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DATA REPORT FOR APOLLO MODEL FS-1 WIND TUNNEL TEST (SAL-1204) (U)

NAS 9-150

8 June 1962

Revised 29 August 1962

Prepared by

Apollo Engineering
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Flight Technology

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APPENDIX B

PLOTTED DATA

Launch Escape System Characteristics
$C_{m_{cg}}$, C_N, C_A, C_L, and C_D versus angle of attack.

Configuration	Mach No.	Figure No.	Page Nos.
E T_7C	1.575	1 a-e	B-4
E T_7C w/grit			
$E_{10}T_{11}C$	0.681	2 a-e	B-9
	1.575	3 a-e	B-14
$E_{12}T_{11}C$	0.681	4 a-e	B-19
	1.575	5 a-e	B-24
$E_{14}T_{11}C$	0.681	6 a-e	B-29
	1.575	7 a-e	B-34
$E_{15}T_{11}C$	0.681	8 a-e	B-39
	1.575	9 a-e	B-44
$E_{16}T_{11}C$	0.681	10 a-e	B-49
$E_{17}T_{11}C$	0.681	11 a-e	B-54
$E_{18}T_{11}C$	0.681	12 a-e	B-59
$E_{19}T_{11}C$	0.681	13 a-e	B-64
$E_{20}T_{11}C$	0.681	14 a-e	B-69
	1.575	15 a-e	B-74
	3.270	16 a-e	B-79
$E_{21}T_{11}C$	0.681	17 a-e	B-84
	1.575	18 a-e	B-89
$E_{22}T_{11}C$	0.681	19 a-e	B-94
	1.575	20 a-e	B-99
	3.270	21 a-e	B-104
$E_{23}T_{11}C$	0.681	22 a-e	B-109
	1.575	23 a-e	B-114
$E_{24}T_{11}C$	0.681	24 a-e	B-119
	1.575	25 a-e	B-124
$E_{25}T_{11}C$	0.681	26 a-e	B-129
	1.575	27 a-e	B-134
$E_{26}T_{11}C$	0.681	28 a-e	B-139
	1.575	29 a-e	B-144
$E_{27}T_{11}C$	0.681	30 a-e	B-149
$E_{28}T_{11}C$	0.681	31 a-e	B-154

Configuration	Mach No.	Figure No.	Page Nos.
$E_{29}T_{11}C$	0.681	32 a-e	B-159
	1.575	33 a-e	B-164
$E_{30}T_{11}C$	0.681	34 a-e	B-169
$E_{31}T_{11}C$	0.681	35 a-e	B-174
$E_{32}T_{11}C$	0.681	36 a-e	B-179
$E_{33}T_{11}C$	0.681	37 a-e	B-184
$E_{34}T_{11}C$	0.681	38 a-e	B-189

Note: The discontinuities apparent in plots of C_D and C_A occur when the command module model-sting angles are changed. These discontinuities are due to sting interference that increases the base pressure, which in turn, decreases axial force and drag. This occurs when the sector is at a negative angle of attack.

LAUNCH ESCAPE SYSTEM CHARACTERISTICS

$C_{m_{cg}}$ vs α

E T C 120" TOWER

$M_\infty = 1.525$ RN $= .374 \times 10^6$

$\frac{x}{D} = 0.61$

$\frac{z}{D} = 0.044$

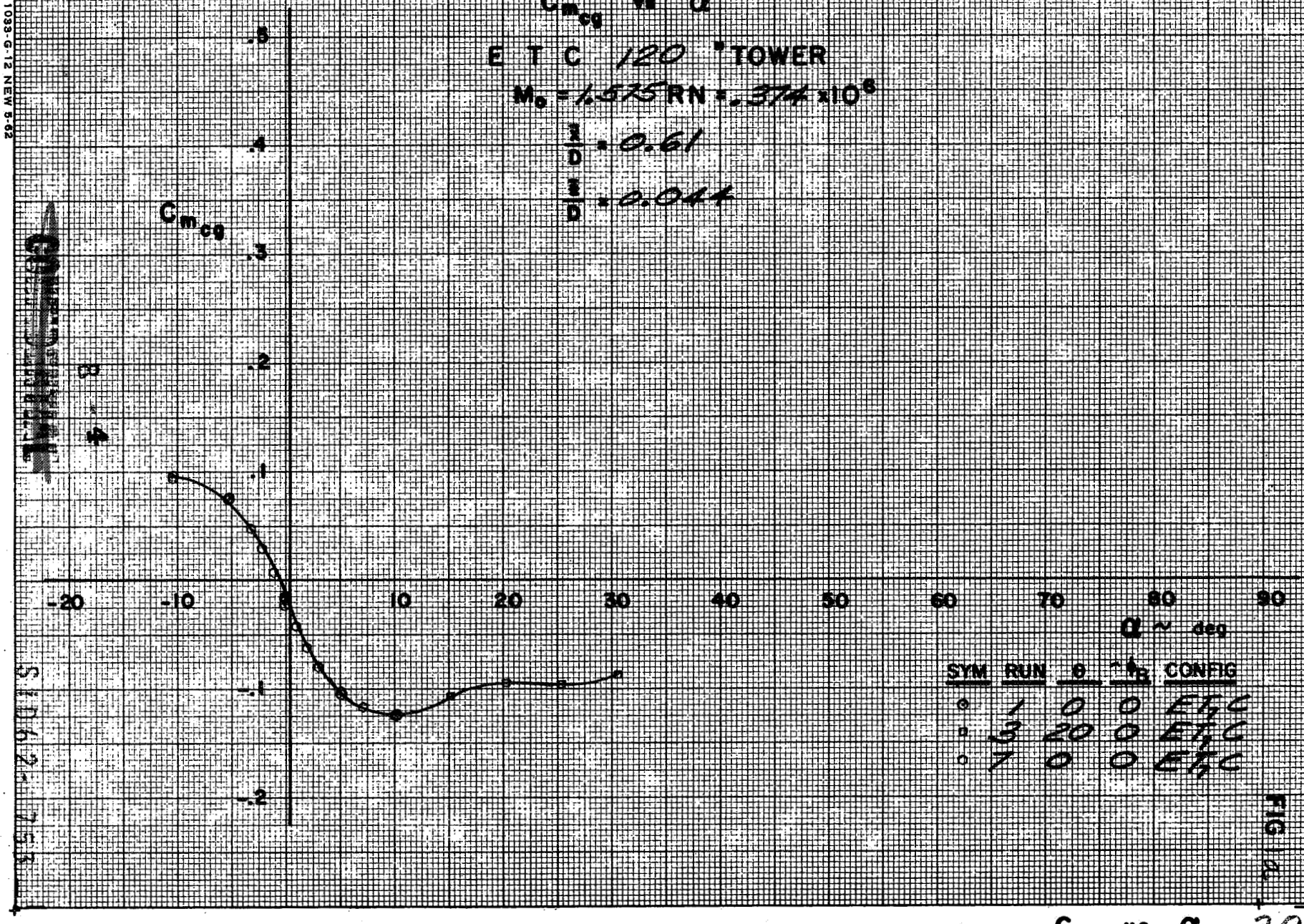

FIG 10

$C_{m_{cg}}$ vs α 201-19

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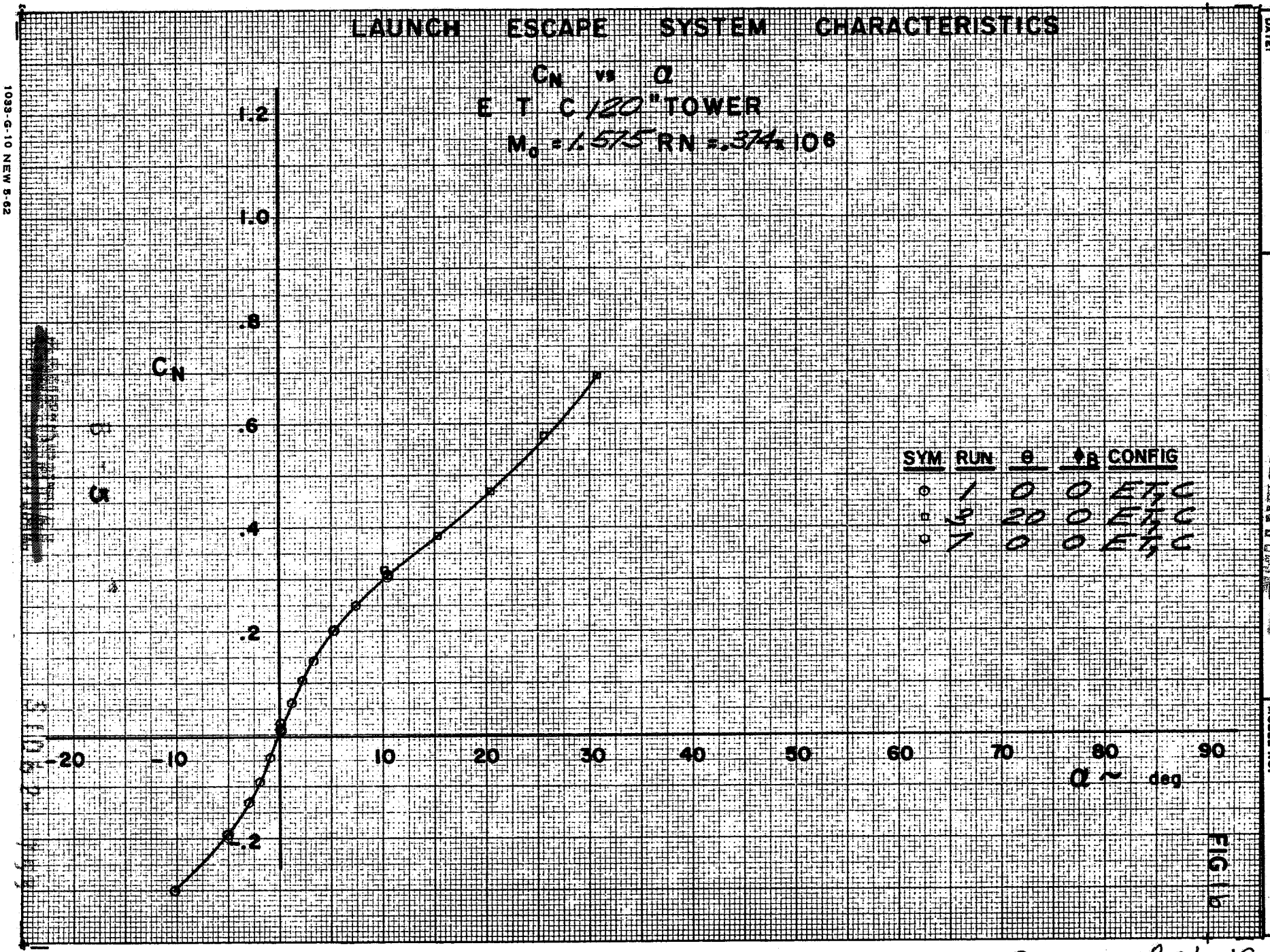

