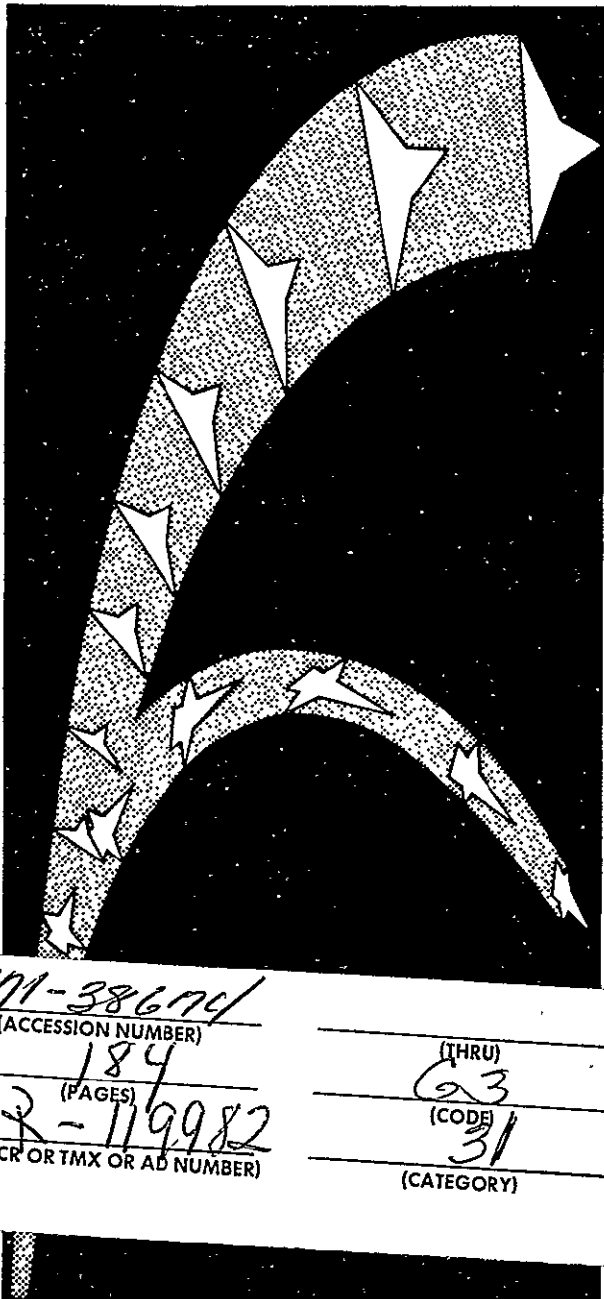


*J-P
m, x*



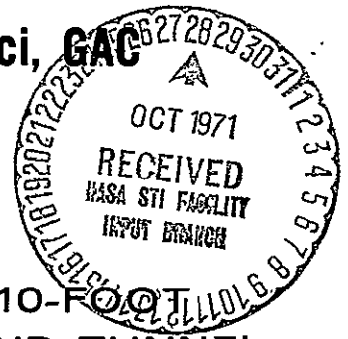
—SPACE SHUTTLE—

**BASIC AERODYNAMIC CHARACTERISTICS
FOR THREE GAC REUSABLE ORBITAL
SPACEPLANE CONFIGURATIONS,
ROS-NB1, ROS-NB2, AND ROS-WB1
AT 0.17 MACH NUMBER**

by

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GRUMMAN 7x10-FOOT
LOW SPEED WIND TUNNEL

SADSAC SPACE SHUTTLE
AEROTHERMODYNAMIC
DATA MANAGEMENT SYSTEM

**GRUMMAN
AEROSPACE CORPORATION**

CONTRACT NAS8-4016
MARSHALL SPACE FLIGHT CENTER



SADSAC/SPACE SHUTTLE
WIND TUNNEL TEST DATA REPORT

CONFIGURATION: GAC CONFIGURATION ROS-NB1, ROS-NB2, AND ROS-WB1

TEST PURPOSE: TO DETERMINE BASIC SUBSONIC AERODYNAMIC INFORMATION AT
0.17 MACH NUMBER

TEST FACILITY: GRUMMAN 7 x 10 FOOT LOW SPEED WIND TUNNEL

TESTING AGENCY: GRUMMAN AEROSPACE CORPORATION

TEST NO. & DATE: GWTT 290, March and April, 1971

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CONTRACT NAS 8-4016 AMENDMENT 153 DRL 184 - 58

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ABSTRACT

Three Grumman Aerospace Corporation (GAC) configurations of the Reusable Orbital Spaceplane (ROS) were tested in the GAC Low Speed Wind Tunnel during March and April, 1971. The tests were made with 1/25 scale models to obtain basic subsonic aerodynamic data. The models were pitched over selected angle of attack ranges at fixed sideslip angles of 0° and 3° and yawed from -15° to $+15^\circ$ at fixed angles of attack of 0° and 20° . The nominal test conditions were: Mach number, 0.17; Reynolds number, 1.6×10^6 per foot; dynamic pressure, 40 psf.

Most of the testing was done using the basic body-wing-vertical tail arrangement of configuration ROS-NB1. This configuration, with various elevon, aileron and rudder deflections, was tested with and without a ground board. Other test parameters included a split rudder, a body flap, turbojet engine pods and aft end body modifications. In addition, tests were performed on configurations ROS-NB2 and ROS-WB1; a short nose and wide body configuration respectively.

Several runs were also made to test the model in ground effect. The surface of the ground board was located 15 inches below the trunnion. This location of the ground board provided a value for the wing height parameter, $h/b = 0.295$, where h is the height of the 0.25 MAC above the ground board and b is the wing span.

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SUMMARY

This report presents the results of a second series of aerodynamic tests conducted on 1/25 scale models of three GAC Reusable Orbital Spaceplanes (ROS). This test, designated GWTT 290 was performed at the GAC Low Speed Wind Tunnel during the period 29 March - 13 April, 1971. The first series of tests have been reported in SADSAC reports DMS-DR-1081. The results presented herein supplement and extend the Series I test results.

The objectives of this test were to obtain low speed aerodynamic data on:

- 1) configuration ROS-NB1 with and without ground proximity for various conditions of pitch, yaw, elevon deflection and rudder deflection.
- 2) a modification of configuration ROS-NB1 at various angles of sideslip for $\alpha = 21$ degrees.
- 3) the effects of nose length, body flap deflection and engine pods.
- 4) configuration ROS-WB1, with and without twin tail fins, at various angles of sideslip for $\alpha = 21^\circ$.

Additionally, the effects of elevons and aft body modifications on base pressure were determined. Tufts were utilized on several test runs to ascertain the flow patterns over the model. It should be noted that the data in data sets RCW079 and RCW080 were recorded while the model had thread tufts attached.

TABLE I. SADSAC NOMENCLATURE OF AERODYNAMIC COEFFICIENTS

COEFFICIENT	COEFFICIENT NAME	SADSAC NOMENCLATURE		
		BODY AXIS	STABILITY AXIS	WIND AXIS
C_A	Total Axial Force	C_A	-	-
C_{AB}	Base Axial Force	C_{AB}	--	-
C_{AF}	Forebody Axial Force	C_{AF}	-	-
C_D	Total Drag Force	-	C_D	C_{DTOTL}
C_{DB}	Base Drag Force	-	C_{DB}	C_{DBASE}
C_{DF}	Forebody Drag Force	-	C_{DF}	C_{DFORE}
C_L	Lift Force	-	C_L	C_L
C_N	Normal Force	C_N	-	-
C_Y	Side Force	C_Y	C_Y	C_C
C_l	Rolling Moment	C_{BL}	C_{SL}	C_{WL}
C_m	Pitching Moment	C_{LM}	C_{LM}	C_{PM}
C_n	Yawing Moment	C_{YN}	C_{LN}	C_{LN}
L/D	Lift-To-Drag Force Ratio	-	L/D	C_L/C_D
L/D	Lift-To-Forebody Drag Force Ratio	-	L/DF	C_L/C_{DF}
N/A	Normal-To-Axial Force Ratio	N/A	-	-
N/A	Normal-To-Forebody Axial Force Ratio	C_N/C_{AF}	-	-

CONFIGURATIONS INVESTIGATED

Individual components tested in various combinations were:

- B₁ - basic ROS-NB1 fuselage
- B_{1B} } - basic ROS-NB1 fuselage with aft end modifications (see Figure 13)
- B_{1C} }
- B₂ - basic ROS-WB1 fuselage
- B₃ - ROS-NB2 fuselage derived from mating short nose to the B₁ body at Fus. Sta. 1216.
- E₁ - turbojet engine nacelles (see Figure 11)
- E₂ - twin turbojet engine nacelles (see Figure 12)
- W₁ - basic wing (see Figure 9)
- W₂ - basic wing, W₁, with clipped tips (see Figure 9)
- V₁ - basic ROS-NB1, centerline vertical tail
- V₂ - basic ROS-WB1 twin body tails
- V₃ - wing tip fins
- V_{3B} - modified wing tip fins (see Figure 10)
- F₁ - body flap
- GB - ground board

Pertinent dimensional information for each of the above component is given in the Model Component Description Sheets which are located after the figures. The Data Set Collation Sheets, which follow immediately, give a complete test summary of configurations investigated.

LOW SPEED AERODYNAMIC FORCE TEST ON THE
1/25 SCALE GRUMMAN CONF. ROS-NB1, NB2, WB1

PRETEST
 POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		Mach Number			NO. of RUNS	Parameter/Values										
		a	B	0.17				SEI	SER	SP	SE	SA						
RCW002	B,F ⁻¹⁵ W ₁ V ₁	0	B	2			1	0	0	0	0	0						
RCW004	B,F ⁻¹⁵ W ₁ V ₁	A	0	4			1	0	0	0	0	0						
RCW005	B,F ⁻¹⁵ W ₁ V ₁ +GB ¹⁵	C	0	5			1	0	0	0	0	0						
RCW007	B,F ⁻¹⁵ W ₁ V ₁ +GB ¹⁵	C	3	7			1	0	0	0	0	0						
RCW008	B,F ⁻¹⁵ W ₁ V ₁ +GB ¹⁵	C	0	8			1	0	-10	0	-5	-10						
RCW009	B,F ⁻¹⁵ W ₁ V ₁ +GB ¹⁵	C	0	9			1	-10	-10	0	-5	-10						
RCW010	B,F ⁻¹⁵ W ₁ V ₁ +GB ¹⁵	C	0	10			1	+5	-5	0	0	-10						
RCW011	B,F ⁻¹⁵ W ₁ V ₁ +GB ¹⁵	C	0	11			1	+5	-15	0	-5	-20						
RCW012	B,F ⁻¹⁵ W ₁ V ₁ +GB ¹⁵	C	0	12			1	-15	-15	0	-15	0						
RCW013	B,F ⁻¹⁵ W ₁ V ₁ +GB ¹⁵	C	0	13			1	-5	-15	0	-10	-10						
RCW014	B,F ⁻¹⁵ W ₁ V ₁ +GB ¹⁵	C	0	14			1	-5	-5	0	-5	0						
RCW015	B,F ⁻¹⁵ W ₁ V ₁ +GB ¹⁵	C	0	15			1	0	0	-5	0	0						
RCW016	B,F ⁻¹⁵ W ₁ V ₁ +GB ¹⁵	C	0	16			1	0	0	-10	0	0						
RCW017	B,F ⁻¹⁵ W ₁ V ₁ +GB ¹⁵	C	0	17			1	0	0	-15	0	0						
RCW018	B,F ⁻¹⁵ W ₁ V ₁ +GB ¹⁵	0	B	18			1	0	0	-15	0	0						
RCW019	B,F ⁻¹⁵ W ₁ V ₁ +GB ¹⁵	0	B	19			1	0	0	-10	0	0						
RCW020	B,F ⁻¹⁵ W ₁ V ₁ +GB ¹⁵	0	B	20			1	0	0	-5	0	0						
RCW021	B,F ⁻¹⁵ W ₁ V ₁ +GB ¹⁵	0	B	21			1	0	0	0	0	0						
RCW022	B,F ⁻¹⁵ W ₁ V ₁ +GB ¹⁵	0	B	22			1	0	-10	0	-5	-10						
RCW023	B,F ⁻¹⁵ W ₁ V ₁ +GB ¹⁵	0	B	23			1	10	-10	0	-10	0						

1	7	13	19	25	31	37	43	49	55	61	67	75	76
CL	CD	CLY	CLN	CLM	CSL								

COEFFICIENTS: $\alpha, A = -4 \pm 0 + 2 \pm 0$ by 2° IDPVAR(1) IDPVAR(2) NDV
 a or B $B.C. = 0.1, 0.2, 0.3, 0.5, 0.7, 0.9, 1.2, 1.5$
 SCHEDULES $\alpha.C. = -4 \pm 0$ by 2°

PRETEST

POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		Mach Number		NO. of RUNS	Parameters/Values											
		a	B	2.17			SE	SR	SE	SA								
RCW024	$B_3 F_1^{-15} W_1^{+5} V_1^{+5} + GB^{15}$	0	B	24		1	+5	-5	0	0	-10							
RCW025	$B_3 F_1^{-15} W_1^{+5} V_1^{+5} + GB^{15}$	0	B	25		1	+5	-15	0	-5	-20							
RCW026	$B_3 F_1^{-15} W_1^{+5} V_1^{+5} + GB^{15}$	0	B	26		1	-5	-15	0	-10	-10							
RCW027	$B_3 F_1^{-15} W_1^{+5} V_1^{+5} + GB^{15}$	0	B	27		1	-5	-5	0	-5	0							
RCW029	$B_3 F_1^{-15} W_1^{+5} V_1^{+5} + GB^{15}$	20	B	29		1	-5	-5	0	-5	0							
RCW030	$B_3 F_1^{-15} W_1^{+5} V_1^{+5} + GB^{15}$	20	B	30		1	-5	-15	0	-10	-10							
RCW031	$B_3 F_1^{-15} W_1^{+5} V_1^{+5} + GB^{15}$	20	B	31		1	+5	-15	0	-5	-20							
RCW032	$B_3 F_1^{-15} W_1^{+5} V_1^{+5} + GB^{15}$	20	B	32		1	+5	-5	0	0	-10							
RCW033	$B_3 F_1^{-15} W_1^{+5} V_1^{+5} + GB^{15}$	20	B	33		1	-10	-10	0	-10	0							
RCW034	$B_3 F_1^{-15} W_1^{+5} V_1^{+5} + GB^{15}$	20	B	34		1	0	-10	0	-5	-10							
RCW035	$B_3 F_1^{-15} W_1^{+5} V_1^{+5} + GB^{15}$	20	B	35		1	0	0	0	0	0							
RCW036	$B_3 F_1^{-15} W_1^{+5} V_1^{+5} + GB^{15}$	20	B	36		1	0	0	-5	0	0							
RCW037	$B_3 F_1^{-15} W_1^{+5} V_1^{+5} + GB^{15}$	20	B	37		1	0	0	-10	0	0							
RCW038	$B_3 F_1^{-15} W_1^{+5} V_1^{+5} + GB^{15}$	20	B	38		1	0	0	-15	0	0							
RCW040	$B_3 F_1^{-15} W_1^{+5} V_1^{+5}$	20	B	40		1	0	0	0	0	0							
RCW042	$B_3 F_1^{-15} W_1^{+5} V_1^{+5}$	0	B	42		1	0	0	0	0	0							
RCW044	$B_3 F_1^{-15}$	0	B	44		1	—	—	—	—	—							
RCW046	$B_3 F_1^{-15}$	A	C	46		1	—	—	—	—	—							
RCW045	$B_3 F_1^{-15} W_1^{+5} V_1^{+5}$	A	0	45		1	0	0	0	0	0							
RCW047	$B_3 F_1^{-15} W_1^{+5} V_1^{+5}$	A	3	47		1	0	0	0	0	0							

1	7	13	19	25	31	37	43	49	55	61	67	75	76
CL	LD	LV	CLM	CLN	CSL								

COEFFICIENTS:

$\alpha A = -4 \pm 2 \pm 4 \pm 6 \pm 8 \pm 10 \pm 12 \pm 14 \pm 16 \pm 18 \pm 20$

⇒ IDPVAR(1) IDPVAR(2) NDV

a or B

$\beta B = 0, \pm 1, \pm 2, \pm 3, \pm 5, \pm 7, \pm 9, \pm 12, \pm 15$

SCHEDULES

$\alpha C = -4^\circ \text{ to } 20^\circ \text{ by } 2^\circ$

PRETEST

POSTTEST

DATA SET IDENTIFIER	CONFIGURATION	SCHD.		Mach Number			NO. of RUNS	Parameters/Values											
		α	β	2.17				SEL	SER	GR	SE	SA							
RCW050	$B_1 F_1^{-9} W_1 V_1$	A	0	50			1	0	0	0	0	0							
RCW051	$B_1 F_1^{-15} W_1 V_1^{-5}$	A	0	51			1	0	0	-5	0	0							
RCW052	$B_1 F_1^{-15} W_1 V_1^{-15}$	A	0	52			1	0	0	-15	0	0							
RCW058	$B_1 F_1^{-15} W_1 V_1^{60-60}$	A	0	58			1	0	0	60/60	0	0							
RCW059	$B_1 F_1^{-15} W_1 V_1^{30-30}$	A	0	59			1	0	0	30/30	0	0							
RCW060	$B_1 F_1^{-15} W_1 V_1 E_1$	A	0	60			1	0	0	0	0	0							
RCW061	$B_1 F_1^{-15} W_1 V_1 E_1$	A	3	61			1	0	0	0	0	0							
RCW062	$B_1 F_1^{-15} W_1 V_1 E_1$	20	B	62			1	0	0	0	0	0							
RCW063	$B_1 F_1^{-15} W_1 V_1^{-5}$	20	B	63			1	0	0	-5	0	0							
RCW064	$B_1 F_1^{-15} W_1 V_1^{-5}$	20	B	64			1	0	0	-5	0	0							
RCW065	$B_1 F_1^{-15} W_1 V_1^{-15}$	20	B	65			1	0	0	-15	0	0							
RCW066	$B_1 F_1^{-15} W_1 V_1^{-15}$	20	B	66			1	0	0	-15	0	0							
RCW067	$B_1 F_1^{-15} W_1 V_1^{60-60}$	20	B	67			1	0	0	60/60	0	0							
RCW068	$B_1 F_1^{-15} W_1 V_1^{60-60}$	20	B	68			1	0	0	60/60	0	0							
RCW069	$B_1 F_1^{-15} W_1 V_1^{30-30}$	20	B	69			1	0	0	30/30	0	0							
RCW070	$B_1 F_1^{-15} W_1 V_1^{30-30}$	20	B	70			1	0	0	30/30	0	0							
RCW072	$B_2 W_1$	20	B	72			1	0	0	—	0	0							
RCW074	$B_2 W_1 V_2$	20	B	74			1	0	0	0	0	0							
RCW075	$B_1 F_1^{-15} W_1 V_3$	20	B	75			1	0	0	0	0	0							
RCW077	$B_1 F_1^{-15} W_2^{-15-15} V_3$	20	B	77			1	-15	-15	0	-15	0							

1	7	13	19	25	31	37	43	49	55	61	67	75	76
C.L.	C.D.	C.Y.	C.L.M.	C.L.N.	C.S.L.								

COEFFICIENTS: $\alpha A = -1^\circ + n + 24^\circ$ by 2° \Rightarrow IDPVAR(1) IDPVAR(2) NDV
 α or β
 SCHEDULES $\beta B = 0, \pm 1, \pm 2, \pm 3, \pm 5, \pm 7, \pm 9, \pm 12, \pm 15$
 $\alpha C = -4^\circ$ to 20° by 2°

TEST GNTT 290 DATA SET COLLATION SHEET

PRETEST
 POSTTEST

PAGE 4 of 4

DATA SET IDENTIFIER	CONFIGURATION	SCHED.		Mach Number	NO. of RUNS	Parameters/Values														
		α	β			δ_1	δ_2	δ_3	δ_4	δ_5	δ_6									
RCW079	$B_1 F_1^{-15} W_2^{-15} V_3$	A	0	0.17	1	-15	-15	0	-15	0										
RCW080	$B_1 F_1^{-15} W_2^{-15} V_{3B}$	A	0	30	1	-15	-15	0	-15	0										
RCW081	$B_{15} F_1^{-15} W_1 V_1$	D	0	31	1	0	0	0	0	0										
RCW082	$B_{1c} F_1^{-15} W_1 V_1$	D	0	32	1	0	0	0	0	0										
RCW083	$B_1 F_1^{-15} W_1 V_1 E_2$	A	0	33	1	0	0	0	0	0										
RCW084	$B_1 F_1^{-15} W_1 V_1 E_2$	A	3	34	1	0	0	0	0	0										

9

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

CL CD CY CLM CLN CSL

COEFFICIENTS: $\alpha A = -2^\circ$ to $+8^\circ$ by 2° IDPVAR(1) IDPVAR(2) NDV
 $\alpha D = -4^\circ$ to 10° by 2°
 SCHEDULES

TEST FACILITY DESCRIPTION

Description: This is a continuous flow, open circuit, closed throat tunnel. The test section is 7 feet by 10 feet by 20 feet. A 12-foot diameter propeller is driven at speeds up to 1200 rpm by a 1750 HP induction electric motor.

PERFORMANCE PARAMETERS:

Speed Range (mph):	134 maximum
Reynolds Number ($\times 10^6$ /ft):	1.7 maximum
Operating Pressure:	Atmospheric
Dynamic Pressure (psf):	.46 maximum
Stagnation Temperature:	Ambient
Power (HP):	1750

TESTING CAPABILITIES:

The GAC Low Speed Wind Tunnel is equipped for aerodynamic force and pressure testing on 3-dimensional, 2-dimensional, and reflection plane models. Capability also exists for conducting powered model, flutter, jet flap, flow visualization, and wake survey tests.

A variable frequency power unit having a range from 0 to 660 HZ, and a maximum output of 100 KW is available for the 3 phase induction motors used in powered models.

Available model supports include: two and three point supports, a single mount with fixed linkages for setting model pitch attitude, wire supports, and a pedestal mount for half model tests. Special installations can be provided to sting support models. Image systems are available for evaluating model support tare and interference effects.

TEST FACILITY DESCRIPTION
(CONTINUED)

The tunnel primary balance is a six-component mechanical external yoke type. The balance incorporates a pitch arm with $\pm 45^\circ$ pitch capability and a yaw table which can provide $\pm 45^\circ$ of yaw. Capability also exists for conducting tests with internal strain gage balance installations.

Removable wall inserts are available for 2-dimensional tests and a stationary ground plane is available for investigating ground effects.

An IBM 1800 computer system serves as the facilities data acquisition and reduction center. It is dedicated to the facility and provides on-line data reduction capability. On-site plotting is also available on a Calcomp drum-type plotter.

The facility can provide photographic, closed-circuit and play-back television documentation. Manometers and scanivalves are available for pressure recording.

TEST CONDITIONS
TEST GWFT 290

MACH NUMBER	REYNOLDS NUMBER per unit length	DYNAMIC PRESSURE (pounds/sq. inch)	STAGNATION TEMPERATURE (degrees Fahrenheit)
.17	1.6×10^6	.278	80 degrees

BALANCE UTILIZED: YOKE-TYPE LOW SPEED WIND TUNNEL

CAPACITY:	ACCURACY:	COEFFICIENT TOLERANCE:
NF <u>+ 4,000 lb.to -2,000 lb.</u>	<u>± .5 lb.</u>	<u>± .002</u>
SF <u>± 500 lbs.</u>	<u>± .2 lb.</u>	<u>± .001</u>
AF <u>± 500 lbs.</u>	<u>± .2 lb.</u>	<u>± .0005</u>
PM <u>± 1,200 ft.lbs.</u>	<u>± 1 ft. lb.</u>	<u>± .005</u>
YM <u>± 1,200 ft.lbs.</u>	<u>± 1 ft. lb.</u>	<u>± .005</u>
RM <u>± 1,200 ft.lbs.</u>	<u>± 1 ft. lb.</u>	<u>± .005</u>

COMMENTS:

Transition was fixed with strips of pinked electricians tape, 1.5 inches streamwise aft of the fuselage nose and 0.75 inches aft of the leading edge of the wing and tail surfaces. (see Figures 2, 3 and 4.)

DATA REDUCTION AND CORRECTIONS

Force Data - The force data were reduced with respect to a nominal C.G. The location of the nominal C.G., the trunnion center, and the reference dimensions used to reduce the force data are listed in Table II.

Table II. Location of Nominal C.G., Trunnion Center and Reference Dimensions Used to Reduce the Force Data.

		FULL SCALE VALUE	1/25 SCALE VALUE
NOMINAL C.G.	FS	1485 in.	59.40 in.
	WL	377 in.	15.08 in.
	BL	0	0
TRUNNION CENTER	FS	1314 in.	52.56 in.
	WL	333.2 in.	13.328 in.
	BL	0	0
	S_{REF}	5,747 ft. ²	9.1952 ft. ²
	l_{REF}	160.8 ft.	6.432 ft.
	b_{REF}	97.3 ft.	3.892 ft.

Corrections were applied to the data to compensate for effects due to tunnel flow misalignment and model support interference. These corrections were taken from the Series I tests (GWIT 289). They were obtained by taking force data under various conditions: (a) with body alone and with body-wing arrangements of the model, (b) with the model upright and with the model

DATA REDUCTION AND CORRECTIONS
(CONTINUED)

inverted, (c) with an image of the model support system and without, and (d) at various angles of pitch (with $\beta = 0$) and at various angles of yaw (with $\alpha = 0$).

The angle of attack was computed with an equation that included corrections for tunnel wall interference and flow misalignment. The tunnel wall interference correction was estimated to be $1.203 C_L$, and the flow misalignment correction was determined (from GWTM 289) to be 0.35 deg. Hence, the angle of attack was computed as

$$\alpha = \theta_N + 1.203 C_L + 0.35 \text{ deg.}$$

where θ_N denotes the nominal angle of pitch.

The angle of sideslip was taken to be minus the nominal angle of yaw,

$$\beta = -\Psi_N$$

where Ψ_N denotes the nominal angle of yaw.

Tare, support system interference, tunnel wall and model blockage corrections were applied to the longitudinal components of the force data (C_L , C_D , $C_{m,s}$). Only model blockage corrections were applied to the lateral components of the force data ($C_{l,s}$, $C_{n,s}$, C_Y). The tunnel wall corrections applied to the data were:

$$\Delta C_D = 0.018 C_L^2, \text{ and}$$

$$\Delta C_{m,w} = 0.004 C_L$$

DATA REDUCTION AND CORRECTIONS
(CONTINUED)

The model blockage correction was made by computing a corrected free-stream dynamic pressure from one of the equations

$$q_{\infty} = 1.0189 q_N, \quad \text{if ground board was out, or}$$

$$q_{\infty} = 1.1448 q_N, \quad \text{if ground board was in.}$$

All force data were tabulated in standard NASA coefficient form in the stability axis systems.

Transition was fixed with strips of pinked electricians tape . . . 1.5 inches streamwise aft of the fuselage nose and 0.75 inches aft of the leading edges of the wing and tail surfaces.

SUMMARY DATA PLOT INDEX

SUMMARY DATA PLOT INDEX

PLOT TITLE	PLOTTED COEFFICIENTS SCHEDULE	CONDITIONS VARYING	NOMINAL MACH NUMBER	NOMINAL α SCHEDULE (DEGREES)	NOMINAL β SCHEDULE (DEGREES)	PAGES
Figure 1 Yaw Polar in Ground Effect	A	Angle of Sideslip	0.17	-4 - 21	0 and 3	1-6
Figure 2 Elevator Effectiveness in Ground Effect	B	Elevator Deflection Angle	0.17	-4 - 21	0	7-9
Figure 3 Aileron Effectiveness in Ground Effect - ELEVTR=0. Deg.	A	Aileron Deflection Angle	0.17	-4 - 21	0	10-15
Figure 4 Aileron Effectiveness in Ground Effect - ELEVTR=-5. Deg.	A	Aileron Deflection Angle	0.17	-4 - 21	0	16-21
Figure 5 Aileron Effectiveness in Ground Effect - ELEVTR=-10. Deg.	A	Aileron Deflection Angle	0.17	-4 - 21	0	22-27
Figure 6 Rudder Effectiveness in Pitch in Ground Effect	A	Rudder Deflection Angle	0.17	-4 - 21	0	28-33
Figure 7 Rudder Effectiveness in Yaw in Ground Effect, ALPHA=0. Deg.	C	Rudder Deflection Angle	0.17	0	-15 - 15	34-39
Figure 8 Aileron Effectiveness in Yaw in Ground Effect, ALPHA=0. Deg., ELEVTR=0. Deg.	C	Aileron Deflection Angle	0.17	0	-15 - 15	40-45
Figure 9 Aileron Effectiveness in Yaw in Ground Effect, ALPHA=0., ELEVTR=-5. Deg.	C	Aileron Deflection Angle	0.17	0	-15 - 15	46-51

SUMMARY DATA PLOT INDEX
(CONTINUED)

PLOT TITLE	PLOTTED COEFFICIENTS SCHEDULE	CONDITIONS VARYING	NOMINAL MACH NUMBER	NOMINAL α SCHEDULE (DEGREES)	NOMINAL β SCHEDULE (DEGREES)	PAGES
Figure 10 Aileron Effectiveness in Yaw in Ground Effect, ALPHA=0., ELEVTR=-10. Deg.	C	Aileron Deflection Angle	0.17	0	-15 - 15	52-57
Figure 11 Aileron Effectiveness in Yaw in Ground Effect, ALPHA=21., ELEVTR=-10. Deg.	C	Aileron Deflection Angle	0.17	21	-15 - 15	58-63
Figure 12 Aileron Effectiveness in Yaw in Ground Effect, ALPHA=21., ELEVTR=-5. Deg.	C	Aileron Deflection Angle	0.17	21	-15 - 15	64-69
Figure 13 Aileron Effectiveness in Yaw in Ground Effect, ALPHA=21., ELEVTR=0.Deg.	C	Aileron Deflection Angle	0.17	21	-15 - 15	70-75
Figure 14 Rudder Effectiveness in Yaw in Ground Effect, ALPHA = 21. Deg.	C	Rudder Deflection Angle	0.17	21	-15 - 15	76-81
Figure 15 Effect of Short Nose in Yaw, ALPHA = 0. Deg.	C	Configuration	0.17	0	-15 - 15	82-87
Figure 16 Effect of Short Nose in Yaw, ALPHA = 21. Deg.	C	Configuration	0.17	21	-15 - 15	88-93
Figure 17 Effect of Short Nose in Yaw, (Body Alone), ALPHA=0. Deg.	C	Configuration	0.17	0	-15 - 15	94-99
Figure 18 Effect of Short Nose in Pitch	B	Configuration	0.17	-4 - 26	0	100-102

SUMMARY DATA PLOT INDEX
(CONTINUED)

PLOT TITLE	PLOTTED COEFFICIENTS SCHEDULE	CONDITIONS VARYING	NOMINAL MACH NUMBER	NOMINAL α SCHEDULE (DEGREES)	NOMINAL β SCHEDULE (DEGREES)	PAGES
Figure 19 Yaw Polar-Short Nose	A	Angle of Sideslip	0.17	-4 - 26	0 and 3	103-108
Figure 20 Effect of Body Flap (Long Nose)	B	Body Flap Deflec- tion Angle	0.17	-4 - 26	0	109-111
Figure 21 Rudder Effectiveness in Pitch	A	Rudder Deflection Angle	0.17	-4 - 26	0	112-117
Figure 22 Effect of Split Rudders in Pitch	D	Rudder Deflection Angle	0.17	-4 - 26	0	118-120
Figure 23 Effect of Engine Pods (El) in Pitch	D	Configuration	0.17	-4 - 26	0	121-123
Figure 24 Yaw Polars With Engine Pods (El)	A	Angle of Sideslip	0.17	-4 - 26	0 and 3	124-129
Figure 25 Effect of Engine Pods (El) in Yaw, ALPHA=21. Deg.	C	Configuration	0.17	21	-15 - 15	130-135
Figure 26 Rudder Effectiveness in Yaw, ALPHA=0.0 Deg.	C	Rudder Deflection Angle	0.17	0	-15 - 15	136-141
Figure 27 Rudder Effectiveness in Yaw, ALPHA=21. Deg.	C	Rudder Deflection Angle	0.17	21	-15 - 15	142-147
Figure 28 Effect of Split-Rudders in Yaw, ALPHA=0. Deg.	C	Rudder Deflection Angle	0.17	0	-15 - 15	148-153
Figure 29 Effect of Split Rudders in Yaw, ALPHA=21. Deg.	C	Rudder Deflection Angle	0.17	21	-15 - 15	154-159
Figure 30 Effect of Twin Fins With Wide Body in Yaw,ALPHA=21. Deg.	E	Configuration	0.17	21	-15 - 15	160-162

SUMMARY DATA PLOT INDEX
(CONTINUED)

PLOT TITLE	PLOTTED COEFFICIENTS		NOMINAL MACH NUMBER	NOMINAL α SCHEDULE (DEGREES)	NOMINAL β SCHEDULE (DEGREES)	PAGES
	SCHEDULE	CONDITIONS VARYING				
Figure 31 Effect of Wing Tip Fins in Yaw, ALPHA=21. Deg.	E	Configuration	0.17	21	-15 - 15	163-165
Figure 32 Wing Tip Fin Modified, ELEVTIP=-15. Deg.	F	Configuration	0.17	-4 - 25	0	166-167
Figure 33 Effect of Aft End Modification	B	Configuration	0.17	-4 - 25	0	168-170
Figure 34 Effect of E2 Engine Pods	A	Engine Pods	0.17	-4 - 26	0	171-176
Figure 35 Yaw Polars With E2 Engine Pods	A	Angle of Sideslip	0.17	-4 - 26	0 and 3	177-182

PLOTTED COEFFICIENTS SCHEDULE:

SCHEDULE A

CL vs. α
 CD vs. α
 CIM vs. α
 CY vs. α
 CLN vs. α
 CSL vs. α

SCHEDULE B

CL vs. α
 CL vs. CIM
 CL vs. CD

SCHEDULE C

CY vs. β
 CLN vs. β
 CSL vs. β
 CL vs. β
 CD vs. β
 CIM vs. β

SCHEDULE D

CL vs. α
 CD vs. α
 CIM vs. α

SCHEDULE E

CY vs. β
 CLN vs. β
 CSL vs. β

SCHEDULE F

CL vs. α
 CL vs CIM

FIGURES

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.

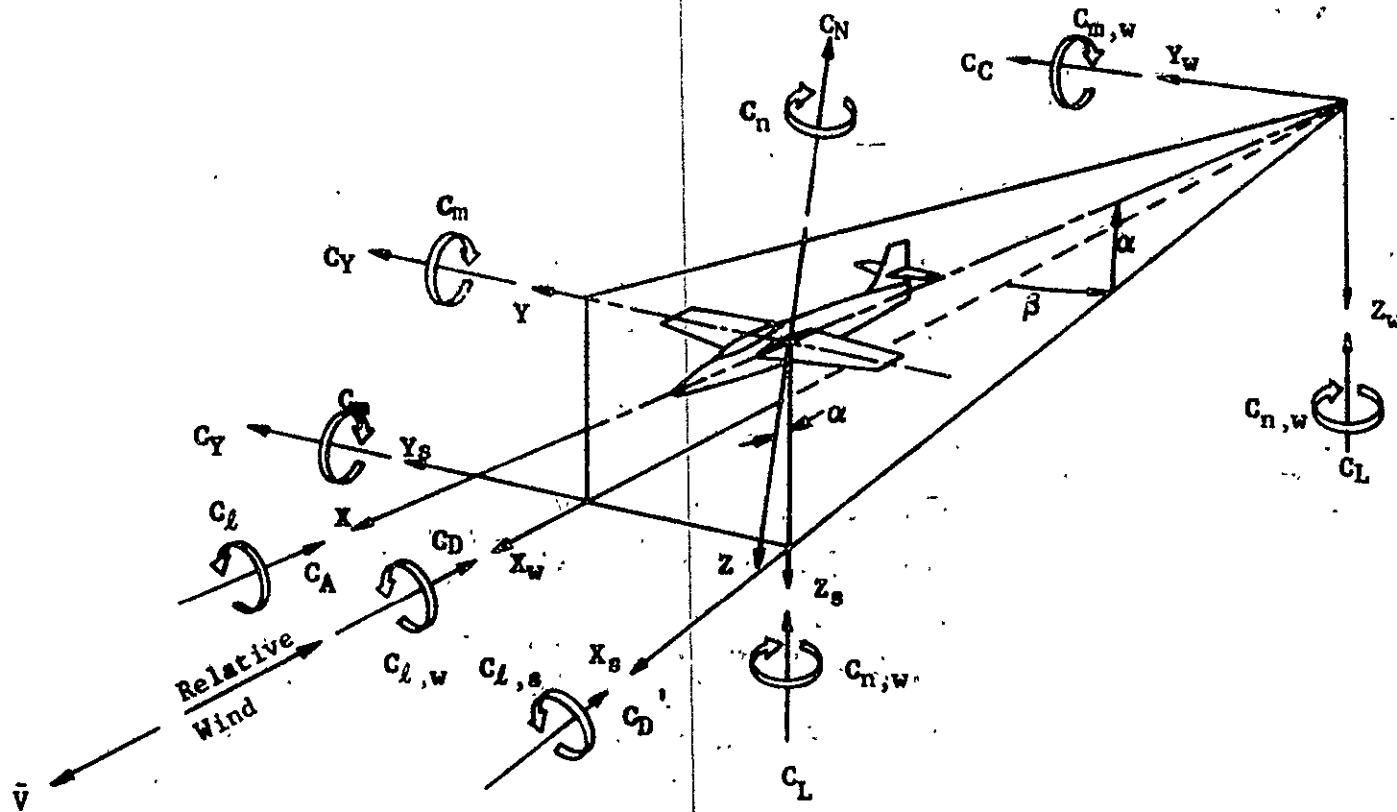


Figure 1. Axis systems, showing direction and sense of force and moment coefficients, angle of attack, and sideslip angle

NOT REPRODUCIBLE

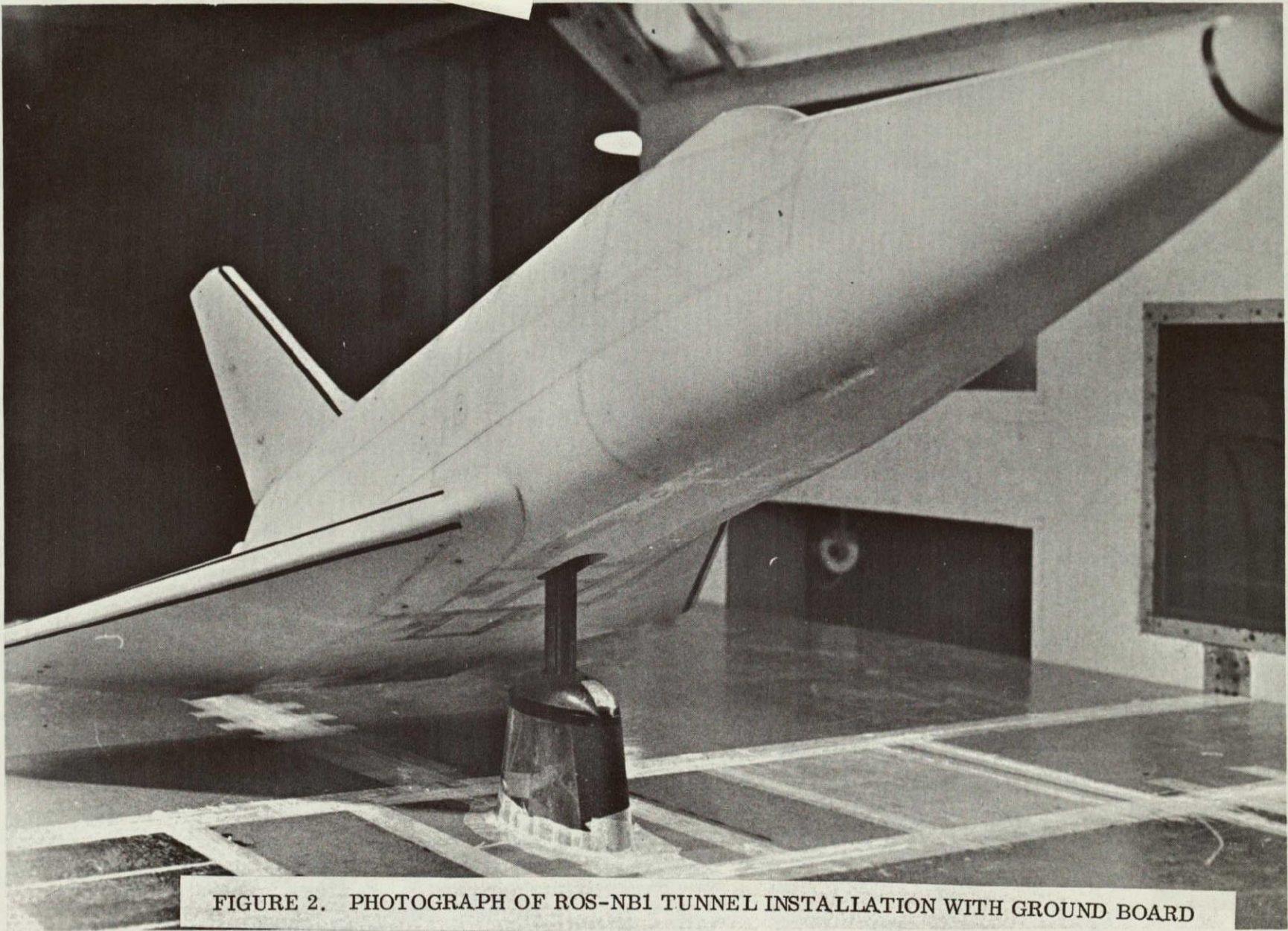


FIGURE 2. PHOTOGRAPH OF ROS-NB1 TUNNEL INSTALLATION WITH GROUND BOARD

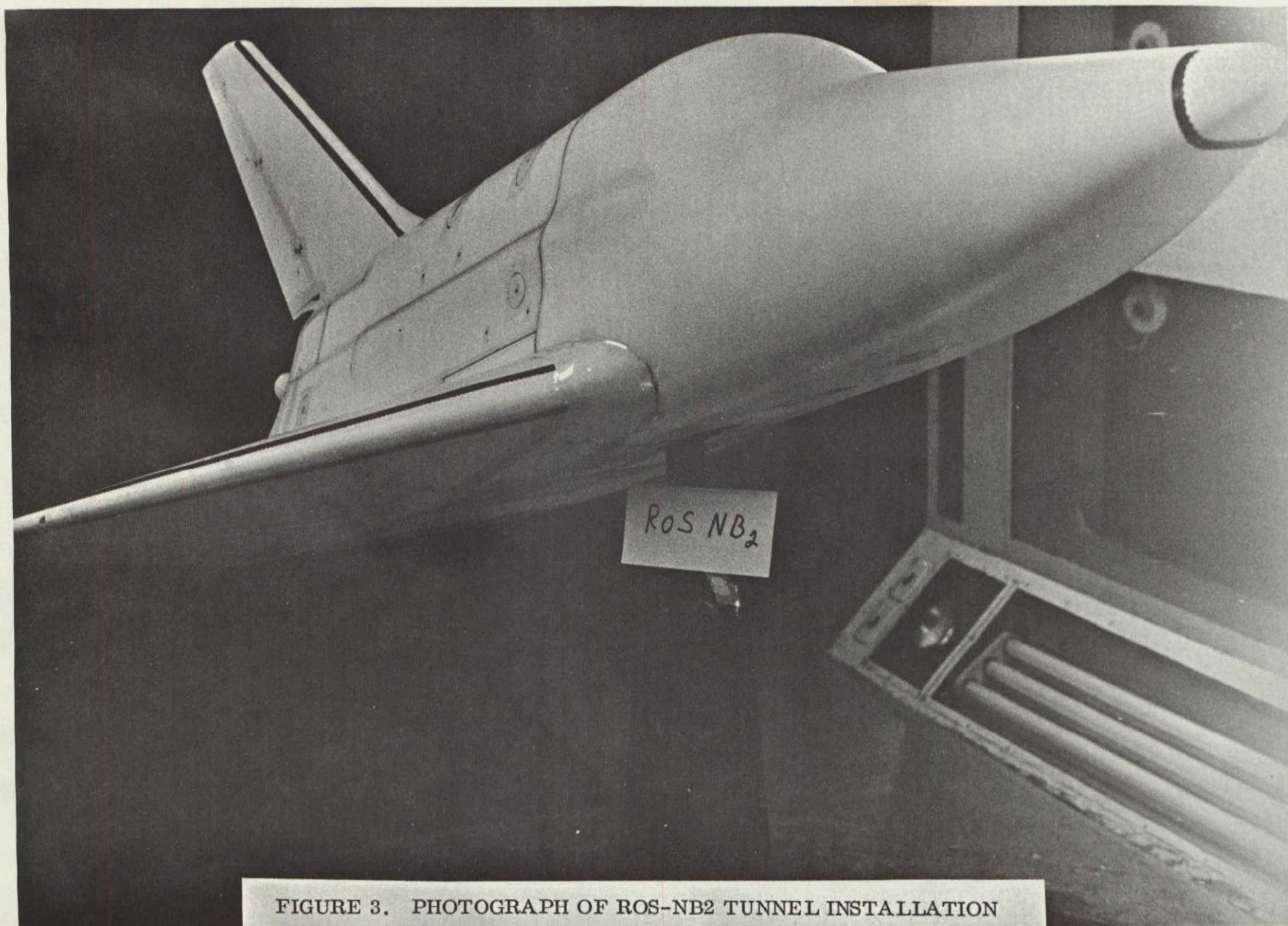


FIGURE 3. PHOTOGRAPH OF ROS-NB2 TUNNEL INSTALLATION

NOT REPRODUCIBLE

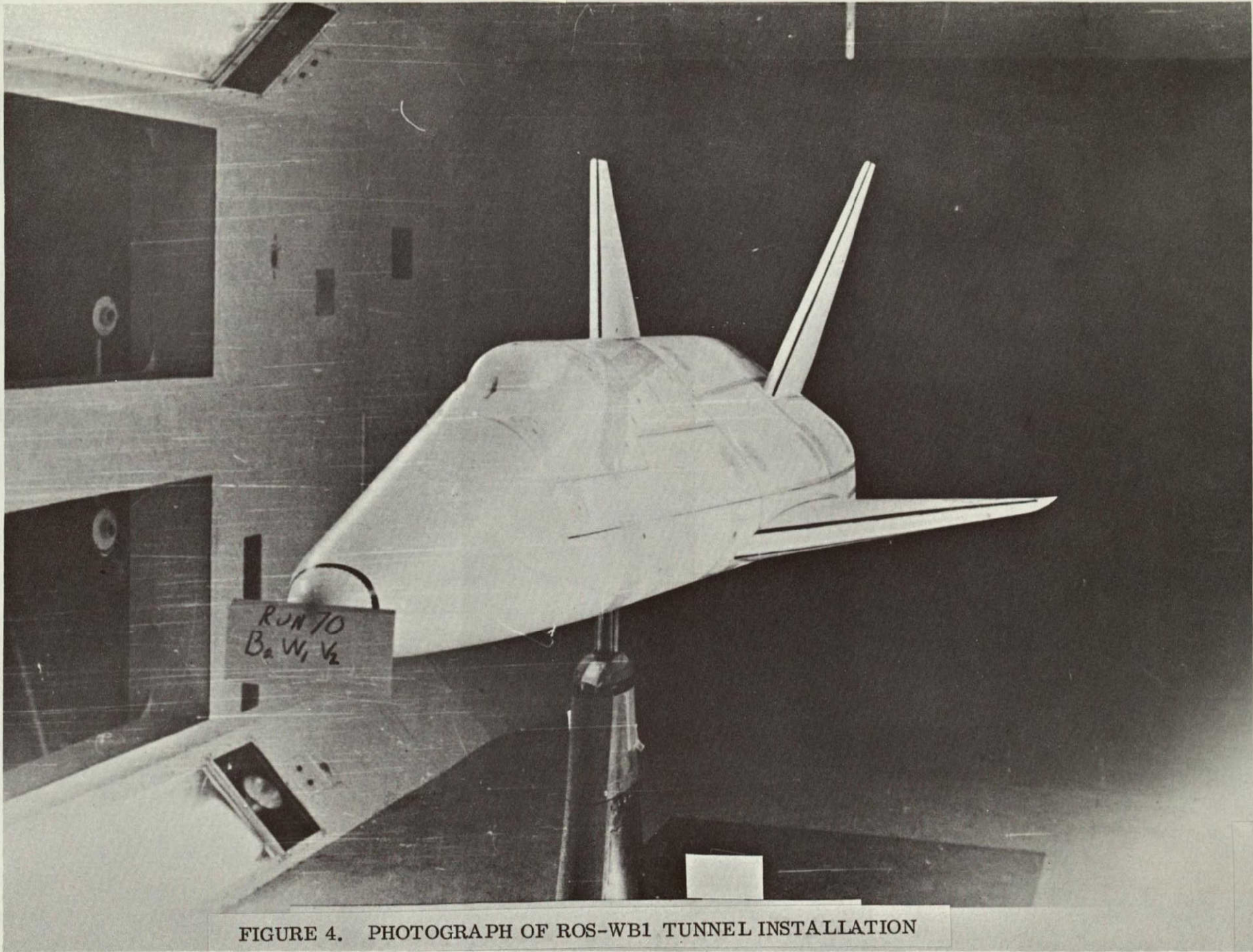


FIGURE 4. PHOTOGRAPH OF ROS-WB1 TUNNEL INSTALLATION

REFERENCE DIMENSIONS

$S_{REF} = 5747 \text{ FT}^2$

$Q_{REF} = 160.8 \text{ FT.}$

$b = 97.3 \text{ FT.}$

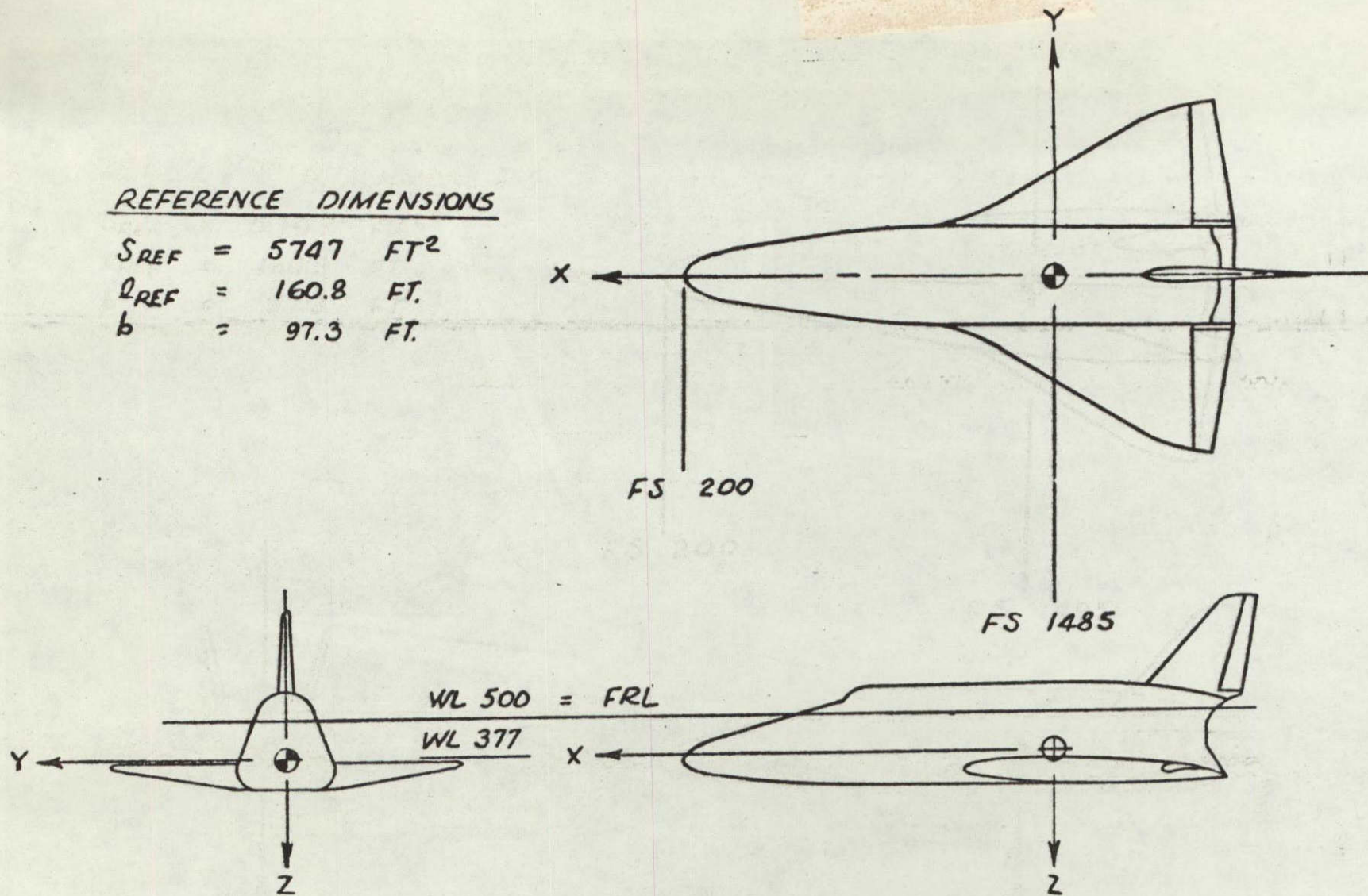


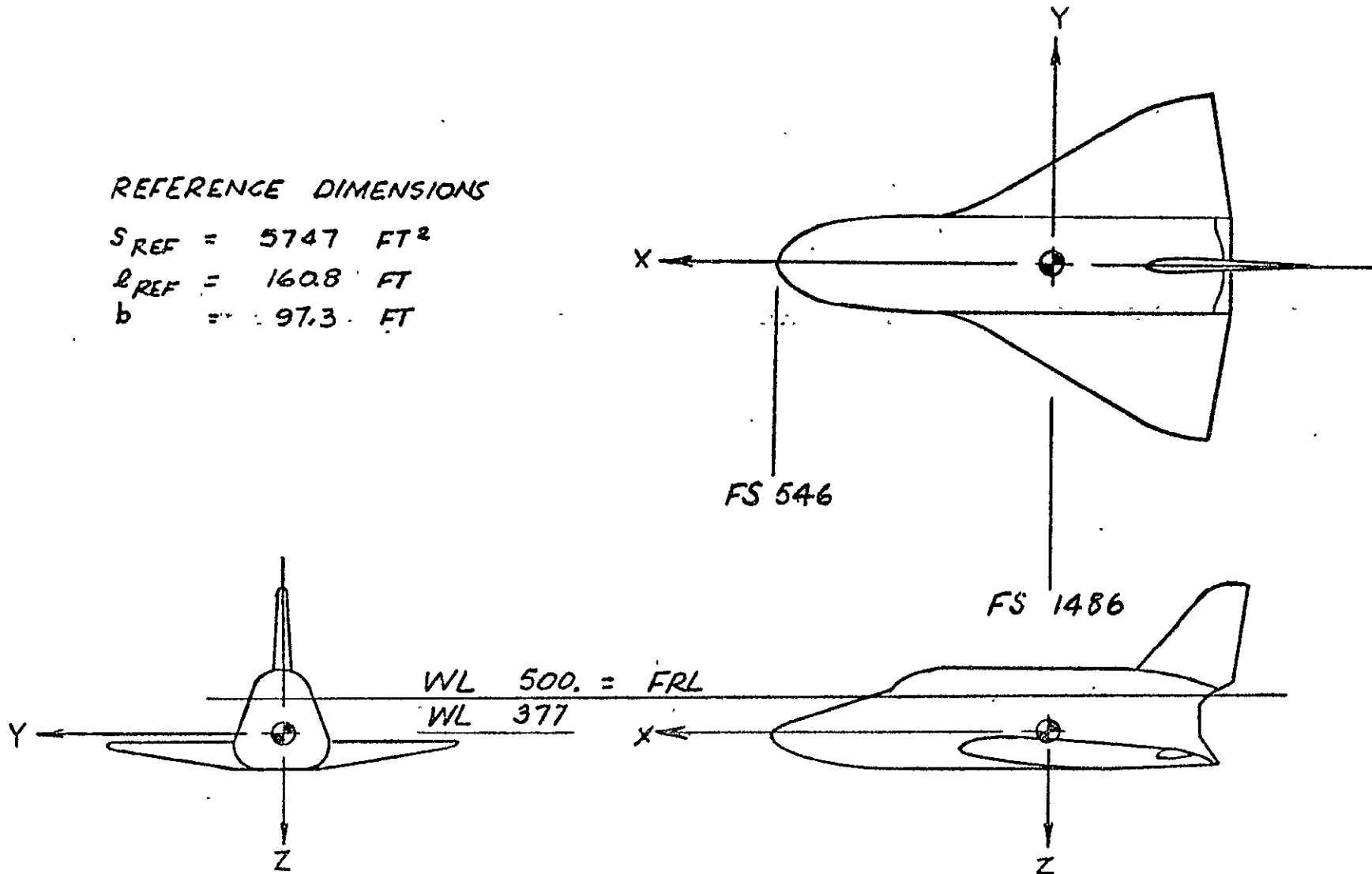
FIGURE 5. GENERAL ARRANGEMENT, ROS-NB1

REFERENCE DIMENSIONS

$$S_{REF} = 5747 \text{ FT}^2$$

$$L_{REF} = 160.8 \text{ FT}$$

$$b = 97.3 \text{ FT}$$



27

FIGURE 6. GENERAL ARRANGEMENT, ROS-NB2

REFERENCE DIMENSIONS

$S_{REF} = 5747 \text{ FT}^2$

$l_{REF} = 160.8 \text{ FT}$

$b = 97.3 \text{ FT}$

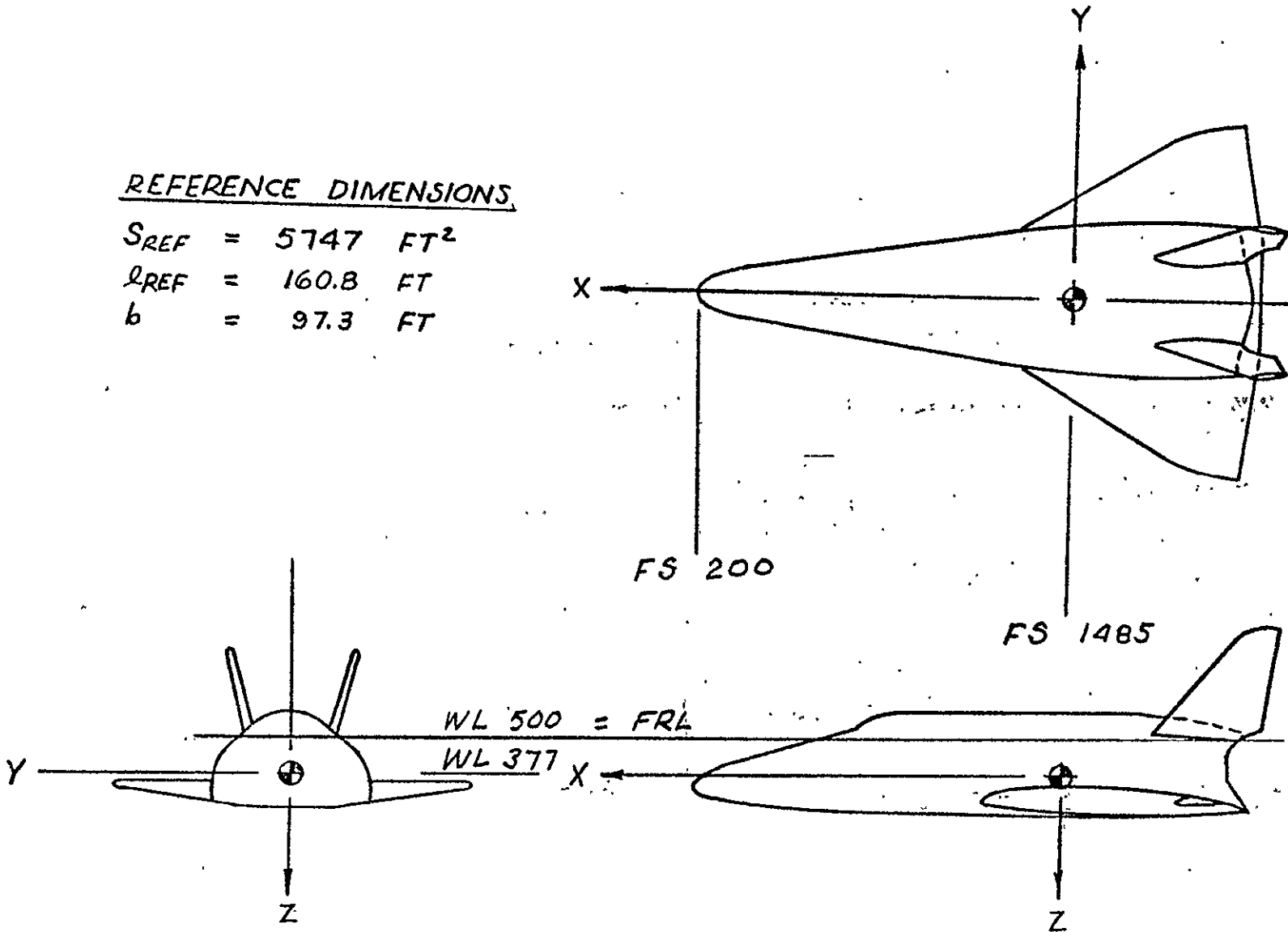


FIGURE 7. GENERAL ARRANGEMENT, ROS-WB1

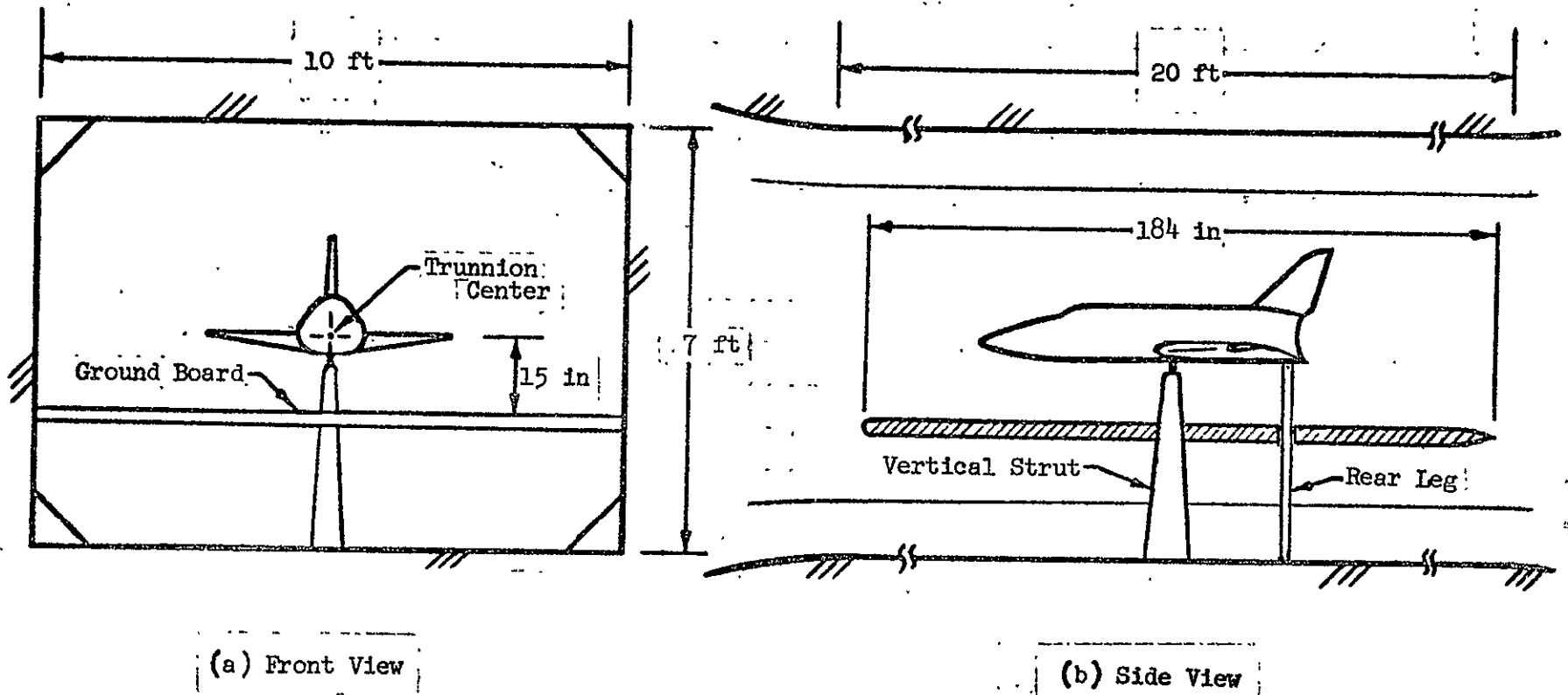


FIGURE 8. INSTALLATION OF MODEL WITH GROUND BOARD

W₂ Basic W₁ wing clipped to accomodate V₃ wing tip fins. Ref. drawing 518 MOD. 802.

—— W₁
- - - - W₂

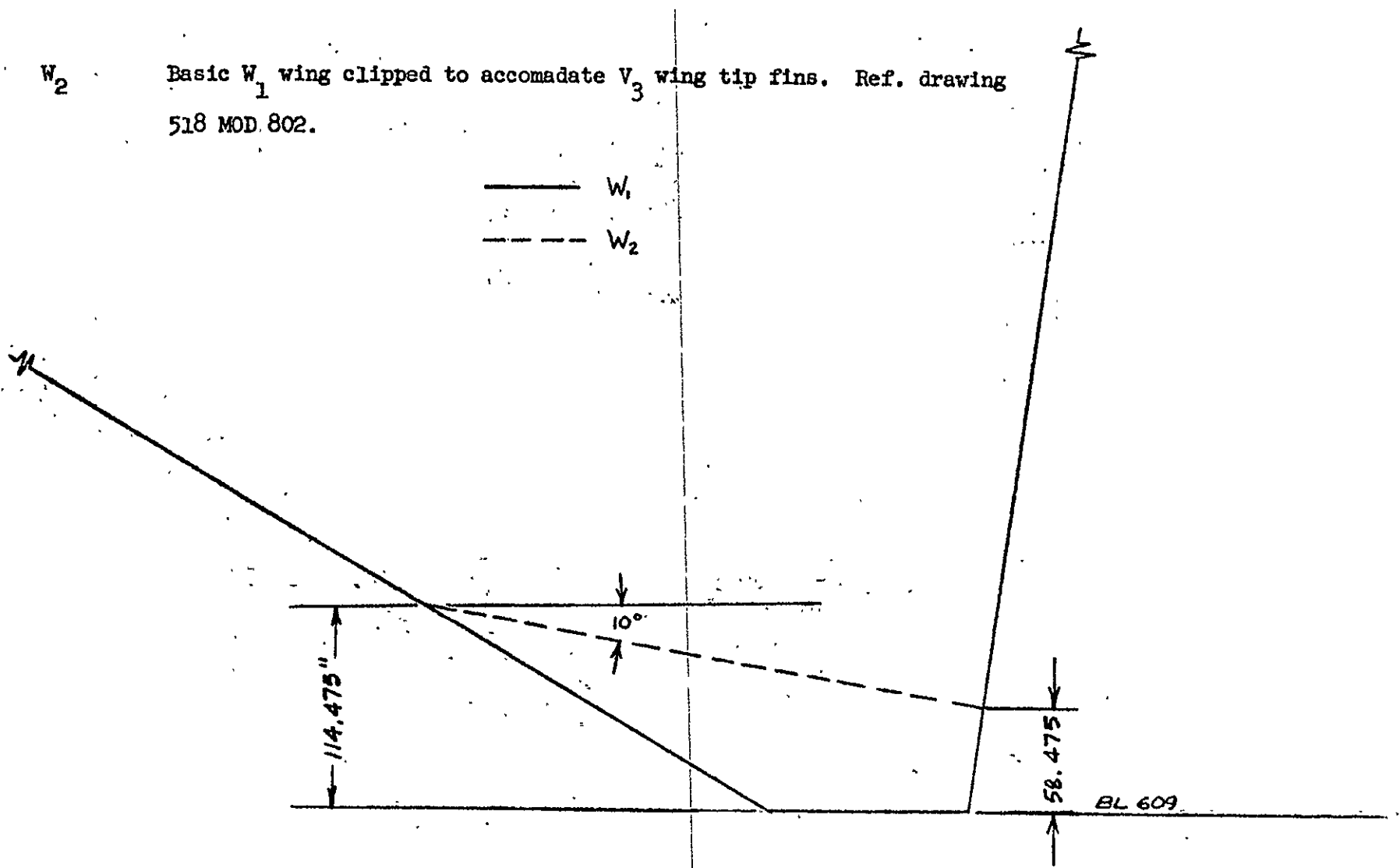


FIGURE 9. W₂ - WING (FULL SCALE.)

Outboard leading edge buildup on vertical fins consisting of 5/16" dowel and shimstock.

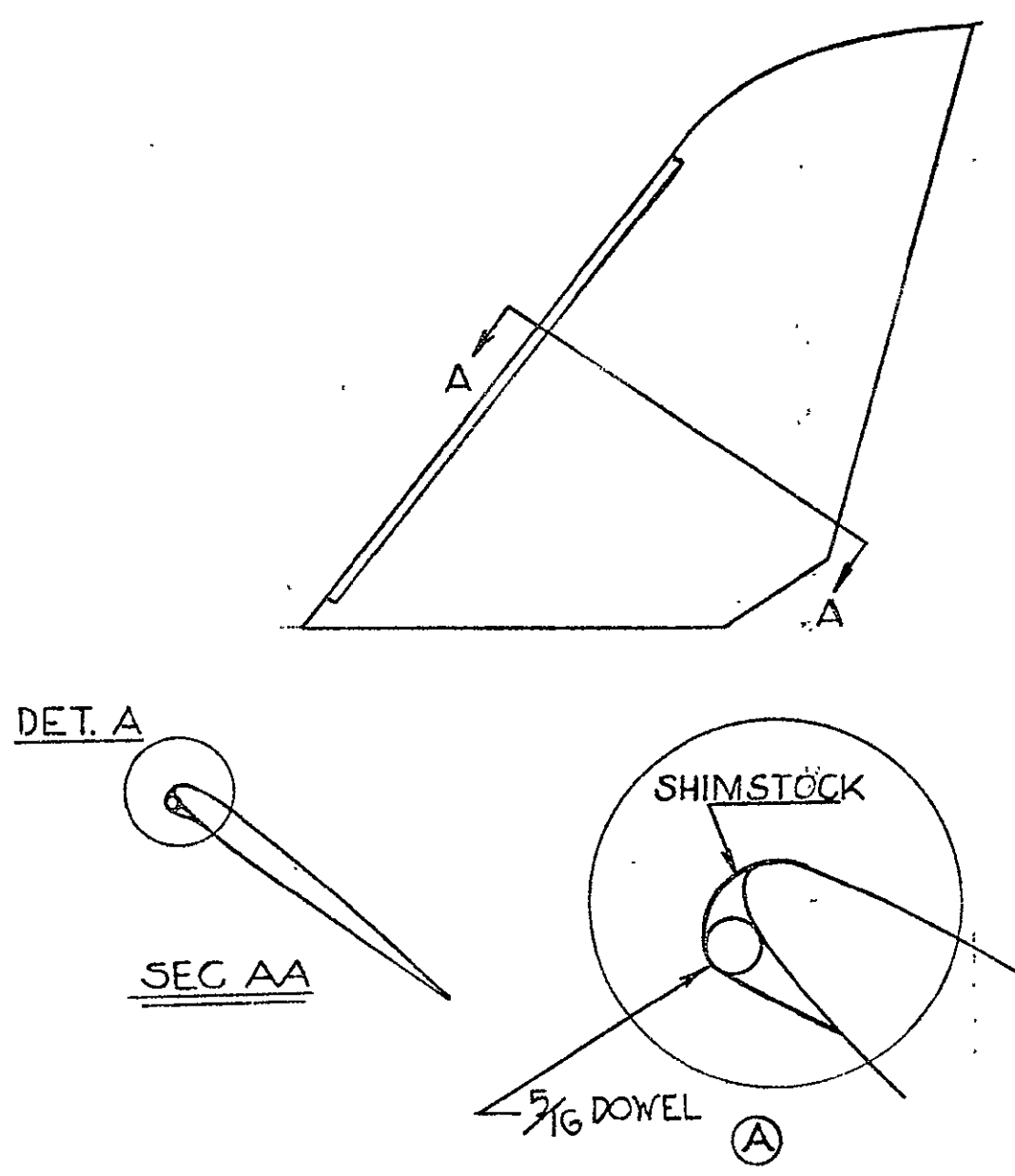


FIGURE 10. VERTICAL FIN, V3B

E₁ Flow through models of the four air-breathing engines that swing out of the fuselage. There are two on each side; the forward one under the \bar{c} of the rear.

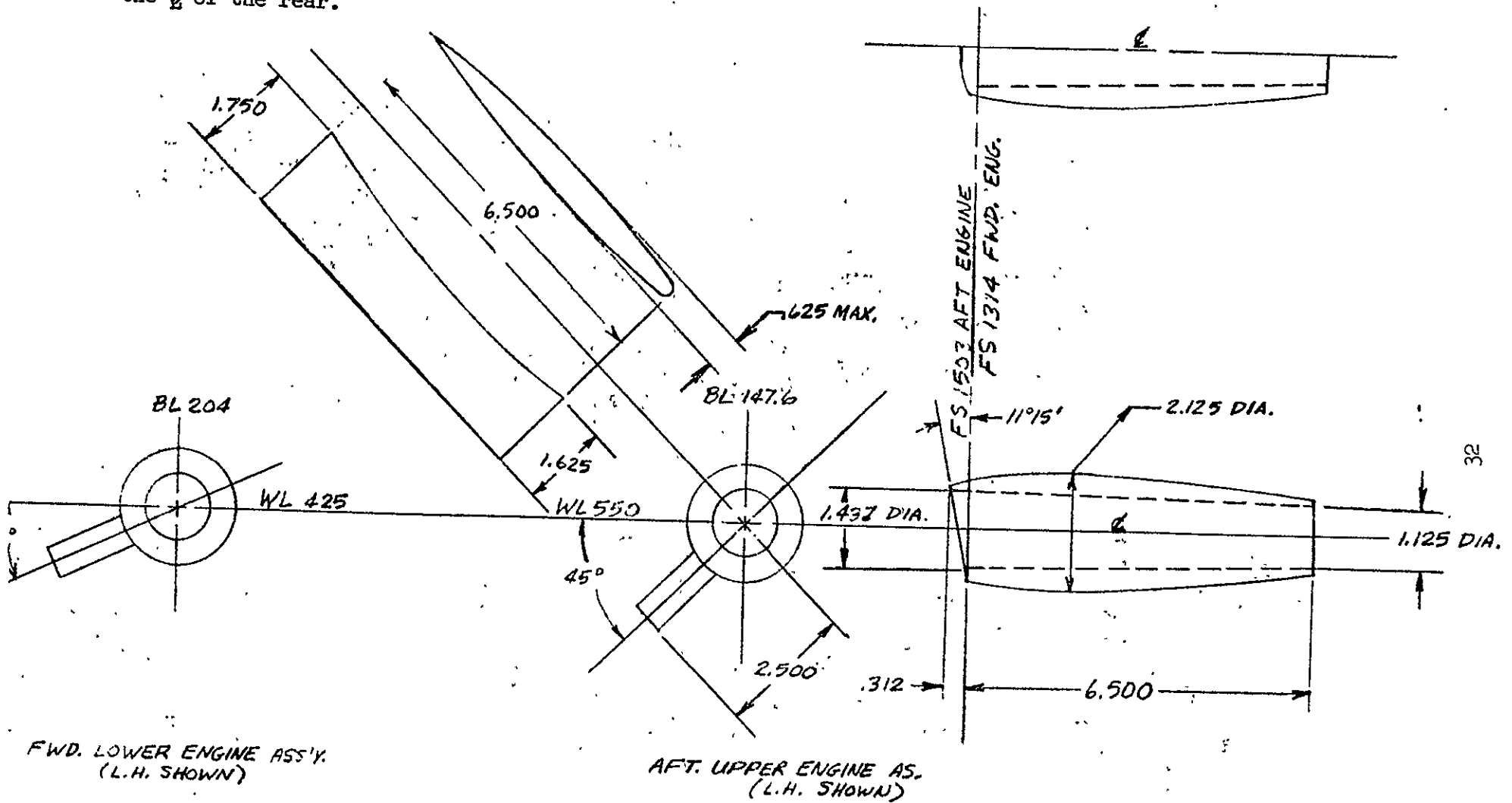


FIGURE 11. ENGINE NACELLES, E₁

SECT.
AA

Flow through models of the
twin turbojet engine pods,
one being on each side of
the model.

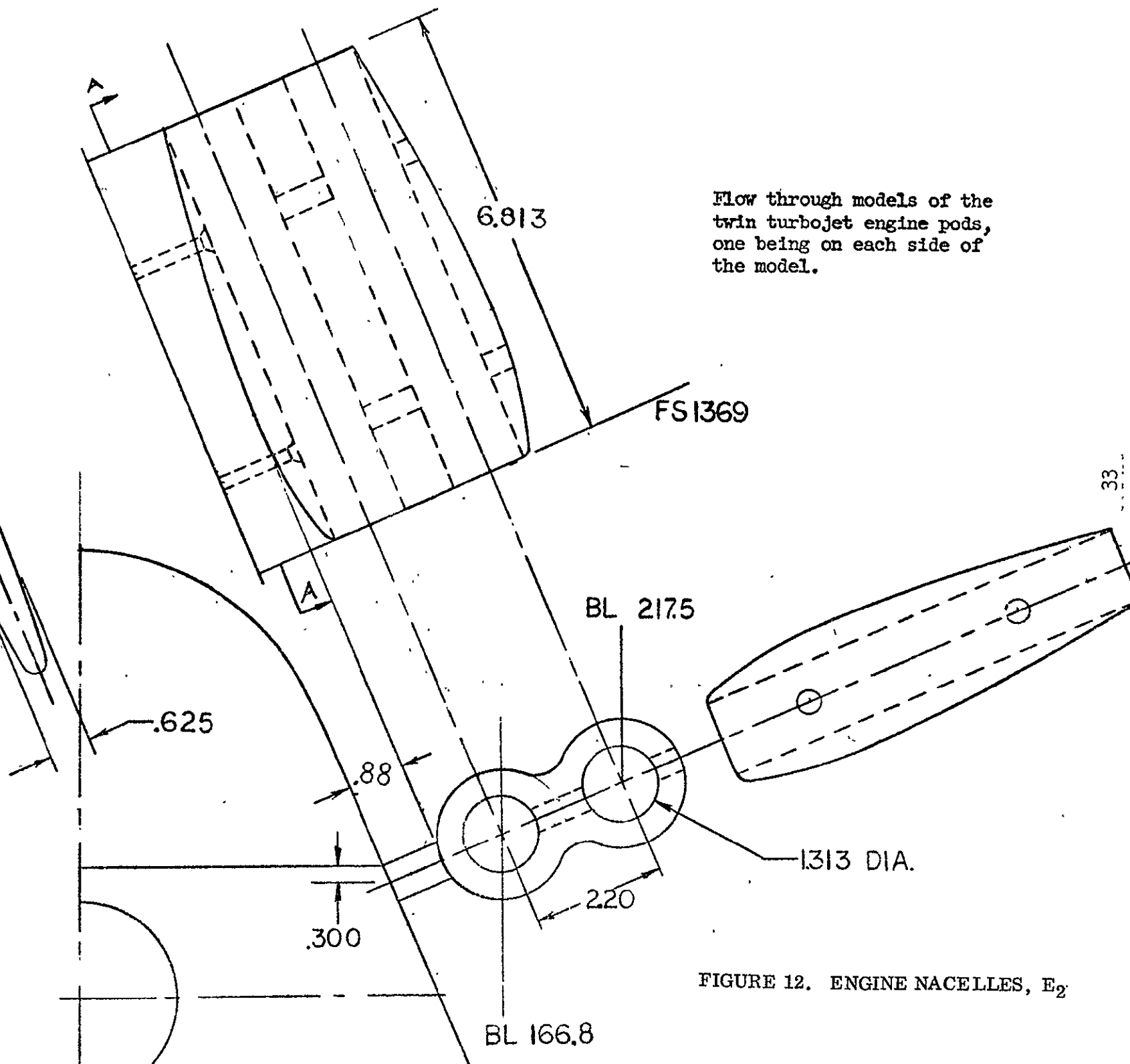


FIGURE 12. ENGINE NACELLES, E₂

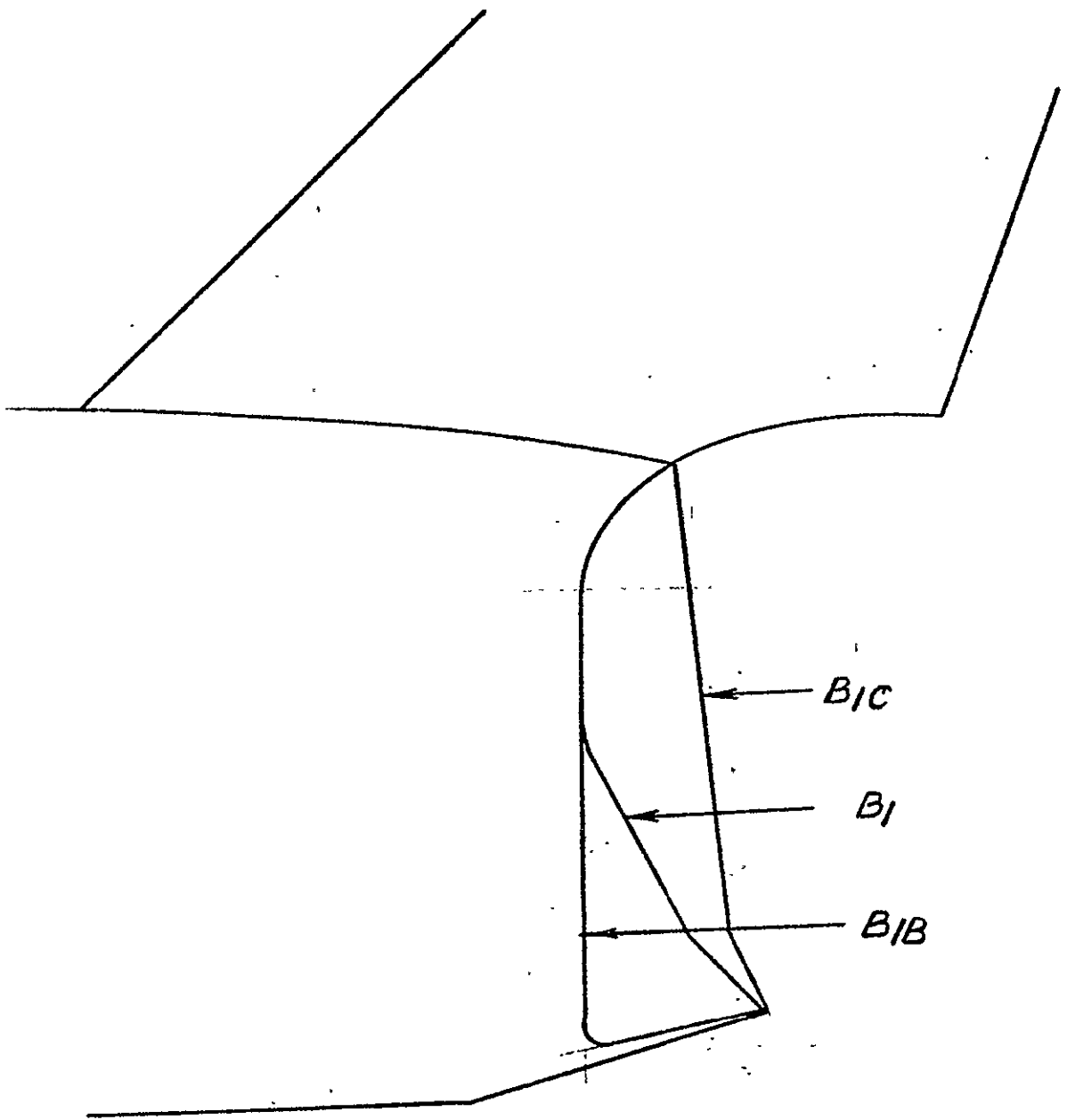


FIGURE 13. AFT END MODIFICATIONS

MODEL COMPONENT DESCRIPTION SHEETS

MODEL COMPONENT: BODY - B₁

GENERAL DESCRIPTION: BASIC ROS-NB1 BODY

DRAWING NUMBER: 518 MOD 800

DIMENSIONS:

	<u>FULL-SCALE</u> (FT. or FT ²)	<u>MODEL SCALE</u> (FT. or FT. ²)
Length	<u>160.8</u>	<u>6.43</u>
Max. Width	<u>28.0</u>	<u>1.12</u>
Max. Depth	<u>28.7</u>	<u>1.15</u>
Fineness Ratio	<u>5.61</u>	<u>5.61</u>
Area		
Max. Cross-Sectional	<u>616</u>	<u>.986</u>
Planform	<u>3990</u>	<u>6.38</u>
Wetted	<u>12,610</u>	<u>20.18</u>
Base	<u>590</u>	<u>.944</u>

MODEL COMPONENT: BODY - B₂

GENERAL DESCRIPTION: BASIC ROS-WBI BODY

DRAWING NUMBER: _____

<u>DIMENSIONS:</u>	<u>FULL-SCALE</u> (FT. OR FT. ²)	<u>MODEL SCALE</u> (ft. or ft. ²)
Length	<u>160.8</u>	<u>6.13</u>
Max. Width	<u>44.8</u>	<u>1.79</u>
Max. Depth	<u>28.8</u>	<u>1.15</u>
Fineness Ratio	<u>3.6</u>	<u>3.6</u>
Area		
Max. Cross-Sectional	<u>956</u>	<u>1.53</u>
Planform	<u>5160</u>	<u>8.26</u>
Wetted	<u>13,230</u>	<u>21.17</u>
Base	<u>744</u>	<u>1.19</u>

MODEL COMPONENT: BODY - B₃

GENERAL DESCRIPTION: ROS-NB2 Body Derived From Mating a Short Nose to the B₁
Body at FS 1216

DRAWING NUMBER: 518 MOD 815

<u>DIMENSIONS:</u>	<u>FULL-SCALE</u> (ft. or ft. ²)	<u>MODEL SCALE</u> (ft. or ft. ²)
Length	<u>132</u>	<u>5.28</u>
Max. Width	<u>28</u>	<u>1.12</u>
Max. Depth	<u>28.7</u>	<u>1.15</u>
Fineness Ratio	<u>4.6</u>	<u>4.6</u>
Area		
Max. Cross-Sectional	<u>616</u>	<u>.986</u>
Planform	<u> </u>	<u> </u>
Wetted	<u> </u>	<u> </u>
Base	<u>590</u>	<u>.944</u>

MODEL COMPONENT: WING - W₁

GENERAL DESCRIPTION: BASIC ROS-NB 1 WING

DRAWING NUMBER: 518 MOD 802

DIMENSIONS:

TOTAL DATA

FULL-SCALE
(FT. OR FT.²)

MODEL SCALE
(FT. OR FT.²)

Area		
Planform	<u>5747</u>	<u>9.195</u>
Wetted	<u>7780</u>	<u>12.45</u>
Span (equivalent)	<u>97.3</u>	<u>3.89</u>
Aspect Ratio	<u>1.65</u>	<u>1.65</u>
Rate of Taper	<u>1.87</u>	<u>1.87</u>
Taper Ratio	<u>.129</u>	<u>.129</u>
Diehedral Angle, degrees	<u>5°</u>	<u>5°</u>
Incidence Angle, degrees	<u>+ 2° @body - 3° @tip</u>	
Aerodynamic Twist, degrees		
Toe-In Angle		
Cant Angle		
Sweep Back Angles, degrees		
Leading Edge	<u>60°</u>	<u>60°</u>
Trailing Edge	<u>-8.4°</u>	<u>-8.4°</u>
0.25 Element Line	<u>42.9°</u>	<u>42.9°</u>
Chords:		
Root (Wing Sta. 0.0)	<u>104.6</u>	<u>4.18</u>
Tip, (equivalent)	<u>13.5</u>	<u>.54</u>
MAC	<u>59.0</u>	<u>2.36</u>
Fus. Sta. of .25 MAC	<u>1580 in.</u>	<u>5.27</u>
W.P. of .25 MAC	<u>302.6 in.</u>	<u>1.01</u>
B.L. of .25 MAC		
Airfoil Section		
Root	<u>18% max.camber 10% thickness</u>	
Tip	<u>3% max.camber 10% thickness</u>	
<u>EXPOSED DATA</u>		
Area	<u>3217</u>	<u>5.147</u>
Span, (equivalent)	<u>69.3</u>	<u>2.77</u>
Aspect Ratio	<u>1.5</u>	<u>1.5</u>
Taper Ratio	<u>.172</u>	<u>.172</u>
Chords		
Root	<u>78.25</u>	<u>3.13</u>
Tip	<u>13.5</u>	<u>.54</u>
MAC	<u>46.4</u>	<u>1.86</u>
Fus. Sta. of .25 MAC		
W.P. of .25 MAC		
B.L. of .25 MAC		

MODEL COMPONENT: Elevon (for the W₁ wing)

GENERAL DESCRIPTION: Moveable Control Surface Associated With the W₁ Wing

DRAWING NUMBER: 518 MOD 802

DIMENSIONS:

	<u>FULL-SCALE</u> (ft. or ft. ²)	<u>MODEL SCALE</u> (ft. or ft. ²)
Area	<u>364</u>	<u>.582</u>
Span (equivalent) :	<u>35.5</u>	<u>1.42</u>
^{Root} Inb'd equivalent chord	<u>12.75</u>	<u>.51</u>
Outb'd equivalent chord	<u>7.75</u>	<u>.31</u>
Ratio Elevator chord/horizontal tail chord		
At Inb'd equiv. chord	<u> </u>	<u> </u>
At Outb'd equiv. chord	<u> </u>	<u> </u>
Sweep Back Angles, degrees		
Leading Edge	<u>0°</u>	<u>0°</u>
Tailing Edge	<u>-8.4°</u>	<u>-8.4°</u>
Hingeline	<u> </u>	<u> </u>
Area Moment (Normal to hinge line)	<u> </u>	<u> </u>

MODEL COMPONENT: VERTICAL TAIL - V₁

GENERAL DESCRIPTION: BASIC ROS-NB 1 VERTICAL TAIL

DRAWING NUMBER: 518 MOD 803

<u>DIMENSIONS:</u>	<u>FULL-SCALE</u> (<u>FT. OR FT.²</u>)	<u>MODEL SCALE</u> (<u>FT. OR FT.²</u>)
Area	<u>805</u>	<u>1.29</u>
Span (equivalent)	<u>33.3</u>	<u>1.33</u>
Inb'd equivalent chord	<u>34.6</u>	<u>1.38</u>
Outb'd equivalent chord	<u>13.75</u>	<u>.55</u>
Ratio movable surface chord/ total surface chord		
At Inb'd equiv. chord	<u>.3</u>	<u>.3</u>
At Outb'd equiv. chord	<u>.3</u>	<u>.3</u>
Sweep Back Angles, degrees		
Leading Edge	<u>45°</u>	<u>45°</u>
Tailing Edge	<u>19.7°</u>	<u>19.7°</u>
Hingeline	<u>28.7°</u>	<u>28.7°</u>
Area Moment (Normal to hinge line)	<u>945</u>	<u>1.51</u>
AIRFOIL SECTION	<u>64A010</u>	

MODEL COMPONENT: Rudder (for the V₁ vertical tail)

GENERAL DESCRIPTION: Moveable Control Surface Associated With the V₁
Vertical Tail

DRAWING NUMBER: 518 MOD 803

DIMENSIONS:

	<u>FULL-SCALE</u> <u>(ft. or ft.²)</u>	<u>MODEL SCALE</u> <u>(ft. or ft.²)</u>
Area	<u>240</u>	<u>.384</u>
Span (equivalent) ROOT	<u>33.3</u>	<u>1.33</u>
Inb'd equivalent chord	<u>10.4</u>	<u>.416</u>
Outb'd equivalent chord RUDDER	<u>4.02</u>	<u>.161</u>
Ratio Elevator chord/horizontal tail chord		
At Inb'd equiv. chord	<u>.3</u>	<u>.3</u>
At Outb'd equiv. chord	<u>.3</u>	<u>.3</u>
Sweep Back Angles, degrees		
Leading Edge	<u>29.5°</u>	<u>29.5°</u>
Tailing Edge	<u>19.7°</u>	<u>19.7°</u>
Hingeline	<u></u>	<u></u>
Area Moment (Normal to hinge line)	<u></u>	<u></u>

MODEL COMPONENT: TWIN BODY TAILS - V₂

GENERAL DESCRIPTION: BASIC ROS-WB1 VERTICAL TAILS

DRAWING NUMBER: 518 MOD 804

<u>DIMENSIONS:</u>	<u>FULL-SCALE</u> (FT. OR FT. ²)	<u>MODEL SCALE</u> (FT. OR FT. ²)
Area	<u>670</u>	<u>1.07</u>
Span (equivalent)	<u>35.5</u>	<u>2.46</u>
Inb'd equivalent chord	<u>33.17</u>	<u>1.33</u>
Outb'd equivalent chord	<u>9.08</u>	<u>.36</u>
Ratio movable surface chord/ total surface chord		
At Inb'd equiv. chord	<u> </u>	<u> </u>
At Outb'd equiv. chord	<u> </u>	<u> </u>
Sweep Back Angles, degrees		
Leading Edge	<u>40°</u>	<u>40°</u>
Tailing Edge	<u>8.5°</u>	<u>8.5°</u>
Hingeline	<u> </u>	<u> </u>
Area Moment (Normal to hinge line)	<u> </u>	<u> </u>
AIRFOIL SECTION	<u>NACA 64A010</u>	
CANT ANGLE (OUTBOARD)	<u>15°</u>	

MODEL COMPONENT: WING TIP FINS - V₃

GENERAL DESCRIPTION: VERTICAL FINS LOCATED AT THE TIPS OF THE CLIPPED
BASIC WING (DESIGNATED W₂)

DRAWING NUMBER: 518 MOD 807

<u>DIMENSIONS:</u>	<u>FULL-SCALE</u> (<u>FT. OR FT.²</u>)	<u>MODEL SCALE</u> (<u>FT. OR FT.²</u>)
Area	<u>684</u>	<u>1.09</u>
Span (equivalent)	<u>30.17</u>	<u>1.21</u>
Inb'd equivalent chord	<u>30.25</u>	<u>1.21</u>
Outb'd equivalent chord	<u>15.17</u>	<u>0.61</u>
Ratio movable surface chord/ total surface chord		
At Inb'd equiv. chord	<u>.274</u>	<u>.274</u>
At Outb'd equiv. chord	<u>.546</u>	<u>.546</u>
Sweep Back Angles, degrees		
Leading Edge	<u>40°</u>	<u>40°</u>
Tailing Edge	<u>18.44°</u>	<u>18.44°</u>
Hingeline	<u>18.44°</u>	<u>18.44°</u>
Area Moment (Normal to hinge line)	<u>805</u>	<u>1.29</u>
CANT ANGLE	<u>15° (OUTBOARD)</u>	
TOE-IN ANGLE	<u>10°</u>	

NOMENCLATURE

(General)

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

NOMENCLATURE (Continued)

Reference & C. G. Definitions

<u>SYMBOL</u>	<u>SADSAC SYMBOL</u>	<u>DEFINITION</u>
S		wing area; m^2 , ft^2
S	SREF	reference area; m^2 , ft^2
\bar{c}		wing mean aerodynamic chord or reference chord; m, ft, in (see l_{ref} or LREF)
l_{ref}	LREF	reference length; m, ft, in.; (see \bar{c})
b_{ref}	BREF	wing span or reference span; m, ft, in
A_b		base area; m^2 , ft^2 , in^2
c. g.		center of gravity
MRP	MRP	abbreviation for moment reference point
	XMRP	abbreviation for moment reference point on X-axis
	YMRP	abbreviation for moment reference point on Y-axis
	ZMRP	abbreviation for moment reference point on Z-axis

NOMENCLATURE (Continued)

Axis System Gener

<u>SYMBOL</u>	<u>DEFINITION</u>
F	force; F, lbs
M	moment; M, in-lb

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

NOMENCLATURE (Continued)

Stability Axis System

<u>SYMBOL</u>	<u>SADSAC SYMBOL</u>	<u>DEFINITION</u>
C_L	CL	lift force coefficient; F_L/qS
C_D	CD	drag force coefficient; F_D/qS
C_{D_b}	CDB	base drag coefficient
C_{D_f}	CDF	forebody drag coefficient; $C_D - C_{D_b}$
C_m	CIM	pitching moment coefficient; $M_{y,s}/qS l_{ref}$
C_y	CY	side force coefficient; F_y/qS
C_n	CIN	yawing moment coefficient; $M_{z,s}/qS b_{ref}$
C_l	CSL	rolling moment coefficient; $M_{x,s}/qS b_{ref}$
L/D	L/D	lift-to-drag ratio; C_L/C_D
L/D_f	L/DF	lift to forebody drag ratio; C_L/C_{D_f}

NOMENCLATURE (Continued)

Surface Definitions

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

SURFACE
SUBSCRIPTS

DEFINITION

a	aileron
b	base
c	canard
e	elevator or elevon
f	flap
r	rudder or ruddervator
s	spoiler
t	tail

ADDITIONS TO STANDARD SADSAC NOMENCLATURE
FOR
GRUMMAN GWIT TEST 290

<u>SYMBOL</u>	<u>SADSAC SYMBOL</u>	<u>DEFINITION</u>
δ_{EL}	LELEVW	left wing elevon deflection angle, positive in trailing edge down; degrees
δ_{ER}	RELEVW	right wing elevon deflection angle, positive in trailing edge down; degrees
δ_E	ELEVTR	elevator deflection angle, $(S_{EL} + S_{ER})/2$; degrees
δ_A	AILRON	aileron deflection angle, $(S_{ER} - S_{EL})$; degrees
	BODFLP	body flap deflection angle (negative is trailing edge up)

TABULATED DATA LISTING

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

- (a) a brief summary list of all data sets containing the identifier, the descriptor, and the resident dependent variables.
- (b) a full list of all data sets containing all resident or selected aerodynamic coefficients of the data sets as well as the above mentioned information.

