ADA037356

12

TECHNICAL REPORT RD-77-12

A SUMMARY OF JET PLUME EFFECTS ON THE STABILITY CHARACTERISTICS OF A BODY OF REVOLUTION WITH VARIOUS FIN CONFIGURATIONS AT MACH NUMBERS FROM 0.2 TO 2.3 (NORMAL JET PLUME SIMULATOR)

George Batiuk
James H. Henderson
Aeroballistics Directorate
US Army Missile Research, Development
and Engineering Laboratory
US Army Missile Command
Redstone Arsenal, Alabama 35809

13 December 1976

DDC
RECEIVED
MAR 25 1977
C

Approved for public release; distribution unlimited

AD No.
DDC FILE COPY

U.S. ARMY MISSILE COMMAND
Redstone Arsenal, Alabama 35809

DISPOSITION INSTRUCTIONS

DESTROY THIS REPORT WHEN IT IS NO LONGER NEEDED. DO NOT RETURN IT TO THE ORIGINATOR.

DISCLAIMER

THE FINDINGS IN THIS REPORT ARE NOT TO BE CONSTRUED AS AN OFFICIAL DEPARTMENT OF THE ARMY POSITION UNLESS SO DESIGNATED BY OTHER AUTHORIZED DOCUMENTS.

TRADE NAMES

USE OF TRADE NAMES OR MANUFACTURERS IN THIS REPORT DOES NOT CONSTITUTE AN OFFICIAL INDORSEMENT OR APPROVAL OF THE USE OF SUCH COMMERCIAL HARDWARE OR SOFTWARE.

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

(14) **REPORT DOCUMENTATION PAGE**

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
RD-77-12		(9)

(6) 4. TITLE (and Subtitle)
A SUMMARY OF JET PLUME EFFECTS ON THE STABILITY CHARACTERISTICS OF A BODY OF REVOLUTION WITH VARIOUS FIN CONFIGURATIONS AT MACH NUMBERS FROM 0.2 TO 2.3 (NORMAL JET PLUME SIMULATOR).

5. TYPE OF REPORT & PERIOD COVERED
Technical Report.

6. PERFORMING ORG. REPORT NUMBER
DMS-AR-1037

(10) 7. AUTHOR(s)
George Batiuk
James H. Henderson

8. CONTRACT OR GRANT NUMBER(s)
DAAH01-76-C-0301

(16)

9. PERFORMING ORGANIZATION NAME AND ADDRESS
U. S. Army Missile Command
Attn: AMSMI-RDK
Redstone Arsenal, Alabama 35809

10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
DA Project No. 1W362303A214
AMC MS Code 632303.11.21400

11. CONTROLLING OFFICE NAME AND ADDRESS
Commander
US Army Missile Command
Attn: AMSMI-RPR, Redstone Arsenal, Alabama 35809

(11) 12. REPORT DATE
13 December 1976

13. NUMBER OF PAGES

14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)

(12) 186 p.

15. SECURITY CLASS. (of this report)
Unclassified

15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited.

DDC RELEASED MAR 25 1977 C

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

All data presented are in a data base maintained by Data Management Services and are available in tabular or magnetic tape form.

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

Thrust Effects
Longitudinal Stability
Plume Effects
Base Pressure
Jet Plume

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report summarizes the studies made to date by the Army Missile Command on the effects of the rocket jet plume on the stability characteristics of a body of revolution with various fin configurations and at various fin positions on the body. The Mach numbers ranged from 0.2 to 2.3. A normal jet plume simulator was used to obtain the desired plume effects. This report concerns itself with those tests conducted on a 5" diameter, 52" long model, with a 3 caliber tangent ogive nose. The test numbers were CAL T17-093, CAL T17-123, and AEDC SF172/TF360.

5-in. 52-in.

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

Unclassified

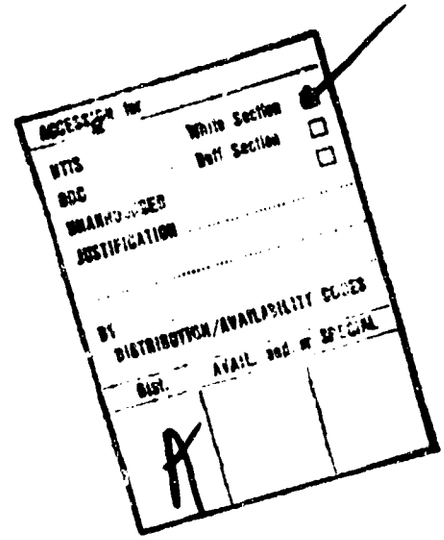
SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

400407

16

CONTENTS

	Page
INDEX OF TABLES	2
INDEX OF MODEL FIGURES	2
INDEX OF DATA FIGURES	3
INTRODUCTION	4
APPARATUS AND TESTS	5
PLUME SIMULATION	6
RESULTS AND DISCUSSION	8
REFERENCES	10
NOMENCLATURE	16
TABLES	20
MODEL FIGURES	30
PLOTTED DATA	39



INDEX OF TABLES

TABLE	DESCRIPTION	PAGE
1	SUMMARY OF FINS TESTED.....	20
2	DATA SET/RUN NUMBER COLLATION SUMMARY.....	21

INDEX OF MODEL FIGURES

FIGURE	DESCRIPTION	PAGE
1	AXIS SYSTEMS AND POSITIVE SIGN CONVENTION, BODY AXIS SYSTEM.....	30
2	TAIL FIN AXIS SYSTEMS, POSITIVE SIGN CONVENTION AND CENTER OF PRESSURE LOCATION.....	31
3	MODEL GENERAL LAYOUT.....	32
4	FIN CONFIGURATION.....	33
5	a) INSTALLATION DRAWING (CALSPAN 8 FT. TRANSONIC TUNNEL).....	35
	b) INSTALLATION DRAWING (AEDC PWT, 16S).....	36
	c) INSTALLATION DRAWING (AEDC PWT, 16T).....	37
6	PHOTOGRAPH OF BODY AND FO FINS OF LONGBOW AT THREE TAIL POSITIONS IN THE CALSPAN 8 FT. TRANSONIC TUNNEL.....	38

INDEX OF DATA FIGURES

TITLE	CONDITIONS VARYING	PLOT SCHEDULE	PAGE
STABILITY VARIATION DUE TO PLUME EFFECTS, BODY ALONE, B	MACH TEST	(A)	40-51
STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF0	MACH FINPOS	(B)	52-75
STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1	MACH FINPOS TEST	(B)	76-107
STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF2	MACH TEST FINPOS	(B)	108-131
STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF3	MACH FINPOS	(B)	132-147
STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF4	MACH FINPOS	(B)	148-159
STABILITY VARIATION DUE TO PLUME EFFECTS, BODY ALONE COMPARISON	TEST MACH	(A)	160-167
STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1 COMPARISON	TEST MACH	(B)	168-179
STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF2 COMPARISON	TEST	(B)	180-183

PLOT SCHEDULE:

(A) C_{N_α}, C_{m_α} VERSUS C_{RT}

(B) C_{N_α}, C_{m_α}, $C_{N_{\alpha_{F2}}}$, $C_{N_{\alpha_{F4}}}$ VERSUS C_{RT}

INTRODUCTION

During the past few years, the Army Missile Command has been interested in the adverse effects of the propulsive jet plume on missile longitudinal stability. A research program established as a means of obtaining the understanding necessary for proper design of future missiles susceptible to plume effects has been completed. The first phase of this program involved the study of conditions where plume-induced aerodynamic effects occur and the study of wind tunnel test techniques which adequately simulate high thrust effects on aerodynamic stability. For these tests, strut-mounted models were utilized and pressure measurements were the primary type of data taken. Results of this phase of the program have been reported in references 2 to 19.

Based on these results, a decision was made to construct a sting-mounted wind tunnel model having the capability to simulate various thrust levels. The model, which was designed and fabricated by Calspan Corporation, included a 6-component main balance, a 3-component balance for each of 4 fins, and a normal jet plume simulator. The fins were capable of being tested in 3 different longitudinal positions. The model was partially funded by the "Canard Control Aerodynamics" work unit and included 4 independent remote control canards each with a 3-component balance (see references 20 and 21). The canards are also capable of being tested in 3 longitudinal positions.

The purpose of this report is to summarize the investigations of plume effects conducted with this model. Two tests were made at the

Calspan 8-Foot Transonic Wind Tunnel (CAL T17-093 and CAL T17-123) and one test each in the Arnold Engineering Development Center's Propulsion Wind Tunnel transonic and supersonic legs (AEDC SF172/TF360). Tests were made of 5 fin configurations at 3 longitudinal positions and at roll positions of 0, 22.5, and 45 deg. Mach number was varied from 0.2 to 2.3 and angle of attack from -4 to 12 deg. Plume simulator chamber pressure was varied up to 600 psi. Results of these tests were presented in detail in references 21 to 25.

APPARATUS AND TESTS

The model used in all tests is a body of revolution, 5 inches in diameter and 52 inches long with a 3 caliber tangent ogive nose. Figure 3 depicts the general layout of the model. It was tested with five different sets of fins, as shown in Figure 4. In addition, it was possible to locate the fins at three separate positions longitudinally. Figure 3 illustrates fin F1 in position 3, which is defined as having the fin trailing edge 1.5 calibers (7.5 inches) forward of the model base. Position 2 had the fin trailing edge at 0.75 caliber and position 1 at 0 caliber, or flush with the base. Figure 6 shows the F0 fin in the 3 positions in the Calspan tunnel.

The model was mounted on a sting which incorporated the plume simulator. This simulator consisted of 2 rows of 12 sonic jets arranged circumferentially so that the air from a common air chamber was ejected normal to the longitudinal axis of the model. It was located 2.5 inches aft of the model base as shown in Figure 3.

A 6-component main balance was used to determine the body forces and a 3-component balance for each of the fins.

Installation drawings of the model in the various tunnels are shown in Figure 5, and photographs of the model depicting these installations are in Figure 6.

The tests conducted in the Calspan tunnel encompassed the transonic region in their 8-foot Transonic wind tunnel. The AEDC tests extended the results into the supersonic region, to a Mach number of 2.3. The latter test was conducted in the AEDC Propulsion Wind Tunnel, Supersonic (16S). Additional transonic data were obtained in their Transonic facility, 16T. Details of each of the tunnel's capabilities can be found in references 27 and 28.

Table 1 summarizes the tests conducted on the five fins at the various facilities.

The model aerodynamic data were resolved in the body axis system with the origin located at model station 26.5 on the model centerline. The aerodynamic data from the tail fin balances were resolved in individual axis systems, having origins located at the intersection of the tail fin hinge lines and the balance centerlines. The axis system and sign conventions are shown in Figures 1 and 2.

PLUME SIMULATION

The model utilized a normal jet plume simulator which was geometrically similar to the one used with the strut-mounted model and the sting-mounted model and the sting-mounted pressure model (see references 5 and

11). Although various other devices adequately simulated plume effects on aerodynamics, the normal jet simulator appeared to have several advantages. The primary advantage involved the economics of wind tunnel testing. It is possible to investigate a variation in the level of plume effects without shutting down the tunnel. Another advantage is that the normal jets tend to adjust toward the free stream flow direction when model angle of attack is varied. The normal jet also has a measurable quantity (such as momentum or thrust components) which can be related to the free stream flow.

In the past, the Army Missile Command has used base pressure ratio P_b/P_∞ as an indication of the onset and the severity of plume effects on missile aerodynamics (see reference 1). One of the parameters that can be conveniently used to correlate base pressure is thrust coefficient C_T where C_T is axial thrust non-dimensionalized by dynamic pressure and body cross-sectional area (S_{ref}). For the normal jet simulator, a similar parameter is radial thrust coefficient, C_{RT}, where

$$C_{RT} = \frac{\text{Radial Thrust}}{qS}$$

Radial thrust is the summation of the thrust of the 24 individual nozzles. For an axial jet, base pressure appears to be primarily influenced by the portion of the jet plume in the vicinity of the jet boundary where it interacts with the freestream flow. Where C_T can be considered to represent the axial component of the effective jet, it can be assumed that C_{RT} represents the normal component.

For the plume size of interest in these investigations, a value of C_T several times the value of C_{RT} is required for matching base pressures. The exact C_T/C_{RT} ratio will depend on a comparison of flight base pressures with base pressure values for the the normal jet simulator. Where flight base pressures are unavailable, methods exist which allow simulation of flight rockets with cold air axial jets (see, for example, reference 26). An estimate of the C_T/C_{RT} ratio (although crude) is valuable for use in preliminary design and to insure that the range of C_{RT} values planned for wind tunnel tests are sufficient.

RESULTS AND DISCUSSION

The variation of normal force slope, C_{N_α}, and pitching moment slope, C_{m_α}, with radial thrust coefficient, C_{RT}, for the body alone, B, is presented on data pages 40 - 51. Of interest are the large negative values of C_{N_α} with plume effects, especially at Mach numbers of 1.25 and 1.5. In some cases the magnitude of the negative values of C_{N_α} is almost double the jet off positive value.

For the body-fin combinations, the variation of C_{N_α}, C_{m_α}, and the horizontal fin panels $C_{N_{\alpha FX}}$ with C_{RT} is shown on pages 52 to 159. In general the loss in C_{N_α} due to plume effects is delayed to a higher value of C_{RT} as the fin is moved to forward positions. With the fins in the forward position, the fins maintain effectiveness up to a reasonable value of C_{RT}. For example, by comparing page 112 with pages 114 and 115, it is apparent that the total configuration C_{N_α} is affected by the plume

at a C_{RT} of 1 or 2 where the $C_{N_{\alpha FX}}$ of the fin panels is not affected until a C_{RT} of about 6.

Presented on pages 160 to 183 are comparisons of data between the two Calspan tests and comparisons between data from the two transonic wind tunnels. Overall, the data are in good agreement.

REFERENCES

1. Deep, R. A., Henderson, J. H., and Brazzel, C. E., Thrust Effects on Missile Aerodynamics, US Army Missile Command, Redstone Arsenal, Alabama, Report No. RD-TR-71-9, May 1971.

2. Sutton, C. E., Wind Tunnel Tests of a Research Base Drag Model at Transonic Speeds, Cornell Aeronautical Laboratory, Inc., Buffalo, New York, July 1967, Report No. AA-2400-W-1.

3. Gorin, B. F., Transonic Wind Tunnel Tests of a Base Drag Research Missile Model, Cornell Aeronautical Laboratory, Inc., Buffalo, New York, June 1970, Report No. AA-4017-W-1.

4. Burt, J. R., Jr., Henderson, J. H., and Pettis, W., Jr., The Effects of Three Rocket Jet Plume Simulators on the Aerodynamic Characteristics of Several Missile Configurations, U. S. Army Missile Command, Redstone Arsenal, Alabama, October 1970, Report No. RD-TR-70-20.

5. Burt, J. R., Jr., An Experimental Investigation of the Effect of Several Rocket Plume Simulators on the Pressure Distribution of a Body of Revolution at Free-Stream Mach Numbers of 0.9 to 1.2, U. S. Army Missile Command, Redstone Arsenal, Alabama, September 1970, Report No. RD-TR-70-23.

6. Rubin, Donald V., A Transonic Investigation of Jet Plume Effects on Base and Afterbody Pressures of Boattail and Flared Bodies of Revolution, U. S. Army Missile Command, Redstone Arsenal, Alabama, October 1970, Report No. RD-TR-70-10.

REFERENCES (Continued)

7. Craft, Joseph C., and Brazzel, Charles E., An Experimental Investigation of Base Pressure on a Body of Revolution at High Thrust Levels and Free-Stream Mach Numbers of 1.5 to 2.87, U. S. Army Missile Command, Redstone Arsenal, Alabama, July 1970, Report No. RD-TM-70-6.

8. Rubin, Donald V., Rocket Plume Effects on Boattail and Flare Bodies of Revolution at Transonic Speeds, U. S. Army Missile Command, Redstone Arsenal, Alabama, May 1971, Report No. RD-TR-71-17.

9. Lilienthal, P.F., II, Brink, D. F., and Addy, A. L., An Investigation of Factors Influencing the Annular Base Drag of Bodies of Revolution with Jet Flow, in Transonic and Supersonic External Streams, Dept. of Mechanical and Industrial Engineering, University of Illinois at Urbana - Champaign, Urbana, Illinois, Supported by U. S. Army Missile Command Contract DA-01-21-AMC-13902 (Z), July 1970.

10. Burt, J. R., Jr., An Investigation of the Effectiveness of Several Devices in Simulating a Rocket Plume at Free Stream Mach Numbers of 0.9 to 1.2, U. S. Army Missile Command, Redstone Arsenal, Alabama, Report No. RD-TR-71-22, September 1971.

11. Burt, James, Jr., An Experimental Investigation of the Effects of Rocket Plume Simulators on the Radial and Longitudinal Pressure Distribution of a Sting Mounted Body of Revolution at Transonic Mach Numbers. U. S. Army Missile Command, Redstone Arsenal, Alabama, Report RD-72-21 (Misnumbered RD-74-21), July 1973.

REFERENCES (Continued)

12. Chudyk, D. W., Transonic Wind Tunnel Test of a Sting Mounted Base Drag Research Missile, Cornell Aeronautical Laboratory, Inc., Buffalo, N. Y., 23 November 1971, Report No. CAL AA-4017-W-Z.

13. deKuyper, R. E., An Investigation of Power-on Base Drag and Plume-Induced Aerodynamic Effects and Effects of Nozzle Geometry in a Transonic Wind Tunnel, Cornell Aeronautical Laboratory, Inc., Buffalo, New York, June 1972, Report No. AA-4017-W-5.

14. Henderson, J. H., Results of Transonic Wind Tunnel Investigations to Determine the Effects of Nozzle Geometry and Jet Plume on the Aerodynamics of a Body of Revolution, U. S. Army Missile Command RD-72-17, 1972.

15. Dennis, R. J., Transonic Wind Tunnel Investigation of Thrust Effects on Missile Aerodynamics, Calspan Report No. AA-4017-W-7, April 1973.

16. Henderson, J. H., Results of a Transonic Wind Tunnel Investigation of Thrust Effects on the Aerodynamics of the LONGBOW Missile Configuration. U. S. Army Missile Command, Redstone Arsenal, Alabama, Report No. RD-73-18, September 1973.

17. Henderson, J. H., Results of a Transonic Wind Tunnel Investigation of Thrust Effects on the Aerodynamics of Four Longitudinally-Supported Ringtail Missile Configurations. U. S. Army Missile Command, Redstone Arsenal, Alabama, Report No. RD-73-15, Oct. 1973.

REFERENCES (Continued)

18. Rubin, D. V., Brazzel, C. E., Henderson, J. H., The Effects of Jet Plume and Boattail Geometry on Base and Afterbody Pressures of a Body of Revolution at Mach Numbers of 2.0 to 3.5, U. S. Army Missile Command, Redstone Arsenal, Alabama, Report No. RD-TR-70-5, April 1970.

19. Martin, T. A., and Brazzel, C. E., Investigation of the Effect of Low Thrust Levels on the Base Pressure of a Cylindrical Body at Supersonic Speeds, U. S. Army Missile Command, Redstone Arsenal, Alabama, Report No. RD-TR-70-11, May 1970.

20. Burt, James R., Jr., An Experimental Investigation of the Aerodynamic Characteristics of Several Nose-Mounted Configurations at Transonic Mach Numbers. U. S. Army Missile Command, Redstone Arsenal, Alabama, Report No. RD-75-2.

21. deKuyper, R. E., Transonic Wind Tunnel Tests on a Missile Model With Canard Wings. Calspan Corporation Wind Tunnel Report No. AA-4017-W-9, July 1973.

22. deKuyper, R. E., Investigation of Plume Effects on the Stability Characteristics of a Body of Revolution with Various Fin Configurations at Transonic Speeds. Calspan Corp. Report No. AA-4017-W-11, May 1974.

REFERENCES (Continued)

23. Henderson, J. H., Transonic Wind Tunnel Investigation of Thrust Effects on the Longitudinal Stability Characteristics of Several Body-Fin Configurations (Sting-Mounted Model with Normal-Jet Plume Simulator). U. S. Army Missile Command, Redstone Arsenal, Alabama, Report No. RD-75-14, 31 December 1974.

24. Henderson, J. H., An Investigation of Jet Plume Effects on the Stability Characteristics of a Body of Revolution in Conjunction with Fins of Various Geometry and Longitudinal Positions at Transonic Speeds (Sting Mounted Model with Normal Jet Plume Simulator). U. S. Army Missile Command, Redstone Arsenal, Alabama, Report No. RD-75-37, 12 June 1975.

25. Henderson, J. H., Investigation of Jet Plume Effects on the Longitudinal Stability Characteristics of a Body of Revolution with Various Fin Configurations at Mach Numbers from 0.2 to 2.3 (Normal Jet Plume Simulator), U. S. Army Missile Command, Redstone Arsenal, Alabama, Report No. RD-76-22, 20 February 1976.

26. Korst, H. H., Approximate Determination of Jet Contours Near the Exit of Axially Symmetrical Nozzles as a Basis for Plume Modeling, Technical Report No. RD-72-14, August 1973, U. S. Army Missile Command, Redstone Arsenal, Alabama.

27. Test Facilities Handbook, "Propulsion Wind Tunnel Facility, Vol. 4," Arnold Engineering Development Center, May 1, 1974.

REFERENCES (Concluded)

28. "8-Foot Transonic Wind Tunnel," Calspan Corporation Wind Tunnel, Report No. WTO-300, Revised September 1973.

29. Batiuk, George, A Bibliography of Plume Effects Investigations Conducted by the Army Missile Command, Technical Report No. RD-76-16, December 1975, U. S. Army Missile Command, Redstone Arsenal, Alabama.

NOMENCLATURE

SYMBOL	MNEMONIC	DEFINITION
RN/L	RN/L	unit Reynolds number; per ft
V		velocity; ft/sec
α	ALPHA	angle of attack, degrees
β	BETA	angle of sideslip, degrees
ψ	PSI	angle of yaw, degrees
ϕ	PHI	angle of roll, degrees
ρ		mass density; slugs/ft^3
C_T	CT	thrust coefficient, axial thrust/qS
C_{RT}	CRT	radial thrust coefficient, radial thrust/qS
$P_{b_{AVG}}/P_\infty$	PB/P1 (PBX/P)	ratio of average base pressure to tunnel freestream static pressure
F.P.	FINPOS	fin longitudinal position on body:
	1. AFT;	Fin Trailing Edge 1.5 calibers forward of base
	2. MID;	Fin Trailing Edge 0.75 caliber forward of base
	3. FWD;	Fin Trailing Edge flush with base
a		speed of sound; ft/sec
C_p	CP	pressure coefficient; $(p_1 - p_\infty)/q$
M	MACH	Mach number; V/a
p		pressure; psf
q	Q(NSM) Q(PSF)	dynamic pressure; $1/2\rho V^2$
P_b/P_∞		base pressure ratio

NOMENCLATURE (Continued)

Reference & C. G. Definitions

SYMBOL	MNEMONIC	DEFINITION
A_b		base area, m^2, in^2
b	BREF	wing span or reference span; m, in
c.g.		center of gravity
ℓ_{REF}, $\bar{c}$	LREF	reference length or wing mean aerodynamic chord; m, in
S, S_{ref}	SREF	reference area based on body diameter, in^2
	MRP	moment reference point
	XMRP	moment reference point on X axis
	YMRP	moment reference point on Y axis
	ZMRP	moment reference point on Z axis

Fin Balances

$C_{N_{FX}}$ ($C_{N_{TX}}$)	CNFX (CNTX)	fin normal force coefficient, $\frac{\text{fin normal force}}{qS_{ref}}$
$C_{HM_{FX}}$	CLMHX	fin hinge moment coefficient, $\frac{\text{fin hinge moment}}{qS_{ref}\,\ell_{ref}}$
$C_{BM_{FX}}$	CLMRX	fin root bending moment coefficient, $\frac{\text{fin root bending moment}}{qS_{ref}\,\ell_{ref}}$
$CPX_{T1(FX)}$	CPXT1	tail (fin) No. 1, longitudinal center of pressure
$CPY_{T1(FX)}$	CPYT1	tail (fin) No. 1, lateral center of pressure

NOMENCLATURE (Continued)

SYMBOL	MNEMONIC	DEFINITION
$X_{CP_{FX}}$	XCPFX	chordwise center of pressure location relative to fin hinge line, positive toward the leading edge, inches
$C_{N_{\alpha_{FX}}}$	CNAFX	fin normal force coefficient derivative with alpha, per degree

Body-Axis System (Main Balance)

C_N	CN	normal-force coefficient; $\frac{\text{normal force}}{qS}$
C_A	CA	axial-force coefficient; $\frac{\text{axial force}}{qS}$
C_Y	CY	side-force coefficient; $\frac{\text{side force}}{qS}$
C_m	CLM	pitching-moment coefficient; $\frac{\text{pitching moment}}{qS\ell_{REF}}$
C_n	CYN	yawing-moment coefficient; $\frac{\text{yawing moment}}{qSb}$
C_ℓ	CBL	rolling-moment coefficient; $\frac{\text{rolling moment}}{qSb}$
C_{m_α}	CLMALF	pitching moment coefficient derivative with alpha, per degree
C_{N_α}	CNALFA	normal force coefficient derivative with respect to angle of attack, per degree
T.P.		tail positio

NOMENCLATURE (Concluded)

SYMBOL	MNEMONIC	DEFINITION
BF		body with fin
BF0,1,2,3,4 (F0,1,2,3,4)		body with fin configuration 0, 1, 2, 3, 4; see Figure 4
F		fin
B		body alone
PL	PL	air supply pressure upstream of orifice, psi
WA	WA	air supply flow rate, lbs./sec.
T.E.		trailing edge
SUBSCRIPTS		
b		base
l		local
s		static conditions
t		total conditions
∞		free stream
1,2,3,4		fin radial position about body

TABLE 1. SUMMARY OF FINS TESTED

Fin	Positions Tested*	CRT Range	Mach No. Range	Facility (MICOM Report No.)
F0 (T1 in Ref. 23)	1 2 3	0-37.5	0.4-1.25	Calspan (RD-75-14)
F1 (T2 in Ref. 23)	3	0-100	0.2-2.3	AEDC (RD-75-28)
	1	0-12	0.4-1.25	Calspan (RD-75-14); (RD-75-37)
	2-3	0-37.5		
F2	3	0-100	0.2-1.5	AEDC (RD-75-28)
	1 2 3	0-20	0.7-1.2	Calspan (RD-75-37)
F3	1 2 3	0-37.5	0.4-1.2	Calspan (RD-75-37)
F4	1 2 3	0-10.3	0.7-1.2	Calspan (RD-75-37)

*Positions: 1 - T.E. of fin at base.
2 - T.E. of fin 0.75 caliber forward of base.
3 - T.E. of fin 1.5 calibers forward of base.

Model used in all tests = 3 caliber tangent ogive nose + 7.4 caliber body, with a 5-inch diameter.

TABLE 2.

TEST : CAL T17-093 — DATA SET/RUN NUMBER COLLATION SUMMARY — DATE : May 18, 1973

DATA SET IDENTIFIER	CONFIGURATION	PAR. α	PAR. T.P	PAR. M	RADIAL THRUST COEFFICIENT, CRT 0.0	1.0	1.5	2.5	3.0	3.6	4.2	5.0	5.2	6.0	7.2	8.5	10.3	12.0	37.5
RUN001	B	A	-	.4	185										184				183
02		A	-	.8	182			181		180					179		178		
03		A	-	.9	186			187		188	189				190	191		192	
04		B	-	1.0	198		197	196			195				194			193	
05		A	-	1.1	202			201						200	199				
06		A	-	1.25	208		207	206			205		204		203				
07	BF1	B	1	.4	233						939				232				
08		B		.8	229		938	230			937				231				
09		B		.9	228		936	227			226				225			224	
10		B		.95	935		934	935			920				919			916	
11		B		.975	929	932	931	930							918				
12		B		1.0	218	928	219	220			221				222			223	
13		B		1.05	927	926	922	921							917				
14		B		1.1	215	924	923	216							217				
15		B		1.25	214	925	213	212			211				210				
16	BF0	A		.4	126														129
17		A		.8	111					131							130		
18		A		.9	122										125	914			

TEST RUN NUMBERS

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

CNP CLMP CNF2 CNF4 CRT ALPHA

α OR β SCHEDULES — COEFFICENTS — IDVAR (1) IDVAR (2) NDV

αA: $-4^0 \rightarrow 4^0$

αB: $-4^0 \rightarrow 12^0$

TABLE 2 (Continued)

TEST: CAL T17-093 — DATA SET/RUN NUMBER COLLATION SUMMARY — DATE: May 18, 1973

DATA SET IDENTIFIER	CONFIGURATION	α	PAR. T	PAR. M	RADIAL THRUST COEFFICIENT, CRT 0.0	1.0	1.5	2.5	3.0	3.6	4.2	5.0	5.2	6.0	7.2	8.5	10.3	12.0	37.5
RUE019	BFO	A	1	1.0	115						117				915				
20			1	1.1	114									128					
21			1	1.25	113		134	133				132							
22			2	0.4	176														175
23				0.6	174			173		172							171		
24				0.9	170			169		168						167			
25				1.0	162			166			165				164				
26				1.1	161									163					
27				1.25	160		159	158				157							
28			3	0.4	154														155
29				0.6	153			152		151							150		
30				0.9	148			149	148							147			
31				1.0	142			145			144				143				
32				1.1	141									140					
33				1.25	139		138	137				136							

TEST RUN NUMBERS

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

COEFFICENTS — IDVAR (1) — IDVAR (2) — NDV

α OR β SCHEDULES

TABLE 2. (Continued)

TEST : AEDC SF172/TF360 | DATA SET/RUN NUMBER COLLATION SUMMARY | DATE : 01-20-76

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS φ	PARAMETERS F.P.	MACH	CRT (OR ALTERNATE INDEPENDENT VARIABLE) 0.01	1	2	3	4	6	6.5	12	25	37.5	50	100
RXEΔ*02	B	A	0	0	-	0.2	128								129		130	133
03		A				0.4	134							135		136		
04		B				1.0	137					138						
05						1.25	139			140	141	142		143				
06						1.5	144		145	146	147	148		149				
07						1.7	45*		46*	47*	48*	49*						
08						2.0	56*		57*		58*	59*						
09	BF1	A			3	0.2	103								104		105	107
11		A				0.4	109							110		111		
12		B				1.0	112					113						
13						1.25	114			115	116	117		118				
14						1.50	119		120	121	123	122	124	125				
15						1.7	18*		19*	22*	20*	21*						
16						2.0	30*		31*		32*	33*		34*				
17		A				2.3	36*		37*		38*	39*		40*				
18	BF2	A				0.2	172					173		174	175		176	177
19	BF2	B				0.4	168					169		170		171		

TEST RUN NUMBERS

*Δ=0 DATA	CN	CLM	CY	CYN	CBL	CA	PB/P1			CRT	ALPHA	7
Δ=1 DATA	CNF1	CNF2	CNF3	CNF4	XCPF1	XCPF2	XCPF3	XCPF4		CRT	ALPHA	8
Δ=2 DATA	CLMH1	CLMH2	CLMH3	CLMH4	CLMR1	CLMR2	CLMR3	CLMR4		CRT	ALPHA	8

TYPE OF DATA α OR β SCHEDULES — COEFFICIENT SCHEDULES — IDVAR(1) IDVAR(2) NDV

α (A) = -4,-3,-2,-1.5,-1,-0.5,0,0.5,1,1.5,2,3,4,5,7,9,11

α (B) = -4,-3,-2,-1.5,-1,-0.5,0,0.5,1,1.5,2,3,4 *SF172

TABLE 2. (Continued)

TEST : AEDC SF172/TF360 — DATA SET/RUN NUMBER COLLATION SUMMARY — DATE : 01-20-76

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS φ	PARAMETERS F.P	PARAMETERS MACH	CRT (OR ALTERNATE INDEPENDENT VARIABLE) 0.01	1	2	3	4	6	6.5	12	25	37.5	50	100	TEST RUN NUMBERS
RXEΔ*20	BF2	B	0	0	3	1.0	152					153							
21						1.25	154	155	156	157	158	159		160					
22						1.5	161	162	163	164	165	166		167					
23		A				0.2											131		
24																	132		
25																	108	106	

*Δ=0 DATA	CN	CLM	CY	CYN	CBL	CA	PB/P1				CRT	ALPHA	7
Δ=1 DATA	CNF1	CNF2	CNF3	CNF4	XCPF1	XCPF2	XCPF3	XCPF4			CRT	ALPHA	8
Δ=2 DATA	CLMH1	CLMH2	CLMH3	CLMH4	CLR1	CLMR2	CLMR3	CLMR4			CRT	ALPHA	8

TYPE OF DATA α OR β SCHEDULES — COEFFICIENT SCHEDULES — IDVAR (1) — IDVAR (2) — NDV

α decreasing for runs 106, 108, 131, 132

TABLE 2. (Continued)

TEST: CAL T17-123 — DATA SET/RUN NUMBER COLLATION SUMMARY — DATE: 06-13-74

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES φ	PARAMETERS/VALUES F.P.	PARAMETERS/VALUES MACH	NO. OF RUNS	CRT (OR ALTERNATE INDEPENDENT VARIABLE) 0	2.5	4.2	6.0	7.2	8.5	10.3	12.0	20	37.5	TEST RUN NUMBERS
RX8Δ*02	B	A	0	0		0.4	1								9			
03		B				0.4	2	10			11							
04		A				0.7	3			13				15				
05		B				0.7	2	12			14							
06		A				0.9	1						18					
07		B				0.9	2	16			17							
08		B				1.0	2	28			24							
09		A				1.2	4		26	25		21		20				
10		B				1.2	2	27			23							
11		A				1.25	1				22							
13	BF2	A	0	45	3	0.7	5	48		49	50			51		52		
14				0		0.9	4	47		46	45		44					
15				0		1.0	5	43	42	41	40	39						
16				0		1.2	4	38	37	36	35							
17				45		0.9	2	58			53							
18				45		1.0	2	57			54							
19				45		1.2	2	56			55							

Δ=0 DATA	CN	CLM	CNT1	CNT2	CNT3	CNT4	PB1/P	PB2/P	CA	CRT	ALPHA	9
Δ=1 DATA	CY	CYN	CBL	PL	WA					CRT	ALPHA	5
Δ=2 DATA	CLMH1	CLMH2	CLMH3	CLMH4	CLMR1	CLMR2	CLMR3	CLMR4	CPXT1	CPYT1	CRT	ALPHA	10

TYPE OF DATA α OR β SCHEDULES

COEFFICIENT SCHEDULES

αA=-4, -2, -1, -1/2, 0, 1/2, 1, 2, 4

αB=-4, -2, -1, -1/2, 0, 1/2, 2, 3, 4,6,8,10,12

IDVAR (1) IDVAR (2) NDV

F.P. = FIN POSITION CODE: 1 = AFT

2 = MID, 3 = FWD

TABLE 2. (Continued)

TEST: CAL T17-123 — DATA SET/RUN NUMBER COLLATION SUMMARY — DATE: 06-13-74

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES φ	PARAMETERS/VALUES F.P.	PARAMETERS/VALUES MACH	NO. OF RUNS	CRT (OR ALTERNATE INDEPENDENT VARIABLE) 0	2.5	4.2	6.0	7.2	8.5	10.3	12.0	20	37.5	TEST RUN NUMBERS
RX8Δ*20	BF3	A	0	0	3	0.4	4	92			91				90		71	
21						0.7	5	89		88	87			86		68		
22						0.9	5	85		84	83		73		69			
23						1.0	6	82	81	80	79	74		70				
24						1.2	5	78	77	76	75	72						
25	BF4	A	0		3	0.7	3	96			94			95				
26						0.9	3	105			104		103					
27						1.0	3	100		102	101							
28						1.2	3	99		98	97							
29				45		0.9	2	109			108							
30						1.0	2	110			107							
31						1.2	2	111			106							
32	BF1	A	0	0	3	0.4	2	132			134						133	
33						0.7	3	131		130	129							
34						0.9	3	126		128	127							
35						1.0	5	125	124	123	122	121						
36						1.2	5	117	120	119	118	116						

Δ=0 DATA	CN	CLM	CNT1	CNT2	CNT3	CNT4	PB1/P	PB2/P	CA	CRT	ALPHA	9		
Δ=1 DATA	CY	CYN	CBL	PL	WA					CRT	ALPHA	5		
Δ=2 DATA	CLMH1	CLMH2	CLMH3	CLMH4	CLMR1	CLMR2	CLMR3	CLMR4	CPXT1	CPYT1	CRT	ALPHA	10	

TYPE OF DATA α OR β SCHEDULES

COEFFICIENT SCHEDULES

αA=-4, -2, -1, -1/2, 0, 1/2, 1, 2, 4

αB=-4, -2, -1, -1/2, 0, 1/2, 2, 3, 4,6,8,10,12

IDVAR (1) IDVAR (2) NDV

F.P. = FIN POSITION CODE: 1 = AFT, 2 = MID, 3 = FWD

TABLE 2. (Continued)

TEST: CAL T17-123 — DATA SET/RUN NUMBER COLLATION SUMMARY — DATE: 06-13-74

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES φ	PARAMETERS/VALUES F.P.	PARAMETERS/VALUES MACH	NO. OF RUNS	CRT (OR ALTERNATE INDERENDENT VARIABLE) 0	2.5	4.2	6.0	7.2	8.5	10.3	12.0	20	37.5
RX84*37	BF1	A	0	0	3	1.25	2			114	113						
38					3	1.25	1	115									
39					2	0.4	3	152			153						159
40						0.7	5	148		149	150			151		160	
41						0.9	4	144		145	146		147				
42						1.0	5	155	154	156	157	158					
43						1.2	5	139	143	142	141	140					
44						1.25	3	138		137	136						
45	BF2	A	0	0	2	0.7	5	166		165	164			163		162	
46						0.9	4	170		169	168		167				
47						1.0	5	174	173	175	172	171					
48						1.2	5	180	179	178	177	176					
49	BF4	A	0	0	2	0.7	3	213			214			215			
50						0.9	3	212			211		210				
51						1.0	3	209		208	207						
52						1.2	3	206		205	204						
53	BF3	A	0	0	2	0.4	3	182			183				184		

TEST RUN NUMBERS

Δ=0 DATA	CN	CLM	CNT1	CNT2	CNT3	CNT4	PB1/P	PB2/P	CA	CRT	ALPHA	9
Δ=1 DATA	CY	CYN	CBL	PL	WA					CRT	ALPHA	5
Δ=2 DATA	CLMH1	CLMH2	CLMH3	CLMH4	CLMR1	CLMR2	CLMR3	CLMR4	CPXT1	CPYT1	CRT	ALPHA	10

TYPE OF α OR β SCHEDULES

COEFFICIENT SCHEDULES

αA=-4, -2, -1, -1/2, 0, 1/2, 1, 2, 4

αB=-4, -2, -1, -1/2, 0, 1/2, 2, 3, 4,6,8,10,12

IDVAR (1) IDVAR (2) NDV

F.P. = FIN POSITION CODE: 1 = AFT

2 = MID, 3 = FWD

TABLE 2. (Continued)

TEST: CAL T17-123 — DATA SET/RUN NUMBER COLLATION SUMMARY — DATE: 06-13-74

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES φ	F.P.	MACH	NO. OF RUNS	CRT (OR ALTERNATE INDEPENDENT VARIABLE) 0	2.5	4.2	6.0	7.2	8.5	10.3	12.0	20	37.5
RX8Δ*54	BF3	A	0	0	2	0.7	4	185		186	187			188			
55						0.9	4	189		190	191		192				
56						1.0	5	193	194	195	196	197					
57						1.2	5	202	201	200	199	198					
58					1	0.4	4	235			236				237		238
59						0.7	4	217		218	219			220			
60						0.9	4	221		222	223		224				
61						1.0	5	225	226	227	228	229					
62						1.2	5	234	233	232	231	230					
63	BF4	A	0	0	1	0.7	3	251			250			249			
64						0.9	3	246			247		248				
65						1.0	3	245		244	243						
66						1.2	3	240		241	242						
67	BF2	A	0	0	1	0.7	5	273		272	271			270		253	
68						0.9	5	266		269	268		267		254		
69						1.0	6	265	259	258	257	256		255			
70						1.2	5	264	263	262	261	260					

TEST RUN NUMBERS

Δ=0 DATA, CN	CLM	CNT1	CNT2	CNT3	CNT4	PB1/P	PB2/P	CA	CRT	ALPHA	9
Δ=1 DATA, CY	CYN	CBL	PL	WA					CRT	ALPHA	5
Δ=2 DATA, CLMH1	CLMH2	CLMH3	CLMH4	CLMR1	CLMR2	CLMR3	CLMR4	CPXT1	CPYT1	CRT	ALPHA	10

TYPE OF DATA α OR β SCHEDULES — COEFFICIENT SCHEDULES: αA=-4, -2, -1, -1/2, 0, 1/2, 1, 2, 4

αB=-4, -2, -1, -1/2, 0, 1/2, 2, 3, 4,6,8,10,12

IDVAR(1) IDVAR(2) NDV

F.P. = FIN POSITION CODE: 1 = AFT, 2 = MID, 3 = FWD

TABLE 2. (Concluded)

TEST: CAL T17-123 — DATA SET/RUN NUMBER COLLATION SUMMARY — DATE: 06-13-74

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES φ	F.P.	MACH	NO. OF RUNS	CRT (OR ALTERNATE INDEPENDENT VARIABLE) 0	2.5	4.2	6.0	7.2	8.5	10.3	12.0	20	37.5
RX8Δ*71	BF2	A	0	180	3	0.7	1	66									
72						0.9	1	65									
73						1.0	1	64									
74						1.2	1	63									

TEST RUN NUMBERS

Δ=0 DATA	CN	CLM	CNT1	CNT2	CNT3	CNT4	PB1/P	PB2/P	CA	CRT	ALPHA	9
Δ=1 DATA	CY	CYN	CBL	PL	WA					CRT	ALPHA	5
Δ=2 DATA	CLMH1	CLMH2	CLMH3	CLMH4	CLMR1	CLMR2	CLMR3	CLMR4	CPXT1	CPYT1	CRT	ALPHA	10

TYPE OF DATA α OR β SCHEDULES

COEFFICIENT SCHEDULES

αA=-4, -2, -1, -1/2, 0, 1/2, 1, 2, 4

αB=-4, -2, -1, -1/2, 0, 1/2, 2, 3, 4,6,8,10,12

IDVAR(1) IDVAR(2) NDV

F.P. = FIN POSITION CODE: 1 = AFT

2 = MID, 3 = FWD

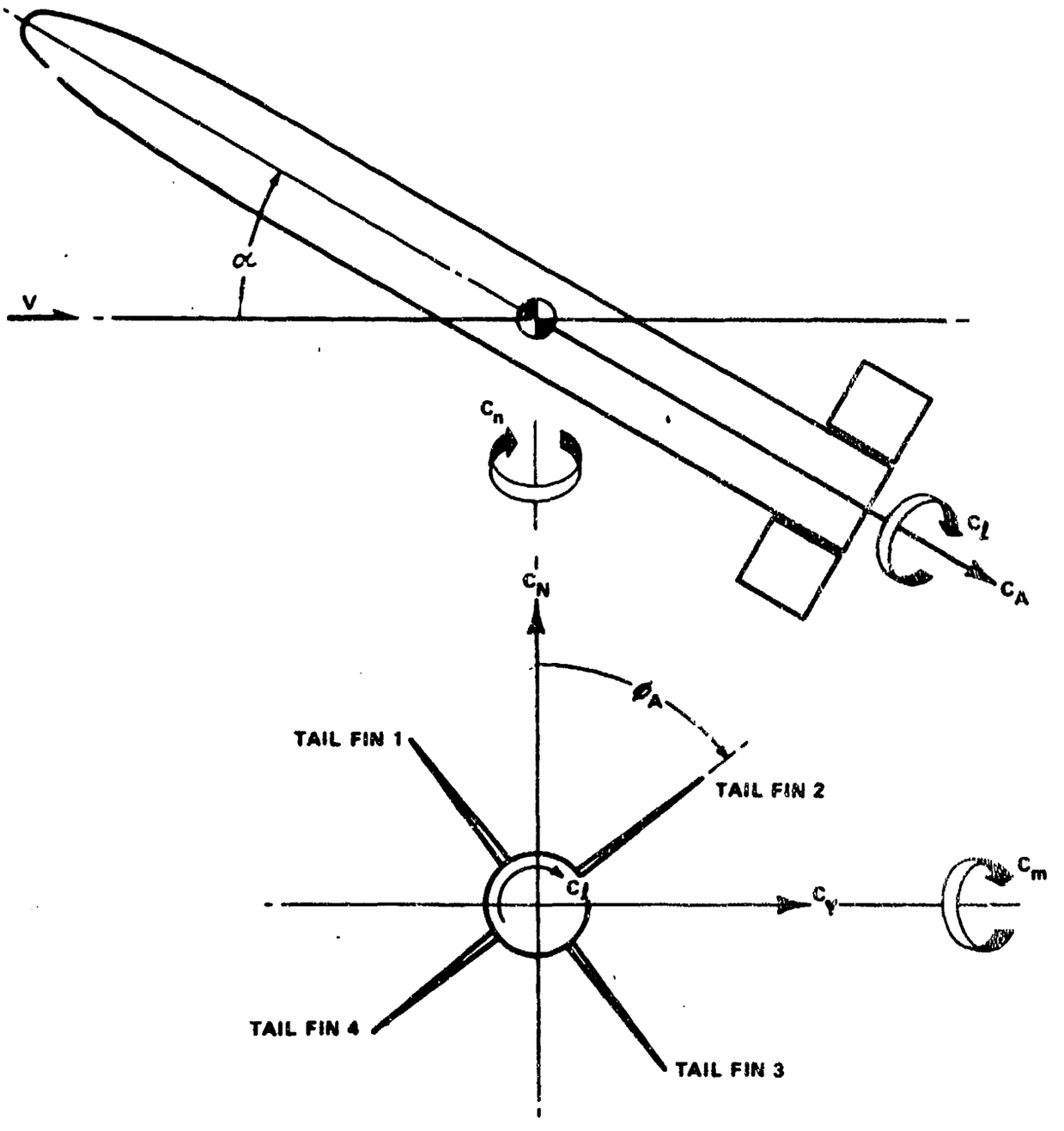
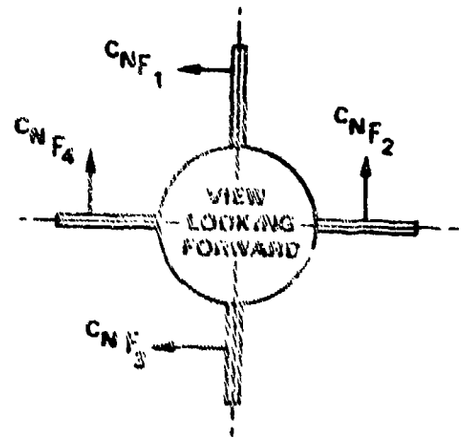


FIGURE 1. AXIS SYSTEMS AND POSITIVE SIGN CONVENTION, BODY AXIS SYSTEM



TAIL FINS

HINGE LINE LOCATION	
FINS	DIMENSION "a"
F_1	2.750
F_2, F_3, F_4	0.750

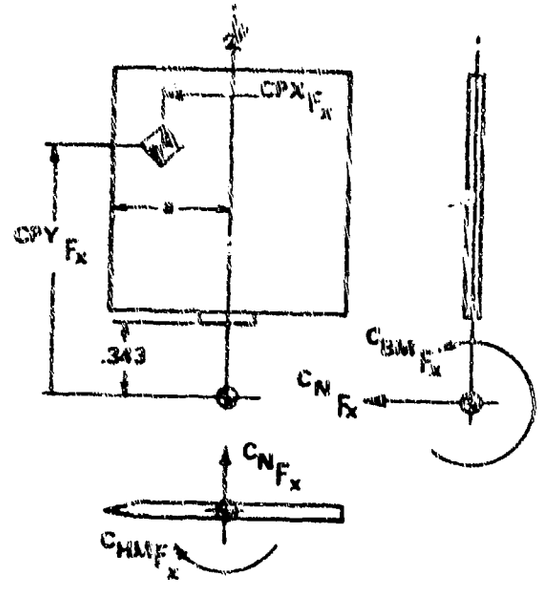


FIGURE 2. TAIL FIN AXIS SYSTEMS, POSITIVE SIGN CONVENTION AND CENTER OF PRESSURE LOCATION

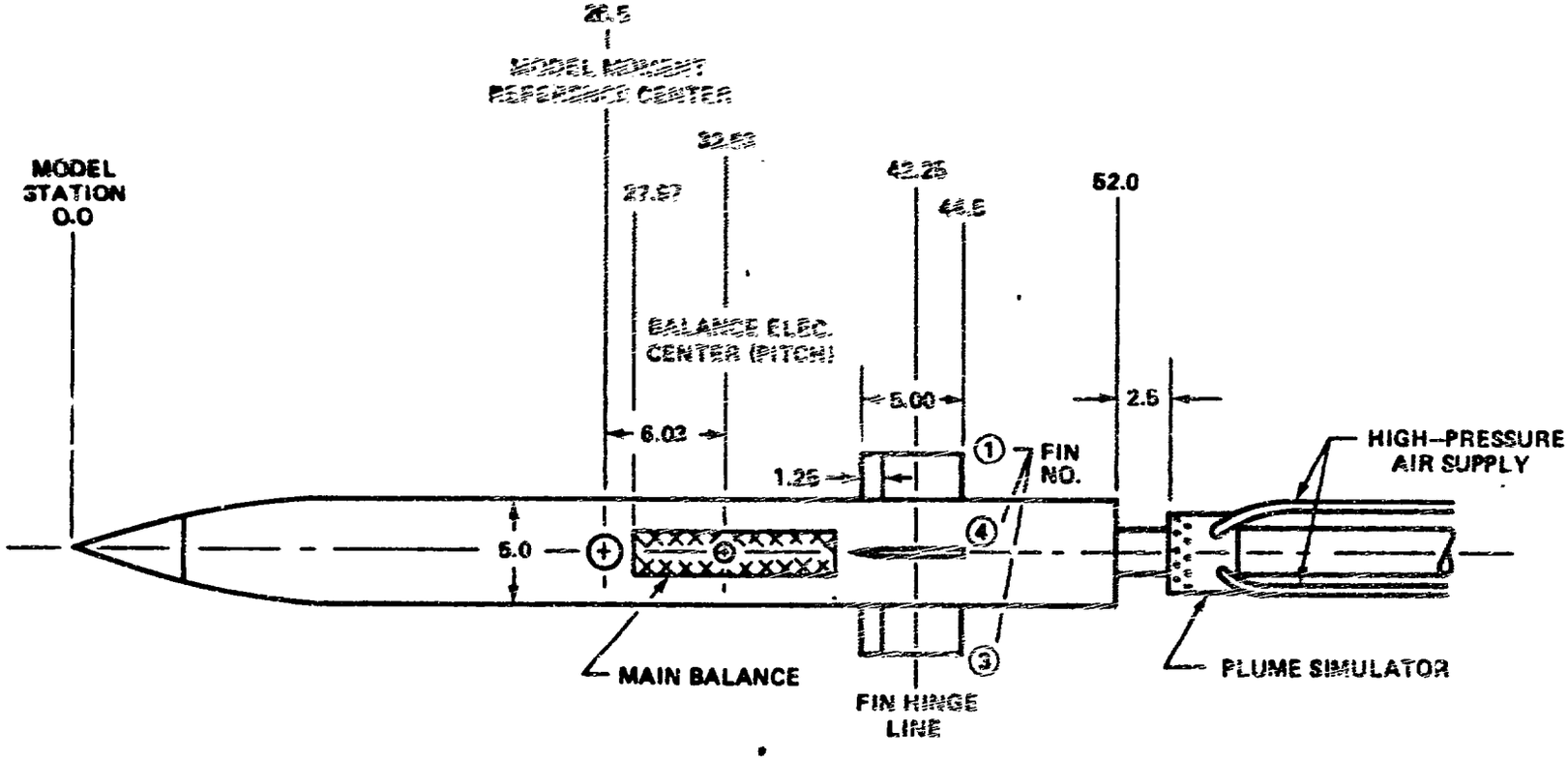


Figure 3 - Model General Layout

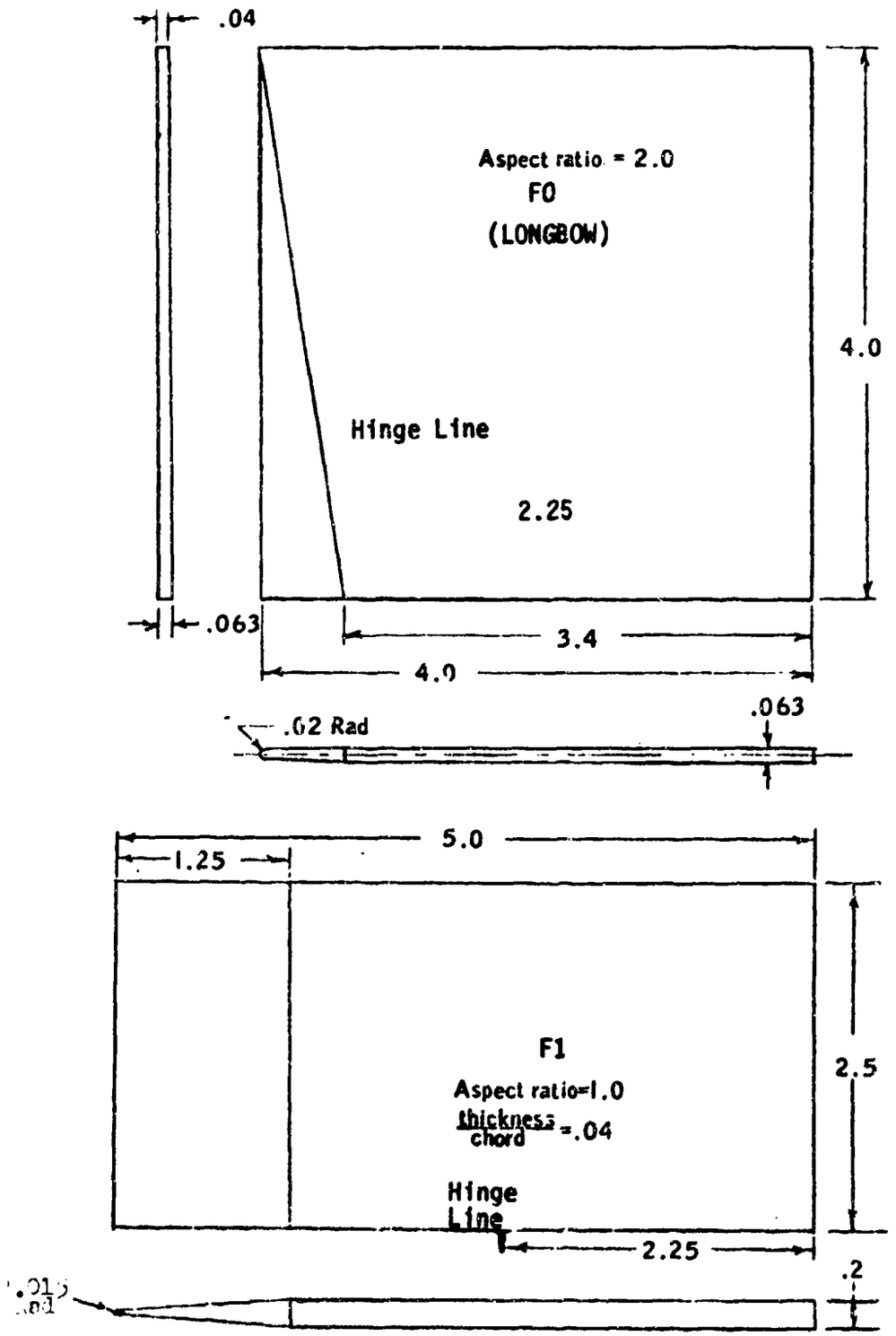


Figure 4. - Fin Configuration

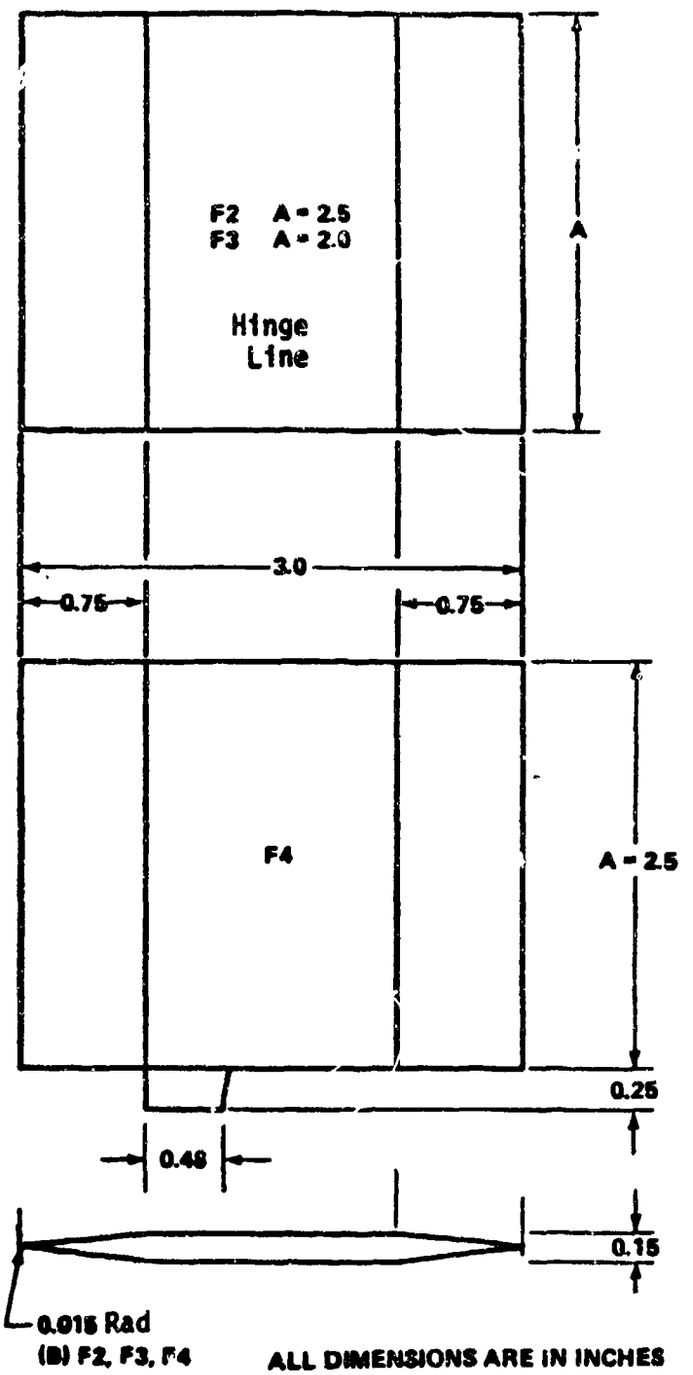


FIGURE 4. Concluded

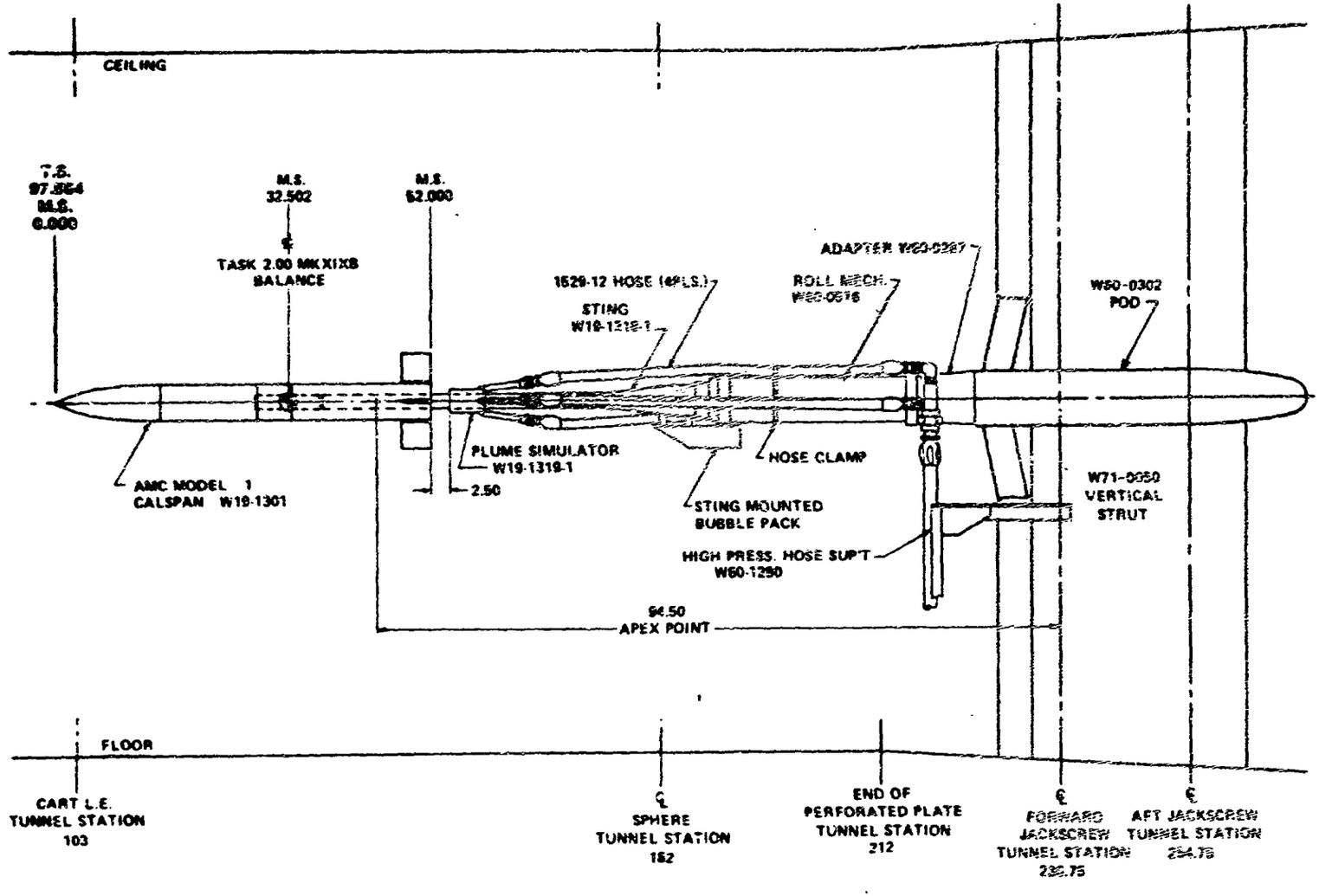


FIGURE 5a.INSTALLATION DRAWING (Calspan 8 Ft. Transonic Tunnel)

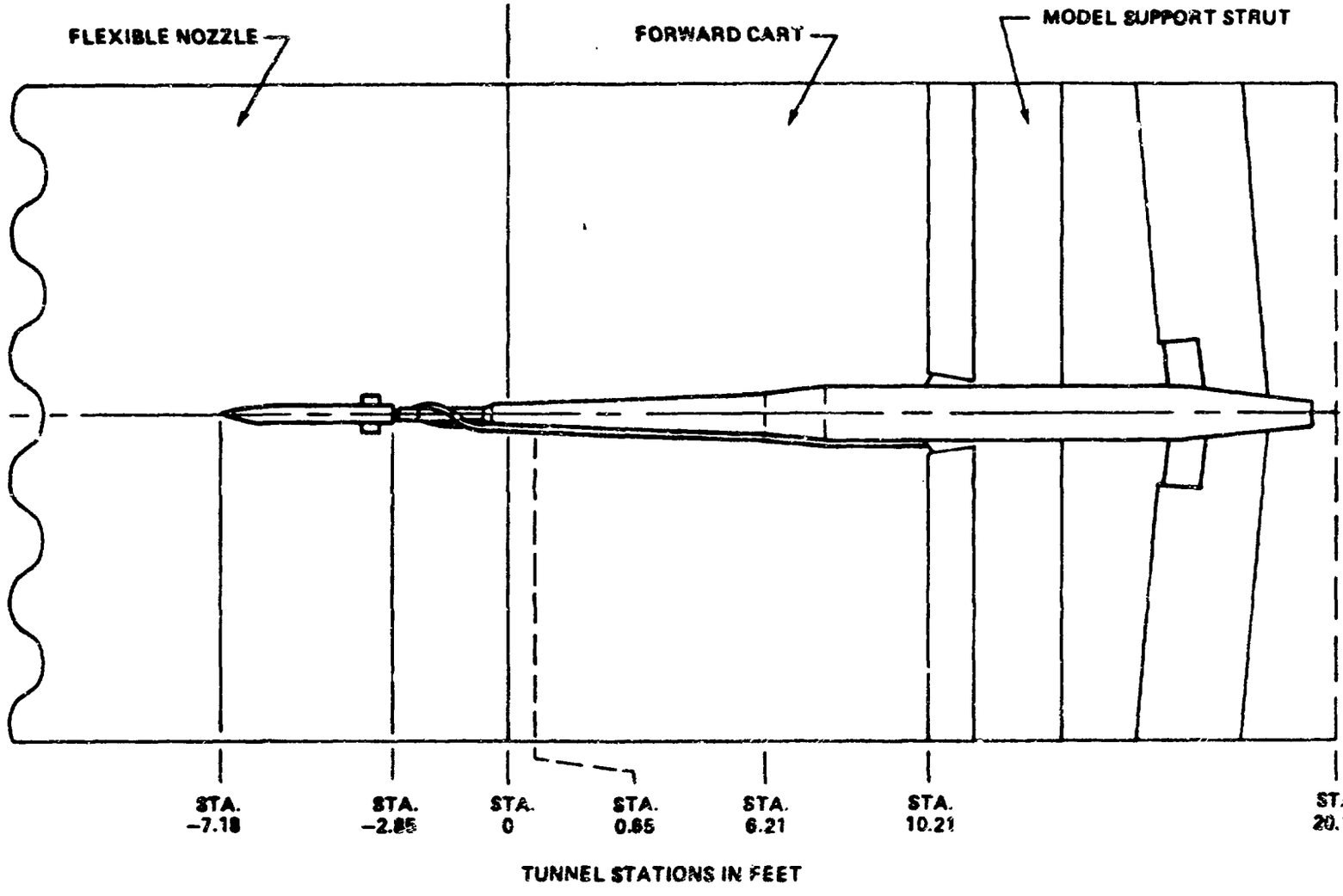


Figure 5b. Installation Drawing (AEDC PWT, 16S)

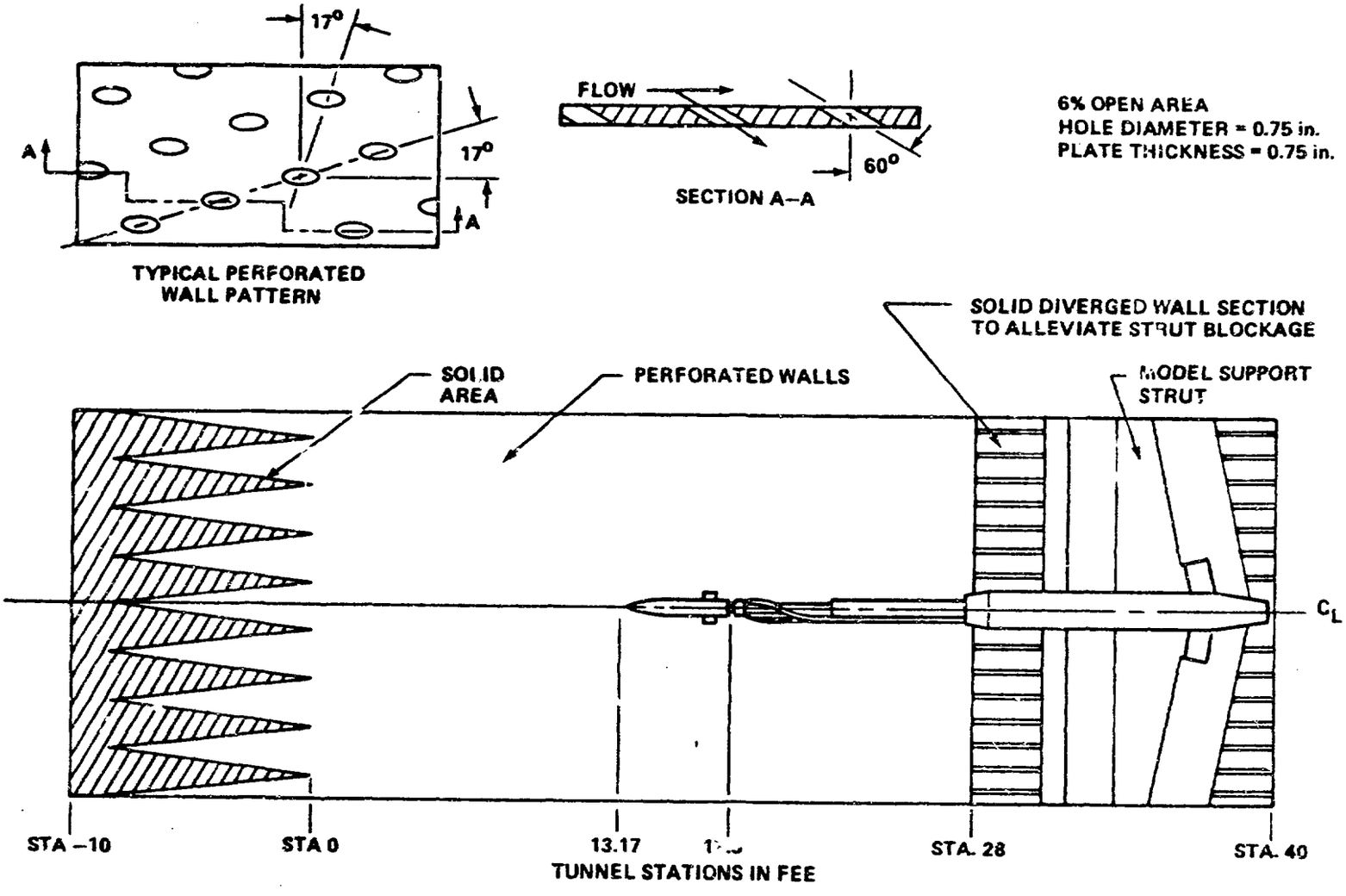


Figure 5c. Installation Drawing
(AEDC PWT, 16T)

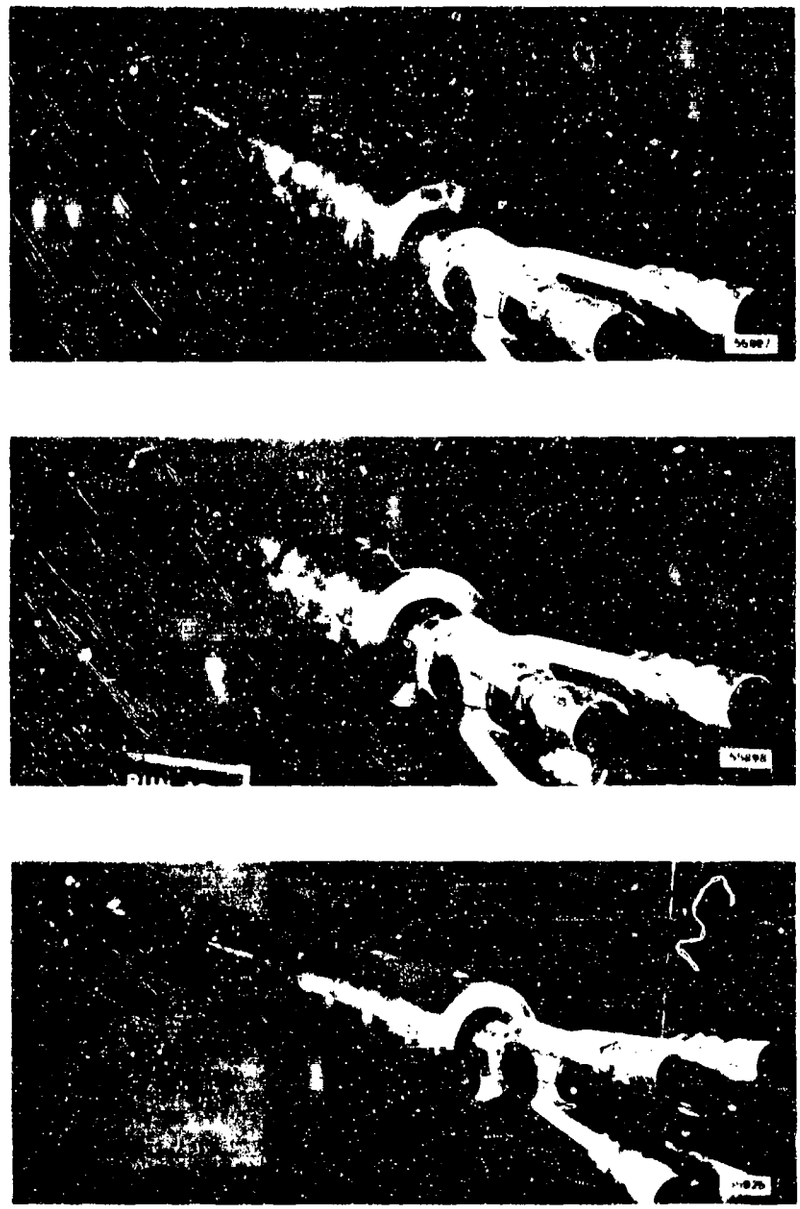


Figure 6. - Photograph of Body and FO Fins of LONGBOW at Three Tail Positions in the Calspan 8 Ft. Transonic Tunnel

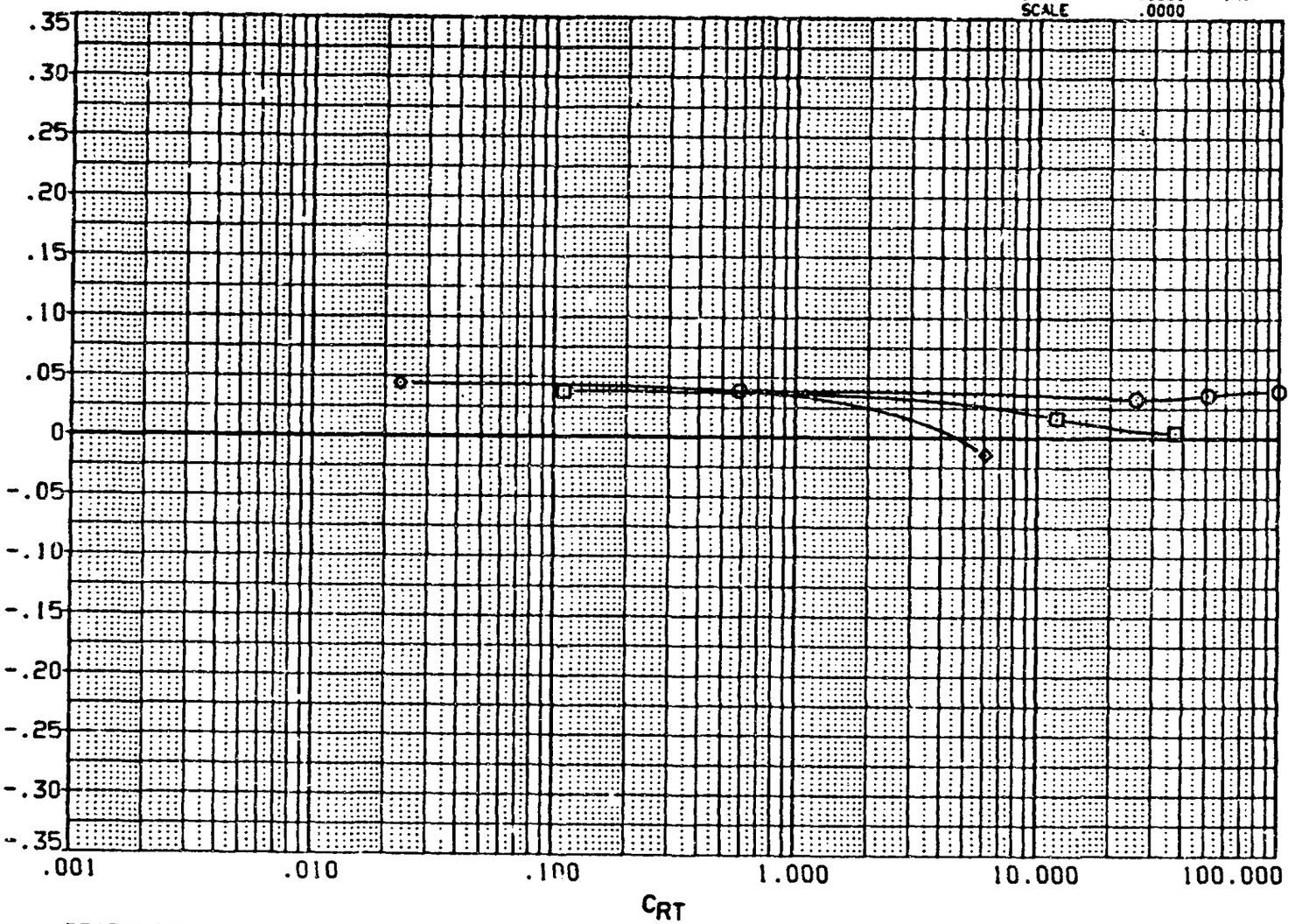
PLOTTED DATA

Tabulations of the plotted data and corresponding source data are available from Data Management Services.