FIG 16

C_N vs α 201-19

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LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_A vs α

E T C 120" TOWER

$M_\infty = 1.575$ RN $= .374 \times 10^6$

SYM	RUN	θ	ψ	CONFIG
⊙	1	0	0	ETC
⊡	3	20	0	ETC
○	7	0	0	ETC

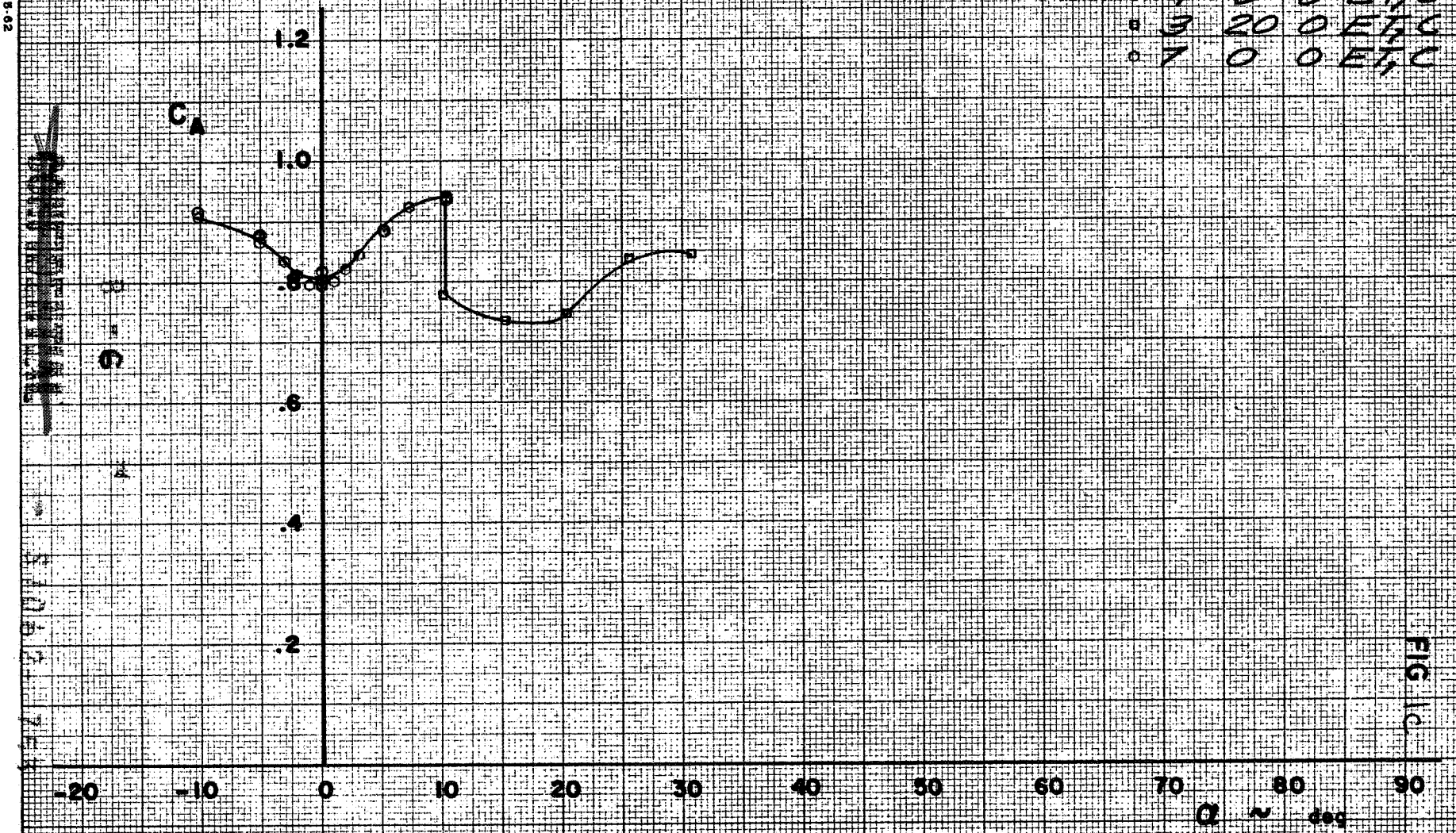

FIG 1C

C_A vs α

201-19

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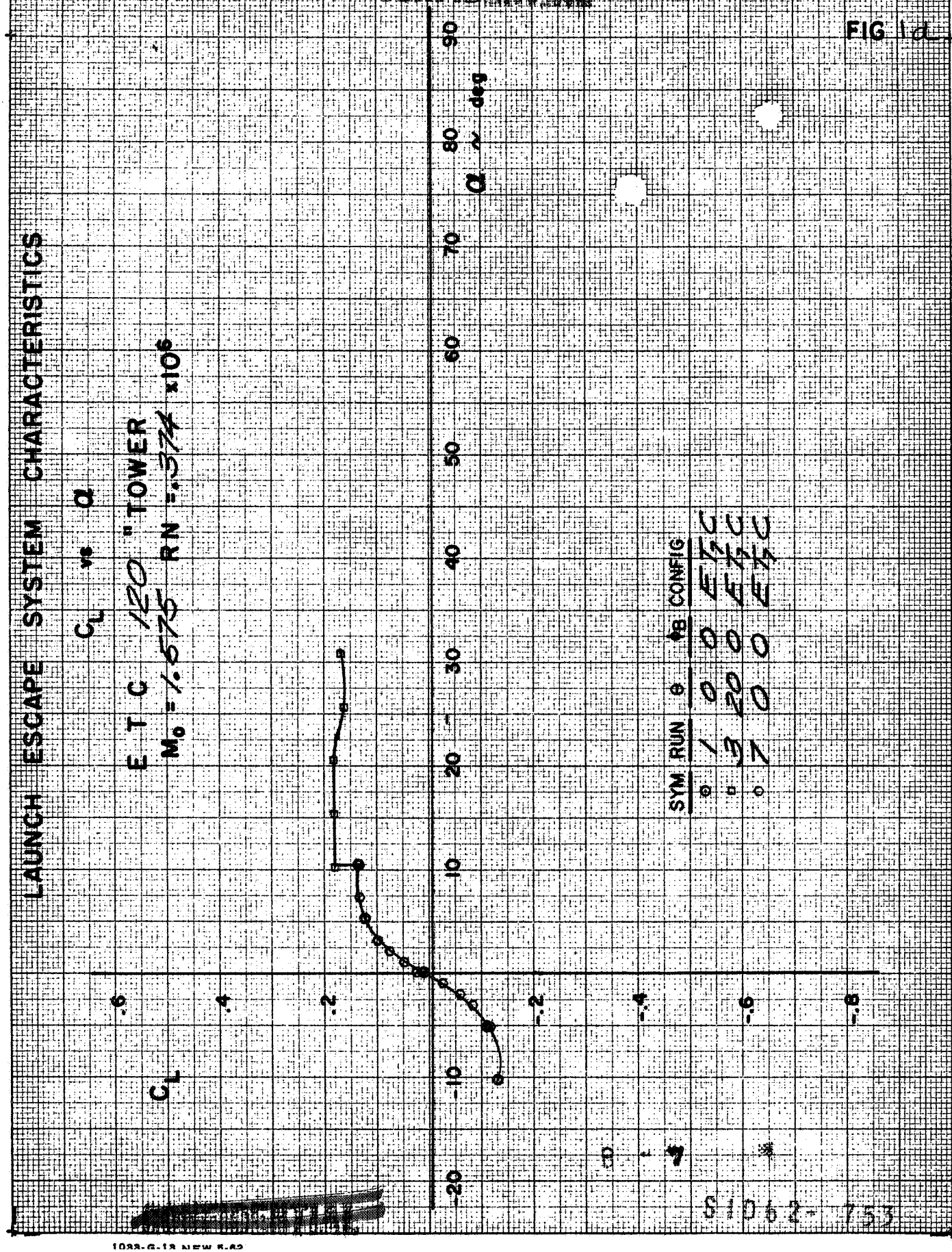
FIG 1d



C_L vs α 201-

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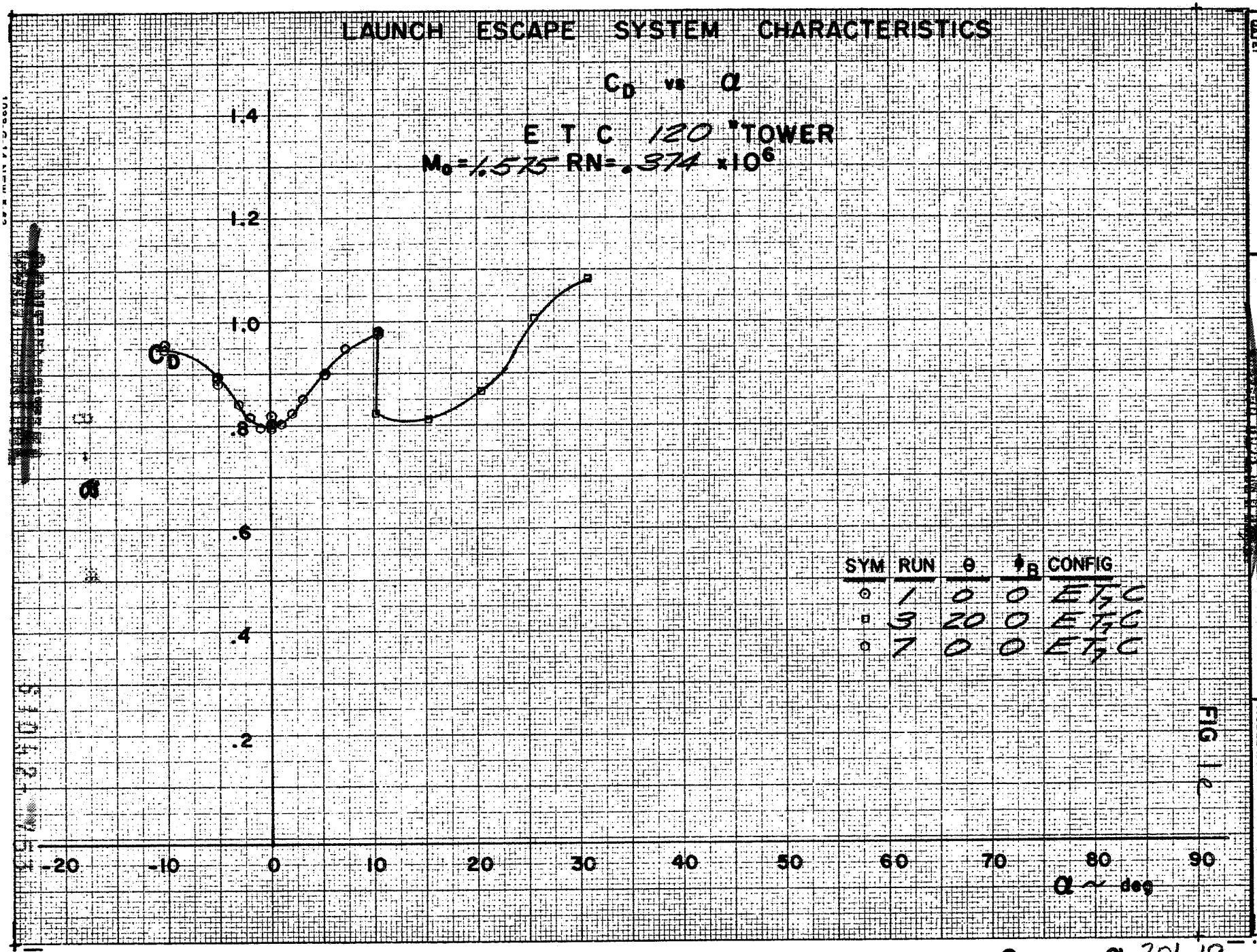

