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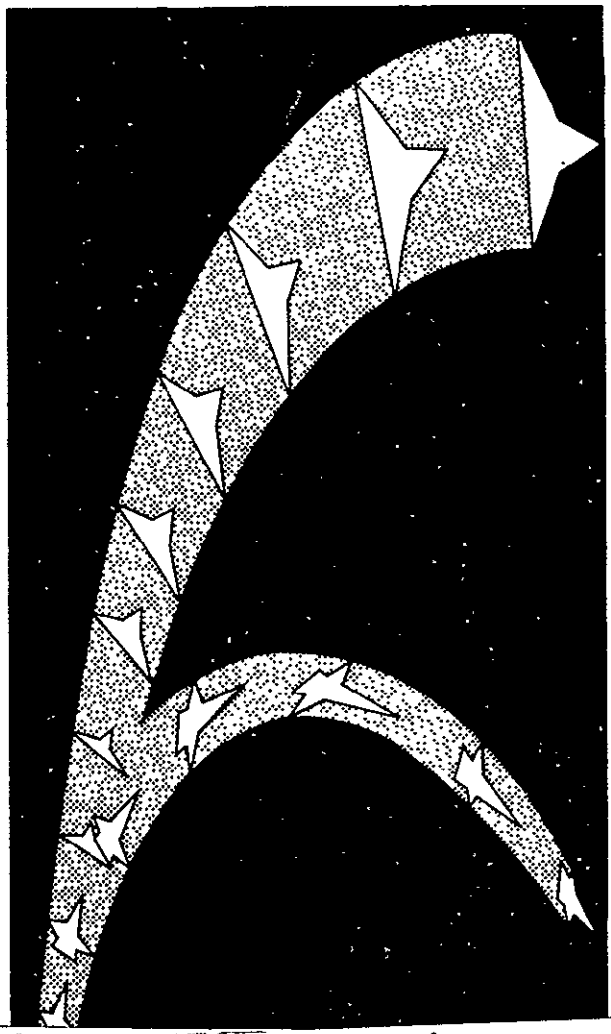

—SPACE SHUTTLE—

INVESTIGATION OF LOW SPEED AERODYNAMIC CHARACTERICS OF A HIGH CROSSRANGE MDC STS ORBITER

MCDONNELL - DOUGLAS
LOW SPEED

WIND TUNNEL TEST RESULTS
DATA REPORT

JANUARY 1971

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16. ABSTRACT

The objective of this test program was to define the low speed longitudinal and lateral aerodynamic characteristics of the MDAC Double Delta (HCR) Orbiter Shuttle. The 4.0 percent scale model Double Delta Orbiter was tested in the McDonnell Aircraft Company (MCAIR) Low Speed Wind Tunnel during the period from 22 October through 26 October 1970. The configurations were tested over an angle of attack range from -10° to $+20^{\circ}$ and a sideslip angle range from -6° to $+3^{\circ}$. Nominal test conditions were at a dynamic pressure of 90 psf with a Mach number of 0.25 and Reynolds number of 1.6 million per foot.

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SADSAC/SPACE SHUTTLE

WIND TUNNEL TEST DATA REPORT

CONFIGURATION: MDC STS Orbiter (02), High Cross Range; 4% Scale

TEST PURPOSE: Investigation of Longitudinal and Lateral Stability Characteristics

TEST FACILITY: MDC MCAIR LSWT

TESTING AGENCY: MDAC/ED

TEST NO. & DATE: LSWT 240; 22 through 26 October 1970

TEST CONDUCTOR(S): D. Fields, M. V. Heckart, P. J. Seeney

FACILITY COORDINATOR: W. P. Bush

DATA MANAGEMENT SERVICES

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DATA OPERATIONS: W. R. Morgan
Aero Thermo Data Group

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

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ABSTRACT

The objective of this test program was to define the low speed longitudinal and lateral aerodynamic characteristics of the MDAC Double Delta (HCR) Orbiter Shuttle. The 4.0 percent scale model Double Delta Orbiter was tested in the McDonnell Aircraft Company (MCAIR) Low Speed Wind Tunnel during the period from 22 October through 26 October 1970. The configurations were tested over an angle of attack range from -10° to $+20^{\circ}$ and a sideslip angle range from -6° to $+3^{\circ}$. Nominal test conditions were at a dynamic pressure of 90 psf with a Mach number of 0.25 and Reynolds number of 1.6 million per foot.

TEST FACILITY DESCRIPTION

The McDonnell Low Speed Wind Tunnel is a closed circuit, single return, atmospheric tunnel with a test section 8-1/2 feet high, 12 feet wide, and 18 feet long. It is capable of a maximum continuous velocity of 240 mph with a clear test section.

The tunnel circuit is 412.6 feet long and consists of two 164-foot legs and two 42.3-foot legs. The entrance cone contraction ratio is 7.35 to 1 and the total diffuser angle is 7.5°. Cooling is accomplished by a spray system passing water over the outside tunnel shell.

The main drive motor, housed in a nacelle 30 feet downstream of the third leg of the circuit, is a Westinghouse 1750 hp wound rotor motor equipped with a liquid rheostat for coarse rpm control and a dynamic brake, coupled to the motor shaft, for fine rpm control. The four-bladed fan is 20 feet in diameter.

TEST CONDITIONS

The model was installed in the tunnel on the external pyramidal balance using the two-strut system shown in the model installation sketch. This balance uses a push-rod and flexure arrangement to transmit forces and moments to individual null balance scales. Sliding-beam weights, driven by servo motors, balance the model forces. These forces are converted into digital readouts in pounds and foot-pounds through an optical encoder and readout system.

The test was conducted by setting the tunnel to the desired dynamic pressure, the model was then pitched or sideslipped to the prescribed angle, stopped at that position and the appropriate data recorded.

Transition strips, 0.10 inch wide, of No. 120 silicon grit were installed on both surfaces of the wings and vertical tail at the 10 percent chord. The fuselage transition strip was located 1.5 inches aft of the nose.

TEST CONDITIONS

TEST MCAIR LSWT 240

MACH NUMBER	REYNOLDS NUMBER per ~~unit length~~ FOOT	DYNAMIC PRESSURE (pounds/~~sq. inch~~)	STAGNATION TEMPERATURE (degrees Fahrenheit)
0.25	1.6×10^6	90 PSF	

BALANCE UTILIZED: LSWT MAIN PYRAMIDAL.

CAPACITY:		ACCURACY:	COEFFICIENT TOLERANCE:
LIFT ~~NF~~	± 3000 lbs.	± 3.0 lbs.	
SF	± 1500 lbs.	± 1.5 lbs.	
DRAG ~~AF~~	± 750 lbs.	± 0.75 lbs.	
PM	± 1500 ft.lbs.	± 1.5 ft.lbs.	
YM	± 750 ft.lbs.	± 0.75 ft.lbs.	
RM	± 1500 ft.lbs.	± 1.5 ft.lbs.	

COMMENTS:

DATA REDUCTION

Force and moment data were reduced to coefficient form in both the body axis and stability axis system. The model moment reference center was located at F.S. 50.65, W.L. 8.0 and B.L. 0.0.

All force and moment data were corrected for wall effects, weight tares and aerodynamic tare and interference effects. Test section dynamic pressure was corrected for solid and wake blockage. Model base pressure data were reduced to coefficient form and applied as an axial force correction.

The model dimensional data utilized to reduce the data to coefficient form are listed below:

S_{ref} = Wing W1 planform area = 9.58 ft^2

l_{ref} = Wing W1 mean aerodynamic chord = 3.02 ft.

b = Wing W1 equivalent span = 3.54 ft.

The data values of S_{ref}, l_{ref}, and b are the same for MCAIR LSWT tests 235 and 240.

CONFIGURATIONS INVESTIGATED

NOMENCLATURE

Symbol	Description	Drawing Number
B1	Body	STS-03300
EN1	Elevon, inboard	STS-03301
EN3	Elevon, outboard (EN2 extended to wing tips)	STS-03303
FB1	Body flap	STS-03303
R3	Rudder	STS-03303
V3	Vertical Tail	
W3	Basic wing with extended wing tips	

COMBINATIONS TESTED

B1W3	B1W3V3EN3
B1W3V3	B1W3V3EN1EN3
B1W3V3R3	V1W3V3EN1EN3FB1
B1W3V3EN1	

TEST MCAIR LSWT 240 DATA SET COLLATION SHEET

☐ PRETEST
☒ POSTTEST

IDPVAR (1)

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	CONTROL DEFLECTION δ_{EN1}	δ_{EN3}	δ_{R3}	δ_{FB1}	NO. of RUNS	ELEVTR -30	-20	-15	-10	0	FLAP, B -30	-15	0	15			
RCFD10	B1 W3	A	0					1					4							
11			3					1					5							
RCFD20	B1 W3 V3	A	0					1					8							
21								1					29							
22			3					1					9							
23		4	AA					1					10							
24		8						1					11							
25		12						1					12							
RCFD26	R3	A	0			20		1					7							
RCFD27	B1 W3 V3 EN1	A	0	—	0			1		13										
28	EN3			—	—			1		14										
29	B1 W3 V3 EN3			0	20/-20			1					15							
30	EN1			—	0			1	16											
31	B1 W3 V3 EN1 EN3			—	—			3	17		21	20								
32				0/-30	0/-30			1					18							
33	EN1			—	0			1				19								
34	EN3 FB1			-15	-15			4						25	24	21	26			
RCFD35		A	0	—	—		-30	2		28		27								

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

C.L. | C.D. | C.L.M. | C.Y. | C.L.N. | C.S.L. | C.D.B. | ELEV.T.B1 | IDPVAR(1) | IDPVAR(2) | NDV

COEFFICIENTS: FLAP, B

α or β SCHEDULES

α: A = -10 $\xrightarrow{\Delta 2}$ 20°

β: AA = -6 $\xrightarrow{\Delta 1}$ 3°

TEST MCAIR LSWT 240 DATA SET DESCRIPTOR SHEET

DATA SET IDENTIFIER	DATA SET DESCRIPTOR 1 11 21 31 41	Mode Type	CURVE SLOPE RANGE 51 LOWER LIMIT	61 UPPER LIMIT
RCFD 10	LSWT 240 4.0 PC HCR ØRBITER (Ø2) B1V3	1.1		
11		1.1		
20	B1V3V3	1.1		
21		1.1		
22		1.1		
23		2.1		
24		2.1		
25		2.1		
26	R3	1.1		
27	B1V3V3EN1	1.1		
28	EN3	1.1		
29	EN3	1.1		
30		1.1		
31	EN1EN3	1.1		
32		1.1		
33		1.1		
RCFD 34	FB1	1.1		
RCFD 35		1.1		

1 SREF(1)	11 SREF(2)	21 LREF(1)	31 LREF(2)	41 BREF(1)	51 BREF(2)	61 XMRP(1)	71 XMRP(2)
9.58	SQ. FT.	3.02	FT.	3.54	FT.	4.221	FT.
0.0	FT.	0.667	FT.	4.0	PER CENT	STS 03300	
YMRP(1)	YMRP(2)	ZMRP(1)	ZMRP(2)	SCALE(1)	SCALE(2)	FILREF	

DATA SET PARAMETER NAME SHEET

TEST MCAIR LSWT 240

DATA SET IDENTIFIER	PARAMETER NAMES (Format 10A6) 1	7	13	19	25	31	37	43	49	55	61	NPRA
RCFD 10	BETA											
11												
20												
21												
22												
23	ALPHA											
24												
25												
26	BETA	RUDDER										
27		LHINBDRHINBD										
28												
29		AILRON										
30		LHINBDRHINBD										
31												
32		AILRON										
33		LHINBDRHINBD										
34		ELEVTR										
RCFD 35	BETA	FLAPS										

DATA SET PARAMETER VALUE SHEET

TEST MCAIR LSWT 240

DATA SET IDENTIFIER	PARAMETER VALUE (Format 10F8.3) 1	9	17	25	33	41	49	51	65	73
RCFD 10	0.0									
11	3.0									
20	0.0									
21										
22	3.0									
23	4.0									
24	8.0									
25	12.0									
26	0.0	12.0								
27		-20.0	-20.0							
28										
29		20.0								
30		-30.0	-30.0							
31										
32		15.0								
33		-10.0	-10.0							
34		-15.0								
RCFD 35	0.0	-30.0								

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.

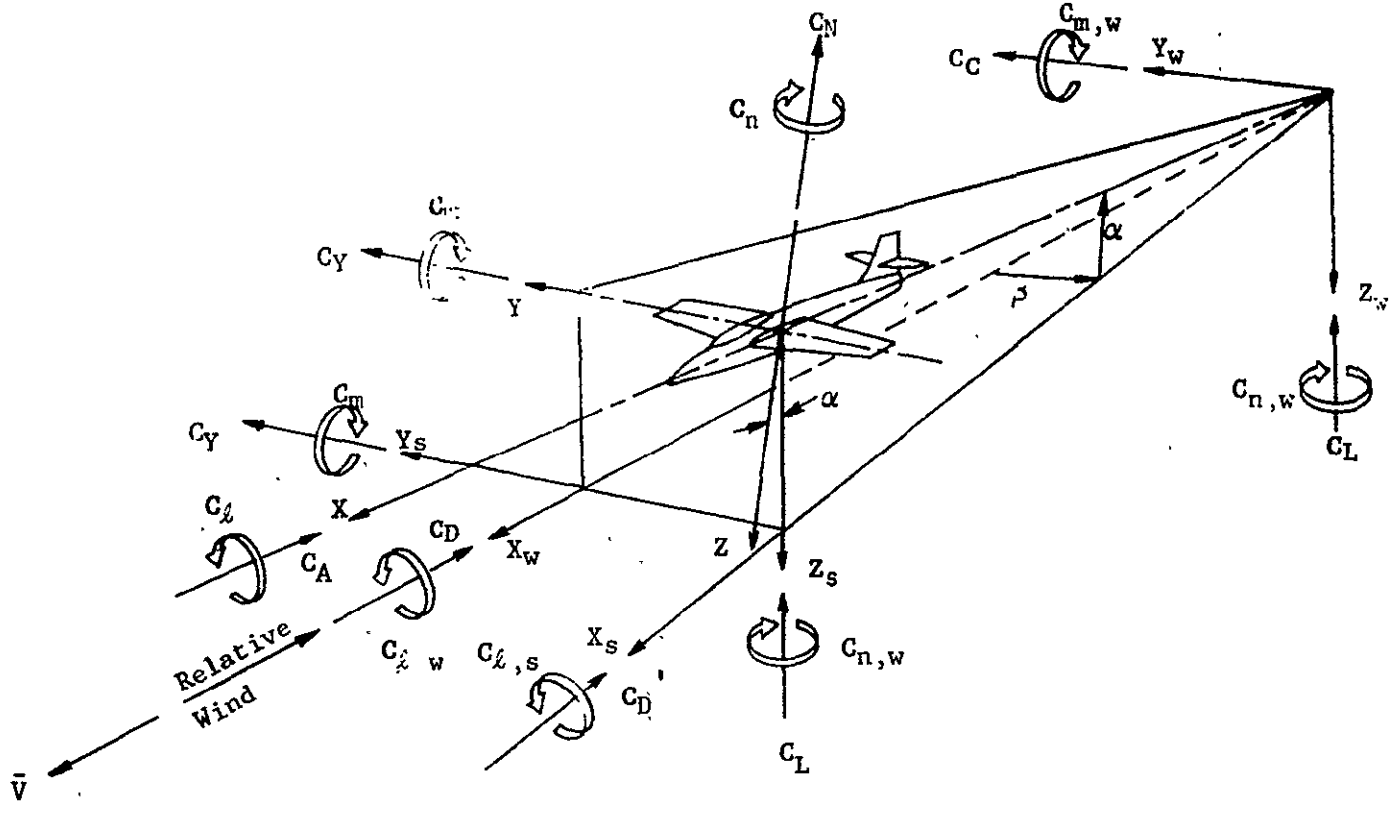


Figure 1. Axis systems, showing direction and sense of force and moment coefficients, angle of attack, and sideslip angle

NASA-MSFC-MAF

Notes:
All dimensions are model scale in inches.
Reference: McDonnell Dwg. Nos. STS-03300, STS-03301, STS-03303

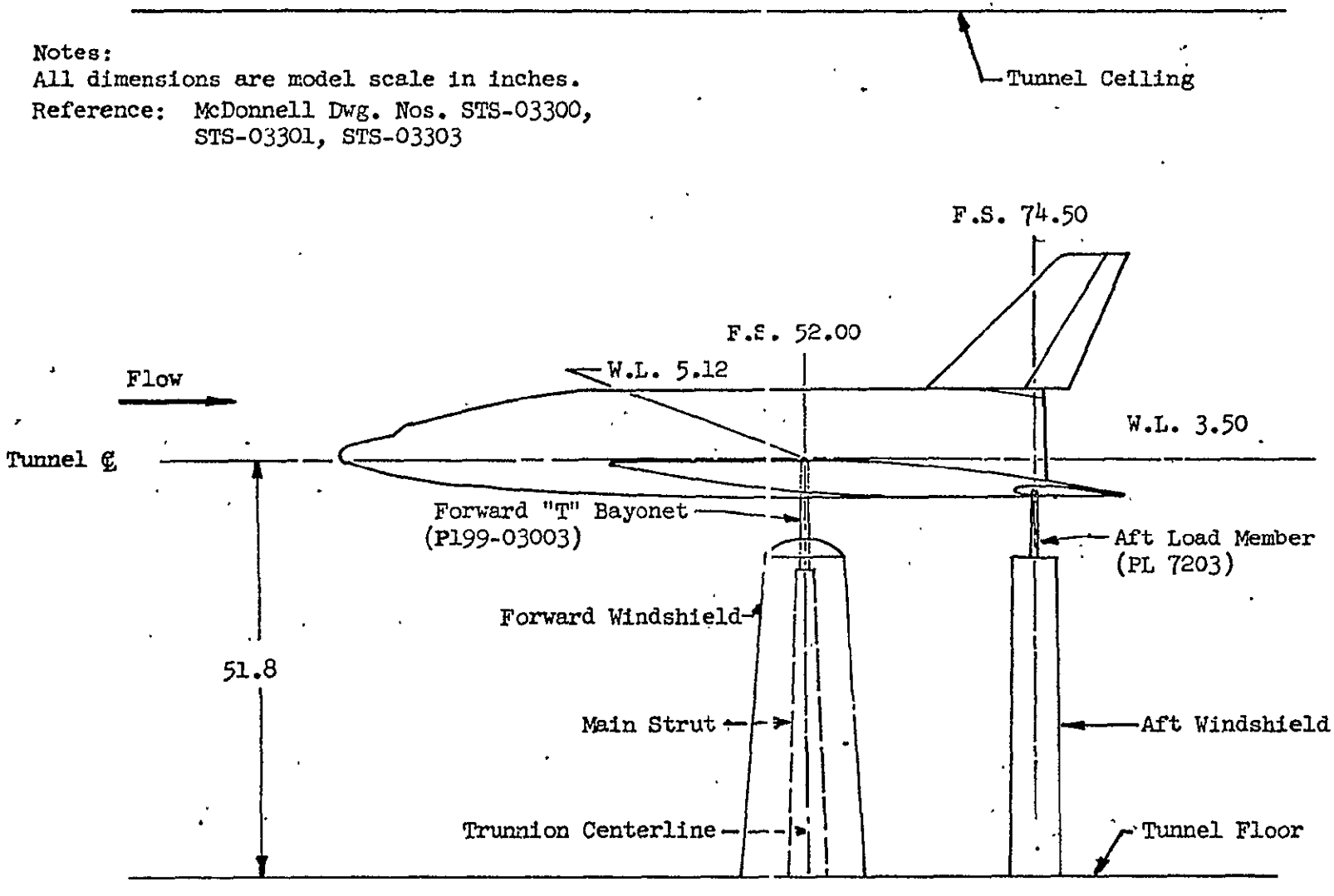
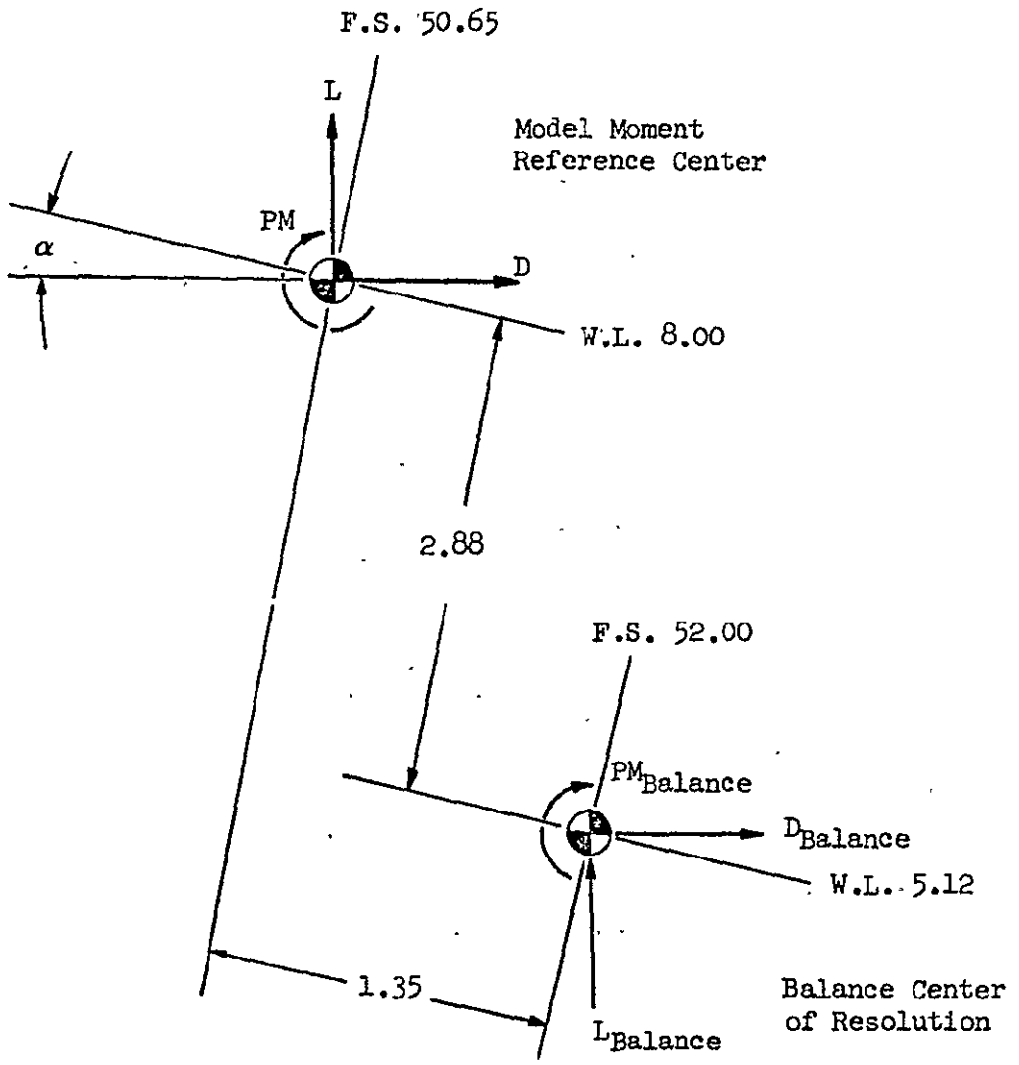
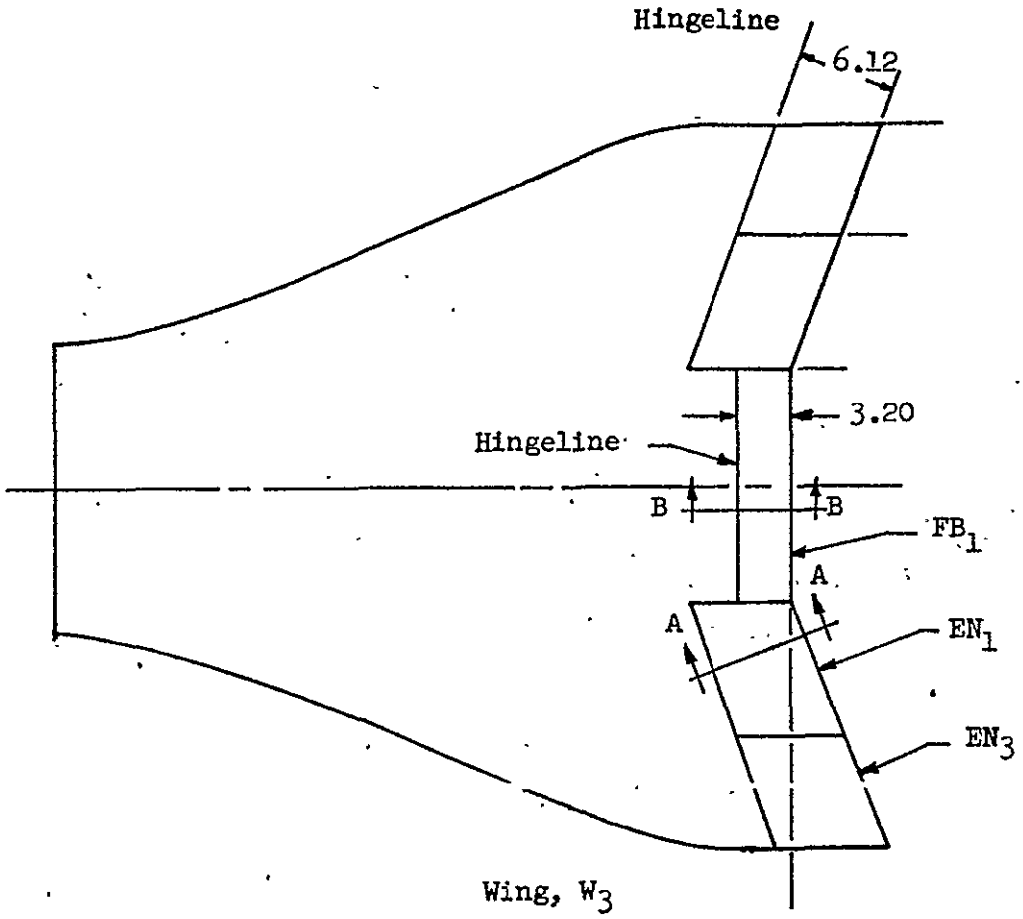


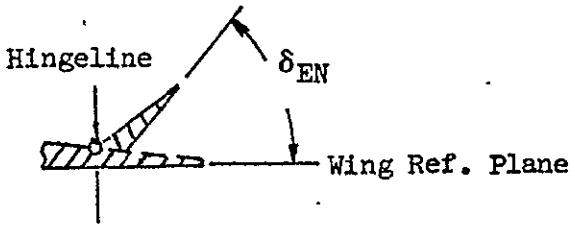
FIGURE 2 - MODEL INSTALLATION



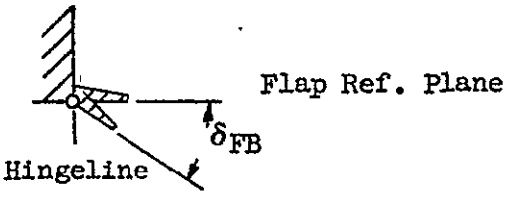
Note: All dimensions are model scale in inches.

FIGURE 3 - MOMENT TRANSFER DIAGRAM
MODEL UPRIGHT





Section A-A

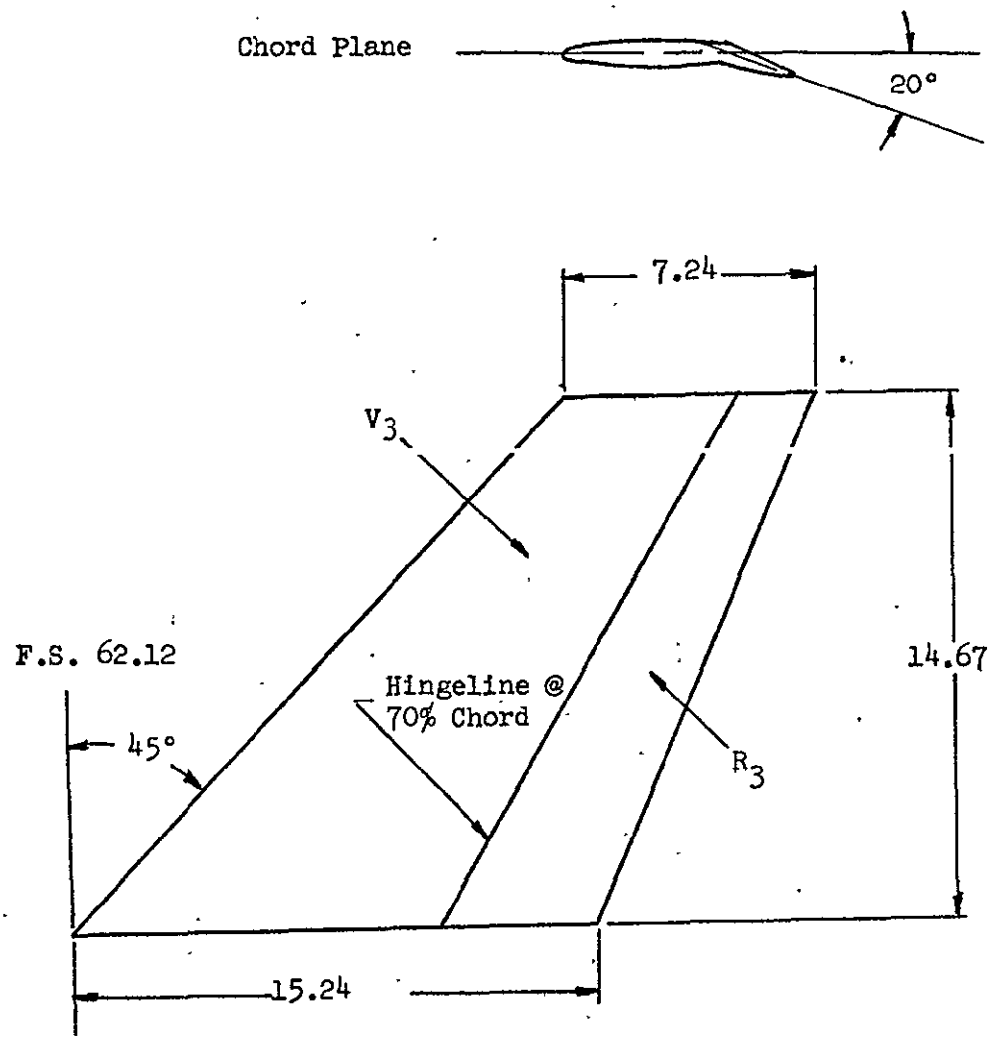


Section B-B

Notes:
All dimensions are model scale in inches.

FIGURE 4 - WING (W_3), ELEVONS (EN_1, EN_3), AND BODY FLAP (FB_1)

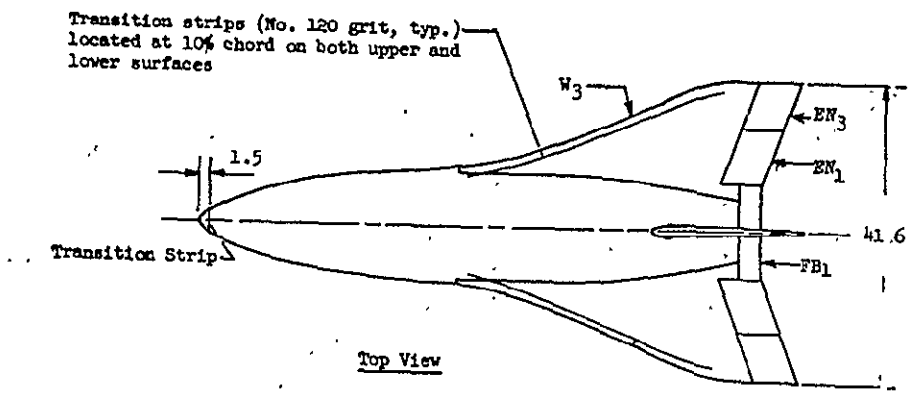
MAC 318U (REV 25 AUG 6



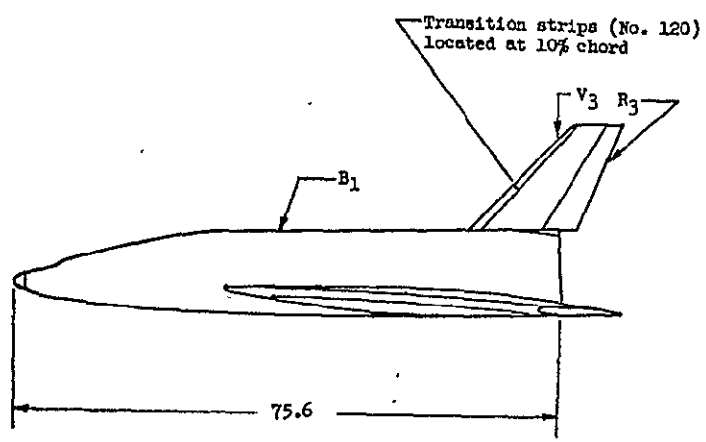
Notes:
All dimensions are model scale in inches.
Reference: McDonnell Dwg. No. STS-03303

FIGURE 5 - VERTICAL TAIL (V_3) AND RUDDER (R_3)

MAC 318U (REV 28 AUG 61)

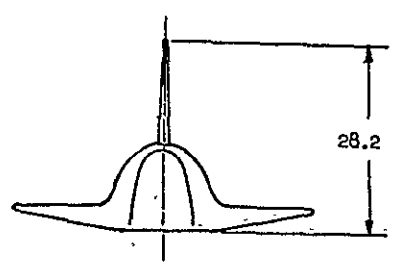


Top View



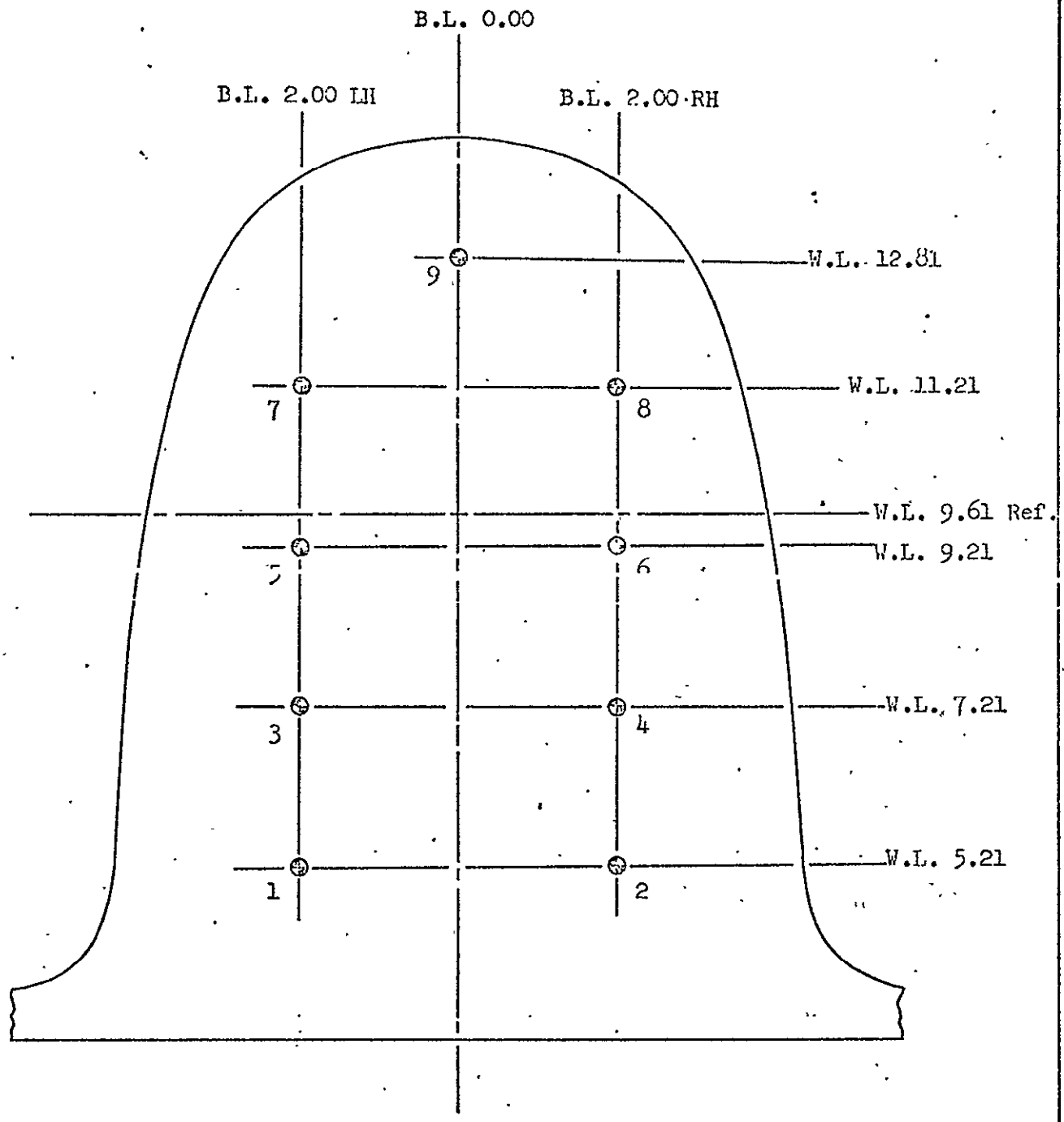
Side View

Note:
All dimensions are model scale in inches.
Reference: McDonnell Dwg. Nos. ST3-03300, STS-03301, and STS-03303



Rear View

FIGURE 6 - GENERAL ASSEMBLY ($B_1EN_1EN_3R_3V_3W_3FB_1$)



View Looking Upstream

Notes:
All Dimensions are model scale in inches.
Ref.: McDonnell Dwg. No. STS-03300

FIGURE 7 - BASE-PRESSURE ORIFICE LOCATIONS

MAC 2310 (REV 1 AUG 61)

MODEL COMPONENT: BODY - HCR ORBITER

GENERAL DESCRIPTION: B1

DRAWING NUMBER: _____

DIMENSIONS:	FULL-SCALE	4% MODEL SCALE
Length	1890 IN.	75.6 IN.
Max. Width	378 IN.	15.12 IN.
Max. Depth	303 IN.	12.12 IN.
Fineness Ratio	–	–
Area		
Max. Cross-Sectional	–	–
Planform	–	–
Wetted	–	–
Base	362.5 FT.^{2}	83.5 IN.^{2}

MODEL COMPONENT: WING ~ HIGH CROSS RANGE ORBITER

GENERAL DESCRIPTION: W3

DRAWING NUMBER: _____

DIMENSIONS:

	FULL-SCALE	MODEL SCALE 4%
TOTAL DATA		
Area		
Planform	6018 FT.^{2}	1386.5 IN.^{2}
Wetted	—	—
Span (equivalent)	1040 IN.	41.6 IN.
Aspect Ratio	1.248	1.248
Rate of Taper	—	—
Taper Ratio	.211	.211
Diehedral Angle, degrees	10.0	10.0
Incidence Angle, degrees	—	—
Aerodynamic Twist, degrees	—	—
Toe-In Angle	—	—
Cant Angle	—	—
Sweep Back Angles, degrees		
Leading Edge	67.5	67.5
Trailing Edge	20.5	20.5
0.25 Element Line	62.5	62.5
Chords:		
Root (Wing Sta. 0.0)	1416 IN.	56.64 IN.
Tip, (equivalent)	298.2 IN.	11.93 IN.
MAC	956.8 IN	38.27 IN.
Fus. Sta. of .25 MAC	1283 IN	51.32
W.P. of .25 MAC	—	—
B.L. of .25 MAC	202.9	8.12
Airfoil Section		
Root	—	—
Tip	—	—
EXPOSED DATA		
Area	3282 FT.^{2}	756.2 IN.^{2}
Span, (equivalent)	661.7 IN.	26.47 IN.
Aspect Ratio	0.926	0.926
Taper Ratio	0.298	0.298
Chords		
Root	1002 IN.	40.08 IN.
Tip	298.2 IN.	11.93 IN.
MAC		
Fus. Sta. of .25 MAC	—	—
W.P. of .25 MAC	—	—
B.L. of .25 MAC	—	—

MODEL COMPONENT: ELEVON ~ HCR ORBITER

GENERAL DESCRIPTION: EN1

DRAWING NUMBER:

DIMENSIONS:	FULL-SCALE	MODEL SCALE 4%
Area	416.1 FT.^{2}	95.87 IN.^{2}
Span (equivalent)	391.6 IN.	15.664 IN.
Inb'd equivalent chord	153 IN.	6.12
Outb'd equivalent chord	153 IN.	6.12
Ratio movable surface chord/ total surface chord		
At Inb'd equiv. chord	–	
At Outb'd equiv. chord	–	
Sweep Back Angles, degrees		
Leading Edge	20.5	20.5
Tailing Edge	20.5	20.5
Hingeline	20.5	20.5
Area Moment (Normal to hinge line)	2652.5 FT.^{3}	293.35 IN.^{3}

MODEL COMPONENT: ELEVON ~ HCR ORBITER

GENERAL DESCRIPTION: EN 3

DRAWING NUMBER: _____

DIMENSIONS:	FULL-SCALE	MODEL SCALE 4%
Area	347.9 FT.^{2}	80.16 IN.^{2}
Span (equivalent)	327.4 IN.	13.1 IN
Inb'd equivalent chord	153 IN.	6.12 IN.
Outb'd equivalent chord	153 IN.	6.12 IN.
Ratio movable surface chord/ total surface chord		
At Inb'd equiv. chord	—	—
At Outb'd equiv. chord	—	—
Sweep Back Angles, degrees		
Leading Edge	20.5	20.5
Tailing Edge	20.5	20.5
Hingeline	20.5	20.5
Area Moment (Normal to hinge line)	2217.6 FT^3	245.25 IN.^{3}

MODEL COMPONENT: BODY FLAP ~ HCR ORBITER

GENERAL DESCRIPTION: FB1

DRAWING NUMBER: _____

DIMENSIONS:	FULL-SCALE	MODEL SCALE 4 %
Area	178.33 FT.^{2}	41.087 IN.^{2}
Span (equivalent)	321.0 IN.	12.84 IN.
Inb'd equivalent chord	80.0 IN.	3.20 IN.
Outb'd equivalent chord	80.0 IN.	3.20 IN.
Ratio movable surface chord/ total surface chord		
At Inb'd equiv. chord	—	—
At Outb'd equiv. chord	—	—
Sweep Back Angles, degrees		
Leading Edge	0°	0°
Tailing Edge	0°	0°
Hingeline	0°	0°
Area Moment (Normal to hinge line)	594.44 FT.^{3}	65.6 IN.^{3}

MODEL COMPONENT: RUDDER ~ HCR ORBITER

GENERAL DESCRIPTION: R_3

DRAWING NUMBER: _____

DIMENSIONS:	FULL-SCALE	MODEL SCALE 4%
Area	214.5 FT^2	49.42 IN.^{2}
Span (equivalent)	366.0 IN	14.64 IN.
Inb'd equivalent chord	115.0 IN	4.60 IN.
Outb'd equivalent chord	53.8 IN.	2.15 IN.
Ratio movable surface chord/ total surface chord		
At Inb'd equiv. chord	0.300	0.300
At Outb'd equiv. chord	0.299	0.299
Sweep Back Angles, degrees		
Leading Edge	31.5°	31.5°
Tailing Edge	24.0°	24.0
Hingeline	31.5°	31.5°
Area Moment (Normal to hinge line)	757.8 FT^3	83.81 IN.^{3}

MODEL COMPONENT: VERTICAL TAIL ~ HCR ORBITER

GENERAL DESCRIPTION: V_5

DRAWING NUMBER: _____

DIMENSIONS:

	FULL-SCALE	MODEL SCALE 4 %
TOTAL DATA		
Area		
Planform	715.5 FT^2	164.85 IN.^{2}
Wetted	—	
Span (equivalent)	366.0 IN.	14.64 IN.
Aspect Ratio	1.30	1.30
Rate of Taper	—	—
Taper Ratio	0.470	0.470
Diehedral Angle, degrees	—	—
Incidence Angle, degrees	—	—
Aerodynamic Twist, degrees	—	—
Toe-In Angle	—	—
Cant Angle	—	—
Sweep Back Angles, degrees		
Leading Edge	45.0°	45.0°
Trailing Edge	24.0°	24.0°
0.25 Element Line	40.7°	40.7°
Chords:		
Root (Wing Sta. 0.0)	383.0 IN.	15.32 IN.
Tip, (equivalent)	180.0 IN.	7.20 IN.
MAC	293.8 IN.	11.75 IN.
Fus. Sta. of .25 MAC	1791.9 IN	71.68 IN.
W.P. of .25 MAC	297.6 IN.	11.9 IN.
B.L. of .25 MAC	0	
Airfoil Section		
Root	0012-64	0012-64
Tip	0012-64	0012-64
EXPOSED DATA		
Area	715.5 FT.^{2}	164.85 IN.^{2}
Span, (equivalent)	366.0	14.64 IN.
Aspect Ratio	1.30	1.30
Taper Ratio	0.470	0.470
Chords		
Root	383.0 IN.	15.32 IN.
Tip	180.0 IN.	7.20 IN.
MAC	293.8 IN.	11.75 IN.
Fus. Sta. of .25 MAC	1791.9 IN.	71.68 IN.
W.P. of .25 MAC	297.6 IN.	11.9 IN.
B.L. of .25 MAC	0	0

NOMENCLATURE

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

NOMENCLATURE (continued)

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

NOMENCLATURE (continued)

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

NOMENCLATURE (continued)

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

NOMENCLATURE (continued)

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

NOMENCLATURE (continued)

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

NOMENCLATURE (Continued)

SYMBOL	SADSAC SYMBOL	DEFINITION
	LH OBD	parameter name for left half outboard wing control surface; deflection, degrees, positive with trailing edge down.
	RH OBD	parameter mane for right half outboard wing control surface, deflection, degrees, positive with trailing edge down.
	FLAPB	parameter name for body flap FB1; deflection, degrees, positive with trailing edge down.
	ELEVON	wing control surface, deflection, degrees, positive trailing edge down.

NOMENCLATURE (continued)

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

NOMENCLATURE (continued)

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

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 three sections:

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

(b) an expanded list of all data sets, containing the identifier, the descriptor, the resident dependent variables, reference data, parameters and respective values, and independent variable ranges.

(c) the 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. John Axelson
NASA LaRC	Mr. David Stone
NASA MSC	Mr. Ray Nelson
NASA MSFC	Mr. Jim Weaver
MDAC (EAST)	Mr. John Hrenak

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

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DATA PLOT INDEX

DATA REPEATIBILITY OF THE AERODYNAMIC CHARACTERISTICS OF THE HCR ORBITER (02)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, MULTIPLE DATASETS

DATASETS PLOTTED:
DCFD20 DCFD21

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CL	ALPHA	1	1
CLM	ALPHA	2	2
CD	ALPHA	3	3
L/D	ALPHA	4	4
CDB	ALPHA	5	5

DATA REPEATIBILITY OF THE AERODYNAMIC CHARACTERISTICS OF THE HCR ORBITER (02)

DEPENDENT VARIABLE VS DEPENDENT VARIABLE, MULTIPLE DATASETS

DATASETS PLOTTED:
DCFD20 DCFD21

DEPENDENT VARIABLE	DEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CL	CLM	6	6
CL	CD	7	7
CLSQR	CD	8	8

EFFECT OF A VERTICAL TAIL ON THE HCR ORBITER(02) AERODYNAMIC CHARACTERISTICS

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, MULTIPLE DATASETS

DATASETS PLOTTED:
DCFD10 DCFD20

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CL	ALPHA	9	9
CLM	ALPHA	10	10
CD	ALPHA	11	11
L/D	ALPHA	12	12
CDB	ALPHA	13	13

DATA PLOT INDEX

EFFECT OF A VERTICAL TAIL ON THE HCR ORBITER(02) AERODYNAMIC CHARACTERISTICS

DEPENDENT VARIABLE VS DEPENDENT VARIABLE, MULTIPLE DATASETS

DATASETS PLOTTED:
DCFD10 DCFD20

DEPENDENT VARIABLE	DEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CL	CLM	14	14
CL	CD	15	15
CLSQR	CD	16	16

EFFECT OF A VERTICAL TAIL ON THE HCR ORBITER(02) AERODYNAMIC CHARACTERISTICS

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, MULTIPLE DATASETS

DATASETS PLOTTED:
DCFD11 DCFD22

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CL	ALPHA	17	17
CLM	ALPHA	18	18
CD	ALPHA	19	19
L/D	ALPHA	20	20
CDB	ALPHA	21	21
CSL	ALPHA	22	22
CLN	ALPHA	23	23
CY	ALPHA	24	24

DATASETS PLOTTED:
CCFD11 CCFD22

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CYN	ALPHA	25	25
CBL	ALPHA	26	26

DATA PLOT INDEX

EFFECT OF A VERTICAL TAIL ON THE HCR ORBITER(02) AERODYNAMIC CHARACTERISTICS

DEPENDENT VARIABLE VS DEPENDENT VARIABLE, MULTIPLE DATASETS

DATASETS PLOTTED:
DCFD11 DCFD22

DEPENDENT VARIABLE	DEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CL	CLM	27	27
CL	CD	28	28
CLSQR	CD	29	29

EFFECT OF CONSTANT SIDE SLIP ON THE HCR ORBITER(02) WING-BODY

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
DCFD10 DCFD11

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CL	ALPHA	30	30
CLM	ALPHA	31	31
CD	ALPHA	32	32
L/D	ALPHA	33	33
CDB	ALPHA	34	34
CSL	ALPHA	35	35
CLN	ALPHA	36	36
CY	ALPHA	37	37

EFFECT OF CONSTANT SIDE SLIP ON THE HCR ORBITER(02) WING-BODY

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
CCFD10 CCFD11

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CYN	ALPHA	38	38
CBL	ALPHA	39	39

DATA PLOT INDEX

EFFECT OF CONSTANT SIDE SLIP ON THE HCR ORBITER(02) WING-BODY

DEPENDENT VARIABLE VS DEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
DCFD10 DCFD11

DEPENDENT VARIABLE	DEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CL	CLM	40	40
CL	CD	41	41
CLSQR	CD	42	42

EFFECT OF CONSTANT SIDESLIP ON THE HCR ORBITER(02)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
DCFD20 DCFD22

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CL	ALPHA	43	43
CLM	ALPHA	44	44
CD	ALPHA	45	45
L/D	ALPHA	46	46
CDB	ALPHA	47	47
CSL	ALPHA	48	48
CLN	ALPHA	49	49
CY	ALPHA	50	50

EFFECT OF CONSTANT SIDESLIP ON THE HCR ORBITER(02)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
CCFD20 CCFD22

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CYN	ALPHA	51	51
CBL	ALPHA	52	52

DATA PLOT INDEX

EFFECT OF CONSTANT SIDESLIP ON THE HCR ORBITER(02)

DEPENDENT VARIABLE VS DEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
DCFD20 DCFD22

DEPENDENT VARIABLE	DEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CL	CLM	53	53
CL	CD	54	54
CLSQR	CD	55	55

AERODYNAMIC CHARACTERISTICS OF THE HCR OBITER (02) IN SIDE SLIP

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
DCFD23 DCFD24 DCFD25

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CL	BETA	56	56
CLM	BETA	57	57
CD	BETA	58	58
L/D	BETA	59	59
CDB	BETA	60	60
CSL	BETA	61	61
CLN	BETA	62	62
CY	BETA	63	63

AERODYNAMIC CHARACTERISTICS OF THE HCR OBITER (02) IN SIDE SLIP

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
CCFD23 CCFD24 CCFD25

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CBL	BETA	64	64
CYN	BETA	65	65

DATA PLOT INDEX

EFFECT OF RUDDER(R3) DEFLECTION ON THE HCR ORBITER(O2)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
DCFD26 . DCFD20

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CL	ALPHA	66	66
CLM	ALPHA	67	67
CD	ALPHA	68	68
L/D	ALPHA	69	69
CDB	ALPHA	70	70
CSL	ALPHA	71	71
CLN	ALPHA	72	72
CY	ALPHA	73	73

EFFECT OF RUDDER(R3) DEFLECTION ON THE HCR ORBITER(O2)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
CCFD26 . CCFD20

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CYN	ALPHA	74	74
CBL	ALPHA	75	75

EFFECT OF RUDDER(R3) DEFLECTION ON THE HCR ORBITER(O2)

DEPENDENT VARIABLE VS DEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
DCFD26 DCFD20

DEPENDENT VARIABLE	DEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CL	CLM	76	76
CL	CD	77	77
CLSQR	CD	78	78

DATA PLOT INDEX

EFFECT OF PART SPAN ELEVON(EN1) DEFLECTION ON THE HCR ORBITER(02)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
ECFD30 ECFD27 ECFD33 ECFD20

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CL	ALPHA	79	79
CLM	ALPHA	80	80
CD	ALPHA	81	81
L/D	ALPHA	82	82
CDB	ALPHA	83	83

EFFECT OF PART SPAN ELEVON(EN1) DEFLECTION ON THE HCR ORBITER(02)

DEPENDENT VARIABLE VS DEPENDENT VARIABLE, PARAMETRIC STUDY

DATASETS PLOTTED:
ECFD30 ECFD27 ECFD33 ECFD20

DEPENDENT VARIABLE	DEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CL	CLM	84	84
CL	CD	85	85
CLSQR	CD	86	86

EFFECT OF FULL SPAN ELEVON(EN1EN3) DEFLECTION ON THE HCR ORBITER(02)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE,

DATASETS PLOTTED	DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
ACFD31	CL	ALPHA	87	87
ACFD31	CLM	ALPHA	88	88
ACFD31	CD	ALPHA	89	89
ACFD31	L/D	ALPHA	90	90
ACFD31	CDB	ALPHA	91	91

DATA PLOT INDEX

EFFECT OF FULL SPAN ELEVON(EN1EN3) DEFLECTION ON THE HCR ORBITER(02)

DEPENDENT VARIABLE VS DEPENDENT VARIABLE,

DATASETS PLOTTED	DEPENDENT VARIABLE	DEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
ACFD31	CL	CLM	92	92
ACFD31	CL	CD	93	93
ACFD31	CLSQR	CD	94	94

COMPARISION OF FULL AND PART SPAN ELEVON DEFLECTIONS ON THE HCR ORBITER(02)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, MULTIPLE DATASETS

DATASETS PLOTTED:
TCFD28 TCFD27 TCFD20

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CL	ALPHA	95	95
CLM	ALPHA	96	96
CD	ALPHA	97	97
L/D	ALPHA	98	98
CD8	ALPHA	99	99

COMPARISION OF FULL AND PART SPAN ELEVON DEFLECTIONS ON THE HCR ORBITER(02)

DEPENDENT VARIABLE VS DEPENDENT VARIABLE, MULTIPLE DATASETS

DATASETS PLOTTED:
TCFD28 TCFD27 TCFD20

DEPENDENT VARIABLE	DEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CL	CLM	100	100
CL	CD	101	101
CLSQR	CD	102	102

DATA PLOT INDEX

EFFECT OF FULL SPAN AILERON(EN1EN3) DEFLECTION ON THE HCR ORBITER(02)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, MULTIPLE DATASETS

DATASETS PLOTTED:
TCFT32 TCFD31 TCFD20

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CL	ALPHA	103	103
CLM	ALPHA	104	104
CD	ALPHA	105	105
L/D	ALPHA	106	106
CDB	ALPHA	107	107
CSL	ALPHA	108	108
CLN	ALPHA	109	109
CY	ALPHA	110	110

EFFECT OF FULL SPAN AILERON(EN1EN3) DEFLECTION ON THE HCR ORBITER(02)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, MULTIPLE DATASETS

DATASETS PLOTTED:
JCFT32 JCFD31 JCFD20

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CYN	ALPHA	111	111
CBL	ALPHA	112	112

EFFECT OF FULL SPAN AILERON(EN1EN3) DEFLECTION ON THE HCR ORBITER(02)

DEPENDENT VARIABLE VS DEPENDENT VARIABLE, MULTIPLE DATASETS

DATASETS PLOTTED:
TCFT32 TCFD31 TCFD20

DEPENDENT VARIABLE	DEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CL	CLM	113	113
CL	CD	114	114
CLSQR	CD	115	115

DATA PLOT INDEX

COMPARISON OF VARIOUS AILERON DEFLECTIONS ON THE HCR ORBITER(02)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, MULTIPLE DATASETS

DATASETS PLOTTED:
TCFD32 TCFD29 TCFD20

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CL	ALPHA	116	116
CLM	ALPHA	117	117
CD	ALPHA	118	118
L/D	ALPHA	119	119
CDB	ALPHA	120	120
CSL	ALPHA	121	121
CLN	ALPHA	122	122
CY	ALPHA	123	123

COMPARISON OF VARIOUS AILERON DEFLECTIONS ON THE HCR ORBITER(02)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, MULTIPLE DATASETS

DATASETS PLOTTED:
JCFD32 JCFD29 JCFD20

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CYN	ALPHA	124	124
CBL	ALPHA	125	125

COMPARISON OF VARIOUS AILERON DEFLECTIONS ON THE HCR ORBITER(02)

DEPENDENT VARIABLE VS DEPENDENT VARIABLE, MULTIPLE DATASETS

DATASETS PLOTTED:
TCFD32 TCFD29 TCFD20

DEPENDENT VARIABLE	DEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CL	CLM	126	126
CL	CD	127	127
CLSQR	CD	128	128

DATA PLOT INDEX

EFFECT OF BODY FLAP(FB1) DEFLECTION ON THE HCR ORBITER(02)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE

DATASETS PLOTTED	DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
ACFD34	CL	ALPHA	129	129
ACFD34	CLM	ALPHA	130	130
ACFD34	CD	ALPHA	131	131
ACFD34	L/D	ALPHA	132	132
ACFD34	CDB	ALPHA	133	133

EFFECT OF BODY FLAP(FB1) DEFLECTION ON THE HCR ORBITER(02)

DEPENDENT VARIABLE VS DEPENDENT VARIABLE

DATASETS PLOTTED	DEPENDENT VARIABLE	DEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
ACFD34	CL	CLM	134	134
ACFD34	CL	CD	135	135
ACFD34	CL SQR	CD	136	136

COMPARISON OFTHE HCR ORBITER(02) WITH BODY FLAP(FB1) AND WITH BODY FLAP OFF

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, MULTIPLE DATASETS

DATASETS PLOTTED:
KCFD31 BCFD34

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CL	ALPHA	137	137
CLM	ALPHA	138	138
CD	ALPHA	139	139
L/D	ALPHA	140	140
CDB	ALPHA	141	141

DATA PLOT INDEX

COMPARISON OFTHE HCR ORBITER(02) WITH BODY FLAP(FB1) AND WITH BODY FLAP OFF

DEPENDENT VARIABLE VS DEPENDENT VARIABLE, MULTIPLE DATASETS

DATASETS PLOTTED:
KCFD31 BCFD34

DEPENDENT VARIABLE	DEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
CL	CLM	142	142
CL	CD	143	143
CLSQR	CD	144	144

EFFECT OF FULL SPAN ELEVON DEFLECTION ON THE HCR ORBITER(02) WITH BODY FLAP

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE

DATASETS PLOTTED	DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
ACFD35	CL	ALPHA	145	145
ACFD35	CLM	ALPHA	146	146
ACFD35	CD	ALPHA	147	147
ACFD35	L/D	ALPHA	148	148
ACFD35	CDB	ALPHA	149	149

EFFECT OF FULL SPAN ELEVON DEFLECTION ON THE HCR ORBITER(02) WITH BODY FLAP

DEPENDENT VARIABLE VS DEPENDENT VARIABLE

DATASETS PLOTTED	DEPENDENT VARIABLE	DEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
ACFD35	CL	CLM	150	150
ACFD35	CL	CD	151	151
ACFD35	CLSQR	CD	152	152

DATA PLOT INDEX

EFFECT OF PART SPAN ELEVON(EN1) DEFLECTION ON THE HCR ORBITER(02)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE

DATASETS PLOTTED	DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
ICFD30	CL	ELEVON	153	155
ICFD30	CLM	ELEVON	156	158
ICFD30	CD	ELEVON	159	161

EFFECT OF FULL SPAN ELEVON(EN1EN3) DEFLECTION ON THE HCR ORBITER(02)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE

DATASETS PLOTTED	DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
ICFD31	CL	ELEVON	162	164
ICFD31	CLM	ELEVON	165	167
ICFD31	CD	ELEVON	168	170

EFFECT OF FULL SPAN ELEVON DEFLECTION ON THE HCR ORBITER(02) WITH BODY FLAP

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE

DATASETS PLOTTED	DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
ICFD35	CL	ELEVON	171	173
ICFD35	CLM	ELEVON	174	176
ICFD35	CD	ELEVON	177	179

DATA PLOT INDEX

LATERAL STABILITY DERIVATIVE FOR THE HCR ORBITER(02) WING-BODY

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, MULTIPLE DATASETS

DATASETS PLOTTED:
GCFH11

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
DCSLDB	ALPHA	180	180
DCLNDB	ALPHA	181	181
CYBETA	ALPHA	182	182

DATASETS PLOTTED:
GCFG11

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
DCYNDB	ALPHA	183	183
DCBLDB	ALPHA	184	184

LATERAL STABILITY DERIVATIVE FOR THE HCR ORBITER(02)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, MULTIPLE DATASETS

DATASETS PLOTTED:
GCFH22

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
DCSLDB	ALPHA	185	185
DCLNDB	ALPHA	186	186
CYBETA	ALPHA	187	187

DATASETS PLOTTED:
GCFG22

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
DCYNDB	ALPHA	188	188
DCBLDB	ALPHA	189	189

DATA PLOT INDEX

RUDDER EFFECTIVENESS OF THE HCR ORBITER(02)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, MULTIPLE DATASETS

DATASETS PLOTTED:
GCFH26

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
DCSLDR	ALPHA	190	190
DCLNDR	ALPHA	191	191
DCY/DR	ALPHA	192	192

DATASETS PLOTTED:
GCFG26

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
DCYNDR	ALPHA	193	193
DCBLDR	ALPHA	194	194

AILERON EFFECTIVENESS OF THE HCR ORBITER(02)

DEPENDENT VARIABLE VS INDEPENDENT VARIABLE, MULTIPLE DATASETS (FMALFA)

DATASETS PLOTTED:
GCFH29 GCFH32

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
DCSLDA	ALPHA	195	195
DCLNDA	ALPHA	196	196
DCY/DA	ALPHA	197	197

DATASETS PLOTTED:
GCFG29 GCFG32

DEPENDENT VARIABLE	INDEPENDENT VARIABLE	PLOT PAGE BEGINNING	/ ENDING
DCYNDA	ALPHA	198	198
DCBLDA	ALPHA	199	199

PLOTTED DATA

DCBFDR	ALPHA	1.4	1.4
DCYNDR	ALPHA	1.3	1.3

VARIABLE DEPENDENT	VARIABLE INDEPENDENT	BEGINNING \ ENDING PLOT PAGE

GCFG24 GCFG32
DATASETS PLOTTED:

DCY\DR	ALPHA	1.2	1.2
DCFNDR	ALPHA	1.1	1.1
DCSFDR	ALPHA	1.0	1.0

VARIABLE DEPENDENT	VARIABLE INDEPENDENT	BEGINNING \ ENDING PLOT PAGE

GCFH24
DATASETS PLOTTED:

DEPENDENT VARIABLE AS INDEPENDENT VARIABLE, MULTIPLE DATASETS

RUDDER EFFECTIVENESS OF THE HCR ORBITER(02)

DATA PLOT INDEX

DCBFDR	ALPHA	1.4	1.4
DCYNDR	ALPHA	1.3	1.3

VARIABLE DEPENDENT	VARIABLE INDEPENDENT	BEGINNING \ ENDING PLOT PAGE

GCFG24
DATASETS PLOTTED:

DCY\DR	ALPHA	1.2	1.2
DCFNDR	ALPHA	1.1	1.1
DCSFDR	ALPHA	1.0	1.0

VARIABLE DEPENDENT	VARIABLE INDEPENDENT	BEGINNING \ ENDING PLOT PAGE

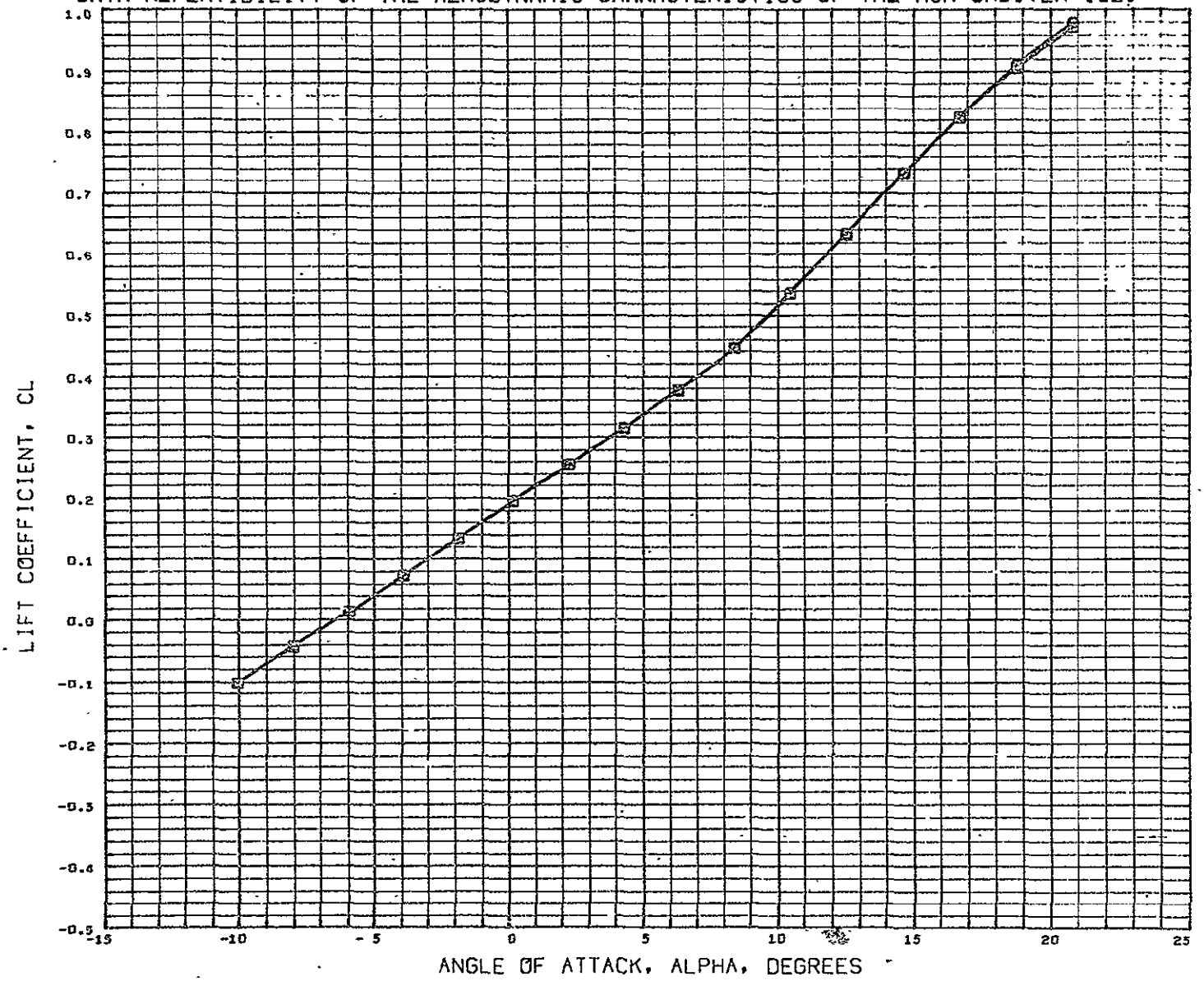
GCFH24
DATASETS PLOTTED:

DEPENDENT VARIABLE AS INDEPENDENT VARIABLE, MULTIPLE DATASETS

AILERON EFFECTIVENESS OF THE HCR ORBITER(02)

NASA-MSFC-MAF

DATA REPEATIBILITY OF THE AERODYNAMIC CHARACTERISTICS OF THE HCR ORBITER (02)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(DCFD20)	○	LSWT 240 4.0 FC HCR ORBITER(02) B1W3V3
(DCFD21)	□	LSWT 240 4.0 FC HCR ORBITER(02) B1W3V3

PARAMETRIC VALUES

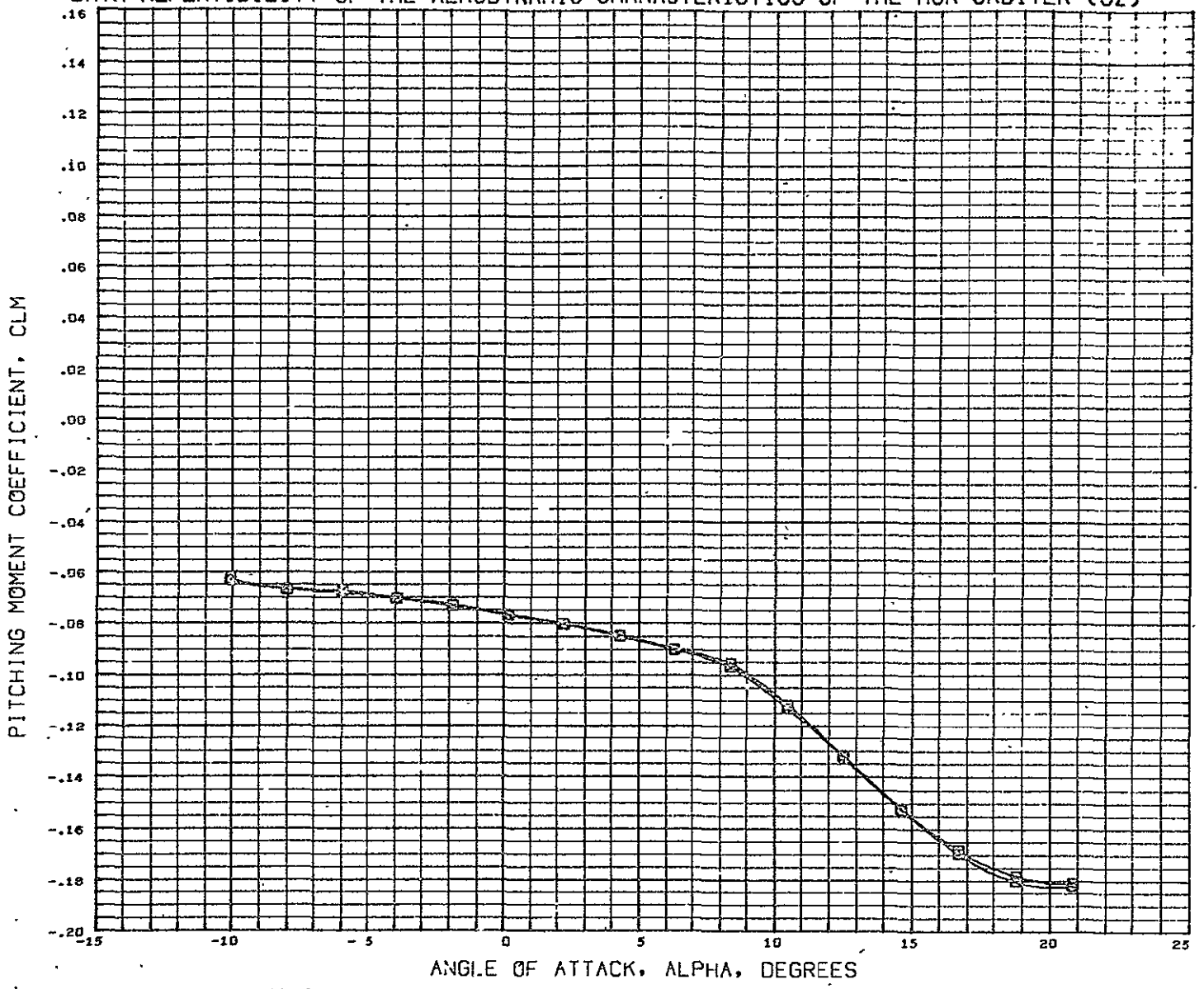
BETA	0.000	RUDDER	0.000
LHINBD	0.000	RHINBD	0.000
AILRON	0.000	FLAP,B	0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

ELEVON 0.000

DATA REPEATIBILITY OF THE AERODYNAMIC CHARACTERISTICS OF THE HCR ORBITER (02)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(DCFD20)	○	LSWT 240 4.0 FC HCR ORBITER(02) B1W3V3
(DCFD21)	□	LSWT 240 4.0 FC HCR ORBITER(02) B1W3V3

PARAMETRIC VALUES

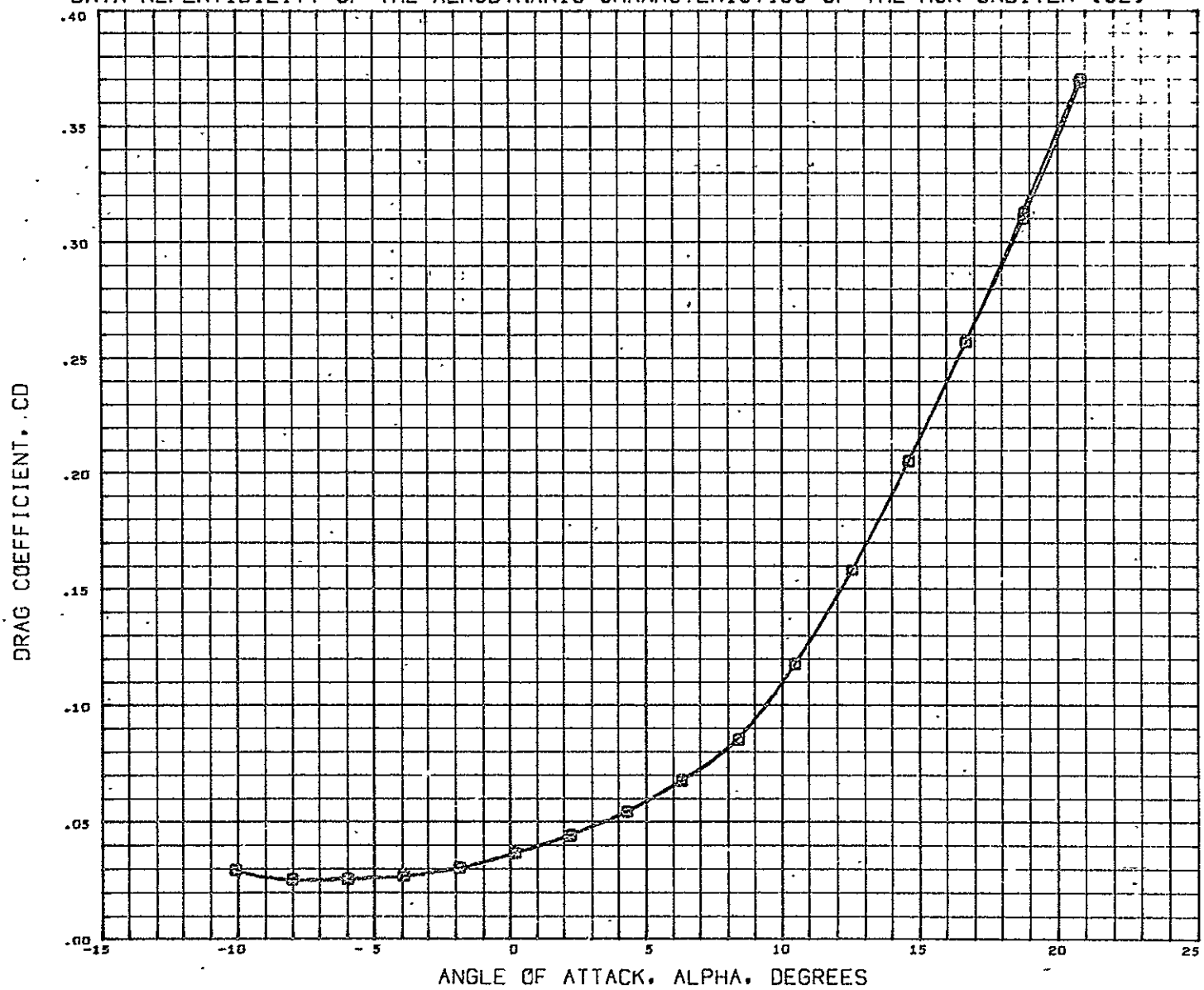
BETA	0.000	RUDDER	0.000
LHINBD	0.000	RHINBD	0.000
AILRON	0.000	FLAP,B	0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

ELEVON 0.000

DATA REPEATIBILITY ØF THE AERØDYNAMIC CHARACTERISTICS ØF THE HCR ØRBITER (02)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(DCFD20)	○	LSWT 240 4.0 FC HCR ORBITER(02) B1W3V3
(DCFD21)	□	LSWT 240 4.0 FC HCR ORBITER(02) B1W3V3

ELEVON 0.000

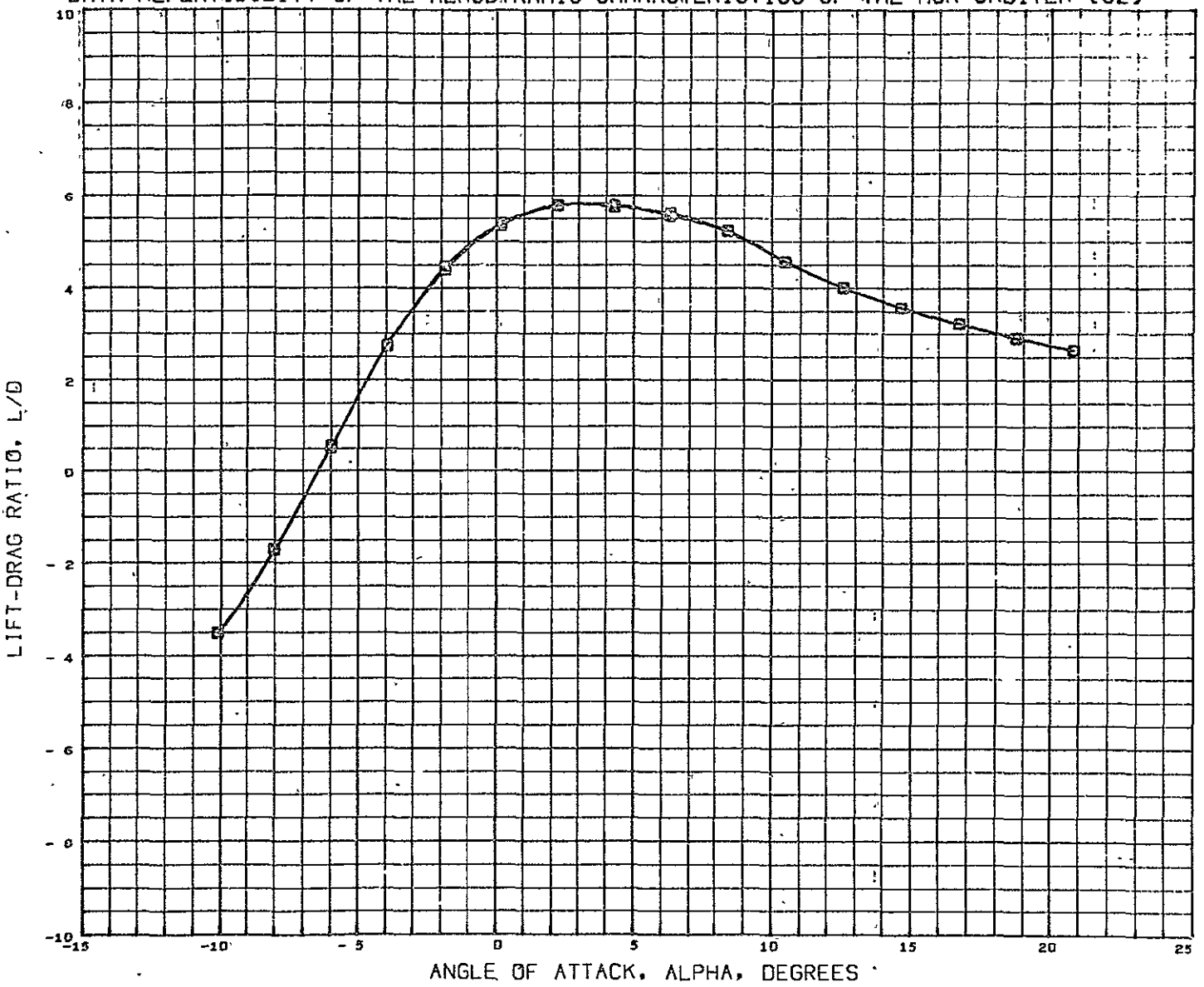
PARAMETRIC VALUES

BETA	0.000	RUDDER	0.000
LHINBD	0.000	RHINBD	0.000
AILRON	0.000	FLAP,B	0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

DATA REPEATIBILITY OF THE AERODYNAMIC CHARACTERISTICS OF THE HCR ORBITER (02)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(DCFD20)	○	LSWT 240 4.0 FC HCR ORBITER(02) B1W3V3
(DCFD21)	□	LSWT 240 4.0 FC HCR ORBITER(02) B1W3V3

FARAMETRIC VALUES

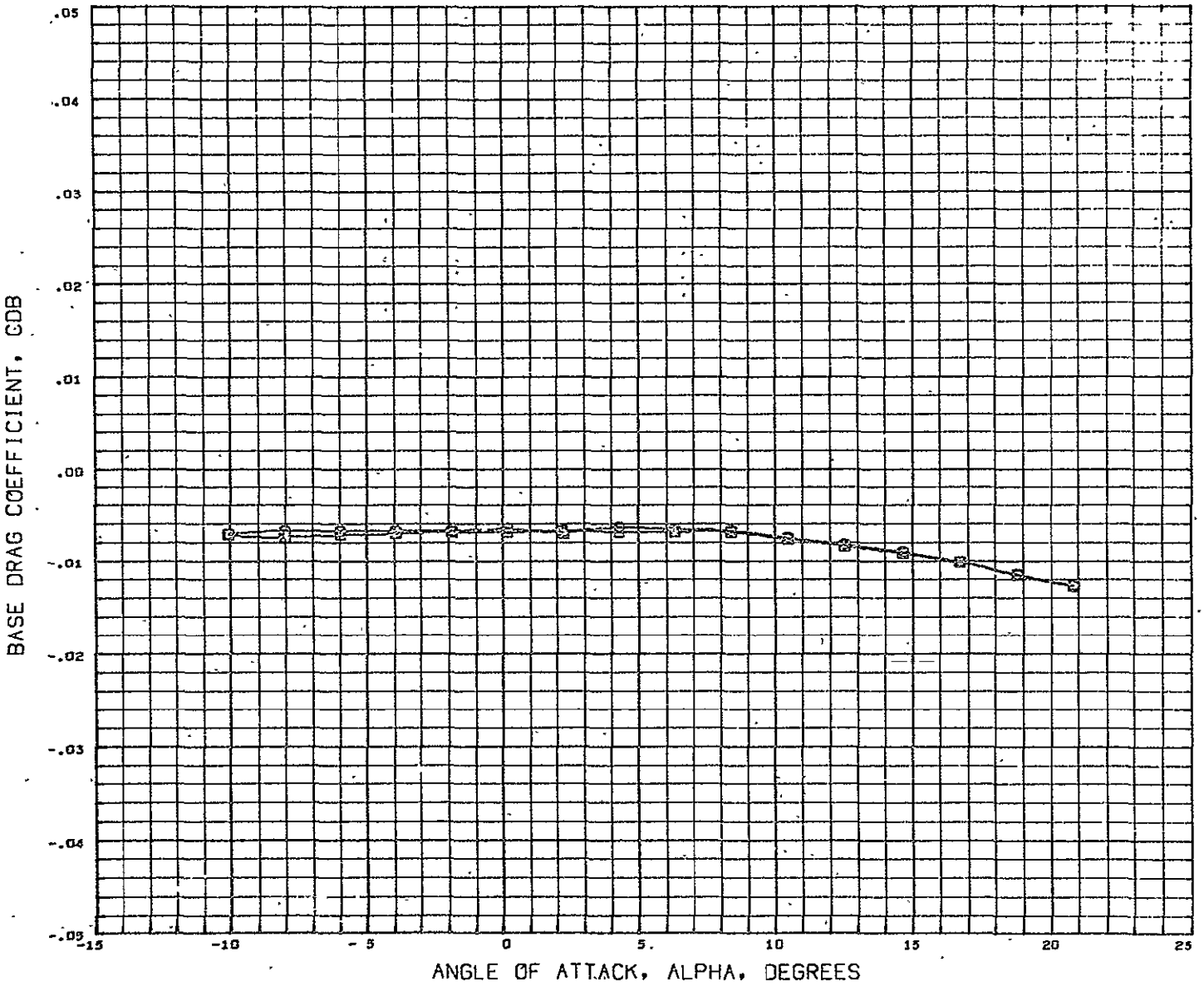
BETA	0.000	RUDDER	0.000
LHINBD	0.000	RHINBD	0.000
AILRON	0.000	FLAP,B	0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

ELEVON 0.000

DATA REPEATIBILITY OF THE AERODYNAMIC CHARACTERISTICS OF THE HCR ORBITER (02)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(DCFD20)	O	LSWT 240 4.0 FC HCR ORBITER(02) B1W3V3
(DCFD21)	□	LSWT 240 4.0 FC HCR ORBITER(02) B1W3V3

PARAMETRIC VALUES

BETA	0.000	RUDDER	0.000
LHINBD	0.000	RHINBD	0.000
AILRON	0.000	FLAP,B	0.000

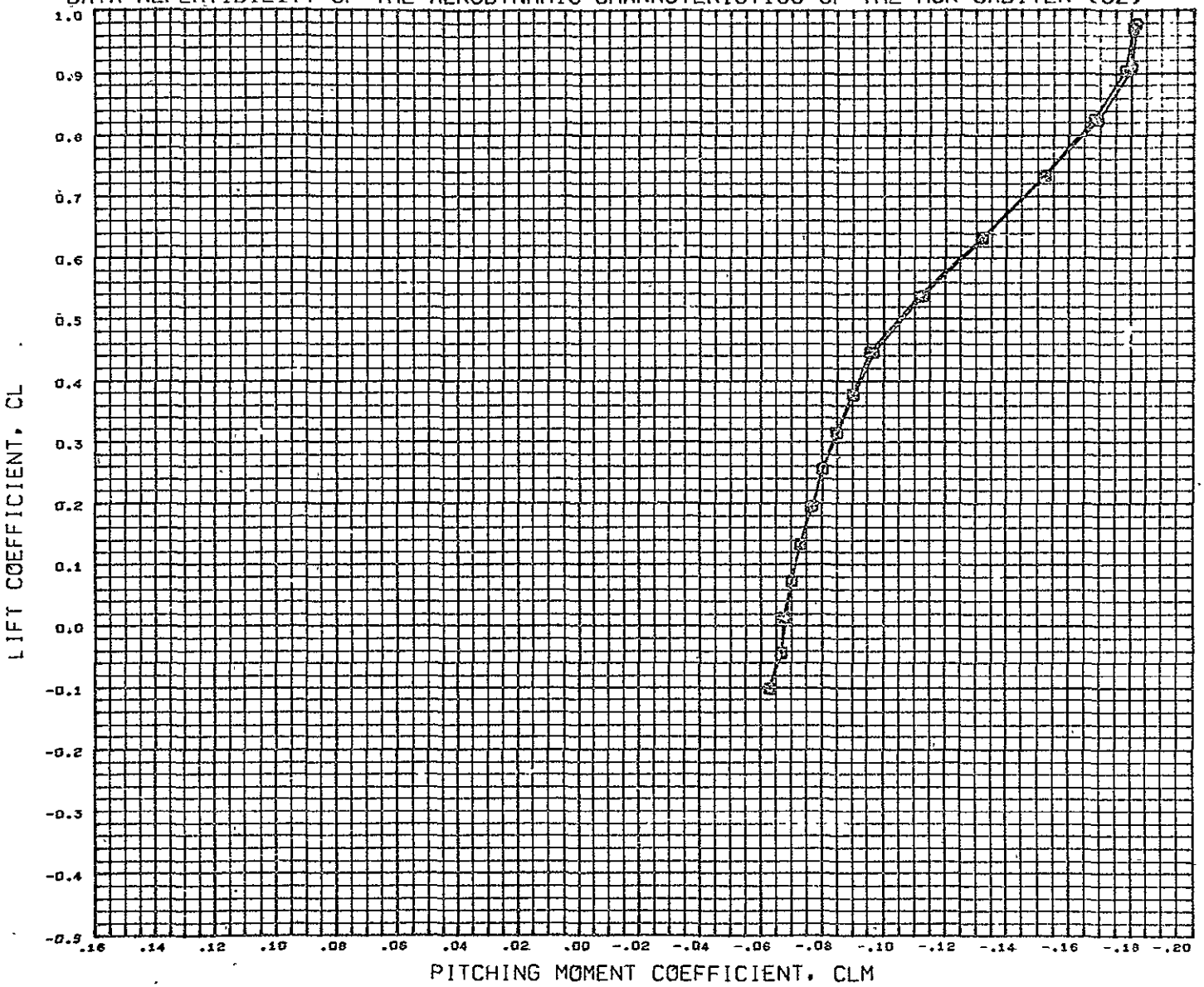
ELEVON 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

2

DATA REPEATIBILITY ØF THE AERØDYNAMIC CHARACTERISTICS ØF THE HCR ØRBITER (02)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(DCFD20)	○	LSWT 249 4.0 FC HCR ORBITER(02) B1W3V3
(DCFD21)	□	LSWT 249 4.0 FC HCR ORBITER(02) B1W3V3

PARAMETRIC VALUES

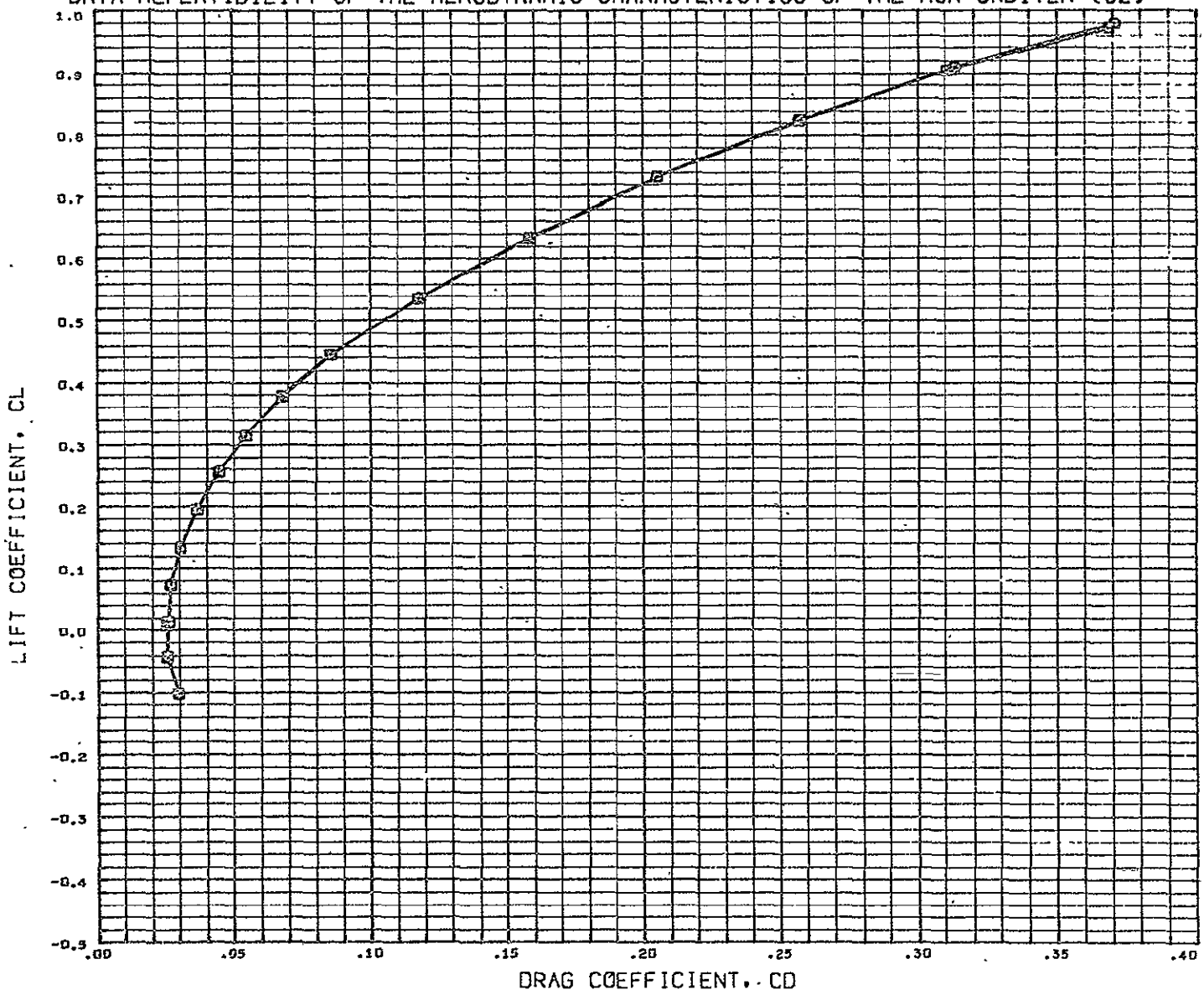
BETA	0.000	RUDDER	0.000
LHINBD	0.000	RHINBD	0.000
AILRON	0.000	FLAP,B	0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

ELEVON 0.000

DATA REPEATIBILITY OF THE AERODYNAMIC CHARACTERISTICS OF THE HCR ORBITER (02)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(DCFD20)	O	LSWT 240 4.0 FC HCR ORBITER(02) B1W3V3
(DCFD21)	□	LSWT 240 4.0 FC HCR ORBITER(02) B1W3V3

PARAMETRIC VALUES

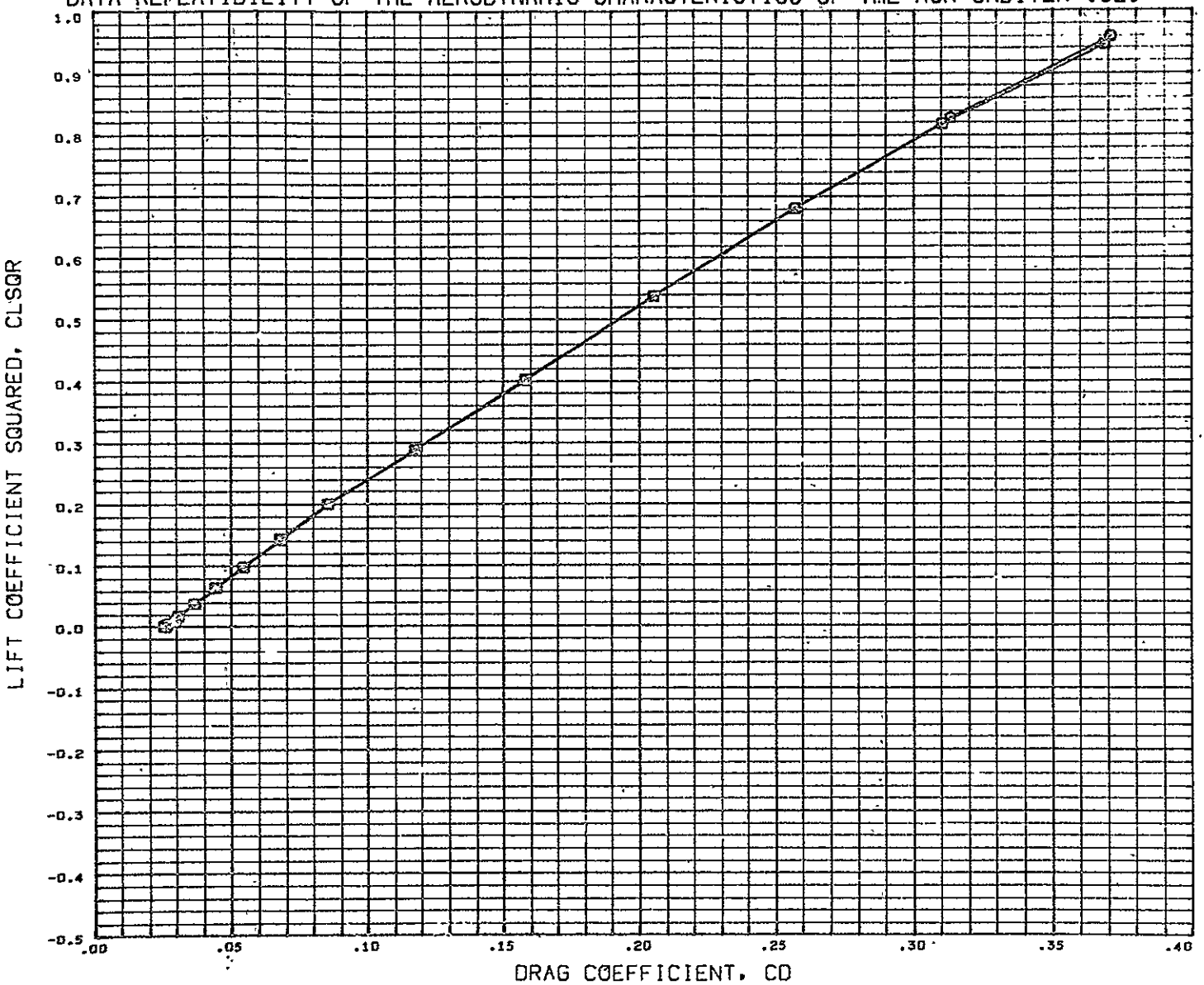
BETA	0.000	RUDDER	0.000
LHINBD	0.000	RHINBD	0.000
AILRON	0.000	FLAP,B	0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	FER CE

ELEVON 0.000

DATA REPEATIBILITY ØF THE AERØDYNAMIC CHARACTERISTICS ØF THE HCR ØRBITER (Ø2)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(ØCFØ20)	O	LSWT 240 4.0 PC HCR ORBITER(Ø2) B1W3V3
(ØCFØ21)	□	LSWT 240 4.0 PC HCR ORBITER(Ø2) B1W3V3

ELEVON 0.000

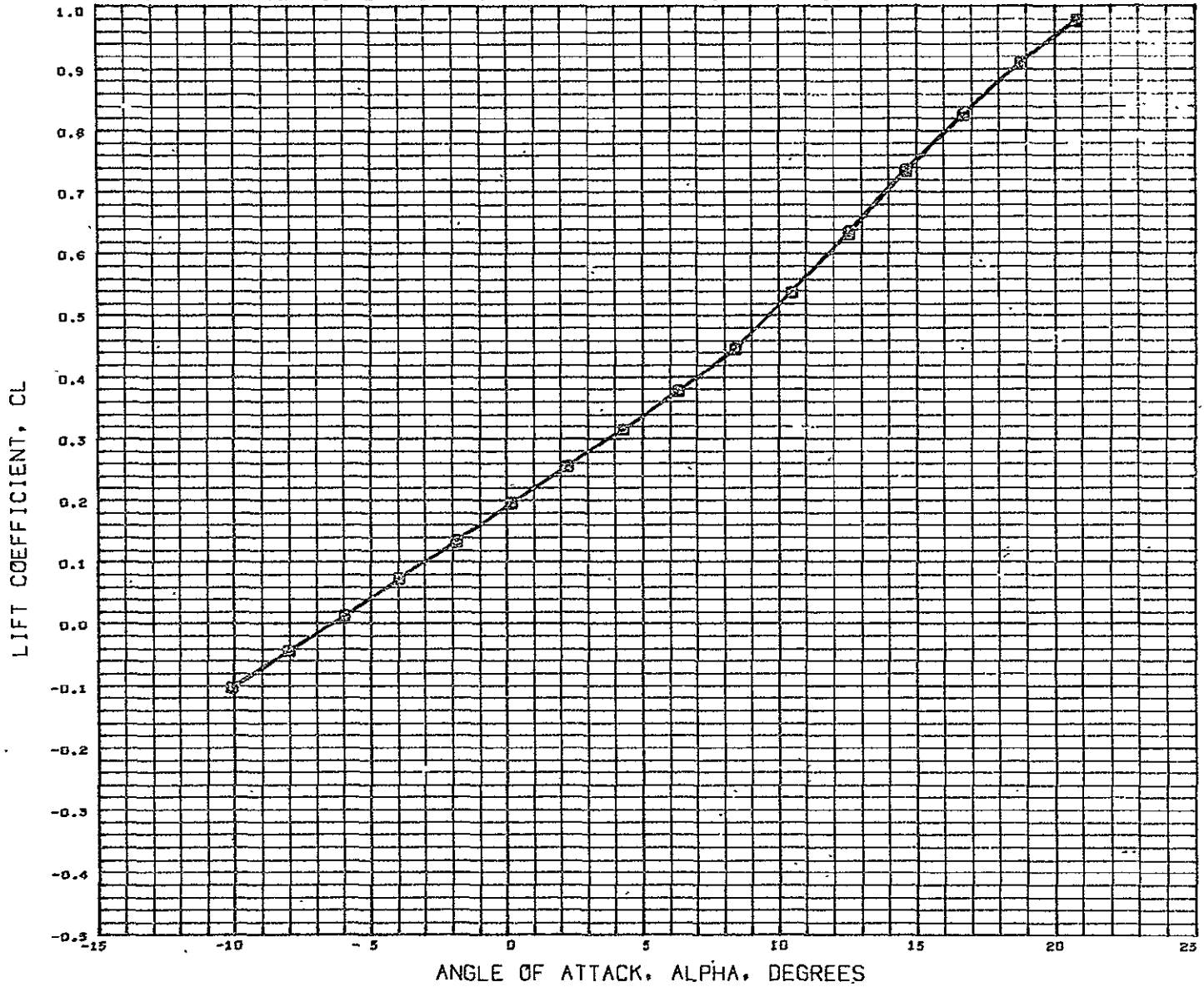
PARAMETRIC VALUES

BETA	0.000	RUDDER	0.000
LHINBD	0.000	RHINBD	0.000
AILRON	0.000	FLAP,B	0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZHRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF A VERTICAL TAIL ON THE HCR ORBITER(02) AERODYNAMIC CHARACTERISTICS



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(DCFD10)	○	LSWT 240 4.0 PC HCR ORBITER(02) B1W3
(DCFD20)	□	LSWT 240 4.0 PC HCR ORBITER(02) B1W3V3

PARAMETRIC VALUES

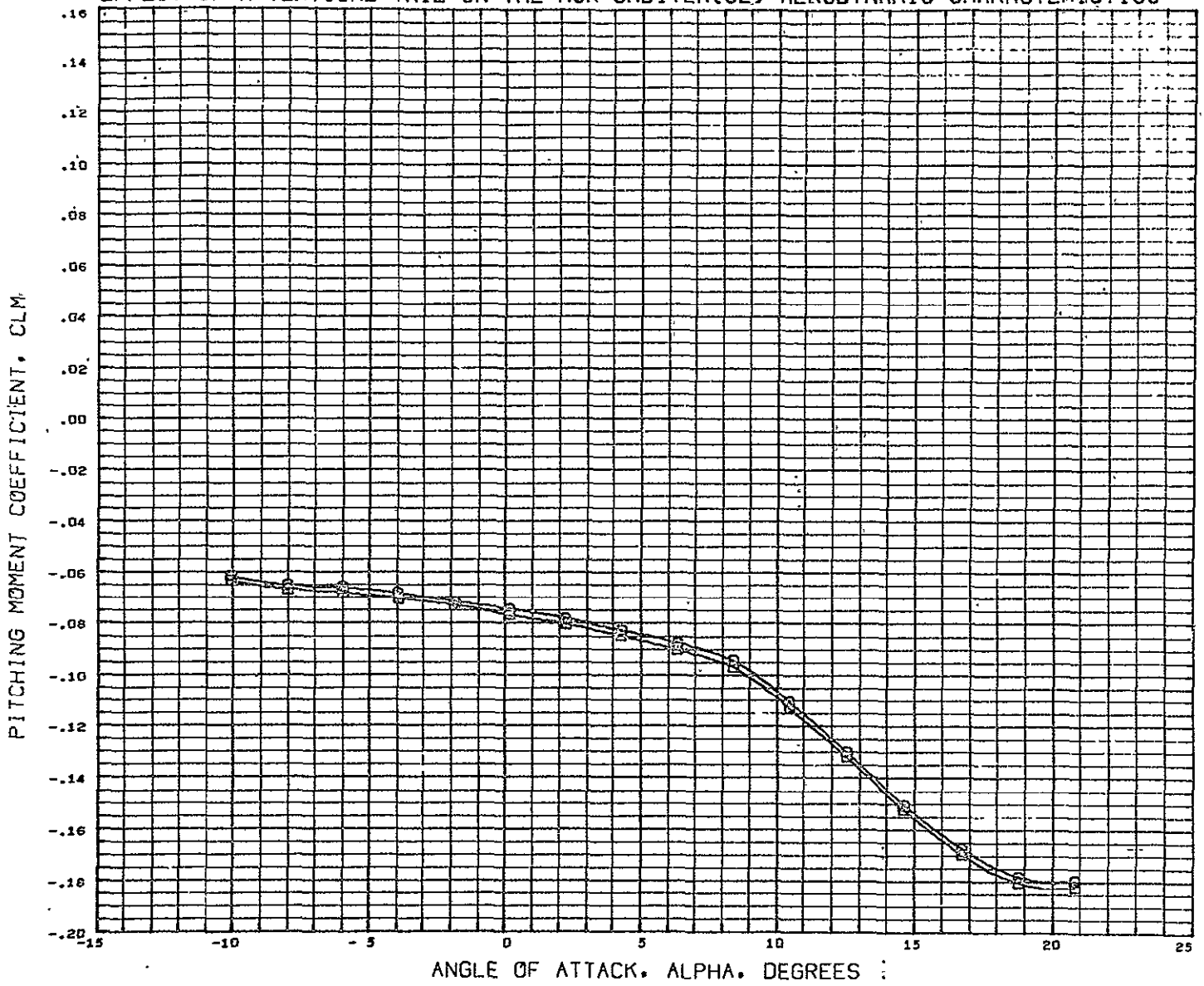
BETA	0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

ELEVON 0.000

EFFECT OF A VERTICAL TAIL ON THE HCR ORBITER(02) AERODYNAMIC CHARACTERISTICS



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(DCFD19)	○	LSWT 240 4.0 FC HCR ORBITER(02) B1W3
(DCFD20)	□	LSWT 240 4.0 FC HCR ORBITER(02) B1W3V3

ELEVON 0.000

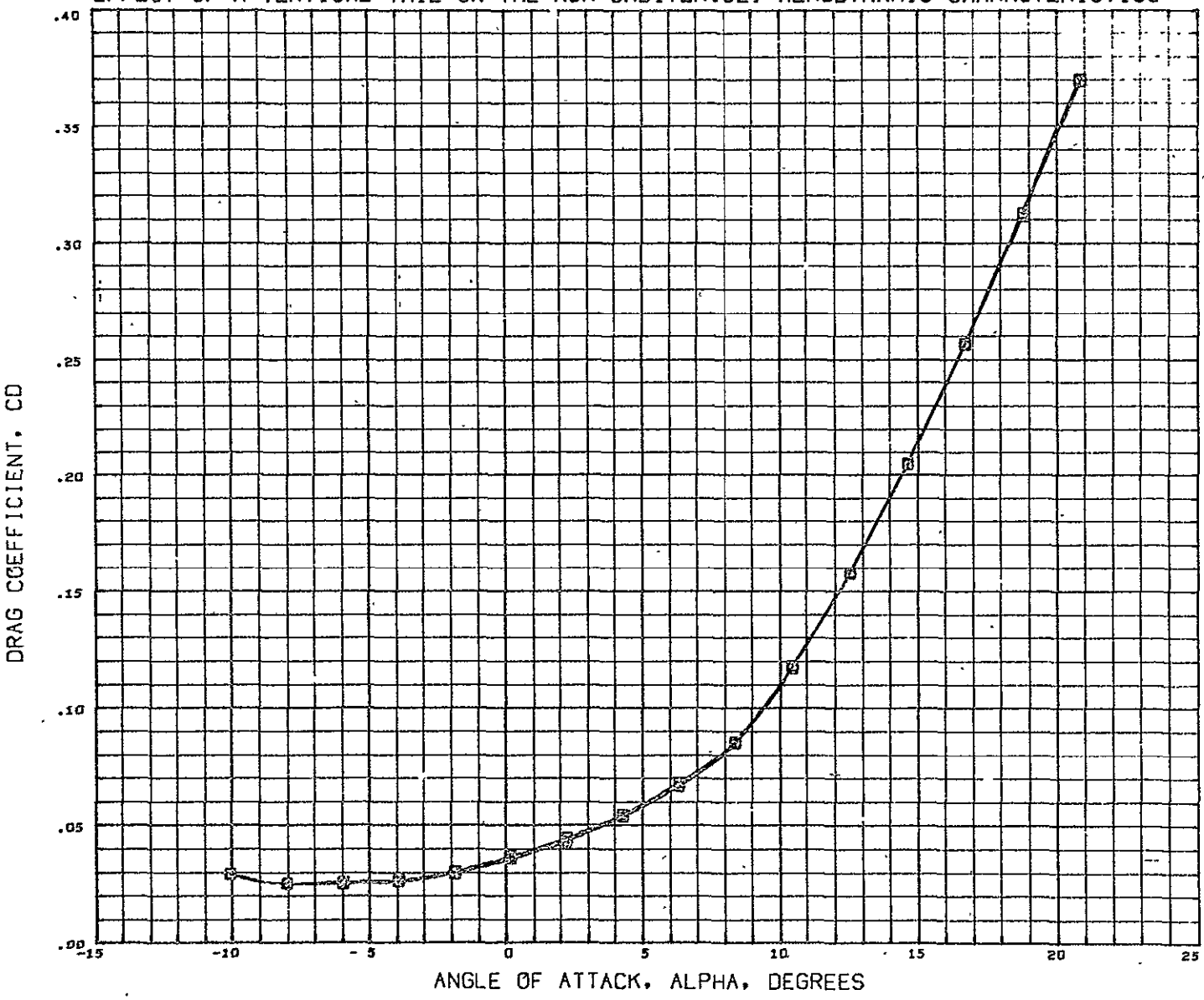
PARAMETRIC VALUES

BETA 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF A VERTICAL TAIL ON THE HCR ORBITER(02) AERODYNAMIC CHARACTERISTICS