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH
(RXE002)	○	AEDC TF360 BODY ALONE,B	.200
(RXE003)	□	AEDC TF360 BODY ALONE,B	.400
(RXE004)	◇	AEDC TF360 BODY ALONE,B	1.000

REFERENCE INFORMATION

SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



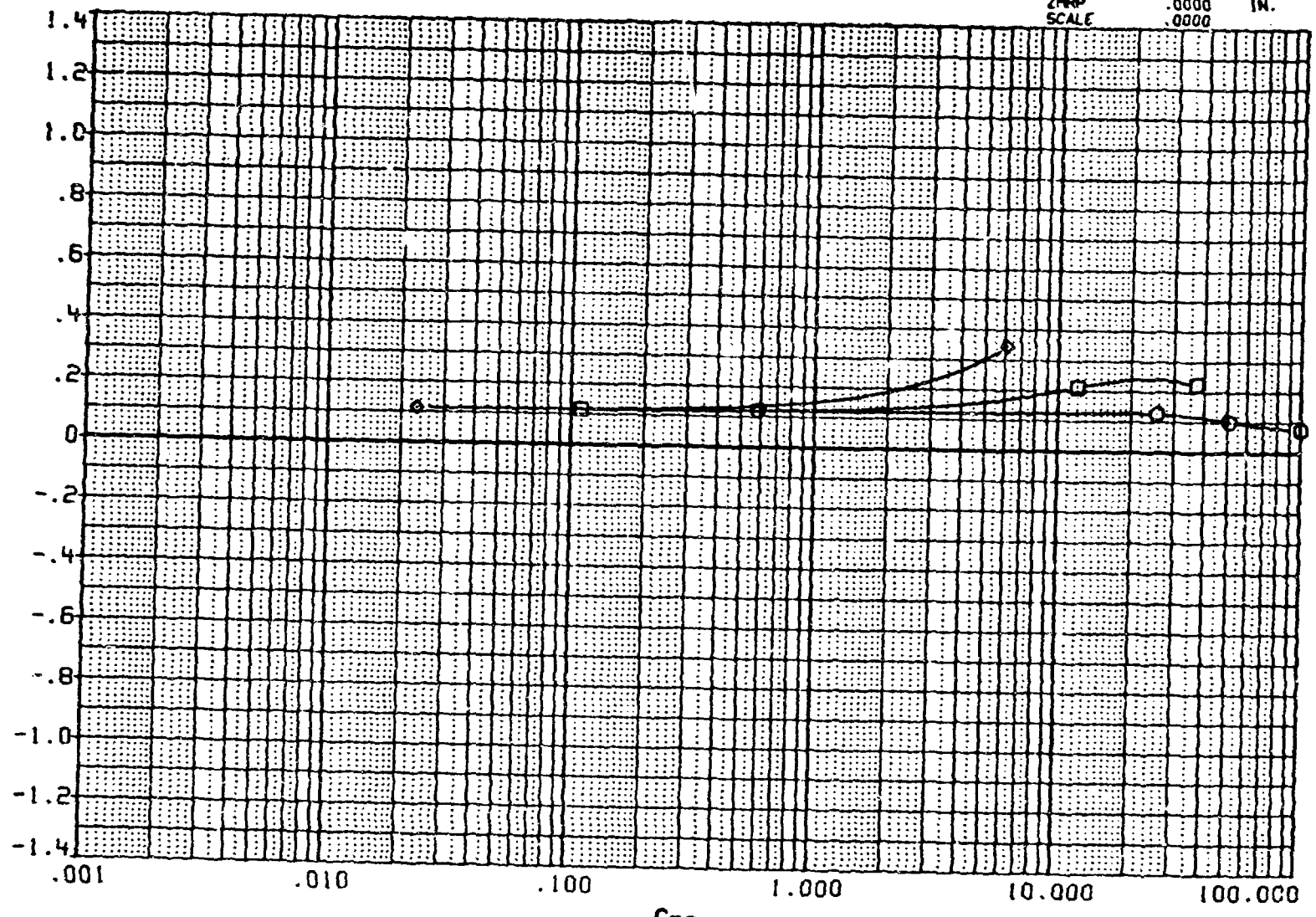
STABILITY VARIATION DUE TO PLUME EFFECTS, BODY ALONE

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(RXE002)	○	AEDC TF360 BODY ALONE.B
(RXE003)	□	AEDC TF360 BODY ALONE.B
(RXE004)	◇	AEDC TF360 BODY ALONE.B

MACH
.200
.400
1.000

REFERENCE INFORMATION

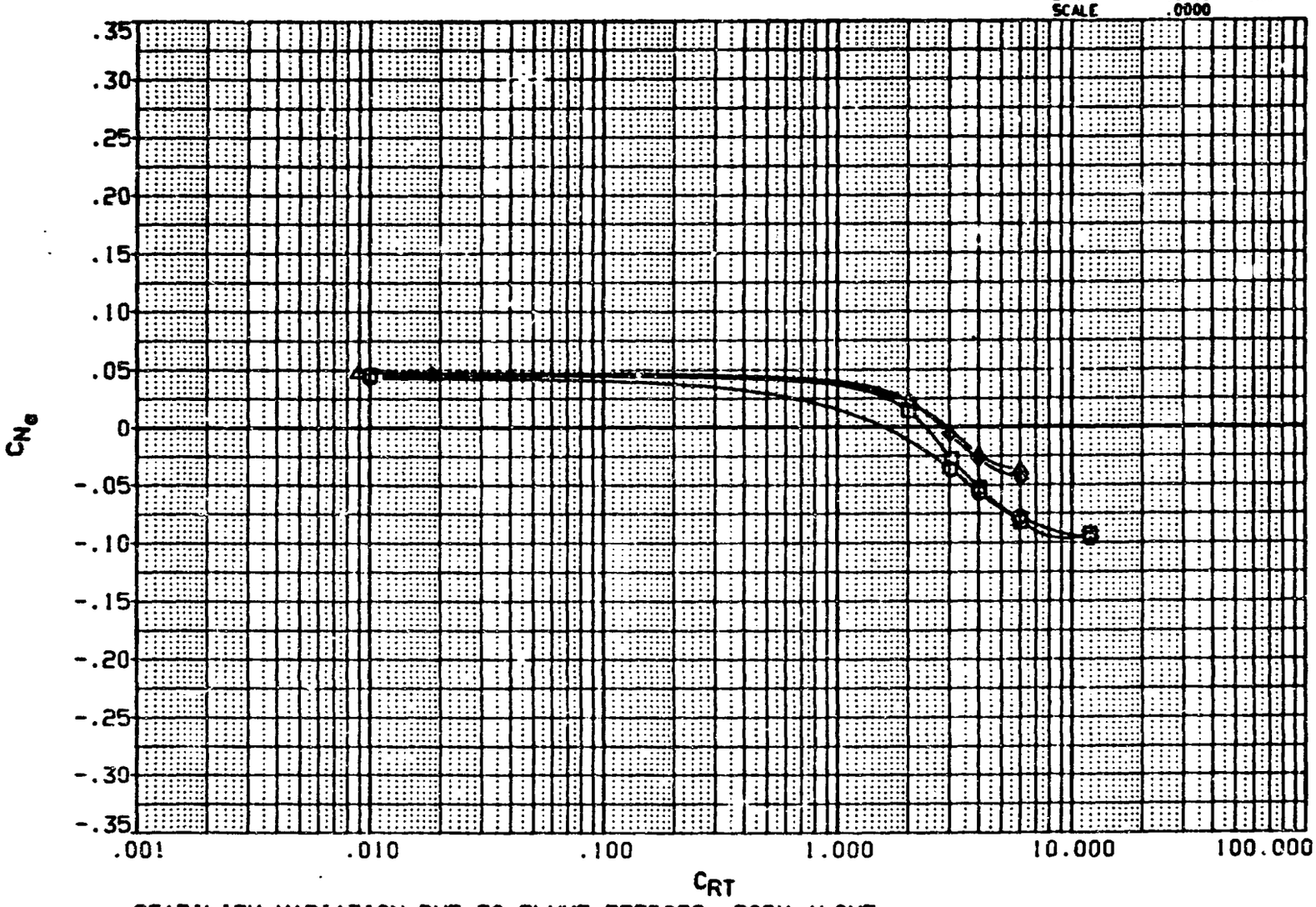
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY ALONE

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH
(RUE005)	○	AEDC TF360 BODY ALONE.B	1.250
(RUE006)	□	AEDC TF360 BODY ALONE.B	1.500
(RUE007)	◇	AEDC SF172 BODY ALONE.B	1.700
(RUE008)	△	AEDC SF172 BODY ALONE.B	2.000

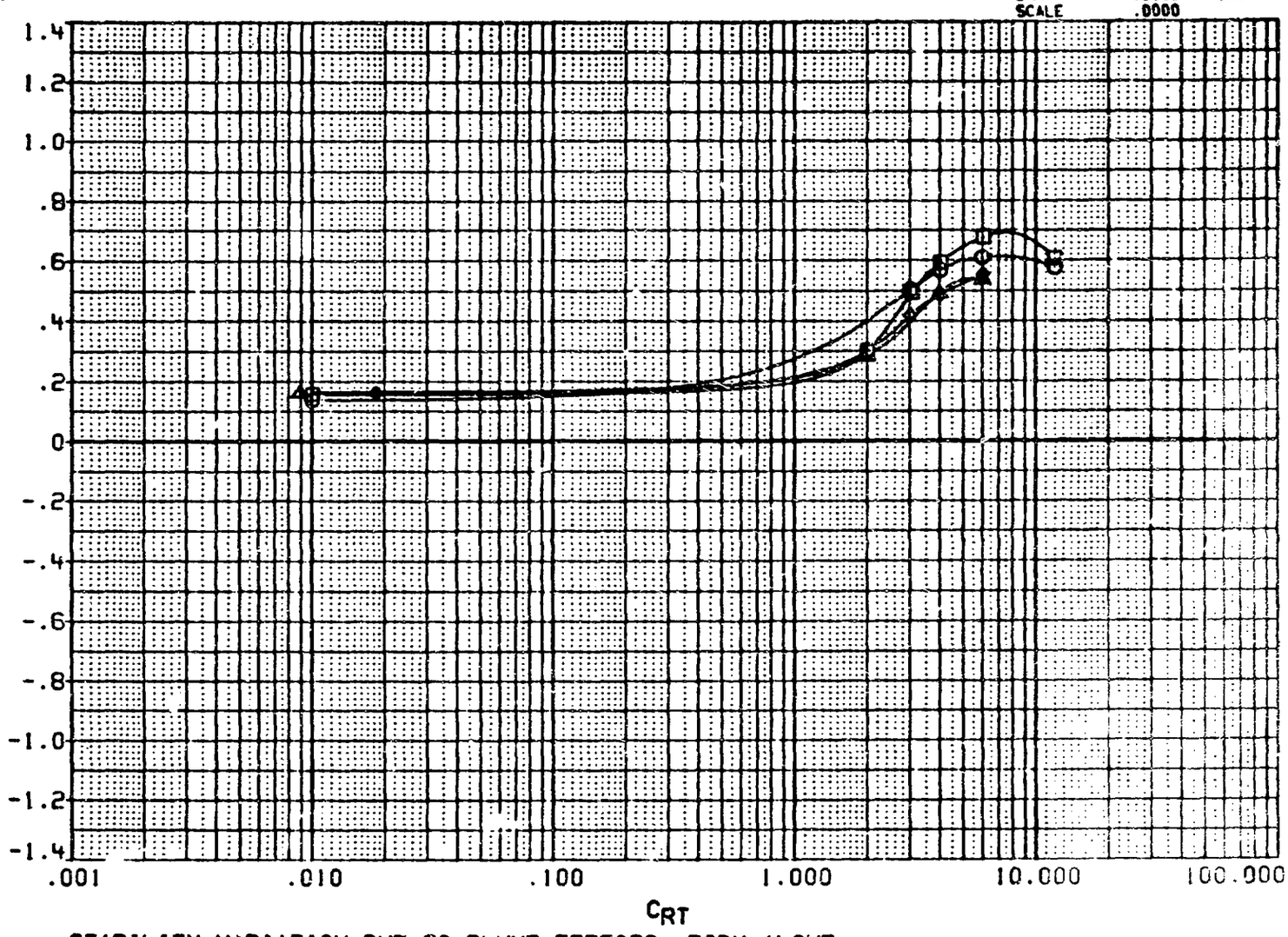
REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY ALONE

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH
(R0E005)	○	AEDC TF360 BODY ALONE,B	1.250
(R0E006)	□	AEDC TF360 BODY ALONE,B	1.500
(R0E007)	◇	AEDC SF172 BODY ALONE,B	1.700
(R0E008)	△	AEDC SF172 BODY ALONE,B	2.000

REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

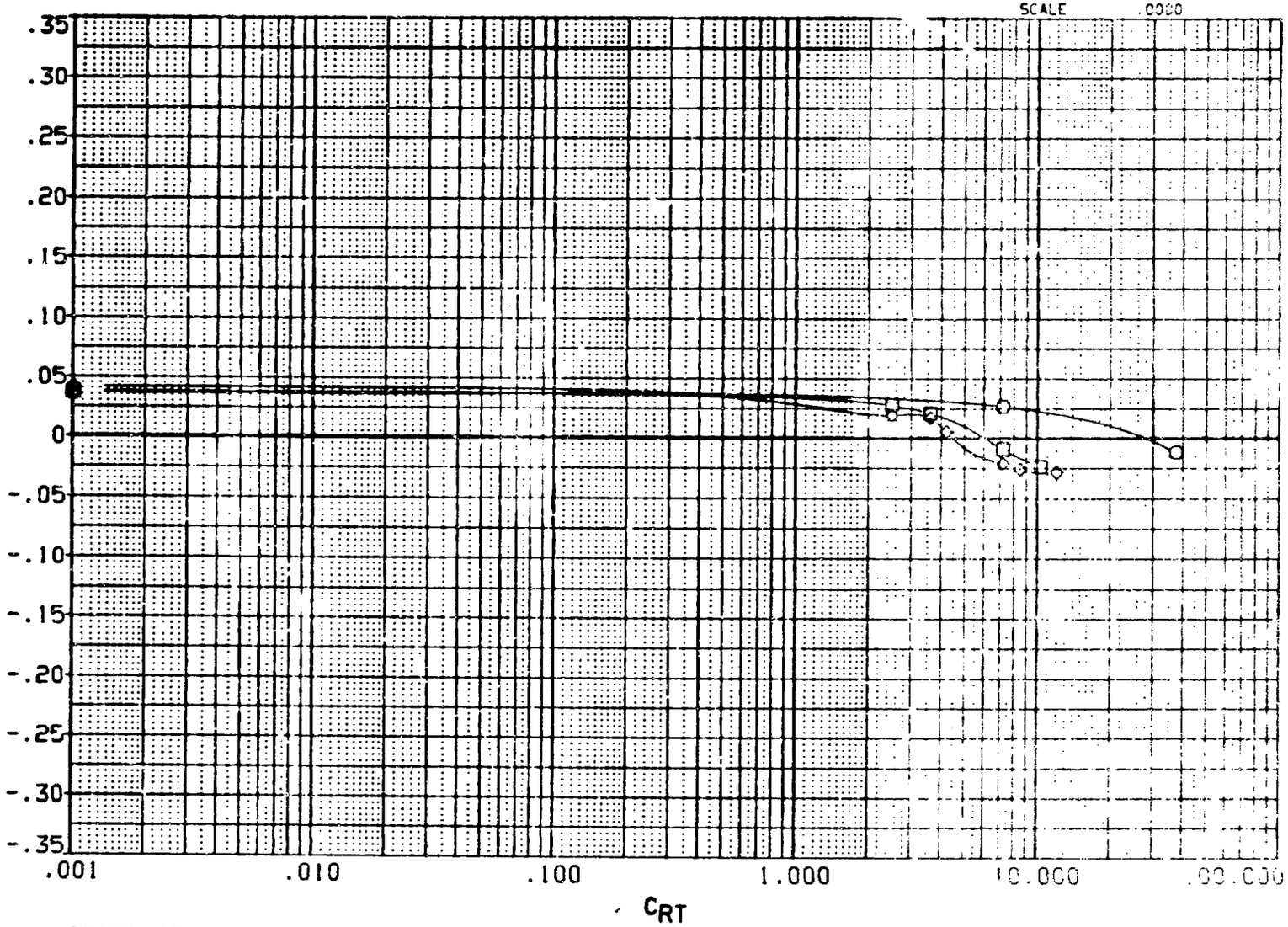


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY ALONE

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH
(BUE001)	○	CAL T17-093 THRUST EFFECTS, BODY ALONE, B	.402
(BUE002)	□	CAL T17-093 THRUST EFFECTS, BODY ALONE, B	.801
(BUE003)	◇	CAL T17-093 THRUST EFFECTS, BODY ALONE, B	.897

REFERENCE INFORMATION

SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	25.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

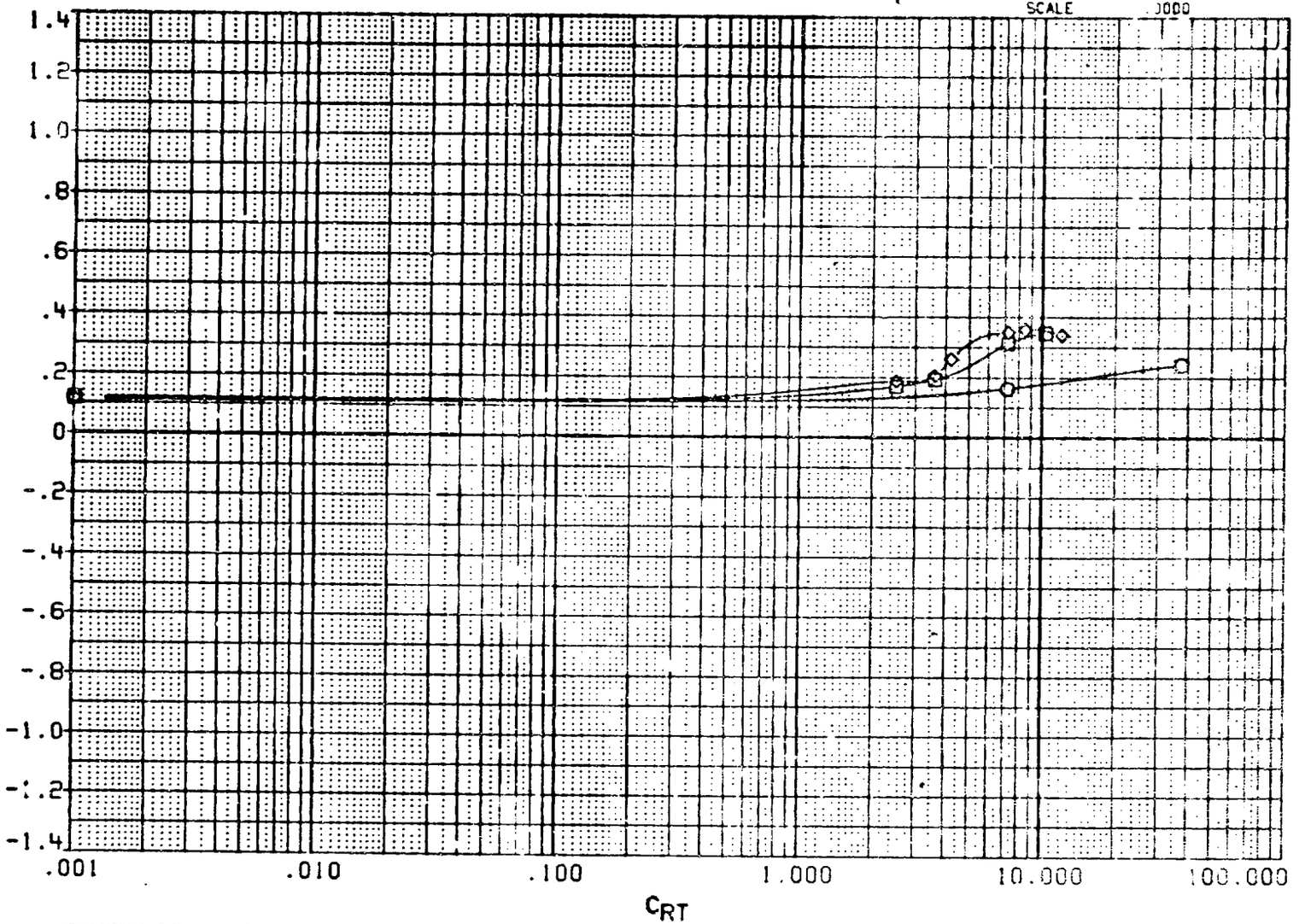


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY ALONE

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH
(BUE001)	○	CAL T17-093 THRUST EFFECTS, BODY ALONE, B	.402
(BUE002)	□	CAL T17-093 THRUST EFFECTS, BODY ALONE, B	.801
(BUE003)	◇	CAL T17-093 THRUST EFFECTS, BODY ALONE, B	.897

REFERENCE INFORMATION

SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

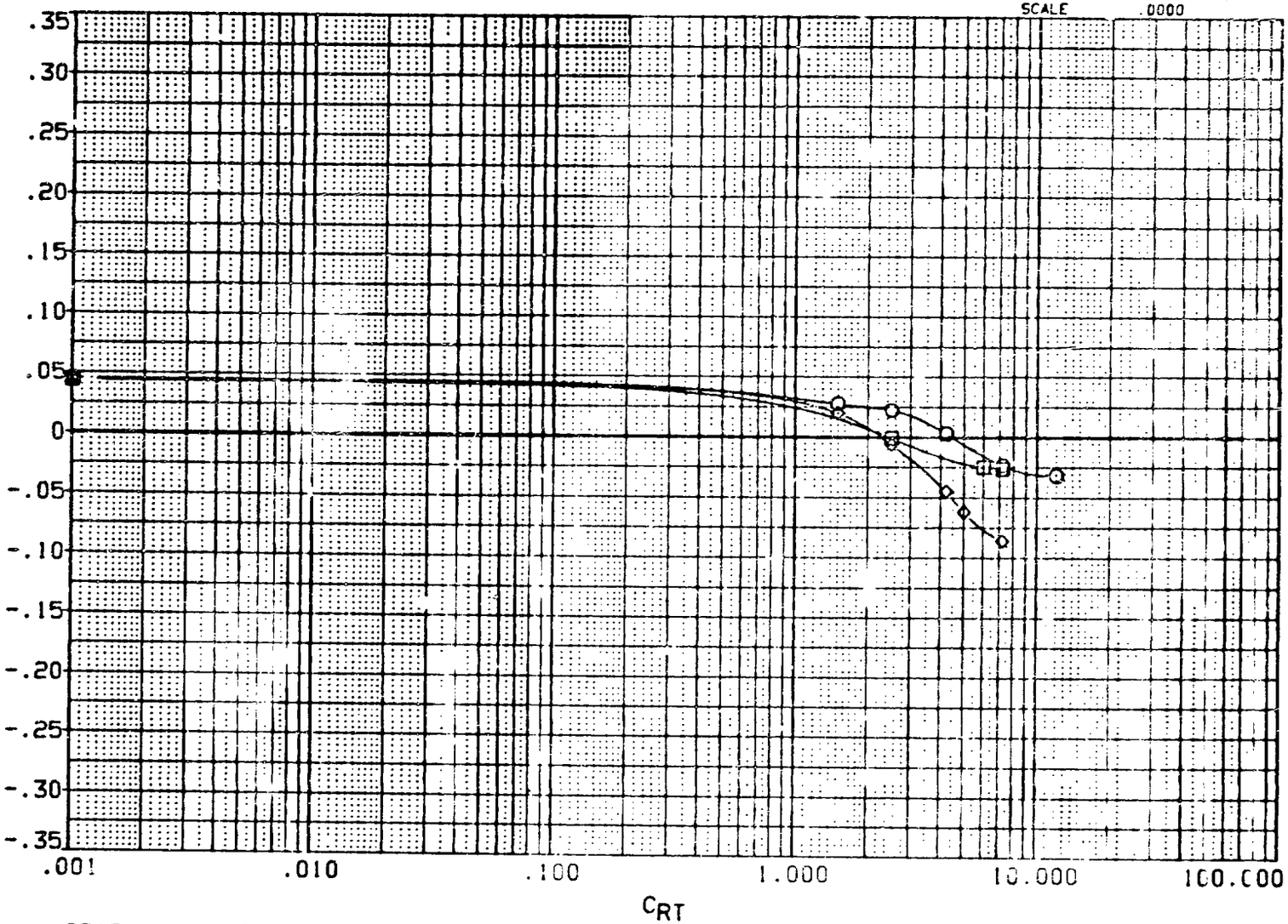


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY ALONE

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH
(BUE004)	○	CAL T17-093 THRUST EFFECTS, BODY ALONE, B	.999
(BUE005)	□	CAL T17-093 THRUST EFFECTS, BODY ALONE, B	1.099
(BUE006)	◇	CAL T17-093 THRUST EFFECTS, BODY ALONE, B	1.251

REFERENCE INFORMATION

SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

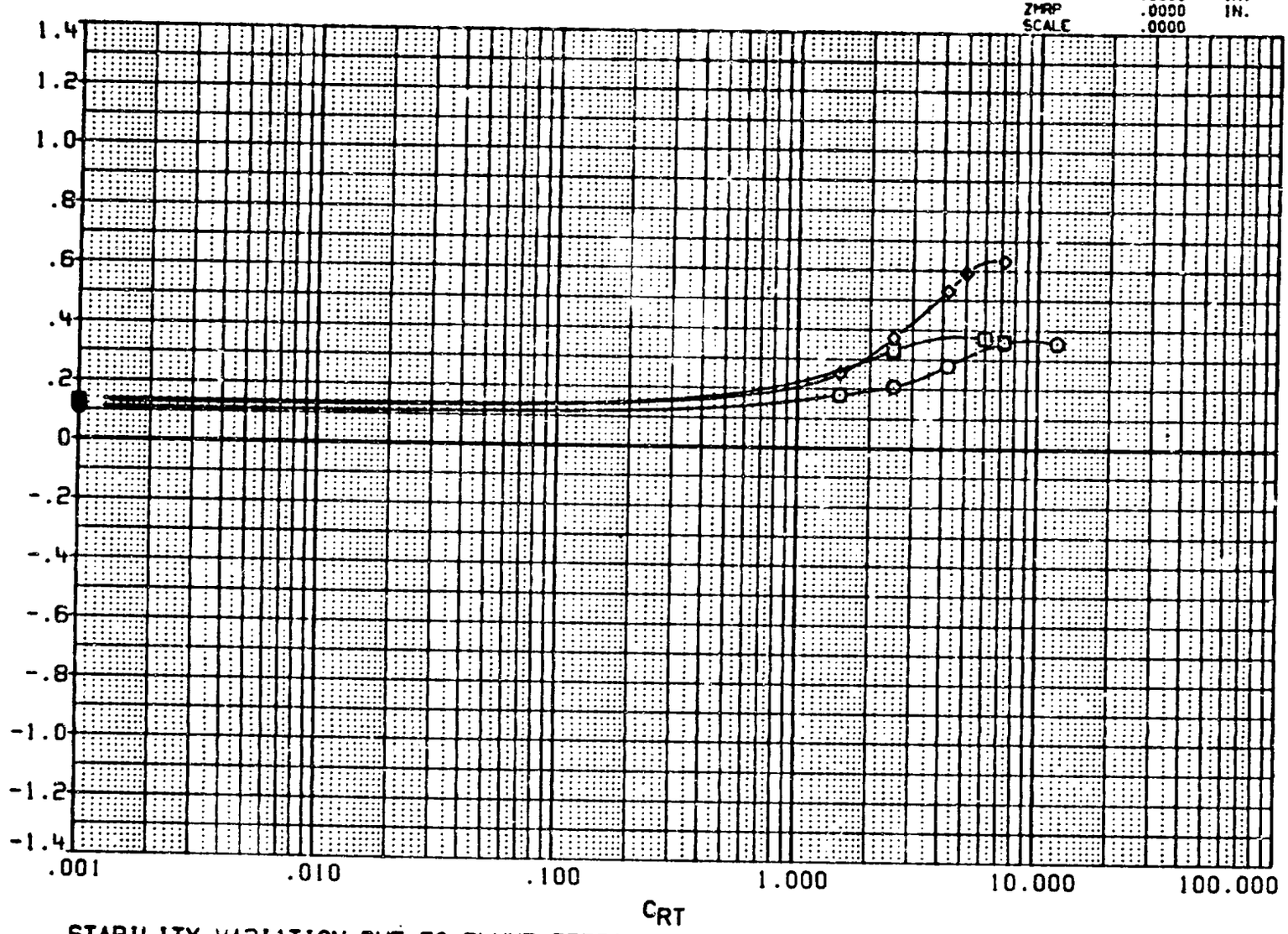


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY ALONE

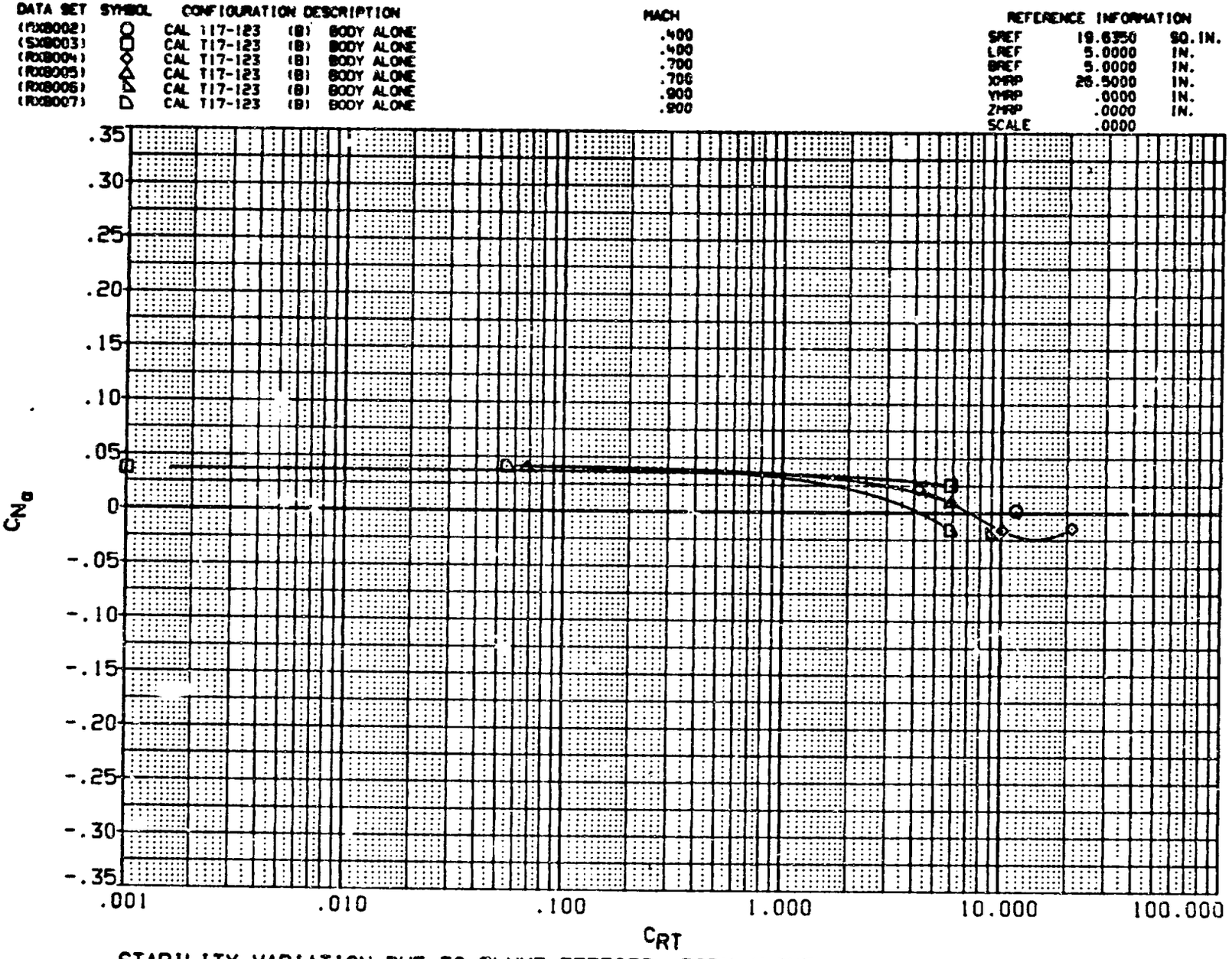
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH
(BUE004)	○	CAL T17-093 THRUST EFFECTS, BODY ALONE, B	.999
(BUE005)	□	CAL T17-093 THRUST EFFECTS, BODY ALONE, B	1.099
(BUE006)	◇	CAL T17-093 THRUST EFFECTS, BODY ALONE, B	1.251

REFERENCE INFORMATION

SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY ALONE

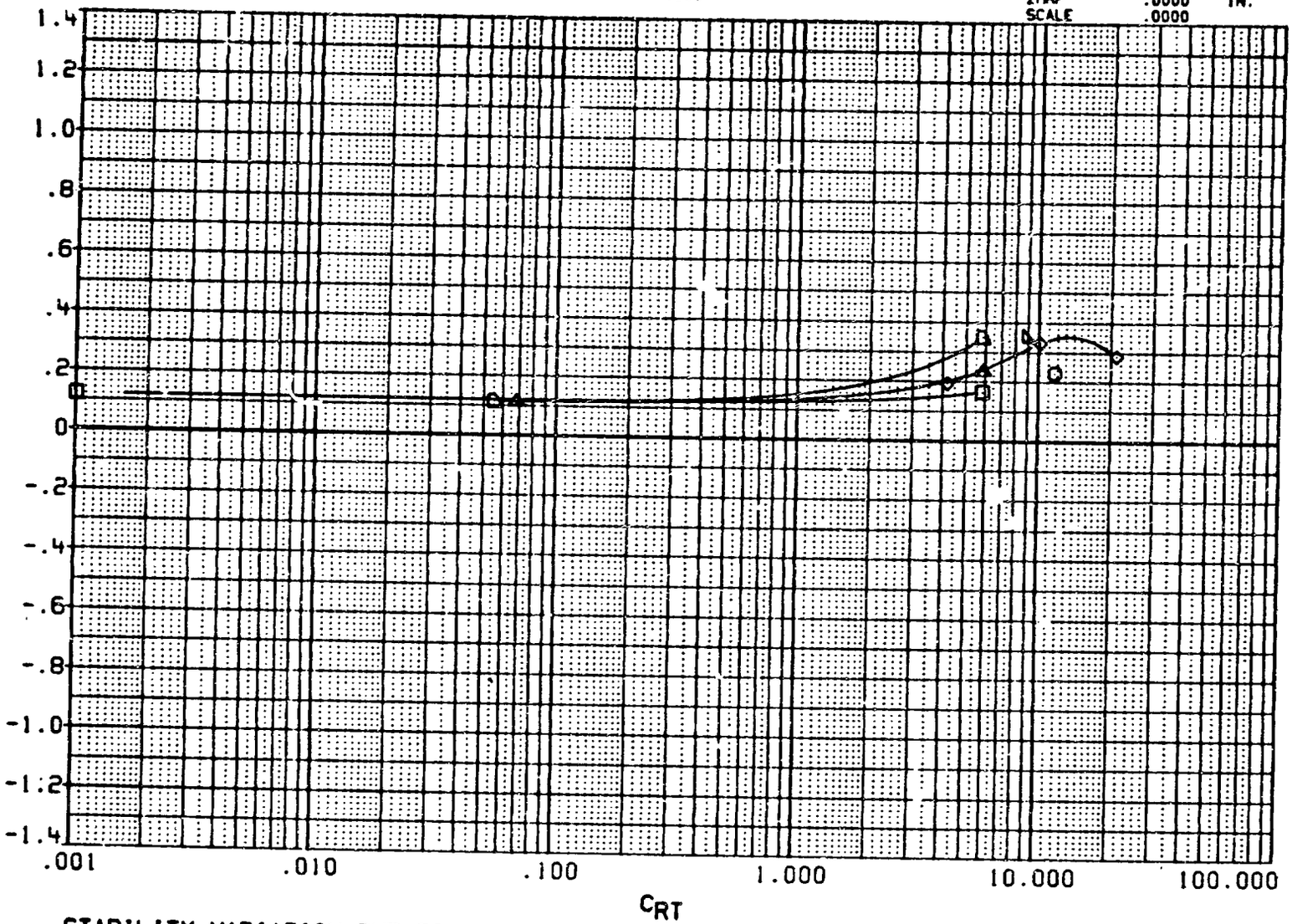


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY ALONE

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH
(RXB002)	○	CAL T17-123 (B) BODY ALONE	.400
(SXB003)	□	CAL T17-123 (B) BODY ALONE	.400
(RXB004)	◇	CAL T17-123 (B) BODY ALONE	.700
(RXB005)	△	CAL T17-123 (B) BODY ALONE	.700
(RXB006)	▽	CAL T17-123 (B) BODY ALONE	.900
(RXB007)	▷	CAL T17-123 (B) BODY ALONE	.900

REFERENCE INFORMATION

SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

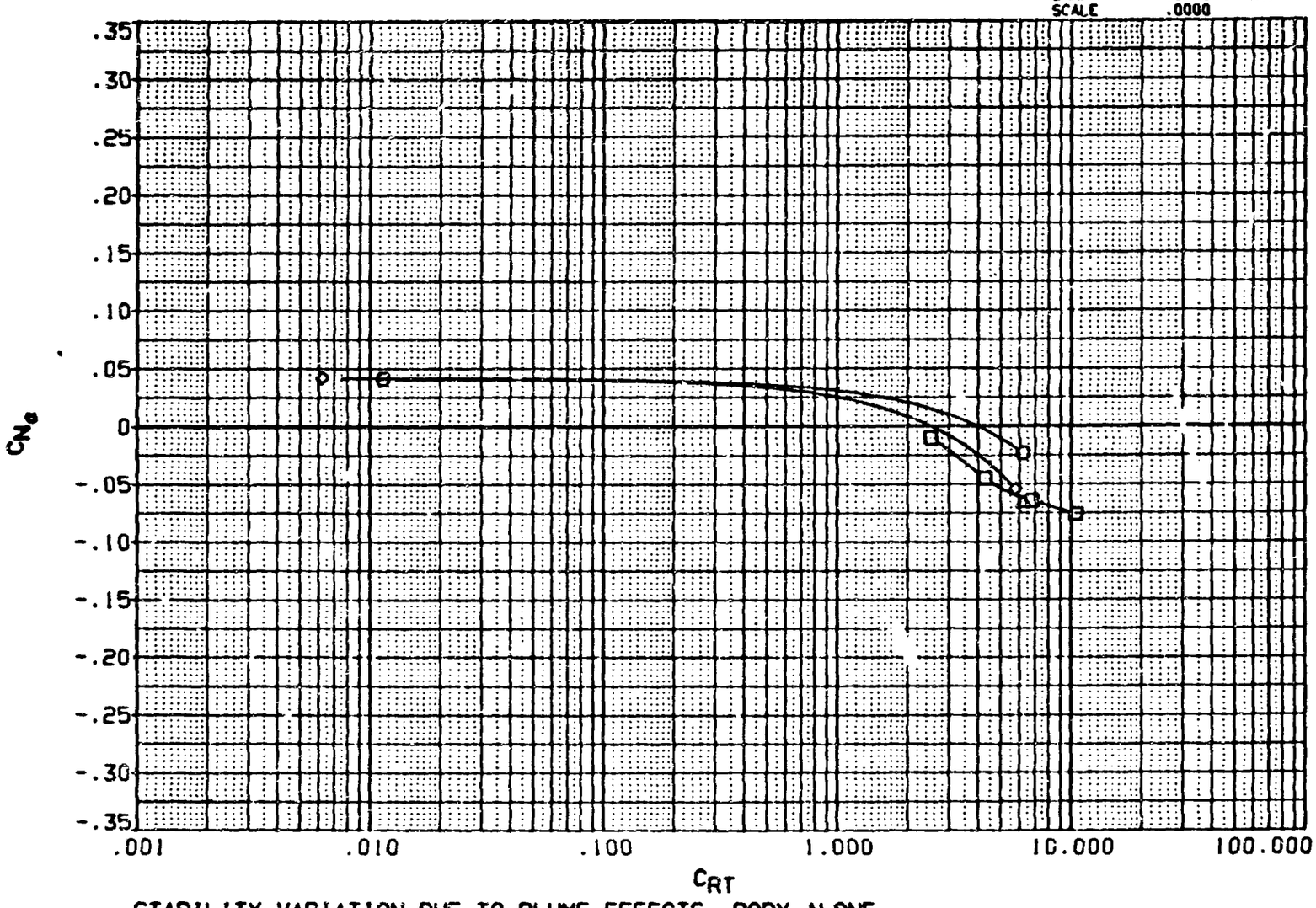


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY ALONE

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH
(RX8008)	○	CAL T17-123 (8) BODY ALONE	1.000
(RX8009)	□	CAL T17-123 (8) BODY ALONE	1.200
(RX8010)	◇	CAL T17-123 (15) BODY ALONE	1.200
(RX8011)	△	CAL T17-123 (8) BODY ALONE	1.250

REFERENCE INFORMATION

SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

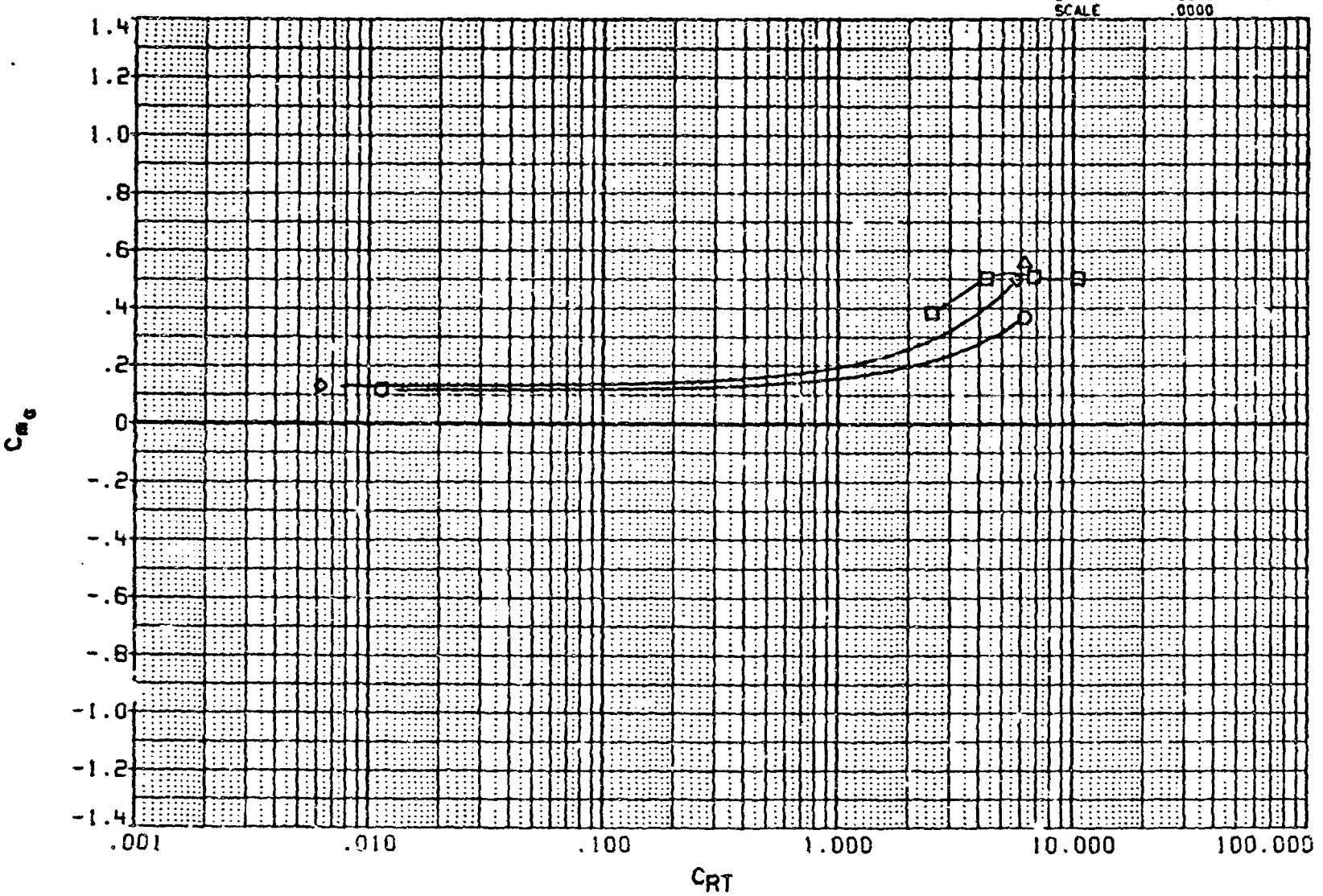


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY ALONE

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH
(R08008)	○	CAL T17-123 (8) BODY ALONE	1.000
(R08009)	□	CAL T17-123 (8) BODY ALONE	1.200
(R08010)	◇	CAL T17-123 (8) BODY ALONE	1.200
(R08011)	△	CAL T17-123 (8) BODY ALONE	1.250

REFERENCE INFORMATION

SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

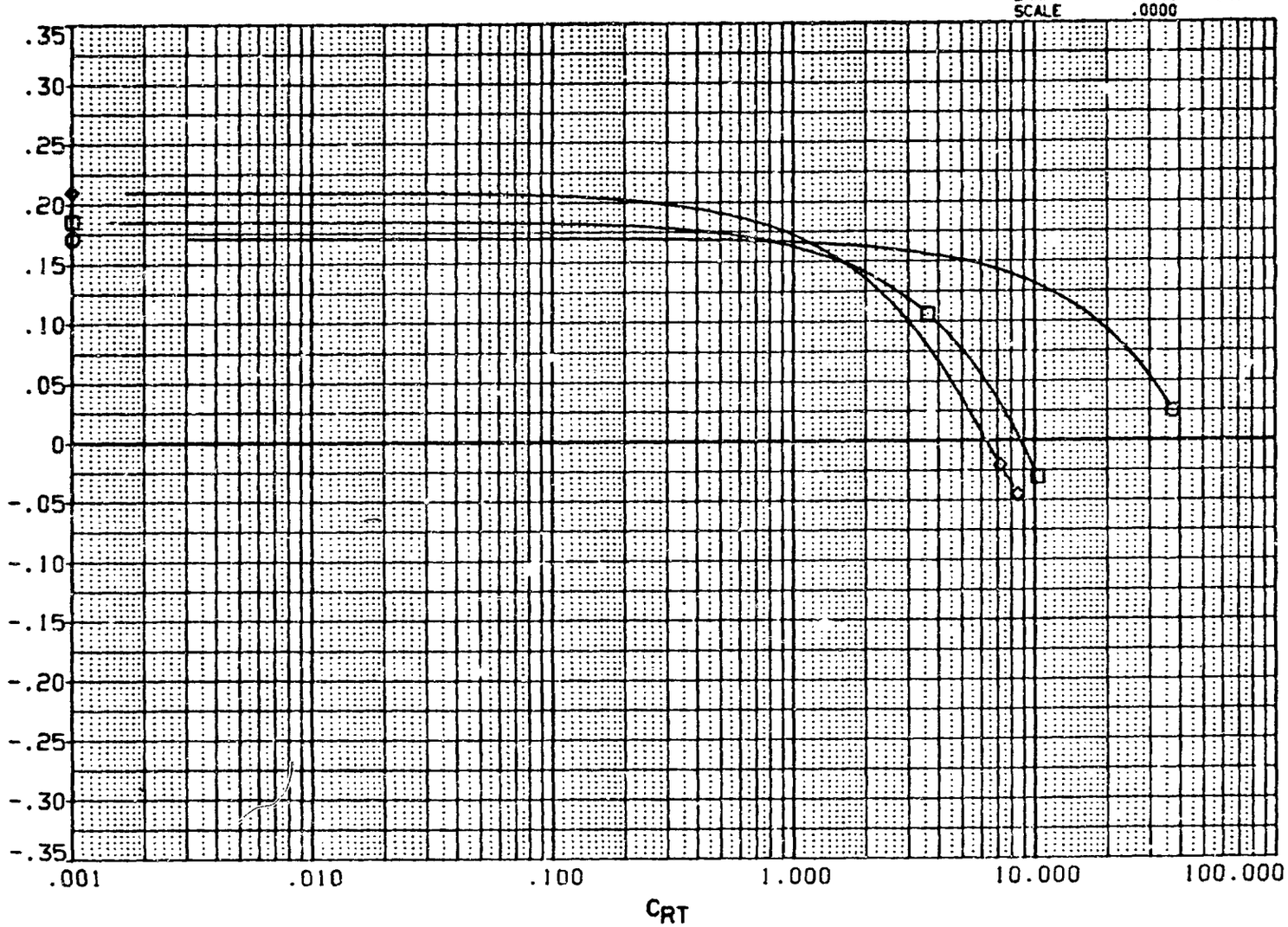


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY ALONE

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(BUE016)	○	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	.404	1.000
(BUE017)	□	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	.794	1.000
(BUE018)	◇	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	.897	1.000

REFERENCE INFORMATION

SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

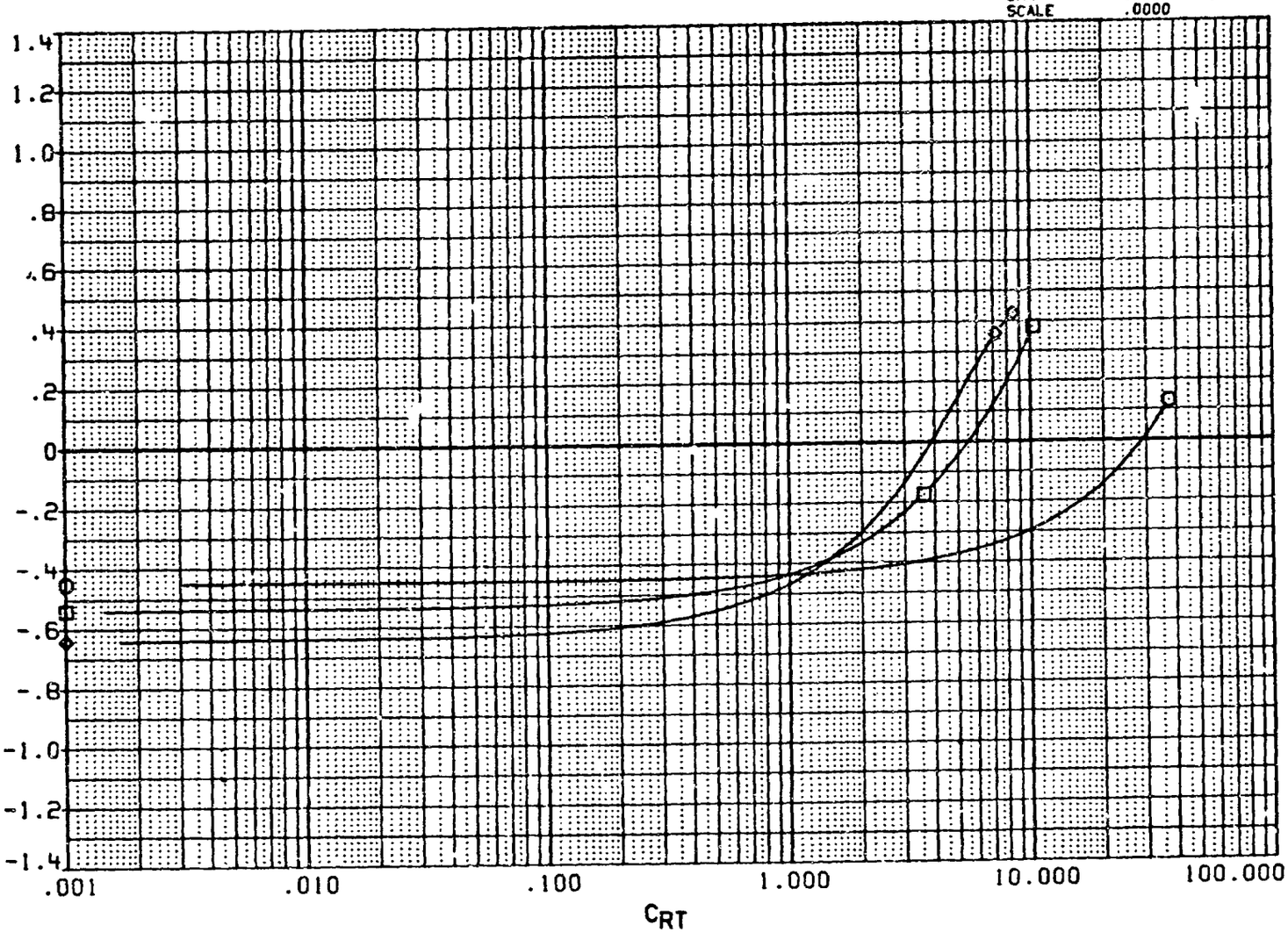


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF0

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(SUE016)	○	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	.404	1.000
(SUE017)	□	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	.794	1.000
(SUE018)	◇	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	.897	1.000

REFERENCE INFORMATION

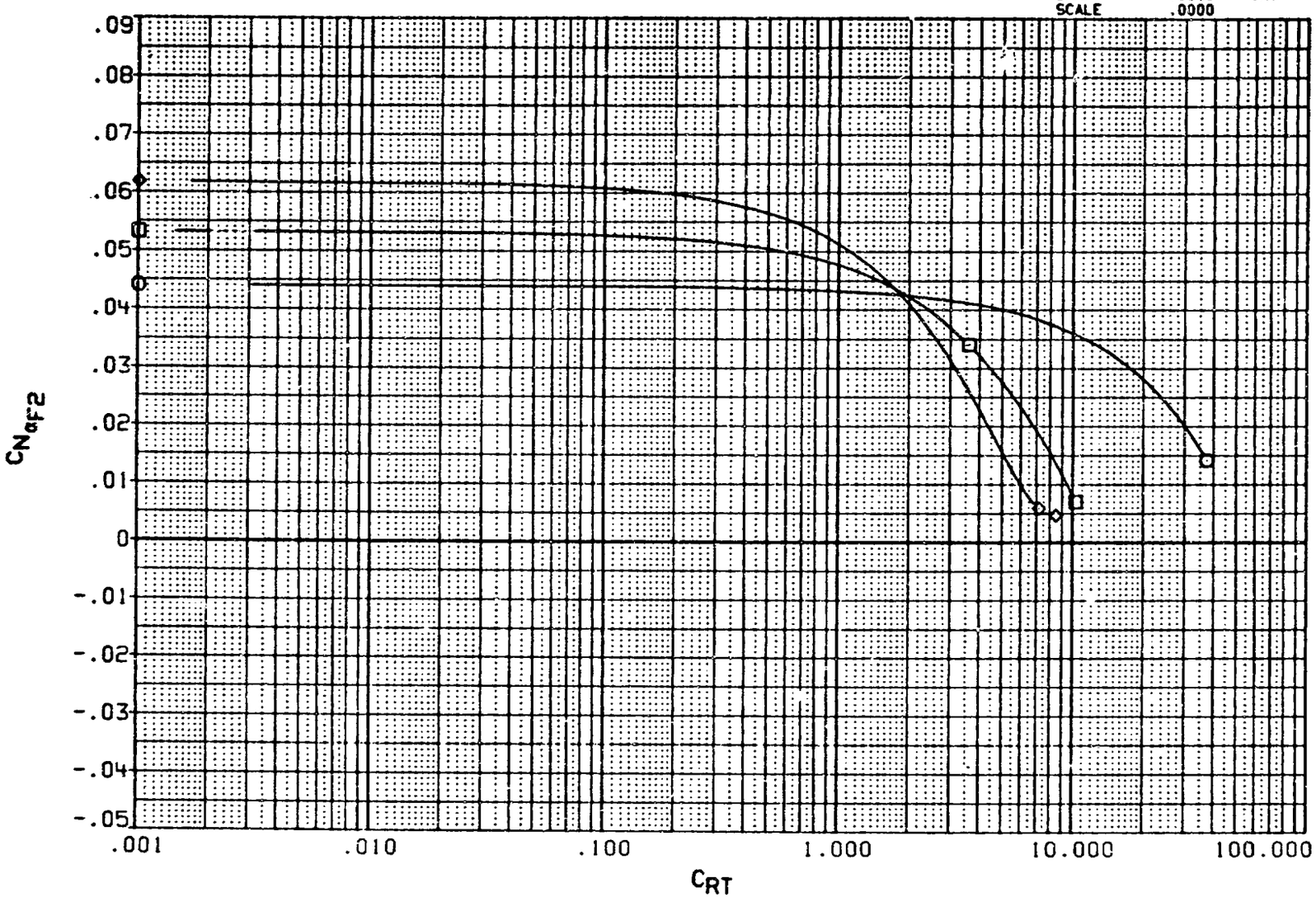
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF0

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(BUE016)	○	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	.404	1.000
(BUE017)	□	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	.794	1.000
(BUE018)	◇	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	.897	1.000

REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

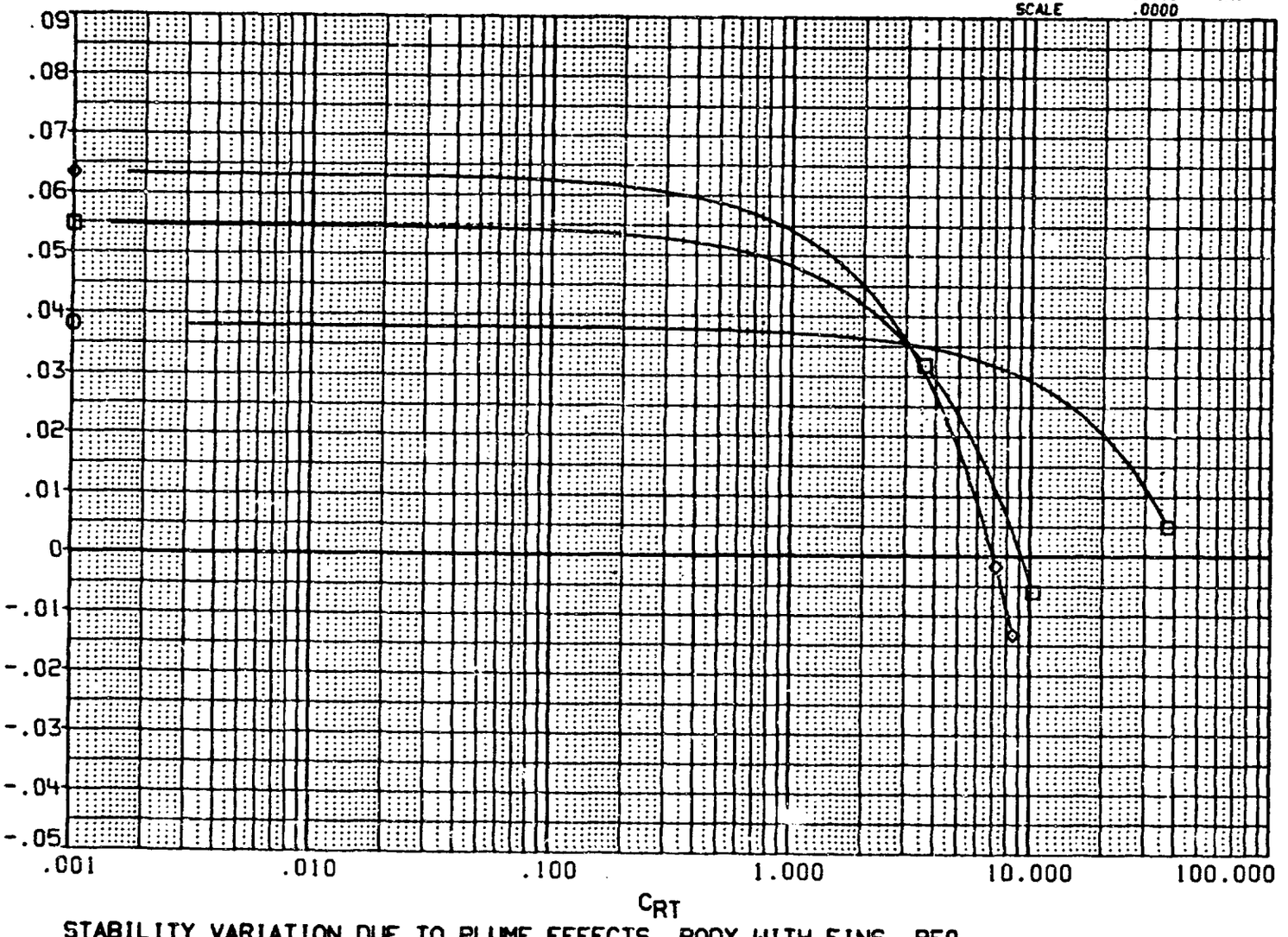


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF0

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(BUE016)	○	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	.404	1.000
(BUE017)	□	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	.794	1.000
(BUE018)	◇	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	.897	1.000

REFERENCE INFORMATION

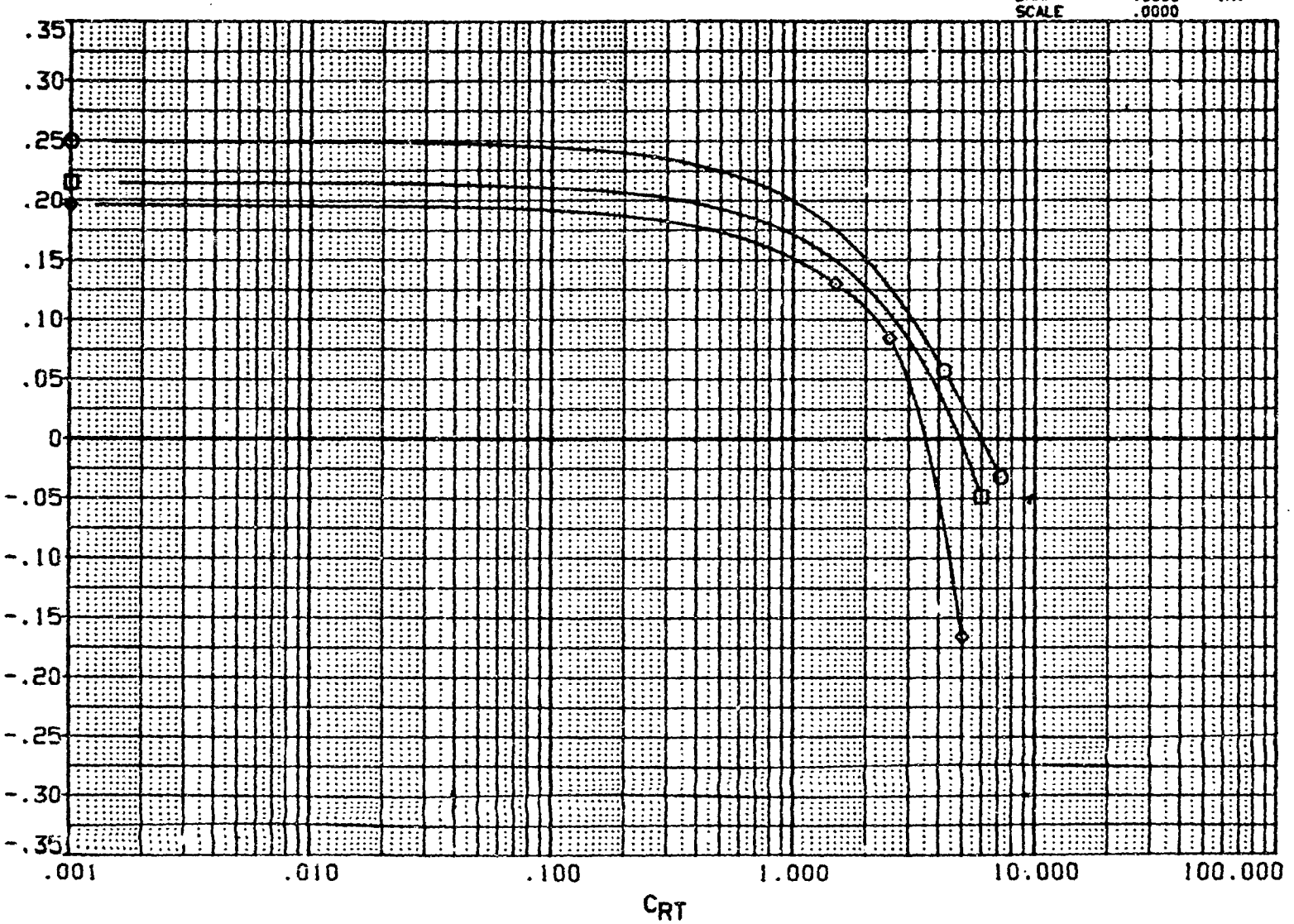
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF0

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(BUE019)	○	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	.998	1.000
(BUE020)	□	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	1.097	1.000
(BUE021)	◇	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	1.250	1.000

REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

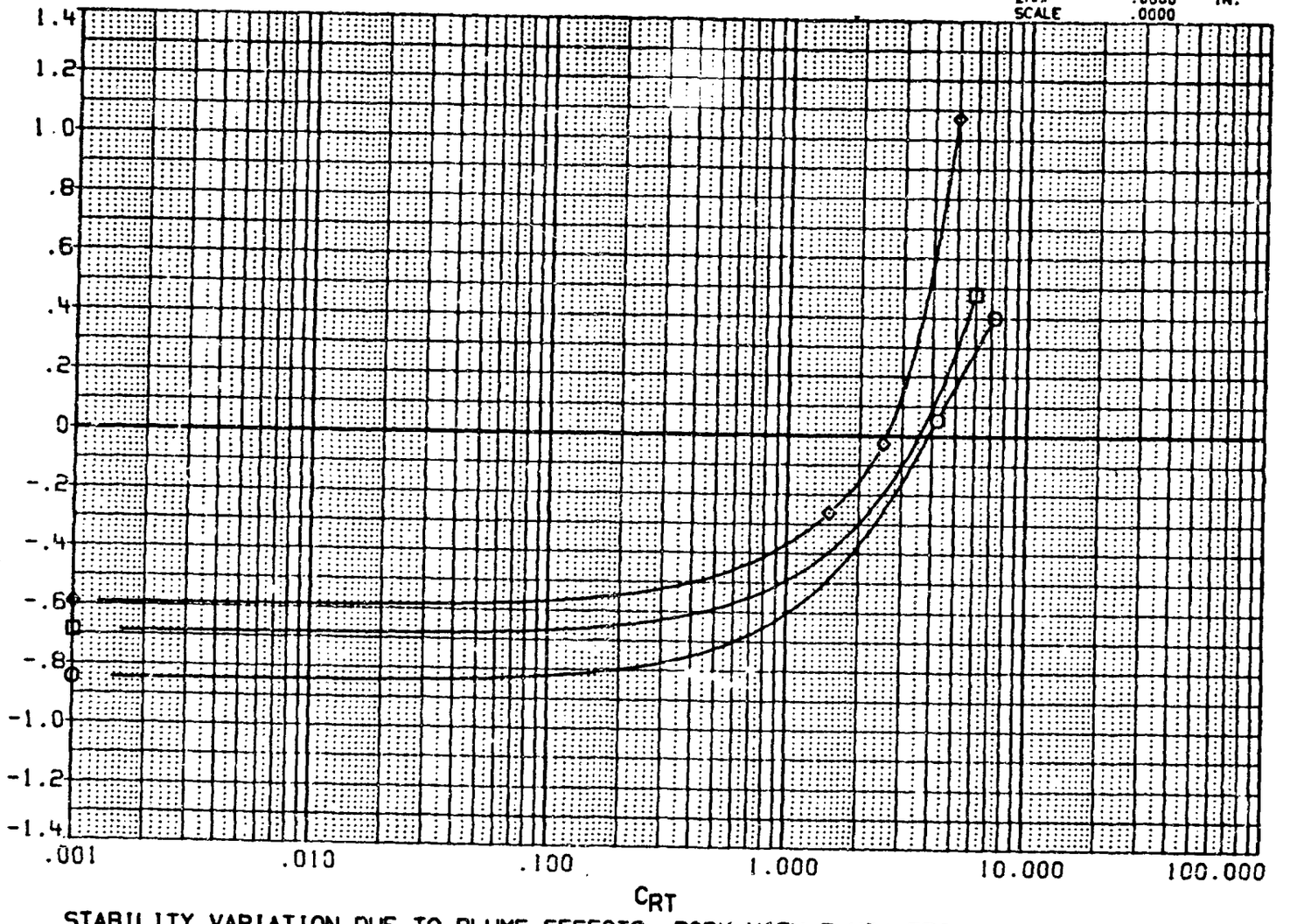


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF0

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(BUE019)	○	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	.999	1.000
(BUE020)	□	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	1.097	1.000
(BUE021)	◇	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	1.250	1.000

REFERENCE INFORMATION

SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

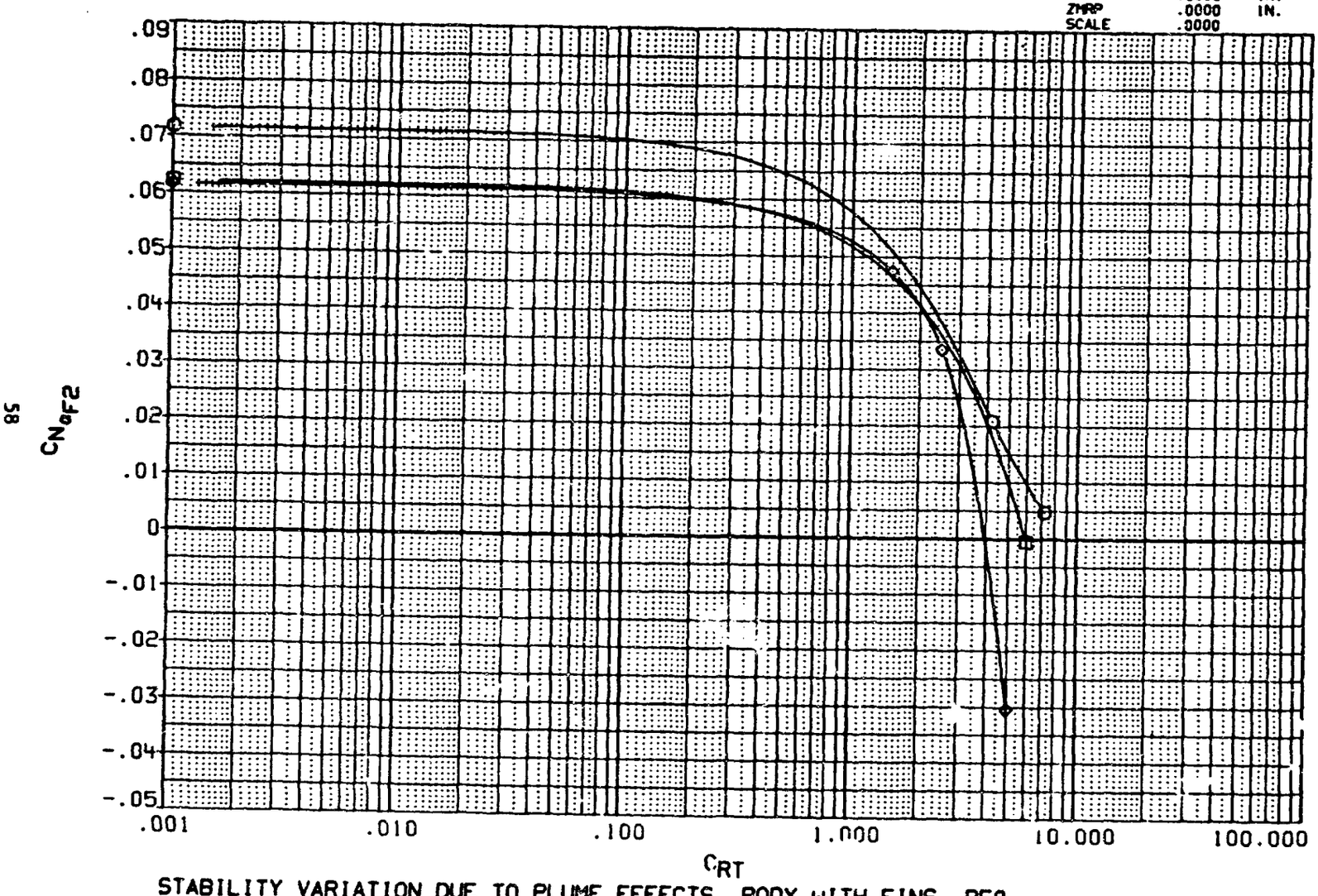


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF0

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(BUE019)	○	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	.999	1.000
(BUE020)	□	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	1.097	1.000
(BUE021)	◇	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	1.250	1.000

REFERENCE INFORMATION

SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

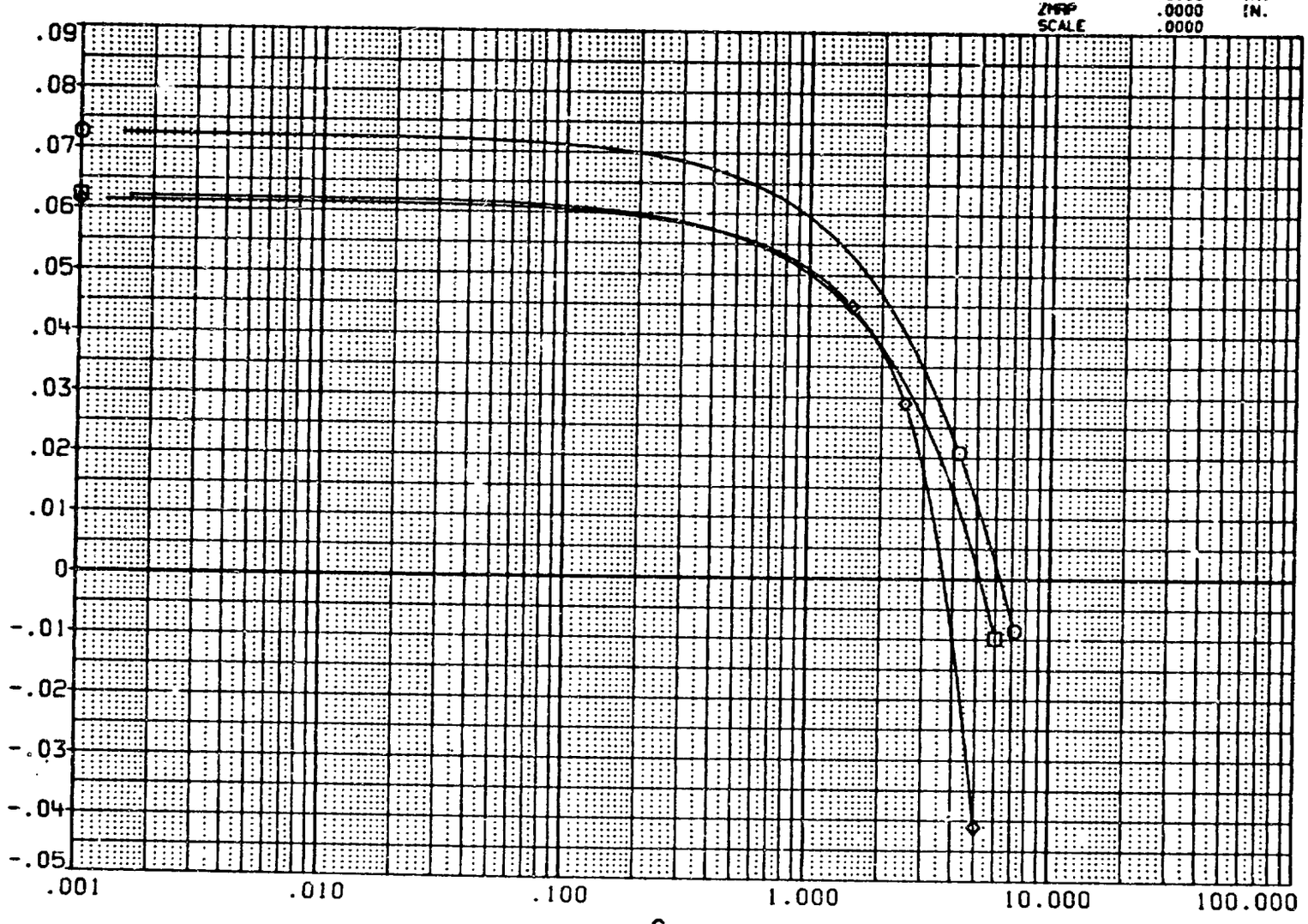


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF0

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(BUE019)	○	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	.999	1.000
(BUE020)	□	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	1.097	1.000
(BUE021)	◇	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	1.250	1.000

REFERENCE INFORMATION

SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

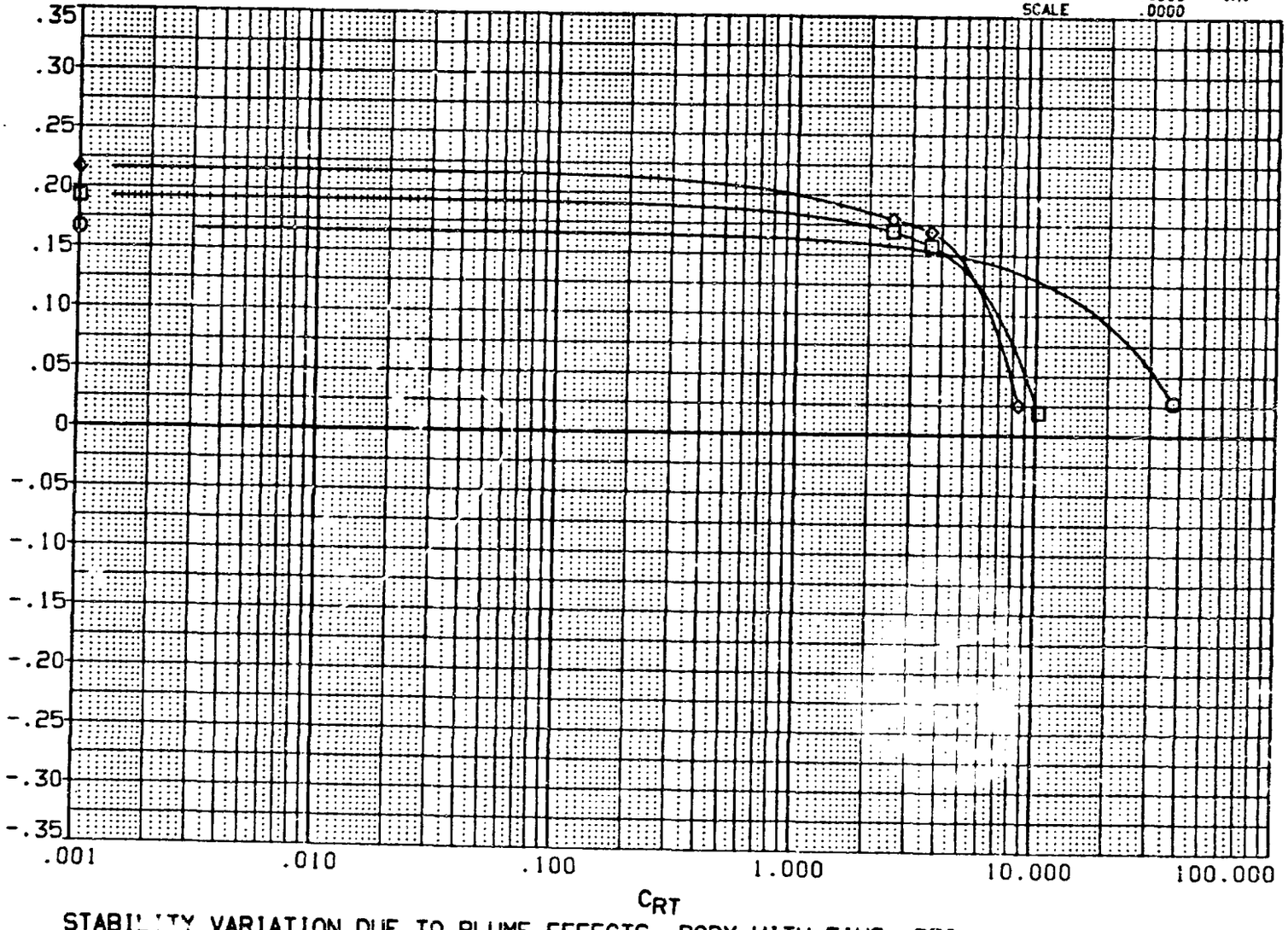


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF0

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(BUE022)	○	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	.400	2.000
(BUE023)	□	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	.801	2.000
(BUE024)	◇	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	.898	2.000

REFERENCE INFORMATION

SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

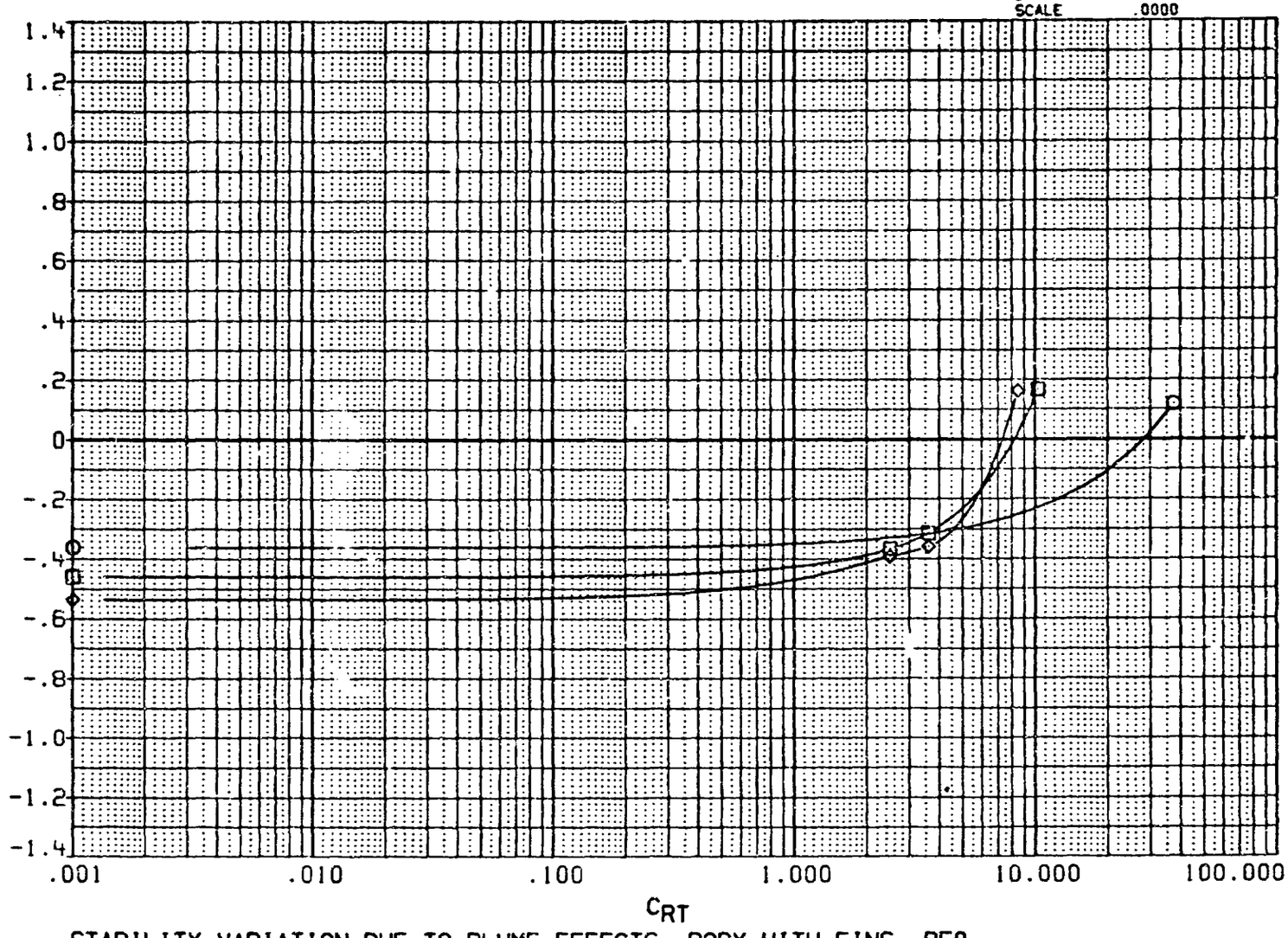


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF0

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(BUE022)	○	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	.400	2.000
(BUE023)	□	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	.801	2.000
(BUE024)	◇	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	.898	2.000

REFERENCE INFORMATION

SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

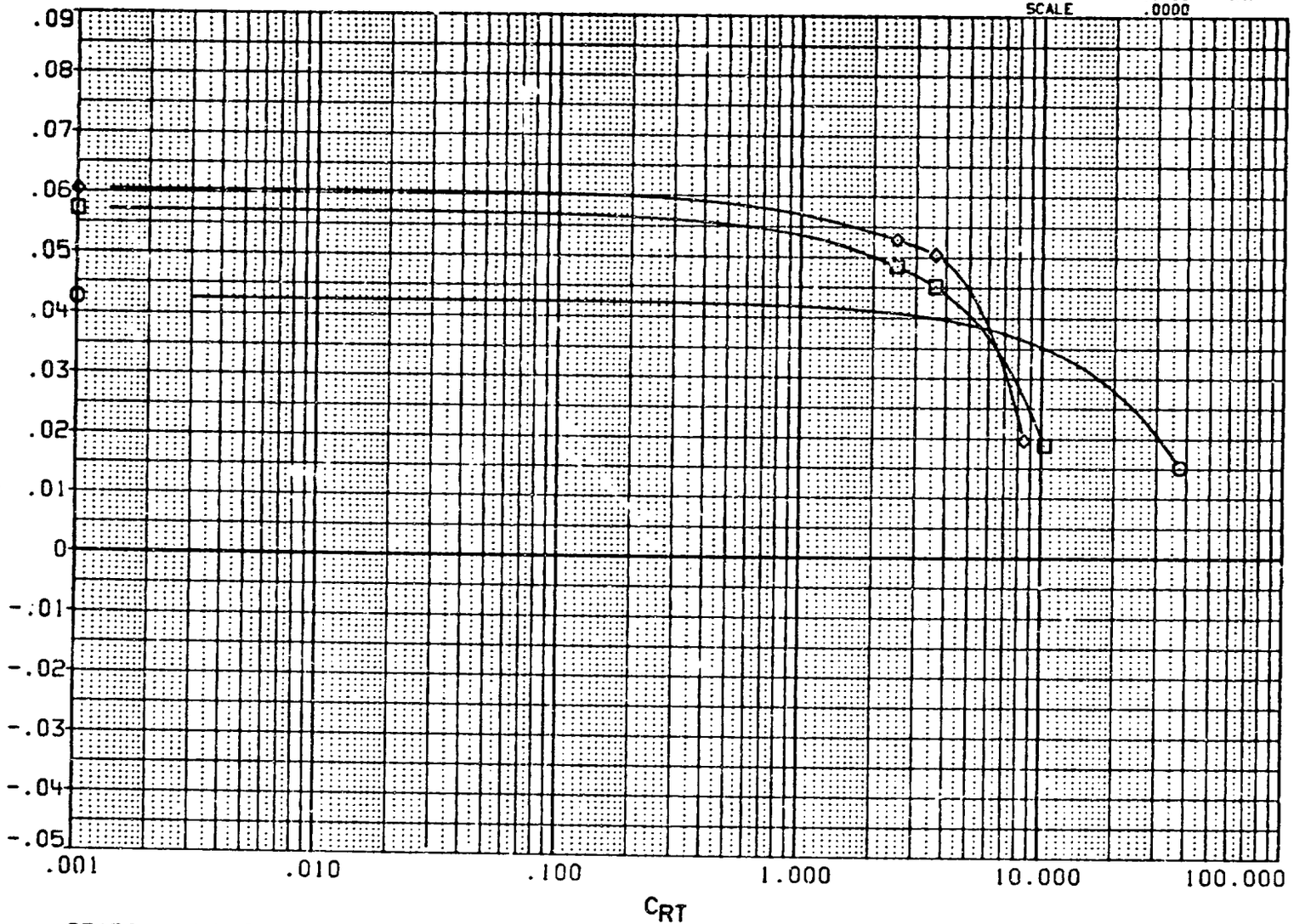


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF0

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(BUE022)	○	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	.400	2.000
(BUE023)	□	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	.801	2.000
(BUE024)	◇	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	.898	2.000

