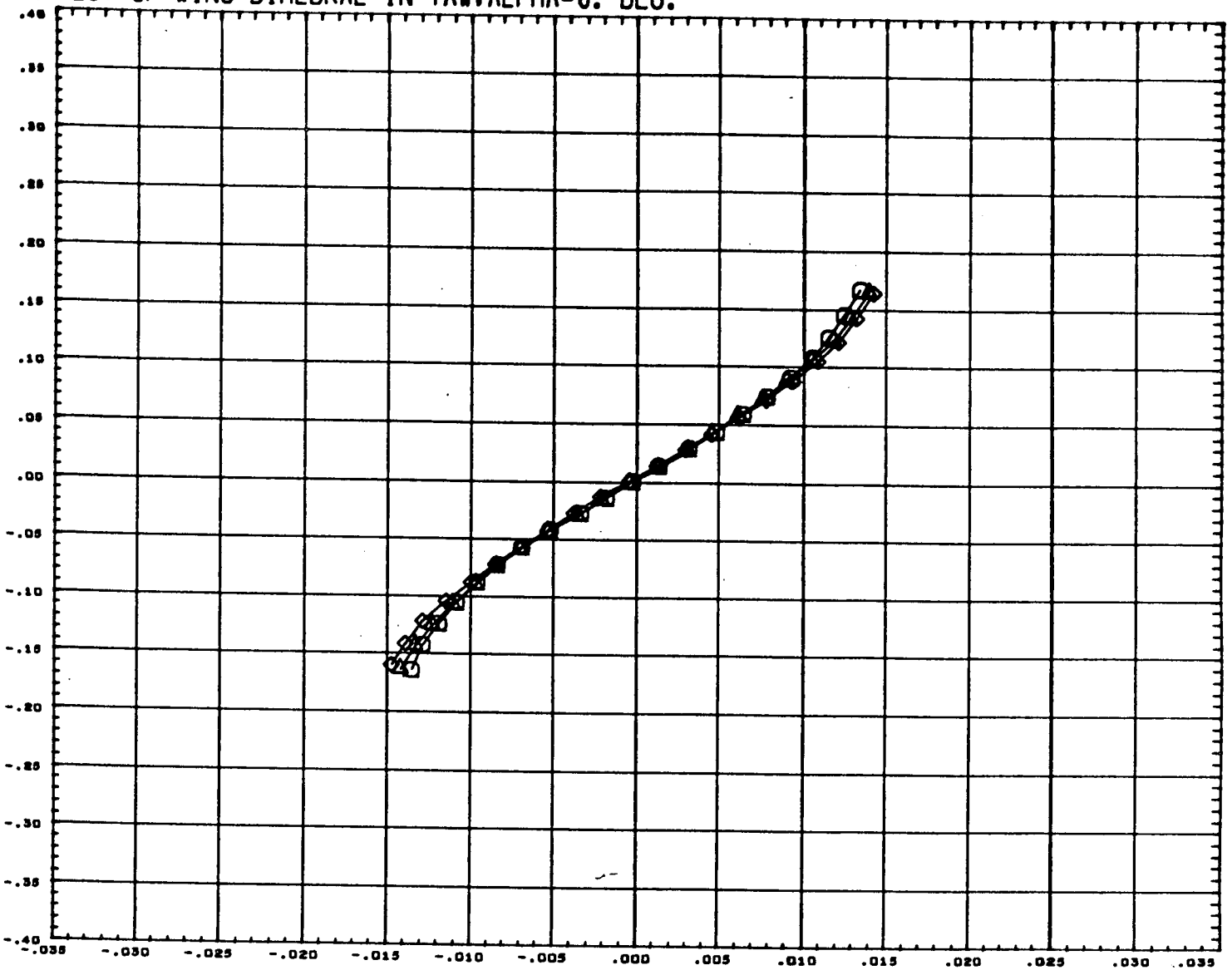


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			ALPHA	ELEVTR	HTAIL
(FCX224)	○	GAC HST-020	TBC H-32 BOOSTER	B8W4H4V3		0.000	-15.000
(FCX374)	△	GAC HST-020	TBC H-32 BOOSTER	B8W6H4V3	0.000	0.000	-15.000
(FCX364)	◇	GAC HST-020	TBC H-32 BOOSTER	B8W7H4V3	0.000	0.000	-15.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4680	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT

EFFECT OF WING DIHEDRAL IN YAW. ALPHA=0. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION		
(FCX224)	GAC HST-020	TBC H-32 BOOSTER	B8W4H4V3
(FCX374)	GAC HST-020	TBC H-32 BOOSTER	B8W6H4V3
(FCX384)	GAC HST-020	TBC H-32 BOOSTER	B8W7H4V3

ALPHA	ELEVTR	HTAIL
	0.000	-15.000
0.000	0.000	-15.000
0.000	0.000	-15.000

MACH 0.120

REFERENCE INFORMATION		
SREF	13.3440	SQ.IN.
LREF	1.4660	INCHES
BREF	9.6520	INCHES
XMRP	7.8210	INCHES
YMRP	0.0000	INCHES
ZMRP	1.5870	INCHES
SCALE	0.4348	PERCNT