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

NASA AMES	Mr. V. Stevens
NASA MSC	Mr. Ray Nelson
GAC	Mr. M. Quan

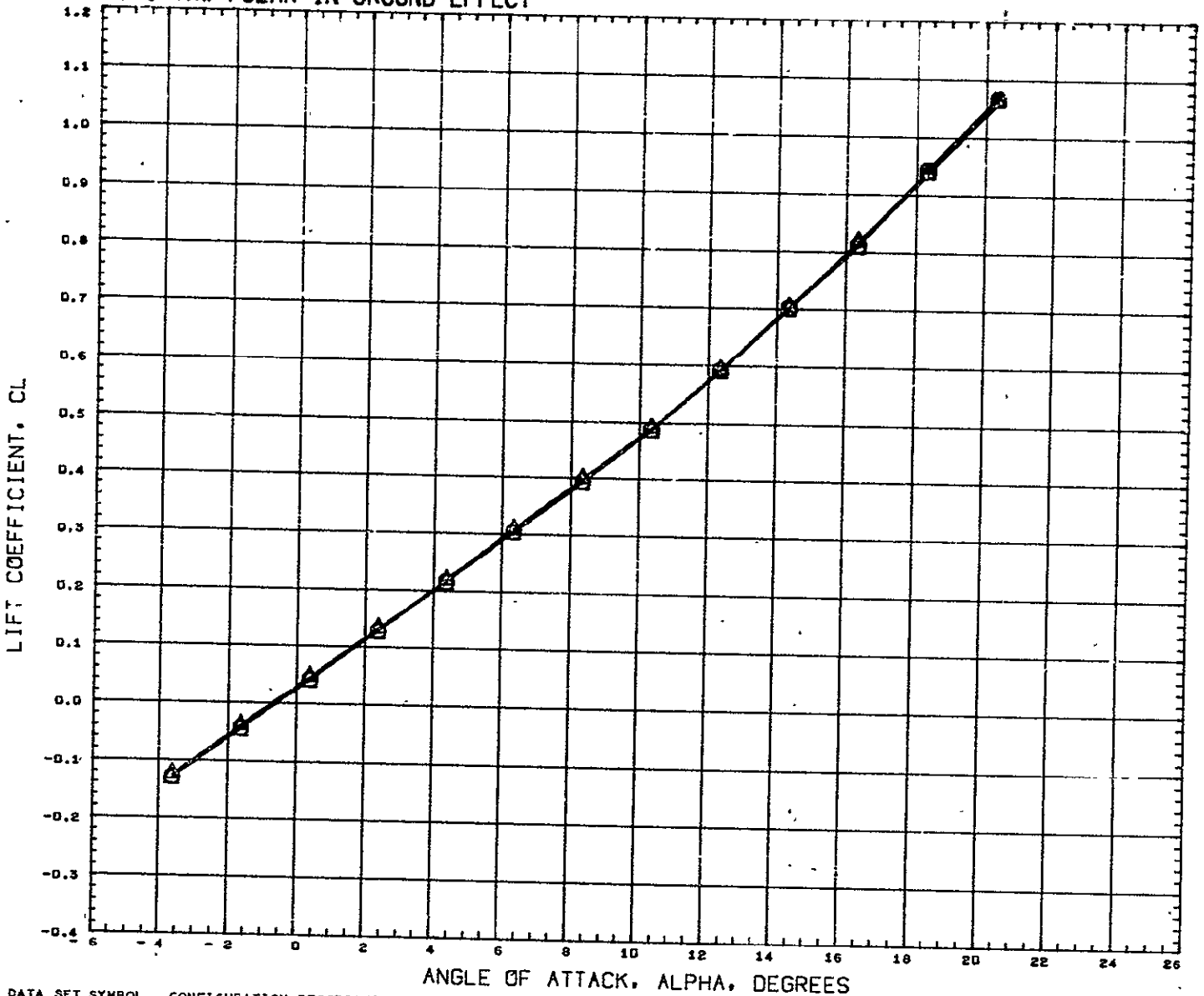
If copies of this listing are desired, please contact the above or the cognizant SADSAC personnel who, for this data, is:

Mr. J. R. Ziler
Department 2780
Chrysler Corporation Space Division
New Orleans, La. 70129

(504) 255-2304

PLOTTED DATA

FIG. 1 YAW POLAR IN GROUND EFFECT



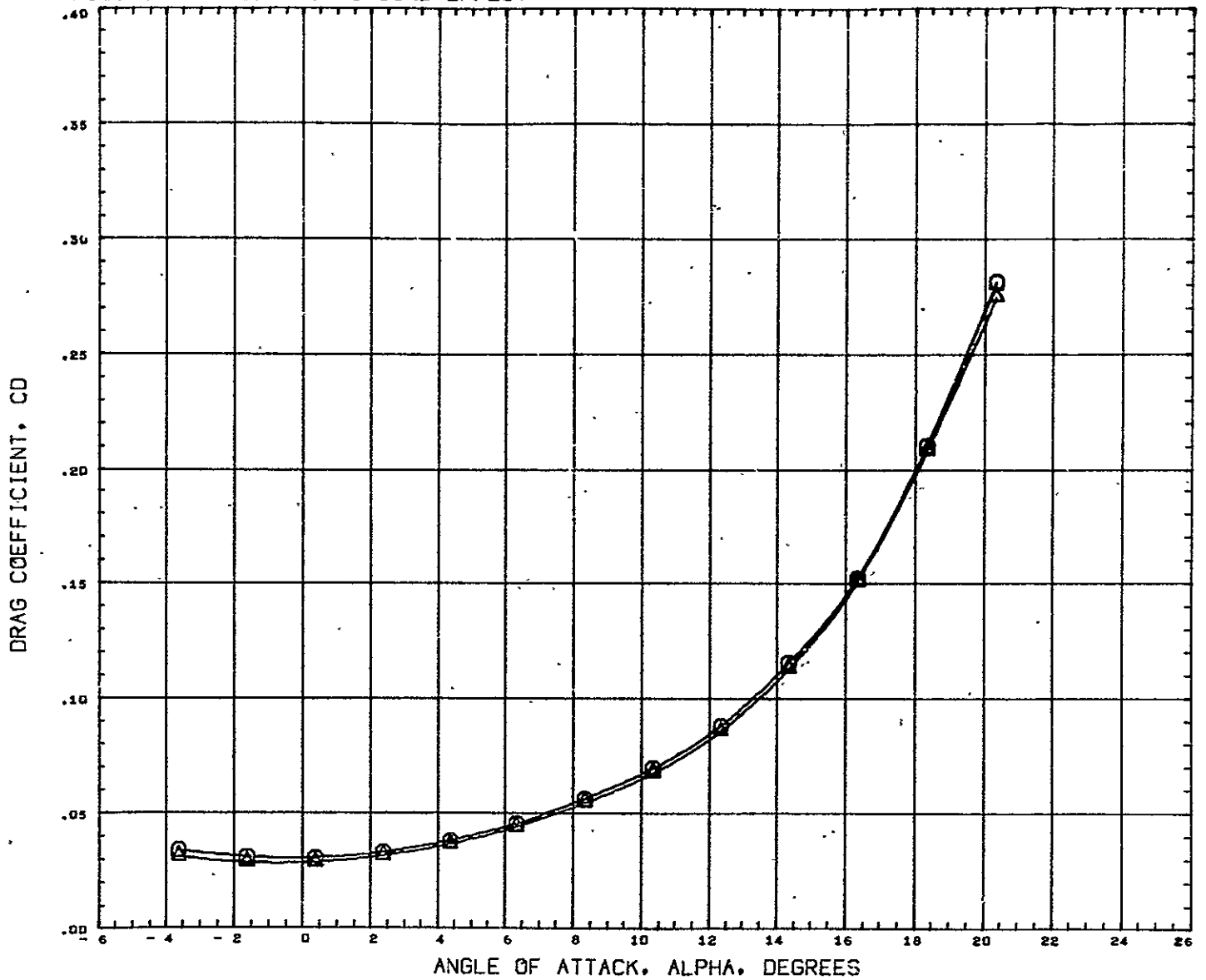
DATA SET SYMBOL CONFIGURATION DESCRIPTION
 (RCW005) 6WTT 290-CONF ROS-NB1 B1F1W1V1GB
 (RCW007) 6WTT 290-CONF ROS-NB1 B1F1W1V1GB

BETA 0.000 ELEVTR 0.000 AILRON 0.000 RUDDER 0.000
 3.000 0.000 0.000 0.000

REFERENCE INFORMATION
 SREF 9.1952 SQ FT
 LREF 6.4320 FT
 BREF 3.8920 FT
 XMRP 1485.0040 IN
 YMRP 0.0000 IN
 ZMRP 377.0004 IN
 SCALE 0.0400

MACH 0.170

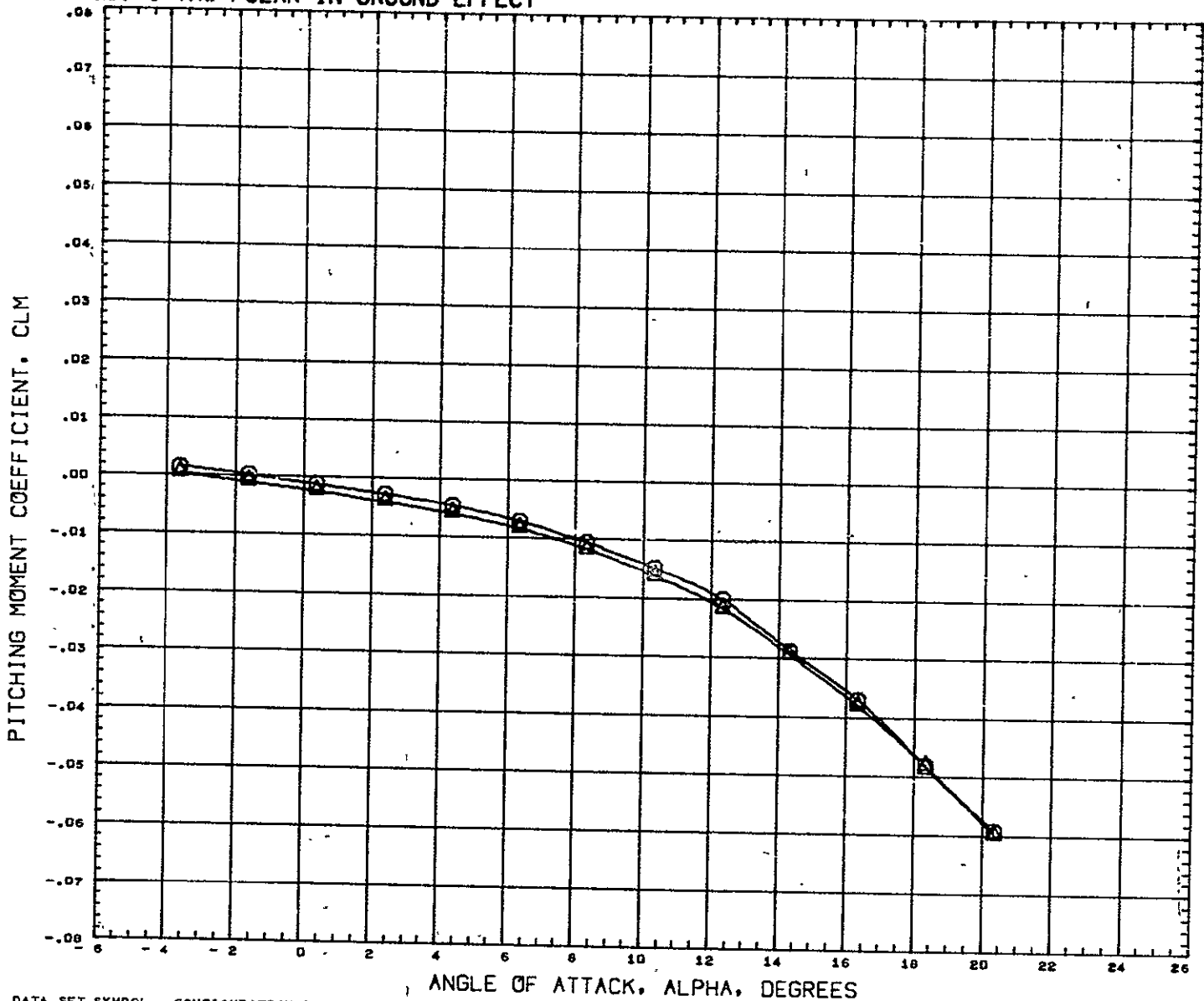
FIG. 1 YAW POLAR IN GROUND EFFECT



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW005)	GWTT 29D-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCW007)	GWTT 29D-CONF ROS-NB1 B1F1W1V1GB	3.000	0.000	0.000	0.000	LREF 6.4320 FT
						BREF 3.8929 FT
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						SCALE 0.0400

MACH 0.170

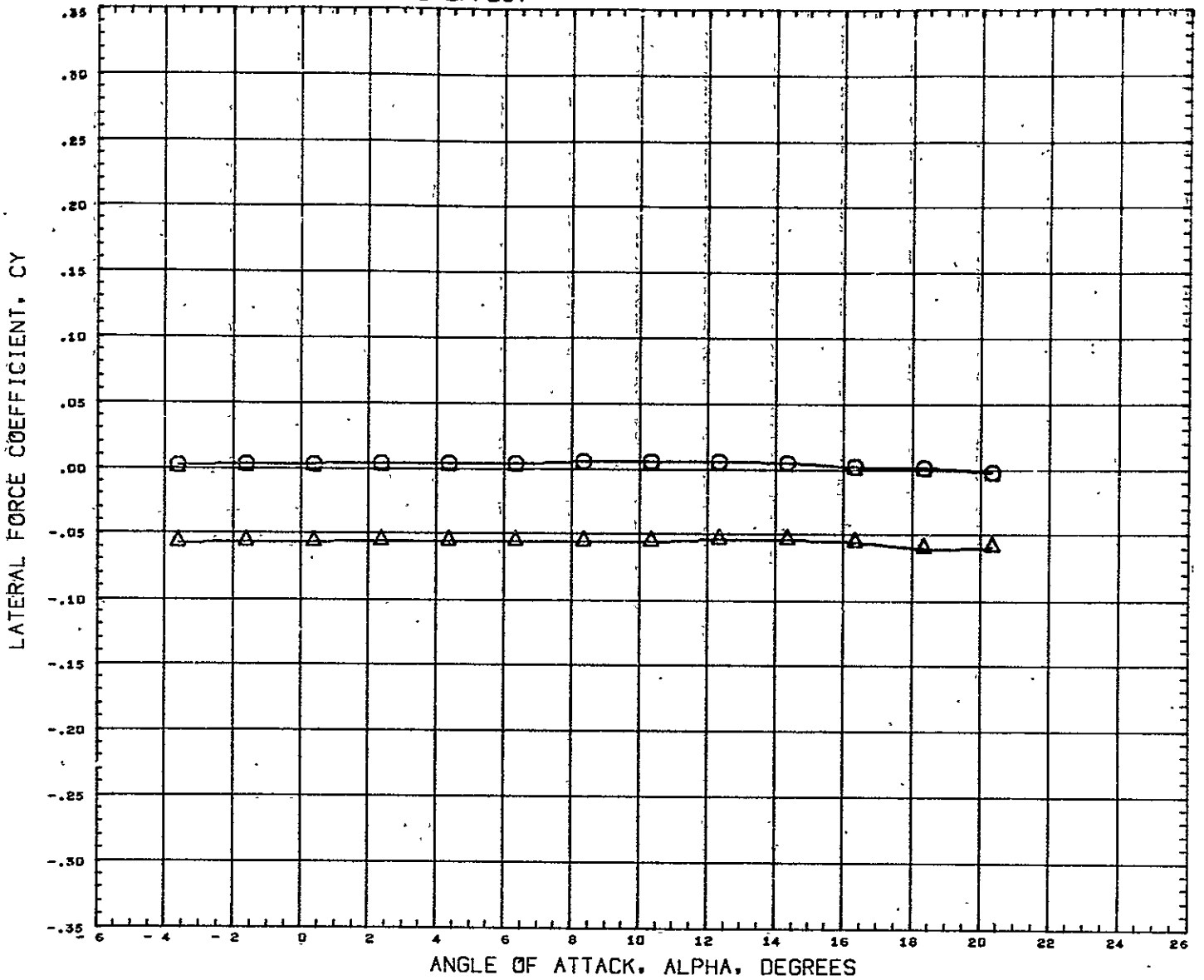
FIG. 1 YAW POLAR IN GROUND EFFECT



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION	
(RCW005)	GWTT 29D-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	0.000	SREF	9.1952 SQ FT
(RCW007)	GWTT 29D-CONF ROS-NB1 B1F1W1V1GB	3.000	0.000	0.000	0.000	LREF	.64320 FT
						BREF	3.8925 FT
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						YMRP	0.0000 IN
						ZMRP	377.0004 IN
						SCALE	0.0400

MACH 0.170

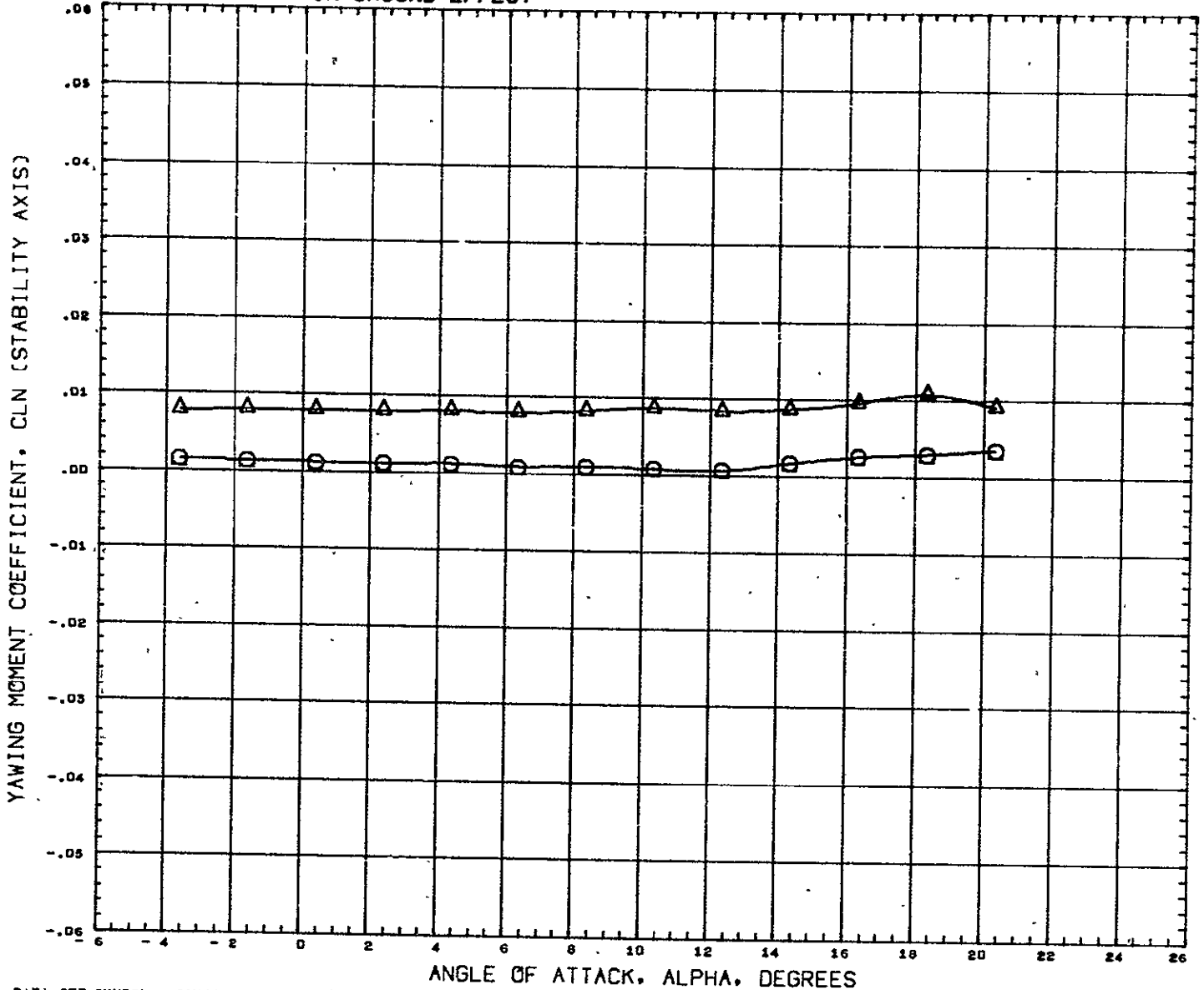
FIG. 1 YAW POLAR IN GROUND EFFECT



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION	
(RCW005)	○	GWT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	0.000	SREF	9.1952 SQ FT
(RCW007)	△	GWT 290-CONF ROS-NB1 B1F1W1V1GB	3.000	0.000	0.000	0.000	LREF	6.4320 FT
							BREF	3.8920 FT
							XMRP	1485.0040 IN
							YMRP	0.0000 IN
							ZMRP	377.0004 IN
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MACH 0.170

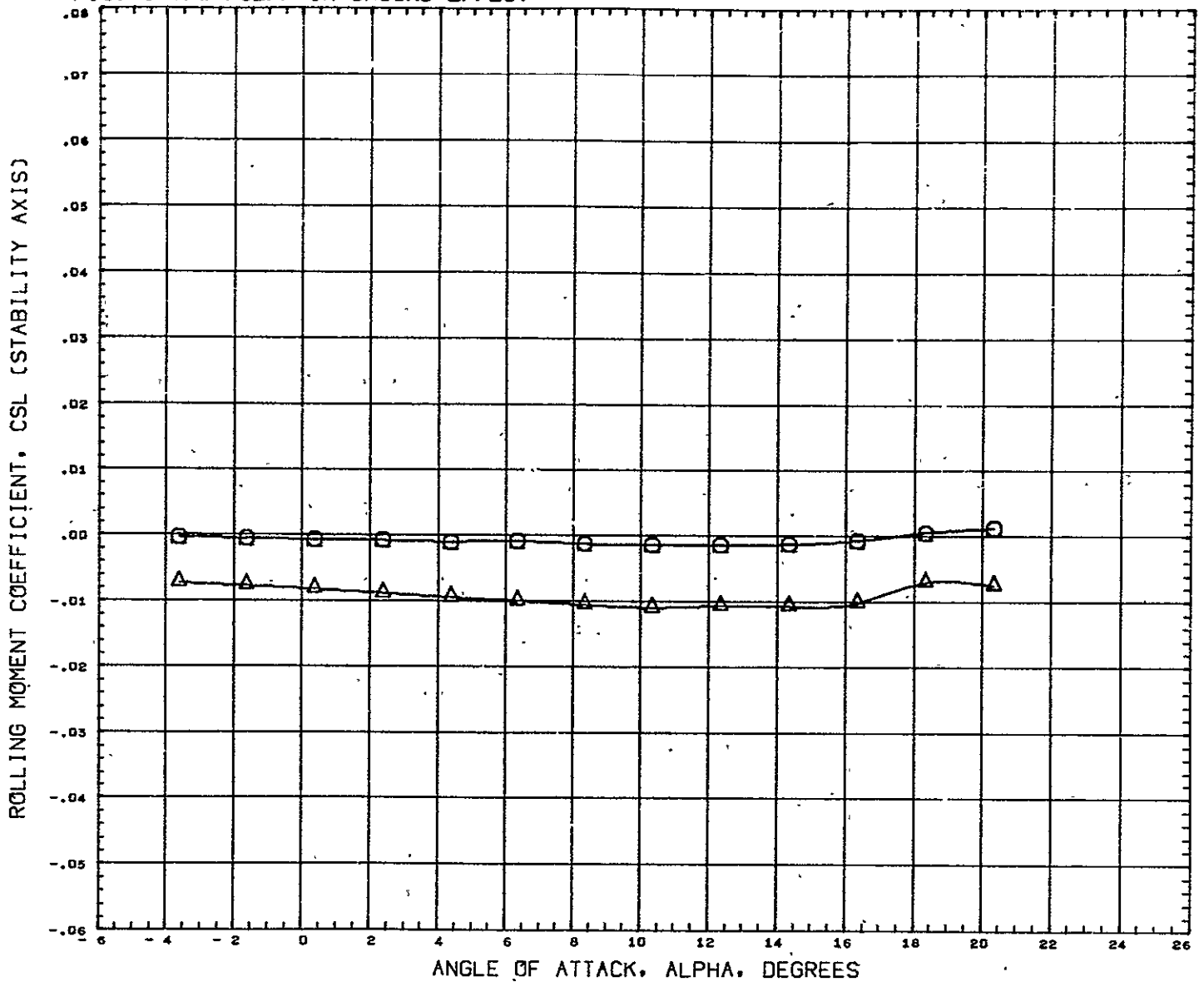
FIG. 1 YAW POLAR IN GROUND EFFECT



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION	
(RCW005)	GWTT 29G-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	0.000	SREF	9.1952 SQ FT
(RCW007)	GWTT 29Q-CONF ROS-NB1 B1F1W1V1GB	3.000	0.000	0.000	0.000	LREF	6.4320 FT
						BREF	3.8920 FT
						XMRP	1485.0040 IN
						YMRP	0.0000 IN
						ZMRP	377.0004 IN
						SCALE	0.0400

MACH 0.170

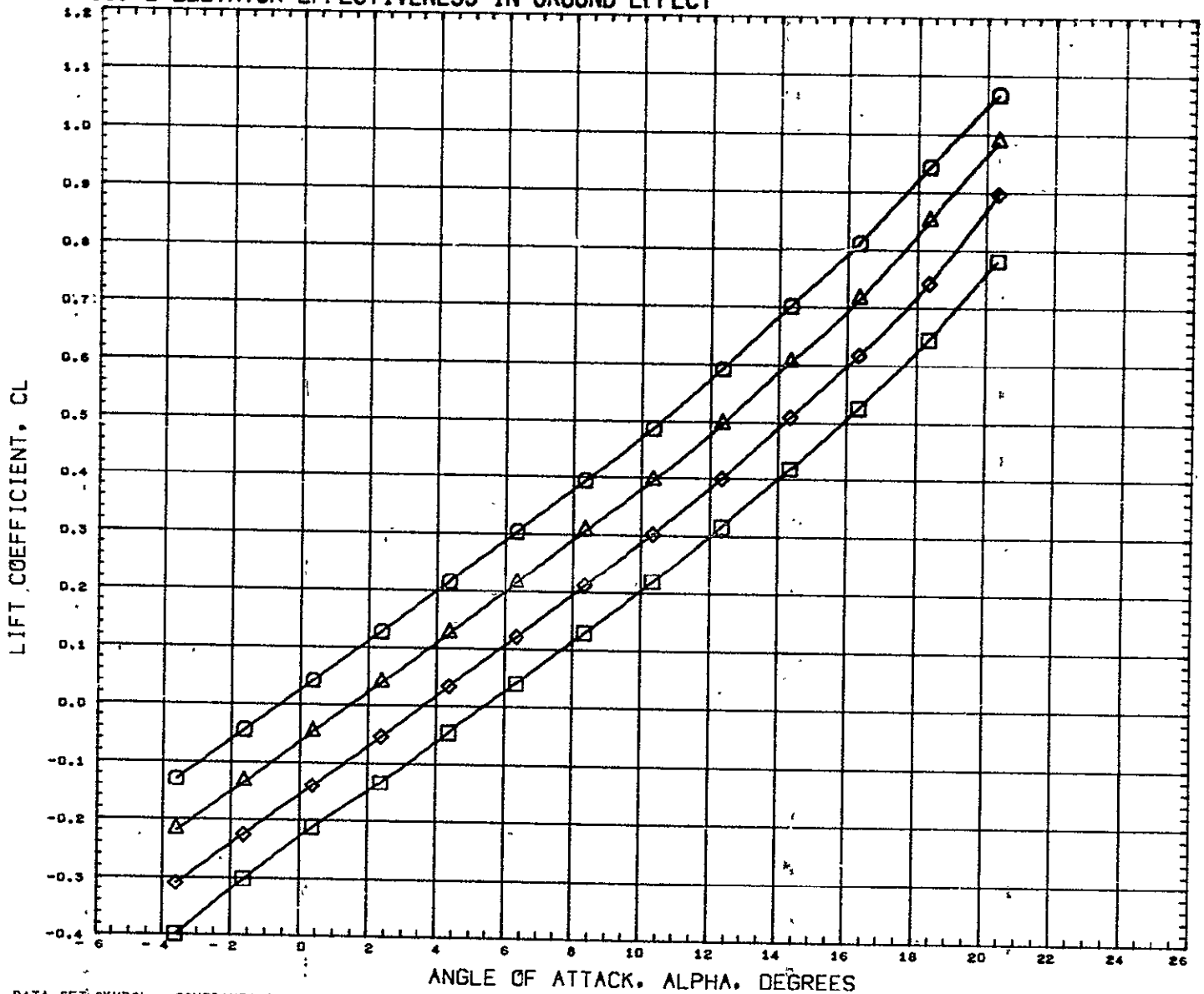
FIG. 1 YAW POLAR IN GROUND EFFECT



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW005)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCW007)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	3.000	0.000	0.000	0.000	LREF 6.4320 FT
						BREF 3.0920 FT
						XMRP 1465.0040 IN
						YMRP 0.0000 IN
						ZMRP 377.0004 IN
						SCALE 0.0400

MACH 0.170

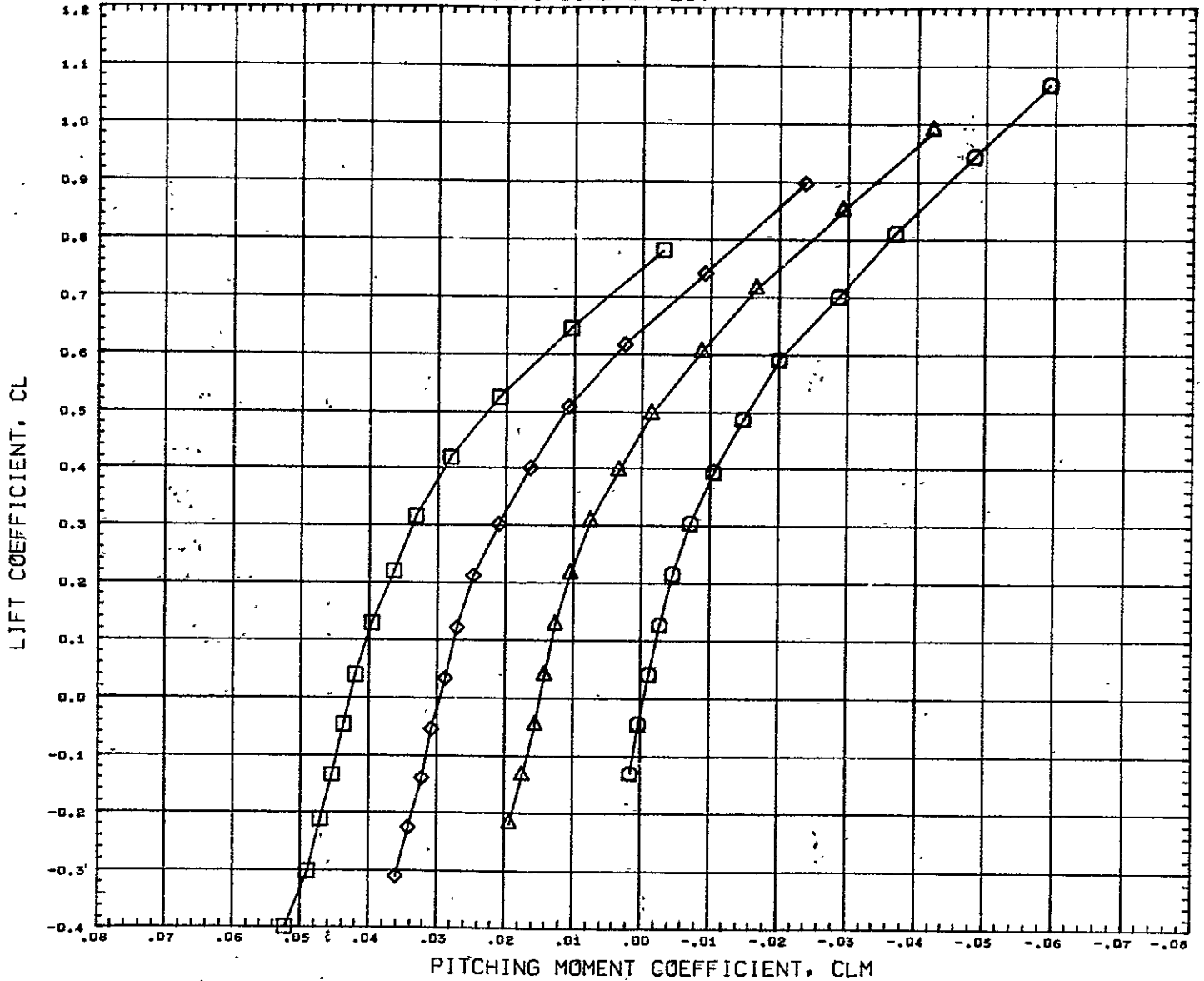
FIG. 2 ELEVATOR EFFECTIVENESS IN GROUND EFFECT



DATA SET	SYMBOL	CONFIGURATION	DESCRIPTION	BETA	ELEVTR	AAILRON	RUDDER	REFERENCE INFORMATION	
(RCW005)	○	GWTT 29D-CONF	ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	0.000	SREF	9.1952 SQ FT
(RCW014)	△	GWTT 29D-CONF	ROS-NB1 B1F1W1V1GB	0.000	-5.000	0.000	0.000	LREF	6.4320 FT
(RCW009)	◇	GWTT 29D-CONF	ROS-NB1 B1F1W1V1GB	0.000	-10.000	0.000	0.000	BREF	3.8920 F1
(RCW012)	□	GWTT 29D-CONF	ROS-NB1 B1F1W1V1GB	0.000	-15.000	0.000	0.000	XMRP	1485.0040 IN
								YMRP	0.0000 IN
								ZMRP	377.0004 IN
								SCALE	0.0400

MACH 0.170

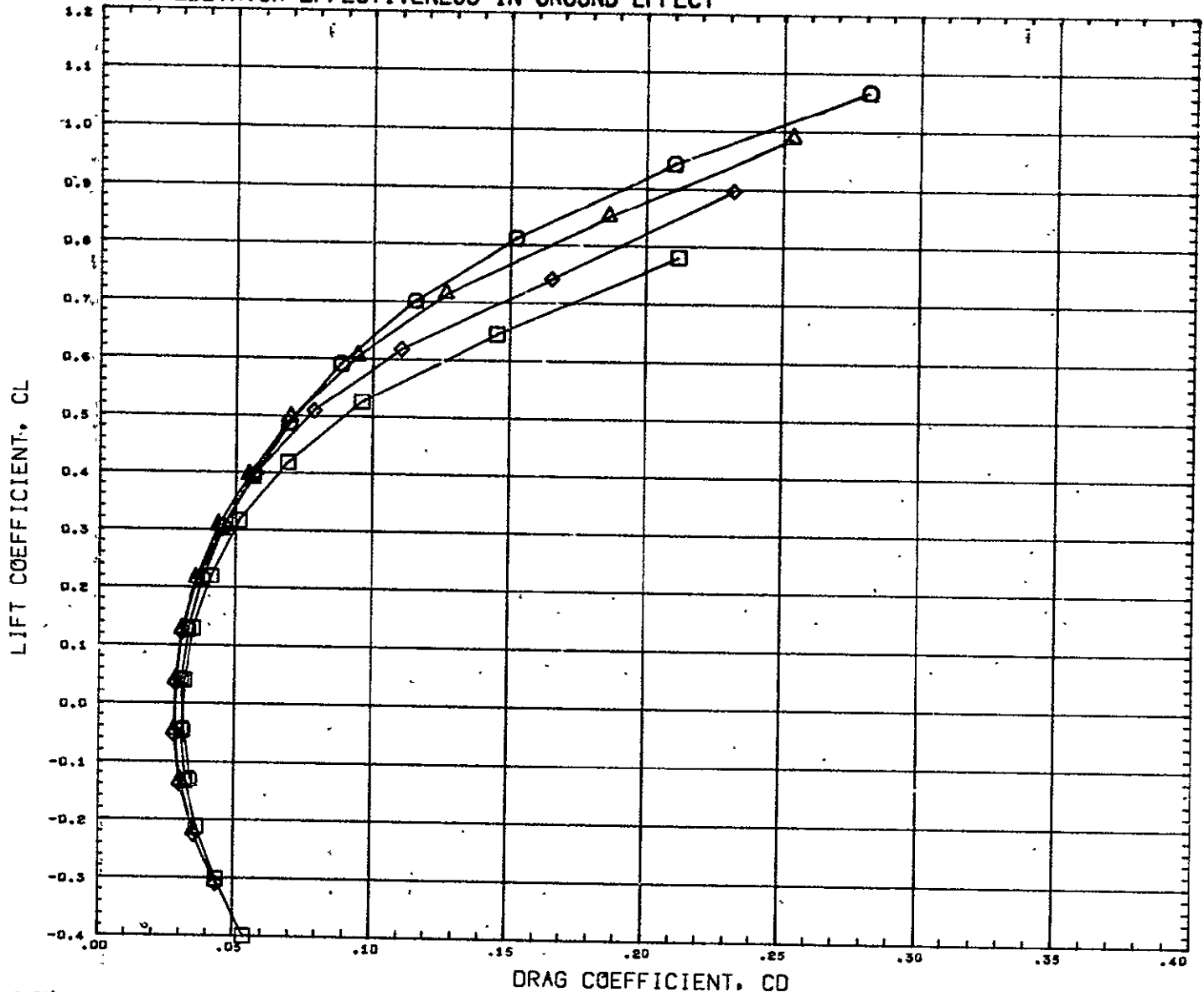
FIG. 2 ELEVATOR EFFECTIVENESS IN GROUND EFFECT



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW005)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	5.000	0.000	0.000	SREF 9.1952 SQ FT
(RCW014)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	-5.000	0.000	0.000	LREF 6.4320 FT
(RCW009)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	-10.000	0.000	0.000	BREF 3.8920 FT
(RCW012)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	-15.000	0.000	0.000	XMRP 1485.0040 IN
						YMRP 0.0000 IN
						ZMRP 377.0004 IN
						SCALE 0.0400

MACH 0.170

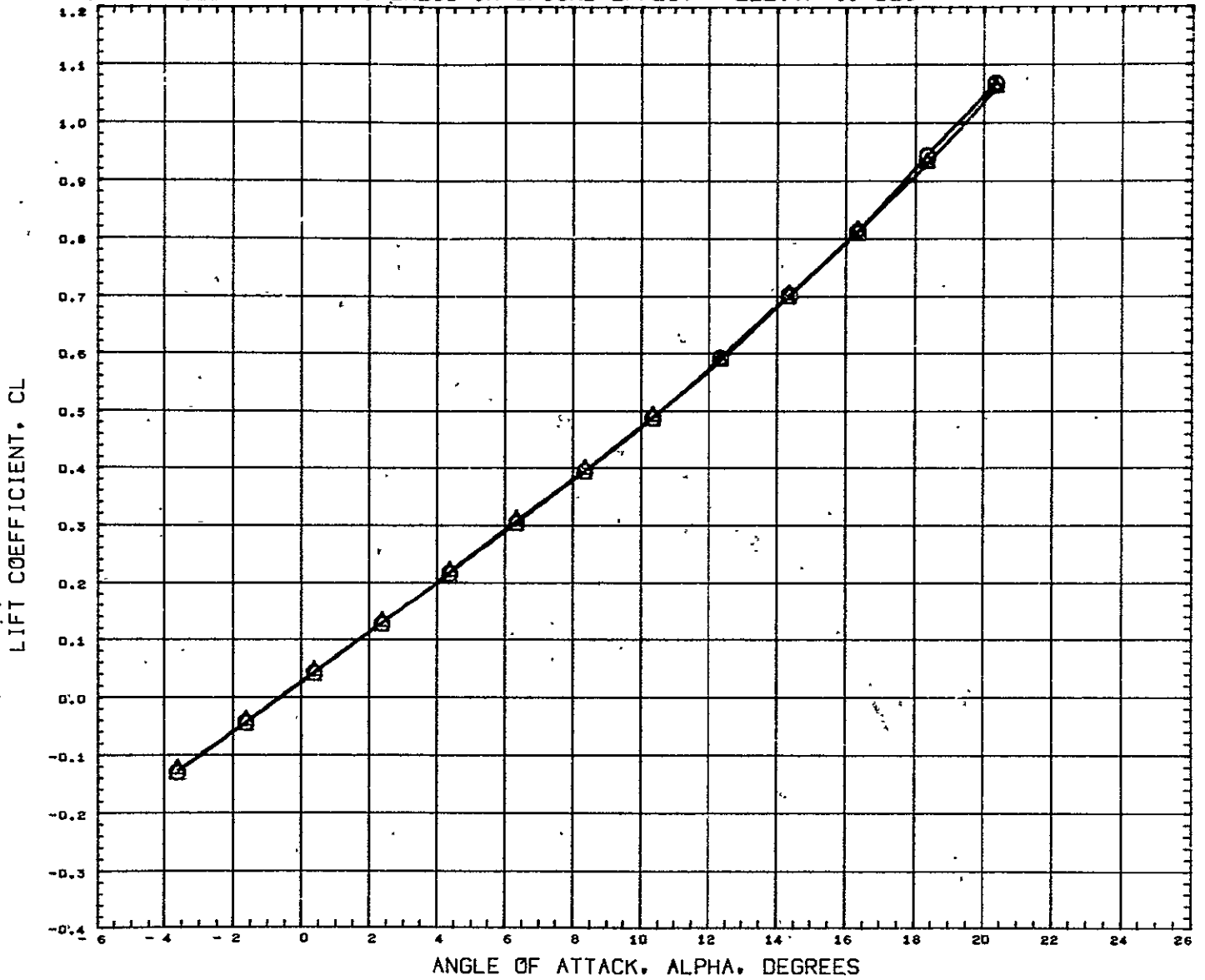
FIG. 2 ELEVATOR EFFECTIVENESS IN GROUND EFFECT



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCWG05)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCW014)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	-5.000	0.000	0.000	LREF 6.4320 FT
(RCW009)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	-10.000	0.000	0.000	BREF 3.8920 FT
(RCW012)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	-15.000	0.000	0.000	XMRP 1485.0040 IN
						YMRP 0.0000 IN
						ZMRP 377.0004 IN
						SCALE 0.0400

MACH 0.170

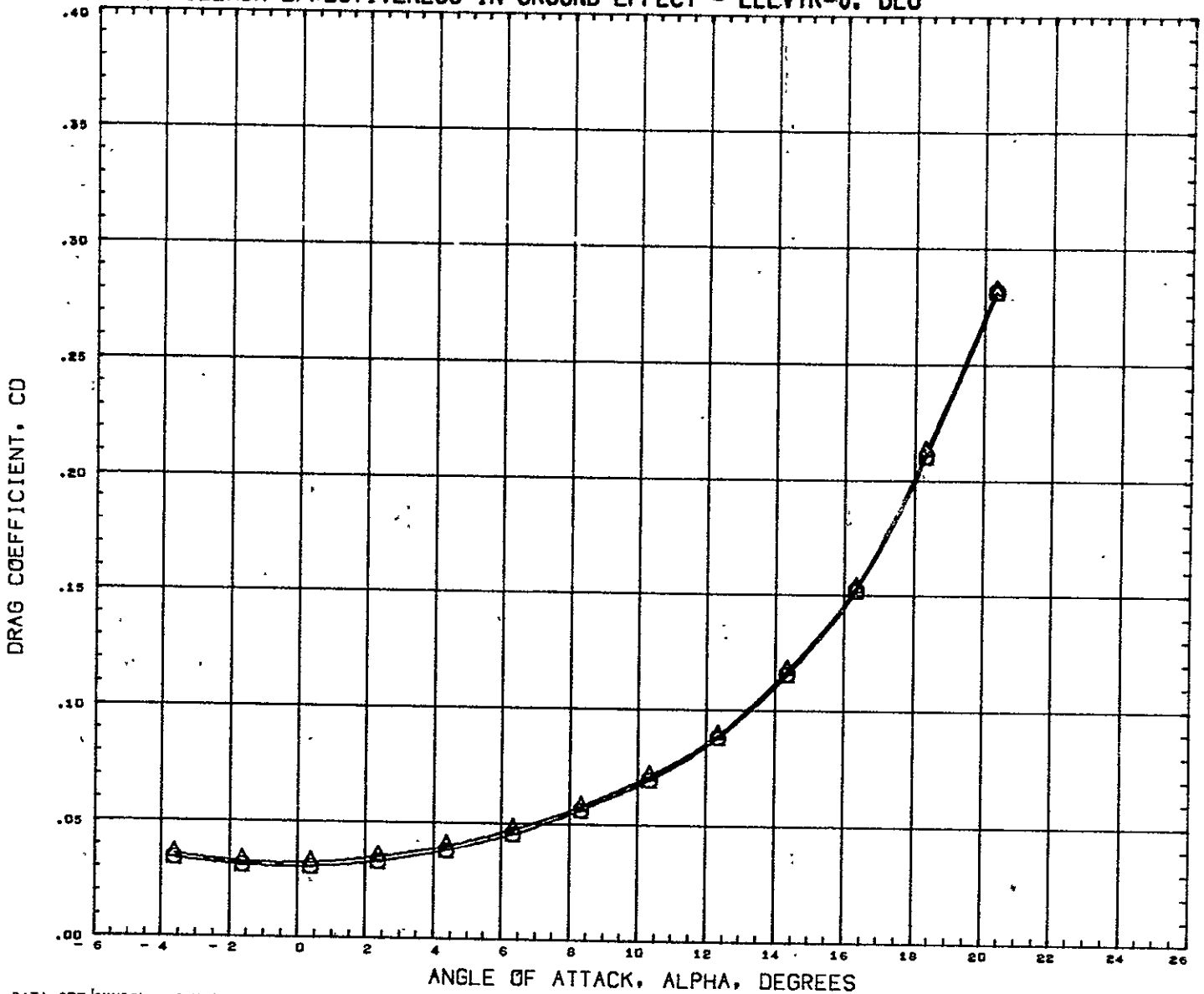
FIG. 3 AILERON EFFECTIVENESS IN GROUND EFFECT - ELEVTR=0. DEG



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	AILRON	LELEVN	RELEVN	REFERENCE INFORMATION
(RCW005)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCW010)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	-10.000	5.000	-5.000	LREF 6.4320 FT
						BREF 3.8920 FT
						XHRF 1485.0040 IN
						YHRF 0.0000 IN
						ZHRF 377.0004 IN
						SCALE 0.0400

MACH 0.170

FIG. 3 AILERON EFFECTIVENESS IN GROUND EFFECT - ELEVTR=0. DEG



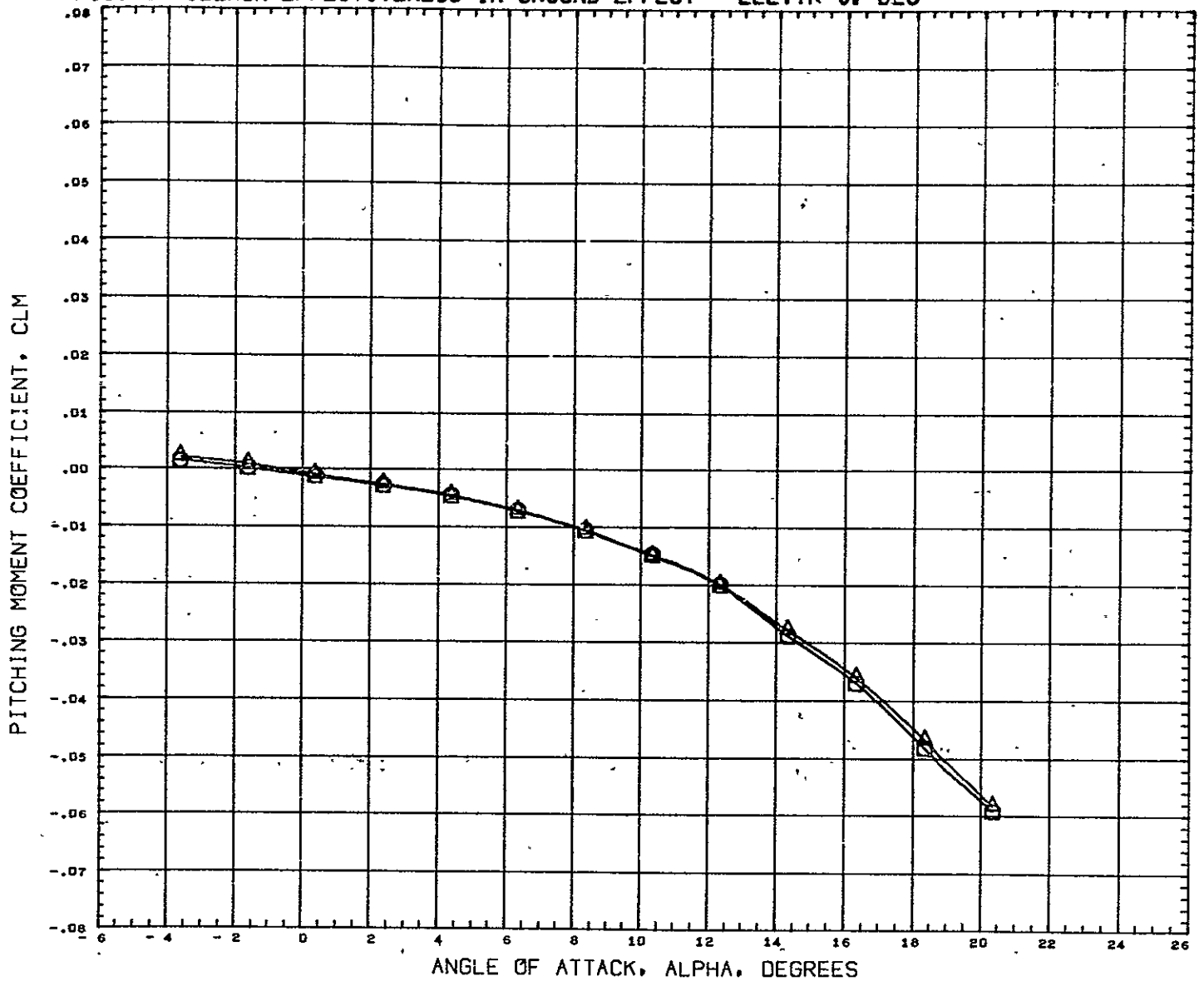
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(RCWD05)	○	GWTT 29D-CONF ROS-NB1 B1F1W1V1GB
(RCWD10)	△	GWTT 29D-CONF ROS-NB1 B1F1W1V1GB

BETA	AILRON	LELEVN	RELEVN
0.000	0.000	0.000	0.000
0.000	-10.000	5.000	-5.000

REFERENCE INFORMATION	
SREF	9.1952 SQ FT
LREF	6.4320 FT
BREF	3.8920 FT
XMRP	1485.0040 IN
YMRP	0.0000 IN
ZMRP	377.0004 IN
SCALE	0.0400

MACH 0.170

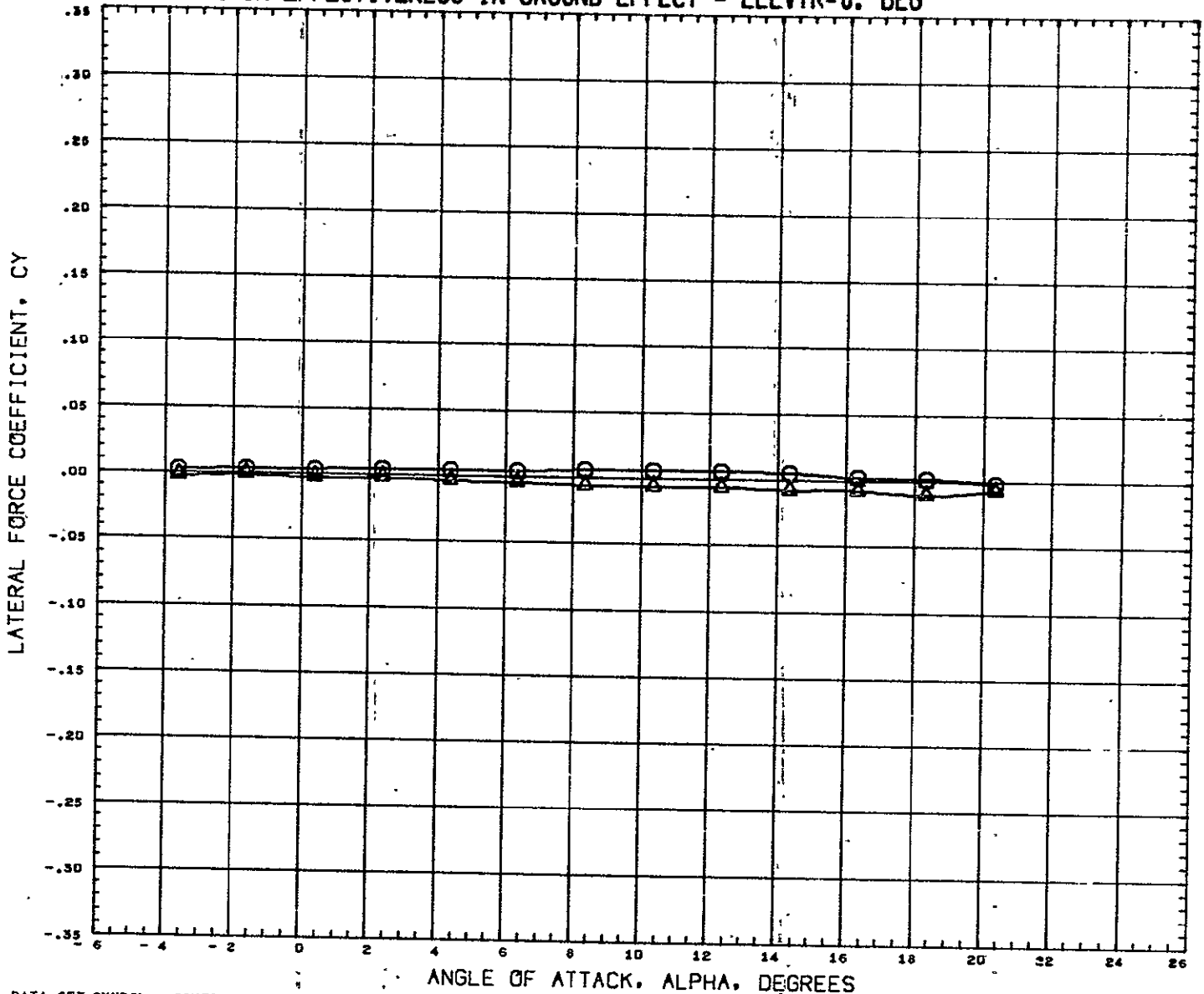
FIG. 3 AILERON EFFECTIVENESS IN GROUND EFFECT - ELEVTR=0. DEG



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	AILRON	LELEVN	RELEVN	REFERENCE INFORMATION
(RCW005)	○	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCW010)	△	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	-10.000	5.000	-5.000	LREF 6.4320 FT
							BREF 3.8920 FT
							XMRP 1485.0040 IN
							YMRP 0.0000 IN
							ZMRP 377.0004 IN
							SCALE 0.0490

MACH 0.170

FIG. 3 AILERON EFFECTIVENESS IN GROUND EFFECT - ELEVTR=0. DEG



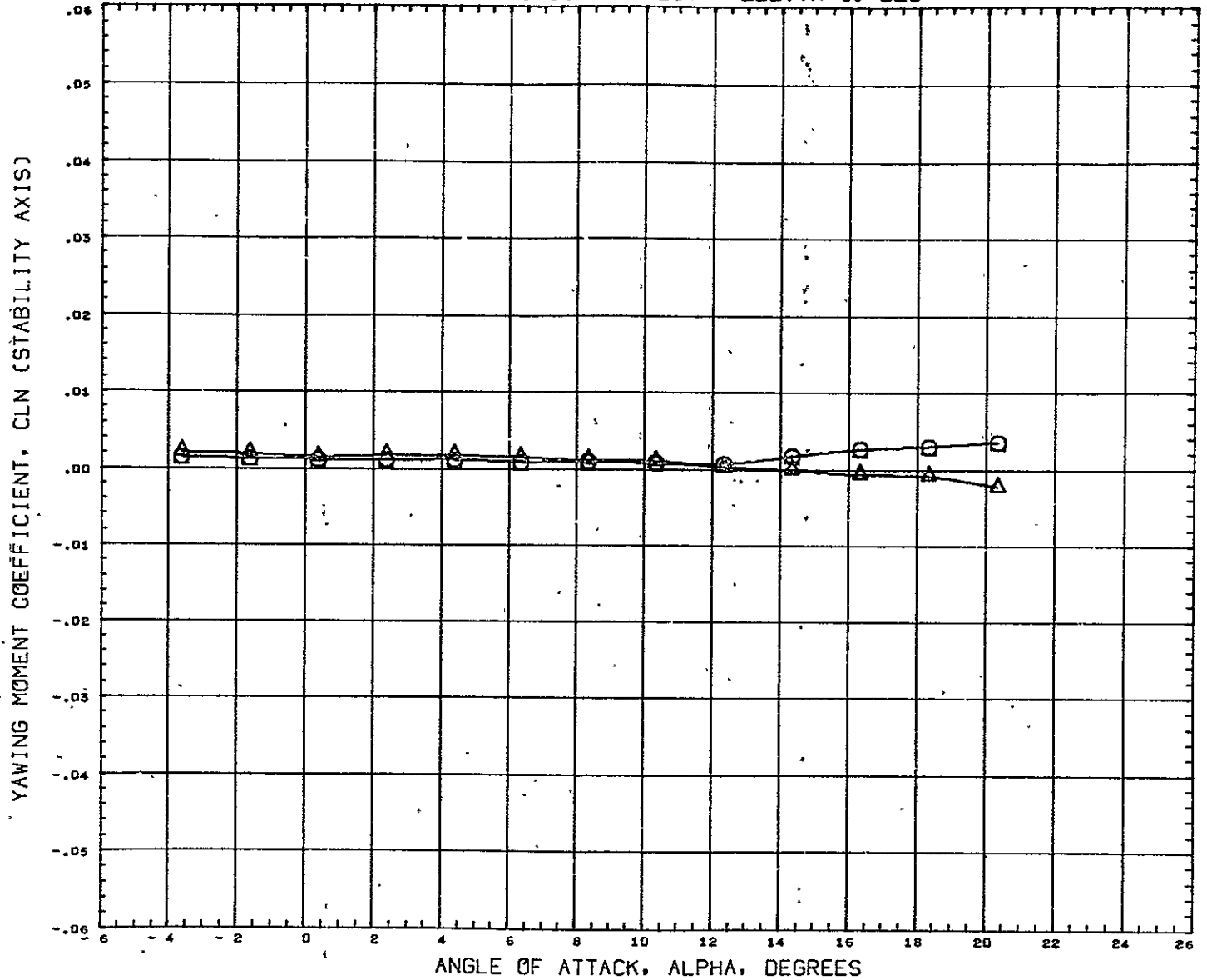
DATA SET SYMBOL	CONFIGURATION	DESCRIPTION
(RCW005)	GWTT 290-CONF	ROS-NB1 B1F1W1V1GB
(RCW010)	GWTT 290-CONF	ROS-NB1 B1F1W1V1GB

BETA	AILRON	ELEVTR	RELEVTR
0.000	0.000	0.000	0.000
0.000	-10.000	5.000	-5.000

REFERENCE INFORMATION	
SREF	9.1952 SQ FT
LREF	6.4320 FT
BREF	3.8920 FT
XMRP	1485.0040 IN
YMRP	0.0000 IN
ZMRP	377.0004 IN
SCALE	0.0400

MACH 0.170

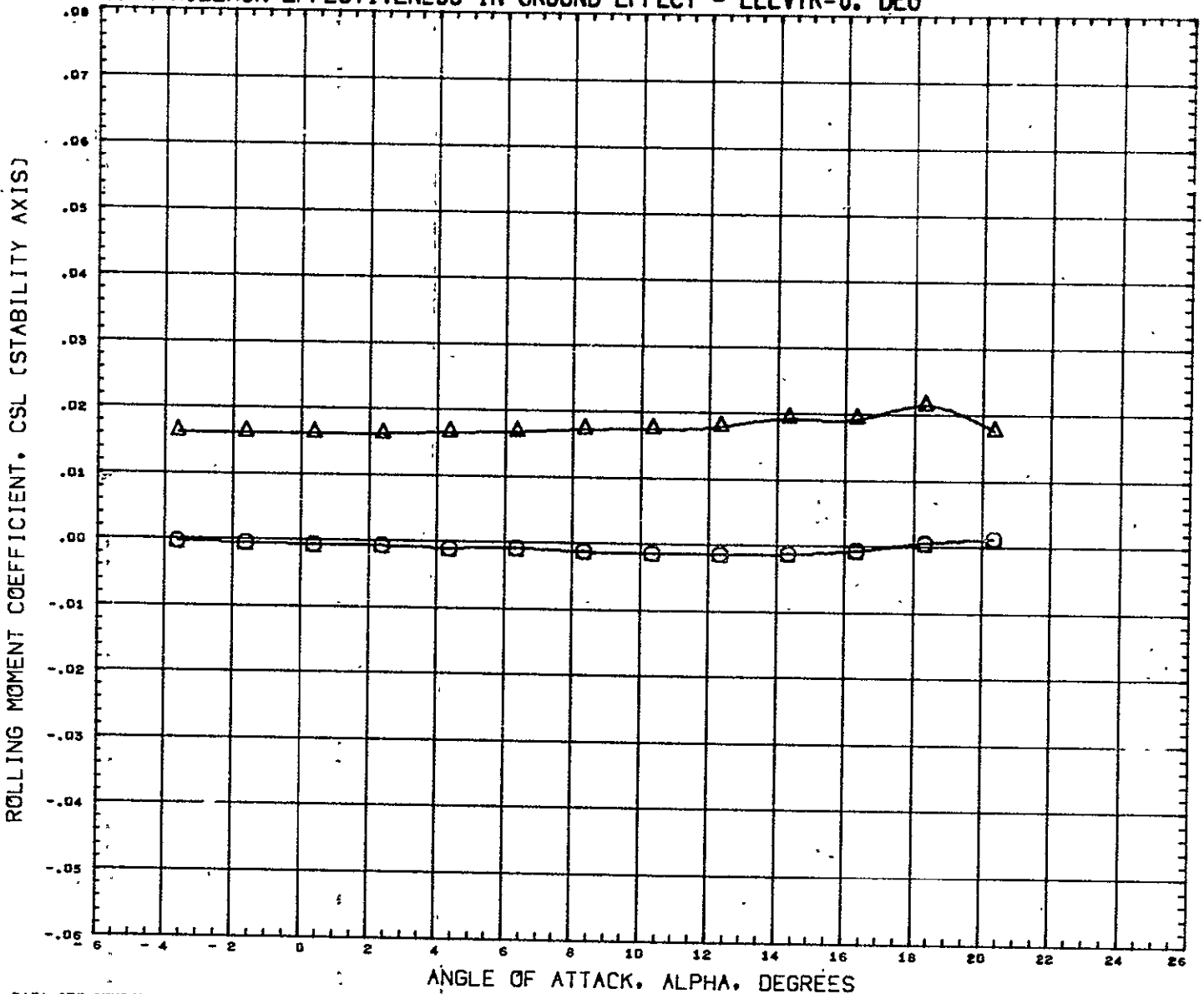
FIG. 3 AILERON EFFECTIVENESS IN GROUND EFFECT - ELEVTR=0. DEG



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	AILRON	LELEVN	RELEVN	REFERENCE INFORMATION
(RCW005)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCW010)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	-10.000	5.000	-5.000	LREF 6.4320 FT
						BREF 3.8920 FT
						XHRP 1485.0040 IN
						YHRP 0.0000 IN
						ZHRP 377.0004 IN
						SCALE 0.0400

MACH 0.170

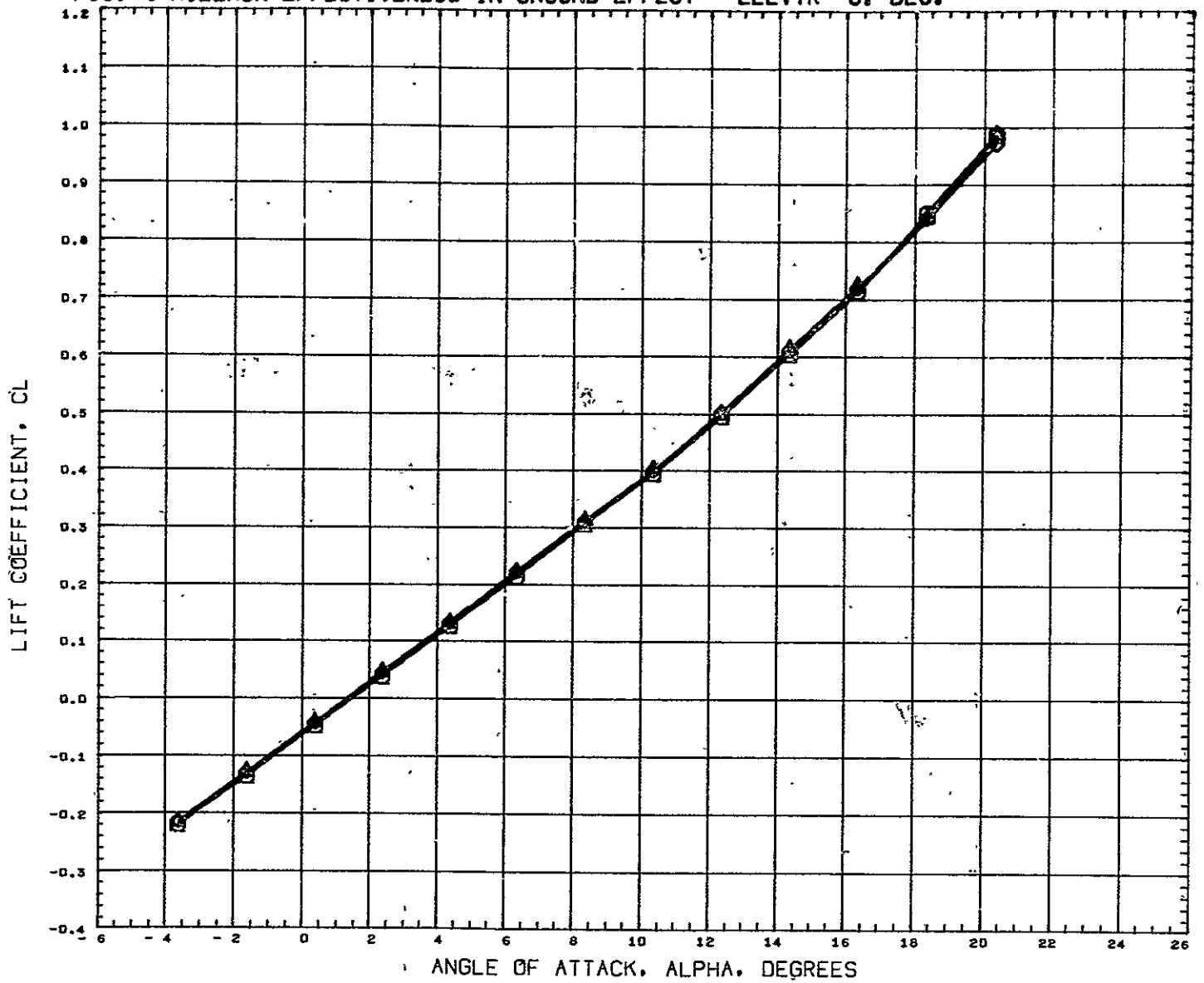
FIG. 3 AILERON EFFECTIVENESS IN GROUND EFFECT - ELEVTR=0. DEG



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	AILRON	LELEVN	RELEVN	REFERENCE INFORMATION
(RCWD05)	○	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCWD10)	△	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	-10.000	5.000	-5.000	LREF 6.4320 FT
							BREF 3.8920 FT
							XMRP 1485.0040 IN
							YMRP 0.0000 IN
							ZMRP 377.0004 IN
							SCALE 0.0400

MACH 0.170

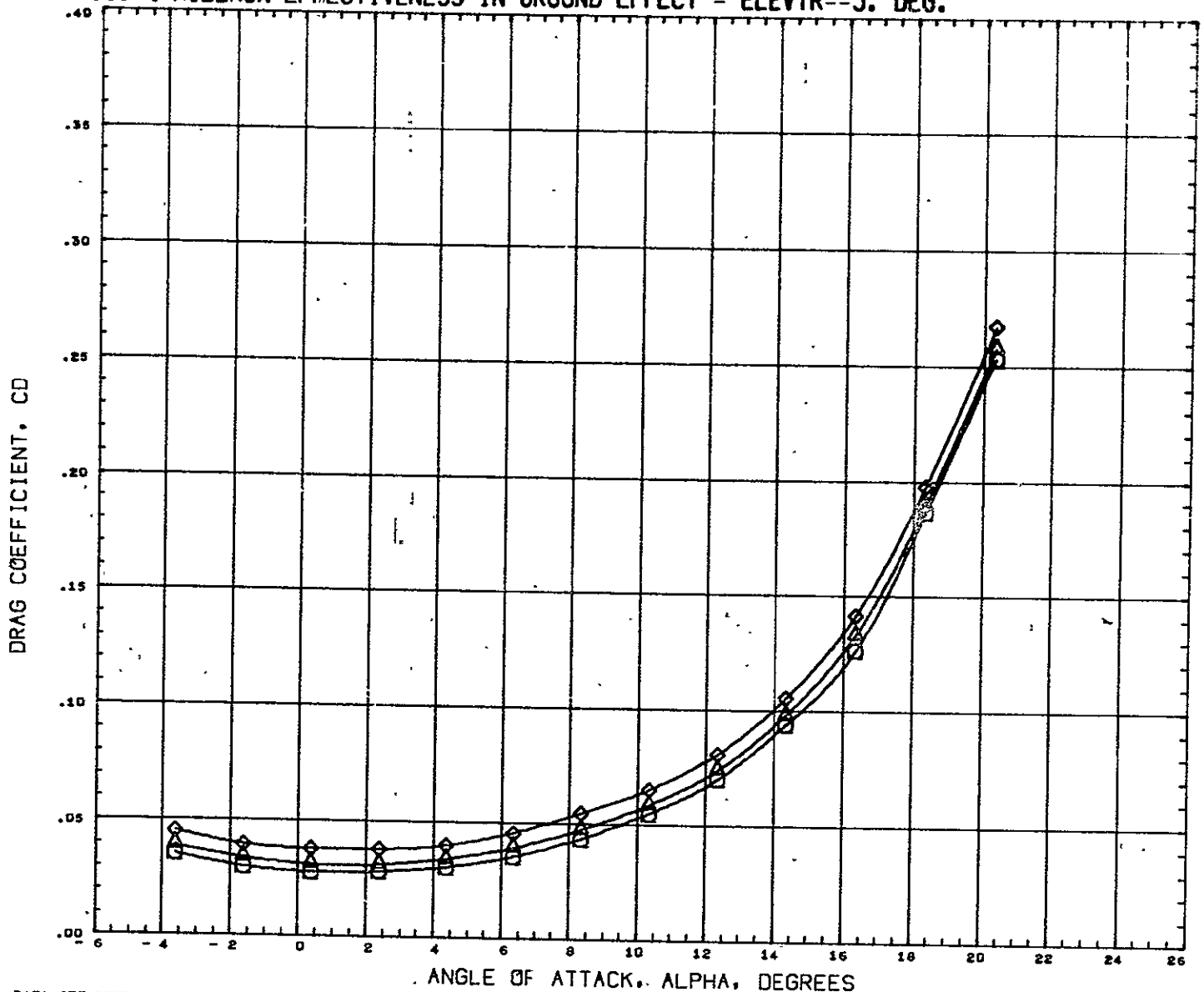
FIG. 4 AILERON EFFECTIVENESS IN GROUND EFFECT - ELEVTR=-5. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	AILRON	LELVN	RELVN	REFERENCE INFORMATION
(RCWD14)	GWTT 29D-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	-5.000	-5.000	SREF 9.1952 SQ FT
(RCWD08)	GWTT 29D-CONF ROS-NB1 B1F1W1V1GB	0.000	-10.000	0.000	-10.000	LREF 6.4320 FT
(RCWD11)	GWTT 29D-CONF ROS-NB1 B1F1W1V1GB	0.000	-20.000	5.000	-15.000	BREF 3.8920 FT
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						YHRF 0.0000 IN
						ZHRF 377.0004 IN
						SCALE 0.0400

MACH 0.170

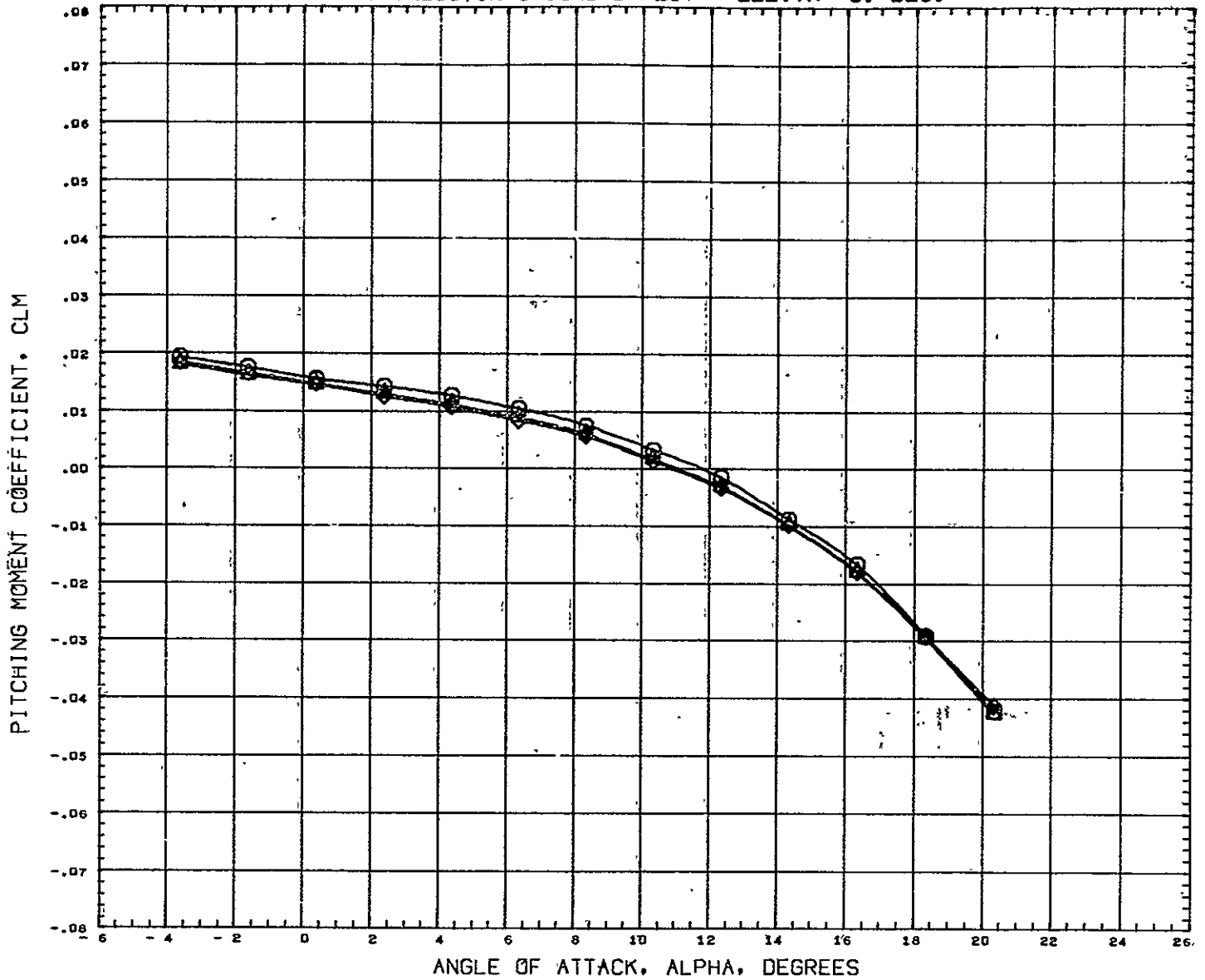
FIG. 4 AILERON EFFECTIVENESS IN GROUND EFFECT - ELEVTR=-5. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	AILRON	LELEVN	RELEVN	REFERENCE INFORMATION
(RCWB14)	GWTT 29D-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	-5.000	-5.000	SREF 9.1952 SQ FT
(RCW008)	GWTT 29D-CONF ROS-NB1 B1F1W1V1GB	0.000	-10.000	0.000	-10.000	LREF 6.4320 FT
(RCWB11)	GWTT 29D-CONF ROS-NB1 B1F1W1V1GB	0.000	-20.000	5.000	-15.000	BREF 3.8920 FT
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						YMRF 0.0000 IN
						ZMRF 377.0004 IN
						SCALE 0.0400

MACH 0.170

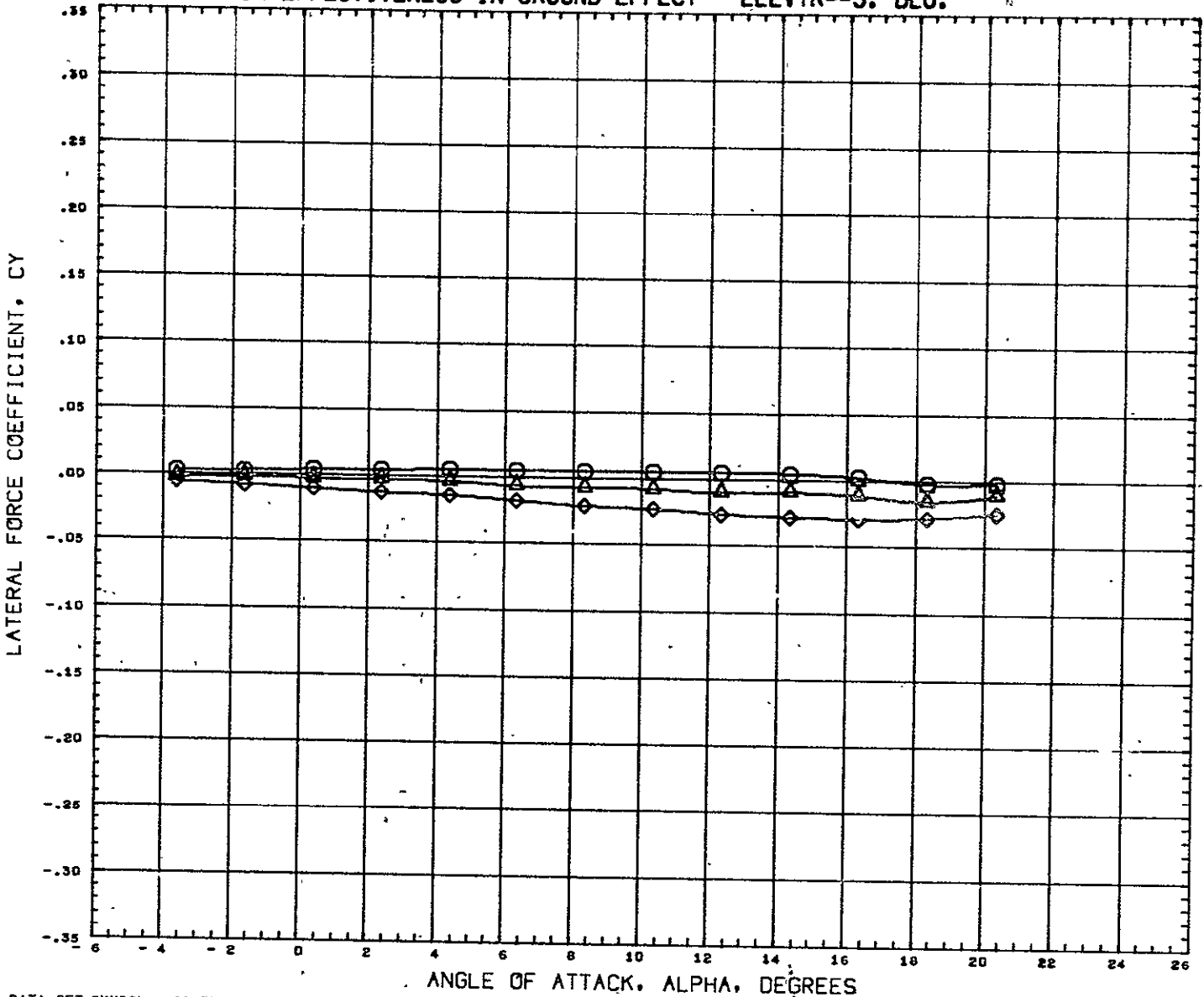
FIG. 4 AILERON EFFECTIVENESS IN GROUND EFFECT - ELEVTR=-5. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	AILRON	LELEVN	RELEVN	REFERENCE INFORMATION
(RCW014)	GWTI 290-CONF ROS-NB1 B1F1W1V1GB	0.000	-0.000	-5.000	-5.000	SREF 9.1952 SQ FT
(RCW008)	GWTI 290-CONF ROS-NB1 B1F1W1V1GB	0.000	-10.000	0.000	-10.000	LREF 6.4320 FT
(RCW011)	GWTI 290-CONF ROS-NB1 B1F1W1V1GB	0.000	-20.000	5.000	-15.000	BREF 3.8920 FT
						XMRP 1485.0040 IN
						YMRP 0.0000 IN
						ZMRP 377.0004 IN
						SCALE 0.0400

MACH 0.170

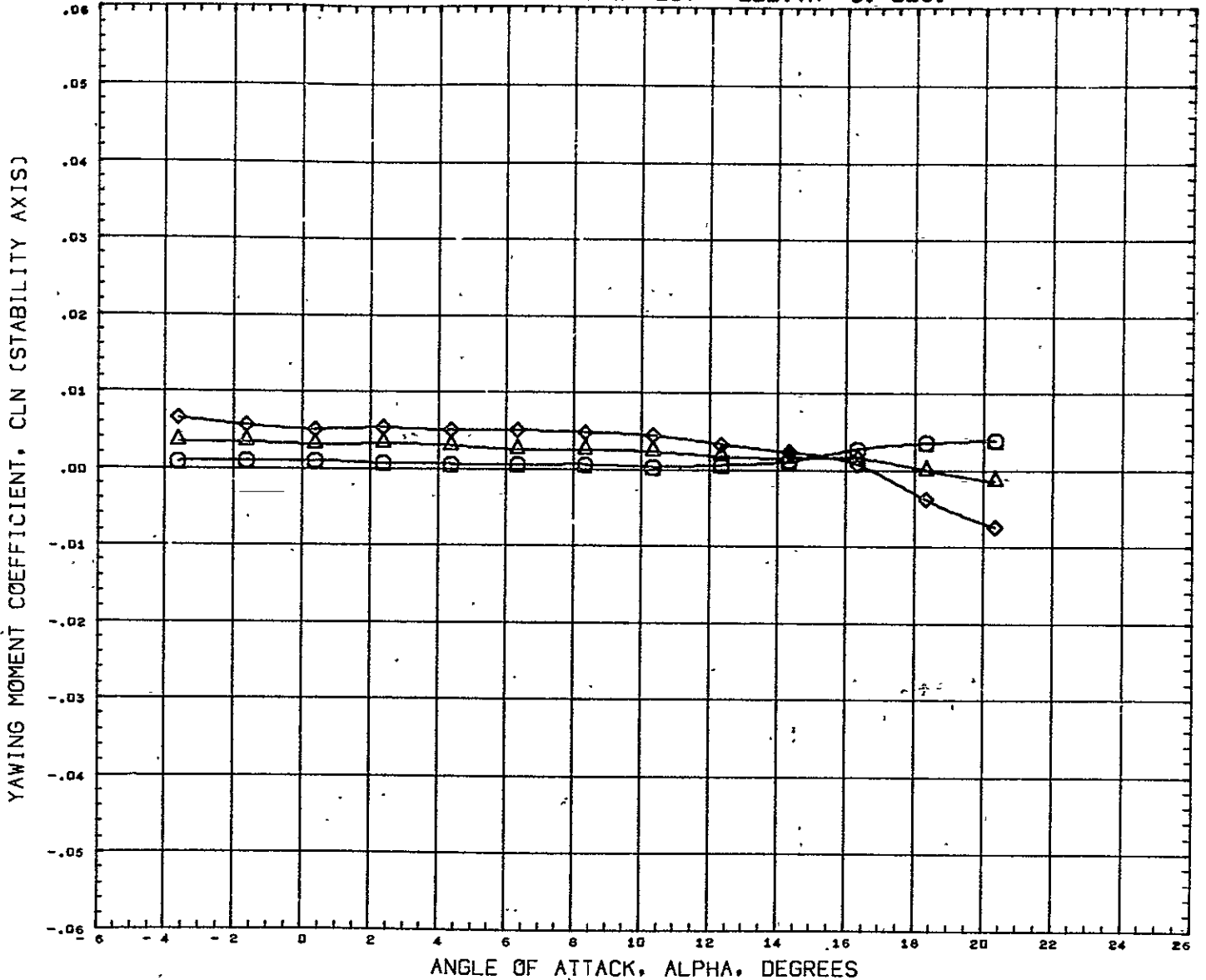
FIG. 4 AILERON EFFECTIVENESS IN GROUND EFFECT - ELEVTR=-5. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	AILRON	LELEVN	RELEVN	REFERENCE INFORMATION
(RCWD14)	GWTT 29D-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	-5.000	-5.000	SREF 9.1952 SQ FT
(RCW08)	GWTT 29D-CONF ROS-NB1 B1F1W1V1GB	0.000	-10.000	0.000	-10.000	LREF 6.4320 FT
(RCW011)	GWTT 29D-CONF ROS-NB1 B1F1W1V1GB	0.000	-20.000	0.000	-15.000	BREF 3.8920 FT
						XMRP 1485.0040 IN
						YMRP 0.0000 IN
						ZMRP 377.0004 IN
						SCALE 0.0400

MACH 0.170

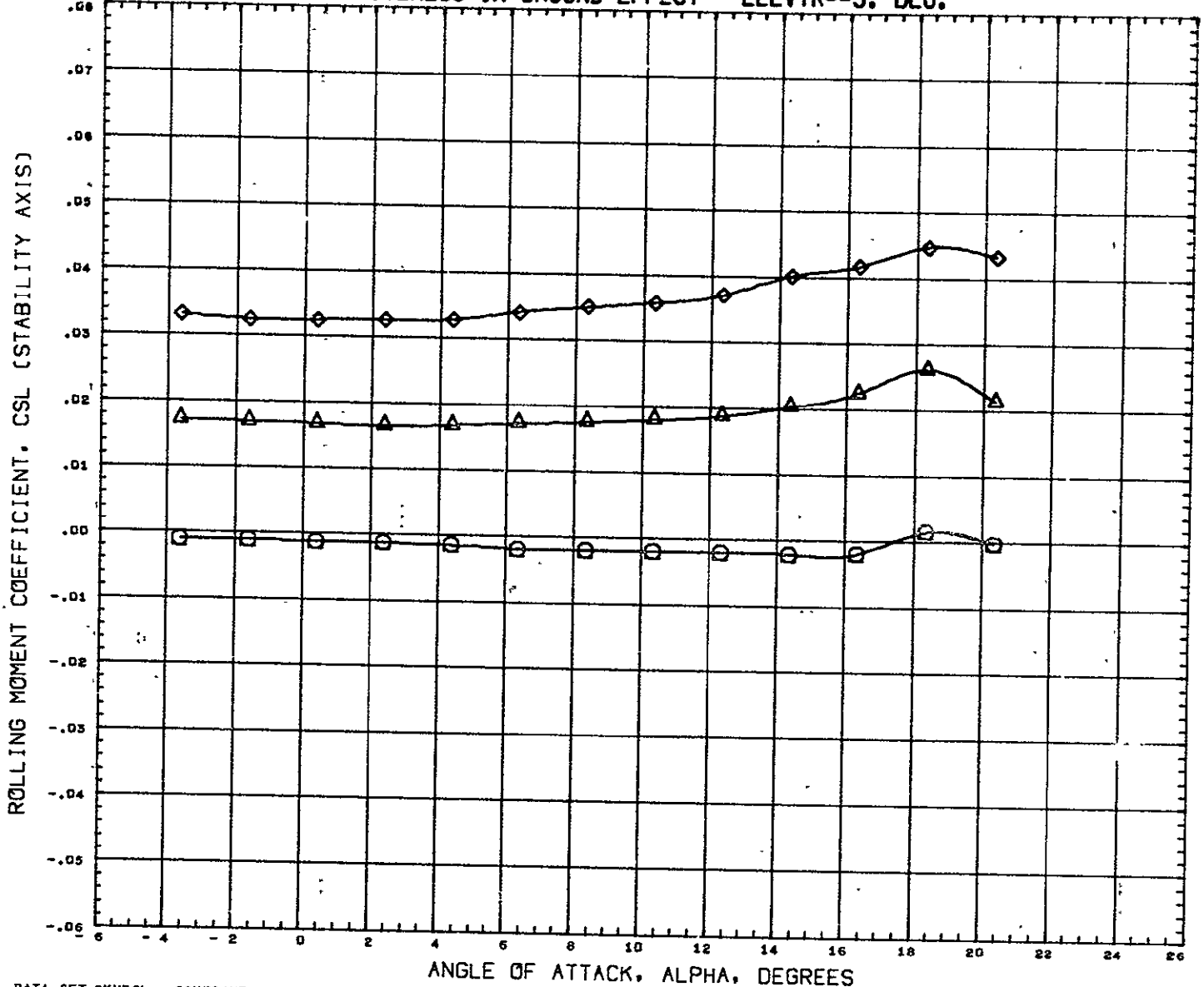
FIG. 4 AILERON EFFECTIVENESS IN GROUND EFFECT - ELEVTR=-5. DEG.



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	AILRON	LELEVN	RELEVN	REFERENCE INFORMATION
(RCW014)	○	GWTI 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	-5.000	-5.000	SREF 9.1952 SQ FT
(RCW008)	△	GWTI 290-CONF ROS-NB1 B1F1W1V1GB	0.000	-10.000	0.000	-10.000	LREF 6.4320 FT
(RCW011)	◇	GWTI 290-CONF ROS-NB1 B1F1W1V1GB	0.000	-20.000	5.000	-15.000	BREF 3.8920 FT
							XMRP 1485.0040 IN
							YMRP 0.0000 IN
							ZMRP 377.0004 IN
							SCALE 0.0400

MACH 0.170

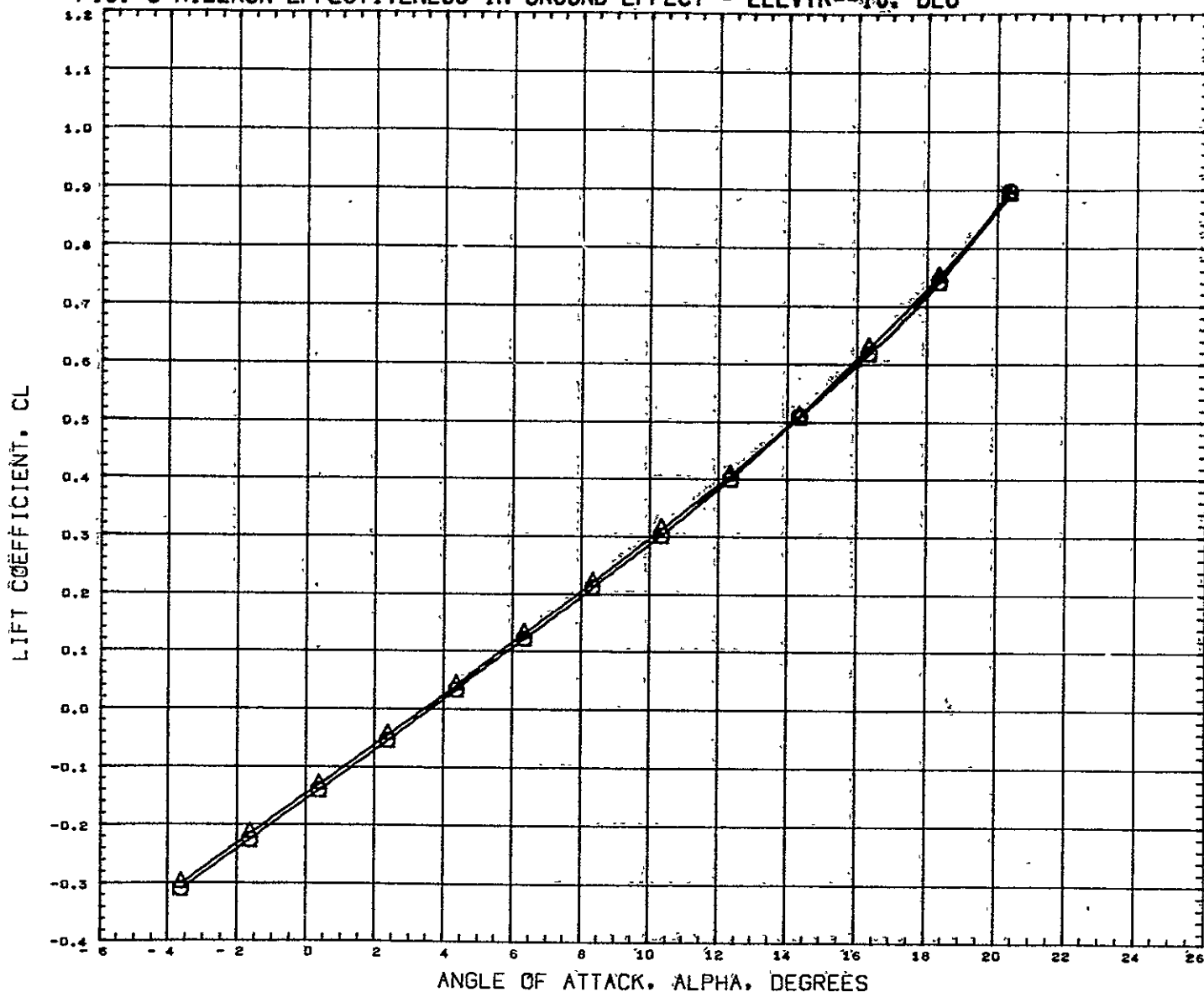
FIG. 4 AILERON EFFECTIVENESS IN GROUND EFFECT - ELEVTR=-5. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	AILRON	LELEVN	RELEVN	REFERENCE INFORMATION
(RCWD14)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	-5.000	-5.000	SREF 9.1952 SQ FT
(RCWD08)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	-10.000	0.000	-10.000	LREF 6.4320 FT
(RCWD11)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	-20.000	5.000	-15.000	BREF 3.8920 FT
						XMRP 1485.0040 IN
						YMRP 0.0000 IN
						ZMRP 377.0004 IN
						SCALE 0.0400

MACH 0.170

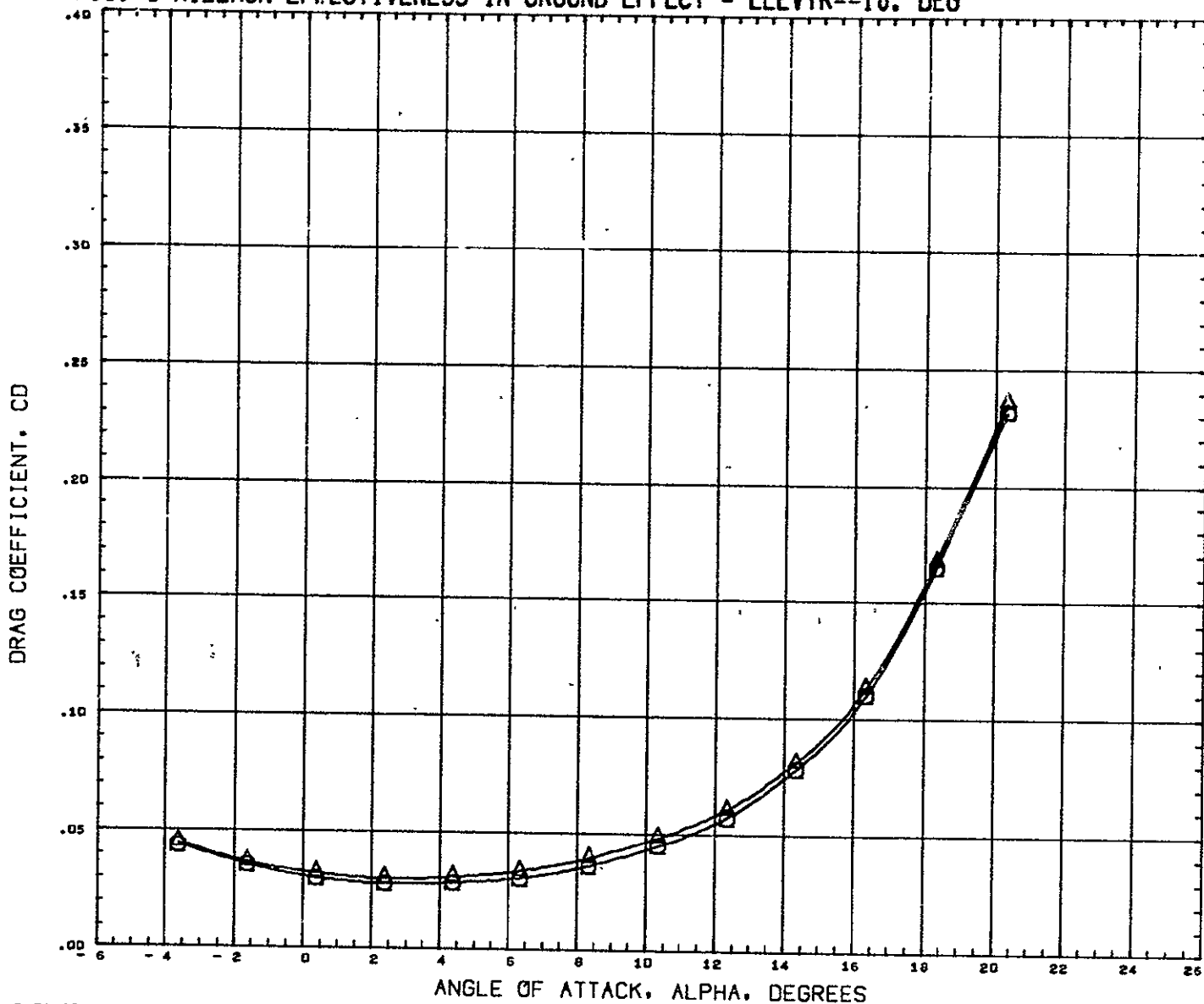
FIG. 5 AILERON EFFECTIVENESS IN GROUND EFFECT - ELEVTR=-10. DEG



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	AILRON	LELEVN	RELEVN	REFERENCE INFORMATION
(RCW009)	GWTT 290-CONF ROS-NB1 B1F1W1V1G8	0.000	0.000	-10.000	-10.000	SREF 9.1952 SQ FT
(RCW013)	GWTT 290-CONF ROS-NB1 B1F1W1V1G8	0.000	-10.000	-5.000	-15.000	LREF 6.4320 FT
						BREF 3.8920 FT
						XMRP 1485.0040 IN
						YMRP 0.0000 IN
						ZMRP 377.0054 IN
						SCALE 0.0400

MACH 0.170

FIG. 5 AILERON EFFECTIVENESS IN GROUND EFFECT - ELEVTR=-10. DEG



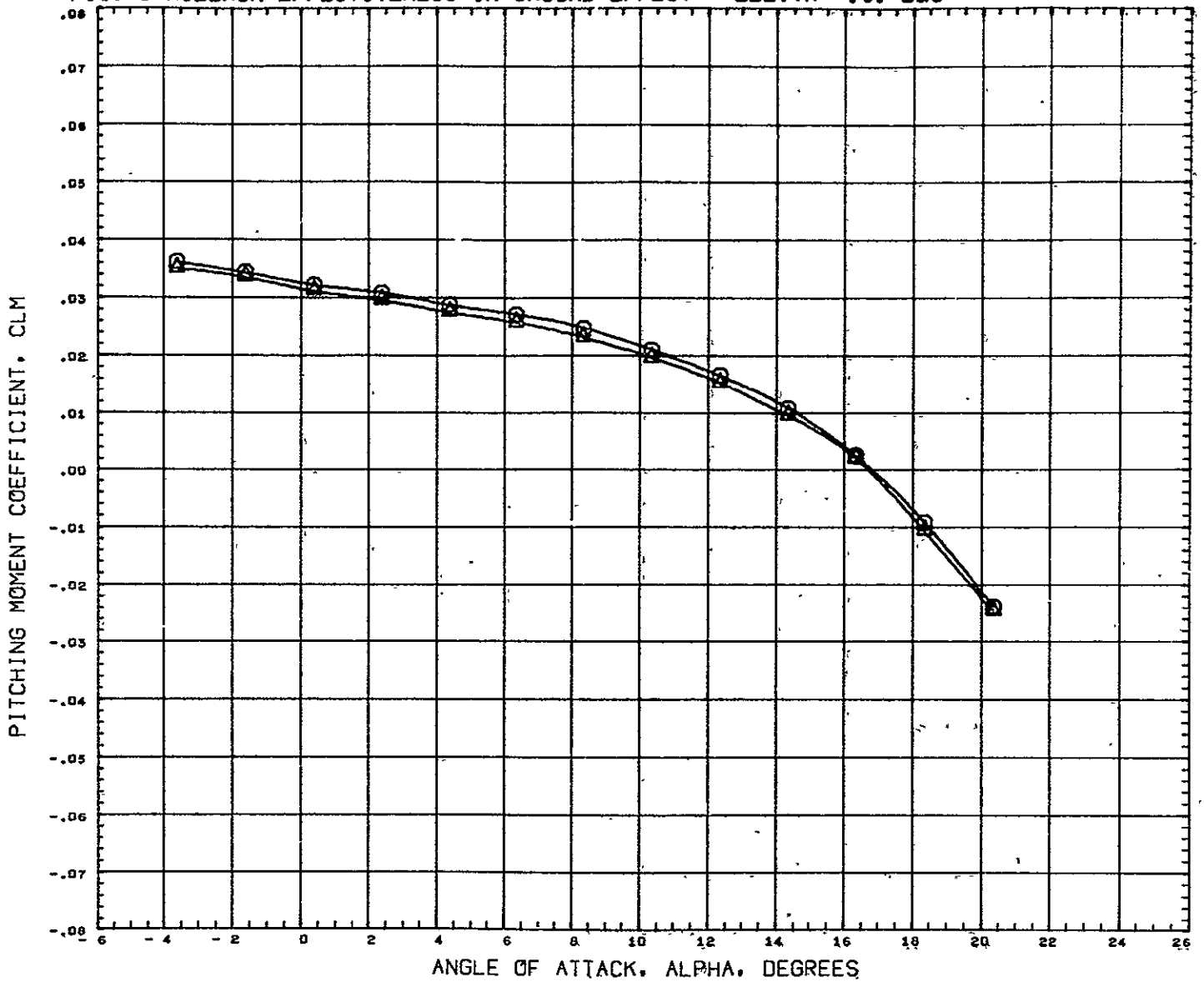
DATA SET SYMBOL CONFIGURATION DESCRIPTION
 (RCWD09) ○ GWTT 290-CONF ROS-NB1 B1F1W1V1GB
 (RCWD13) △ GWTT 290-CONF ROS-NB1 B1F1W1V1GB

BETA AILRON LELEVN RELEVN
 0.000 0.000 -10.000 -10.000
 0.000 -10.000 -5.000 -15.000

REFERENCE INFORMATION
 SREF 9.1952 SQ FT
 LREF 6.4320 FT
 BREF 3.8920 FT
 XHRF 1485.0040 IN
 YHRF 0.0000 IN
 ZHRF 377.0004 IN
 SCALE 0.0400

MACH 0.170

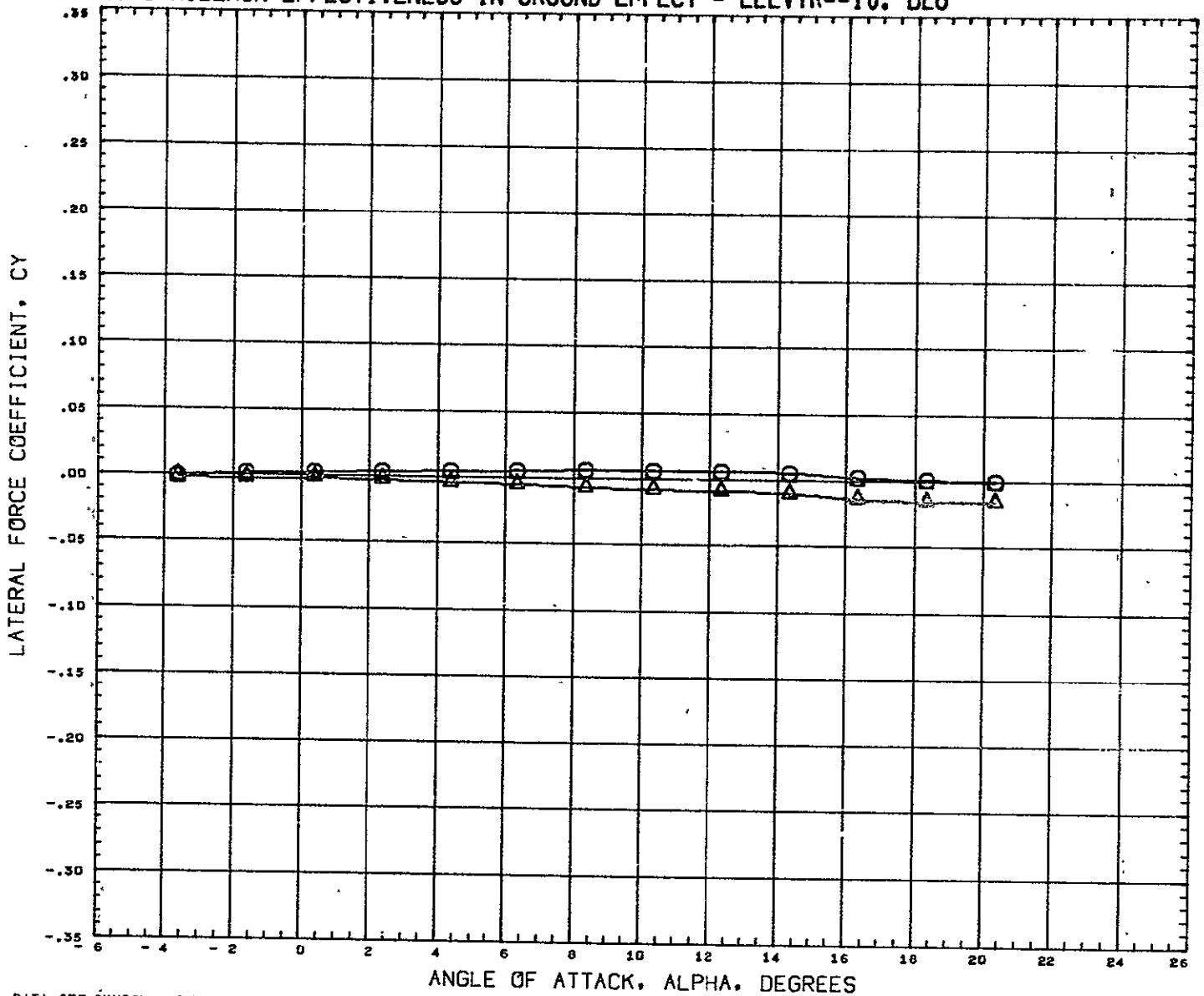
FIG. 5 AILERON EFFECTIVENESS IN GROUND EFFECT - ELEVTR=-10. DEG



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	AILRON	LELEVN	RELEVN	REFERENCE INFORMATION
(RCW009)	GWTT 29D-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	-10.000	-10.000	SREF 9.1952 SQ FT
(RCW013)	GWTT 29D-CONF ROS-NB1 B1F1W1V1GB	0.000	-10.000	-5.000	-15.000	LREF 6.4320 FT
						BREF 3.8920 FT
						XMRP 1485.0040 IN
						YMRP 0.0000 IN
						ZMRP 377.0004 IN
						SCALE 0.0400

MACH 0.170

FIG. 5 AILERON EFFECTIVENESS IN GROUND EFFECT - ELEVTR=-10. DEG

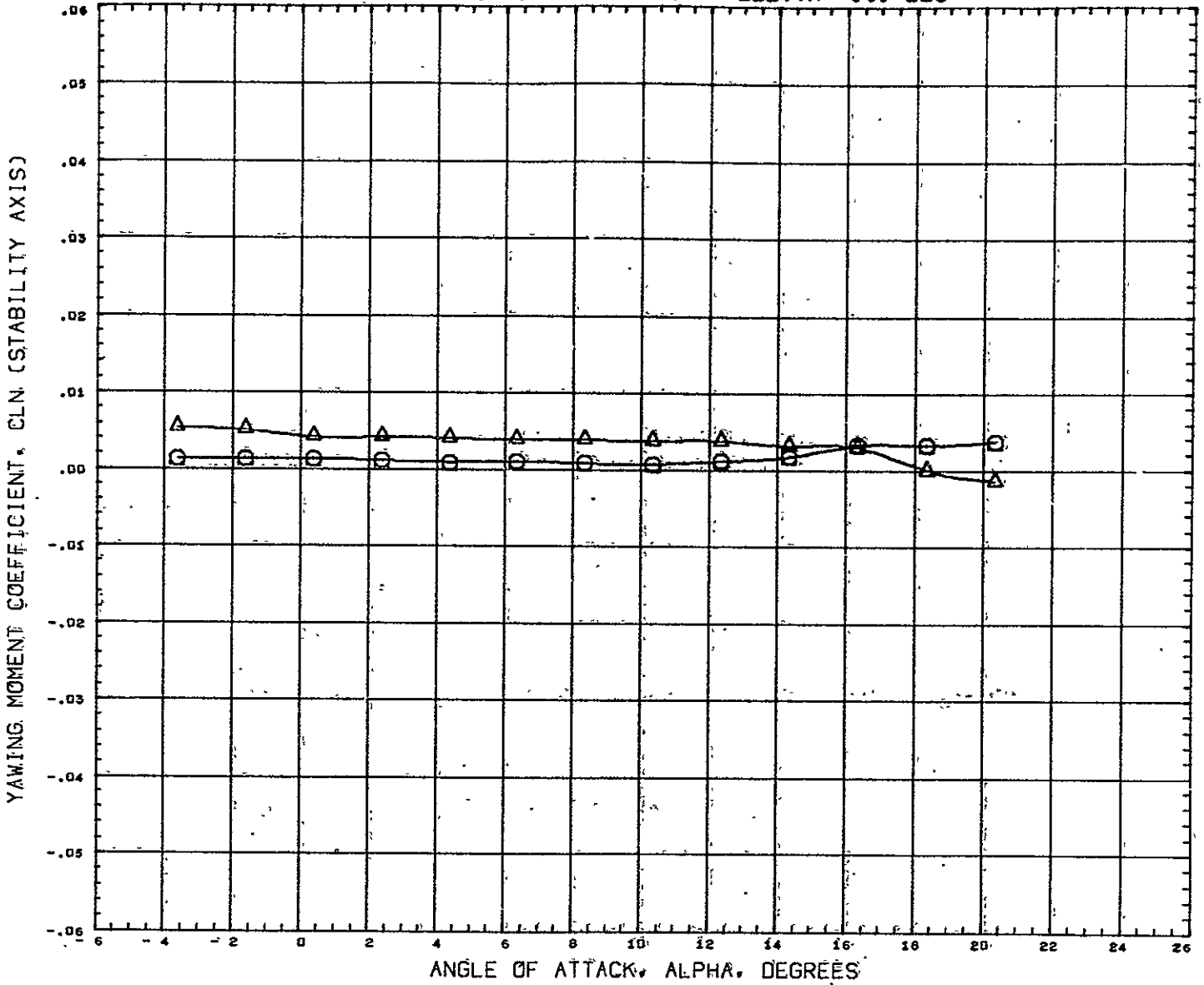


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(RCWD09)	○	GWTT 29D-CONF ROS-NB1 B1F1W1V1GB
(RCWD13)	△	GWTT 29D-CONF ROS-NB1 B1F1W1V1GB

BETA	AILRON	LELEVN	RELEVN	REFERENCE INFORMATION
0.000	0.000	-10.000	-10.000	SREF 9.1952 SQ FT
0.000	-10.000	-5.000	-15.000	LREF 6.4320 FT
				BREF 3.8920 FT
				XHRP 1485.0040 IN
				YHRP 0.0000 IN
				ZHRP 377.0004 IN
				SCALE 0.0400

MACH 0.170

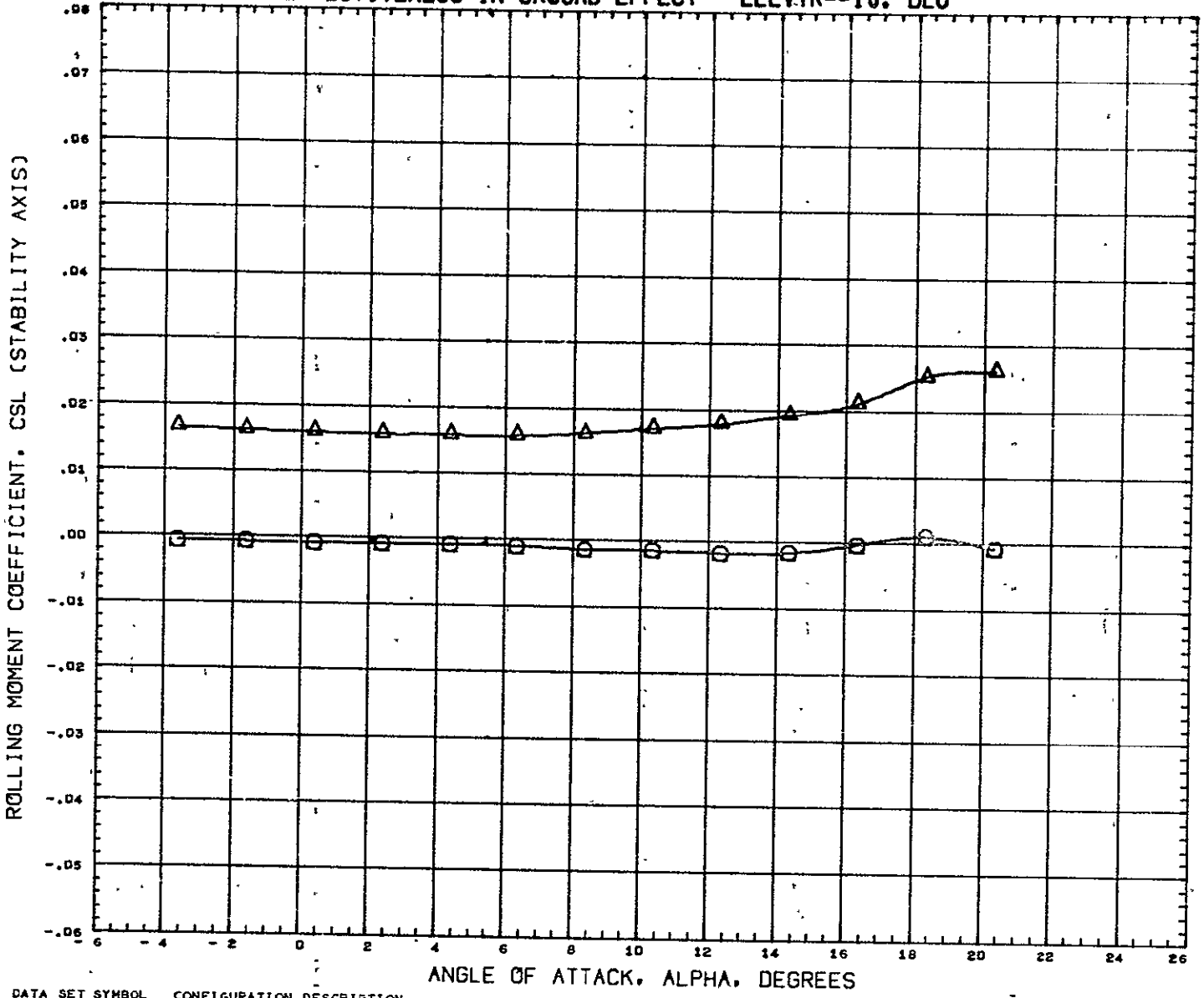
FIG. 5 AILERON EFFECTIVENESS IN GROUND EFFECT - ELEVTR=-10. DEG



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	AILRON	LELEVN	RELEVN	REFERENCE INFORMATION
(RCW009)	GWTT 290-CONF ROS-NB1 B1F3W1V16B	0.000	0.000	-10.000	-10.000	SREF 9.1952 SQ FT
(RCW013)	GWTT 290-CONF ROS-NB1 B1F1W1V16B	0.000	-10.000	-5.000	-15.000	LREF 6.4320 FT
						BREF 3.8920 FT
						XMRP 1485.0040 IN
						YMRP 0.0000 IN
						ZMRP 377.0004 IN
						SCALE 0.0400

MACH 0.170

FIG. 5 AILERON EFFECTIVENESS IN GROUND EFFECT - ELEVTR=-10. DEG



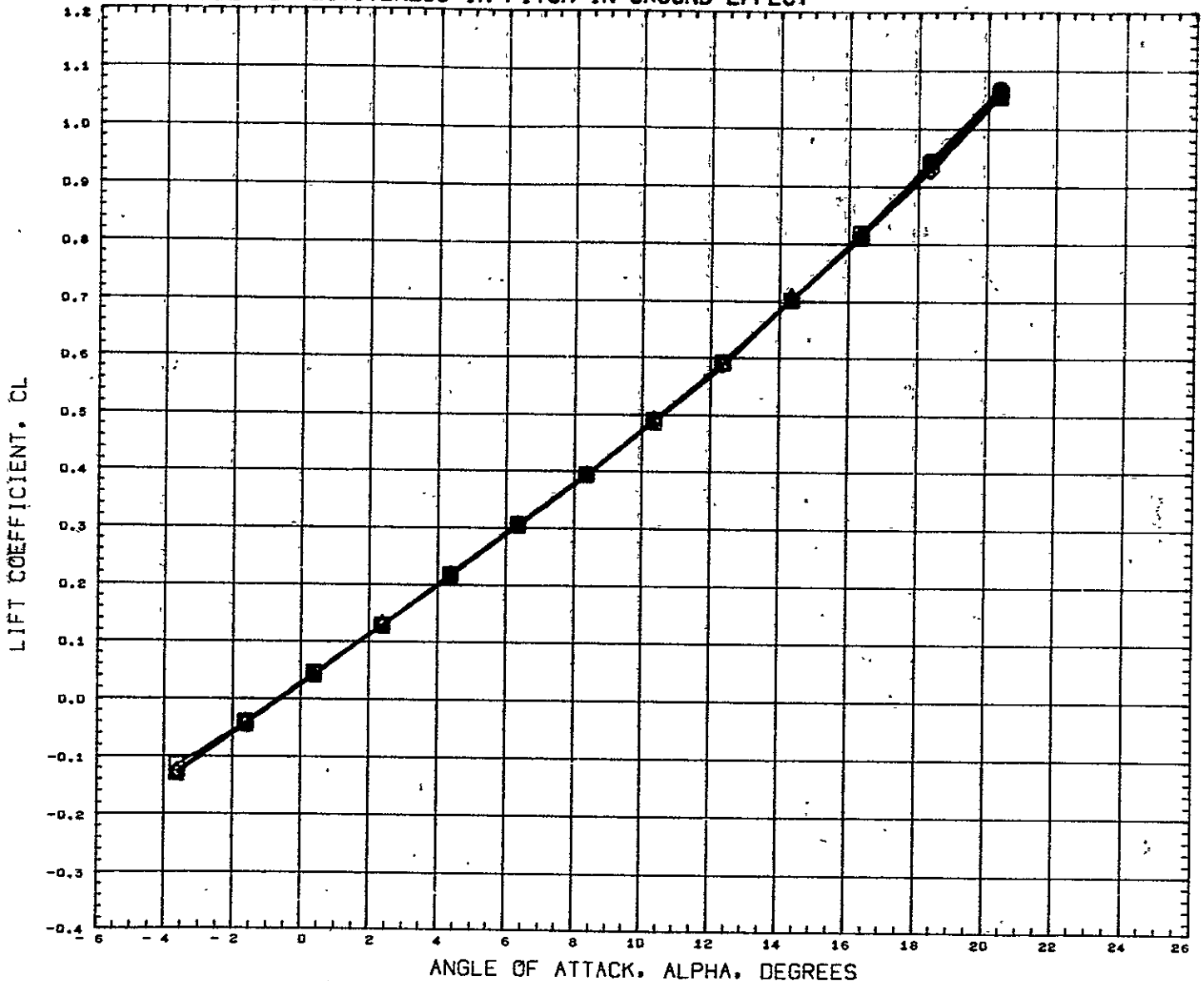
DATA SET SYMBOL CONFIGURATION DESCRIPTION
 (RCW009) O GWTT 290-CONF ROS-NB1 B1F1W1V1GB
 (RCW013) Δ GWTT 290-CONF ROS-NB1 B1F1W1V1GB

BETA AILRON LELEVN RELEVN
 0.000 0.000 -10.000 -10.000
 0.000 -10.000 -5.000 -15.000

REFERENCE INFORMATION
 SREF 9.1952 SQ FT
 LREF 6.4320 FT
 BREF 3.8920 FT
 XMRP 1485.0040 IN
 YMRP 0.0000 IN
 ZMRP 377.0004 IN
 SCALE 0.0400

MACH 0.170

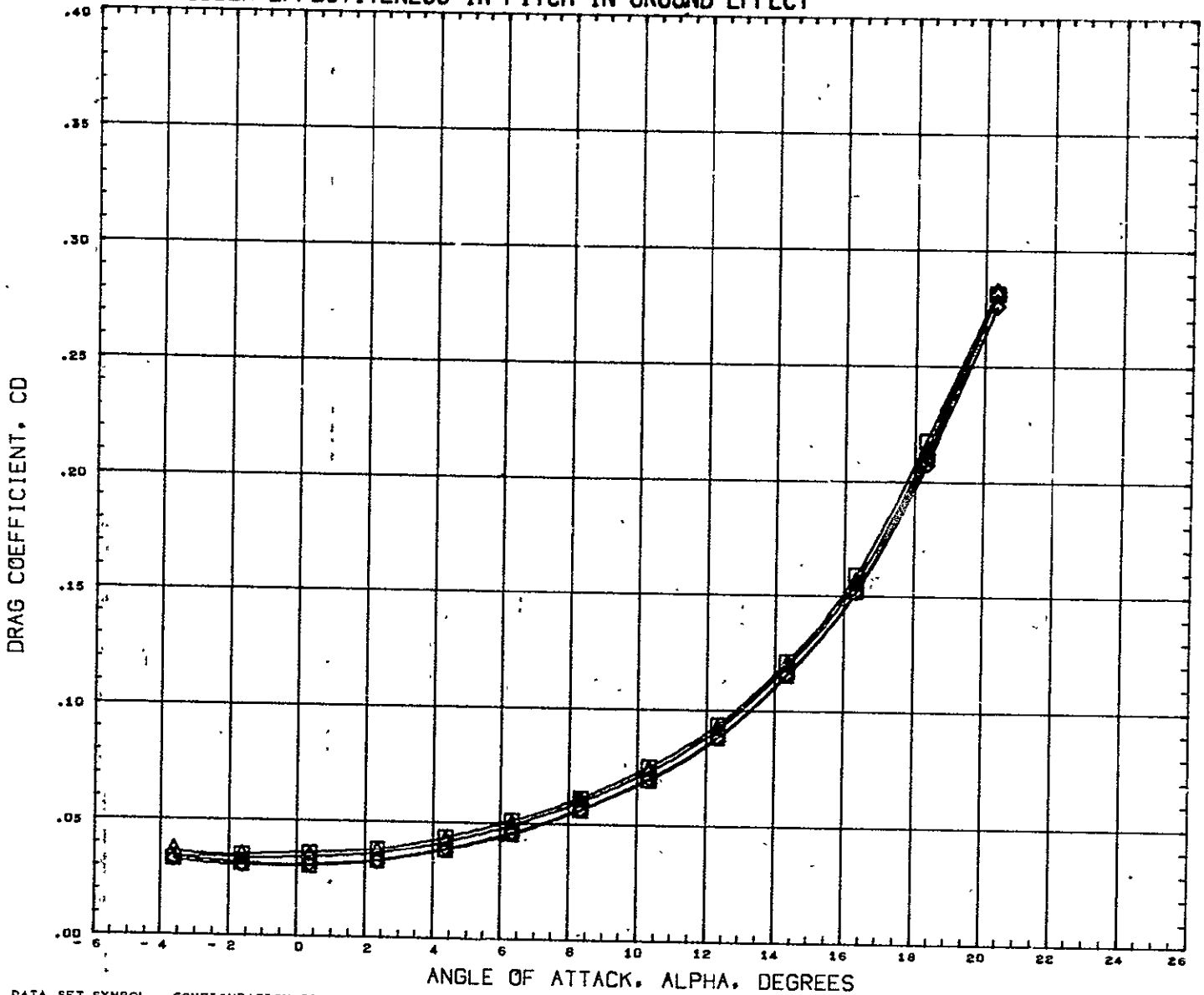
FIG. 6 RUDDER EFFECTIVENESS IN PITCH IN GROUND EFFECT