REFERENCE INFORMATION

SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

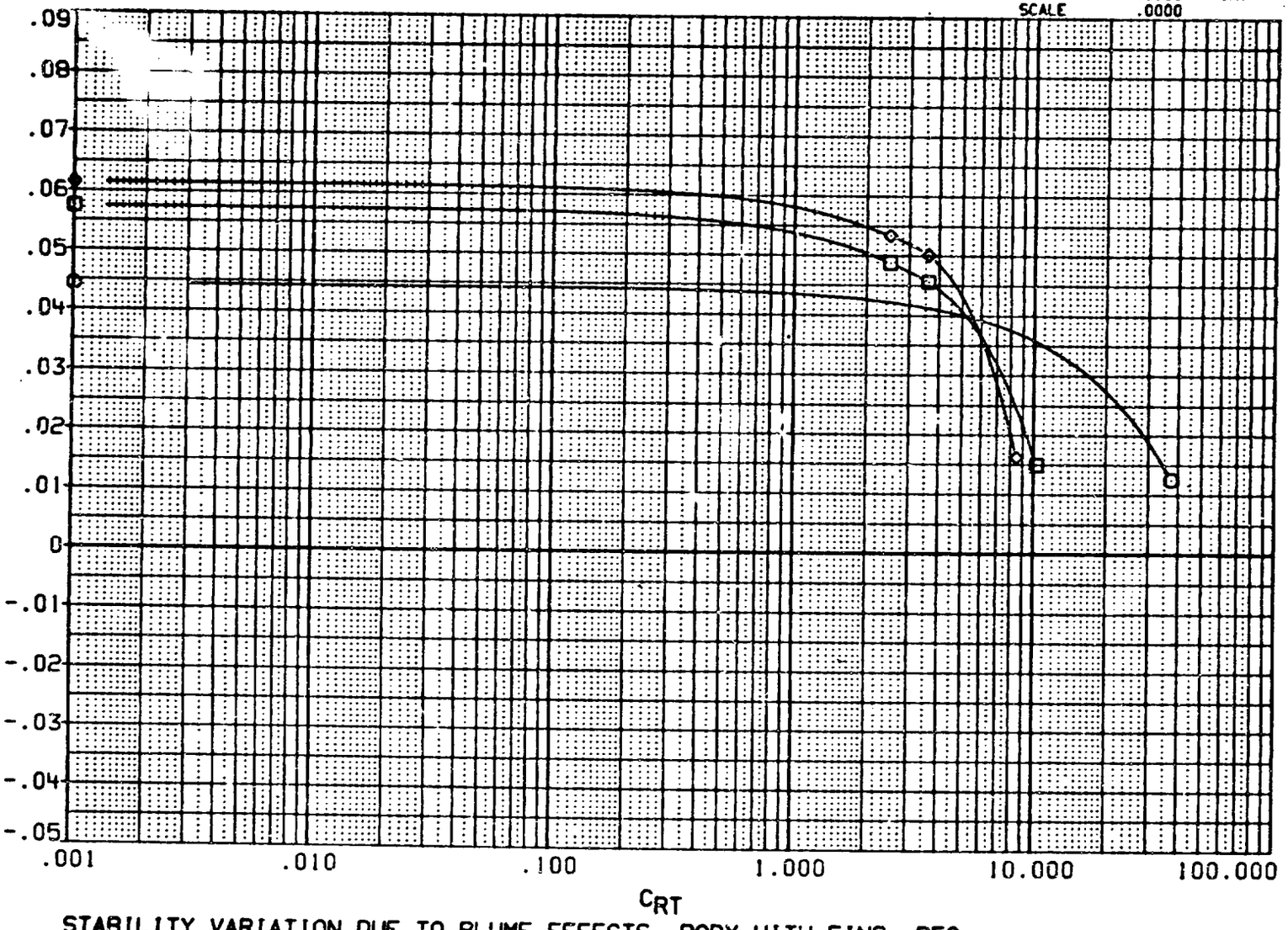


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF0

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(BUE022)	○	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	.400	2.000
(BUE023)	□	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	.801	2.000
(BUE024)	◇	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	.898	2.000

REFERENCE INFORMATION

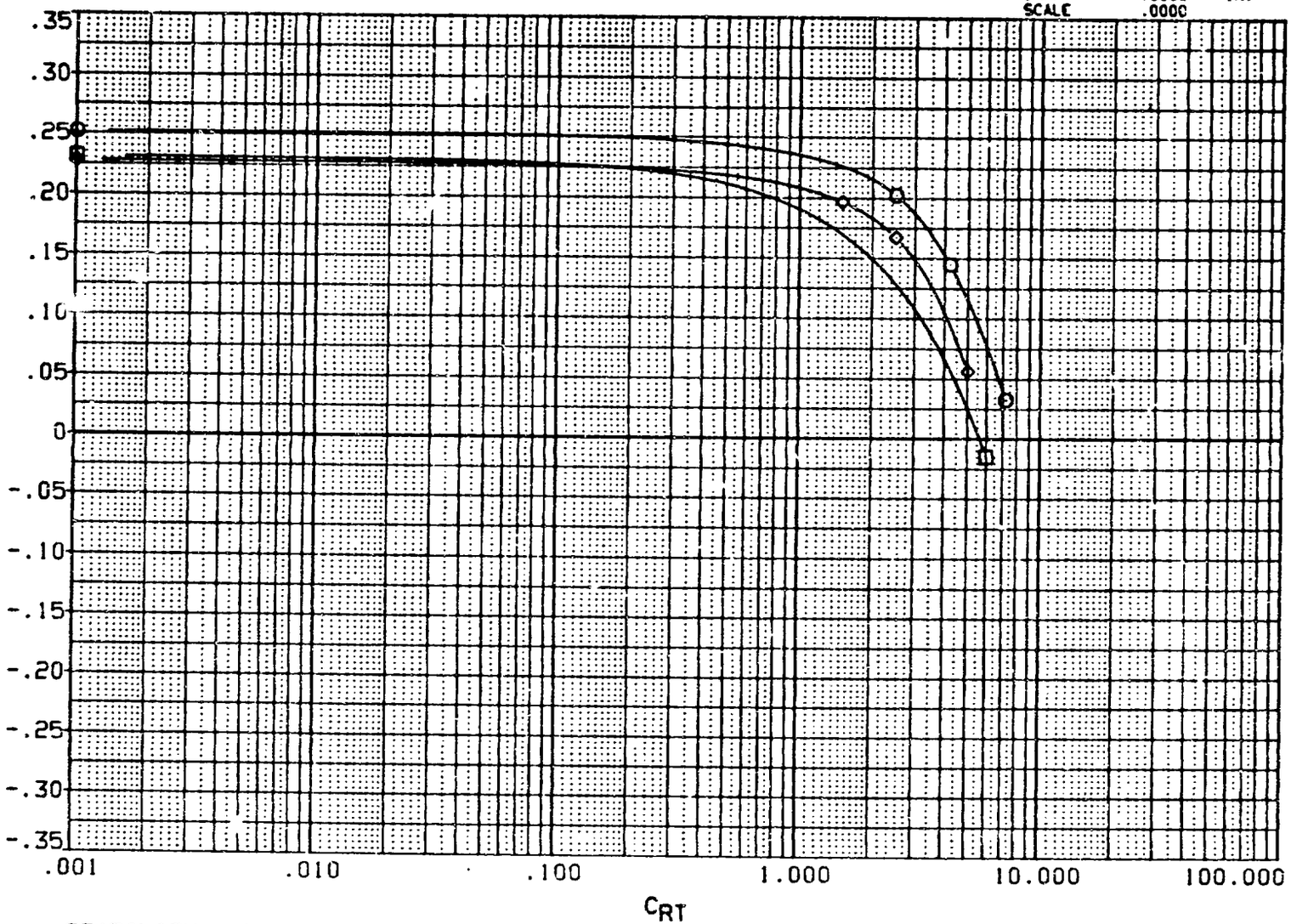
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF0

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(BUE025)	○	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	1.002	2.000
(BUE026)	□	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	1.101	2.000
(BUE027)	◇	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	1.250	2.000

REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	25.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

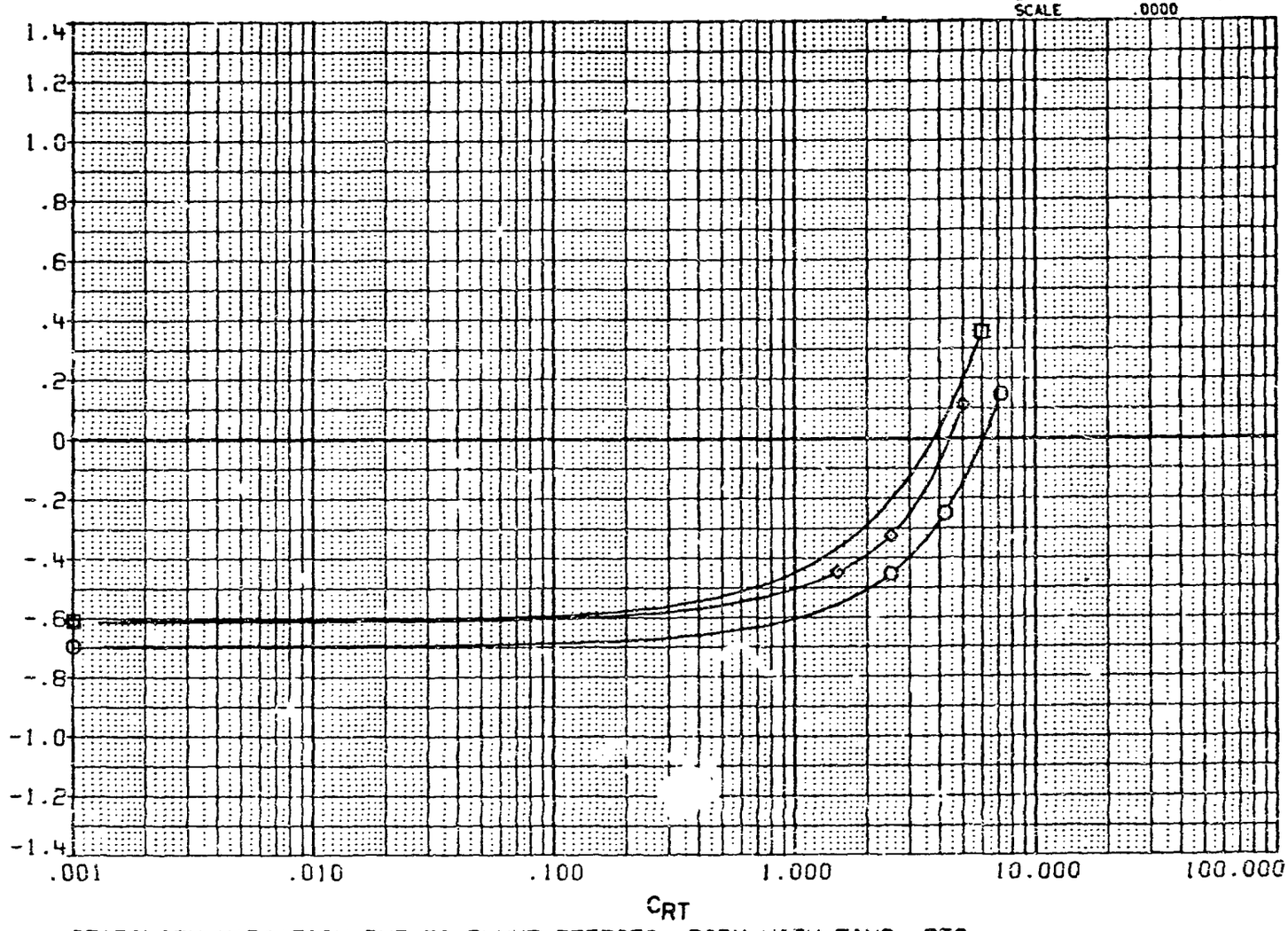


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF0

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(BUE025)	○	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BFO	1.002	2.000
(BUE026)	□	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BFO	1.101	2.000
(BUE027)	◇	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BFO	1.250	2.000

REFERENCE INFORMATION

SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

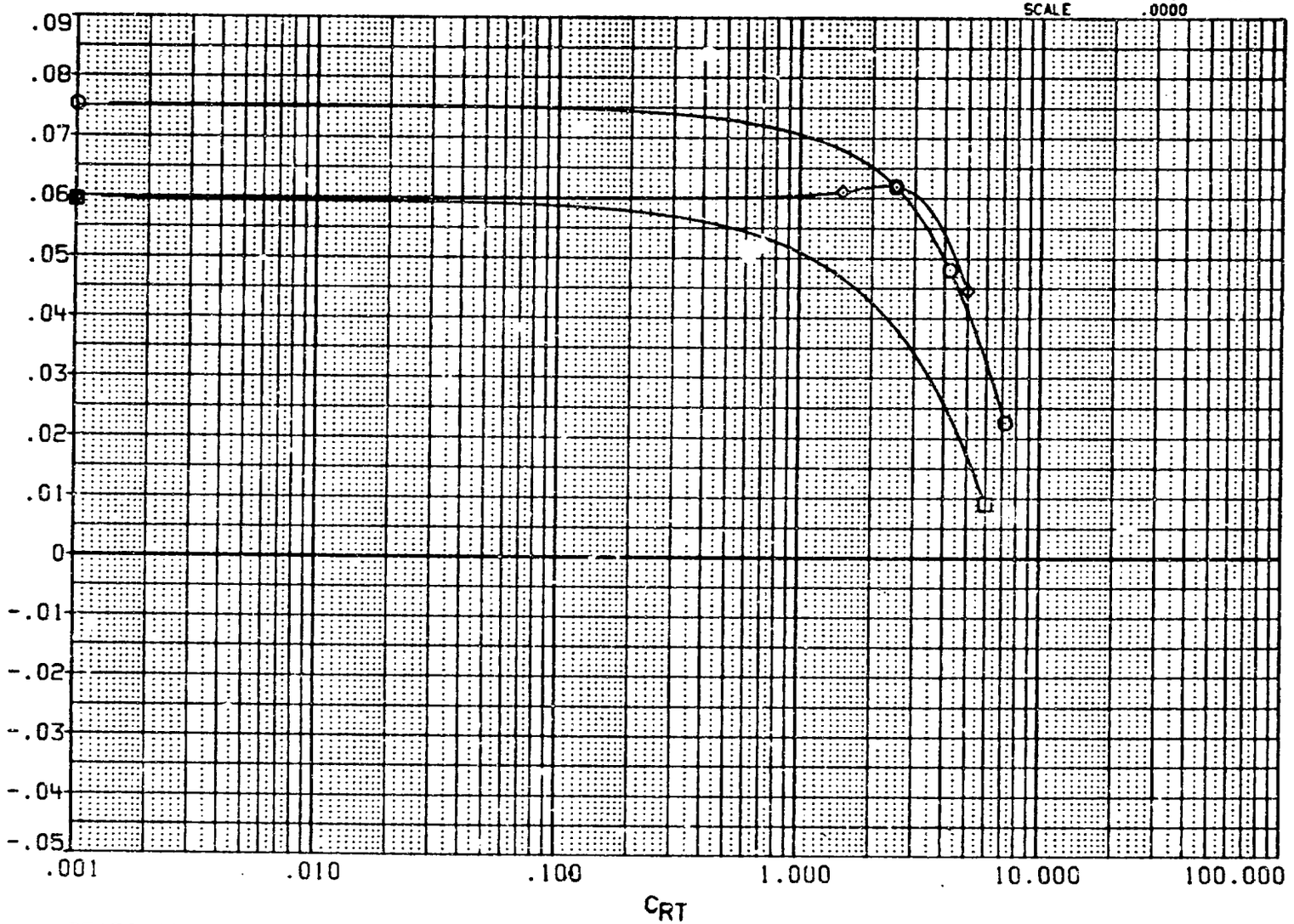


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BFO

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(BUE025)	○	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	1.002	2.000
(BUE026)	□	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	1.101	2.000
(BUE027)	◇	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	1.250	2.000

REFERENCE INFORMATION

SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

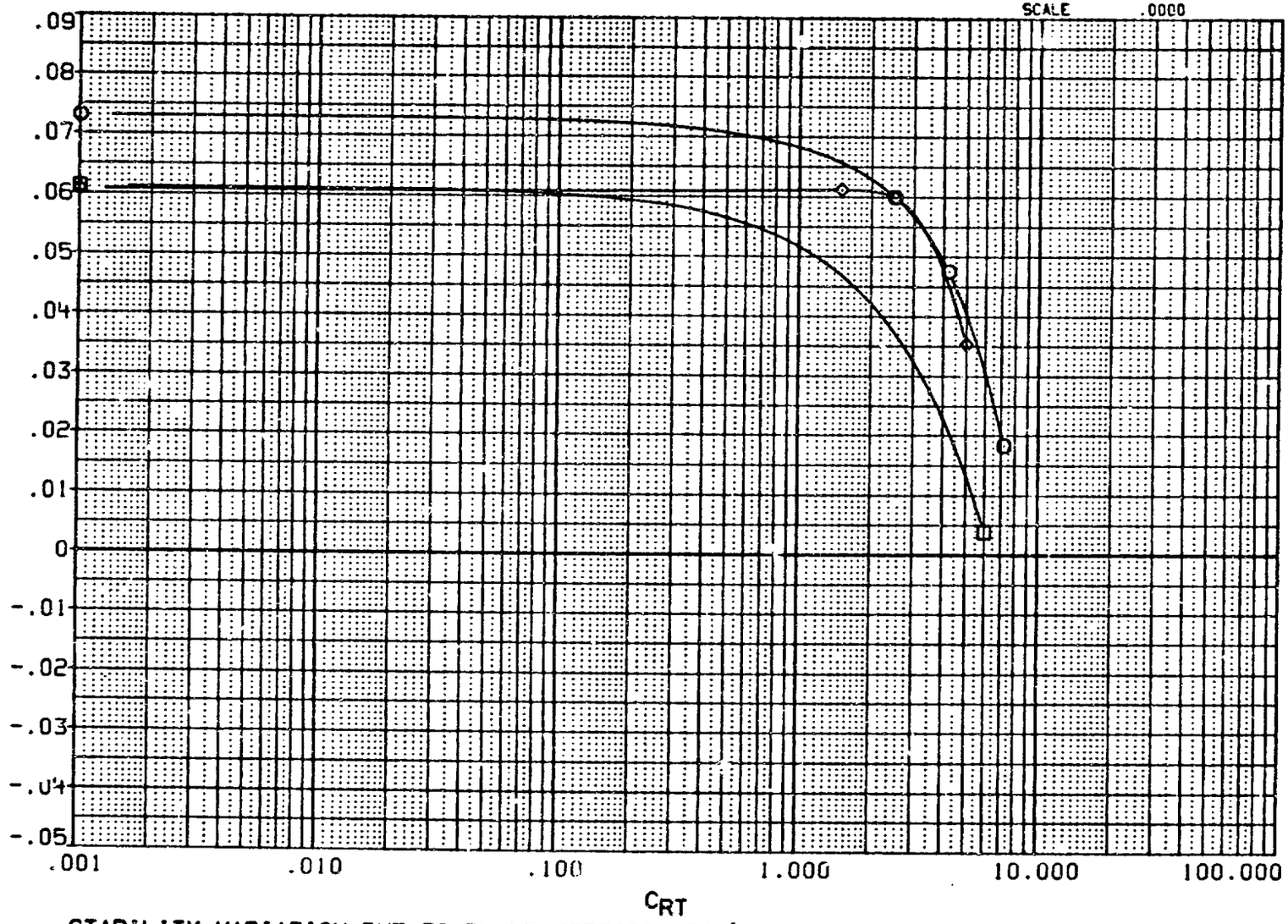


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF0

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(BUE025)	○	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	1.002	2.000
(BUE026)	□	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	1.101	2.000
(BUE027)	◇	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	1.250	2.000

REFERENCE INFORMATION

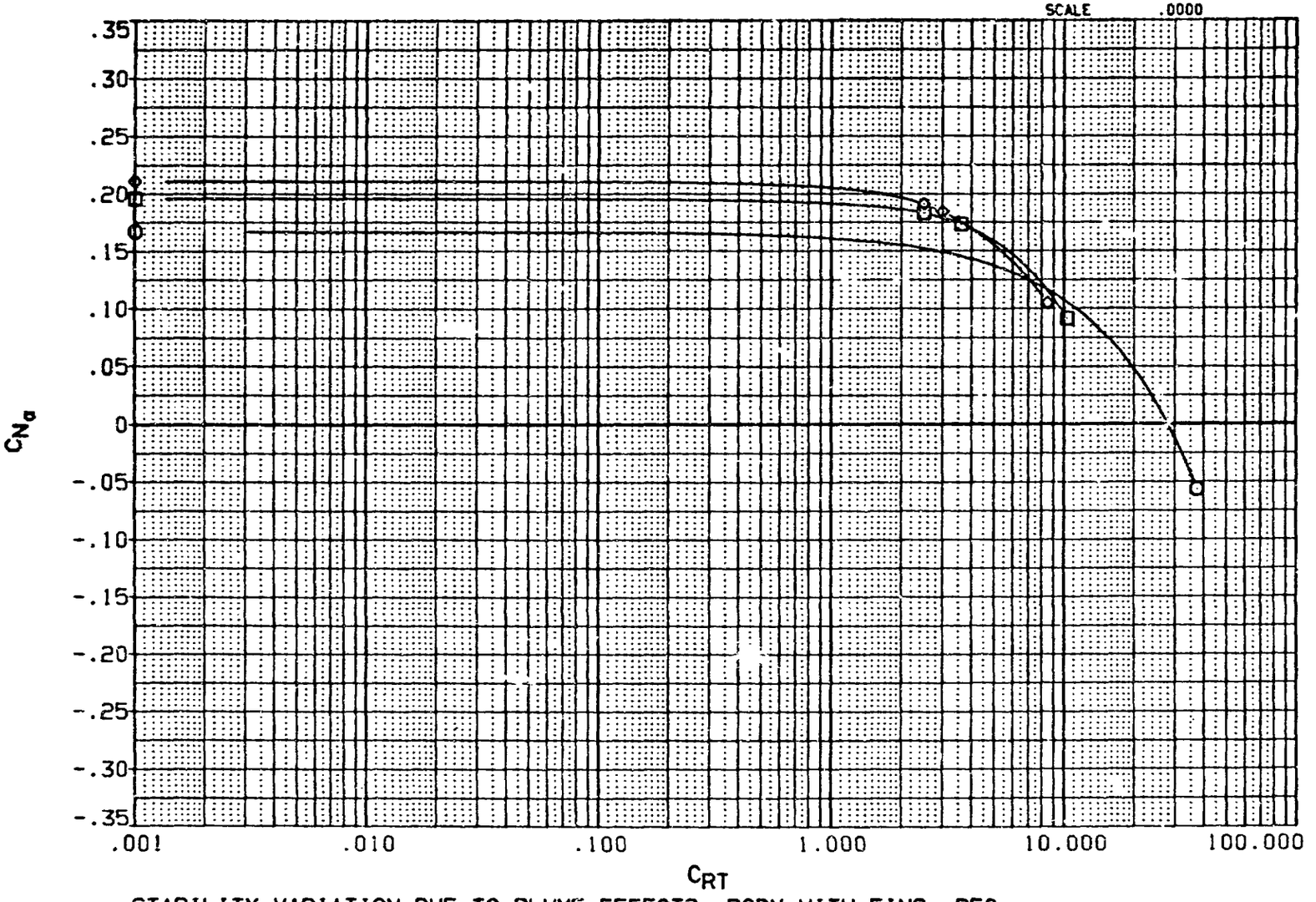
SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF0

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(BUE028)	○	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	.401	3.000
(BUE029)	□	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	.803	3.000
(BUE030)	◇	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	.899	3.000

REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

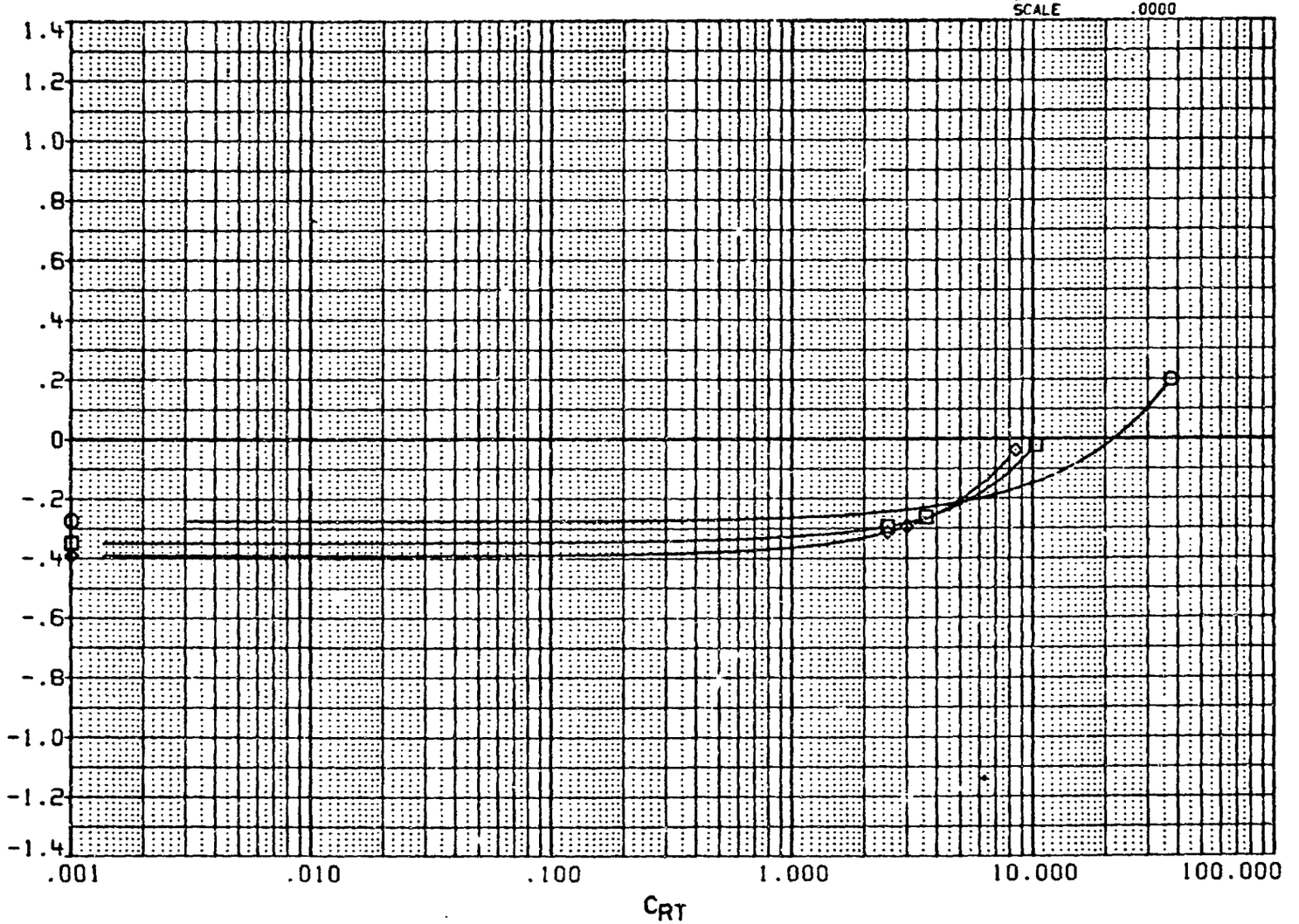


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF0

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(BUE028)	○	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BFO	.401	3.000
(BUE029)	□	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BFO	.803	3.000
(BUE030)	◇	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BFO	.899	3.000

REFERENCE INFORMATION

SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

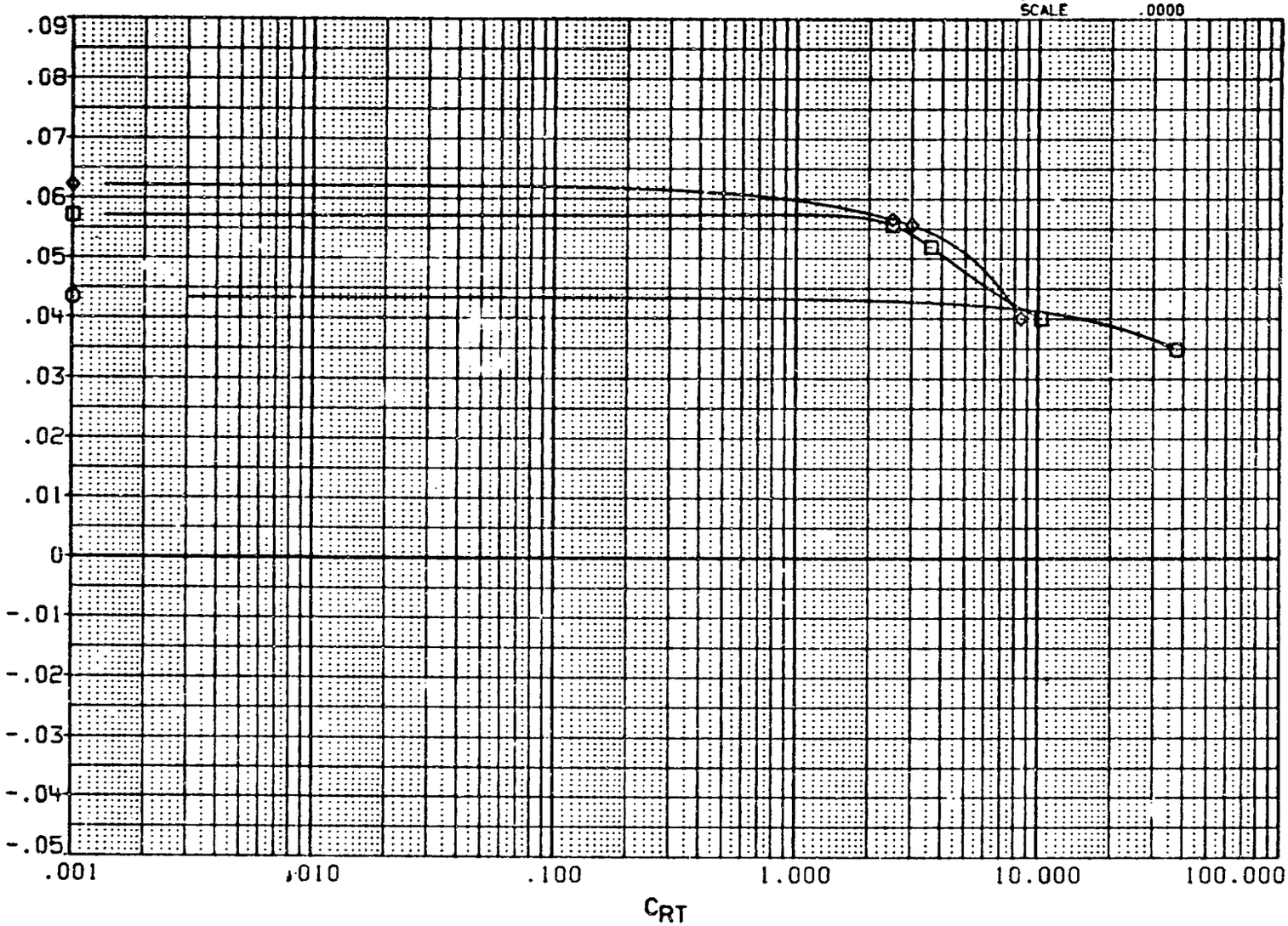


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BFO

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(BUE028)	○	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	.401	3.000
(BUE029)	□	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	.803	3.000
(BUE030)	◇	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	.899	3.000

REFERENCE INFORMATION

SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

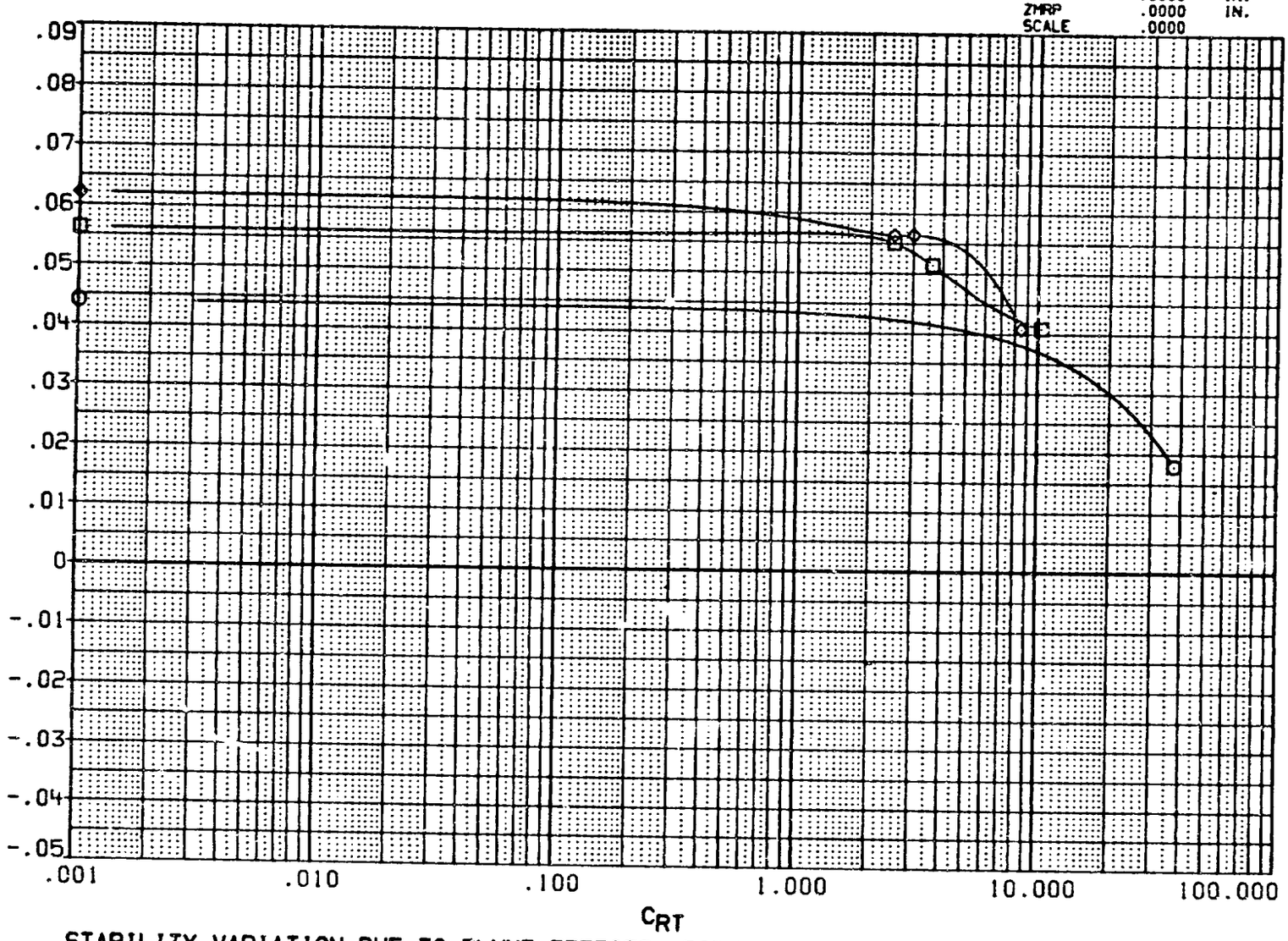


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF0

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(BUE028)	○	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	.401	3.000
(BUE029)	□	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	.803	3.000
(BUE030)	◇	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	.899	3.000

REFERENCE INFORMATION

SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

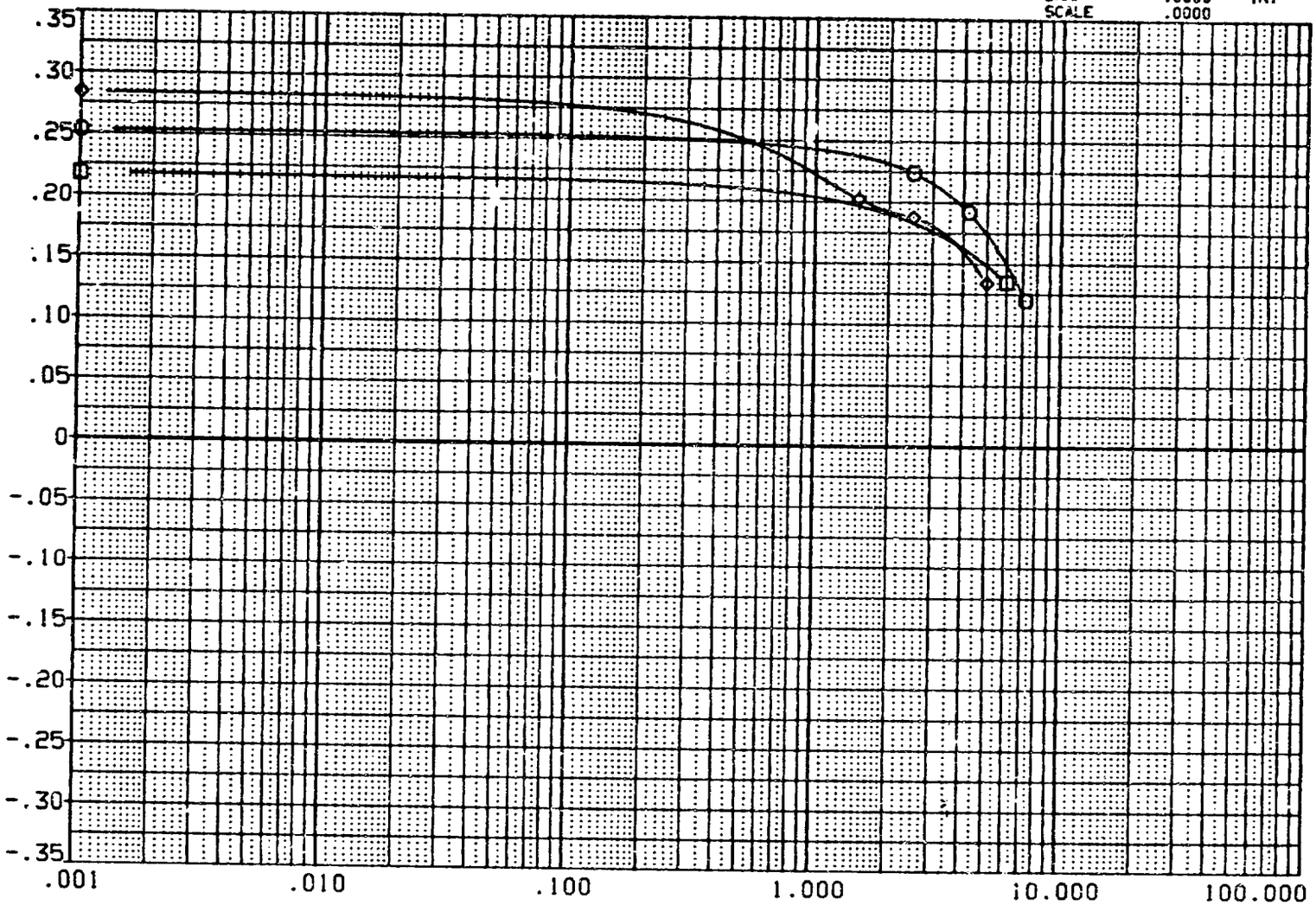


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF0

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(BUE031)	○	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	1.000	3.000
(BUE032)	□	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	1.100	3.000
(BUE033)	◇	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	1.251	3.000

REFERENCE INFORMATION

SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

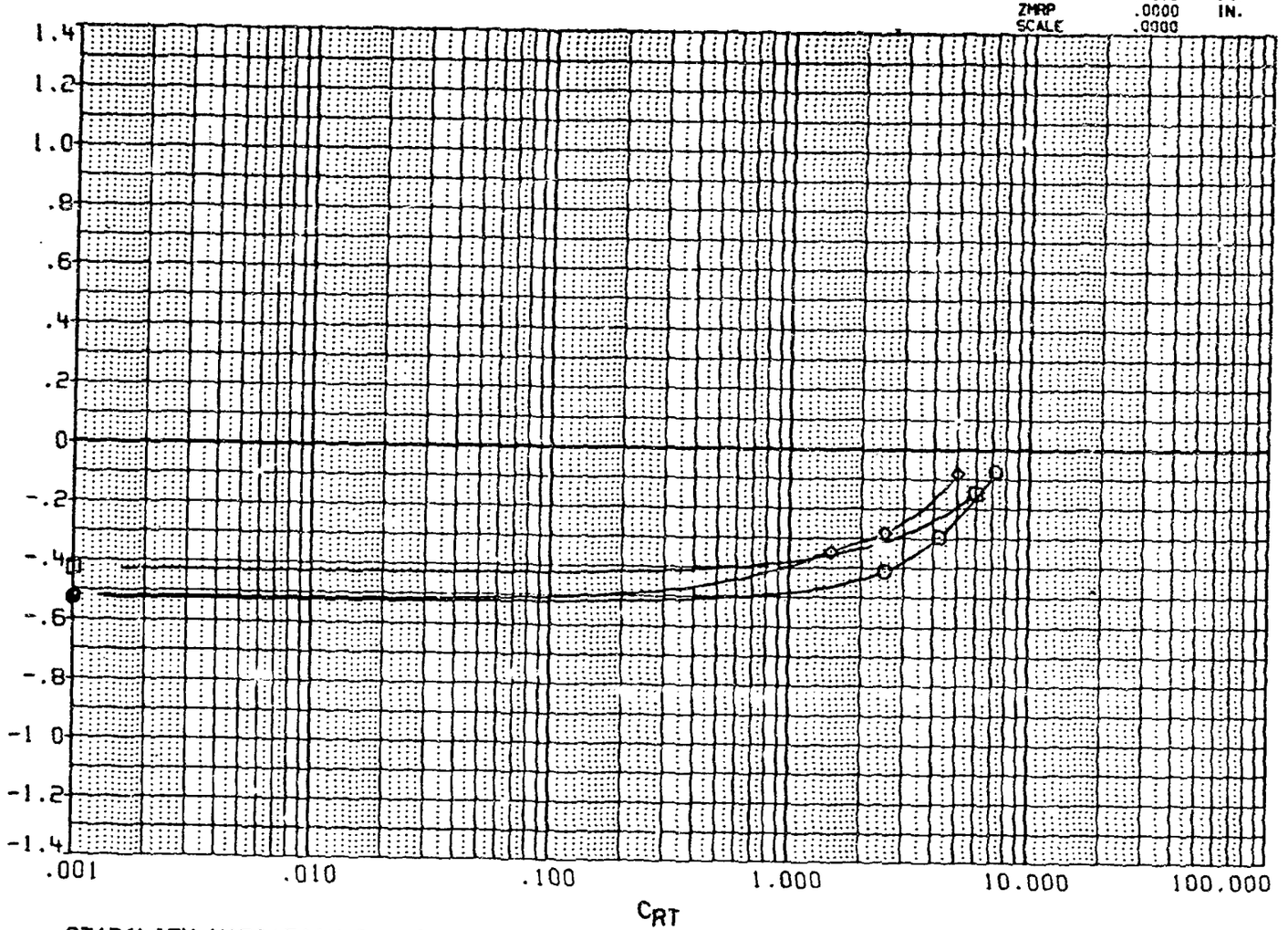


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF0

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(BUE031)	○	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	1.000	3.000
(BUE032)	□	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	1.100	3.000
(BUE033)	◇	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	1.25:	3.000

REFERENCE INFORMATION

SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

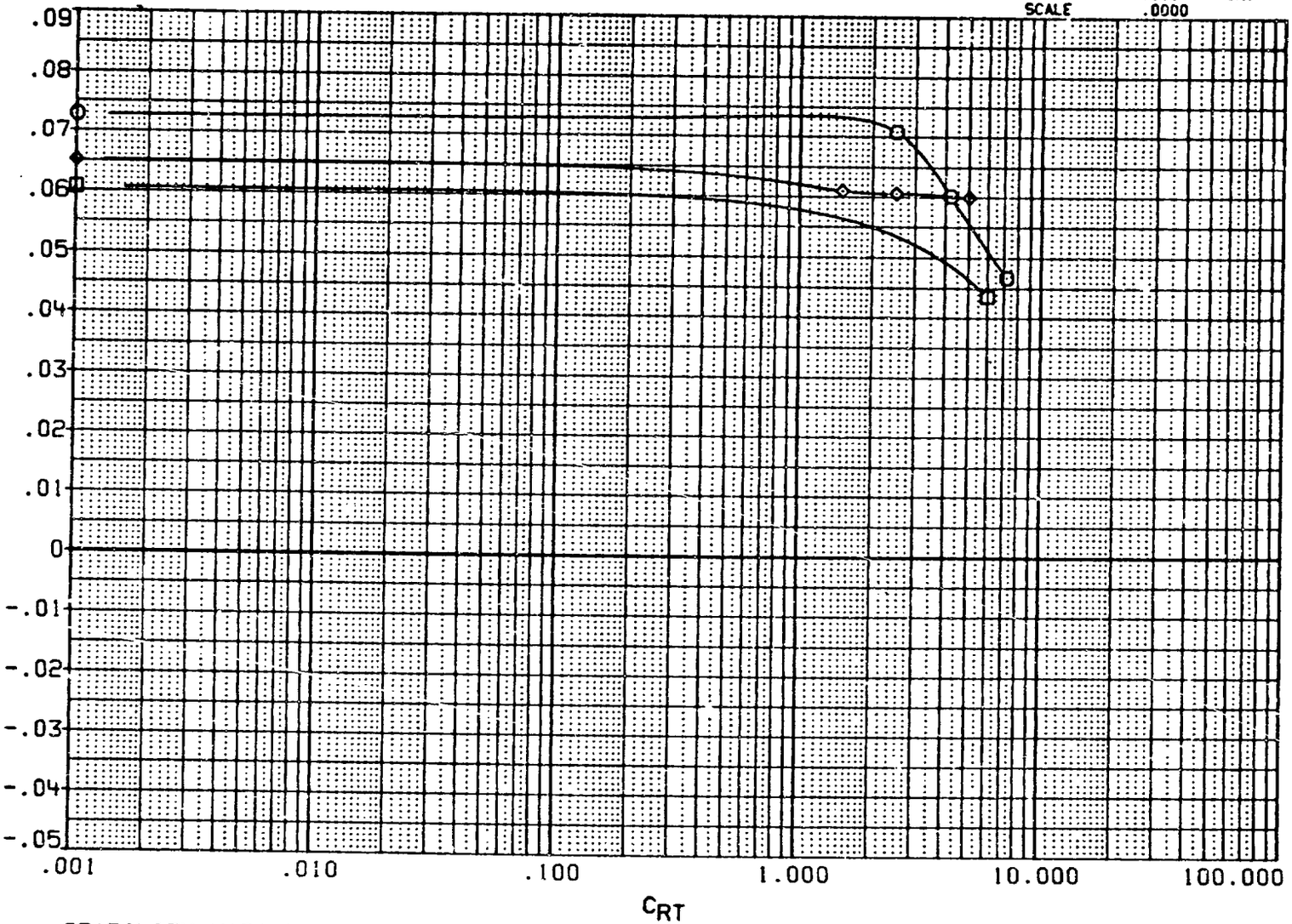


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF0

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(BUE031)	○	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	1.000	3.000
(BUE032)	□	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	1.100	3.000
(BUE033)	◇	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	1.251	3.000

REFERENCE INFORMATION

SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

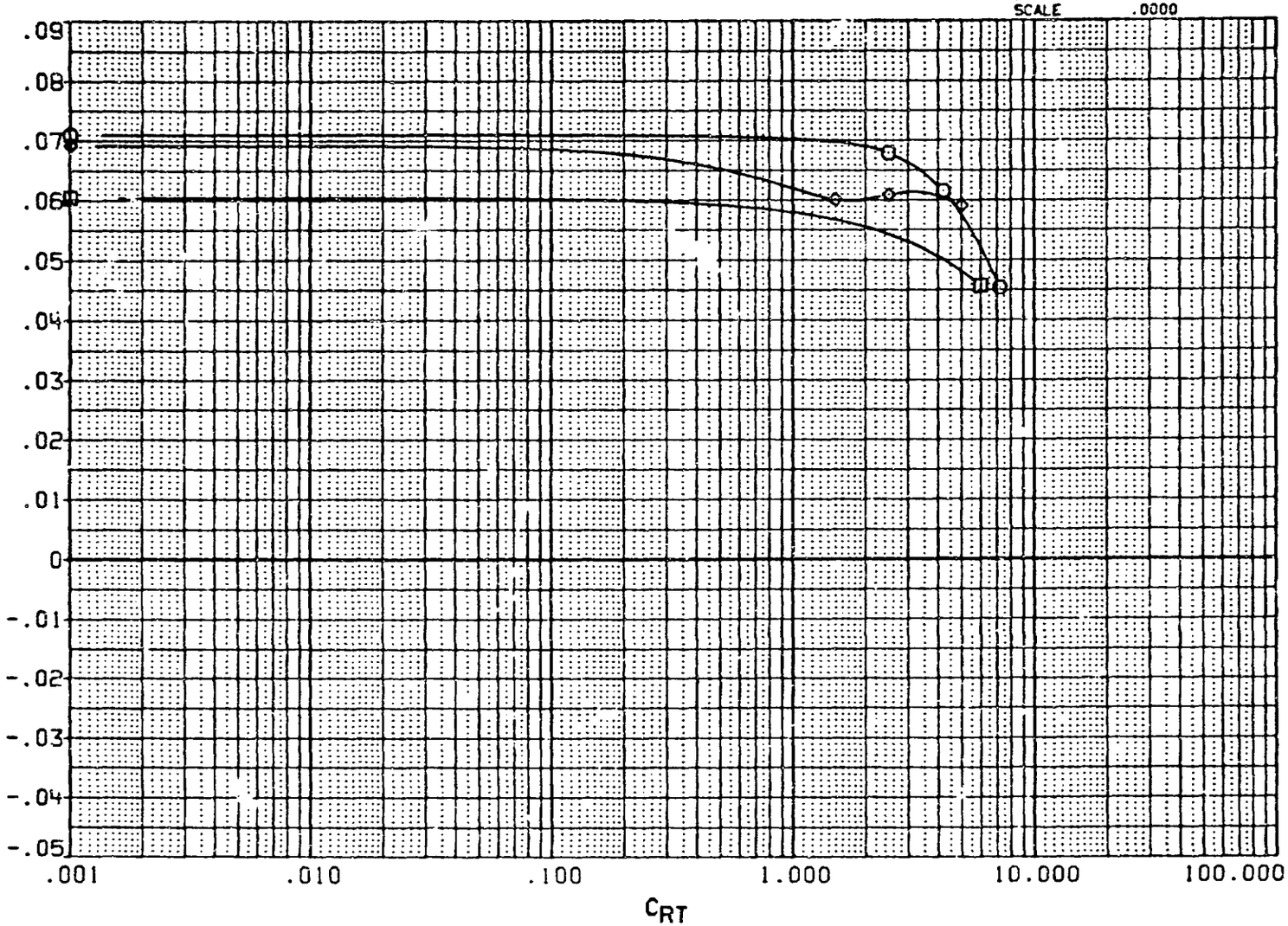


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF0

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(BUE031)	○	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	1.000	3.000
(BUE032)	□	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	1.100	3.000
(BUE033)	◇	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF0	1.251	3.000

REFERENCE INFORMATION

SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

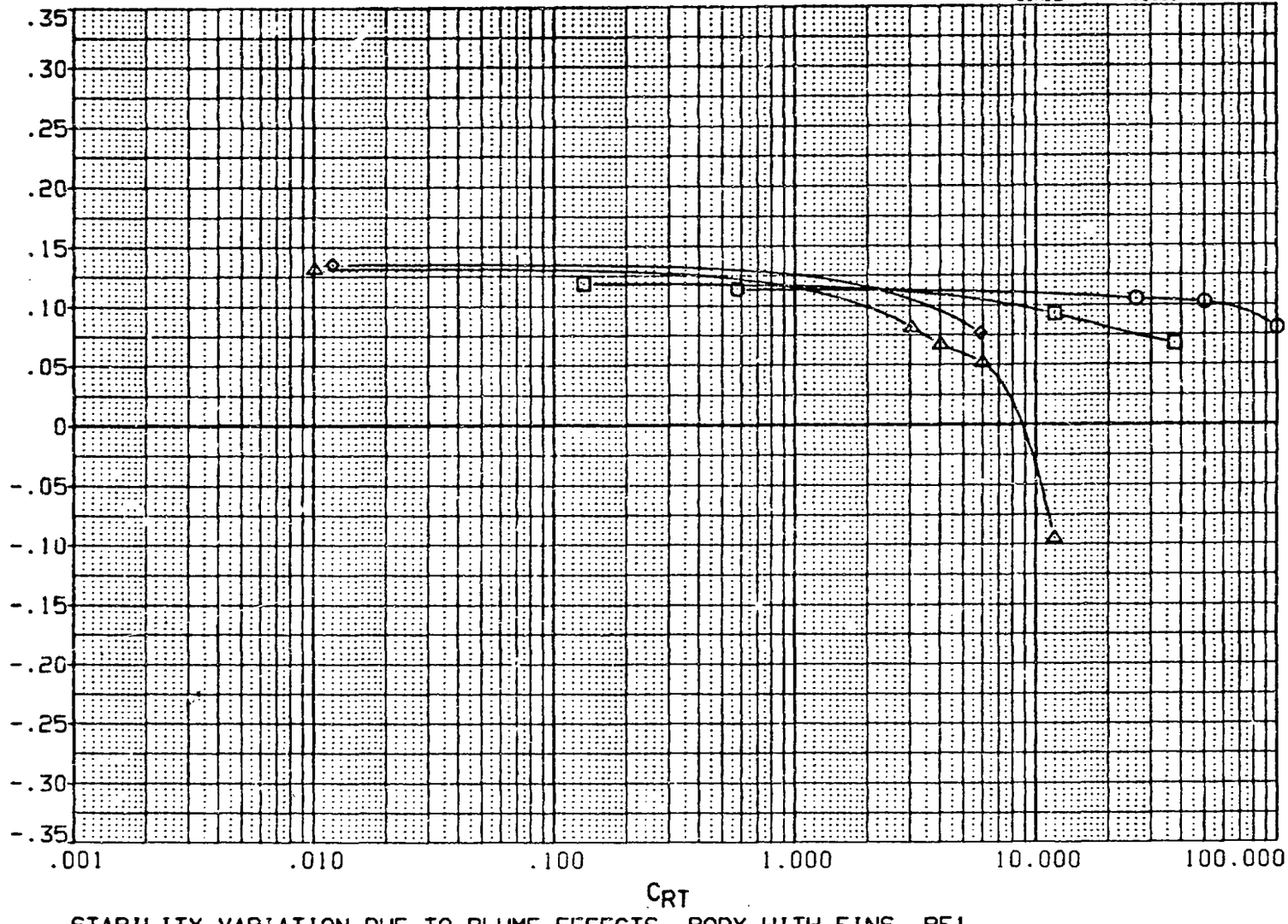


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF0

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AXE009)	○	AEDC TF360 BODY FIN, BF1	.200	3.000
(AXE011)	□	AEDC TF360 BODY FIN, BF1	.400	3.000
(AXE012)	◇	AEDC TF360 BODY FIN, BF1	1.000	3.000
(AXE013)	△	AEDC TF360 BODY FIN, BF1	1.250	3.000

REFERENCE INFORMATION

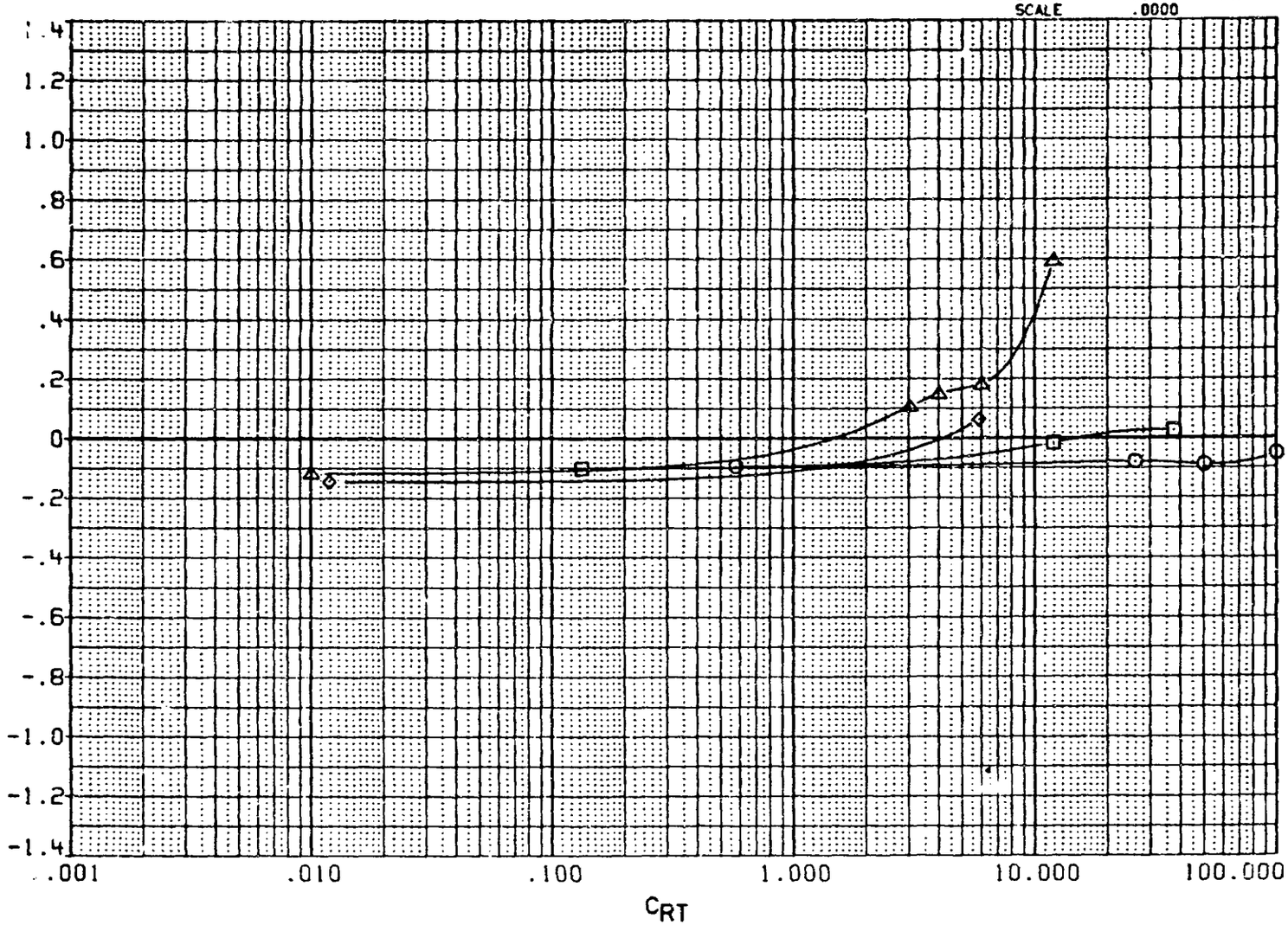
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AXE009)	○	AEDC TF360 BODY FIN, BFI	.200	3.000
(AXE011)	□	AEDC TF360 BODY FIN, BFI	.400	3.000
(AXE012)	◇	AEDC TF360 BODY FIN, BFI	1.000	3.000
(AXE013)	△	AEDC TF360 BODY FIN, BFI	1.250	3.000

REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

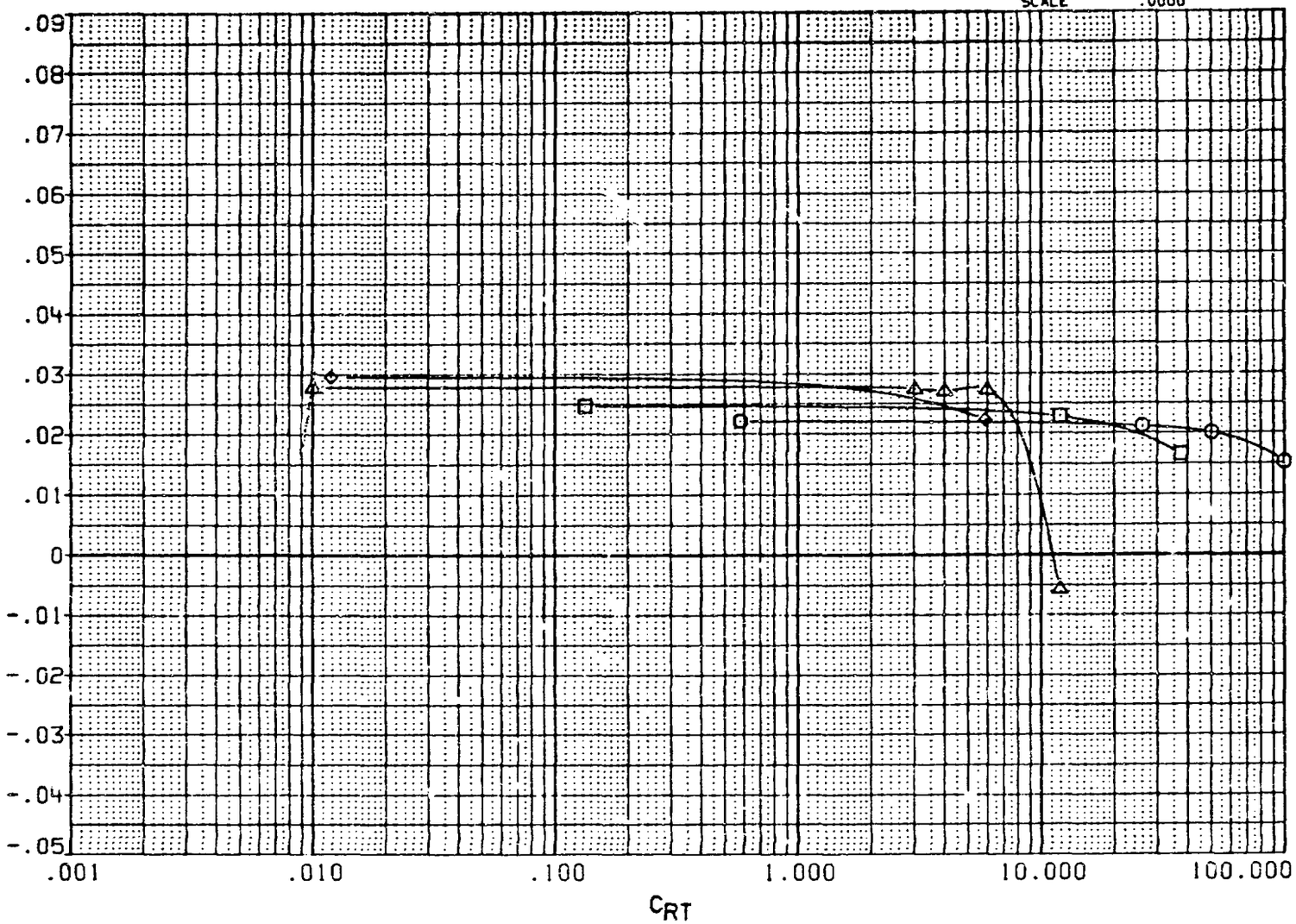


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BFI

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AXE009)	○	AEDC TF36(BODY FIN, BF1	.200	3.000
(AXE011)	□	AEDC TF360 BODY FIN, BF1	.400	3.000
(AXE012)	◇	AEDC TF360 BODY FIN, BF1	1.000	3.000
(AXE013)	△	AEDC TF360 BODY FIN, BF1	1.250	3.000

REFERENCE INFORMATION

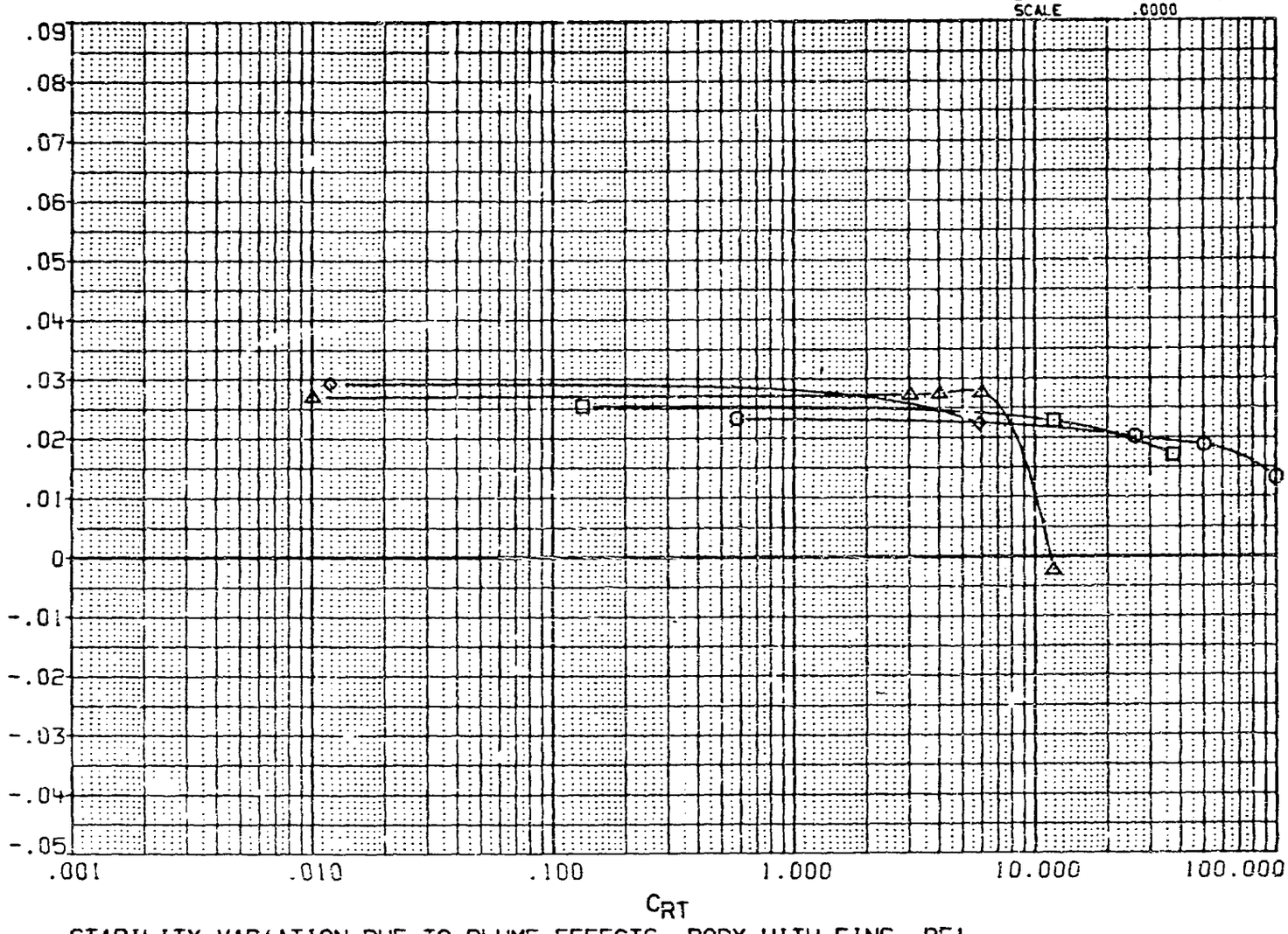
SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AXE009)	○	AEDC TF360 BODY FIN, BF1	.200	3.000
(AXE011)	□	AEDC TF360 BODY FIN, BF1	.400	3.000
(AXE012)	◇	AEDC TF360 BODY FIN, BF1	1.000	3.000
(AXE013)	△	AEDC TF360 BODY FIN, BF1	1.250	3.000

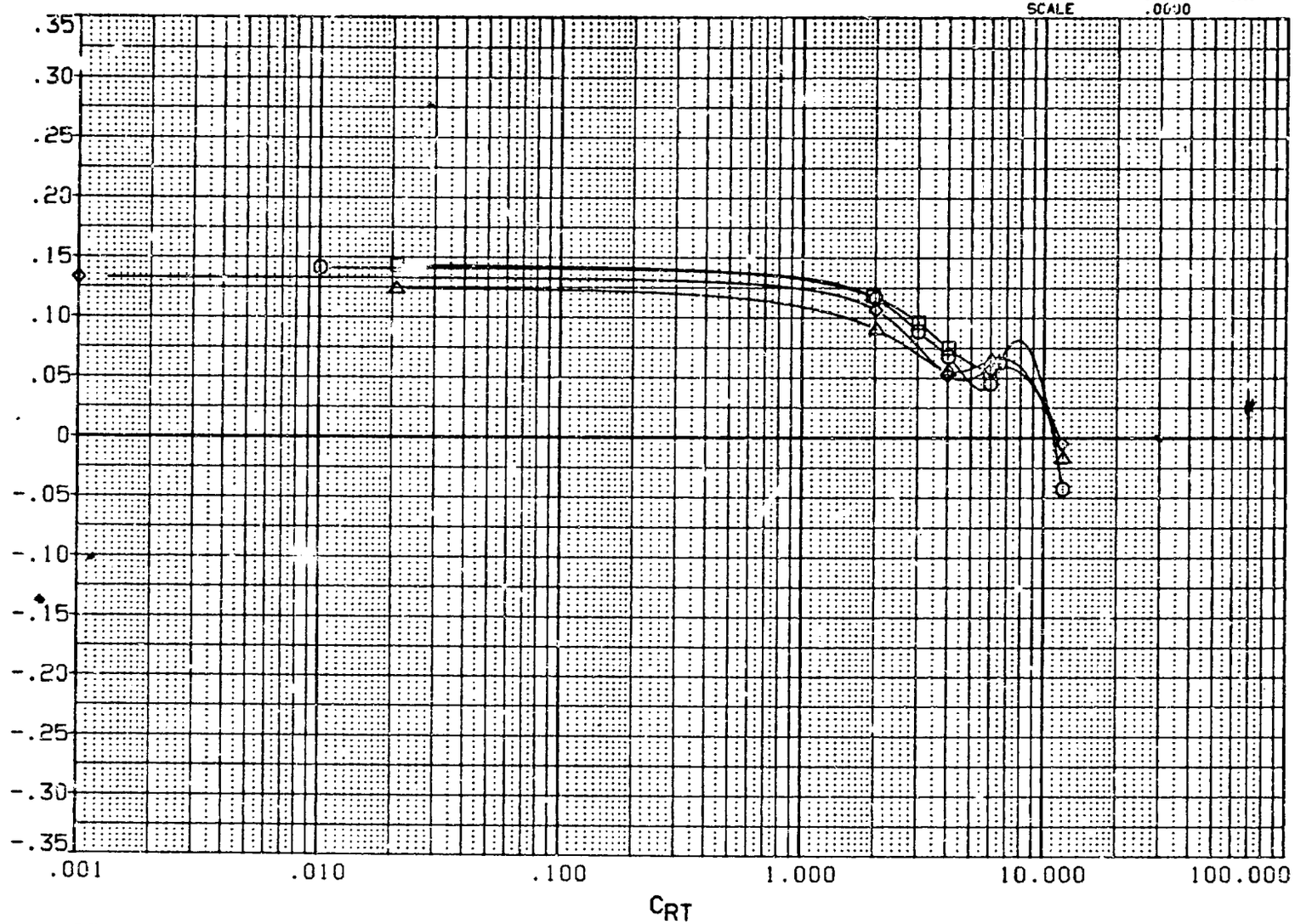
REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(E014)	○	AEDC TF350 BODY FIN, BF1	1.500	3.000
(E015)	□	AEDC SF172 BODY FIN, BF1	1.700	3.000
(E016)	◇	AEDC SF172 BODY FIN, BF1	2.000	3.000
(E017)	△	AEDC SF172 BODY FIN, BF1	2.300	3.000

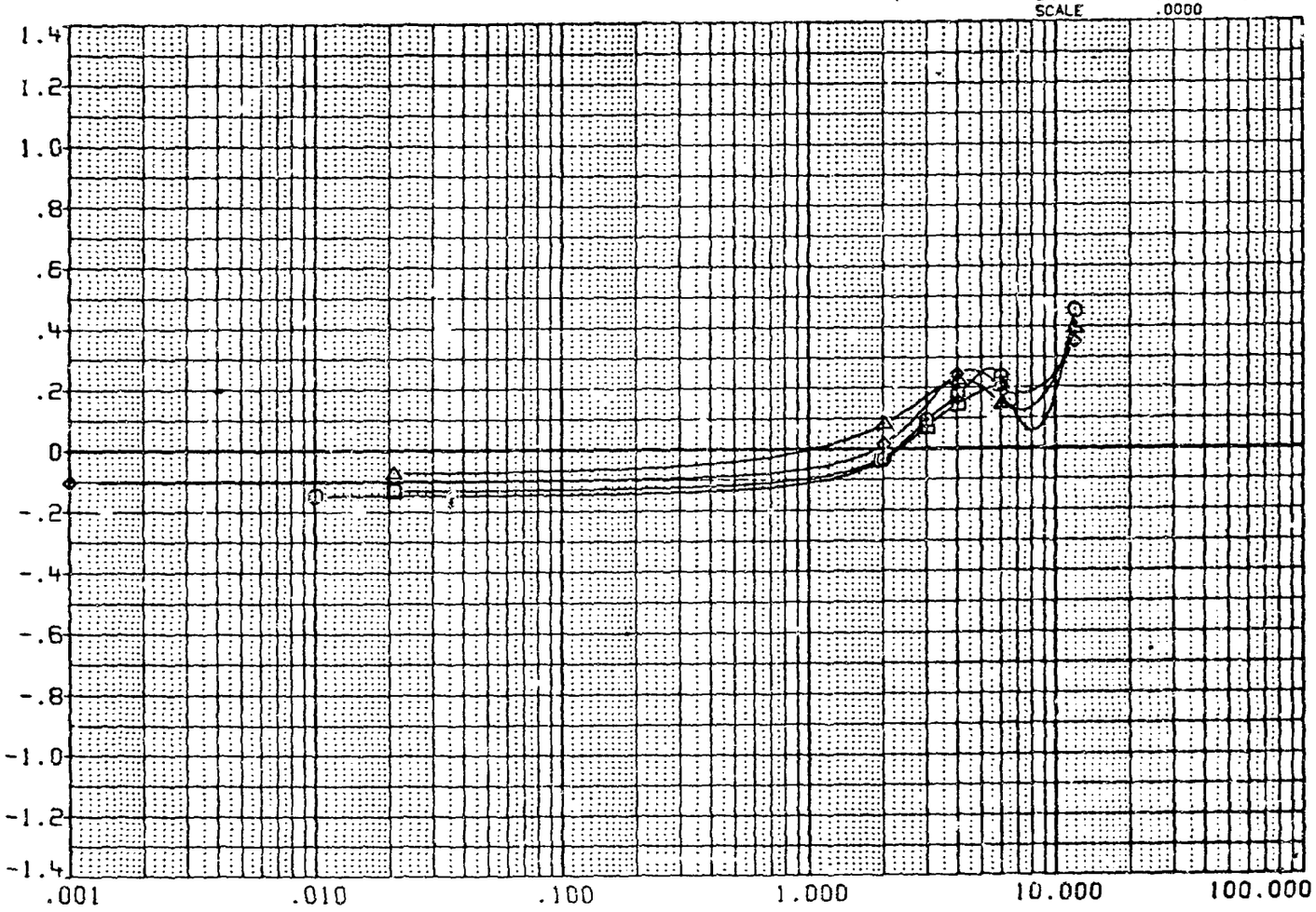
REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0050	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WIT. FINS, BF1

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(XE014)	○	AEDC TF360 BODY FIN, BF1	1.500	3.000
(XE015)	□	AEDC SF172 BODY FIN, BF1	1.700	3.000
(XE016)	◇	AEDC SF172 BODY FIN, BF1	2.000	3.000
(XE017)	△	AEDC SF172 BODY FIN, BF1	2.300	3.000

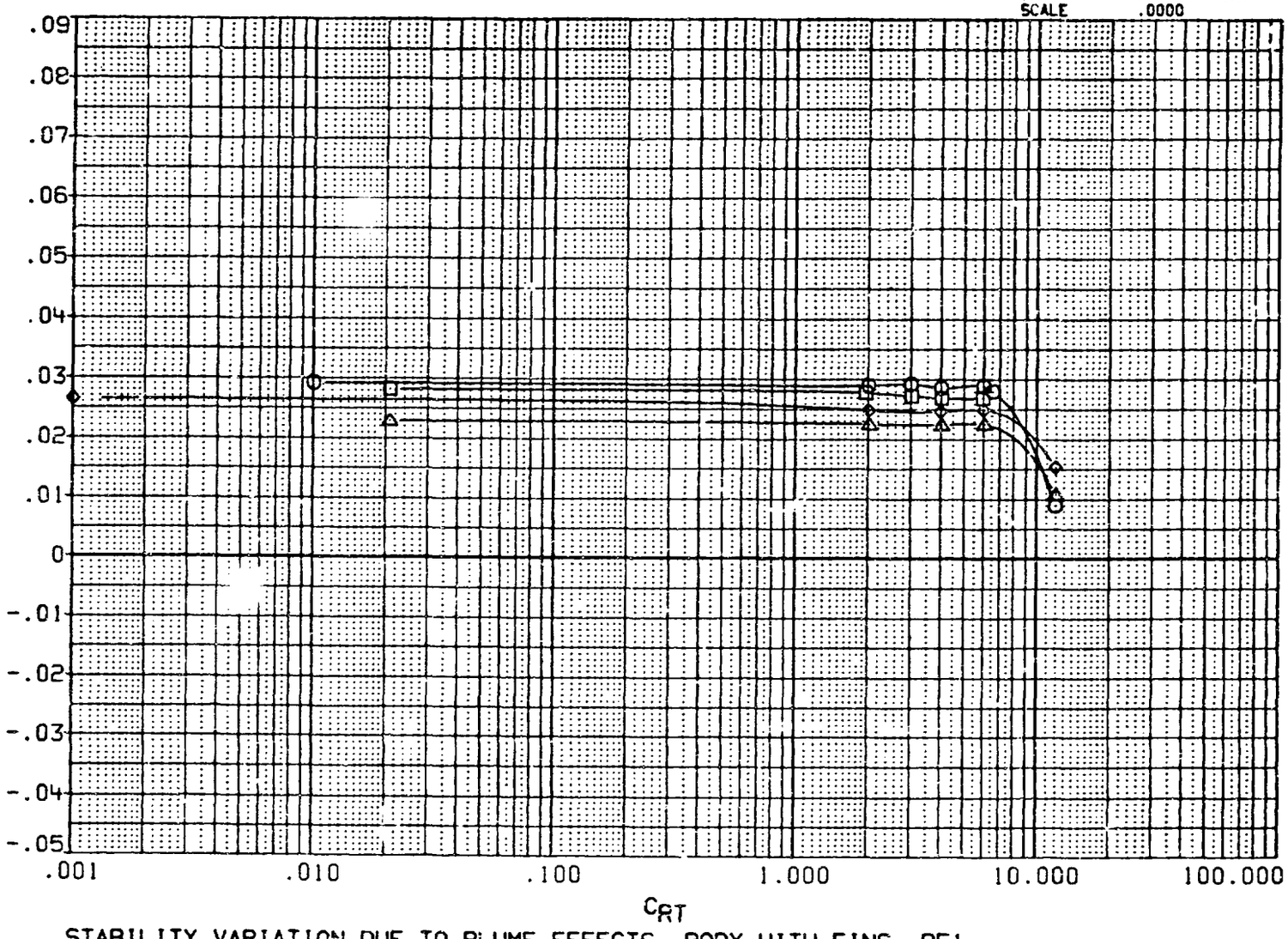
REFERENCE INFORMATION		
SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION D_L PLUME EFFECTS, BODY WITH FINS, BF1

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AXE014)	○	AEDC TF360 BODY FIN, BF1	1.500	3.000
(AXE015)	□	AEDC SF172 BODY FIN, BF1	1.700	3.000
(AXE016)	◇	AEDC SF172 BODY FIN, BF1	2.000	3.000
(AXE017)	△	AEDC SF172 BODY FIN, BF1	2.300	3.000

REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



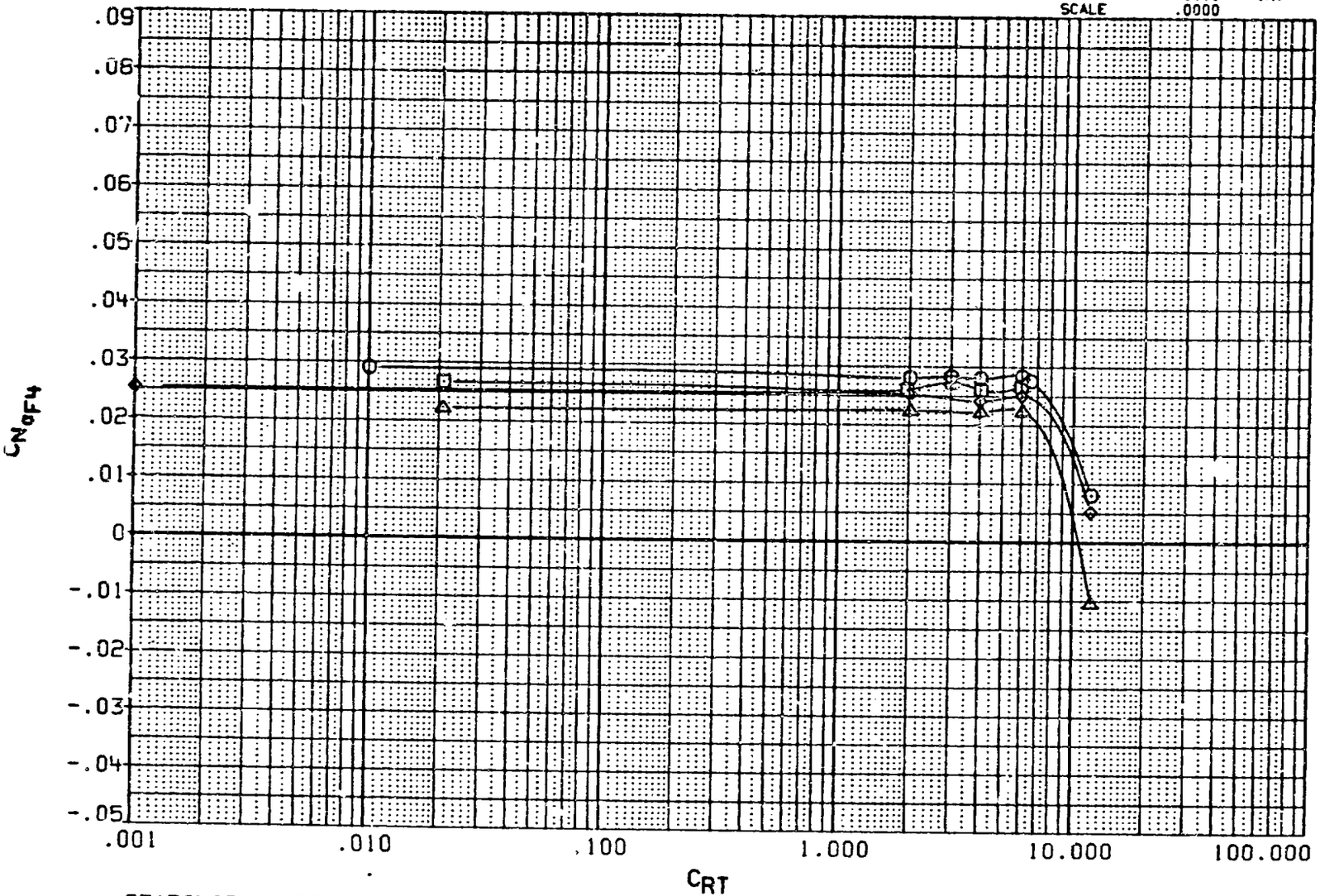
STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(AXE014)	○	AEDC TF360 BODY FIN, BF1
(AXE015)	□	AEDC SF172 BODY FIN, BF1
(BXE016)	◇	AEDC SF172 BODY FIN, BF1
(AXE017)	△	AEDC SF172 BODY FIN, BF1

MACH	FINPOS
1.500	3.000
1.700	3.000
2.000	3.000
2.300	3.000

REFERENCE INFORMATION

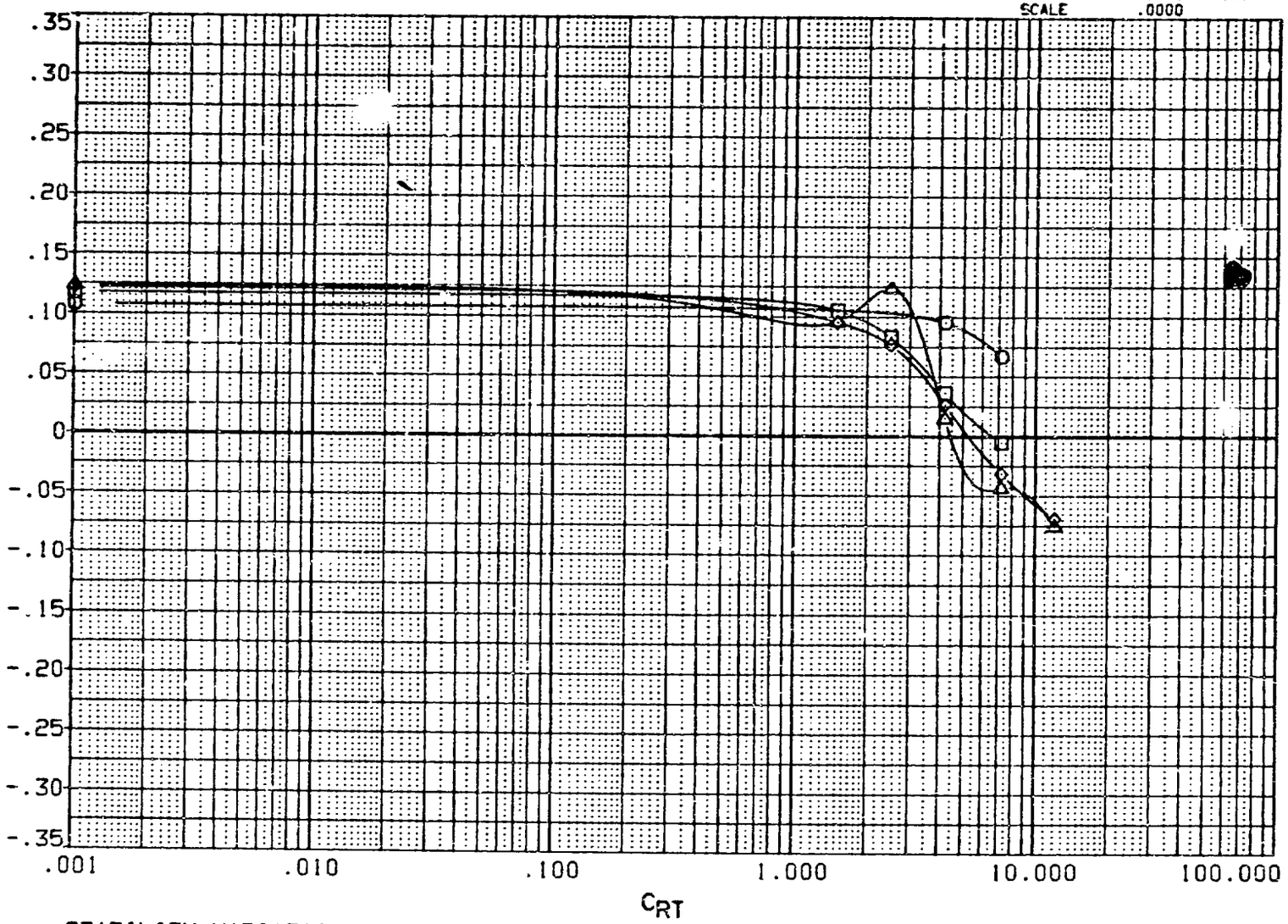
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(BUE007)	○	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF1	.403	1.000
(BUE008)	□	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF1	.799	1.000
(BUE009)	◇	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF1	.900	1.000
(BUE010)	△	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF1	.950	1.000

REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

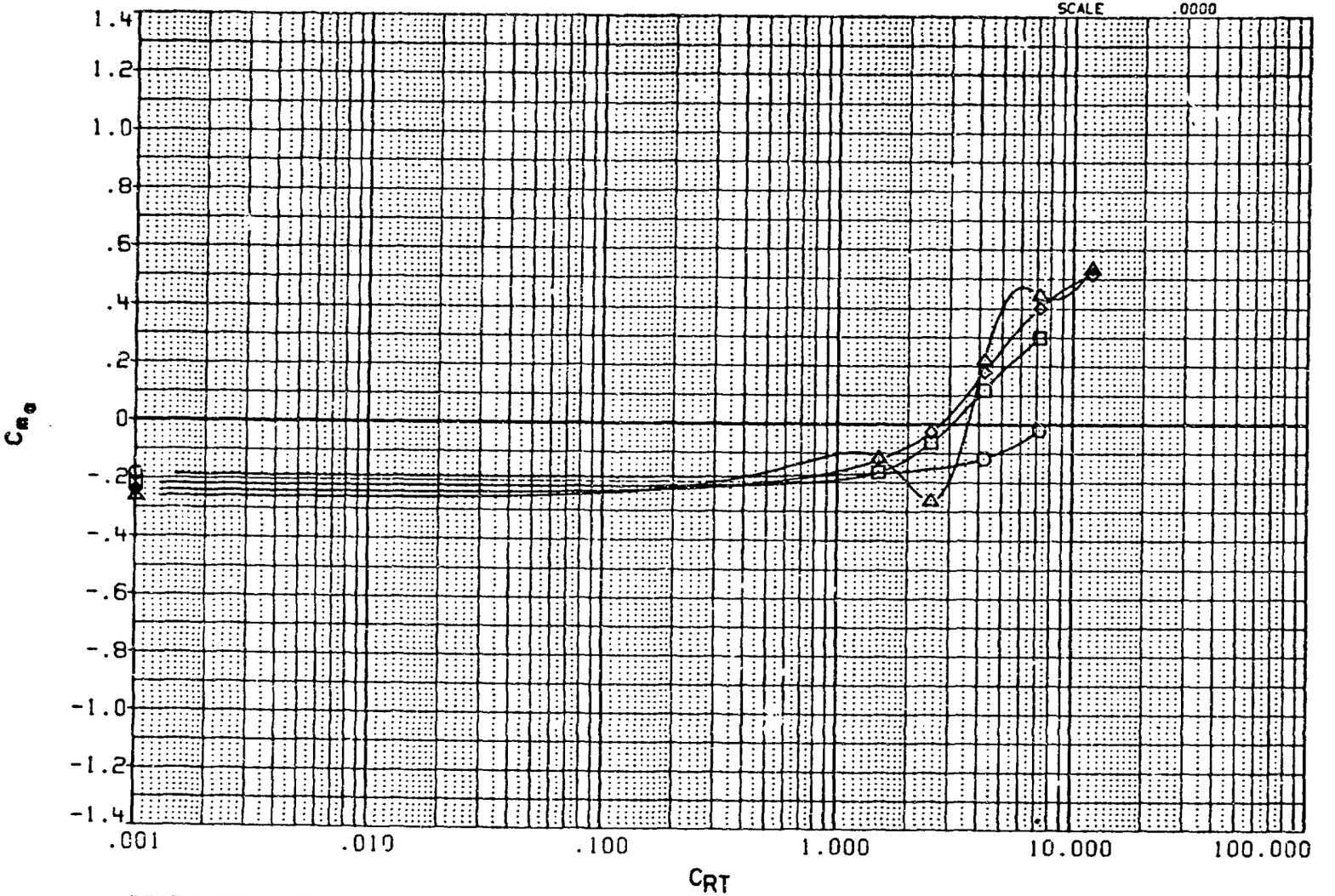


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(BUE007)	○	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF1	.403	1.000
(BUE008)	□	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF1	.799	1.000
(BUE009)	◇	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF1	.900	1.000
(BUC010)	△	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF1	.950	1.000

REFERENCE INFORMATION

SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

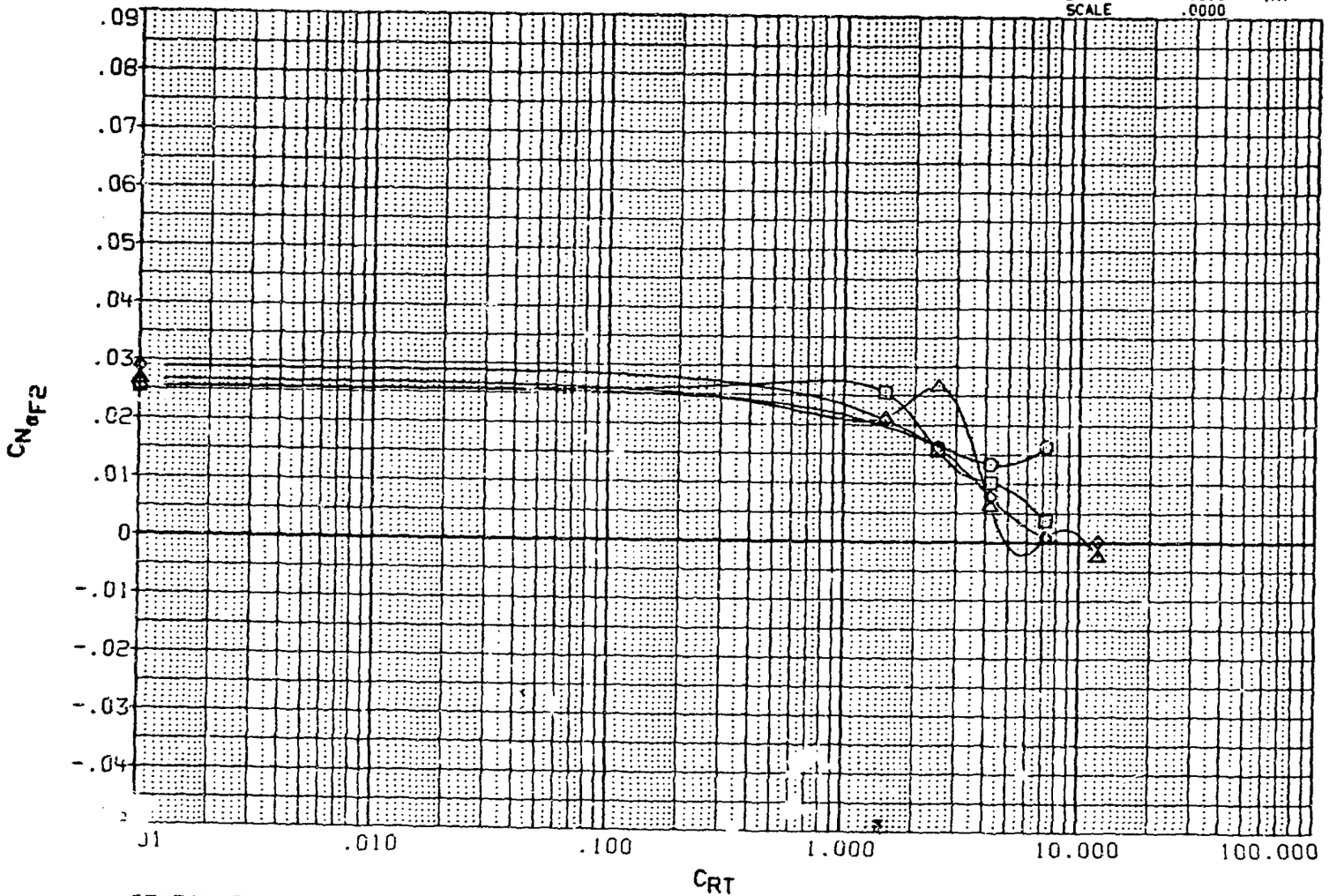


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(BUE007)	○	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF1	.403	1.000
(BUE008)	□	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF1	.799	1.000
(BUE009)	◇	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF1	.900	1.000
(BUE010)	△	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF1	.950	1.000

REFERENCE INFORMATION

SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

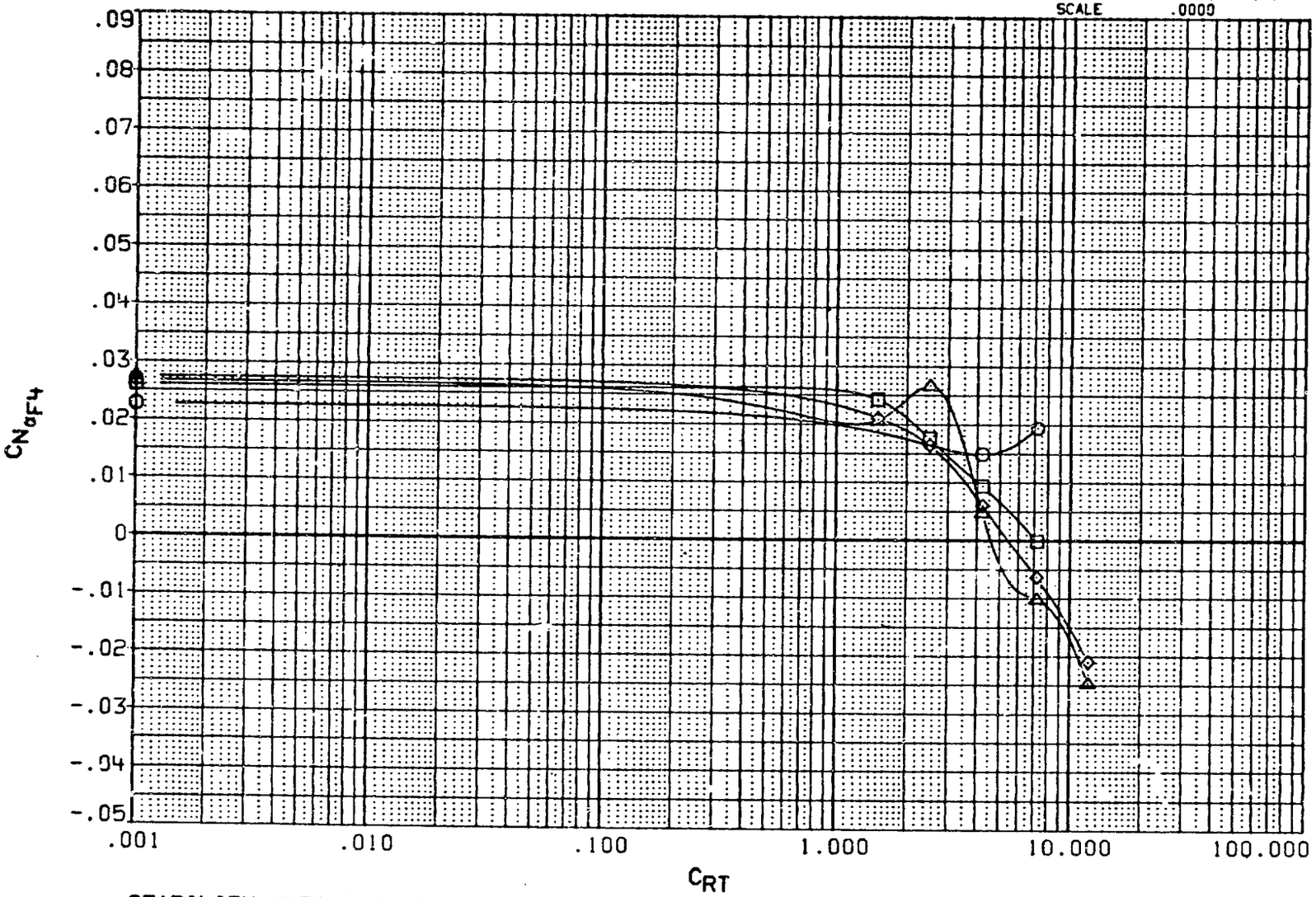


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(BUE007)	○	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF1	.403	1.000
(BUE008)	□	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF1	.799	1.000
(BUE009)	◇	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF1	.900	1.000
(BUE010)	△	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF1	.950	1.000

REFERENCE INFORMATION

SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

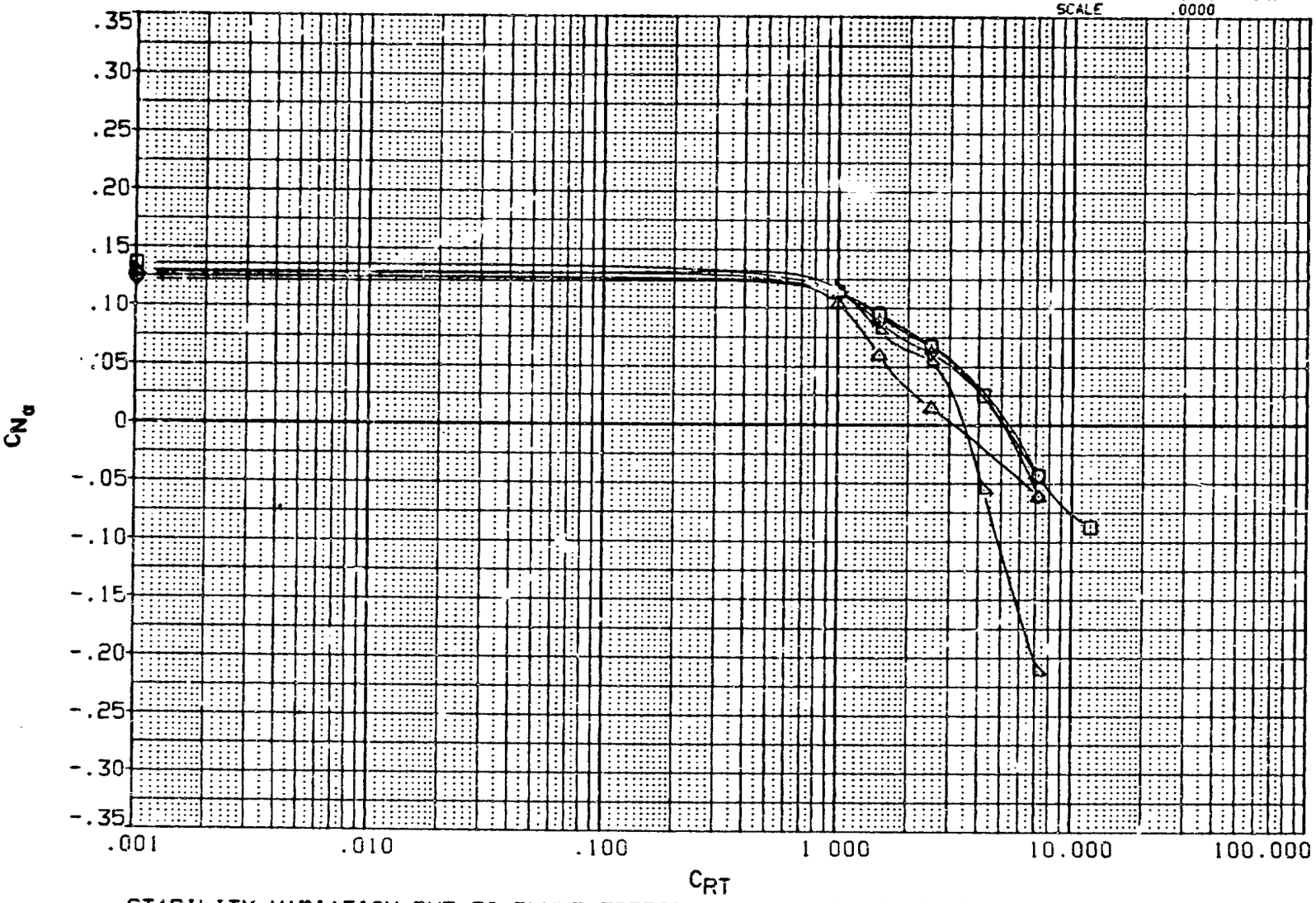


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(BUE011)	○	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF1	.973	1.000
(BUE012)	□	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF1	1.000	1.000
(BUE013)	◇	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF1	1.047	1.000
(BUE014)	△	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF1	1.101	1.000
(BUE015)	▷	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF1	1.250	1.000

REFERENCE INFORMATION

SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

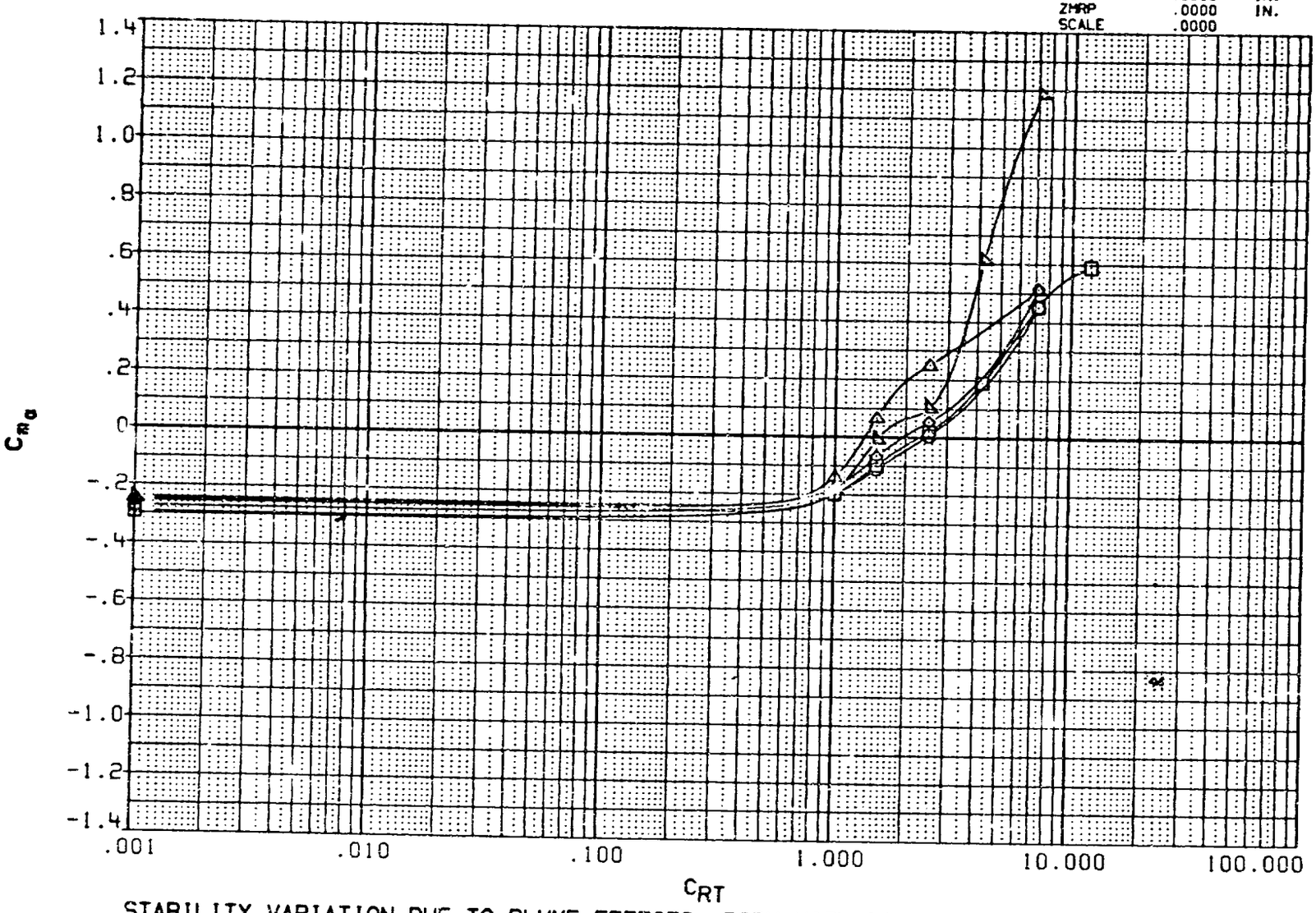


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(BUE011)	○	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF1	.973	1.000
(BUE012)	□	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF1	1.000	1.000
(BUE013)	◇	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF1	1.047	1.000
(BUE014)	△	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF1	1.101	1.000
(BUE015)	▷	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF1	1.250	1.000

REFERENCE INFORMATION

SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

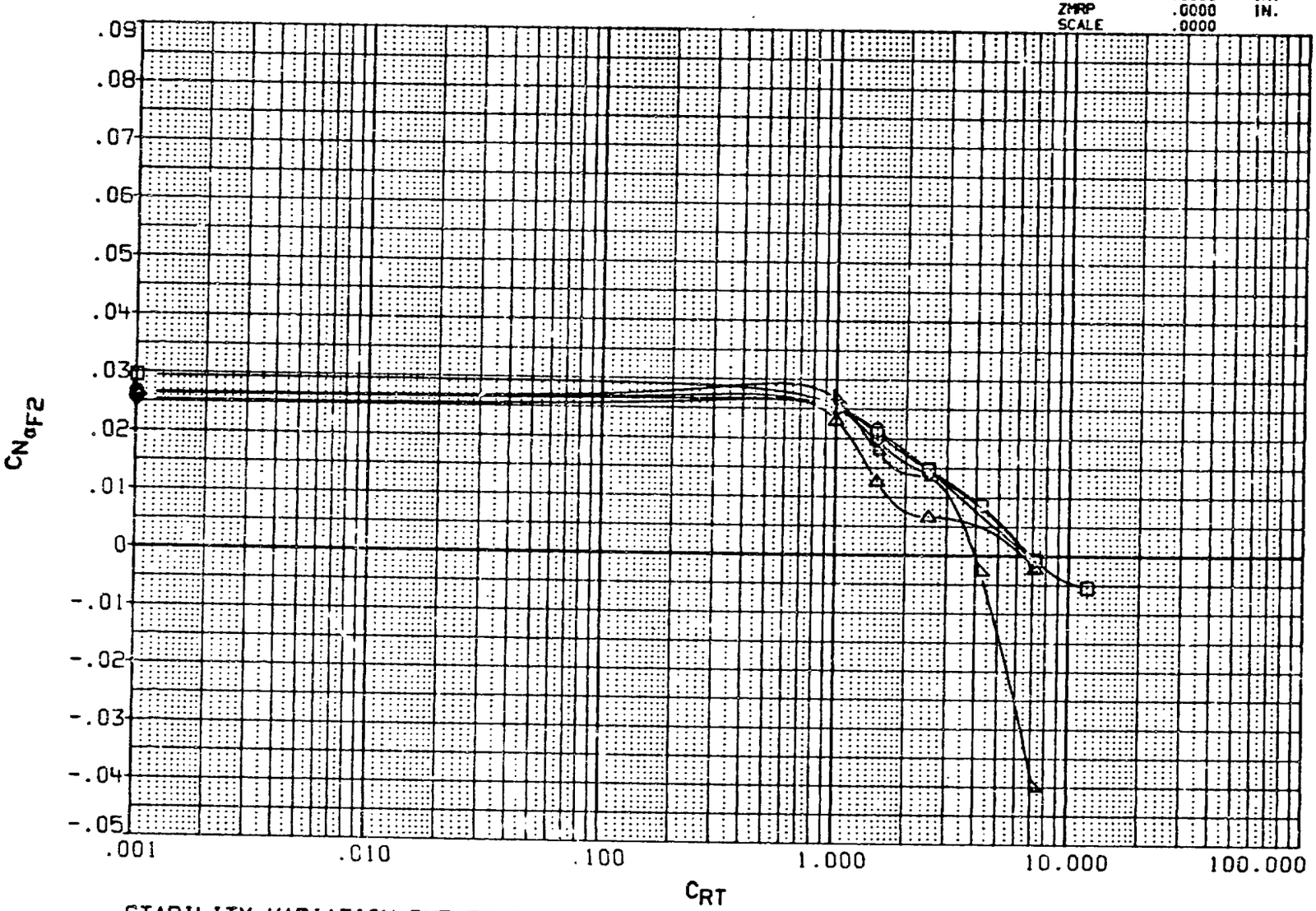


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(BUE011)	○	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF1	.973	1.000
(BUE012)	□	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF1	1.000	1.000
(BUE013)	◇	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF1	1.047	1.000
(BUE014)	△	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF1	1.101	1.000
(BUE015)	▷	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BF1	1.250	1.000

REFERENCE INFORMATION

SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

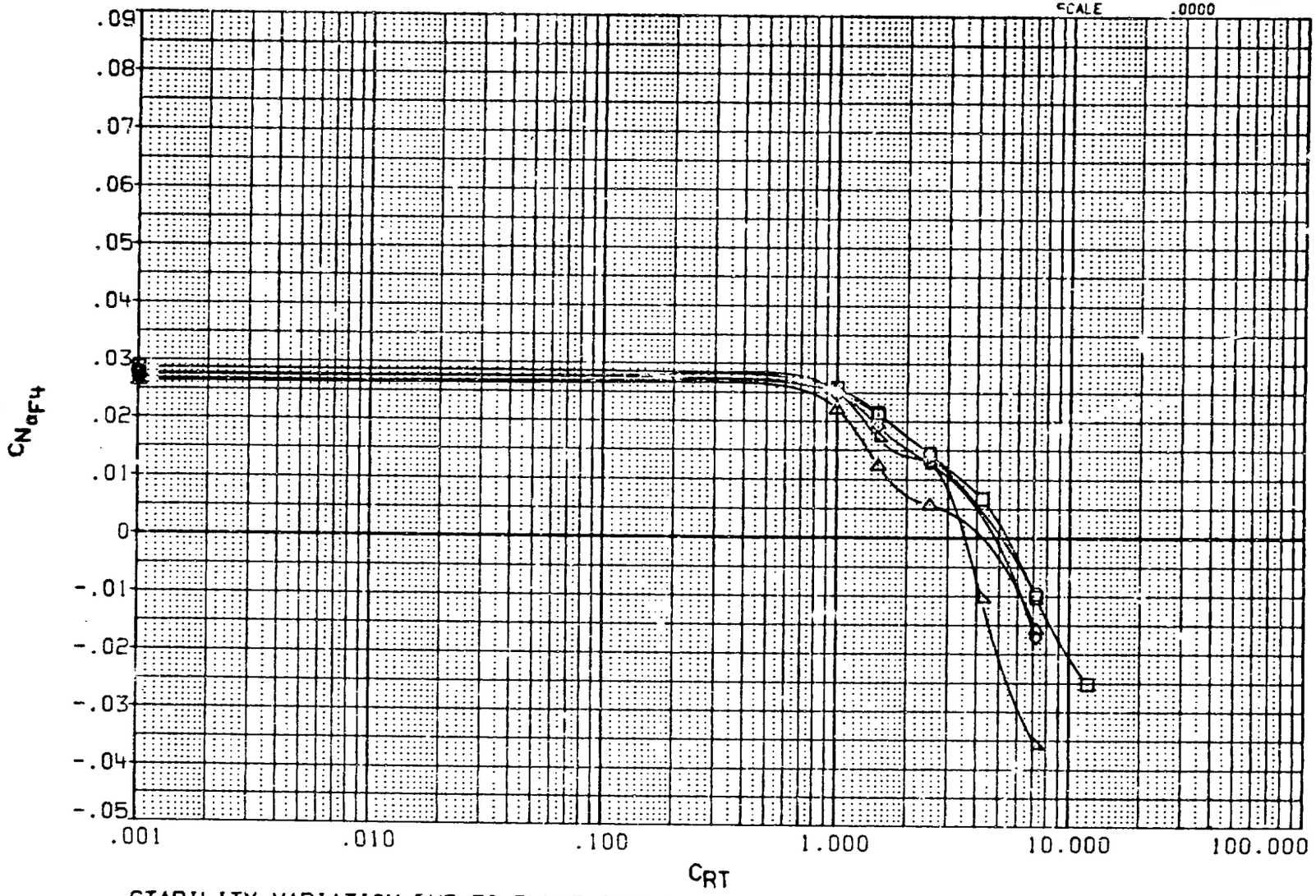


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(BUE011)	○	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BFI	.973	1.000
(BUE012)	□	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BFI	1.000	1.000
(BUE013)	◇	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BFI	1.047	1.000
(BUE014)	△	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BFI	1.101	1.000
(BUE015)	◁	CAL T17-093 THRUST EFFECTS, BODY WITH FINS, BFI	1.250	1.000

REFERENCE INFORMATION

SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

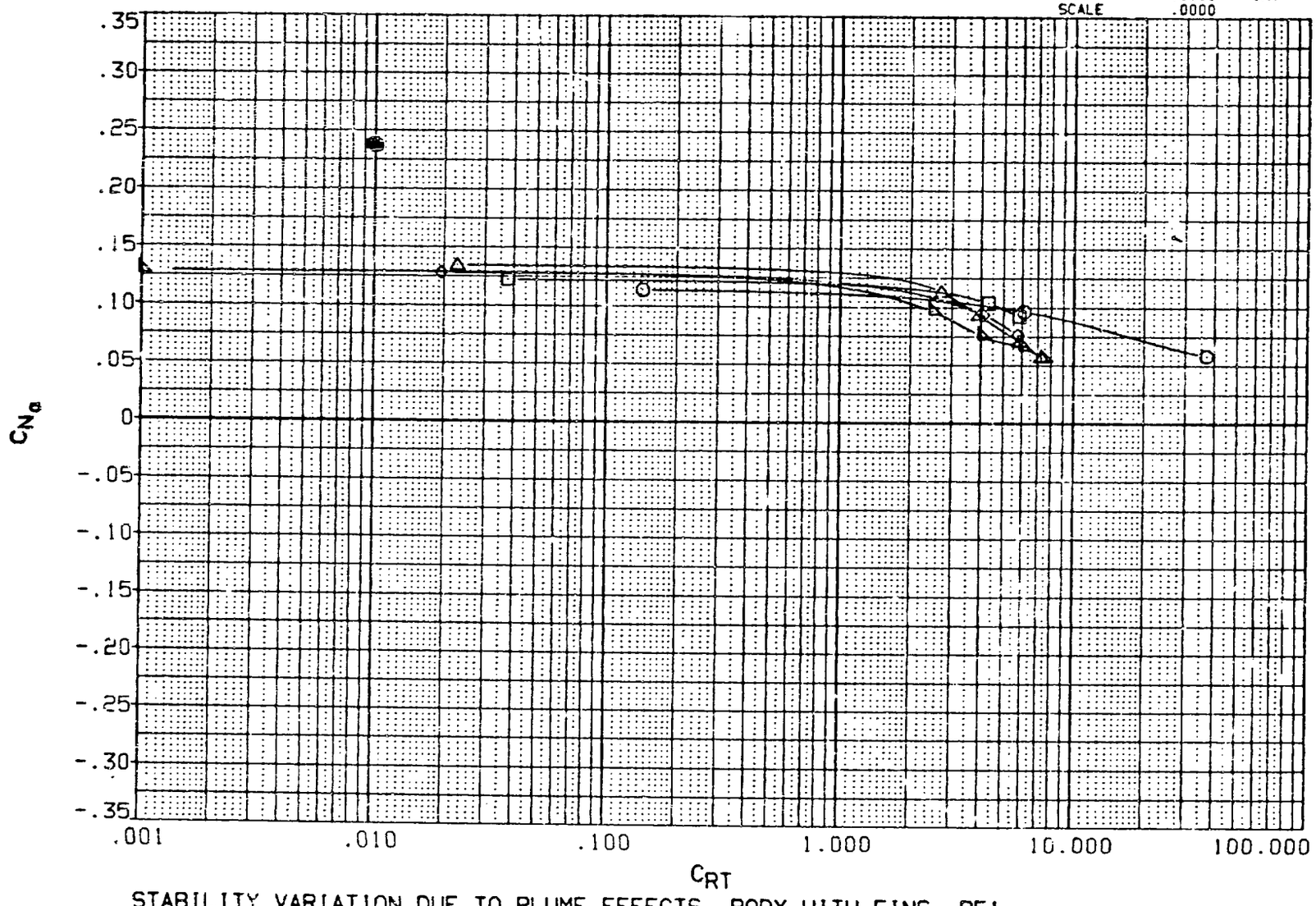


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BFI

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX8032)	○	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	.400	3.000
(AX8033)	□	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	.700	3.000
(AX9034)	◇	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	.900	3.000
(AX8035)	△	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	1.000	3.000
(BX8036)	▷	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	1.200	3.000

REFERENCE INFORMATION

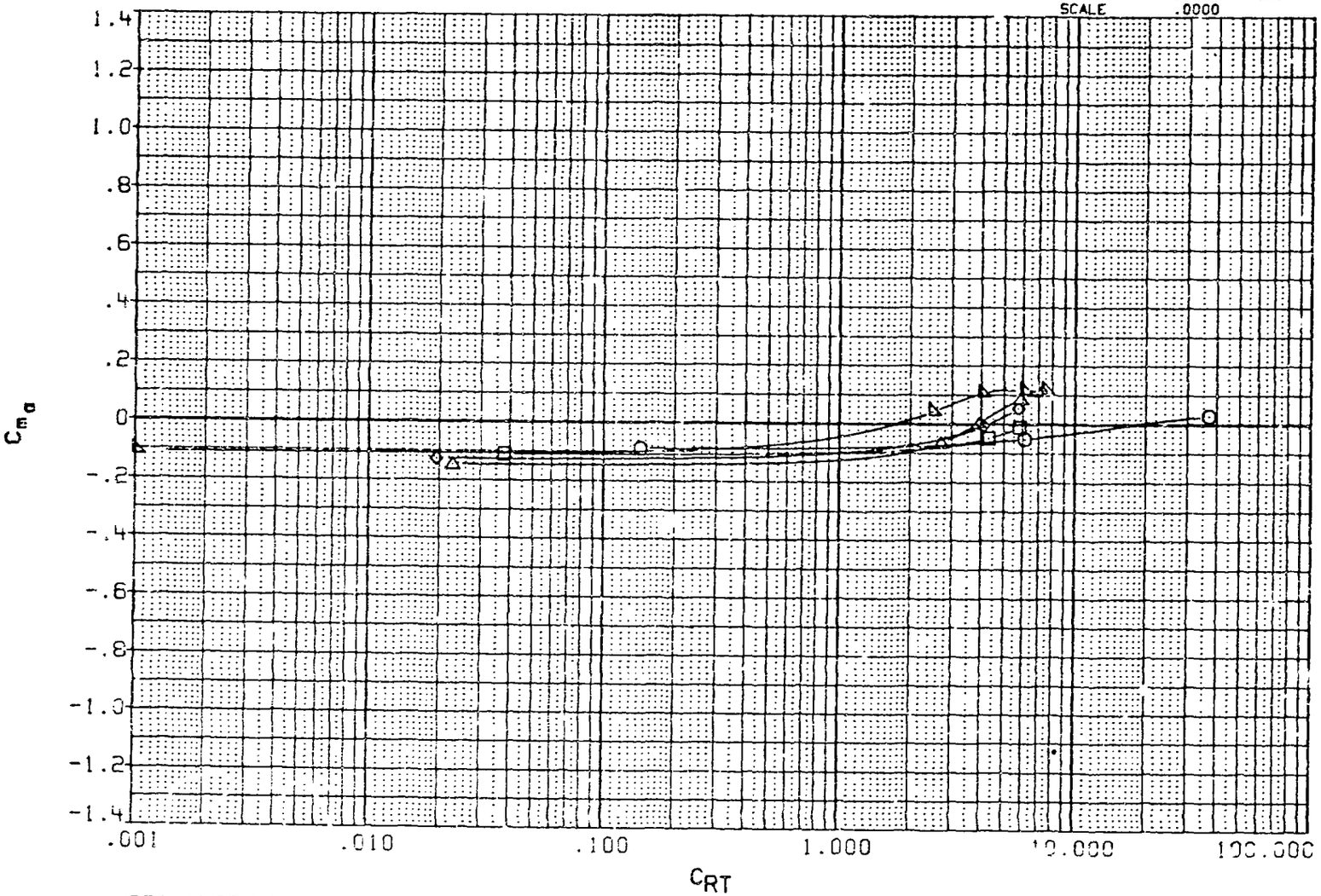
SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX8032)	○	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	.400	3.000
(AX8033)	□	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	.700	3.000
(AX8034)	◇	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	.900	3.000
(AX8035)	△	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	1.000	3.000
(BX8036)	▷	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	1.200	3.000

REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

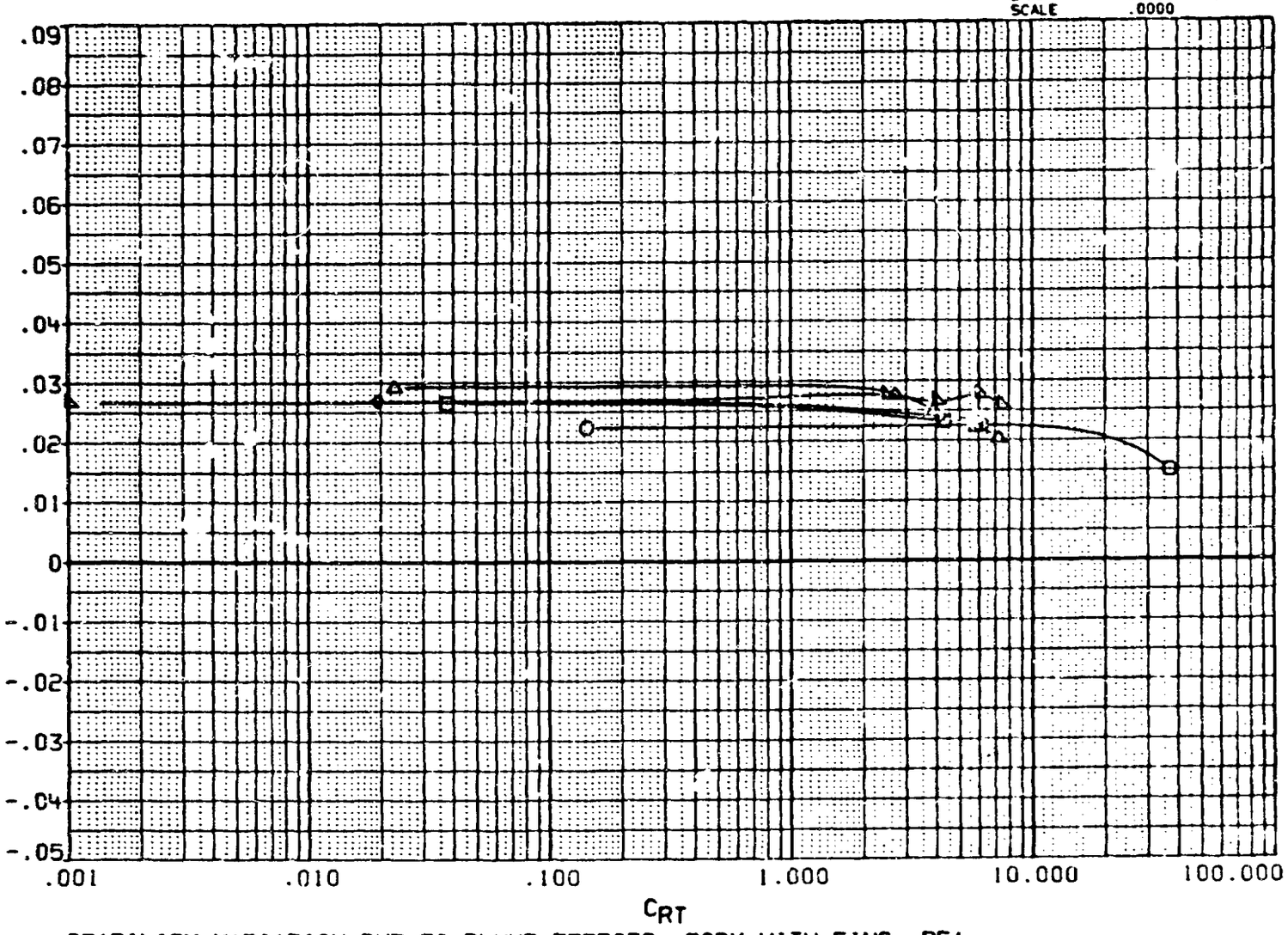


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX8032)	○	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	.400	3.000
(AX8033)	□	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	.700	3.000
(AX8034)	◇	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	.900	3.000
(AX8035)	△	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	1.000	3.000
(BX8035)	▷	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	1.200	3.000

REFERENCE INFORMATION

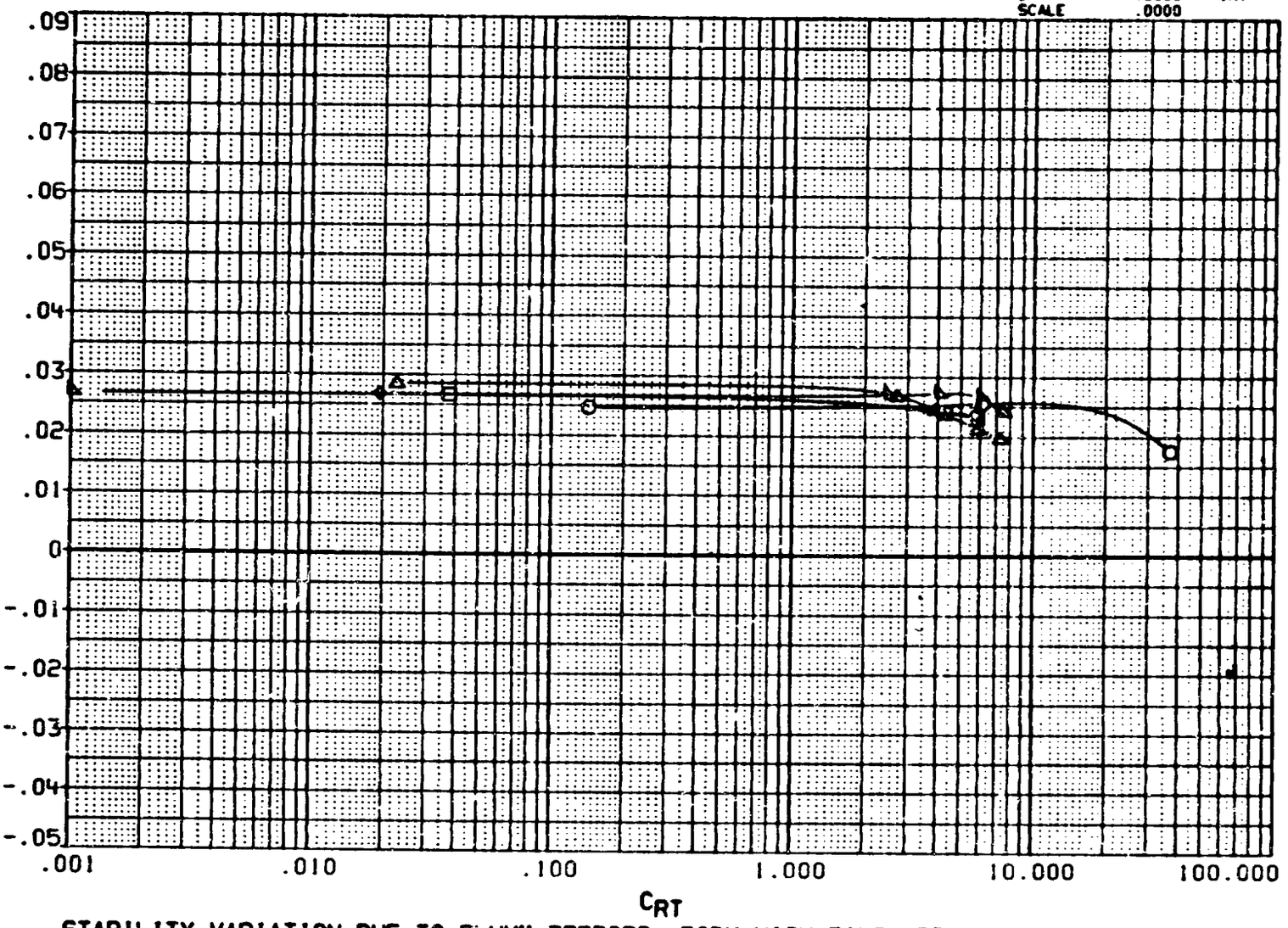
SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX8032)	○	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	.400	3.000
(AX8033)	□	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	.700	3.000
(AX8034)	◇	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	.900	3.000
(AX8035)	△	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	1.000	3.000
(BX8036)	▷	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	1.200	3.000

REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	28.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

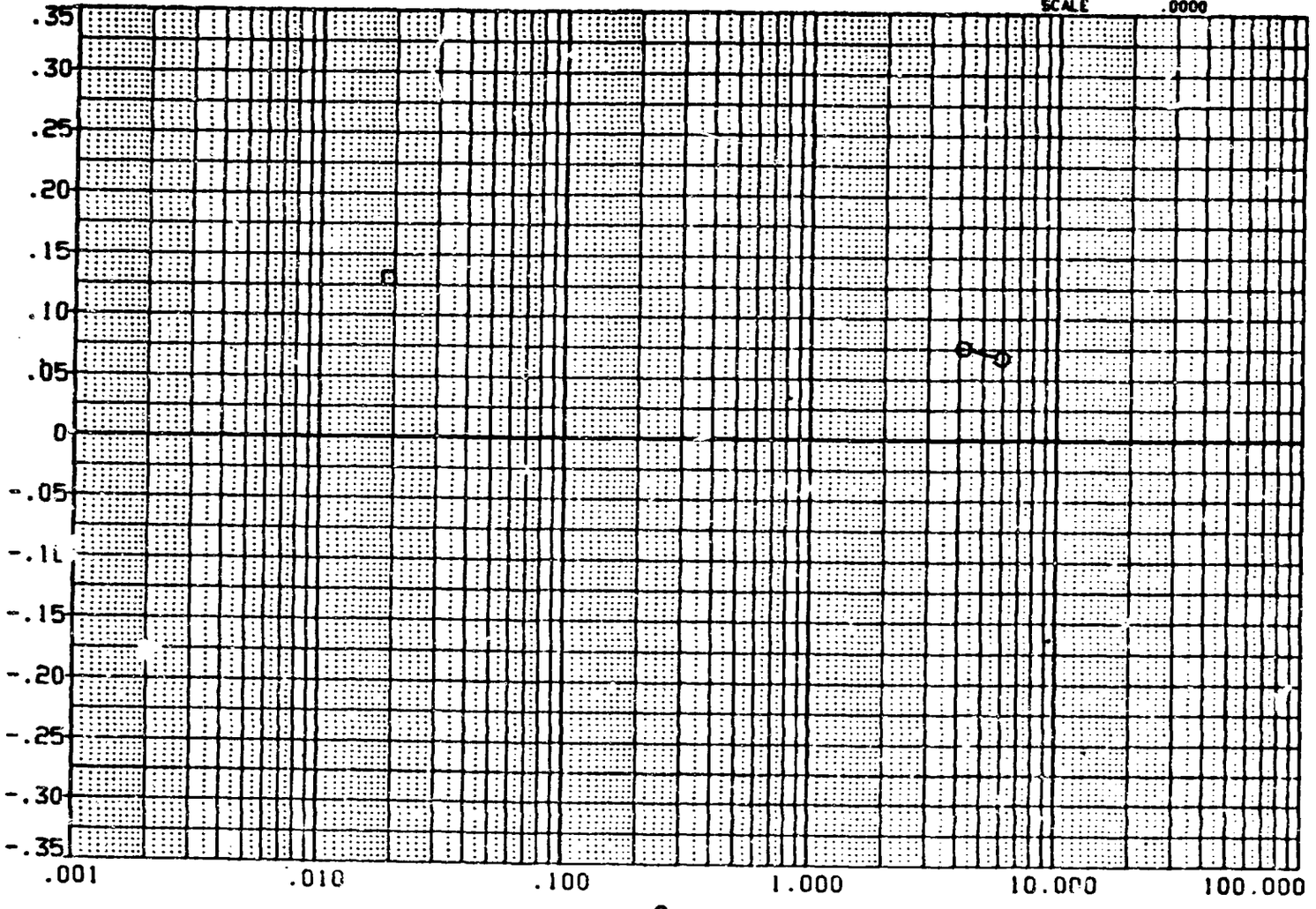


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX80037)	○	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	1.250	3.000
(AX80038)	□	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	1.250	3.000

REFERENCE INFORMATION

SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

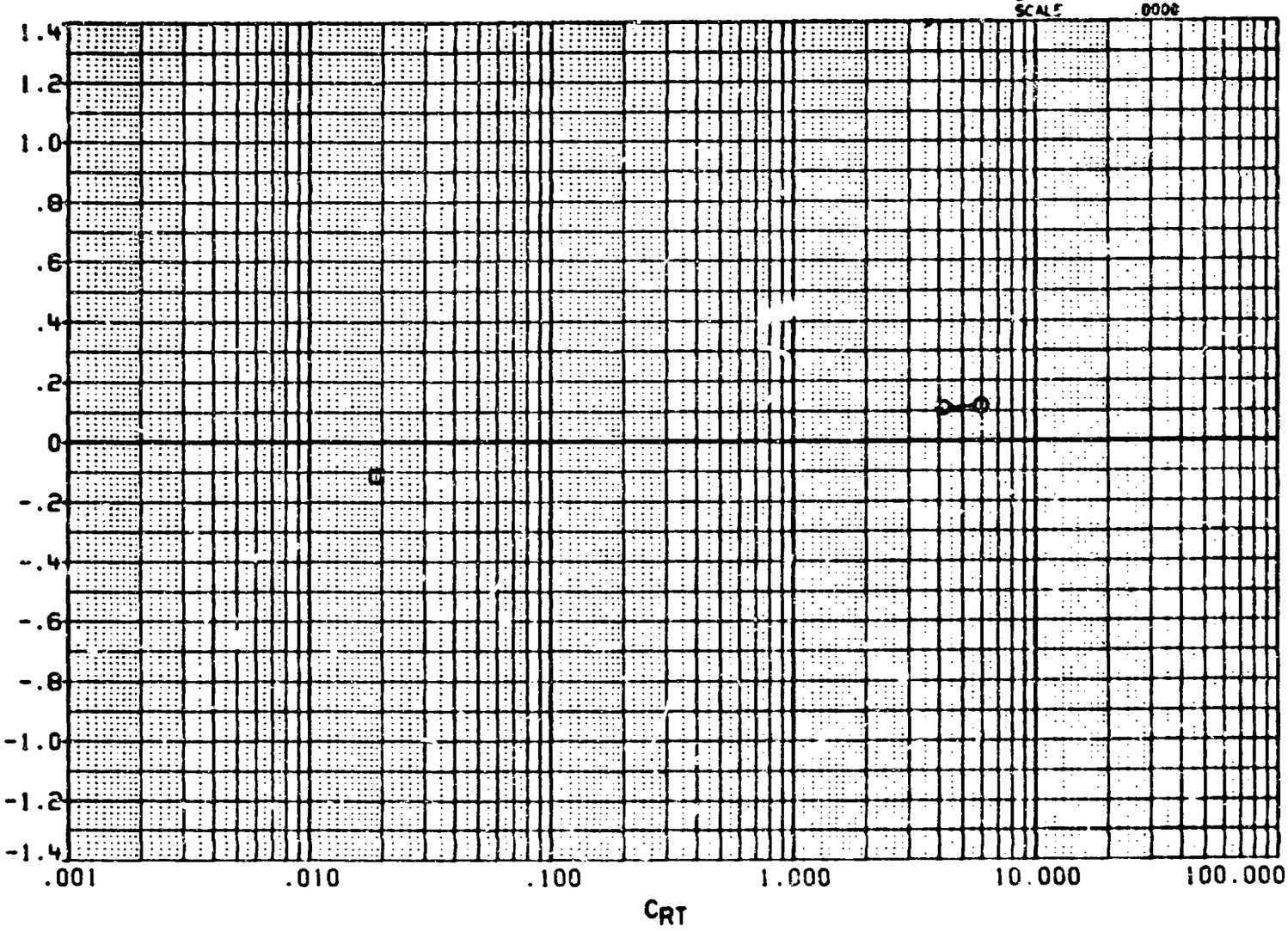


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX80837)	○	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	1.250	3.000
(AX80381)	□	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	1.250	3.000

REFERENCE INFORMATION

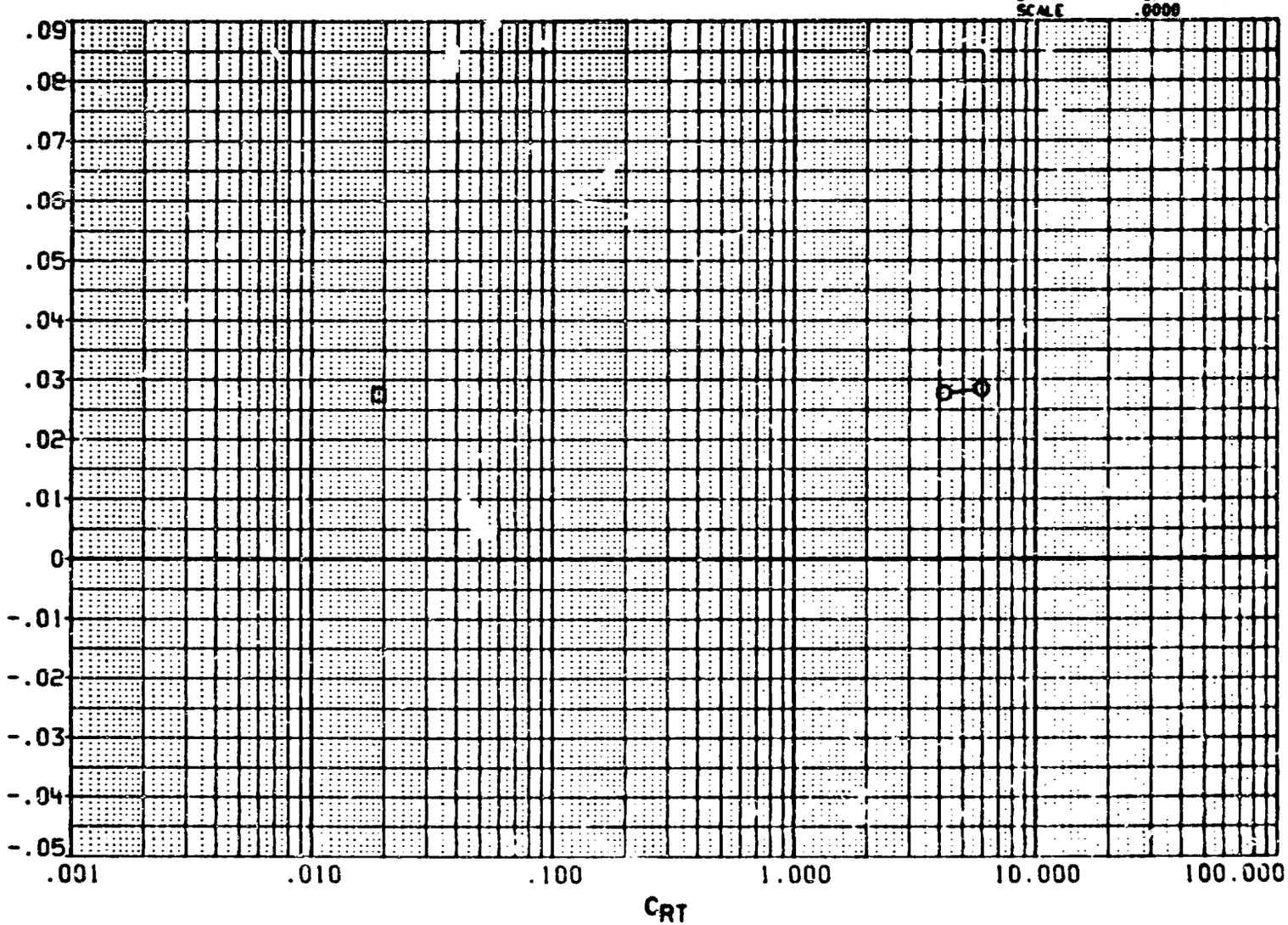
SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX8037)	○	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	1.250	3.000
(AX8038)	○	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	1.250	3.000

REFERENCE INFORMATION		
SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	28.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



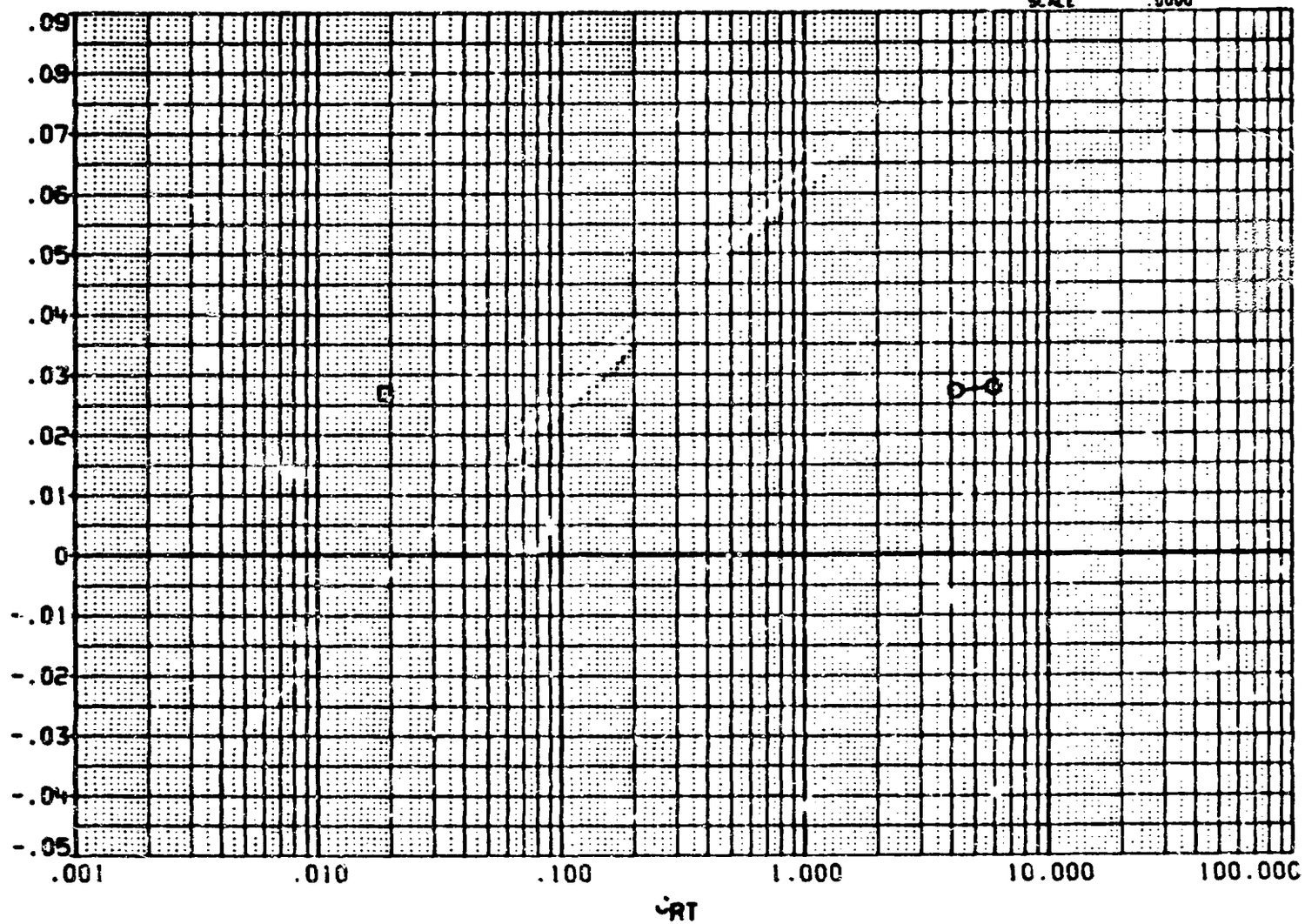
86

STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, δ_{F1}

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AM8637)	○	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	1.250	3.900
(AM8638)	□	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	1.250	3.900

REFERENCE INFORMATION

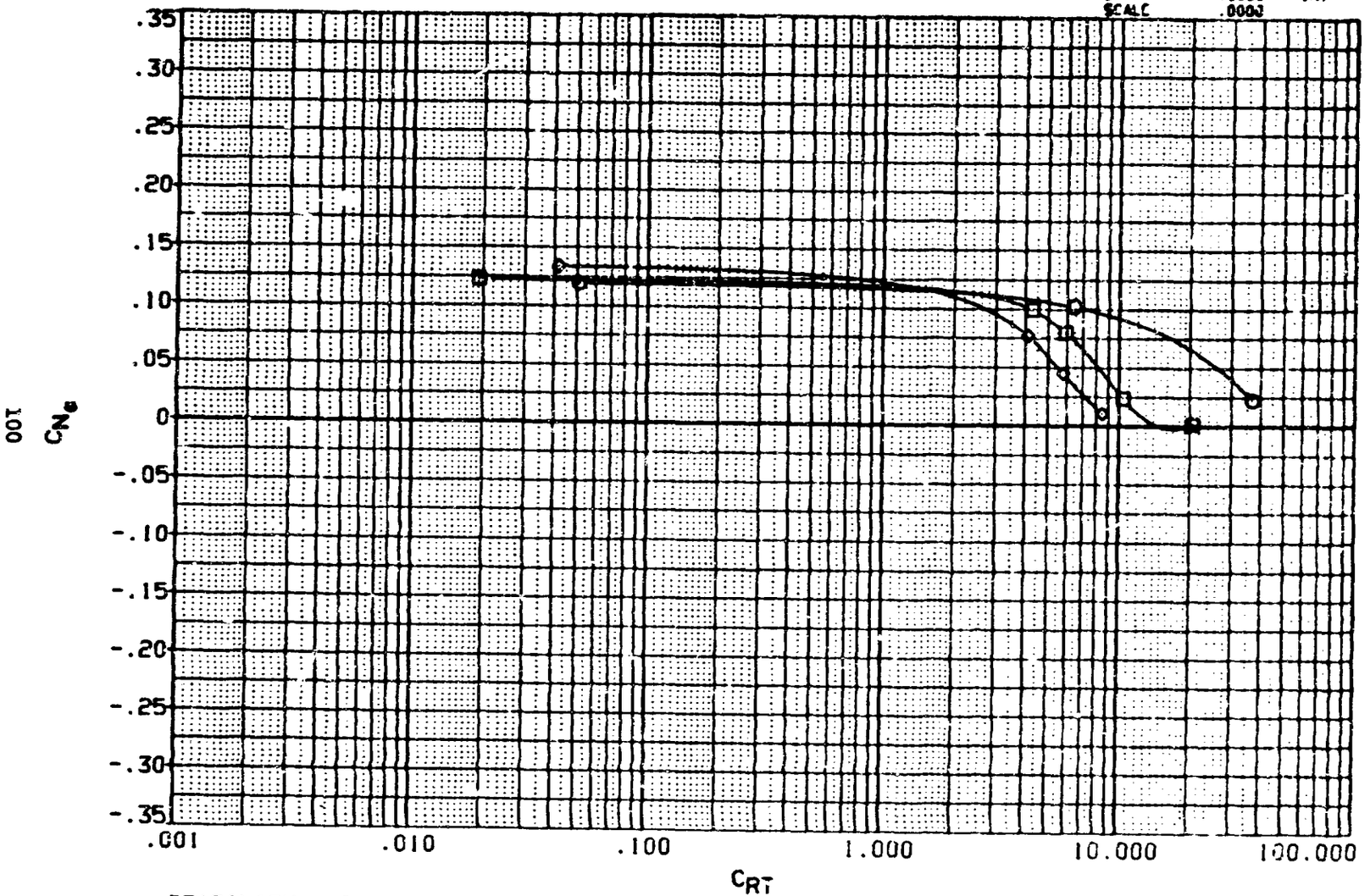
SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX8838)	○	CAL T17-123 (BF1) BODY, FIN IN MID POSITION	.400	2.000
(AX8840)	□	CAL T17-123 (BF1) BODY, FIN IN MID POSITION	.700	2.000
(AX8841)	◇	CAL T17-123 (BF1) BODY, FIN IN MID POSITION	.900	2.000

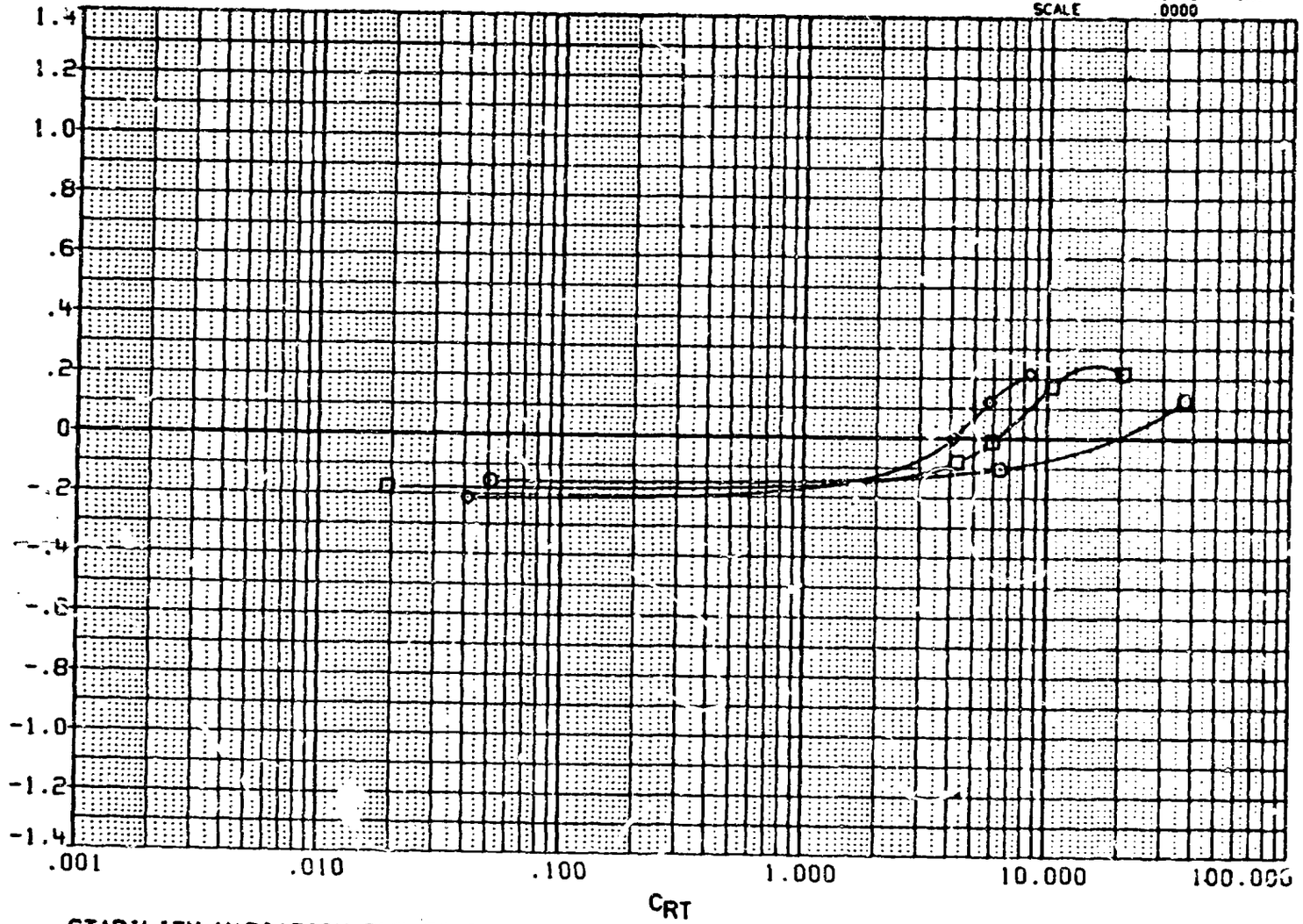
REFERENCE INFORMATION		
SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	25.5300	IN.
YMRP	.0010	IN.
ZMRP	.0000	IN.
SCALE	.0003	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX80039)	○	CAL T17-123 (BF1) BODY, FIN IN MID POSITION	.400	2.000
(AX80040)	□	CAL T17-123 (BF1) BODY, FIN IN MID POSITION	.700	2.000
(AX80041)	◇	CAL T17-123 (BF1) BODY, FIN IN MID POSITION	.900	2.000

REFERENCE INFORMATION		
SREF	19.6[illegible]	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

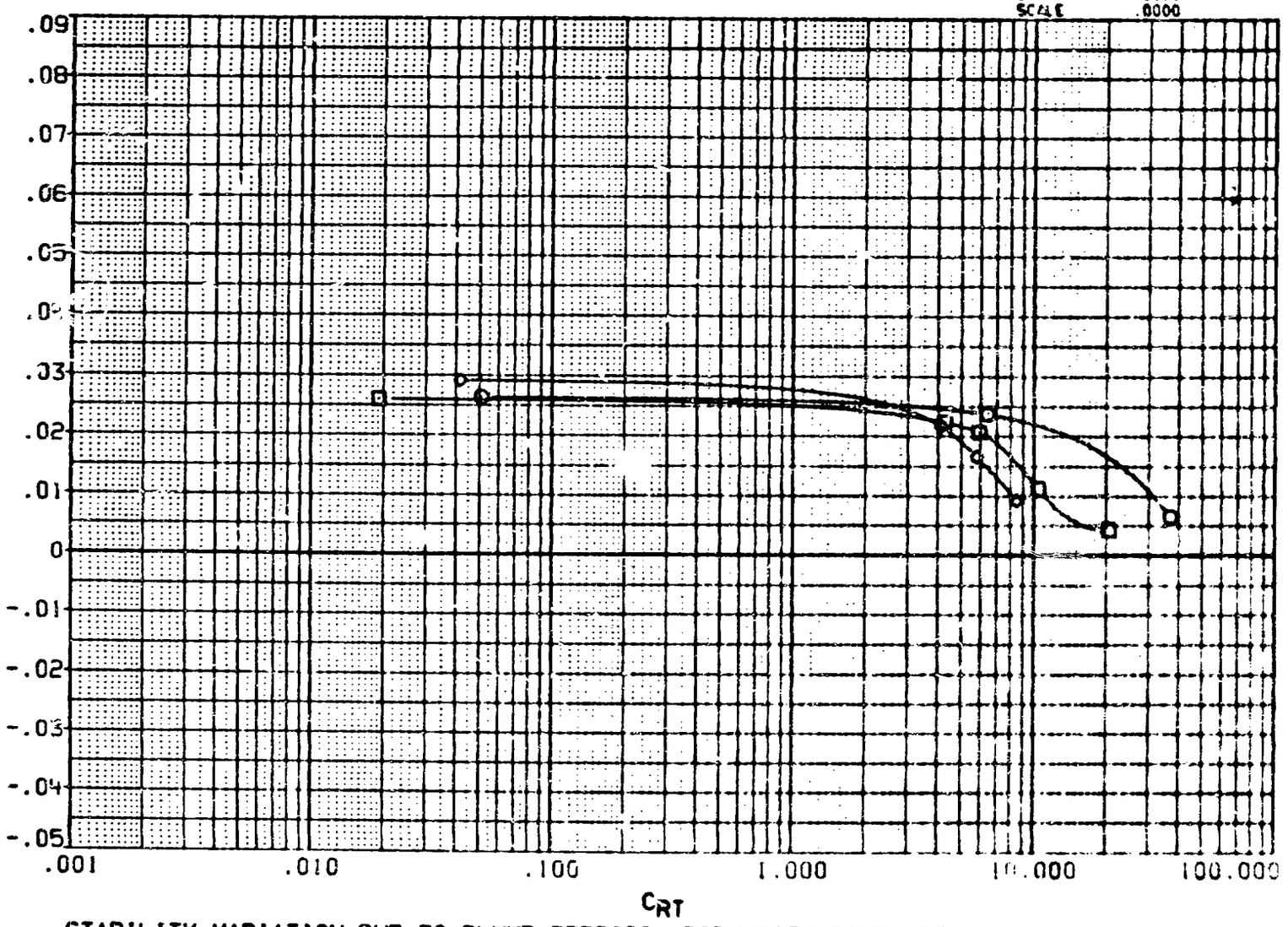


101

STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AXB039)	○	CAL T17-123 (BF1) BODY, FIN IN MID POSITION	.400	2.000
(AXB040)	□	CAL T17-123 (BF1) BODY, FIN IN MID POSITION	.700	2.000
(AXB041)	◇	CAL T17-123 (BF1) BODY, FIN IN MID POSITION	.900	2.000

REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN
SCALE	.0000	

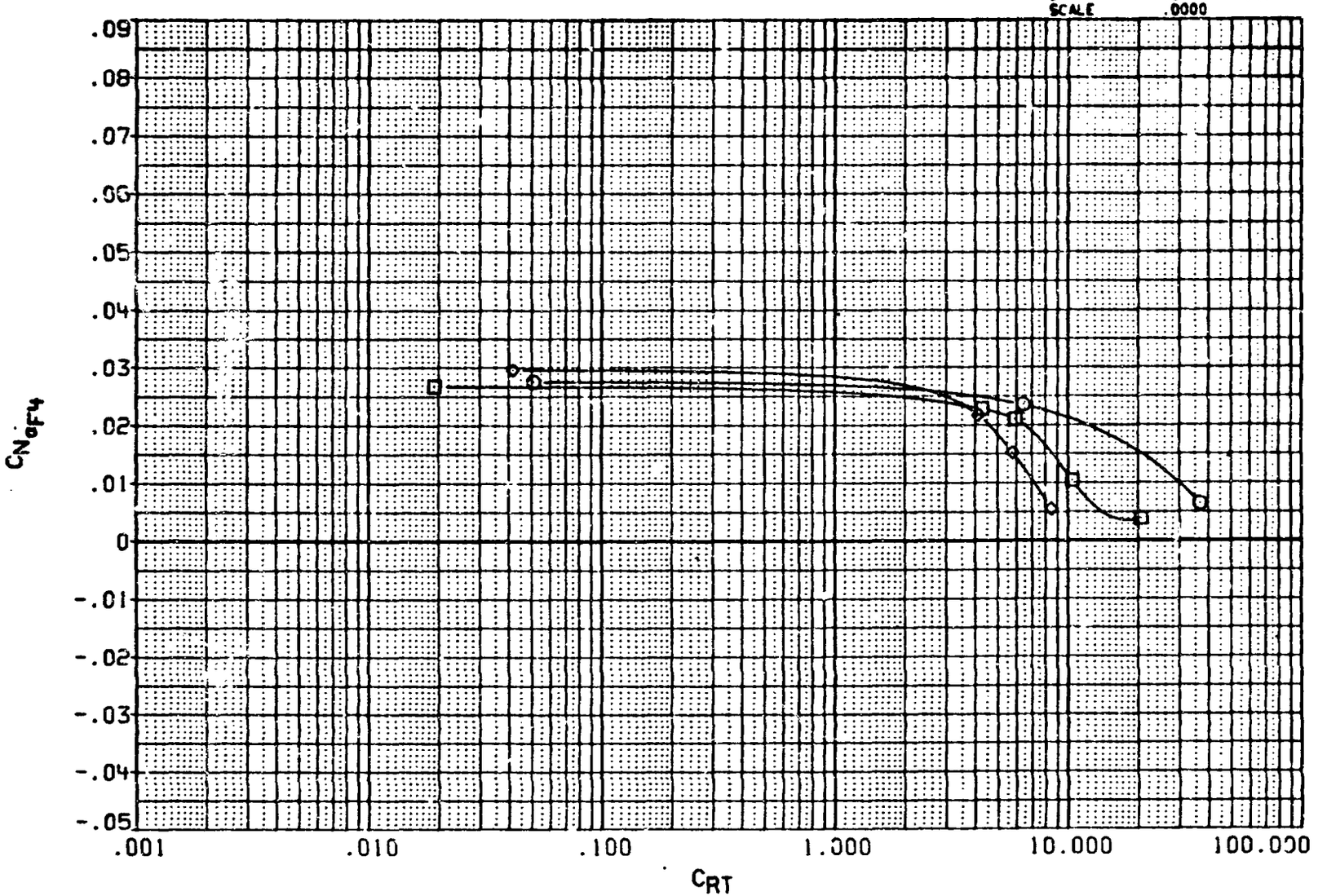


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX80398)	○	CAL T17-123 (BF1) BODY, FIN IN MID POSITION	.400	2.000
(AX80400)	□	CAL T17-123 (BF1) BODY, FIN IN MID POSITION	.700	2.000
(AX80401)	◇	CAL T17-123 (BF1) BODY, FIN IN MID POSITION	.900	2.000

