Z65·11660

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CLASSIFICATION CHANGE

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SID-62-936

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DATA REPORT FOR APOLLO MODEL (FS-2) IN THE AMES 8'x 7' UNITARY PLAN WIND TUNNEL NAS 9-150

(U)

4.5.5.1

23 August 1962

D.J. Gildea - Manager
Flight Technology

[redacted]

"THIS DOCUM[redacted]CONTAINS INFO[redacted]ION AFFECTING THE NAT[redacted] OF THE [redacted] STATES WITHIN THE MEAN[redacted] OF [redacted]S, TITLE 18 U.S.C. SECTIONS [redacted] AND [redacted] OR THE REVELATION OF ITS CONTEN[redacted]ER TO AN UNAUTHORIZED PERSO[redacted]BITED [redacted]LAW."

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DECLASSIFI[redacted] YEARS
DO[redacted] 520[redacted]

NORTH AMERICAN AVIATION, INC.
SPACE and INFORMATION SYSTEMS DIVISION

[redacted]

FORM M158-D-3 VOLUM REV. 2-61

[redacted]

FOREWORD

The tests described in this report were conducted under NASA Apollo Contract NAS 9-150.

This report was prepared by J. K. Kagawa of the Wind Tunnel Projects Group, Los Angeles Division.

[redacted]

ABSTRACT

This report contains results of the aerodynamic force tests of the 0.105-scale FS-2 Apollo model and presents basic wind tunnel test data only, in order to make the test results available at the earliest possible date. Analyses and summary of results will be reported later under separate cover.

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I. INTRODUCTION

Wind tunnel tests of the 0.105-scale Apollo force model FS-2 were conducted in the Ames Unitary Plan Wind Tunnel to investigate the static stability characteristics of the launch escape system, and to evaluate the effects of changes in the aft portion of the escape rocket. In addition, a command module fitted with four longitudinal flow separators (strakes) was tested alone and then in combination with a typical tower and rocket. The launch escape system configurations were tested over an angle of attack range of -15° to +95°. The command module alone covered an angle of attack range of 75° to 155°. The Mach number range at which these data were obtained extend from 2.6 through 3.4.

II. REMARKS

This investigation was conducted on the 0.105 scale model of the Apollo to obtain aerodynamic force and stability characteristics of various launch escape system configurations. Various flow separating discs were attached to the aft end of the launch escape motor to study their effect on the stability of the launch escape system. The effect on command module stability, of flow separating strakes attached to the module, was also investigated. These configurations are illustrated on pages 5 to 8.

The tests were conducted over a Mach number range from 2.6 to 3.4 utilizing the 8 x 7 foot leg of the Ames Unitary Plan Wind Tunnel during the period from 21 June to 27 June 1962.

The data contained from these tests are presented in the appendices of this report. Appendix A contains the tabulated data and Appendix B presents the plotted data obtained in the 8 x 7 foot tunnel.

III. MODEL DESCRIPTION

A. General

The FS-2 model is a 0.105-scale replica of the Apollo command module and launch escape system. To cover the required angle of attack range, three basic command modules were constructed. These modules consisted of a steel balance cavity block enclosed by a cast aluminum shell. All modules are identical except that the balance cavities are positioned such that ten different balance installations, are possible, in which the angle between the model axis and balance axis is varied. All three modules are designed to accept the escape tower configurations throughout the required angle attack range for the launch escape system.

The stress analysis of the FS-2 components is presented in Reference (b) and detailed model design and tunnel installation drawings are included in Reference (a).

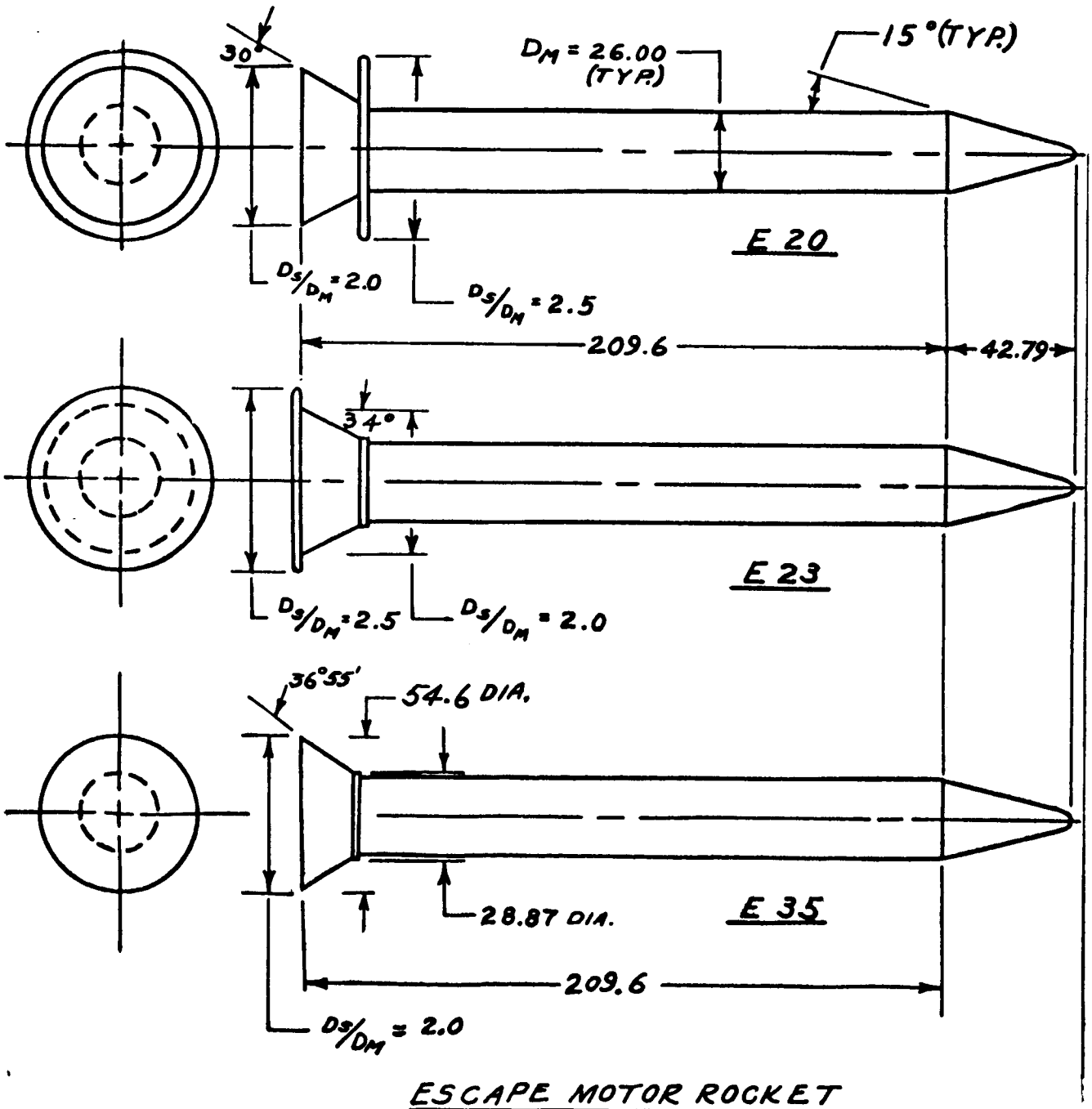
III. MODEL DESCRIPTION - continued

B. Model Nomenclature

Symbol	Description	Drawing No.	Sketch
C2	Command Module. Max. Dia. = 154 in.	7121-01077 -3,-4,-5	page 7
C15	Command Module. Max. Dia. = 154 in. 4 strakes 81.90 in. long, 6.16 in. high and 2.86 in. wide.	7121-01077 -3,-4,-5 and -18	8
T9	Tower Structure. Length = 114.51 in.	7121-0179-11	6
E20	Escape Motor. Length= 252.89. 30° flared skirt with 1.8 diameter ratio. 65 in. Disc mounted fwd. of the flared skirt.	7121-01080 -2,-9,-10,-11 -18 and -21	5
E23	Escape Motor. Length= 254.88 in. 34° flared skirt with 65 in. Disc attached to base.	7121-01080 -2,-9,-15-18	5
E35	Escape Motor. Length= 252.39. 36°55' flared skirt with 2.0 diameter ratio.	7121-01080 -18,-9,-2	5

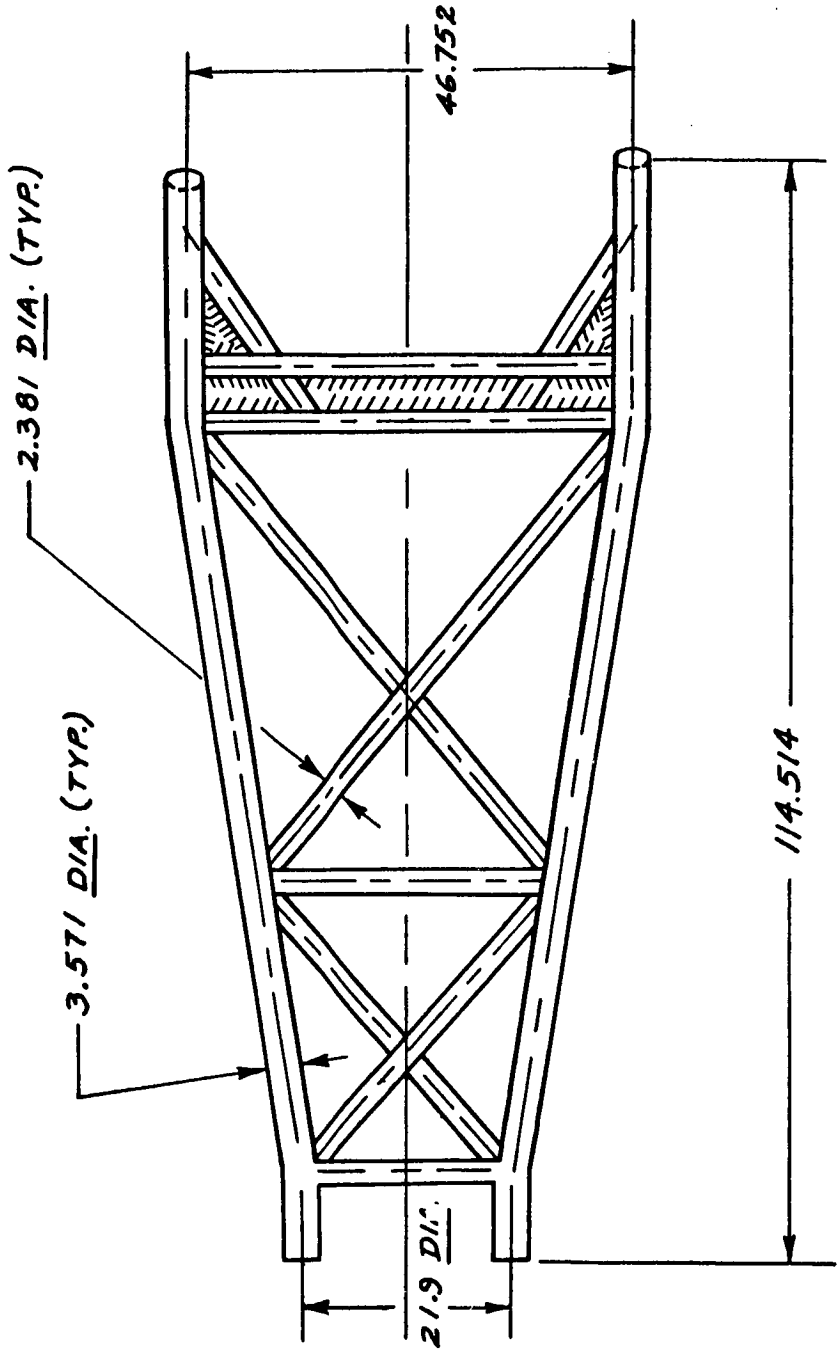
III. MODEL DESCRIPTION

C. NOMENCLATURE SKETCHES



ESCAPE MOTOR ROCKET CONFIGURATIONS

[redacted]



ESCAPE TOWER STRUCTURE, T_9

DWG. 7121-01079-11

SCALE 1.0
DIMENSIONS IN INCHES

III. MODEL DESCRIPTION

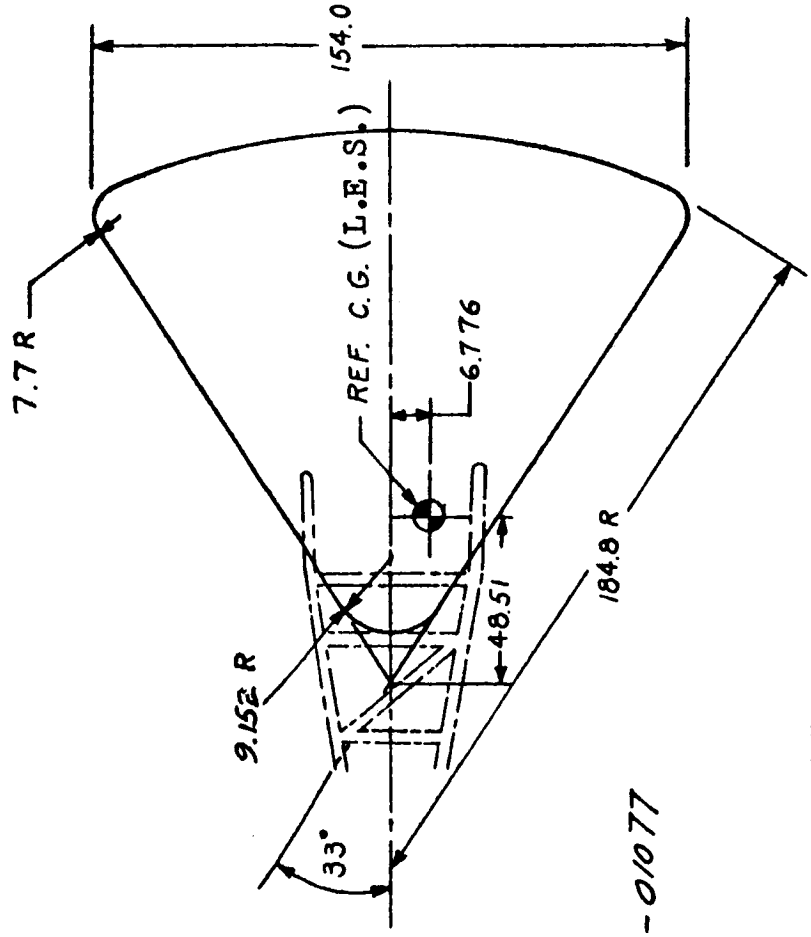
C. NOMENCLATURE SKETCHES

[redacted]

[redacted]

III. MODEL DESCRIPTION

C. NOMENCLATURE SKETCHES



COMMAND MODULE, (C_2)

DWG. NO. 7121-01077

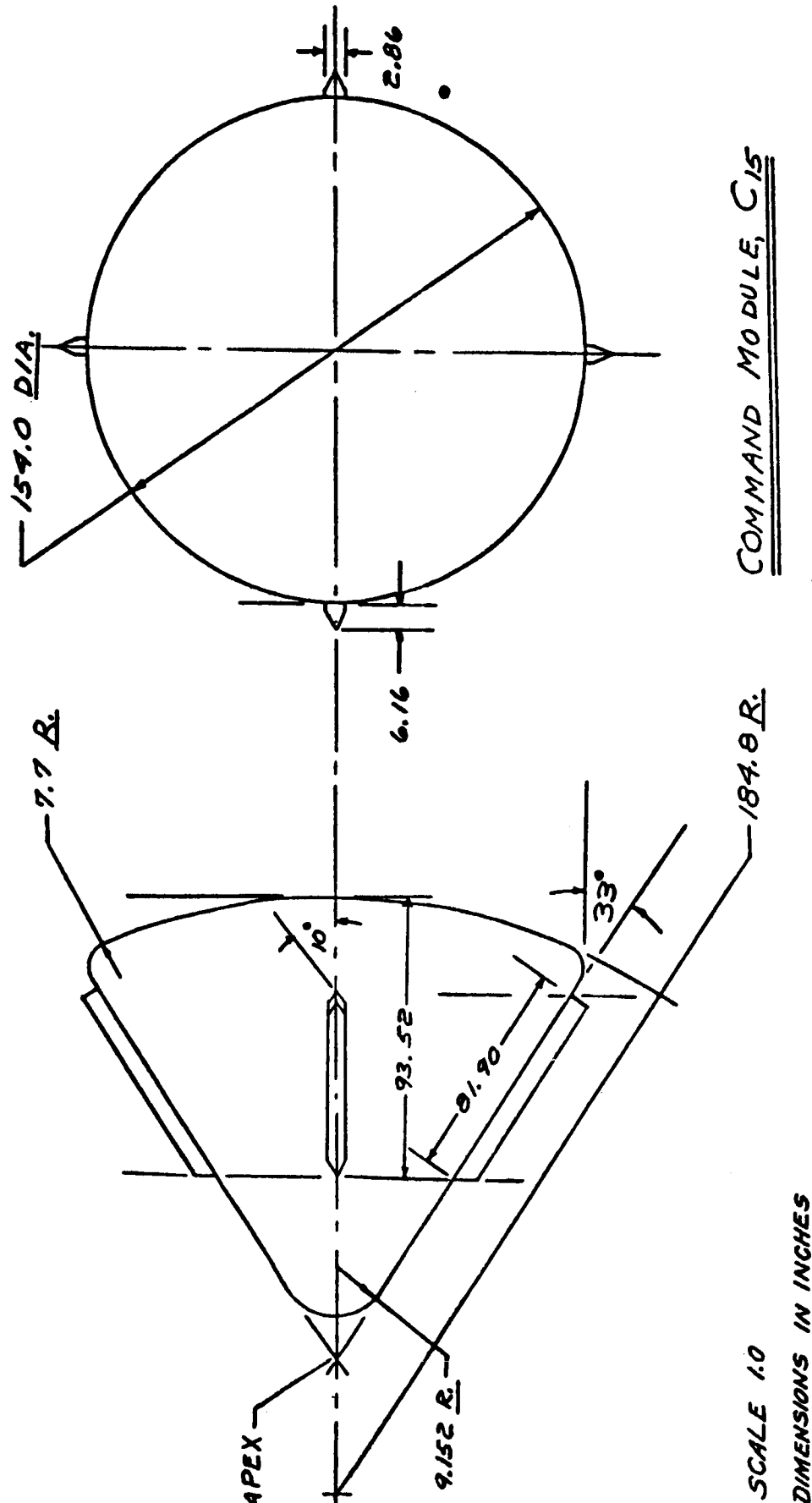
FULL SCALE DIMENSIONS - INCHES
NOT TO SCALE

[redacted]

[redacted]

III. MODEL DESCRIPTION

C. NOMENCLATURE SKETCHES



COMMAND MODULE, C_{15}

DWG. 7121-01077

SCALE 1.0

DIMENSIONS IN INCHES

[redacted]

III. MODEL DESCRIPTION - continued

D. Dimensional Data

	Full Scale Dimensions
Escape Rocket Motor, E20 (Dwg. No. 7101-01080)	
Total length, including jettison motor, in.	252.39
Length of jettison motor, in.	48.00
Diameter of escape rocket and jettison motor, in.	26.00
Nose included angle, degrees	30.00
Skirt-disc diameter, in.	65.00
Skirt-disc thickness	2.5
Skirt-disc position forward of flared skirt, in.	0.50
Diameter of escape rocket base, in.	52.0
Skirt flare angle, degrees	30.0
Escape Rocket Motor, E23 (Dwg. No. 7121-01080)	
Total length, including jettison motor, in.	254.38
Length of jettison motor, in.	48.00
Diameter of escape rocket and jettison motor, in.	26.00
Nose included angle, degrees	30.0
Skirt disc diameter, in.	65.0
Skirt disc thickness, in.	2.5
Diameter of escape rocket base, in.	51.85
Skirt flare angle, degrees	34
Escape Rocket Motor, E35 (Dwg. No. 7121-01080)	
Total length including jettison motor, in.	252.39
Length of jettison motor, in.	48.00
Diameter of escape rocket and jettison motor	26.00
Nose included angle, degrees	30.0
Diameter of escape rocket base	54.6
Skirt flare angle, degrees-minutes	36°55'

III. MODEL DESCRIPTION - continued

D. Dimensional Data

	Full Scale Dimensions
Command Module, C2 (Dwg. No. 7121-01077)	
Max. diameter, in.	154.0
Radius of spherical blunt end, in.	184.8
Corner radius, in.	7.7
Nose cone semi-angle, in.	33.0
Nose cone vertex radius, in.	9.152
Total height, in.	135.021
Frontal area, ft.^{2}	129.351
Command Module, C15 (Dwg. No. 7121-01077-3, -4, -5 & -18)	
Max. diameter, in.	154.0
Radius of spherical blunt end, in.	184.8
Corner radius, in.	7.7
Nose cone semi-angle, in.	33.0
Nose cone vertex radius, in.	9.152
Total height, in.	135.021
Frontal area, ft.^{2}	129.351
Flow separator length, in.	81.90
Flow separator height, in.	6.16
Flow separator width, in.	2.86
Flow separator forward end, in. location from heat shield face, in.	93.52
Tower Structure, T9 (Dwg. No. 7121-01079)	
Total length, in.	114.514 in.
Number of longitudinal members	4
Diameter of longitudinal member, in.	3.571
Diameter of cross braces, in.	2.381
Distance between attachment points at command module, in.	46.752
Distance between attachment points at escape motor, in.	21.905

IV. TEST PROCEDURE

A. Test Nomenclature

General

Mo	free-stream Mach number
Mach	free-stream Mach number
α	angle of attack of model axis of symmetry (zero for apex forward), degrees
β	angle of sideslip of model axis of symmetry, degrees
q	free-stream dynamic pressure, lb/ft^2
A	model reference area, 1.4261 ft^2 (max. cross-sectional area)
K_c	configuration number code
K_O	balance offset angle code
d = D	model reference diameter (maximum diameter of command module), 1.3475 ft.
θ	offset angle between balance axis and model axis of symmetry, degrees
ϕ_B	Model roll angle relative to the balance plane of symmetry ($\phi_B = 0°$ for these tests)
RN	Reynolds number based on reference diameter
pt	free-stream total pressure, lb/ft^2
po	free-stream static pressure, lb/ft^2
pb	balance cavity pressure, lb/ft^2
Cp_b	balance cavity-pressure coefficient, $\frac{pb - po}{q}$
Corr.	Data point correlation number

IV. TEST PROCEDURE - continued

A. Test Nomenclature

Stability system of axes with origin at center of gravity

C_D	drag coefficient (not corrected for base effects) drag/qA
C_L	lift coefficient, lift/qA
$C_m = C_{m_{cg}}$	pitching-moment coefficient, pitching-moment/qAd
C_Y	side-force coefficient, side force/qA
C_n	yawing-moment coefficient, yawing moment/qAd
C_ℓ	rolling-moment coefficient, rolling moment/qAd
L/D	lift-to-drag ratio, C_L/C_D

Body system of axes with origin at center of gravity

$C_{N1} = C_N$	normal-force coefficient, normal force/qA
$C_{A1} = C_A$	axial-force coefficient (not corrected for base effects), axial force/qA
C_{n1}	yawing-moment coefficient, yawing moment/qAd
$C_{\ell 1}$	rolling-moment coefficient, rolling moment/qAd

Body system of axes with origin at command module projected cone apex

$C_{m2} = C_{m_A}$	pitching-moment coefficient, pitching moment/qAd
C_{n2}	yawing-moment coefficient, yawing moment/qAd
$(X_{cp})_N = X_{cp}/D$	center-of-pressure location in the normal force direction, reference diameters from cone apex, negative toward heat shield, $+(C_{m2}/C_{N1})$
$(X_{cp})_Y$	center-of-pressure location in the side force direction, reference diameters from cone apex, negative toward heat shield, $+(C_{n2}/C_Y)$

IV. TEST PROCEDURE - continued

A. Test Nomenclature

Center-of-gravity locations

(a) Launch escape system

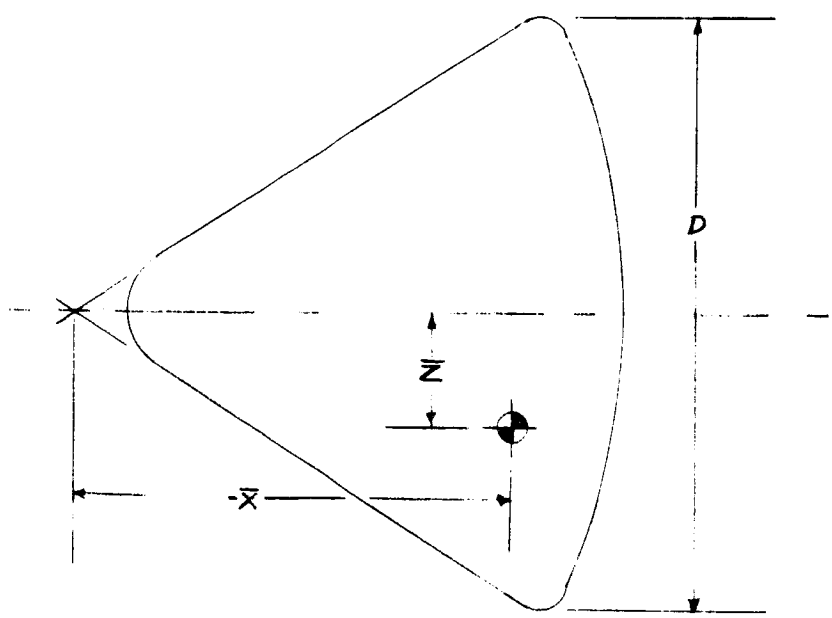
$\bar{X}/D = -0.315$

$\bar{Z}/D = 0.044$

(b) Command module alone

$\bar{X}/D = -0.685$

$\bar{Z}/D = 0.059$



IV. TEST PROCEDURE - continued

B. Model Installation

The FS-2 Apollo model was installed on the Ames 2-1/2 inch Task MK-XI balance and sting combination. An adapter of proper length was selected to locate the model in the proper position for schlieren or shadowgraph pictures.

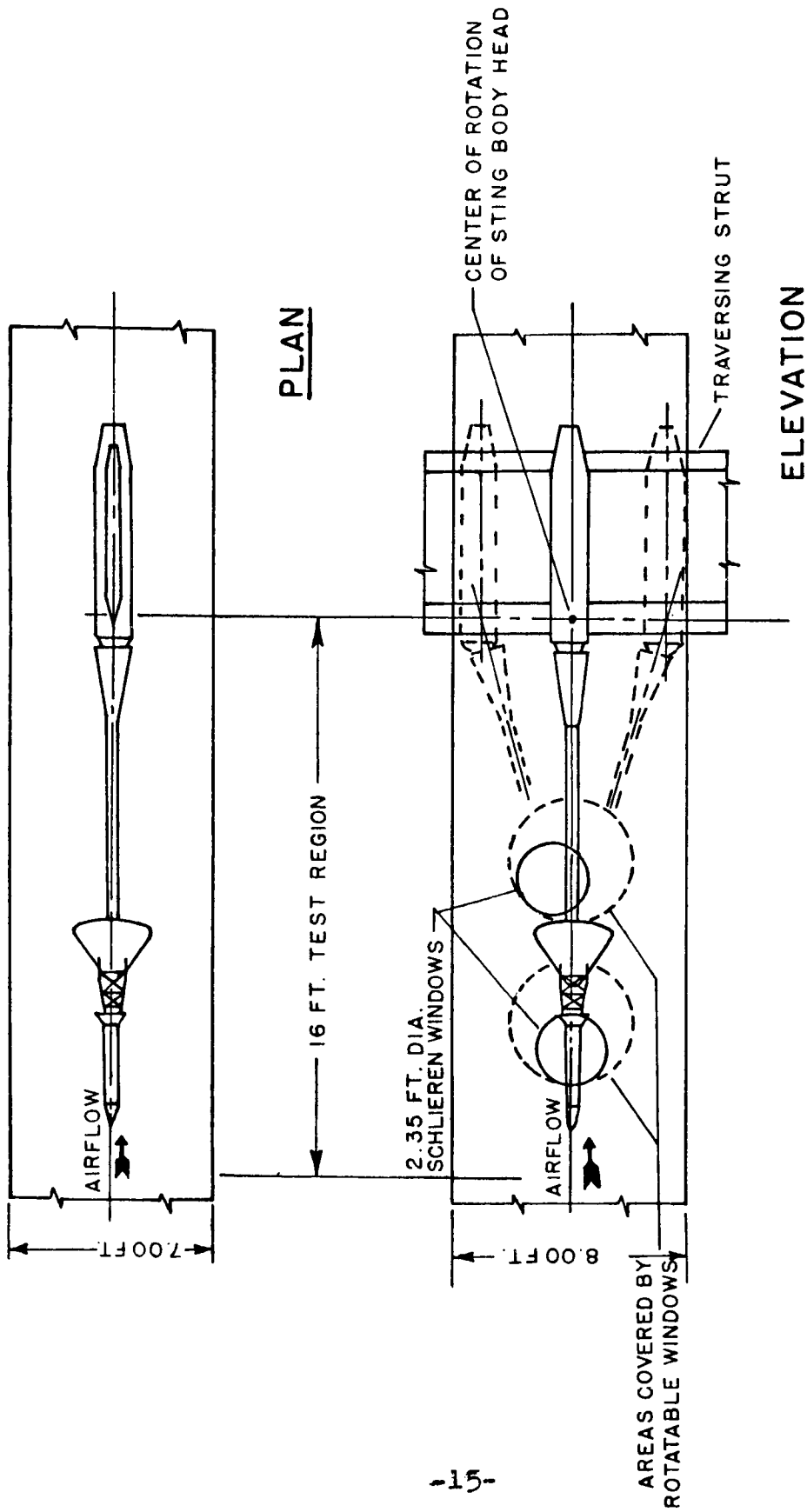
The basic angle range for the support system extended from $\chi = -14.7$ to $+14.7°$. This range, combined with the various model offset angles (θ) allowed complete coverage of the angles of attack required in the test program. For example, if $\theta = 20°$, an angle of attack range of 5.3° to 34.7° was covered.

For this tunnel installation, no bent stings were utilized. A typical installation sketch is shown on page 15.

[redacted]

IV. TEST PROCEDURE

B. MODEL INSTALLATION



TYPICAL INSTALLATION SKETCH
AMES 8X7 FT. UPWT

(NOT TO SCALE)

[redacted]

IV. TEST PROCEDURE - continued

C. Instrumentation

Six component force data were measured by the Ames 2-1/2 inch (Task MK XI) internal balance. The output of each element was fed into the Ames ASGAR digitizing equipment and the data were reduced at a remote computer location. The reduced data were then transmitted to a flexowriter and plotter located in the tunnel control room.

Base pressure readings were obtained but were not used in the data reduction. Schlieren motion pictures were obtained and still pictures were also taken. Prints are on file at the Ames Research Center Unitary Plan Wind Tunnel facility.

V. REFERENCES

(a) Kagawa, J. K. "Test and Model Information for Wind Tunnel Tests of an 0.105-Scale Force Model (FS-2) of the Apollo in the Ames 11 x 11 ft., 9 x 7 ft. and 8 x 7 ft. Unitary Plan Wind Tunnels", North American Aviation, Inc. Space and Information Systems Division, Report SID-62-100, February 6, 1962

(b) McClain, C. B. "Structural Analysis of the .105 Scale Apollo Wind Tunnel Model (FS-2)", North American Aviation, Inc., Space and Information Systems Division, Report SID-62-104, March 12, 1962

APPENDIX "A" 8 x 7 FT. TUNNEL TEST NO. 106

TABULATED DATA

TEST # 106

SUMMARY OF COMPLETED RUNS

FACILITY - AMES 8'x7'
MODEL - .105 SCALE FS-2

CONFIG.	α RANGE	RUN NUMBER			
MACH NUMBER		2.6	3.0	3.4	
E20T9 C2	-15° TO +15°	121	120	119	
	12° TO 35°	103	102	101	
	45° TO 72.5°	116	118	117	
E20T9C15	12° TO 35°	106	105	104	
E23T9 C2	-15° TO +15°	127	126	125	
	12° TO 35°	109	108	107	
E35T9 C2	-15° TO +15°	123	124	122	
	12° TO 35°	112	111	110	
	45° TO 72.5°	115	114	113	
	75° TO 95°	133	132	131	
C15	75° TO 95°	130	129	128	
	125° TO 155°	135		134	

TEST	RUN	K
106	xxx	xx.x

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Facility 8 x 7

TABLE III.- KEY TO TABULATED DATA

POINT	1	2	3	4	5	6	7	8	9	10	11	12 *	13*	14	15	16	17	18	19	20
Corr.	Mach	K_c K_θ	β	α	C_D	C_L	C_m	C_Y	C_n	C_l	L/D	$(X_{cp})_N$	$(X_{cp})_Y$	C_{N_1}	C_{A_1}	C_{n_1}	C_{l_1}	C_{m_2}	C_{n_2}	C_{p_b}
xxxx	x.xxx	xx x	xx.x	xxx.x	x.xxx	x.xxx	.xxxx	.xxxx	.xxxx	.xxxx	x.xxx	x.xxx	x.xxx	x.xxx	x.xxx	.xxxx	.xxxx	.xxxx	.xxxx	x.xxx
		Configuration no. Offset angle code			Not corrected for base pressure															
					Stability system of axes with origin at C. G.							Diameters from apex		Body system of axes with origin at C. G.				Body system of axes with origin at apex		

* Multiply all values of $(X_{cp})_N$ and $(X_{cp})_Y$ by minus one (-1).

SID 62 936
APPENDIX A-3

Encl 3, Cover letter to Boa 4/2/62

4-C

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PRELIMINARY DATA

TEST	RUN	Rx10-6
106	101	03.5

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08 x07

POINT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3010	3402	111	001	0116	0727	0210	-0651	-0094	-0010	-0002	0289	0571	0192	0352	0670	-0010		-2006	0018	-0087
3011	3402	111	001	0146	0799	0231	-0702	-0086	-0008	0002	0289	0540	0218	0425	0715	-0007	0004	-2300	0019	-0089
3012	3402	111	001	0177	0883	0256	-0747	-0062	0002	0004	0290	0513	0358	0511	0763	0004	0003	-2626	0022	-0090
3013	3402	111	001	0197	0946	0273	-0793	-0043	-0009	0002	0288	0500	0131	0576	0799	-0007	0005	-2882	0006	-0090
3014	3402	111	001	0248	1135	0282	-0833	0003	-0012	-0001	0249	0470	4595	0733	0912	-0012	0004	-3444	-0013	-0094
3015	3402	111		0299	1254	0235	-0278	0065	-0020	0001	0187	0387	0571	0829	0969	-0017	0011	-3204	-0037	-0094
3016	3402	111		0347	1327	0154	0375	0063	-0014	0003	0116	0309	0463	0882	1003	-0010	0011	-2727	-0029	-0097

SID 62 936
APPENDIX A-4

Exc 3

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PRELIMINARY DATA

TEST	RUN	Rx10-6
106	102	03.9

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National Aeronautics and Space Administration
Ames Research Center
MOFFETT FIELD, CALIFORNIA

Facility
08 x 07

POINT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3017	2997	111		0117	0768	0199	-0610	-0098	0009	0002	0259	0566	0400	0349	0712	0010		-1977	0039	-0110
3018	2997	111	001	0147	0835	0224	-0616	-0151	-0041	-0010	0268	0522	0024	0429	0750	-0042	0001	-2239	0004	-0111
3019	2997	111		0178	0913	0246	-0657	-0054	0044	0016	0270	0497	1168	0514	0794	0046	0002	-2555	0063	-0116
3020	2997	111		0199	0969	0258	-0646	-0057	0004	0005	0266	0478	0408	0572	0824	0006	0003	-2734	0023	-0119
3021	2997	111		0251	1149	0284	-0574	0021	-0020		0247	0433	1174	0743	0920	-0018	0008	-3221	-0024	-0123
3022	2997	111		0302	1267	0233	-0123	0056	-0028	-0006	0184	0368	0796	0838	0978	-0028	0009	-3083	-0045	-0128
3023	2997	111		0350	1334	0162	0495	0047	-0024	-0006	0122	0295	0794	0898	1000	-0023	0009	-2653	-0037	-0125

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APPENDIX A-5

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PRELIMINARY DATA

TEST	RUN	Rx10-6
106	103	03.6

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POINT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3024	2597	111		0116	0827	0188	-0569	-0101	0001		0228	0561	0307	0351	0772	0001		-1968	0031	-0140
3025	2597	111		0147	0885	0205	-0563	-0104	-0001	0001	0232	0518	0299	0423	0804		0001	-2193	0031	-0140
3026	2597	111		0178	0954	0229	-0508	-0169	-0058	-0019	0240	0474	-0060	0510	0838	-0061	-0001	-2415	-0010	-0148
3027	2597	111		0199	1002	0239	-0479	-0083	-0039	-0010	0238	0453	-0178	0565	0862	-0040	0003	-2563	-0015	-0155
3028	2597	111		0251	1136	0265	-0303	0039	-0020	0001	0233	0400	0744	0721	0917	-0017	0009	-2882	-0029	-0160
3029	2597	111		0302	1262	0240	0071	0037	-0037	-0010	0190	0344	1290	0843	0970	-0037	0010	-2897	-0048	-0166
3030	2597	111		0350	1342	0173	0684	0057	-0023	-0003	0129	0275	0661	0911	1000	-0021	0011	-2504	-0038	-0170

SID 62 936
APPENDIX A-6

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PRELIMINARY DATA

TEST	RUN	Rx10-6
106	104	03.5

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National Aeronautics and Space Administration
Ames Research Center
MOFFETT FIELD, CALIFORNIA

Facility
08 x07

POINT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3035	3402	181	001	0116	0733	0228	-0664	-0043	-0008	-0001	0311	0561	0117	0370	0672	-0008	0001	-2075	0005	-0090
3036	3402	181	001	0146	0805	0255	-0737	-0048	0004	0002	0317	0535	0382	0450	0715	0004	0001	-2409	0018	-0089
3037	3402	181	001	0177	0893	0285	-0799	-0022	-0005	0003	0319	0511	0115	0543	0764	-0004	0004	-2772	0003	-0089
3038	3402	181	001	0197	0963	0305	-0866	-0002	-0006		0316	0501	-2057	0612	0804	-0006	0002	-3066	-0005	-0090
3039	3402	181		0249	1176	0327	-0951	0099	-0028	0002	0278	0474	0546	0791	0929	-0024	0014	-3745	-0054	-0092
3040	3402	181		0300	1319	0288	-0464	0134	-0037	0001	0218	0401	0534	0908	0999	-0031	0020	-3643	-0072	-0095
3041	3402	181		0347	1405	0213	0182	0127	-0036	0001	0152	0330	0531	0975	1033	-0029	0021	-3214	-0067	-0097

SID 62 936
APPENDIX A-7

4-C

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PRELIMINARY DATA

TEST	RUN	Rx10-6
106	105	03.9

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National Aeronautics and Space Administration
Ames Research Center
MOFFETT FIELD, CALIFORNIA

Facility
08 x07

POINT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3042	2997	181		0117	0775	0220	-0630	-0017	-0002	0004	0284	0555	0219	0373	0715	-0001	0004	-2068	0004	-0115
3043	2997	181	001	0148	0847	0248	-0660	-0105	-0031	-0007	0293	0520	0003	0455	0756	-0031	0001	-2365		-0115
3045	2997	181		0178	0927	0279	-0735	-0050	-0035	-0005	0301	0499	-0396	0550	0797	-0035	0006	-2744	-0020	-0118
3046	2997	181		0199	0988	0295	-0736	-0017	0001	0005	0298	0481	0470	0614	0829	0003	0004	-2953	0008	-0120
3047	2997	181		0251	1191	0332	-0714	0070	-0027	0001	0279	0441	0649	0806	0938	-0024	0013	-3558	-0045	-0127
3048	2997	181		0303	1327	0288	-0307	0116	-0043	-0007	0217	0383	0651	0918	1001	-0040	0015	-3515	-0075	-0130
3049	2997	181		0350	1408	0216	0317	0115	-0031	-0002	0153	0315	0536	0985	1029	-0027	0016	-3107	-0061	-0128

SID 62 936
APPENDIX A-8

4-C

~~CONFIDENTIAL~~

PRELIMINARY DATA

TEST	RUN	Rx10-6
106	106	03.6

~~CONFIDENTIAL~~

National Aeronautics and Space Administration
Ames Research Center
MOFFETT FIELD, CALIFORNIA

Facility
08 x07

POINT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3050	2599	181		0117	0836	0207	-0581	-0073	-0025	-0005	0248	0550	-0048	0372	0777	-0026		-2044	-0004	-0148
3051	2599	181		0147	0901	0234	-0610	-0059	-0015	-0002	0260	0514	0057	0456	0812	-0015	0002	-2342	0003	-0148
3052	2599	181		0178	0975	0269	-0595	-0095	-0069	-0018	0276	0476	-0452	0555	0846	-0072	0004	-2642	-0043	-0150
3053	2599	181		0199	1031	0284	-0592	-0020	-0049	-0008	0276	0459	-2200	0619	0873	-0049	0009	-2842	-0043	-0156
3054	2599	181		0251	1191	0319	-0451	0104	-0029	0002	0267	0411	0543	0794	0943	-0025	0014	-3261	-0056	-0167
3055	2599	181		0303	1337	0298	-0114	0113	-0046	-0010	0223	0361	0699	0931	1004	-0045	0014	-3365	-0079	-0171
3056	2599	181		0351	1420	0228	0501	0125	-0023		0161	0297	0453	1002	1031	-0019	0013	-2975	-0056	-0173

SID 62 936
APPENDIX A-9

~~CONFIDENTIAL~~

PRELIMINARY DATA

TEST	RUN	Rx10-6
106	107	03.5

~~CONFIDENTIAL~~

National Aeronautics and Space Administration
Ames Research Center
MOFFETT FIELD, CALIFORNIA

Facility
08 x07

POINT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3060	3402	101	001	0116	0691	0213	-0220	0013	-0034		0308	0445	2914	0347	0634	-0033	0006	-1546	-0037	-0087
3061	3402	101		0147	0757	0249	-0060	0079		0005	0329	0384	0280	0432	0669	0002	0005	-1659	-0022	-0085
3062	3402	101		0178	0836	0269	-0010	0118	-0018	0005	0322	0365	0434	0511	0714	-0016	0010	-1864	-0051	-0085
3063	3402	101		0198	0888	0277	0061	0085	-0027	-0001	0312	0349	0606	0562	0742	-0026	0009	-1961	-0051	-0087
3064	3402	101		0249	1050	0301	0031	0110	-0055	-0012	0286	0348	0806	0715	0826	-0055	0012	-2489	-0088	-0090
3065	3402	101		0300	1231	0298	0160	0135	-0036	-0006	0242	0329	0552	0874	0916	-0034	0013	-2879	-0074	-0092
3066	3402	101		0348	1299	0252	0704	0124	-0027	-0007	0194	0270	0517	0948	0923	-0027	0009	-2562	-0064	-0097

SID 62 936
APPENDIX A-10

~~CONFIDENTIAL~~

PRELIMINARY DATA

TEST	RUN	Rx10-6
106	108	03.8

~~CONFIDENTIAL~~

National Aeronautics and Space Administration
Ames Research Center
MOFFETT FIELD, CALIFORNIA

Facility
08 x07

POINT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3067	2997	101		0117	0735	0192	-0302	0001	-0007	0001	0261	0480	8208	0337	0681	-0007	0003	-1617	-0007	-0114
3068	2997	101		0148	0792	0233	-0019	-0038	-0032	-0004	0294	0379	-0545	0428	0706	-0032	0005	-1620	-0021	-0112
3069	2997	101		0179	0871	0263	0012	-0041	-0027	-0005	0302	0363	-0351	0518	0747	-0027	0003	-1880	-0015	-0115
3070	2997	101		0200	0922	0277	0058	0011	-0045	-0010	0300	0351	4630	0575	0771	-0046	0006	-2016	-0049	-0115
3071	2997	101		0251	1071	0301	0097	0110	-0054	-0012	0281	0339	0796	0728	0841	-0054	0012	-2468	-0087	-0120
3072	2997	101		0303	1238	0301	0269	0113	-0028	-0004	0243	0317	0530	0885	0916	-0026	0011	-2804	-0060	-0128
3073	2997	101		0351	1316	0253	0836	0115	-0024	-0006	0192	0257	0501	0964	0932	-0023	0009	-2481	-0058	-0134

SID 62 936
APPENDIX A-11

~~CONFIDENTIAL~~

PRELIMINARY DATA

TEST	RUN	Rx10-6
106	109	03.6

~~CONFIDENTIAL~~

National Aeronautics and Space Administration
Ames Research Center
MOFFETT FIELD, CALIFORNIA

Facility
08 x07

POINT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3074	2599	101		0117	0793	0177	-0252	-0002	-0017	-0001	0223	0475	-7042	0333	0741	-0017	0002	-1584	-0017	-0147
3075	2597	101		0148	0863	0199	-0035	0014	-0037	-0005	0231	0394	2847	0413	0784	-0037	0005	-1625	-0041	-0148
3076	2597	101		0179	0909	0251	0060	0145	-0056	-0006	0276	0357	0685	0518	0788	-0056	0012	-1850	-0099	-0147
3077	2597	101		0199	0976	0236	0082	0042	-0042	-0007	0242	0353	1293	0554	0837	-0042	0008	-1958	-0055	-0151
3078	2597	101		0251	1083	0273	0278	0122	-0049	-0013	0252	0316	0711	0707	0865	-0050	0010	-2234	-0087	-0156
3079	2597	101		0303	1239	0288	0431	0150	-0033	-0006	0232	0299	0513	0874	0924	-0032	0012	-2612	-0077	-0165
3080	2597	101		0351	1323	0257	0950	0104	-0018	-0003	0194	0246	0458	0971	0935	-0016	0007	-2390	-0048	-0170

SID 62 936
APPENDIX A-12

~~CONFIDENTIAL~~

PRELIMINARY DATA

TEST	RUN	Rx10-6
106	110	03.4

~~CONFIDENTIAL~~

National Aeronautics and Space Administration
Ames Research Center
MOFFETT FIELD, CALIFORNIA

Facility
08 x07

POINT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3084	3402	161	001	0116	0680	0228	-0289	0007	-0013	0001	0335	0458	2072	0360	0620	-0012	0004	-1650	-0014	-0092
3085	3402	161	001	0147	0742	0282	-0335	0020	-0022	-0001	0380	0436	1375	0461	0647	-0021	0005	-2010	-0027	-0092
3086	3402	161		0178	0822	0323	-0354	0046	-0018	-0001	0393	0419	0689	0558	0684	-0018	0005	-2339	-0031	-0090
3087	3402	161		0198	0885	0348	-0362	0058	-0020	0001	0393	0409	0611	0627	0715	-0018	0008	-2568	-0036	-0090
3088	3402	161		0250	1013	0372	-0107	0104	-0023		0367	0359	0505	0765	0762	-0021	0010	-2748	-0052	-0094
3089	3402	161		0301	1135	0350	0323	0129	-0019	-0001	0309	0305	0436	0872	0806	-0017	0008	-2662	-0056	-0095
3090	3402	161		0348	1198	0299	0862	0151	-0019	-0005	0250	0247	0424	0930	0813	-0019	0007	-2300	-0064	-0099

SID 62 936
APPENDIX A-13

4-C

~~CONFIDENTIAL~~

PRELIMINARY DATA

TEST	RUN	Rx10-6
106	111	03.8

~~CONFIDENTIAL~~

National Aeronautics and Space Administration
Ames Research Center
MOFFETT FIELD, CALIFORNIA

Facility
08 x07

POINT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3091	2997	161		0117	0716	0204	-0229	-0012	-0015	0001	0285	0452	-0861	0345	0660	-0014	0004	-1560	-0011	-0120
3092	2997	161		0148	0775	0255	-0239	-0005	-0016	-0001	0329	0423	-2758	0445	0684	-0015	0003	-1882	-0014	-0120
3093	2997	161		0179	0847	0298	-0233	0005	-0013		0352	0402	2854	0545	0714	-0013	0004	-2190	-0014	-0120
3094	2997	161		0200	0909	0326	-0252	0030	-0019	-0001	0359	0395	0897	0618	0742	-0018	0006	-2442	-0027	-0120
3095	2997	161		0252	1037	0353	-0002	0100	-0036	-0006	0341	0347	0656	0761	0787	-0035	0010	-2644	-0065	-0123
3096	2997	161		0304	1157	0341	0438	0138	-0025	-0004	0295	0293	0475	0879	0826	-0024	0009	-2578	-0065	-0128
3097	2997	161		0351	1225	0293	0991	0121	-0019	-0006	0239	0235	0457	0944	0833	-0019	0006	-2223	-0055	-0133

SID 62 936
APPENDIX A-14

4-C

~~CONFIDENTIAL~~

PRELIMINARY DATA

TEST	RUN	Rx10-6
106	112	03.5

~~CONFIDENTIAL~~

National Aeronautics and Space Administration
Ames Research Center
MOFFETT FIELD, CALIFORNIA

Facility
08 x07

POINT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3098	2599	161		0117	0768	0181	-0189	0006	-0022	-0001	0236	0453	4197	0333	0716	-0022	0003	-1508	-0023	-0152
3099	2599	161		0148	0821	0223	-0145	0023	-0031	-0002	0271	0412	1631	0425	0737	-0031	0006	-1751	-0038	-0154
3100	2599	161		0179	0883	0264	-0092	0031	-0023	-0001	0299	0383	1018	0523	0759	-0022	0006	-2005	-0031	-0154
3101	2599	161		0200	0933	0293	-0069	0041	-0022	-0002	0314	0371	0834	0594	0777	-0022	0006	-2202	-0034	-0152
3102	2599	161		0252	1060	0327	0167	0118	-0032	-0006	0308	0328	0572	0747	0820	-0032	0008	-2447	-0067	-0156
3103	2599	161		0304	1165	0332	0563	0153	-0036	-0009	0285	0279	0533	0876	0837	-0035	0010	-2446	-0082	-0161
3104	2599	161		0351	1246	0290	1078	0139	-0021	-0004	0233	0228	0441	0955	0852	-0019	0008	-2176	-0061	-0176

SID 62 936
APPENDIX A-15

~~CONFIDENTIAL~~

PRELIMINARY DATA

TEST	RUN	Rx10⁻⁶
106	113	03.5

~~CONFIDENTIAL~~

National Aeronautics and Space Administration
Ames Research Center
MOFFETT FIELD, CALIFORNIA

Facility
08 x07

POINT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3110	3402	163	001	0449	1260	0201	2000	-0088	0032	0019	0159	0140	0709	1032	0750	0036	-0009	-1443	0062	-0089
3111	3402	163	001	0497	1281	0110	2432	-0082	0036	0029	0086	0101	0864	1048	0745	0046	-0009	-1057	0070	-0029
3112	3402	163	001	0547	1283	0037	2847	-0059	0031	0034	0029	0065	1080	1069	0711	0046	-0006	-0691	0063	-0026
3113	3402	163	001	0598	1291	-0016	3209	-0043	0024	0028	-0012	0038	1145	1108	0663	0036	-0006	-0425	0049	-0024
3114	3402	163	001	0649	1299	-0065	3519	-0043	0017	0023	-0050	0019	0949	1149	0609	0028	-0006	-0214	0041	-0027
3115	3402	163	001	0700	1300	-0105	3792	-0057	0012	0026	-0081	0002	0799	1186	0543	0029	-0003	-0023	0046	-0031
3116	3402	163	001	0725	1298	-0120	3912	-0058	0011	0022	-0093	-0006	0725	1201	0506	0024	-0004	0066	0042	-0014

SID 62 930
APPENDIX A-16

~~CONFIDENTIAL~~

PRELIMINARY DATA

TEST	RUN	Rx10-6
106	114	03.8

~~CONFIDENTIAL~~

National Aeronautics and Space Administration
Ames Research Center
MOFFETT FIELD, CALIFORNIA

Facility
08 x07

POINT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3117	2997	163		0451	1288	0181	2136	-0102	0028	0022	0141	0129	0650	1040	0781	0036	-0004	-1344	0066	-0011
3118	2997	163		0498	1307	0101	2582	-0092	0031	0030	0077	0091	0764	1064	0766	0043	-0005	-0965	0070	-0001
3119	2997	163		0549	1311	0026	2996	-0072	0024	0028	0020	0056	0815	1088	0732	0037	-0003	-0608	0058	0006
3120	2997	163		0601	1314	-0029	3353	-0080	0021	0027	-0022	0030	0722	1124	0681	0034	-0005	-0337	0058	0008
3121	2997	163		0652	1324	-0081	3683	-0108	0020	0030	-0061	0010	0636	1168	0629	0036	-0006	-0116	0068	0003
3122	2997	163		0703	1324	-0126	3970	-0114	0013	0031	-0095	-0007	0596	1204	0565	0033	-0002	0089	0068	-0001
3123	2997	163	001	0728	1320	-0141	4074	-0116	0010	0028	-0107	-0014	0556	1219	0526	0030	-0001	0166	0065	-0005

SID 62 936
APPENDIX A-17

~~CONFIDENTIAL~~

PRELIMINARY DATA

TEST	RUN	Rx10-6
106	115	03.5

~~CONFIDENTIAL~~

National Aeronautics and Space Administration
Ames Research Center
MOFFETT FIELD, CALIFORNIA

Facility
08 x07

POINT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3124	2597	163		0451	1319	0173	2236	-0145	0043	0035	0131	0124	0679	1056	0809	0055	-0006	-1307	0098	-0072
3125	2597	163		0498	1338	0097	2702	-0140	0040	0045	0073	0085	0730	1086	0789	0060	-0001	-0919	0102	-0053
3126	2597	163		0549	1343	0015	3116	-0125	0032	0040	0011	0050	0709	1108	0759	0051	-0003	-0559	0089	-0047
3127	2597	163		0601	1341	-0046	3468	-0139	0031	0041	-0034	0025	0665	1139	0709	0051	-0007	-0279	0093	-0040
3128	2597	163		0652	1345	-0090	3774	-0118	0025	0050	-0067	0007	0770	1183	0646	0055	-0002	-0078	0091	-0044
3129	2597	163		0703	1343	-0127	4044	-0148	0016	0040	-0094	-0009	0591	1222	0572	0043	-0002	0106	0088	-0052
3130	2597	163		0728	1338	-0141	4152	-0151	0014	0041	-0105	-0015	0585	1237	0531	0043	-0001	0188	0088	-0046

SID 62 936
APPENDIX A-18

~~CONFIDENTIAL~~

PRELIMINARY DATA

TEST	RUN	Rx10-6
106	116	03.6

~~CONFIDENTIAL~~

National Aeronautics and Space Administration
Ames Research Center
MOFFETT FIELD, CALIFORNIA

Facility
08 x07

POINT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3137	2599	113		0450	1391	0038	1916	-0092	0012	0018	0027	0154	0536	1011	0957	0022	0004	-1554	0049	-0149
3138	2599	113		0498	1389	-0017	2404	-0088	0018	0027	-0012	0111	0669	1050	0909	0032	0004	-1163	0059	-0144
3139	2599	113		0549	1375	-0067	2899	-0040	0013	0029	-0049	0069	1075	1087	0845	0031	0007	-0752	0043	-0135
3140	2599	113		0601	1368	-0099	3379	-0063	0011	0029	-0073	0034	0781	1136	0768	0030	0005	-0386	0049	-0110
3141	2599	113		0653	1368	-0130	3794	-0047	0004	0028	-0095	0008	0875	1188	0691	0027	0008	-0094	0041	-0119
3142	2599	113		0704	1365	-0167	4166	-0075	-0003	0020	-0122	-0015	0536	1230	0615	0018	0009	0185	0040	-0119
3143	2599	113		0729	1356	-0183	4309	-0080	-0004	0014	-0135	-0025	0452	1242	0574	0012	0007	0310	0036	-0110

SID 62 936
APPENDIX A-19

4-C

~~CONFIDENTIAL~~

PRELIMINARY DATA

TEST	RUN	Rx10-6
106	117	03.4

~~CONFIDENTIAL~~

National Aeronautics and Space Administration
Ames Research Center
MOFFETT FIELD, CALIFORNIA

Facility
08 x07

POINT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3144	3402	113	001	0449	1343	0023	1702	-0071	0024	0020	0017	0168	0741	0964	0936	0031	-0002	-1616	0052	-0044
3145	3402	113	001	0496	1335	-0021	2222	-0071	0031	0032	-0015	0119	0927	1004	0880	0045	-0003	-1193	0066	-0036
3146	3402	113	001	0548	1319	-0056	2712	-0039	0022	0032	-0042	0076	1315	1045	0807	0039		-0795	0051	-0039
3147	3402	113	001	0599	1321	-0084	3153	-0060	0011	0023	-0063	0044	0718	1100	0735	0025	0002	-0490	0043	-0036
3148	3402	113	001	0650	1322	-0123	3568	-0047	0006	0026	-0093	0016	0853	1146	0671	0026	0005	-0184	0040	-0042
3149	3402	113	001	0701	1322	-0159	3914	-0068	0004	0023	-0121	-0005	0644	1189	0600	0023	0004	0063	0044	-0036
3150	3402	113	001	0726	1317	-0178	4072	-0055	0002	0017	-0135	-0016	0598	1203	0564	0016	0003	0195	0033	-0037

SID 62 936
APPENDIX A-20

~~CONFIDENTIAL~~

PRELIMINARY DATA

TEST	RUN	Rx10-6
106	118	03.8

~~CONFIDENTIAL~~

National Aeronautics and Space Administration
Ames Research Center
MOFFETT FIELD, CALIFORNIA

Facility
08 x07

POINT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3151	2997	113		0450	1366	0027	1826	-0108	0031	0025	0020	0158	0674	0985	0947	0040	-0004	-1561	0073	-0063
3152	2997	113		0498	1362	-0026	2312	-0087	0027	0029	-0019	0114	0758	1023	0899	0040	-0002	-1169	0066	-0021
3153	2997	113		0549	1344	-0065	2800	-0035	0016	0023	-0048	0072	1103	1062	0825	0028		-0767	0038	-0018
3154	2997	113		0601	1343	-0094	3284	-0062	0008	0022	-0070	0037	0681	1117	0751	0024	0004	-0416	0042	-0012
3155	2997	113		0653	1347	-0130	3706	-0058	0006	0020	-0097	0010	0662	1169	0682	0021	0003	-0120	0038	-0011
3156	2997	113		0704	1343	-0168	4085	-0069	0002	0018	-0125	-0014	0556	1209	0608	0018	0004	0171	0038	-0012
3157	2997	113		0729	1338	-0186	4231	-0069	-0002	0014	-0139	-0023	0480	1224	0572	0012	0006	0287	0033	-0015

SID 62 936
APPENDIX A-21

~~CONFIDENTIAL~~

PRELIMINARY DATA

TEST	RUN	Rx10⁻⁶
106	119	03.4

~~CONFIDENTIAL~~

National Aeronautics and Space Administration
Ames Research Center
MOFFETT FIELD, CALIFORNIA

Facility
08 x07

POINT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3164	3402	110	001	-0142	0791	-0223	1281	-0034	-0002	-0001	-0282	0549	0255	-0410	0713	-0002	-0002	2253	0009	-0092
3165	3402	110		-0107	0717	-0198	1196	0039	0020	-0002	-0276	0588	-0190	-0328	0668	0020	0001	1932	0007	-0090
3166	3402	110	001	-0056	0604	-0165	1079		-0004		-0273	0681	-7332	-0224	0585	-0004		1524	-0004	-0090
3167	3402	110	001	-0036	0567	-0143	0990	0022	-0015	0001	-0253	0730	0995	-0179	0556	-0015		1306	-0022	-0092
3168	3402	110		-0026	0550	-0123	0895	0045	-0018	0003	-0223	0758	0712	-0147	0544	-0018	0002	1118	-0032	-0092
3169	3402	110		-0015	0538	-0087	0708	0048	-0024	0002	-0161	0780	0808	-0101	0536	-0024	0001	0789	-0039	-0092
3170	3402	110		-0005	0534	-0041	0474	0078	-0033	0003	-0077	0837	0734	-0046	0533	-0033	0003	0383	-0057	-0092
3171	3402	110		0005	0532	0035	0004	0108	-0049	0004	0066	0890	0769	0040	0532	-0049	0004	-0355	-0083	-0092
3172	3402	110		0016	0537	0090	-0275	0101	-0040	0002	0168	0800	0702	0105	0534	-0039	0004	-0839	-0071	-0092
3173	3402	110		0026	0547	0127	-0464	0101	-0043	0002	0231	0777	0733	0152	0541	-0043	0003	-1177	-0074	-0092
3174	3402	110		0047	0584	0165	-0604	0095	-0034		0283	0716	0676	0212	0569	-0034	0003	-1520	-0064	-0092
3175	3402	110		0077	0650	0188	-0630	0107	-0022		0290	0643	0520	0274	0619	-0022	0003	-1762	-0056	-0090
3176	3402	110		0098	0698	0201	-0654	0107	-0002	0003	0289	0611	0324	0317	0653	-0001	0004	-1934	-0035	-0090
3177	3402	110		0118	0741	0220	-0686	0060	-0002	0001	0296	0582	0350	0367	0681	-0002	0002	-2136	-0021	-0090
3178	3402	110		0145	0806	0248	-0723	0046	-0009	-0002	0307	0549	0517	0442	0718	-0009	0001	-2424	-0024	-0092

SID 62 936
APPENDIX A-22

~~CONFIDENTIAL~~

PRELIMINARY DATA

TEST	RUN	Rx10-6
106	120	03.8

~~CONFIDENTIAL~~

National Aeronautics and Space Administration
Ames Research Center
MOFFETT FIELD, CALIFORNIA

Facility
08 x07

POINT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3179	2997	110		-0142	0840	-0222	1254	0026	0048	-0012	-0265	0532	-1613	-0422	0760	0049		2241	0041	-0123
3180	2997	110		-0107	0769	-0199	1228	-0021	-0001	-0002	-0259	0583	0294	-0338	0718		-0002	1972	0006	-0120
3181	2997	110		-0056	0654	-0164	1136	-0018	0013	-0003	-0251	0691	1032	-0227	0635	0013	-0002	1567	0019	-0121
3182	2997	110		-0035	0608	-0135	0964	-0008	-0003	-0002	-0221	0721	0005	-0172	0599	-0002	-0002	1240		-0123
3183	2997	110		-0025	0596	-0107	0797	-0011		-0001	-0180	0717	0296	-0133	0590		-0001	0954	0003	-0123
3184	2997	110		-0015	0582	-0086	0728	0020	-0013		-0147	0783	0943	-0101	0579	-0013	-0001	0788	-0019	-0123
3185	2997	110		-0004	0574	-0044	0501	0054	-0033	0001	-0077	0825	0930	-0049	0574	-0033	0001	0401	-0050	-0121
3186	2997	110		0006	0577	0011	0186	0031	-0019		0019	0709	0927	0017	0577	-0019		-0122	-0029	-0120
3187	2997	110		0017	0581	0064	-0121	0039	-0020	-0001	0110	0777	0840	0081	0579	-0020		-0630	-0033	-0120
3188	2997	110		0027	0594	0100	-0297	0026	-0007	-0001	0168	0748	0588	0128	0589	-0007	-0001	-0958	-0015	-0121
3189	2997	110		0048	0632	0152	-0561	-0004	0020	-0001	0241	0720	5640	0205	0617	0020	-0002	-1474	0021	-0121
3190	2997	110		0079	0698	0182	-0628	0052	0056	0008	0260	0648	-0770	0276	0667	0057		-1786	0040	-0120
3191	2997	110		0099	0748	0193	-0617	0027	-0014	-0003	0258	0604	0827	0319	0704	-0014	-0001	-1928	-0023	-0120
3192	2997	110		0120	0792	0209	-0626	0032	0007	0001	0264	0570	0092	0369	0732	0007	-0001	-2105	-0003	-0121
3193	2997	110	001	0147	0853	0236	-0620	-0072	-0066	-0023	0277	0528	-0656	0445	0765	-0070	-0005	-2353	-0047	-0123