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(DCFD19)	O	LSWT 240 4.0 FC HCR ORBITER(02) B1W3
(DCFD20)	□	LSWT 240 4.0 FC HCR ORBITER(02) B1W3V3

PARAMETRIC VALUES

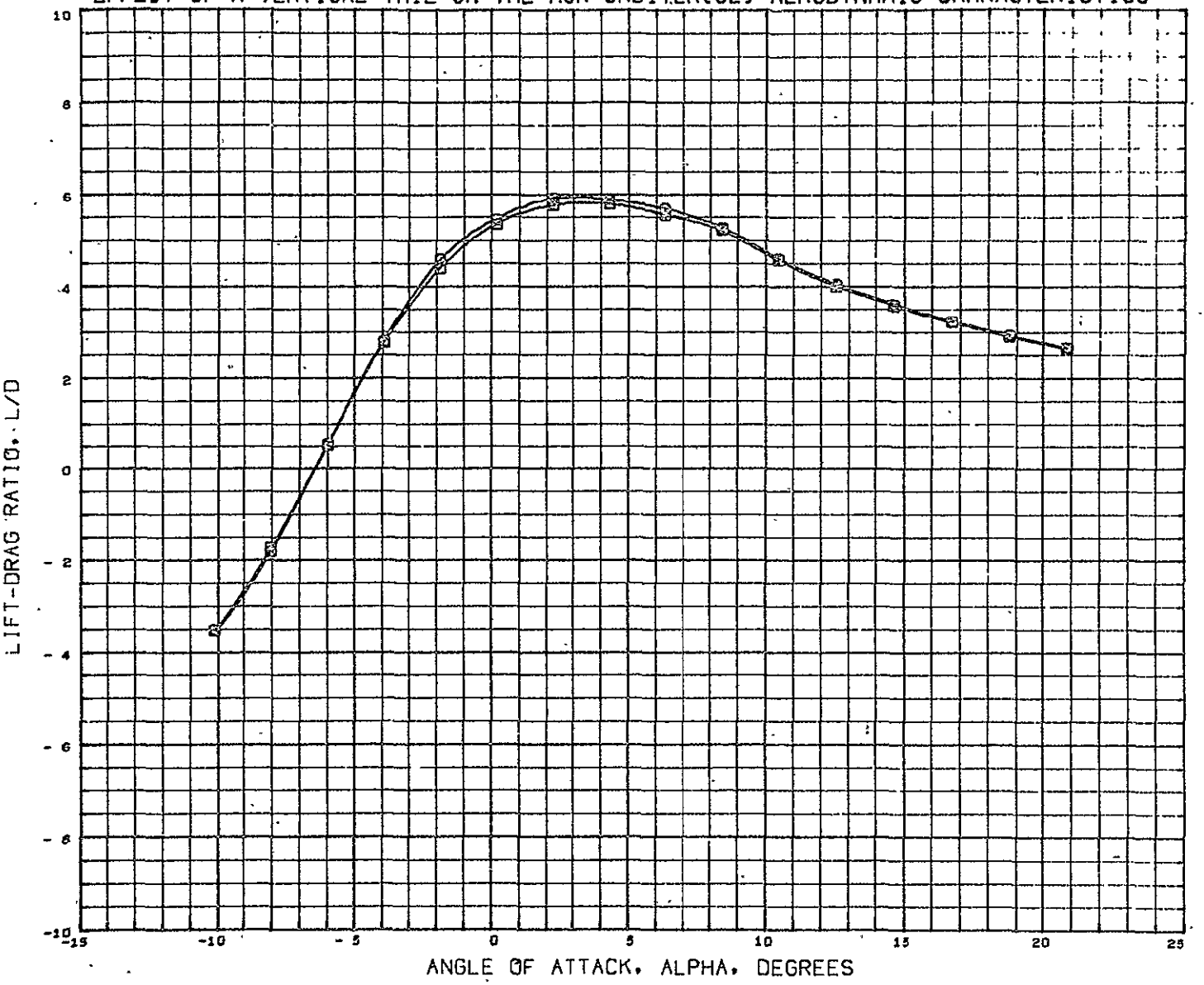
BETA 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

ELEVON 0.000

EFFECT OF A VERTICAL TAIL ON THE HCR ORBITER(02) AERODYNAMIC CHARACTERISTICS



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(DCFD10)	○	LSWT 240 4.0 FC HCR ORBITER(02) B1W3
(DCFD20)	□	LSWT 240 4.0 FC HCR ORBITER(02) B1W3V3

PARAMETRIC VALUES

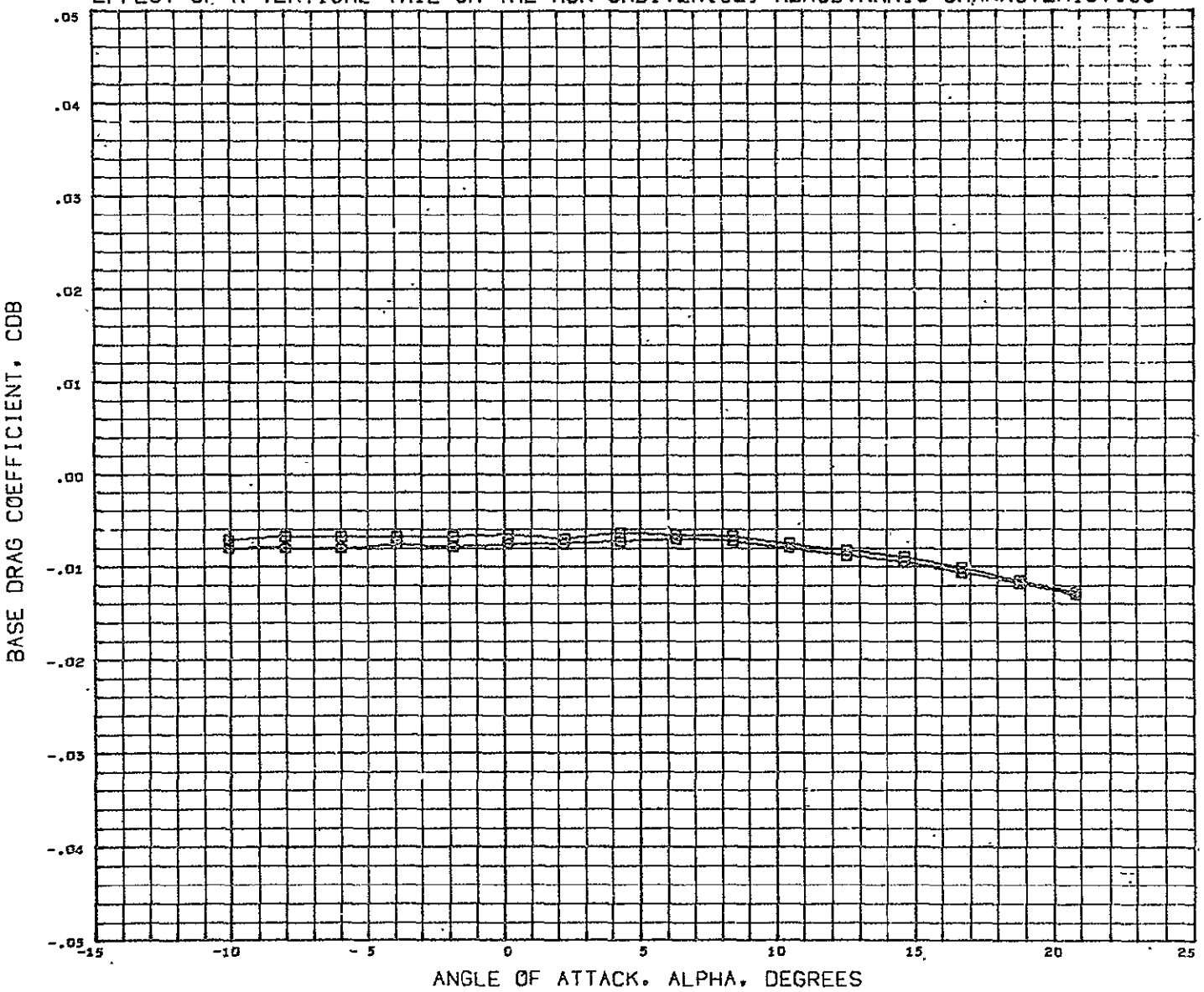
BETA 0.000

ELEVON 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF A VERTICAL TAIL ON THE HCR ORBITER(02) AERODYNAMIC CHARACTERISTICS



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(DCFD10)	○	LSWT 249 4.0 FC HCR ORBITER(02) B1W3
(DCFD20)	□	LSWT 249 4.0 FC HCR ORBITER(02) B1W3V3

PARAMETRIC VALUES

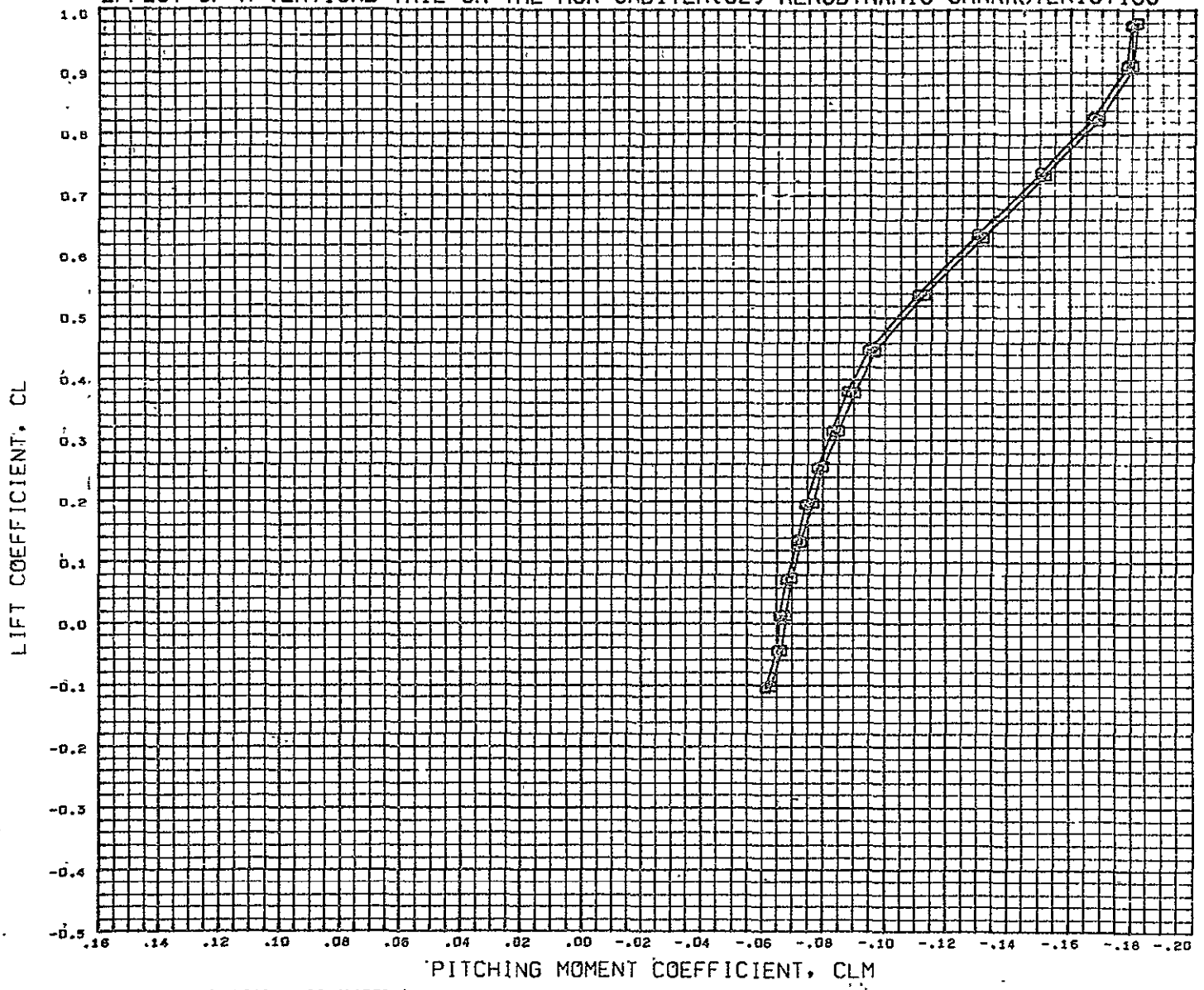
BETA 0.000

ELEVON 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5490	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF A VERTICAL TAIL ON THE HCR ORBITER(02) AERODYNAMIC CHARACTERISTICS



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(DCFD10)	○	LSWT 240 4.0 FC HCR ORBITER(02) B1W3
(DCFD20)	□	LSWT 240 4.0 FC HCR ORBITER(02) B1W3V3

PARAMETRIC VALUES

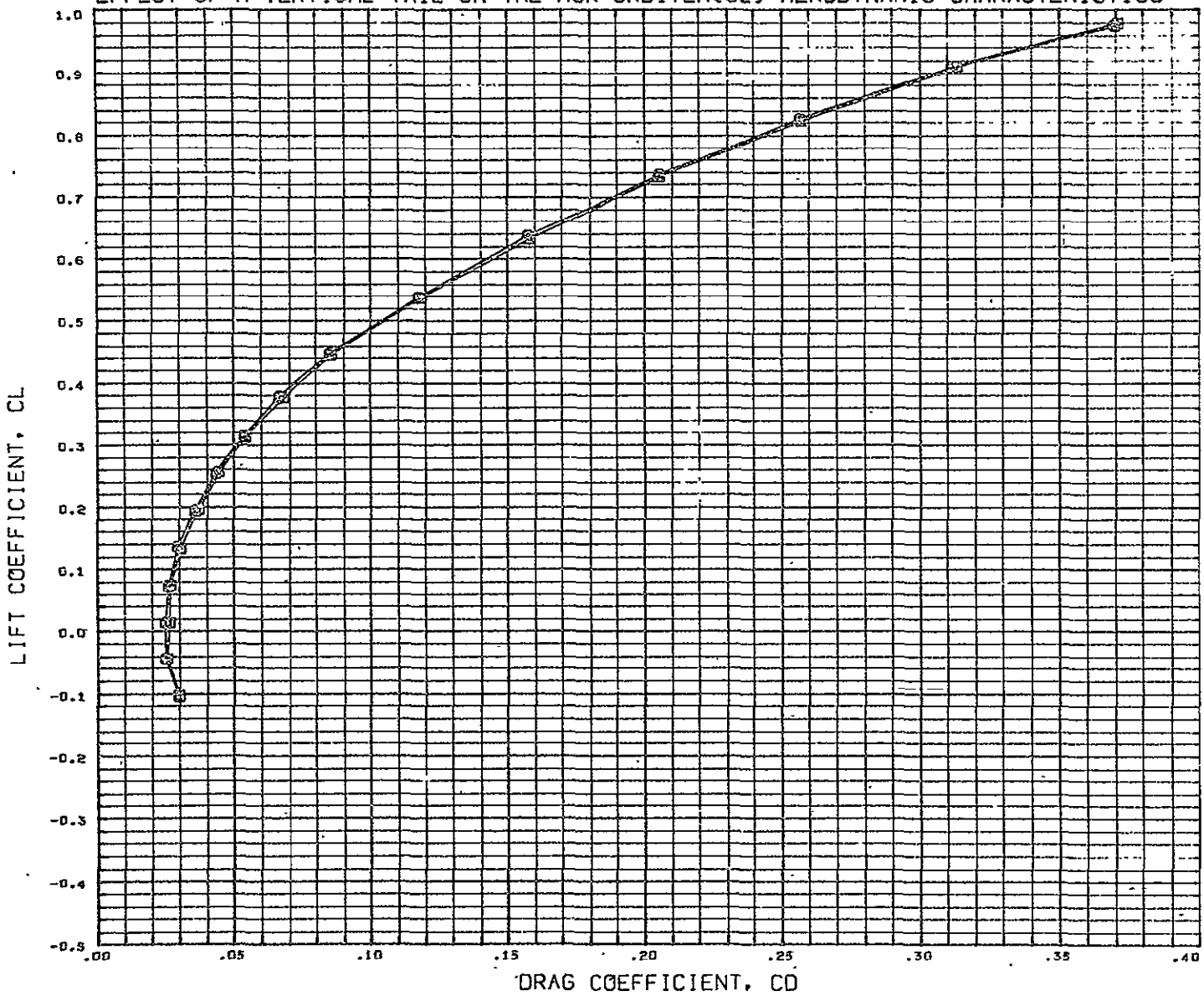
BETA 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

ELEVON 0.000

EFFECT OF A VERTICAL TAIL ON THE HCR ORBITER(02) AERODYNAMIC CHARACTERISTICS



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(DCFD10)	O	LSWT 249 4.9 FC HCR ORBITER(02) B1W3
(DCFD20)	□	LSWT 249 4.9 FC HCR ORBITER(02) B1W3V3

ELEVON 0.000

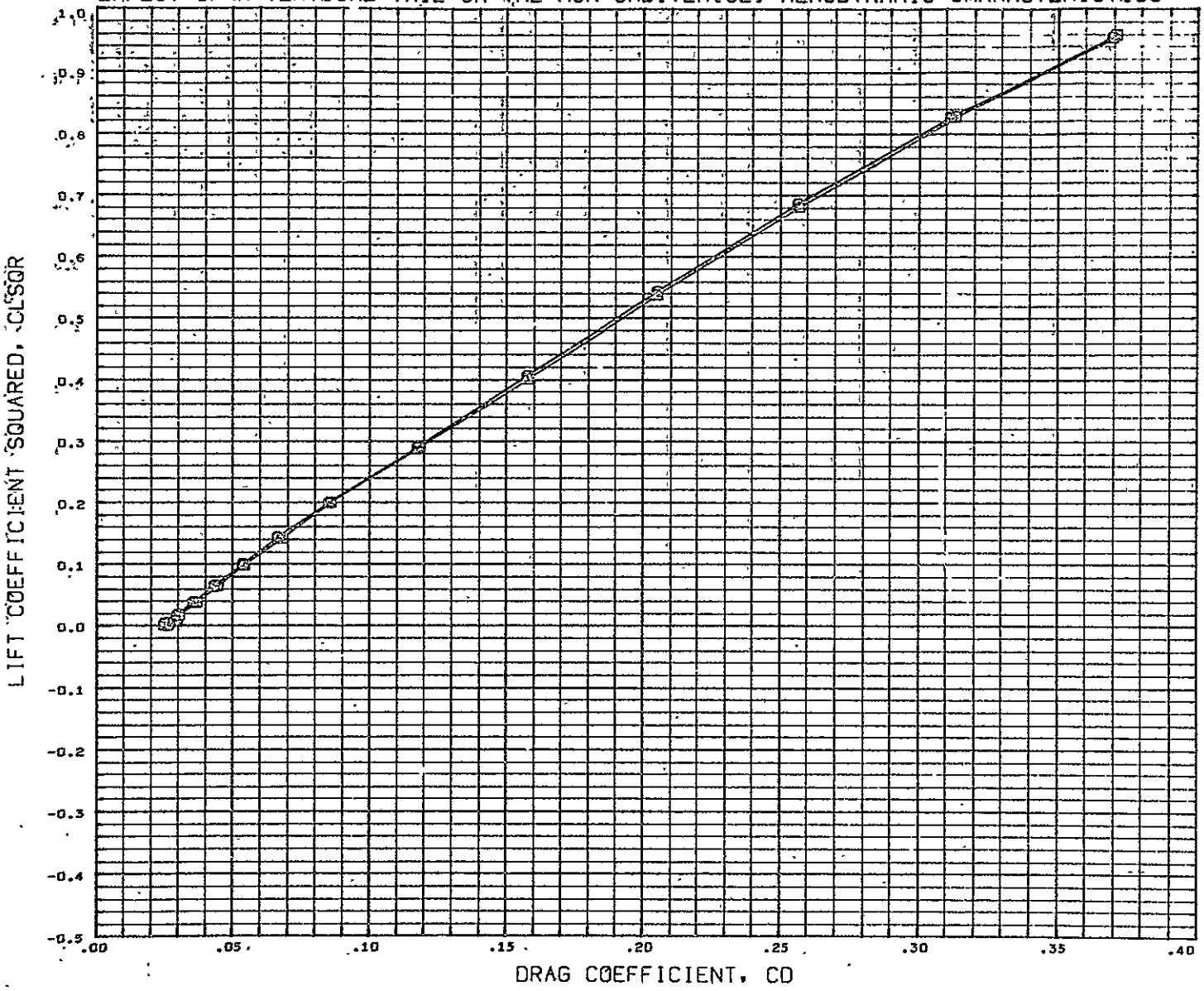
PARAMETRIC VALUES

BETA 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF A VERTICAL TAIL ON THE HCR ORBITER(02) AERODYNAMIC CHARACTERISTICS



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(DCFD19)	○	LSWT 249 4.0 FC HCR ORBITER(02) B1W3
(DCFD20)	□	LSWT 249 4.0 FC HCR ORBITER(02) B1W3V3

PARAMETRIC VALUES

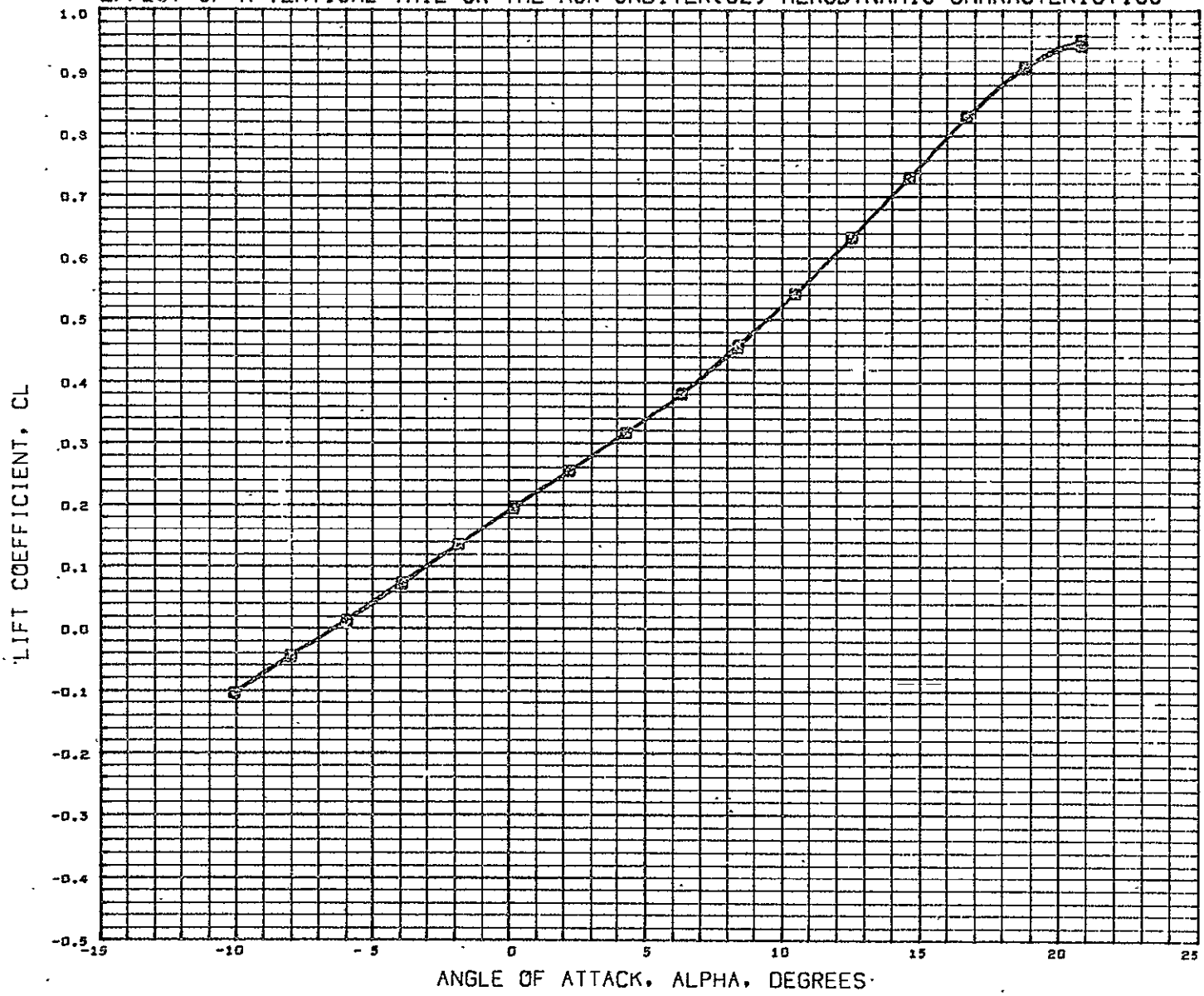
BETA 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

ELEVON 0.000

EFFECT OF A VERTICAL TAIL ON THE HCR ORBITER(02) AERODYNAMIC CHARACTERISTICS



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(DCFD11)	○	LSWT 240 4.0 FC HCR ORBITER(02) B1W3
(DCFD22)	□	LSWT 240 4.0 FC HCR ORBITER(02) B1W3V3

PARAMETRIC VALUES

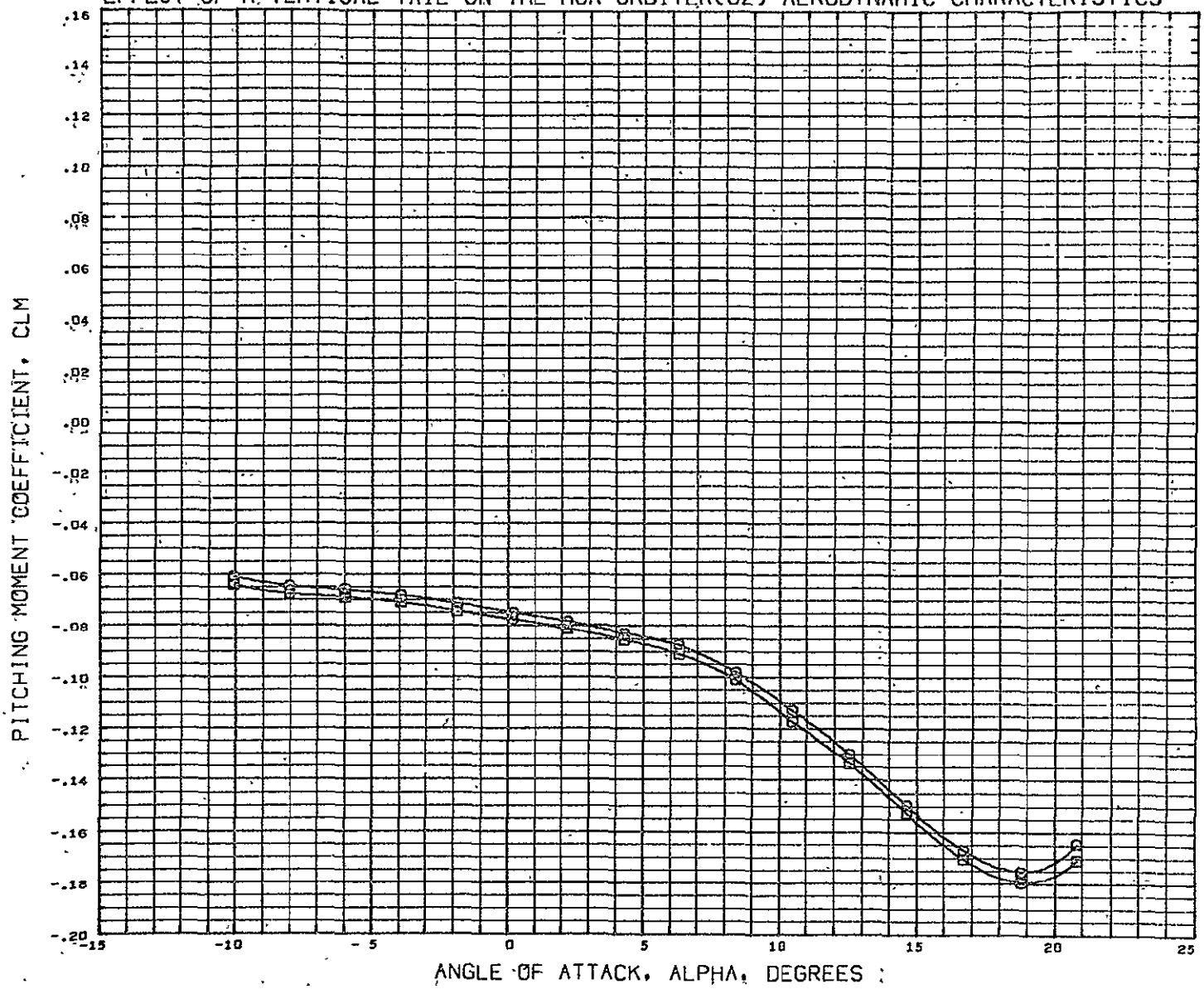
BETA - 3.000

ELEVON 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF A VERTICAL TAIL ON THE HCR ORBITER(02) AERODYNAMIC CHARACTERISTICS



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(DCFD11)	O	LSWT 240 4.0 FC HCR ORBITER(02) B1W3
(DCFD22)	O	LSWT 240 4.0 FC HCR ORBITER(02) B1W3V3

PARAMETRIC VALUES

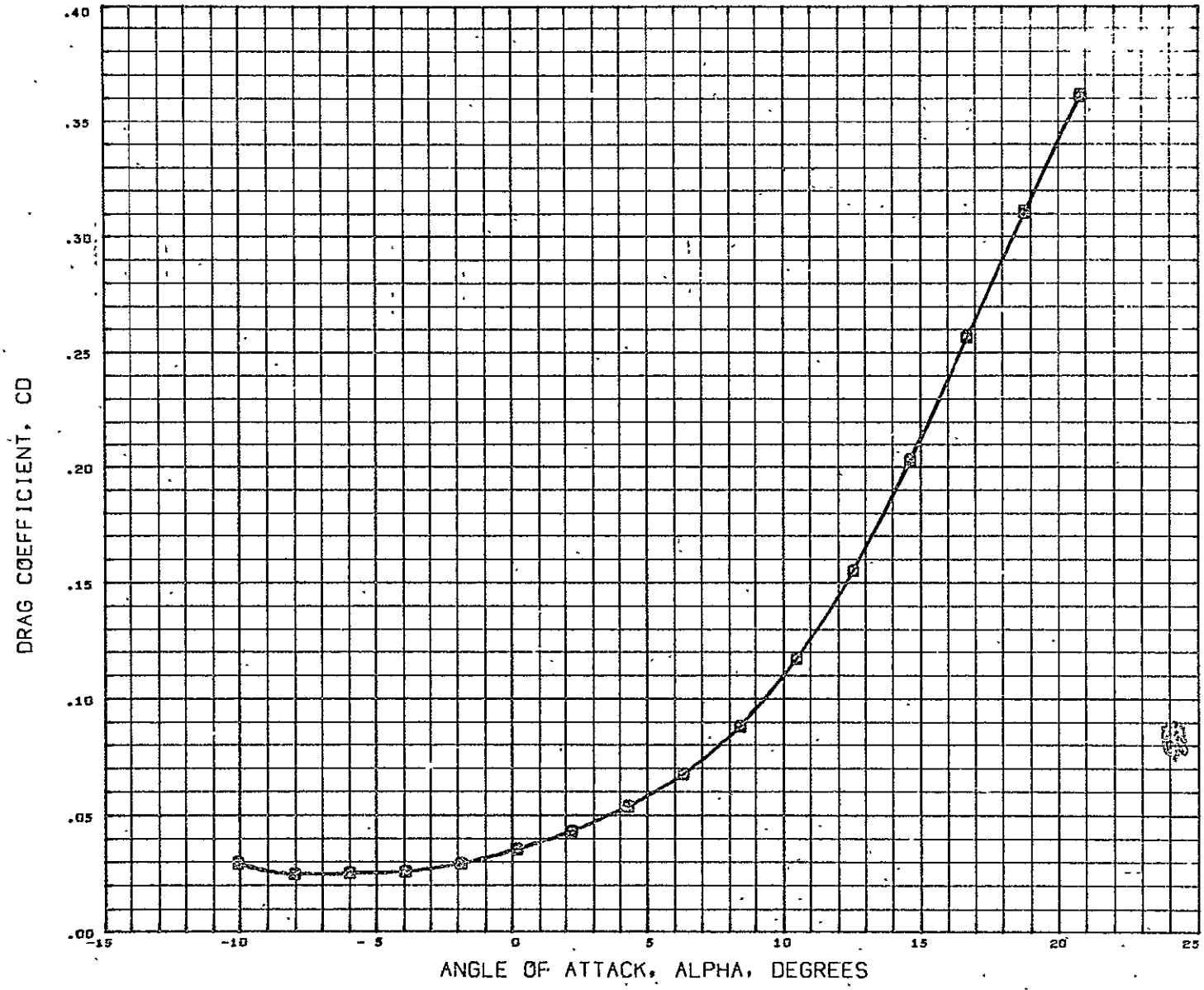
BETA - 3.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

ELEVON 0.000

EFFECT OF A VERTICAL TAIL ON THE HCR ORBITER(02) AERODYNAMIC CHARACTERISTICS



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(DCFD11)	O	LSWT 249 4.9 FC HCR ORBITER(02) B1W3
(DCFD22)	□	LSWT 249 4.9 FC HCR ORBITER(02) B1W3V3

PARAMETRIC VALUES

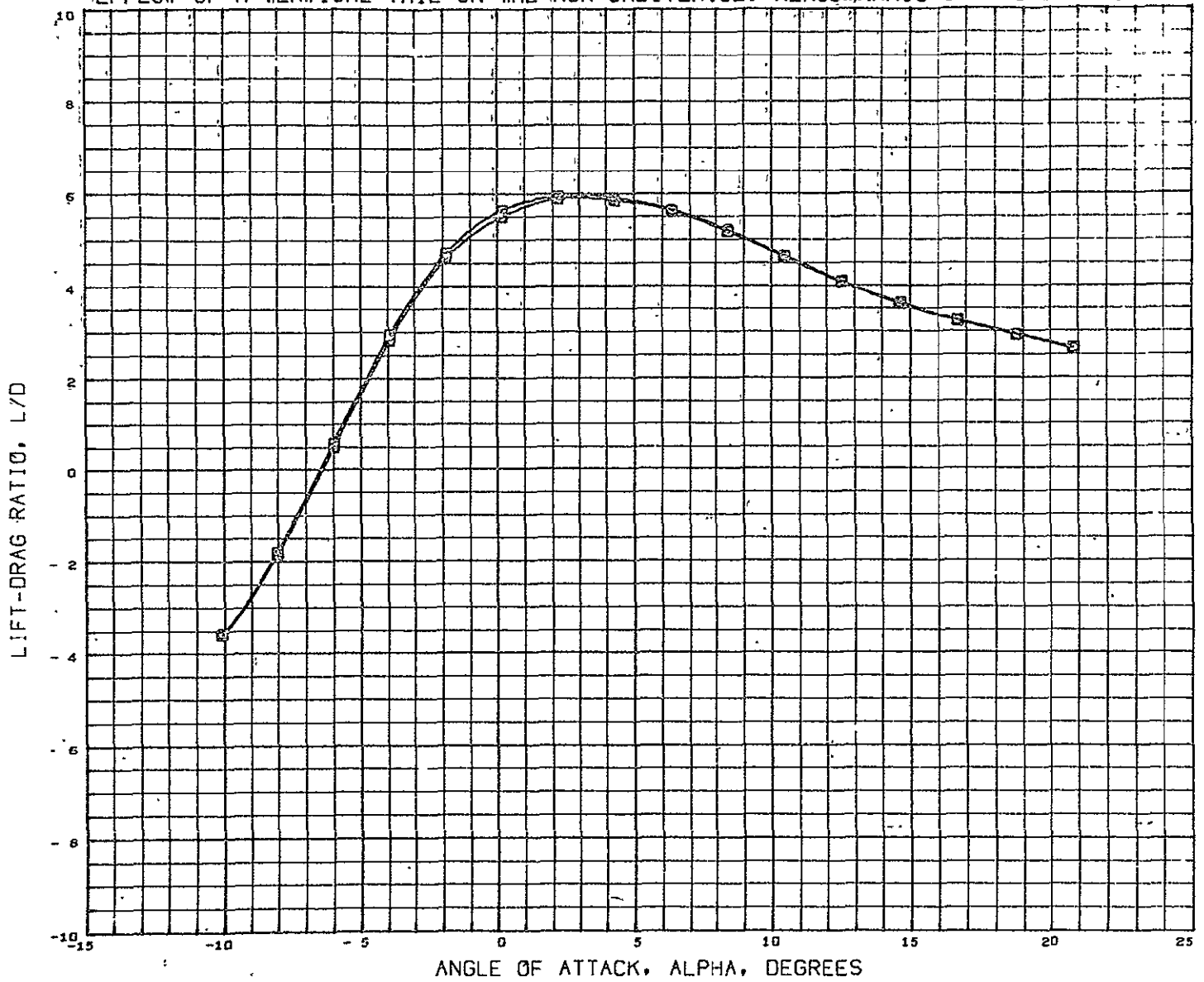
BETA - 3.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

ELEVON 0.000

EFFECT OF A VERTICAL TAIL ON THE HCR ORBITER(02) AERODYNAMIC CHARACTERISTICS



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(DCFD11)	O	LSWT 24G 4.0 FC HCR ORBITER(02) B1W3
(DCFD22)	□	LSWT 24G 4.0 FC HCR ORBITER(02) B1W3V3

PARAMETRIC VALUES

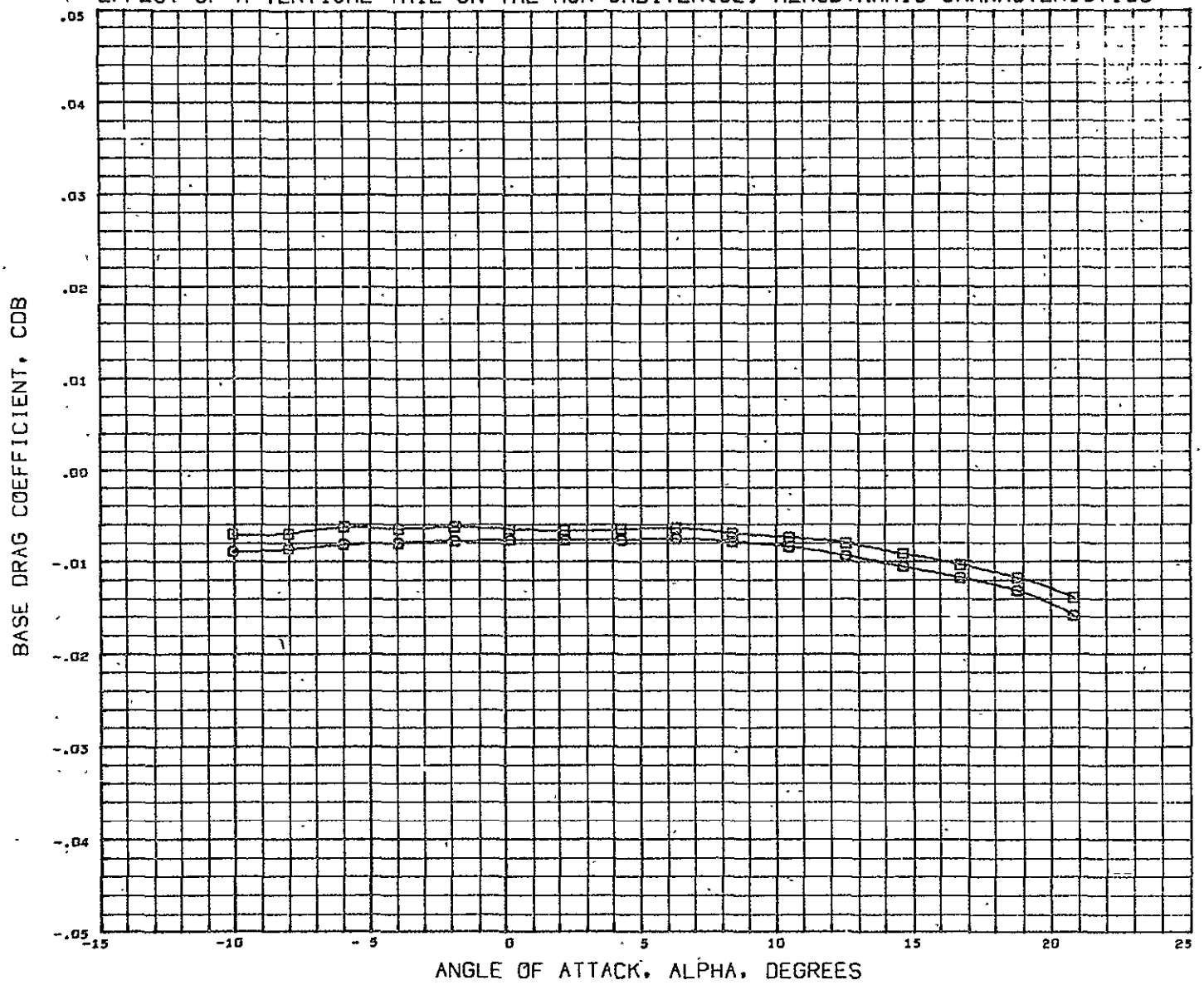
BETA - 3.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

ELEVON 0.000

EFFECT OF A VERTICAL TAIL ON THE HCR ORBITER(02) AERODYNAMIC CHARACTERISTICS



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(DCFD11)	O	LSWT 249 4.0 FC HCR ORBITER(02) B1W3
(DCFD22)	□	LSWT 249 4.0 FC HCR ORBITER(02) B1W3V3

PARAMETRIC VALUES

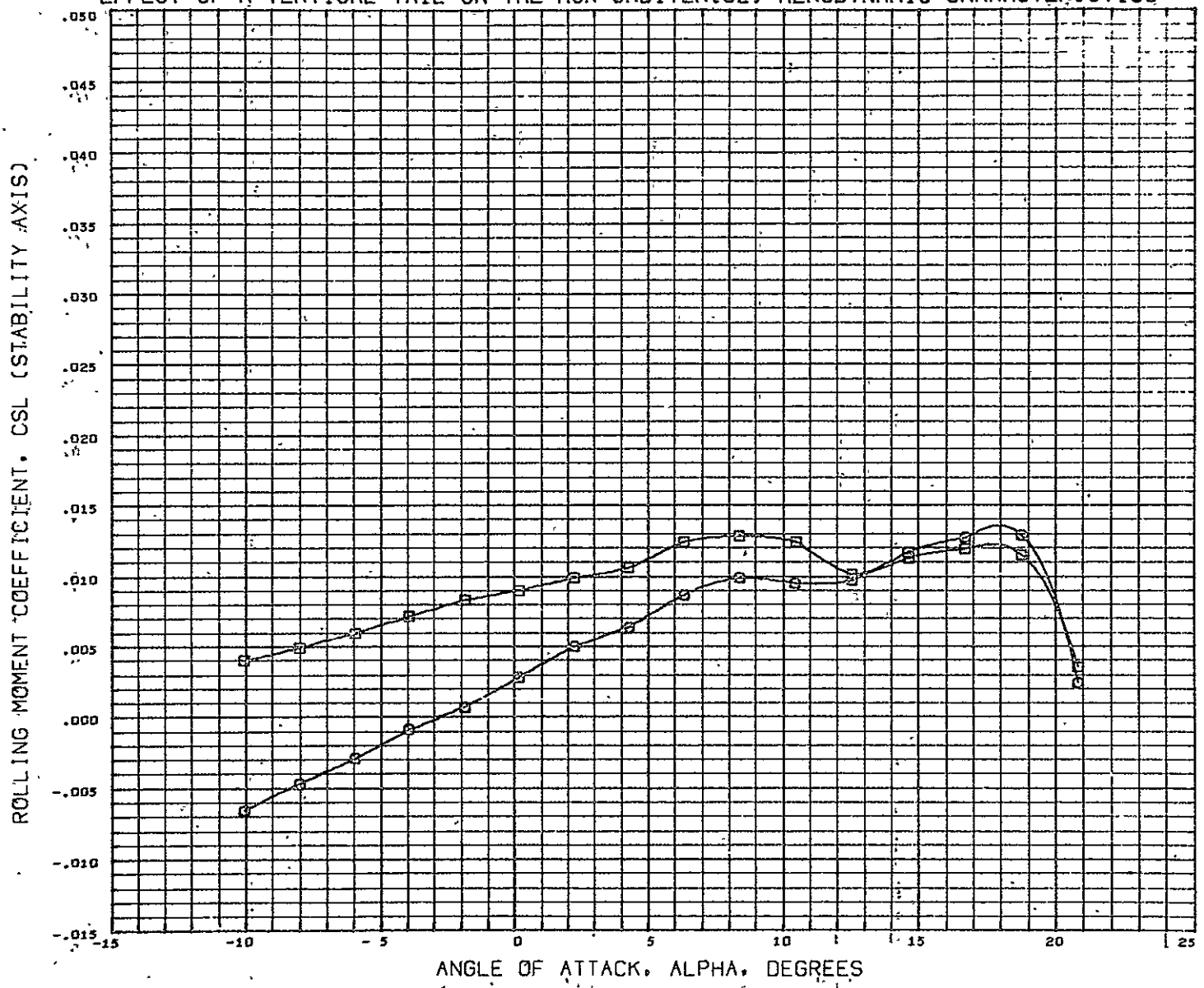
BETA - 3.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

ELEVON 0.000

EFFECT OF A VERTICAL TAIL ON THE HCR ORBITER(02) AERODYNAMIC CHARACTERISTICS



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(DCFD11)	○	LSWT 240 4.0 FC HCR ORBITER(02) B1W3
(DCFD22)	□	LSWT 240 4.0 FC HCR ORBITER(02) B1W3V3

PARAMETRIC VALUES

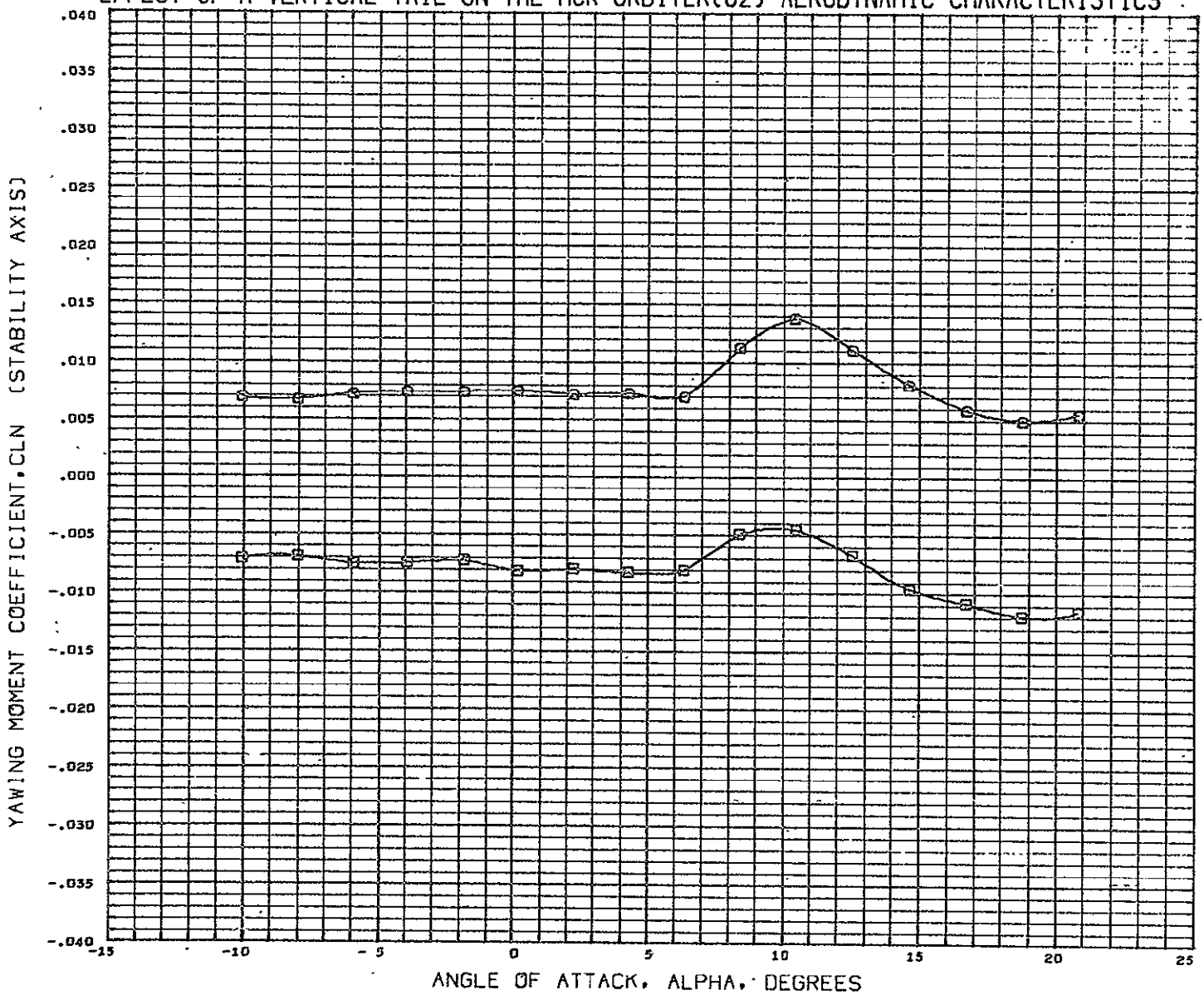
BETA - 3.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

ELEVON 0.000

EFFECT OF A VERTICAL TAIL ON THE HCR ORBITER(02) AERODYNAMIC CHARACTERISTICS



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(DCFD11)	○	LSWT 245 4.5 FC HCR ORBITER(02) B1W3
(DCFD22)	□	LSWT 245 4.5 FC HCR ORBITER(02) B1W3V3

PARAMETRIC VALUES

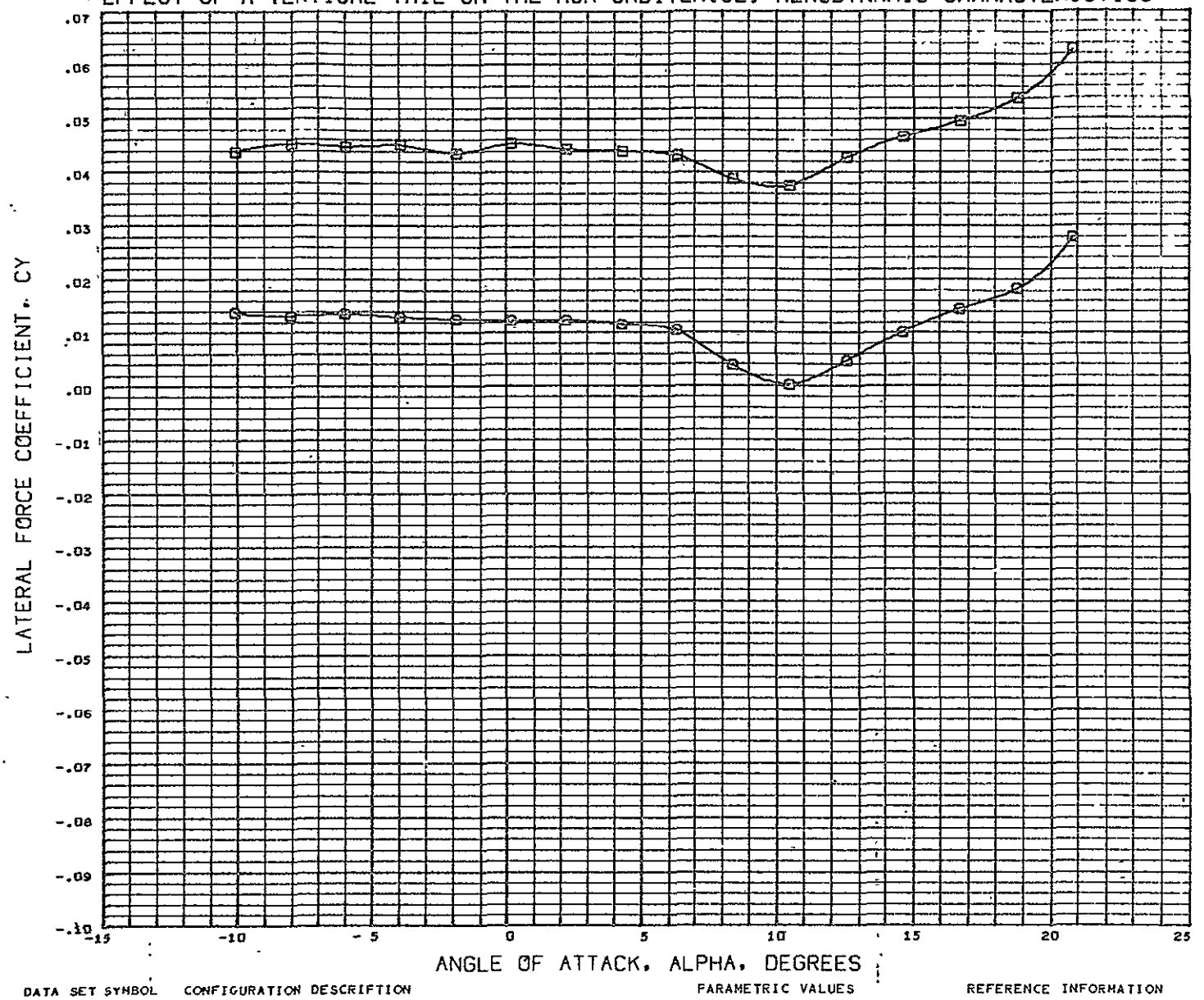
BETA - 3.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

ELEVON 0.000

EFFECT OF A VERTICAL TAIL ON THE HCR ORBITER(02) AERODYNAMIC CHARACTERISTICS



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(DCFD11)	O	LSWT 240 4.0 FC HCR ORBITER(02) B1W3
(DCFD22)	□	LSWT 240 4.0 FC HCR ORBITER(02) B1W3V3

PARAMETRIC VALUES

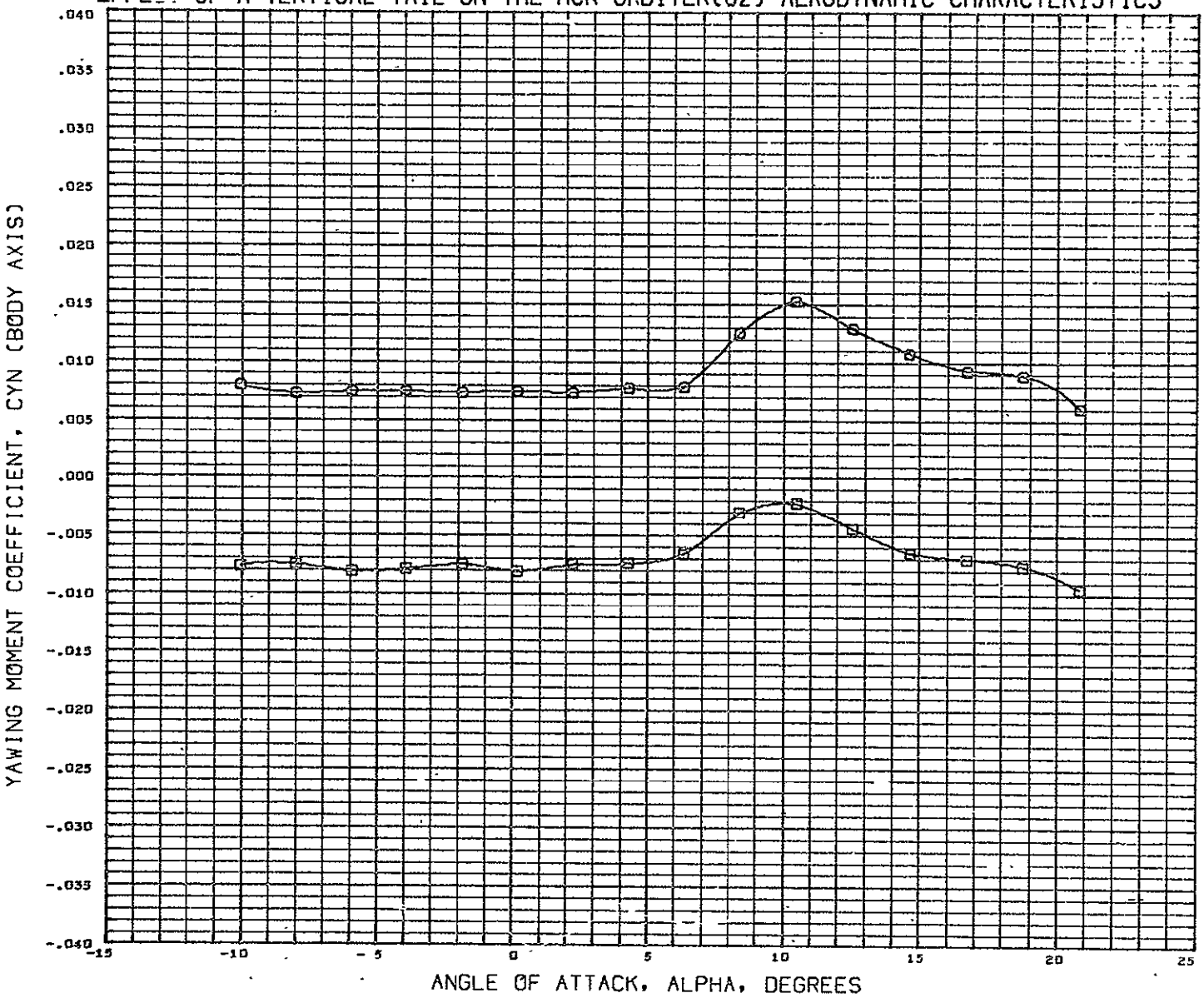
BETA - 3.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

ELEVON -0.000

EFFECT OF A VERTICAL TAIL ON THE HCR ORBITER(02) AERODYNAMIC CHARACTERISTICS



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(CCFD11)	○	LSWT 249 4.0 FC HCR ORBITER(02) B1W3
(CCFD22)	□	LSWT 249 4.0 FC HCR ORBITER(02) B1W3V3

PARAMETRIC VALUES

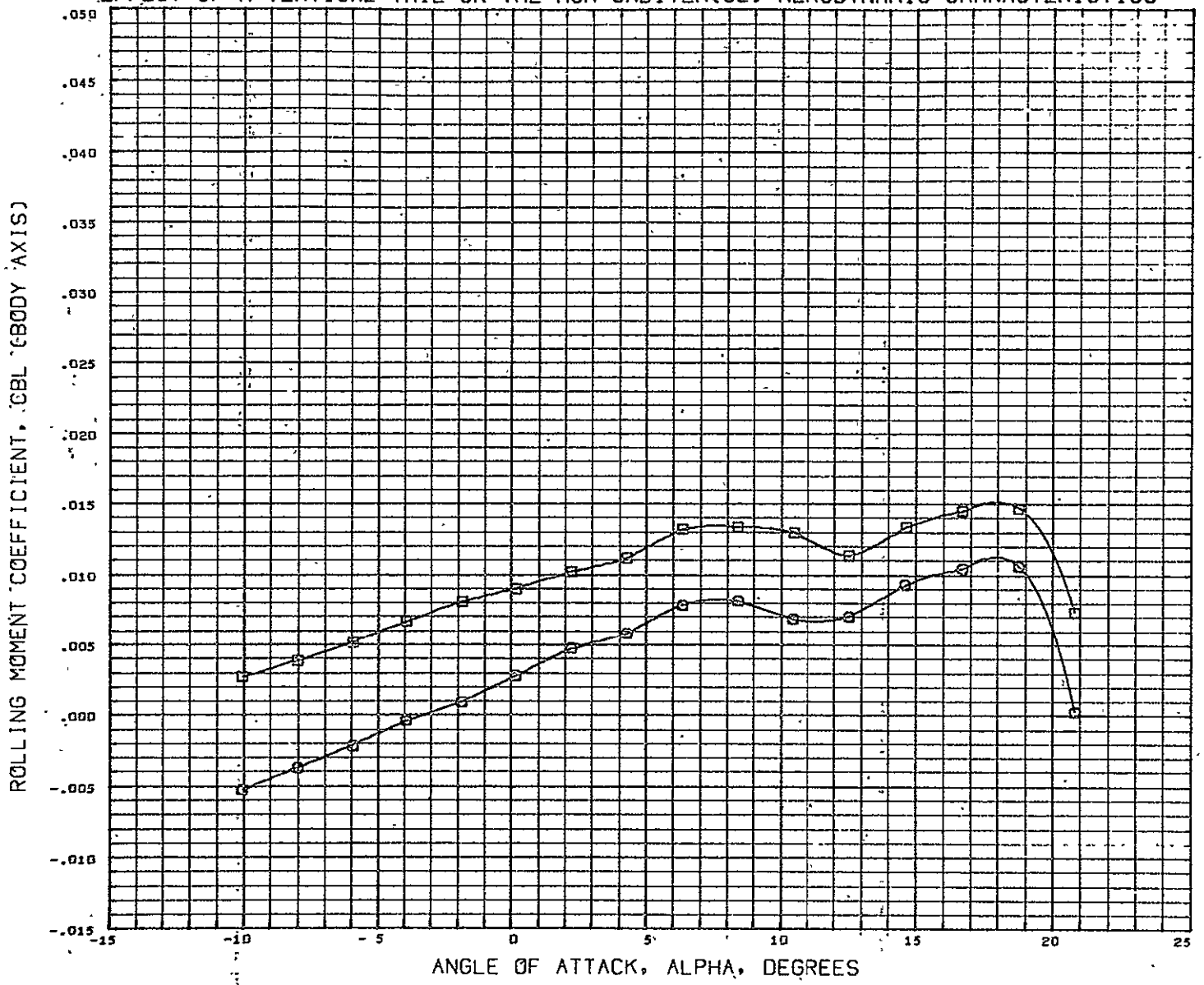
BETA - 3.000

ELEVON 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF A VERTICAL TAIL ON THE HCR ORBITER(02) AERODYNAMIC CHARACTERISTICS



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(CCFD11)	O	LSWT 249 4.0 FC HCR ORBITER(02) B1W3
(CCFD22)	□	LSWT 249 4.0 FC HCR ORBITER(02) B1W3V3

ELEVON 0.000

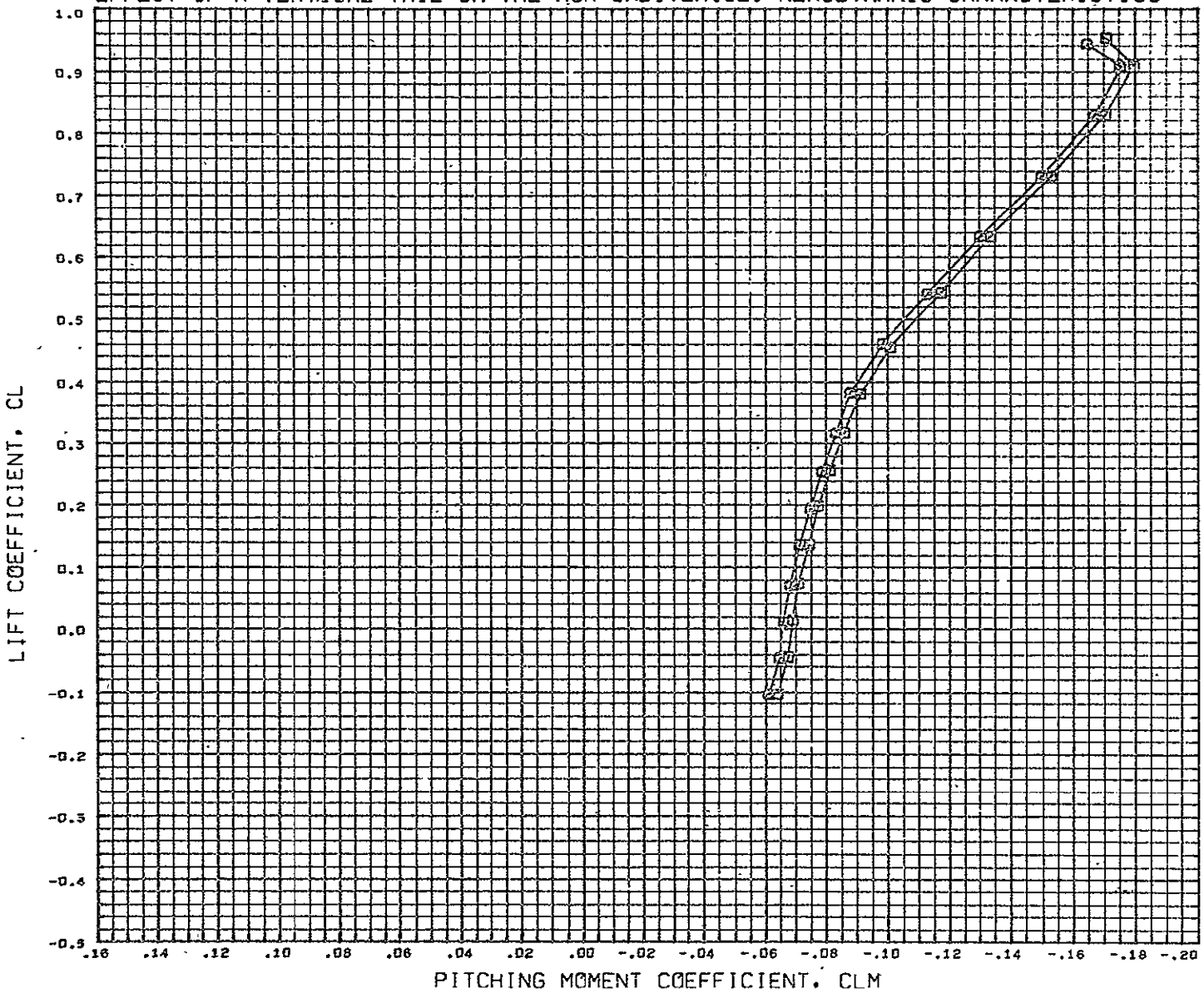
PARAMETRIC VALUES

BETA - 3.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF A VERTICAL TAIL ON THE HCR ORBITER(02) AERODYNAMIC CHARACTERISTICS



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(DCFD11)	O	LSWT 240 4.0 FC HCR ORBITER(02) B1W3
(DCFD22)	□	LSWT 240 4.0 FC HCR ORBITER(02) B1W3V3

PARAMETRIC VALUES

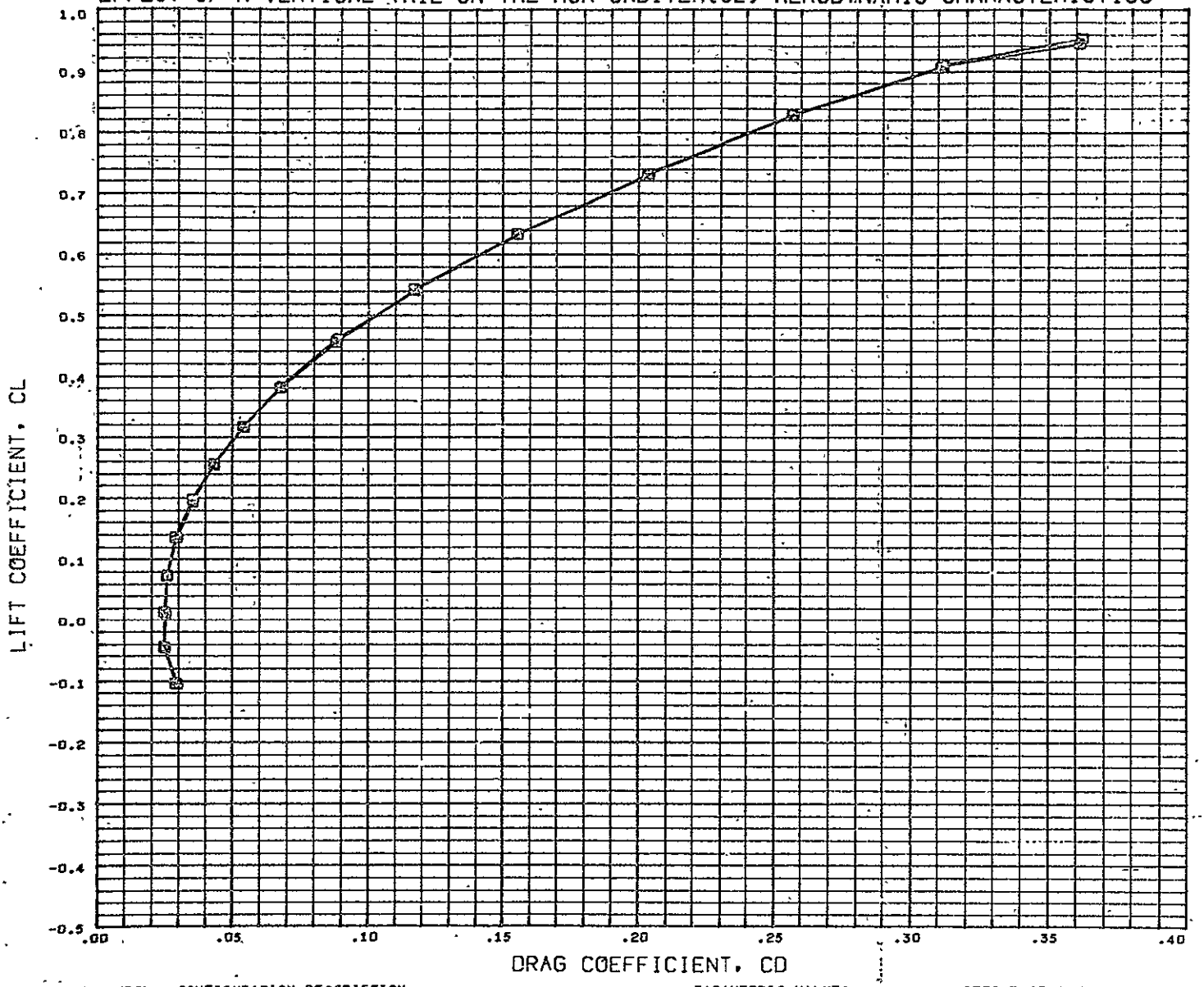
BETA - 3.000 .

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

ELEVON 0.000

EFFECT OF A VERTICAL TAIL ON THE HCR ORBITER(02) AERODYNAMIC CHARACTERISTICS



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(DCFD11)	○	LSWT 240 4.0 FC HCR ORBITER(02) B1W3
(DCFD22)	□	LSWT 240 4.0 FC HCR ORBITER(02) B1W3V3

PARAMETRIC VALUES

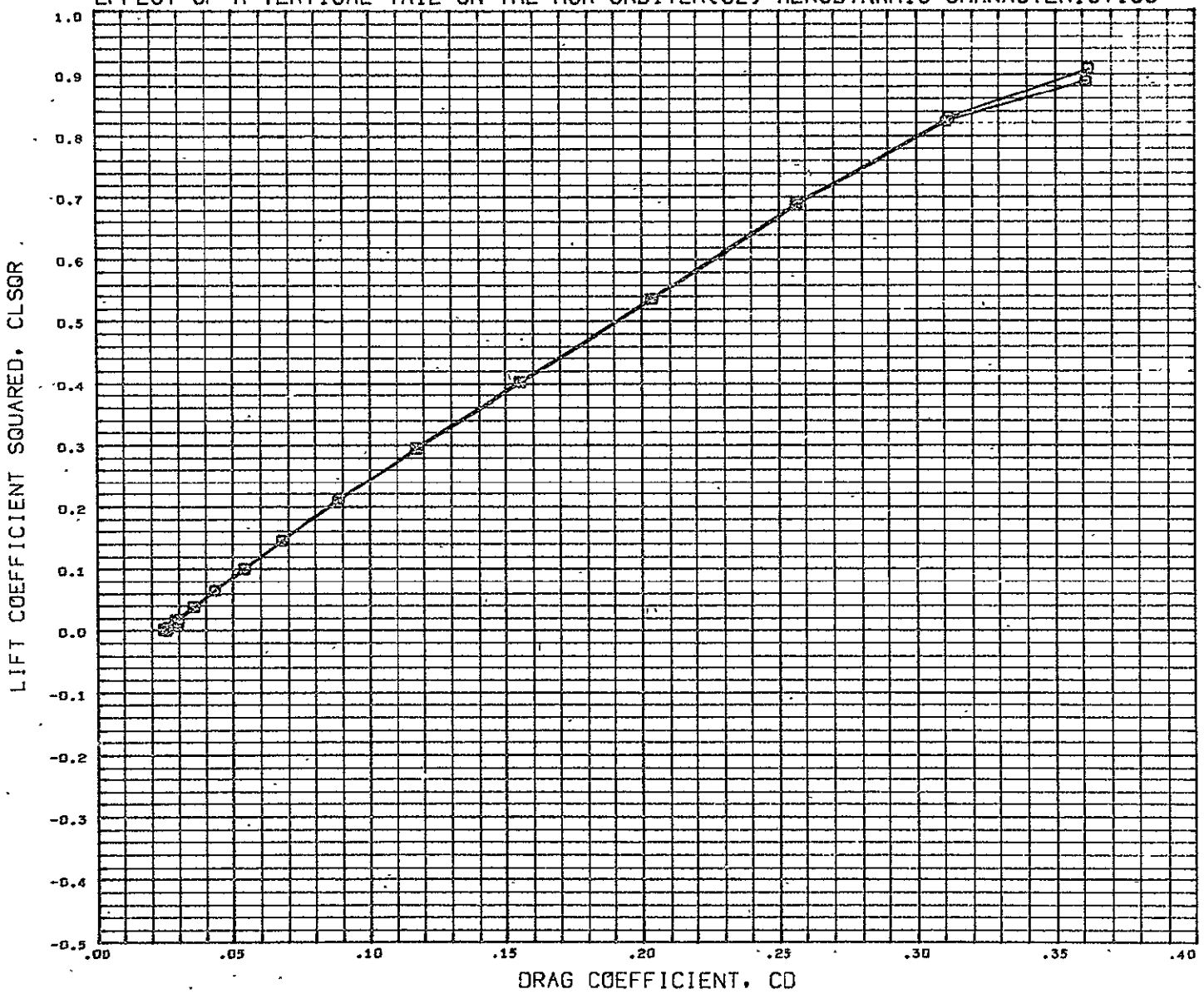
BETA - 3.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

ELEVON 0.000

EFFECT OF A VERTICAL TAIL ON THE HCR ORBITER(02) AERODYNAMIC CHARACTERISTICS



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(DCFD11)	O	LSWT 249 4.9 FC HCR ORBITER(02) B1W3
(DCFD22)	□	LSWT 249 4.9 FC HCR ORBITER(02) B1W3V3

ELEVON 0.000

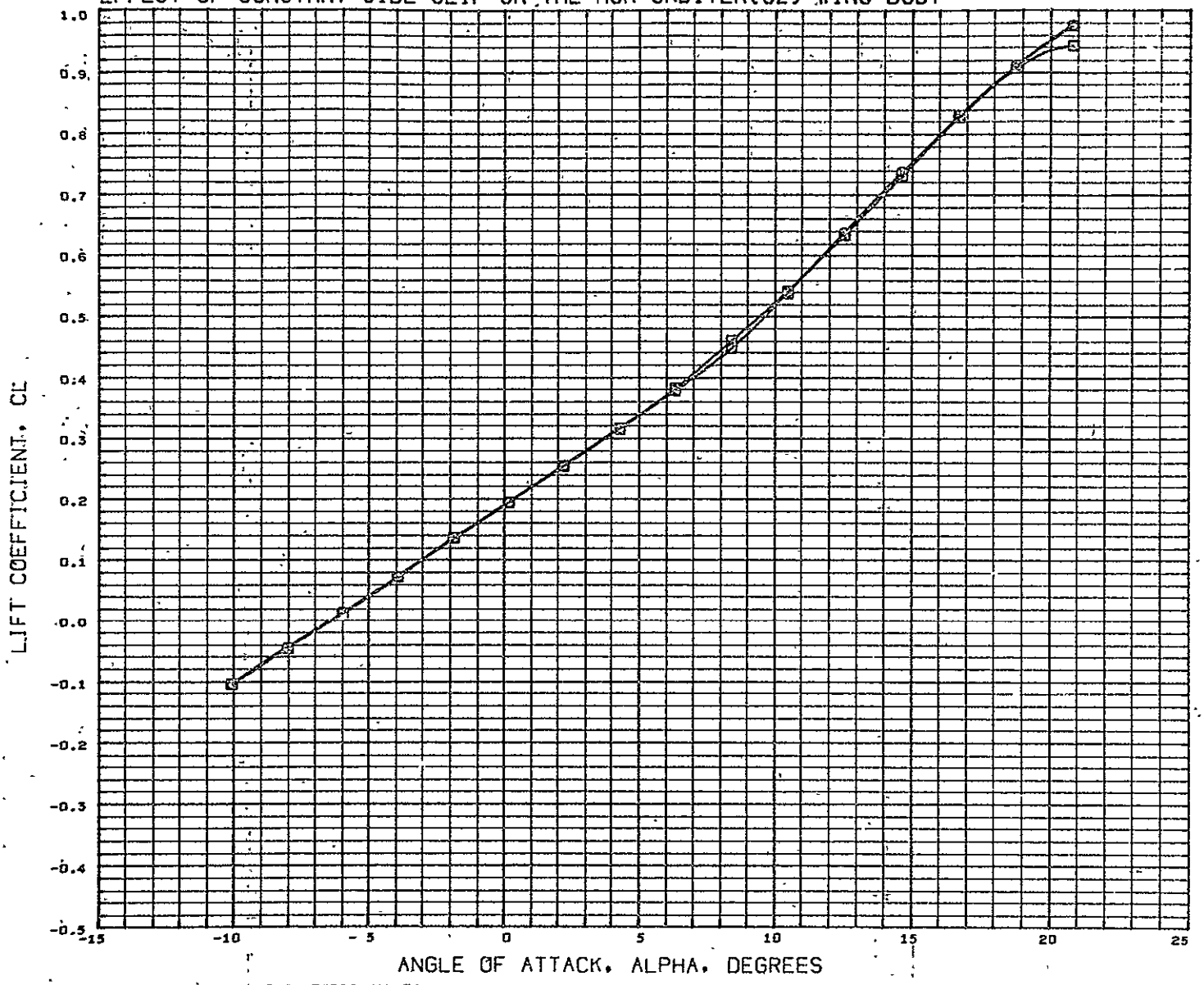
PARAMETRIC VALUES

BETA - 3.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF CONSTANT SIDE SLIP ON THE HCR ORBITER(02) WING-BODY



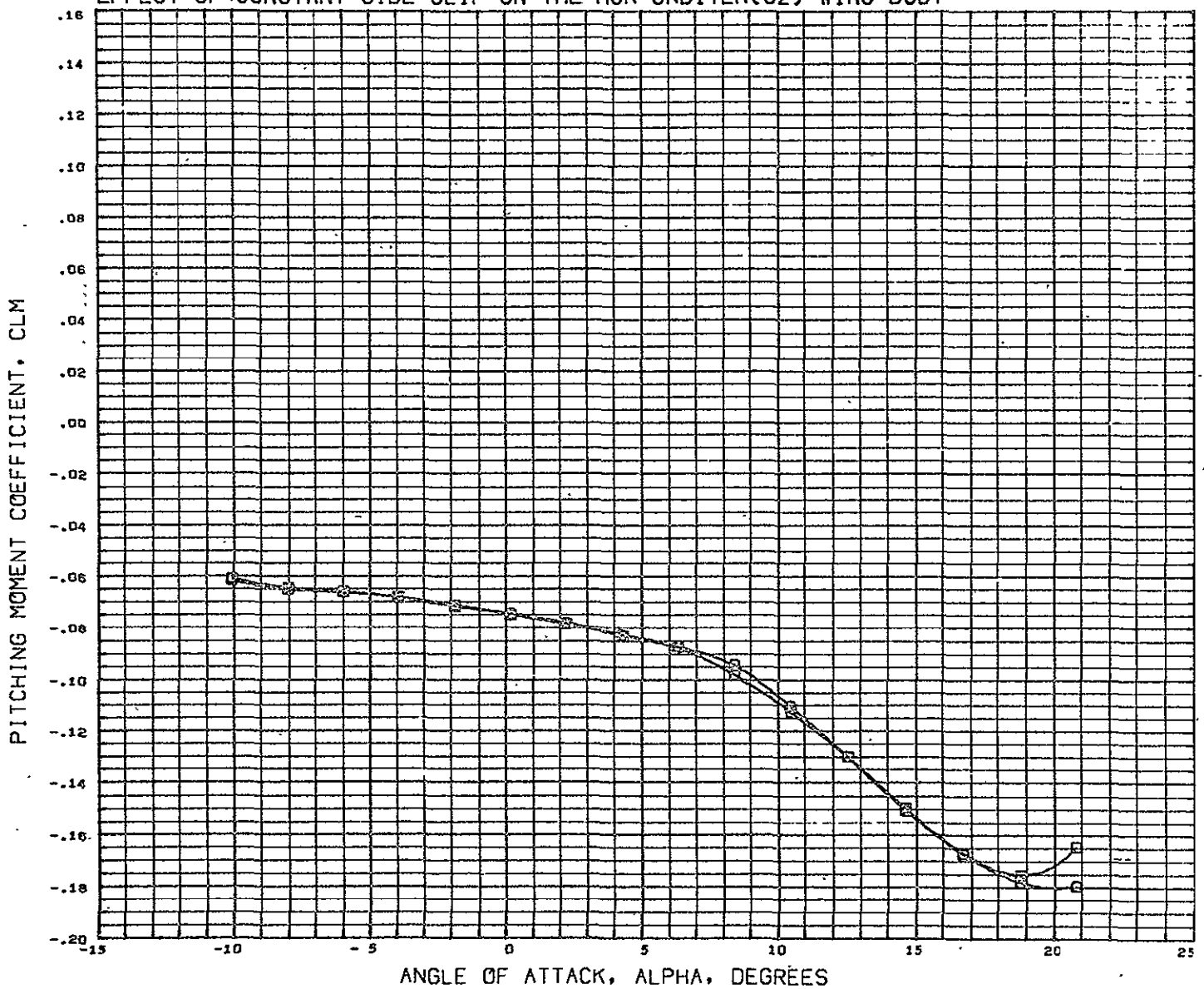
SYMBOL	BETA		PARAMETRIC VALUES
⊡	0.000	ELEVON	0.000
	3.000		

DATA HIST. CODE V

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF CONSTANT SIDE SLIP ON THE HCR ORBITER(02) WING-BODY



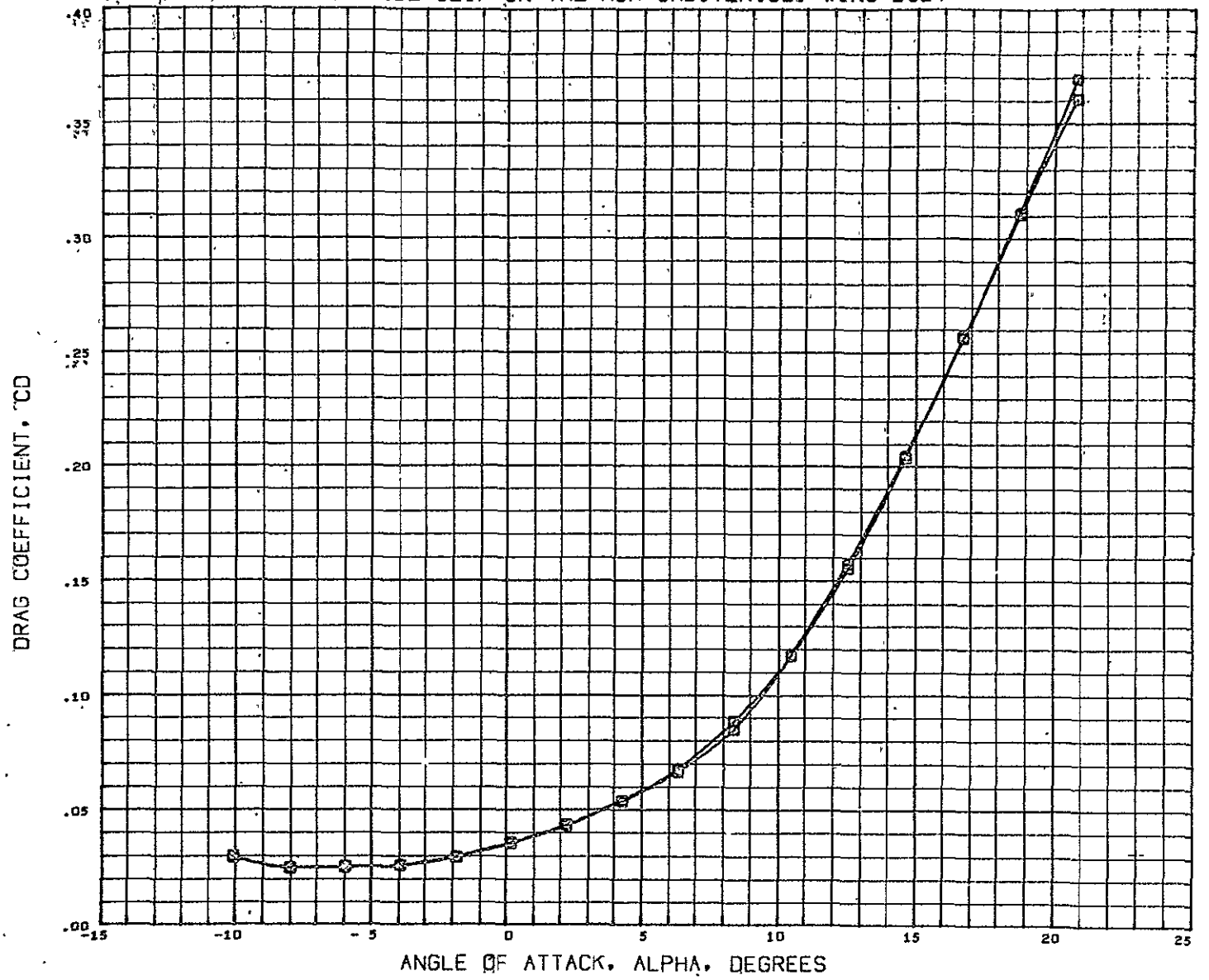
SYMBOL	BETA		PARAMETRIC VALUES
○	0.000	ELEVON	0.000
□	- 3.000		

DATA HIST. CODE V

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF CONSTANT SIDE SLIP ON THE HCR ORBITER(02) WING-BODY



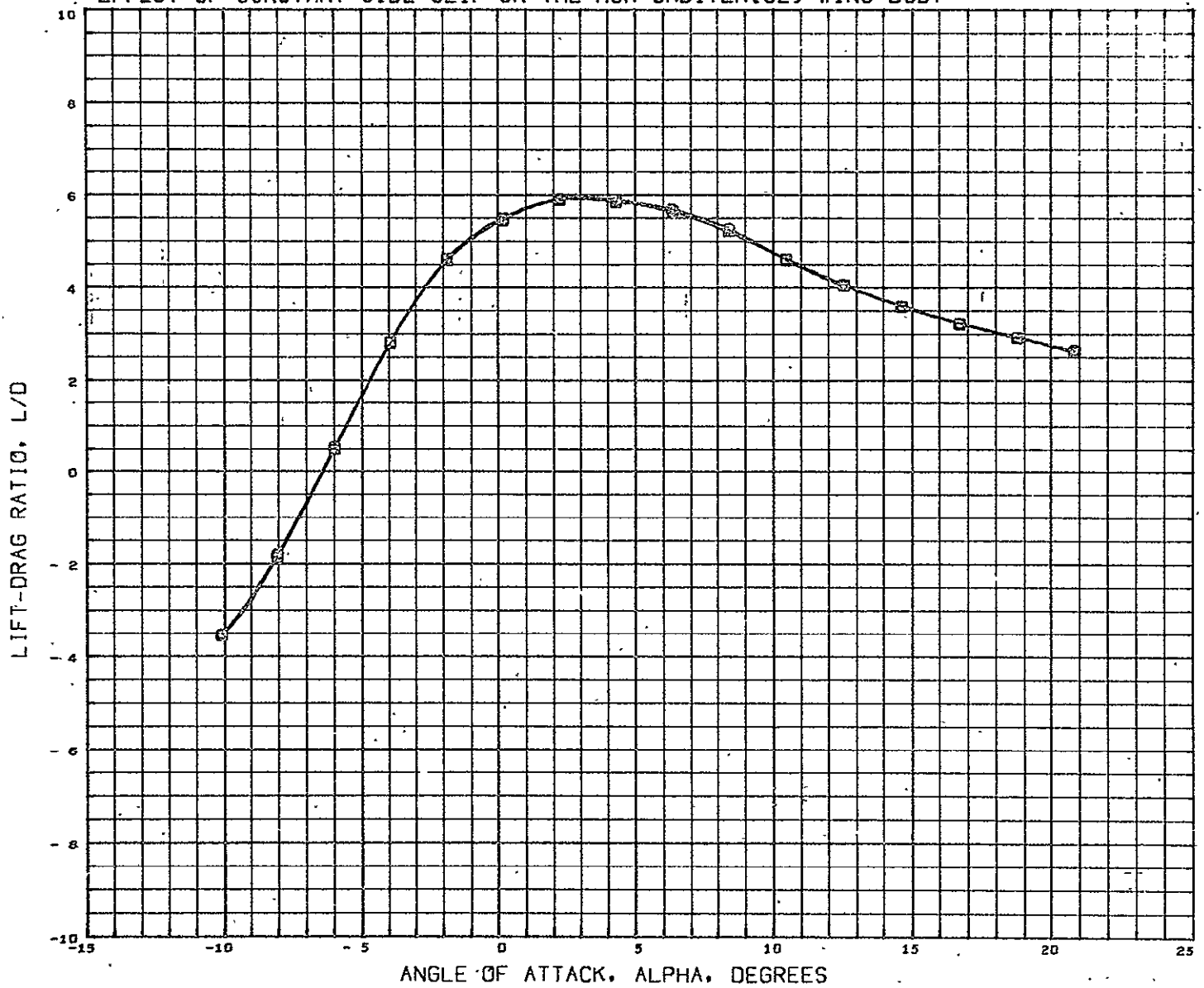
SYMBOL	BETA		PARAMETRIC VALUES	
○	0.000	ELEVON	0.000	
□	- 3.000			

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

DATA HIST. CODE V

EFFECT OF CONSTANT SIDE SLIP ON THE HCR ORBITER(02) WING-BODY



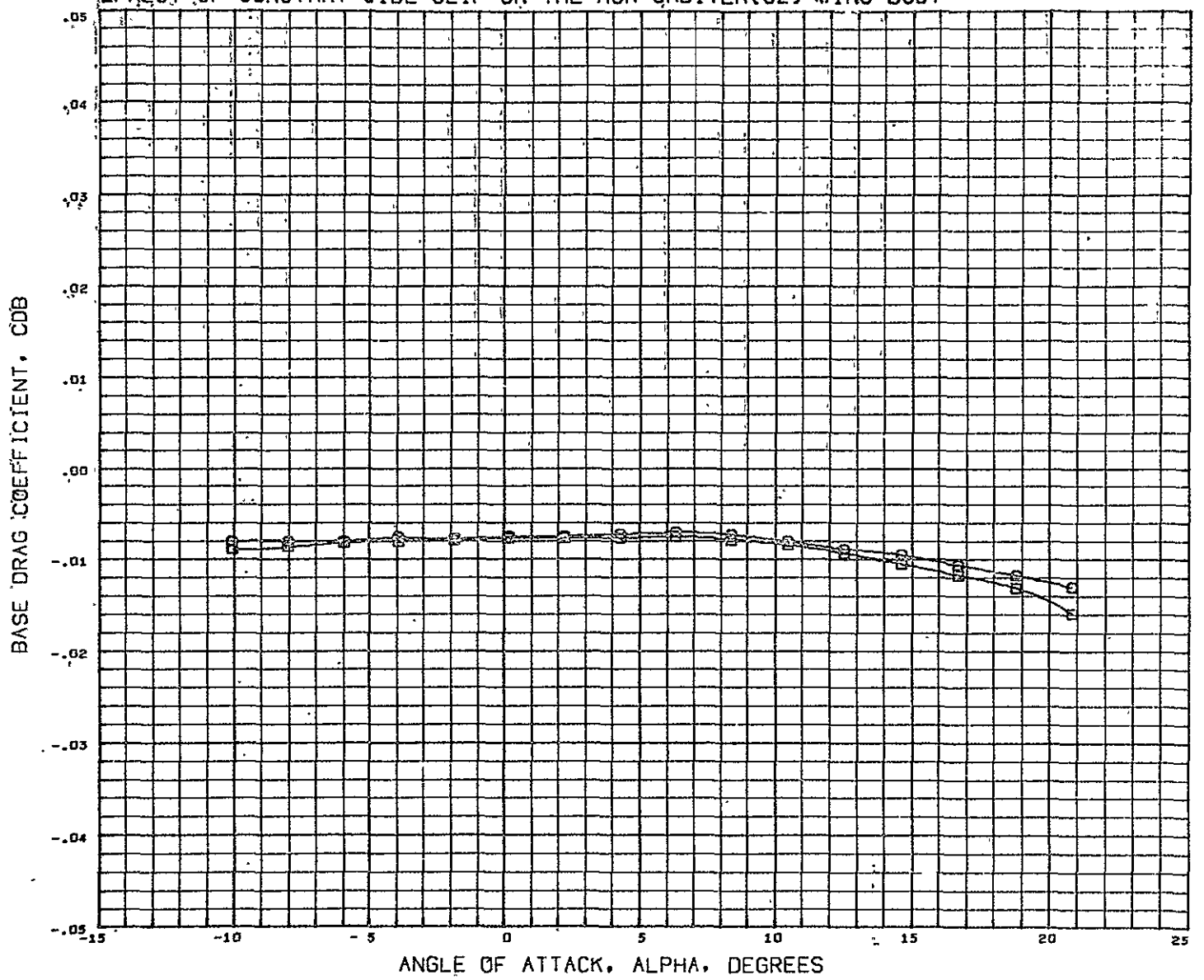
SYMBOL	BETA		PARAMETRIC VALUES
O	0.000	ELEVON	0.000
□	-3.000		

DATA HIST. CODE V

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.5670	FT.
SCALE	4.0000	PER CE

EFFECT OF CONSTANT SIDE SLIP ON THE HCR ORBITER(02) WING-BODY



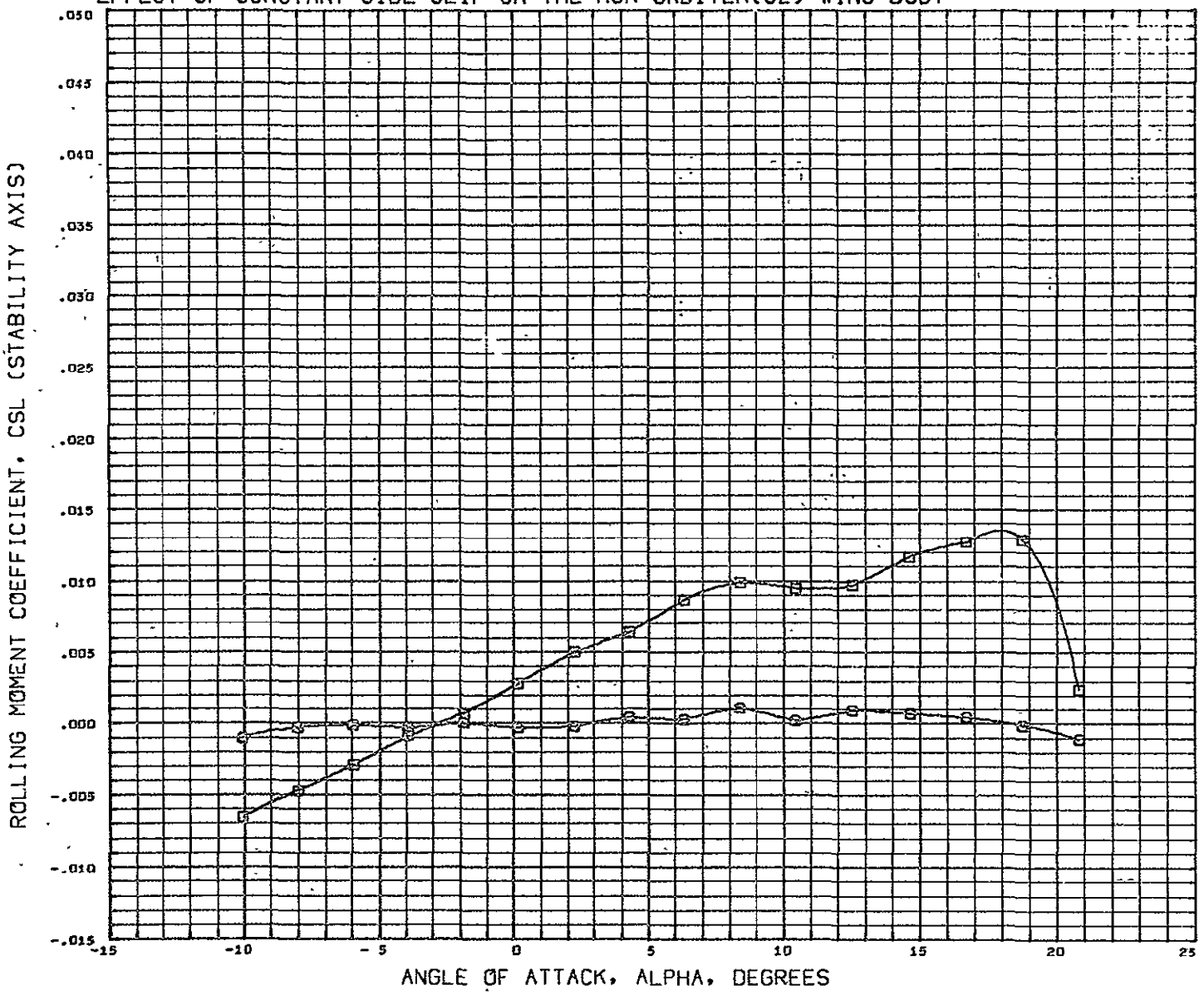
SYMBOL	BETA	PARAMETRIC VALUES	
	0.000	ELEVON	0.000
	- 3.000		

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

DATA HIST. CODE V

EFFECT OF CONSTANT SIDE SLIP ON THE HCR ORBITER(02) WING-BODY



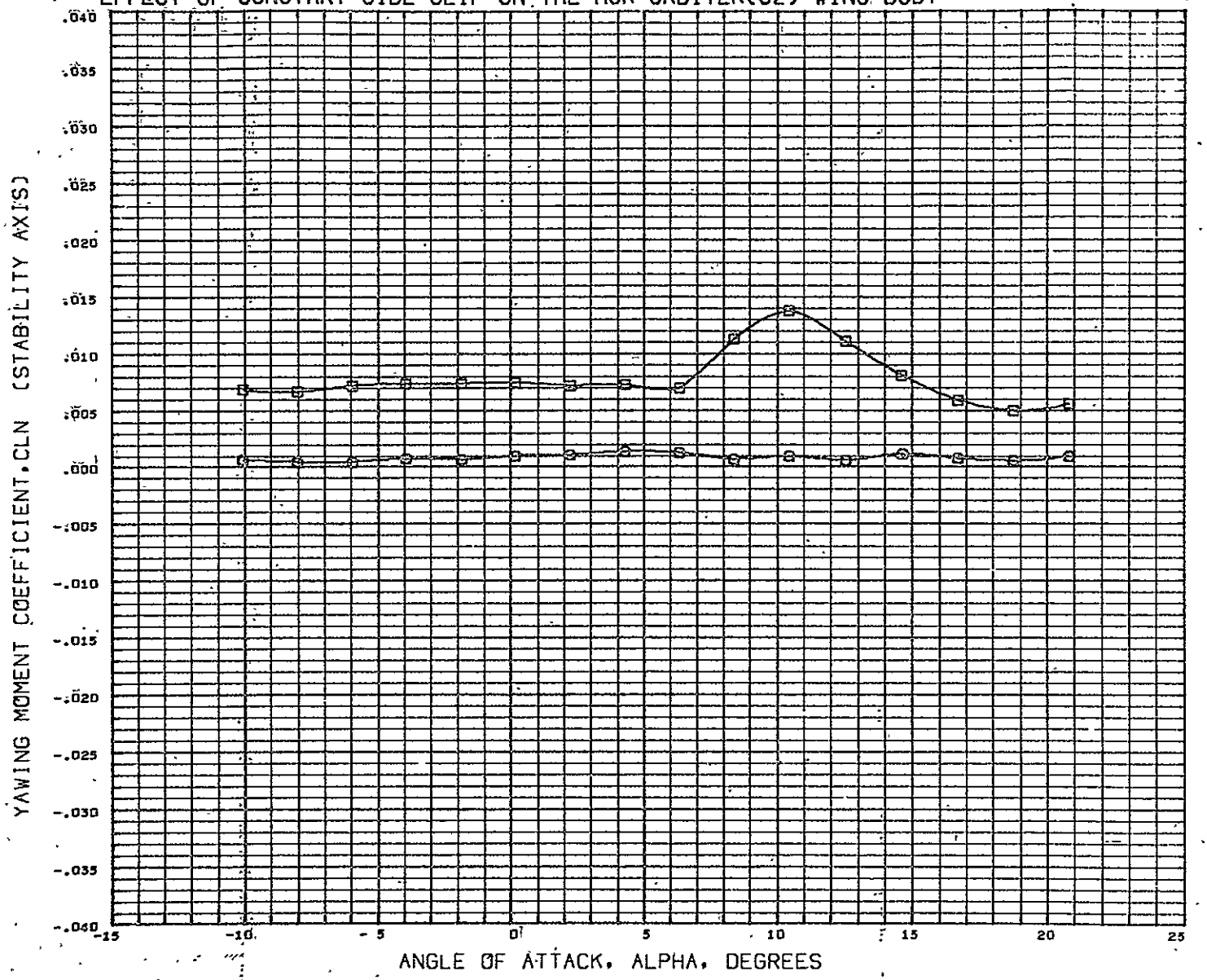
SYMBOL	BETA	PARAMETRIC VALUES	
O	0.000	ELEVON	0.000
□	- 3.000		

DATA HIST. CODE V

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF CONSTANT SIDE SLIP ON THE HCR ORBITER(02) WING-BODY



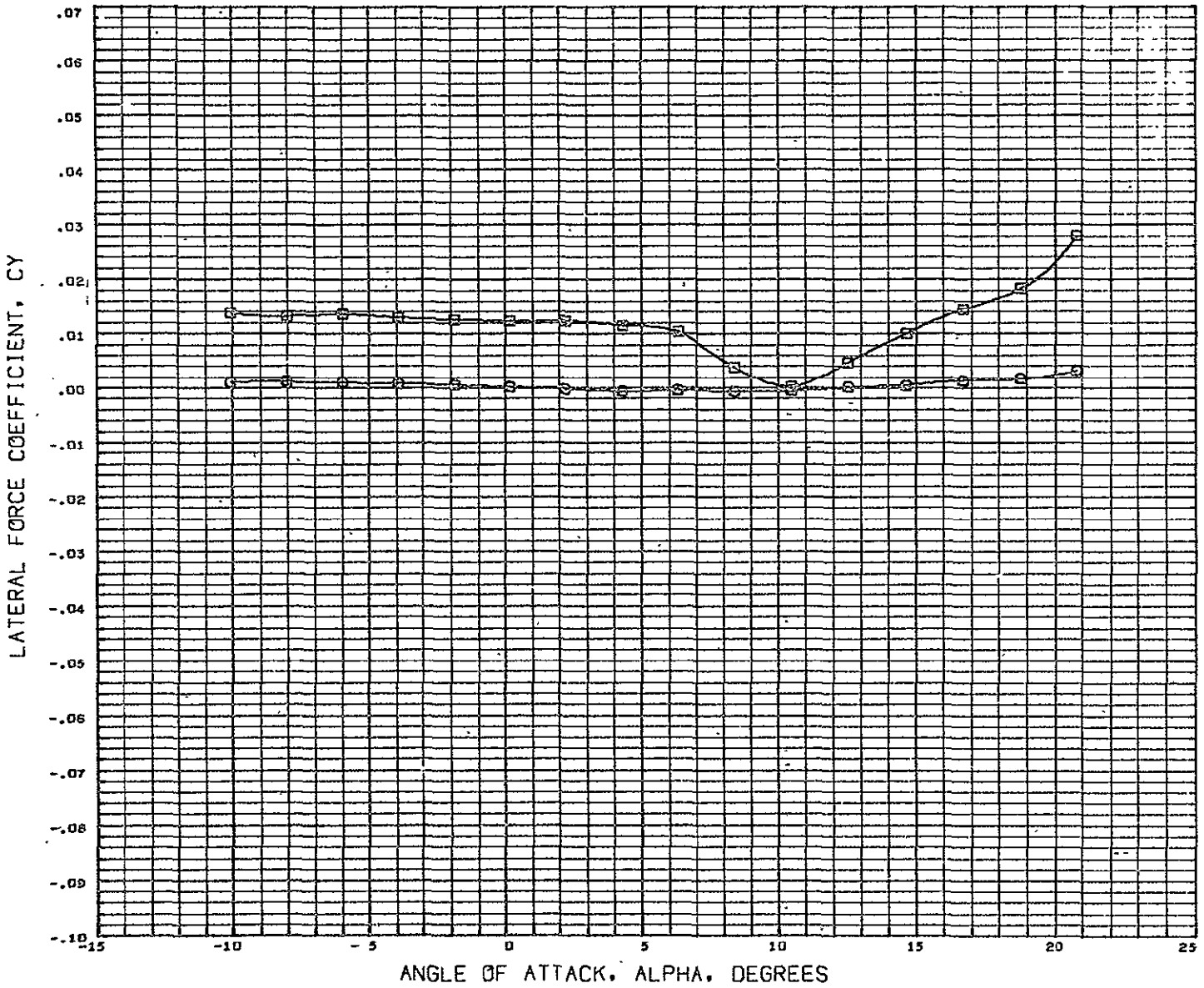
SYMBOL	BETA		PARAMETRIC VALUES
○	0.000	ELEVON	0.000
□	- 3.000		

DATA HIST. CODE V

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF CONSTANT SIDE SLIP ON THE HCR ORBITER(02) WING-BODY



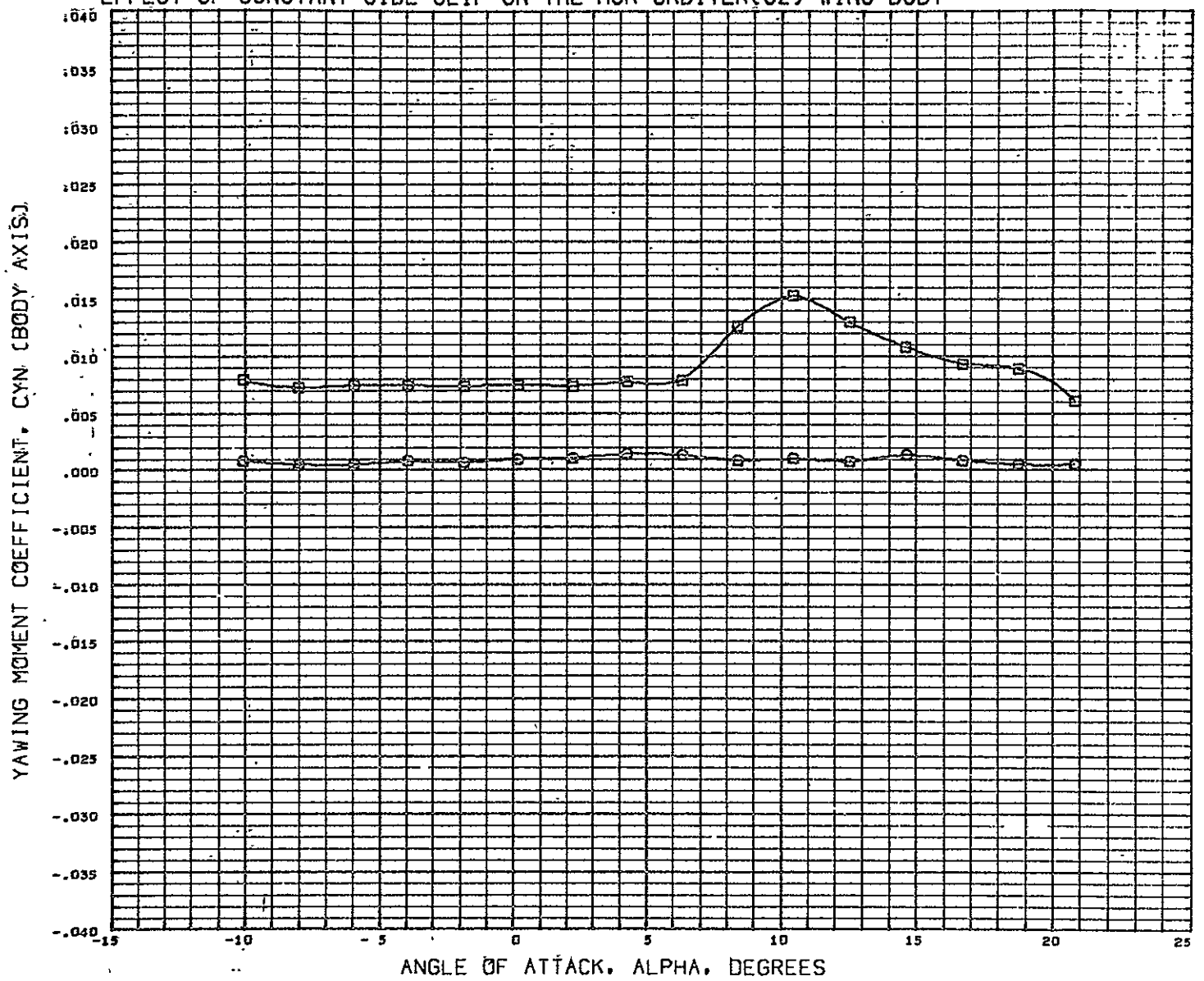
SYMBOL	BETA		PARAMETRIC VALUES
O	0.000	ELEVON	0.000
□	- 3.000		