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCWD05)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCWD15)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	5.000	-5.000	LREF 6.4320 FT
(RCWD16)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	-10.000	BREF 3.8920 FT
(RCWD17)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	-15.000	XMRP 1485.0040 IN
						YMRP 0.0000 IN
						ZMRP 377.0004 IN
						SCALE 0.0400

MACH 0.170

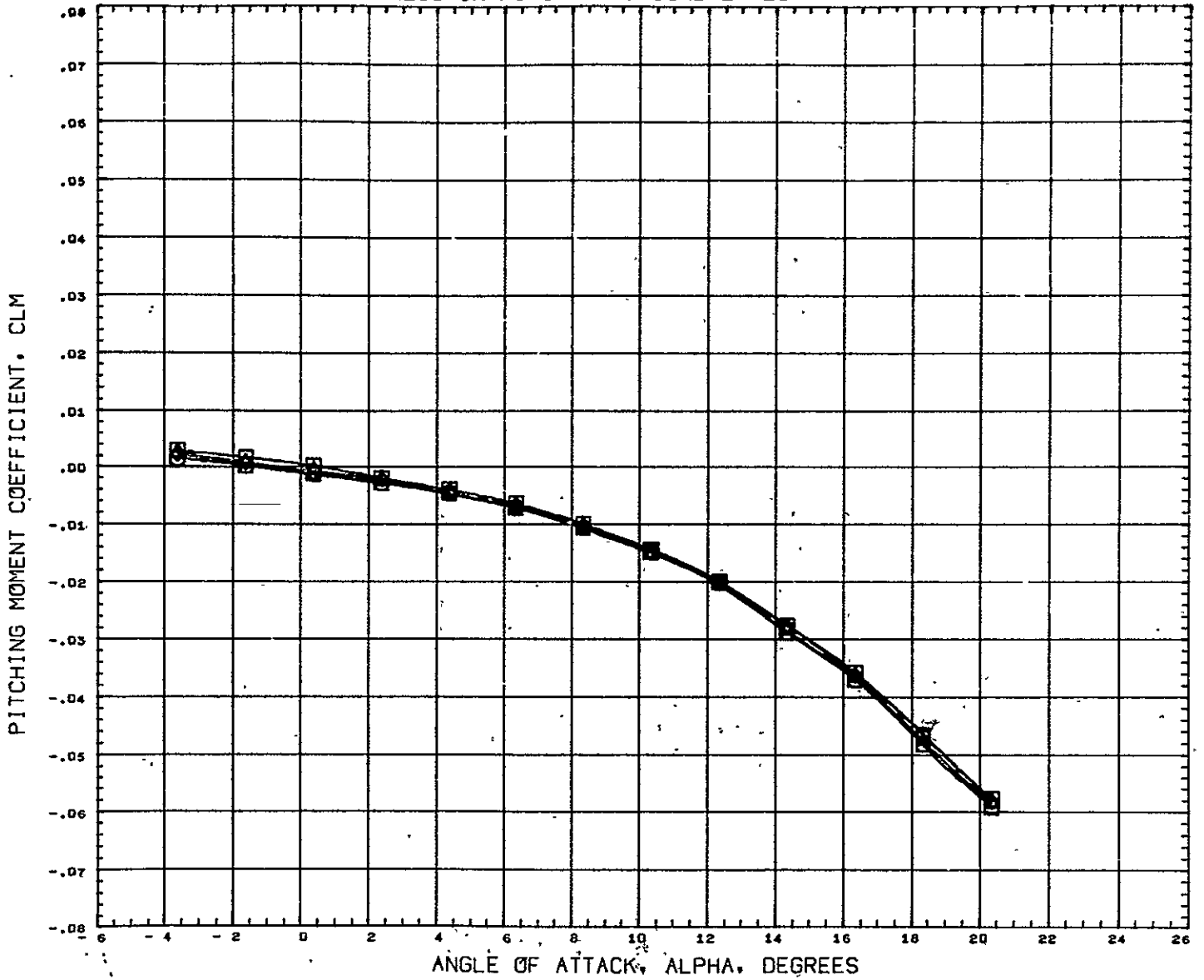
FIG. 6 RUDDER EFFECTIVENESS IN PITCH IN GROUND EFFECT



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW05)	○	GWT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCW15)	△	GWT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	-5.000	LREF 6.4320 FT
(RCW16)	◇	GWT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	-10.000	BREF 3.8920 FT
(RCW17)	□	GWT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	-15.000	XMRP 1485.0040 IN
							YMRP 0.0000 IN
							ZMRP 377.0004 IN
							SCALE 0.0400

MACH 0.170

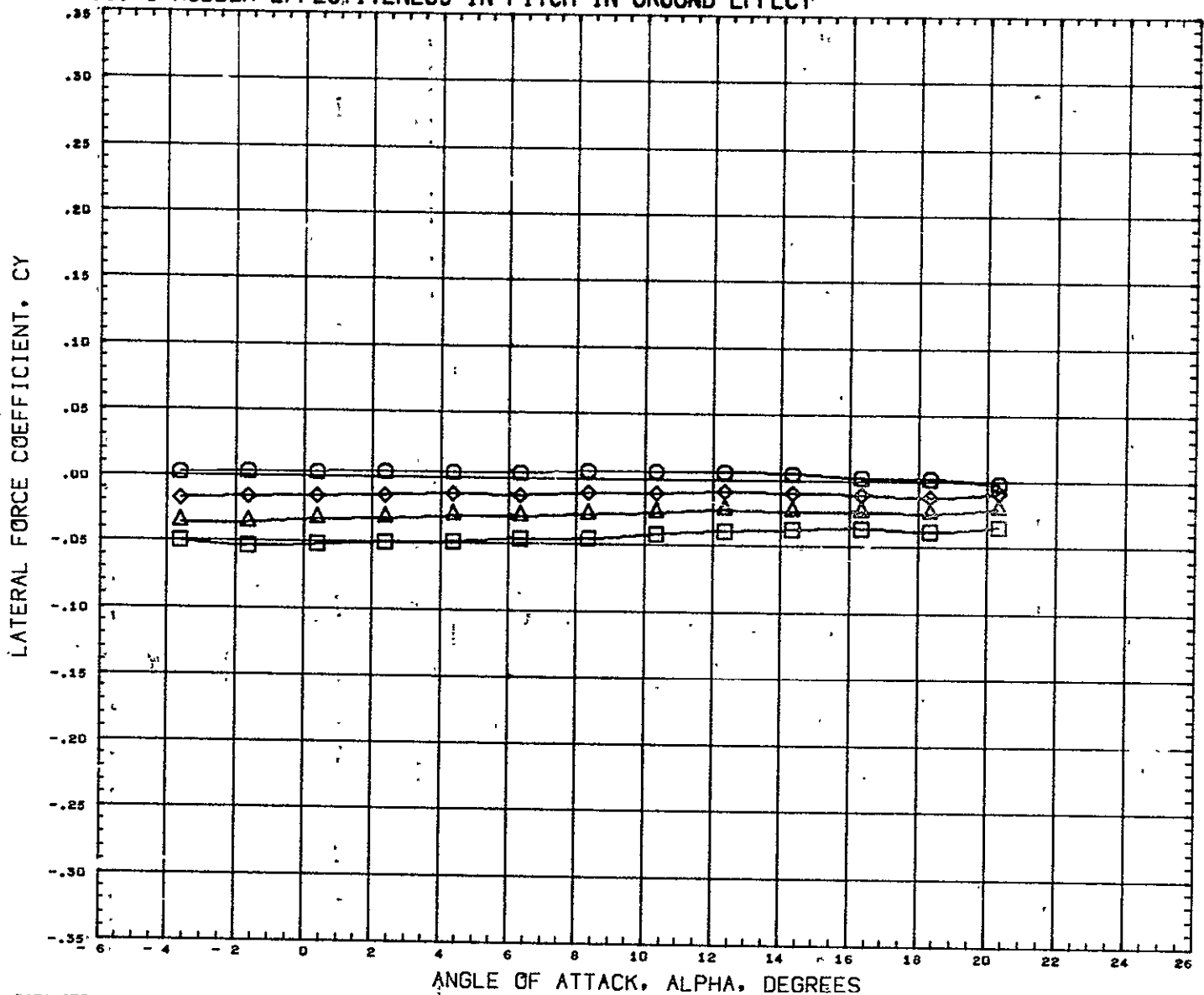
FIG. 6 RUDDER EFFECTIVENESS IN PITCH IN GROUND EFFECT



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCWD05)	○	GWTT 29D-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCWD15)	△	GWTT 29D-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	-5.000	LREF 6.4320 FT
(RCWD16)	◇	GWTT 29D-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	-10.000	BREF 3.8920 FT
(RCWD17)	□	GWTT 29D-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	-15.000	XMRP 1485.0040 IN YMRP 0.0000 IN ZMRP 377.0004 IN SCALE 0.0400

MACH 0.170

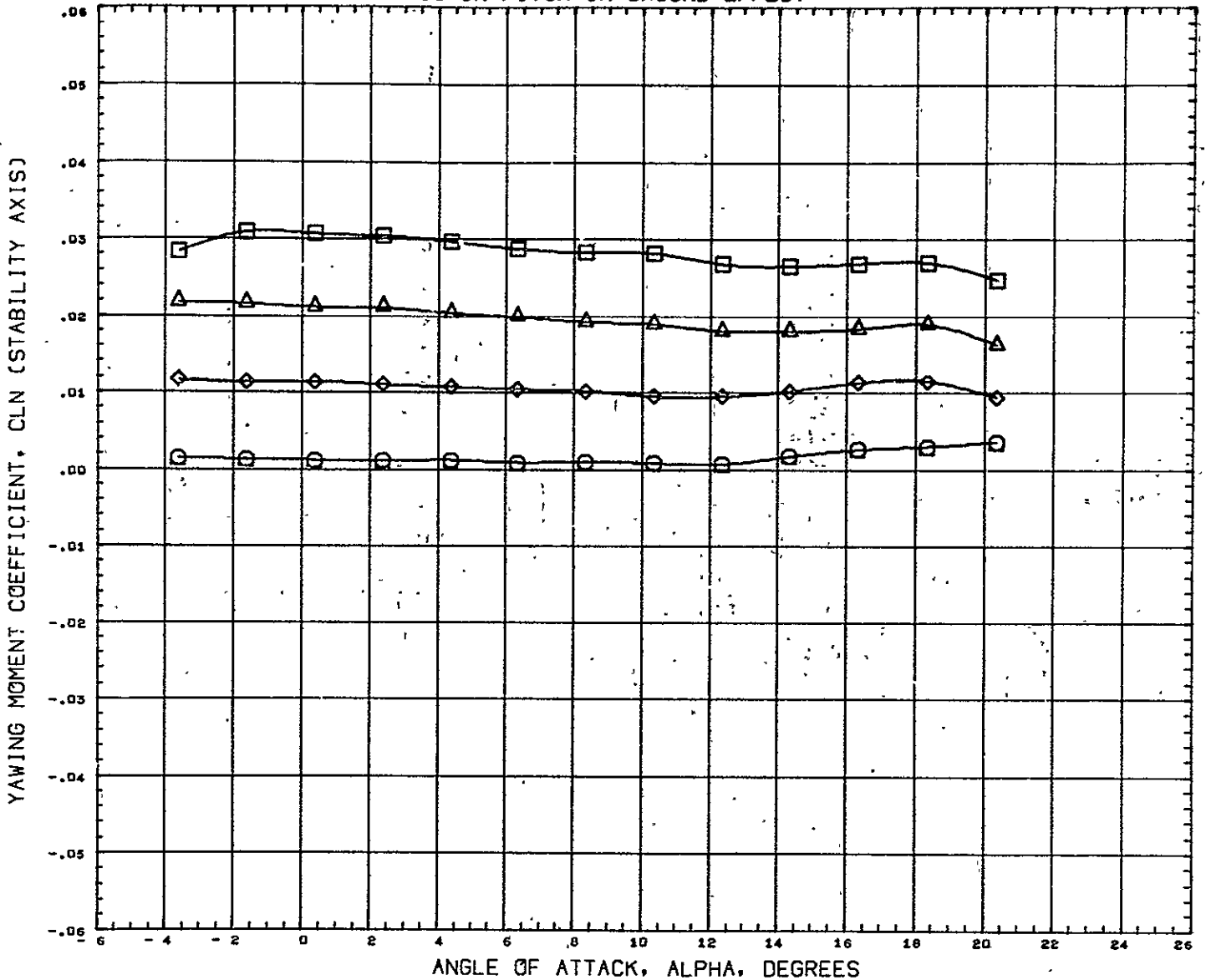
FIG. 6 RUDDER EFFECTIVENESS IN PITCH IN GROUND EFFECT



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCWD05)	○	GWT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCWD15)	◇	GWT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	-5.000	LREF 6.4320 FT
(RCWD16)	△	GWT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	-10.000	BREF 3.8920 FT
(RCWD17)	□	GWT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	-15.000	XMRP 1485.0040 IN
							YMRP 0.0000 IN
							ZMRP 377.0004 IN
							SCALE 0.0400

MACH 0.170

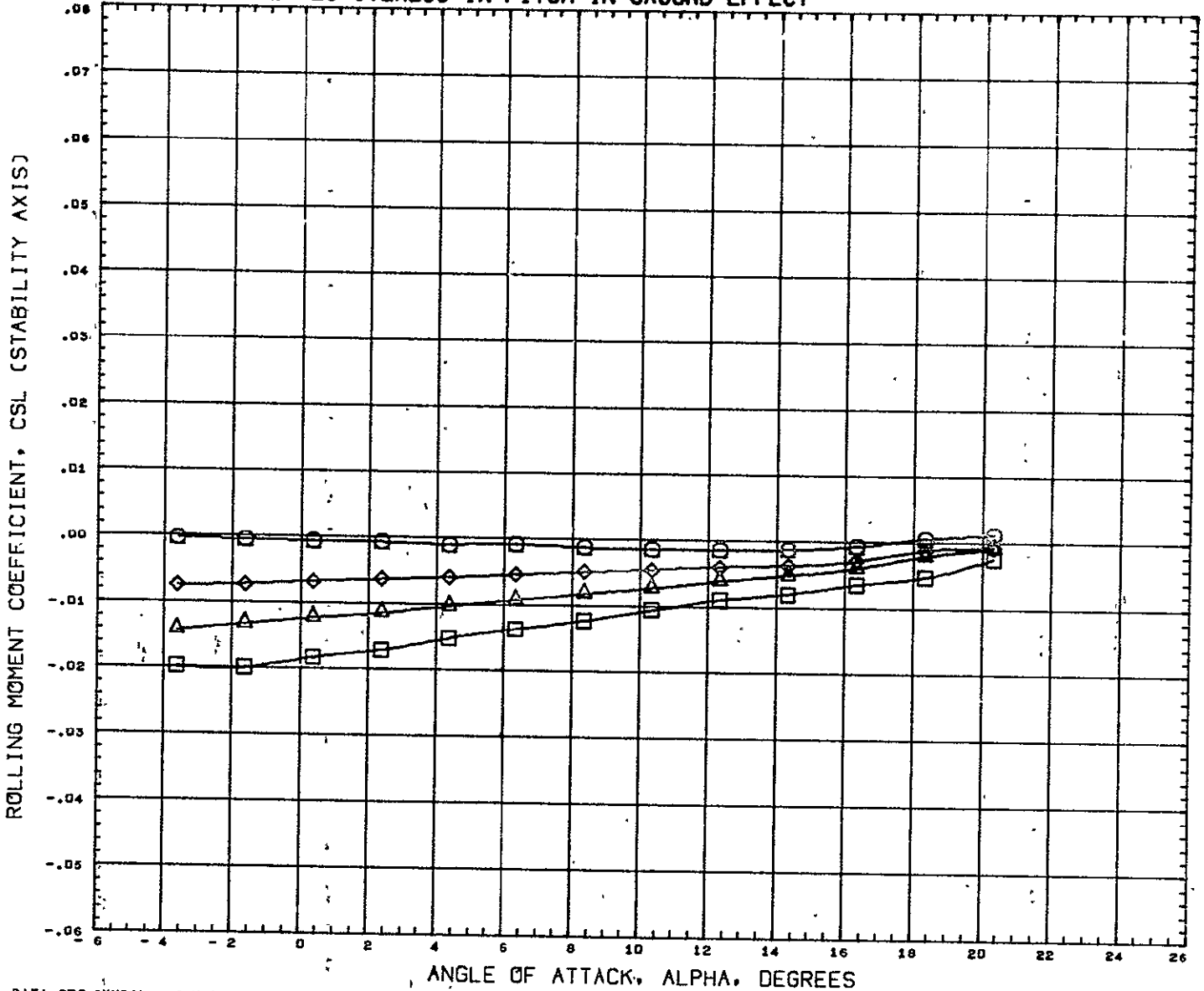
FIG. 6 RUDDER EFFECTIVENESS IN PITCH IN GROUND EFFECT



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW005)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCW015)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	-5.000	LREF 6.4320 FT
(RCW016)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	-10.000	BREF 3.8920 FT
(RCW017)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	-15.000	XHRF 1485.0040 IN
						YHRF 0.0000 IN
						ZHRF 377.0004 IN
						SCALE 0.0400

MACH 0.170

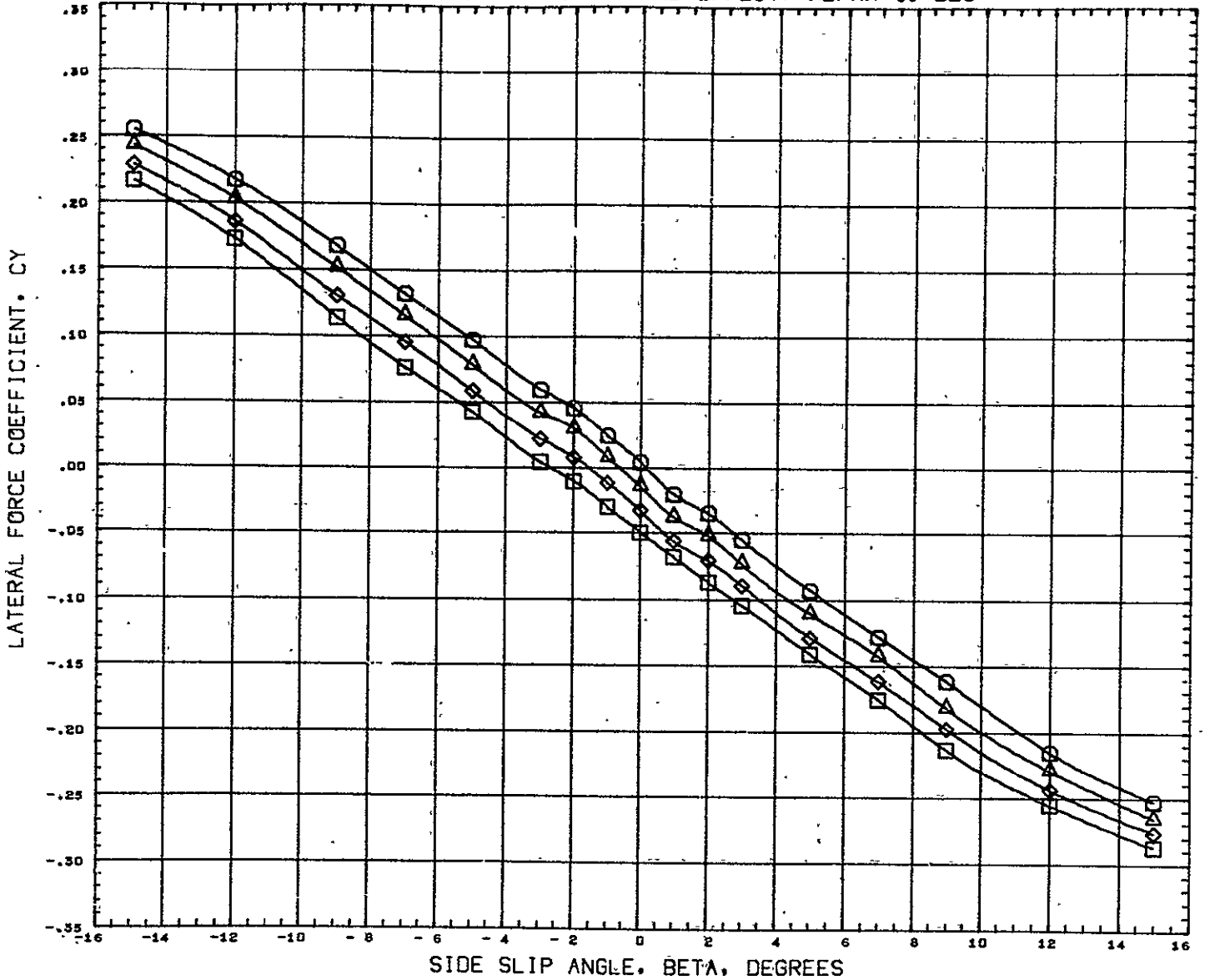
FIG. 6 RUDDER EFFECTIVENESS IN PITCH IN GROUND EFFECT



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW005)	○	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCW015)	△	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	-5.000	LREF 6.4320 FT
(RCW016)	◇	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	-10.000	BREF 3.8920 FT
(RCW017)	□	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	-15.000	XMRF 1485.0040 IN YMRF 0.0006 IN ZMRF 377.0004 IN SCALE 0.0400

MACH 0.170

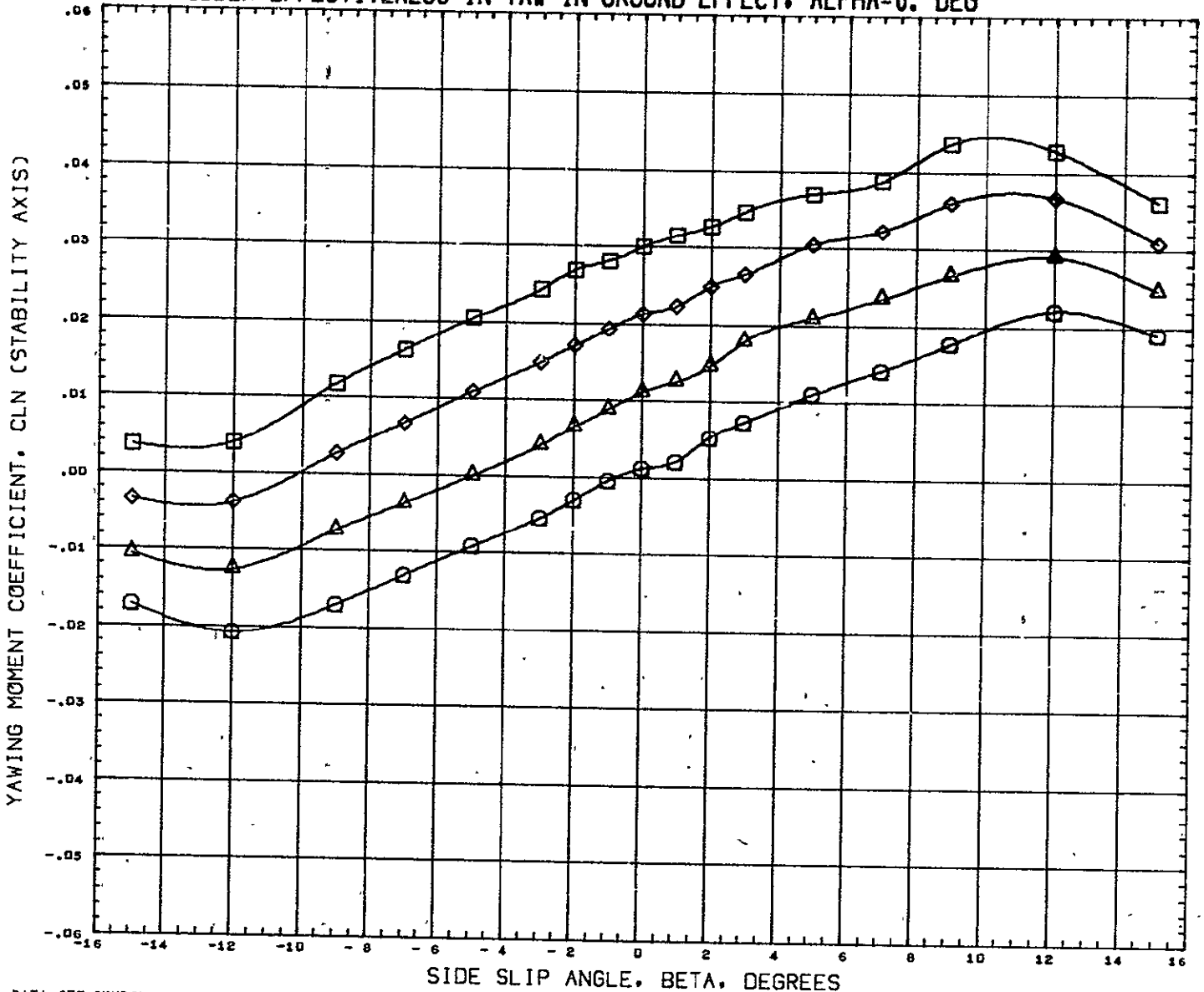
FIG. 7 RUDDER EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=0. DEG



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCWD21)	GWTI 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	0.000	SREF -9.1952 SQ FT
(RCWD20)	GWTI 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	-5.000	LREF 6.4320 FT
(RCWD19)	GWTI 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	-10.000	SREF 3.8920 FT
(RCWD18)	GWTI 290-CONF ROS-NB1 B1F1W1V1GB	0.000	3.000	0.000	-15.000	XMRP 1485.0040 IN
						YMRP 0.0000 IN
						ZMRP 377.0004 IN
						SCALE 0.0400

MACH 0.170

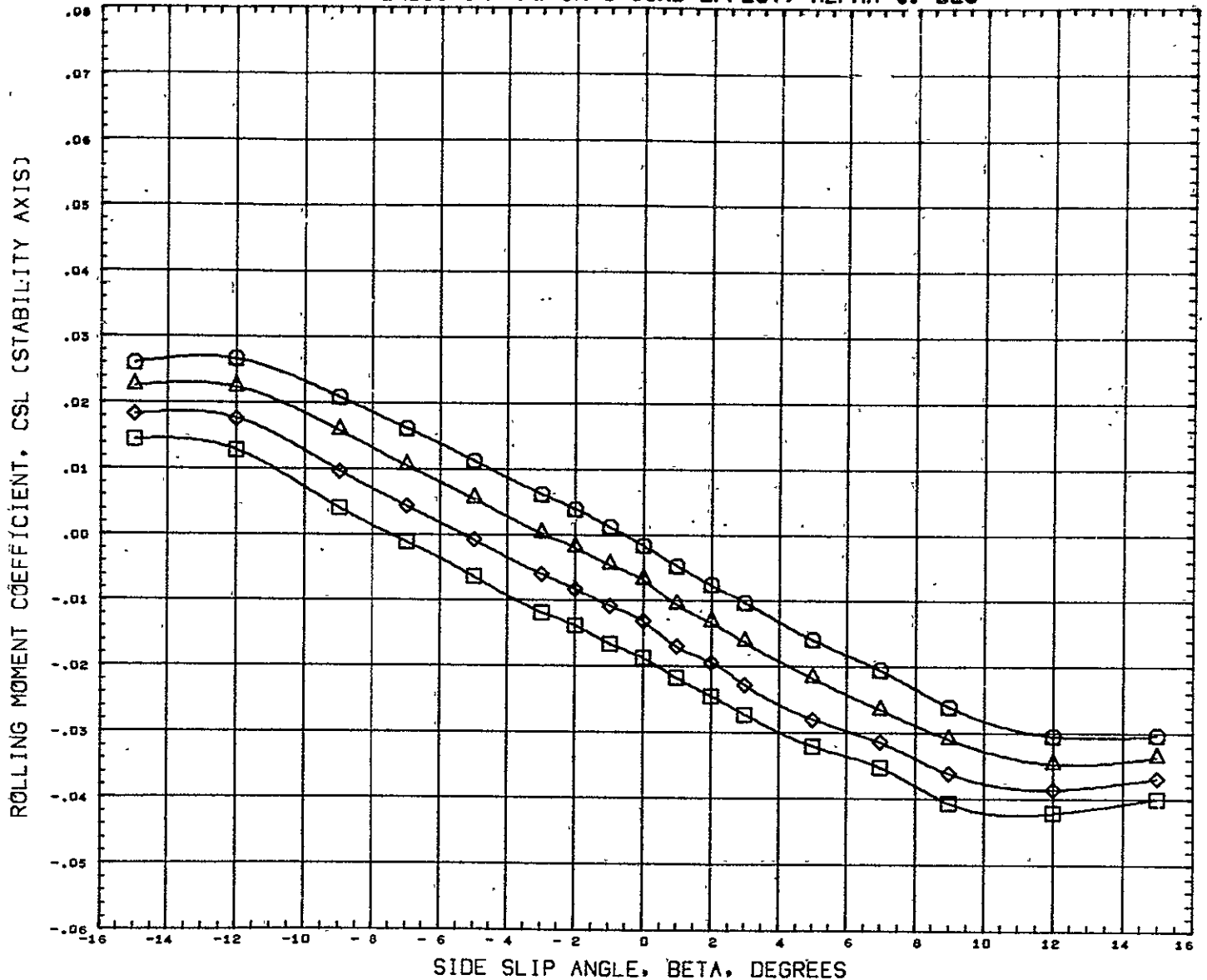
FIG. 7 RUDDER EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=0. DEG



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW021)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCW020)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	-5.000	LREF 6.4320 FT
(RCW019)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	-10.000	BREF 3.8920 FT
(RCW018)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	-15.000	XMRP 1485.0040 IN
						YMRP 0.0000 IN
						ZMRP 377.0004 IN
						SCALE 0.0400

HACH 0.170

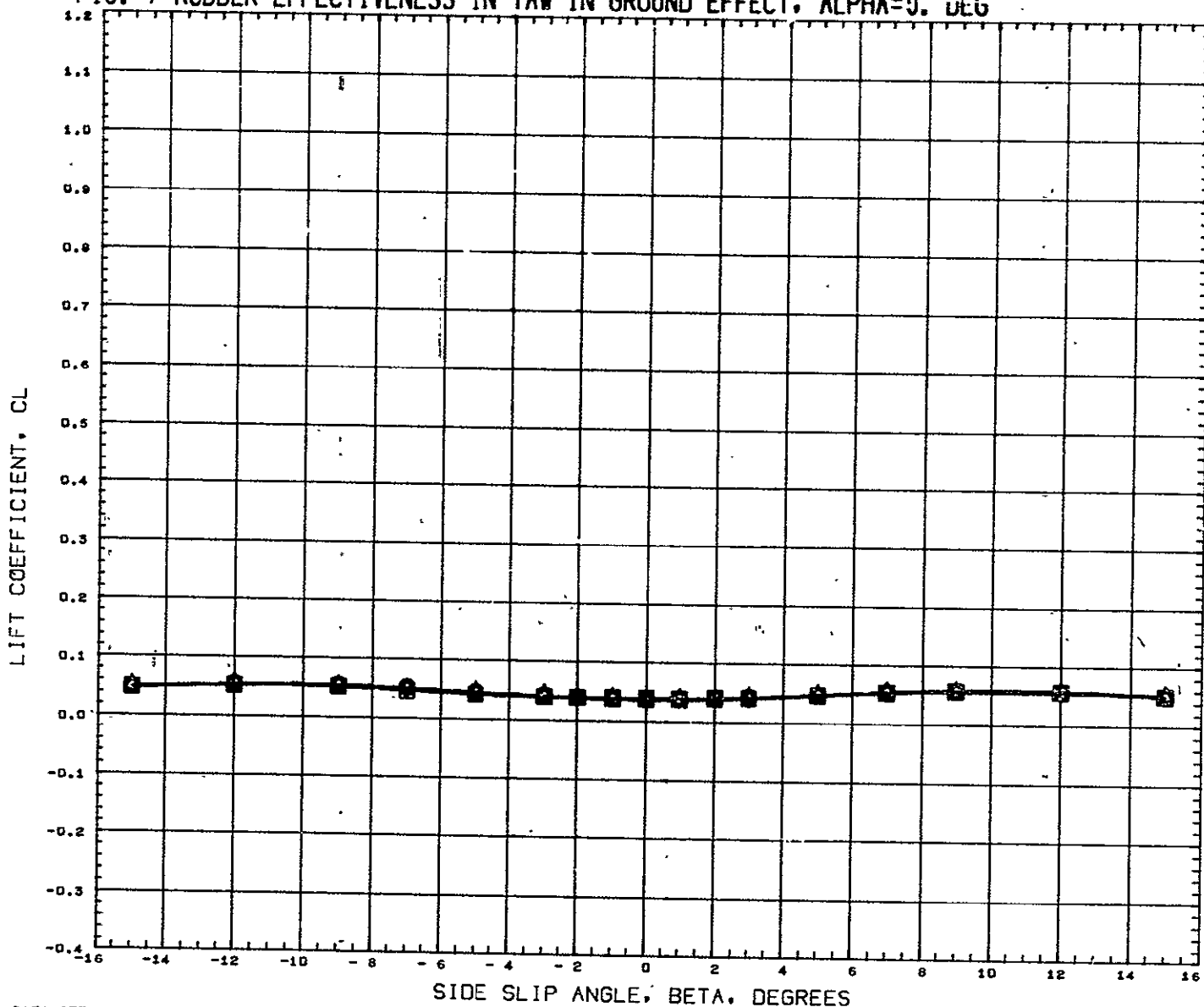
FIG. 7 RUDDER EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=0. DEG



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCWD21)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCWD20)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	-5.000	LREF 6.4320 FT
(RCWD19)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	-10.000	BREF 3.8920 FT
(RCWD18)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	-15.000	XHRP 1485.0040 IN
						YHRP 0.0000 IN
						ZHRP 377.0004 IN
						SCALE 0.0400

MACH 0.170

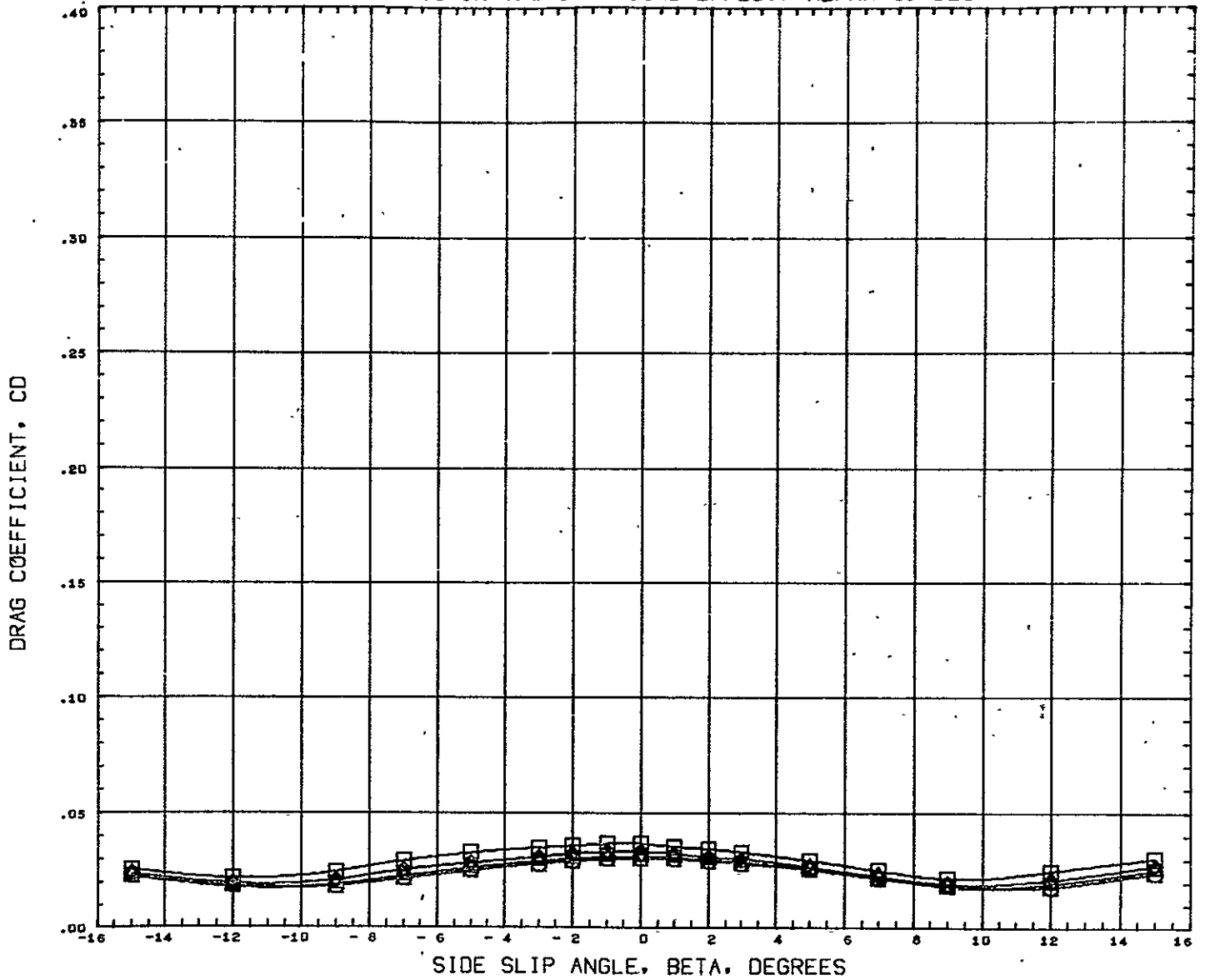
FIG. 7 RUDDER EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=0. DEG



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCWD21)	○	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCWD20)	△	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	-5.000	LREF 6.4320 FT
(RCWD19)	◇	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	-10.000	BREF 3.8920 FT
(RCWD18)	□	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	-15.000	XMRP 1485.0040 IN
							YMRP 0.0000 IN
							ZMRP 377.0004 IN
							SCALE 0.0400

MACH 0.170

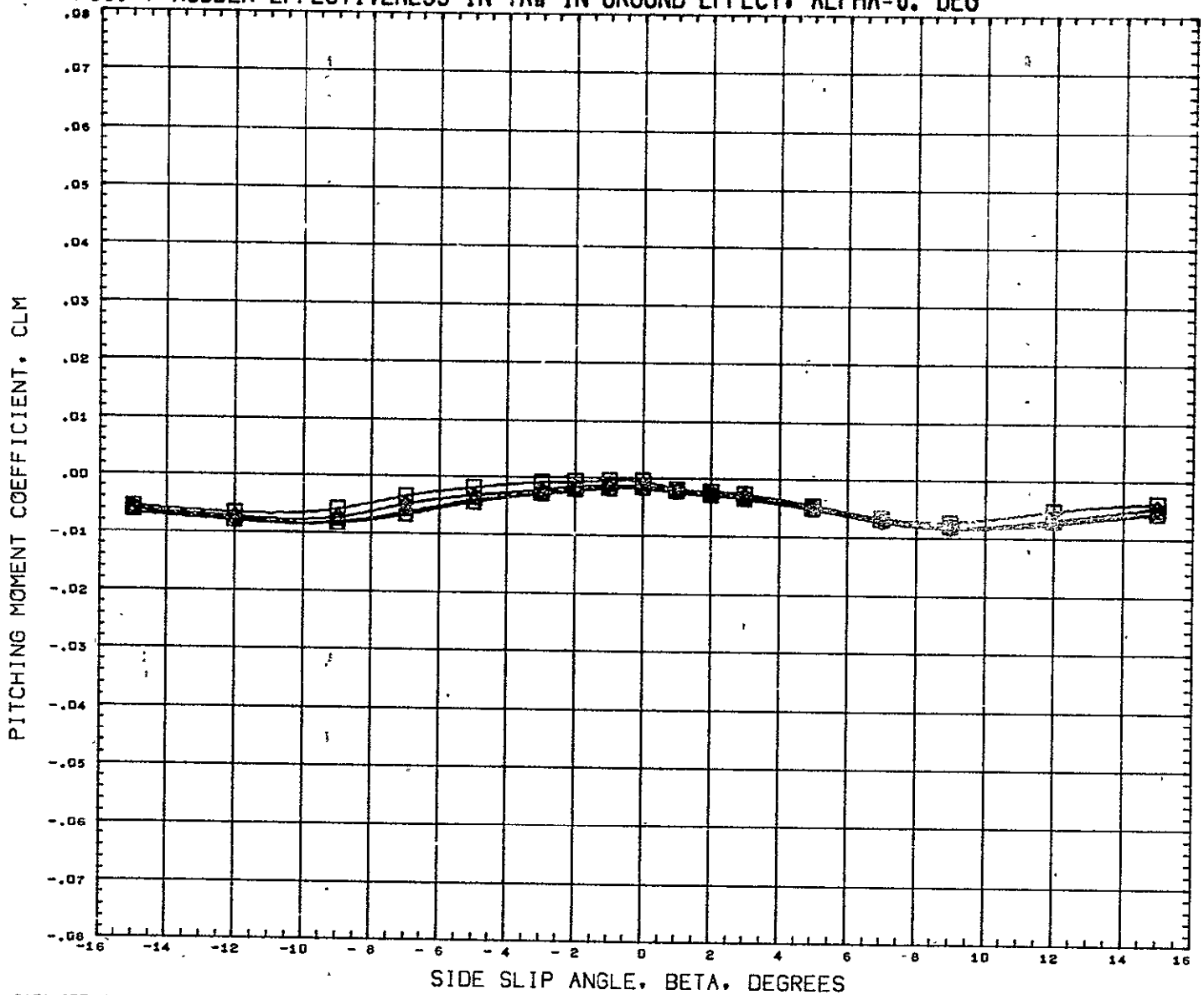
FIG. 7 RUDDER EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=0. DEG



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW021)	GWTT 290-CONF ROS-NB1 81F1W1V1GB	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCW020)	GWTT 290-CONF ROS-NB1 81F1W1V1GB	0.000	0.000	0.000	-5.000	LREF 6.4320 FT
(RCW019)	GWTT 290-CONF ROS-NB1 81F1W1V1GB	0.000	0.000	0.000	-10.000	BREF 3.8920 FT
(RCW018)	-GWTT 290-CONF ROS-NB1 81F1W1V1GB	0.000	0.000	0.000	-15.000	XMRP 1485.0040 IN
						YMRP 0.0000 IN
						ZMRP 377.0004 IN
						SCALE 0.0400

MACH 0.170

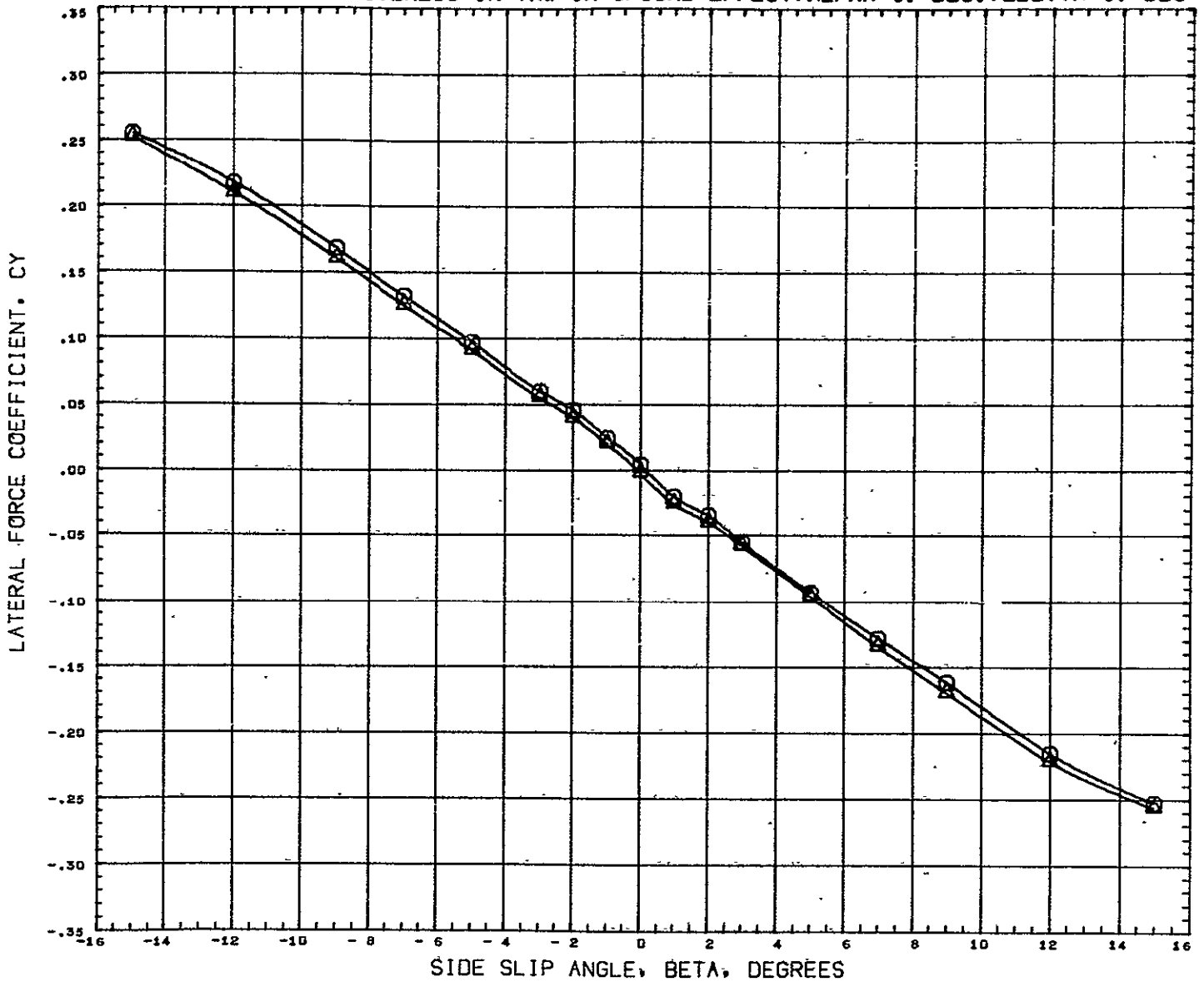
FIG. 7 RUDDER EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=0. DEG



DATA SET SYMBOL	SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCWD21)	□	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCWD2D)	△	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	-5.000	LREF 6.4320 FT
(RCWD19)	◇	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	-10.000	BREF 3.8920 FT
(RCWD18)	□	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	-15.000	XHRP 1485.0040 IN YHRP 0.0000 IN ZHRP 377.0004 IN SCALE 0.0400

MACH 0.170

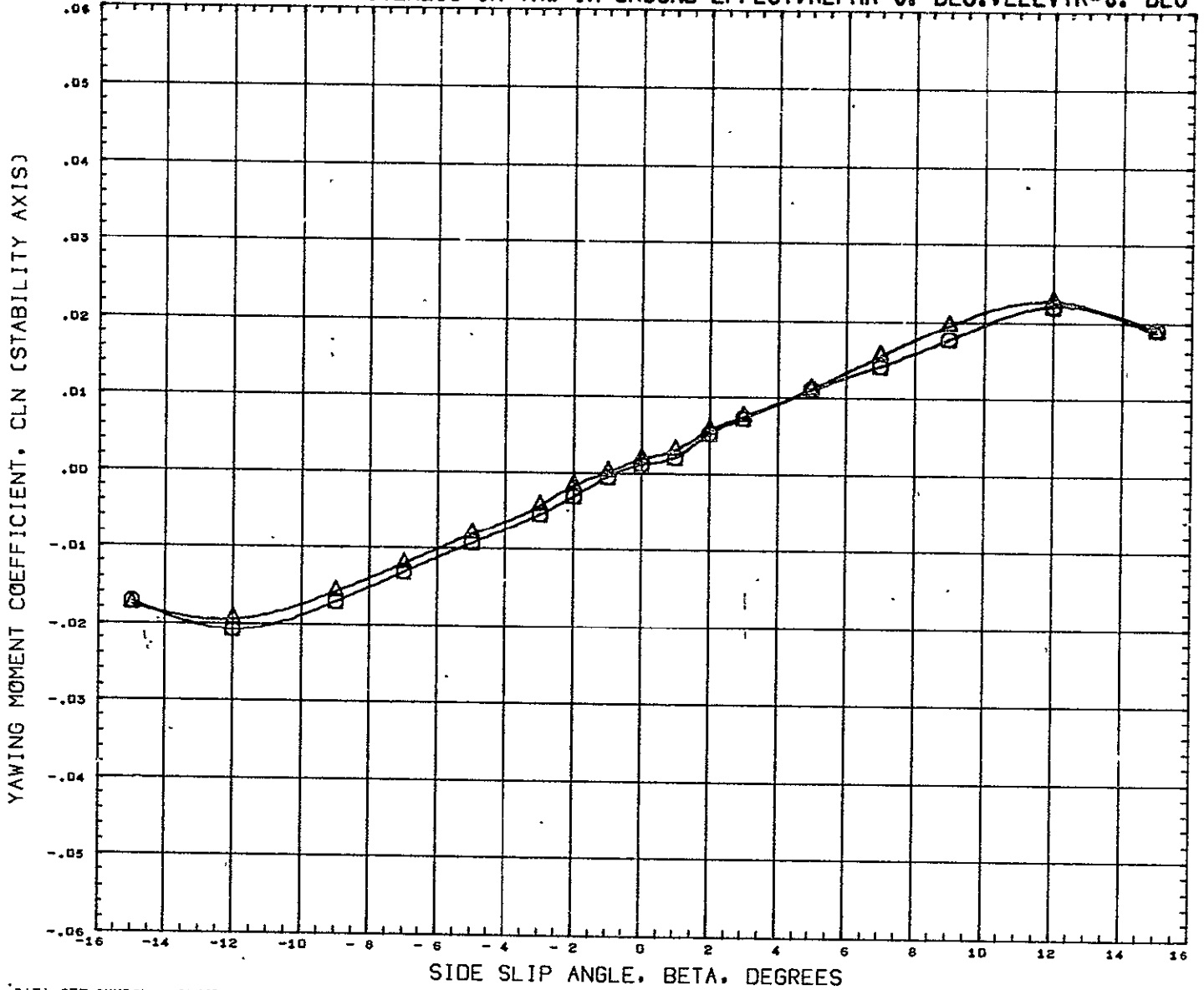
FIG. 8 AILERON EFFECTIVENESS IN YAW IN GROUND EFFECT. ALPHA=0. DEG. ELEVTR=0. DEG



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION	
(RCW021)	GWT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	0.000	SREF	9.1952 SQ FT
(RCW024)	GWT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	-10.000	0.000	LREF	6.4320 FT
						BREF	3.8920 FT
						XHRF	1485.0040 IN
						YHRF	0.0000 IN
						ZHRF	377.0004 IN
						SCALE	0.0400

MACH 0.170

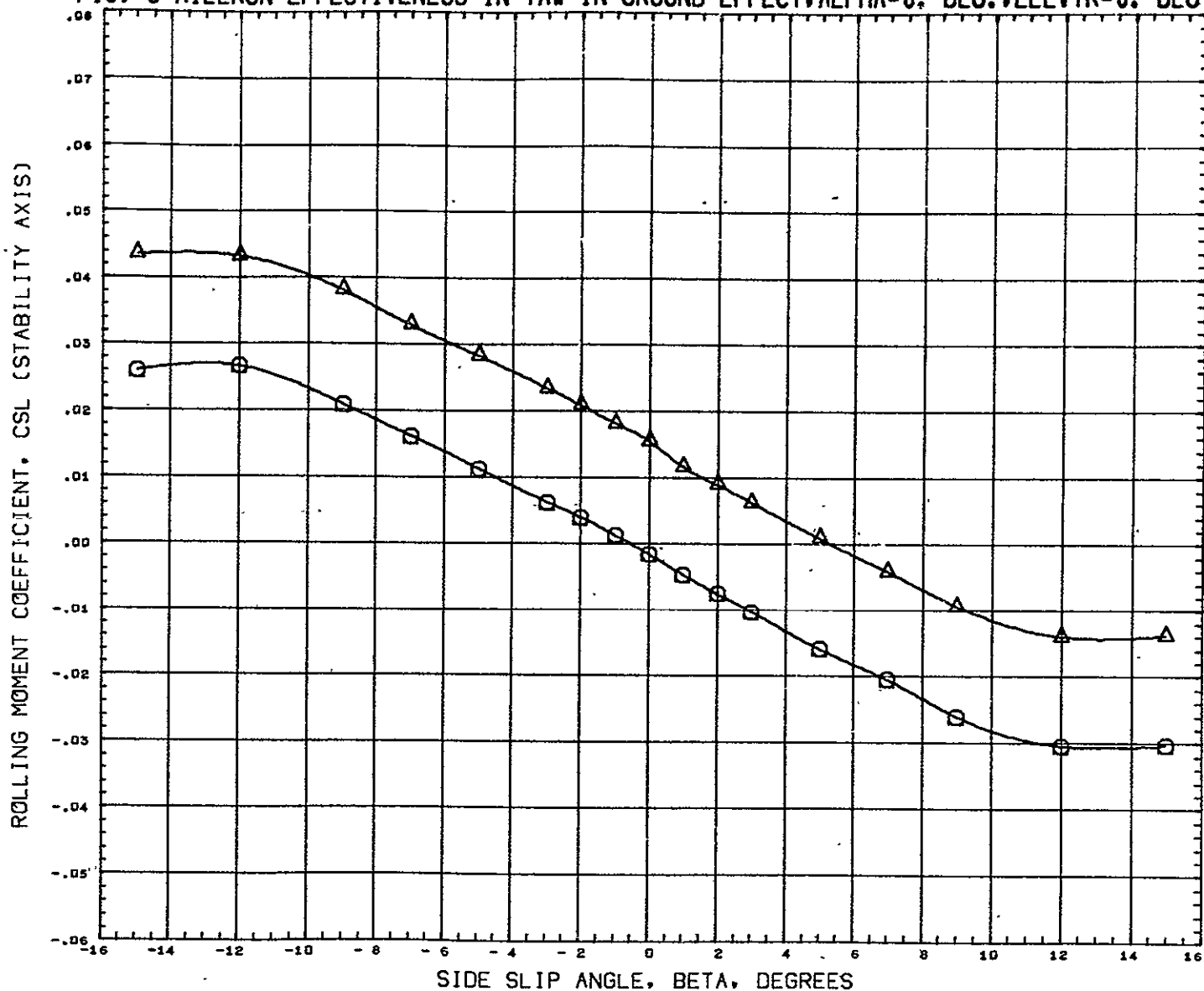
FIG. 8 AILERON EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=0. DEG., ELEVTR=0. DEG



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCWD21)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCWD24)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	-10.000	0.000	LREF 6.4320 FT
						BREF 3.8920 FT
						XMRP 1485.0040 IN
						YMRP 0.0000 IN
						ZMRP 377.6004 IN
						SCALE 0.0400

MACH 0.170

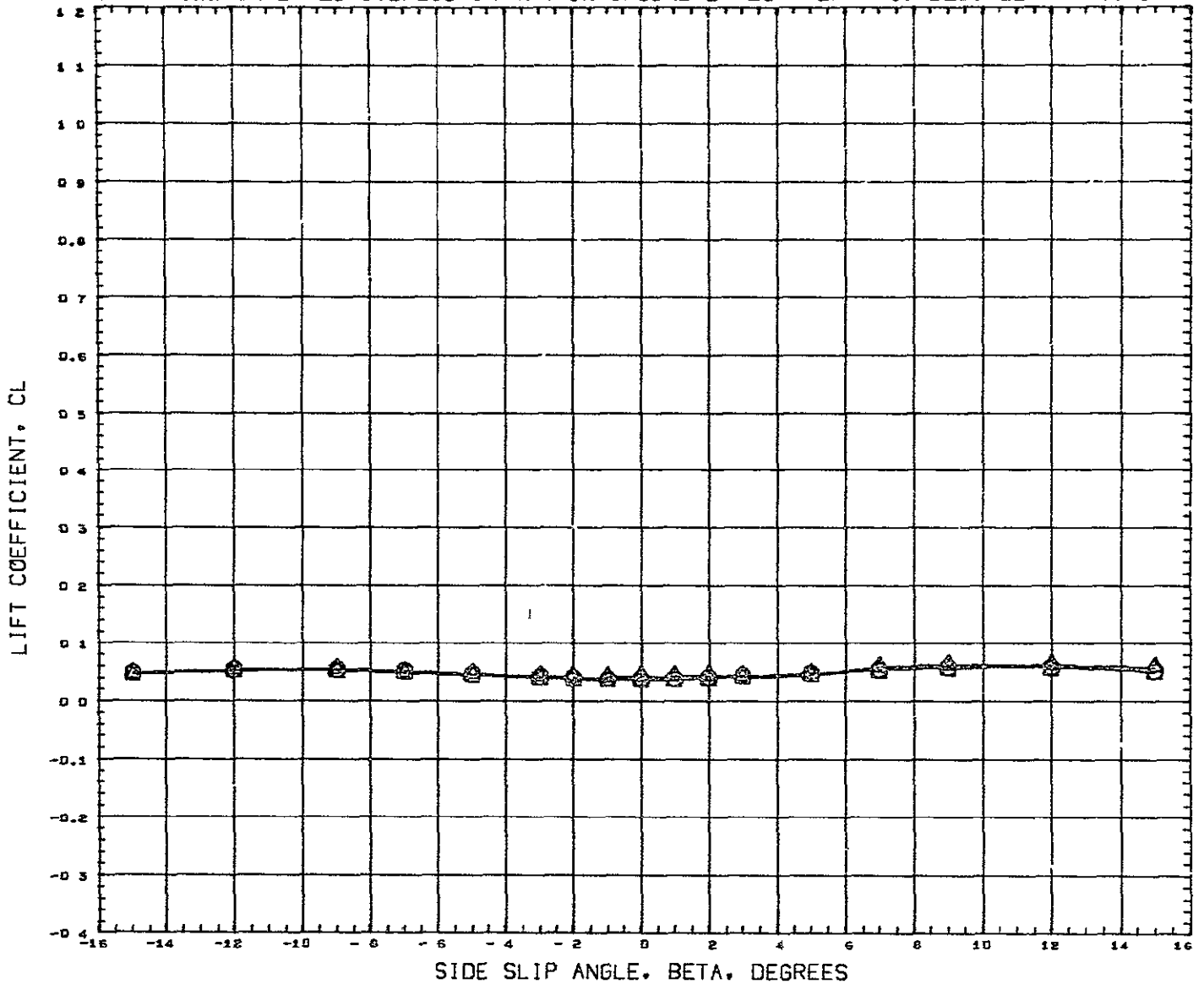
FIG. 8 AILERON EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=0. DEG., ELEVTR=0. DEG



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW021)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCW024)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	-10.000	0.000	LREF 6.4320 FT
						BREF 3.6920 FT
						XMRP 1485.0040 IN
						YMRP 0.0000 IN
						ZMRP 377.0004 IN
						SCALE 0.0400

MACH 0.170

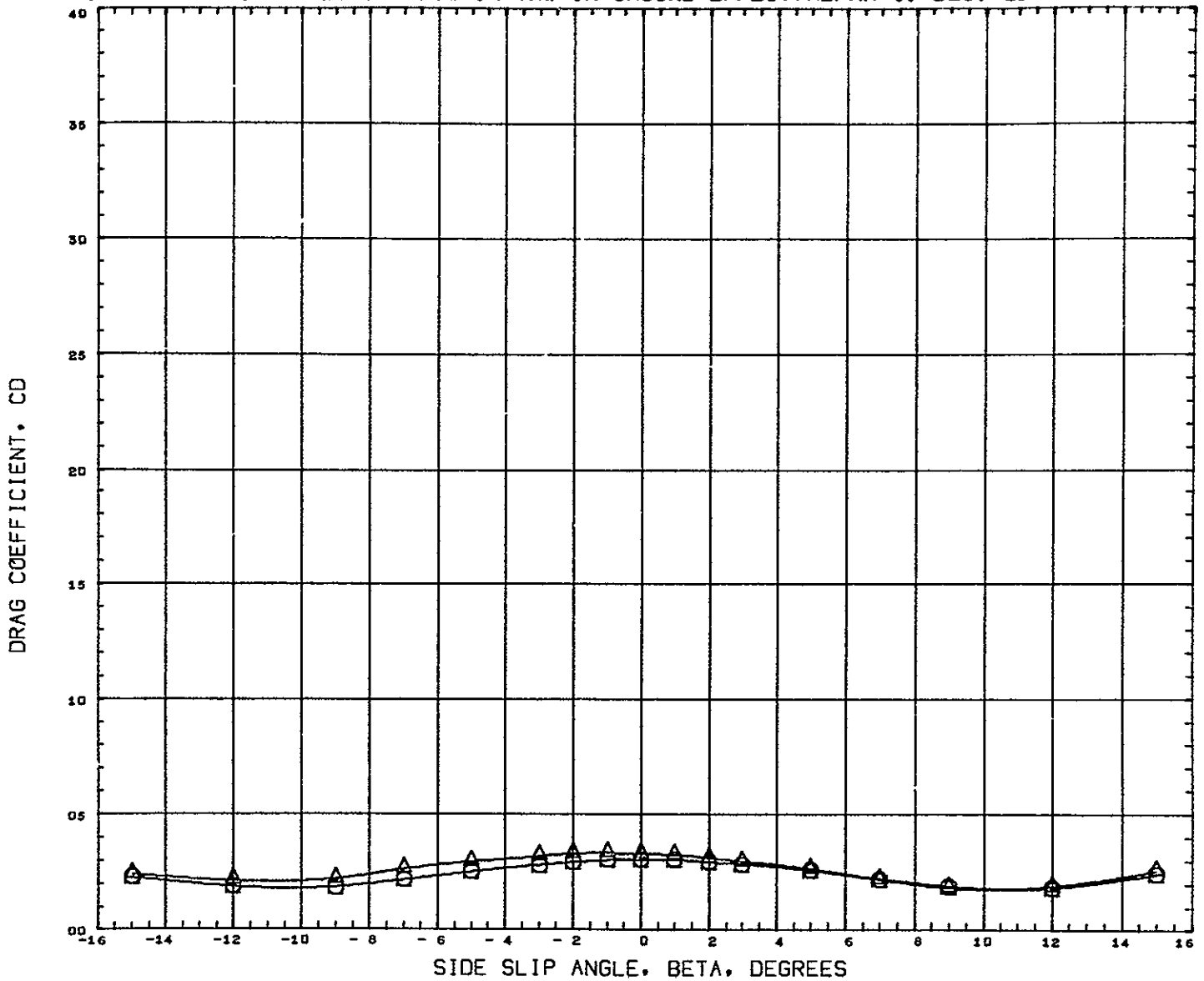
FIG. 8 AILERON EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=0. DEG., ELEVTR=0. DEG



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW021)	⊙ GWT 290-CONF ROS-NB1 B1F1W1V1GB	0 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
(RCW024)	△ GWT 290-CONF ROS-NB1 B1F1W1V1GB	0 000	0 000	-10 000	0 000	LREF 6 4320 FT
						BREF 3 8920 FT
						AMRF 1485 0040 IN
						YMRP 0 0000 IN
						ZMRP 377 0004 IN
						SCALE 0 0400

MACH 0 170

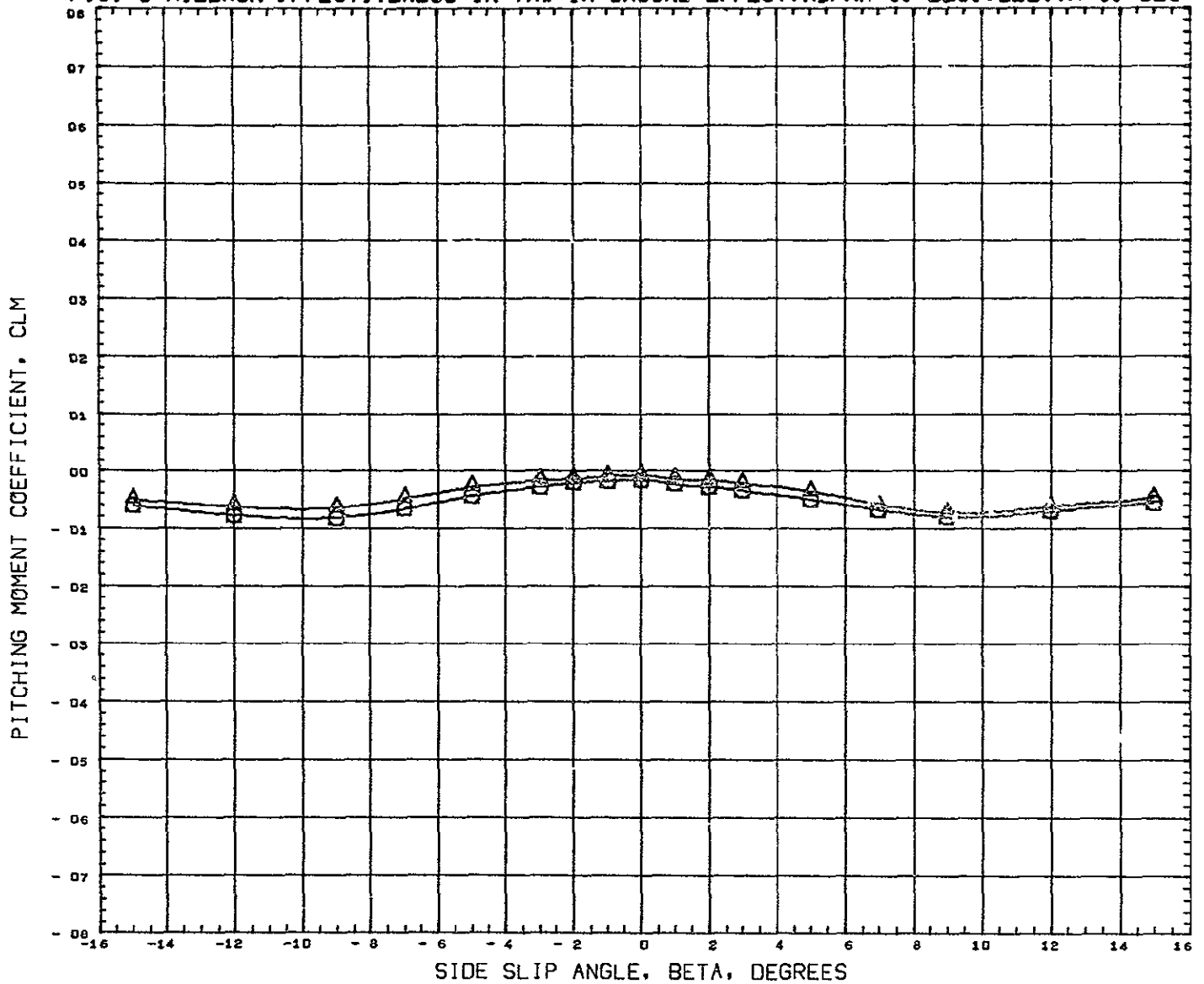
FIG. 8 AILERON EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=0. DEG., ELEVTR=0. DEG



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW021)	GWT 290-CONF ROS-NB1 B1F1W1V16B	0 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
(RCW024)	GWT 290-CONF ROS-NB1 B1F1W1V16B	0 000	0 000	-10 000	0 000	LREF 6 4320 FT
						BREF 3 8920 FT
						XNRF 1485 0040 IN
						YHRF 0 0000 IN
						ZHRF 377 0004 IN
						SCALE 0 0400

MACH 0 170

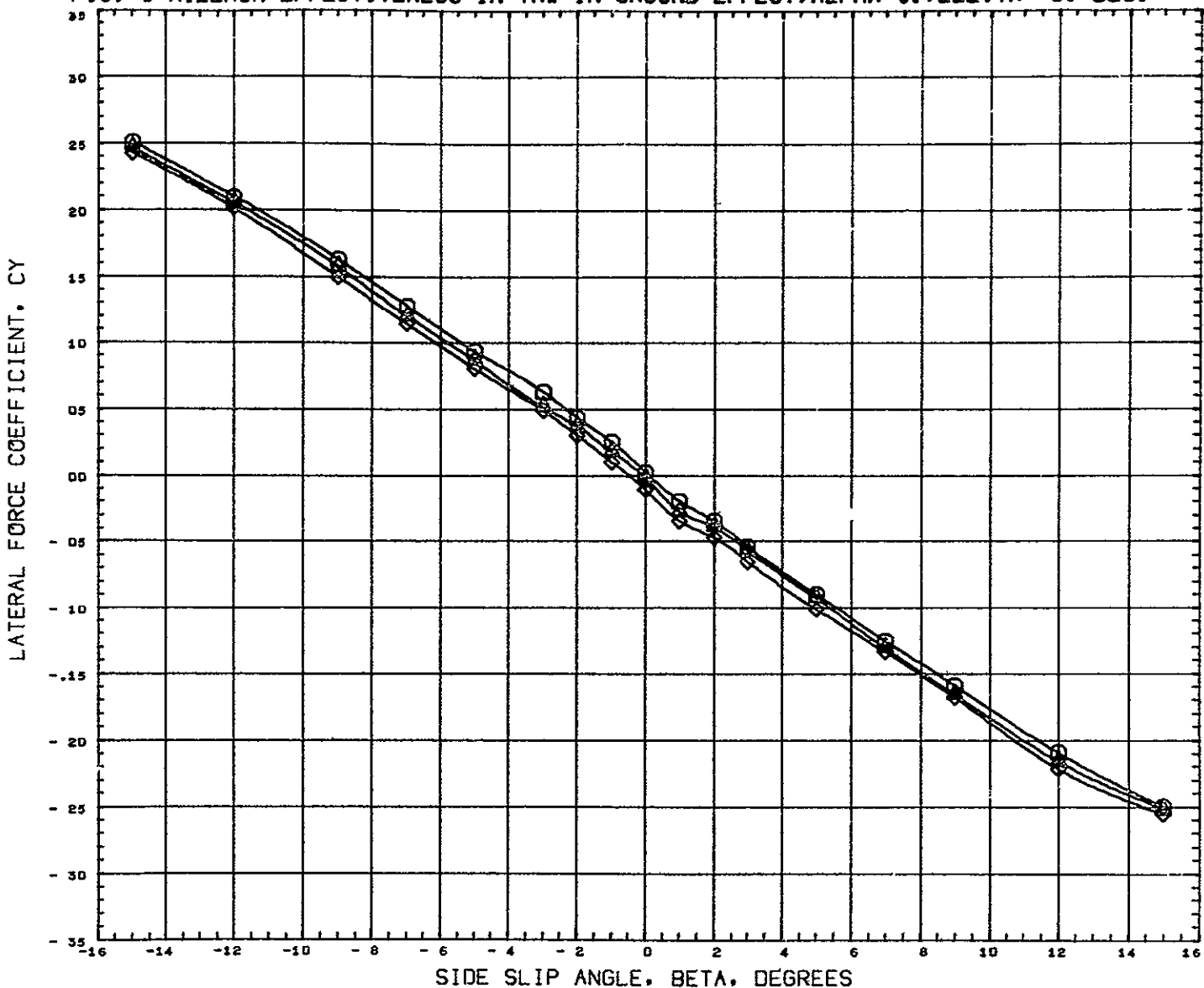
FIG. 8 AILERON EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=0. DEG., ELEVTR=0. DEG



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCWD21) ○	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
(RCWD24) △	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0 000	0 000	-10 000	0 000	LREF 6 4320 FT
						BREF 3 8920 FT
						XNRF 1485 0040 IN
						YNRF 0 0000 IN
						ZNRF 377 0004 IN
						SCALE 0 0400

MACH 0 170

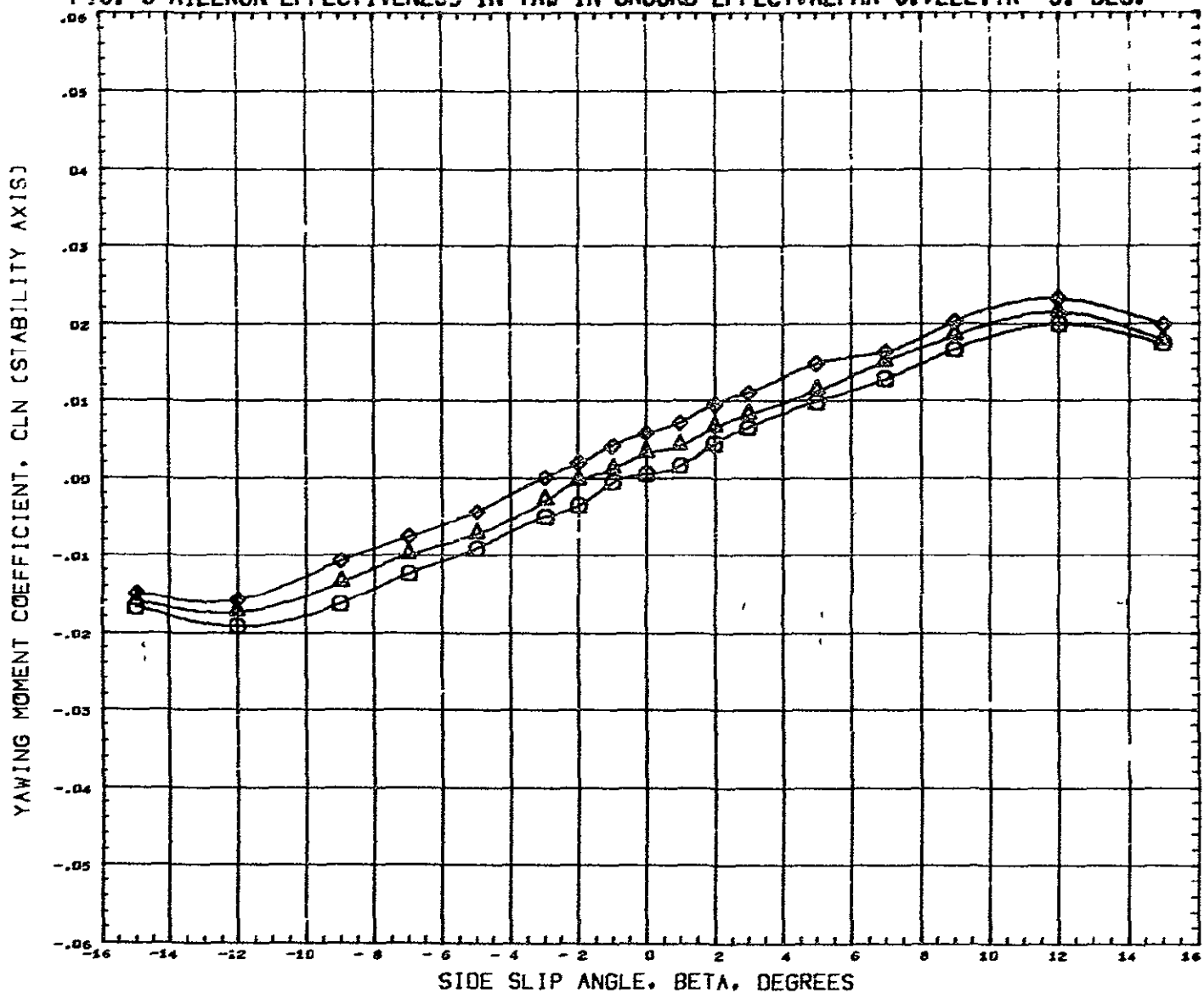
FIG. 9 AILERON EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=0., ELEVTR=-5. DEG.



DATA SET	SYMBOL	CONFIGURATION	DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION	
(RCWD27)	○	GWTT 290-CONF	ROS-NB1 B1F1W1V1GB	0 000	-5 000	0 000	0 000	SREF	9 1952 SQ FT
(RCWD22)	△	GWTT 290-CONF	ROS-NB1 B1F1W1V1GB	0 000	-5 000	0 000	0 000	LREF	6 4320 FT
(RCWD25)	◇	GWTT 290-CONF	ROS-NB1 B1F1W1V1GB	0 000	-5 000	-20 000	0 000	BREF	3 8920 FT
								XMRP	1485 0040 IN
								YMRP	0 0000 IN
								ZMRP	377 0004 IN
								SCALE	0 0400

MACH 0 170

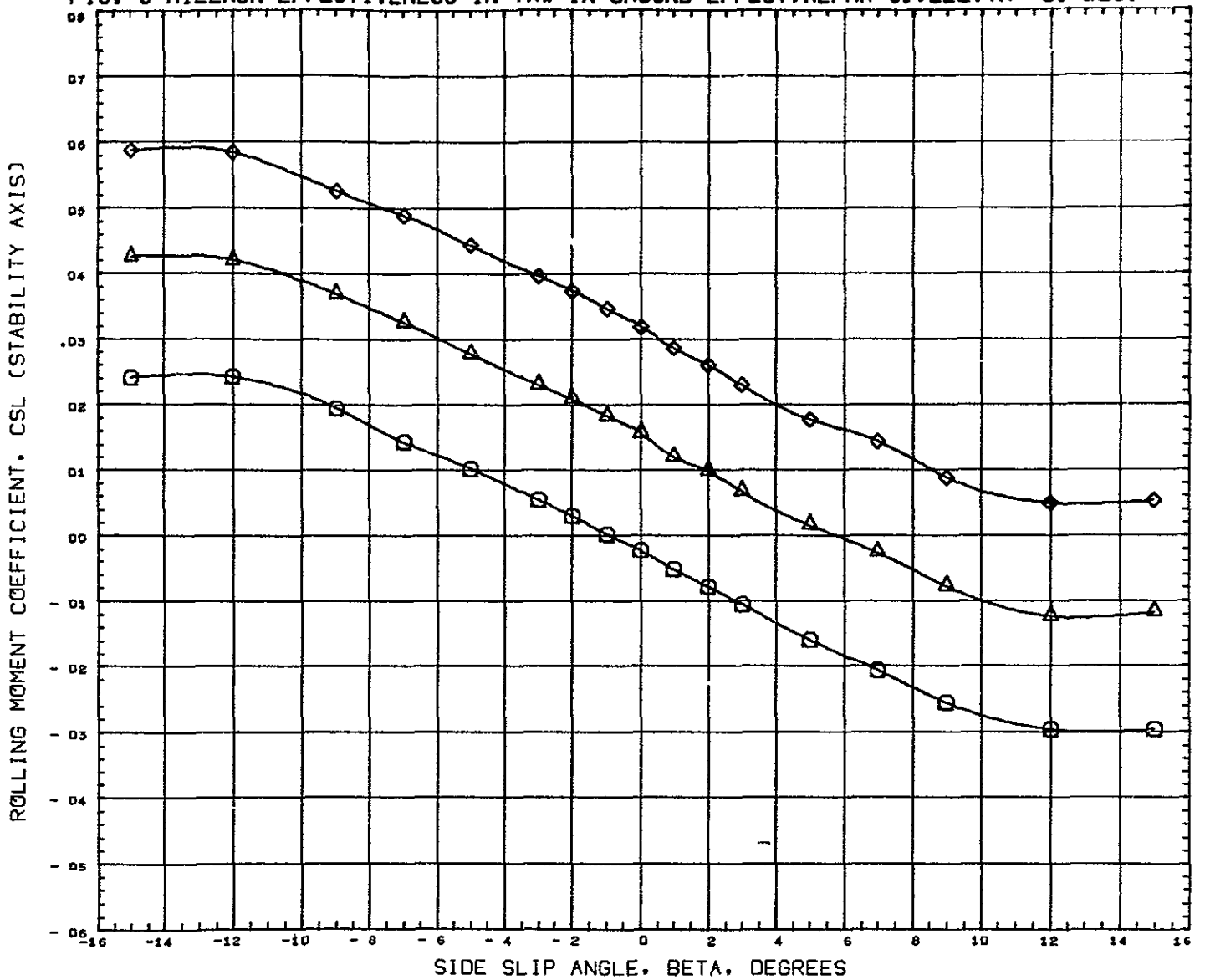
FIG. 9 AILERON EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=0., ELEVTR=-5. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW027)	QWTI 290-COMF ROS-NB1 B1F1W1V168	0 000	-5.000	0 000	0 000	SREF 9 1952 SQ FT
(RCW022)	QWTI 290-COMF ROS-NB1 B1F1W1V168	0 000	-5.000	0 000	0 000	LREF 6 4320 FT
(RCW025)	QWTI 290-COMF ROS-NB1 B1F1W1V168	0 000	-5 000	-20 000	0 000	BREF 3 8920 FT
						XNRF 1485 0040 IN
						YNRF 0 0055 IN
						ZNRF 377.0004 IN
						SCALE 0 0450

MACH 0 170

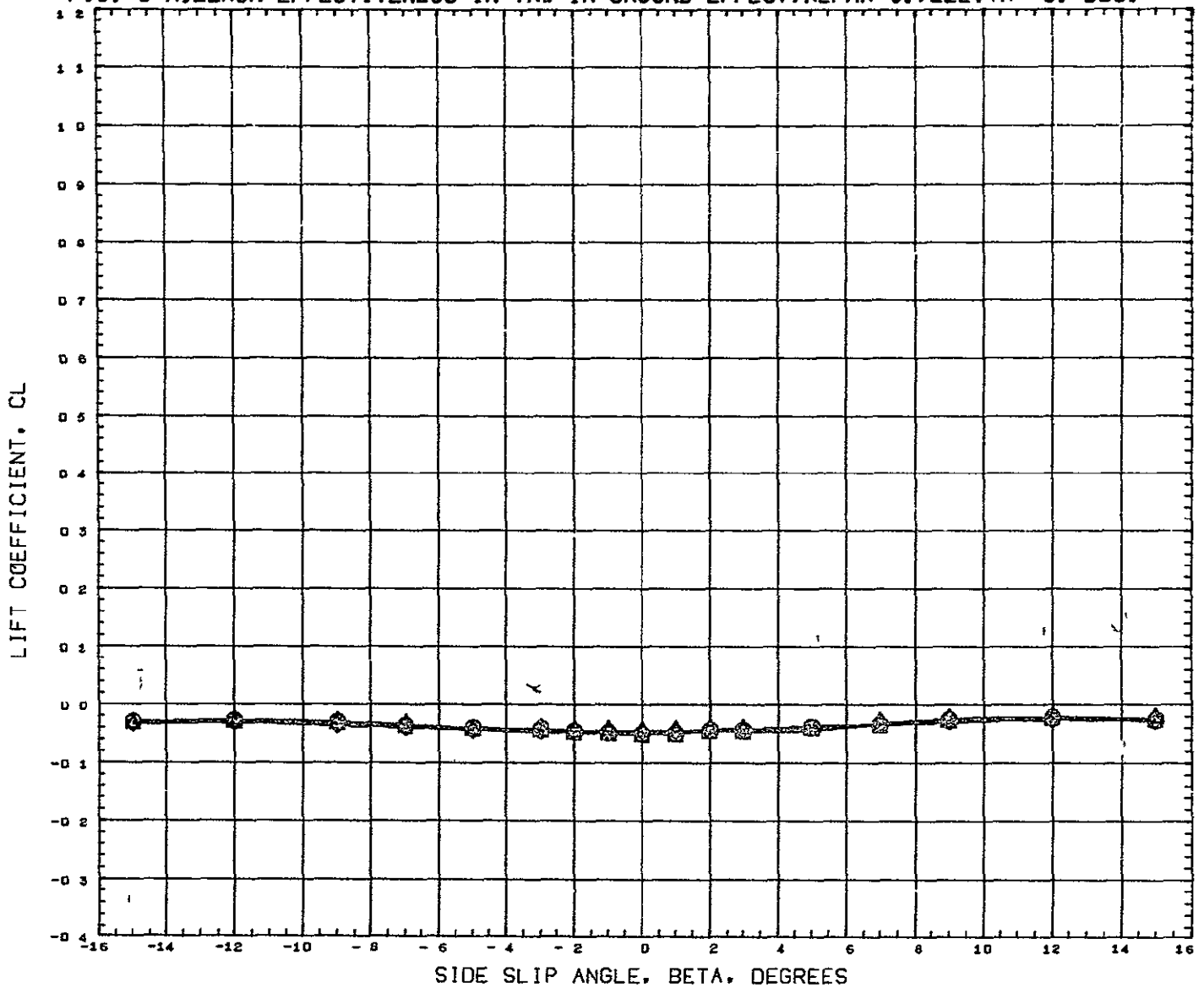
FIG. 9 AILERON EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=0., ELEVTR=-5. DEG.



DATA SET	SYMBOL	CONFIGURATION	DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION	
(RCWD27)	○	GWTT 29D-CONF	ROS-NB1 B1F1W1V1GB	0 000	-5 000	0 000	0 000	SREF	9 1952 SQ FT
(RCWD22)	△	GWTT 29D-CONF	ROS-NB1 B1F1W1V1GB	0 000	-5 000	0 000	0 000	LREF	6 4320 FT
(RCWD25)	◇	GWTT 29D-CONF	ROS-NB1 B1F1W1V1GB	0 000	-5 000	-20 000	0 000	BREF	3 8920 FT
								XMRP	1485 0040 IN
								YMRP	0 0000 IN
								ZMRP	377 0004 IN
								SCALE	0 0400

NACH 0 170

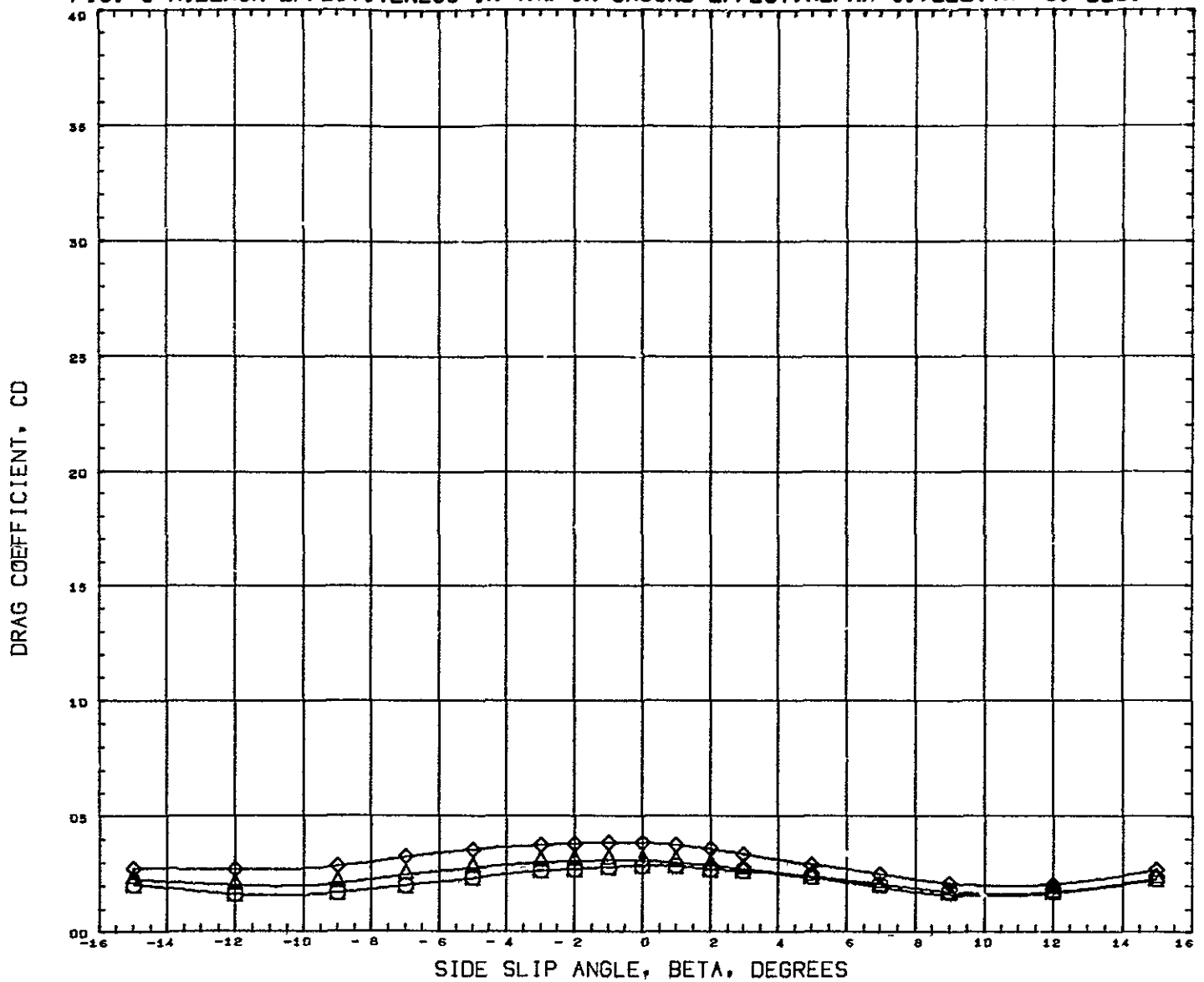
FIG. 9 AILERON EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=0., ELEVTR=-5. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCWD27)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0 000	-5 000	0 000	0 000	SREF 9 1952 SQ FT
(RCWD22)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0 000	-5 000	0 000	0 000	LREF 6 4320 FT
(RCWD25)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0 000	-5 000	-20 000	0 000	BREF 3 8920 FT
						XMRP 1485 0045 IN
						YMRP 0 0000 IN
						ZMRP 377 0004 IN
						SCALE 0 0400

MACH 0 170

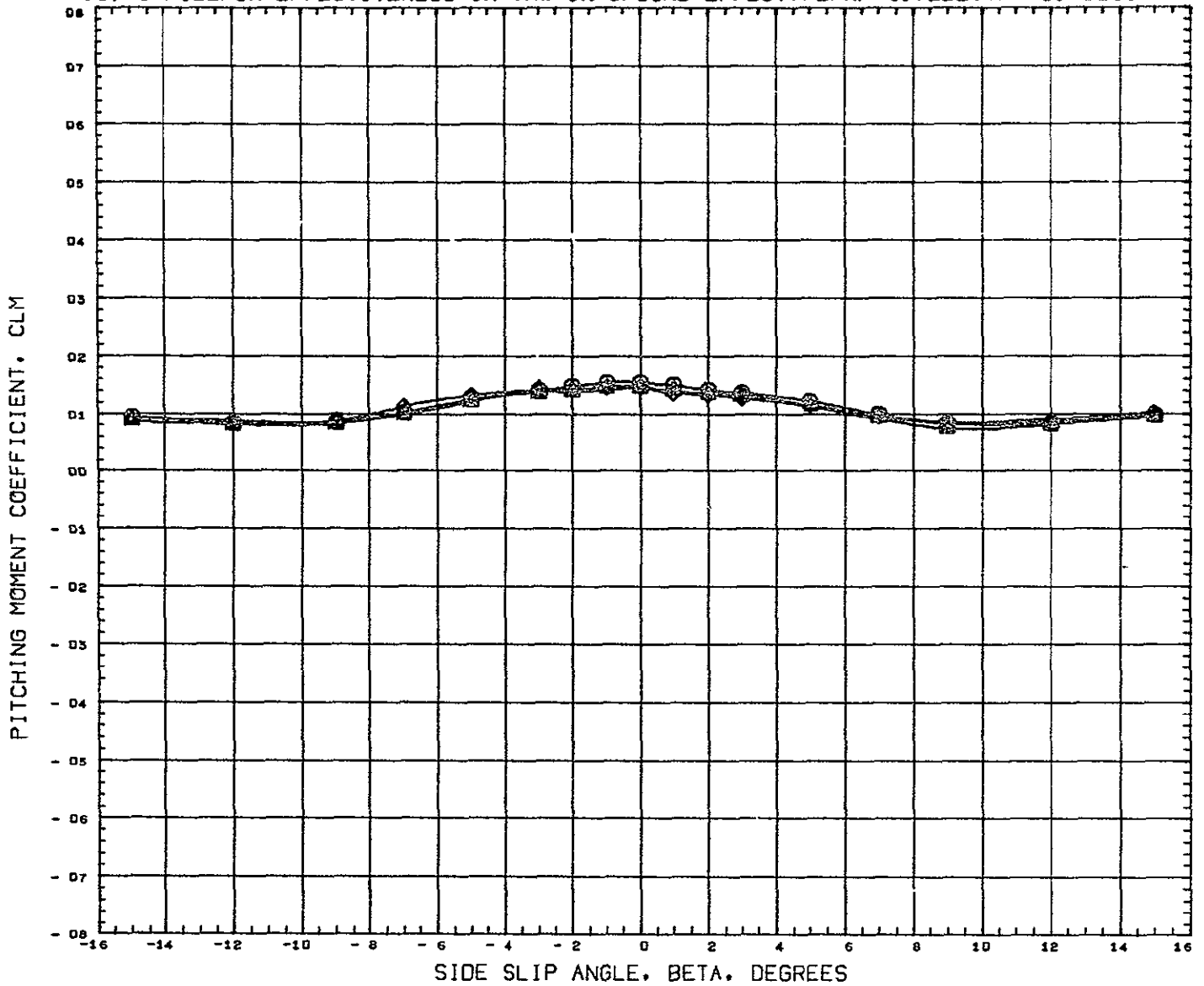
FIG. 9 AILERON EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=0., ELEVTR=-5. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW027)	GWTT 290-CONF ROS-NB1 B1F1W1V16B	0 000	-5 000	0 000	0 000	SREF 9 1952 SQ FT
(RCW022)	GWTT 290-CONF ROS-NB1 B1F1W1V16B	0 000	-5 000	0 000	0 000	LREF 6 4320 FT
(RCW025)	GWTT 290-CONF ROS-NB1 B1F1W1V16B	0 000	-5 000	-20 000	0,000	BREF 3 8920 FT
						XMRP 1485 0040 IN
						YMRP 0 0000 IN
						ZMRP 377 0004 IN
						SCALE 0 0400

MACH 0 170

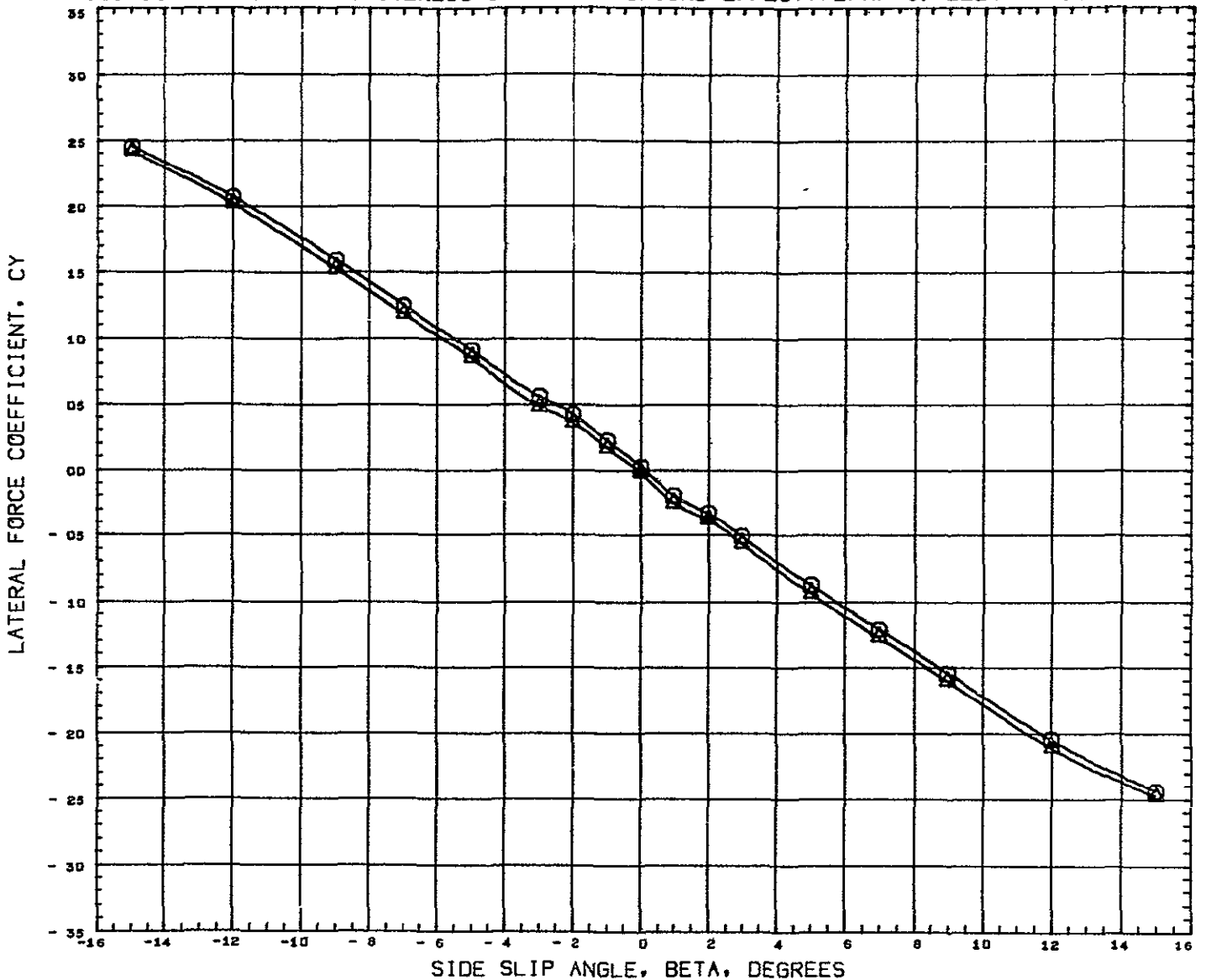
FIG. 9 AILERON EFFECTIVENESS IN YAW IN GROUND EFFECT. ALPHA=0. ELEVTR=-5. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW027)	GWT 290-CONF ROS-NB1 B1F1W1V16B	0 000	-5 000	0 000	0 000	SREF 9 1952 SQ FT
(RCW022)	GWT 290-CONF ROS-NB1 B1F1W1V16B	0 000	-5 000	0 000	0 000	LREF 6 4320 FT
(RCW025)	GWT 290-CONF ROS-NB1 B1F1W1V16B	0 000	-5 000	-20 000	0 000	BREF 3 8920 FT
						XMRP 1485 0048 IN
						YMRP 0 0000 IN
						ZMRP 377 0004 IN
						SCALE 0 0400

MACH 0 170

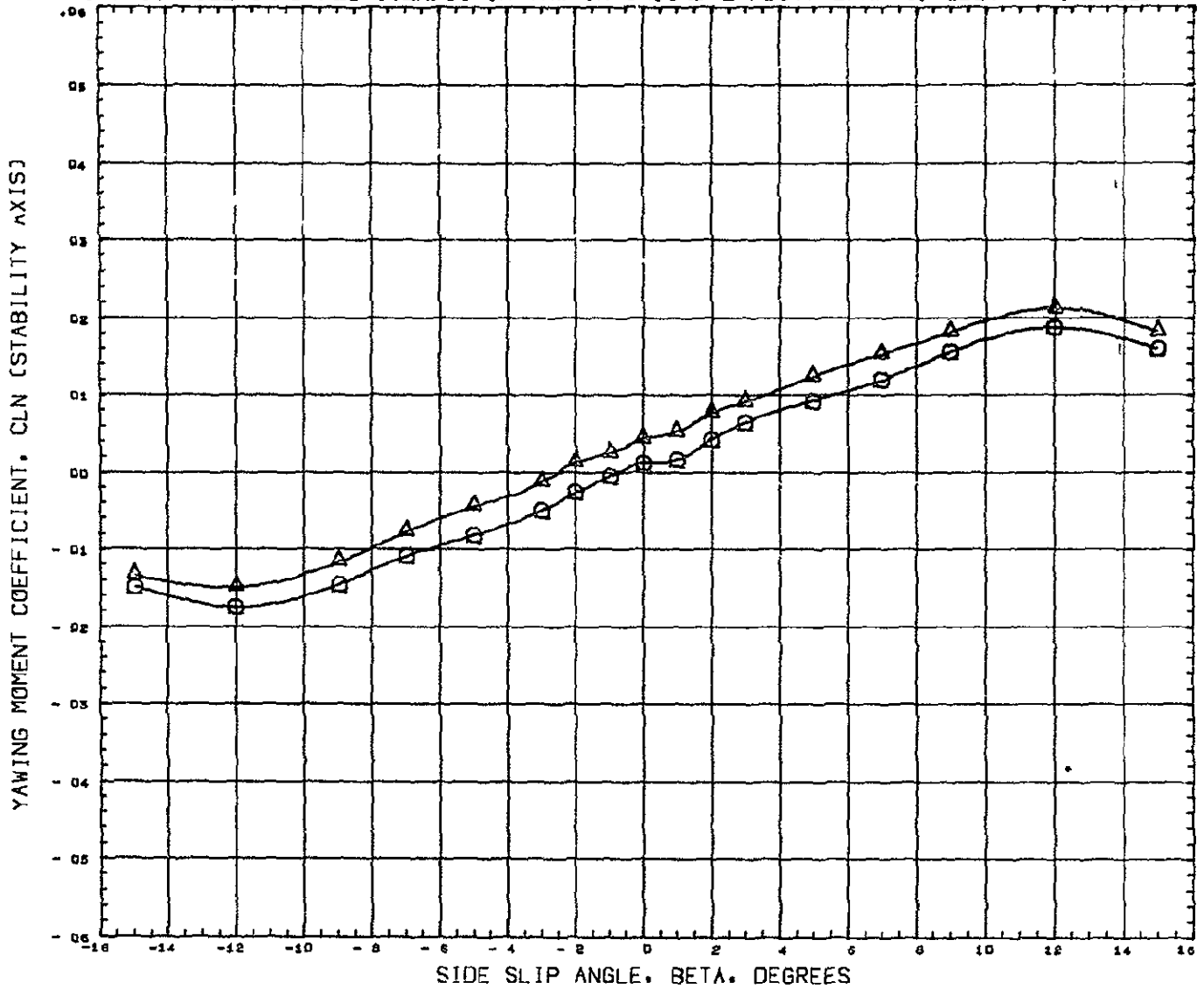
FIG. 10 AILERON EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=0., ELEVTR=-10. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW023)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0 000	-10 000	0 000	0 000	SREF 9 1952 SQ FT
(RCW026)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0 000	-10 000	-10 000	0 000	LREF 6 4320 FT
						BREF 3 8920 FT
						XMRP 1485 0040 IN
						YMRP 0 0000 IN
						ZMRP 377 0004 IN
						SCALE 0 0400

MACH 0 170

FIG. 10 AILERON EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=0., ELEVTR=-10. DEG.

