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DATA REPORT FOR APOLLO MODEL (FS-2) IN NAA TRISONIC WIND TUNNEL (TWT 80)

NAS9-150

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Reissued 17 December 1962

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Apollo

(NASA-CR-117713) APOLLO MODEL /FS-2/ IN NAA TRISONIC WIND TUNNEL /TWT 80/ DATA REPORT, 21-27 AUG. 1962 (North American Aviation, Inc.) 191 p

N79-76108

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NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION

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FOREWORD

The Apollo model FS-2 tests were conducted under NASA Apollo Contract NAS9-150 from 21 August to 27 August 1962.

This report was prepared by D.G. Cummings of the Wind Tunnel Projects Group, Los Angeles Division of North American Aviation, Inc.

This report has been reissued with amendments to the data sections; all copies of the original issue, dated 20 November 1962, should be destroyed.

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ABSTRACT

Tabulated and plotted results from force tests of the 0.105-scale Apollo Model FS-2 in the NAA Trisonic Wind Tunnel at Mach numbers 0.4, 0.7, and 3.5 are presented. These data consist of longitudinal characteristics of the command module in the clean configuration and with umbilical and tie-down pads (Mach number 3.5) on the heat shield. Data obtained at various Reynolds numbers are presented with oil-drop flow pictures and Schlieren photographs.

Basic wind tunnel test data are included to make the test results available at the earliest possible date. Analyses and summary of results will be reported in a separate document.

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I. INTRODUCTION

Wind tunnel tests of the 0.105-scale Apollo force model FS-2 were conducted in the North American Aviation 7- by 7-foot Trisonic Wind Tunnel. These tests were a continuation of previous FS-2 model tests[1] and were conducted to further investigate the effect of Reynolds number on the low-speed characteristics of the command module over an angle-of-attack range from -10 to 180 degrees. Flow studies were conducted on the model at an angle of attack of 150 degrees using the oil drop technique. These flow studies were performed at Mach number 0.20.

This investigation was conducted to obtain aerodynamic force and stability characteristics of the command module at nominal Mach numbers of 0.4, 0.7, and 3.5. Additional investigations were conducted on the command module at Mach number 3.5 to study the effects of bumps on surface of heat shield. These bumps represent the condition of the command module after separation from the service module with the tension ties, shear pads, and the umbilical pad exposed.

[1]Smith, H. C. Data Report for Apollo FS-2 model in the North American Aviation Trisonic Wind Tunnel (TWT 79).

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II. MODEL DESCRIPTION

To cover the required angle-of-attack range, two command modules were used. The modules consisted of steel balance blocks enclosed by cast aluminum shells. Both modules were identical except that balance cavities were positioned so that there were six different balance installations in which the angle between the model axis and balance axis was varied. The basic command module configuration is shown in Figure 1.

In addition to the basic module, bumps consisting of shear pads, tension ties, and the umbilical pad were added to the surface of heat shield to simulate the condition of command module after separation from service module. This configuration is illustrated in Figure 2.

Structural analysis of the basic model is contained in SID 62-104.[1]

INSTRUMENTATION

Six-component force and moment data were measured by the revised 2-3/4-inch Task Mark I-A internal balance mounted to the sting assembly.

Balance chamber pressure was measured by a Statham differential pressure transducer, type PM6±5-700, referenced to a preselected pressure.

TEST MODELS

Model data - are presented in the following listing.

Symbol	Description	Drawing No.	Sketch
C_2	Command module Maximum diameter = 154 in.	T121-01077	Figure 1
C_{2O}	Same as C_2 except tension ties, shear pads and umbilical pad were added to heat shield area	CO 7121-126	Figure 2

[1]McClain, C. B. Structural Analysis of the 0.105-Scale Apollo Wind Tunnel Model FS-2. NAA/S&ID SID 62-104 (12 March 1962).

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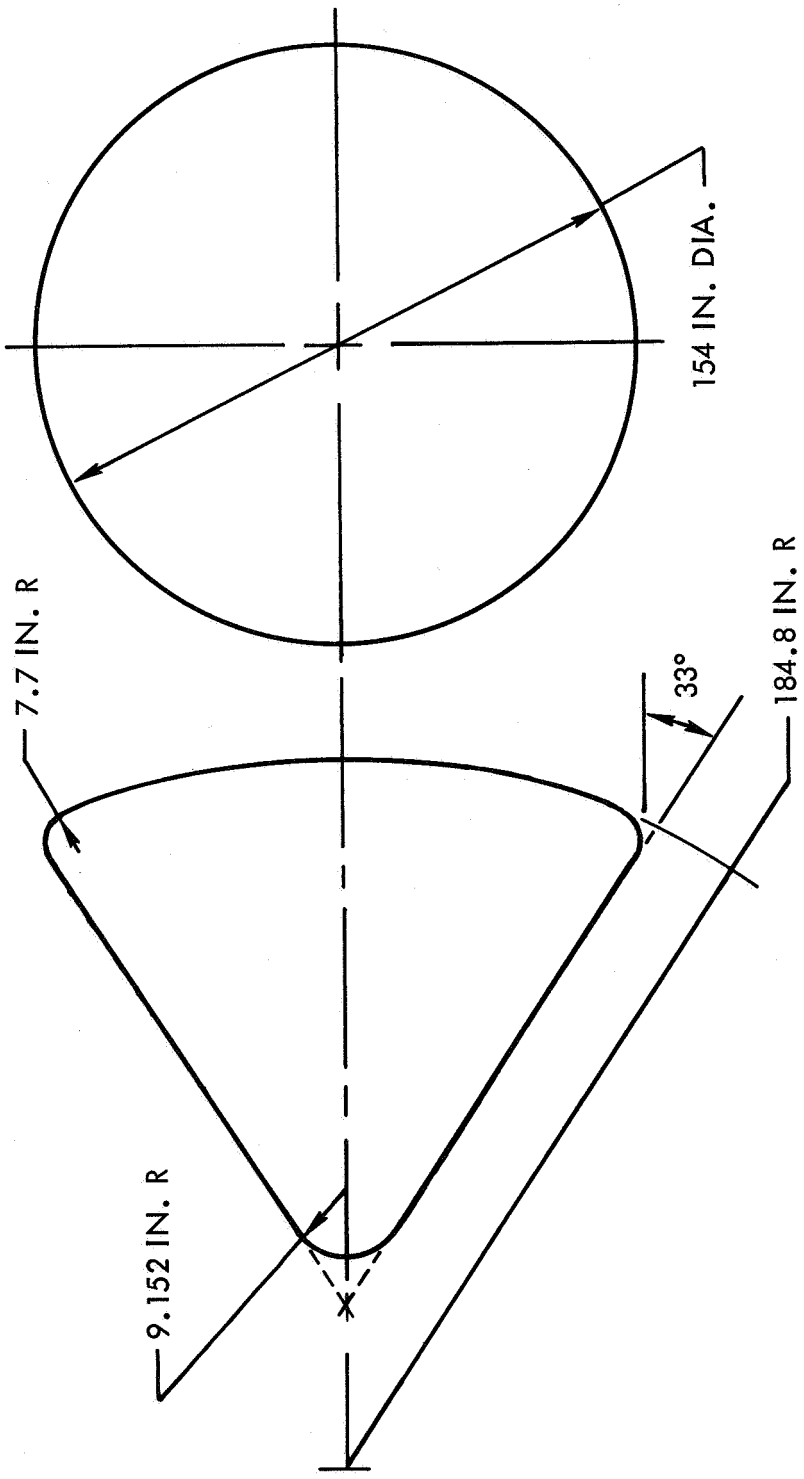

Figure 1. Command Module - C_2

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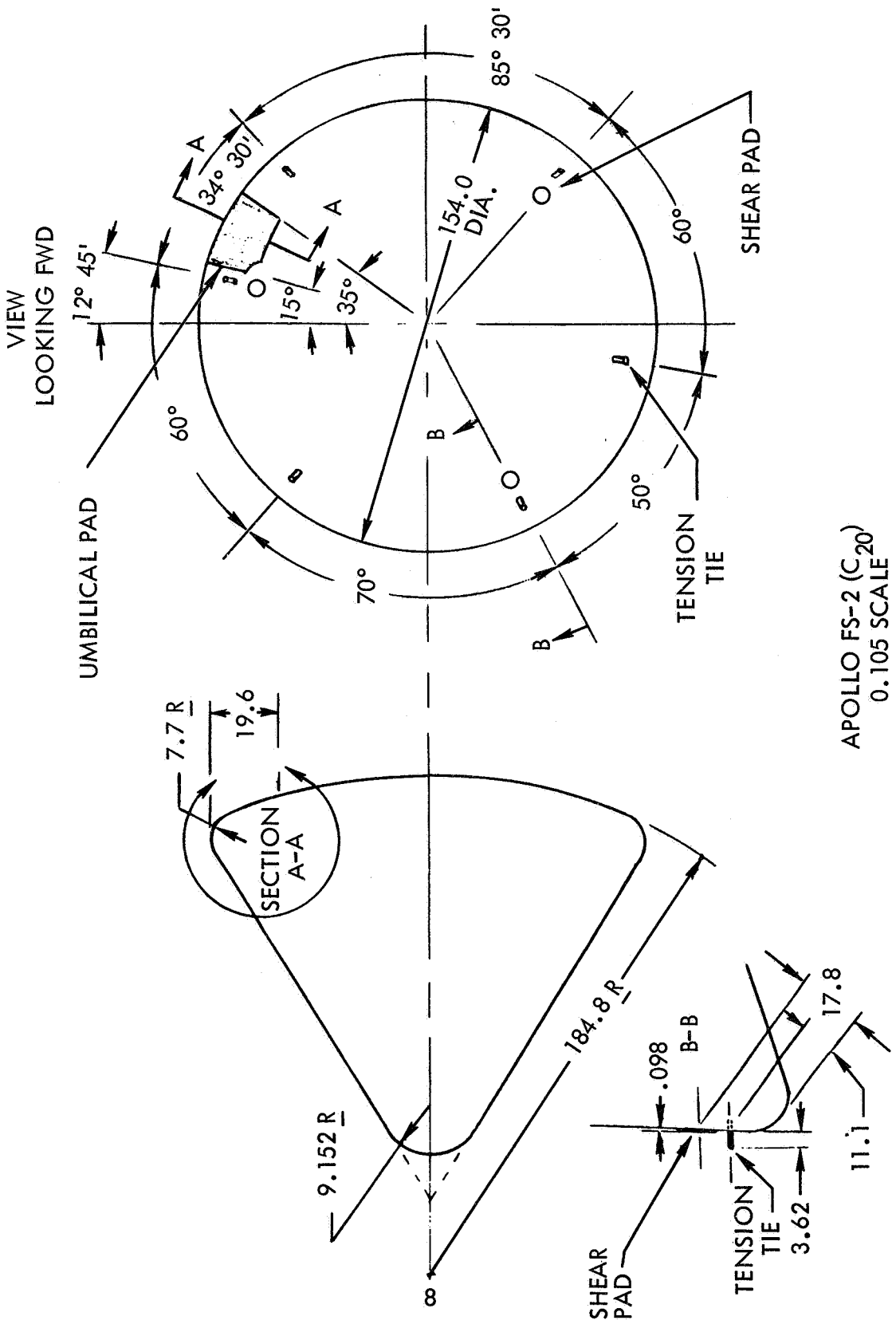

APOLLO FS-2 (C_{20})
0.105 SCALE
DWG. C.O. 7121-154

Figure 2. Apollo FS-2 - C_{20}

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MODEL FULL-SCALE DIMENSIONS

The full-scale dimensions of the C_2 command module are as follows:

Max diameter	154.0 in.
Radius of spherical blunt end	184.8 in.
Corner radius	7.7 in.
Nose cone semi-angle	33.0 deg
Nose cone vertex radius	9.152 in.
Total height	135.021 in.
Frontal area	129.351 ft^2

The full-scale dimensions of the C_{20} command module are as follows:

Same as C_2 except	12.75 deg
three shear pads mounted	132.75 deg
on blunt face spaced at Ø	242.75 deg
Outside diameter of pads	12.78 in.
Inside diameter of pads	4.0 in.
Shear pad thickness	0.38 in.
Six tension ties mounted	12.75 deg
on blunt face spaced at Ø	47.25 deg
	132.75 deg
	192.75 deg
	242.75 deg
	312.75 deg
Diameter, tension ties	0.595 in.
Distance from top surface of tension tie to blunt space surface of module	3.62 in.
Umbilical pad on blunt space thickness of pad	1.14 in.
Radius of pad to be tangent to surface of module outside edge of blunt face	
Width of umbilical pad	19.5 in.
Taper radius	2.48 in.
Location of umbilical pad between Ø = 0.50 to 35 degrees	

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III. TEST PROCEDURE

MODEL INSTALLATION

The FS-2 Apollo force model was installed on the Task 2-3/4 inch Mark I-A internal balance mounted on the 7121-01082 sting. The sting is mounted on the H-998 fixed sting support on the H-822-3 sector head. The sector was located so that the center of rotation was at tunnel station 3735 when testing transonically.

Upon completion of the transonic test, the sector was repositioned for supersonic testing with the center of rotation at tunnel station 3563.

During the operation of this test in Trisonic Wind Tunnel, an angle-of-attack range of -15 to 30 degrees was covered with the sector support system. This range combined with the various model offset angles (θ) allowed adequate coverage for the angle of attack on the model. It was necessary to roll the model and balance 180 degrees on the sting to cover the angle-of-attack range of -10 to 20 degrees and 90 to 120 degrees on the model. This operation was necessary because of the unavailability of one command module that contained the offset angles of θ = 0 and 100 degrees.

A typical tunnel installation is shown in Figure 3, and the actual installation used in these tests is shown in Figures 4 to 6.

INSTRUMENTATION

The electrical output of each element passed through an analog-digital converter and was recorded on magnetic tape. The magnetic tape was reduced on the ALWAC III-E digital computer using program A033.

The balance chamber pressure was measured using a column of mercury. The output of the Stratham transducer was recorded on the data system. No corrections based on balance chamber pressure were applied to the data.

Black and white Schlieren photographs were taken during the supersonic portions of the test (Figures 7 to 10). Flow visualization photographs taken at Mach number 0.2 (Figures 11 through 16).

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DATA REDUCTION

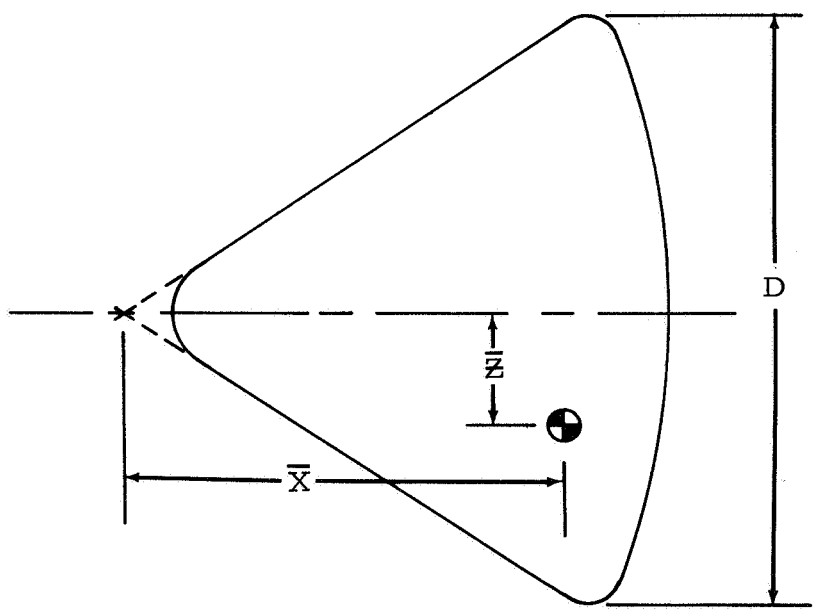
All angle-of-attack data were corrected for sting and balance deflection. Although balance pressure was measured, no corrections were made to the data for base drag.

Force and moment coefficients were computed based on the following geometric constants:

A = Model reference area, 1.4261 ft^2 (maximum cross-sectional area)

D = Model reference diameter, 16.17 in. (maximum diameter of command module)

The reference center of gravity location for the command module alone was $\bar{x}/D = -0.686$ and $\bar{z}/D = 0.059$.



DATA ACCURACY

The balance and recording instrumentation were set to provide maximum possible sensitivity within the capabilities of the amplifying instrumentation and the limits established by keeping maximum loads less than full scale on the recorders.

At Mach numbers 0.2 and 0.4, the coefficient accuracy suffers because the free-stream dynamic pressure (q) is too low relative to the capacity and accuracy of the balance. In addition, the instrumentation for recording tunnel pressures used in computing q is not sufficiently accurate or sensitive

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enough at the low values of q. The probable coefficient errors for all test conditions are listed as follows:

Mach No.	$\pm\Delta C_N$	$\pm\Delta C_A$	$\pm\Delta C_{M_{cg}}$	$\pm\Delta C_{M_A}$	$\pm\Delta C_L$	$\pm\Delta C_D$
0.4	0.007	0.008	0.0018	0.005	0.007	0.010
0.7	0.005	0.004	0.0009	0.004	0.003	0.005
3.5	0.003	0.003	0.0006	0.002	0.002	0.005

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IV. TEST PROCEDURE - CONT

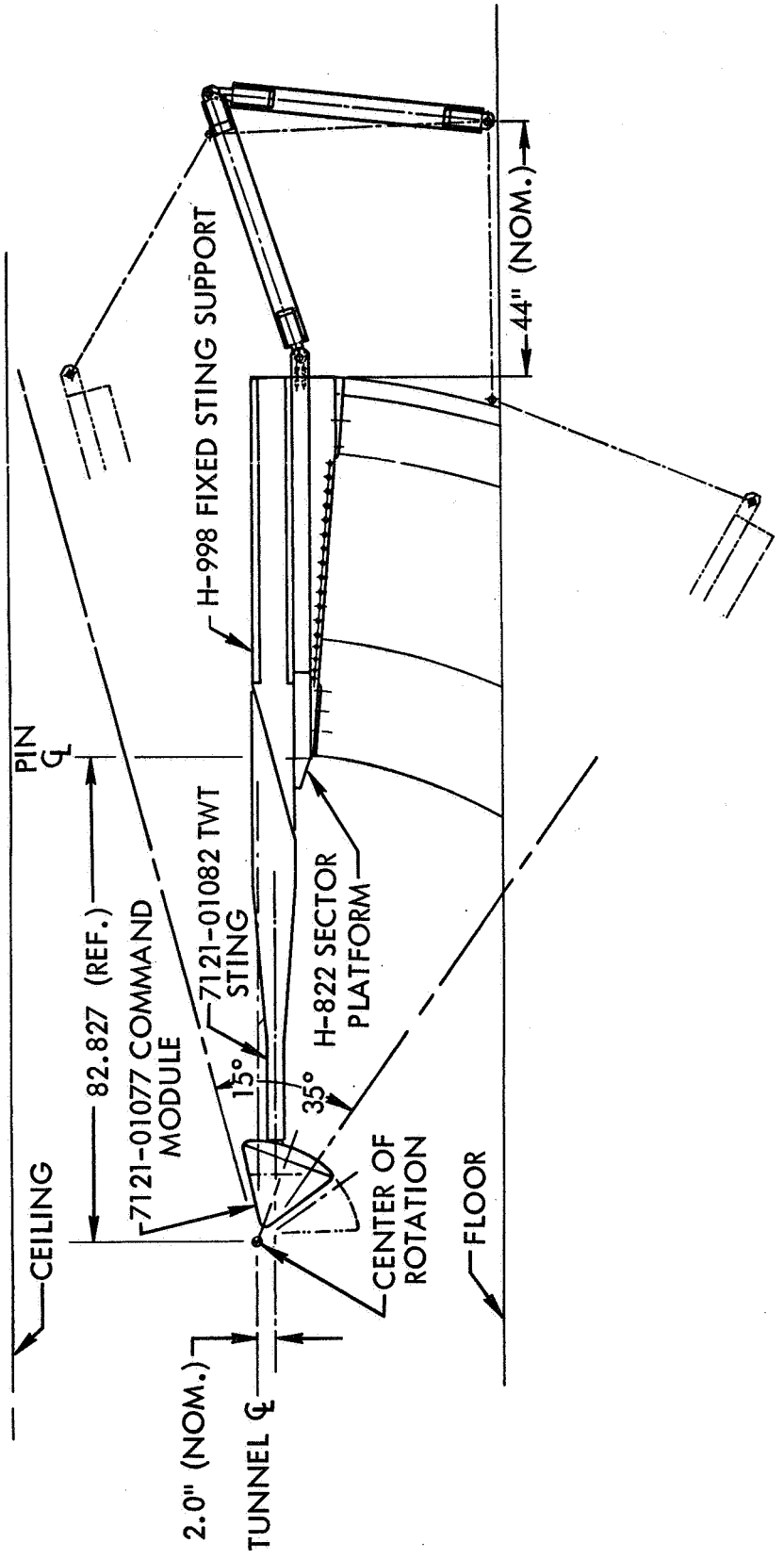

Figure 3. NAA Trisonic Wind Tunnel Installation of Apollo FS-2

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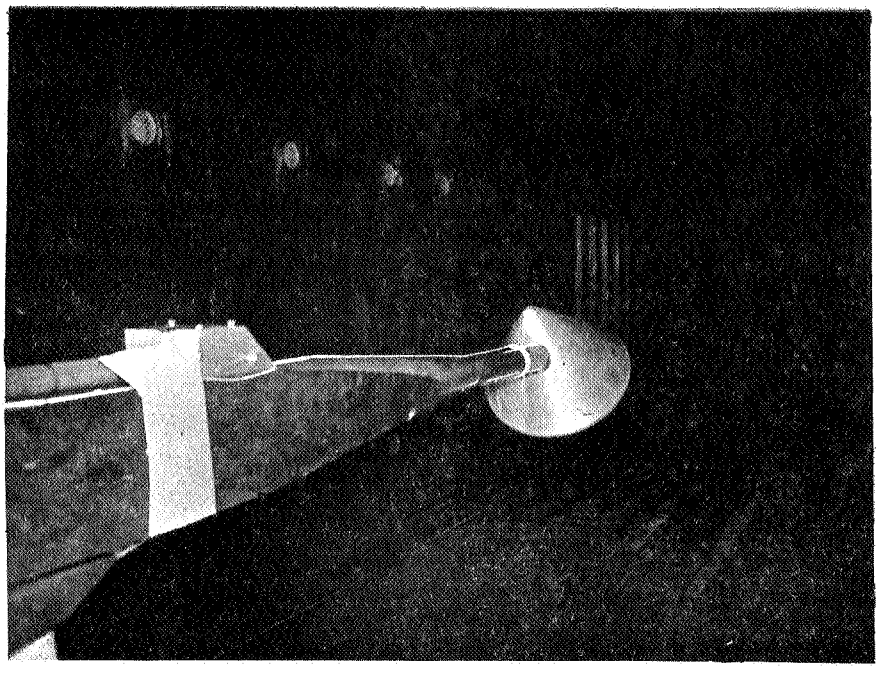

Figure 4. Rear View of Command Module - C_2

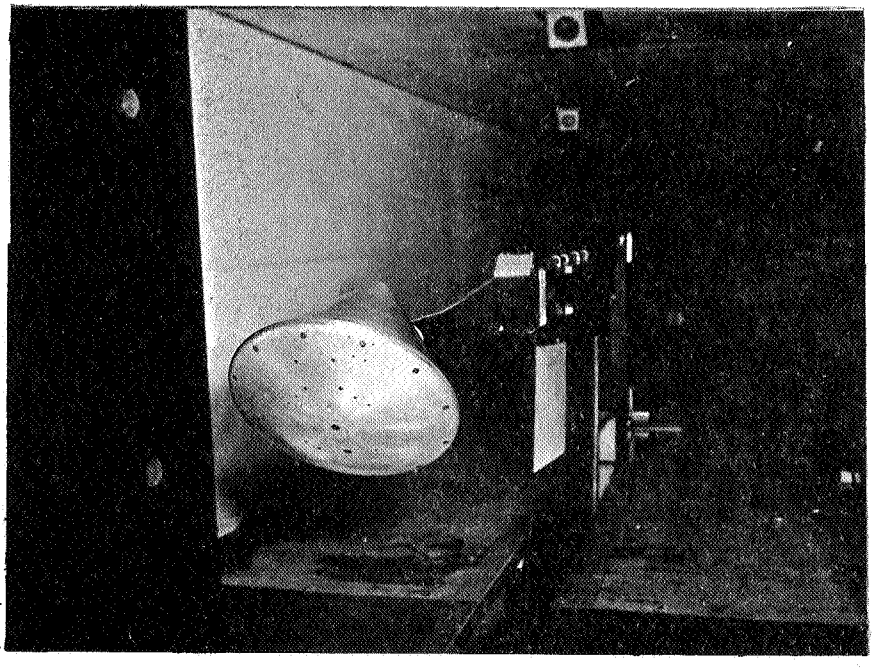

Figure 5. Front View of Command Module - C_2

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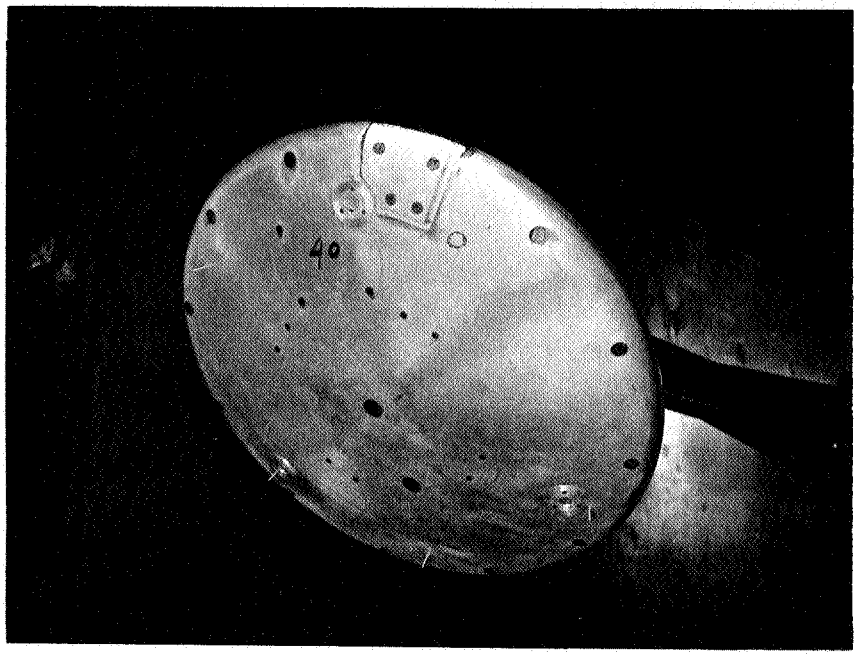

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Figure 6. Heat Shield (C_{20}) with Shear Pads, Tension Ties and Umbilical Pad at α = 150 Degrees

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Figure 7. Typical Schlieren of Command Module (C_{20}) at M = 3.5, α = 150 Degrees

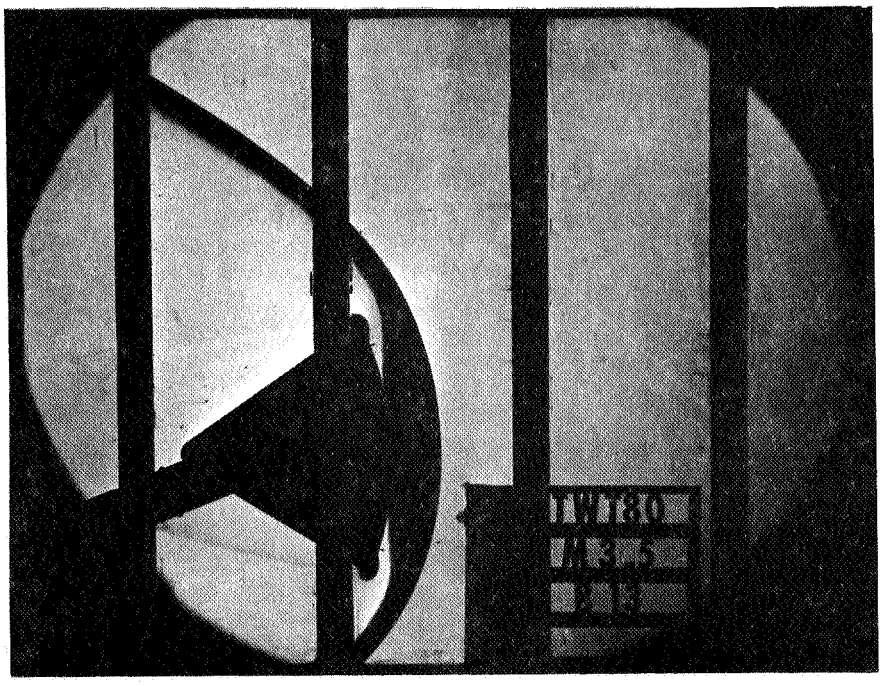

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Figure 8. Typical Schlieren of Command Module (C_{20}) at M = 3.5, α = 180 Degrees

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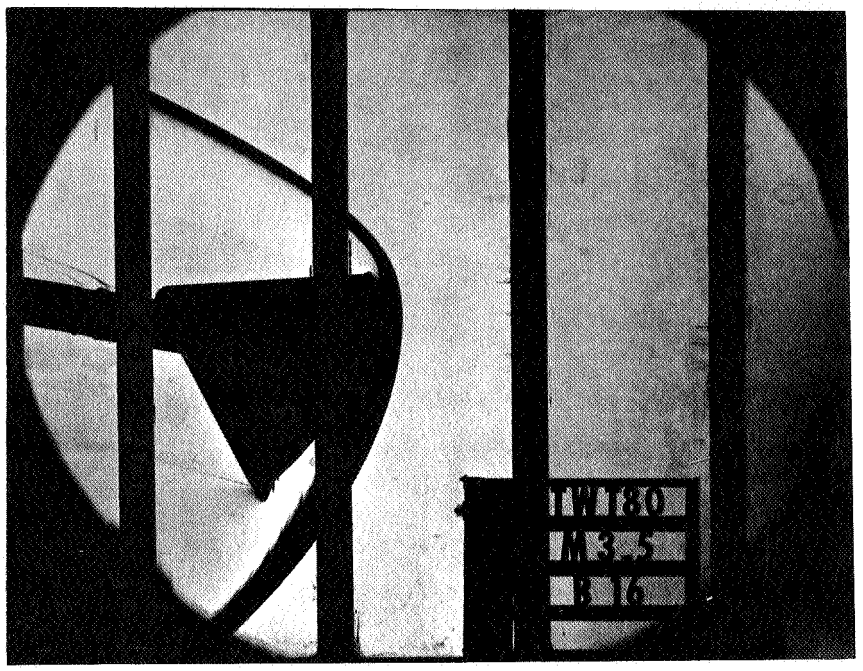

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Figure 9. Typical Schlieren of Command Module (C_2) at M = 3.5, α = 150 Degrees

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Figure 10. Typical Schlieren of Command Module (C_2) at M - 3.5, α = 180 Degrees

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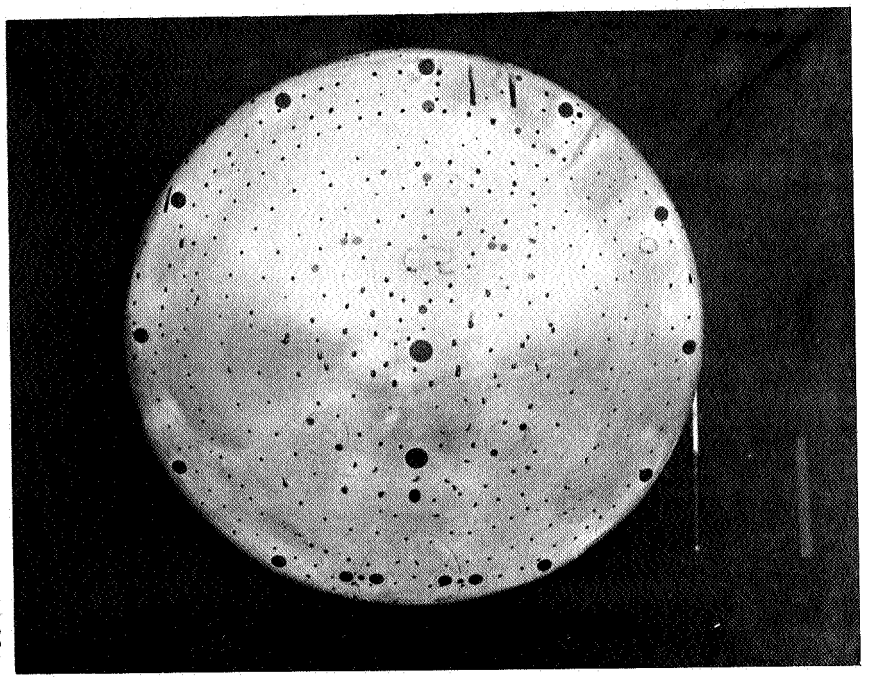

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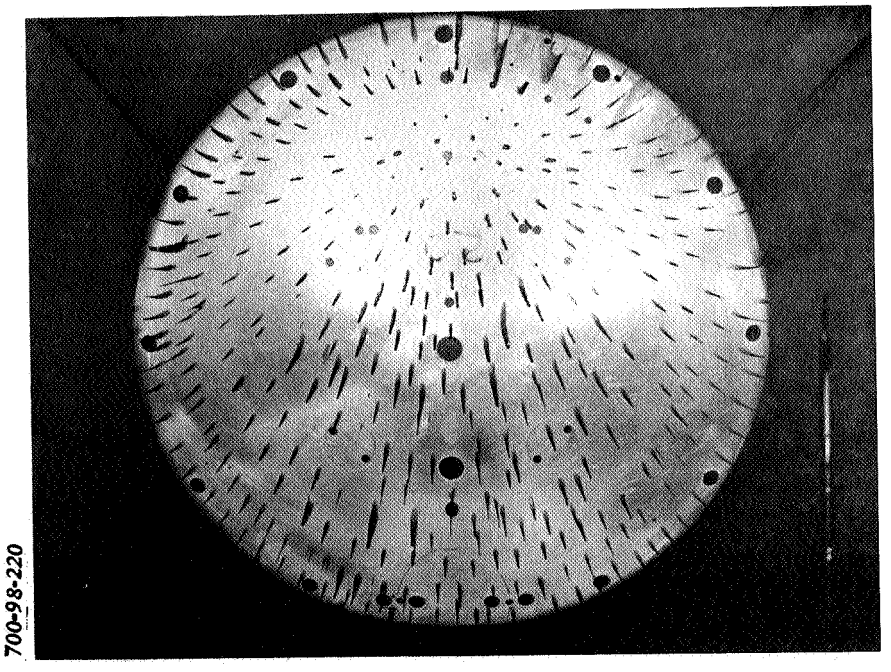

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Figure 11. Typical Oil Flow Photographs of Command Module Heat Shield (C_2) - α = 150 Degrees, M = 0.20, RN = 2.7×10^6

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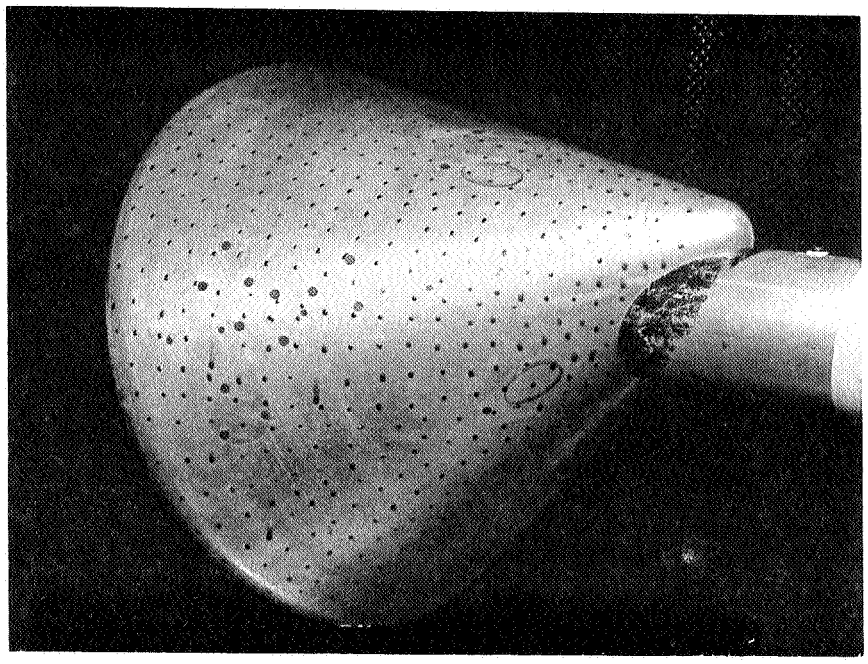

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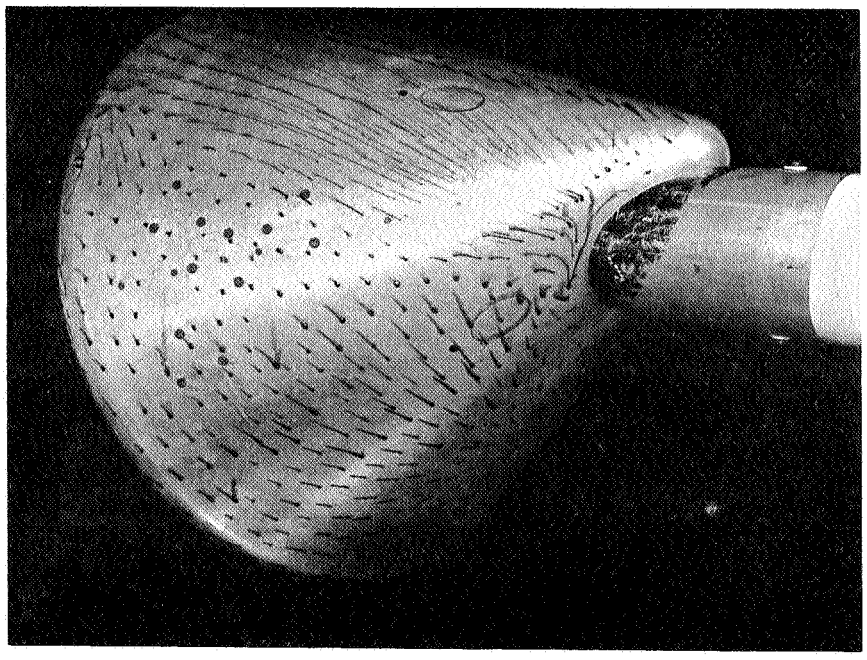
Before



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After

Figure 12. Typical Oil Flow Photographs of Command Module Left Side (C_2) - α = 150 Degrees, M = 0.20, RN = 2.7×10^6

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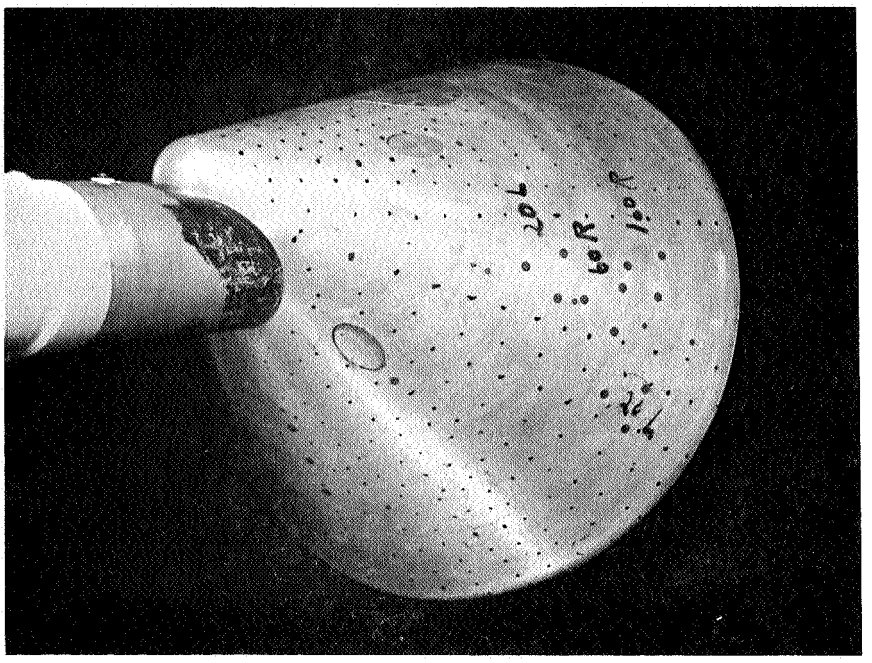

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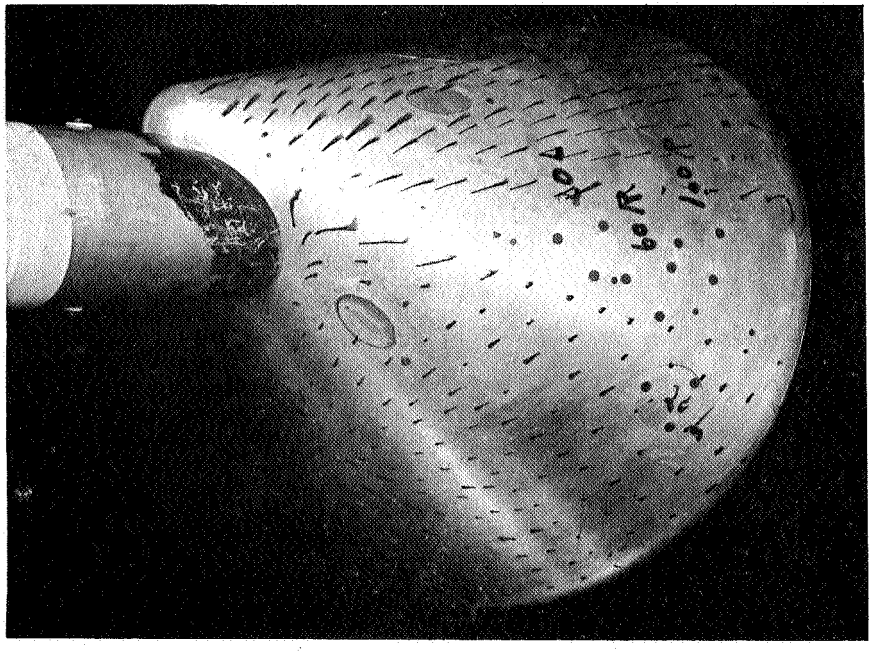

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After

Figure 13. Typical Oil Flow Photographs of Command Module Right Side (C_2) - α = 150 Degrees, M = 0.20, RN - 2.7 x 10^6

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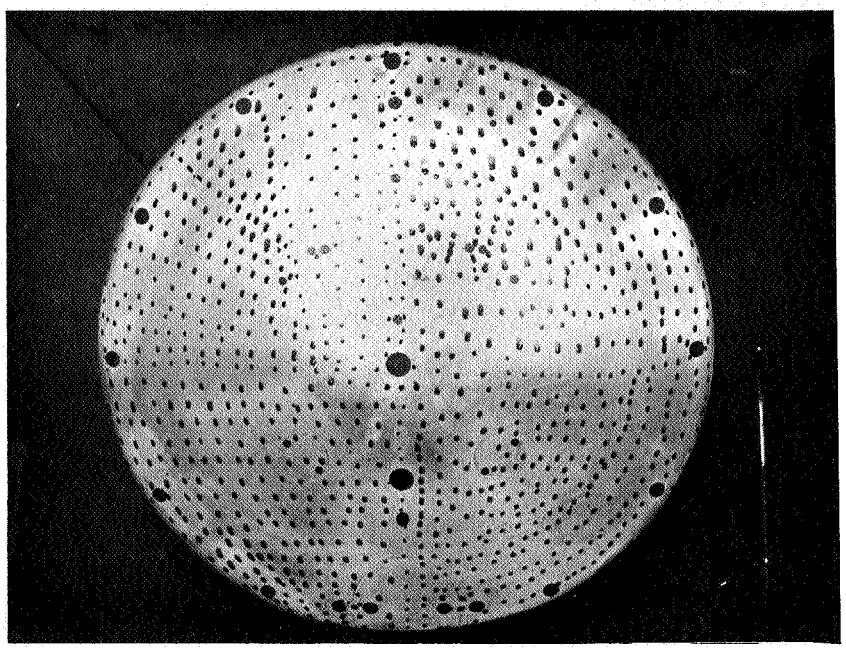

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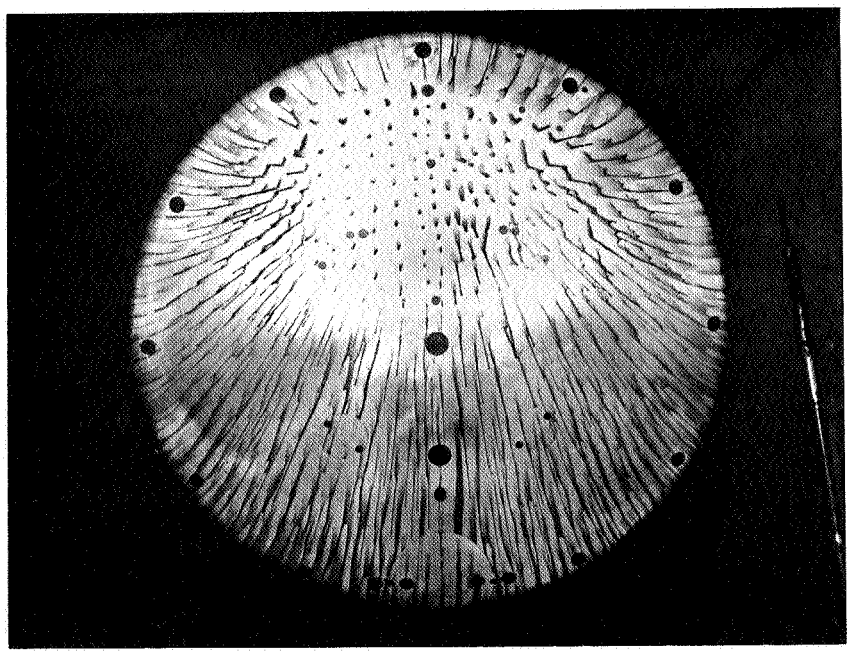