SID 62 936
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~~CONFIDENTIAL~~

PRELIMINARY DATA

TEST	RUN	Rx10⁻⁶
106	121	03.5

~~CONFIDENTIAL~~

National Aeronautics and Space Administration
Ames Research Center
MOFFETT FIELD, CALIFORNIA

Facility
08 X07

POINT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3194	2597	110		-0142	0900	-0209	1283	-0003	-0021	0002	-0233	0531	-7235	-0424	0821	-0021	-0003	2251	-0020	-0157
3195	2599	110		-0107	0836	-0190	1253	0017	-0005	-0001	-0227	0579	0557	-0342	0786	-0004	-0002	1980	-0010	-0156
3196	2599	110		-0056	0725	-0161	1203	0023	-0012		-0222	0700	0835	-0231	0706	-0012	-0001	1617	-0020	-0160
3197	2599	110		-0035	0661	-0128	1009	0051	-0030	0002	-0194	0741	0890	-0169	0652	-0030		1252	-0046	-0160
3198	2599	110		-0025	0639	-0103	0833	0039	-0019	0001	-0162	0737	0815	-0131	0634	-0019		0965	-0031	-0158
3199	2599	110		-0014	0625	-0059	0557	0072	-0046	0002	-0095	0690	0943	-0075	0623	-0046	0001	0518	-0068	-0154
3200	2599	110		-0004	0619	-0040	0498	0030	-0010	-0001	-0064	0826	0653	-0044	0618	-0010	-0001	0364	-0020	-0154
3201	2599	110		0006	0614	0010	0205	0062	-0029	0001	0016	0706	0779	0016	0613	-0029	0001	-0116	-0048	-0153
3202	2599	110		0017	0623	0051	-0026	0078	-0038		0082	0744	0807	0070	0621	-0038	0002	-0517	-0063	-0154
3203	2599	110		0027	0645	0093	-0252	0072	-0035		0144	0746	0801	0123	0640	-0035	0001	-0921	-0058	-0156
3204	2599	110		0048	0701	0145	-0552	0051	-0008	-0001	0207	0734	0468	0203	0687	-0008		-1490	-0024	-0158
3205	2599	110		0079	0766	0175	-0658	0074	-0015	-0001	0229	0665	0522	0279	0735	-0015	0001	-1855	-0039	-0157
3206	2599	110		0099	0817	0183	-0599	0047	-0036	-0007	0225	0605	1085	0322	0773	-0037		-1947	-0051	-0157
3207	2599	110		0120	0858	0197	-0593	0037	-0033	-0008	0230	0568	1251	0371	0798	-0034	-0001	-2107	-0046	-0156
3208	2599	110		0147	0914	0217	-0573	0026	-0021	-0006	0238	0525	1155	0442	0829	-0022	-0001	-2325	-0030	-0157

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~~CONFIDENTIAL~~

PRELIMINARY DATA

TEST	RUN	Rx10-6
106	122	03.4

~~CONFIDENTIAL~~

National Aeronautics and Space Administration
Ames Research Center
MOFFETT FIELD, CALIFORNIA

Facility
08 x07

POINT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3212	3402	160	001	-0142	0738	-0274	0889	-0038	-0005	-0002	-0371	0449	0202	-0447	0648	-0004	-0004	2004	0008	-0092
3213	3402	160	001	-0056	0618	-0103	0528	-0021	-0002	-0002	-0166	0474	0211	-0163	0605	-0002	-0003	0773	0004	-0090
3214	3402	160	001	-0108	0674	-0211	0815	-0036	-0002	-0003	-0314	0476	0272	-0334	0622	-0001	-0004	1587	0010	-0090
3215	3402	160	001	-0036	0622	-0058	0437	-0003	-0007	-0001	-0093	0485	-1862	-0096	0617	-0007	-0002	0467	-0006	-0090
3216	3403	160	001	-0026	0622	-0042	0393	-0007	-0009	-0002	-0068	0486	-0976	-0070	0620	-0009	-0002	0340	-0007	-0090
3217	3403	160		-0015	0624	-0024	0345	0019	-0017	-0001	-0038	0490	1214	-0040	0623	-0017	-0001	0198	-0022	-0089
3218	3403	160	001	-0005	0623	-0009	0326	-0006	-0013	-0003	-0015	0663	-1873	-0015	0623	-0013	-0003	0099	-0011	-0089
3219	3403	160		0005	0622	0013	0206	0037	-0021	-0001	0020	0685	0878	0018	0622	-0021	-0001	-0125	-0033	-0089
3220	3403	160		0015	0623	0029	0172	0027	-0012	-0002	0046	0537	0764	0045	0622	-0012	-0001	-0244	-0021	-0089
3221	3403	160		0026	0622	0046	0127	0014	-0013	-0003	0073	0511	1272	0074	0619	-0013	-0002	-0375	-0018	-0088
3222	3403	160		0046	0622	0082	0033	0027	-0022	-0004	0131	0493	1117	0131	0613	-0022	-0002	-0648	-0031	-0090
3223	3403	160	001	0077	0628	0155	-0172	0004	-0014	-0005	0247	0497	3773	0238	0602	-0014	-0003	-1183	-0015	-0090
3224	3403	160		0098	0660	0198	-0279	0027	-0017	-0005	0299	0493	0948	0307	0616	-0017	-0002	-1512	-0026	-0092
3225	3403	160		0118	0695	0241	-0328	0027	-0016	-0006	0347	0473	0948	0379	0630	-0017	-0002	-1792	-0026	-0092
3226	3403	160		0146	0753	0293	-0366	0037	-0023	-0008	0389	0452	0976	0473	0655	-0024	-0002	-2136	-0036	-0093

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APPENDIX A-25

~~CONFIDENTIAL~~

PRELIMINARY DATA

TEST	RUN	Re10⁻⁶
106	123	03.5

~~CONFIDENTIAL~~

National Aeronautics and Space Administration
Ames Research Center
MOFFETT FIELD, CALIFORNIA

Facility
08 x07

POINT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3227	2599	160		-0143	0825	-0225	0807	-0071	0007	-0005	-0273	0428	0421	-0421	0744	0008	-0004	1799	0030	-0160
3228	2599	160		-0107	0772	-0176	0822	-0044	0009	-0004	-0228	0472	0535	-0317	0725	0010	-0003	1495	0024	-0158
3229	2599	160		-0056	0729	-0098	0615	-0020	-0007	-0001	-0135	0491	-0002	-0169	0716	-0006	-0002	0828		-0153
3230	2599	160		-0035	0730	-0060	0477	-0014	-0005	-0001	-0082	0465	-0066	-0105	0725	-0005	-0001	0487	-0001	-0152
3231	2599	160		-0025	0731	-0044	0409	-0002	-0006		-0060	0432	-2781	-0075	0728	-0006		0324	-0005	-0152
3232	2599	160		-0014	0732	-0023	0330		-0007		-0032	0334		-0042	0731	-0007		0139	-0007	-0153
3233	2599	160		-0004	0733	-0005	0287	-0025	0005	-0002	-0006	-0051	0519	-0010	0733	0005	-0002	-0005	0013	-0154
3234	2599	160		0006	0735	0004	0329	-0005	0007	-0001	0005	0264	1822	0012	0735	0007	-0001	-0031	0009	-0154
3235	2599	160		0017	0732	0025	0265	0016	-0007		0034	0436	0767	0046	0731	-0007		-0202	-0013	-0153
3236	2599	160		0027	0731	0044	0192	0022	-0020	-0001	0060	0477	1224	0079	0728	-0020		-0374	-0026	-0152
3237	2599	160		0048	0729	0082	0045	0024	-0019	-0002	0112	0505	1114	0142	0719	-0020		-0717	-0027	-0152
3238	2599	160		0079	0741	0133	-0163	0071	-0037	-0003	0180	0519	0828	0233	0715	-0037	0002	-1209	-0059	-0154
3239	2599	160		0099	0759	0165	-0213	0056	-0028	-0004	0217	0494	0825	0293	0719	-0028	0001	-1448	-0046	-0157
3240	2599	160		0120	0783	0198	-0240	0050	-0034	-0006	0253	0470	1007	0357	0725	-0035	0001	-1678	-0051	-0158
3241	2599	160		0148	0835	0241	-0176	0023	-0031	-0008	0288	0427	1674	0445	0746	-0032		-1900	-0039	-0161

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APPENDIX A-26

~~CONFIDENTIAL~~

PRELIMINARY DATA

TEST	RUN	Rx10-6
106	124	03.8

~~CONFIDENTIAL~~

National Aeronautics and Space Administration
Ames Research Center
MOFFETT FIELD, CALIFORNIA

Facility
08 x07

POINT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3242	2997	160		-0143	0777	-0255	0841	-0042	-0011	-0001	-0328	0436	0074	-0438	0690	-0010	-0004	1910	0003	-0124
3243	2997	160		-0108	0714	-0197	0814	-0044	0001	-0003	-0276	0473	0354	-0327	0665	0002	-0003	1545	0016	-0124
3244	2997	160		-0056	0671	-0098	0581	-0073	0024	-0007	-0146	0493	0651	-0162	0658	0025	-0004	0801	0048	-0120
3245	2997	160		-0035	0671	-0062	0465	-0043	-0001	-0004	-0092	0481	0300	-0103	0666	-0001	-0004	0495	0013	-0118
3246	2997	160		-0025	0672	-0044	0389	-0033	-0004	-0003	-0066	0442	0189	-0073	0669	-0004	-0003	0324	0006	-0118
3247	2997	160		-0014	0674	-0025	0325	-0007	-0009	-0001	-0037	0383	-0905	-0042	0673	-0009	-0002	0161	-0007	-0118
3248	2997	160		-0004	0674	-0008	0292	-0008	-0009	-0002	-0012	0281	-0727	-0013	0674	-0009	-0002	0036	-0006	-0117
3249	2997	160		0006	0674	0005	0287	-0004	-0008	-0002	0007	0396	-1628	0012	0674	-0008	-0002	-0047	-0006	-0116
3250	2997	160		0017	0674	0022	0250	-0004	-0011	-0002	0032	0426	-2498	0041	0673	-0011	-0002	-0176	-0010	-0117
3251	2997	160		0027	0672	0040	0188	0025	-0018	-0002	0059	0463	1025	0071	0670	-0018	-0001	-0331	-0026	-0117
3252	2997	160		0048	0671	0077	0047	0044	-0021	-0002	0114	0498	0802	0132	0662	-0021		-0658	-0035	-0118
3253	2997	160		0079	0675	0139	-0124	0044	-0029	-0005	0206	0492	0997	0230	0650	-0030		-1133	-0043	-0120
3254	2997	160		0099	0701	0176	-0195	0033	-0019	-0004	0251	0478	0903	0294	0660	-0019		-1407	-0030	-0122
3255	2997	160		0120	0733	0218	-0250	0019	-0024	-0006	0297	0463	1584	0365	0671	-0025	-0001	-1691	-0031	-0124
3256	2997	160		0148	0788	0269	-0260	0014	-0020	-0008	0342	0436	1812	0461	0693	-0021	-0002	-2011	-0025	-0125

SID 62 936
APPENDIX A-27

~~CONFIDENTIAL~~

PRELIMINARY DATA

TEST	RUN	Rx10⁻⁶
106	125	03.5

~~CONFIDENTIAL~~

National Aeronautics and Space Administration
Ames Research Center
MOFFETT FIELD, CALIFORNIA

Facility
08 x07

POINT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3260	3402	100	001	-0143	0754	-0236	0623	-0157	-0024	-0003	-0313	0392	0172	-0415	0673	-0022	-0009	1627	0027	-0089
3261	3402	100	001	-0108	0689	-0193	0926	-0092	0004	-0006	-0281	0515	0371	-0319	0641	0005	-0005	1642	0034	-0090
3262	3402	100	001	-0056	0596	-0143	0868	-0040	-0015	-0001	-0239	0619	-0058	-0201	0579	-0015	-0003	1242	-0002	-0092
3263	3402	100	001	-0036	0571	-0110	0761	-0032	-0016	-0002	-0192	0667	-0194	-0145	0563	-0016	-0003	0968	-0006	-0094
3264	3402	100	001	-0026	0561	-0087	0663	-0005	-0022	-0001	-0154	0688	-3827	-0112	0557	-0022	-0002	0769	-0020	-0094
3265	3402	100	001	-0015	0556	-0054	0514	0018	-0028		-0098	0703	1895	-0069	0554	-0028	-0001	0487	-0034	-0094
3266	3402	100	001	-0005	0550	-0012	0304	0004	-0022	-0001	-0022	0682	5577	-0017	0550	-0022	-0001	0115	-0024	-0094
3267	3402	100	001	0005	0551	0032	0072	0001	-0018	-0002	0058	0771		0037	0551	-0018	-0002	-0287	-0019	-0094
3268	3402	100	001	0016	0552	0071	-0104	0014	-0027	-0002	0129	0716	2213	0086	0550	-0027	-0001	-0616	-0031	-0094
3269	3402	100	001	0026	0558	0095	-0217	-0003	-0028	-0003	0170	0697	-9381	0120	0553	-0028	-0002	-0836	-0027	-0094
3270	3402	100	001	0046	0578	0136	-0395	-0005	-0003	-0002	0236	0665	-0190	0183	0565	-0003	-0002	-1216	-0001	-0094
3271	3402	100	001	0077	0632	0167	-0382	0014	-0016	-0003	0264	0573	1448	0250	0604	-0016	-0001	-1432	-0021	-0092
3272	3402	100	001	0098	0661	0180	-0054	0040	-0034	-0006	0271	0427	1170	0289	0621	-0034		-1234	-0047	-0092
3273	3402	100	001	0118	0707	0210	-0090	0017	-0023	-0006	0296	0421	1781	0350	0649	-0024	-0001	-1473	-0029	-0089
3274	3402	100	001	0146	0771	0257	-0092	-0050	-0052	-0018	0333	0402	-0771	0442	0682	-0055	-0005	-1779	-0039	-0089

SID 62 936
APPENDIX A-28

~~CONFIDENTIAL~~

PRELIMINARY DATA

TEST	RUN	Rx10-6
106	126	03.8

~~CONFIDENTIAL~~

National Aeronautics and Space Administration
Ames Research Center
MOFFETT FIELD, CALIFORNIA

Facility
08 x07

POINT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3275	2998	100		-0142	0797	-0231	0639	-0032	-0015	0002	-0290	0391	-0169	-0420	0716	-0016	-0002	1641	-0005	-0117
3276	2998	100		-0107	0738	-0188	0922	-0088	0011	-0007	-0255	0505	0455	-0322	0690	0012	-0005	1628	0040	-0117
3277	2998	100		-0107	0737	-0188	0922	-0088	0007	-0006	-0254	0506	0404	-0322	0690	0008	-0005	1628	0035	-0120
3278	2998	100		-0056	0647	-0130	0842	-0046	-0011	-0002	-0201	0607	0074	-0192	0631	-0011	-0003	1167	0003	-0121
3279	2998	100		-0035	0611	-0111	0823	-0042	-0012	-0002	-0181	0691	0022	-0148	0603	-0012	-0003	1022	0001	-0124
3280	2998	100		-0025	0601	-0093	0731	-0042	-0007	-0003	-0155	0706	0156	-0119	0597	-0007	-0003	0842	0007	-0124
3281	2998	100		-0015	0592	-0053	0512	-0061	-0003	-0004	-0089	0685	0261	-0068	0591	-0003	-0004	0465	0016	-0124
3282	2998	100		-0004	0590	-0019	0341	-0043	-0008	-0003	-0031	0673	0125	-0023	0590	-0008	-0003	0154	0005	-0123
3283	2998	100		0006	0590	0019	0157	-0022	-0007	-0002	0032	0722	-0025	0025	0590	-0007	-0002	-0181	-0001	-0123
3284	2998	100		0017	0592	0054	-0011	-0009	-0020	-0002	0091	0693	-1918	0071	0590	-0020	-0002	-0494	-0017	-0123
3285	2998	100		0027	0599	0093	-0225	-0006	-0015	-0002	0155	0715	-2310	0121	0594	-0016	-0001	-0866	-0014	-0124
3286	2998	100		0048	0624	0127	-0358	0017	-0038	-0004	0203	0665	2620	0178	0612	-0038	-0001	-1186	-0044	-0124
3287	2998	100		0079	0682	0145	-0249	0007	-0018	-0004	0212	0540	3104	0237	0656	-0018	-0002	-1279	-0020	-0121
3288	2998	100		0099	0721	0180	-0324	0005	-0041	-0009	0249	0520	8650	0301	0679	-0042	-0002	-1567	-0043	-0120
3289	2998	100		0120	0757	0202	-0315	0014	-0024	-0006	0266	0489	2150	0355	0698	-0025	-0001	-1734	-0029	-0120
3290	2998	100		0148	0810	0247	-0049	-0060	-0037	-0013	0305	0396	-0342	0446	0720	-0039	-0004	-1762	-0020	-0119

SID 62 936
APPENDIX A-29

~~CONFIDENTIAL~~

PRELIMINARY DATA

TEST	RUN	R×10⁻⁶
106	127	03.6

~~CONFIDENTIAL~~

National Aeronautics and Space Administration
Ames Research Center
MOFFETT FIELD, CALIFORNIA

Facility
08 x07

POINT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3291	2599	100		-0142	0865	-0202	0747	-0069	0002	-0004	-0233	0411	0363	-0408	0789	0003	-0004	1679	0025	-0154
3292	2599	100		-0107	0799	-0176	0933	-0083	0003	-0006	-0221	0500	0356	-0322	0752	0003	-0005	1612	0029	-0156
3293	2599	100		-0056	0705	-0131	0922	-0011	-0037	0002	-0185	0625	-3159	-0199	0689	-0037	-0002	1242	-0033	-0161
3294	2599	100		-0035	0669	-0110	0880	-0017	-0021	-0001	-0164	0704	-0947	-0151	0661	-0021	-0002	1062	-0016	-0162
3295	2599	100		-0025	0649	-0096	0803	0017	-0020		-0148	0730	1479	-0125	0645	-0020		0910	-0026	-0162
3296	2599	100		-0015	0625	-0058	0581	0004	-0019	-0001	-0093	0727	4728	-0074	0623	-0019	-0001	0539	-0020	-0161
3297	2599	100		-0004	0619	-0020	0366	0038	-0040		-0032	0697	1363	-0024	0619	-0040		0171	-0051	-0157
3298	2599	100		0006	0619	0015	0189	0053	-0053		0024	0692	1321	0022	0619	-0053	0001	-0151	-0070	-0156
3299	2599	100		0017	0622	0052	-0018	0023	-0026	-0002	0084	0727	1482	0070	0621	-0026	-0001	-0512	-0033	-0157
3300	2599	100		0027	0647	0093	-0244	0033	-0029	-0002	0144	0740	1198	0123	0642	-0029		-0913	-0039	-0160
3301	2599	100		0048	0684	0123	-0360	0029	-0047	-0005	0180	0678	1945	0180	0671	-0047	-0001	-1218	-0056	-0161
3302	2599	100		0079	0746	0139	-0248	0024	-0020	-0004	0186	0549	1160	0240	0720	-0021	-0001	-1317	-0028	-0158
3303	2599	100		0099	0783	0165	-0273	0027	-0027	-0006	0210	0515	1345	0297	0743	-0027	-0001	-1533	-0036	-0156
3304	2599	100		0120	0816	0187	-0269	0037	-0031	-0007	0229	0485	1182	0352	0759	-0032	-0001	-1708	-0044	-0157
3305	2599	100		0147	0880	0213	-0072	0028	-0035	-0010	0242	0412	1596	0430	0797	-0036	-0001	-1771	-0045	-0156

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APPENDIX A-30

~~CONFIDENTIAL~~

PRELIMINARY DATA

TEST	RUN	Rx10-6
106	128	03.5

~~CONFIDENTIAL~~

National Aeronautics and Space Administration
Ames Research Center
MOFFETT FIELD, CALIFORNIA

Facility
08 x07

POINT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3309	3402	194	001	0658	0890	-0211	0130	-0040	-0025	0005	-0237	0711	0532	0725	0558	-0006	0025	-5157	0021	-0049
3310	3402	194	001	0692	0858	-0242	0103	-0027	-0025	0002	-0282	0713	0437	0717	0531	-0007	0024	-5107	0012	-0054
3311	3402	194	001	0742	0805	-0273	0077	-0019	-0025	0001	-0339	0713	0359	0701	0481	-0006	0025	-4997	0007	-0059
3312	3402	194	001	0793	0745	-0290	0053	-0031	-0019	-0006	-0390	0713	0380	0678	0424	-0009	0018	-4829	0012	-0067
3313	3402	194	001	0843	0683	-0285	0051	-0026	-0015	-0010	-0417	0707	0262	0652	0350	-0011	0014	-4610	0007	-0072
3314	3402	194	001	0894	0621	-0260	0067	-0013	-0016	-0010	-0418	0698	-0095	0618	0266	-0010	0016	-4314	-0001	-0074
3315	3402	194	001	0942	0567	-0214	0098	0004	-0018	-0009	-0378	0684	2491	0581	0173	-0007	0019	-3977	-0010	-0077

SID 62 936
APPENDIX A-31

~~CONFIDENTIAL~~

PRELIMINARY DATA

TEST	RUN	Rx10-6
106	129	03.9

~~CONFIDENTIAL~~

National Aeronautics and Space Administration
Ames Research Center
MOFFETT FIELD, CALIFORNIA

Facility
08 x07

POINT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3317	2997	194		0658	0909	-0218	0135	-0042	-0024	0005	-0239	0711	0560	0740	0571	-0005	0024	-5257	0023	-0068
3318	2997	194		0692	0878	-0247	0112	-0034	-0027	0002	-0282	0712	0470	0732	0543	-0007	0026	-5215	0016	-0085
3319	2997	194		0742	0822	-0280	0085	-0028	-0025	0001	-0340	0712	0478	0715	0493	-0006	0025	-5094	0013	-0094
3320	2997	194		0793	0763	-0295	0070	-0014	-0025	-0002	-0387	0710	0185	0695	0432	-0007	0024	-4932	0003	-0095
3321	2997	194		0844	0701	-0288	0061	-0009	-0020	-0005	-0410	0706	-0179	0669	0355	-0007	0019	-4723	-0002	-0099
3322	2997	194		0895	0639	-0260	0075	-0006	-0015	-0008	-0407	0696	-0629	0637	0266	-0008	0015	-4436	-0004	-0103
3323	2997	194		0942	0587	-0213	0109	-0002	-0017	-0008	-0362	0682	-2309	0601	0169	-0007	0018	-4100	-0005	-0105

SID 62 936
APPENDIX A-32

~~CONFIDENTIAL~~

PRELIMINARY DATA

TEST	RUN	Rx10-6
106	130	03.6

~~CONFIDENTIAL~~

National Aeronautics and Space Administration
Ames Research Center
MOFFETT FIELD, CALIFORNIA

Facility
08 x07

POINT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3324	2597	194		0658	0934	-0227	0142	-0030	-0025	0004	-0243	0711	0451	0758	0590	-0007	0025	-5390	0014	-0091
3325	2597	194		0692	0902	-0259	0118	-0039	-0030	0003	-0287	0712	0487	0751	0563	-0008	0029	-5347	0019	-0122
3326	2597	194		0742	0845	-0290	0089	-0015	-0032	0001	-0343	0712	0142	0734	0509	-0008	0031	-5231	0002	-0131
3327	2597	194		0793	0783	-0300	0084	-0009	-0028	-0004	-0384	0708	-0315	0714	0441	-0009	0027	-5053	-0003	-0129
3328	2597	194		0844	0723	-0290	0077	-0004	-0027	-0007	-0401	0703	-1845	0691	0359	-0010	0026	-4858	-0007	-0133
3329	2597	194		0895	0665	-0258	0085	0016	-0032	-0007	-0388	0694	1149	0662	0264	-0008	0032	-4597	-0019	-0138
3330	2597	194		0943	0612	-0208	0119	-0008	-0017	-0011	-0340	0680	-0522	0626	0162	-0010	0018	-4253	-0004	-0139

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APPENDIX A-33

~~CONFIDENTIAL~~

PRELIMINARY DATA

TEST	RUN	Rx10-6
106	131	03.4

~~CONFIDENTIAL~~

National Aeronautics and Space Administration
Ames Research Center
MOFFETT FIELD, CALIFORNIA

Facility
08 x07

POINT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3333	3402	164	001	0749	1283	-0178	4032	-0054	0007	0001	-0139	-0006	0368	1192	0507	0003	-0006	0073	0020	-0047
3334	3402	164	001	0800	1253	-0212	4259	-0044	0005	-0008	-0170	-0027	0162	1197	0428	-0007	-0007	0319	0007	-0060
3335	3402	164	001	0851	1212	-0224	4450	-0041	0009	-0008	-0185	-0049	0148	1188	0328	-0007	-0009	0582	0006	-0059
3336	3402	164	001	0902	1164	-0214	4543	-0061	0009		-0184	-0069	0310	1165	0211		-0009	0798	0019	-0065
3337	3402	164	001	0922	1142	-0207	4563	-0064	0010	-0009	-0181	-0077	0174	1149	0162	-0009	-0009	0890	0011	-0064

SID 62 936
APPENDIX A-34

~~CONFIDENTIAL~~

PRELIMINARY DATA

TEST	RUN	Rx10-6
106	132	03.8

~~CONFIDENTIAL~~

National Aeronautics and Space Administration
Ames Research Center
MOFFETT FIELD, CALIFORNIA

Facility
08 x 07

POINT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3338	2997	164		0751	1303	-0180	4171	-0082	0010	0007	-0138	-0012	0424	1213	0509	0009	-0008	0145	0035	-0063
3339	2997	164		0802	1275	-0212	4384	-0095	0008	-0001	-0166	-0030	0319	1220	0426	0001	-0008	0371	0030	-0082
3340	2997	164		0853	1233	-0225	4549	-0100	0010	0010	-0183	-0050	0421	1211	0325	0011	-0009	0611	0042	-0089
3341	2997	164		0905	1186	-0213	4639	-0079	0011	-0004	-0180	-0070	0266	1188	0204	-0004	-0011	0826	0021	-0089
3342	2997	164		0925	1166	-0205	4660	-0081	0011	-0015	-0176	-0078	0125	1174	0154	-0015	-0010	0914	0010	-0092

SID 62 936
APPENDIX A-35

~~CONFIDENTIAL~~

PRELIMINARY DATA

TEST	RUN	Rx10-6
106	133	03.5

~~CONFIDENTIAL~~

National Aeronautics and Space Administration
Ames Research Center
MOFFETT FIELD, CALIFORNIA

Facility
08 x07

POINT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3343	2599	164		0751	1322	-0179	4236	-0080	0007	0003	-0135	-0012	0372	1231	0513	0005	-0006	0150	0030	-0089
3344	2599	164		0802	1292	-0205	4477	-0111	0012	0003	-0159	-0033	0356	1239	0422	0005	-0011	0408	0040	-0097
3345	2599	164		0853	1252	-0220	4611	-0101	0011	0005	-0176	-0050	0376	1230	0321	0006	-0010	0614	0038	-0114
3346	2599	164		0905	1210	-0213	4700	-0074	0010	-0016	-0176	-0067	0091	1212	0203	-0016	-0010	0812	0007	-0117
3347	2599	164		0925	1190	-0203	4712	-0079	0012	-0022	-0171	-0074	0029	1198	0151	-0022	-0011	0890	0002	-0118

SID 62 936
APPENDIX A-36

~~CONFIDENTIAL~~

PRELIMINARY DATA

TEST	RUN	Rx10-6
106	134	03.4

~~CONFIDENTIAL~~

National Aeronautics and Space Administration
Ames Research Center
MOFFETT FIELD, CALIFORNIA

Facility
08 x07

POINT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3351	3402	197	001	1348	0774	0468	0209	0009	-0019	-0001	0604	0334	-0722	0219	-0877	0013	0015	-0732	0007	-0094
3352	3402	197	001	1379	0837	0490	0149	0019	-0023		0585	0307	-0241	0198	-0950	0017	0016	-0608	0005	-0094
3353	3402	197	001	1399	0882	0500	0110	0012	-0023		0567	0289	-0825	0185	-0997	0017	0015	-0536	0010	-0094
3354	3402	197	001	1420	0927	0507	0061	0025	-0023	-0003	0548	0271	0014	0171	-1042	0016	0017	-0465		-0094
3355	3402	197	001	1440	0972	0510	0020	0018	-0024	-0003	0525	0248	-0349	0158	-1086	0018	0016	-0394	0006	-0092
3356	3402	197	001	1460	1015	0510	-0028	0024	-0027	-0004	0502	0225	-0140	0144	-1126	0020	0019	-0324	0003	-0092
3357	3402	197	001	1480	1062	0505	-0078	0027	-0028	-0005	0475	0209	-0114	0134	-1168	0021	0019	-0280	0003	-0090
3358	3402	197	001	1501	1105	0497	-0128	0040	-0031	-0006	0450	0181	0065	0120	-1206	0024	0020	-0219	-0003	-0089
3359	3402	197	001	1521	1149	0486	-0179	0033	-0032	-0008	0423	0152	-0068	0108	-1243	0025	0022	-0164	0002	-0089
3360	3402	197	001	1548	1203	0466	-0247	0033	-0032	-0009	0387	0104	-0086	0091	-1287	0025	0022	-0095	0003	-0090

SID 62 936
APPENDIX A-37

~~CONFIDENTIAL~~

PRELIMINARY DATA

TEST	RUN	Rx10-6
106	135	03.5

~~CONFIDENTIAL~~

National Aeronautics and Space Administration
Ames Research Center
MOFFETT FIELD, CALIFORNIA

Facility
08 x07

POINT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3361	2599	197		1350	0833	0476	0206	0031	-0020	-0002	0571	0366	0250	0252	-0925	0013	0016	-0922	-0008	-0170
3362	2599	197		1381	0896	0499	0147	0036	-0023	-0003	0557	0340	0249	0227	-1001	0015	0017	-0772	-0009	-0169
3363	2599	197		1402	0939	0511	0105	0033	-0023	-0003	0545	0319	0200	0209	-1048	0015	0017	-0665	-0007	-0167
3364	2599	197		1422	0982	0520	0058	0030	-0025	-0006	0529	0297	0145	0191	-1094	0016	0020	-0568	-0004	-0165
3365	2599	197		1442	1027	0523	0013	0038	-0024	-0007	0509	0275	0258	0175	-1139	0015	0019	-0483	-0010	-0163
3366	2599	197		1463	1070	0523	-0038	0040	-0029	-0005	0489	0251	0146	0159	-1180	0021	0020	-0397	-0006	-0162
3367	2599	197		1483	1115	0520	-0092	0043	-0028	-0006	0466	0227	0178	0143	-1222	0021	0020	-0326	-0008	-0161
3368	2599	197		1504	1158	0512	-0146	0043	-0028	-0007	0442	0200	0169	0128	-1260	0021	0021	-0256	-0007	-0161
3369	2599	197		1524	1199	0501	-0201	0048	-0029	-0009	0418	0162	0217	0112	-1295	0021	0022	-0182	-0010	-0162
3370	2599	197		1551	1253	0481	-0272	0050	-0031	-0011	0384	0106	0193	0092	-1339	0024	0023	-0098	-0010	-0161

SID 62 936
APPENDIX A-38

~~CONFIDENTIAL~~

PRELIMINARY DATA

APPENDIX "B" 8 x 7 FT. TUNNEL TEST NO. 106

PLOTTED DATA

INDEX OF FIGURES

	Figure
A. Command Module Characteristics CD, CL, Cmcg, L/D, CA, CN, C_{mA}, Xcp/D vs. α	
1. Configuration: C15	
M = 2.6	1a - h
M = 3.0	2a - h
M = 3.4	3a - h
B. Launch Escape System Characteristics CD, CL, Cmcg, CA, CN, C_{mA}, Xcp/D vs.	
1. Configuration: E20T9C2	
M = 2.6	4a - g
M = 3.0	5a - g
M = 3.4	6a - g
2. Configuration: E20T9C15	
M = 2.6	7a - g
M = 3.0	8a - g
M = 3.4	9a - g
3. Configuration: E23T9C2	
M = 2.6	10a - g
M = 3.0	11a - g
M = 3.4	12a - g
4. Configuration: E35T9C2	
M = 2.6	13a - g
M = 3.0	14a - g
M = 3.4	15a - g

FORM M-113-N2- (REV. 3-61)

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION [redacted]	PAGE NO. B-3 OF
CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO - FS-2 MODEL NO. SCALE .105

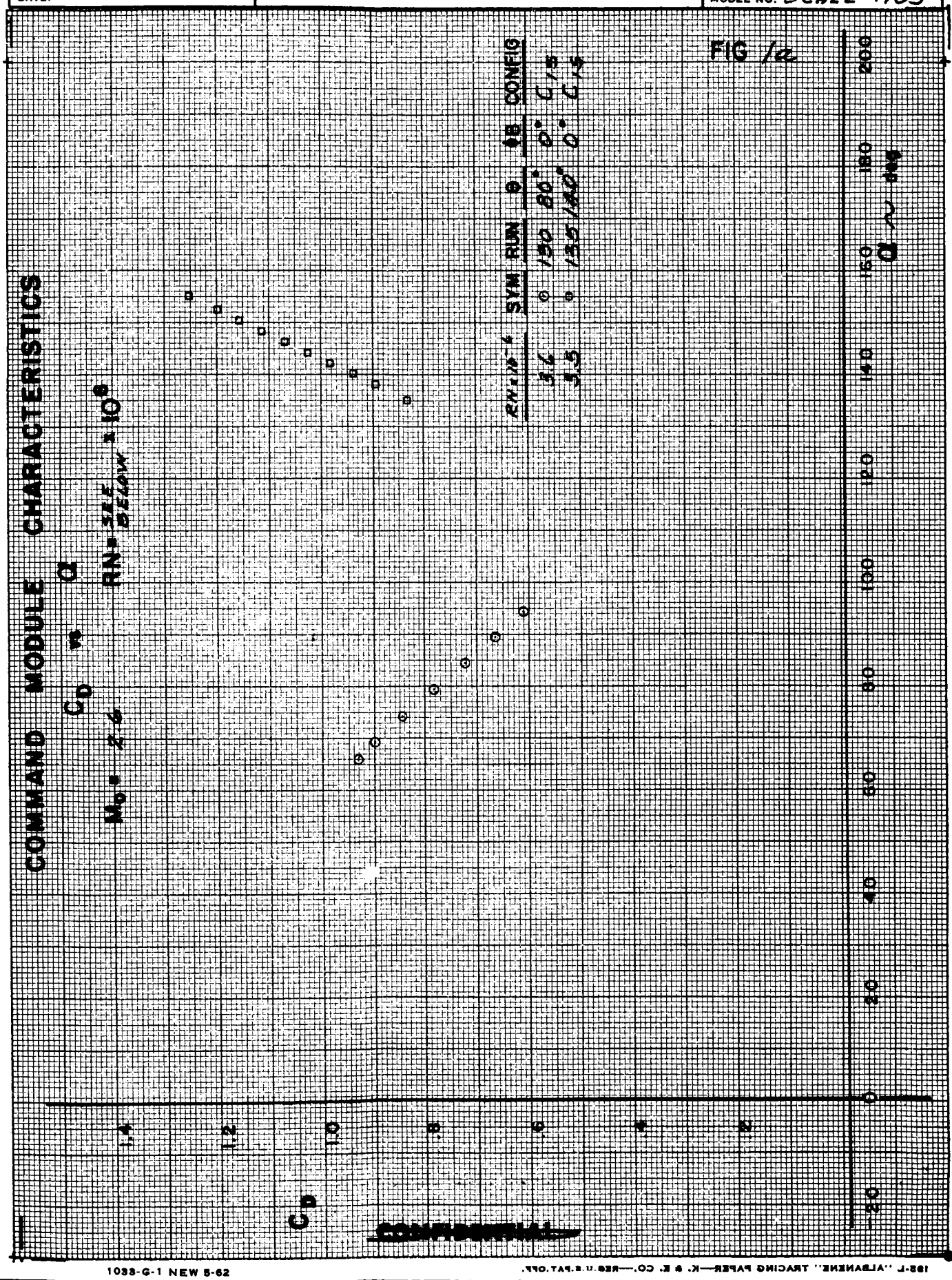

FIG 16

C_D vs α

[redacted]

FORM M-113-N2- (REV. 3-61)

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION ~~CONFIDENTIAL~~	PAGE NO. B-4 OF
CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES-106	APOLLO - FS-2 MODEL NO. SCALE .105

FIG 16

~~CONFIDENTIAL~~

1033-G NEW 5-62

108-J "ALBANENE" TRACING PAPER—K. & E. CO.,—REG.U.S.PAT.OFF.

FORM M-113-N2- (REV. 3-61)

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION ~~CONFIDENTIAL~~	PAGE NO. B-5 OF
CHECKED BY: JK K		REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO - FS-2 MODEL NO. SCALE .105

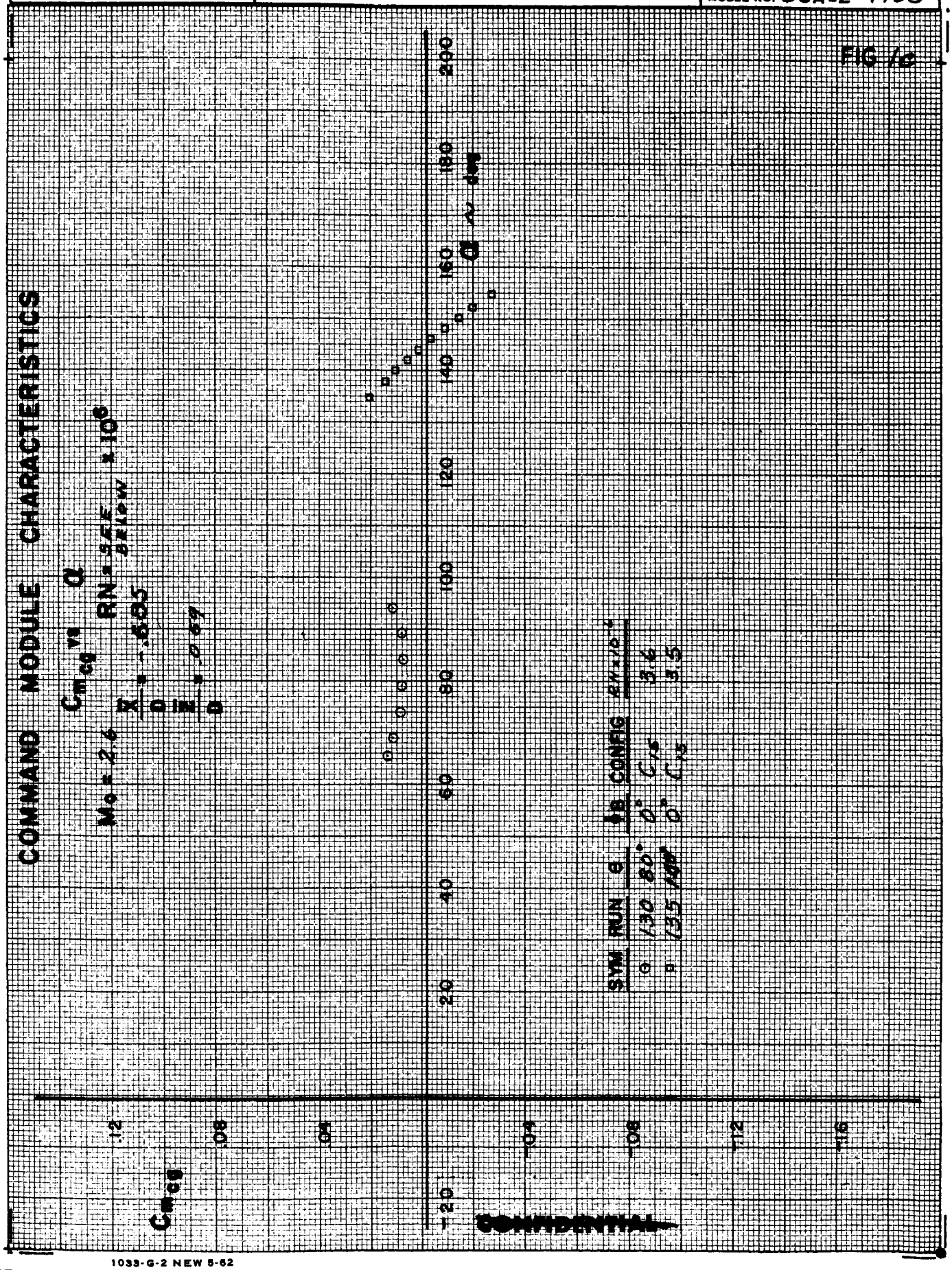

FIG 16

$C_{m_{cg}}$ vs α

PREPARED BY:

CHECKED BY: JKK

DATE:

NORTH AMERICAN AVIATION, INC.
SPACE and INFORMATION SYSTEMS DIVISION

CONFIDENTIAL

AMES - 106

PAGE NO. B-6 OF

REPORT NO. S/D-62-936

MODEL NO. SCALE .105

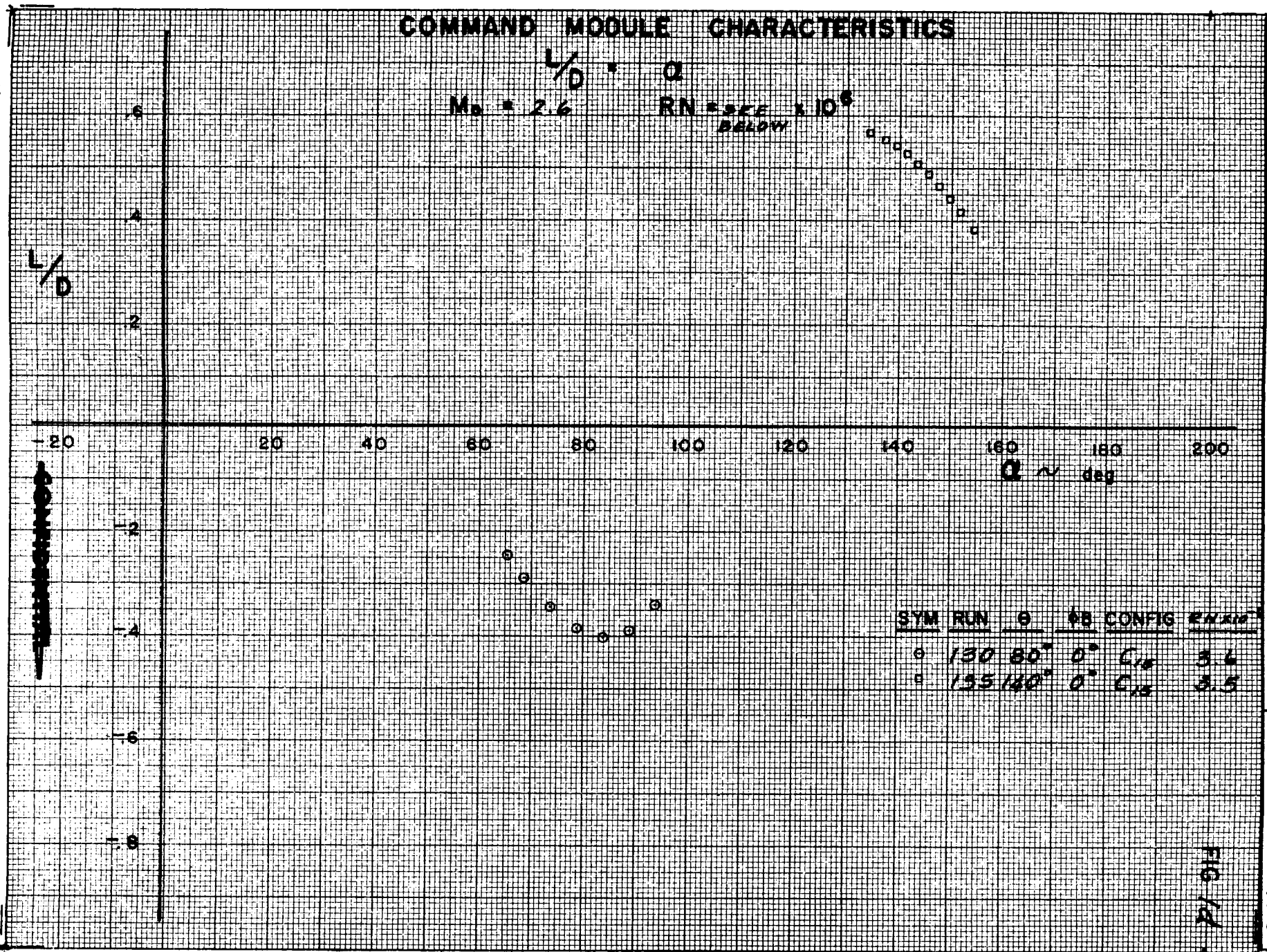

FIG 2

L/D vs α

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FORM M-113-N2- (REV. 3-61)

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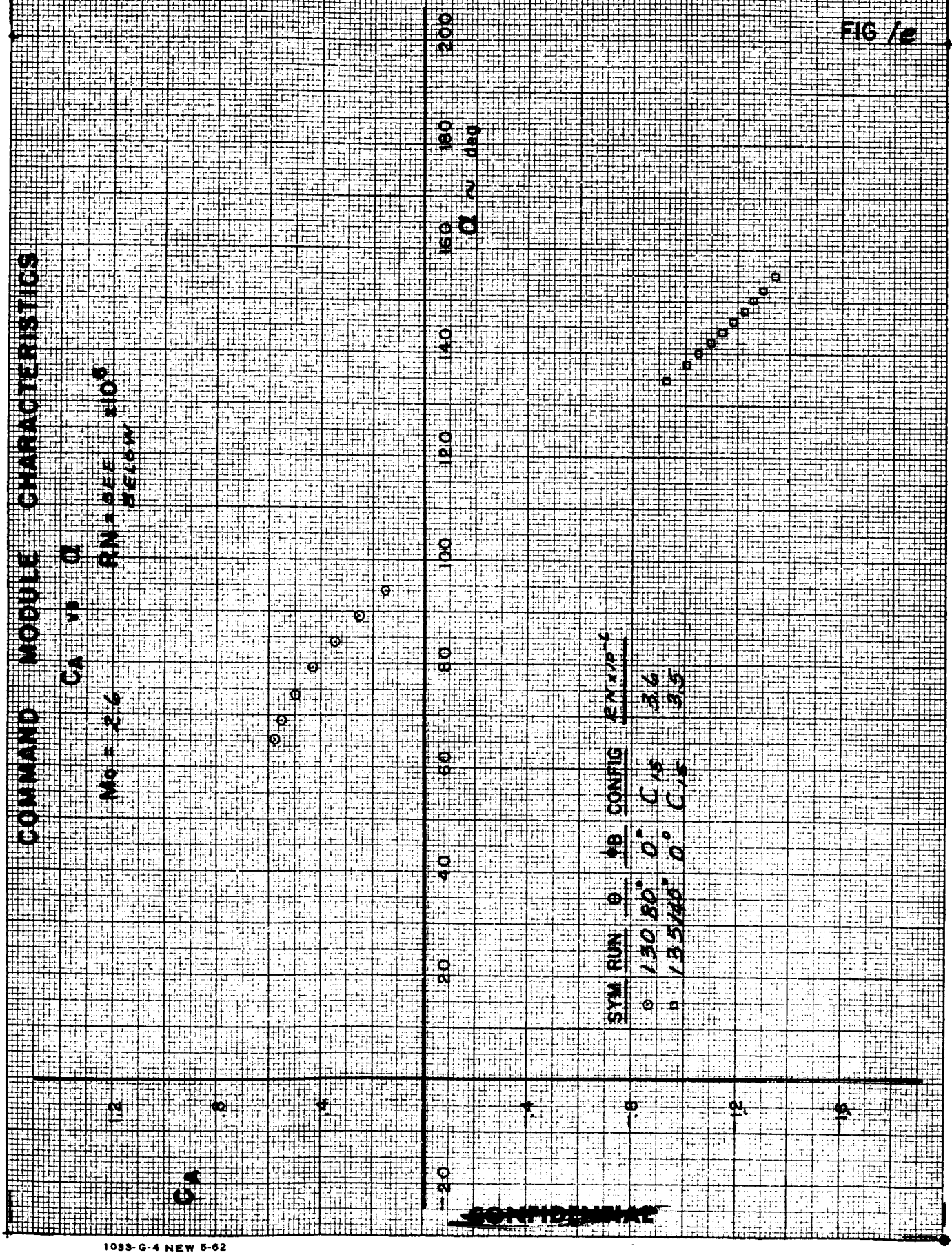
CHECKED BY: JK K	CONFIDENTIAL	REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO - FS-2 MODEL NO. SCALE .105

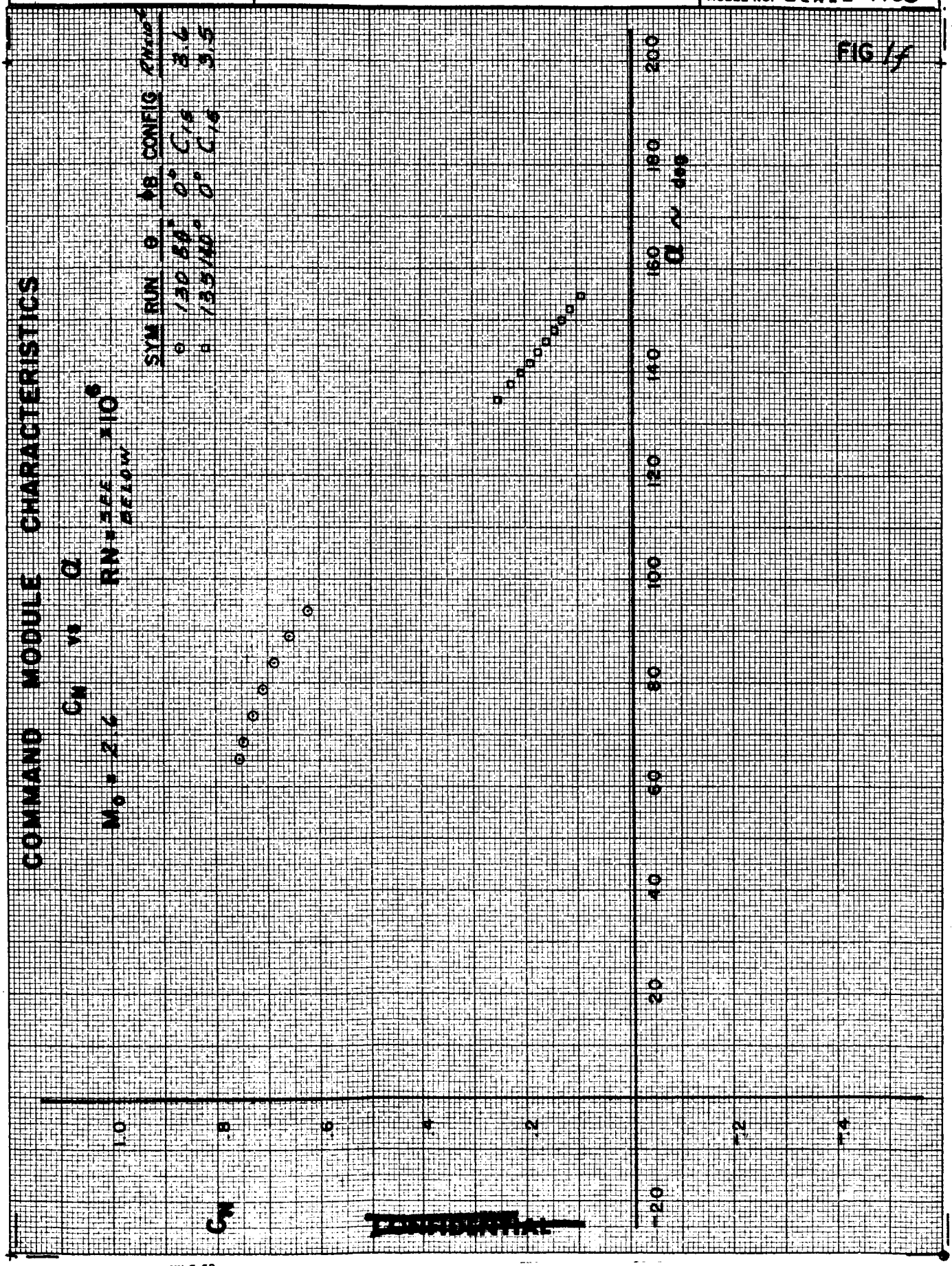
FIG 1e



C_A vs α

FORM M-113-N2- (REV. 3-61)

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION [redacted]	PAGE NO. B-8 OF
CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES - 106	MODEL NO. APOLLO - FS-2 SCALE .105



1033-G-5 NEW 5-62

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION ~~CONFIDENTIAL~~	PAGE NO. B-9 OF
CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO - FS-2 MODEL NO. SCALE .105

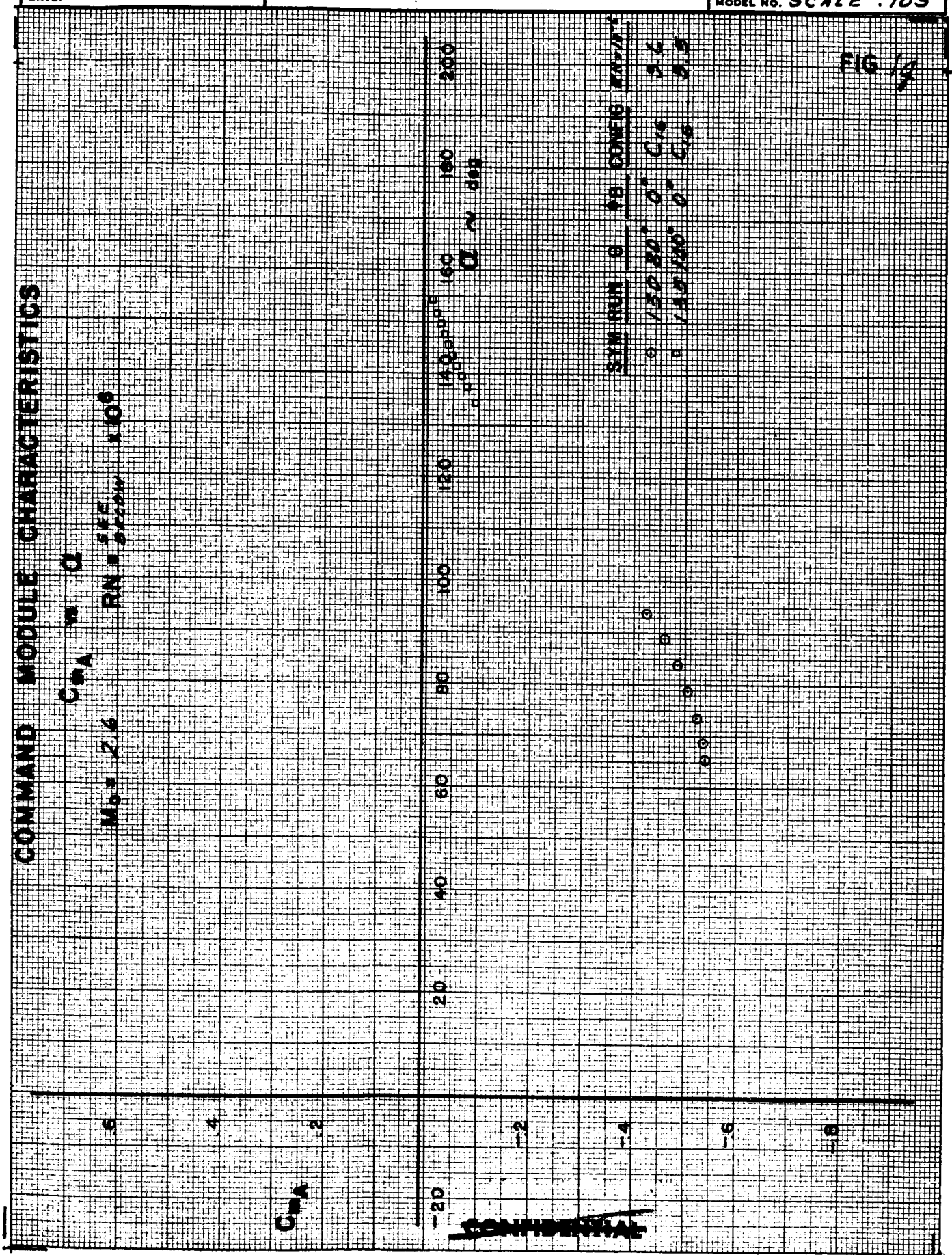


FIG 14

C_{m_A} vs α

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FORM M-113-N2- (REV. 3-61)

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CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO - FS-2 MODEL NO. SCALE .105

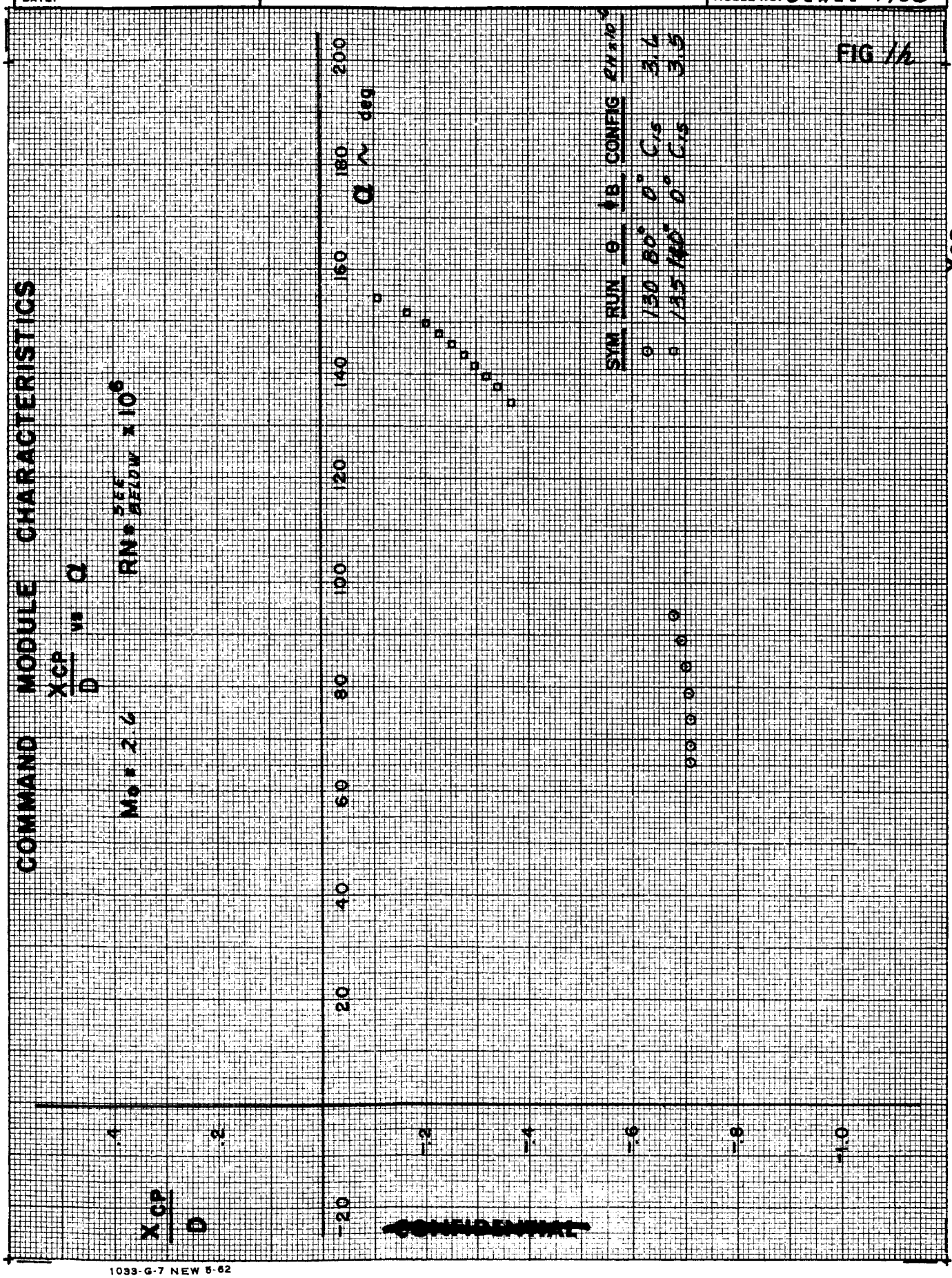

FIG 16

$\frac{X_{CP}}{D}$ vs α

1033-G-7 NEW 5-62

FORM M-113-N2- (REV. 3-61)

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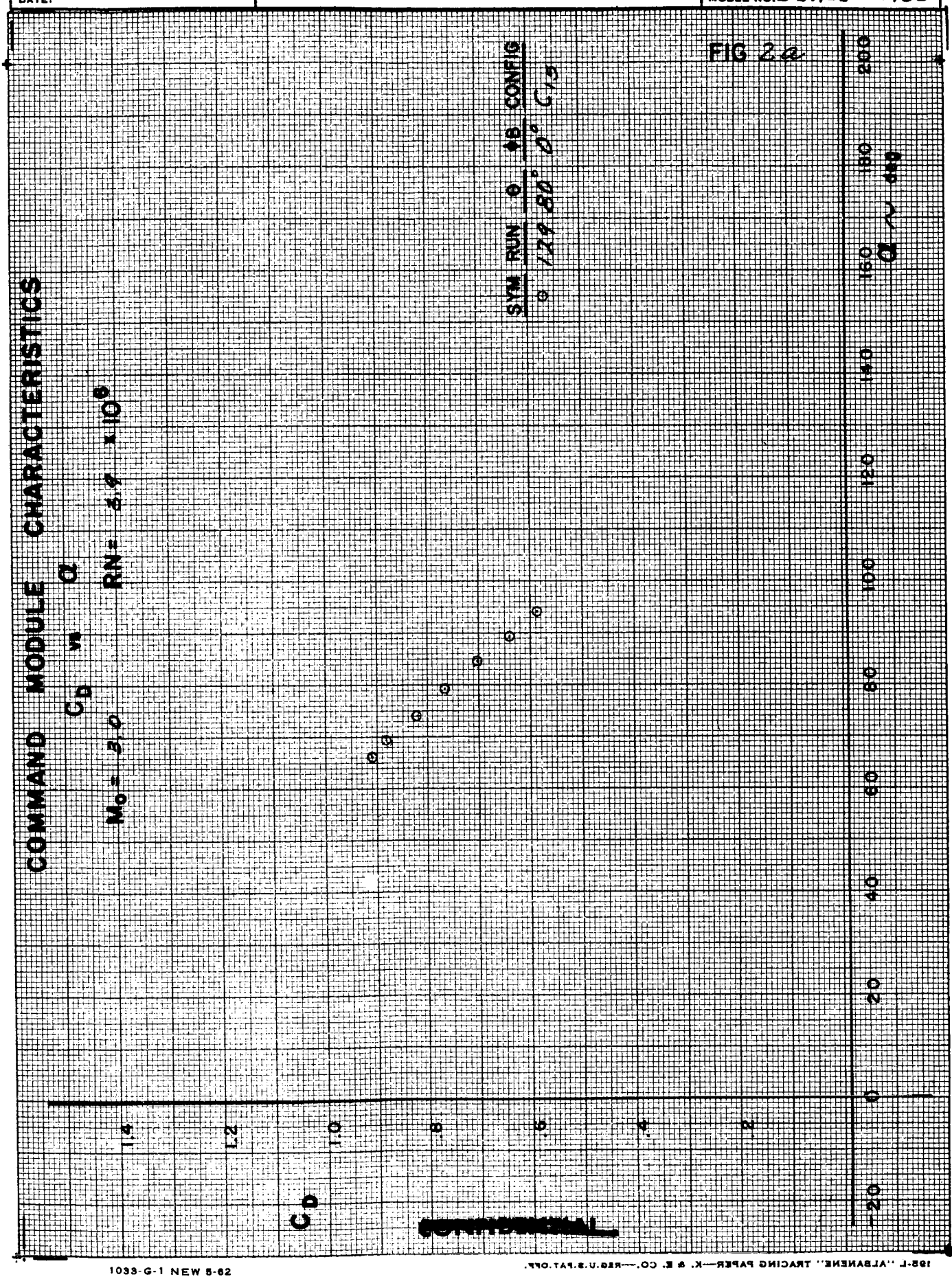
CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES - 106	MODEL NO. APOLLO-FS-2 SCALE - .105



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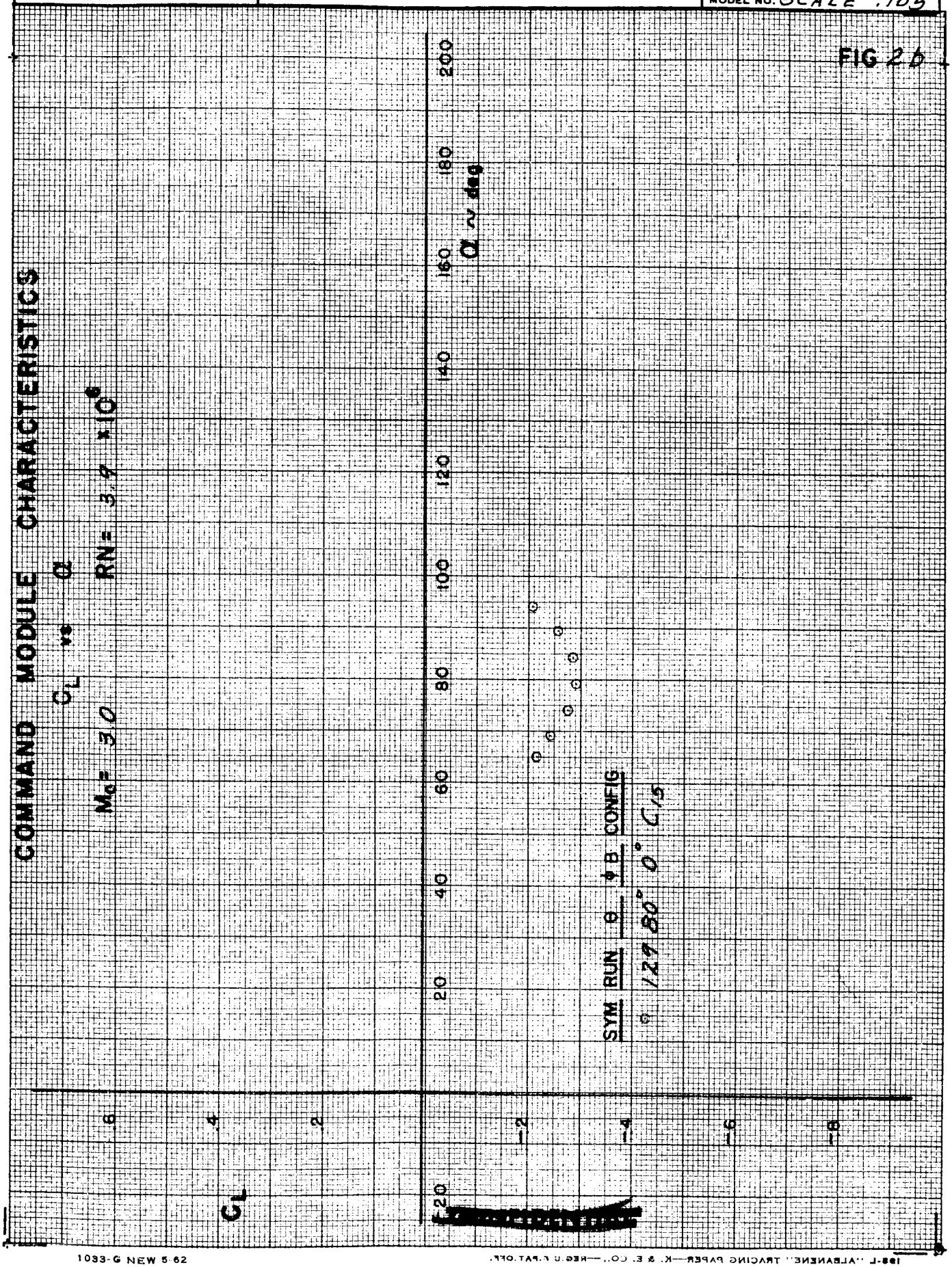
1033-G-1 NEW 5-62

195-L "ALBANENE" TRACING PAPER—K. & E. CO.—REG.U.S.PAT.OFF.