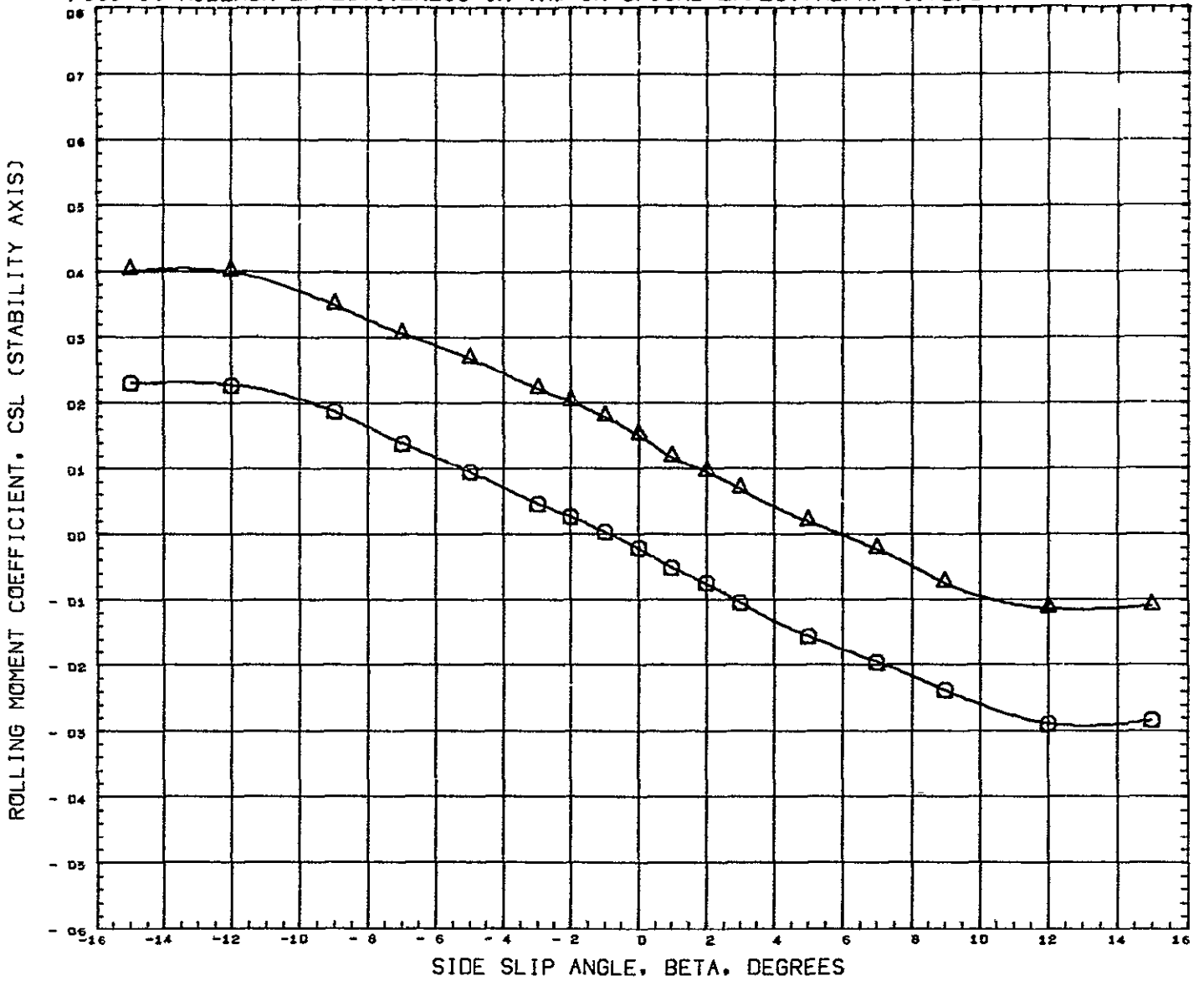


DATA SET SYMBOL CONFIGURATION DESCRIPTION
 (RCW025) GWTT 290-CONF ROS-NB1 B1F1W1V16B
 (RCW026) GWTT 290-CONF ROS-NB1 B1F1W1V16B

ALPHA	ELEVTR	AILRON	RUGGER	REFERENCE INFORMATION
0 000	-10 000	0 000	0 000	SREF 9 1952 SQ FT
0 000	-10 000	-10 000	0 000	LREF 6 4320 FT
				BREF 3 0920 FT
				XWRP 1485 0040 IN
				YWRP 0 0000 IN
				ZWRP 377 0004 IN
				SCALE 0 0400

MACH 0 170

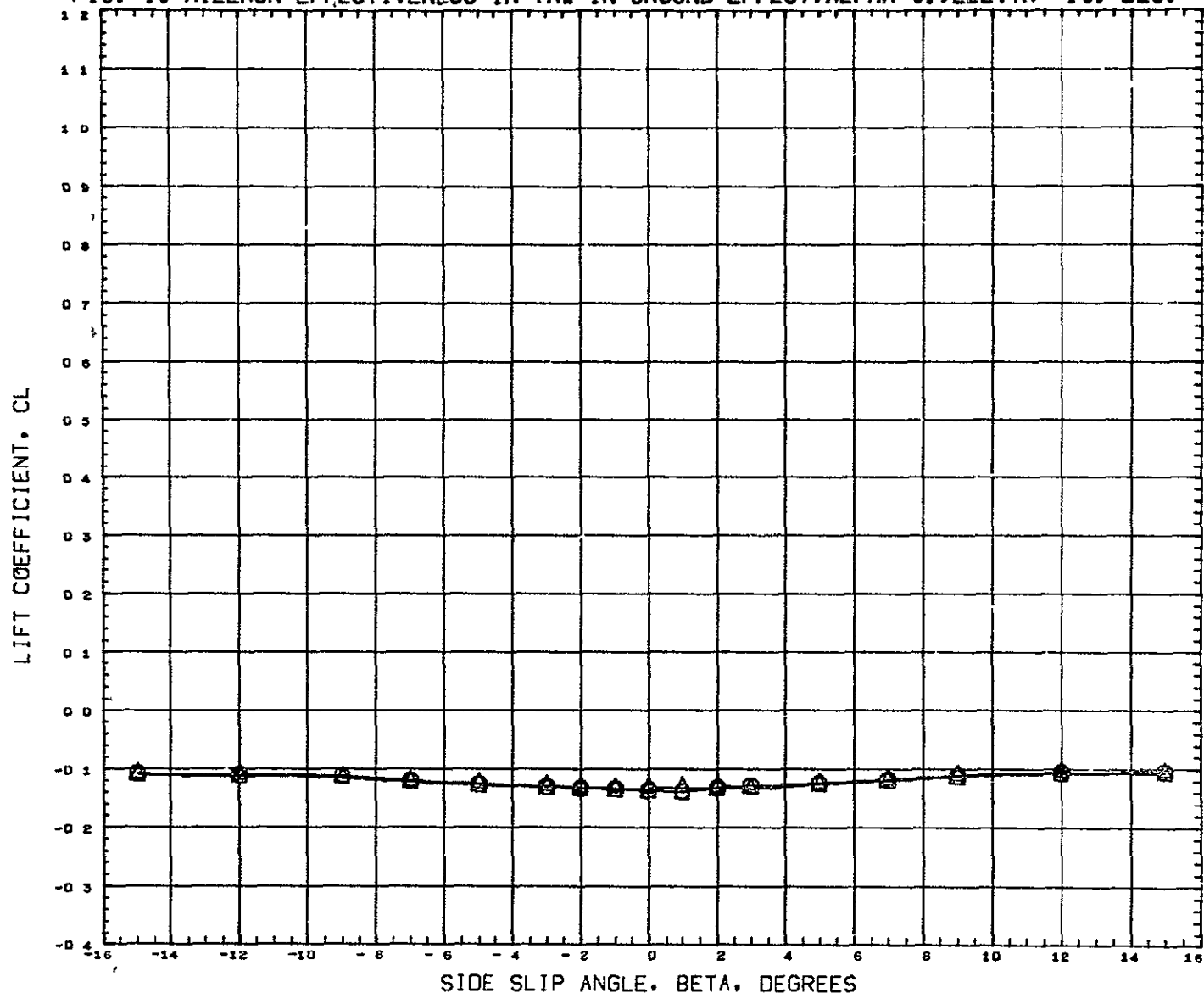
FIG. 10 AILERON EFFECTIVENESS IN YAW IN GROUND EFFECT. ALPHA=0., ELEVTR=-10. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW023)	□ GWTT 29D-CONF ROS-NB1 B1F1W1V16B	0 000	-10 000	0 000	0 000	SREF 9 1952 SQ FT
(RCW026)	△ GWTT 29D-CONF ROS-NB1 B1F1W1V16B	0 000	-10 000	-10 000	0 000	LREF 6 4320 FT
						BREF 3 8920 FT
						XMRP 1485 0040 IN
						YMRP 0 0000 IN
						ZMRP 377 0004 IN
						SCALE 0.0400

MACH 0 170

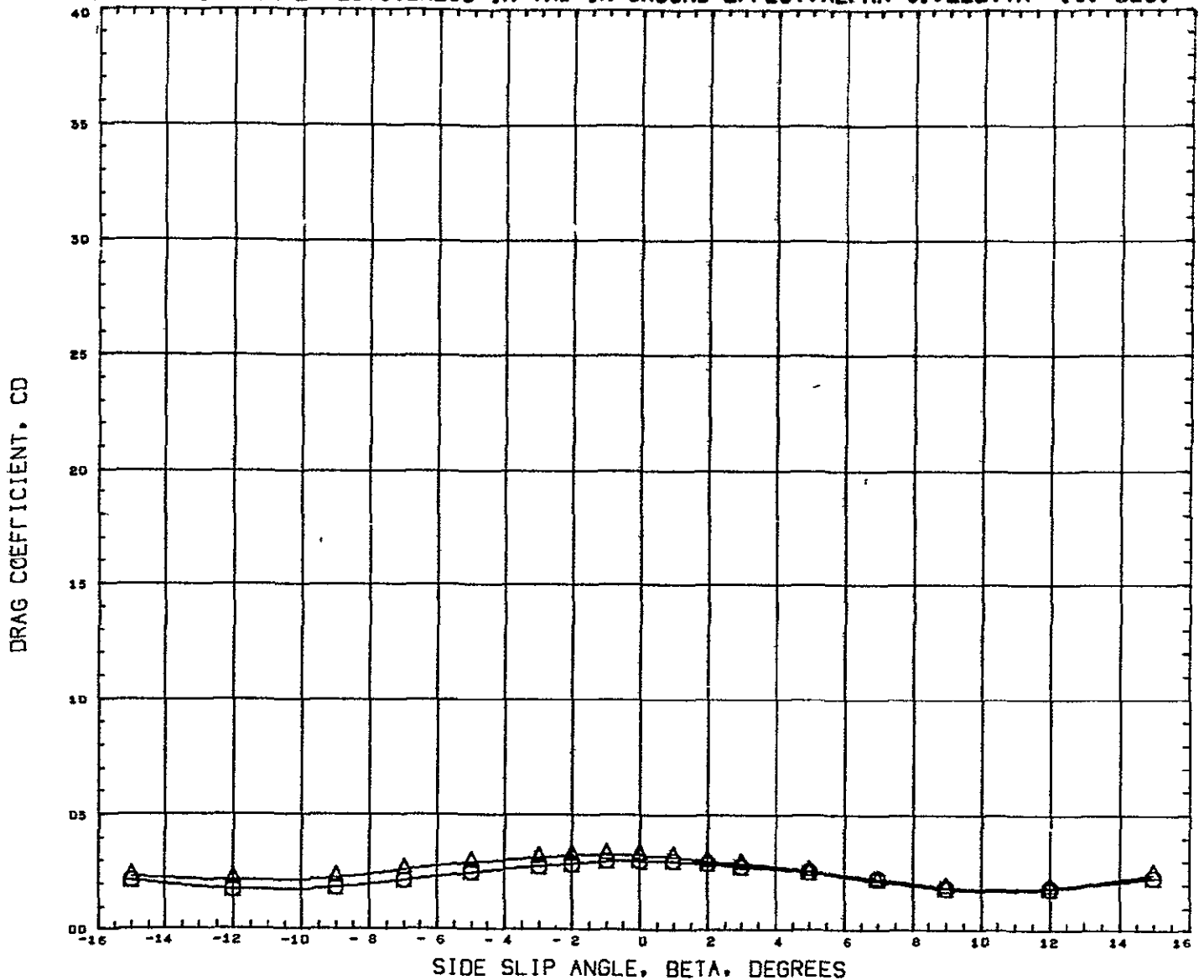
FIG. 10 AILERON EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=0., ELEVTR=-10. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW023)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0 000	-10 000	0 000	0 000	SREF 9 1952 SQ FT
(RCW026)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0 000	-10 000	-10 000	0 000	LREF 6 4320 FT
						BREF 3 8920 FT
						XHRP 1485 0040 IN
						YHRP 0 0000 IN
						ZHRP 377 0004 IN
						SCALE 0 0400

MACH 0 170

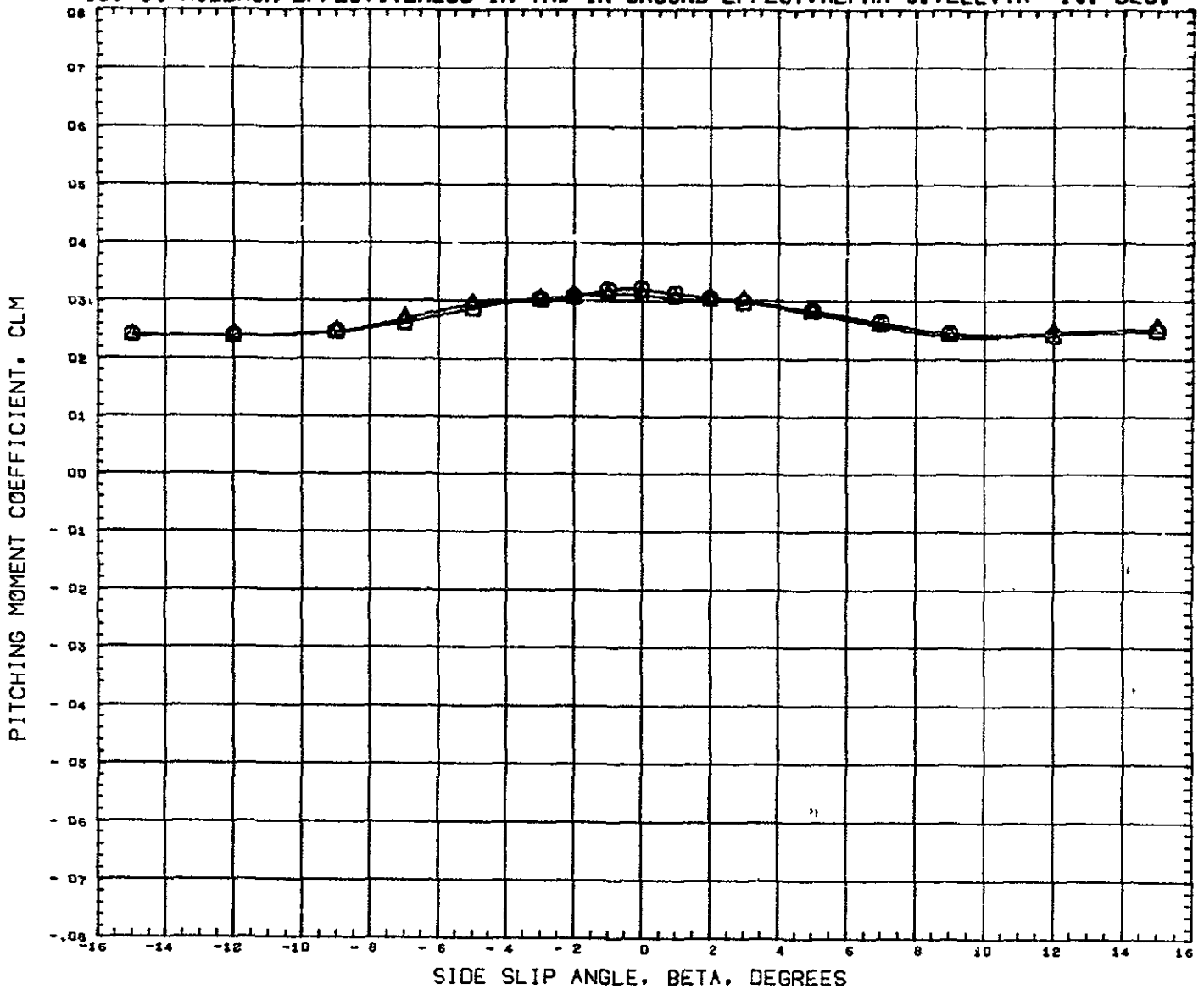
FIG. 10 AILERON EFFECTIVENESS IN YAW IN GROUND EFFECT. ALPHA=0., ELEVTR=-10. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW23) \square	GWT 290-CONF ROS-NB1 B1F1W1V1GB	0 000	-10 000	0 000	0.000	SREF 9 1952 SQ FT
(RCW26) \triangle	GWT 290-CONF ROS-NB1 B1F1W1V1GB	0 000	-10 000	-10 000	0 000	LREF 6 4320 FT
						BREF 3 8920 FT
						XMRP 1485 0040 IN
						YMRP 0 0000 IN
						ZMRP 377 0004 IN
						SCALE 0 0400

MACH 0 170

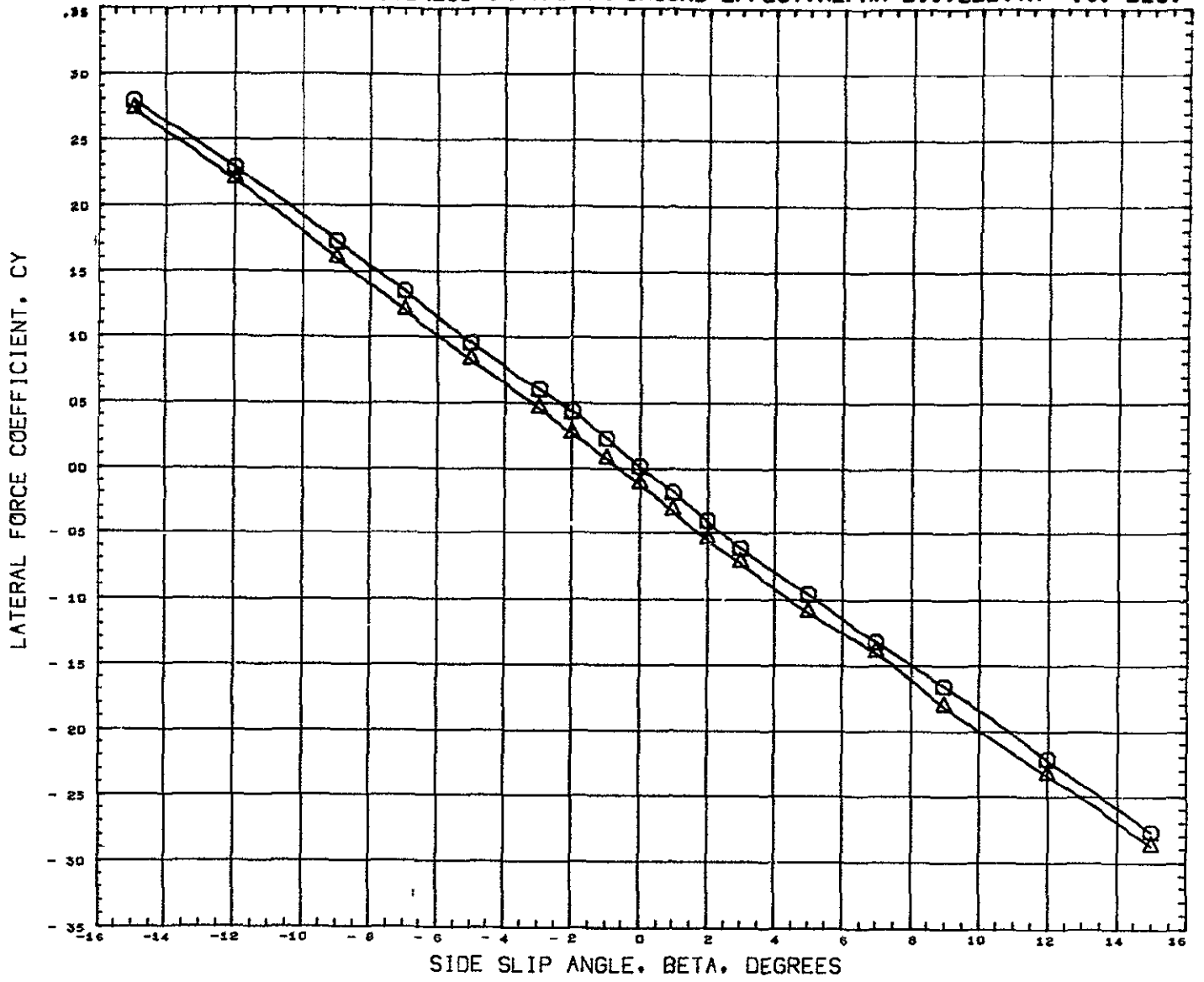
FIG. 10 AILERON EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=0., ELEVTR=-10. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW023)	GWT 290-CONF ROS-NB1 B1F1W1V1GB	0 000	-10 000	0 000	0 000	SREF 9 1952 SQ FT
(RLW026)	GWT 290-CONF ROS-NB1 B1F1W1V1GB	0 000	-10 000	-10 000	0 000	LREF 6 4320 FT
						BREF 3 8920 FT
						XNRF 1485 0040 IN
						YNRF 0 0000 IN
						ZNRF 377 0004 IN
						SCALE 0 0400

MACH 0 170

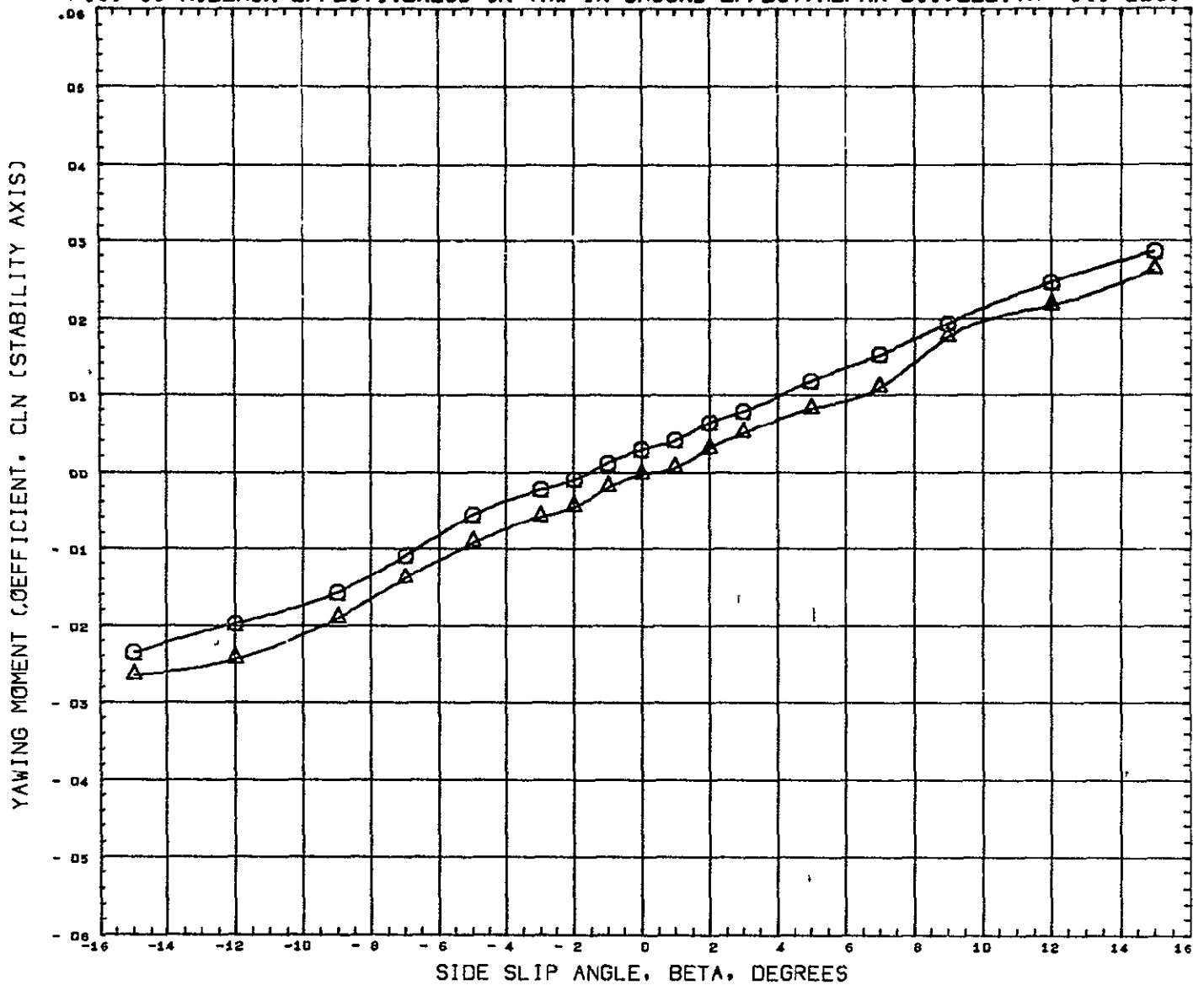
FIG. 11 AILERON EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=21., ELEVTR=-10. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(ACWD33)	GWTT 290-CONF ROS-NB: B1F1W1V1GB	-10 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
(ACWD30)	GWTT 290-CONF ROS-NB: B1F1W1V1GB	-10 000	-10 000	0 000	0 000	LREF 6 4320 FT
						BREF 3 8920 FT
						XHRP 1485 0040 IN
						YHRP 0 0000 IN
						ZHRP 377 0004 IN
						SCALE 0 0400

MACH 0 170

FIG. 11 AILERON EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=21., ELEVTR=-10. DEG.

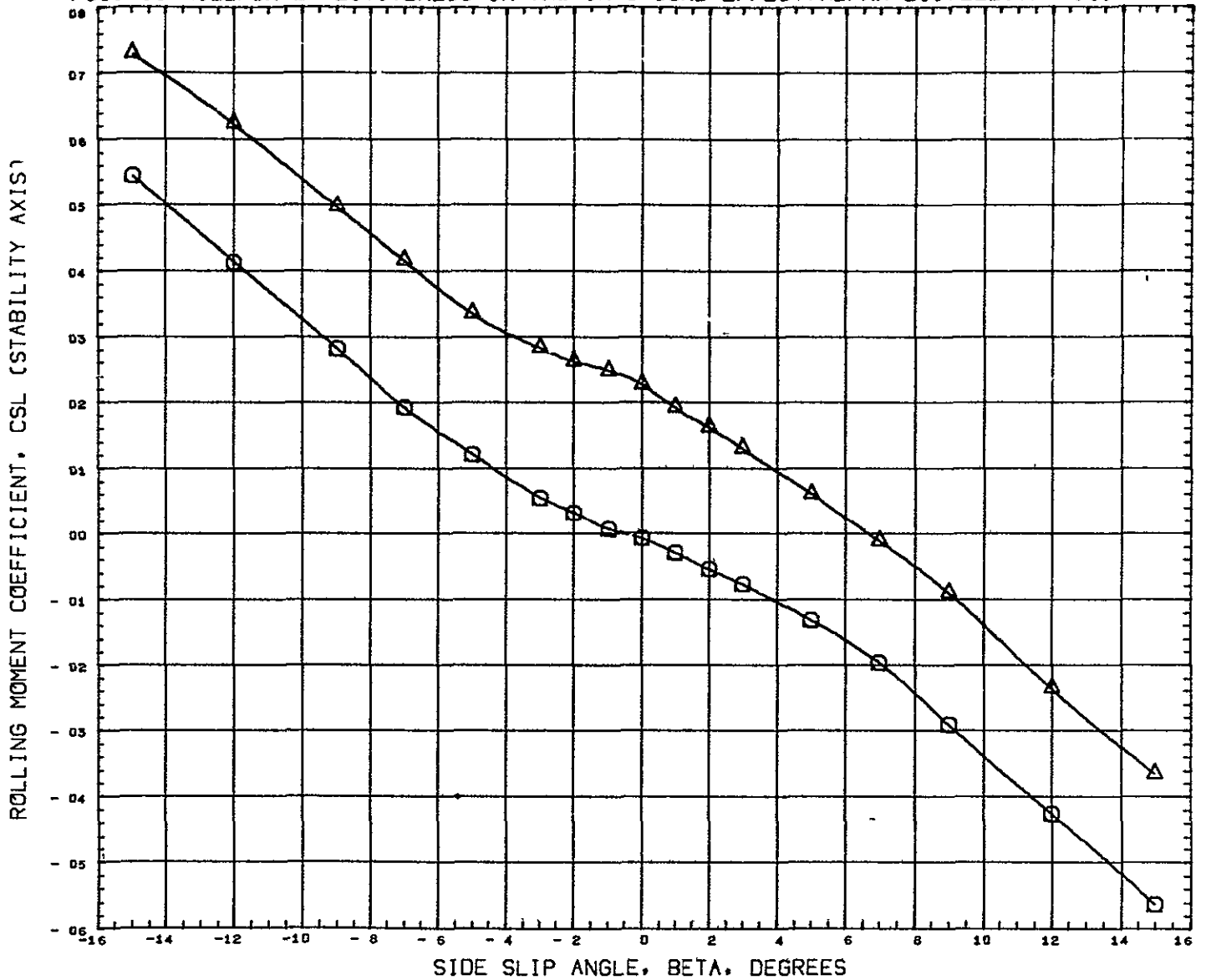


DATA SET SYMBOL CONFIGURATION DESCRIPTION
 (ACWB33) ○ GWT 29D-CONF ROS-NB1 B1F1W1V1GB
 (ACWB30) △ GWT 29D-CONF ROS-NB1 B1F1W1V1GB

ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION		
-10 000	0 000	0 000	0 000	SREF	9 1952	SQ FT
-10 000	-10 000	0 000	0 000	LREF	6 4320	FT
				BREF	3 8920	FT
				XMRP	1485 0040	IN
				YMRP	0 0000	IN
				ZMRP	377 0004	IN
				SCALE	0 0400	↓

*MACH 0 170

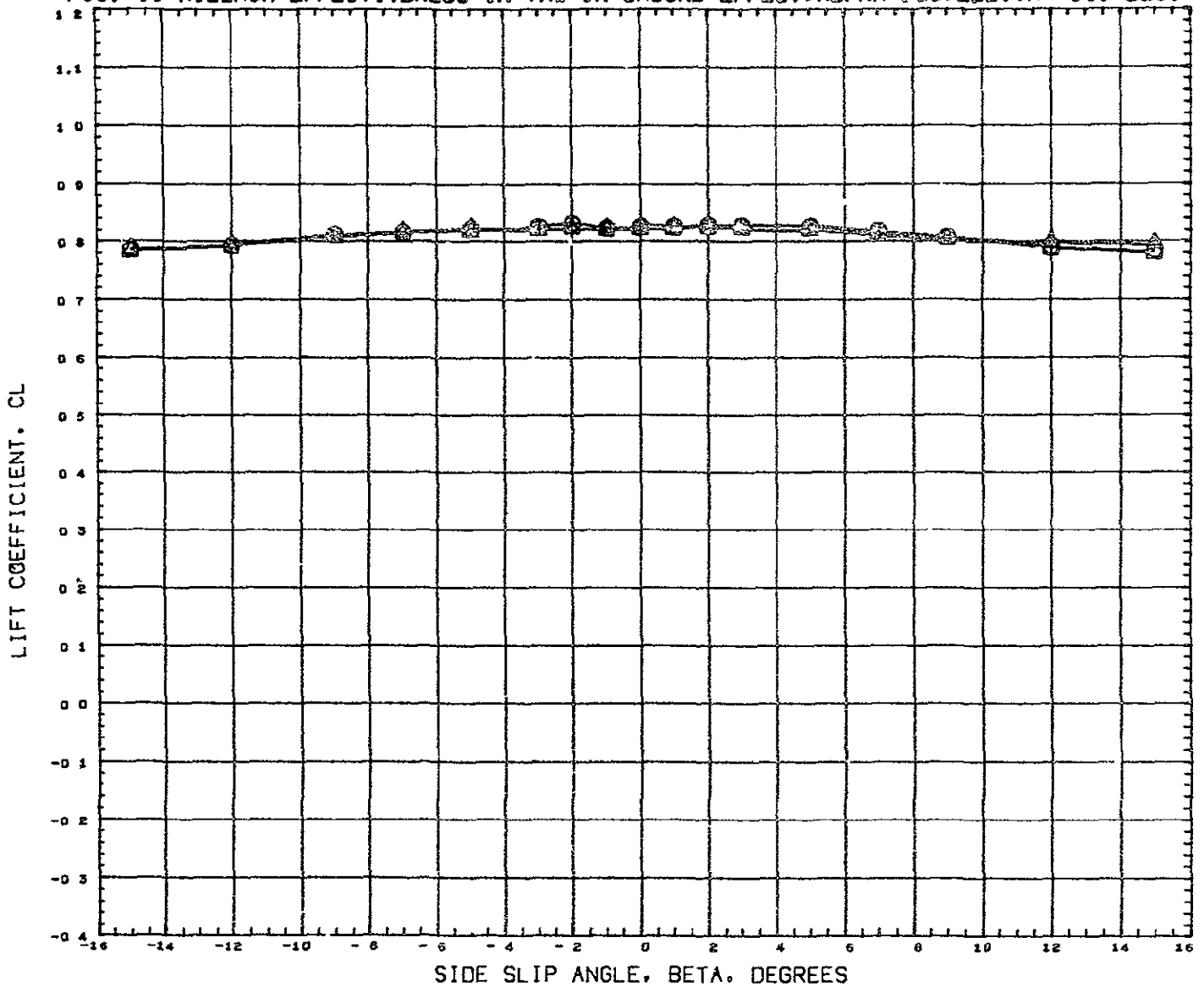
FIG. 11 AILERON EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=21., ELEVTR=-10. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILERON	RUDDER	REFERENCE INFORMATION
(ACW033)	GWTT 29D-CONF ROS-NB1 B1F1W1V1GB	-10 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
(ACW030)	GWTT 29D-CONF ROS-NB1 B1F1W1V1GB	-10 000	-10 000	0 000	0 000	LREF 6 4320 FT
						BREF 3 8920 FT
						XMRP 1485 0040 IN
						YMRP 0 0000 IN
						ZMRP 377 0004 IN
						SCALE 0 0400

MACH 0 170

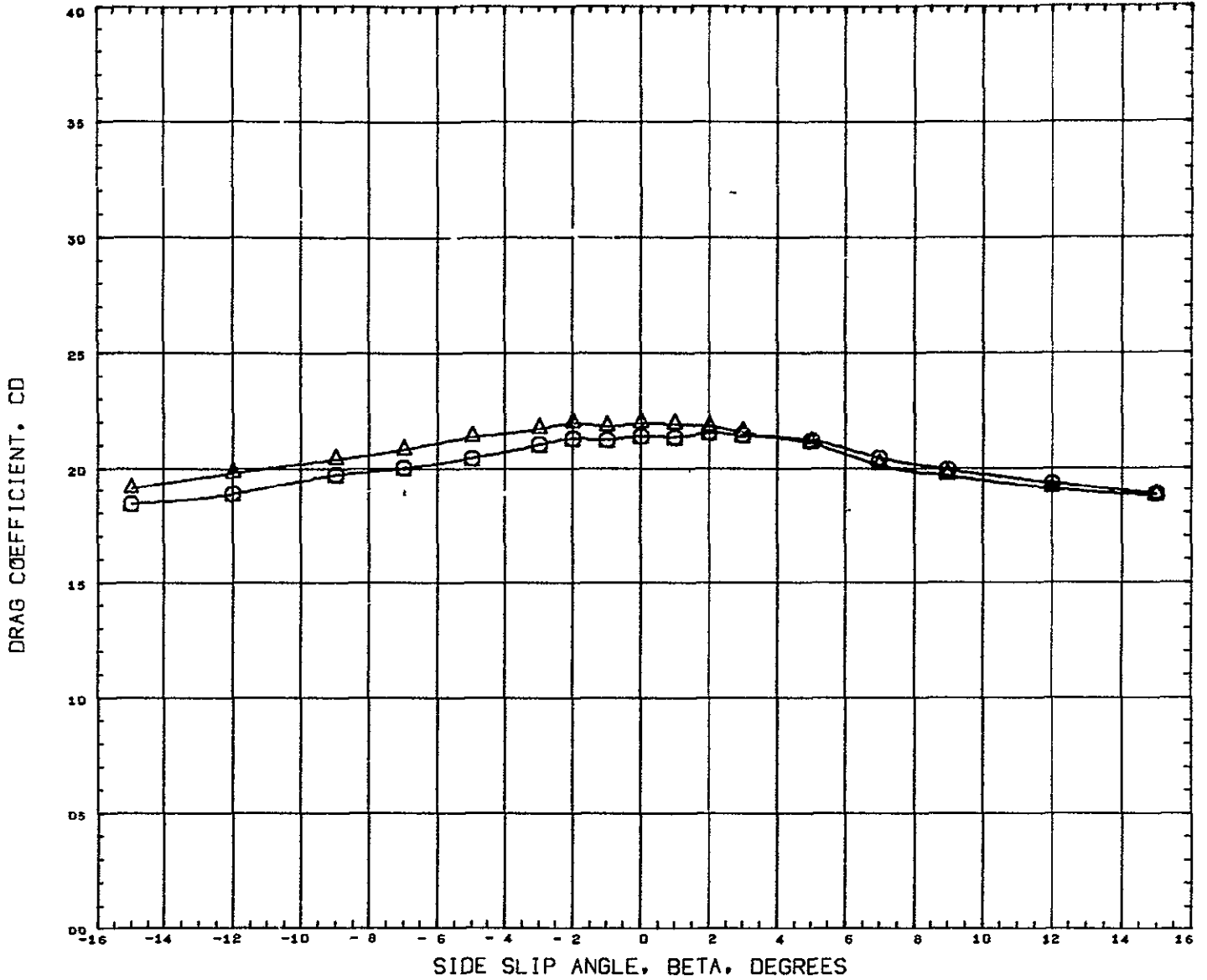
FIG. 11 AILERON EFFECTIVENESS IN YAW IN GROUND EFFECT. ALPHA=21.0. ELEVTR=-10. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(ACW033)	GWIT 290-CONF ROS-NB1 B1F1W1V1GB	-10 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
(ACW030)	GWIT 290-CONF ROS-NB1 B1F1W1V1GB	-10 000	-10 000	0 000	0 000	LREF 6 4320 FT
						BREF 3 8920 FT
						XHRF 1485,0040 IN
						YHRF 0 0000 IN
						ZHRF 377 0004 IN
						SCALE 0 0400

MACH 0.170

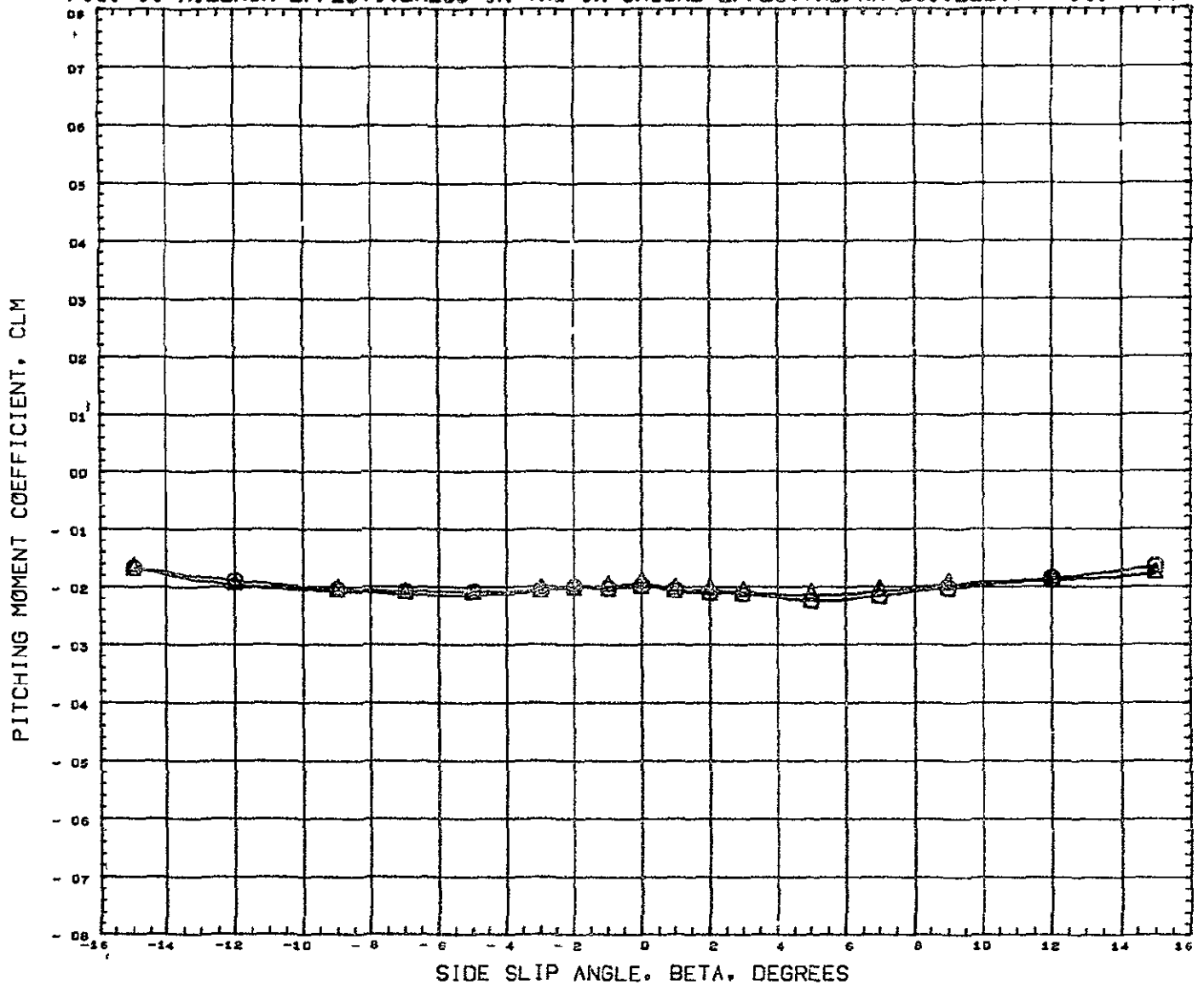
FIG. 11 AILERON EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=21., ELEVTR=-10. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(ACW033)	GWTT 29D-CONF ROS-NB1 B1F1W1V16B	-10 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
(ACW030)	GWTT 29D-CONF ROS-NB1 B1F1W1V16B	-10 000	-10 000	0 000	0 000	LREF 6 4320 FT
						BREF 3 8920 FT
						XHRF 1485 0040 IN
						YHRF 0 0000 IN
						ZHRF 377 0004 IN
						SCALE 0 0400

MACH 0 170

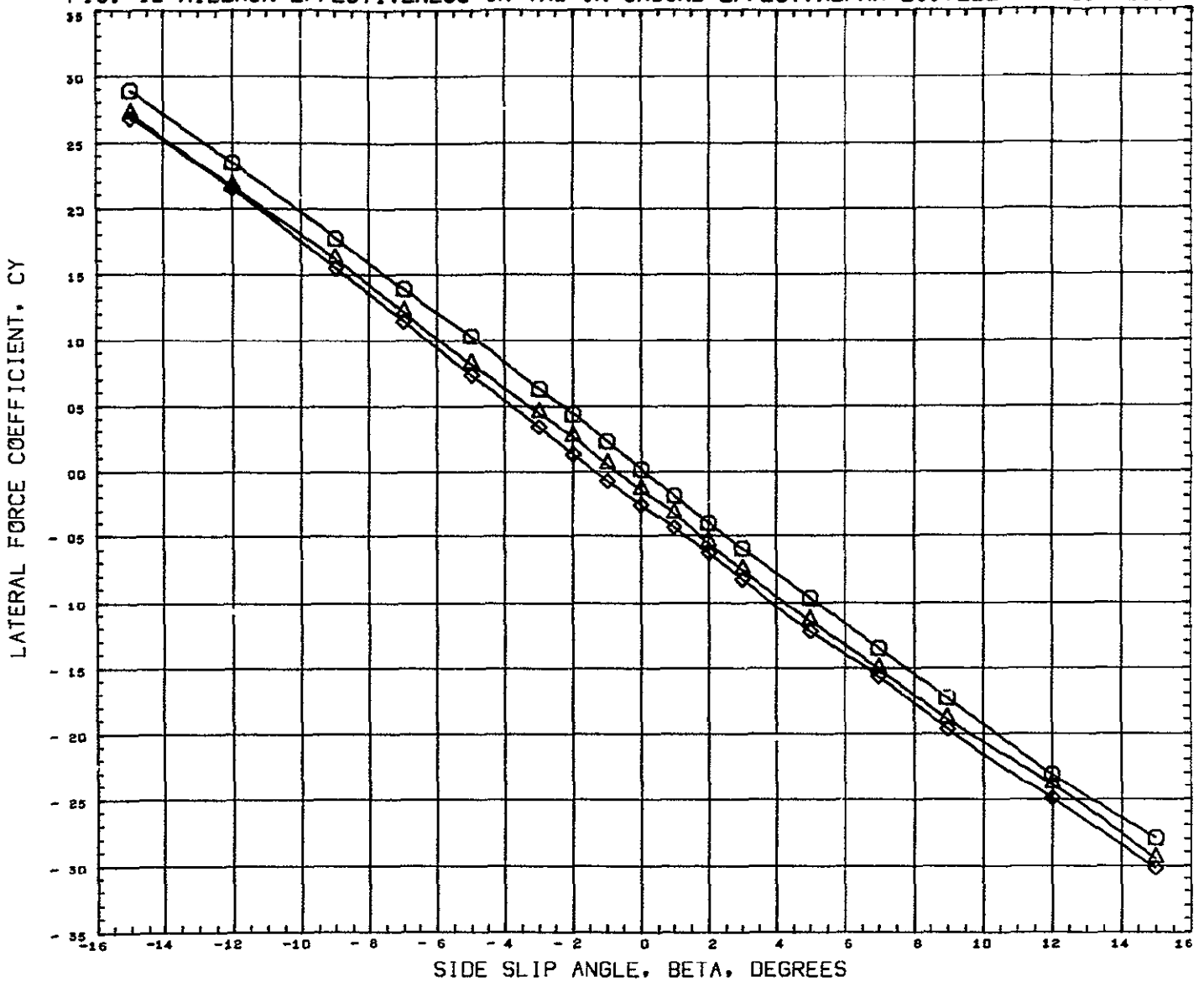
FIG. 11 AILERON EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=21, ELEVTR=-10, DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(ACW033)	GWT 290-CONF RO-NB1 B1F1W1V1GB	-10 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
(ACW030)	GWT 290-CONF ROS-NB1 B1F1W1V1GB	-10 000	-10 000	0 000	0 000	LREF 6 4320 FT
						BRFF 3 8920 FT
						XMRP 1485 0045 IN
						YMRP 0 0000 IN
						ZMRP 377 0004 IN
						SCALE 0 0400

MACH 0 170

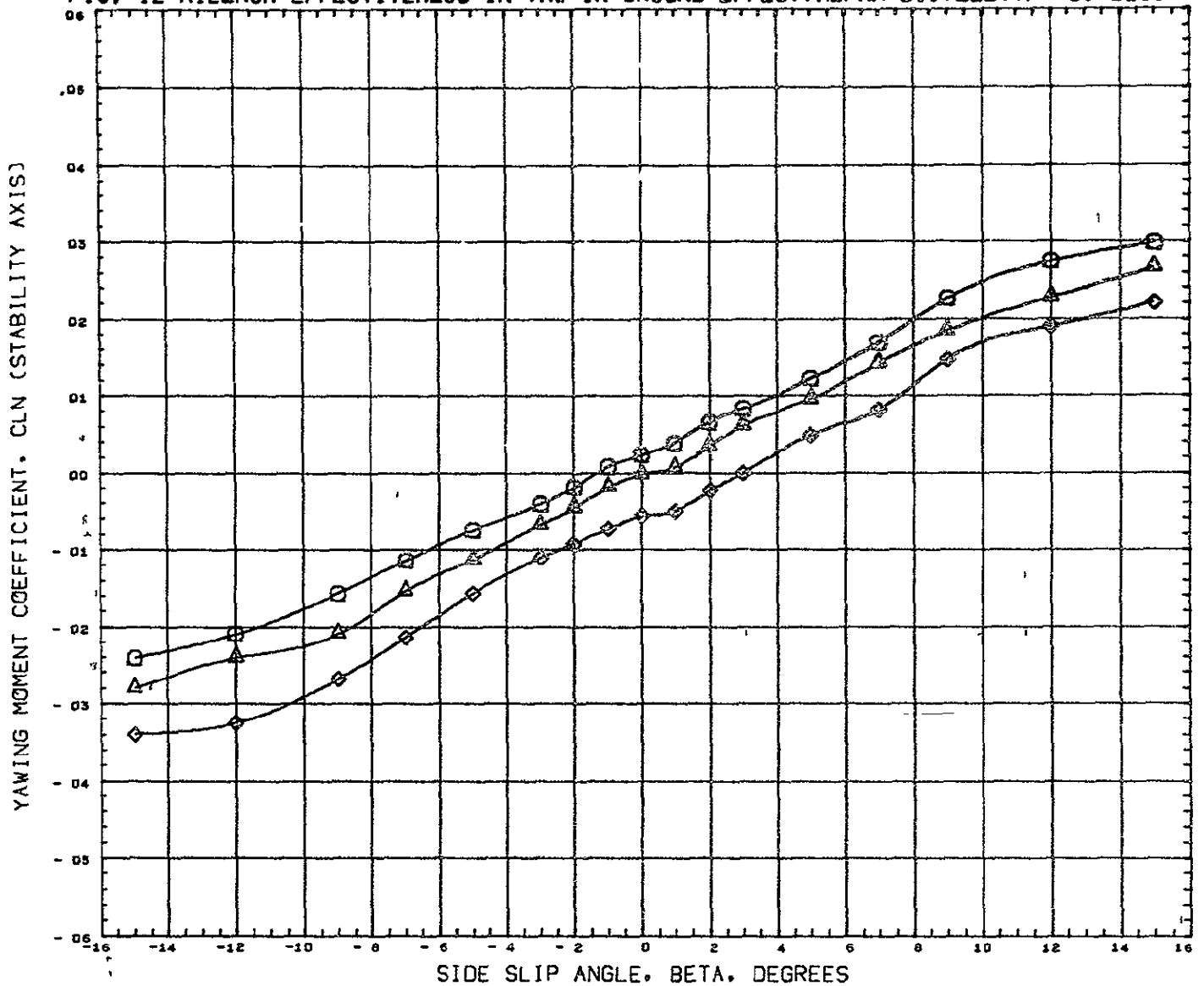
FIG. 12 AILERON EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=21., ELEVTR=-5. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(ACW029)	GWT 290-CONF ROS-NB1 B1F1W1V1GB	-5 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
(ACW034)	GWT 290-CONF ROS-NB1 B1F1W1V1GB	-5 000	-10 000	0 000	0 000	LREF 6 4320 FT
(ACW031)	GWT 290-CONF ROS-NB1 B1F1W1V1GB	-5 000	-20 000	0 000	0 000	BREF 3 8920 FT
						XMRP 1485 0040 IN
						YMRP 0 0000 IN
						ZMRP 377 0004 IN
						SCALE 0 0400

MACH 0 170

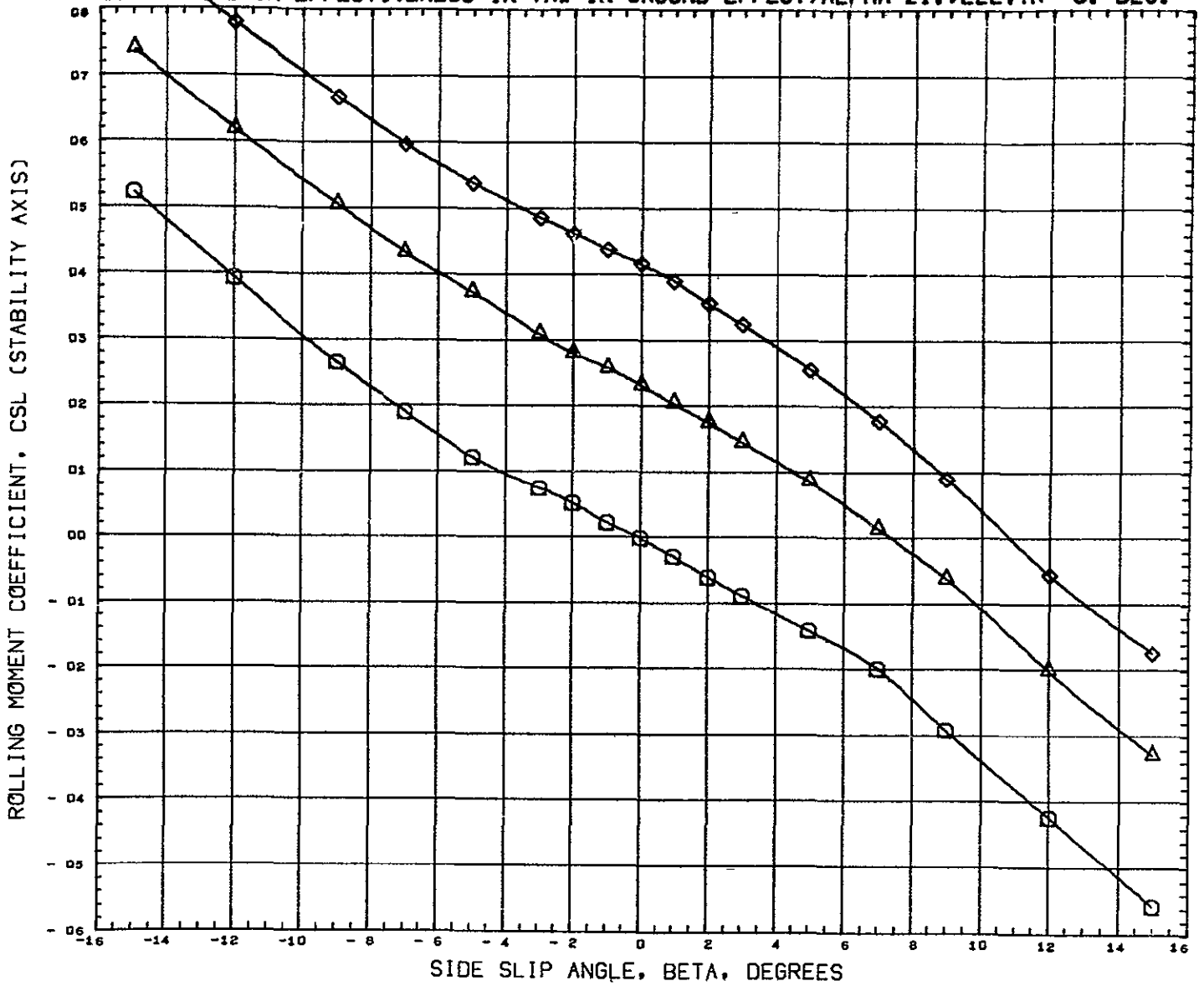
FIG. 12 AILERON EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=21., ELEVTR=-5. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(ACW029)	GWT 290-CONF ROS-NB1 B1F1W1V1G6	-5 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
(ACW034)	GWT 290-CONF ROS-NB1 B1F1W1V1G6	-5 000	-10 000	0 000	0 000	LREF 6 4320 FT
(ACW031)	GWT 290-CONF ROS-NB1 B1F1W1V1G6	-5 000	-20 000	0 000	0 000	BREF 3 8920 FT
						XMRP 1405 0040 IN
						YMRP 0 0000 IN
						ZMRP 377 0004 IN
						SCALE 0 0400

MACH 0 170

FIG. 12 AILERON EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=21., ELEVTR=-5. DEG.

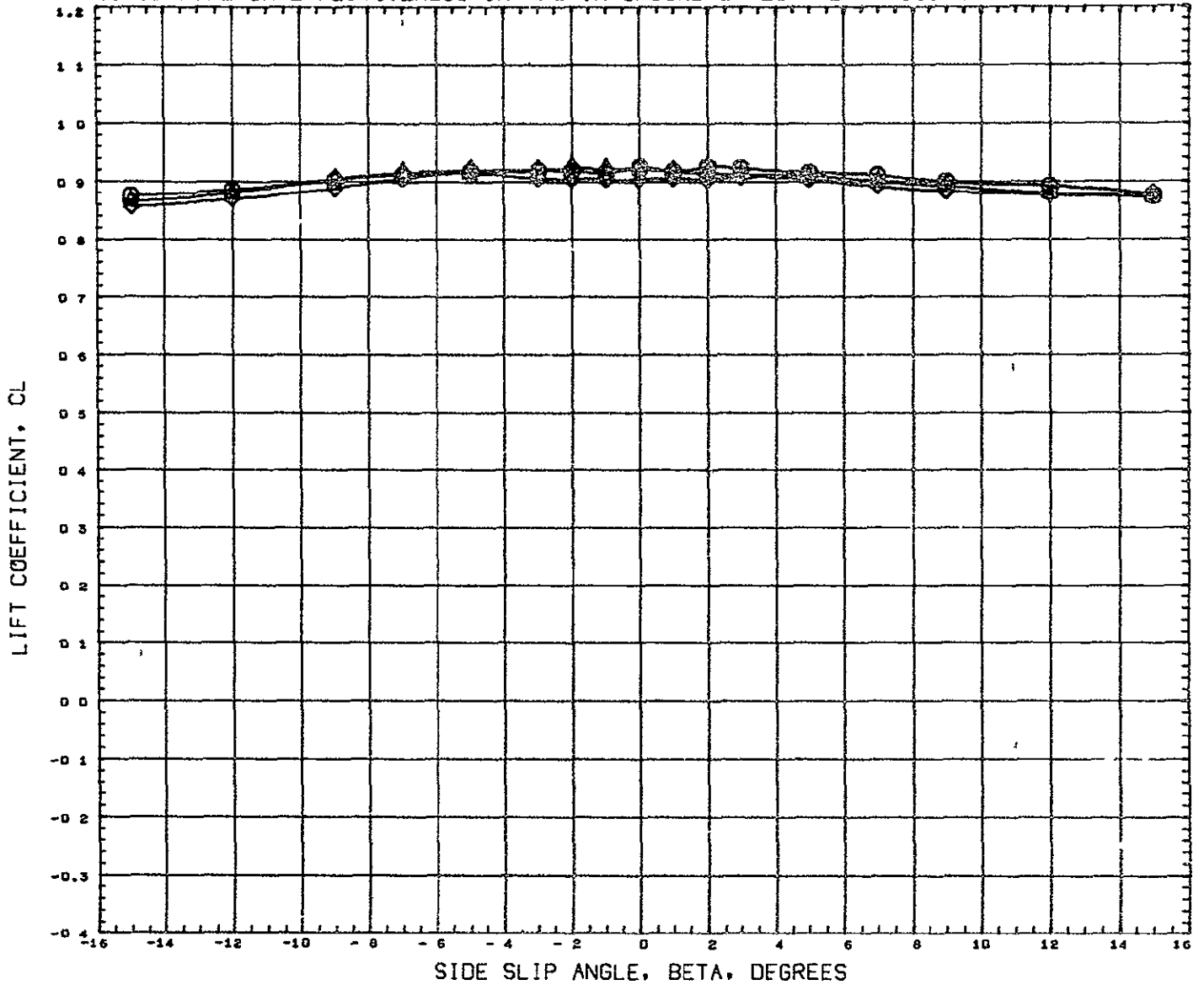


DATA SET SYMBOL	CONFIGURATION DESCRIPTION
(ACW029)	GWTI 290-CONF ROS-NB1 B1F1W1V1GB
(ACW034)	GWTI 290-CONF ROS-NB1 B1F1W1V1GB
(ACW031)	GWTI 290-CONF ROS-NB1 B1F1W1V1GF

ALPHA	ELEVTR	AILRON	RUPDER	REFERENCE INFORMATION
-5 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
-5 000	-10 000	0 000	0 000	LREF 6 4320 FT
-5 000	-20 000	0 000	0 000	BREF 3 8920 FT
				XHRF 1485 0040 IN
				YHRF 0 0000 IN
				ZHRF 377 0004 IN
				SCALE 0 0400

MACH 0 170

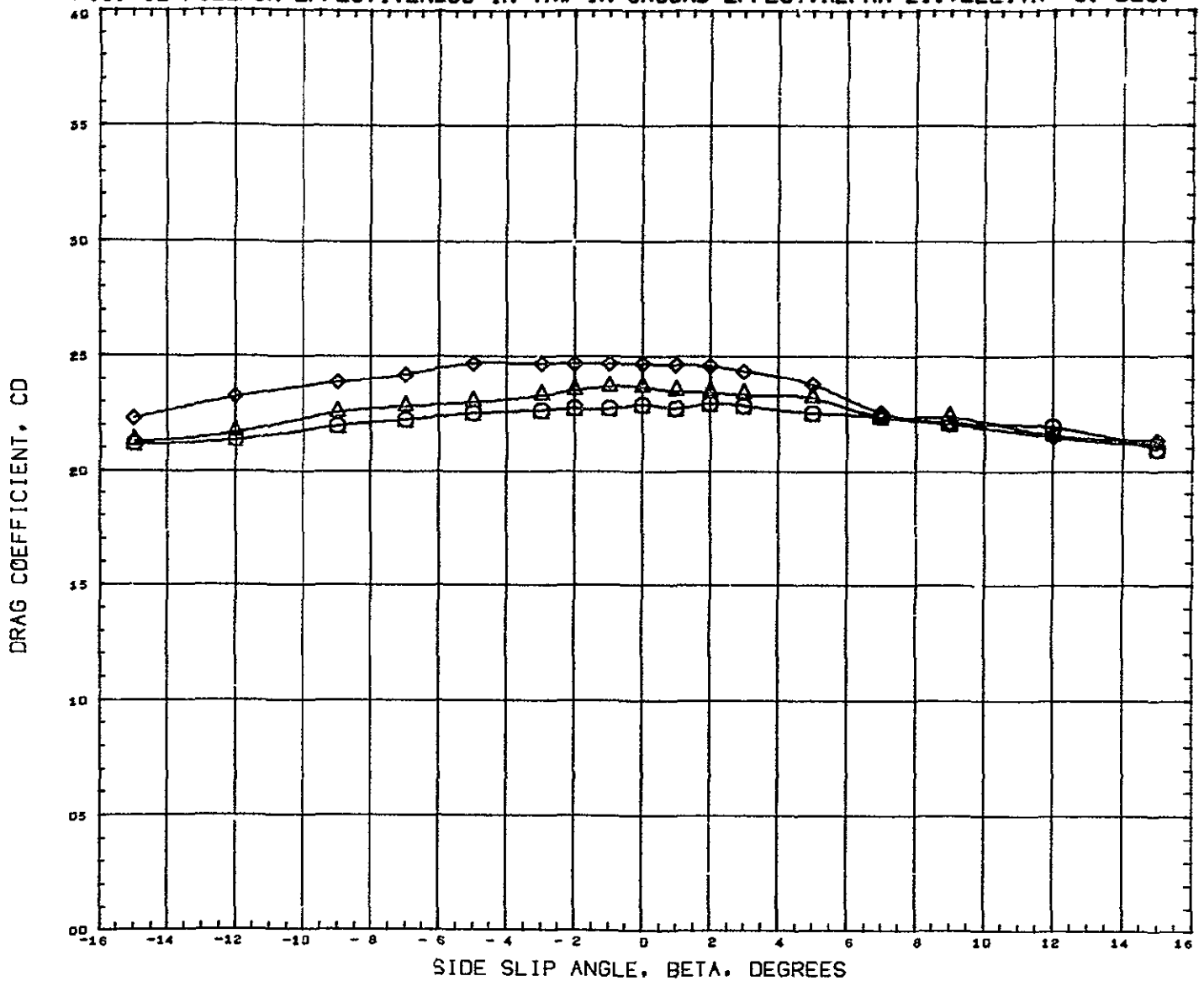
FIG. 12 AILERON EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=21., ELEVTR=-5. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(ACWD29)	GWTT 290-CONF ROS-NB1 B1F1W1V16B	-5 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
(ACWD34)	GWTT 290-CONF ROS-NB1 B1F1W1V16B	-5 000	-10 000	0 000	0 000	LREF 6 4320 FT
(ACWD31)	GWTT 290-CONF ROS-NB1 B1F1W1V16B	-5 000	-20 000	0 000	0 000	BREF 3 8920 FT
						XHRF 1485 0040 IN
						YHRF 0 0000 IN
						ZHRF 377 0004 IN
						SCALE 0 0400

MACH 0 170

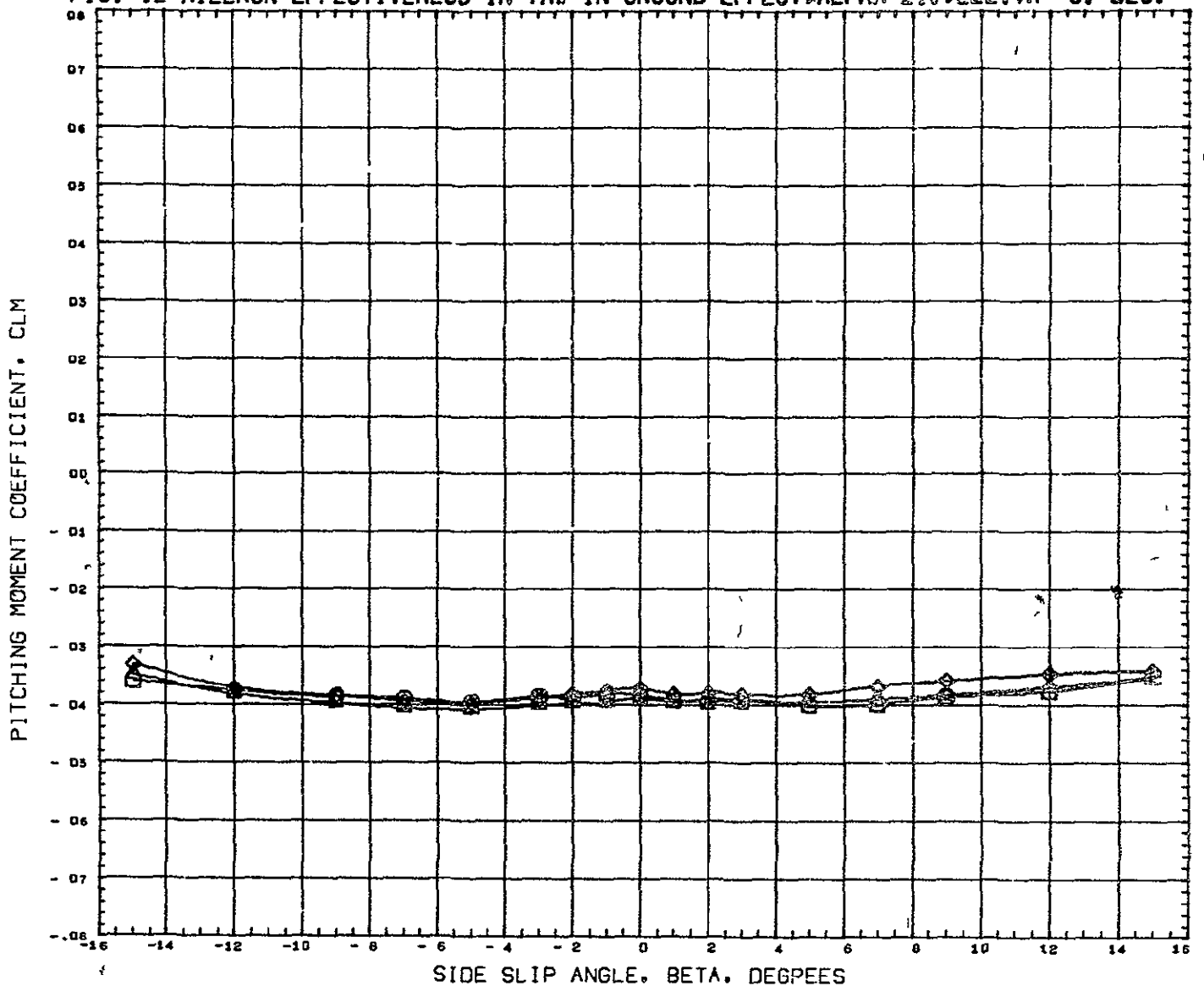
FIG. 12 AILERON EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=21., ELEVTR=-5. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(ACW029)	GWTT 29D-CONF ROS-NB1 B1F1W1V1GB	-5 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
(ACW034)	GWTT 29D-CONF ROS-NB1 B1F1W1V1GB	-5 000	-10 000	0 000	0 000	LREF 6 4320 FT
(ACW031)	GWTT 29D-CONF ROS-NB1 B1F1W1V1GB	-5 000	-20 000	0 000	0 000	BREF 3 8920 FT
						XHRF 1485 0040 IN
						YHRF 0 0000 IN
						ZHRF 377 0004 IN
						SCALE 0 0400

MACH 0 170

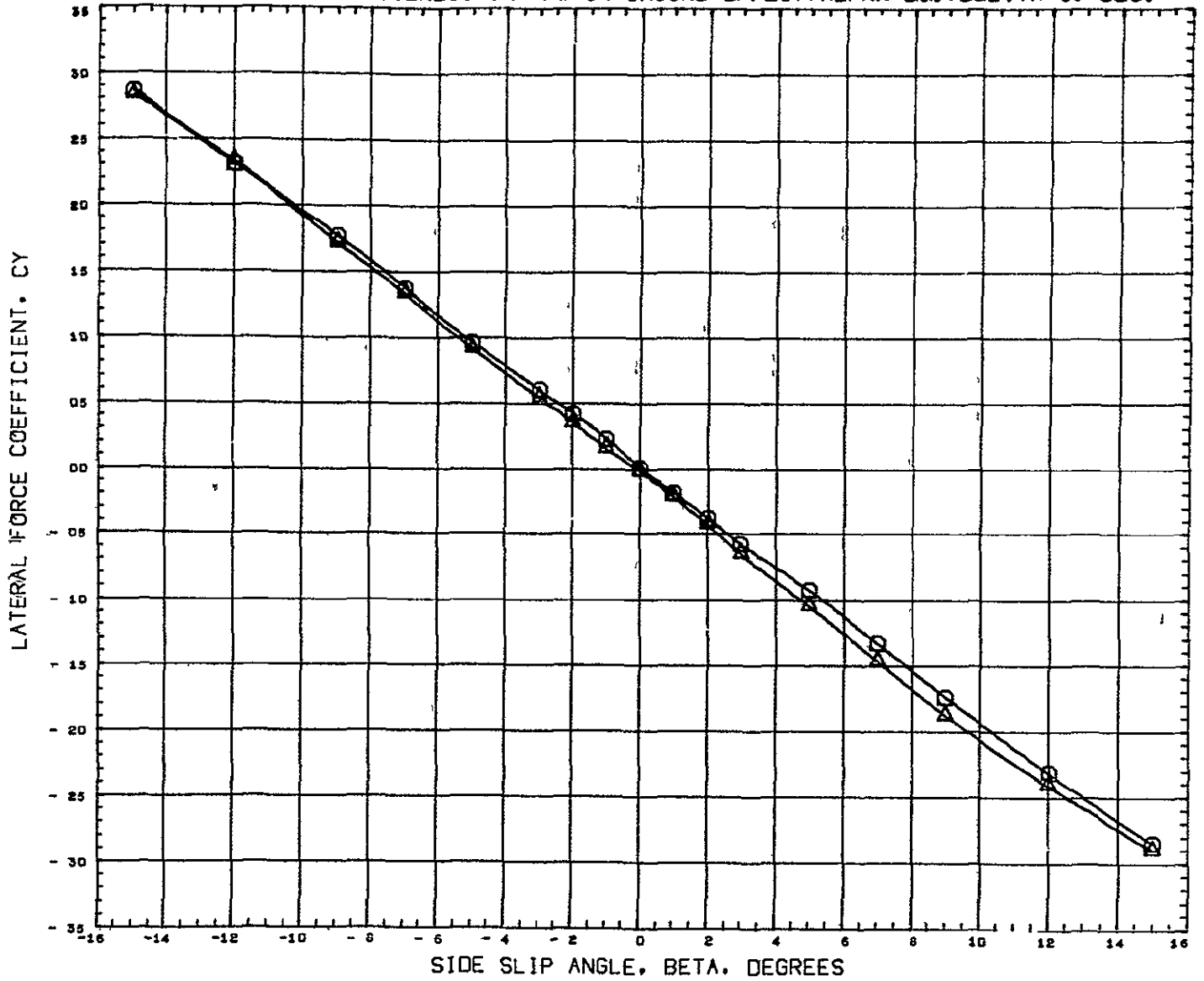
FIG. 12 AILERON EFFECTIVENESS IN YAW IN GROUND EFFECT. ALPHA=21.0. ELEVTR=-5. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(ACW029)	GWT 290-CONF ROS-NB1 B1F1W1V1GB	-5.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(ACW034)	GWT 290-CONF ROS-NB1 B1F1W1V1GB	-5.000	-10.000	0.000	0.000	LREF 6.4320 FT
(ACW031)	GWT 290-CONF ROS-NB1 B1F1W1V1GB	-5.000	-20.000	0.000	0.000	BREF 3.8920 FT
						XMRP 1485.0040 IN
						YMRP 0.0000 IN
						ZMRP 377.0004 IN
						SCALE 0.0400

MACH 0.170

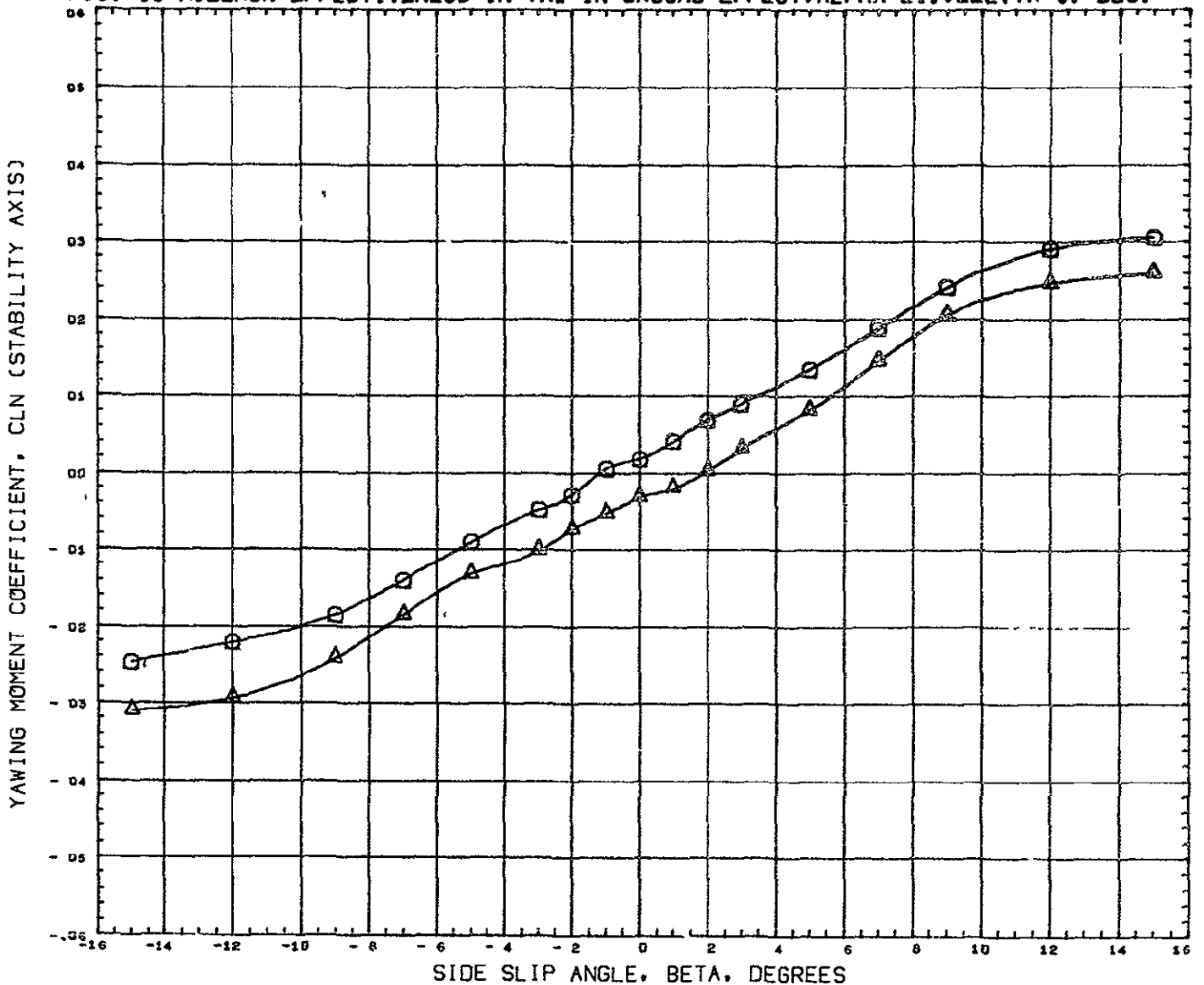
FIG. 13 AILERON EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=21.0, ELEVTR=0. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(ACWD35)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
(ACWD32)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0 000	0 000	-10 000	0 000	LREF 6 4320 FT
						BREF 3 8920 FT
						XNRF 1485 0040 IN
						YNRF 0 0000 IN
						ZNRF 377 0004 IN
						SCALE 0 0400

MACH 0 170

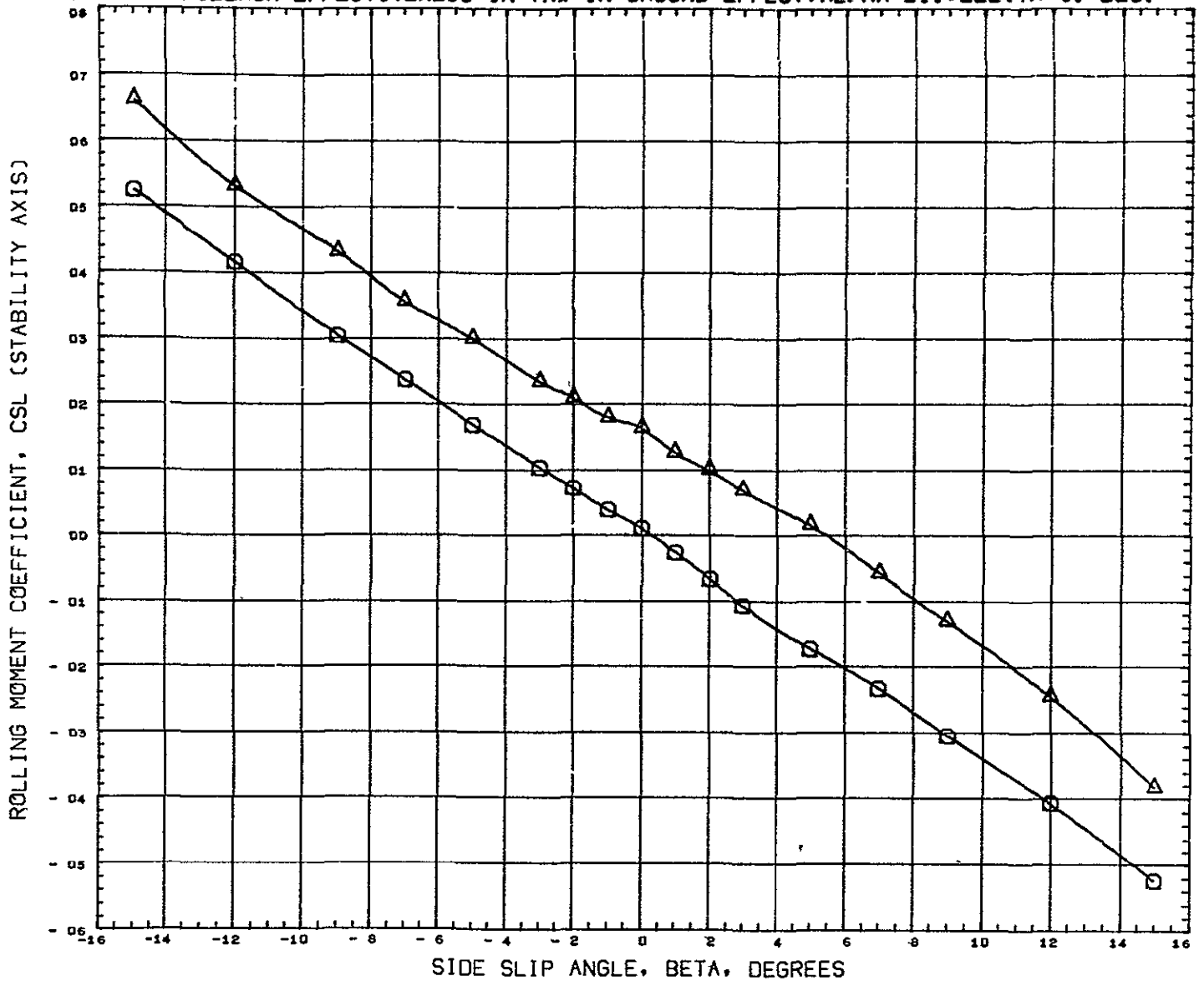
FIG. 13 AILERON EFFECTIVENESS IN YAW IN GROUND EFFECT. ALPHA=21.0. ELEVTR=0. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(ACW035)	Q GWTT 290-CONF ROS-NB1 B1F1W1V16B	21.0	0.000	0.000	0.000	SREF 9 1952 SQ FT
(ACW032)	△ GWTT 290-CONF ROS-NB1 B1F1W1V16B	21.0	0.000	-10.000	0.000	LREF 6 4320 FT
						BREF 3 8920 FT
						XHRP 1485 0040 IN
						YHRP 0 0000 IN
						ZHRP 377 0004 IN
						SCALE 0 0400

MACH 0 170

FIG. 13 AILERON EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=21., ELEVTR=0. DEG.

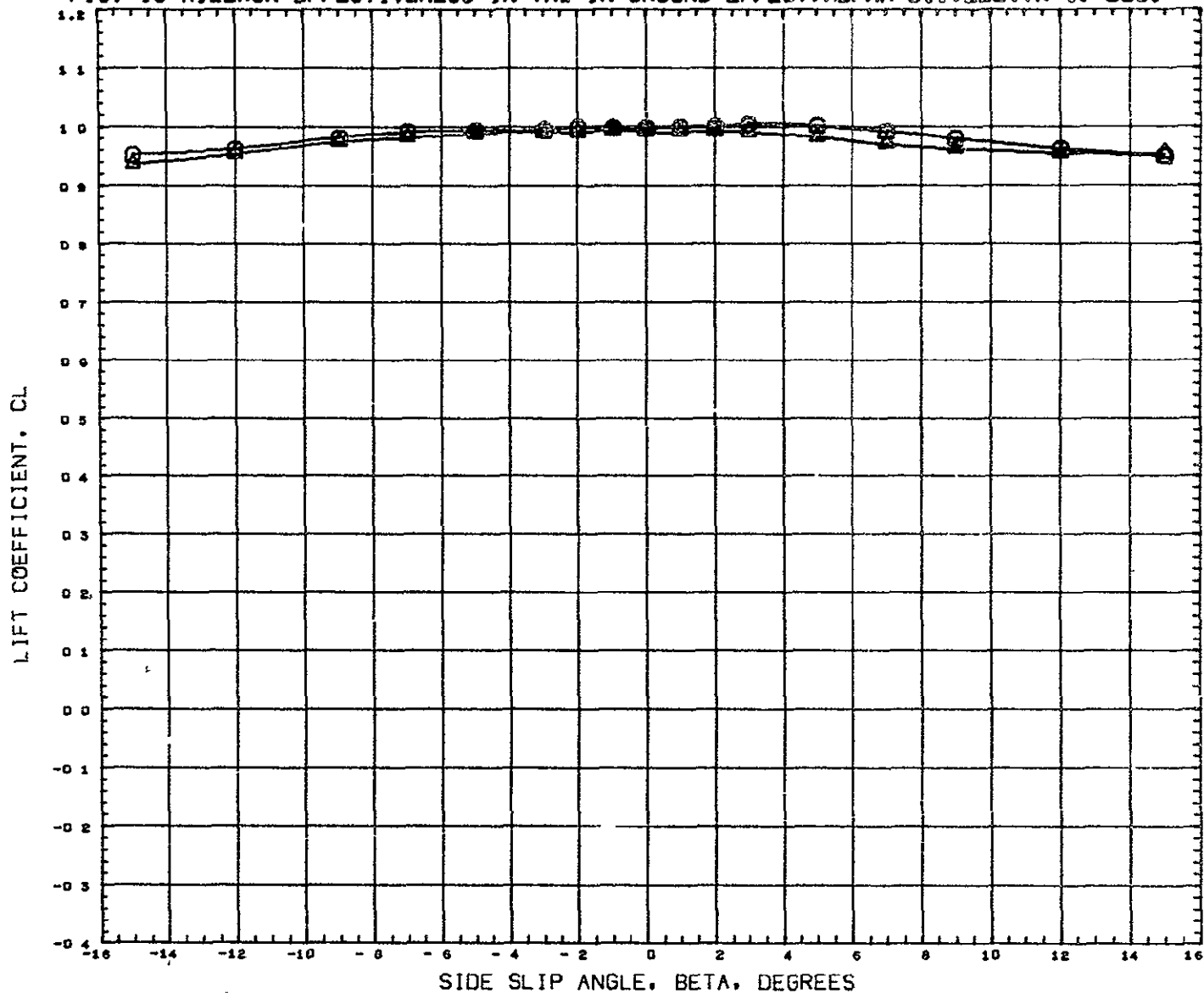


DATA SET SYMBOL CONFIGURATION DESCRIPTION
 (ACWG35) ○ GWTI 290-CONF ROS-N21 B1F1W1V1GB
 (ACWD32) △ GWTI 290-CONF ROS-NB1 B1F1W1V1GB

ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
0 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
0 000	-10 000	0 000	0 000	LREF 6 4320 FT
				BREF 3 8920 FT
				XMRP 1485 0040 IN
				YMRP 0 0000 IN
				ZMRP 377 0004 IN
				SCALE 0 0400

MACH 0 170

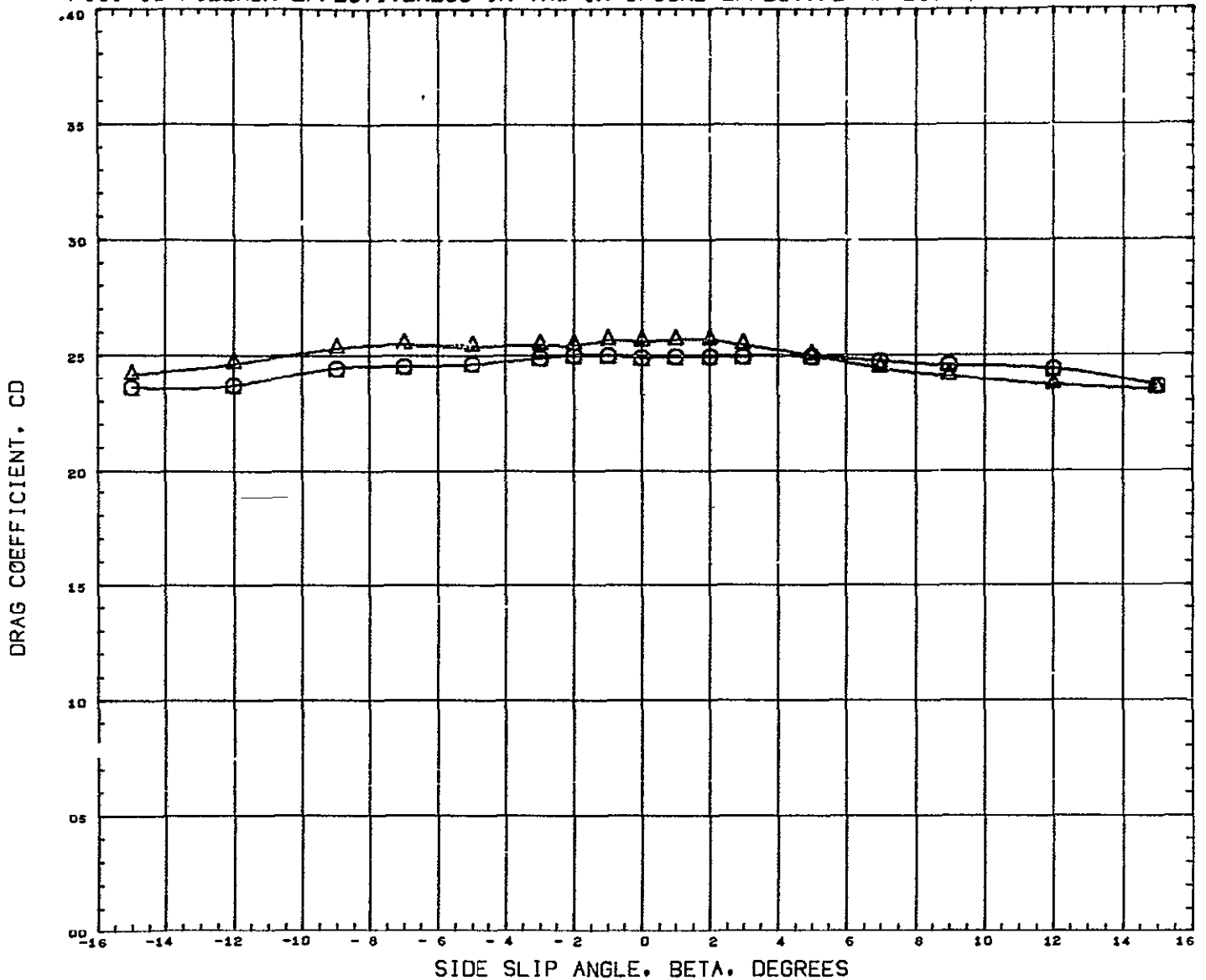
FIG. 13 AILERON EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=21.0, ELEVTR=0. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(ACWD35)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
(ACWD32)	GWTT 290-CONF ROS-NB1 B1F1W1V1GB	0 000	-10 000	0 000	0 000	LREF 6 4320 FT
						BREF 3 8920 FT
						XHRP 1485 0040 IN
						YHRP 0 0000 IN
						ZHRP 377 0004 IN
						SCALE 0 0400

MACH 0 170

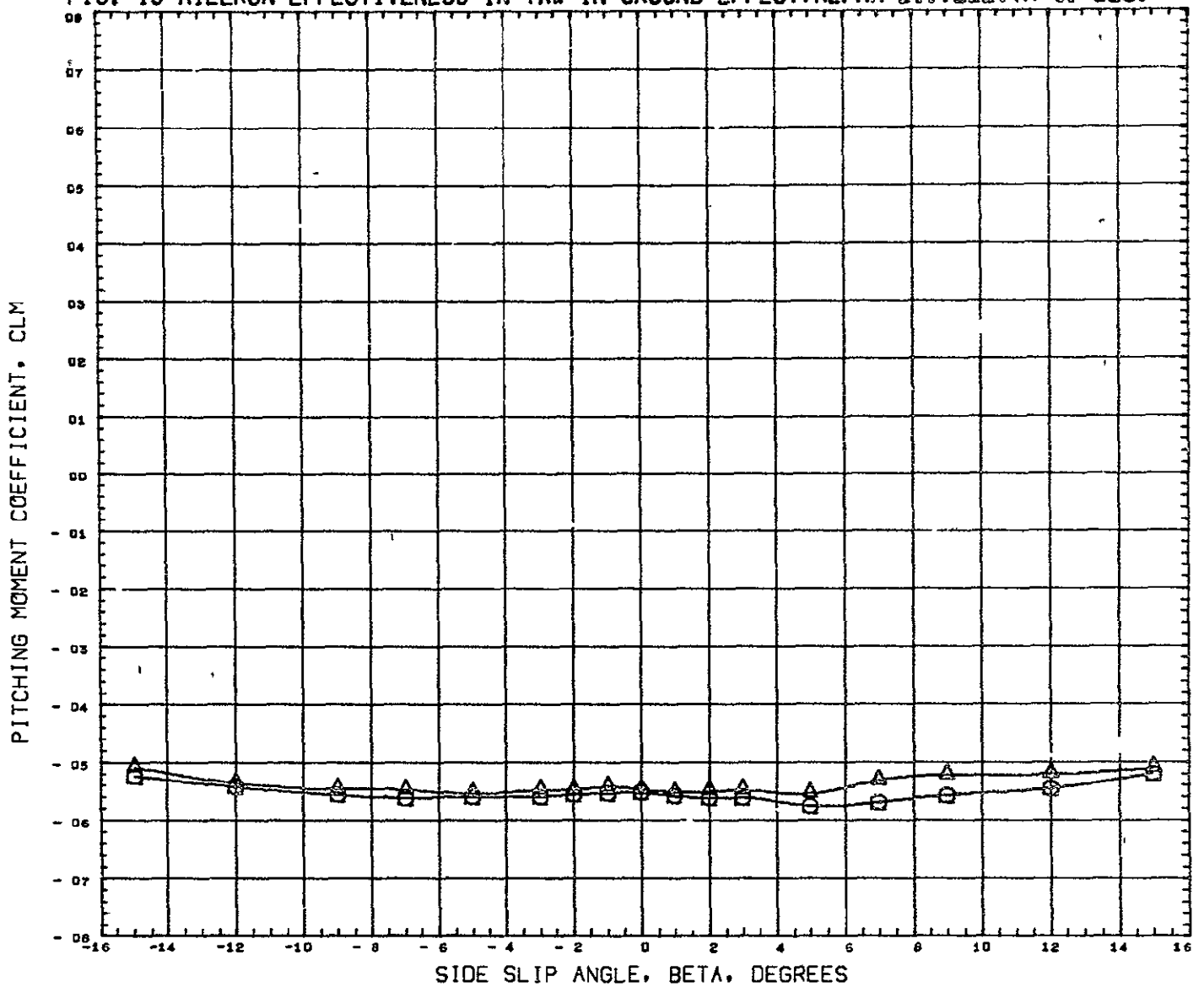
FIG. 13 AILERON EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=21., ELEVTR=0. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(ACWD35)	⊙ GWT 290-CONF ROS-NB1 B1F1W1V1GB	0 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
(ACWD32)	△ GWT 290-CONF ROS-NB1 B1F1W1V1GB	0 000	0 000	-10 000	0 000	LREF 6 4320 FT
						BREF 3 8920 FT
						XHRF 1485 0040 IN
						YHRF 0 0000 IN
						ZHRF 377 0004 IN
						SCALE 0 0400

MACH 0 170

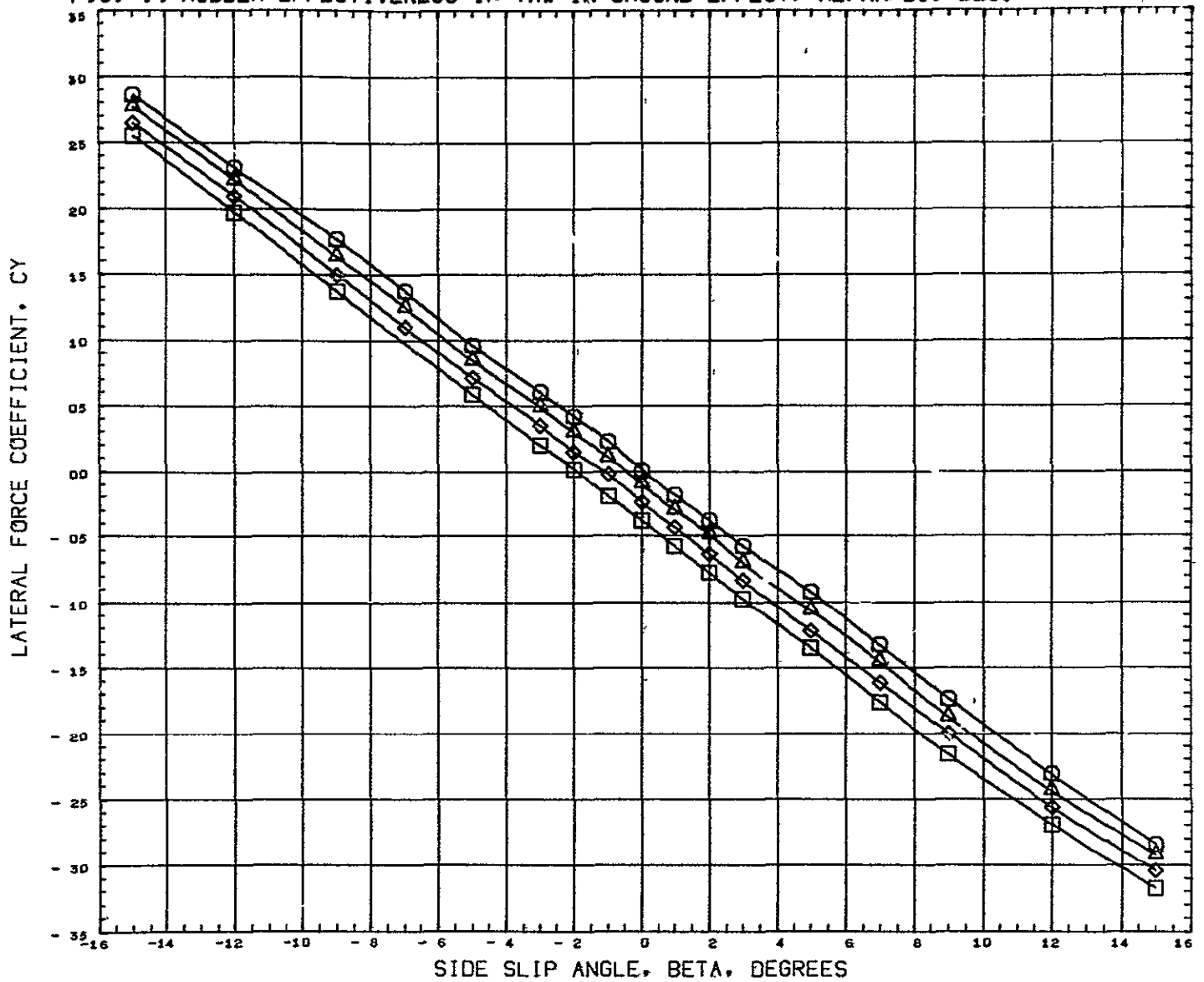
FIG. 13 AILERON EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=21., ELEVTR=0. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(ACW035)	GWTT 290-CONF ROS-NB1 01F1W1V16B	0 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
(ACW032)	GWTT 290-CONF ROS-NB1 01F1W1V16B	0 000	-10 000	0 000	0 000	LREF 6 4320 FT
						BREF 3 8920 FT
						XMRP 1485 0040 IN
						YMRP 0 0000 IN
						ZMRP 377 0004 IN
						SCALE 0 0400

MACH 0 170

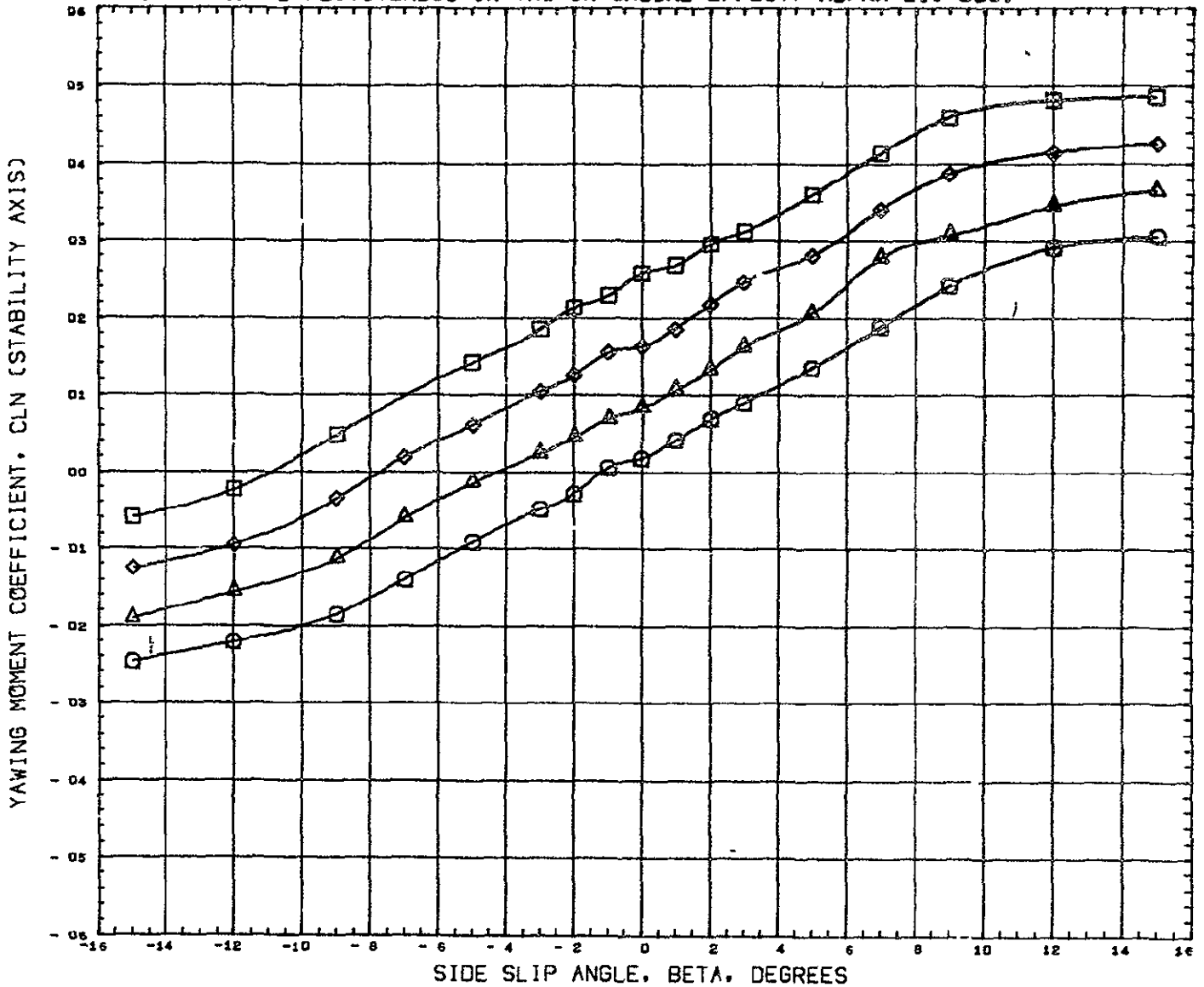
FIG. 14 RUDDER EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=21. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(ACWD35)	GWT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	0.000	0.000	SREF 9 19.2 SQ FT
(ACWD36)	GWT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	-5.000	-5.000	LREF 6 4320 FT
(ACWD37)	GWT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	-10.000	-10.000	BREF 3 8920 FT
(ACWD38)	GWT 290-CONF ROS-NB1 B1F1W1V1GB	0.000	0.000	-15.000	-15.000	XMRP 1485 0040 IN
						YMRP 0 0000 IN
						ZMRP 377 0004 IN
						SCALE 0 0400

HACH 0-170

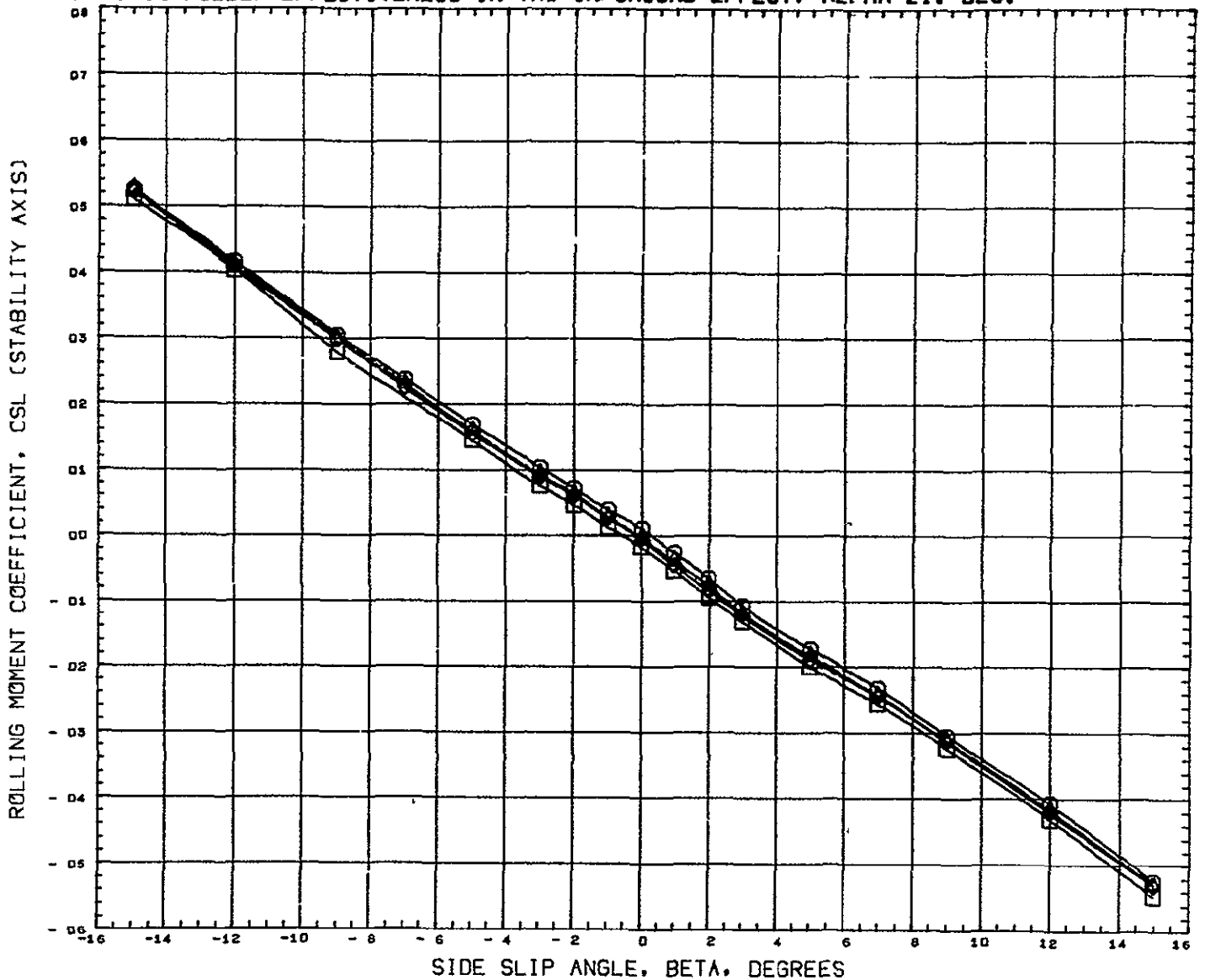
FIG. 14 RUDDER EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=21. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(ACW035)	GWTT 290-CONF ROS-NB1 B1F1W1V16B	0 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
(ACW036)	GWTT 290-CONF ROS-NB1 B1F1W1V16B	0 000	0 000	0 000	-5 000	LREF 6 4320 FT
(ACW037)	GWTT 290-CONF ROS-NB1 B1F1W1V16B	0 000	0 000	0 000	-10 000	BREF 3 8920 FT
(ACW038)	GWTT 290-CONF ROS-NB1 B1F1W1V16B	0 000	0 000	0 000	-15 000	XMRP 1485 0040 IN
						YHRP 0 0000 IN
						ZMRP 377 0004 IN
						SCALE 0 0400

MACH 0 170

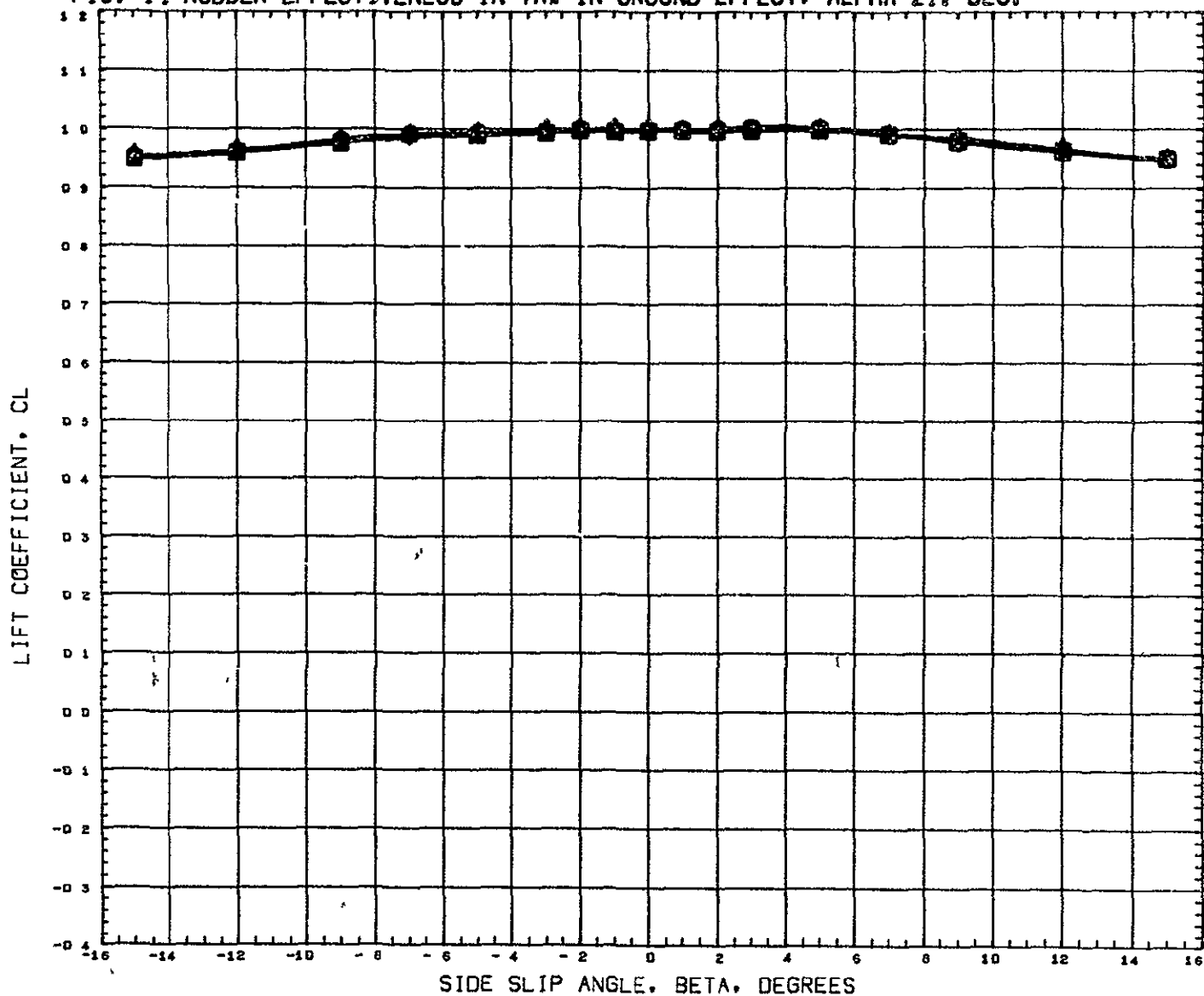
FIG. 14 RUDDER EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=21. DEG.



DATA SET	SYMBOL	CONFIGURATION	DESCRIPTION	ALPHA	ELEVTR	AIRLON	RUDDER	REFERENCE INFORMATION
(ACW035)	○	GWTT 290-CONF	ROS-NB1 B1F1W1V1G8	0 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
(ACW036)	△	GWTT 290-CONF	ROS-NB1 B1F1W1V1G8	0 000	0 000	0 000	-5 000	LREF 6 4320 FT
(ACW037)	◇	GWTT 290-CONF	ROS-NB1 B1F1W1V1G8	0 000	0 000	0 000	-10 000	BREF 3 8920 FT
(ACW038)	□	GWTT 290-CONF	ROS-NB1 B1F1W1V1G8	0 000	0 000	0 000	-15 000	XMRP 1485 0045 IN YMRP 0 0000 IN ZMRP 377 0004 IN SCALE 0 0400

MACH 0 170

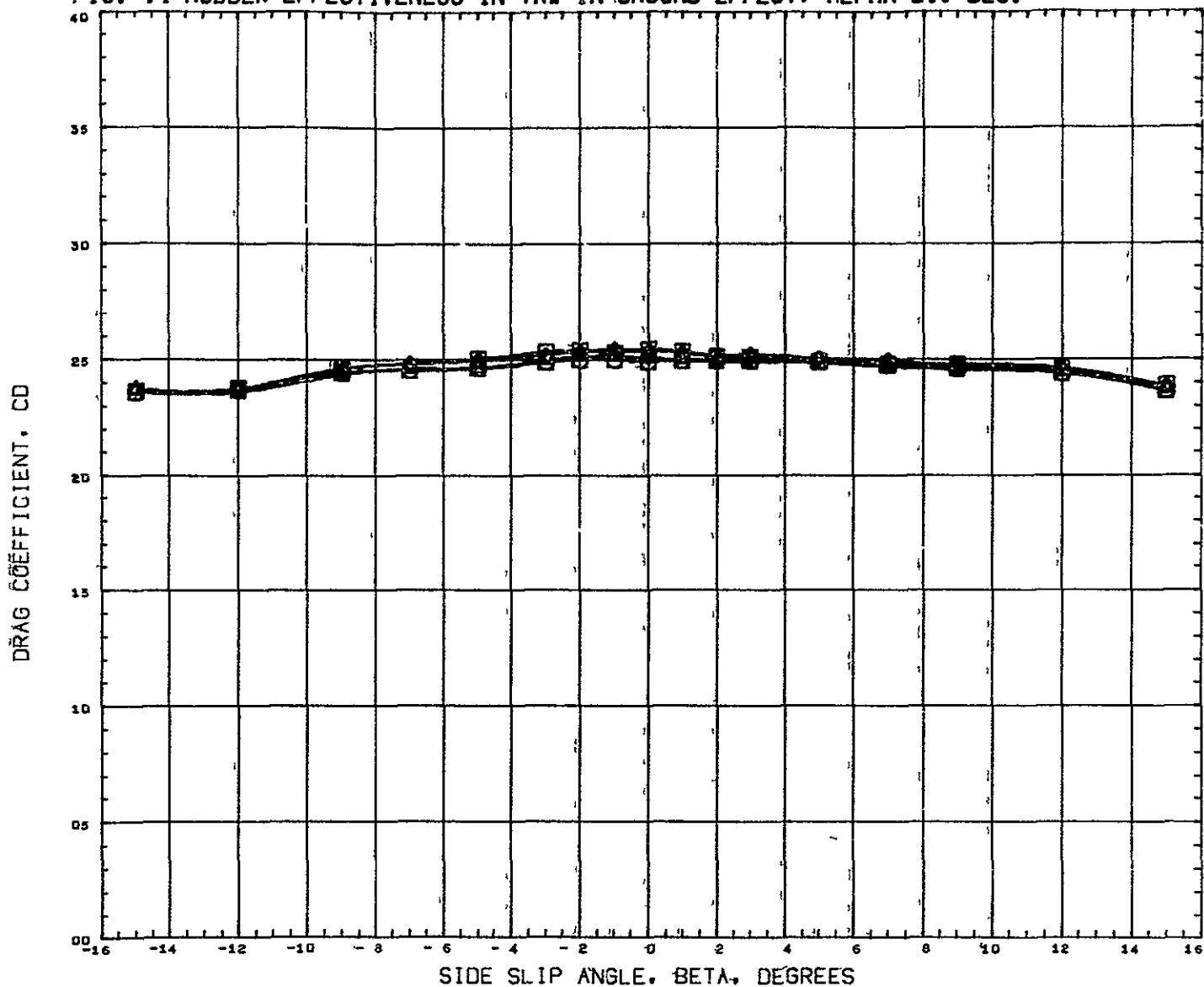
FIG. 14 RUDDER EFFECTIVENESS IN YAW IN GROUND EFFECT. ALPHA=21. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(ACW035)	GWTT 290-CONF ROS-NB1 B1F1W1V16B	0 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
(ACW036)	GWTT 290-CONF ROS-NB1 B1F1W1V16B	0 000	0 000	0 000	-5 000	LREF 5 4320 FT
(ACW037)	GWTT 290-CONF ROS-NB1 B1F1W1V16B	0 000	0 000	0 000	-10 000	BREF 3 8920 FT
(ACW038)	GWTT 290-CONF ROS-NB1 B1F1W1V16B	0 000	0 000	0 000	-15 000	XMRP 1485 0040 IN
						YMRP 0 0000 IN
						ZMRP 377 0004 IN
						SCALE 0 0400

MACH 0 170

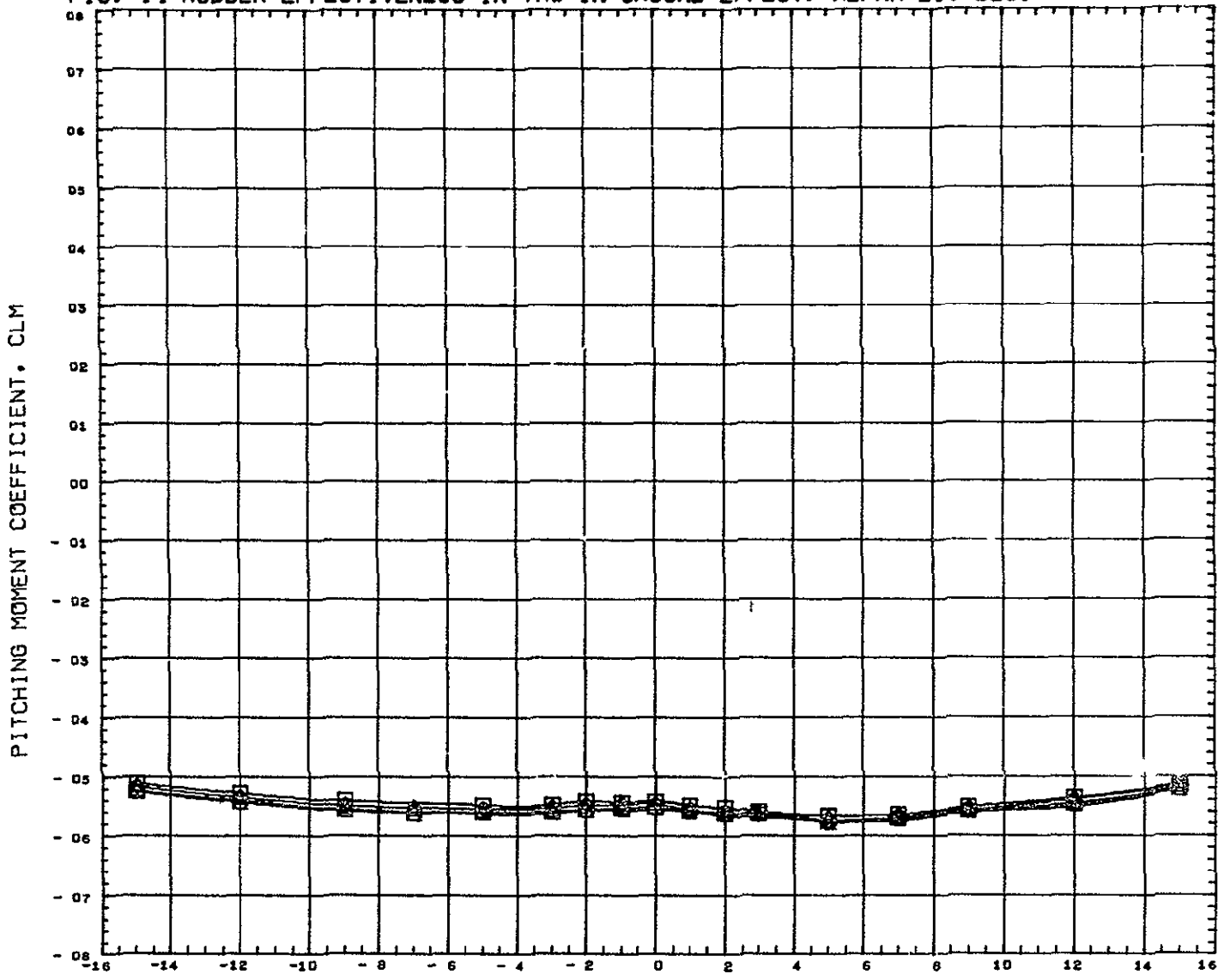
FIG. 14 RUDDER EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=21. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(ACW035)	GWTT 29D-CONF ROS-NB1 B1F1W1V1GB	0 000	0 000	0 000	0 000	.SREF 9 1952 SQ FT
(ACW036)	GWTT 29D-CONF ROS-NB1 B1F1W1V1GB	0 000	0 000	-5 000	0 000	LREF 6 4320 FT
(ACW037)	GWTT 29D-CONF ROS-NB1 B1F1W1V1GB	0 000	0 000	-10 000	0 000	BREF 3 8920 FT
(ACW038)	GWTT 29D-CONF ROS-NB1 B1F1W1V1GB	0 000	0 000	-15 000	0 000	XMRF 1485 0040 IN
						YMRF 0 0000 IN
						ZMRF 377 0004 IN
						SCALE 0 0400

MACH 0 170

FIG. 14 RUDDER EFFECTIVENESS IN YAW IN GROUND EFFECT, ALPHA=21. DEG.