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Figure 14. Typical Oil Flow Photographs of Heat Shield (C_2) - α = 150 Degrees, M = 0.20, RN = 6.0×10^6

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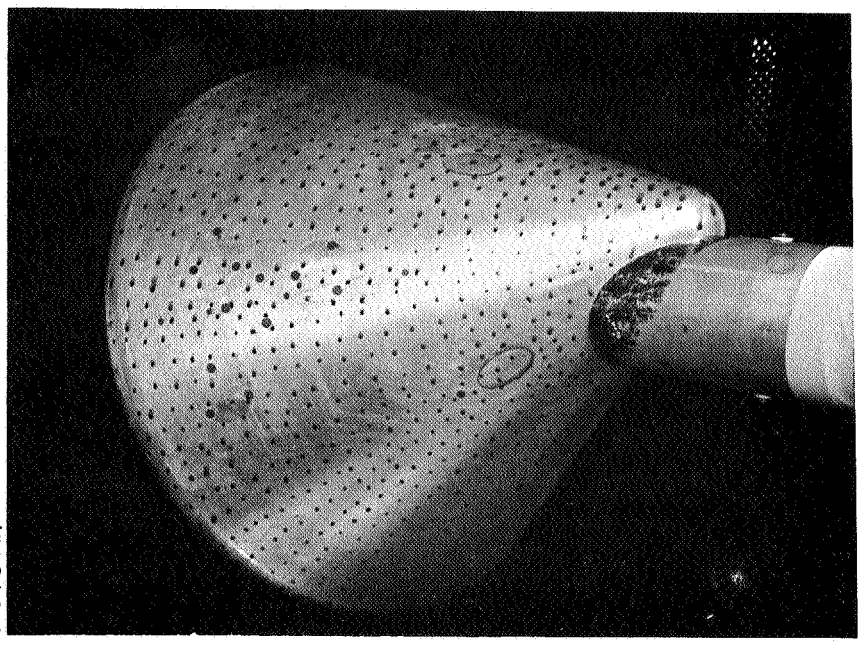

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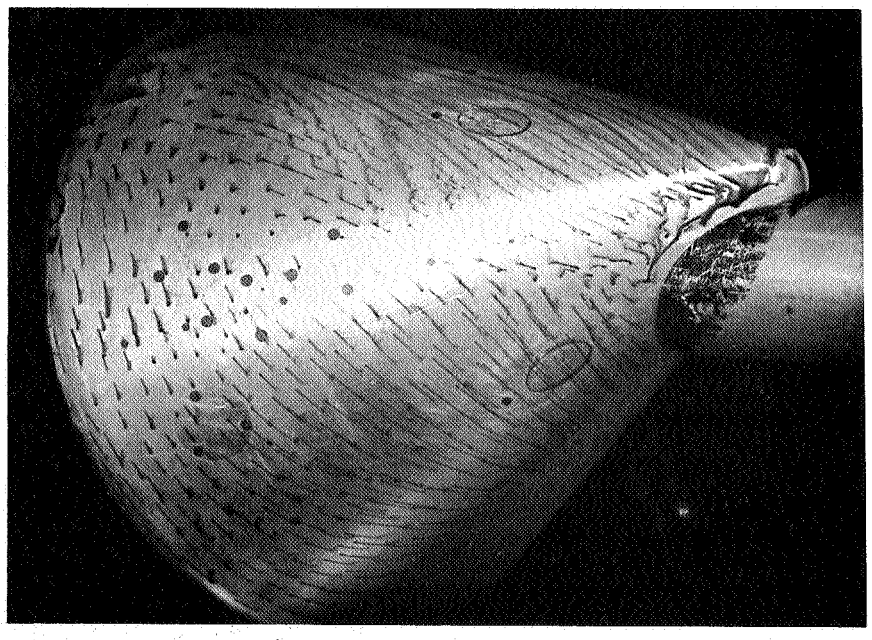

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Figure 15. Typical Oil Flow Photographs of Command Module Left Side (C_2) - α = 150 Degrees, M = 0.20, RN = 6.0×10^6

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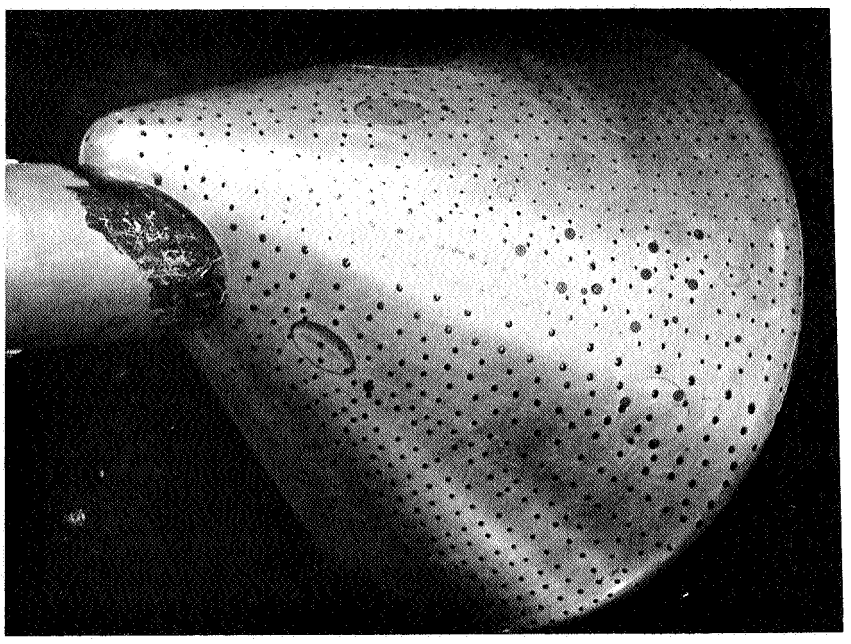

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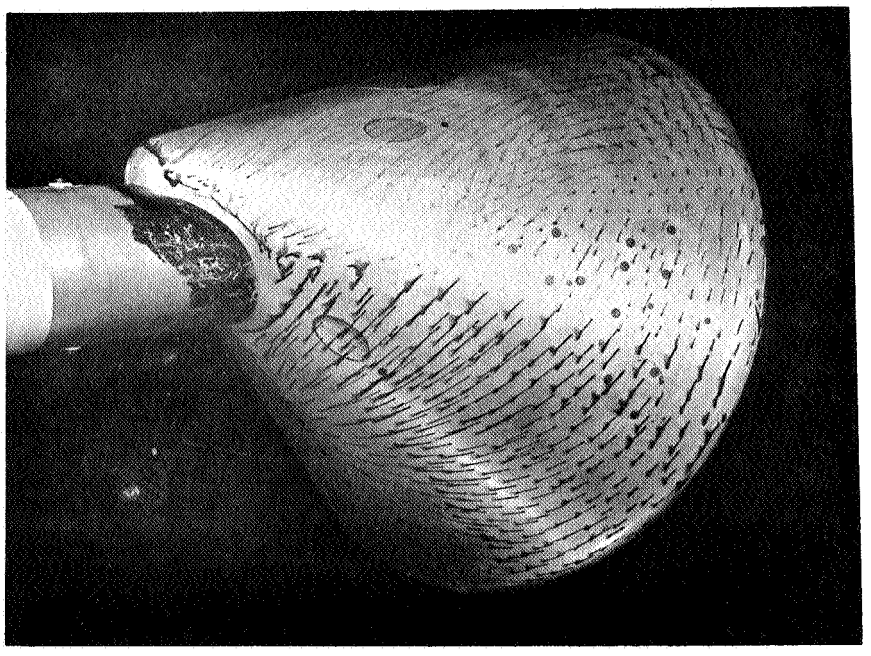

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Figure 16. Typical Oil Flow Photographs of Command Module Right Side (C_2) - α = 150 Degrees, M = 0.20, RN = 6.0×10^6

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IV. NOMENCLATURE

MO=Mach	Test section free-stream Mach number
Po	Test section free-stream static pressure, lb/ft^2
Ho	Test section total pressure, lb/ft^2
TTo	Test section free-stream total temperature, °R
q=Q	Test section free-stream dynamic pressure, lb/ft^2
Pb	Balance chamber pressure, lb/ft^2
PBC	Balance chamber pressure coefficient, $Pb-Po/Q_F$
RN	Reynolds number x 10^{-6} base on reference diameter
α	Angle of attack of model axis of symmetry (zero for apex forward), degrees
ψ	Angle of yaw of model, degrees
ϕB	Model roll angle relative to the tunnel center-line (ϕB=0° and 180° for these tests whenever noted)
θ	Angle between balance axis and model axis of symmetry, degrees
A	Model reference area, 1.4261 ft^2 (maximum cross-sectional area of command module)
d=D	Model reference diameter, 1.3475 ft (maximum diameter of command module)
$\bar{x}$	Distance along model ℄ from command module apex to C.G., inches; negative when aft of apex.
$\bar{z}$	Perpendicular distance from model ℄ to C.G., inches, positive when below model ℄

STABILITY SYSTEM OF AXES WITH ORIGIN AT CENTER OF GRAVITY

CD	Drag coefficient, drag/qA
CL	Lift coefficient, lift/qA
CMS=Cmcg	Pitching-moment coefficient, pitching moment/qAd
CY	Side-force coefficient, side-force/qA
CNS	Yawing-moment coefficient, yawing moment/qAd
CLS	Rolling-moment coefficient, rolling moment/qAd
L/D	Lift-to-drag ratio, CL/CD

BODY SYSTEM OF AXES WITH ORIGIN AT CENTER OF GRAVITY

CA	Axial-force coefficient, axial force/qA
CN	Normal force coefficient, normal force/qA
CNB	Yawing-moment coefficient, yawing moment/qAd
CLB	Rolling-moment coefficient, rolling moment/qAd

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BODY SYSTEM OF AXES WITH ORIGIN AT COMMAND MODULE PROJECTED CONE APEX

CMA	Pitching-moment coefficient, pitching moment/qAd
XCPN	Location of normal force center of pressure divided by the command module diameter measured from the apex, CMA/CN; negative when aft of apex

SUBSCRIPTS

S	Referenced to the stability axes system
B	Referenced to the body axes system

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Appendix A

TABULATED TEST DATA

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Summary of Completed Runs in the NAA Trisonic Tunnel (TWT 80)

Configuration	α Range (Deg)	RUN NUMBER						
		Mach No.	0.2		0.4		0.7		3.493
		RN x 10^{-6}	2.7	6.0	6.8	11.0	8.0	13.0	16.2
C_2	-10 to 20				20	8	19	18	
	5 to 37				28	7		27	
	10 to 30						26		
	35 to 67					5		32	
	60 to 90					6, 11*		33	
	70 to 90				34				
	90 to 120				21	9	22	23	
	105 to 135					10	25	24	
	130 to 162					1	31	2	14, 15*
	150 to 182				29	4	30	3	17+
C_{20}	α = 150		35°	36°					
	130 to 152								12
	150 to 182								13

*Angle of attack decreased during blow
+Repeat of blow 16
°Flow visualization blows

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DATA FORMAT

The key to reading the tabulated data is as follows:

1. The first two lines at the top of each page contain the following identification.

   TWT 80 = Trisonic Wind Tunnel Test No. 80
   Blow xx = The blow number
   Config = Configuration tested
   Theta = Model Offset Angle (θ)

2. First Page - Tunnel conditions

   BN = Block number, identifies block of data computed

   Alpha = Angle of attack, deg

   Yaw = Angle of yaw, deg

   Mach = Test section Mach number

   RN = Reynold's number x 10^{-6} (based on command module diameter, 16.170 inches)

   HO = Test section total pressure, psfa

   PO = Test section static pressure, psfa

   Q = Test section dynamic pressure, psf

   TTO = Test section total temperature, deg Rankin

   Dec = Number of decimal places to the left of the last digit

3. Second Page - Body axis data and balance chamber pressure

   BN = Block number, identifies block of data computed

   Alpha = Angle of attack, deg

   Yaw = Angle of yaw, deg

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CA = Axial force coefficient

CN = Normal force coefficient

CNB = Yawing moment coefficient, about C.G. body axis

CLB = Rolling moment coefficient, body axis

XCPN = Location of the normal force center of pressure divided by the command module diameter.

XCPY = No data

PBC = Balance chamber pressure coefficient

CMA = Pitching moment coefficient about the command module apex

Dec = Number of decimal places to the left of the last digit

4. Third Page - Stability axis data and Lift to Drag ratio

BN = Block number, identifies block of data computed

Alpha = Angle of attack, deg

Yaw = Angle of yaw, deg

CD = Drag coefficient

CL = Lift coefficient

CMS = Pitching moment coefficient, about the center of gravity, stability axis

CY = Side force coefficient

CNS = Yawing moment coefficient, about C.G. stability axis

CLS = Rolling moment coefficient, stability axis

L/D = Lift to Drag ratio

Dec = Number of decimal places to the left of the last digit

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TWT 80 BLOW 1 2ND REDUCTION

CONFIG C2 THETA = 140

TUNNEL CONDITIONS

BN	ALPHA	YAW	MACH	RN	HO	PO	Q	TTO
DEC=	2	2	3	2		1	1	1
369	13012		386	1072	6868	61967	6468	5377
425	13209		395	1101	6851	61523	6720	5338
440	13407		389	1082	6808	61320	6507	5331
456	13609		393	1086	6765	60819	6571	5322
472	13823		397	1098	6765	60694	6686	5312
488	14036		396	1101	6784	60876	6696	5309
504	14247		398	1108	6791	60892	6751	5303
520	14450		395	1100	6778	60868	6651	5298
537	14668		397	1105	6774	60779	6690	5291
553	14878		401	1114	6766	60581	6806	5290
569	15085		396	1104	6760	60674	6665	5283
586	15302		398	1108	6762	60641	6711	5281
602	15503		393	1096	6743	60613	6563	5276
620	15719		394	1100	6741	60556	6592	5269
638	15939		394	1097	6718	60366	6553	5262
719	16182		389	1068	6573	59206	6285	5244

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TWT 80 BLOW 1 2ND REDUCTION

CONFIG C2 THETA = 140

BODY AXES DATA AND BALANCE CHAMBER PRESSURE. (DELTA PBC)/Q

BN	ALPHA	YAW	CA	CN	CNB	CLB	XCPN	PBC	CMA
DEC=	2	2	4	4	4	4	4	4	4
369	13012		- 5992	830	29	13	3514	- 3901	292
425	13209		- 6288	663	8	12	6562	- 4811	435
440	13407		- 6712	546	- 7	10	10321	- 5168	563
456	13609		- 6992	341	8	22	20362	- 5115	695
472	13823		- 7209	135	14	28	62334	- 5325	840
488	14036		- 7544	- 75	13	31	-34299	- 5718	1006
504	14247		- 7665	- 342	4	27	-34600	- 5462	1183
520	14450		- 8060	- 558	9	24	-24009	- 5198	1339
537	14668		- 8166	- 602	- 1	12	-22715	- 5519	1366
553	14878		- 8071	- 801	- 4	19	-18189	- 5099	1458
569	15085		- 8733	- 999	6	7	-15909	- 5157	1589
586	15302		- 8891	- 1200	- 6	8	-13995	- 5344	1679
602	15503		- 9045	- 1157	- 12	17	-13666	- 5000	1582
620	15719		- 9166	- 984	1	20	-13713	- 4988	1350
638	15939		- 8777	- 383	13	17	-20376	- 4813	781
719	16182		- 8944	- 353	12	25	-18825	- 3638	665

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TWT 80 BLOW 1 2ND REDUCTION

CONFIG C2 THETA = 140

STABILITY AXES DATA, DRAG, AND LIFT TO DRAG RATIO

BN	ALPHA	YAW	CD	CL	CMS	CY	CNS	CLS	L/D
DEC=	2	2	4	4	4	4	4	4	4
369	13012		4496	4047	508	165	-29	13	9002
425	13209		4707	4221	519	71	-14	-2	8968
440	13407		5061	4442	542	319	-2	-12	8777
456	13609		5274	4603	516	364	-21	-10	8728
472	13823		5467	4701	507	491	-29	-12	8600
488	14036		5761	4870	510	470	-30	-15	8453
504	14247		5870	4940	496	261	-20	-18	8416
520	14450		6238	5134	481	244	-21	-15	8231
537	14668		6493	4988	472	362	-6	-11	7682
553	14878		6487	4868	431	339	-6	-19	7505
569	15085		7140	5126	388	135	-8	-3	7179
586	15302		7379	5103	331	134	2	-10	6916
602	15503		7711	4868	254	281	4	-20	6313
620	15719		8068	4461	133	334	-9	-18	5529
638	15939		8081	3448	-106	309	-18	-12	4267
719	16182		8388	3126	-106	236	-20	-20	3726

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TWT 80 BLOW 2 2ND REDUCTION

CONFIG C2 THETA = 140

TUNNEL CONDITIONS

BN	ALPHA	YAW	MACH	RN	HO	PO	Q	TTO
DEC=	2	2	3	2		1	1	1
532	13030		742	1350	5257	36464	14064	5332
618	13177		727	1295	5079	35731	13215	5312
633	13376		723	1287	5059	35714	13078	5310
649	13586		728	1299	5084	35718	13266	5309
666	13809		732	1301	5069	35481	13324	5305
683	14034		723	1291	5068	35784	13096	5303
699	14245		727	1299	5080	35739	13221	5300
715	14452		728	1300	5075	35673	13230	5298
731	14657		726	1295	5058	35600	13149	5295
748	14877		724	1292	5049	35612	13075	5290
765	15088		726	1295	5052	35571	13128	5290
782	15303		724	1299	5068	35739	13126	5285
798	15504		718	1283	5030	35686	12871	5283
815	15724		723	1293	5044	35628	13022	5278
832	15936		719	1286	5030	35653	12898	5276
865	16177		719	1284	5015	35547	12857	5269

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TWT 80 BLOW 2 2ND REDUCTION

CONFIG C2 THETA = 140

BODY AXES DATA AND BALANCE CHAMBER PRESSURE, (DELTA PBC)/Q

BN	ALPHA	YAW	CA	CN	CNB	CLB	XCPN	PBC	CMA
DEC=	2	2	4	4	4	4	4	4	4
532	13030		- 6790	1156	12	3	1398	- 5147	162
618	13177		- 6760	979	4	3	2760	- 4761	270
633	13376		- 7323	828	5	4	4946	- 4889	410
649	13586		- 7814	694	3	3	7547	- 5115	524
666	13809		- 8002	452	- 2	7	15115	- 4867	683
683	14034		- 8487	313		4	26280	- 5202	824
699	14245		- 8849	233	- 3	5	36099	- 5310	841
715	14452		- 9002	126	1	8	70202	- 5035	883
731	14657		- 9327	- 3	6	9	-	- 5083	930
748	14877		- 9316	- 32	9	6	-	- 4763	872
765	15088		- 9190	158	3	- 4	39210	- 4623	620
782	15303		- 9173	194	-	3	27057	- 4329	525
798	15504		- 9354	175	2	-	27767	- 4275	485
815	15724		- 9222	185	4	1	21908	- 4042	406
832	15936		- 9345	177	8	1	20059	- 4050	354
865	16177		- 9585	184	6	2	15581	- 4030	287

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TWT 80 BLOW 2 2ND REDUCTION

CONFIG C2 THETA = 140

STABILITY AXES DATA, DRAG, AND LIFT TO DRAG RATIO

BN	ALPHA	YAW	CD	CL	CMS	CY	CNS	CLS	L/D
DEC=	2	2	4	4	4	4	4	4	4
532	13030		5273	4431	554	178	- 10	7	8404
618	13177		5233	4389	544	114	- 5	1	8388
633	13376		5663	4716	546	94	- 6	1	8329
649	13586		6091	4944	539	175	- 4	-	8116
666	13809		6257	5009	521	147	- 3	- 6	8005
683	14034		6734	5175	538	242	- 3	- 3	7685
699	14245		7158	5209	479	151	- 1	- 5	7278
715	14452		7403	5122	439	211	- 6	- 6	6919
731	14657		7782	5141	378	289	- 10	- 4	6605
748	14877		7949	4858	300	293	- 11	-	6112
765	15088		8105	4334	187	148	- 1	5	5347
782	15303		8264	3988	117	212	- 1	- 3	4826
798	15504		8554	3789	53	226	- 2	1	4429
815	15724		8576	3397	- 11	172	- 4		3962
832	15936		8807	3129	- 76	157	- 8	2	3552
865	16177		9162	2823	- 152	212	- 6		3081

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TWT 80 BLOW 3 2ND REDUCTION

CONFIG C2 THETA = 160

TUNNEL CONDITIONS

BN	ALPHA	YAW	MACH	RN	HO	PO	Q	TTO
DEC=	2	2	3	2		1	1	1
500	15027		741	1327	5182	35999	13823	5339
528	15026		728	1335	5260	36966	13720	5338
556	15033		717	1294	5141	36504	13131	5332
584	15334		712	1282	5107	36430	12917	5327
612	15697		721	1284	5072	35877	13056	5322
640	16060		722	1288	5078	35885	13094	5317
668	16421		719	1286	5077	35975	13022	5314
696	16779		716	1279	5055	35909	12903	5310
724	17130		720	1285	5058	35807	12999	5305
752	17480		717	1282	5052	35872	12900	5300
780	17832		717	1280	5043	35807	12885	5298
808	18127		716	1279	5031	35746	12830	5290
836	18168		717	1279	5023	35672	12829	5285
864	18180		717	1278	5009	35561	12799	5278
880	17641		713	1270	4989	35541	12658	5276

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TWT 80 BLOW 3 2ND REDUCTION

CONFIG C2 THETA = 160

BODY AXES DATA AND BALANCE CHAMBER PRESSURE, (DELTA PBC)/Q

BN	ALPHA	YAW	CA	CN	CNB	CLB	XCPN	PBC	CMA
DEC=	2	2	4	4	4	4	4	4	4
500	15027		- 9890	272	26	2	22217	- 5706	604
528	15026		- 9611	109	23	4	66162	- 6453	721
556	15033		- 9560	23	25	- 2	-	- 6390	788
584	15334		- 9886	185	25	3	31421	- 6439	582
612	15697		- 9697	147	30	7	32535	- 5947	477
640	16060		- 9738	76	30	4	56241	- 5936	429
668	16421		- 9862	- 51	34	7	-81525	- 5801	418
696	16779		- 9699	- 2	42	9	-	- 3987	285
724	17130		- 9608	118	46	14	9303	- 3921	110
752	17480		- 9855	420	48	9	- 4340	- 3996	- 182
780	17832		-10052	459	53	13	- 6139	- 4312	- 282
808	18127		-10169	414	56	12	- 7810	- 4258	- 323
836	18168		-10118	396	55	10	- 7941	- 4572	- 315
864	18180		-10187	413	57	12	- 7869	- 4446	- 325
880	17641		-10015	538	52	5	- 5816	- 4449	- 313

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TWT 80 BLOW 3 2ND REDUCTION

CONFIG C2 THETA = 160

STABILITY AXES DATA, DRAG, AND LIFT TO DRAG RATIO

BN	ALPHA	YAW	CD	CL	CMS	CY	CNS	CLS	L/D
DEC=	2	2	4	4	4	4	4	4	4
500	15027		8723	4669	207	216	-23	11	5352
528	15026		8399	4673	229	192	-22	8	5564
556	15033		8318	4712	240	254	-21	14	5665
584	15334		8918	4270	126	271	-24	9	4789
612	15697		8981	3659	6	210	-31	5	4074
640	16060		9211	3162	-93	237	-29	6	3433
668	16421		9476	2732	-199	196	-34	2	2884
696	16779		9479	2054	-289	317	-43	-7	2167
724	17130		9515	1337	-375	221	-48	-5	1405
752	17480		9853	476	-475	155	-48	-11	483
780	17832		10061	-164	-560	246	-54	-13	-163
808	18127		10158	-639	-639	185	-55	-11	-629
836	18168		10102	-692	-640	247	-55	-14	-685
864	18180		10169	-733	-643	275	-56	-2	-721
880	17641		10029	91	-534	150	-52		91

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TWT 80 BLOW 4 2ND REDUCTION

CONFIG C2 THETA = 160

TUNNEL CONDITIONS

BN	ALPHA	YAW	MACH	RN	HO	PO	Q	TTO
DEC=	2	2	3	2		1	1	1
646	15030		386	1081	6903	62279	6505	5365
696	15189		398	1116	6873	61620	6839	5326
712	15399		390	1095	6854	61717	6571	5319
727	15599		396	1098	6767	60731	6673	5310
743	15810		407	1121	6745	60193	6966	5302
759	16023		403	1124	6805	60832	6929	5298
775	16233		394	1116	6879	61802	6727	5295
791	16445		388	1082	6758	60909	6423	5290
808	16665		404	1121	6744	60258	6897	5281
824	16873		404	1136	6823	60969	6973	5273
842	17104		396	1117	6827	61285	6720	5271
859	17325		399	1111	6731	60318	6723	5264
877	17561		398	1117	6772	60711	6737	5259
894	17779		403	1134	6795	60751	6918	5256
911	17997		393	1105	6773	60896	6573	5254

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TWT 80 BLOW 4 2ND REDUCTION

CONFIG C2 THETA = 160

BODY AXES DATA AND BALANCE CHAMBER PRESSURE, (DELTA PBC)/Q

BN	ALPHA	YAW	CA	CN	CNB	CLB	XCPN	PBC	CMA
DEC=	2	2	4	4	4	4	4	4	4
646	15030		- 8521	- 772	33	20	-18857	- 3086	1455
696	15189		- 8800	- 857	31	10	-17500	- 4579	1500
712	15399		- 9340	- 1042	57	31	-15211	- 4925	1585
727	15599		- 9034	- 1028	28	11	-14247	- 5045	1464
743	15810		- 8778	- 1074	41	14	-12814	- 5027	1376
759	16023		- 8992	- 926	63	6	-12699	- 5485	1176
775	16233		- 9341	- 672	58	2	-14170	- 5714	953
791	16445		- 9415	- 721	54	12	-12601	- 5160	909
808	16665		- 8708	- 457	52	16	-13617	- 4689	623
824	16873		- 8576	- 365	56	23	-13697	- 4670	500
842	17104		- 8687	- 60	58	15	-41471	- 4149	248
859	17325		- 8435	79	60	2	9635	- 3887	76
877	17561		- 8733	297	75	17	- 3485	- 4814	- 103
894	17779		- 8512	447	57	13	- 5526	- 4678	- 247
911	17997		- 9138	621	72	6	- 6598	- 5217	- 410

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TWT 80 BLOW 4 2ND REDUCTION

CONFIG C2 THETA = 160

STABILITY AXES DATA, DRAG, AND LIFT TO DRAG RATIO

BN	ALPHA	YAW	CD	CL	CMS	CY	CNS	CLS	L/D
DEC=	2	2	4	4	4	4	4	4	4
646	15030		7019	4892	423	242	-38	-1	6969
696	15189		7359	4902	393	259	-32	6	6662
712	15399		7938	5032	318	235	-65	-3	6339
727	15599		7834	4615	226	321	-30	2	5891
743	15810		7744	4271	121	341	-43	2	5515
759	16023		8148	3913	10	161	-61	15	4802
775	16233		8696	3476	-60	84	-56	15	3998
791	16445		8877	3220	-142	237	-55	3	3627
808	16665		8368	2455	-205	391	-54	-4	2934
824	16873		8339	2034	-257	324	-60	-12	2440
842	17104		8572	1412	-305	101	-60	-6	1648
859	17325		8386	913	-367	239	-60	5	1089
877	17561		8730	373	-415	326	-76	-12	428
894	17779		8523	-118	-442	138	-58	-10	-139
911	17997		9138	-617	-523	57	-72	-6	-675

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TWT 80 BLOW 5

CONFIG C2 THETA = 40

TUNNEL CONDITIONS

BN	ALPHA	YAW	MACH	RN	HO	PO	Q	TTO
DEC=	2	2	3	2		1	1	1
519	3916		387	1089	6852	61779	6492	5314
581	3916		396	1116	6842	61420	6731	5285
600	3927		396	1107	6775	60813	6667	5278
617	4156		391	1097	6771	60922	6537	5273
634	4378		399	1118	6788	60846	6766	5268
651	4604		398	1120	6792	60886	6765	5262
668	4824		398	1119	6786	60842	6750	5259
685	5044		397	1120	6807	61068	6729	5256
702	5262		400	1124	6772	60648	6793	5250
719	5474		400	1122	6749	60429	6784	5245
735	5679		396	1115	6768	60753	6664	5244
752	5894		401	1129	6768	60583	6817	5239
770	6119		399	1123	6760	60587	6737	5235
787	6326		401	1126	6749	60429	6786	5233

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TWT 80 BLOW 5

CONFIG C2 THETA = 40

BODY AXES DATA AND BALANCE CHAMBER PRESSURE, (DELTA PBC)/Q

BN	ALPHA	YAW	CA	CN	CNB	CLB	XCPN	PBC	CMA
DEC=	2	2	4	4	4	4	4	4	4
519	3916		2748	4029	5	- 3	- 6809	- 2822	- 2743
581	3916		2624	4193	13	5	- 6821	- 3639	- 2860
600	3927		2300	4324	11	2	- 6817	- 3632	- 2947
617	4156		2144	4567	4	7	- 6830	- 4368	- 3120
634	4378		1737	4480	3	5	- 6822	- 4001	- 3056
651	4604		1450	4469	2	5	- 6815	- 3839	- 3046
668	4824		1264	4480	9	9	- 6849	- 3817	- 3068
685	5044		877	4459	- 1	7	- 6853	- 3588	- 3056
702	5262		856	4252	39	19	- 6917	- 3449	- 2941
719	5474		1926	3099	125	55	- 7670	- 2793	- 2377
735	5679		2411	2480	120	59	- 8660	- 3103	- 2148
752	5894		2300	1954	75	61	- 9729	- 2784	- 1901
770	6119		2062	1687	42	66	-10675	- 2964	- 1800
787	6326		2205	432	- 20	7	-26135	- 2570	- 1129

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TWT 80 BLOW 5

CONFIG C2 THETA = 40

STABILITY AXES DATA, DRAG, AND LIFT TO DRAG RATIO

BN	ALPHA	YAW	CD	CL	CMS	CY	CNS	CLS	L/D
DEC=	2	2	4	4	4	4	4	4	4
519	3916		4674	1389	185	13	6		2971
581	3916		4682	1594	173	96	7	12	3404
600	3927		4517	1891	156	95	7	9	4187
617	4156		4635	1995	142	96	- 2	7	4304
634	4378		4354	2033	122	91	- 1	5	4668
651	4604		4224	2059	108	124	- 2	5	4874
668	4824		4184	2041	81	174	- 1	13	4878
685	5044		3996	2164	57	105	- 6	4	5416
702	5262		3898	1901	28	323	9	42	4876
719	5474		3642	216	- 136	890	27	133	593
735	5679		3396	- 658	- 303	1052	16	133	- 1938
752	5894		2860	- 963	- 424	1118	- 14	96	- 3365
770	6119		2471	- 994	- 521	1082	- 38	69	- 4023
787	6326		1378	- 1775	- 702	311	- 15	- 15	-12884

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TWT 80 BLOW 6

CONFIG C2 THETA = 60

TUNNEL CONDITIONS

BN	ALPHA	YAW	MACH	RN	HO	PO	Q	TTO
DEC=	2	2	3	2		1	1	1
589	5977		396	1121	6867	61619	6779	5288
630	6139		397	1110	6774	60779	6690	5273
645	6340		396	1109	6768	60746	6670	5268
660	6534		399	1119	6780	60754	6775	5264
677	6754		398	1118	6784	60819	6745	5262
694	6977		399	1122	6789	60847	6772	5256
711	7195		398	1117	6770	60710	6724	5254
727	7403		399	1120	6759	60560	6752	5249
744	7623		398	1120	6763	60617	6737	5244
761	7829		400	1124	6764	60593	6770	5240
777	8032		397	1118	6759	60617	6704	5240
794	8249		397	1114	6735	60427	6658	5235
811	8465		398	1116	6719	60241	6678	5228
828	8681		400	1123	6718	60156	6753	5227
916	8937		392	1056	6395	57522	6190	5201

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TWT 80 BLOW 6

CONFIG C2 THETA = 60

BODY AXES DATA AND BALANCE CHAMBER PRESSURE, (DELTA PBC)/Q

BN	ALPHA	YAW	CA	CN	CNB	CLB	XCPN	PBC	CMA
DEC=	2	2	4	4	4	4	4	4	4
589	5977		2344	2167	121	43	- 9015	- 901	- 1954
630	6139		2045	1832	93	54	- 9651	61	- 1768
645	6340		1667	1716	57	47	-10176	358	- 1746
660	6534		1682	1096	15	39	-13507	2025	- 1481
677	6754		1622	314	- 9	- 6	-36800	2907	- 1157
694	6977		1213	551	- 13	1	-23491	2784	- 1293
711	7195		796	775	- 7	- 3	-18444	2809	- 1429
727	7403		458	1005	- 5	- 6	-15419	2611	- 1549
744	7623		592	1551	- 8	6	-12125	2299	- 1881
761	7829		3237	2048	3	7	-11215	2382	- 2296
777	8032		2992	2223	4	6	-10685	2522	- 2376
794	8249		2666	2353		8	-10225	2671	- 2406
811	8465		2369	2443	1	6	- 9793	1868	- 2393
828	8681		1983	2493	- 1	10	- 9411	295	- 2346
916	8937		1540	2653	2		- 8871	- 1476	- 2354

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[redacted]

TWT 80 BLOW 6

CONFIG C2 THETA = 60

STABILITY AXES DATA, DRAG, AND LIFT TO DRAG RATIO

BN	ALPHA	YAW	CD	CL	CMS	CY	CNS	CLS	L/D
DEC=	2	2	4	4	4	4	4	4	4
589	5977		3053	- 934	- 328	679	24	126	- 3060
630	6139		2587	- 919	- 390	830	- 3	108	- 3552
645	6340		2281	- 722	- 470	750	- 16	72	- 3168
660	6534		1698	- 1072	- 629	544	- 29	30	- 6310
677	6754		910	- 1379	- 845	- 39	2	- 11	-15151
694	6977		936	- 948	- 844	- 43	- 5	- 12	-10122
711	7195		983	- 517	- 850	- 12	1	- 8	- 5253
727	7403		1092	- 164	- 832	2	5	- 6	- 1503
744	7623		1648	- 206	- 781	33	- 8	- 6	- 1250
761	7829		2662	- 2754	- 700	78	- 7	4	-10346
777	8032		2695	- 2576	- 673	76	- 6	5	- 9559
794	8249		2681	- 2336	- 633	38	- 8	1	- 8711
811	8465		2653	- 2131	- 576	34	- 6	1	- 8031
828	8681		2600	- 1842	- 518	47	- 10	- 1	- 7084
916	8937		2670	- 1511	- 442	26	-	2	- 5660

[redacted]

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TWT 80 BLOW 7

CONFIG C2 THETA = 20

TUNNEL CONDITIONS

BN	ALPHA	YAW	MACH	RN	HO	PO	Q	TTO
DEC=	2	2	3	2		1	1	1
548	522		403	1138	6873	61459	6982	5286
596	686		397	1106	6758	60626	6682	5278
612	893		395	1103	6758	60695	6623	5273
628	1102		399	1118	6789	60832	6783	5273
644	1306		396	1109	6779	60852	6668	5269
660	1515		397	1112	6782	60852	6701	5269
676	1718		397	1113	6773	60767	6694	5262
692	1926		399	1119	6762	60577	6767	5259
708	2131		397	1113	6759	60630	6696	5259
724	2339		396	1112	6763	60699	6669	5256
740	2542		396	1109	6749	60573	6648	5256
756	2744		399	1119	6755	60525	6756	5250
773	2960		398	1114	6739	60436	6686	5245
790	3175		396	1107	6715	60266	6622	5245
806	3377		399	1114	6717	60210	6694	5242
825	3610		396	1104	6691	60060	6591	5237

[redacted]

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TWT 80 BLOW 7

CONFIG C2 THETA = 20

BODY AXES DATA AND BALANCE CHAMBER PRESSURE, (DELTA PBC)/Q

BN	ALPHA	YAW	CA	CN	CNB	CLB	XCPN	PBC	CMA
DEC=	2	2	4	4	4	4	4	4	4
548	522		5329	717	9	4	- 6555	- 4053	- 470
596	686		5248	1039	3	- 1	- 6511	- 3641	- 677
612	893		5270	1340	24	10	- 6527	- 3753	- 875
628	1102		5055	1540	16	4	- 6616	- 3797	- 1019
644	1306		4989	1885	10	9	- 6629	- 3928	- 1250
660	1515		4773	2179	10	9	- 6617	- 3897	- 1442
676	1718		4561	2400	13	11	- 6652	- 3775	- 1597
692	1926		4255	2583	16	8	- 6687	- 3629	- 1727
708	2131		4137	2879	6	7	- 6674	- 3699	- 1922
724	2339		3853	3132	- 6	4	- 6679	- 3639	- 2092
740	2542		3710	3347	3	9	- 6715	- 3616	- 2247
756	2744		3384	3453	- 12	9	- 6726	- 3428	- 2322
773	2960		3074	3649	8	8	- 6738	- 3331	- 2459
790	3175		2870	3856	8	7	- 6749	- 3442	- 2602
806	3377		2618	3966	8	8	- 6766	- 3462	- 2683
825	3610		2308	4142	- 4	12	- 6784	- 3373	- 2810

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TWT 80 BLOW 7

CONFIG C2 THETA = 20

STABILITY AXES DATA, DRAG, AND LIFT TO DRAG RATIO

BN	ALPHA	YAW	CD	CL	CMS	CY	CNS	CLS	L/D
DEC=	2	2	4	4	4	4	4	4	4
548	522		5372	230	337	36	9	5	428
596	686		5334	406	346	-15	3	-	760
612	893		5415	506	356	104	23	13	934
628	1102		5256	546	336	50	15	7	1039
644	1306		5286	709	339	84	8	11	1341
660	1515		5177	856	336	82	8	11	1653
676	1718		5066	946	320	115	9	15	1867
692	1926		4869	1035	297	97	12	13	2127
708	2131		4900	1178	299	62	3	9	2405
724	2339		4779	1345	285	27	-7	2	2814
740	2542		4787	1431	269	78	-2	10	2989
756	2744		4594	1505	247	58	-14	3	3275
773	2960		4475	1654	227	92	3	11	3697
790	3175		4469	1769	214	92	3	10	3957
806	3377		4381	1841	193	90	2	11	4203
825	3610		4305	1987	169	107	-10	7	4616

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TWT 80 BLOW 8

CONFIG C2 THETA = 20

TUNNEL CONDITIONS

BN	ALPHA	YAW	MACH	RN	HO	PO	Q	TTO
DEC=	2	2	3	2		1	1	1
586	2012		388	1100	6967	62810	6611	5344
622	1849		403	1094	6661	59568	6767	5317
638	1639		401	1119	6833	61161	6889	5317
655	1417		397	1113	6862	61565	6780	5314
671	1207		398	1107	6793	60902	6758	5310
688	987		398	1102	6751	60514	6726	5303
704	779		400	1111	6774	60676	6791	5298
721	560		396	1106	6794	60959	6709	5297
737	353		393	1096	6786	61019	6581	5295
753	144		396	1103	6770	60760	6670	5290
769	- 60		398	1106	6753	60558	6705	5286
787	- 286		398	1108	6763	60643	6719	5283
804	- 502		398	1111	6769	60680	6735	5281
821	- 717		398	1110	6754	60538	6727	5278
934	- 963		394	1085	6637	59645	6467	5256

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TWT 80 BLOW 8

CONFIG C2 THETA = 20

BODY AXES DATA AND BALANCE CHAMBER PRESSURE, (DELTA PBC)/Q

BN	ALPHA	YAW	CA	CN	CNB	CLB	XCPN	PBC	CMA
DEC=	2	2	4	4	4	4	4	4	4
586	2012		4542	2778	1	-1	-6684	-3254	-1857
622	1849		4341	2468	-5	6	-6673	-3570	-1647
638	1639		4715	2374	5	8	-6626	-4129	-1573
655	1417		4908	2097	-5	9	-6632	-4114	-1391
671	1207		4933	1778		1	-6578	-3803	-1169
688	987		5003	1467	12	5	-6609	-3667	-970
704	779		5203	1189	1	6	-6634	-3626	-789
721	560		5385	852	9	4	-6592	-3986	-561
737	353		5570	629	20	13	-6494	-4192	-408
753	144		5505	334	17	9	-6331	-3652	-212
769	-60		5510	-11	4	5	-	-3521	15
787	-286		5439	-313	4	5	-7349	-3640	230
804	-502		5378	-672	17	2	-6903	-3862	464
821	-717		5267	-1001	10	-2	-6808	-3797	681
934	-963		5182	-1334	11		-6887	-3646	919

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TWT 80 BLOW 8

CONFIG C2 THETA = 20

^TABILITY AXES DATA, DRAG, AND LIFT TO DRAG RATIO

BN	ALPHA	YAW	CD	CL	CMS	CY	CNS	CLS	L/D
DEC=	2	2	4	4	4	4	4	4	4
586	2012		5220	1046	318	30	1	-	2004
622	1849		4900	963	303	63	- 6	4	1966
638	1639		5193	947	335	95	3	9	1824
655	1417		5272	832	338	64	- 7	7	1578
671	1207		5195	707	342	32		1	1361
688	987		5180	588	333	67	11	7	1136
704	779		5316	473	334	33		6	890
721	560		5442	322	341	35	9	5	591
737	353		5598	285	352	123	19	14	509
753	144		5512	196	343	88	17	10	355
769	- 60		5510	47	333	22	4	5	86
787	- 286		5448	- 41	336	23	4	5	- 75
804	- 502		5416	- 199	320	42	17		- 368
821	- 717		5350	- 335	305	- 7	9	- 3	- 627
934	- 963		5332	- 448	309	- 7	11	- 1	- 841

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TWT 80 BLOW 9

CONFIG C2 THETA = 120

TUNNEL CONDITIONS

BN	ALPHA	YAW	MACH	RN	HO	PO	Q	TTO
DEC=	2	2	3	2		1	1	1
545	12024		395	1080	6702	60192	6565	5324
572	11855		405	1124	6798	60701	6985	5314
588	11645		400	1125	6881	61631	6904	5314
604	11431		397	1105	6802	61032	6723	5310
620	11220		398	1101	6761	60628	6710	5309
637	10999		402	1112	6767	60555	6836	5305
653	10792		397	1105	6790	60907	6723	5303
670	10576		398	1108	6792	60907	6746	5303
687	10357		396	1102	6773	60778	6681	5300
703	10152		398	1107	6770	60681	6744	5298
719	9947		400	1109	6757	60519	6771	5295
736	9730		396	1100	6750	60592	6648	5290
753	9509		398	1108	6761	60608	6735	5290
769	9304		398	1105	6748	60503	6704	5286
837	9051		399	1103	6697	59998	6698	5274

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TWT 80 BLOW 9

CONFIG C2 THETA = 120

BODY AXES DATA AND BALANCE CHAMBER PRESSURE, (DELTA PBC)/Q

BN	ALPHA	YAW	CA	CN	CNB	CLB	XCPN	PBC	CMA
DEC=	2	2	4	4	4	4	4	4	4
545	12024		- 3934	1440	- 5	- 1	- 2378	- 3634	- 342
572	11855		- 3563	1496	- 3	12	- 2748	- 4190	- 411
588	11645		- 2246	1523	- 1	- 9	- 2723	- 2724	- 415
604	11431		- 1405	1746	1	- 2	- 3695	- 2188	- 645
620	11220		- 980	1927	- 2	- 3	- 4326	- 2566	- 833
637	10999		- 534	2068	- 1	- 2	- 4900	- 2435	- 1013
653	10792		- 181	2261	- 1	- 1	- 5345	- 2705	- 1209
670	10576		235	2378	- 4	- 10	- 5784	- 2380	- 1376
687	10357		565	2490	- 2	- 3	- 6173	- 2492	- 1537
703	10152		858	2512	- 1	- 9	- 6512	- 2337	- 1636
719	9947		1108	2569	1	- 2	- 6859	- 2218	- 1762
736	9730		1463	2726	7	4	- 7234	- 2511	- 1972
753	9509		1760	2760	3	- 3	- 7558	- 2691	- 2086
769	9304		2047	2793	2	- 4	- 7852	- 2913	- 2193
837	9051		2290	2737	2	- 3	- 8216	- 3438	- 2248

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TWT 80 BLOW 9

CONFIG C2 THETA = 120

STABILITY AXES DATA, DRAG, AND LIFT TO DRAG RATIO

BN	ALPHA	YAW	CD	CL	CMS	CY	CNS	CLS	L/D
DEC=	2	2	4	4	4	4	4	4	4
545	12024		3225	2673	414	71	3	- 4	8288
572	11855		3017	2415	405	51	- 9	- 8	8005
588	11645		2364	1332	498	9	8	3	5636
604	11431		2169	561	470	35	2	1	2588
620	11220		2154	179	431	6	3	- 1	833
637	10999		2126	- 205	375	10	2	-	- 964
653	10792		2207	- 524	333	14	1	-	- 2373
670	10576		2225	- 872	271	- 15	11	- 2	- 3921
687	10357		2288	- 1134	205	- 46	4	- 1	- 4955
703	10152		2290	- 1342	139	- 9	9	1	- 5862
719	9947		2351	- 1515	67	- 40	2	2	- 6445
736	9730		2519	- 1797	- 14	32	- 4	6	- 7137
753	9509		2593	- 1998	- 87	- 16	2	3	- 7704
769	9304		2680	- 2192	- 155	4	4	2	- 8179
837	9051		2716	- 2314	- 235	- 44	3	2	- 8521

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TWT 80 BLOW 10 2ND REDUCTION