DATA HIST. CODE V

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF CONSTANT SIDE SLIP ON THE HCR ORBITER(02) WING-BODY



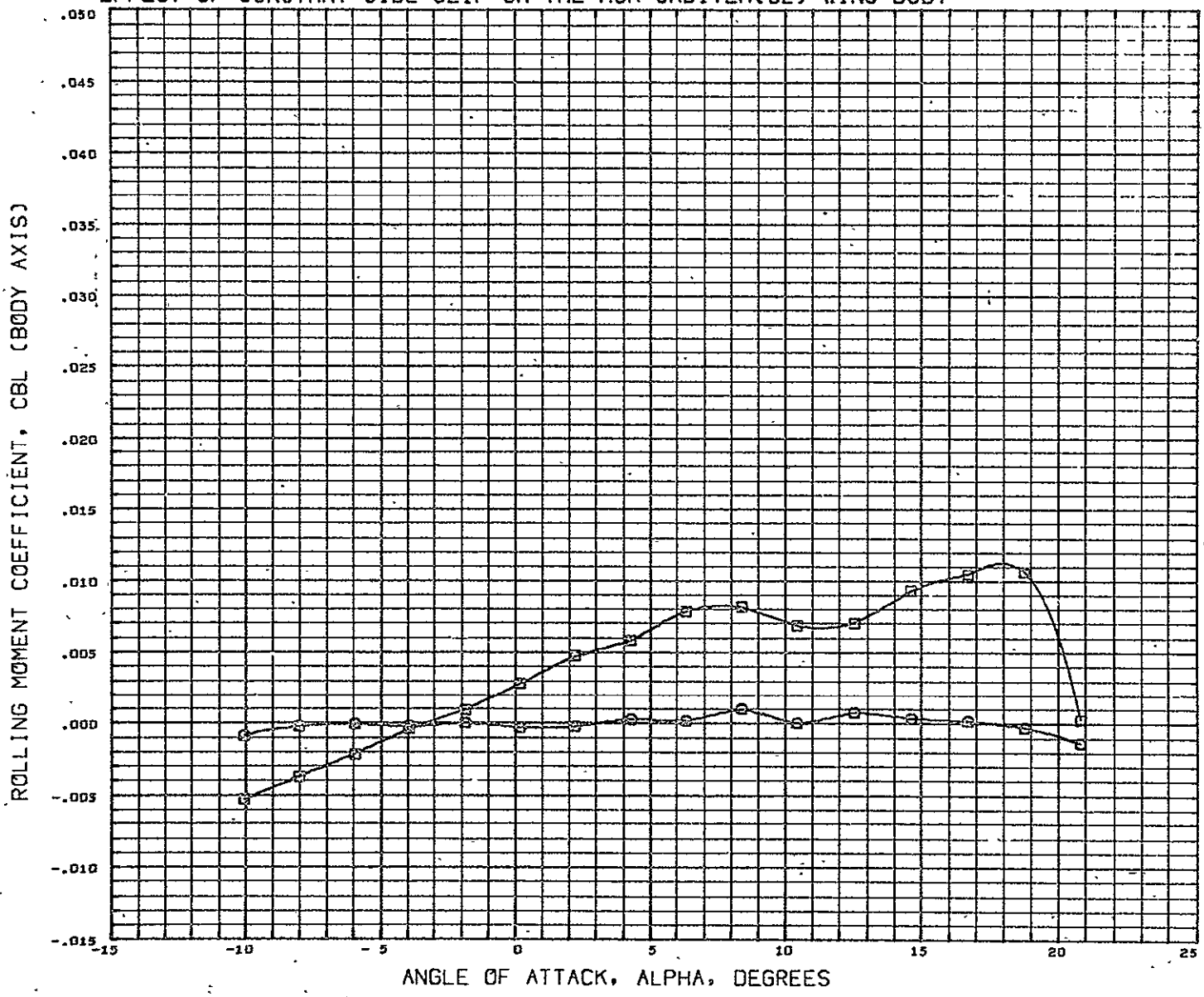
SYMBOL	BETA		PARAMETRIC VALUES
○	0.000	ELEVON	0.000
□	- 3.000		

DATA HIST. CODE T

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF CONSTANT SIDE SLIP ON THE HCR ORBITER(02) WING-BODY



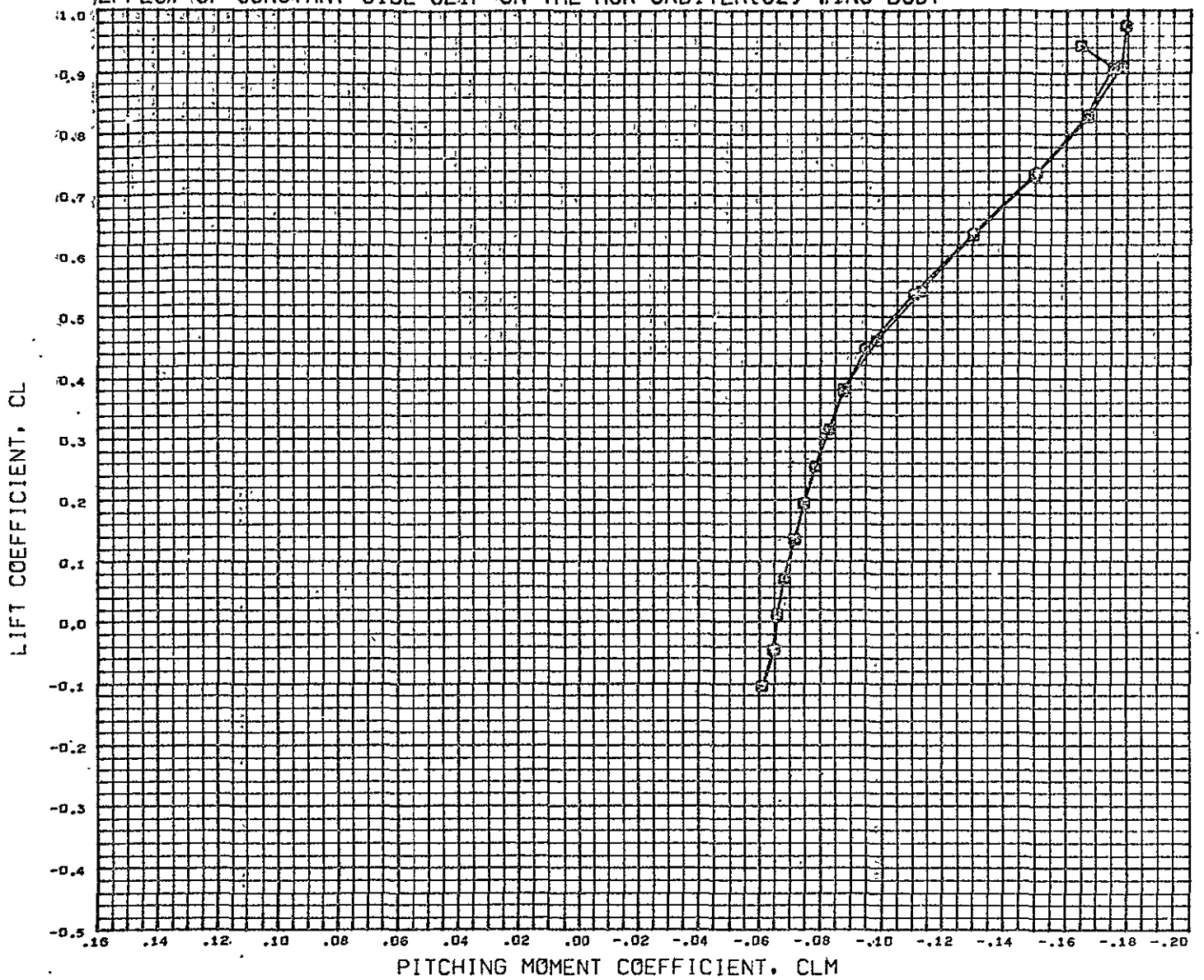
SYMBOL	BETA		PARAMETRIC VALUES
O	0.000	ELEVON	0.000
□	- 3.000		

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

DATA HIST. CODE T

EFFECT OF CONSTANT SIDE SLIP ON THE HCR ORBITER(02) WING-BODY



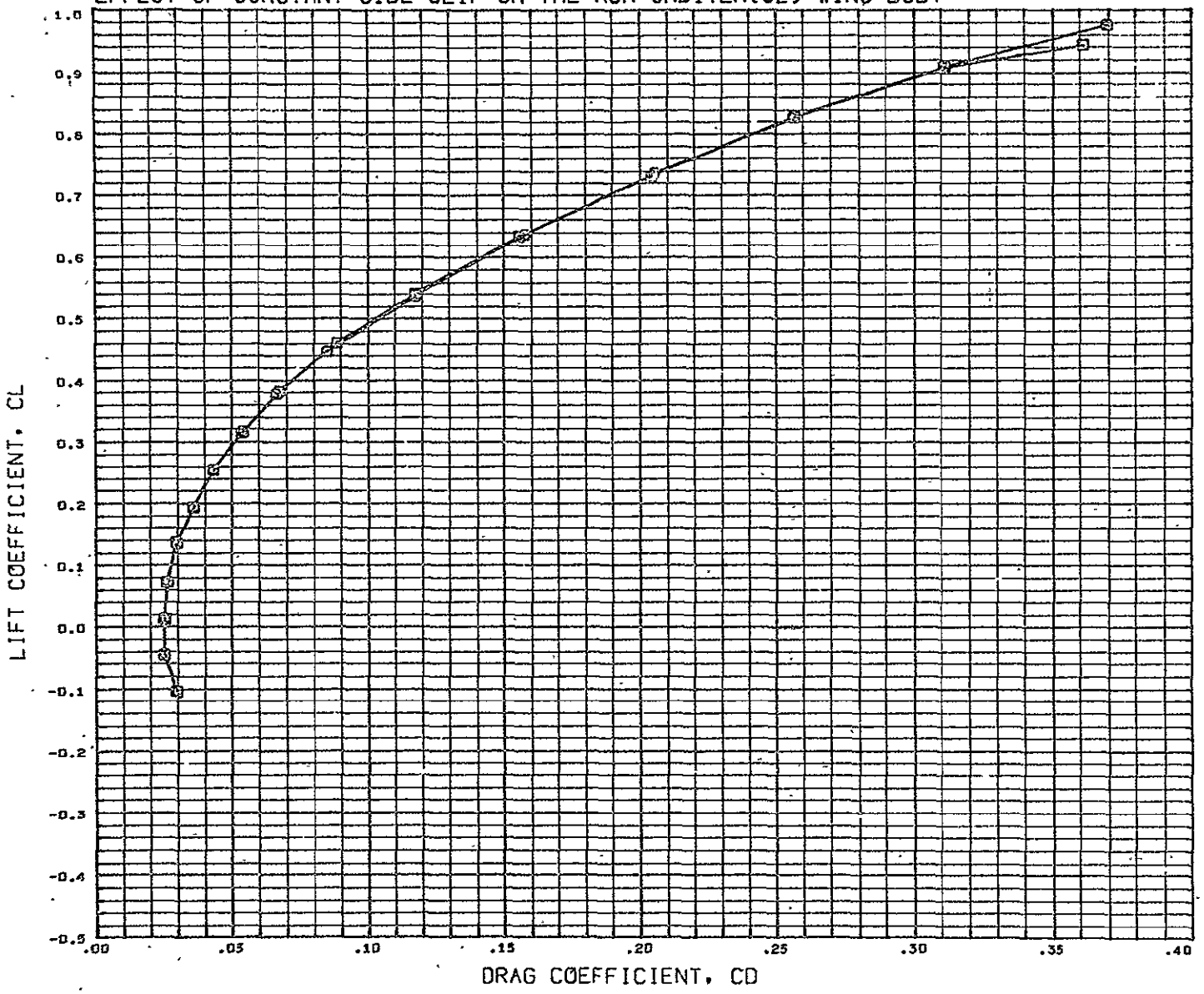
SYMBOL	BETA		PARAMETRIC VALUES
○	0.000	ELEVON	0.000
□	- 3.000		

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

DATA HIST. CODE Y

EFFECT OF CONSTANT SIDE SLIP ON THE HCR ORBITER(02) WING-BODY



SYMBOL	BETA		PARAMETRIC VALUES
O	0.000	ELEVON	0.000
□	- 3.000		

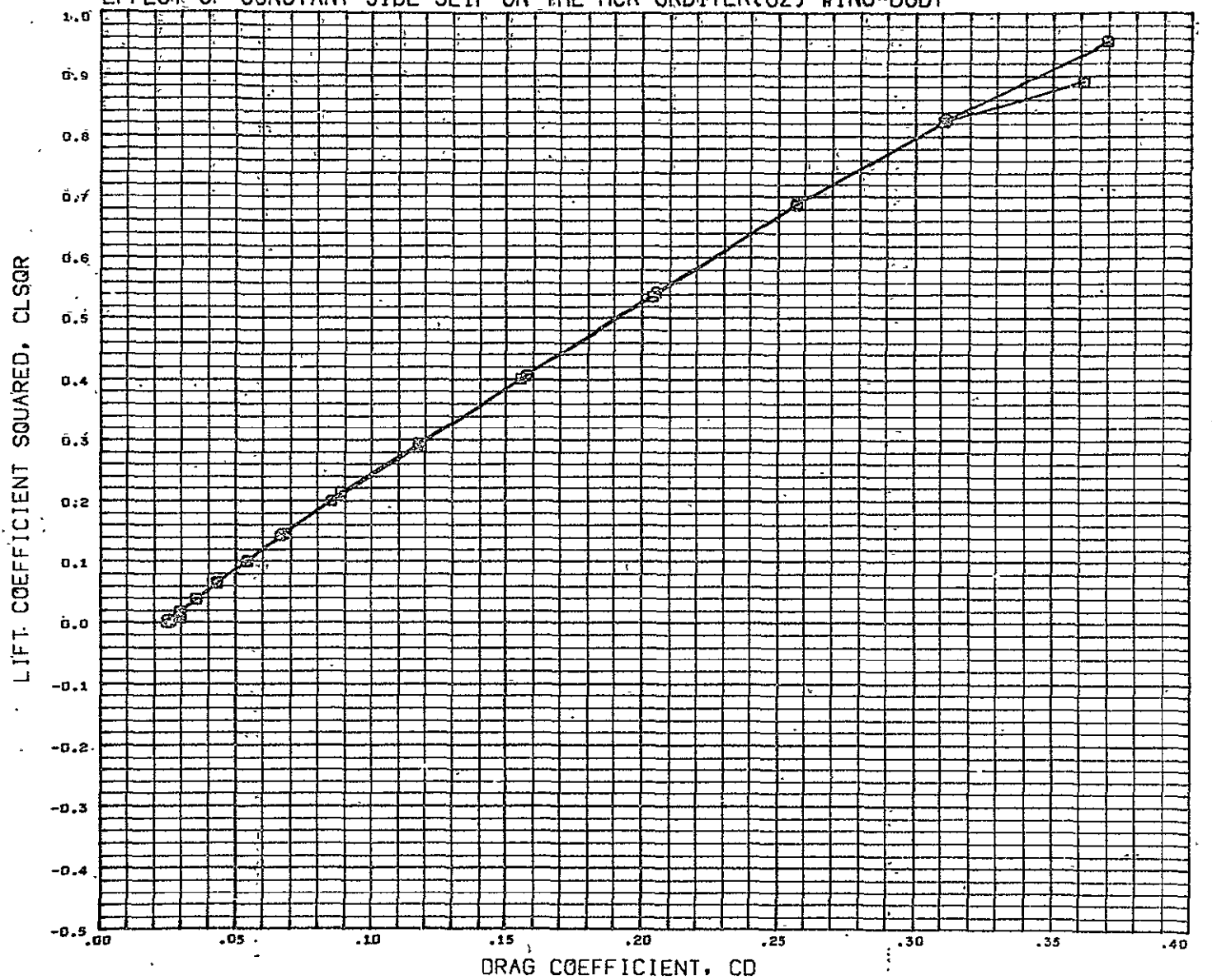
REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

DATA HIST. CODE V

LSWT 240 4.0 PC HCR ORBITER(02) B1W3 (DCFD10) 08 JAN 71 PAGE 41

EFFECT OF CONSTANT SIDE SLIP ON THE HCR ORBITER(02) WING-BODY



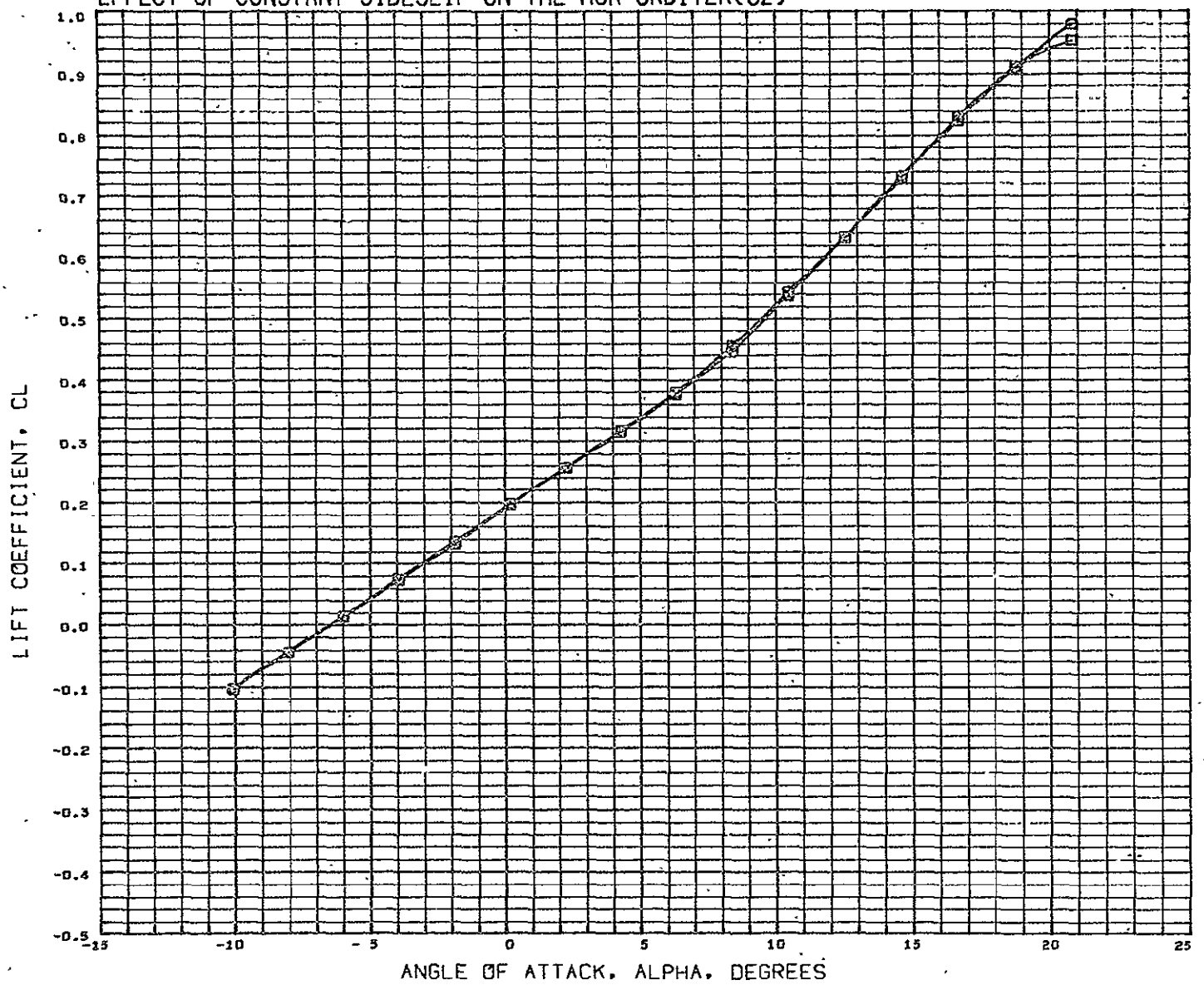
SYMBOL	BETA		PARAMETRIC VALUES
O	0.000	ELEVON	0.000
□	- 3.000		

DATA HIST. CODE V

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF CONSTANT SIDESLIP ON THE HCR ORBITER(02)



SYMBOL	BETA	PARAMETRIC VALUES			
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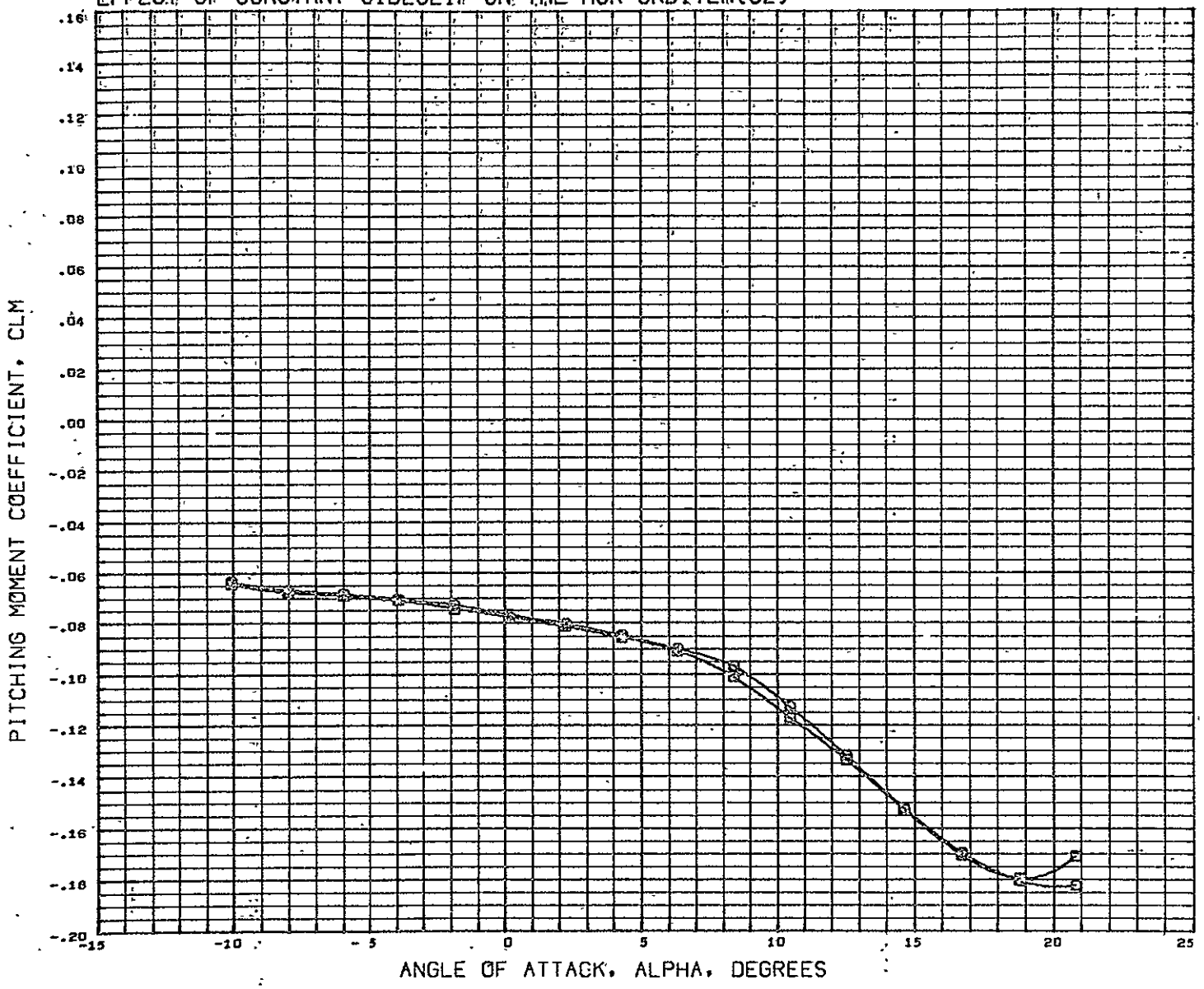
□	- 3.000	LHINBD	0.000	RHINBD	0.000
		AILRON	0.000	FLAP,B	0.000

DATA HIST. CODE V

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF CONSTANT SIDESLIP ON THE HCR ORBITER(02)

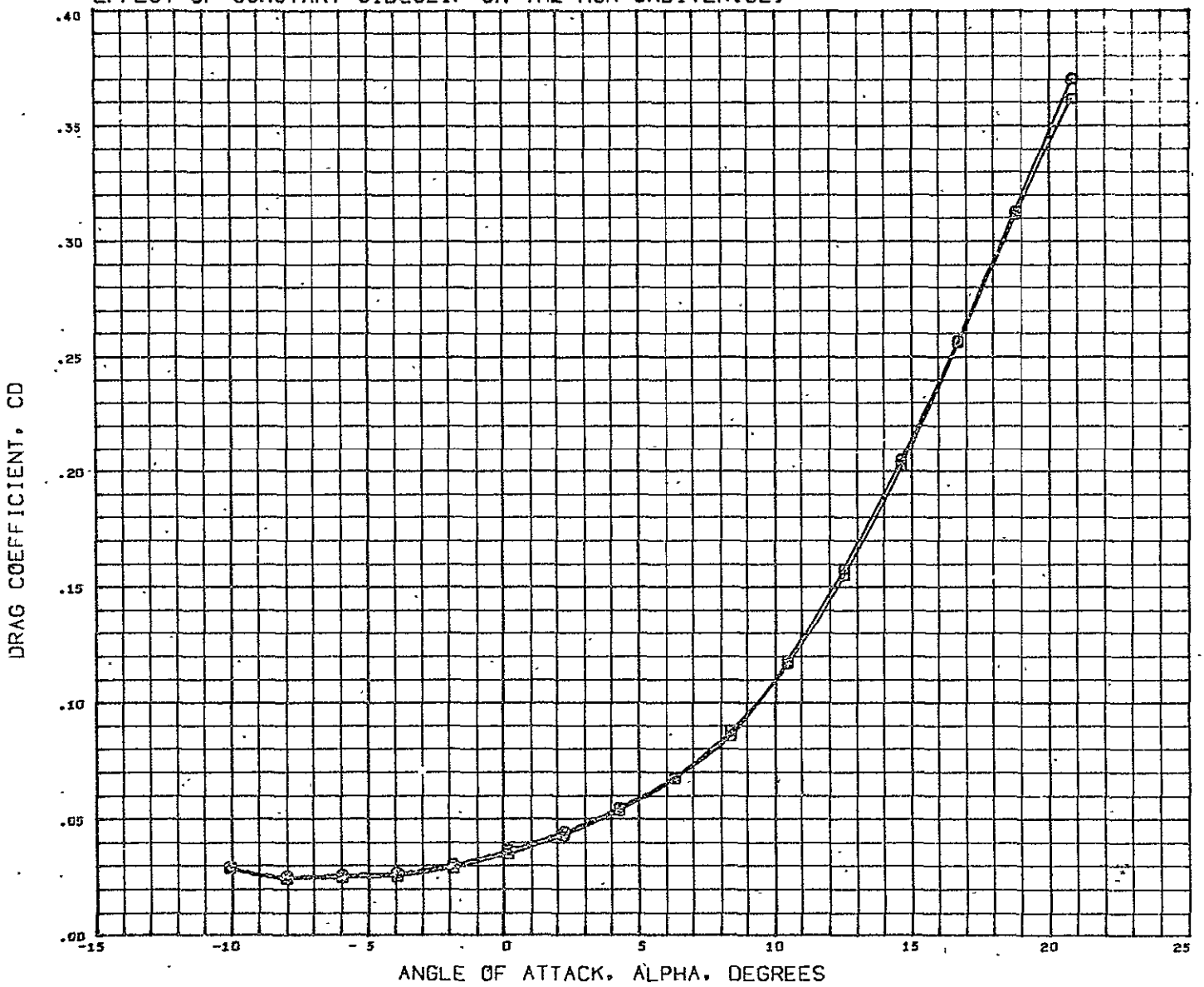


SYMBOL	BETA	PARAMETRIC VALUES			
○	0.000	ELEVON	0.000	RUDDER	0.000
□	3.000	LHINBD	0.000	RHINBD	0.000
		AILRON	0.000	FLAP,B	0.000

DATA HIST. CODE V

REFERENCE INFORMATION		
REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5490	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF CONSTANT SIDESLIP ON THE HCR ORBITER(02)

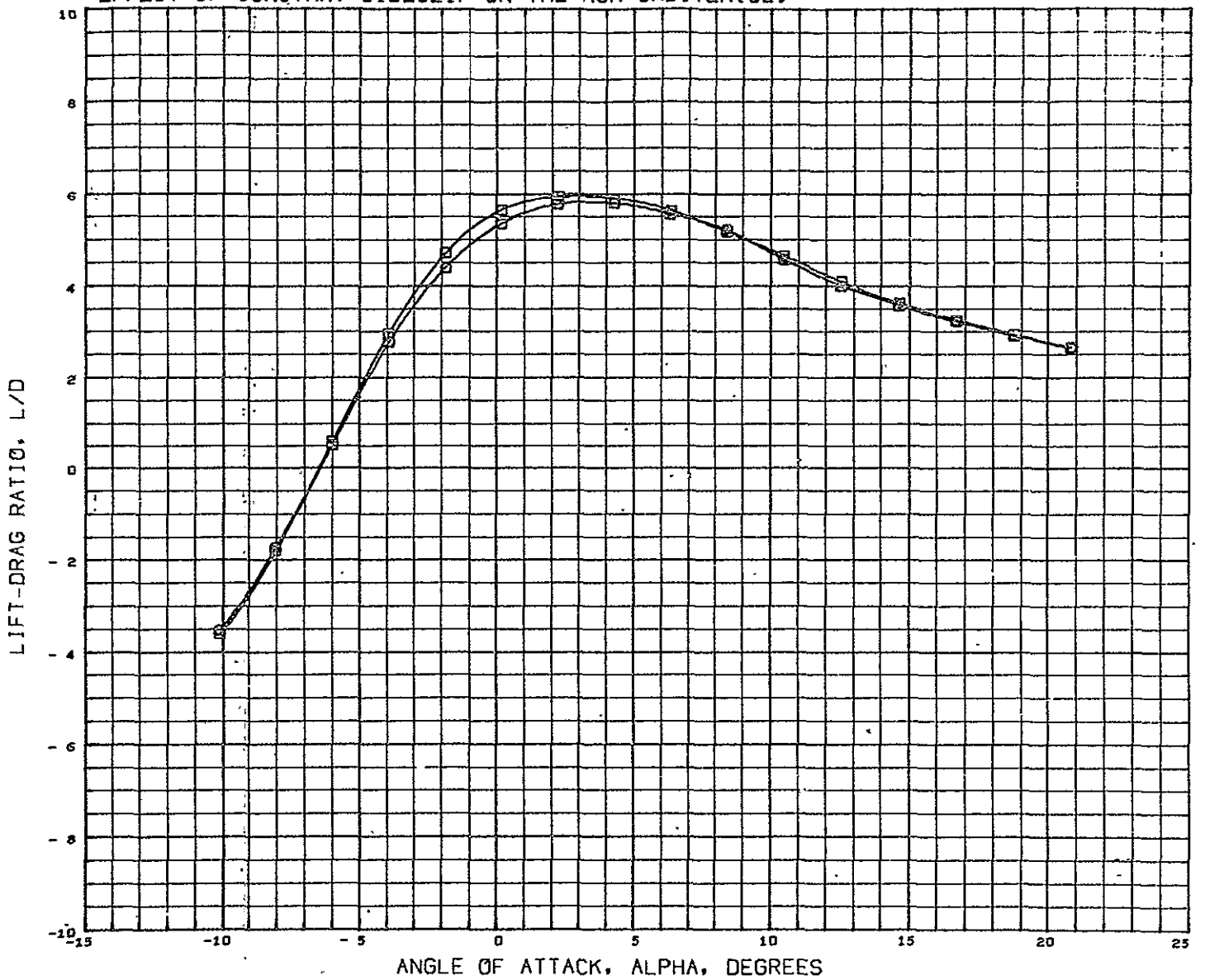


SYMBOL	BETA		PARAMETRIC VALUES		
O	0.000	ELEVON	0.000	RUDDER	0.000
□	- 3.000	LHINBD	0.000	RHINBD	0.000
		AILRON	0.000	FLAP,B	0.000

DATA HIST. CODE V

REFERENCE INFORMATION		
REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF CONSTANT SIDESLIP ON THE HCR ORBITER(02)



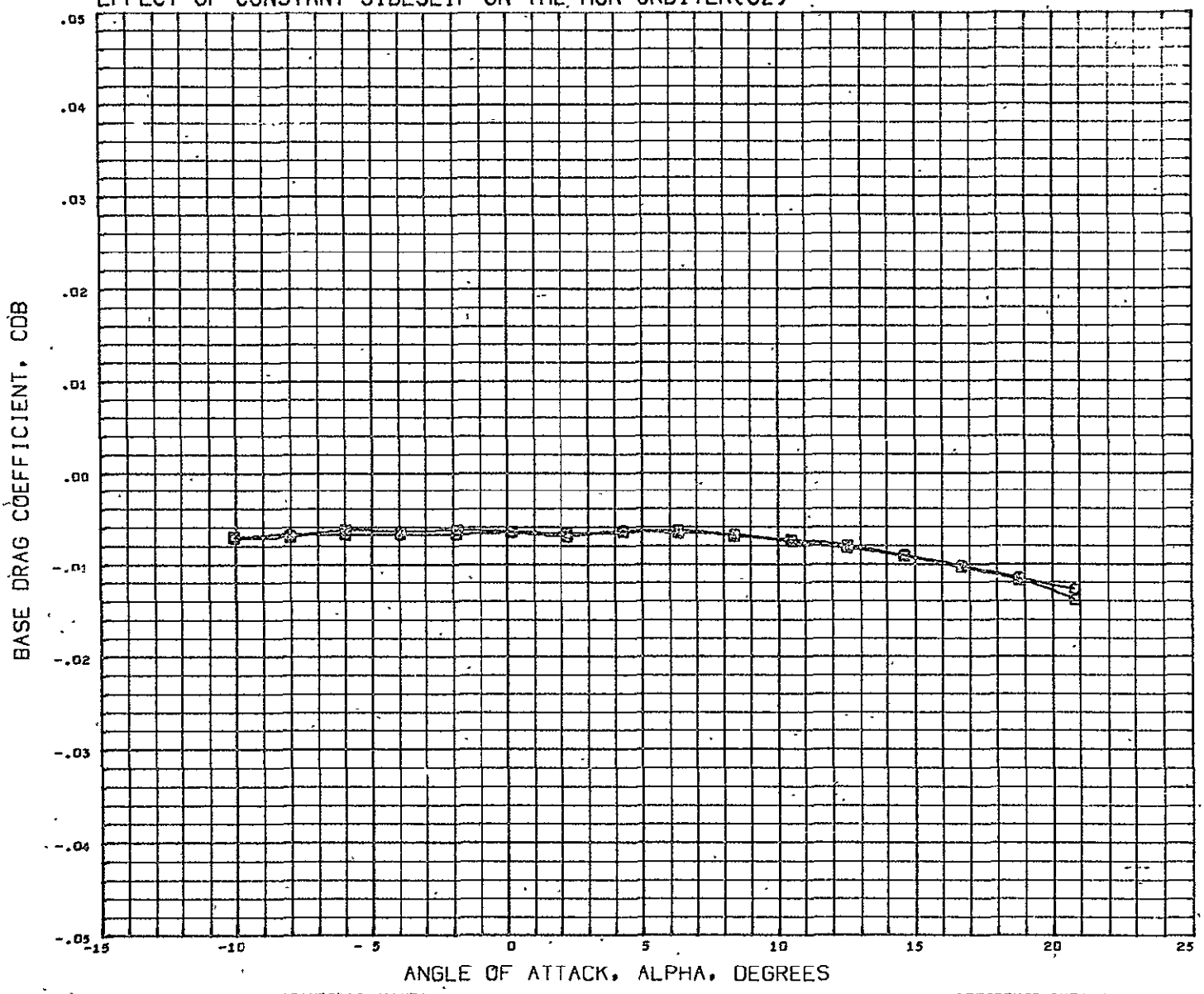
SYMBOL	BETA		PARAMETRIC VALUES		
○	0.000	ELEVON .	0.000	RUDDER	0.000
□	- 3.000	LHINBD .	0.000	RHINBD	0.000
		AILRON	0.000	FLAP,B	0.000

DATA HIST. CODE V

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF CONSTANT SIDESLIP ON THE HCR ORBITER(02)

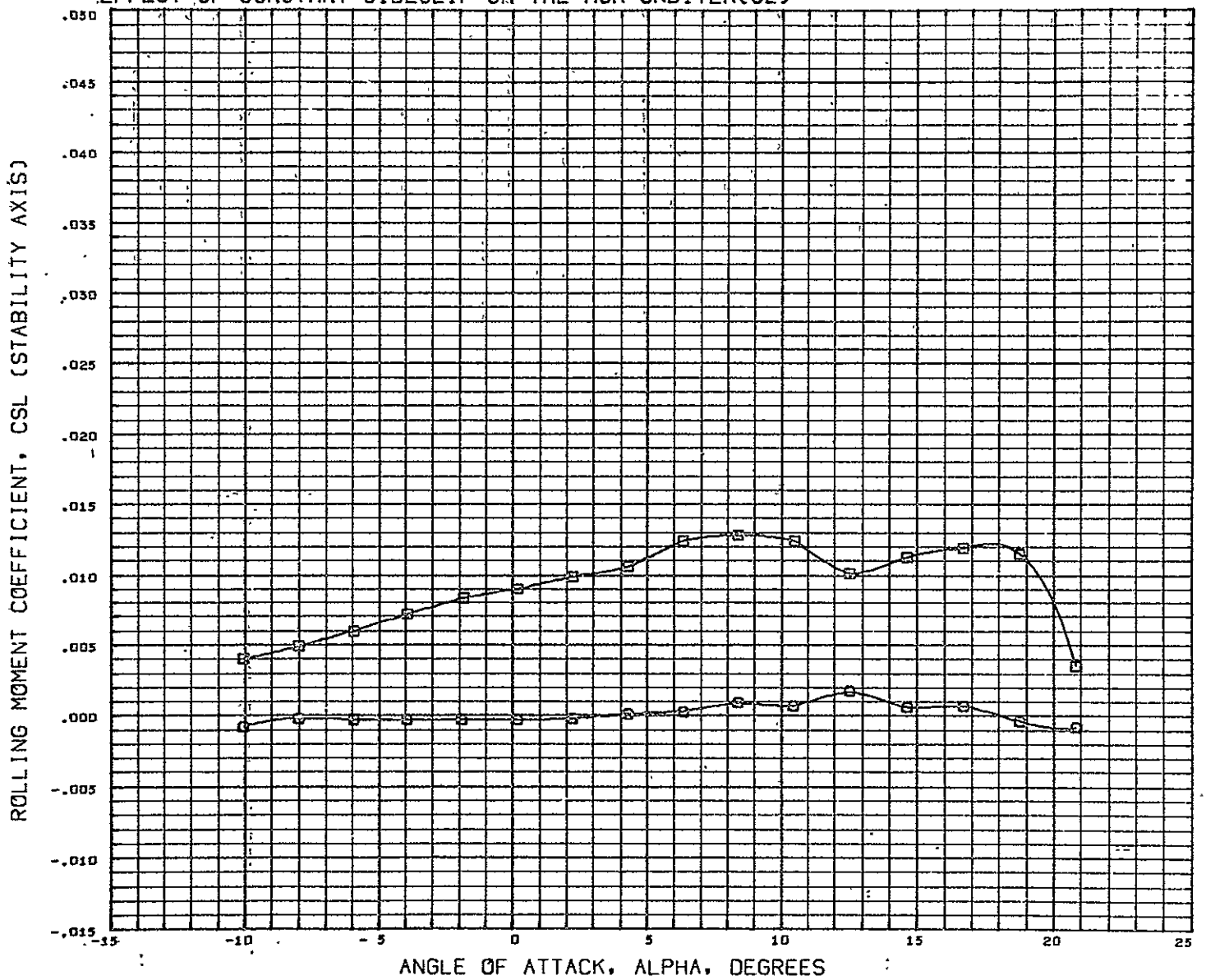


SYMBOL	BETA	PARAMETRIC VALUES			
○	0.000	ELEVON	0.000	RUDDER	0.000
□	- 3.000	LHINBD	0.000	RHINBD	0.000
		AILRON	0.000	FLAP,B	0.000

DATA HIST. CODE V

REFERENCE INFORMATION		
REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF CONSTANT SIDESLIP ON THE HCR ORBITER(02)



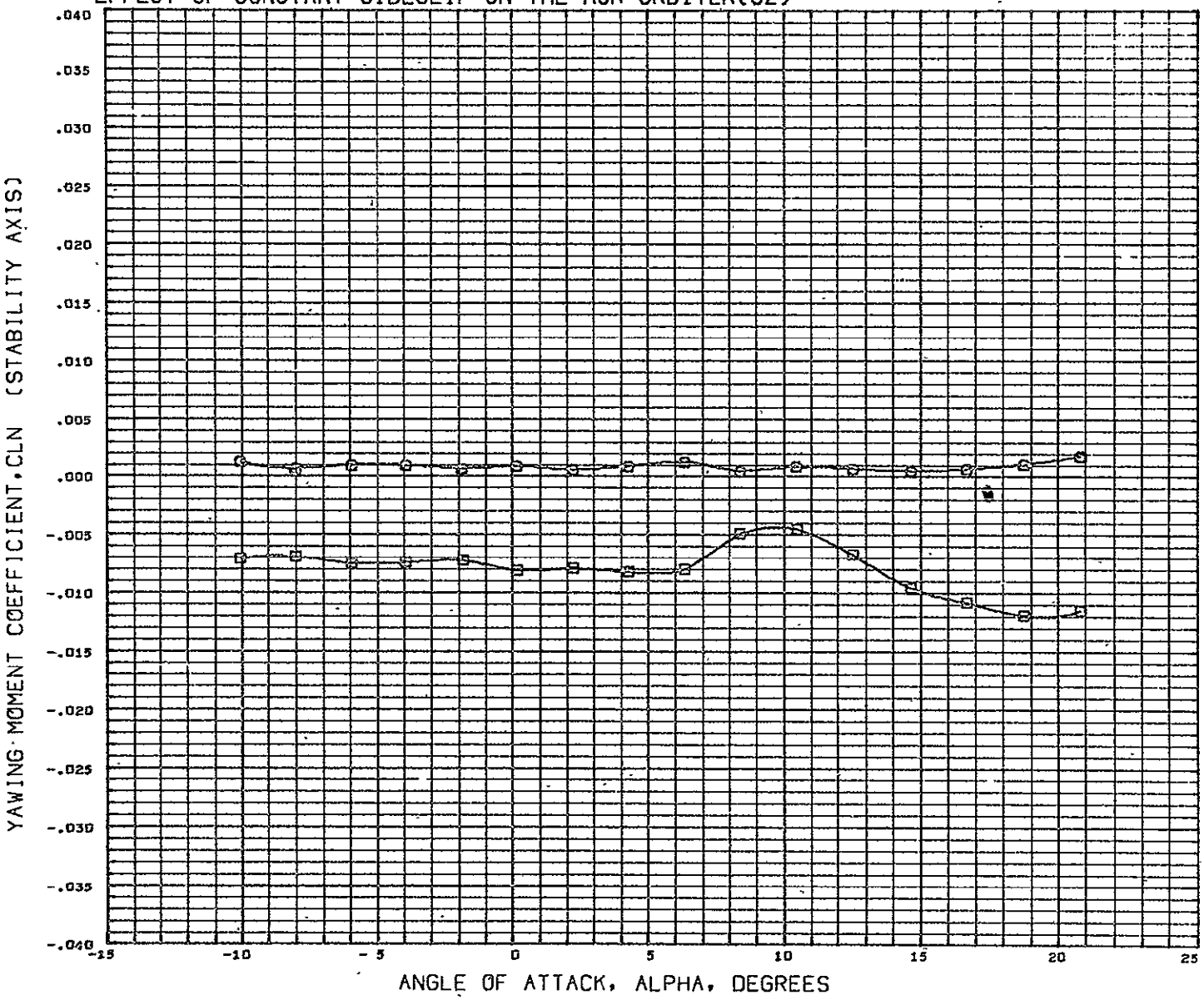
SYMBOL	BETA	PARAMETRIC VALUES			
○	0.000	ELEVON	0.000	RUDDER	0.000
□	- 3.000	LHINBD	0.000	RHINBD	0.000
		AILRON	0.000	FLAP,B	0.000

DATA HIST. CODE V

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF CONSTANT SIDESLIP ON THE HCR ORBITER(02)



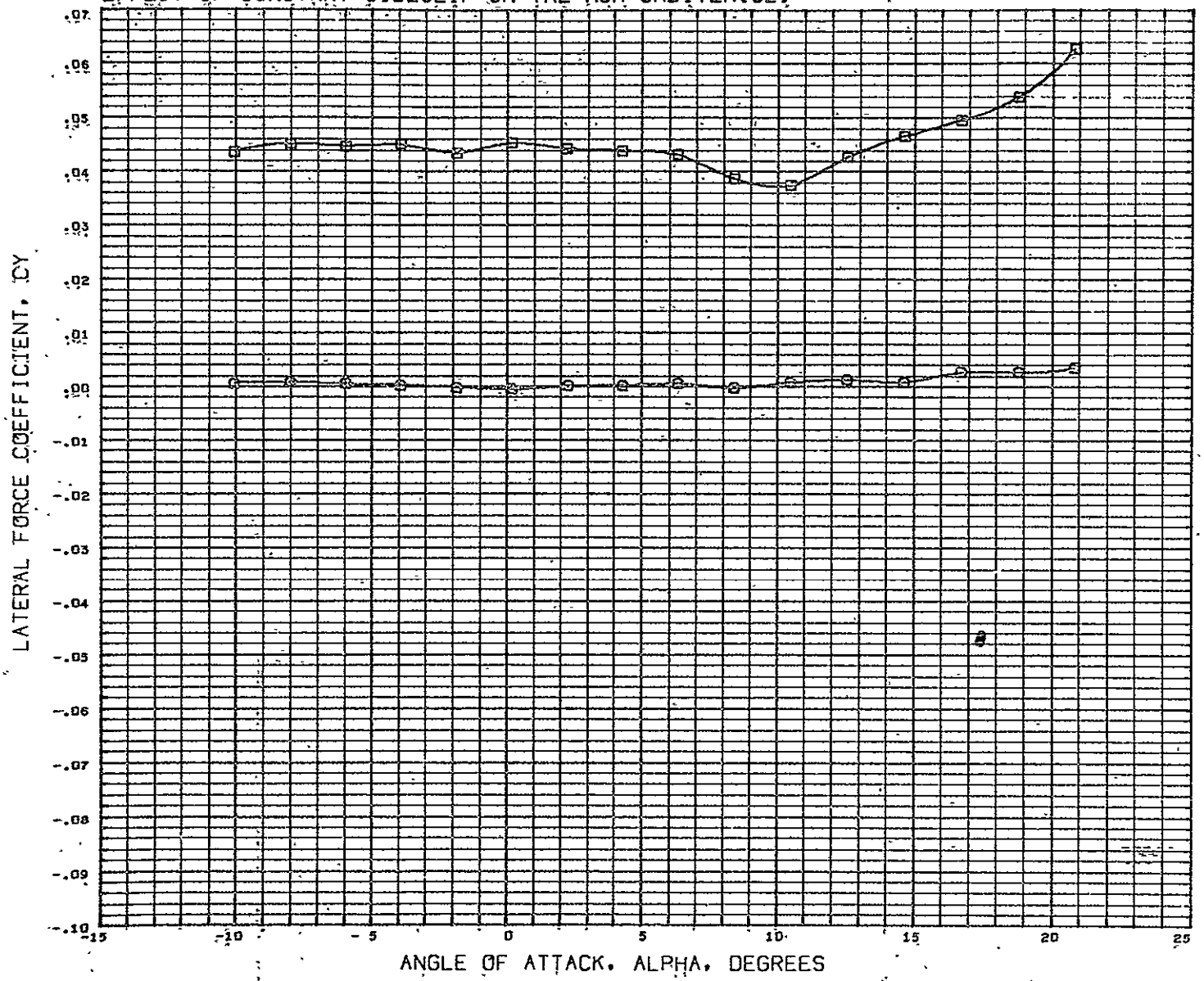
SYMBOL	BETA	PARAMETRIC VALUES			
○	0.000	ELEVON	0.000	RUDDER	0.000
□	- 3.000	LHINBD	0.000	RHINBD	0.000
		AILRON	0.000	FLAP,B	0.000

DATA HIST. CODE V

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XHRP	4.2210	FT.
YHRP	0.0000	FT.
ZHRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF CONSTANT SIDESLIP ON THE HCR ORBITER(02)



SYMBOL	BETA
□	0.000
○	3.000

PARAMETRIC VALUES

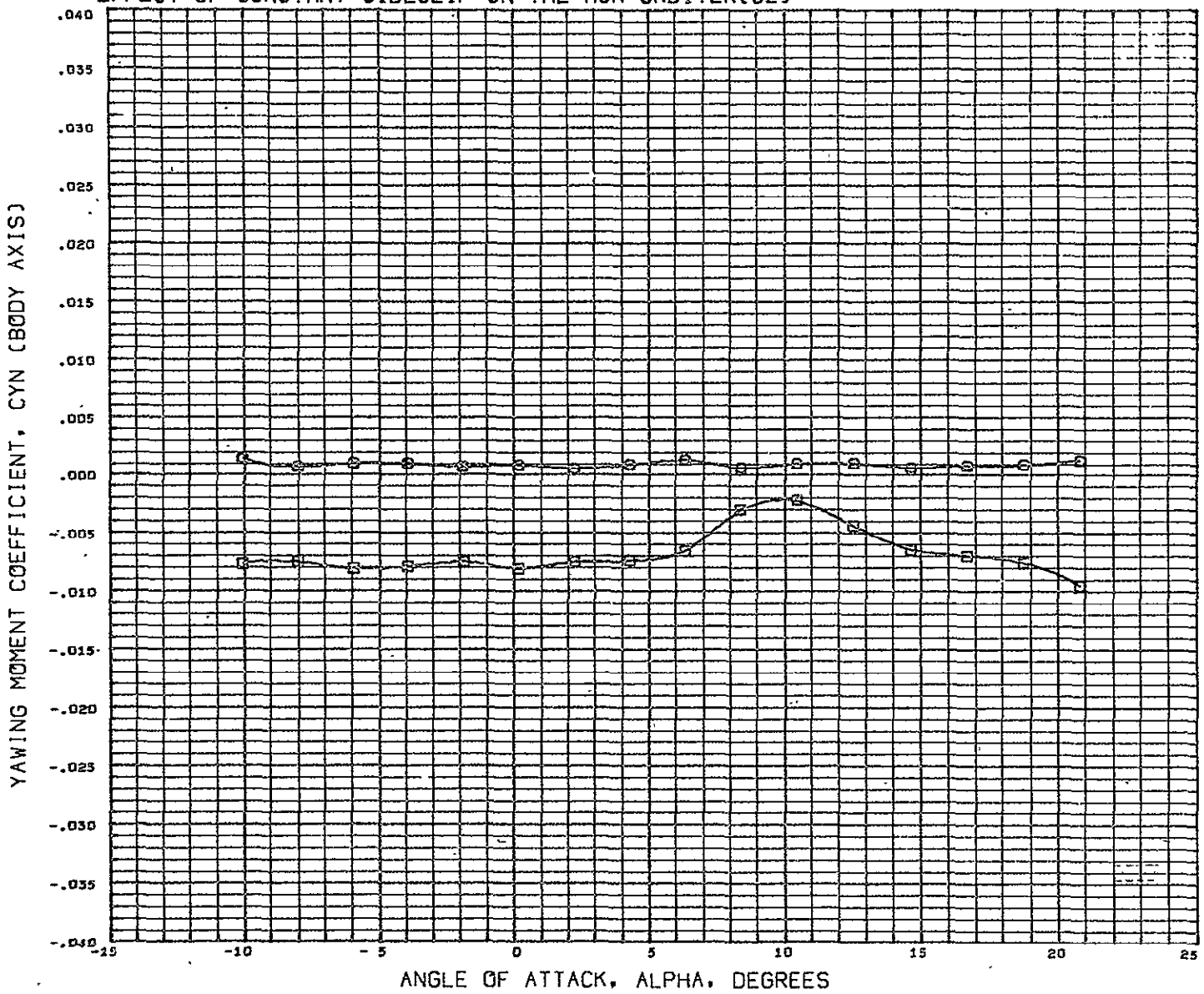
ELEVON	0.000	RUDDER	0.000
LHINBD	0.000	RHINBD	0.000
AILRON	0.000	FLAP,B	0.000

DATA HIST. CODE V

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF CONSTANT SIDESLIP ON THE HCR ORBITER(02)



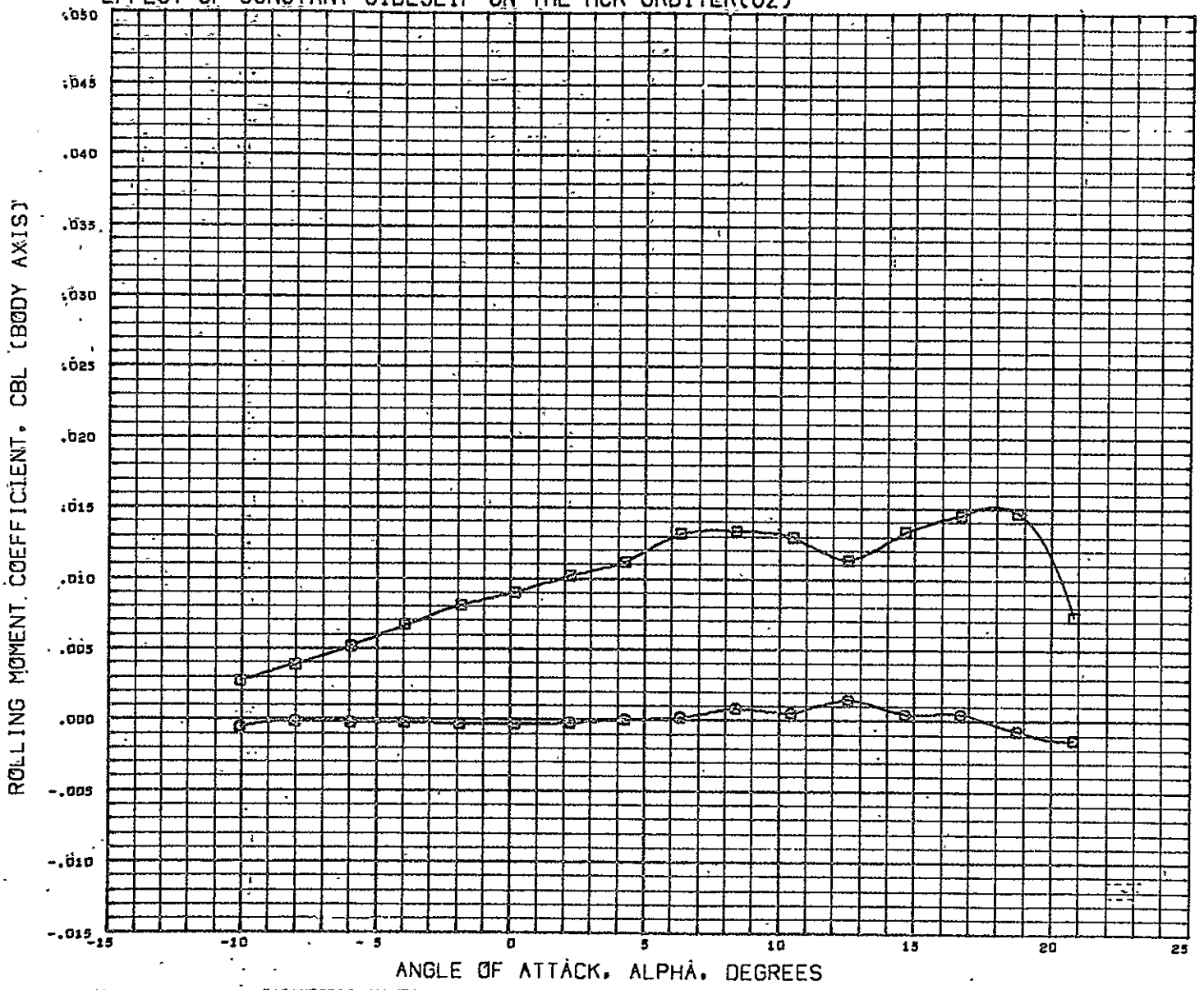
SYMBOL	BETA	PARAMETRIC VALUES			
O	0.000	ELEVON	0.000	RUDDER	0.000
□	- 3.000	LHINBD	0.000	RHINBD	0.000
		AILRON	0.000	FLAP,B	0.000

DATA HIST. CODE T

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF CONSTANT SIDESLIP ON THE HCR ORBITER(02)



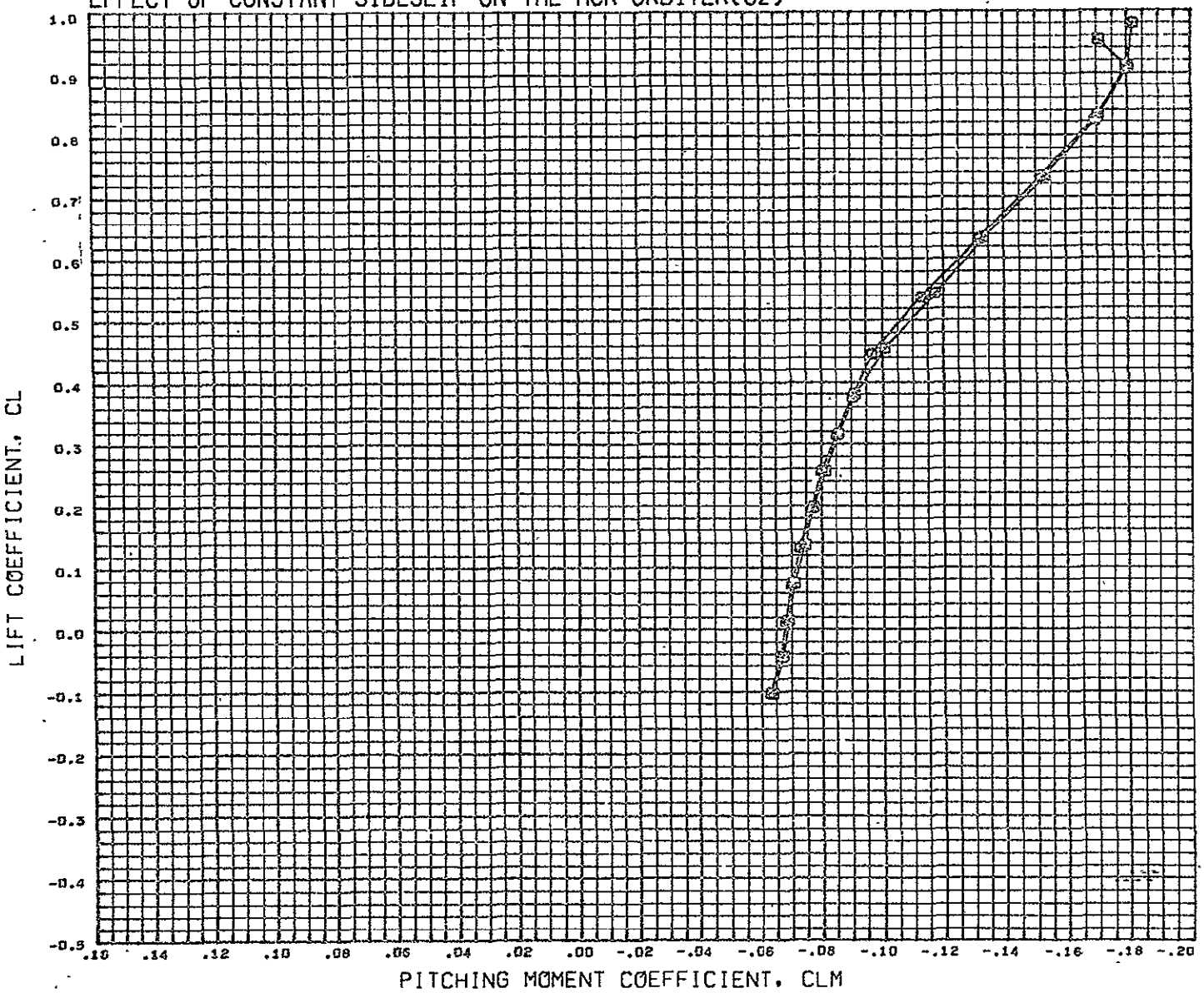
SYMBOL	BETA	PARAMETRIC VALUES			
○	0.000	ELEVON	0.000	RUDDER	0.000
□	- 3.000	LHINBD	0.000	RHINBD	0.000
		AILRON	0.000	FLAP,B	0.000

DATA HIST. CODE T

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF CONSTANT SIDESLIP ON THE HCR ORBITER(02)



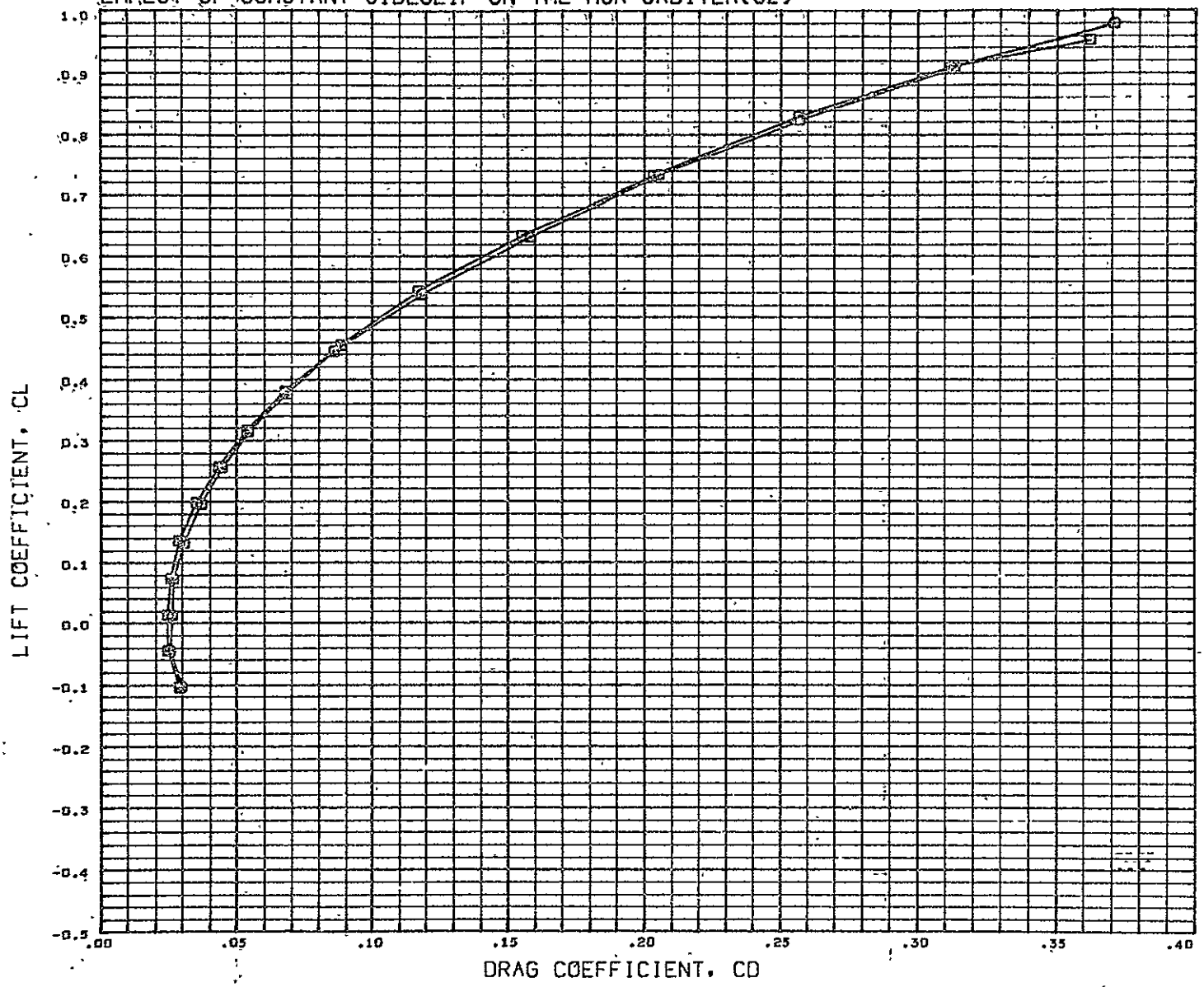
SYMBOL	BETA	PARAMETRIC VALUES			
O	0.000	ELEVON	0.000	RUDDER	0.000
O -	3.000	LHINBD	0.000	RHINBD	0.000
		AILRON	0.000	FLAP,B	0.000

DATA HIST. CODE V

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF CONSTANT SIDESLIP ON THE HCR ORBITER(02)



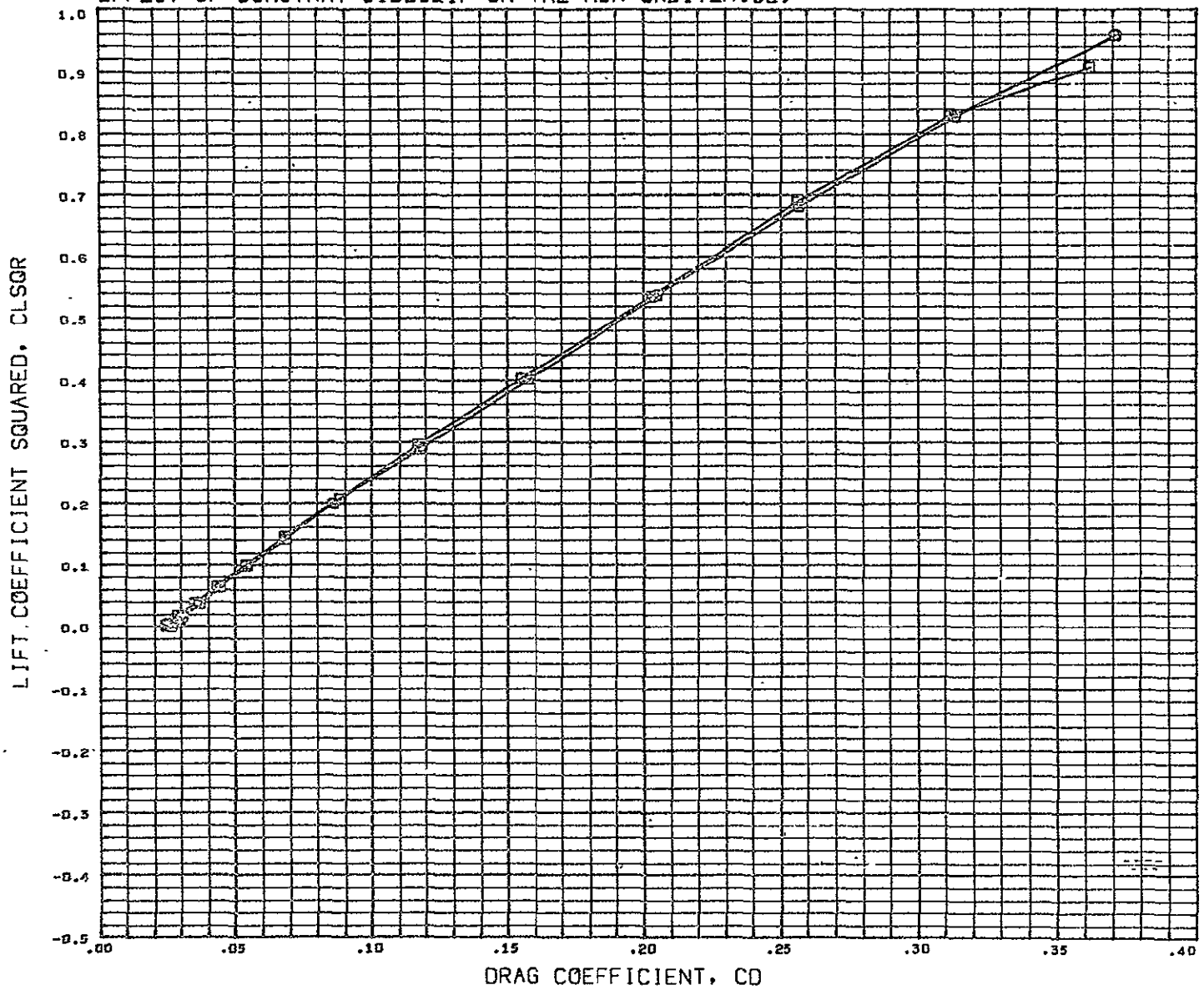
SYMBOL	BETA	PARAMETRIC VALUES			
O	0.000	ELEVON	0.000	RUDDER	0.000
□	- 3.000	LHINBD	0.000	RHINBD	0.000
		AILRON	0.000	FLAP,B	0.000

DATA HIST. CODE V

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF CONSTANT SIDESLIP ON THE HCR ORBITER(02)



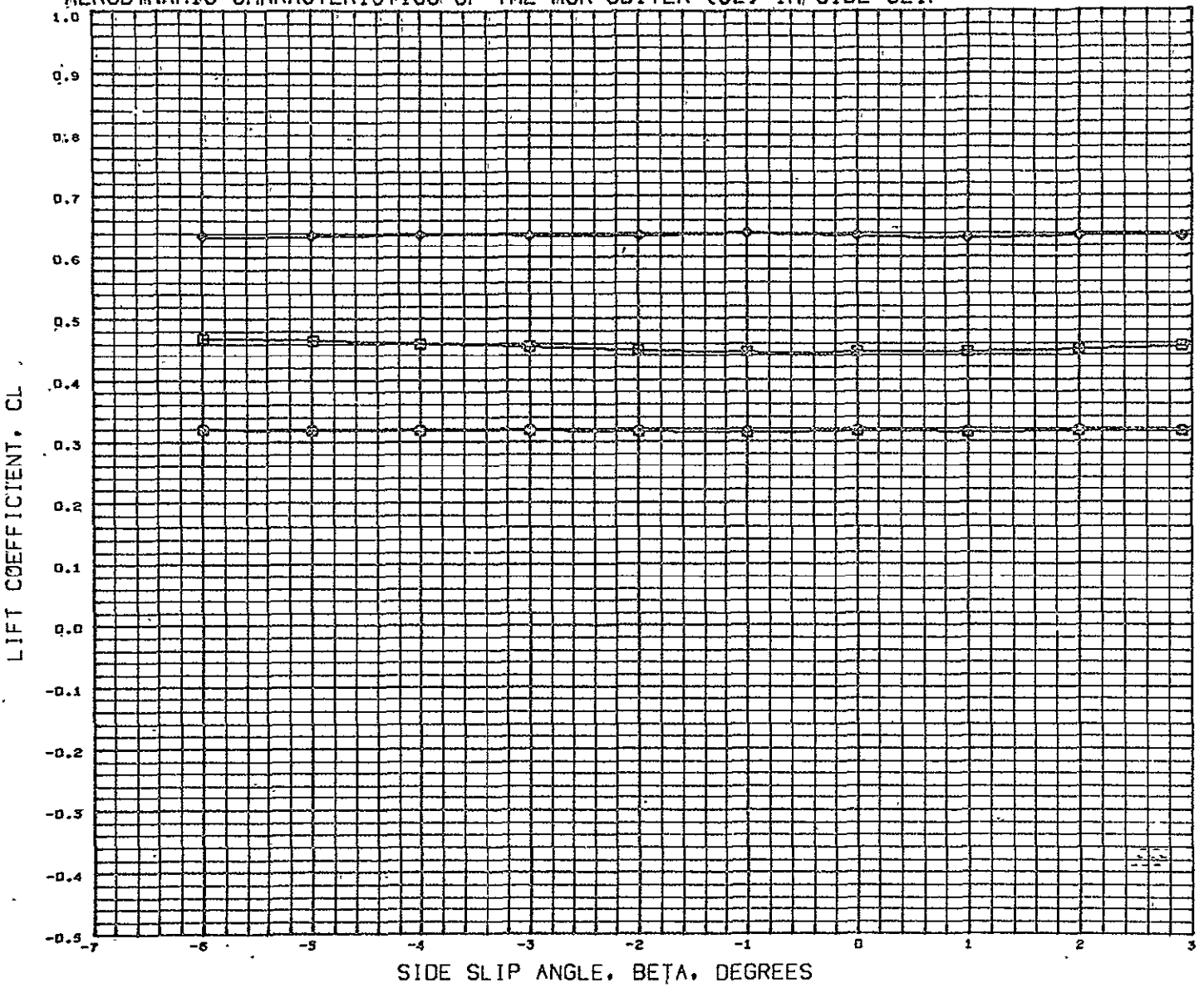
SYMBOL	BETA		PARAMETRIC VALUES		
O	0.000	ELEVON	0.000	RUDDER	0.000
□	- 3.000	LHINBD	0.000	RHINBD	0.000
		AILRON	0.000	FLAP,B	0.000

DATA HIST. CODE V

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

AERODYNAMIC CHARACTERISTICS OF THE HCR ORBITER (02) IN SIDE SLIP



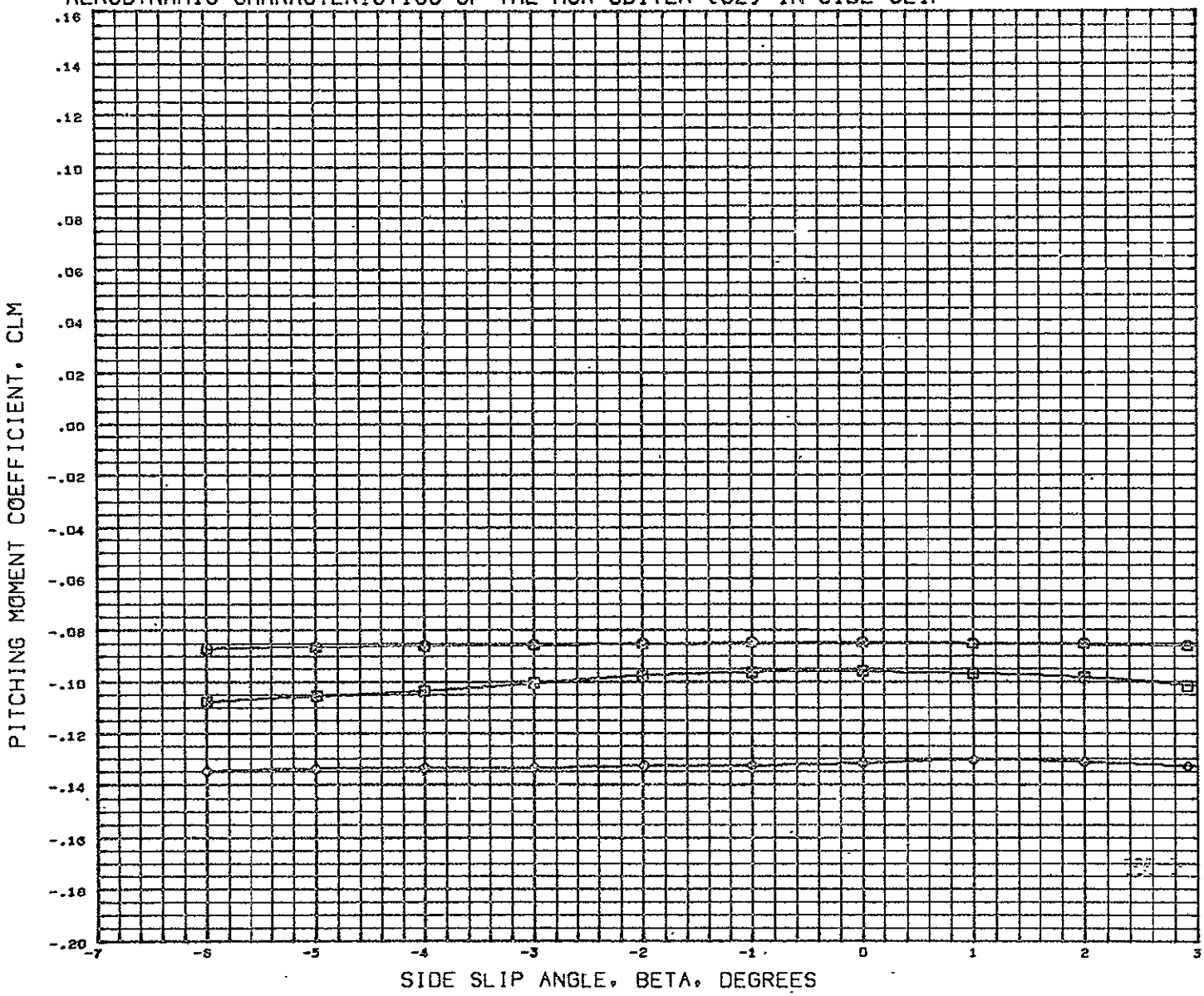
SYMBOL	ALPHA	PARAMETRIC VALUES	
○	4.000	ELEVON	0.000
□	8.000		
◇	12.000		

DATA HIST. CODE V

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	FER CE

AERODYNAMIC CHARACTERISTICS OF THE HCR OBITER (02) IN SIDE SLIP



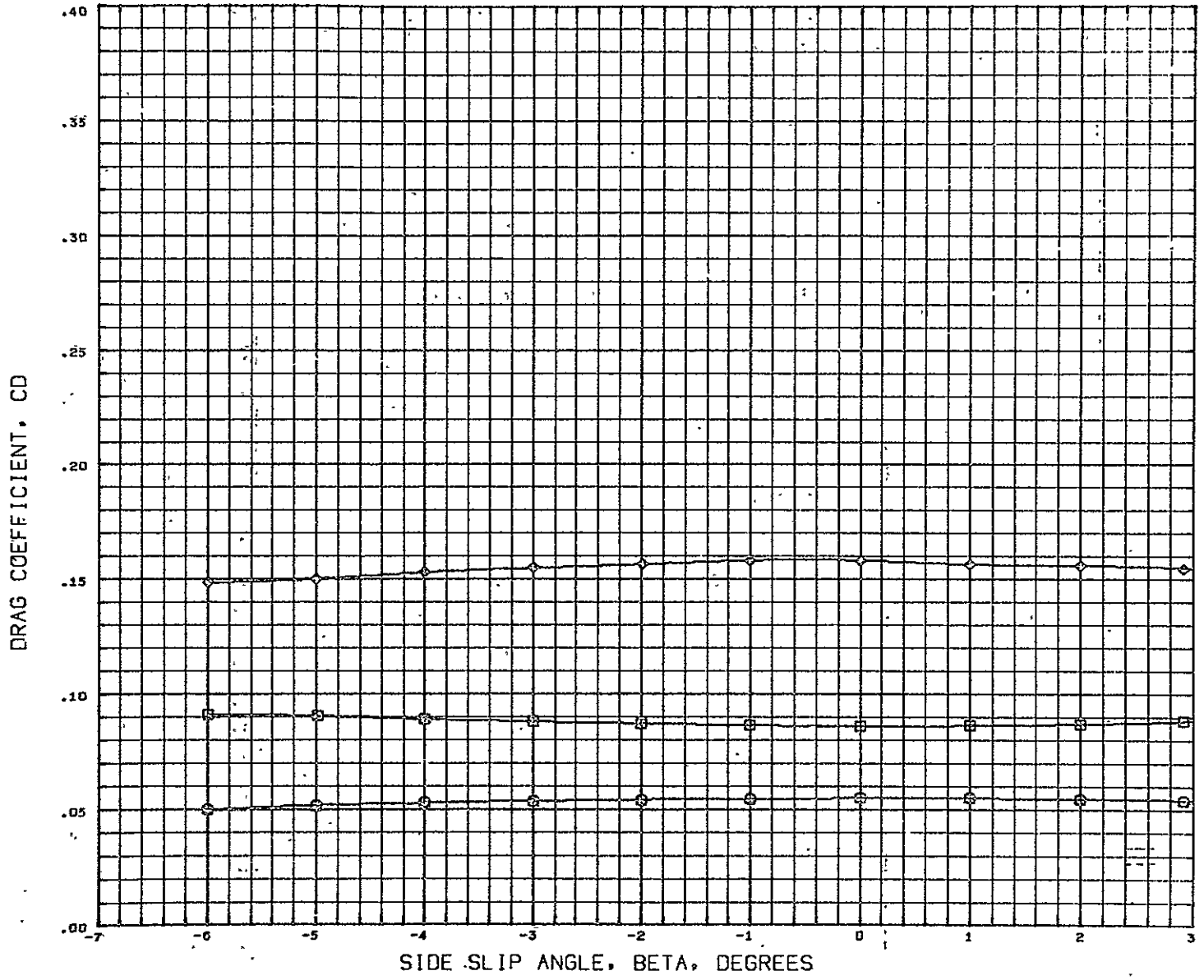
SYMBOL	ALPHA		PARAMETRIC VALUES
○	4.000	ELEVON	0.000
□	8.000		
◇	12.000		

DATA HIST. CODE V

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

AERODYNAMIC CHARACTERISTICS OF THE HCR OBITER (02) IN SIDE SLIP



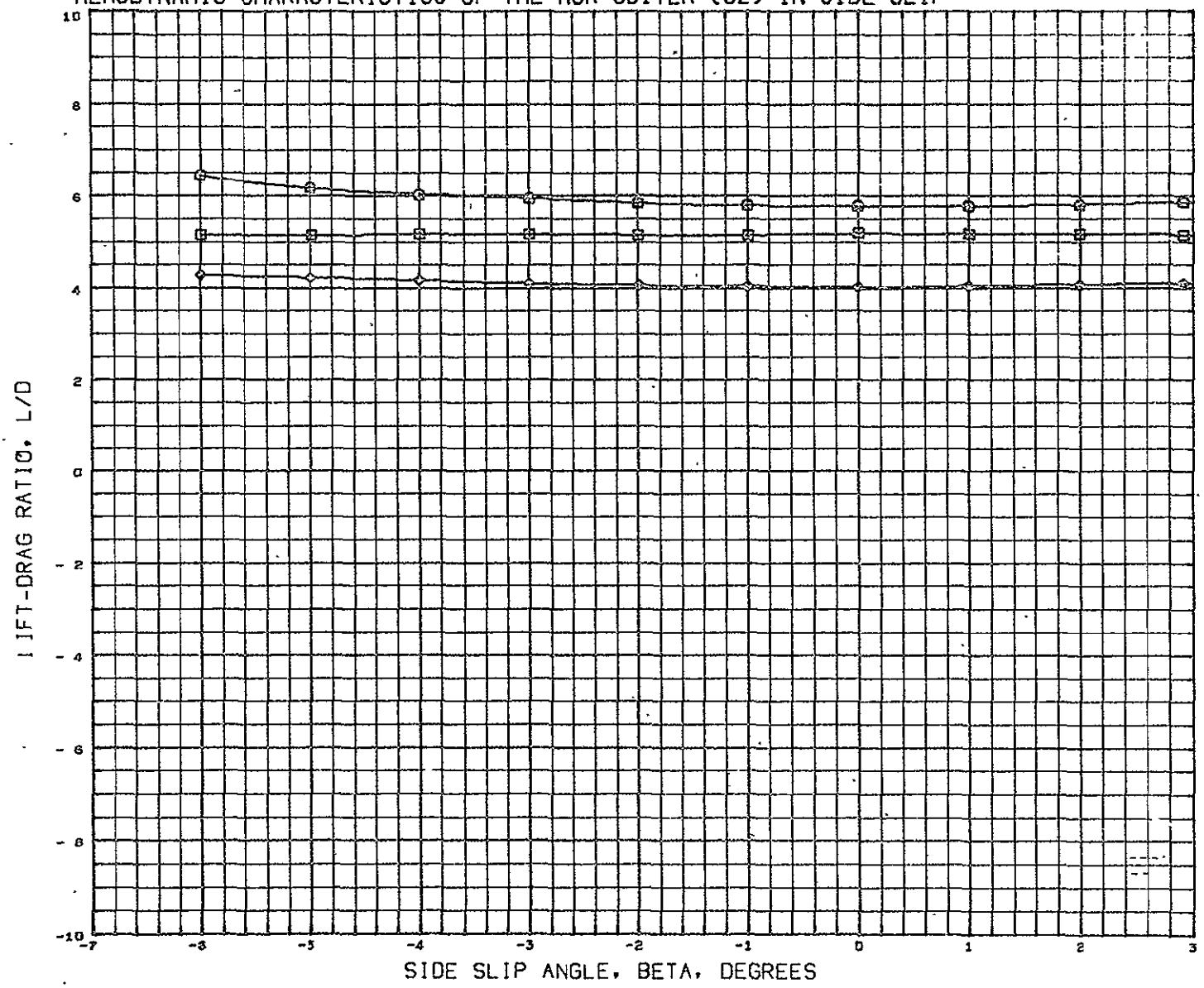
SYMBOL	ALPHA		PARAMETRIC VALUES
○	4.000	ELEVON	0.000
□	8.000		
◇	12.000		

DATA HIST. CODE V

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

AERØDYNAMIC CHARACTERISTICS ØF THE HCR ØBITER (Ø2) IN SIDE SLIP



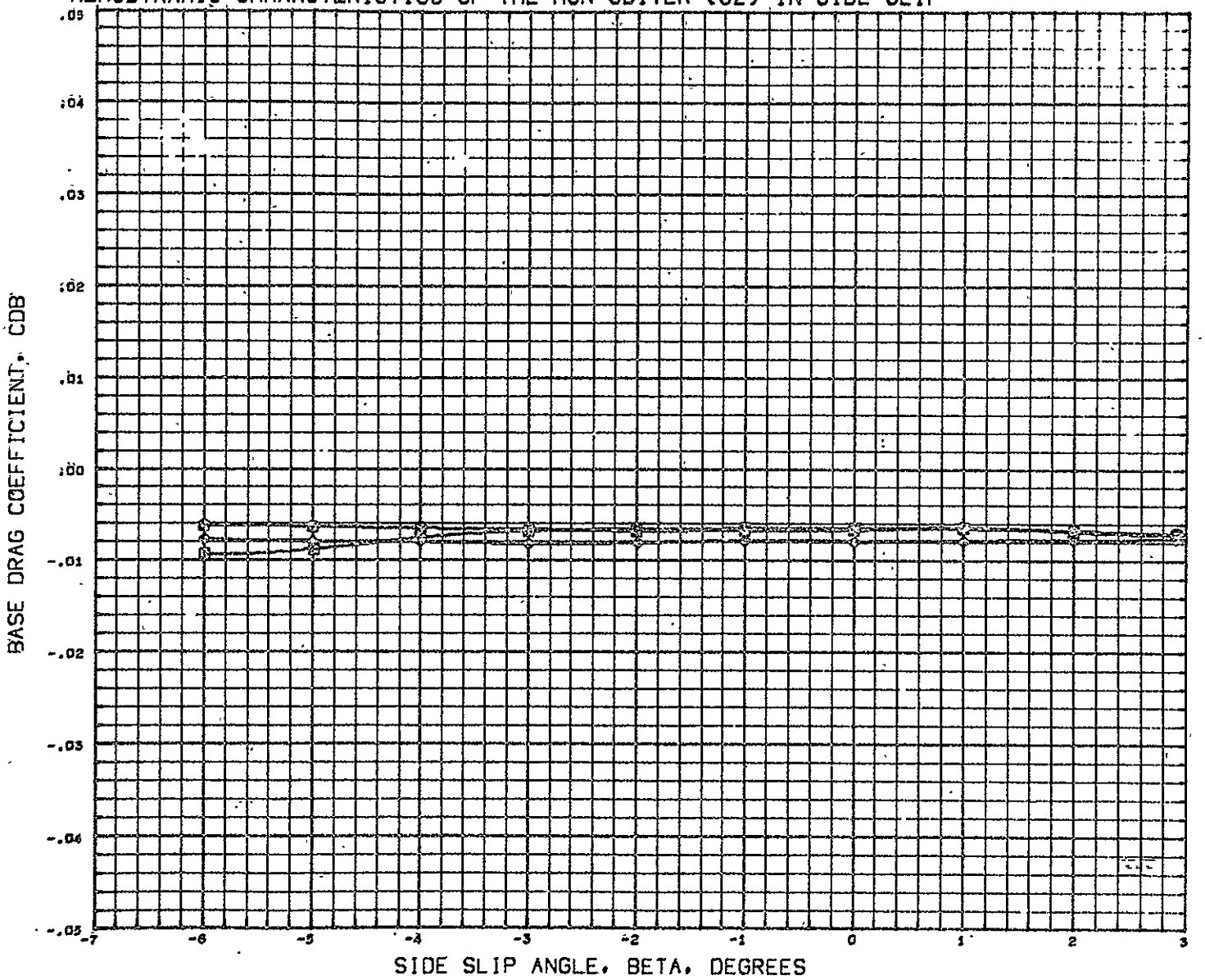
SYMBOL	ALFHA		PARAMETRIC VALUES
○	4.000	ELEVON	0.000
□	8.000		
◇	12.000		

DATA HIST. CODE V

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	FER CE

AERODYNAMIC CHARACTERISTICS OF THE HCR ORBITER (02) IN SIDE SLIP



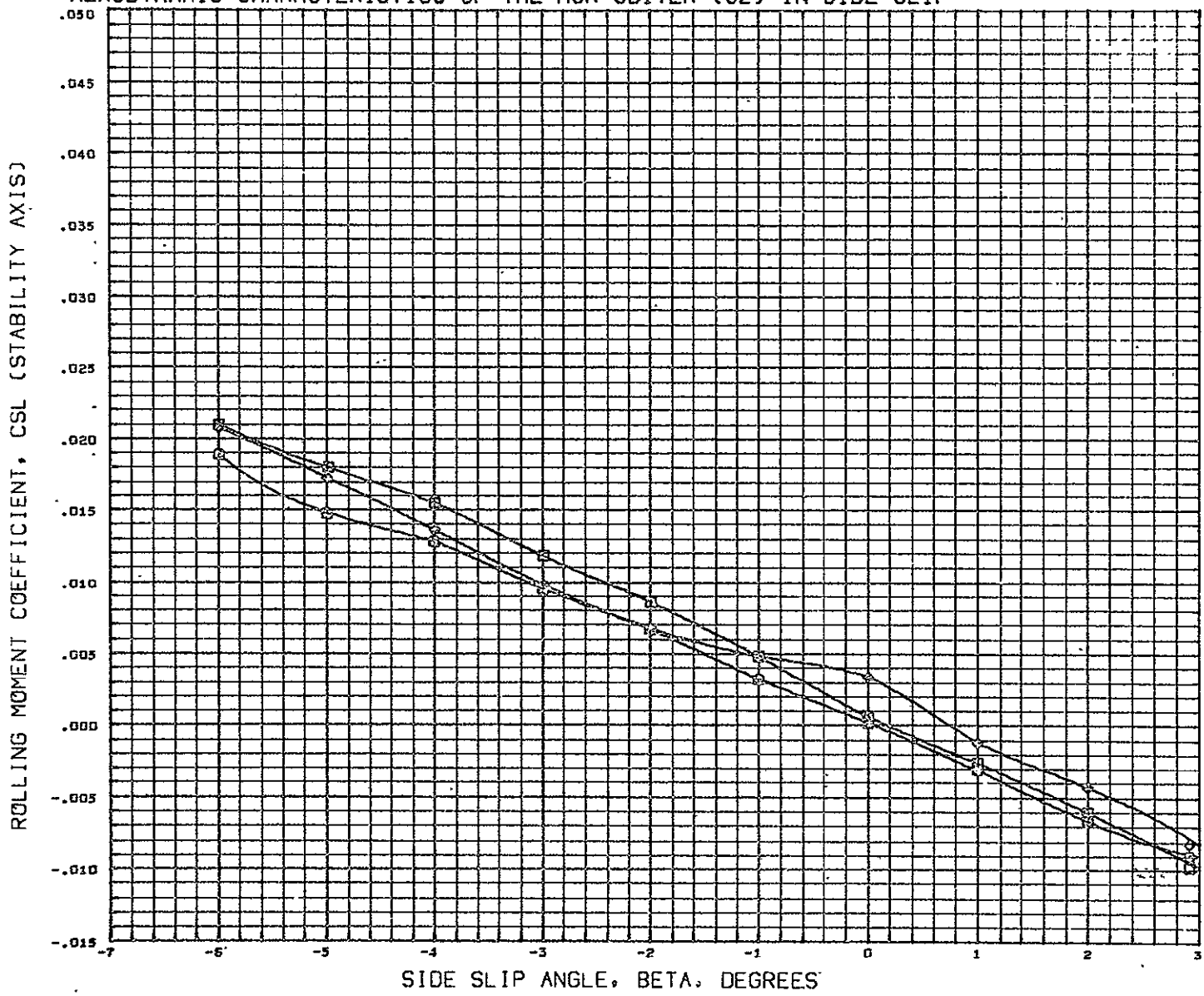
SYMBOL	ALPHA	PARAMETRIC VALUES	
○	4.000	ELEVON	0.000
□	8.000		
◇	12.000		

DATA HIST. CODE V

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

AERODYNAMIC CHARACTERISTICS OF THE HCR ORBITER (02) IN SIDE SLIP



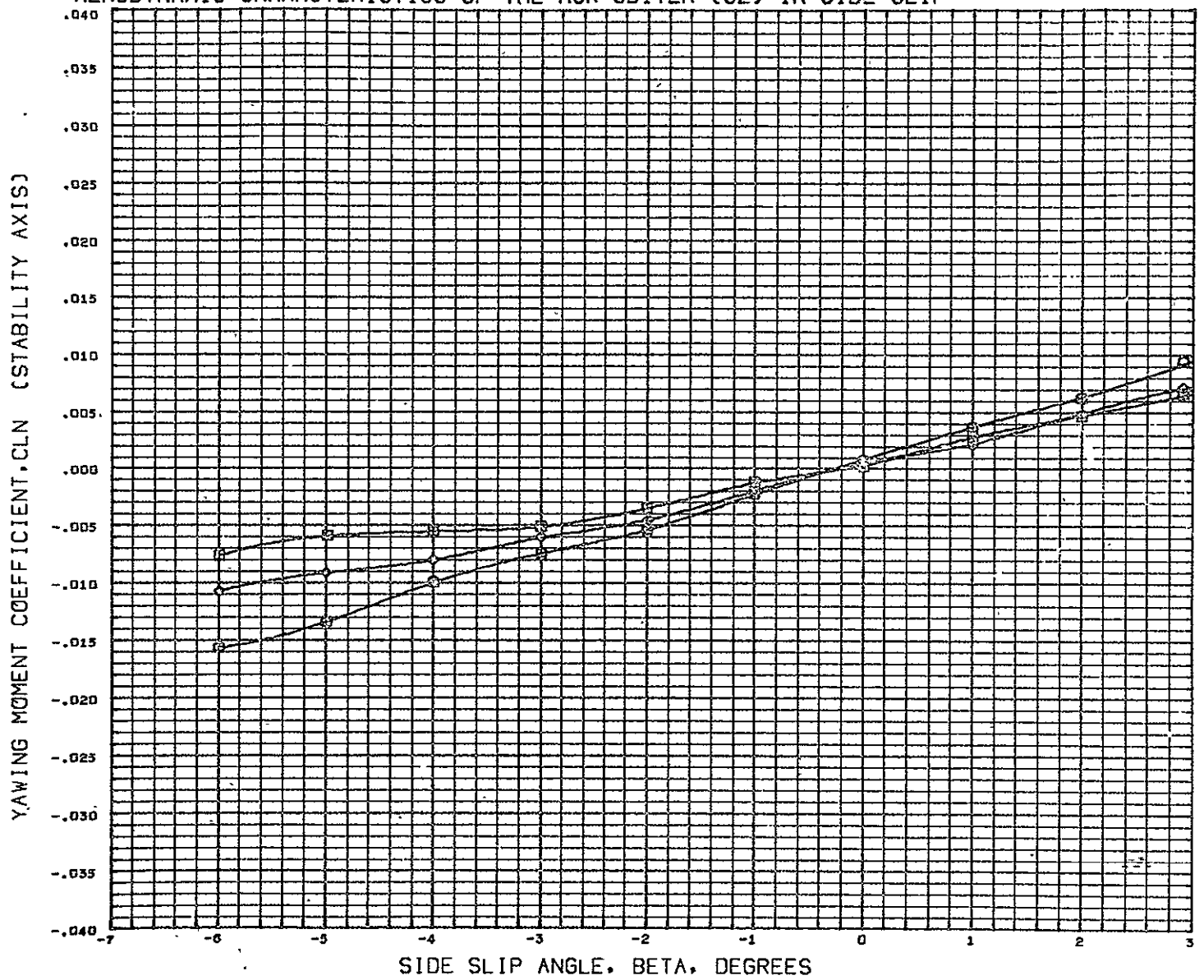
SYMBOL	ALPHA		PARAMETRIC VALUES.
○	4.000	ELEVON	0.000
□	6.000		
◇	12.000		

DATA HIST. CODE V

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

AERODYNAMIC CHARACTERISTICS OF THE HCR OBITER (02) IN SIDE SLIP



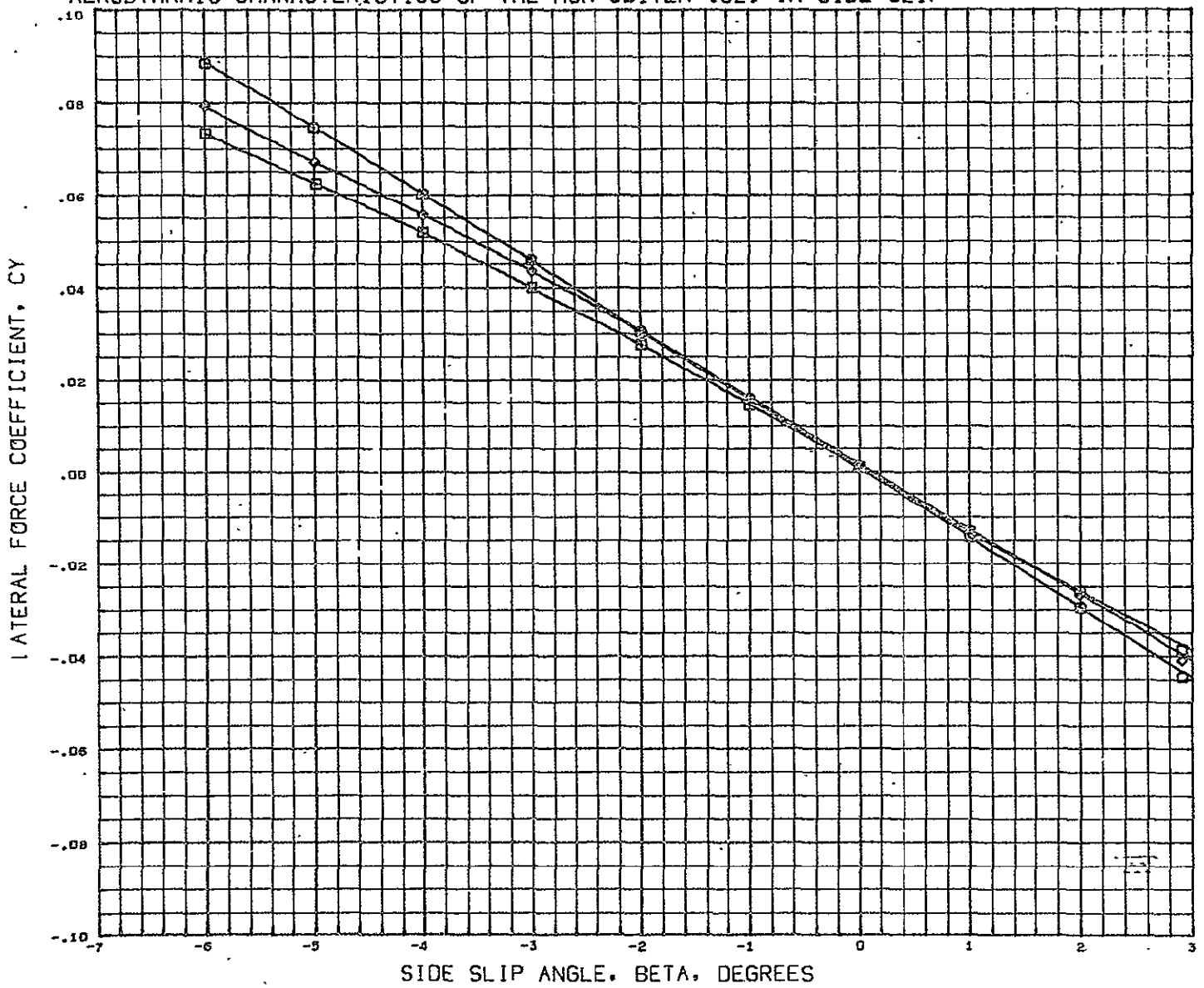
SYMBOL	ALFHA		PARAMETRIC VALUES
O	4.000	ELEVON	0.000
□	8.000		
◇	12.000		

DATA HIST. CODE V

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

AERØDYNAMIC CHARACTERISTICS ØF THE HCR ØBITER (Ø2) IN SIDE SLIP



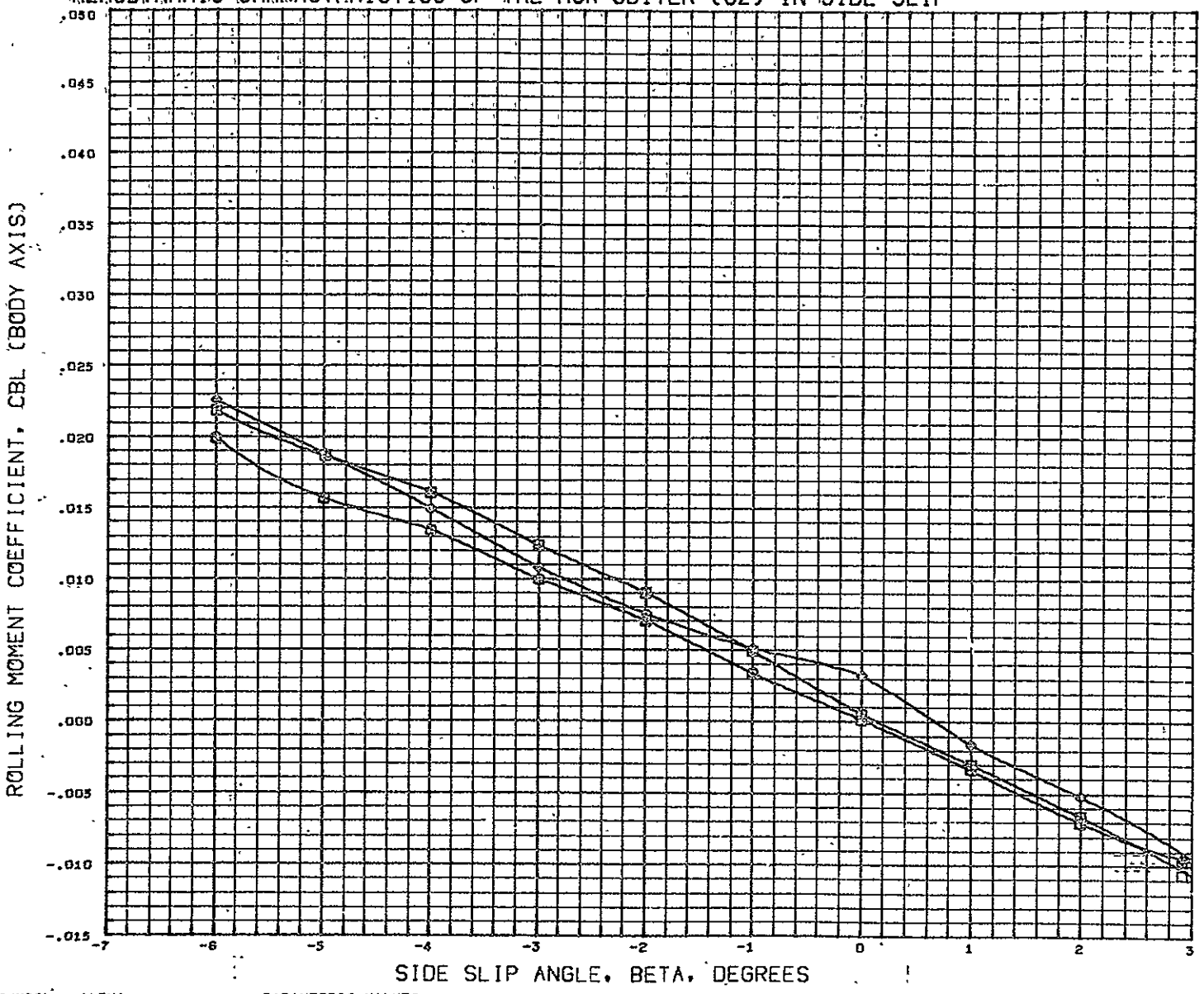
SYMBOL	ALPHA		PARAMETRIC VALUES
○	4.000	ELEVON	0.000
□	8.000		
◇	12.000		

DATA HIST. CODE V

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

AERODYNAMIC CHARACTERISTICS OF THE HCR ORBITER (02) IN SIDE SLIP



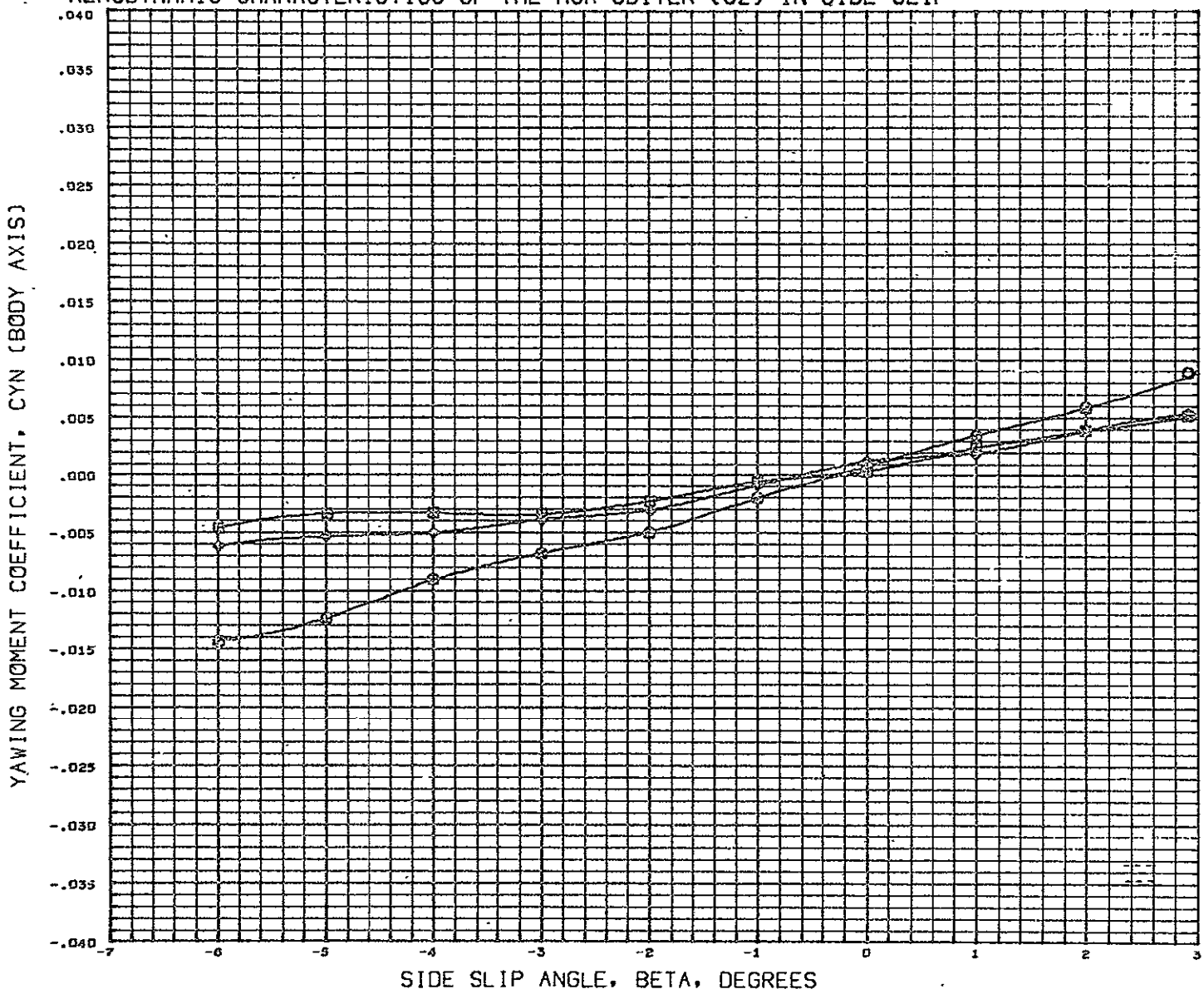
SYMBOL	ALPHA	PARAMETRIC VALUES	
○	4.000	ELEVON	0.000
□	8.000		
◇	12.000		