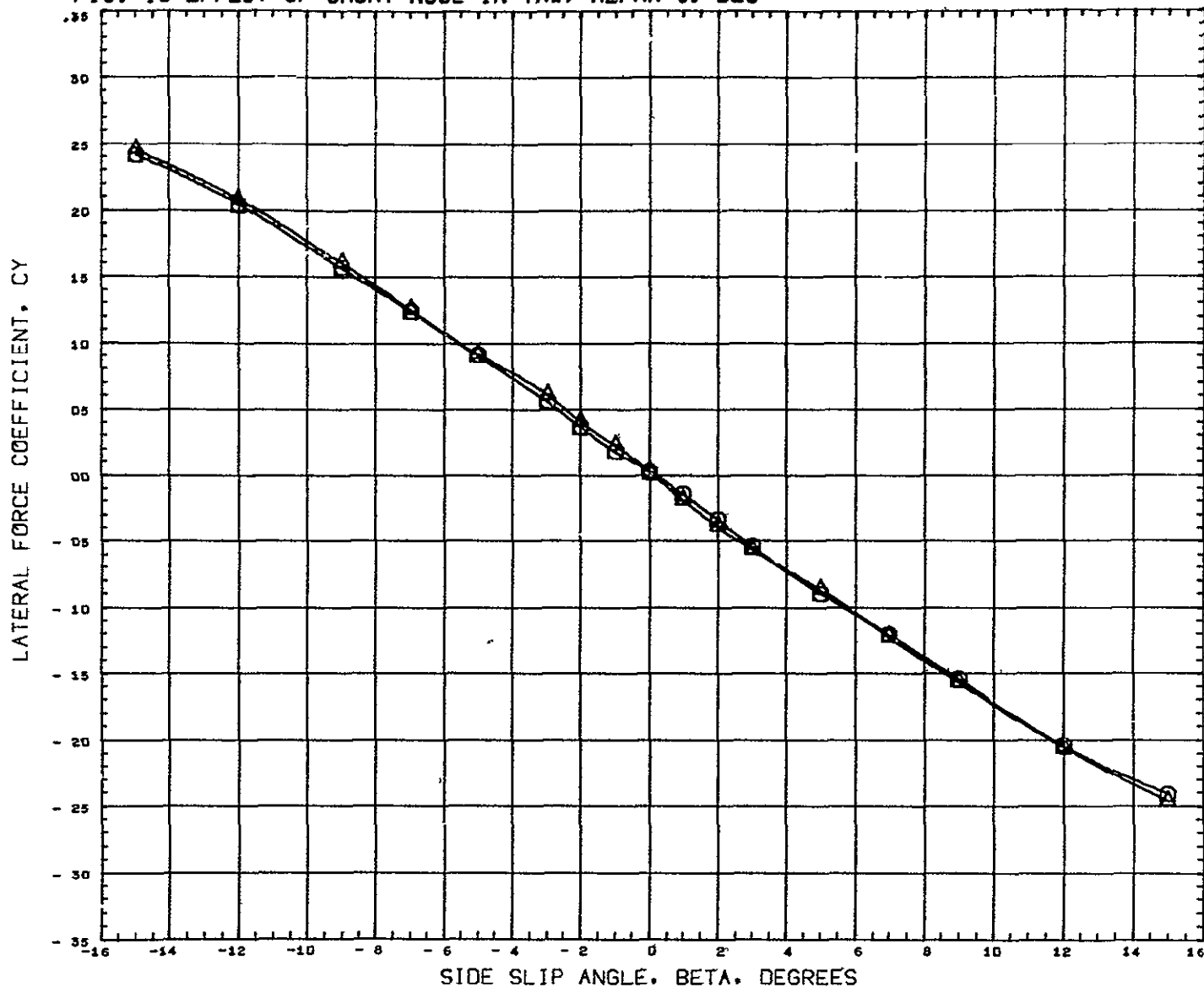


SIDE SLIP ANGLE, BETA, DEGREES

DATA SET	SYMBOL	CONFIGURATION	DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(ACWG35)	○	GWTT 29D-CONF	ROS-NB1 B1F1W1V1GB	0 000	0 000	0 000	0 000	SREF 9 1952 50 FT
(ACWD36)	△	GWTT 29D-CONF	ROS-NB1 B1F1W1V1GB	0 000	0 000	-5 000	-5 000	LREF 6 4320 FT
(ACWD37)	◇	GWTT 29D-CONF	ROS-NB1 B1F1W1V1GB	0 000	0 000	0 000	-10 000	BRF 3 8920 FT
(ACWD38)	□	GWTT 29D-CONF	ROS-NB1 B1F1W1V1GB	0 000	0 000	0 000	-15 000	XMRP 1485 0040 IN YMRP 0 0000 IN ZMRP 377 0004 IN SCALE 0 0400

MACH 0 170

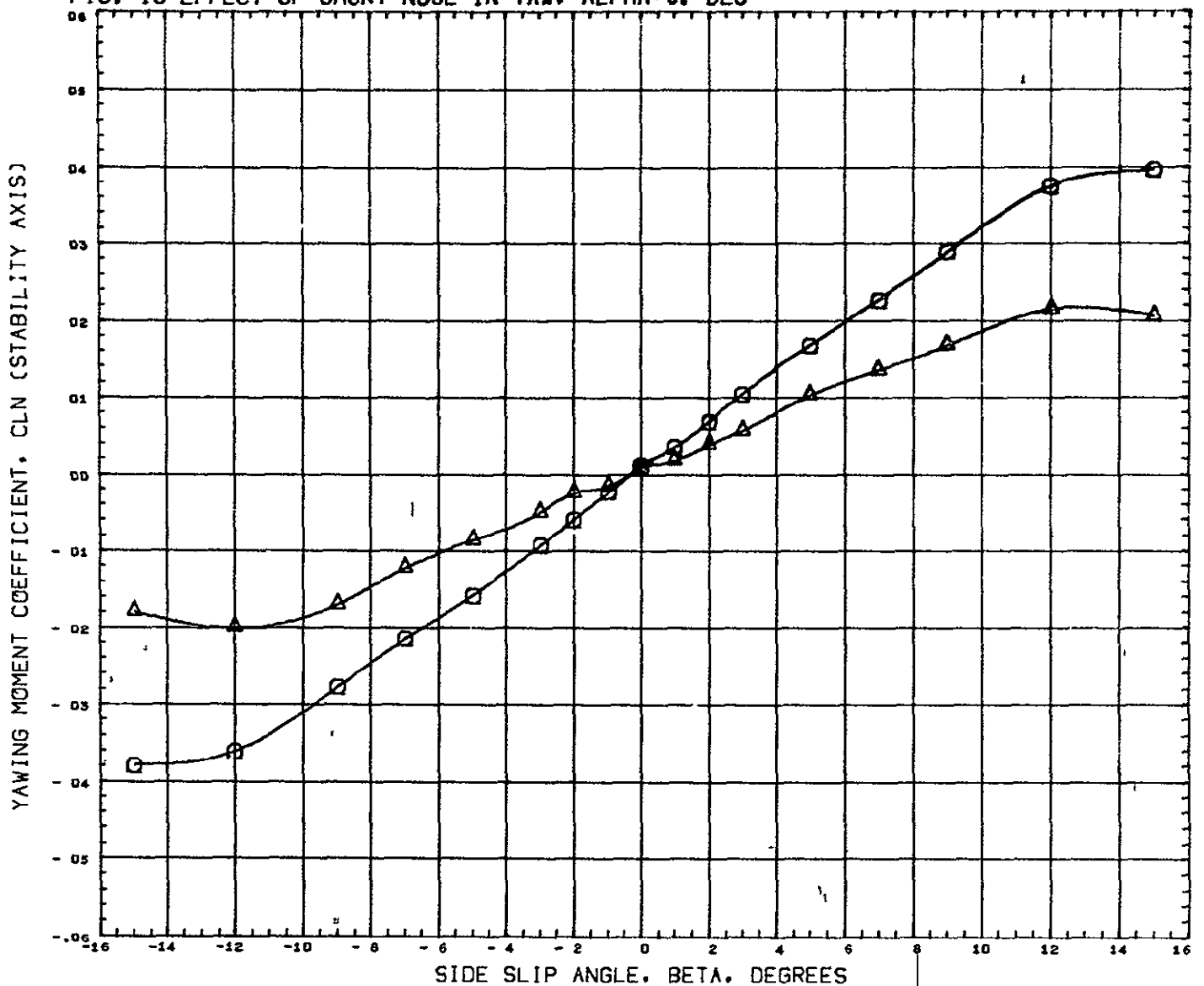
FIG. 15 EFFECT OF SHORT NOSE IN YAW, ALPHA=0. DEG



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCND42)	GWTT 290-CONF ROS-NB2 B3F1W1V1	0 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
(XC0054)	GWTT 289-CONF ROS-NB1 B1W1V1	0 000	0 000	0 000	0 000	LREF 6 4320 FT
						BREF 3 8920 FT
						XMRP 1485 0040 IN
						YMRP 0 0000 IN
						ZMRP 377 0004 IN
						SCALE 0 0400

MACH 0.170

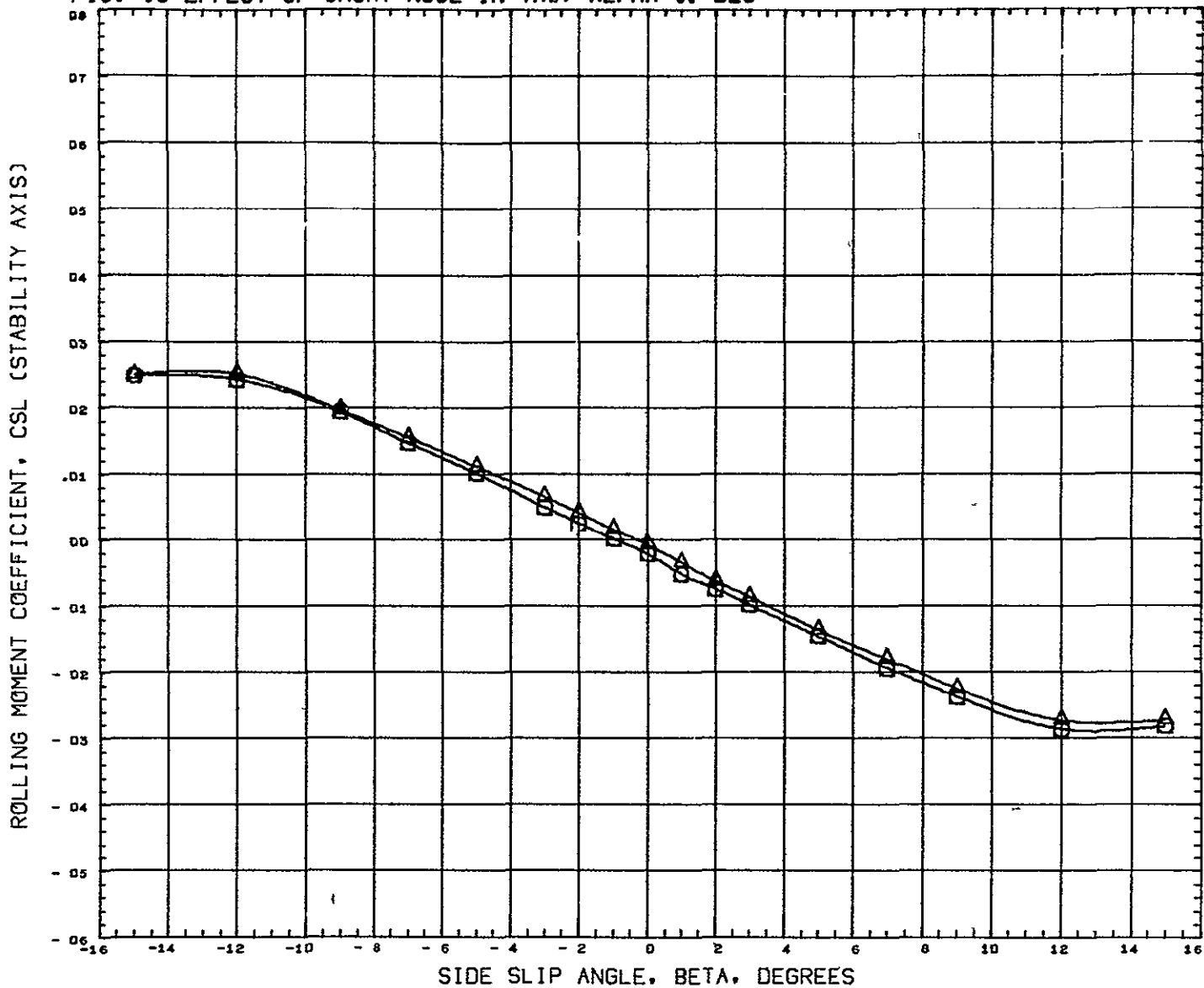
FIG. 15 EFFECT OF SHORT NOSE IN YAW. ALPHA=0. DEG



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCWD42)	GWTT 290-CONF ROS-NB2 B3F1W1V1	0 000	0 000	0 000	0 000	SREF 9 1952 50 FT
(XC9954)	GWTT 289-CONF ROS-NB1 B1W1V1	0 000	0 000	0 000	0 000	LREF 6 4320 FT
						BREF 3 8920 FT
						XHRF 1485 0040 IN
						YHRF 70 0000 IN
						ZHRF 377 0004 IN
						SCALE 0 0400

MACH 0 170

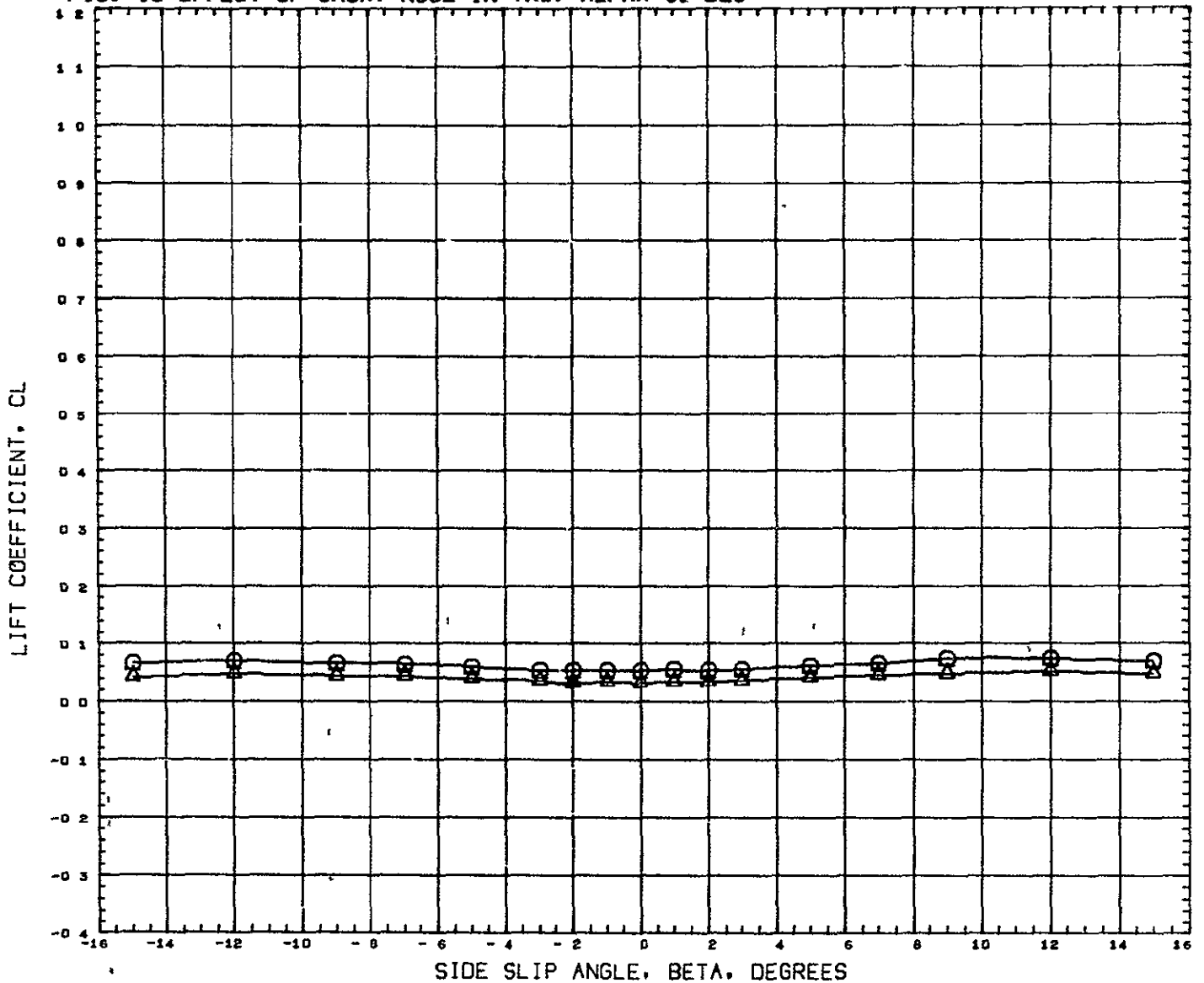
FIG. 15 EFFECT OF SHORT NOSE IN YAW, ALPHA=0. DEG



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCWD42)	GWTT 290-CONF ROS-NB2 B3F1W1V1	0 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
(XCR054)	GWTT 289-CONF ROS-NB1 B1W1V1	0 000	0 000	0 000	0 000	LREF 6 4320 FT
						BREF 3 8920 FT
						XMRP 1485 0040 IN
						YMRP 0 0000 IN
						ZMRP 377 0004 IN
						SCALE 0 0400

MACH 0 170

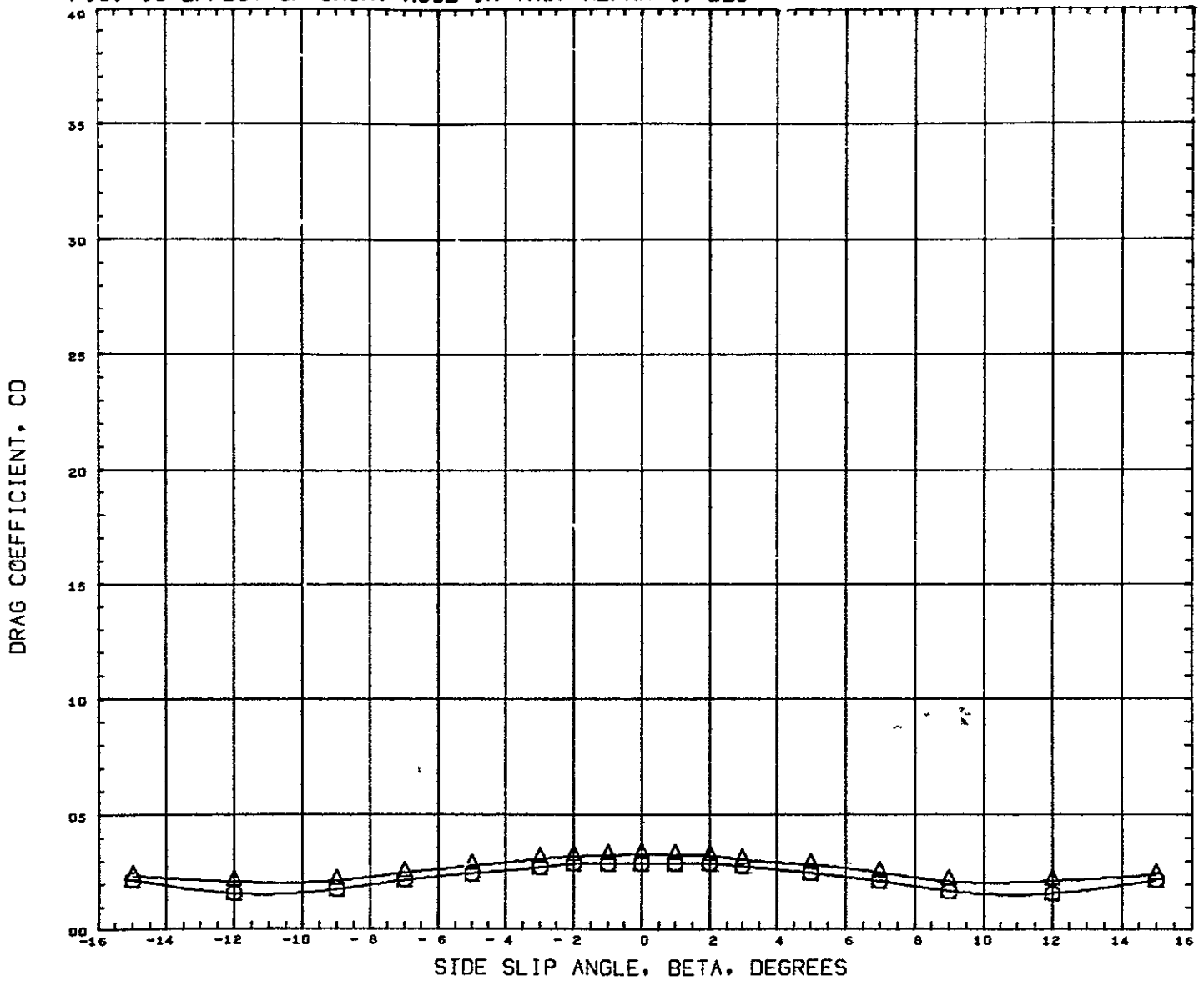
FIG. 15 EFFECT OF SHORT NOSE IN YAW. ALPHA=0. DEG



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCWD42)	GWTT 290-CONF ROS-NB2 B3F1W1V1	0 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
(XC054)	GWTT 289-CONF ROS-NB1 B1W1V1	0 000	0 000	0 000	0 000	LREF 6 4320 FT
						BREF 3 8920 FT
						XMRP 1485 0040 IN
						YMRP 0 0000 IN
						ZMRP 37 0004 IN
						SCALE 0 0400

MACH 0 170

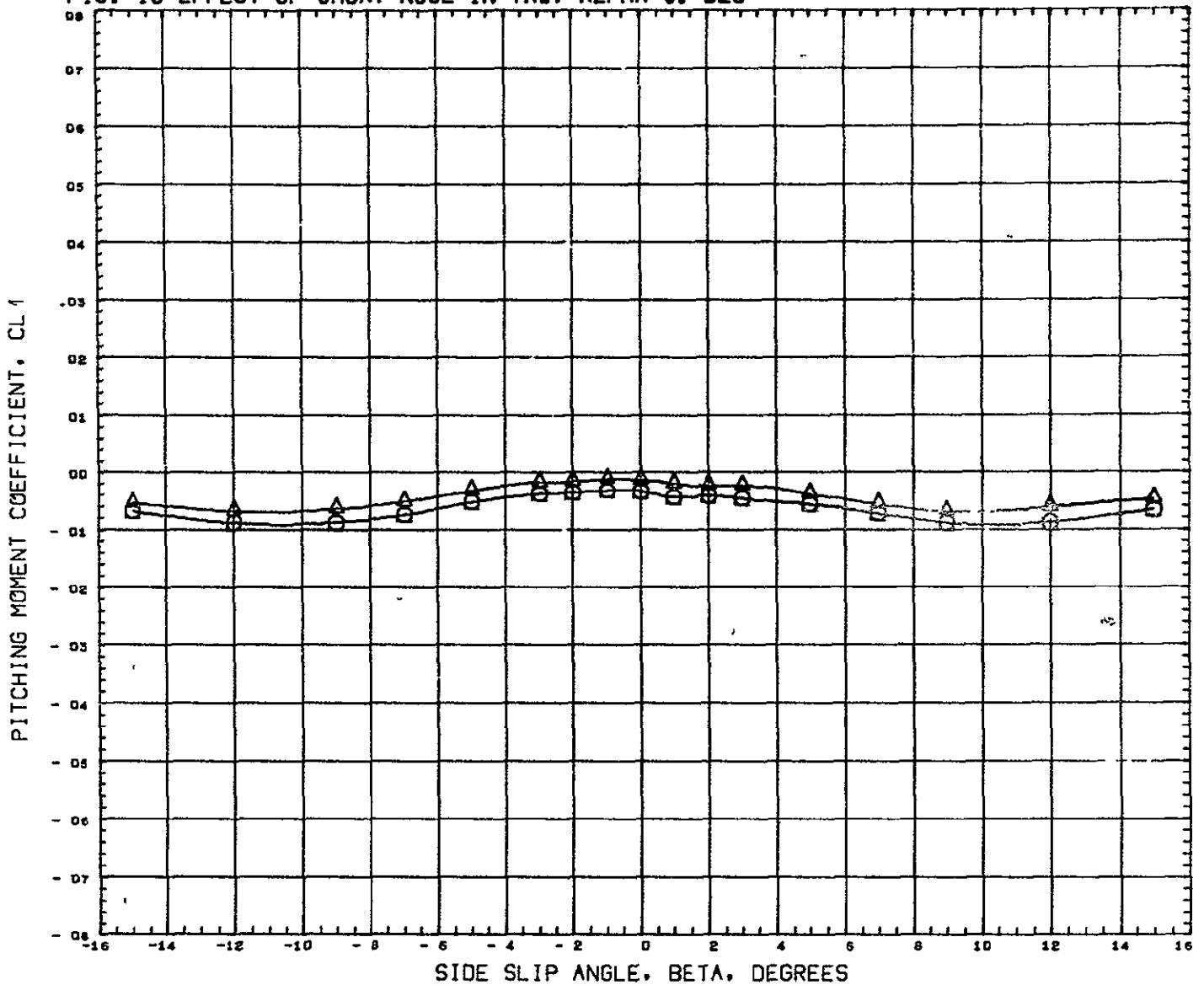
FIG. 15 EFFECT OF SHORT NOSE IN YAW, ALPHA=0. DEG



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCWD42)	GWTT 29D-CONF ROS-NB2 B3F1W1V1	0 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
(XCQ054)	GWTT 289-CONF ROS-NB1 B1W1V1	0 000	0 000	0 000	0 000	LREF 6 4320 FT
						BREF 3 8920 FT
						XMRP 1485 0040 IN
						YMRP 0 0000 IN
						ZMRP 377 0004 IN
						SCALE 0 0400

MACH 0 170

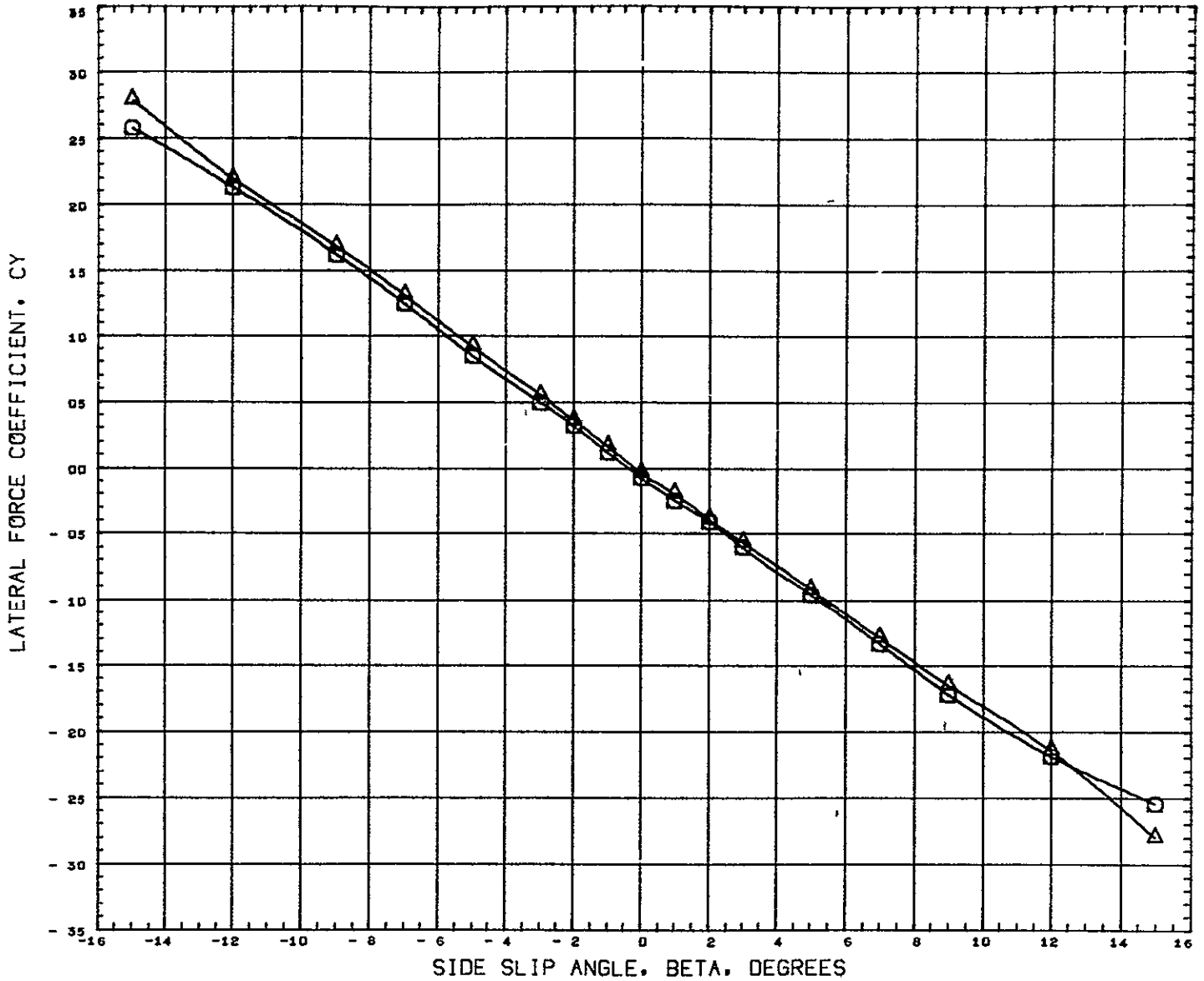
FIG. 15 EFFECT OF SHORT NOSE IN YAW, ALPHA=0. DEG



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW042)	GWT 290-CONF ROS-NB2 B3F1W1V1	0 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
(XCR054)	GWT 289-CONF ROS-NB1 B1W1V1	0 000	0 000	0 000	0 000	LREF 6 4320 FT
						BREF 3 8920 FT
						XMRP 1485 0040 IN
						YMRP 0 0000 IN
						ZMRP 377 0004 IN
						SCALE 0 0400

MACH 0 170

FIG. 16 EFFECT OF SHORT NOSE IN YAW, ALPHA=21. DEG

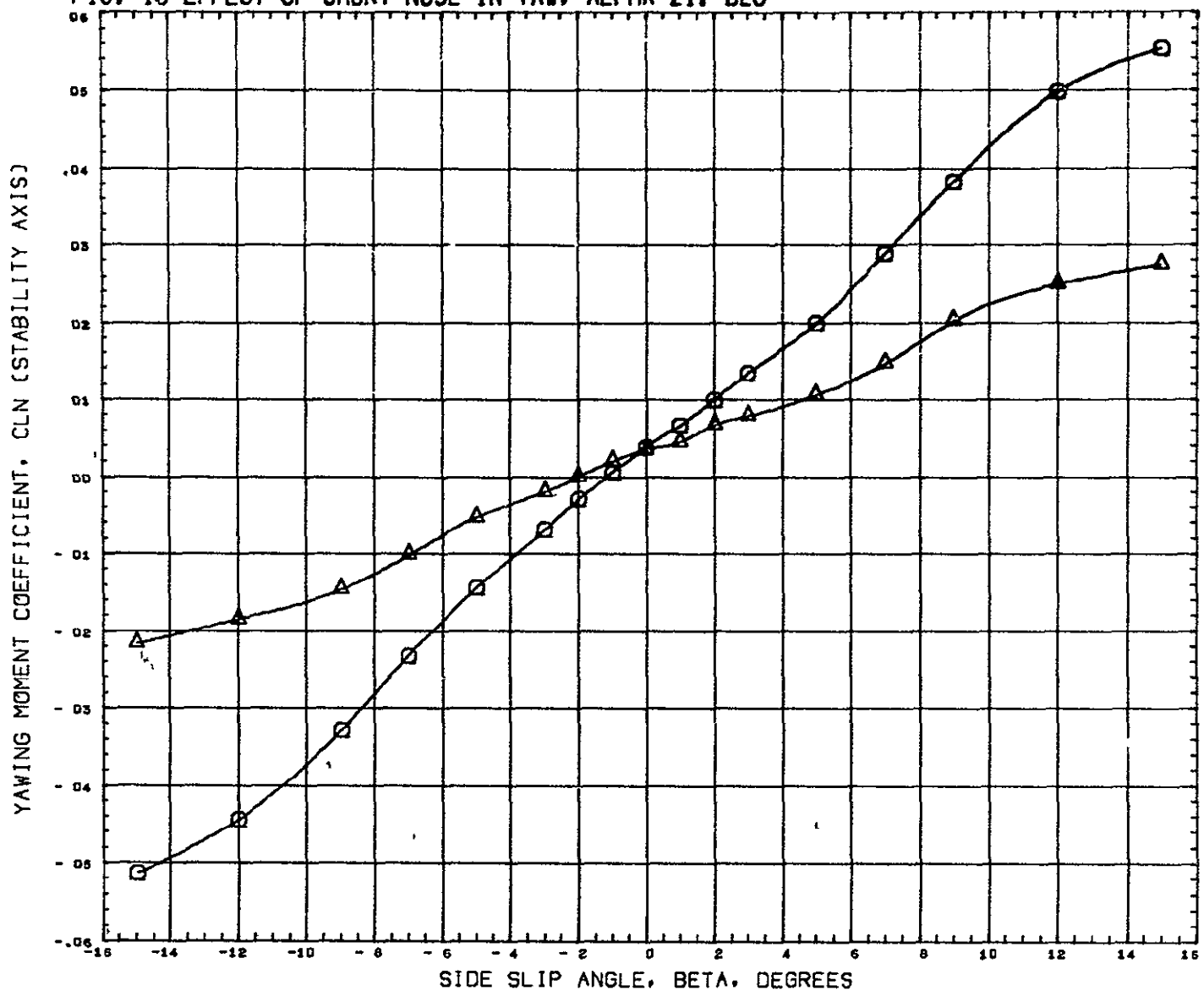


DATA SET SYMBOL	CONFIGURATION DESCRIPTION
(ACWB40)	GWT 290-CONF ROS-NB2 B3F1W1V1
(XCQB52)	GWT 289-CONF ROS-NB1 B1W1V1

ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
21 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
	0 000	0 000	0 000	LREF 6 4320 FT
				BREF 3 8920 FT
				XMRP 1485 0040 IN
				YMRP 0 0000 IN
				ZMRP 377 0004 IN
				SCALE 0 0400

MACH 0 170

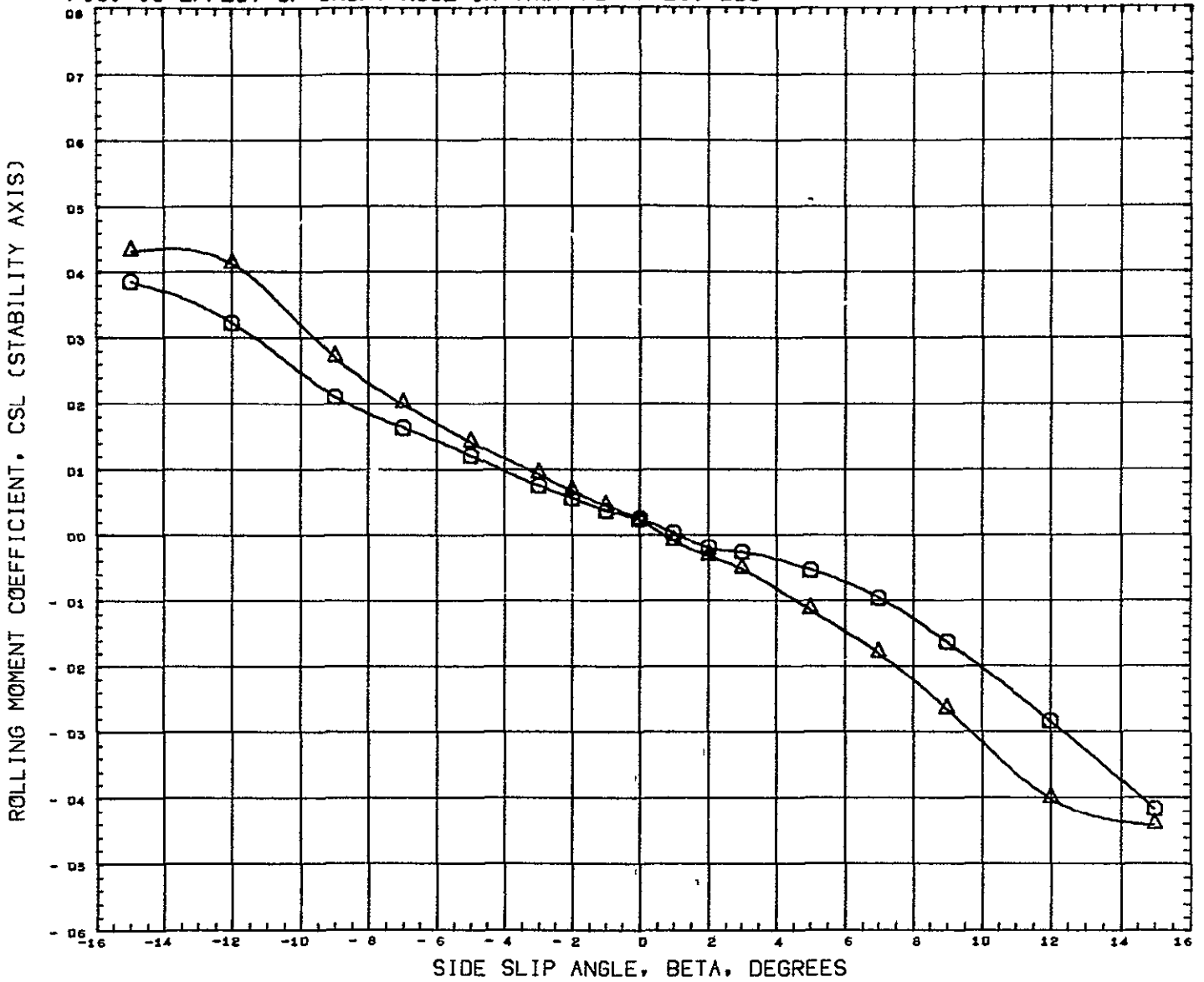
FIG. 16 EFFECT OF SHORT NOSE IN YAW, ALPHA=21. DEG



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(ACWD40)	GWTT 290-CONF ROS-NB2 B3F1W1V1	21.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(XC0052)	GWTT 289-CONF ROS-NB1 B1W1V1	21.000	0.000	0.000	0.000	LREF 6.4320 FT
						BREF 3.8920 FT
						XMRP 1485.0040 IN
						YMRP 0.0000 IN
						ZMRP 377.0004 IN
						SCALE 0.0400

MACH 0.170

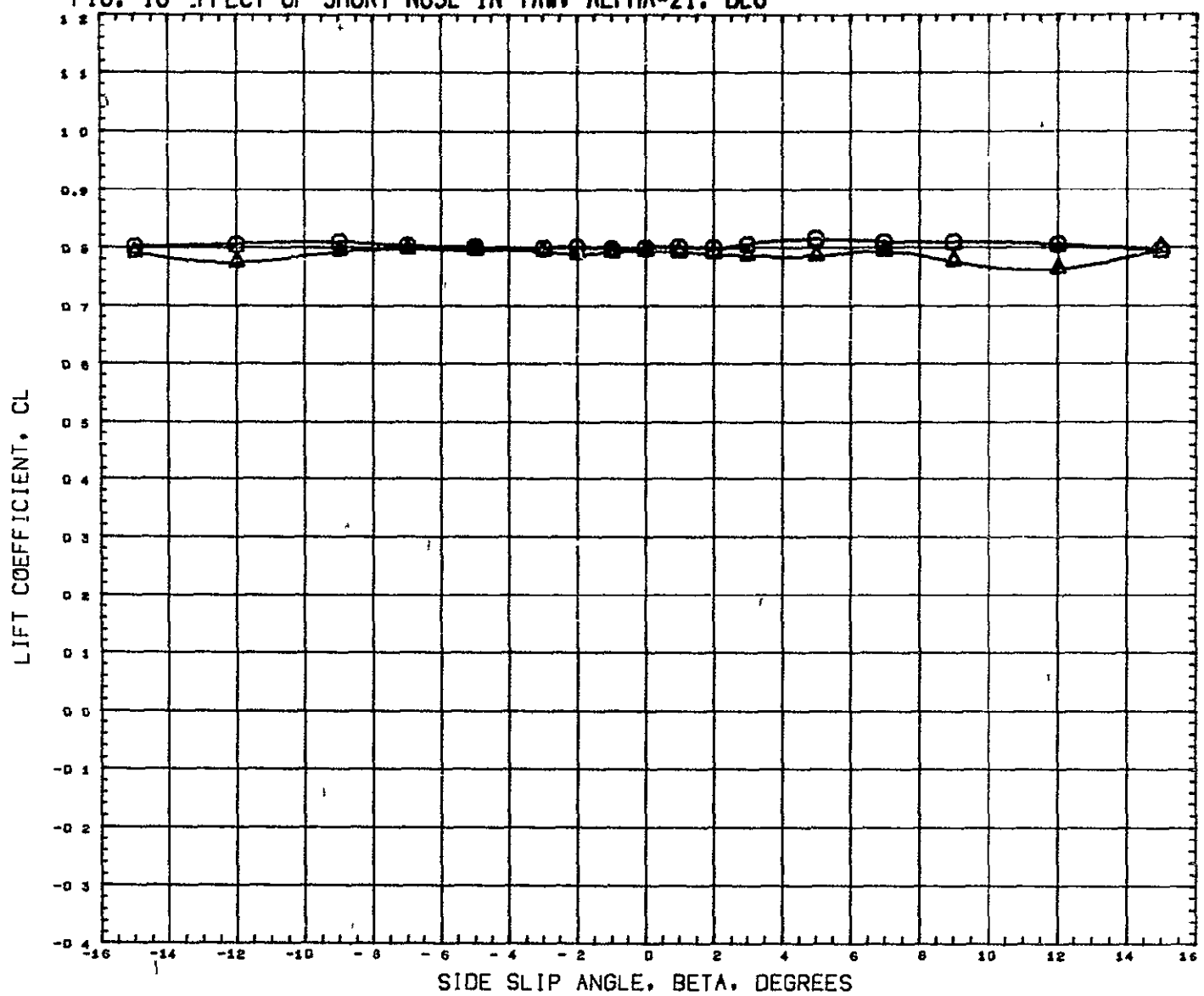
FIG. 16 EFFECT OF SHORT NOSE IN YAW, ALPHA=21. DEG



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(ACWD40)	GWTT 290-CONF ROS-NB2 B3F1W1V1	21 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
(XCWD52)	GWTT 289-CONF ROS-NB1 B1W1V1		0 000	0 000	0 000	LREF 6 4320 FT
						BREF 3 8920 FT
						XMRP 1485 0040 IN
						YMRP 0 0000 IN
						ZMRP 377 0004 IN
						SCALE 0 0400

MACH 0 170

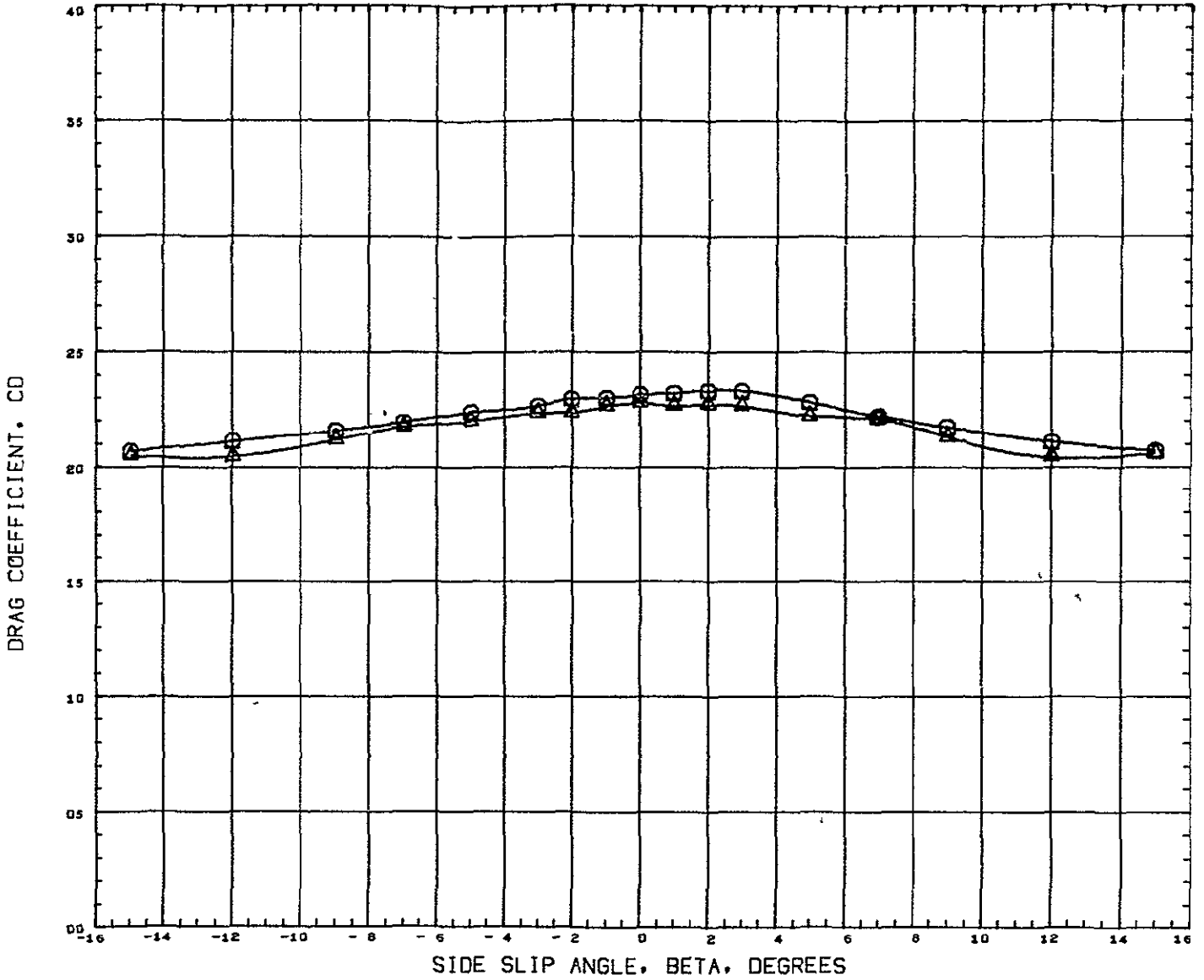
FIG. 16 EFFECT OF SHORT NOSE IN YAW, ALPHA=21. DEG



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(ACW040)	Q GWTT 290-CONF ROS-NB2 B3F1W1V1	21 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
(XC0052)	Δ GWTT 289-CONF ROS-NB1 B1W1V1	21 000	0 000	0 000	0 000	LREF 6 4320 FT
						BREF 3 8920 FT
						XMRP 1485 0040 IN
						YMRP 0 0000 IN
						ZMRP 377 0004 IN
						SCALE 0 0400

MACH 0 170

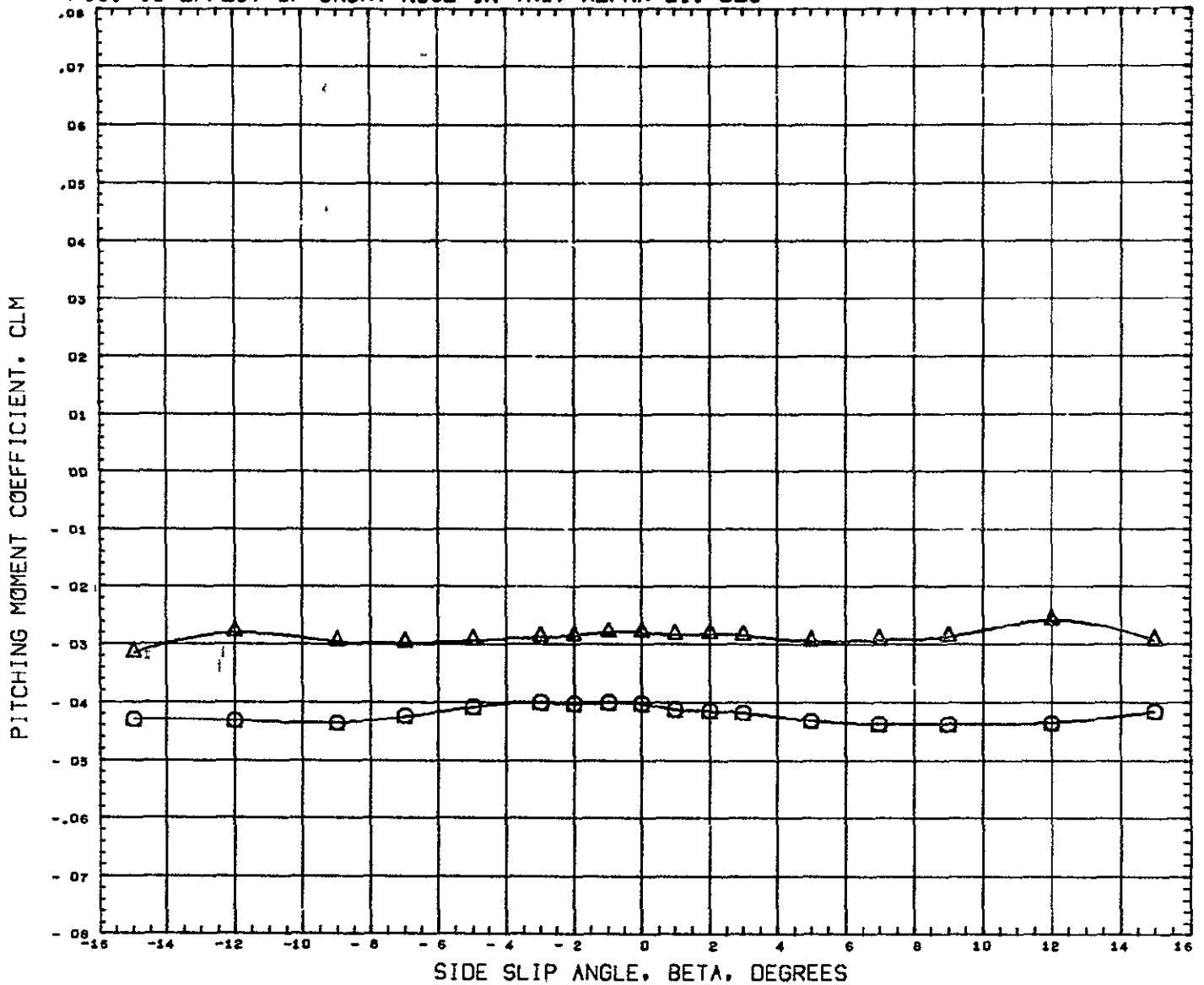
FIG. 16 EFFECT OF SHORT NOSE IN YAW, ALPHA=21. DEG



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(ACW040)	Q GTT 290-CONF ROS-NB2 B3F1W1V1	21 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
(XCR052)	A GTT 289-CONF ROS-NB1 B1W1V1	21 000	0 000	0 000	0 000	LREF 6 4320 FT
						BREI 3 8920 FT
						XMRP 1485 0040 IN
						YMRP 0 0000 IN
						ZMRP 377 0004 IN
						SCALE 0 6400

HACH 0 170

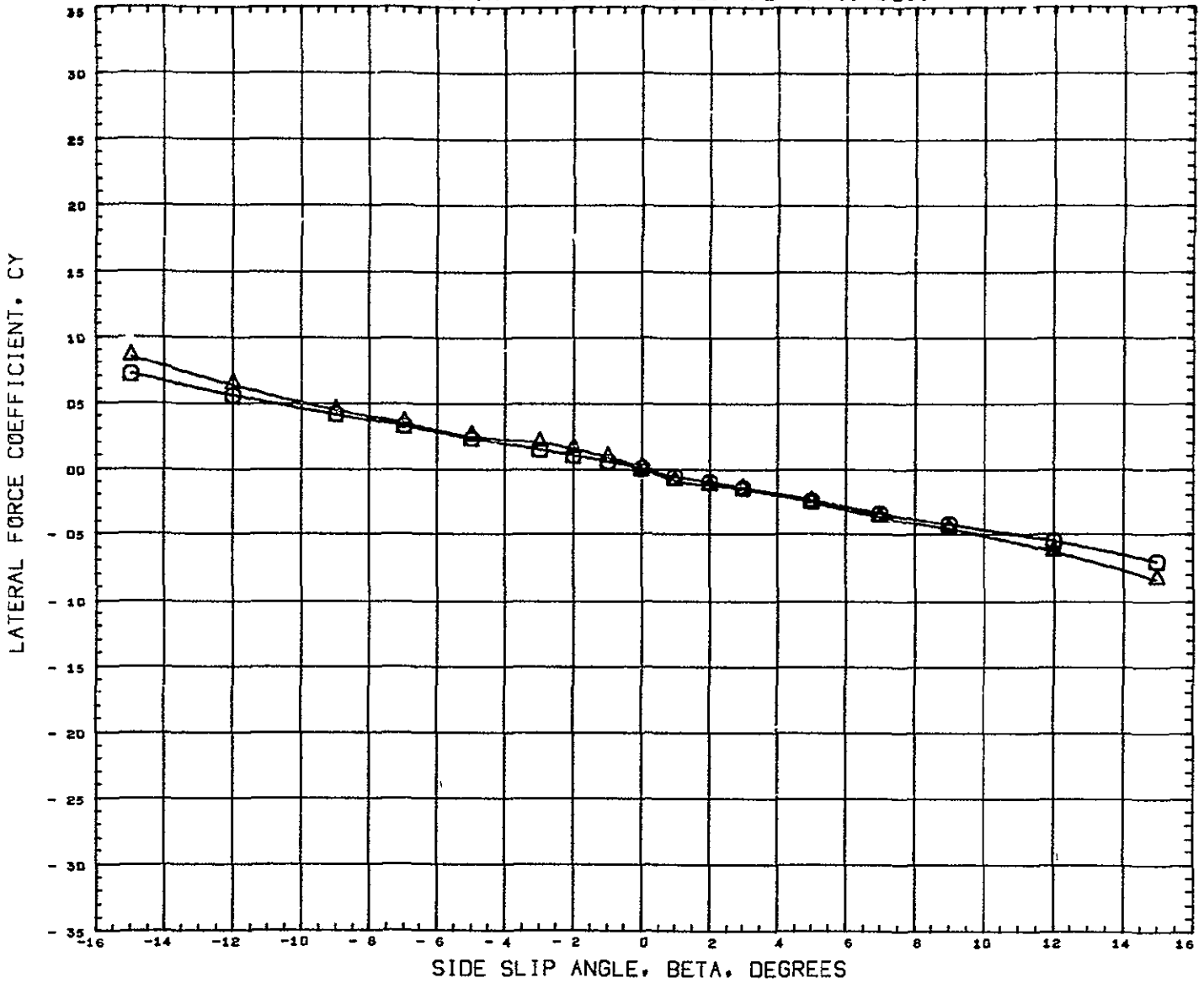
FIG. 16 EFFECT OF SHORT NOSE IN YAW, ALPHA=21. DEG



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(ACW040)	GWTT 290-CONF ROS-NB2 B3F1W1V1	21 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
(XC0052)	GWTT 289-CONF ROS-NB1 B1W1V1					LREF 6 4320 FT
						BREF 3 8920 FT
						XMRP 1485 0040 IN
						YMRP 0 0000 IN
						ZMRP 377 0004 IN
						SCALE 0 0400

MACH 0 170

FIG. 17 EFFECT OF SHORT NOSE IN YAW(BODY ALONE), ALPHA=0. DEG.



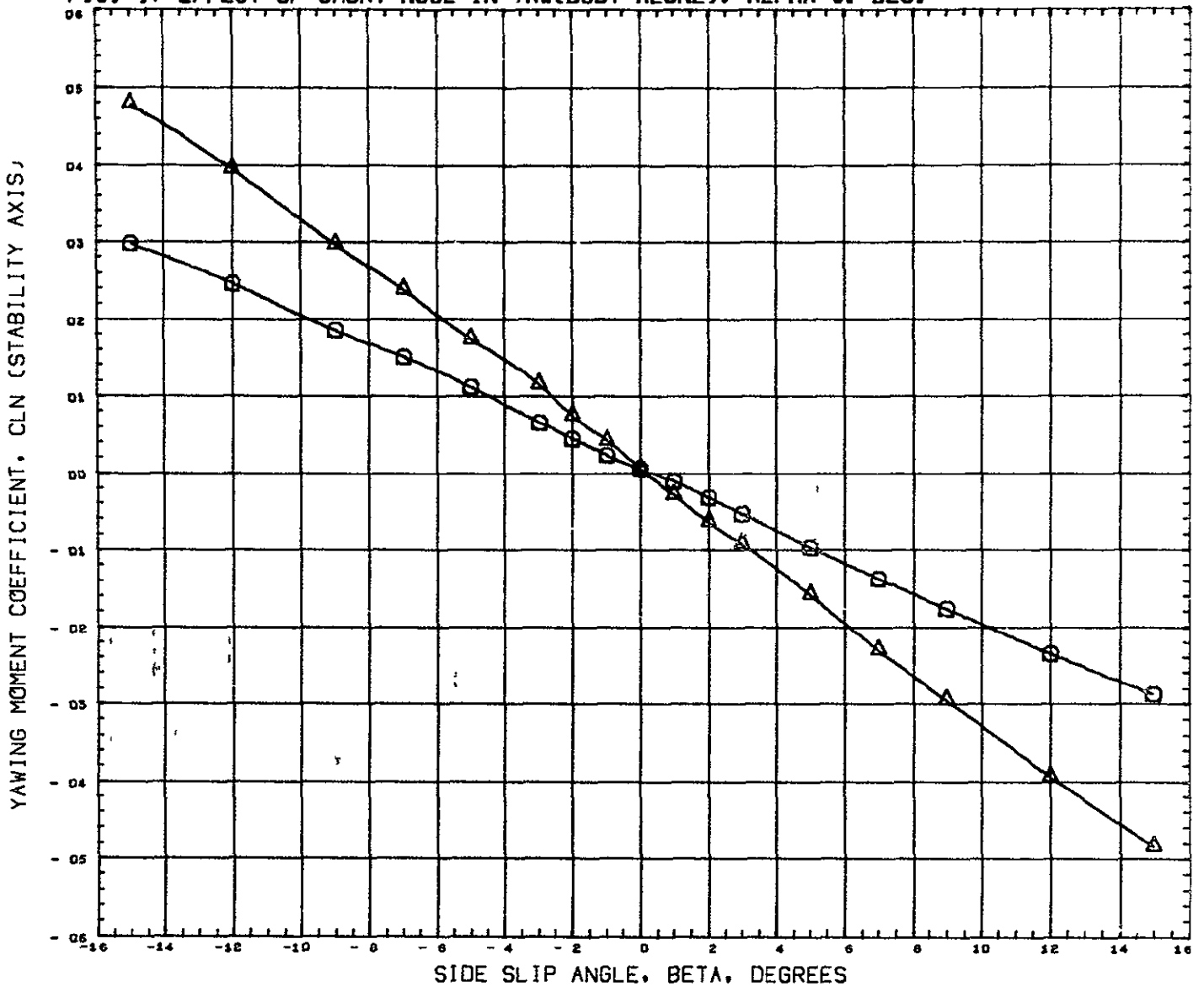
DATA SET SYMBOL	CONFIGURATION DESCRIPTION
(RCW044) \bigcirc	GWTT 290-CONF ROS-NB2 B3F1
(XCQ042) \triangle	GWTT 289-CONF ROS-NB1 B1

ALPHA	ELEVTR	AILRON	RUDDER
0 000			
0 000			

REFERENCE INFORMATION		
SREF	9 1952	SQ FT
LREF	6 4320	FT
BREF	3 8920	FT
XMRP	1485 0040	IN
YMRP	0 0000	IN
ZMRP	377 0004	IN
SCALE	0 0400	

MACH 0 170

FIG. 17 EFFECT OF SHORT NOSE IN YAW(BODY ALONE). ALPHA=0. DEG.



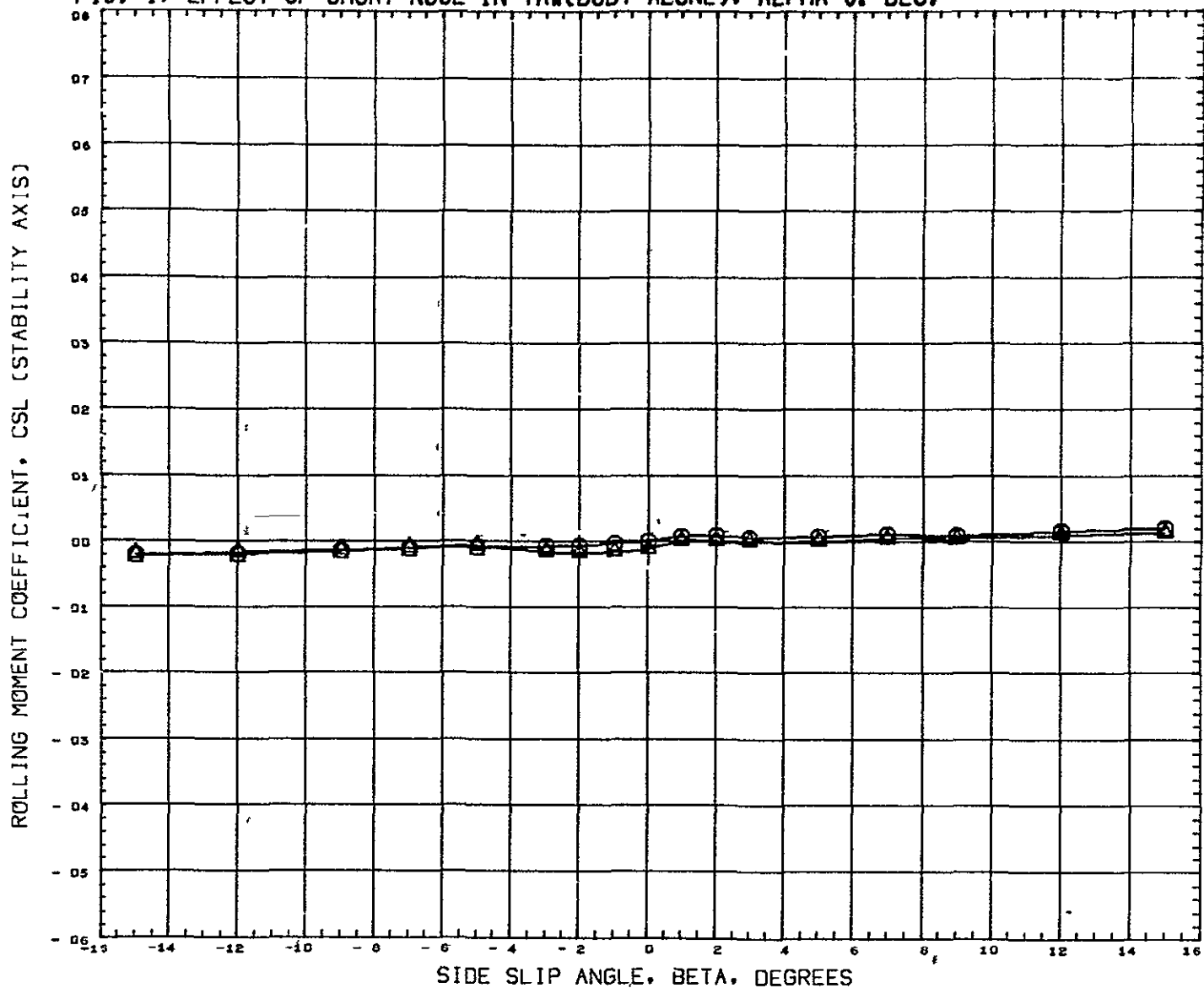
DATA SET SYMBO	CONFIGURATION DESCRIPTION
(RCWD44)	GWTT 290-CONF ROS-NB2 B3F1
(XCQD42)	GWTT 289-CONF ROS-NB1 B1

ALPHA	ELEVTR	AILRON	RUDDER
0 000			
0 000			

REFERENCE INFORMATION	
SREF	9 1952 SQ FT
LREF	6 4320 FT
BREF	3 8920 FT
XMRP	1485 0040 IN
YMRP	0 0000 IN
ZMRP	377 0004 IN
SCALE	0.0400

MACH | 0 170

FIG. 17 EFFECT OF SHORT NOSE IN YAW(BODY ALONE), ALPHA=0. DEG.



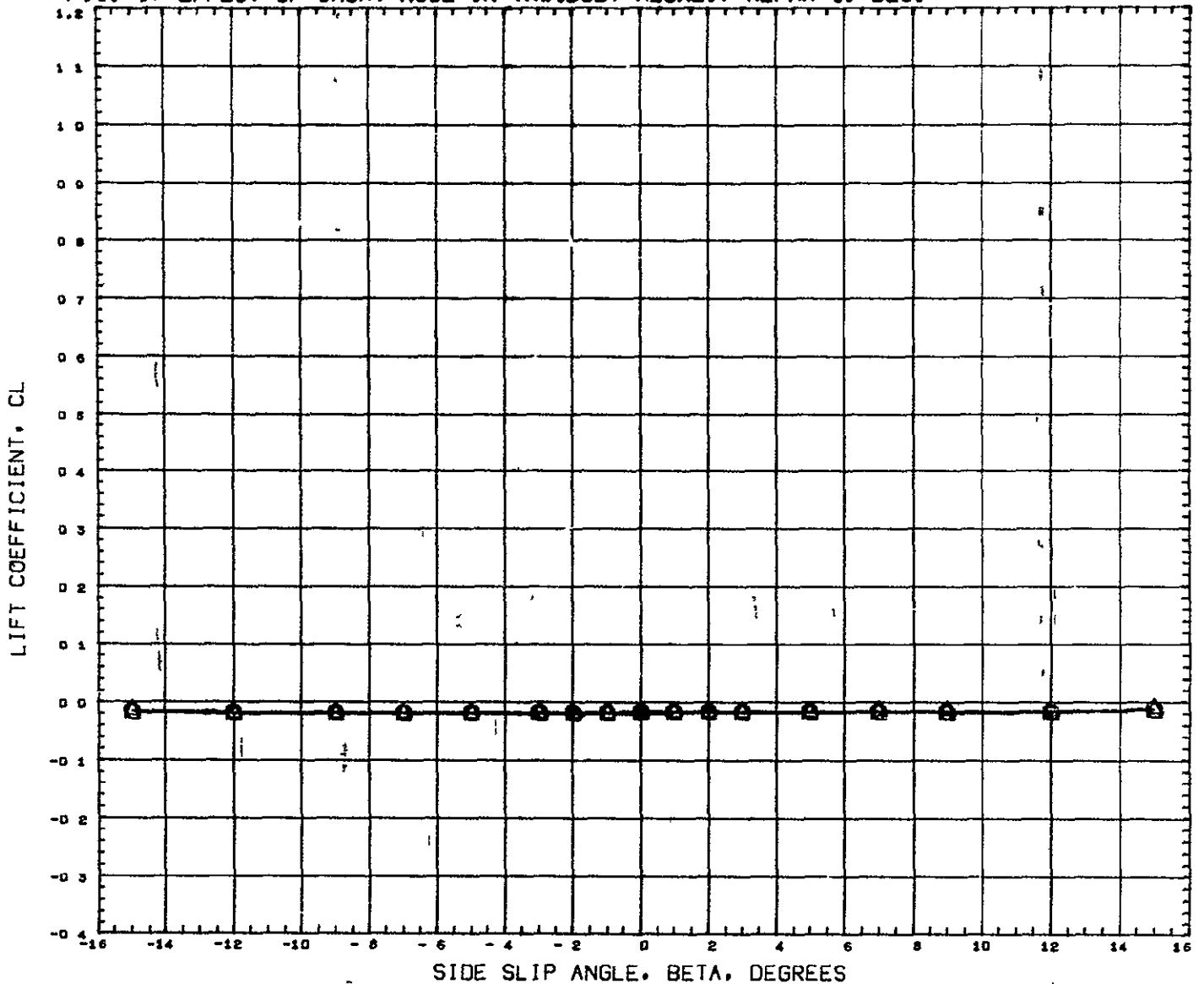
DATA SET SYMBOL	CONFIGURATION DESCRIPTION
(RCWD44)	GWTT 290-CONF ROS-NB2 B3F1
(XCWD42)	GWTT 289-CONF ROS-NB1 B1

ALPHA	ELEVTR	AILRON	RUDDER
0.000			
0.000			

REFERENCE INFORMATION	
SREF	9 1952 SQ FT
LREF	6 4320 FT
BREF	3 8920 FT
XMRP	1485 0040 IN
YMRP	0 0000 IN
ZMRP	377 0004 IN
SCALE	0 0400

MACH 0 170

FIG. 17 EFFECT OF SHORT NOSE IN YAW(BODY ALONE), ALPHA=0. DEG.



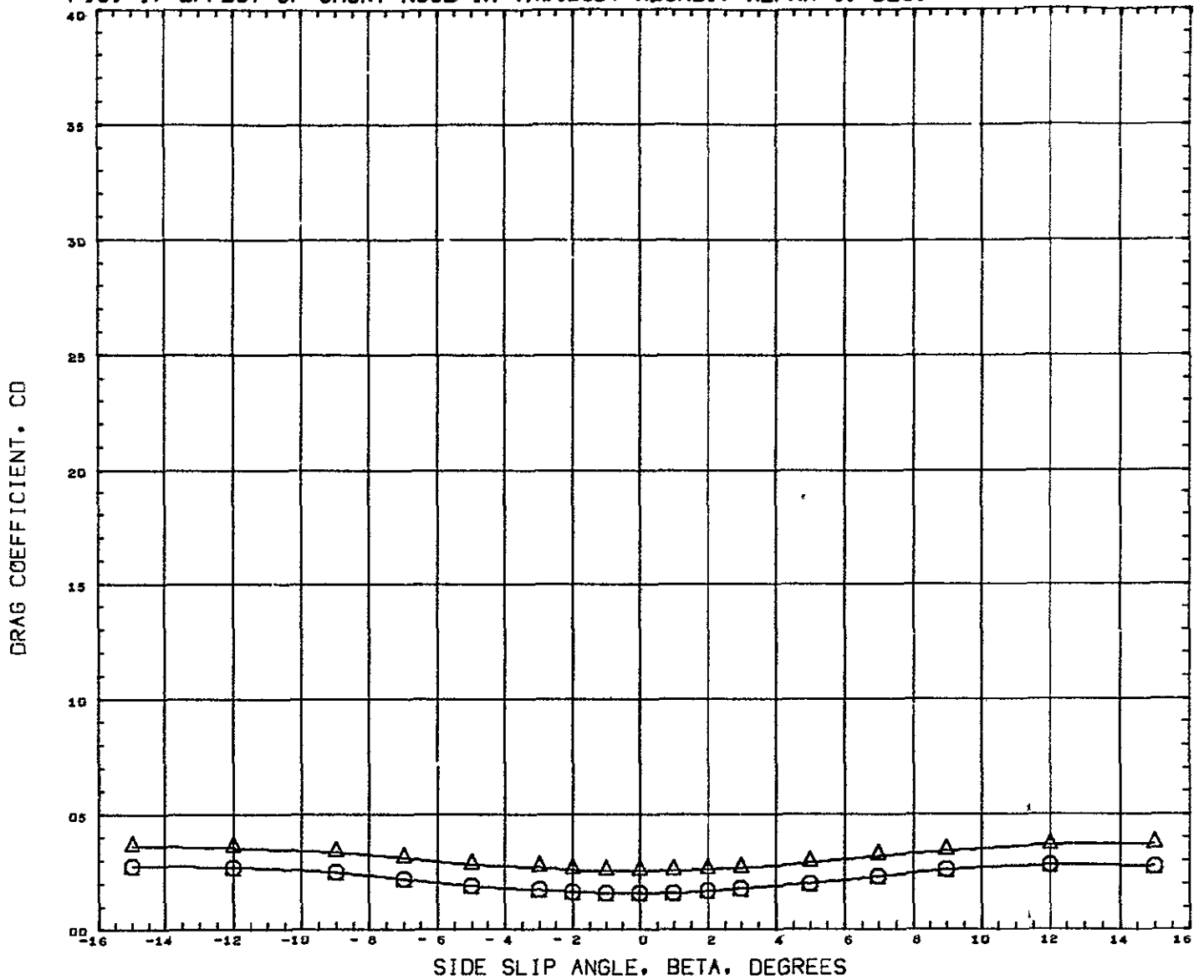
DATA SET SYMBOL	CONFIGURATION DESCRIPTION
(RCWD44) \odot	GWT 290-CONF ROS-NB2 B3F1
(XCWD42) \triangle	GWT 289-CONF ROS-NB1 B1

ALPHA	ELEVTR	AILRON	RUDDER
0 000			
0 000			

REFERENCE INFORMATION		
SREF	9 1952	SQ FT
LREF	6 4320	FT
BREF	3 8920	FT
XMRP	1485 0040	IN
YMRP	0 0000	IN
ZMRP	377 0004	IN
SCALE	0 0400	

MACH 0 170

FIG. 17 EFFECT OF SHORT NOSE IN YAW (BODY ALONE), ALPHA=0. DEG.



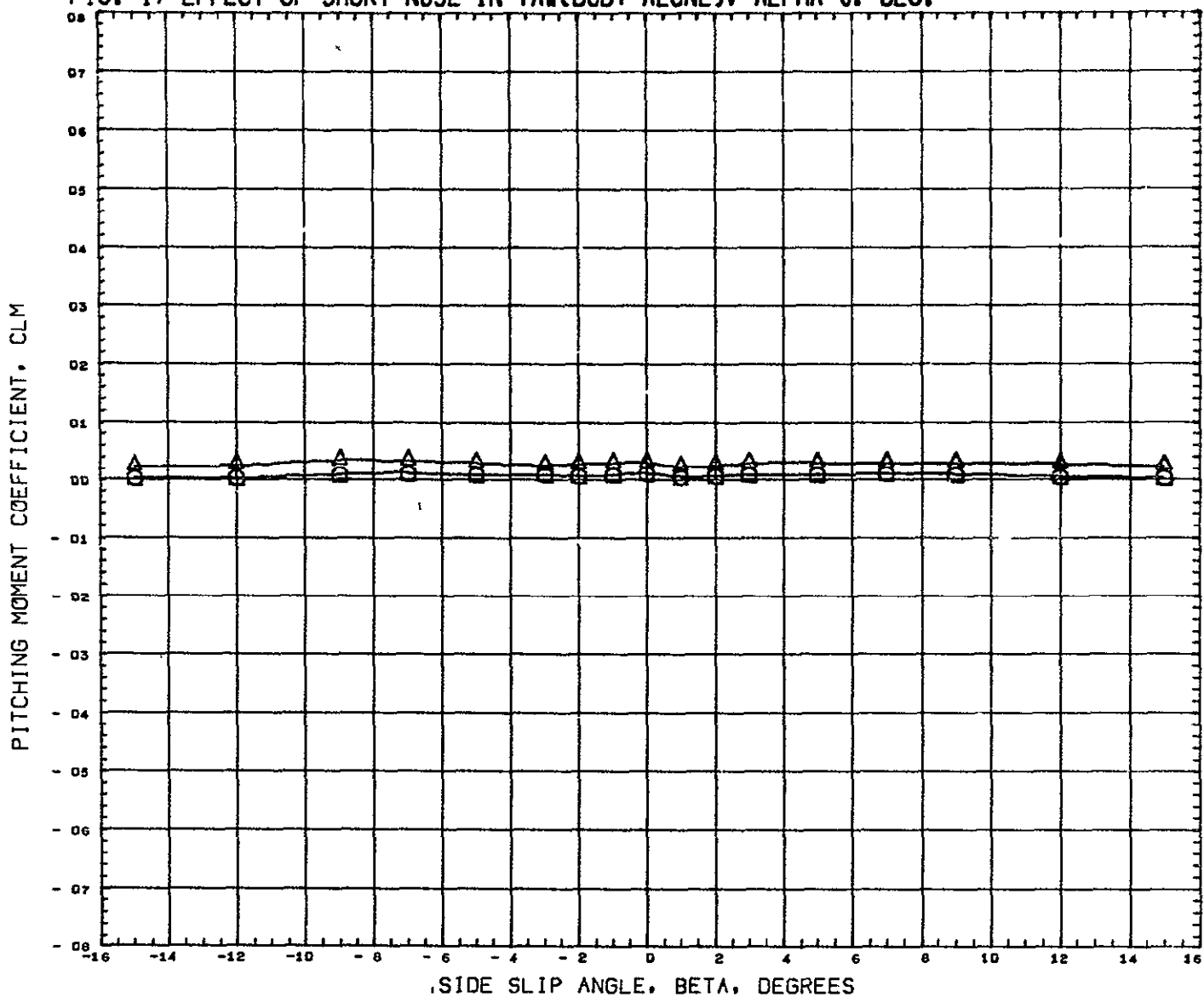
DATA SET SYMBOL	CONFIGURATION DESCRIPTION
(RCWD44) ○	GWT 290-CONF ROS-NB2 B3F1
(XCWD42) △	GWT 289-CONF ROS-NB1 B1

ALPHA	ELEVTR	AILRON	RUDDER
0 000			
0 000			

REFERENCE INFORMATION		
SREF	9 1952	SQ FT
LREF	6 4320	FT
BREF	3 8920	FT
XMRP	1485 0040	IN
YMRP	0 0000	IN
ZMRP	377 0004	IN
SCALE	0 0400	

MACH 0 170

FIG. 17 EFFECT OF SHORT NOSE IN YAW(BODY ALONE), ALPHA=0. DEG.



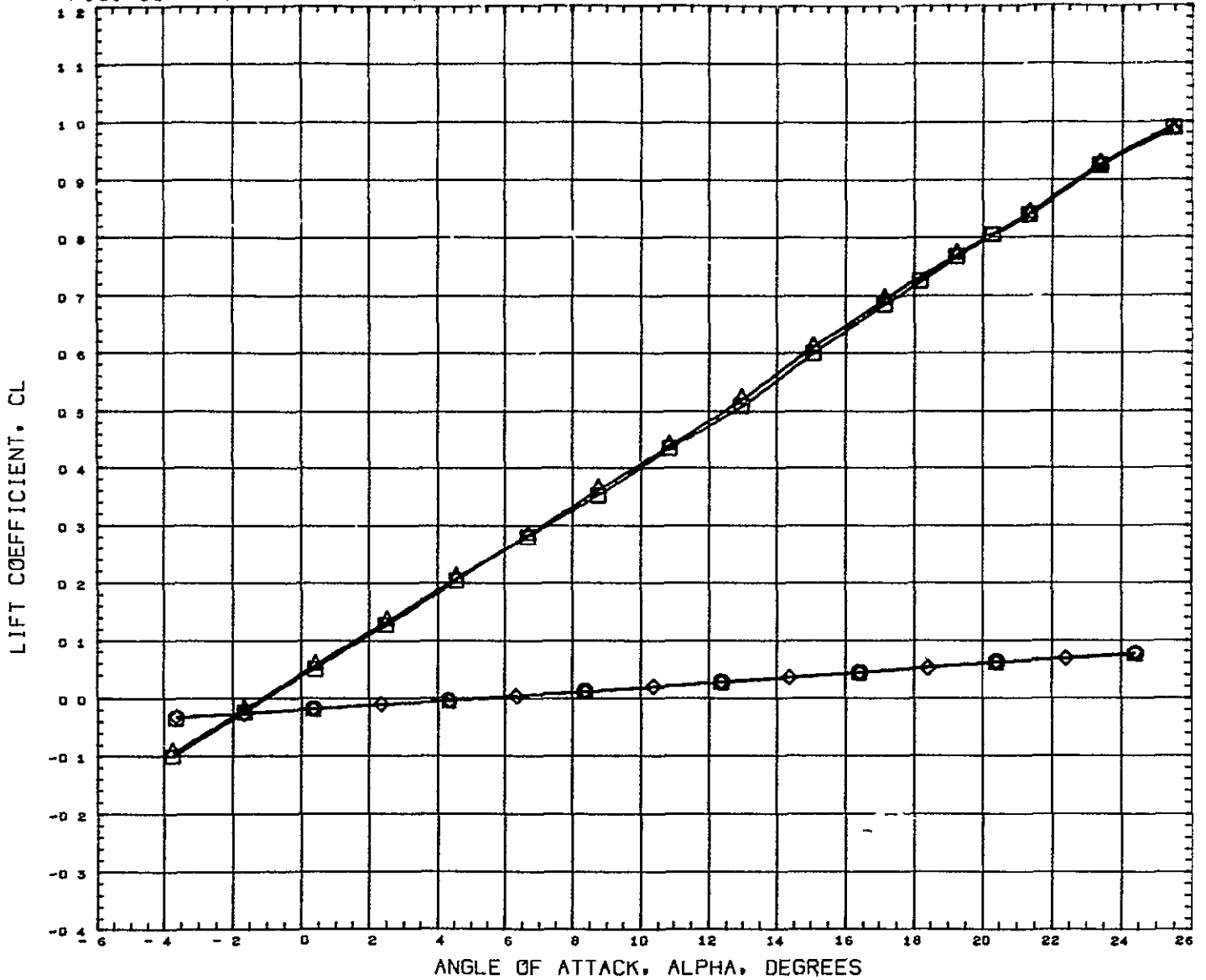
DATA SET SYMBOL	CONFIGURATION DESCRIPTION
(RCW044)	Q GWTT 290-CONF ROS-NB2 B3F1
(XC0042)	A GWTT 289-CONF ROS-NB1 B1

ALPHA	ELEVTR	AILRON	RUDDER
0 000			
0 000			

REFERENCE INFORMATION		
SREF	9 1952	SQ FT
LREF	6 4320	FT
BREF	3 8920	FT
XMRP	1485 00-0	IN
YMRP	0 0000	IN
ZMRP	377 0004	IN
SCALE	0 0400	

MACH 0 170

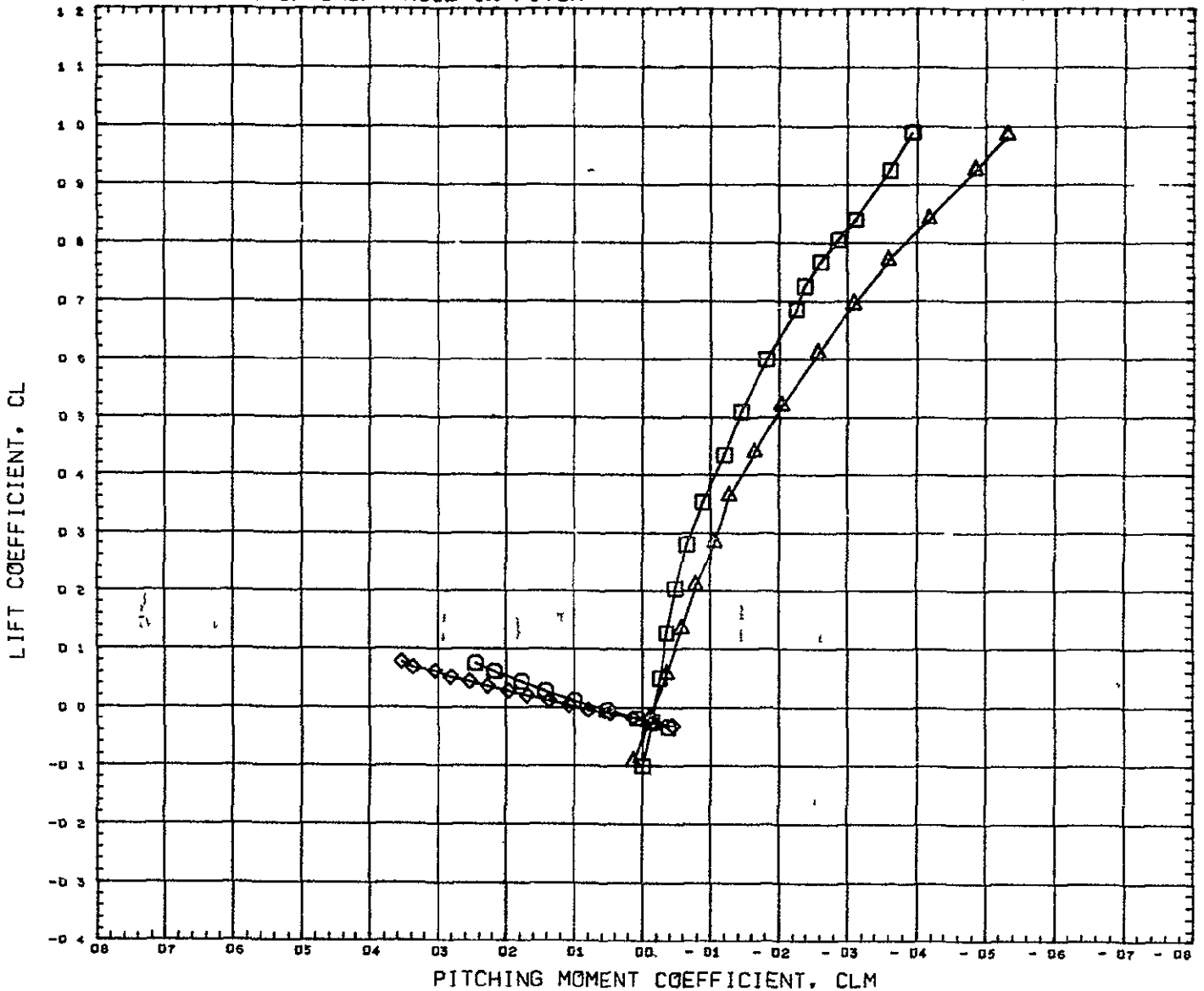
FIG. 18 EFFECT OF SHORT NOSE IN PITCH



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDEP	REFERENCE INFORMATION
(RCWD46)	GWTT 29D-CONF ROS-NB2 B3F1	0 000				SREF 9 1952 SQ FT
(RCWD48)	GWTT 29G-CONF ROS-NB2 B3F1W1V1	0 000	0 000	0 000	0 000	LREF 6 4320 FT
(RCQB40)	GWTT 289-CONF ROS-NB1 B1	0 000				BREF 3 8920 FT
(RCQB27)	GWTT 289-CONF ROS-NB1 B1W1V1	0 000	0 000	0 000	0 000	XNRF 1485 0040 IN YNRF 0 0000 IN ZNRF 377 0004 IN SCALE 0 0400

MACH 0 170

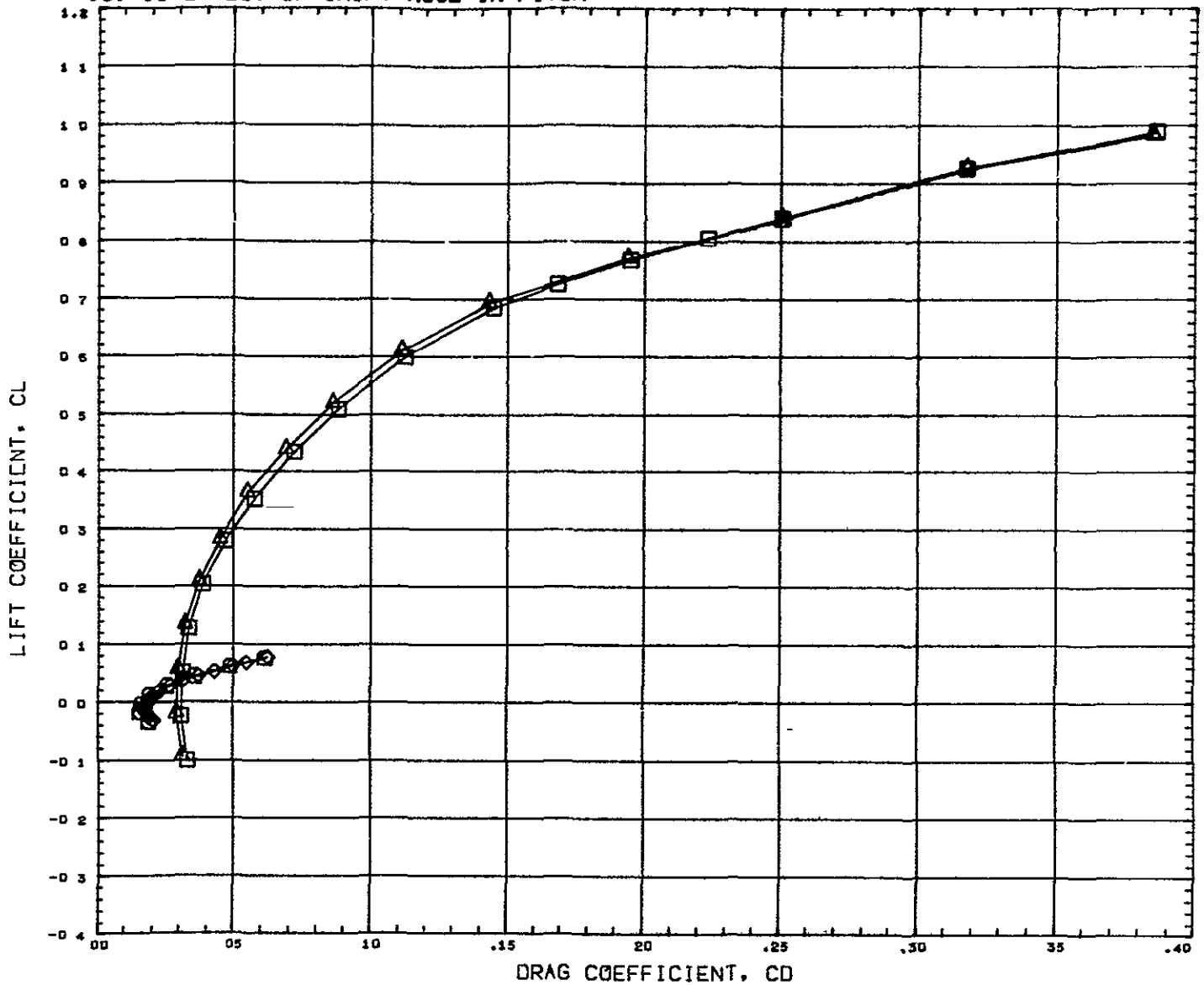
FIG. 18 EFFECT OF SHORT NOSE IN PITCH



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW046)	GWTT 290-CONF ROS-NB2 B3F1	0 000				SREF 9 1952 SQ FT
(RCW048)	GWTT 290-CONF ROS-NB2 B3F1W1V1	0 000	0 000	0 000	0 000	LREF 6 4320 FT
(RCQ040)	GWTT 289-CONF ROS-NB1 B1	0 000				SREF 3 8920 FT
(RCQ027)	GWTT 289-CONF ROS-NB1 B1W1V1	0 000	0 000	0 000	0 000	XNRP 1485 0040 IN
						YNRP 0 0000 IN
						ZNRP 377 0004 IN
						SCALE 0 0400

MACH 0 170

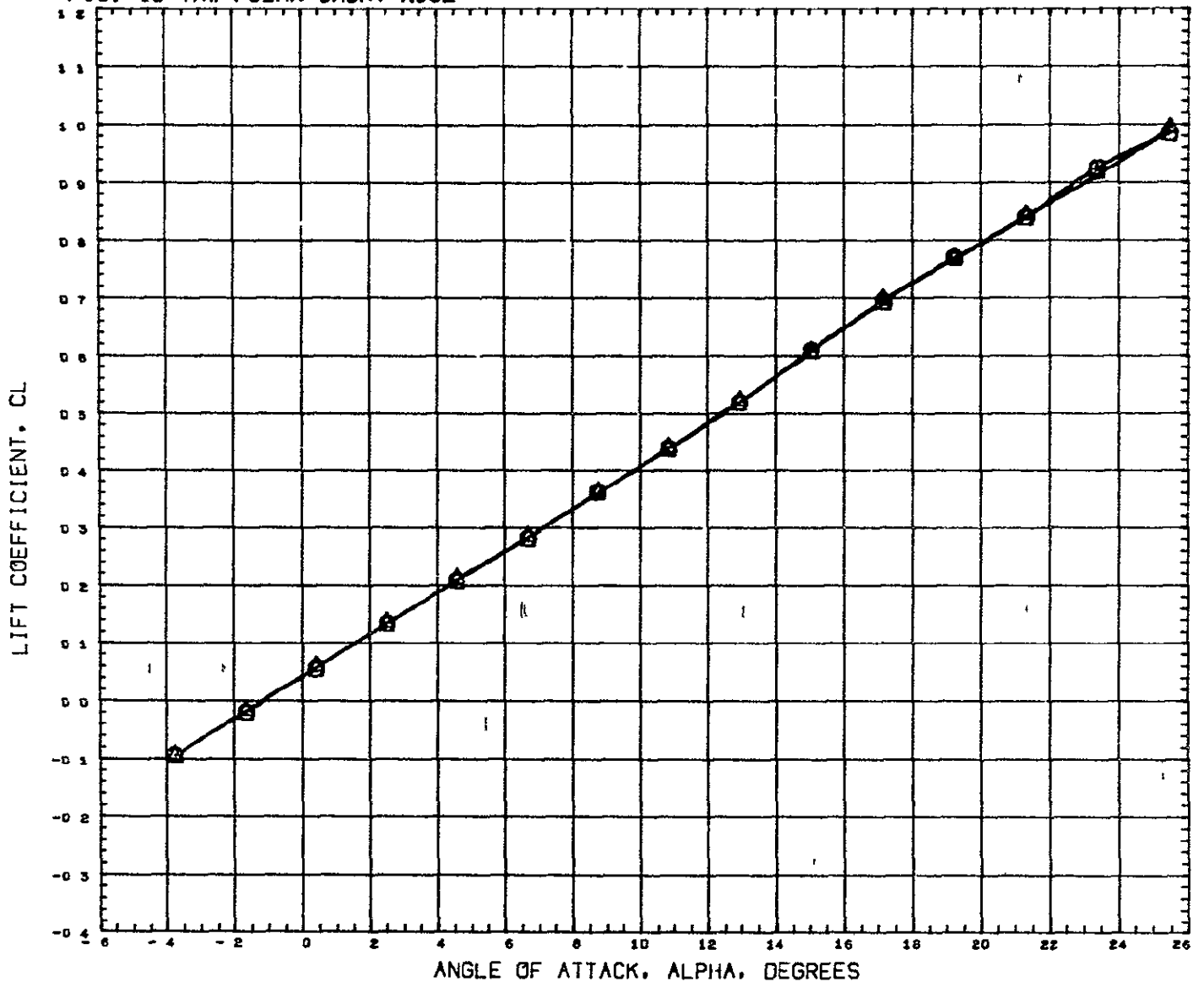
FIG. 18 EFFECT OF SHORT NOSE IN PITCH



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCWD46)	GWTT 290-CONF ROS-NB2 B3F1	0.000	0.000	0.000	0.000	SREF 9 1952 SQ FT
(RCWD48)	GWTT 290-CONF ROS-NB2 B3F1W1V1	0.000	0.000	0.000	0.000	LREF 6 4320 FT
(RCWD40)	GWTT 289-CONF ROS-NB1 B1	0.000	0.000	0.000	0.000	BREF 3 8920 FT
(RCWD27)	GWTT 289-CONF ROS-NB1 B1W1V1	0.000	0.000	0.000	0.000	XMRP 1485 0040 IN
						YMRP 0 0000 IN
						ZMRP 377 0004 IN
						SCALE 0 0400

MACH 0 170

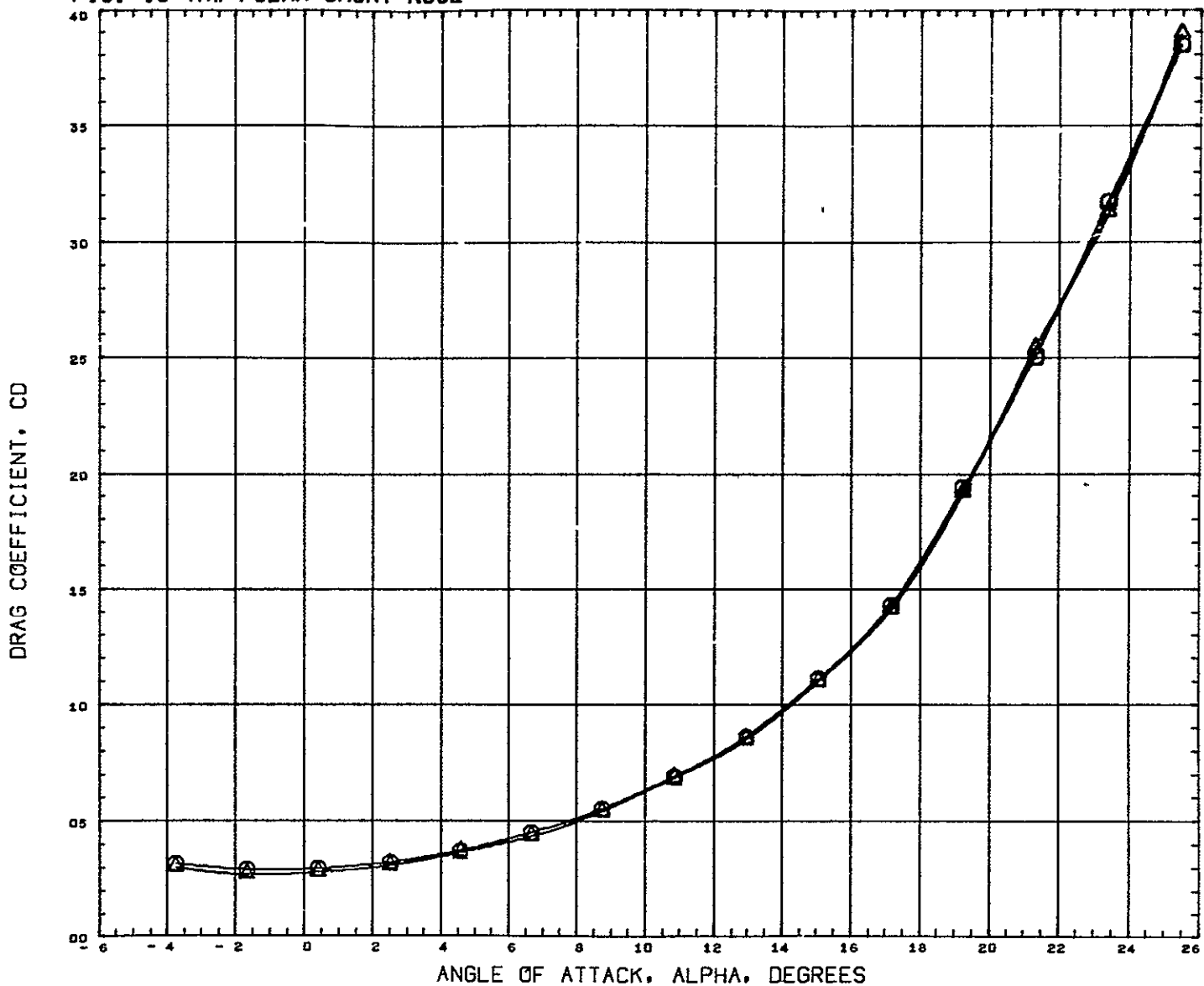
FIG. 19 YAW POLAR-SHORT NOSE



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCWD48)	GWTT 290-CONF ROS-NB2 B3F1W1V1	0 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
(RCWD49)	GWTT 290-CONF ROS-NB2 B3F1W1V1	3 000	0 000	0 000	0 000	LREF 6 4320 FT
						BREF 3 8920 FT
						XMRP 1485 0040 IN
						YMRP 0 0000 IN
						ZMRP 377 0004 IN
						SCALE 0 0400

MACH 0 170

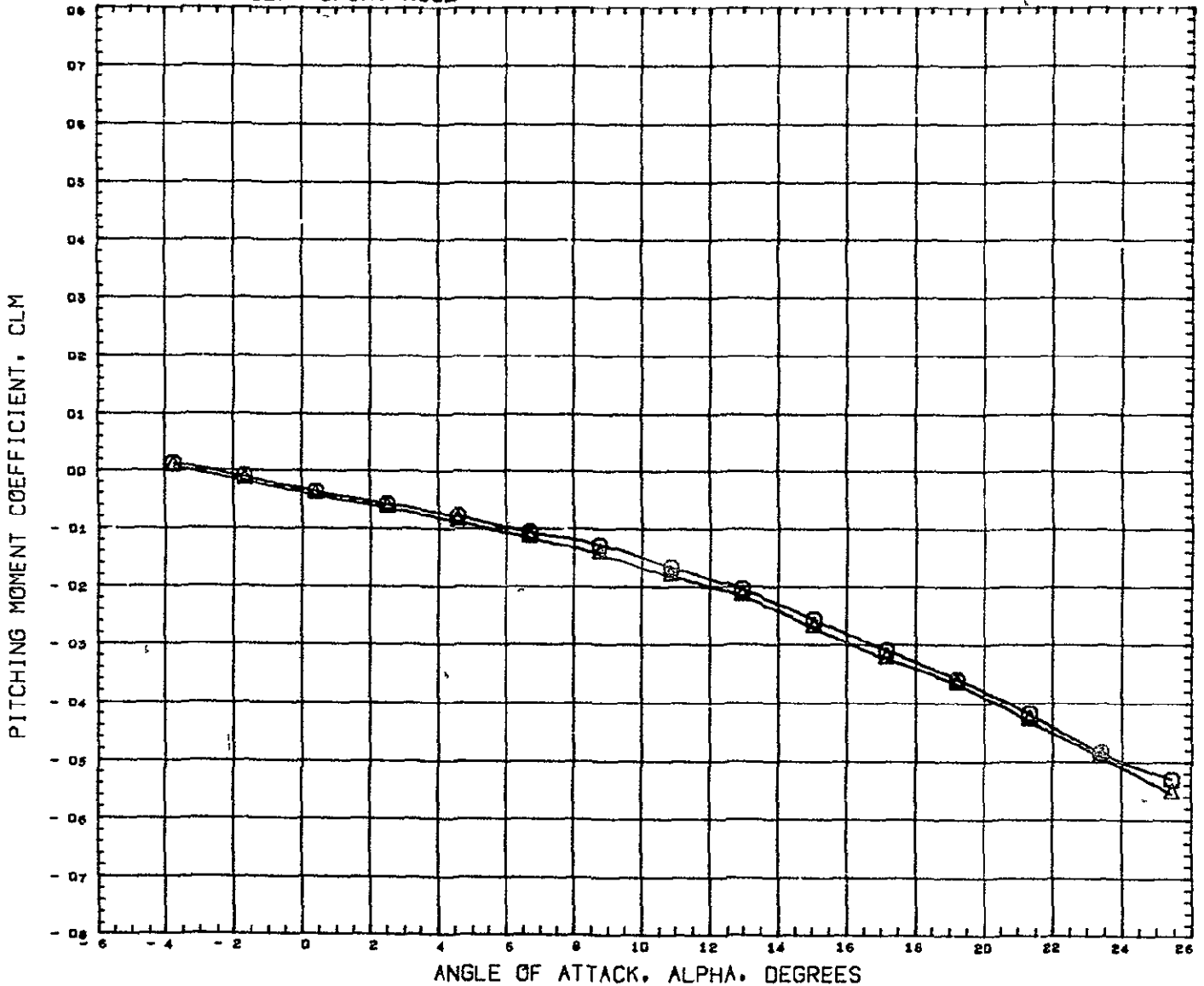
FIG. 19 YAW POLAR-SHORT NOSE



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE	INFORMATION
(RCND48)	GWTT 290-CONF ROS-NB2 B3F1W1V1	0 000	0 000	0 000	0 000	SREF	9 1952 SQ FT
(RCND49)	GWTT 290-CONF ROS-NB2 B3F1W1V1	3 000	0 000	0 000	0 000	LREF	6 4320 FT
						BREF	3 8920 FT
						XMRP	1485 0040 IN
						YMRP	0 0000 IN
						ZMRP	377 0004 IN
						SCALE	0 0400

MACH 0 170

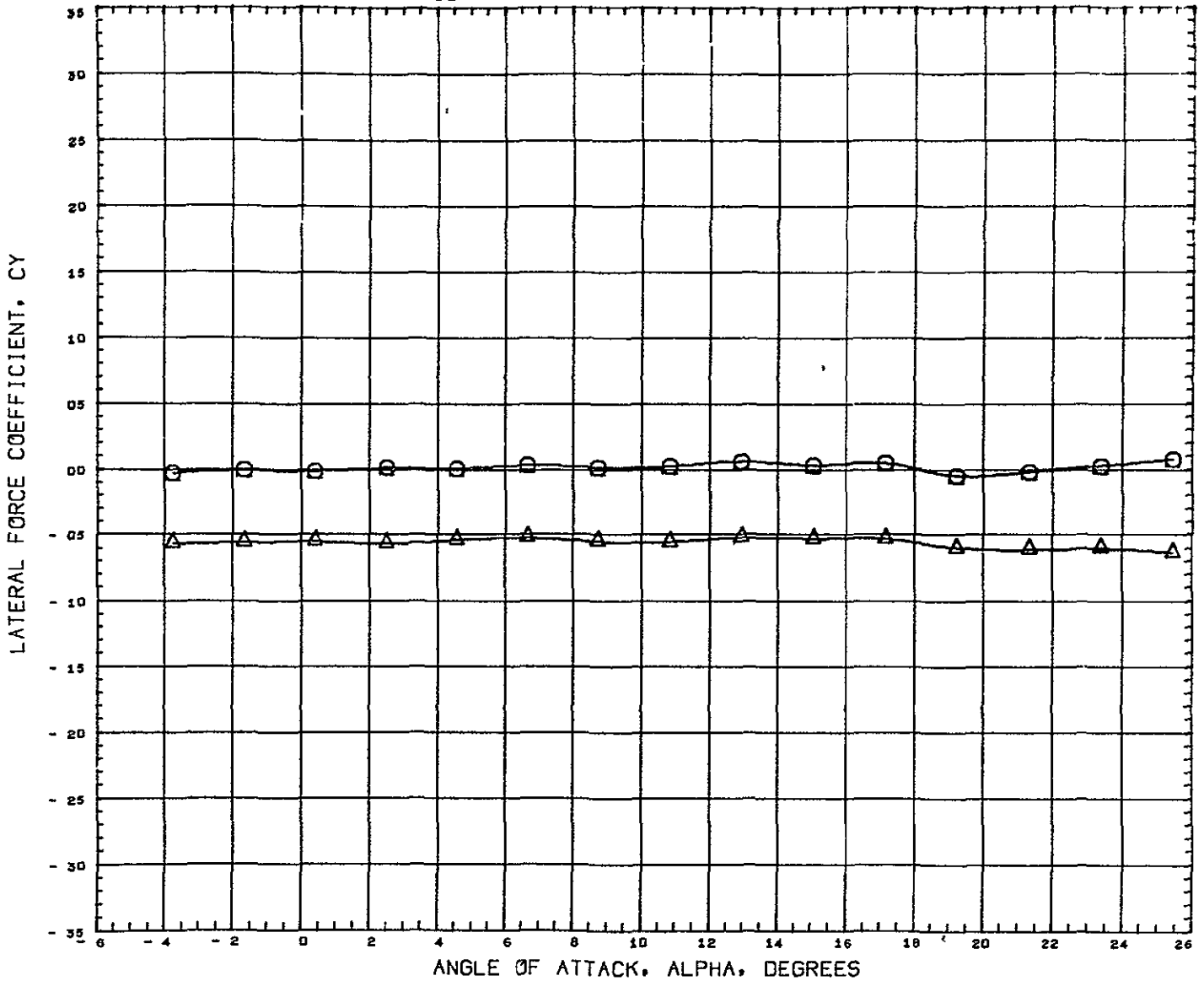
FIG. 19 YAW POLAR-SHORT NOSE



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW048)	GWTT 29D-CONF ROS-NB2 B3F1W1V1	0 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
(RCW049)	GWTT 29D-CONF ROS-NB2 B3F1W1V	3 000	0 000	0 000	0 000	LREF 6 4320 FT
						BREF 5 8920 FT
						XMRP 1485 0040 IN
						YMRP 0 0000 IN
						ZMRP 377 0004 IN
						SCALE 0 0.00