CONFIG C2 THETA = 120

TUNNEL CONDITIONS

BN	ALPHA	YAW	MACH	RN	HO	PO	Q	TTO
DEC=	2	2	3	2		1	1	1
656	10526		403	1101	6709	59980	6824	5324
700	10693		391	1084	6774	60950	6536	5322
716	10901		396	1095	6769	60764	6662	5319
732	11108		402	1113	6792	60772	6868	5317
748	11318		397	1103	6799	60987	6730	5317
765	11539		398	1105	6794	60922	6750	5314
782	11759		396	1100	6787	60918	6688	5312
798	11969		395	1101	6800	61059	6680	5310
815	12187		398	1103	6776	60760	6725	5309
832	12408		397	1096	6738	60453	6665	5307
849	12626		395	1096	6769	60789	6636	5305
866	12844		396	1103	6792	60962	6690	5303
883	13063		396	1099	6761	60688	6660	5300
900	13279		396	1096	6745	60542	6639	5298
917	13494		396	1096	6728	60372	6644	5295
977	13692		395	1081	6634	59572	6512	5283

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TWT 80 BLOW 10 2ND REDUCTION

CONFIG C2 THETA = 120

BODY AXES DATA AND BALANCE CHAMBER PRESSURE, (DELTA PBC)/Q

BN	ALPHA	YAW	CA	CN	CNB	CLB	XCPN	PBC	CMA
DEC=	2	2	4	4	4	4	4	4	4
656	10526		399	2348	- 6	5	- 5924	- 2811	- 1391
700	10693		116	2380	3	5	- 5689	- 2338	- 1354
716	10901		- 249	2231	4	9	- 5261	- 2678	- 1174
732	11108		- 620	2048	- 6	- 9	- 4790	- 2574	- 981
748	11318		- 1068	1910	- 4	- 8	- 4266	- 2255	- 815
765	11539		- 1553	1692	- 4	- 6	- 3523	- 2292	- 596
782	11759		- 2178	1472	- 4	-	- 2570	- 2648	- 378
798	11969		- 3768	1489		3	- 2544	- 3966	- 379
815	12187		- 4211	1358	- 2	1	- 1827	- 4177	- 248
832	12408		- 4722	1188	20	- 17	- 647	- 4110	- 77
849	12626		- 5216	1047	- 10	8	659	- 4622	69
866	12844		- 5598	866	- 5	- 3	2757	- 4466	239
883	13063		- 6014	608	- 6	- 24	7560	- 4691	460
900	13279		- 6336	493	9	- 23	11547	- 4773	569
917	13494		- 6541	410	5	- 8	15379	- 4764	631
977	13692		- 7078	34	3	3	-	- 4775	935

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TWT 80 BLOW 10 2ND REDUCTION

CONFIG C2 THETA = 120

STABILITY AXES DATA, DRAG, AND LIFT TO DRAG RATIO

BN	ALPHA	YAW	CD	CL	CMS	CY	CNS	CLS	L/D
DEC=	2	2	4	4	4	4	4	4	4
656	10526		2160	- 1003	244	- 128	- 3	- 7	- 4643
700	10693		2243	- 804	287	- 16	- 6	1	- 3585
716	10901		2190	- 491	343	- 2	- 10	1	- 2243
732	11108		2134	- 158	388	11	11	- 2	- 742
748	11318		2176	230	433	40	9	-	1059
765	11539		2194	678	474	18	7	- 2	3089
782	11759		2313	1248	504	80	2	- 4	5396
798	11969		3160	2536	421	87	- 3	- 2	8024
815	12187		3376	2859	436	99		- 2	8467
832	12408		3630	3245	460	- 201	3	26	8941
849	12626		3930	3587	480	179	-	- 13	9128
866	12844		4159	3846	503	155	6	- 2	9249
883	13063		4378	4168	523	- 313	22	11	9520
900	13279		4666	4315	534	- 268	11	22	9249
917	13494		4911	4340	527	- 182	2	9	8838
977	13692		5192	4810	540	286	- 4		9264

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TWT 80 BLOW 11

CONFIG C2 THETA = 60

TUNNEL CONDITIONS

BN	ALPHA	YAW	MACH	RN	HO	PO	Q	TTO
DEC=	2	2	3	2		1	1	1
954	8897		397	1093	6746	60510	6679	5324
971	8825		396	1107	6848	61472	6745	5324
1004	8455		396	1099	6799	61023	6700	5322
1018	8284		403	1114	6777	60582	6898	5317
1034	8091		400	1108	6787	60793	6803	5317
1050	7896		400	1111	6797	60869	6825	5315
1066	7705		398	1106	6791	60878	6758	5314
1082	7515		398	1104	6775	60732	6744	5310
1098	7325		397	1102	6776	60772	6717	5310
1114	7135		396	1099	6772	60772	6681	5309
1130	6946		401	1114	6783	60700	6846	5305
1162	6571		394	1091	6746	60623	6578	5300
1178	6381		397	1097	6738	60461	6654	5298
1194	6194		395	1092	6722	60356	6599	5297
1210	6022		393	1086	6711	60316	6534	5295
1226	5905		396	1091	6697	60109	6596	5290

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TWT 80 BLOW 11

CONFIG C2 THETA = 60

BODY AXES DATA AND BALANCE CHAMBER PRESSURE, (DELTA PBC)/Q

BN	ALPHA	YAW	CA	CN	CNB	CLB	XCPN	PBC	CMA
DEC=	2	2	4	4	4	4	4	4	4
954	8897		1734	2657	-	- 10	- 8972	- 4127	- 2384
971	8825		1848	2620	-	- 9	- 9141	- 4069	- 2395
1004	8455		2386	2439	1	- 5	- 9787	- 3829	- 2387
1018	8284		2511	2253	4	- 5	-10128	- 3930	- 2281
1034	8091		2879	2170	3	- 8	-10623	- 3991	- 2305
1050	7896		3134	2059	8	- 5	-11073	- 3859	- 2279
1066	7705		3427	1976	10	- 9	-11579	- 3873	- 2288
1082	7515		3614	1815	11	- 7	-12212	- 2879	- 2217
1098	7325		3691	1645	2	- 5	-13007	- 2198	- 2140
1114	7135		3913	1508	4	- 2	-13764	- 1680	- 2076
1130	6946		4008	1302	- 2		-14817	- 1314	- 1930
1162	6571		4524	915	4	19	-18839	- 641	- 1724
1178	6381		4860	700	6	9	-22560	- 875	- 1578
1194	6194		5524	540	- 3	21	-27340	- 998	- 1476
1210	6022		3199	1561	79	44	-11352	- 596	- 1772
1226	5905		2361	2163	149	45	- 8851	- 791	- 1915

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TWT 80 BLOW 11

CONFIG C2 THETA = 60

STABILITY AXES DATA, DRAG, AND LIFT TO DRAG RATIO

BN	ALPHA	YAW	CD	CL	CMS	CY	CNS	CLS	L/D
DEC=	2	2	4	4	4	4	4	4	4
954	8897		2688	- 1686	- 458	- 23	10	- 1	- 6271
971	8825		2675	- 1767	- 487	- 22	9	-	- 6605
1004	8455		2655	- 2144	- 572	- 16	5	1	- 8075
1018	8284		2548	- 2210	- 587	3	5	4	- 8674
1034	8091		2597	- 2500	- 646	- 26	8	2	- 9626
1050	7896		2621	- 2682	- 681	44	6	7	-10234
1066	7705		2694	- 2897	- 729	30	11	8	-10756
1082	7515		2681	- 3028	- 757	33	10	9	-11296
1098	7325		2639	- 3060	- 793	52	5		-11595
1114	7135		2681	- 3225	- 810	54	4	4	-12032
1130	6946		2626	- 3297	- 799	22	- 1	- 2	-12555
1162	6571		2695	- 3747	- 829	129	- 15	12	-13902
1178	6381		2772	- 4052	- 811	79	- 6	9	-14616
1194	6194		3075	- 4621	- 780	118	- 20	7	-15030
1210	6022		2944	- 2002	- 512	722	1	91	- 6799
1226	5905		3070	- 912	- 290	764	38	151	- 2972

[redacted]

~~CONFIDENTIAL~~

TWT 80 BLOW 12 3RD REDUCTION

CONFIG C20 THETA = 140

TUNNEL CONDITIONS

BN	ALPHA	YAW	MACH	RN	HO	PO	Q	TTO
DEC=	2	2	3	2		1	1	1
703	13036		3493	1537	14173	1877	16029	5549
758	13203		3493	1569	14185	1878	16043	5479
775	13430		3493	1573	14153	1874	16007	5462
790	13634		3493	1579	14148	1873	16001	5449
806	13847		3493	1583	14139	1872	15991	5437
823	14071		3493	1588	14128	1871	15978	5423
839	14281		3493	1592	14114	1869	15962	5411
856	14512		3493	1596	14119	1870	15968	5402
873	14742		3493	1597	14082	1865	15926	5392
890	14972		3493	1601	14078	1864	15922	5384
907	15202		3493	1603	14076	1864	15920	5377
924	15426		3493	1605	14052	1861	15893	5367
939	15628		3493	1605	14024	1857	15861	5360
955	15844		3493	1601	13958	1848	15786	5353
971	16054		3493	1596	13887	1839	15706	5346

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CONF[redacted]

TWT 80 BLOW 12 3RD REDUCTION

CONFIG C20 THETA = 140

BODY AXES DATA AND BALANCE CHAMBER PRESSURE, (DELTA PBC)/Q

BN	ALPHA	YAW	CA	CN	CNB	CLB	XCPN	PBC	CMA
DEC=	2	2	4	4	4	4	4	4	4
703	13036		- 8358	2588	8	2	- 4009	64	- 1038
758	13203		- 8733	2489	7	1	- 3878	- 337	- 965
775	13430		- 9352	2345	6	-	- 3657	- 414	- 858
790	13634		- 9856	2211	5	-	- 3468	- 453	- 767
806	13847		-10367	2085	4	- 1	- 3276	- 507	- 683
823	14071		-10905	1945	4	- 1	- 3079	- 541	- 599
839	14281		-11386	1817	2	- 3	- 2893	- 575	- 526
856	14512		-11869	1680	2	- 3	- 2693	- 591	- 452
873	14742		-12383	1552	2	- 2	- 2502	- 629	- 388
890	14972		-12836	1415	1	- 3	- 2316	- 639	- 328
907	15202		-13246	1281	1	- 4	- 2147	- 653	- 275
924	15426		-13649	1153	1	- 4	- 1943	- 677	- 224
939	15628		-13960	1036 -	1	- 5	- 1742	- 662	- 180
955	15844		-14270	921 -	1	- 5	- 1549	- 679	- 143
971	16054		-14557	813 -	1	- 6	- 1333	- 682	- 108

[redacted]

TWT 80 BLOW 12 3RD REDUCTION

CONFIG C20 THETA = 140

STABILITY AXES DATA, DRAG, AND LIFT TO DRAG RATIO

BN	ALPHA	YAW	CD	CL	CMS	CY	CNS	CLS	L/D
DEC=	2	2	4	4	4	4	4	4	4
703	13036		7385	4693	246	136	- 6	5	6354
758	13203		7696	4821	228	141	- 6	4	6264
775	13430		8210	5056	200	151	- 4	4	6158
790	13634		8657	5206	169	148	- 4	4	6014
806	13847		9143	5313	137	153	- 3	3	5810
823	14071		9672	5400	93	157	- 2	3	5583
839	14281		10169	5434	50	169	-	4	5344
856	14512		10697	5410		166	-	3	5058
873	14742		11270	5361	- 54	165	-	3	4757
890	14972		11798	5251	- 114	170		3	4451
907	15202		12298	5085	- 177	175	1	4	4134
924	15426		12795	4888	- 238	174	1	4	3820
939	15628		13198	4666	- 293	166	3	4	3536
955	15844		13610	4386	- 352	166	3	4	3222
971	16054		13997	4083	- 409	174	3	5	2917

CONFI[redacted]

TWT 80 BLOW 13 2ND REDUCTION

CONFIG C20 THETA = 160

TUNNEL CONDITIONS

BN	ALPHA	YAW	MACH	RN	HO	PO	Q	TTO
DEC=	2	2	3	2		1	1	1
709	15028		3493	1552	14114	1869	15962	5500
757	15185		3493	1584	14189	1879	16047	5447
772	15383		3493	1584	14129	1871	15980	5432
788	15596		3493	1595	14169	1876	16025	5418
804	15804		3493	1599	14156	1875	16010	5406
820	16016		3493	1603	14140	1872	15991	5394
836	16225		3493	1606	14131	1871	15981	5384
853	16447		3493	1611	14121	1870	15971	5372
869	16655		3493	1611	14097	1867	15943	5365
885	16864		3493	1617	14114	1869	15962	5356
901	17069		3493	1619	14106	1868	15953	5351
917	17280		3493	1621	14080	1865	15924	5341
934	17503		3493	1624	14079	1864	15922	5334
950	17709		3493	1625	14069	1863	15911	5329
966	17917		3493	1625	14040	1859	15879	5322
991	18159		3493	1623	13983	1852	15814	5314

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TWT 80 BLOW 13 2ND REDUCTION

CONFIG C20 THETA = 160

BODY AXES DATA AND BALANCE CHAMBER PRESSURE, (DELTA PBC)/Q

BN	ALPHA	YAW	CA	CN	CNB	CLB	XCPN	PBC	CMA
DEC=	2	2	4	4	4	4	4	4	4
709	15028		-12839	1316	40	9	- 2042	203	- 269
757	15185		-13104	1241	41	9	- 1921	- 242	- 238
772	15383		-13476	1128	42	8	- 1702	- 323	- 192
788	15596		-13796	1001	43	8	- 1441	- 375	- 144
804	15804		-14100	893	41	7	- 1224	- 428	- 109
820	16016		-14406	790	43	8	- 1004	- 447	- 79
836	16225		-14621	684	44	8	- 690	- 462	- 47
853	16447		-14814	582	44	8	- 411	- 461	- 24
869	16655		-14994	505	44	8	- 311	- 465	- 16
885	16864		-15087	429	45	8	- 262	- 471	- 11
901	17069		-15204	365	43	8	- 308	- 460	- 11
917	17280		-15293	310	40	10	- 640	- 469	- 20
934	17503		-15342	265	42	9	- 1290	- 464	- 34
950	17709		-15376	232	46	8	- 2465	- 478	- 57
966	17917		-15390	197	44	7	- 4116	- 457	- 81
991	18159		-15372	121	46	8	- 6769	- 439	- 82

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CONF[redacted]

TWT 80 BLOW 13 2ND REDUCTION

CONFIG C20 THETA = 160

STABILITY AXES DATA, DRAG, AND LIFT TO DRAG RATIO

BN	ALPHA	YAW	CD	CL	CMS	CY	CNS	CLS	L/D
DEC=	2	2	4	4	4	4	4	4	4
709	15028		11802	5223	-123	206	-39	12	4425
757	15185		12139	5088	-159	232	-40	12	4191
772	15383		12592	4930	-213	232	-41	11	3915
788	15596		13007	4706	-271	259	-43	10	3618
804	15804		13411	4445	-328	251	-40	9	3315
820	16016		13819	4145	-387	265	-43	8	3000
836	16225		14134	3805	-440	265	-44	6	2692
853	16447		14428	3406	-498	265	-45	4	2361
869	16655		14701	2996	-554	273	-44	2	2038
885	16864		14876	2551	-607	265	-45	1	1715
901	17069		15062	2100	-658	287	-44	-1	1394
917	17280		15212	1608	-709	282	-41	-5	1057
934	17503		15307	1066	-757	268	-43	-5	696
950	17709		15368	549	-805	275	-46	-5	357
966	17917		15391	26	-854	263	-44	-7	17
991	18159		15363	-549	-906	250	-46	-9	-357

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TWT 80 BLOW 14 2ND REDUCTION

CONFIG C2 THETA = 140

TUNNEL CONDITIONS

BN	ALPHA	YAW	MACH	RN	HO	PO	Q	TTO
DEC=	2	2	3	2		1	1	1
556	13031		3493	1593	14227	1884	16090	5437
598	13187		3493	1604	14155	1874	16009	5396
614	13398		3493	1609	14150	1874	16003	5382
630	13611		3493	1612	14130	1871	15980	5372
646	13821		3493	1619	14140	1872	15992	5360
662	14033		3493	1622	14127	1871	15978	5350
678	14244		3493	1626	14129	1871	15979	5341
695	14467		3493	1627	14103	1868	15950	5332
712	14689		3493	1632	14103	1868	15950	5324
728	14902		3493	1635	14105	1868	15952	5317
744	15107		3493	1637	14096	1867	15942	5310
760	15318		3493	1639	14088	1866	15933	5305
776	15527		3493	1640	14073	1864	15916	5298
792	15733		3493	1637	14039	1859	15878	5297
808	15941		3493	1635	13989	1852	15821	5290
829	16173		3493	1627	13905	1841	15726	5285

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TWT 80 BLOW 14 2ND REDUCTION

CONFIG C2 THETA = 140

BODY AXES DATA AND BALANCE CHAMBER PRESSURE, (DELTA PBC)/Q

BN	ALPHA	YAW	CA	CN	CNB	CLB	XCPN	PBC	CMA
DEC=	2	2	4	4	4	4	4	4	4
556	13031		- 8307	2587	3	- 4	- 3999	273	- 1035
598	13187		- 8677	2493	-	- 4	- 3875	- 154	- 966
614	13398		- 9230	2345	- 2	- 6	- 3668	- 242	- 860
630	13611		- 9757	2211	-	- 5	- 3458	- 320	- 765
646	13821		-10281	2083	- 4	- 7	- 3278	- 375	- 683
662	14033		-10785	1957		- 4	- 3086	- 429	- 604
678	14244		-11276	1830	- 5	- 6	- 2895	- 489	- 530
695	14467		-11763	1691	- 6	- 8	- 2695	- 517	- 456
712	14689		-12228	1566	- 8	- 8	- 2533	- 557	- 397
728	14902		-12653	1443	- 6	- 8	- 2370	- 572	- 342
744	15107		-13031	1326	- 9	- 9	- 2226	- 606	- 295
760	15318		-13434	1210	- 7	- 8	- 2046	- 606	- 248
776	15527		-13767	1095	- 9	- 9	- 1897	- 625	- 208
792	15733		-14108	995	- 9	- 9	- 1749	- 624	- 174
808	15941		-14390	880	- 10	- 10	- 1542	- 642	- 136
829	16173		-14698	762	- 10	- 11	- 1351	- 639	- 103

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TWT 80 BLOW 14 2ND REDUCTION

CONFIG C2 THETA = 140

STABILITY AXES DATA, DRAG, AND LIFT TO DRAG RATIO

BN	ALPHA	YAW	CD	CL	CMS	CY	CNS	CLS	L/D
DEC=	2	2	4	4	4	4	4	4	4
556	13031		7347	4660	251	164	1	5	6343
598	13187		7648	4798	234	128	3	2	6273
614	13398		8097	5014	205	146	6	3	6193
630	13611		8565	5171	178	150	4	3	6037
646	13821		9054	5298	140	147	7	3	5851
662	14033		9550	5379	103	165	3	4	5632
678	14244		10055	5422	61	141	7	2	5393
695	14467		10574	5423	11	153	9	3	5128
712	14689		11098	5367	- 43	137	11	2	4836
728	14902		11590	5277	- 98	156	10	4	4553
744	15107		12047	5142	- 154	148	12	4	4269
760	15318		12535	4981	- 209	161	10	4	3974
776	15527		12962	4766	- 269	153	12	5	3677
792	15733		13402	4519	- 323	152	12	5	3372
808	15941		13781	4236	- 381	159	13	6	3074
829	16173		14196	3885	- 447	167	13	7	2736

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TWT 80 BLOW 15 2ND REDUCTION

CONFIG C2 THETA = 140

TUNNEL CONDITIONS

BN	ALPHA	YAW	MACH	RN	HO	PO	Q	TTO
DEC=	2	2	3	2		1	1	1
714	16181		3493	1584	14168	1876	16024	5442
732	16157		3493	1591	14154	1874	16008	5423
750	15981		3493	1599	14159	1875	16013	5408
768	15755		3493	1605	14152	1874	16005	5392
786	15534		3493	1609	14133	1872	15984	5379
804	15320		3493	1616	14134	1872	15986	5365
822	15110		3493	1618	14124	1870	15973	5358
840	14904		3493	1622	14114	1869	15963	5346
858	14693		3493	1626	14112	1869	15960	5338
876	14470		3493	1627	14087	1865	15932	5329
894	14254		3493	1627	14064	1862	15906	5324
912	14043		3493	1628	14043	1860	15882	5317
930	13826		3493	1628	14015	1856	15850	5310
948	13616		3493	1623	13945	1847	15772	5303
966	13405		3493	1618	13883	1838	15701	5298
984	13196		3493	1613	13816	1829	15625	5293
1002	13035		3493	1608	13743	1820	15543	5286
1020	13006		3493	1601	13670	1810	15460	5283
1036	13004		3493	1595	13603	1801	15384	5278

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TWT 80 BLOW 15 2ND REDUCTION

CONFIG C2 THETA = 140

BODY AXES DATA AND BALANCE CHAMBER PRESSURE. (DELTA PBC)/Q

BN	ALPHA	YAW	CA	CN	CNB	CLB	XCPN	PBC	CMA
DEC=	2	2	4	4	4	4	4	4	4
714	16181		-14708	760	- 9	- 11	- 1417	318	- 108
732	16157		-14657	767	- 8	- 9	- 1391	369	- 107
750	15981		-14446	837	- 8	- 9	- 1435	447	- 120
768	15755		-14150	954	- 8	- 9	- 1613	517	- 154
786	15534		-13813	1073	- 8	- 9	- 1799	568	- 193
804	15320		-13457	1188	- 8	- 10	- 1962	519	- 233
822	15110		-13088	1302	- 7	- 8	- 2130	476	- 277
840	14904		-12687	1421	- 7	- 9	- 2298	437	- 327
858	14693		-12263	1544	- 6	- 8	- 2458	428	- 380
876	14470		-11810	1668	- 6	- 8	- 2616	431	- 436
894	14254		-11343	1803	- 5	- 8	- 2825	448	- 509
912	14043		-10864	1934	- 4	- 8	- 3014	470	- 583
930	13826		-10361	2070	- 3	- 6	- 3207	469	- 664
948	13616		- 9835	2192	- 3	- 6	- 3381	482	- 741
966	13405		- 9323	2334	- 2	- 6	- 3590	499	- 838
984	13196		- 8775	2471	-	- 3	- 3792	522	- 937
1002	13035		- 8332	2587	1	- 3	- 3964	531	- 1025
1020	13006		- 8249	2614		- 4	- 4006	540	- 1047
1036	13004		- 8239	2623	1	- 3	- 4008	534	- 1051

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TWT 80 BLOW 15 2ND REDUCTION

CONFIG C2 THETA = 140

STABILITY AXES DATA, DRAG, AND LIFT TO DRAG RATIO

BN	ALPHA	YAW	CD	CL	CMS	CY	CNS	CLS	L/D
DEC=	2	2	4	4	4	4	4	4	4
714	16181		14210	3870	- 454	191	12	8	2723
732	16157		14147	3907	- 445	170	10	6	2762
750	15981		13847	4201	- 398	170	11	6	3034
768	15755		13442	4522	- 334	171	11	6	3364
786	15534		13000	4789	- 272	173	11	5	3684
804	15320		12547	5007	- 212	174	12	5	3991
822	15110		12087	5186	- 156	161	10	4	4291
840	14904		11610	5309	- 99	163	10	4	4573
858	14693		11119	5398	- 43	158	10	3	4855
876	14470		10603	5463	12	160	10	3	5152
894	14254		10101	5468	59	156	9	3	5413
912	14043		9606	5430	104	152	8	3	5653
930	13826		9109	5353	146	140	6	2	5876
948	13616		8612	5232	183	144	6	2	6075
966	13405		8160	5077	214	141	6	3	6222
984	13196		7705	4873	241	124	3	2	6324
1002	13035		7366	4674	259	120	1	2	6346
1020	13006		7309	4631	260	129	2	3	6336
1036	13004		7309	4620	263	122	1	2	6321

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TWT 80 BLOW 16

CONFIG C2 THETA = 160

TUNNEL CONDITIONS

BN	ALPHA	YAW	MACH	RN	HO	PO	Q	TTO
DEC=	2	2	3	2		1	1	1
644	15024		3493	1594	14179	1878	16036	5423
694	15195		3493	1612	14158	1875	16012	5379
710	15407		3493	1615	14138	1872	15990	5368
726	15613		3493	1618	14130	1871	15981	5358
742	15824		3493	1622	14130	1871	15981	5350
759	16046		3493	1625	14119	1870	15968	5341
775	16253		3493	1628	14108	1868	15956	5332
792	16473		3493	1630	14093	1866	15939	5324
809	16696		3493	1633	14095	1866	15941	5319
826	16917		3493	1636	14099	1867	15945	5314
842	17120		3493	1636	14076	1864	15919	5309
859	17341		3493	1635	14048	1860	15888	5303
876	17563		3493	1634	14017	1856	15853	5298
892	17767		3493	1629	13954	1848	15781	5293
909	17982		3493	1623	13874	1837	15691	5286

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TWT 80 BLOW 16

CONFIG C2 THETA = 160

BODY AXES DATA AND BALANCE CHAMBER PRESSURE, (DELTA PBC)/Q

BN	ALPHA	YAW	CA	CN	CNB	CLB	XCPN	PBC	CMA
DEC=	2	2	4	4	4	4	4	4	4
644	15024		-12810	1342	30	6	- 2172	287	- 291
694	15195		-13114	1261	36	8	- 2058	422	- 260
710	15407		-13492	1139	36	8	- 1832	454	- 209
726	15613		-13825	1024	37	9	- 1645	454	- 168
742	15824		-14108	907	36	8	- 1444	459	- 131
759	16046		-14421	800	36	8	- 1261	471	- 101
775	16253		-14637	697	36	9	- 1048	467	- 73
792	16473		-14814	596	36	9	- 846	493	- 50
809	16696		-14956	515	37	9	- 866	493	- 45
826	16917		-15080	448	36	9	- 1049	547	- 47
842	17120		-15187	398	36	10	- 1358	594	- 54
859	17341		-15278	343	37	10	- 1782	647	- 61
876	17563		-15553	- 287	34	10	- 1337	726	38
892	17767		-15637	- 437	39	11	- 680	729	30
909	17982		-15334	223	36	10	- 4897	705	- 109

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TWT 80 BLOW 16

CONFIG C2 THETA = 160

STABILITY AXES DATA, DRAG, AND LIFT TO DRAG RATIO

BN	ALPHA	YAW	CD	CL	CMS	CY	CNS	CLS	L/D
DEC=	2	2	4	4	4	4	4	4	4
644	15024		11786	5193	- 126	199	- 29	10	4406
694	15195		12167	5053	- 167	212	- 36	10	4153
710	15407		12631	4876	- 223	211	- 36	8	3860
726	15613		13057	4658	- 281	210	- 37	7	3568
742	15824		13439	4388	- 341	224	- 36	6	3265
759	16046		13857	4070	- 403	231	- 36	4	2937
775	16253		14171	3729	- 458	224	- 37	3	2631
792	16473		14448	3327	- 515	231	- 37	1	2303
809	16696		14687	2874	- 574	231	- 38	-	1957
826	16917		14896	2394	- 629	238	- 37	- 2	1607
842	17120		15069	1929	- 677	239	- 37	- 4	1280
859	17341		15217	1412	- 727	240	- 38	- 6	928
876	17563		15486	1471	- 1076	215	- 34	- 7	950
892	17767		15606	1074	- 1193	246	- 40	- 9	688
909	17982		15335	- 175	- 861	224	- 36	- 10	- 114

CONF[redacted]

TWT 80 BLOW 17 2ND REDUCTION

CONFIG C2 THETA = 160

TUNNEL CONDITIONS

BN	ALPHA	YAW	MACH	RN	HO	PO	Q	TTO
DEC=	2	2	3	2		1	1	1
603	15018		3493	1610	14191	1879	16049	5391
637	15191		3493	1608	14068	1863	15910	5365
653	15399		3493	1620	14131	1871	15981	5355
669	15607		3493	1627	14146	1873	15998	5344
685	15814		3493	1627	14124	1870	15974	5338
701	16020		3493	1630	14116	1869	15965	5331
717	16226		3493	1631	14089	1866	15935	5322
733	16433		3493	1631	14071	1863	15914	5317
750	16650		3493	1635	14079	1864	15922	5310
767	16868		3493	1637	14065	1862	15907	5303
783	17074		3493	1637	14048	1860	15888	5300
800	17294		3493	1638	14038	1859	15877	5295
816	17495		3493	1633	13971	1850	15801	5290
833	17712		3493	1626	13904	1841	15725	5286
849	17917		3493	1620	13828	1831	15639	5281
873	18153		3493	1612	13740	1819	15539	5276

[redacted]

TWT 80 BLOW 17 2ND REDUCTION

CONFIG C2 THETA = 160

BODY AXES DATA AND BALANCE CHAMBER PRESSURE, (DELTA PBC)/Q

BN	ALPHA	YAW	CA	CN	CNB	CLB	XCPN	PBC	CMA
DEC=	2	2	4	4	4	4	4	4	4
603	15018		-12795	1354	36	7	- 2198	406	- 298
637	15191		-13133	1276	29	5	- 2081	454	- 266
653	15399		-13455	1149	34	7	- 1888	427	- 217
669	15607		-13785	1035	30	7	- 1689	470	- 175
685	15814		-14109	924	35	8	- 1514	472	- 140
701	16020		-14376	821	36	8	- 1314	458	- 108
717	16226		-14617	728	35	7	- 1161	486	- 85
733	16433		-14790	623	36	8	- 940	473	- 59
750	16650		-14935	547	36	8	- 995	492	- 54
767	16868		-15081	475	39	9	- 1093	519	- 52
783	17074		-15181	422	39	9	- 1426	575	- 60
800	17294		-15263	369	36	10	- 1802	616	- 67
816	17495		-15324	321	37	9	- 2417	714	- 78
833	17712		-15344	293	38	8	- 3688	708	- 108
849	17917		-15338	252	39	9	- 4867	704	- 123
873	18153		-15314	173	41	9	- 6835	635	- 119

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TWT 80 BLOW 17 2ND REDUCTION

CONFIG C2 THETA = 160

STABILITY AXES DATA, DRAG, AND LIFT TO DRAG RATIO

BN	ALPHA	YAW	CD	CL	CMS	CY	CNS	CLS	L/D
DEC=	2	2	4	4	4	4	4	4	4
603	15018		11774	5188	-123	212	-35	11	4406
637	15191		12186	5059	-164	221	-28	9	4151
653	15399		12595	4869	-222	240	-34	9	3865
669	15607		13020	4647	-278	204	-30	6	3569
685	15814		13439	4395	-338	231	-36	6	3270
701	16020		13805	4097	-393	231	-36	5	2968
717	16226		14144	3760	-447	246	-35	3	2659
733	16433		14409	3394	-504	239	-36	2	2356
750	16650		14650	2955	-560	239	-37		2017
767	16868		14880	2495	-616	246	-40	-1	1677
783	17074		15051	2025	-666	254	-40	-3	1345
800	17294		15193	1510	-713	248	-37	-5	994
816	17495		15293	1028	-761	242	-38	-6	672
833	17712		15340	477	-812	244	-39	-6	311
849	17917		15340	-30	-855	239	-39	-8	-19
873	18153		15304	-583	-903	227	-41	-10	-381

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TWT 80 BLOW 18

CONFIG C2 THETA = 20

TUNNEL CONDITIONS

BN	ALPHA	YAW	MACH	RN	HO	PO	Q	TTO
DEC=	2	2	3	2		1	1	1
556	2015		792	1488	5583	36911	16214	5324
574	2014		694	1334	5383	39034	13143	5315
592	2000		717	1297	5108	36261	13054	5298
610	1806		730	1302	5060	35484	13253	5286
628	1566		732	1333	5169	36191	13580	5283
646	1332		725	1327	5164	36392	13392	5276
664	1095		725	1325	5147	36265	13354	5269
682	861		730	1335	5157	36183	13495	5262
700	624		726	1326	5131	36122	13335	5256
718	393		726	1331	5143	36220	13354	5249
736	157		723	1328	5139	36277	13282	5245
754	- 73		722	1322	5113	36126	13196	5240
772	- 303		724	1328	5121	36118	13263	5235
790	- 531		729	1333	5115	35925	13355	5230
808	- 752		731	1336	5113	35835	13407	5227
826	- 933		735	1340	5100	35610	13469	5218
844	- 968		732	1333	5080	35565	13351	5215
862	- 980		733	1332	5063	35414	13329	5208
873	- 983		733	1330	5054	35361	13294	5204

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TWT 80 BLOW 18

CONFIG C2 THETA = 20

BODY AXES DATA AND BALANCE CHAMBER PRESSURE, (DELTA PBC)/Q

BN	ALPHA	YAW	CA	CN	CNB	CLB	XCPN	XCPY	PBC	CMA
DEC=	2	2	4	4	4	4	4	4	4	4
556	2015		4544	2658	-2	9	-6744	7265	-87	-1792
574	2014		5579	3270	1	18	-6828	6766	-123	-2233
592	2000		4896	2881	4	12	-6776	6413	-159	-1952
610	1806		5073	2628	-5	11	-6768	7561	-114	-1779
628	1566		5620	2406	5	14	-6797	6303	-288	-1635
646	1332		5969	2098	-11	12	-6799	9178	-223	-1426
664	1095		6068	1755	11	16	-6779	5961	-170	-1190
682	861		6170	1404	2	15	-6735	6636	-49	-945
700	624		6295	1057	5	12	-6746	6216	-194	-713
718	393		6383	712	19	15	-6740	5332	-273	-480
736	157		6466	383	2	8	-6458	6411	-133	-247
754	-73		6451	37	4	7	-3543	5951	-217	-13
772	-303		6558	-381	16	4	-6506	3138	-210	248
790	-531		6277	-646	23	2	-7075	2353	-248	457
808	-752		6203	-1036	11	-1	-6800	-33723	-304	704
826	-933		6126	-1293	-13	-4	-6810	5039	-153	880
844	-968		6110	-1344	25	2	-6860	1415	-139	922
862	-980		6088	-1321	4	-2	-6978	8464	-156	922
873	-983		6018	-1352	9	-1	-6910	25670	-170	934

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TWT 80 BLOW 18

CONFIG C2 THETA = 20

STABILITY AXES DATA, DRAG, AND LIFT TO DRAG RATIO

BN	ALPHA	YAW	CD	CL	CMS	CY	CNS	CLS	L/D
DEC=	2	2	4	4	4	4	4	4	4
556	2015		5181	930	300	59	- 5	7	1794
574	2014		6364	1149	341	125	- 5	17	1805
592	2000		5586	1032	314	91	-	12	1848
610	1806		5638	926	325	65	- 8	9	1642
628	1566		6061	799	348	98	2	15	1319
646	1332		6292	666	366	49	- 14	9	1059
664	1095		6291	571	373	119	7	18	907
682	861		6310	464	382	93	-	15	736
700	624		6373	367	384	78	4	13	576
718	393		6416	273	385	122	18	16	426
736	157		6474	205	397	47	2	8	317
754	- 73		6450	119	393	40	4	7	185
772	- 303		6569	- 34	373	43	16	3	- 51
790	- 531		6310	- 63	384	52	24		- 100
808	- 752		6285	- 215	359	3	11	- 2	- 342
826	- 933		6254	- 282	354	- 73	- 14	- 2	- 451
844	- 968		6249	- 298	360	47	25	- 2	- 477
862	- 980		6224	- 265	374	- 22	3	- 2	- 426
873	- 983		6161	- 305	361	- 5	9	- 3	- 495

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TWT 80 BLOW 19

CONFIG C2 THETA = 20

TUNNEL CONDITIONS

BN	ALPHA	YAW	MACH	RN	HO	PO	Q	TTO
DEC=	2	2	3	2		1	1	1
508	2019		729	839	3242	22753	8476	5262
551	1863		733	837	3219	22518	8474	5252
566	1670		710	807	3166	22623	7979	5256
583	1443		721	827	3215	22753	8271	5257
598	1249		730	830	3205	22477	8393	5259
614	1043		711	808	3172	22648	8006	5262
630	835		725	831	3223	22721	8356	5262
647	618		725	822	3190	22477	8277	5262
664	396		713	810	3178	22648	8053	5268
681	181		712	812	3189	22737	8073	5268
698	- 40		727	830	3218	22627	8383	5269
715	- 256		723	820	3190	22518	8247	5268
732	- 472		716	813	3183	22623	8116	5268
748	- 675		724	833	3237	22826	8386	5269
771	- 915		729	827	3198	22461	8350	5262

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TWT 80 BLOW 19

CONFIG C2 THETA = 20

BODY AXES DATA AND BALANCE CHAMBER PRESSURE, (DELTA PBC)/Q

BN	ALPHA	YAW	CA	CN	CNB	CLB	XCPN	PBC	CMA
DEC=	2	2	4	4	4	4	4	4	4
508	2019		5061	2980	11	10	- 6738	- 143	- 2008
551	1863		5011	2686	- 10	8	- 6673	- 190	- 1792
566	1670		5535	2593	7	18	- 6702	- 157	- 1738
583	1443		5968	2304	- 3	10	- 6650	- 185	- 1532
598	1249		5686	1900	24	14	- 6649	- 153	- 1263
614	1043		6345	1726	4	9	- 6593	- 118	- 1138
630	835		6356	1391	3	9	- 6533	- 229	- 909
647	618		6286	1026	- 1	10	- 6435	- 155	- 660
664	396		6602	710	- 8	6	- 6366	- 147	- 452
681	181		6781	354	6	9	- 5810	- 305	- 205
698	- 40		6464	25	6	9	-	- 267	21
715	- 256		6483	- 271	22	9	- 8630	- 177	234
732	- 472		6568	- 665	14	2	- 7238	- 193	481
748	- 675		6538	- 922	-		- 7410	- 203	684
771	- 915		6384	- 1318	20	-	- 7196	- 239	948

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TWT 80 BLOW 19

CONFIG C2 THETA = 20

STABILITY AXES DATA, DRAG, AND LIFT TO DRAG RATIO

BN	ALPHA	YAW	CD	CL	CMS	CY	CNS	CLS	L/D
DEC=	2	2	4	4	4	4	4	4	4
508	2019		5778	1051	336	103	7	14	1819
551	1863		5606	944	347	36	- 12	4	1683
566	1670		6046	893	369	139	2	19	1477
583	1443		6354	744	401	66	- 5	9	1171
598	1249		5962	625	376	148	20	19	1049
614	1043		6552	549	421	70	2	10	838
630	835		6490	453	421	68	2	9	698
647	618		6360	344	415	56	- 2	10	540
664	396		6635	253	425	16	- 8	5	381
681	181		6789	139	437	60	6	9	205
698	- 40		6463	70	420	59	6	9	109
715	- 256		6488	18	430	89	22	8	28
732	- 472		6600	- 123	412	23	14	1	- 186
748	- 675		6601	- 148	436	- 18	-		- 225
771	- 915		6513	- 285	420	26	19	- 3	- 438

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TWT 80 BLOW 20

CONFIG C2 THETA = 20

TUNNEL CONDITIONS

BN	ALPHA	YAW	MACH	RN	HO	PO	Q	TTO
DEC=	2	2	3	2		1	1	1
499	2026		423	718	4190	37052	4638	5317
565	1875		395	674	4164	37392	4088	5310
583	1641		404	679	4110	36729	4197	5303
599	1432		389	660	4129	37194	3941	5303
616	1209		406	691	4160	37133	4290	5300
632	1004		400	674	4112	36834	4121	5298
647	813		390	662	4123	37125	3951	5295
663	604		409	695	4145	36935	4327	5290
679	400		395	670	4119	36983	4045	5290
696	187		397	679	4152	37246	4110	5286
712	- 17		403	682	4116	36806	4183	5285
729	- 232		393	670	4130	37125	4014	5283
747	- 458		401	683	4145	37109	4167	5281
764	- 670		408	691	4125	36789	4276	5278
791	- 921		408	694	4136	36878	4300	5276

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TWT 80 BLOW 20

CONFIG C2 THETA = 20

BODY AXES DATA AND BALANCE CHAMBER PRESSURE, (DELTA PBC)/Q

BN	ALPHA	YAW	CA	CN	CNB	CLB	XCPN	PBC	CMA
DEC=	. 2	2	4	4	4	4	4	4	4
499	2026		4023	2650	2	4	- 6629	59	- 1757
565	1875		4505	2738	12	8	- 6634	- 52	- 1816
583	1641		4368	2207	- 1	12	- 6655	- 121	- 1469
599	1432		5022	2183	3	8	- 6666	- 290	- 1455
616	1209		4811	1788	2	8	- 6608	- 437	- 1182
632	1004		4890	1504	3	9	- 6586	- 321	- 990
647	813		5407	1319	- 1	5	- 6589	- 275	- 869
663	604		4945	968	7	6	- 6481	43	- 628
679	400		5299	651	8	7	- 6500	- 230	- 423
696	187		5486	456	- 1	8	- 6082	- 42	- 277
712	- 17		5221	123	8	9	- 4922	34	- 60
729	- 232		5565	- 312	17	11	- 7174	- 251	224
747	- 458		5353	- 508	8	10	- 7288	- 89	370
764	- 670		4973	- 847	4	5	- 7071	- 95	599
791	- 921		4870	- 1126	12	3	- 7115	- 100	801

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TWT 80 BLOW 20

CONFIG C2 THETA = 20

STABILITY AXES DATA, DRAG, AND LIFT TO DRAG RATIO

BN	ALPHA	YAW	CD	CL	CMS	CY	CNS	CLS	L/D
DEC=	2	2	4	4	4	4	4	4	4
499	2026		4692	1093	300	69	1	4	2329
565	1875		5146	1144	329	107	9	11	2224
583	1641		4813	883	304	104	- 5	11	1835
599	1432		5406	873	340	83	1	8	1615
616	1209		5079	740	330	77	1	8	1458
632	1004		5077	628	330	81	1	9	1237
647	813		5540	542	355	28	- 2	5	978
663	604		5020	442	329	52	7	6	881
679	400		5332	280	336	57	7	8	525
696	187		5498	277	359	29	- 1	8	503
712	- 17		5220	138	332	57	8	9	265
729	- 232		5573	- 86	338	91	17	11	- 154
747	- 458		5376	- 79	337	61	8	9	- 147
764	- 670		5037	- 262	311	7	5	4	- 519
791	- 921		4988	- 332	316	36	12	1	- 665

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TWT 80 BLOW 21

CONFIG C2 THETA = 120

TUNNEL CONDITIONS

BN	ALPHA	YAW	MACH	RN	HO	PO	Q	TIO
DEC=	2	2	3	2		1	1	1
614	12028		400	660	4037	36146	4056	5314
659	11868		401	680	4146	37112	4177	5310
675	11660		398	666	4090	36679	4062	5309
691	11448		392	663	4119	37043	3987	5305
708	11227		409	694	4150	36974	4340	5303
725	11007		403	676	4103	36683	4170	5303
741	10800		390	659	4113	37035	3938	5300
757	10594		409	690	4129	36805	4305	5298
774	10375		392	661	4104	36922	3964	5298
792	10144		395	671	4131	37100	4053	5297
808	9940		409	691	4132	36825	4309	5295
824	9738		399	672	4100	36744	4094	5293
840	9535		385	654	4114	37140	3851	5290
856	9336		411	694	4125	36724	4336	5290
880	9091		407	688	4126	36817	4264	5291

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TWT 80 BLOW 21

CONFIG C2 THETA = 120

BODY AXES DATA AND BALANCE CHAMBER PRESSURE, (DELTA PBC)/Q

BN	ALPHA	YAW	CA	CN	CNB	CLB	XCPN	PBC	CMA
DEC=	2	2	4	4	4	4	4	4	4
614	12028		-3890	1359	29	-21	-2051	-418	-279
659	11868		-3582	1418	33	-12	-2430	-118	-345
675	11660		-2078	1483	13	-16	-2662	-84	-395
691	11448		-1537	1781	1	-20	-3592	-267	-640
708	11227		-958	1788	3	-13	-4302	-269	-769
725	11007		-593	1980	-2	-20	-4888	-242	-968
741	10800		-264	2354	-3	-24	-5332	-30	-1255
757	10594		131	2216	1	-13	-5741	-114	-1272
774	10375		473	2483	4	-14	-6106	136	-1516
792	10144		818	2594	4	-11	-6538	-228	-1696
808	9940		976	2435	9	-7	-6851	-179	-1668
824	9738		1306	2568	3	-13	-7230	-145	-1857
840	9535		1794	2965	-	-10	-7523	-447	-2231
856	9336		1765	2590	2	-14	-7812	-127	-2023
880	9091		2032	2611	-1	-16	-8171	-347	-2133

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TWT 80 BLOW 21

CONFIG C2 THETA = 120

STABILITY AXES DATA, DRAG, AND LIFT TO DRAG RATIO

BN	ALPHA	YAW	CD	CL	CMS	CY	CNS	CLS	L/D
DEC=	2	2	4	4	4	4	4	4	4
614	12028		3135	2674	425	- 125	3	36	8529
659	11868		2963	2462	417	- 94	- 5	35	8309
675	11660		2257	1194	501	87	9	19	5290
691	11448		2258	661	492	154	17	9	2926
708	11227		2018	209	402	120	11	8	1035
725	11007		2064	- 123	356	102	19	5	- 594
741	10800		2321	- 476	345	141	24	5	- 2052
757	10594		2095	- 734	257	79	12	5	- 3504
774	10375		2299	- 1050	216	89	12	7	- 4566
792	10144		2380	- 1317	133	91	10	6	- 5532
808	9940		2242	- 1361	61	141	6	10	- 6068
824	9738		2379	- 1625	- 17	124	13	5	- 6830
840	9535		2785	- 2062	- 89	137	10	1	- 7405
856	9336		2482	- 1913	- 141	150	14	3	- 7708
880	9091		2578	- 2073	- 221	102	16	- 1	- 8040

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TWT 80 BLOW 22

CONFIG C2 THETA = 120

TUNNEL CONDITIONS

BN	ALPHA	YAW	MACH	RN	HO	PO	Q	TTO
DEC=	2	2	3	2		1	1	1
594	12035		720	809	3165	22397	8138	5283
640	11873		715	810	3178	22596	8093	5276
656	11660		723	792	3085	21775	7976	5273
673	11439		737	826	3186	22213	8442	5278
688	11242		734	824	3186	22262	8406	5281
706	11011		717	800	3140	22295	8019	5285
723	10789		742	827	3185	22095	8517	5285
740	10572		732	816	3163	22140	8313	5285
756	10366		718	800	3140	22266	8046	5286
773	10150		721	804	3151	22287	8117	5290
791	9921		734	817	3170	22164	8351	5290
809	9693		744	830	3196	22140	8572	5290
827	9469		715	793	3122	22201	7950	5290
844	9251		743	827	3185	22066	8538	5290