FORM M-113-N2- (REV. 3-61)

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION	PAGE NO. B-12 OF
CHECKED BY: JKK	[redacted]	REPORT NO. SID-62-936
DATE:	AMES-106	MODEL NO. APOLLO-FS-2 SCALE .105

FIG 26



C_L vs α

FORM M-113-N2- (REV. 3-61)

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION	PAGE NO. B-13 OF
CHECKED BY: JKK	CONFIDENTIAL	REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO-FS-2 MODEL NO. SCALE - .105

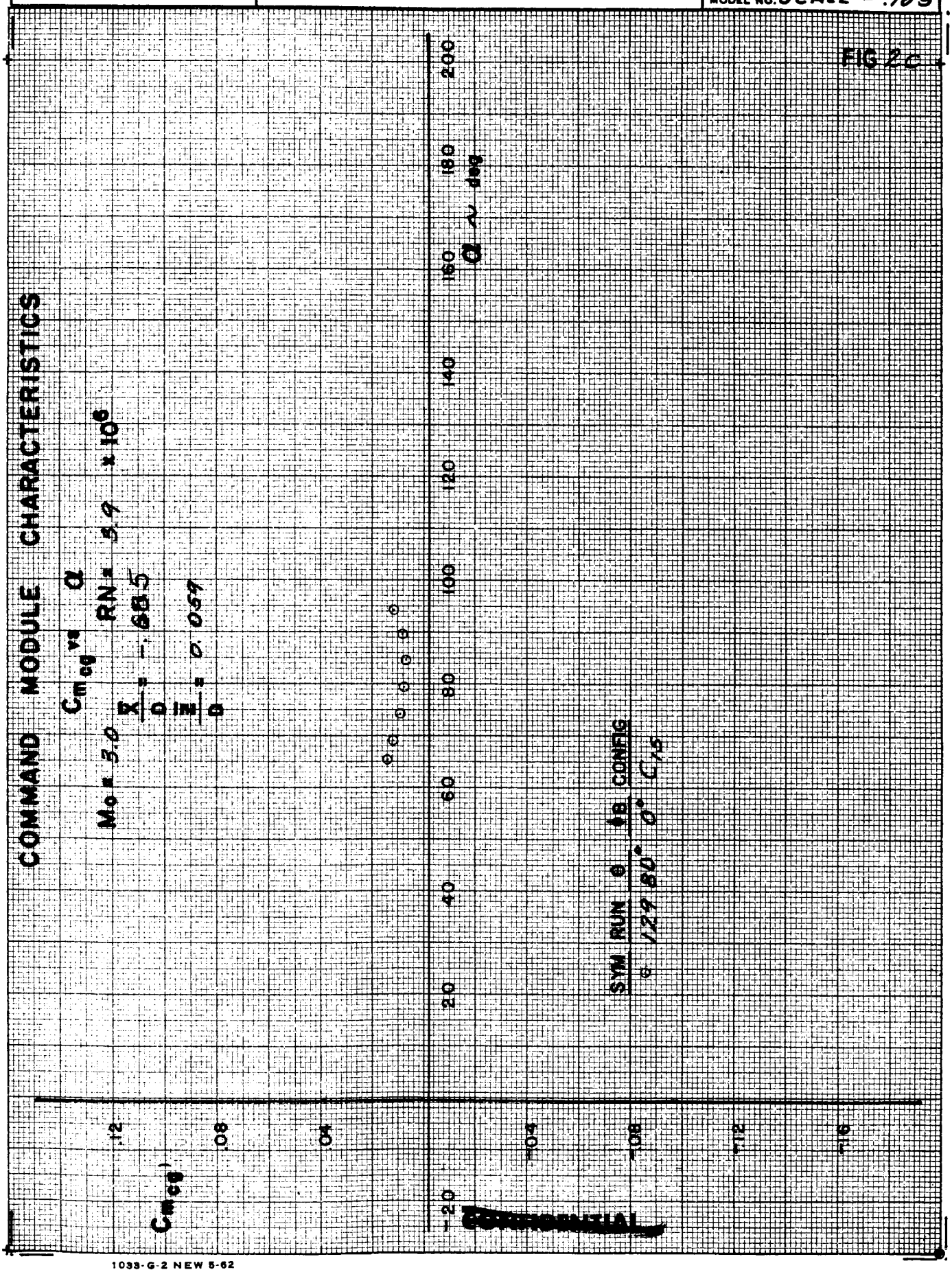


FIG 2C

$C_{m_{cg}}$ vs α

1033-G-2 NEW 5-62

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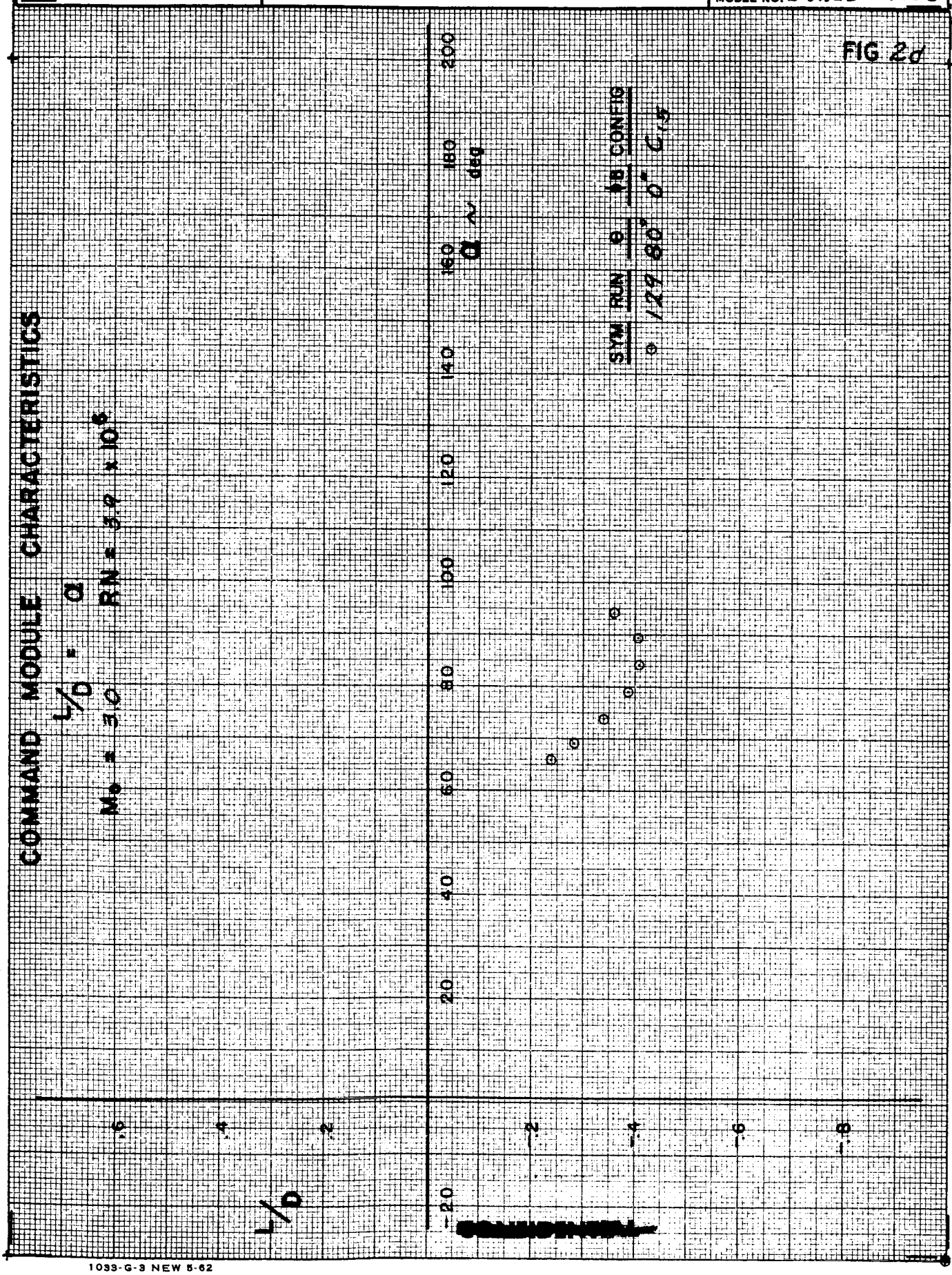
CHECKED BY: JKK	[redacted]	REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO-FS-2 MODEL NO. SCALE - .105

FIG 2d



[redacted]

1033-G-3 NEW 5-62

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DATE:

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SPACE and INFORMATION SYSTEMS DIVISION

[redacted]

AMES - 106

PAGE NO. B-15 OF

REPORT NO. SID-62-936

MODEL NO. APOLLO - FS-2

SCALE - .105

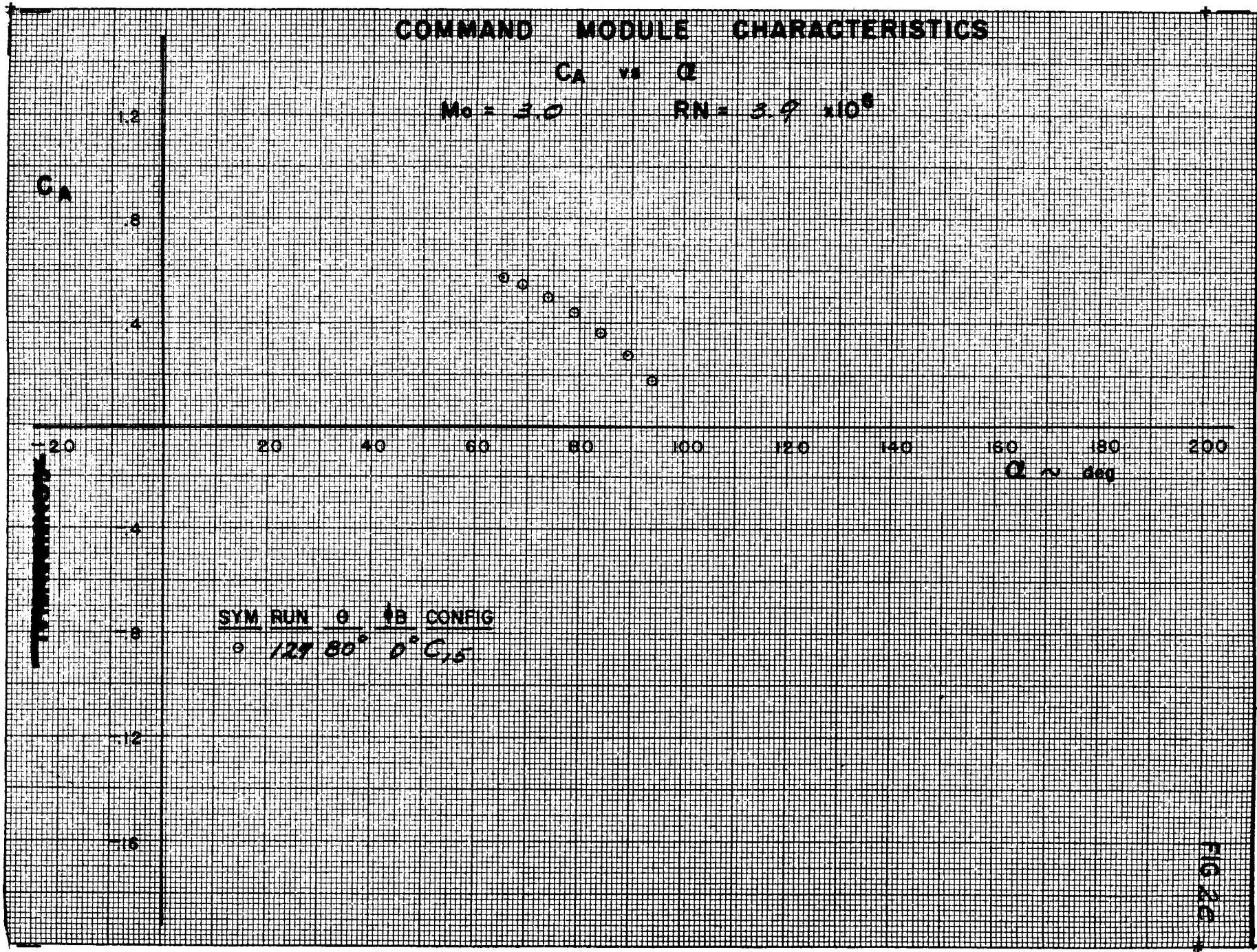

FIG 2C

C_A vs α

1033-G-4 NEW 5-62

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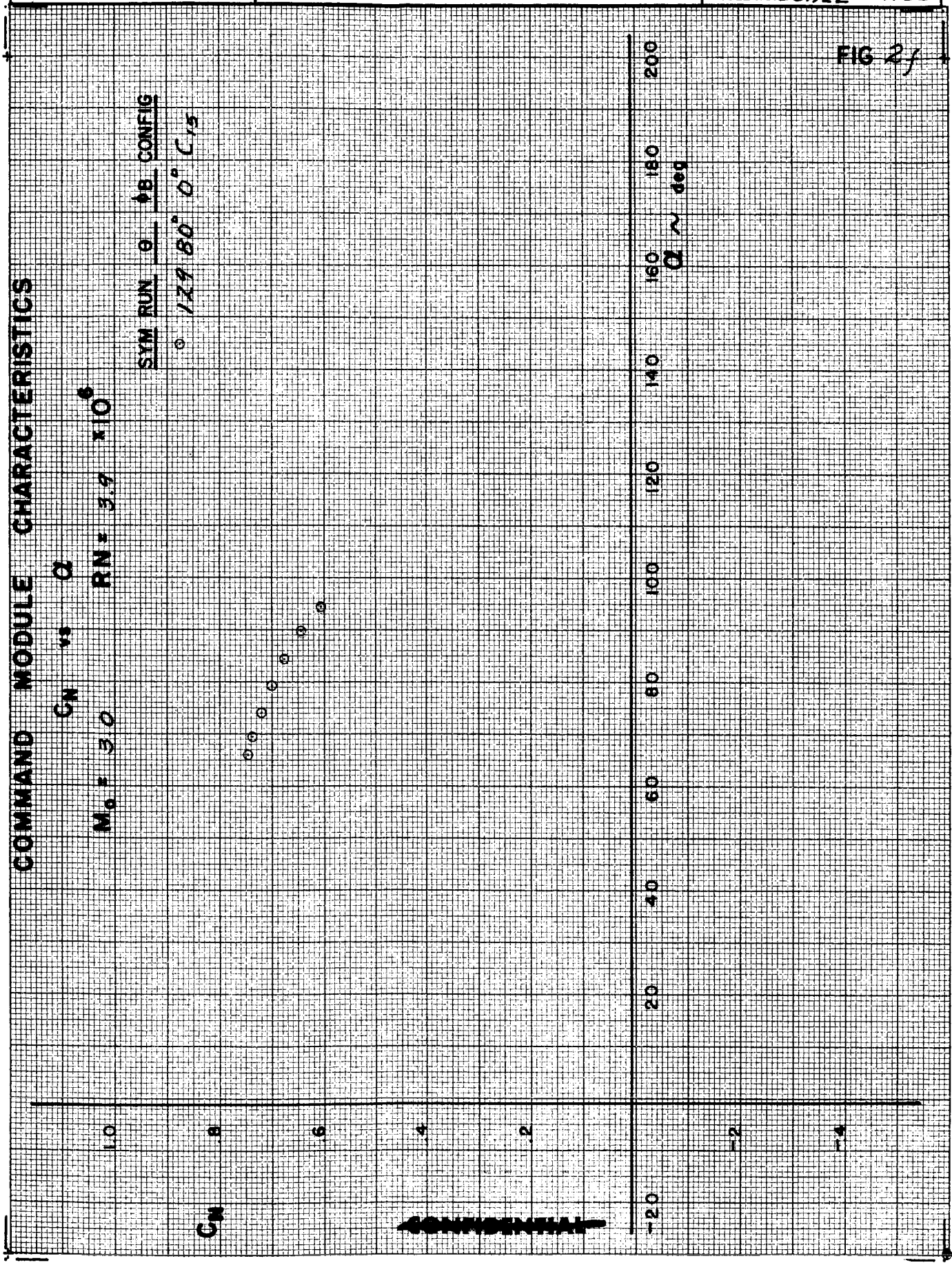
DATE:	AMES - 106	APOLLO F3-2 MODEL NO. SCALE - .105

FIG 21



C_N vs α

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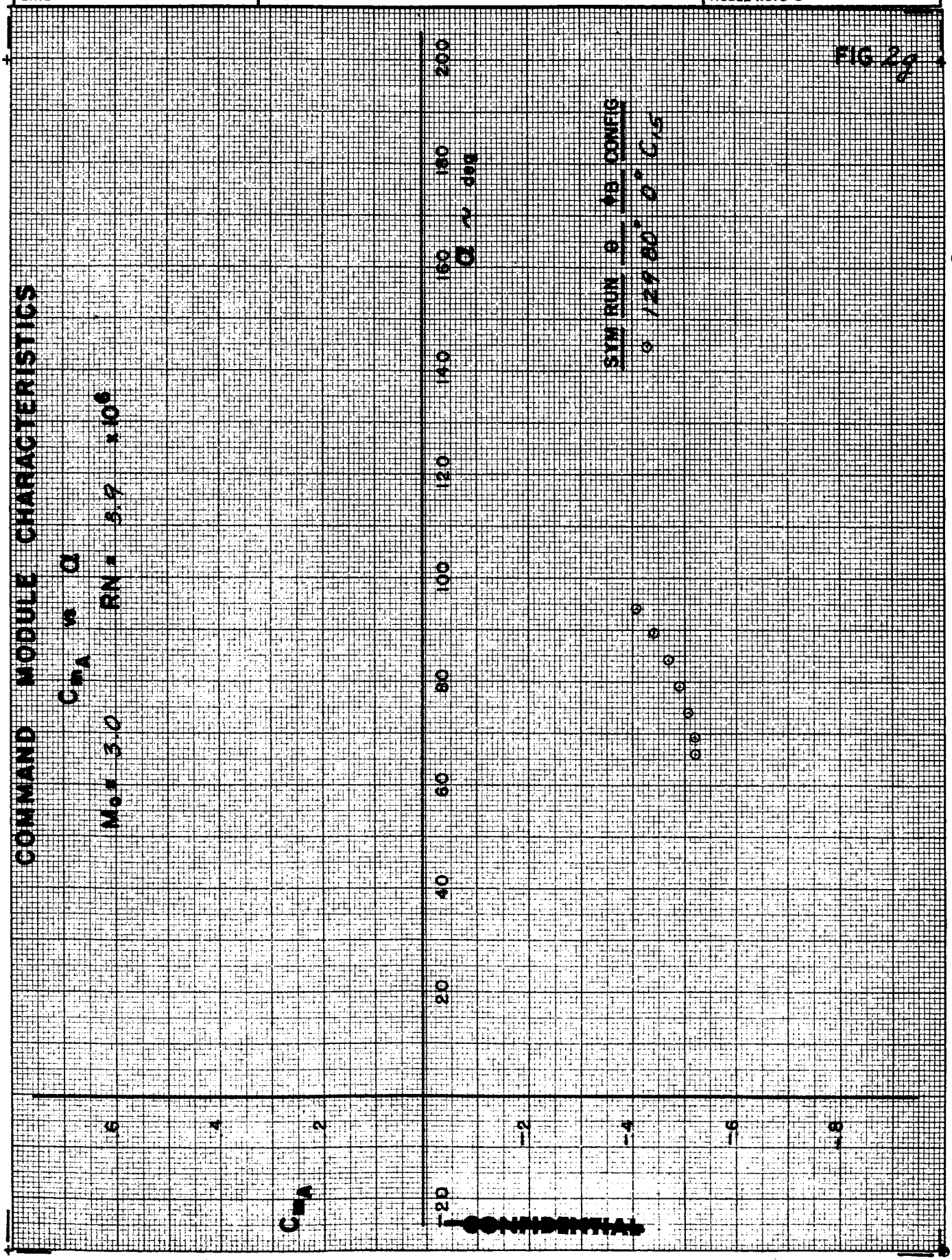
PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION [redacted]	PAGE NO. B-17 OF
CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO-FS-2 MODEL NO. SCALE - .105



[redacted]

1033-G-6 NEW 5-62

FORM M-113-N2- (REV. 3-61)

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION CONFIDENTIAL	PAGE NO. B-18 OF
CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO-FS-2 MODEL NO. SCALE - .105

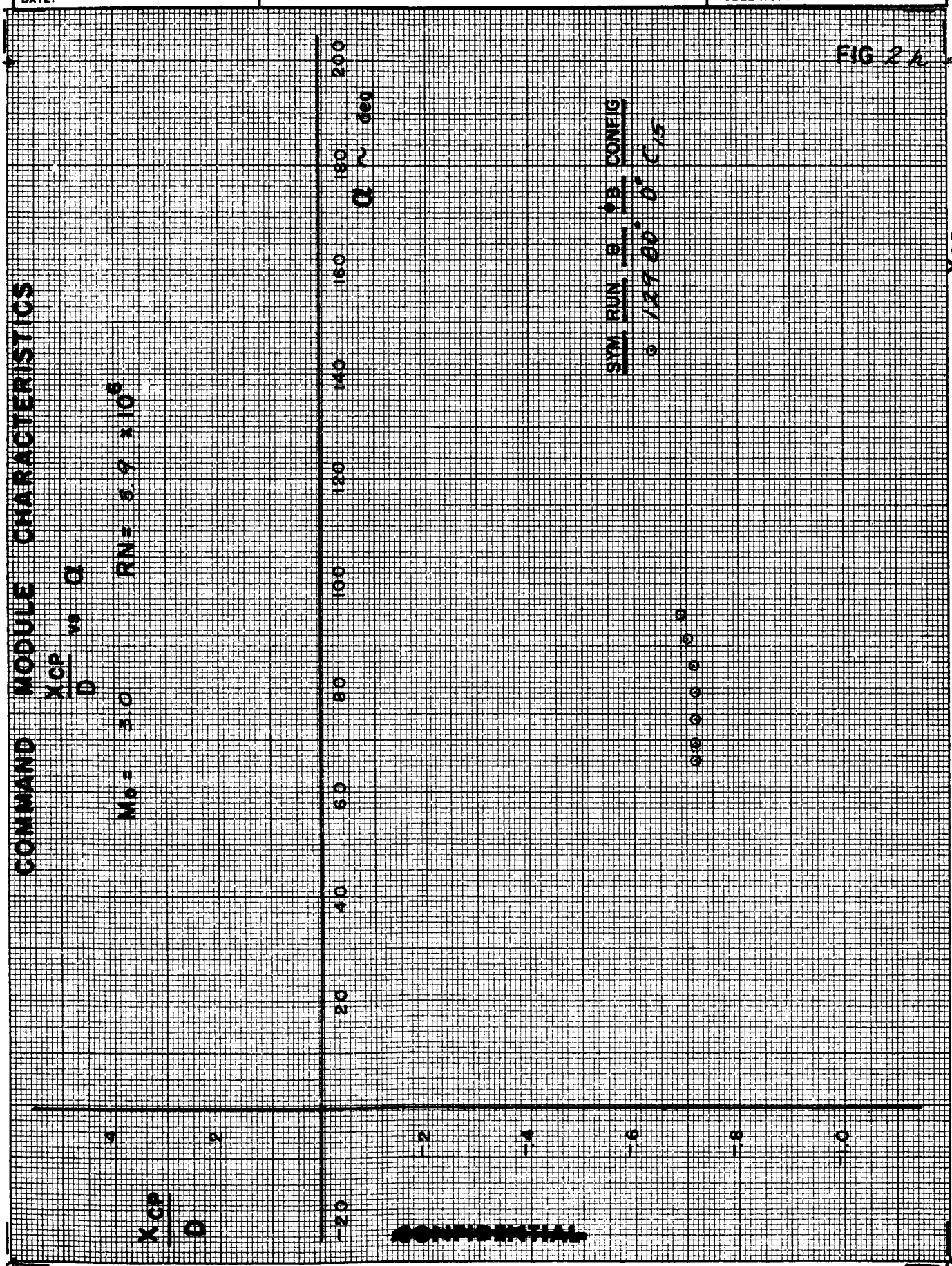


FIG 2 h

Xcp/D vs α

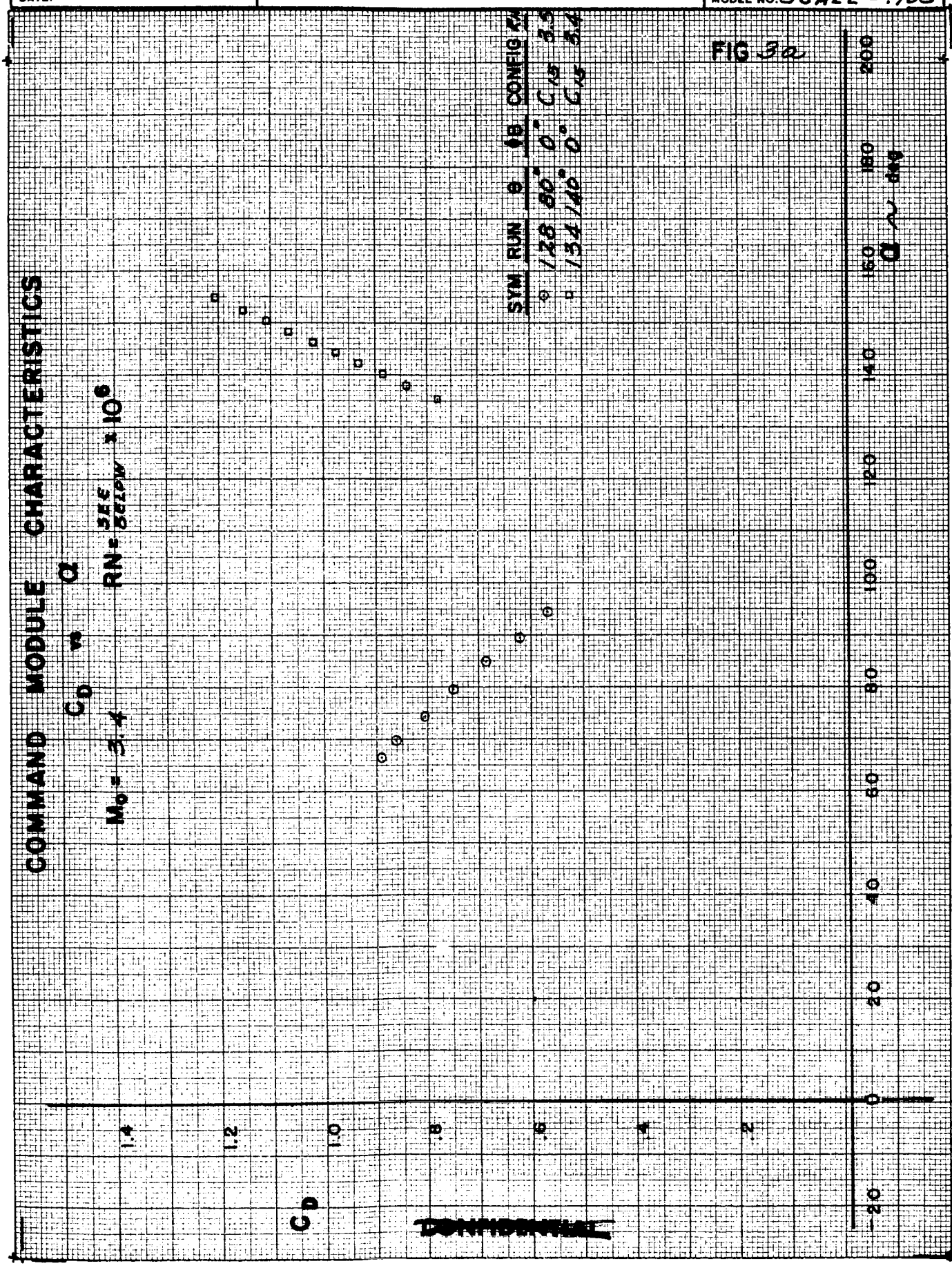


FIG 32

C_D vs α

FORM M-113-N2- (REV. 3-61)

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CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO - FS - 2 MODEL NO. SCALE - .105

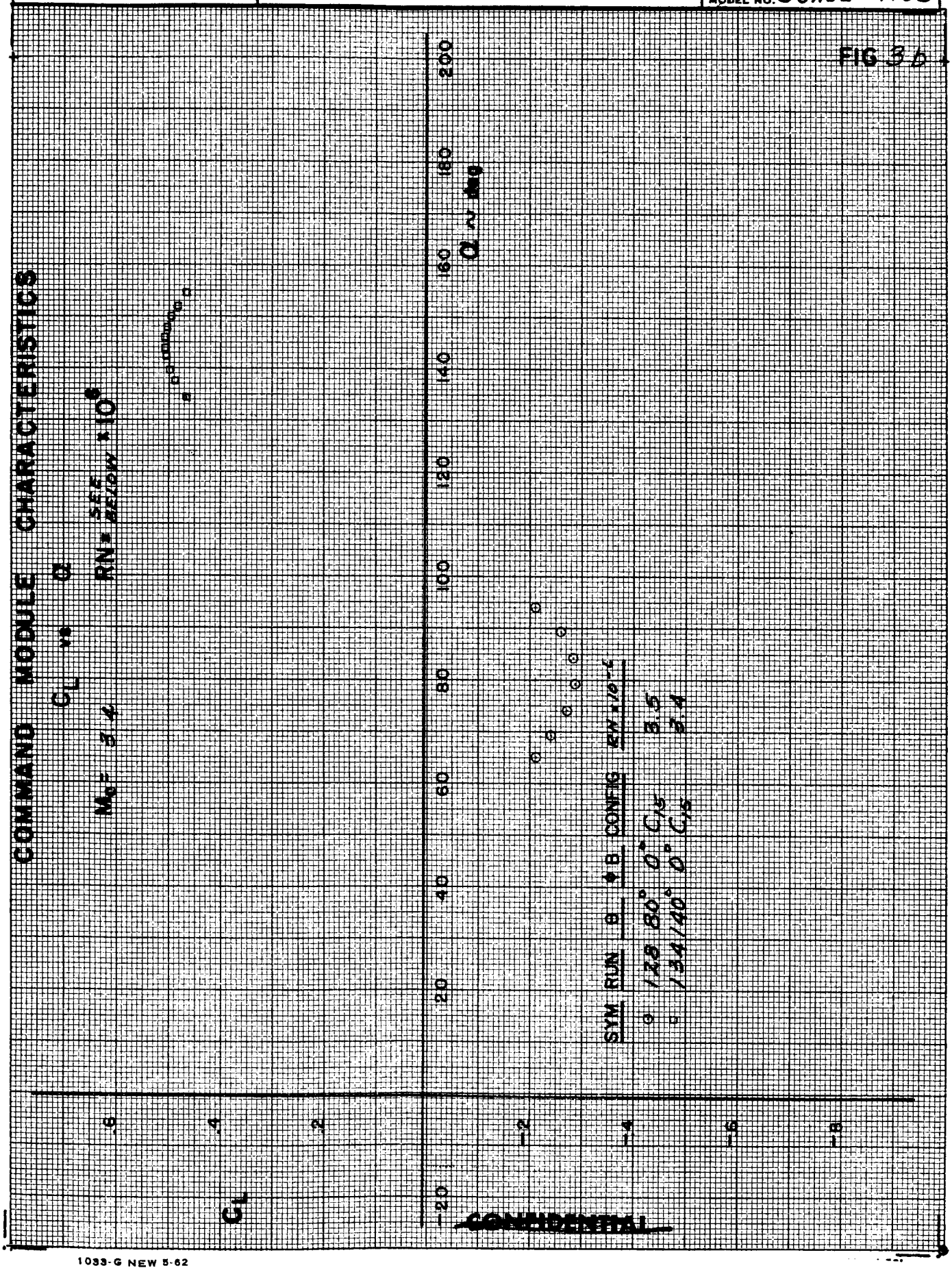
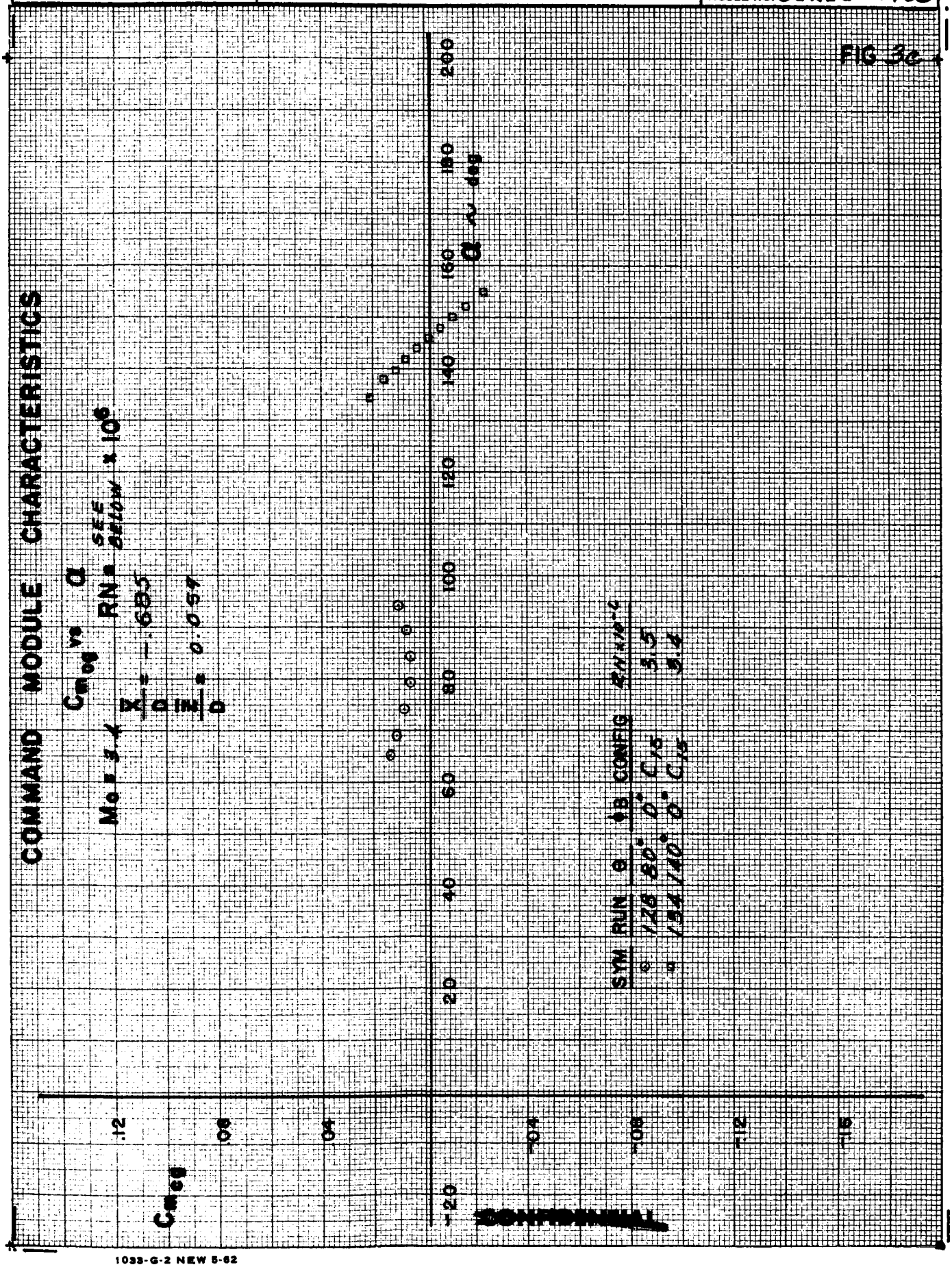


FIG 3b

C_L vs α

FORM M-113-N2- (REV. 3-61)

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION ~~CONFIDENTIAL~~	PAGE NO. B-21 OF
CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO - FS - 2 MODEL NO. SCALE - .105



$C_{m_{cg}}$ vs α

1033-G-2 NEW 5-62

FORM M-113-N2- (REV. 3-61)

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION [redacted]	PAGE NO. B-22 OF
CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO - FS-2 MODEL NO. SCALE - .105

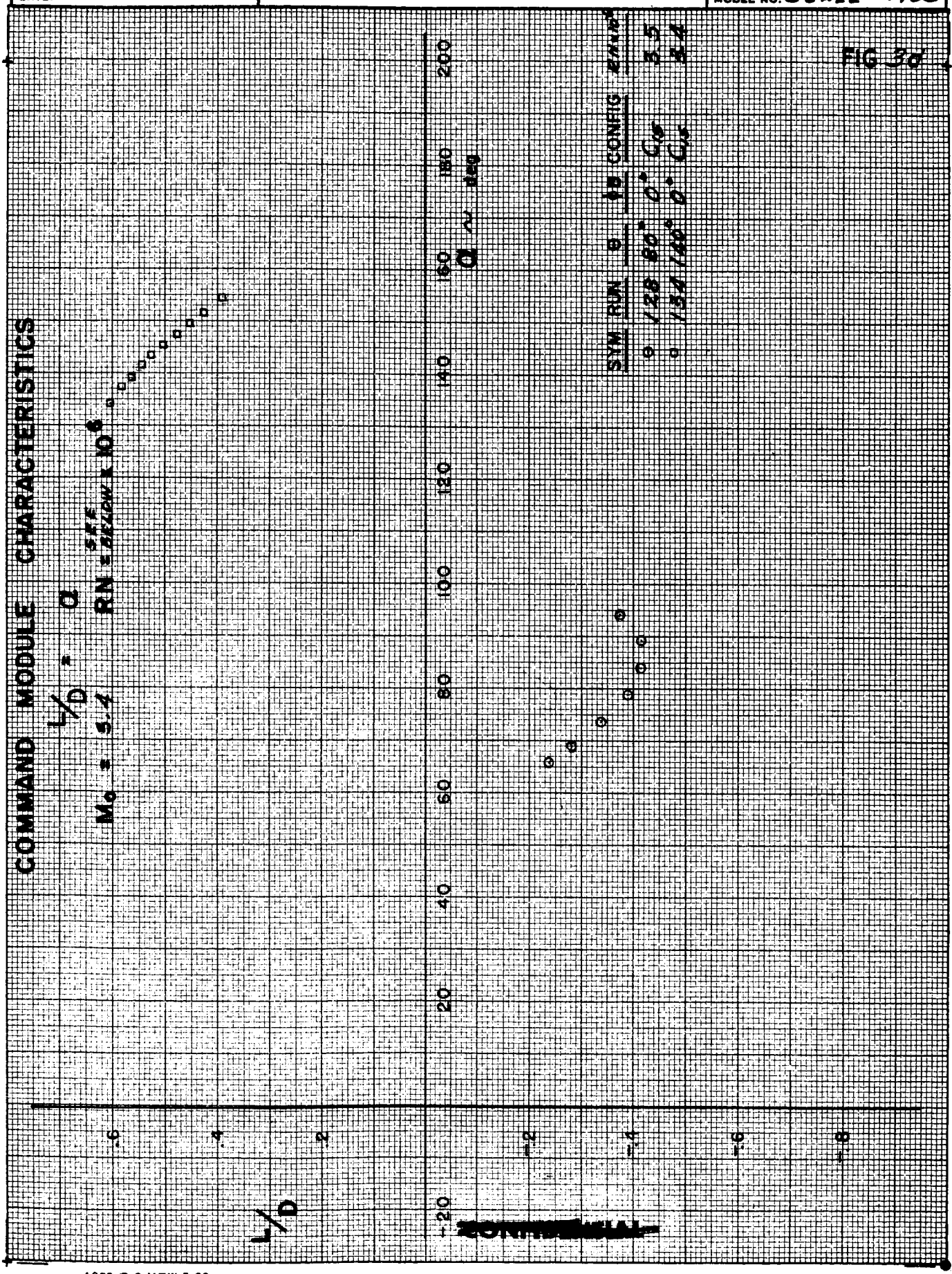
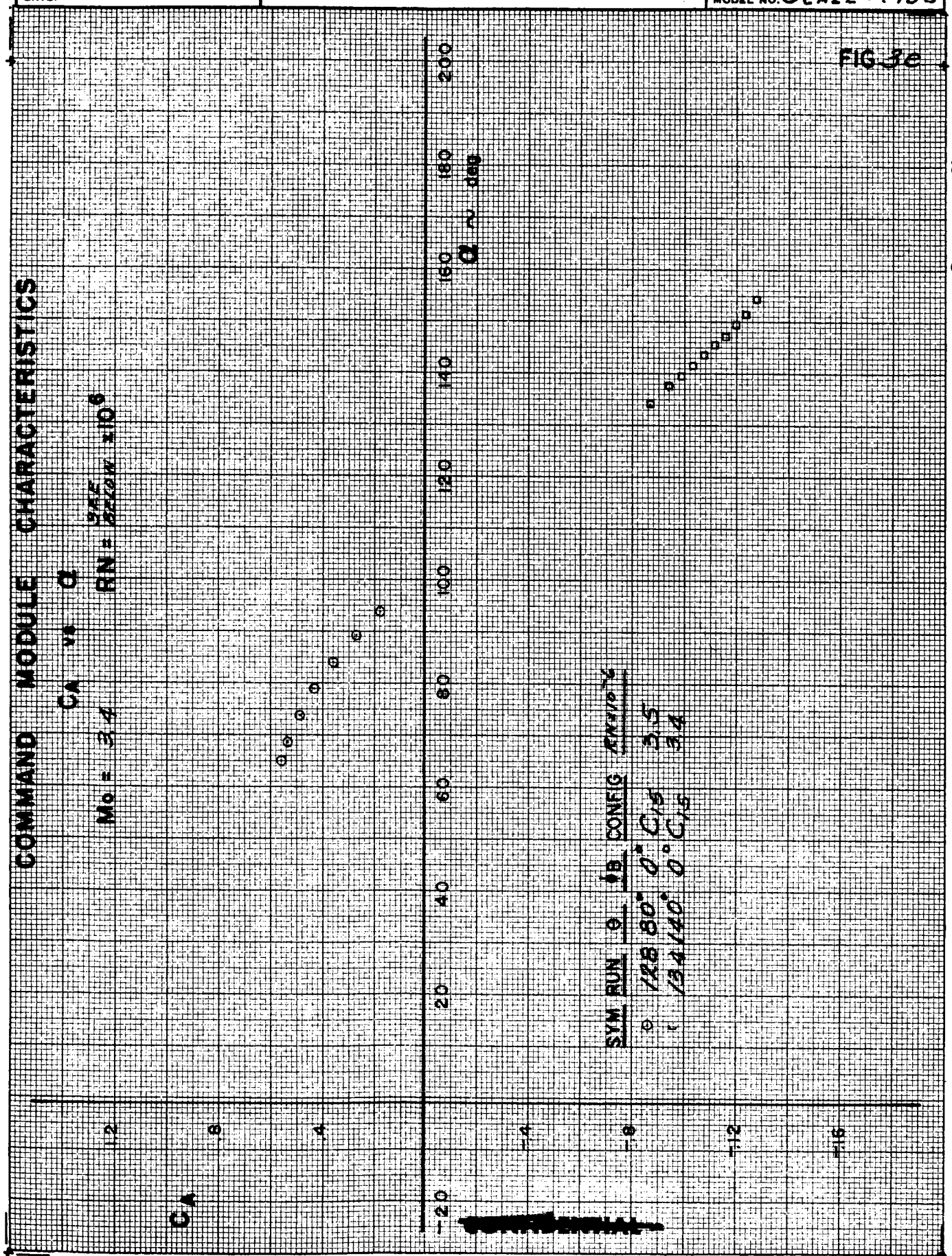


FIG 3d

L/D vs α

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION [redacted]	PAGE NO. B-23 OF
CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO - FS - 2 MODEL NO. SCALE - .105

FIG 3e



[redacted]

FORM M-113-N2- (REV. 3-61)

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION ~~CONFIDENTIAL~~	PAGE NO. B-24 OF
CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO - FS-2 MODEL NO. SCALE - .105

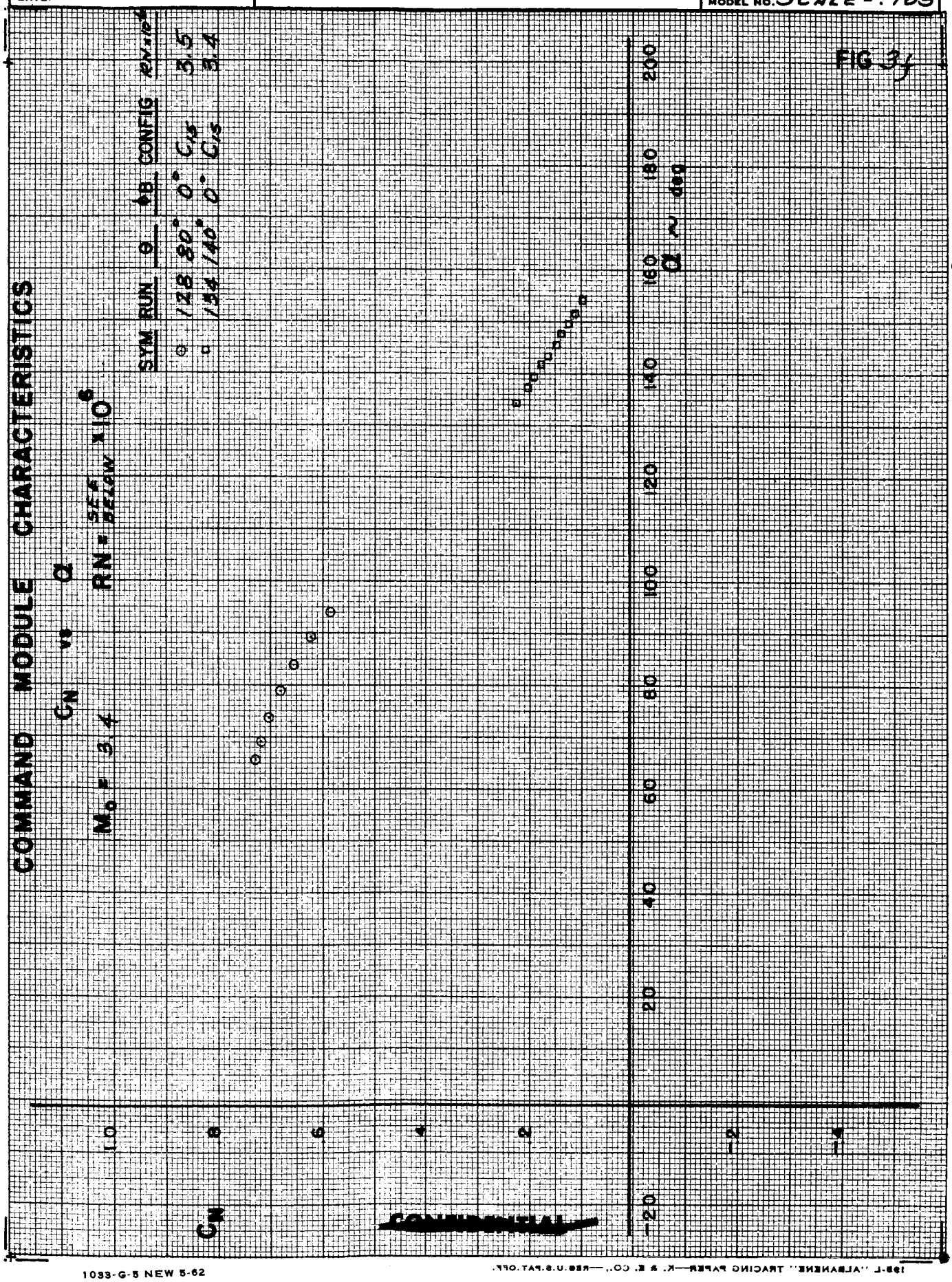


FIG 34

C_N vs α

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193-L "ALBANENE" TRACING PAPER—K. & E. CO.,—REG. U.S. PAT. OFF.

FORM M-113-N2- (REV. 3-61)

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION [redacted]	PAGE NO. B-25 OF
CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO-F5-2 MODEL NO. SCALE - .105

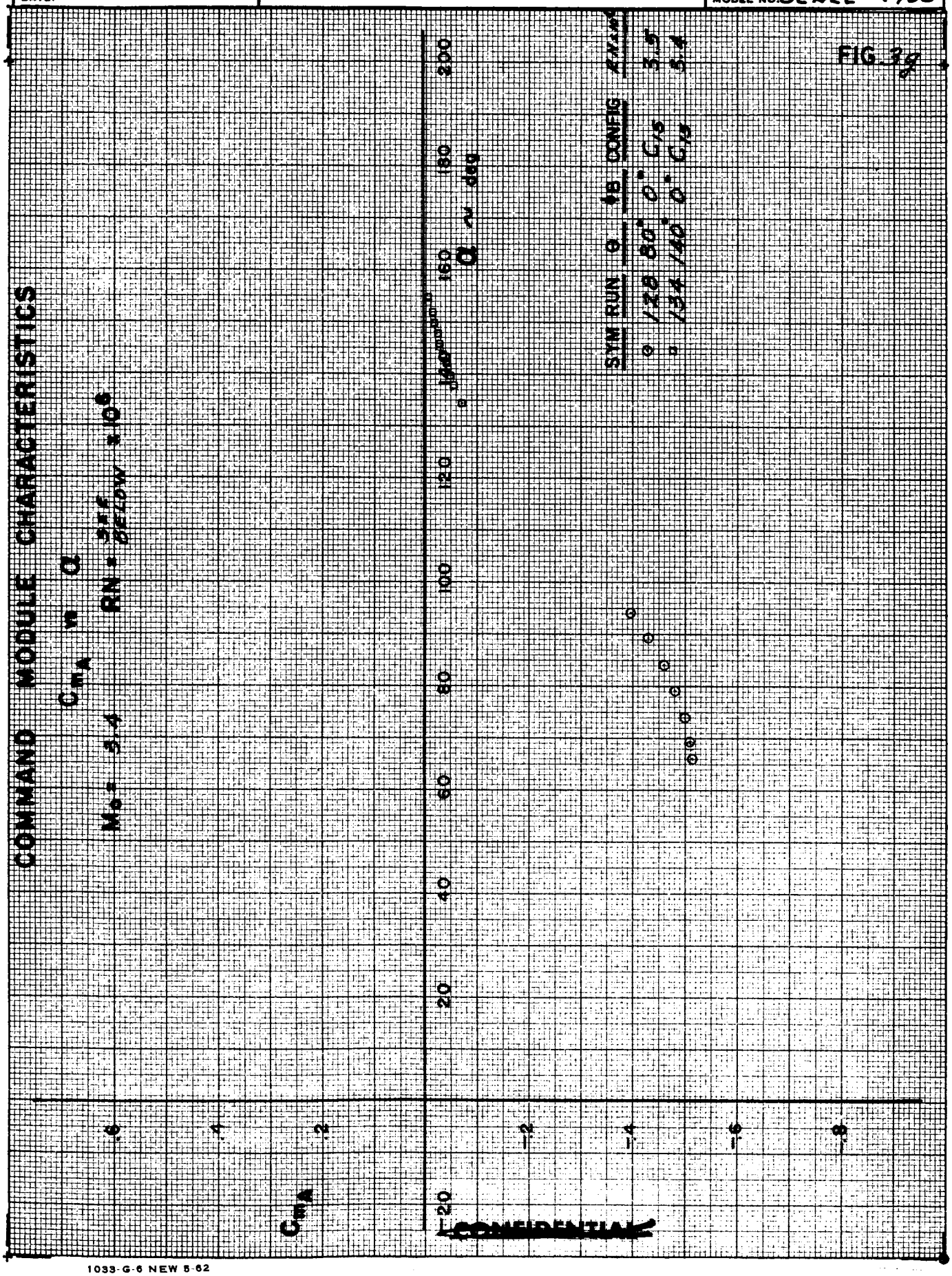


FIG. 38

C_{m_A} vs α

[redacted]

1033-G-6 NEW 5-62

FORM M-113-N2- (REV. 3-61)

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION [redacted]	PAGE NO. B-26 OF
CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO - FS - 2 MODEL NO. SCALE - .105

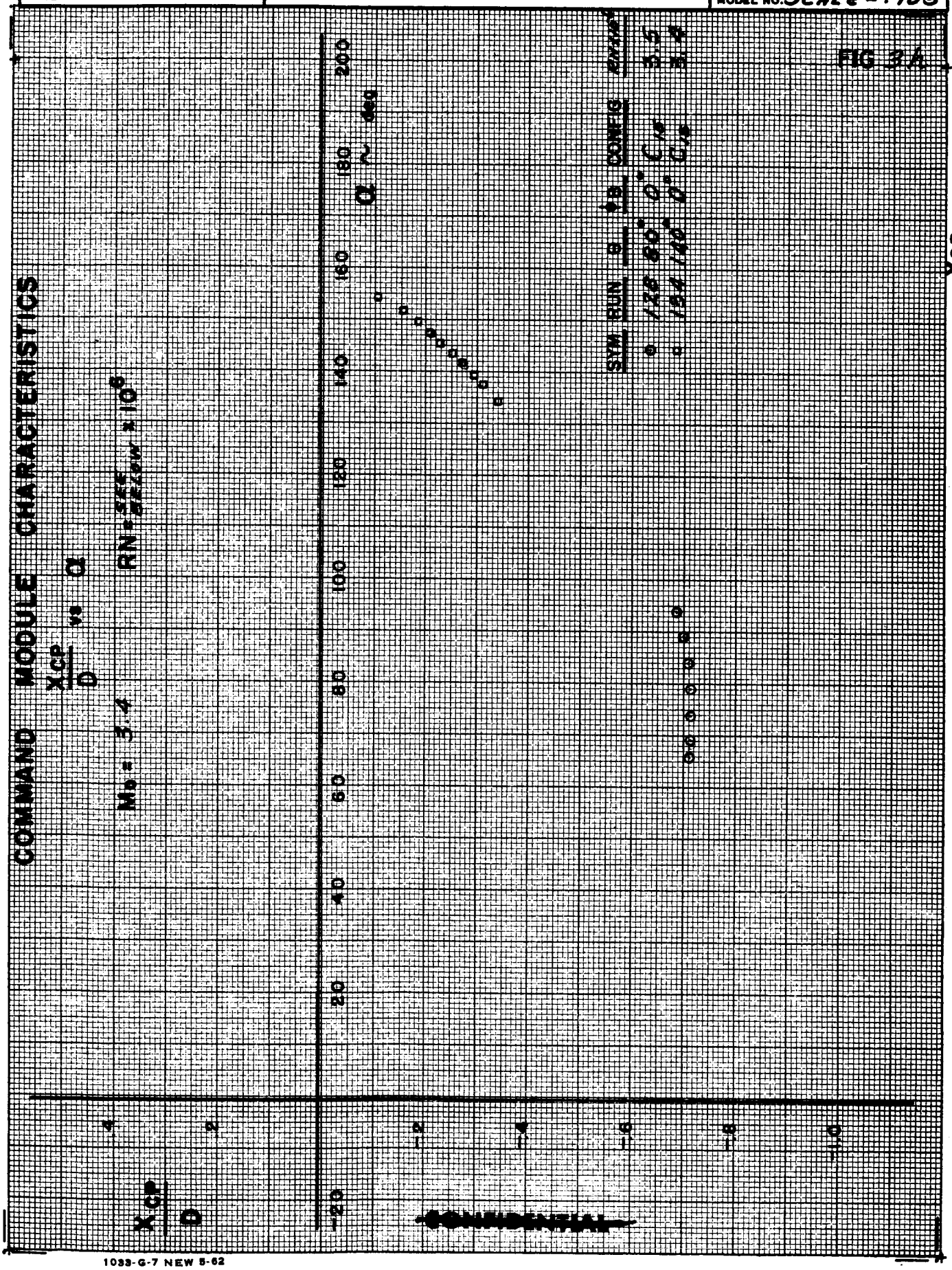
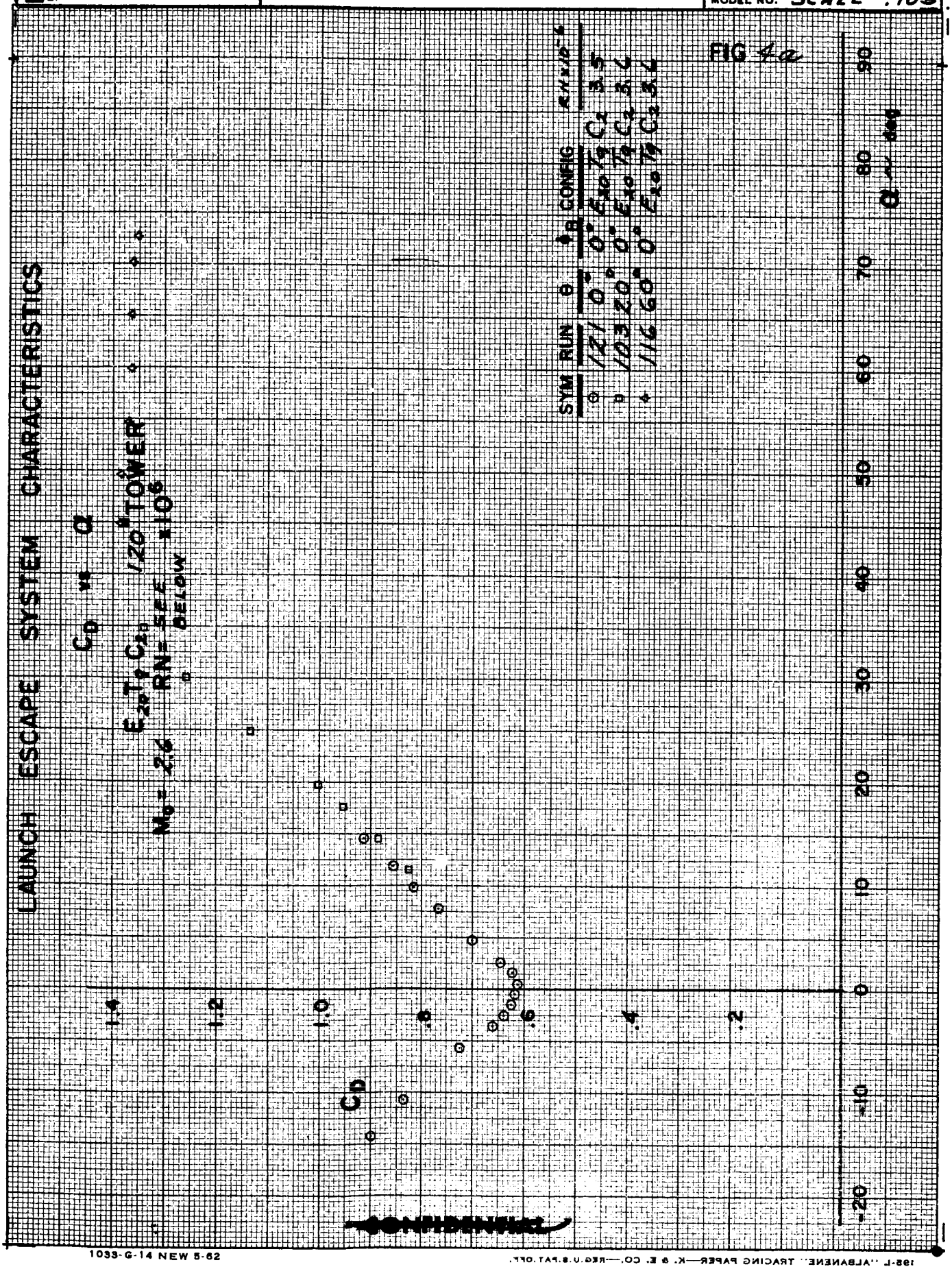


FIG 3A

$\frac{X_{CP}}{D}$ vs α

FORM M-113-N2- (REV. 3-61)

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION [redacted]	PAGE NO. B-27 OF
CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES - 106	MODEL NO. APOLLO-FS-2 SCALE .105



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FORM M-113-N2- (REV. 3-61)

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION ~~CONFIDENTIAL~~	PAGE NO. B-28 OF
CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES - 106	MODEL NO. APOLLO-FS-2 SCALE .105

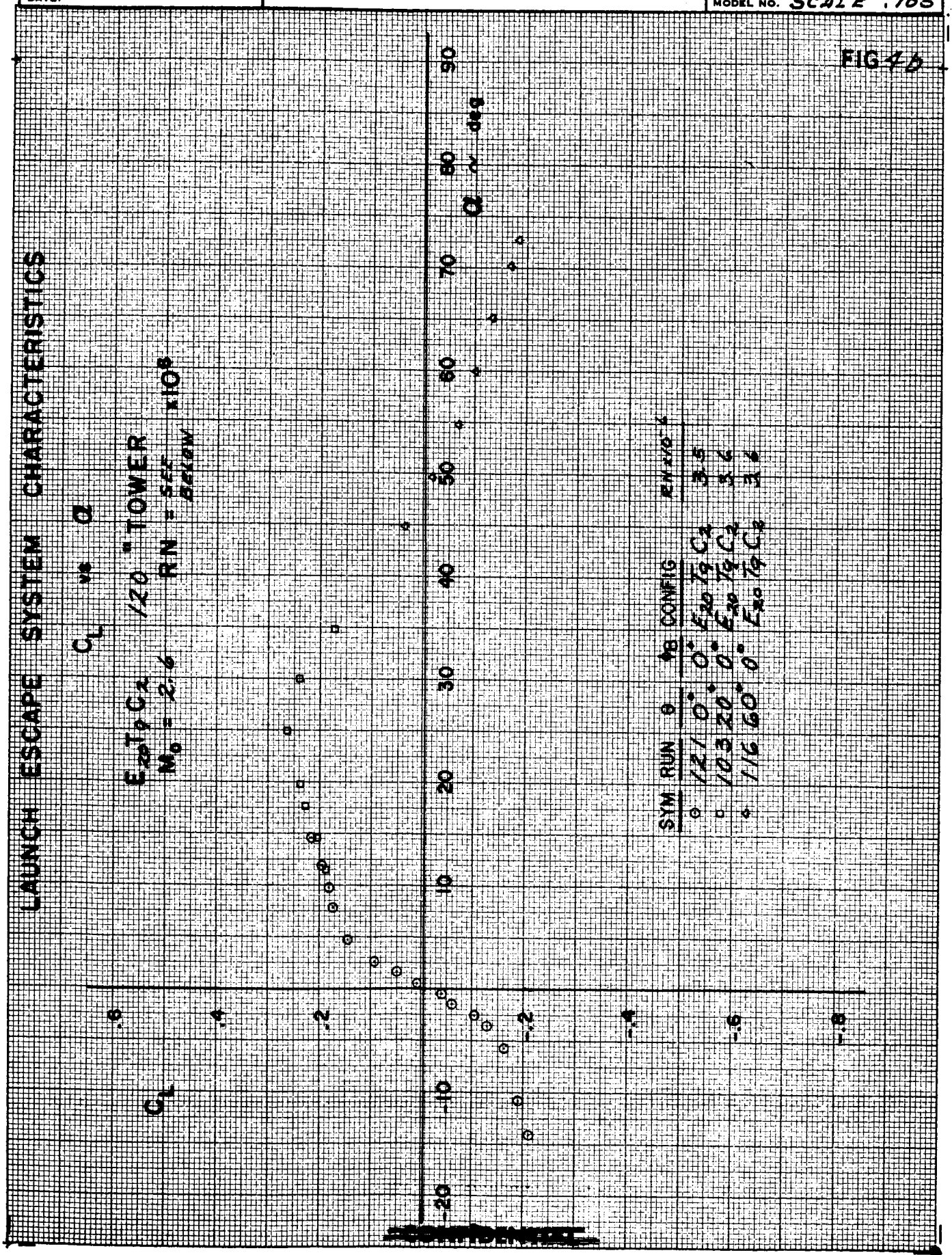

FIG 4b

C_L vs α

~~CONFIDENTIAL~~

1033-G-13 NEW 5-62

195-L "ALBANENE" TRACING PAPER—K. & E. CO.—REG. U.S. PAT. OFF.