REFERENCE INFORMATION

SREF	19.6350	SQ IN.
LREF	5.0000	IN.
SREF	5.0000	IN.
XMRP	28.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

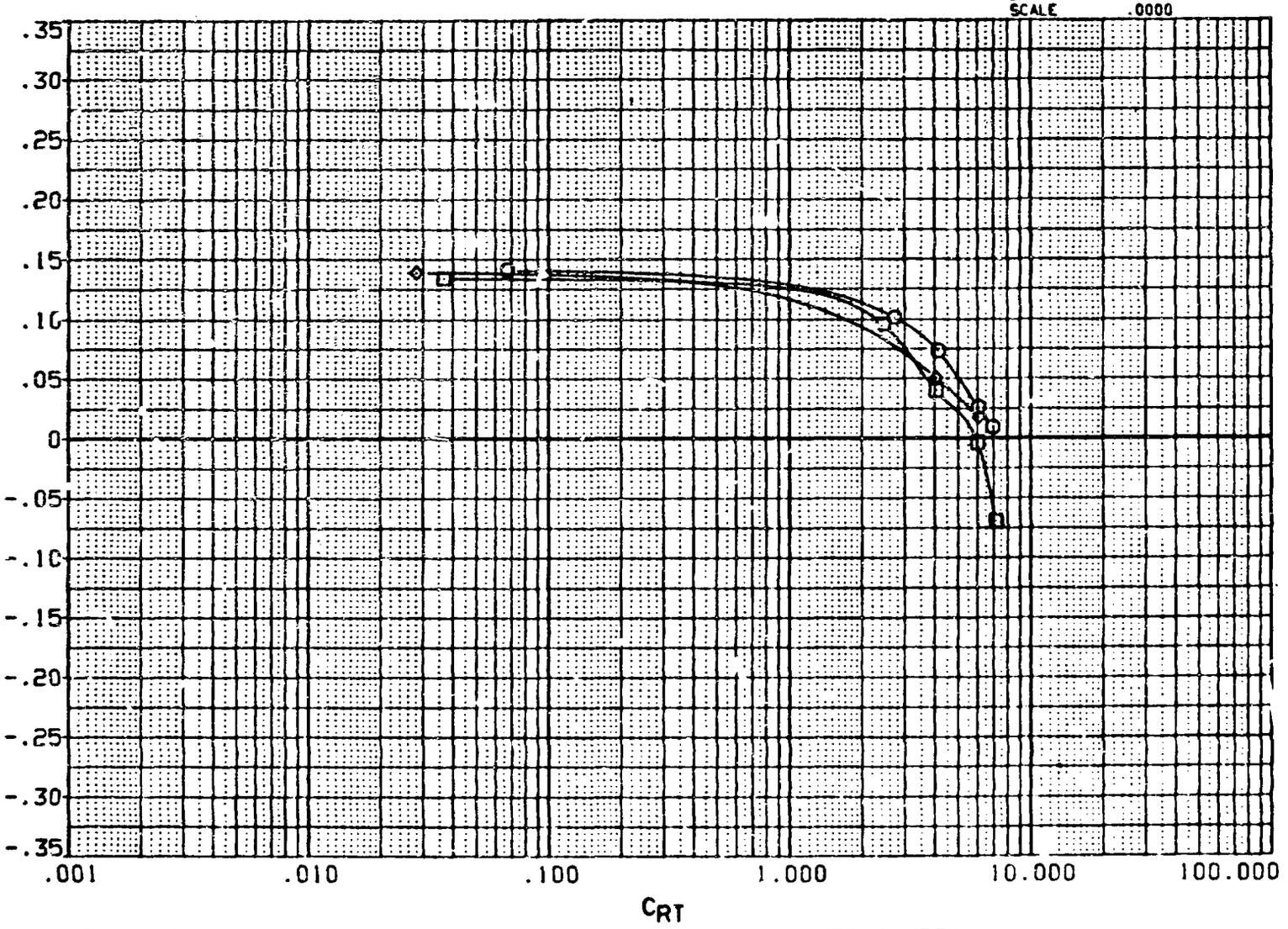


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX8042)	○	CAL T17-123 (BF1) BODY, FIN IN MID POSITION	1.000	- 2.000
(AX8043)	□	CAL T17-123 (BF1) BODY, FIN IN MID POSITION	1.200	2.000
(AX8044)	◇	CAL T17-123 (BF1) BODY, FIN IN MID POSITION	1.250	2.000

REFERENCE INFORMATION

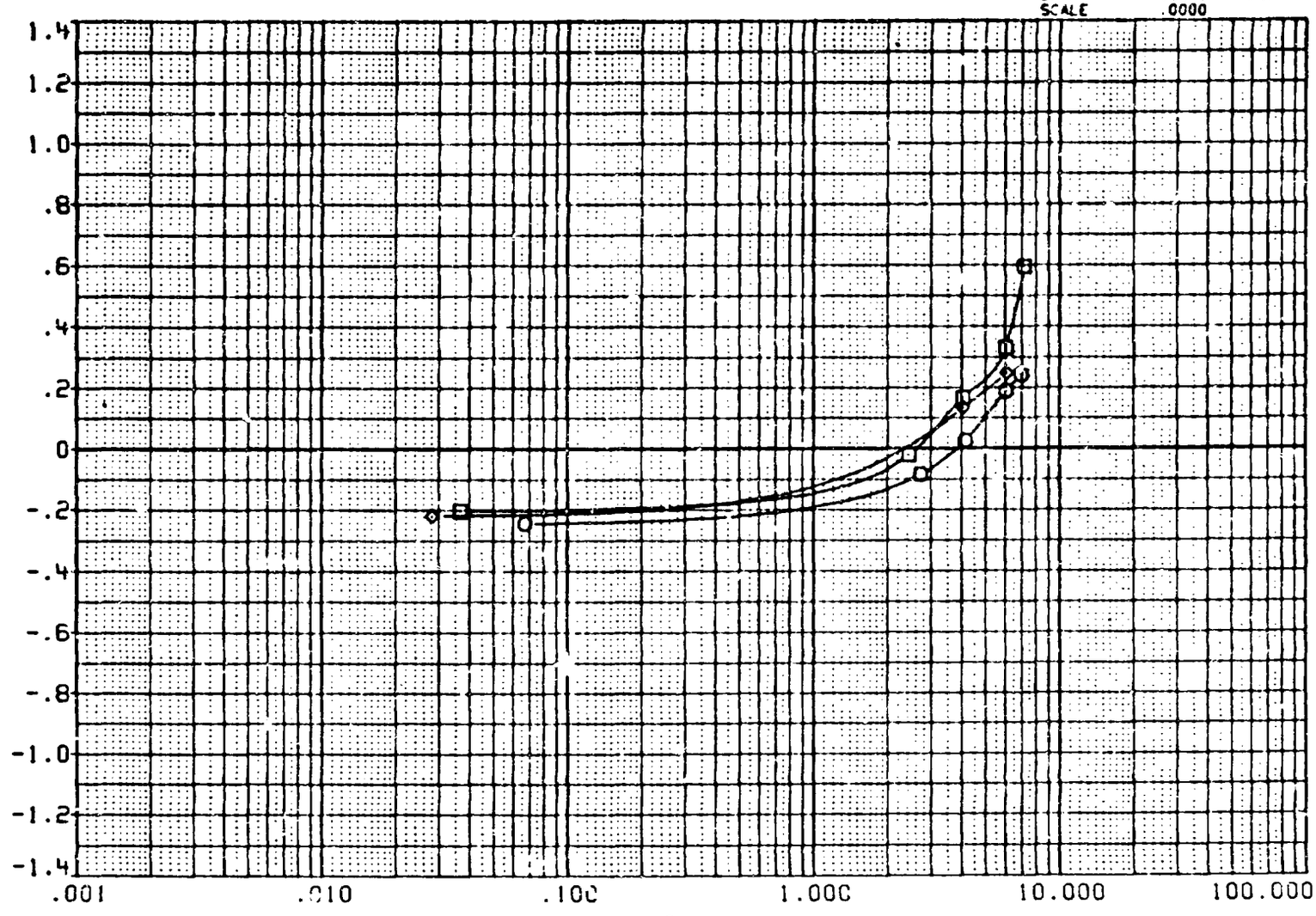
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX8042)	○	CAL T17-123 (BF1) BODY, FIN IN MID POSITION	1.000	2.000
(AX8043)	□	CAL T17-123 (BF1) BODY, FIN IN MID POSITION	1.200	2.000
(AX8044)	◇	CAL T17-123 (BF1) BODY, FIN IN MID POSITION	1.250	2.000

REFERENCE INFORMATION		
SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

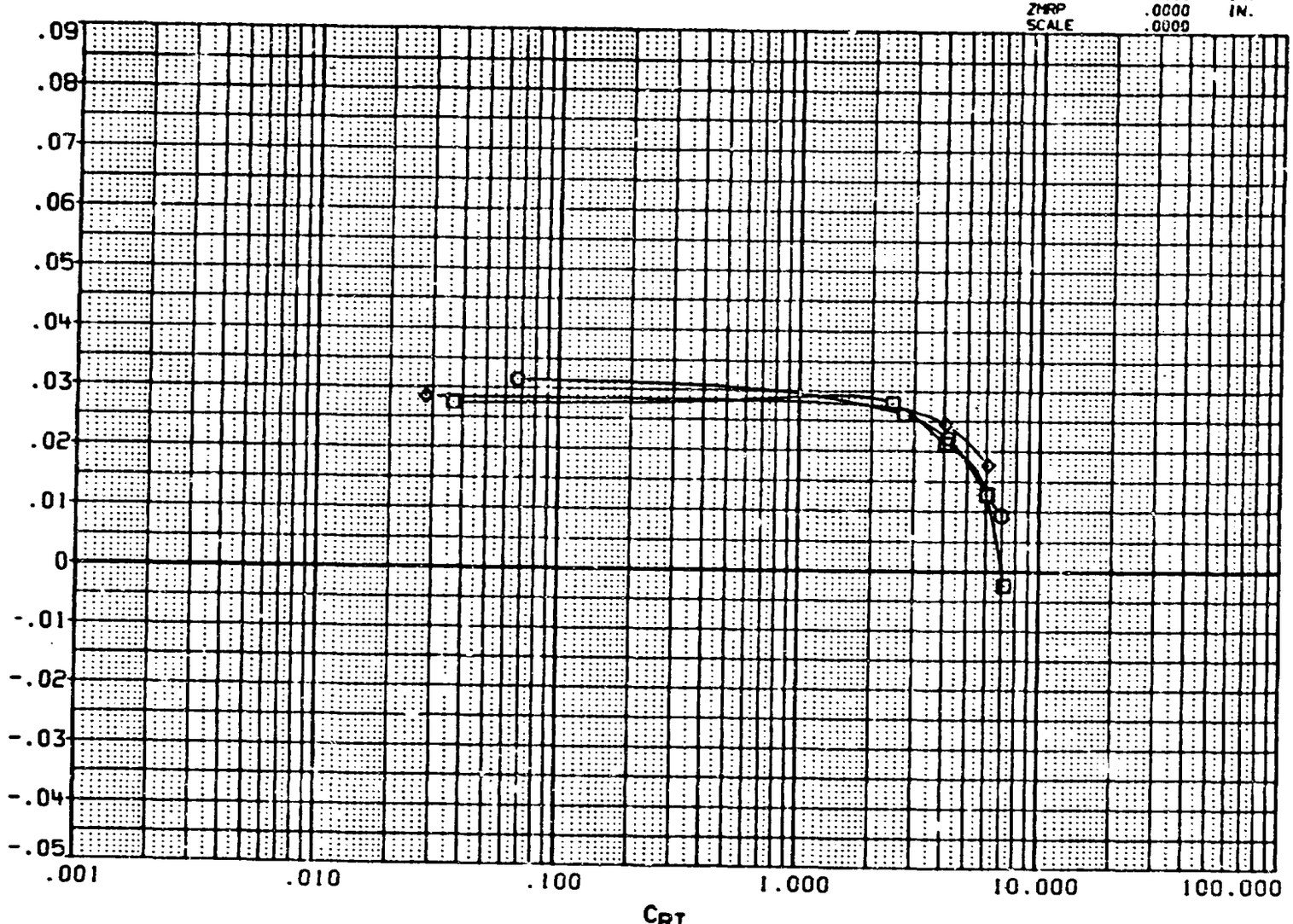


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AXBD42)	○	CAL T17-123 (BF1) BODY, FIN IN MID POSITION	1.000	2.000
(AXBD43)	□	CAL T17-123 (BF1) BODY, FIN IN MID POSITION	1.200	2.000
(AXBD44)	◇	CAL T17-122 (BF1) BODY, FIN IN MID POSITION	1.250	2.000

REFERENCE INFORMATION

SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

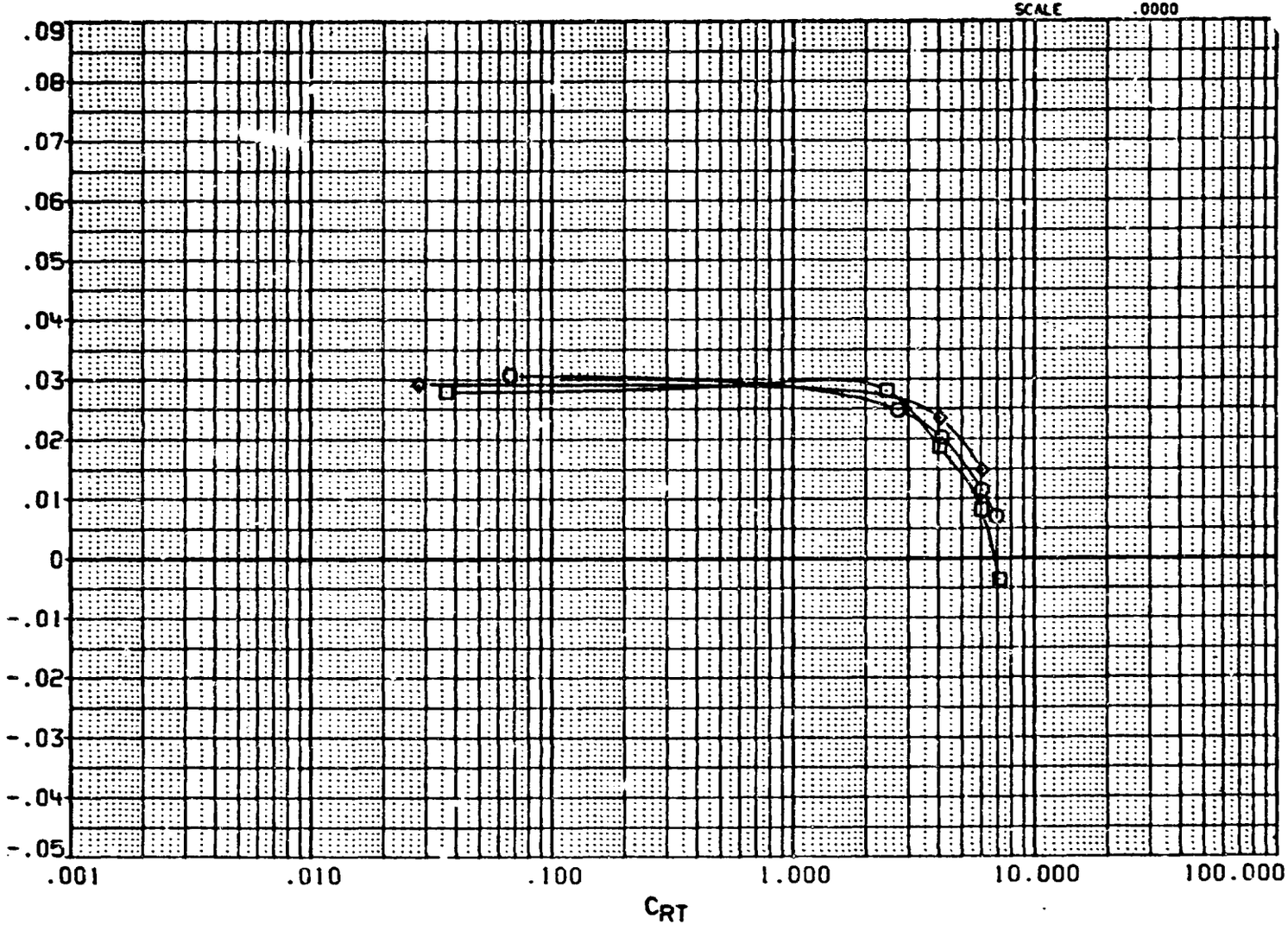


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX80942)	○	CAL T17-123 (BF1) BODY, FIN IN MID POSITION	1.000	2.000
(AX80943)	□	CAL T17-123 (BF1) BODY, FIN IN MID POSITION	1.200	2.000
(AX80944)	◇	CAL T17-123 (BF1) BODY, FIN IN MID POSITION	1.250	2.000

REFERENCE INFORMATION

SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



107

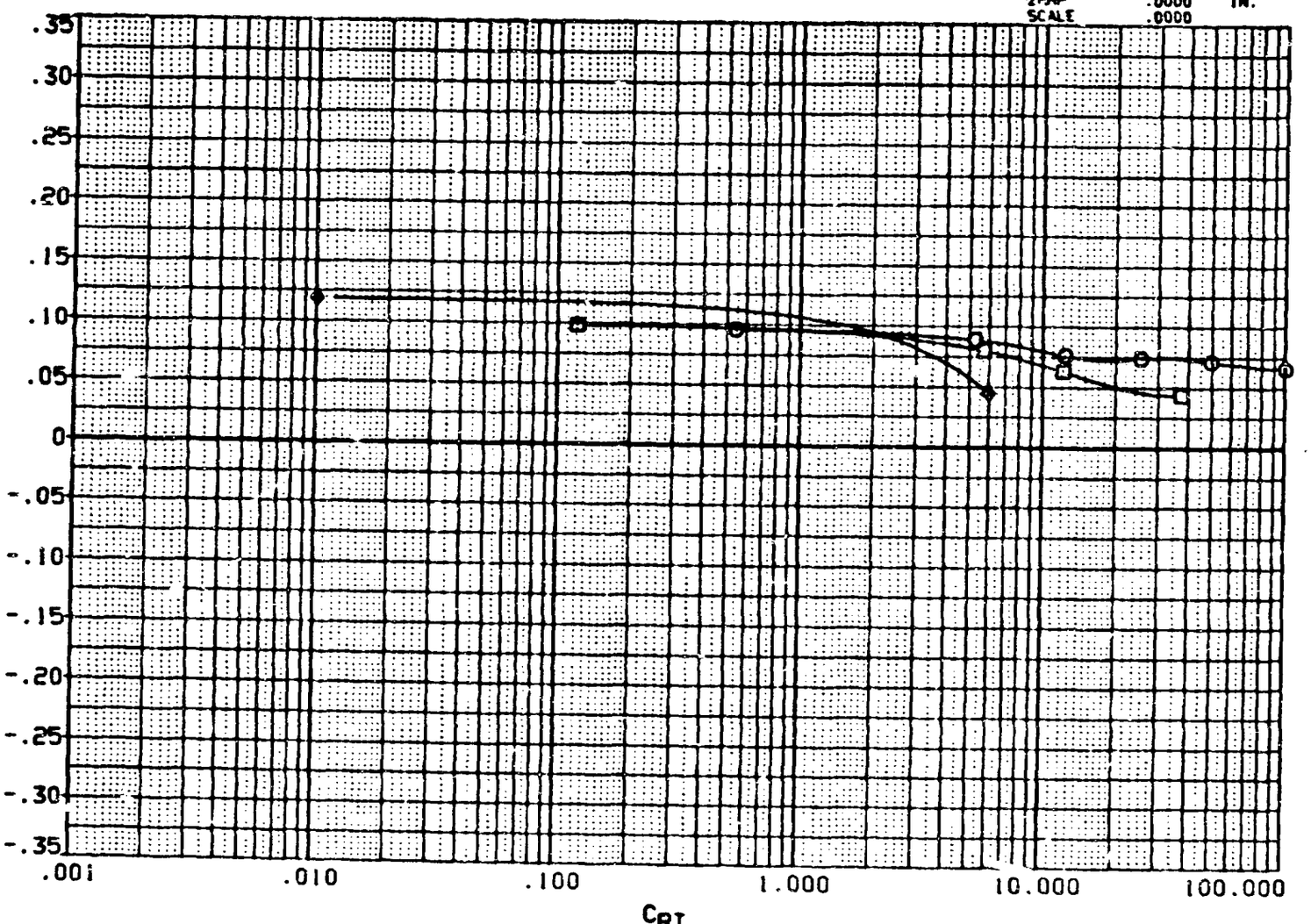
STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION
(AXE018)	○	AEDC TF380 BODY FIN, BF2
(CXE019)	□	AEDC TF380 BODY FIN, BF2
(AXE020)	◇	AEDC TF380 BODY FIN, BF2

MACH	FINPOS
.200	3.000
.400	3.000
1.000	3.000

REFERENCE INFORMATION

SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	28.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

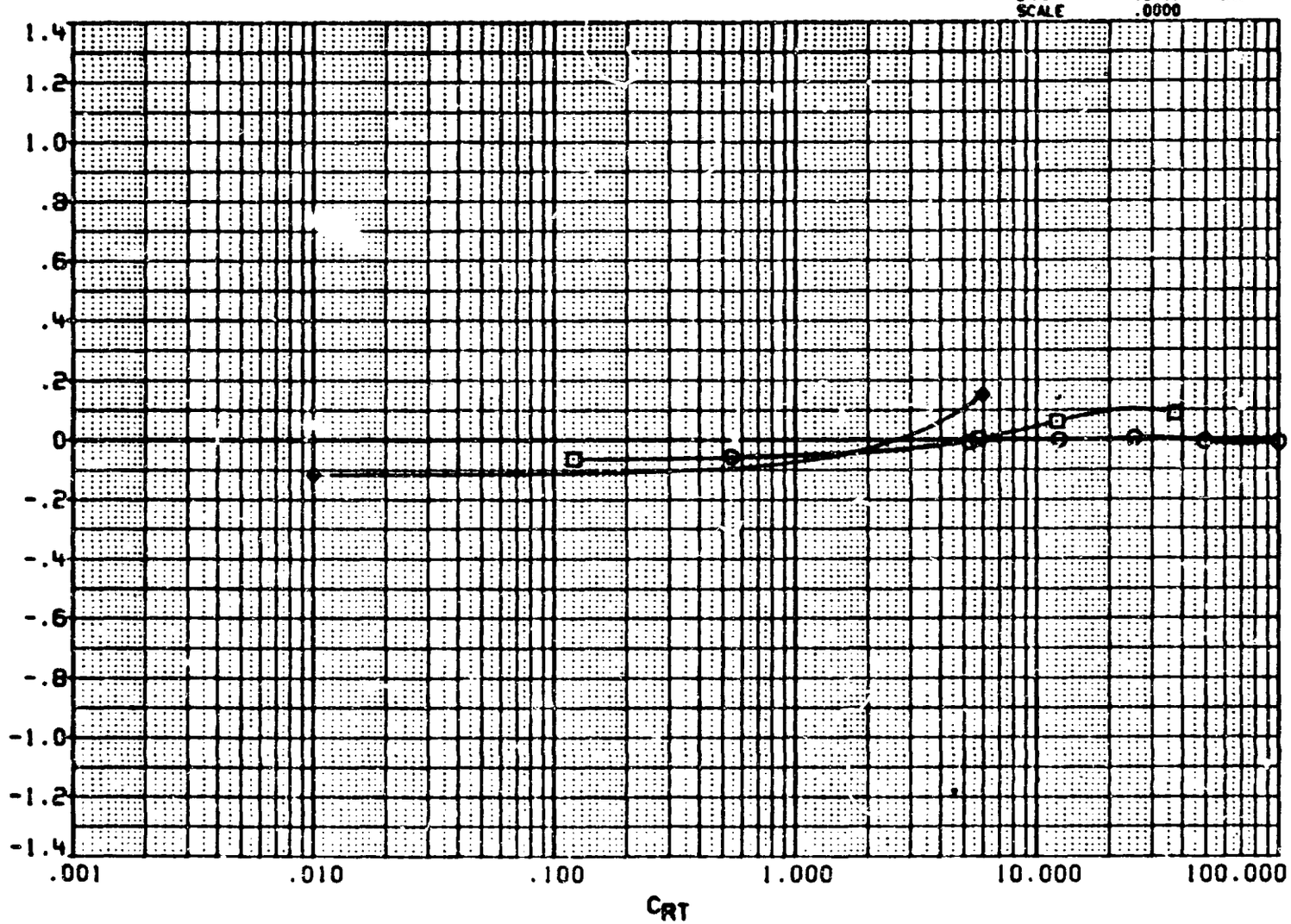


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF2

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AXE818)	○	AEDC TF380 BODY FIN, BF2	.200	3.000
(CNE818)	□	AEDC TF380 BODY FIN, BF2	.400	3.000
(AXE618)	◇	AEDC TF380 BODY FIN, BF2	1.000	3.000

REFERENCE INFORMATION

SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

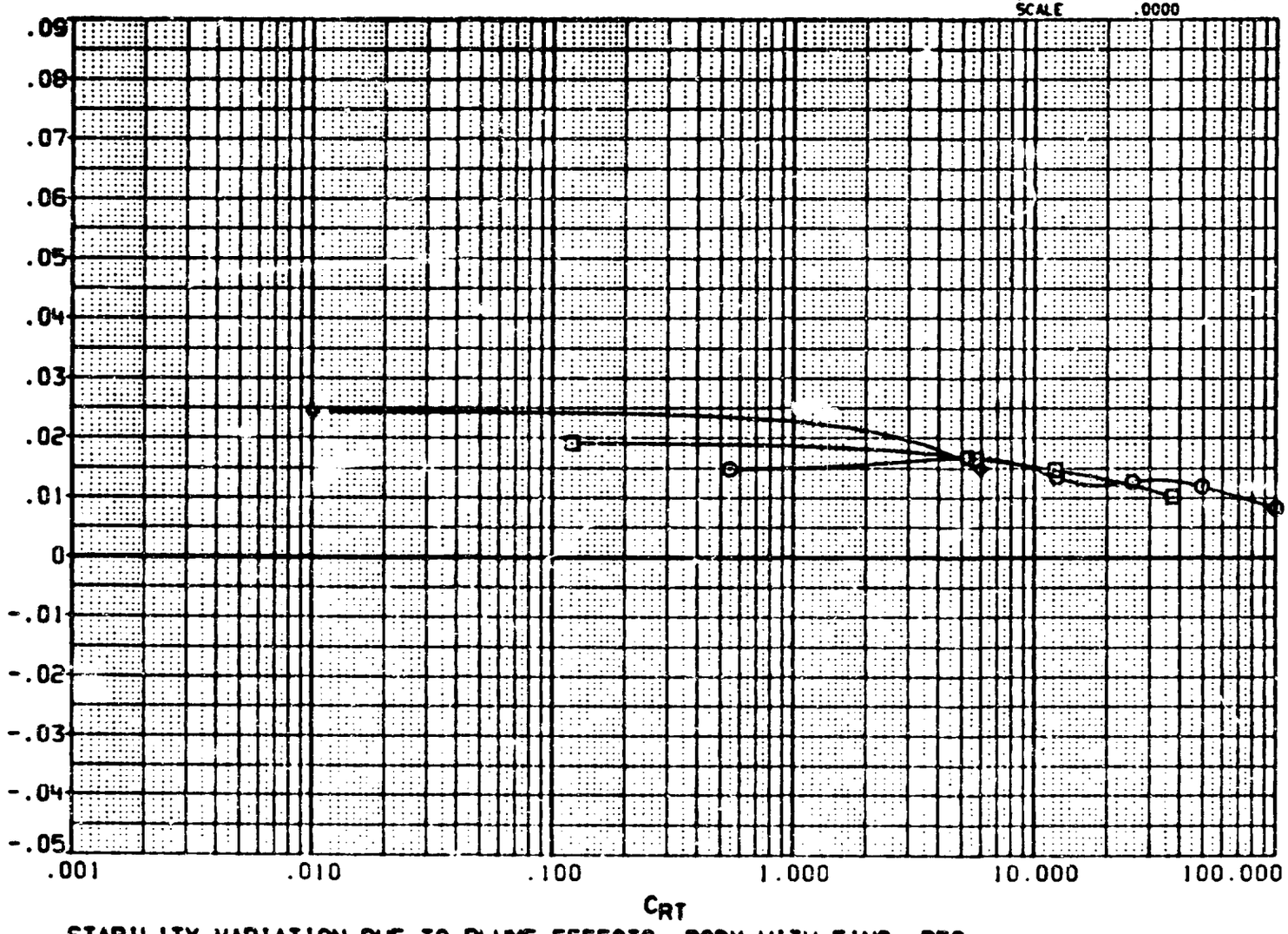


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF2

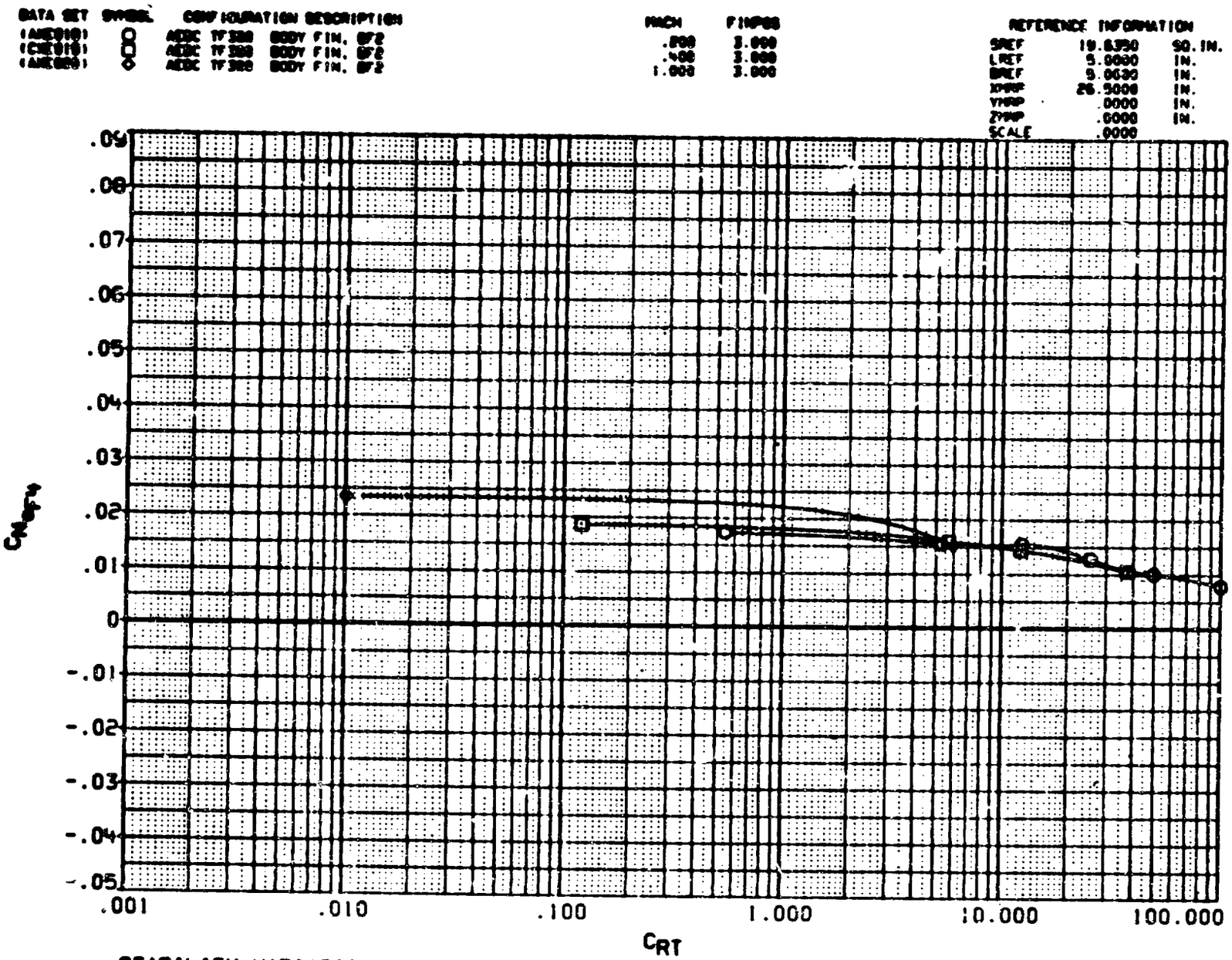
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	PINPOS
(AXES10)	○	AEDC TF300 BODY FIN, BF2	.800	3.000
(CXES10)	□	AEDC TF300 BODY FIN, BF2	.400	3.000
(AXES00)	◇	AEDC TF300 BODY FIN, BF2	1.000	3.000

REFERENCE INFORMATION

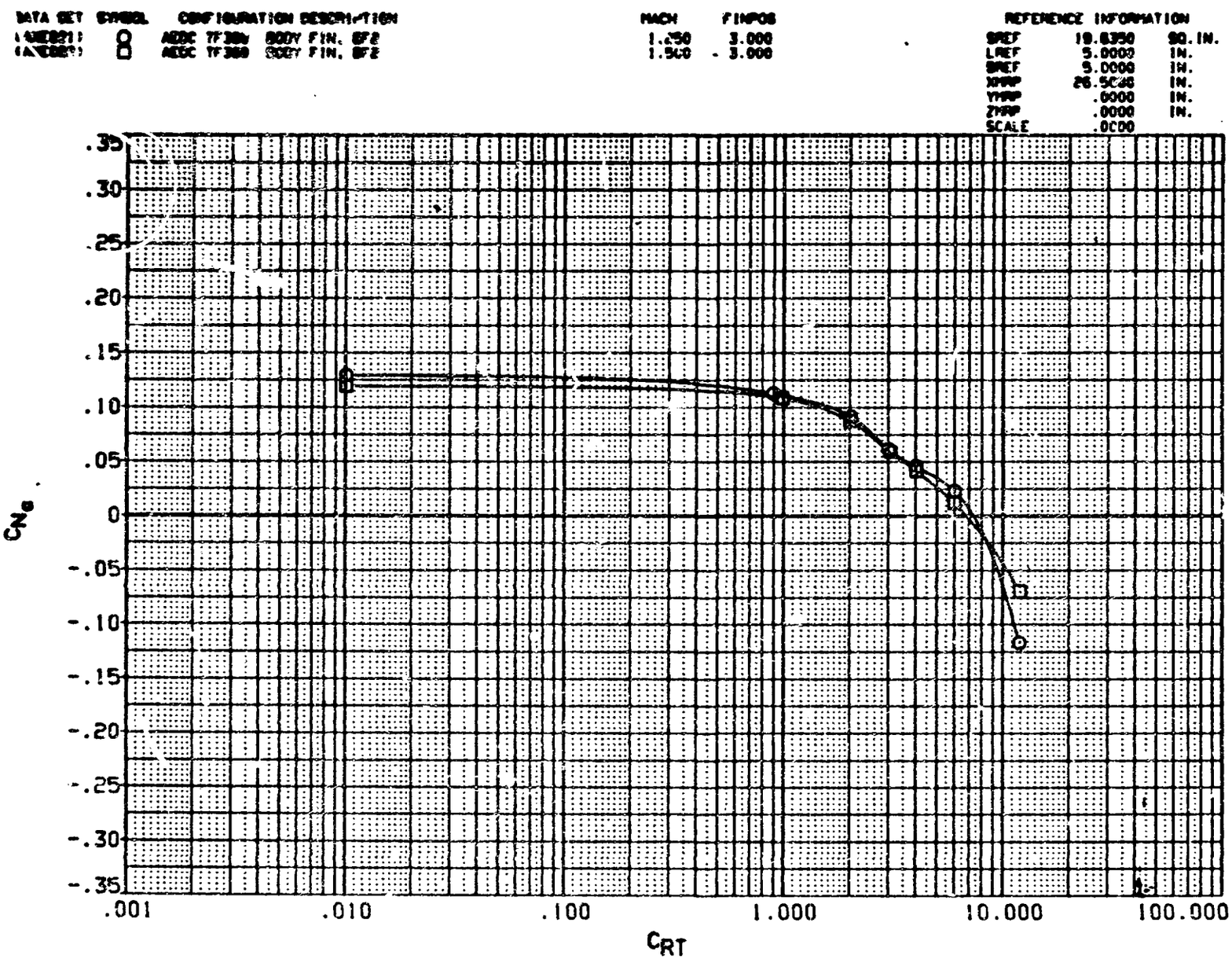
SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	28.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF2



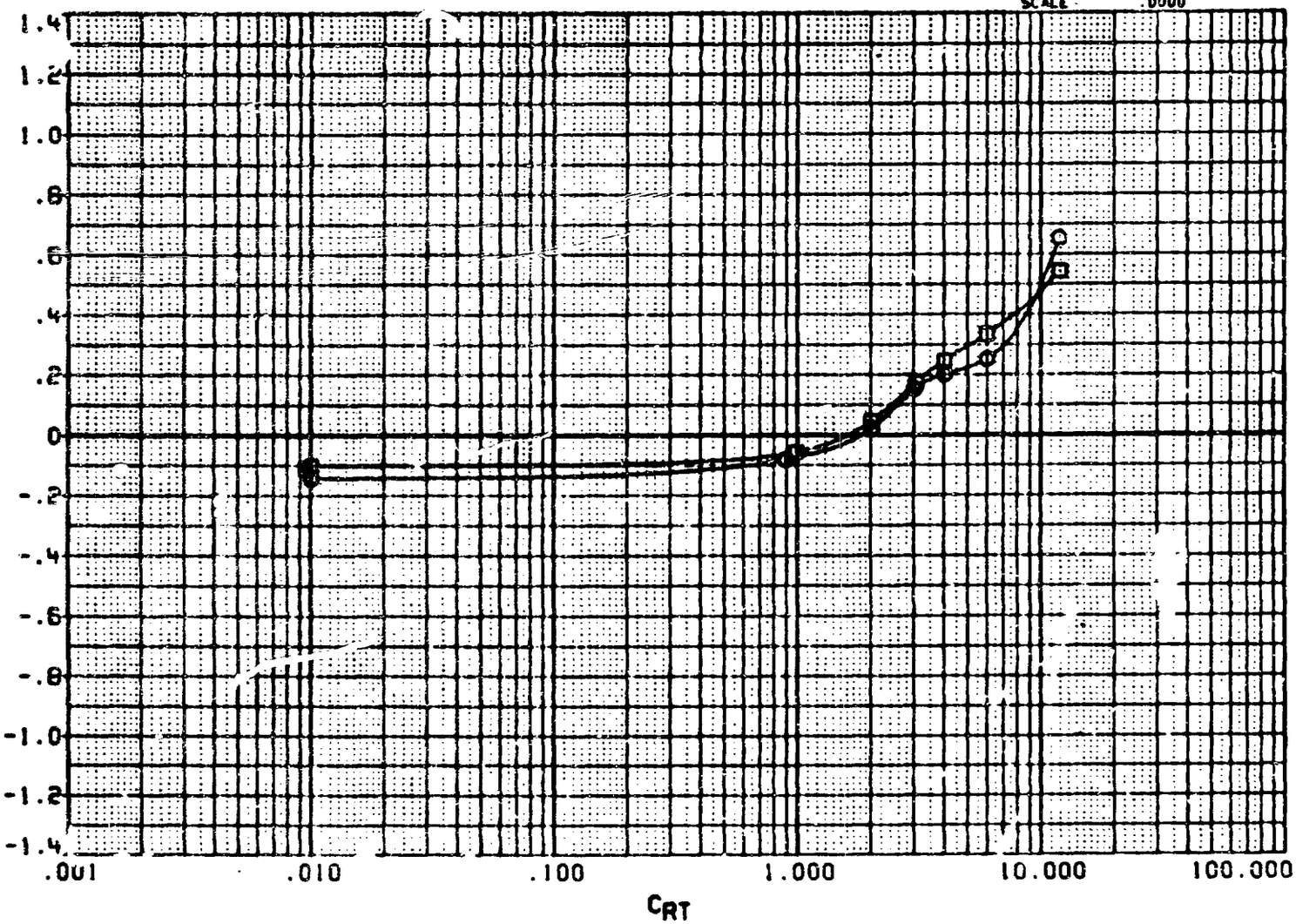
STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF2



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF2

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FIMPOS
(AEDC821)	○	AEDC TF380 BODY FIN, BF2	1.250	3.000
(AEDC822)	□	AEDC TF380 BODY FIN, BF2	1.500	3.000

REFERENCE INFORMATION		
SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	25.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

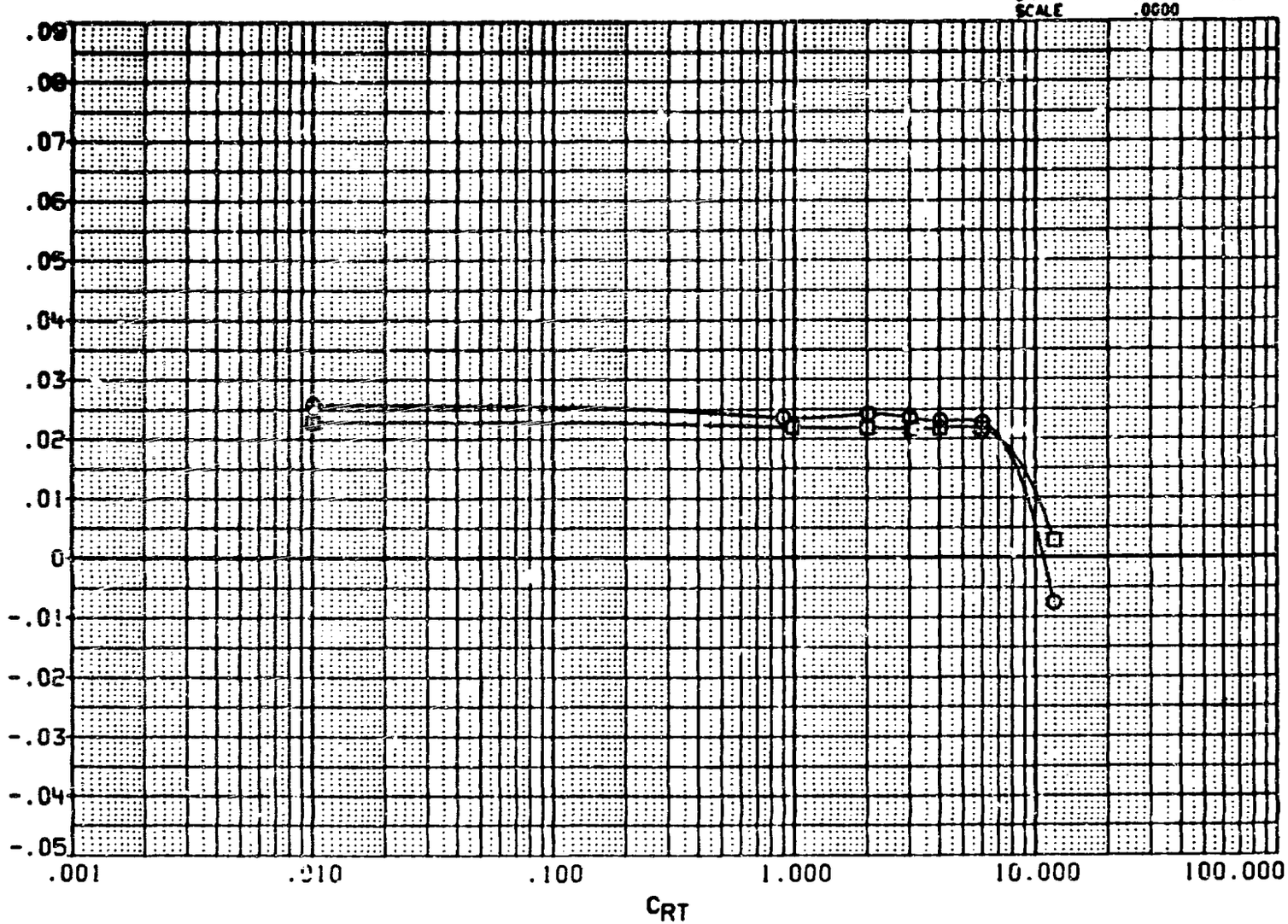


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF2

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AEDC1)	8	AEDC TF388 BODY FIN, BF2	1.850	3.000
(AEDC8)	8	AEDC TF388 BODY FIN, BF2	1.900	3.000

REFERENCE INFORMATION

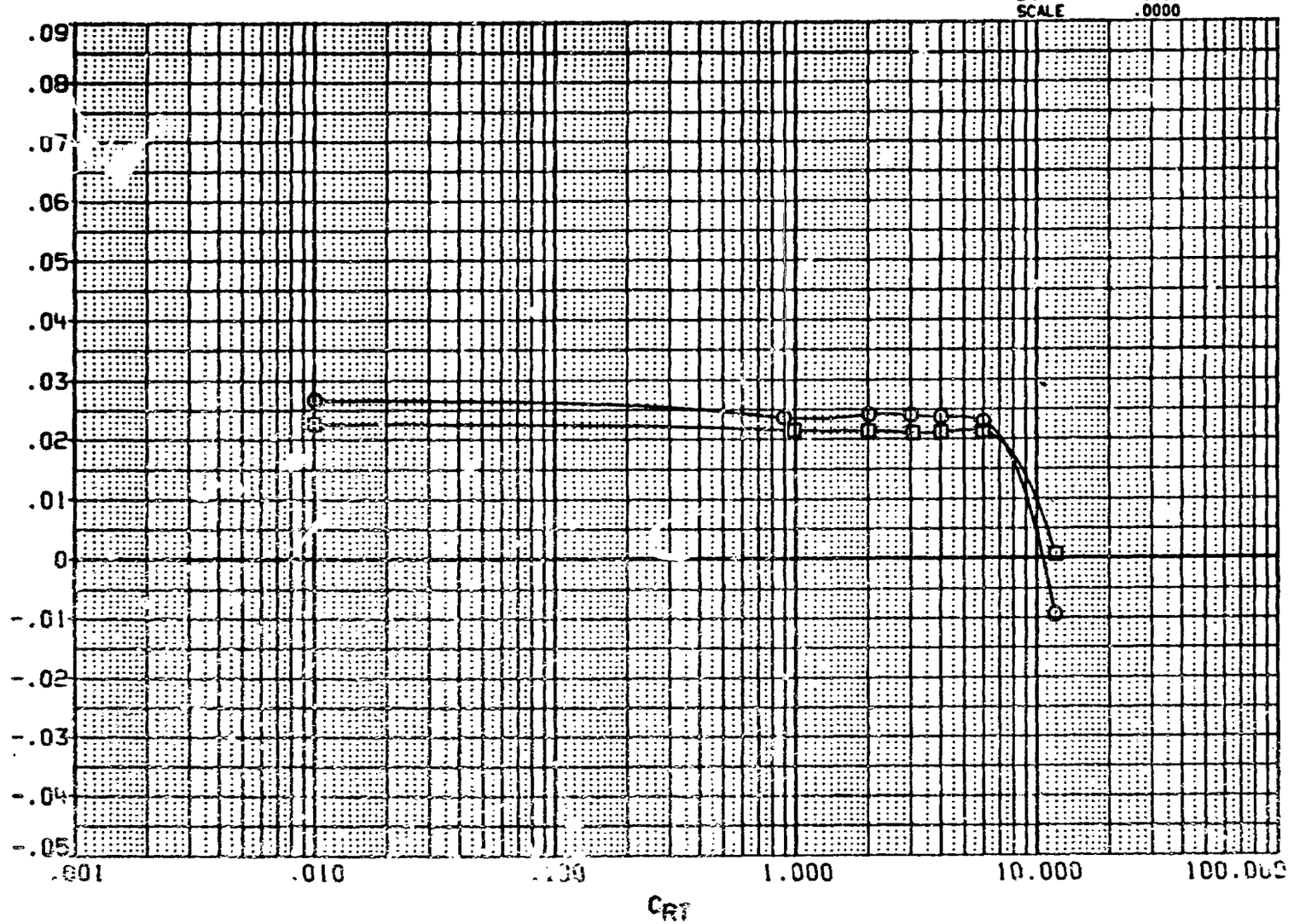
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF2

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AXE021)	○	AEDC TF360 BODY FIN, BF2	1.250	3.000
(AXE022)	□	AEDC TF360 BODY FIN, BF2	1.500	3.000

REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

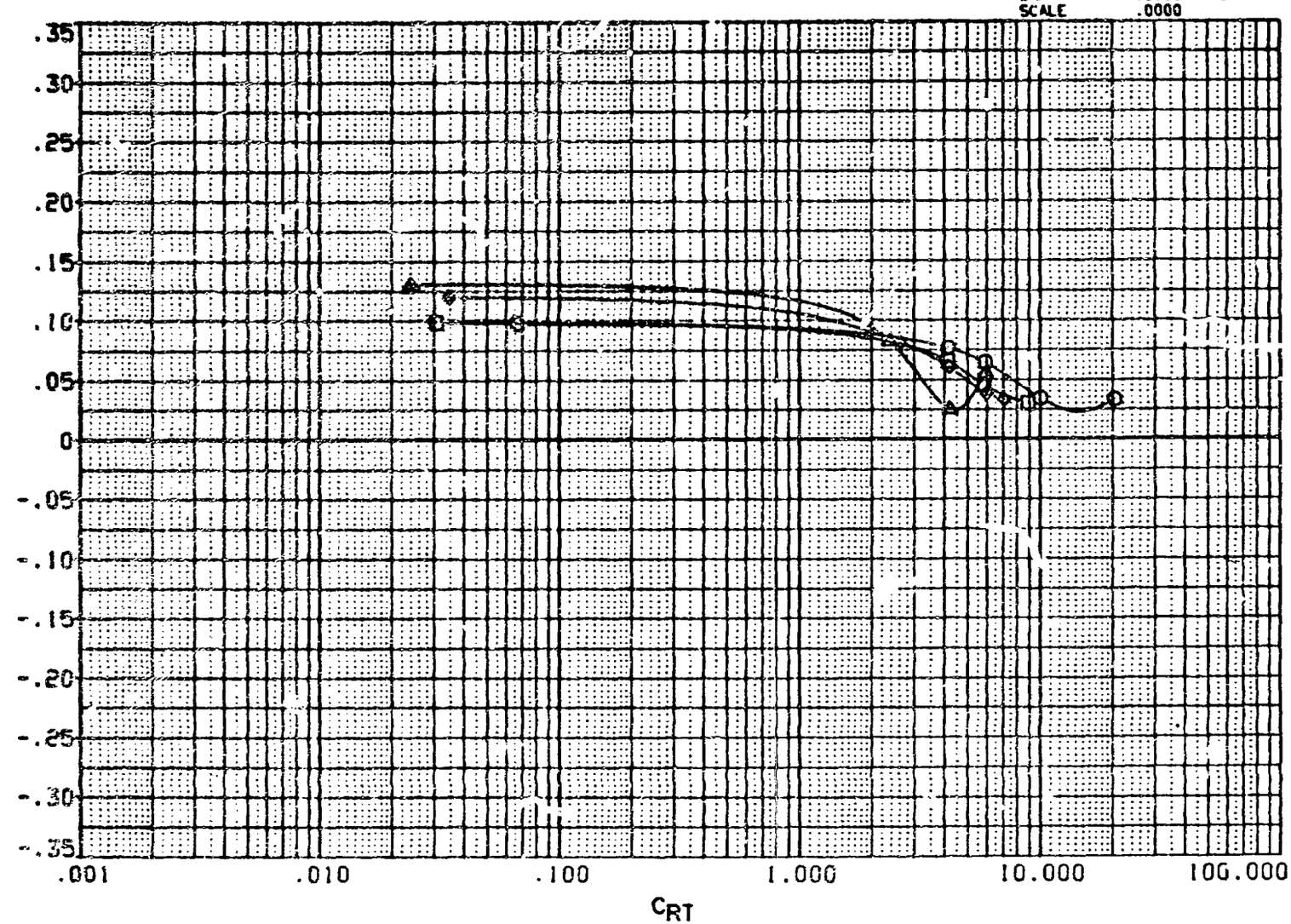


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF2

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINFOS
(AX80[3])	○	CAL T17-123 (BF2) BODY, FIN IN FORWARD POSITION	.700	3.000
(AX80[4])	□	CAL T17-123 (BF2) BODY, FIN IN FORWARD POSITION	.900	3.000
(AX80[5])	◇	CAL T17-123 (BF2) BODY, FIN IN FORWARD POSITION	1.000	3.000
(AX80[6])	△	CAL T17-123 (BF2) BODY, FIN IN FORWARD POSITION	1.200	3.000

REFERENCE INFORMATION

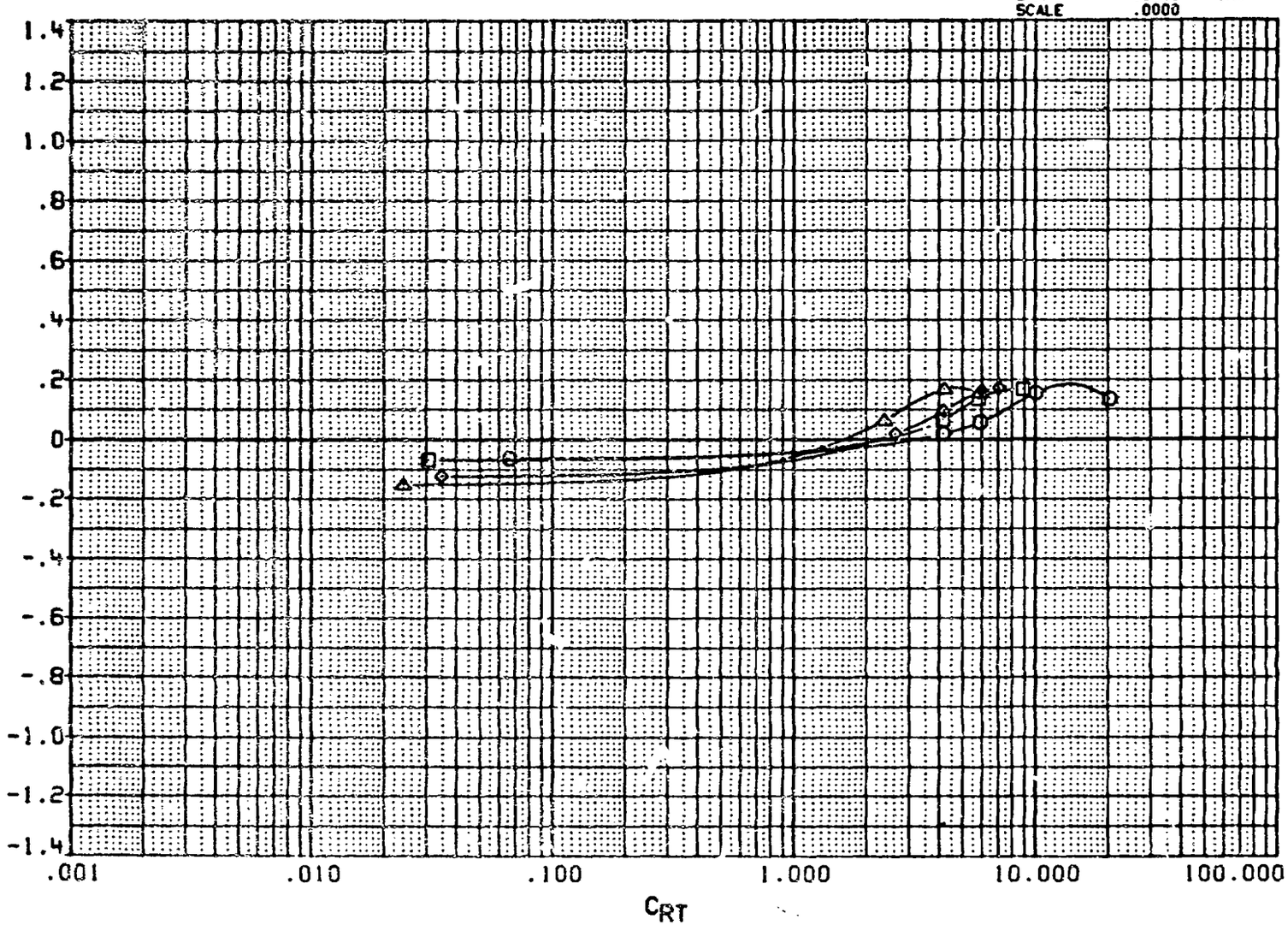
SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, SF2

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX8013)	○	CAL T17-123 (BF2) BODY, FIN IN FORWARD POSITION	.700	3.000
(AX8014)	□	CAL T17-123 (BF2) BODY, FIN IN FORWARD POSITION	.901	3.000
(AX8015)	◇	CAL T17-123 (BF2) BODY, FIN IN FORWARD POSITION	1.060	3.000
(AX8016)	△	CAL T17-123 (BF2) BODY, FIN IN FORWARD POSITION	1.200	3.000

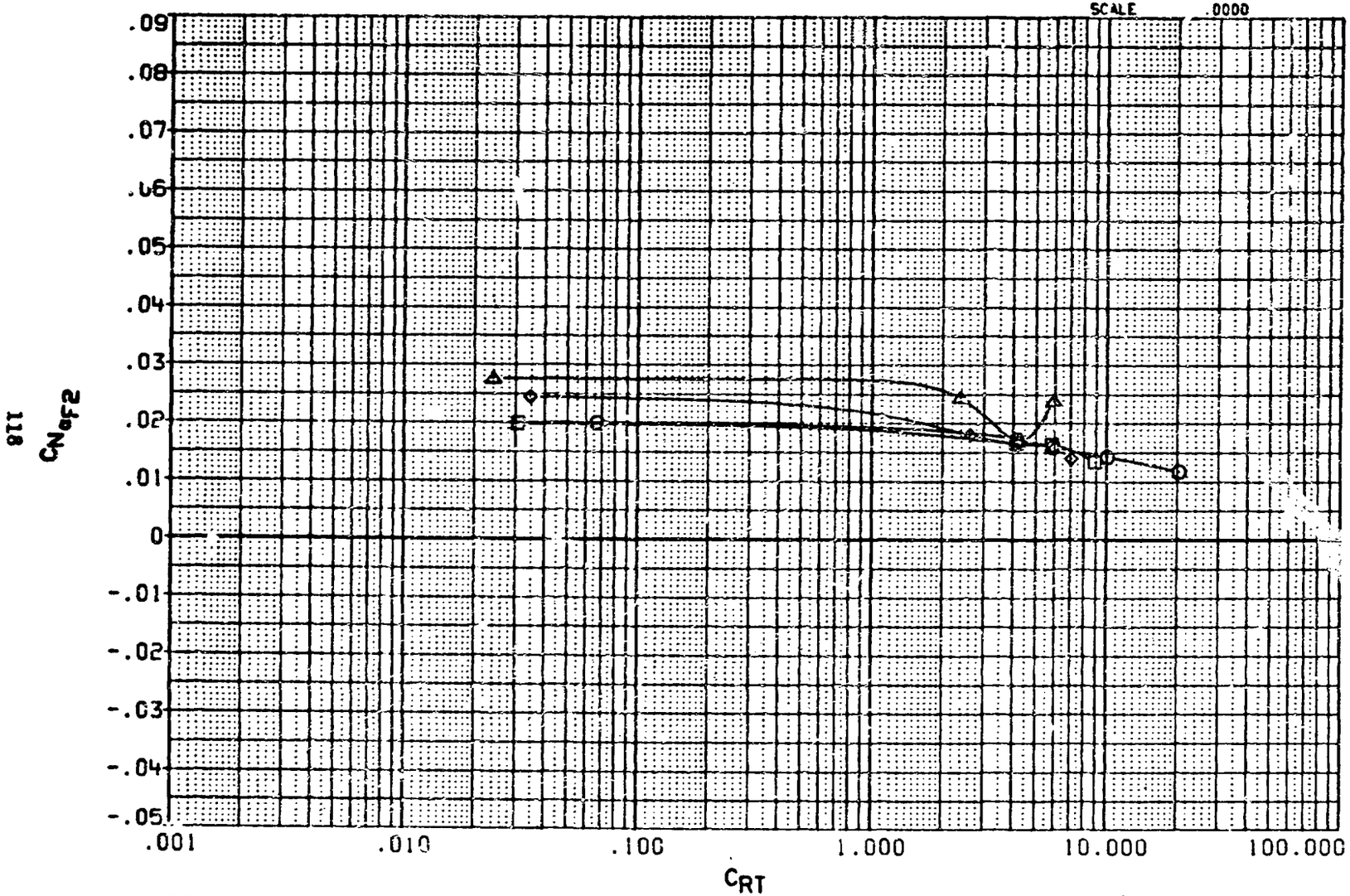
REFERENCE INFORMATION		
SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF2

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX80(3)	○	CAL T17-123 (BF2) BODY, FIN IN FORWARD POSITION	.700	3.000
(AX80(4)	□	CAL T17-123 (BF2) BODY, FIN IN FORWARD POSITION	.900	3.000
(AX80(5)	◇	CAL T17-123 (BF2) BODY, FIN IN FORWARD POSITION	1.000	3.000
(AX80(6)	△	CAL T17-123 (BF2) BODY, FIN IN FORWARD POSITION	1.200	3.000

REFERENCE INFORMATION		
SREF	18.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

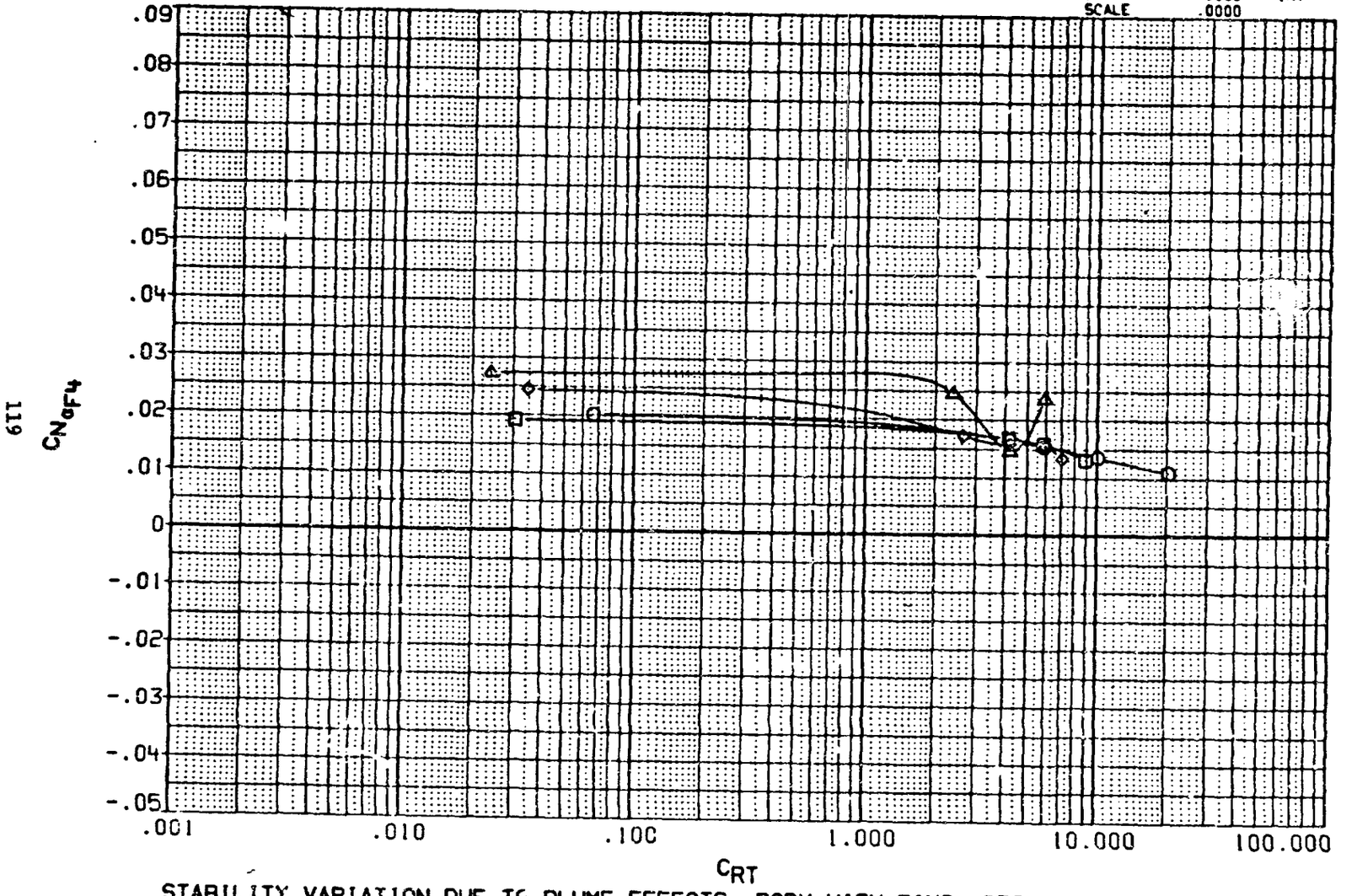


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF2

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX80013)	○	CAL T17-123 (BF2) BODY, FIN IN FORWARD POSITION	.700	3.000
(AX80014)	□	CAL T17-123 (BF2) BODY, FIN IN FORWARD POSITION	.900	3.000
(AX80015)	◇	CAL T17-123 (BF2) BODY, FIN IN FORWARD POSITION	1.000	3.000
(AX80016)	△	CAL T17-123 (BF2) BODY, FIN IN FORWARD POSITION	1.200	3.000

REFERENCE INFORMATION

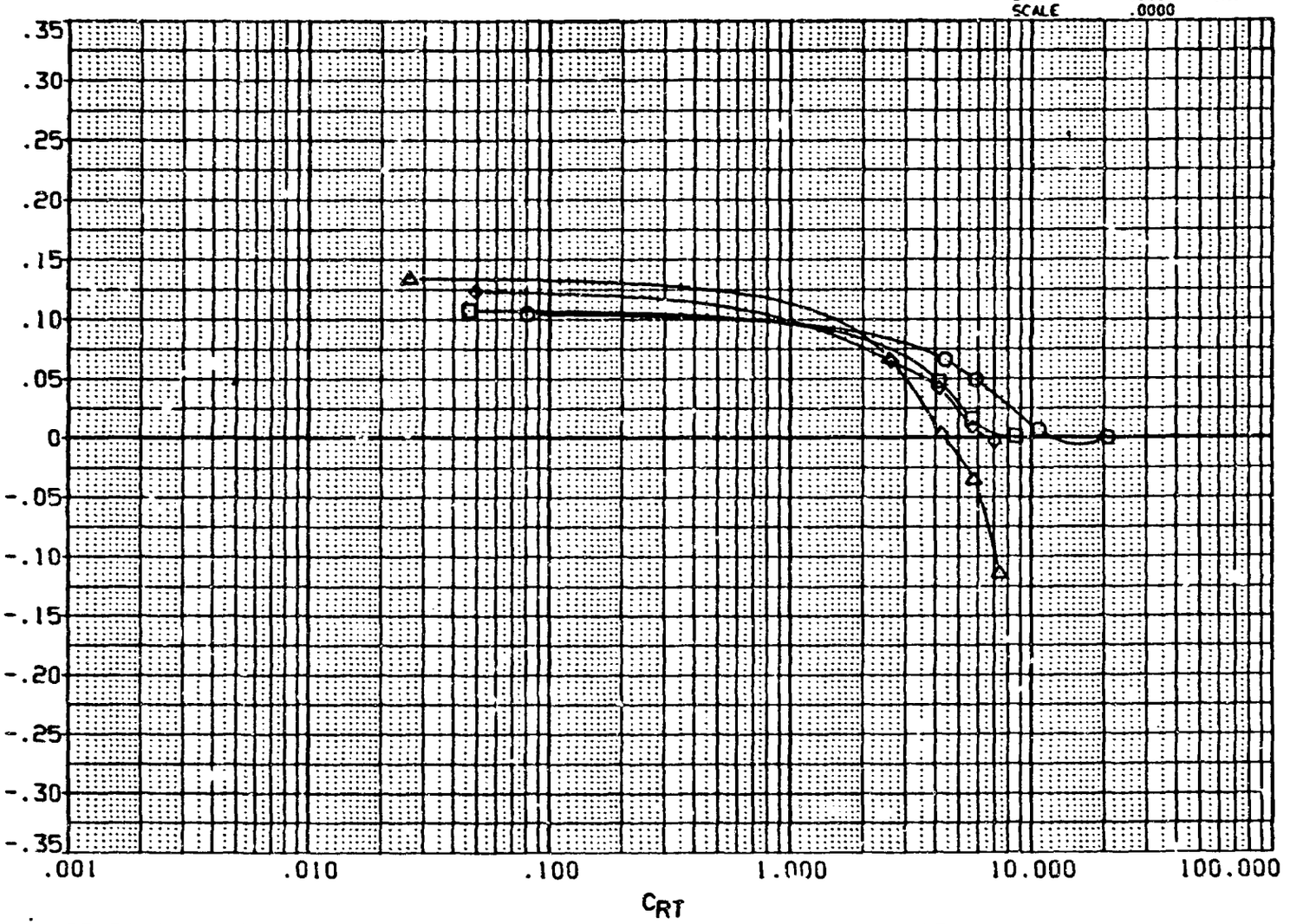
SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF2

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX8045)	○	CAL T17-123 (BF2) BODY, FIN IN MID POSITION	.700	2.000
(AX8046)	□	CAL T17-123 (BF2) BODY, FIN IN MID POSITION	.900	2.000
(AX8047)	◇	CAL T17-123 (BF2) BODY, FIN IN MID POSITION	1.000	2.000
(AX8048)	△	CAL T17-123 (BF2) BODY, FIN IN MID POSITION	1.200	2.000

REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

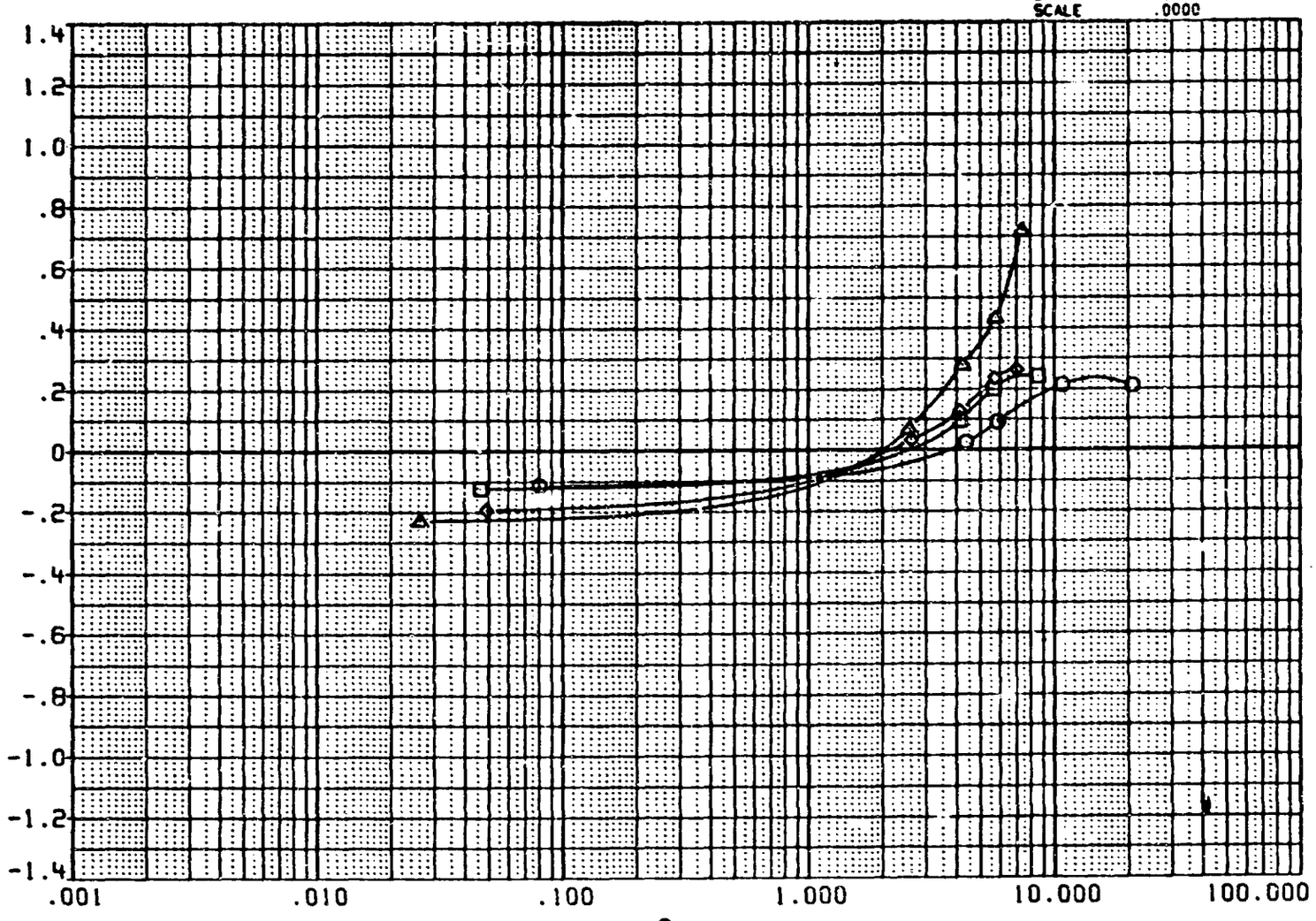


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF2

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AXB045)	○	CAL T17-123 (BF2) BODY, FIN IN MID POSITION	.700	2.000
(AXB046)	□	CAL T17-123 (BF2) BODY, FIN IN MID POSITION	.900	2.000
(AXB047)	◇	CAL T17-123 (BF2) BODY, FIN IN MID POSITION	1.000	2.000
(AXB048)	△	CAL T17-123 (BF2) BODY, FIN IN MID POSITION	1.200	2.000

REFERENCE INFORMATION

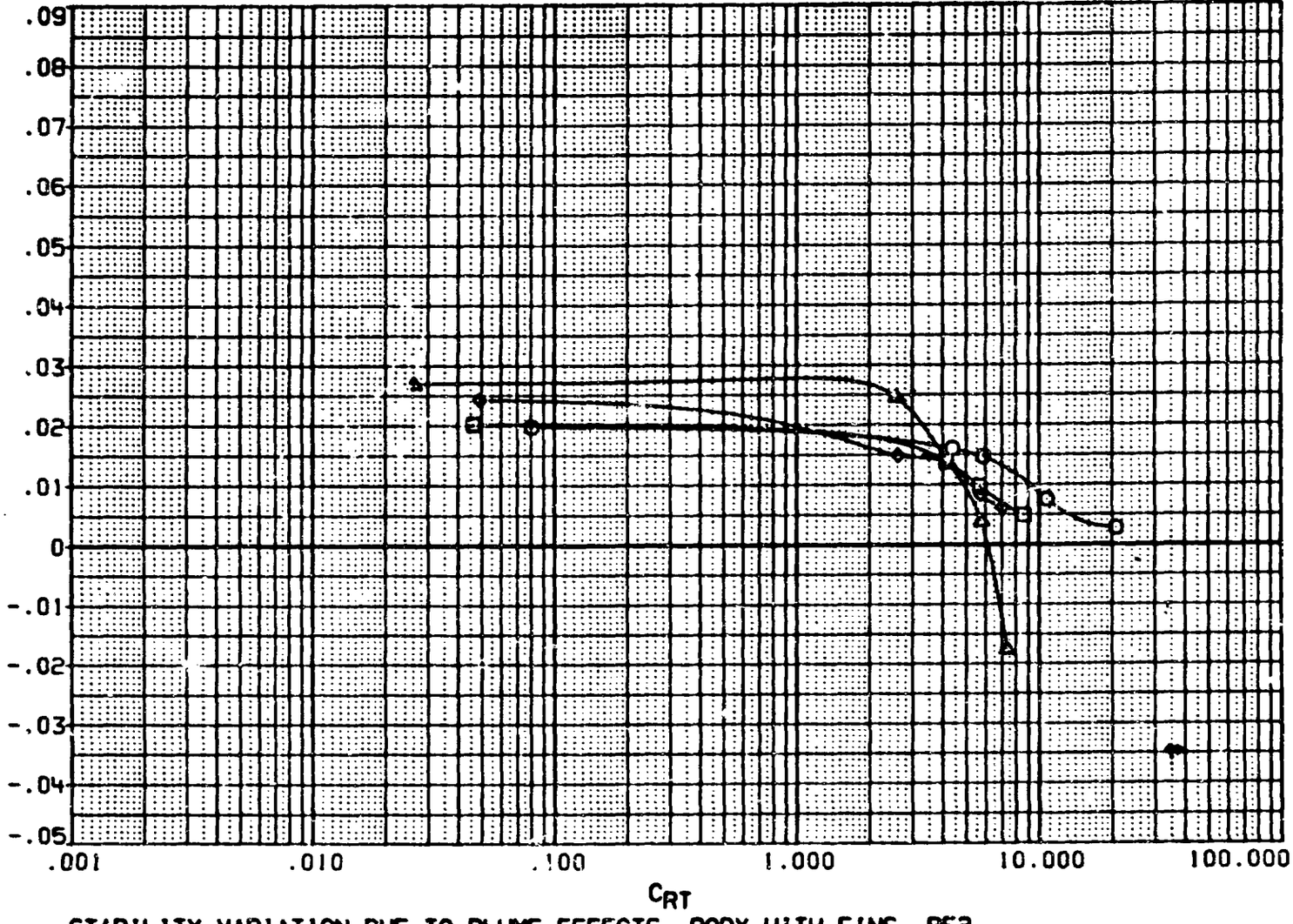
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF2

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AXBDM5)	○	CAL T17-123 (BF2) BODY, FIN IN MID POSITION	.700	2.000
(AXBDM6)	□	CAL T17-123 (BF2) BODY, FIN IN MID POSITION	.900	2.000
(AXBDM7)	◇	CAL T17-123 (BF2) BODY, FIN IN MID POSITION	1.000	2.000
(AXBDM8)	△	CAL T17-123 (BF2) BODY, FIN IN MID POSITION	1.200	2.000

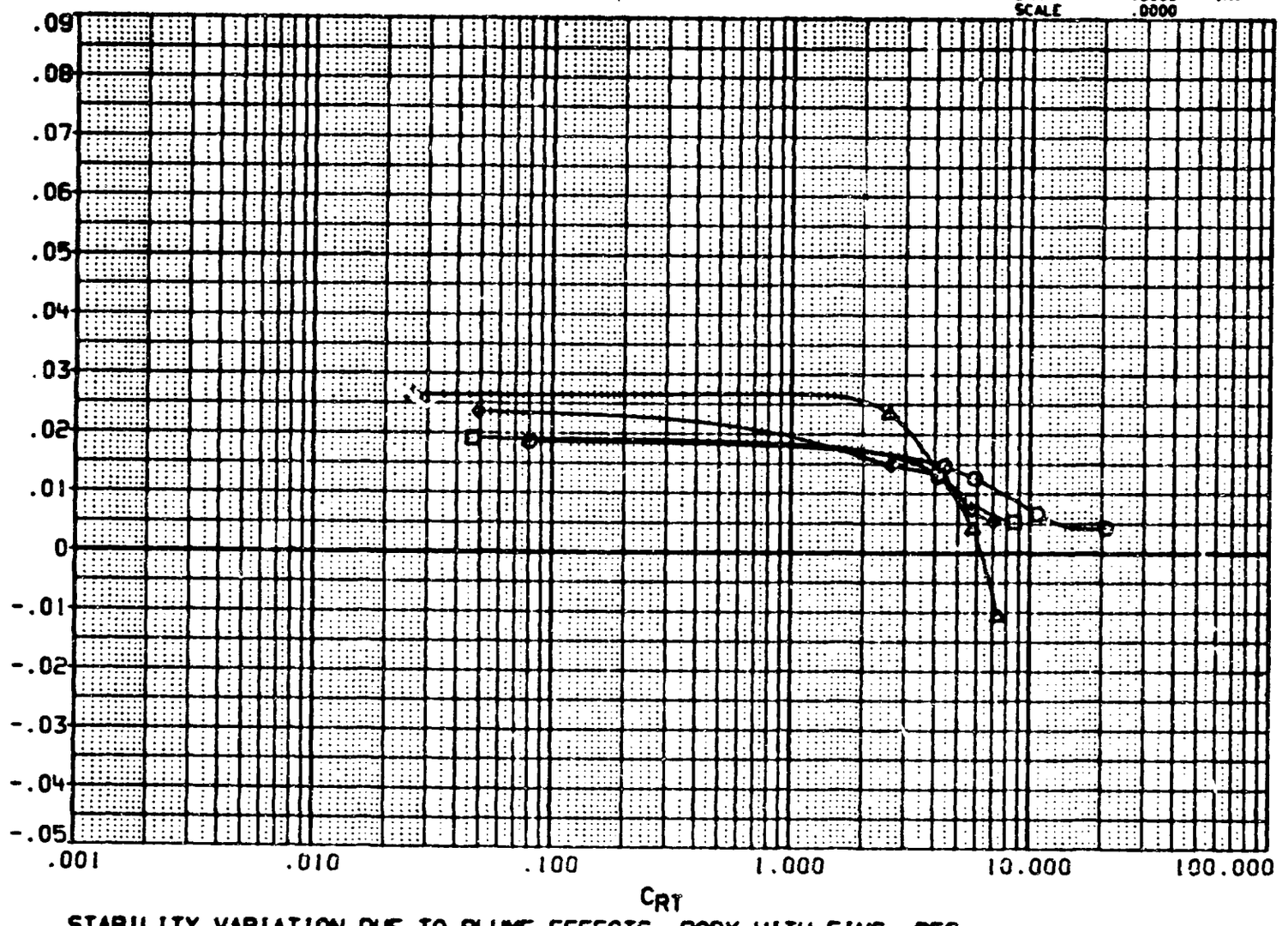
REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF2

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AXBDY5)	○	CAL T17-123 (BF2) BODY, FIN IN MID POSITION	.700	2.000
(AXBDY6)	□	CAL T17-123 (BF2) BODY, FIN IN MID POSITION	.900	2.000
(AXBDY7)	◇	CAL T17-123 (BF2) BODY, FIN IN MID POSITION	1.000	2.000
(AXBDY8)	△	CAL T17-123 (BF2) BODY, FIN IN MID POSITION	1.200	2.000