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TWT 80 BLOW 22

CONFIG C2 THETA = 120

BODY AXES DATA AND BALANCE CHAMBER PRESSURE, (DELTA PBC)/Q

BN	ALPHA	YAW	CA	CN	CNB	CLB	XCPN	PBC	CMA
DEC=	2	2	4	4	4	4	4	4	4
.594	12035		- 4206	2040	69	- 26	- 3015	- 260	- 615
640	11873		- 3801	2195	50	- 27	- 3437	- 283	- 754
656	11660		- 2469	1910	- 2	- 7	- 3426	- 220	- 654
673	11439		- 1813	2374	- 4	- 12	- 4219	- 80	- 1001
688	11242		- 1179	2463	1	- 6	- 4628	- 129	- 1140
706	11011		- 514	2790	- 2	- 9	- 5048	- 206	- 1408
723	10789		53	2857	-	- 7	- 5448	- 219	- 1556
740	10572		560	3035	1	- 3	- 5776	- 126	- 1753
756	10366		1081	3306		- 6	- 6080	- 140	- 2010
773	10150		1552	3538	- 1	- 6	- 6376	- 154	- 2256
791	9921		1888	3551	-	- 7	- 6670	- 240	- 2369
809	9693		2163	3543	- 2	- 9	- 6969	- 94	- 2469
827	9469		2679	3764	- 3	- 8	- 7265	- 228	- 2735
844	9251		2939	3673	- 2	- 6	- 7447	- 120	- 2735

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TWT 8C BLOW 22

CONFIG C2 THETA = 120

STABILITY AXES DATA, DRAG, AND LIFT TO DRAG RATIO

BN	ALPHA	YAW	CD	CL	CMS	CY	CNS	CLS	L/D
DEC=	2	2	4	4	4	4	4	4	4
594	12035		3886	2599	537	- 362	- 13	73	6687
640	11873		3751	2278	528	- 115	-	56	6073
656	11660		2813	1353	511	47	7	1	4809
673	11439		2911	672	521	9	12	1	2307
688	11242		2726	150	481	15	5	3	552
706	11011		2797	- 477	477	8	9	1	- 1704
723	10789		2702	- 928	408	12	7	2	- 3436
740	10572		2770	- 1362	363	3	3	2	- 4915
756	10366		2957	- 1831	323	- 6	6	2	- 6192
773	10150		3157	- 2226	264	- 29	6		- 7050
791	9921		3203	- 2432	181	- 52	7	1	- 7593
809	9693		3256	- 2575	91	- 20	9	- 1	- 7907
827	9469		3532	- 2978	7	- 60	8	- 2	- 8431
844	9251		3541	- 3097	- 41	- 52	6	- 2	- 8746

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TWT 80 BLOW 23

CONFIG C2 THETA = 120

TUNNEL CONDITIONS

BN	ALPHA	YAW	MACH	RN	HO	PO	Q	TTO
DEC=	2	2	3	2		1	1	1
592	12050		732	1290	5072	35504	13330	5341
638	11886		730	1290	5073	35586	13282	5336
654	11673		730	1276	5014	35185	13114	5331
671	11448		735	1294	5059	35320	13368	5327
688	11223		734	1298	5078	35496	13380	5324
705	11001		731	1292	5062	35468	13280	5324
722	10780		731	1293	5067	35509	13286	5322
738	10572		730	1288	5043	35382	13199	5317
755	10352		730	1292	5055	35459	13233	5314
772	10133		731	1292	5046	35357	13237	5310
788	9931		730	1287	5034	35320	13170	5310
805	9716		731	1291	5034	35267	13209	5305
822	9503		733	1292	5034	35230	13236	5303
839	9288		734	1289	5010	35030	13197	5298
868	9041		737	1292	5005	34899	13254	5295

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TWT 80 BLOW 23

CONFIG C2 THETA = 120

BODY AXES DATA AND BALANCE CHAMBER PRESSURE, (DELTA PBC)/Q

BN	ALPHA	YAW	CA	CN	CNB	CLB	XCPN	PBC	CMA
DEC=	2	2	4	4	4	4	4	4	4
592	12050		- 4108	2095	- 2	8	- 3235	- 204	- 678
638	11886		- 3641	2110	- 9	8	- 3487	- 147	- 736
654	11673		- 2584	2059	- 8	8	- 3607	- 85	- 743
671	11448		- 1795	2292	-	- 4	- 4173	- 66	- 957
688	11223		- 1161	2602	- 1	- 6	- 4720	- 103	- 1228
705	11001		- 445	2812	- 1	- 8	- 5104	- 213	- 1435
722	10780		135	3030	- 4	- 11	- 5485	- 327	- 1662
738	10572		651	3145	4	- 3	- 5789	- 197	- 1821
755	10352		1134	3366		- 4	- 6118	- 220	- 2059
772	10133		1544	3455	1	- 4	- 6410	- 142	- 2215
788	9931		1923	3598	1	- 4	- 6700	- 187	- 2411
805	9716		2274	3713	-	- 7	- 6960	- 218	- 2584
822	9503		2649	3779	2	- 3	- 7196	- 286	- 2719
839	9288		2975	3788	- 2	- 8	- 7471	- 303	- 2830
868	9041		3453	3780	- 2	- 6	- 7754	- 251	- 2931

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TWT 80 BLOW 23

CONFIG C2 THETA = 120

STABILITY AXES DATA, DRAG, AND LIFT TO DRAG RATIO

BN	ALPHA	YAW	CD	CL	CMS	CY	CNS	CLS	L/D
DEC=	2	2	4	4	4	4	4	4	4
592	12050		3890	2476	518	16	- 6	- 5	6365
638	11886		3605	2171	498	202	- 3	- 12	6021
654	11673		3001	1382	518	54	- 3	- 10	4604
671	11448		2830	684	511	- 1	4	2	2416
688	11223		2848	90	489	23	6	1	317
705	11001		2794	- 544	469	20	8	2	- 1946
722	10780		2844	- 1055	426	9	12	-	- 3709
738	10572		2851	- 1479	377	39	2	4	- 5189
755	10352		3008	- 1890	318	- 34	4	1	- 6283
772	10133		3084	- 2192	248	5	4	2	- 7109
788	9931		3240	- 2480	173	- 9	4	2	- 7654
805	9716		3400	- 2720	99	- 30	7		- 7999
822	9503		3532	- 2970	31	8	3	2	- 8410
839	9288		3634	- 3161	- 54	- 23	8	- 1	- 8698
868	9041		3755	- 3480	- 132	- 17	6	- 2	- 9267

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TWT 80 BLOW 24 2ND REDUCTION

CONFIG C2 THETA = 120

TUNNEL CONDITIONS

BN	ALPHA	YAW	MACH	RN	HO	PO	Q	TTO
DEC=	2	2	3	2		1	1	1
500	10521		735	1296	5090	35549	13435	5344
550	10687		725	1278	5058	35647	13117	5344
566	10895		727	1279	5057	35582	13154	5344
582	11113		732	1293	5090	35660	13360	5344
598	11323		726	1275	5038	35484	13085	5341
614	11536		727	1277	5045	35504	13120	5341
630	11748		728	1283	5058	35549	13186	5338
647	11971		728	1277	5037	35410	13125	5338
663	12183		731	1285	5050	35385	13245	5336
680	12404		730	1283	5042	35369	13197	5332
696	12616		729	1282	5043	35426	13166	5331
712	12821		730	1281	5029	35295	13151	5327
728	13026		729	1279	5022	35279	13108	5324
744	13235		727	1278	5023	35336	13074	5322
769	13477		726	1275	5007	35255	13010	5317

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TWT 80 BLOW 24 2ND REDUCTION

CONFIG C2 THETA = 120

BODY AXES DATA AND BALANCE CHAMBER PRESSURE, (DELTA PBC)/Q

BN	ALPHA	YAW	CA	CN	CNB	CLB	XCPN	PBC	CMA
DEC=	2	2	4	4	4	4	4	4	4
500	10521		869	3220	- 2	- 6	- 5875	- 310	- 1892
550	10687		497	3017	- 4	- 8	- 5668	- 212	- 1710
566	10895		- 68	2906	-	- 9	- 5342	- 143	- 1553
582	11113		- 682	2732	- 1	- 10	- 5024	- 110	- 1373
598	11323		- 1309	2457	- 3	- 12	- 4590	- 93	- 1128
614	11536		- 2005	2270	- 5	- 10	- 4081	- 175	- 926
630	11748		- 2743	2072	- 5	- 8	- 3556	- 154	- 737
647	11971		- 3873	2128	- 6	- 6	- 3455	- 296	- 735
663	12183		- 4426	1988	- 9	2	- 2967	- 144	- 590
680	12404		- 5057	1774	- 10	10	- 2212	- 54	- 392
696	12616		- 5617	1539	- 4	4	- 1168	- 242	- 180
712	12821		- 5976	1312	-	4	87	- 154	11
728	13026		- 6292	1110	- 6	4	1529	- 173	170
744	13235		- 6828	892	- 1	5	4110	- 296	367
769	13477		- 7297	679	- 4	10	7899	- 131	536

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TWT 80 BLOW 24 2ND REDUCTION

CONFIG C2 THETA = 120

STABILITY AXES DATA, DRAG, AND LIFT TO DRAG RATIO

BN	ALPHA	YAW	CD	CL	CMS	CY	CNS	CLS	L/D
DEC=	2	2	4	4	4	4	4	4	4
500	10521		2879	- 1684	370	- 27	6	-	- 5847
550	10687		2743	- 1351	390	- 22	9	- 2	- 4926
566	10895		2771	- 880	438	33	9	3	- 3176
582	11113		2794	- 349	463	28	10	2	- 1249
598	11323		2774	234	482	5	12	2	842
614	11536		2910	840	514	16	12		2886
630	11748		3104	1477	524	18	9	- 1	4759
647	11971		3767	2309	497	80	8	- 2	6129
663	12183		4024	2712	514	196	3	- 9	6739
680	12404		4301	3197	527	96	- 3	- 14	7433
696	12616		4557	3627	545	229	- 1	- 6	7959
712	12821		4727	3884	559	78	- 3	- 3	8216
728	13026		4913	4084	561	67	1	- 7	8313
744	13235		5259	4445	576	115	- 3	- 4	8453
769	13477		5621	4703	572	94	- 4	- 10	8367

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TWT 80 BLOW 25 2ND REDUCTION

CONFIG C2 THETA = 120

TUNNEL CONDITIONS

BN	ALPHA	YAW	MACH	RN	HO	PO	Q	TTO
DEC=	2	2	3	2		1	1	1
674	10528		725	816	3193	22497	8284	5298
716	10686		708	795	3153	22571	7918	5297
733	10908		733	820	3189	22310	8391	5300
749	11117		717	804	3174	22538	8104	5307
765	11327		738	818	3178	22142	8431	5310
782	11550		719	800	3161	22408	8103	5317
799	11773		727	810	3182	22384	8280	5319
816	11998		722	800	3157	22310	8145	5324
832	12209		724	801	3159	22294	8171	5326
848	12416		733	806	3157	22089	8305	5327
864	12623		734	805	3154	22048	8313	5332
880	12830		718	789	3130	22203	8013	5332
896	13036		731	807	3171	22236	8307	5334
912	13240		725	795	3140	22138	8136	5336
964	13498		723	795	3147	22208	8137	5338

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TWT 80 BLOW 25 2ND REDUCTION

CONFIG C2 THETA = 120

BODY AXES DATA AND BALANCE CHAMBER PRESSURE, (DELTA PBC)/Q

BN	ALPHA	YAW	CA	CN	CNB	CLB	XCPN	PBC	CMA
DEC=	2	2	4	4	4	4	4	4	4
674	10528		786	3184	2	-1	-5878	-262	-1871
716	10686		464	3130	4	2	-5684	-178	-1779
733	10908		-124	2824	3	1	-5337	-139	-1507
749	11117		-705	2782	4	10	-5006	-95	-1392
765	11327		-1211	2311	-	-8	-4575	-137	-1057
782	11550		-1997	2246	-2	-9	-4062	-168	-912
799	11773		-2720	2003	-7	-4	-3458	-211	-693
816	11998		-3897	2090	-13	5	-3388	-143	-708
832	12209		-4487	1858	52	-21	-2570	-249	-477
848	12416		-5035	1535	18	-5	-1468	-170	-225
864	12623		-5577	1392	16	7	-673	-273	-94
880	12830		-6400	1081	-10	5	2065	-221	223
896	13036		-6674	941	-14	15	3467	-52	326
912	13240		-6889	733	-1	12	6666	-215	489
964	13498		-7358	445	-17	7	16110	-203	716

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TWT 80 BLOW 25 2ND REDUCTION

CONFIG C2 THETA = 120

STABILITY AXES DATA, DRAG, AND LIFT TO DRAG RATIO

BN	ALPHA	YAW	CD	CL	CMS	CY	CNS	CLS	L/D
DEC=	2	2	4	4	4	4	4	4	4
674	10528		2864	- 1598	361	- 7		2	- 5578
716	10686		2861	- 1352	397	3	- 3	3	- 4726
733	10908		2709	- 806	424	- 2	- 2	2	- 2975
749	11117		2849	- 347	475	- 63	- 10		- 1220
765	11327		2601	199	458	29	8	3	767
782	11550		2886	836	512	23	9	2	2895
799	11773		3039	1476	522	- 39	7	- 5	4857
816	11998		3757	2332	497	52	2	- 14	6206
832	12209		3958	2815	533	- 374	- 10	55	7112
848	12416		4098	3304	532	62	- 6	18	8064
864	12623		4419	3676	533	3	- 15	9	8319
880	12830		4815	4353	587	258	3	- 11	9040
896	13036		5039	4476	578	163	- 2	- 20	8884
912	13240		5186	4593	585	135	- 8	- 9	8855
964	13498		5516	4890	588	245	7	- 17	8866

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TWT 80 BLOW 26

CONFIG C2 THETA = 20

TUNNEL CONDITIONS

BN	ALPHA	YAW	MACH	RN	HO	PO	Q	TIO
DEC=	2	2	3	2		1	1	1
621	999		731	813	3176	22251	8334	5314
653	1160		727	814	3191	22443	8309	5310
668	1357		711	792	3143	22443	7934	5309
685	1580		730	819	3198	22443	8368	5305
701	1790		724	802	3150	22223	8149	5307
717	2001		715	800	3166	22516	8061	5310
733	2212		732	817	3192	22349	8386	5314
749	2418		713	789	3135	22345	7945	5319
765	2628		725	806	3174	22374	8224	5322
782	2847		733	813	3181	22247	8373	5324

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TWT 80 BLOW 26

CONFIG C2 THETA = 20

BODY AXES DATA AND BALANCE CHAMBER PRESSURE (DELTA PBC)/Q

BN	ALPHA	YAW	CA	CN	CNB	CLB	XCPN	PBC	CMA
DEC=	2	2	4	4	4	4	4	4	4
621	999		5870	1547	1	6	- 6493	- 239	- 1004
653	1160		5900	1754	21	10	- 6613	- 166	- 1160
668	1357		5874	2087	13	8	- 6645	- 214	- 1387
685	1580		5554	2318	18	11	- 6735	- 127	- 1561
701	1790		5090	2560	26	7	- 6698	- 210	- 1715
717	2001		5155	3013	9	6	- 6733	- 223	- 2028
733	2212		4562	3089	8	4	- 6728	- 119	- 2078
749	2418		4523	3473	12	7	- 6733	- 250	- 2339
765	2628		4074	3661	7	6	- 6771	- 161	- 2479
782	2847		3652	3731		1	- 6761	- 186	- 2523

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TWT 80 BLOW 26

CONFIG C2 THETA = 20

STABILITY AXES DATA, DRAG, AND LIFT TO DRAG RATIO

BN	ALPHA	YAW	CD	CL	CMS	CY	CNS	CLS	L/D
DEC=	2	2	4	4	4	4	4	4	4
621	999		6049	505	404	27	- 2	5	835
653	1160		6132	532	392	96	18	14	868
668	1357		6200	651	392	70	10	11	1050
685	1580		5975	718	358	107	14	15	1202
701	1790		5631	872	343	109	23	15	1548
717	2001		5874	1067	344	52	6	8	1816
733	2212		5390	1143	311	49	6	7	2121
749	2418		5549	1315	312	79	8	11	2370
765	2628		5273	1479	275	61	3	9	2804
782	2847		4989	1539	254	18	-	1	3085

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TWT 80 BLOW 27

CONFIG C2 THETA = 20

TUNNEL CONDITIONS

BN	ALPHA	YAW	MACH	RN	HO	PO	Q	TTO
DEC=	2	2	3	2		1	1	1
713	528		726	1280	5107	35966	13261	5379
753	689		720	1260	5048	35733	12975	5379
769	899		724	1272	5078	35827	13138	5377
785	1111		724	1272	5070	35757	13131	5372
801	1321		725	1272	5068	35716	13148	5372
817	1530		722	1266	5053	35724	13025	5370
833	1739		733	1287	5089	35610	13386	5367
849	1946		725	1268	5040	35508	13080	5365
865	2157		728	1278	5068	35610	13226	5363
881	2364		728	1273	5045	35463	13149	5360
897	2570		729	1275	5050	35463	13190	5360
913	2774		727	1272	5040	35471	13107	5355
929	2982		728	1269	5021	35303	13083	5353
945	3192		729	1273	5031	35332	13140	5350
962	3411		731	1278	5034	35291	13192	5344
980	3634		726	1267	5010	35291	13009	5343

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TWT 80 BLOW 27

CONFIG C2 THETA = 20

BODY AXES DATA AND BALANCE CHAMBER PRESSURE, (DELTA PBC)/Q

BN	ALPHA	YAW	CA	CN	CNB	CLB	XCPN	PBC	CMA
DEC=	2	2	4	4	4	4	4	4	4
713	528		6388	890	13	1	- 6378	- 107	- 568
753	689		6349	1119	9	2	- 6462	- 180	- 723
769	899		6231	1429	- 1	6	- 6571	- 104	- 939
785	1111		6056	1724	12	5	- 6625	- 160	- 1142
801	1321		5828	2030	4	8	- 6649	- 165	- 1350
817	1530		5741	2347	11	7	- 6682	4	- 1568
833	1739		5236	2553	- 1	6	- 6714	- 289	- 1714
849	1946		5176	2878	13	7	- 6711	- 194	- 1931
865	2157		4817	3155	31	10	- 6733	- 239	- 2124
881	2364		4536	3380	10	8	- 6738	- 225	- 2278
897	2570		4098	3609	14	8	- 6736	- 230	- 2431
913	2774		3887	3865	10	10	- 6754	- 57	- 2611
929	2982		3569	4037	2	5	- 6765	- 177	- 2731
945	3192		3354	4211	5	10	- 6785	- 228	- 2857
962	3411		2997	4391	8	8	- 6795	- 100	- 2984
980	3634		2778	4620	2	7	- 6799	- 180	- 3141

CONFIDENTIAL

TWT 80 BLOW 27

CONFIG C2 THETA = 20

STABILITY AXES DATA, DRAG, AND LIFT TO DRAG RATIO

BN	ALPHA	YAW	CD	CL	CMS	CY	CNS	CLS	L/D
DEC=	2	2	4	4	4	4	4	4	4
713	528		6442	298	420	11	13	2	463
753	689		6438	349	420	11	9	3	542
769	899		6378	438	410	18	- 2	5	686
785	1111		6275	525	399	43	11	7	837
801	1321		6138	644	388	42	2	8	1049
817	1530		6157	749	382	50	9	9	1217
833	1739		5760	872	347	22	- 3	5	1514
849	1946		5839	989	349	65	10	10	1694
865	2157		5640	1164	326	133	25	21	2063
881	2364		5511	1278	310	80	6	12	2319
897	2570		5257	1476	288	87	9	13	2807
913	2774		5239	1612	272	104	4	14	3077
929	2982		5103	1727	251	51	-	5	3385
945	3192		5073	1801	231	84	- 1	11	3551
962	3411		4944	1955	207	91	2	11	3953
980	3634		4976	2075	194	74	- 2	7	4171

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TWT 80 BLOW 28

CONFIG C2 THETA = 20

TUNNEL CONDITIONS

BN	ALPHA	YAW	MACH	RN	HO	PO	Q	TTO
DEC=	2	2	3	2		1	1	1
832	531		413	672	4083	36305	4341	5399
918	678		391	656	4166	37494	4008	5382
934	887		392	654	4144	37283	4001	5382
950	1100		397	660	4129	37041	4089	5379
966	1310		379	646	4207	38100	3827	5379
982	1520		373	612	4042	36713	3579	5377
998	1727		423	700	4132	36527	4585	5368
1015	1950		388	648	4124	37166	3924	5370
1031	2157		400	667	4134	37037	4139	5367
1047	2366		396	654	4094	36750	4028	5367
1063	2576		391	656	4148	37340	3988	5367
1079	2786		401	668	4131	36984	4154	5363
1095	2996		383	637	4096	37012	3805	5363
1111	3203		401	670	4132	36984	4167	5360
1127	3413		405	672	4114	36754	4215	5360
1145	3637		388	647	4106	37008	3904	5358

CONFIDENTIAL

TWT 80 BLOW 28

CONFIG C2 THETA = 20

BODY AXES DATA AND BALANCE CHAMBER PRESSURE, (DELTA PBC)/Q

BN	ALPHA	YAW	CA	CN	CNB	CLB	XCPN	PBC	CMA
DEC=	2	2	4	4	4	4	4	4	4
832	531		5091	805	4	1	- 6582	80	- 530
918	678		5625	1072	5	1	- 6652	- 168	- 713
934	887		5198	1302	5	- 1	- 6703	- 430	- 873
950	1100		5015	1561	- 3	- 12	- 6662	- 117	- 1040
966	1310		5523	2088	- 1	3	- 6676	- 362	- 1394
982	1520		5131	2293	1	4	- 6697	- 516	- 1536
998	1727		4072	2158	-	2	- 6691	- 220	- 1444
1015	1950		4438	2732	5	- 4	- 6649	- 120	- 1816
1031	2157		4047	2865	4	7	- 6687	- 143	- 1916
1047	2366		3873	2957	25	10	- 6685	- 334	- 1977
1063	2576		3901	3313	- 11	7	- 6690	- 337	- 2217
1079	2786		3198	3160	- 4	3	- 6662	- 320	- 2105
1095	2996		3292	3608	- 2	6	- 6665	- 320	- 2405
1111	3203		2817	3588	- 11	4	- 6652	- 73	- 2387
1127	3413		2549	3528	- 16	20	- 6694	- 198	- 2362
1145	3637		2521	3982	- 2	5	- 6708	- 221	- 2671

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TWT 80 BLOW 28

CONFIG C2 THETA = 20

STABILITY AXES DATA, DRAG, AND LIFT TO DRAG RATIO

BN	ALPHA	YAW	CD	CL	CMS	CY	CNS	CLS	L/D
DEC=	2	2	4	4	4	4	4	4	4
832	531		5143	330	323	3	4	1	642
918	678		5712	400	355	3	4	2	701
934	887		5336	486	328	2	5	-1	910
950	1100		5221	575	328	-110	-1	-13	1102
966	1310		5852	782	365	29	-2	2	1336
982	1520		5553	868	341	30	-	4	1562
998	1727		4530	852	278	22	-1	2	1880
1015	1950		5095	1094	321	-4	6	-2	2146
1031	2157		4817	1176	290	77	1	8	2441
1047	2366		4734	1154	282	193	19	20	2439
1063	2576		4954	1289	288	78	-13	1	2601
1079	2786		4304	1300	253	46	-5	1	3019
1095	2996		4654	1482	266	109	-5	5	3185
1111	3203		4291	1548	242	70	-11	-2	3607
1127	3413		4090	1490	210	176	-24	8	3644
1145	3637		4391	1711	211	103	-5	3	3896

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TWT 80 BLOW 29

CONFIG C2 THETA = 160

TUNNEL CONDITIONS

BN	ALPHA	YAW	MACH	RN	HO	PO	Q	TTO
DEC=	2	2	3	2		1	1	1
871	15011		381	637	4121	37290	3780	5363
960	15181		398	664	4121	36947	4098	5353
976	15387		382	638	4097	37040	3793	5353
991	15592		397	662	4111	36882	4068	5350
1007	15807		380	636	4099	37092	3758	5350
1023	16023		390	656	4137	37258	3959	5346
1040	16250		396	659	4091	36712	4040	5344
1056	16464		381	636	4089	36999	3755	5344
1071	16664		391	658	4132	37181	3984	5343
1087	16873		402	670	4108	36753	4154	5339
1103	17084		392	656	4103	36898	3977	5339
1119	17291		385	644	4092	36939	3837	5338
1136	17507		393	659	4118	37028	4000	5338
1154	17708		393	660	4123	37072	4005	5338
1172	17909		399	666	4099	36720	4101	5334
1197	18129		396	659	4087	36688	4019	5332

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TWT 80 BLOW 29

CONFIG C2 THETA = 160

BODY AXES DATA AND BALANCE CHAMBER PRESSURE. (DELTA PBC)/Q

BN	ALPHA	YAW	CA	CN	CNB	CLB	XCPN	PBC	CMA
DEC=	2	2	4	4	4	4	4	4	4
871	15011		- 9263	- 1294	39	16	-14914	- 112	1930
960	15181		- 8272	- 1352	3	2	-13530	140	1830
976	15387		- 8959	- 1692	20	- 6	-12323	10	2085
991	15592		- 8664	- 1664	18	- 2	-11761	- 320	1957
1007	15807		- 9391	- 1739	45	4	-11194	- 340	1947
1023	16023		- 9391	- 1512	10	- 1	-10993	- 304	1662
1040	16250		- 8892	- 1476	48	2	-10259	- 213	1515
1056	16464		- 9613	- 1186	41	12	-10655	- 344	1263
1071	16664		- 8880	- 843	41	- 7	-10985	- 208	926
1087	16873		- 8057	- 621	54	14	-10867	- 172	675
1103	17084		- 8557	- 532	68	20	-10766	68	573
1119	17291		- 8962	- 420	57	27	-10686	- 14	448
1136	17507		- 8623	235	66	6	- 1772	- 118	- 42
1154	17708		- 8750	377	87	15	- 4881	- 13	- 184
1172	17909		- 8428	669	83	23	- 6373	97	- 426
1197	18129		- 8619	796	86	26	- 7051	238	- 562

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TWT 80 BLOW 29

CONFIG C2 THETA = 160

STABILITY AXES DATA, DRAG, AND LIFT TO DRAG RATIO

BN	ALPHA	YAW	CD	CL	CMS	CY	CNS	CLS	L/D
DEC=	2	2	4	4	4	4	4	4	4
871	15011		7386	5737	495	-129	-42	6	7767
960	15181		6652	5099	414	-32	-3	-	7665
976	15387		7298	5465	395	-190	-15	14	7489
991	15592		7230	5055	304	-177	-16	9	6991
1007	15807		8062	5121	199	55	-43	13	6352
1023	16023		8326	4600	70	116	-9	4	5525
1040	16250		8037	4081	-23	28	-46	12	5078
1056	16464		8955	3690	-118	-207	-43	-1	4121
1071	16664		8445	2872	-177	-135	-38	17	3401
1087	16873		7780	2184	-227	126	-56	-4	2808
1103	17084		8363	1888	-297	161	-71	-9	2258
1119	17291		8841	1522	-368	141	-60	-19	1722
1136	17507		8611	507	-389	109	-66	-	589
1154	17708		8758	69	-441	23	-88	-11	79
1172	17909		8438	-535	-464	196	-83	-22	-634
1197	18129		8599	-991	-523	345	-86	-28	-1152

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TWT 80 BLOW 30

CONFIG C2 THETA = 160

TUNNEL CONDITIONS

BN	ALPHA	YAW	MACH	RN	HO	PO	Q	TTO
DEC=	2	2	3	2		1	1	1
738	15018		731	825	3234	22665	8478	5326
829	15175		723	803	3167	22368	8182	5324
845	15376		709	791	3161	22612	7952	5327
861	15589		727	816	3215	22612	8373	5332
877	15802		728	813	3202	22498	8352	5336
893	16013		713	793	3161	22523	8019	5336
909	16223		715	795	3167	22531	8055	5338
924	16421		731	814	3200	22437	8385	5338
940	16632		730	819	3226	22628	8442	5339
956	16840		718	794	3158	22408	8076	5339
972	17045		713	793	3166	22567	8022	5341
988	17254		729	814	3209	22535	8383	5339
1004	17463		715	795	3171	22551	8073	5341
1021	17684		706	784	3150	22592	7875	5341
1037	17892		721	806	3197	22604	8235	5339
1059	18127		721	806	3197	22612	8229	5339

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TWT 80 BLOW 30

CONFIG C2 THETA = 160

BODY AXES DATA AND BALANCE CHAMBER PRESSURE, (DELTA PBC)/Q

BN	ALPHA	YAW	CA	CN	CNB	CLB	XCPN	PBC	CMA
DEC=	2	2	4	4	4	4	4	4	4
738	15018		- 9224	132	37	6	52696	- 173	695
829	15175		- 9090	251	27	9	21215	- 173	533
845	15376		- 9658	354	28	8	12151	- 147	430
861	15589		- 9382	323	35	6	11451	- 206	369
877	15802		- 9279	203	31	8	19340	24	392
893	16013		- 9806	106	42	9	39899	- 192	421
909	16223		-10044	49	38	2	84881	- 152	413
924	16421		- 9528	14	40	4	-	- 100	371
940	16632		- 9552	- 22	37	10	-	- 186	338
956	16840		- 9569	- 96	40	14	-34863	- 118	335
972	17045		- 9803	94	54	13	15063	- 218	141
988	17254		- 9424	214	46	16	111	- 161	2
1004	17463		- 9668	499	51	14	- 4838	- 197	- 241
1021	17684		-10245	398	59	4	- 5413	- 213	- 215
1037	17892		- 9972	412	55	8	- 6602	- 171	- 272
1059	18127		-10184	443	60	15	- 7644	- 104	- 339

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TWT 80 BLOW 30

CONFIG C2 THETA = 160

STABILITY AXES DATA, DRAG, AND LIFT TO DRAG RATIO

BN	ALPHA	YAW	CD	CL	CMS	CY	CNS	CLS	L/D
DEC=	2	2	4	4	4	4	4	4	4
738	15018		8068	4473	241	126	-35	13	5544
829	15175		8126	4081	169	179	-28	5	5022
845	15376		8819	3952	103	200	-29	5	4482
861	15589		8695	3538	37	190	-34	9	4069
877	15802		8680	3285	-16	151	-32	4	3785
893	16013		9258	3233	-85	56	-43	5	3492
909	16223		9580	3019	-146	126	-37	10	3151
924	16421		9173	2578	-181	164	-39	7	2811
940	16632		9276	2280	-241	178	-38	-1	2458
956	16840		9354	2019	-295	246	-42	-6	2158
972	17045		9683	1534	-373	363	-55	-4	1584
988	17254		9372	1011	-407	255	-48	-10	1079
1004	17463		9672	408	-469	97	-52	-9	422
1021	17684		10251	167	-547	228	-59	-1	163
1037	17892		9978	-224	-578	150	-55	-7	-225
1059	18127		10172	-669	-635	318	-59	-16	-658

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TWT 80 BLOW 31 2ND REDUCTION

CONFIG C2 THETA = 140

TUNNEL CONDITIONS

BN	ALPHA	YAW	MACH	RN	HO	PO	Q	TTO
DEC=	2	2	3	2		1	1	1
724	13018		716	793	3158	22433	8056	5338
844	13170		719	794	3141	22253	8061	5326
860	13382		717	801	3181	22580	8129	5332
876	13596		732	819	3216	22511	8452	5334
891	13795		709	781	3127	22360	7871	5336
907	14008		735	813	3188	22253	8424	5338
923	14218		728	805	3173	22311	8266	5338
939	14432		717	796	3168	22498	8089	5341
955	14638		733	814	3200	22392	8419	5341
972	14862		722	796	3155	22298	8139	5341
989	15083		715	792	3161	22494	8039	5344
1005	15290		729	812	3202	22494	8361	5344
1021	15499		718	794	3160	22413	8091	5344
1037	15707		715	791	3155	22433	8039	5344
1054	15930		736	827	3245	22636	8586	5344
1083	16169		726	796	3147	22163	8170	5341

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TWT 80 BLOW 31 2ND REDUCTION

CONFIG C2 THETA = 140

BODY AXES DATA AND BALANCE CHAMBER PRESSURE, (DELTA PBC)/Q

BN	ALPHA	YAW	CA	CN	CNB	CLB	XCPN	PBC	CMA
DEC=	2	2	4	4	4	4	4	4	4
724	13018		-6735	810	32	-6	5085	-81	412
844	13170		-6885	720	5	-13	6458	-221	465
860	13382		-7636	602	6	5	10282	-183	619
876	13596		-7723	456	-	9	15245	-131	695
891	13795		-8215	343	-6	4	24108	-140	826
907	14008		-8214	283		-1	28635	-193	809
923	14218		-8423	181	-5		48193	-122	873
939	14432		-9156	178	4	2	48197	-161	857
955	14638		-8932	138	6	7	56840	-132	785
972	14862		-9071	53	18	2	49429	-148	797
989	15083		-9439	218	-1	6	27344	-177	595
1005	15290		-9025	280	-2	-3	16166	-95	453
1021	15499		-9192	231	-3	-1	19258	-182	444
1037	15707		-9377	202	1	4	19846	-229	400
1054	15930		-9066	273	-2	-3	9938	-129	271
1083	16169		-9444	235	2	-5	10113	-214	237

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TWT 80 BLOW 31 2ND REDUCTION

CONFIG C2 THETA = 140

STABILITY AXES DATA, DRAG, AND LIFT TO DRAG RATIO

BN	ALPHA	YAW	CD	CL	CMS	CY	CNS	CLS	L/D
DEC=	2	2	4	4	4	4	4	4	4
724	13018		4964	4623	570	-43	-16	28	9312
844	13170		5118	4661	553	45	6	12	9107
860	13382		5721	5093	583	166	-8	1	8901
876	13596		5869	5041	553	280	-6	-6	8589
891	13795		6329	5248	576	184	1	-7	8291
907	14008		6480	5054	519	100		1	7799
923	14218		6765	5022	501	130	4	-3	7424
939	14432		7541	5196	438	244	-4	1	6891
955	14638		7515	4830	353	194	-9	-3	6427
972	14862		7772	4678	299	159	-17	7	6020
989	15083		8348	4410	187	166	-2	-6	5283
1005	15290		8162	3862	112	162	3	2	4731
1021	15499		8428	3677	60	169	3	-	4362
1037	15707		8714	3467	-15	185	-2	-3	3979
1054	15930		8577	2950	-77	174	3	2	3439
1083	16169		9040	2745	-159	170	-1	5	3036

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TWT 80 BLOW 32

CONFIG C2 THETA = 40

TUNNEL CONDITIONS

BN	ALPHA	YAW	MACH	RN	HO	PO	Q	TTO
DEC=	2	2	3	2		1	1	1
644	3505		726	1273	5087	35813	13222	5387
774	3674		729	1274	5049	35465	13184	5363
790	3878		725	1273	5058	35649	13117	5360
804	4063		725	1268	5032	35482	13039	5355
822	4302		727	1270	5030	35375	13098	5353
838	4517		725	1268	5027	35412	13046	5351
855	4739		724	1265	5009	35343	12964	5344
871	4949		725	1264	5002	35244	12978	5344
888	5177		726	1267	5001	35199	13003	5338
905	5390		725	1262	4985	35150	12917	5336
922	5609		724	1258	4970	35060	12867	5332
938	5804		718	1245	4934	34983	12641	5327
954	5997		710	1208	4816	34414	12136	5322
970	6203		704	1167	4668	33526	11639	5317

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TWT 80 BLOW 32

CONFIG C2 THETA = 40

BODY AXES DATA AND BALANCE CHAMBER PRESSURE, (DELTA PBC)/Q

BN	ALPHA	YAW	CA	CN	CNB	CLB	XCPN	PBC	CMA
DEC=	2	2	4	4	4	4	4	4	4
644	3505		3033	4568	10	5	- 6817	- 105	- 3114
774	3674		2794	4717	11	5	- 6807	- 178	- 3211
790	3878		2417	4908	8	5	- 6795	- 162	- 3335
804	4063		2298	5064	8	5	- 6770	- 211	- 3428
822	4302		1883	5142	8	3	- 6735	- 195	- 3464
838	4517		1668	5390	3	8	- 6692	- 176	- 3607
855	4739		1429	5593	4	5	- 6629	- 154	- 3708
871	4949		1110	5696	5	8	- 6594	- 175	- 3756
888	5177		819	5813	7	11	- 6571	- 238	- 3820
905	5390		756	5984	8	8	- 6588	- 287	- 3942
922	5609		737	5939	3	10	- 6800	- 212	- 4039
938	5804		3156	4779	12	8	- 7190	- 173	- 3436
954	5997		4462	3965	23	16	- 7683	- 156	- 3046
970	6203		4896	3768	16	11	- 8029	- 80	- 3026

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TWT 80 BLOW 32

CONFIG C2 THETA = 40

STABILITY AXES DATA, DRAG, AND LIFT TO DRAG RATIO

BN	ALPHA	YAW	CD	CL	CMS	CY	CNS	CLS	L/D
DEC=	2	2	4	4	4	4	4	4	4
644	3505		5106	1998	201	72	6	10	3913
774	3674		5060	2108	192	70	6	10	4167
790	3878		4959	2312	177	77	3	9	4663
804	4063		5041	2348	184	76	3	9	4657
822	4302		4885	2475	178	74	3	8	5067
838	4517		4998	2617	192	98	- 4	8	5236
855	4739		5083	2736	216	87	- 1	6	5381
871	4949		5052	2857	219	120	- 3	9	5655
888	5177		5073	2954	219	153	- 4	12	5824
905	5390		5280	2914	210	144	- 2	11	5519
922	5609		5340	2701	82	130	- 7	8	5058
938	5804		5725	- 148	31	105	-	15	- 258
954	5997		5666	- 1879	- 61	194	- 2	28	- 3317
970	6203		5625	- 2557	- 150	108	- 3	19	- 4546

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TWT 80 BLOW 33

CONFIG C2 THETA = 60

TUNNEL CONDITIONS

BN	ALPHA	YAW	MACH	RN	HO	PO	Q	TTO
DEC=	2	2	3	2		1	1	1
626	6002		721	1250	5022	35511	12936	5396
682	6129		711	1231	4986	35589	12599	5392
698	6332		709	1228	4981	35618	12536	5391
714	6541		713	1238	4999	35618	12676	5387
729	6736		717	1246	5014	35601	12805	5387
745	6942		709	1233	4986	35642	12557	5382
761	7151		709	1230	4976	35581	12524	5380
778	7371		714	1239	4989	35519	12671	5379
794	7583		711	1232	4968	35454	12560	5377
810	7794		712	1238	4986	35556	12621	5372
826	8008		713	1237	4978	35462	12627	5372
842	8218		711	1231	4954	35360	12513	5367
858	8429		715	1234	4948	35192	12596	5367
874	8637		718	1238	4952	35135	12666	5363
893	8872		720	1240	4940	34963	12700	5355

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TWT 80 BLOW 33

CONFIG C2 THETA = 60

BODY AXES DATA AND BALANCE CHAMBER PRESSURE. (DELTA PBC)/Q

BN	ALPHA	YAW	CA	CN	CNB	CLB	XCPN	PBC	CMA
DEC=	2	2	4	4	4	4	4	4	4
626	6002		1576	5230	5	- 14	- 7356	- 181	- 3847
682	6129		3729	4325	6	- 2	- 7362	- 185	- 3184
698	6332		4918	3896	10	10	- 7827	- 202	- 3050
714	6541		5389	3705	12	10	- 8210	- 88	- 3042
729	6736		5457	3561	1	10	- 8504	- 173	- 3029
745	6942		5869	3507	46	11	- 8861	- 165	- 3108
761	7151		6071	3479	27	3	- 9164	- 135	- 3188
778	7371		6115	3326	19	3	- 9662	- 198	- 3214
794	7583		5871	3210	- 1	- 5	-10090	- 192	- 3239
810	7794		5505	3211	2	- 13	-10232	- 83	- 3285
826	8008		4899	3293	- 1	- 12	- 9930	- 116	- 3270
842	8218		4344	3445	8	- 7	- 9494	- 117	- 3271
858	8429		3886	3508	7	- 10	- 9127	- 216	- 3202
874	8637		3510	3649	5	- 8	- 8778	- 169	- 3203
893	8872		3088	3731	4	- 10	- 8454	- 177	- 3154

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TWT 80 BLOW 33

CONFIG C2 THETA = 60

STABILITY AXES DATA, DRAG, AND LIFT TO DRAG RATIO

BN	ALPHA	YAW	CD	CL	CMS	CY	CNS	CLS	L/D
DEC=	2	2	4	4	4	4	4	4	4
626	6002		5318	1248	- 164	- 19	15	- 3	2346
682	6129		5584	- 1193	5	18	5	4	- 2137
698	6332		5690	- 2645	- 85	73	- 4	14	- 4649
714	6541		5612	- 3359	- 180	68	- 4	15	- 5986
729	6736		5387	- 3666	- 262	45	- 9	4	- 6804
745	6942		5346	- 4262	- 354	109	6	47	- 7972
761	7151		5225	- 4655	- 442	79	6	27	- 8910
778	7371		4908	- 4937	- 570	37	2	19	-10059
794	7583		4550	- 4907	- 689	- 41	5	- 2	-10785
810	7794		4290	- 4713	- 756	- 114	14	- 1	-10986
826	8008		4088	- 4258	- 721	- 91	12	- 3	-10414
842	8218		4004	- 3835	- 650	12	8	7	- 9577
858	8429		3877	- 3517	- 565	7	11	6	- 9071
874	8637		3864	- 3272	- 491	3	9	5	- 8469
893	8872		3799	- 3004	- 411	- 11	10	4	- 7906

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TWT 80 BLOW 34 2ND REDUCTION

CONFIG C2 THETA = 60

TUNNEL CONDITIONS

BN	ALPHA	YAW	MACH	RN	HO	PO	Q	TTO
DEC=	2	2	3	2		1	1	1
831	6983		369	612	4070	37044	3537	5372
883	7144		380	626	4057	36712	3718	5368
900	7368		363	601	4057	37044	3410	5368
915	7566		374	624	4097	37193	3650	5367
931	7777		390	643	4073	36676	3908	5367
947	7982		370	611	4053	36882	3528	5367
963	8186		371	618	4086	37157	3581	5367
980	8408		388	642	4078	36748	3880	5365
996	8612		371	611	4048	36813	3542	5367
1014	8839		369	616	4092	37246	3551	5363

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CONF[redacted]

TWT 80 BLOW 34 2ND REDUCTION

CONFIG C2 THETA = 60

BODY AXES DATA AND BALANCE CHAMBER PRESSURE, (DELTA PBC)/Q

BN	ALPHA	YAW	CA	CN	CNB	CLB	XCPN	PBC	CMA
DEC=	2	2	4	4	4	4	4	4	4
831	6983		1304	676	- 2	12	-22345	- 497	- 1510
883	7144		810	815	-	10	-18471	- 132	- 1506
900	7368		547	1186	2	- 2	-15518	- 262	- 1840
915	7566		257	1422	- 1	- 13	-13437	- 72	- 1911
931	7777		83	1516	16	9	-12022	- 254	- 1822
947	7982		3349	2378	- 1	19	-10907	- 241	- 2593
963	8186		3116	2618	4	- 6	-10341	- 214	- 2707
980	8408		2444	2489	3	3	- 9840	- 78	- 2449
996	8612		2332	2772	11		- 9512	- 313	- 2637
1014	8839		1989	3007	4	- 1	- 9039	- 222	- 2718

[redacted]

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TWT 80 BLOW 34 2ND REDUCTION

CONFIG C2 THETA = 60

STABILITY AXES DATA, DRAG, AND LIFT TO DRAG RATIO

BN	ALPHA	YAW	CD	CL	CMS	CY	CNS	CLS	L/D
DEC=	2	2	4	4	4	4	4	4	4
831	6983		1084	- 991	- 969	58	- 12	3	- 9141
883	7144		1031	- 509	- 898	51	- 10	3	- 4936
900	7368		1292	- 192	- 994	21	3	2	- 1485
915	7566		1441	103	- 919	- 46	12	- 4	717
931	7777		1499	240	- 777	186	- 5	18	1601
947	7982		2932	- 2876	- 764	58	- 19	2	- 9808
963	8186		3033	- 2714	- 726	- 8	7	3	- 8948
980	8408		2728	- 2174	- 597	16	- 3	3	- 7970
996	8612		2924	- 2140	- 596	46	1	11	- 7318
1014	8839		3061	- 1903	- 537	9	1	4	- 6217

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TWT 80 BLOW 35 2ND REDUCTION

CONFIG C2 THETA = 160 FLOW VISUALIZATION STUDY

TUNNEL CONDITIONS

BN	ALPHA	YAW	MACH	RN	HO	PO	Q	TTO
DEC=	2	2	3	2		1	1	1
938	15022		194	261	3145	30641	811	5360
970	15022		203	273	3157	30682	888	5358
1000	15022		201	272	3181	30936	873	5358
1029	15022		200	271	3178	30915	865	5358
1060	15022		205	276	3166	30759	904	5355
1090	15022		199	268	3162	30774	850	5353
1120	15022		201	272	3172	30843	873	5353
1150	15022		208	279	3156	30629	927	5353
1180	15022		201	272	3163	30758	873	5353
1210	15022		201	272	3167	30797	873	5351

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TWT 80 BLOW 35 2ND REDUCTION