MACH 0 170

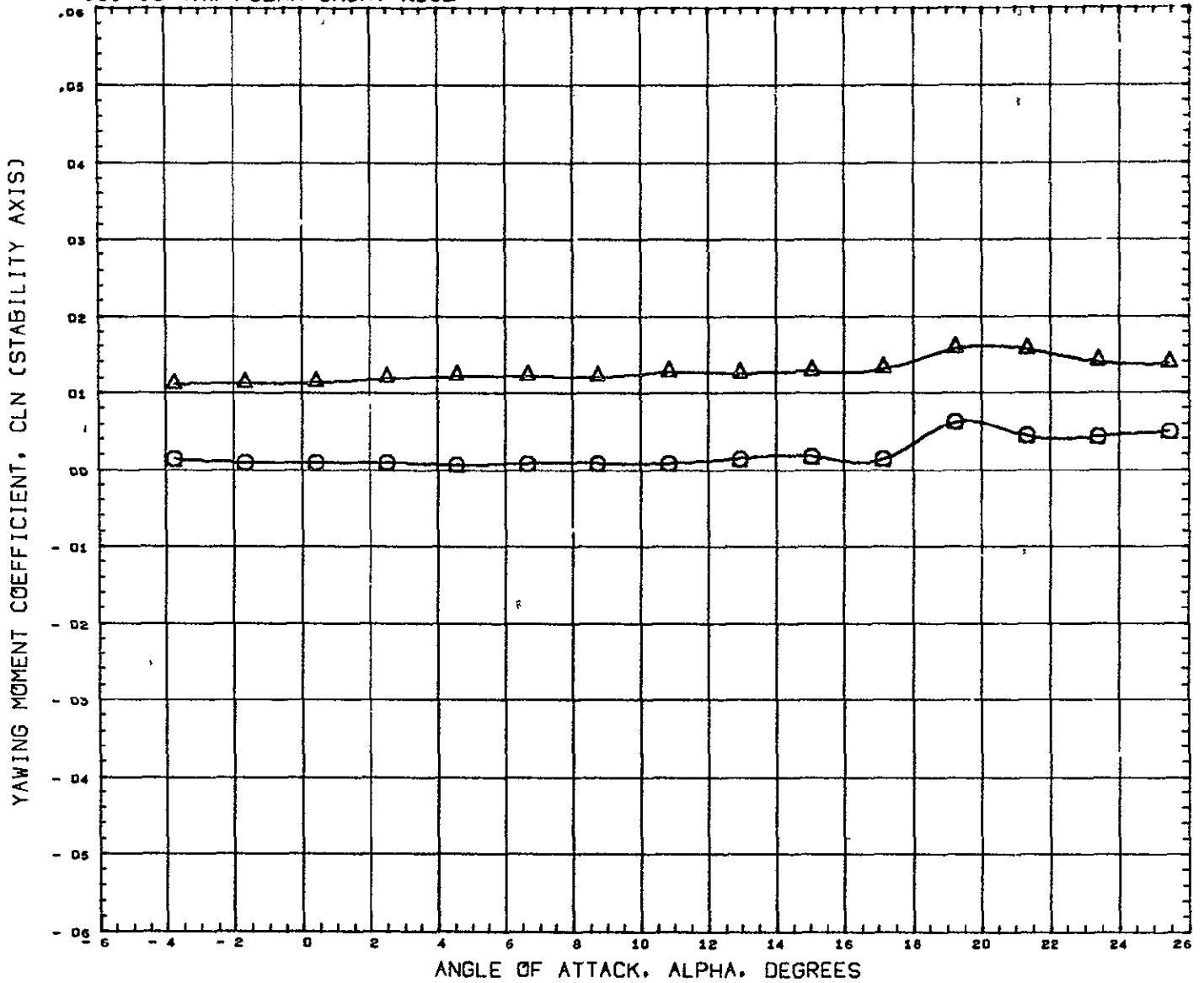
FIG. 19 YAW POLAR-SHORT NOSE



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW048) ○	GWTT 290-CONF ROS-NB2 83F1W1V1	0 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
(RCW049) △	GWTT 290-CONF ROS-NB2 83F1W1V1	3 000	0 000	0 000	0 000	LREF 6 4320 FT
						BREF 3 8920 FT
						XMRF 1485 0040 IN
						YMRF 0 0000 IN
						ZMRF 377 0004 IN
						SCALE 0 0400

MACH 0 170

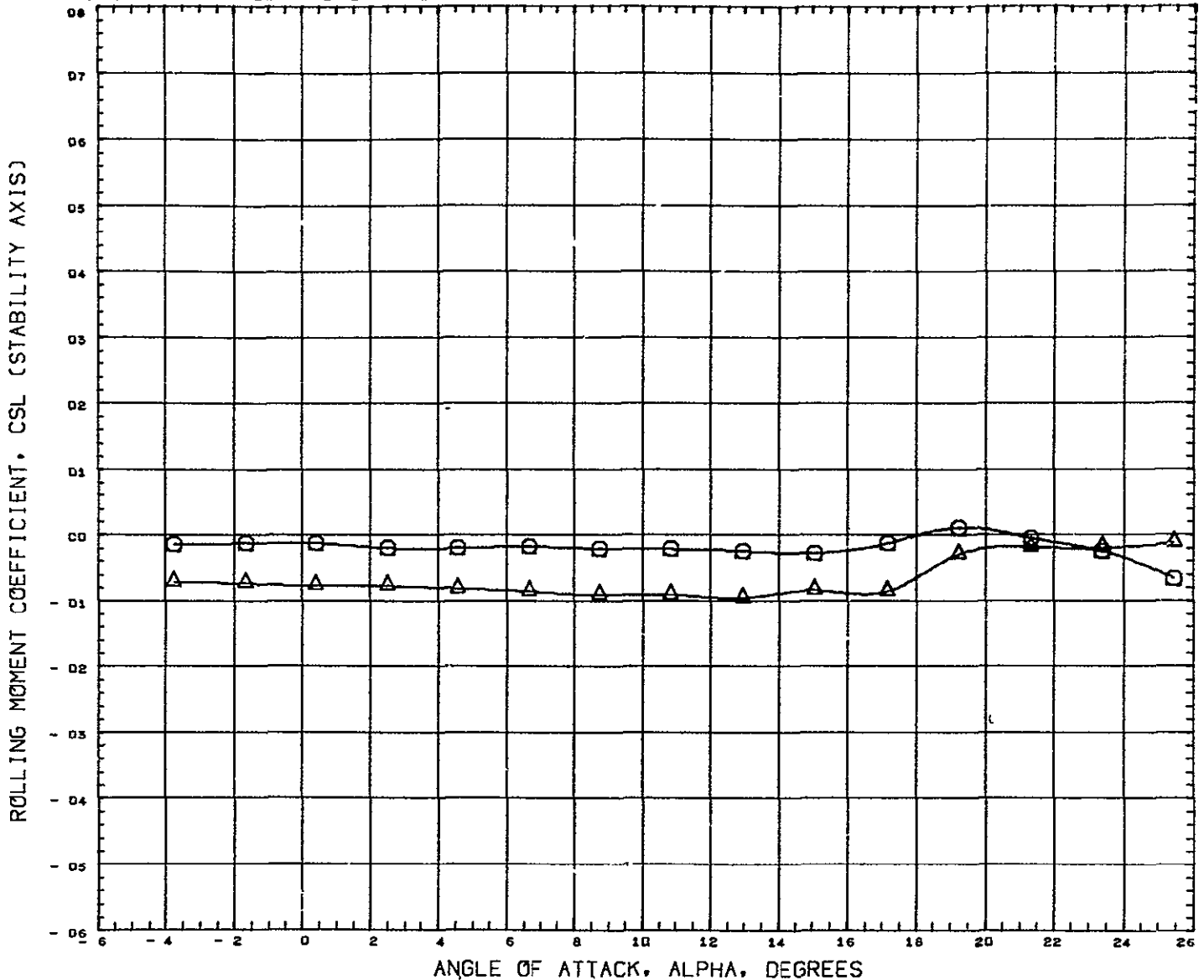
FIG. 19 YAW POLAR-SHORT NOSE



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW048)	GWTT 290-CONF ROS-NB2 B3F1W1V1	0 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
(RCW049)	GWTT 290-CONF ROS-NB2 B3F1W1V1	3 000	0 000	0 000	0 000	LREF 6 4320 FT
						BREF 3 8920 FT
						XMRP 1485 0040 IN
						YMRP 0 0000 IN
						ZMRP 377 0004 IN
						SCALE 0 0400

MACH 0 170

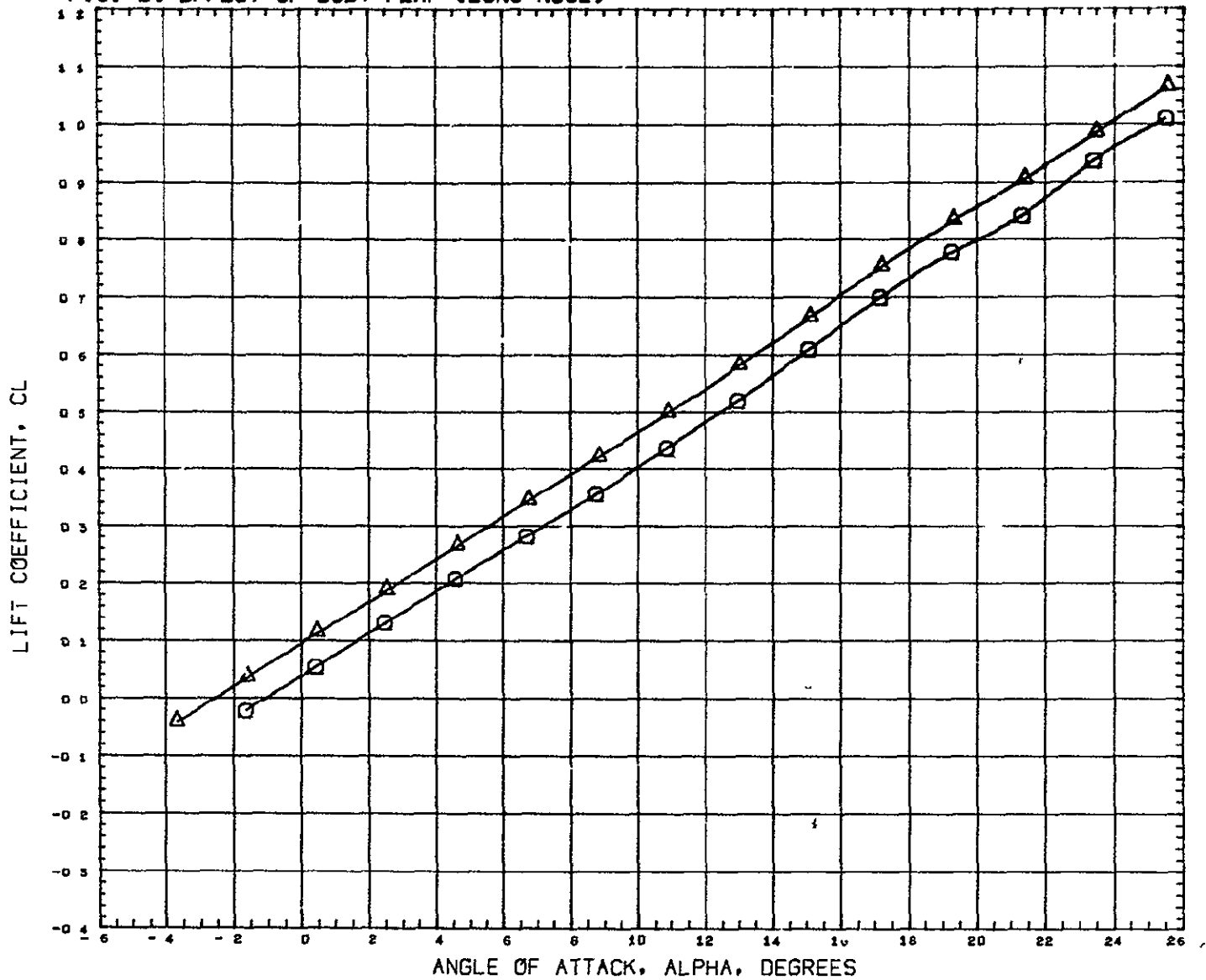
FIG. 19 YAW POLAR-SHORT NOSE



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCWD48)	○	GWTT 290-CONF ROS-NB2 B3F1W1V1	0 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
(RCWD49)	△	GWTT 290-CONF ROS-NB2 B3F1W1V1	3 000	0 000	0 000	0 000	LREF 6 4320 FT
							BREF 3 8920 FT
							XMRP 1485 0046 IN
							YMRP 0 0000 IN
							ZMRP 377 0004 IN
							SCALE 0 0400

MACH U 170

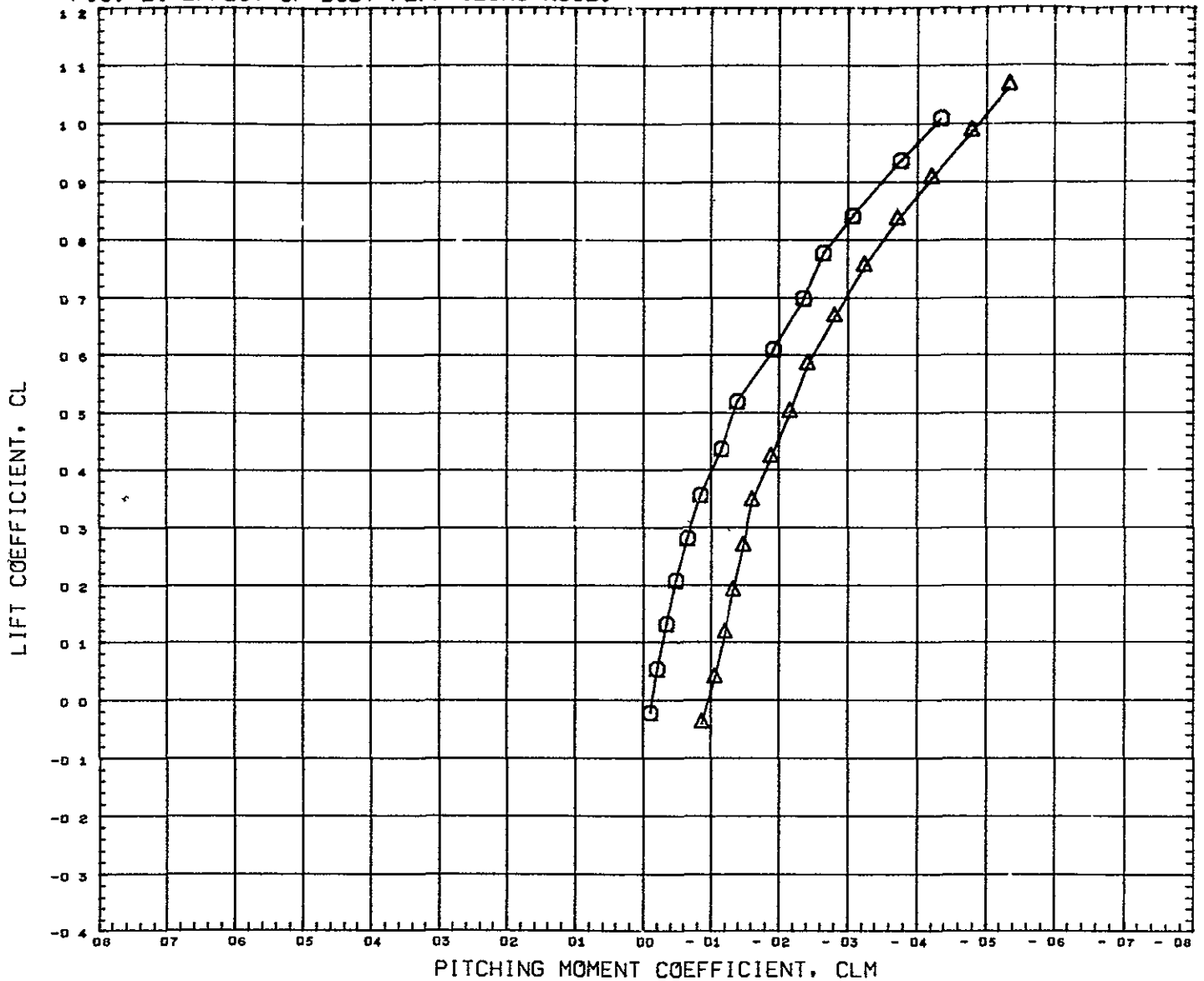
FIG. 20 EFFECT OF BODY FLAP (LONG NOSE)



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW004)	Q GWTT 29D-CONF ROS-NB1 B1F1W1V1	0 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
(RCW050)	△ GWTT 29D-CONF ROS-NB1 B1F1W1V1(BODY FLAP AT 10)	0 000	0 000	0 000	0 000	LREF 6 4320 FT
						BREF 3 8920 FT
						XNRF 1485 0040 IN
						YNRF 0 0000 IN
						ZNRF 377 0004 IN
						SCALE 0 0400

MACH 0 170 1

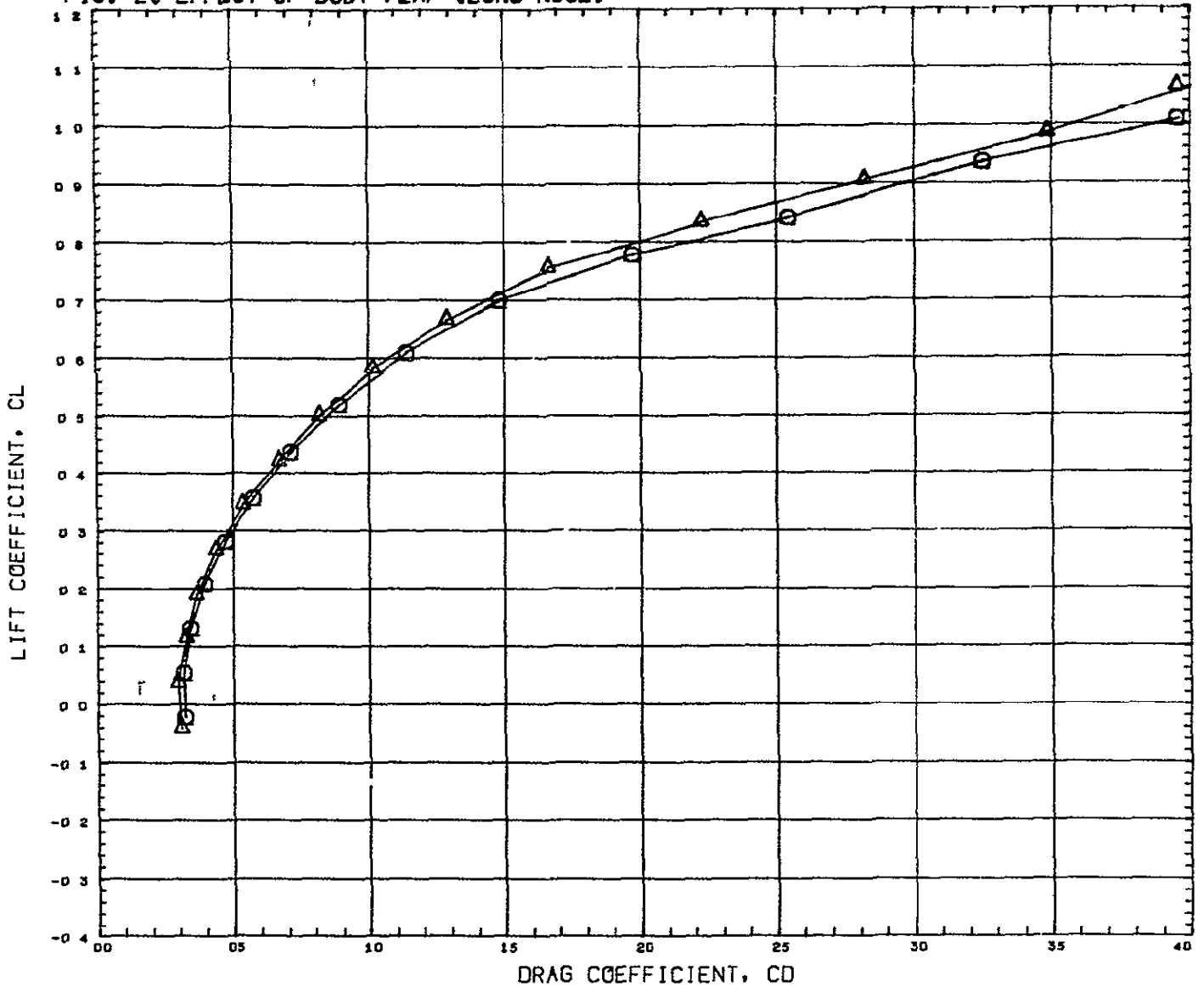
FIG. 20 EFFECT OF BODY FLAP (LONG NOSE)



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW004)	GWTI 290-CONF ROS-NB1 B1F1W1V1	0 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
(RCW050)	GWTI 290-CONF ROS-NB1 B1F1W1V1(BODY FLAP AT 0)	0 000	0 000	0 000	0 000	LREF 6 4320 FT
						BREF 3 8920 FT
						XMRP 1485 0040 IN
						YMRP 0 0000 IN
						ZMRP 377 0004 IN
						SCALE 0 0400

MACH 0 170

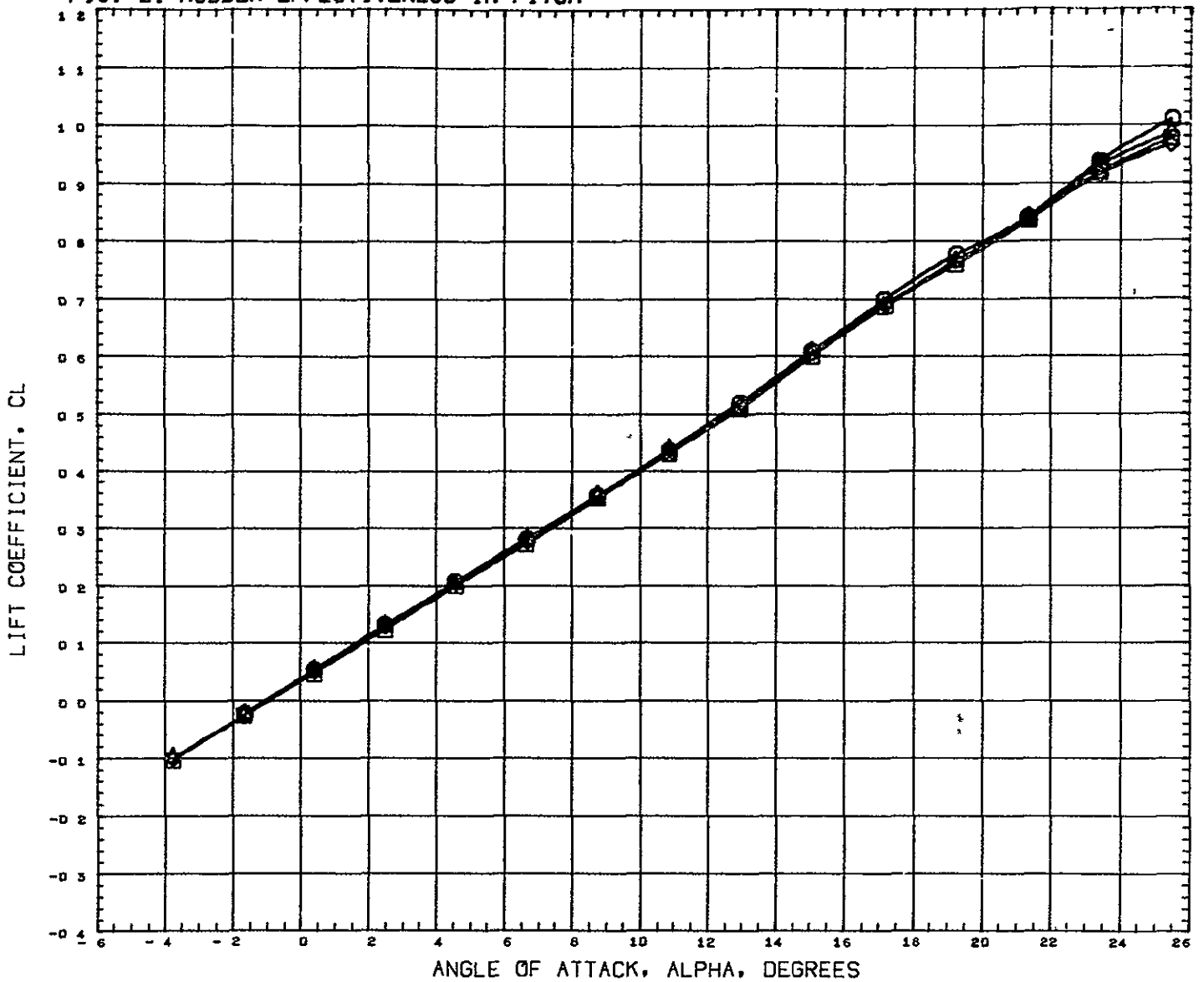
FIG. 20 EFFECT OF BODY FLAP (LONG NOSE)



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW004)	GWTT 290-CONF ROS-NB1 B1F1W1V1	0 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
(RCW050)	GWTT 290-CONF ROS-NB1 B1F1W1V1 (BODY FLAP AT D)	0 000	0 000	0 000	0 000	LREF 6 4320 FT
						BREF 3 8920 FT
						XMRP 1485 0040 IN
						YMRP 0 0000 IN
						ZMRP 377 0004 IN
						SCALE 0 0400

MACH 0 170

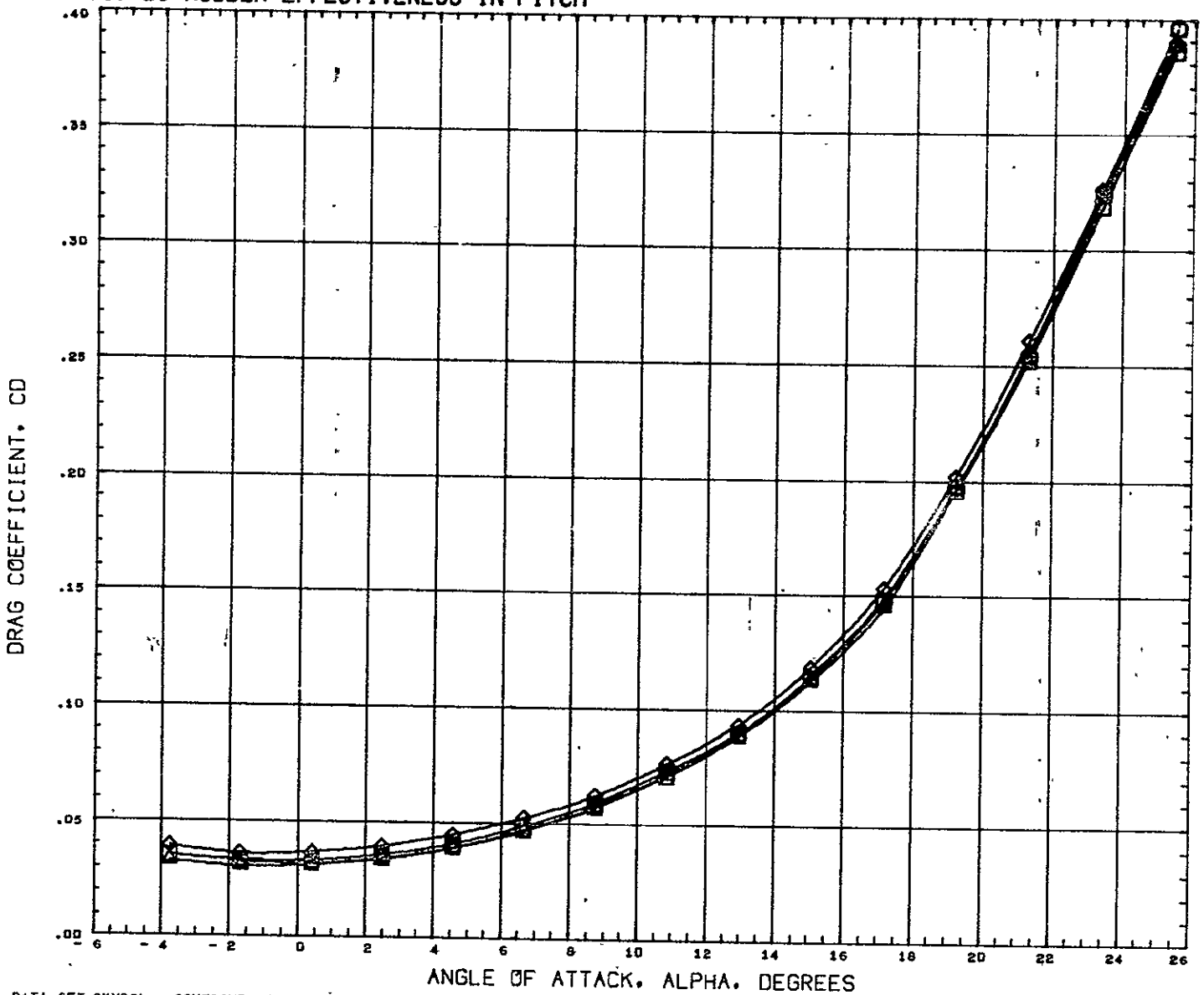
FIG. 21 RUDDER EFFECTIVENESS IN PITCH



DATA SET	SYMBOL	CONFIGURATION	DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW004)	○	GWTT 290-CONF	ROS-NB1 B1F1W1V1	0 000	0 000	0 000	0 000	SREF 9 1952 SQ FT
(RCW051)	△	GWTT 290-CONF	ROS-NB1 B1F1W1V1	0 000	0 000	0 000	-5 000	LREF 6 4320 FT
(RCW052)	◇	GWTT 290-CONF	ROS-NB1 B1F1W1V1	0 000	0 000	0 000	-15 000	BREF 3 8920 FT
(RCQ035)	□	GWTT 289-CONF	ROS-NB1 B1W1V1	0 000	0 000	0 000	-10 000	XMRP 1485 0040 IN YMRP 0 0000 IN ZMRP 377 0004 IN SCALE 0 0400

MACH 0 170

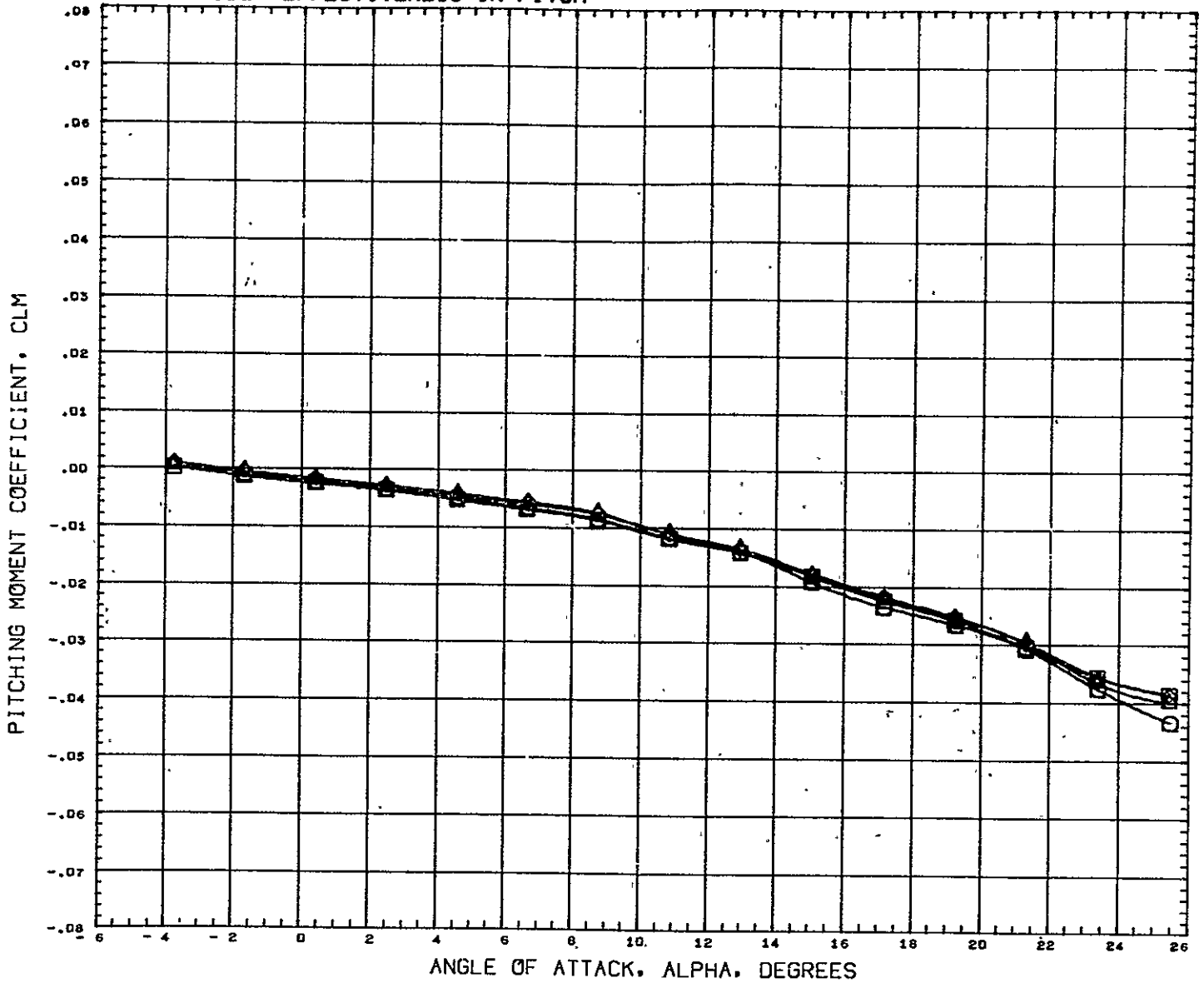
FIG. 21 RUDDER EFFECTIVENESS IN PITCH



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW004)	GWTT 290-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCW051)	GWTT 290-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	-5.000	LREF 6.4320 FT
(RCW052)	GWTT 290-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	-15.000	BREF 3.8920 FT
(RCQ035)	GWTT 289-CONF ROS-NB1 B1W1V1	0.000	0.000	0.000	-10.000	XMRP 1485.0040 IN
						YMRP 10.0000 IN
						ZMRP 377.0004 IN
						SCALE 0.0400

MACH 0.170

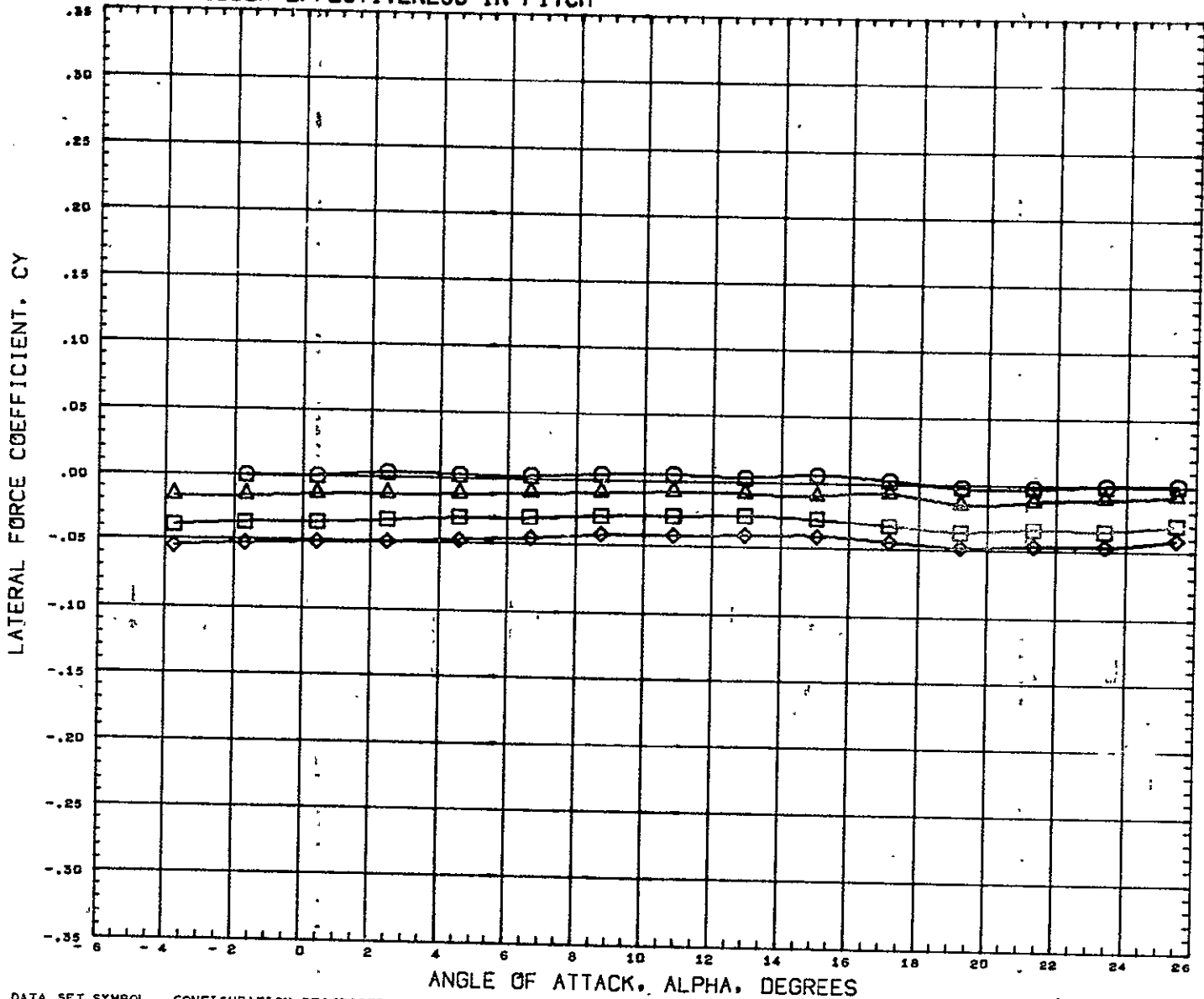
FIG. 21 RUDDER EFFECTIVENESS IN PITCH



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW004)	○	GWT 290-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCW051)	△	GWT 290-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	-5.000	LREF 6.4320 FT
(RCW052)	◇	GWT 290-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	-15.000	BREF 3.8920 FT
(RC0035)	□	GWT 289-CONF ROS-NB1 B1W1V1	0.000	0.000	0.000	-10.000	XMRP 1485.0040 IN YMRP 0.0000 IN ZMRP 377.0004 IN SCALE 0.0400

MACH 0.170

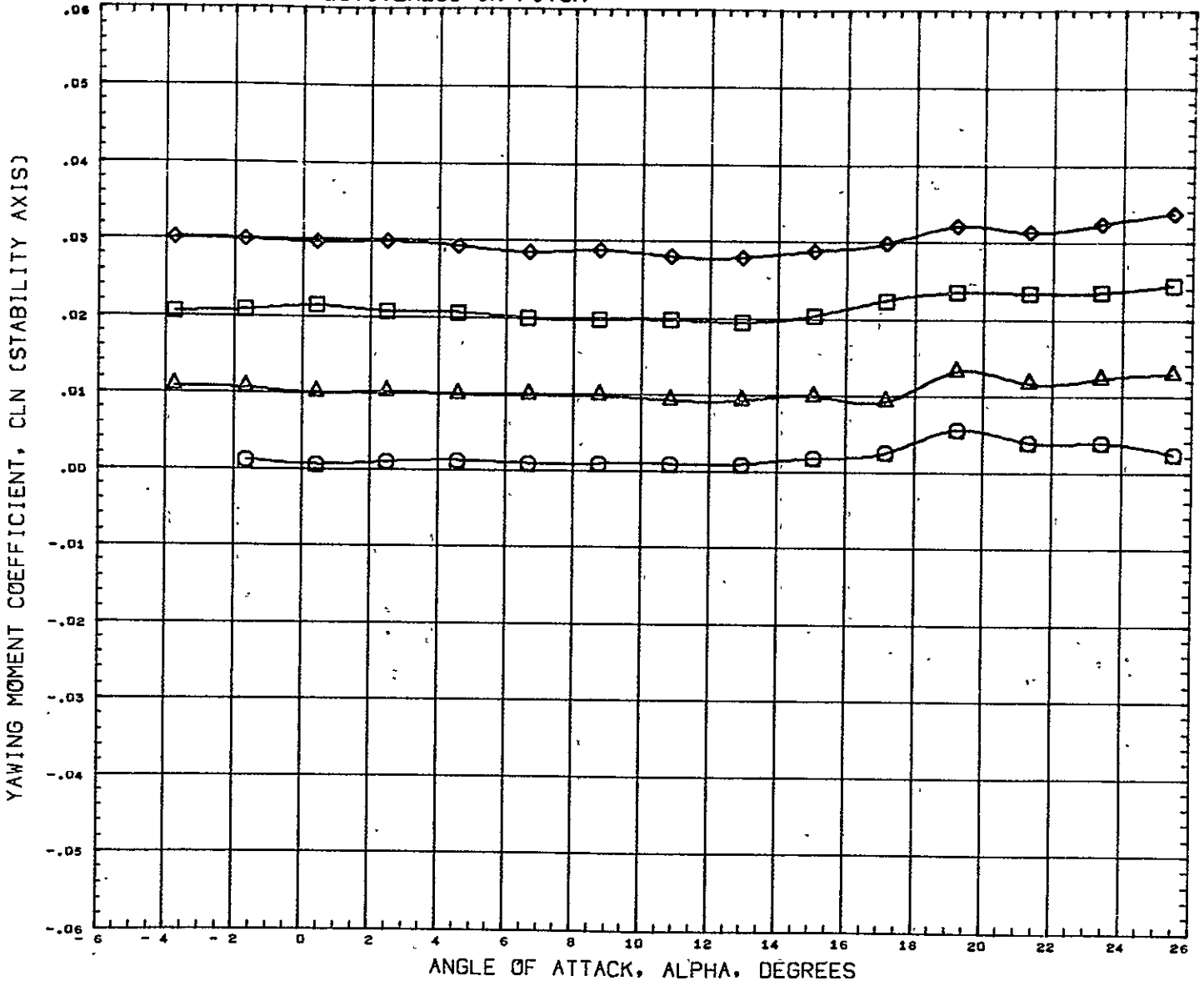
FIG. 21 RUDDER EFFECTIVENESS IN PITCH



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW054)	○	GWTT 290-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCW051)	△	GWTT 290-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	-5.000	LREF 6.4320 FT
(RCW052)	◇	GWTT 290-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	-15.000	BREF 3.8920 FT
(RCW055)	□	GWTT 289-CONF ROS-NB1 B1W1V1	0.000	0.000	0.000	-10.000	XMRP 1485.0040 IN
							YMRP 0.0000 IN
							ZMRP 377.0004 IN
							SCALE 0.0400

MACH 0.170

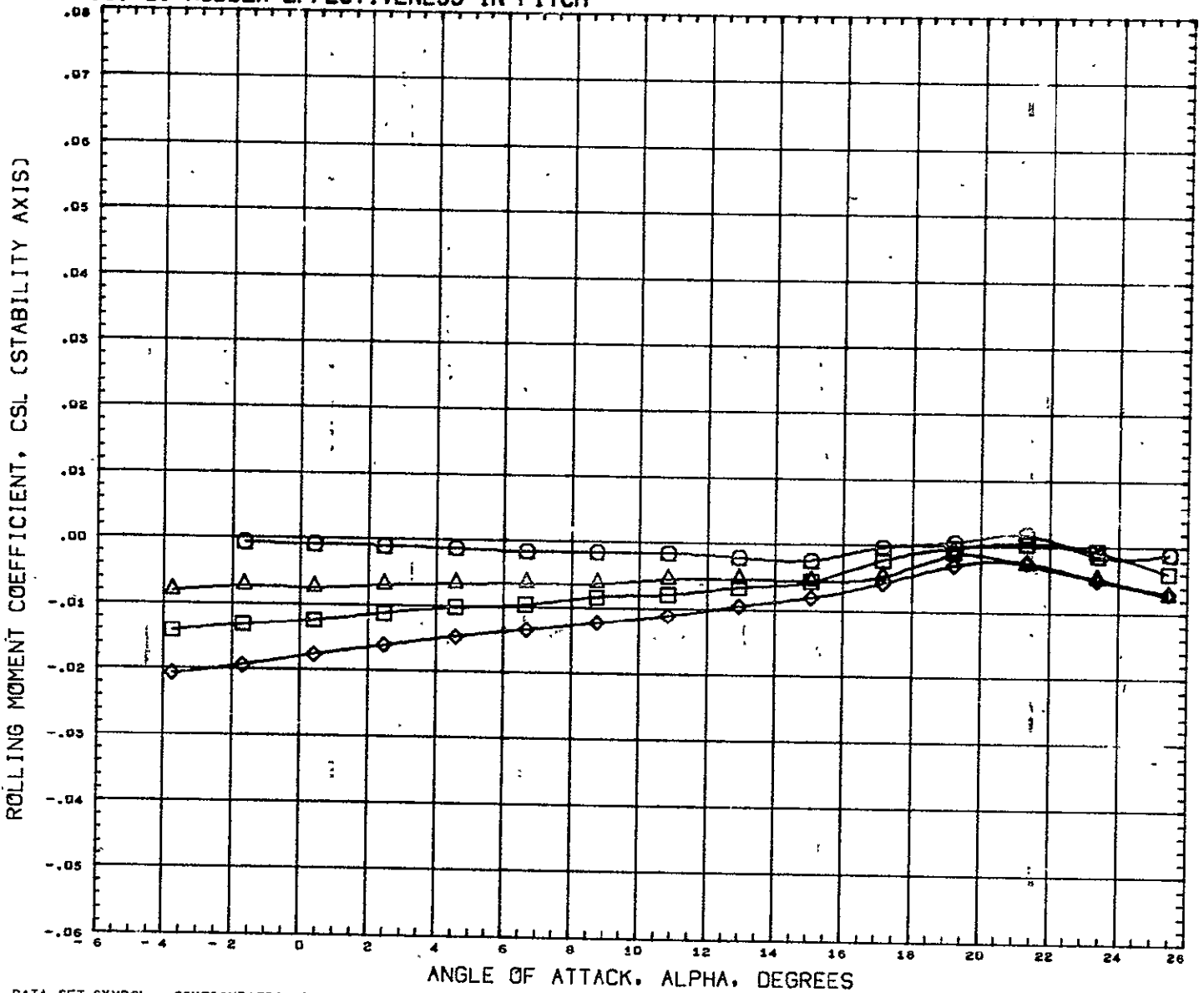
FIG. 21 RUDDER EFFECTIVENESS IN PITCH



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW004)	○	GWTT 290-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCW051)	△	GWTT 290-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	-5.000	LREF 6.4320 FT
(RCW052)	◇	GWTT 290-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	-15.000	BREF 3.8920 FT
(RCW035)	□	GWTT 289-CONF ROS-NB1 B1W1V1	0.000	0.000	0.000	-10.000	XMRP 1485.0040 IN
							YMRP 0.0000 IN
							ZMRP 377.0004 IN
							SCALE 0.0400

HACH 0.170

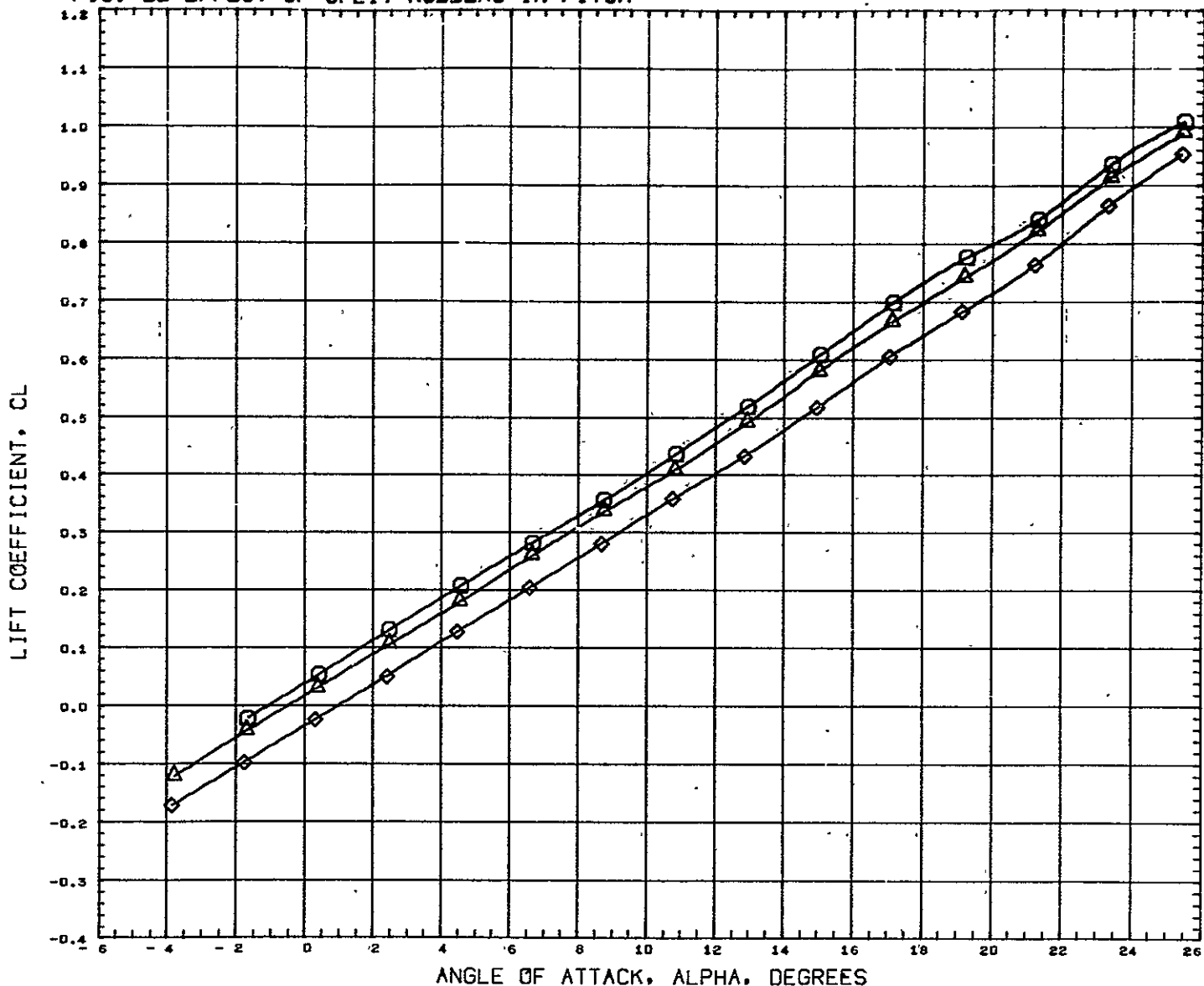
FIG. 21 RUDDER EFFECTIVENESS IN PITCH



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION	
(RCW004)	○	GWTT 290-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	0.000	SREF	9.1952 SQ FT
(RCW051)	△	GWTT 290-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	-5.000	LREF	6.4320 FT
(RCW052)	◇	GWTT 290-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	-15.000	BREF	3.8920 FT
(RCQ035)	□	GWTT 289-CONF ROS-NB1 B1W1V1	0.000	0.000	0.000	-10.000	XMRP	1485.0040 IN
							YMRP	0.0000 IN
							ZMRP	377.0004 IN
							SCALE	0.0400

MACH 0.170

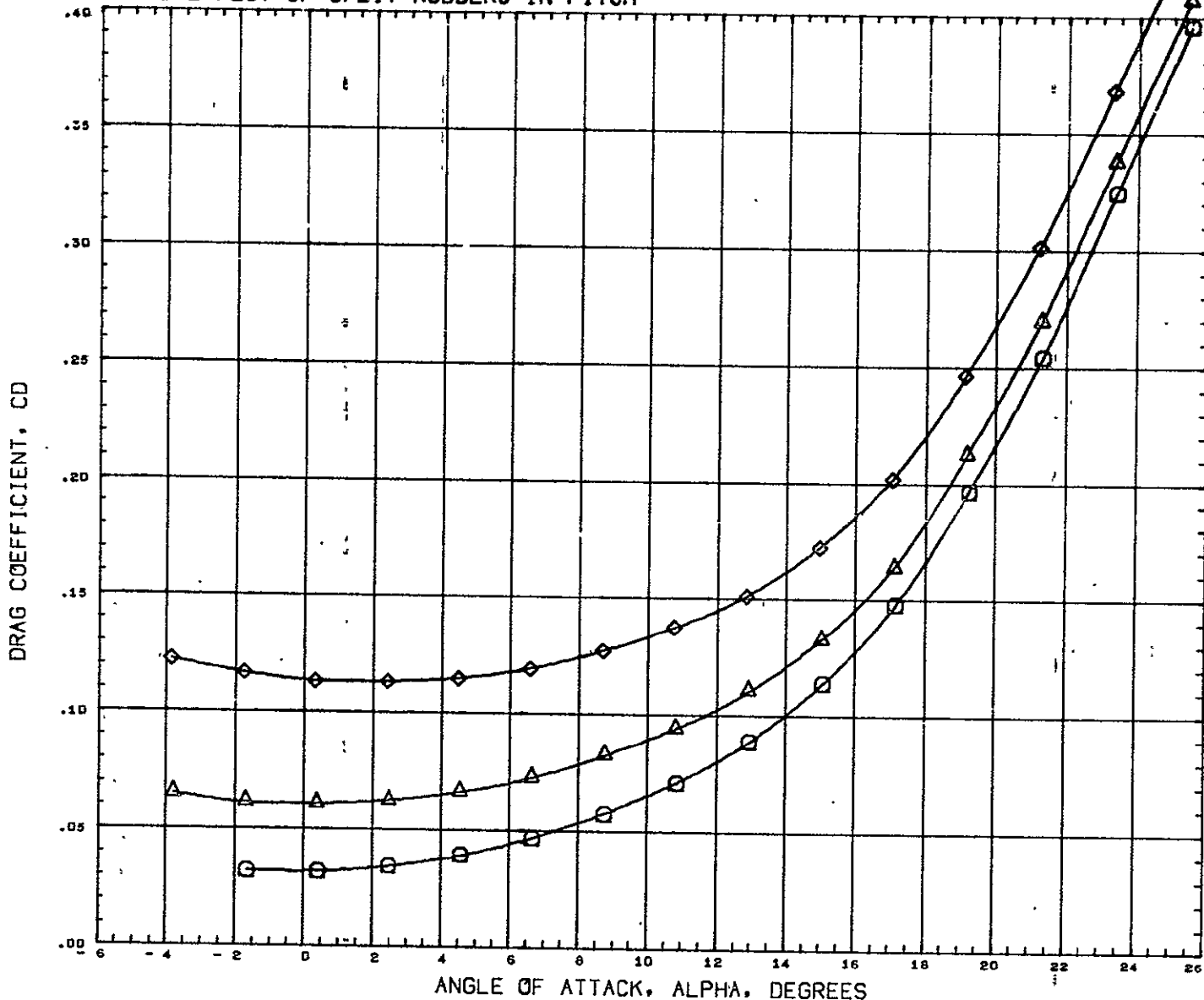
FIG. 22 EFFECT OF SPLIT RUDDERS IN PITCH



DATA SET	SYMBOL	CONFIGURATION	DESCRIPTION	BETA	LRUDDR	RRUDDR	RUDDER	REFERENCE INFORMATION	
(RCW004)	○	GWTT 290-CONF	ROS-NB1 B1F1W1V1	0.000			0.000	SREF	9.1952 SQ FT
(RCW059)	△	GWTT 290-CONF	ROS-NB1 B1F1W1V1	0.000	30.000	-30.000		LREF	6.4320 FT
(RCW058)	◇	GWTT 290-CONF	ROS-NB1 B1F1W1V1	0.000	60.000	-60.000		BREF	3.8920 FT
								XHRF	1485.0040 IN
								YHRF	0.0000 IN
								ZHRF	377.0004 IN
								SCALE	0.0400

MACH 0.170

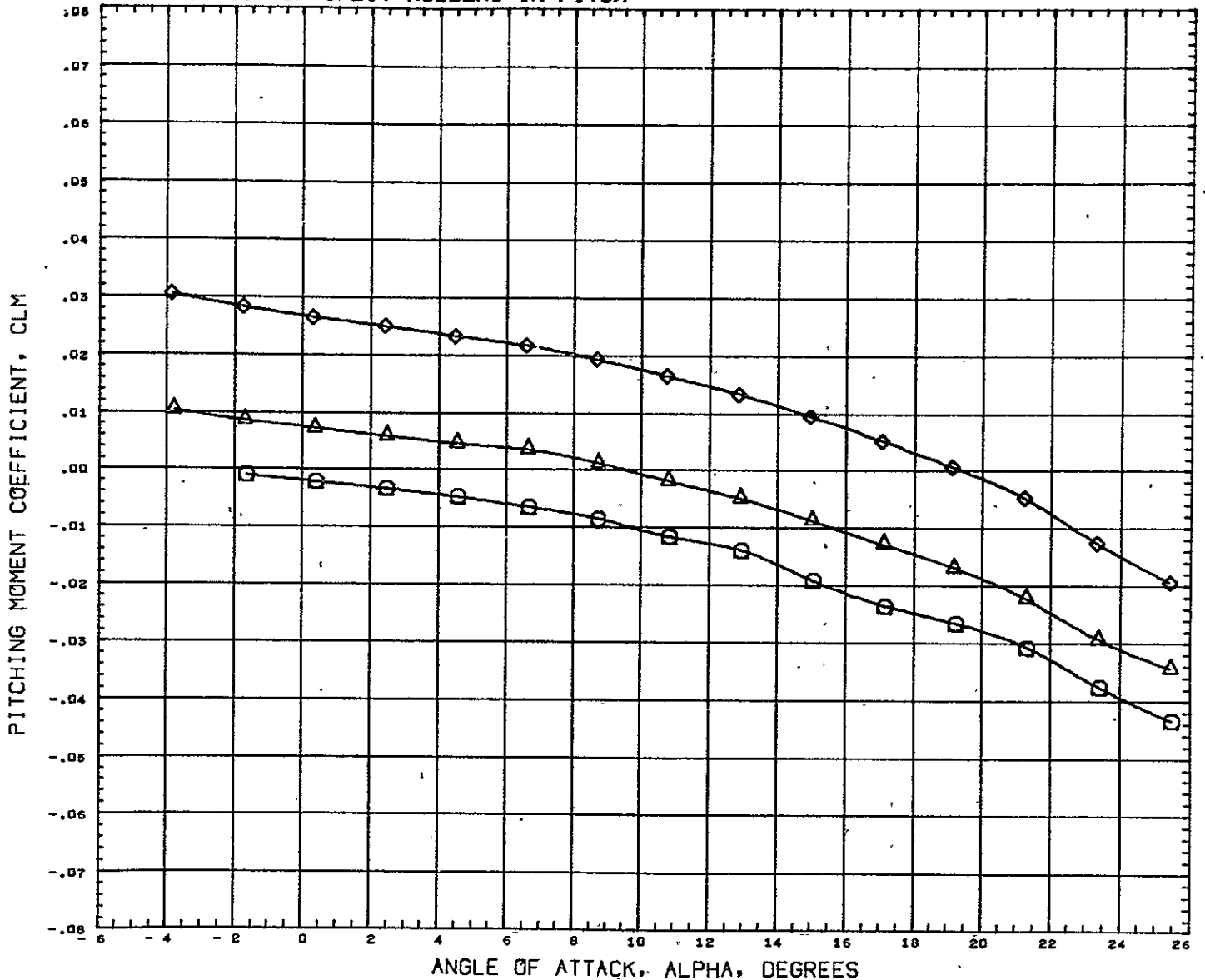
FIG. 22 EFFECT OF SPLIT RUDDERS IN PITCH



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	LRUDDR	RRUDDR	RUDDER	REFERENCE INFORMATION
(RCW004)	GWTT 290-CONF ROS-NB1 B1F1W1V1	0.000			0.000	SREF 9.1952 SQ FT
(RCW059)	GWTT 290-CONF ROS-NB1 B1F1W1V1	0.000	30.000	-30.000		LREF 6.4320 FT
(RCW058)	GWTT 290-CONF ROS-NB1 B1F1W1V1	0.000	60.000	-60.000		BREF 3.8920 FT
						XMRP 1485.0040 IN
						YMRP 0.0000 IN
						ZMRP 377.0004 IN
						SCALE 0.0400

MACH 0.170

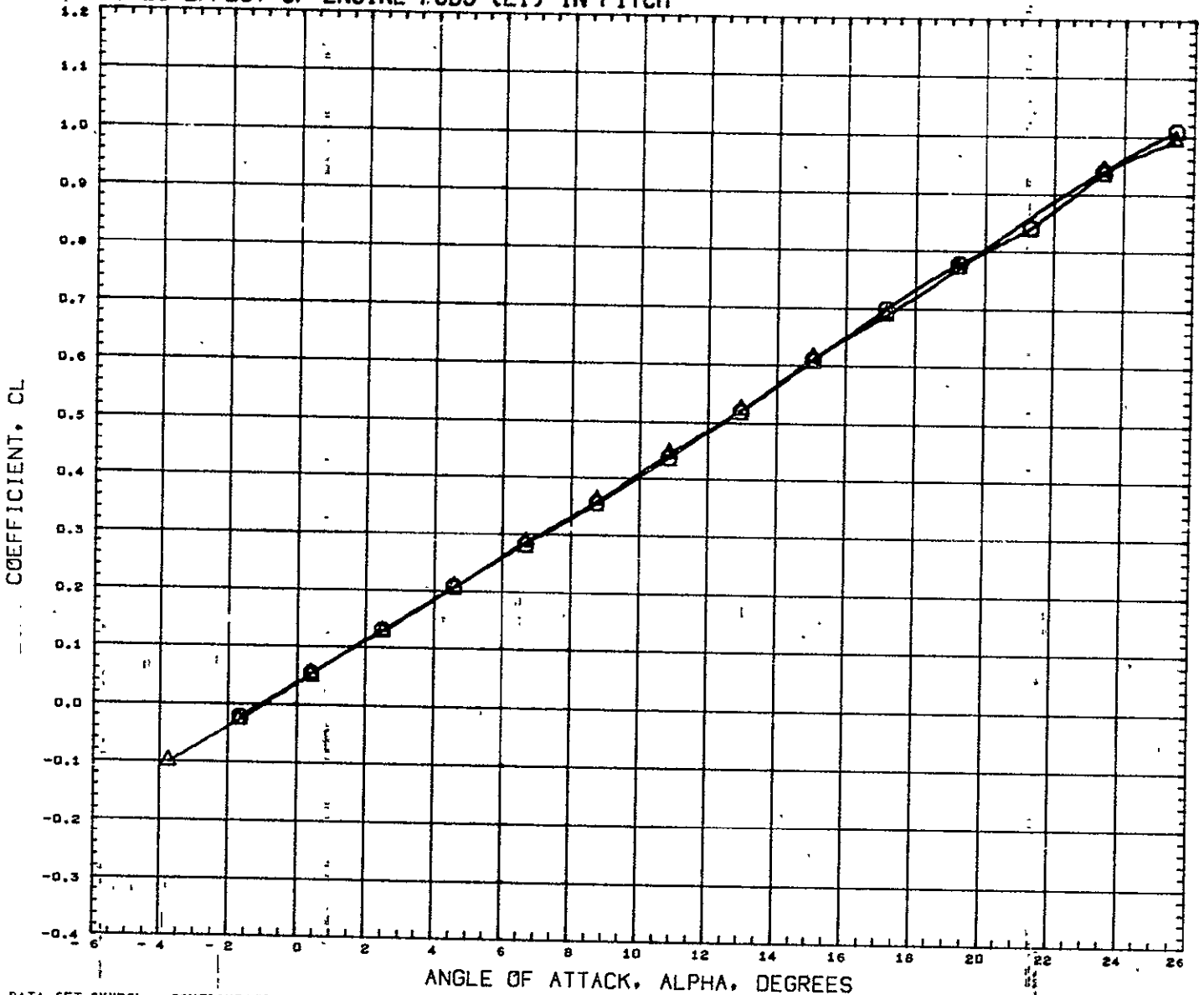
FIG. 22 EFFECT OF SPLIT RUDDERS IN PITCH



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	LRUDDR	RRUDDR	RUDDER	REFERENCE INFORMATION
(RCW004)	□	GWTT 290-CONF ROS-NB1 B1F1W1V1	0.000			0.000	SREF 9.1952 SQ FT
(RCW059)	△	GWTT 290-CONF ROS-NB1 B1F1W1V1	0.000	30.000	-30.000		LREF 6.4320 FT
(RCW058)	◇	GWTT 290-CONF ROS-NB1 B1F1W1V1	0.000	60.000	-60.000		BREF 3.8920 FT
							XMRP 1485.0040 IN
							YMRP 0.0000 IN
							ZMRP 377.0004 IN
							SCALE 0.0400

HACH 0.170

FIG. 23 EFFECT OF ENGINE PODS (E1) IN PITCH

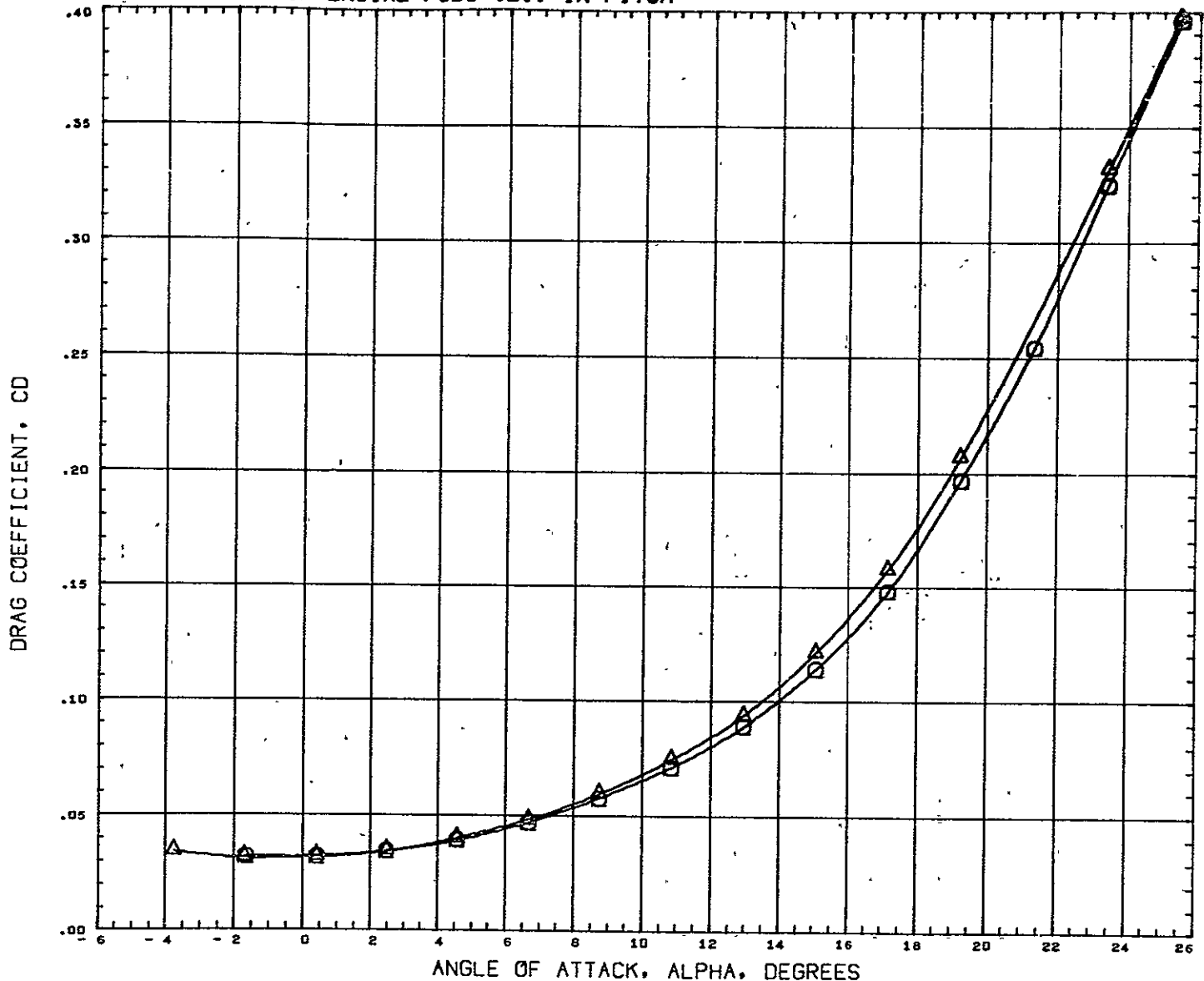


DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW004)	GWIT 290-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCW060)	GWIT 290-CONF ROS-NB1 B1F1W1V1E1	0.000	0.000	0.000	0.000	LREF 6.4320 FT
						BREF 3.8920 FT
						XMRP 1485.0040 IN
						YMRP 0.0000 IN
						ZMRP 377.0004 IN
						SCALE -0.0400

NACH 0.170



FIG. 23 EFFECT OF ENGINE PODS (E1) IN PITCH



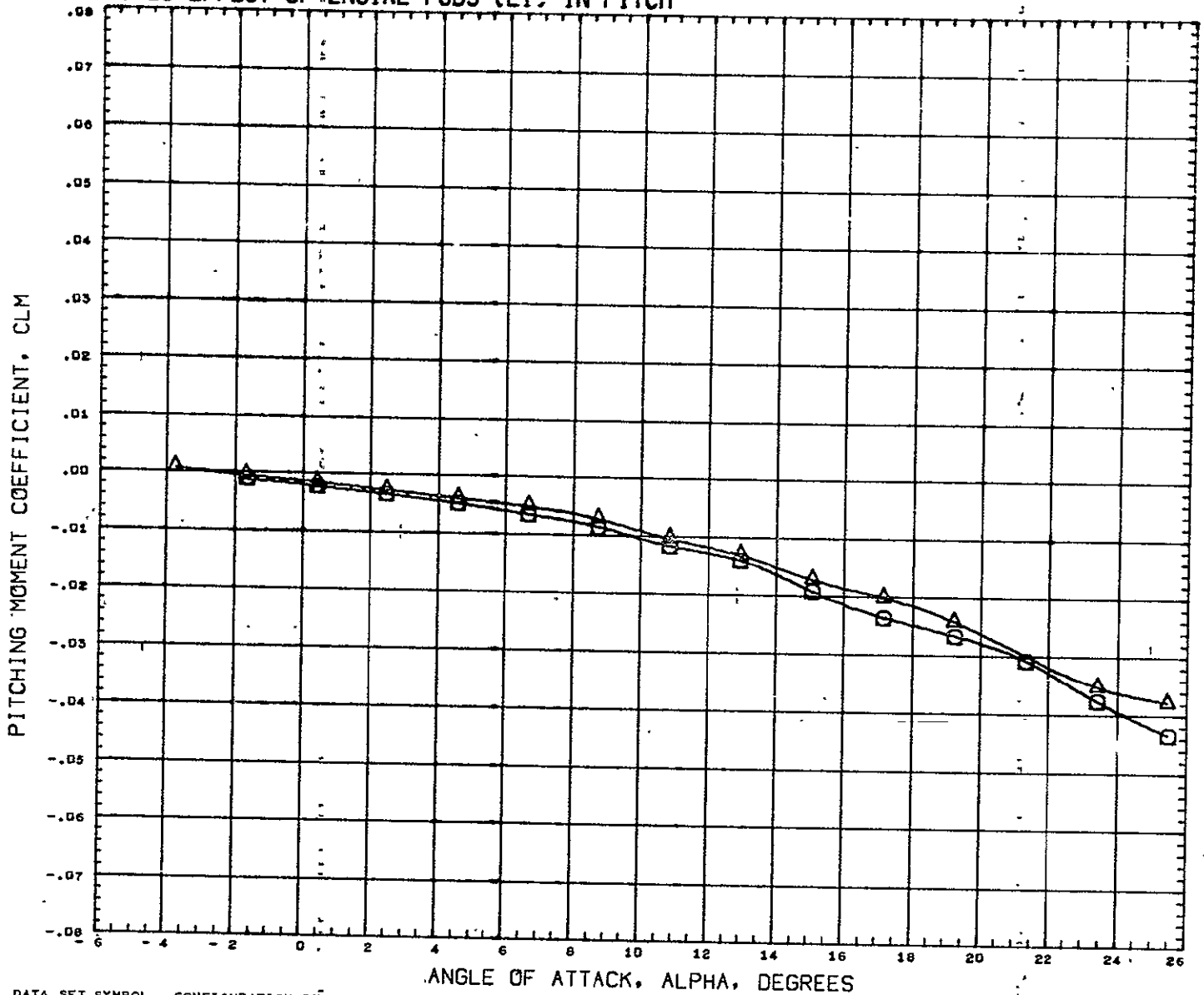
DATA SET SYMBOL	CONFIGURATION DESCRIPTION
(RCW004) ○	GWTI 290-CONF ROS-NB1 B1F1W1V1
(RCW060) △	GWTI 290-CONF ROS-NB1 B1F1W1V1E1

BETA	ELEVTR	AILRON	RUDDER
0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000

REFERENCE INFORMATION	
SREF	9.1952 SQ FT
LREF	6.4320 FT
CREF	3.8920 FT
XMRP	1485.0040 IN
YMRP	0.0000 IN
ZMRP	377.0004 IN
SCALE	0.0400

MACH 0.170

FIG. 23 EFFECT OF ENGINE PODS (E1) IN PITCH



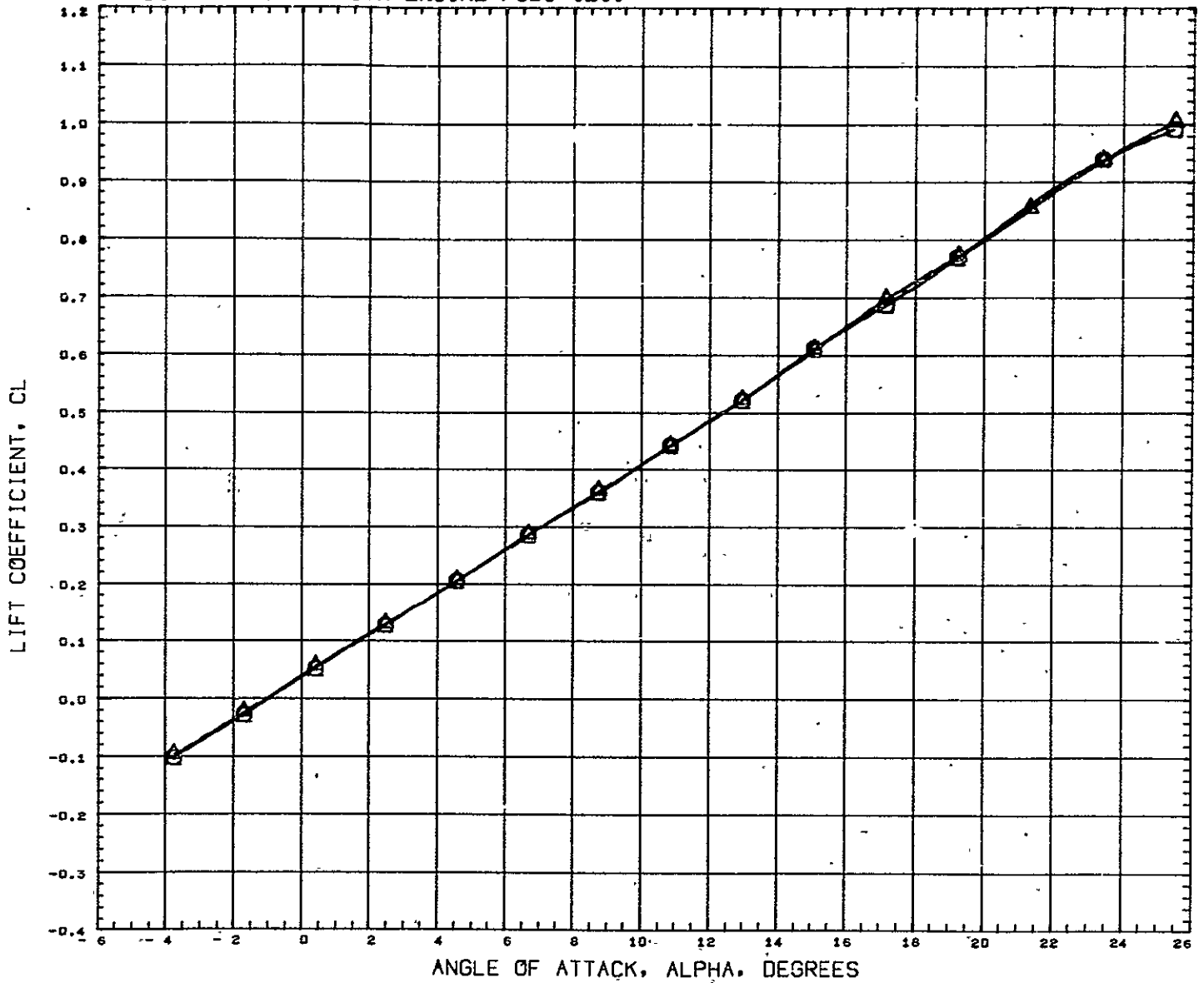
DATA SET SYMBOL	CONFIGURATION DESCRIPTION
(RCW004)	GWTT 290-CONF ROS-NB1 B1F1W1V1
(RCW06D)	GWTT 290-CONF ROS-NB1 B1F1W1V1E1

BETA	ELEVTR	AILRON	RUDDER
0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000

REFERENCE INFORMATION	
SREF	9.1952 SQ FT
LREF	6.4320 FT
BREF	- 3.8920 FT
XMRP	1485.0040 IN
YMRP	0.0000 IN
ZMRP	377.0004 IN
SCALE	- 0.0400

MACH 0.176

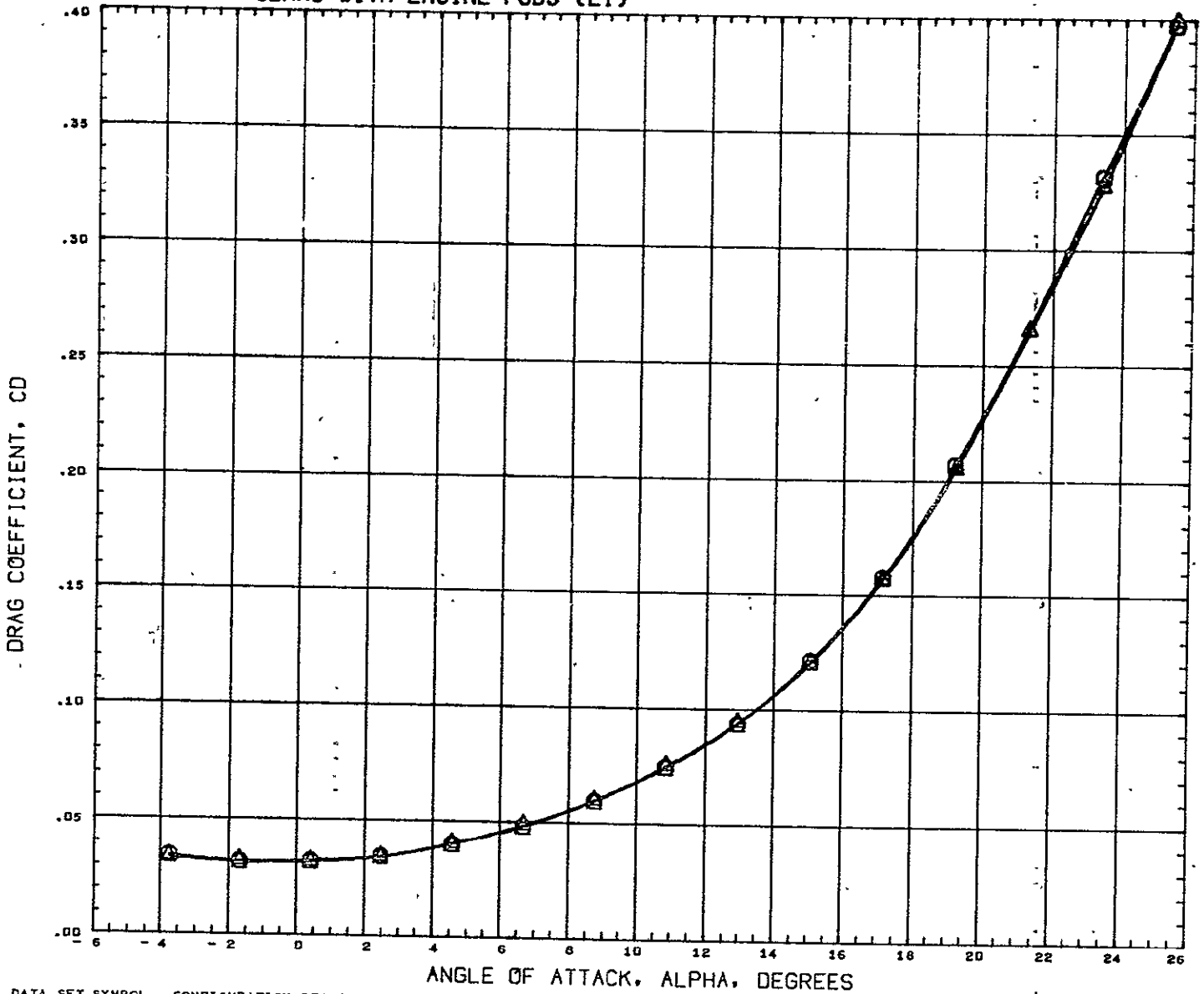
FIG. 24 YAW POLARS WITH ENGINE PODS (E1)



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION	
(RCWD60)	GWTT 290-CONF ROS-NB1 B1F1W1V1E1	0.000	0.000	0.000	0.000	SREF	9.1952 SQ FT
(RCWD61)	GWTT 290-CONF ROS-NB1 B1F1W1V1E1	3.000	0.000	0.000	0.000	LREF	6.4320 FT
						BREF	3.8920 FT
						XMRP	1485.0040 IN
						YMRP	0.0000 IN
						ZMRP	377.0004 IN
						SCALE	0.0400

MACH 0.170

FIG. 24 YAW POLARS WITH ENGINE PODS (E1)



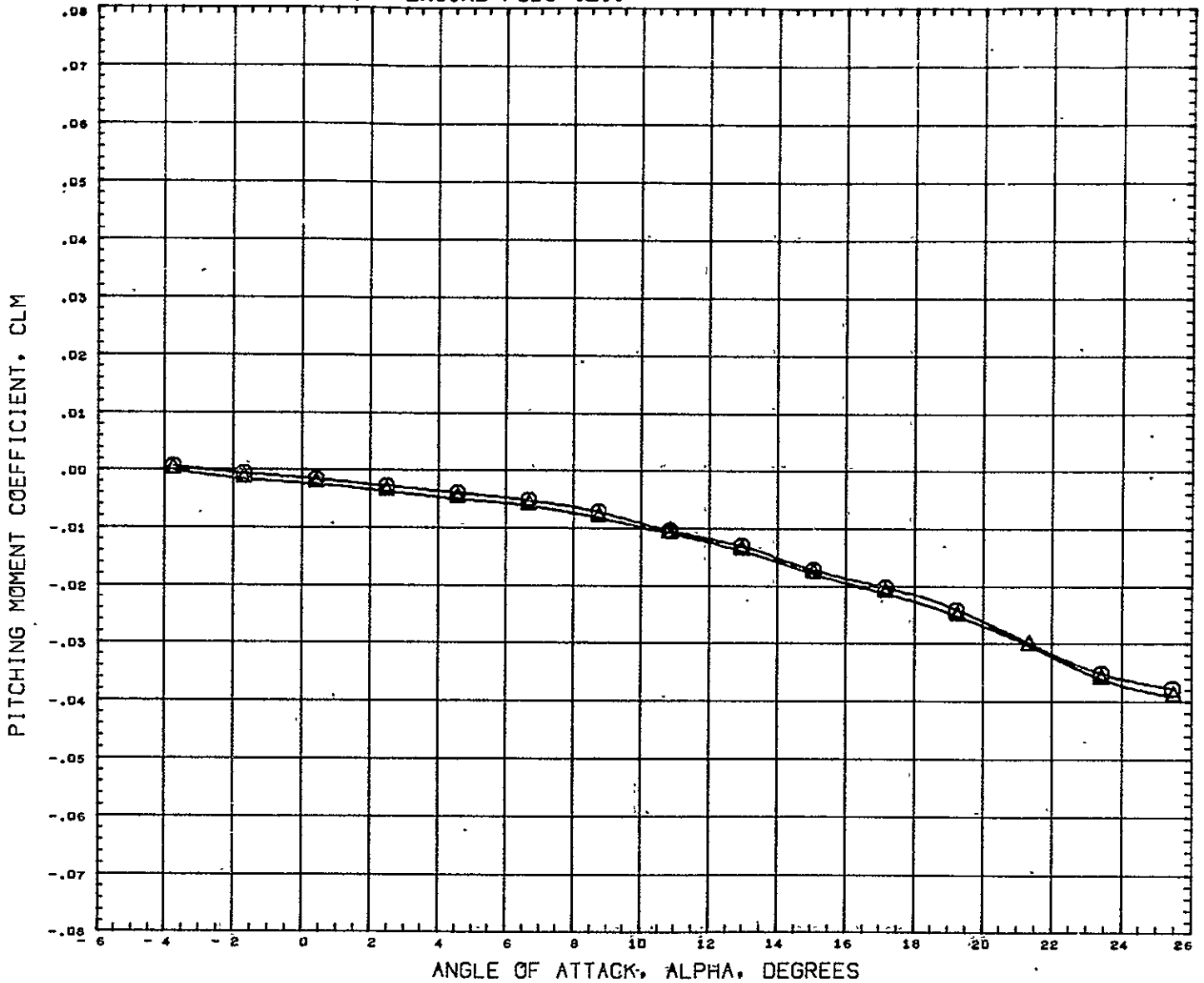
DATA SET SYMBOL CONFIGURATION DESCRIPTION
 (RCW060) \square GWTT 290-CONF ROS-NB1 B1F1W1V1E1
 (RCW061) \triangle GWTT 290-CONF ROS-NB1 B1F1W1V1E1

BETA ELEVTR AILRON RUDDER
 0.000 0.000 0.000 0.000
 3.000 0.000 0.000 0.000

1
 REFERENCE INFORMATION
 SREF 9.1952 SQ FT
 LREF 6.4320 FT
 BREF 3.8920 FT
 XMRP 1485.0040 IN
 YMRP 10.0000 IN
 ZMRP 377.0004 IN
 SCALE -0.0400

MACH 0.170

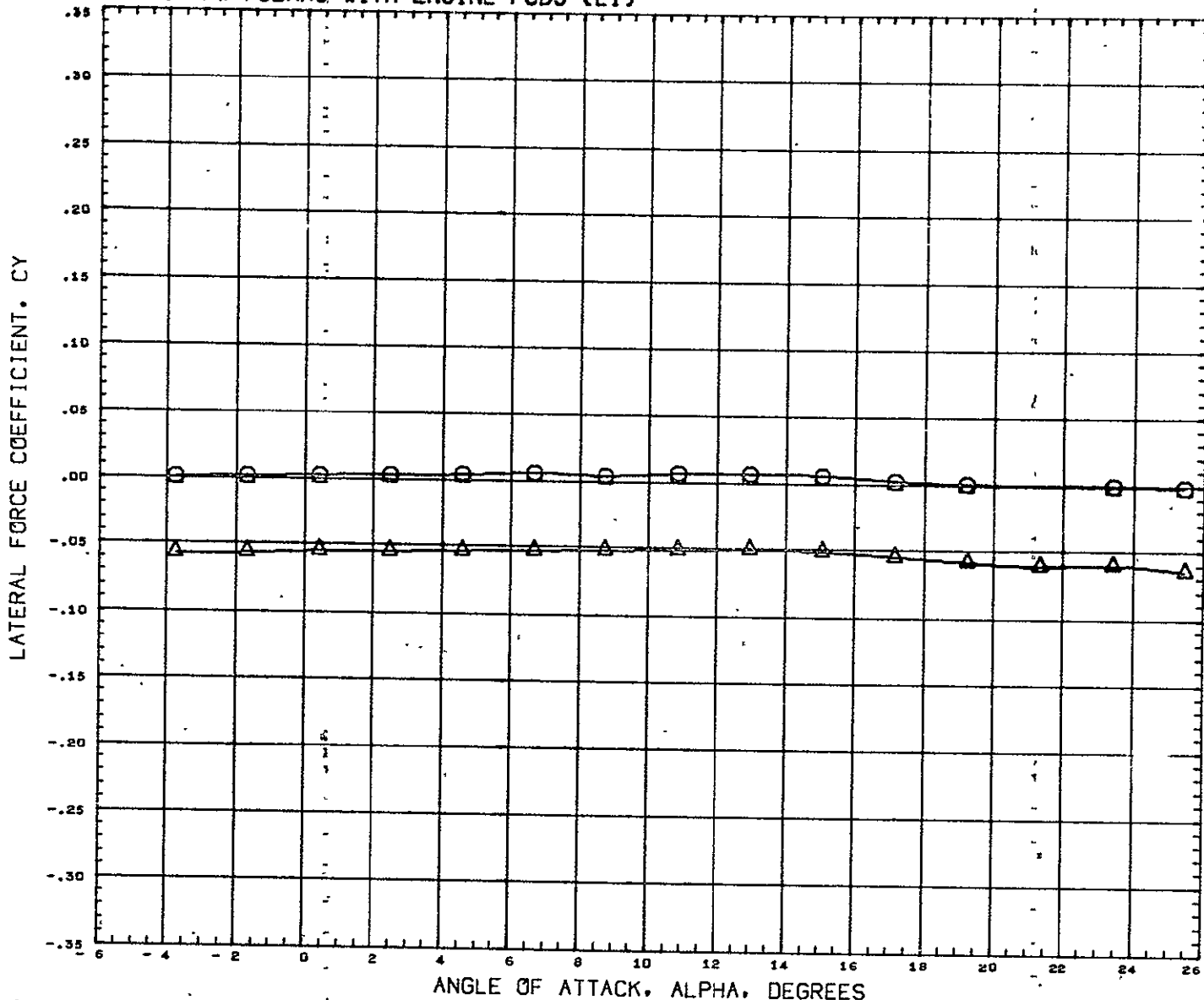
FIG. 24 YAW POLARS WITH ENGINE PODS (E1)



DATA SET SYMBOL	SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AIRON	RUDDER	REFERENCE INFORMATION
(RCW060)	○	GWT 29D-CONF ROS-NB1 B1F1W1V1E1	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCW061)	△	GWT 29D-CONF ROS-NB1 B1F1W1V1E1	3.000	0.000	0.000	0.000	LREF 6.4320 FT
							BREF 3.8920 FT
							XMRP 1485.0040 IN
							YMRP 0.0000 IN
							ZMRP 377.0004 IN
							SCALE 0.0400

MACH 0.170

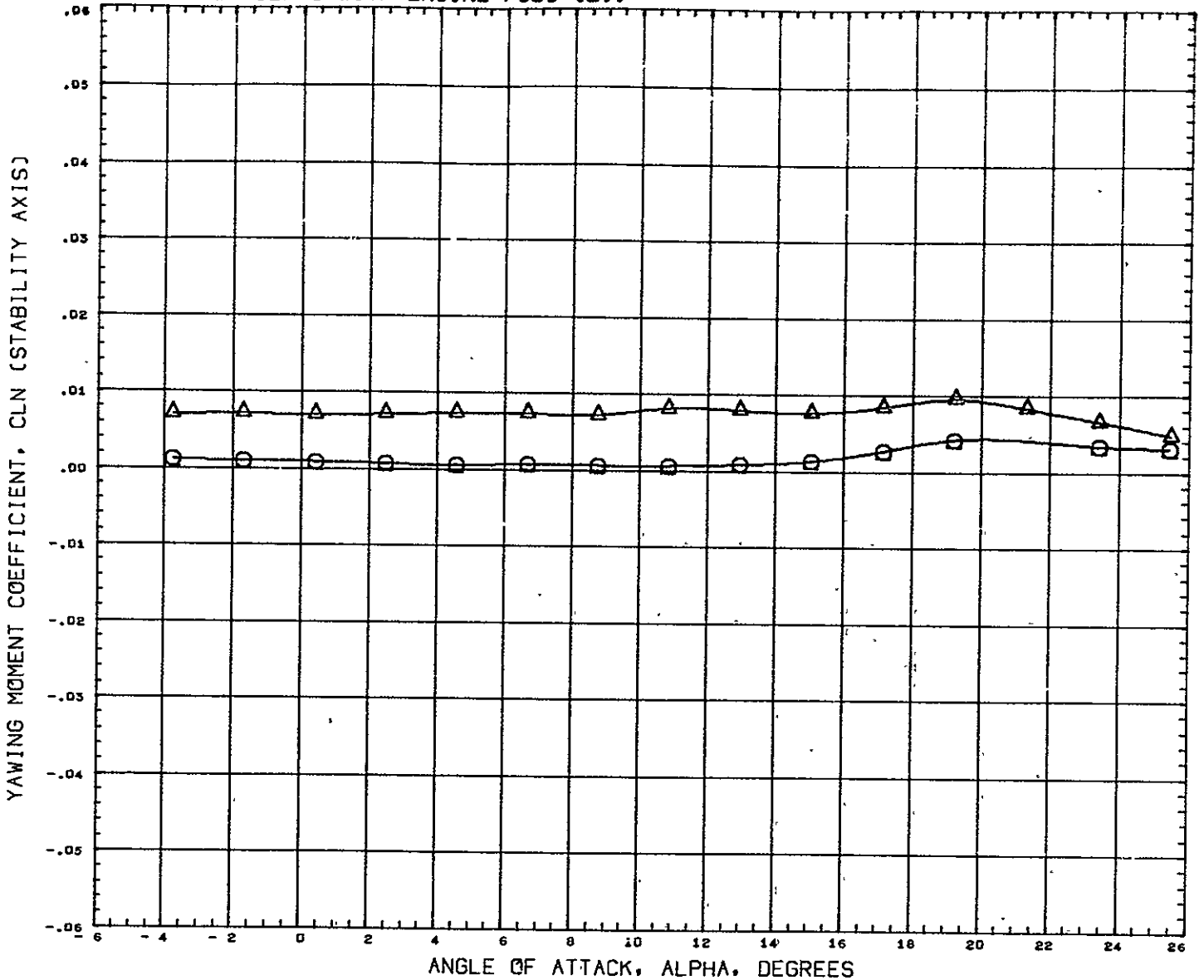
FIG. 24 YAW POLARS WITH ENGINE PODS (E1)



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCWG60)	GWTT 29D-CONF ROS-NB1 B1F1W1V1E1	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCWG61)	GWTT 29D-CONF ROS-NB1 B1F1W1V1E1	3.000	0.000	0.000	0.000	LREF 6.4320 FT
						BREF 3.8920 FT
						XHRF 1483.0040 IN
						YHRF 0.0000 IN
						ZHRF -377.0004 IN
						SCALE 0.0400

MACH 0.170

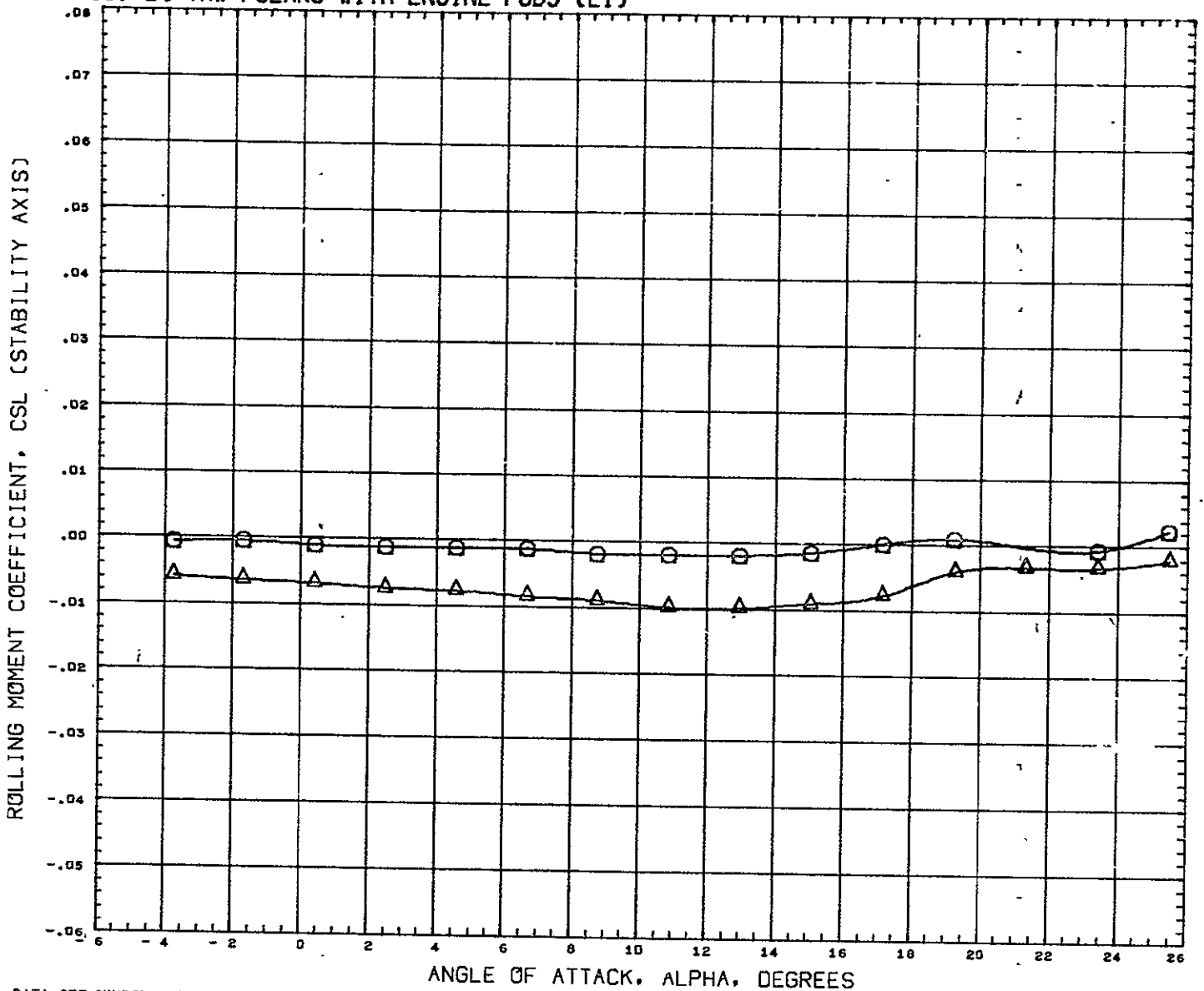
FIG. 24 YAW POLARS WITH ENGINE PODS (E1)



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCWD60) \circ	GWTT 29D-CONF ROS-NB1 B1F1W1V1E1	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCWD61) Δ	GWTT 29D-CONF ROS-NB1 B1F1W1V1E1	3.000	0.000	0.000	0.000	LREF 6.4320 FT
						BREF 3.8920 FT
						XMRP 1485.0040 IN
						YMRP 0.0000 IN
						ZMRP 377.0004 IN
						SCALE 0.0400

MACH 0.170

FIG. 24 YAW POLARS WITH ENGINE PODS (E1)



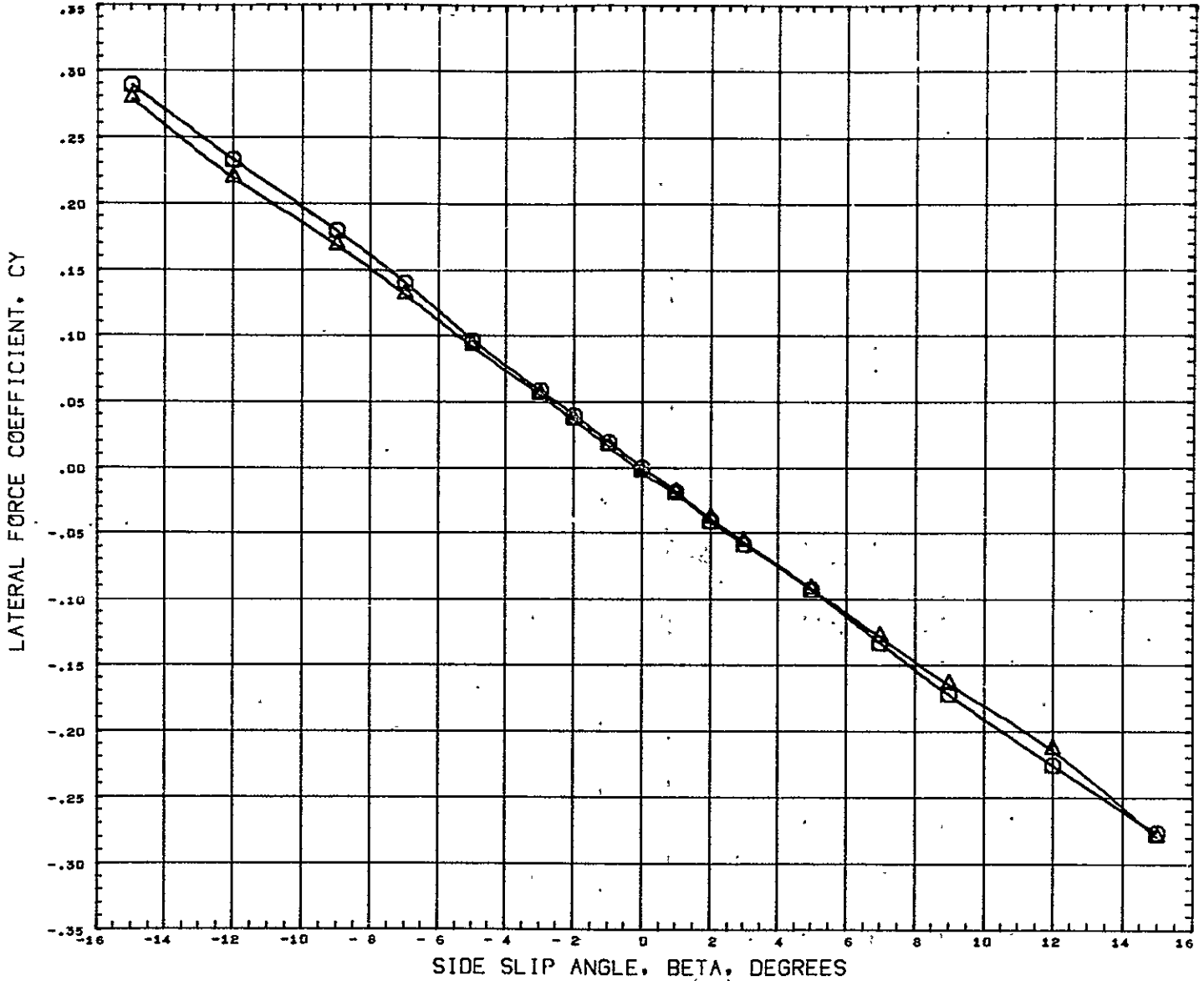
DATA SET	SYMBOL	CONFIGURATION	DESCRIPTION
(RCW060)	○	GWTT 290-CONF	ROS-NB1 BIF1W1V1E1
(RCW061)	△	GWTT 290-CONF	ROS-NB1 BIF1W1V1E1

BETA	ELEVTR	AILRON	RUDDER
0.000	0.000	0.000	0.000
3.000	0.000	0.000	0.000

REFERENCE INFORMATION	
SREF	9.1952 SQ FT
LREF	6.4320 FT
BREF	3.8920 FT
XMRP	1485.0040 IN
YMRP	0.0000 IN
ZMRP	377.0004 IN
SCALE	0.0400

MACH 0.170

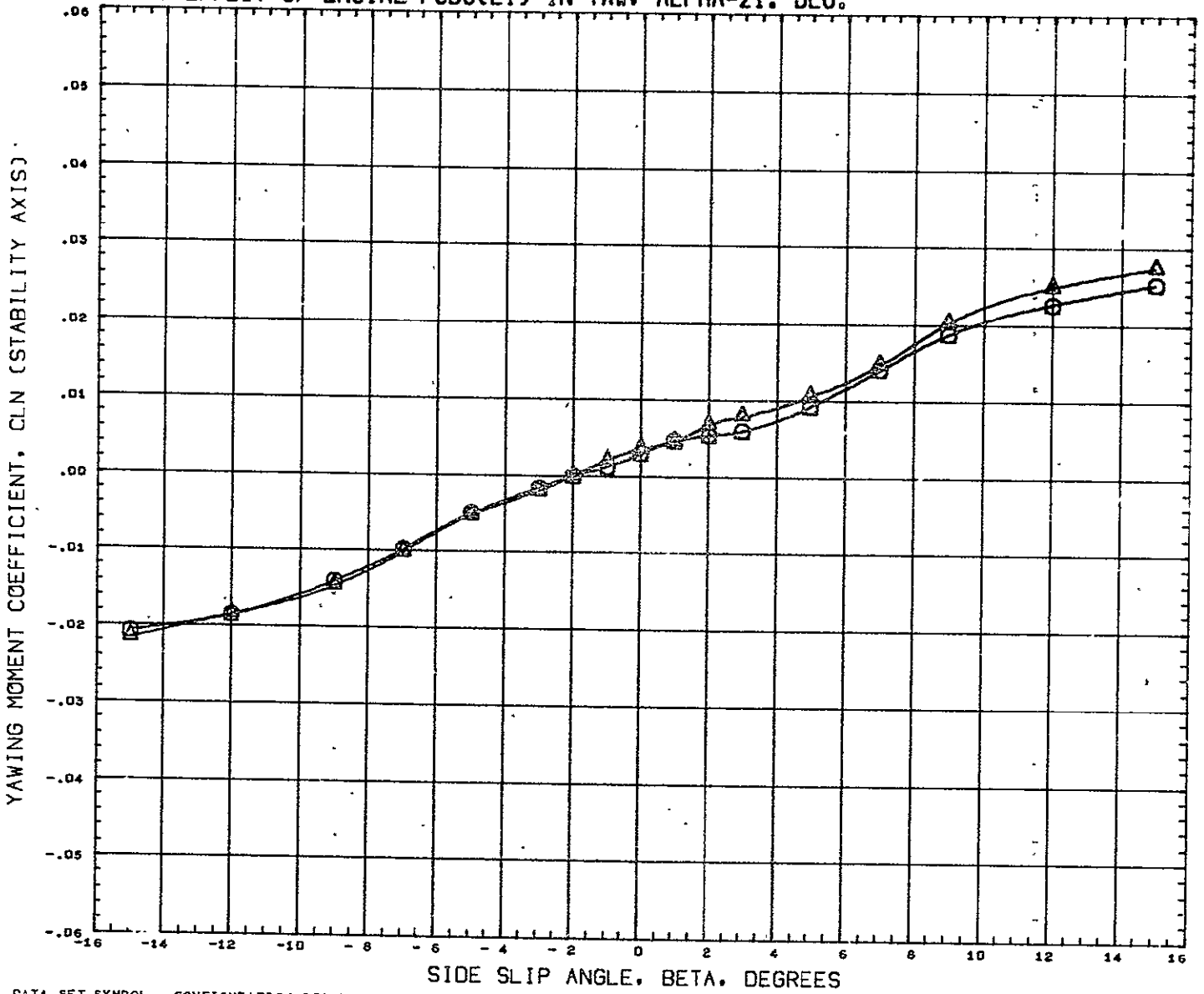
FIG. 25 EFFECT OF ENGINE PODS(E1) IN YAW, ALPHA=21. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(ACW062)	GWT 290-CONF ROS-NB1 B1F1W1V1E1	21.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(XC0052)	GWT 289-CONF. ROS-NB1 B1W1V1		0.000	0.000	0.000	LREF 6.4320 FT
						BREF 3.8920 FT
						XMRP 1465.0040 IN
						YMRP 0.0000 IN
						ZMRP 377.0004 IN
						SCALE 0.0400

MACH 0.170

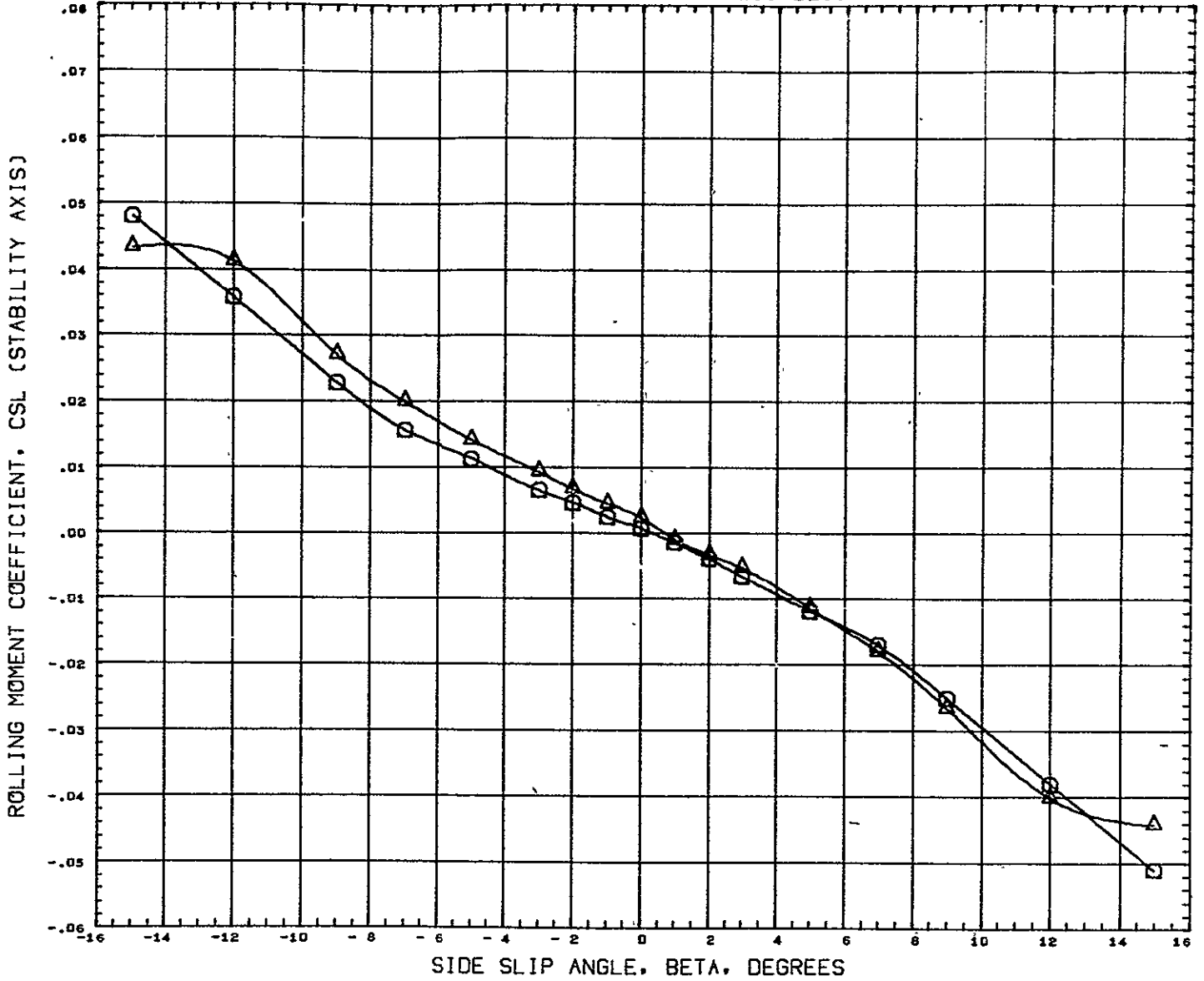
FIG. 25 EFFECT OF ENGINE PODS(E1) IN YAW, ALPHA=21. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AIRON	RUDDER	REFERENCE INFORMATION
(ACWD62)	GWTT 290-CONF ROS-NB1 B1F1W1V1E1	21.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(XC8052)	GWTT 289-CONF. ROS-NB1 B1W1V1		0.000	0.000	0.000	LREF 6.4320 FT
						BREF 3.8920 FT
						XNRF 1485.0040 IN
						YNRF 0.0000 IN
						ZNRF 377.0074 IN
						SCALE 0.0400

MACH 0.170

FIG. 25 EFFECT OF ENGINE PODS(E1) IN YAW, ALPHA=21. DEG.