FORM M-113-N2- (REV. 3-61)

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION ~~CONFIDENTIAL~~	PAGE NO. B-29 OF
CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES-106	APOLLO-FS-2 MODEL NO. SCALE .105

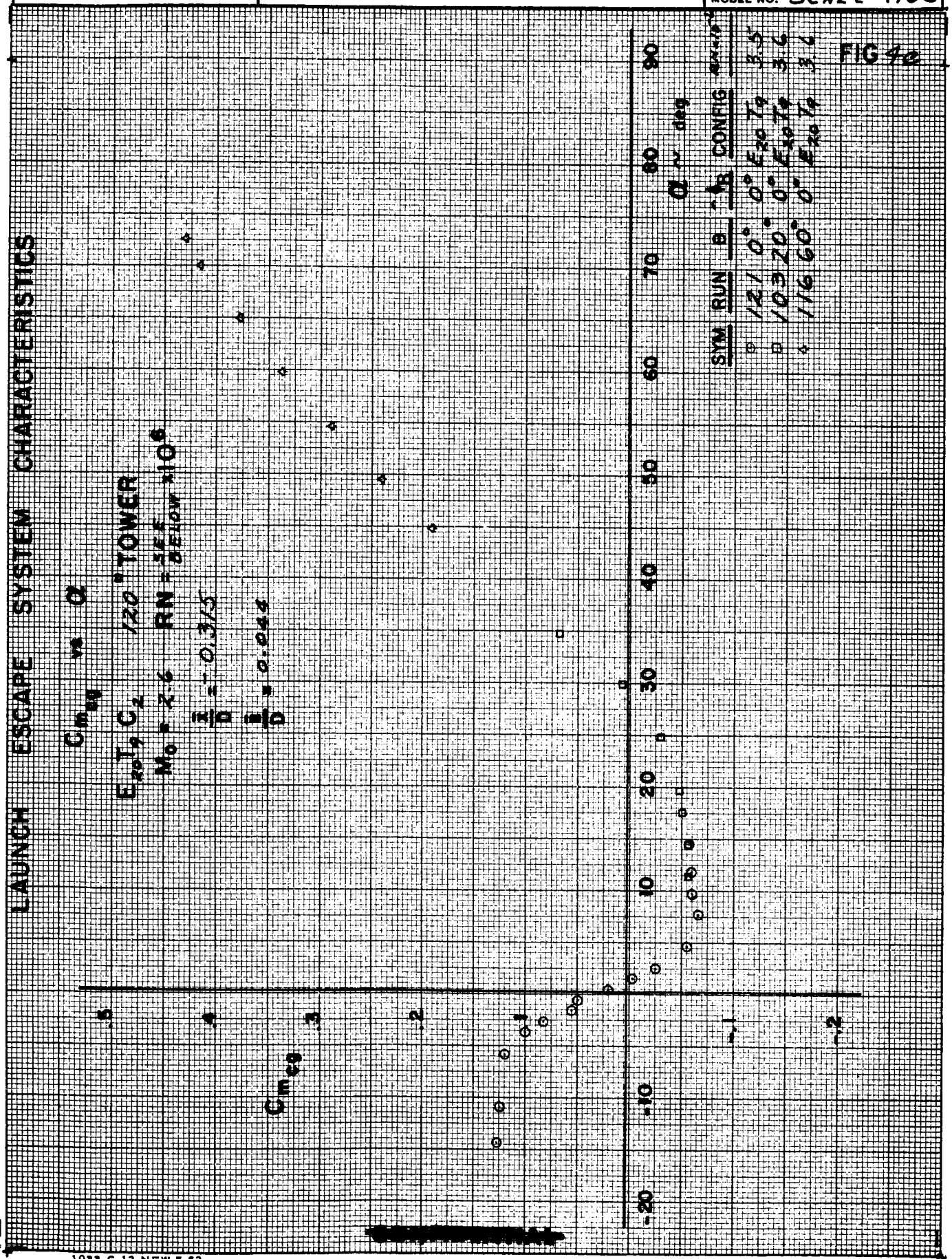

FIG 4e

$C_{m_{cg}}$ vs α

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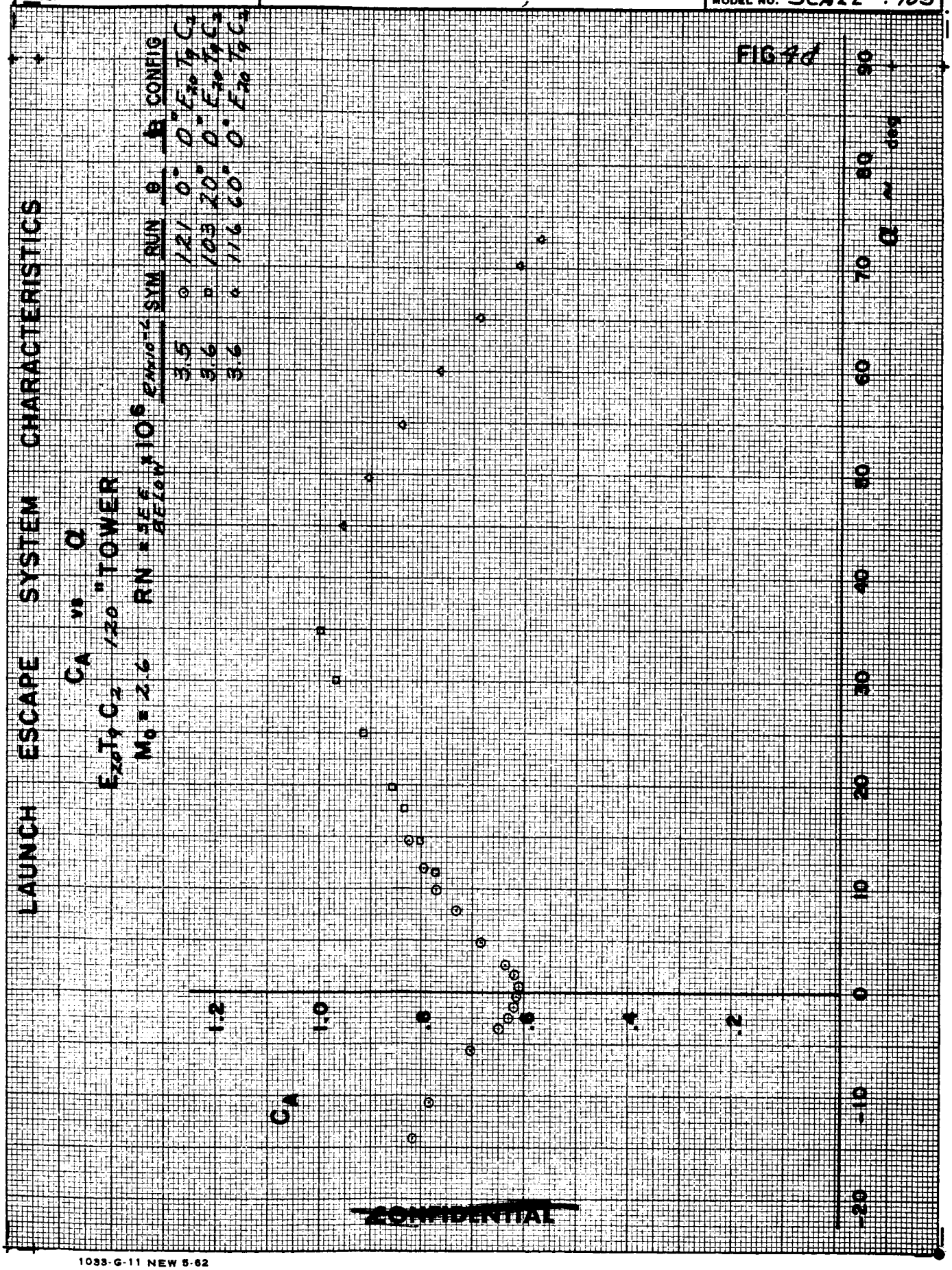
FORM M-113-N2- (REV. 3-61)

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION	PAGE NO. B-30 OF
CHECKED BY: JKK	~~CONFIDENTIAL~~	REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO-FS-2 MODEL NO. SCALE .105



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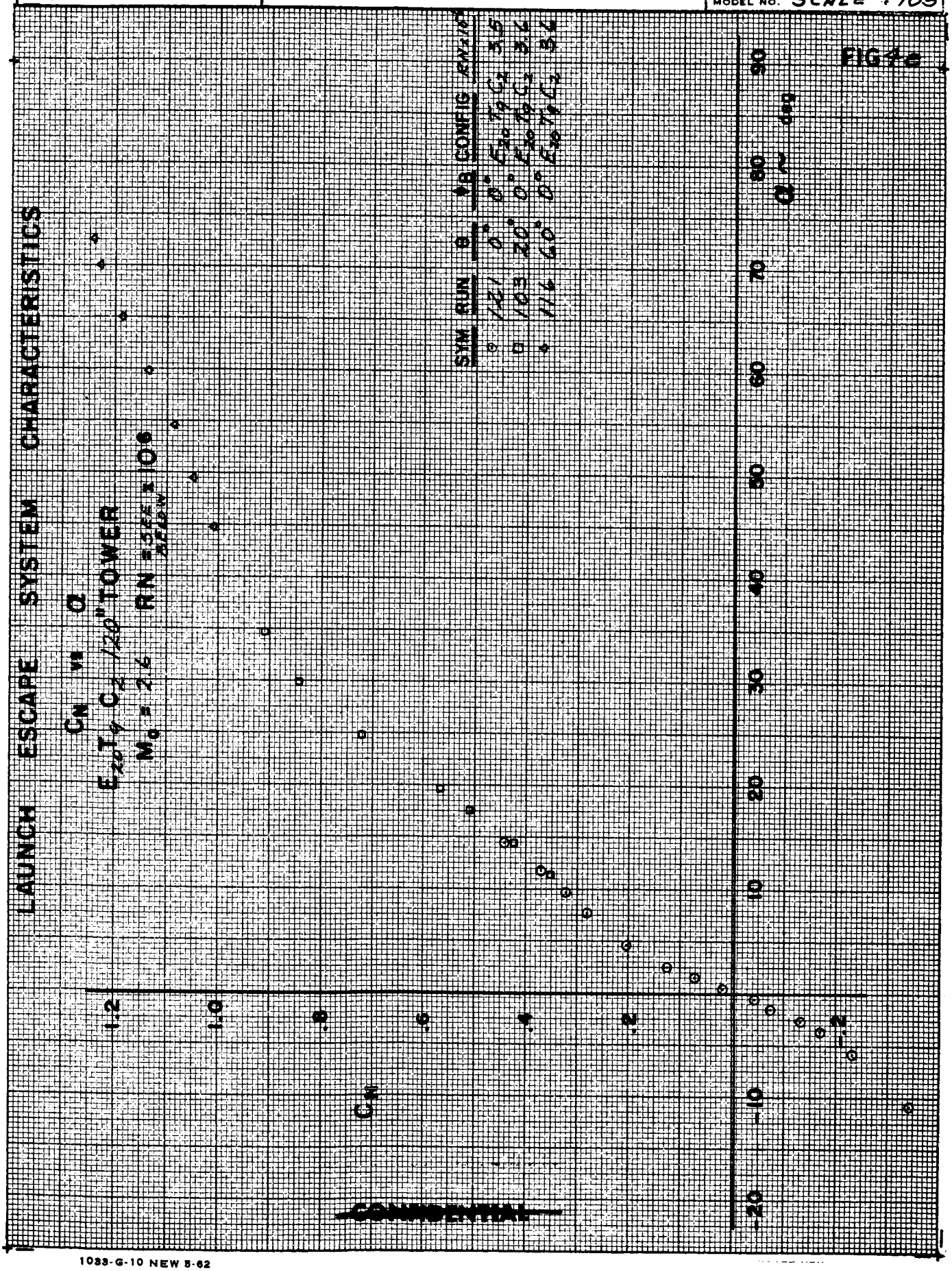
FORM M-113-N2- (REV. 3-61)

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION	PAGE NO. B-31 OF
CHECKED BY: JKK	~~CONFIDENTIAL~~	REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO - FS-2 MODEL NO. SCALE .105



1033-G-10 NEW 5-62

FORM M-113-N2- (REV. 3-61)

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION ~~CONFIDENTIAL~~	PAGE NO. B-32 OF
CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO-FS-2 MODEL NO. SCALE .105

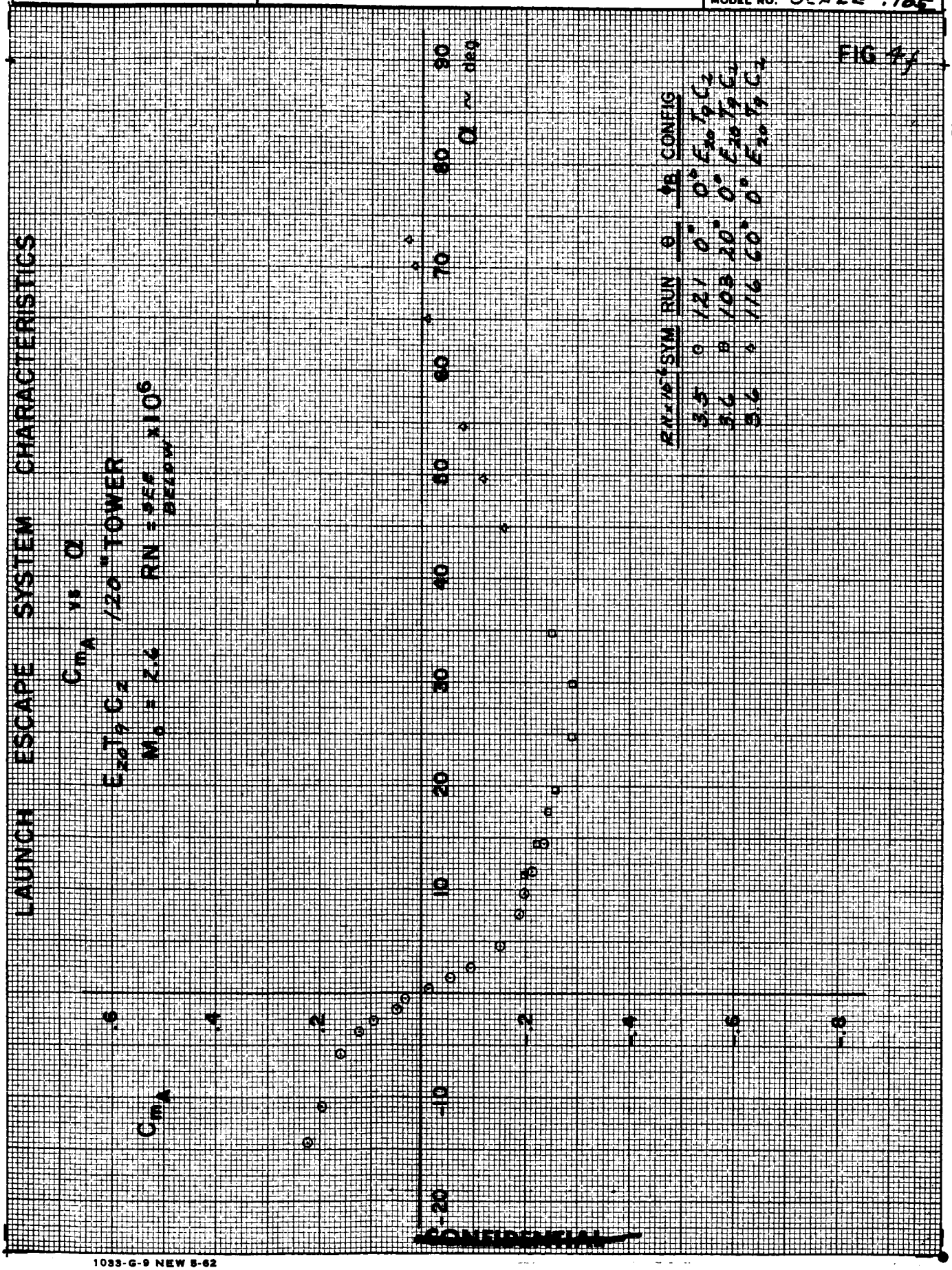


FIG 4

C_{m_A} vs α

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1033-G-9 NEW 5-62

FORM M-113-N2- (REV. 3-61)

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION ~~CONFIDENTIAL~~	PAGE NO. B-33 OF
CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO-FS-2 MODEL NO. SCALE .105

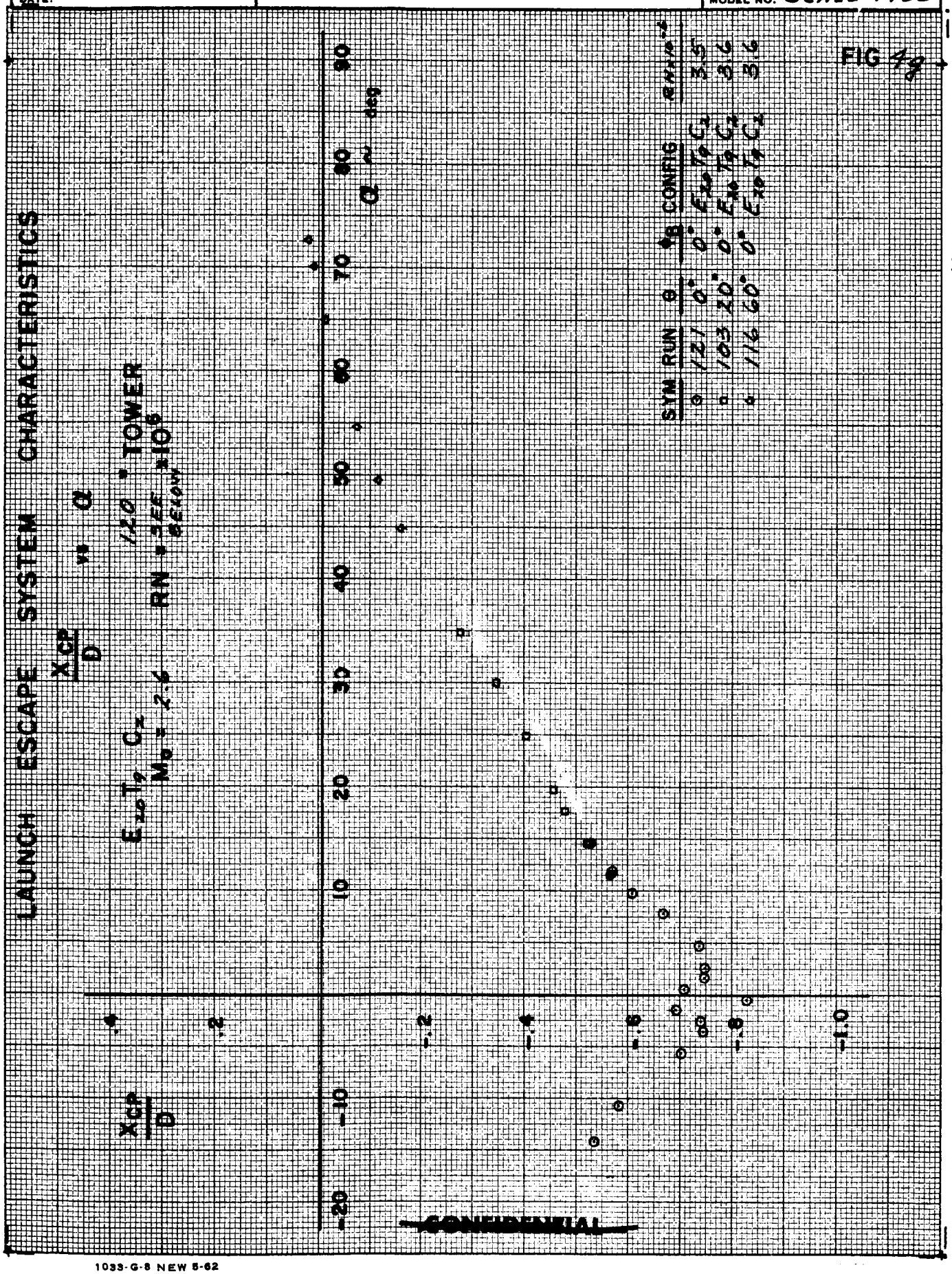


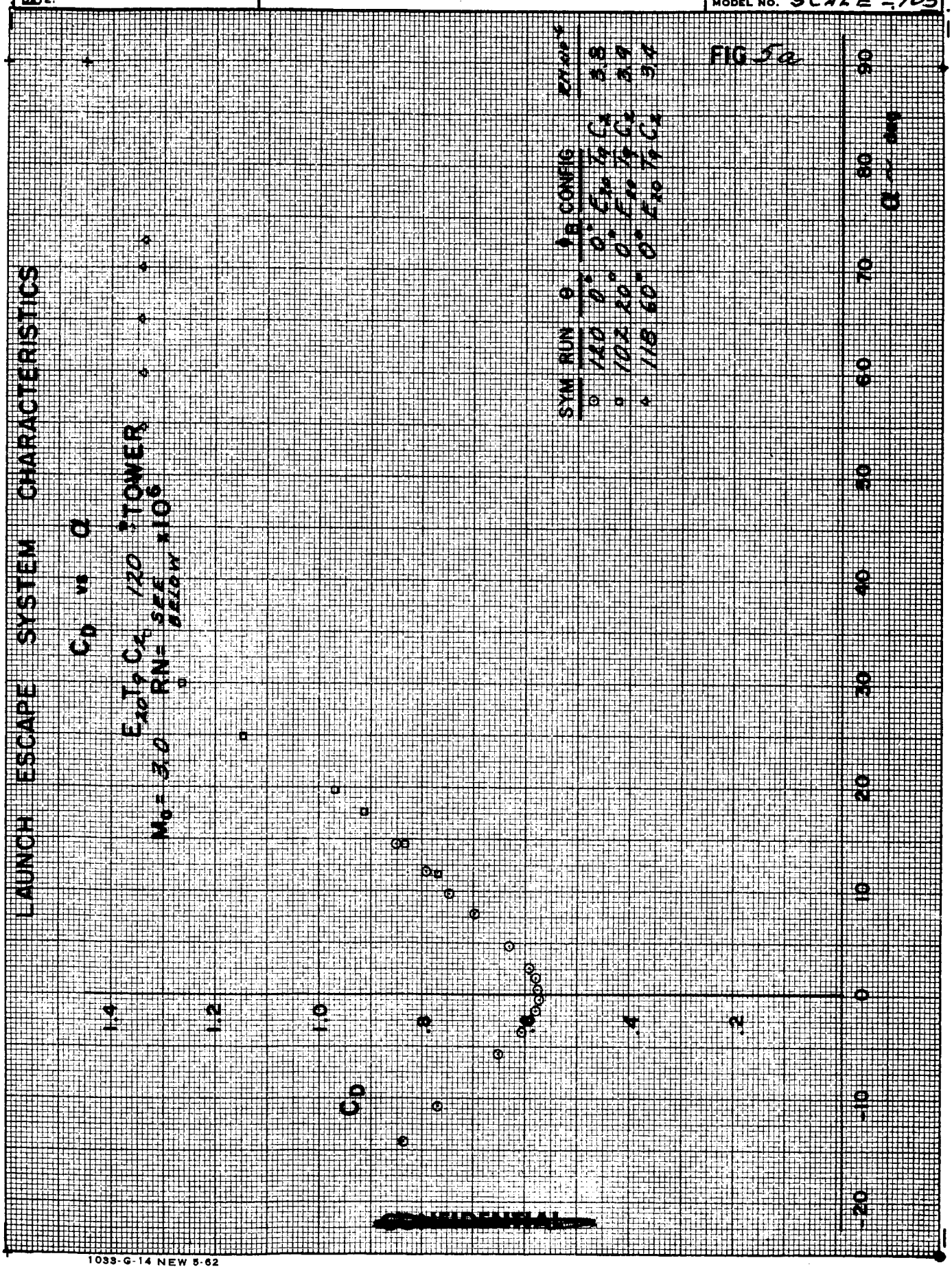
FIG 49

XCP/D vs α

1033-G-8 NEW 5-62

FORM M-113-N2- (REV. 3-61)

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION	PAGE NO. B-34 OF
CHECKED BY: JKK	[redacted]	REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO-FS-2 MODEL NO. SCALE -.105



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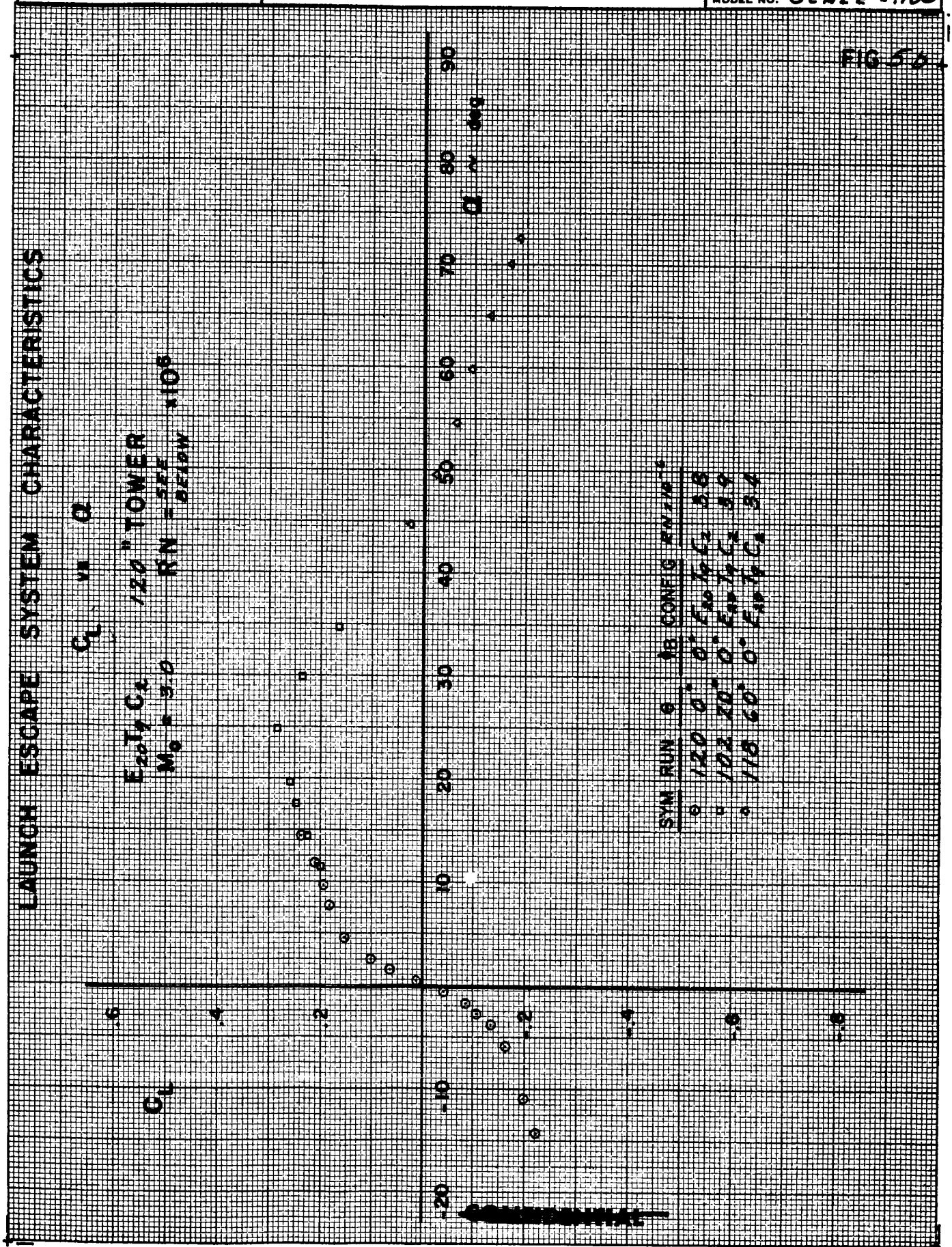
FORM M-113-N2- (REV. 3-61)

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION ~~CONFIDENTIAL~~	PAGE NO. B-35 OF
CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO-FS-2 MODEL NO. SCALE -.105



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1033-G-13 NEW 5-62

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION ~~CONFIDENTIAL~~	PAGE NO. 8-36 OF
CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO-FS-2 MODEL NO. SCALE -.105

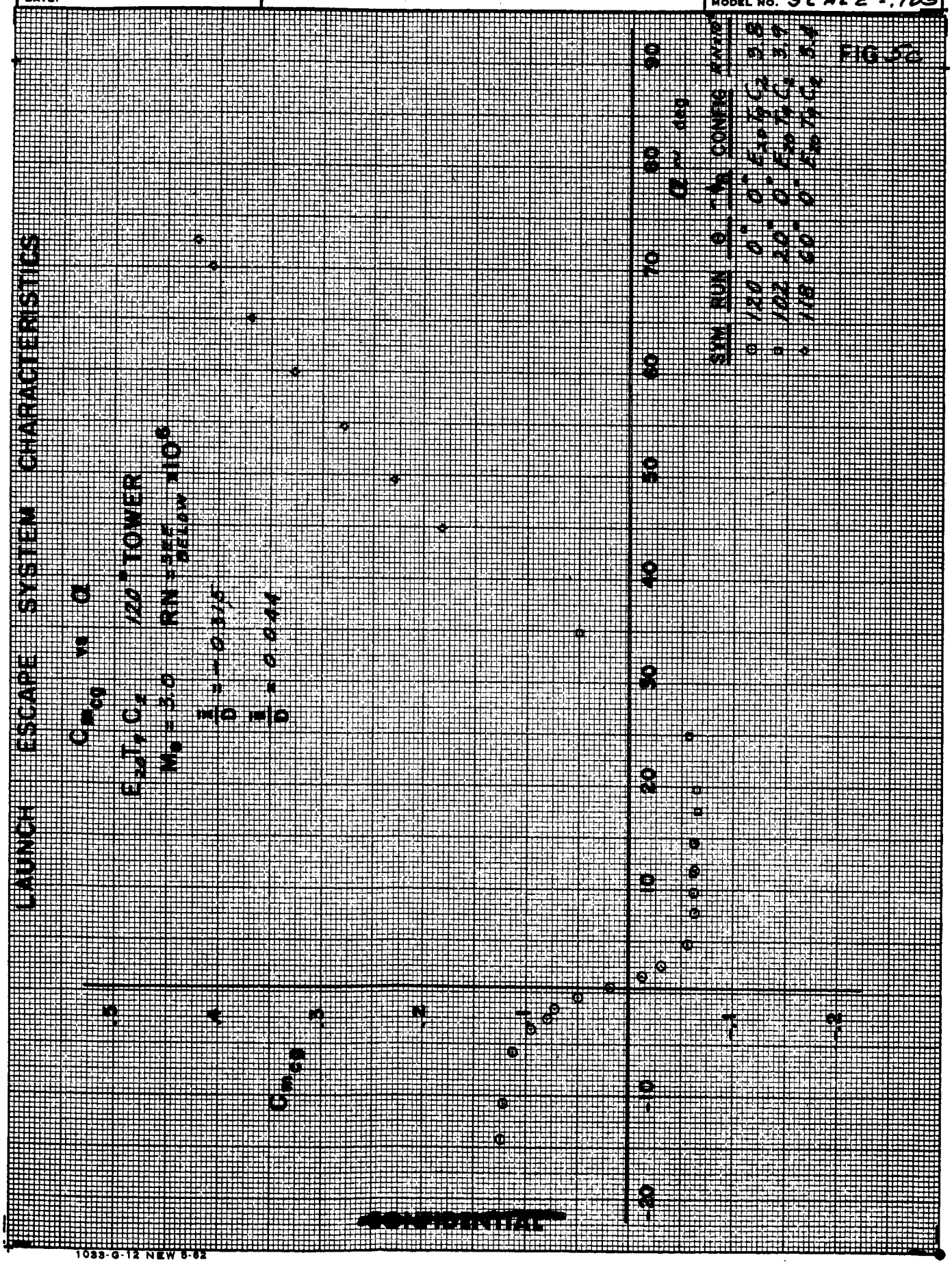

FIG 5c

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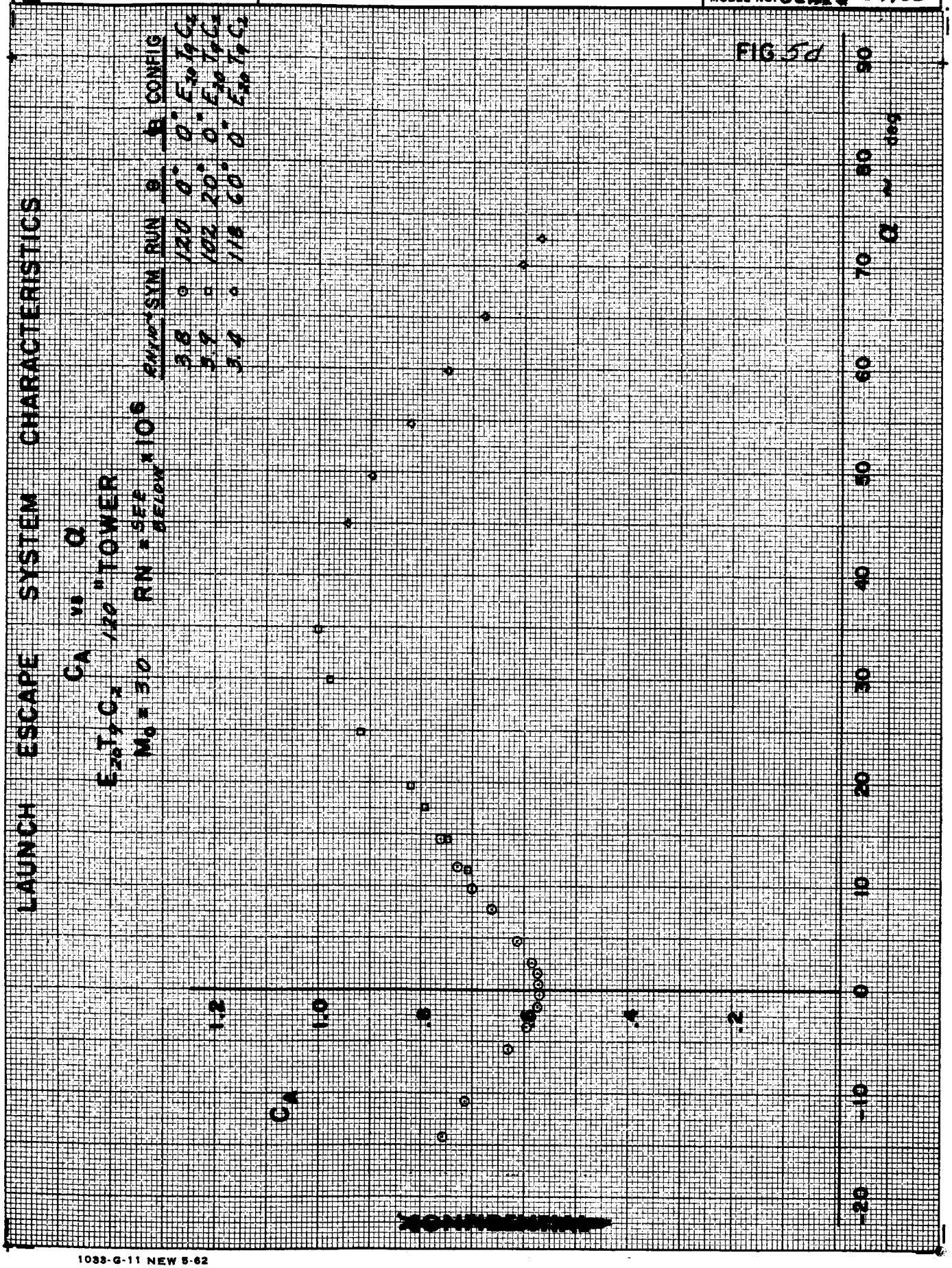
1033-G-12 NEW 5-62

FORM M-113-N2- (REV. 3-61)

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION [redacted]	PAGE NO. B-37 OF
CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO - FS-2 MODEL NO. SCALE = 1/105



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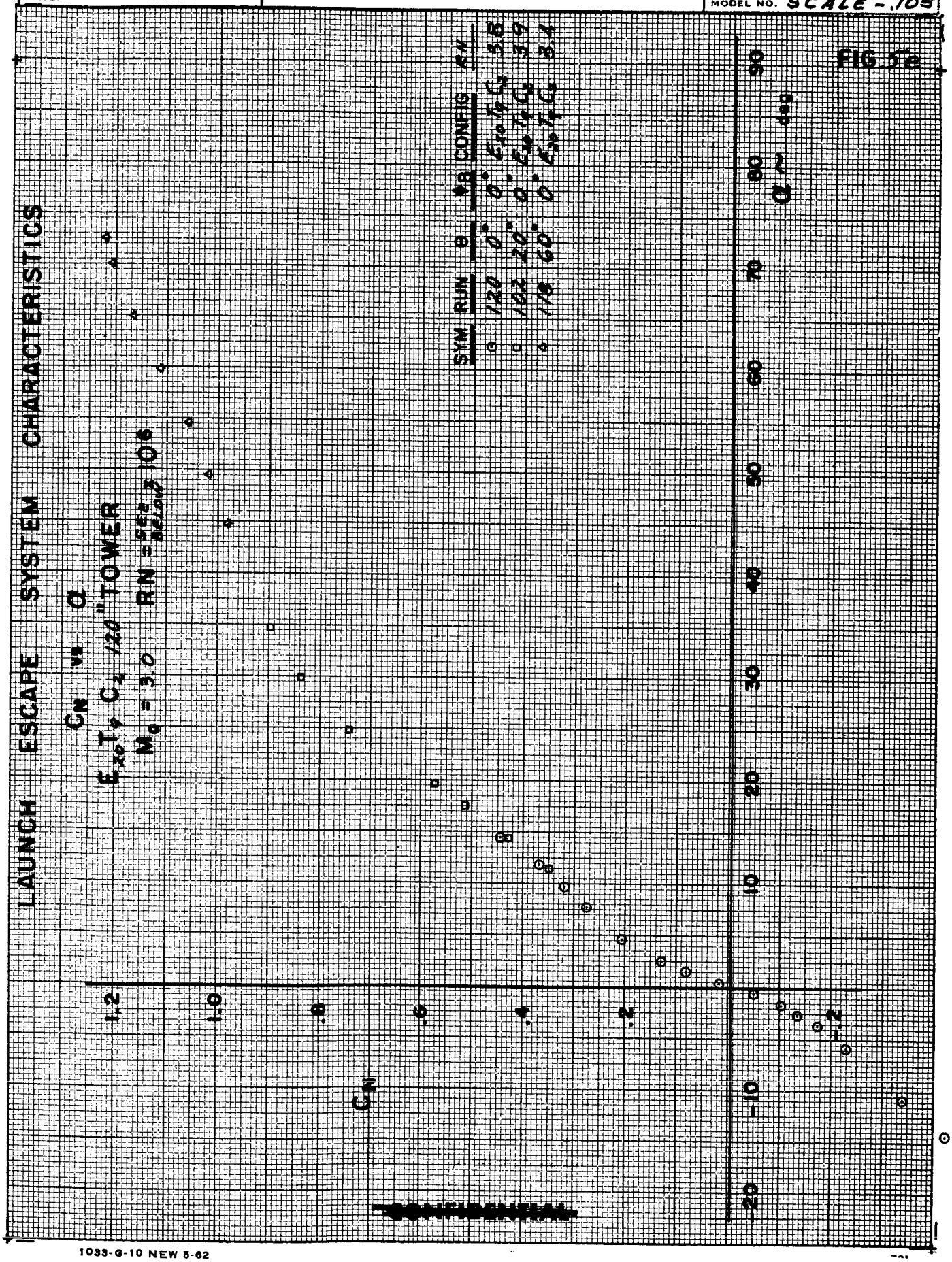
1033-G-11 NEW 5-62

FORM M-113-N2- (REV. 3-61)

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION [redacted]	PAGE NO. B-38 OF
CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES - 106	MODEL NO. APOLLO-FS-2 SCALE - .105



[redacted]

1033-G-10 NEW 5-62

FORM M-113-N2- (REV. 3-61)

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION ~~CONFIDENTIAL~~	PAGE NO. B-39 OF
CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO - FS-2 MODEL NO. SCALE - .105

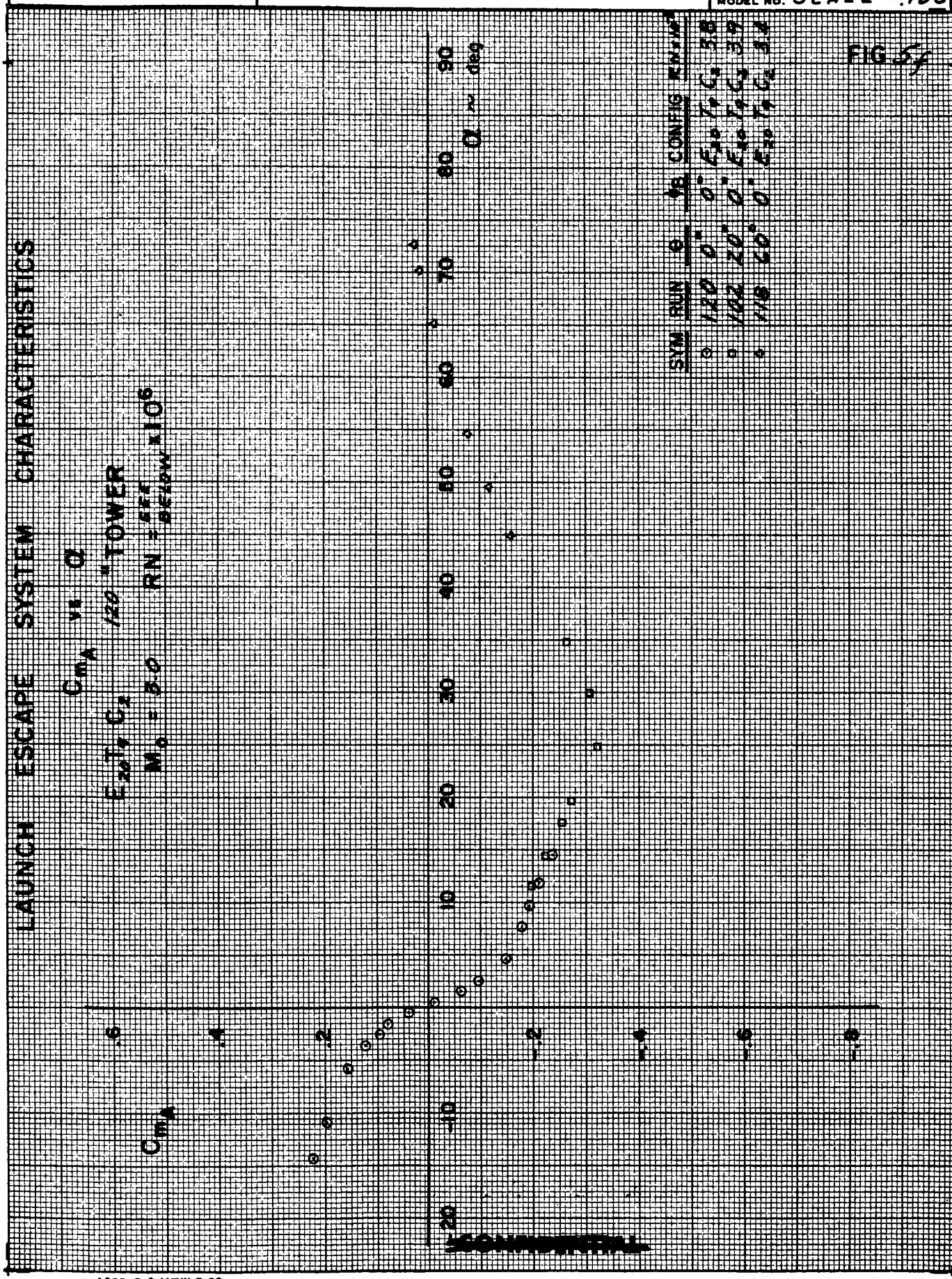


FIG 5f

C_{m_A} vs α

FORM M-113-N2- (REV. 3-61)

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CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO - FS-2 MODEL NO. SCALE - .105

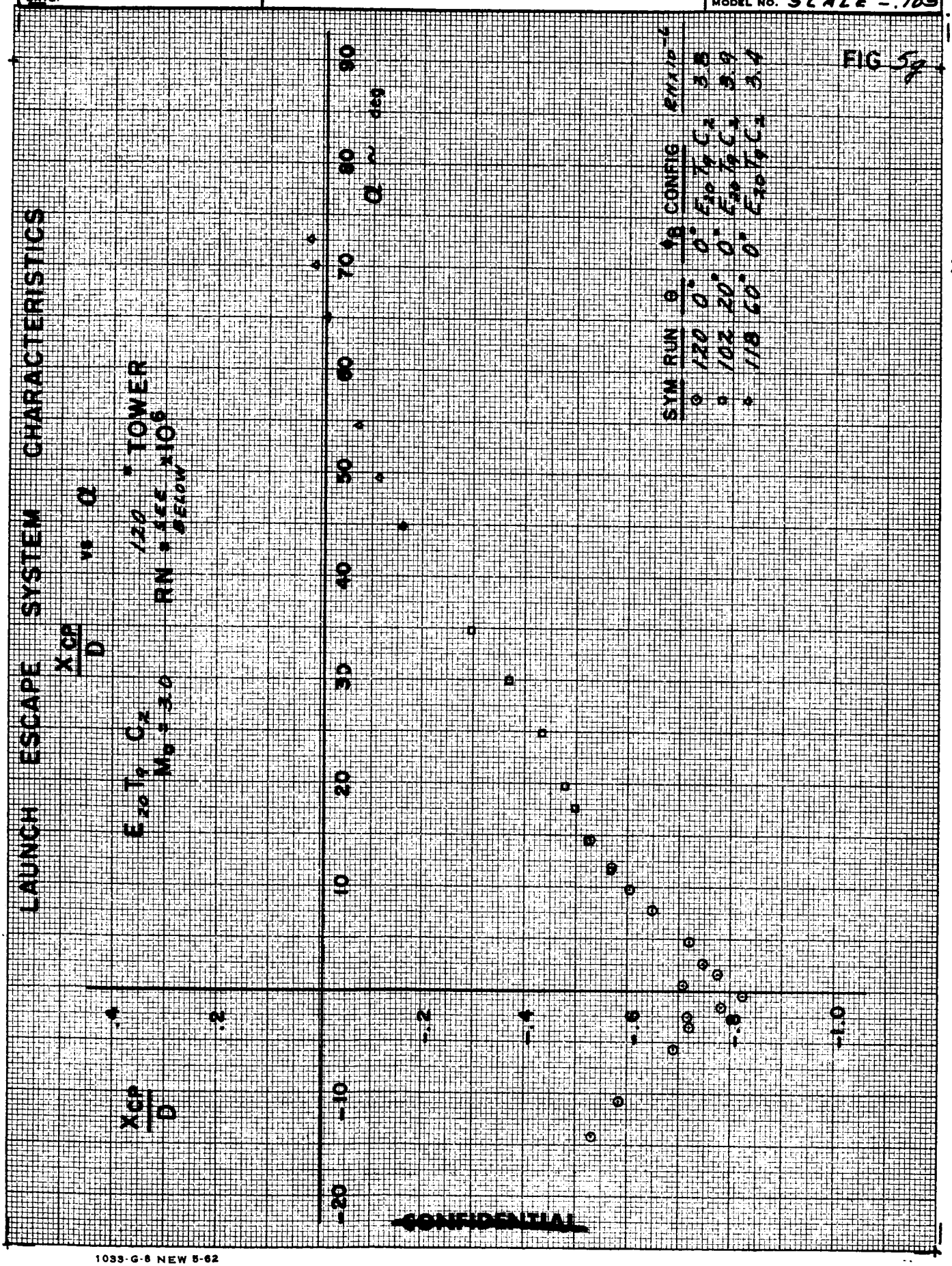

FIG 5g

1033-G-8 NEW 5-62

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION ~~CONFIDENTIAL~~	PAGE NO. B-41 OF
CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO-FS-2 MODEL NO. SCALE-.105

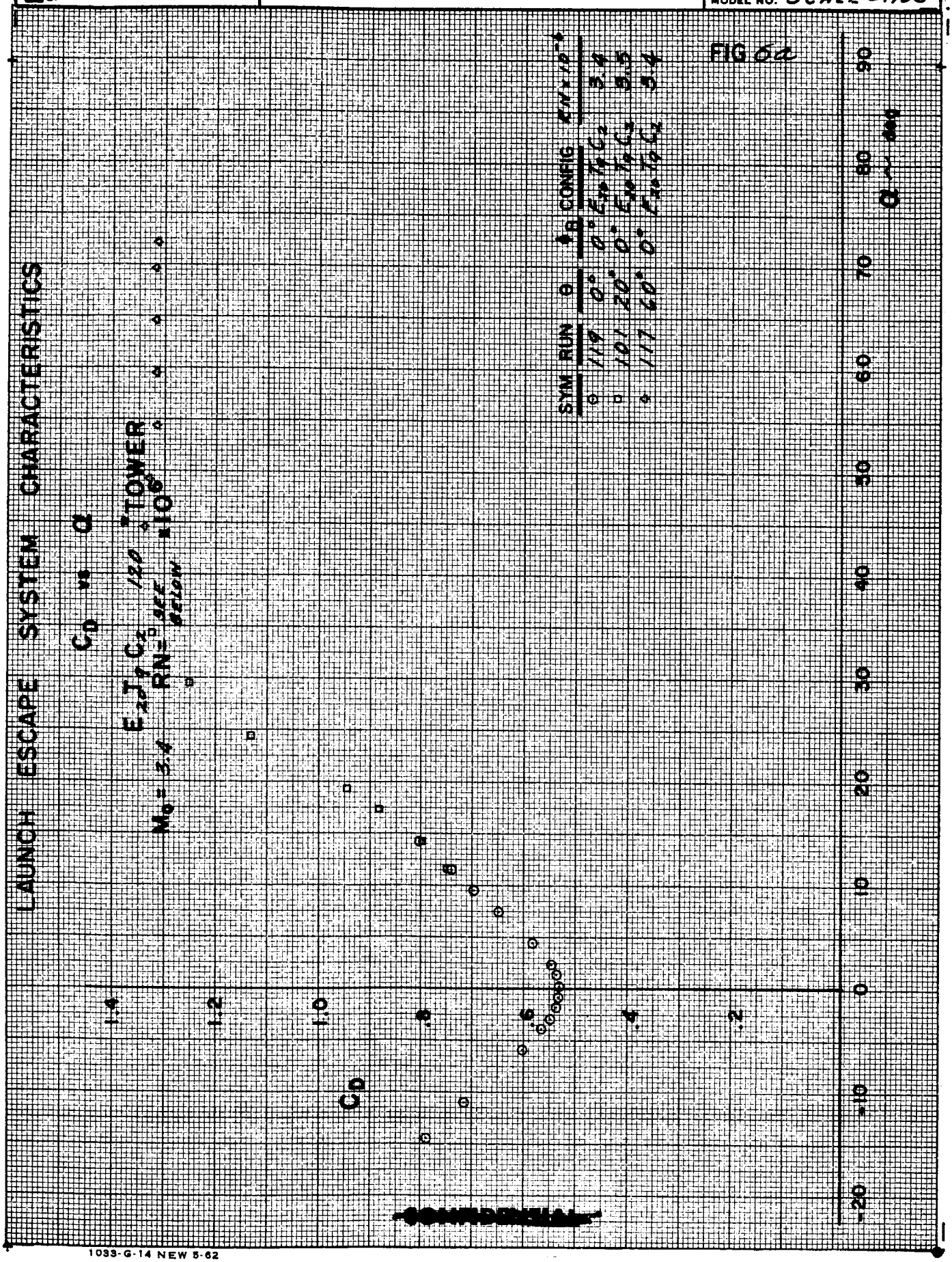

FIG 6a

C_D vs α

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1033-G-14 NEW 5-62

FORM M-113-N2

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CHECKED BY: JKK		REPORT NO. SID-62-936
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FIG 66

C_L vs α

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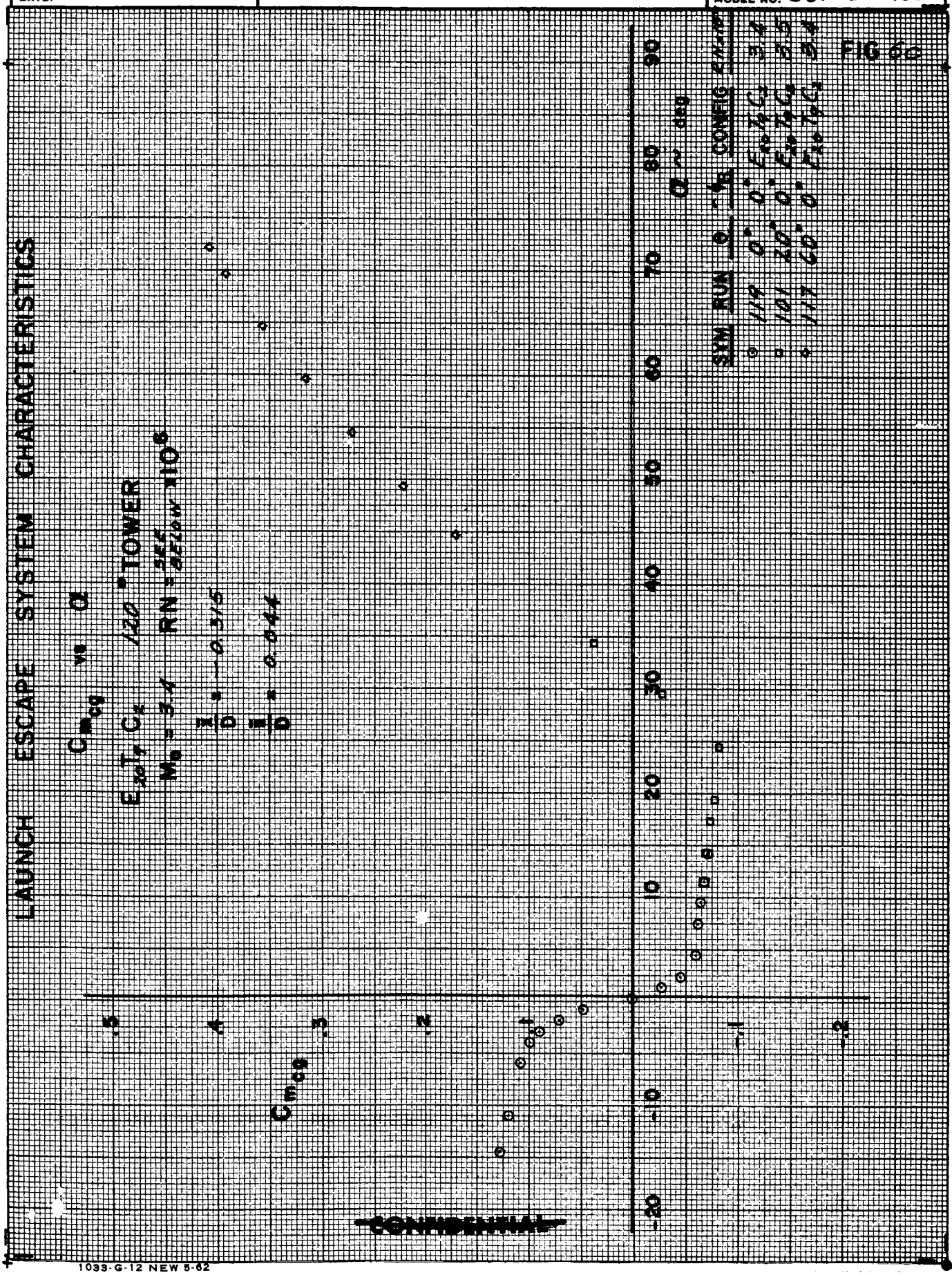
FORM M-113-N2- (REV. 3-61)

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION ~~CONFIDENTIAL~~	PAGE NO. B-43 OF
CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO - FS-2 MODEL NO. SCALE - .105