CONFIG C2 THETA = 160 FLOW VISUALIZATION STUDY

BODY AXES DATA AND BALANCE CHAMBER PRESSURE, (DELTA PBC)/Q

BN	ALPHA	YAW	CA	CN	CNB	CLB	XCPN	PBC	CMA
DEC=	2	2	4	4	4	4	4	4	4
938	15022		- 7541	- 837	- 15	13	-18294	3411	1531
970	15022		- 7363	- 865	47	35	-17187	90	1486
1000	15022		- 7455	- 775	28	21	-18380	69	1424
1029	15022		- 7524	- 789	29	19	-18658	401	1472
1060	15022		- 7218	- 798	5	29	-17785	2633	1419
1090	15022		- 7558	- 840	47	44	-18040	1265	1514
1120	15022		- 7773	- 722	- 10	1	-19705	1129	1423
1150	15022		- 6780	- 940	- 14	14	-15948	1933	1500
1180	15022		- 7394	- 918	35	37	-16636	1479	1527
1210	15022		- 7079	- 972	47	38	-15736	309	1529

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TWT 80 BLOW 35 2ND REDUCTION

CONFIG C2 THETA = 160 FLOW VISUALIZATION STUDY

STABILITY AXES DATA, DRAG, AND LIFT TO DRAG RATIO

BN	ALPHA	YAW	CD	CL	CMS	CY	CNS	CLS	L/D
DEC=	2	2	4	4	4	4	4	4	4
938	15022		6130	4472	512	-52	6	-19	7295
970	15022		5962	4407	458	-54	-58	-7	7393
1000	15022		6086	4375	452	209	-35	-4	7189
1029	15022		6139	4421	486	210	-35	-2	7202
1060	15022		5869	4277	445	-303	-19	-23	7288
1090	15022		6144	4482	492	-55	-62	-15	7296
1120	15022		6388	4487	469	-53	8	-6	7024
1150	15022		5418	4183	454	-48	6	-19	7722
1180	15022		5962	4469	461	78	-49	-15	7496
1210	15022		5661	4359	445	-53	-60	-9	7700

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TWT 80 BLOW 36 2ND REDUCTION

CONFIG C2 THETA = 160 FLOW VISUALIZATION STUDY

TUNNEL CONDITIONS

BN	ALPHA	YAW	MACH	RN	HO	PO	Q	TTO
DEC=	2	2	3	2		1	1	1
575	15013		207	612	7004	68013	2032	5382
606	15010		208	626	7114	69056	2086	5377
635	15011		203	609	7053	68548	1985	5372
666	15010		209	629	7090	68795	2101	5367
696	15010		210	627	7038	68283	2101	5362
726	15010		208	628	7094	68854	2086	5358
756	15008		205	615	7044	68432	2008	5353
786	15013		198	595	7054	68660	1877	5350
816	15011		195	586	7029	68465	1823	5344
846	15010		206	621	7051	68472	2039	5341
876	15010		201	606	7043	68491	1939	5339
906	15010		202	608	7041	68462	1947	5336
936	15010		206	620	7042	68392	2024	5332
966	15010		205	616	7032	68319	2001	5329
996	15013		204	615	7034	68352	1985	5324
1027	15012		205	615	7006	68063	1993	5322
1057	15012		200	605	7020	68282	1916	5317
1087	15012		203	612	7013	68172	1962	5314

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TWT 80 BLOW 36 2ND REDUCTION

CONFIG C2 THETA = 160 FLOW VISUALIZATION STUDY

BODY AXES DATA AND BALANCE CHAMBER PRESSURE, (DELTA PBC)/Q

BN	ALPHA	YAW	CA	CN	CNB	CLB	XCPN	PBC	CMA
DEC=	2	2	4	4	4	4	4	4	4
575	15013		- 7799	- 101	2	- 2	-78674	5465	794
606	15010		- 8294	- 80	25	10	- 2612	5765	817
635	15011		- 8399	- 39	1	- 13	-47306	6079	812
666	15010		- 7853	- 55	26	13	-40448	5469	776
696	15010		- 7501	- 114	14	- 5	-71564	6595	815
726	15010		- 7820	- 69	16	6	-18743	6284	820
756	15008		- 8186	- 115	14	15	-74575	6391	856
786	15013		- 8424	- 207	23	- 3	-46387	5584	960
816	15011		- 8476	- 257	35	9	-39344	5565	1012
846	15010		- 7819	- 106	13	- 2	-78432	5866	831
876	15010		- 8172	- 243	51	14	-39881	5463	967
906	15010		- 8381	- 221	9	14	-43200	4943	957
936	15010		- 8099	- 308	19	4	-31862	5917	983
966	15010		- 8158	- 218	30	13	-42104	5447	917
996	15013		- 8299	- 169	32	9	-53694	6113	907
1027	15012		- 7883	- 320	12	- 10	-31508	5880	1009
1057	15012		- 8343	- 307	8	3	-34132	5383	1049
1087	15012		- 8087	- 274	14	2	-36824	5535	1007

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TWT 80 BLOW 36 2ND REDUCTION

CONFIG C2 THETA = 160 FLOW VISUALIZATION STUDY

STABILITY AXES DATA, DRAG, AND LIFT TO DRAG RATIO

BN	ALPHA	YAW	CD	CL	CMS	CY	CNS	CLS	L/D
DEC=	2	2	4	4	4	4	4	4	4
575	15013		6712	3972	265	-100	-1	3	5917
606	15010		7150	4203	273	228	-27	4	5879
635	15011		7263	4219	289	588	5	12	5809
666	15010		6780	3963	277	-99	-29	2	5845
696	15010		6445	3838	294	392	-10	11	5955
726	15010		6745	3958	311	340	-17	3	5869
756	15008		7038	4182	295	354	-19	-6	5942
786	15013		7202	4375	321	10	-18	14	6075
816	15011		7220	4446	335	200	-35	9	6158
846	15010		6726	3990	297	404	-11	8	5932
876	15010		6964	4284	319	304	-51	14	6152
906	15010		7155	4370	310	424	-14	-8	6107
936	15010		6868	4305	293	8	-18	6	6268
966	15010		6963	4255	286	181	-33	4	6111
996	15013		7113	4280	302	182	-32	8	6017
1027	15012		6675	4205	324	123	-6	14	6300
1057	15012		7081	4423	346	130	-9	2	6247
1087	15012		6876	4267	342	68	-13	5	6205

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Appendix B

PLOTTED DATA

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INDEX OF PLOTTED DATA

Description	Page
Command Module Characteristics	
C_D, C_L, L/D, $C_{m_{c.g.}}$, C_A, C_N, C_{m_A}, XCP/D vs α	
Configuration: C_2	
Mach = 0.4	
RN = 6.8×10^6	B-2 to B-9
RN = 11.0×10^6	B-10 to B-17
Mach = 0.7	
RN = 8.2×10^6	B-18 to B-25
RN = 13.0×10^6	B-26 to B-33
Mach = 3.49	
RN = 16.2×10^6	B-34 to B-41
Configuration: C_{20}	
Mach = 3.49	
RN = 16.2×10^6	B-42 to B-49

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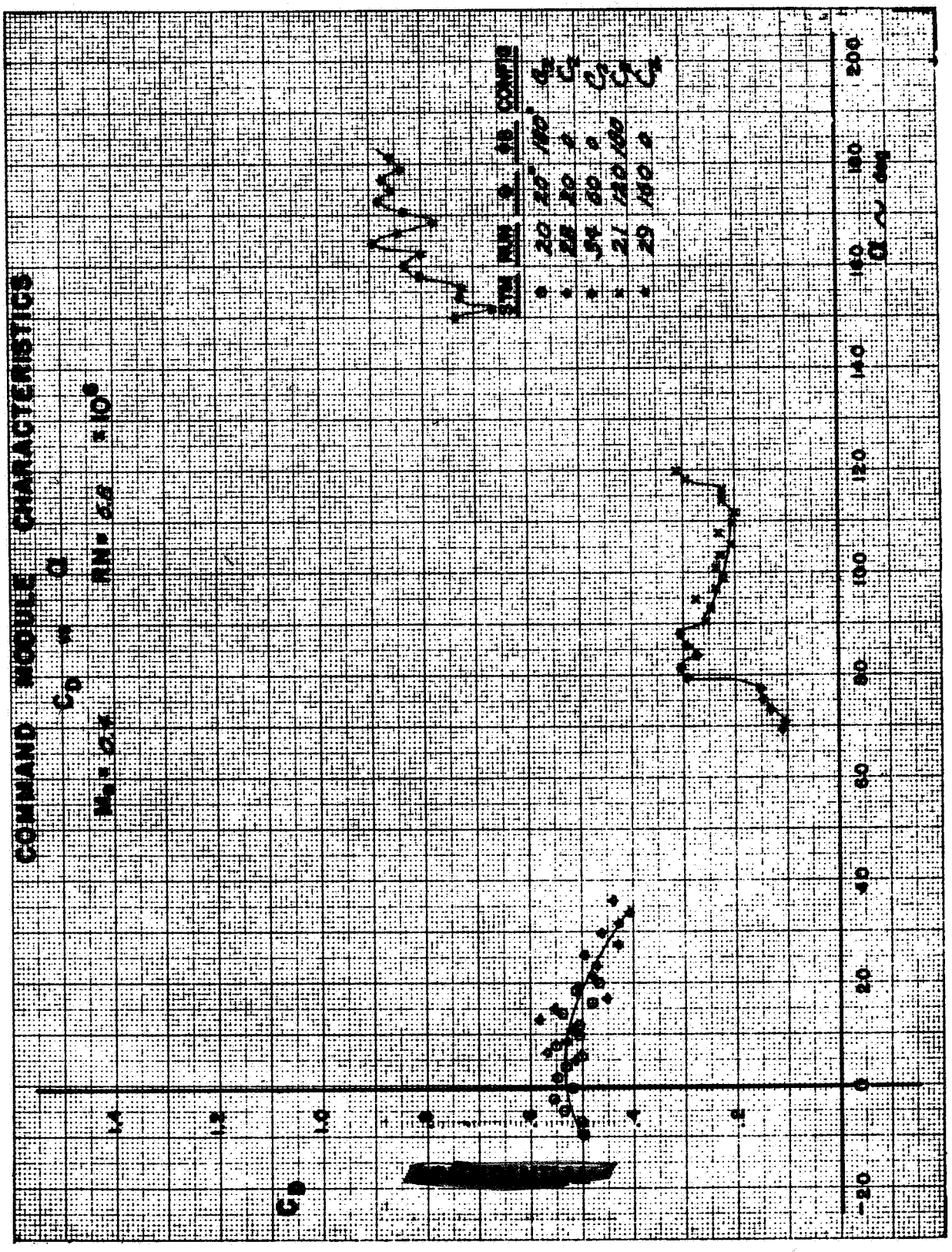

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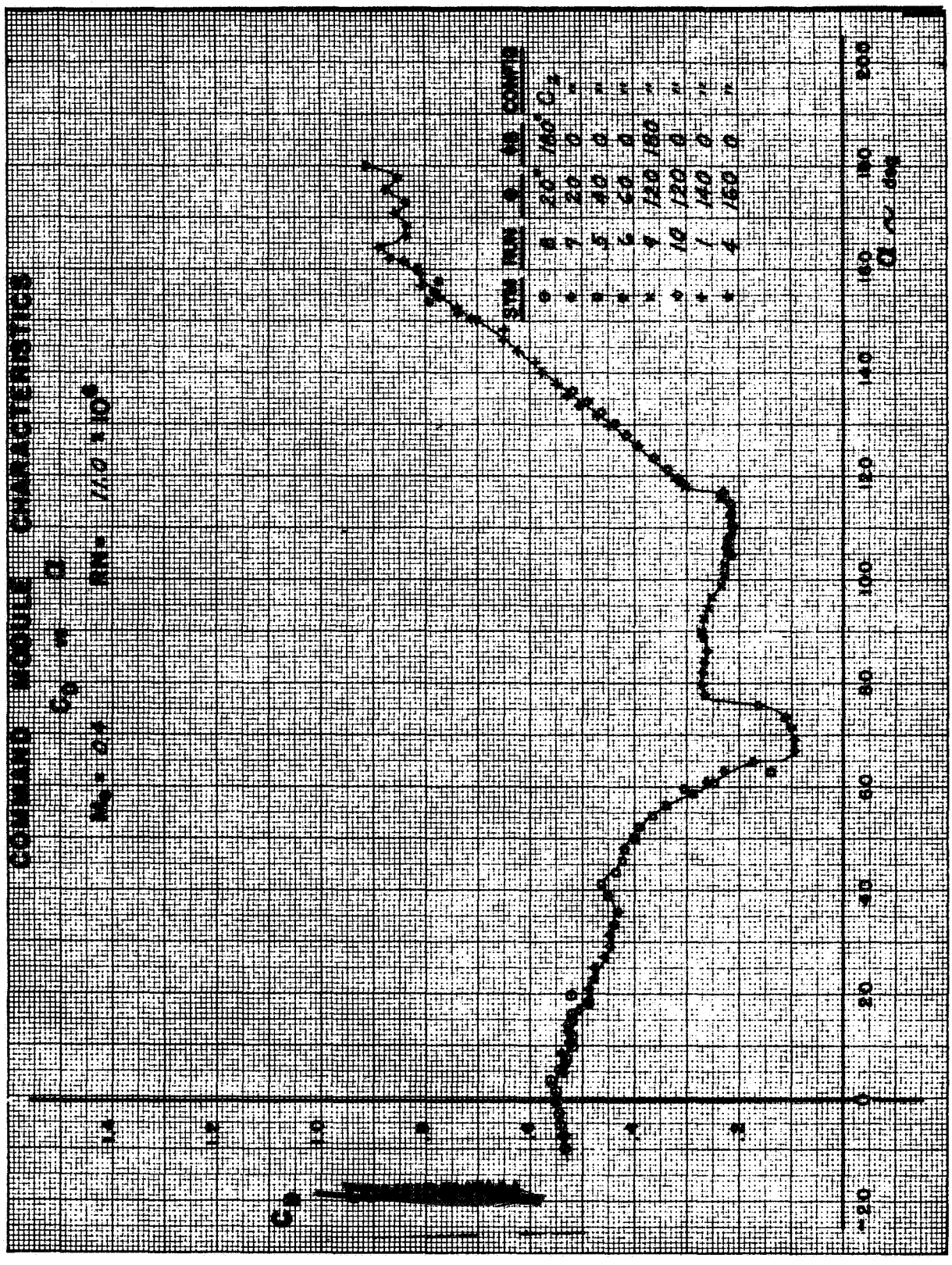

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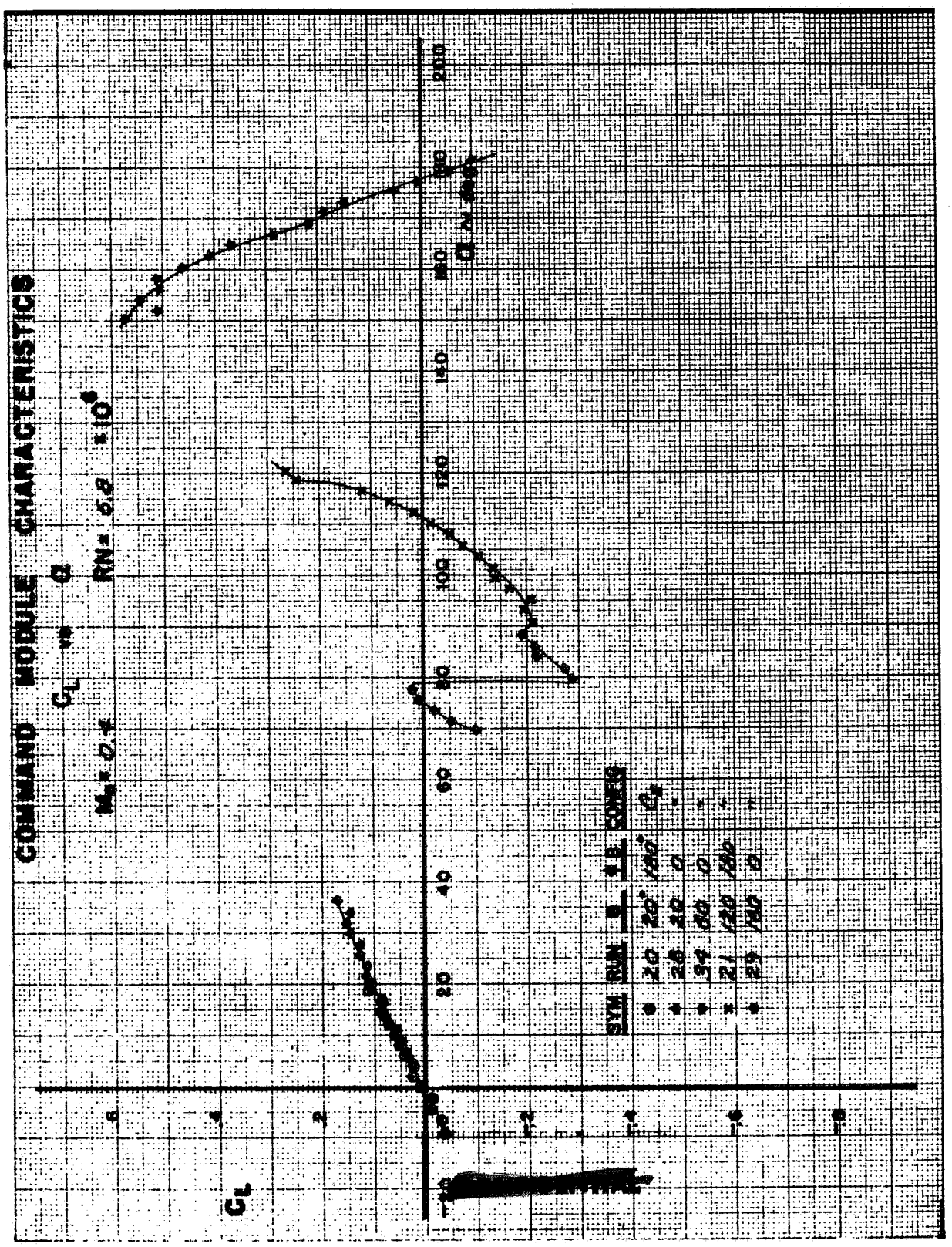

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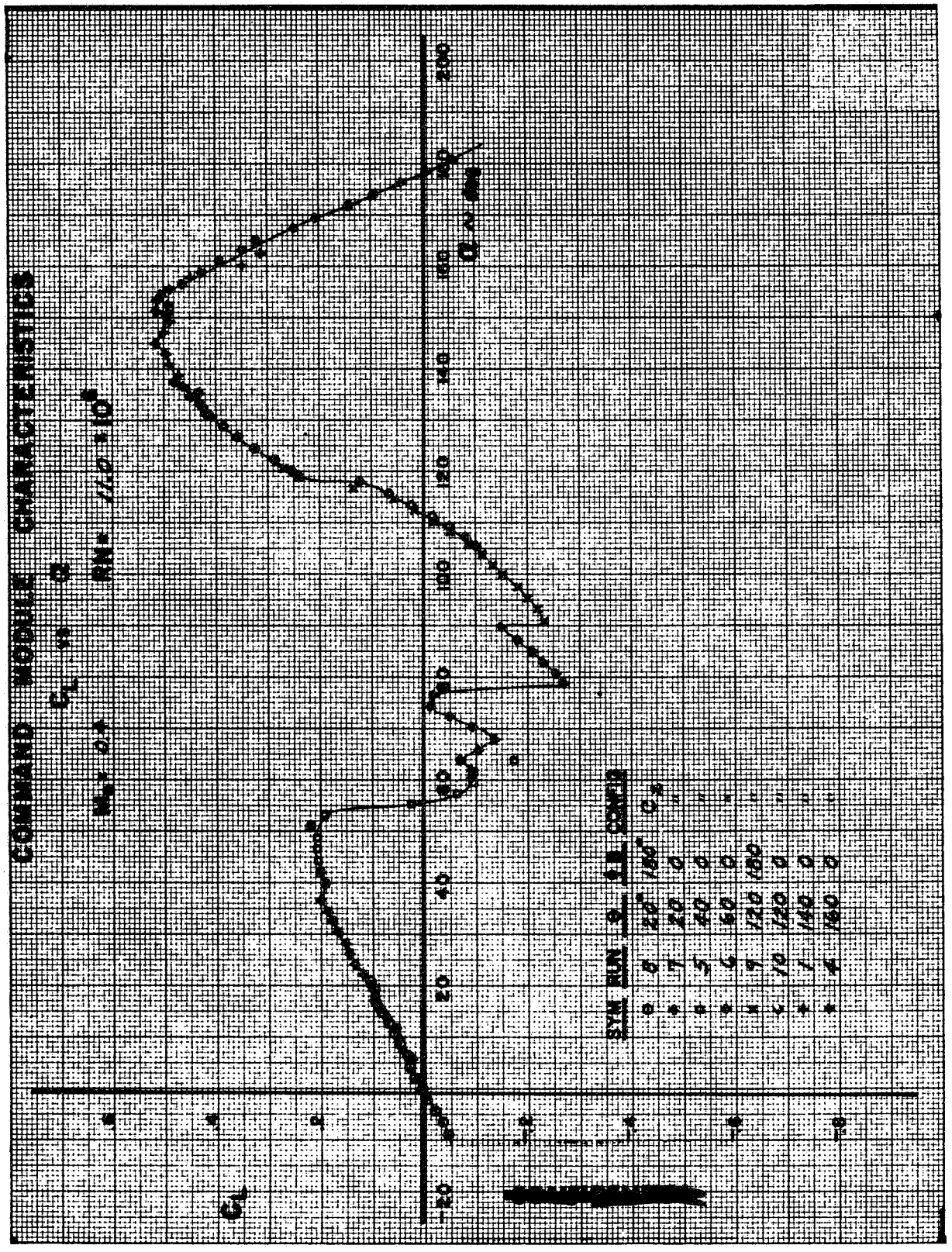

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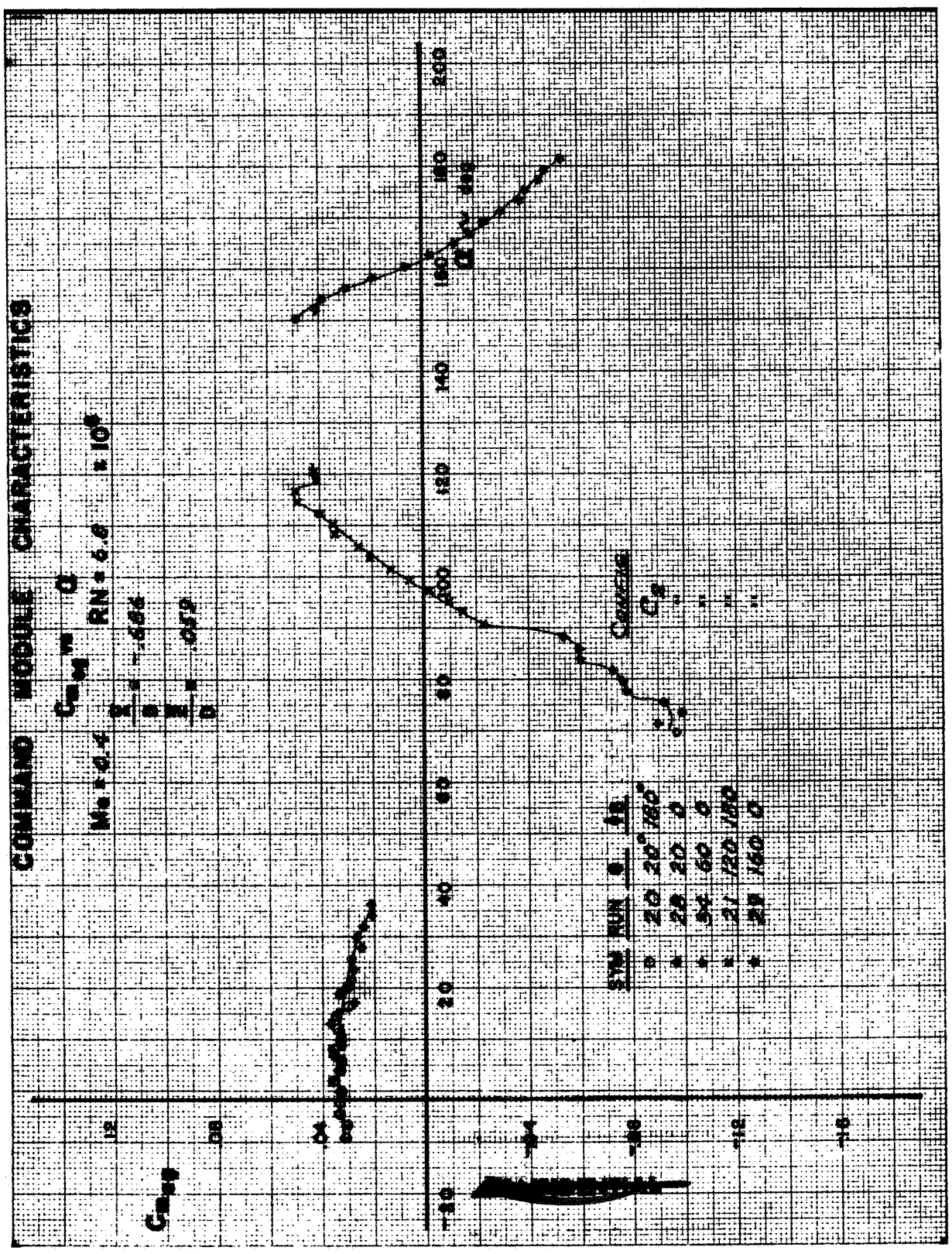

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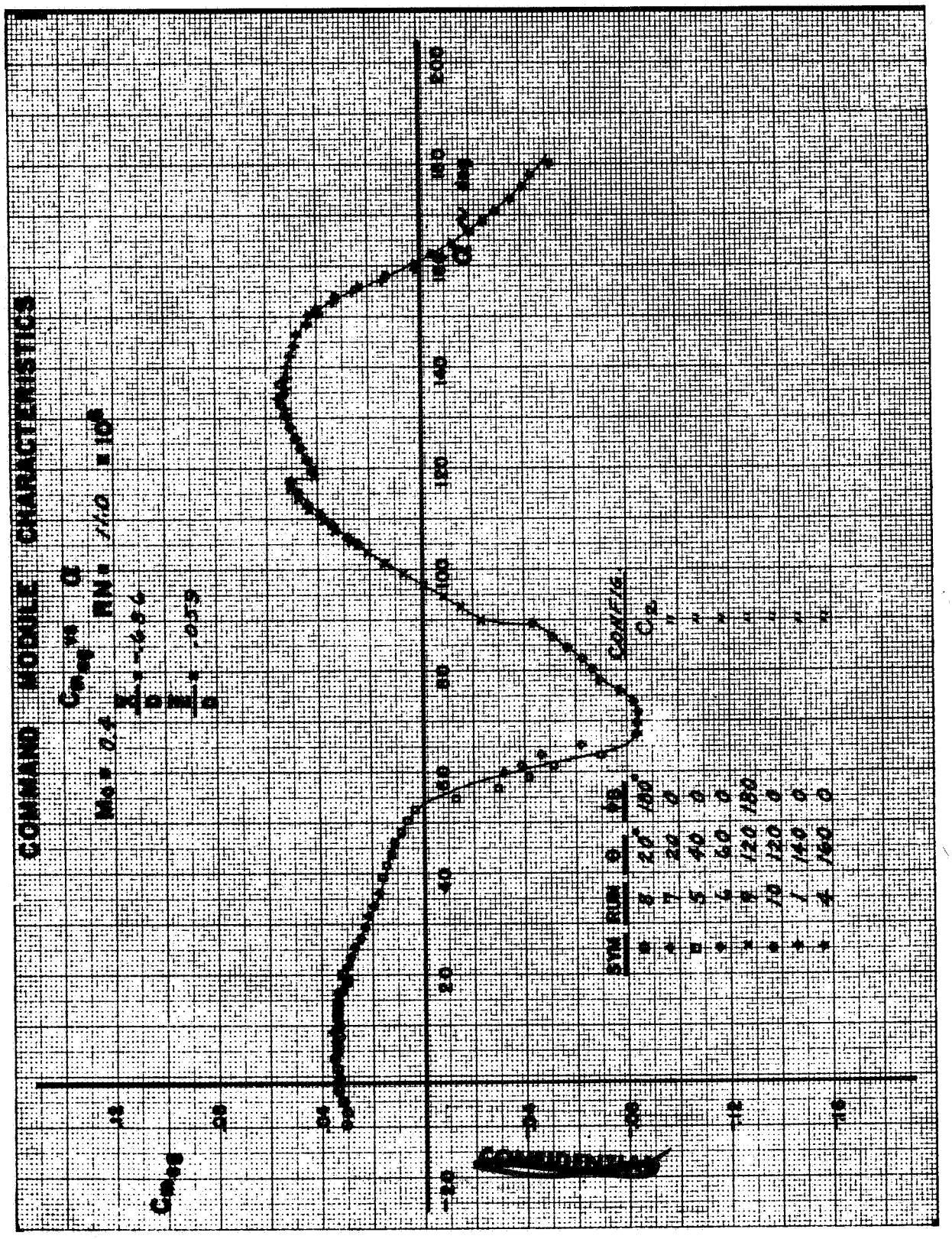

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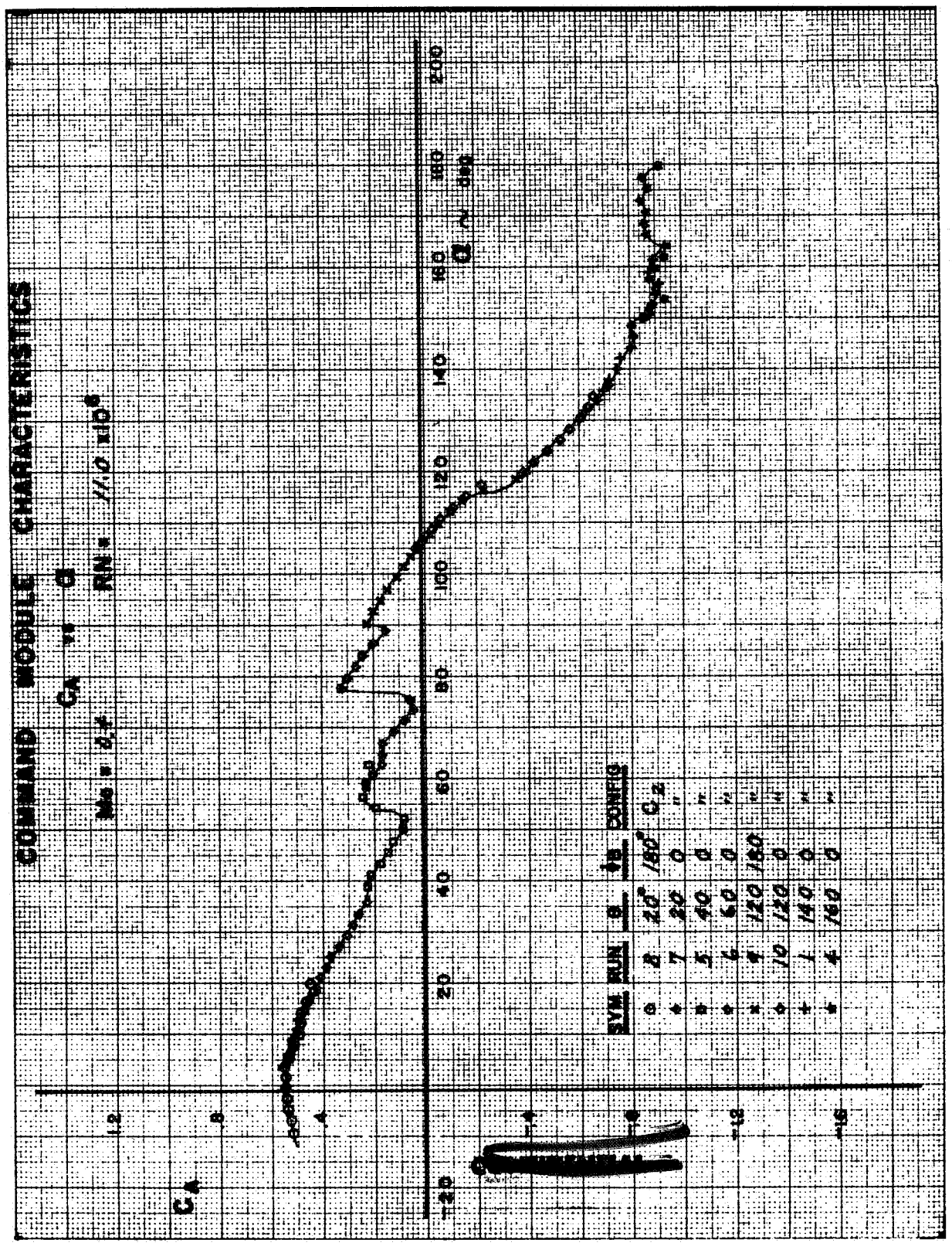

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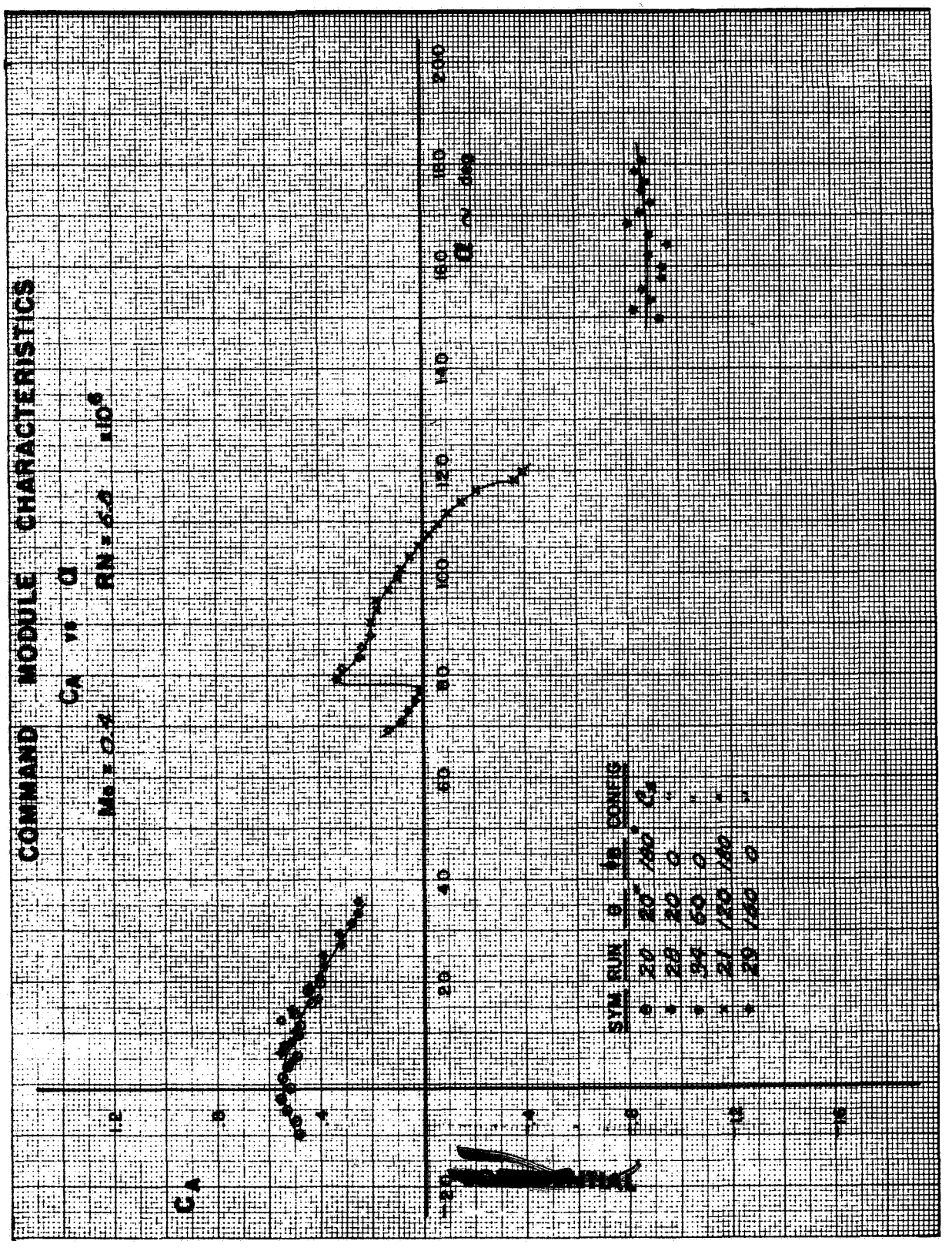

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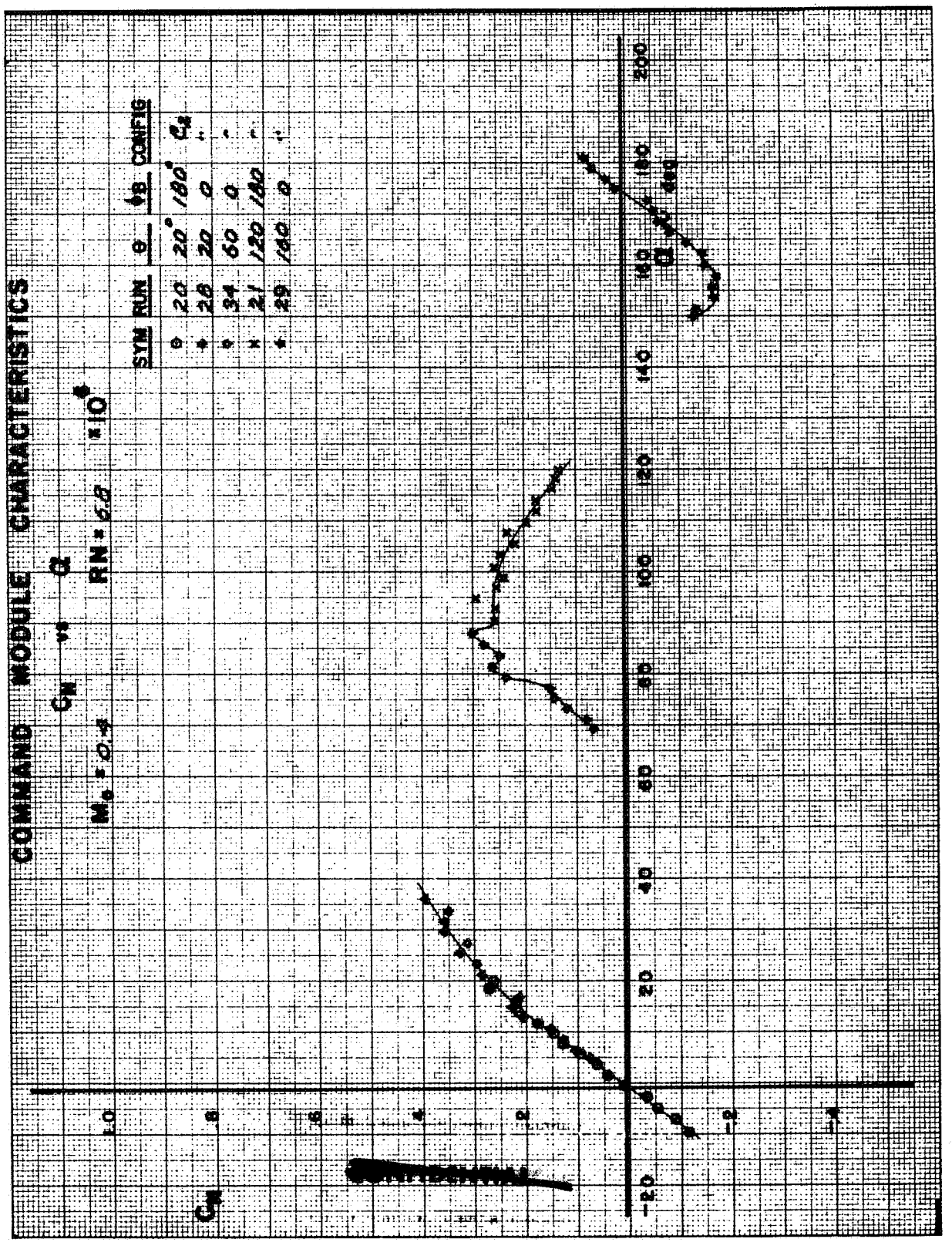

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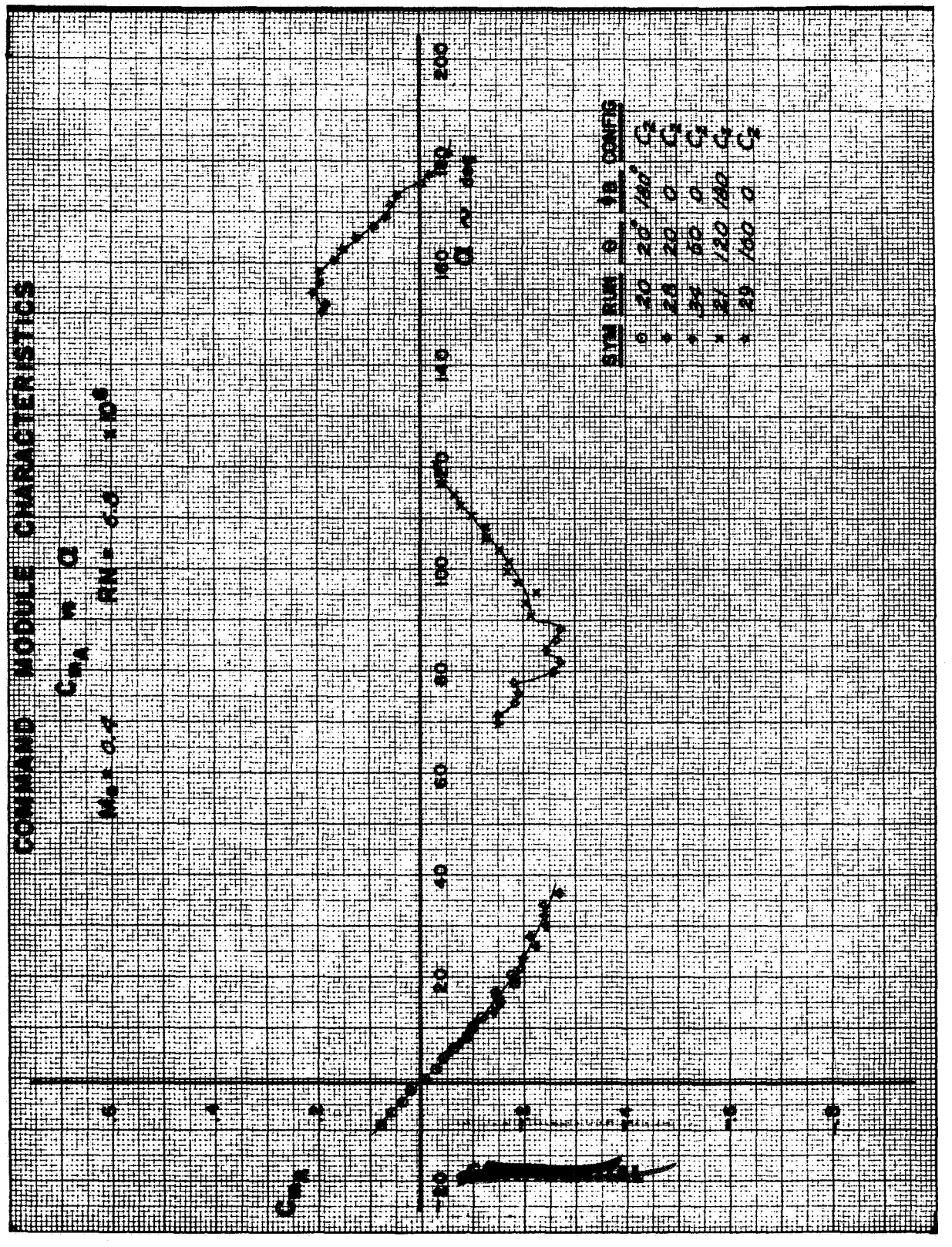

FIG 13-54

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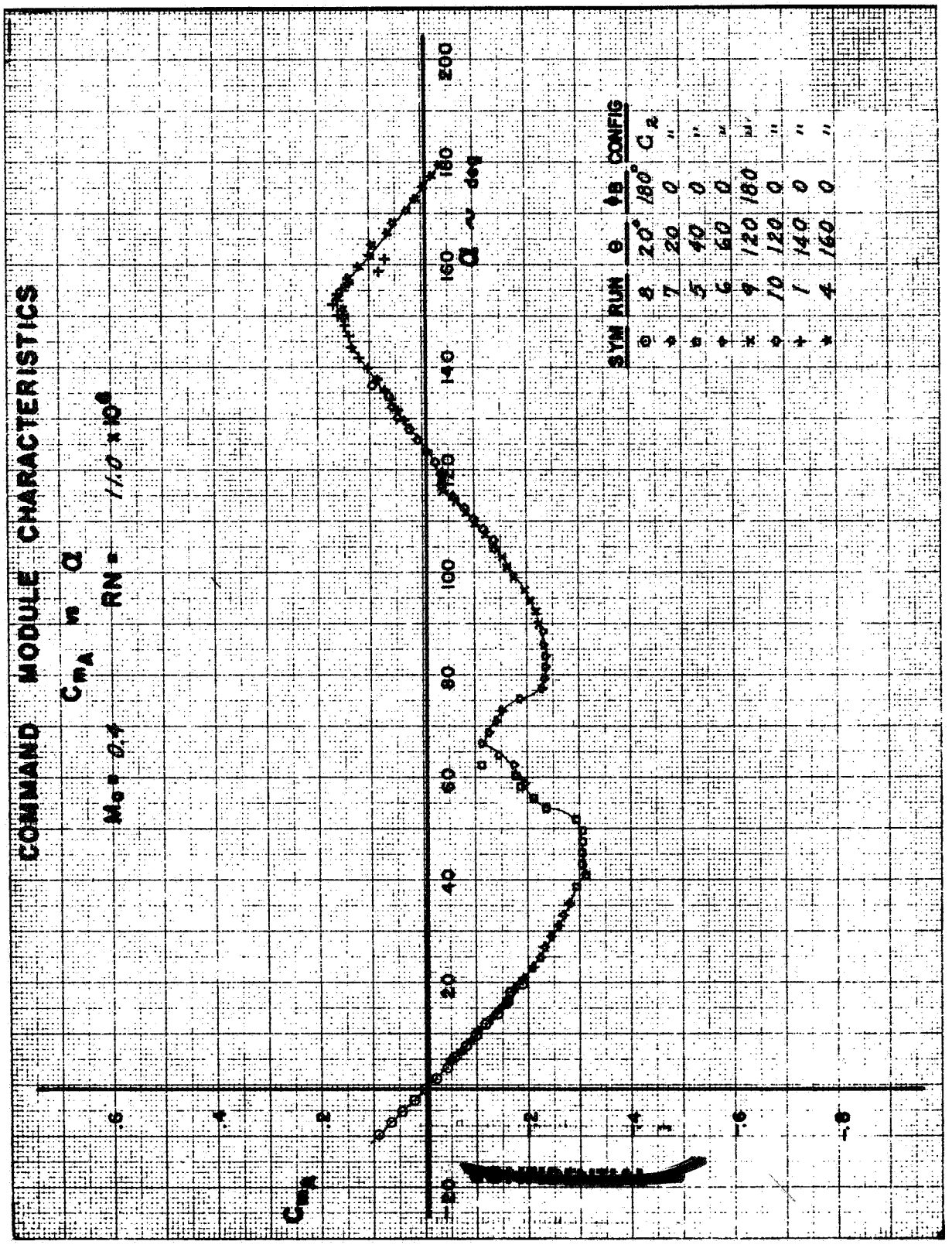