DATA HIST. CODE T

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

AERODYNAMIC CHARACTERISTICS OF THE HCR OBITER (02) IN SIDE SLIP



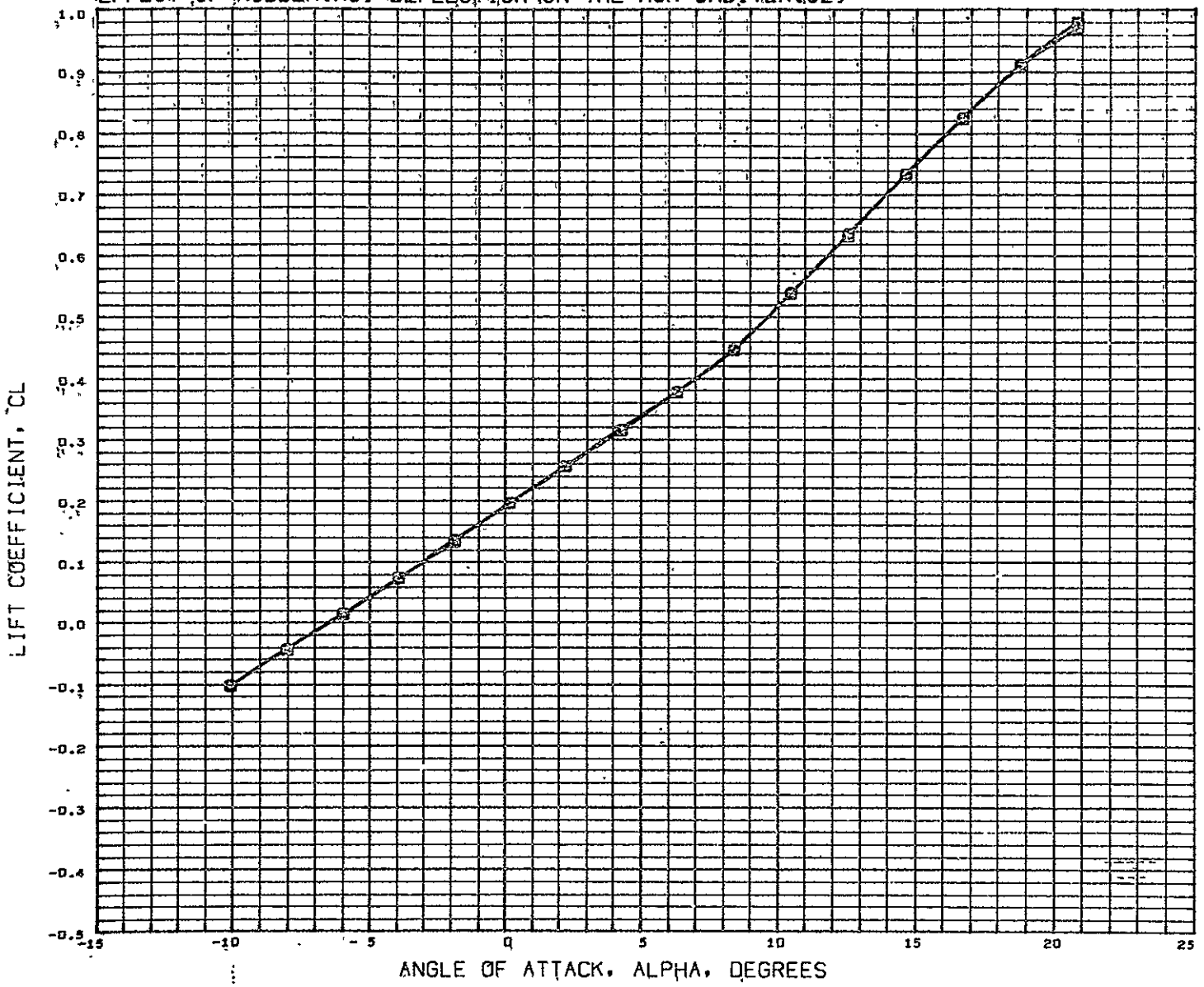
SYMBOL	ALPHA	PARAMETRIC VALUES	
○	4.000	ELEVON	0.000
□	8.000		
◇	12.000		

DATA HIST. CODE T

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF RUDDER(R3) DEFLECTION ON THE HCR ORBITER(02)



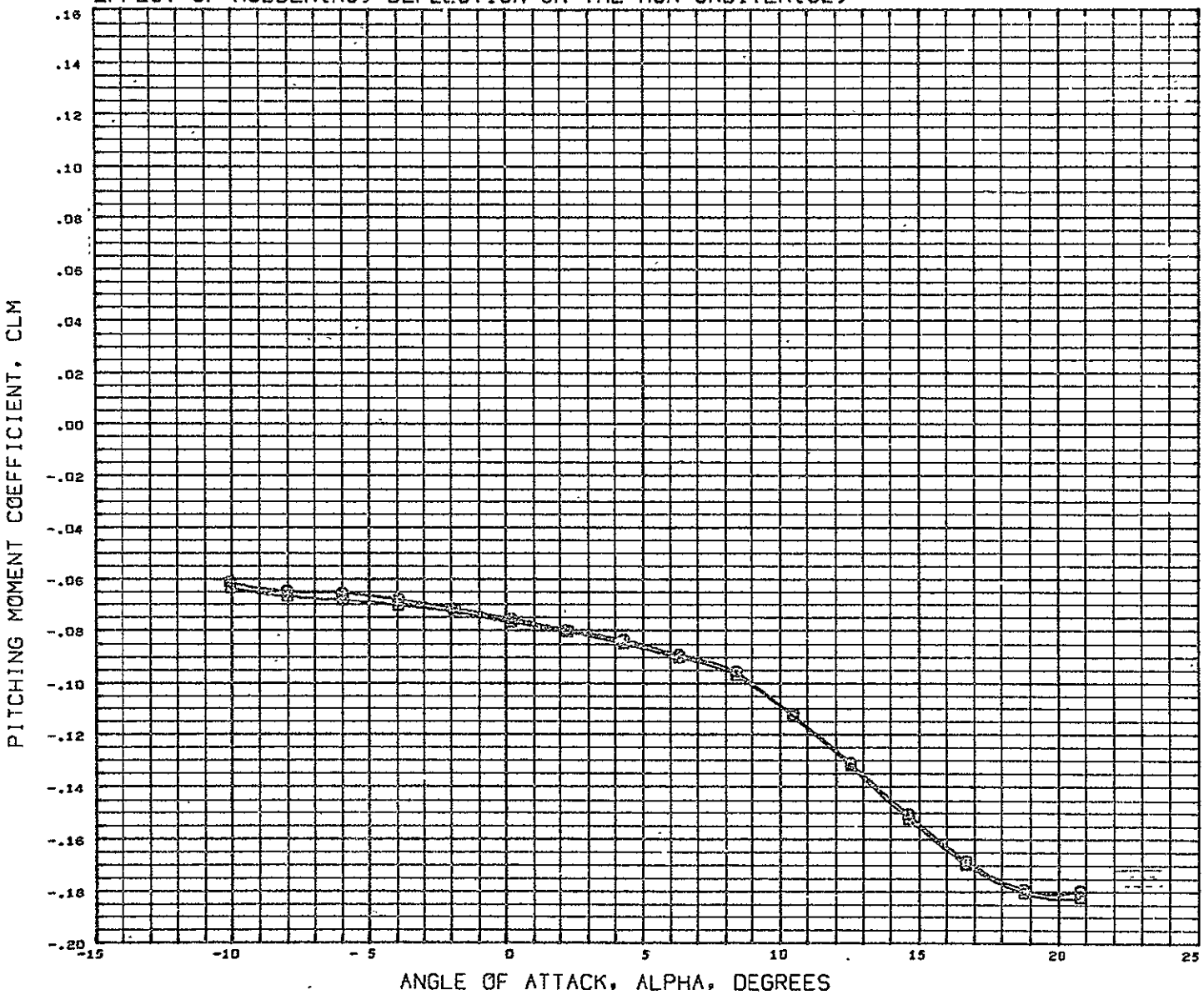
SYMBOL	RUDDER		PARAMETRIC VALUES		
	20.000	ELEVON	0.000	BETA	0.000
	0.000				

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

DATA HIST. CODE V

EFFECT OF RUDDER(R3) DEFLECTION ON THE HCR ORBITER(02)



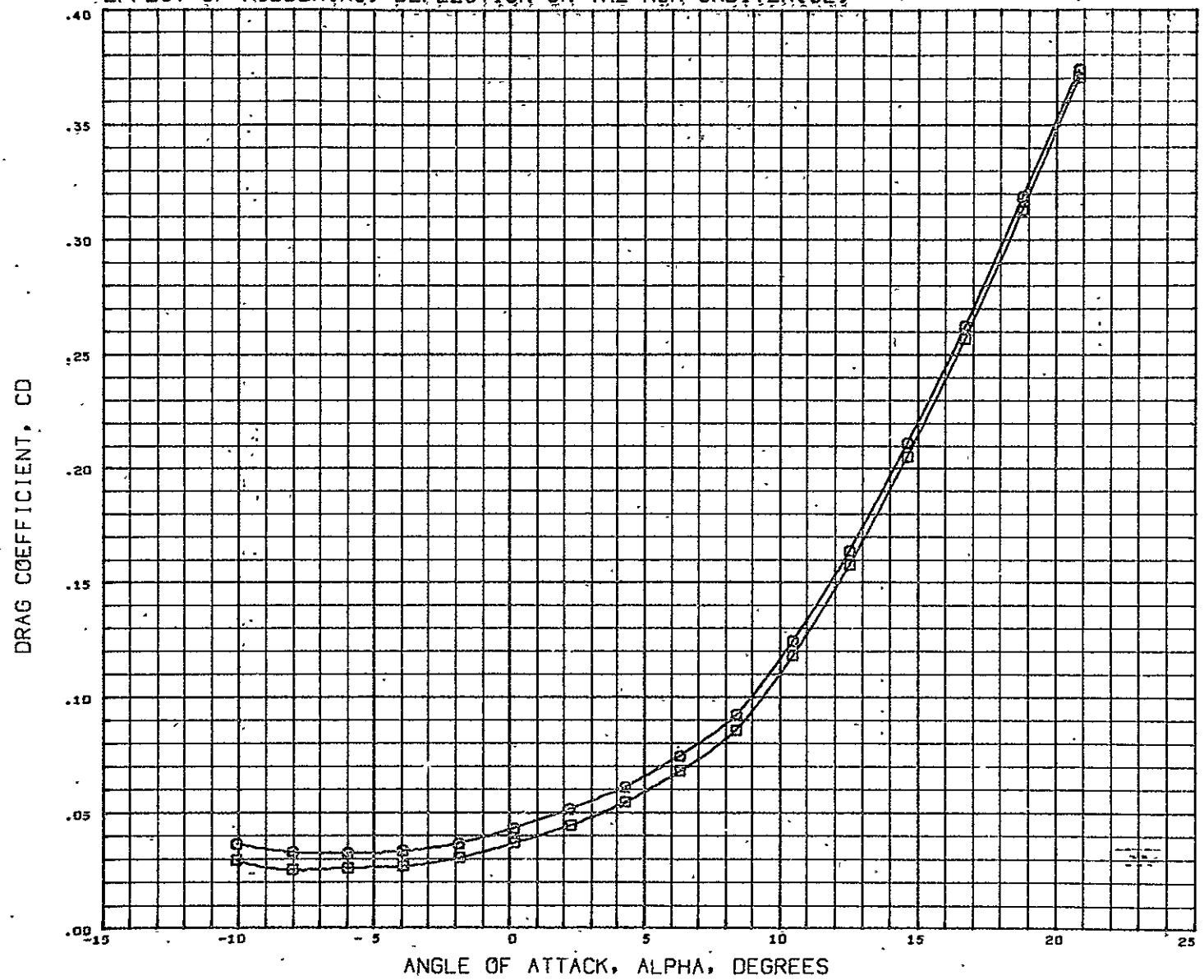
SYMBOL	RUDDER,		PARAMETRIC VALUES		
O	20.000	ELEVON	0.000	BETA	0.000
□	0.000				

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

DATA HIST. CODE V

EFFECT OF RUDDER(R3) DEFLECTION ON THE HCR ORBITER(02)



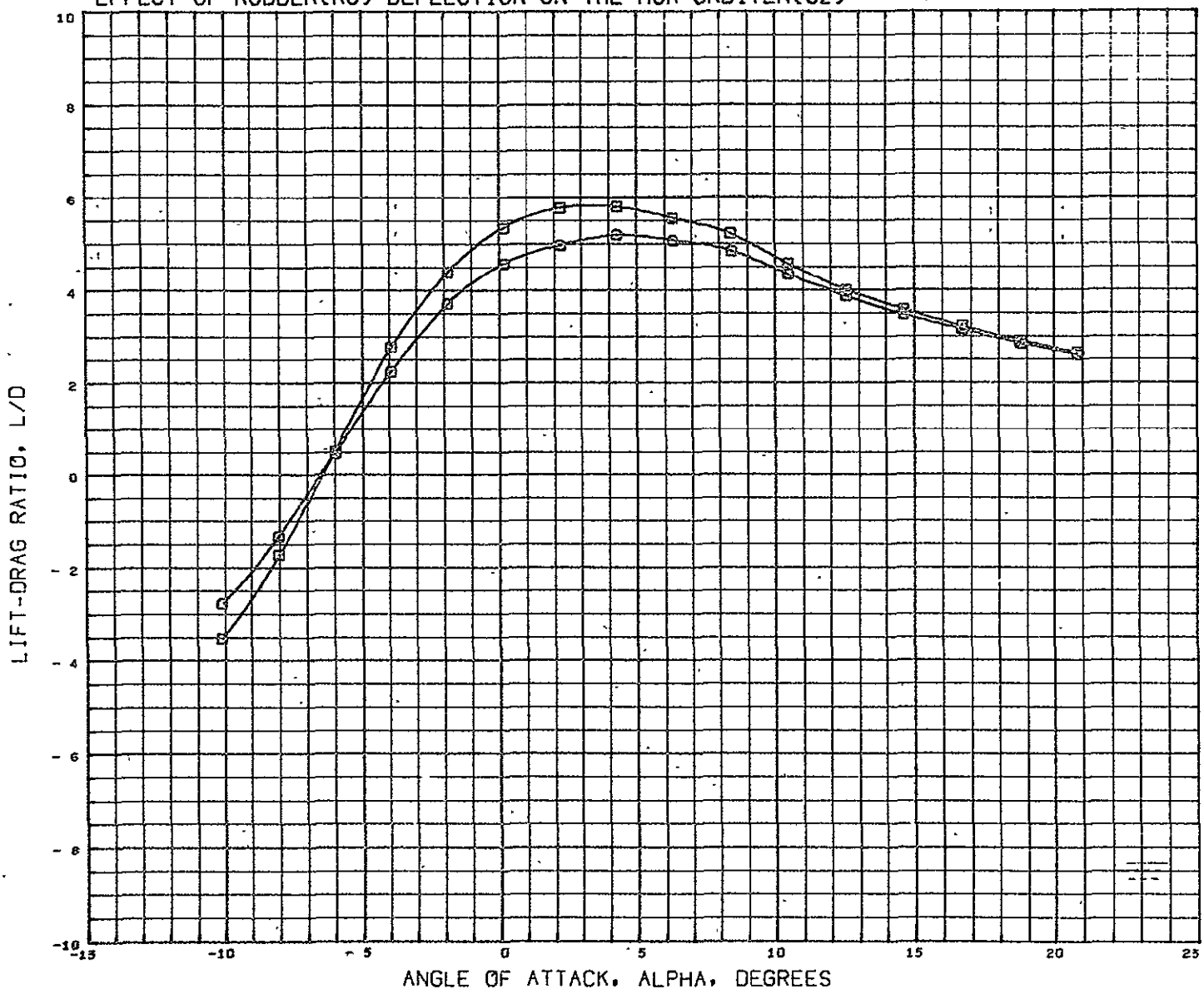
SYMBOL	RUDDER		PARAMETRIC VALUES		
○	20.000	ELEVON.	0.000	BETA	0.000
□	0.000				

DATA HIST. CODE V

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XHRP	4.2210	FT.
YHRP	0.0000	FT.
ZHRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF RUDDER(R3) DEFLECTION ON THE HCR ORBITER(02)



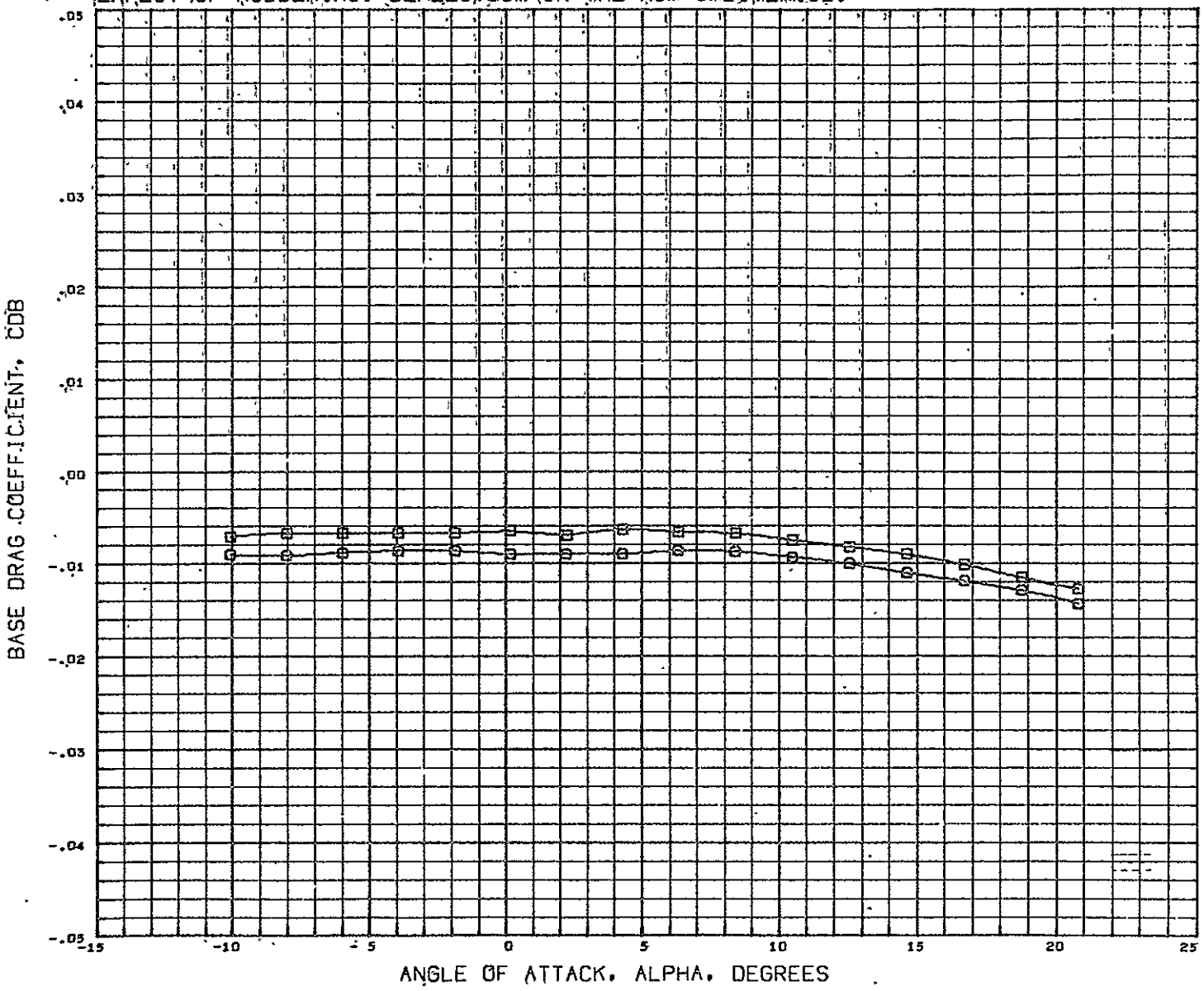
SYMBOL	RUDDER		PARAMETRIC VALUES		
O	20.000	ELEVON	0.000	BETA	0.000
□	0.000				

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

DATA HIST. CODE V

EFFECT OF RUDDER(R3) DEFLECTION ON THE HCR ORBITER(02)



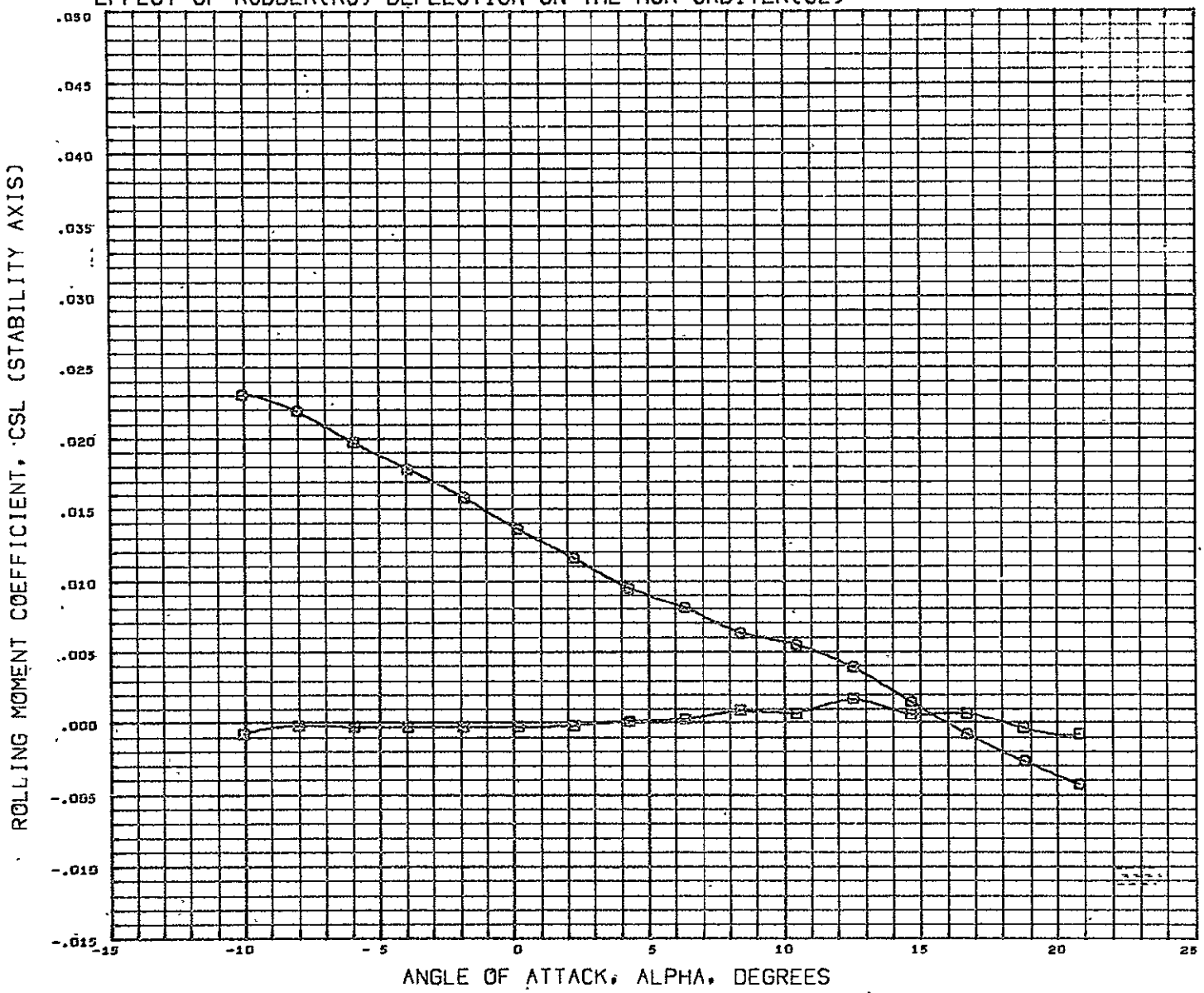
SYMBOL	RUDDER		PARAMETRIC VALUES		
	20.000	ELEVON	0.000	BETA	0.000
	0.000				

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

DATA HIST. CODE V

EFFECT OF RUDDER(R3) DEFLECTION ON THE HCR ORBITER(02)



SYMBOL	RUDDER	PARAMETRIC VALUES			
O	20.000	ELEVON	0.000	BETA	0.000
□	0.000				

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

DATA HIST. CODE V

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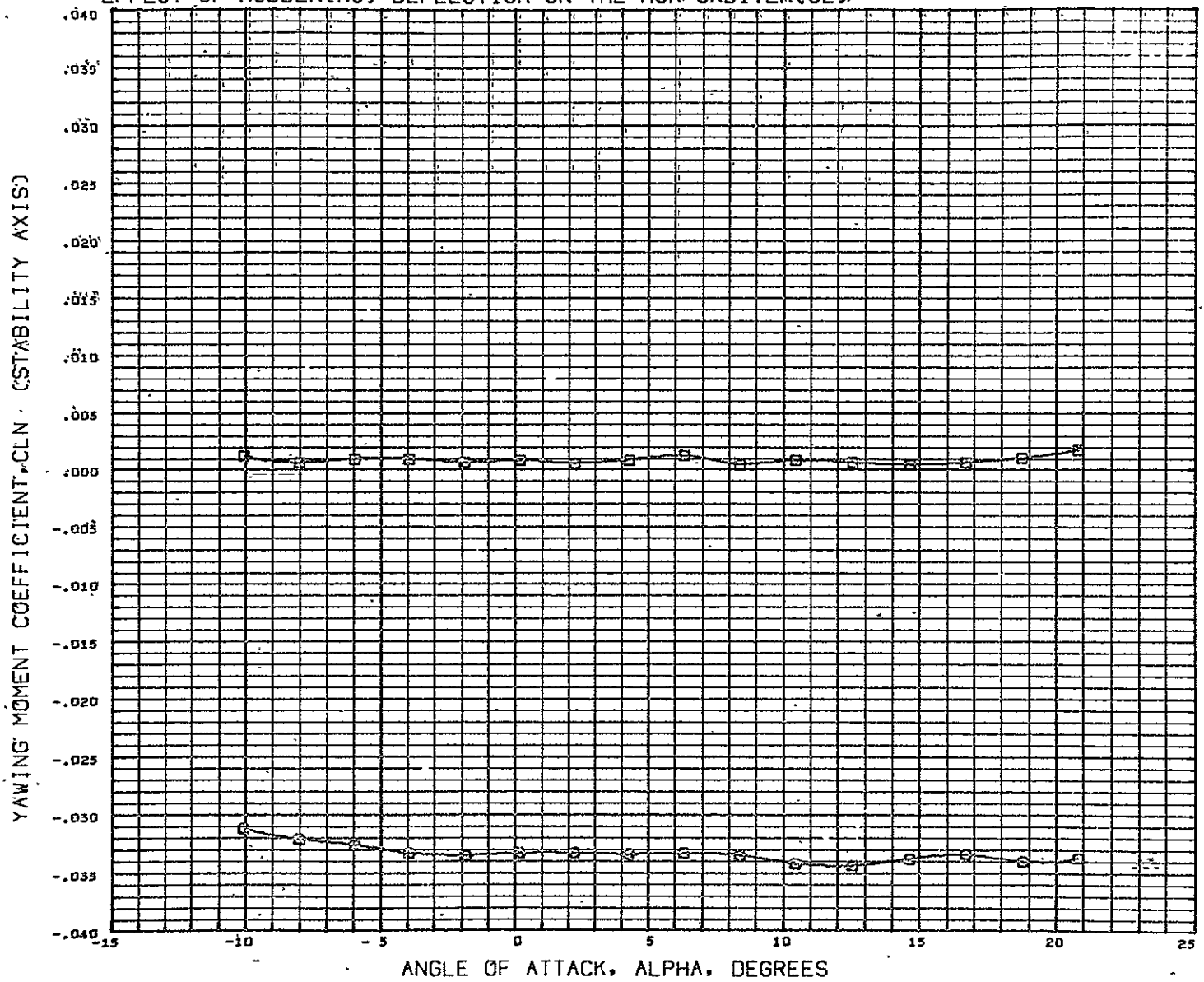
EFFECT OF RUDDER(R3) DEFLECTION ON THE HCR ORBITER(02)



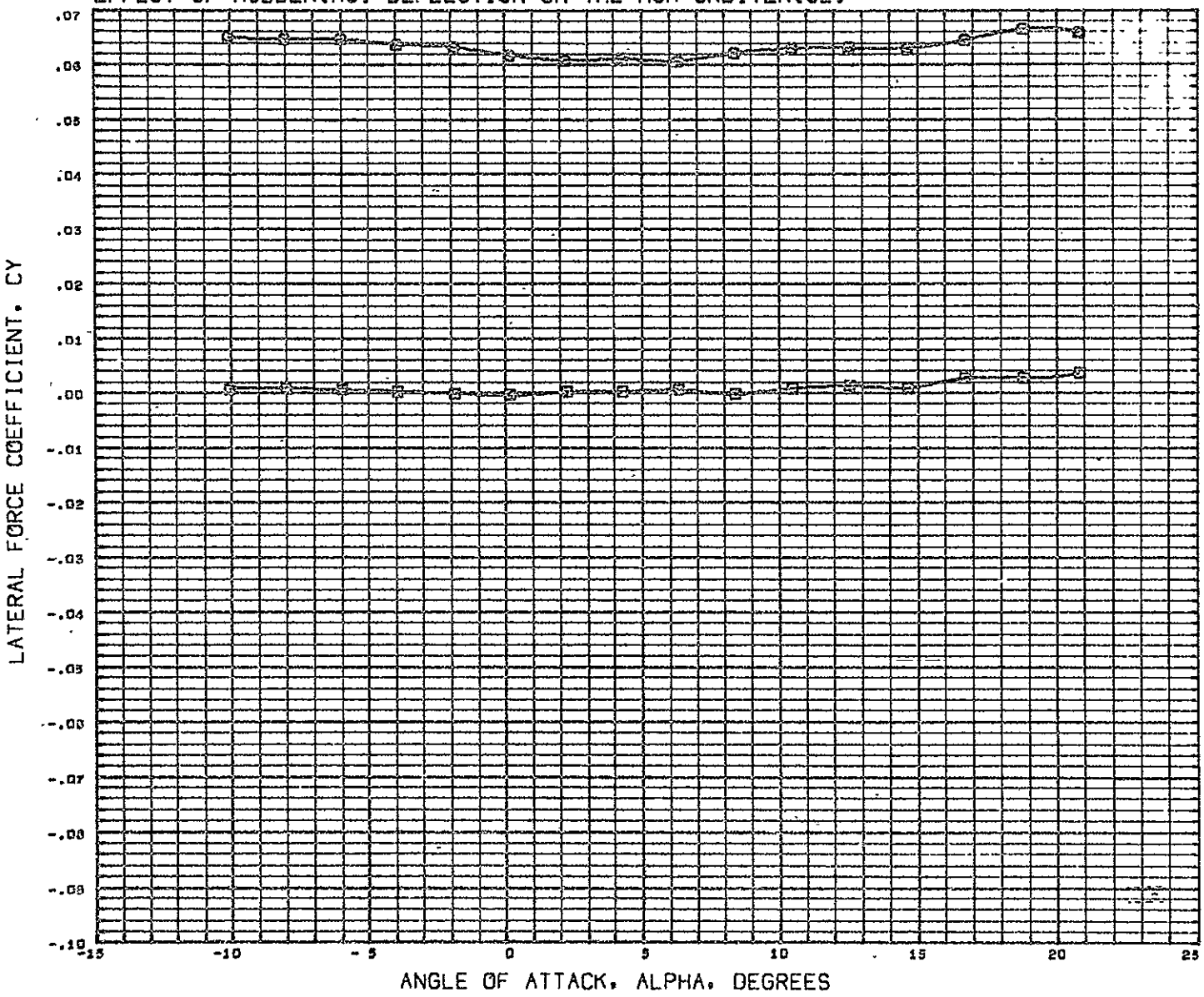
SYMBOL	RUDDER	PARAMETRIC VALUES			
⊙	20.000	ELEVON	0.000	BETA	0.000
⊡	0.000				

DATA HIST. CODE V

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF RUDDER(R3) DEFLECTION ON THE HCR ORBITER(02)



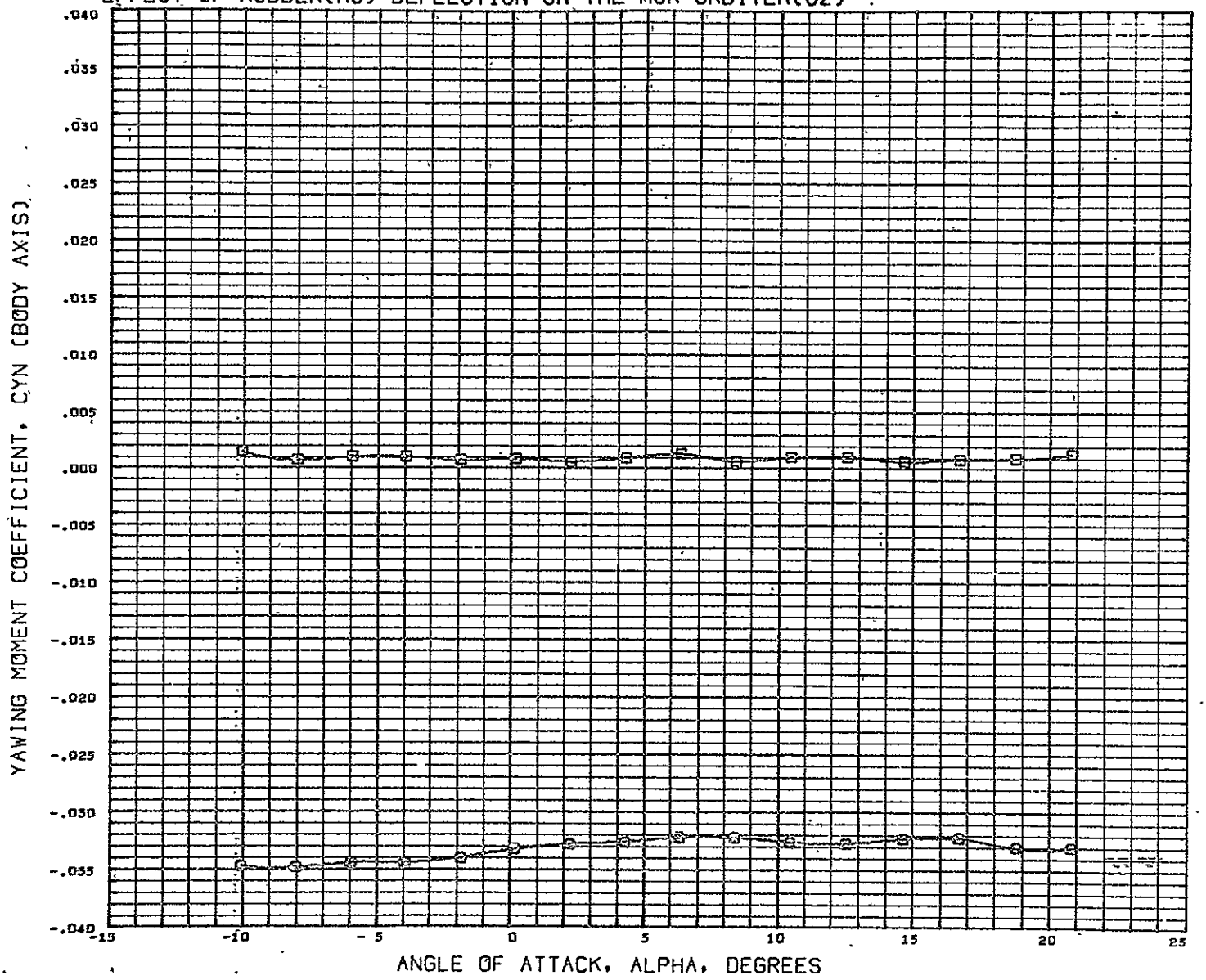
SYMBOL	RUDDER	PARAMETRIC VALUES			
O	20.000	ELEVON	0.000	BETA	0.000
□	0.000				

DATA HIST. CODE V

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF RUDDER(R3) DEFLECTION ON THE HCR ORBITER(02)



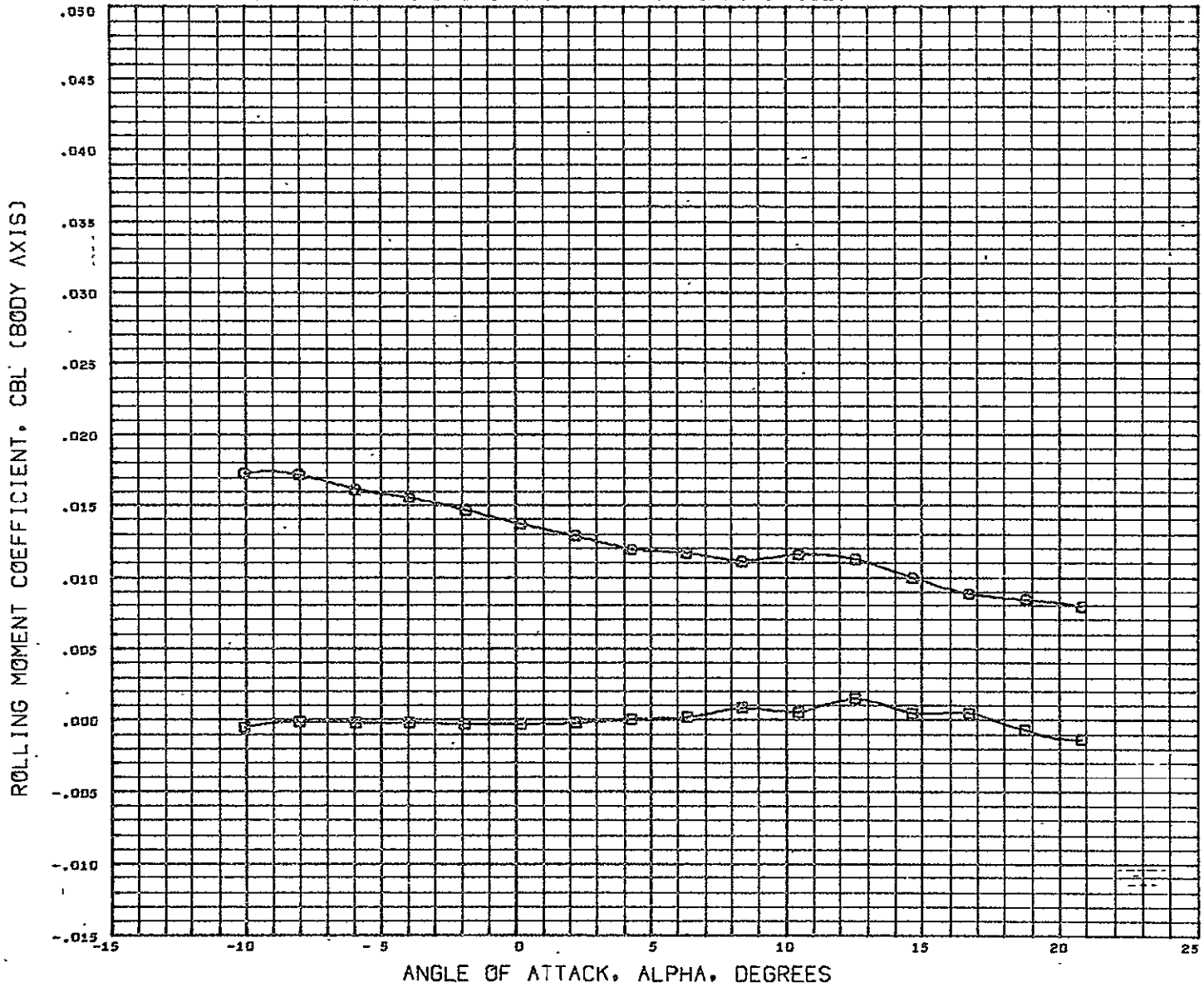
SYMBOL	RUDDER		PARAMETRIC VALUES		
○	20.000	ELEVON	0.000	BETA	0.000
□	0.000				

DATA HIST. CODE T

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF RUDDER(R3) DEFLECTION ON THE HCR ORBITER(02)



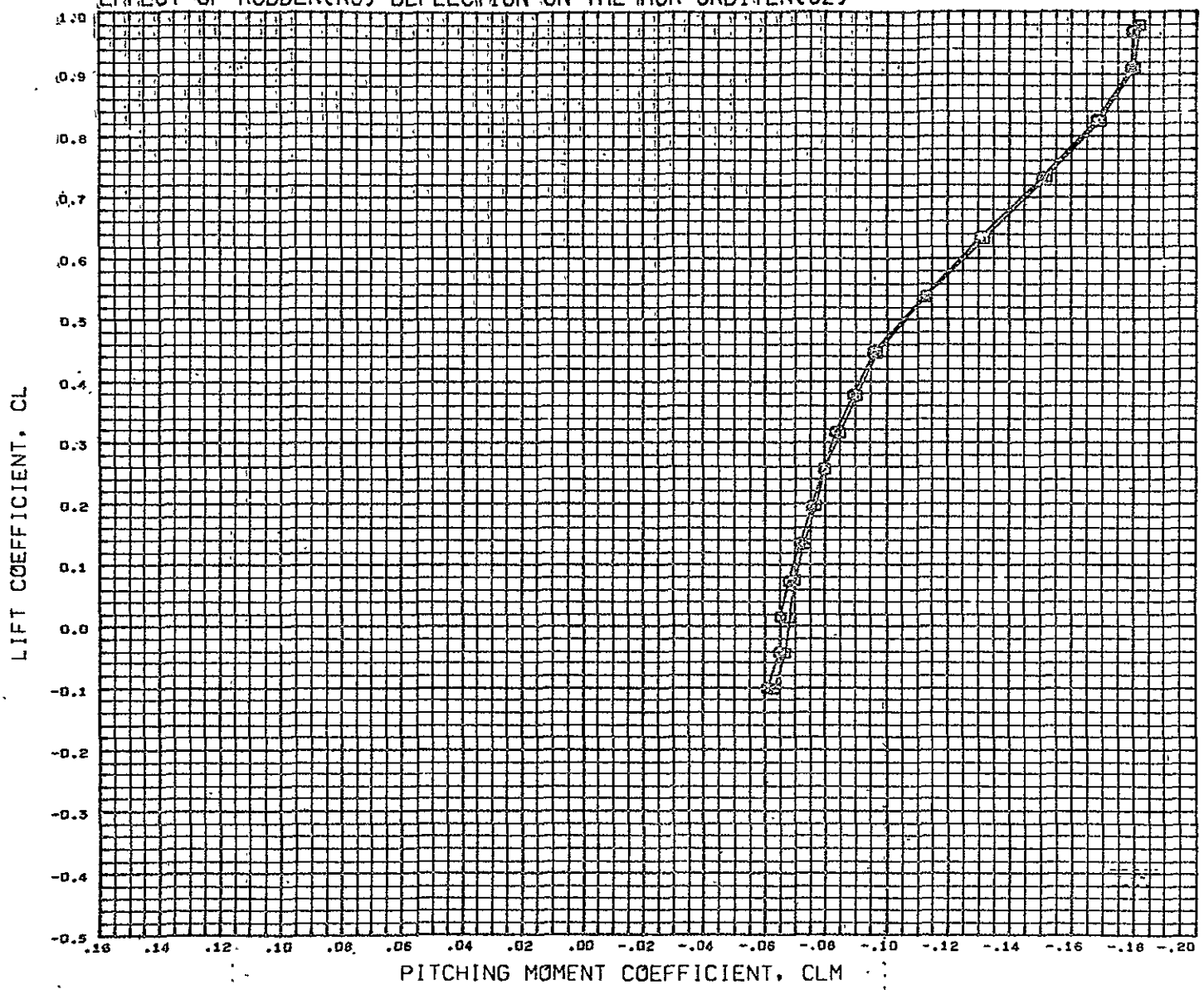
SYMBOL	RUDDER		PARAMETRIC VALUES		
○	20.000	ELEVON	0.000	BETA	0.000
□	0.000				

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

DATA HIST. CODE T

EFFECT OF RUDDER(R3) DEFLECTION ON THE HCR ORBITER(02)



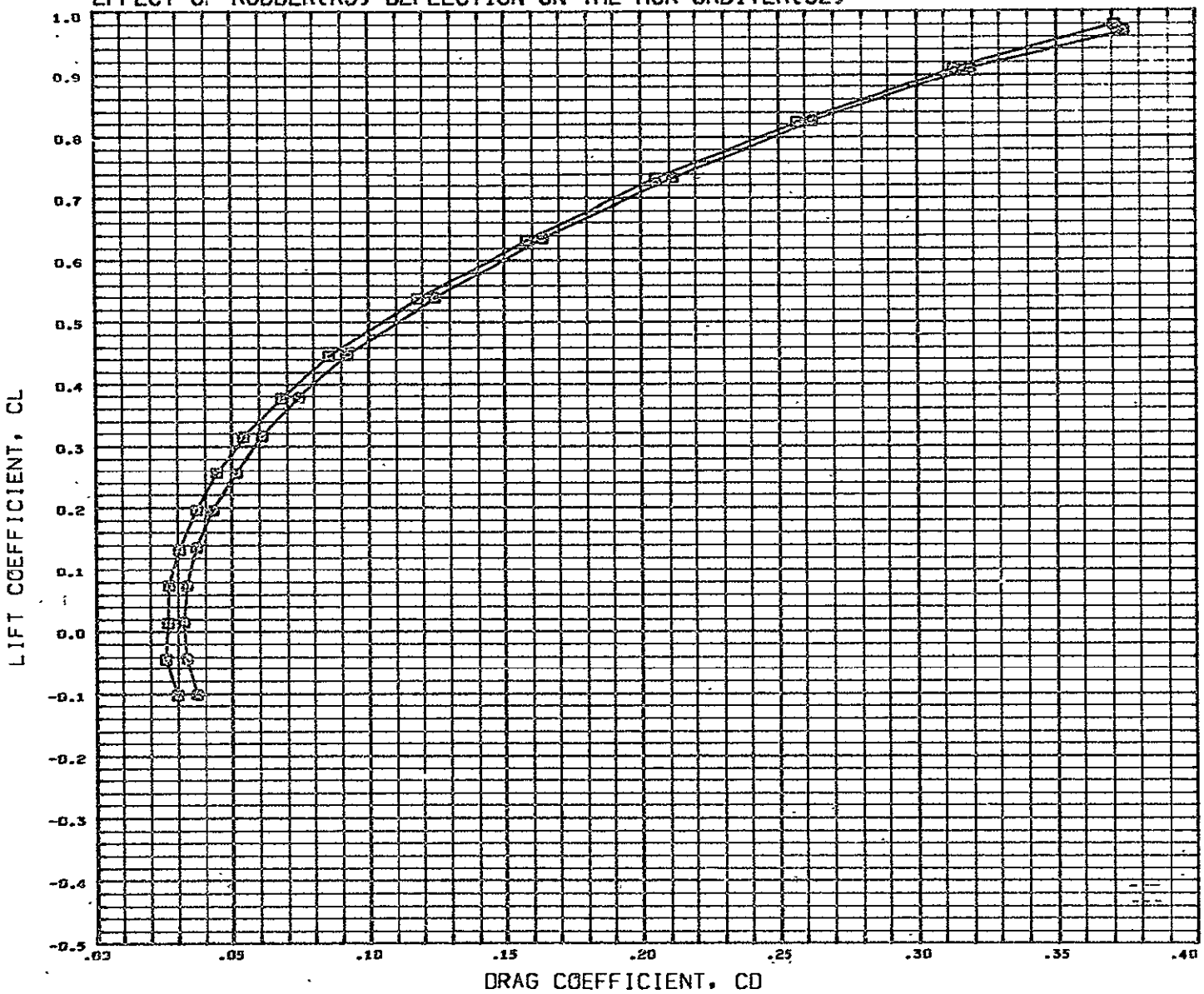
SYMBOL	RUDDER		PARAMETRIC VALUES		
○	20.000	ELEVON,	0.000	BETA	0.000
□	0.000				

DATA HIST. CODE V

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF RUDDER(R3) DEFLECTION ON THE HCR ORBITER(02)



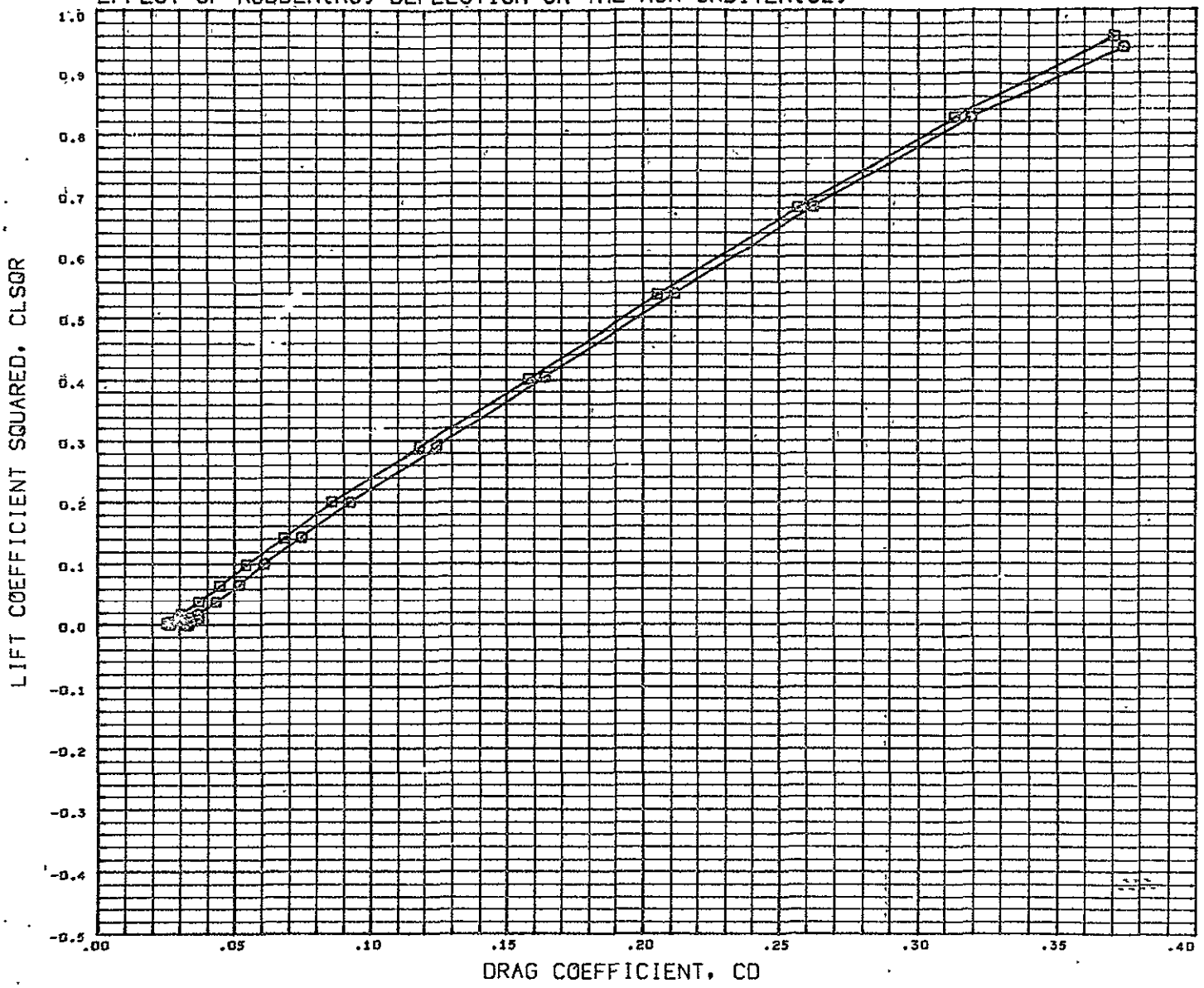
SYMBOL	RUDDER		PARAMETRIC VALUES		
O	20.000	ELEVON	0.000	BETA	0.000
□	0.000				

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

DATA HIST. CODE V

EFFECT OF RUDDER(R3) DEFLECTION ON THE HCR ORBITER(02)



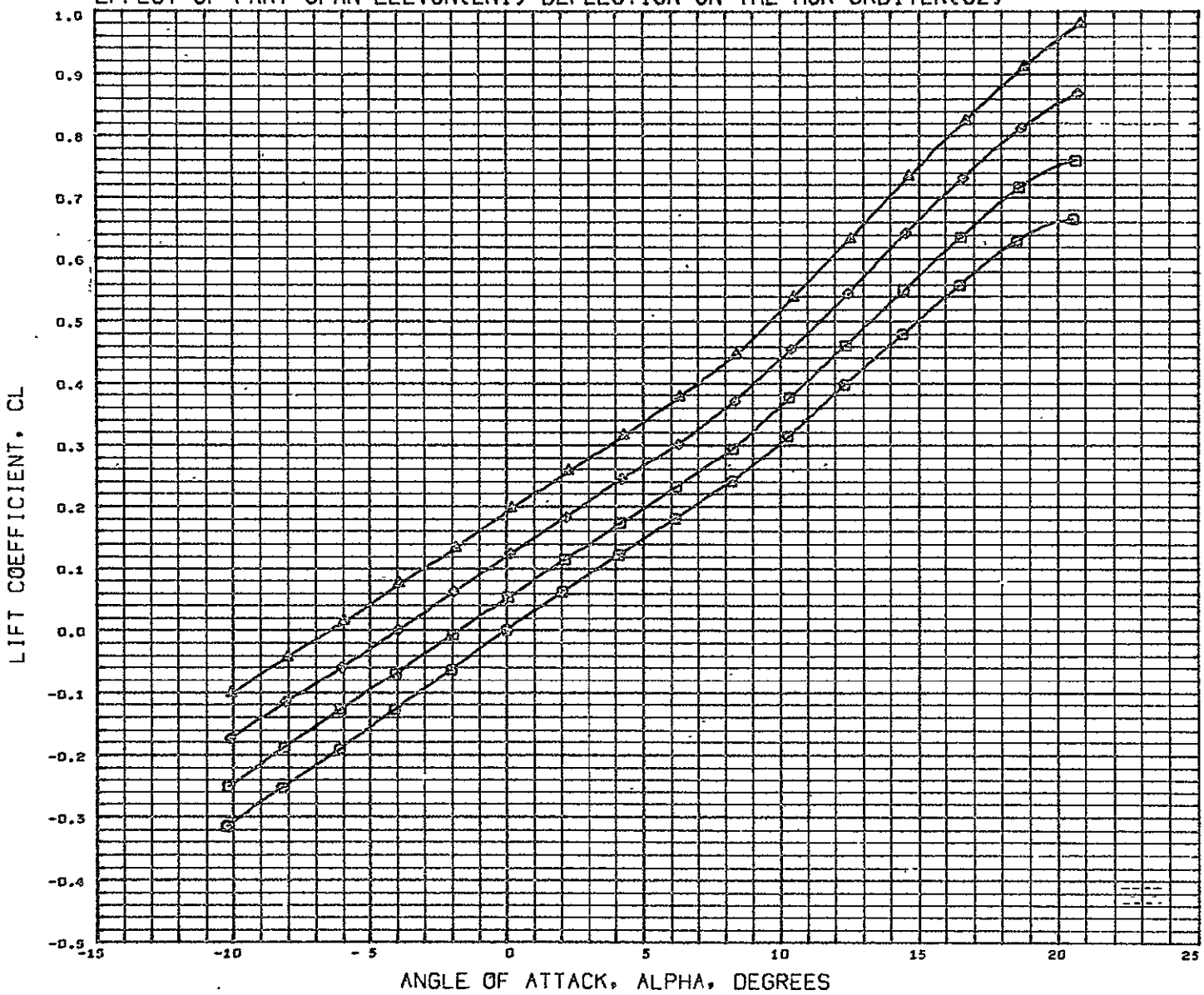
SYMBOL	RUDDER		PARAMETRIC VALUES		
O	20.000	ELEVON	0.000	BETA	0.000
	0.000				

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

DATA HIST. CODE V

EFFECT OF PART SPAN ELEVON(EN1) DEFLECTION ON THE HCR ORBITER(02)



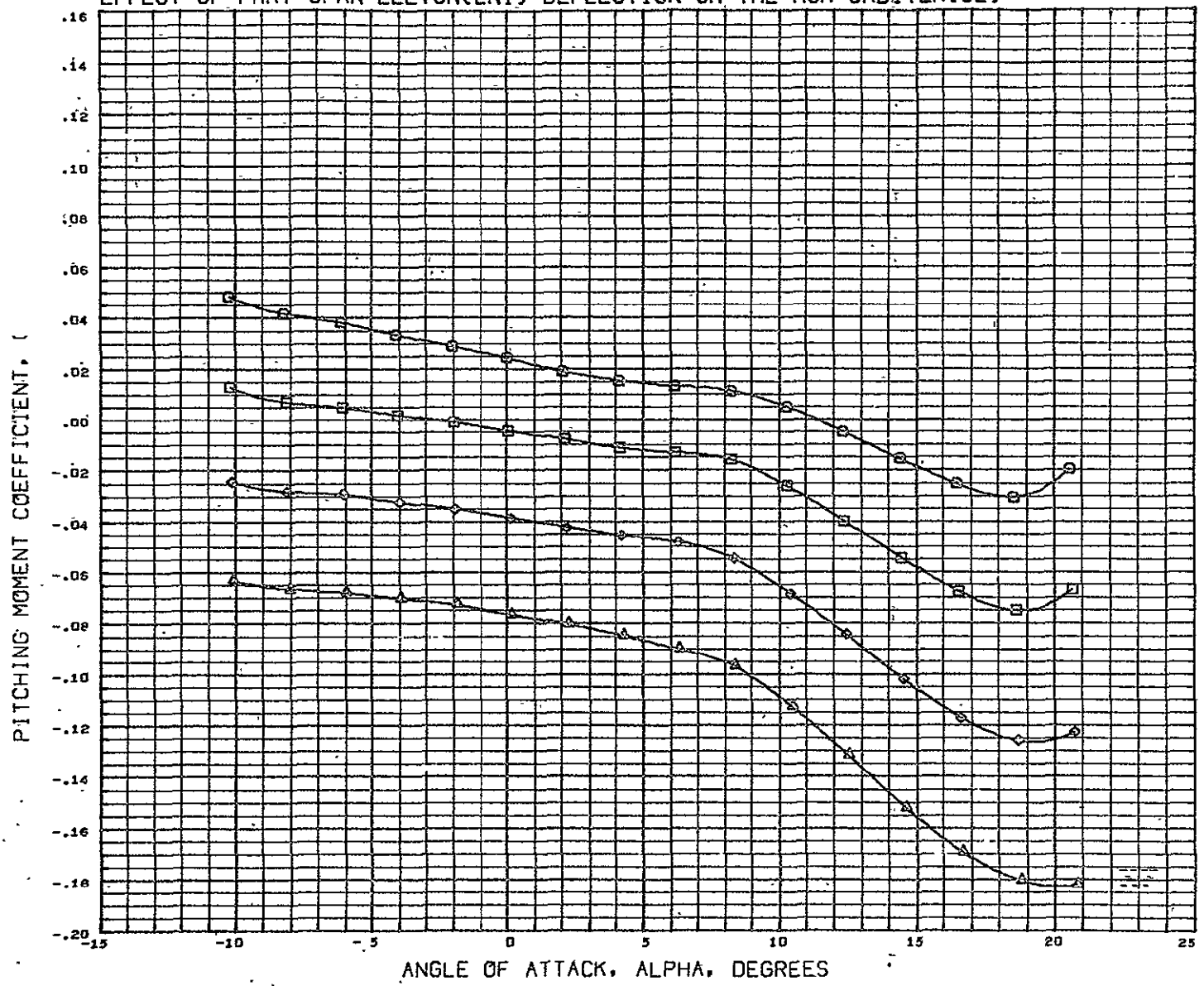
SYMBOL	ELEVON		PARAMETRIC VALUES		
○	- 30.000	LH OBD	0.000	RH OBD	0.000
□	- 20.000	BETA	0.000		
◇	- 10.000				
△	0.000				

DATA HIST. CODE V

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF PART SPAN ELEVON(EN1) DEFLECTION ON THE HCR ORBITER(02)



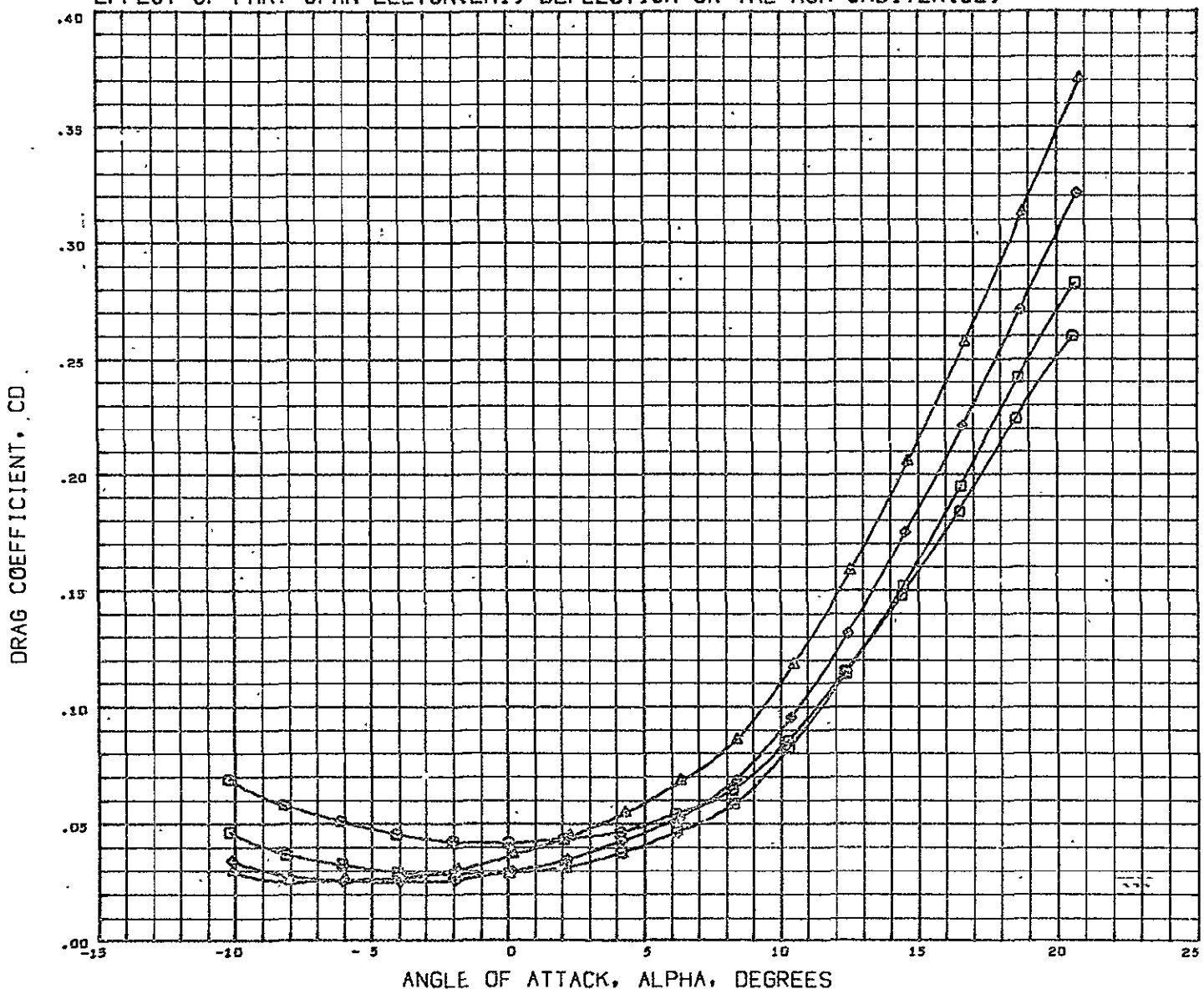
SYMBOL	ELEVON		PARAMETRIC VALUES		
○	- 30.000	LH OBD	0.000	RH OBD	0.000
□	- 20.000	BETA	0.000		
◇	- 10.000				
△	0.000				

DATA HIST. CODE V

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF PART SPAN ELEVON(EN1) DEFLECTION ON THE HCR ORBITER(02)



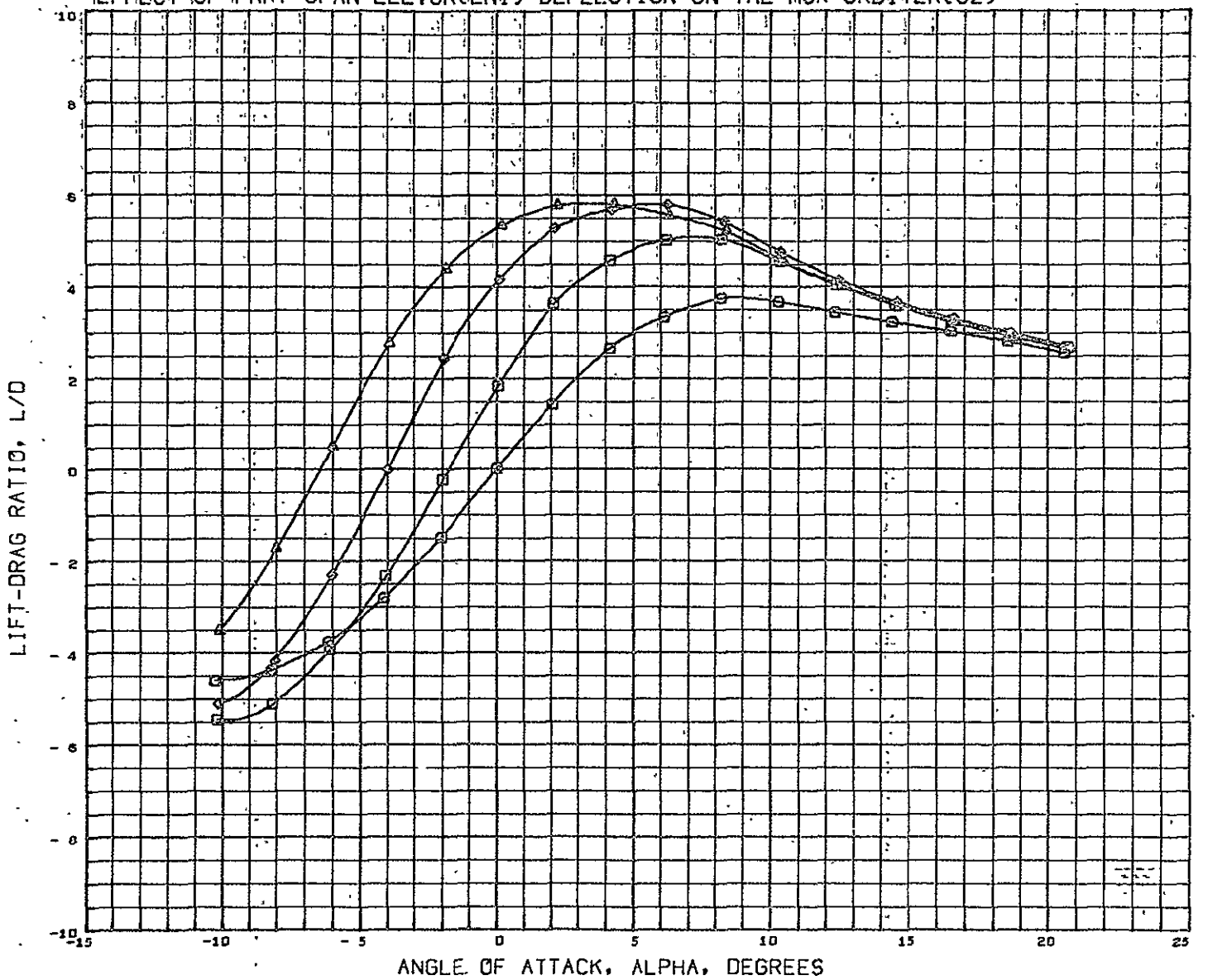
SYMBOL	ELEVON		PARAMETRIC VALUES		
○	- 30.000	LH OBD	0.000	RH OBD	0.000
□	- 20.000	BETA	0.000		
◇	- 10.000				
△	0.000				

DATA HIST. CODE V

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF PART SPAN ELEVON(EN1) DEFLECTION ON THE HCR ORBITER(02)



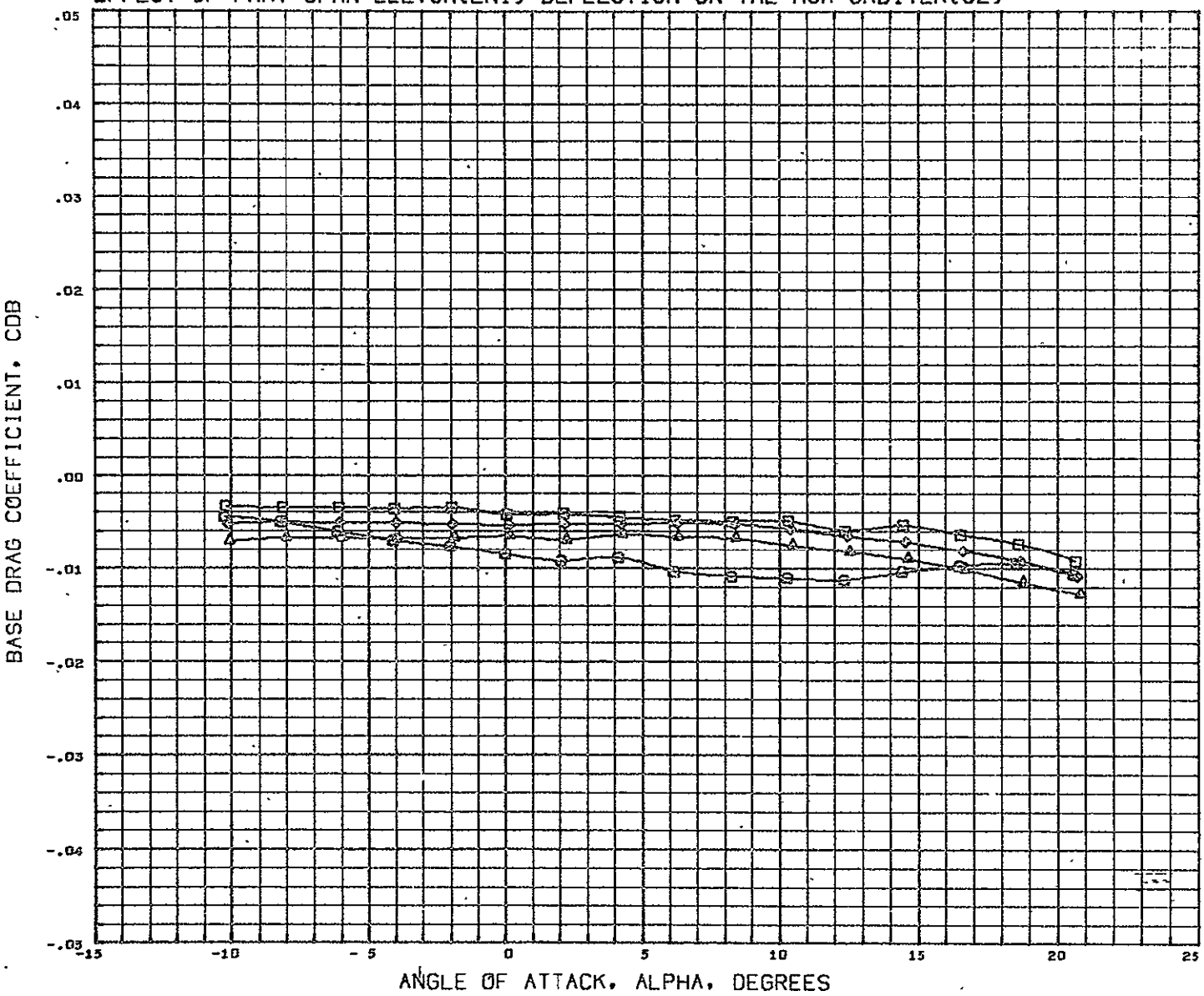
SYMBOL	ELEVON		PARAMETRIC VALUES		
○	- 30.000	LH OBD	0.000	RH OBD	0.000
□	- 20.000	BETA	0.000		
◇	- 10.000				
△	0.000				

DATA HIST. CODE V

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF PART SPAN ELEVON(EN1) DEFLECTION ON THE HCR ORBITER(02)



SYMBOL	ELEVON
○	- 30.000
□	- 20.000
◇	- 10.000
△	0.000

PARAMETRIC VALUES

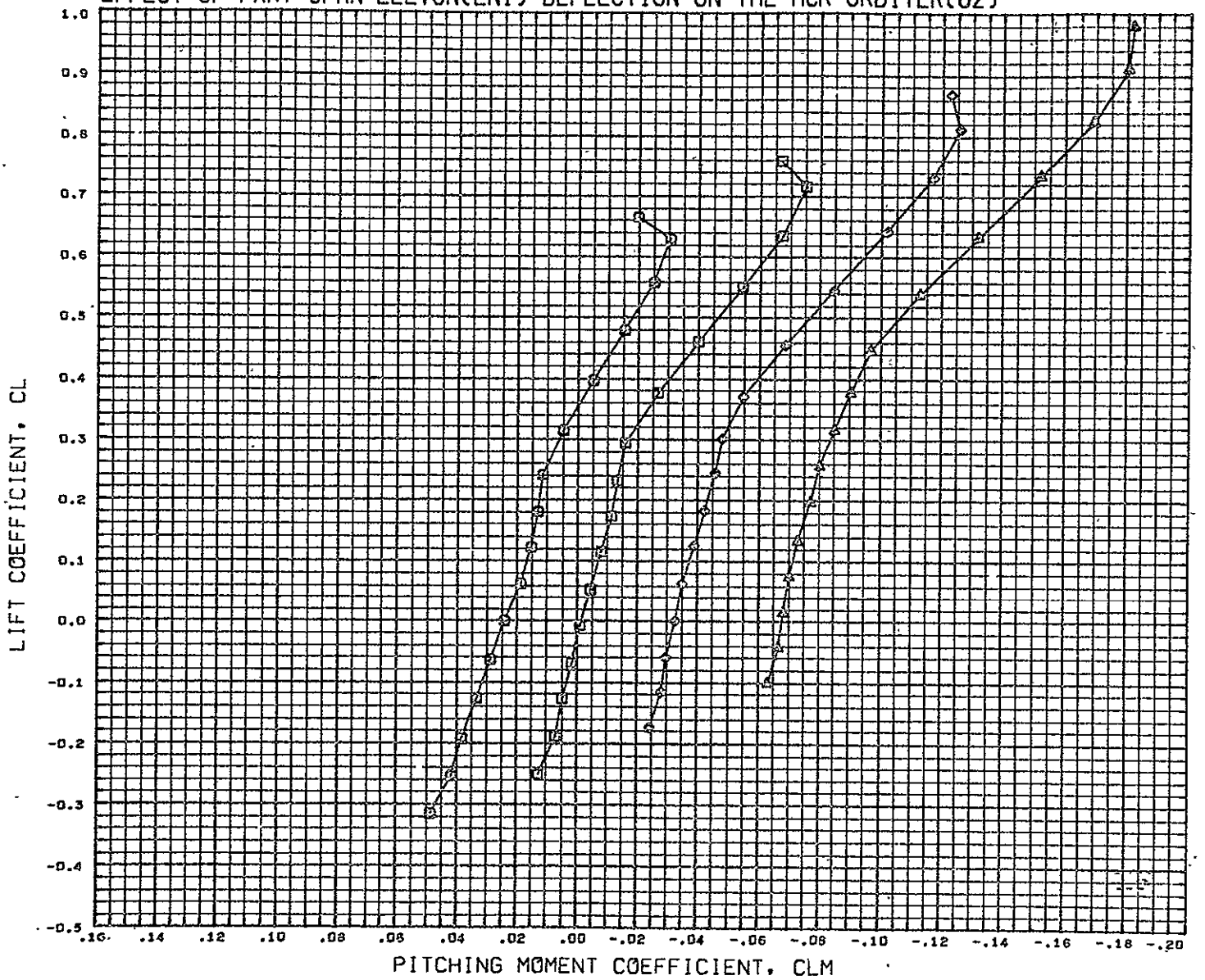
LH OBD	0.000	RH OBD	0.000
BETA	0.000		

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

DATA HIST. CODE V

EFFECT OF PART SPAN ELEVON(EN1) DEFLECTION ON THE HCR ORBITER(02)



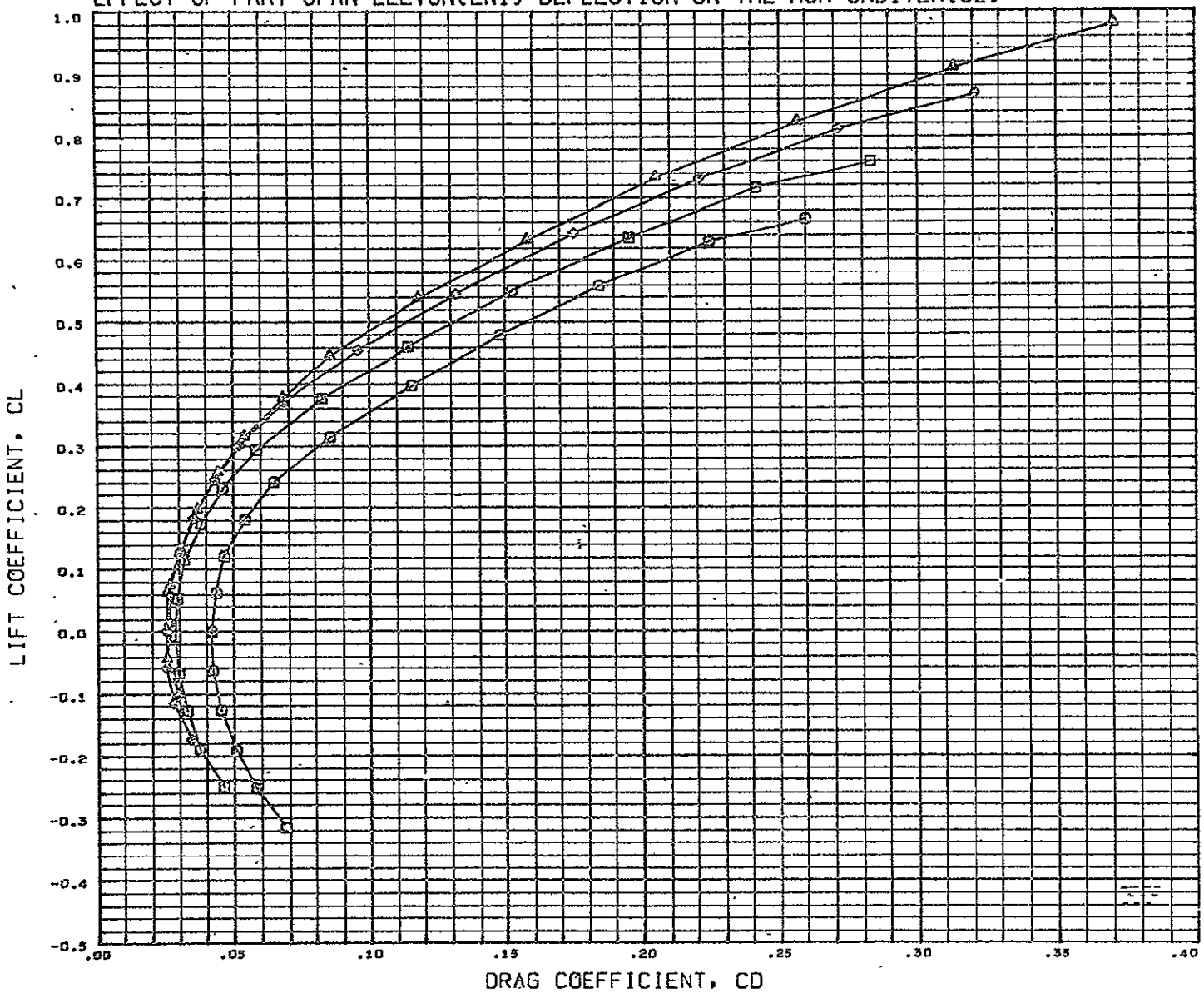
SYMBOL	ELEVON		PARAMETRIC VALUES		
○	- 30.000	LH OBD	0.000	RH OBD	0.000
□	- 20.000	BETA	0.000		
◇	- 10.000				
△	0.000				

DATA HIST. CODE V

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XHRP	4.2210	FT.
YHRP	0.0000	FT.
ZHRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF PART SPAN ELEVON(EN1) DEFLECTION ON THE HCR ORBITER(02)



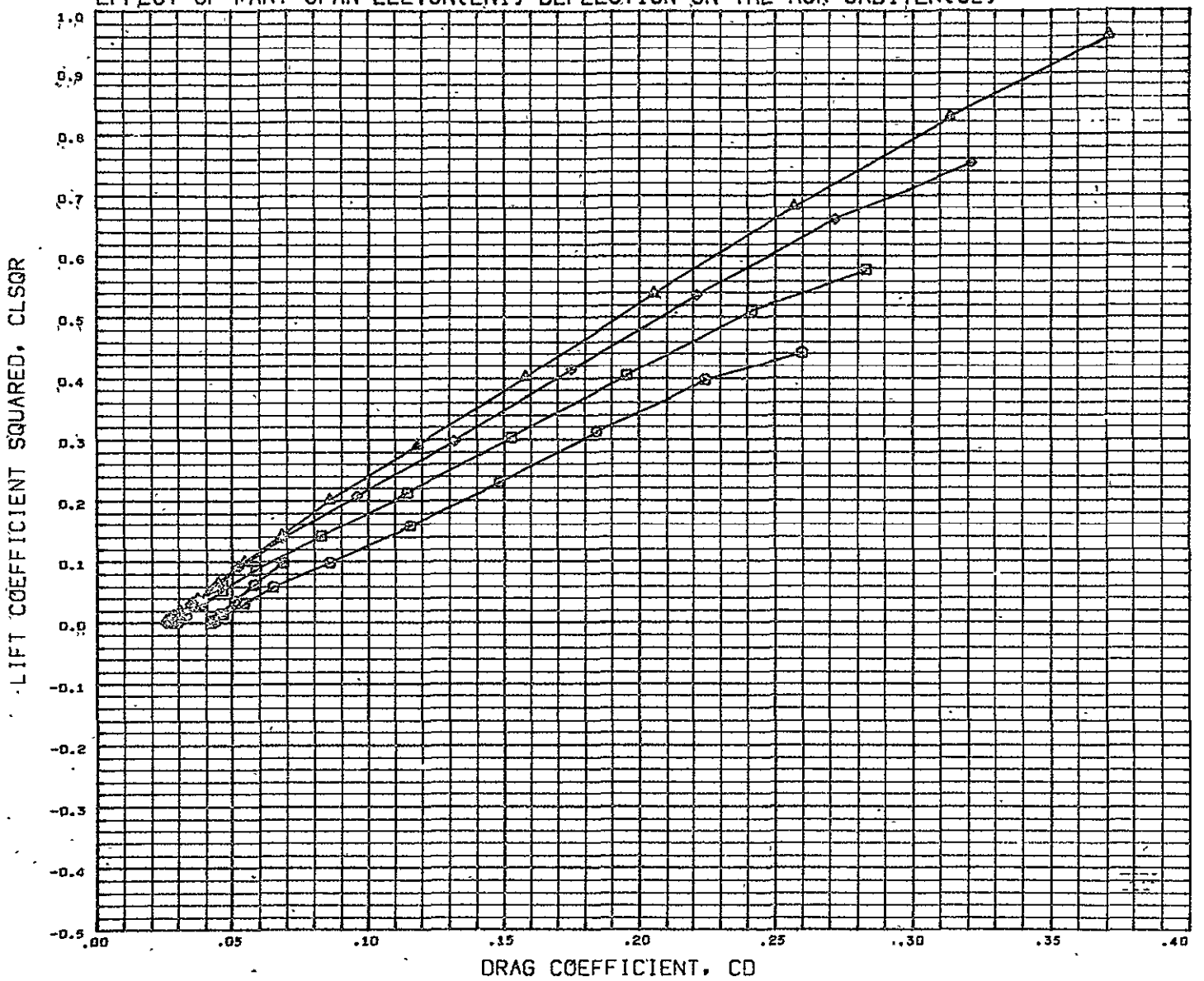
SYMBOL	ELEVON		PARAMETRIC VALUES		
○	- 30.000	LH OBD	0.000	RH OBD	0.000
□	- 20.000	BETA	0.000		
◇	- 10.000				
△	0.000				

DATA HIST. CODE V

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF PART SPAN ELEVON(EN1) DEFLECTION ON THE HCR ORBITER(02)



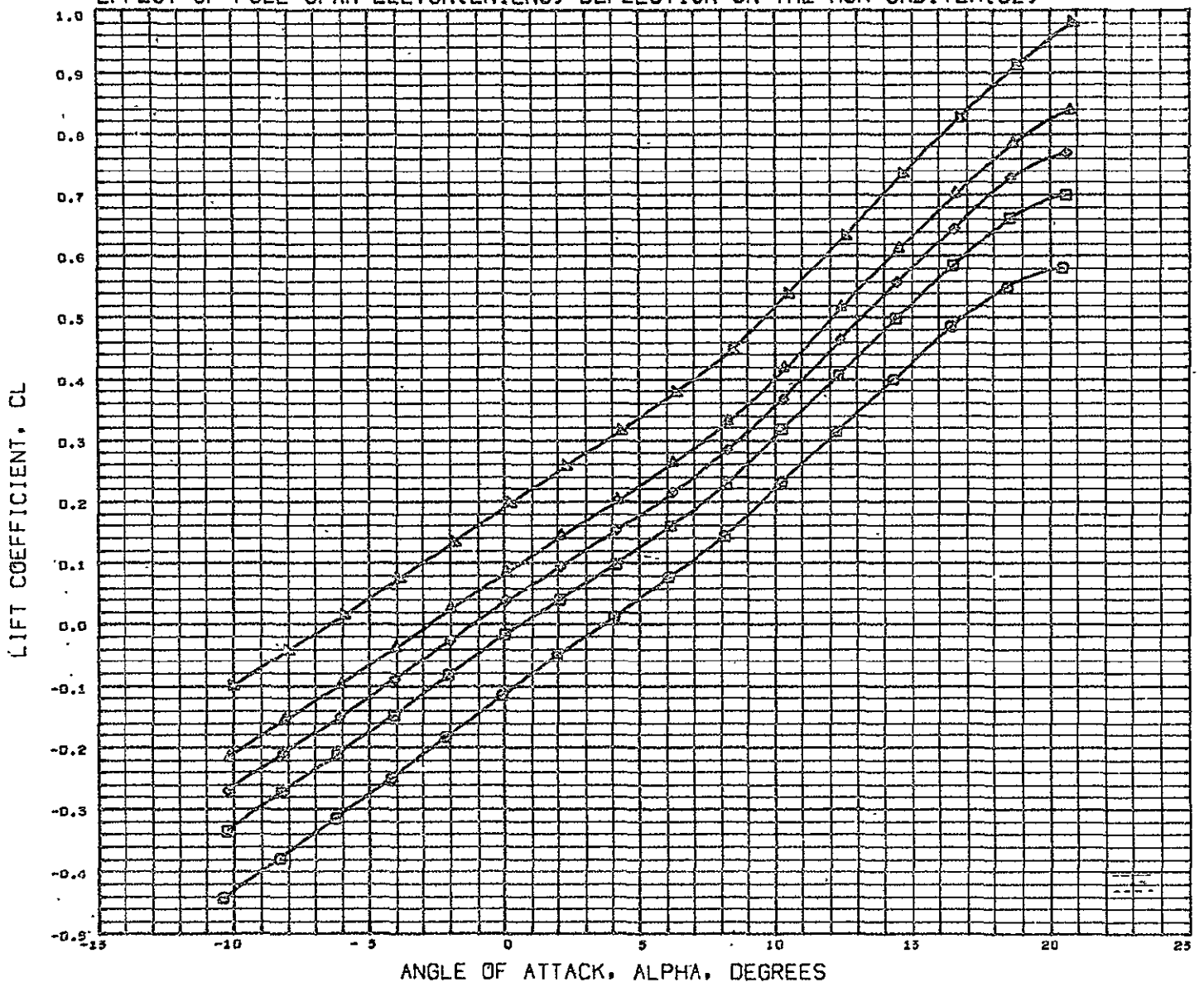
SYMBOL	ELEVON		PARAMETRIC VALUES		
○	- 30.000	LH OBD	0.000	RH OBD	0.000
□	- 20.000	BETA	0.000		
◇	- 10.000				
△	0.000				

DATA HIST. CODE V

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF FULL SPAN ELEVON(EN1EN3) DEFLECTION ON THE HCR ORBITER(02)



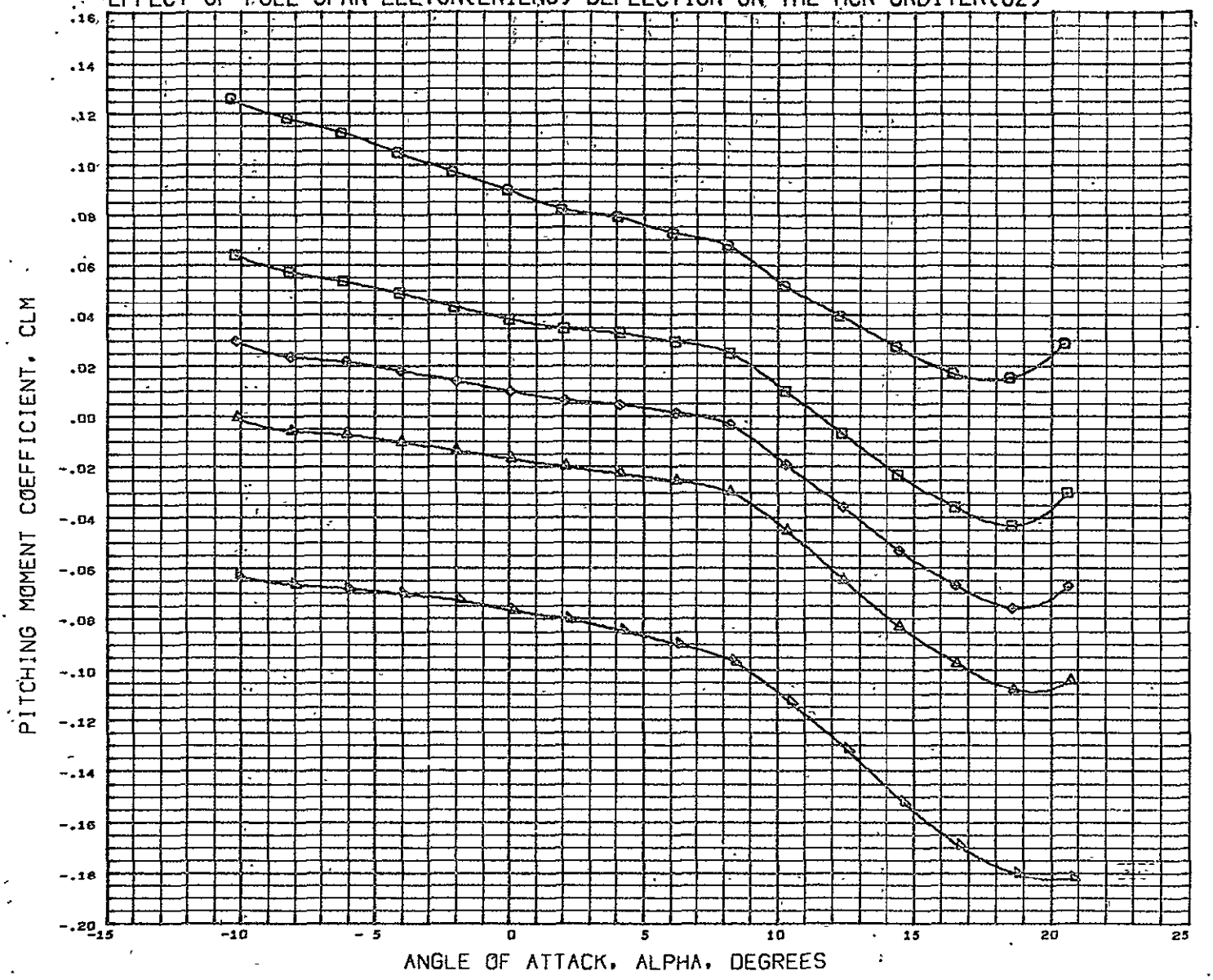
SYMBOL	ELEVON	PARAMETRIC VALUES	
○	- 30.000	BETA	0.000
□	- 20.000		
◇	- 15.000		
△	- 10.000		
▷	0.000		

DATA HIST. CODE V*A

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF FULL SPAN ELEVON(EN1EN3) DEFLECTION ON THE HCR ORBITER(02)



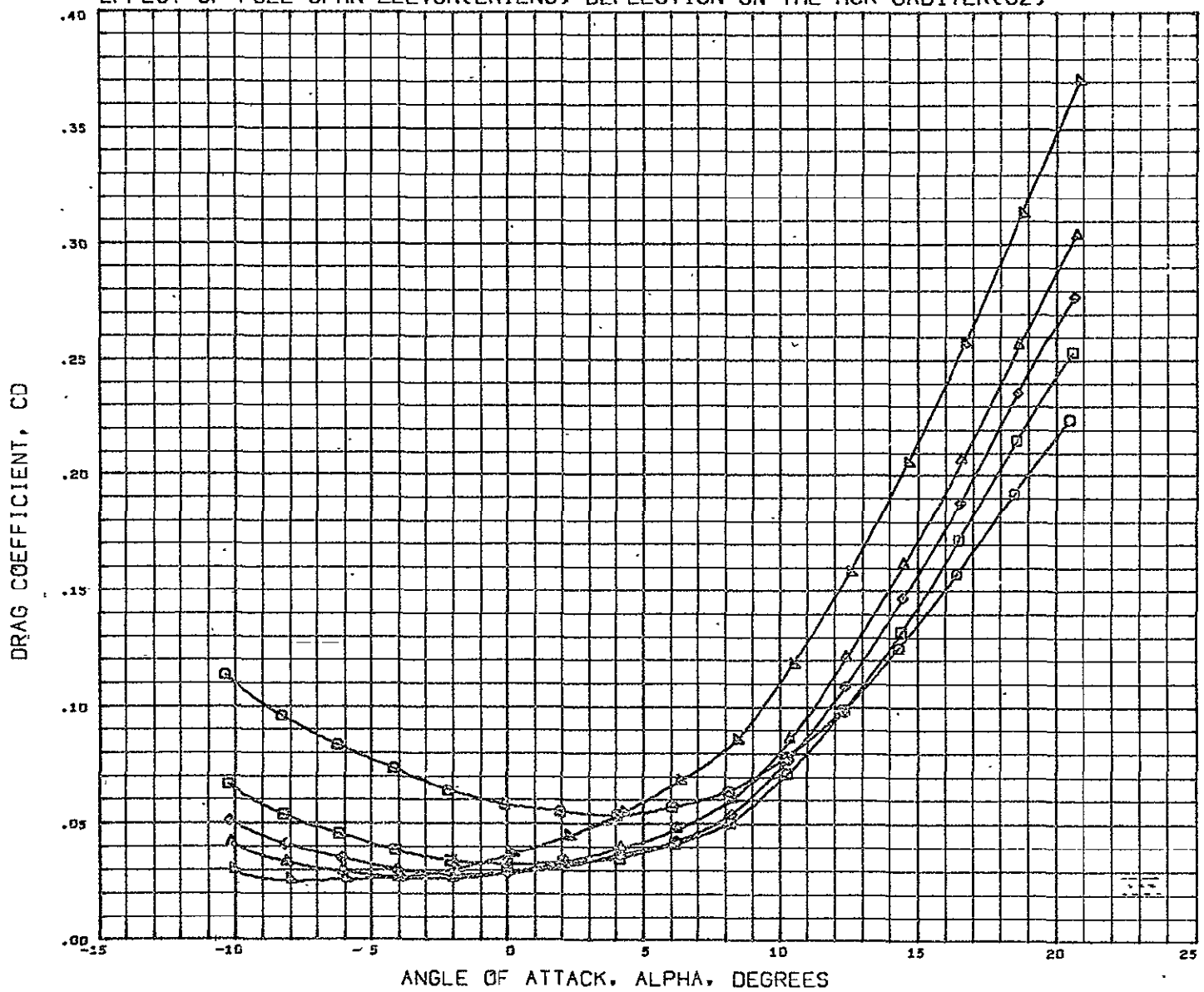
SYMBOL	ELEVON		PARAMETRIC VALUES
○	- 30.000	BETA	0.000
□	- 20.000		
◇	- 15.000		
△	- 10.000		
▷	0.000		

DATA HIST. CODE V*A

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF FULL SPAN ELEVON(EN1EN3) DEFLECTION ON THE HCR ORBITER(02)



SYMBOL	ELEVON		PARAMETRIC VALUES
○	- 30.000	BETA	0.000
□	- 20.000		
◇	- 15.000		
△	- 10.000		
▷	0.000		

DATA HIST. CODE V*A

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

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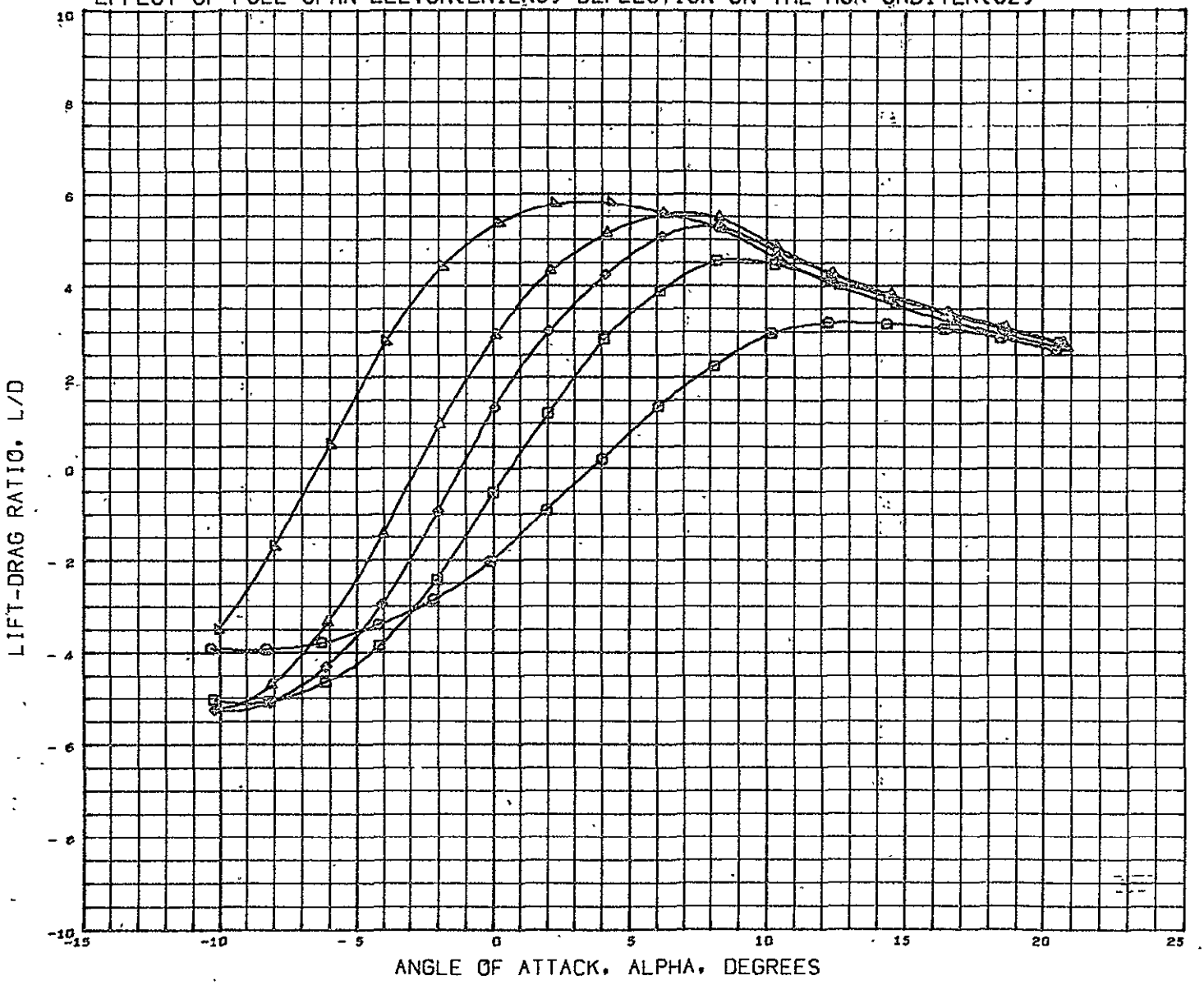
EFFECT OF FULL SPAN ELEVON(EN1EN3) DEFLECTION ON THE HCR ORBITER(02)



SYMBOL	ELEVON	PARAMETRIC VALUES	
○	- 30.000	BETA	0.000
□	- 20.000		
◇	- 15.000		
△	- 10.000		
▽	0.000		

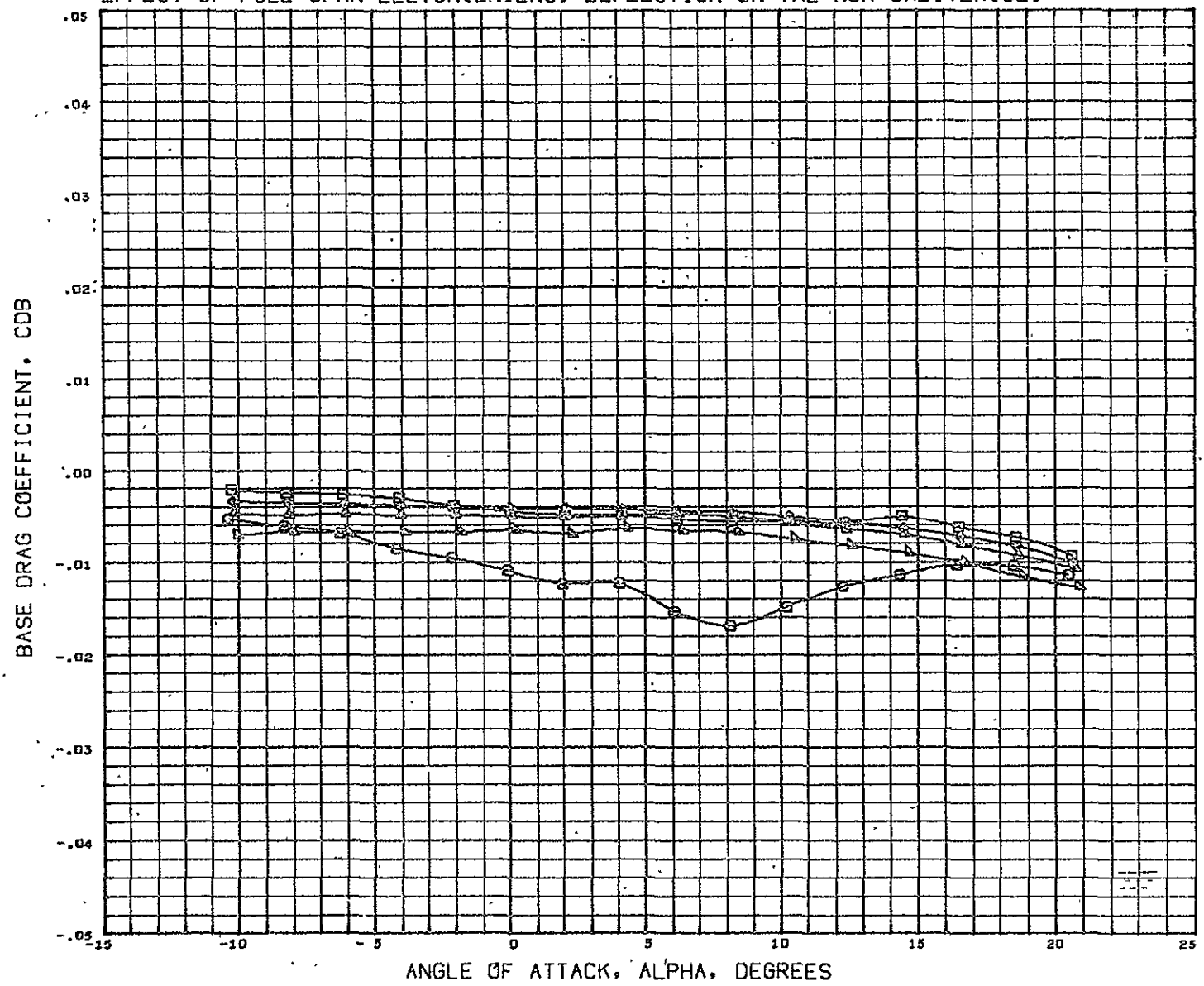
DATA HIST. CODE V*A

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

LSWT 240 4.0 PC HCR ORBITER(02) B1W3V3EN1EN3 (ACFD31) 08 JAN 71 PAGE 90

EFFECT OF FULL SPAN ELEVON(EN1EN3) DEFLECTION ON THE HCR ORBITER(02)



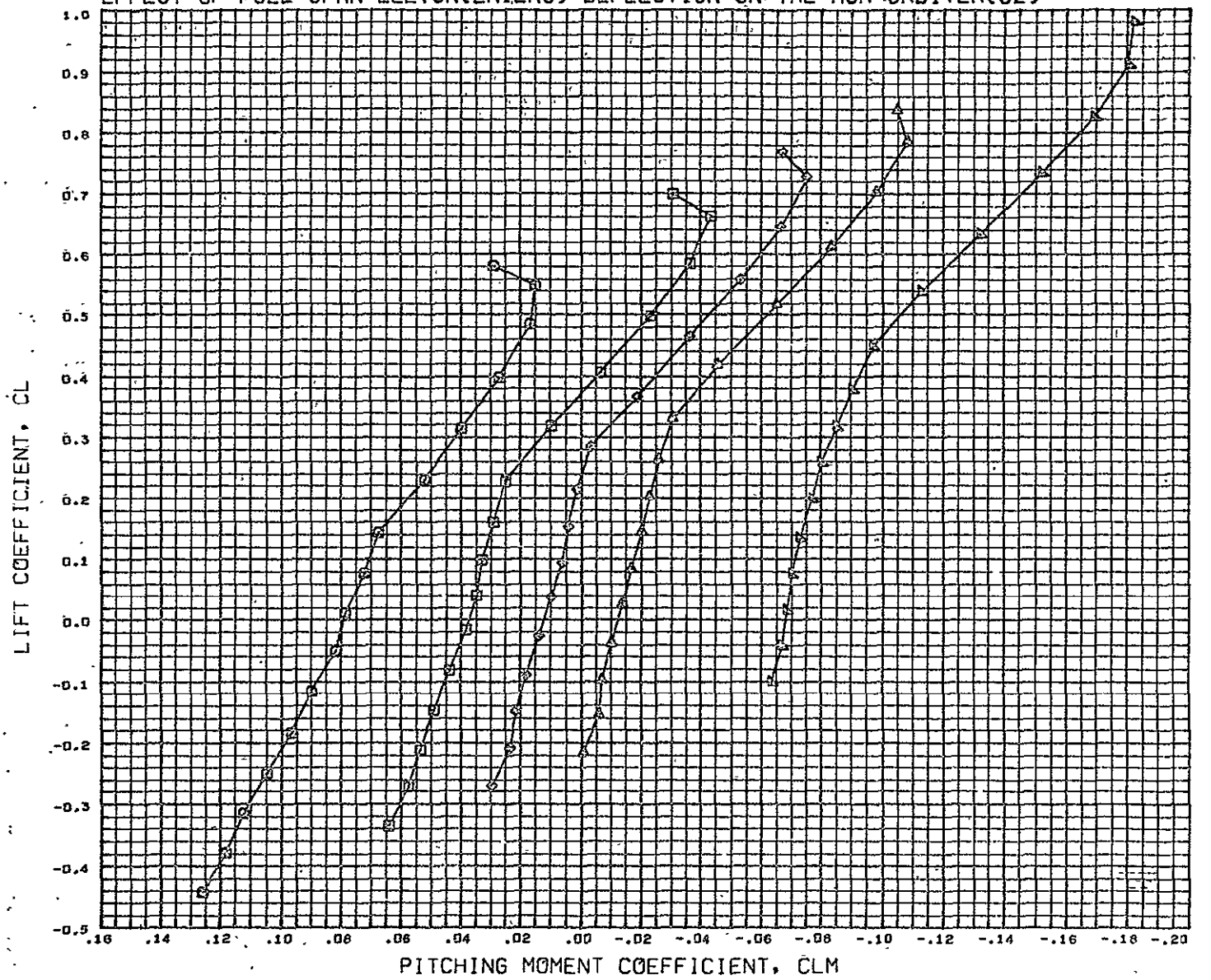
SYMBOL	ELEVON	PARAMETRIC VALUES	
○	- 30.000	BETA	0.000
□	- 20.000		
◇	- 15.000		
△	- 10.000		
◸	0.000		

DATA HIST: CODE V*A

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF FULL SPAN ELEVON(EN1EN3) DEFLECTION ON THE HCR ORBITER(02)



SYMBOL	ELEVON	PARAMETRIC VALUES	
○	- 30.000	BETA	0.000
□	- 20.000		
◇	- 15.000		
△	- 10.000		
▽	0.000		

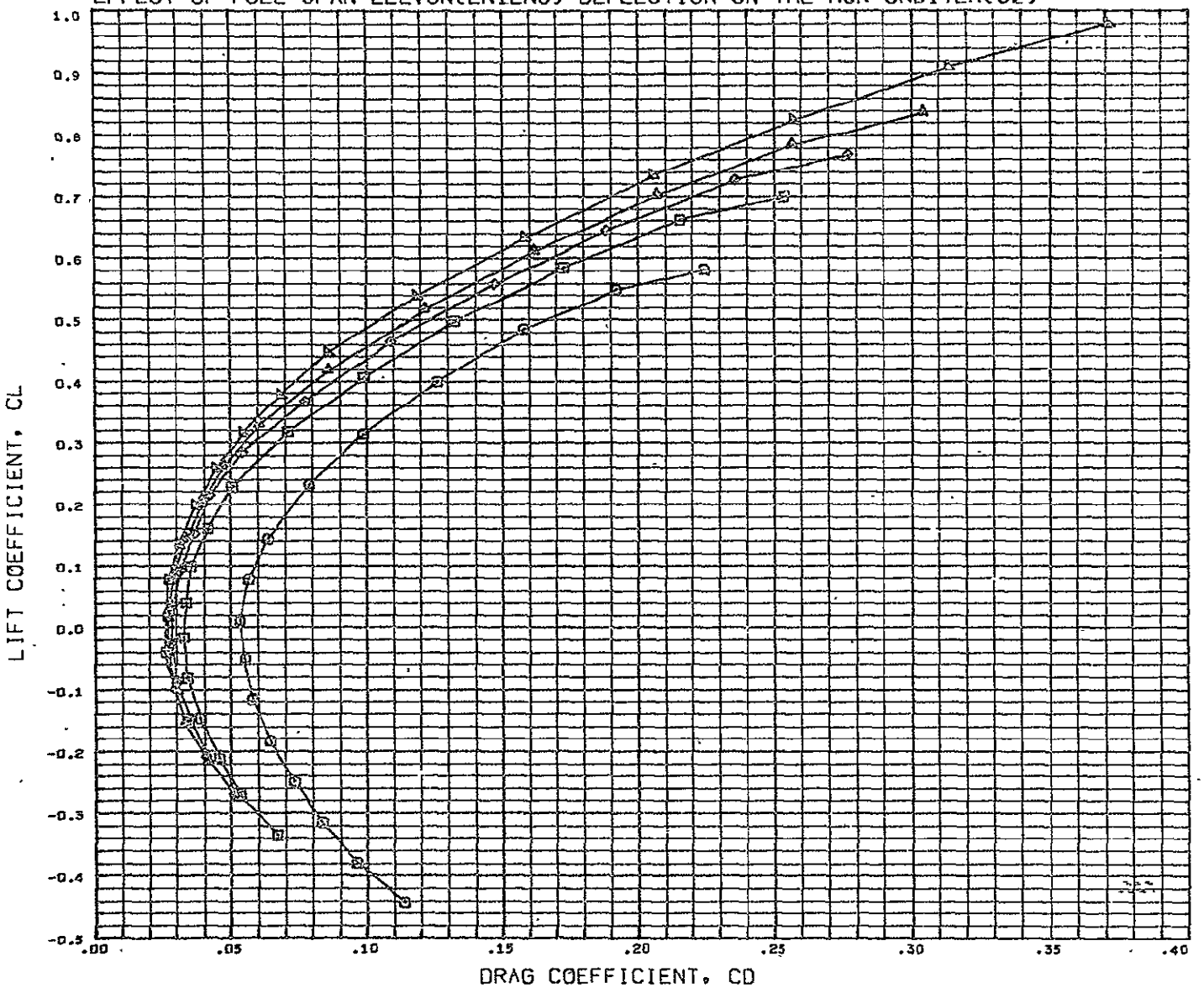
DATA HIST. CODE V*A

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

LSWT 240 4.0 PC HCR ORBITER(02) B1W3V3EN1EN3 (ACFD31) 08 JAN 71 PAGE 92

EFFECT OF FULL SPAN ELEVON(EN1EN3) DEFLECTION ON THE HCR ORBITER(02)