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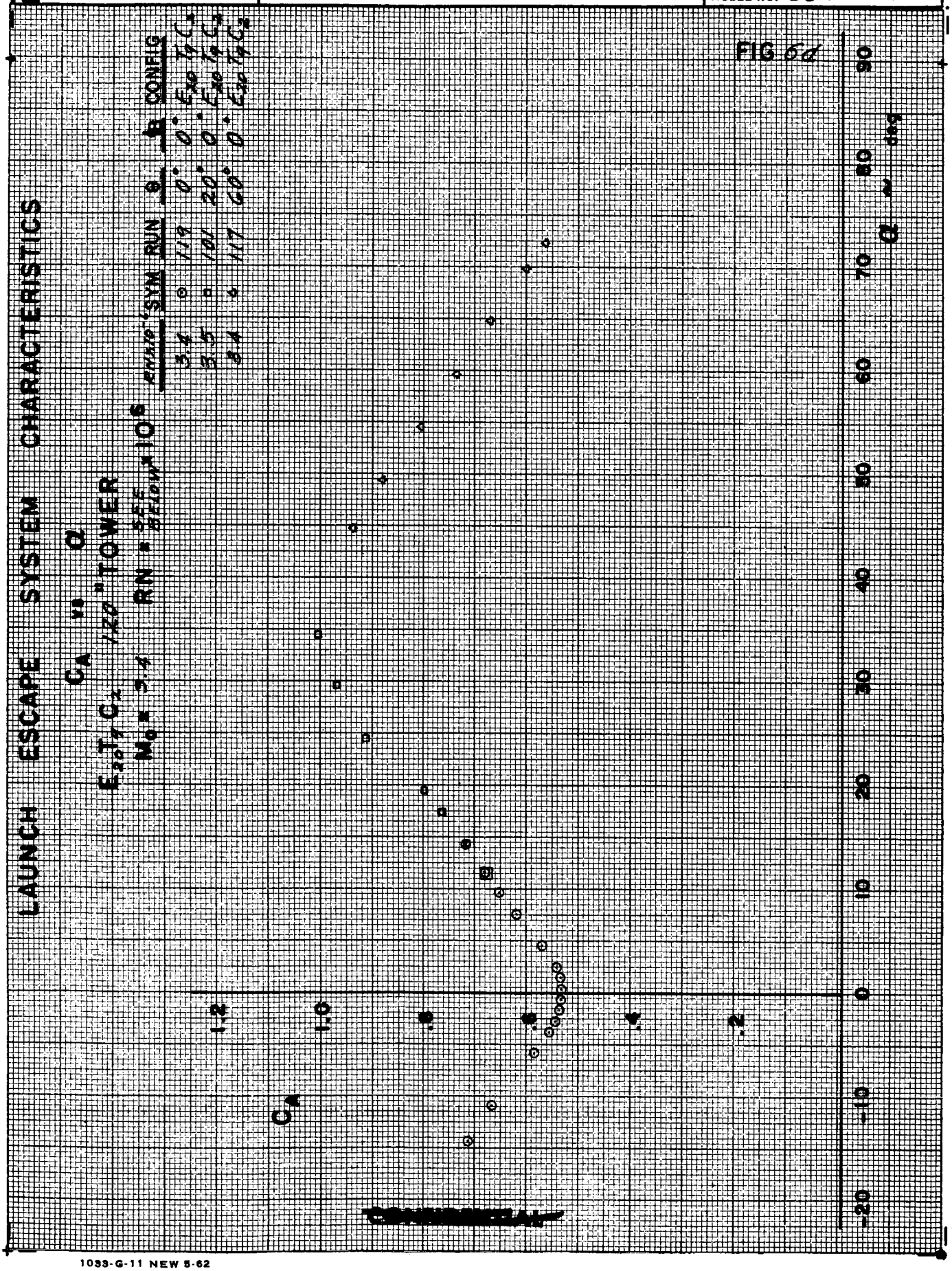
1033-G-12 NEW 5-62

FORM M-113-N2- (REV. 3-61)

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION	PAGE NO. B-44 OF
CHECKED BY: JKK	~~CONFIDENTIAL~~	REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO - FS-2 MODEL NO. SCALE - .106



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1033-G-11 NEW 5-62

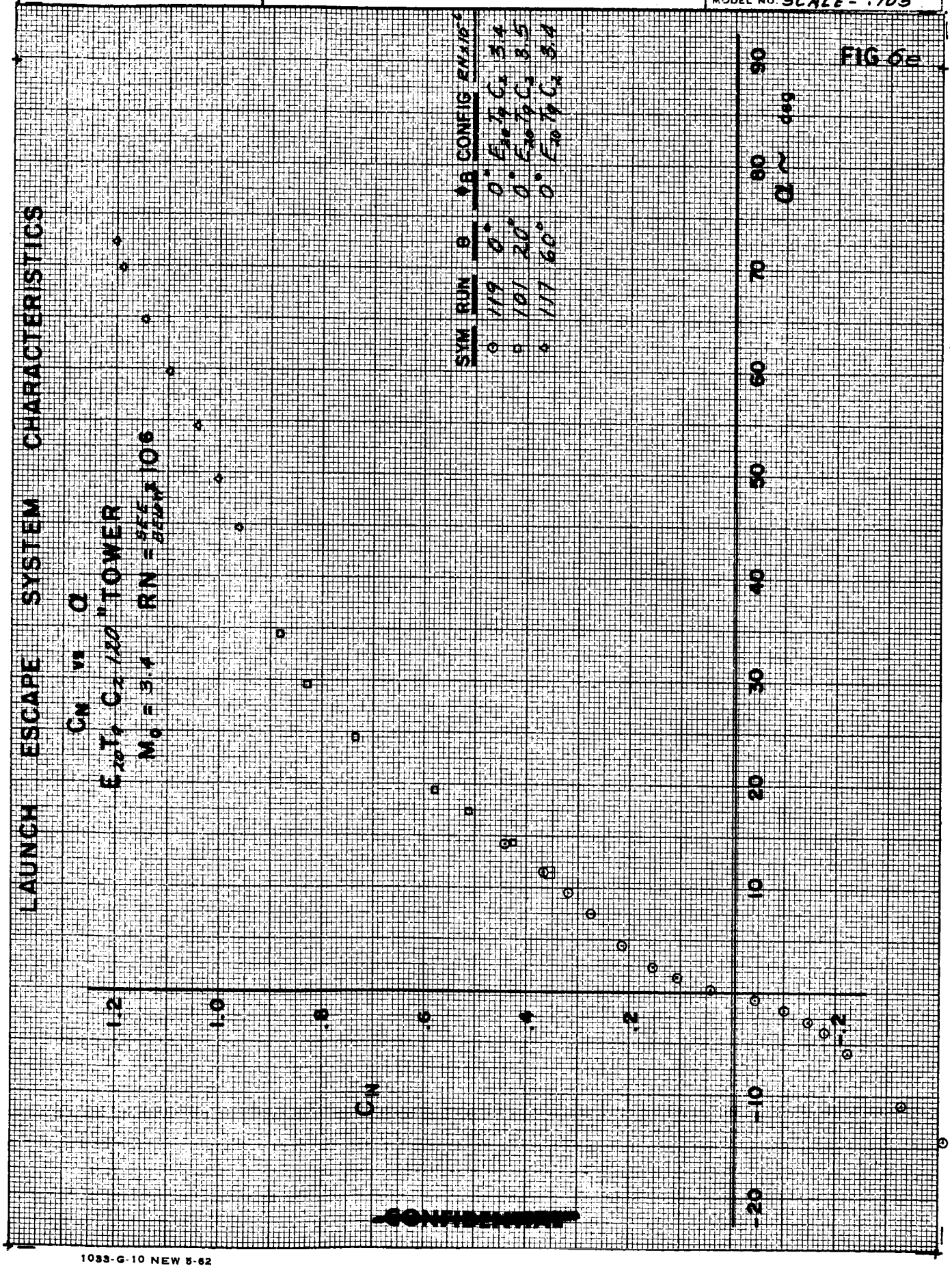

FIG 6e

C_N vs α

FORM M-113-N2- (REV. 3-61)

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION ~~CONFIDENTIAL~~	PAGE NO. B-46 OF
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DATE:	AMES - 106	APOLLO - FS-2 MODEL NO. SCALE - .105

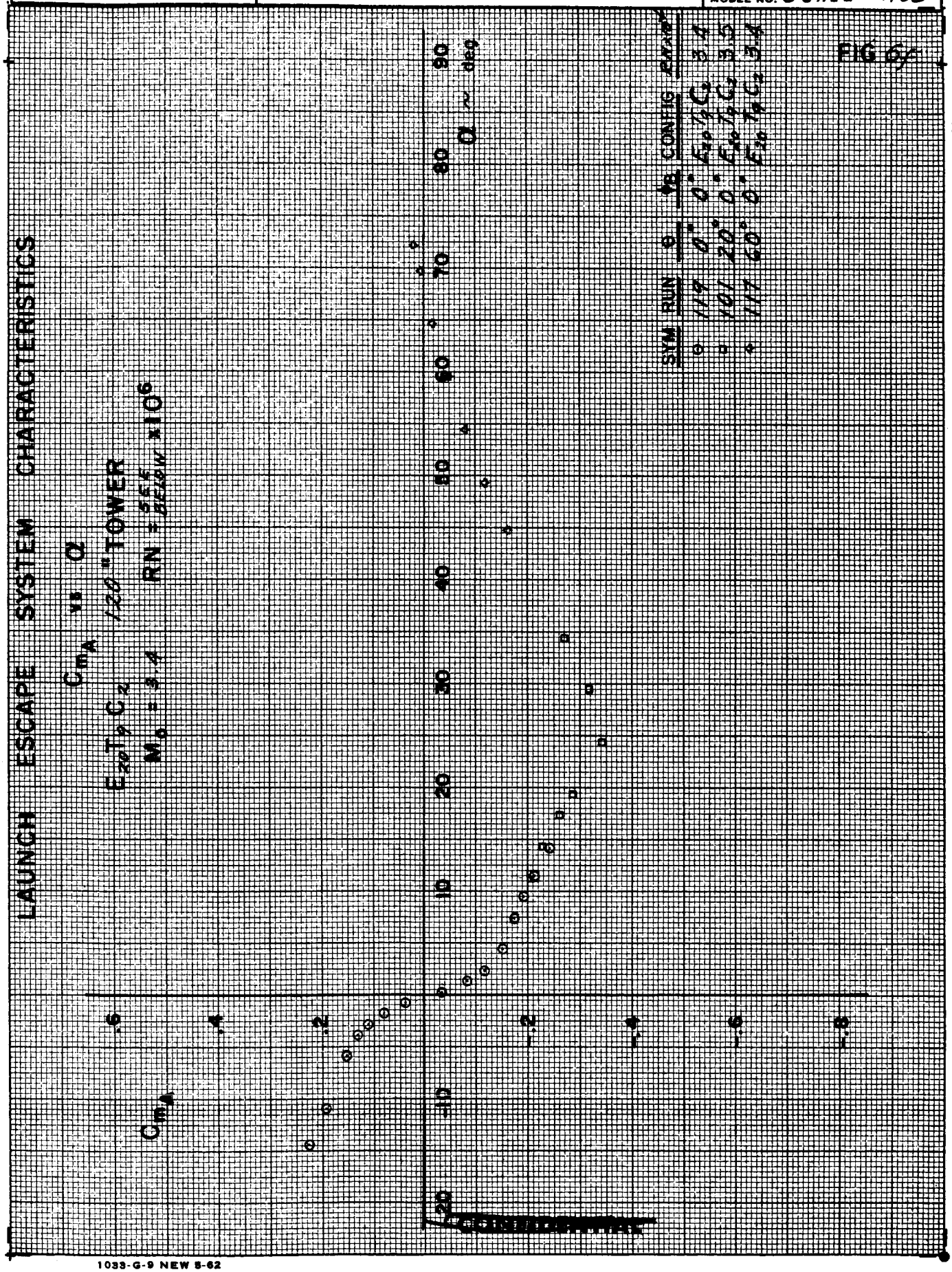

FIG 6f

C_{m_A} vs α

1033-G-9 NEW 5-62

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REPORT NO. SID-62-936

MODEL NO. APOLLO-FS-2 SCALE - .105

LAUNCH ESCAPE SYSTEM CHARACTERISTICS

$\frac{X_{CP}}{D}$ vs α

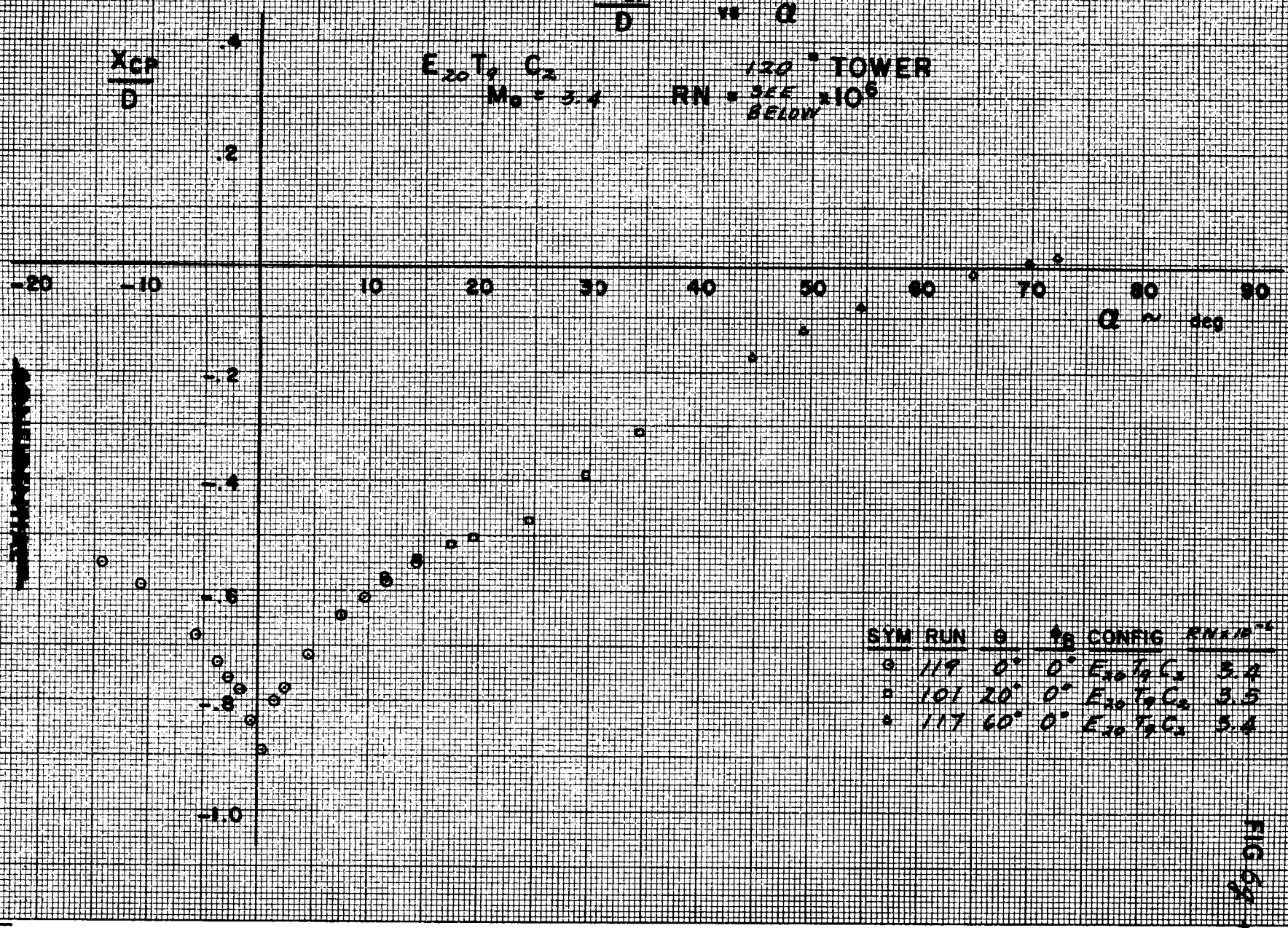
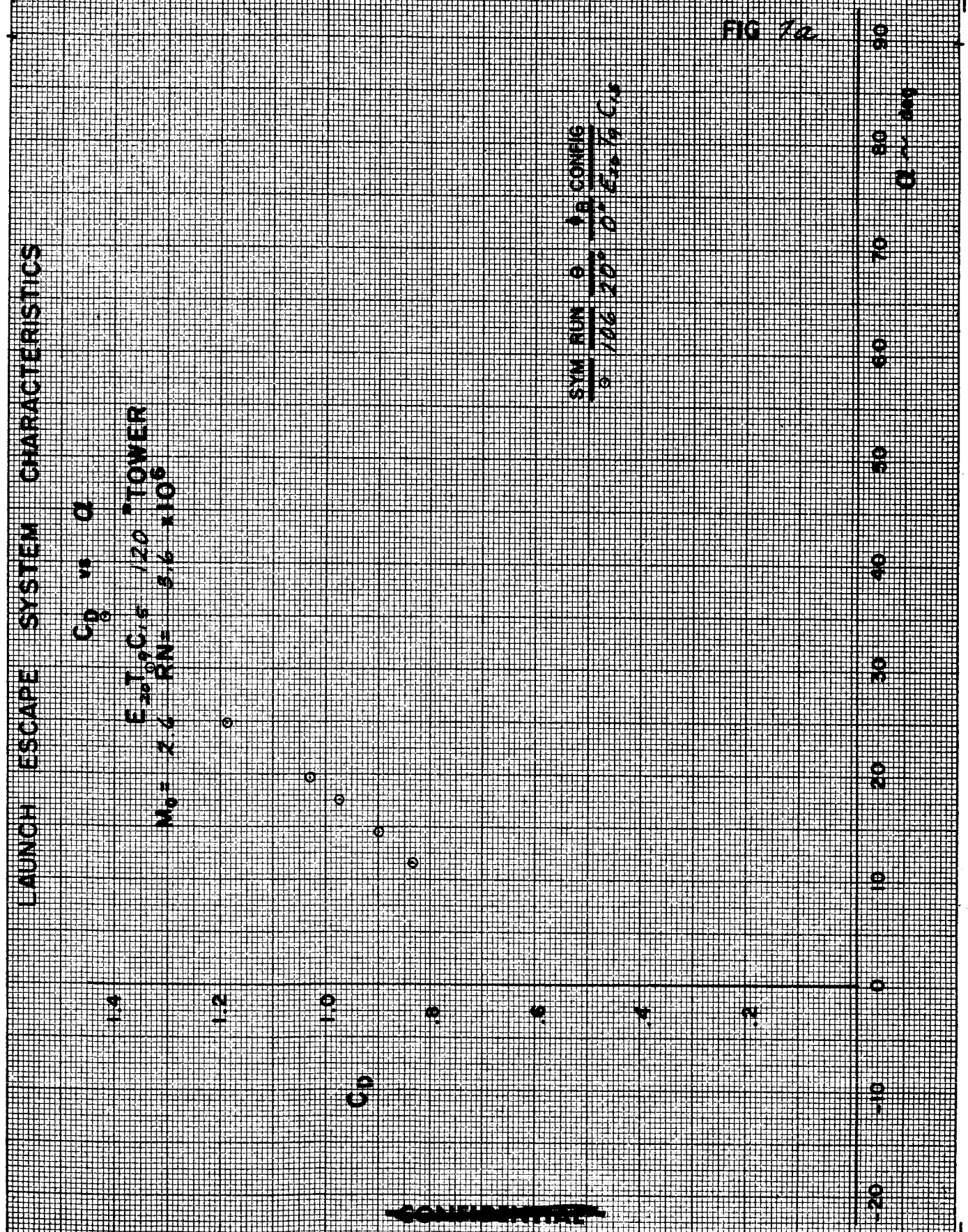


FIG 6

$\frac{X_{CP}}{D}$ vs α

FIG 7a



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FORM M-113-N2- (REV. 3-61)

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CHECKED BY: JKK	[redacted]	REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO - FS-2 MODEL NO. SCALE - .105

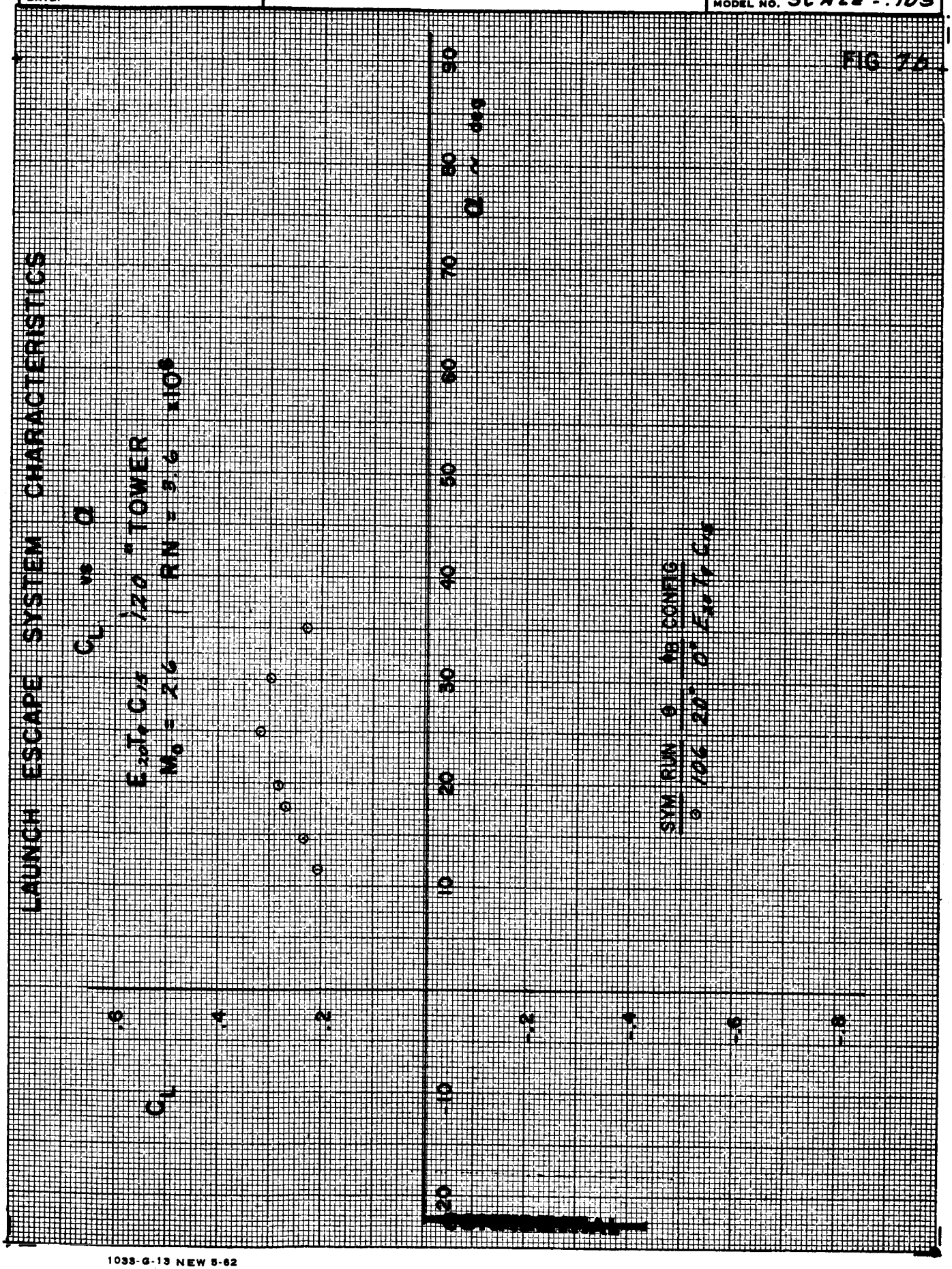

FIG 7b

C_L vs α

1033-G-13 NEW 5-62

FORM M-113-N2- (REV. 3-61)

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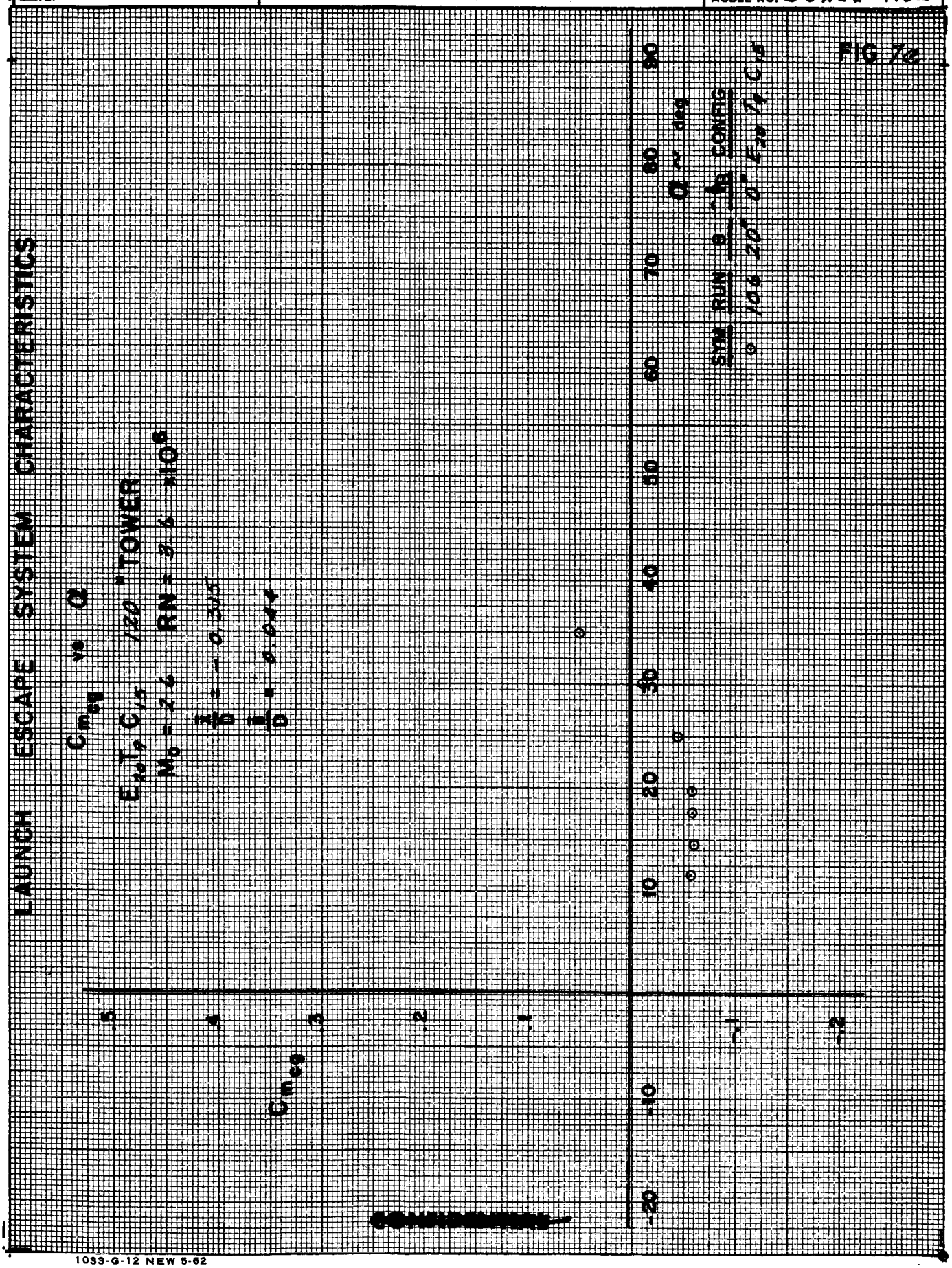
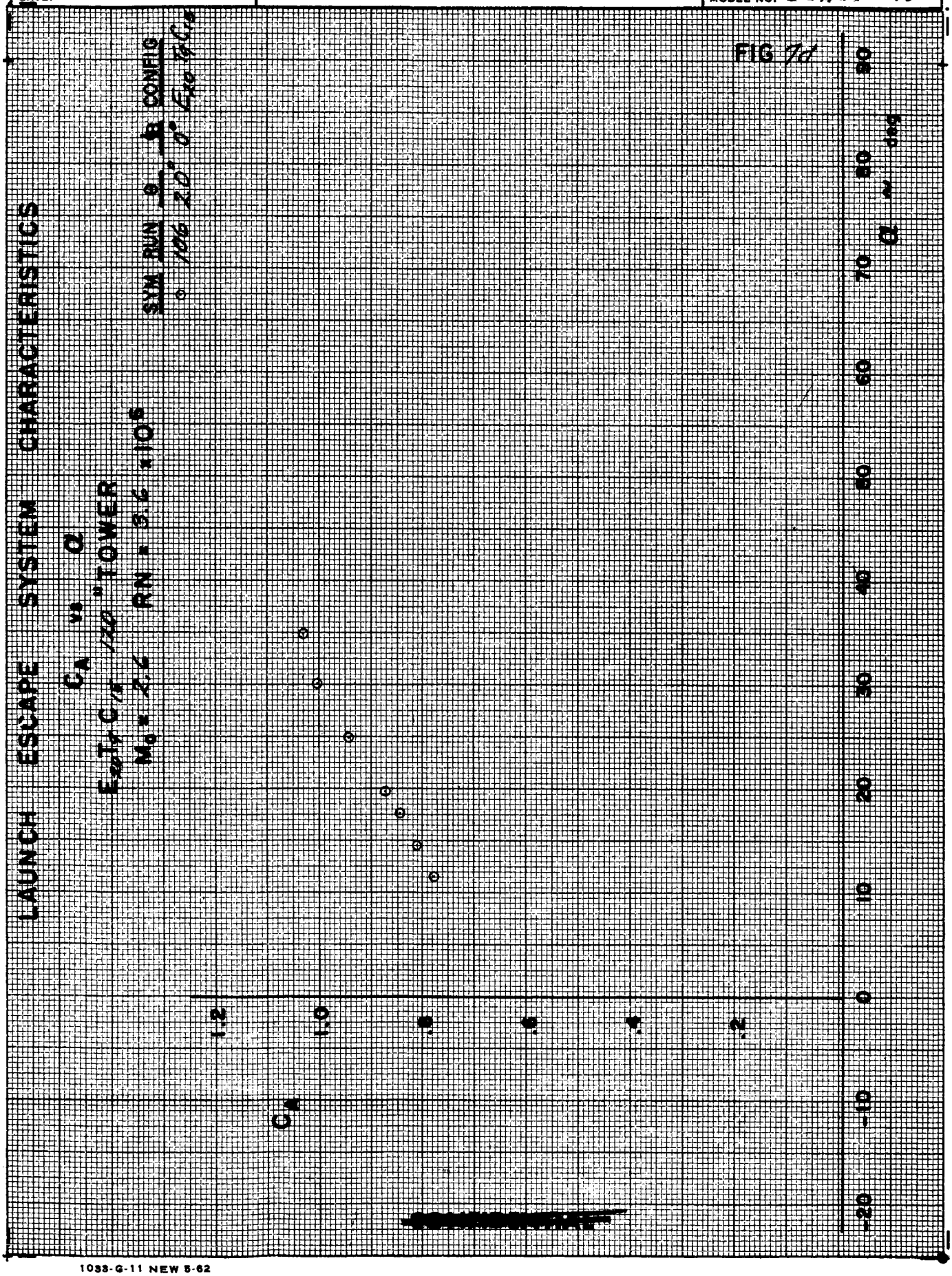
DATE:	AMES - 106	APOLLO - FS-2 MODEL NO. SCALE - .105





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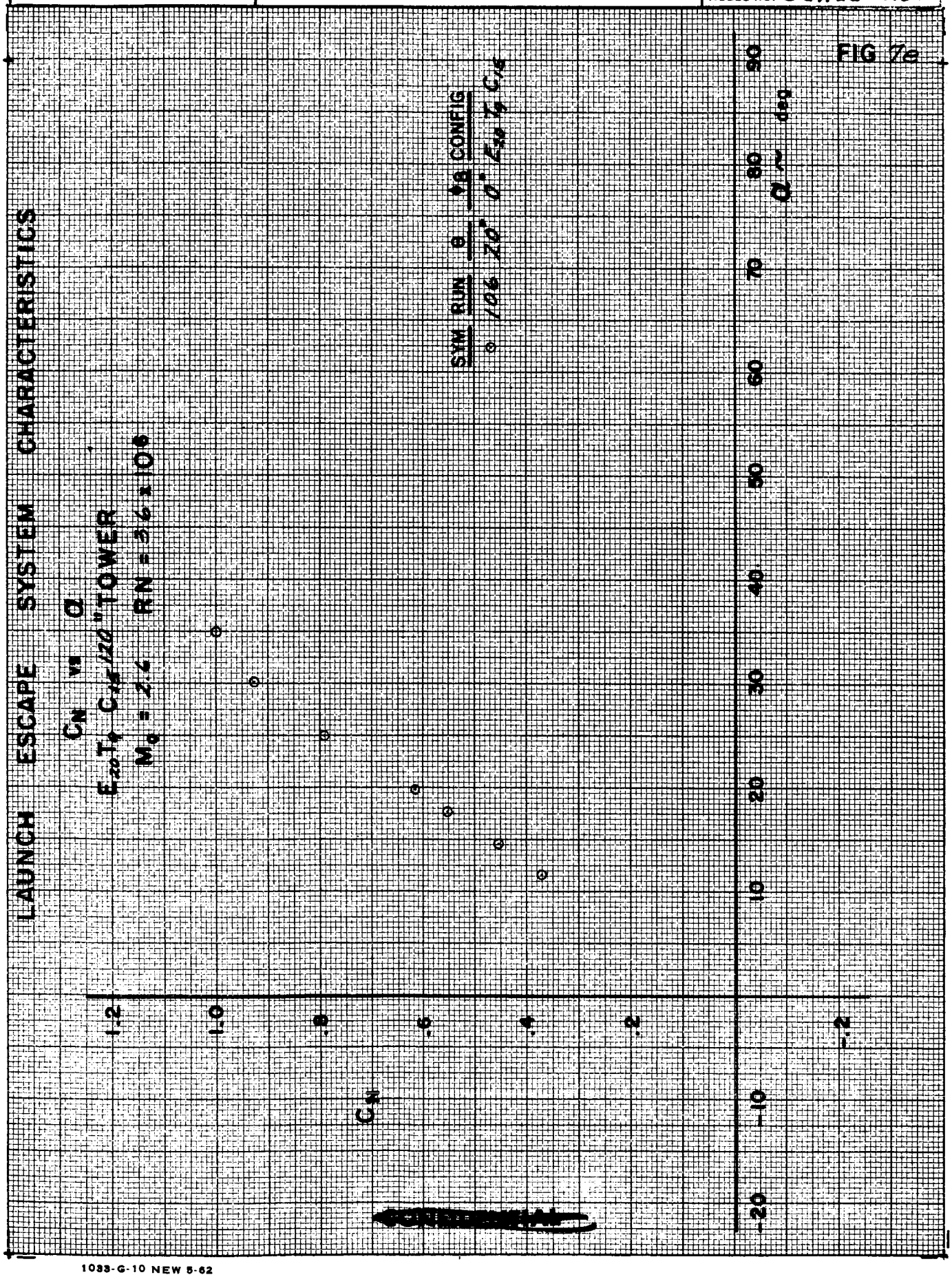

FIG 7a

C_N vs α

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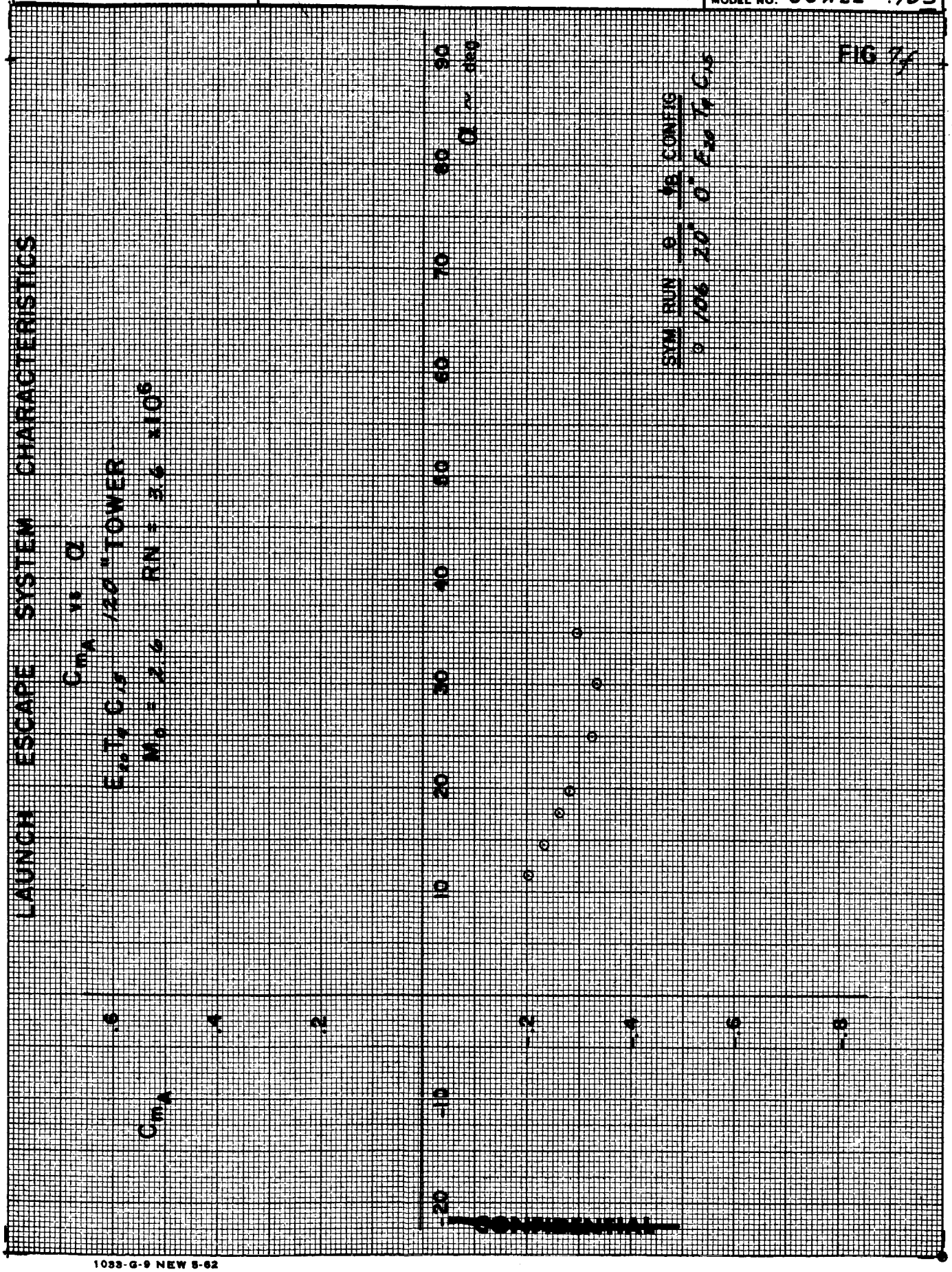
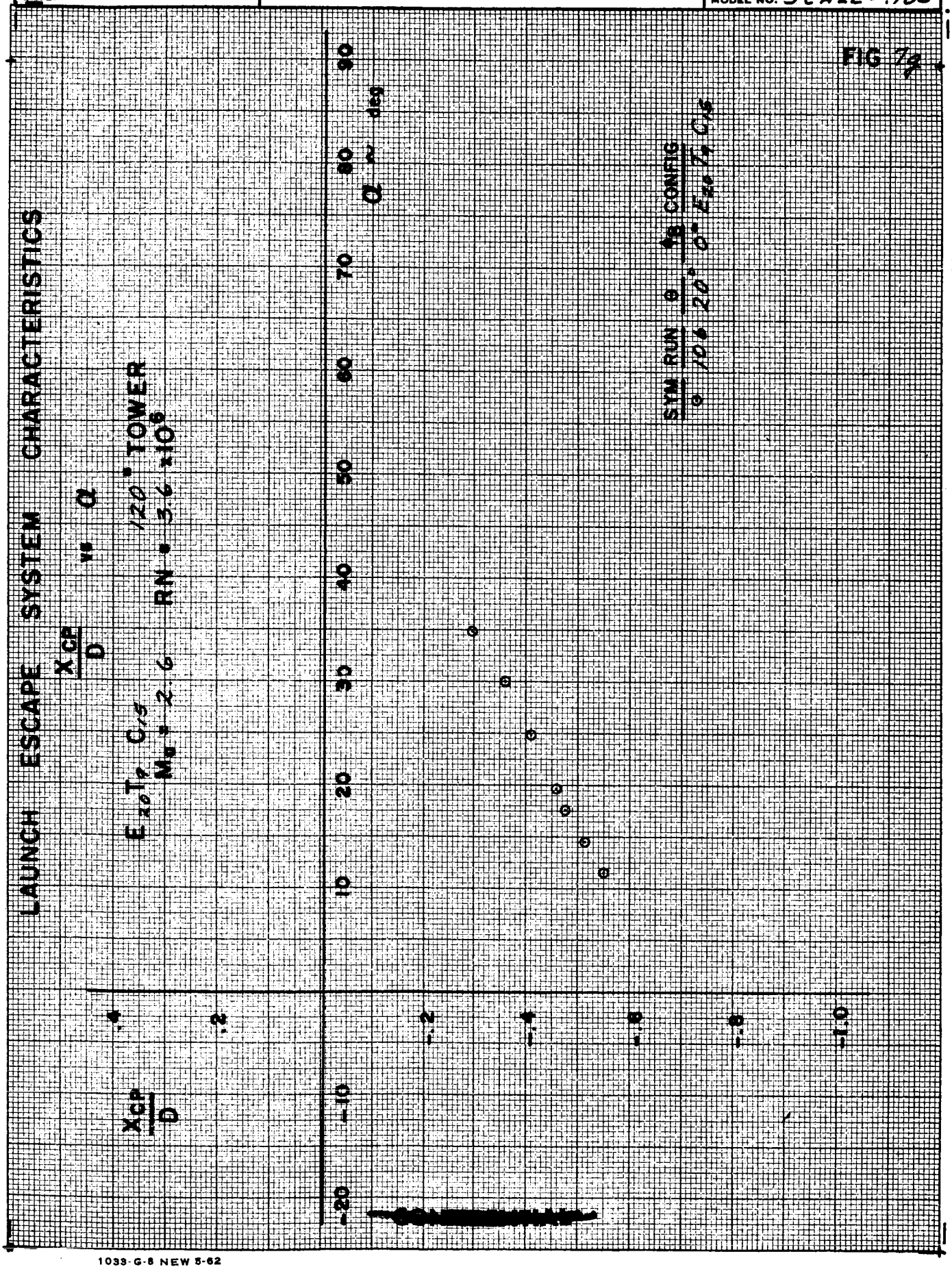
CHECKED BY: JKK	~~CONFIDENTIAL~~	REPORT NO. 31D-62-936
DATE:	AMES - 106	APOLLO - FS-2 MODEL NO. SCALE - .105

FIG 7



C_{m_A} vs α

FIG 7a



$\frac{X_{CP}}{D}$ vs α

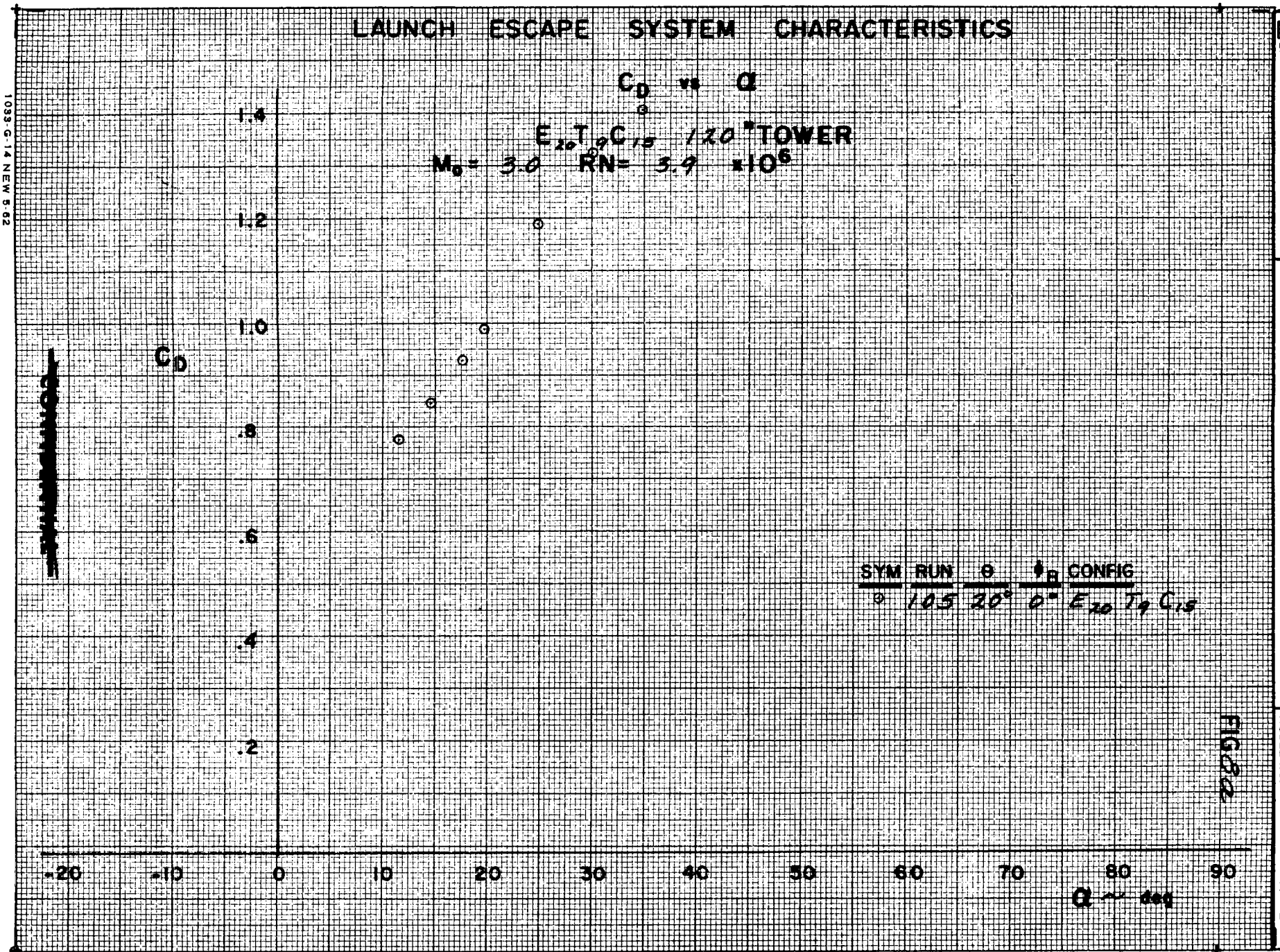


FIG 22

C_D vs α

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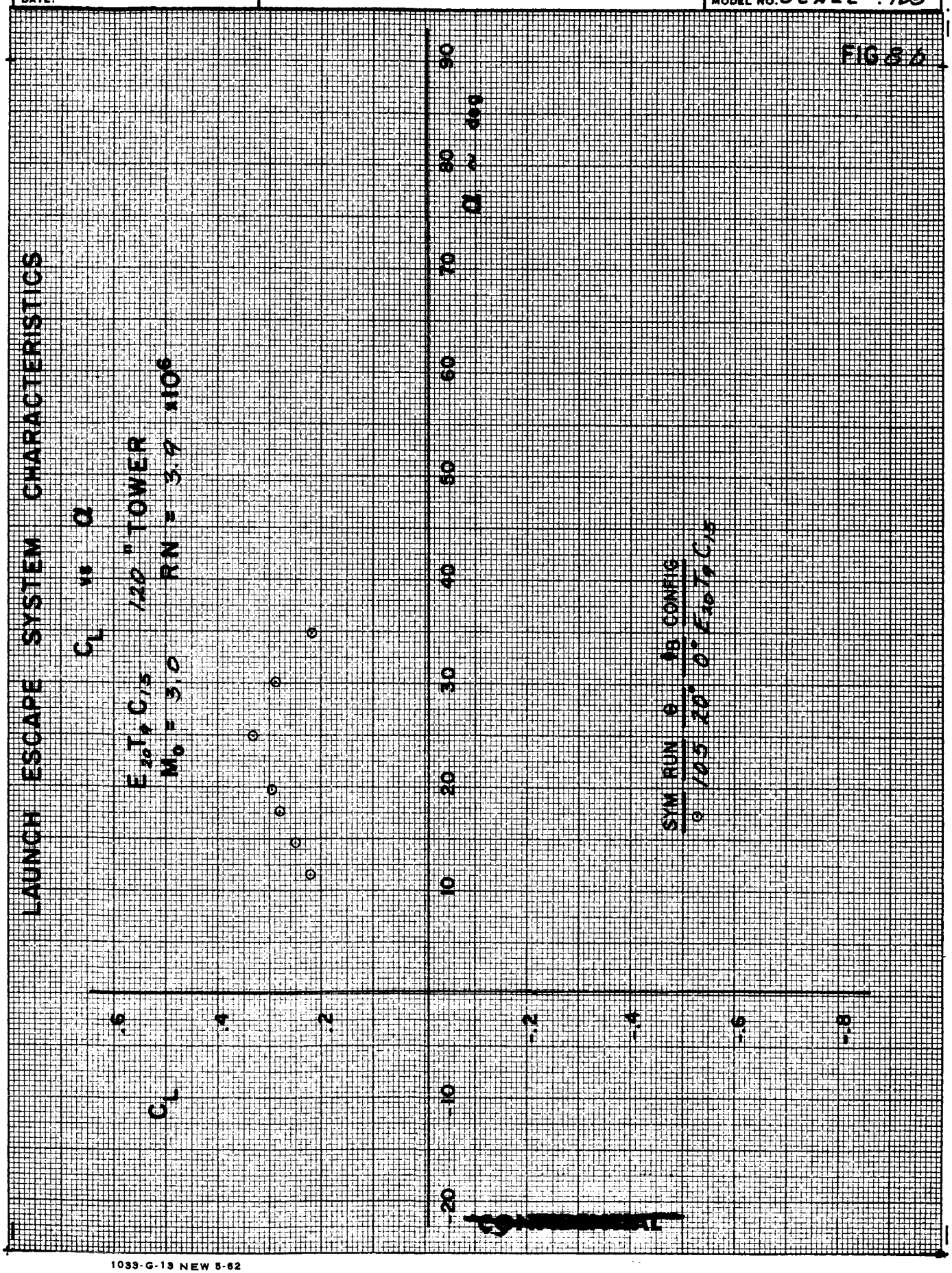

FIG 8b

C_L vs α

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1033-G-13 NEW 5-62

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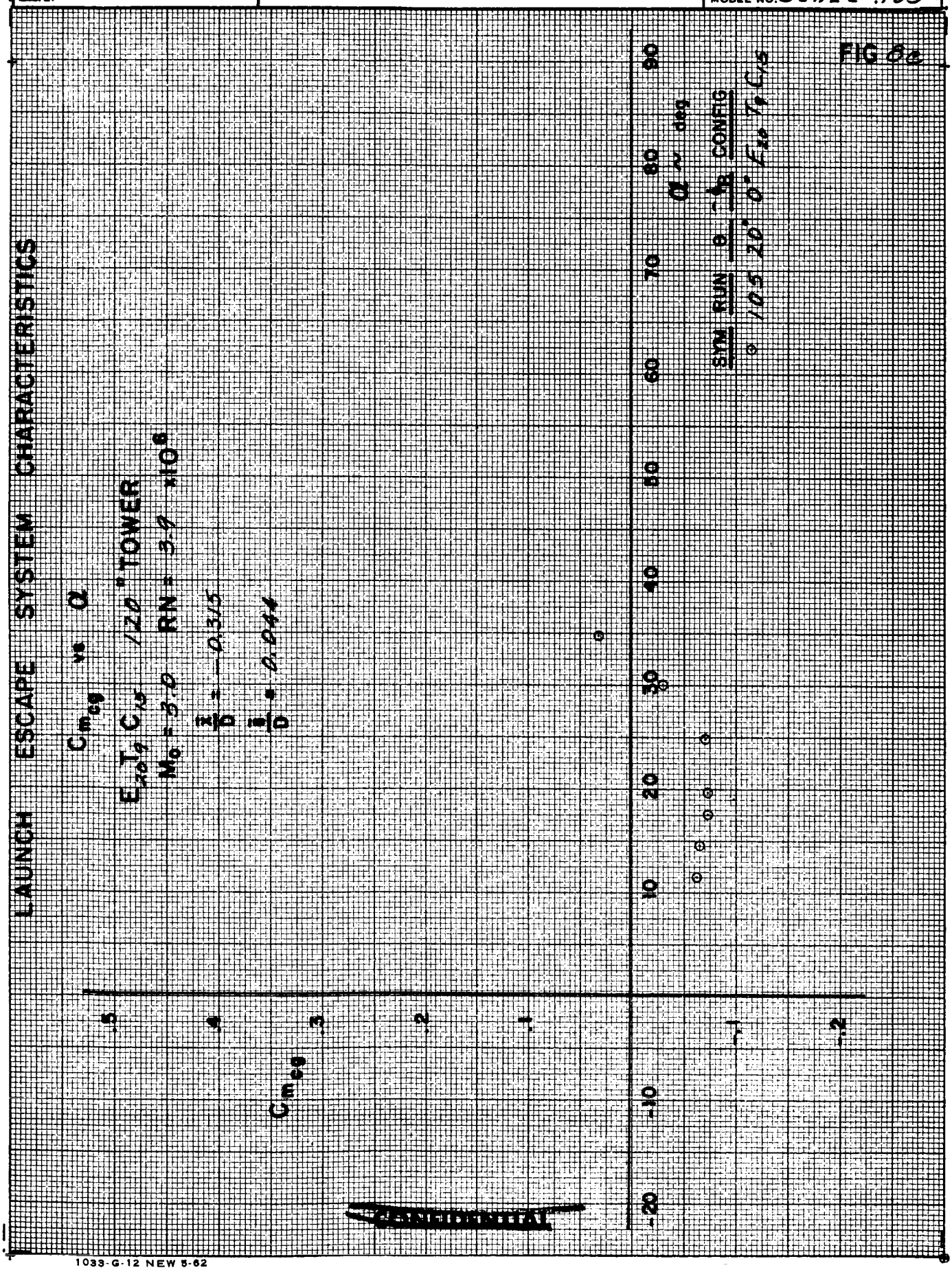

FIG 8e

$C_{m_{cg}}$ vs α

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1033-G-12 NEW 5-62

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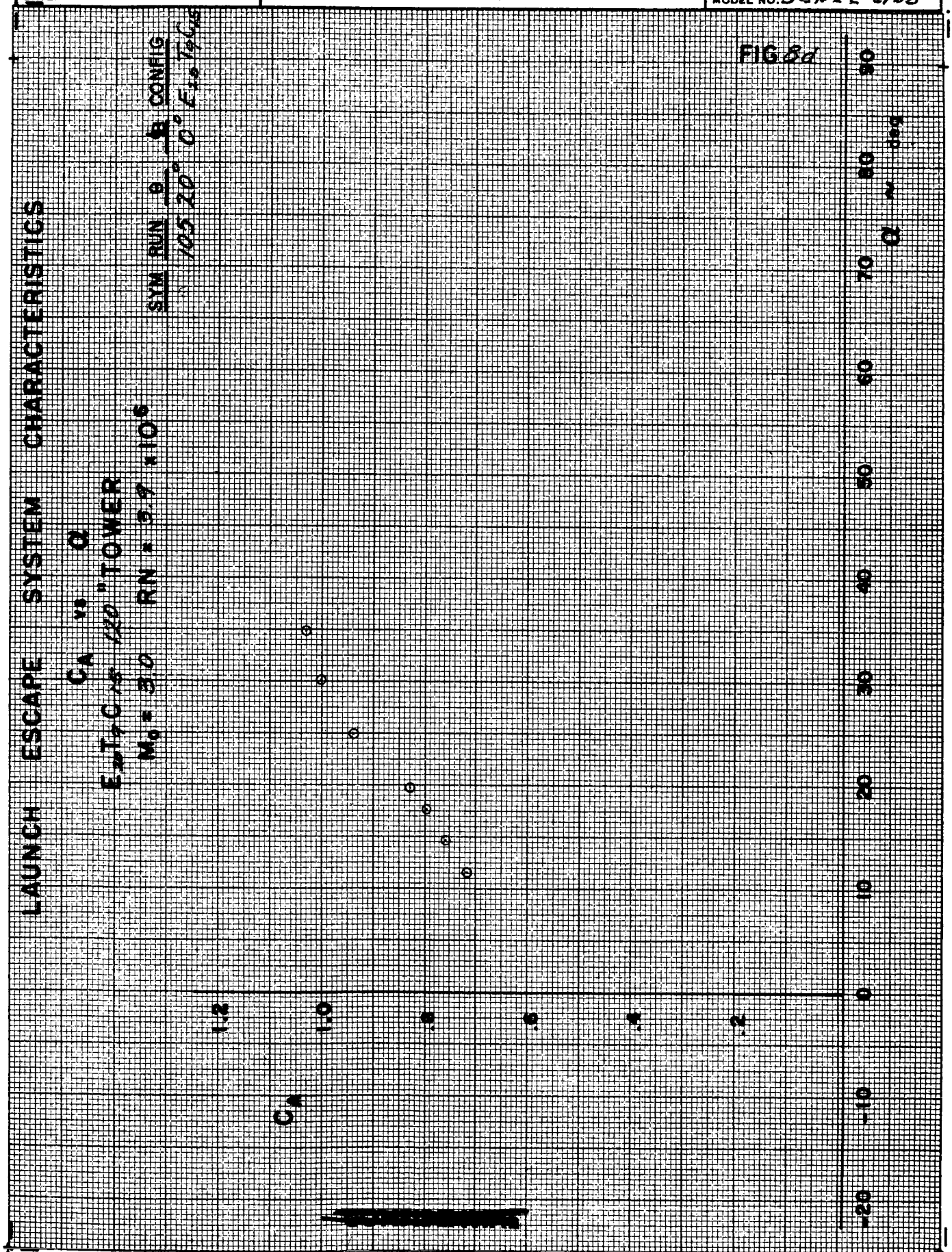
DATE:	AMES - 106	APOLLO-FS-2 MODEL NO. SCALE-105



[redacted]

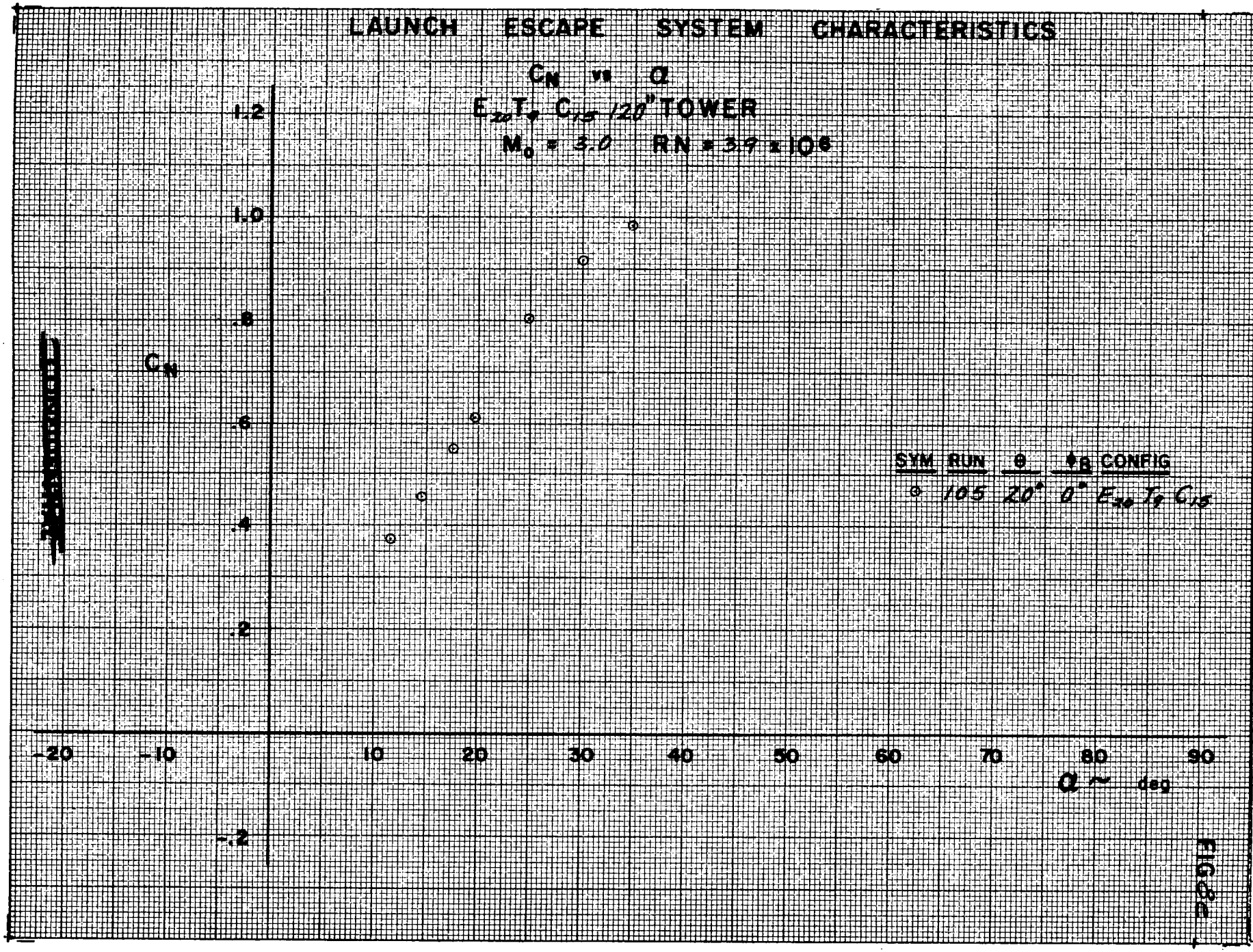


FIG 22

C_N vs α

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SPACE and INFORMATION SYSTEMS DIVISION

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MODEL NO. APOLLO-FS-2

SCALE - .105

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DATE:	AMES - 106	APOLLO-FS-2 MODEL NO. SCALE-.105