FIG 1e

C_D vs α 201-19

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LAUNCH ESCAPE SYSTEM CHARACTERISTICS

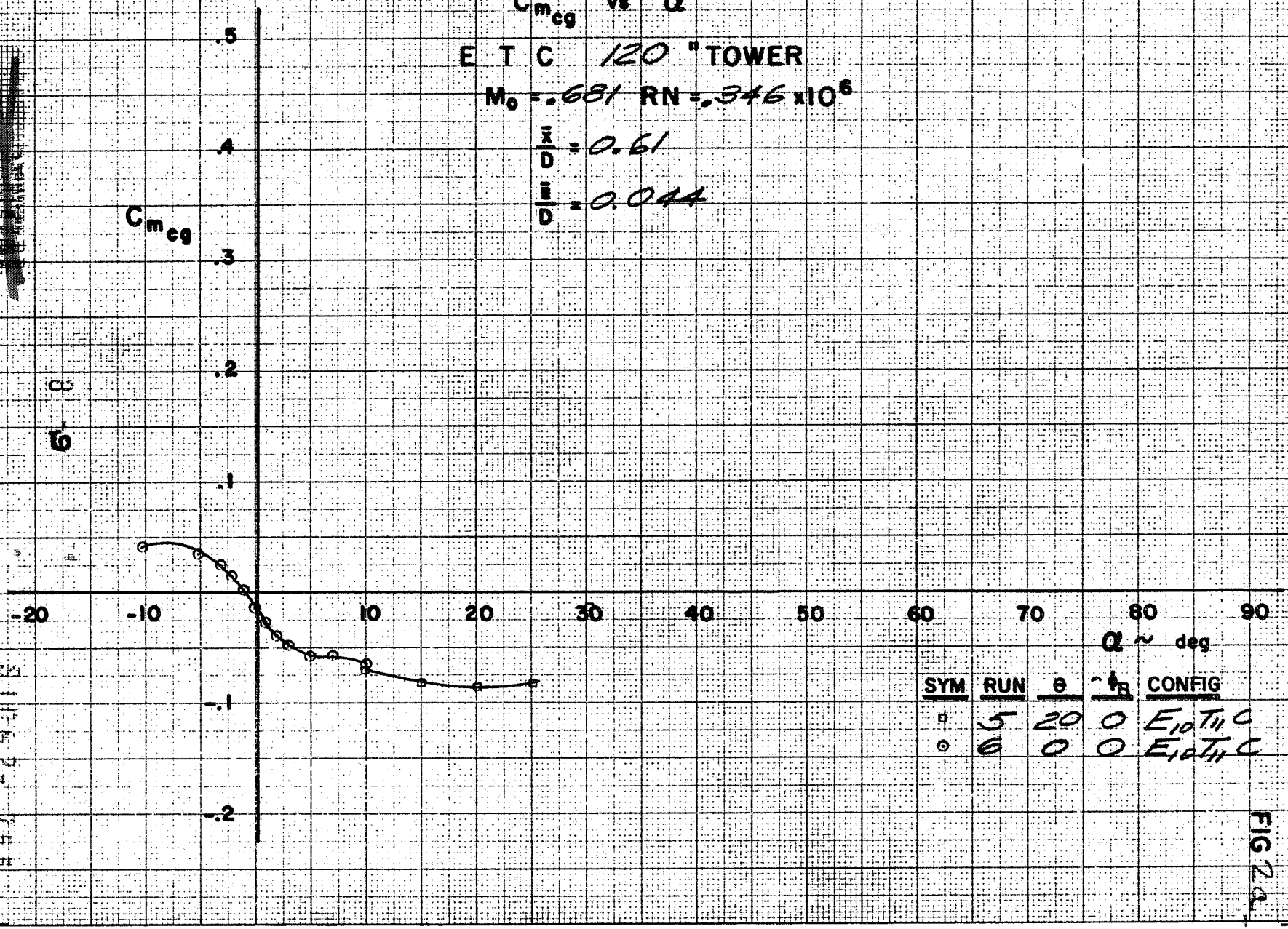
$C_{m_{cg}}$ vs α

E T C 120" TOWER

$M_0 = .681$ $RN = .346 \times 10^6$

$\frac{x}{D} = 0.61$

$\frac{z}{D} = 0.044$



SYM	RUN	θ	ϕ_B	CONFIG
□	5	20	0	$E_{10}T_{11}C$
⊙	6	0	0	$E_{10}T_{11}C$

FIG 2a

$C_{m_{cg}}$ vs α

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LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_N vs α

E T C 120" TOWER

M_o = .681 RN = .346 x 10^6

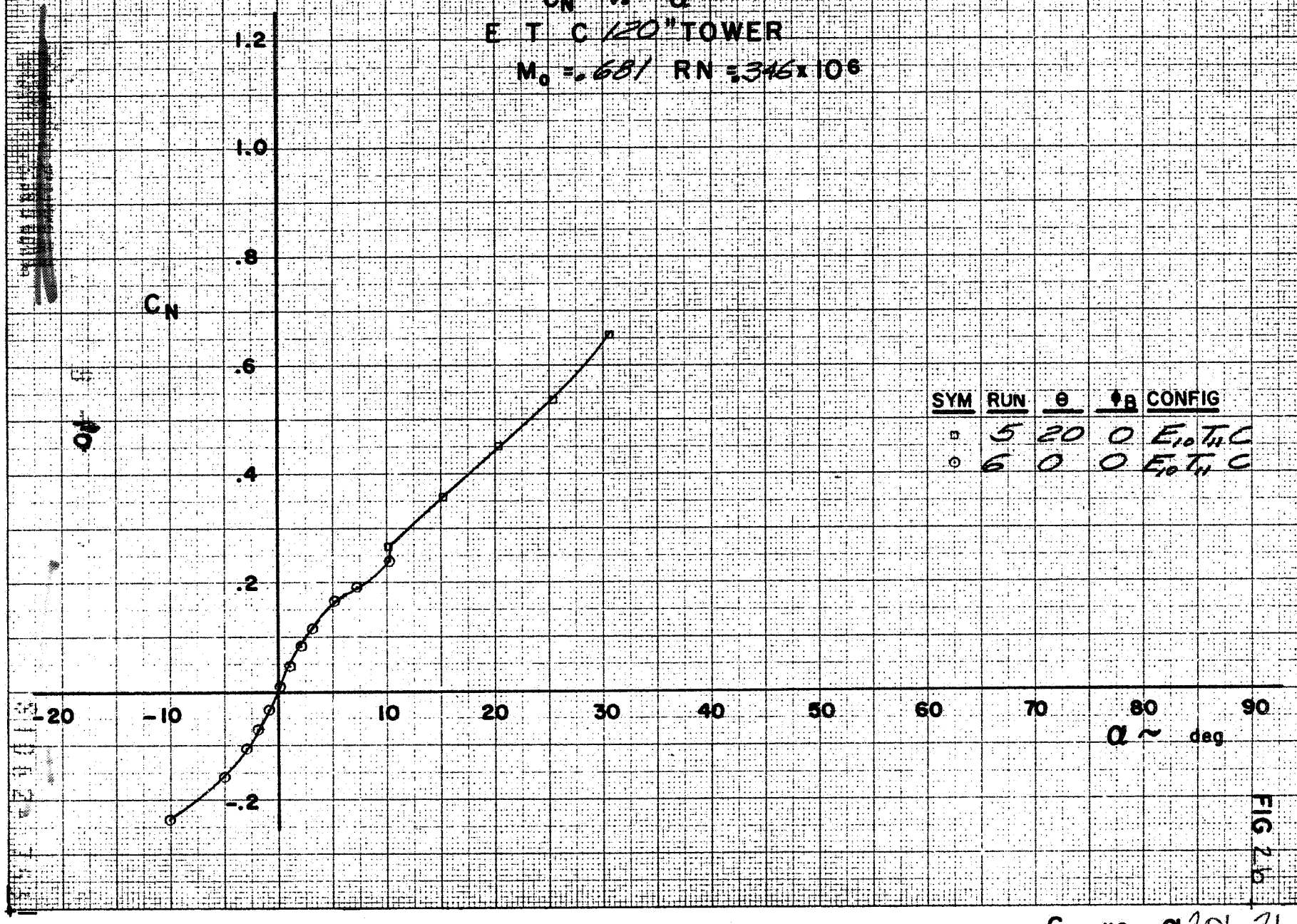

FIG 2b

C_N vs α 201-21

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LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_A vs α