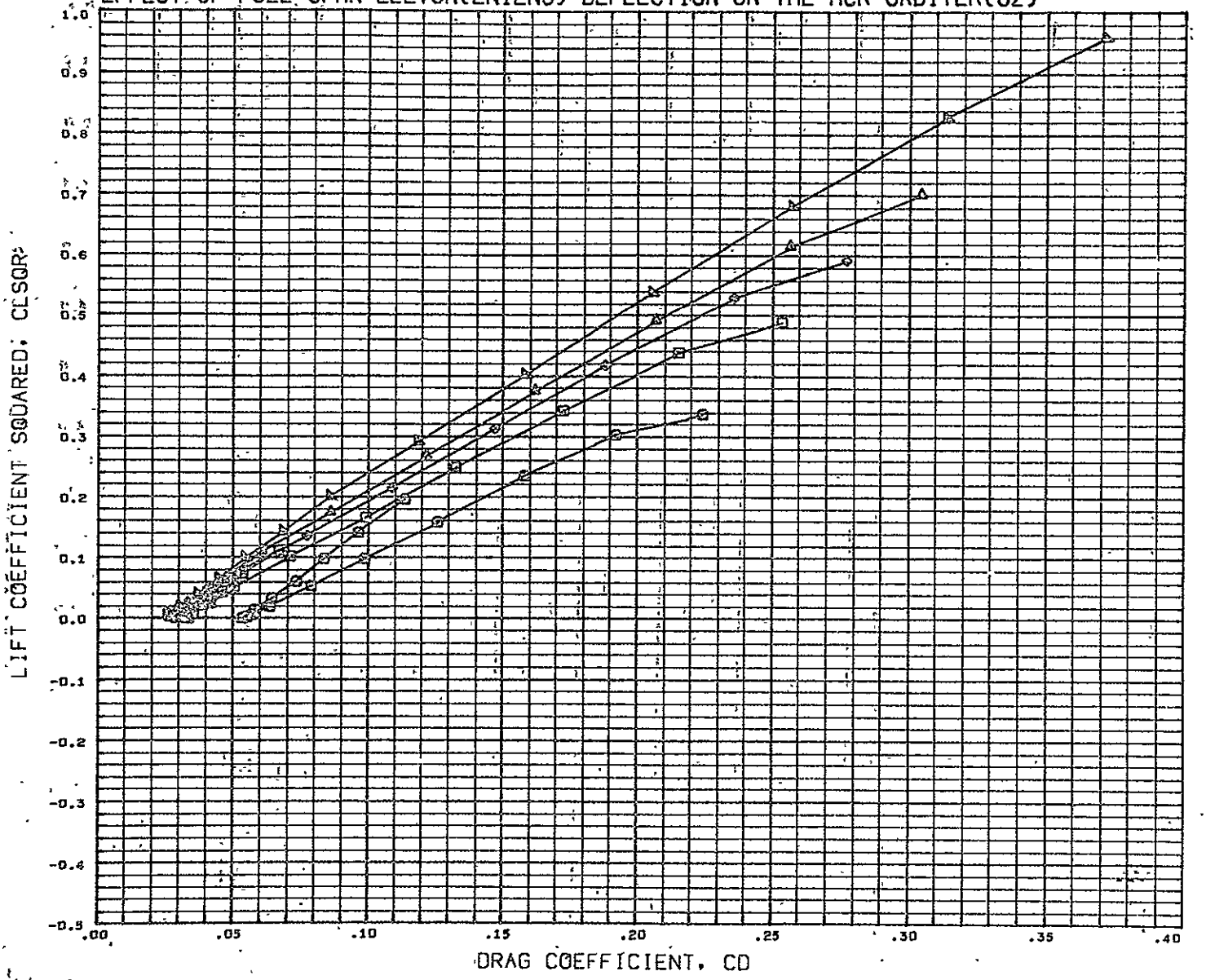
SYMBOL	ELEVON		PARAMETRIC VALUES
○	- 30.000	BETA	0.000
□	- 20.000		
◇	- 15.000		
△	- 10.000		
▷	0.000		

DATA HIST. CODE V*A

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF FULL SPAN ELEVON(EN1EN3) DEFLECTION ON THE HCR ORBITER(02)



SYMBOL	ELEVON	PARAMETRIC VALUES	
○	30.000	BETA	0.000
□	20.000		
◇	15.000		
△	10.000		
▷	0.000		

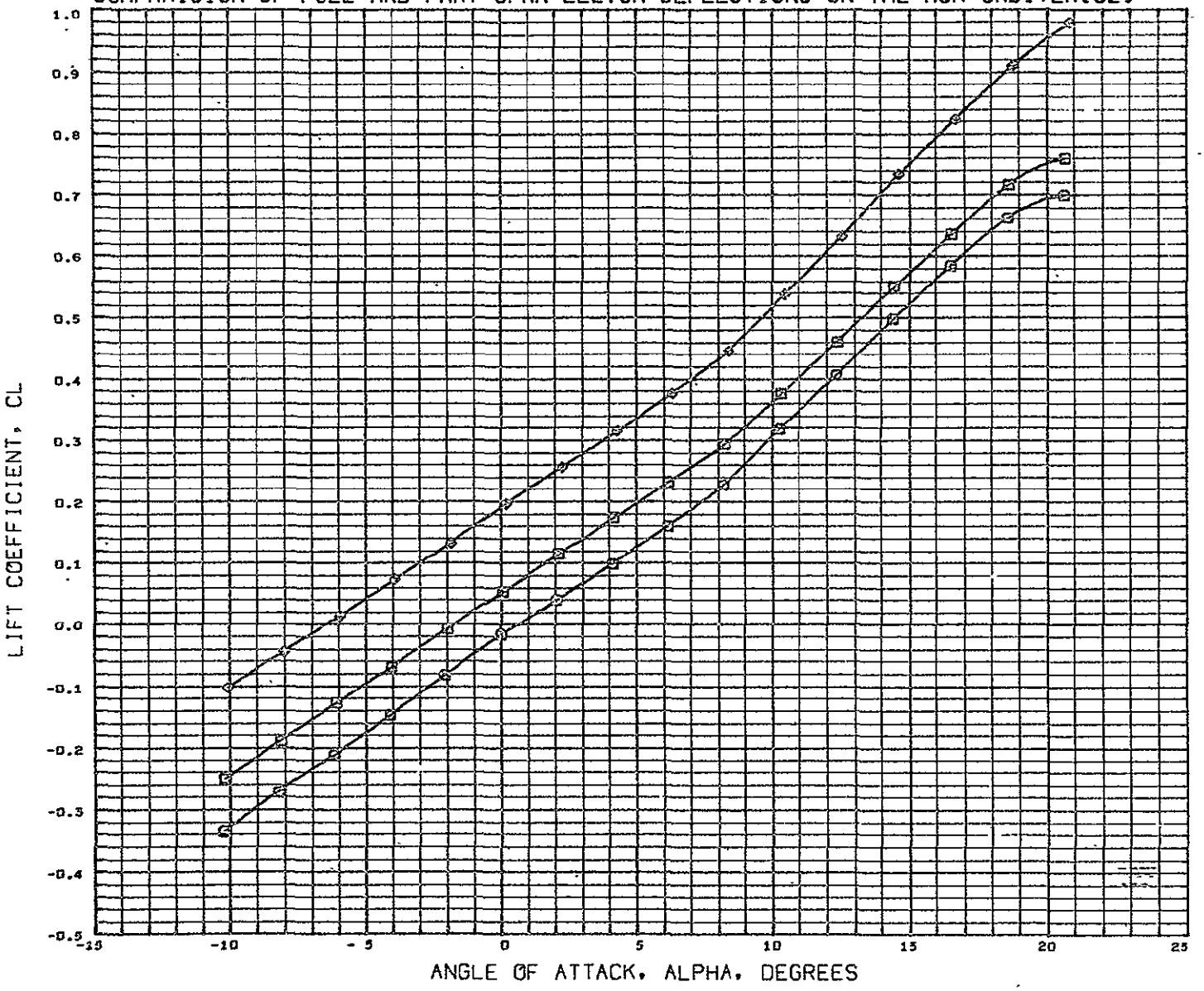
DATA HIST. CODE V*A

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

LSWT 240 4.0 PC HCR ORBITER(02) B1W3V3EN1EN3 (ACFD31) 08 JAN 71 PAGE 94

COMPARISION OF FULL AND PART SPAN ELEVON DEFLECTIONS ON THE HCR ORBITER(02)

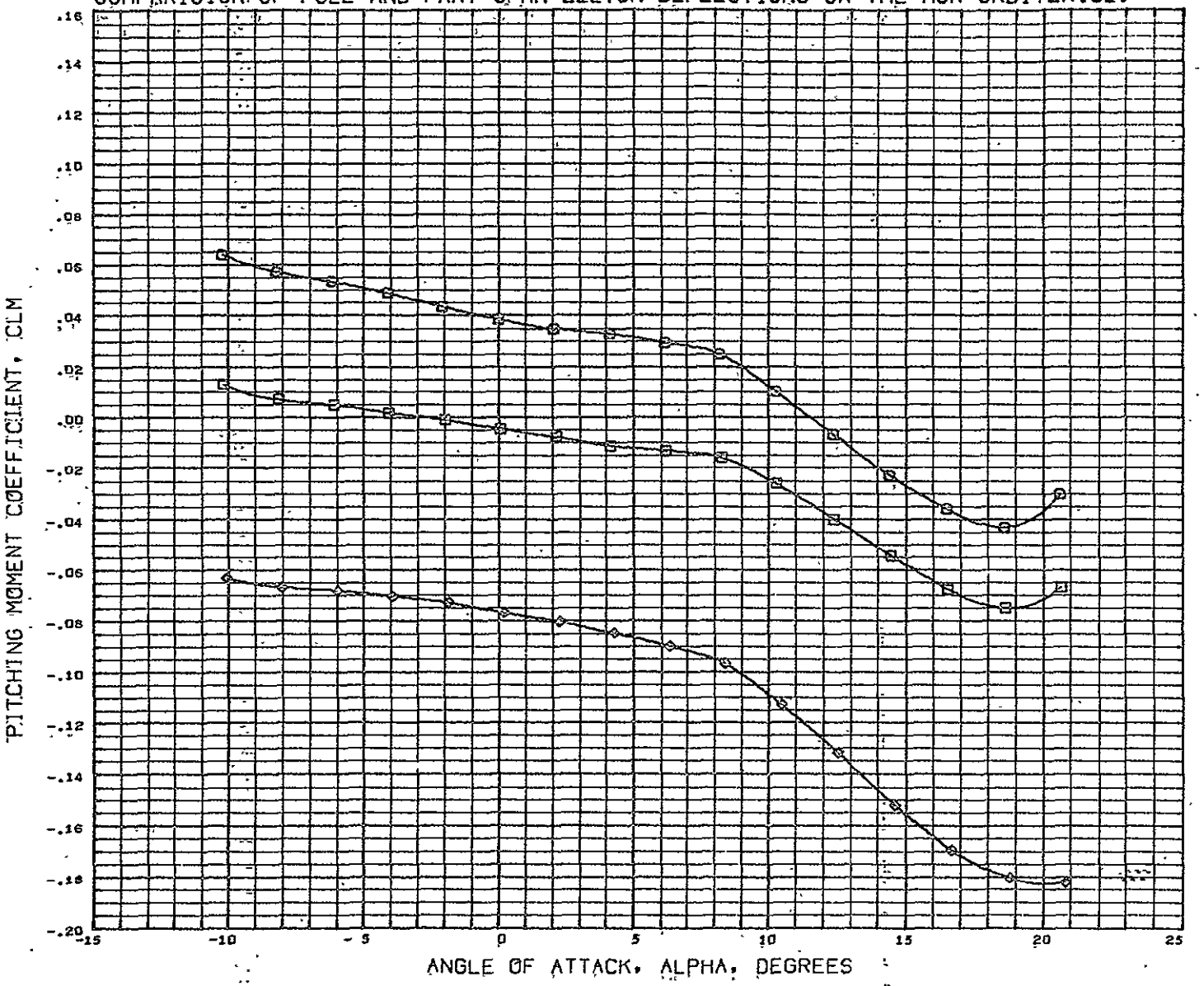


DATA SET-SYMBOL		CONFIGURATION DESCRIPTION				PARAMETRIC VALUES	
(TCFD28)	○	LSWT 240	B1W3V3EN1EN3	ELEVON=-20		BETA	0.000
(TCFD27)	□	LSWT 240	B1W3V3EN1	ELEVON=-20			
(TCFD20)	◇	LSWT 240	B1W3V3	ELEVON=0	AILRON=0/0		

FLAP,B 0.000

REFERENCE INFORMATION		
REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

COMPARISION OF FULL AND PART SPAN ELEVON DEFLECTIONS ON THE HCR ORBITER(02)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			
(TCFD28)	○	LSWT 240	B1W3V3EN1EN3	ELEVON=-20	
(TCFD27)	□	LSWT 240	B1W3V3EN1	ELEVON=-20	
(TCFD20)	◇	LSWT 240	B1W3V3	ELEVON=0	AILRON=0/0

FLAP,B 0.000

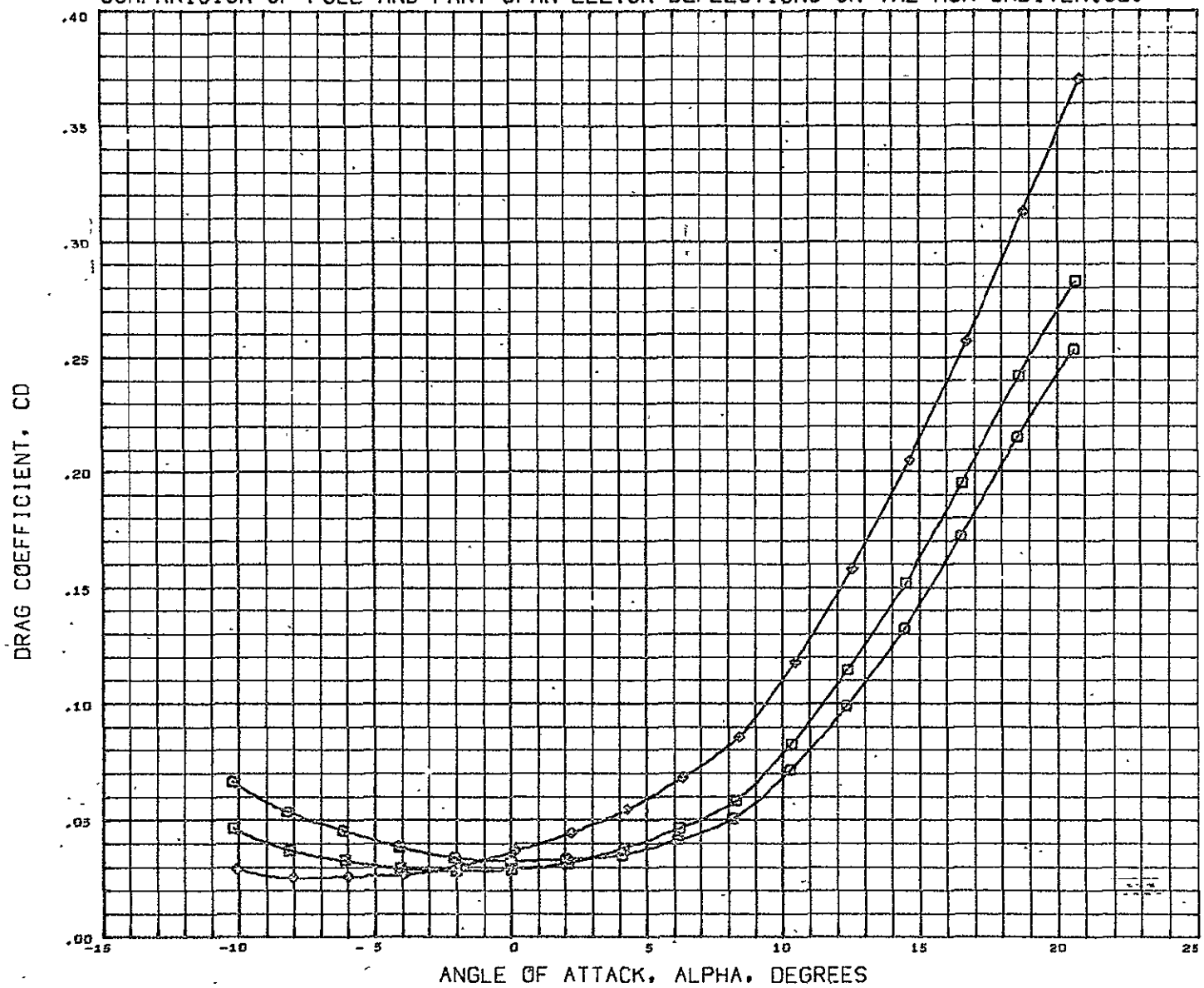
PARAMETRIC VALUES

BETA 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

COMPARISION OF FULL AND PART SPAN ELEVON DEFLECTIONS ON THE HCR ORBITER(02)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			
(TCFD28)	○	LSWT 240	B1W3V3EN1EN3	ELEVON=-20	
(TCFD27)	□	LSWT 240	B1W3V3EN1	ELEVON=-20	
(TCFD20)	◇	LSWT 240	B1W3V3	ELEVON=0	AILRON=0/0

PARAMETRIC VALUES

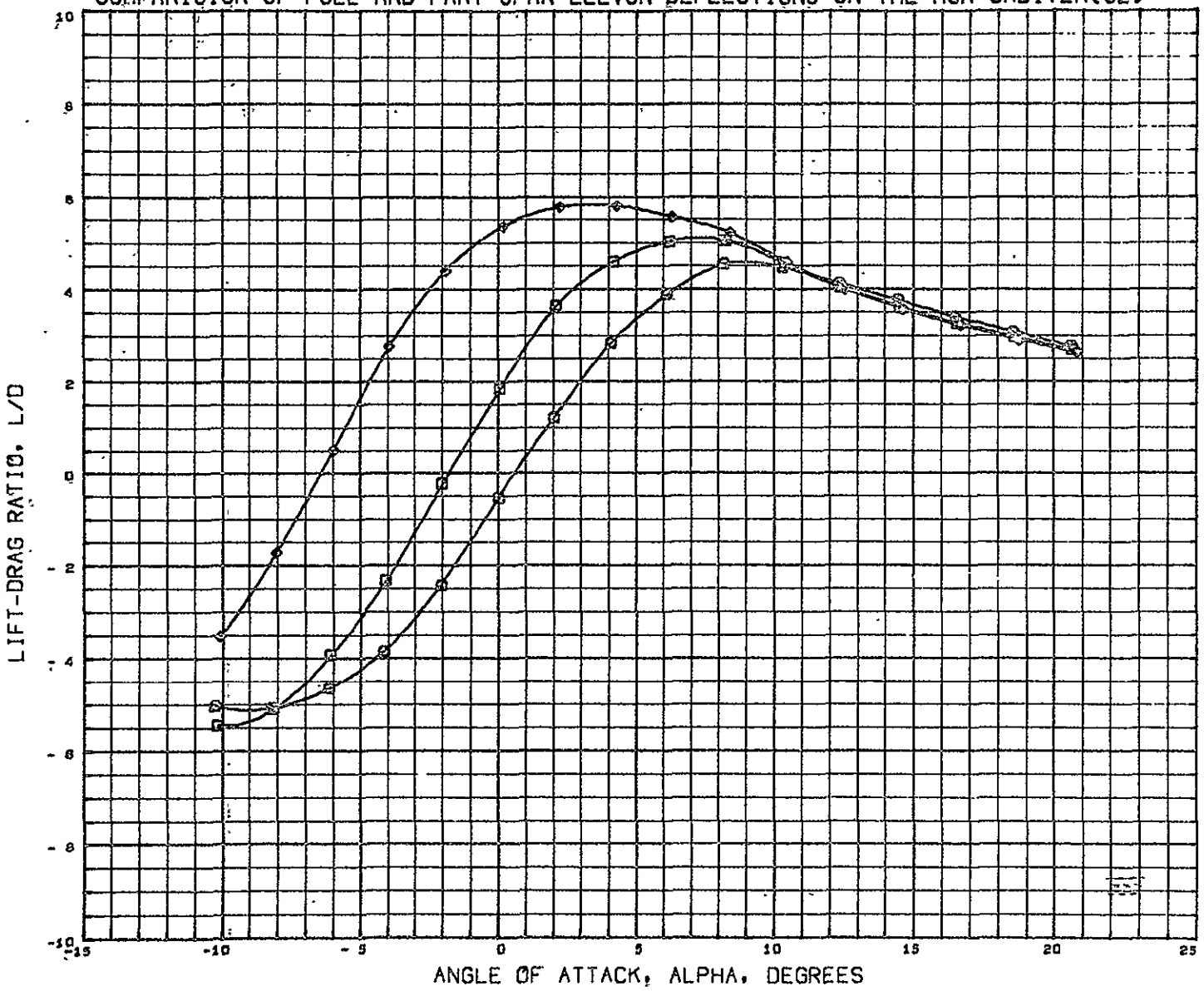
BETA 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

FLAP,B = 0.000

COMPARISION OF FULL AND PART SPAN ELEVON DEFLECTIONS ON THE HCR ORBITER(02)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			
(TCFD28)	○	LSWT 240	B1W3V3EN1EN3	ELEVON=-20	
(TCFD27)	□	LSWT 240	B1W3V3EN1	ELEVON=-20	
(TCFD20)	◇	LSWT 240	B1W3V3	ELEVON=0	AILRON=0/0

PARAMETRIC VALUES

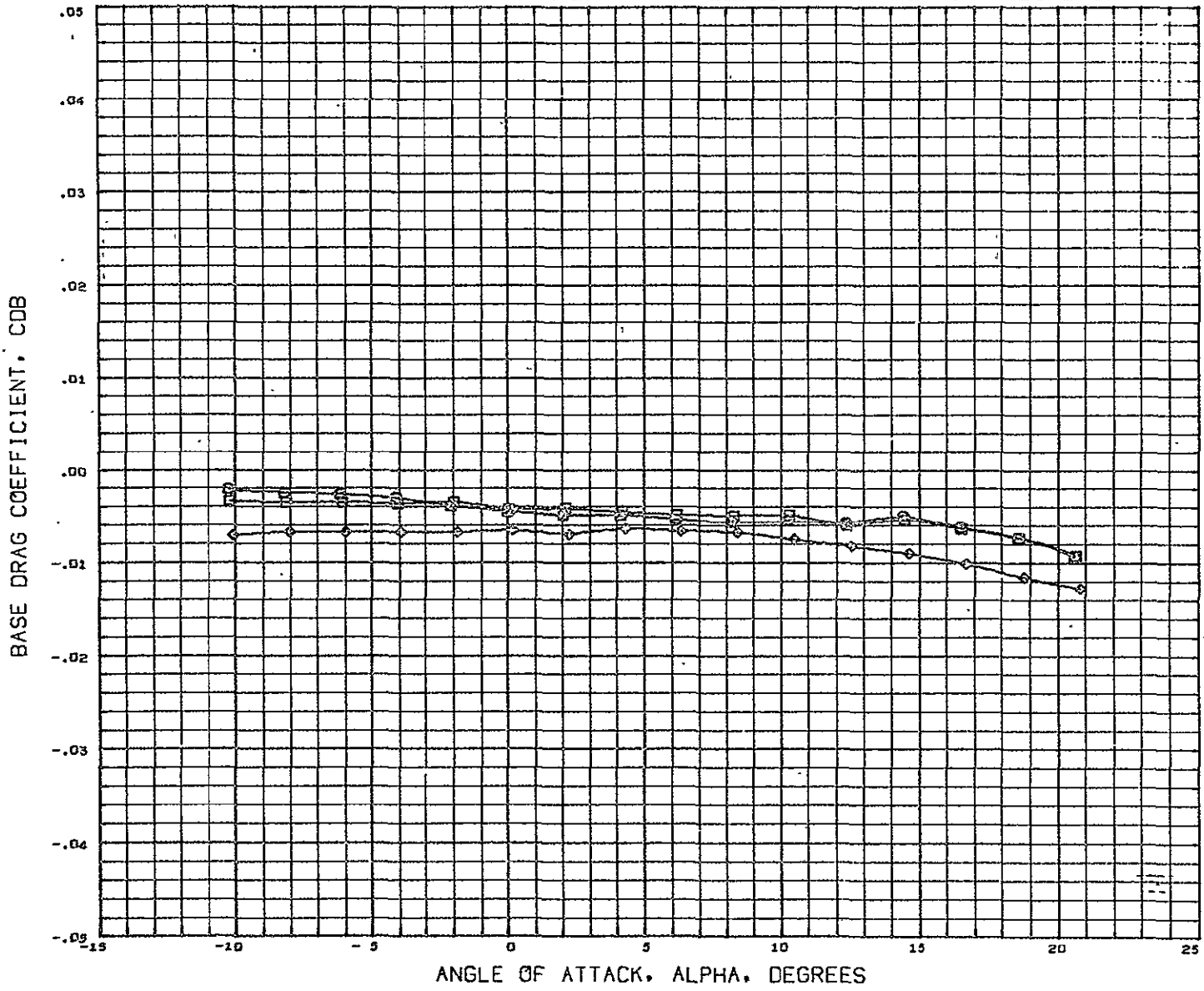
BETA 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

FLAP,B 0.000

COMPARISION OF FULL AND PART SPAN ELEVON DEFLECTIONS ON THE HCR ORBITER(02)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			
(TCFD28)	○	LSWT 240	B1W3V3EN1EN3	ELEVON=-20	
(TCFD27)	□	LSWT 240	B1W3V3EN1	ELEVON=-20	
(TCFD20)	◇	LSWT 240	B1W3V3	ELEVON=0	AILRON=0/0

FLAP,B 0.000

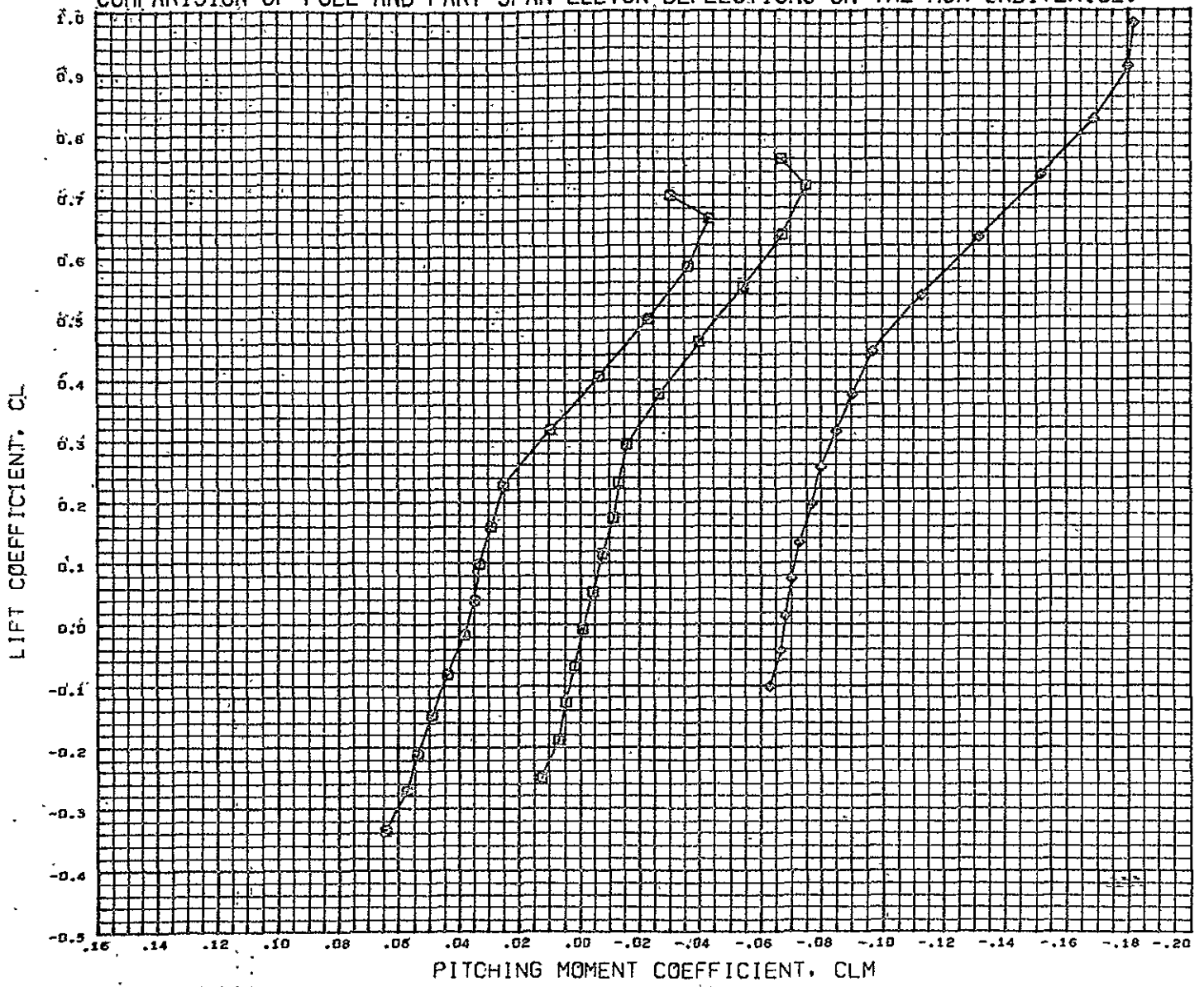
PARAMETRIC VALUES

BETA 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XHRP	4.2210	FT.
YHRP	0.0000	FT.
ZHRP	0.6670	FT.
SCALE	4.0000	PER CE

COMPARISION OF FULL AND PART SPAN ELEVON DEFLECTIONS ON THE HCR ORBITER(02)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION		
(TCFD28)	○	LSWT 240 B1W3V3EN1EN3	ELEVON=-20	
(TCFD27)	□	LSWT 240 B1W3V3EN1	ECEVON=-20	
(TCFD20)	◇	LSWT 240 B1W3V3	ELEVON=0	AILRON=0/0

PARAMETRIC VALUES

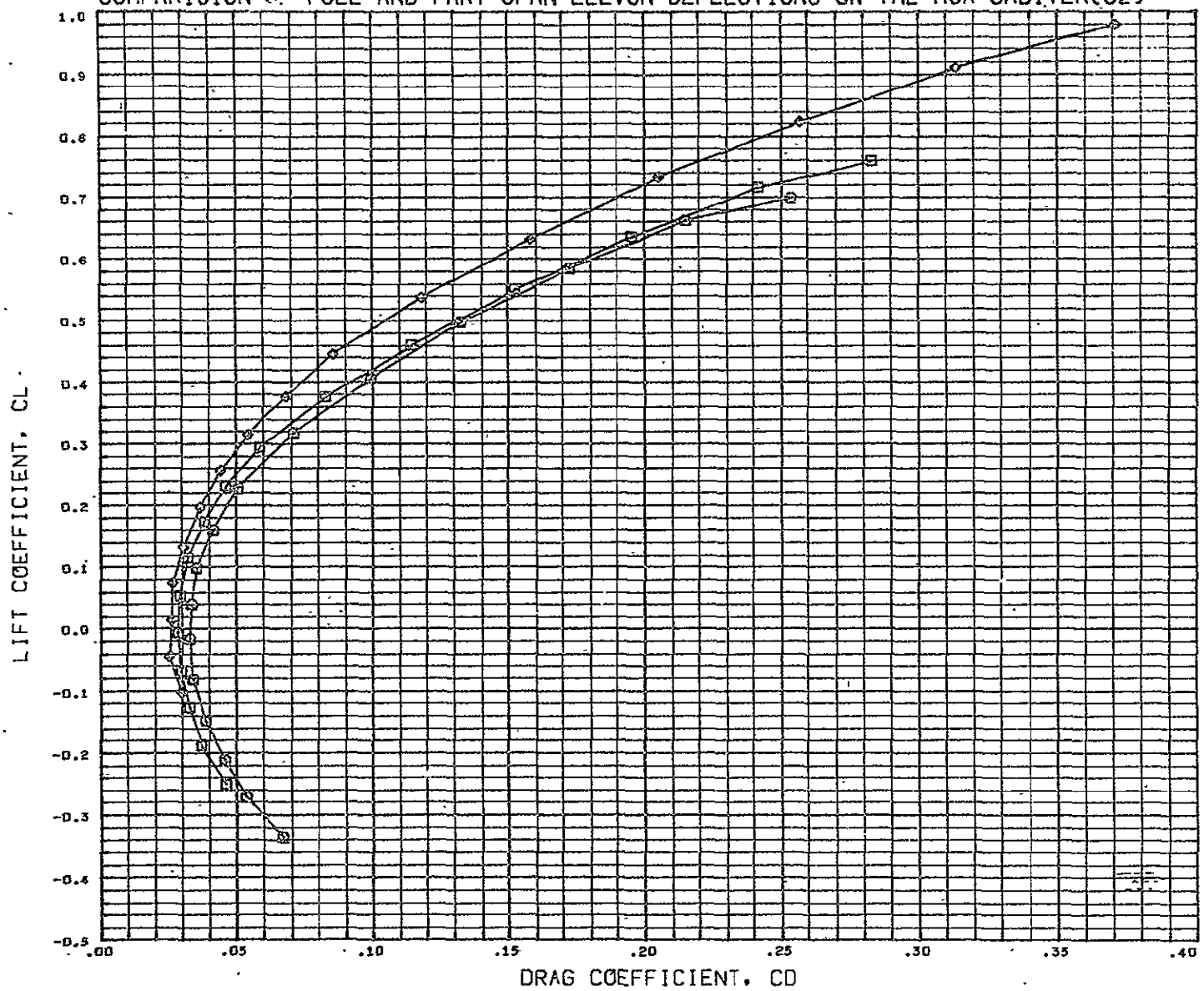
BETA 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

FLAP,B 0.000

COMPARISION OF FULL AND PART SPAN ELEVON DEFLECTIONS ON THE HCR ORBITER(02)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			
(TCFD28)	○	LSWT 240	B1W3V3EN1EN3	ELEVON=-20	
(TCFD27)	□	LSWT 240	B1W3V3EN1	ELEVON=-20	
(TCFD20)	◇	LSWT 240	B1W3V3	ELEVON=0.	AILRON=0/0

FLAP,B 0.000

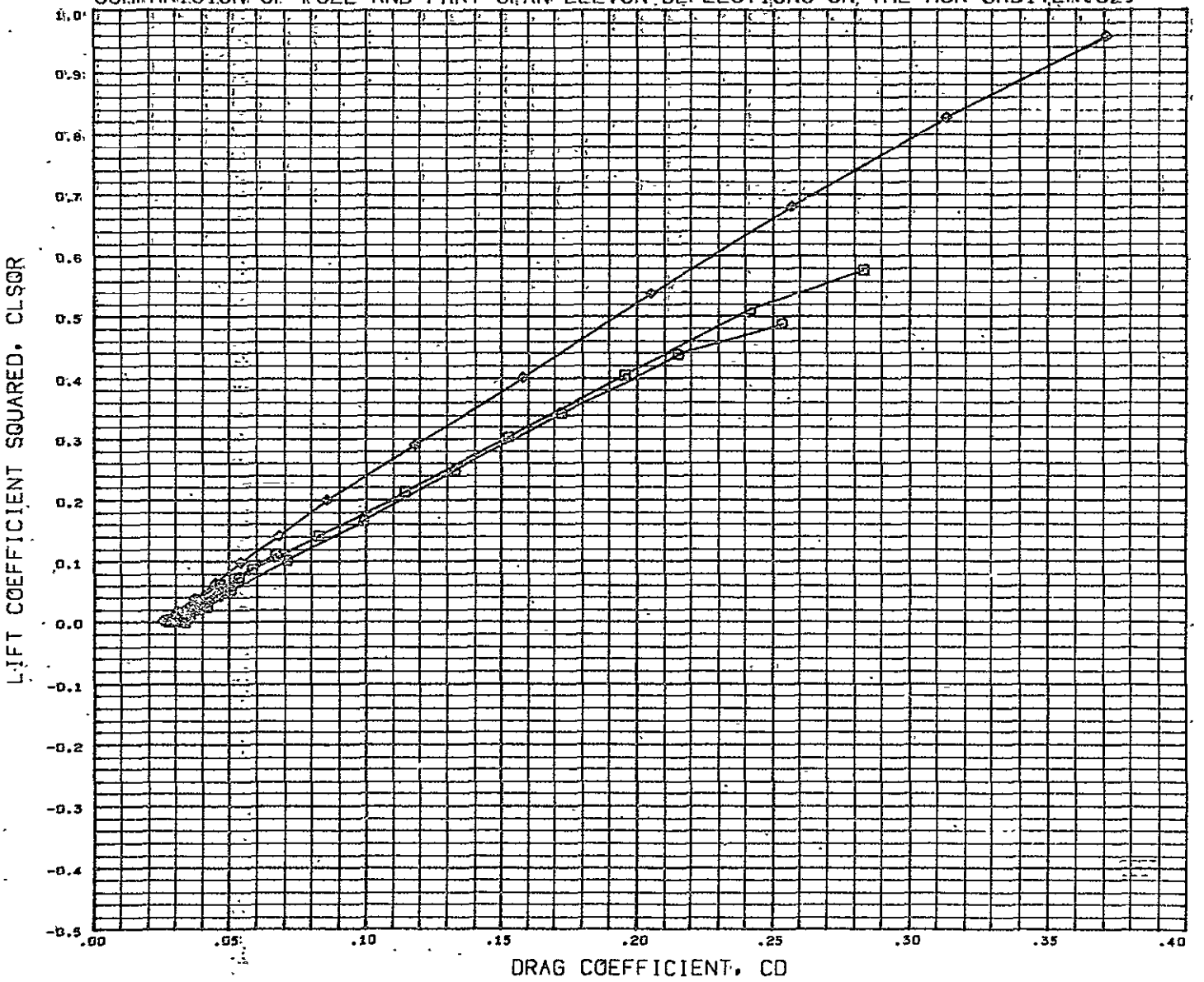
PARAMETRIC VALUES

BETA 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

COMPARISION OF FULL AND PART SPAN ELEVON DEFLECTIONS ON THE HCR ORBITER(02)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			
(XTCFD28)	○	LSWT 240	B1W3V3EN1EN3	ELEVON=-20	
(XTCFD27)	□	LSWT 240	B1W3V3EN1	ELEVON=-20	
(XTCFD20)	◇	LSWT 240	B1W3V3	ELEVON=0	AILRON=0/0

FLAP,B 0.000

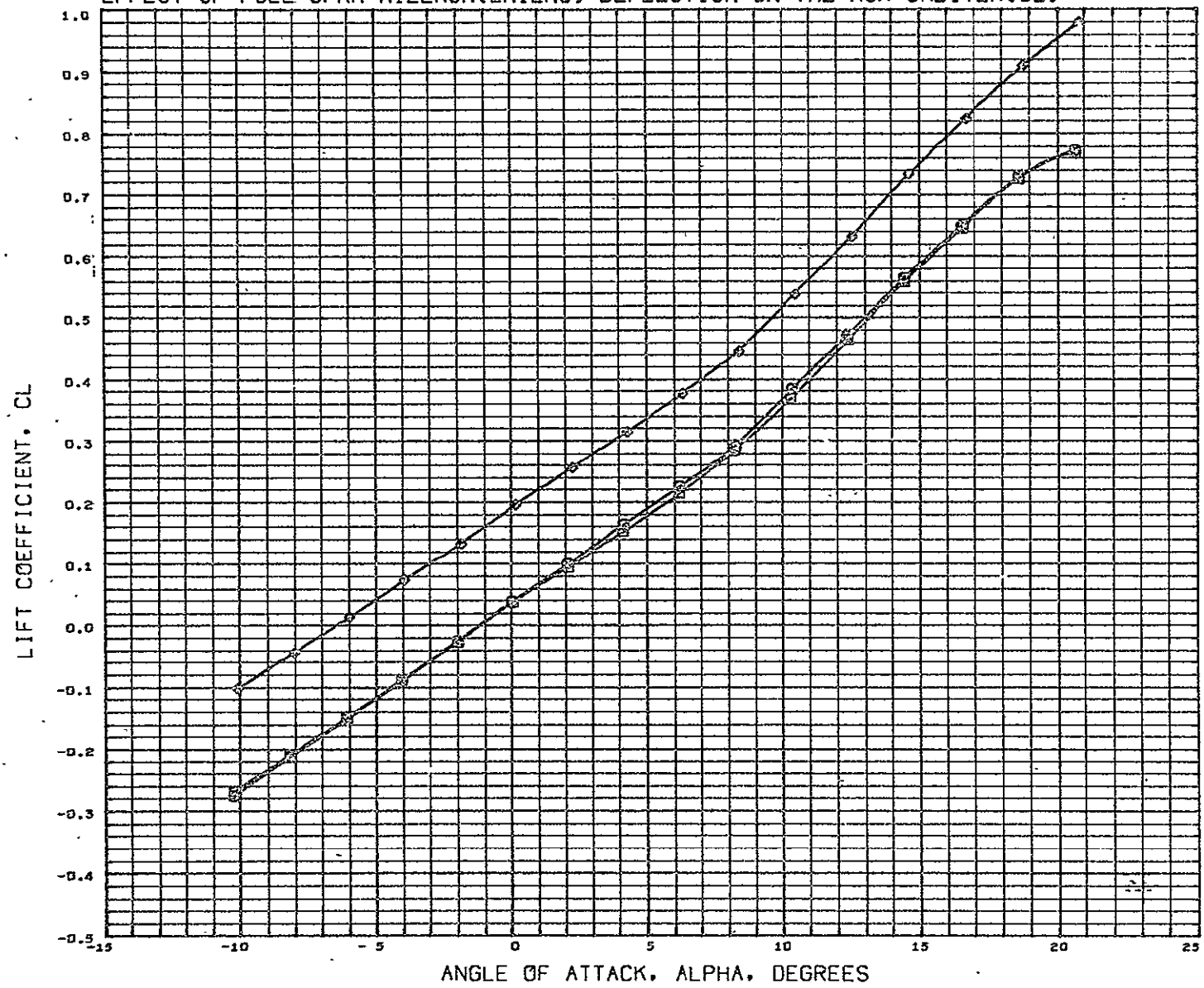
PARAMETRIC VALUES

BETA 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF FULL SPAN AILERON(EN1EN3) DEFLECTION ON THE HCR ORBITER(02)



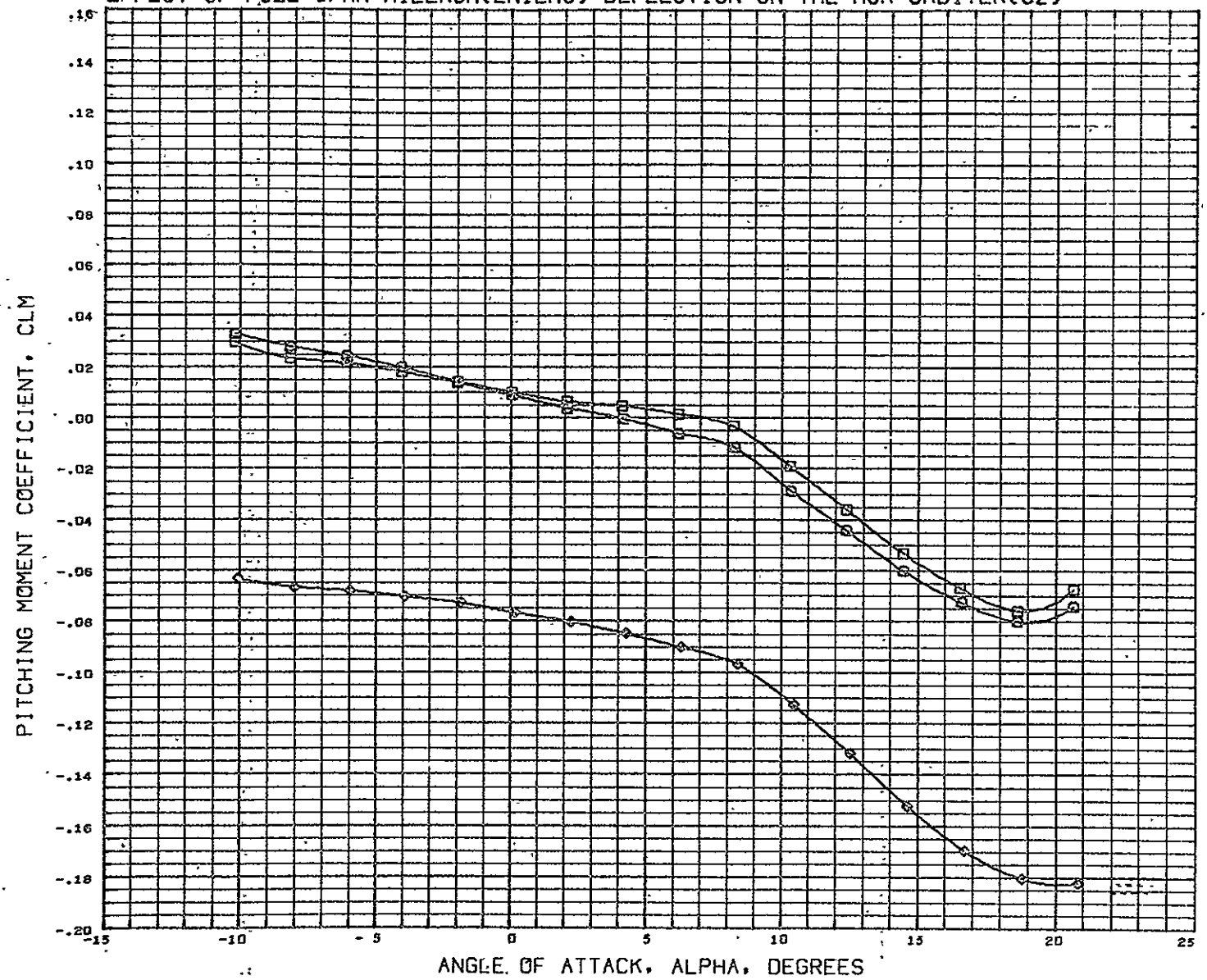
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION				PARAMETRIC VALUES	
(TCFT32)	○	LSWT 240	B1W3V3EN1EN3	ELEVON=0	AILRON=0/-30	BETA	0.000
(TCFD31)	□	LSWT 240	B1W3V3EN1EN3	ELEVON=-15	AILRON=0/0		
(TCFD20)	◇	LSWT 240	B1W3V3	ELEVON=0	AILRON=0/0		

FLAP,B 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

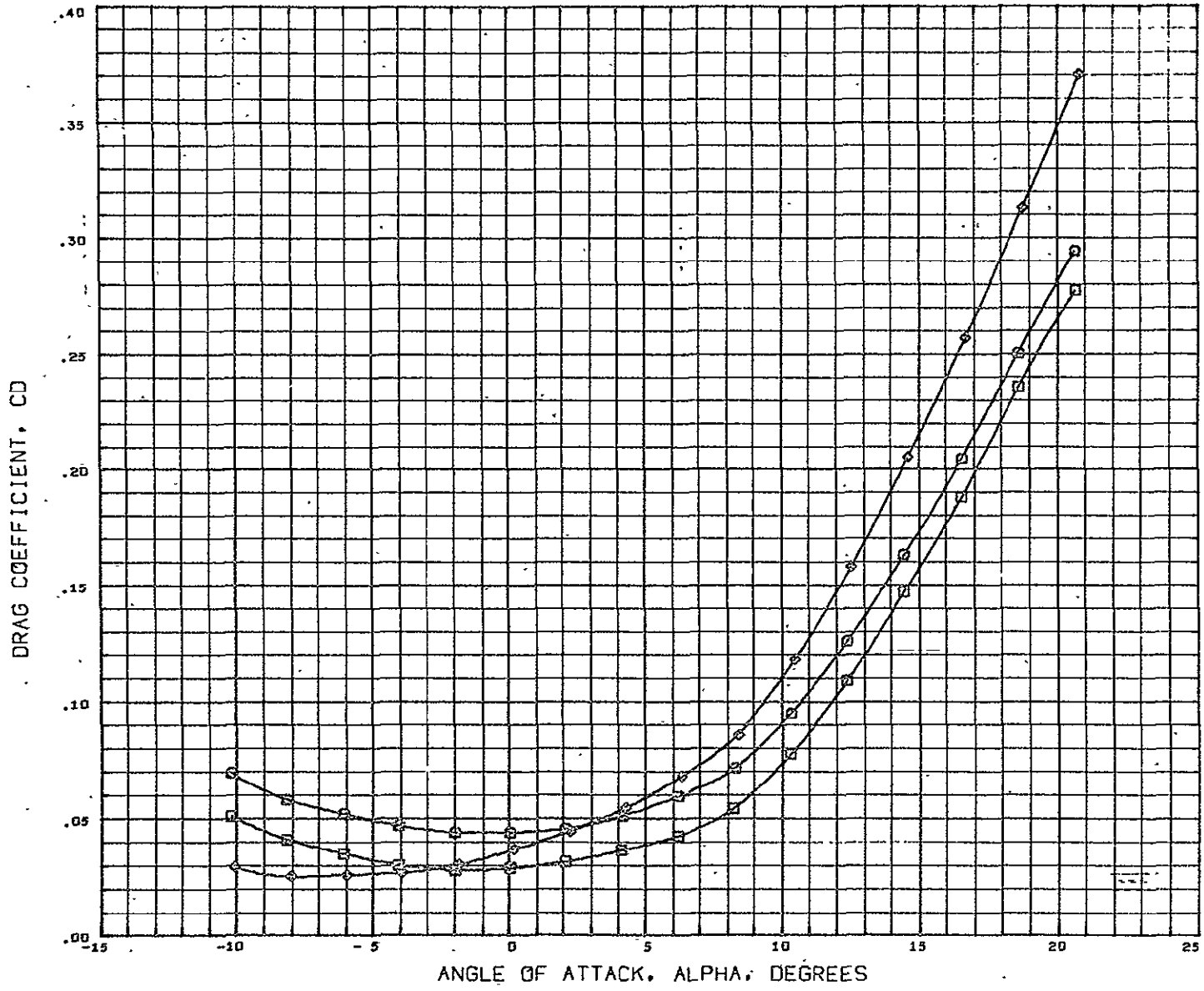
EFFECT OF FULL SPAN AILERON(EN1EN3) DEFLECTION ON THE HCR ORBITER(02)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			PARAMETRIC VALUES		REFERENCE INFORMATION		
(TCFT32)	○	LSWT 240 B1W3V3EN1EN3	ELEVON=0	AILRON=0/-30	BETA	0.000	REFS	9.5800	SQ.FT.
(TCFD31)	□	LSWT 240 B1W3V3EN1EN3	ELEVON=-15	AILRON=0/0			REFL	3.0200	FT.
(TCFD29)	◇	LSWT 240 B1W3V3	ELEVON=0	AILRON=0/0			REFB	3.5400	FT.
							XMRP	4.2210	FT.
							YMRP	0.0000	FT.
							ZMRP	0.6670	FT.
							SCALE	4.0000	PER CE

FLAP,B 0.000

EFFECT OF FULL SPAN AILERON(EN1EN3) DEFLECTION ON THE HCR ORBITER(02)

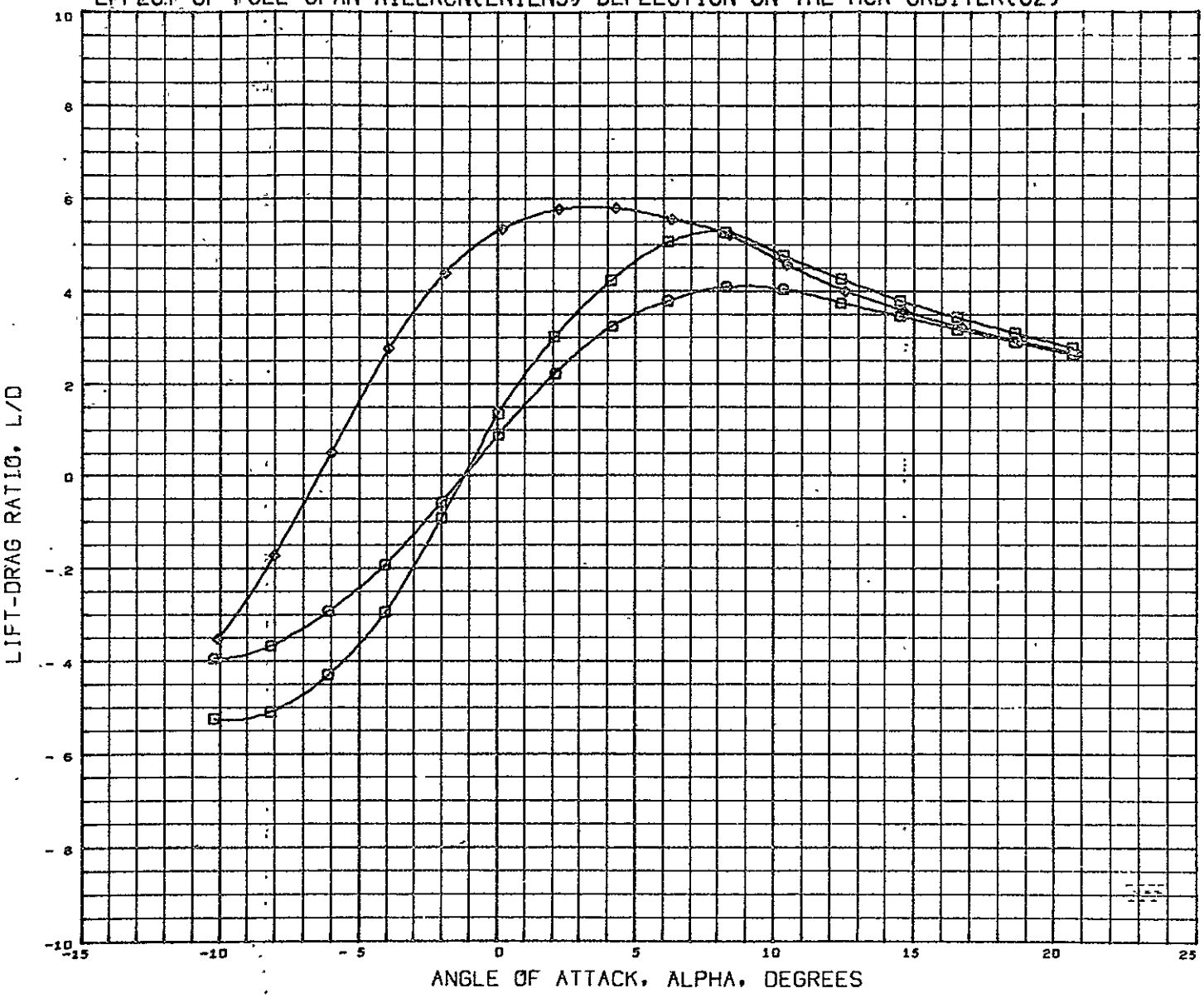


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION				PARAMETRIC VALUES	
(TCFT32)	○	LSWT 240	B1W3V3EN1EN3	ELEVON=0	AILRON=0/-30	BETA	0.000
(TCFD31)	□	LSWT 240	B1W3V3EN1EN3	ELEVON=-15	AILRON=0/0		
(TCFD20)	◇	LSWT 240	B1W3V3	ELEVON=0	AILRON=0/0		

FLAP,B 0.000

REFERENCE INFORMATION		
REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF FULL SPAN AILERON(EN1EN3) DEFLECTION ON THE HCR ORBITER(02)

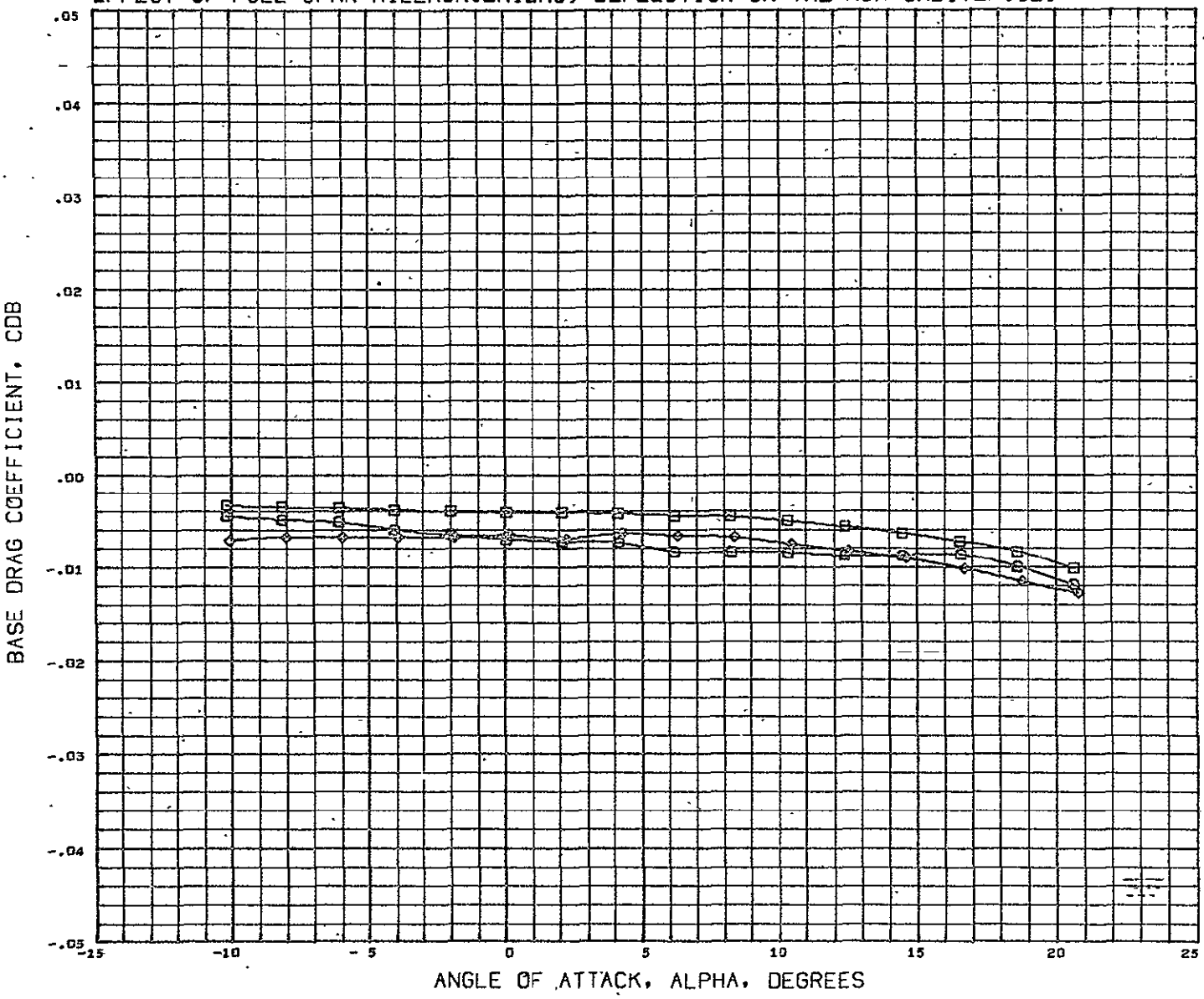


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION				PARAMETRIC VALUES	
(TCFT32)	○	LSWT 240	B1W3V3EN1EN3	ELEVON=0	AILRON=0/-30	BETA	0.000
(TCFD31)	□	LSWT 240	B1W3V3EN1EN3	ELEVON=-15	AILRON=0/0		
(TCFD20)	◇	LSWT 240	B1W3V3	ELEVON=0	AILRON=0/0		

FLAP,B 0.000

REFERENCE INFORMATION		
REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF FULL SPAN AILERON(EN1EN3) DEFLECTION ON THE HCR ORBITER(02)



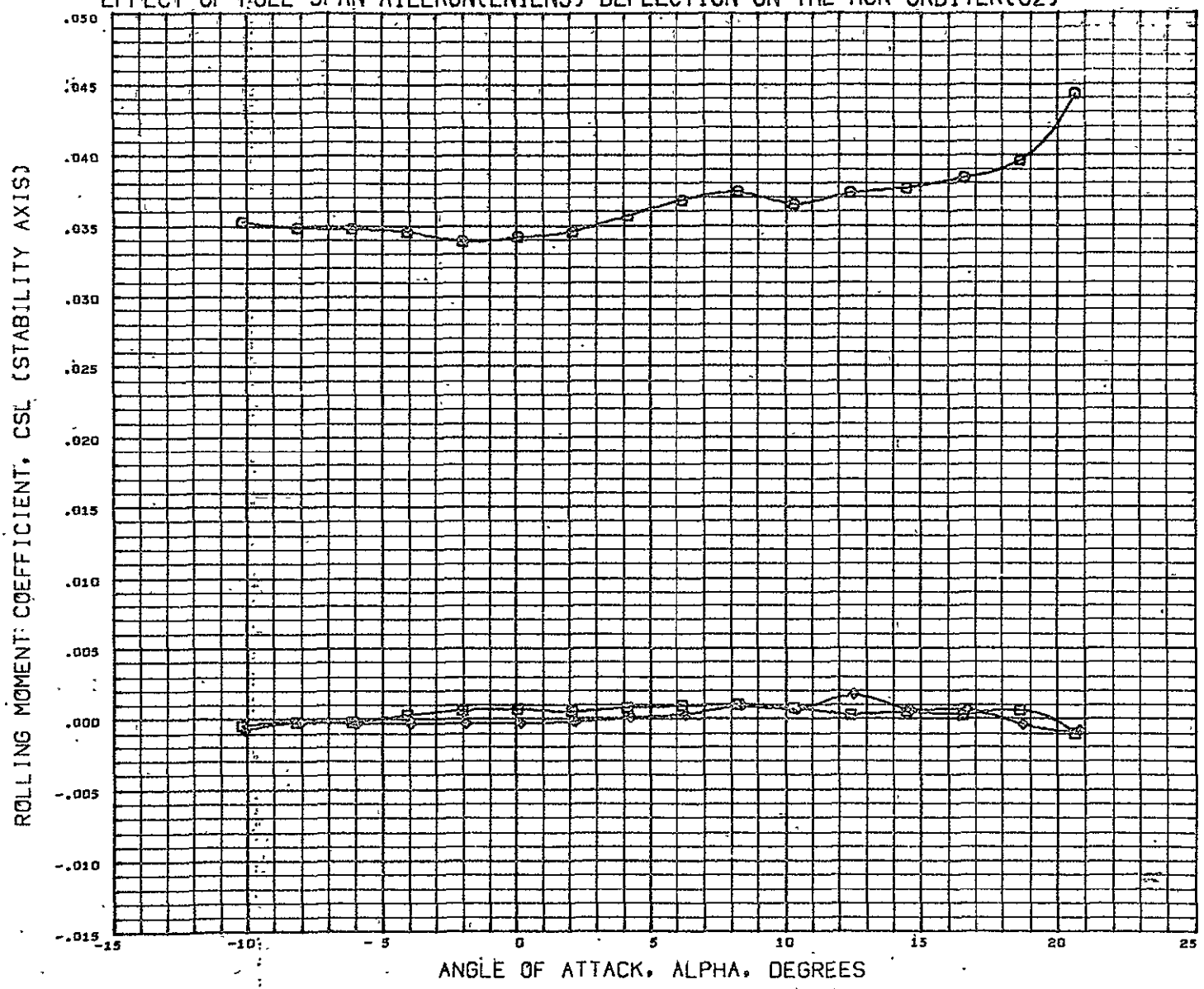
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION				PARAMETRIC VALUES	
(TCFT32)	○	LSWT 240	B1W3V3EN1EN3	ELEVON=0	AILRON=0/-30	BETA	0.000
(TCFD31)	□	LSWT 240	B1W3V3EN1EN3	ELEVON=-15	AILRON=0/0		
(TCFD20)	◇	LSWT 240	B1W3V3	ELEVON=0	AILRON=0/0		

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

FLAP,B 0.000

EFFECT OF FULL SPAN AILERON(EN1EN3) DEFLECTION ON THE HCR ORBITER(02)

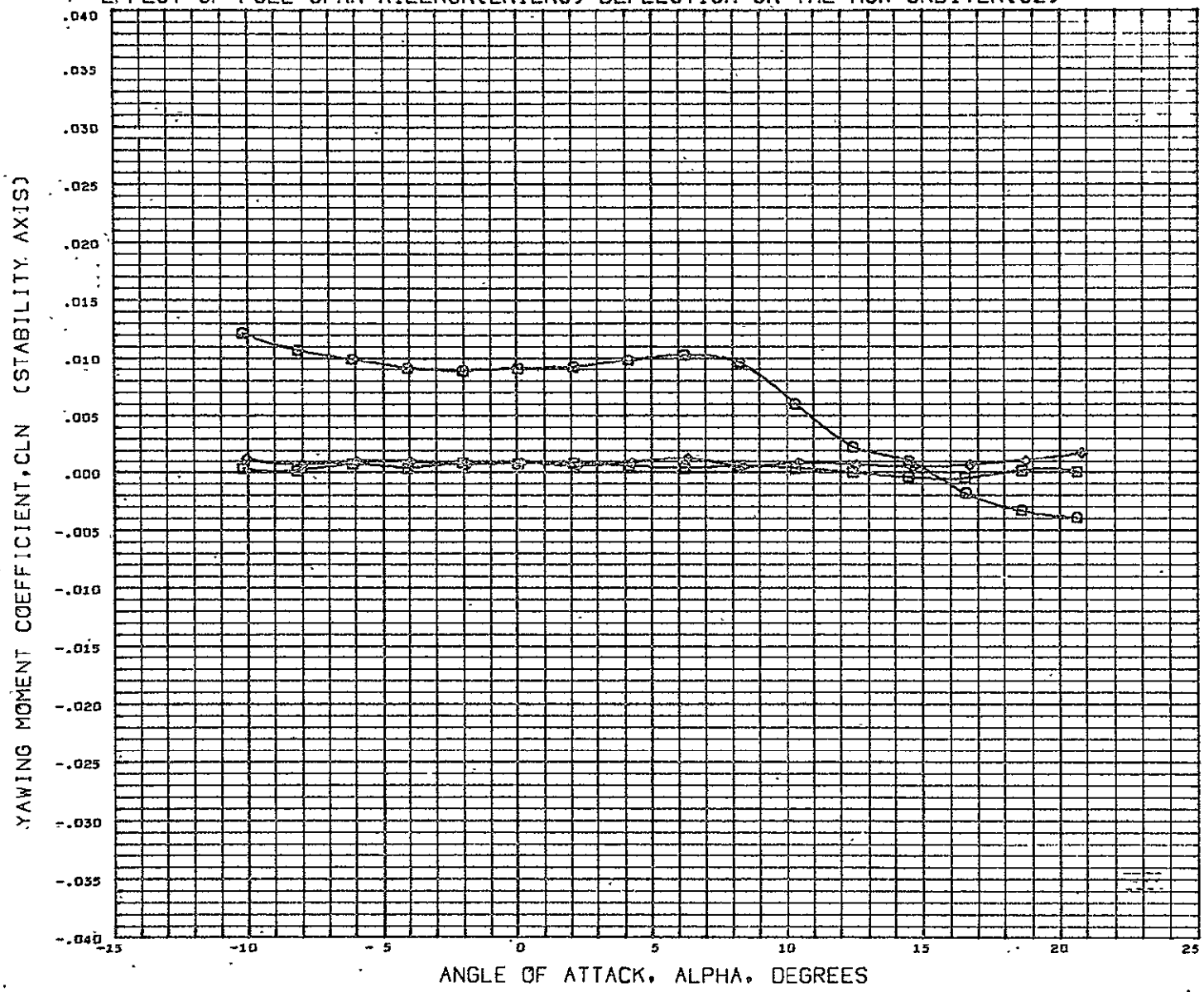


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION				PARAMETRIC VALUES	
(TCF032)	○	LSWT 240	B1W3V3EN1EN3	ELEVON=0	AILRON=0/-30	BETA	0.000
(TCF031)	□	LSWT 240	B1W3V3EN1EN3	ELEVON=-15	AILRON=0/0		
(TCF020)	◇	LSWT 240	B1W3V3	ELEVON=0	AILRON=0/0		

FLAP,B 0.000

REFERENCE INFORMATION		
REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF FULL SPAN AILERON(EN1EN3) DEFLECTION ON THE HCR ORBITER(02)



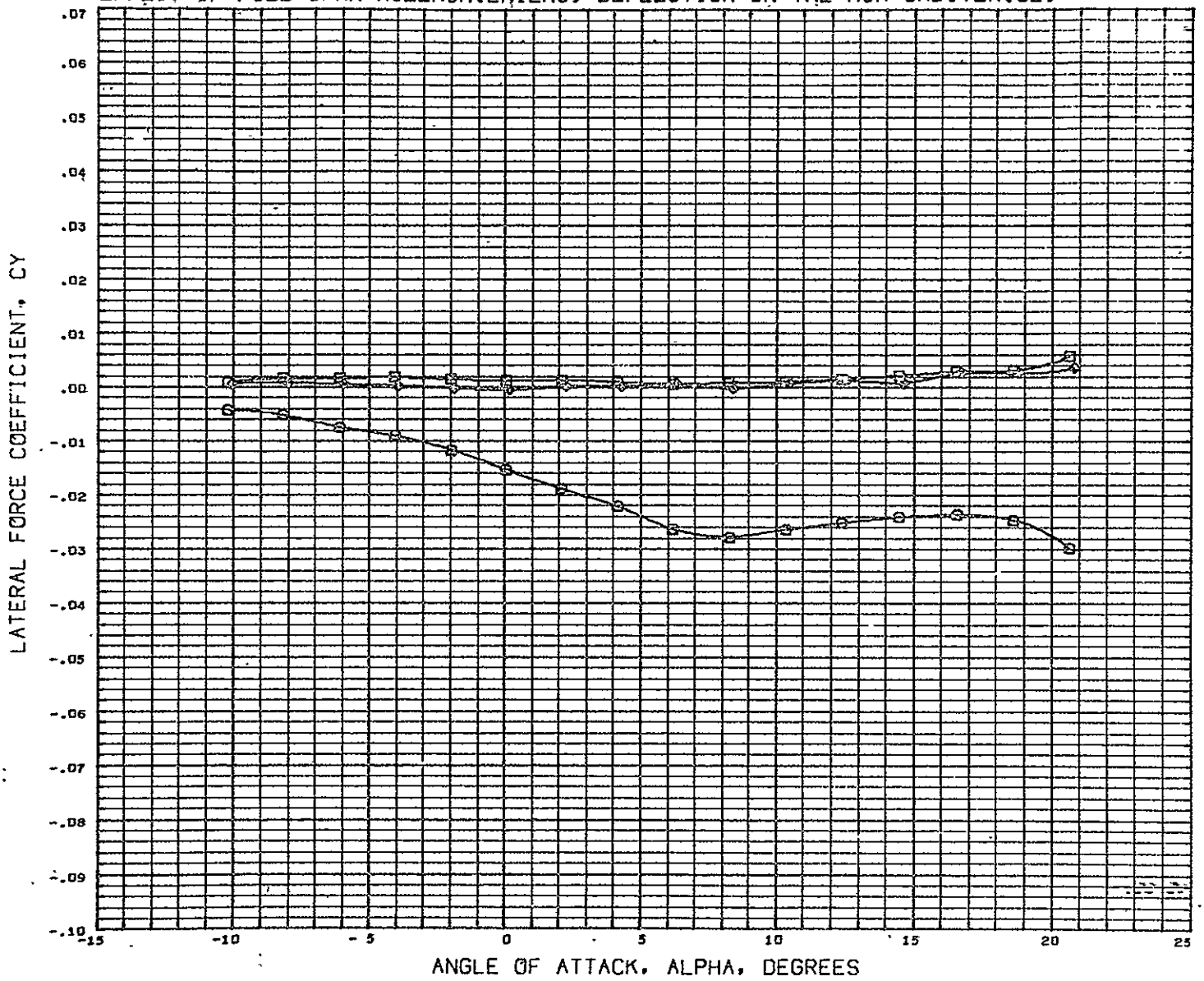
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION					PARAMETRIC VALUES
(TCFT32)	○	LSWT 249	B1W3V3EN1EN3	ELEVON=0	AILRON=0/-30	BETA	0.000
(TCFD31)	□	LSWT 249	B1W3V3EN1EN3	ELEVON=-15	AILRON=0/0		
(TCFD20)	◇	LSWT 249	B1W3V3	ELEVON=0	AILRON=0/0		

FLAP,B 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF FULL SPAN AILERON(EN1EN3) DEFLECTION ON THE HCR ORBITER(02)



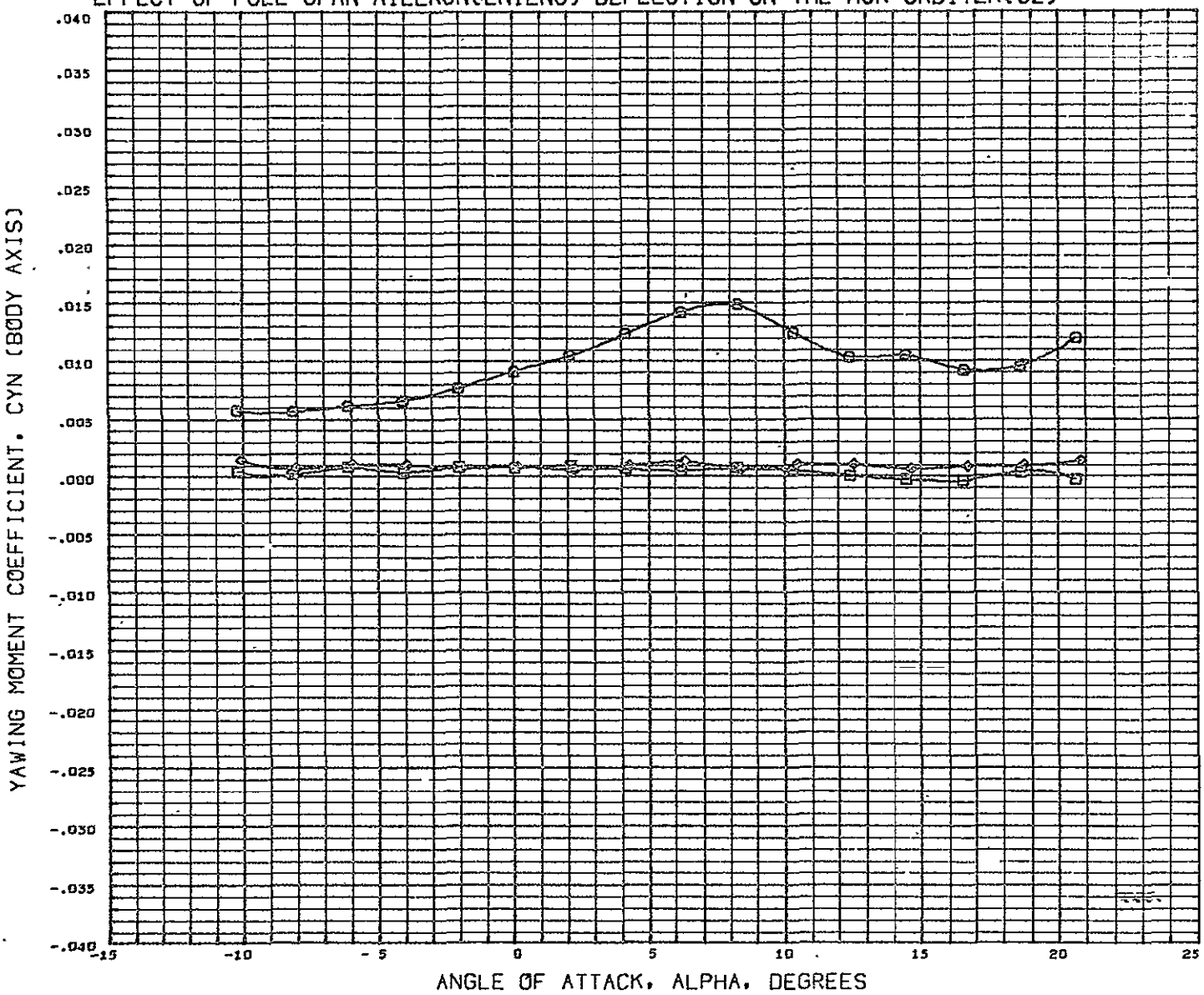
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION				PARAMETRIC VALUES	
(TCFT32)	○	LSWT 240	B1W3V3EN1EN3	ELEVON=0	AILRON=0/-30	BETA	0.000
(TCFD31)	□	LSWT 240	B1W3V3EN1EN3	ELEVON=-15	AILRON=0/0		
(TCFD20)	◇	LSWT 240	B1W3V3	ELEVON=0	AILRON=0/0		

FLAP,B 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

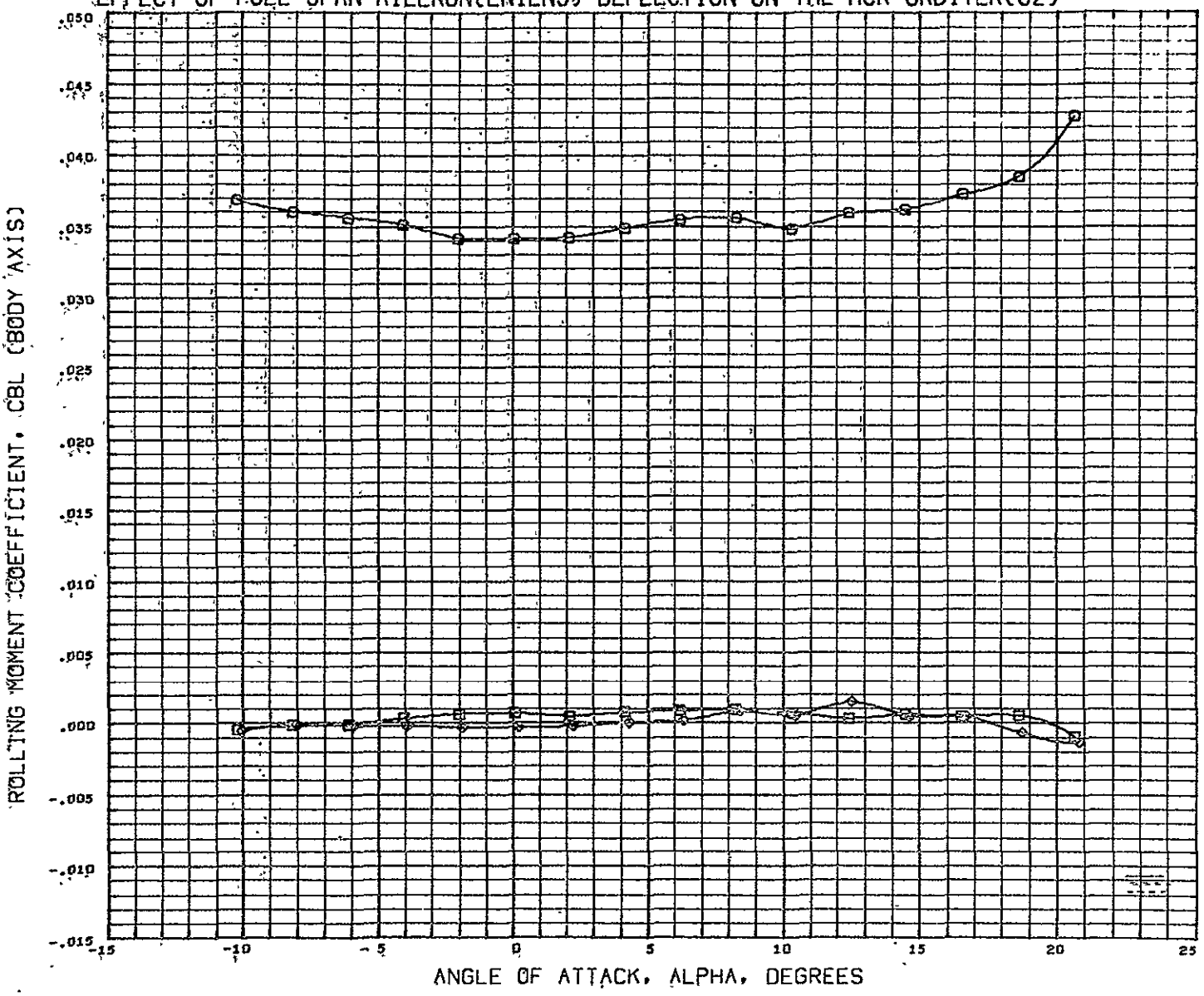
EFFECT OF FULL SPAN AILERON(EN1EN3) DEFLECTION ON THE HCR ORBITER(02)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION					PARAMETRIC VALUES	REFERENCE INFORMATION		
(JCFT32)	○	LSWT 240	B1W3V3EN1EN3	ELEVON=0	AILRON=0/-30	BETA	0.000	REFS	9.5800	SQ.FT.
(JCFD31)	□	LSWT 240	B1W3V3EN1EN3	ELEVON=-15	AILRON=0/0			REFL	3.0200	FT.
(JCFD20)	◇	LSWT 240	B1W3V3	ELEVON=0	AILRON=0/0			REFB	3.5400	FT.
								XMRP	4.2210	FT.
								YMRP	0.0000	FT.
								ZMRP	0.6670	FT.
								SCALE	4.0000	PER CE

FLAP,B 0.000

EFFECT OF FULL SPAN AILERON(EN1EN3) DEFLECTION ON THE HCR ORBITER(02)



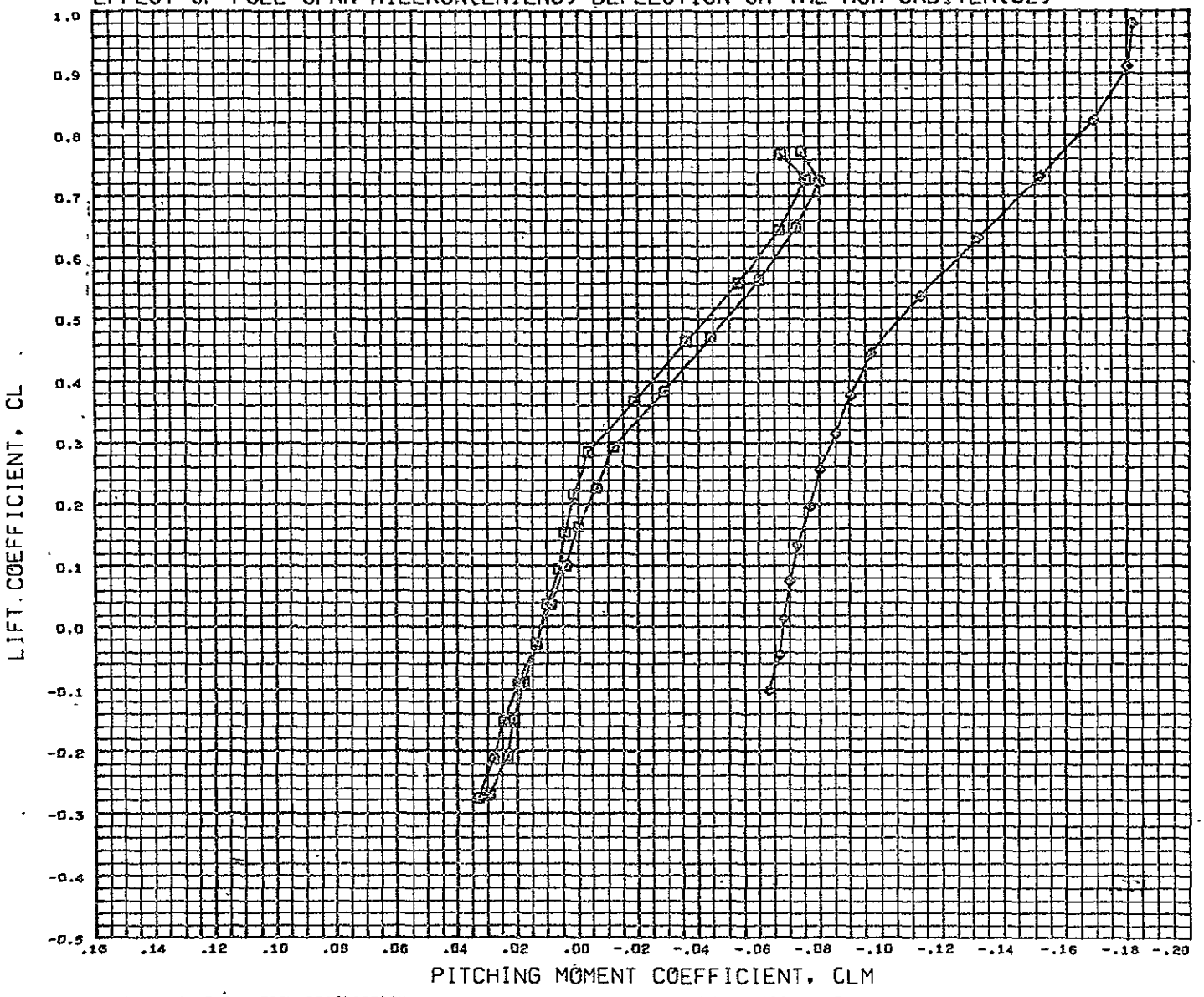
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION				PARAMETRIC VALUES	
(CET32)	○	LSWT 240	B1W3V3EN1EN3	ELEVON=0	AILRON=0/-30	BETA	0.000
(CE031)	□	LSWT 240	B1W3V3EN1EN3	ELEVON=-15	AILRON=0/0		
(CE020)	◇	LSWT 240	B1W3V3	ELEVON=0	AILRON=0/0		

FLAP,B 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF FULL SPAN AILERON(EN1EN3) DEFLECTION ON THE HCR ORBITER(02)

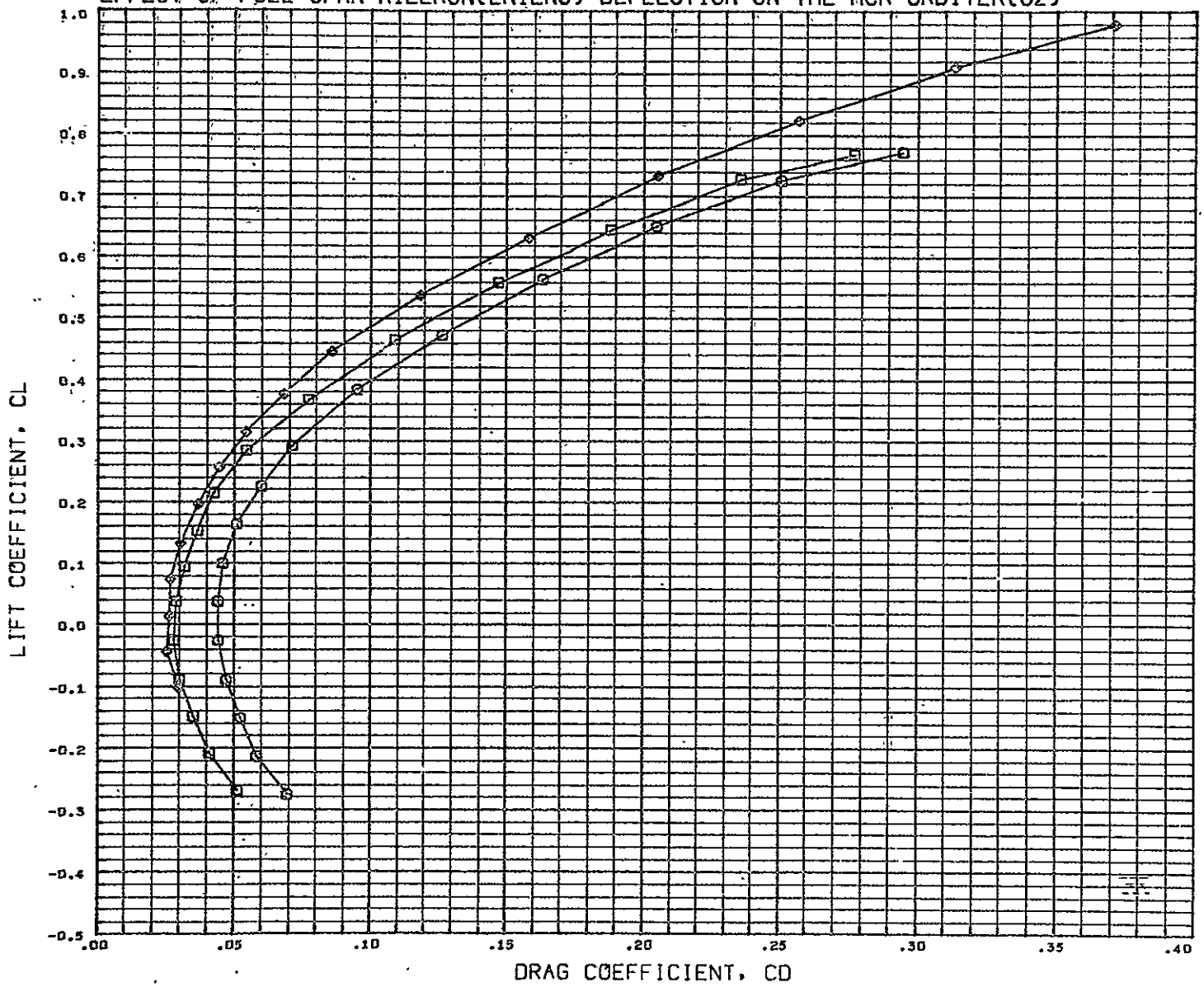


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION				PARAMETRIC VALUES	
(TCFT32)	○	LSWT 249	B1W3V3EN1EN3	ELEVON=0	AILRON=0/-30	BETA	0.000
(TCFD31)	□	LSWT 249	B1W3V3EN1EN3	ELEVON=-15	AILRON=0/0		
(TCFD20)	◇	LSWT 249	B1W3V3	ELEVON=0	AILRON=0/0		

FLAP,B 0.000

REFERENCE INFORMATION		
REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF FULL SPAN AILERON(EN1EN3) DEFLECTION ON THE HCR ORBITER(02)



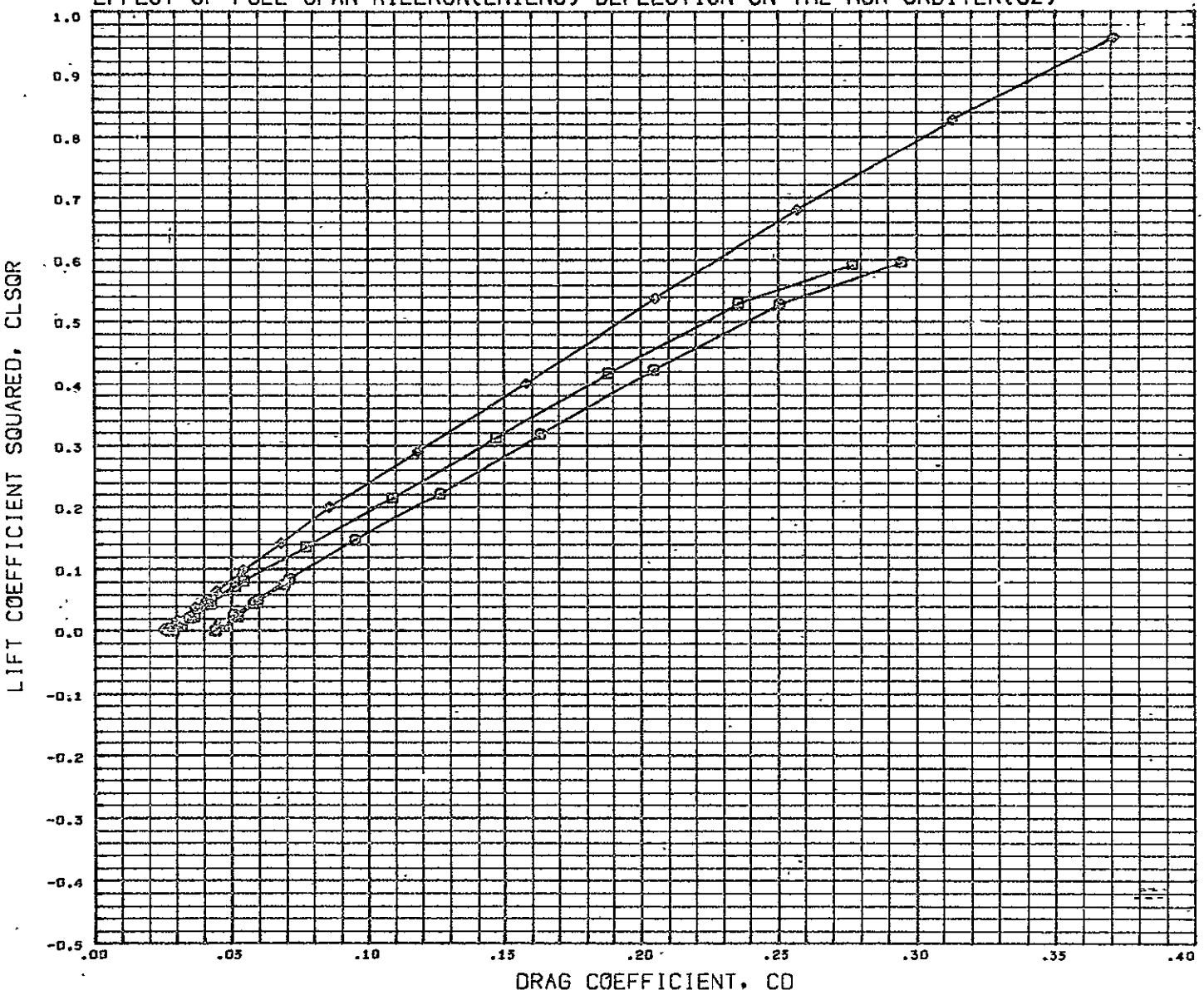
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			PARAMETRIC VALUES	
(TCFT32)	○	LSWT 240	B1W3V3EN1EN3	ELEVON=0	AILRON=0/-30	BETA 0.000
(TCFD31)	□	LSWT 240	B1W3V3EN1EN3	ELEVON=-15	AILRON=0/0	
(TCFD20)	◇	LSWT 240	B1W3V3	ELEVON=0	AILRON=0/0	

FLAP,B 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF FULL SPAN AILERON(EN1EN3) DEFLECTION ON THE HCR ORBITER(02)



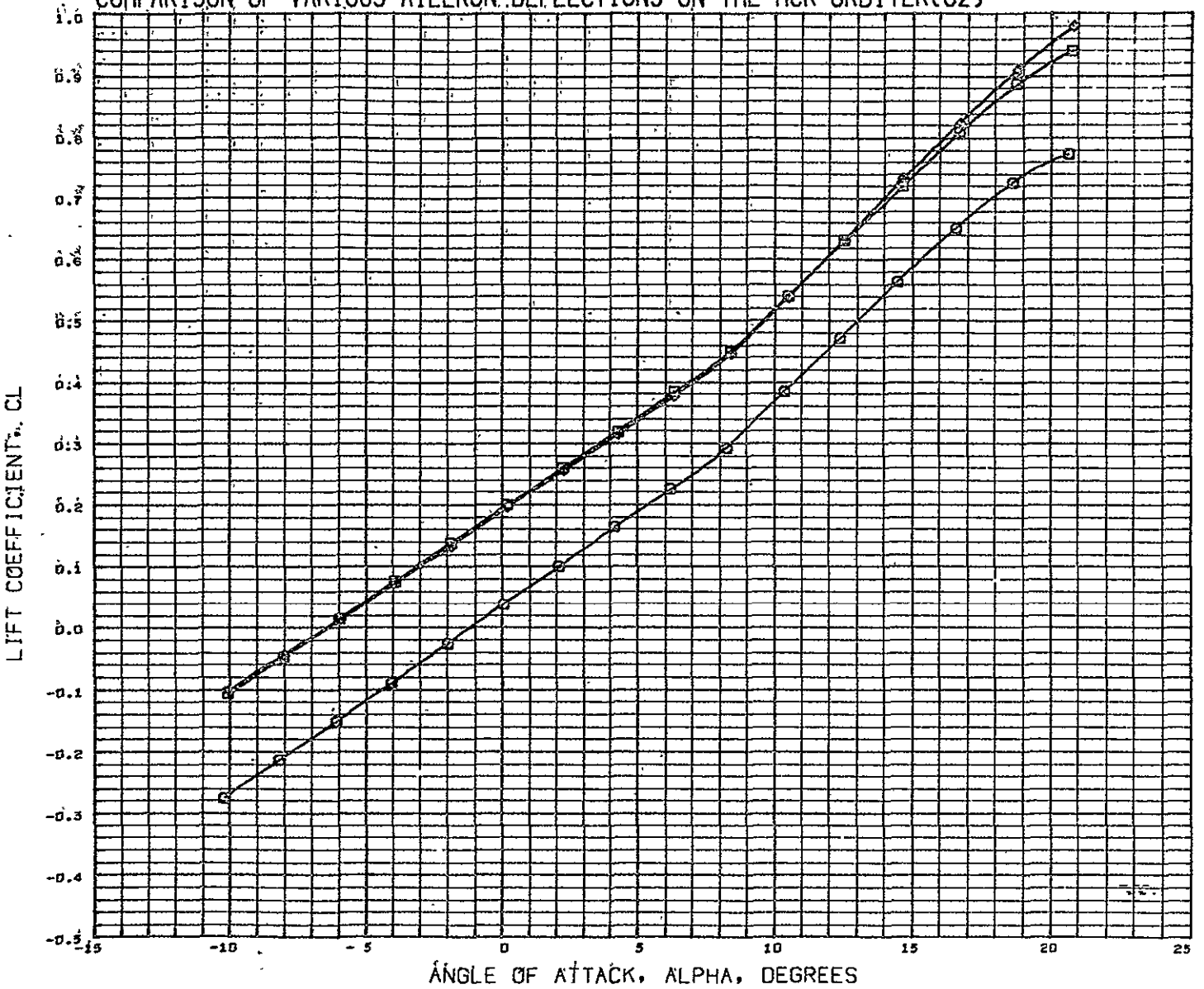
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION				PARAMETRIC VALUES	
(TCFT32)	○	LSWT 240	B1W3V3EN1EN3	ELEVON=0	AILRON=0/-30	BETA	0.000
(TCFD31)	□	LSWT 240	B1W3V3EN1EN3	ELEVON=-15	AILRON=0/0		
(TCFD20)	◇	LSWT 240	B1W3V3	ELEVON=0	AILRON=0/0		

FLAP,B 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

COMPARISON OF VARIOUS AILERON DEFLECTIONS ON THE HCR ORBITER(02)



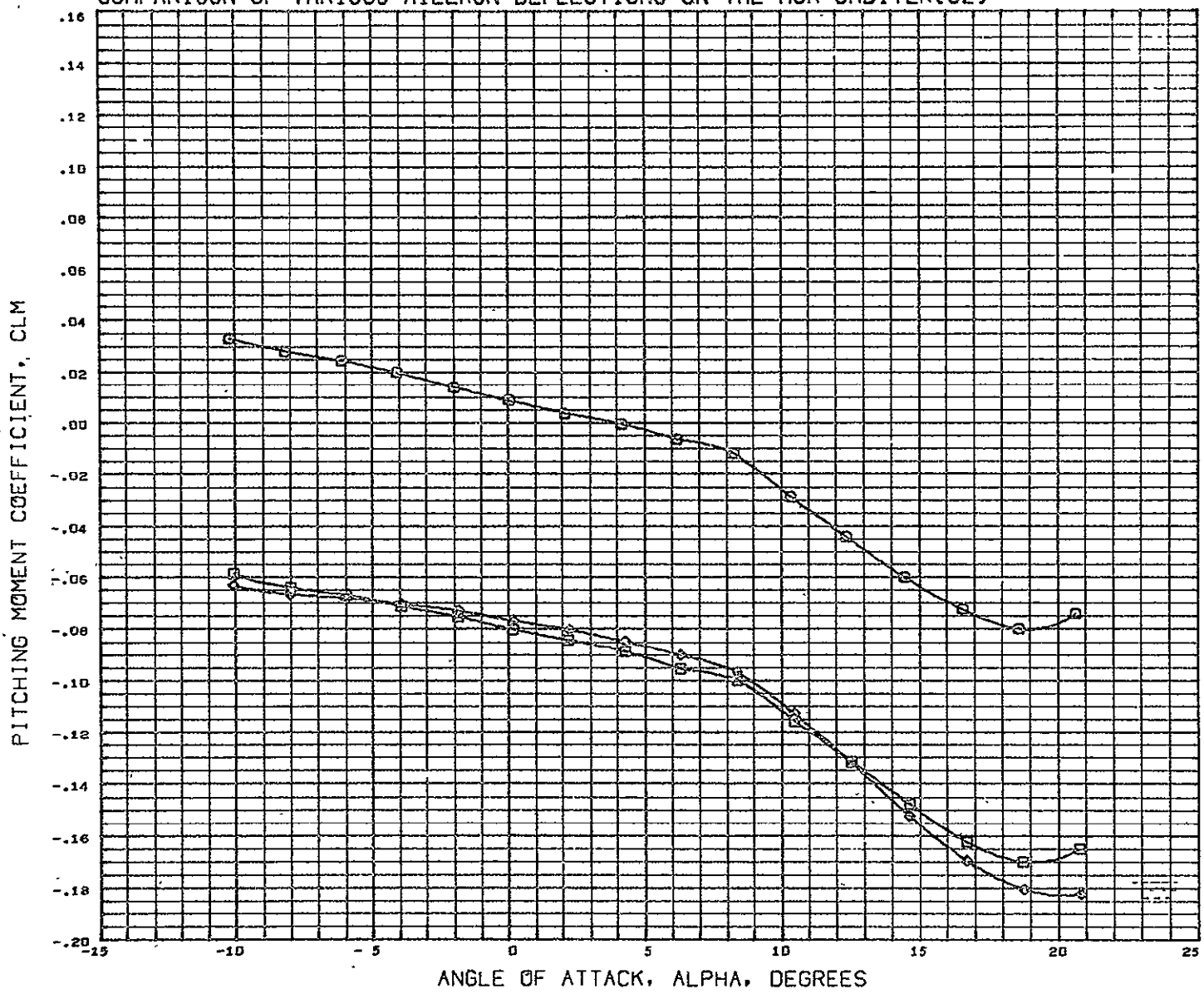
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION				PARAMETRIC VALUES	
(TCFD32)	○	LSWT 240	B1W3V3EN1EN3	AILRON=0/-30	ELEVON=0	BETA	0.000
(TCFD29)	□	LSWT 240	B1W3V3EN3	AILERON=20/-20	ELEVON=0		
(TCFD20)	◇	LSWT 240	B1W3V3	ELEVON=0	AILRON=0/0		

FLAP,B 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

COMPARISON OF VARIOUS AILERON DEFLECTIONS ON THE HCR ORBITER(02)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			
(TCF032)	○	LSWT 240	B1W3V3EN1EN3	AILRON=0/-30	ELEVON=0
(TCF029)	□	LSWT 240	B1W3V3EN3	AILERON=20/-20	ELEVON=0
(TCF020)	◇	LSWT 240	B1W3V3	ELEVON=0	AILRON=0/0

PARAMETRIC VALUES

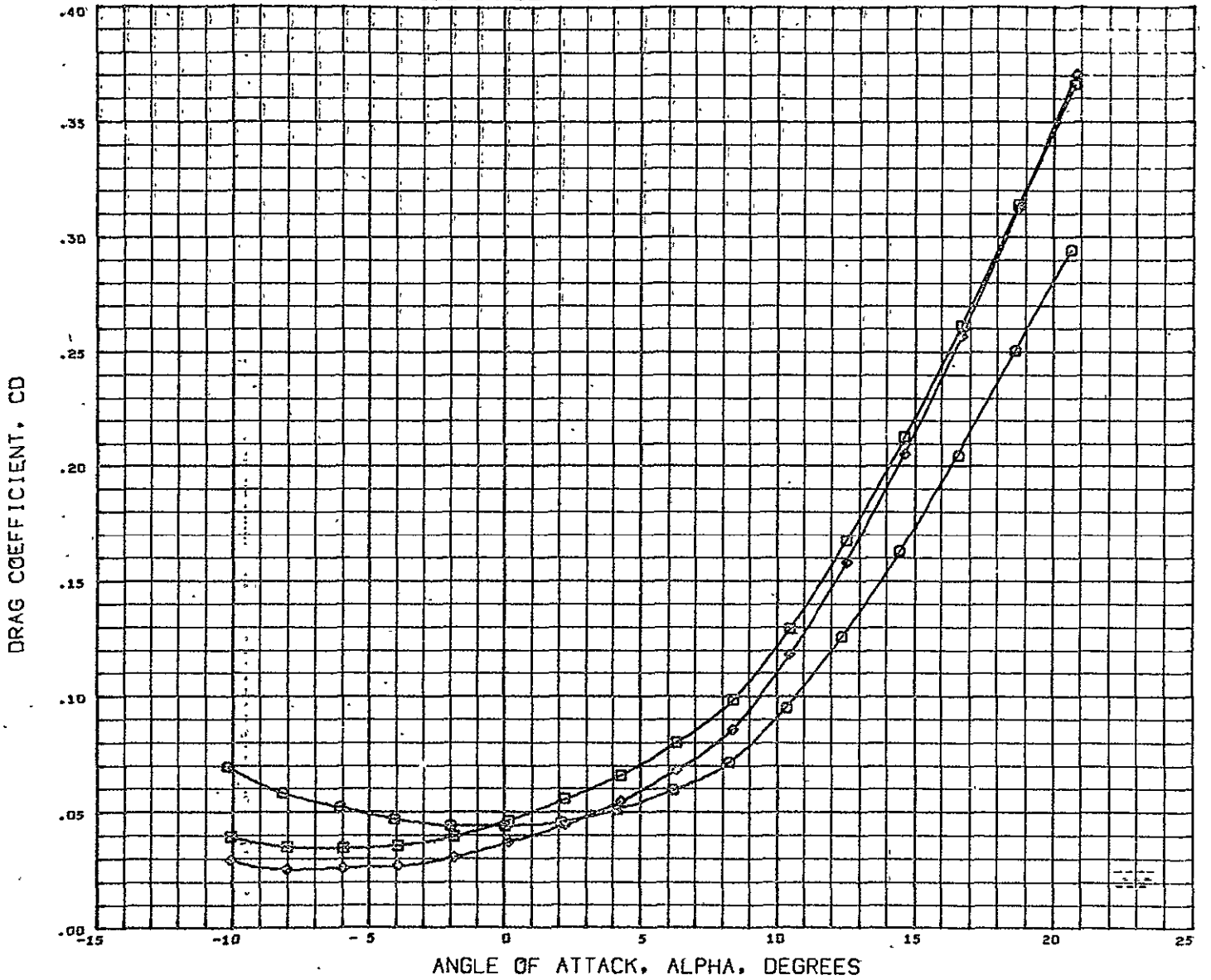
BETA 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

FLAP,B 0.000

COMPARISON OF VARIOUS AILERON DEFLECTIONS ON THE HCR ORBITER(02)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			
(TCFD32)	○	LSWT 240 .B1W3V3EN1EN3	AILRON=0/-30	ELEVON=0	
(TCFD29)	□	LSWT 240 B1W3V3EN3	AILERON=20/-20	ELEVON=0	
(TCFD20)	◇	LSWT 240 B1W3V3	ELEVON=0	AILRON=0/0	

PARAMETRIC VALUES

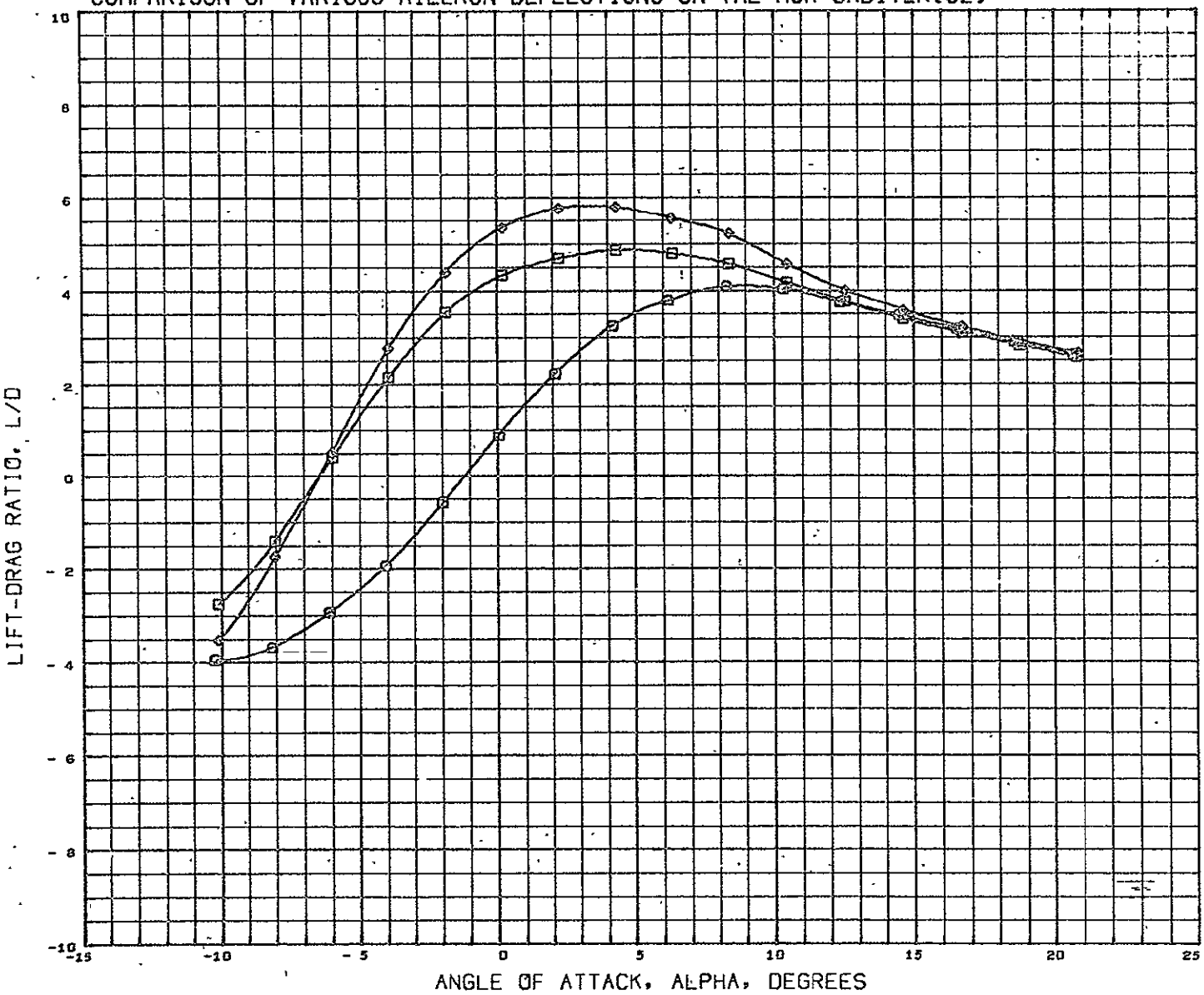
BETA 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