FIG. 12f+

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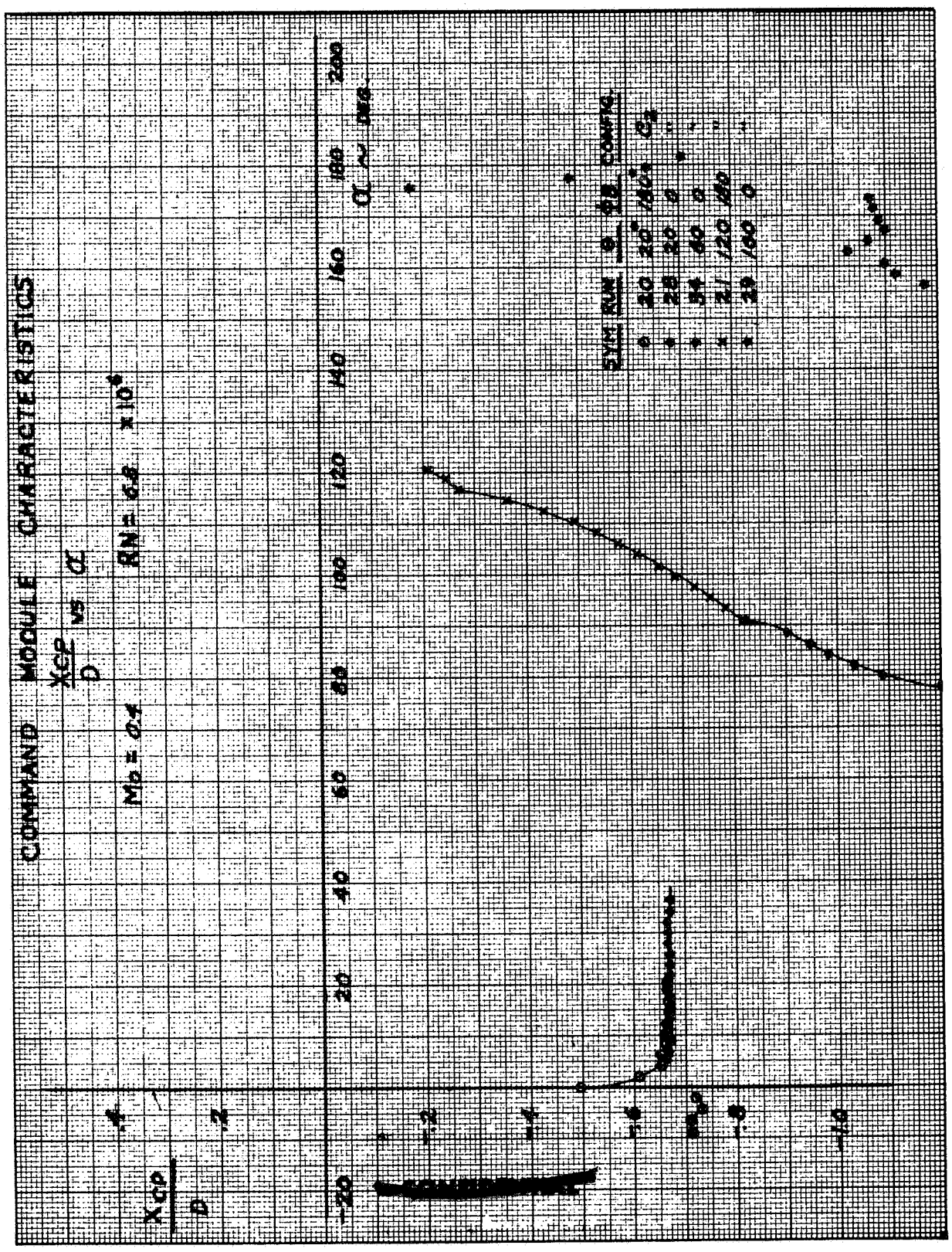

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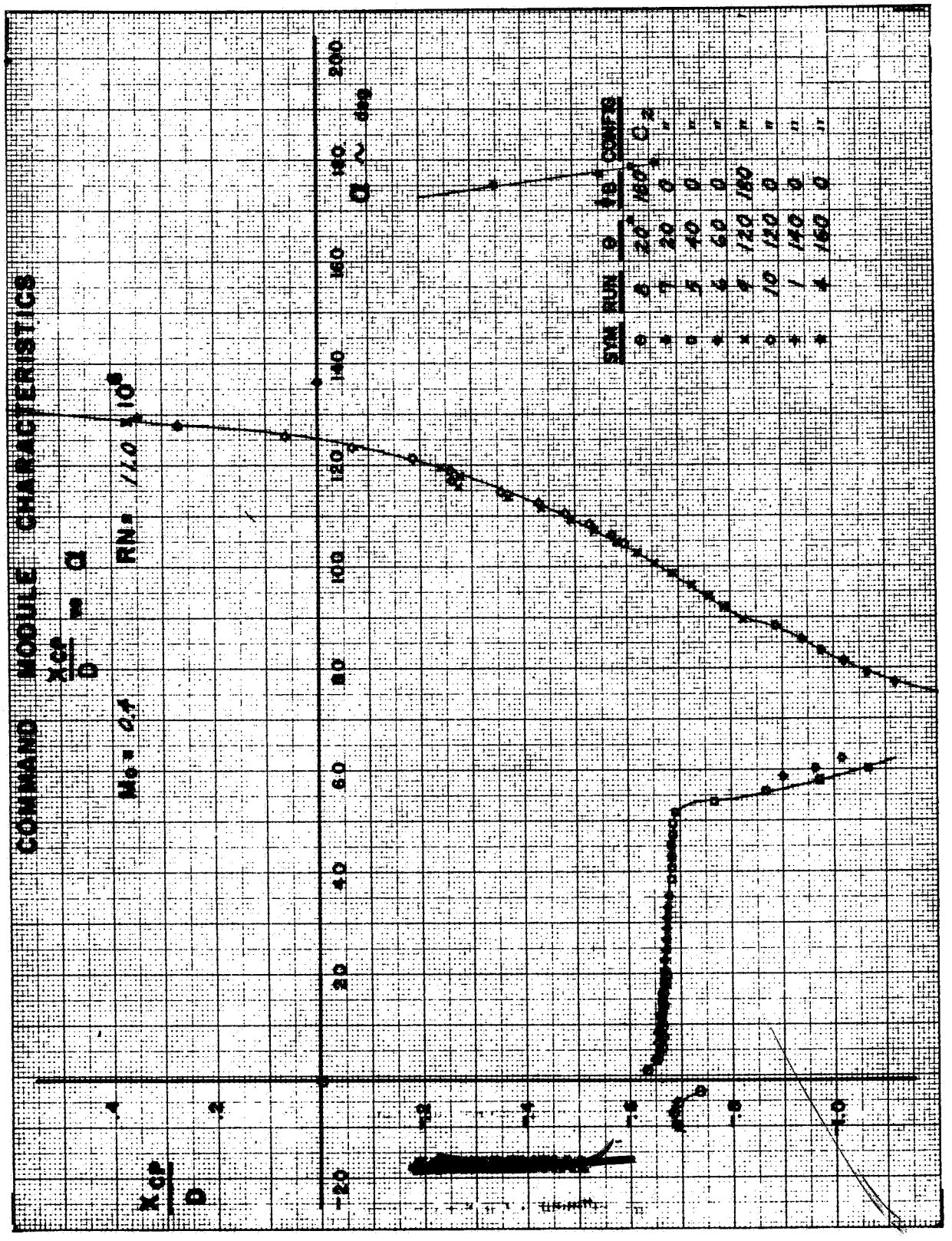

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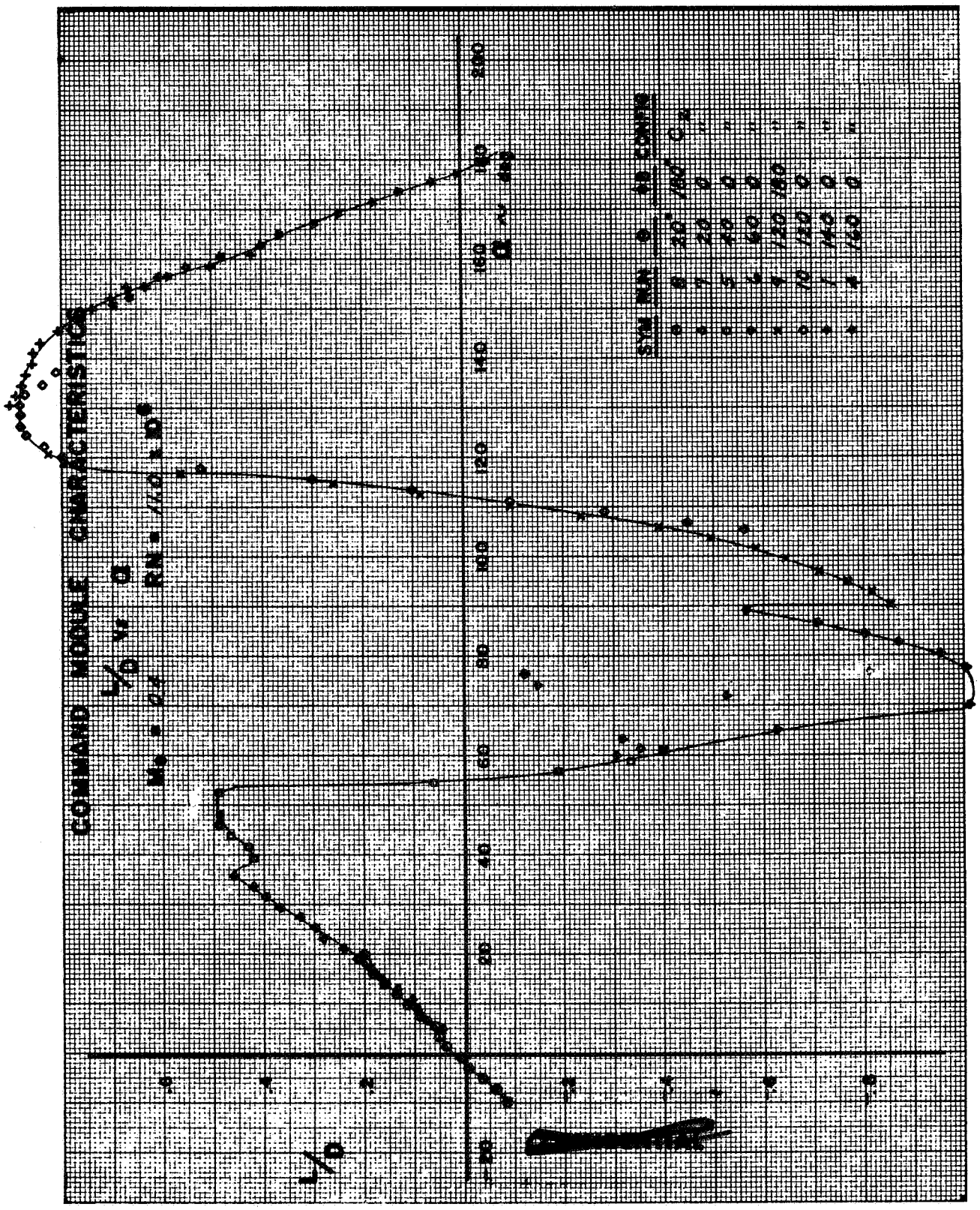

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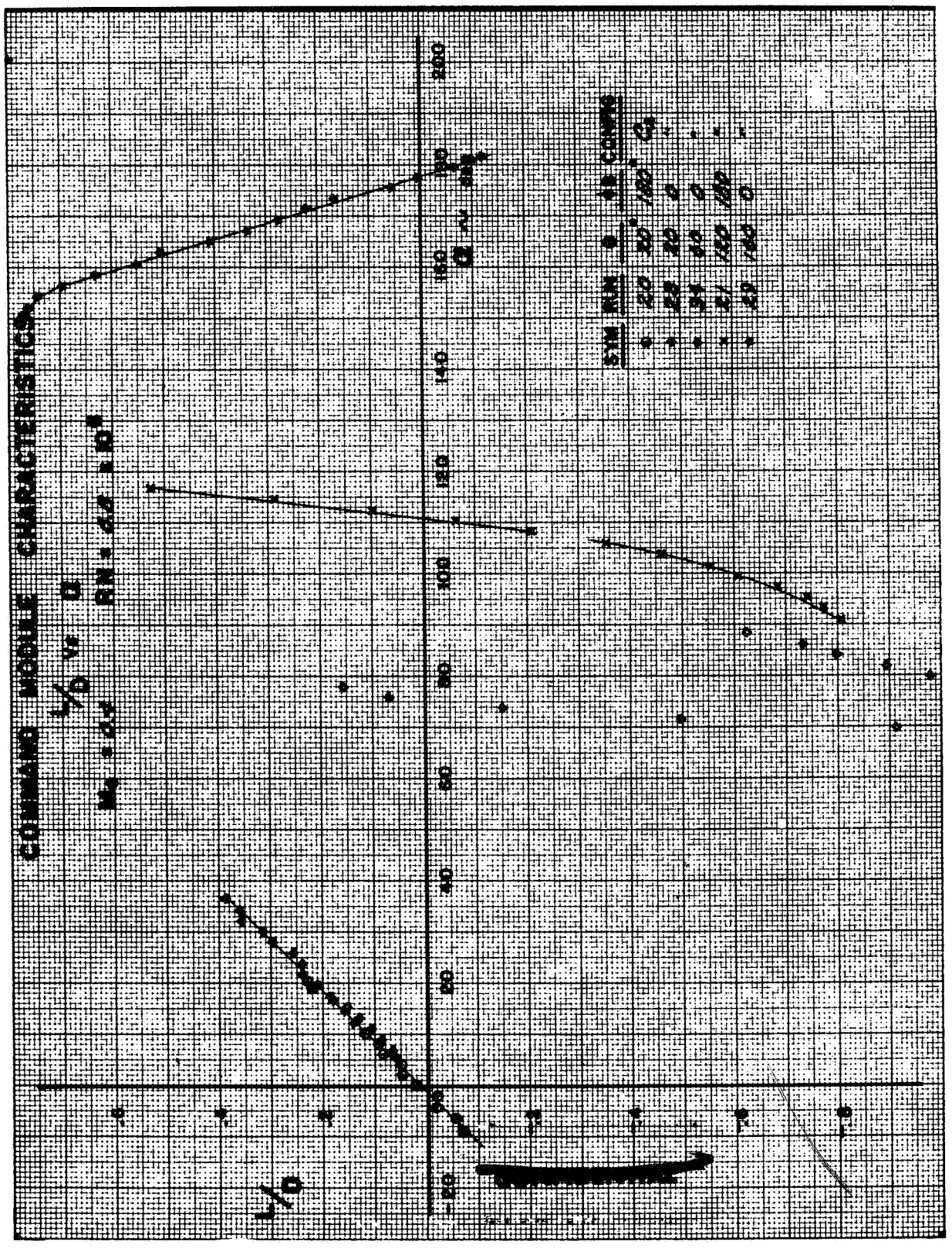

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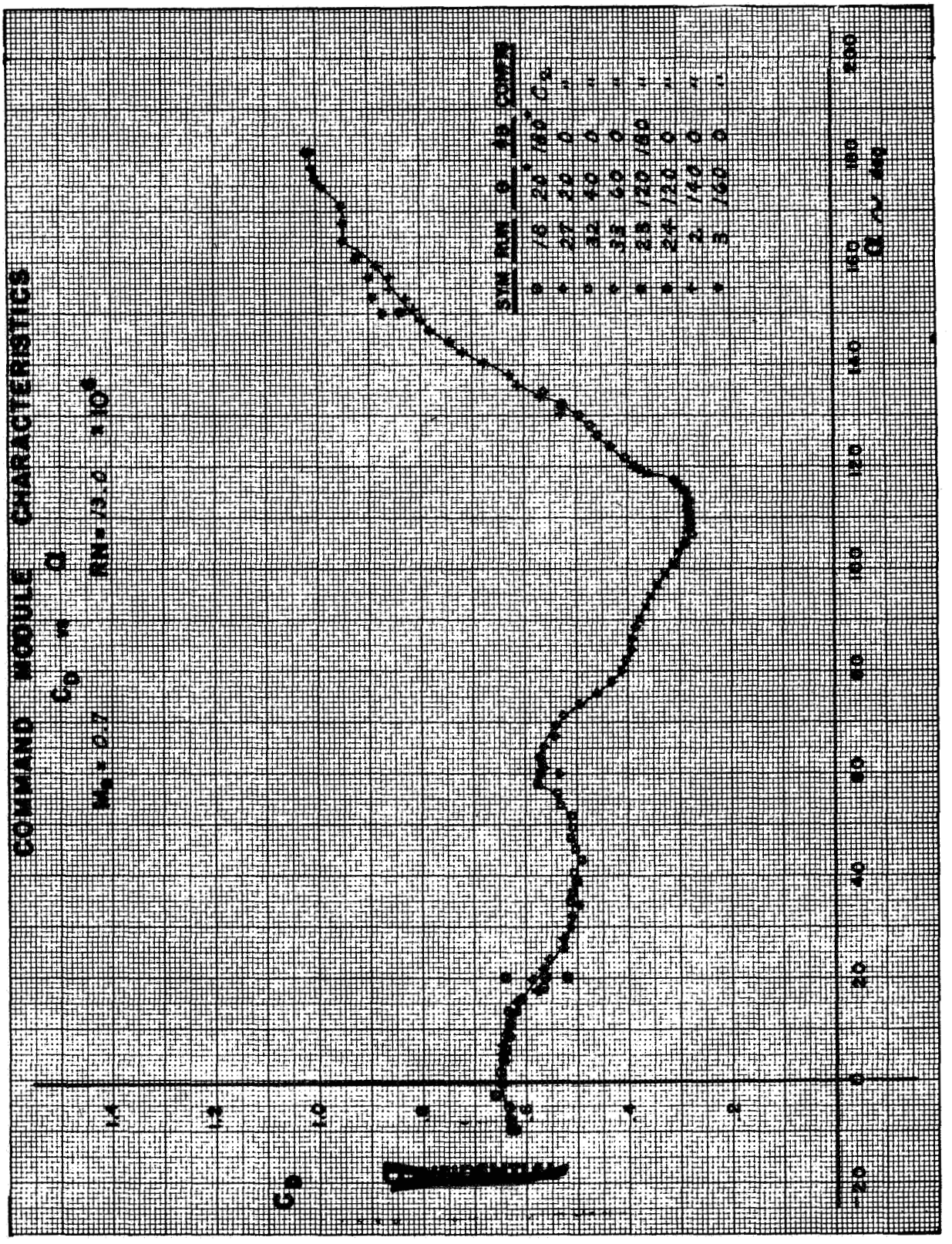

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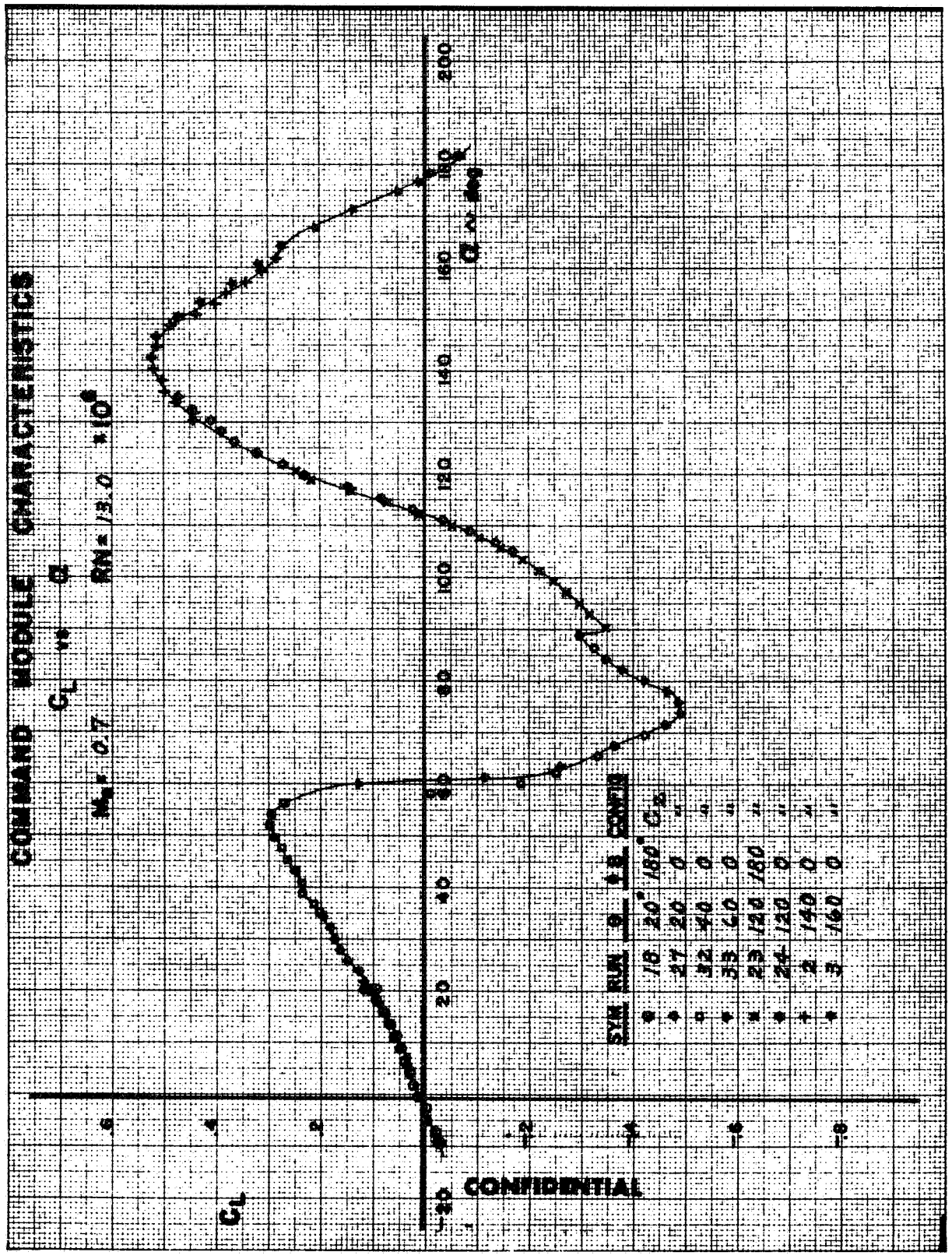

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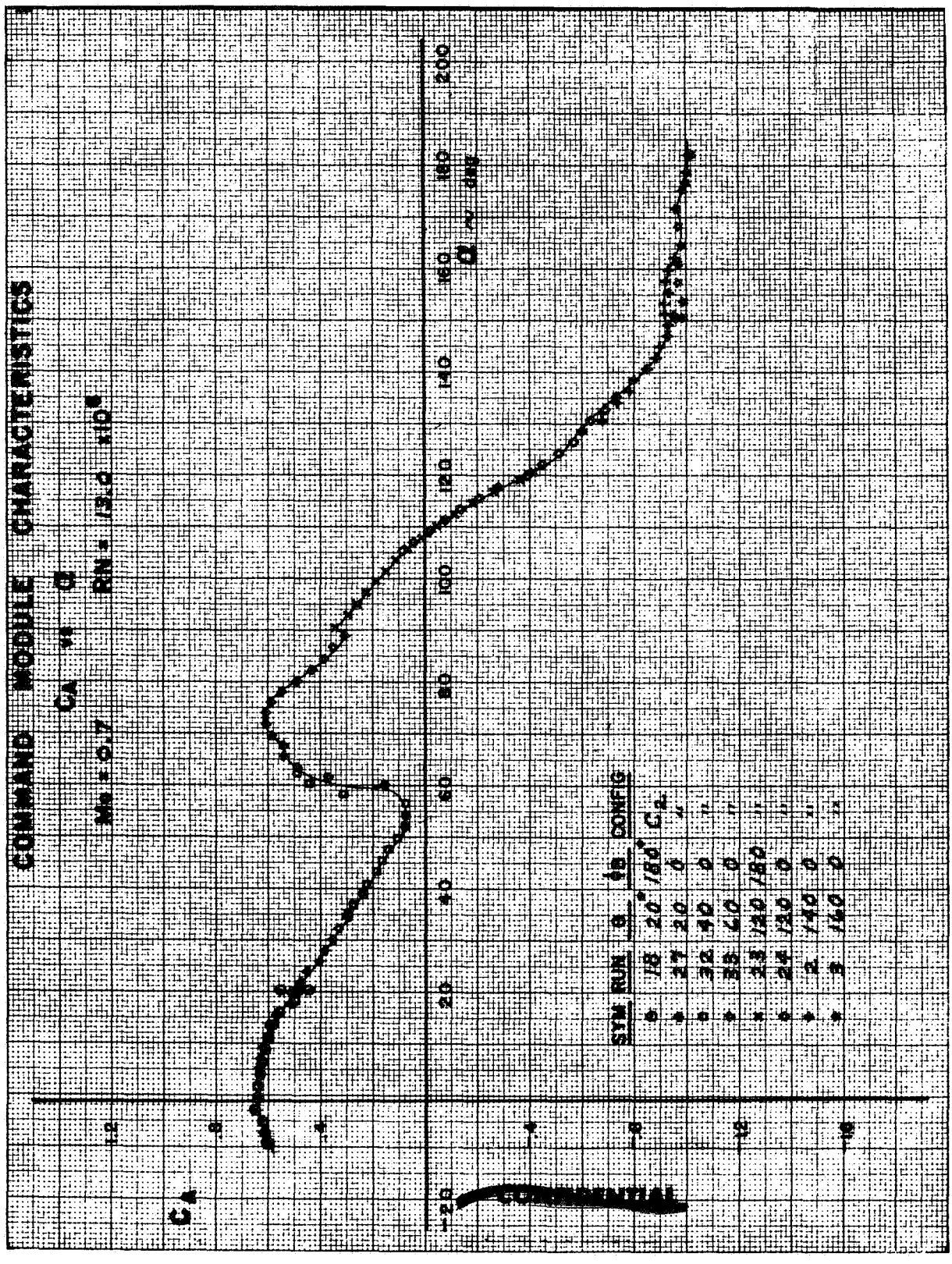

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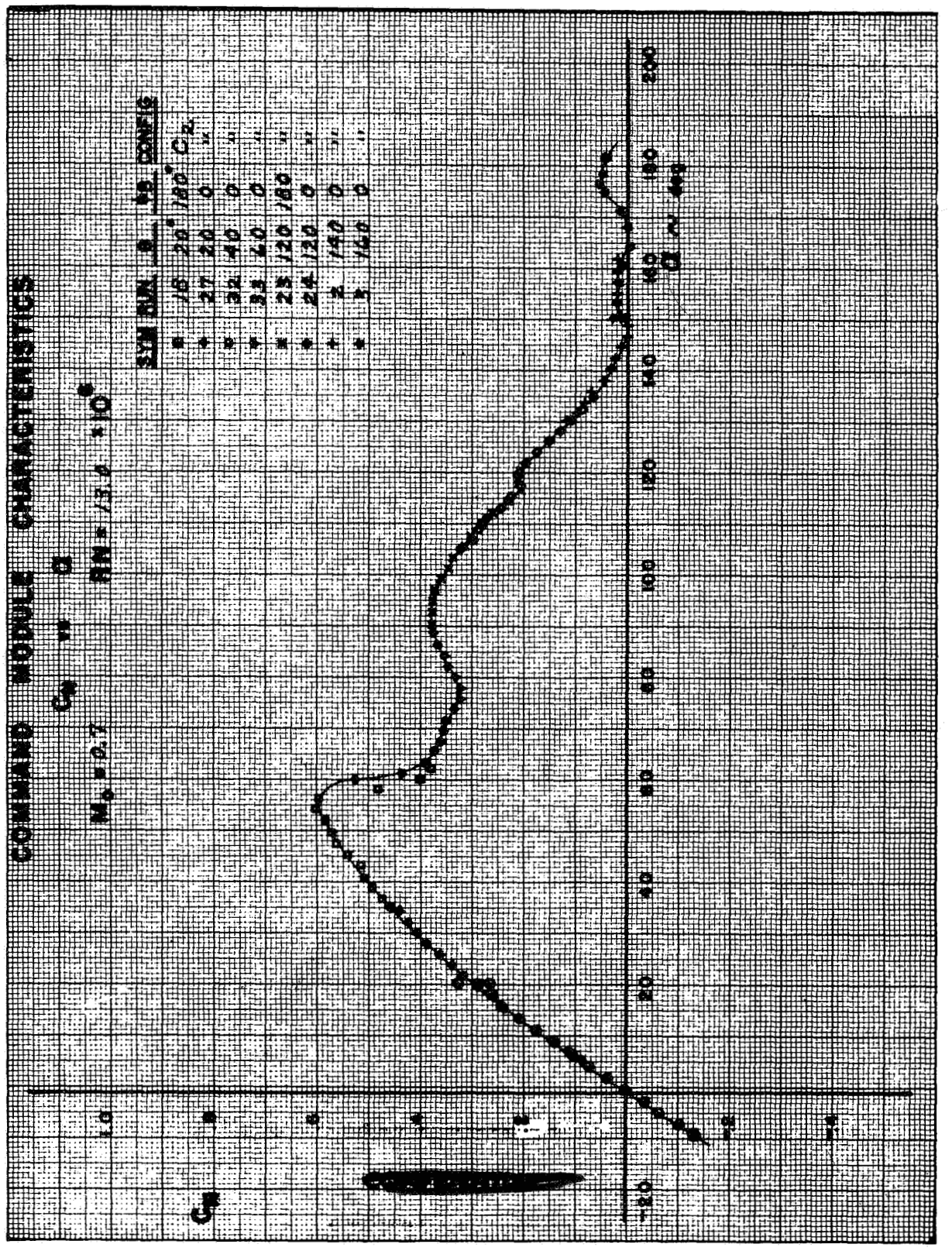

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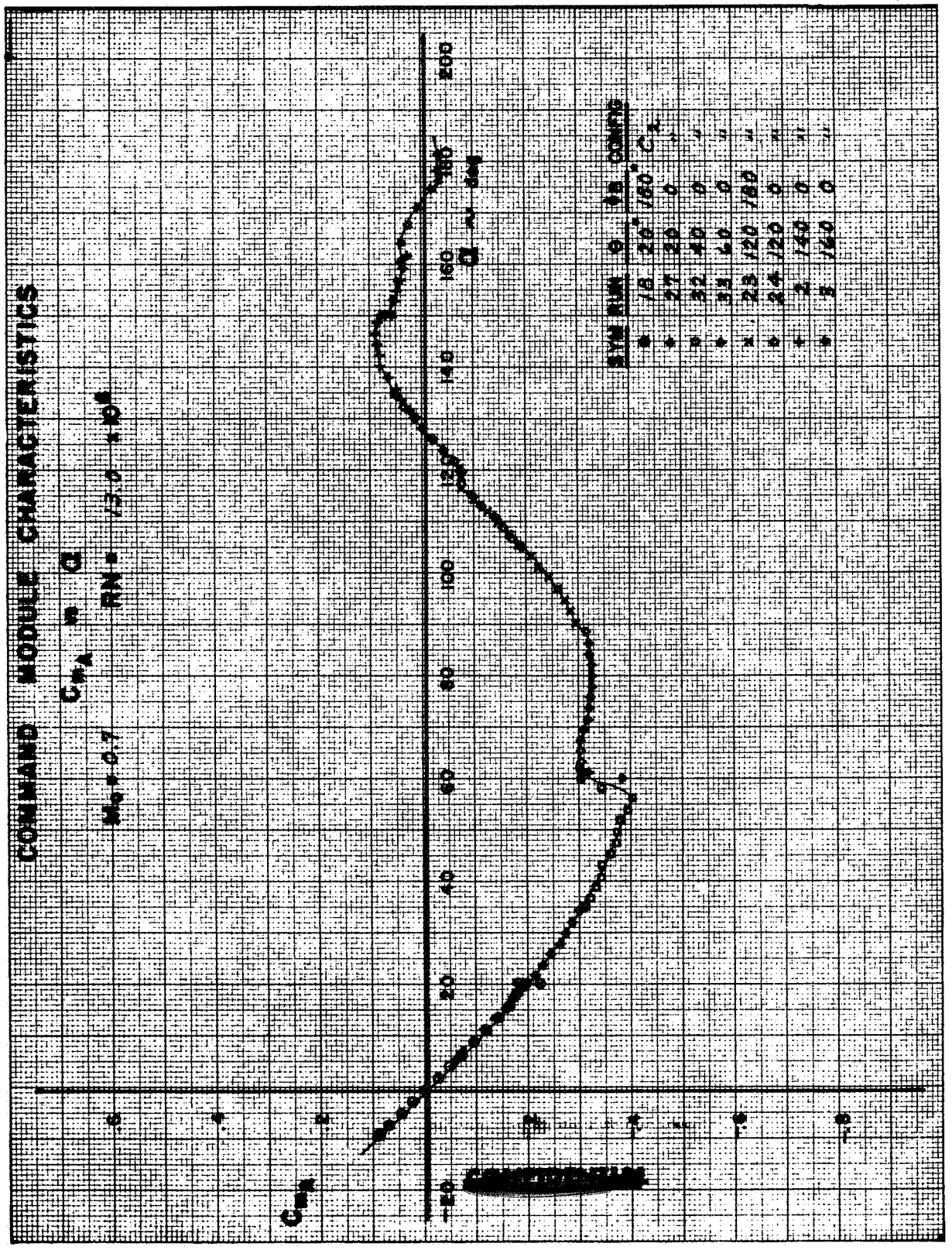

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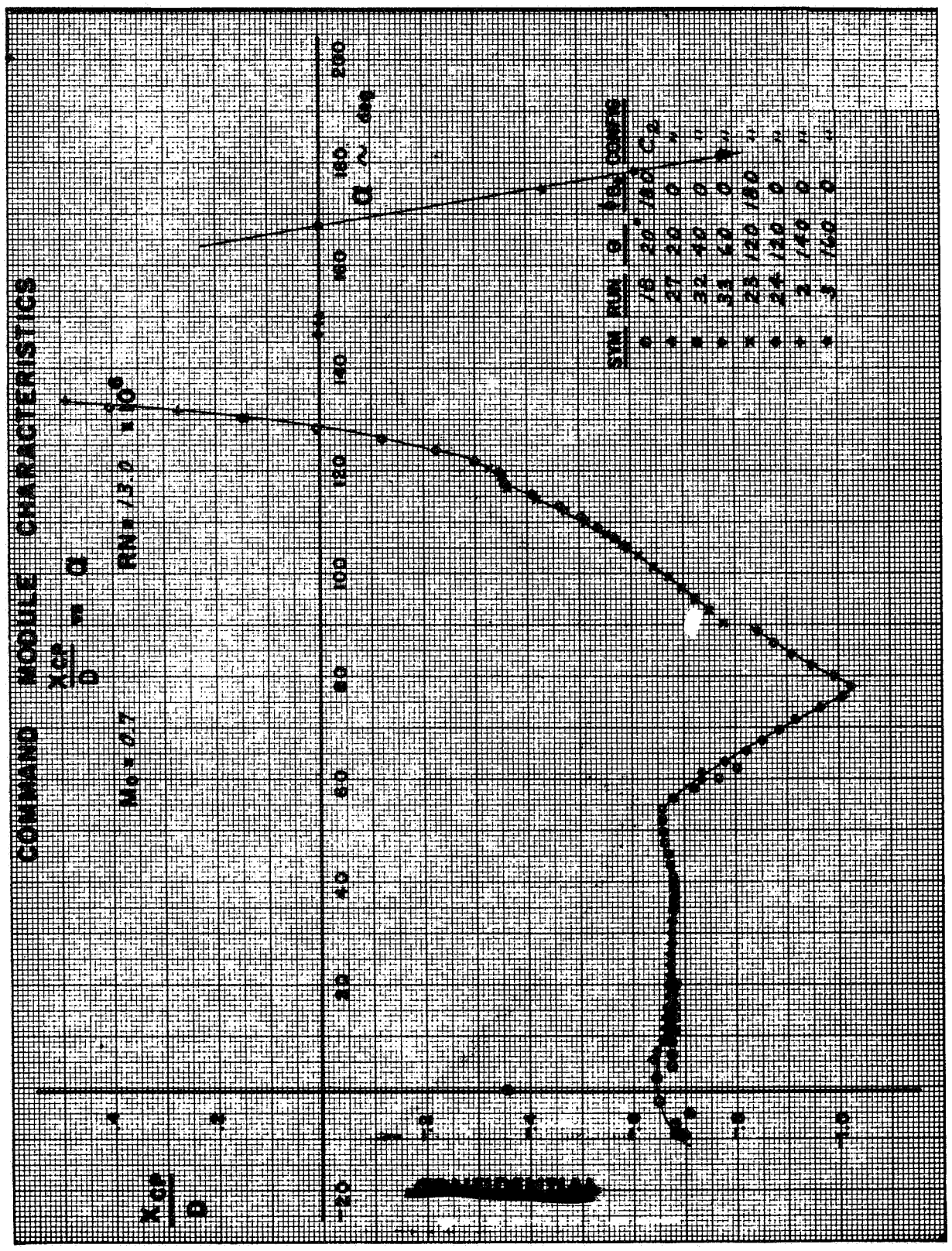

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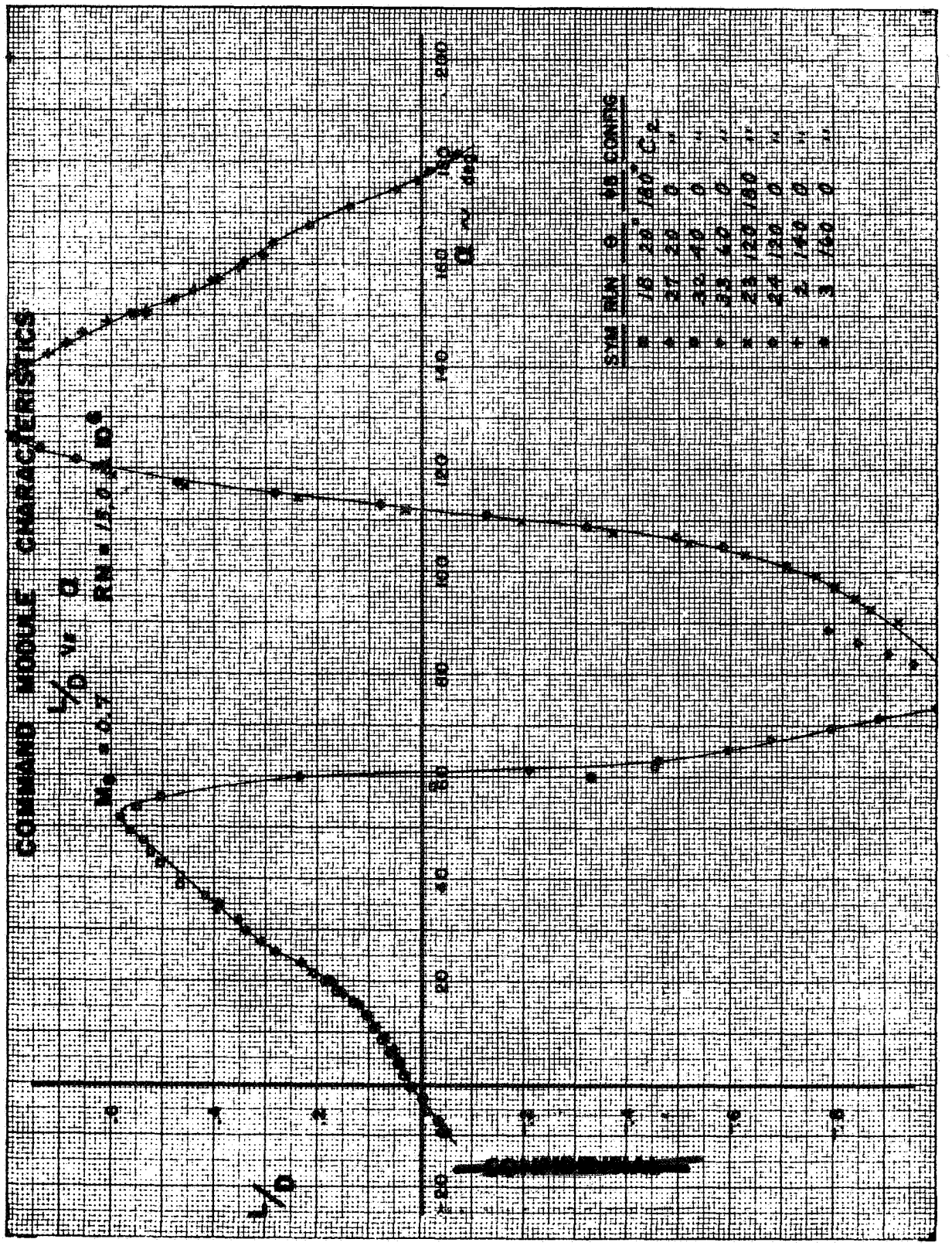

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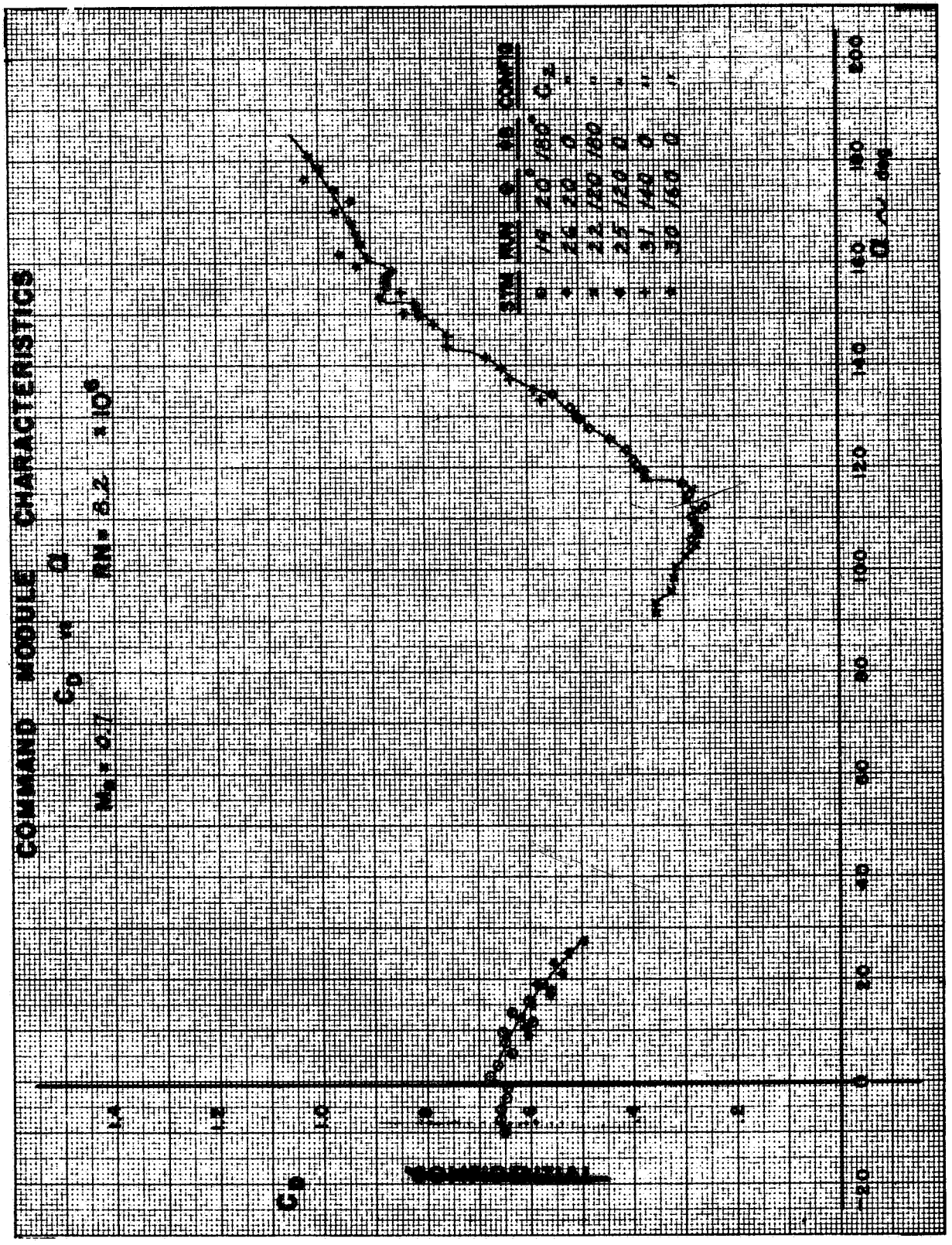