E T C 120" TOWER

M_0 = .681 RN = .346 x 10^6

SYM	RUN	θ	β	CONFIG
□	5	20	0	$F_{10}T_{11}C$
⊙	6	0	0	$F_{10}T_{11}C$

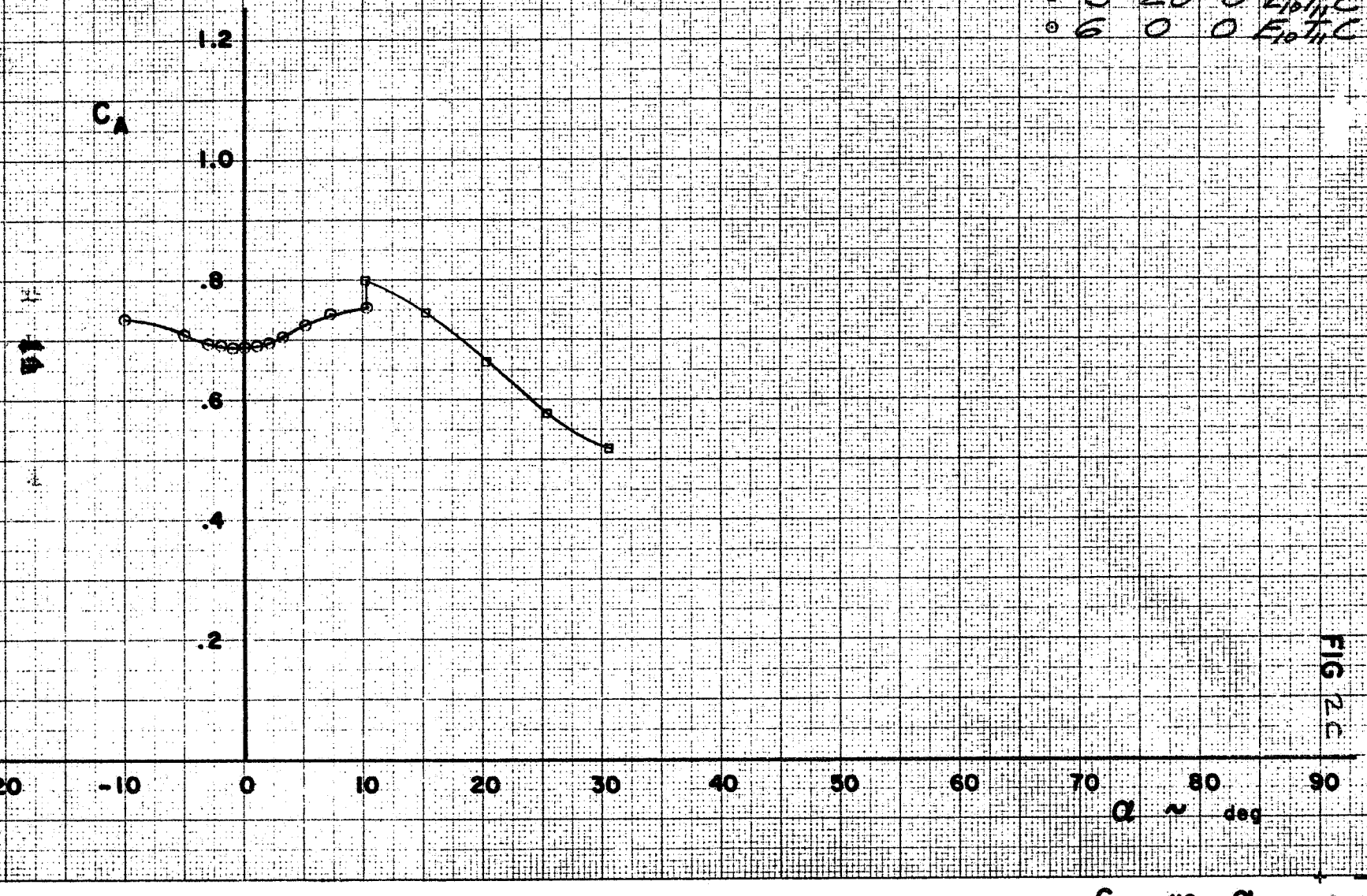

FIG 2C

C_A vs α

201-21

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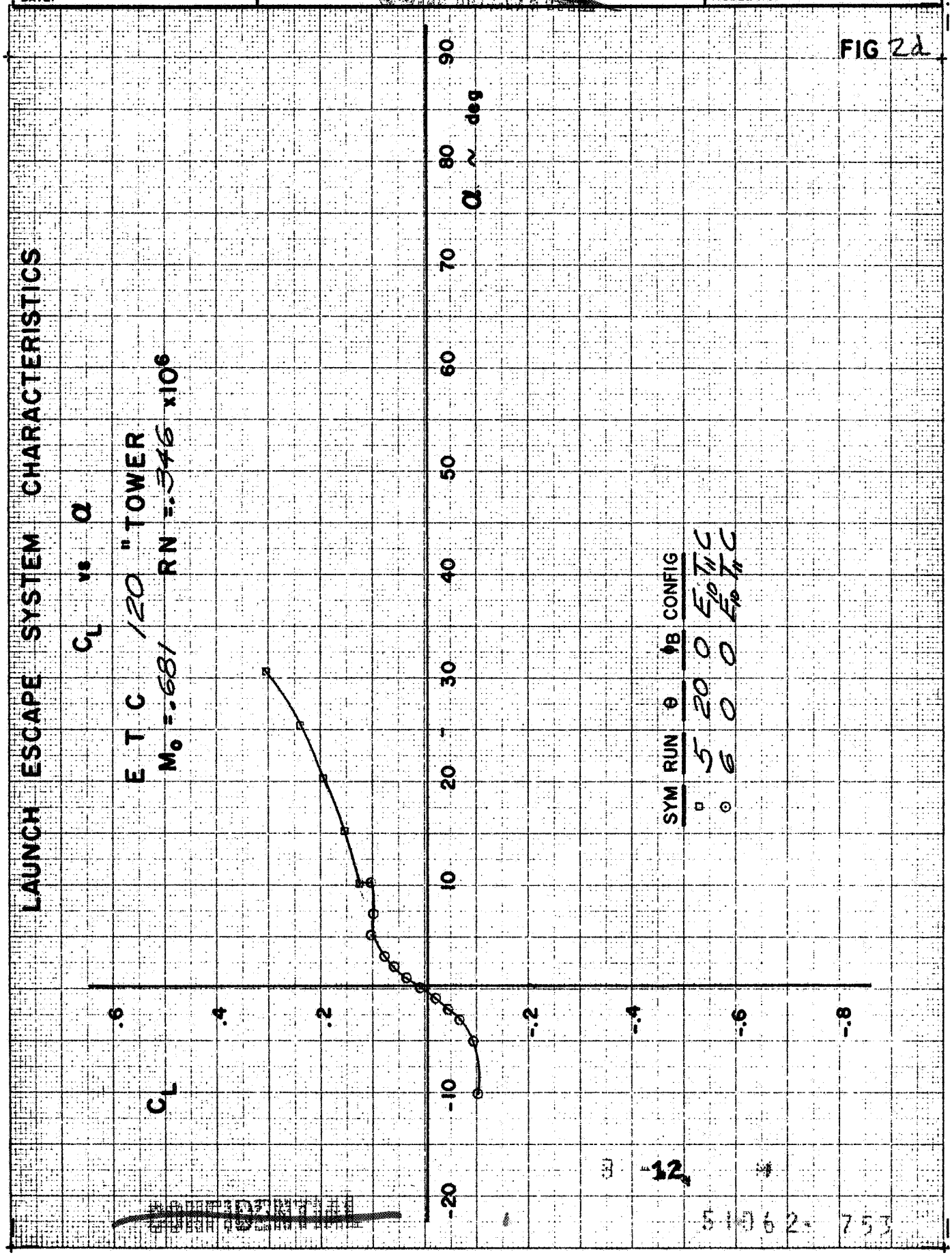
FIG 2d



C_L vs α 201-21

[redacted]

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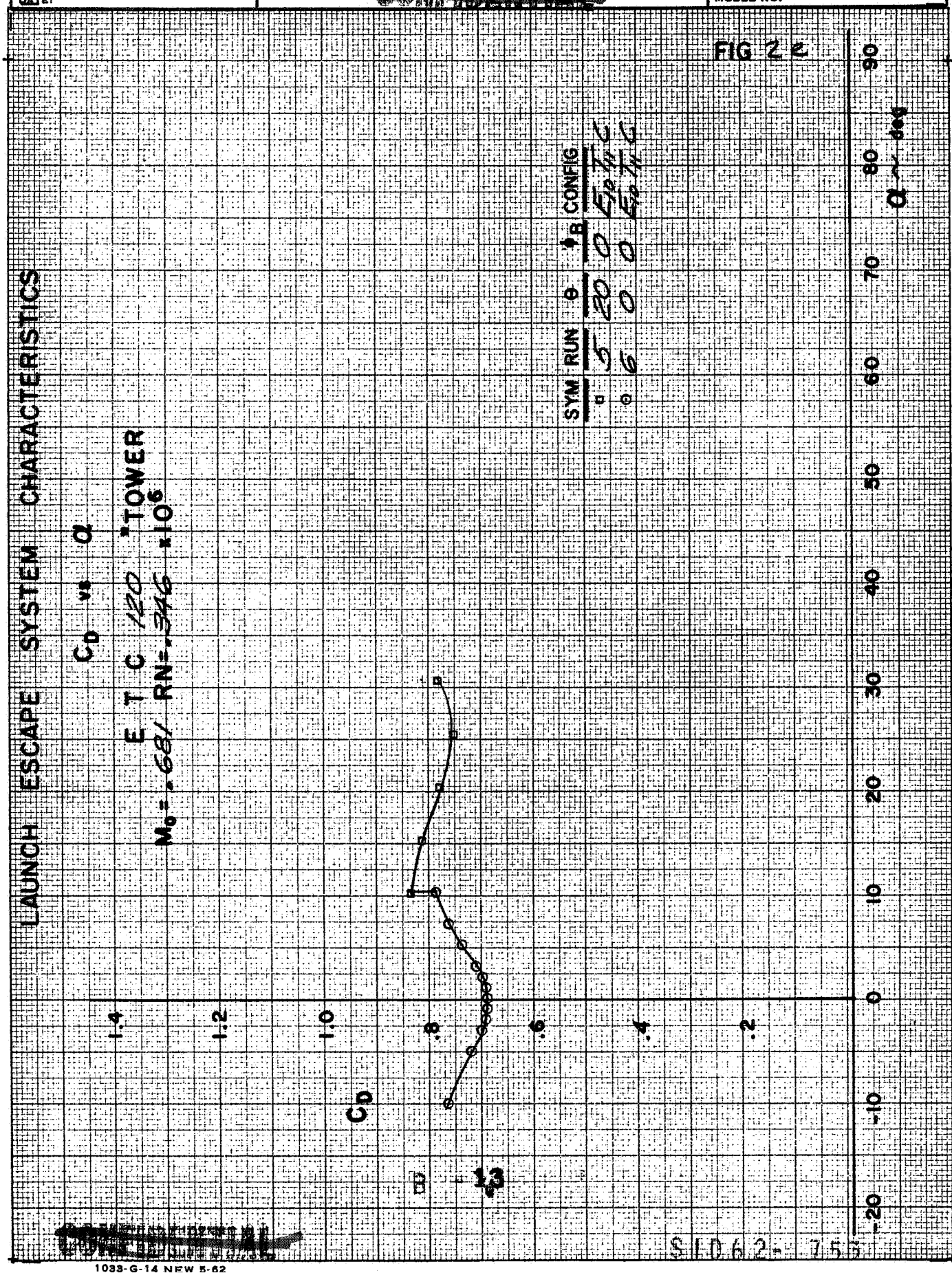

C_D vs α 201-21

B - 13

[redacted]

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LAUNCH ESCAPE SYSTEM CHARACTERISTICS