FLAP,B 0.000

COMPARISON OF VARIOUS AILERON DEFLECTIONS ON THE HCR ORBITER(02)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION				
(TCFD32)	○	LSWT 240	B1W3V3EN1EN3	AILRON=0/-30	ELEVON=0	
(TCFD29)	□	LSWT 240	B1W3V3EN3	AILERON=20/-20	ELEVON=0	
(TCFD20)	◇	LSWT 240	B1W3V3	ELEVON=0	AILRON=0/0	

FLAP,B 0.000

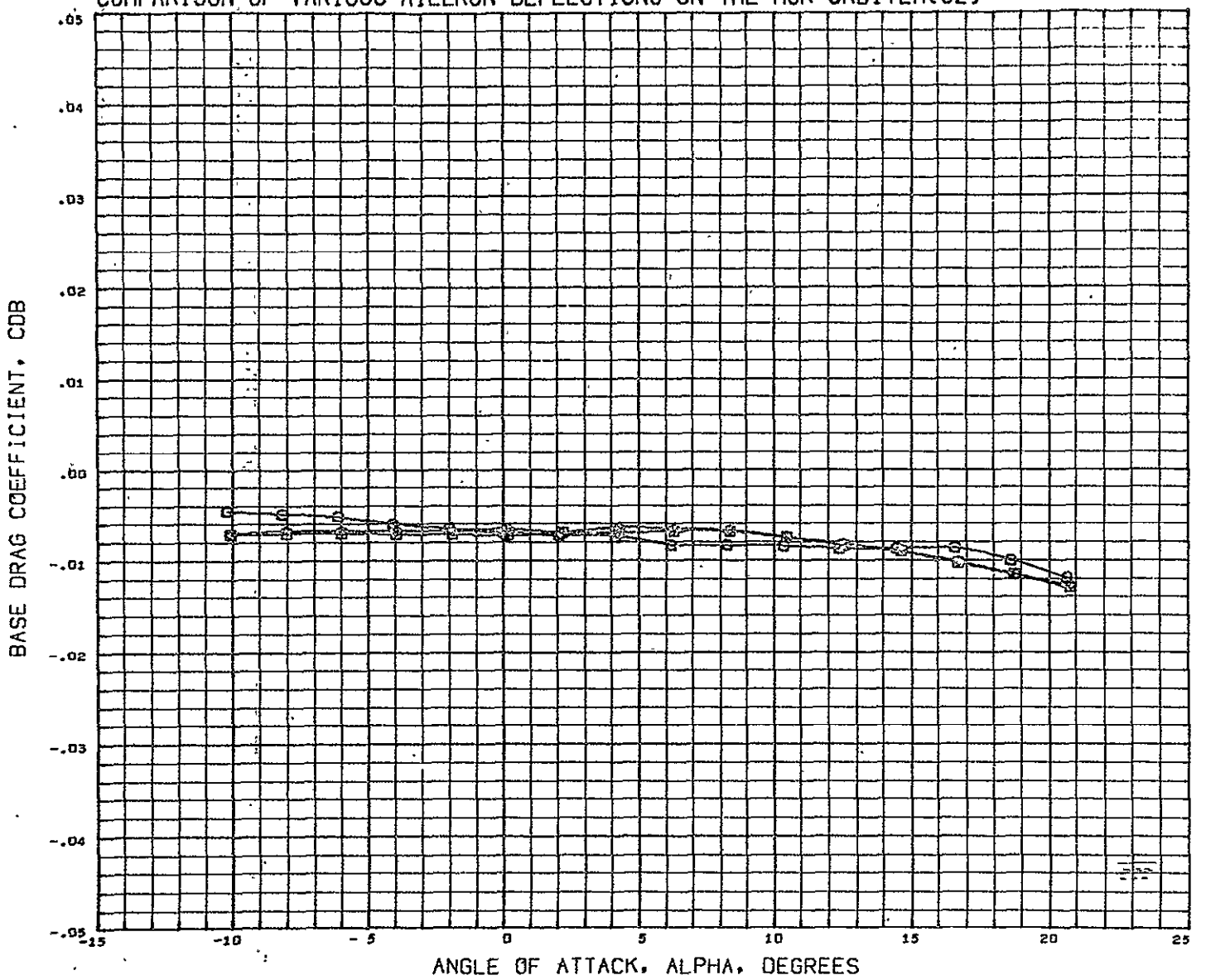
PARAMETRIC VALUES

BETA 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

COMPARISON OF VARIOUS AILERON DEFLECTIONS ON THE HCR ORBITER(02)

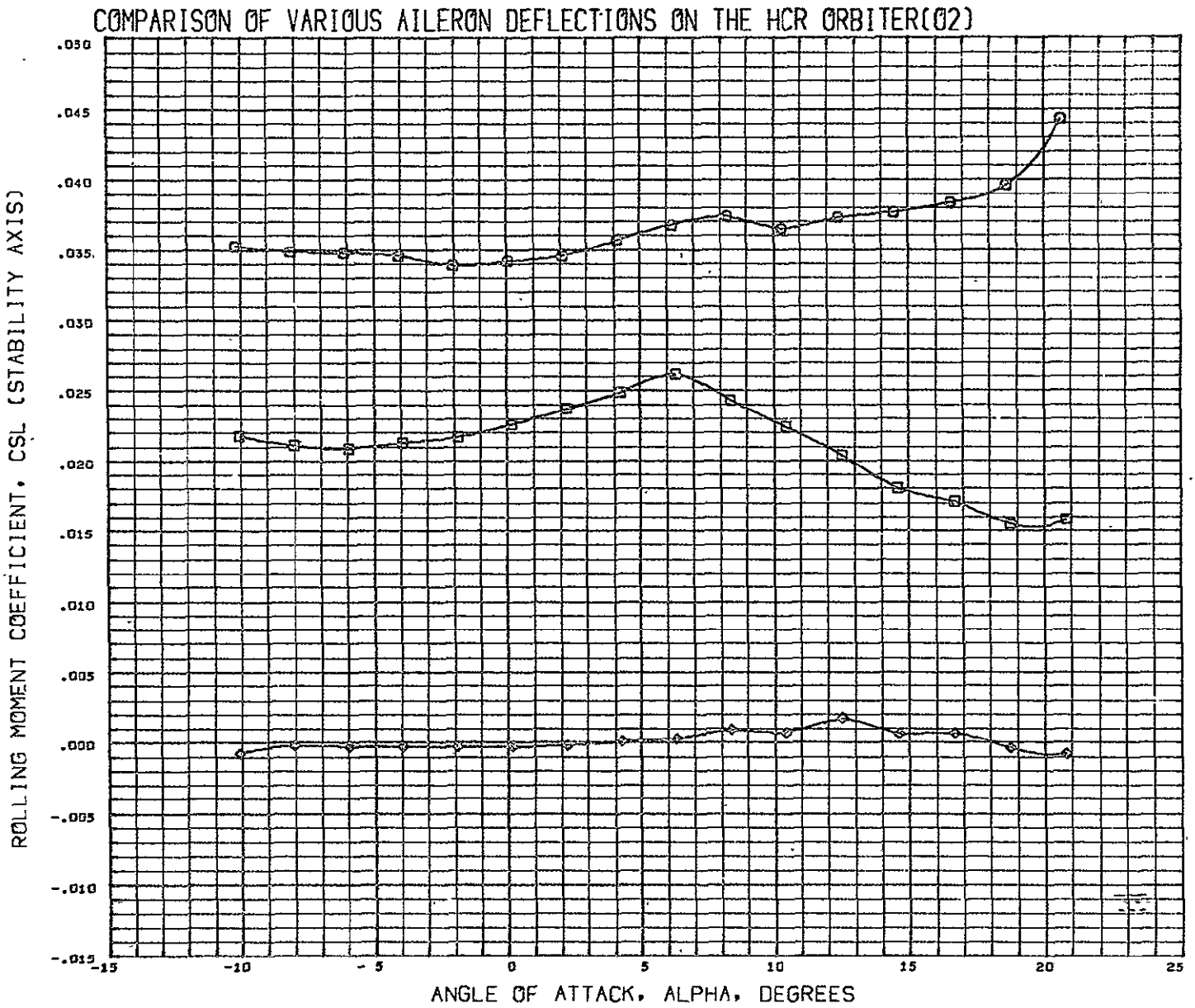


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION				PARAMETRIC VALUES	
(TCFD32)	○	LSWT 240	B1W3V3EN1EN3	AILRON=0/-30	ELEVON=0	BETA	0.000
(TCFD29)	□	LSWT 240	B1W3V3EN3	AILERON=20/-20	ELEVON=0		
(TCFD20)	◇	LSWT 240	B1W3V3	ELEVON=0	AILRON=0/0		

FLAP,B 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE



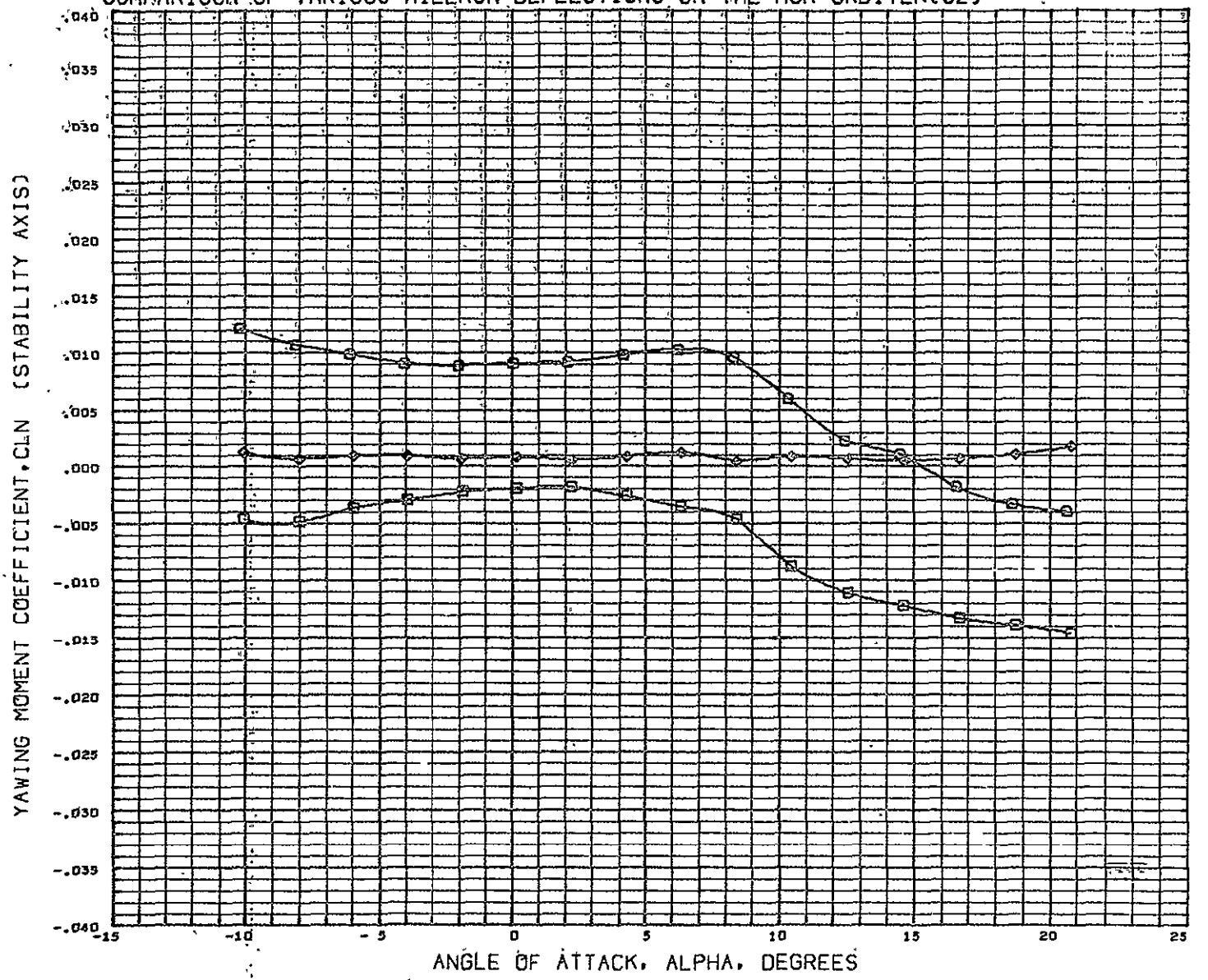
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	PARAMETRIC VALUES	
(TCFD32)	○	LSWT 240 B1W3V3EN1EN3 AILRON=0/-30 ELEVON=0	BETA	0.000
(TCFD29)	□	LSWT 240 B1W3V3EN3 AILERON=20/-20ELEVON=0		
(TCFD20)	◇	LSWT 240 B1W3V3 ELEVON=0 AILRON=0/0		

FLAP,B 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

COMPARISON OF VARIOUS AILERON DEFLECTIONS ON THE HCR ORBITER(02)



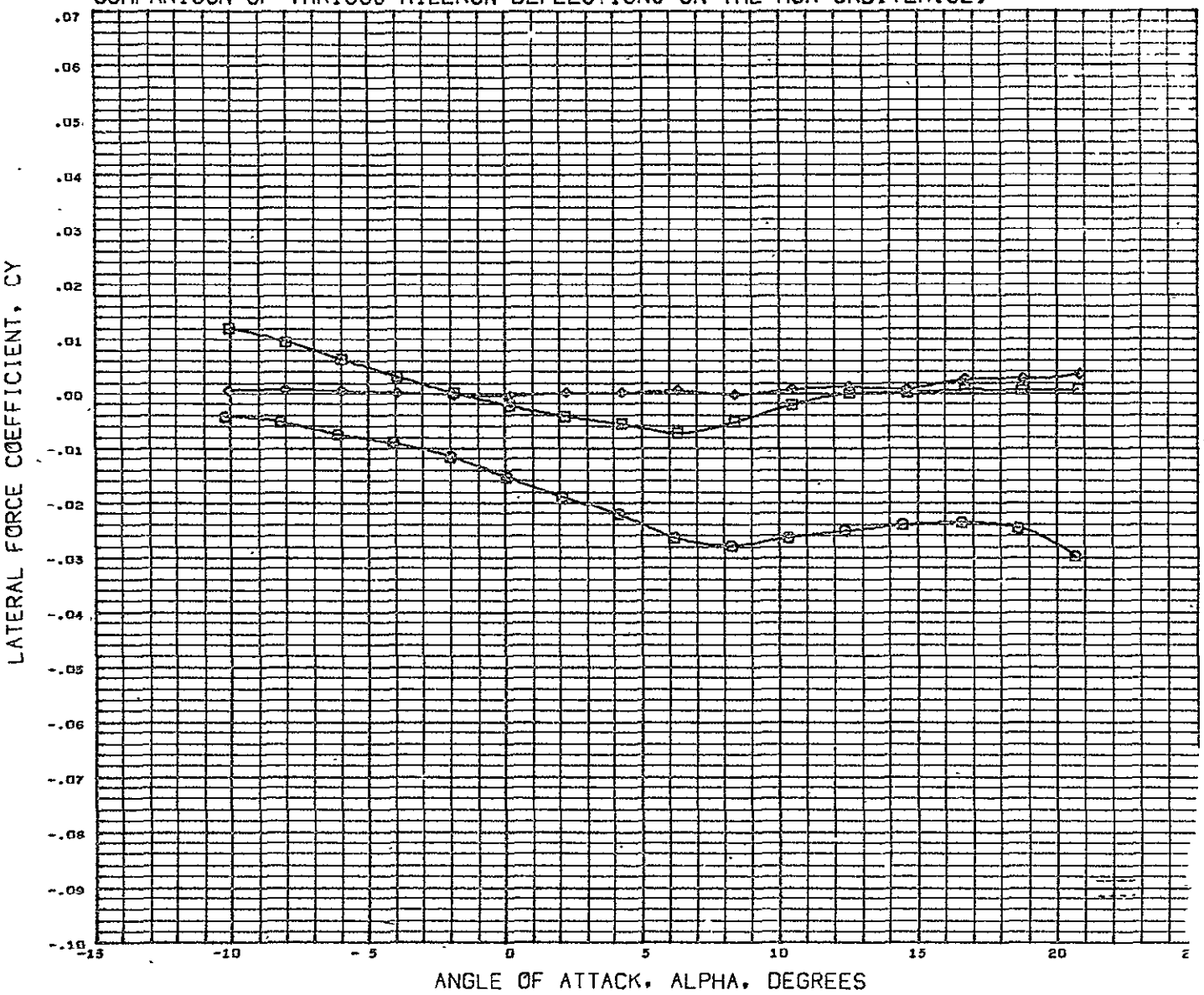
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION				PARAMETRIC VALUES
(TCFD32)	○	LSWT 240	B1W3V3EN1EN3	AILRON=0/-30	ELEVON=0	BETA 0.000
(TCFD29)	□	LSWT 240	B1W3V3EN3	AILERON=20/-20	ELEVON=0	
(TCFD20)	◇	LSWT 240	B1W3V3	ELEVON=0	AILRON=0/0	

FLAP.B 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

COMPARISON OF VARIOUS AILERON DEFLECTIONS ON THE HCR ORBITER(02)

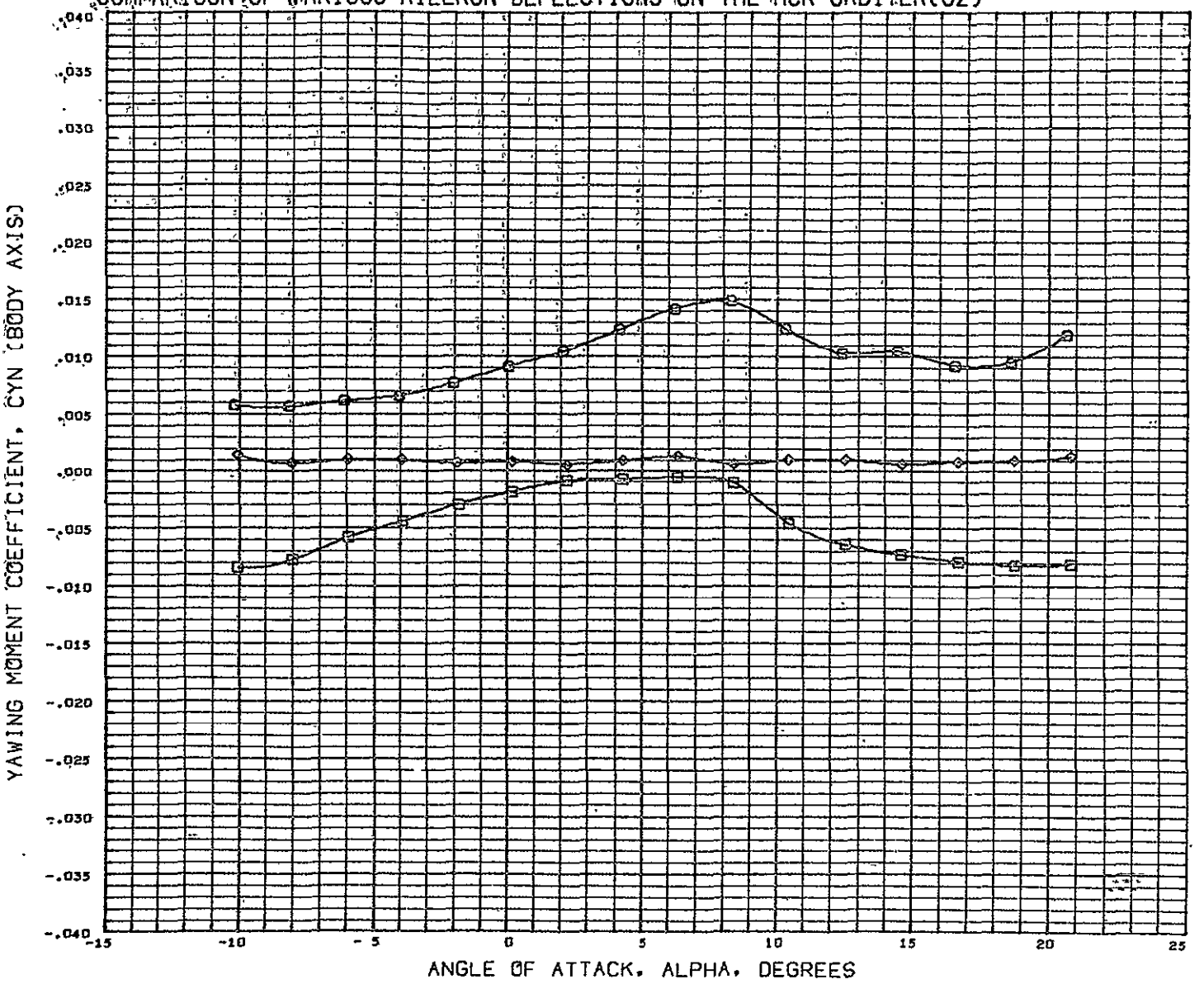


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION				PARAMETRIC VALUES	
(TCFD32)	○	LSWT 240	B1W3V3EN1EN3	AILRON=0/-30	ELEVON=0	BETA	0.000
(TCFD29)	□	LSWT 240	B1W3V3EN3	AILERON=20/-20	ELEVON=0		
(TCFD20)	◇	LSWT 240	B1W3V3	ELEVON=0	AILRON=0/0		

FLAP,B 0.000

REFERENCE INFORMATION		
REFS	9.5800	SQ.FT
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER C

COMPARISON OF VARIOUS AILERON DEFLECTIONS ON THE HCR ORBITER(02)

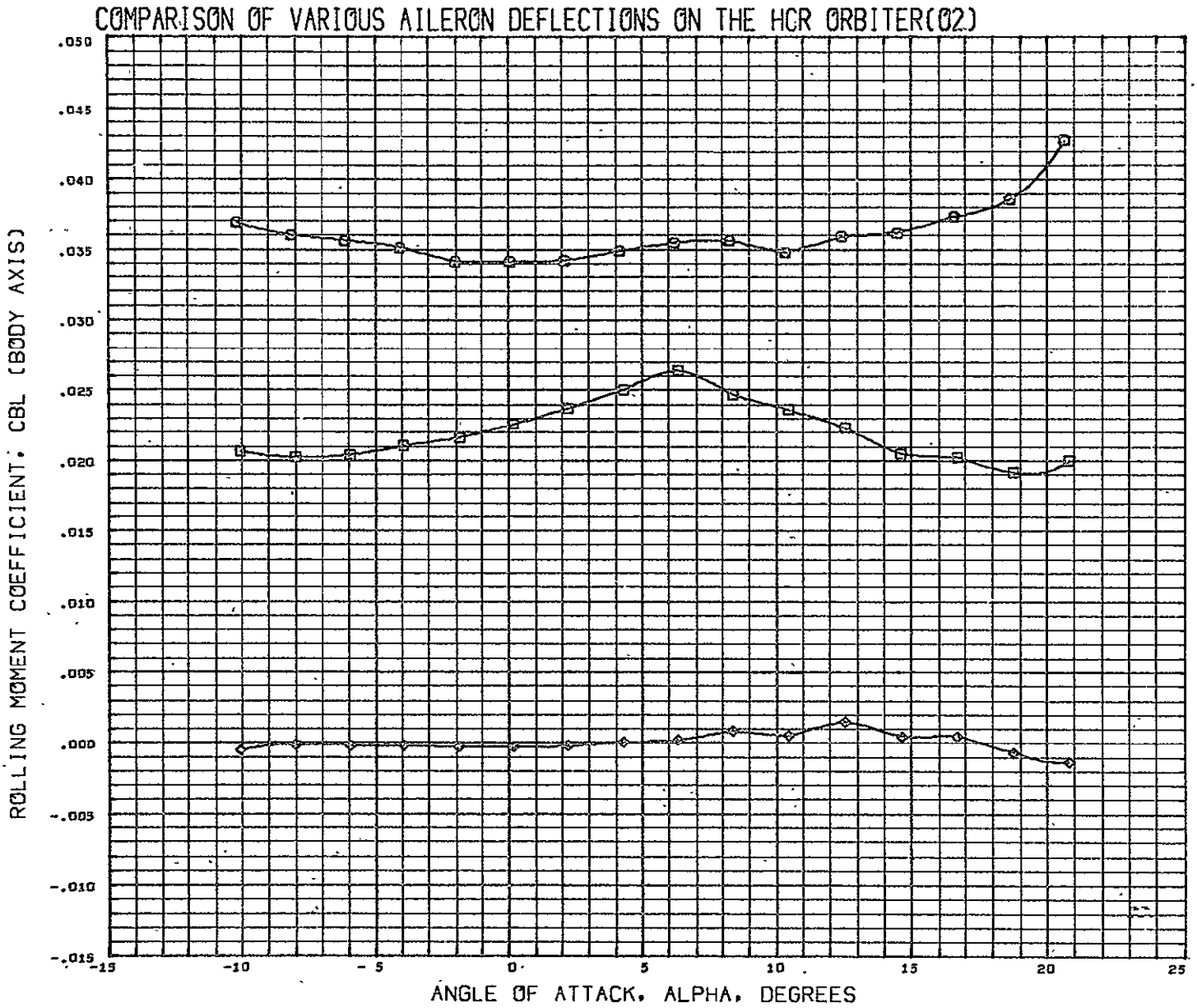


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION				PARAMETRIC VALUES	
(JCFD32)	○	LSWT 240	B1W3V3EN1EN3	AILRON=0/-30	ELEVON=0	BETA	0.000
(JCFD29)	□	LSWT 240	B1W3V3EN3	AILERON=20/-20	ELEVON=0		
(JCFD20)	◇	LSWT 240	B1W3V3	ELEVON=0	AILRON=0/0		

FLAP,B 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			
(JCFD32)	○	LSWT 240	B1W3V3EN1EN3	AILRON=0/-30	ELEVON=0
(JCFD29)	□	LSWT 240	B1W3V3EN3	AILERON=20/-20	ELEVON=0
(JCFD20)	◇	LSWT 240	B1W3V3	ELEVON=0	AILRON=0/0

FLAP,B 0.000

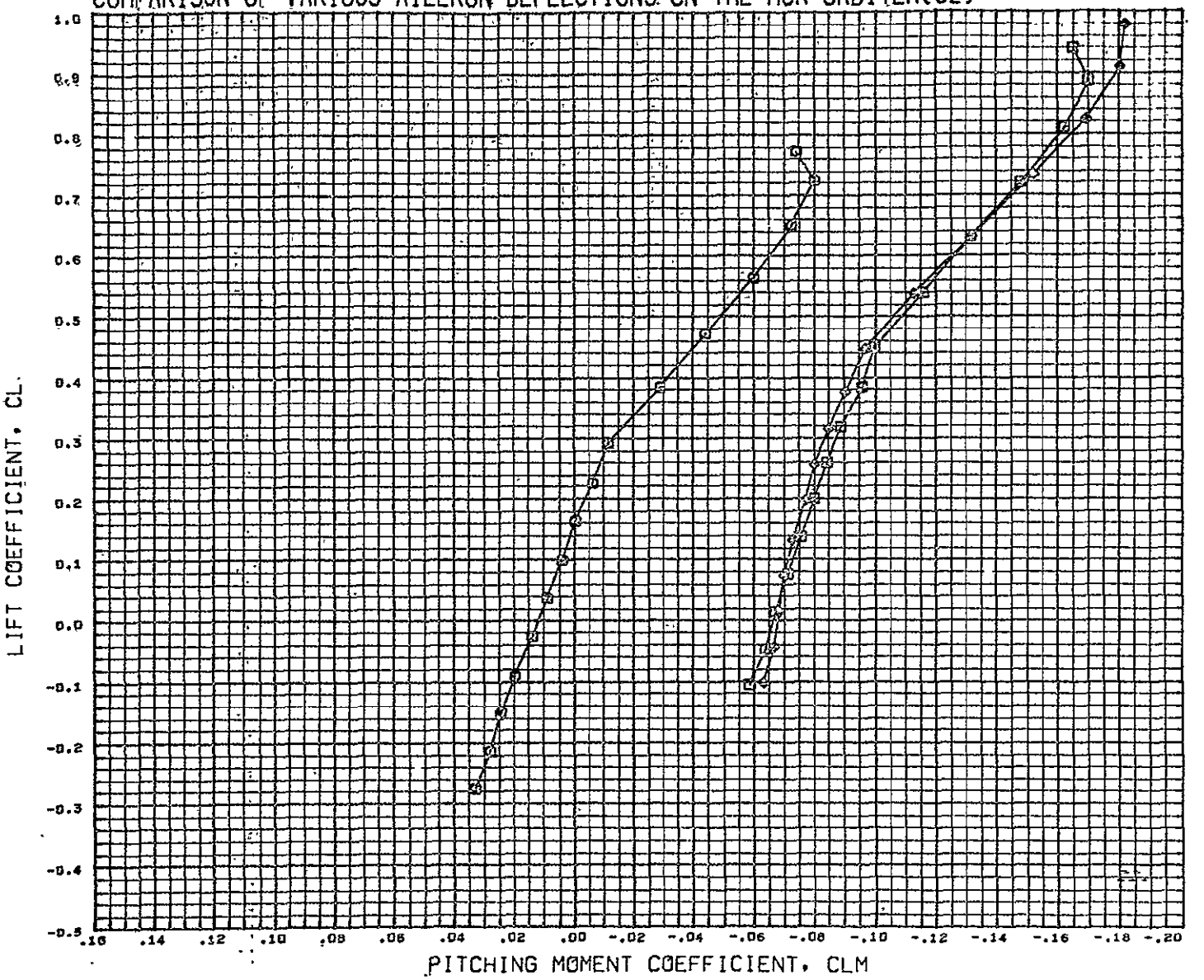
PARAMETRIC VALUES

BETA 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

COMPARISON OF VARIOUS AILERON DEFLECTIONS ON THE HCR ORBITER(02)

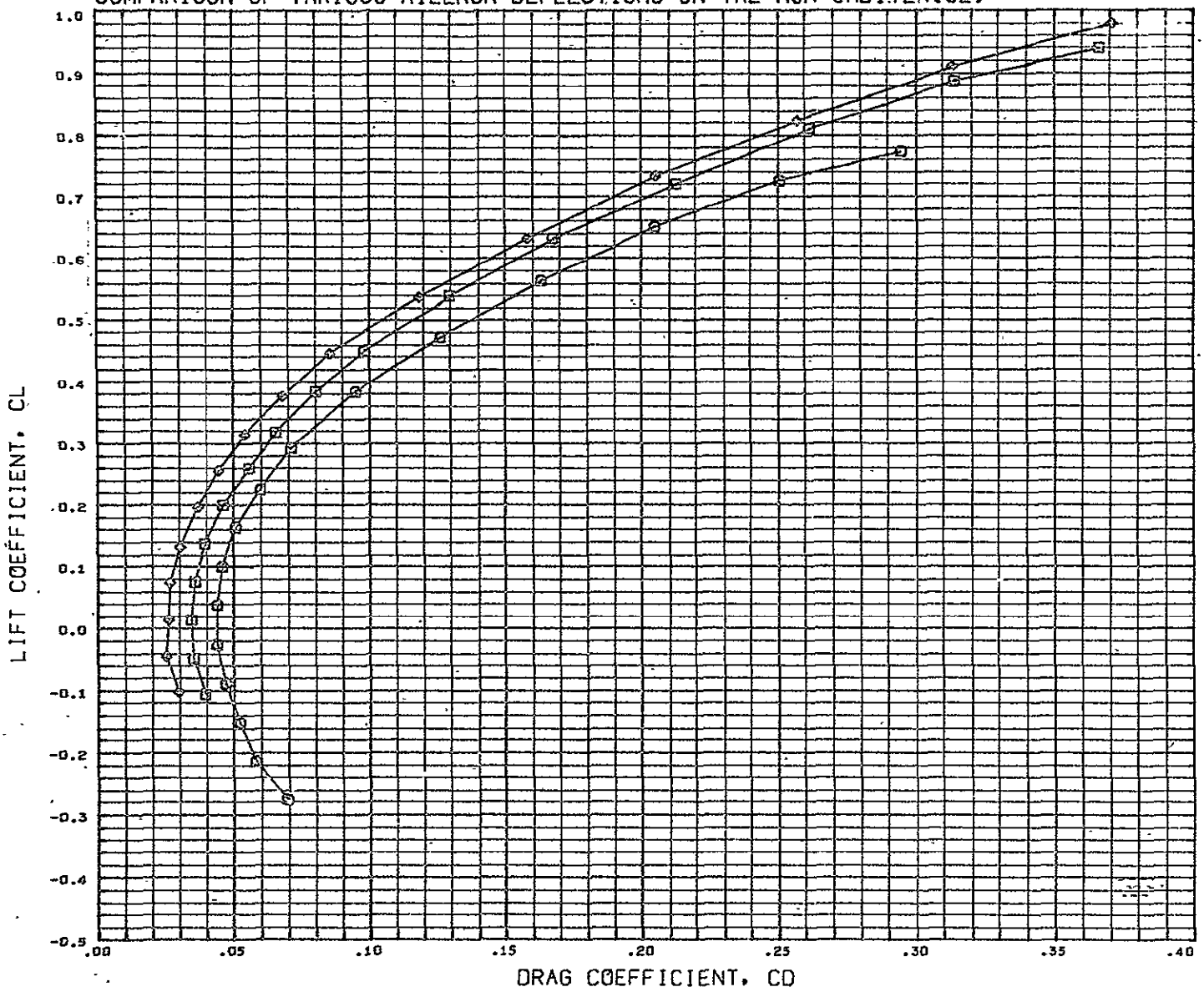


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	PARAMETRIC VALUES	
(TCFD32)	○	LSWT 24D B1W3V3EN1EN3 AILRON=0/-30 ELEVON=0	BETA	0.000
(TCFD29)	□	LSWT 24D B1W3V3EN3 AILERON=20/-20ELEVON=0		
(TCFD20)	◇	LSWT 24D B1W3V3 ELEVON=0 AILRON=0/0		

FLAP,B 0.000

REFERENCE INFORMATION		
REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

COMPARISON OF VARIOUS AILERON DEFLECTIONS ON THE HCR ORBITER(02)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION			
(TCFD32)	○	LSWT 240	B1W3V3EN1EN3	AILRON=0/-30	ELEVON=0
(TCFD29)	□	LSWT 240	B1W3V3EN3	AILERON=20/-20	ELEVON=0
(TCFD20)	◇	LSWT 240	B1W3V3	ELEVON=0	AILRON=0/0

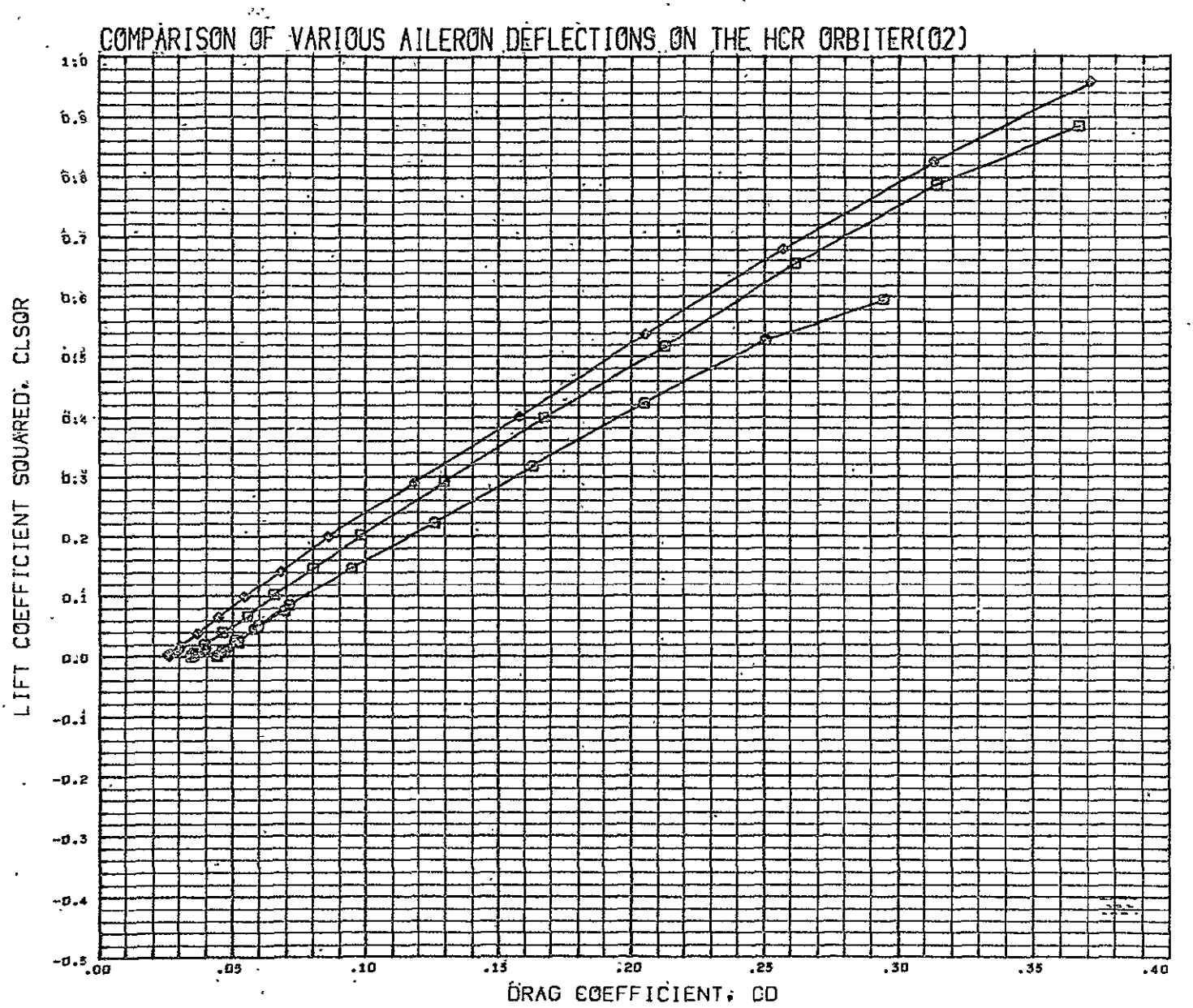
FLAP,B 0.000

PARAMETRIC VALUES

BETA 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE



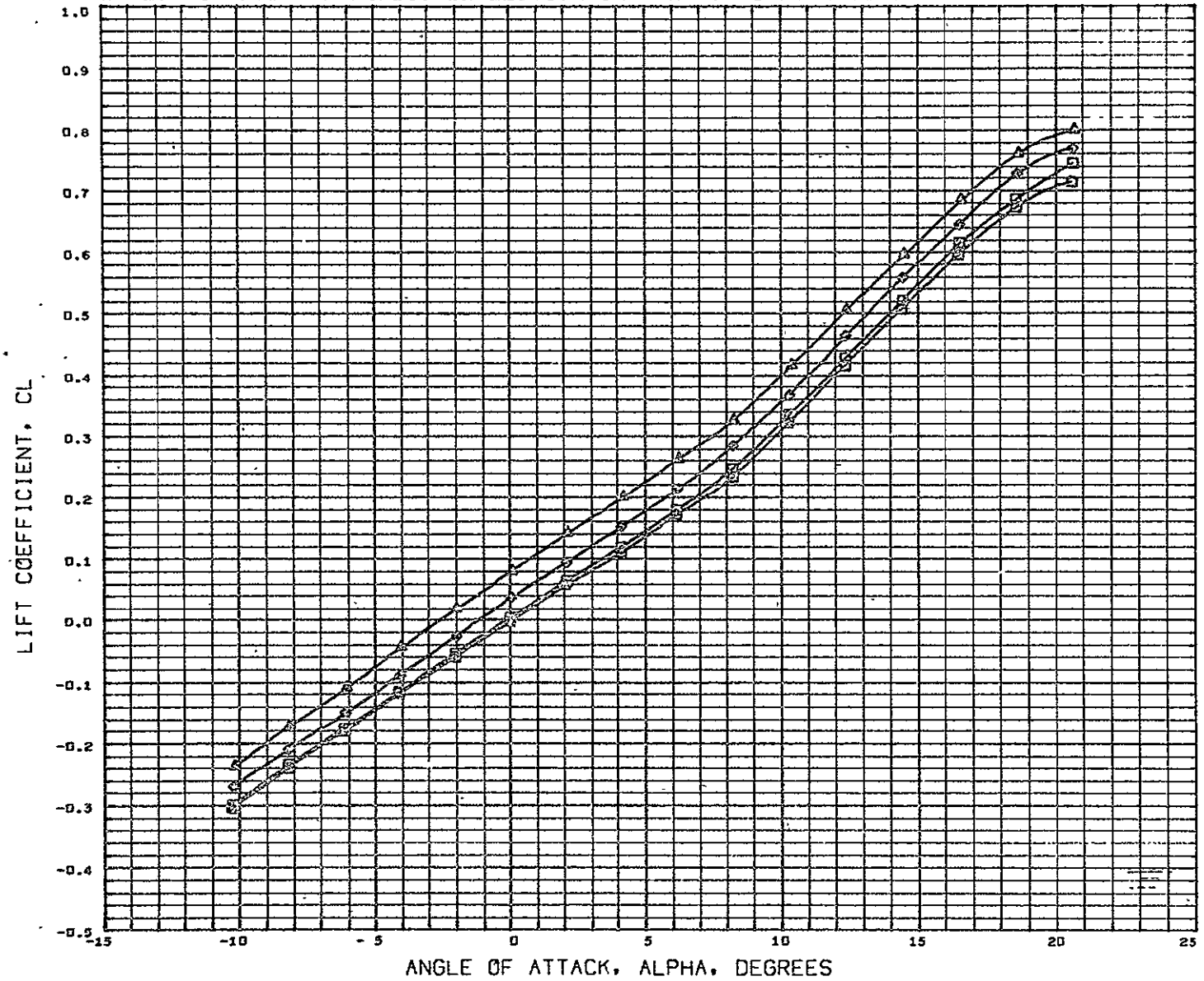
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION				PARAMETRIC VALUES	
(TCFD32)	○	LSWT 240	B1W3V3EN1EN3	AILRON=0/-30	ELEVON=0	BETA	0.000
(TCFD29)	□	LSWT 240	B1W3V3EN3	AILERON=20/-20	ELEVON=0		
(TCFD20)	◇	LSWT 240	B1W3V3	ELEVON=0	AILRON=0/0		

FLAP,B 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF BODY FLAP(FB1) DEFLECTION ON THE HCR ORBITER(02)



SYMBOL	FLAP,B
○	-30.000
□	-15.000
◇	0.000
△	15.000

PARAMETRIC VALUES

BETA 0.000 ELEVON -15.000

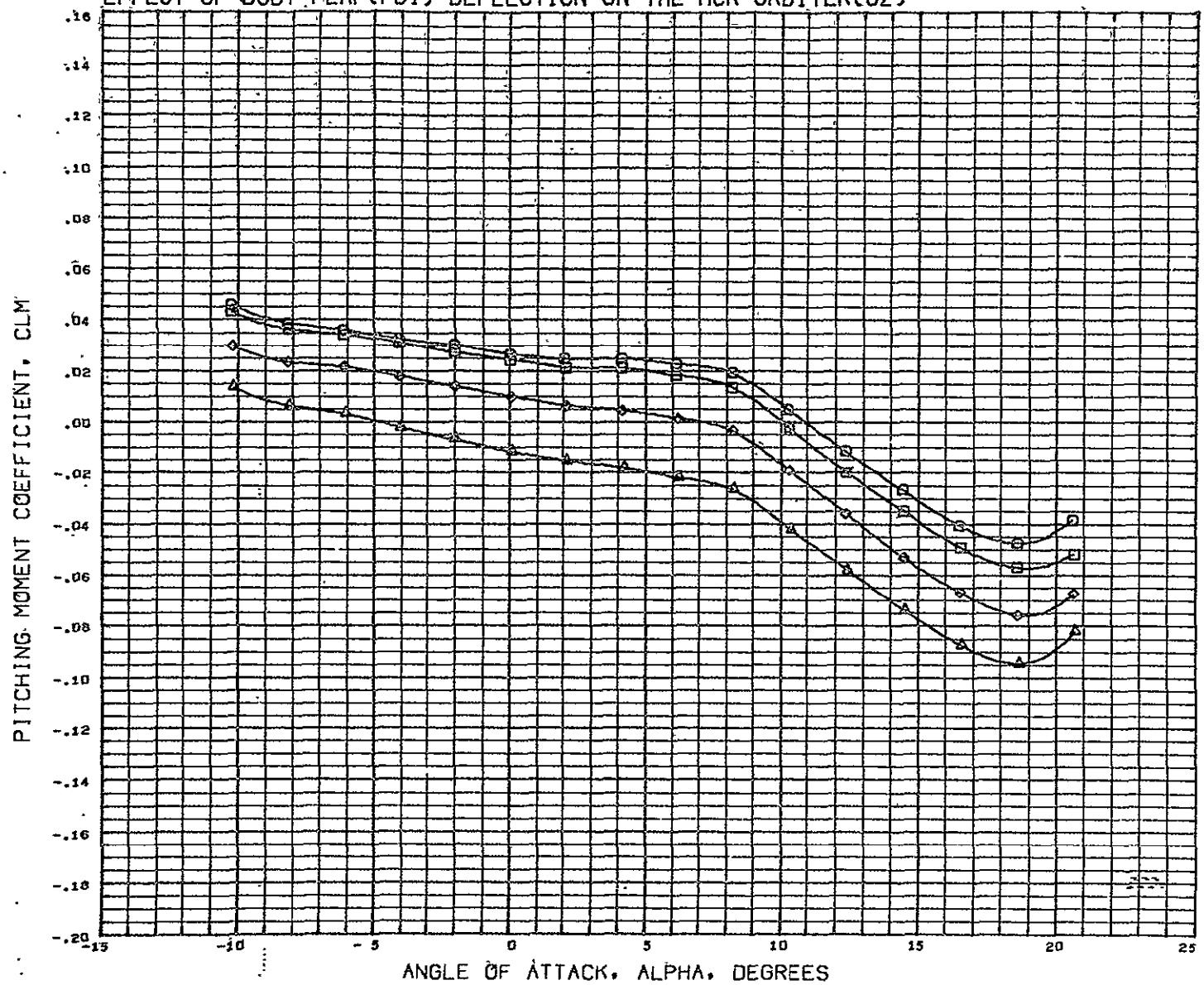
DATA HIST. CODE V*A

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

LSWT 240 4.0 PC HCR ORBITER(02) B1W3V3EN1EN3FB1 (ACFD34) 08 JAN 71 PAGE 129

EFFECT OF BODY FLAP(FB1) DEFLECTION ON THE HCR ORBITER(02)



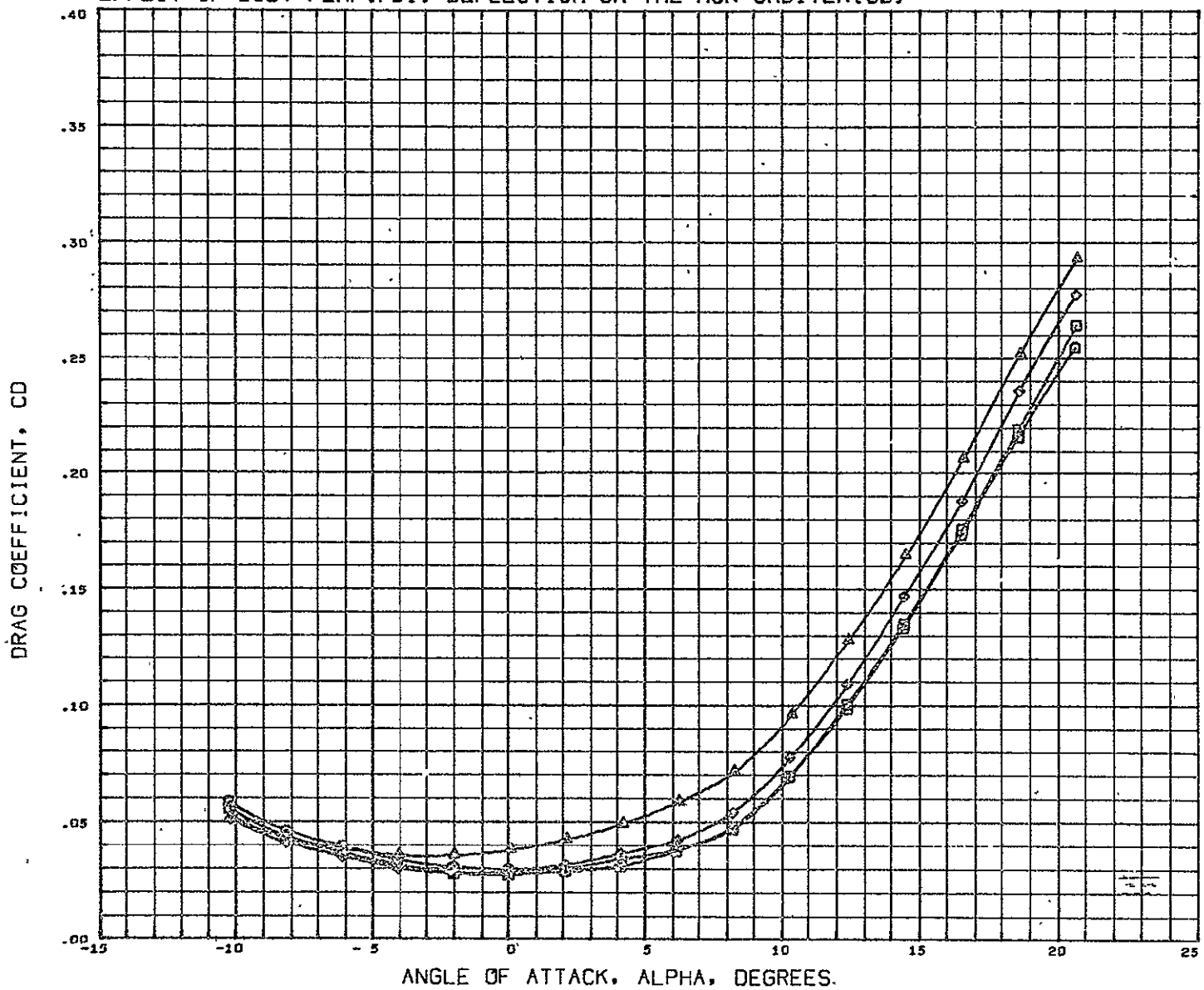
SYMBOL	FLAP,B		PARAMETRIC VALUES		
○	- 30.000	BETA	0.000	ELEVCN	- 15.000
□	- 15.000				
◇	0.000				
△	15.000				

DATA HIST. CODE V*A

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF BODY FLAP(FB1) DEFLECTION ON THE HCR ORBITER(02)



SYMBOL	FLAP,B
○	- 30.000
□	- 15.000
◇	0.000
△	15.000

PARAMETRIC VALUES

BETA 0.000 ELEVON - 15.000

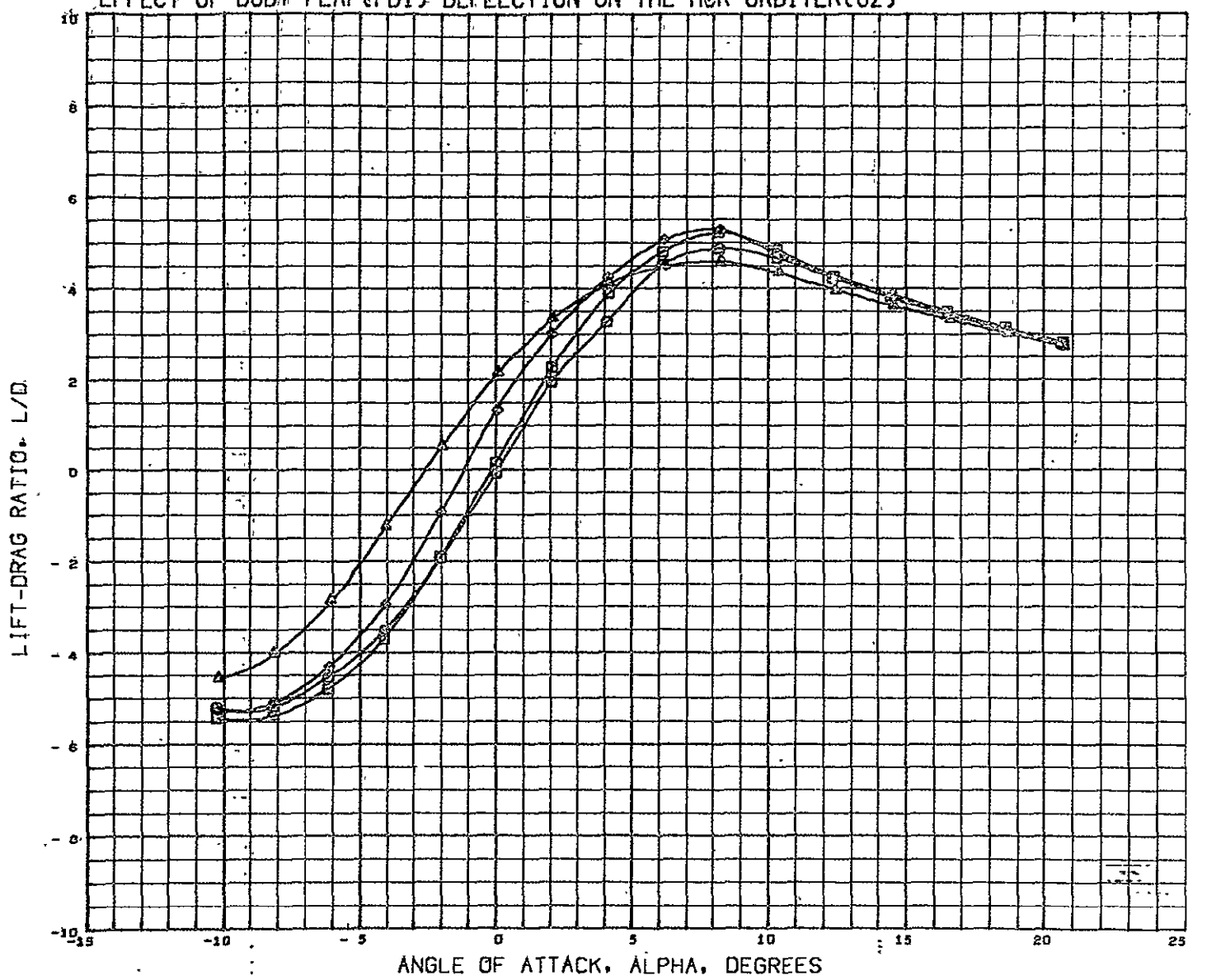
REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

DATA HIST. CODE V*A

LSWT 240 4.0 PC HCR ORBITER(02) B1W3V3EN1EN3FB1 (ACFD34) 08 JAN 71 PAGE 131

EFFECT OF BODY FLAP(FB1) DEFLECTION ON THE HCR ORBITER(02)



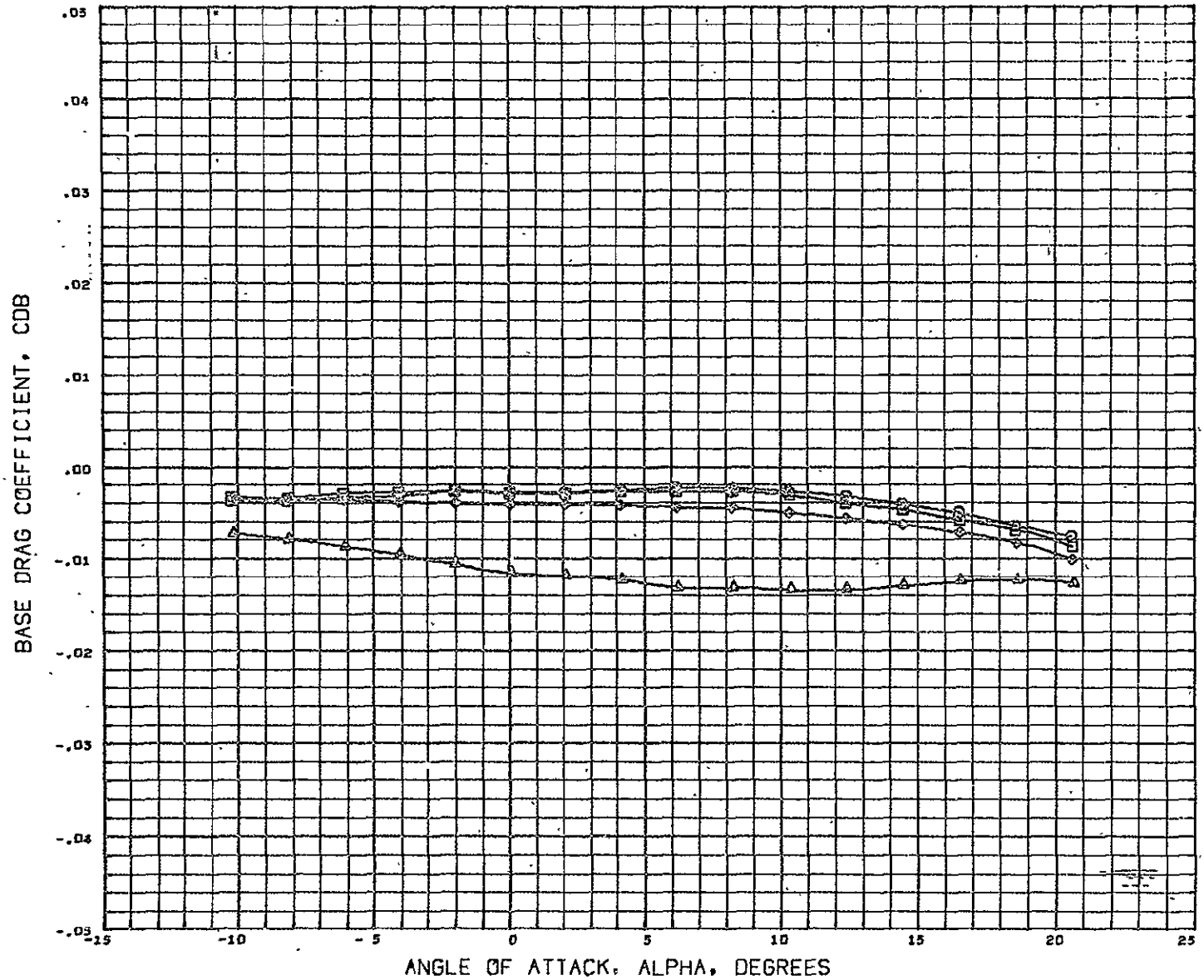
SYMBOL	FLAP,B		PARAMETRIC VALUES		
◇	- 30.000	BETA	0.000	ELEVON	- 15.000
□	- 15.000				
○	0.000				
△	15.000				

DATA HIST. CODE V*A

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF BODY FLAP(FB1) DEFLECTION ON THE HCR ORBITER(02)



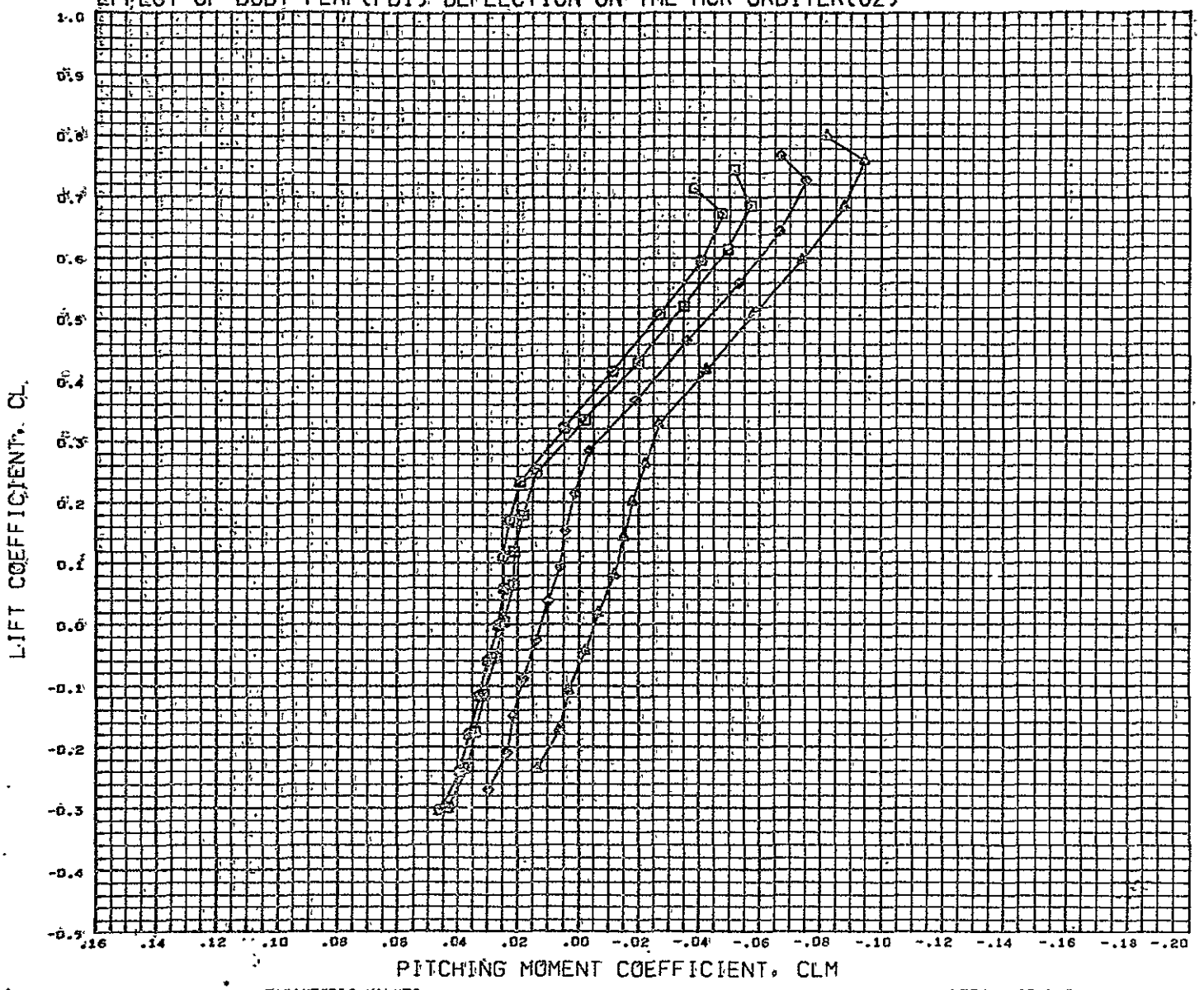
SYMBOL	FLAP,B		PARAMETRIC VALUES		
○	- 30.000	BETA	0.000	ELEVON	- 15.000
□	- 15.000				
◇	0.000				
△	15.000				

DATA HIST. CODE V*A

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF BODY FLAP(FB1) DEFLECTION ON THE HCR ORBITER(02)



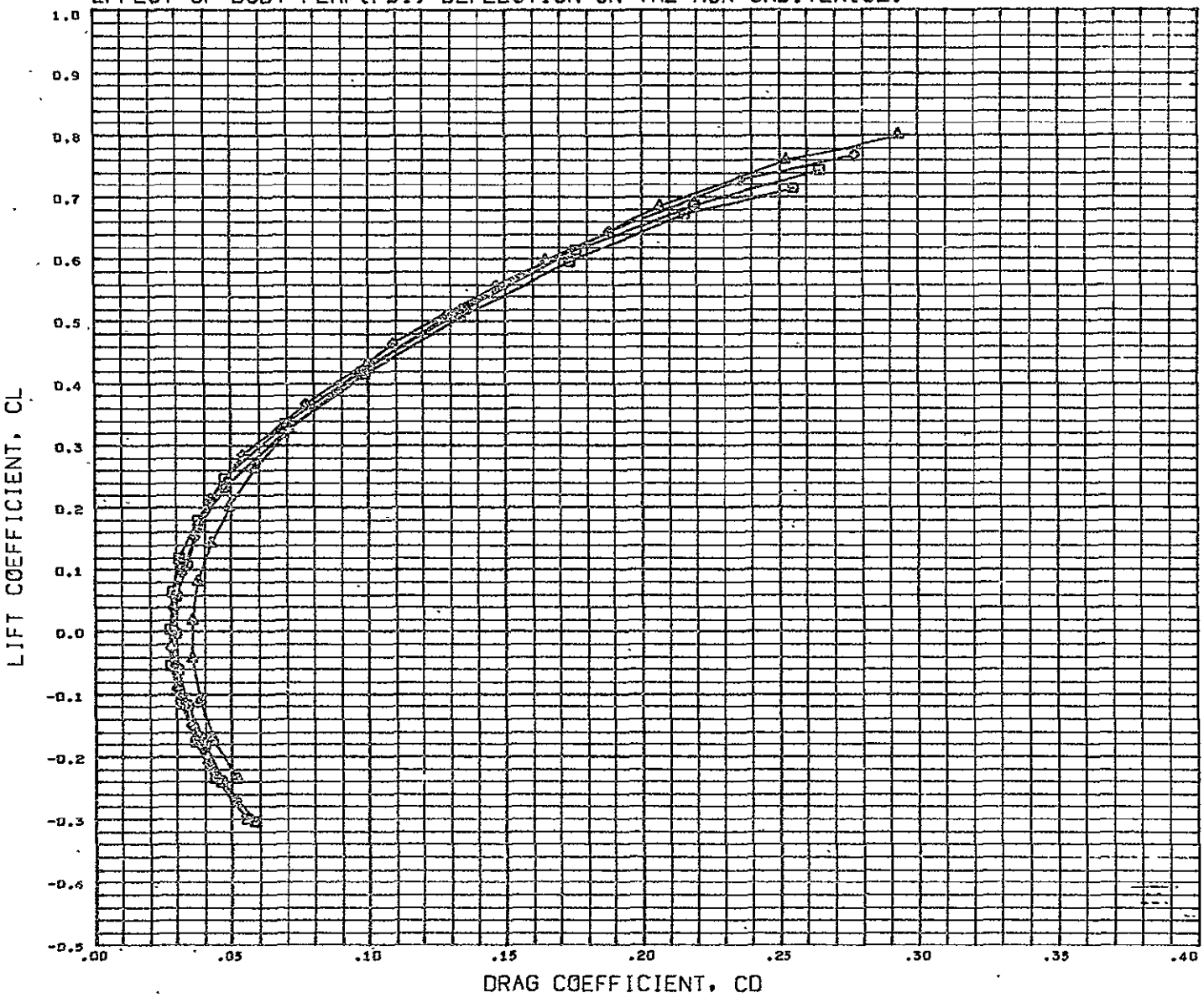
SYMBOL	FLAP,B		PARAMETRIC VALUES		
○	- 30.000	BETA	0.000	ELEVON	- 15.000
□	- 15.000				
◇	0.000				
△	15.000				

DATA HIST. CODE V*A

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF BODY FLAP(FB1) DEFLECTION ON THE HCR ORBITER(02)



SYMBOL	FLAP,B		PARAMETRIC VALUES		
○	- 30.000	BETA	0.000	ELEVON	- 15.000
□	- 15.000				
◇	0.000				
△	15.000				

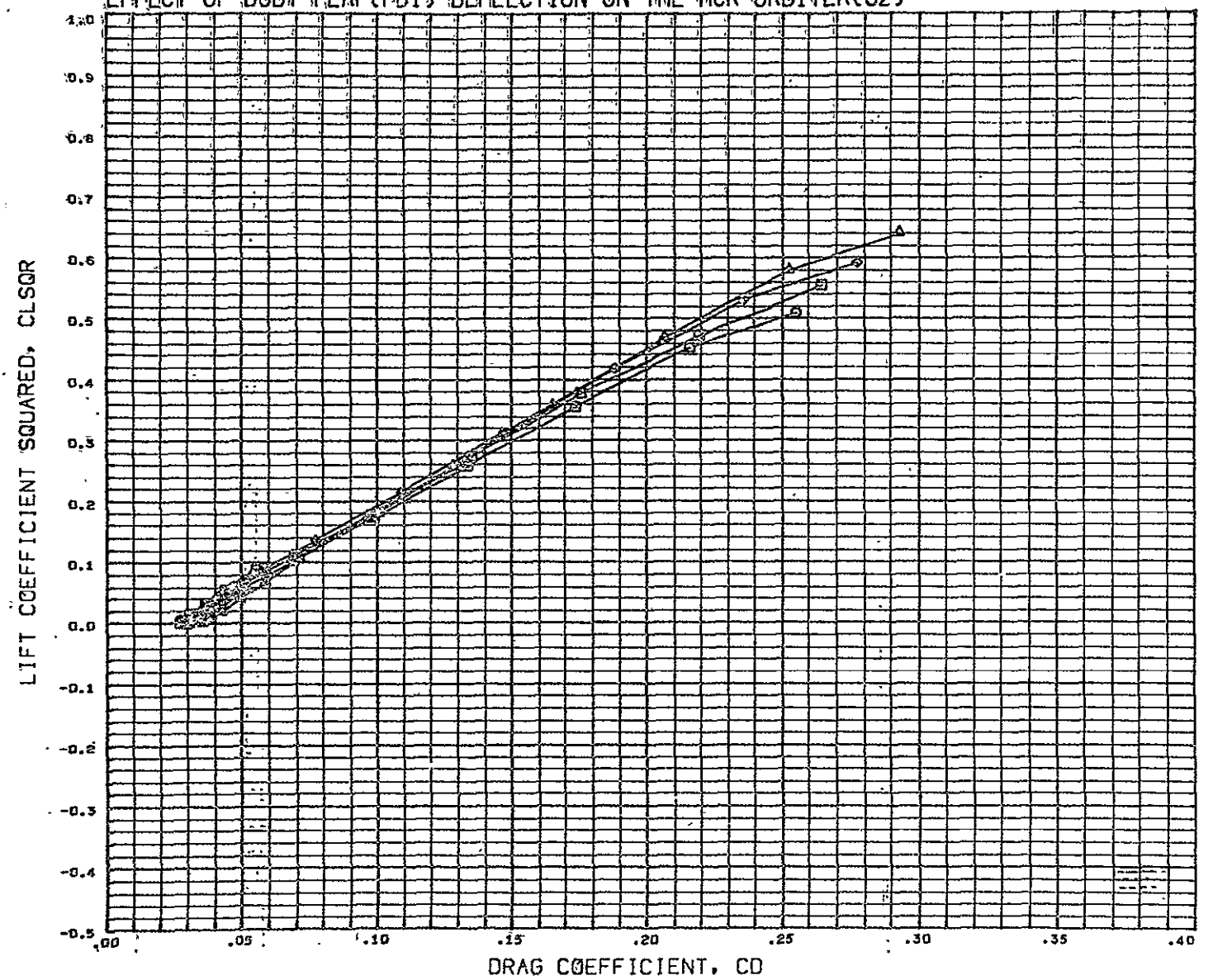
DATA HIST. CODE V#A

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

LSWT 240 4.0 PC HCR ORBITER(02) B1W3V3EN1EN3FB1 (ACFD34) 08 JAN 71 PAGE 135

EFFECT OF BODY FLAP(FB1) DEFLECTION ON THE HCR ORBITER(02)



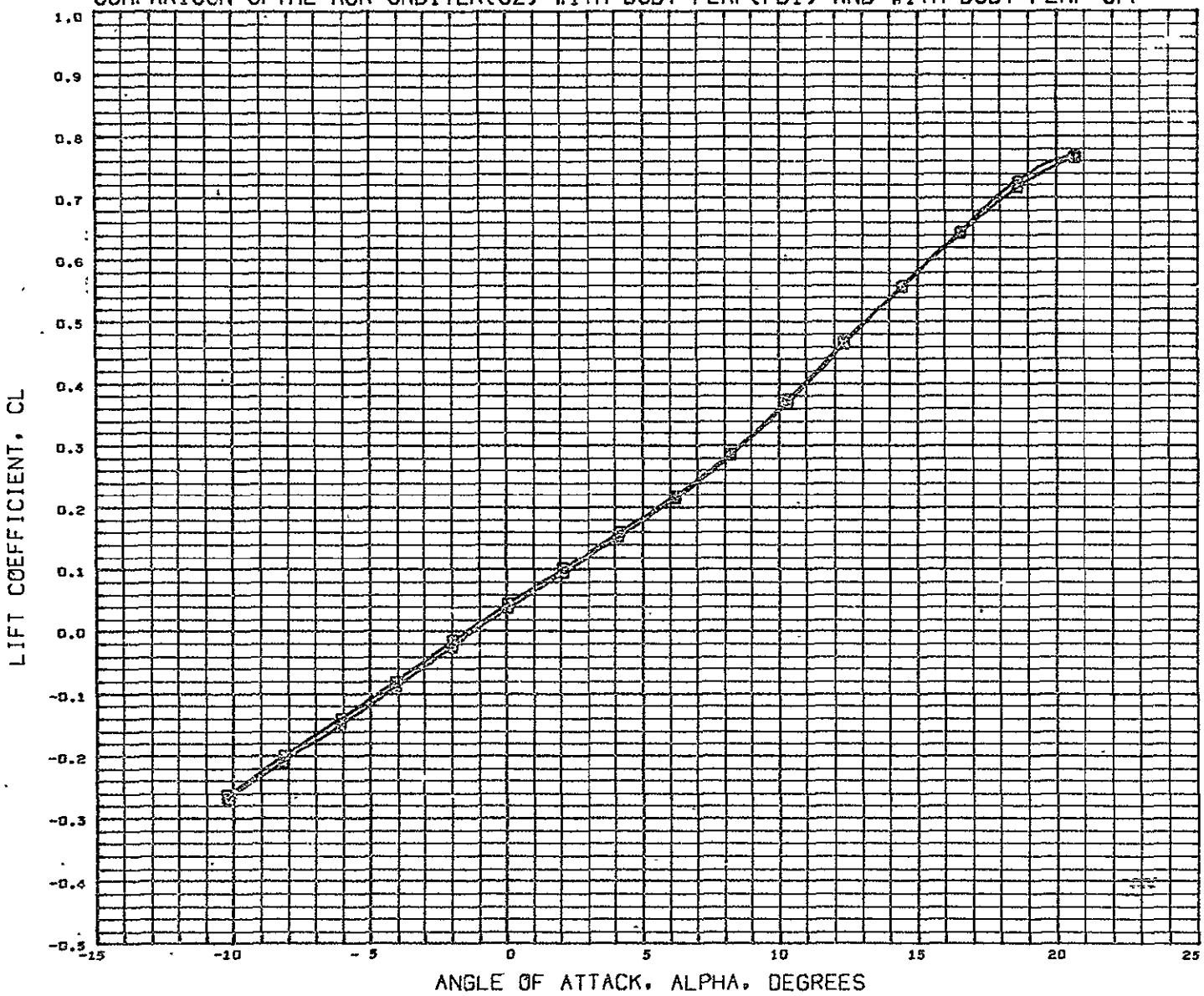
SYMBOL	FLAP,B		PARAMETRIC VALUES		
○	- 30.000	BETA	0.000	ELEVON	- 15.000
□	- 15.000				
◇	0.000				
△	15.000				

DATA HIST. CODE V*A

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

COMPARISON OFTHE HCR ORBITER(02) WITH BODY FLAP(FB1) AND WITH BODY FLAP OFF



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(KCFD31)	O	LSWT 240 B1W3V3EN1EN3 FB1=0
(8CFD34)	□	LSWT 240 B1W3V3EN1EN3 FB1 OFF

PARAMETRIC VALUES

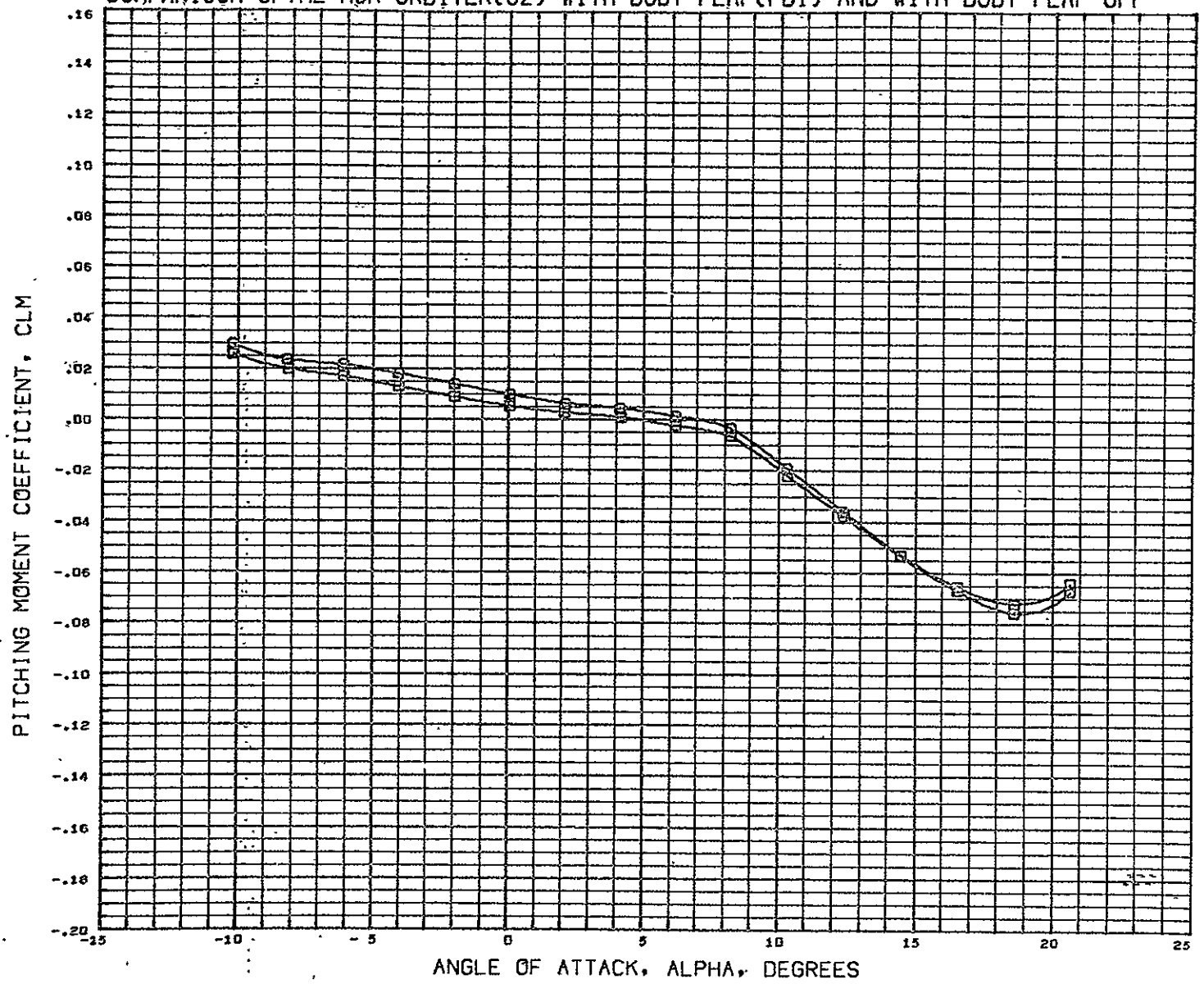
BETA 0.000 AILRON 0.000
ELEVON - 15.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

FLAP,B 0.000

COMPARISON OFTHE HCR ORBITER(02) WITH BODY FLAP(FB1) AND WITH BODY FLAP OFF



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(KCFD31)	○	LSWT 240 B1W3V3EN1EN3 FB1=0
(BCFD34)	□	LSWT 240 B1W3V3EN1EN3 FB1 OFF

FLAP,B 0.000

PARAMETRIC VALUES

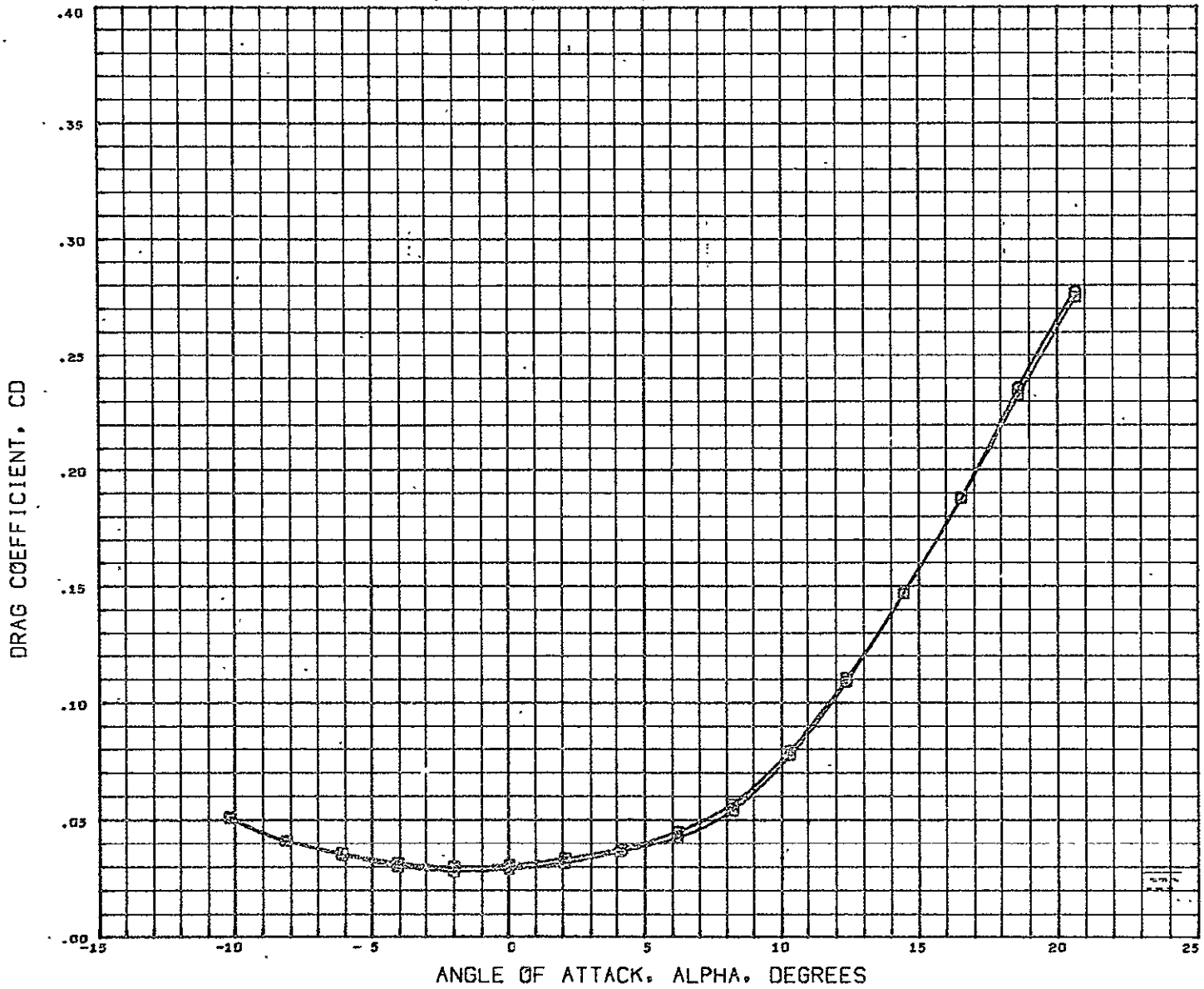
BETA 0.000 AILRON 0.000

ELEVON - 15.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

COMPARISON OF THE HCR ORBITER(02) WITH BODY FLAP(FB1) AND WITH BODY FLAP OFF



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(KCFD31)	○	LSWT 240 B1W3V3EN1EN3 FB1=0
(BCFD34)	□	LSWT 240 B1W3V3EN1EN3 FB1 OFF

FLAP,B 0.000

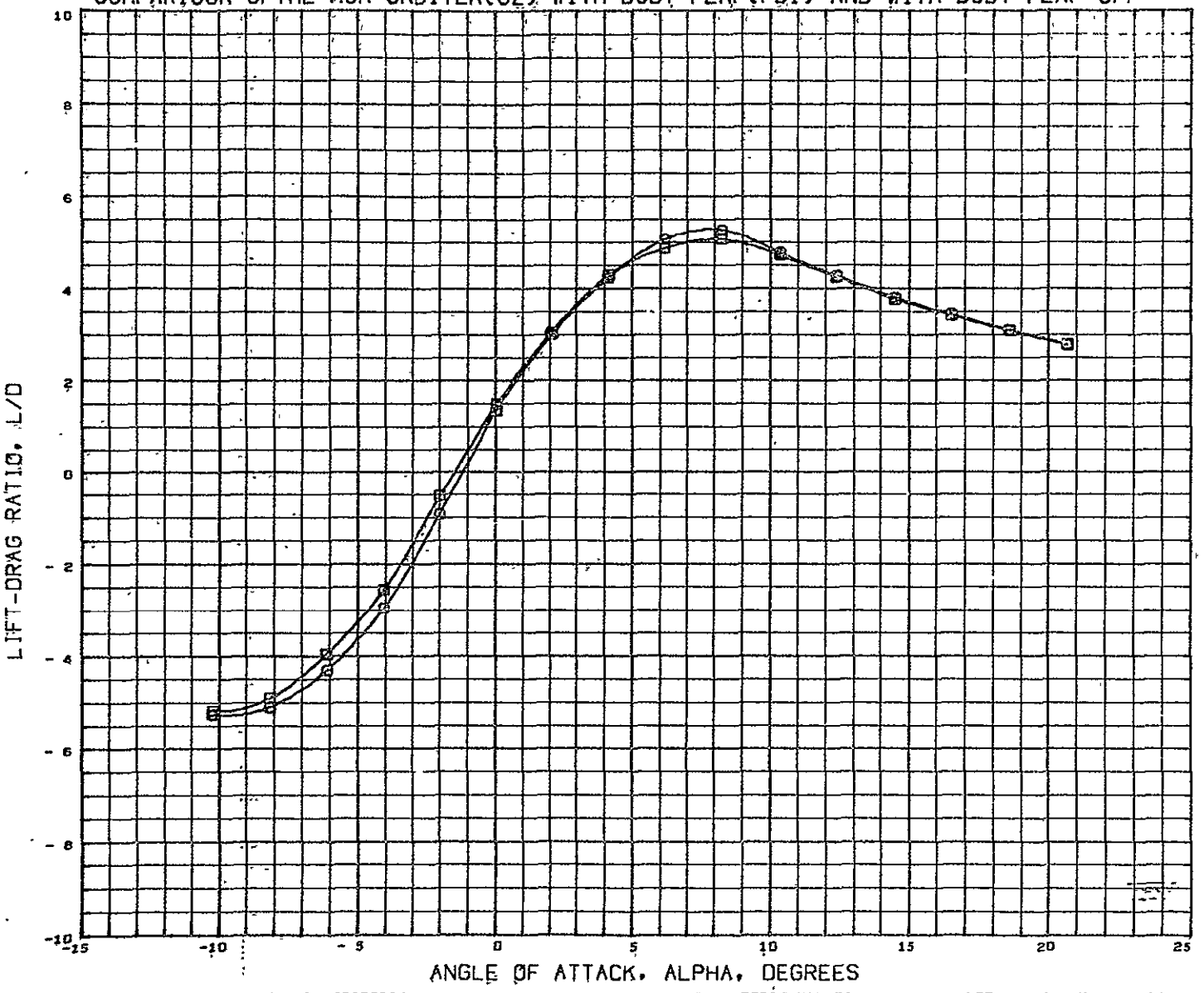
PARAMETRIC VALUES

BETA 0.000 AILRON 0.000
ELEVON - 15.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

COMPARISON OF THE HCR ORBITER(02) WITH BODY FLAP(FB1) AND WITH BODY FLAP OFF



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(BCFD31)	○	LSWT 240 B1W3V3EN1EN3 FB1=0
(BCFD34)	□	LSWT 240 B1W3V3EN1EN3 FB1 OFF

FLAP,B 0.000

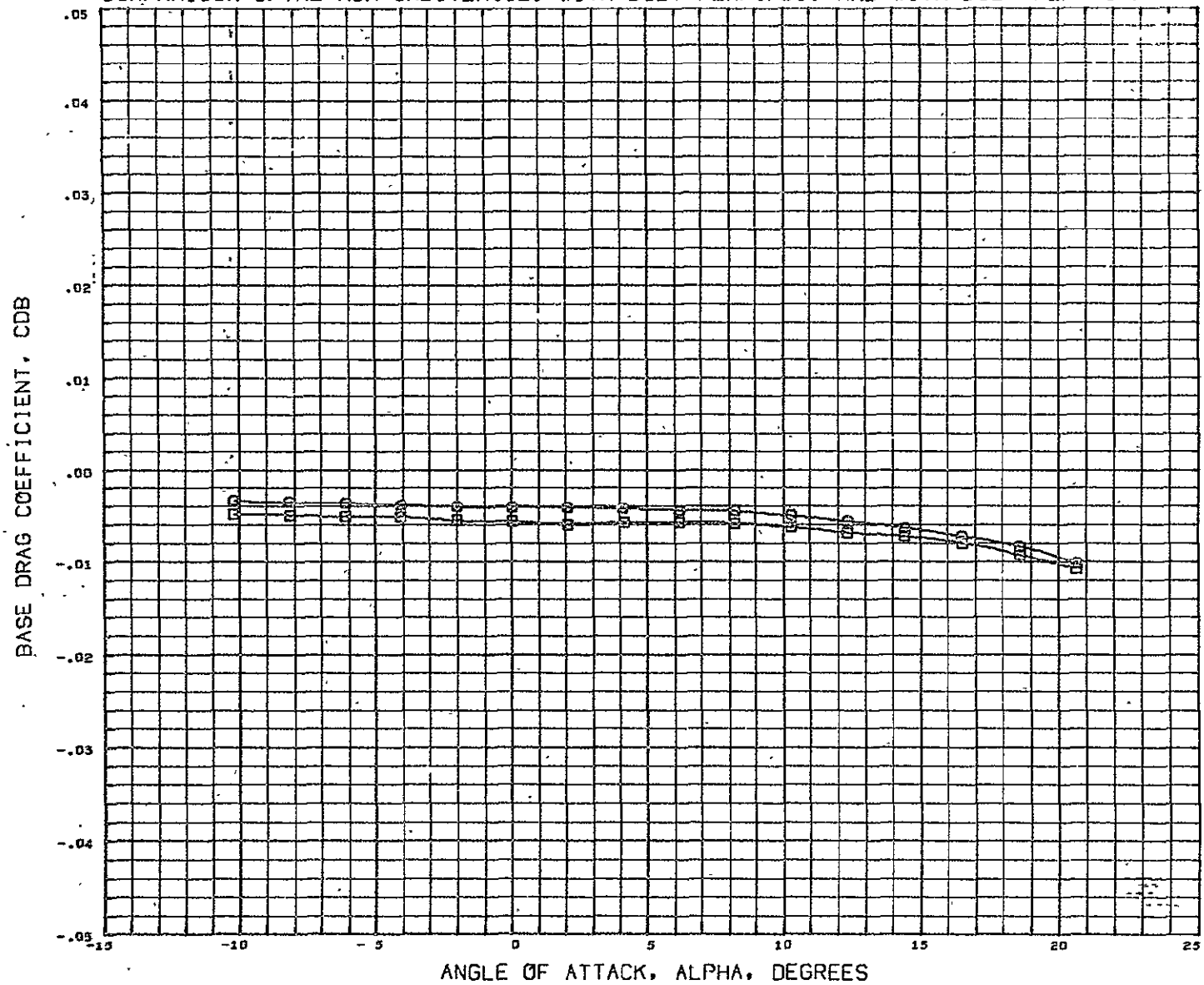
PARAMETRIC VALUES

BETA . 0.000 AILRON 0.000

ELEVON - 15.000

REFERENCE INFORMATION		
REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

COMPARISON OFTHE HCR ORBITER(02) WITH BODY FLAP(FB1) AND WITH BODY FLAP OFF



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(KCFD31)	O	LSWT 249 B1W3V3EN1EN3 FB1=0
(BCFD34)	□	LSWT 249 B1W3V3EN1EN3 FB1 OFF

PARAMETRIC VALUES

BETA 0.000 AILRON 0.000

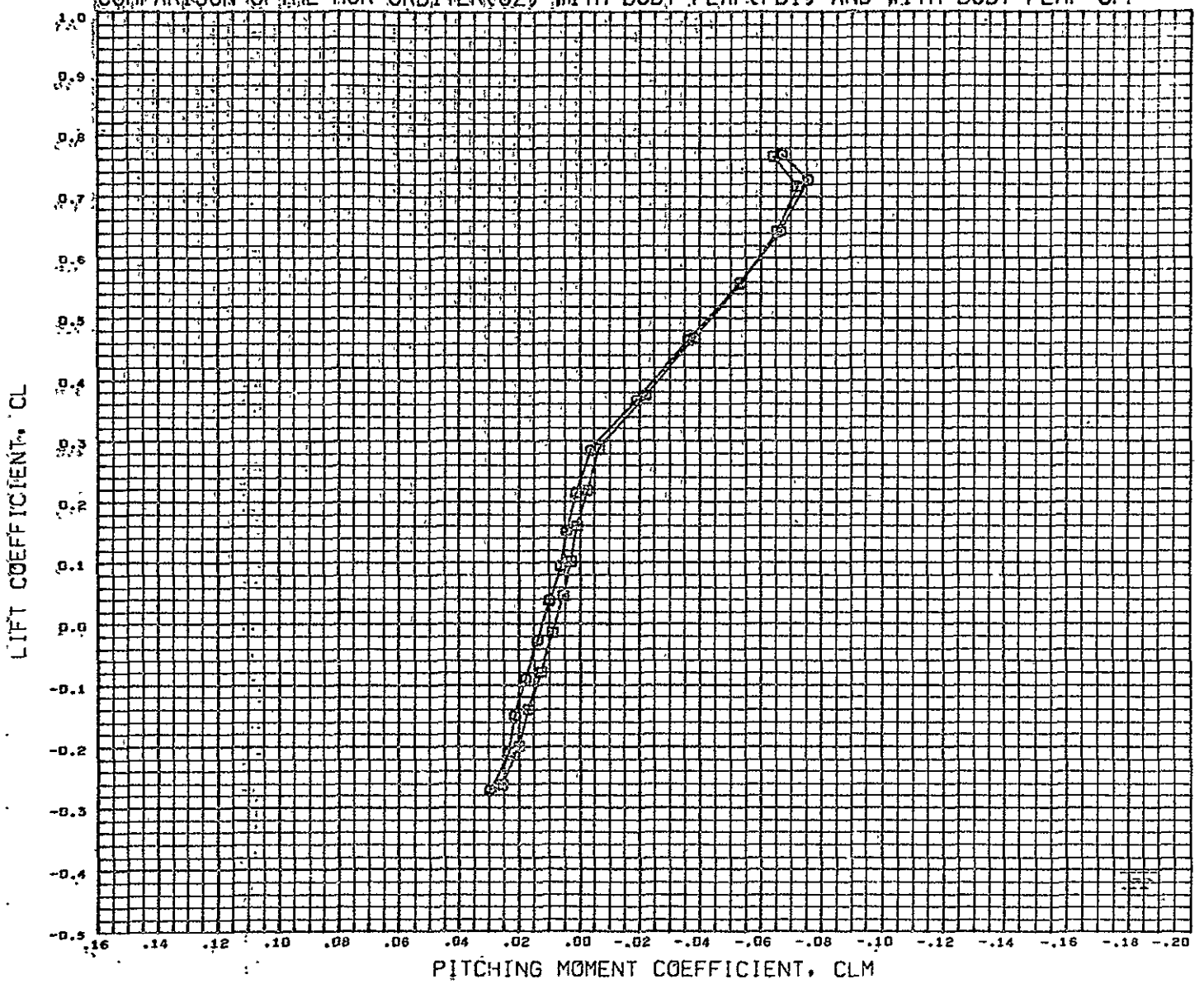
ELEVON - 15.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2219	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

FLAP,B 0.000

COMPARISON OF THE HCR ORBITER(02) WITH BODY FLAP(FB1) AND WITH BODY FLAP OFF



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(KCFD31)	O	LSWT 240 B1W3V3EN1EN3 FB1=0
(BCFD34)	□	LSWT 240 B1W3V3EN1EN3 FB1 OFF

PARAMETRIC VALUES

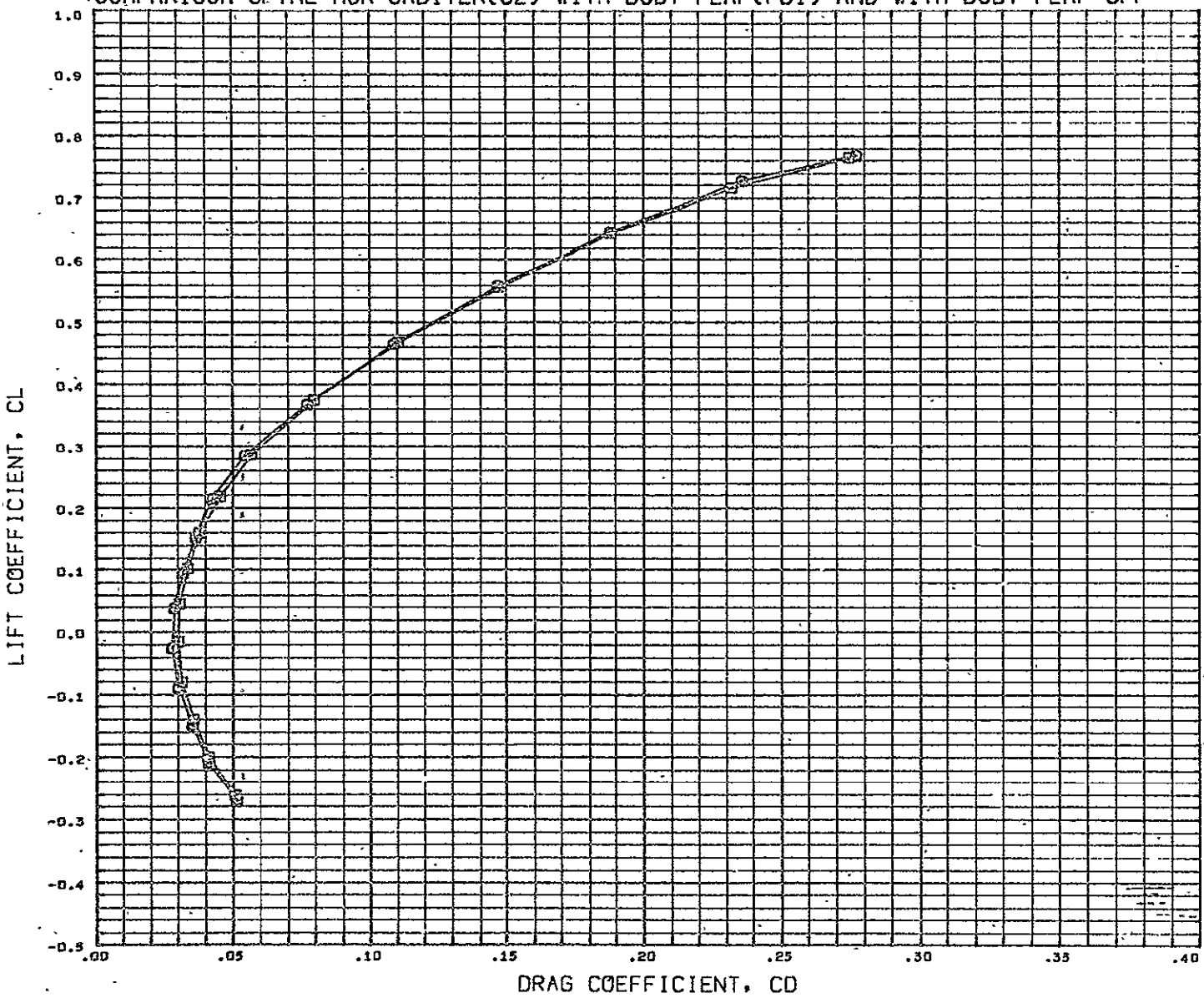
BETA 0.000 AILRON 0.000
ELEVON - 15.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

FLAP,B 0.000

COMPARISON OF THE HCR ORBITER(02) WITH BODY FLAP(FB1) AND WITH BODY FLAP OFF



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(KCFD31)	O	LSWT 240 B1W3V3EN1EN3 FB1=0
(BCFD34)	□	LSWT 240 B1W3V3EN1EN3 FB1 OFF

FLAP,B 0.000

PARAMETRIC VALUES

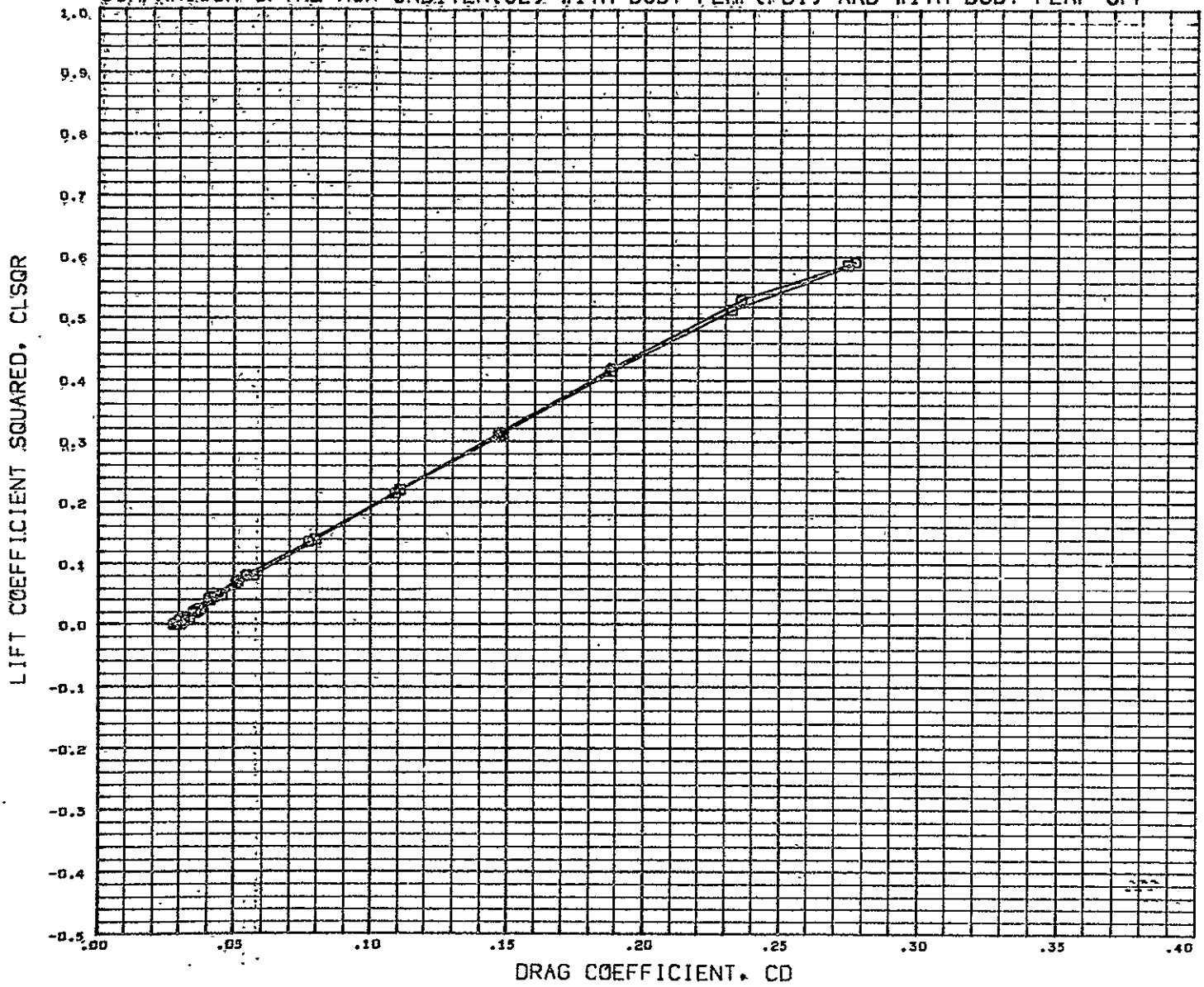
BETA 0.000 AILRON 0.000

ELEVON - 15.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XHRP	4.2210	FT.
YHRP	0.0000	FT.
ZHRP	0.6670	FT.
SCALE	4.0000	PER CE

COMPARISON OF THE HCR ORBITER(02) WITH BODY FLAP(FB1) AND WITH BODY FLAP OFF



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(KCFD31)	O	LSWT 240 B1W3V3EN1EN3 FB1=0
(BCFD34)	□	LSWT 240 B1W3V3EN1EN3 FB1 OFF

FLAP,B 0.000

PARAMETRIC VALUES

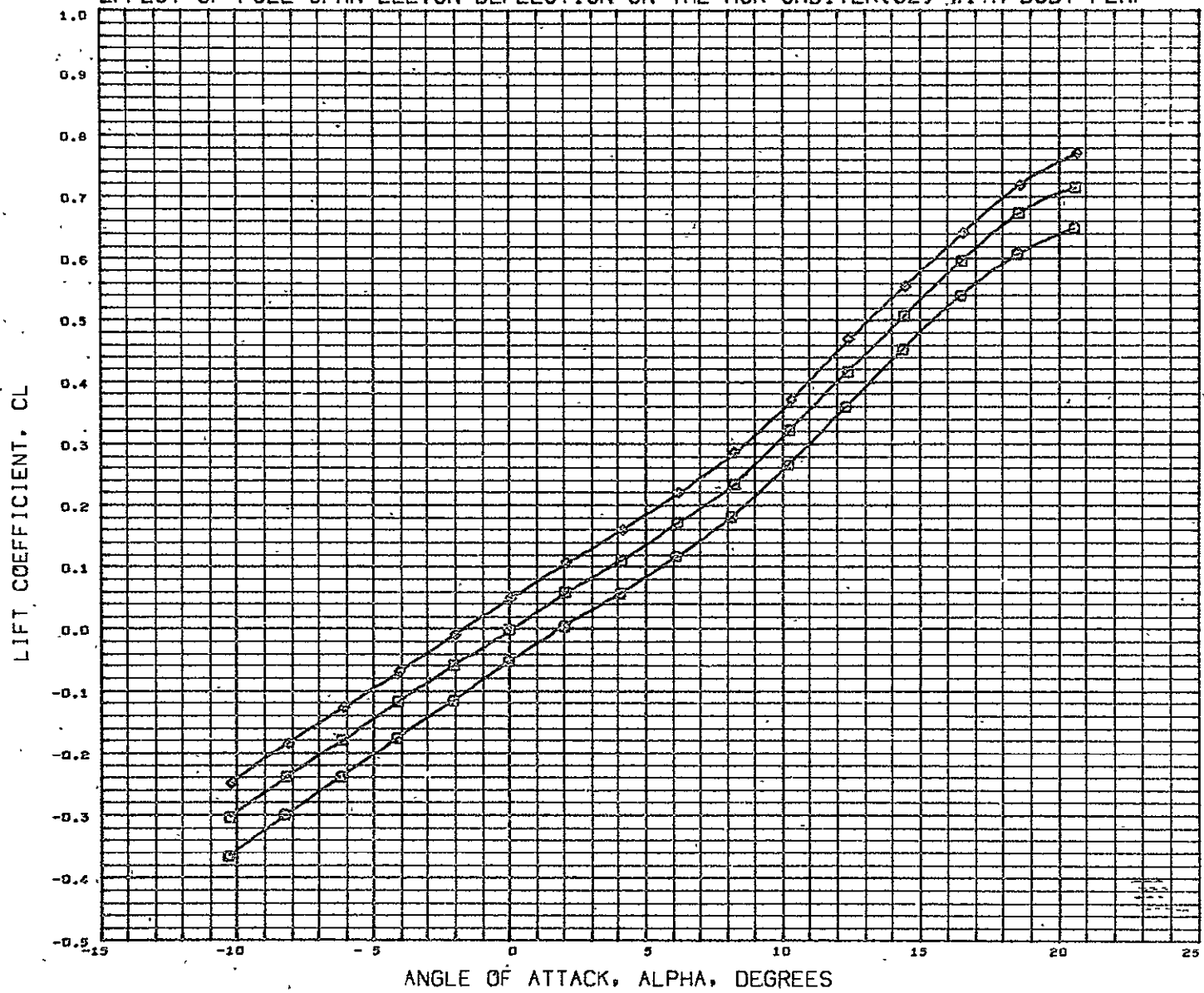
BETA 0.000 AILRON 0.000

ELEVON - 15.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF FULL SPAN ELEVON DEFLECTION ON THE HCR ORBITER(02) WITH BODY FLAP