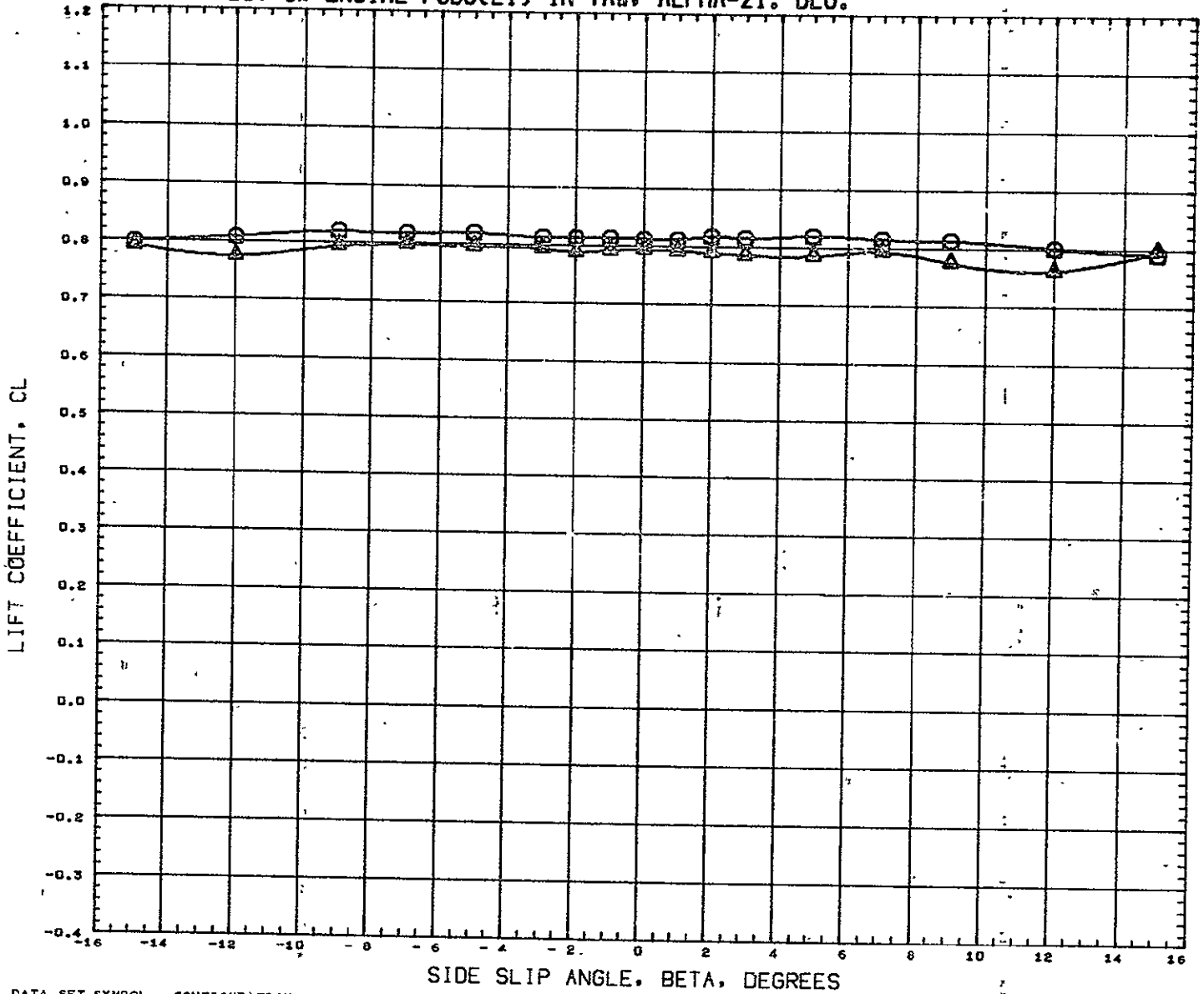
DATA SET SYMBOL	CONFIGURATION DESCRIPTION
(ACW062)	GWTI 290-CONF ROS-NB1 B1F1W1V1E1
(XCQ052)	GWTI 289-CONF. ROS-NB1 B1W1V1

ALPHA	ELEVTR	AILRON	RUDDER
21.000	0.000	0.000	0.000

REFERENCE INFORMATION	
SREF	9.1952 SQ FT
LREF	6.4320 FT
BREF	3.8920 FT
XMRP	1485.0040 IN
YMRP	0.0000 IN
ZMRP	377.0004 IN
SCALE	0.0400

MACH 0.170

FIG. 25 EFFECT OF ENGINE PODS(E1) IN YAW, ALPHA=21. DEG.



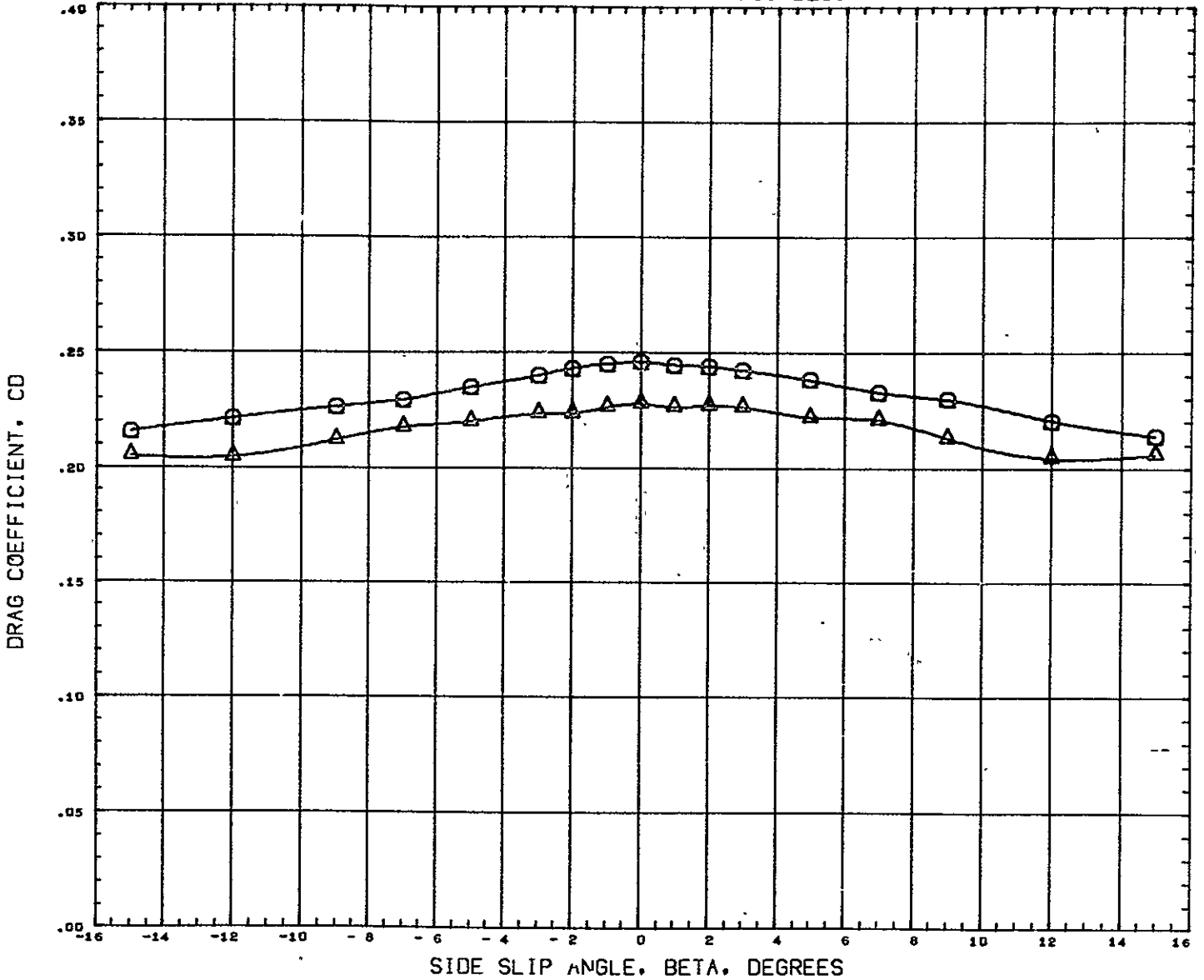
DATA SET SYMBOL - CONFIGURATION DESCRIPTION
 (ACW062) \odot GWTI 290-CONF ROS-NB1 B1:1W1V1E1
 (XCR052) \triangle GWTI 289-CONF ROS-NB1 B1W1V1

ALPHA 21.000
 ELEVTR 0.000
 AILRON 0.000
 RUDDER 0.000

REFERENCE INFORMATION
 SREF 9.1952 SQ FT
 LREF 6.4320 FT
 BREF 3.6920 FT
 XMRP 1485.0040 IN
 YMRP 0.0000 IN
 ZMRP 377.0004 IN
 SCALE 0.0400

MACH 0.170

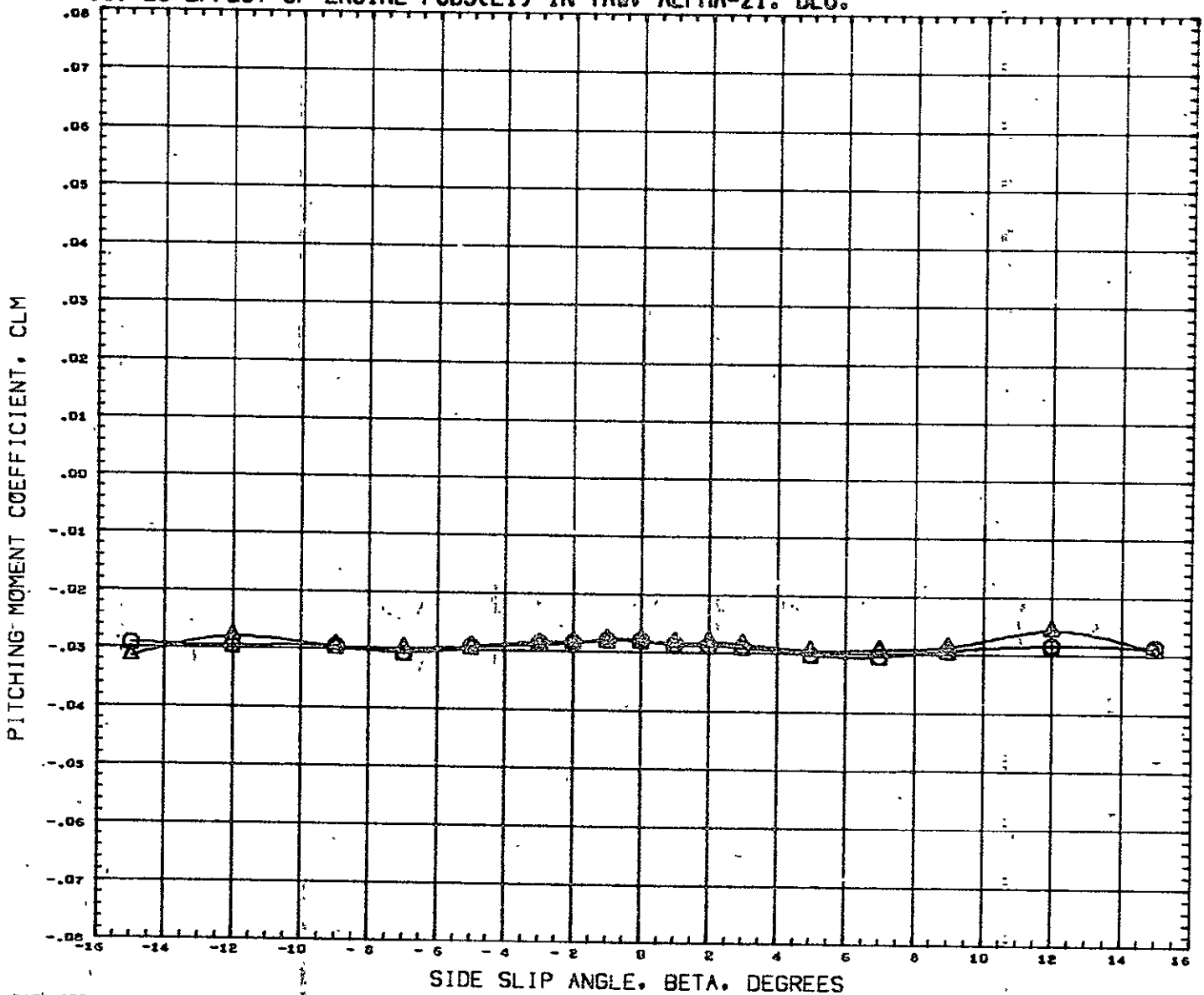
FIG. 25 EFFECT OF ENGINE PODS(E1) IN YAW, ALPHA=21. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(ACW062)	GWTT 290-CONF ROS-NB1 B1F1W1V1E1	21.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(XCQ052)	GWTT 289-CONF ROS-NB1 B1W1V1					LREF 6.4320 FT
						BREF 3.8920 FT
						XHRP 1485.0040 IN
						YHRP 0.0000 IN
						ZHRP 377.0004 IN
						SCALE 0.0400

MACH 0.170

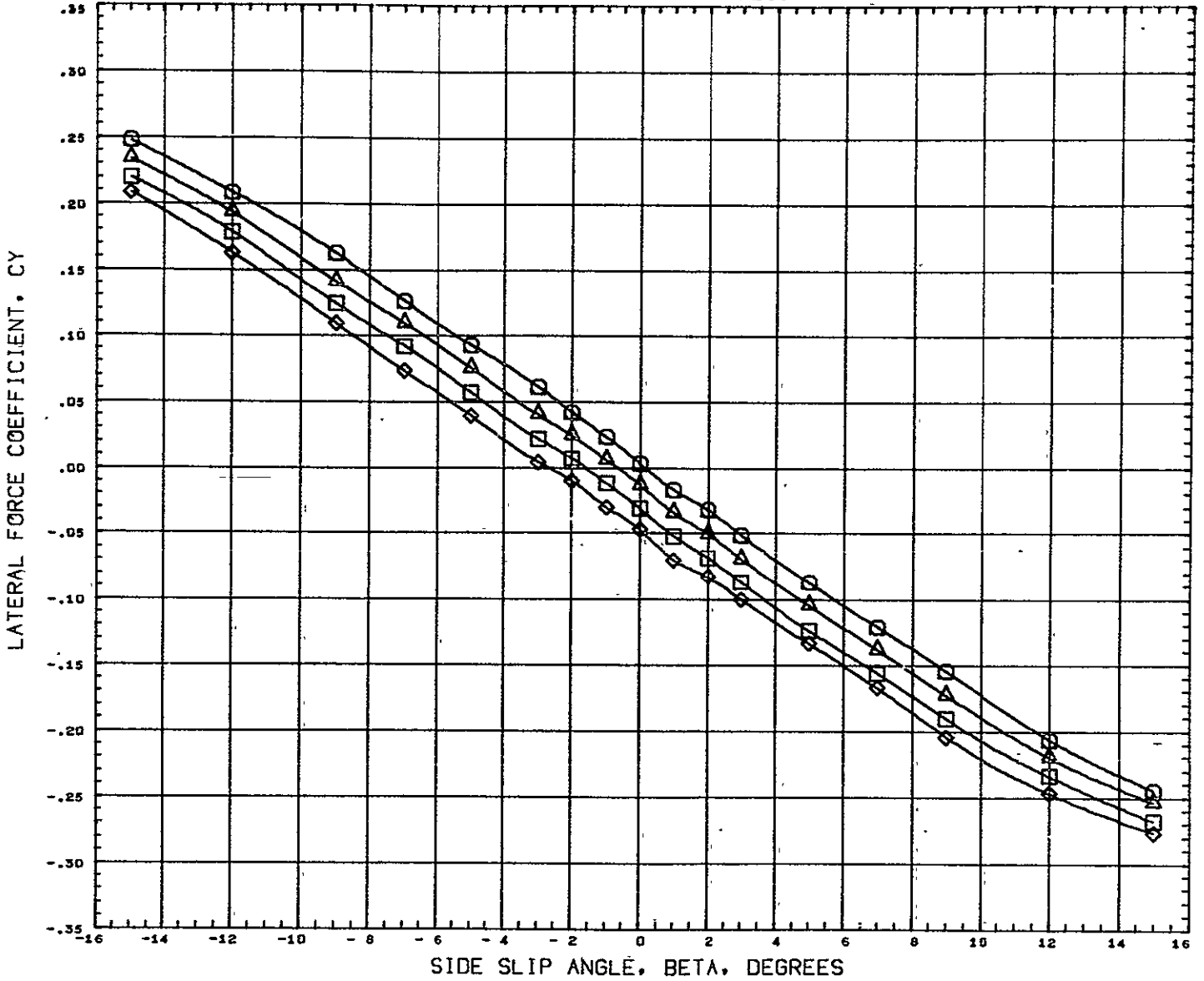
FIG. 25 EFFECT OF ENGINE PODS(E1) IN YAW, ALPHA=21. DEG.



DATA SET SYMBOL	CONFIGURATION	DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(ACW062)	GWTT 290-COMF	ROS-NB1 B1F1W1V1E1	21.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(XCR052)	GWTT 289-COMF	ROS-NB1 B1W1V1					LREF 6.4320 FT
							BREF 3.8920 FT
							XMRP 1485.8040 IN
							YMRP 0.0000 IN
							ZMRP 377.0004 IN
							SCALE 0.0400

MACH 0.170

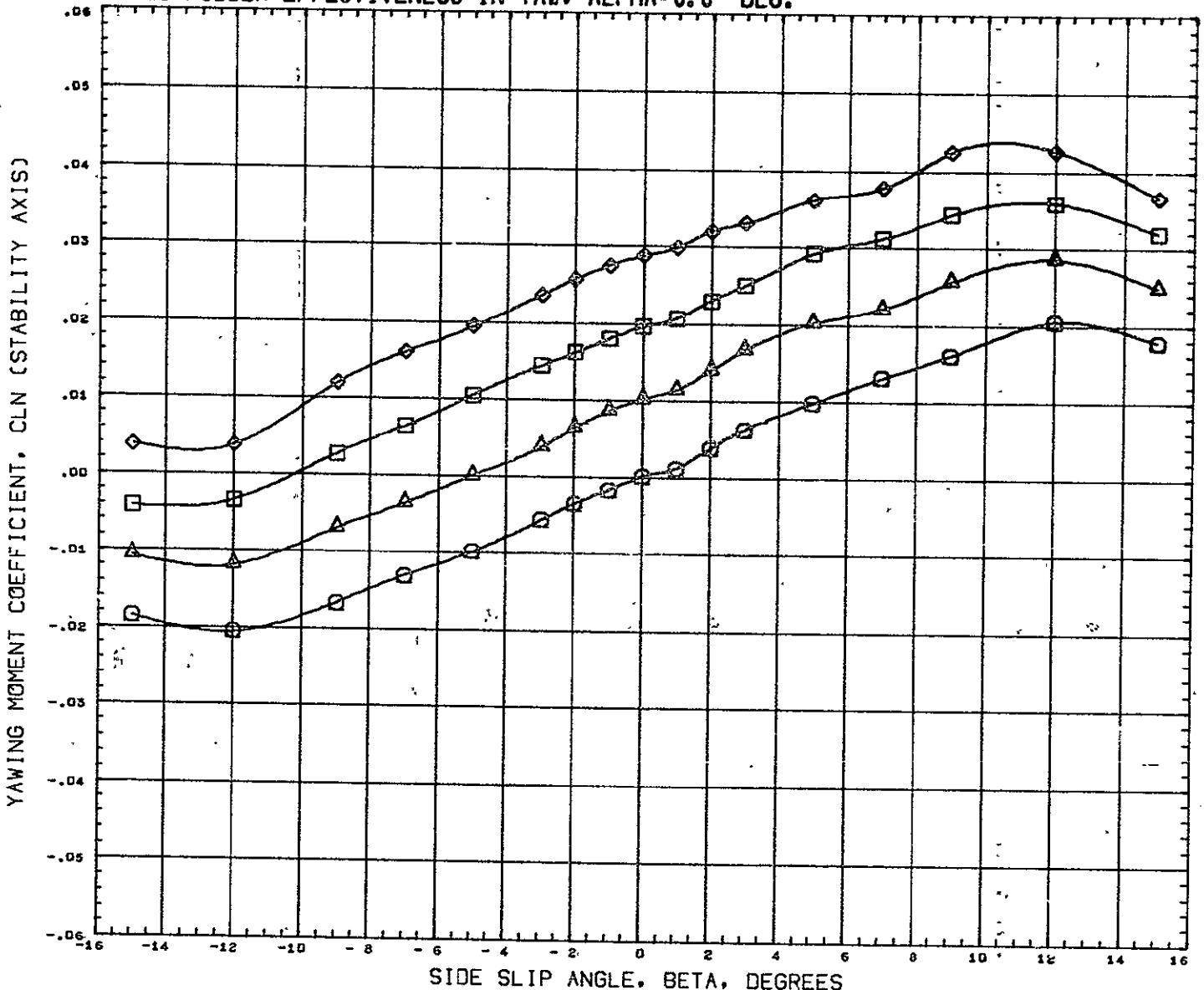
FIG. 26 RUDDER EFFECTIVENESS IN YAW, ALPHA=0.0 DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW062)	GWTT 290-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCW064)	GWTT 290-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	-5.000	LREF 6.4320 FT
(RCW065)	GWTT 290-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	-15.000	BREF 3.8920 FT
(XCR056)	GWTT 289-CONF ROS-NB1 B1W1V1	0.000	0.000	0.000	-10.000	XMRP 1485.0040 IN
						YMRP 0.0000 IN
						ZMRP 377.0004 IN
						SCALE 0.0400

MACH 0.170

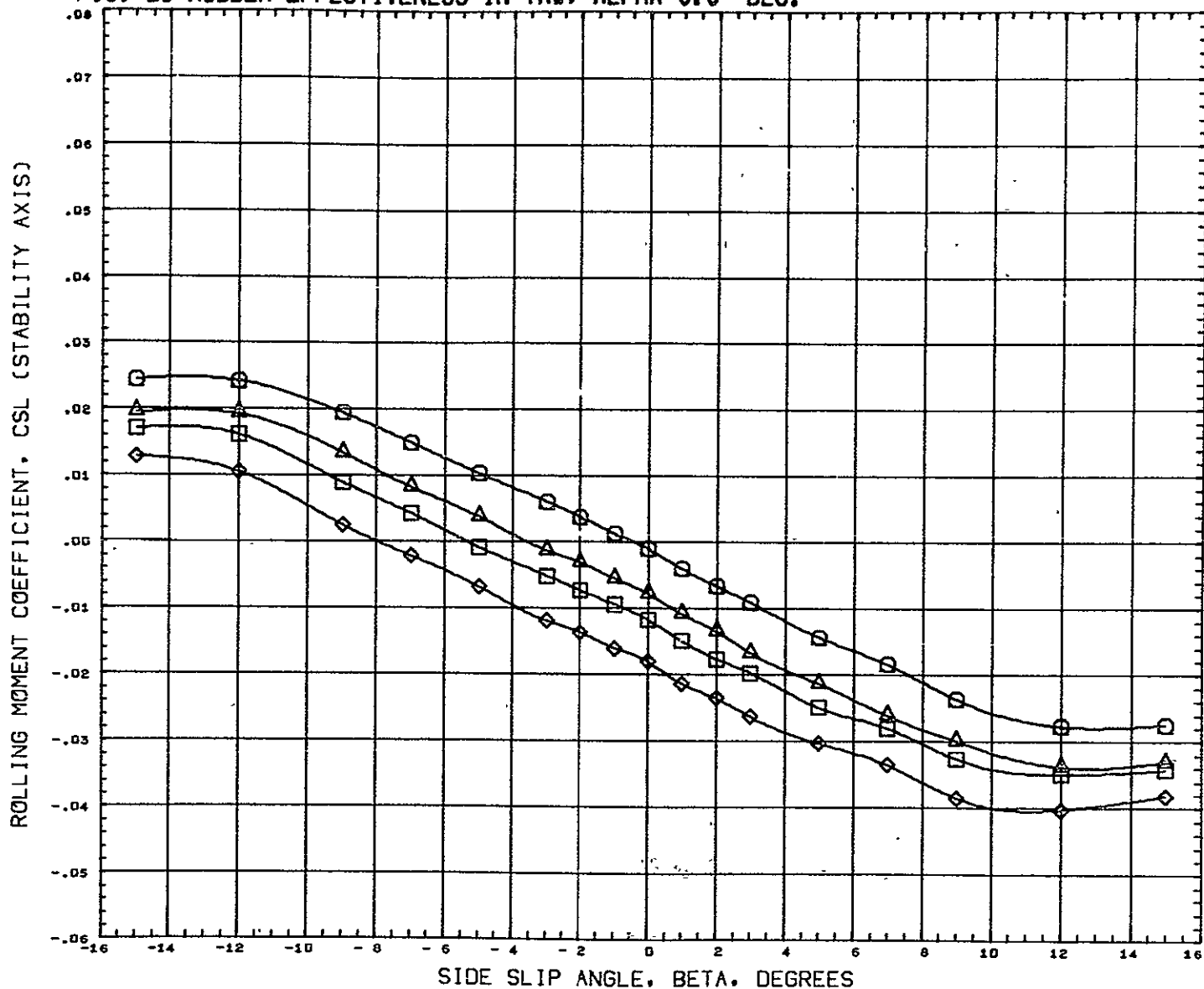
FIG. 26 RUDDER EFFECTIVENESS IN YAW, ALPHA=0.0 DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW002)	GWTT 290-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCW064)	GWTT 290-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	-5.000	LREF 6.4320 FT
(RCW065)	GWTT 290-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	-15.000	BREF 3.8920 FT
(XC0056)	GWTT 289-CONF ROS-NB1 B1W1V1	0.000	0.000	0.000	-10.000	XMRP 1485.0040 IN
						YMRP 0.0000 IN
						ZMRP 377.0004 IN
						SCALE 0.0400

HACH 0.170

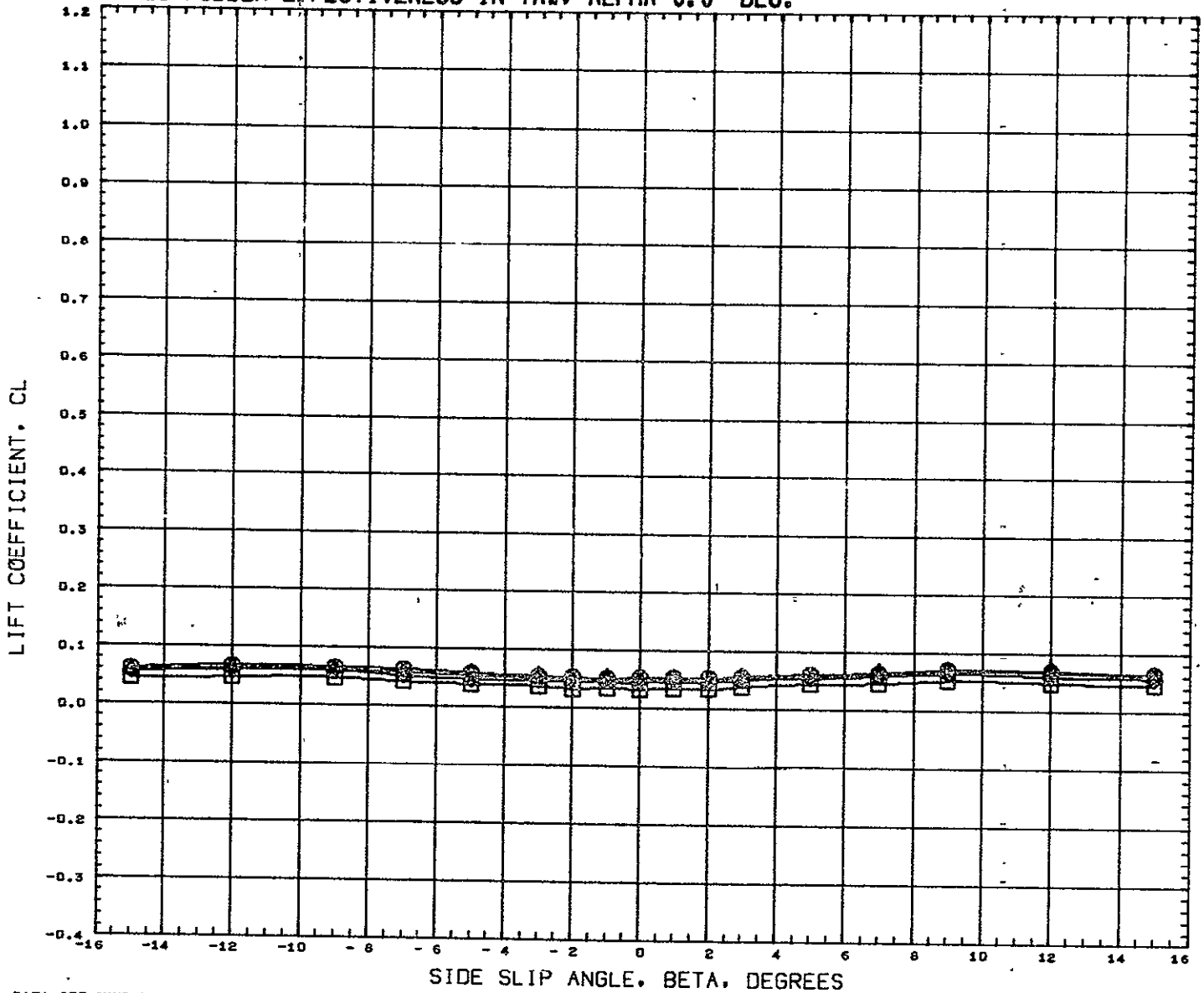
FIG. 26 RUDDER EFFECTIVENESS IN YAW, ALPHA=0.0 DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW062)	GWTT 290-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCW064)	GWTT 290-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	-5.000	LREF 6.4320 FT
(RCW065)	GWTT 290-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	-15.000	BREF 3.8920 FT
(XC056)	GWTT 289-CONF. ROS-NB1 B1W1V1	0.000	0.000	0.000	-10.000	XMRP 1485.0040 IN
						YMRP 0.0000 IN
						ZMRP 377.0004 IN
						SCALE 0.0400

MACH 0.170

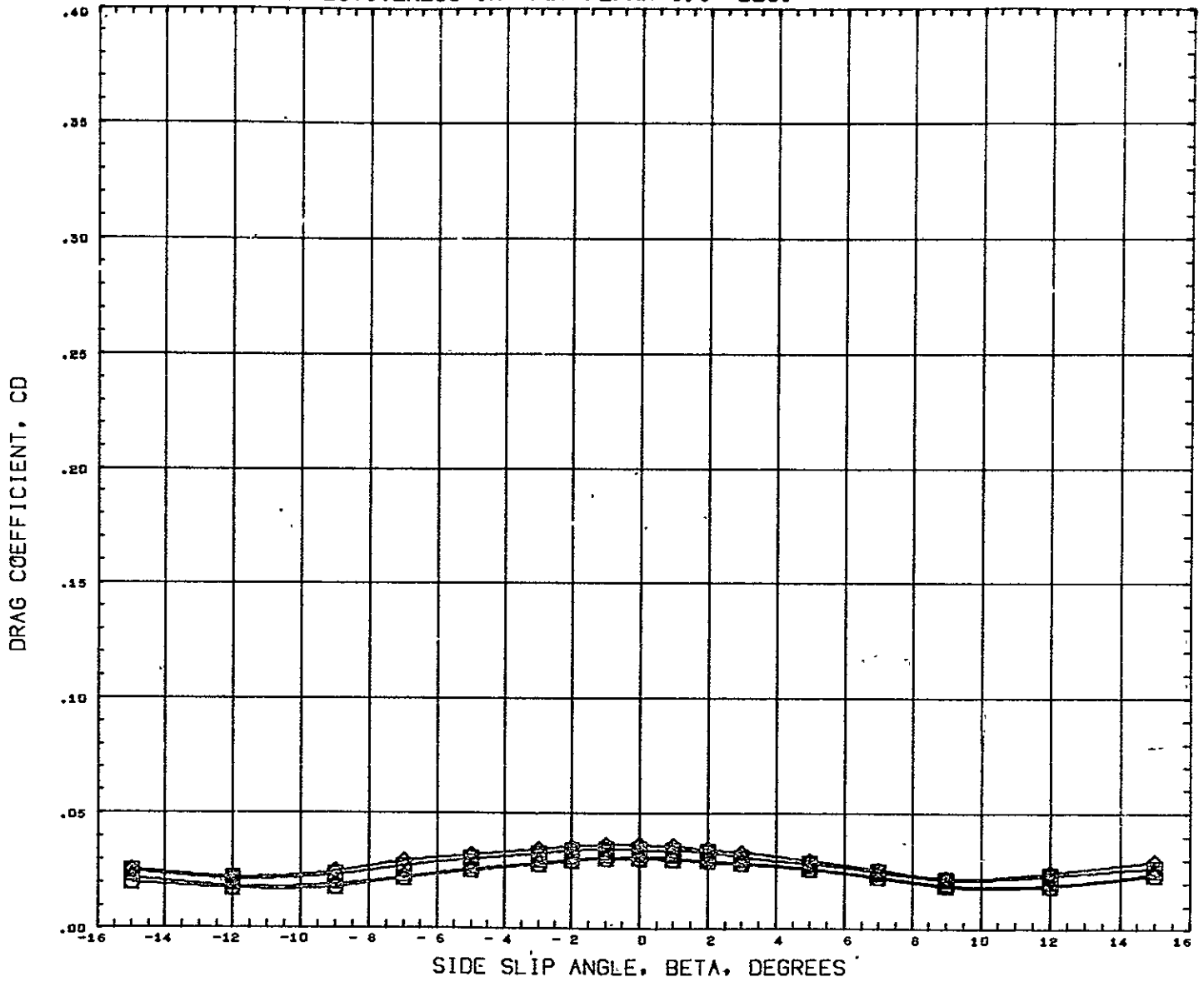
FIG. 26 RUDDER EFFECTIVENESS IN YAW, ALPHA=0.0 DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCWD02)	GWTT 29D-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCWD64)	GWTT 29D-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	-5.000	LREF 6.4320 FT
(RCWD65)	GWTT 29G-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	-15.000	BREF 3.8920 FT
(XCWD56)	GWTT 289-CONF ROS-NB1 B1W1V1	0.000	0.000	0.000	-10.000	XMRP 1485.0040 IN
						YMRP 0.0000 IN
						ZMRP 377.0004 IN
						SCALE 0.0400

MACH 0.170

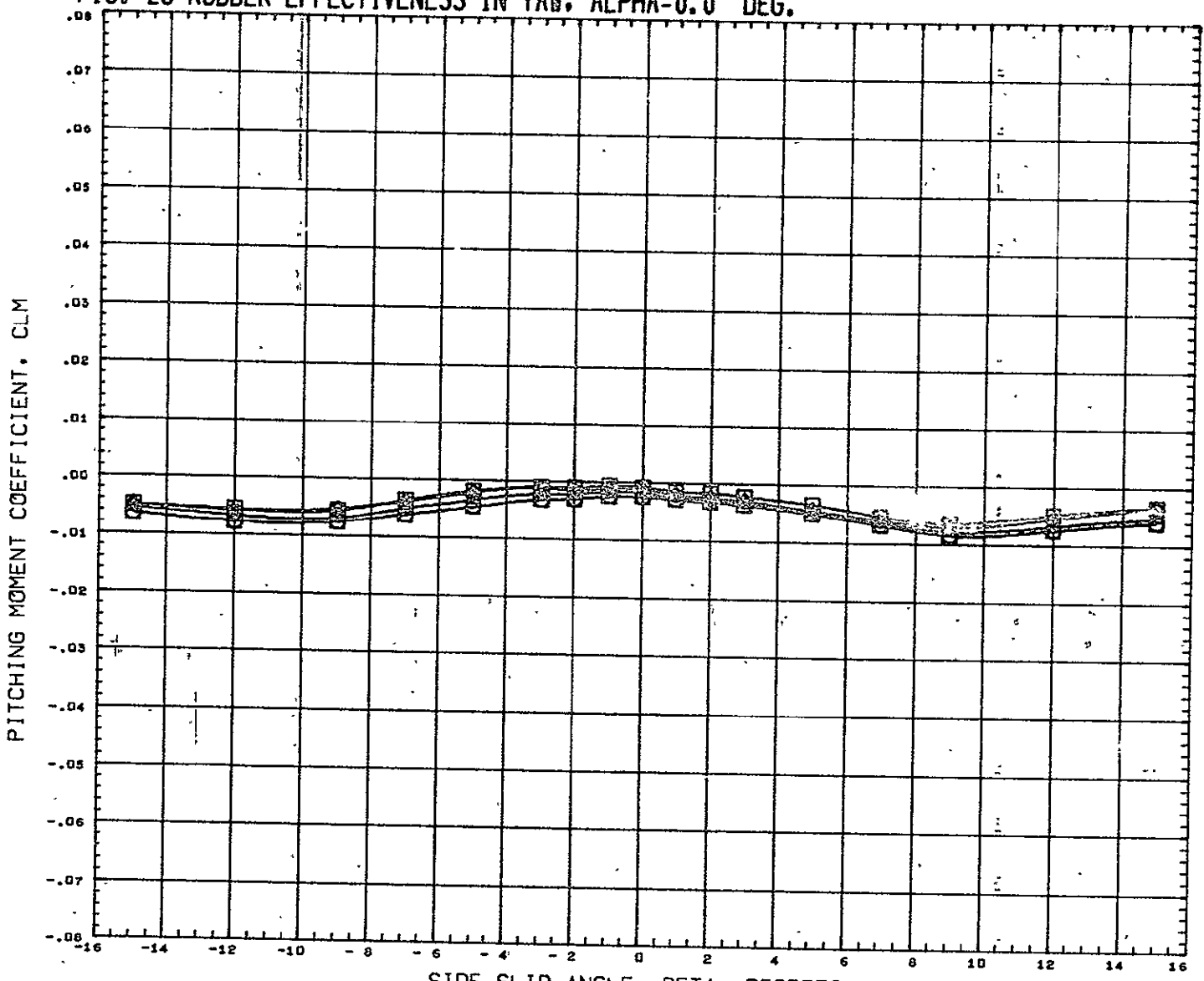
FIG. 26 RUDDER EFFECTIVENESS IN YAW, ALPHA=0.0 DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW002)	GWTT 290-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCW064)	GWTT 290-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	-5.000	LREF 6.4320 FT
(RCW065)	GWTT 290-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	-15.000	BREF 3.8920 FT
(XCQ056)	GWTT 289-CONF ROS-NB1 B1W1V1	0.000	0.000	0.000	-10.000	XHRF 1485.0040 IN
						YHRF 0.0000 IN
						ZHRF 377.0004 IN
						SCALE 0.0400

MACH 0.170

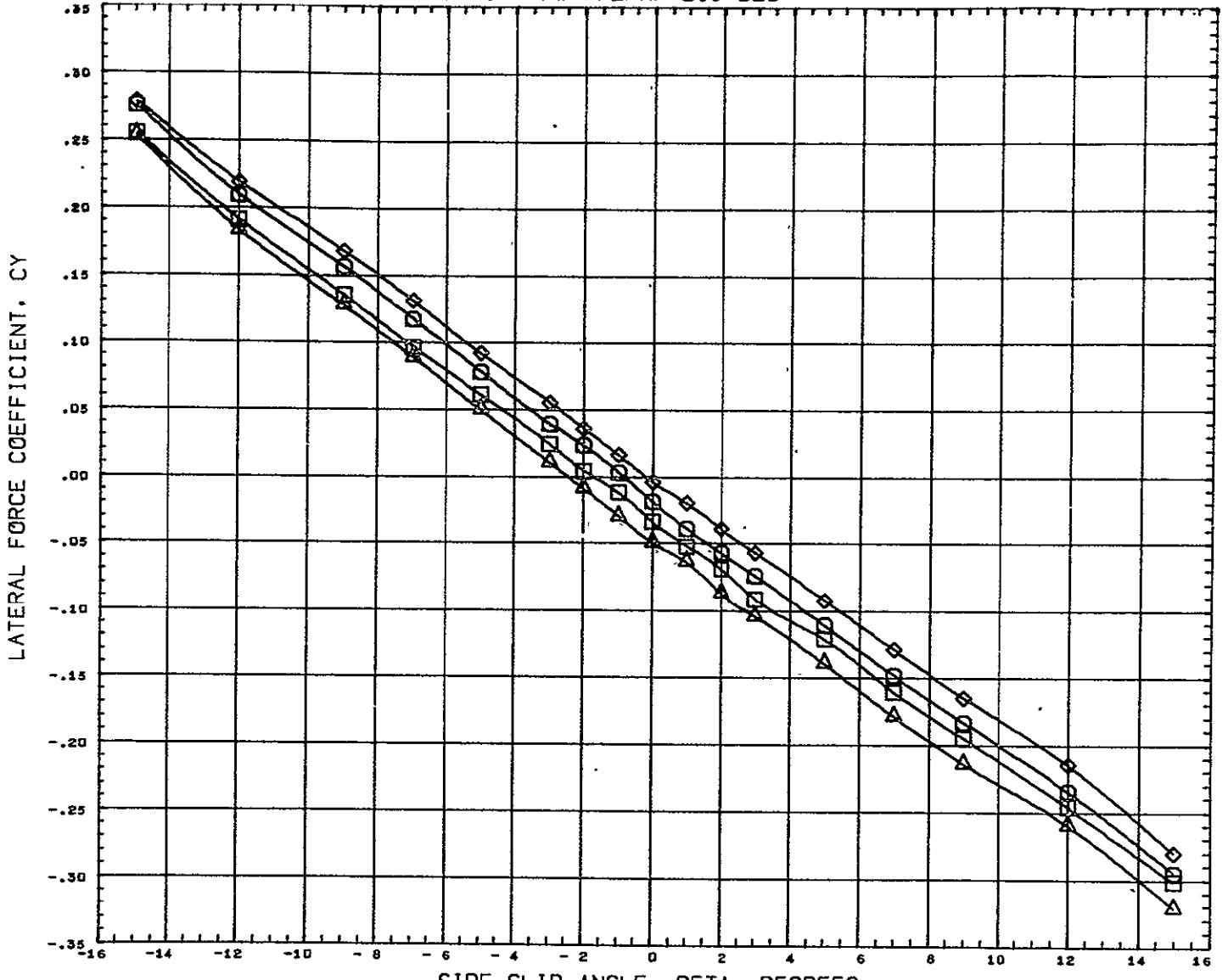
FIG. 26 RUDDER EFFECTIVENESS IN YAW, ALPHA=0.0 DEG.



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW002)	○	GWT 290-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCW064)	△	GWT 290-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	-5.000	LREF 6.4320 FT
(RCW065)	◇	GWT 290-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	-15.000	BREF 3.8920 FT
(XC0056)	□	GWT 289-CONF ROS-NB1 B1W1V1	0.000	0.000	0.000	-10.000	XMRP 1485.0040 IN
							YMRP 0.0000 IN
							ZMRP 377.0004 IN
							SCALE 0.0400

MACH 0.170

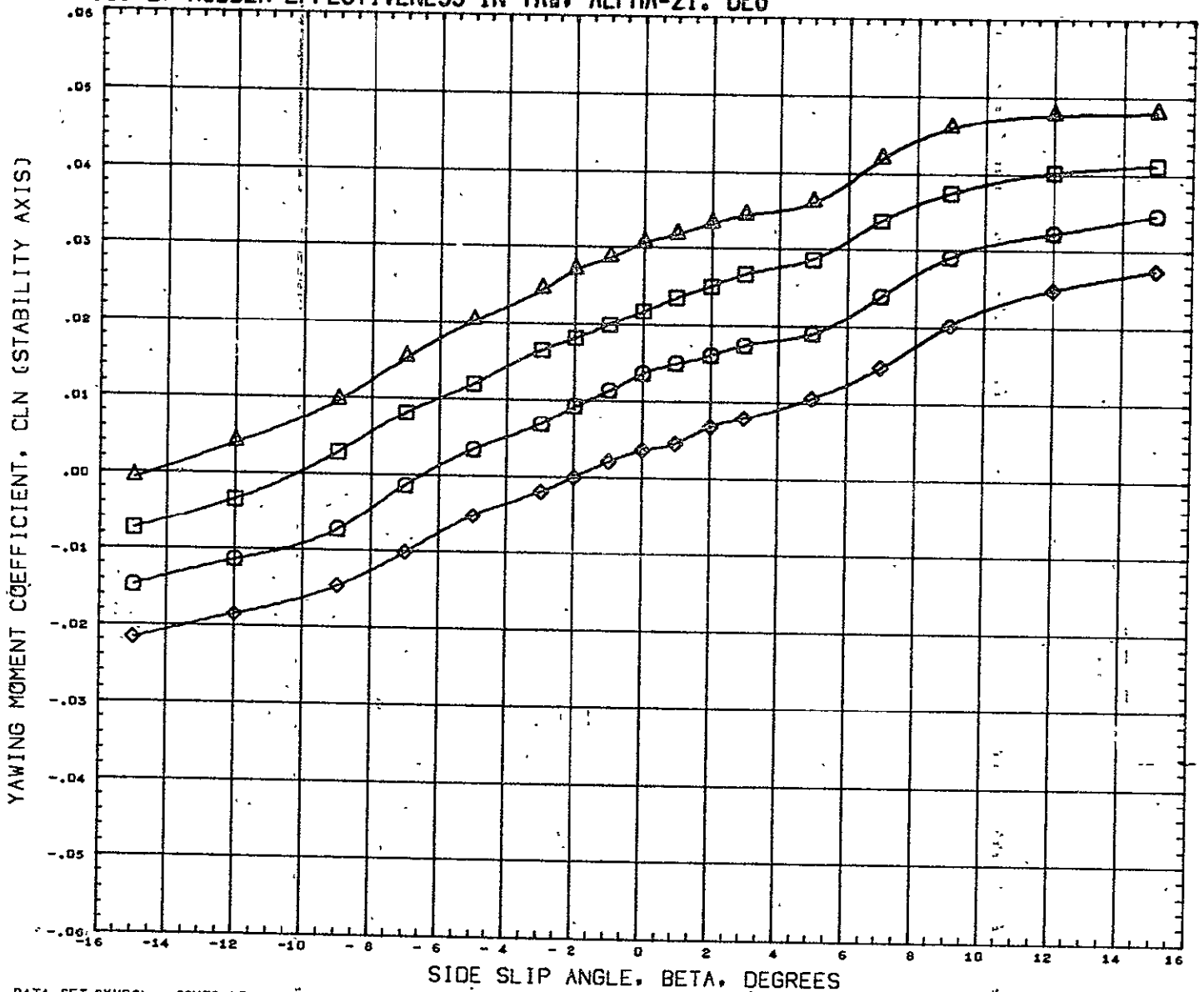
FIG. 27 RUDDER EFFECTIVENESS IN YAW, ALPHA=21. DEG



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(ACWB63)	GWT 290-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	-5.000	SREF, 9.1952 SQ FT
(ACWB66)	GWT 290-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	-15.000	LREF, 6.4320 FT
(XCQ052)	GWT 289-CONF. ROS-NB1 B1W1V1	21.000	0.000	0.000	0.000	BREF, 3.8920 FT
(XCQ057)	GWT 289-CONF. ROS-NB1 B1W1V1	21.000	0.000	0.000	-10.000	XMRP, 1485.0040 IN
						YMRP, 0.0000 IN
						ZMRP, 377.0004 IN
						SCALE, 0.0400

MACH 0.170

FIG. 27 RUDDER EFFECTIVENESS IN YAW, ALPHA=21. DEG

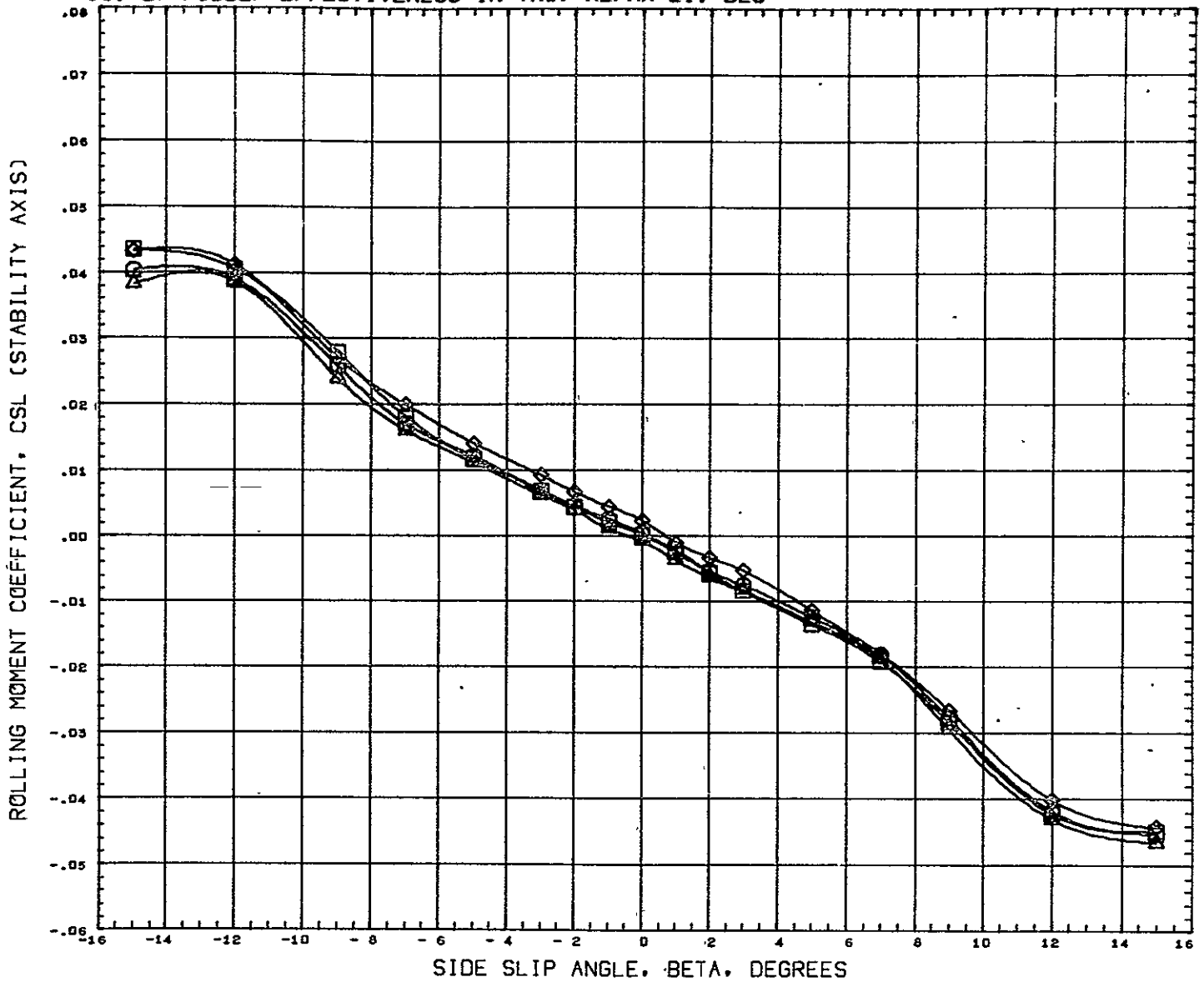


DATA SET SYMBOL	CONFIGURATION DESCRIPTION
(ACW063)	GWTT 290-CONF ROS-NB1 B1F1W1V1
(ACW066)	GWTT 290-CONF ROS-NB1 B1F1W1V1
(XC0052)	GWTT 289-CONF ROS-NB1 B1W1V1
(XC0057)	GWTT 289-CONF ROS-NB1 B1W1V1

ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
21.000	0.000	0.000	-5.000	SREF 9.1952 SQ FT
21.000	0.000	0.000	-15.000	LREF 6.4320 FT
21.000	0.000	0.000	0.000	BREF 3.8920 FT
				XMRP 1485.0040 IN
				YMRP 0.0000 IN
				ZMRP 377.0004 IN
				SCALE 0.0400

MACH 0.170

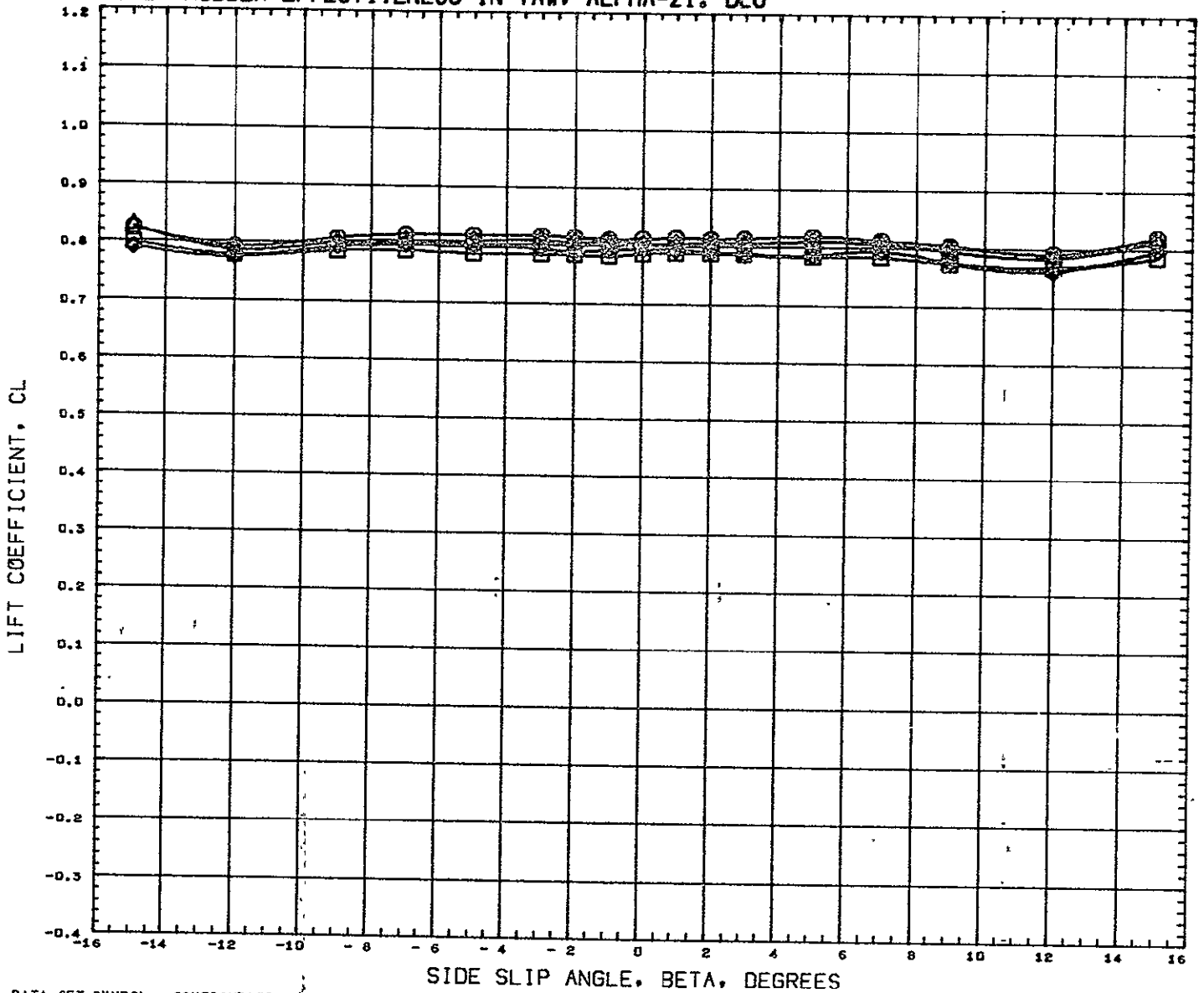
FIG. 27 RUDDER EFFECTIVENESS IN YAW, ALPHA=21. DEG



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AIRLON	RUDDER	REFERENCE INFORMATION
(ACW063)	○	GWTT 290-CONF ROS-NB1 B1F1W1V1	21.000	0.000	0.000	-5.000	SREF 9.1952 SQ FT
(ACW066)	△	GWTT 290-CONF ROS-NB1 B1F1W1V1	21.000	0.000	0.000	-15.000	LREF 6.4320 FT
(XC0052)	◇	GWTT 289-CONF. ROS-NB1 B1W1V1	21.000	0.000	0.000	0.000	BREF 3.8920 FT
(XC0057)	□	GWTT 289-CONF. ROS-NB1 B1W1V1	21.000	0.000	0.000	-10.000	XHRP 1485.0040 IN YHRP 0.0000 IN ZHRP 377.0004 IN SCALE 0.0400

MACH 0.170

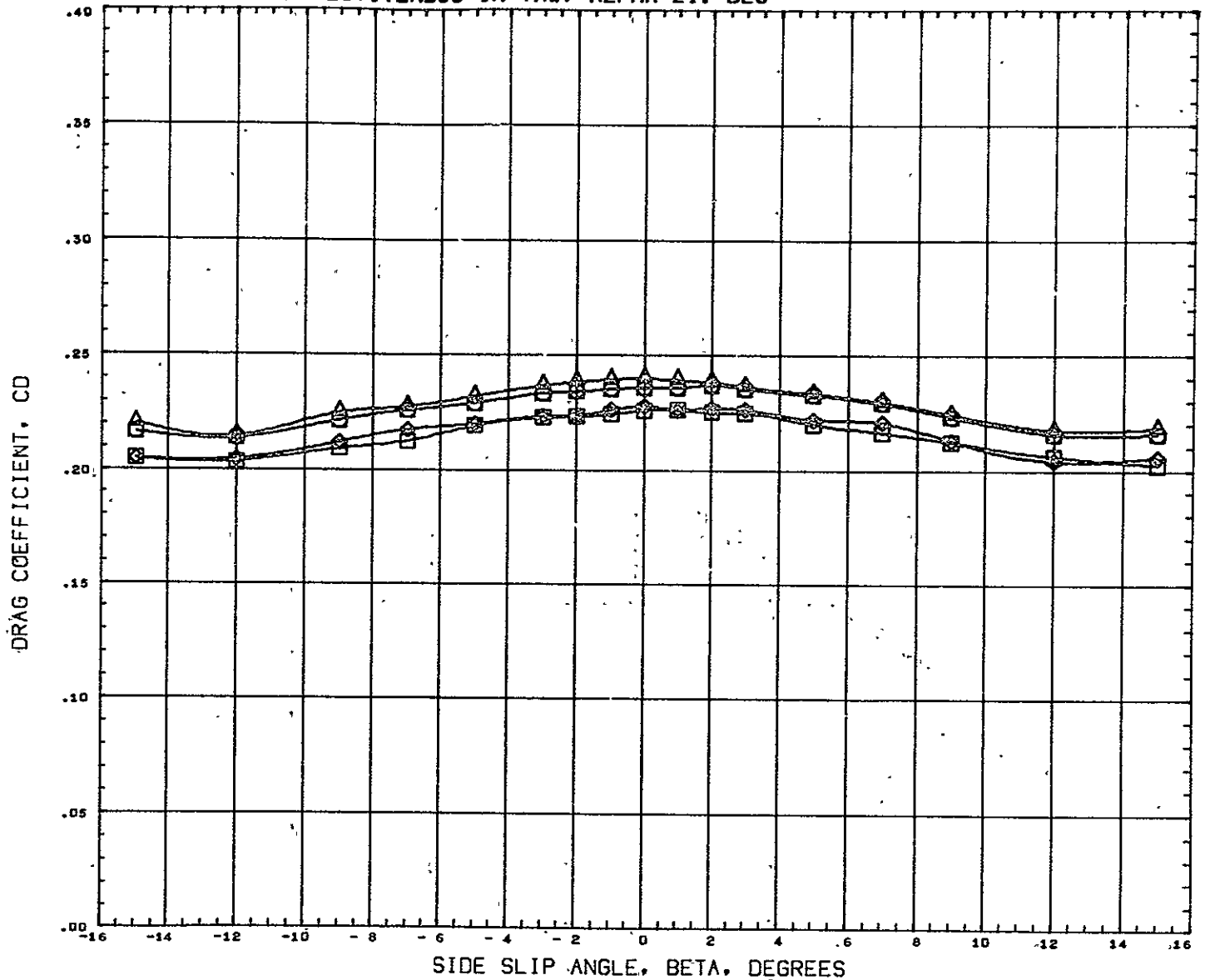
FIG. 27 RUDDER EFFECTIVENESS IN YAW, ALPHA=21. DEG



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(ACW065)	GWT 290-CONF ROS-NB1 B1F1W1V1	21.000	0.000	0.000	-5.000	SREF 9.1952 SQ FT
(ACW066)	GWT 290-CONF ROS-NB1 B1F1W1V1	21.000	0.000	0.000	-15.000	LREF 6.4320 FT
(XC0052)	GWT 289-CONF ROS-NB1 B1W1V1	21.000	0.000	0.000	0.000	BREF 3.8920 FT
(XC0057)	GWT 289-CONF ROS-NB1 B1W1V1	21.000	0.000	0.000	-10.000	XMRP 1485.0040 IN
						YMRP 0.0000 IN
						ZMRP 377.0004 IN
						SCALE 0.0400

MACH 0.170

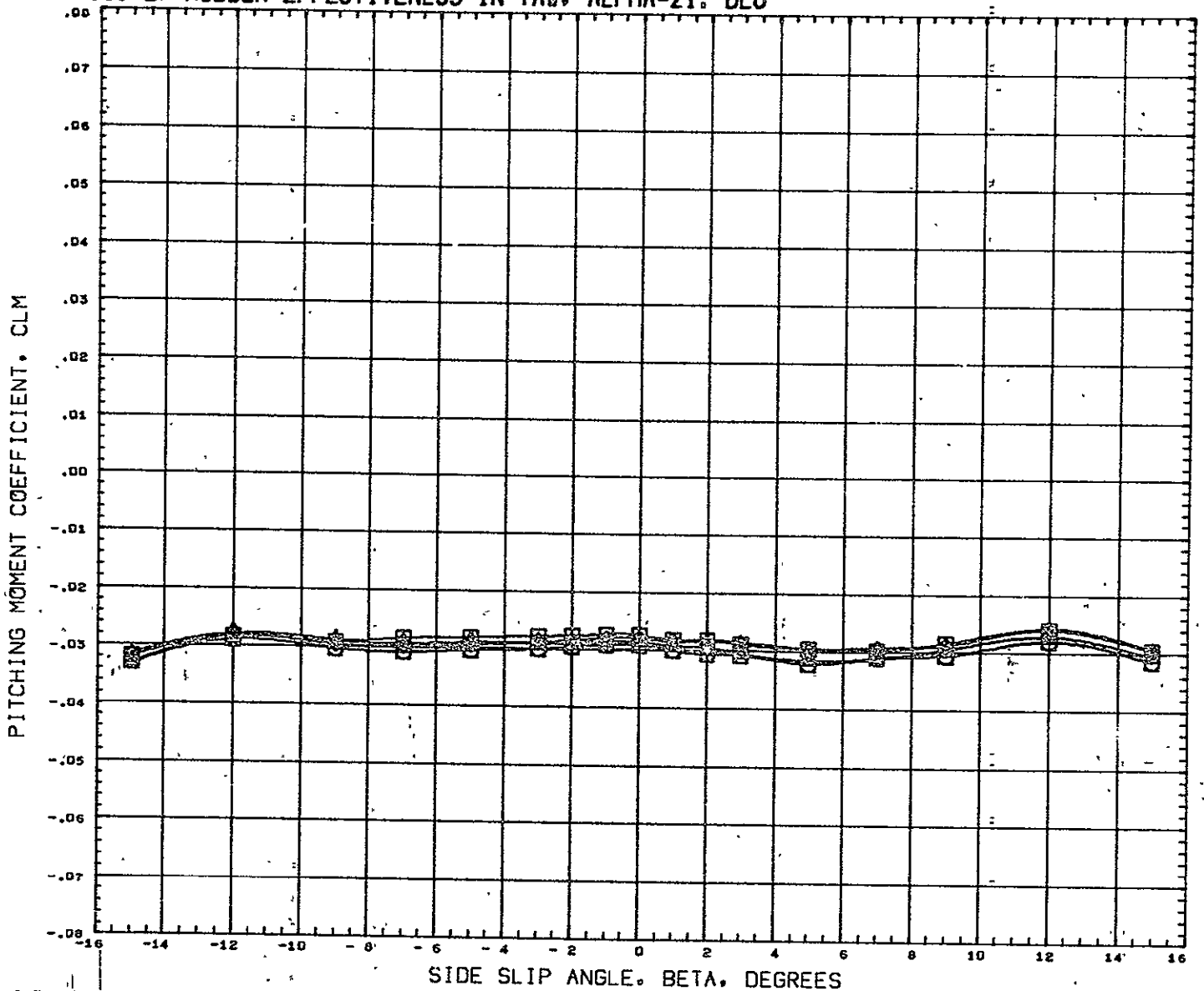
FIG. 27 RUDDER EFFECTIVENESS IN YAW, ALPHA=21. DEG



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(ACWD63)	GWTT 290-CONF ROS-NB1 B1F1W1V1	21.000	0.000	0.000	-5.000	SREF 9.1952 SQ FT
(ACWD66)	GWTT 290-CONF ROS-NB1 B1F1W1V1	21.000	0.000	0.000	-15.000	LREF 6.4320 FT
(XCQD52)	GWTT 289-CONF ROS-NB1 B1W1V1	21.000	0.000	5.000	0.000	BREF 3.8920 FT
(XCQD57)	GWTT 289-CONF ROS-NB1 B1W1V1	21.000	0.000	0.000	-10.000	XHRF 1485.0040 IN
						YHRF 0.0000 IN
						ZHRF 377.0004 IN
						SCALE 0.0400

MACH 0.170

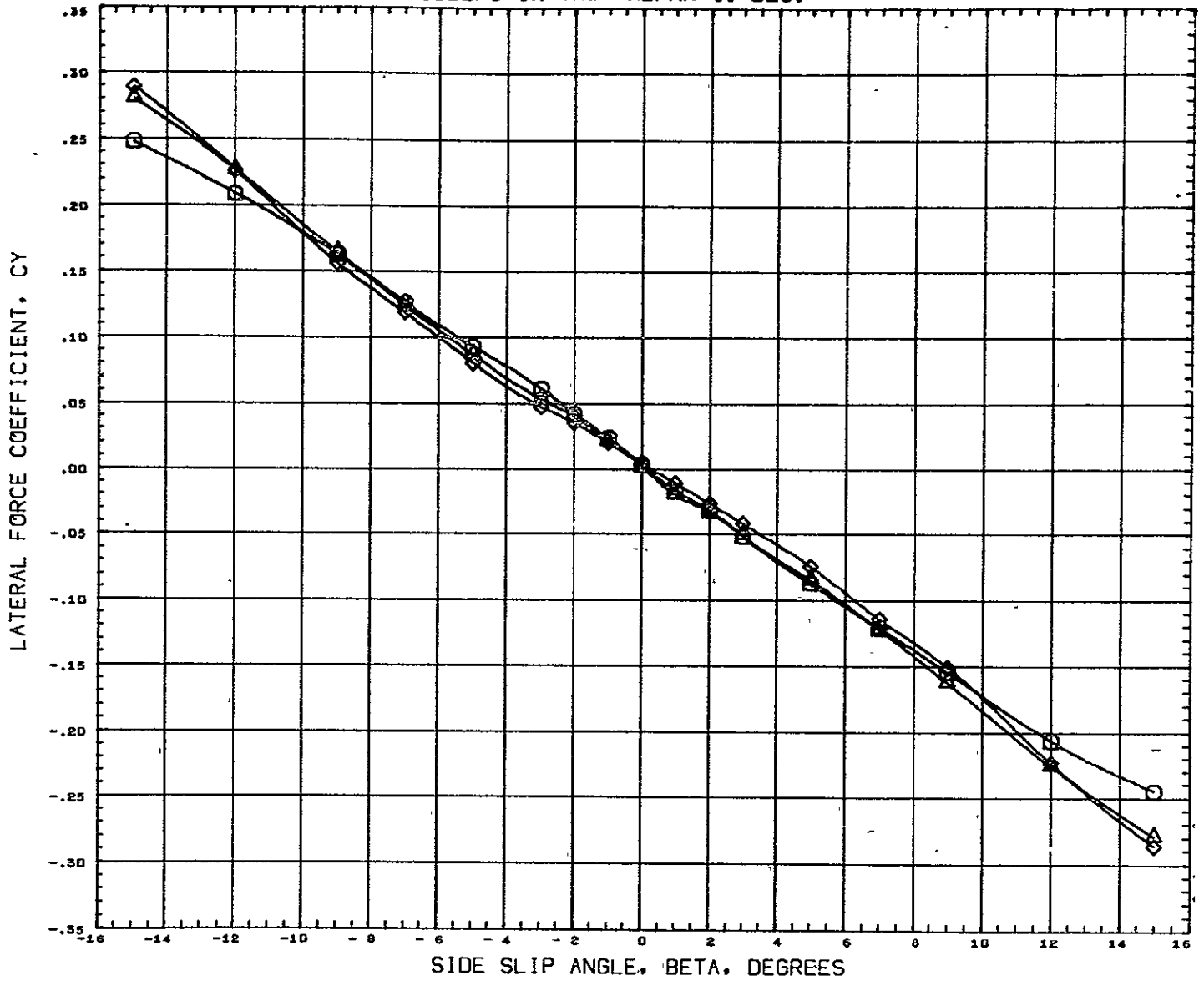
FIG. 27 RUDDER EFFECTIVENESS IN YAW, ALPHA=21. DEG



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(ACWD63)	□	GWTT 290-CONF ROS-NB1 B1F1W1V1		0.000	0.000	-5.000	SREF 9.1952 SQ FT
(ACWD66)		GWTT 290-CONF ROS-NB1 D1F1W1V1		0.000	0.000	-15.000	LREF 6.4320 FT
(XCQ052)		GWTT 289-CONF ROS-NB1 B1W1V1	21.000	0.000	0.000	0.000	BREF 3.8920 FT
(XCQ057)		GWTT 289-CONF ROS-NB1 B1W1V1	21.000	0.000	0.000	-10.000	XHRF 1485.0040 IN
							YHRF 0.0000 IN
							ZHRF 377.0004 IN
							SCALE 0.0400

MACH 0.170

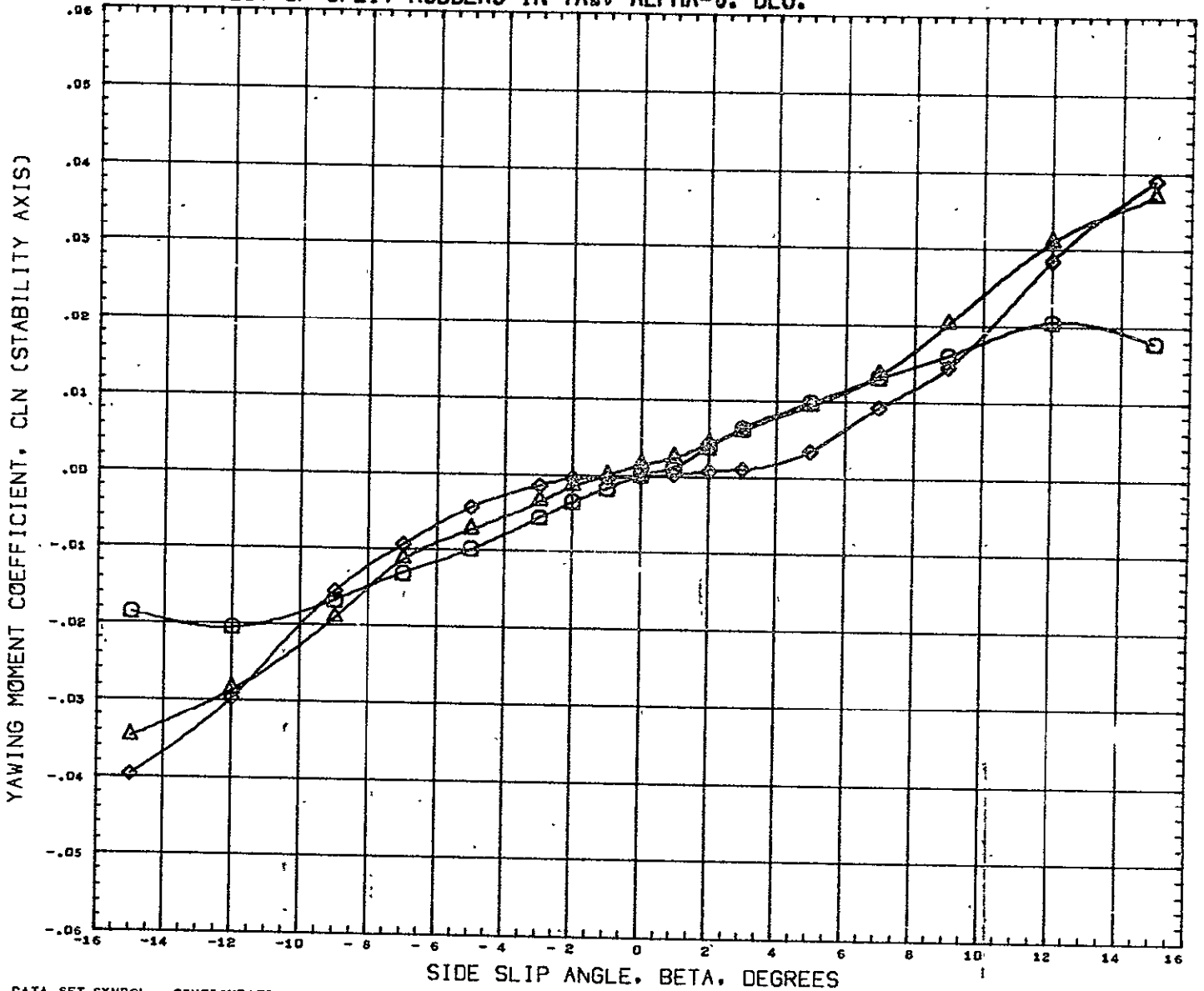
FIG. 28 EFFECT OF SPLIT RUDDERS IN YAW, ALPHA=0. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	LRUDDR	RRUDDR	RUDDER	REFERENCE INFORMATION
(RCW002)	GWTT 290-CONF ROS-NB1 B1F1W1V1	0.000			0.000	SREF 9.1952 SQ FT
(RCW069)	GWTT 290-CONF ROS-NB1 B1F1W1V1	0.000	30.000	-30.000		LREF 6.4320 FT
(RCW068)	GWTT 290-CONF ROS-NB1 B1F1W1V1	0.000	60.000	-60.000		BREF 3.8920 FT
						XMRP 1485.0040 IN
						YMRP 0.0000 IN
						ZMRP 377.0004 IN
						SCALE 0.0400

MACH 0.170

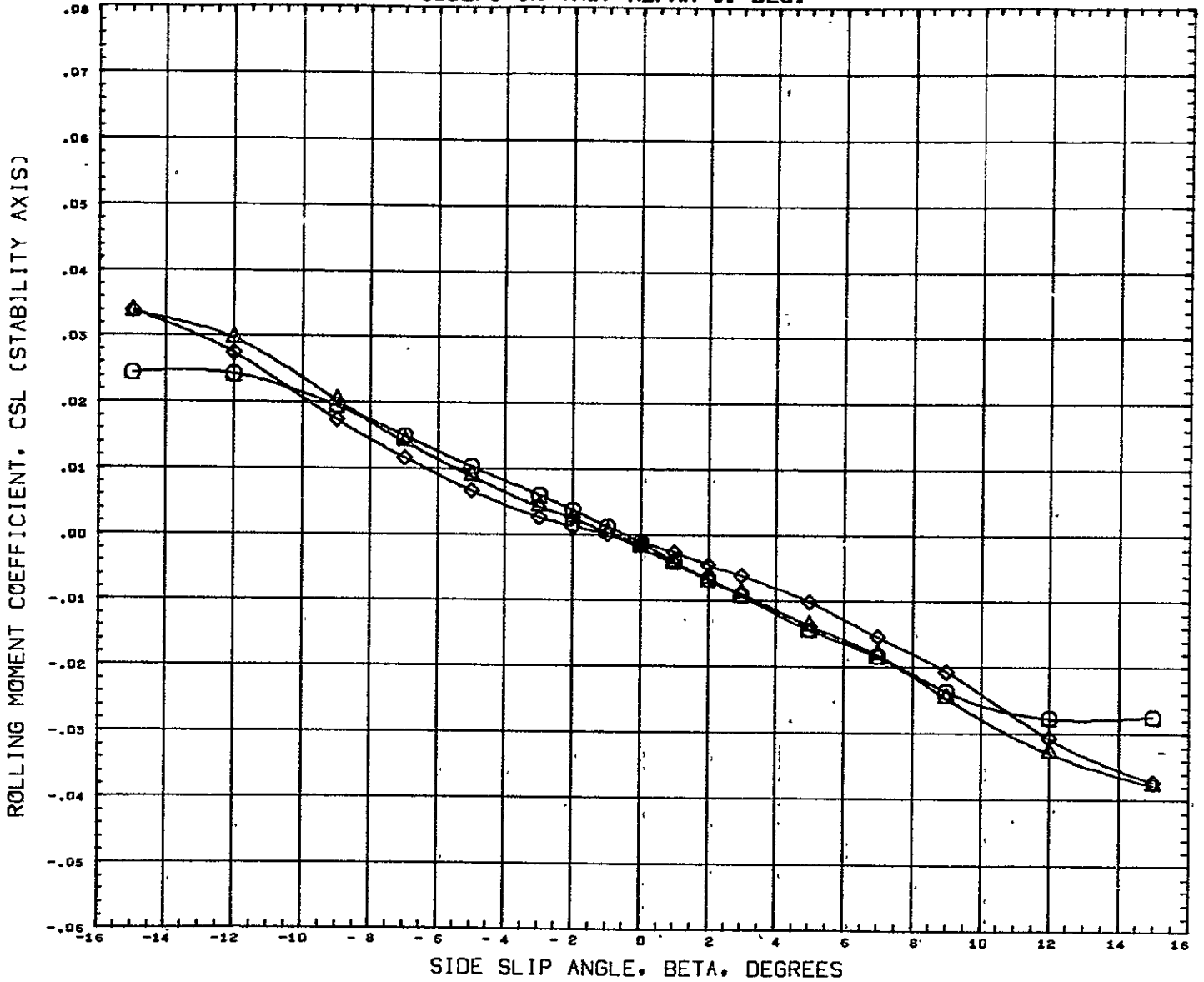
FIG. 28 EFFECT OF SPLIT RUDDERS IN YAW, ALPHA=0. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	LRUDDR	RRUDDR	RUDDER	REFERENCE INFORMATION
(RCW002)	GWT 290-CONF ROS-NB1 B1F1W1V1	0.000				SREF 9.1952 SQ FT
(RCW069)	GWT 290-CONF ROS-NB1 B1F1W1V1	0.000	30.000	-30.000	0.000	LREF 6.4320 FT
(RCW068)	GWT 290-CONF ROS-NB1 B1F1W1V1	0.000	60.000	-60.000		BREF 3.8920 FT
						XHRF 1485.0040 IN
						YHRF 0.0000 IN
						ZHRF 377.0004 IN
						SCALE 0.0400

MACH 0.170

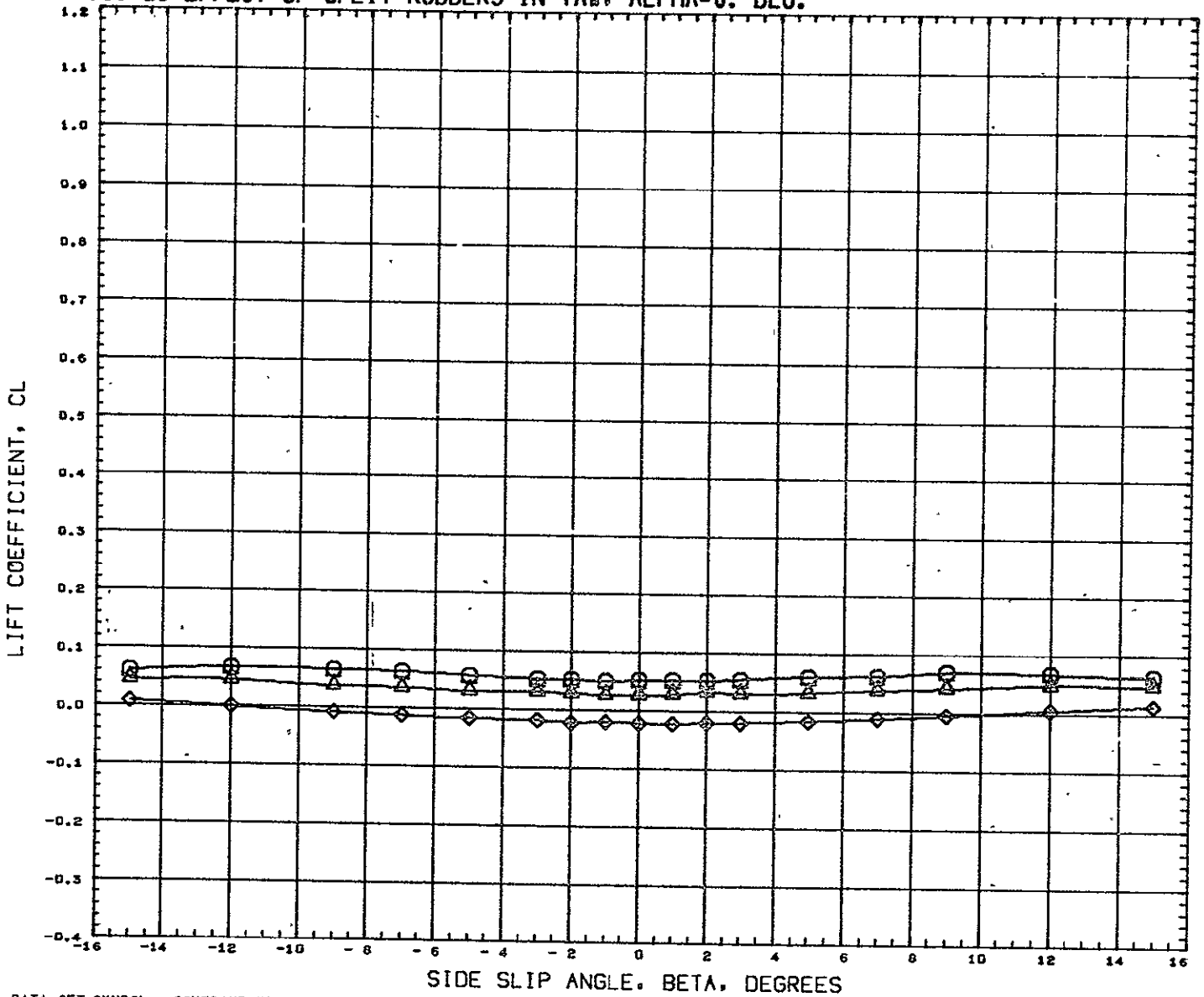
FIG. 28 EFFECT OF SPLIT RUDDERS IN YAW, ALPHA=0. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	LRUDDR	RRUDDR	RUDDER	REFERENCE INFORMATION
(RCW002)	GWT 29D-CONF ROS-NB1 B1F1W1V1	0.000			0.000	SREF 9.1952 SQ FT
(RCW069)	GWT 29D-CONF ROS-NB1 B1F1W1V1	0.000	30.000	-30.000		LREF 6.4320 FT
(RCW068)	GWT 29D-CONF ROS-NB1 B1F1W1V1	0.000	60.000	-60.000		BREF 3.8920 FT
						XMRP 1485.0040 IN
						YMRP 0.0000 IN
						ZMRP 377.0004 IN
						SCALE 0.0400

MACH 0.170

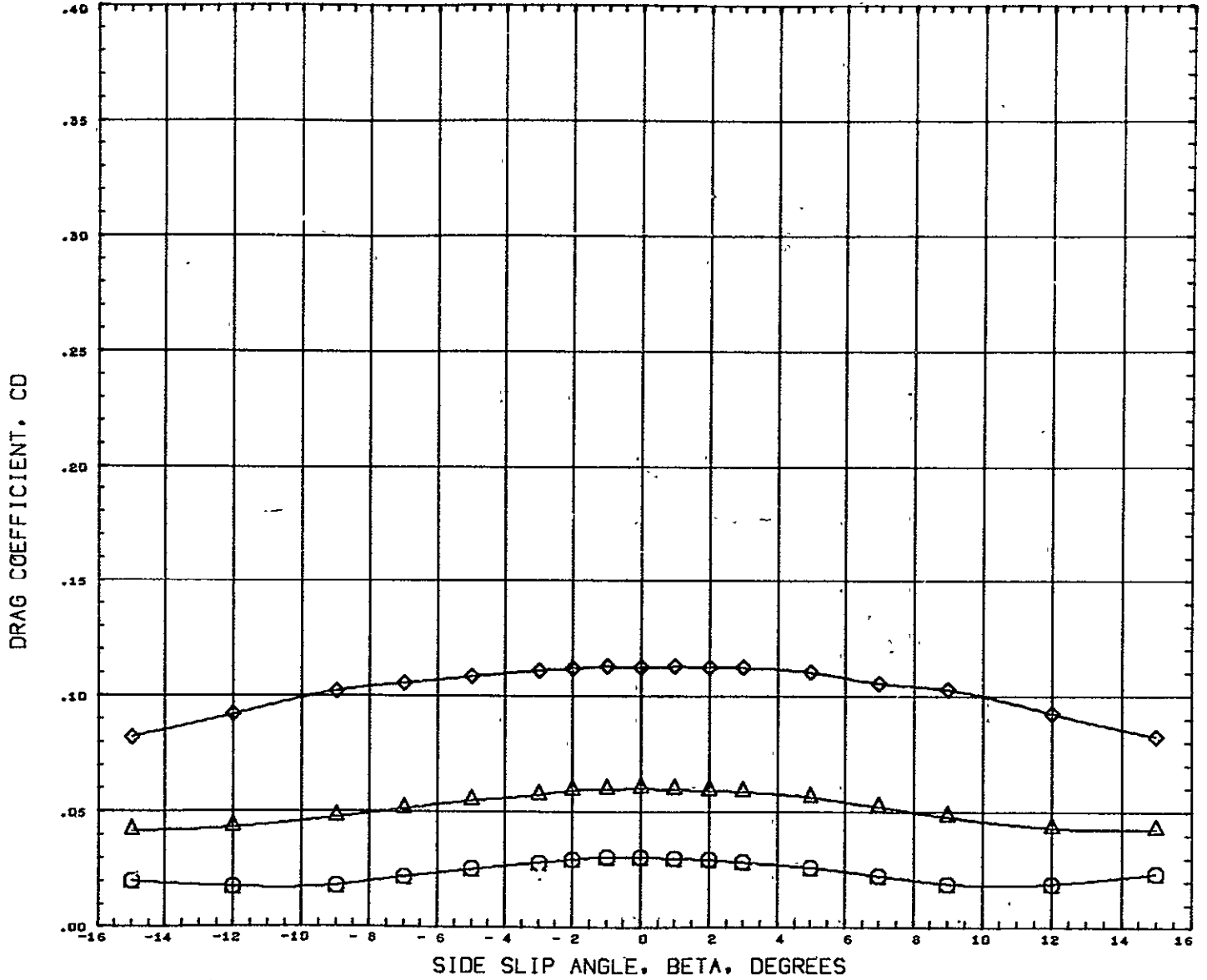
FIG. 28 EFFECT OF SPLIT RUDDERS IN YAW. ALPHA=0. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	LRUDDR	RRUDDR	RUDDER	REFERENCE INFORMATION
(RCWD02)	GWT 290-CONF ROS-NB1 B1F1W1V1	0.000			0.000	SREF 9.1952 Sq FT
(RCWD69)	GWT 290-CONF ROS-NB1 B1F1W1V1	0.000	30.000	-30.000		LREF 6.4320 FT
(RCWD68)	GWT 290-CONF ROS-NB1 B1F1W1V1	0.000	60.000	-60.000		BREF 3.8920 FT
						XMRP 1485.0040 IN
						YMRP 0.0000 IN
						ZMRP 377.0004 IN
						SCALE 0.0400

MACH 0.170

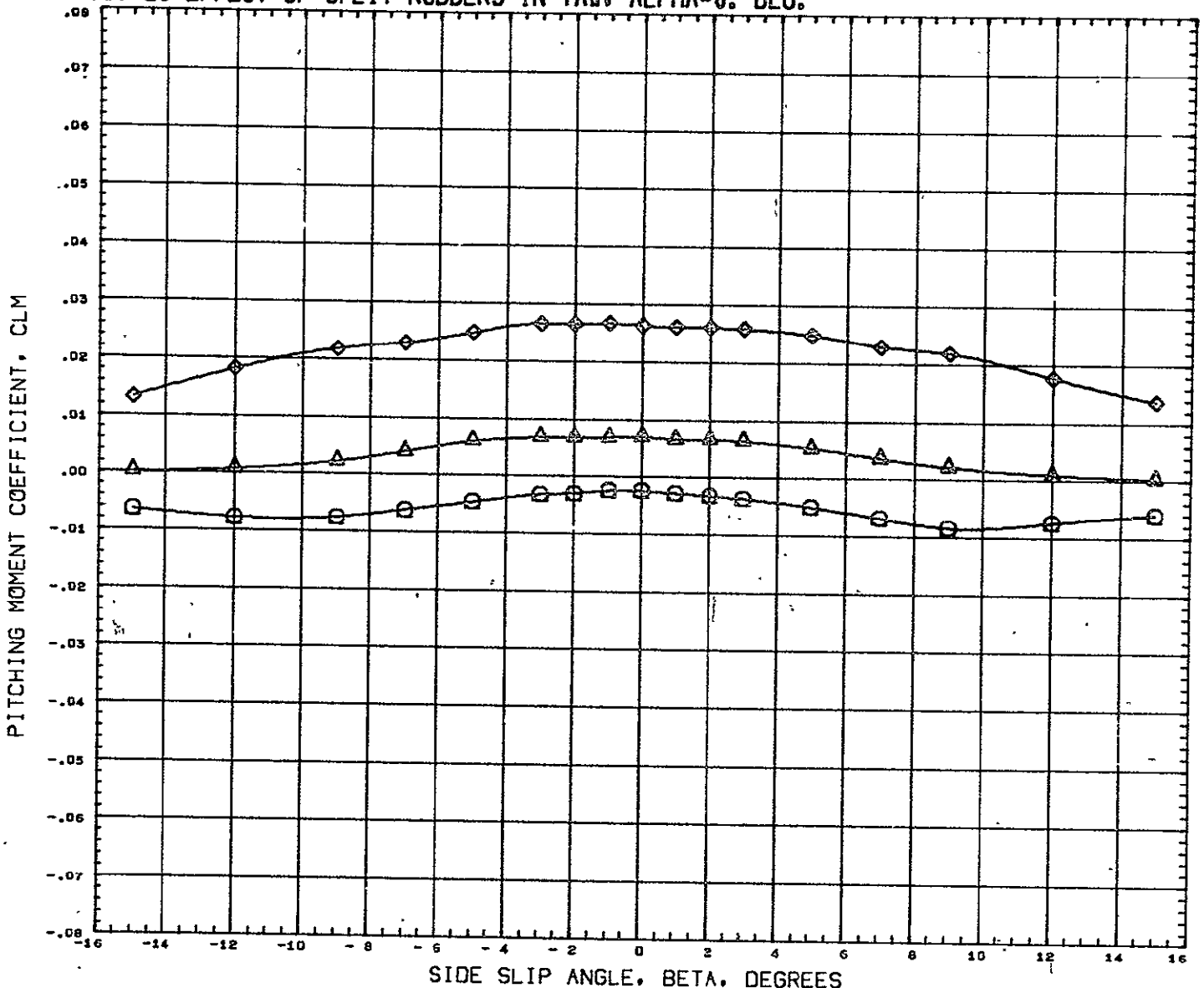
FIG. 28 EFFECT OF SPLIT RUDDERS IN YAW, ALPHA=0. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	LRUDDR	RRUDDR	RUDDER	REFERENCE INFORMATION
(RCW062)	GWT 290-CONF ROS-NB1 B1F1W1V1	0.000			0.000	SREF 9.1952 SQ FT
(RCW069)	GWT 290-CONF ROS-NB1 B1F1W1V1	0.000	30.000	-30.000		LREF 6.4320 FT
(RCW068)	GWT 290-CONF ROS-NB1 B1F1W1V1	0.000	60.000	-60.000		BREF 3.8920 FT
						XMRP 1485.0040 IN
						YMRP 0.0000 IN
						ZMRP 377.0004 IN
						SCALE 0.0400

MACH 0.170

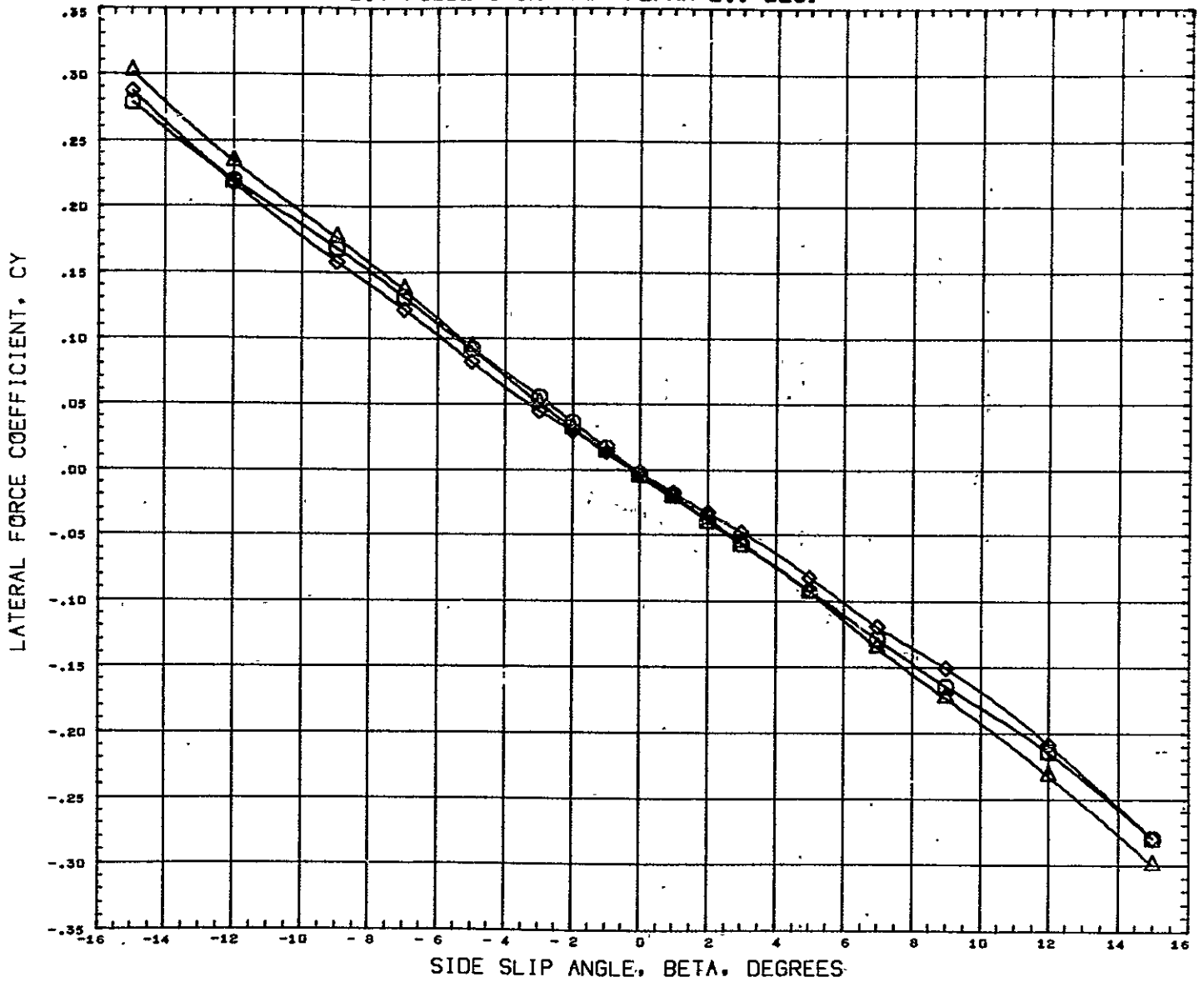
FIG. 28 EFFECT OF SPLIT RUDDERS IN YAW, ALPHA=0. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	LRUDDR	RRUDDR	RUDDER	REFERENCE INFORMATION
(RCW002)	GWTT 290-CONF ROS-NB1 B1F1W1V1	0.000			0.000	SREF 9.1952 SQ FT
(RCW069)	GWTT 290-CONF ROS-NB1 B1F1W1V1	0.000	30.000	-30.000		LREF 6.4320 FT
(RCW068)	GWTT 290-CONF ROS-NB1 B1F1W1V1	0.000	60.000	-60.000		BREF 3.8920 FT
						XMRP 1485.0040 IN
						YMRP 0.0000 IN
						ZMRP 377.0004 IN
						SCALE 0.0400

MACH 0.170

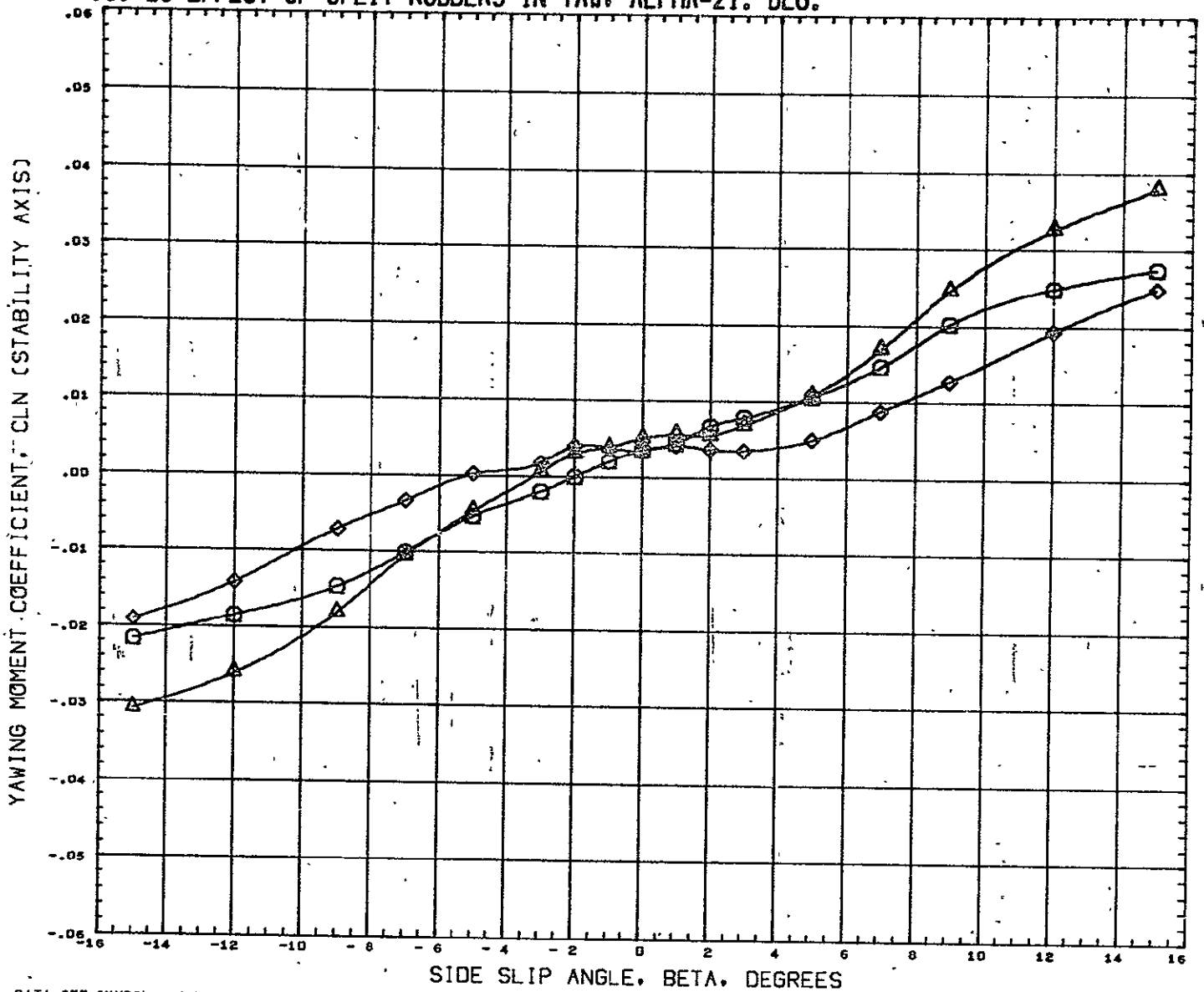
FIG. 29 EFFECT OF SPLIT RUDDERS IN YAW, ALPHA=21. DEG.



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	LRUDDR	RRUDDR	RUDDER	REFERENCE INFORMATION
(XCQD52)	○	GWTT 289-CONF. ROS-NB1 B1W1V1	21.000			0.000	SREF 9.1952 SQ FT
(ACW070)	△	GWTT 290-CONF. ROS-NB1 B1F1W1V1		30.000	-30.000		LREF 6.4320 FT
(ACW067)	◇	GWTT 290-CONF. ROS-NB1 B1F1W1V1		60.000	-60.000		BREF 3.8920 FT
							XNRP 1485.0040 IN
							YNRP 0.0000 IN
							ZNRP 377.0004 IN
							SCALE 0.0400

MACH 0.170

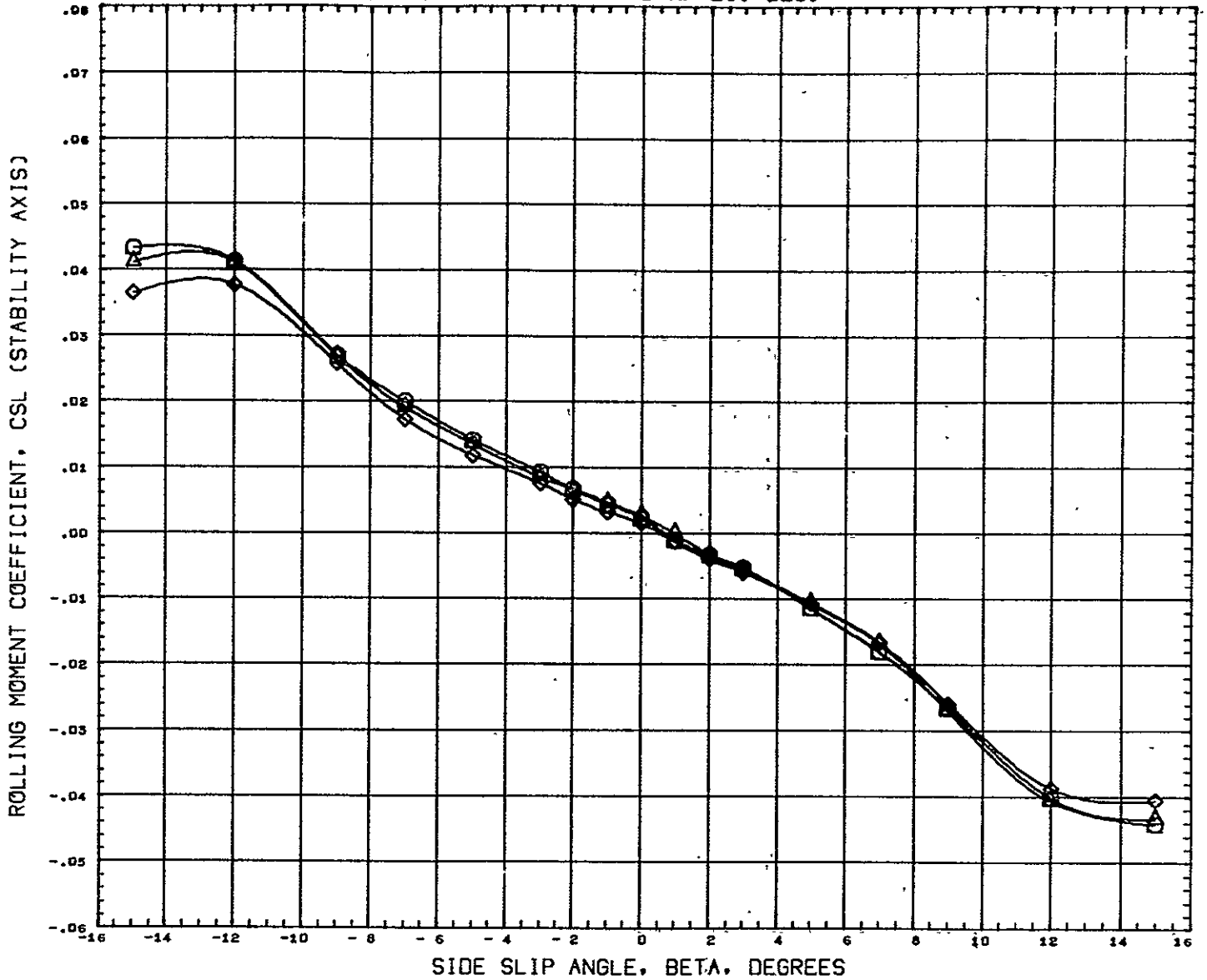
FIG. 29 EFFECT OF SPLIT RUDDERS IN YAW. ALPHA=21. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	LRUDDR	RRUDDR	RUDDER	REFERENCE INFORMATION
(XC0052)	GWTT 289-CONF. ROS-NB1 B1W1V1	21.000				SREF 9.1952 SQ FT
(ACWD70)	GWTT 290-CONF ROS-NB1 B1F1W1V1		30.000	-30.000	0.000	LREF 6.4320 FT
(ACWD67)	GWTT 290-CONF ROS-NB1 B1F1W1V1		60.000	-60.000		BREF 3.8920 FT
						XHRP 1485.0040 IN
						YMRP 0.0000 IN
						ZMRP 377.0004 IN
						SCALE 0.0400

MACH 0.170

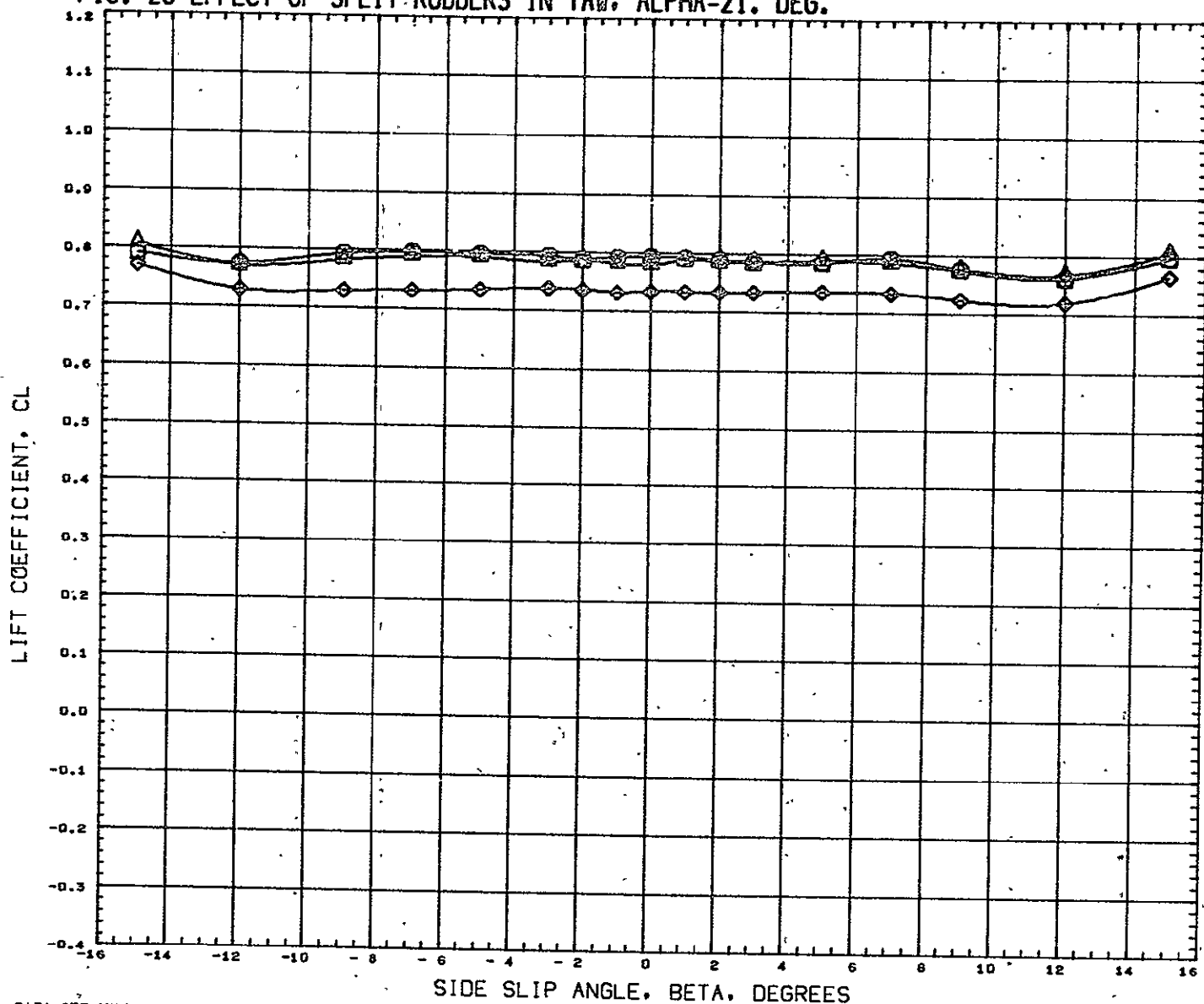
FIG. 29 EFFECT OF SPLIT RUDDERS IN YAW, ALPHA=21. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	LRUDDR	RRUDDR	RUDDER	REFERENCE INFORMATION
(XC0052)	GWTT 289-CONF. ROS-NB1 B1W1V1	21.000			0.000	SREF 9.1952 SQ FT
(AC0070)	GWTT 290-CONF ROS-NB1 B1F1W1V1		30.000	-30.000		LREF 6.4320 FT
(AC0067)	GWTT 290-CONF ROS-NB1 B1F1W1V1		60.000	-60.000		BREF 3.8920 FT
						XMRP 1485.0040 IN
						YMRP 0.0000 IN
						ZMRP 377.0004 IN
						SCALE 0.0400

MACH 0.170

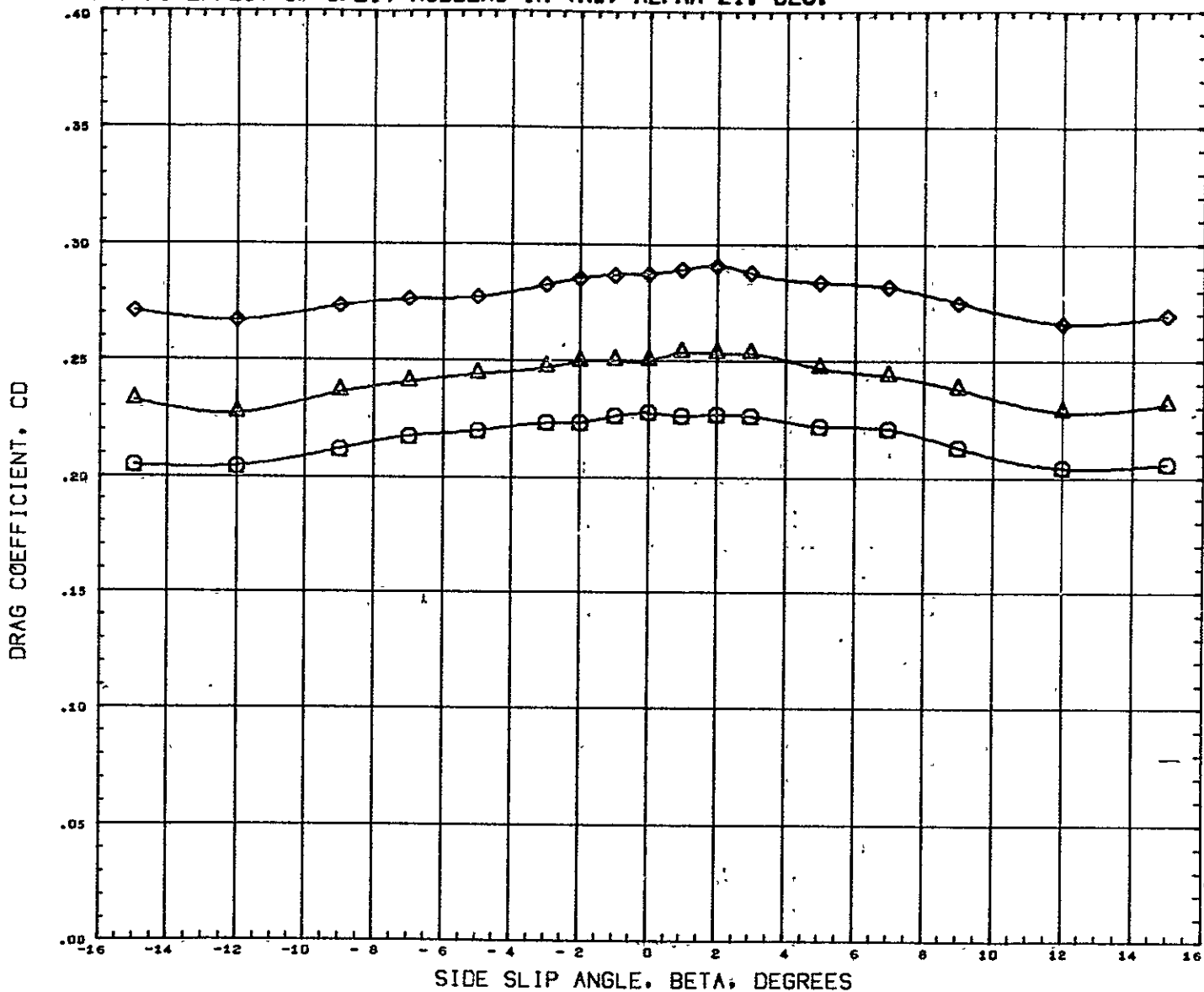
FIG. 29 EFFECT OF SPLIT RUDDERS IN YAW, ALPHA=21. DEG.