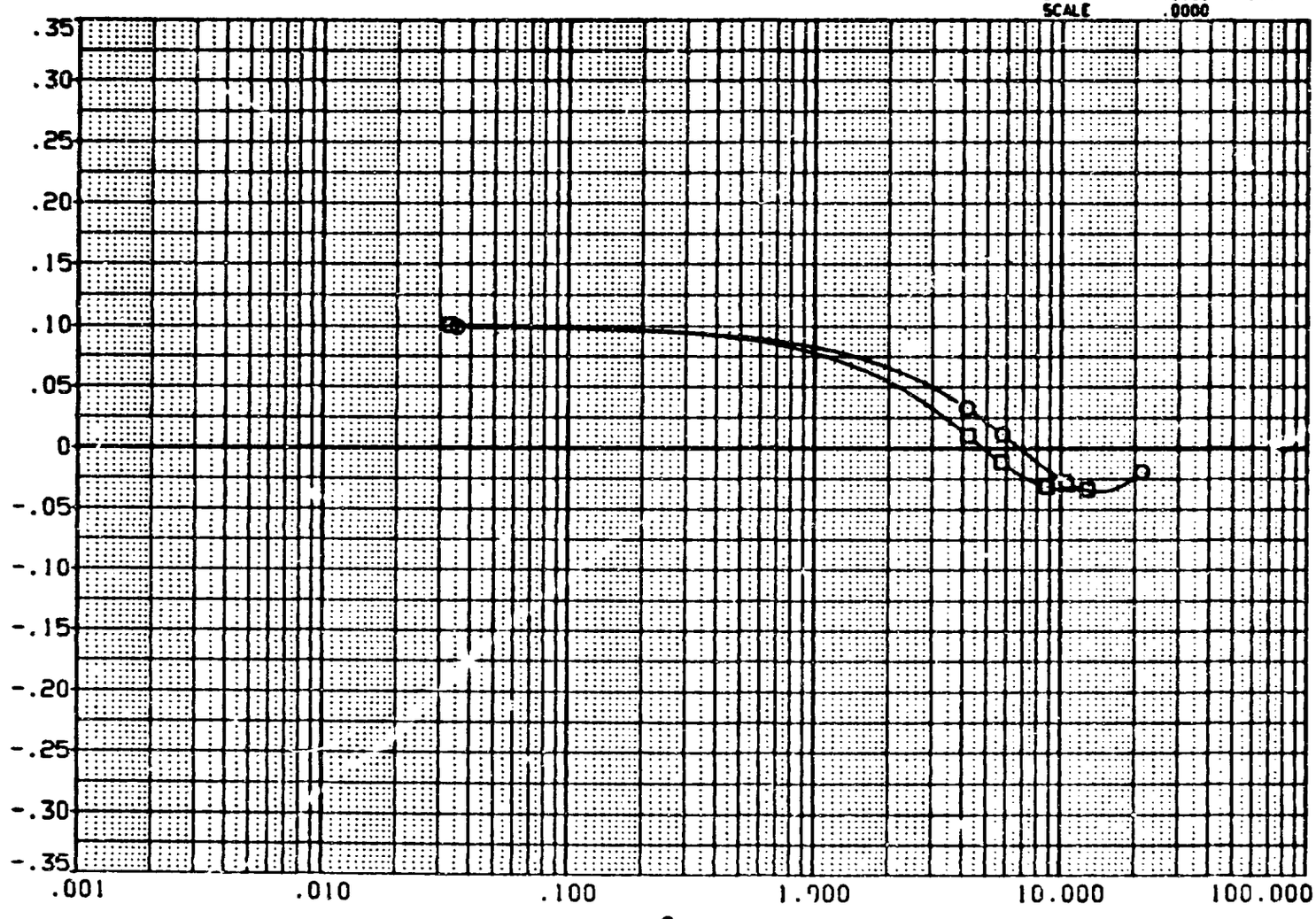
REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	28.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF2

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX8067)	○	CAL T17-123 (BF2) BODY, FIN IN AFT POSITION	.700	1.000
(AX8088)	□	CAL T17-123 (BF2) BODY, FIN IN AFT POSITION	.900	1.000

REFERENCE INFORMATION		
SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

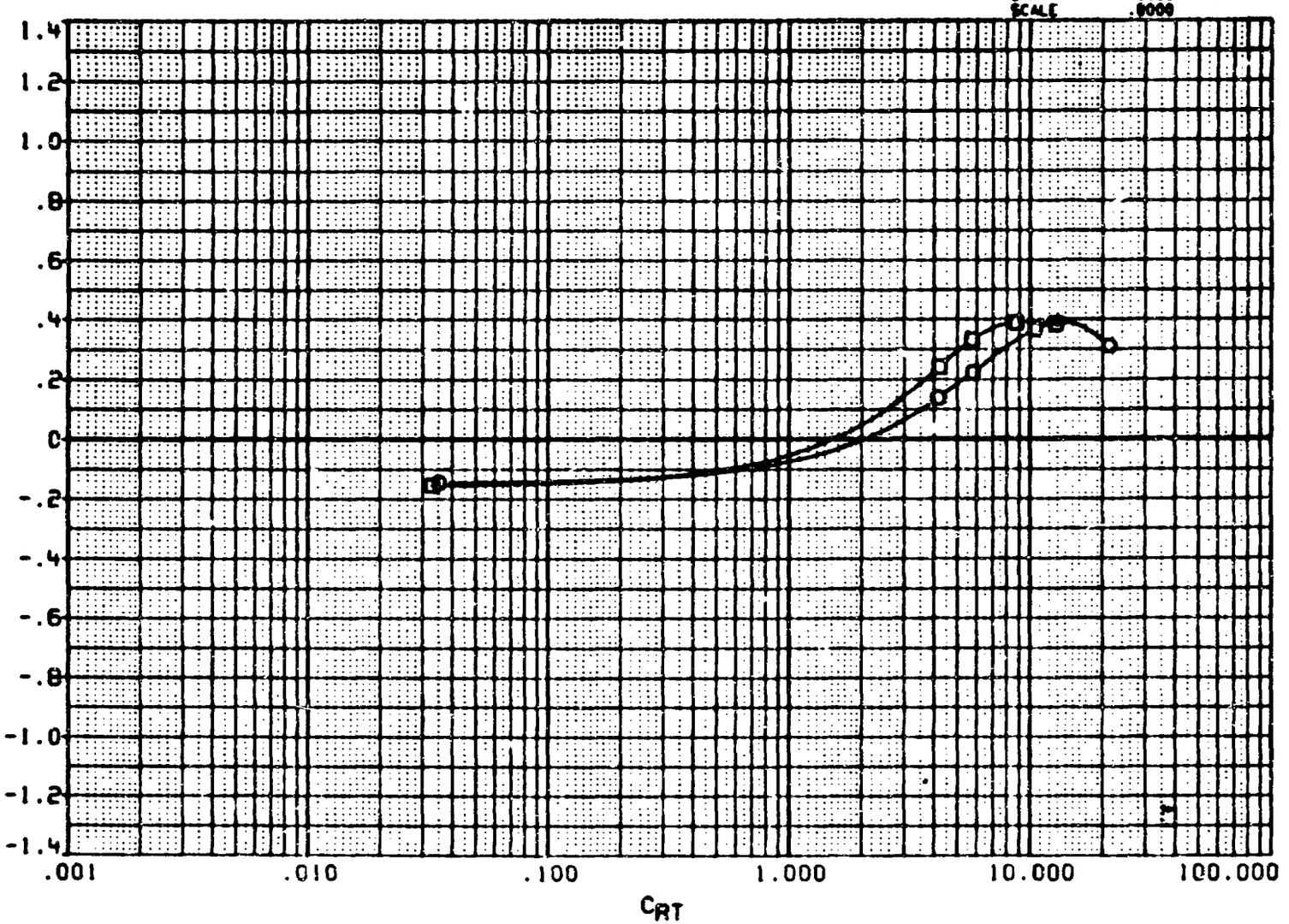


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF2

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AN8087)	8	CAL Y17-123 (BF2) BODY, FIN IN AFT POSITION	.700	1.000
(AN8088)	8	CAL Y17-123 (BF2) BODY, FIN IN AFT POSITION	.900	1.000

REFERENCE INFORMATION

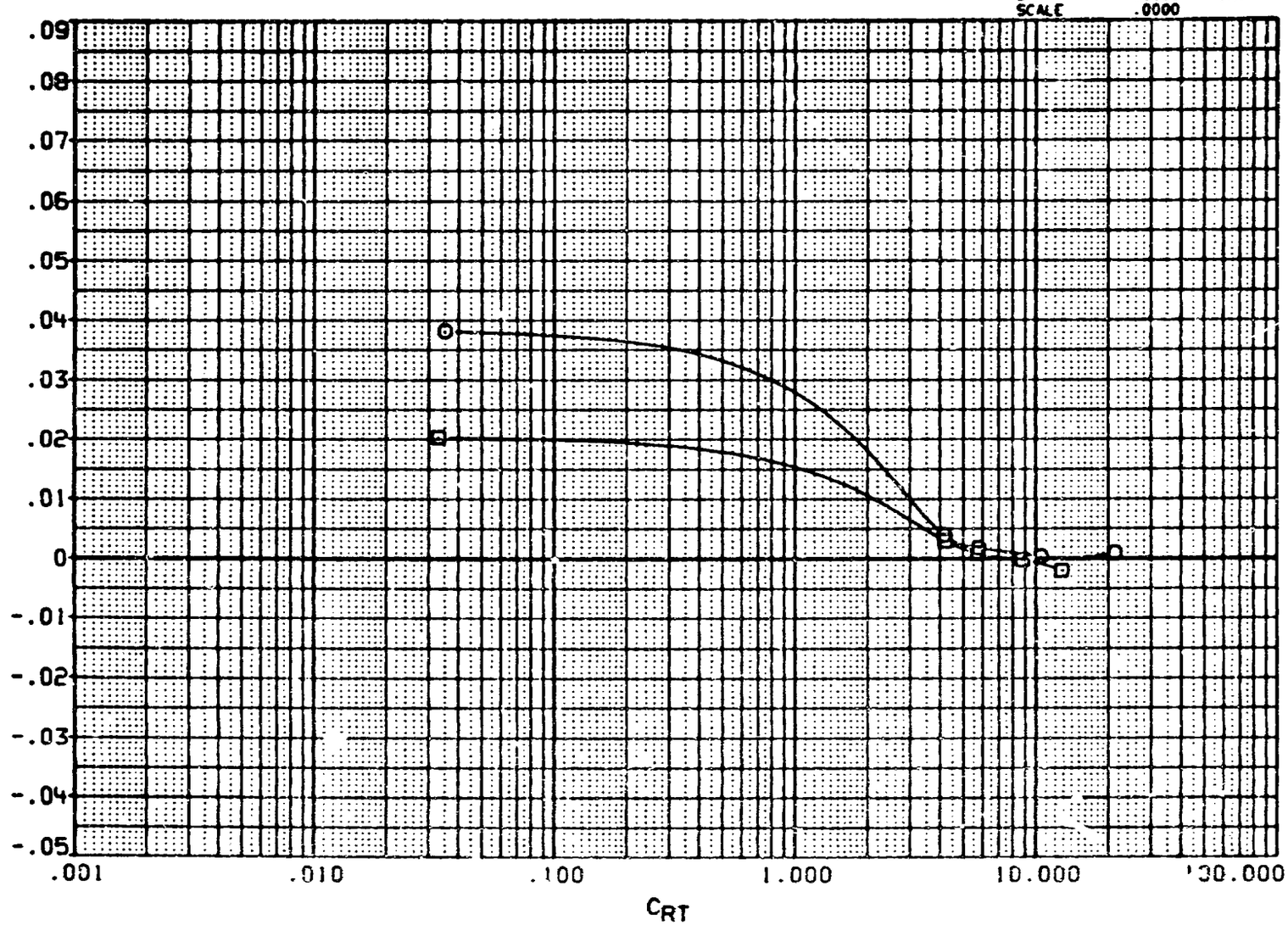
SREF	19.6350	SQ. IN
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.8000	



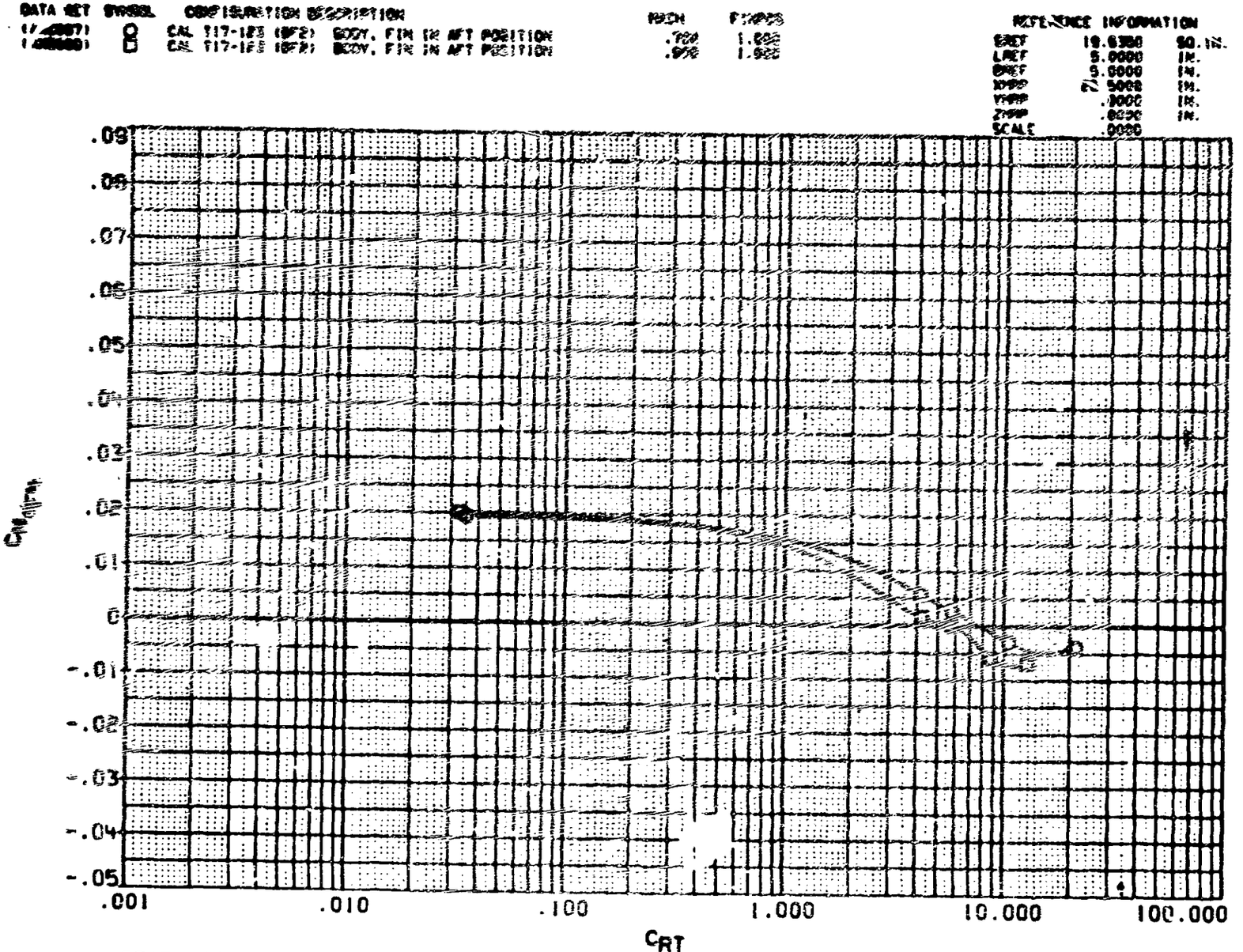
STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF2

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AH8887)	○	CAL T17-123 (BF2) BODY, FIN IN AFT POSITION	.700	1.000
(AH8888)	□	CAL T17-123 (BF2) BODY, FIN IN AFT POSITION	.900	1.000

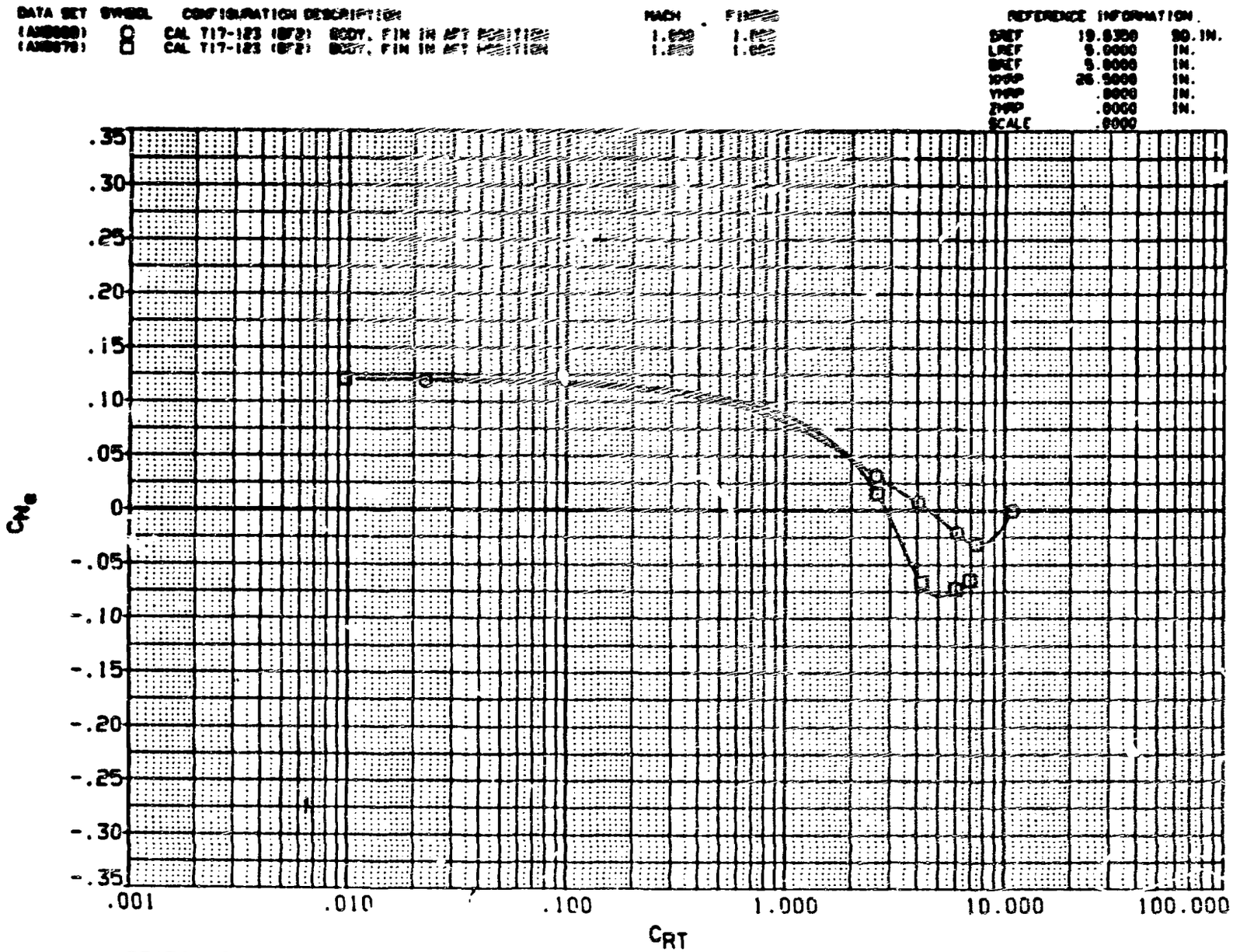
REFERENCE INFORMATION		
SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF2



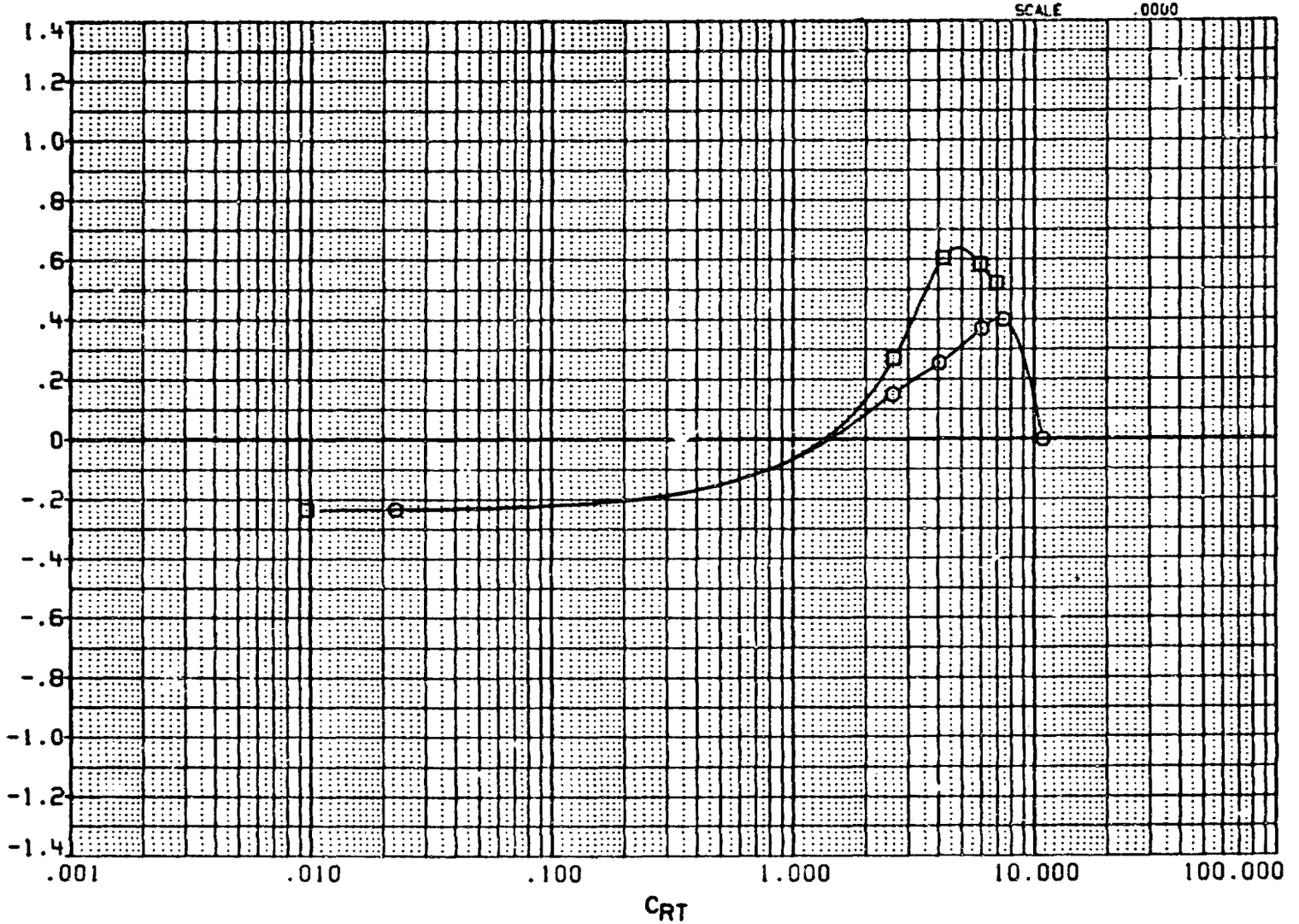
STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF2



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF2

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AXB088)	○	CAL T17-123 (BF1) BODY, FIN IN AFT POSITION	1.000	1.000
(AXB070)	□	CAL T17-123 (BF2) BODY, FIN IN AFT POSITION	1.200	1.000

REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

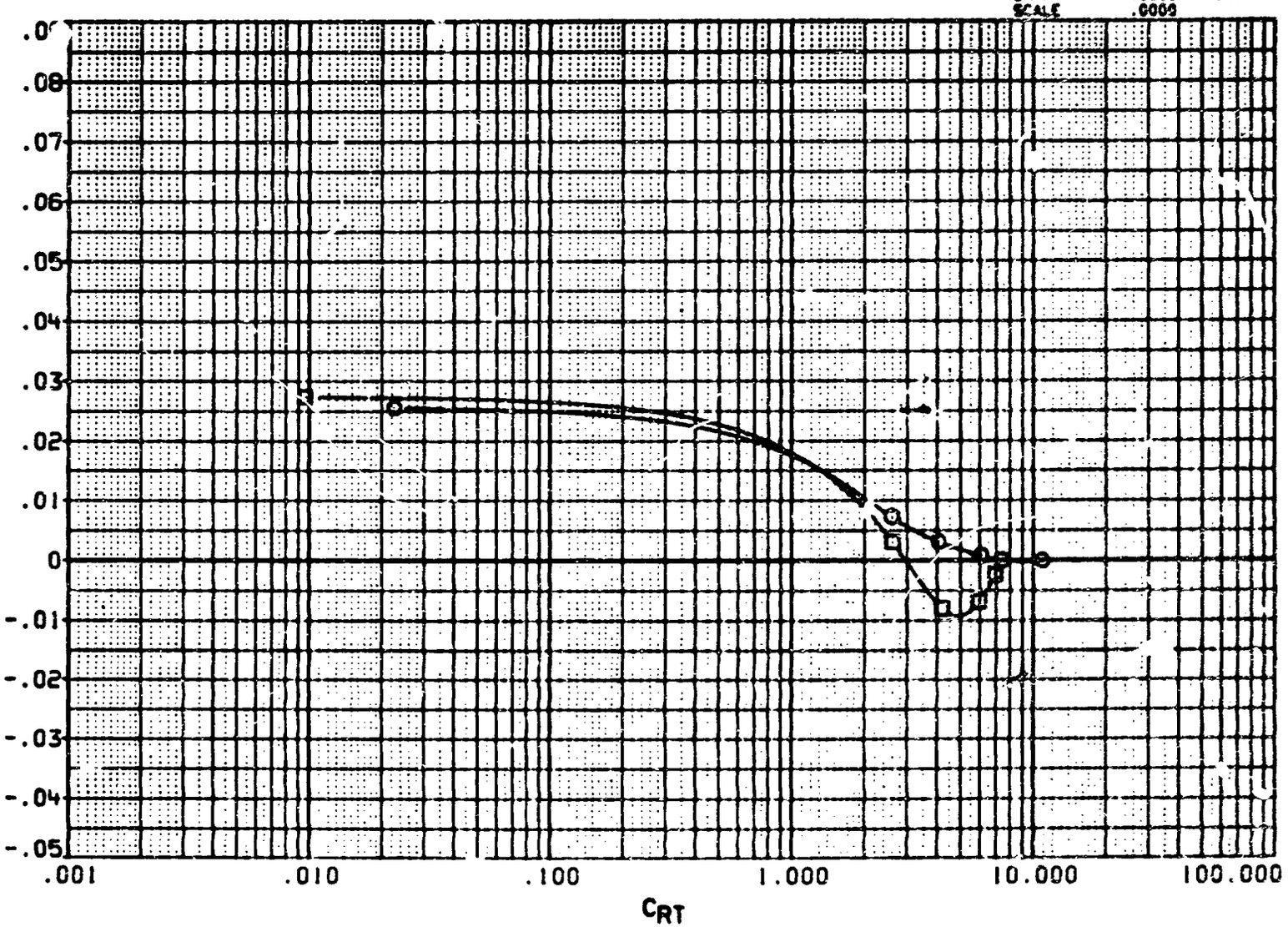


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF2

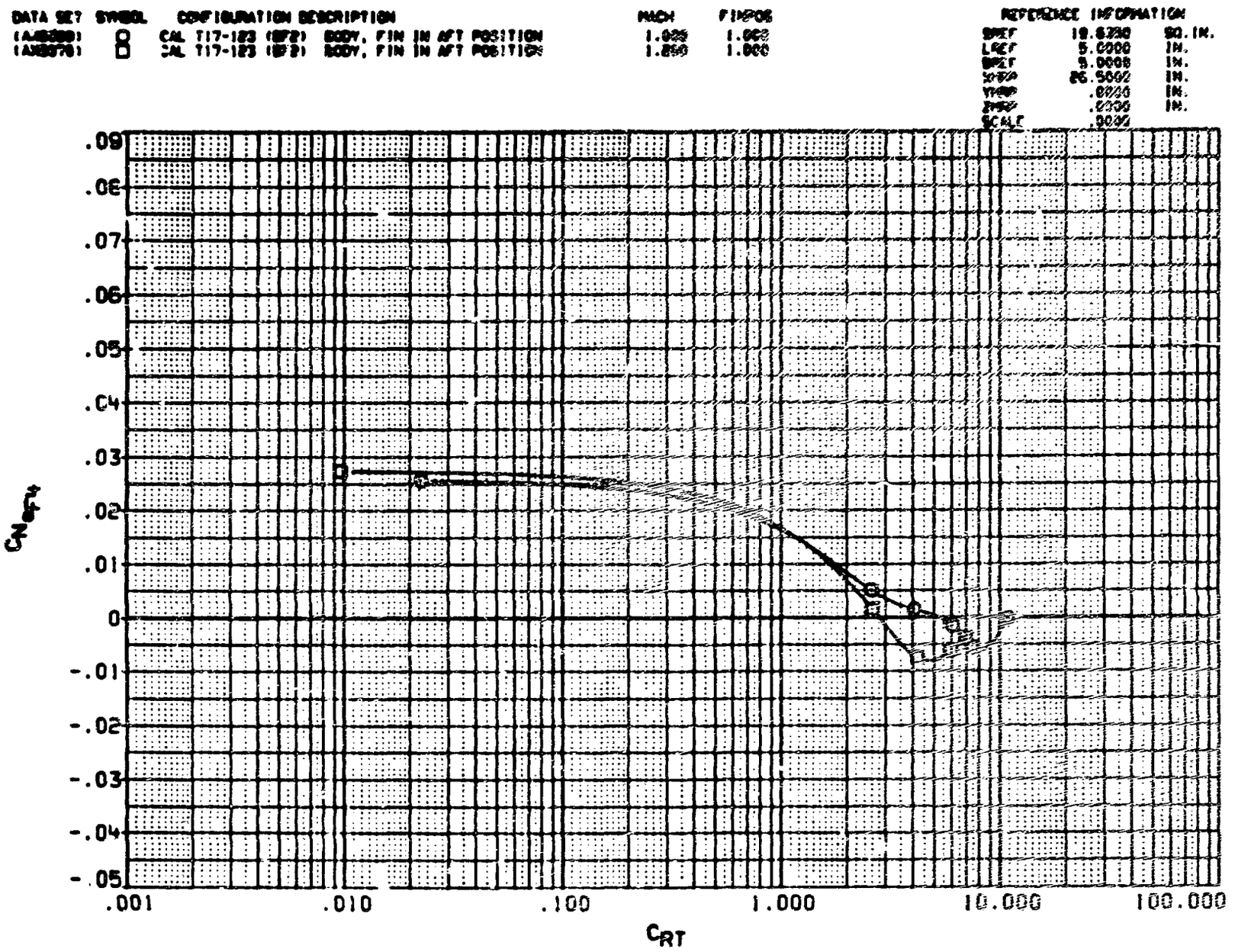
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AN8088)	○	CAL T17-123 (BF2) BODY, FIN IN AFT POSITION	1.000	1.000
(AN8876)	□	CAL T17-123 (BF2) BODY, FIN IN AFT POSITION	1.200	1.000

REFERENCE INFORMATION

SREF	19.6250	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	25.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



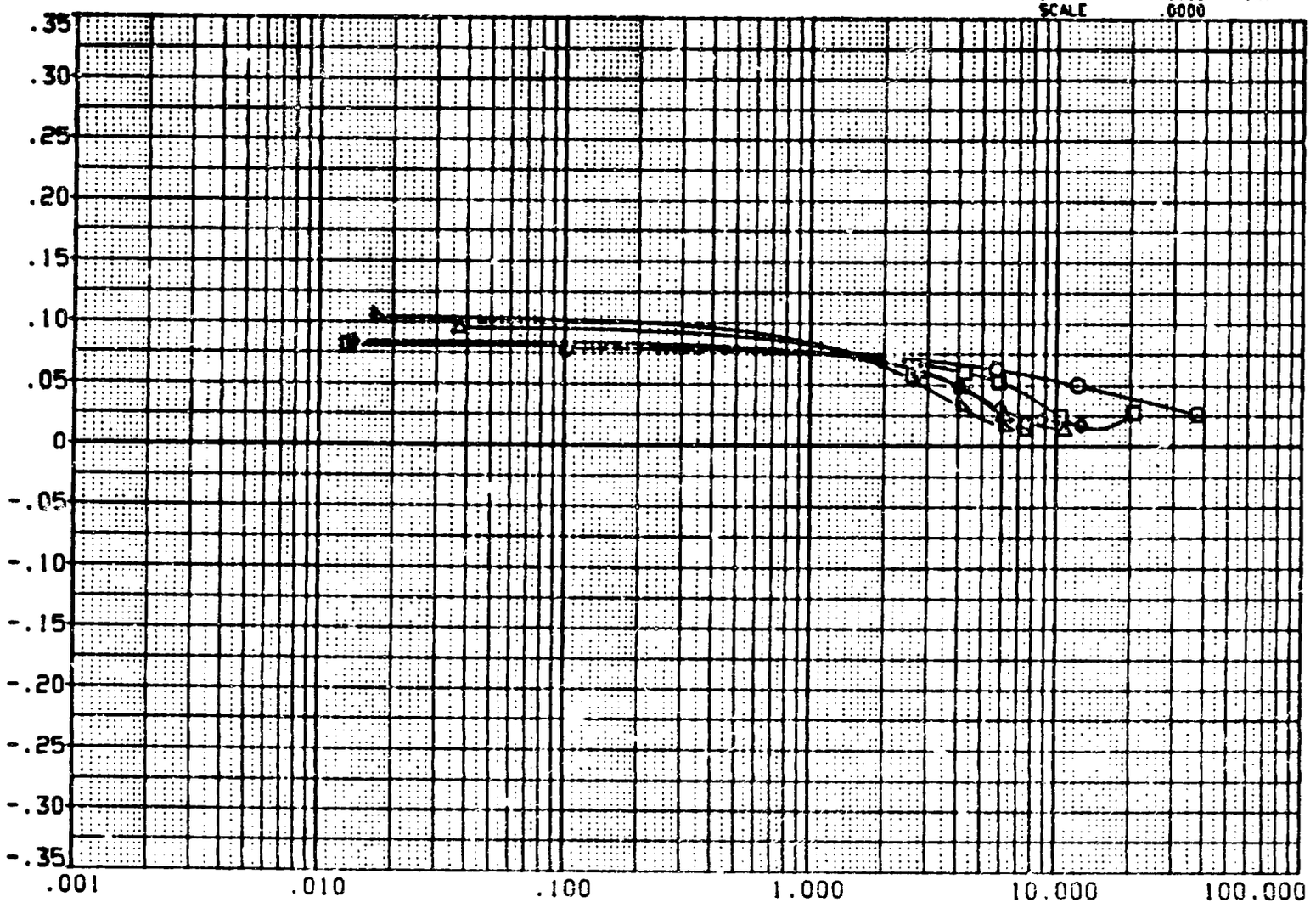
STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF2



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF2

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX80020)	○	CAL T17-123 (BF3) BODY, FIN IN FORWARD POSITION	.400	3.000
(AX80021)	□	CAL T17-123 (BF3) BODY, FIN IN FORWARD POSITION	.700	3.000
(AX80022)	◇	CAL T17-123 (BF3) BODY, FIN IN FORWARD POSITION	.900	3.000
(AX80023)	△	CAL T17-123 (BF3) BODY, FIN IN FORWARD POSITION	1.000	3.000
(AX80024)	▷	CAL T17-123 (BF3) BODY, FIN IN FORWARD POSITION	1.200	3.000

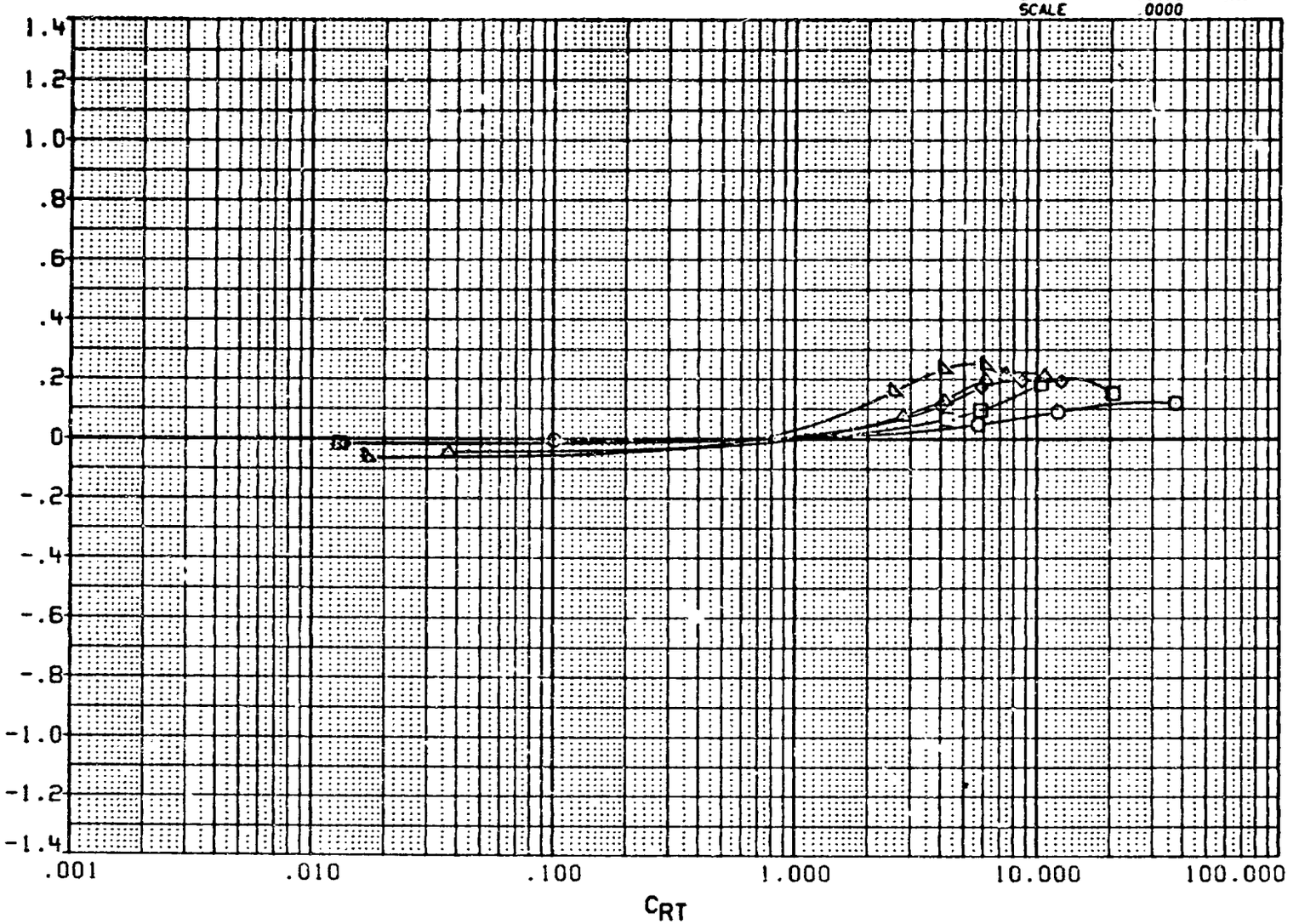
REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS BODY WITH FINS, BF3

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AXB020)	□	CAL T17-123 (BF3) BODY, FIN IN FORWARD POSITION	.400	3.000
(AXB021)	◇	CAL T17-123 (BF3) BODY, FIN IN FORWARD POSITION	.700	3.000
(AXB022)	◁	CAL T17-123 (BF3) BODY, FIN IN FORWARD POSITION	.900	3.000
(AXB023)	▷	CAL T17-123 (BF3) BODY, FIN IN FORWARD POSITION	1.000	3.000
(AXB024)	○	CAL T17-123 (BF3) BODY, FIN IN FORWARD POSITION	1.200	3.000

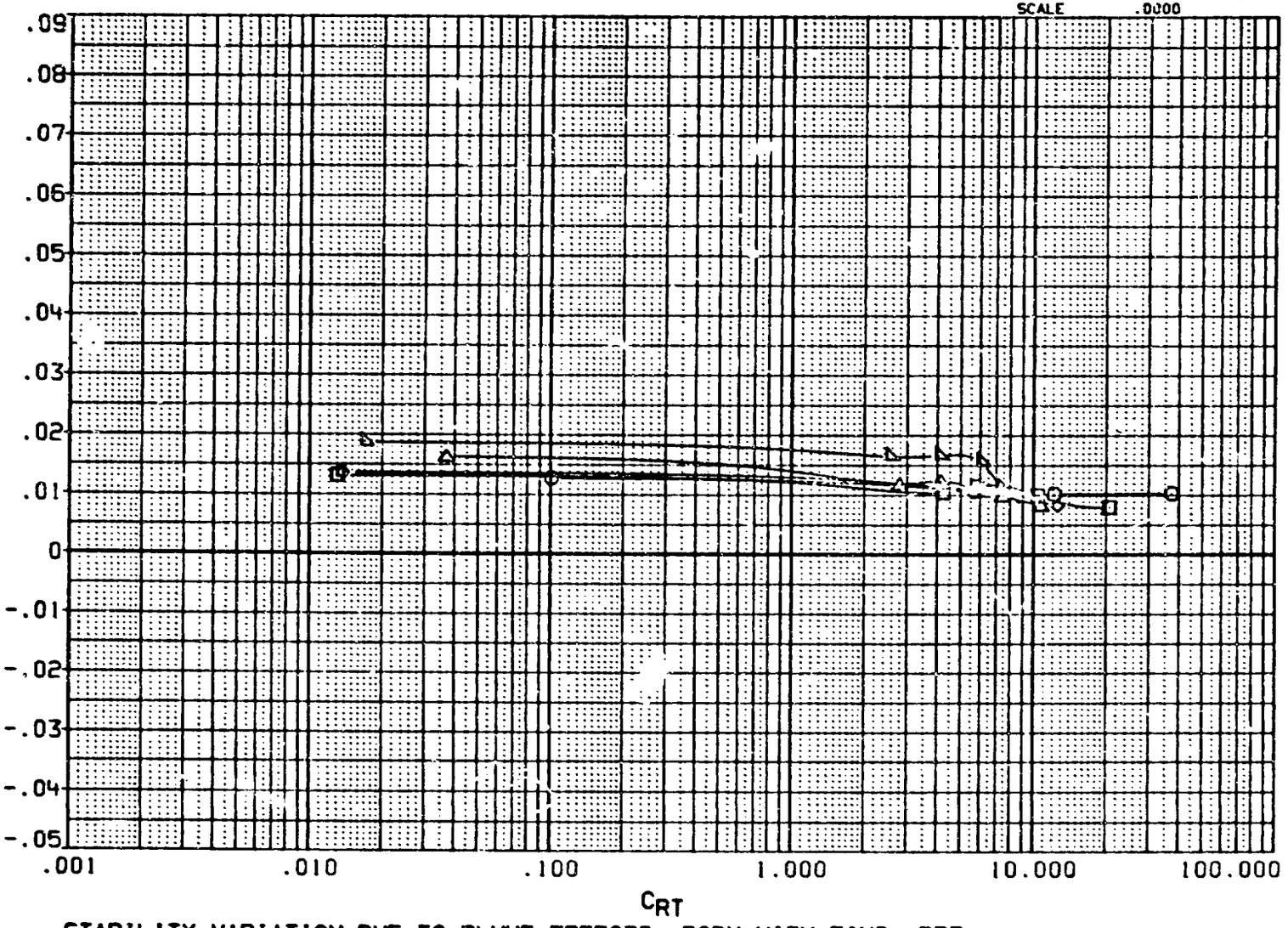
REFERENCE INFORMATION		
SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF3

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX8020)	○	CAL T17-123 (BF3) BODY, FIN IN FORWARD POSITION	.400	3.000
(AX8021)	□	CAL T17-123 (BF3) BODY, FIN IN FORWARD POSITION	.700	3.000
(AX8022)	◇	CAL T17-123 (BF3) BODY, FIN IN FORWARD POSITION	.900	3.000
(AX8023)	△	CAL T17-123 (BF3) BODY, FIN IN FORWARD POSITION	1.000	3.000
(AX8024)	◁	CAL T17-123 (BF3) BODY, FIN IN FORWARD POSITION	1.200	3.000

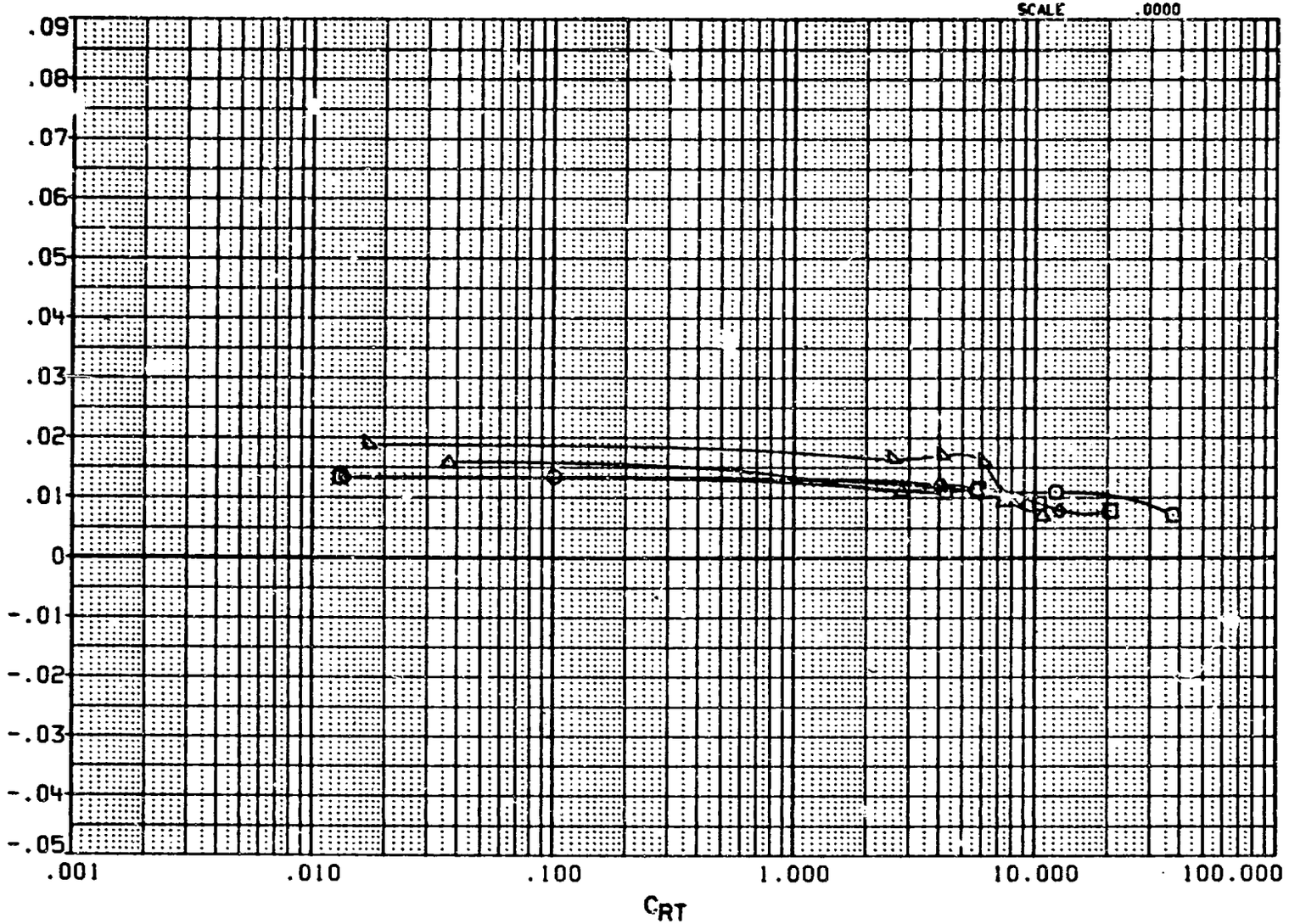
REFERENCE INFORMATION		
SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF3

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX8020)	○	CAL T17-123 (BF3) BODY, FIN IN FORWARD POSITION	.400	3.000
(AX8021)	□	CAL T17-123 (BF3) BODY, FIN IN FORWARD POSITION	.700	3.000
(AX8022)	◇	CAL T17-123 (BF3) BODY, FIN IN FORWARD POSITION	.900	3.000
(AX8023)	◁	CAL T17-123 (BF3) BODY, FIN IN FORWARD POSITION	1.000	3.000
(AX8024)	△	CAL T17-123 (BF3) BODY, FIN IN FORWARD POSITION	1.200	3.000

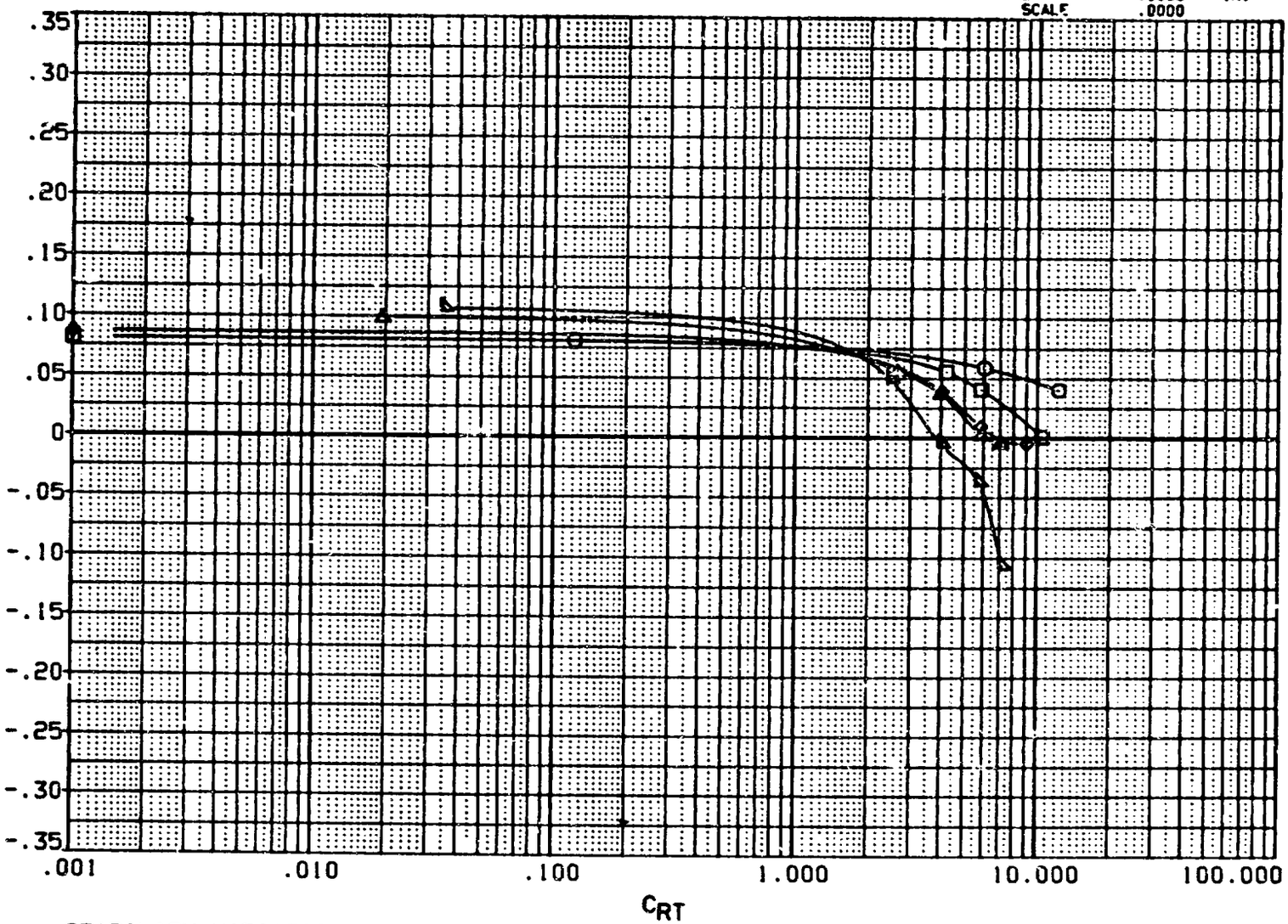
REFERENCE INFORMATION		
SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF3

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX8053)	○	CAL T17-123 (BF3) BODY, FIN IN MID POSITION	.400	2.000
(BX8054)	□	CAL T17-123 (BF3) BODY, FIN IN MID POSITION	.700	2.000
(BX8055)	◇	CAL T17-123 (BF3) BODY, FIN IN MID POSITION	.900	2.000
(AX8056)	△	CAL T17-123 (BF3) BODY, FIN IN MID POSITION	1.000	2.000
(AX8057)	▽	CAL T17-123 (BF3) BODY, FIN IN MID POSITION	1.200	2.000

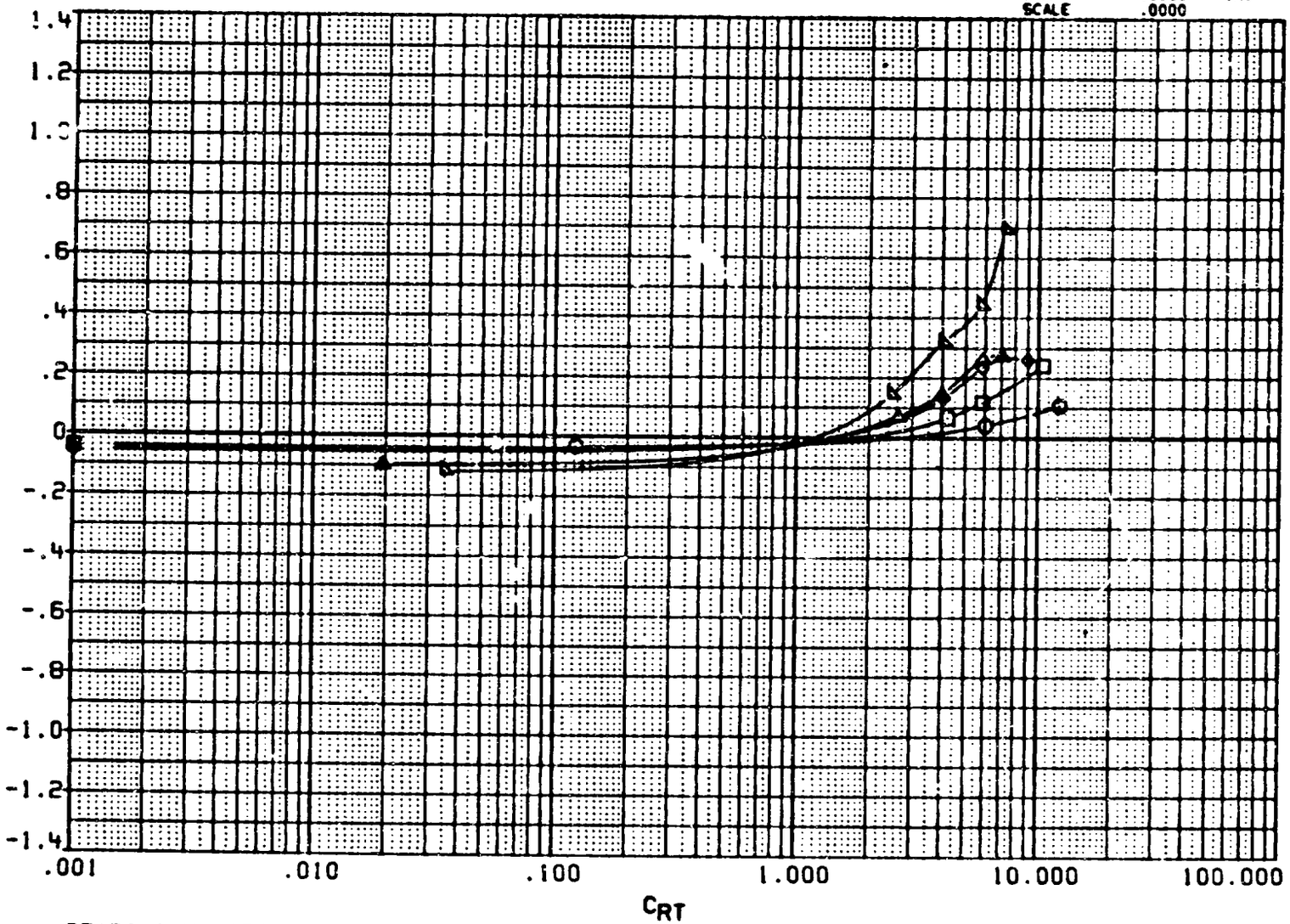
REFERENCE INFORMATION		
SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF3

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX8053)	○	CAL T17-123 (BF3) BODY, FIN IN MID POSITION	.400	2.000
(BX8054)	□	CAL T17-123 (BF3) BODY, FIN IN MID POSITION	.700	2.000
(BX8055)	◇	CAL T17-123 (BF3) BODY, FIN IN MID POSITION	.900	2.000
(AX8056)	△	CAL T17-123 (BF3) BODY, FIN IN MID POSITION	1.000	2.000
(AX8057)	▷	CAL T17-123 (BF3) BODY, FIN IN MID POSITION	1.200	2.000

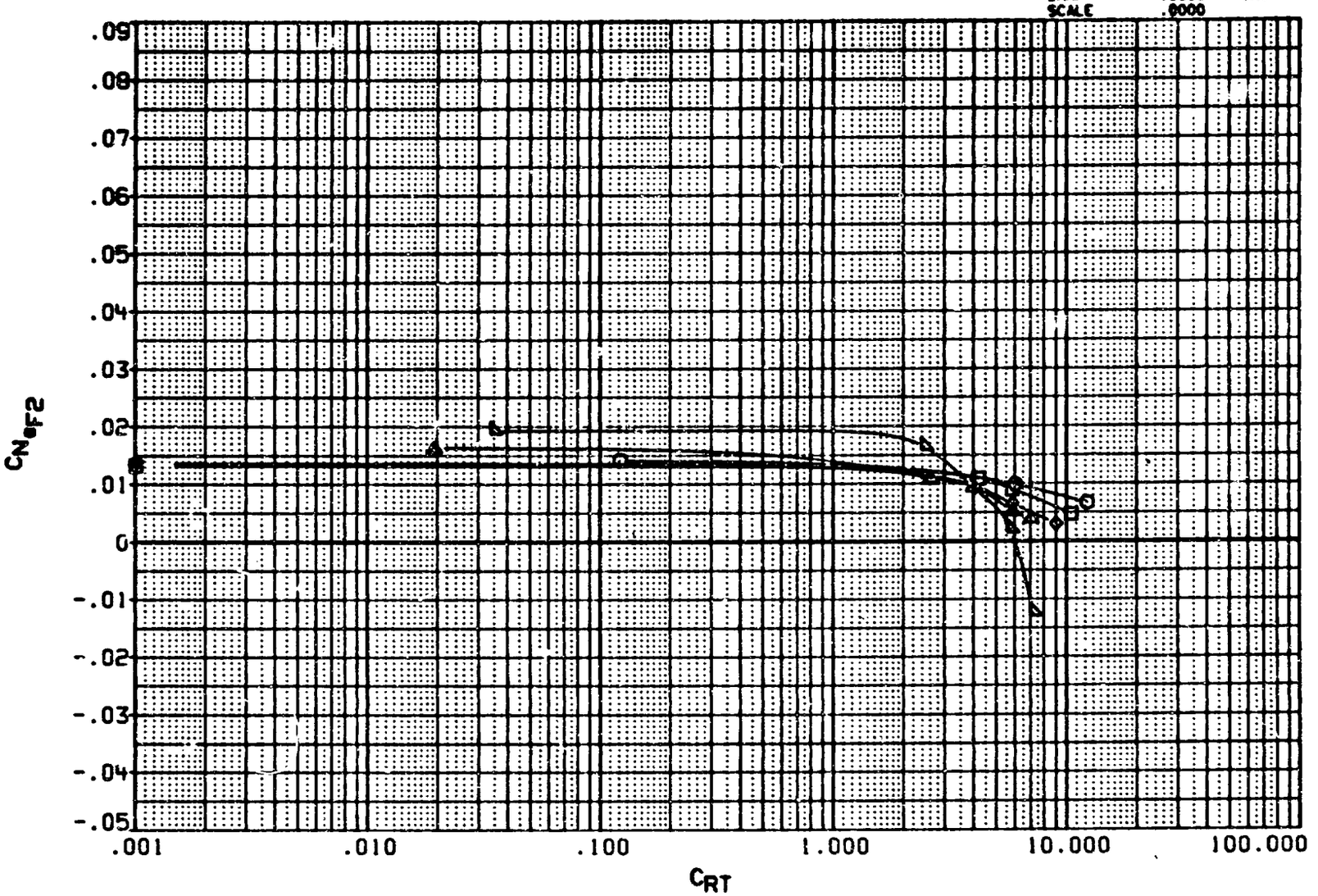
REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



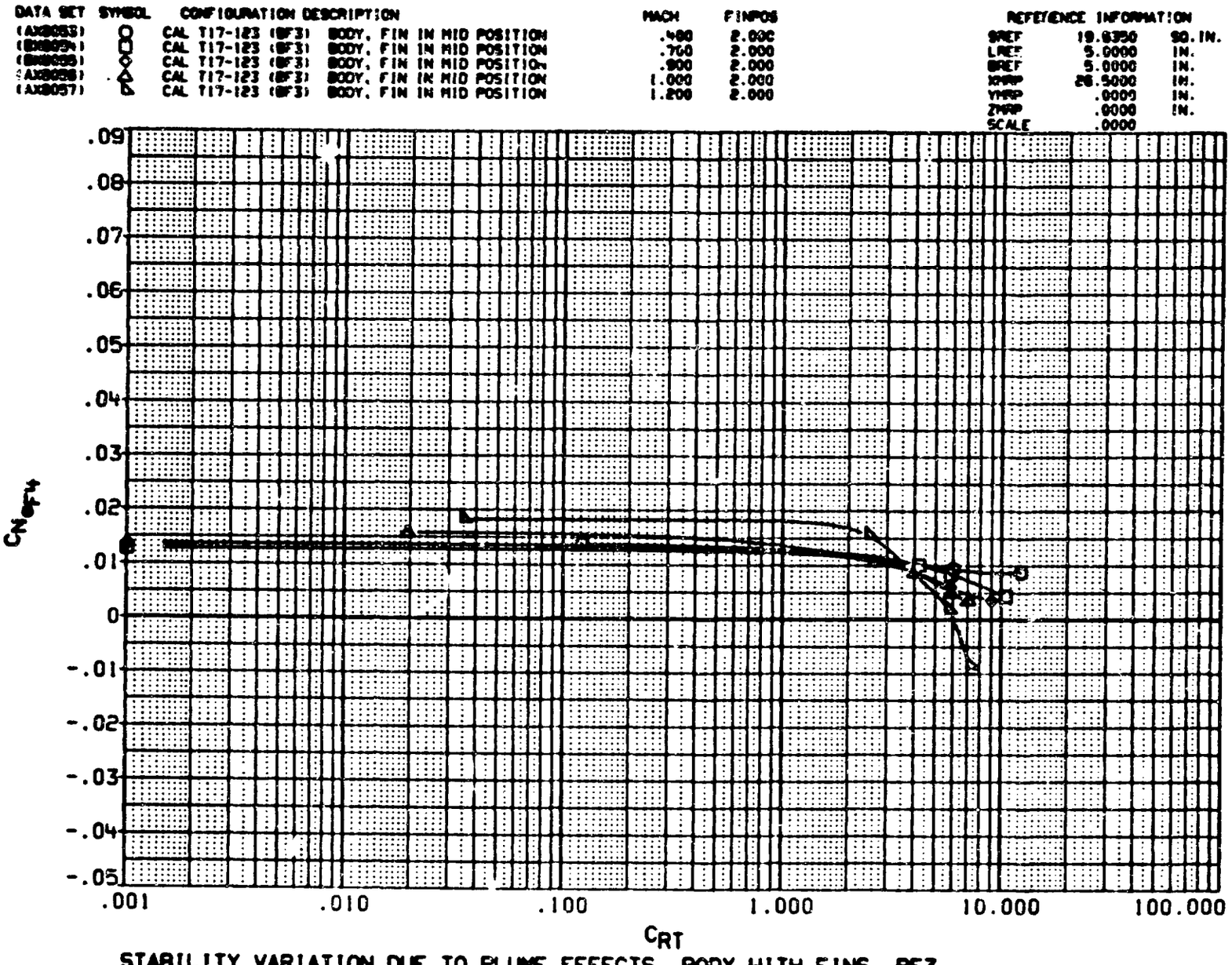
STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF3

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX8053)	○	CAL T17-123 (BF3) BODY, FIN IN MID POSITION	.400	2.000
(BX8054)	□	CAL T17-123 (BF3) BODY, FIN IN MID POSITION	.700	2.000
(BX8055)	◇	CAL T17-123 (BF3) BODY, FIN IN MID POSITION	.900	2.000
(AX8056)	△	CAL T17-123 (BF3) BODY, FIN IN MID POSITION	1.000	2.000
(AX8057)	▷	CAL T17-123 (BF3) BODY, FIN IN MID POSITION	1.200	2.000

REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF3



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF3

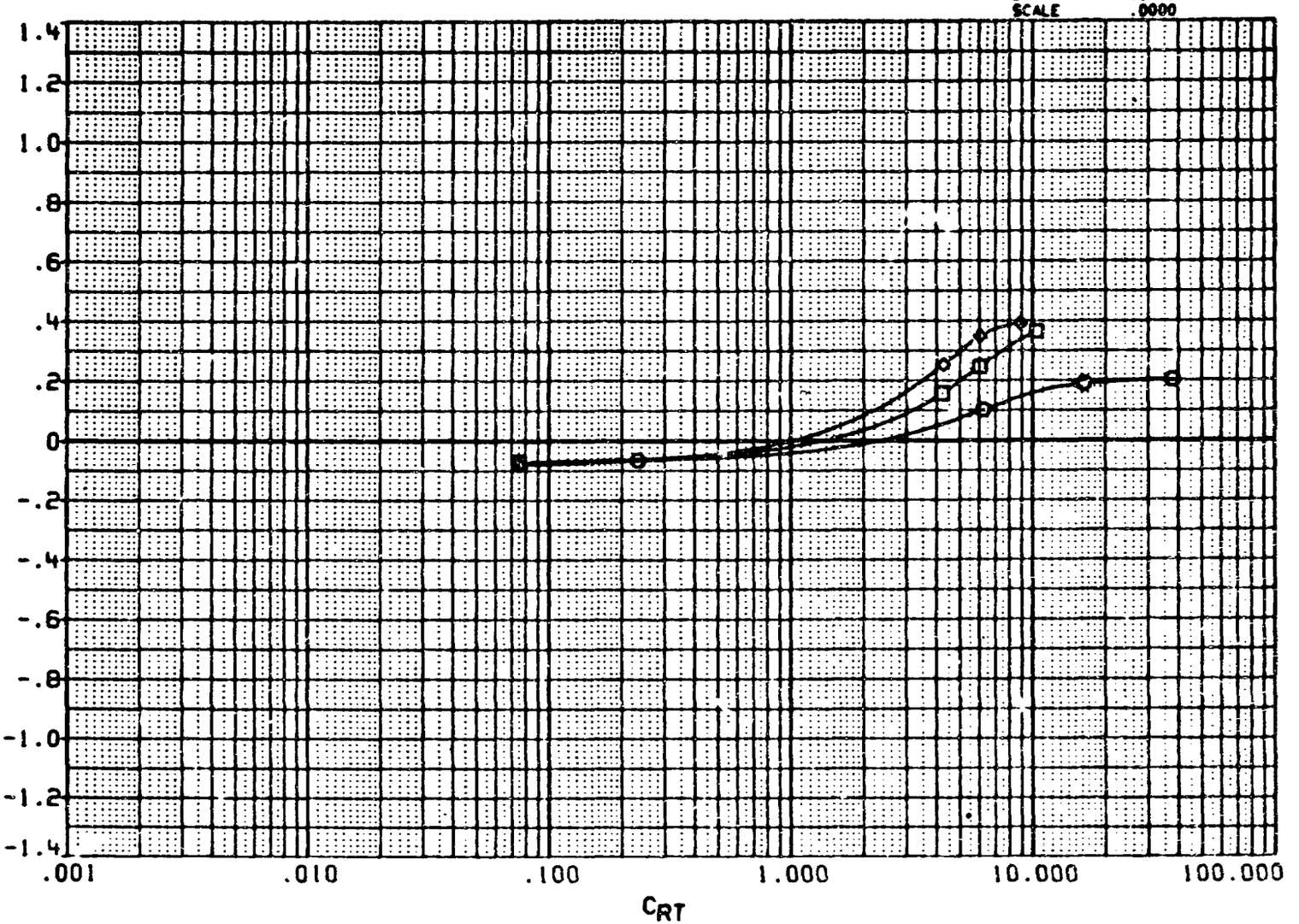
DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX80958)	○	CAL T17-123 (BF3) BODY, FIN IN AFT POSITION	.400	1.000
(AX80959)	□	CAL T17-123 (BF3) BODY, FIN IN AFT POSITION	.700	1.000
(AX80960)	◇	CAL T17-123 (BF3) BODY, FIN IN AFT POSITION	.900	1.000

REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF3

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX8058)	○	CAL T17-123 (BF3) BODY, FIN IN AFT POSITION	.400	1.000
(AX8059)	□	CAL T17-123 (BF3) BODY, FIN IN AFT POSITION	.700	1.000
(AX8060)	◇	CAL T17-123 (BF3) BODY, FIN IN AFT POSITION	.900	1.000

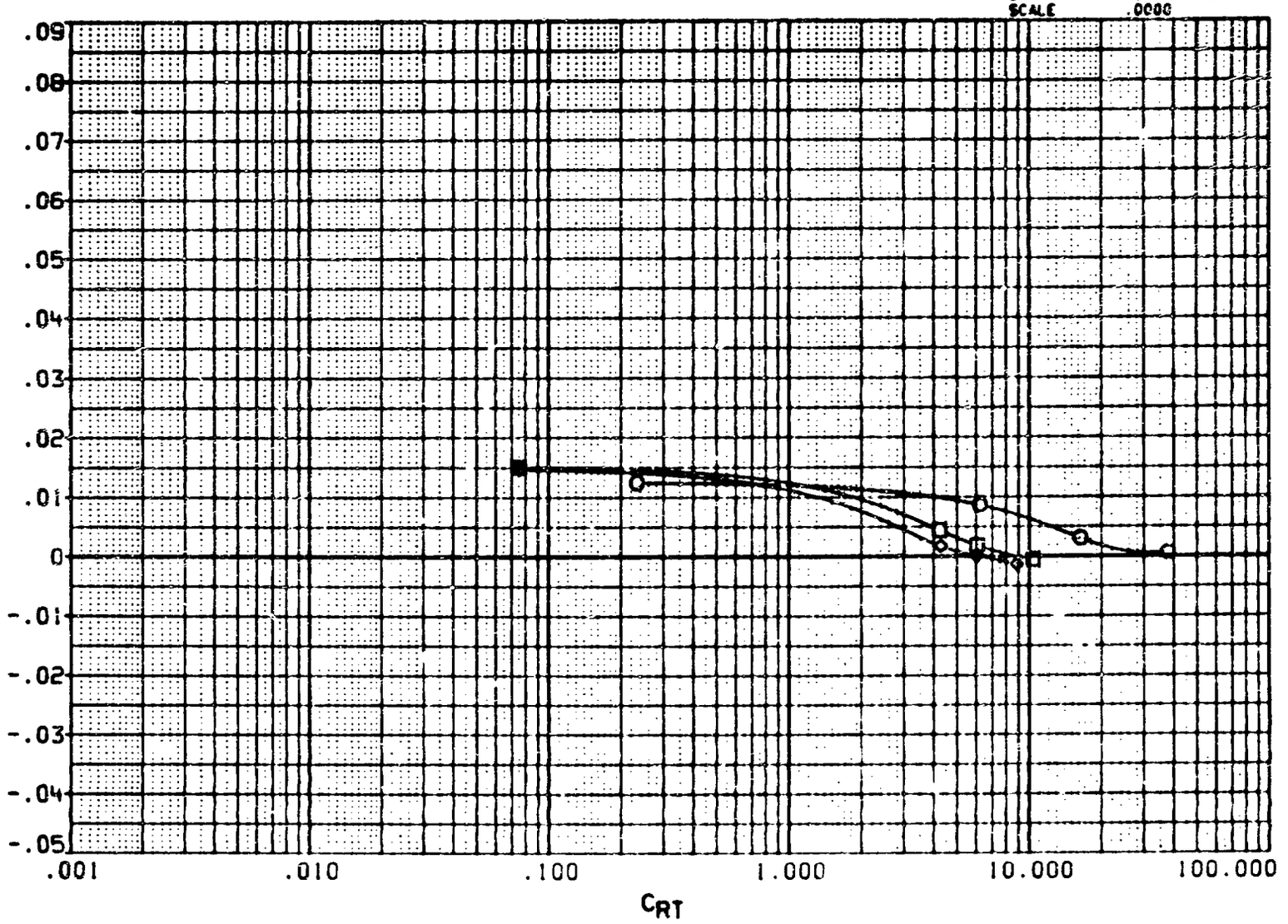
REFERENCE INFORMATION		
SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF3

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX80080)	○	CAL T17-123 (BF3) BODY, FIN IN AFT POSITION	.400	1.000
(AX80090)	□	CAL T17-123 (BF3) BODY, FIN IN AFT POSITION	.700	1.000
(AX80090)	◇	CAL T17-123 (BF3) BODY, FIN IN AFT POSITION	.900	1.000

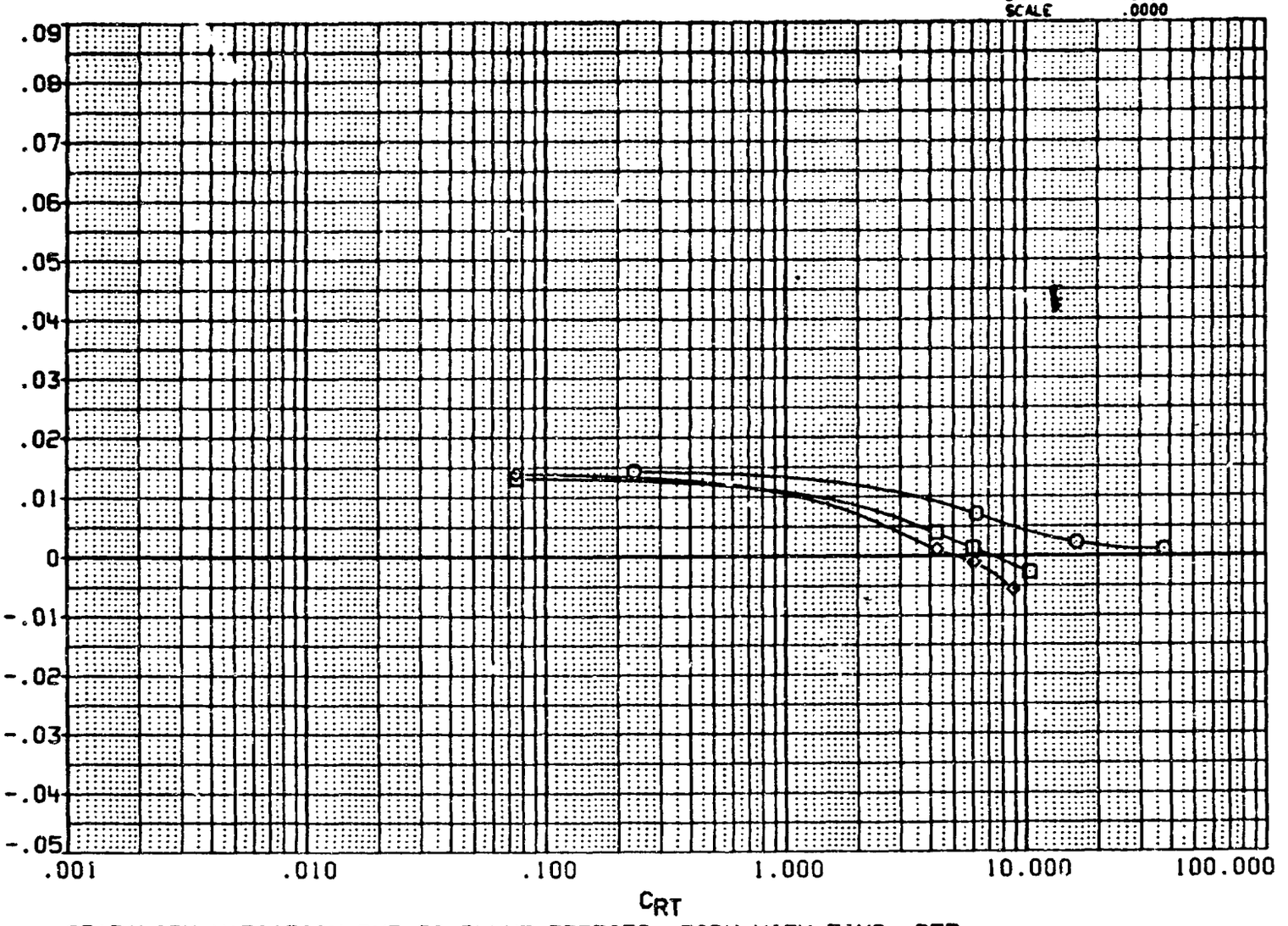
REFERENCE INFORMATION		
SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	25.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF3

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AXBC058)	○	CAL T17-123 (BF3) BODY, FIN IN AFT POSITION	.600	1.000
(AXBC059)	□	CAL T17-123 (BF3) BODY, FIN IN AFT POSITION	.700	1.000
(AXBC060)	◇	CAL T17-1[illegible] (BF3) BODY, FIN IN AFT POSITION	.900	1.000

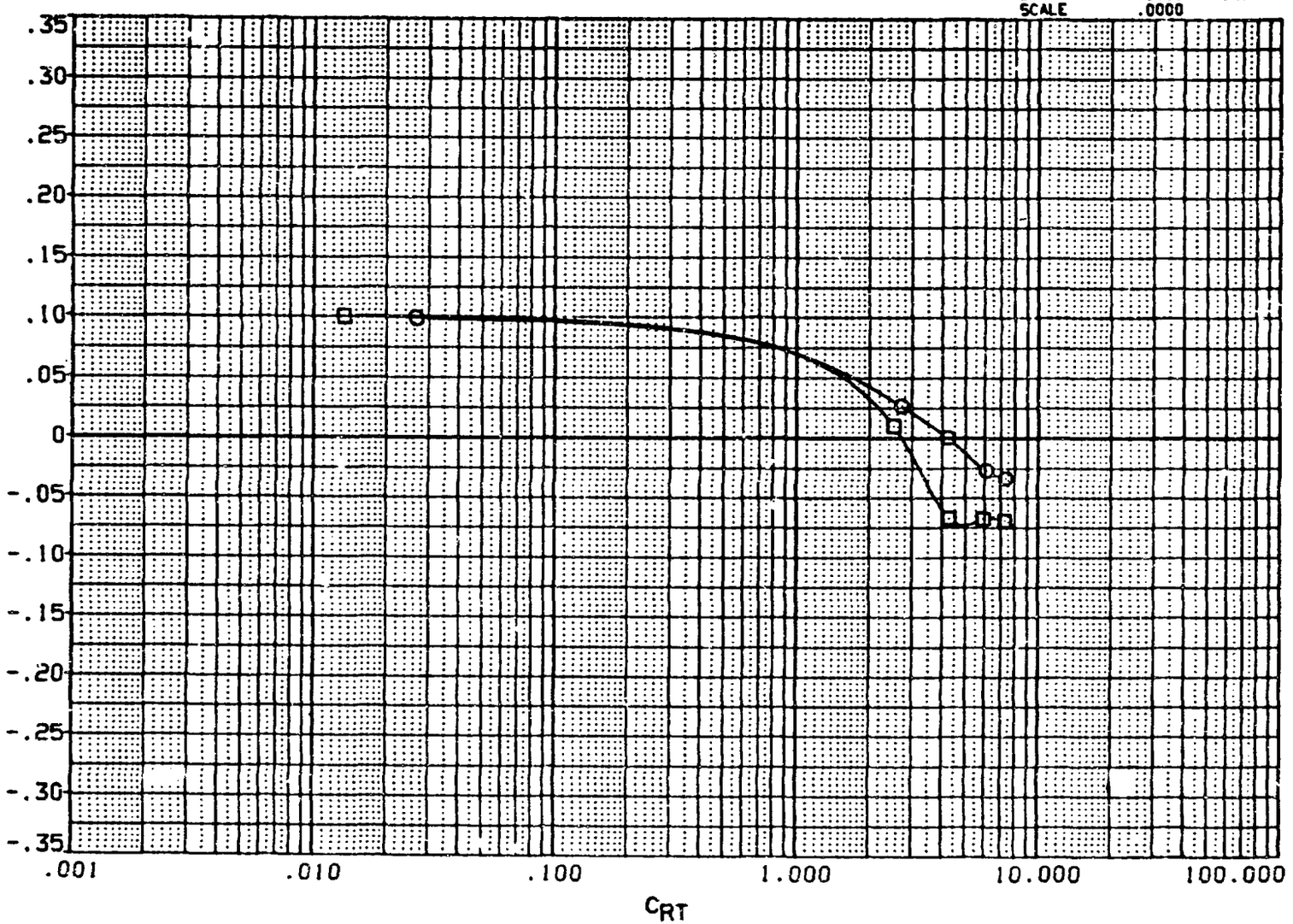
REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF3

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX8051)	○	CAL T17-123 (BF3) BODY, FIN IN AFT POSITION	1.000	1.000
(AX8052)	□	CAL T17-123 (BF3) BODY, FIN IN AFT POSITION	1.200	1.000