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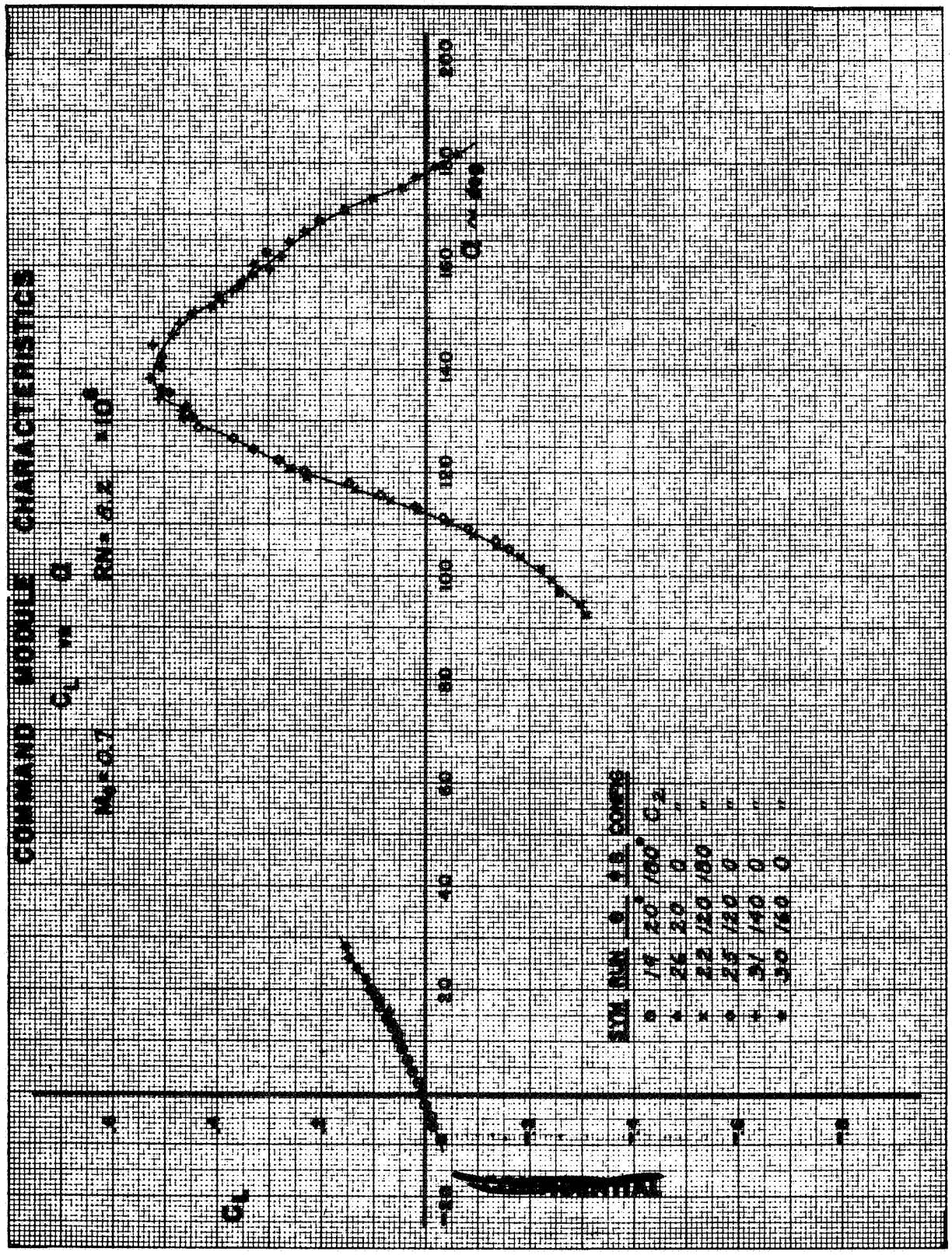

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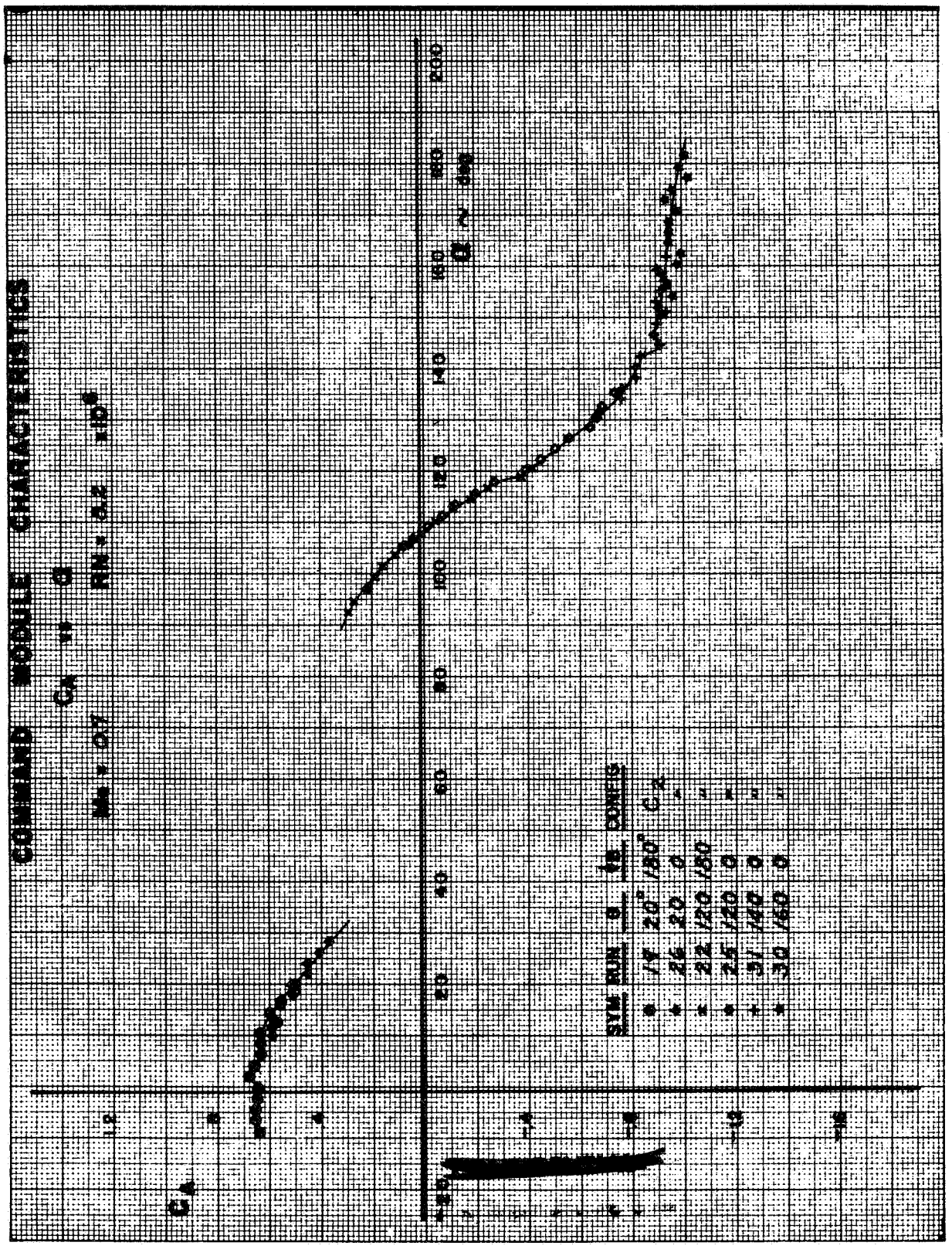

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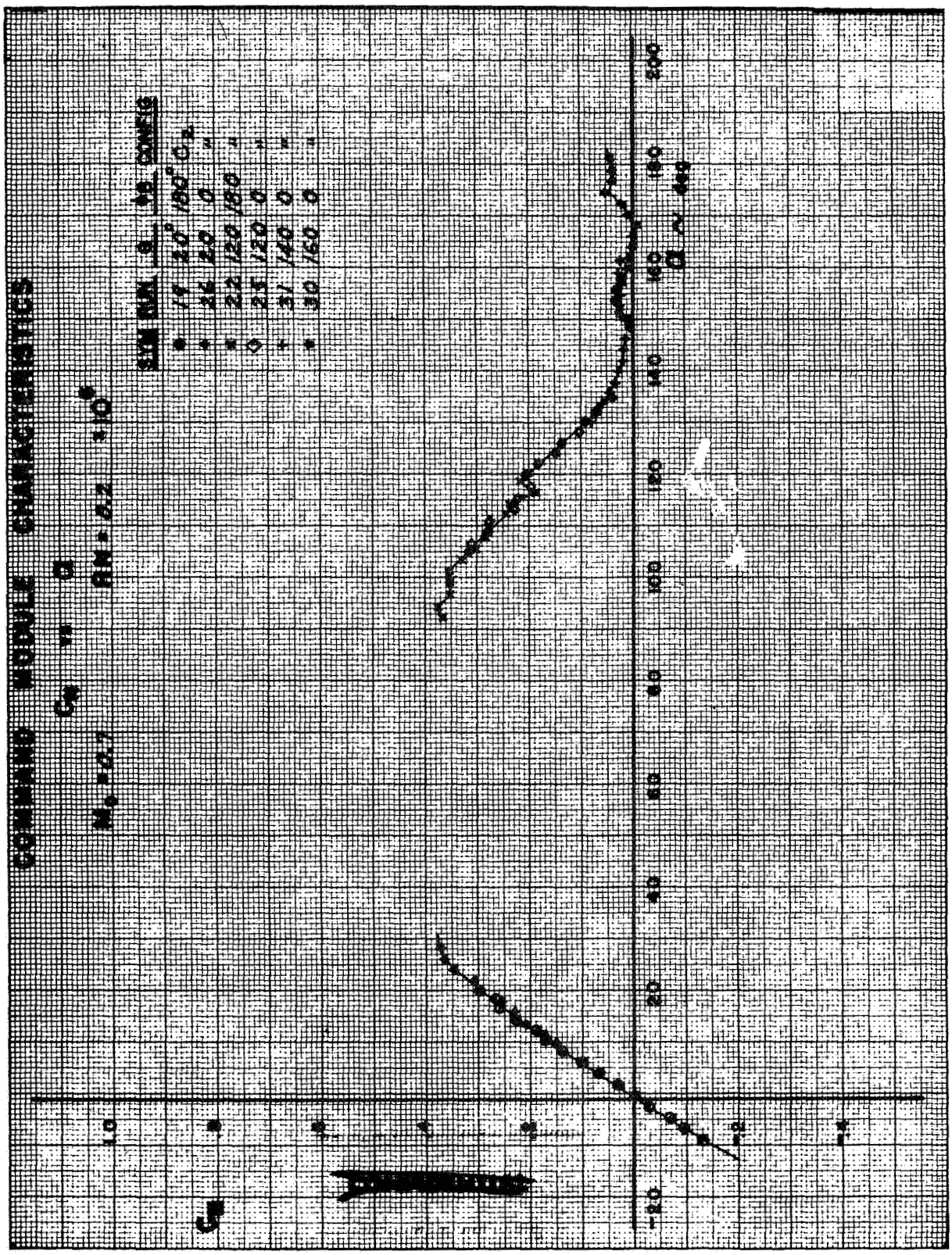

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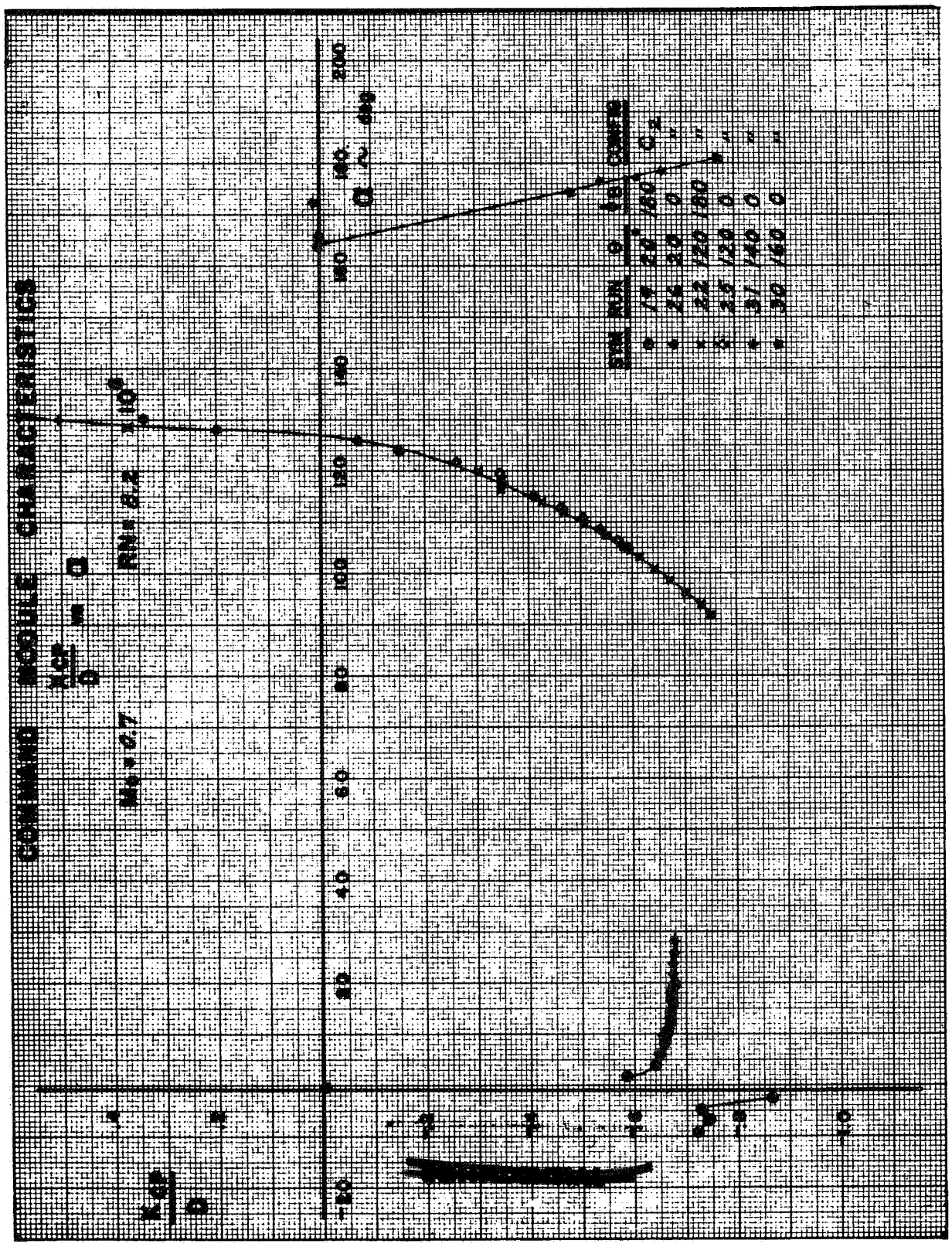

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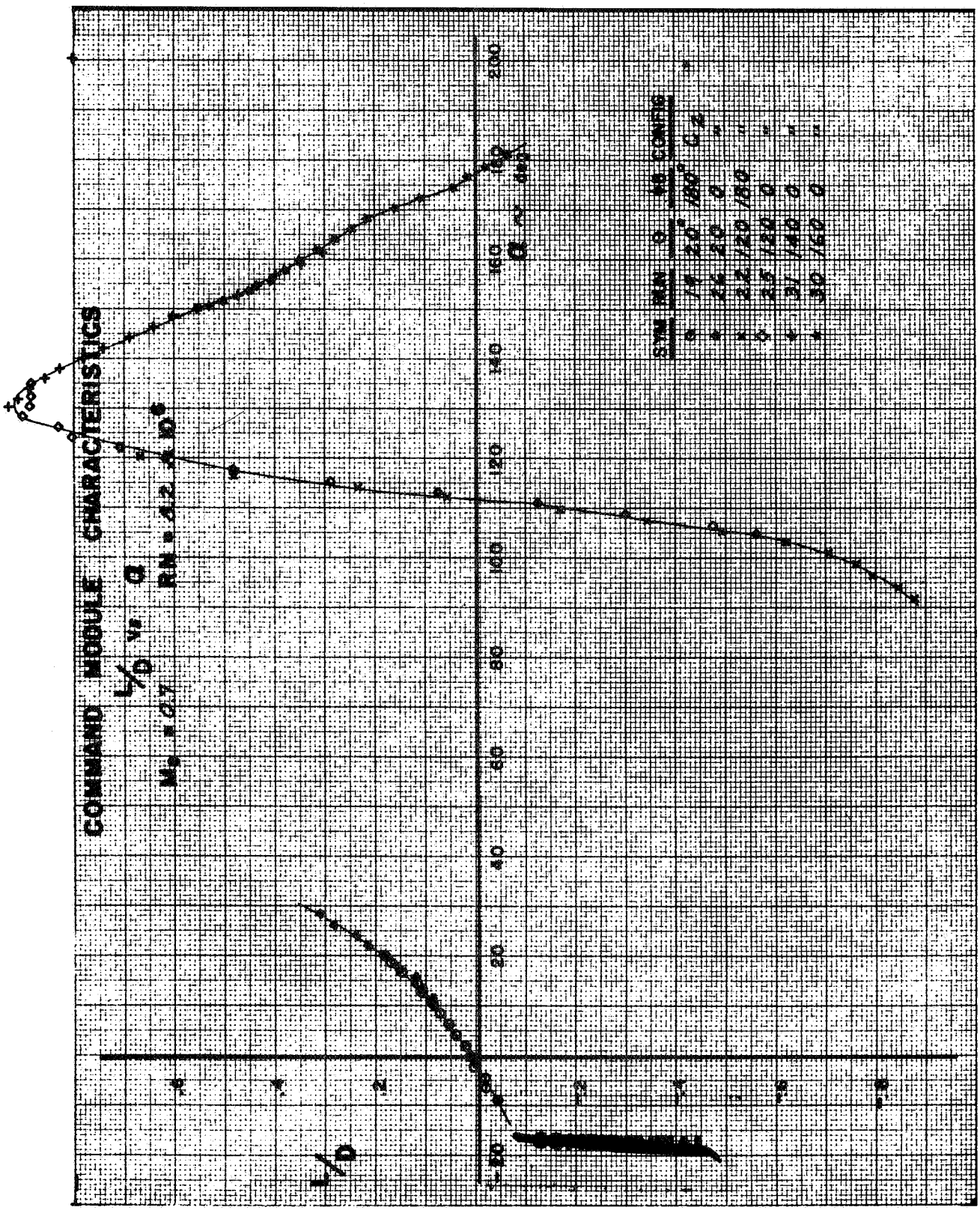

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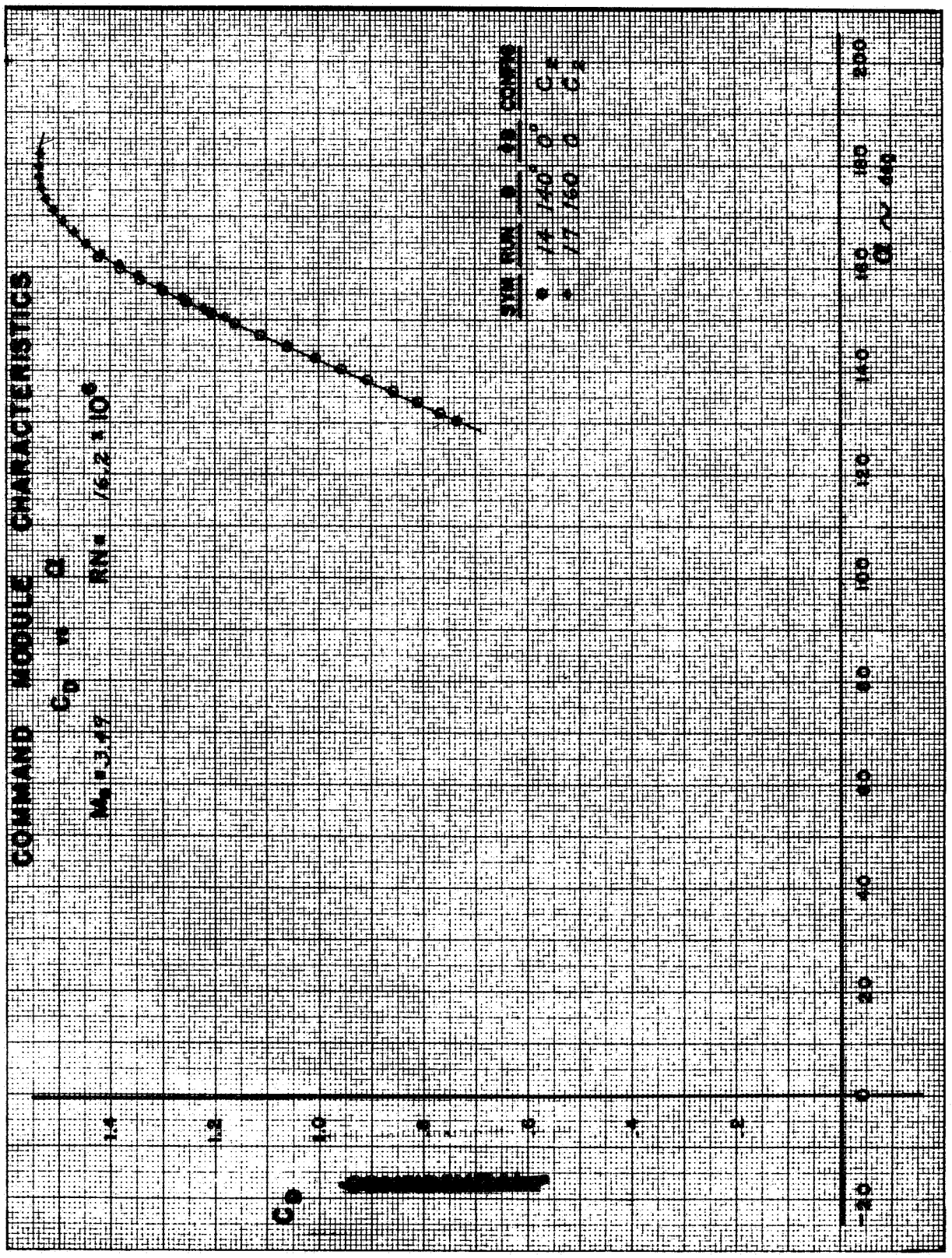

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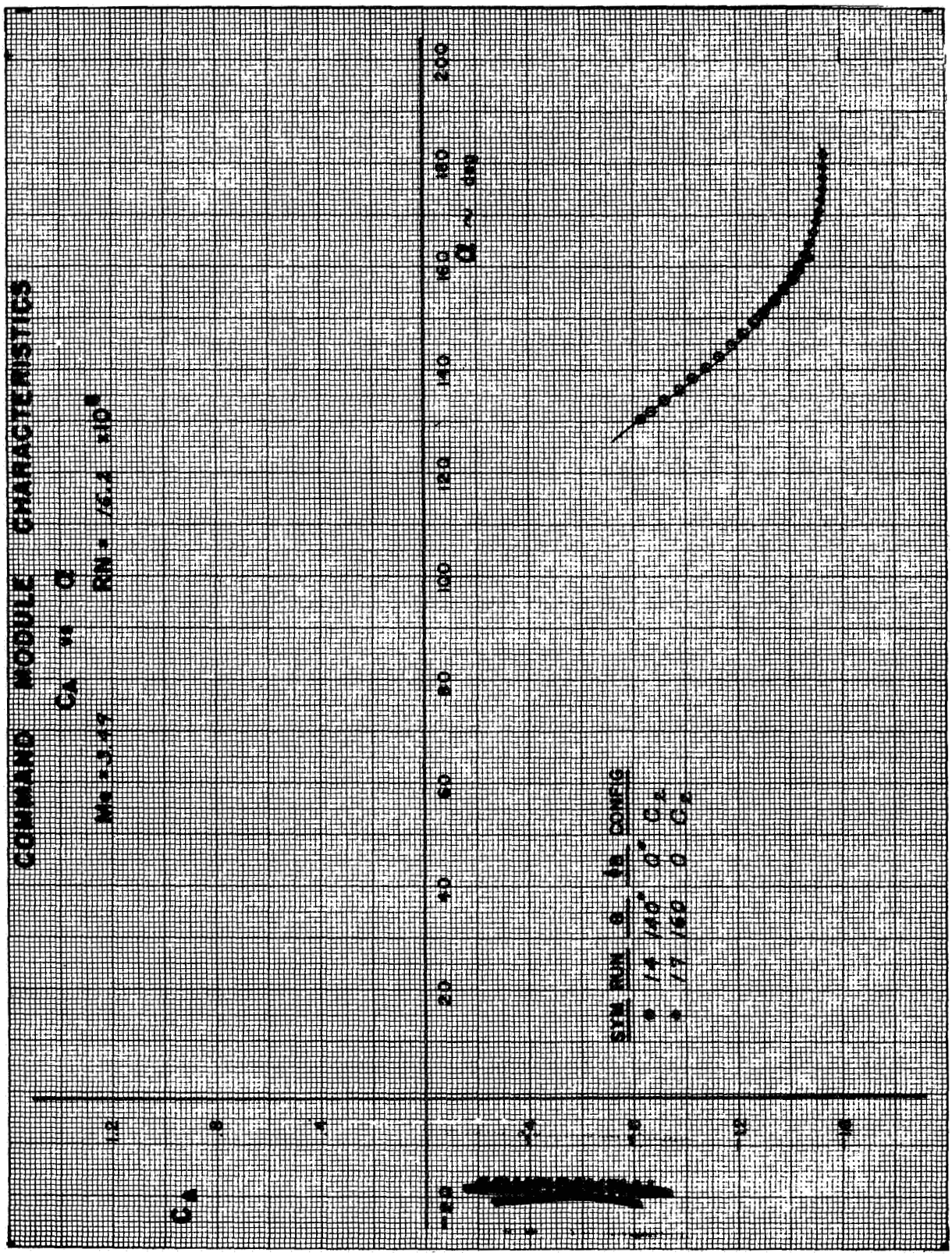

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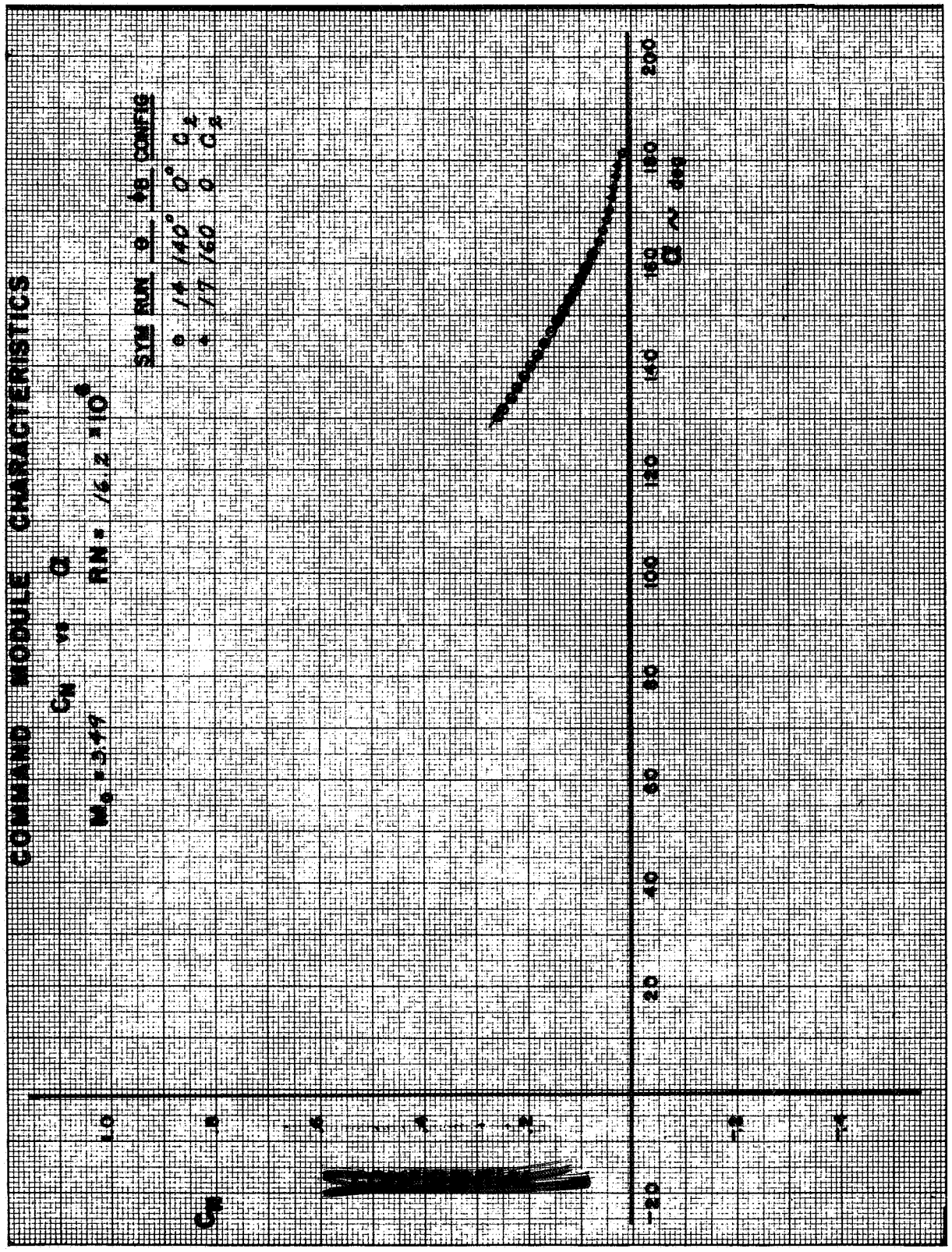

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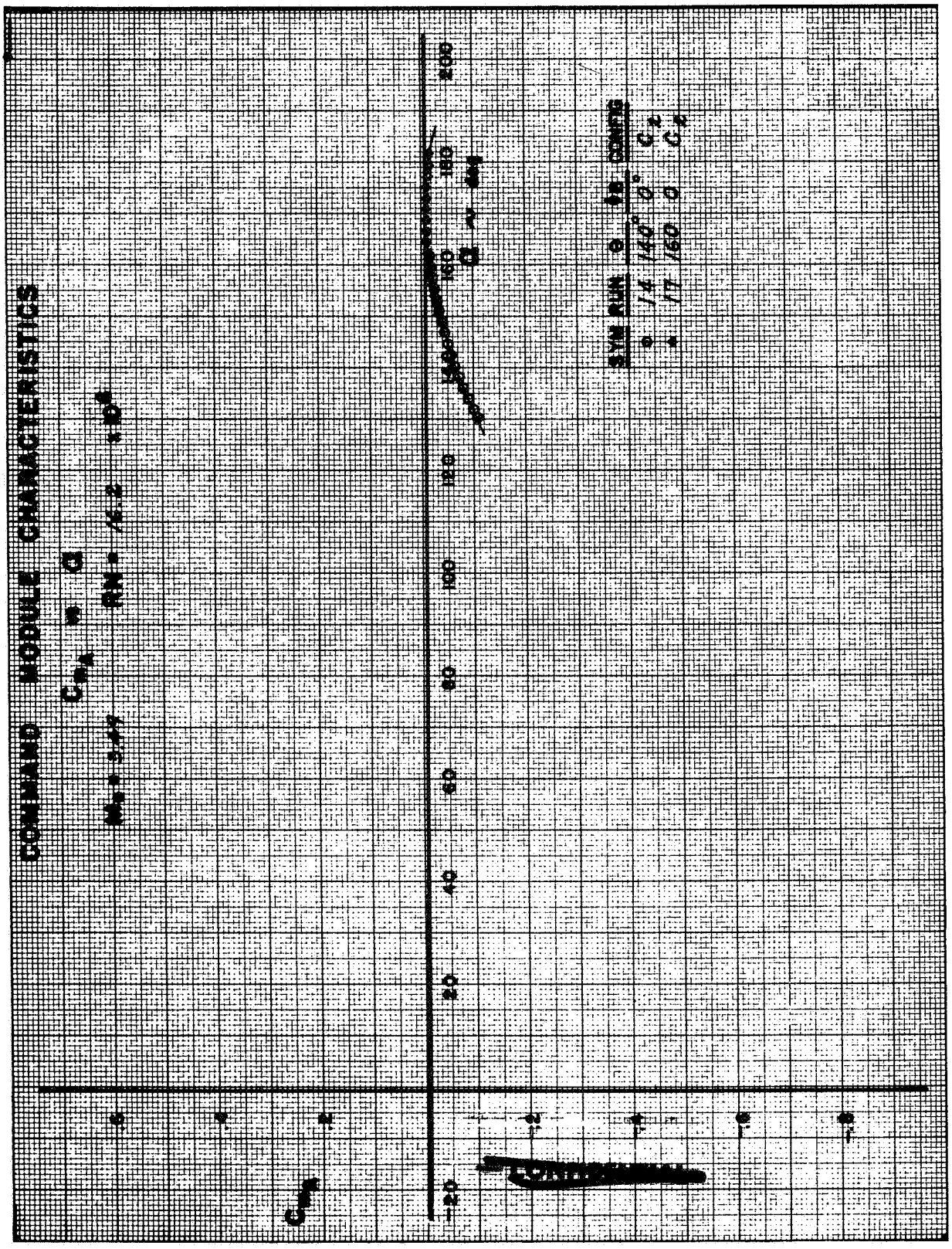

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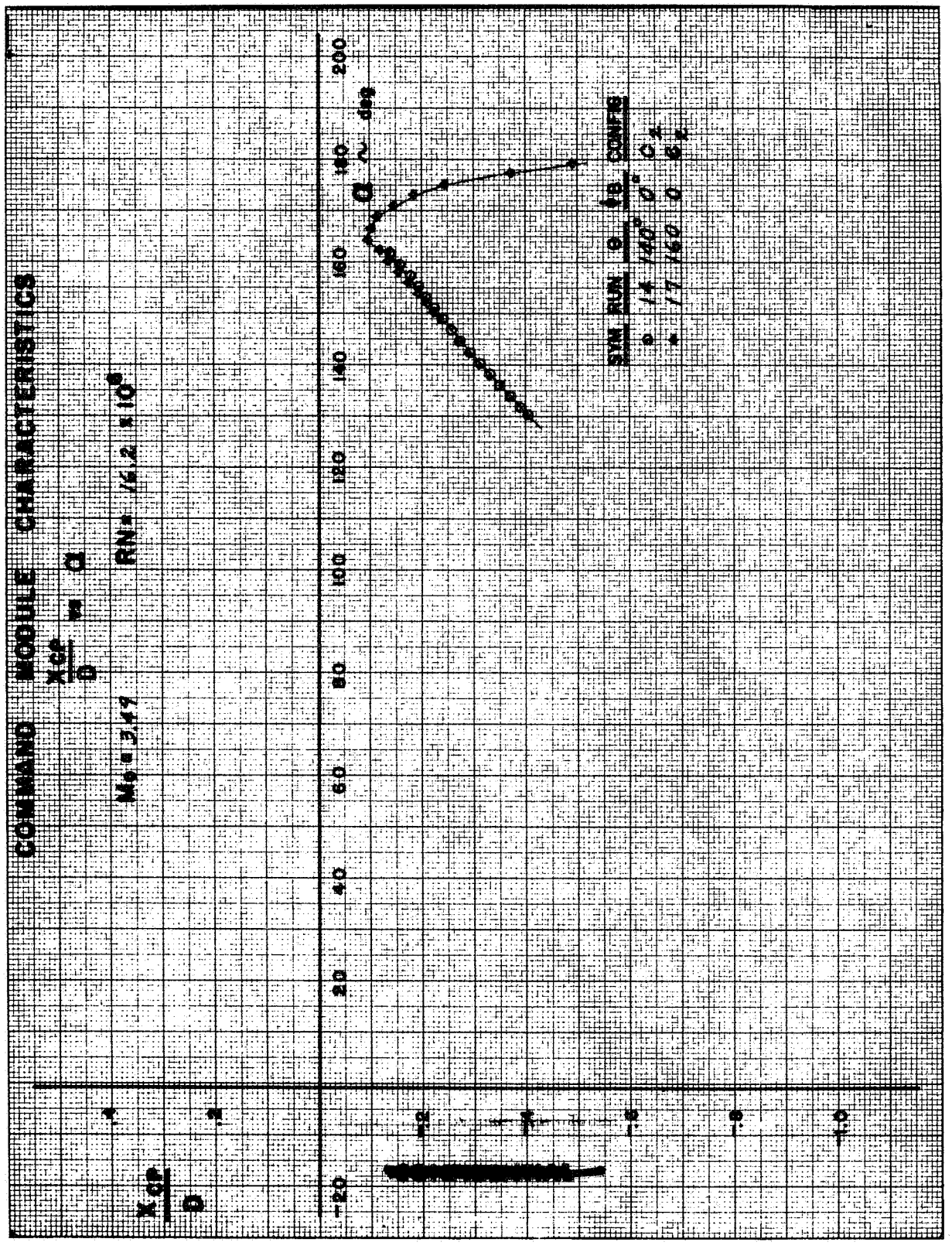

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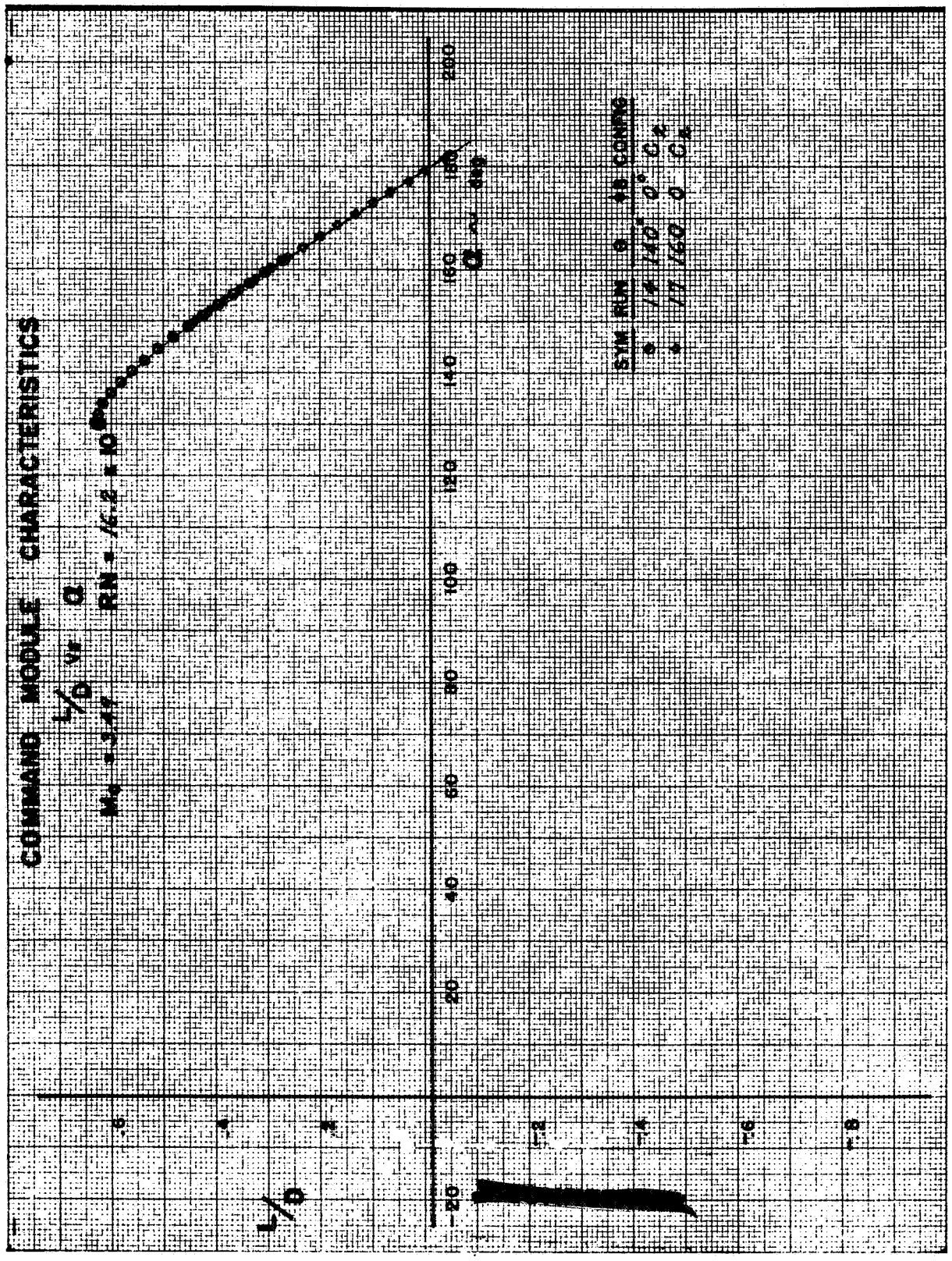

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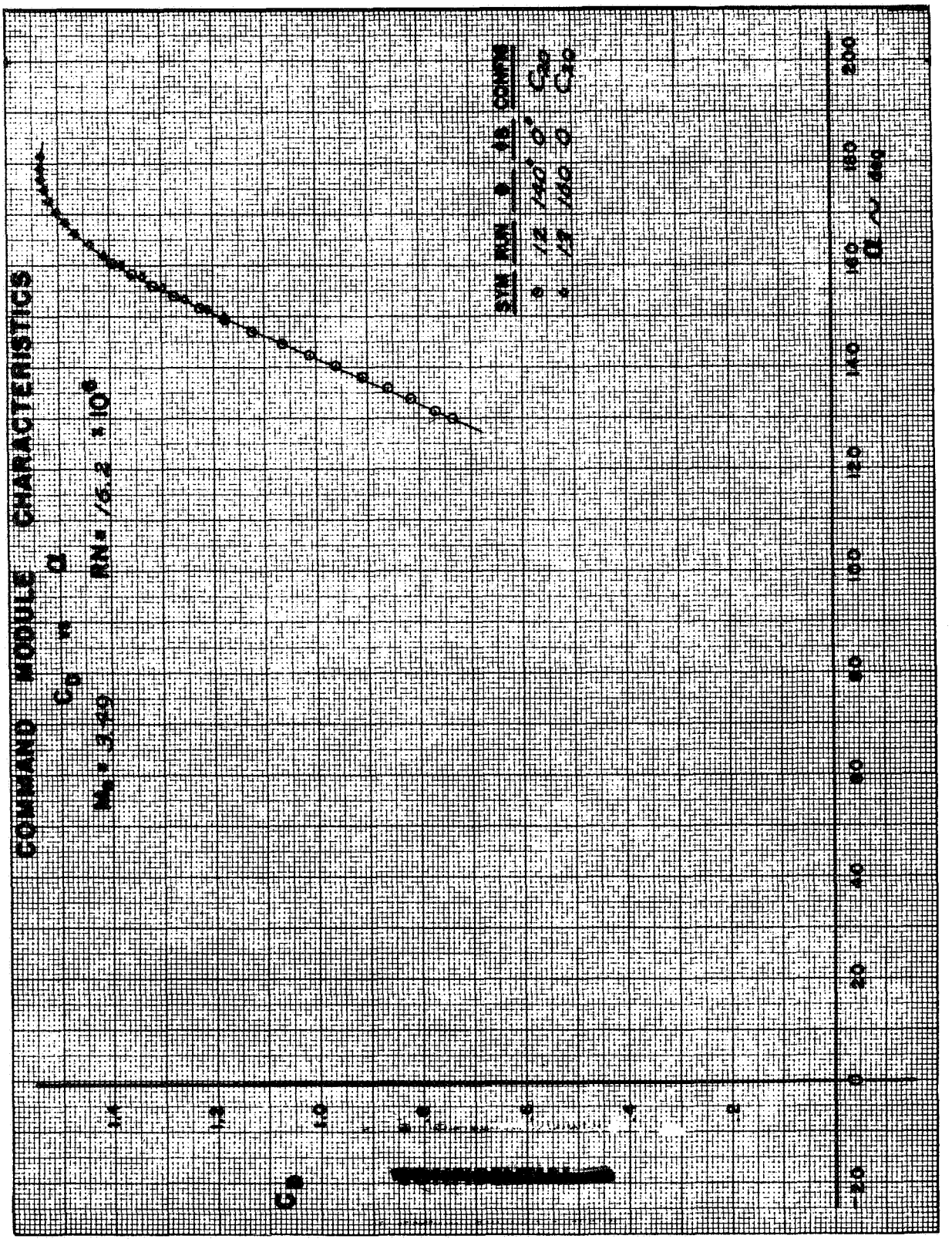

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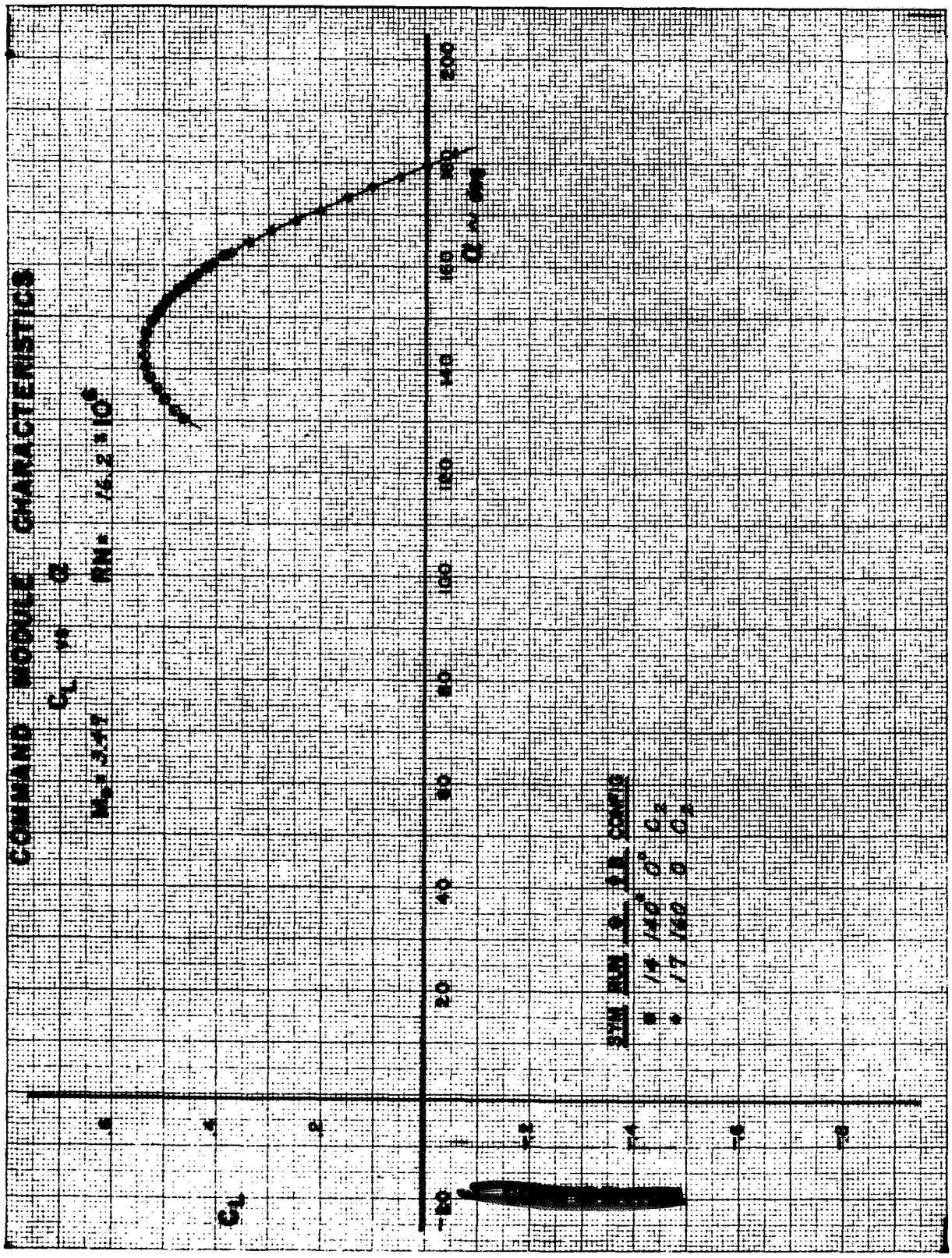