SYMBOL	ELEVON
○	- 20.000
□	- 15.000
◇	- 10.000

PARAMETRIC VALUES

BETA 0.000 FLAP,B - 30.000

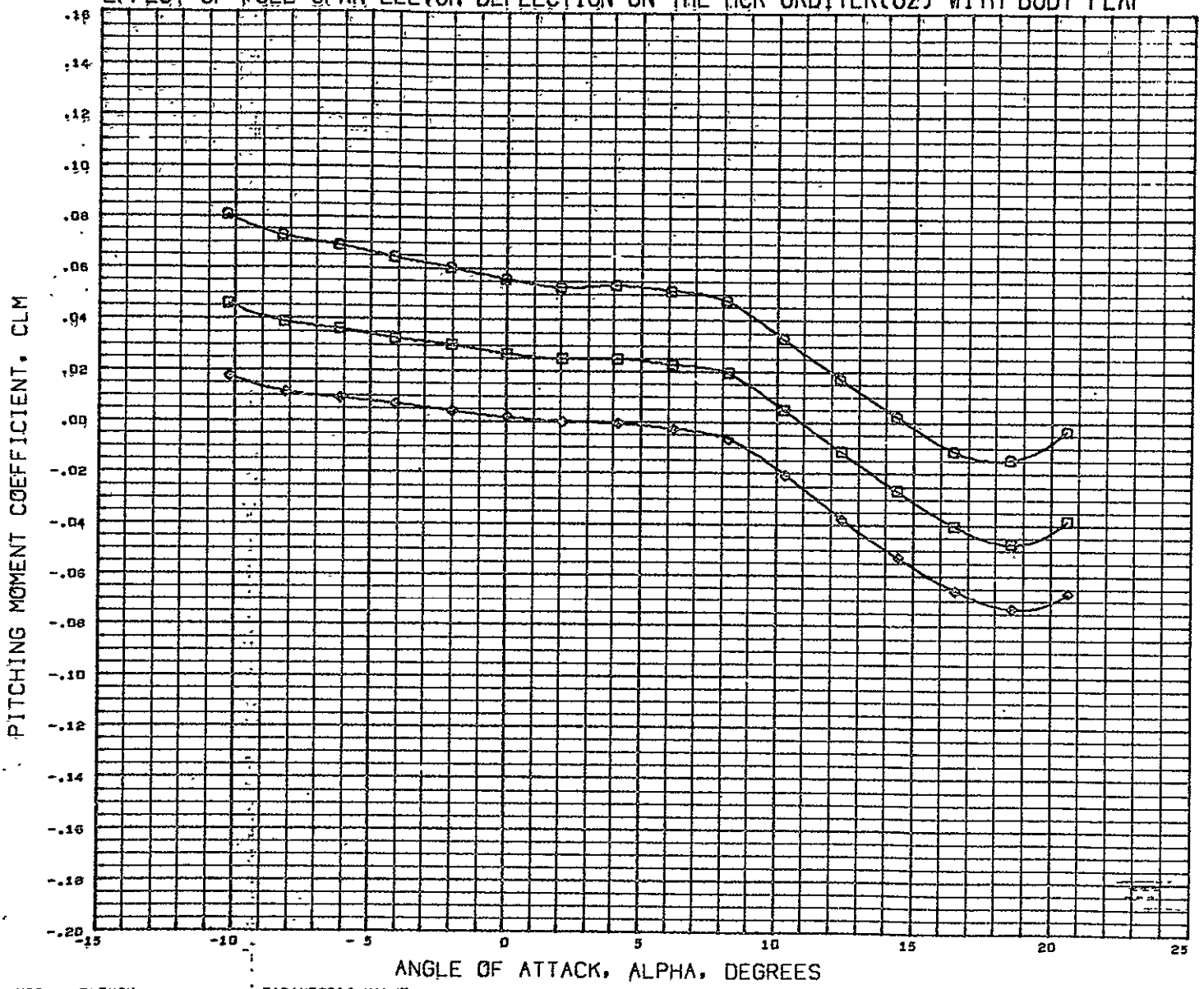
REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

DATA HIST. CODE V*A

LSWT 240 4.0 PC HCR ORBITER(02) B1W3V3EN1EN3FB1 (ACFD35) 08 JAN 71 PAGE 145

EFFECT OF FULL SPAN ELEVON DEFLECTION ON THE HCR ORBITER(02) WITH BODY FLAP



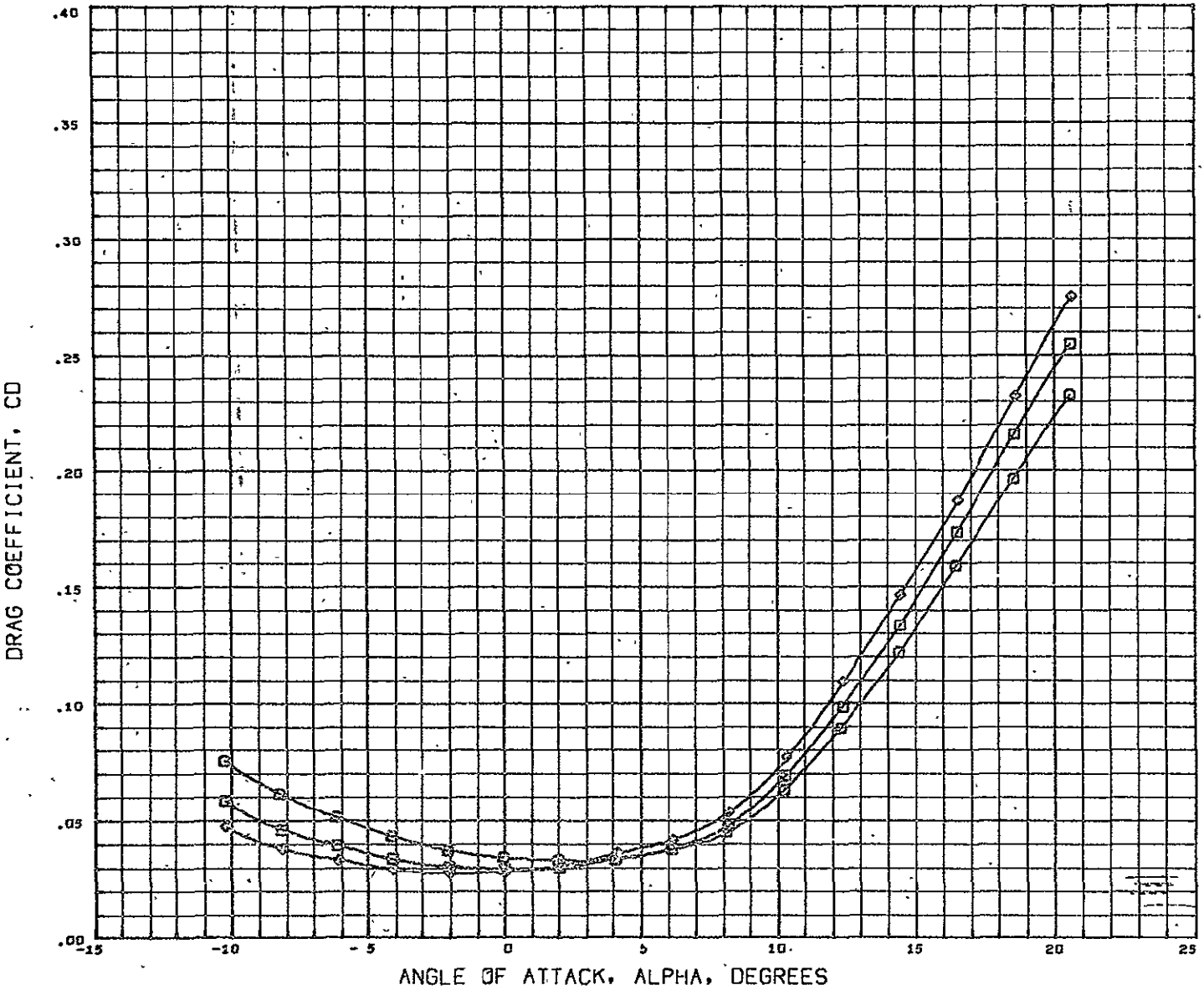
SYMBOL	ELEVON		PARAMETRIC VALUES		
○	- 20.000	BETA	0.000	FLAP,B	- 30.000
□	- 15.000				
◇	- 10.000				

DATA HIST. CODE V*A

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF FULL SPAN ELEVON DEFLECTION ON THE HCR ORBITER(02) WITH BODY FLAP



SYMBOL	ELEVON
○	- 20.000
□	- 15.000
◇	- 10.000

PARAMETRIC VALUES

BETA 0.000 FLAP,B - 30.000

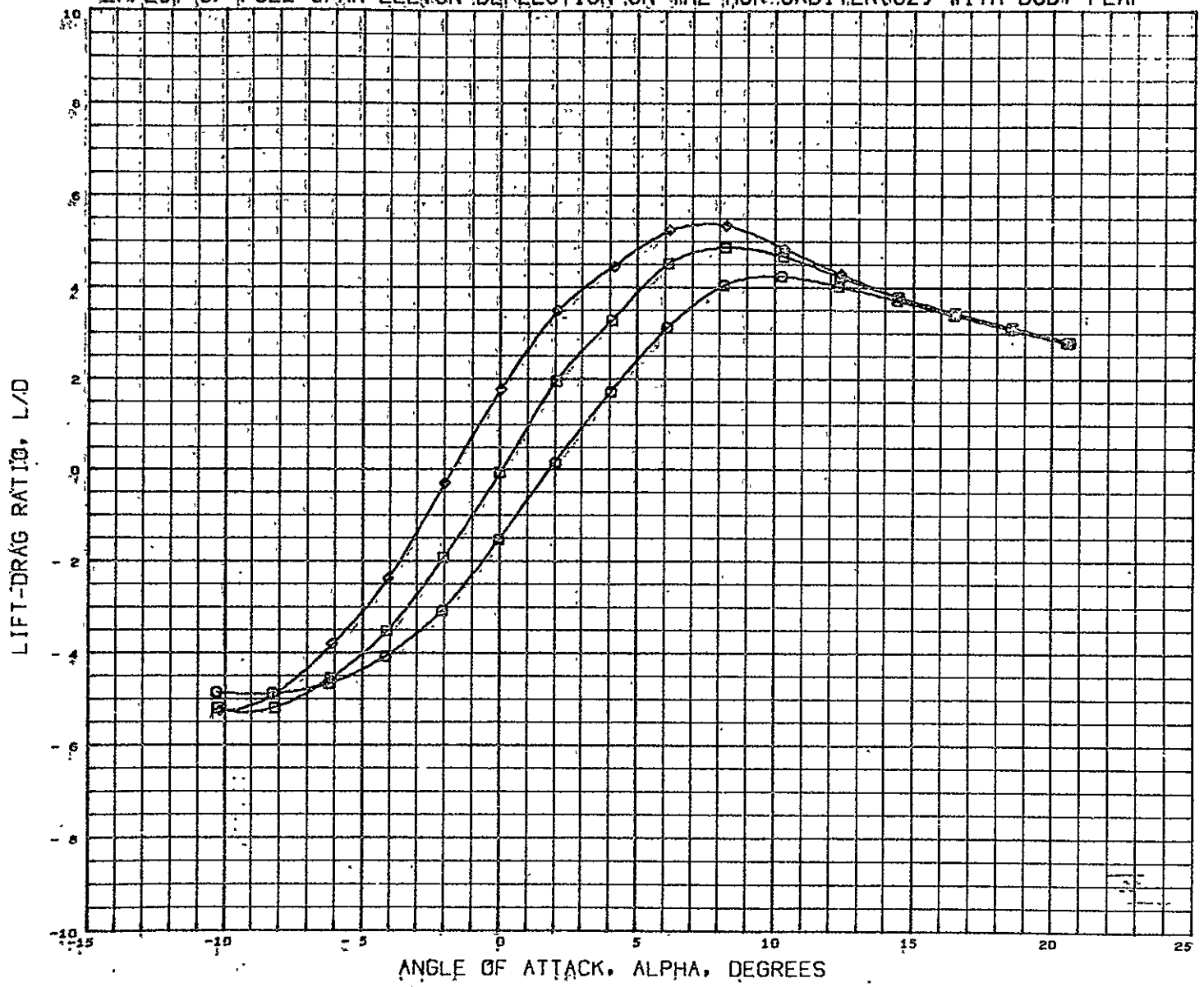
REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

DATA HIST. CODE V*A

LSWT 240 4.0 PC HCR ORBITER(02) B1W3V3EN1EN3FB1 (ACFD35) 08 JAN 71 PAGE 147

EFFECT OF FULL SPAN ELEVON DEFLECTION ON THE HCR ORBITER(02) WITH BODY FLAP



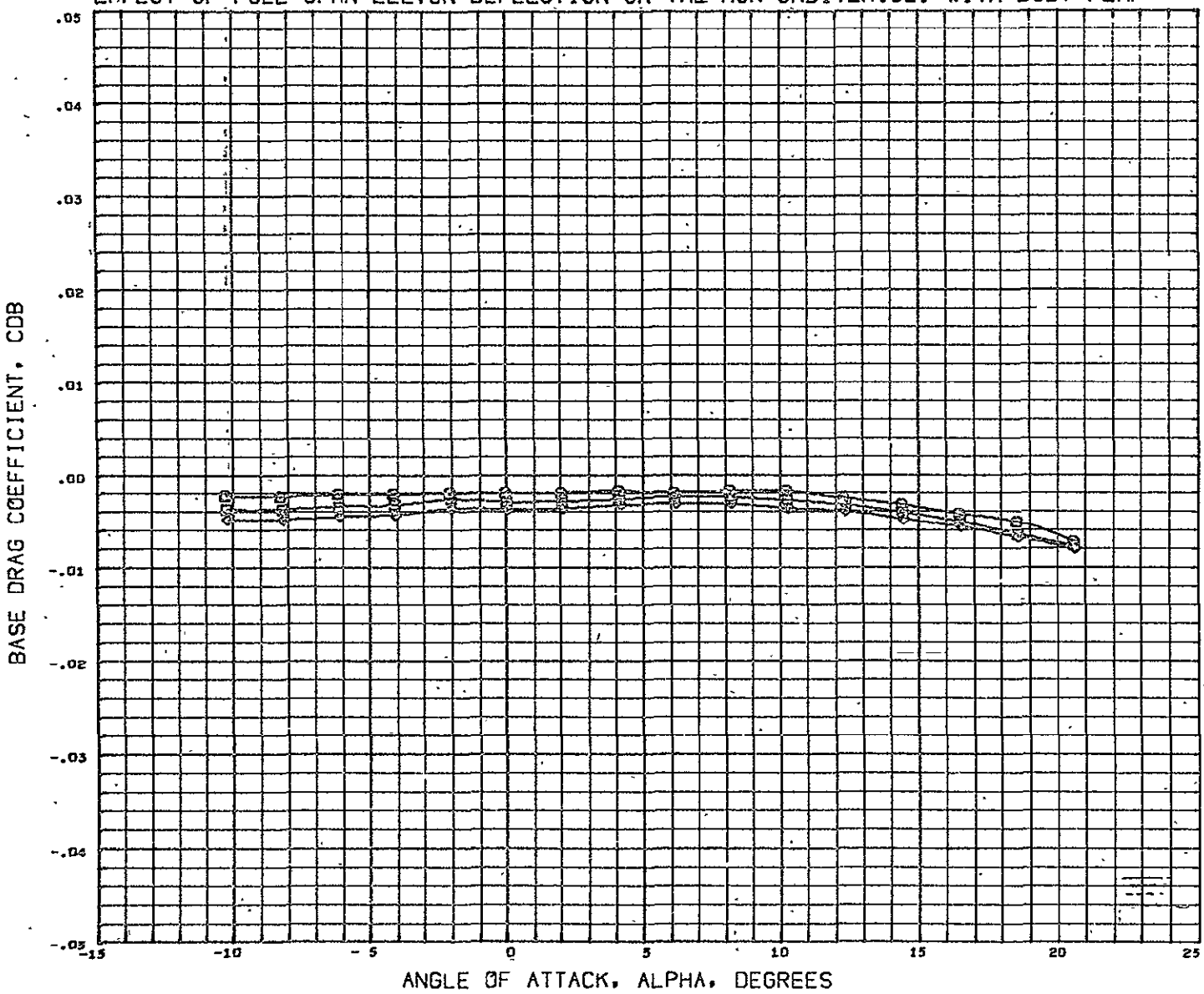
SYMBOL	ELEVON		PARAMETRIC VALUES		
◇	- 20.000	BETA	0.000	ELAF,B	- 30.000
□	- 15.000				
○	- 10.000				

DATA HIST. CODE V*A

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF FULL SPAN ELEVON DEFLECTION ON THE HCR ORBITER(02) WITH BODY FLAP



SYMBOL	ELEVON
○	- 20.000
□	- 15.000
◇	- 10.000

PARAMETRIC VALUES

BETA 0.000 FLAP,B - 30.000

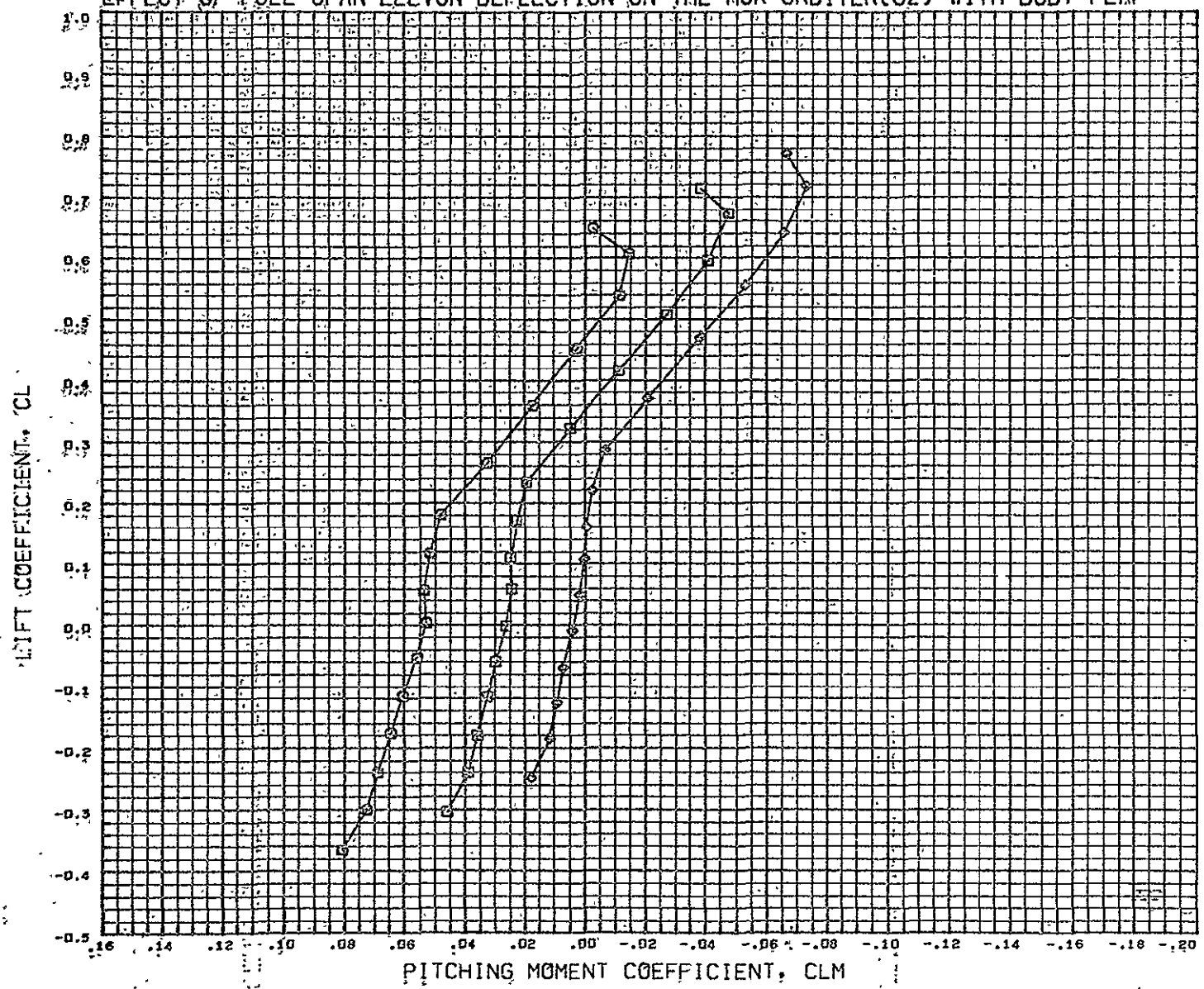
REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

DATA HIST. CODE V#A

LSWT 240 4.0 PC HCR ORBITER(02) B1W3V3EN1EN3FB1 (ACFD35) 08 JAN 71 PAGE 149

EFFECT OF FULL SPAN ELEVON DEFLECTION ON THE HCR ORBITER(02) WITH BODY FLAP



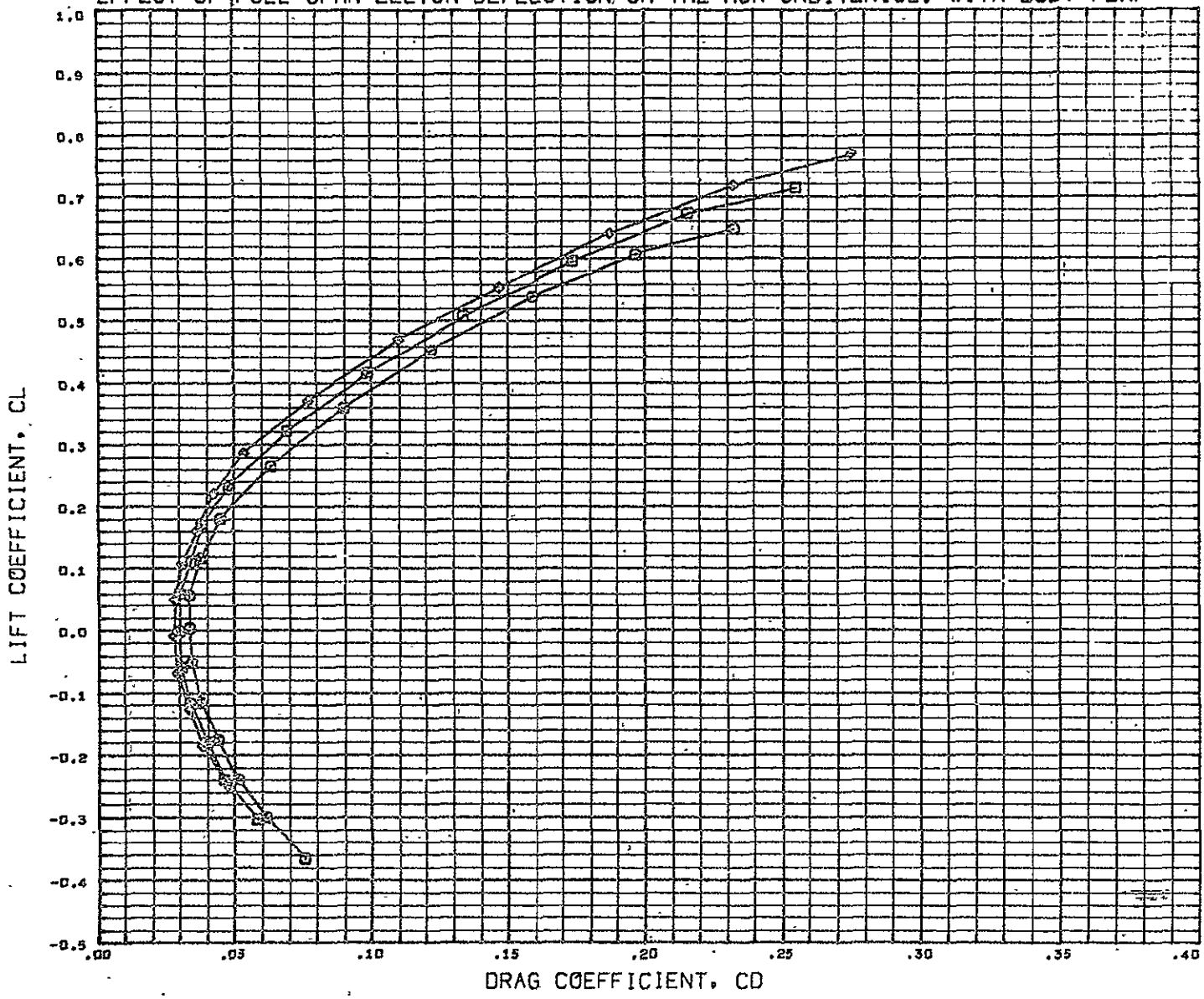
SYMBOL	ELEVON		PARAMETRIC VALUES		
○	- 20.000	BETA	0.000	FLAP,B	- 30.000
◇	- 15.000				
□	- 10.000				

DATA HIST, CODE V*A

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF FULL SPAN ELEVON DEFLECTION ON THE HCR ORBITER(02) WITH BODY FLAP



SYMBOL	ELEVON
○	- 20.000
□	- 15.000
◇	- 10.000

PARAMETRIC VALUES

BETA 0.000 FLAP,B - 30.000

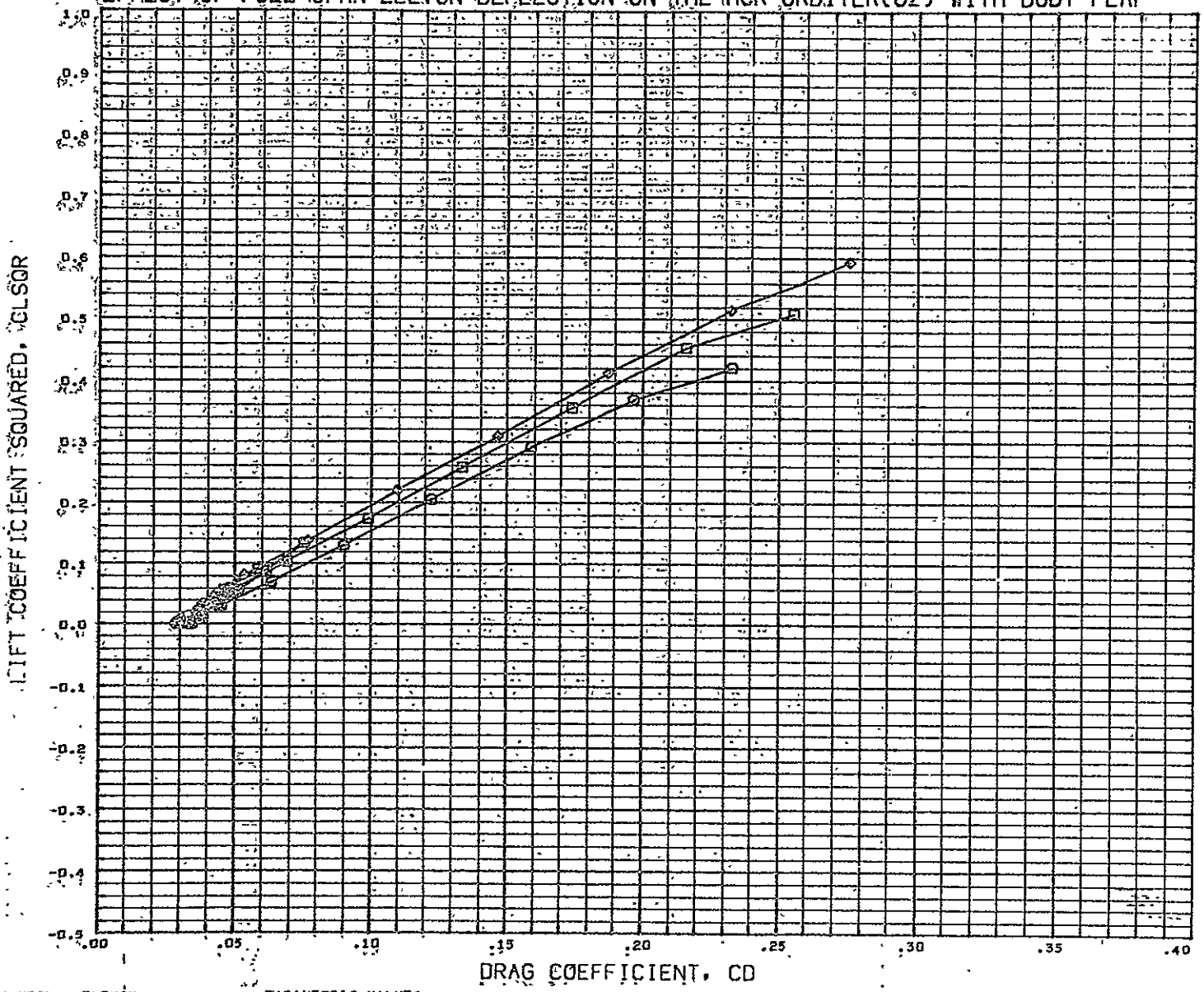
REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

DATA HIST. CODE V#A

LSWT 240 4.0 PC HCR ORBITER(02) B1W3V3EN1EN3FB1 (ACFD35) 08 JAN 71 PAGE 151

EFFECT OF FULL SPAN ELEVON DEFLECTION ON THE HCR ORBITER(02) WITH BODY FLAP



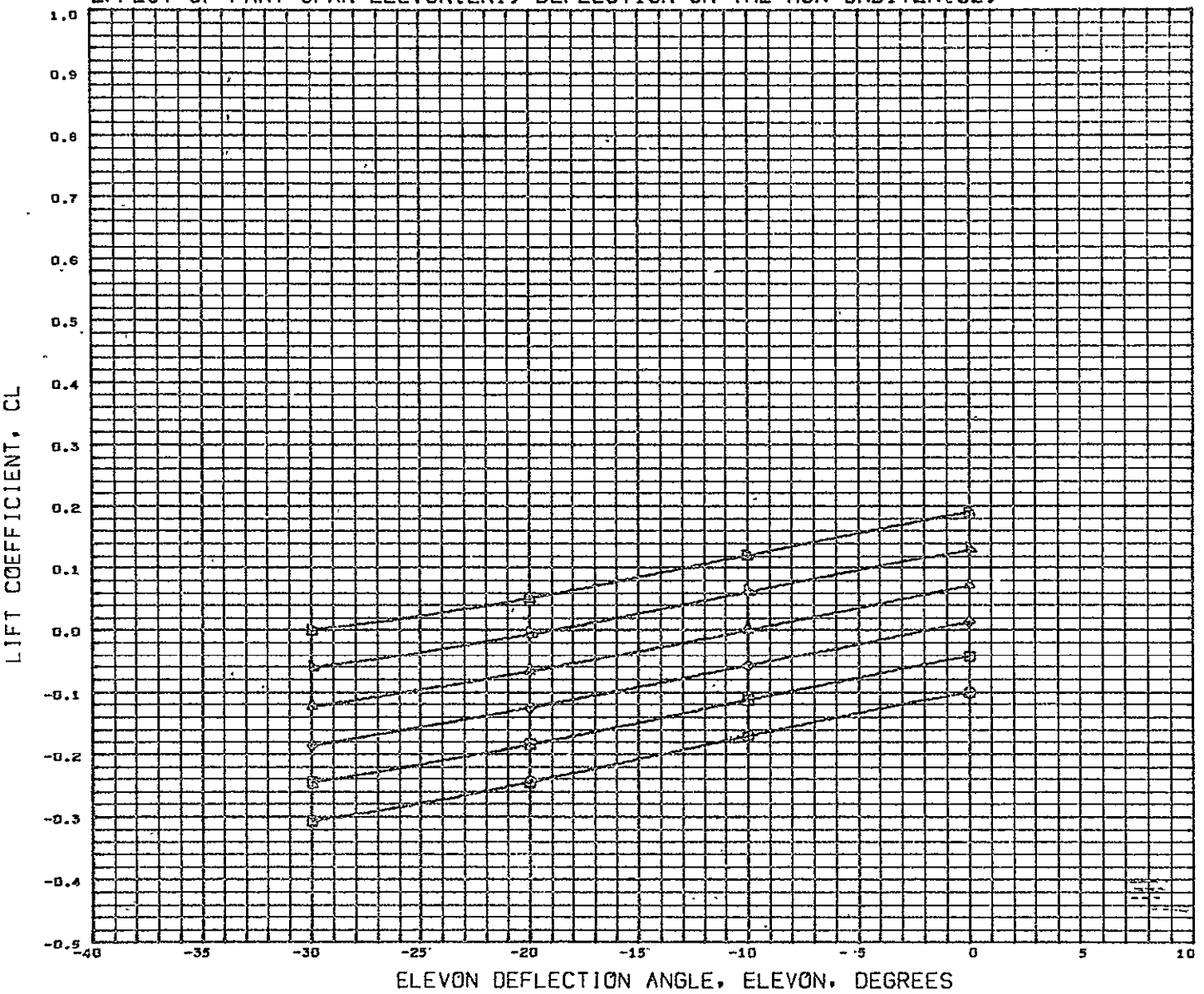
SYMBOL	ELEVON	PARAMETRIC VALUES		
○	- 20.000	BETA	0.000	FLAP,B - 30.000
□	- 15.000			
◇	- 10.000			

DATA HIST. CODE V*A

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF PART SPAN ELEVON(EN1) DEFLECTION ON THE HCR ORBITER(02)

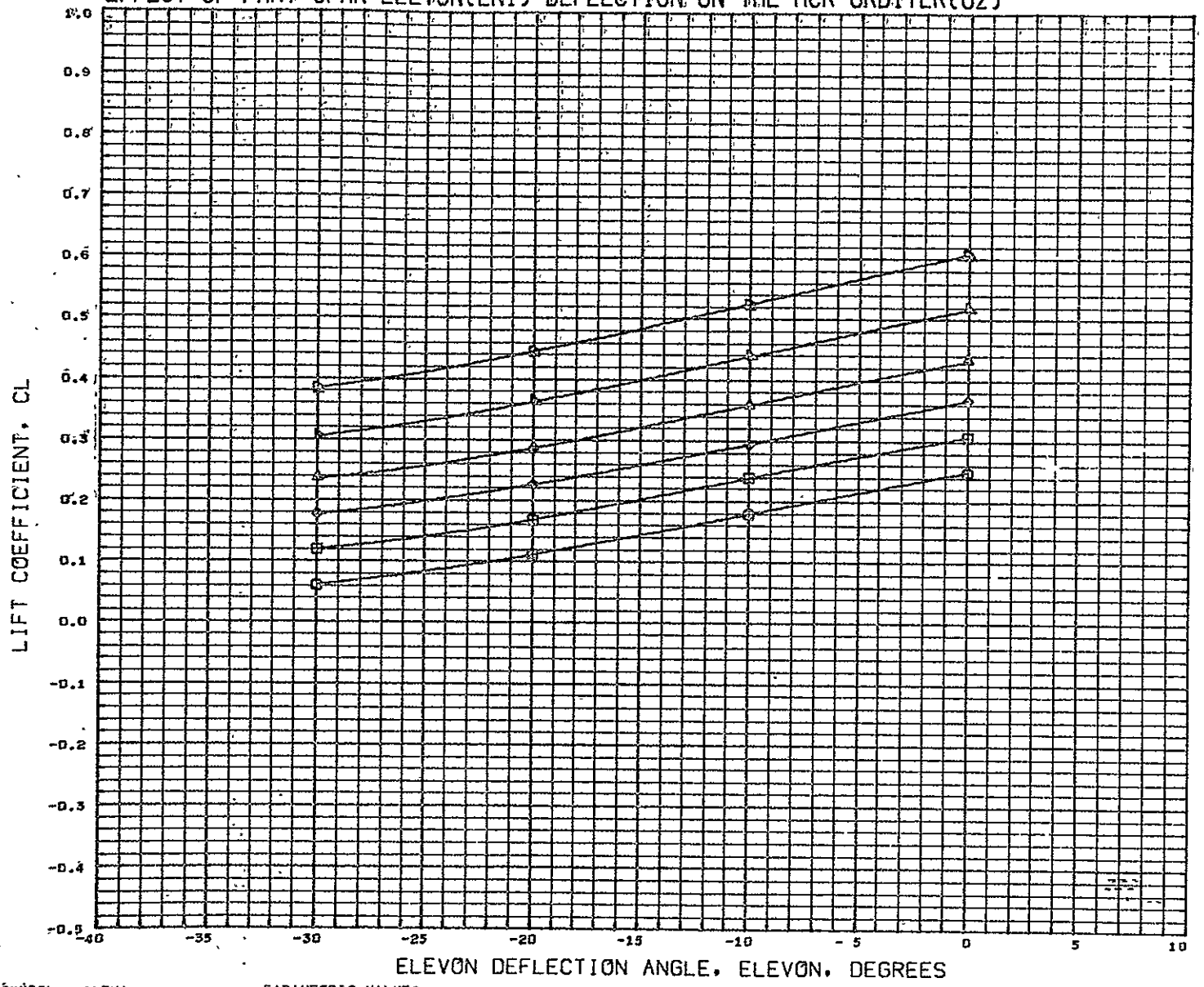


SYMBOL	ALFHA		PARAMETRIC VALUES
○	- 10.000	BETA	0.000
□	- 8.000		
◇	- 6.000		
△	- 4.000		
▷	- 2.000		
D	0.000	DATA HIST. CODE	V*AI

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF PART SPAN ELEVON(EN1) DEFLECTION ON THE HCR ORBITER(02)

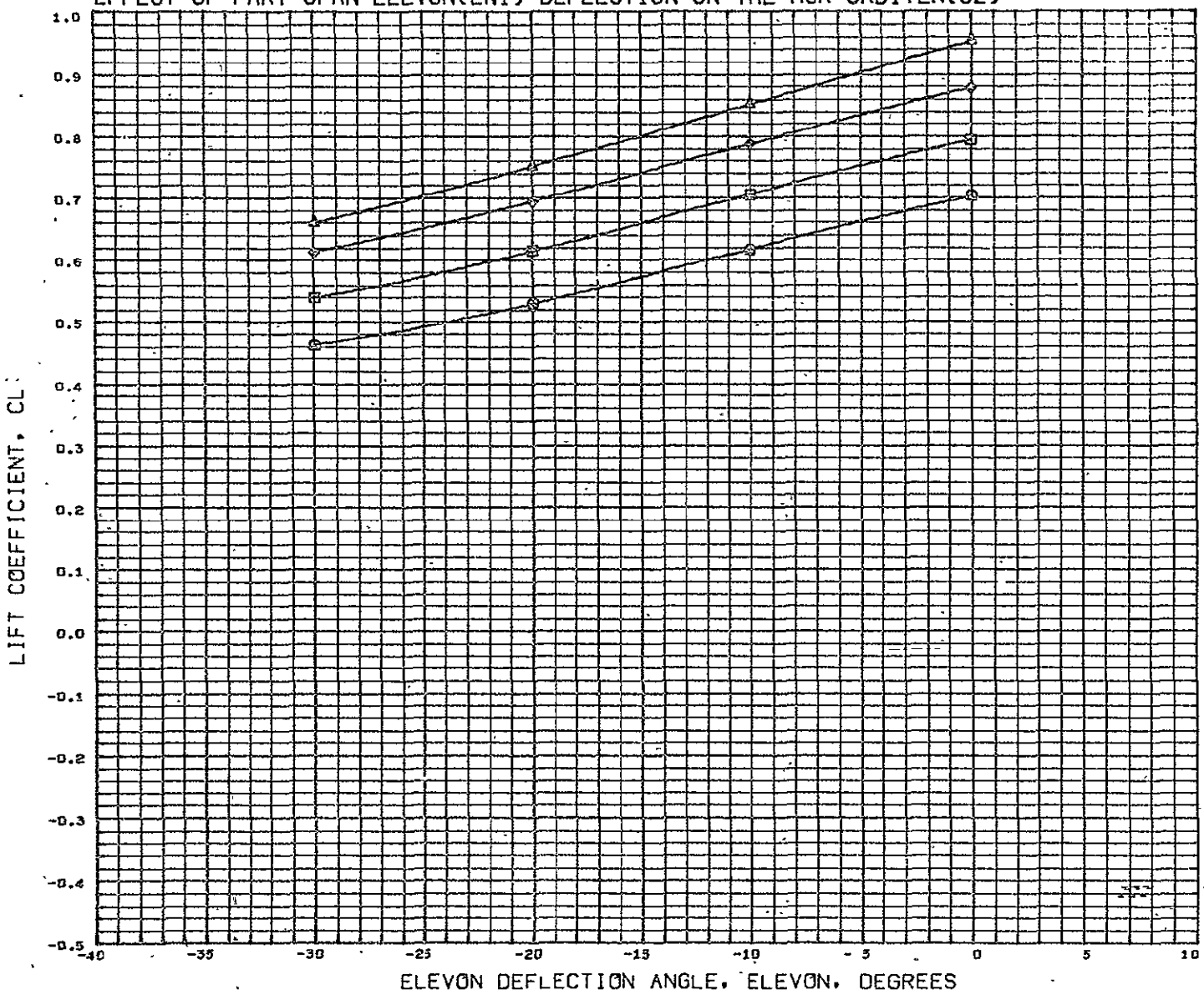


SYMBOL	ALPHA		PARAMETRIC VALUES
○	2.000	BETA	0.000
□	4.000		
◇	6.000		
△	8.000		
▽	10.000		
▷	12.000	DATA HIST. CODE	V*AI

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF PART SPAN ELEVON(EN1) DEFLECTION ON THE HCR ORBITER(02)



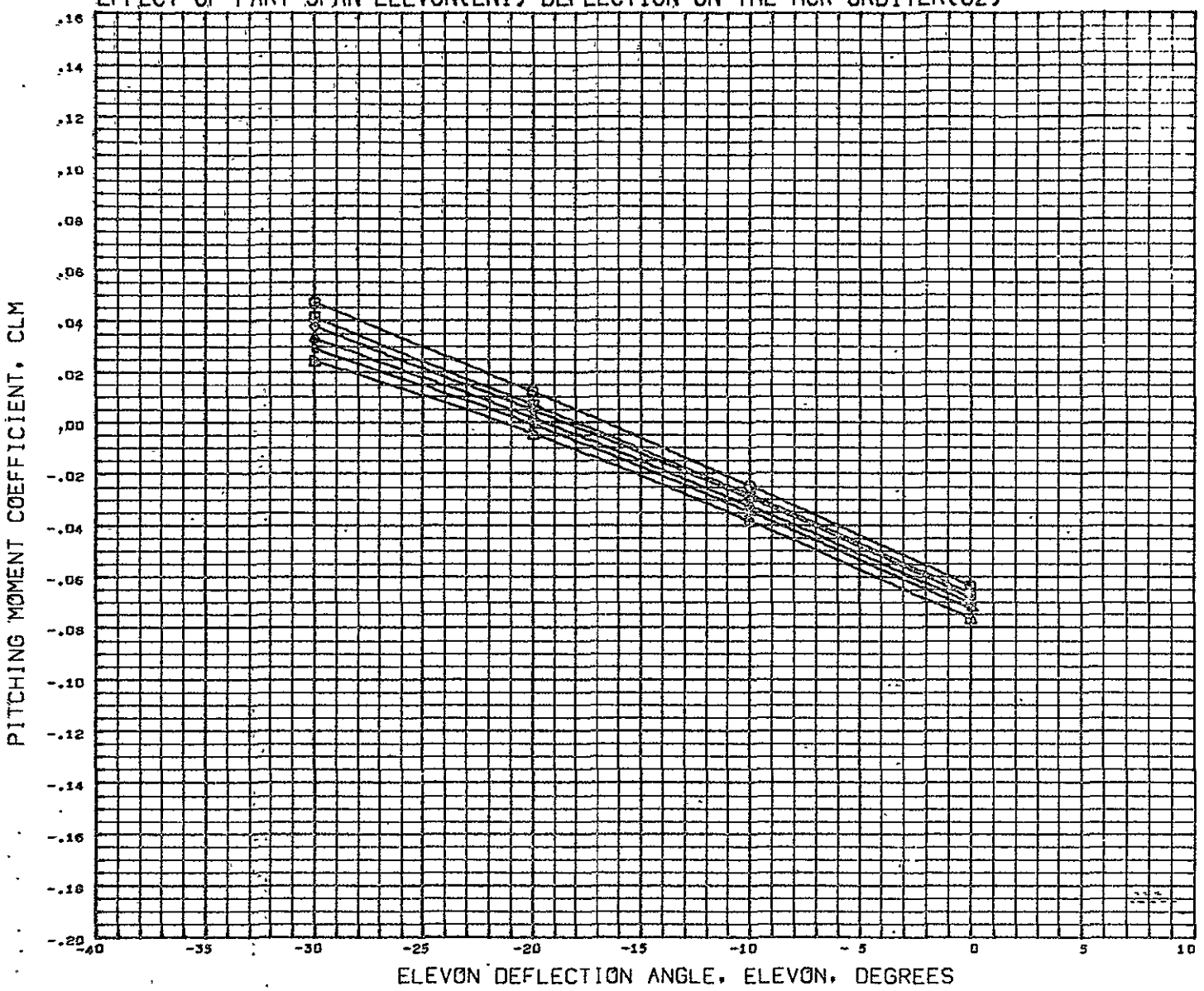
SYMBOL	ALPHA		PARAMETRIC VALUES
○	14.000	BETA	0.000
□	16.000		
◇	18.000		
△	20.000		

DATA HIST. CODE V*AI

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF PART SPAN ELEVON(EN1) DEFLECTION ON THE HCR ORBITER(02)

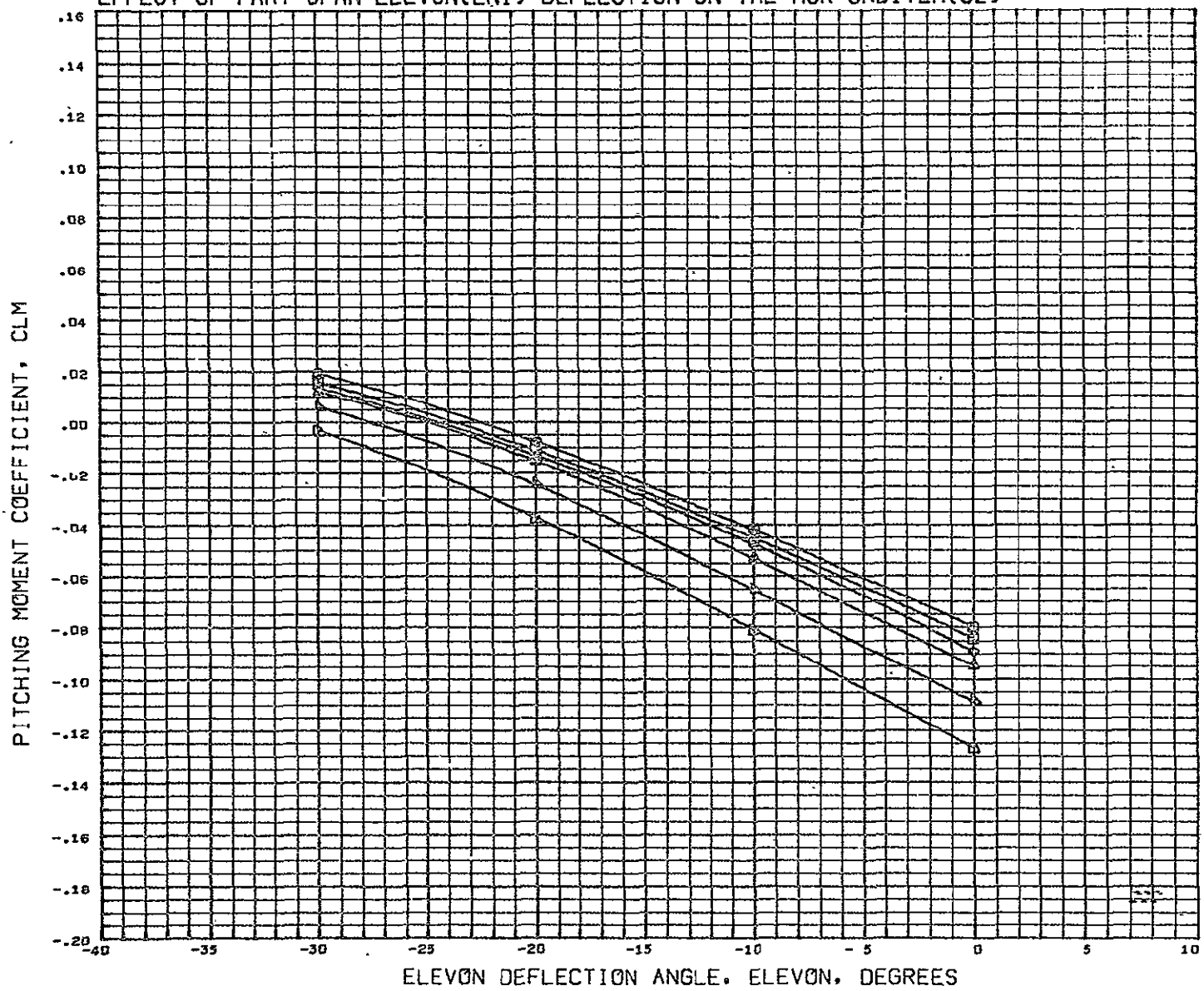


SYMBOL	ALPHA		PARAMETRIC VALUES
○	- 10.000	BETA	0.000
□	- 8.000		
◇	- 6.000		
△	- 4.000		
▷	- 2.000		
D	0.000	DATA HIST, CODE	V*AI

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF PART SPAN ELEVON(EN1) DEFLECTION ON THE HCR ORBITER(02)

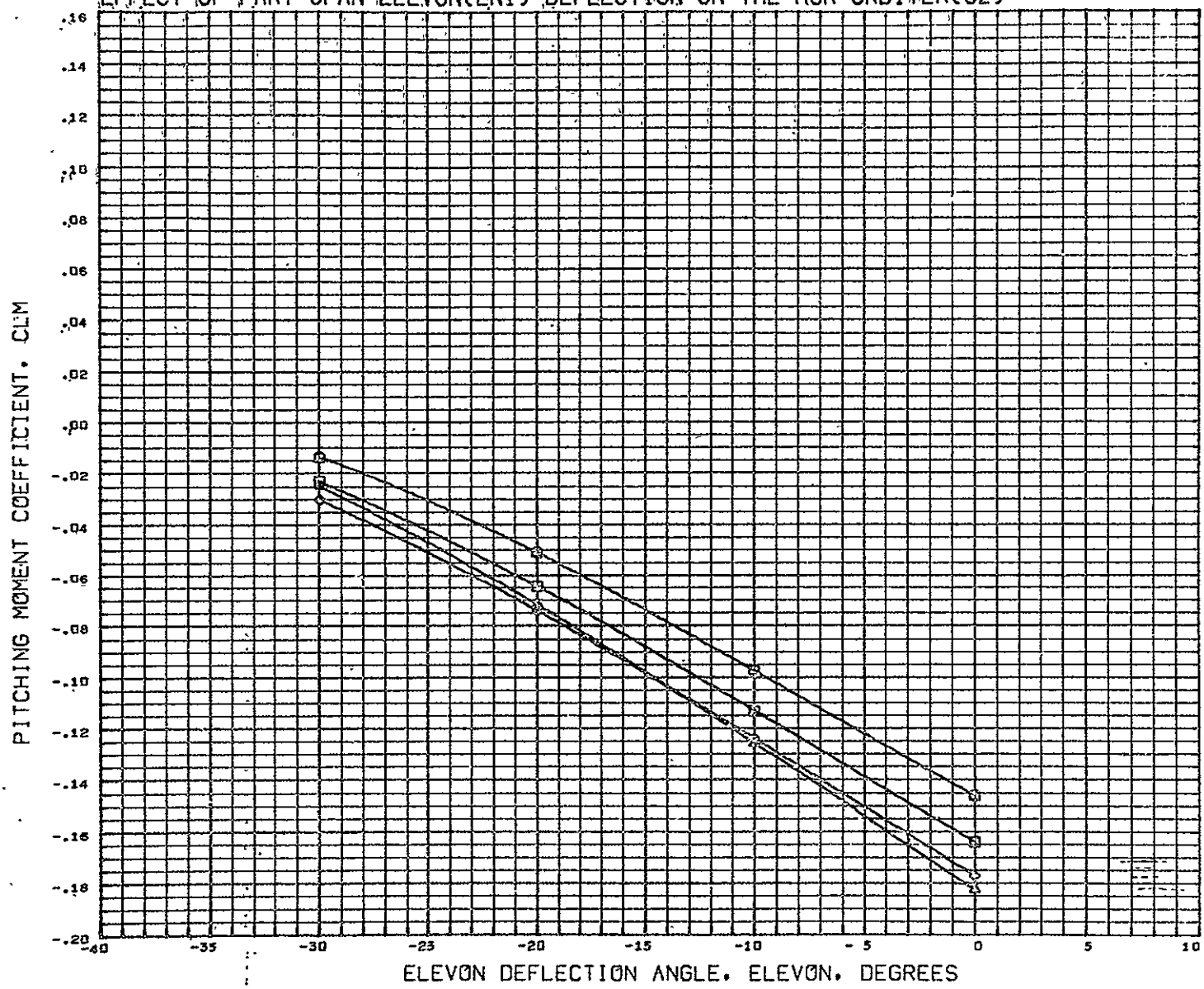


SYMBOL	ALFHA		PARAMETRIC VALUES
○	2.000	BETA	0.000
□	4.000		
◇	6.000		
△	8.000		
◁	10.000		
▷	12.000	DATA HIST. CODE	V*AI

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF PART SPAN ELEVON(EN1) DEFLECTION ON THE HCR ORBITER(02)



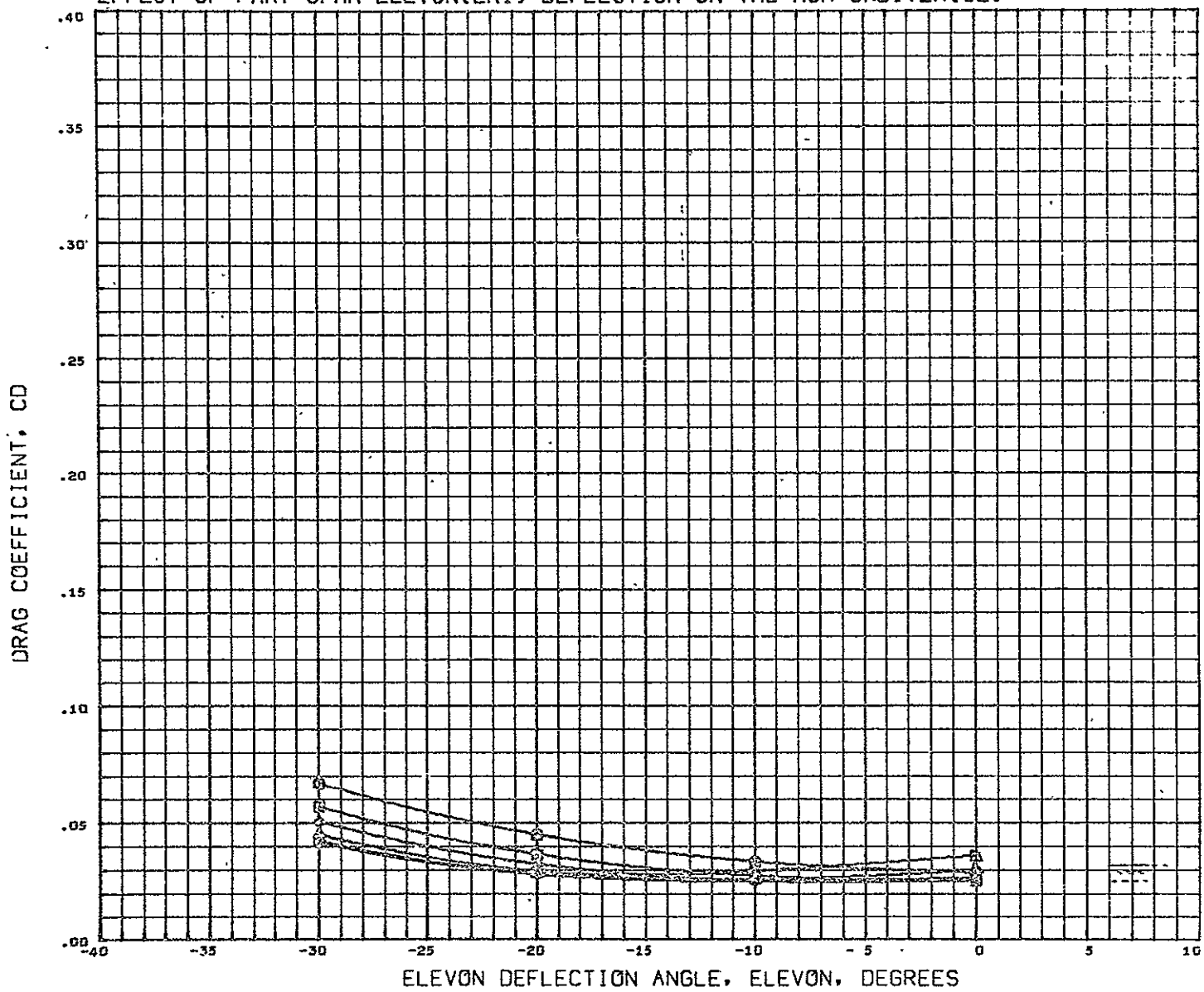
SYMBOL	ALPHA		PARAMETRIC VALUES
○	14.000	BETA	0.000
□	16.000		
◇	18.000		
△	20.000		

DATA HIST. CODE V*AI

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF PART SPAN ELEVON(EN1) DEFLECTION ON THE HCR ORBITER(02)

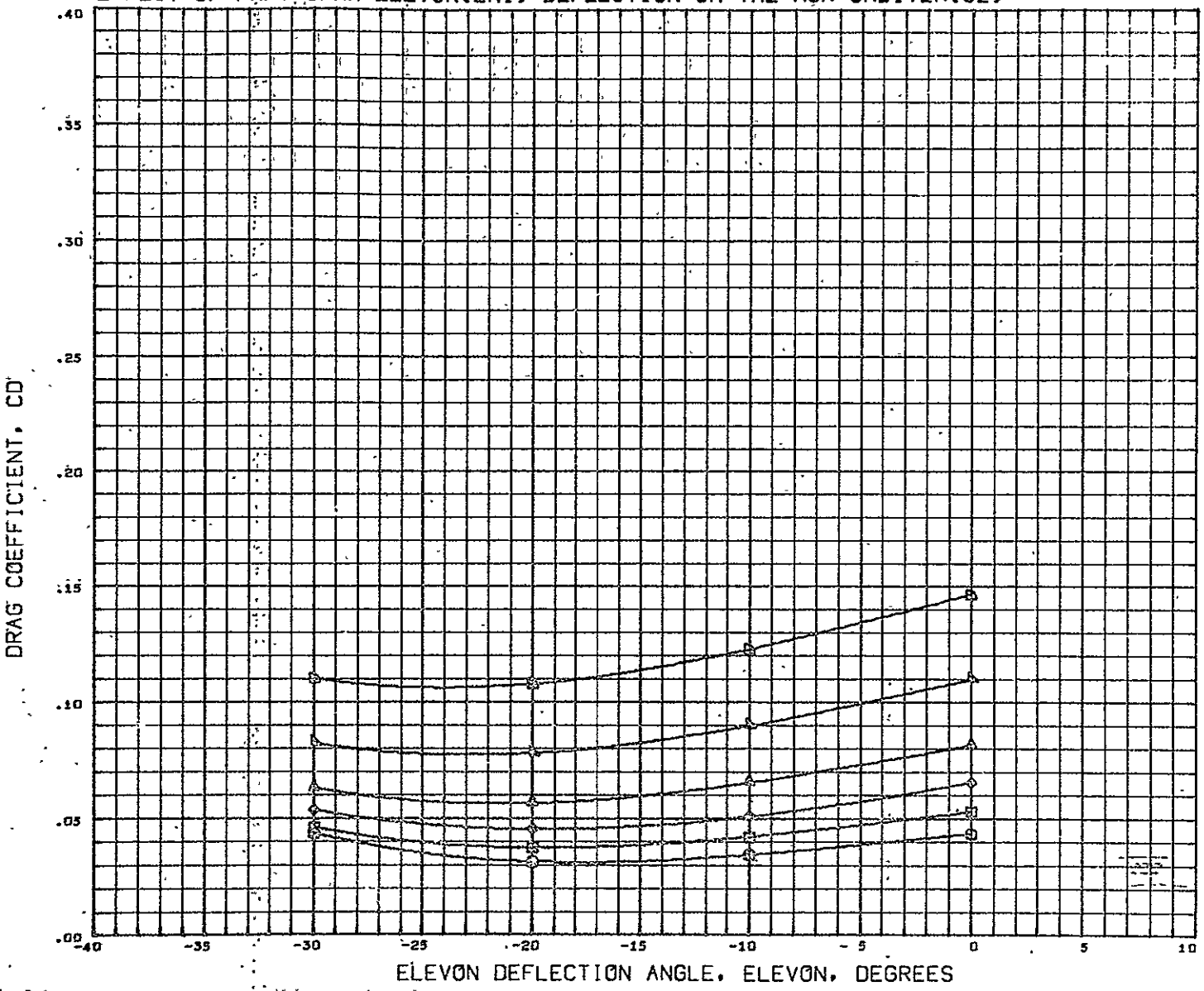


SYMBOL	ALPHA		PARAMETRIC VALUES
○	- 10.000	BETA	0.000
□	- 8.000		
◇	- 6.000		
△	- 4.000		
▷	- 2.000		
D	0.000	DATA HIST. CODE	V*AI

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF PART SPAN ELEVON(EN1) DEFLECTION ON THE HCR ORBITER(02)



SYMBOL	ALPHA		PARAMETRIC VALUES
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◇	6.000		
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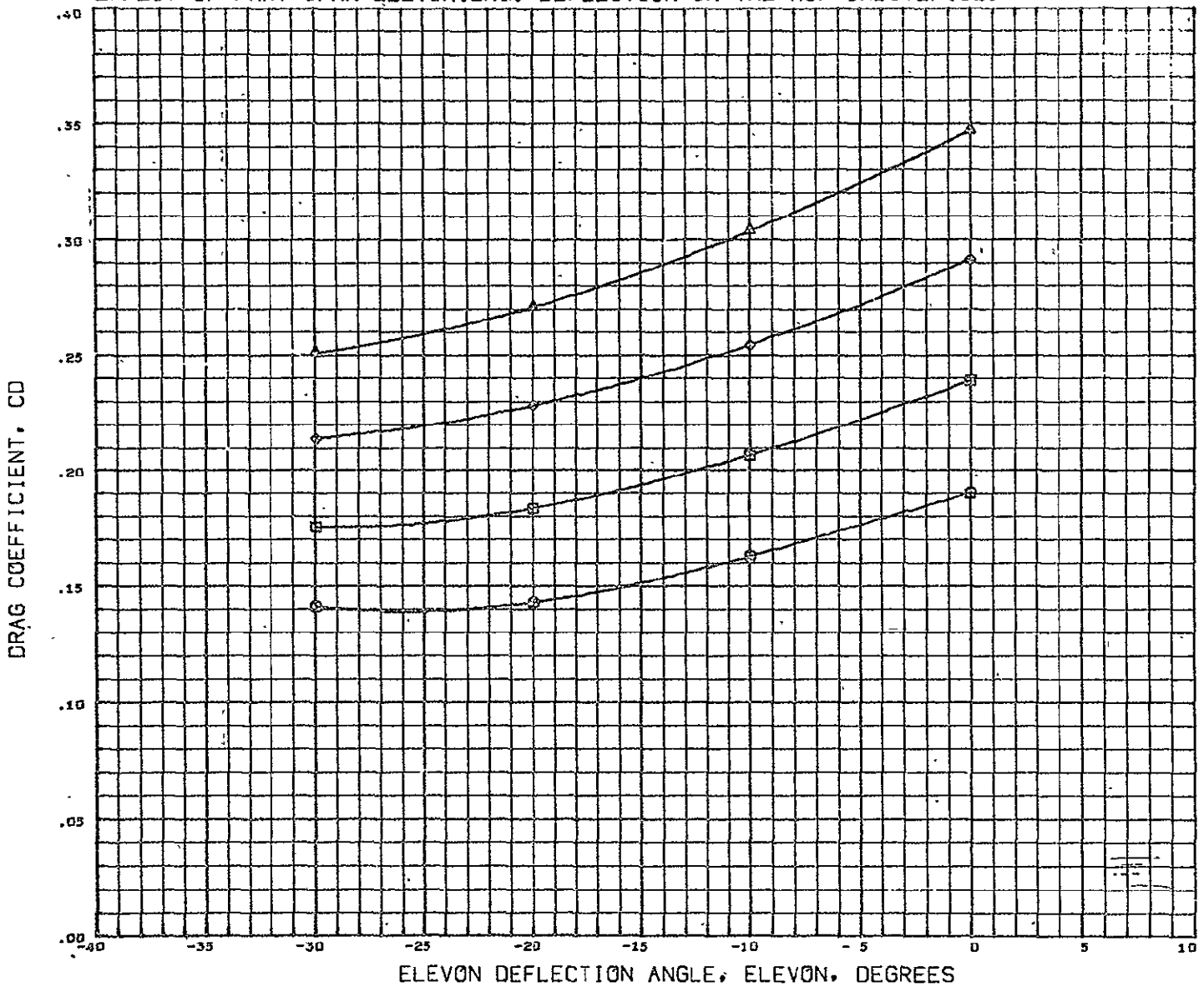
▽	12.000	DATA HIST. CODE	V*AI

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF PART SPAN ELEVON(EN1) DEFLECTION ON THE HCR ORBITER(02)



SYMBOL	ALPHA		PARAMETRIC VALUES
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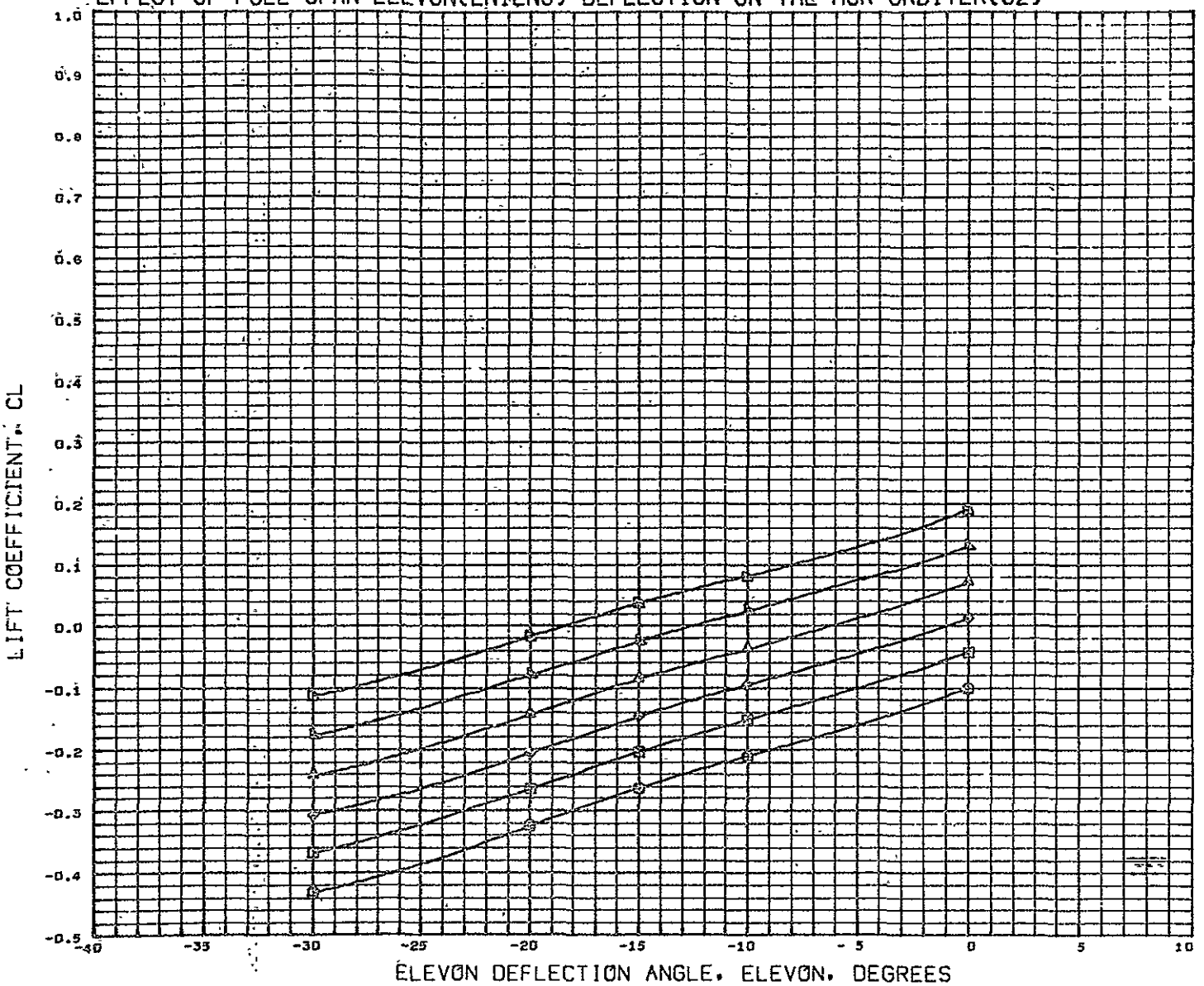
◇	18.000		
△	20.000		

DATA HIST. CODE V#AI

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF FULL SPAN ELEVON(EN1EN3) DEFLECTION ON THE HCR ORBITER(02)



SYMBOL	ALPHA		PARAMETRIC VALUES
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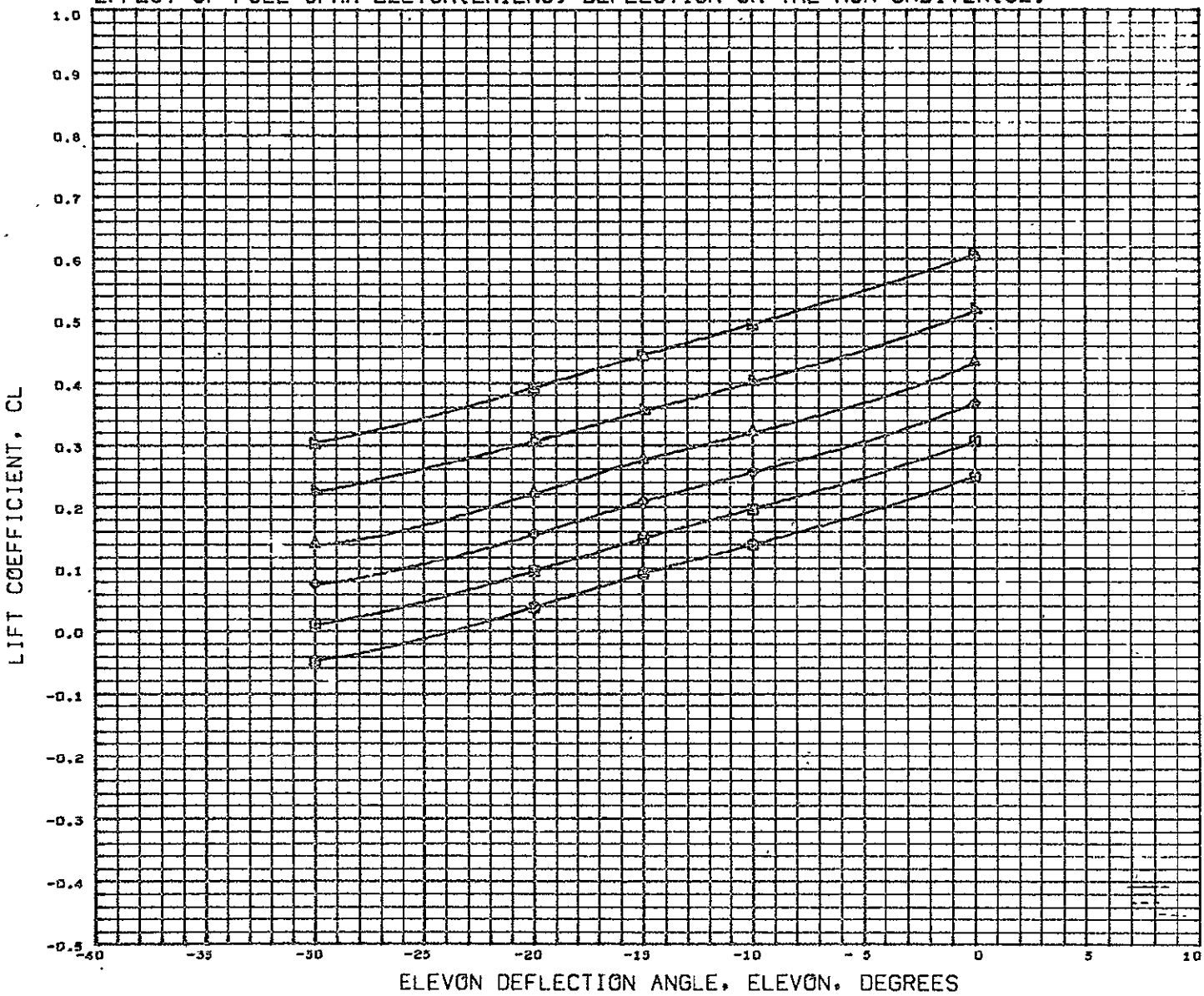
▽	0.000	DATA HIST. CODE	V+AI

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

ESWT 240 4.0 PC HCR ORBITER(02) B1W3V3EN1EN3 (ICFD31) 08 JAN 71 PAGE 162

EFFECT OF FULL SPAN ELEVON(EN1EN3) DEFLECTION ON THE HCR ORBITER(02)



SYMBOL	ALPHA		PARAMETRIC VALUES
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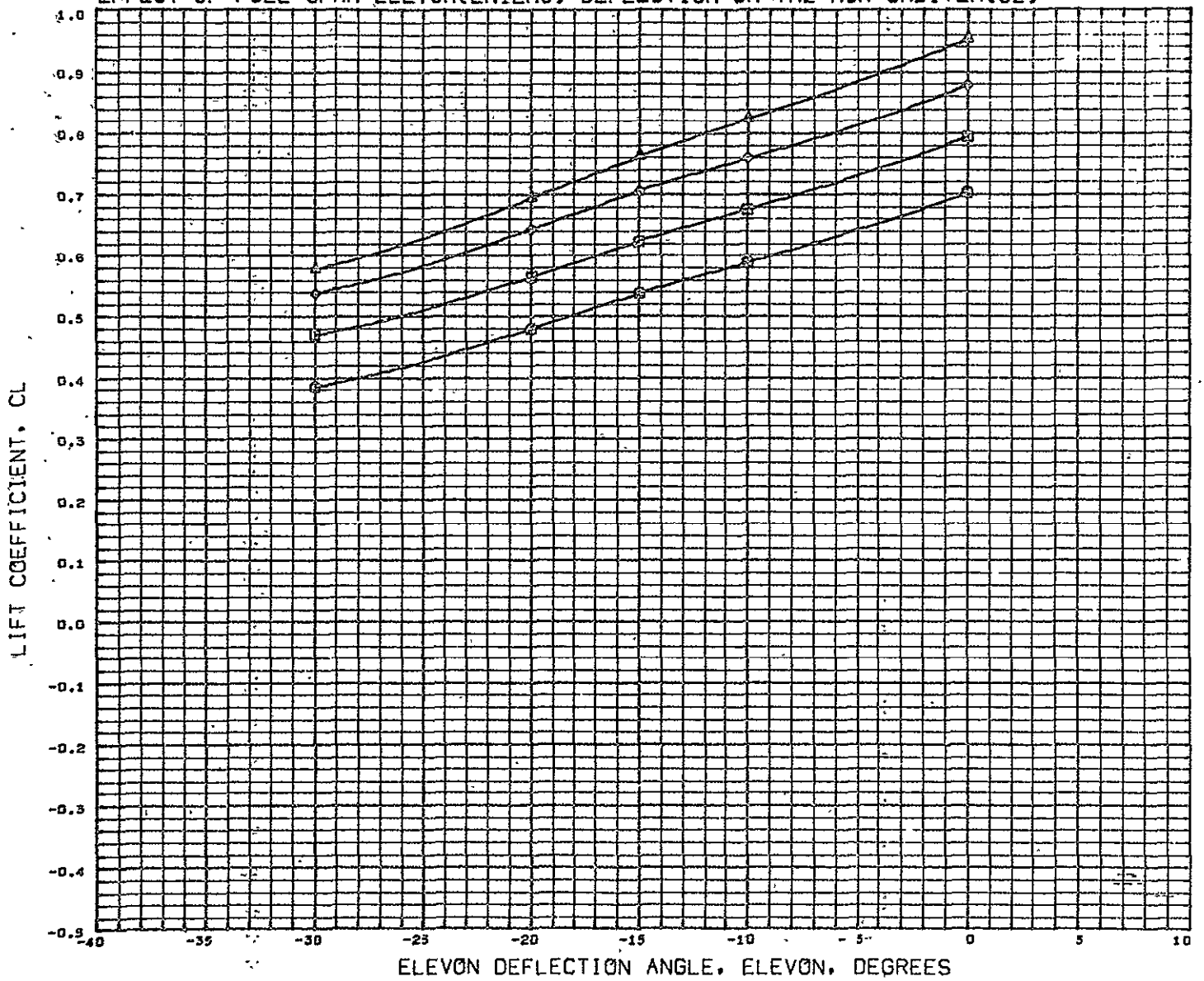
REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF FULL SPAN ELEVON(EN1EN3) DEFLECTION ON THE HCR ORBITER(02)



SYMBOL	ALPHA		PARAMETRIC VALUES
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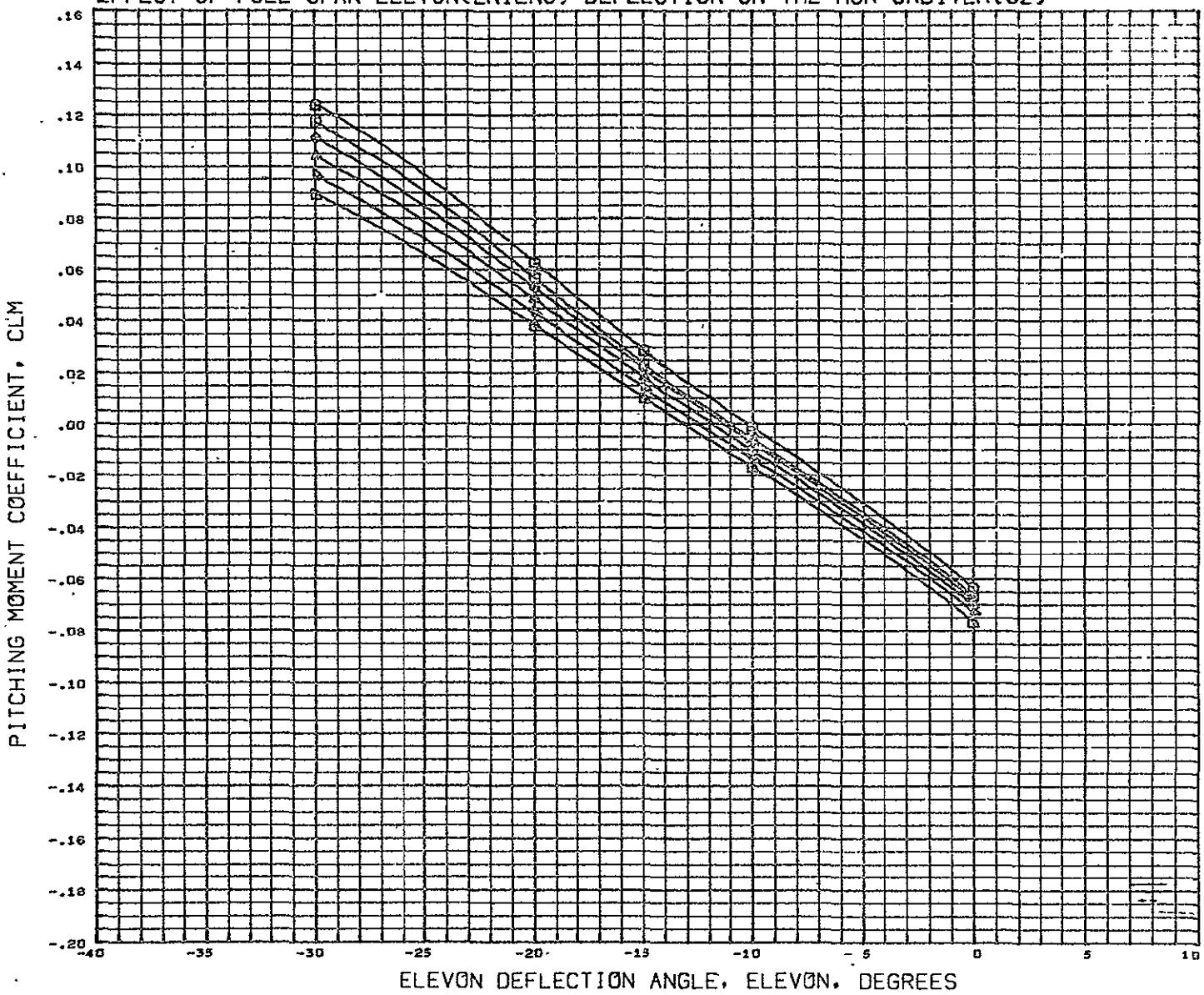
△	20.000		

DATA HIST. CODE V*AI

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF FULL SPAN ELEVON(EN1EN3) DEFLECTION ON THE HCR ORBITER(02)



SYMBOL	ALPHA		PARAMETRIC VALUES
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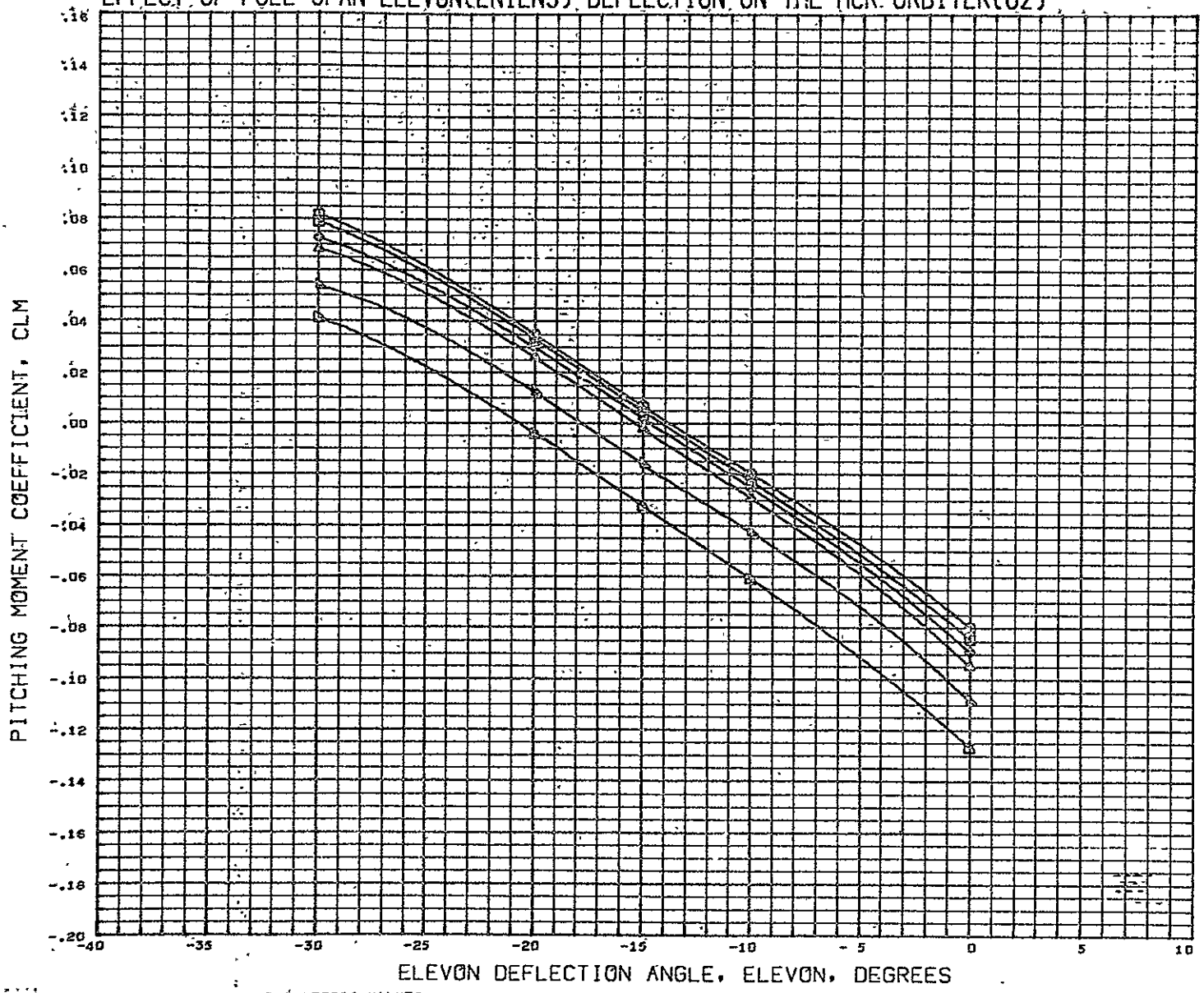
◇	- 6.000		
△	- 4.000		
▷	- 2.000		
D	0.000	DATA HIST. CODE	V*AI

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF FULL SPAN ELEVON(EN1EN3) DEFLECTION ON THE HCR ORBITER(02)



SYMBOL	ALPHA		PARAMETRIC VALUES
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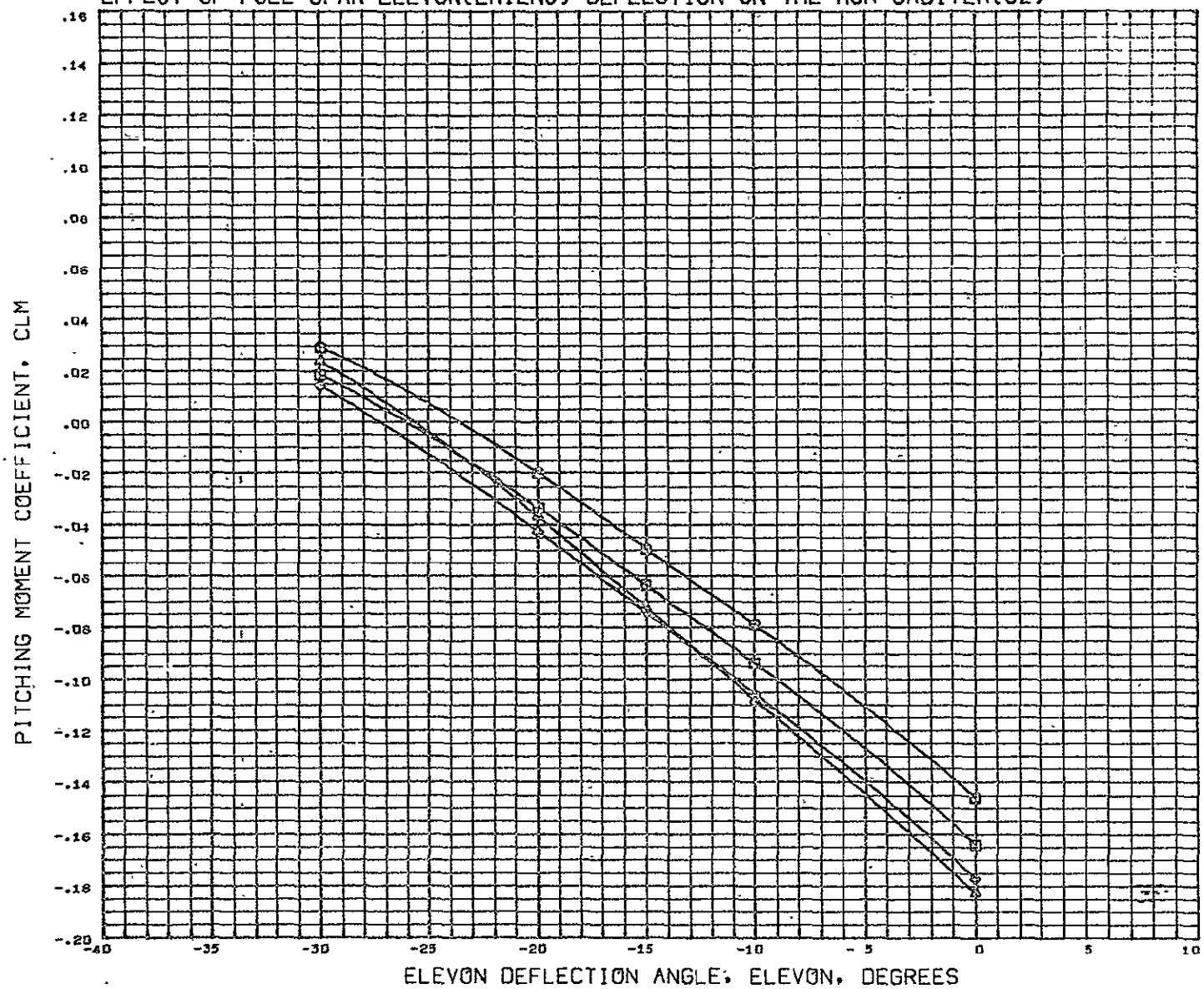
□	4.000		
◇	6.000		
△	8.000		
▽	10.000		
▷	12.000	DATA HIST. CODE	V*AI

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF FULL SPAN ELEVON(EN1EN3) DEFLECTION ON THE HCR ORBITER(02)



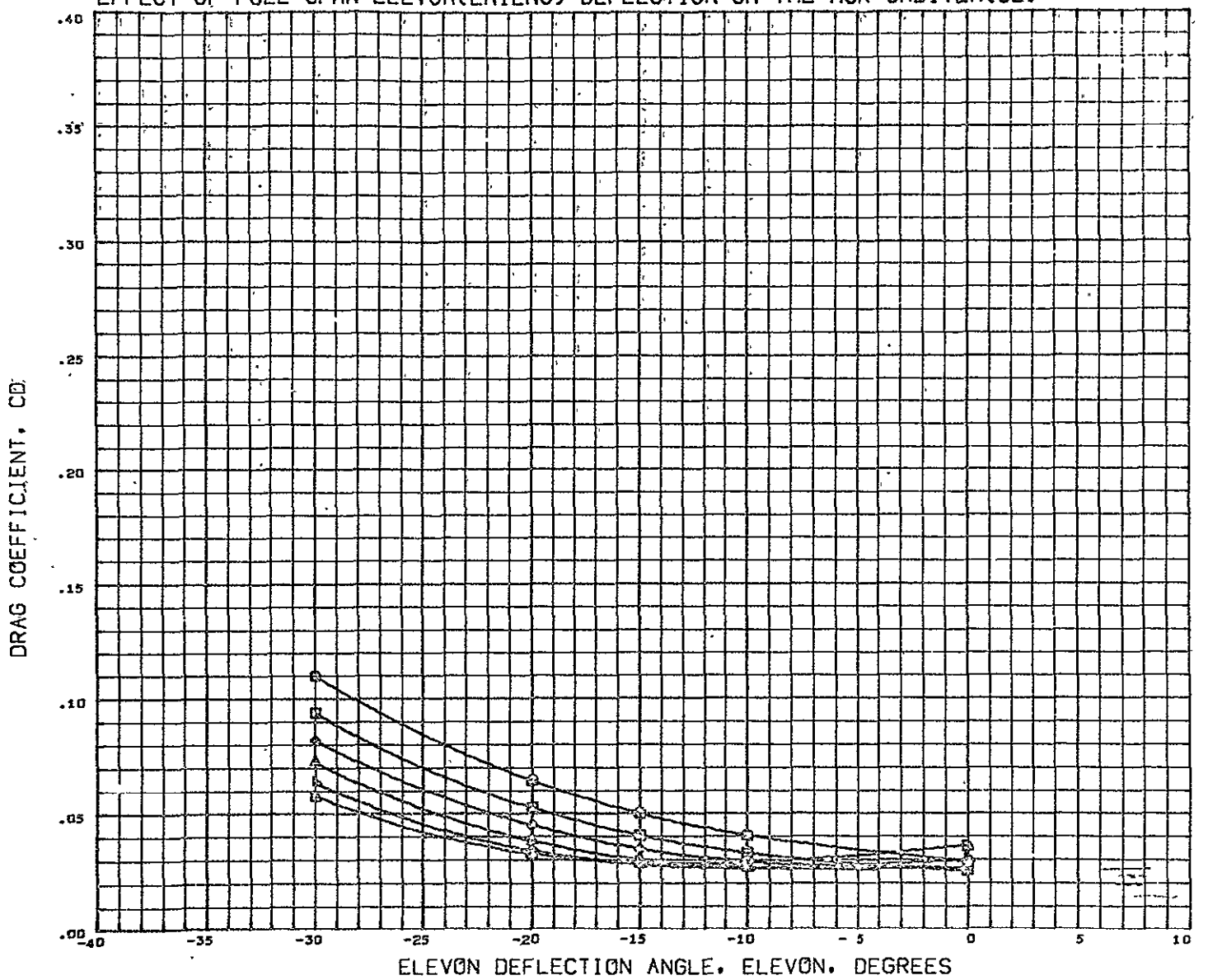
SYMBOL	ALPHA		PARAMETRIC VALUES
○	14.000	BETA	0.000
□	16.000		
◇	18.000		
△	20.000		

DATA HIST. CODE V*AI

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF FULL SPAN ELEVON(EN1EN3) DEFLECTION ON THE HCR ORBITER(02)



SYMBOL	ALPHA		PARAMETRIC VALUES
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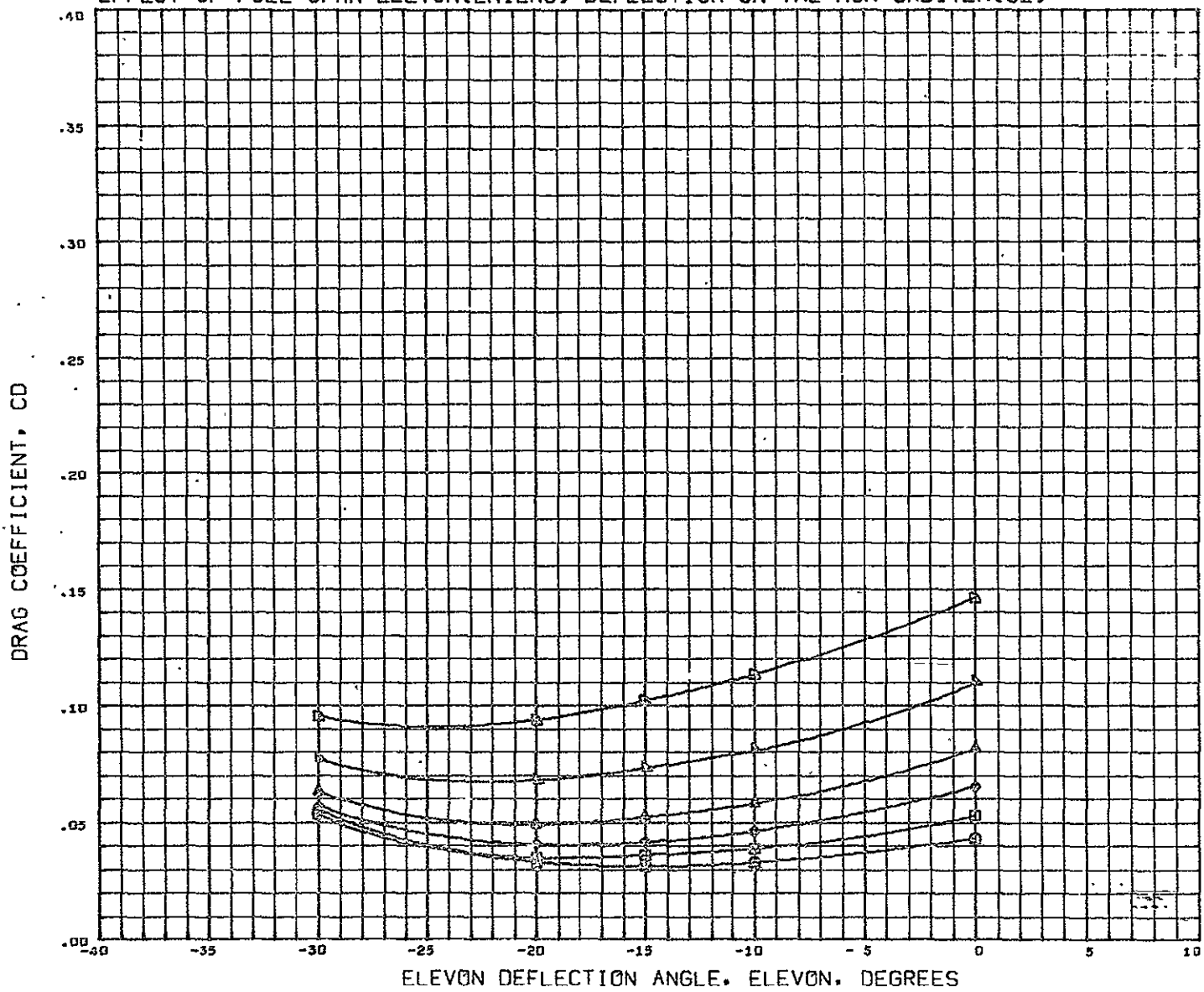
△	- 4.000		
▷	- 2.000		
D	0.000	DATA HIST. CODE	V*AI

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF FULL SPAN ELEVON(EN1EN3) DEFLECTION ON THE HCR ORBITER(02)



SYMBOL	ALPHA		PARAMETRIC VALUES
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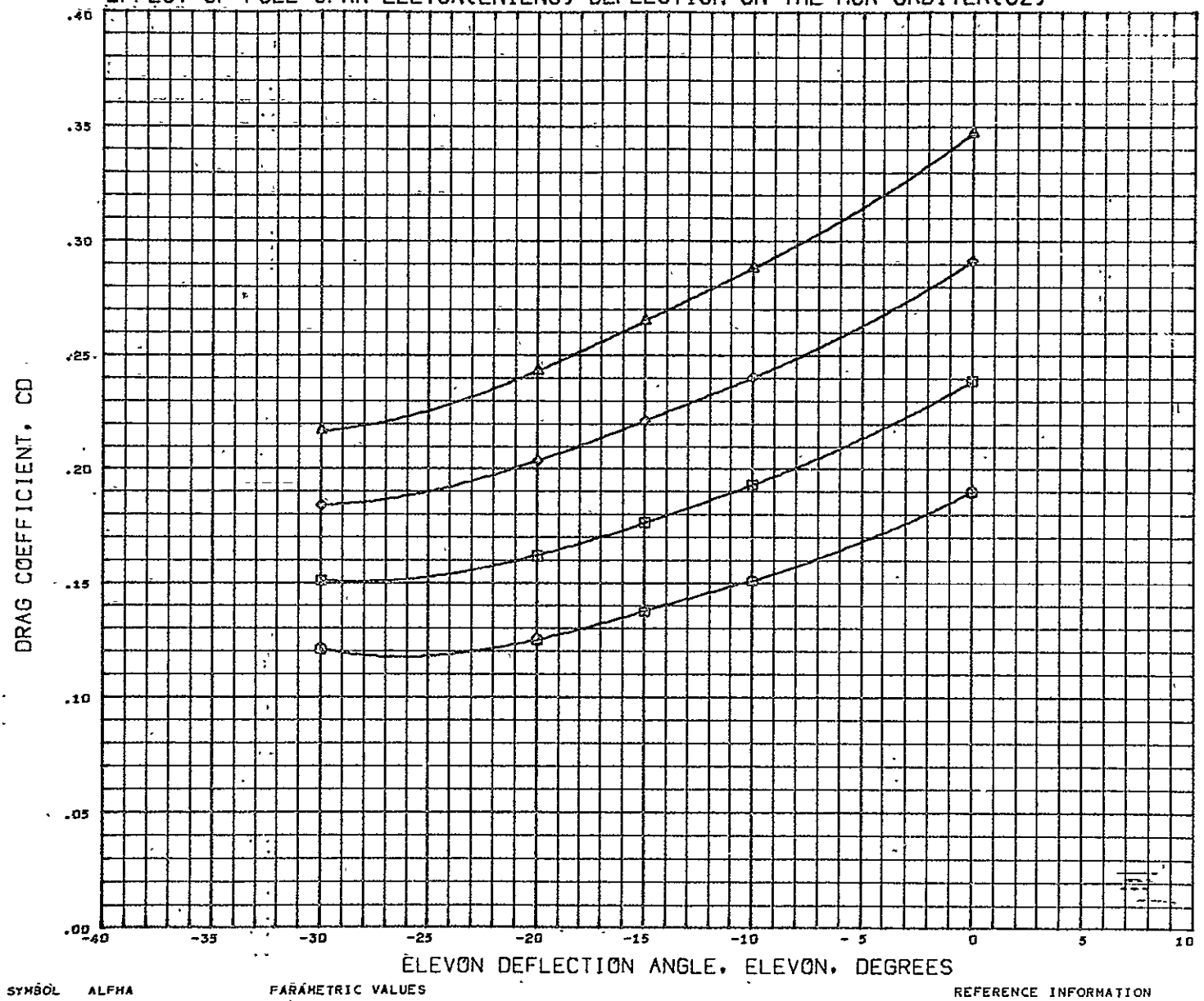
△	8.000		
▷	10.000		
D	12.000	DATA HIST. CODE	V*AI

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT ØF FULL SPAN ELEVØN(EN1EN3) DEFLECTIØN ØN THE HCR ØRBITER(Ø2)



SYMBOL	ALPHA		PARAMETRIC VALUES
○	14.000	BETA	0.000
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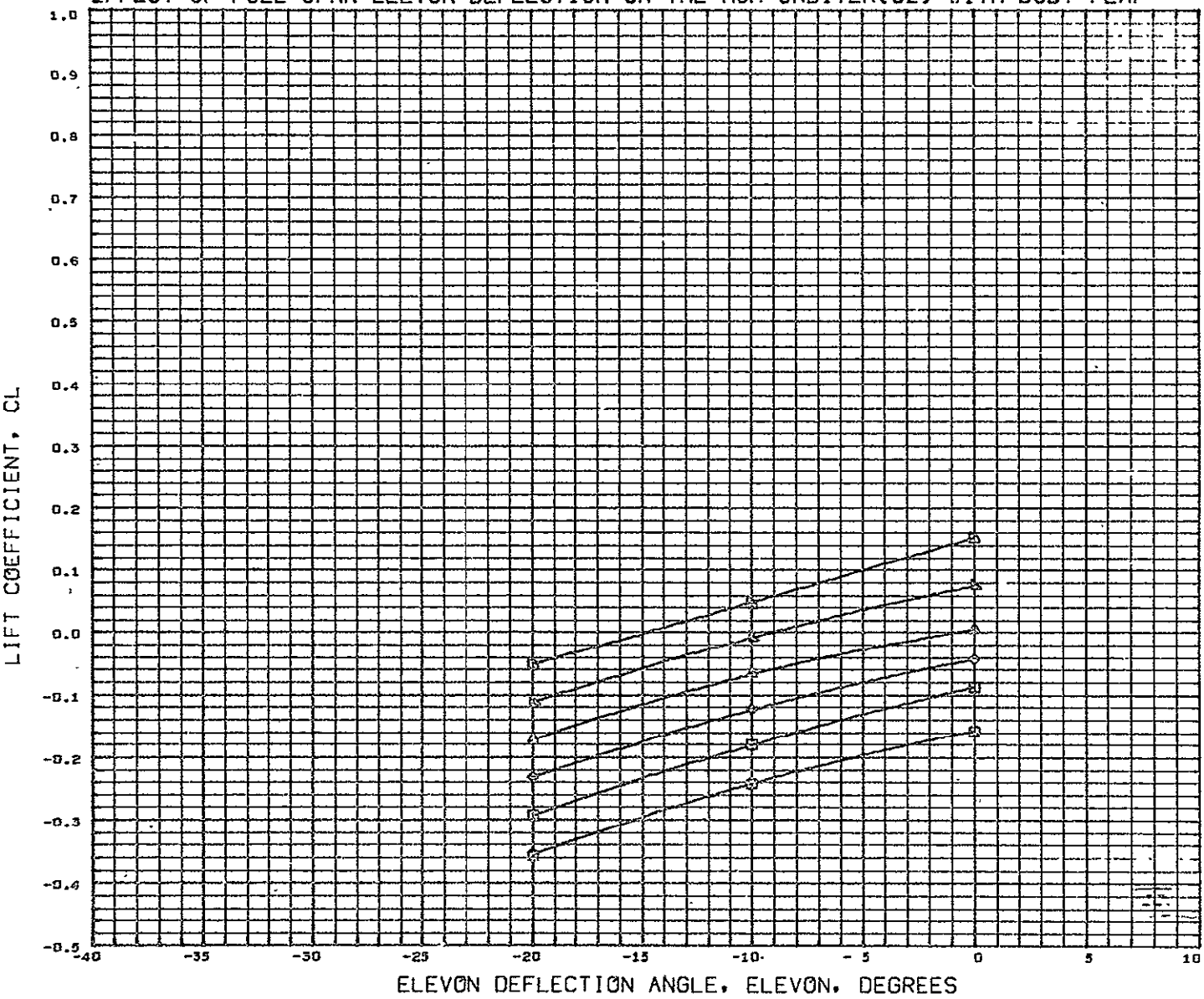
◇	18.000		
△	20.000		

DATA HIST. CODE V*AI

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF FULL SPAN ELEVON DEFLECTION ON THE HCR ORBITER(02) WITH BODY FLAP



SYMBOL	ALPHA		PARAMETRIC VALUES		
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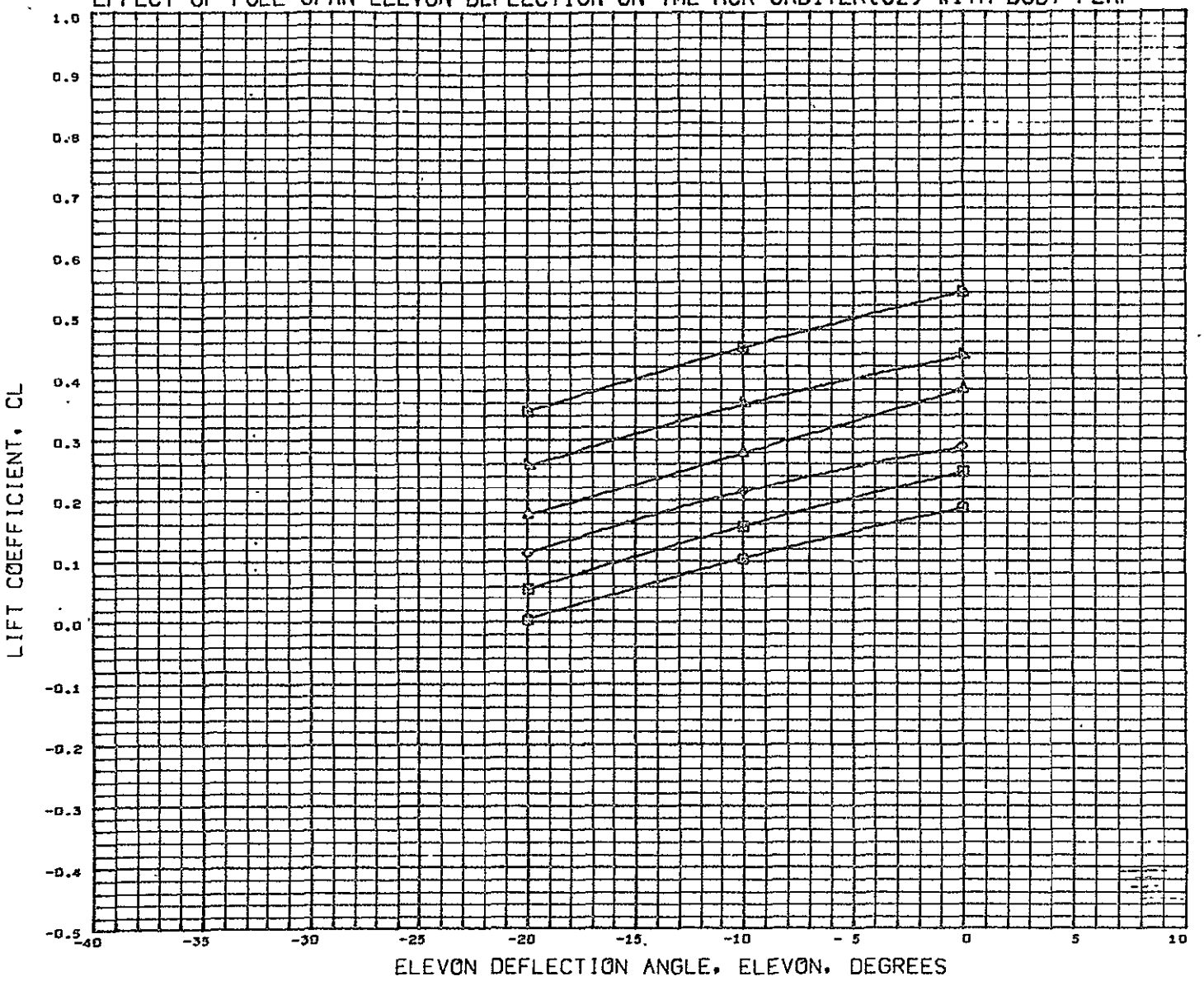
□	- 8.000				
◇	- 6.000				
△	- 4.000				
▷	- 2.000				
D	0.000	DATA HIST. CODE	V*AI		