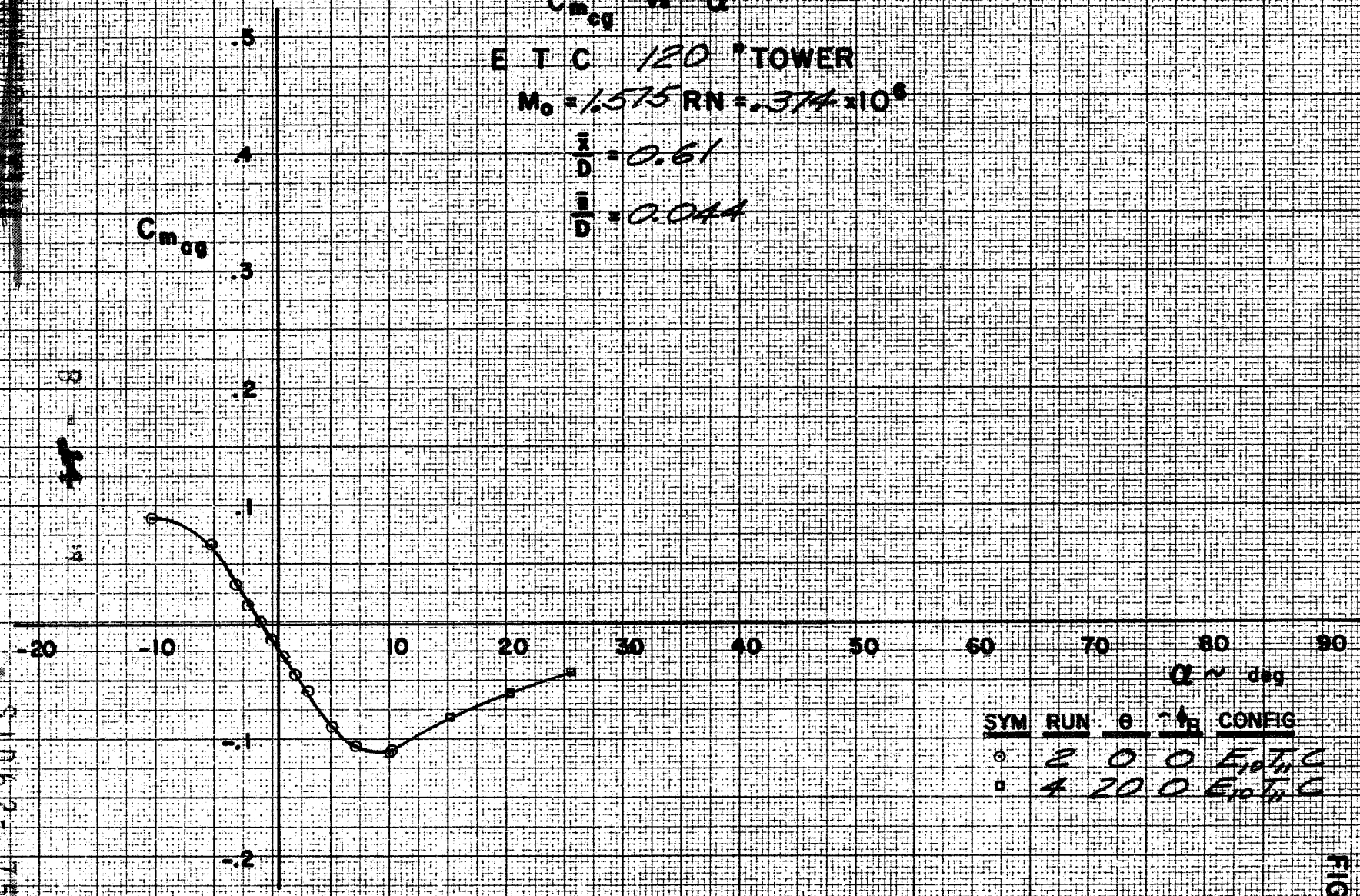
$C_{m_{cg}}$ vs α

E T C 120" TOWER

$M_o = 1.515$ RN $= .374 \times 10^6$

$\frac{\bar{x}}{D} = 0.61$

$\frac{\bar{z}}{D} = 0.044$



SYM	RUN	θ	τ_B	CONFIG
⊙	2	0	0	$E_{10}T_{11}C$
▫	4	20	0	$E_{10}T_{11}C$

FIG 3P

$C_{m_{cg}}$ vs α 201-20

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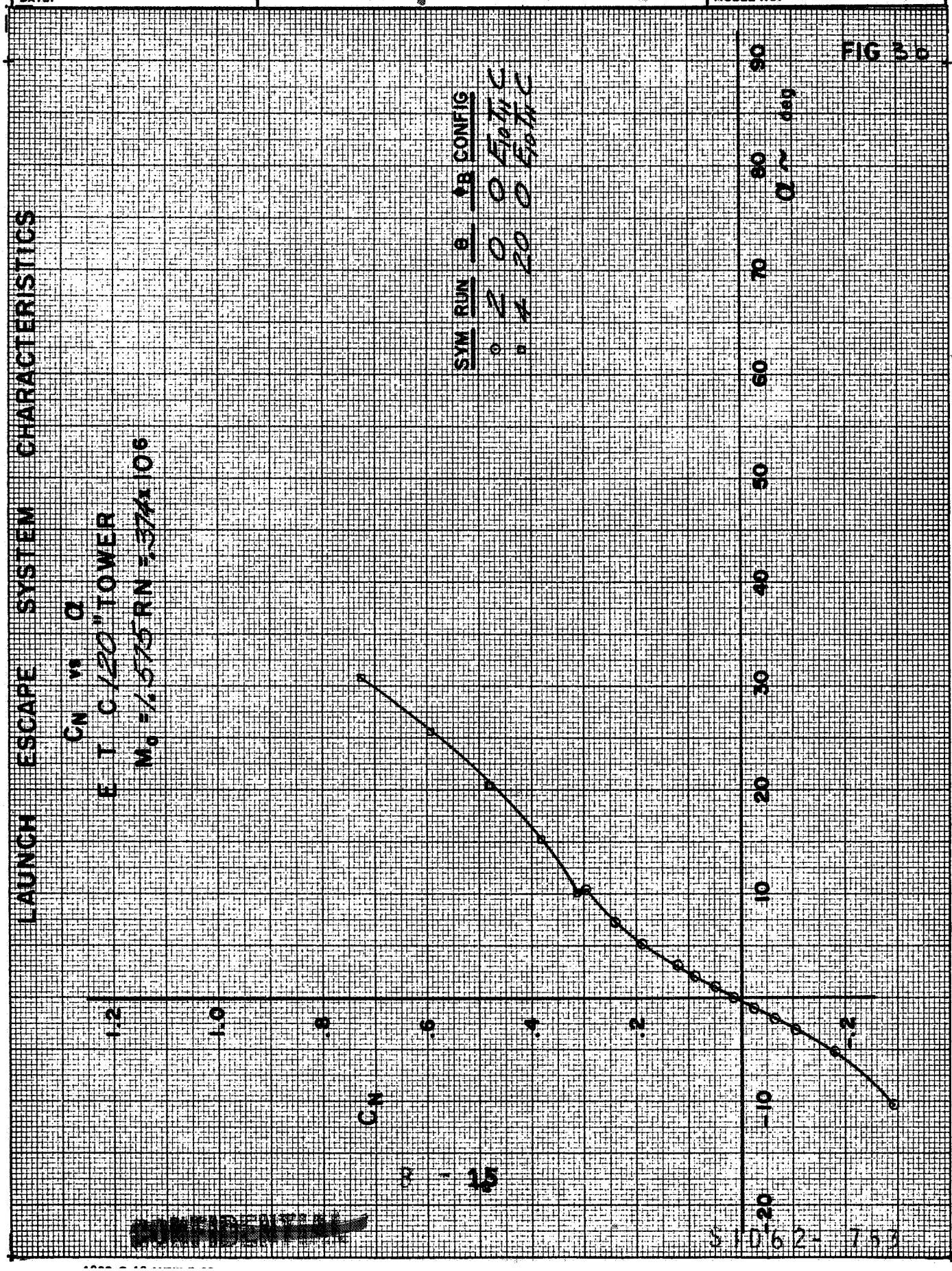

FIG 3b

C_N vs α 201-20

[redacted]

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LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_A vs α