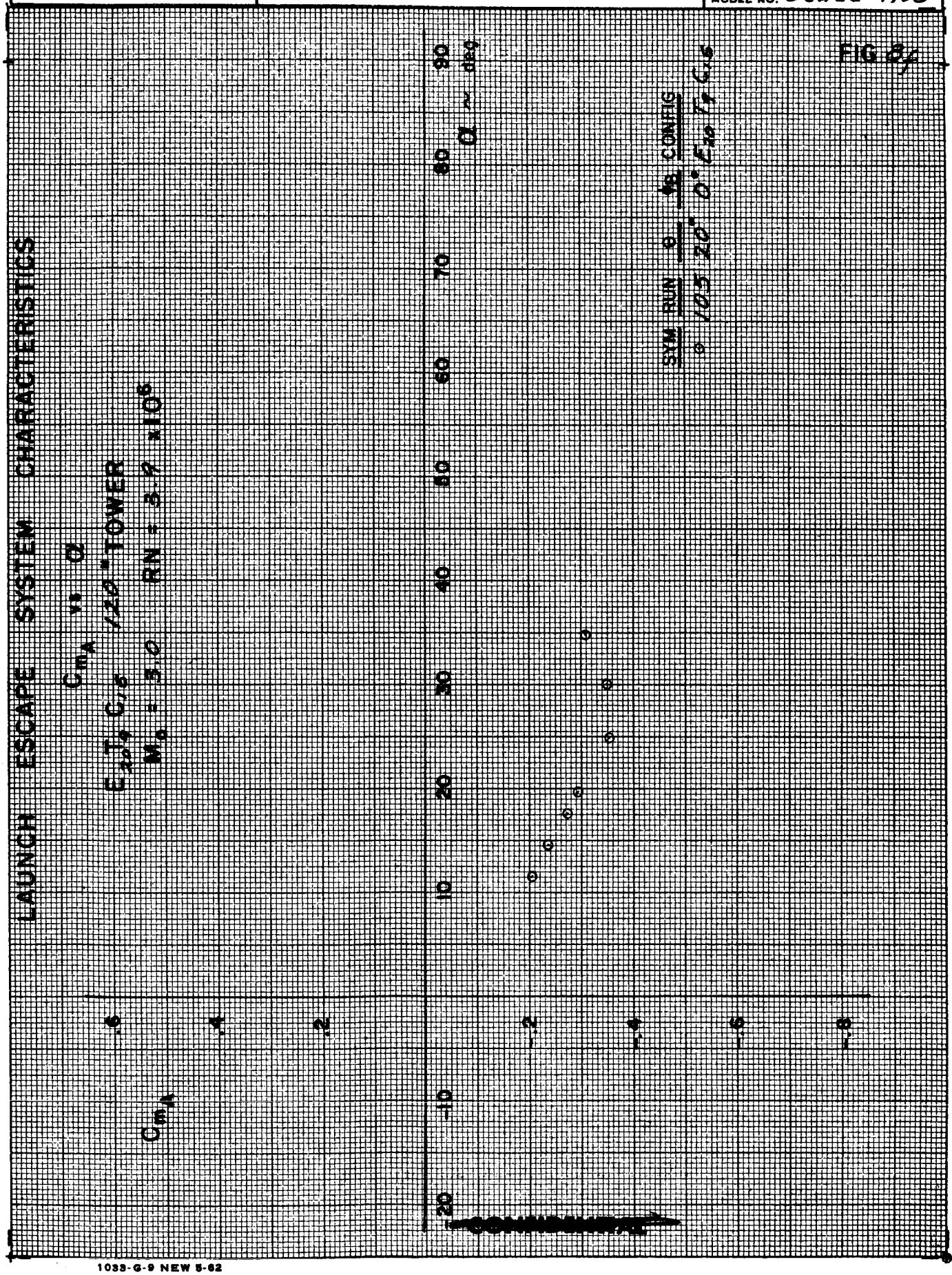

FIG 8f

C_{m_A} vs α

FORM M-113-N2- (REV. 3-61)

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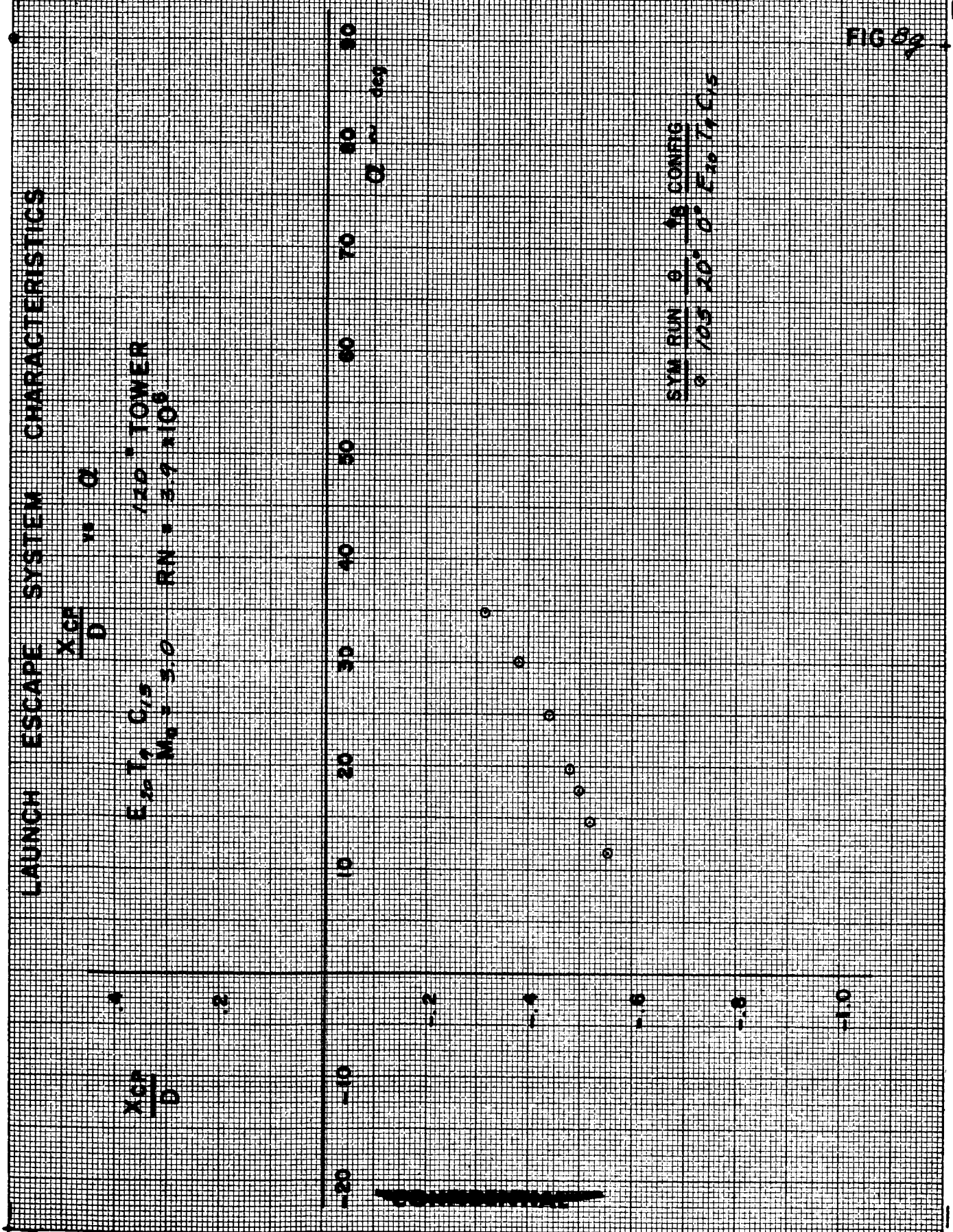
FIG 8g



$\frac{X_{CP}}{D}$ vs α

FORM M-113-N2- (REV. 3-61)

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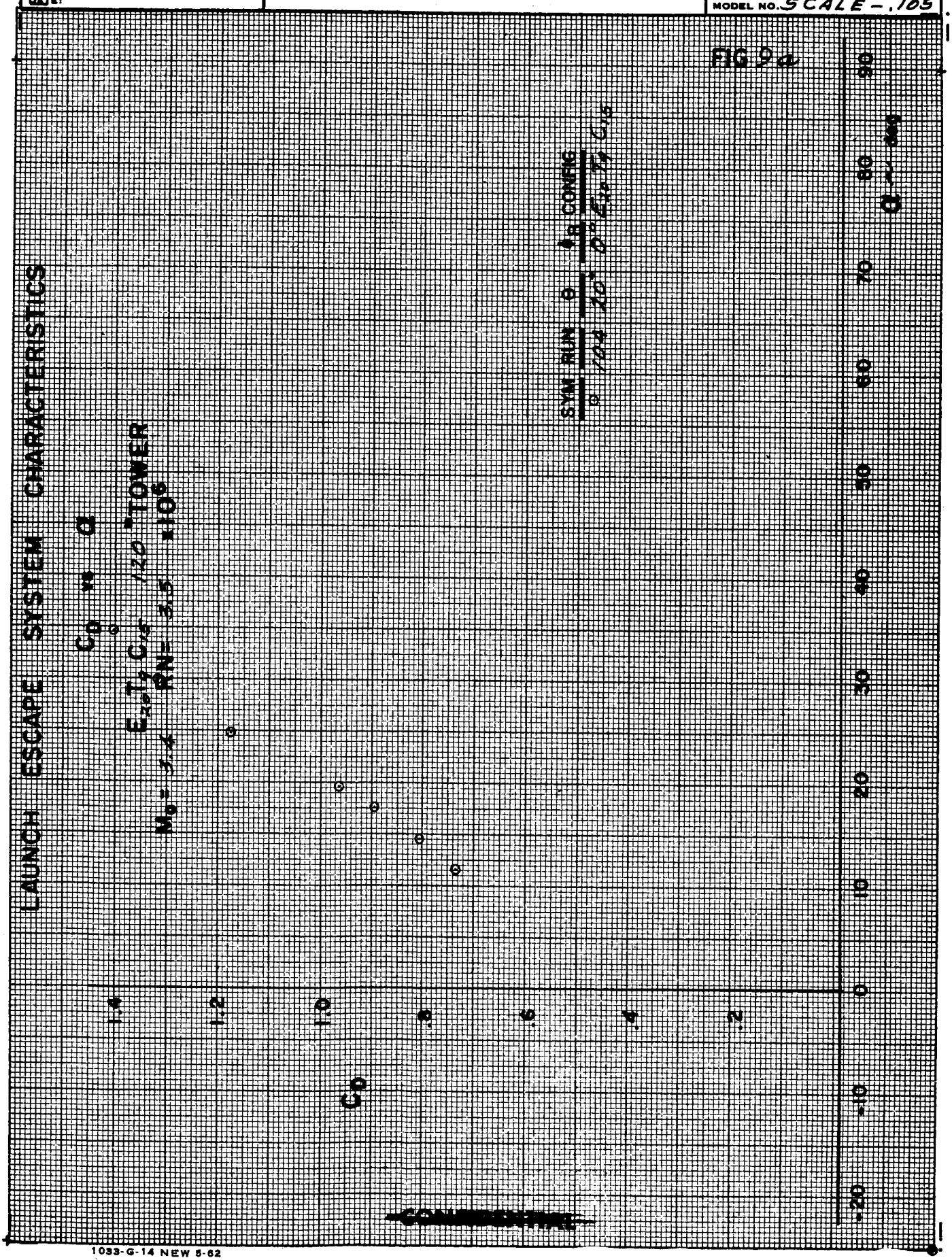
DATE:	AMES - 106	APOLLO-FS-2 MODEL NO. SCALE - .105



1033-G-14 NEW 5-62

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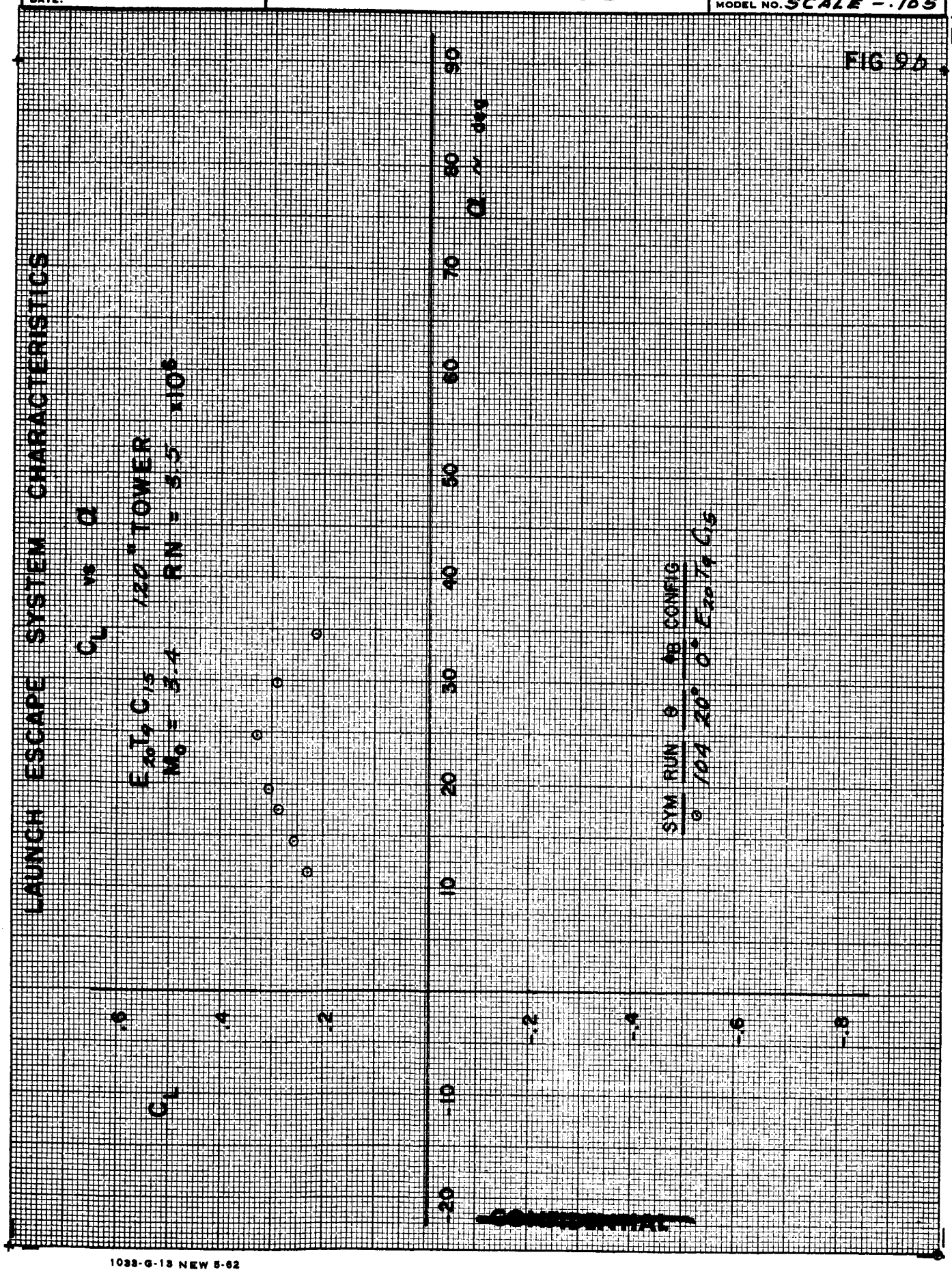

FIG 9b

C_L vs α

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1033-G-13 NEW 5-62

FORM M-113-N2- (REV. 3-61)

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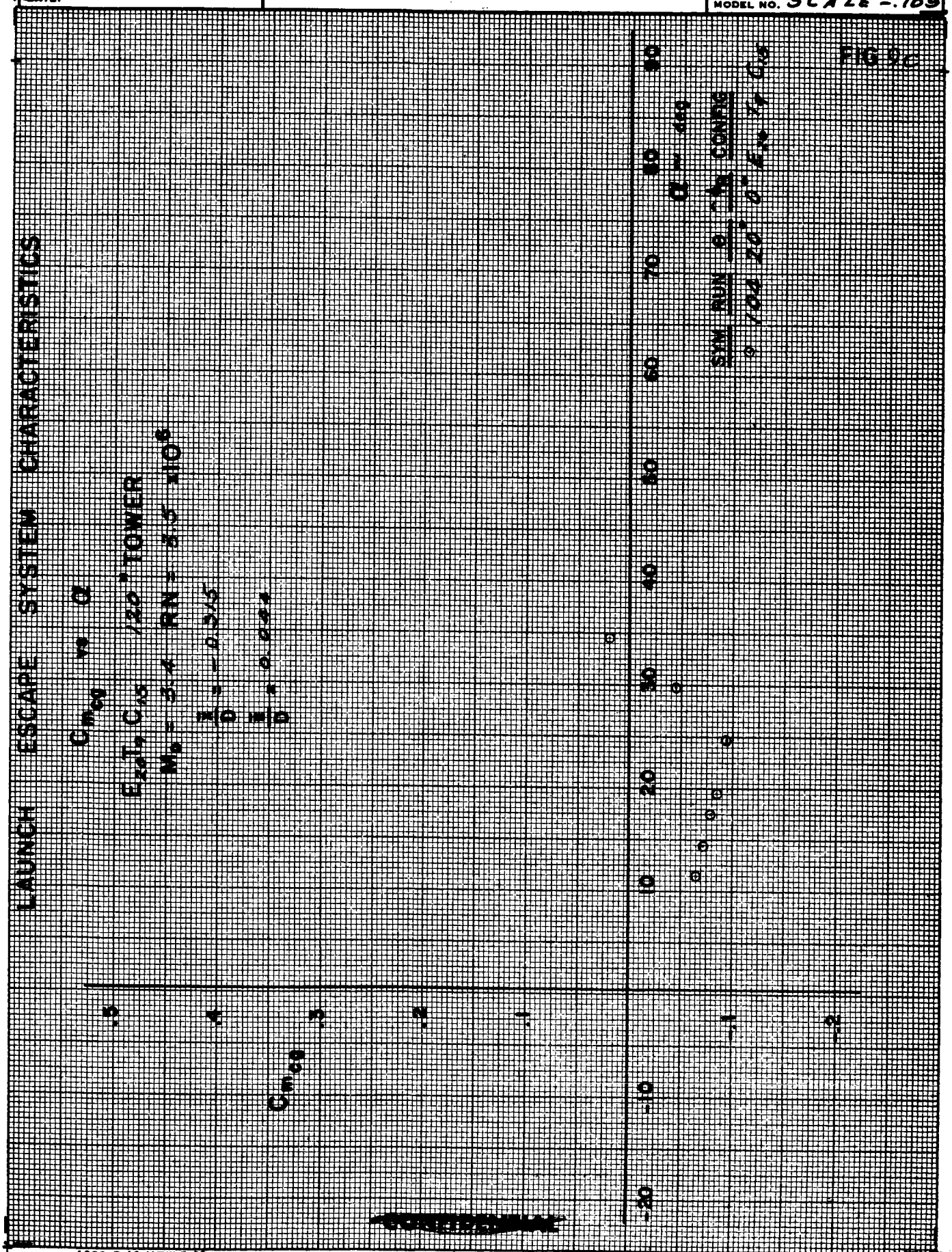

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FORM M-113-N2- (REV. 3-61)

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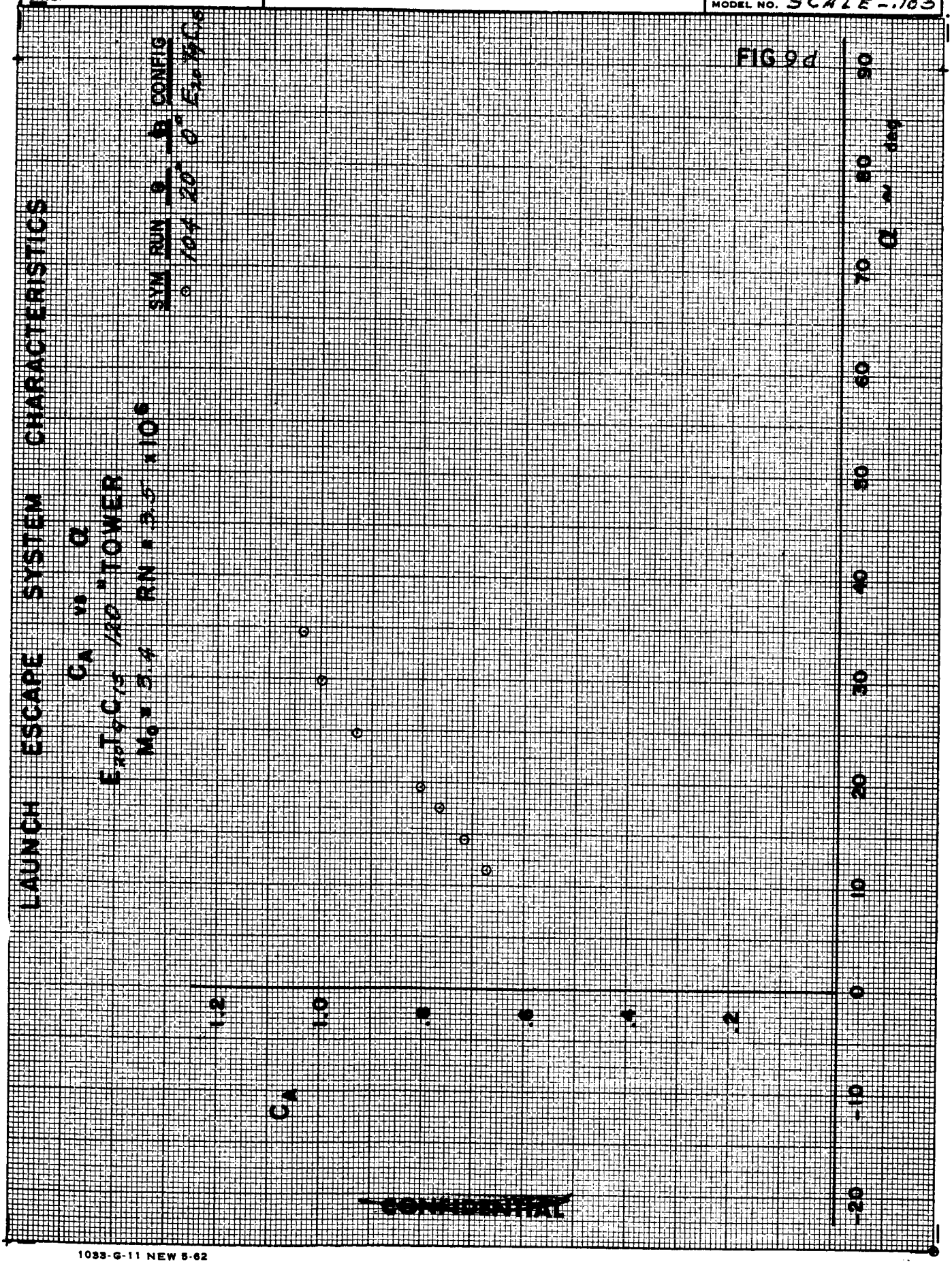
CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO-FS-2 MODEL NO. SCALE-.105



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1033-G-11 NEW 5-62

FORM M-113-N2- (REV. 3-61)

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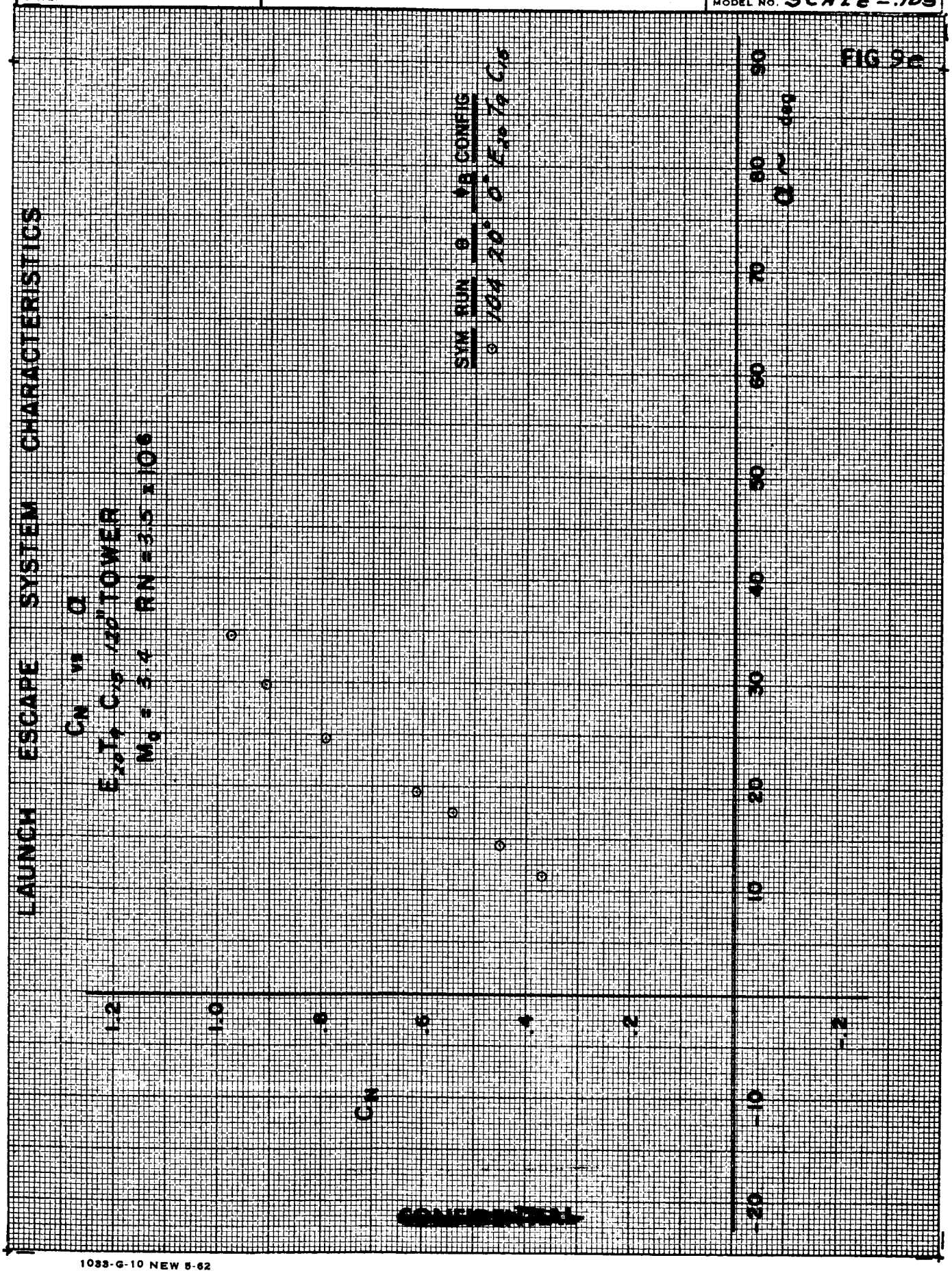
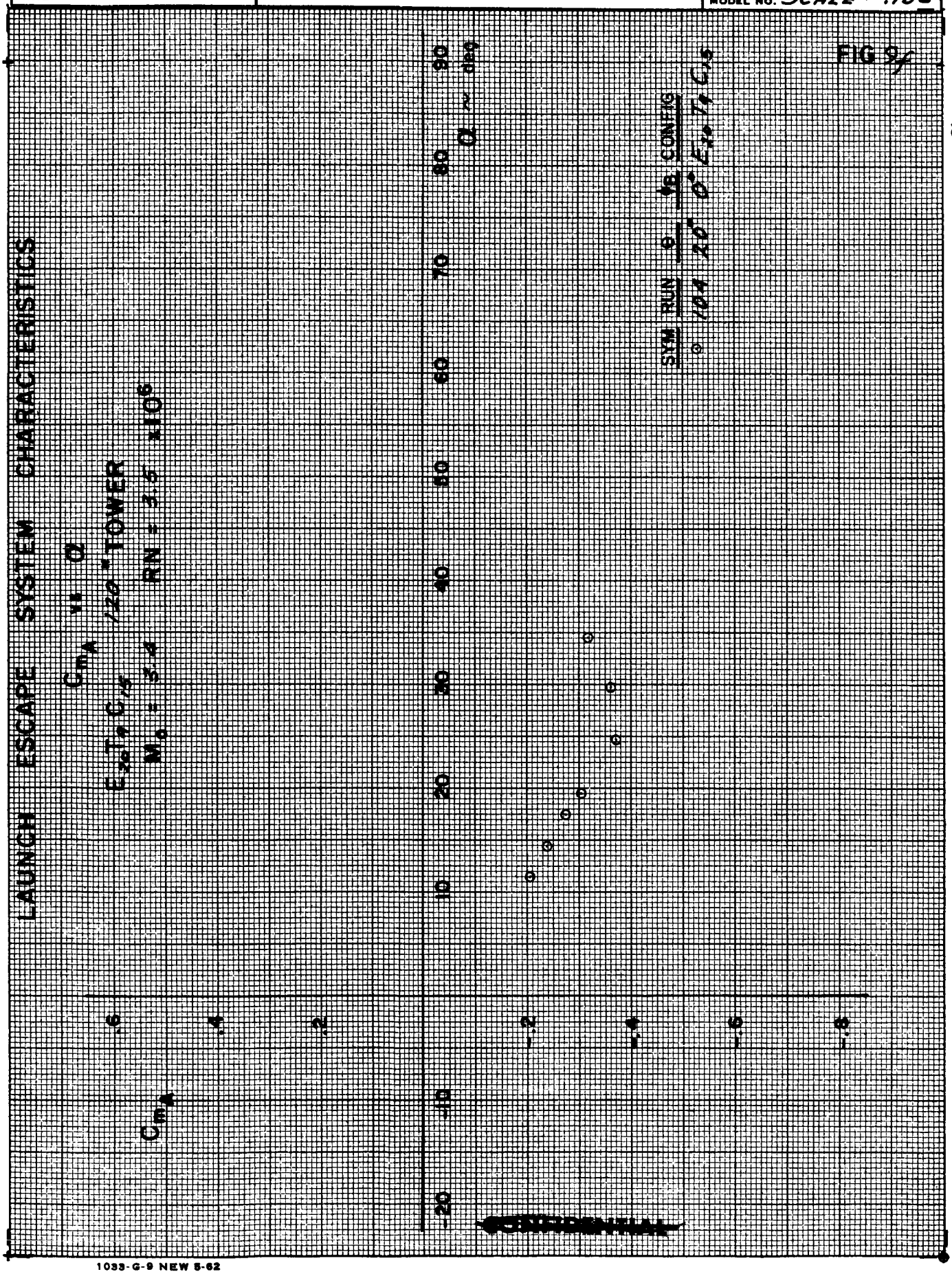
CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO-FS-2 MODEL NO. SCALE-.105



1033-G-10 NEW 5-62

FORM M-113-N2- (REV. 3-61)

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION ~~CONFIDENTIAL~~	PAGE NO. B-67 OF
CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO-FS-2 MODEL NO. SCALE - .105



FORM M-113-N2- (REV. 3-61)

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CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO-FS-2 MODEL NO. SCALE -.105

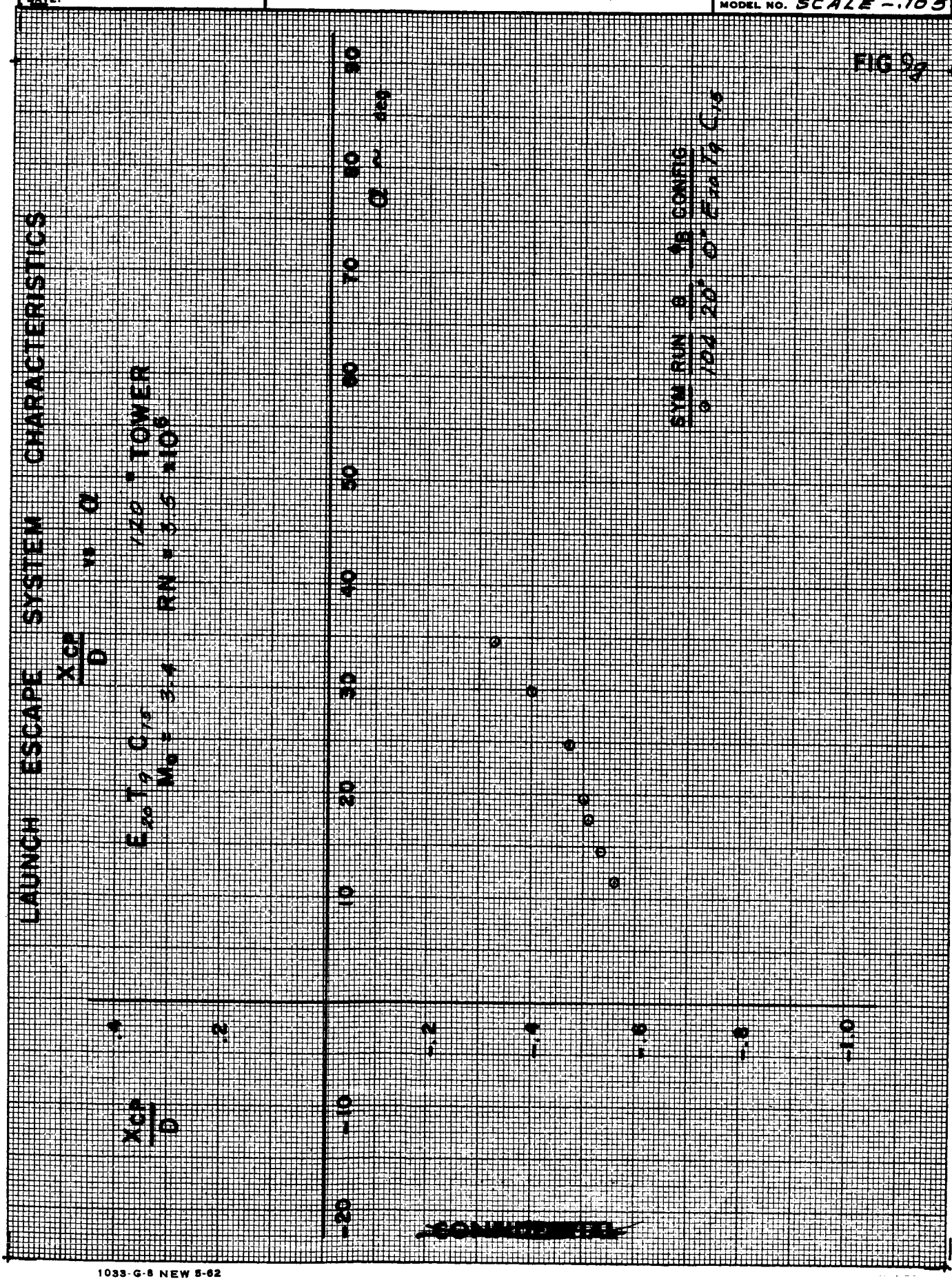

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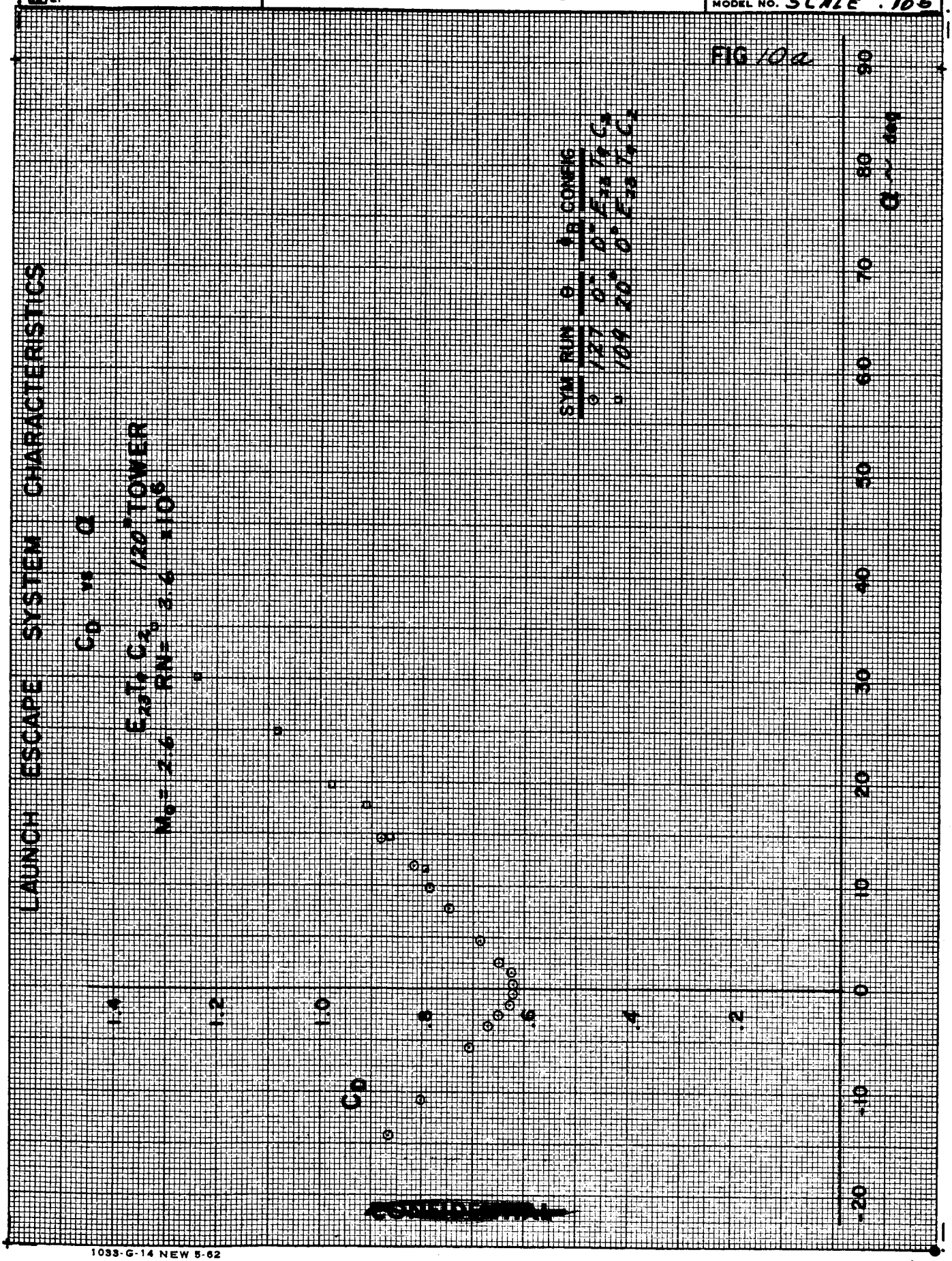
FIG 9g

1033-G-8 NEW 5-62

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION [redacted]	PAGE NO. B-69 OF
CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO-FS-2 MODEL NO. SCALE .105

FIG 10a



C_D vs α

[redacted]

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION ~~CONFIDENTIAL~~	PAGE NO. B-70 OF
CHECKED BY: JKK		REPORT NO. SID-62-936
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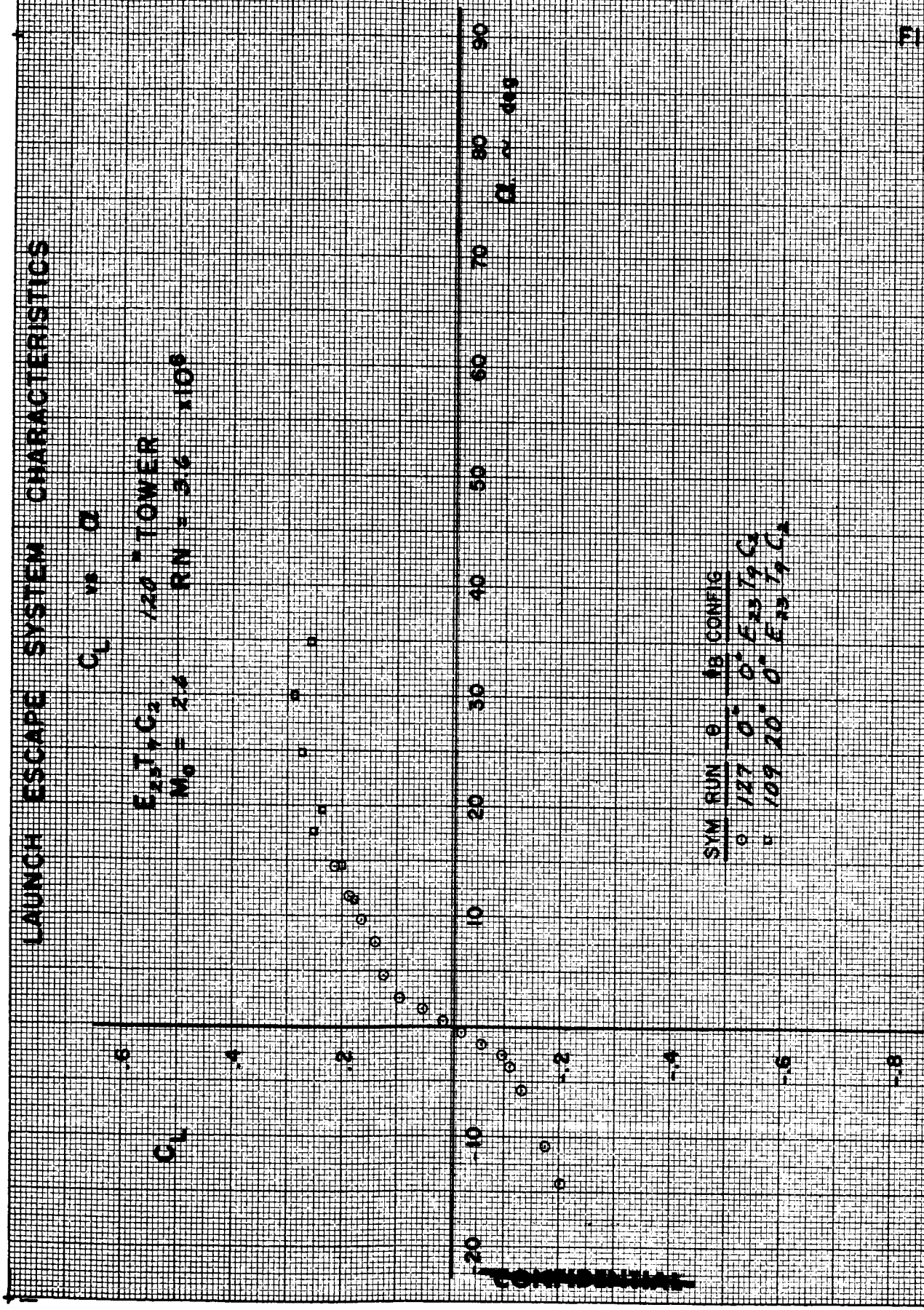
FIG 106



C_L vs α

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1033-G-13 NEW 5-62

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION [redacted]	PAGE NO. B-71 OF
CHECKED BY: JKK		REPORT NO. SID-62-936
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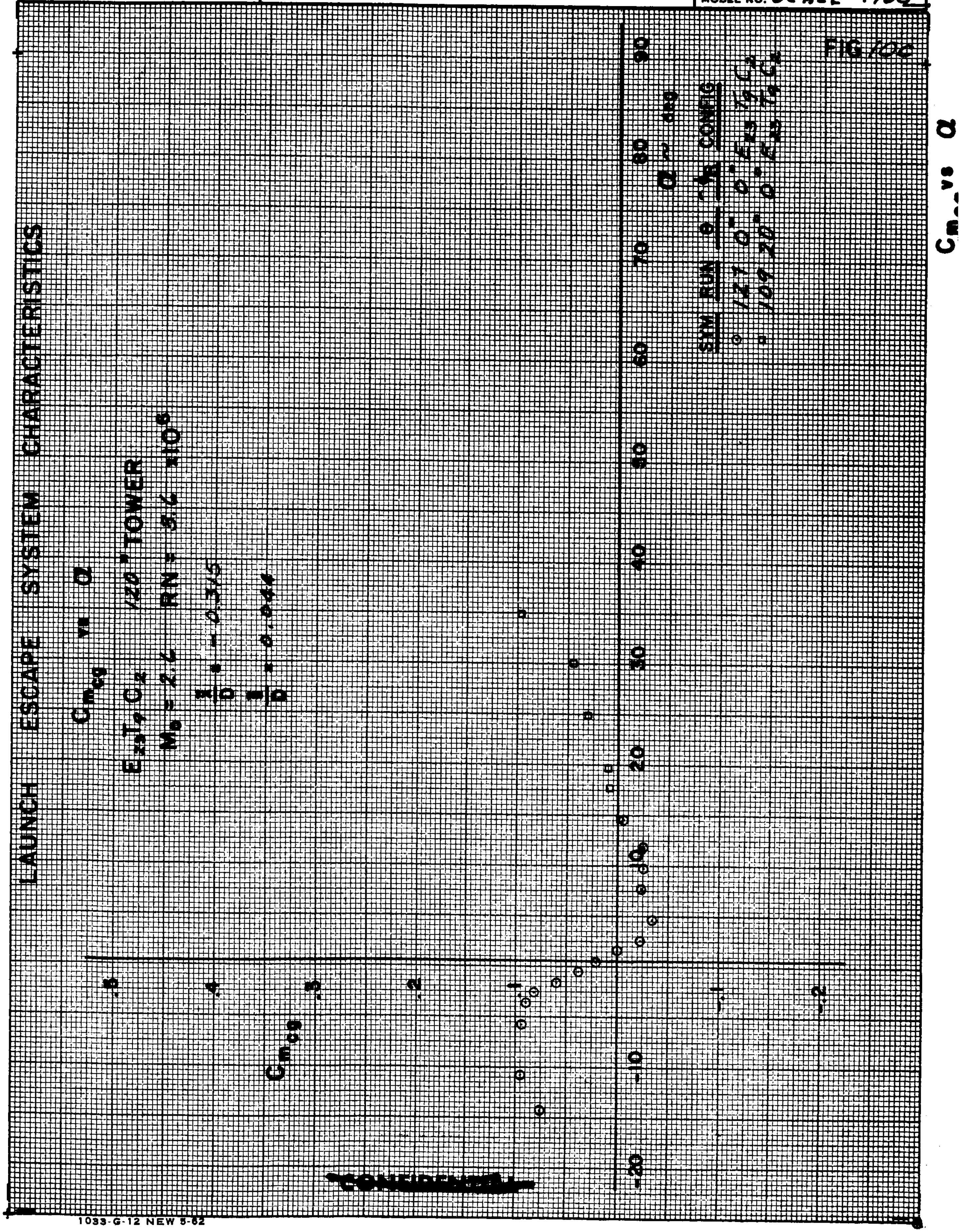

1033-G-12 NEW 5-62

FORM M-113-N2- (REV. 3-61)

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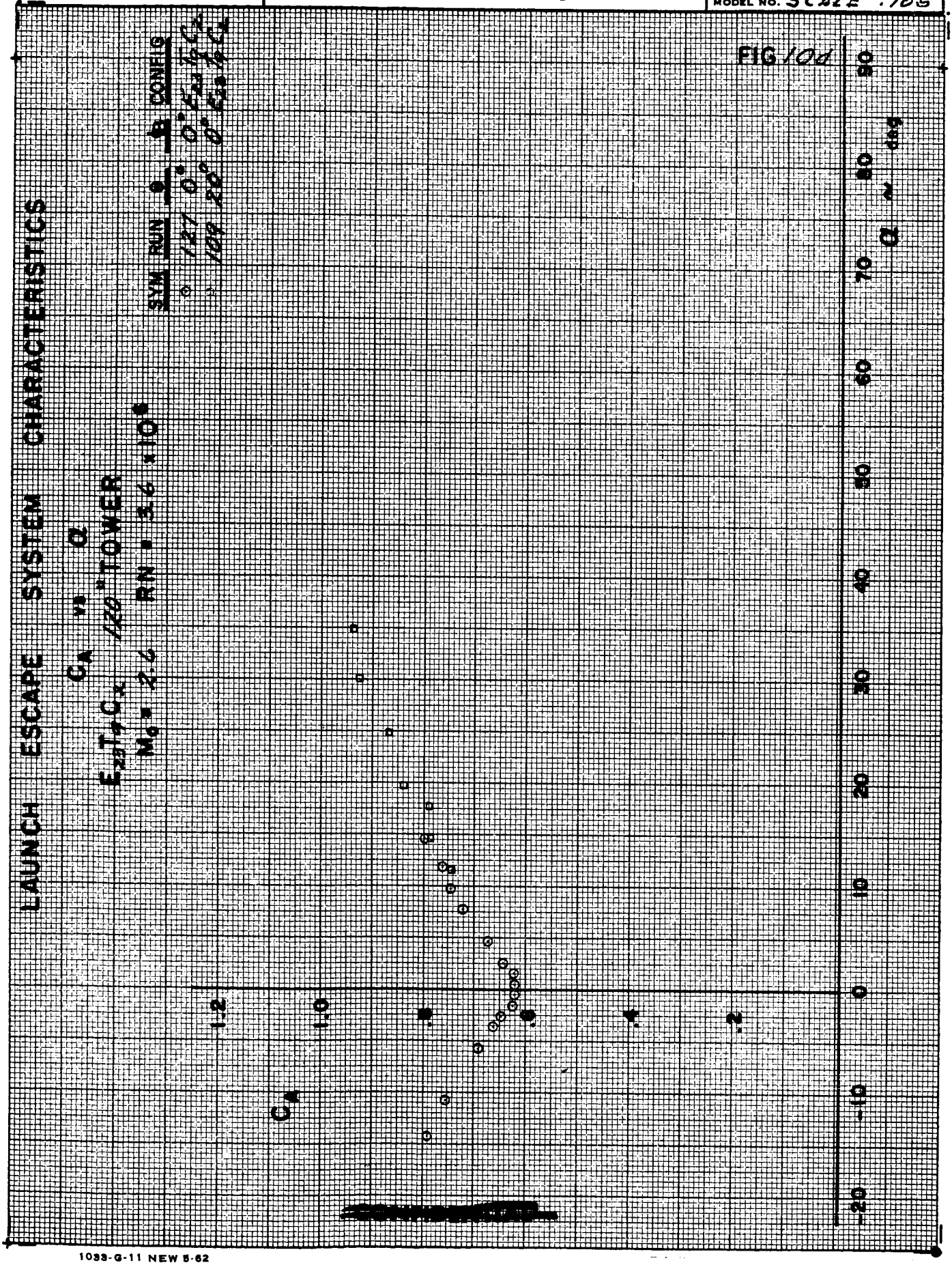
CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO-FS-2 MODEL NO. SCALE .105



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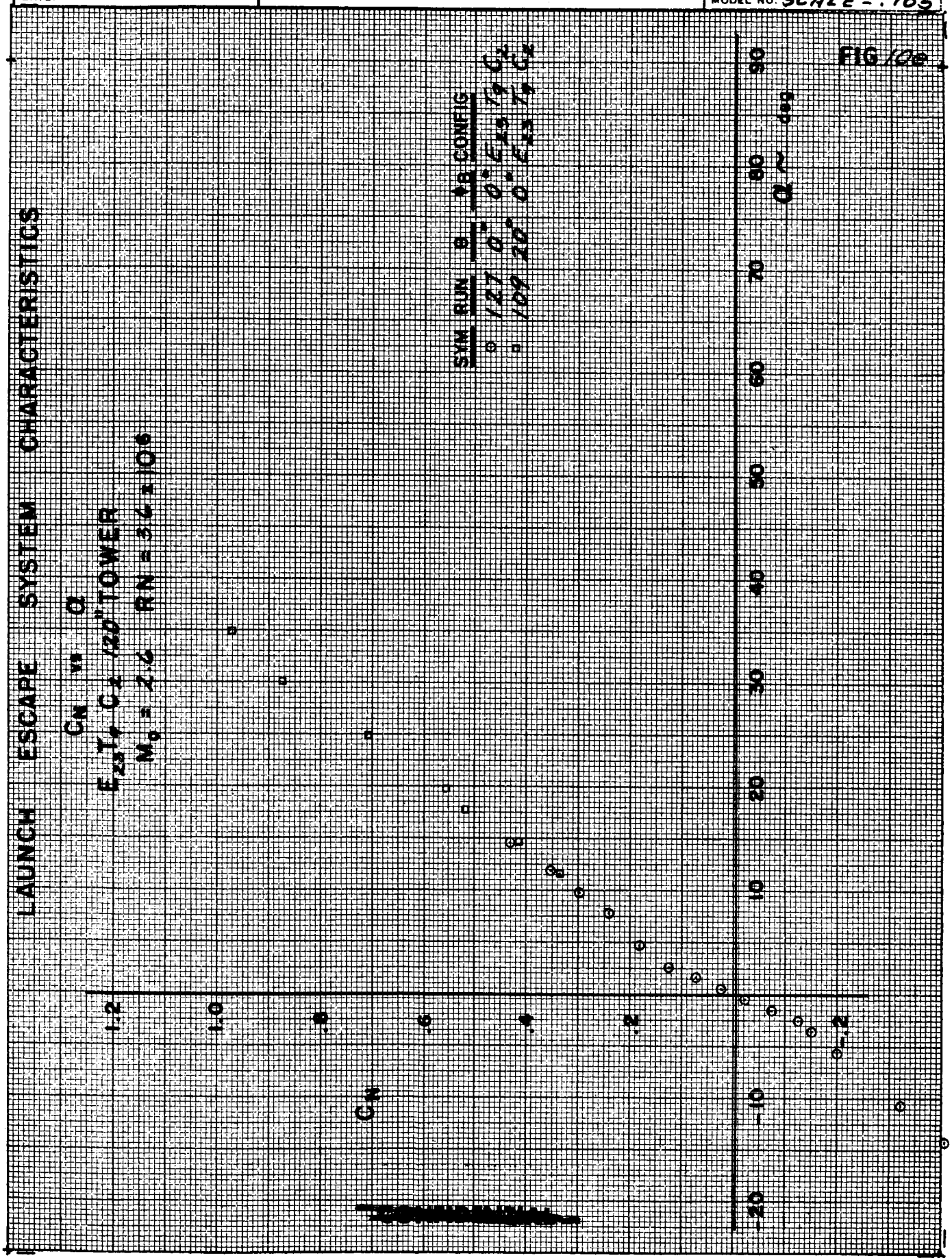
1033-G-11 NEW 5-62

FORM M-113-N2- (REV. 3-61)

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION [redacted]	PAGE NO. B-73 OF
CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES-106	APOLLO-FS-2 MODEL NO. SCALE-.105



PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION [redacted]	PAGE NO. B-74 OF
CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO-FS-2 MODEL NO. SCALE .105

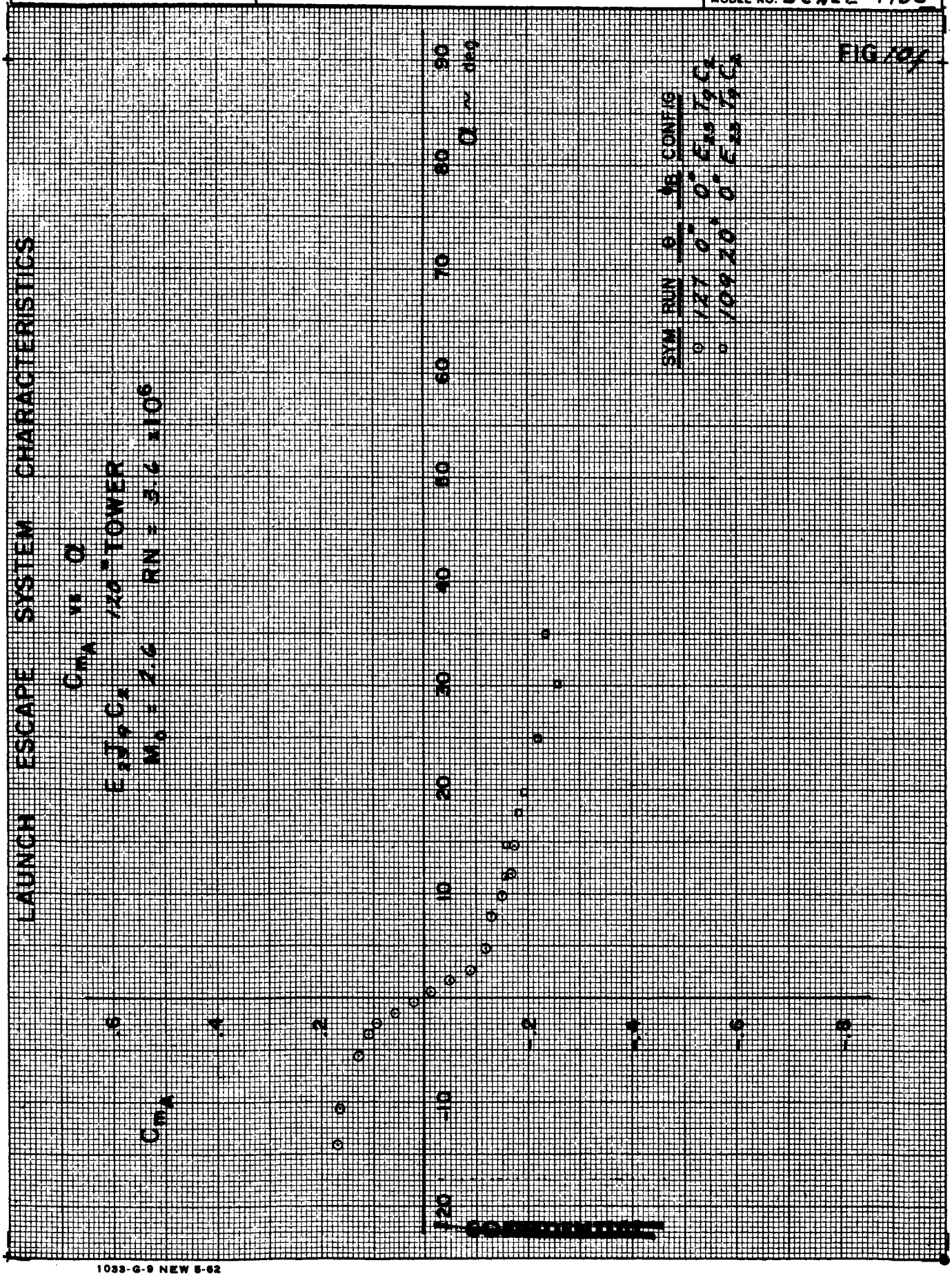


FIG 10f

C_{mA} vs α

[redacted]

1033-G-9 NEW 5-62

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION ~~CONFIDENTIAL~~	PAGE NO. B-75 OF
CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO-FS-2 MODEL NO. SCALE .105

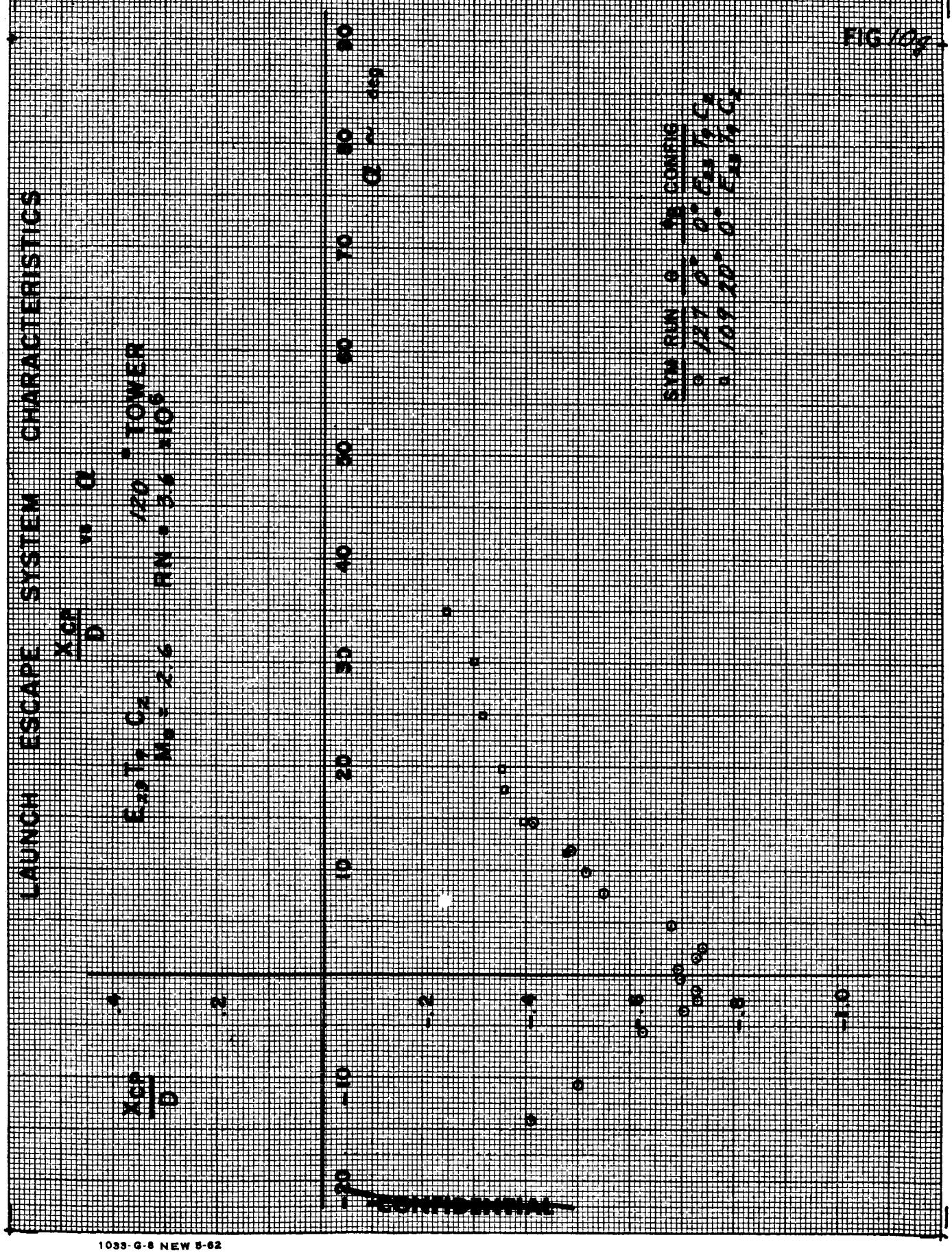


FIG 10g

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1033-G-8 NEW 5-62

FORM M-113-N2- (REV. 3-61)