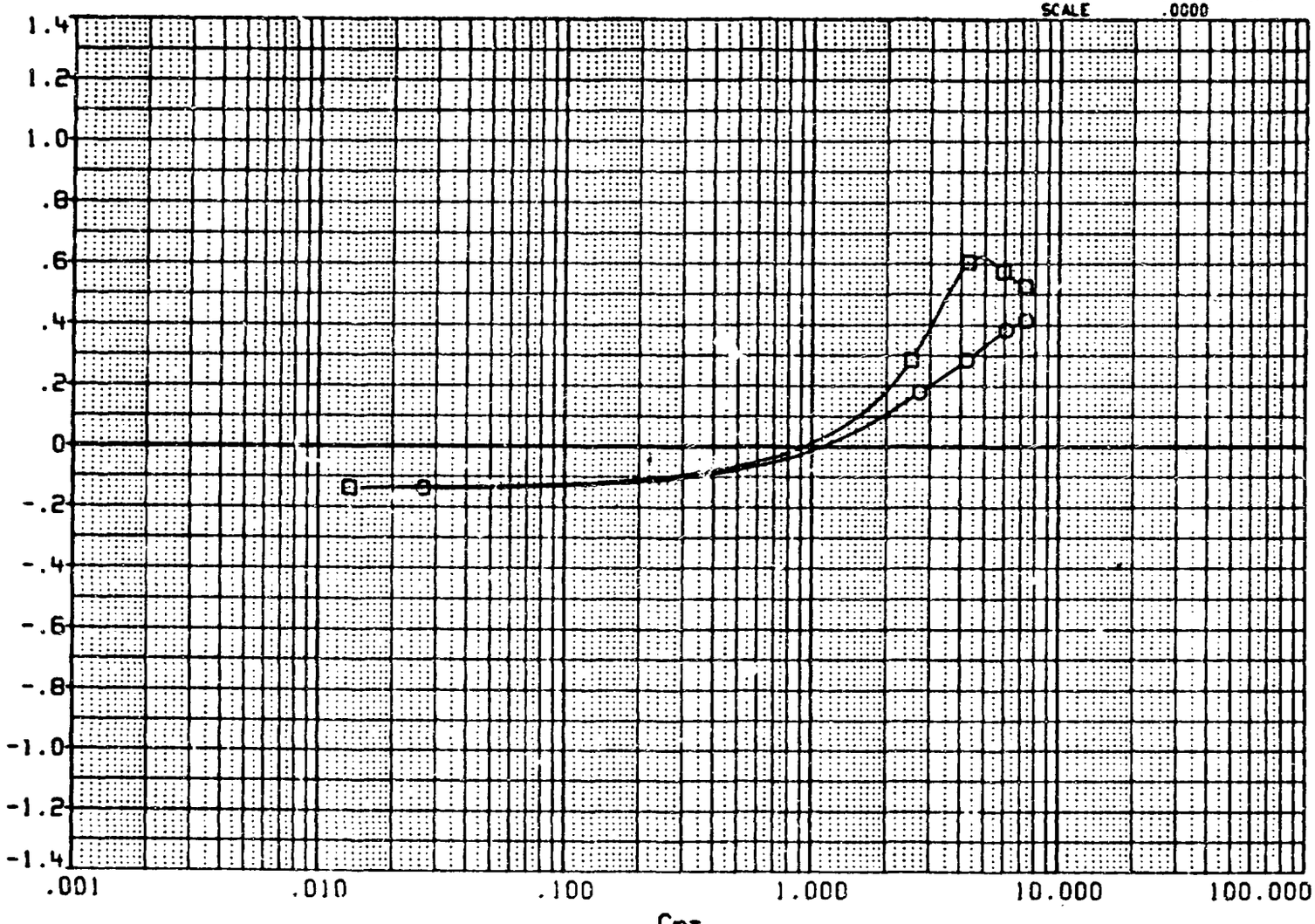
REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF3

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX8061)	○	CAL T17-123 (BF3) BODY, FIN IN AFT POSITION	1.000	1.000
(AX8062)	□	CAL T17-123 (BF3) BODY, FIN IN AFT POSITION	1.200	1.000

REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

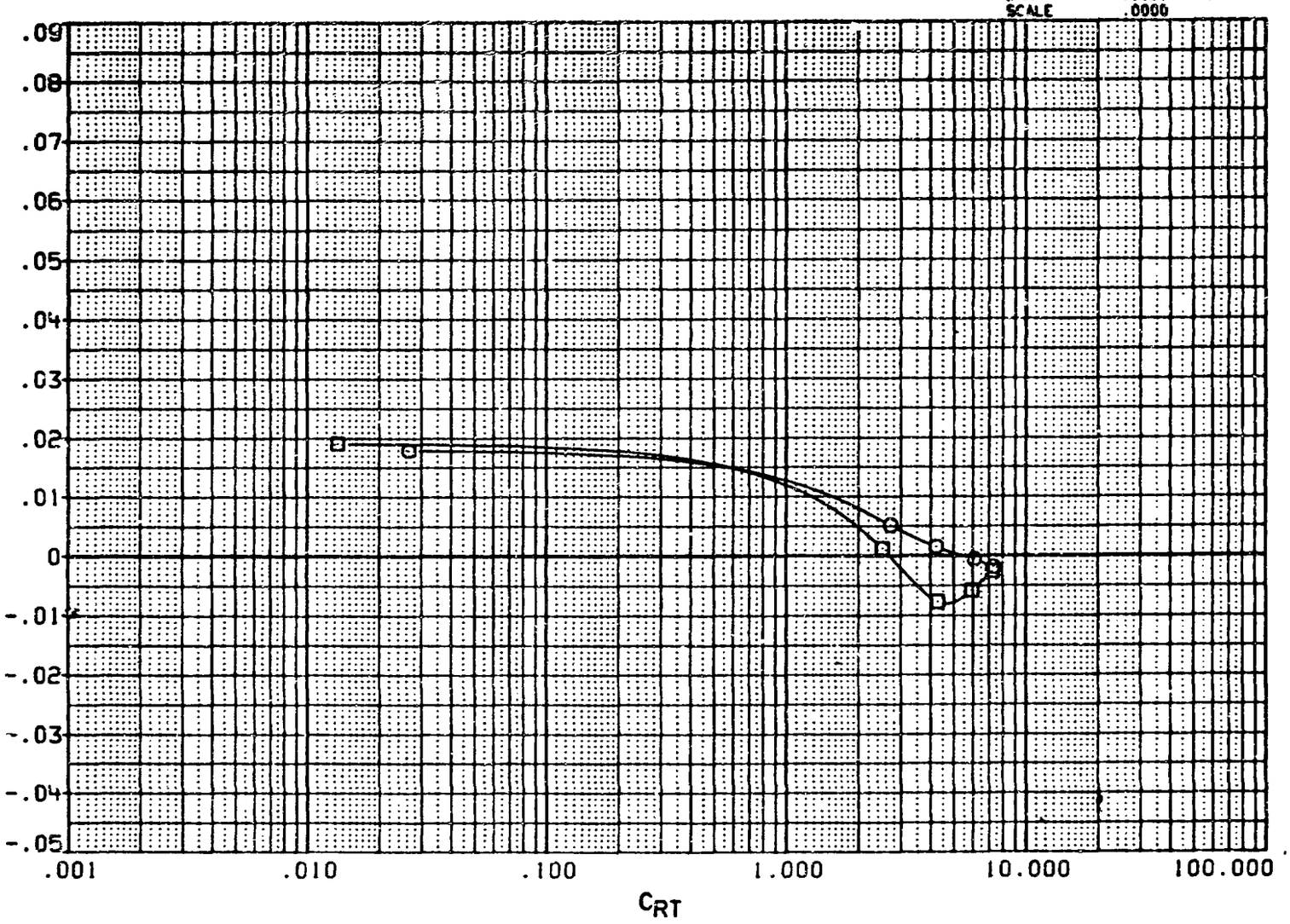


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF3

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX8081)	○	CAL T17-123 (BF3) BODY, FIN IN AFT POSITION	1.000	1.000
(AX8082)	□	CAL T17-123 (BF3) BODY, FIN IN AFT POSITION	1.200	1.000

REFERENCE INFORMATION

SREF	19.8350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

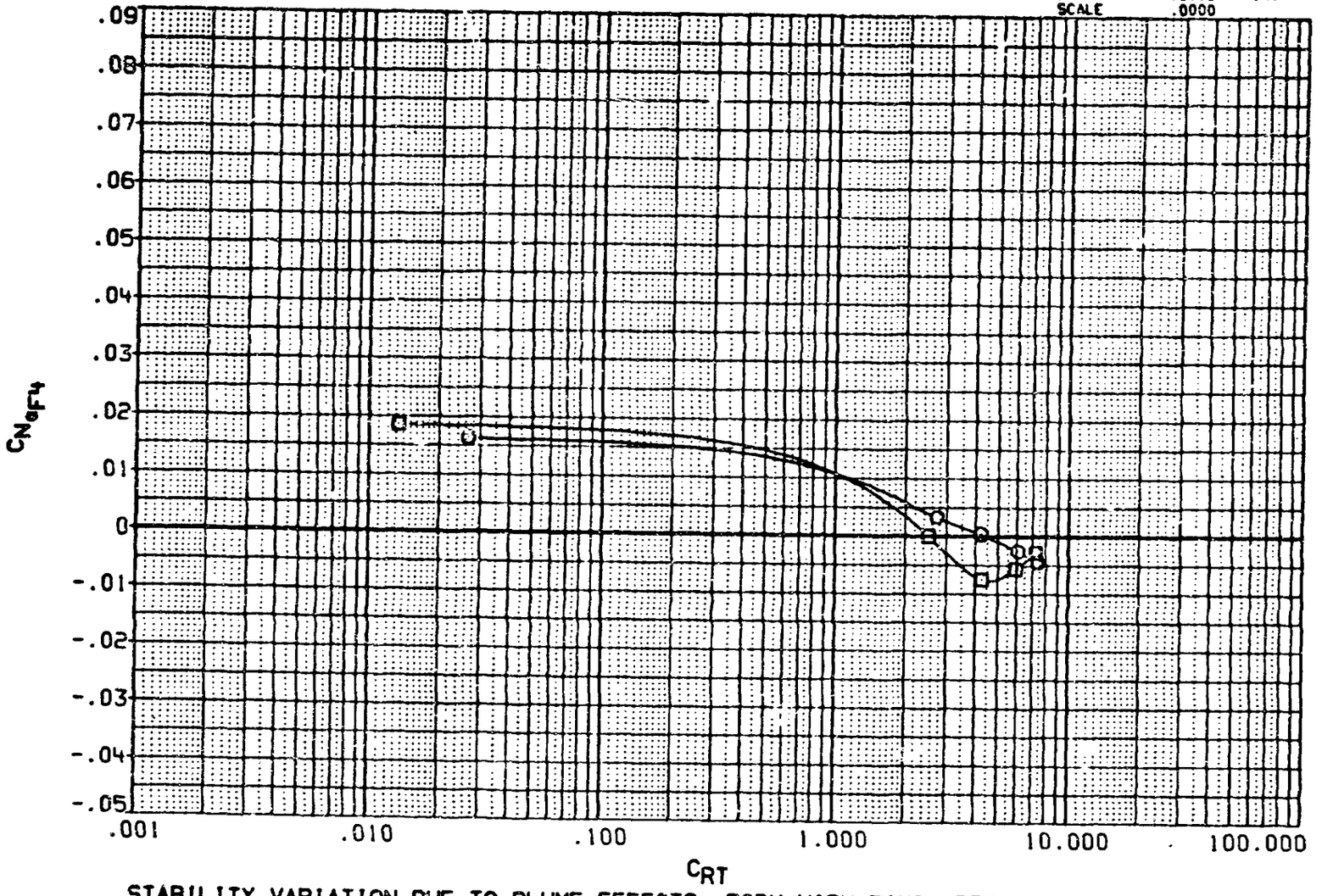


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF3

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX8081)	○	CAL T17-123 (BF3) BODY, FIN IN AFT POSITION	1.000	1.000
(AX8082)	□	CAL T17-123 (BF3) BODY, FIN IN AFT POSITION	1.200	1.000

REFERENCE INFORMATION

SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	28.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



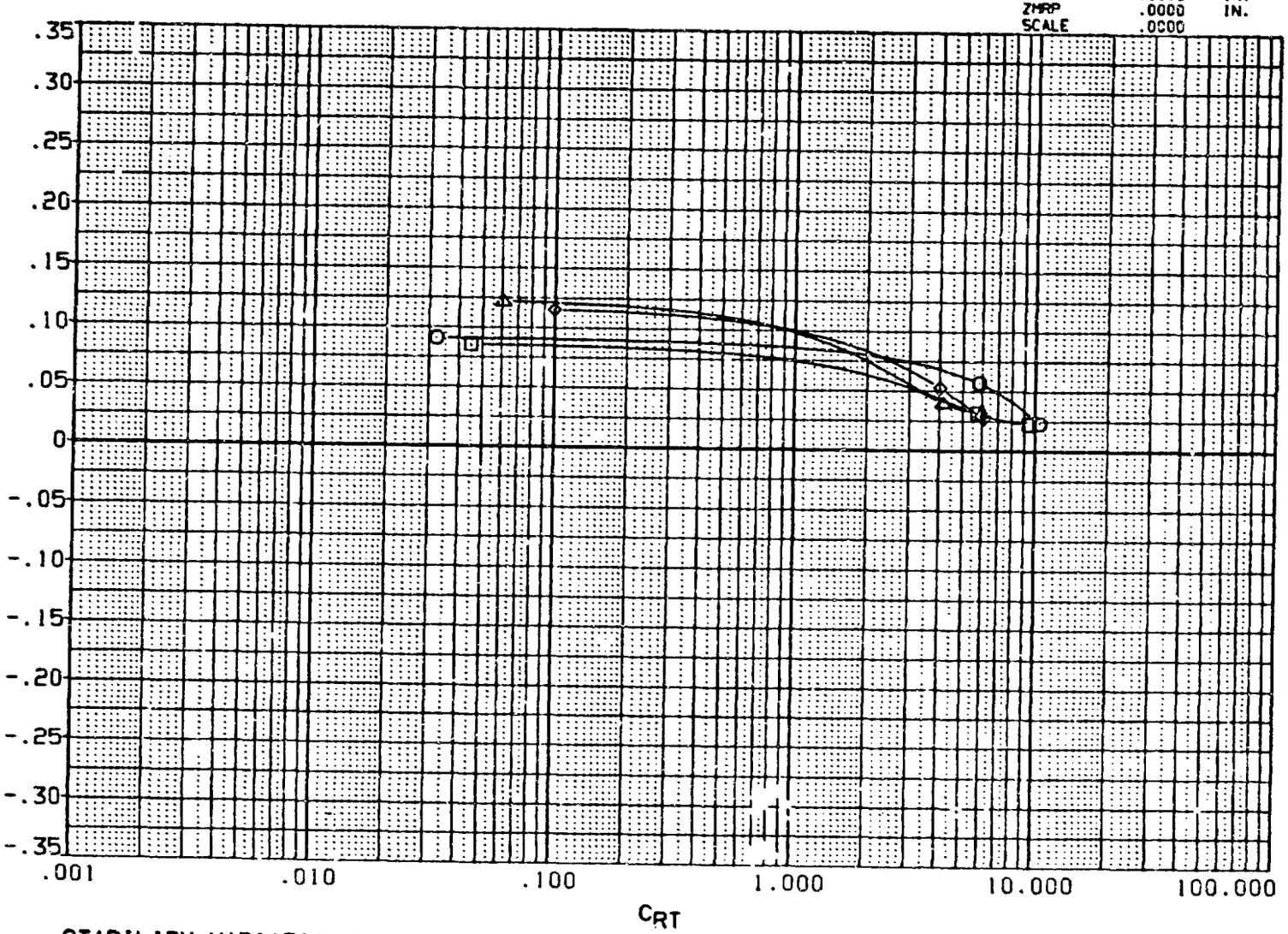
147

STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF3

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX8025)	○	CAL T17-123 (BF4) BODY, FIN IN FORWARD POSITION	.700	3.000
(AX8026)	□	CAL T17-123 (BF4) BODY, FIN IN FORWARD POSITION	.900	3.000
(AX8027)	◇	CAL T17-123 (BF4) BODY, FIN IN FORWARD POSITION	1.000	3.000
(AX8028)	△	CAL T17-123 (BF4) BODY, FIN IN FORWARD POSITION	1.200	3.000

REFERENCE INFORMATION

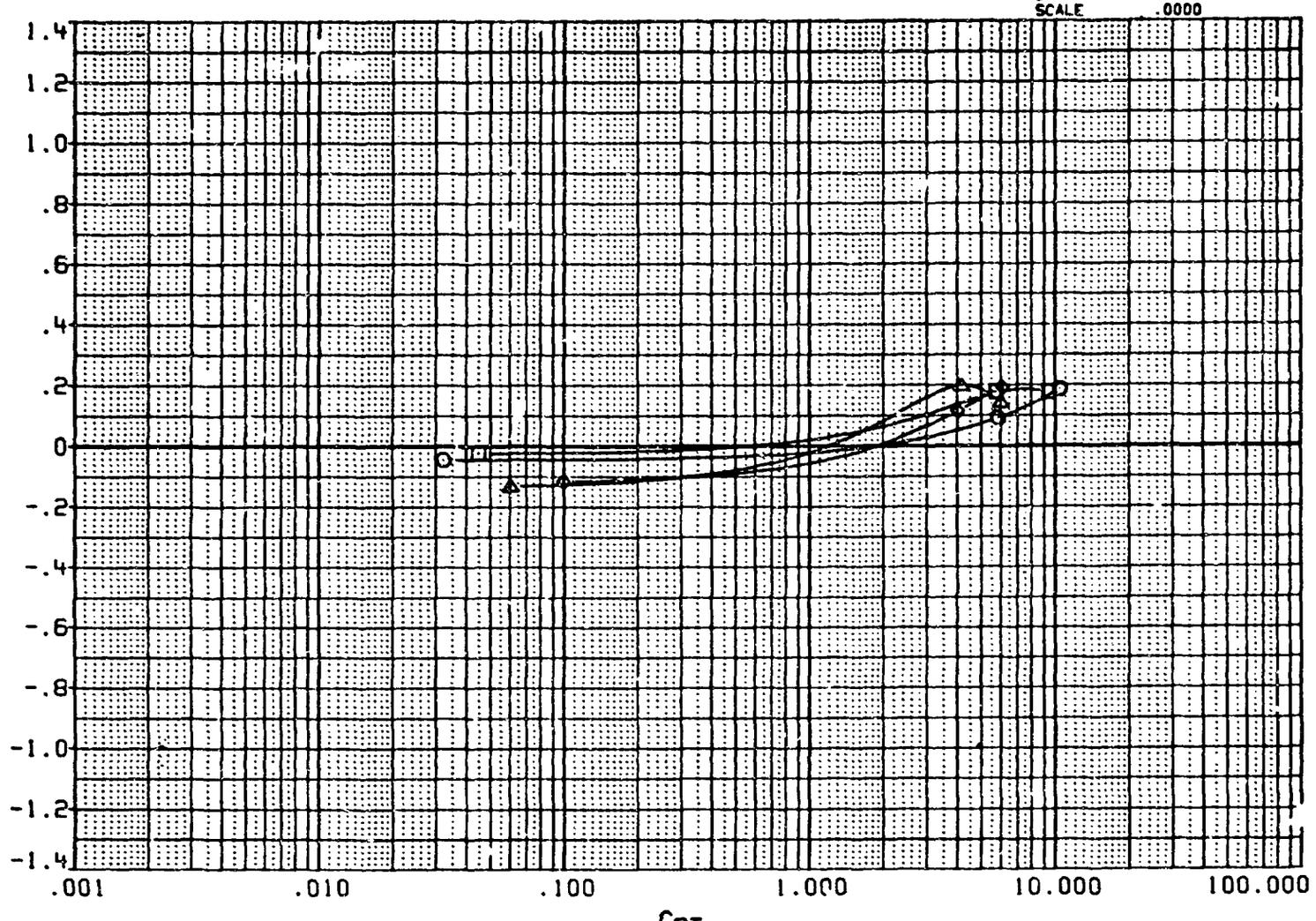
SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF4

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX8025)	○	CAL T17-123 (BF4) BODY, FIN IN FORWARD POSITION	.700	3.000
(AX8026)	□	CAL T17-123 (BF4) BODY, FIN IN FORWARD POSITION	.900	3.000
(AX8027)	◇	CAL T17-123 (BF4) BODY, FIN IN FORWARD POSITION	1.000	3.000
(AX8028)	△	CAL T17-123 (BF4) BODY, FIN IN FORWARD POSITION	1.200	3.000

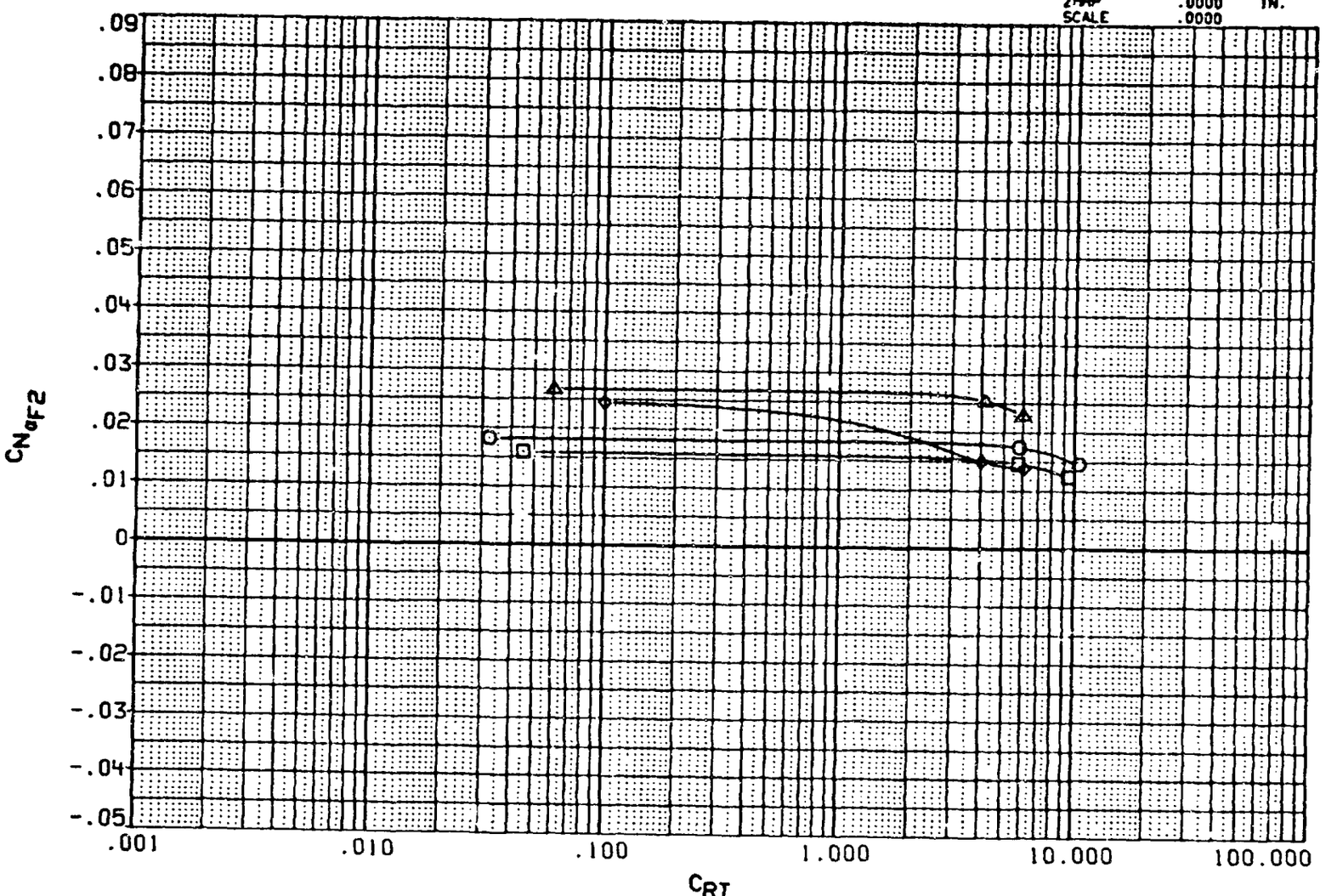
REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF4

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX80251	○	CAL T17-123 (BF4) BODY, FIN IN FORWARD POSITION	.700	3.000
(AX80261	□	CAL T17-123 (BF4) BODY, FIN IN FORWARD POSITION	.900	3.000
(AX80271	◇	CAL T17-123 (BF4) BODY, FIN IN FORWARD POSITION	1.000	3.000
(AX80281	△	CAL T17-123 (BF4) BODY, FIN IN FORWARD POSITION	1.200	3.000

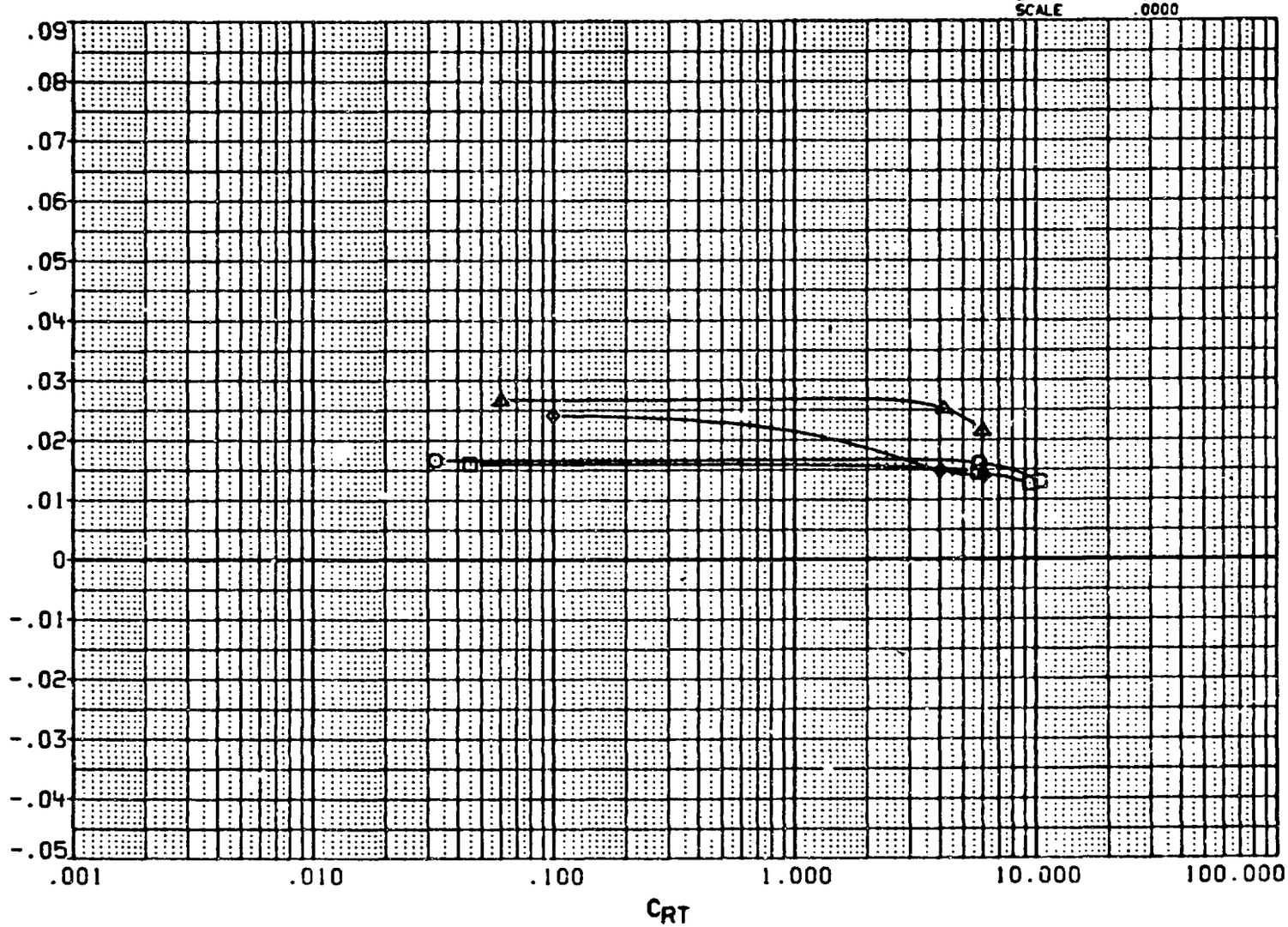
REFERENCE INFORMATION		
SREF	19.8350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF4

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX80025)	○	CAL T17-123 (BF4) BODY, FIN IN FORWARD POSITION	.700	3.000
(AX80026)	□	CAL T17-123 (BF4) BODY, FIN IN FORWARD POSITION	.900	3.000
(AX80027)	◇	CAL T17-123 (BF4) BODY, FIN IN FORWARD POSITION	1.000	3.000
(AX80028)	△	CAL T17-123 (BF4) BODY, FIN IN FORWARD POSITION	1.200	3.000

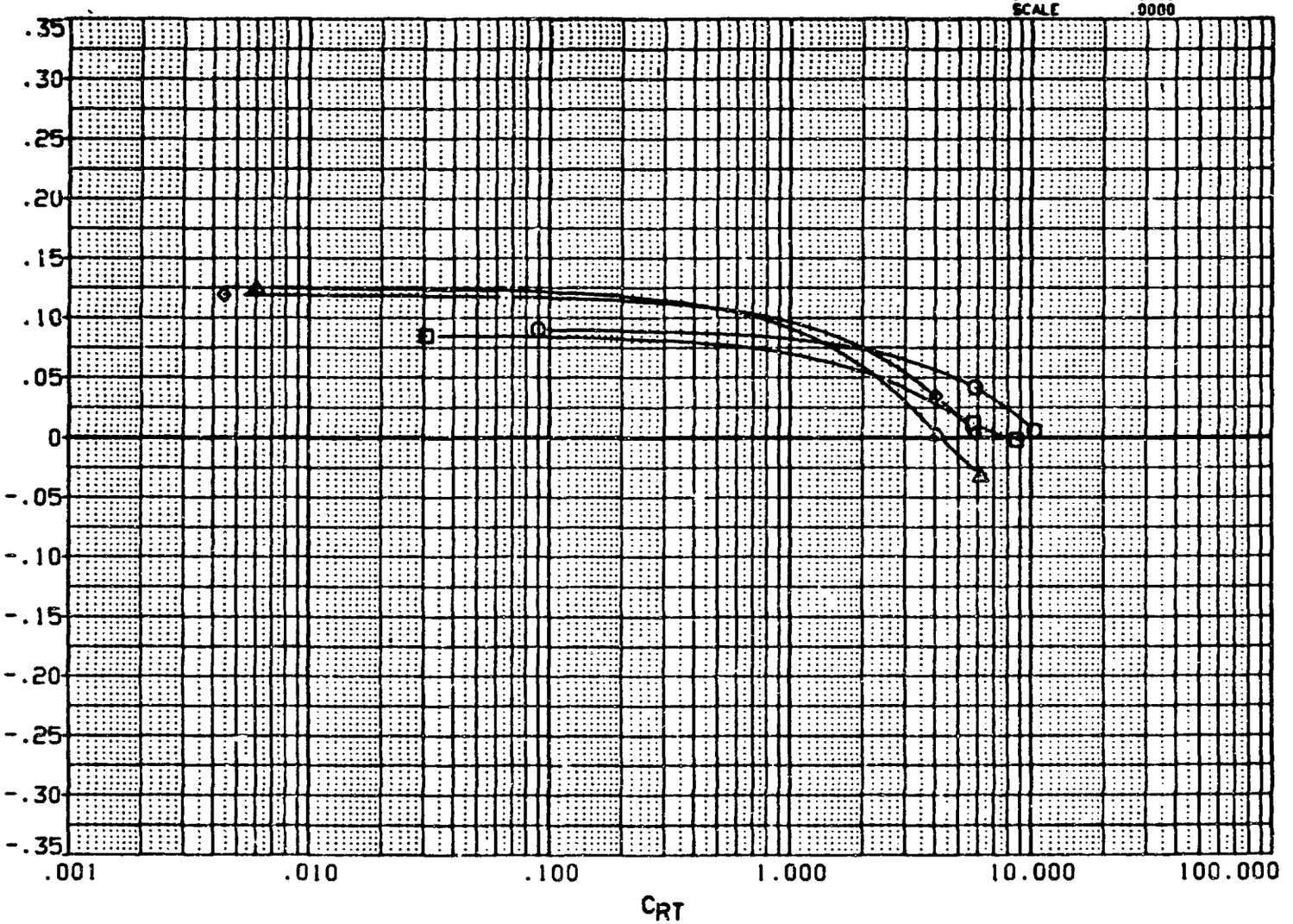
REFERENCE INFORMATION		
SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH F...S, BF4

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX8048)	○	CAL T17-123 (BF4) BODY, FIN IN MID POSITION	.700	2.000
(AX8050)	□	CAL T17-123 (BF4) BODY, FIN IN MID POSITION	.900	2.000
(AX8051)	◇	CAL T17-123 (BF4) BODY, FIN IN MID POSITION	1.000	2.000
(AX8052)	△	CAL T17-123 (BF4) BODY, FIN IN MID POSITION	1.200	2.000

REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

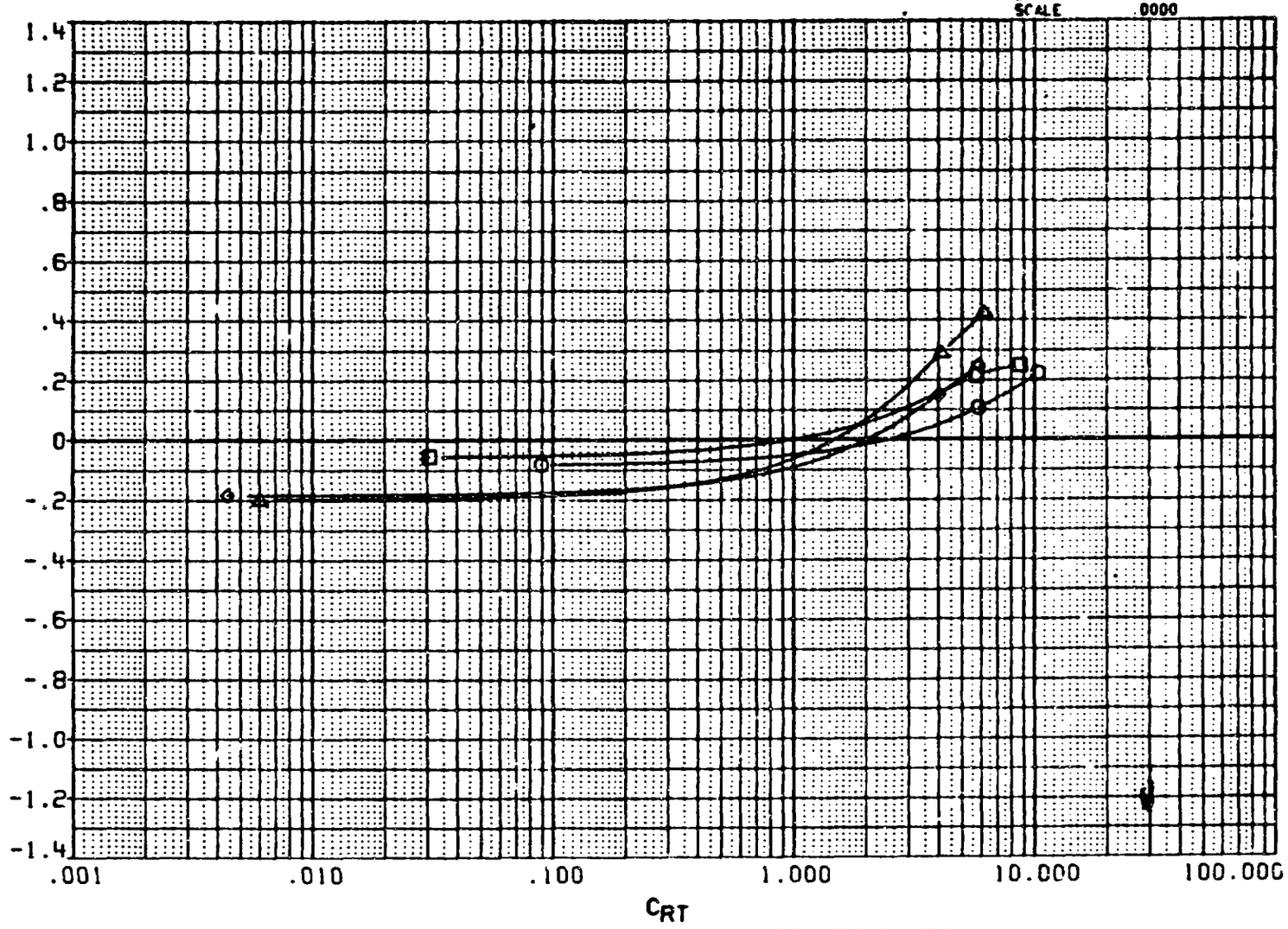


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF4

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX8048)	○	CAL T17-123 (BF4) BODY, FIN IN MID POSITION	.700	2.000
(AX8050)	□	CAL T17-123 (BF4) BODY, FIN IN MID POSITION	.900	2.000
(AX8051)	◇	CAL T17-123 (BF4) BODY, FIN IN MID POSITION	1.000	2.000
(AX8052)	△	CAL T17-123 (BF4) BODY, FIN IN MID POSITION	1.200	2.000

REFERENCE INFORMATION

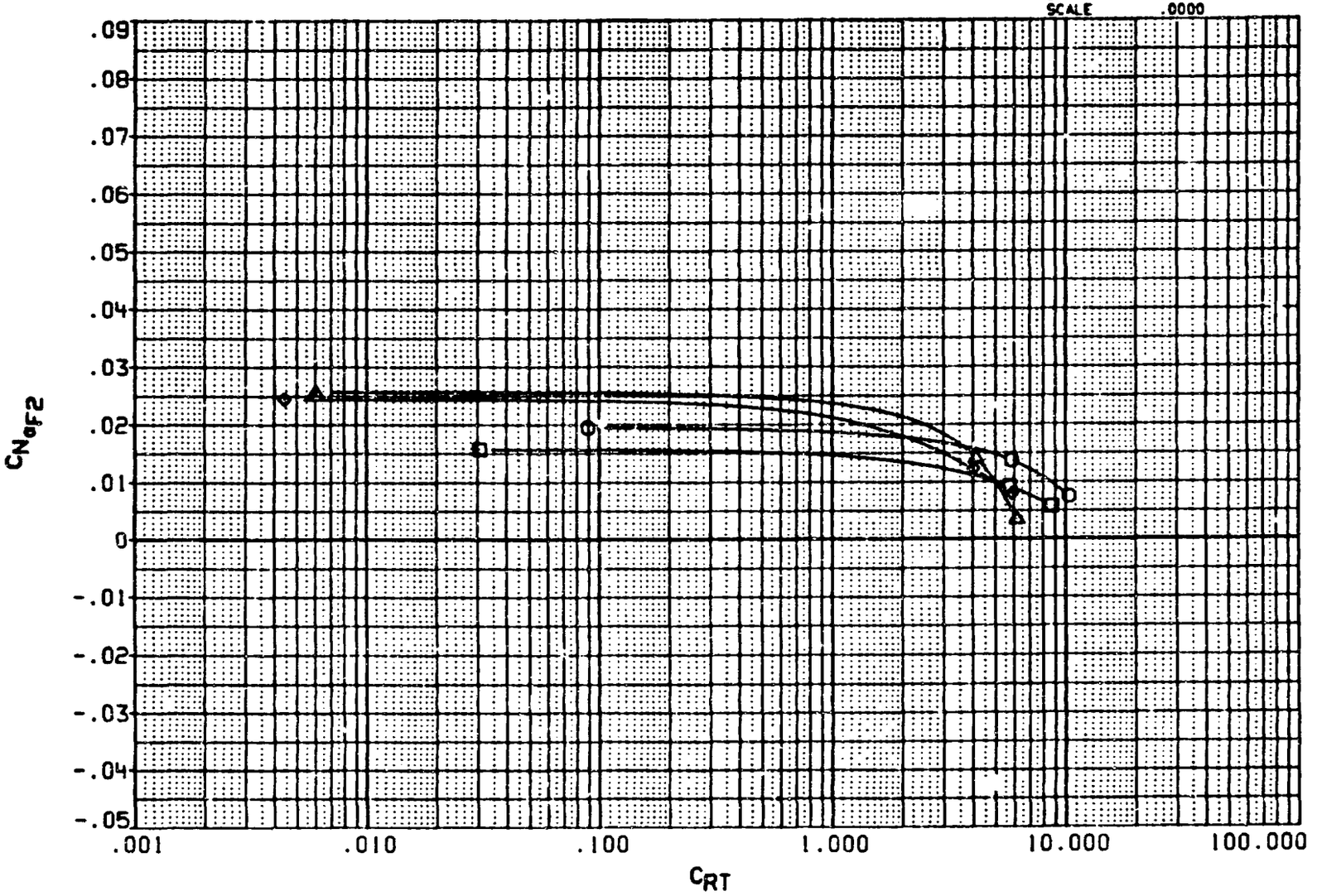
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF4

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX8049)	○	CAL T17-123 (BF4) BODY, FIN IN MID POSITION	.700	2.000
(AX8050)	□	CAL T17-123 (BF4) BODY, FIN IN MID POSITION	.900	2.000
(AX8051)	◇	CAL T17-123 (BF4) BODY, FIN IN MID POSITION	1.600	2.000
(AX8052)	△	CAL T17-123 (BF4) BODY, FIN IN MID POSITION	1.200	2.000

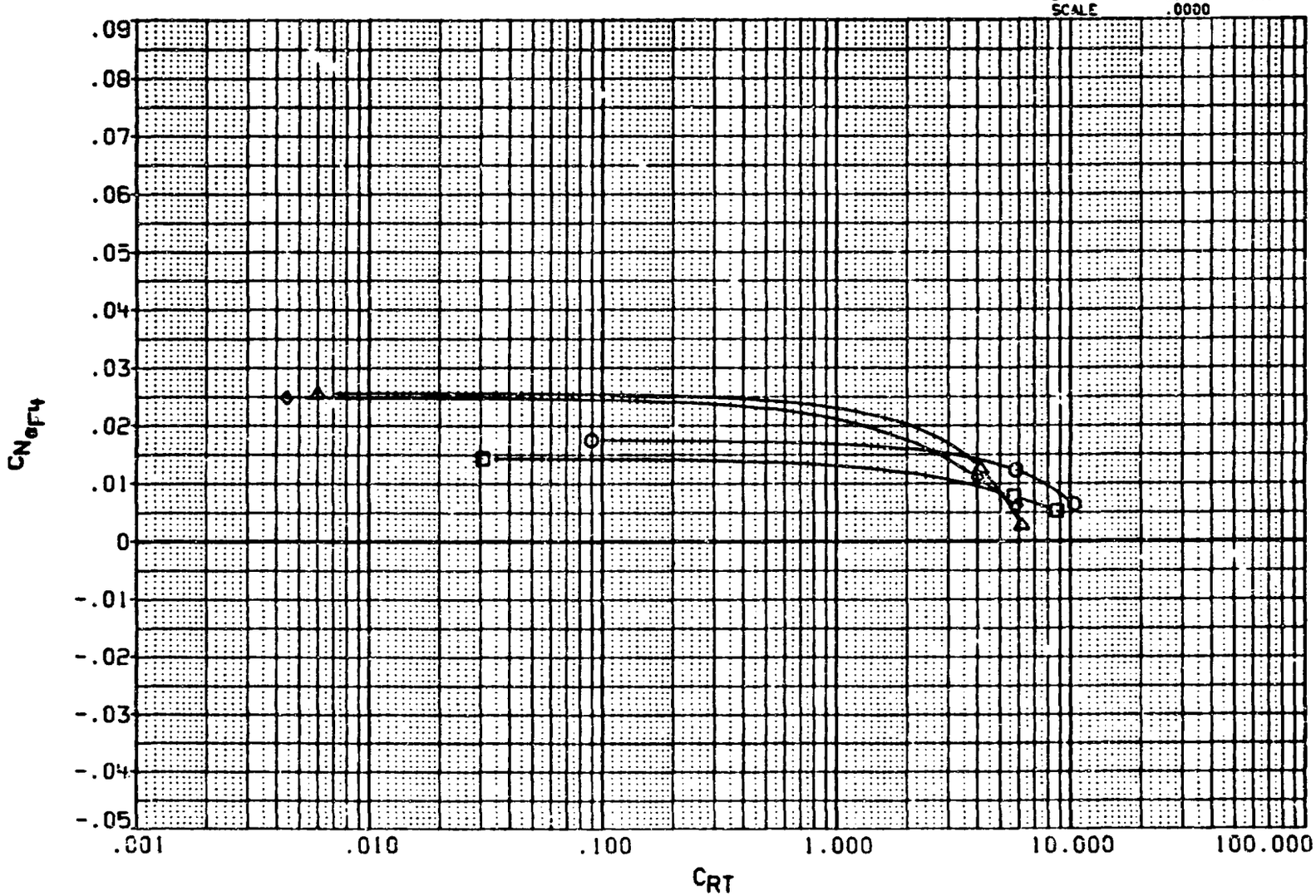
REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	28.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF4

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX80049)	○	CAL T17-123 (BF4) BODY, FIN IN MID POSITION	.700	2.000
(AX80050)	□	CAL T17-123 (BF4) BODY, FIN IN MID POSITION	.900	2.000
(AX80051)	◇	CAL T17-123 (BF4) BODY, FIN IN MID POSITION	1.000	2.000
(AX80052)	△	CAL T17-123 (BF4) BODY, FIN IN MID POSITION	1.200	2.000

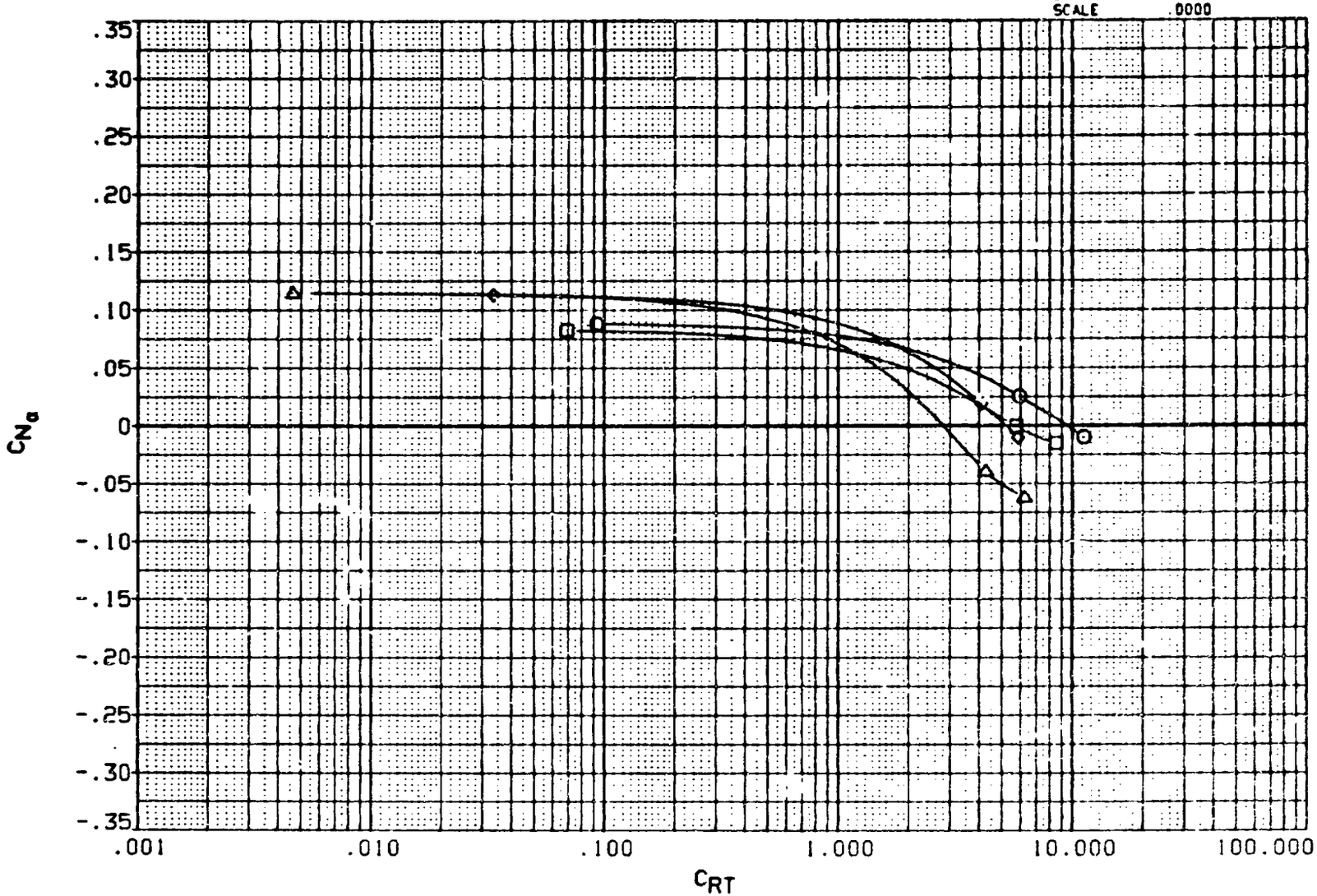
REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF4

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX80063)	○	CAL T17-123 (BF4) BODY, FIN IN AFT POSITION	.700	1.000
(AX80064)	□	CAL T17-123 (BF4) BODY, FIN IN AFT POSITION	.900	1.000
(AX80065)	◇	CAL T17-123 (BF4) BODY, FIN IN AFT POSITION	1.000	1.000
(AX80066)	△	CAL T17-123 (BF4) BODY, FIN IN AFT POSITION	1.200	1.000

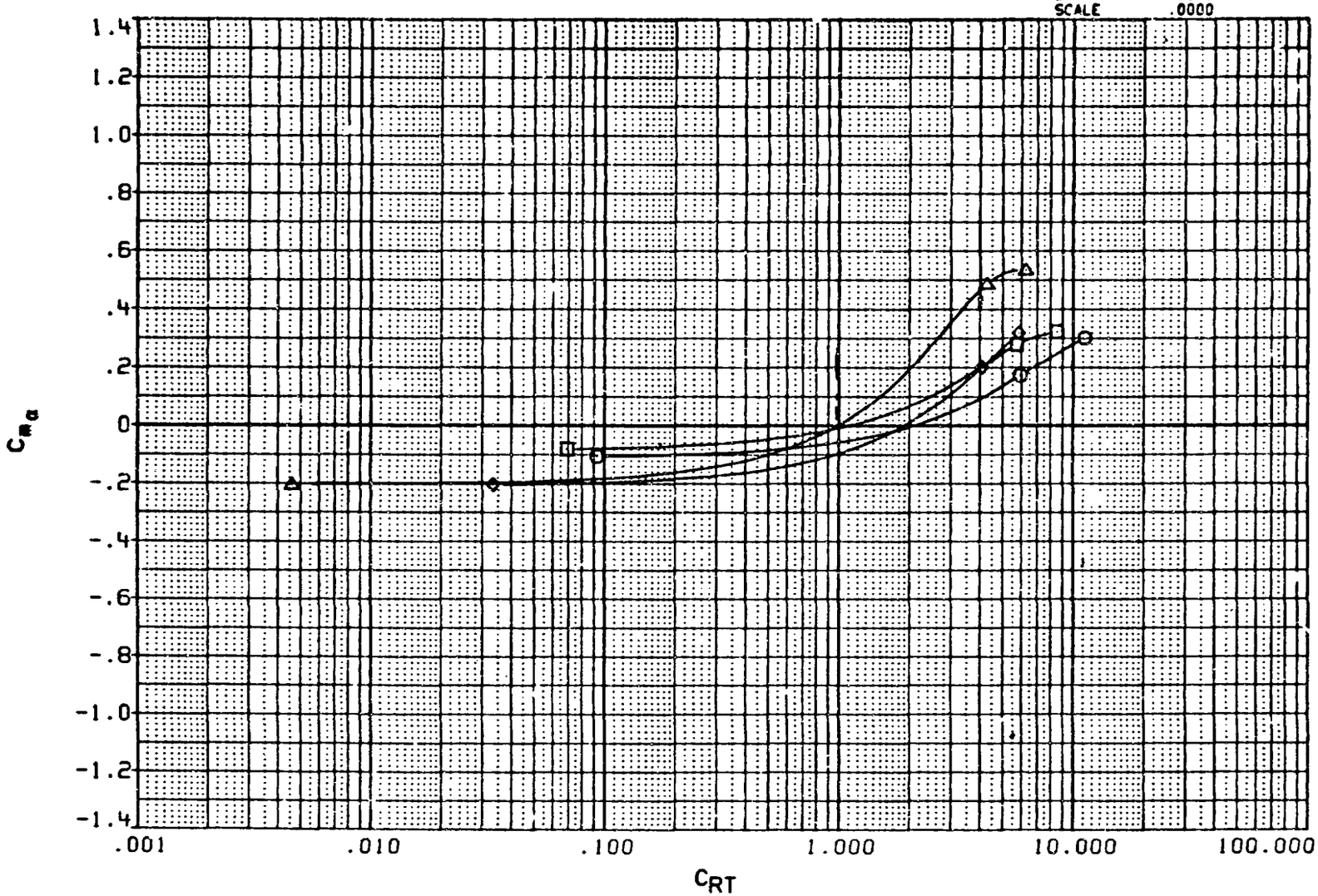
REFERENCE INFORMATION		
SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF4

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX80063)	○	CAL T17-123 (BF4) BODY, FIN IN AFT POSITION	.700	1.000
(AX80064)	□	CAL T17-123 (BF4) BODY, FIN IN AFT POSITION	.900	1.000
(AX80065)	◇	CAL T17-123 (BF4) BODY, FIN IN AFT POSITION	1.000	1.000
(AX80066)	△	CAL T17-123 (BF4) BODY, FIN IN AFT POSITION	1.200	1.000

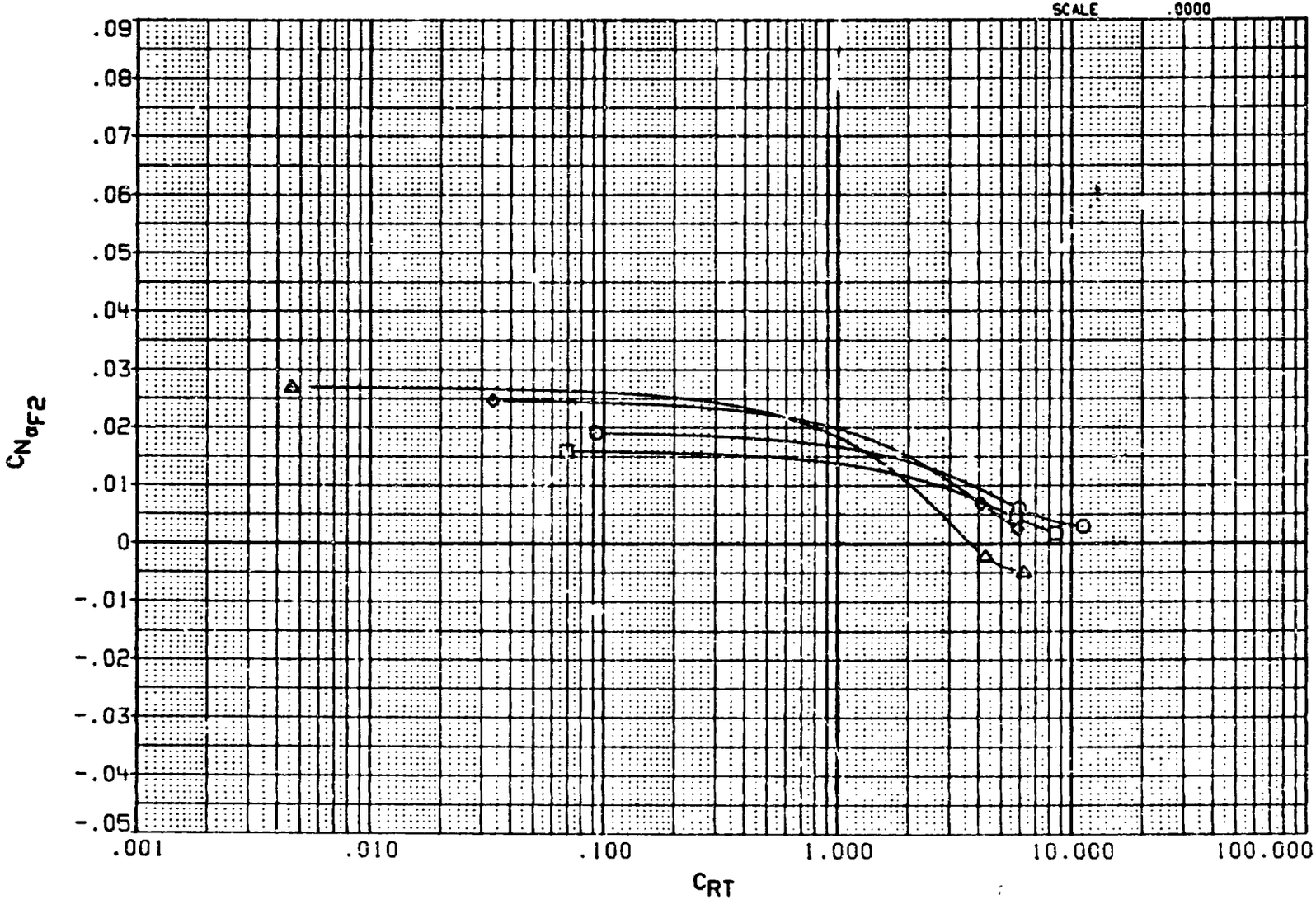
REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF4

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX8063)	○	CAL T17-123 (BF4) BODY, FIN IN AFT POSITION	.700	1.000
(AX8064)	□	CAL T17-123 (BF4) BODY, FIN IN AFT POSITION	.900	1.000
(AX8065)	◇	CAL T17-123 (BF4) BODY, FIN IN AFT POSITION	1.000	1.000
(AX8066)	△	CAL T17-123 (BF4) BODY, FIN IN AFT POSITION	1.200	1.000

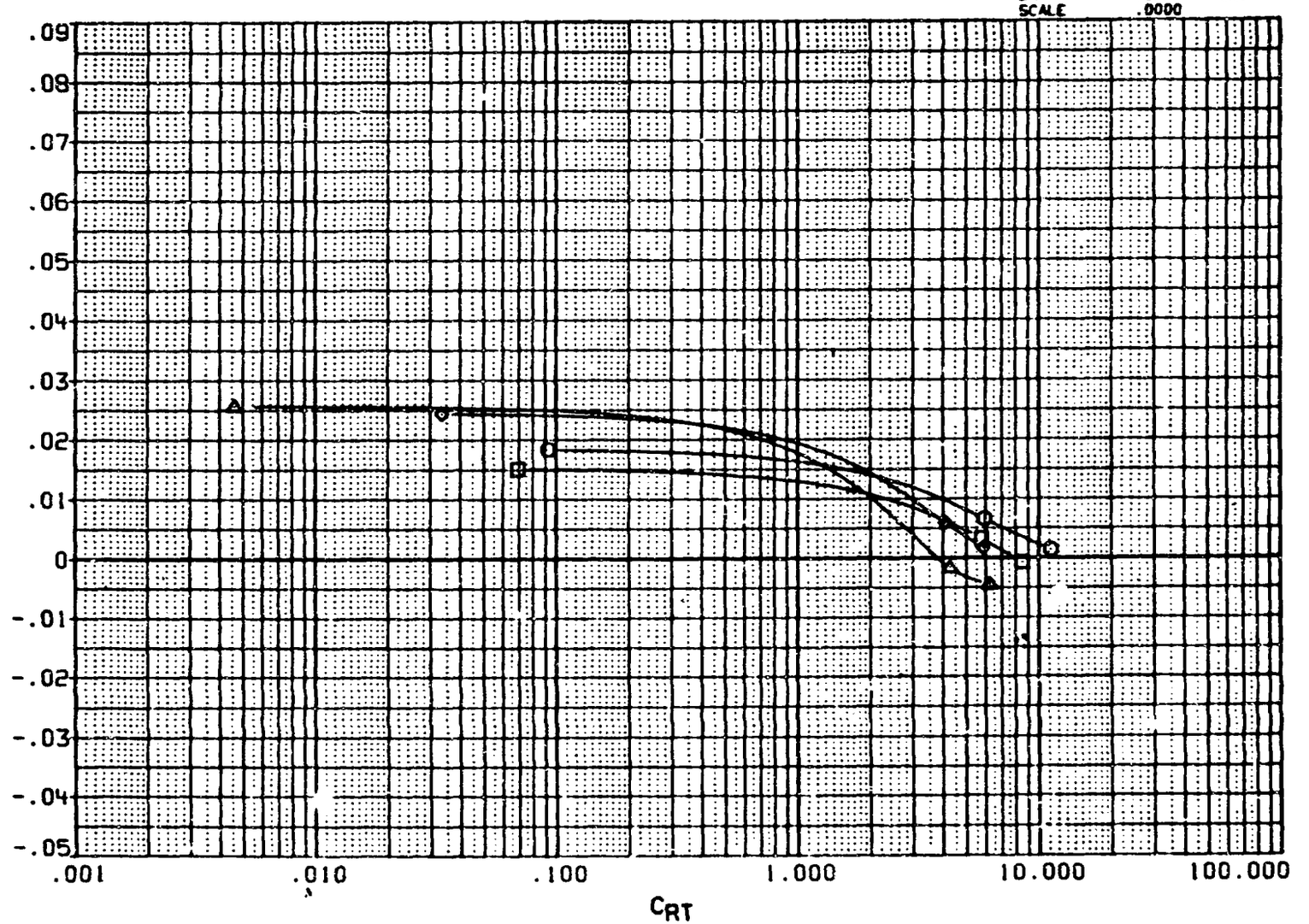
REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF4

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AX8063)	○	CAL T17-123 (BF4) BODY, FIN IN AFT POSITION	.700	1.000
(AX8064)	□	CAL T17-123 (BF4) BODY, FIN IN AFT POSITION	.900	1.000
(AX8065)	◇	CAL T17-123 (BF4) BODY, FIN IN AFT POSITION	1.000	1.000
(AX8066)	△	CAL T17-123 (BF4) BODY, FIN IN AFT POSITION	1.200	1.000

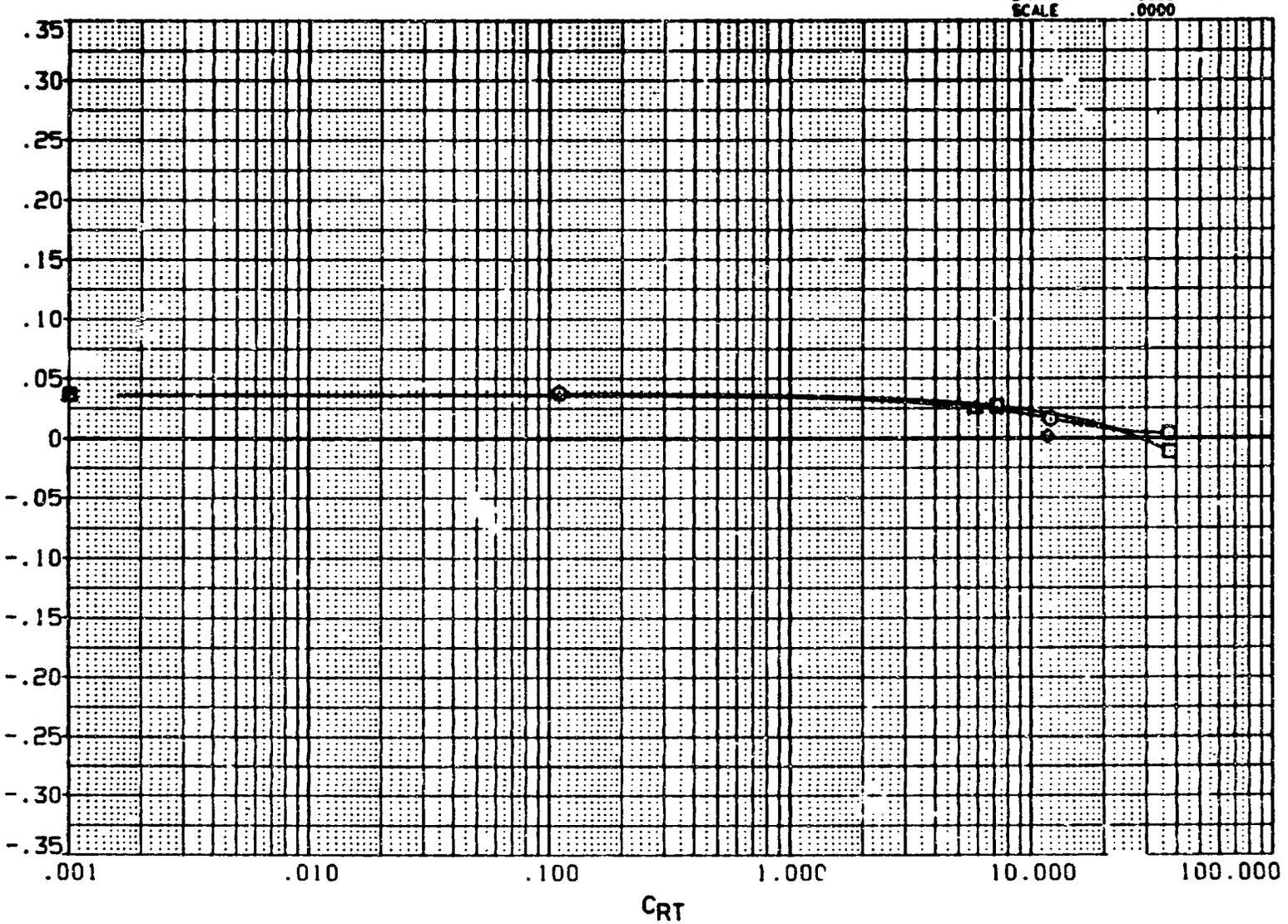
REFERENCE INFORMATION		
SREF	19.8350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF4

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH
(RUE003)	○	AEDC YF380 BODY ALONE,0	.400
(BLE001)	□	CAL T17-083 THRUST EFFECTS, BODY ALONE, 0	.402
(RUB002)	◇	CAL T17-123 (0) BODY ALONE	.400
(SYB003)	△	CAL T17-123 (0) BODY ALONE	.400

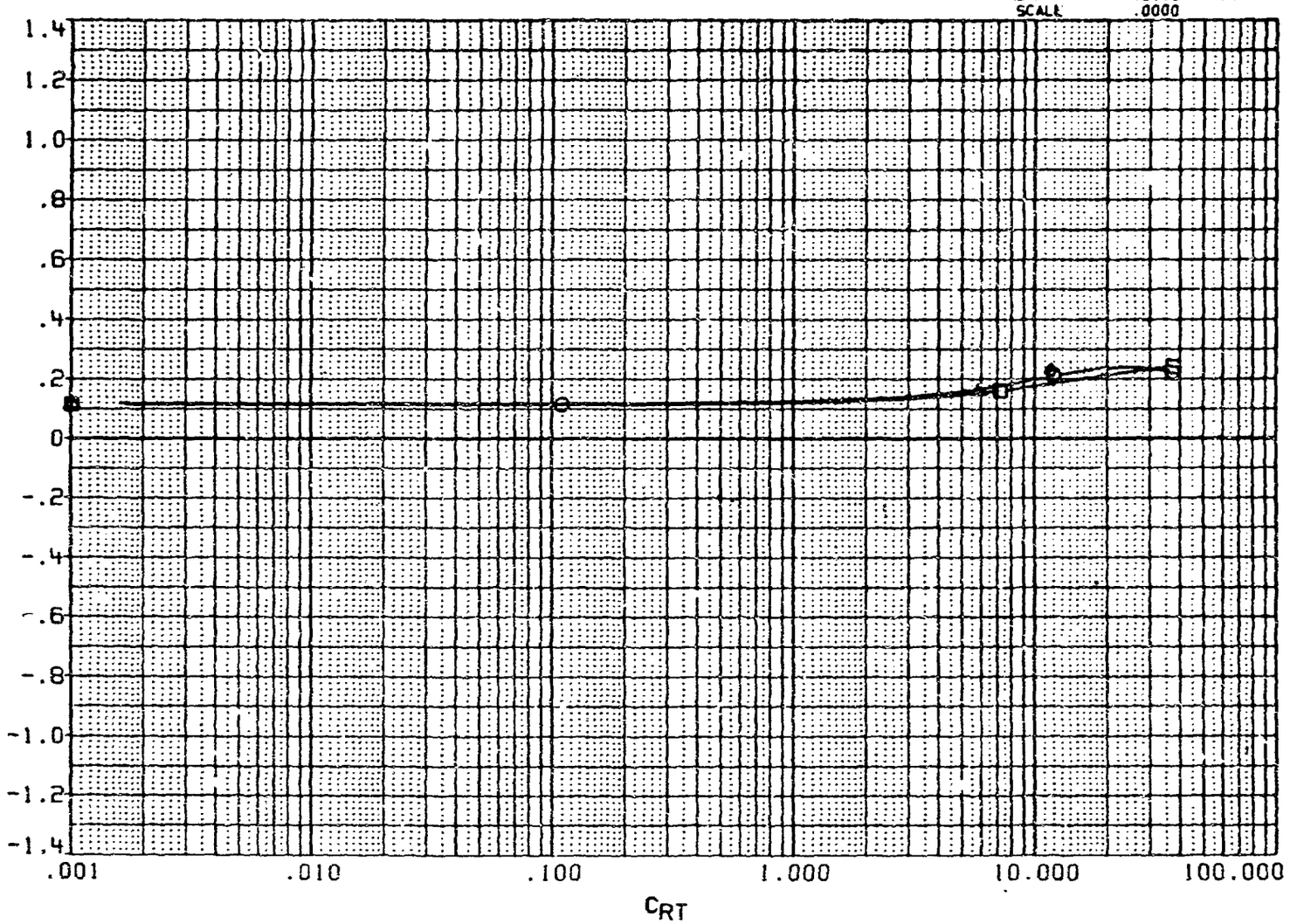
REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY ALONE COMPARISON

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH
(R0E003)	○	AEDC TF360 BODY ALONE,B	.400
(BUE001)	□	CAL T17-093 THRUST EFFECTS, BODY ALONE, B	.402
(R0B002)	◇	CAL T17-123 (B) BODY ALONE	.400
(SX8003)	△	CAL T17-123 (B) BODY ALONE	.400

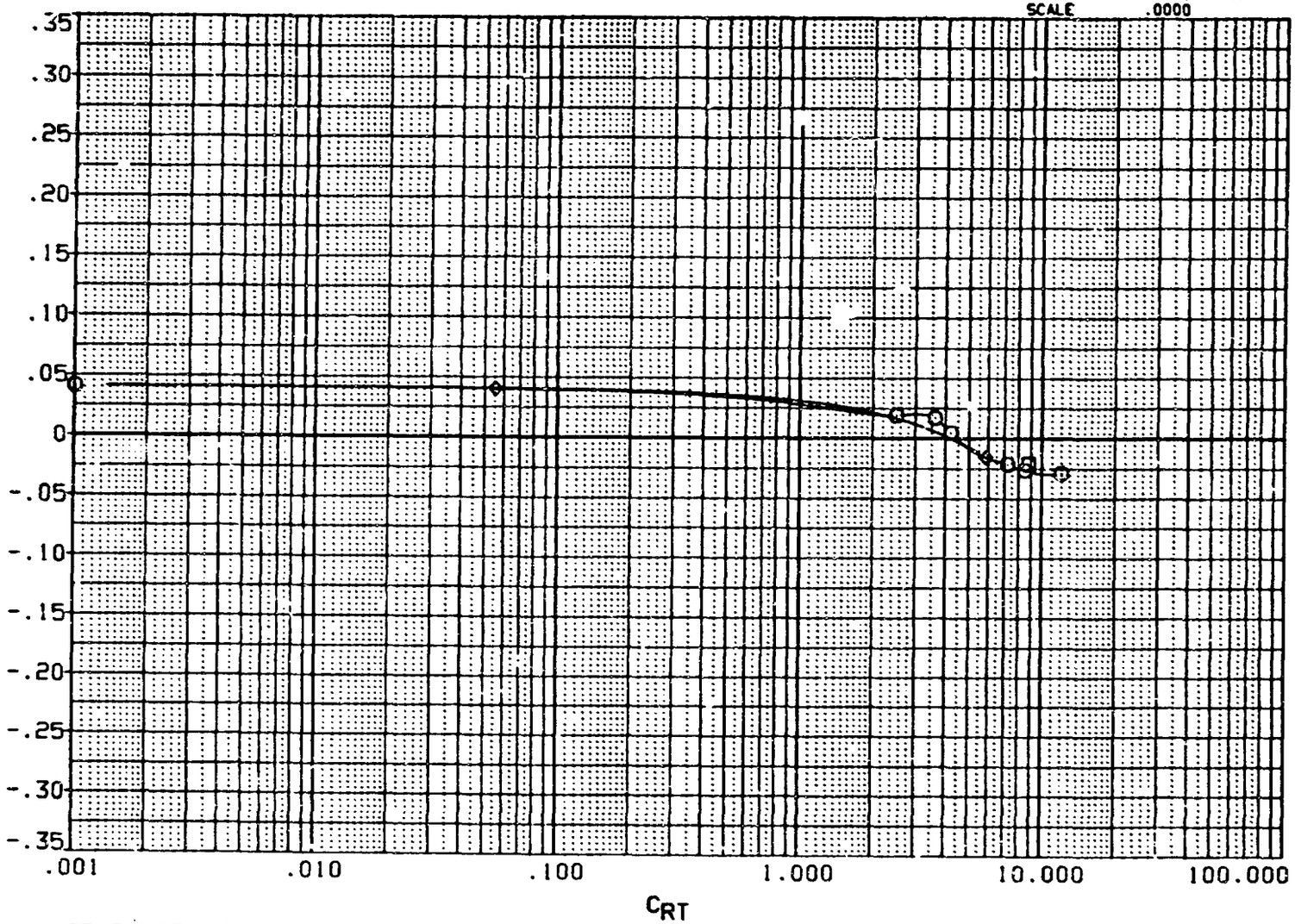
REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY ALONE COMPARISON

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH
(BUE003)	○	CAL T17-093 THRUST EFFECTS, BODY ALONE, B	.897
(RXB006)	□	CAL T17-123 (B) BODY ALONE	.900
(RXB007)	◇	CAL T17-123 (B) BODY ALONE	.900

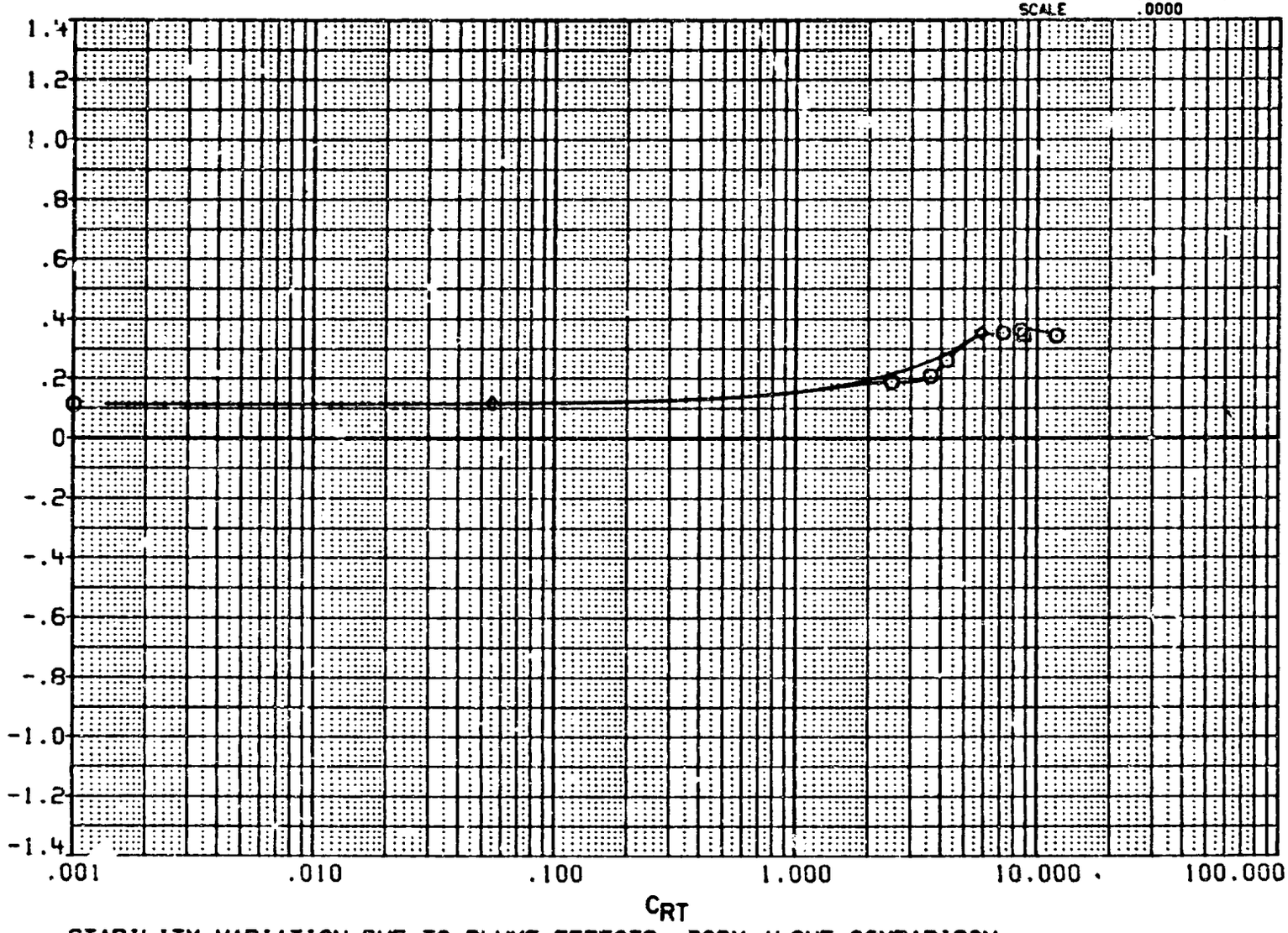
REFERENCE INFORMATION		
SREF	19.6350	SQ. IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY ALONE COMPARISON

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH
(BUE003)	○	CAL T17-093 THRUST EFFECTS, BODY ALONE, B	.897
(RX8006)	□	CAL T17-123 (B) BODY ALONE	.900
(RX8007)	◇	CAL T17-123 (B) BODY ALONE	.900

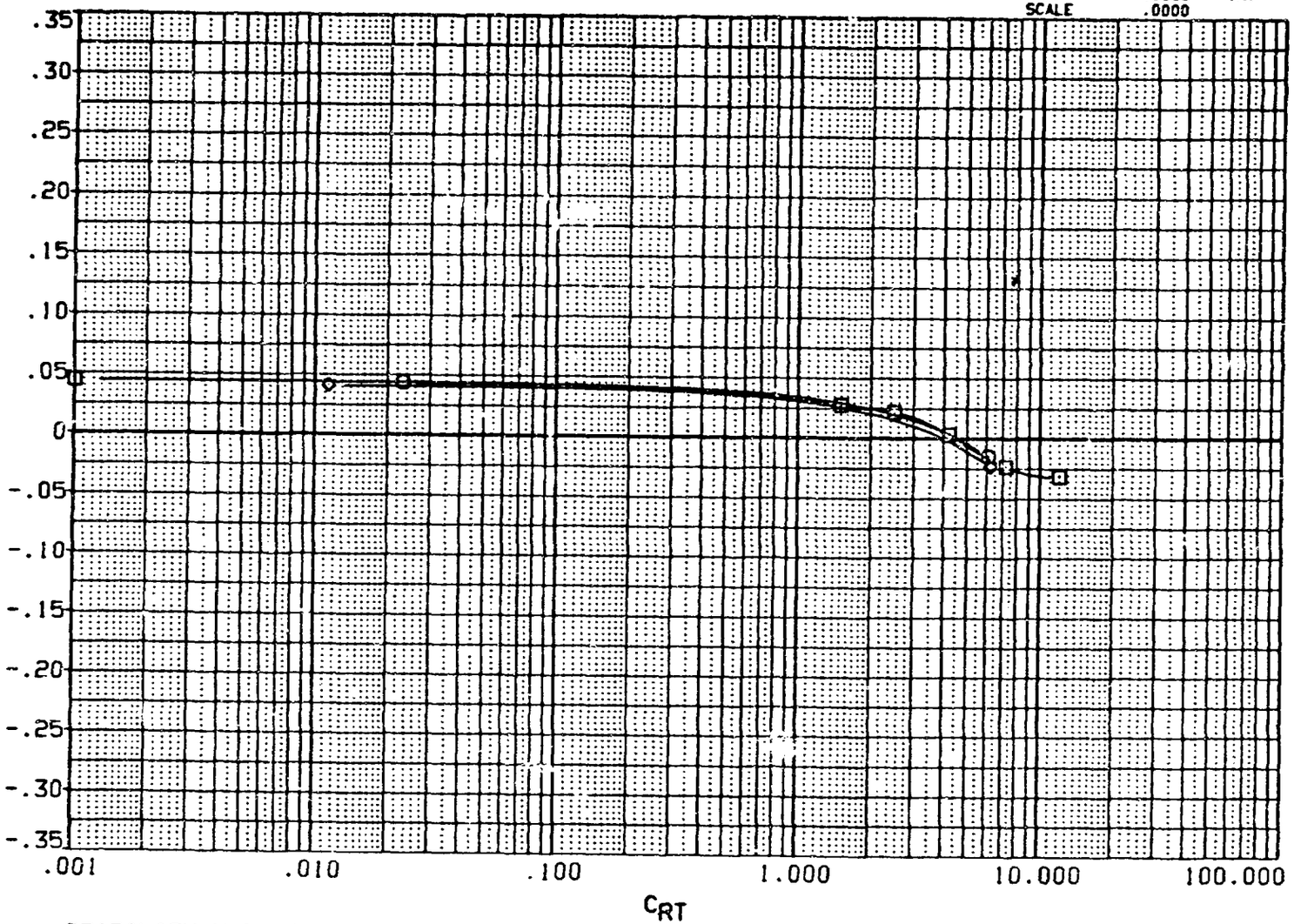
REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY ALONE COMPARISON

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH
(RSE004)	○	AEDC TF360 BODY ALONE,B	1.000
(BLE004)	□	CAL T17-093 THRUST EFFECTS, BODY ALONE, B	.999
(RXB008)	◇	CAL T17-123 (B) BODY ALONE	1.000