E T C 120 "TOWER

$M_\infty = 1.515$ RN $= .374 \times 10^6$

SYM	RUN	θ	ψ	CONFIG
○	2	0	0	$E_{10}T_4C$
▫	4	20	0	$E_{10}T_4C$

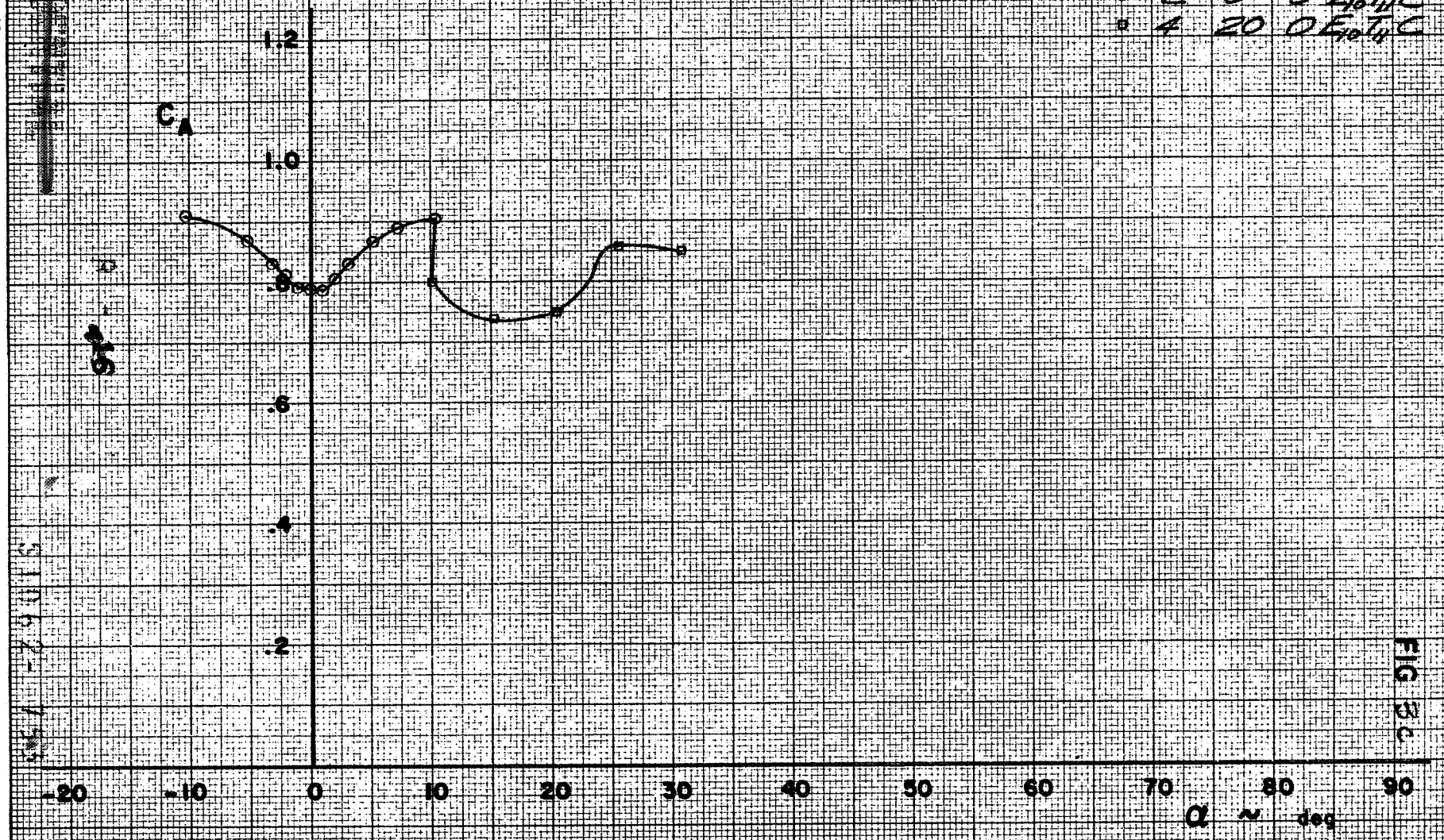

FIG 3c

C_A vs α 201-20

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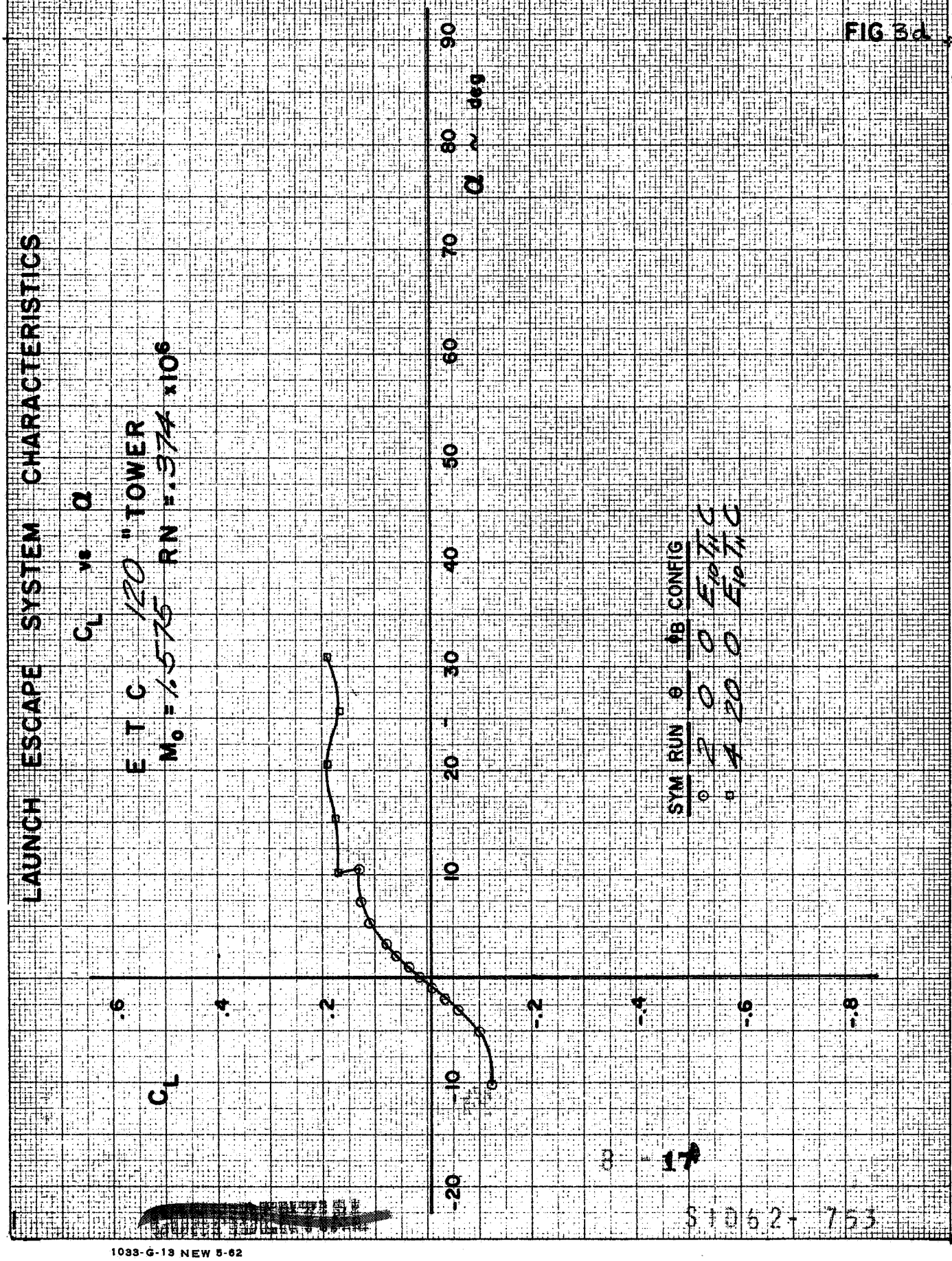
FIG 3d

C_L vs α 201-20



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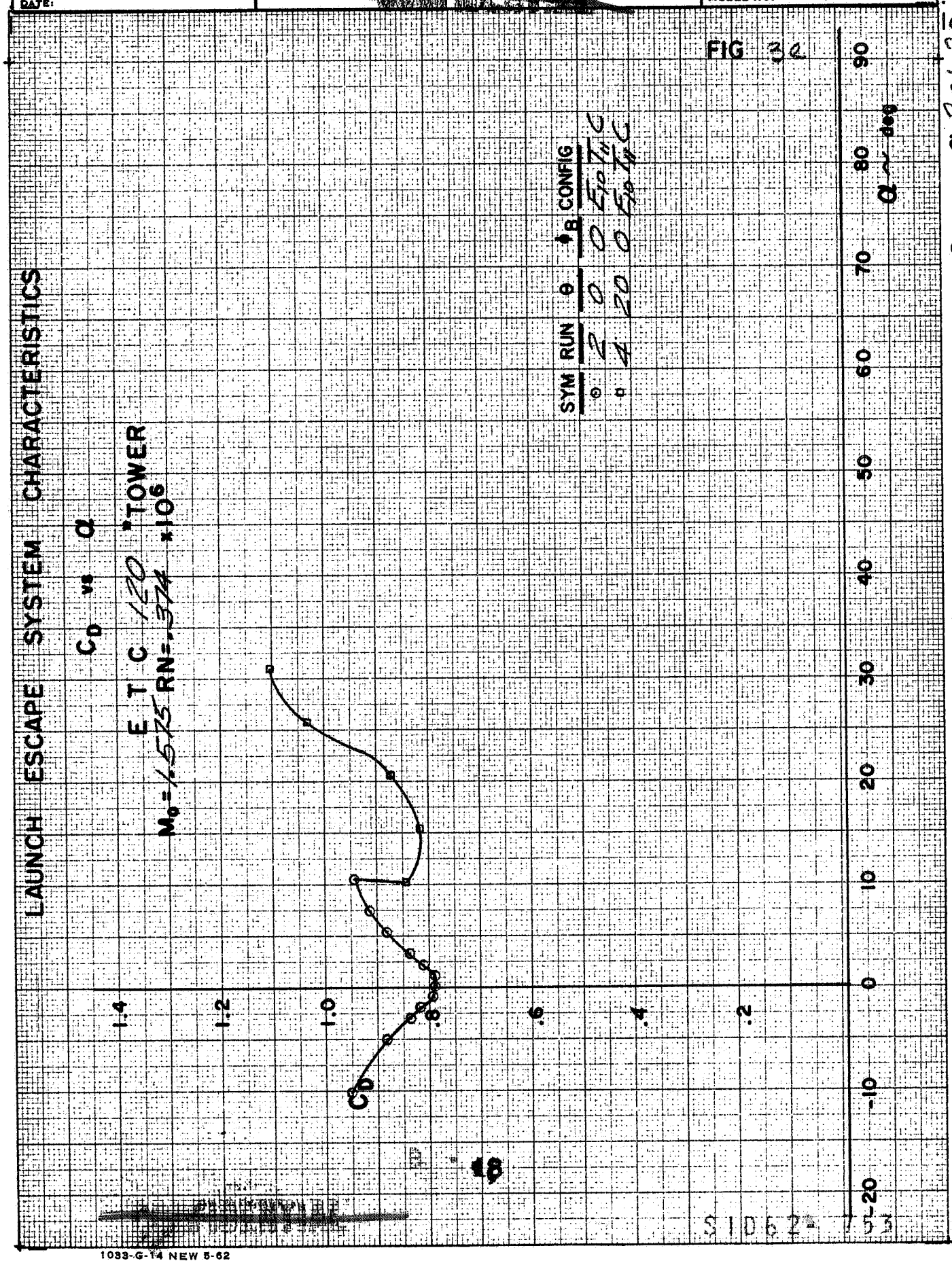

FIG 3e

C_D vs α 201-20

[redacted]

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LAUNCH ESCAPE SYSTEM CHARACTERISTICS