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	LRUDDR	RRUDDR	RUDDER	REFERENCE INFORMATION
(XC062)	□	GWTT 289-CONF. ROS-NB1 B1W1V1	21.000	30.000	-30.000	0.000	SREF 9.1952 SQ FT
(ACW070)	◇	GWTT 290-CONF ROS-NB1 B1F1W1V1		60.000	-60.000		LREF 6.4320 FT
(ACW067)	△	GWTT 290-CONF ROS-NB1 B1F1W1V1					BREF 3.8920 FT
							XMRP 1405.0040 IN
							YMRP 0.0000 IN
							ZMRP 377.0004 IN
							SCALE 0.0400

MACH 0.170

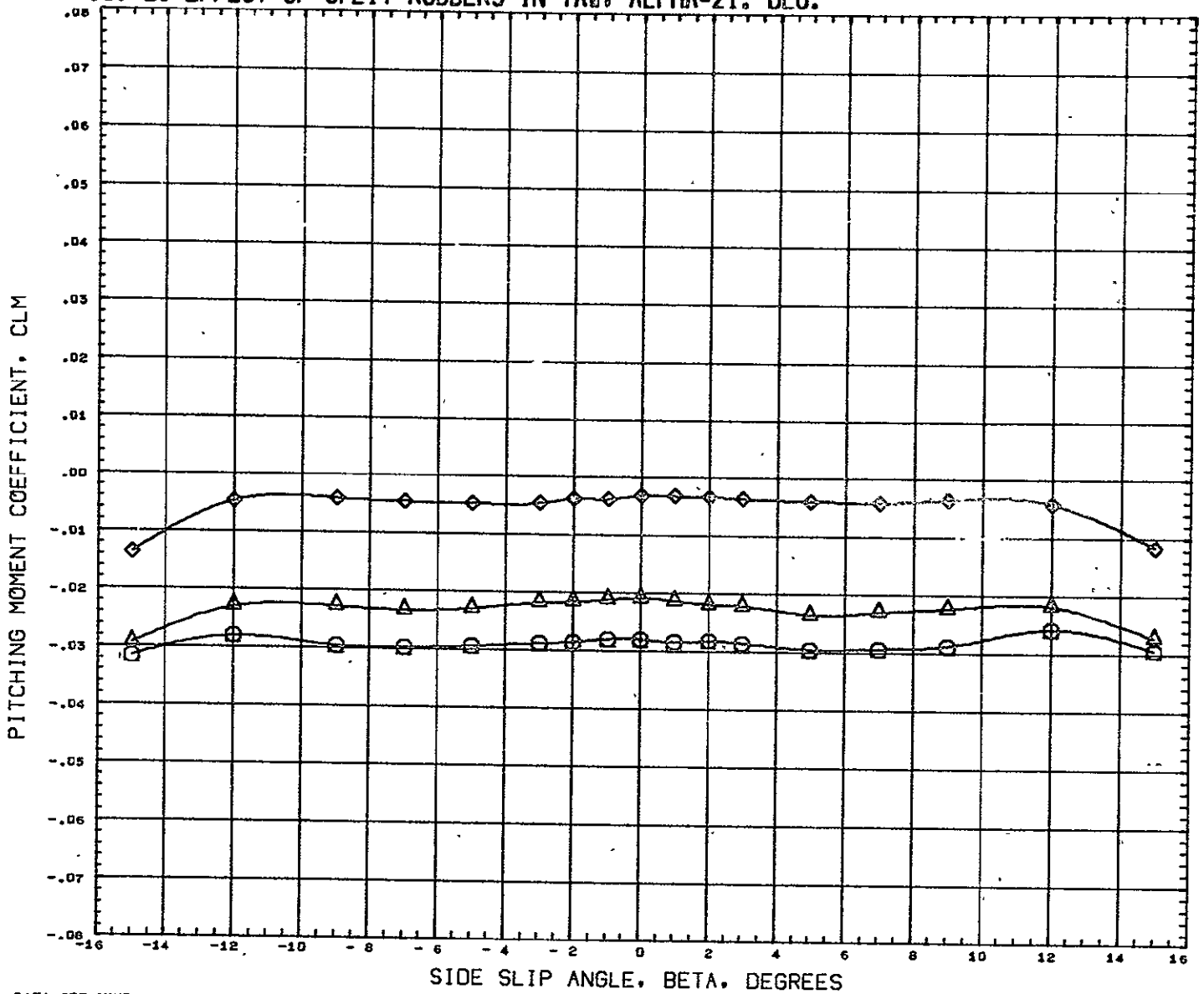
FIG. 29 EFFECT OF SPLIT RUDDERS IN YAW, ALPHA=21. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	LRUDDR	RRUDDR	RUDDER	REFERENCE INFORMATION
(XCR052)	GWTT 289-CONF. ROS-NB1 B1W1V1	21.000			0.000	SREF 9.1952 SQ FT
(ACW070)	GWTT 290-CONF ROS-NB1 B1F1W1V1		30.000	-30.000		LREF 6.4320 FT
(ACW067)	GWTT 290-CONF ROS-NB1 B1F1W1V1		60.000	-60.000		BREF 3.8920 FT
						XMRP 1485.0040 IN
						YMRP 0.0000 IN
						ZMRP 377.0004 IN
						SCALE 0.0400

MACH 0.170

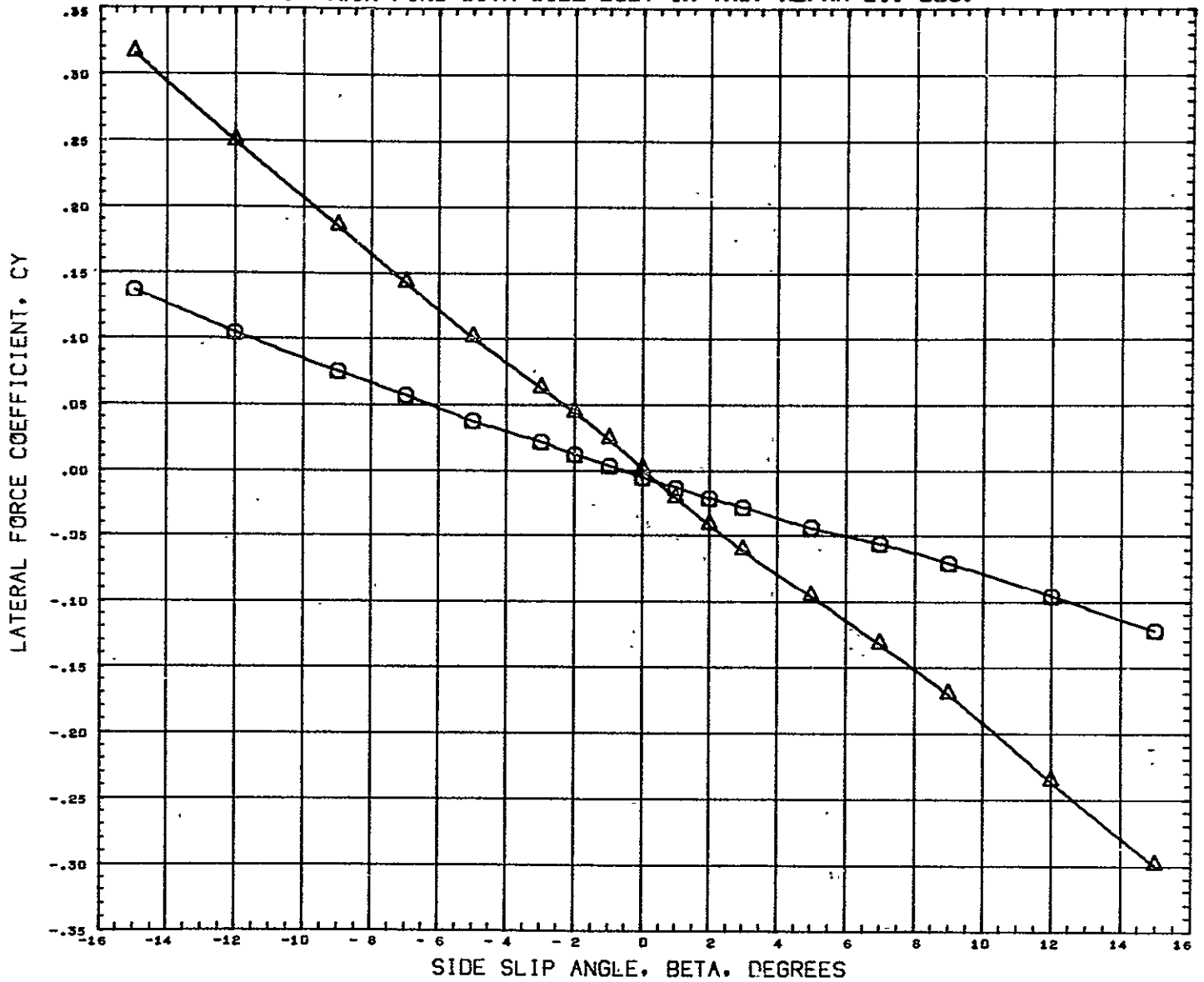
FIG. 29 EFFECT OF SPLIT RUDDERS IN YAW, ALPHA=21. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	LRUDDR	RRUDDR	RUDDER	REFERENCE INFORMATION
(XC052)	GWT 289-CONF. ROS-NB1 B1W1V1	21.000				SREF 9.1952 SQ FT
(ACW070)	GWT 290-CONF. ROS-NB1 B1F1W1V1		30.000	-30.000	0.000	LREF 6.4320 FT
(ACW067)	GWT 290-CONF. ROS-NB1 B1F1W1V1		60.000	-60.000		BREF 3.8920 FT
						XMRP 1485.0040 IN
						YMRP 0.0000 IN
						ZMRP 377.0004 IN
						SCALE 0.0400

MACH 0.170

FIG. 30 EFFECT OF TWIN FINS WITH WIDE BODY IN YAW. ALPHA=21. DEG.



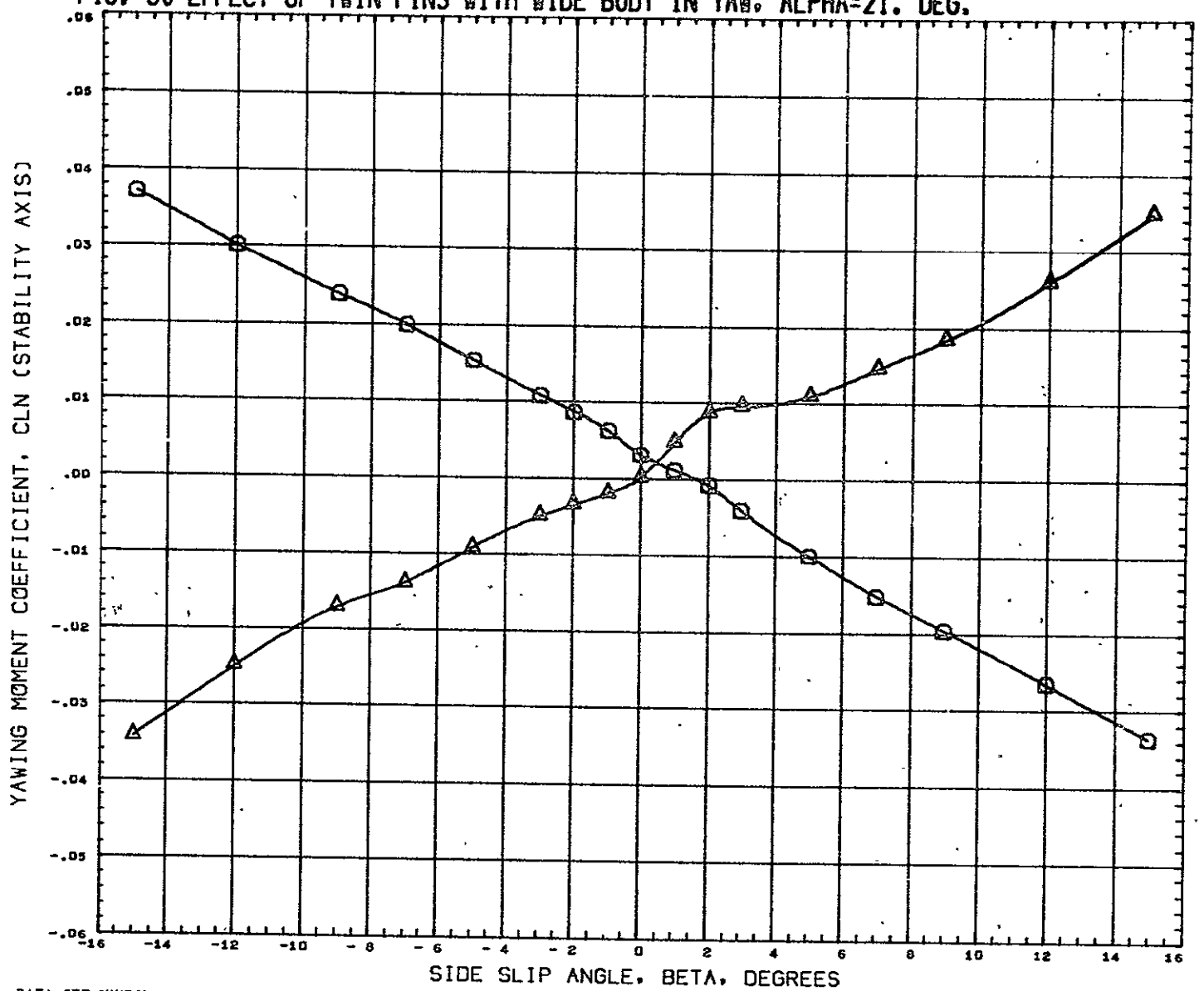
DATA SET SYMBOL CONFIGURATION DESCRIPTION
 (ACW072) ◯ GWTT 29D-CONF ROS-WB1 B2W1
 (ACW074) △ GWTT 29D-CONF ROS-WB1 B2W1V2

ALPHA ELEVTR AILRON RUDDER
 9.000 0.000 0.000 0.000

REFERENCE INFORMATION
 SREF 9.1952 SQ FT
 LREF 6.4320 FT
 BREF 3.8920 FT
 XHRF 1485.0040 IN
 YHRF 0.0000 IN
 ZHRF 377.0004 IN
 SCALE 0.0400

MACH 0.170

FIG. 30 EFFECT OF TWIN FINS WITH WIDE BODY IN YAW, ALPHA=21. DEG.



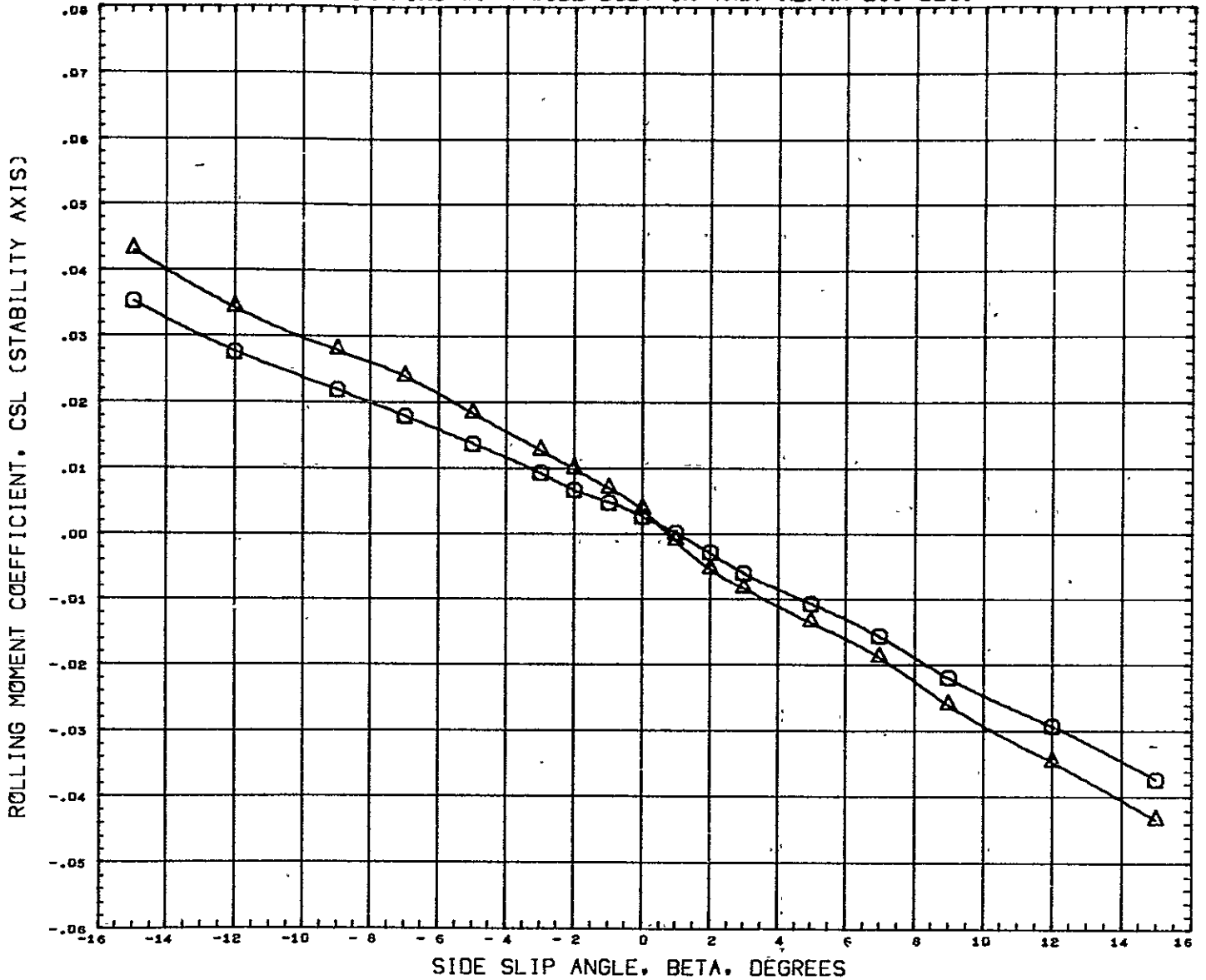
DATA SET SYMBOL CONFIGURATION DESCRIPTION
 (ACWD72) □ GWTT 290-CONF ROS-WB1 B2W1
 (ACWD74) △ GWTT 290-CONF ROS-WB1 B2W1V2

ALPHA ELEVTR AILRON RUDDER
 0.000 0.000 0.000 0.000

REFERENCE INFORMATION
 SREF 9.1952 SQ FT
 LREF 6.4320 FT
 BREF 3.8920 FT
 XMRP 1485.0040 IN
 YMRP 0.0000 IN
 ZMRP 377.0004 IN
 SCALE 0.0400

MACH 0.170

FIG. 30 EFFECT OF TWIN FINS WITH WIDE BODY IN YAW. ALPHA=21. DEG.



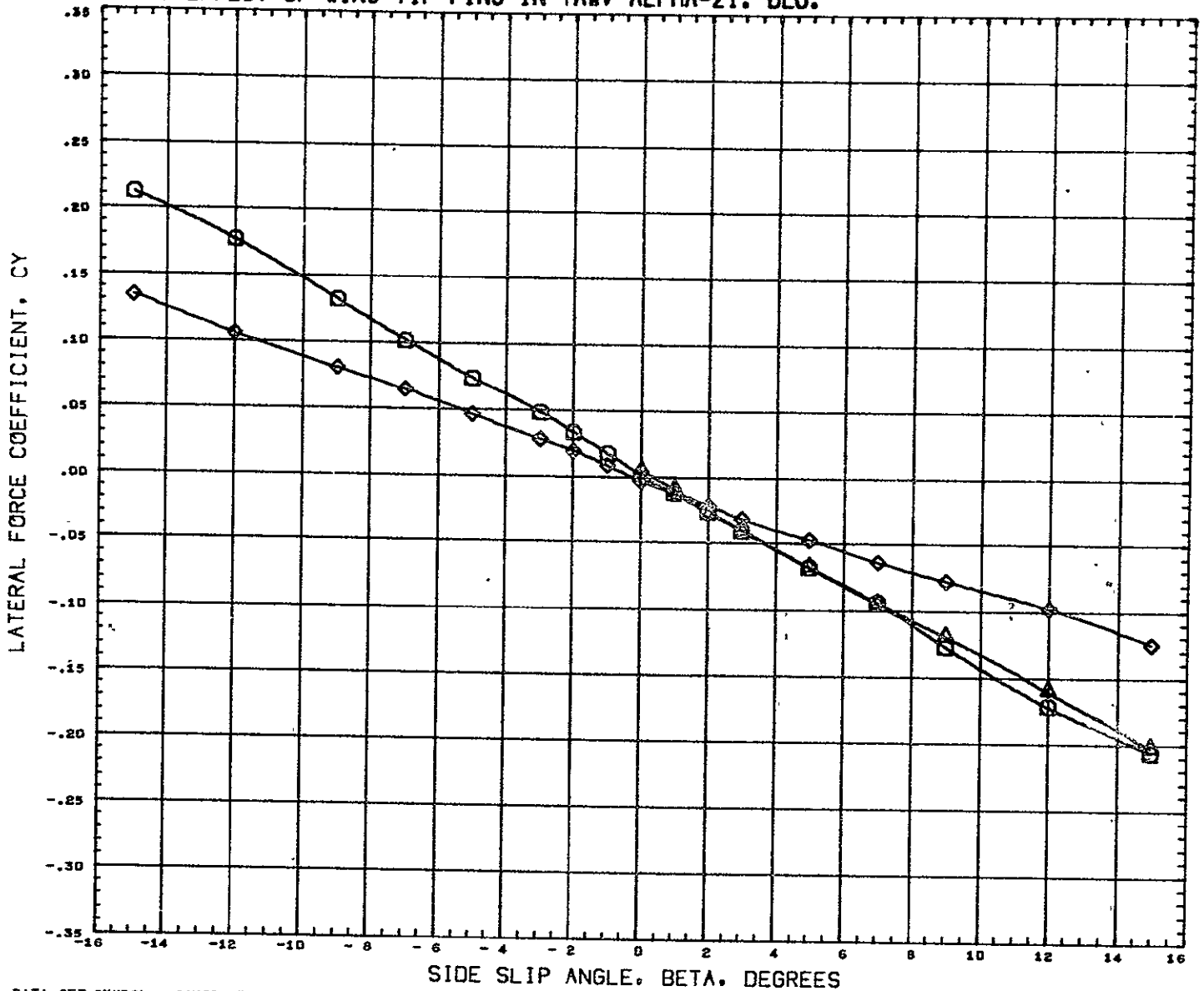
DATA SET SYMBOL CONFIGURATION DESCRIPTION
 (ACW072) ○ GWTI 290-CONF ROS-WB1 B2W1
 (ACW074) △ GWTI 290-CONF ROS-WB1 B2W1V2

ALPHA ELEVTR AILRON RUDDER
 0.000 0.000 0.000 0.000

REFERENCE INFORMATION
 SREF 9.1952 SQ FT
 LREF 6.4320 FT
 BREF 3.8920 FT
 XMRP 1485.0040 IN
 YMRP 0.0000 IN
 ZMRP 377.0004 IN
 SCALE 0.0400

MACH 0.170

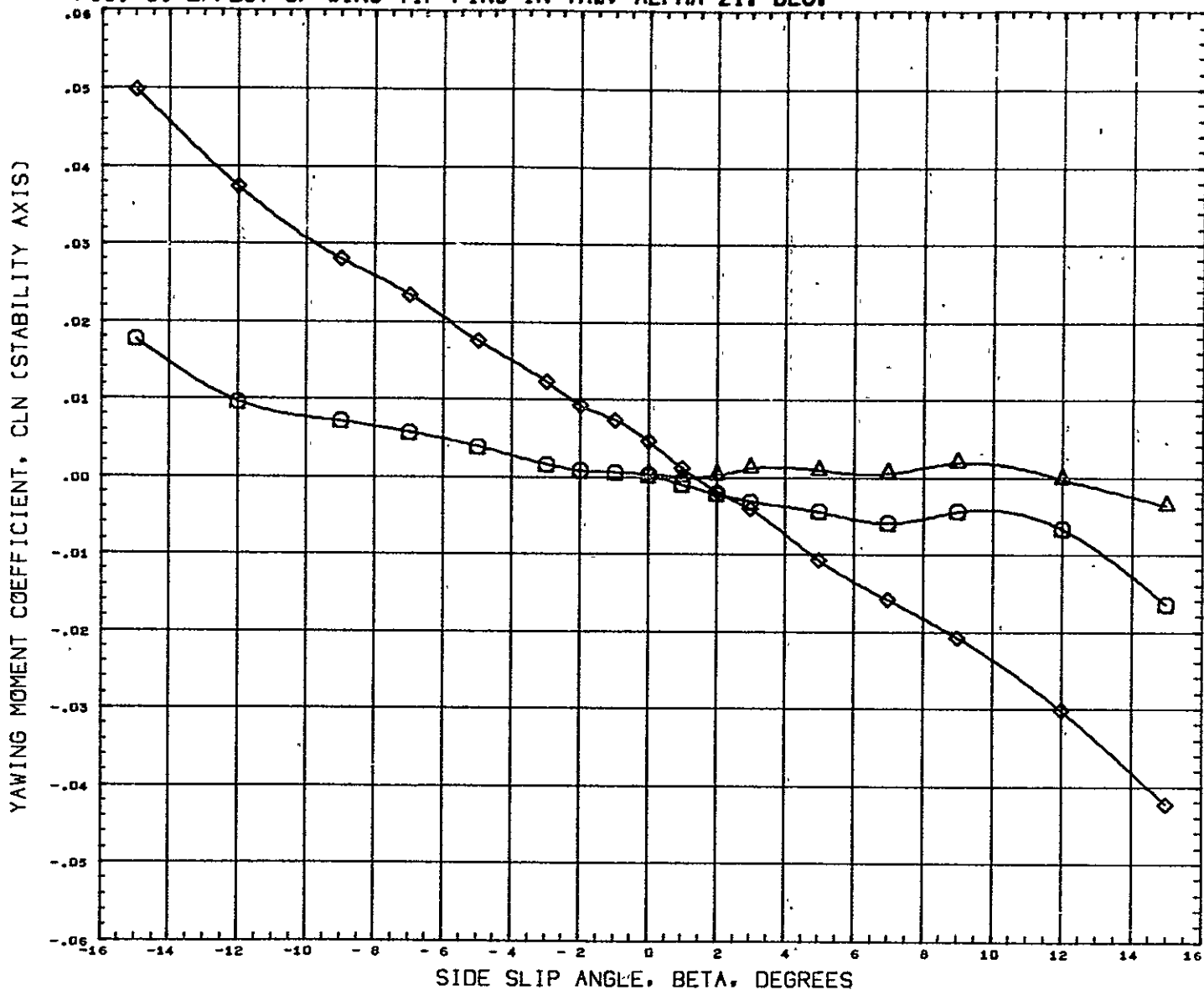
FIG. 31 EFFECT OF WING TIP FINS IN YAW. ALPHA=21. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(ACWD76)	GWTT 290-CONF ROS-NB1 B1F1W2V3	21.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(ACWD77)	GWTT 290-CONF ROS-NB1 B1F1W2V3	21.000	-15.000	0.000	0.000	LREF 6.4320 FT
(XCR050)	GWTT 289-CONF. ROS-NB1 B1W1	21.000	0.000	0.000	0.000	BREF 3.8920 FT
						XMRP 1485.0040 IN
						YMRP 0.0000 IN
						ZMRP 377.0004 IN
						SCALE 0.0400

HACH 0.170

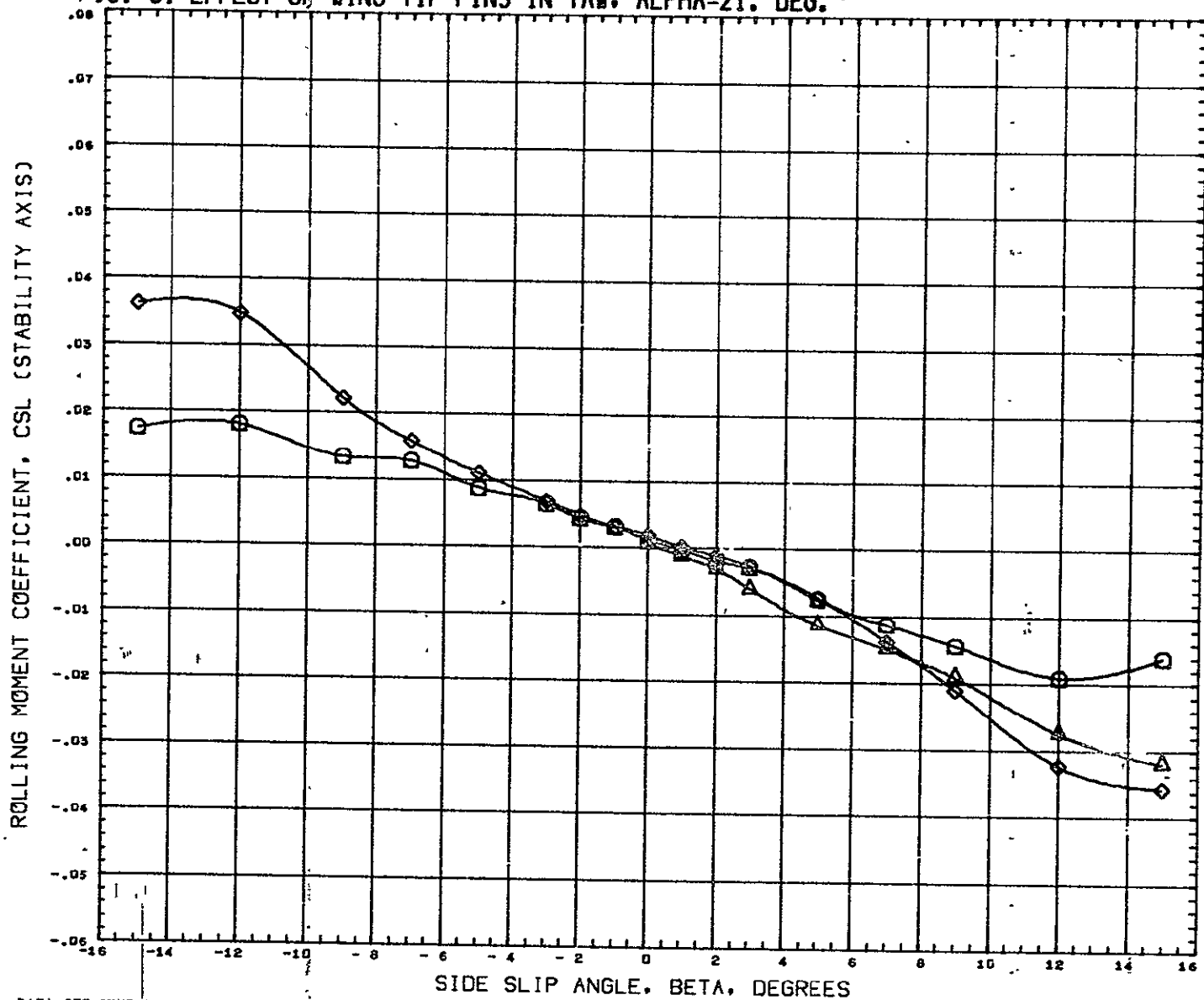
FIG. 31 EFFECT OF WING TIP FINS IN YAW, ALPHA=21. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(ACW076)	GWTT 290-CONF ROS-NB1 B1F1W2V3	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(ACW077)	GWTT 290-CONF ROS-NB1 B1F1W2V3	-15.000	0.000	0.000	0.000	LREF 6.4320 FT
(XCQ050)	GWTT 289-CONF. ROS-NB1 B1W1	21.000	0.000	0.000	0.000	BREF 3.8920 FT
						XMRP 1485.0040 IN
						YMRP 0.0000 IN
						ZMRP 377.8004 IN
						SCALE 0.0400

MACH 0.170

FIG. 31 EFFECT OF WING TIP FINS IN YAW, ALPHA=21. DEG.



DATA SET SYMBOL CONFIGURATION DESCRIPTION

(ACW076) □ GWT 290-CONF ROS-NB1 B1F1W2V3

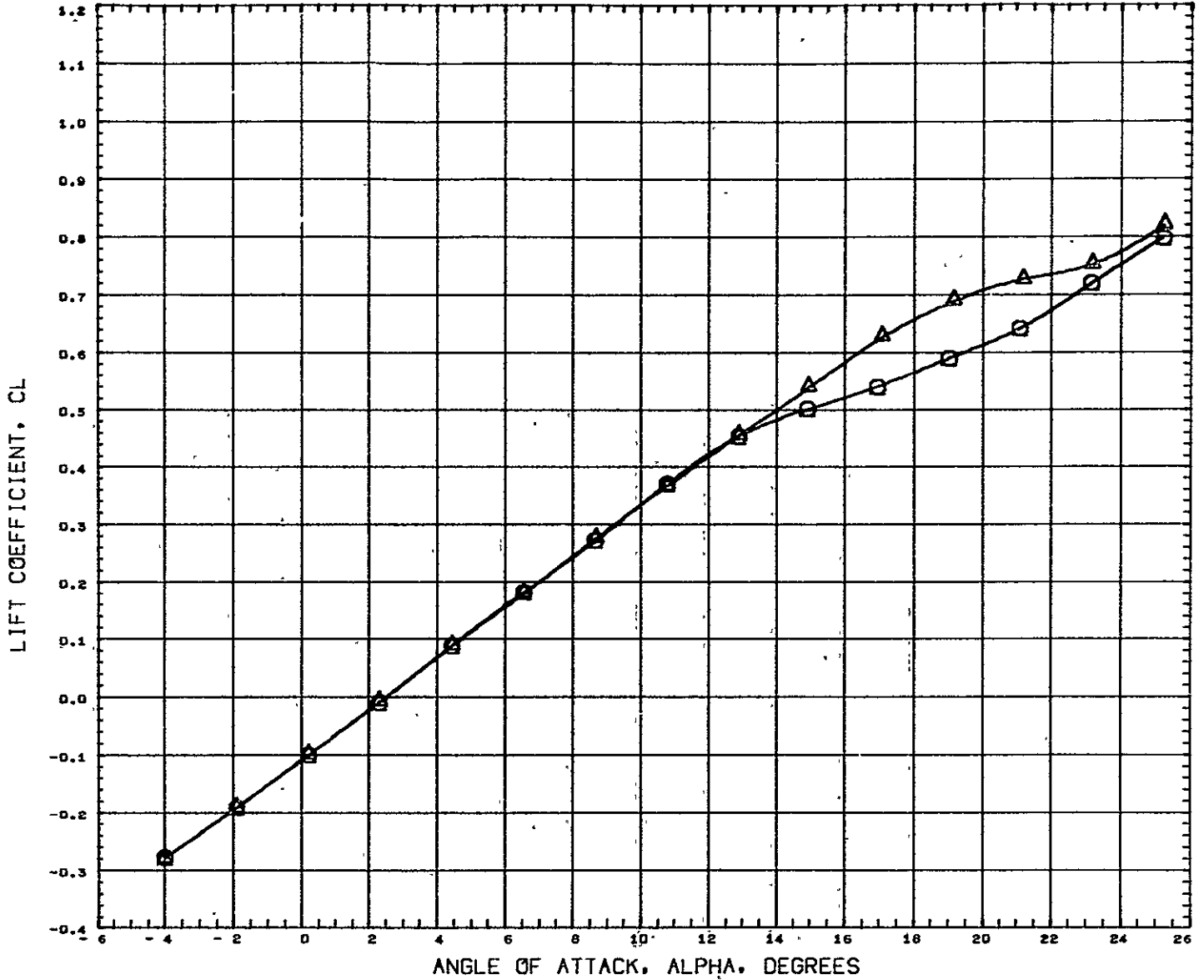
(ACW077) △ GWT 290-CONF ROS-NB1 B1F1W2V3

(XCQ050) ◇ GWT 289-CONF. ROS-NB1 B1W1

ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION	
21.000	0.000	0.000	0.000	SREF	9.1952 Sq FT
	-15.000	0.000	0.000	LREF	6.4320 FT
	0.000	0.000		BREF	3.8920 FT
				XMRP	1485.0040 IN
				YMRP	0.0000 IN
				ZMRP	377.0004 IN
				SCALE	0.0400

MACH 0.170

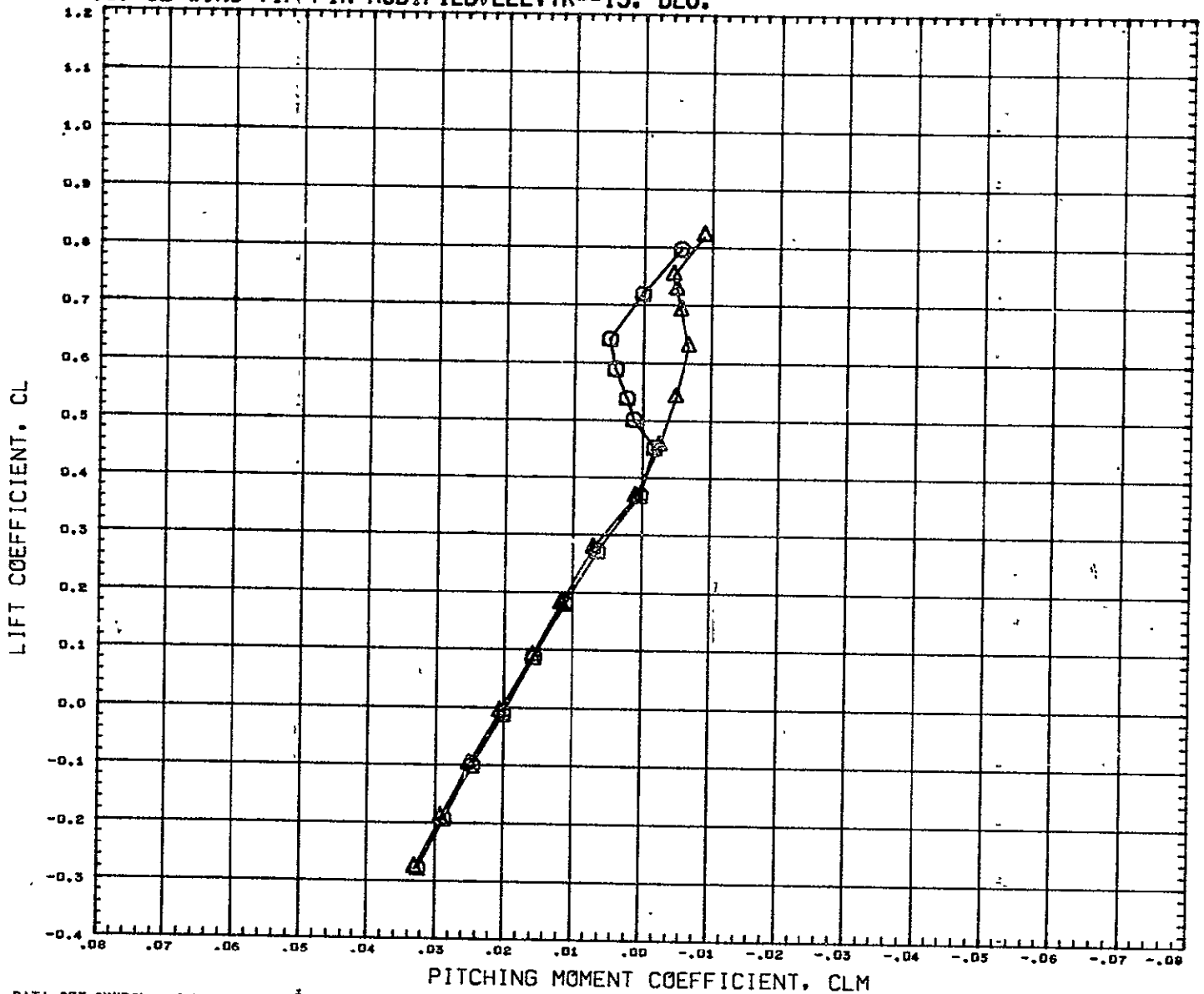
FIG. 32 WING TIP FIN MODIFIED, ELEVTR=-15. DEG.



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	ALPHA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW079)	GWTT 29D-CONF ROS-NB1 B1F1W2V3	-15.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCW080)	GWTT 29D-CONF ROS-NB1 B1F1W2V3B	-15.000	0.000	0.000	0.000	LREF 6.4320 FT
						BREF 3.8920 FT
						XHRF 1485.0040 IN
						YHRF 0.0000 IN
						ZHRF 377.0004 IN
						SCALE 0.0400

MACH 0.170

FIG. 32 WING TIP FIN MODIFIED, ELEVTR=-15. DEG.



DATA SET SYMBOL	SYMBOL	CONFIGURATION	DESCRIPTION
(RCW079)	○	GWTT 290-CONF	ROS-NB1 B1F1W2V3
(RCW080)	△	GWTT 290-CONF	ROS-NB1 B1F1W2V3B

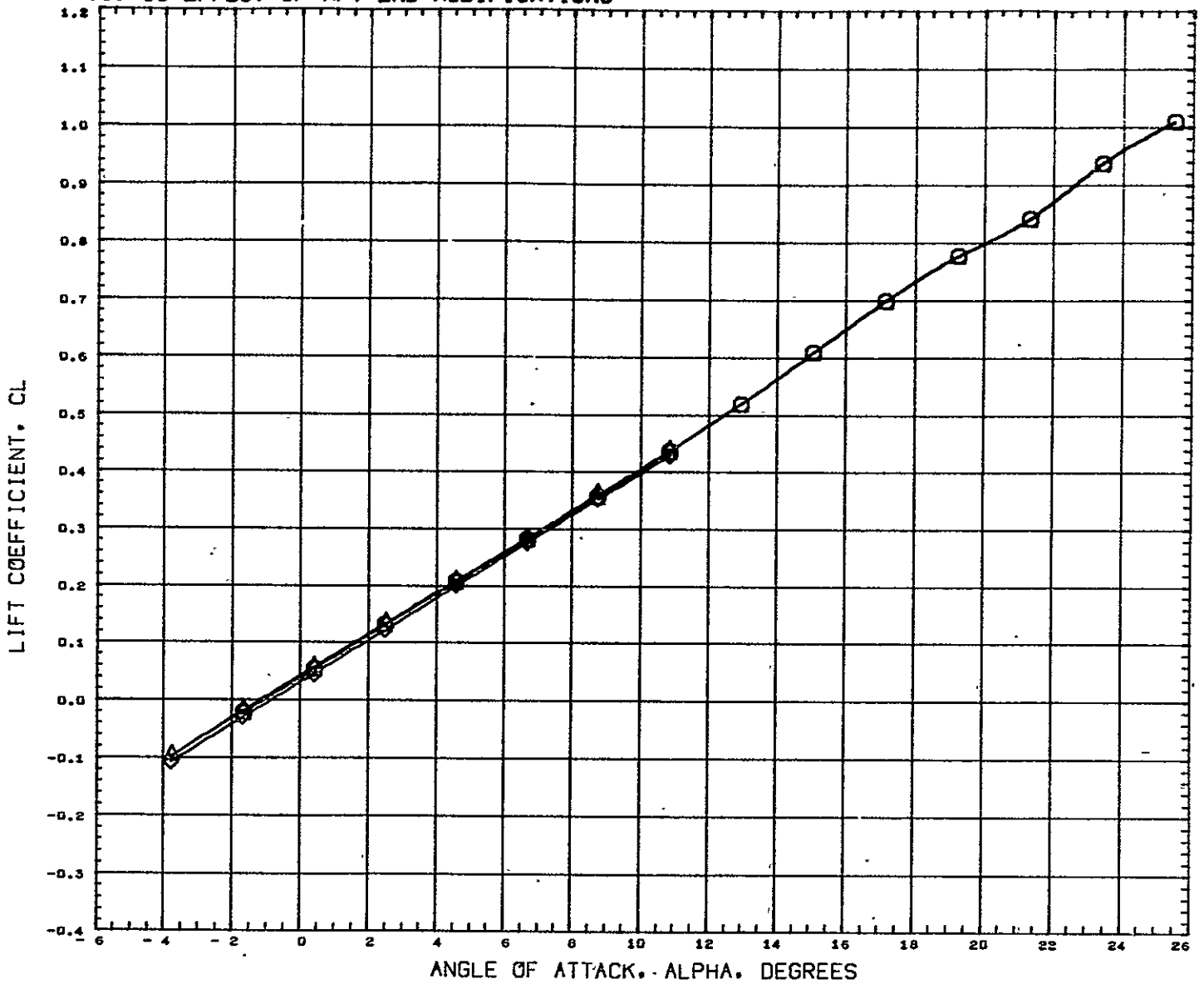
ALPHA	ELEVTR	AILRON	RUDDER
-15.000	0.000	0.000	0.000
-15.000	0.000	0.000	0.000

REFERENCE INFORMATION

SREF	9.1952	SQ FT
LREF	6.4320	FT
BREF	3.8920	FT
XMRP	1485.0040	IN
YMRP	0.0000	IN
ZMRP	377.0004	IN
SCALE	0.0400	

MACH 0.170

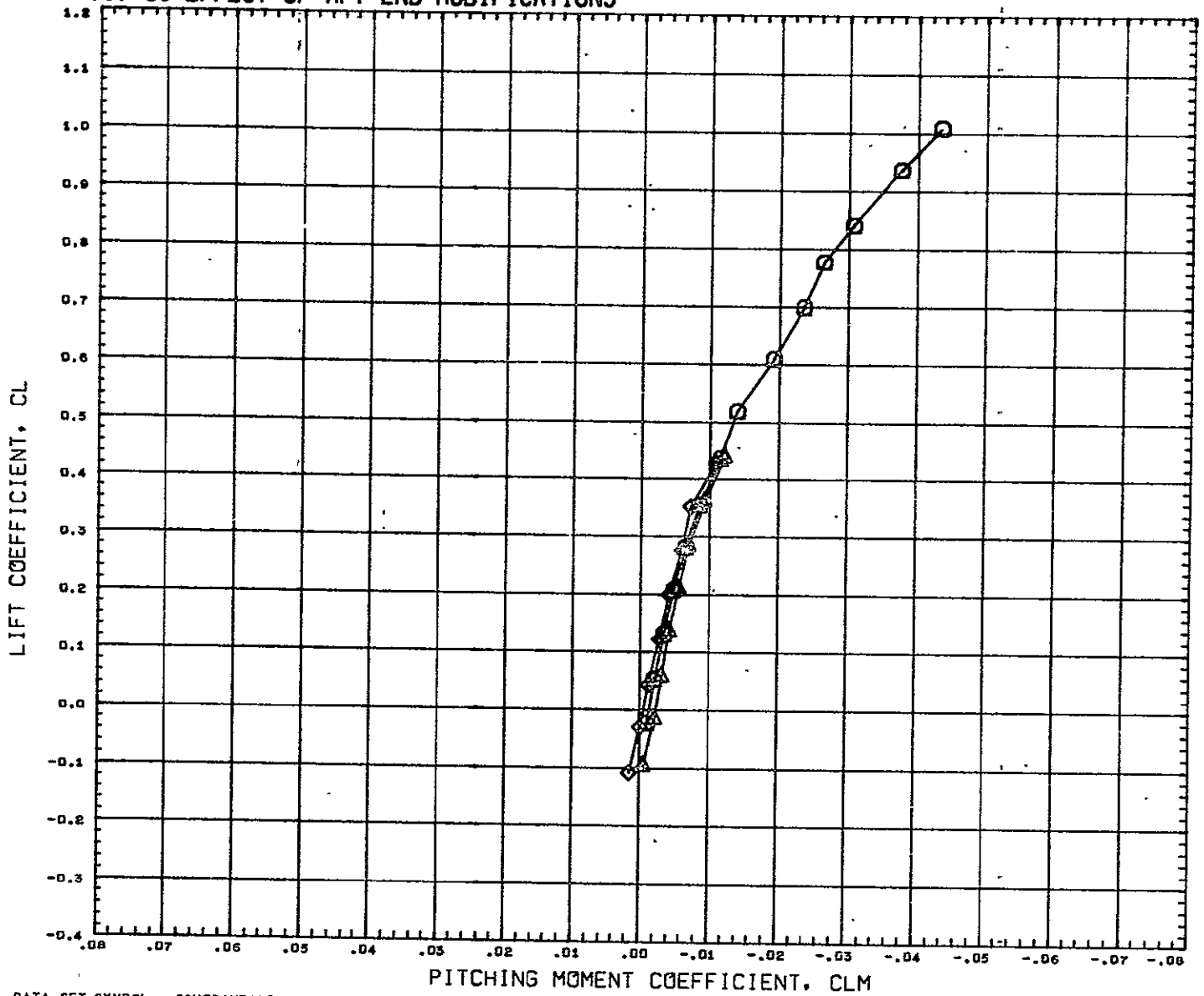
FIG. 33 EFFECT OF AFT END MODIFICATIONS



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW004)	○	GWT 290-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCW081)	△	GWT 290-CONF ROS-NB1 B(1B)F1W1V1	0.000	0.000	0.000	0.000	LREF 6.4320 FT
(RCW082)	◇	GWT 290-CONF ROS-NB1 B(1C)F1W1V1	0.000	0.000	0.000	0.000	BREF 3.8920 FT
							XMRP 1485.0040 IN
							YMRP 0.0000 IN
							ZMRP 377.0004 IN
							SCALE 0.0400

MACH 0.170

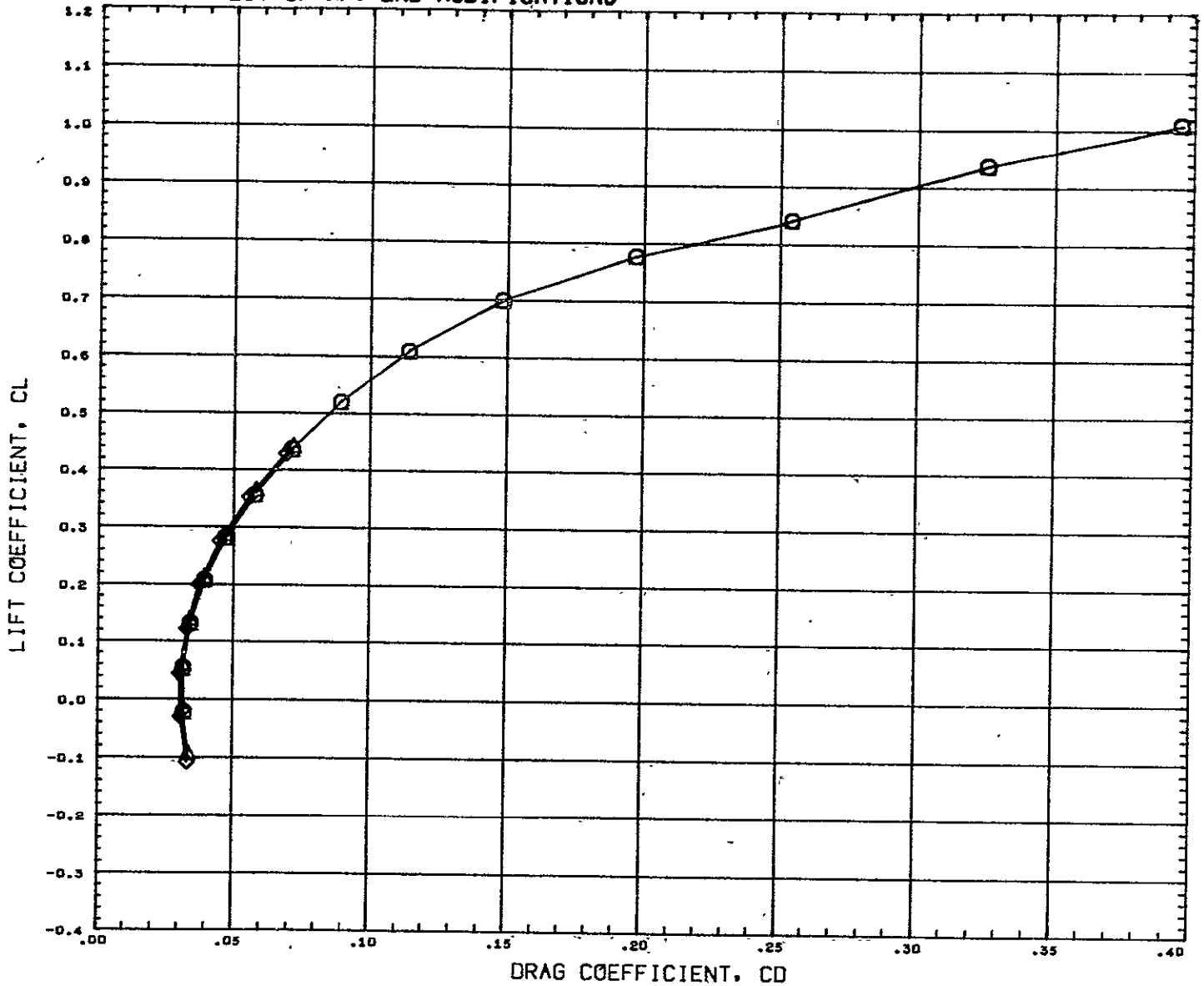
FIG. 33 EFFECT OF AFT END MODIFICATIONS



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW004)	GWT 290-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCW081)	GWT 290-CONF ROS-NB1 B(1B)F1W1V1	0.000	0.000	0.000	0.000	LREF 6.4320 FT
(RCW082)	GWT 290-CONF ROS-NB1 B(1C)F1W1V1	0.000	0.000	0.000	0.000	BREF 3.8920 FT
						XMRP 1485.0040 IN
						YMRP 0.0000 IN
						ZMRP 377.0004 IN
						SCALE 0.0400

MACH 0.170

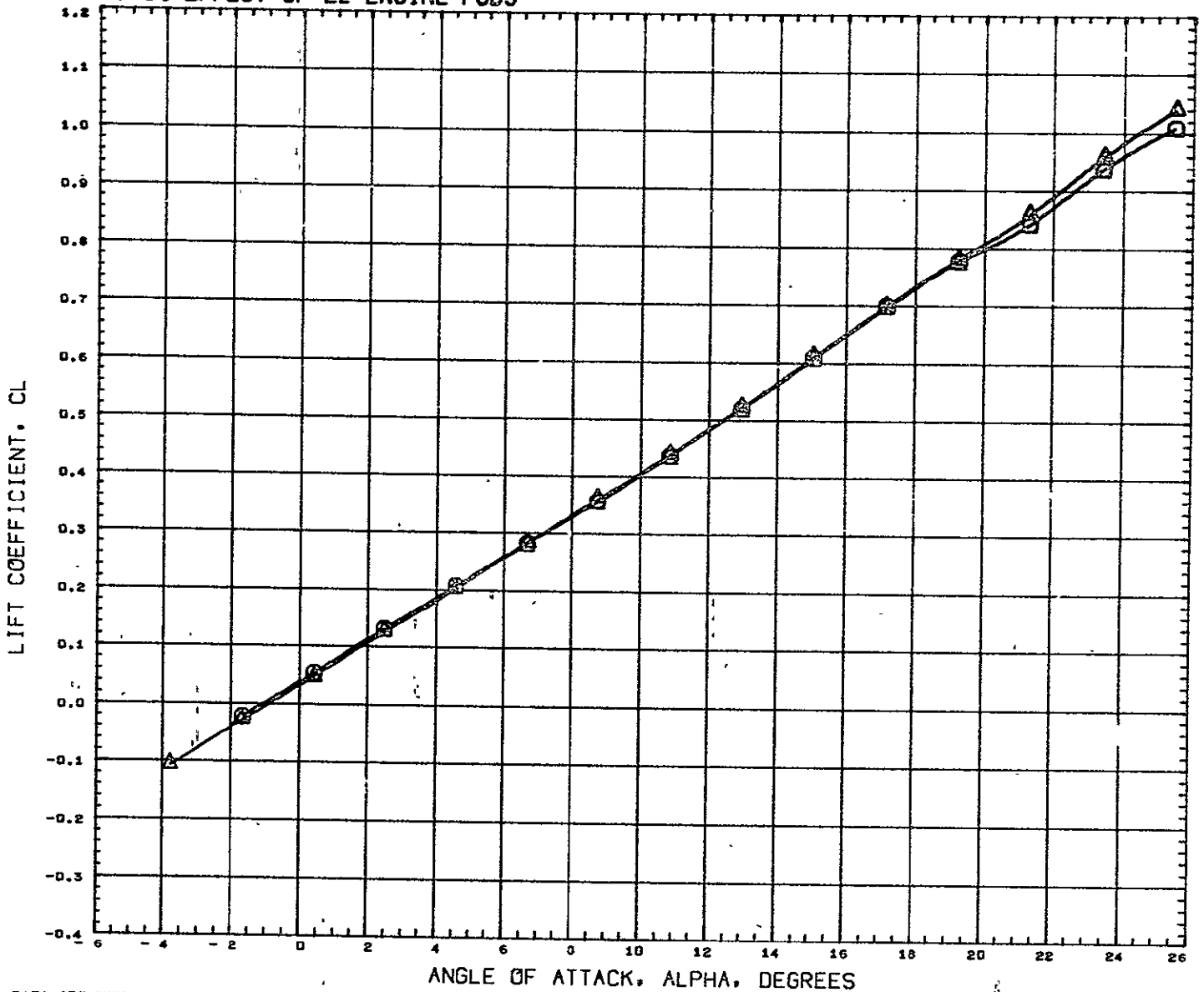
FIG. 33 EFFECT OF AFT END MODIFICATIONS



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW004)	GWTT 29D-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCW001)	GWTT 29D-CONF ROS-NB1 B(1B)F1W1V1	0.000	0.000	0.000	0.000	LREF 6.4320 FT
(RCW002)	GWTT 29D-CONF ROS-NB1 B(1C)F1W1V1	0.000	0.000	0.000	0.000	BREF 3.8920 FT
						XHRF 1485.0040 IN
						YHRF 0.0000 IN
						ZHRF 377.0004 IN
						SCALE 0.0400

MACH 0.170

FIG. 34 EFFECT OF E2 ENGINE PODS



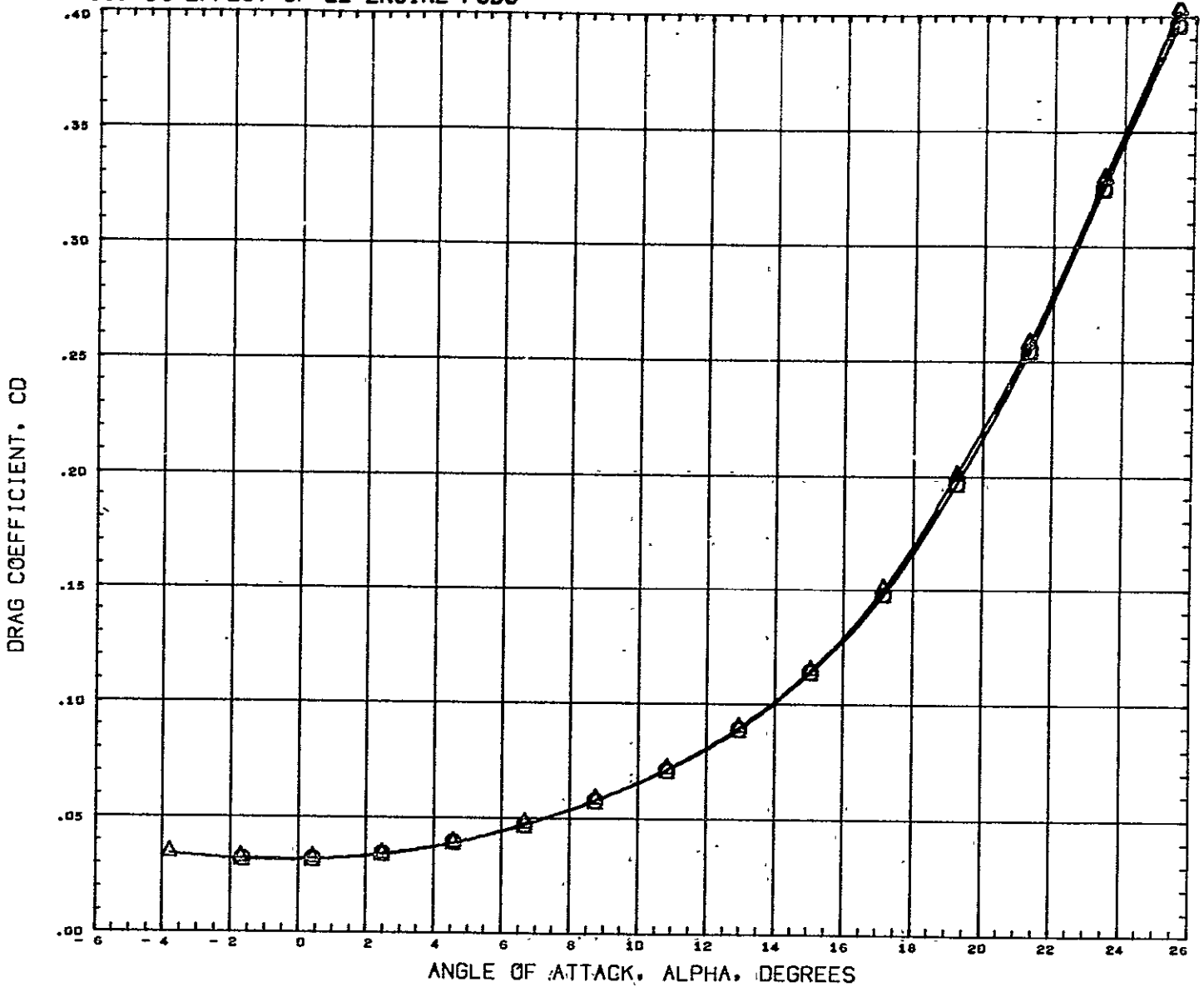
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(RCW004)	○	GWT 290-CONF ROS-NB1 B1F1W1V1
(RCW005)	△	GWT 290-CONF ROS-NB1 B1F1W1V1E2

BETA	ELEVTR	AILRON	RUDDER
0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000

REFERENCE INFORMATION	
SREF	9.1952 Sq FT
LREF	6.4320 FT
BREF	3.8920 FT
XMRP	1485.0040 IN
YMRP	0.0000 IN
ZMRP	377.0004 IN
SCALE	0.0400

MACH 0.170

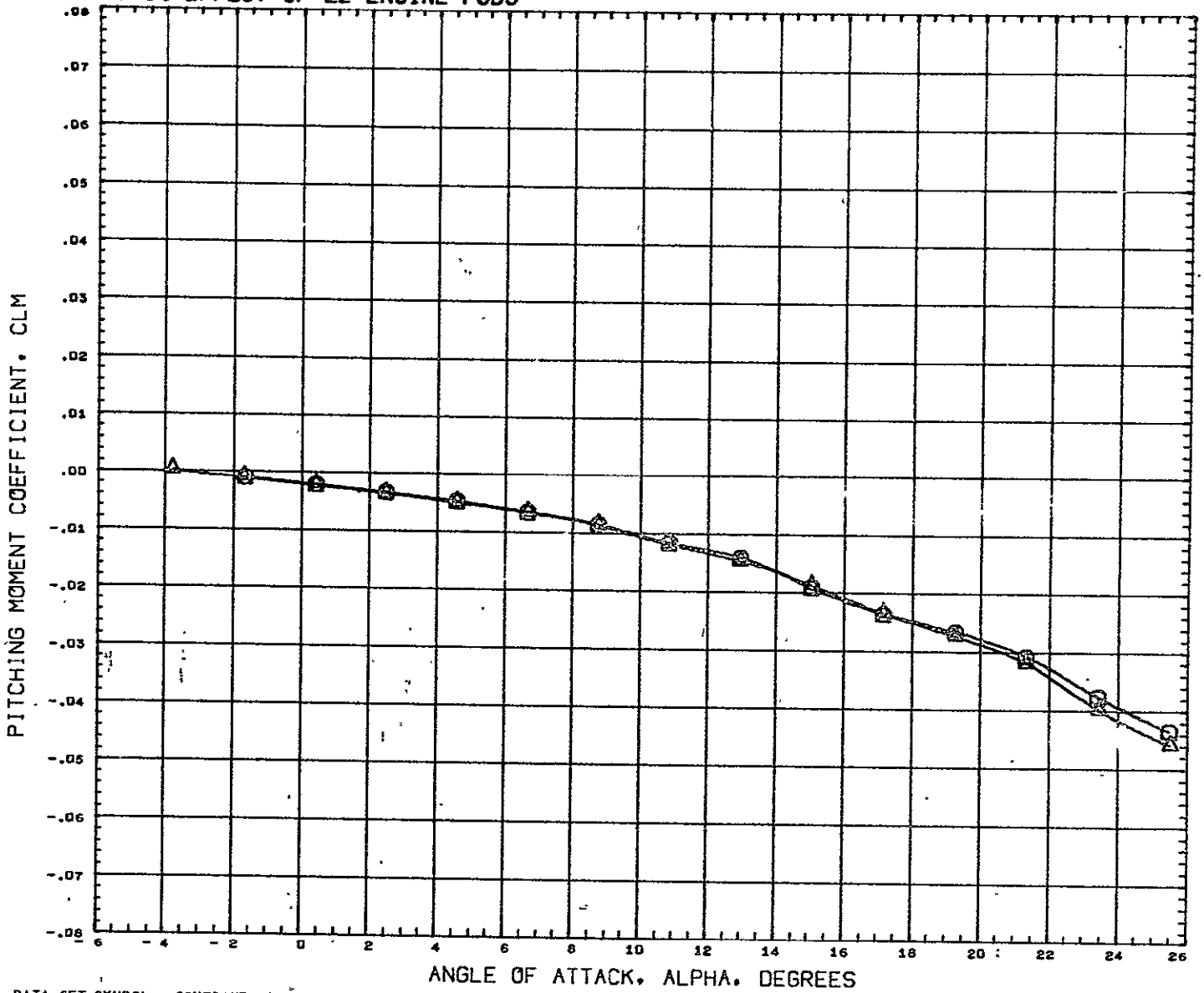
FIG. 34 EFFECT OF E2 ENGINE PODS



DATA SET SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION	
(RCW004)	GWTT 290-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	0.000	SREF	9.1052 SQ FT
(RCW003)	GWTT 290-CONF ROS-NB1 B1F1W1V1E2	0.000	0.000	0.000	0.000	LREF	6.4320 FT
						BREF	3.8920 FT
						XMRP	1485.0040 IN
						YMRP	0.0000 IN
						ZMRP	377.0004 IN
						SCALE	0.0400

MACH 0.170

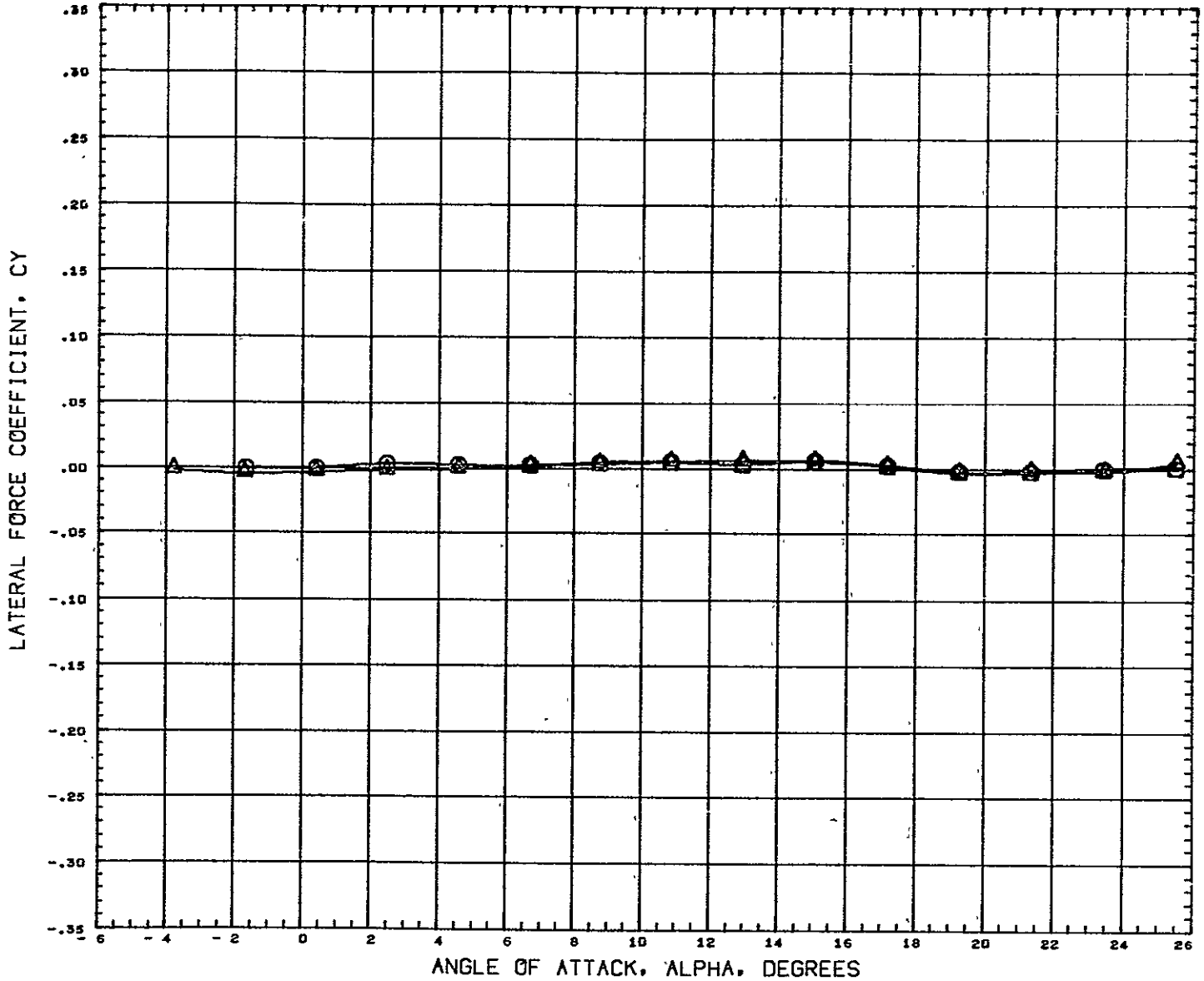
FIG. 34 EFFECT OF E2 ENGINE PODS



DATA SET	SYMBOL	CONFIGURATION	DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION	
(RCW004)	○	GWTT 290-CONF	ROS-NB1 B1F1W1V1	0.000	0.000	0.000	0.000	SREF	9.1952 SQ FT
(RCW083)	△	GWTT 290-CONF	ROS-NB1 B1F1W1V1E2	0.000	0.000	0.000	0.000	LREF	6.4320 FT
								BREF	3.8920 FT
								XNRF	1485.0040 IN
								YNRF	0.0000 IN
								ZNRF	377.0004 IN
								SCALE	0.0400

MACH 0.170

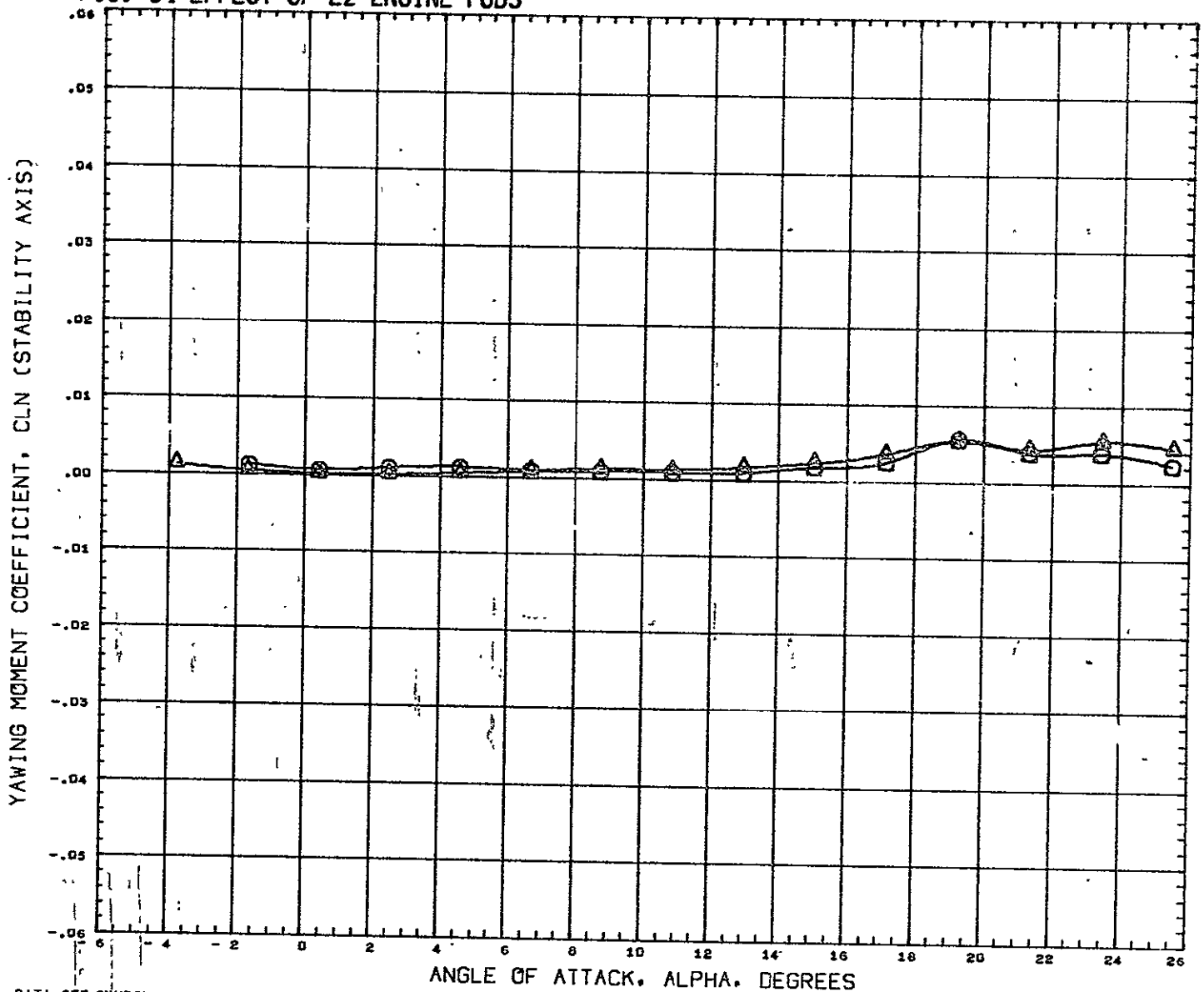
FIG. 34 EFFECT OF E2 ENGINE PODS



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION	
(RCW004)	○	GWT 290-CONF ROS-NB1 B1F1W1V1	0.000	0.000	0.000	0.000	SREF	9.1952 SQ FT
(RCW003)	△	GWT 290-CONF ROS-NB1 B1F1W1V1E2	0.000	0.000	0.000	0.000	LREF	6.4320 FT
							BREF	3.8920 FT
							XMRP	1485.0040 IN
							YMRP	0.0000 IN
							ZMRP	377.0004 IN
							SCALE	0.0400

MACH 0.170

FIG. 34 EFFECT OF E2 ENGINE PODS



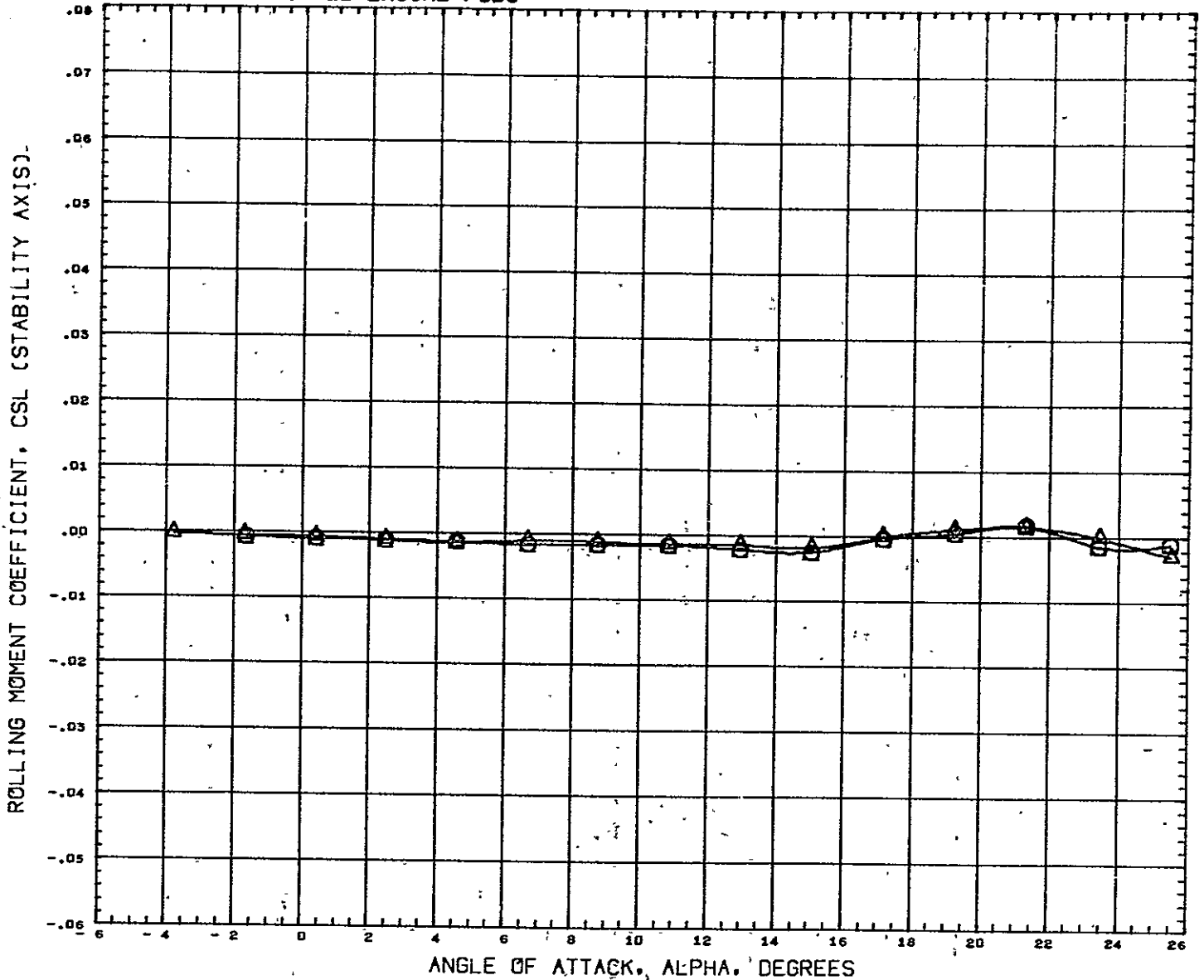
DATA SET SYMBOL CONFIGURATION DESCRIPTION
 (RCW004) GWTT 29D-CONF ROS-NB1 B1F1W1V1
 (RCW083) GWTT 29D-CONF ROS-NB1 B1F1W1V1E2

BETA ELEVTR AILRON RUDDER
 0.000 0.000 0.000 0.000
 0.000 0.000 0.000 0.000

REFERENCE INFORMATION
 SREF 9.1952 SQ FT
 LREF 6.4320 FT
 BREF 3.8920 FT
 XMRP 1485.0040 IN
 YMRP 0.0000 IN
 ZMRP 377.0004 IN
 SCALE 0.6400

MACH 0.170

FIG. 34 EFFECT OF E2 ENGINE PODS



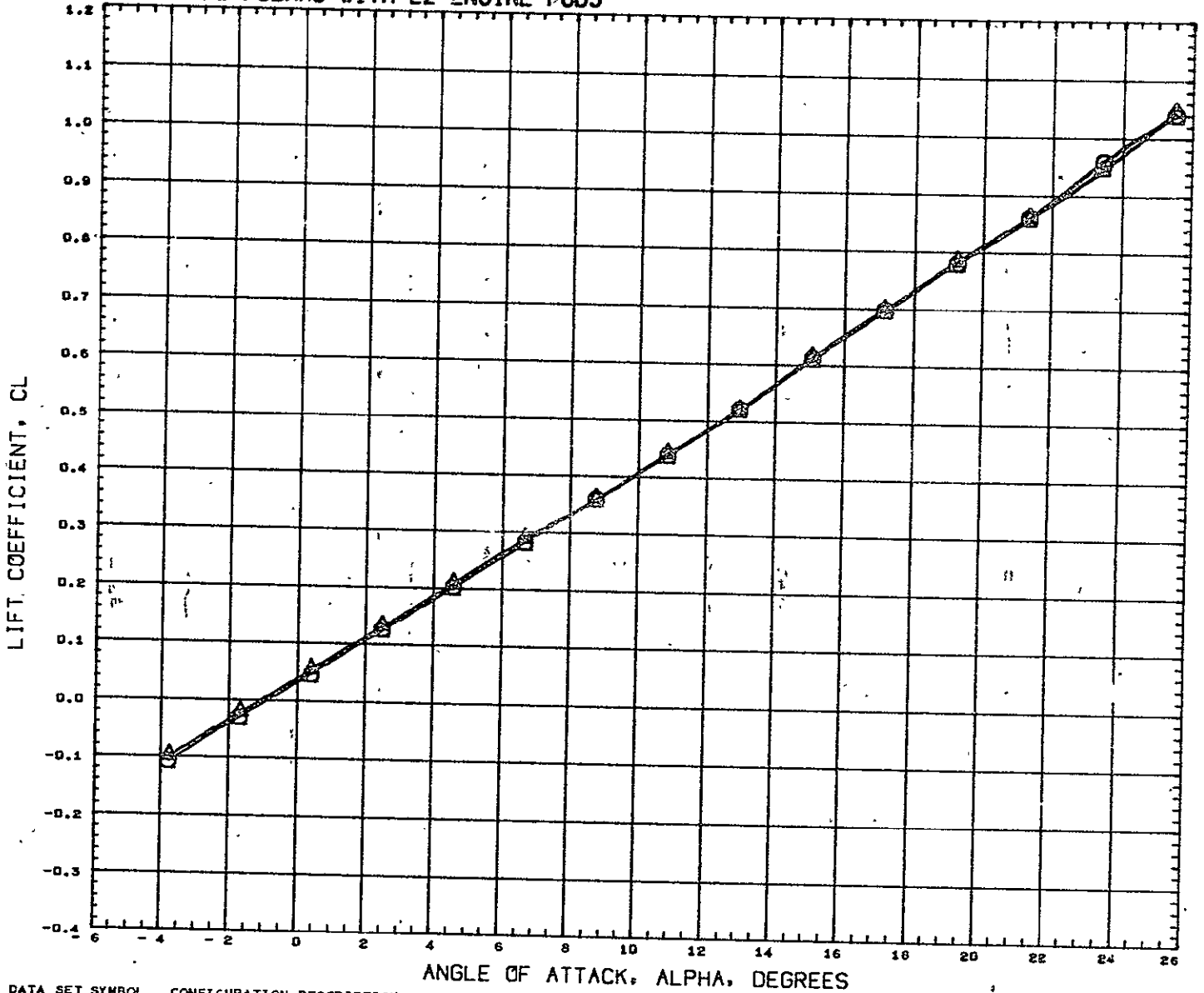
DATA SET SYMBOL	CONFIGURATION DESCRIPTION
(RCW004)	GWTT 29D-CONF ROS-NB1 B1F1W1V1
(RCW083)	GWTT 29D-CONF ROS-NB1 B1F1W1V1E2



BETA	ELEVTR	AILRON	RUDDER
0.000	0.000	0.000	0.000
0.000	0.000	0.000	0.000

REFERENCE INFORMATION	
SREF	9.1952 SQ FT
LREF	6.4320 FT
BREF	3.8920 FT
XMRP	1485.0040 IN
YMRP	0.0000 IN
ZMRP	377.0004 IN
SCALE	0.0400

MACH 0.170

FIG. 35 YAW POLARS WITH E2 ENGINE PODS



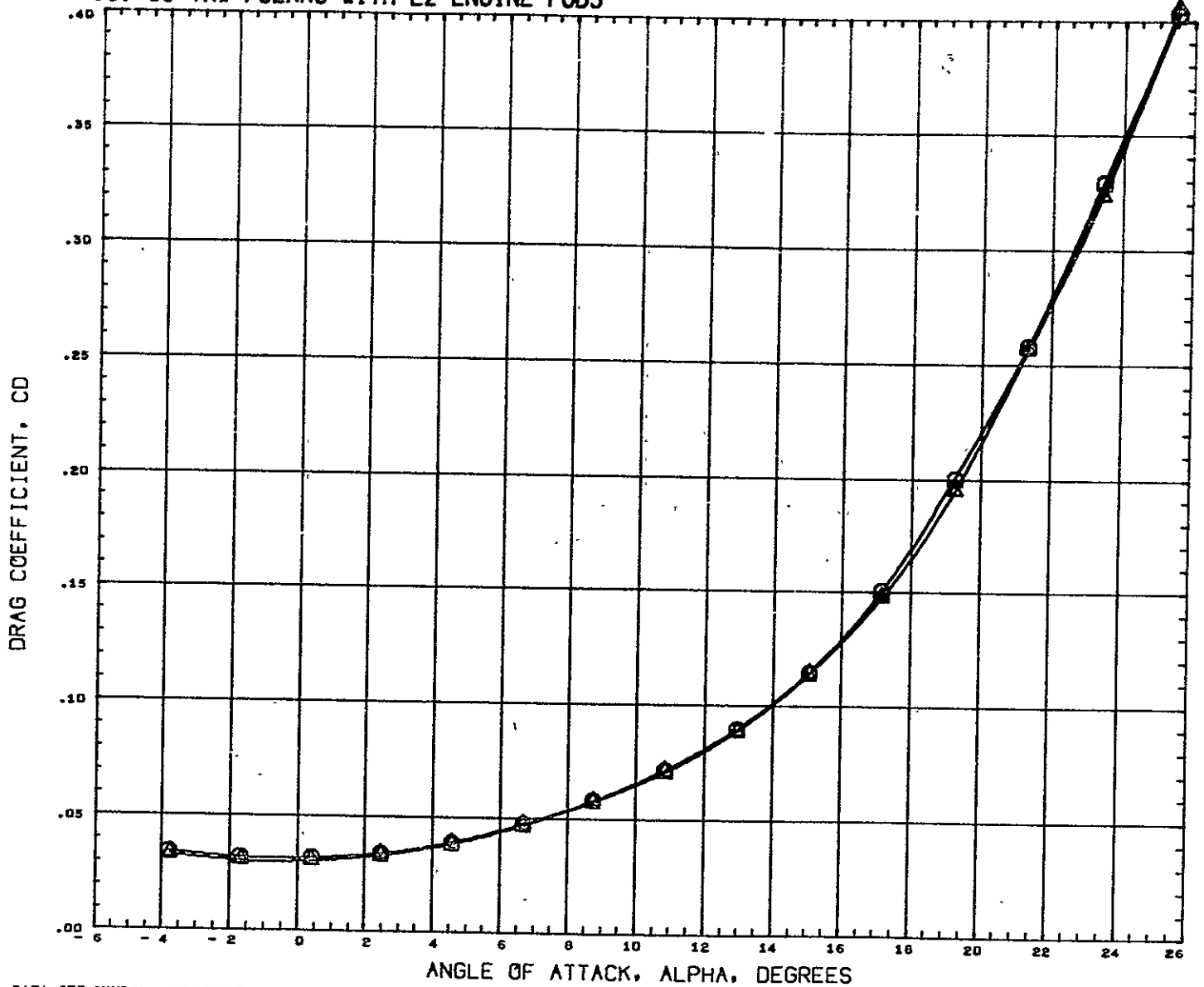
DATA SET SYMBOL CONFIGURATION DESCRIPTION
 (RCW083)  GWT 290-CONF ROS-NB1. B1F1W1V1E2
 (RCW084)  GWT 290-CONF ROS-NB1 B1F1W1V1E2

BETA ELEVTR AILRON RUDDER
 0.000 0.000 0.000 0.000
 3.000 0.000 0.000 0.000

REFERENCE INFORMATION
 SREF 9.1952 SQ FT
 LREF 6.4320 FT
 BREF 3.8920 FT
 XMRP 1485.0040 IN
 YMRP 0.0000 IN
 ZMRP 377.0004 IN
 SCALE 0.0400

MACH 0.170

FIG. 35 YAW POLARS WITH E2 ENGINE PODS



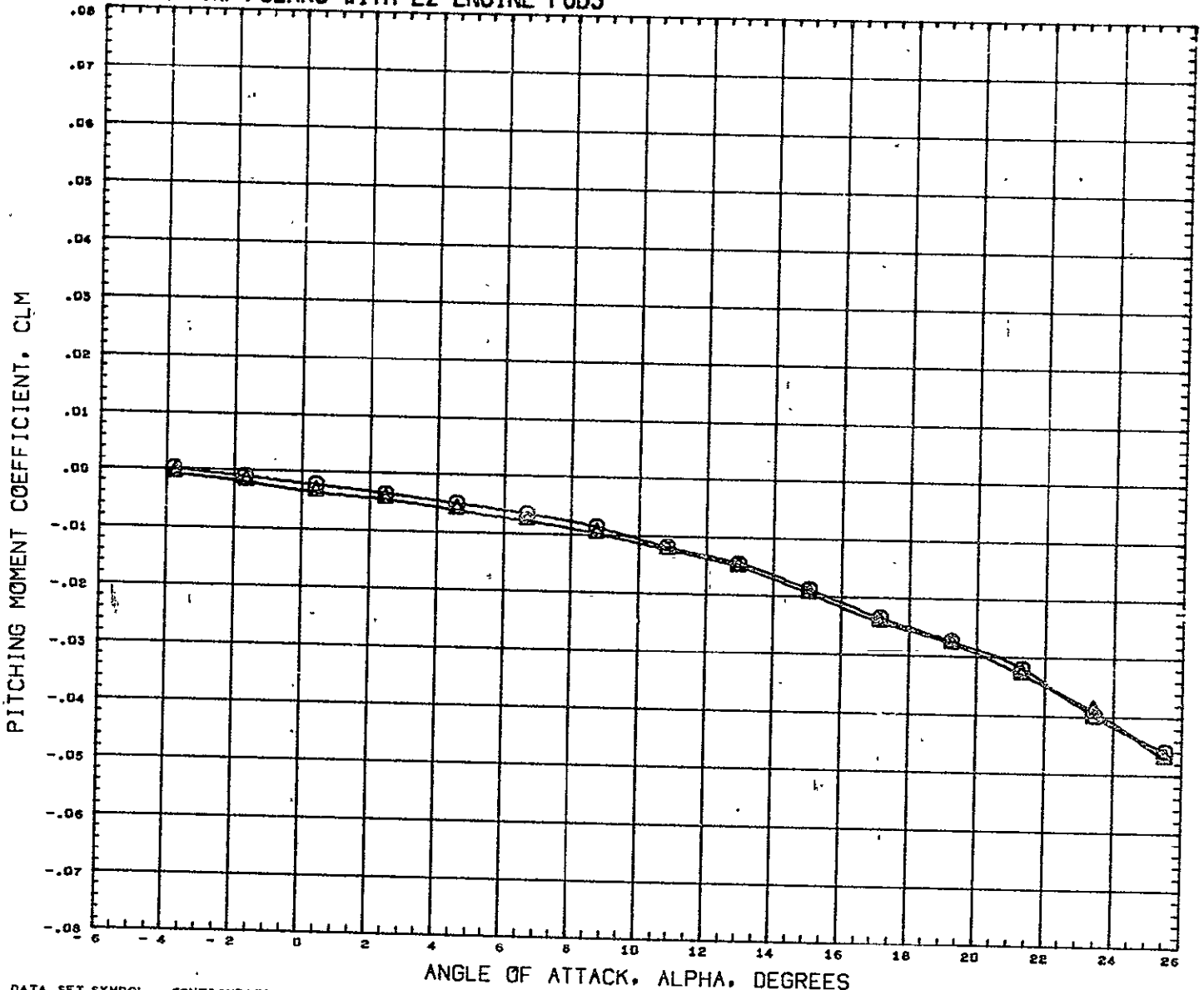
DATA SET SYMBOL	CONFIGURATION DESCRIPTION
(RCW083) \square	GWTT 290-CONF ROS-NB1 B1F1W1V1E2
(RCW084) \triangle	GWTT 290-CONF ROS-NB1 B1F1W1V1E2

BETA	ELEVTR	AILRON	RUDDER
0.000	0.000	0.000	0.000
3.000	0.000	0.000	0.000

REFERENCE INFORMATION	
SREF	9.1952 SQ FT
LREF	6.4320 FT
BREF	3.8920 FT
XMRF	1485.0045 IN
YMRF	0.0000 IN
ZMRF	377.0004 IN
SCALE	0.0400

MACH 0.170

FIG. 35 YAW POLARS WITH E2 ENGINE PODS



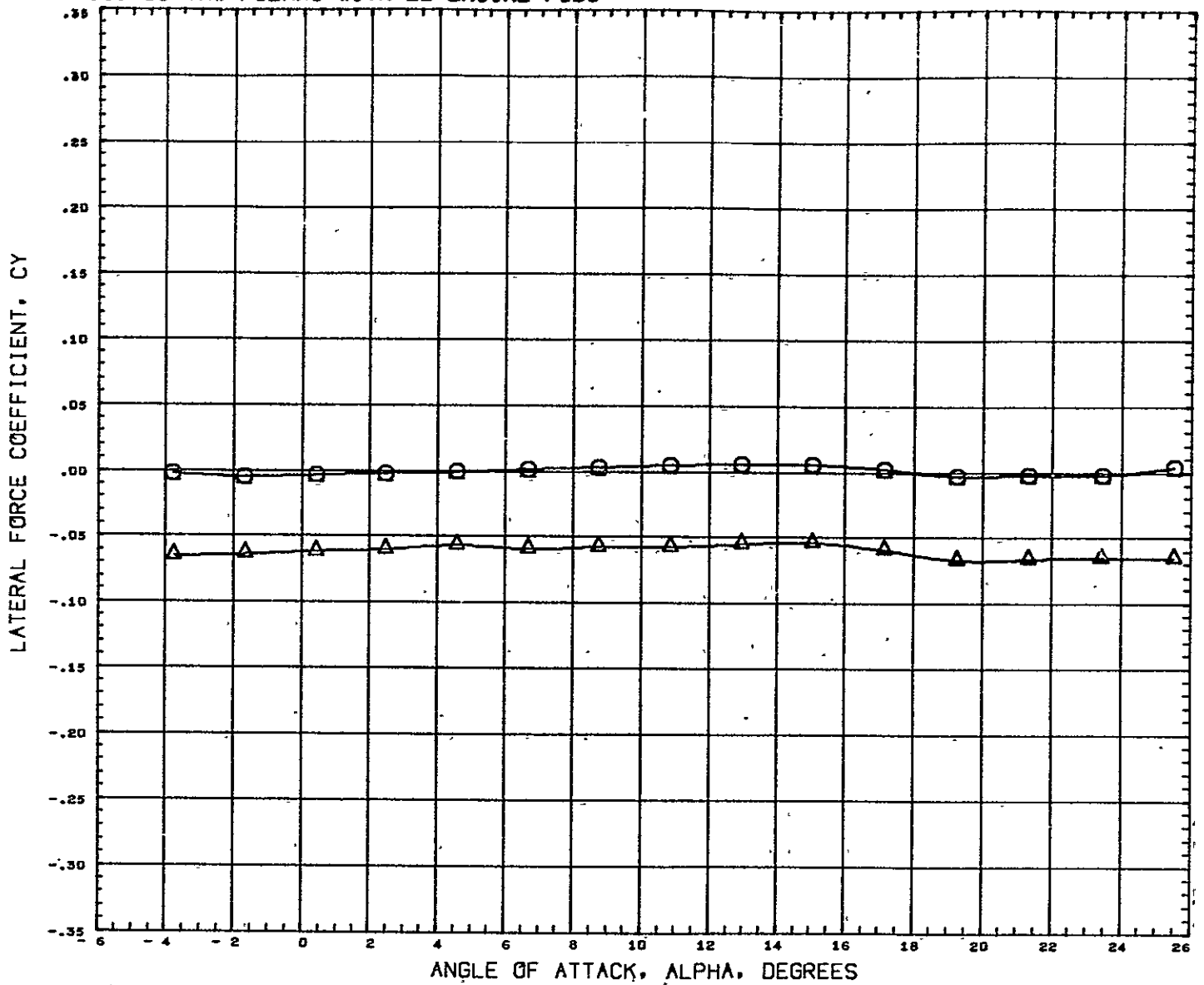
DATA SET SYMBOL	CONFIGURATION DESCRIPTION
(RCW083)	GWTT 290-CONF ROS-NB1 B1F1W1V1E2
(RCW084)	GWTT 290-CONF ROS-NB1 B1F1W1V1E2

BETA	ELEVTR	AILRON	RUDDER
0.000	0.000	0.000	0.000
3.000	0.000	0.000	0.000

REFERENCE INFORMATION	
SREF	9.1952 SQ FT
LREF	6.4320 FT
BREF	3.8920 FT
XMRP	1485.0040 IN
YMRP	0.0000 IN
ZMRP	377.0004 IN
SCALE	0.0400

MACH 0.170

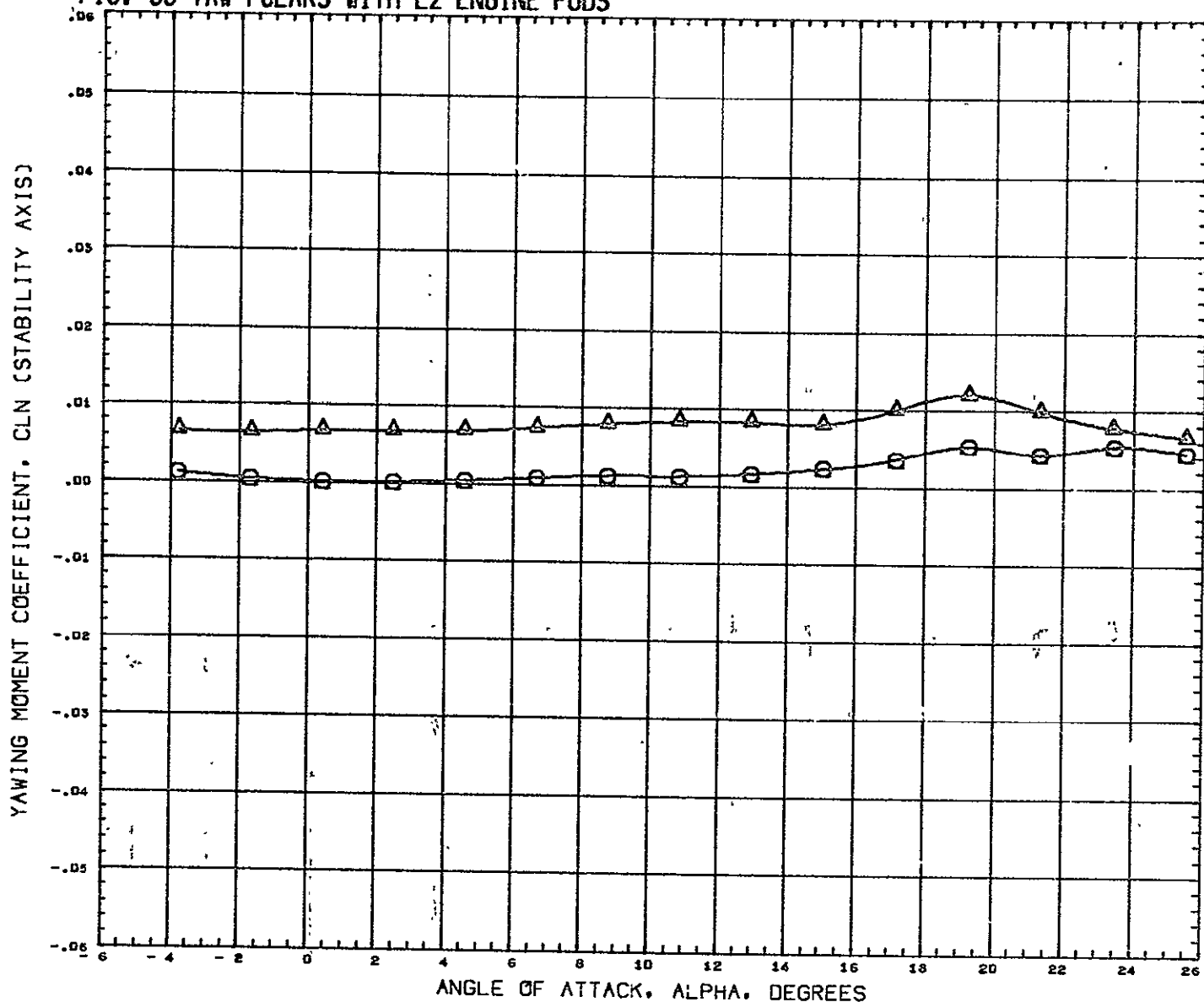
FIG. 35 YAW POLARS WITH E2 ENGINE PODS



DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCW083)	○	GWT 290-CONF ROS-NB1 B1F1W1V1E2	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCW084)	△	GWT 290-CONF ROS-NB1 B1F1W1V1E2	3.000	0.000	0.000	0.000	LREF 6.4320 FT
							BREF 3.8920 FT
							XMRP 1485.0040 IN
							YMRP 0.0000 IN
							ZMRP 377.0004 IN
							SCALE 0.0400

MACH 0.170

FIG. 35 YAW POLARS WITH E2 ENGINE PODS

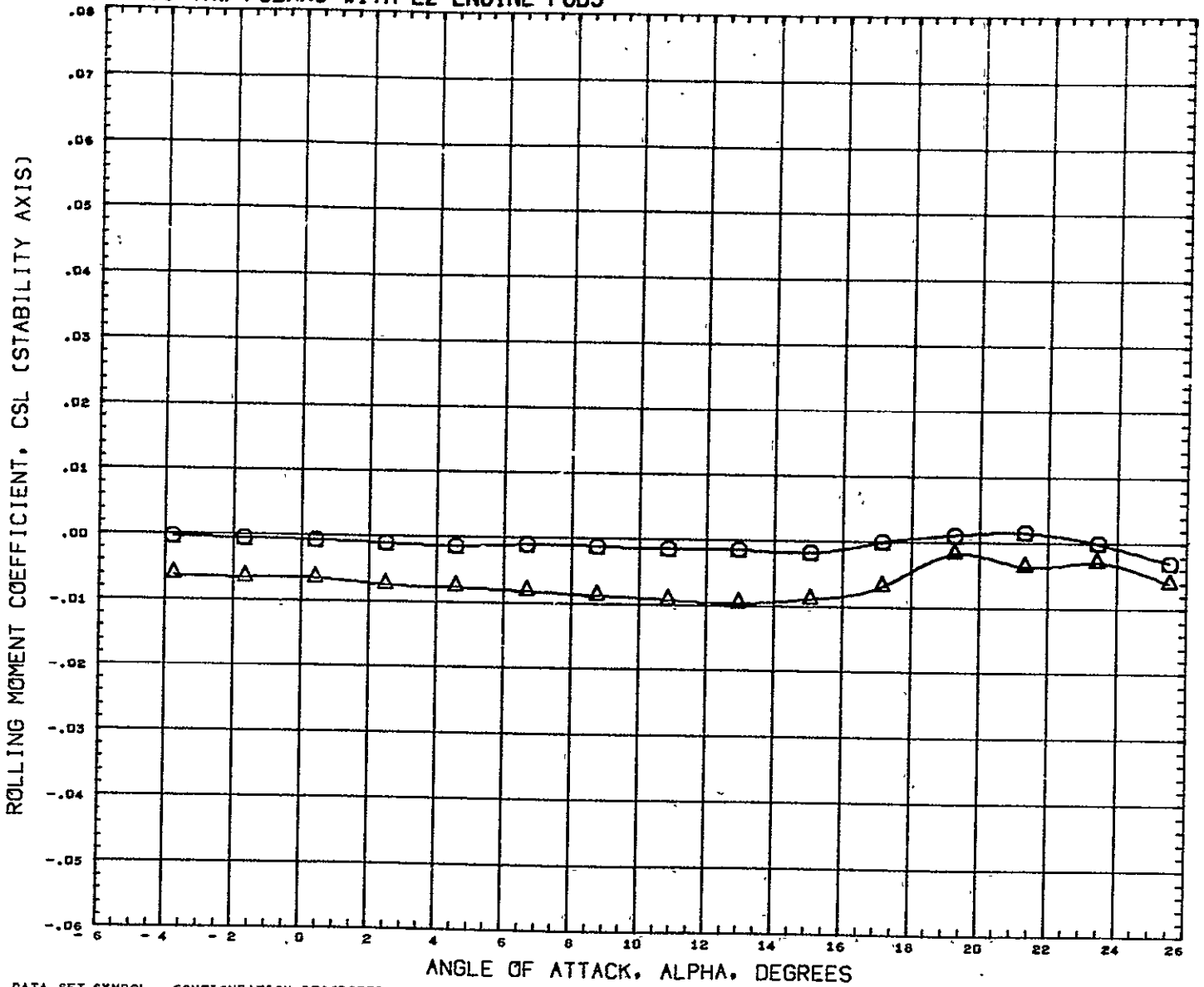


DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	BETA	ELEVTR	AILRON	RUDDER	REFERENCE INFORMATION
(RCWD83)	○	GW1T 290-CONF ROS-NB1 B1F1W1V1E2	0.000	0.000	0.000	0.000	SREF 9.1952 SQ FT
(RCWD84)	△	GW1T 290-CONF ROS-NB1 B1F1W1V1E2	3.000	0.000	0.000	0.000	LREF 6.4320 FT
							BREF 3.8920 FT
							XMRP 1485.0040 IN
							YMRP 0.0000 IN
							ZMRP 377.0004 IN
							SCALE 0.0400

MACH 0.170

5 ⊕

FIG. 35 YAW POLARS WITH E2 ENGINE PODS



DATA SET SYMBOL CONFIGURATION DESCRIPTION
 (RCW083) ○ GWT1 290-CONF ROS-NB1 B1F1W1V1E2
 (RCW084) △ GWT1 290-CONF ROS-NB1 B1F1W1V1E2

BETA 0.000 ELEVTR 0.000 AILRON 0.000 RUDDER 0.000
 3.000 0.000 0.000 0.000

REFERENCE INFORMATION
 SREF 9.1952 SQ FT
 LREF 6.4320 FT
 BREF 3.8920 FT
 XMRP 1485.0040 IN
 YMRP 0.0000 IN
 ZMRP 377.0004 IN
 SCALE 0.0400

MACH 0.170