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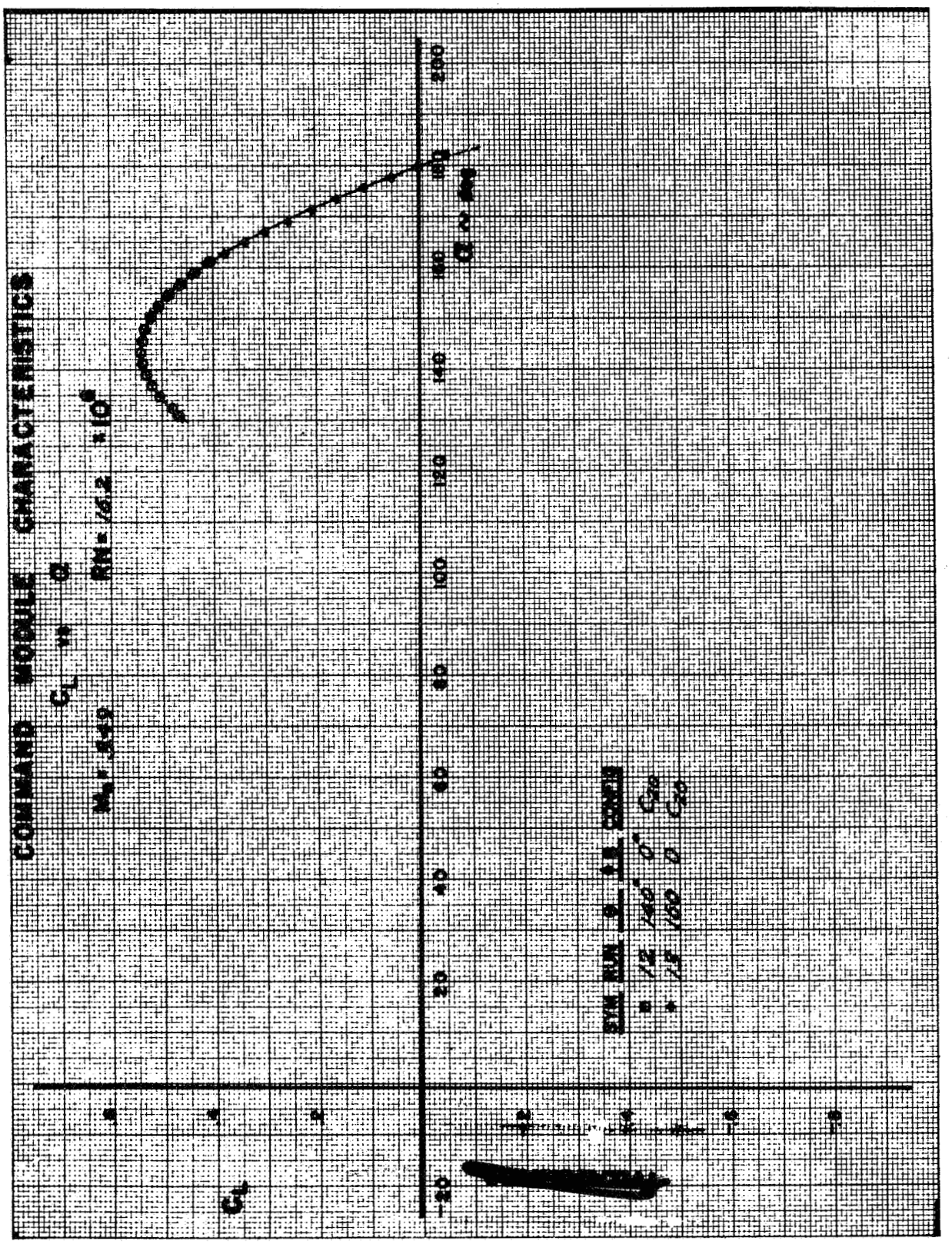

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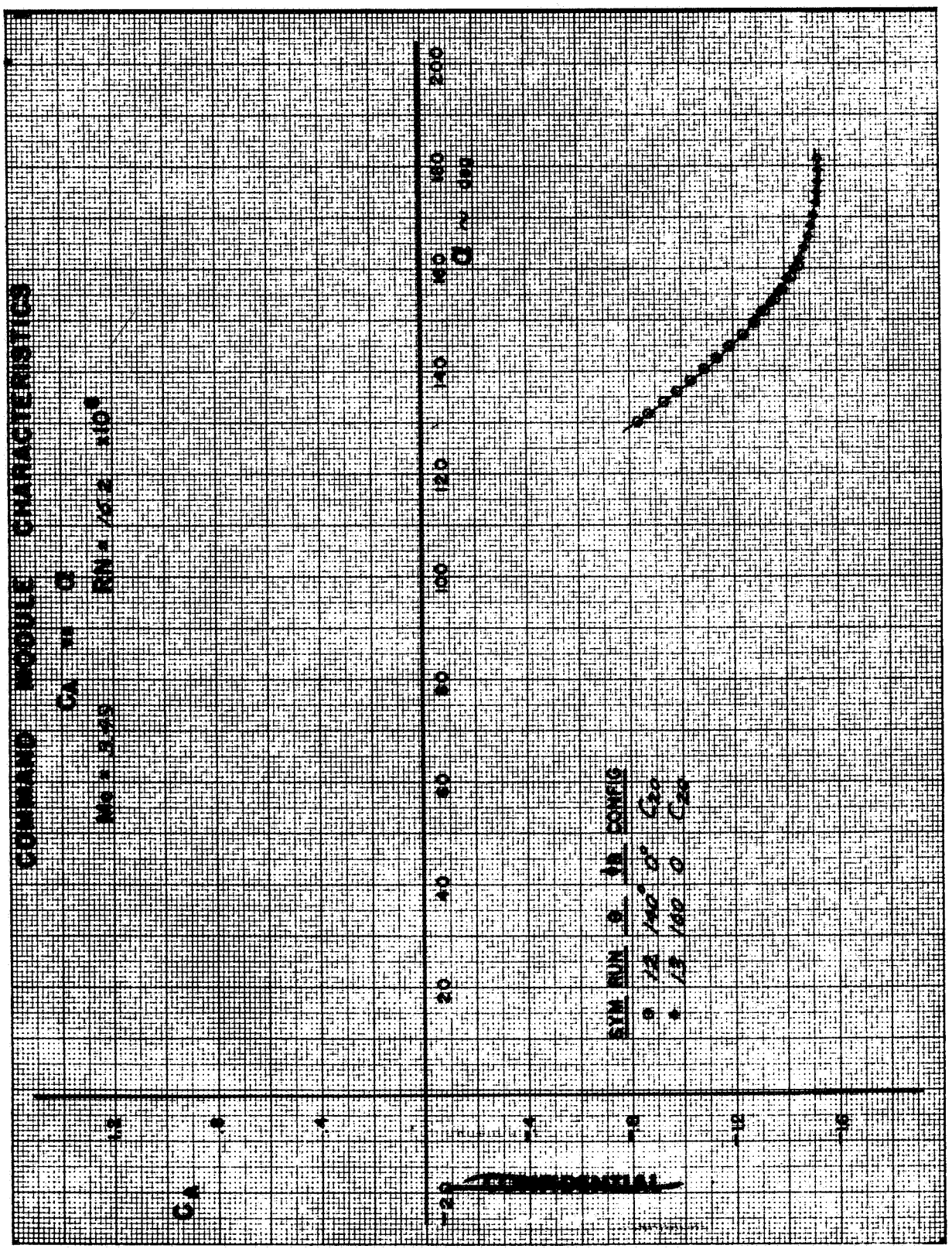

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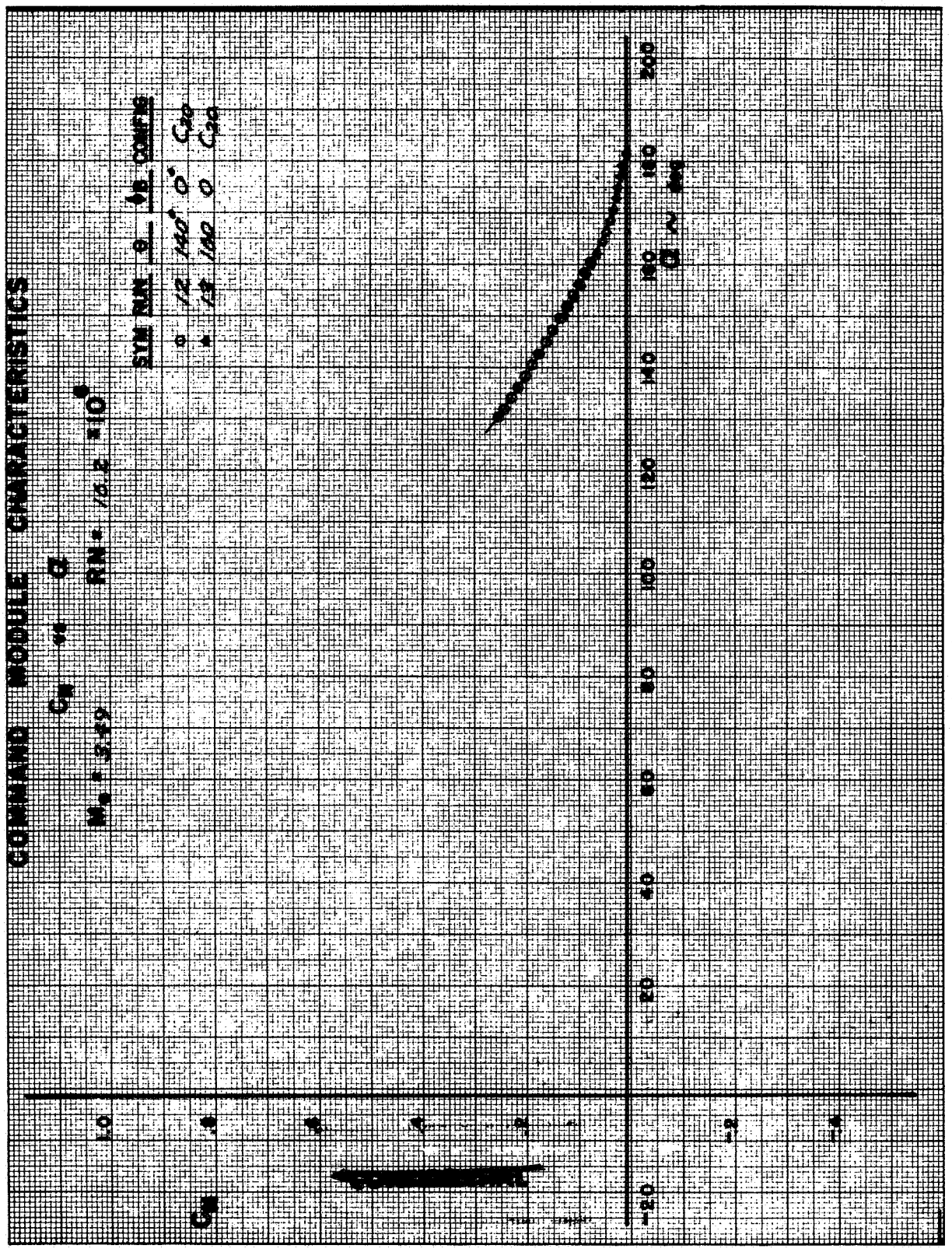

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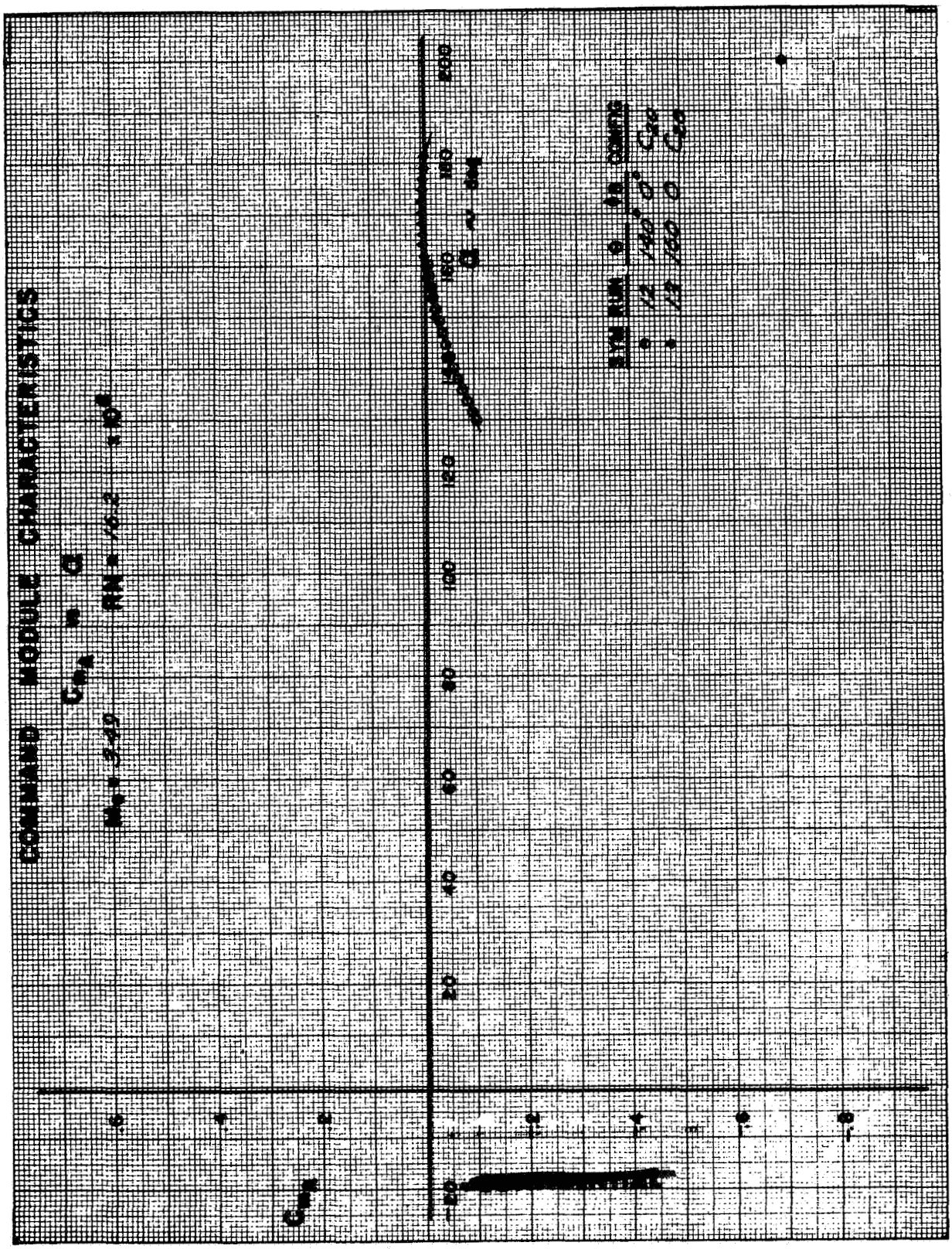

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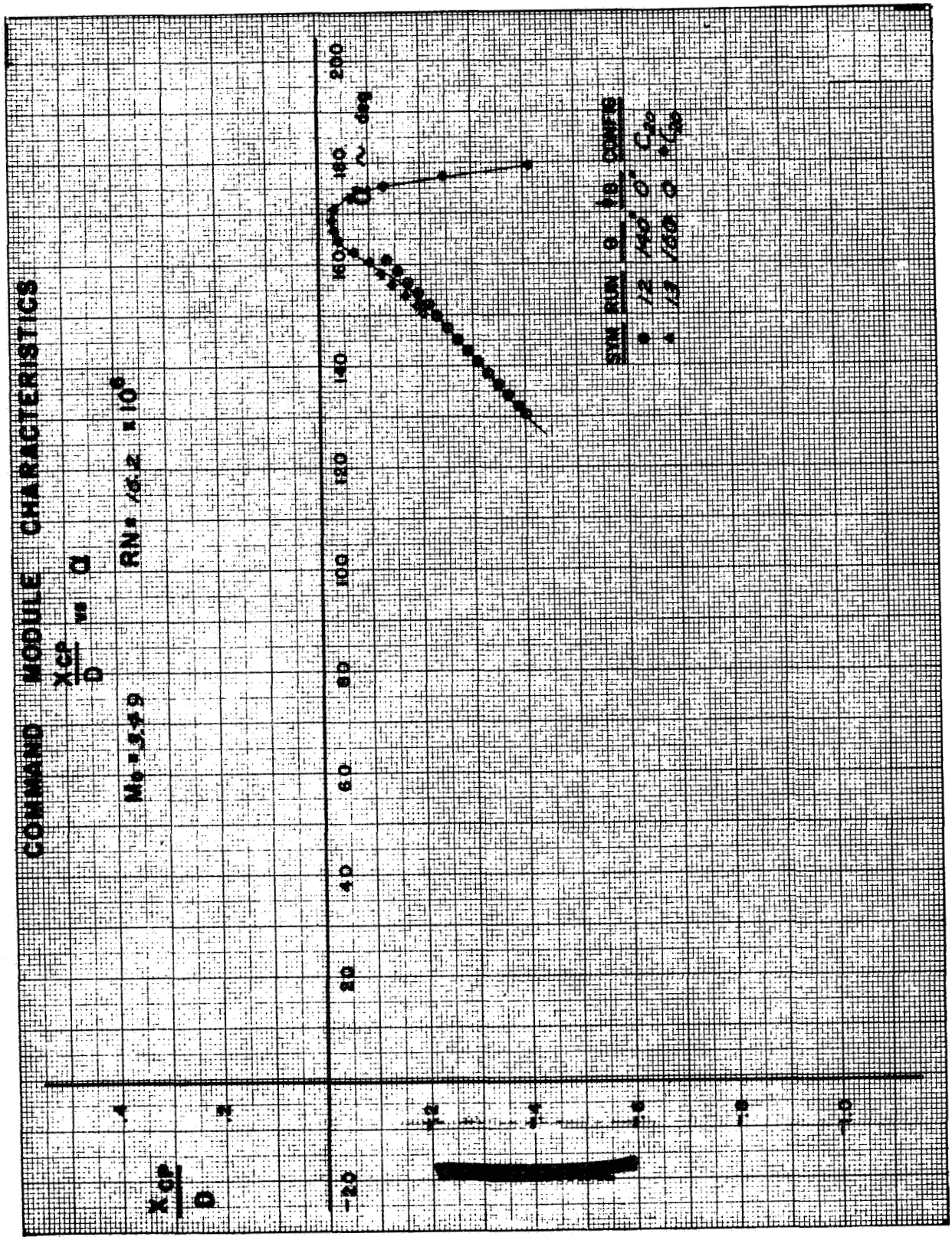

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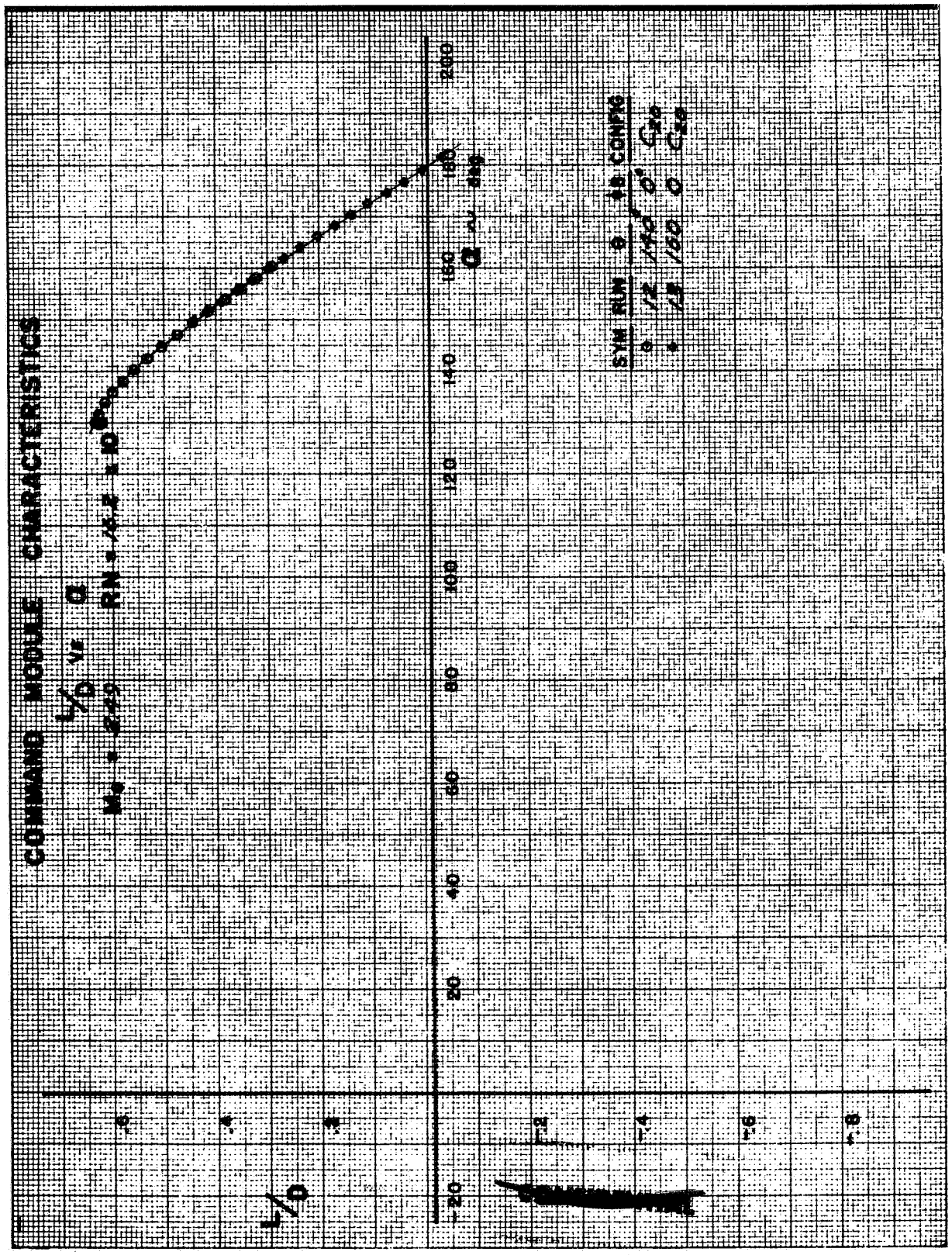

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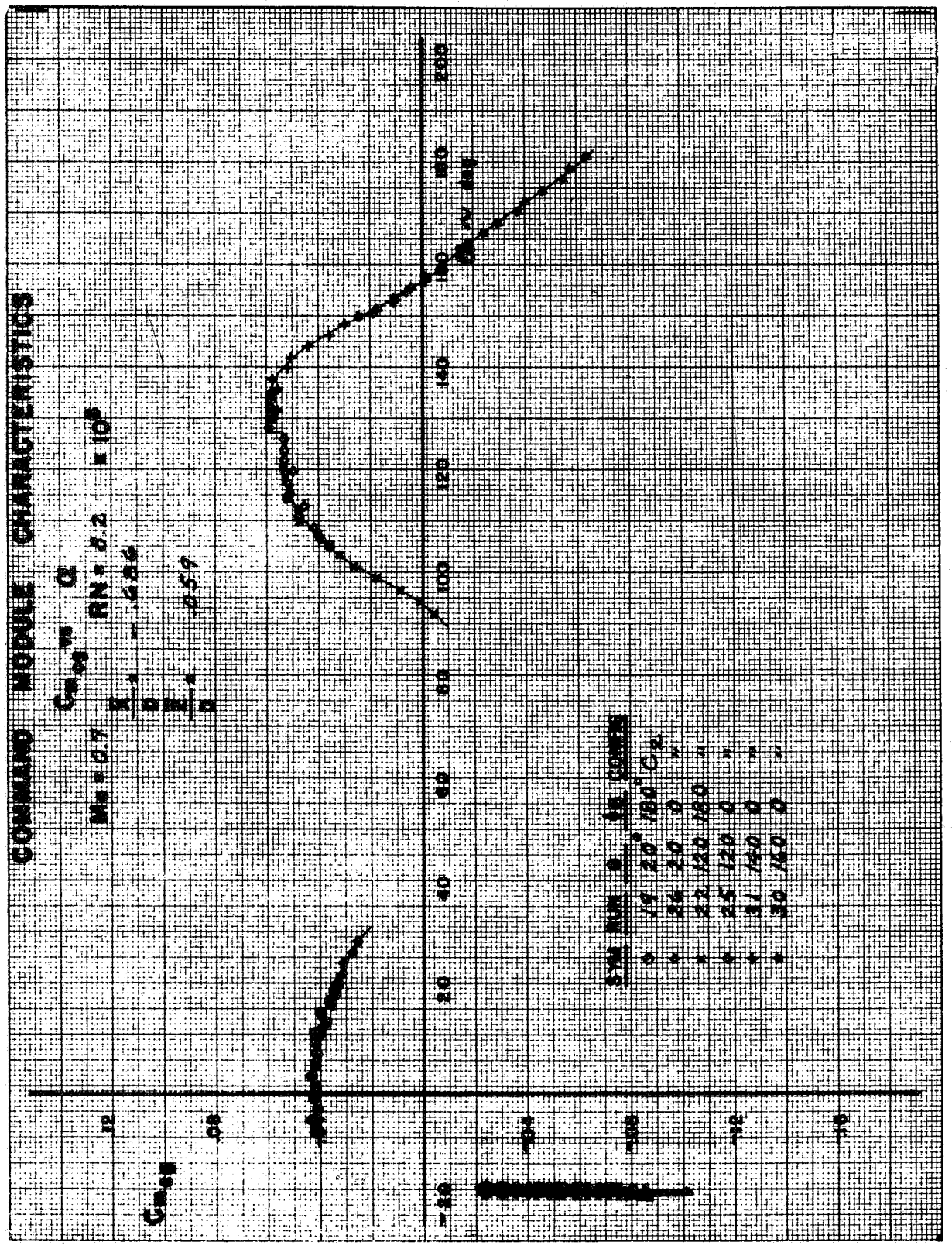

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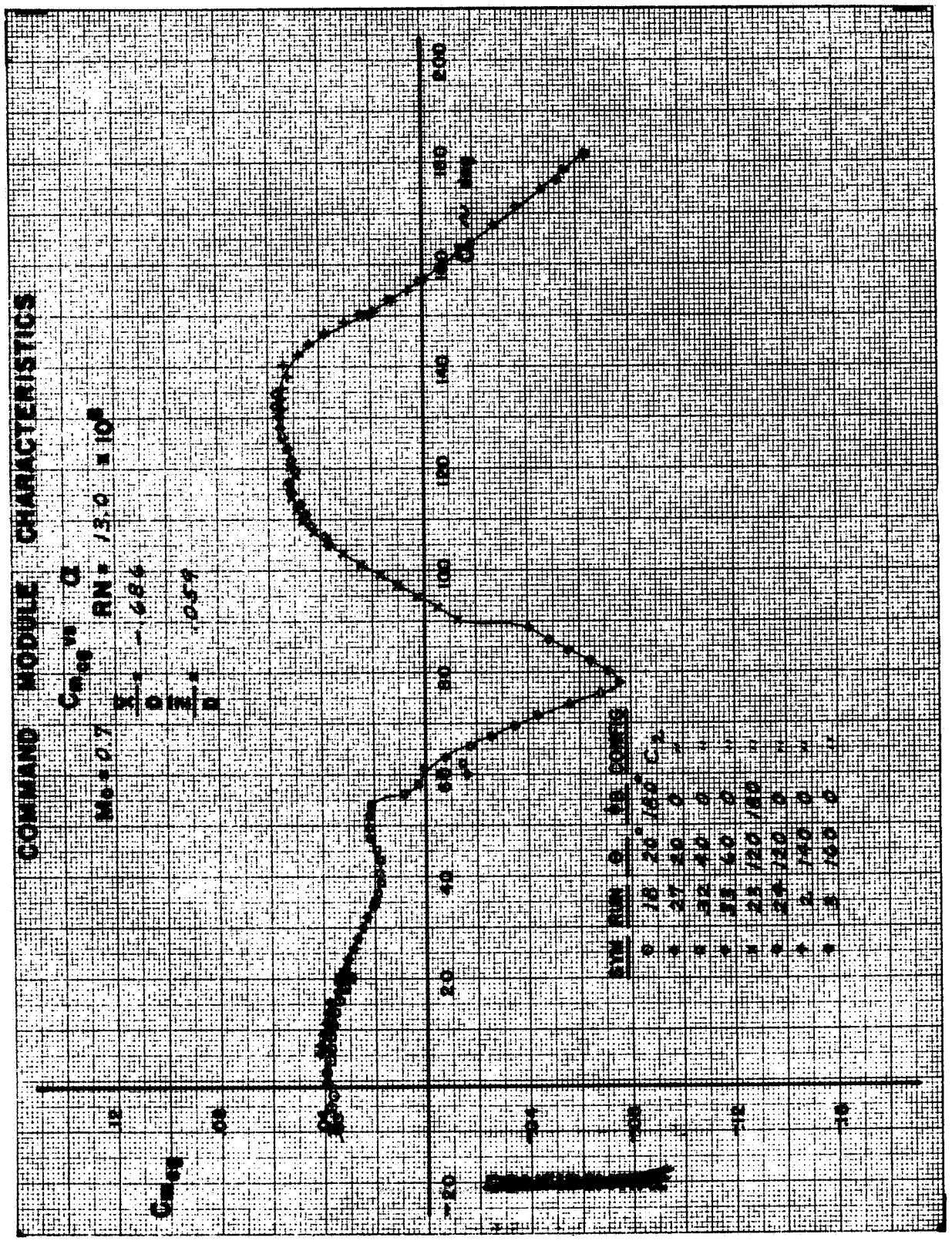

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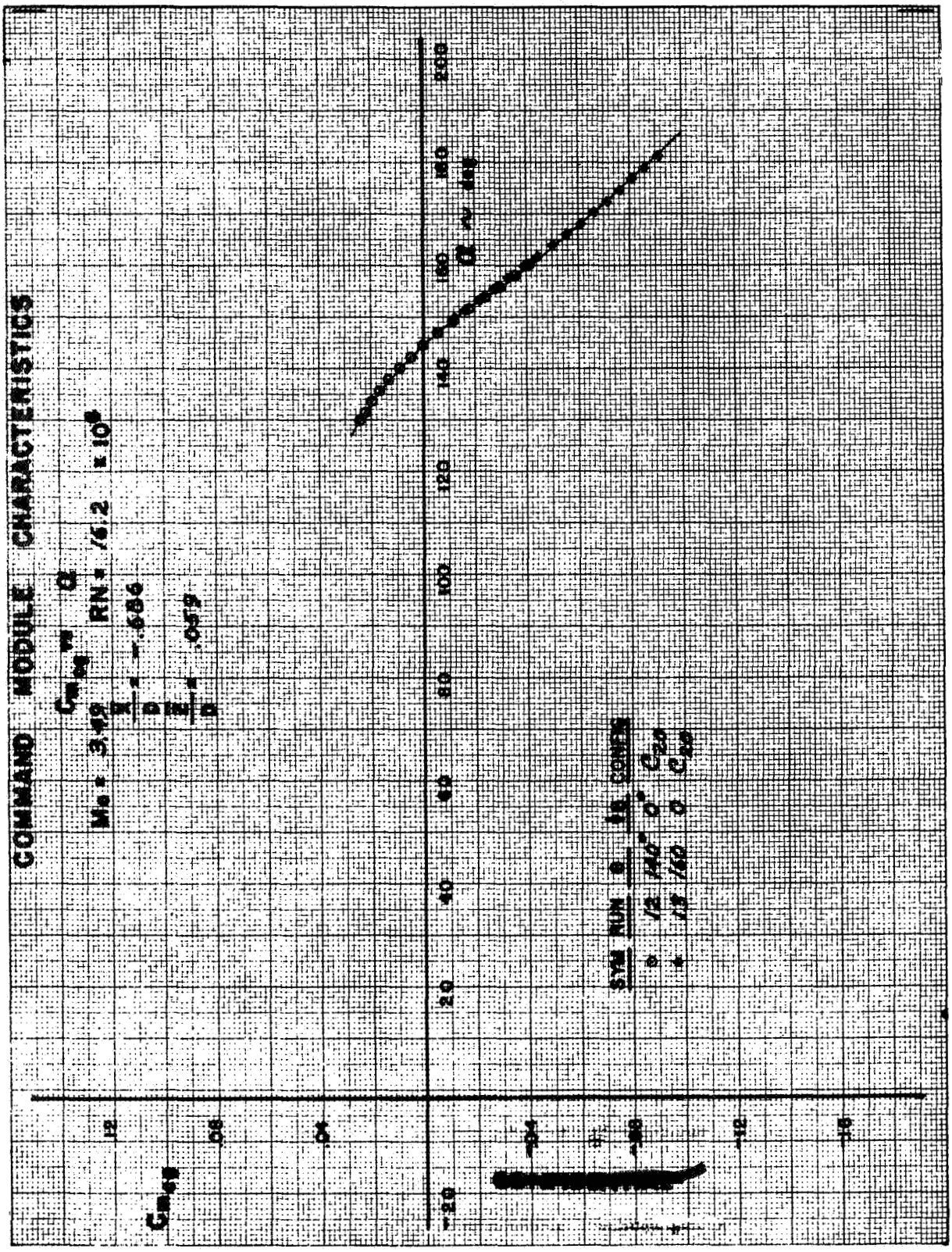

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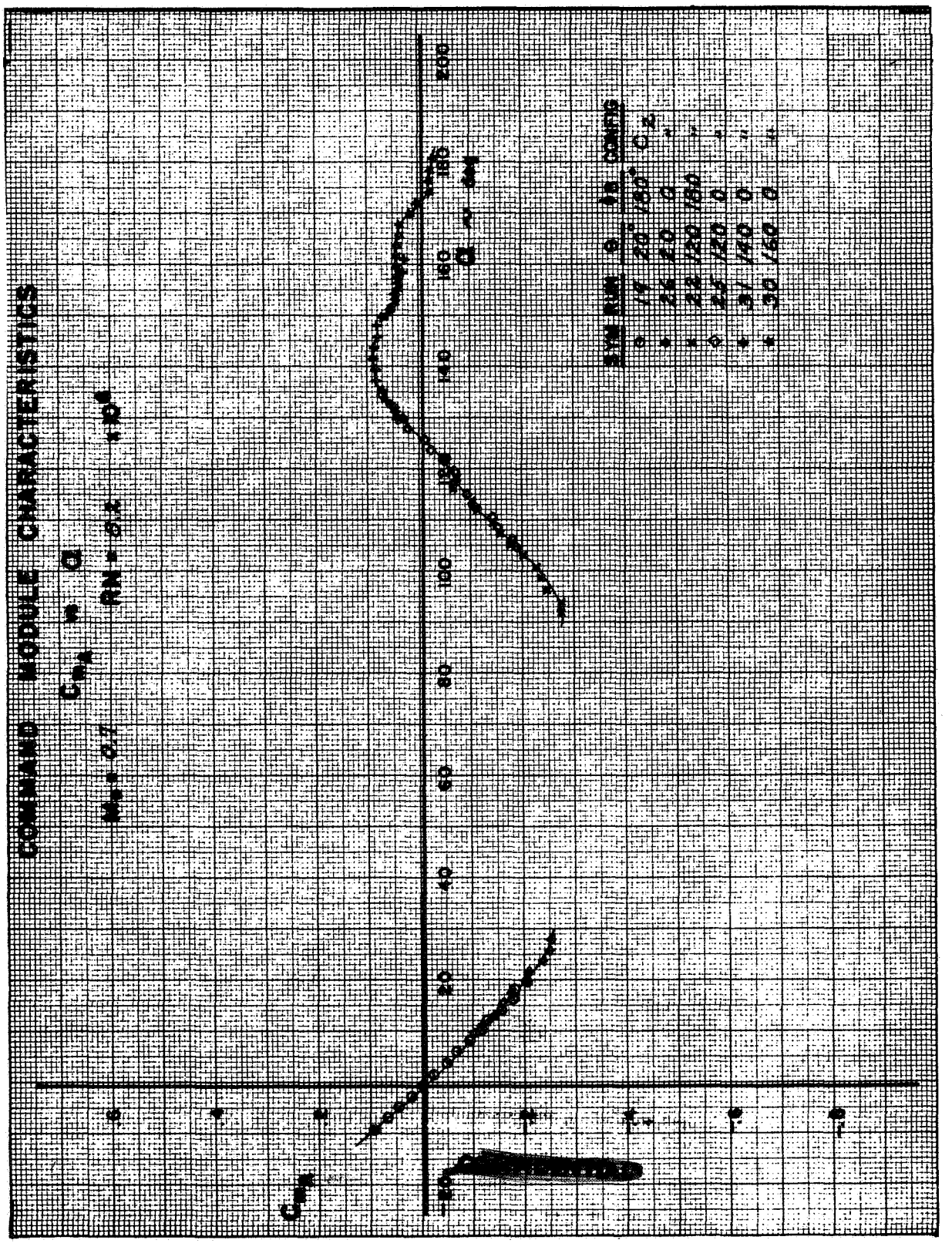

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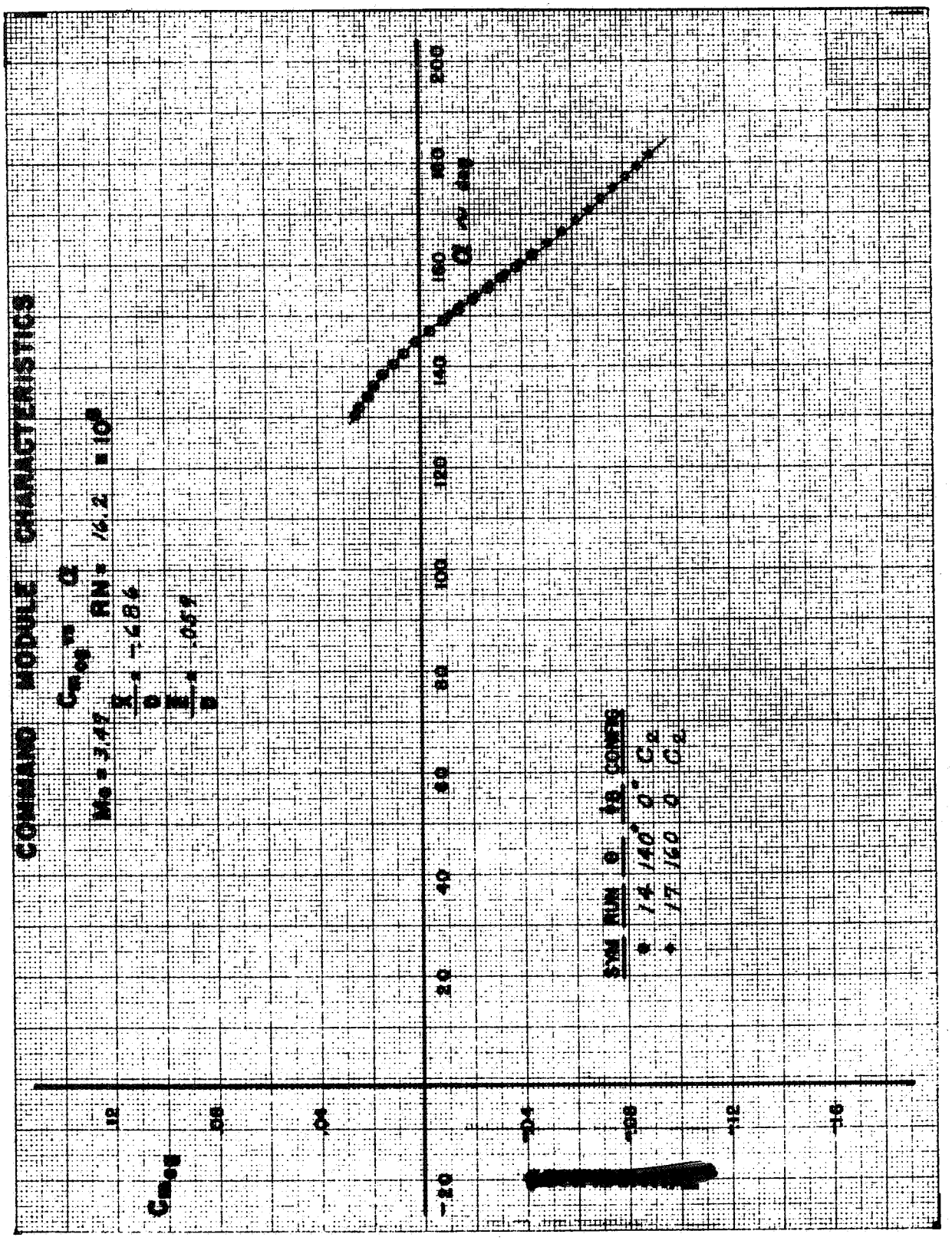

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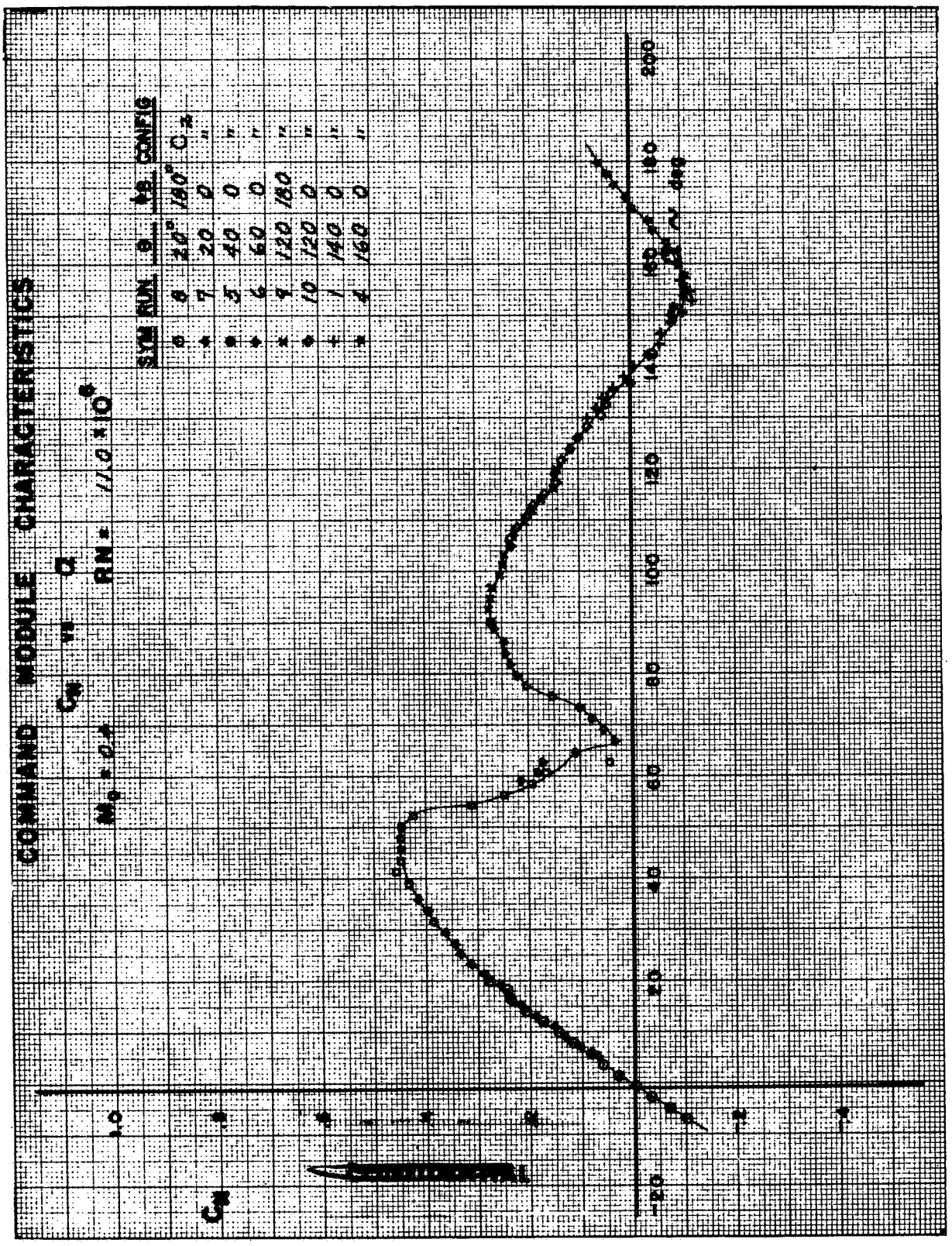

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