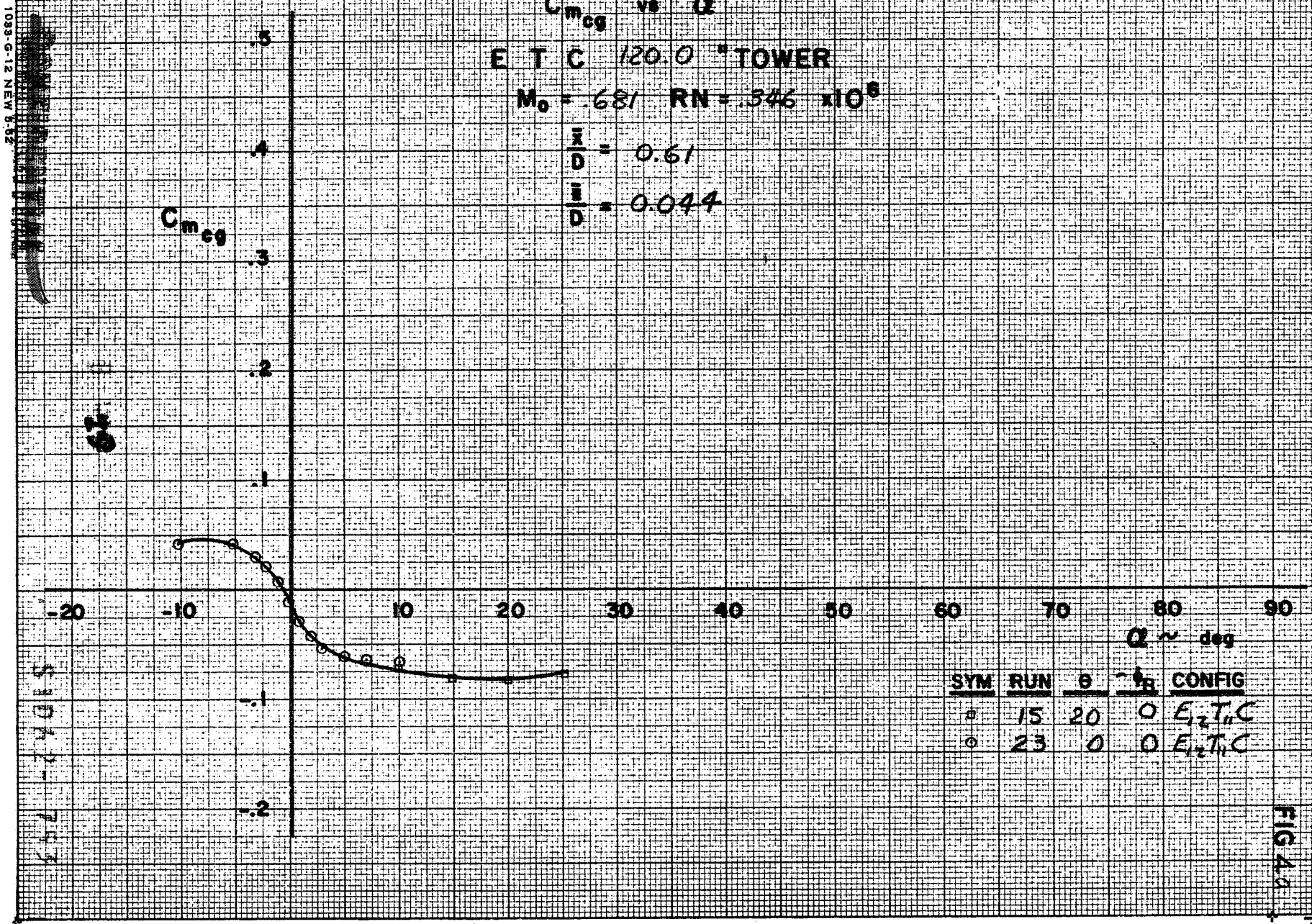
$C_{m_{cg}}$ vs α

E T C 120.0 " TOWER

M_o = .681 RN = .346 x10^6

$\frac{\bar{x}}{D}$ = 0.61

$\frac{\bar{z}}{D}$ = 0.044



SYM	RUN	θ	ϕ_R	CONFIG
▫	15	20	0	$E_{12}T_1C$
○	23	0	0	$E_{12}T_1C$

FIG 4a

$C_{m_{cg}}$ vs α 261-2

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LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_N vs α

E T C 120.0" TOWER

M_0 = .681 RN = .346 x 10^6

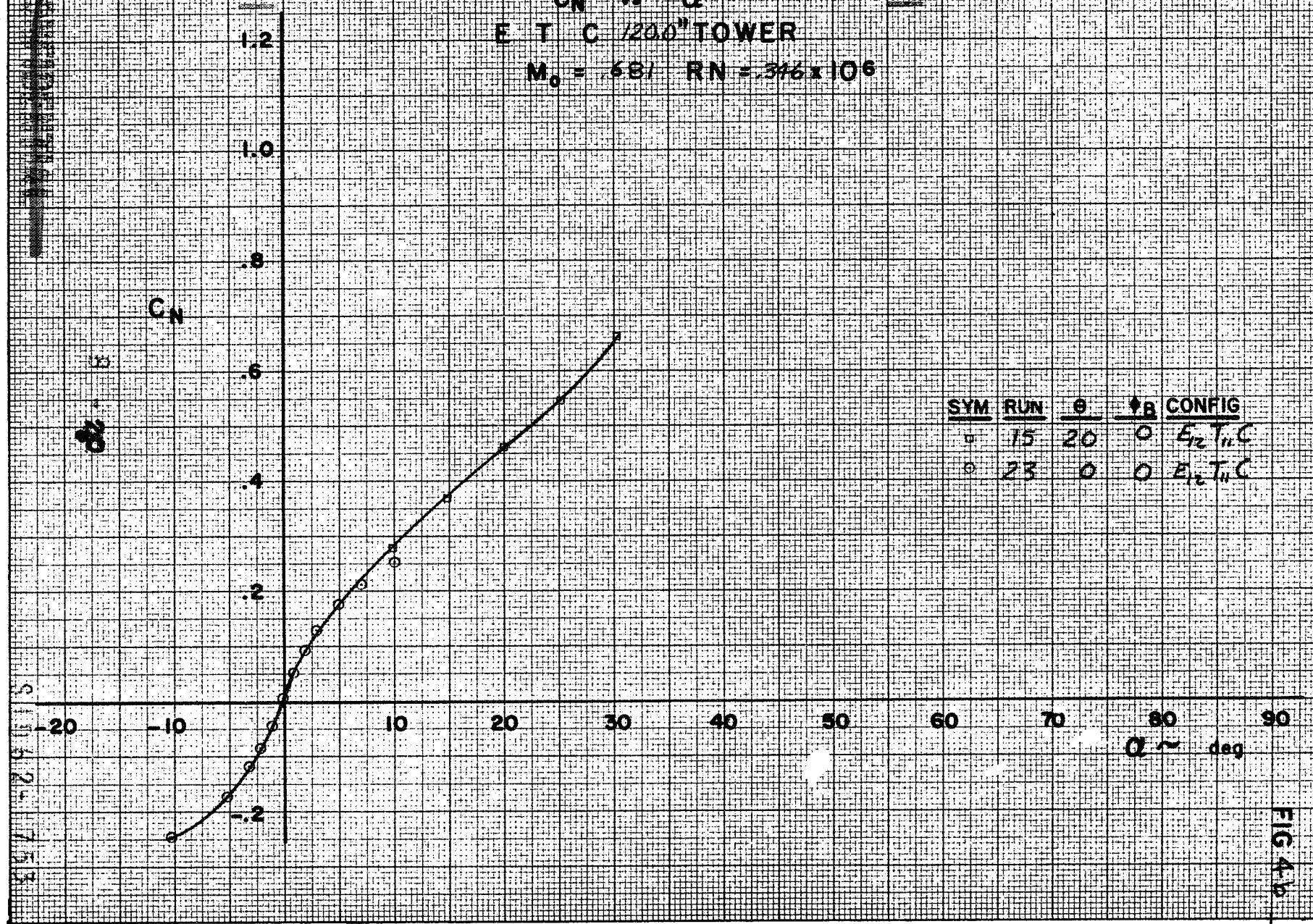

FIG 4b

C_N vs α 201-2

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LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_A vs α

E T C 120.0" TOWER

M_o = .681 RN = .346 x 10^6

SYM	RUN	θ	ψ	CONFIG
⊙	15	20	0	$E_2 T_1 C$
⊙	23	0	0	$E_2 T_1 C$

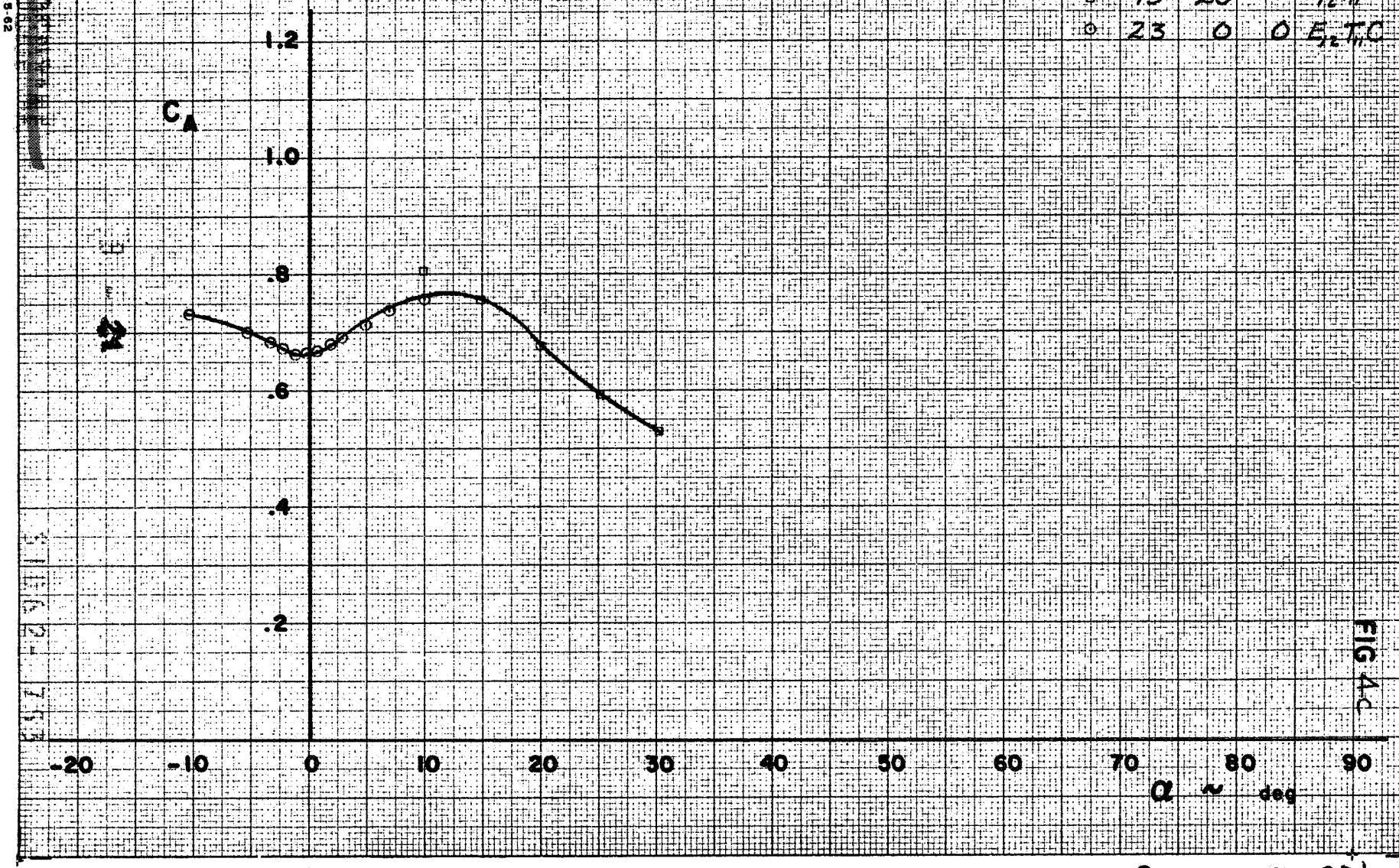

FIG 4-C

C_A vs α 201-2

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LAUNCH ESCAPE SYSTEM CHARACTERISTICS