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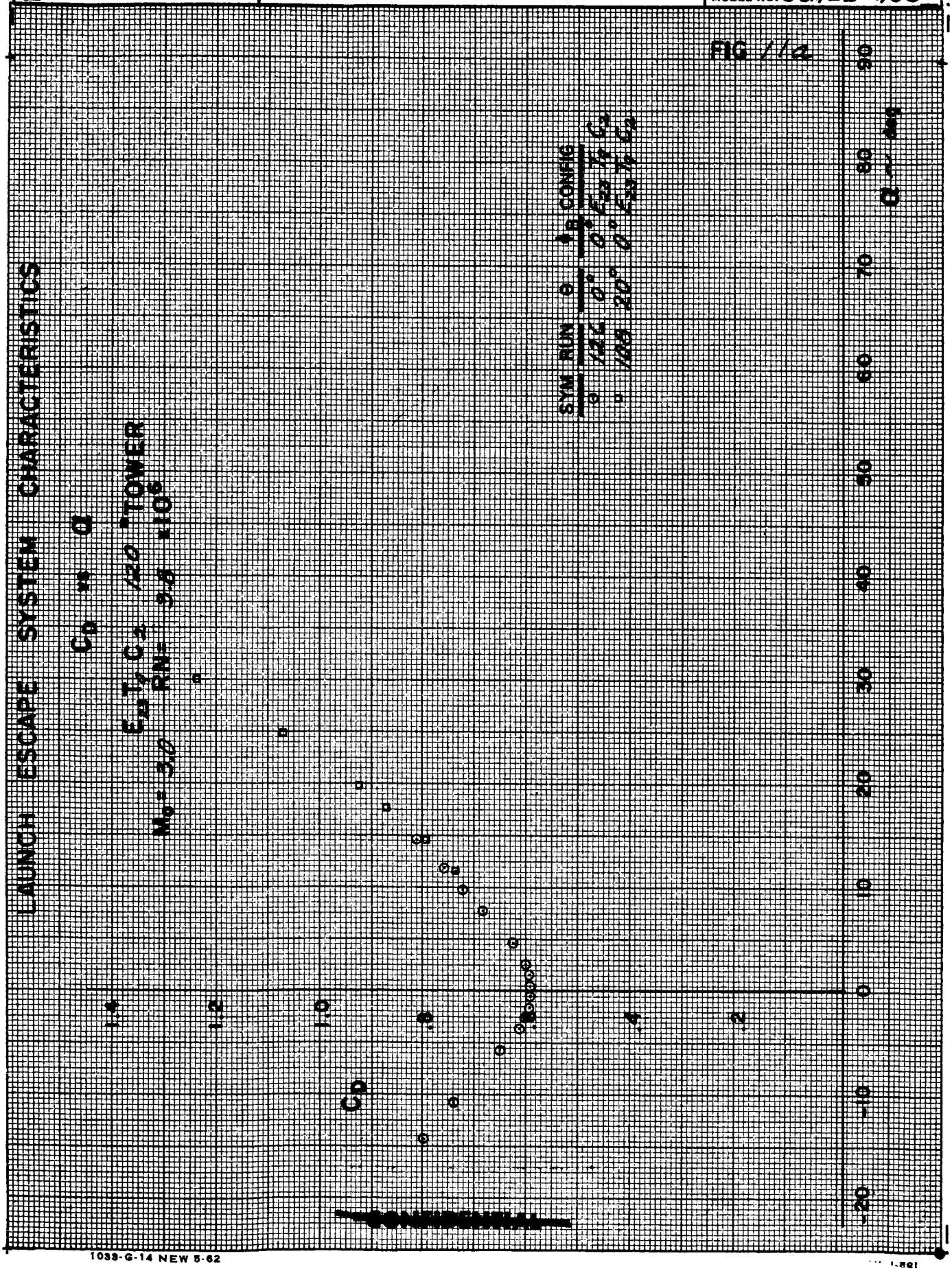
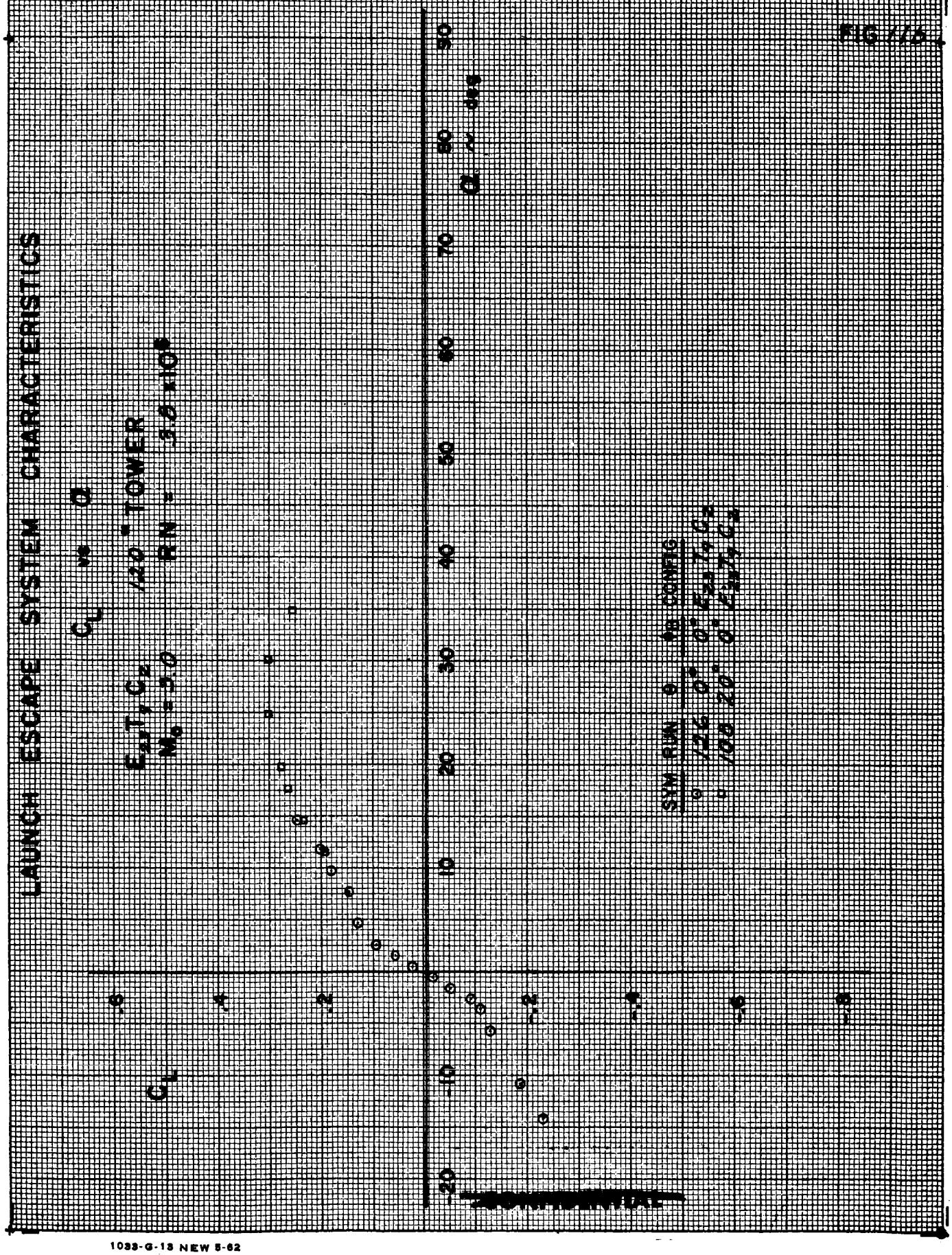
CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO-FS-2 MODEL NO. SCALE .105



AMES - 106

FIG 116



FORM M-113-N2- (REV. 3-61)

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION [redacted]	PAGE NO. B-78 OF
CHECKED BY: JKK		REPORT NO. SID-62-936
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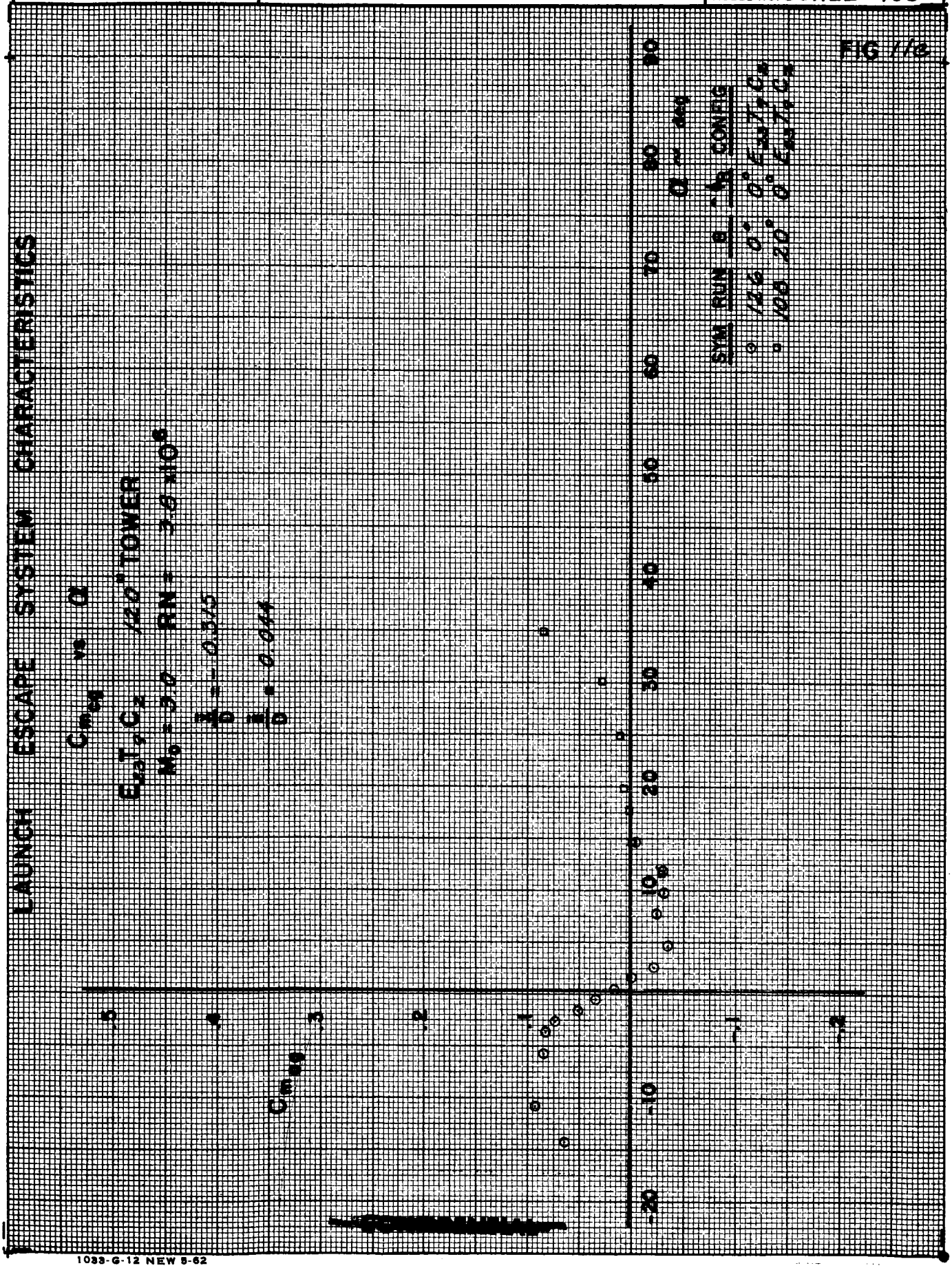
FIG 116



C_{m_B} vs α

[redacted]

1033-G-12 NEW 8-62

FORM M-113-N2- (REV. 3-61)

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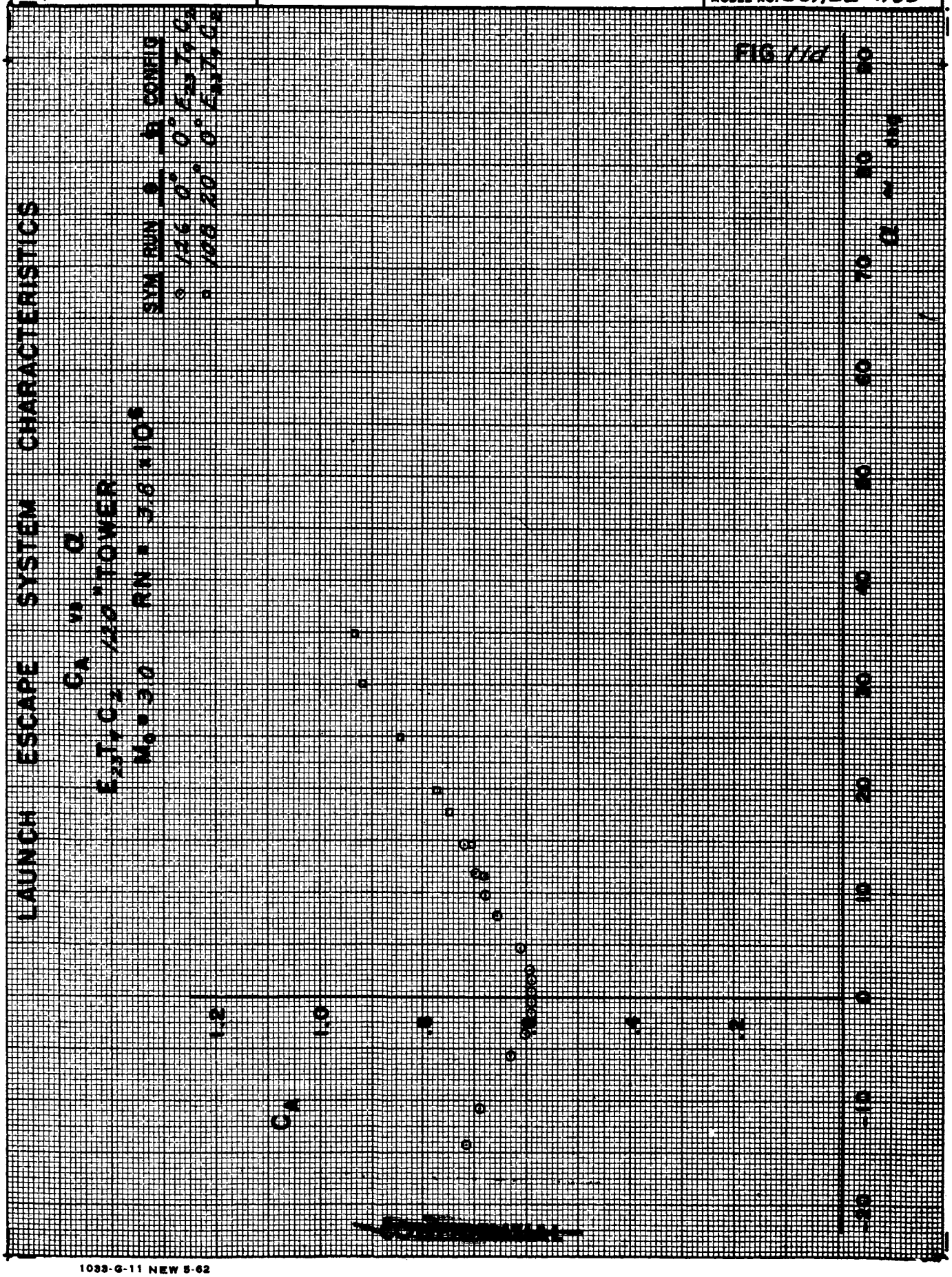
DATE:	AMES - 106	APOLLO-FS-2 MODEL NO. SCALE .105



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1033-G-11 NEW 5-62

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION ~~CONFIDENTIAL~~	PAGE NO. B-80 OF .
CHECKED BY: JKK		REPORT NO. SID-62-936
DATE:	AMES - 106	APOLLO-FS-2 MODEL NO. SCALE .105

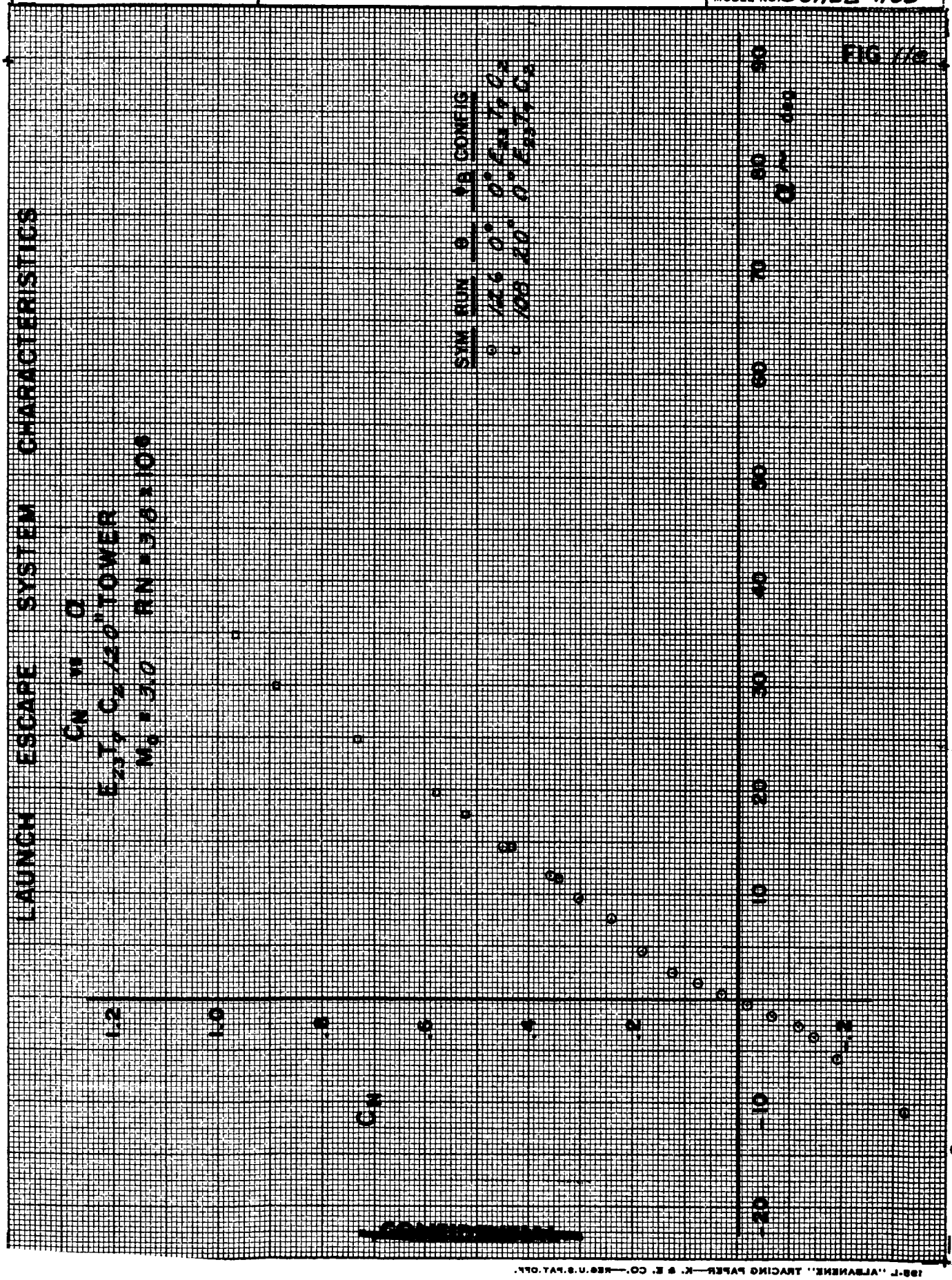

FIG 116

C_N vs α

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198-L "ALBANENE" TRACING PAPER—K. & E. CO.—REG.U.S.PAT.OFF.

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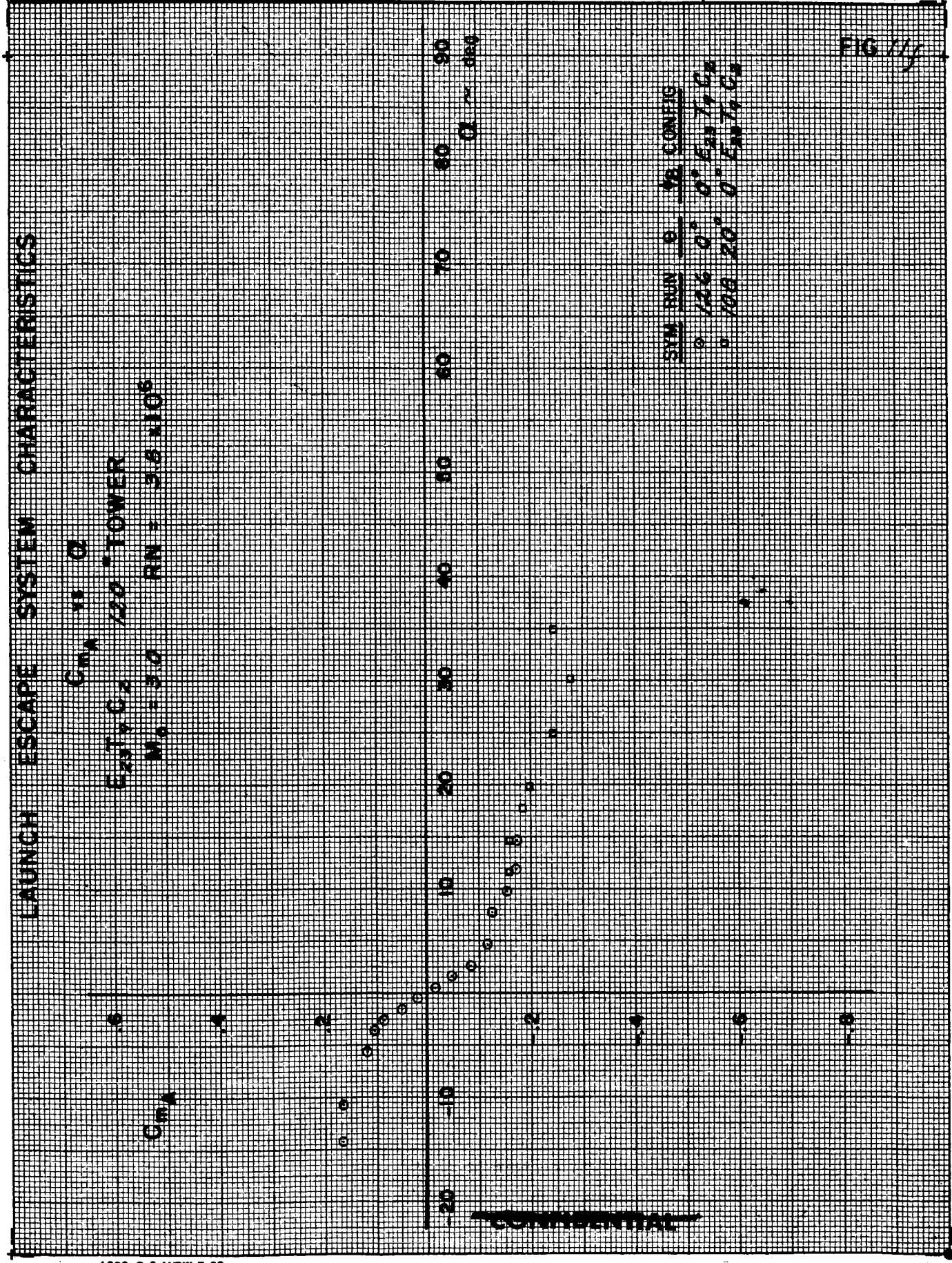
FIG 11f



FORM M-113-N2- (REV. 3-61)

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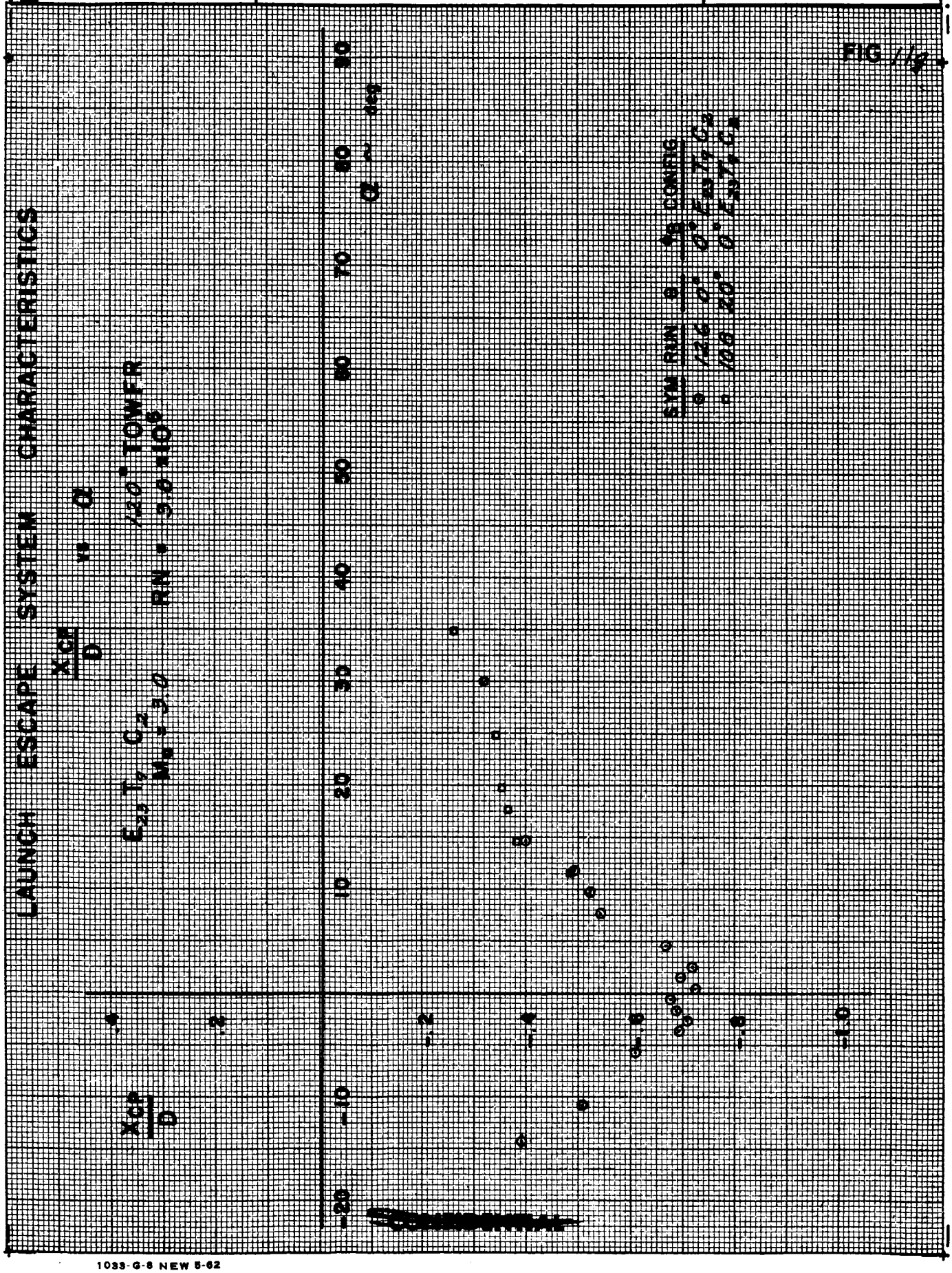

1033-G-8 NEW 5-62

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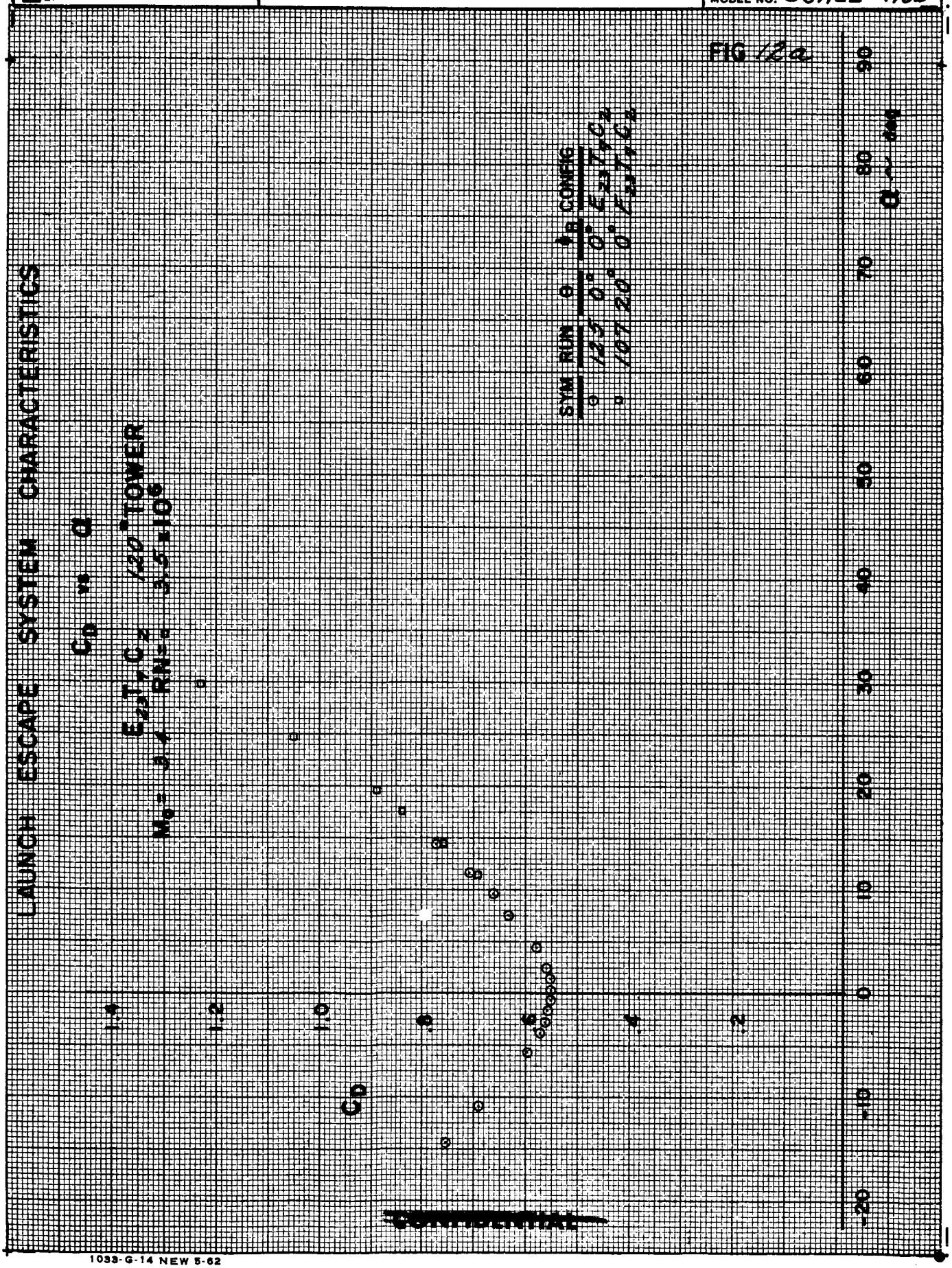

1033-G-14 NEW 5-62

FORM M-113-N2- (REV. 3-61)

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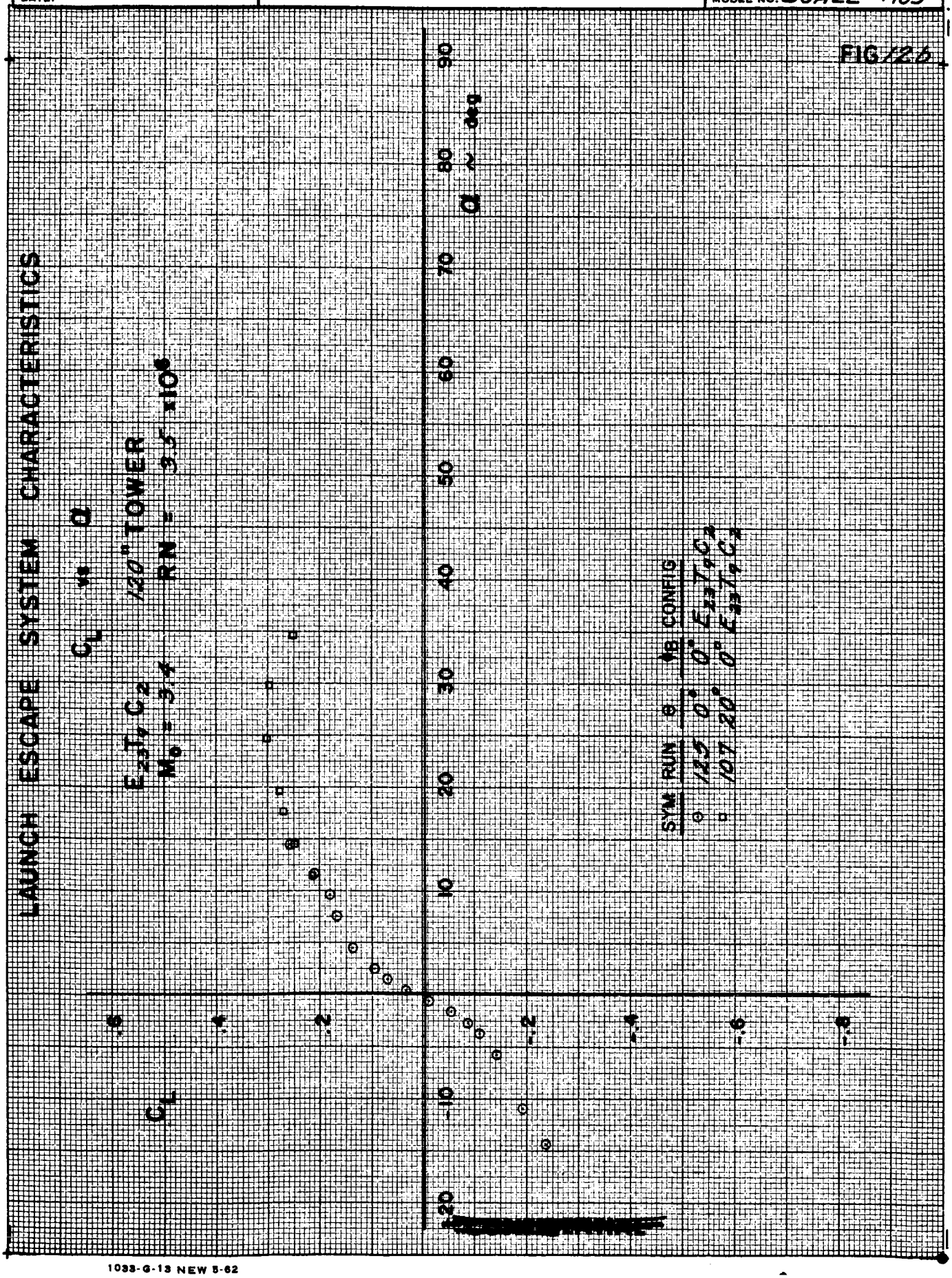

FIG 12b

C_L vs α

[redacted]

1033-G-13 NEW 5-62

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MODEL NO. APOLLO-FS-2 SCALE .105

LAUNCH ESCAPE SYSTEM CHARACTERISTICS

$C_{m_{cg}}$ vs α

$E_{23}T_7C_2$ 120" TOWER

$M_0 = 3.4$ RN = 3.5×10^6

$\frac{x_{cg}}{D} = -0.315$

$\frac{z_{cg}}{D} = 0.044$

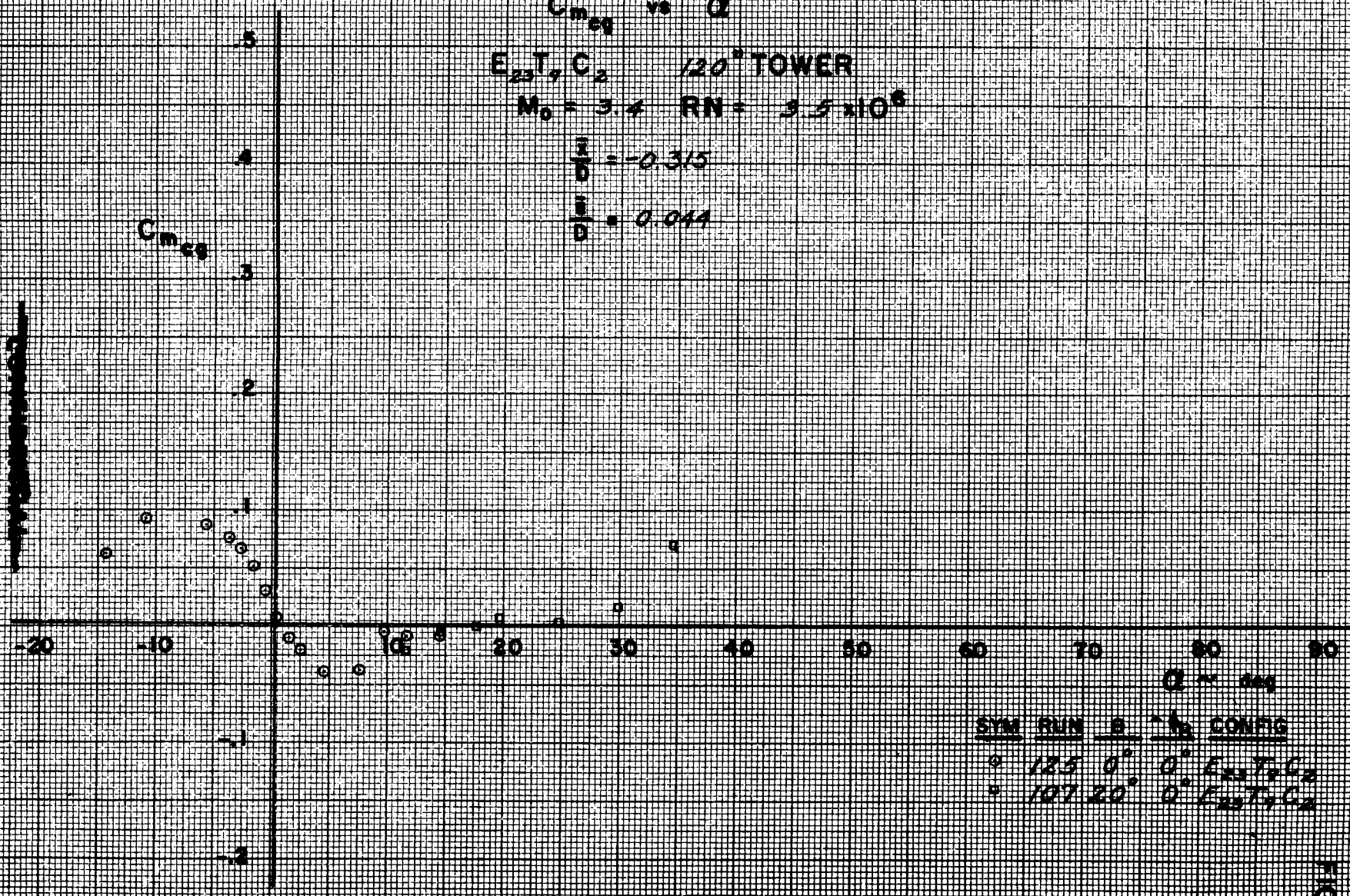

FIG. 12

$C_{m_{cg}}$ vs α

1033-G-12 NEW 5-62

FORM M-113-N2- (REV. 3-61)

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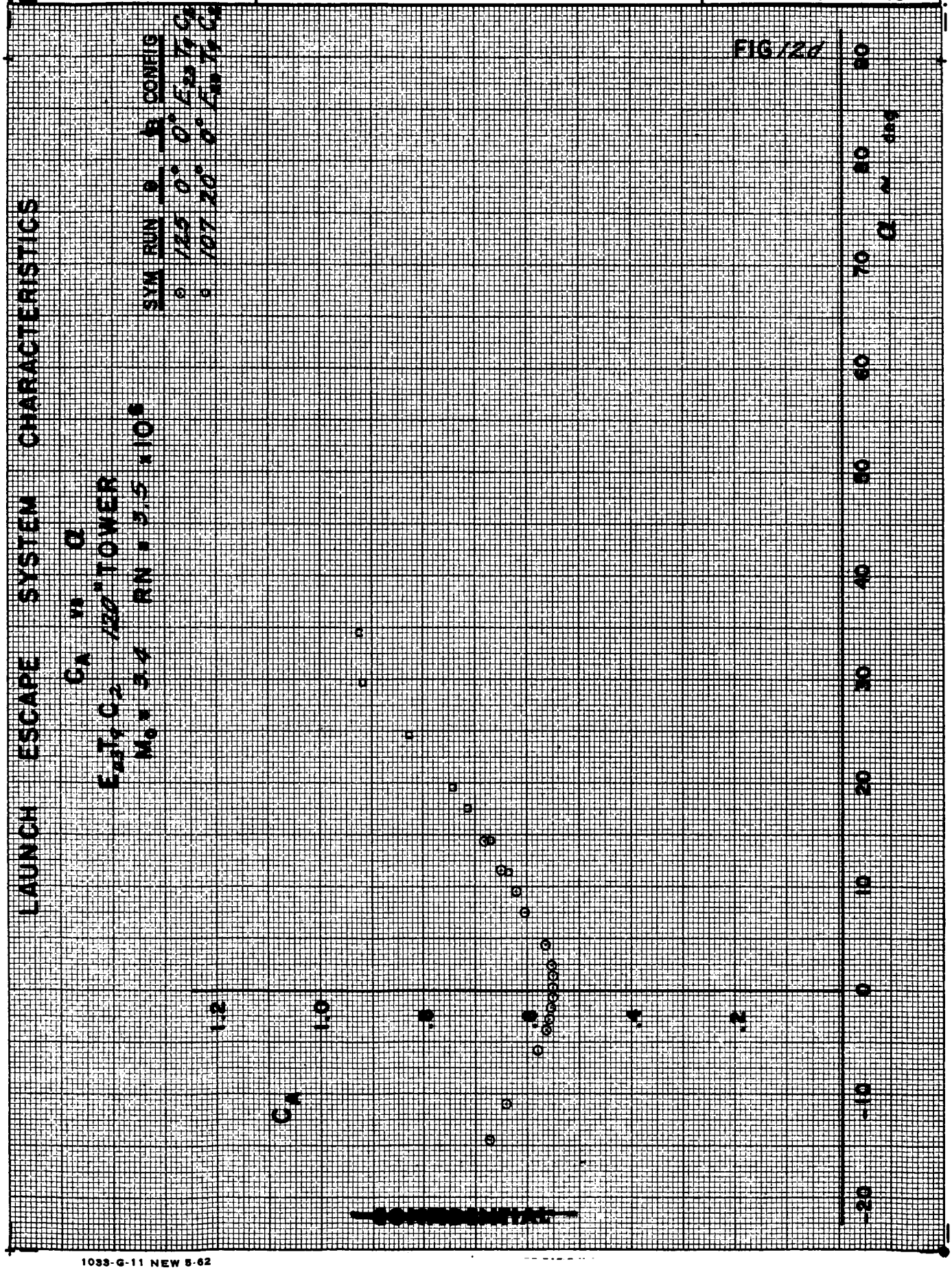

FIG 12d

1033-G-11 NEW 5-62

FORM M-113-N2- (REV. 3-61)

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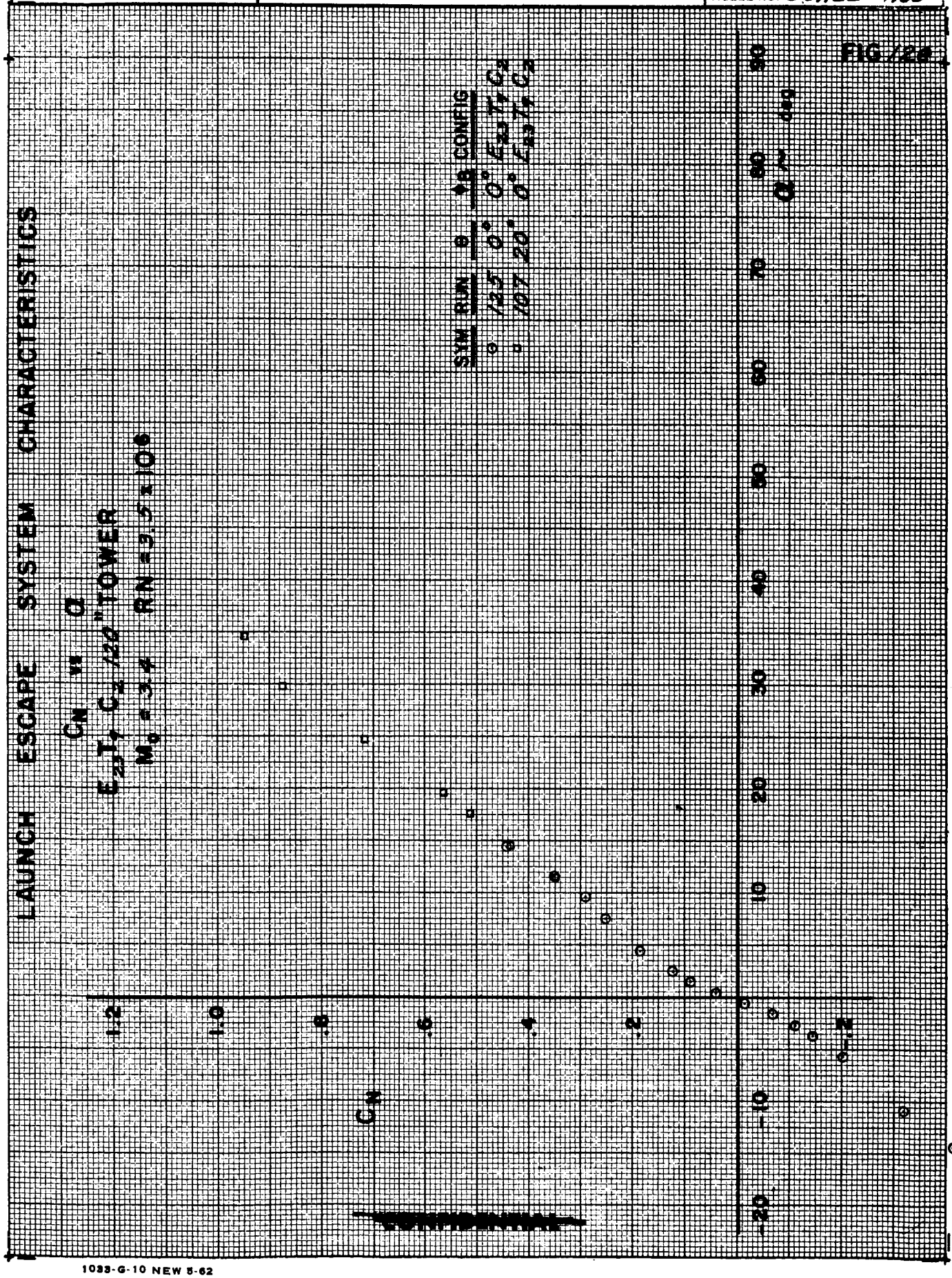

1033-G-10 NEW 5-62

AMES - 106

FIG 12f

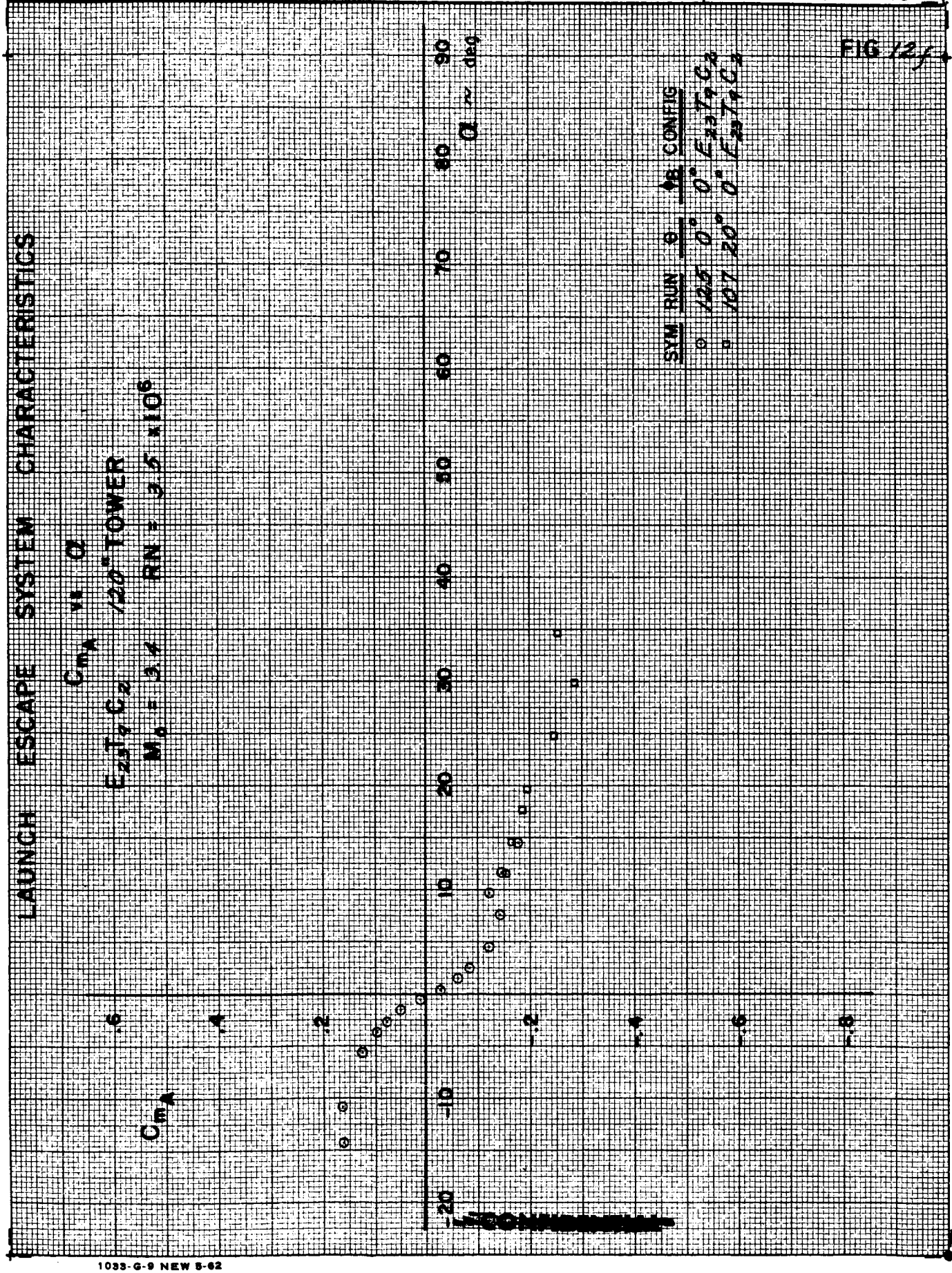

FIG 12

[redacted]

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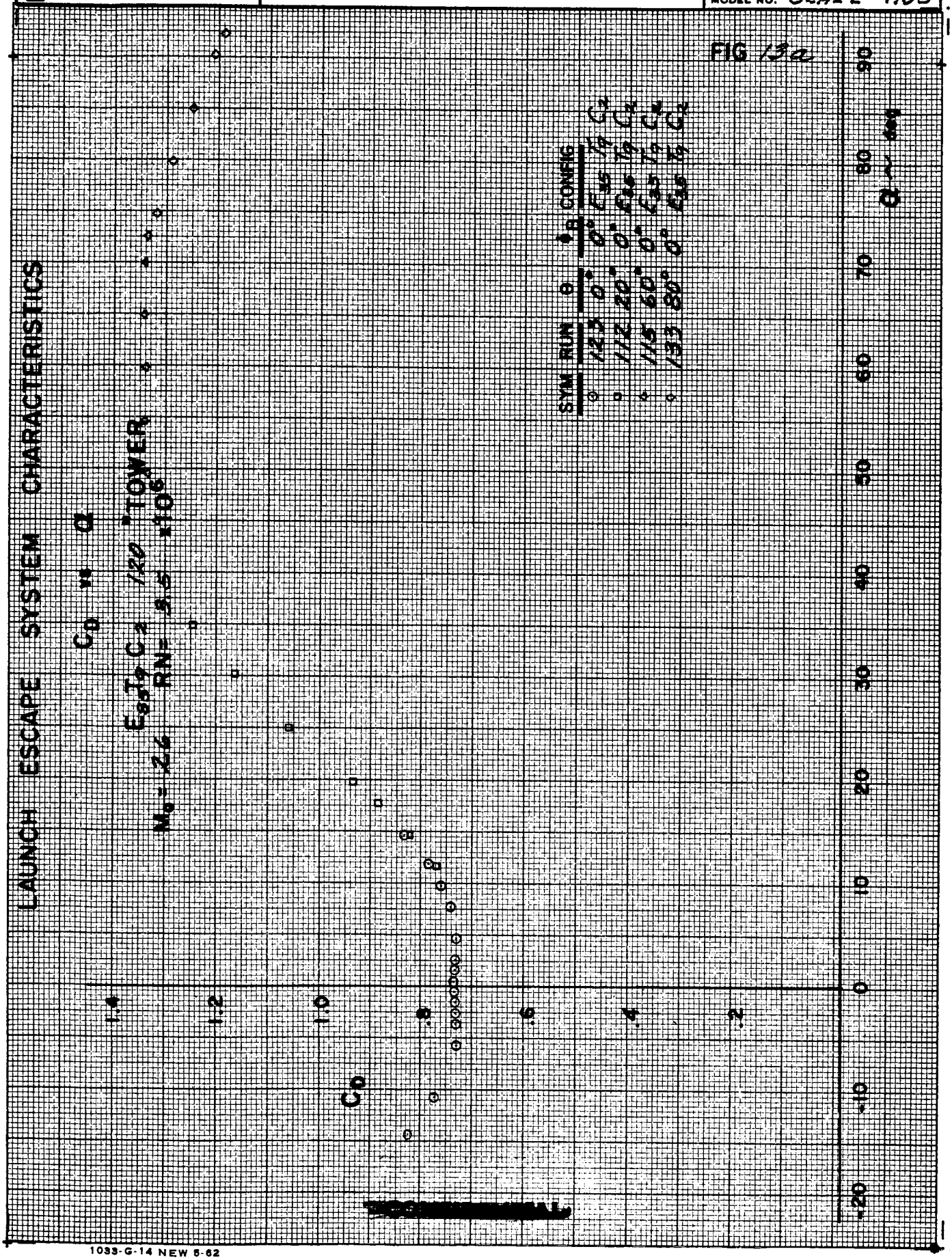
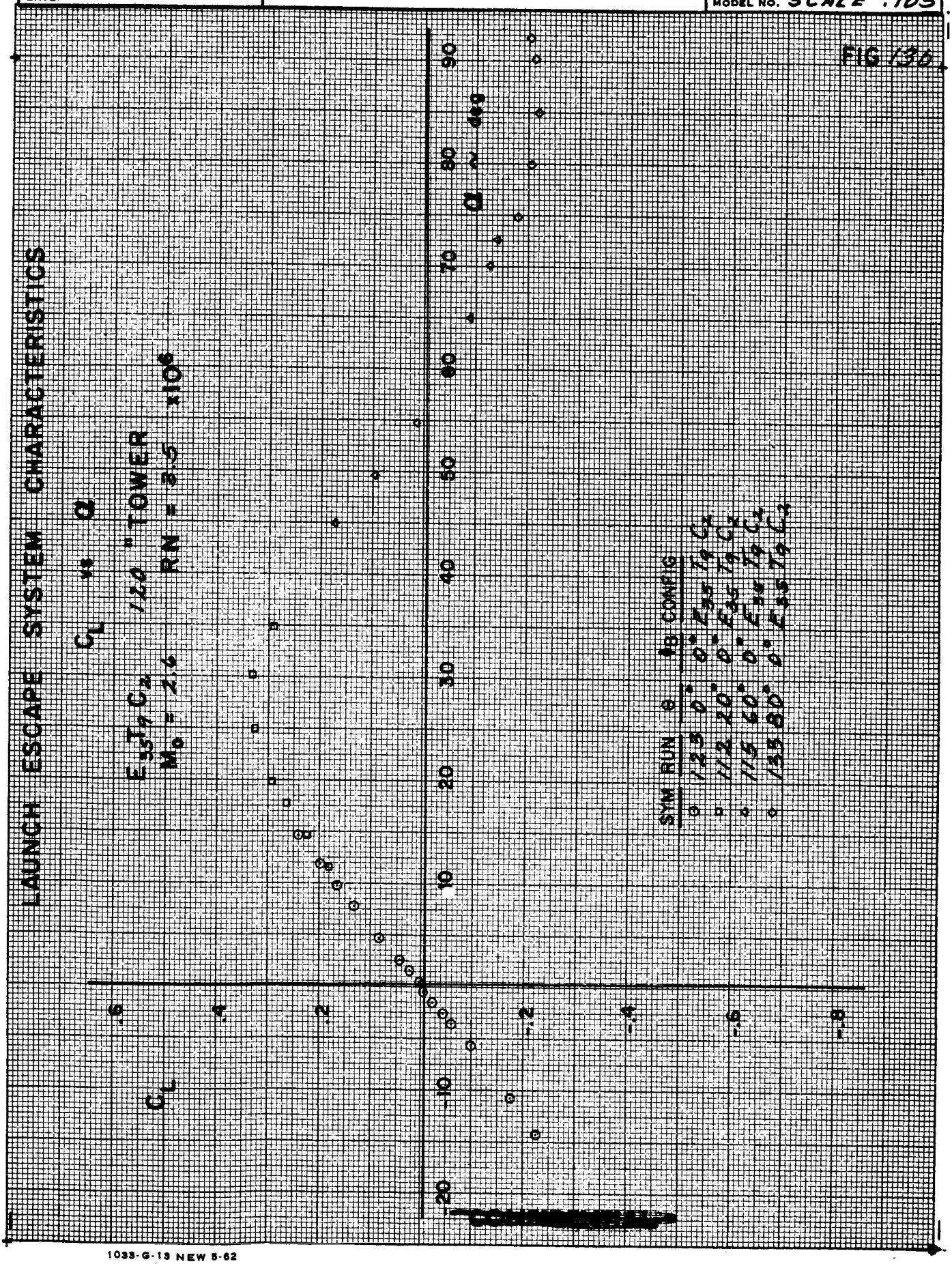
FIG 13a

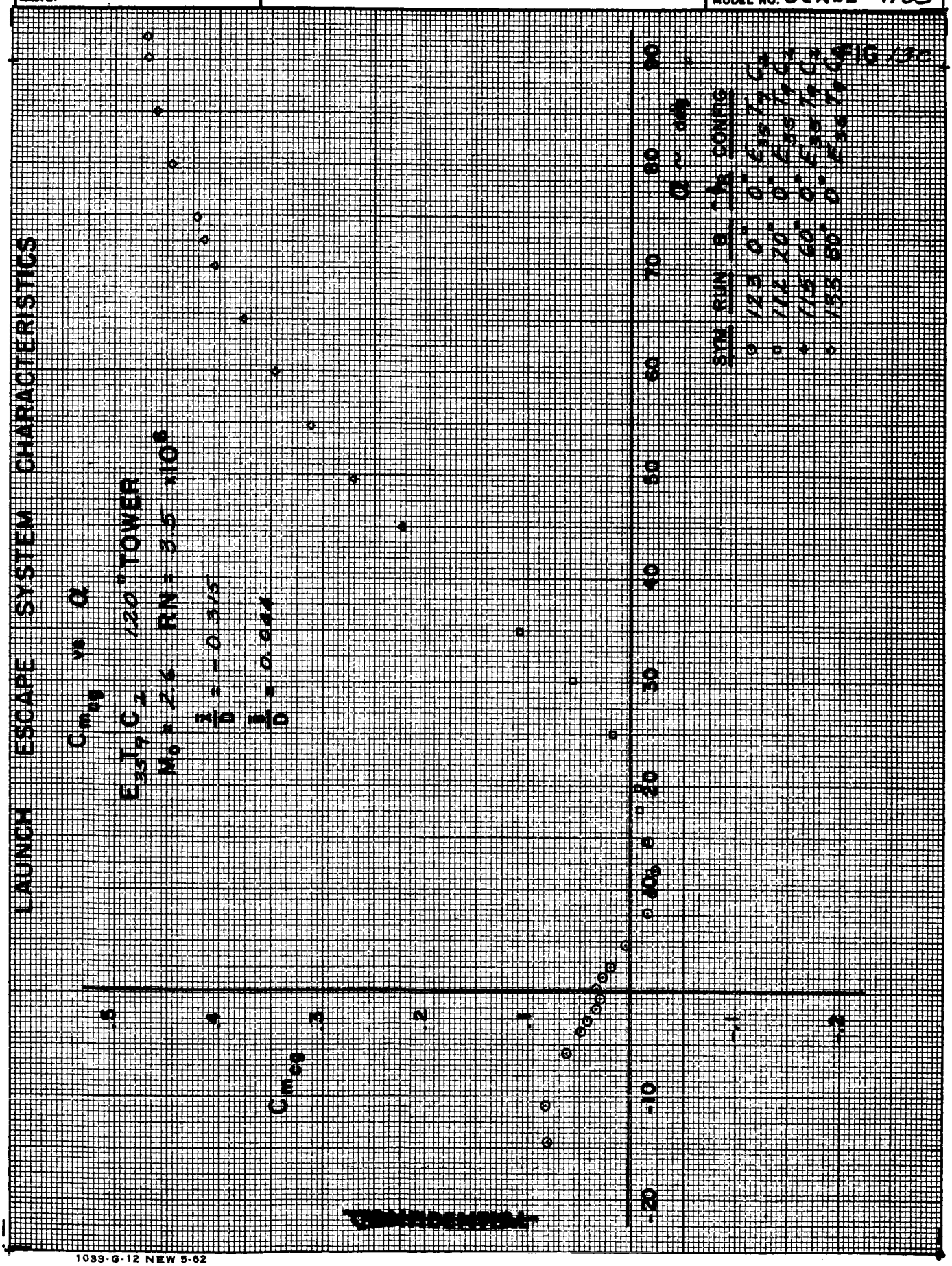


C_D vs α

AMES-106

FIG 136





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MODEL NO. APOLLO - FS-2

SCALE .105

LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_A vs α

$E_{35}T_9C_2$ 120" TOWER

$M_0 = 2.6$ RN = 3.5×10^6

SYM	RUN	θ	ϕ	CONFIG
○	123	0°	0°	$E_{35}T_9C_2$
○	112	20°	0°	$E_{35}T_9C_2$
◇	115	60°	0°	$E_{35}T_9C_2$
◇	133	80°	0°	$E_{35}T_9C_2$

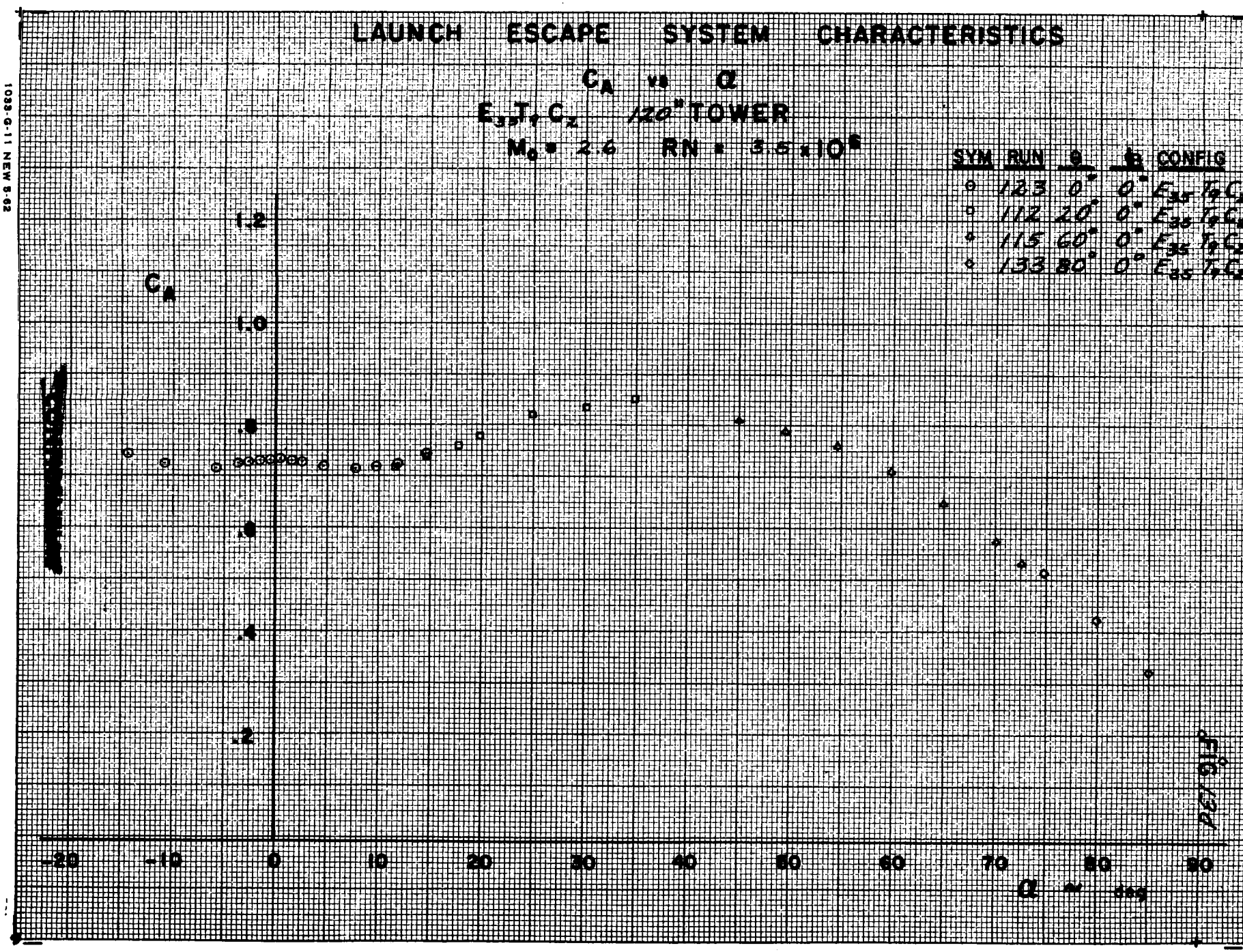

FIG 132

C_A vs α

[redacted]