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF FULL SPAN ELEVON DEFLECTION ON THE HCR ORBITER(02) WITH BODY FLAP



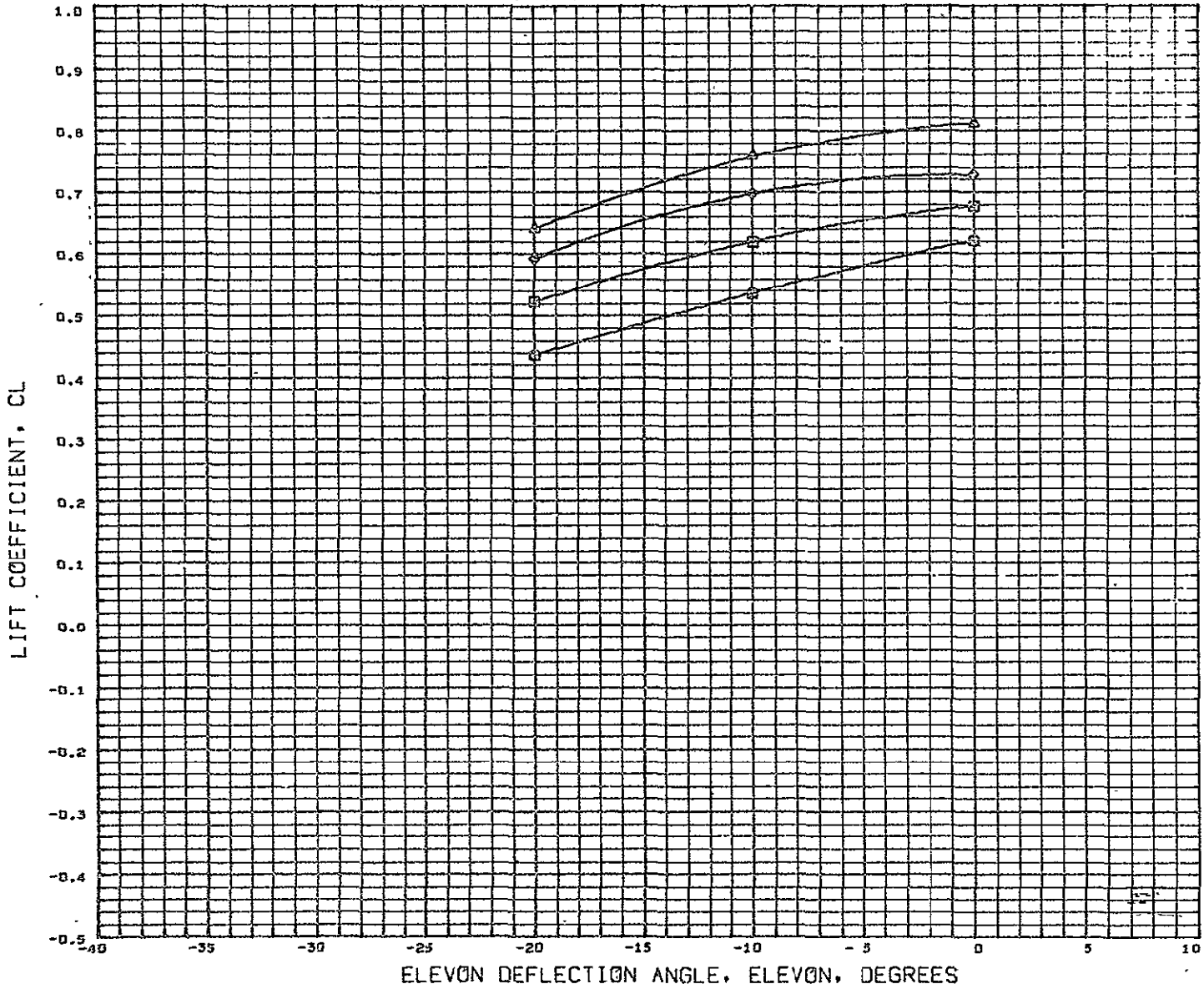
SYMBOL	ALPHA		PARAMETRIC VALUES		
○	2.000	BETA	0.000	FLAP,B	- 30.000
□	4.000				
◇	6.000				
△	8.000				
▷	10.000				
⬠	12.000	DATA HIST. CODE	V*AI		

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

LSWT 240 4.0 PC HCR ORBITER(02) B1W3V3EN1EN3FB1 (ICFD35) 08 JAN 71 PAGE 172

EFFECT OF FULL SPAN ELEVON DEFLECTION ON THE HCR ORBITER(02) WITH BODY FLAP



SYMBOL	ALPHA		PARAMETRIC VALUES		
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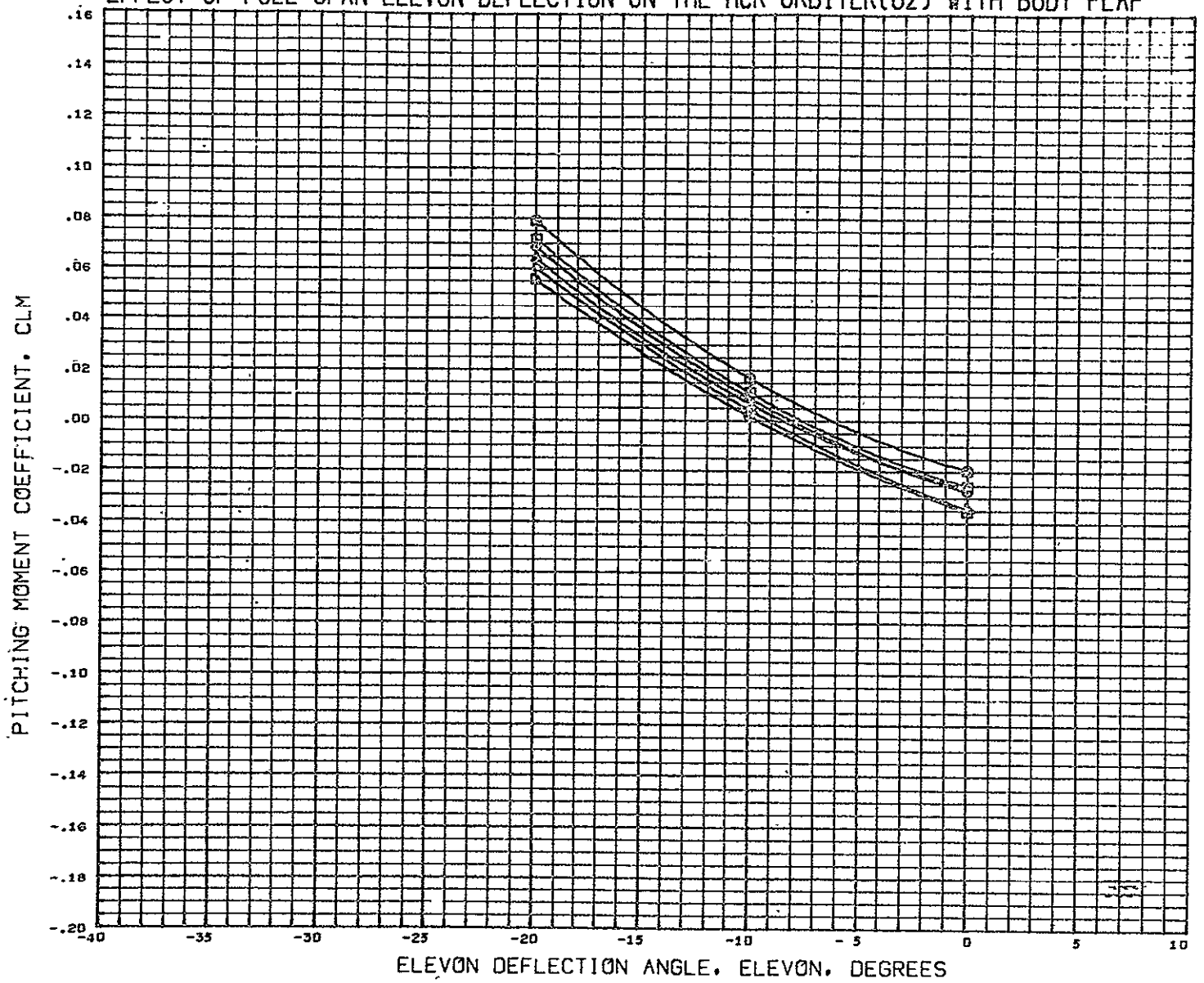
DATA HIST. CODE V*AI

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

EFFECT OF FULL SPAN ELEVON DEFLECTION ON THE HCR ORBITER(02) WITH BODY FLAP



SYMBOL	ALPHA		PARAMETRIC VALUES		
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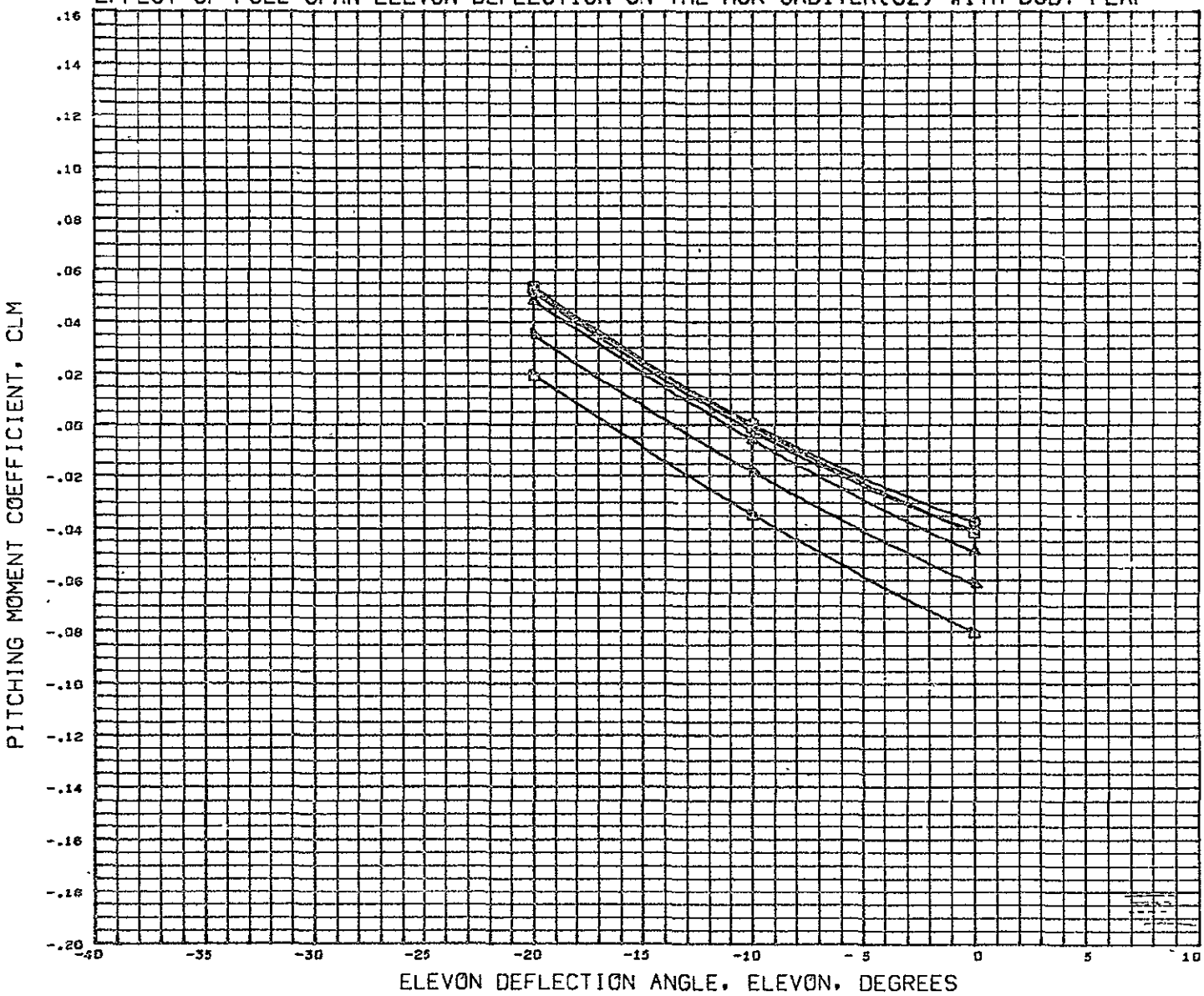
□	- 8.000				
◇	- 6.000				
△	- 4.000				
▽	- 2.000				
D	0.000	DATA HIST. CODE	V#AI		

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

LSWT 240 4.0 PC HCR ORBITER(02) B1W3V3EN1EN3FB1 (ICFD35) 08 JAN 71 PAGE 174

EFFECT OF FULL SPAN ELEVON DEFLECTION ON THE HCR ORBITER(02) WITH BODY FLAP



SYMBOL	ALPHA		PARAMETRIC VALUES		
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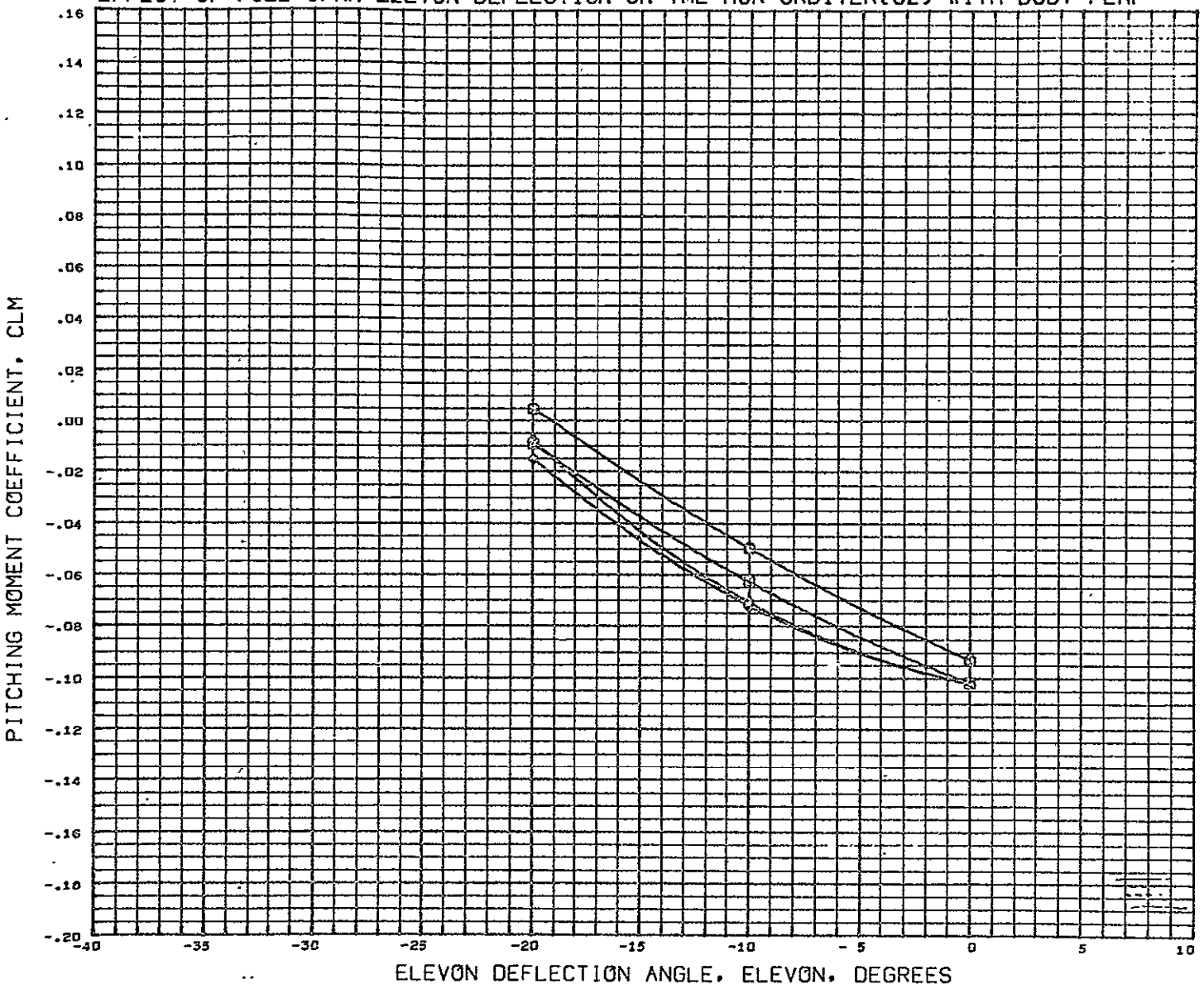
□	4.000				
◇	6.000				
△	8.000				
▷	10.000				
D	12.000	DATA HIST. CODE	V*AI		

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

LSWT 240 4.0 PC HCR ORBITER(02) B1W3V3EN1EN3FB1 (ICFD35) 08 JAN 71 PAGE 175

EFFECT OF FULL SPAN ELEVON DEFLECTION ON THE HCR ORBITER(02) WITH BODY FLAP



SYMBOL	ALPHA	PARAMETRIC VALUES			
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□	16.000				
◇	18.000				
△	20.000				

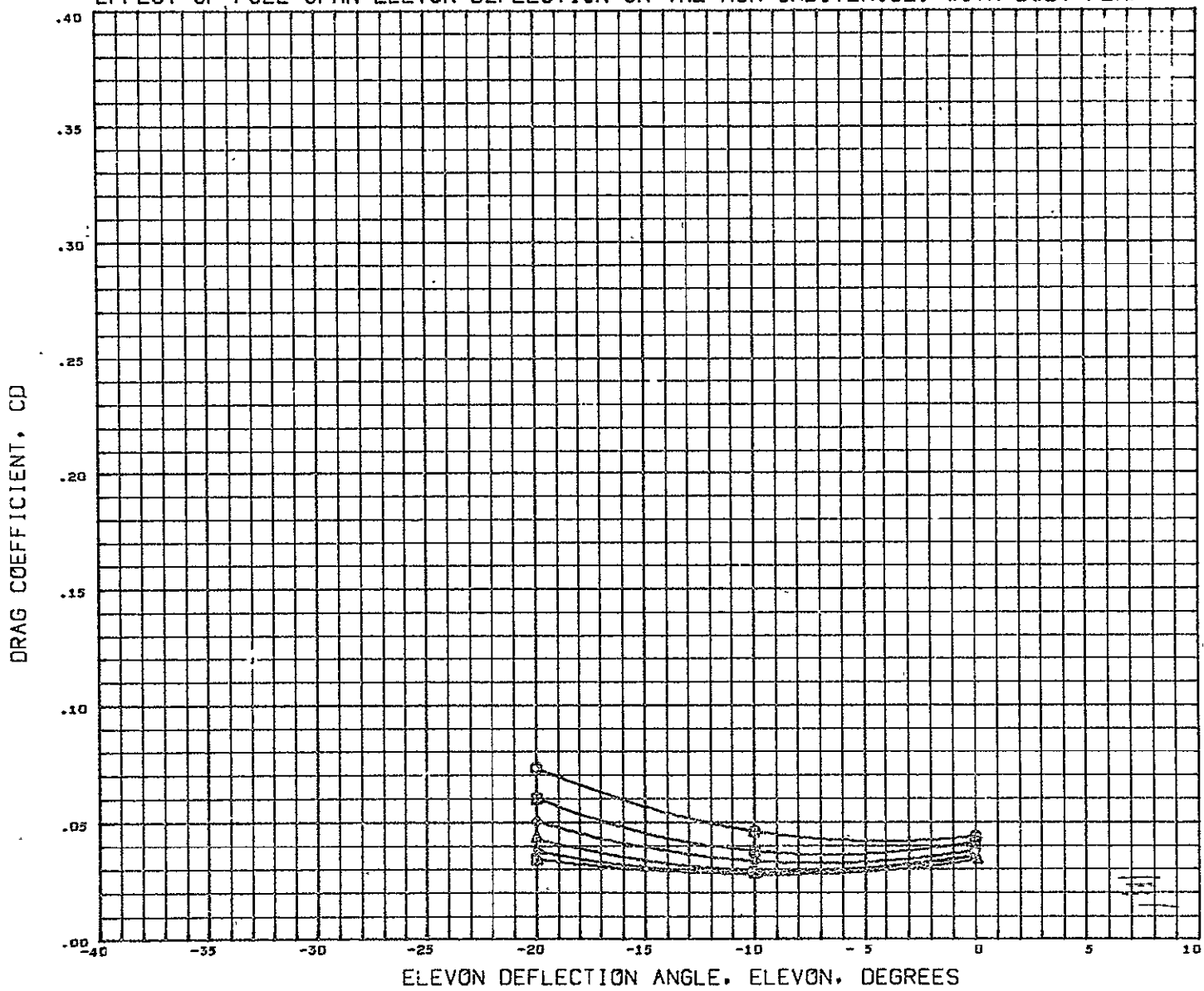
DATA HIST. CODE V*AI

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

LSWT 240 4.0 PC HCR ORBITER(02) B1W3V3EN1EN3FB1 (ICFD35) 08 JAN 71 PAGE 176

EFFECT OF FULL SPAN ELEVON DEFLECTION ON THE HCR ORBITER(02) WITH BODY FLAP



SYMBOL	ALPHA		PARAMETRIC VALUES		
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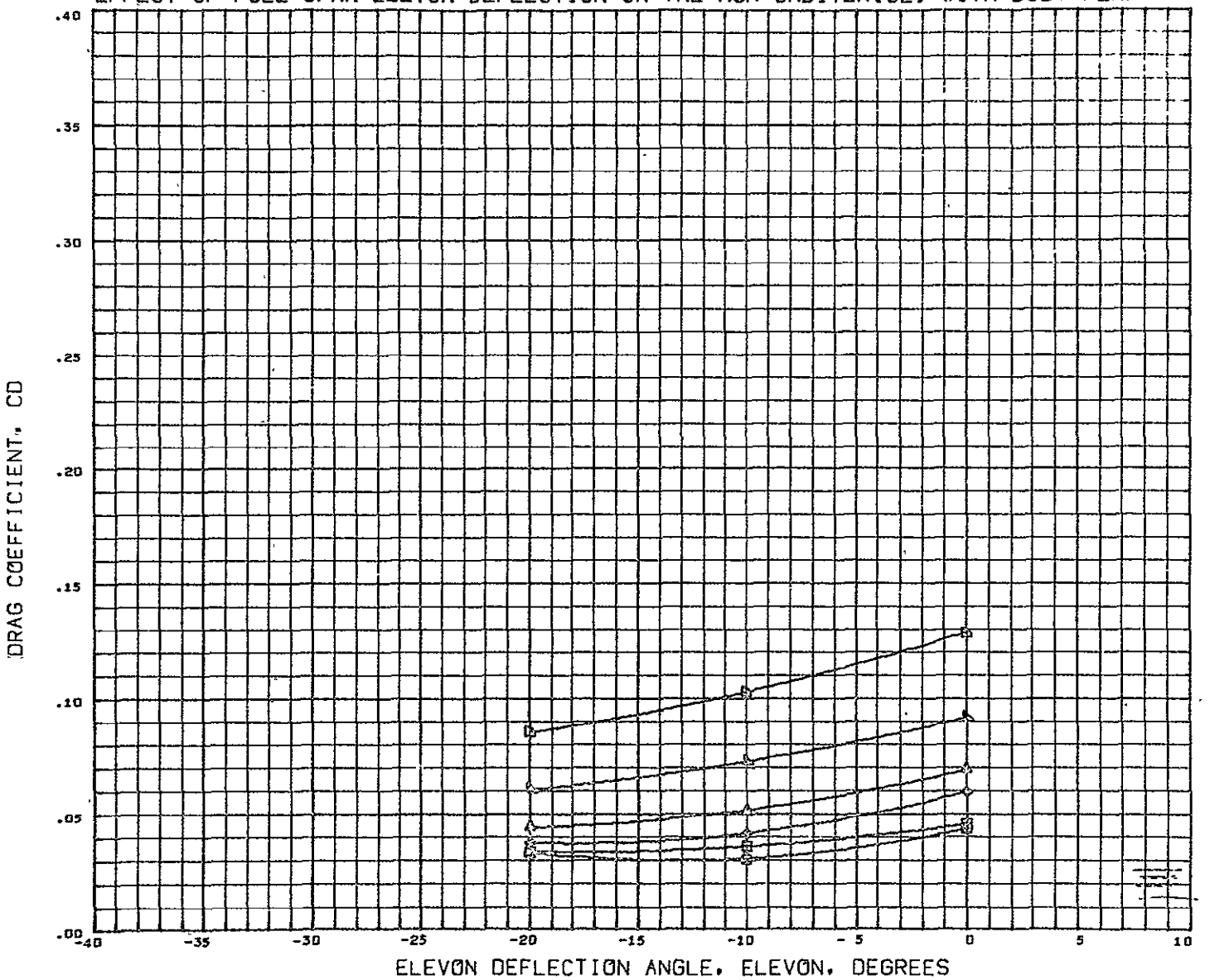
◇	- 6.000				
△	- 4.000				
▷	- 2.000				
D	0.000	DATA HIST. CODE	V*AI		

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

LSWT 240 4.0 PC HCR ORBITER(02) B1W3V3EN1EN3FB1 (ICFD35) 08 JAN 71 PAGE 177

EFFECT OF FULL SPAN ELEVON DEFLECTION ON THE HCR ORBITER(02) WITH BODY FLAP



SYMBOL	ALPHA		PARAMETRIC VALUES		
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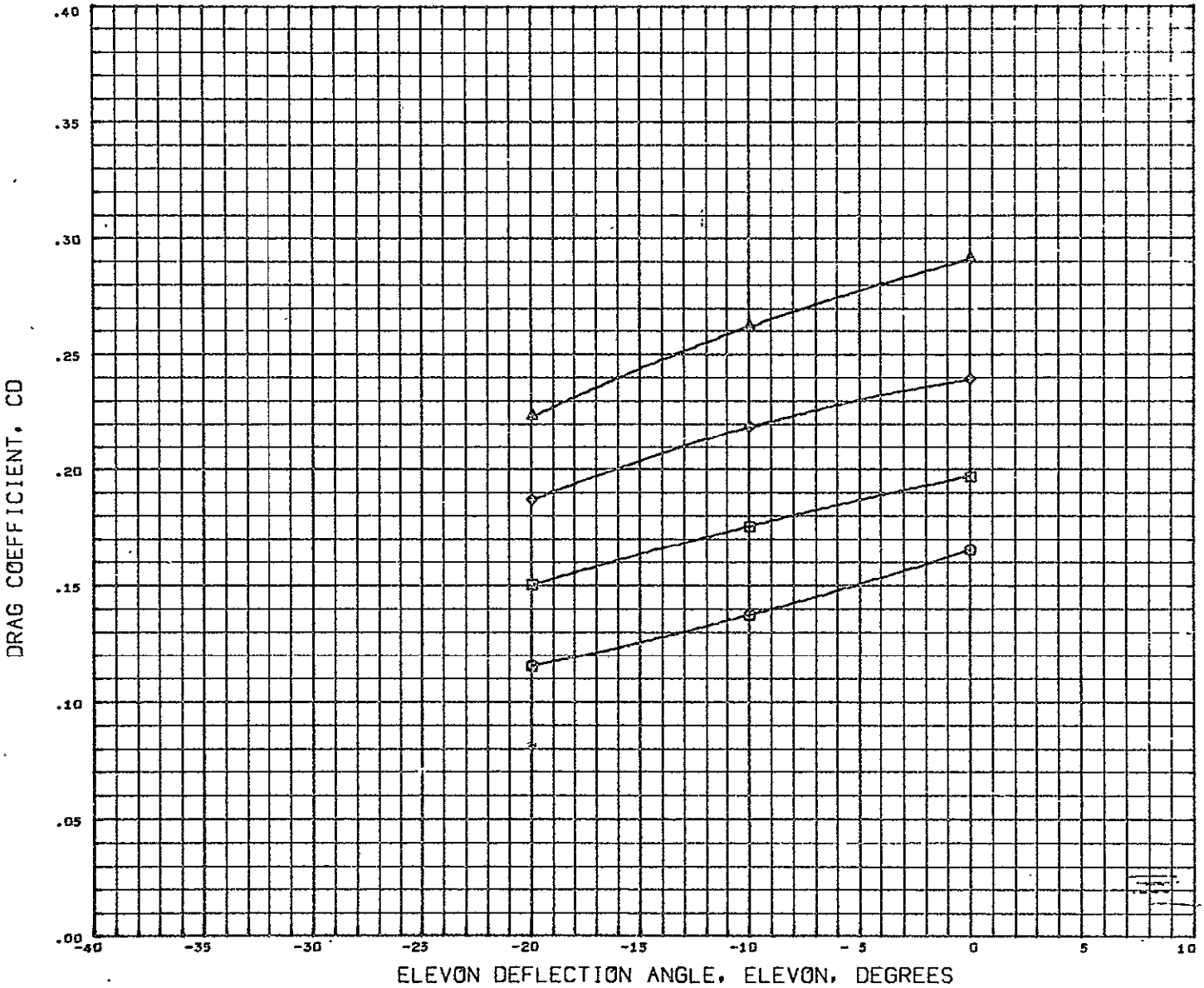
□	4.000				
◇	6.000				
△	8.000				
▷	10.000				
D	12.000	DATA HIST. CODE	V*AI		

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

LSWT 240 4.0 PC HCR ORBITER(02) B1W3V3EN1EN3FB1 (ICFD35) 08 JAN 71 PAGE 178

EFFECT OF FULL SPAN ELEVON DEFLECTION ON THE HCR ORBITER(02) WITH BODY FLAP



SYMBOL	ALPHA	PARAMETRIC VALUES		
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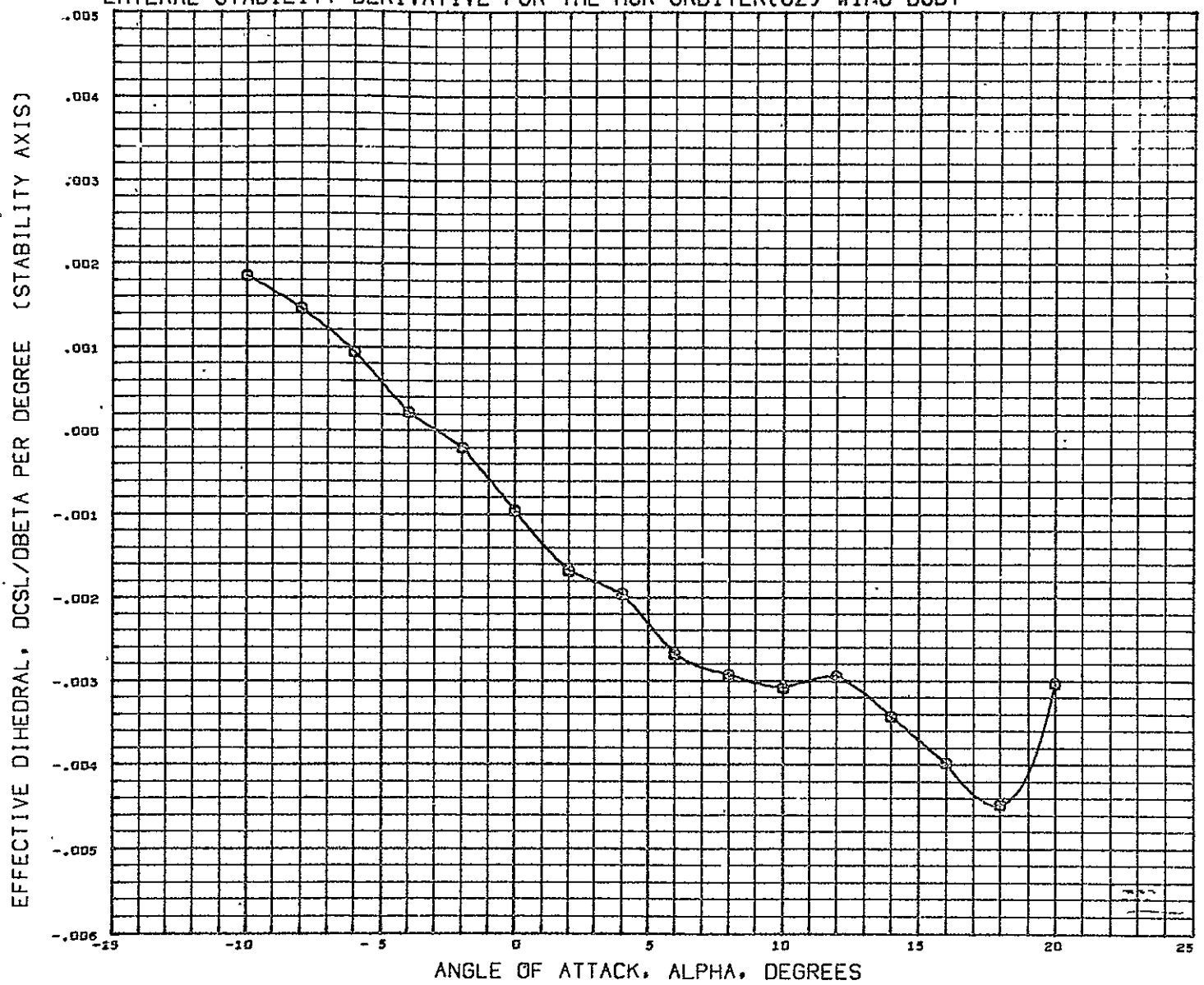
□	16.000			
◇	18.000			
△	20.000			

DATA HIST. CODE V*AI

REFERENCE INFORMATION

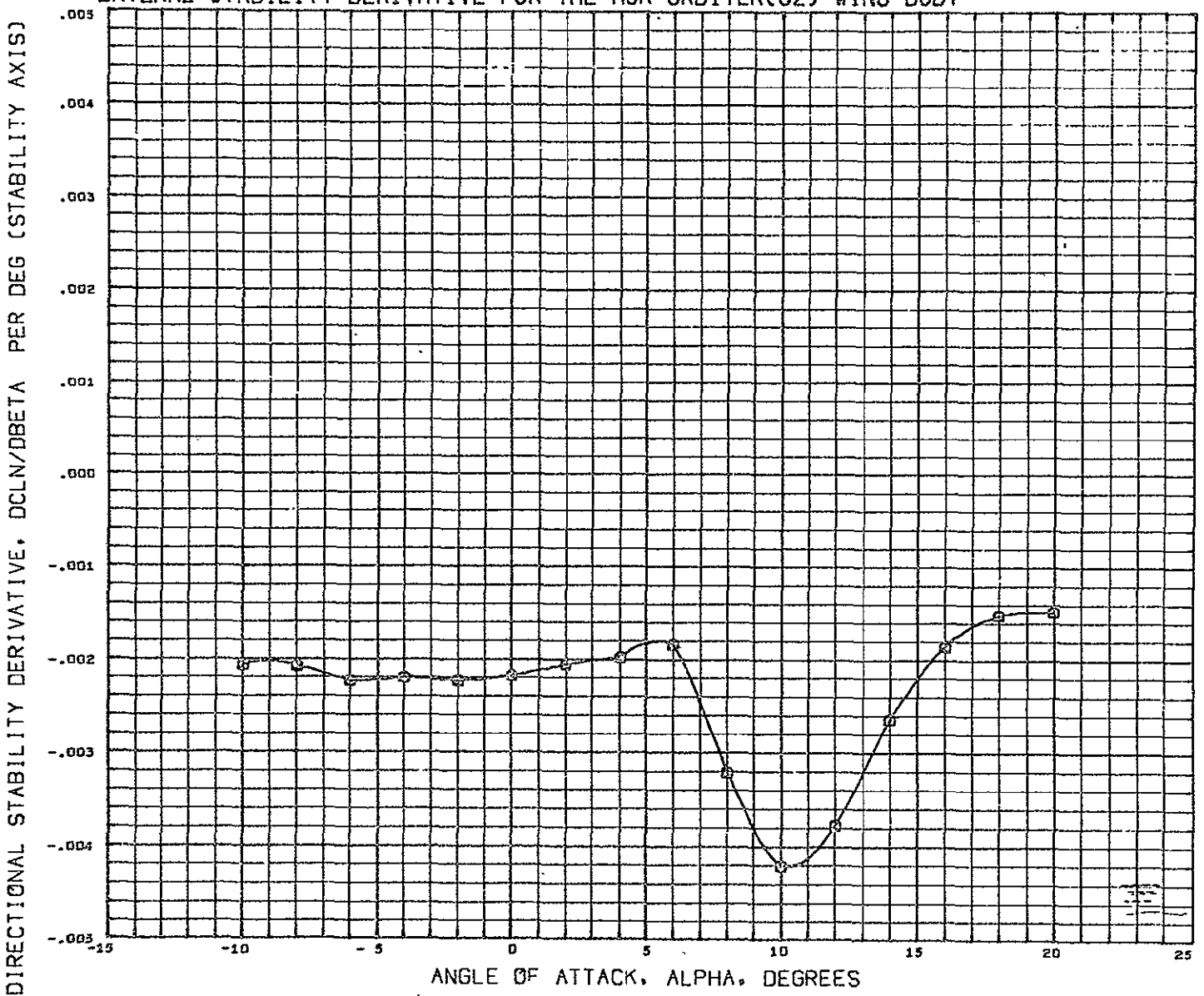
REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

LATERAL STABILITY DERIVATIVE FOR THE HCR ORBITER(02) WING-BODY



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	PARAMETRIC VALUES	REFERENCE INFORMATION		
(GCFH11) O	LSWT 245 4.0 PC HCR ORBITER(02) B1W3	BETA - 3.000	REFS	9.5800	SQ.FT.
			REFL	3.0200	FT.
			REFB	3.5400	FT.
			XMRP	4.2210	FT.
			YMRP	0.0000	FT.
			ZMRP	0.6670	FT.
ELEVON	0.000		SCALE	4.0000	PER CE

LATERAL STABILITY DERIVATIVE FOR THE HCR ORBITER(O2) WING-BODY



DATA SET SYMBOL CONFIGURATION DESCRIPTION
(GCFM11) ○ LSWT 240 4.0 PC HCR ORBITER(O2) B1W3

PARAMETRIC VALUES
BETA - 3.000

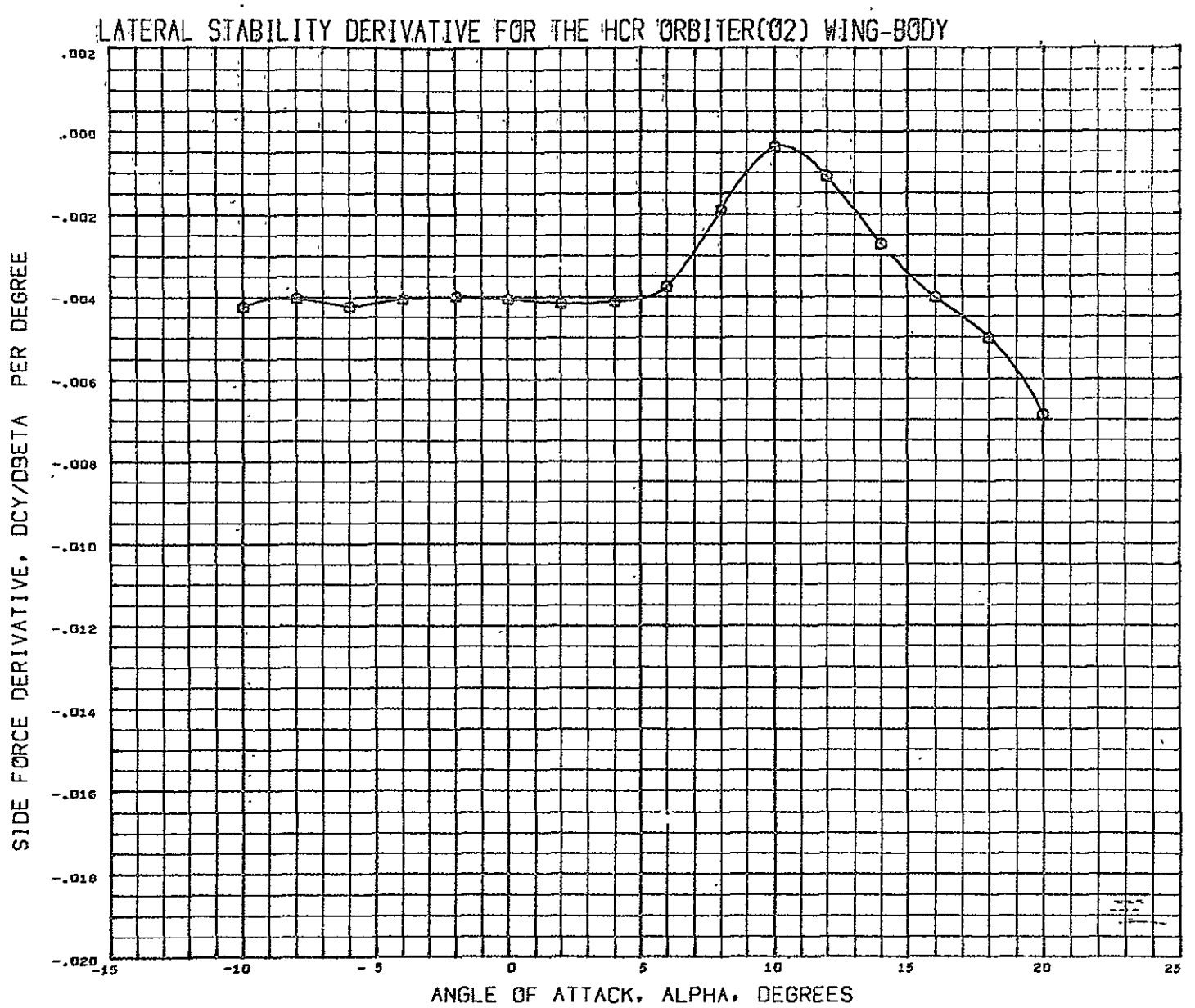
REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

ELEVON 0.000

⊕ S

LATERAL STABILITY DERIVATIVE FOR THE HCR ORBITER(O2) WING-BODY



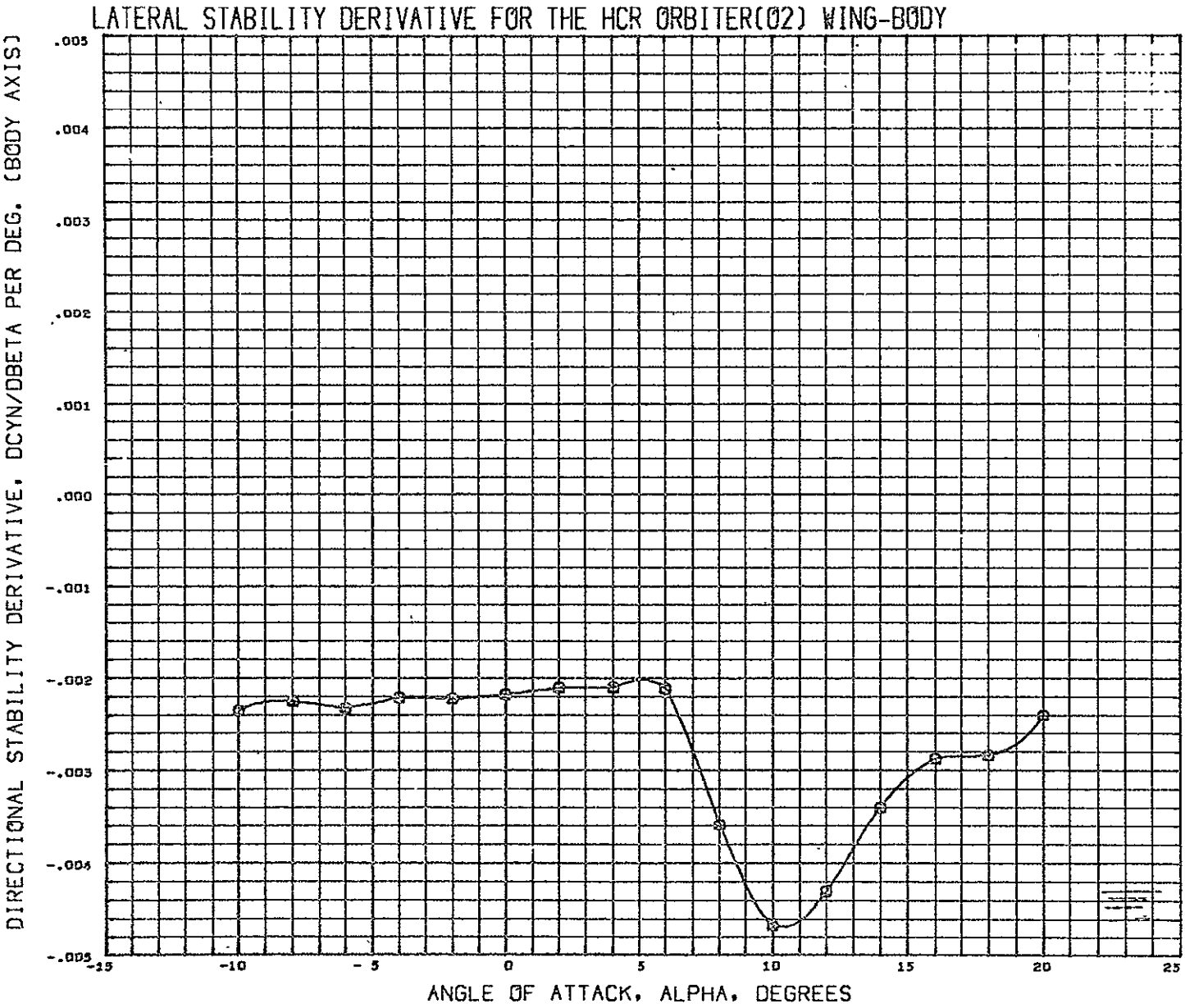
DATA SET SYMBOL CONFIGURATION DESCRIPTION
(GCFH11) O LSWT 240 4.0 PC HCR ORBITER(O2) B1W3

PARAMETRIC VALUES
BETA - 3.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

ELEVON 0.000



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(GCFG11)	O	LSWT 249 4.0 FC HCR ORBITER(02) B1W3

PARAMETRIC VALUES

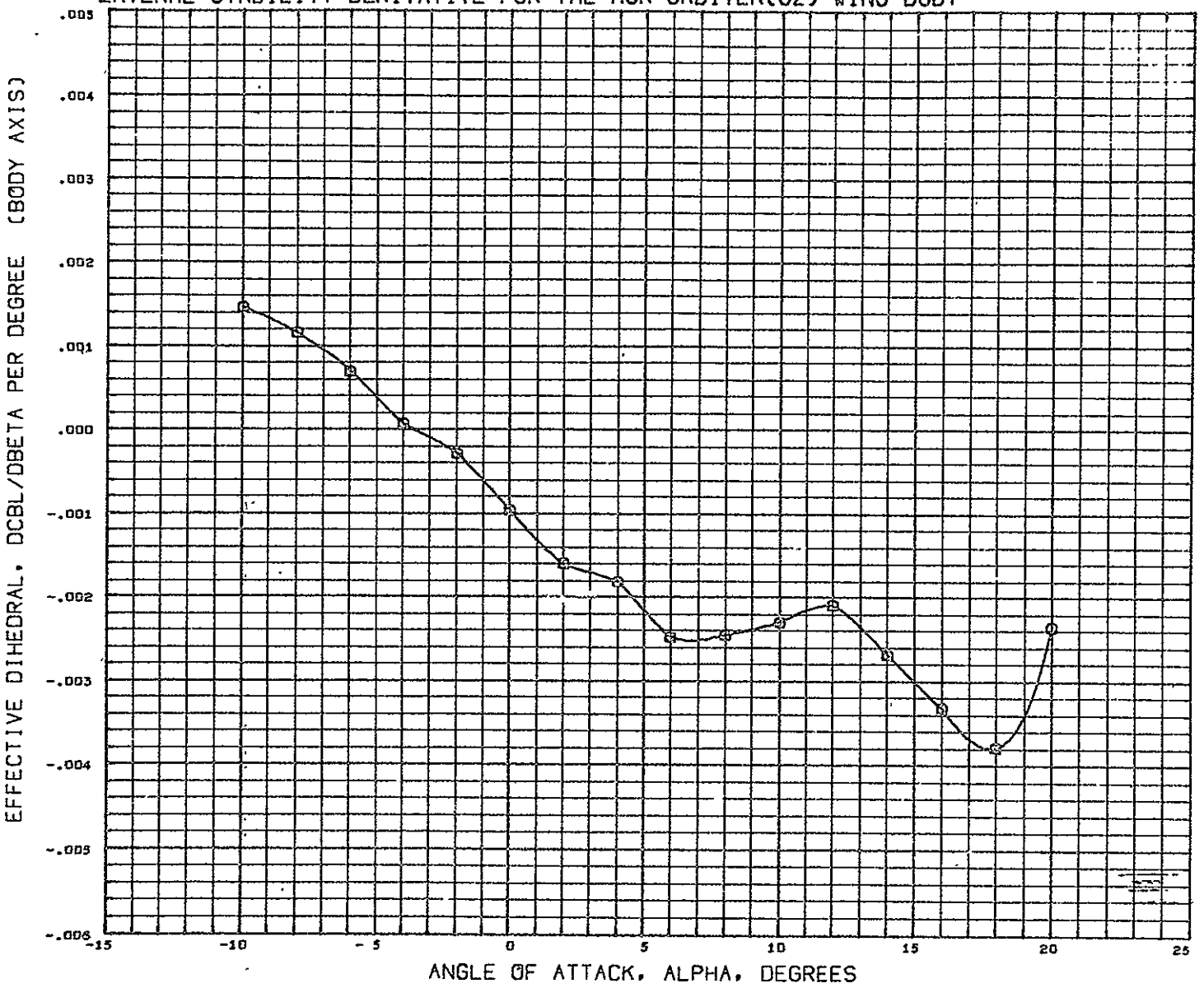
BETA - 3.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

ELEVON 0.000

LATERAL STABILITY DERIVATIVE FOR THE HCR ORBITER(02) WING-BODY



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(GCF011)	O	LSWT 240 4.0 FC HCR ORBITER(02) B1W3

ELEVON 0.000

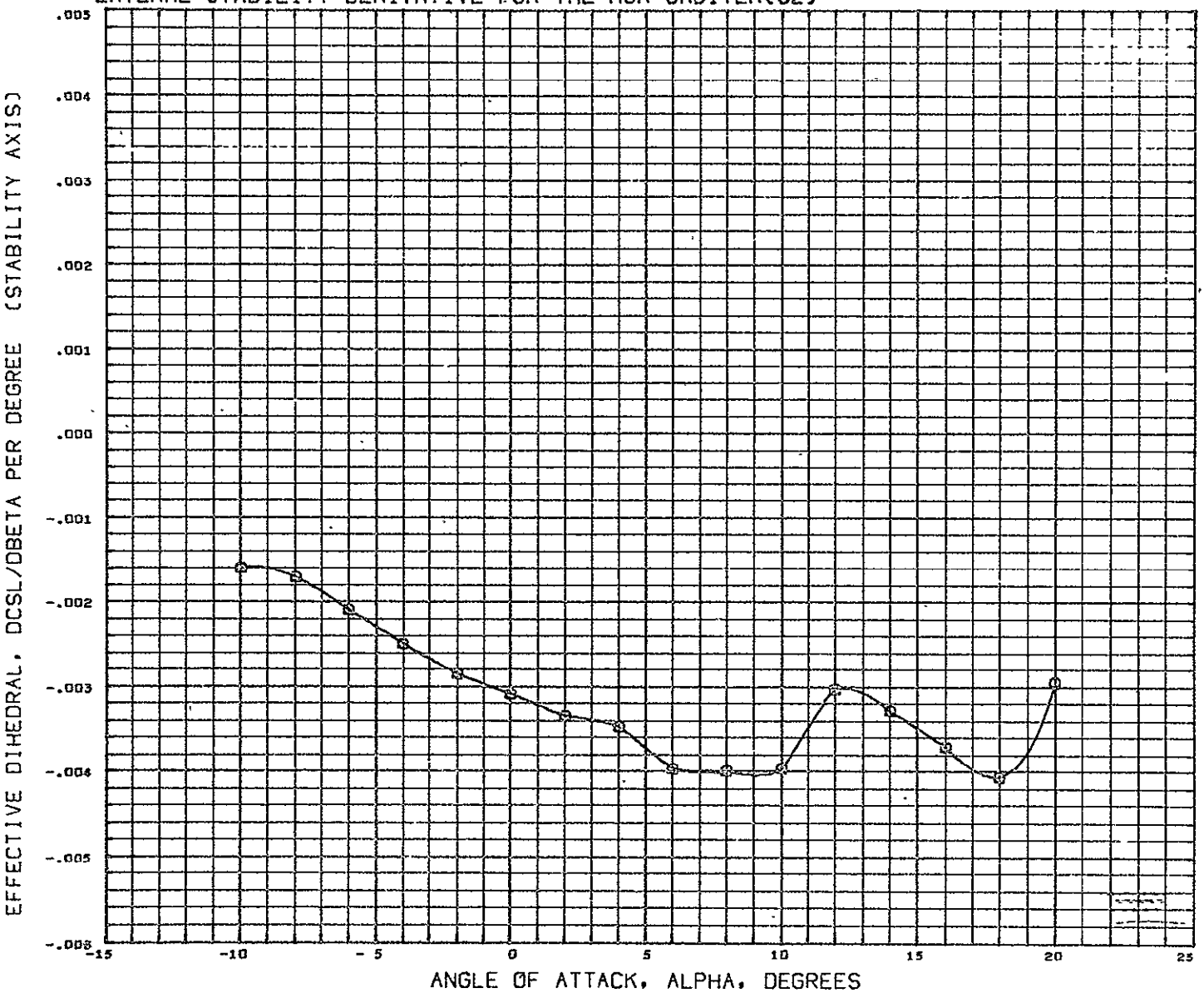
PARAMETRIC VALUES

BETA - 3.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

LATERAL STABILITY DERIVATIVE FOR THE HCR ORBITER(02)

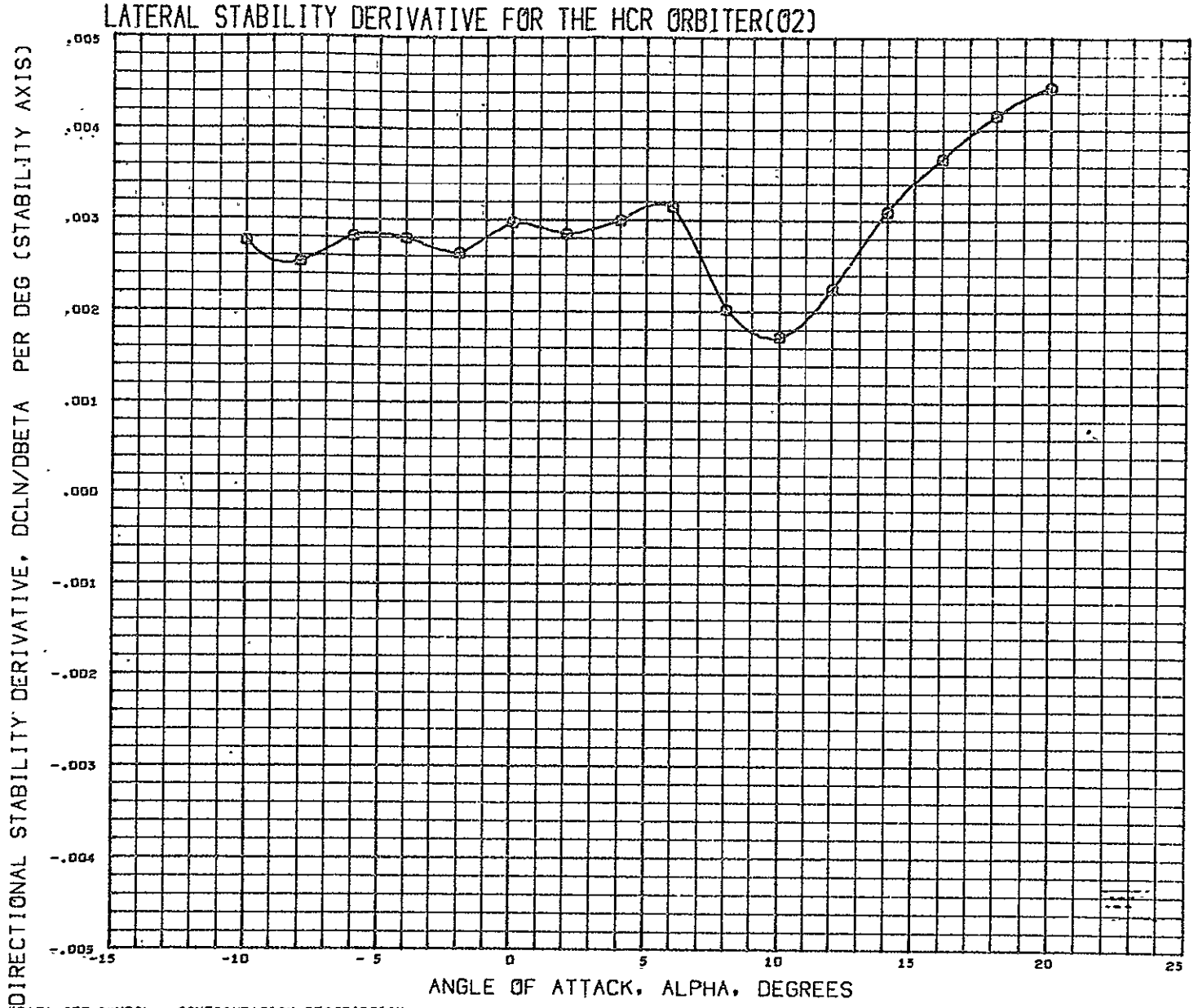


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	PARAMETRIC VALUES	
(GCFH22)	O	LSWT 240 4.0 FC HCR ORBITER(02) B1W3V3	BETA	- 3.000

ELEVON 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE



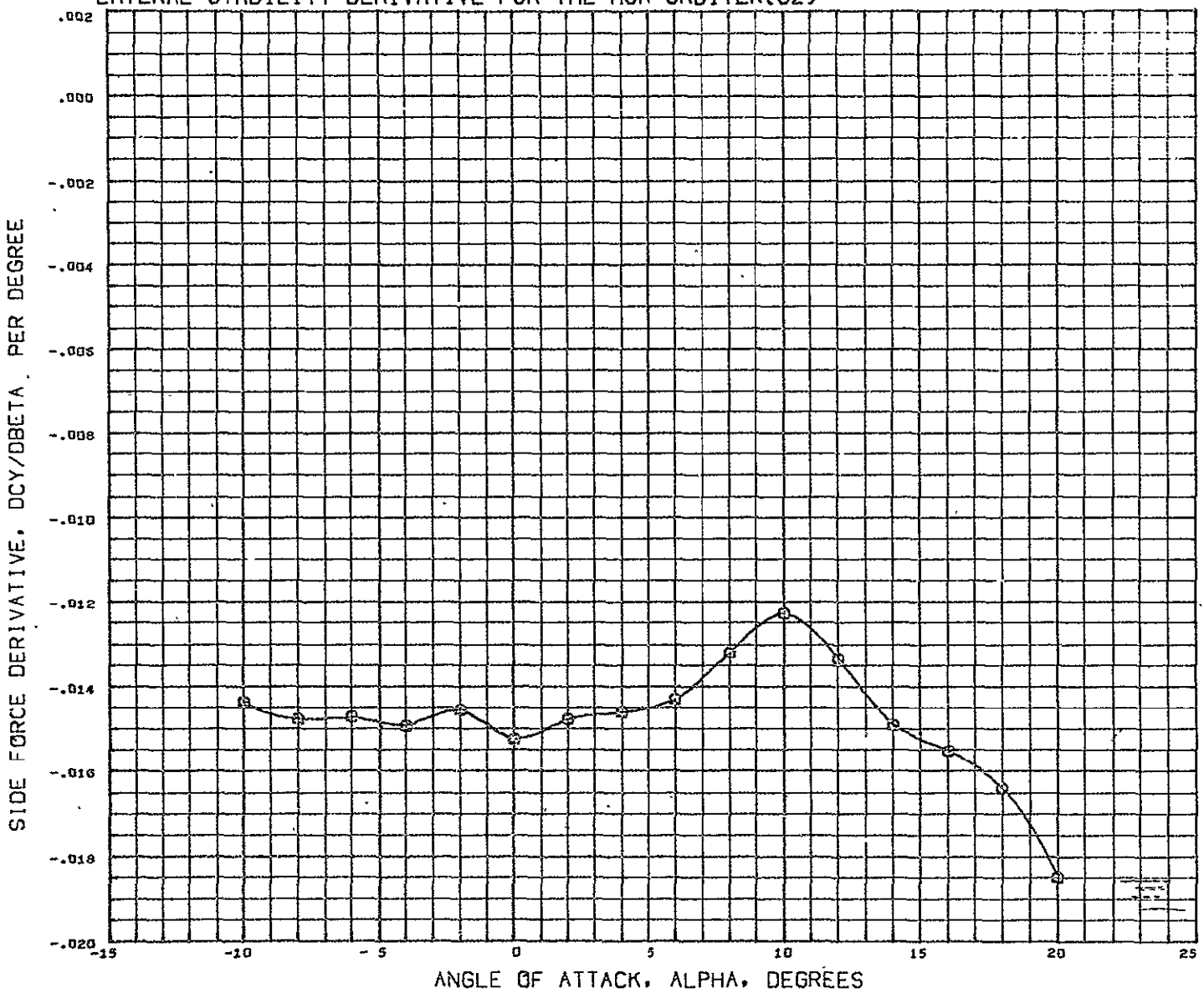
DATA SET SYMBOL	CONFIGURATION DESCRIPTION	PARAMETRIC VALUES
(GCEM22) O	LSWT 240 4.0 FC HCR ORBITER(02) B1W3V3	BETA - 3.000

ELEVON 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

LATERAL STABILITY DERIVATIVE FOR THE HCR ORBITER(02)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(GCFH22)	O	LSWT 240 4.0 PC HCR ORBITER(02) B1W3V3

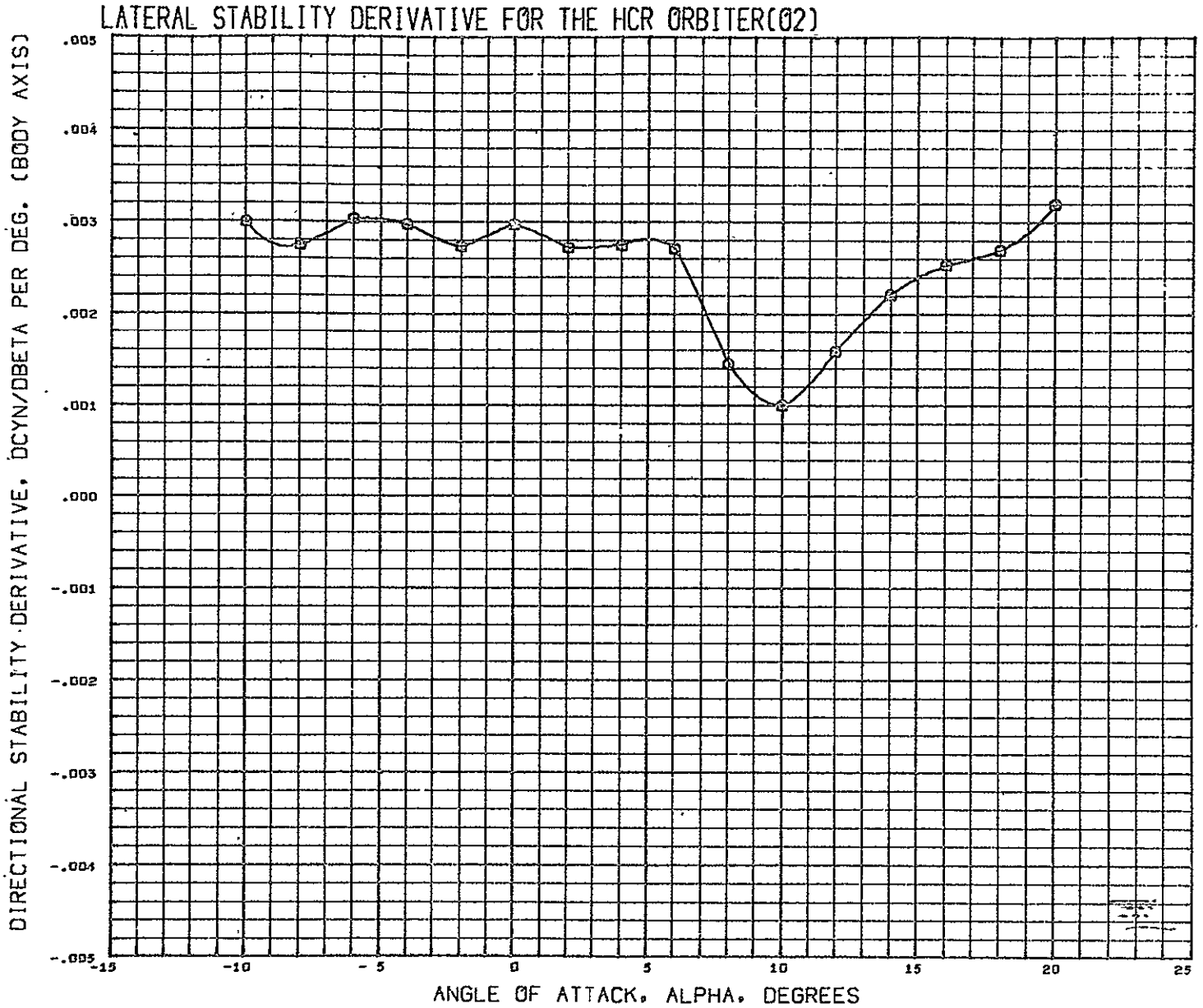
PARAMETRIC VALUES

BETA - 3.000

ELEVON 0.000

REFERENCE INFORMATION

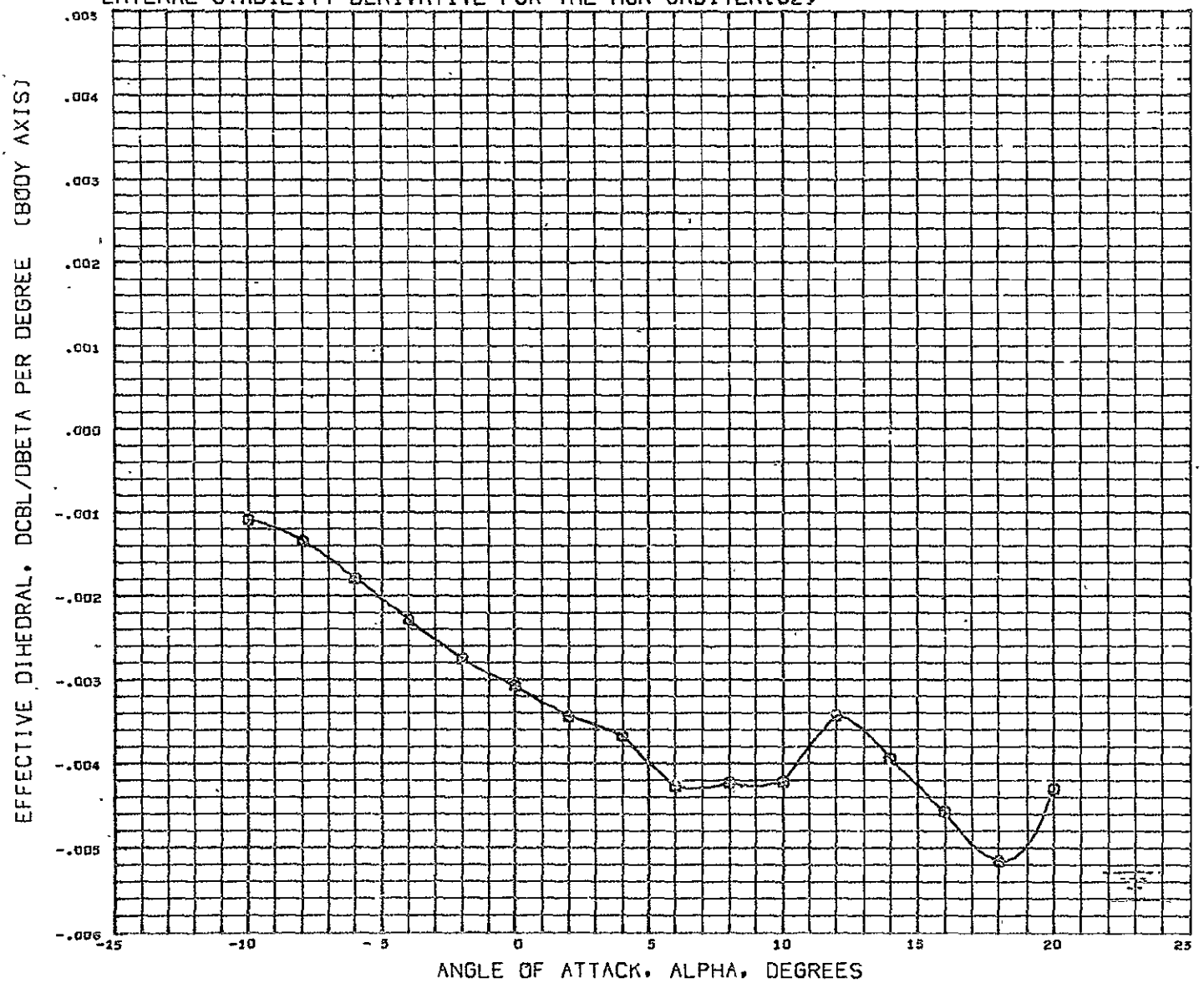
REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	PARAMETRIC VALUES	REFERENCE INFORMATION		
(GCF022) ○	LSWT 240 4.0 FC HCR ORBITER(02) B1W3V3	BETA - 3.000	REFS	9.5800	SQ.FT.
			REFL	3.0200	FT.
			REFB	3.5400	FT.
			XMRF	4.2210	FT.
			YMRF	0.0000	FT.
			ZMRF	0.6670	FT.
			SCALE	4.0000	PER CE

ELEVON 0.000

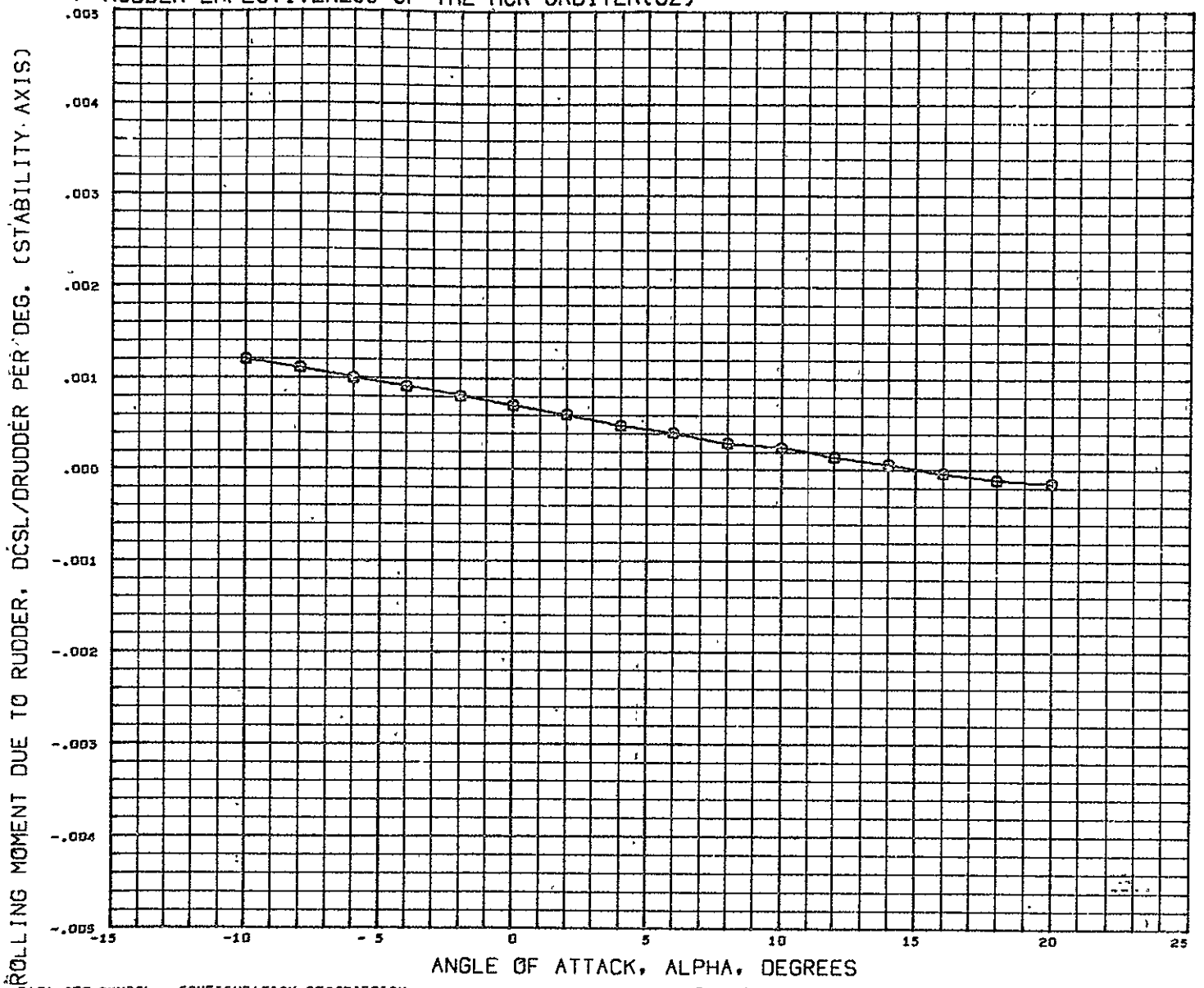
LATERAL STABILITY DERIVATIVE FOR THE HCR ORBITER(02)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	PARAMETRIC VALUES		REFERENCE INFORMATION		
(GCFG22)	O	LSWT 240 4.0 FC HCR ORBITER(02) B1W3V3	BETA	- 3.000	REFS	9.5800	SQ.FT.
					REFL	3.0200	FT.
					REFB	3.5400	FT.
					XMRP	4.2210	FT.
					YMRP	0.0000	FT.
					ZMRP	0.6670	FT.
					SCALE	4.0000	PER CE

ELEVON 0.000

RUDDER EFFECTIVENESS OF THE HCR ORBITER(02)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(GCFH26)	O	LSWT 24G 4.0 FC HCR ORBITER(02) B1W3V3

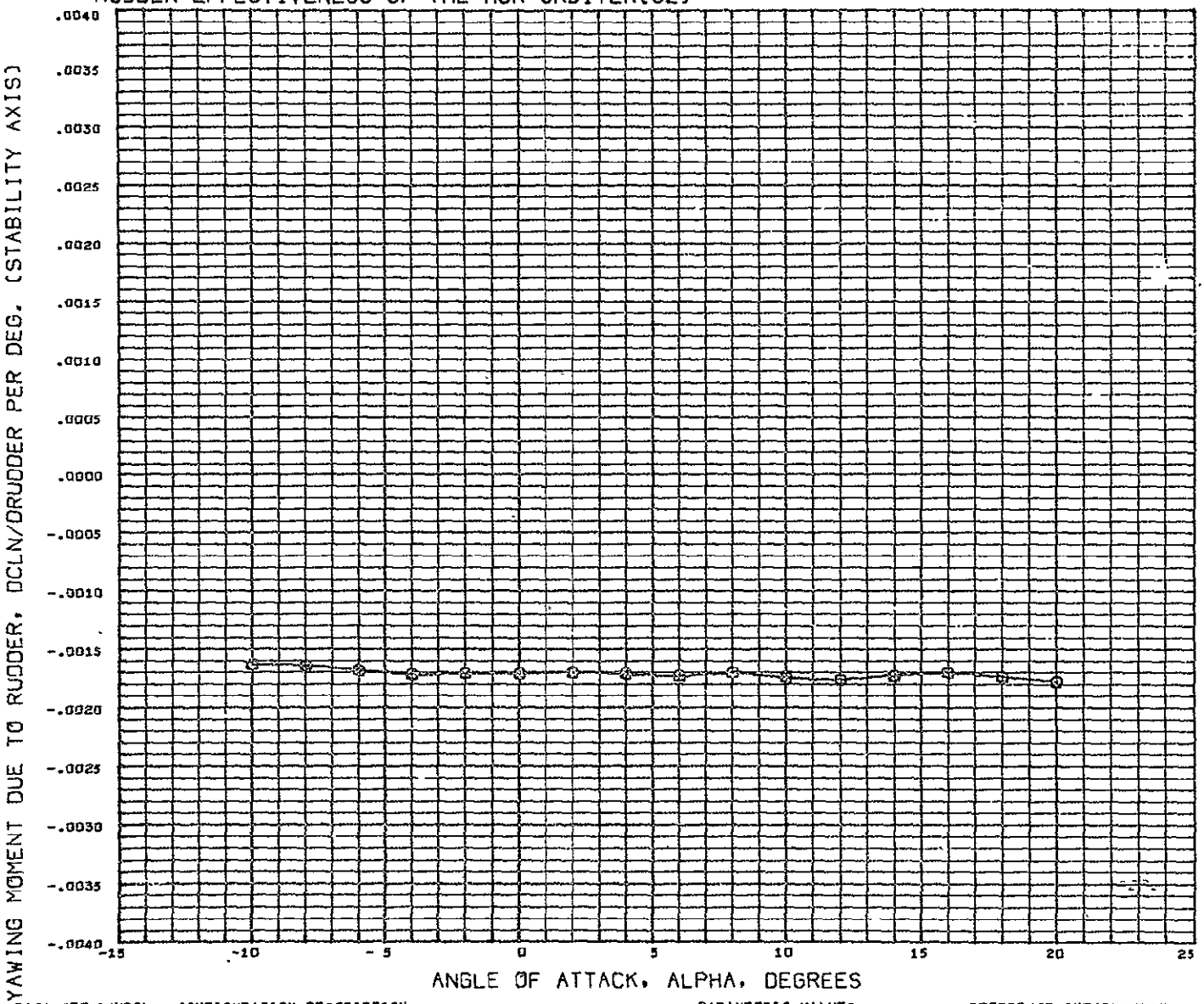
ELEVON 0.000

PARAMETRIC VALUES

BETA 0.000 RUDDER 0.000

REFERENCE INFORMATION		
REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

RUDDER EFFECTIVENESS OF THE HCR ORBITER(02)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(GCFH26)	O	LSWT 240 4.0 FC HCR ORBITER(02) 61W3V3

PARAMETRIC VALUES

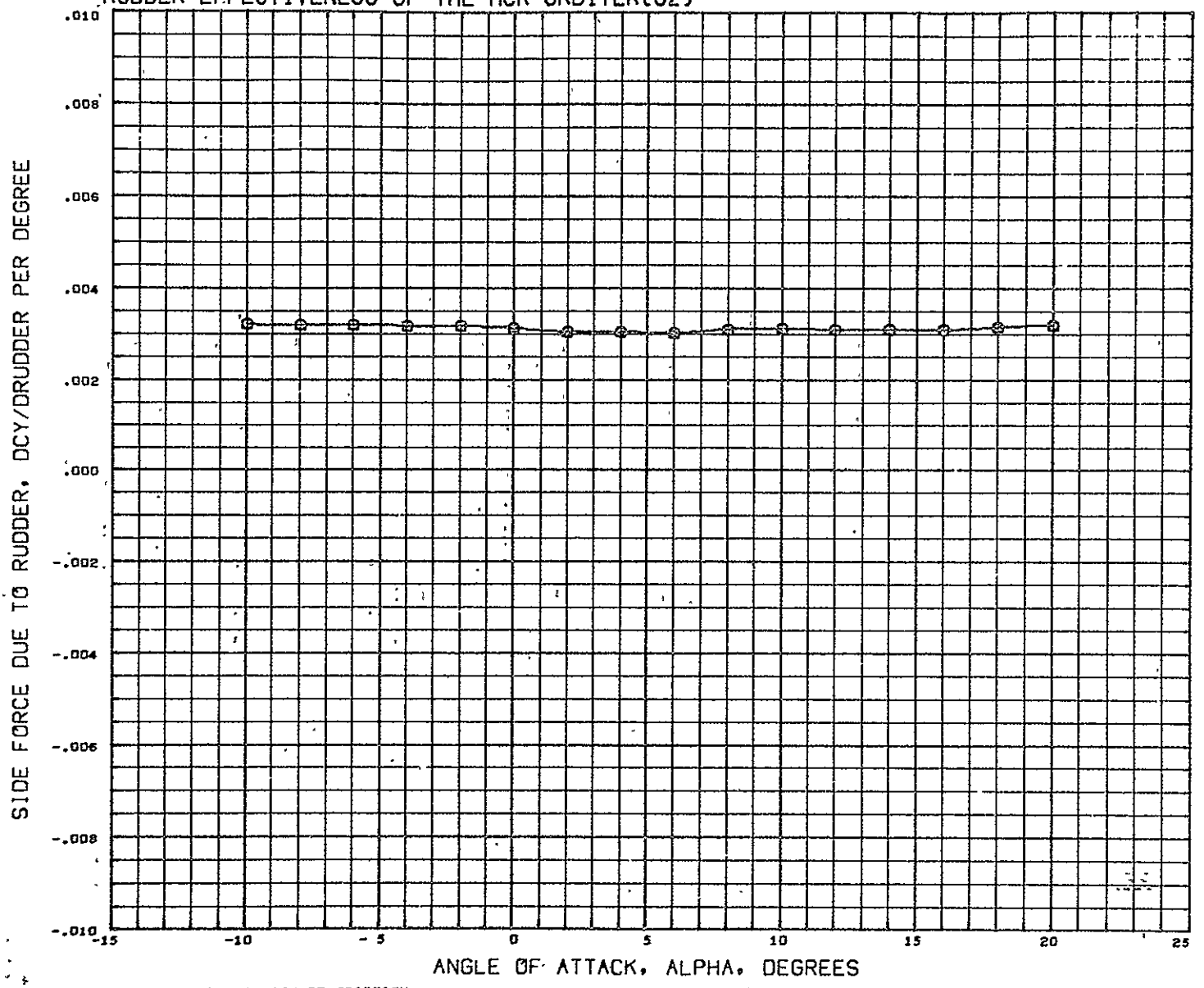
BETA 0.000 RUDDER 0.000

ELEVON 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

RUDDER EFFECTIVENESS OF THE HCR ORBITER(02)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(GCFH26)	O	LSWT 240 4.0 FC HCR ORBITER(02) B1W3V3

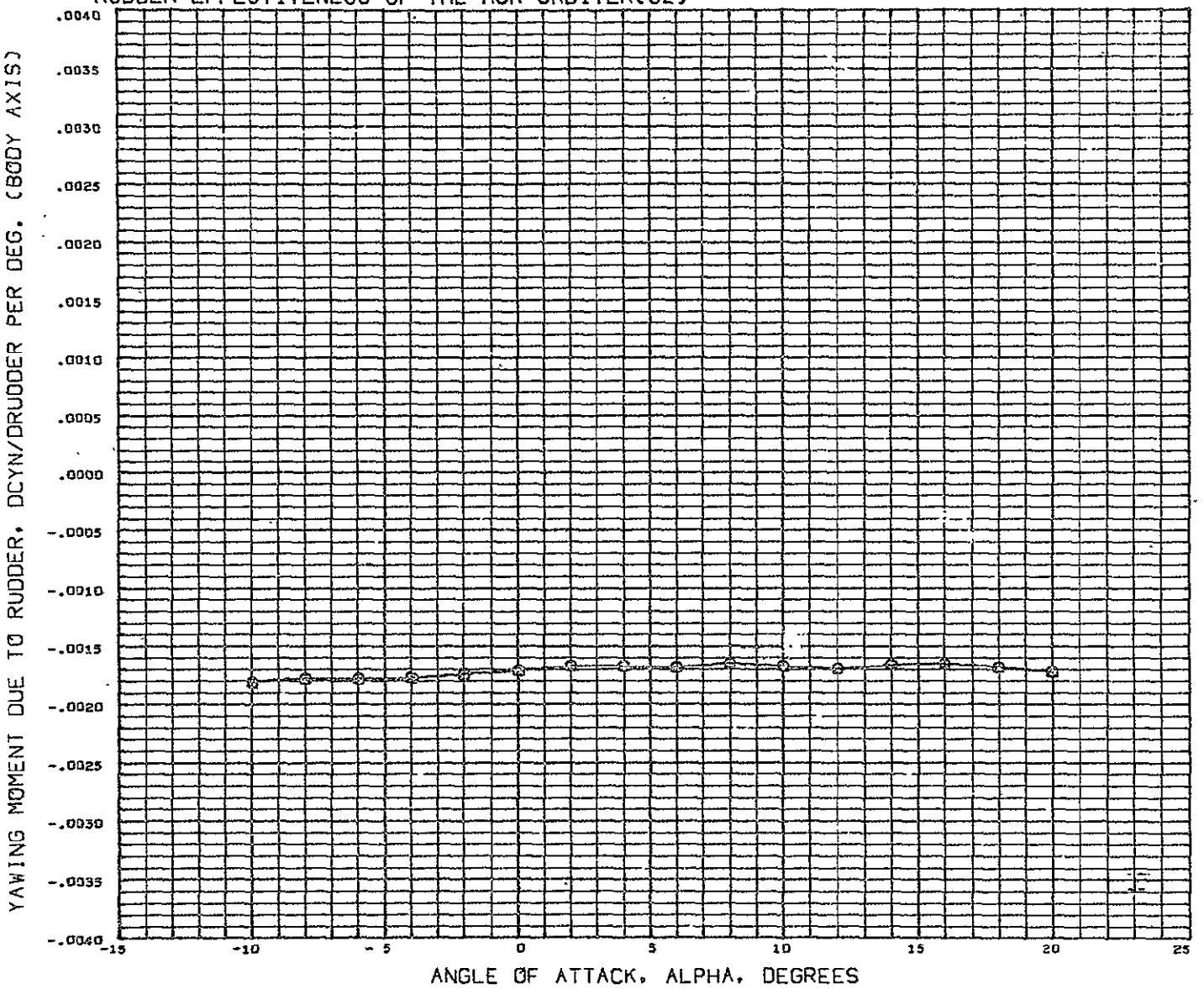
ELEVON 0.000

PARAMETRIC VALUES

BETA 0.000 RUDDER 0.000

REFERENCE INFORMATION		
REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRP	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE

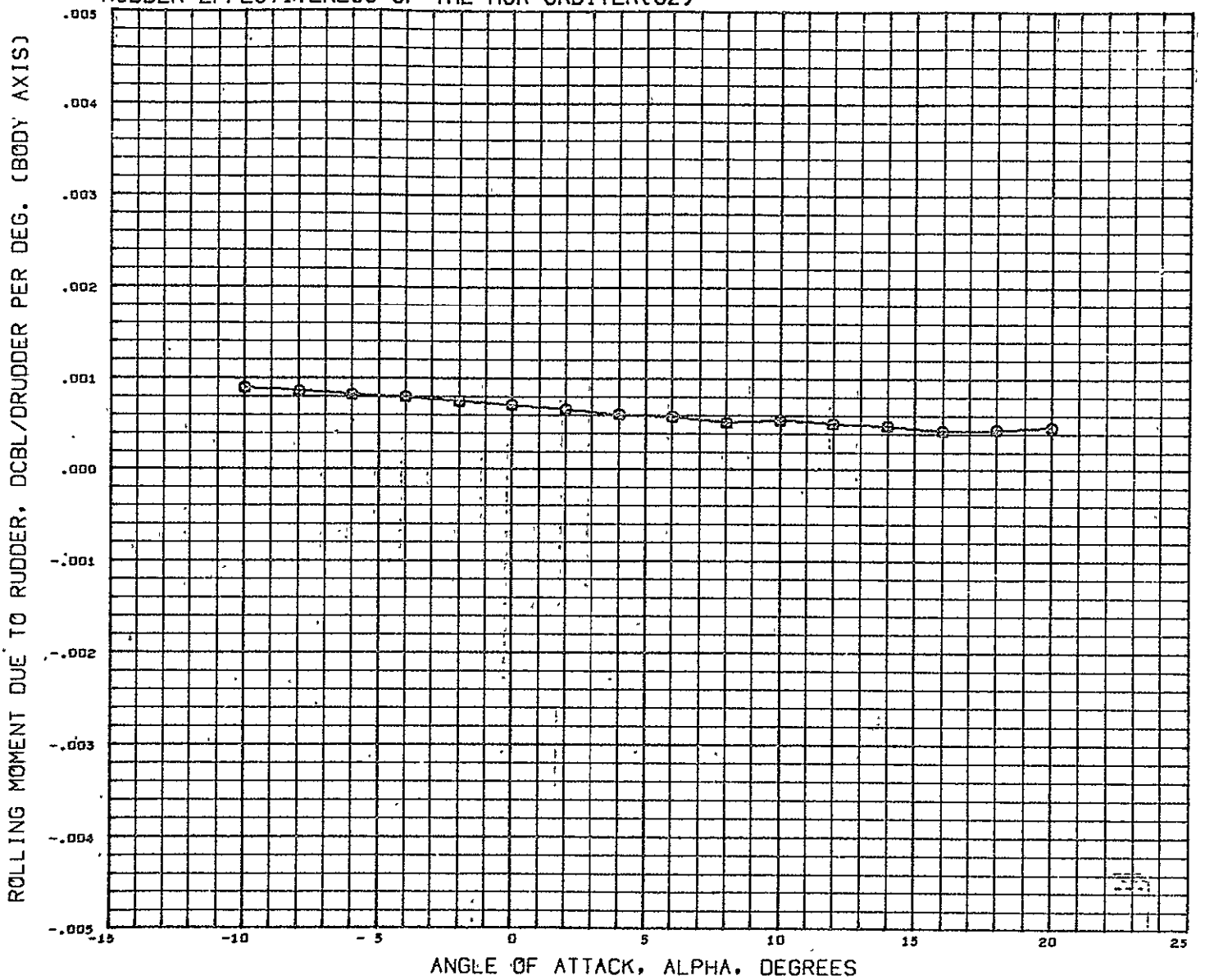
RUDDER EFFECTIVENESS OF THE HCR ORBITER(02)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	PARAMETRIC VALUES				REFERENCE INFORMATION		
(GCF026)	O	LSWT 240 4.0 FC HCR ORBITER(02) B1W3V3	BETA	0.000	RUDDER	0.000	REFS	9.5800	SQ.FT.
							REFL	3.0200	FT.
							REFB	3.5400	FT.
							XMRP	4.2210	FT.
							YMRP	0.0000	FT.
							ZMRP	0.6670	FT.
							SCALE	4.0000	PER CE

ELEVON 0.000

RUDDER EFFECTIVENESS OF THE HCR ORBITER(02)



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(GCFG26)	O	LSWT 249 4.0 FC HCR ORBITER(02) B1W3V3

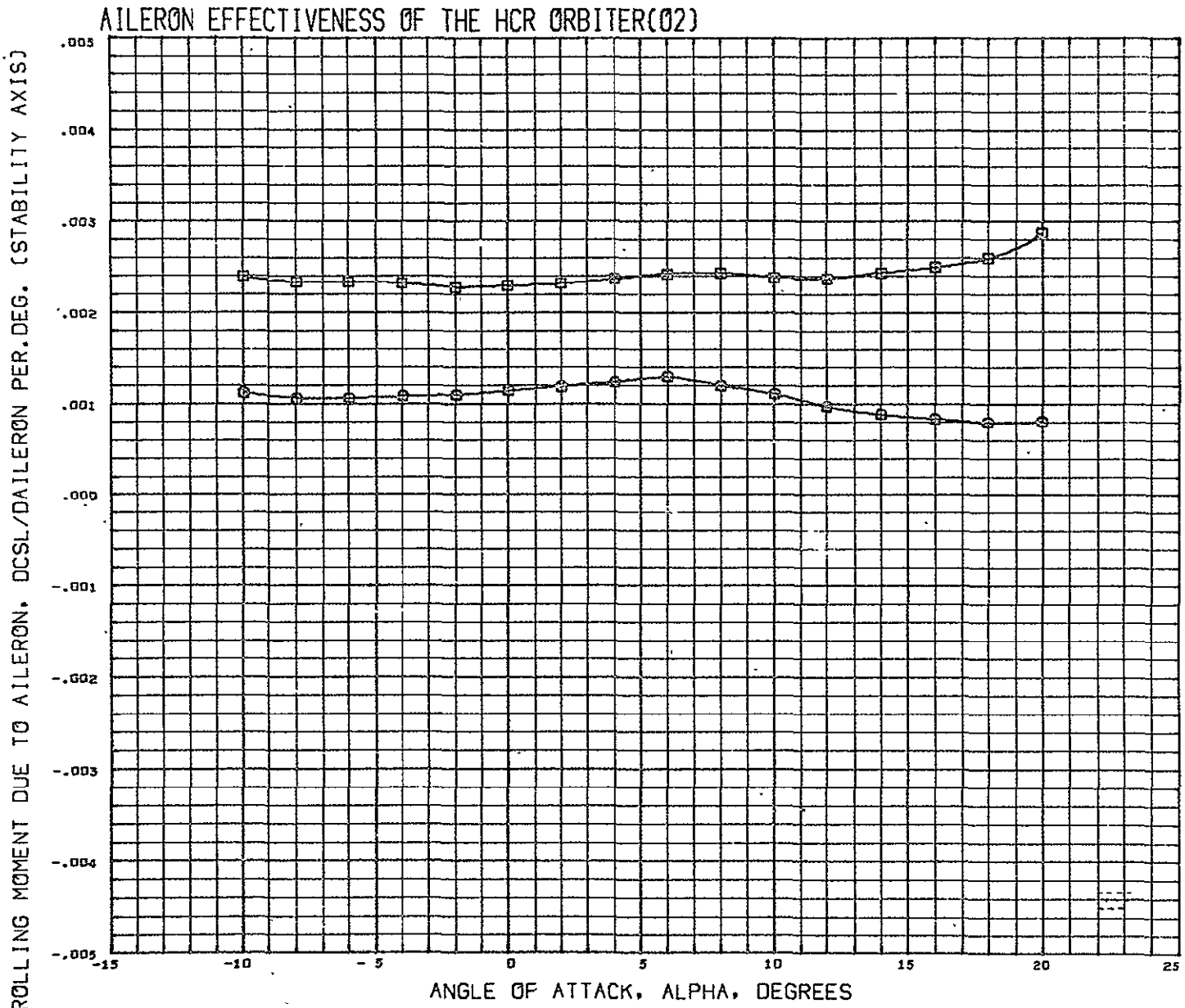
PARAMETRIC VALUES

BETA 0.000 RUDDER 0.000

ELEVON 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(GCFH29)	○	LSWT 240 4.0 FC HCR ORBITER(02) B1W3V3
(GCFH32)	□	LSWT 240 4.0 FC HCR ORBITER(02) B1W3V3

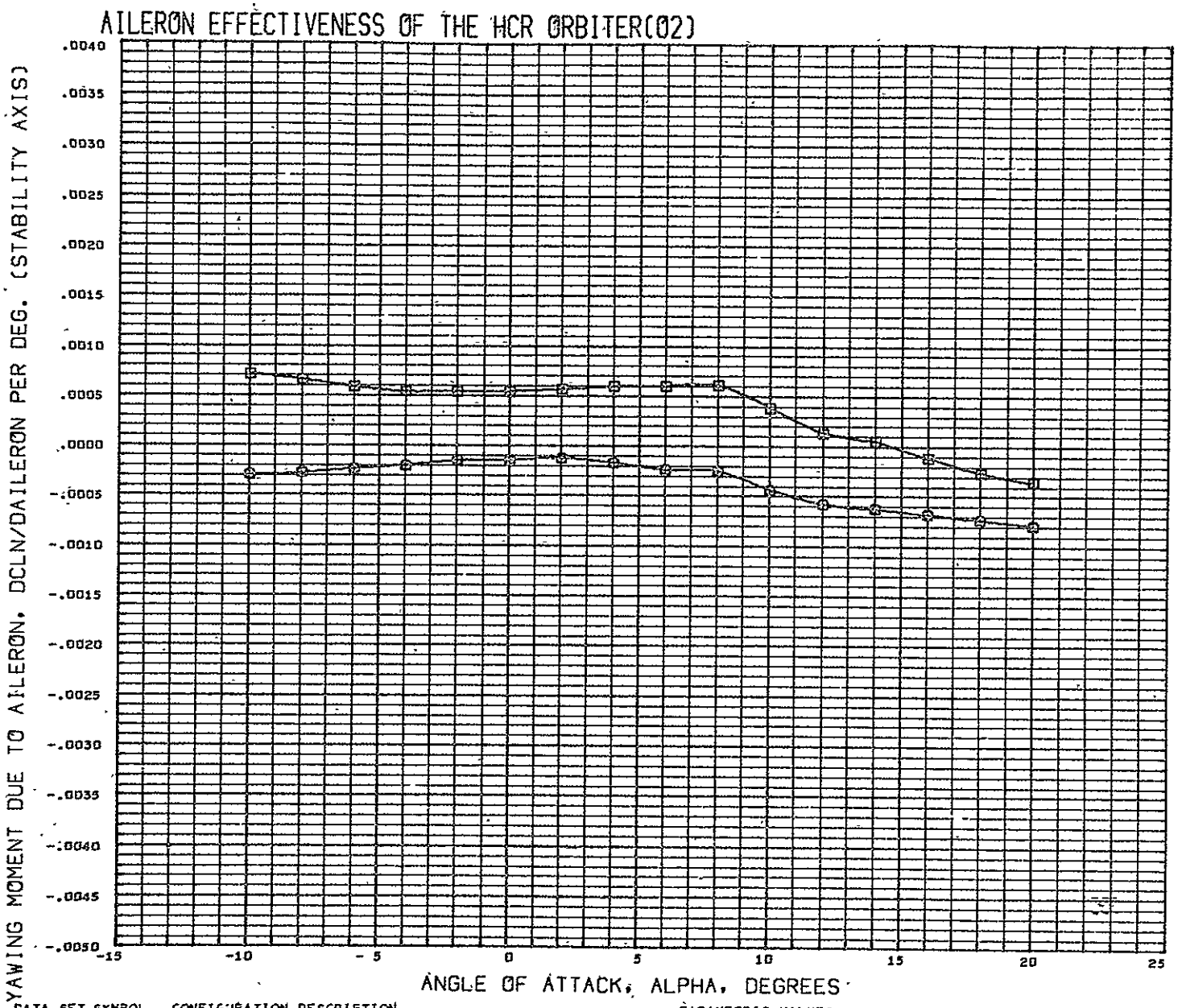
PARAMETRIC VALUES

BETA	0.000	AILRON	0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

ELEVON 0.000



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(GCFH29)	○	LSWT 249 4.0 FC HCR ORBITER(02) B1W3V3
(GCFH32)	□	LSWT 249 4.0 FC HCR ORBITER(02) B1W3V3

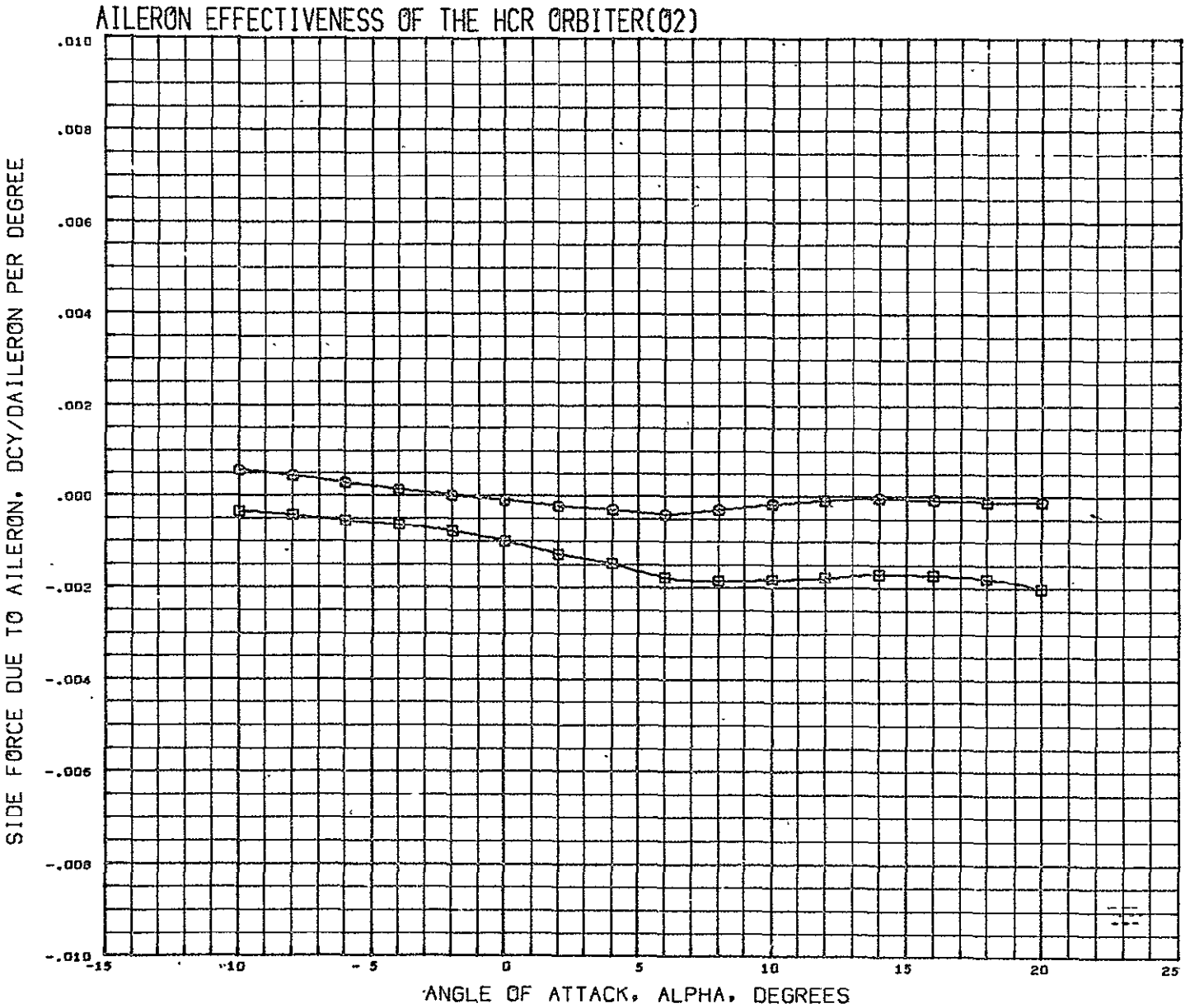
ELEVON 0.000

PARAMETRIC VALUES

BETA 0.000 AILRON 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(GCFH29)	○	LSWT 249 4.0 FC HCR ORBITER(02) B1W3V3
(GCFH32)	□	LSWT 249 4.0 FC HCR ORBITER(02) B1W3V3

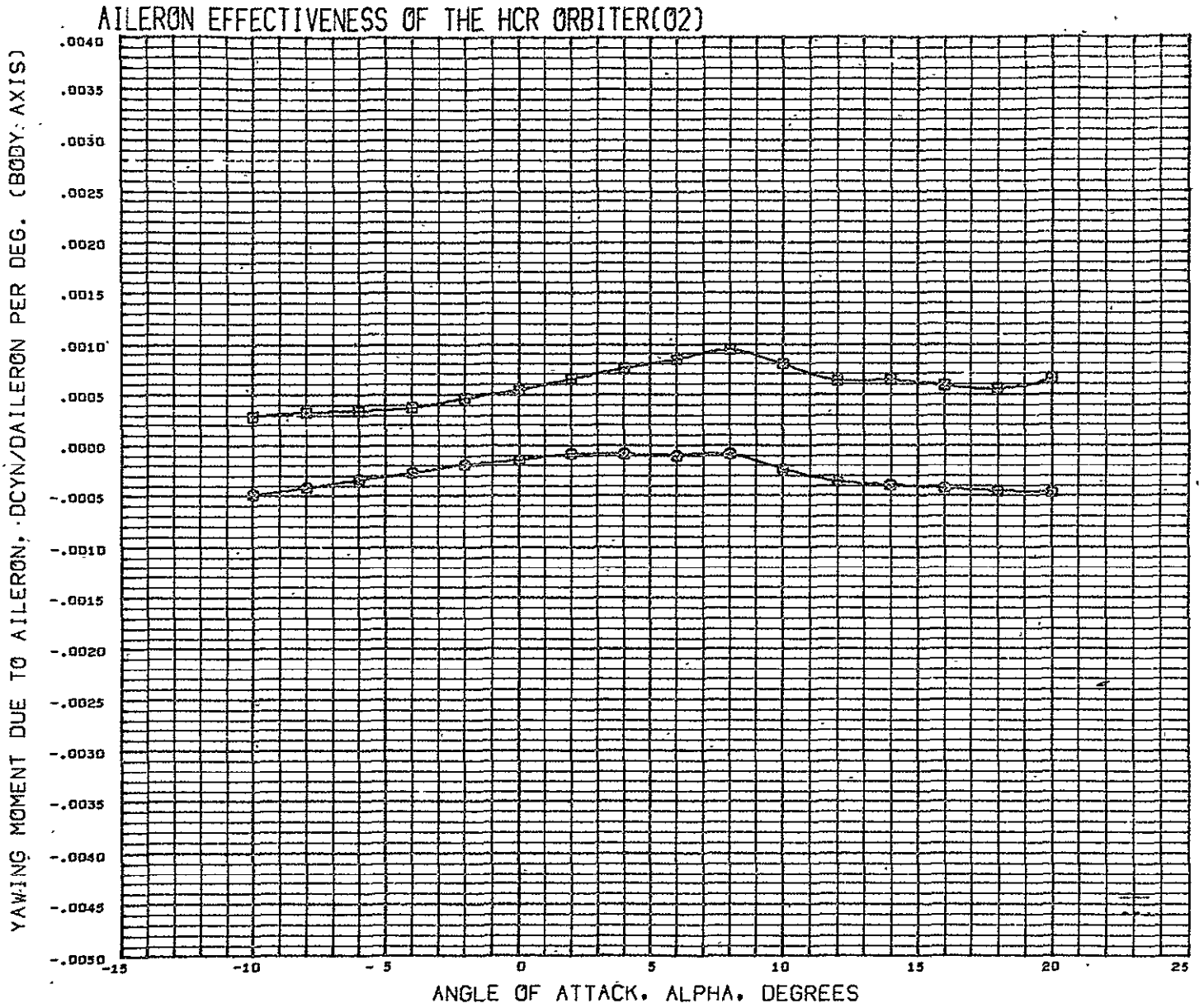
ELEVON 0.000

PARAMETRIC VALUES

BETA 0.000 AILRON 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(GCFG29)	○	LSWT 240 4.0 FC HCR ORBITER(02) B1W3V3
(GCFG32)	□	LSWT 240 4.0 FC HCR ORBITER(02) B1W3V3

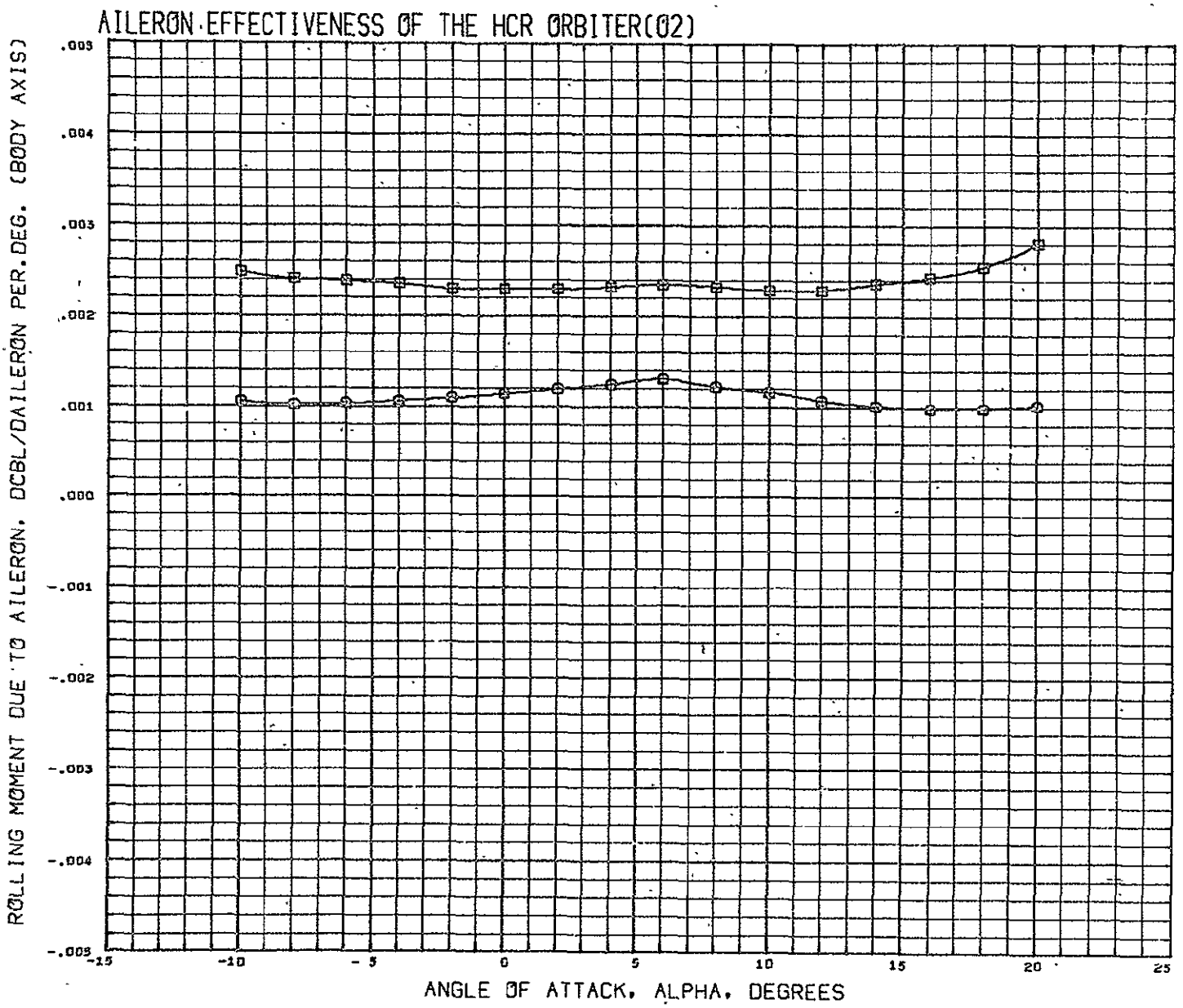
PARAMETRIC VALUES

BETA	0.000	AILRON	0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRP	4.2210	FT.
YMRP	0.0000	FT.
ZMRP	0.6670	FT.
SCALE	4.0000	PER CE

ELEVON 0.000



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(GCFG29)	○	LSWT 240 4.0 FC HCR ORBITER(02) B1W3V3
(GCFG32)	□	LSWT 240 4.0 FC HCR ORBITER(02) B1W3V3

PARAMETRIC VALUES

BETA 0.000 AILRON 0.000

ELEVON 0.000

REFERENCE INFORMATION

REFS	9.5800	SQ.FT.
REFL	3.0200	FT.
REFB	3.5400	FT.
XMRF	4.2210	FT.
YMRF	0.0000	FT.
ZMRF	0.6670	FT.
SCALE	4.0000	PER CE