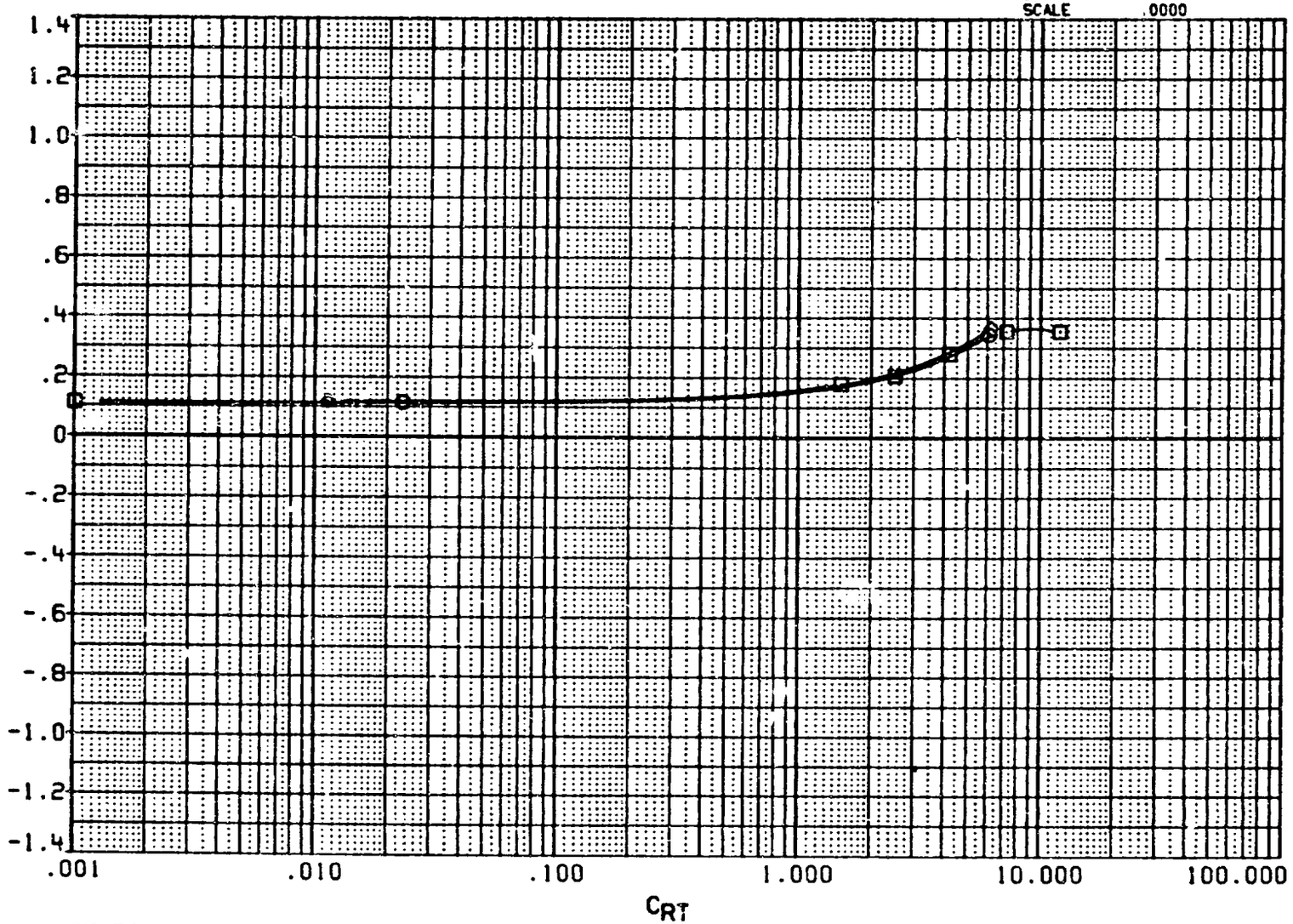
REFERENCE INFORMATION		
SREF	19.0350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY ALONE COMPARISON

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH
(RDE00N)	○	AEDC TF360 BODY ALONE,B	1.000
(BLE00N)	□	CAL T17-093 THRUST EFFECTS, BODY ALONE, B	.999
(RDB008)	◇	CAL T17-123 (B) BODY ALONE	1.000

REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

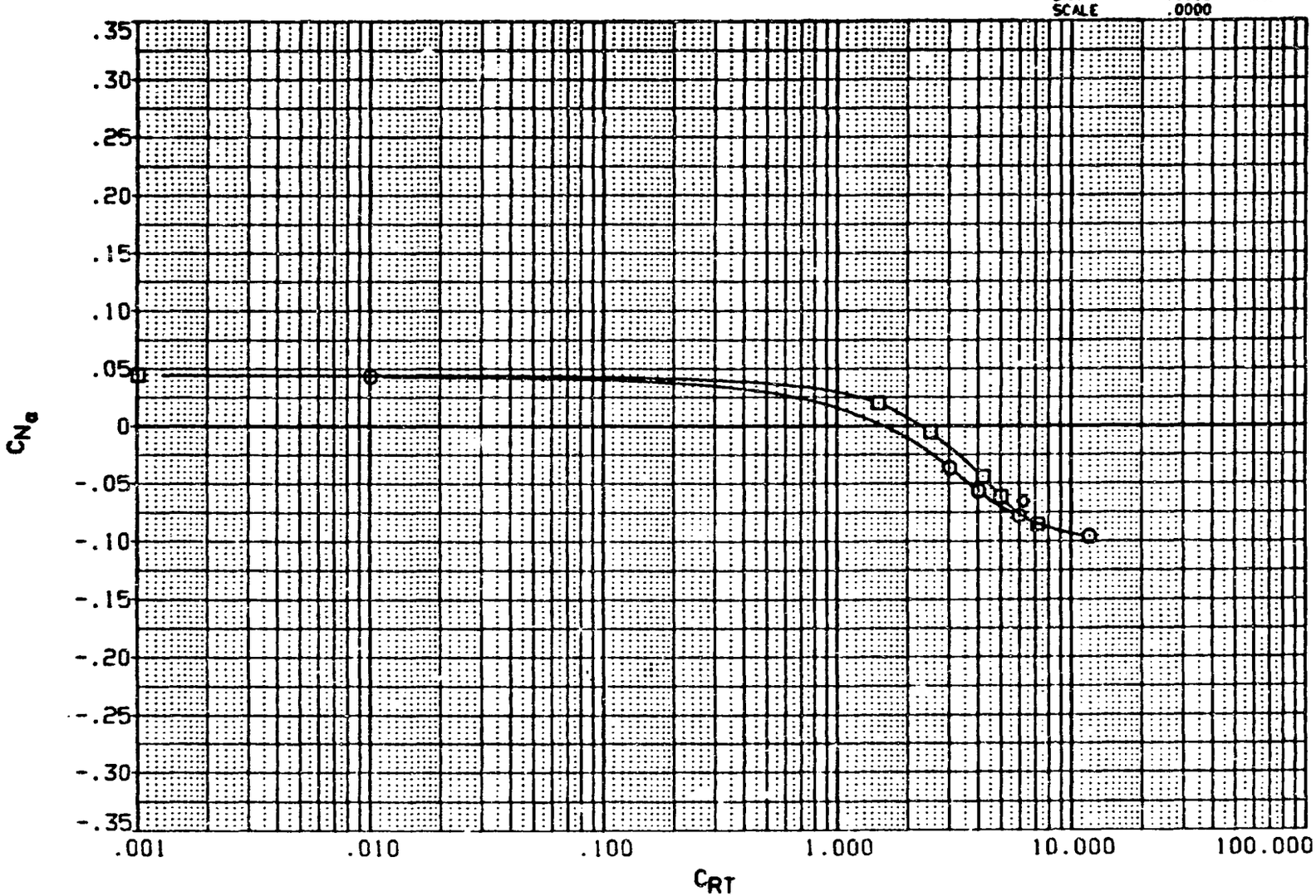


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY ALONE COMPARISON

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH
(RXE005)	○	AEDC TF360 BODY ALONE,B	1.250
(BUE006)	□	CAL T17-093 THRUST EFFECTS, BODY ALONE, B	1.251
(RXB011)	◇	CAL T17-123 (B) BODY ALONE	1.250

REFERENCE INFORMATION

SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

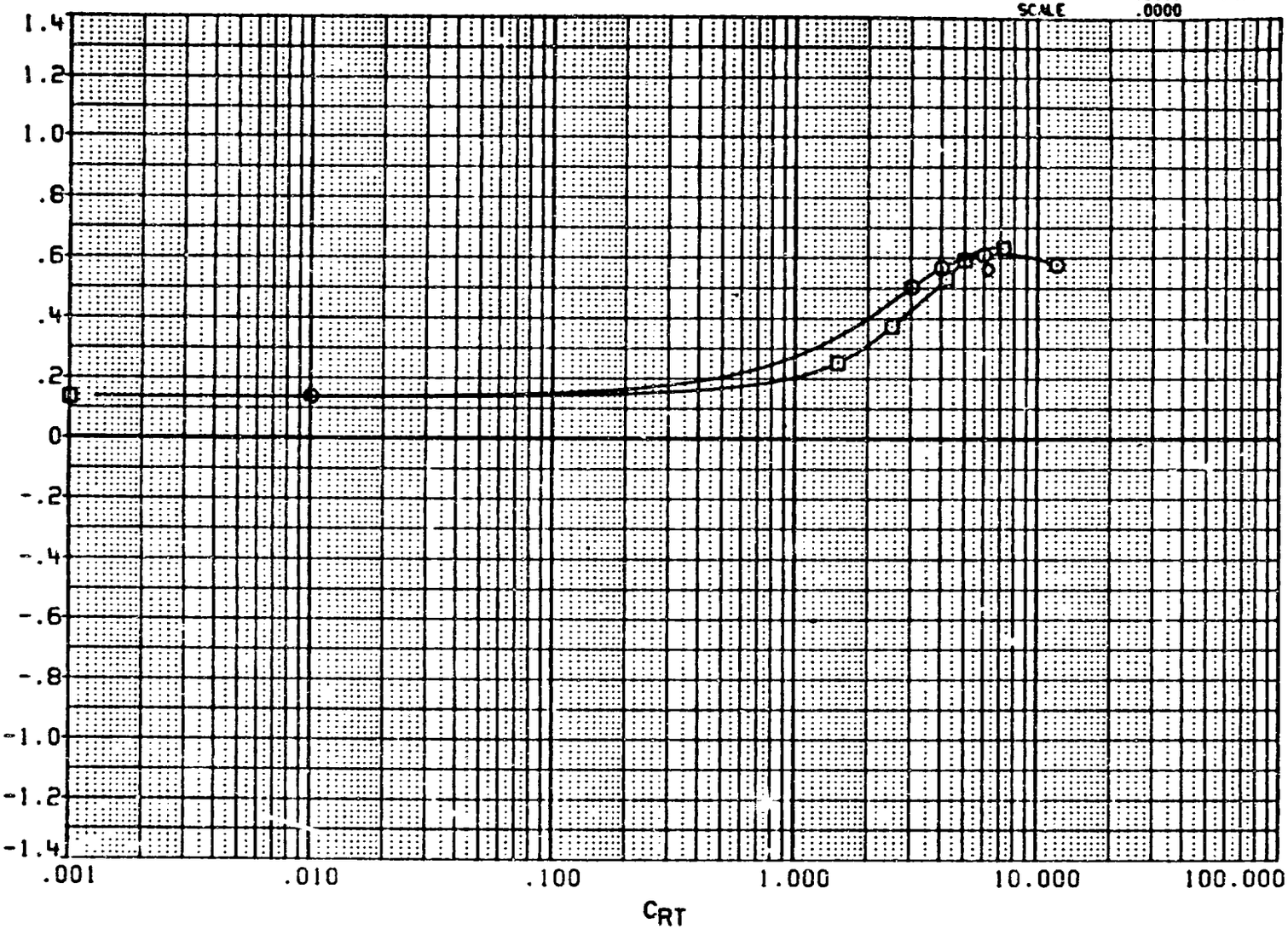


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY ALONE COMPARISON

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH
(R0E005)	○	AEDC TF360 BODY ALONE,B	1.250
(BUE006)	□	CAL T17-083 THRUST EFFECTS, BODY ALONE, B	1.251
(R0B011)	◇	CAL T17-123 (B) BODY ALONE	1.250

REFERENCE INFORMATION

SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

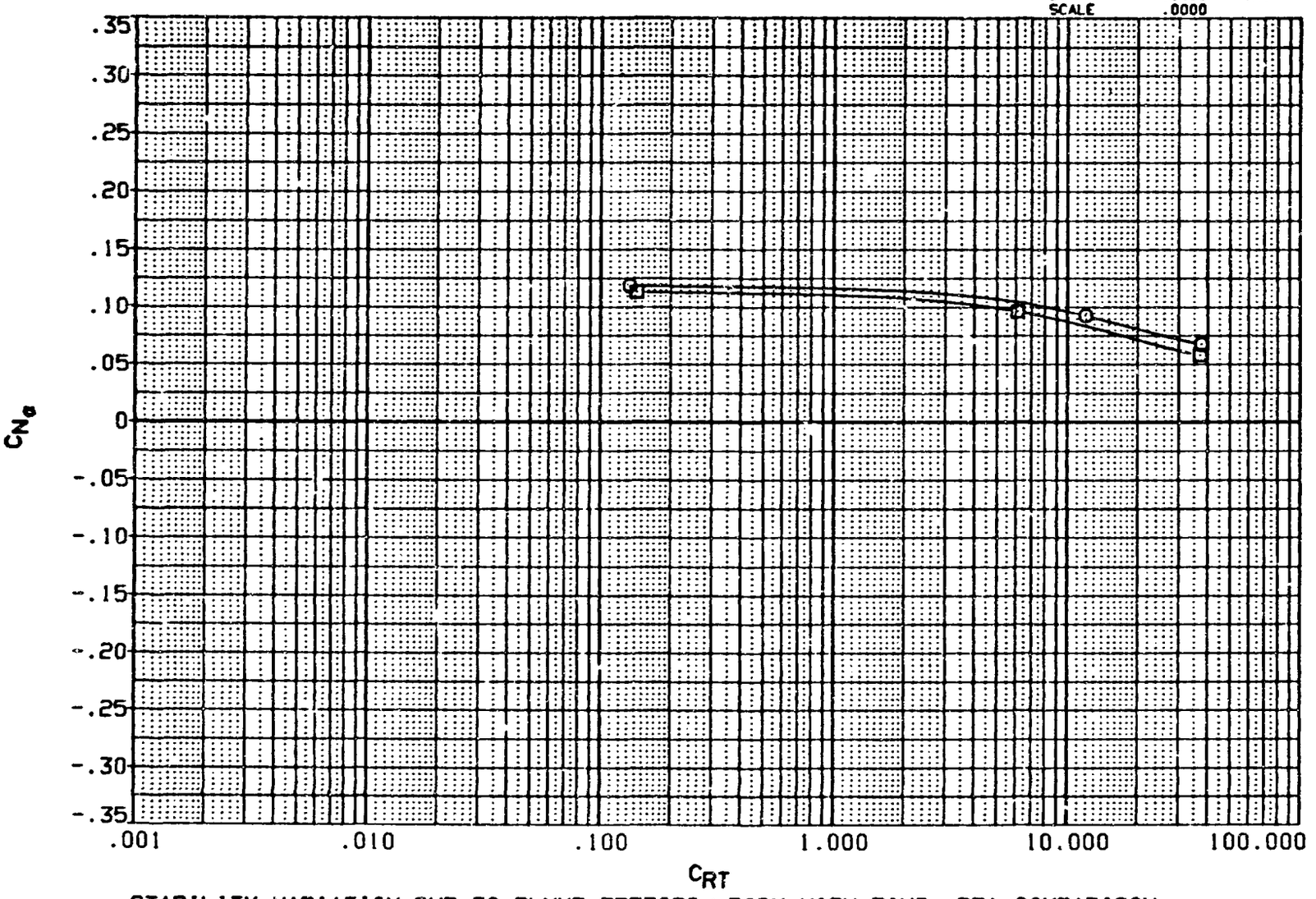


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY ALONE COMPARISON

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AXE011)	○	AEDC TF360 BODY FIN, BF1	.400	3.000
(AX8032)	□	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	.400	3.000

REFERENCE INFORMATION

SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

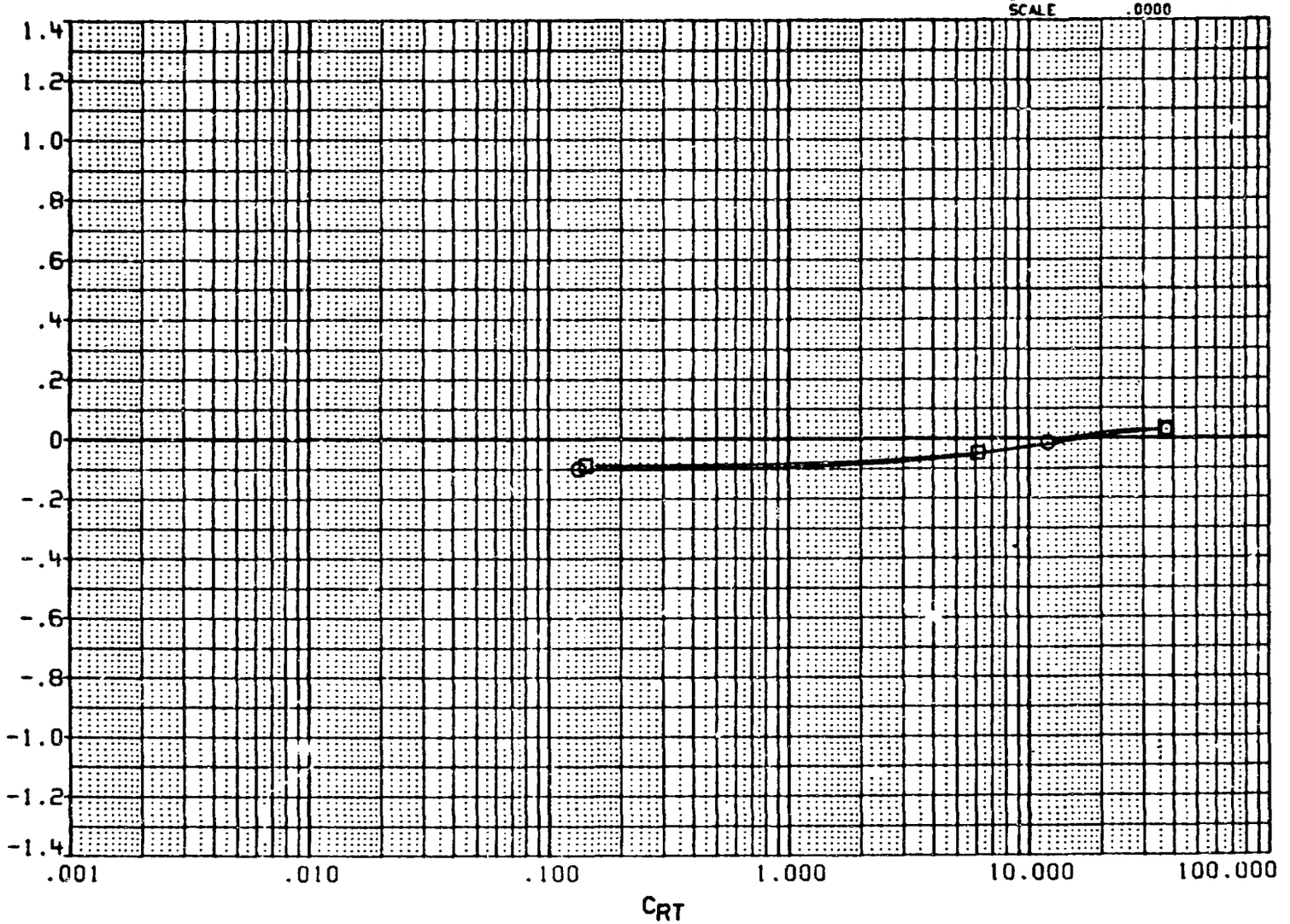


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1 COMPARISON

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	KACH	FINPOS
(AXE011)	○	AEDC TF360 BODY FIN, BF1	.400	3.000
(AX80032)	□	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	.400	3.000

REFERENCE INFORMATION

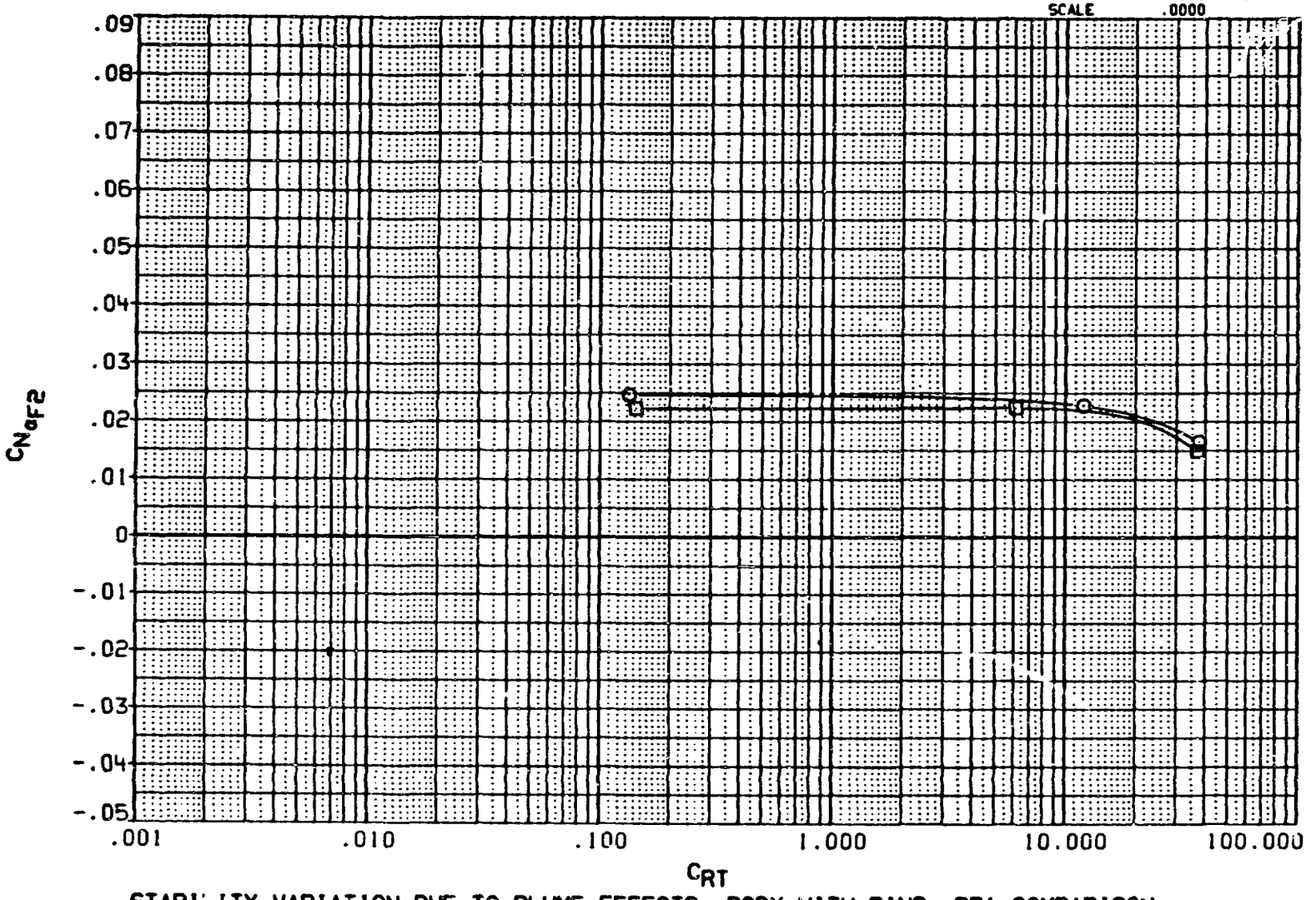
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1 COMPARISON

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AXE011)	○	AEDC TF380 BODY FIN, BF1	.400	3.000
(AX80032)	□	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	.400	3.000

REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

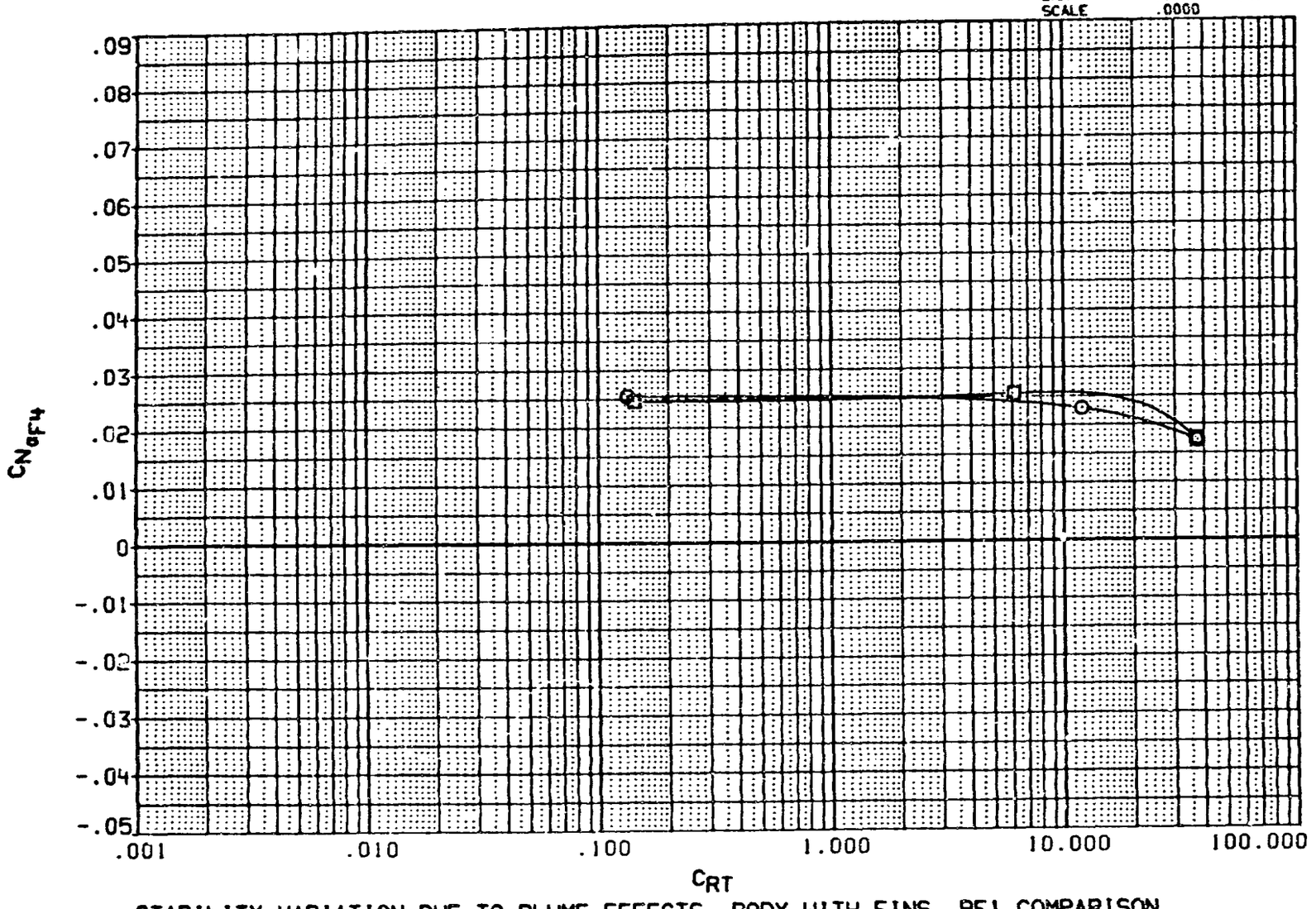


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1 COMPARISON

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AXE011)	8	AEDC TF360 BODY FIN, BF1	.400	3.000
(AXB032)	8	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	.400	3.000

REFERENCE INFORMATION

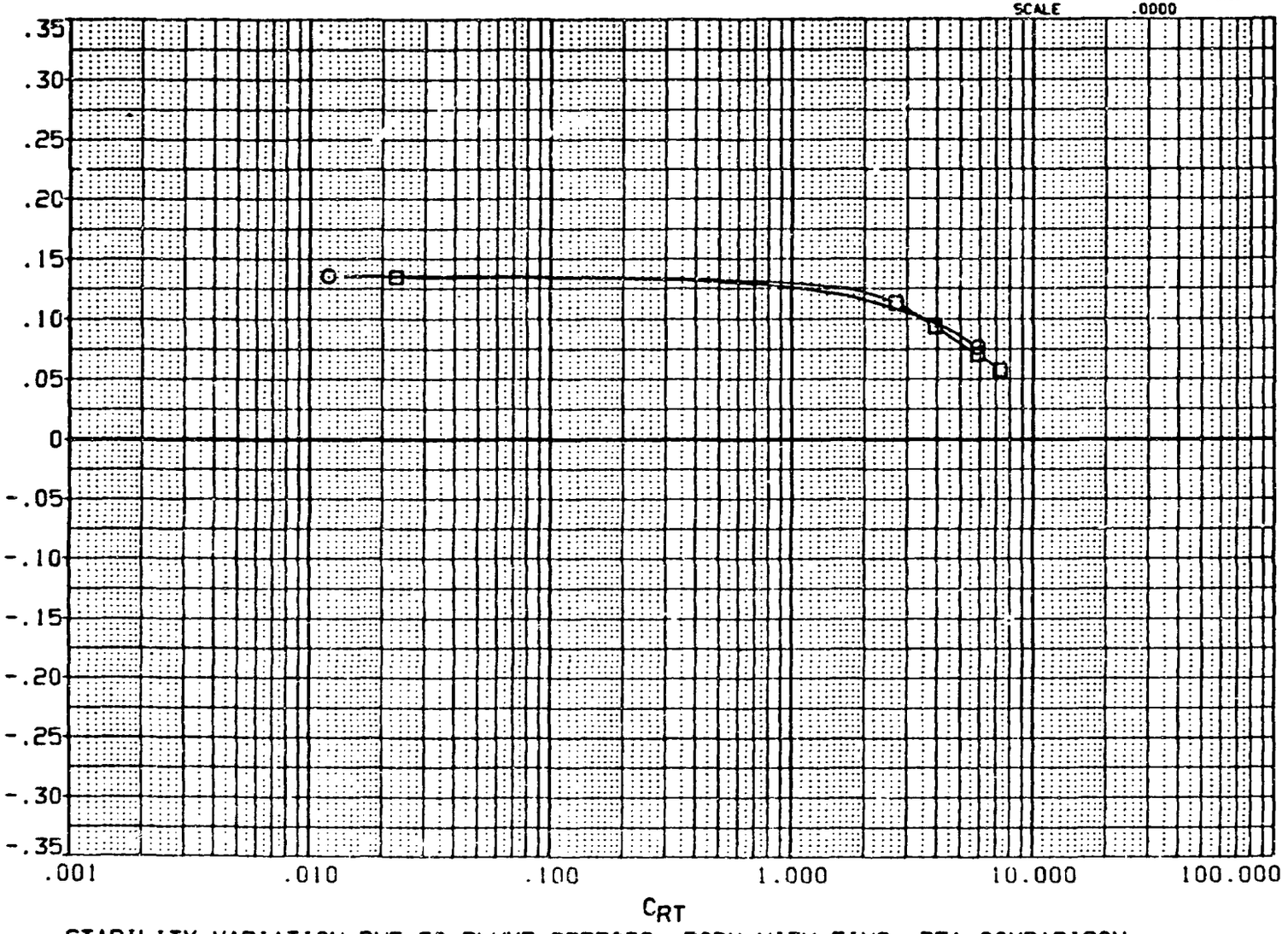
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1 COMPARISON

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPCS
(AXE012)	○	AEDC TF360 BODY FIN, BF1	1.000	3.000
(AXB035)	□	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	1.000	3.000

REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

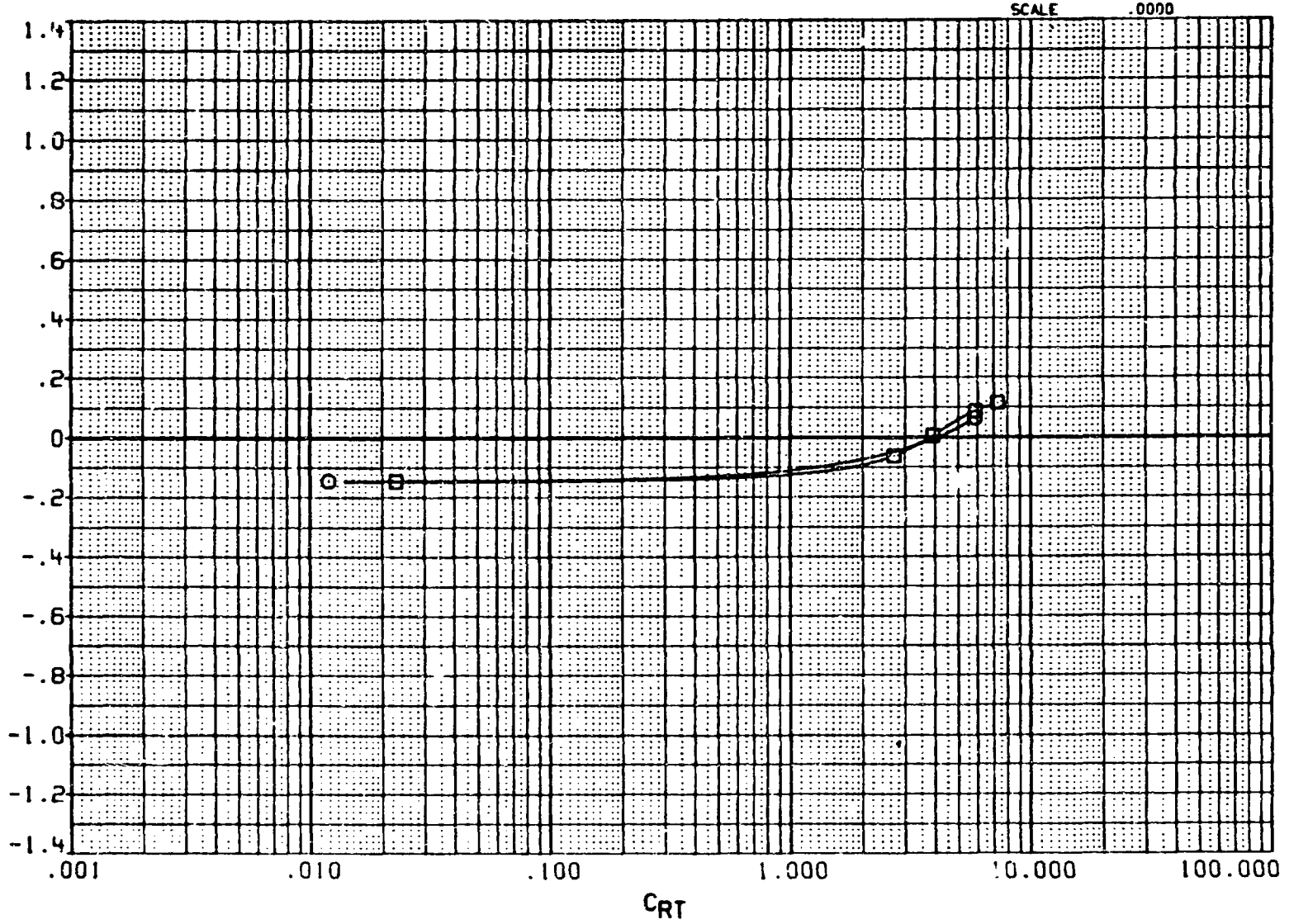


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1 COMPARISON

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AXE012)	○	AEDC TF360 BODY FIN, BF1	1.000	3.000
(AXB035)	□	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	1.000	3.000

REFERENCE INFORMATION

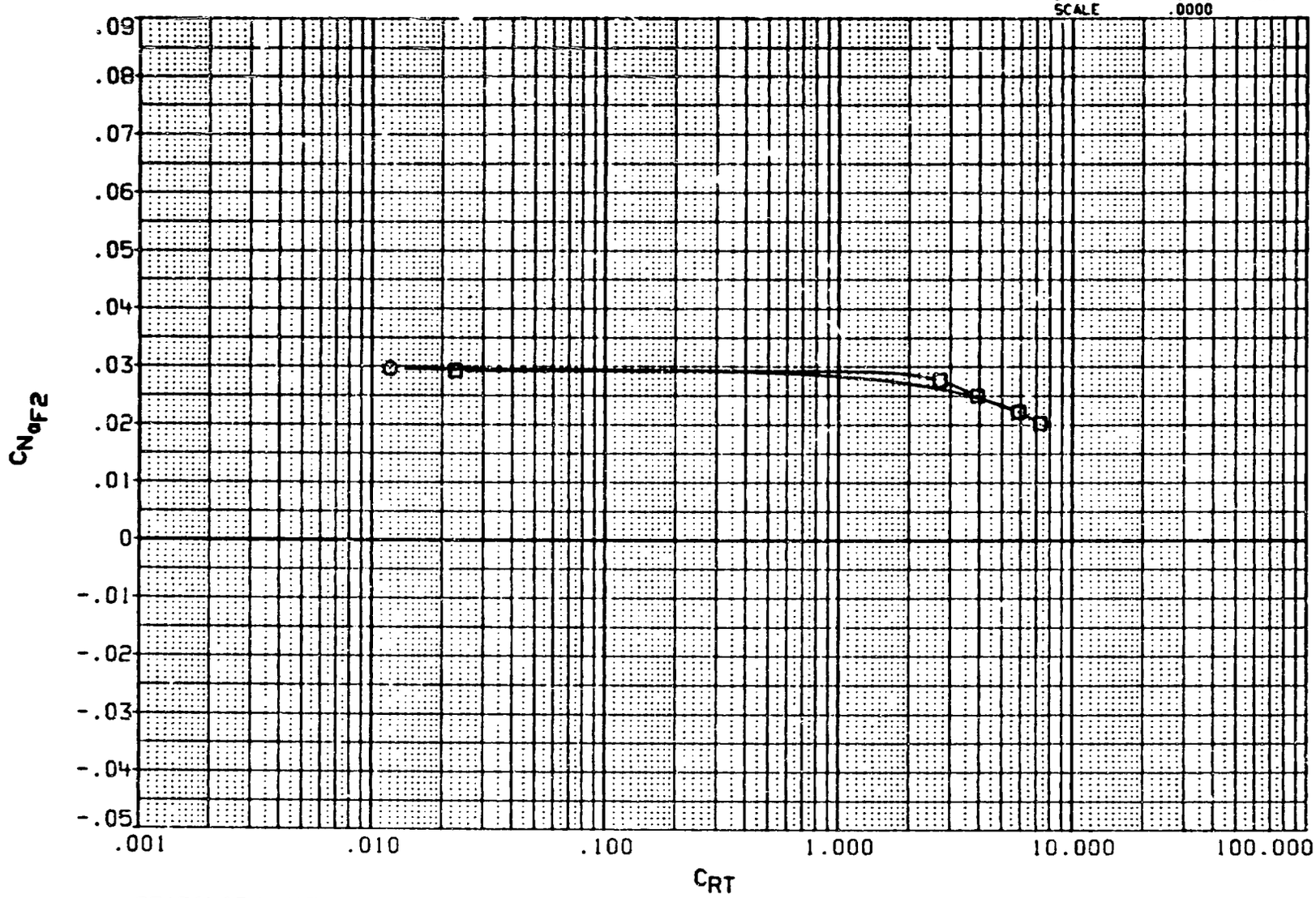
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1 COMPARISON

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AXE012)	○	AEDC TF380 BODY FIN, BF1	1.000	3.000
(AX80035)	□	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	1.000	3.000

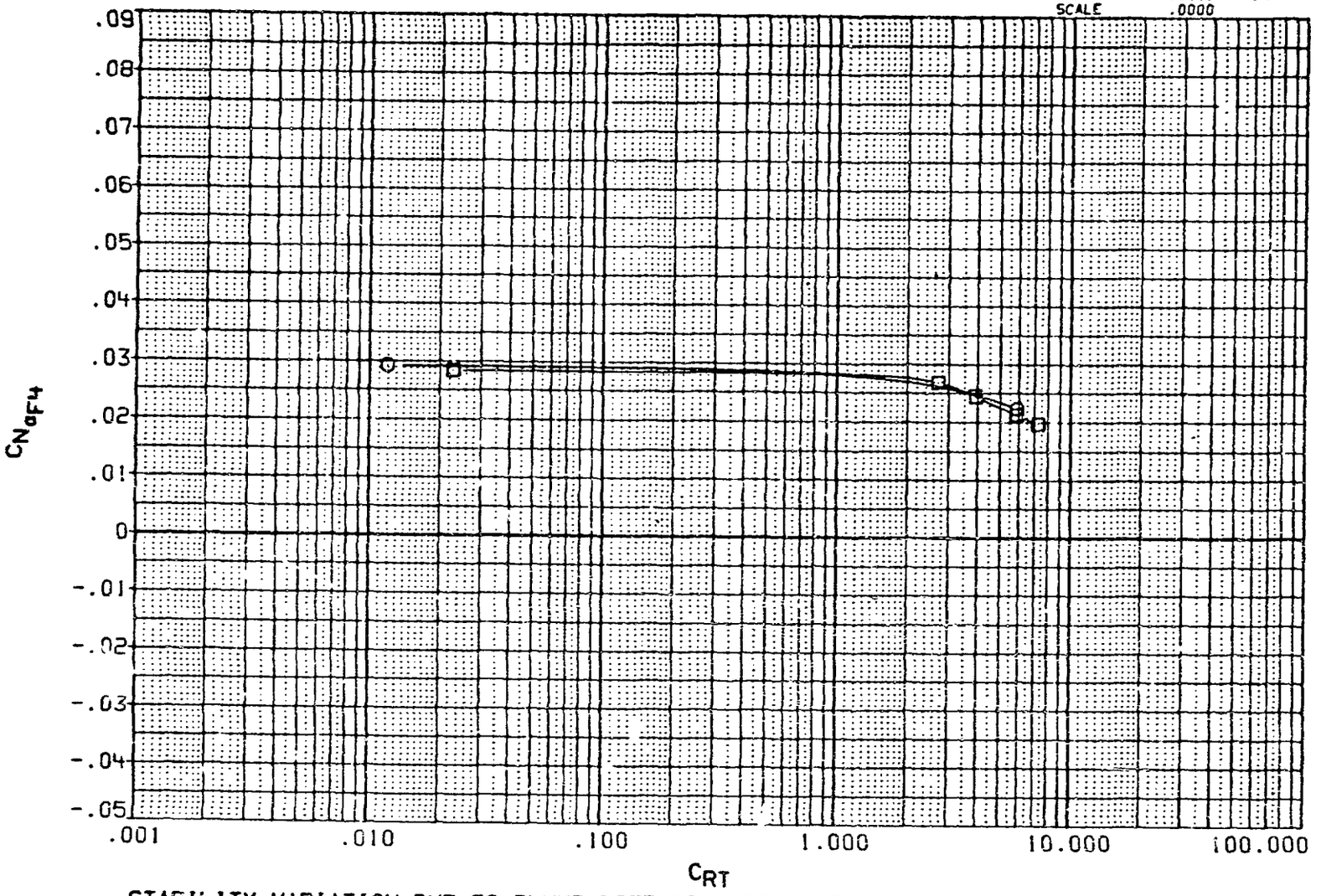
REFERENCE INFORMATION		
SREF	18.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1 COMPARISON

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AXEC12)	○	AEDC TF360 BODY FIN, BF1	1.000	3.000
(AX80351)	□	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	1.000	3.000

REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

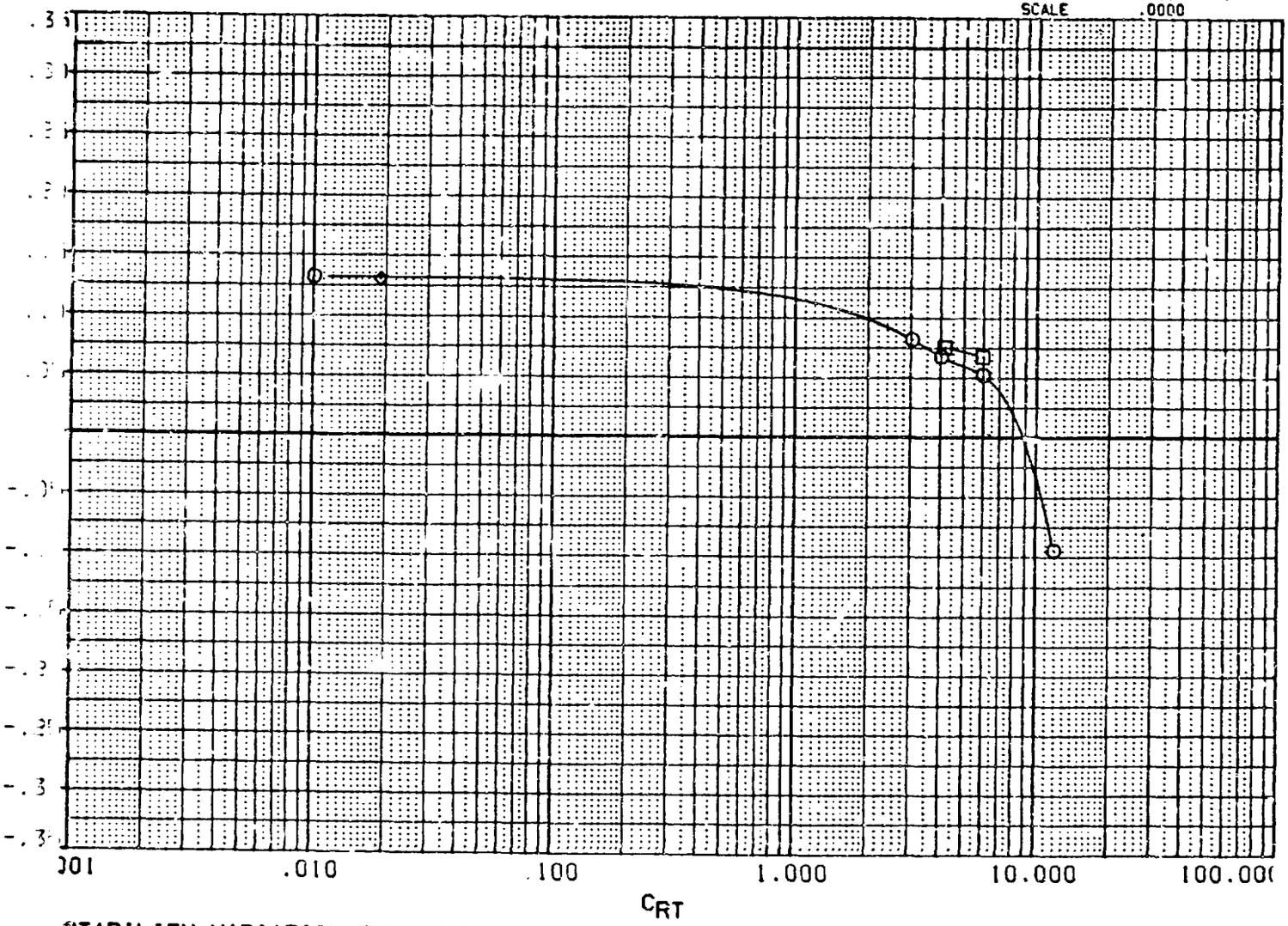


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1 COMPARISON

DATA SE	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
AXE013	○	AEDC TF360 BODY FIN, BF	1.250	3.000
AX@077	□	CAL T17-123 (BFI) BODY, FIN IN FORWARD POSITION	1.250	3.000
AX@038	◇	CAL T17-123 (BFI) BODY, FIN IN FORWARD POSITION	1.250	3.000

REFERENCE INFORMATION

SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

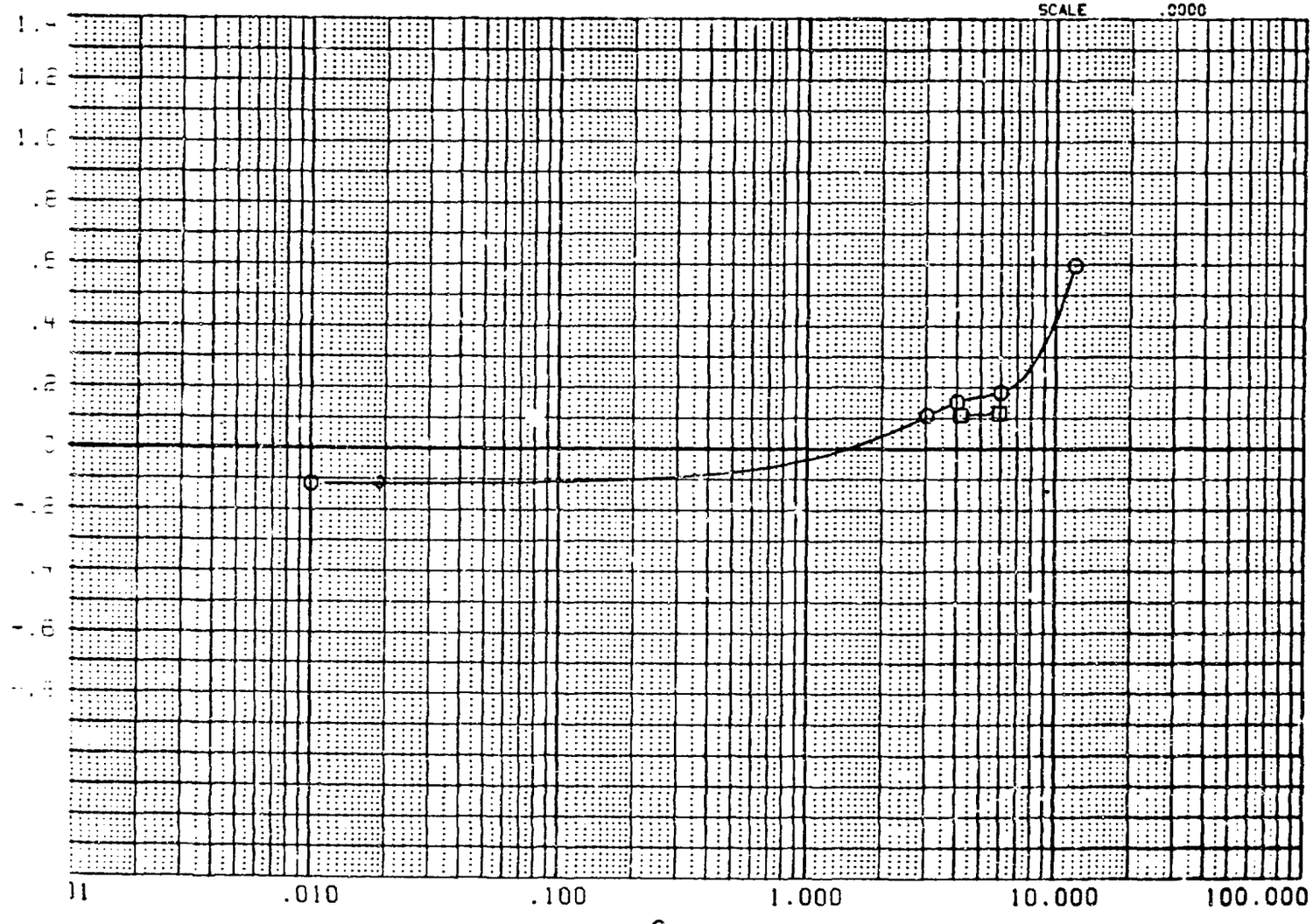


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BFI COMPARISON

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AXE013)		AEDC TF360 BODY FIN, BF1	1.250	3.000
(AXB037)		CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	1.250	3.000
(AXB038)		CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	1.250	3.000

REFERENCE INFORMATION

SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

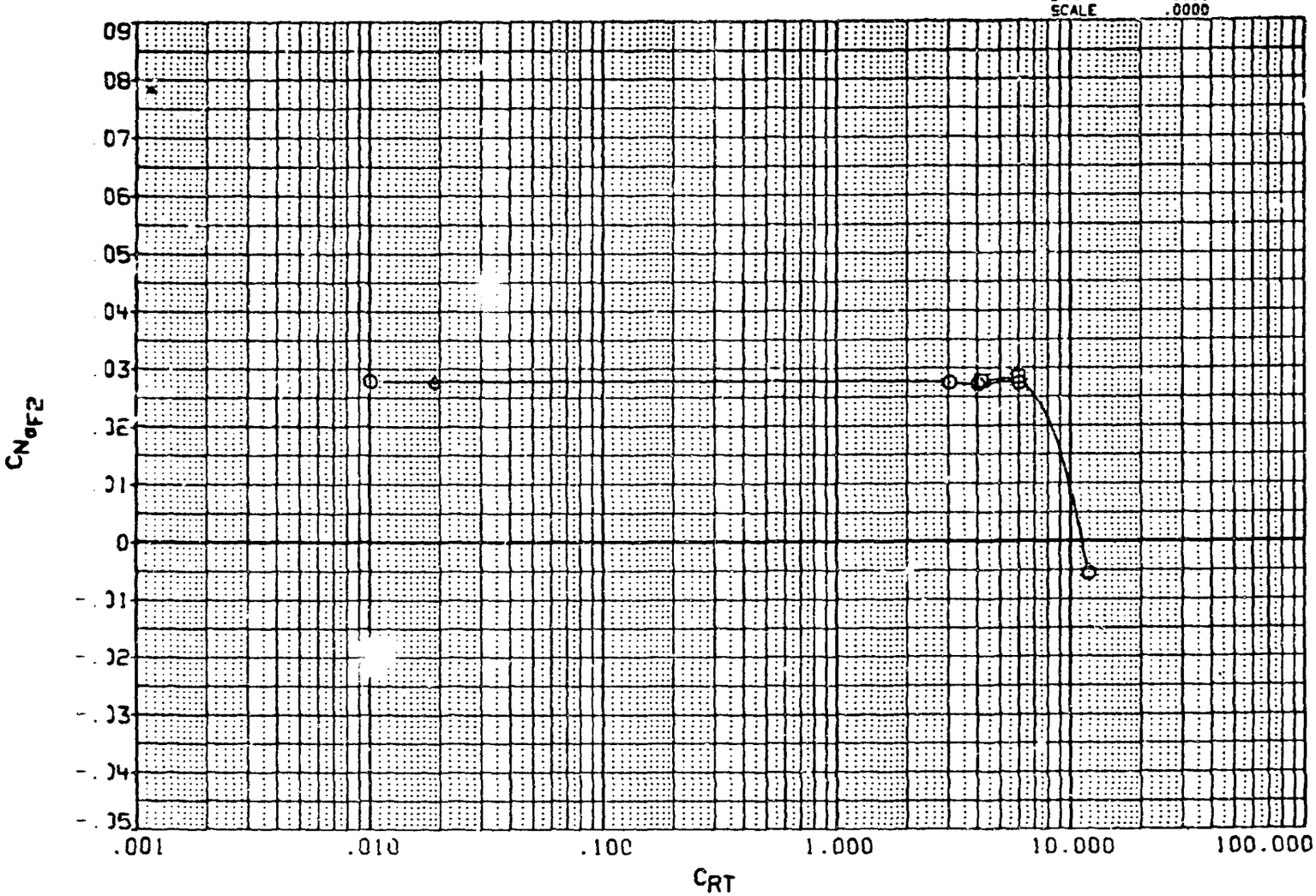


ABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1 COMPARISON

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AXE013)	○	AEDC TF360 BODY FIN, BF1	1.250	3.000
(AXB037)	□	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	1.250	3.000
(AXB038)	◇	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	1.250	3.000

REFERENCE INFORMATION

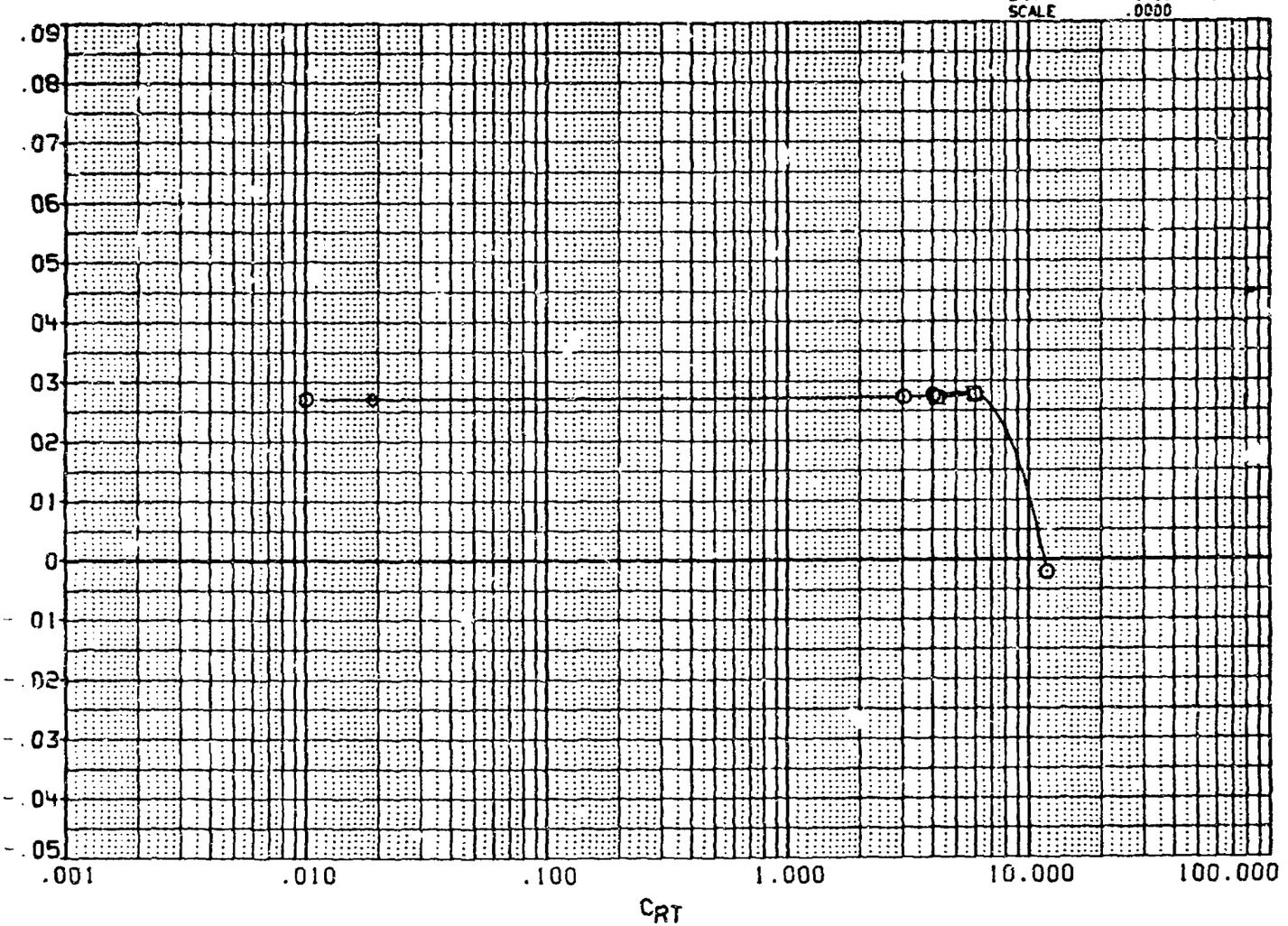
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1 COMPARISON

DATA SE	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AXE013	○	AEDC TF360 BODY FIN, BF1	1.250	3.000
(AX8037	□	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	1.250	3.000
(AX8038	◇	CAL T17-123 (BF1) BODY, FIN IN FORWARD POSITION	1.250	3.000

REFERENCE INFORMATION		
SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

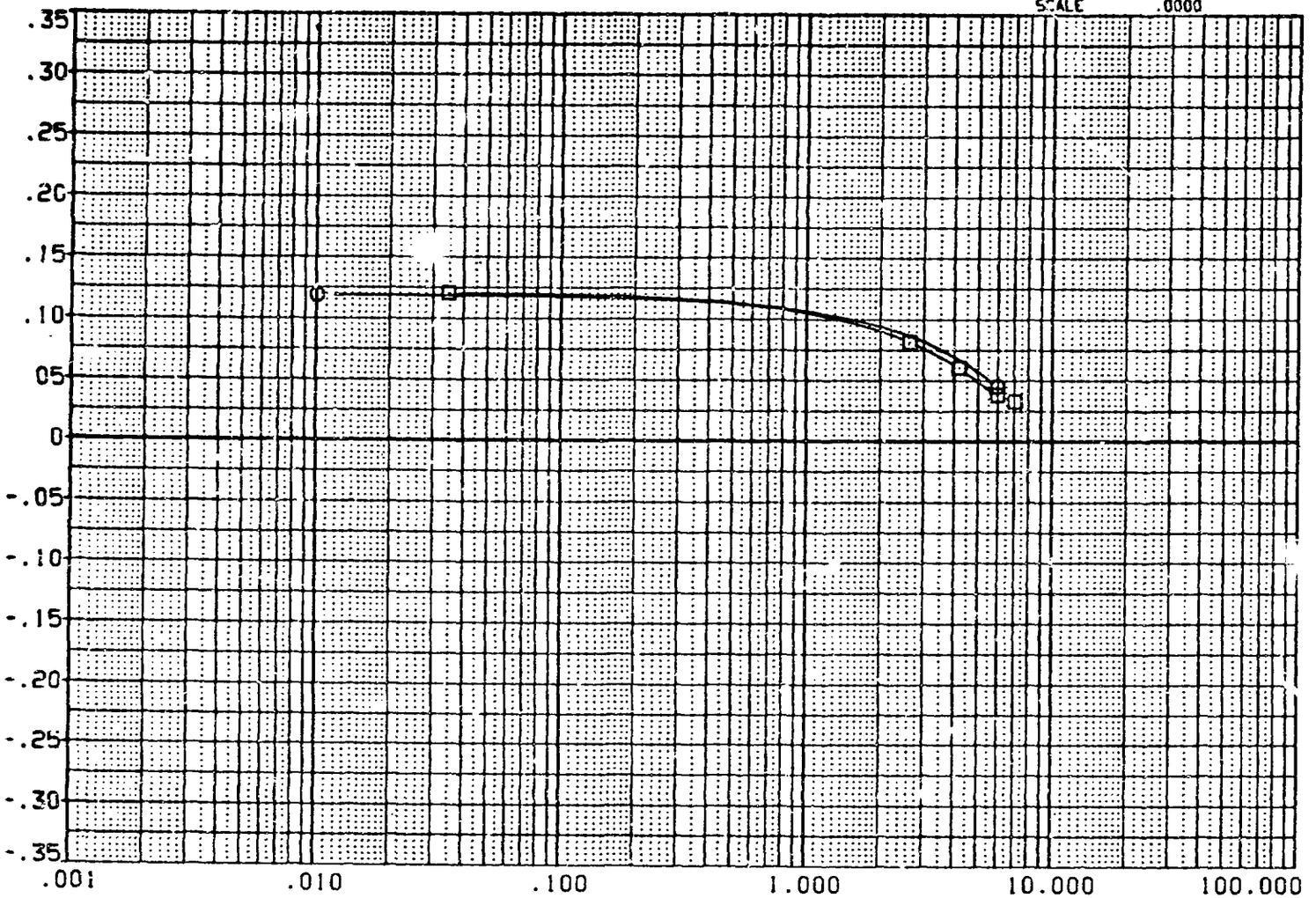


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF1 COMPARISON

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AXE028)	8	AEDC TF360 BODY FIN, BF2	1.000	3.000
(AXE051)	8	CAL T17-123 (BF2) BODY, FIN IN FORWARD POSITION	1.000	3.000

REFERENCE INFORMATION

SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



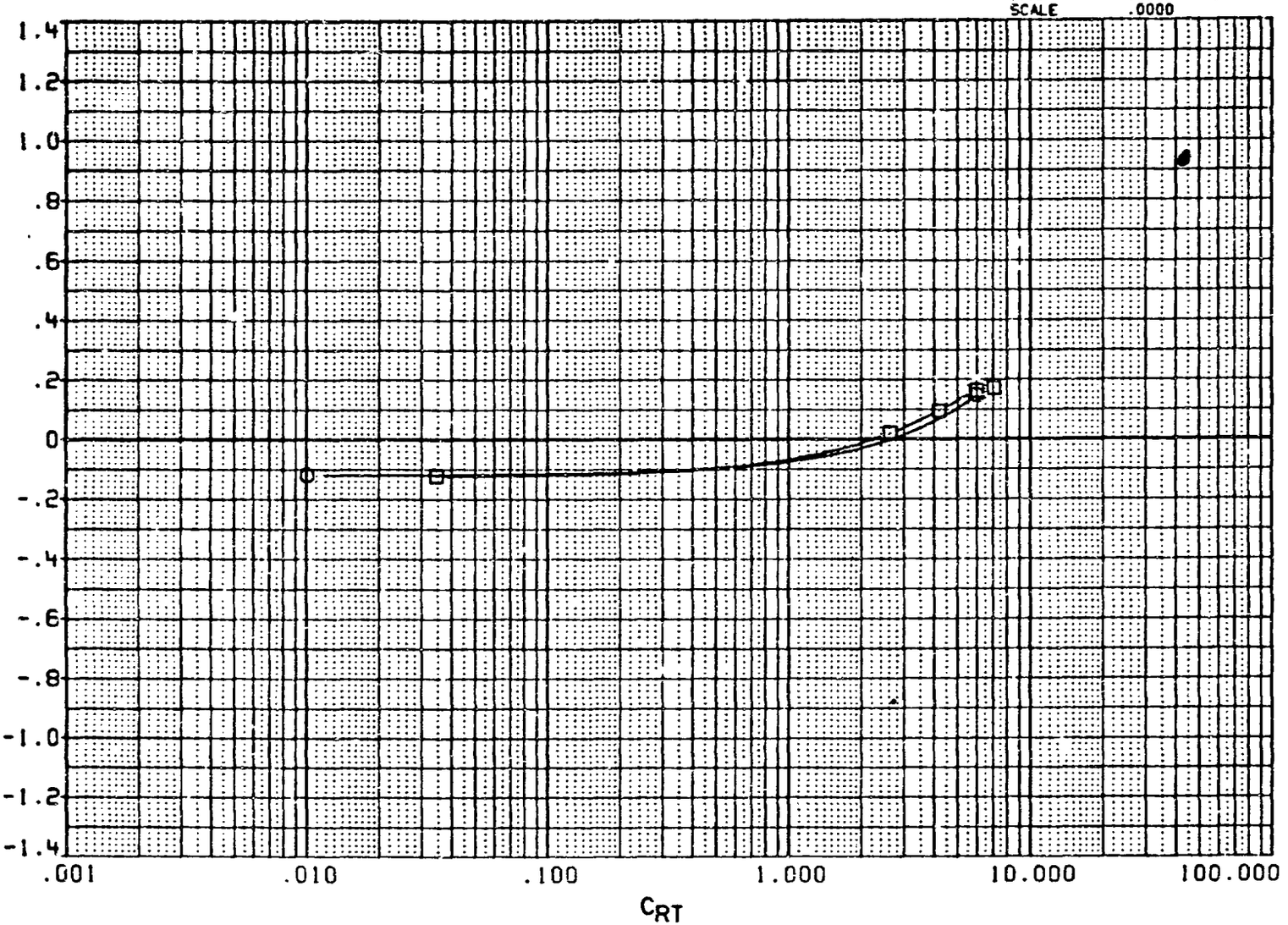
180

STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF2 COMPARISON

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AXE 1261)	○	AEDC TF360 BODY FIN, BF2	1.000	3.000
(AXB 115)	□	CAL T17-123 (BF2) BODY, FIN IN FORWARD POSITION	1.000	3.000

REFERENCE INFORMATION

SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	

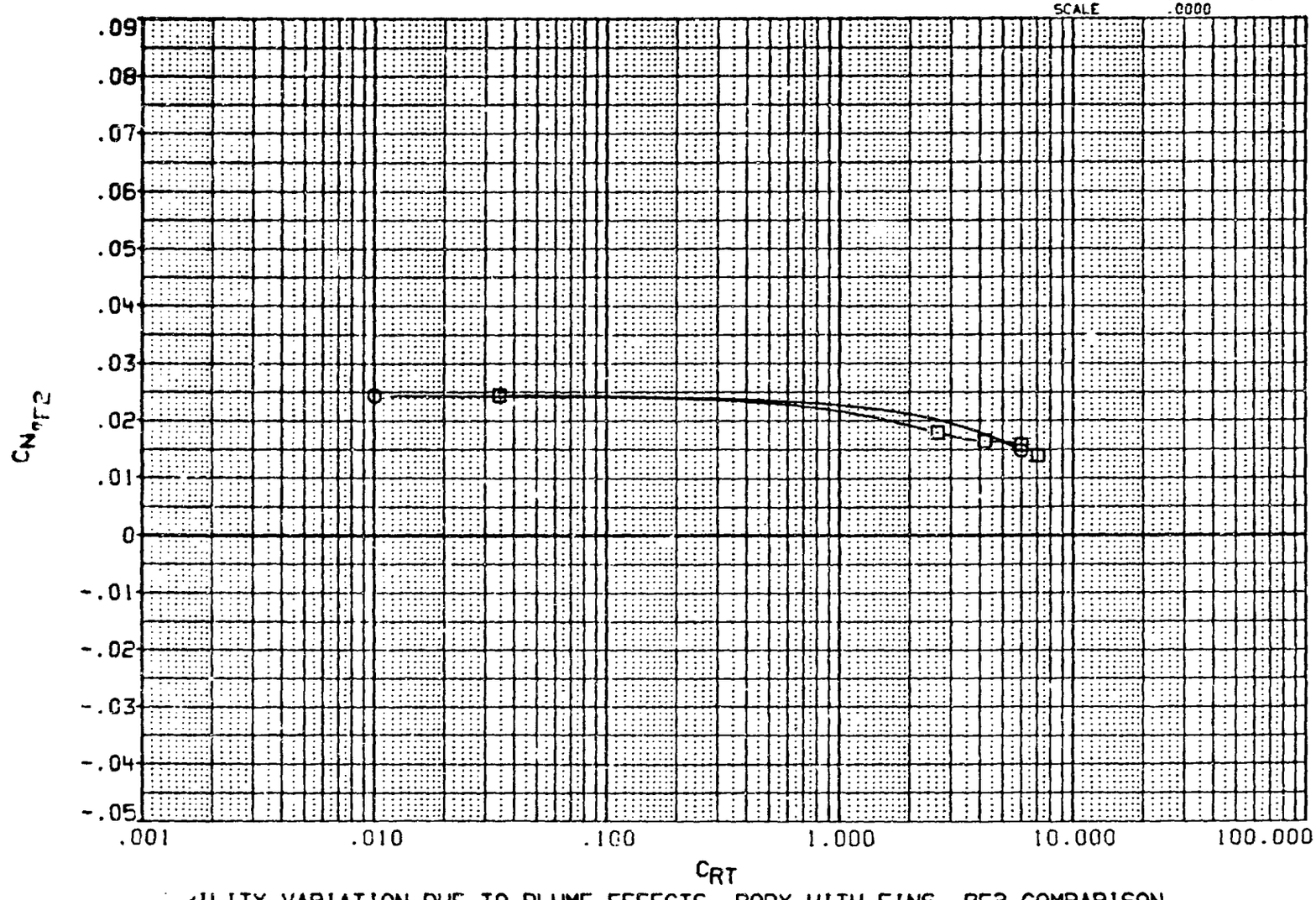


STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF2 COMPARISON

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(AXIS 3)	○	AEDC TF380 BODY FIN, BF2	1.000	3.000
(AXIS 1)	□	CAL T17-123 (BF2) BODY, FIN IN FORWARD POSITION	1.000	3.000

REFERENCE INFORMATION

SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



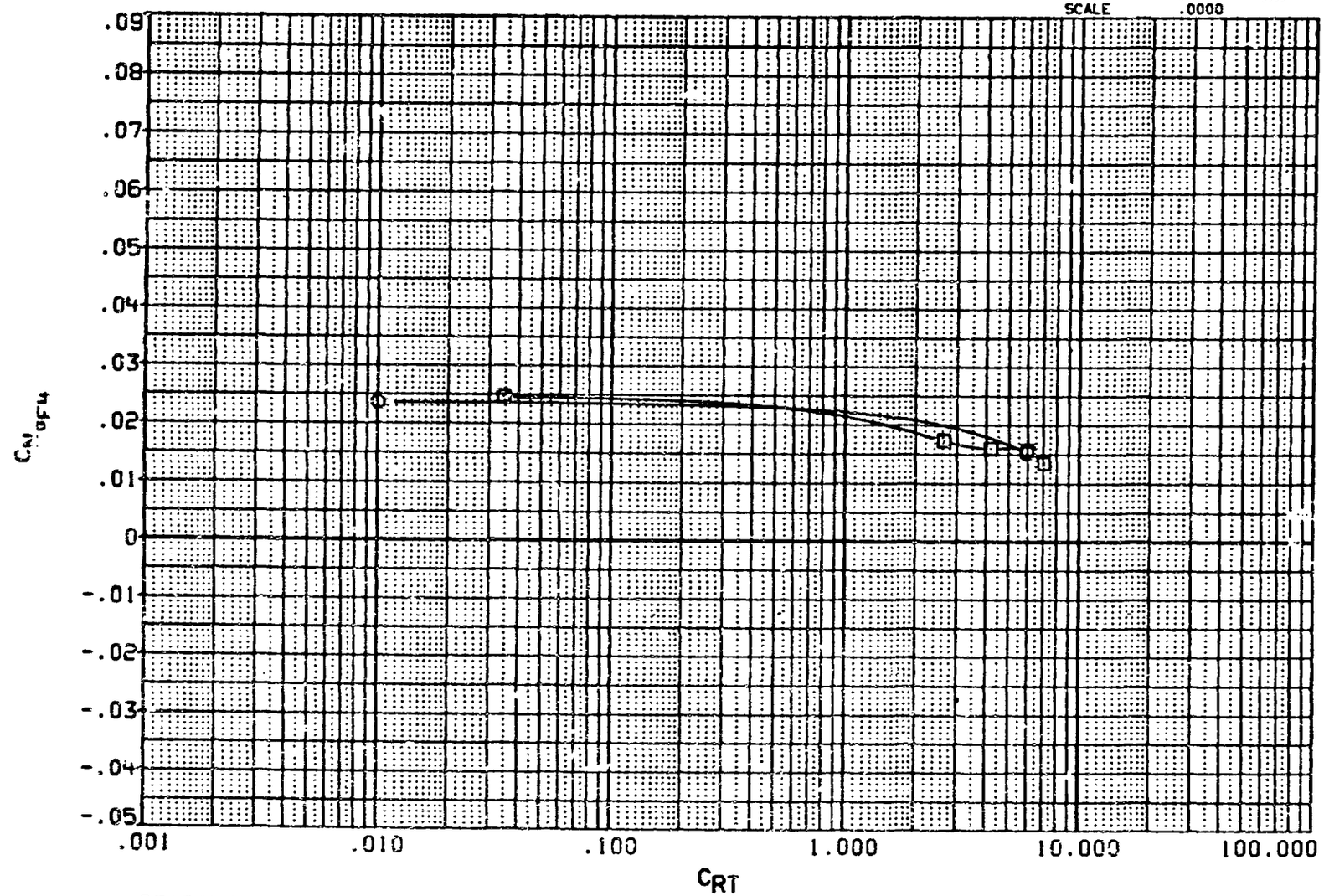
182

ILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF2 COMPARISON

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	MACH	FINPOS
(A)E020	○	AEDC TF360 BODY FIN, BF2	1.000	3.000
(A)B015	□	CAL T17-123 (BF2) BODY, FIN IN FORWARD POSITION	1.000	3.000

REFERENCE INFORMATION

SREF	19.6350	SQ.IN.
LREF	5.0000	IN.
BREF	5.0000	IN.
XMRP	26.5000	IN.
YMRP	.0000	IN.
ZMRP	.0000	IN.
SCALE	.0000	



STABILITY VARIATION DUE TO PLUME EFFECTS, BODY WITH FINS, BF2 COMPARISON

DISTRIBUTION

	Number of Copies
Defense Documentation Center Cameron Station Alexandria, Virginia 22314	12
Commanding General US Army Materiel Command Research & Development Directorate ATTN: DRCRD Washington, D. C. 20315	1
Commanding Officer US Army Picatinny Arsenal ATTN: SMUPA-VC3, Mr. A. Loeb Dover, New Jersey 07801	1
Director US Army Mobility Research and Development Laboratory ATTN: SAVDL-AS Ames Research Center Moffett Field, California 94035	1
Commanding Officer Research Laboratories ATTN: SMUEA-RA, Mr. Abraham Flatau Edgewood Arsenal, Maryland 21010	1
Commanding Officer Air Force Armament Laboratory ATTN: Mr. C. Butler	1
Mr. F. Howard	1
Dr. F. Findley	1
Eglin Air Force Base, Florida 32542	
Arnold Engineering and Development Center ATTN: Dr. McKay	1
Library	1
Arnold Air Force Station, Tennessee 37389	
Air Force Flight Dynamics Laboratory ATTN: FDMM, Mr. Gene Fleeman Wright-Patterson Air Force Base, Ohio 45433	1

	Number of Copies
Commanding Officer Ballistic Research Laboratories ATTN: AMXRD-BEL, Mr. R. Krieger Aberdeen Proving Ground, Maryland 21005	1
Commanding Officer US Naval Ordnance Laboratories ATTN: Mr. S. Hastings	1
Mr. R. T. Hall	1
Library	1
White Oak Silver Spring, Maryland 20910	
NASA-Langley Research Center ATTN: Mr. Leroy Spearman	1
Mr. Charles Jackson	1
Technical Library	1
Hampton, Virginia 23665	
Commanding Officer & Director Naval Ship Research and Development Center ATTN: Aerodynamic Laboratory Carderock, Maryland 20007	1
Naval Weapons Center ATTN: Mr. R. Meeker China Lake, California 93555	1
NASA-Ames Research Center ATTN: Technical Library Moffett Field, California 94035	1
NASA-Lewis Research Center ATTN: Technical Library Cleveland, Ohio 44135	1
NASA-Marshall Space Flight Center ATTN: Mr. K. Blackwell	1
Mr. H. Struck	1
Mr. J. Sims	1
Technical Library	1
Marshall Space Flight Center, Alabama 35812	

	Number of Copies
US Air Force Academy ATTN: Lt. Col. W. A. Edgington DFAN USAF Academy, Colorado 80840	1
Philco Corporation Aeronutronic Division ATTN: Technical Information Services-Acquisitions Mr. L. E. Horowtiz Ford Road Newport Beach, California 92663	1
Rockwell International Columbus Aircraft Division ATTN: Mr. Fred Hessman 4300 East Fifth Avenue Columbus, Ohio 43216	1
Sandia Corporation Sandia Base Division 9322 ATTN: Mr. W. Curry Box 5800 Albuquerque, New Mexico 87115	1
Purdue University ATTN: Dr. J. Hoffman, Propulsion Center Lafayette, Indiana 47907	1
University of Tennessee Space Institute ATTN: Dr. J. M. Wu Tullahoma, Tennessee 37388	1
University of Alabama Department of Aerospace Engineering ATTN: Dr. Zien Dr. J. O. Doughty University, Alabama 35486	1 1
Jet Propulsion Laboratory California Institute of Technology ATTN: Mr. R. Martin 4800 Oak Grove Drive Pasadena, California 91109	1

	Number of Copies
University of Missouri at Columbia Dept. of Mechanical Engineering ATTN: Dr. D. E. Wollersheim Columbia, Missouri 65201	1
University of Illinois College of Engineering ATTN: Dr. A. L. Addy Dr. H. H. Korst Dr. R. A. White Engineering Library Urbana, Illinois 61801	1 1 1 1
John Hopkins University Applied Physics Laboratory ATTN: Dr. L. Cronvich Mr. Gordon Dugger Mr. R. Walker Silver Spring, Maryland 20910	1 1 1
University of Notre Dame Dept. of Aerospace Engineering ATTN: Dr. T. J. Mueller Notre Dame, Indiana 46556	1
Naval Air Systems Command ATTN: Mr. William Volz Air 320-C, Room 778, JP-1 Washington, D. C. 20361	6
For Transmittal to:	
TTCP	
Boeing Company ATTN: Library Unit Chief Mr. R. J. Dixon Mr. H. L. Giles P. O. Box 3707 Seattle, Washington 98124	1 1 1
Convair, A Division of General Dynamics Corporation ATTN: Division Library Pomona, California 91776	1

	Number of Copies
Nielson Engineering & Research, Inc. ATTN: Dr. Jack N. Nielson 850 Maude Avenue Mountain View, California 94040	1
Hughes Aircraft Company ATTN: Documents Group Technical Library Florence Avenue at Teale Street Culver City, California 90230	1
Ling-Temco-Vought Aerospace Corp. ATTN: Mr. Dick Ellison P. O. Box 404 Warren, Michigan 48090	1
Ling-Temco-Vought Aerospace Corp. Vought Aeronautics Division ATTN: C. R. James, Unit 2-53330 Box 5907 Dallas, Texas 75222	1
Lockheed Missiles & Space Company Huntsville R&E Center ATTN: Mr. J. Benefield 4800 Bradford Boulevard, N.W. Huntsville, Alabama 35805	1
Lockheed Aircraft Corporation Missile and Space Division ATTN: Technical Information Center P. O. Box 504 Sunnyvale, California	1
The Martin-Marietta Corporation Orlando Division ATTN: D. Tipping L. Gilbert Orlando, Florida 32804	1 1
McDonnel-Douglas Company - West ATTN: Library A3-328 5301 Bolsa Avenue Huntington Beach, California 92646	1
McDonnel-Douglas Corporation P. O. Box 516 St. Louis, Missouri 63166	1
Northrop Corporation Electro-Mechanical Division ATTN: Mr. E. Clark 500 East Orangethorpe Y20 Anaheim, California 92801	1
Emerson Electric Company ATTN: Mr. Robert Bauman 8100 Florissant St. Louis, Missouri 73136	1
Data Management Services Department 2910 Chrysler Corporation Space Division ATTN: Mr. N. D. Kemp P. O. Box 29200 New Orleans, Louisiana 70189	6
Data Management Services Department 5807 Chrysler Corporation Huntsville Electronics Division ATTN: Mr. J. E. Vaughn 102 Wynn Drive Huntsville, Alabama 35805	1
DRSMI-FR, Mr. Strickland	1
DRSMI-R, Dr. McDaniel	1
-R, Dr. Kobler	1
-RBD	3
-RKD, Mr. Deep	1
Mr. Henderson	20
Mr. Batiuk	10
-RFG, Mr. Sullivan	1
-LP, Mr. Voigt	1
-RPR (Record Copy)	1
(Reference Copy)	1