1033-G-11 NEW 5-62

FORM M-113-N2- (REV. 3-61)

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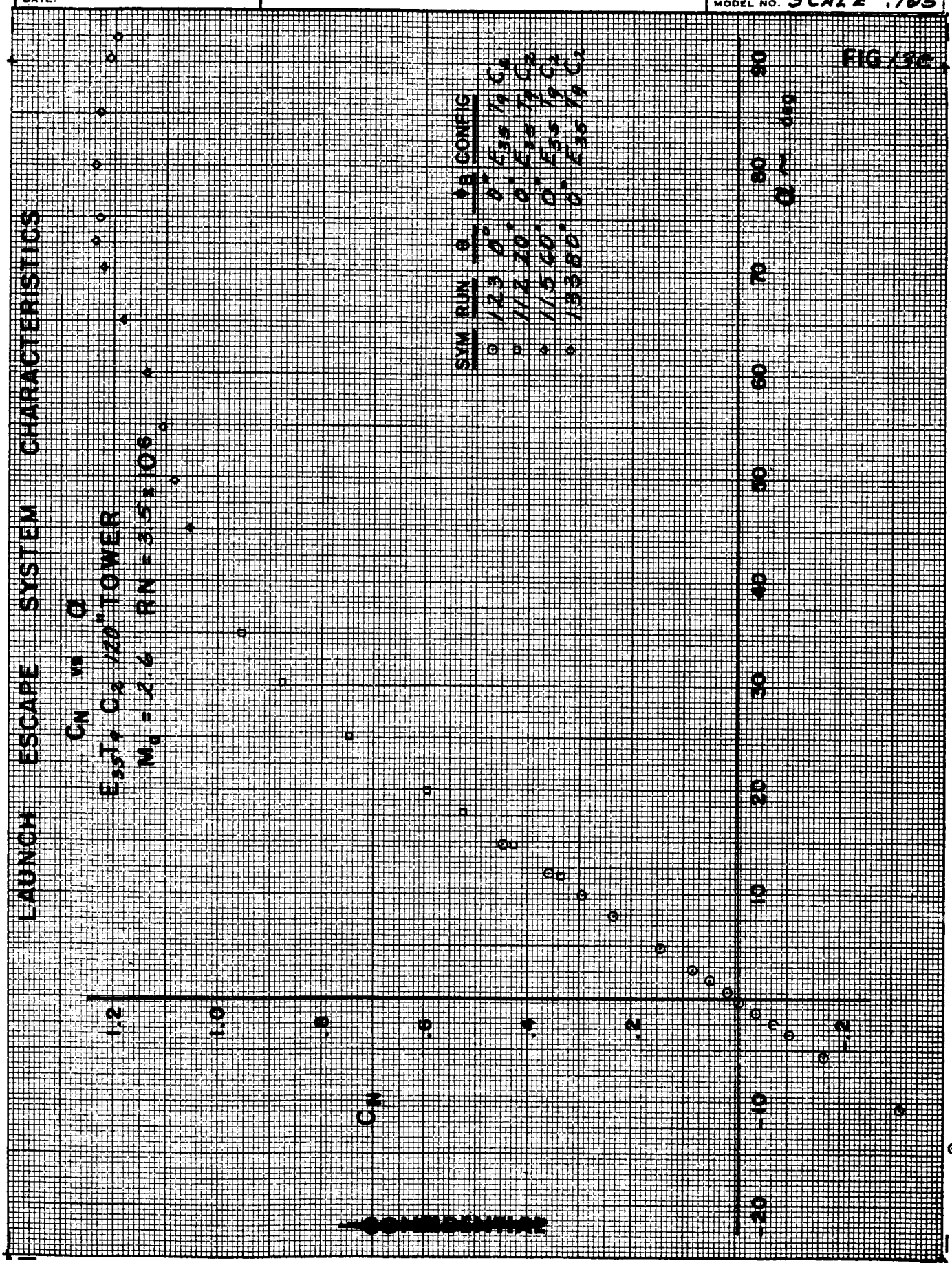

FIG 13E

C_N vs α

[redacted]

FORM M-113-N2- (REV. 3-61)

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION [redacted]	PAGE NO. B-95 OF
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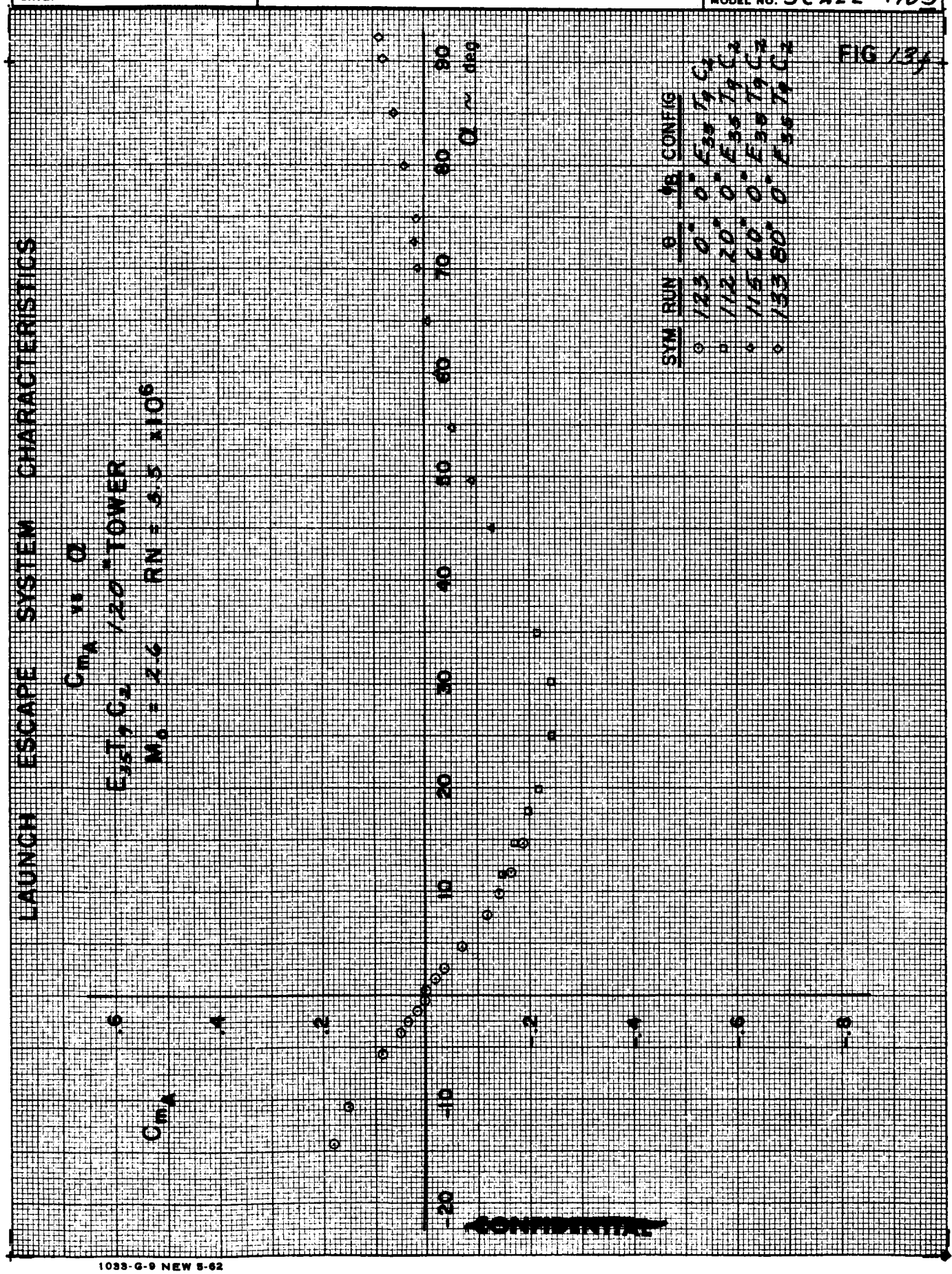
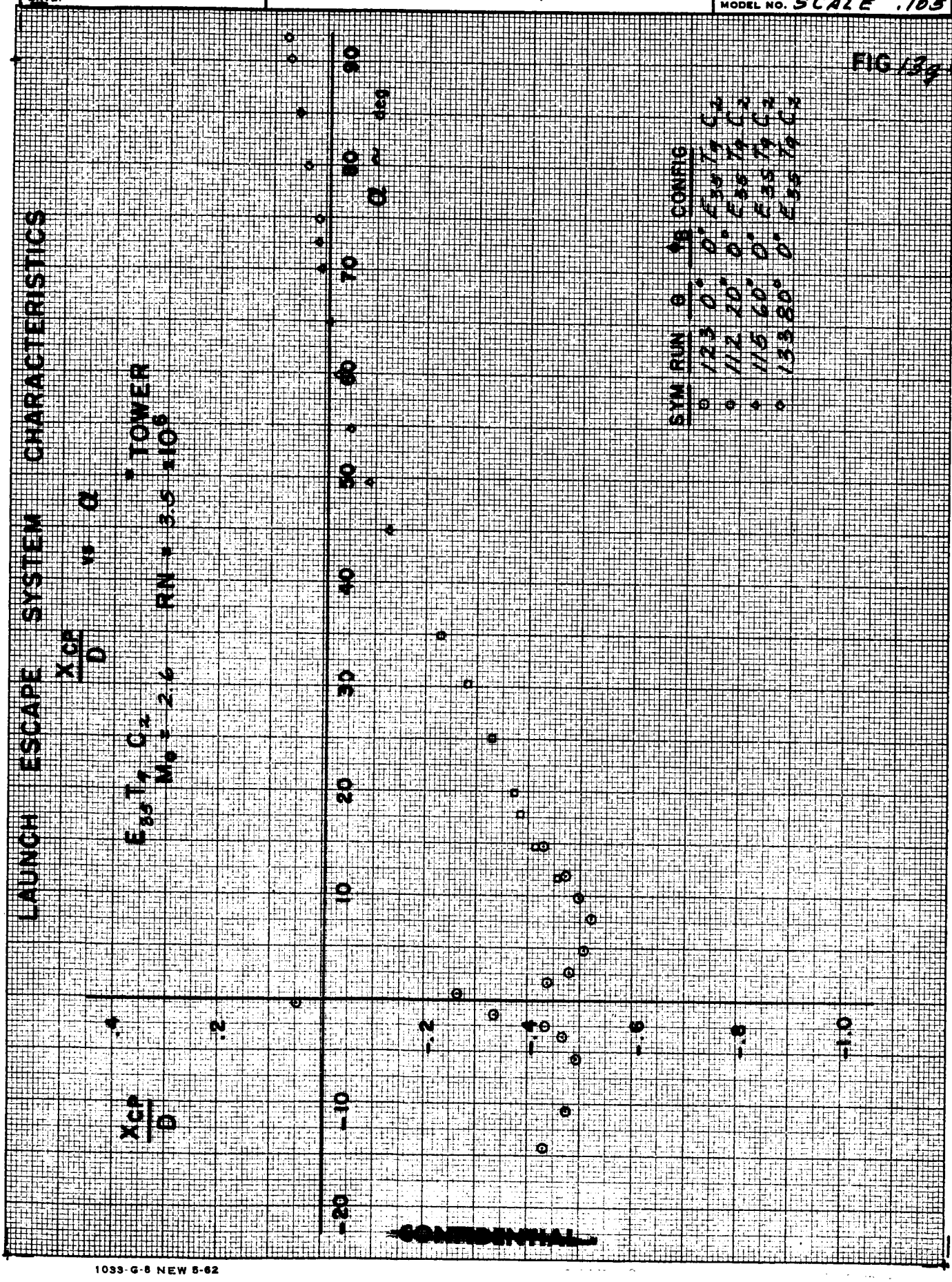


FIG 135

[redacted]

1033-G-9 NEW 5-62

FIG 13g



$\frac{X_{CP}}{D}$ vs α

FORM M-113-N2- (REV. 3-61)

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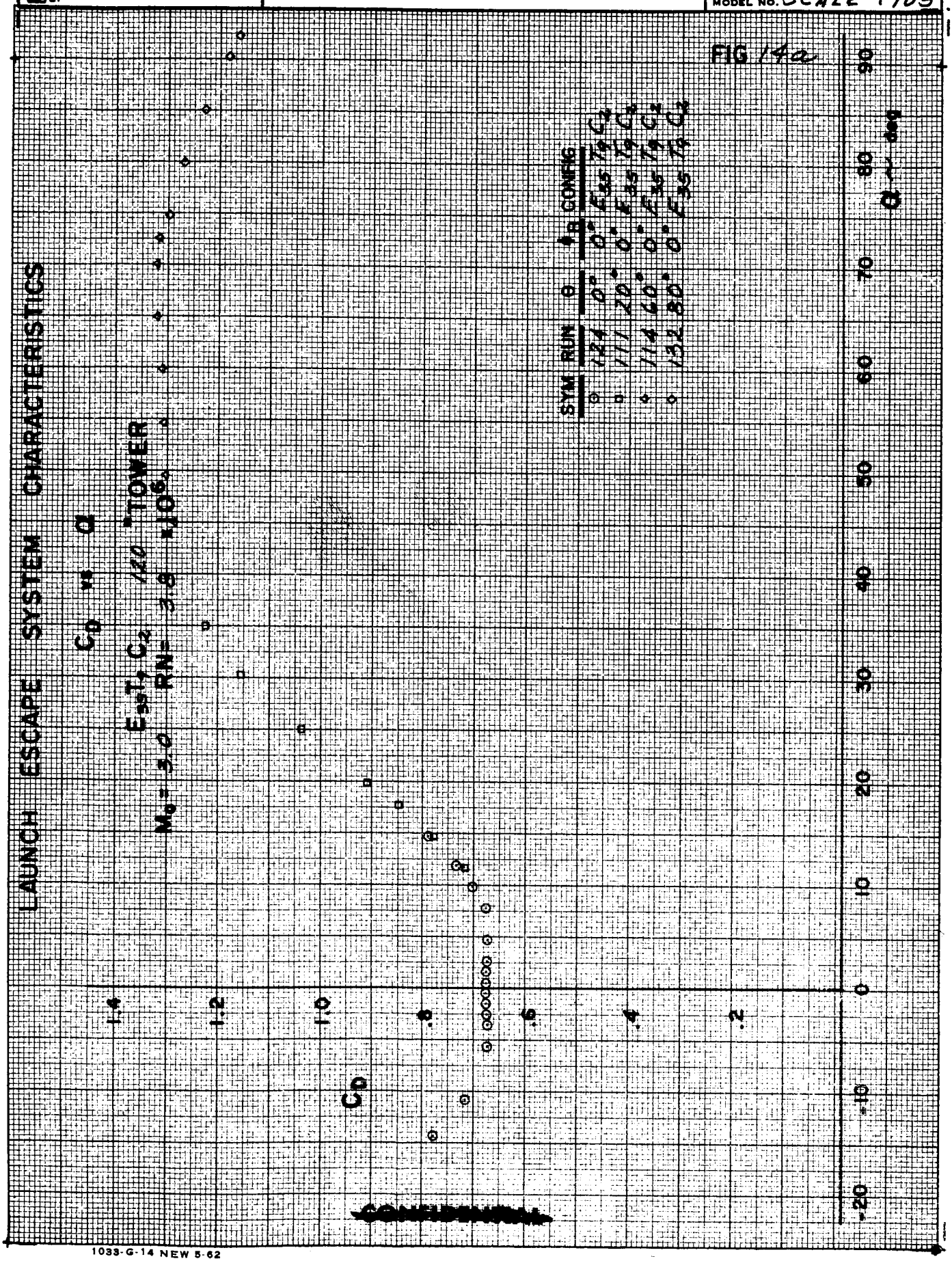
FIG 14a



[redacted]

1033-G-14 NEW 5-62

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION ~~CONFIDENTIAL~~	PAGE NO. B-98 OF
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1033-G-13 NEW 5-62

FORM M-113-N2- (REV. 3-61)

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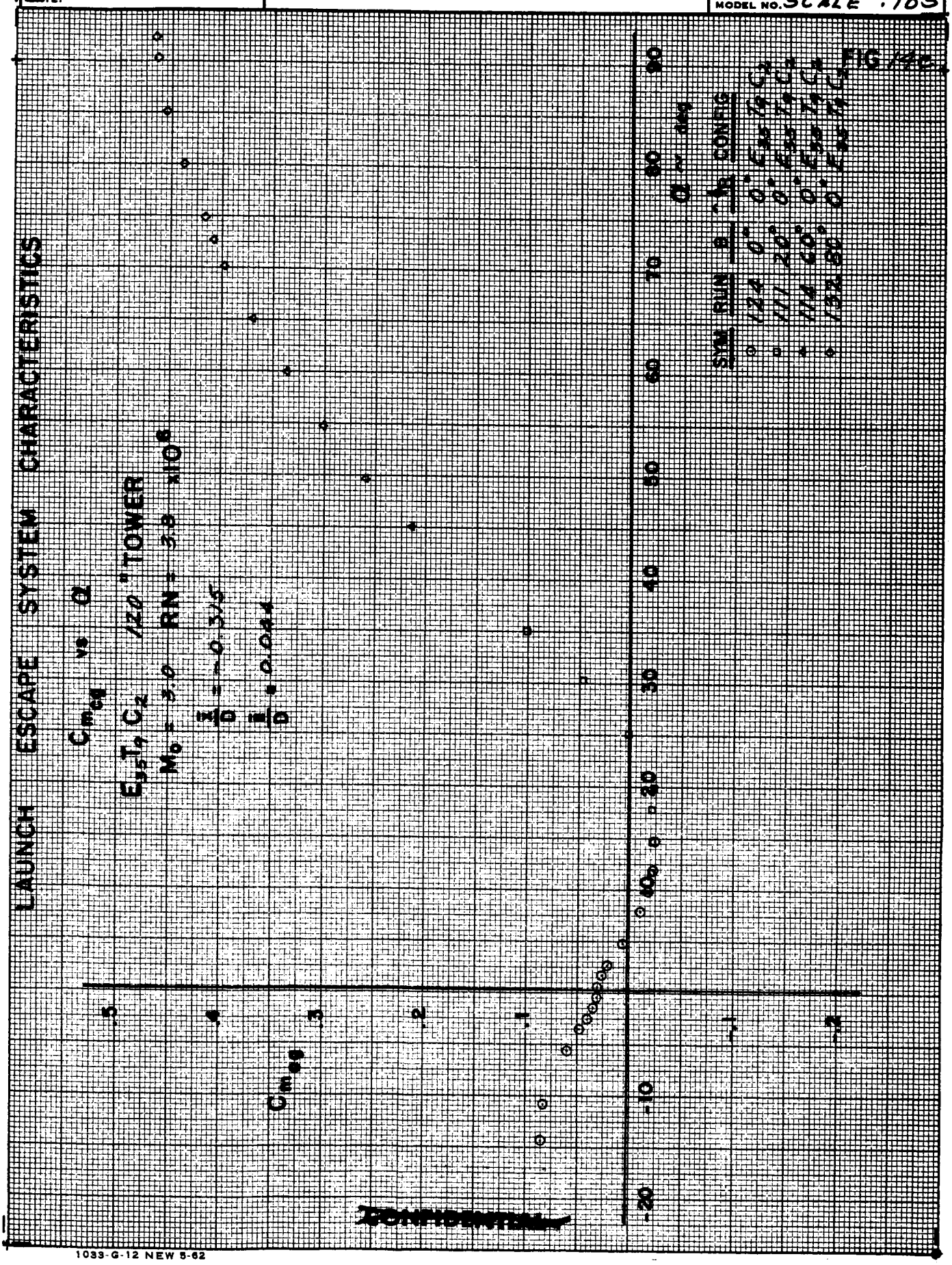

[redacted]

1033-G-12 NEW 5-62

FORM M-113-N2- (REV. 3-61)

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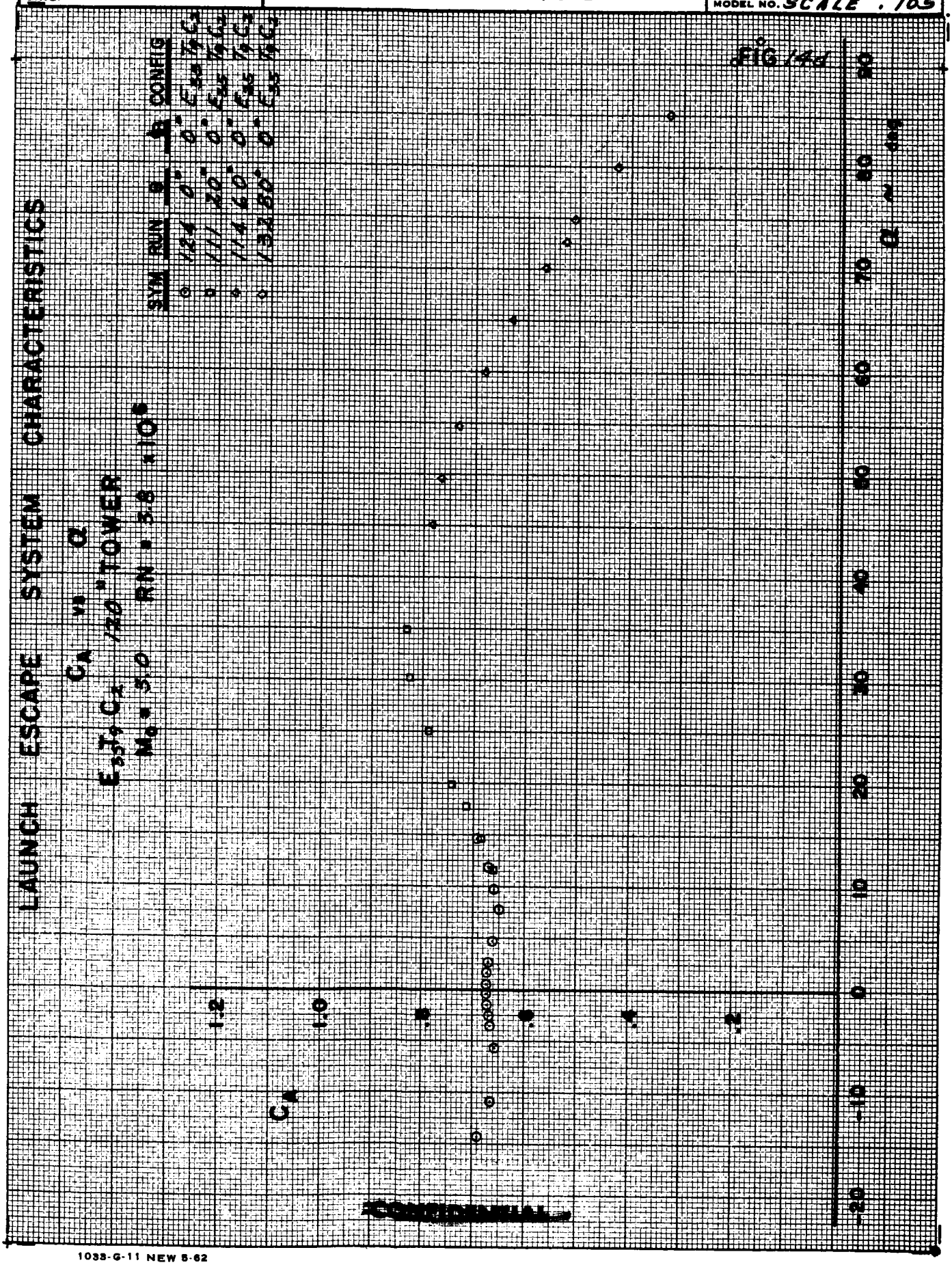

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1033-G-11 NEW 5-62

FORM M-113-N2- (REV. 3-61)

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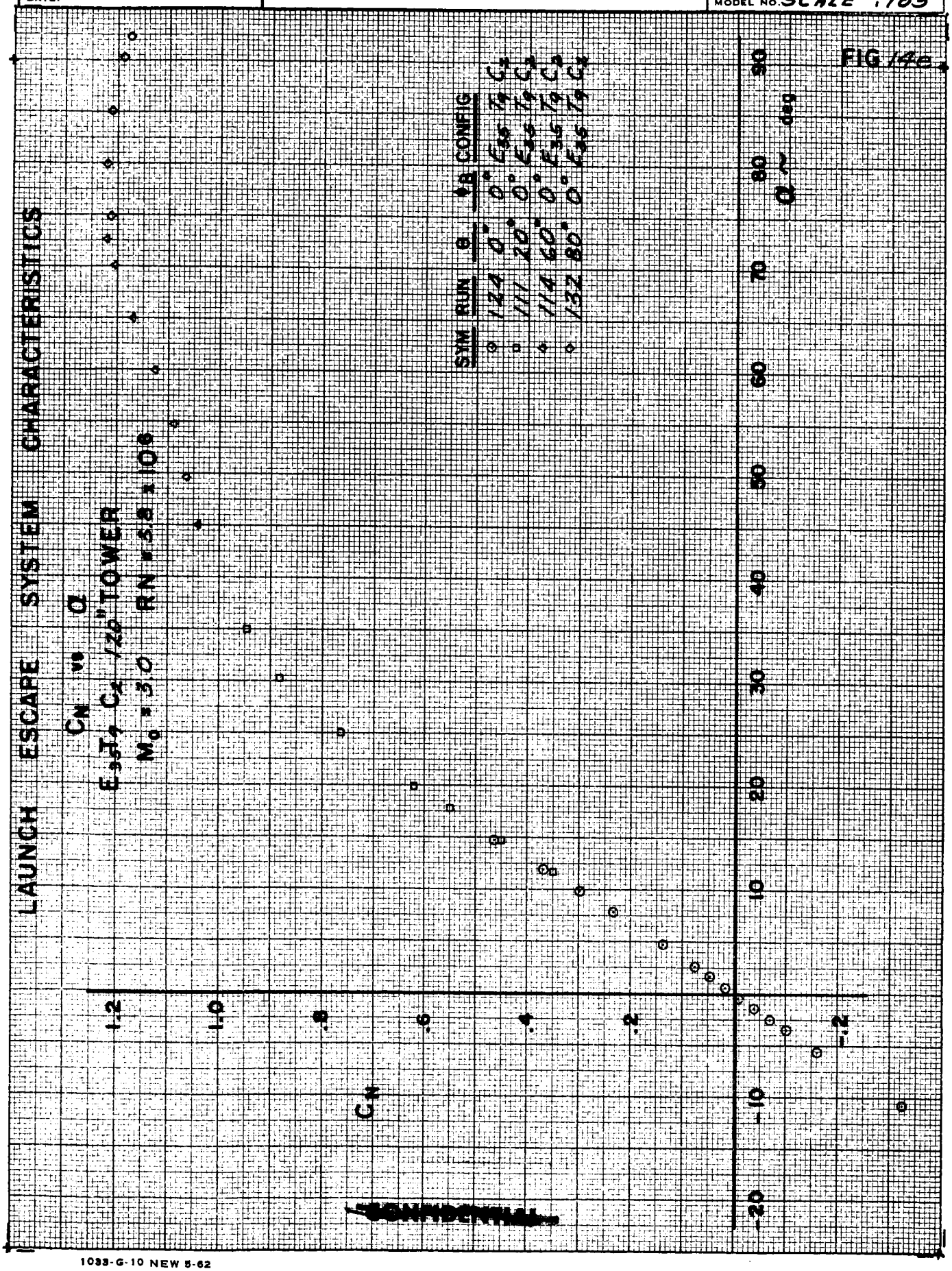

[redacted]

1033-G-10 NEW 5-62

FORM M-113-N2- (REV. 3-61)

PREPARED BY:	NORTH AMERICAN AVIATION, INC. SPACE and INFORMATION SYSTEMS DIVISION [redacted]	PAGE NO. B-102 OF
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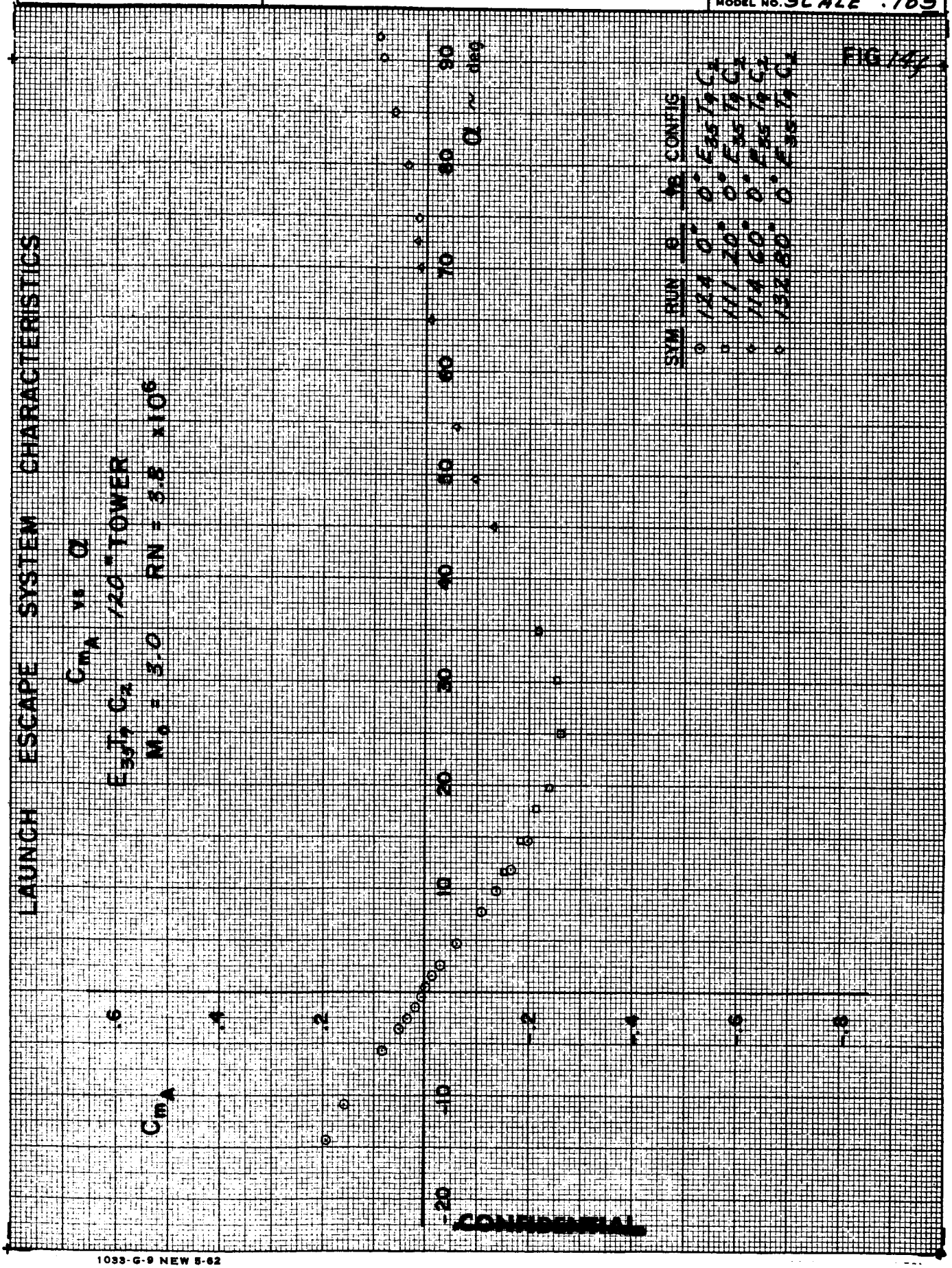

FIG 14

C_{m_A} vs α

1033-G-9 NEW 5-62

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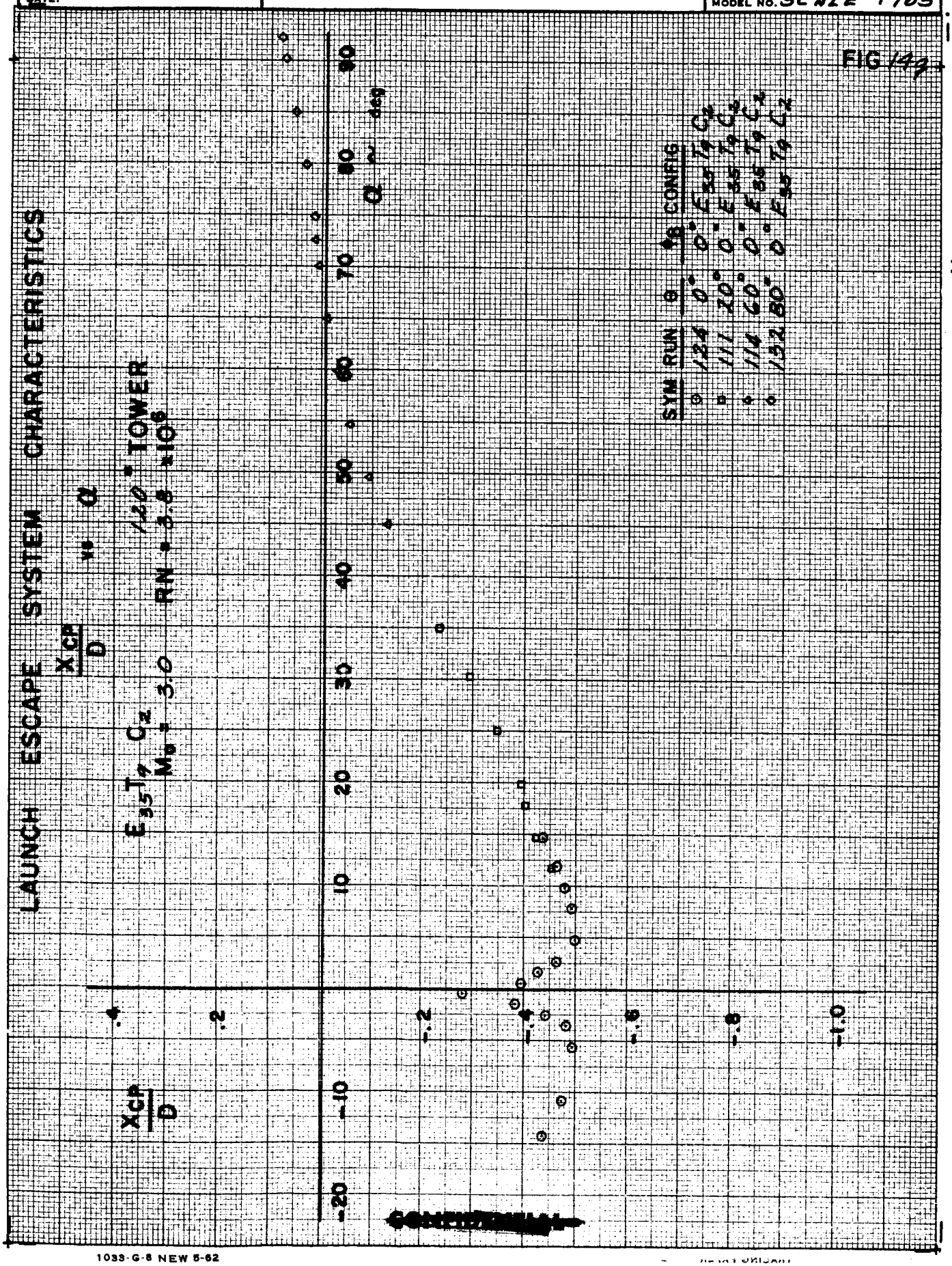
FIG 149



[redacted]

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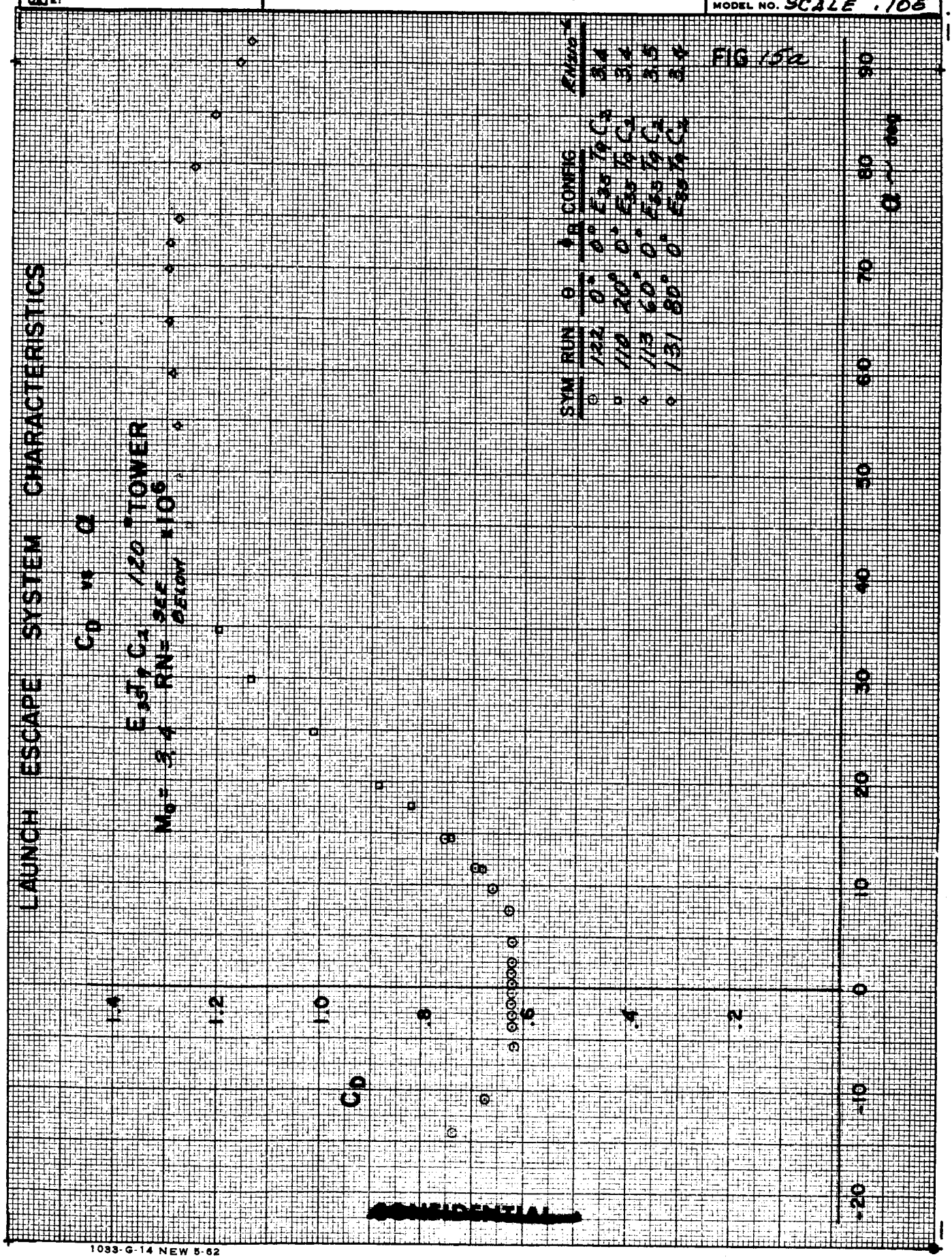

FIG 15a

C_D vs α

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1033-G-14 NEW 5-62

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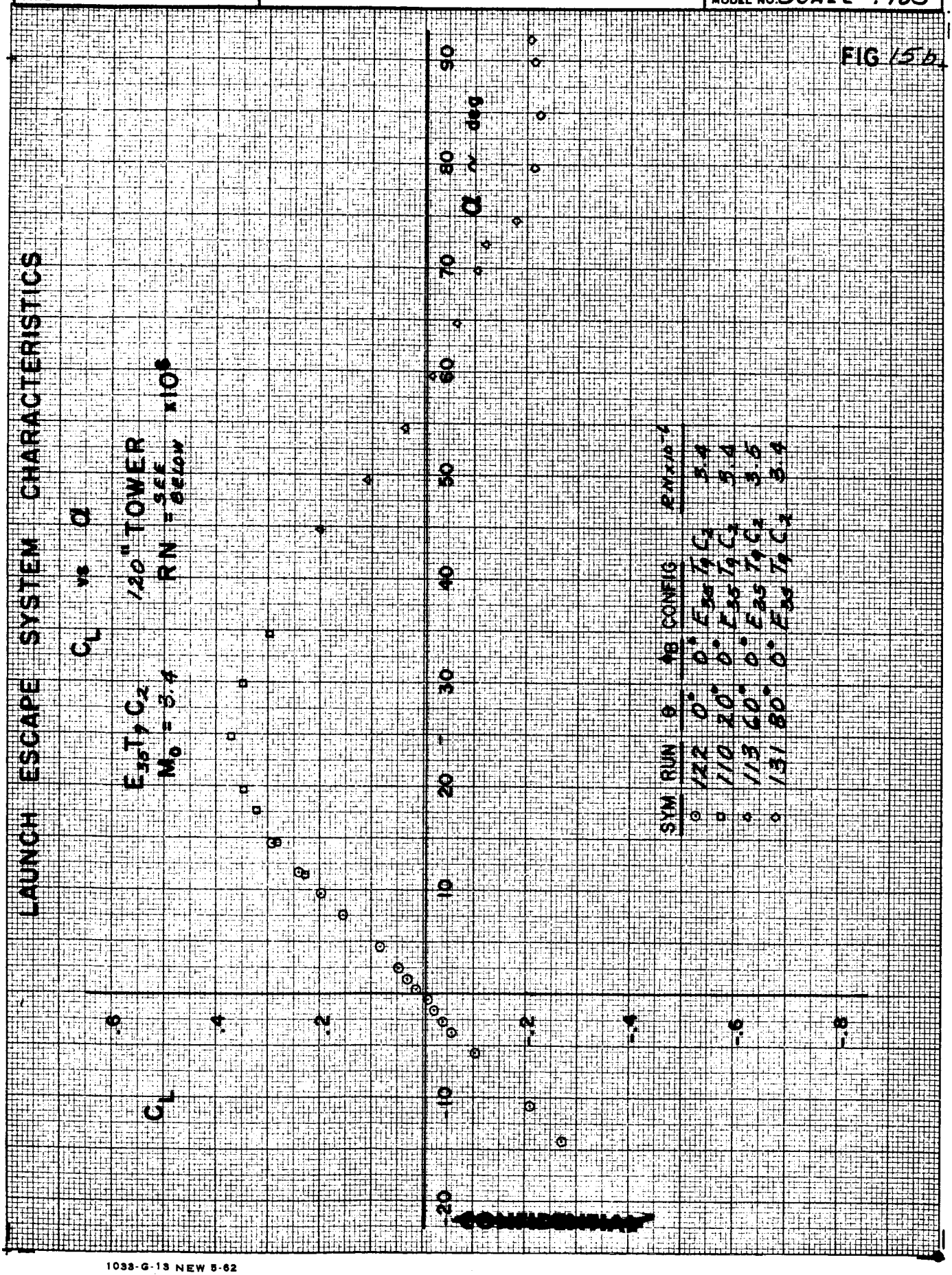
FIG 15b



C_L vs α

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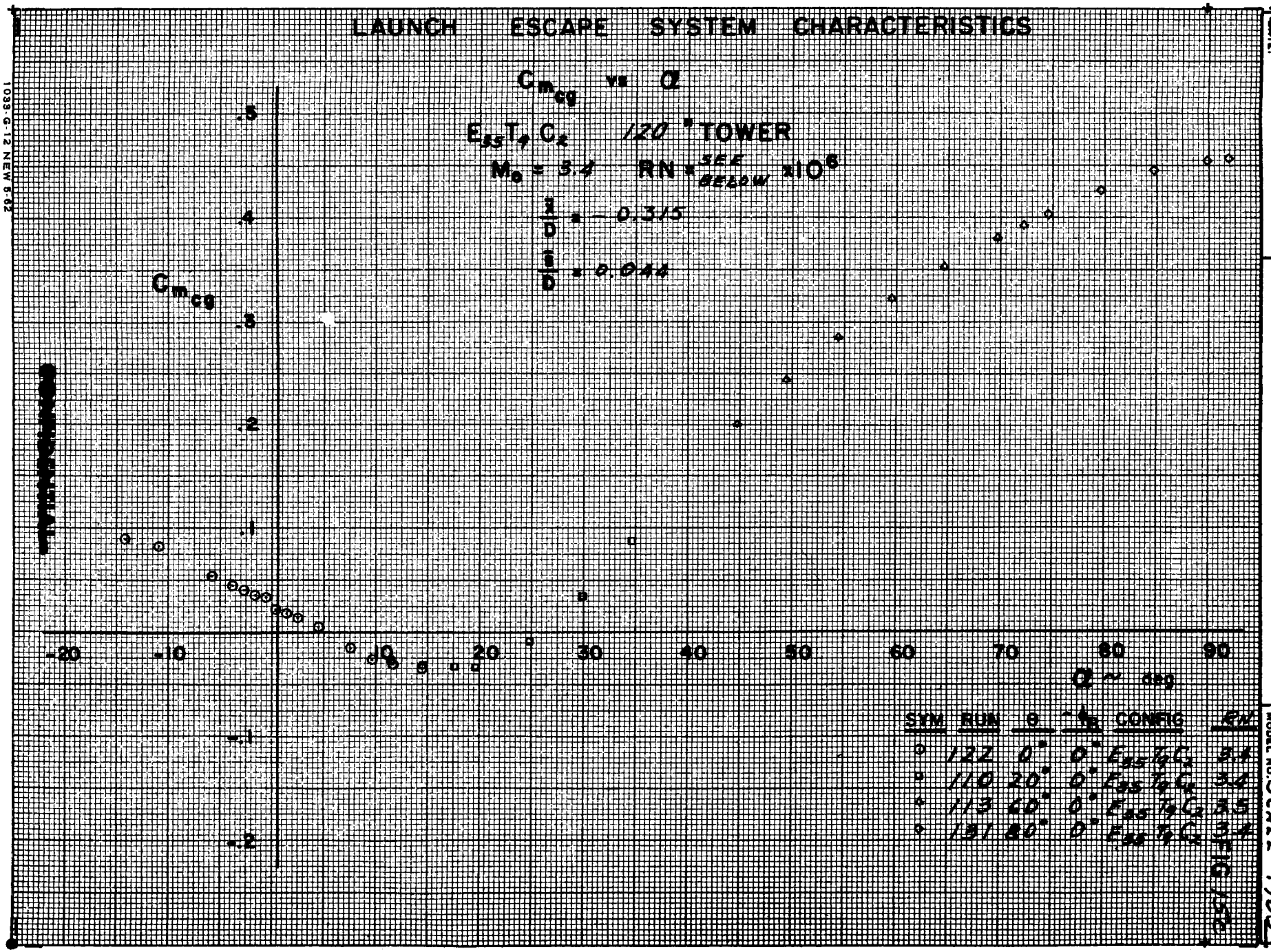

$C_{m_{cg}}$ vs α

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1033-G-12 NEW 8-62

FORM

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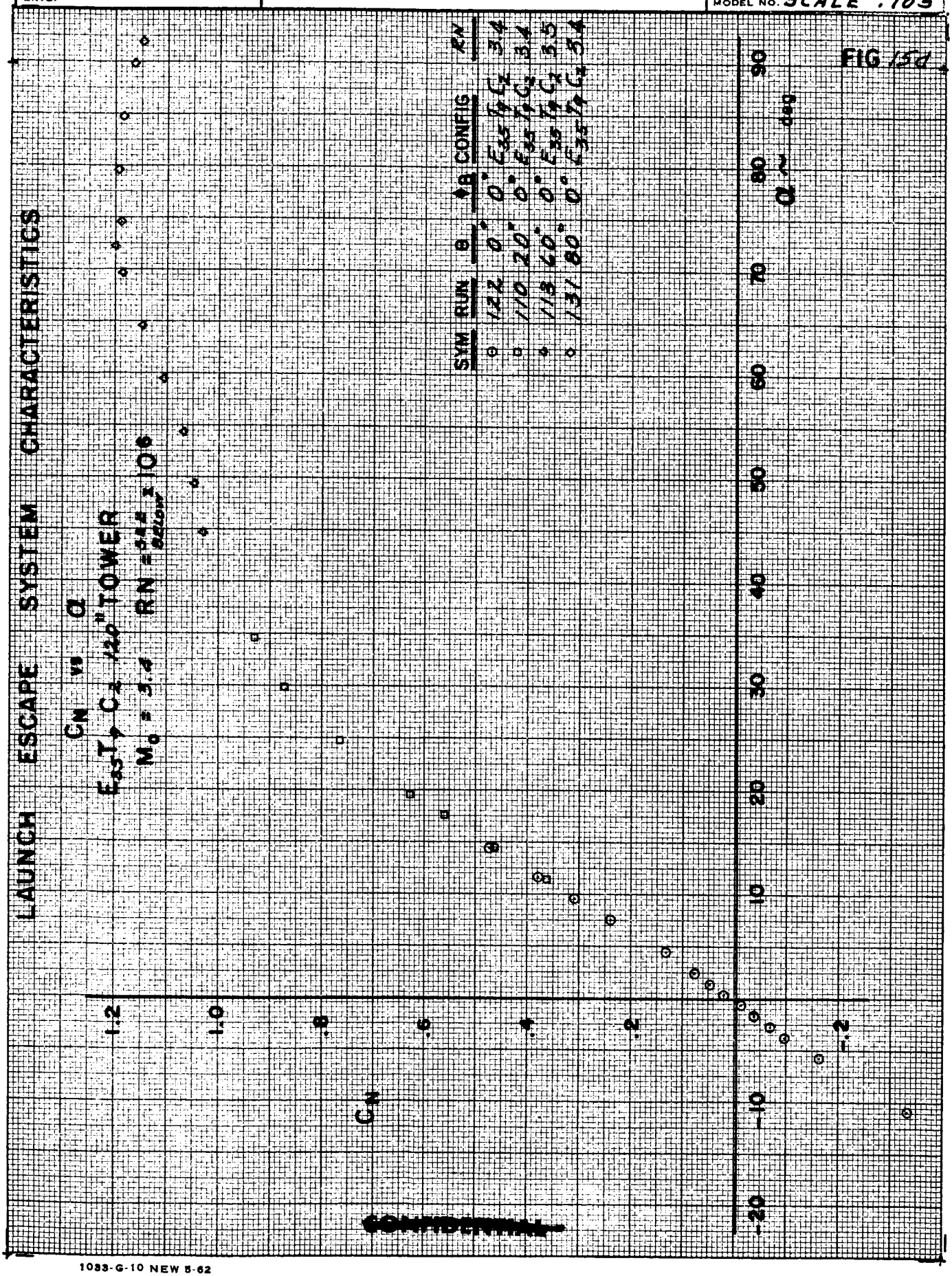

FIG 15d

C_N vs α

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1033-G-10 NEW 5-62

FORM M-113-N2- (REV. 3-61)

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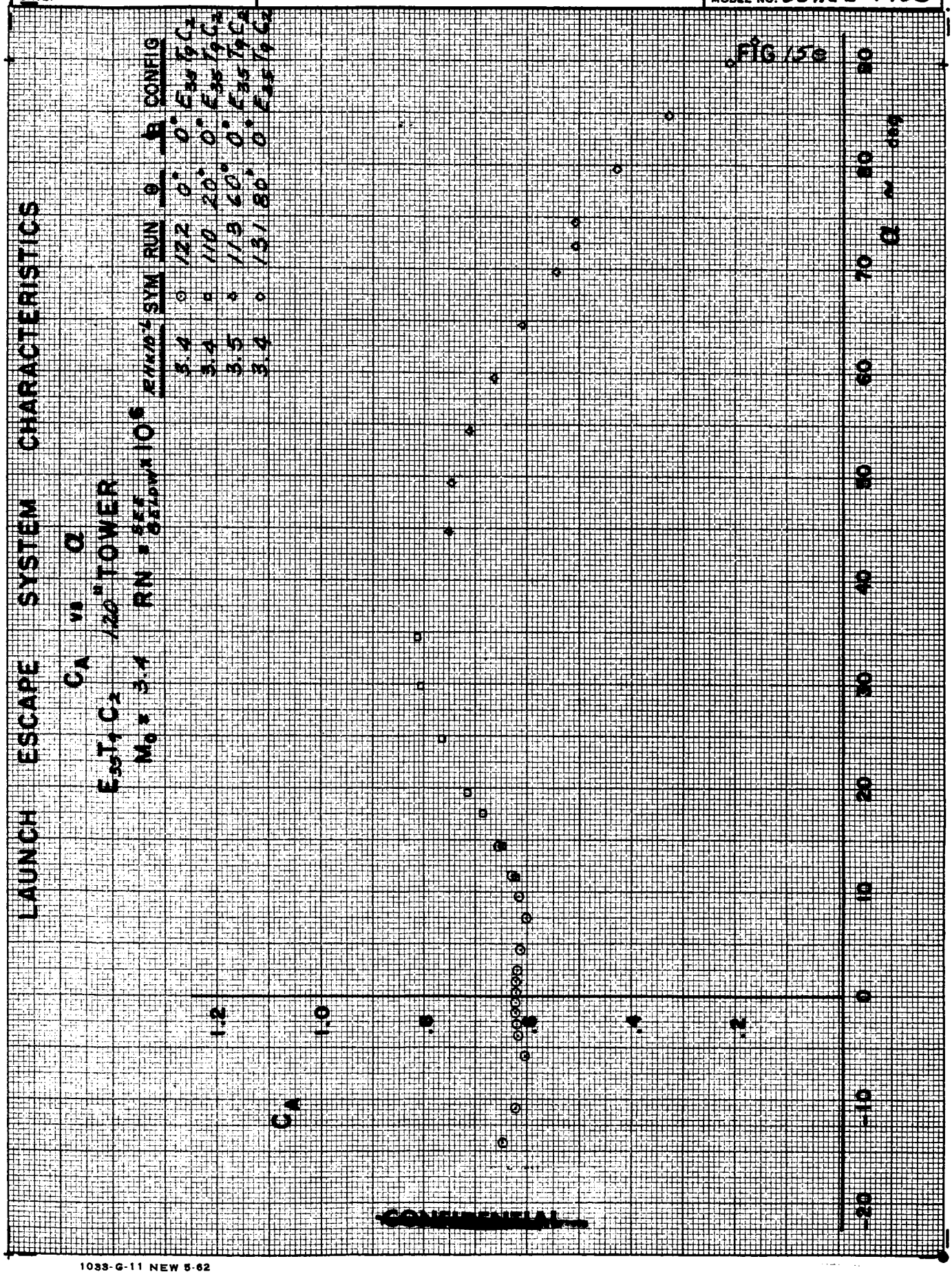

[redacted]

1033-G-11 NEW 5-62

FORM M-113-N2- (REV. 3-61)

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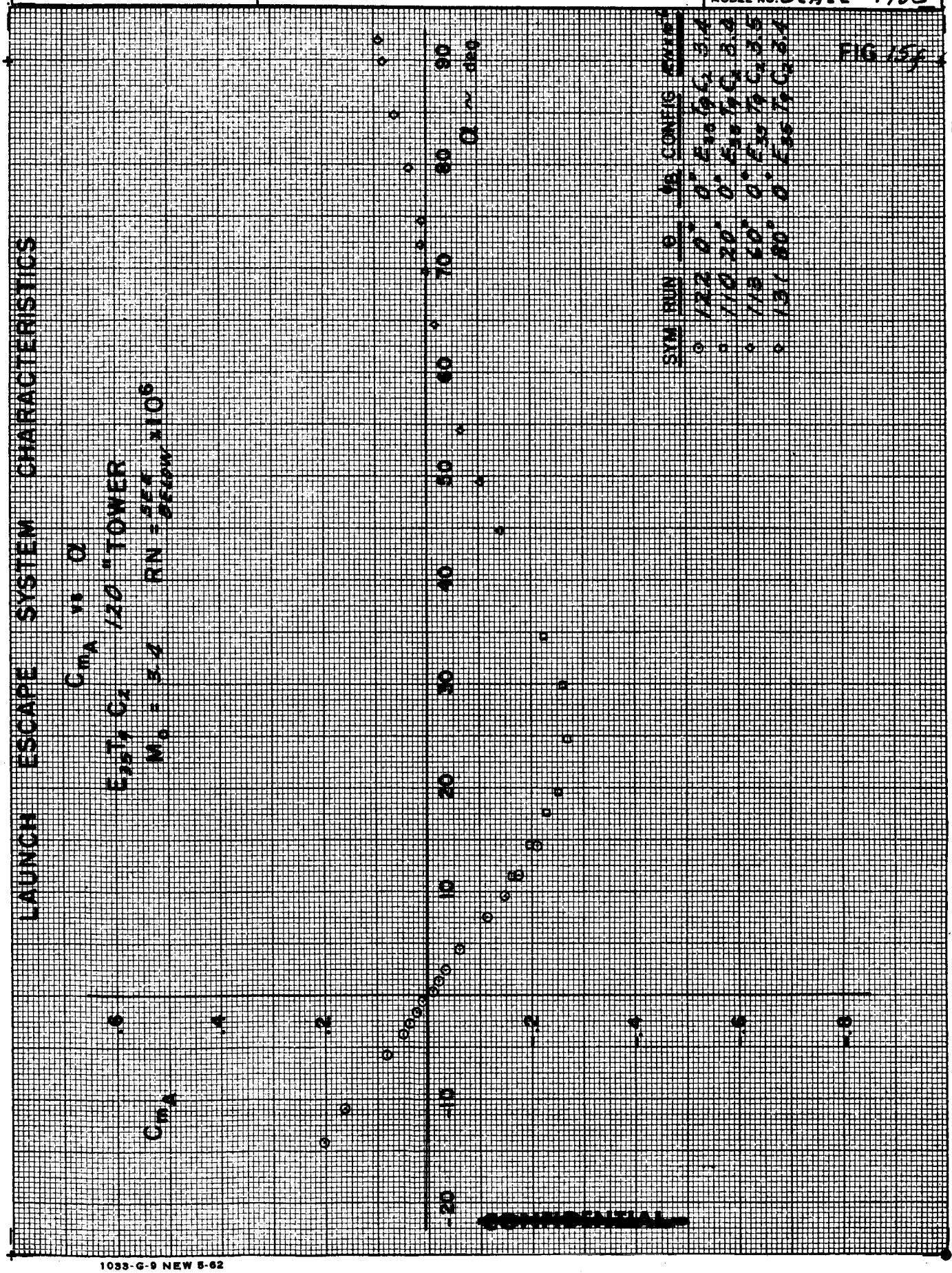

FIG 15

1033-G-9 NEW 5-62

FORM M-113-N2- (REV. 3-61)

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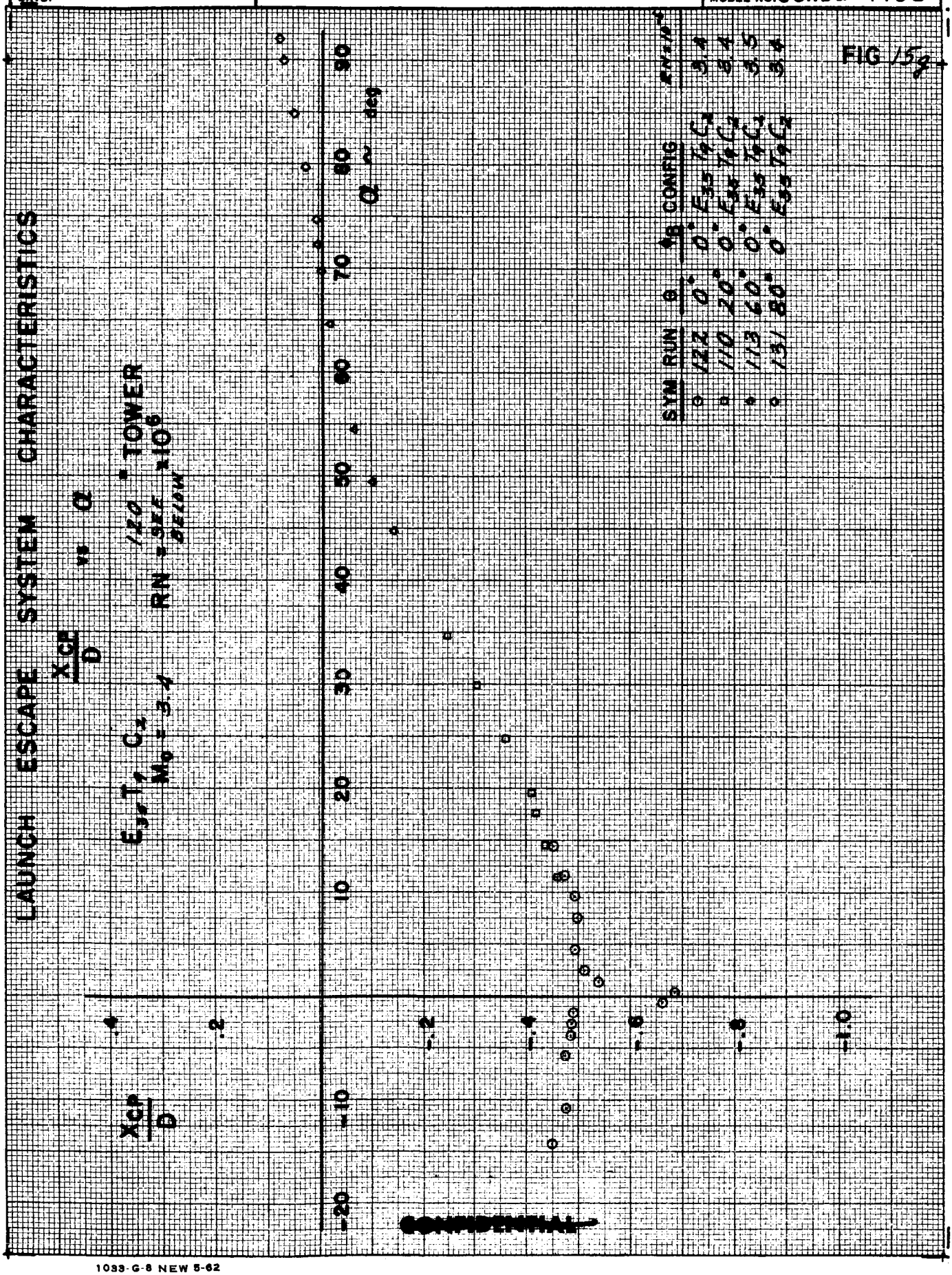

FIG 15a

XCP/D vs α

[redacted]

1033-G-8 NEW 5-62