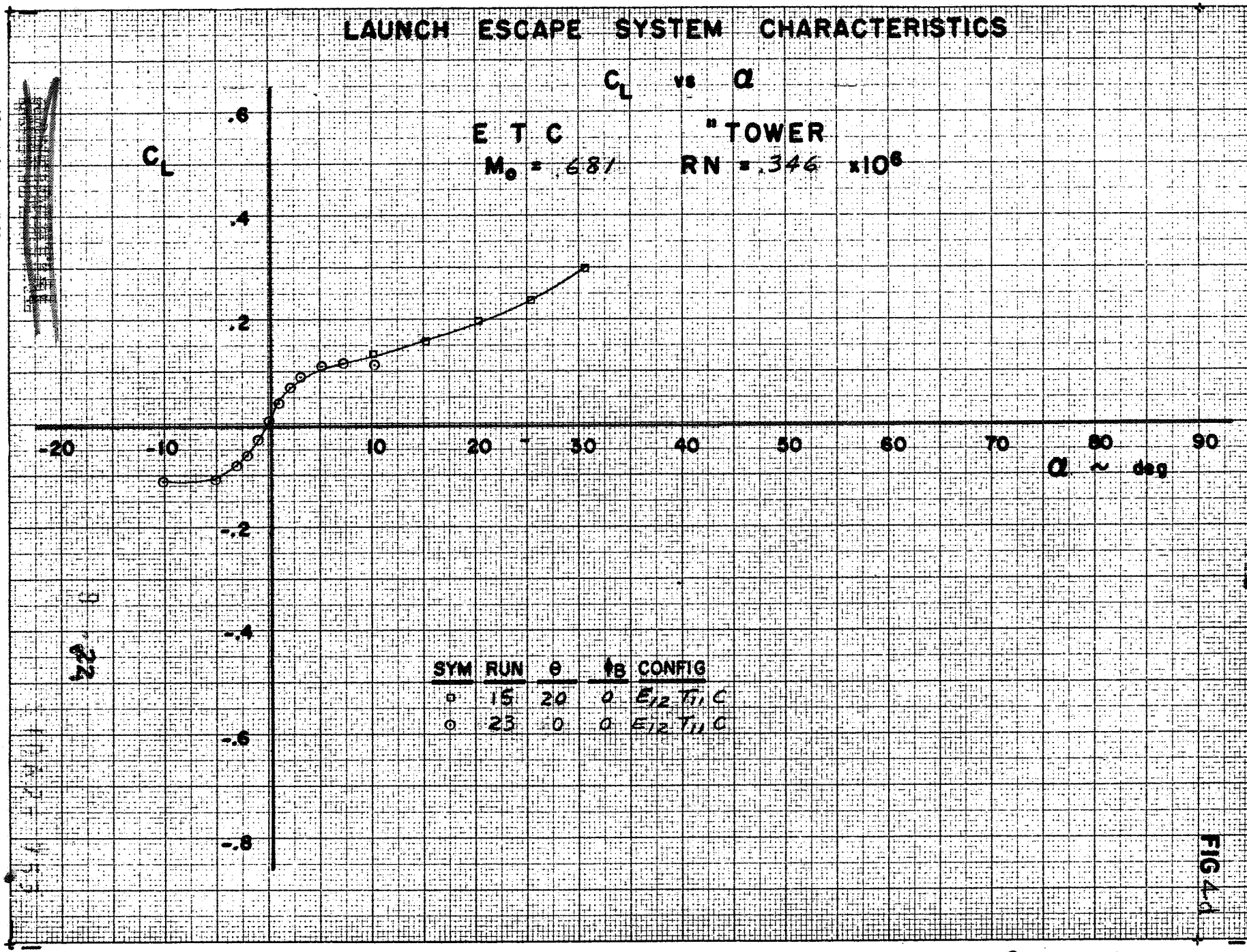

FIG 4-d

C_L vs α 201-2

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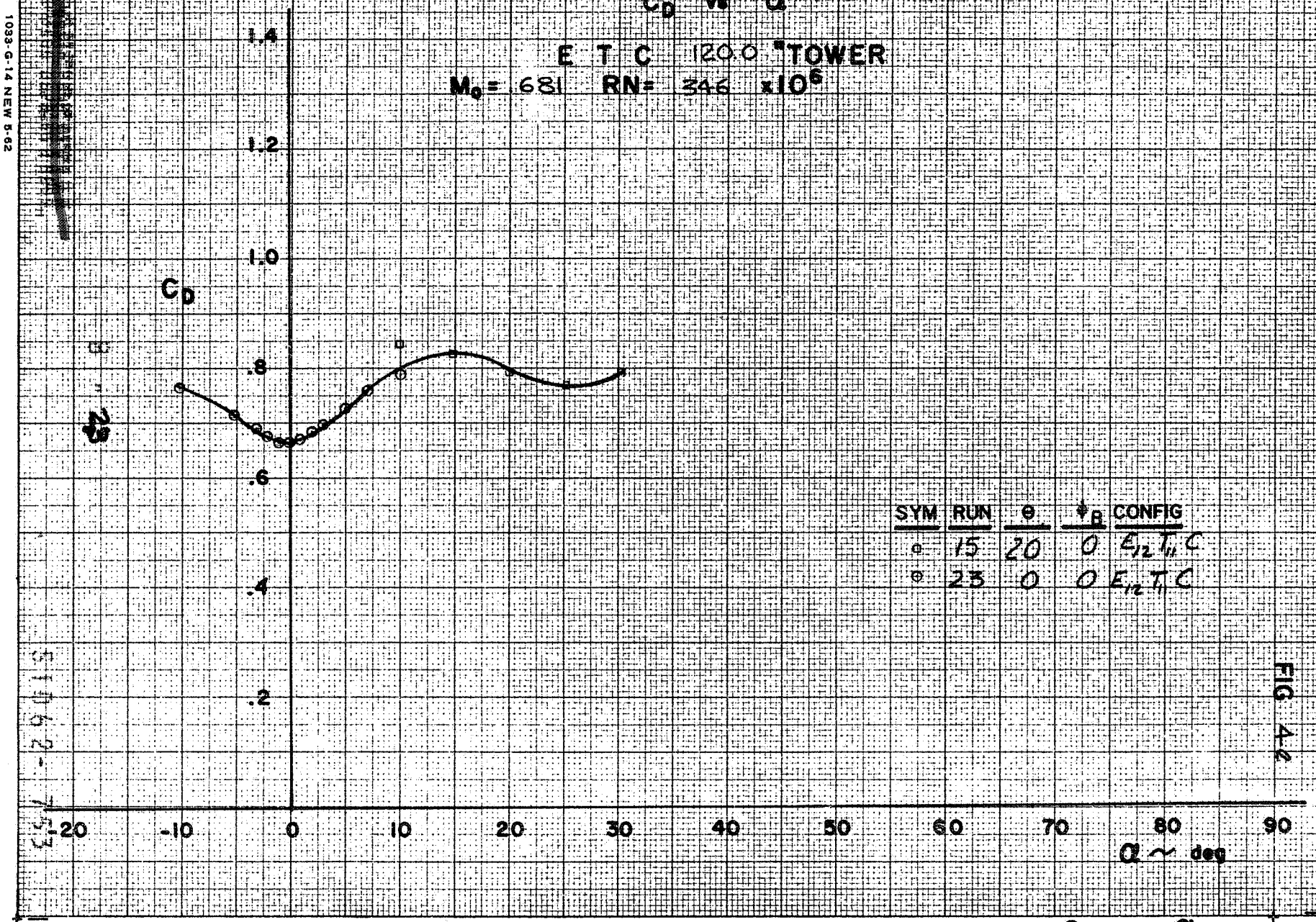
LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_D vs α

E T C 120.0 "TOWER

M_0 = .681 RN = 346 $\times 10^6$



SYM	RUN	θ	ϕ_B	CONFIG
○	15	20	0	$E_{12}T_{11}C$
⊕	23	0	0	$E_{12}T_{11}C$

FIG 42

C_D vs α

201-2

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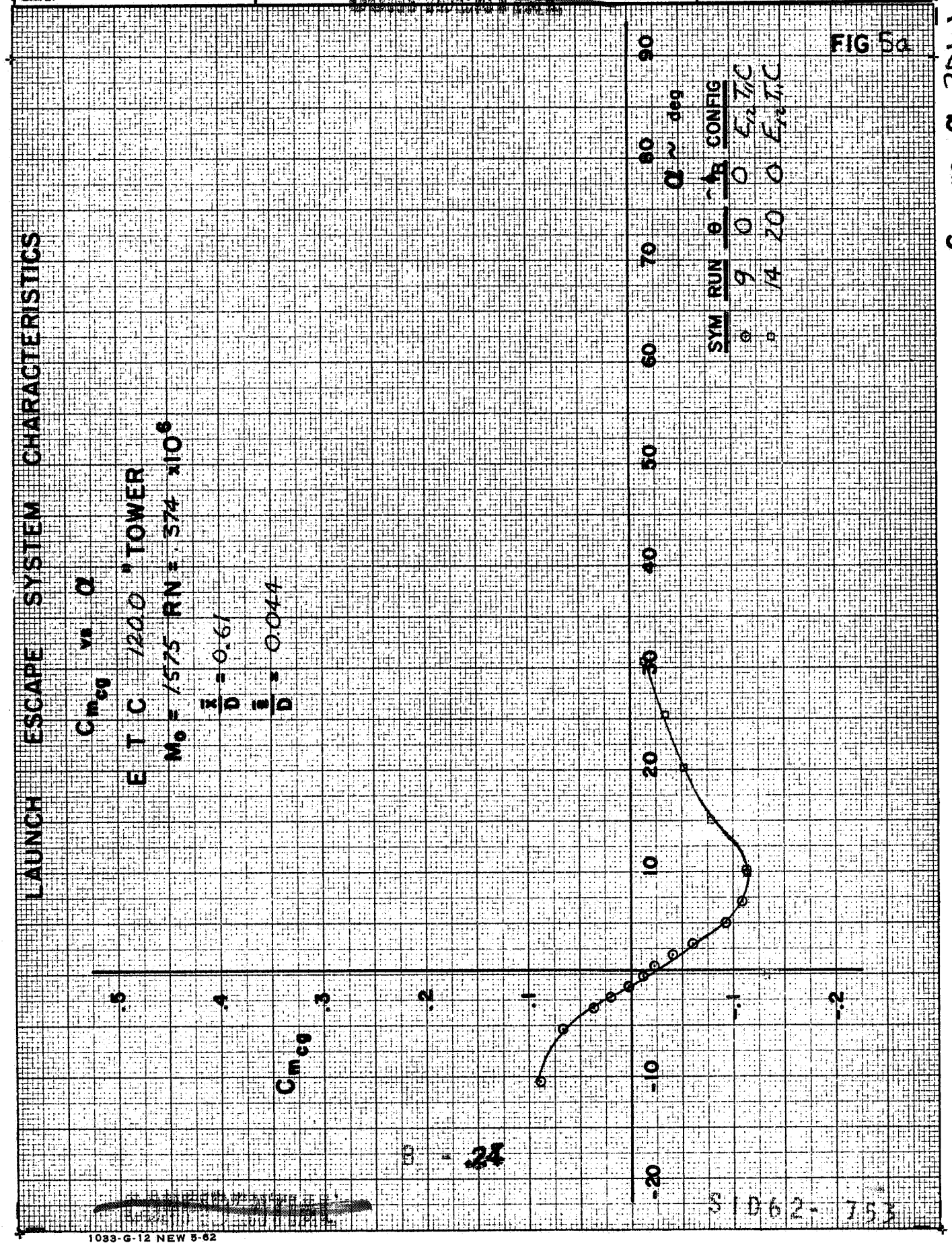

FIG 5a

$C_{m_{cg}}$ vs α 201-1

B - 24

[redacted]

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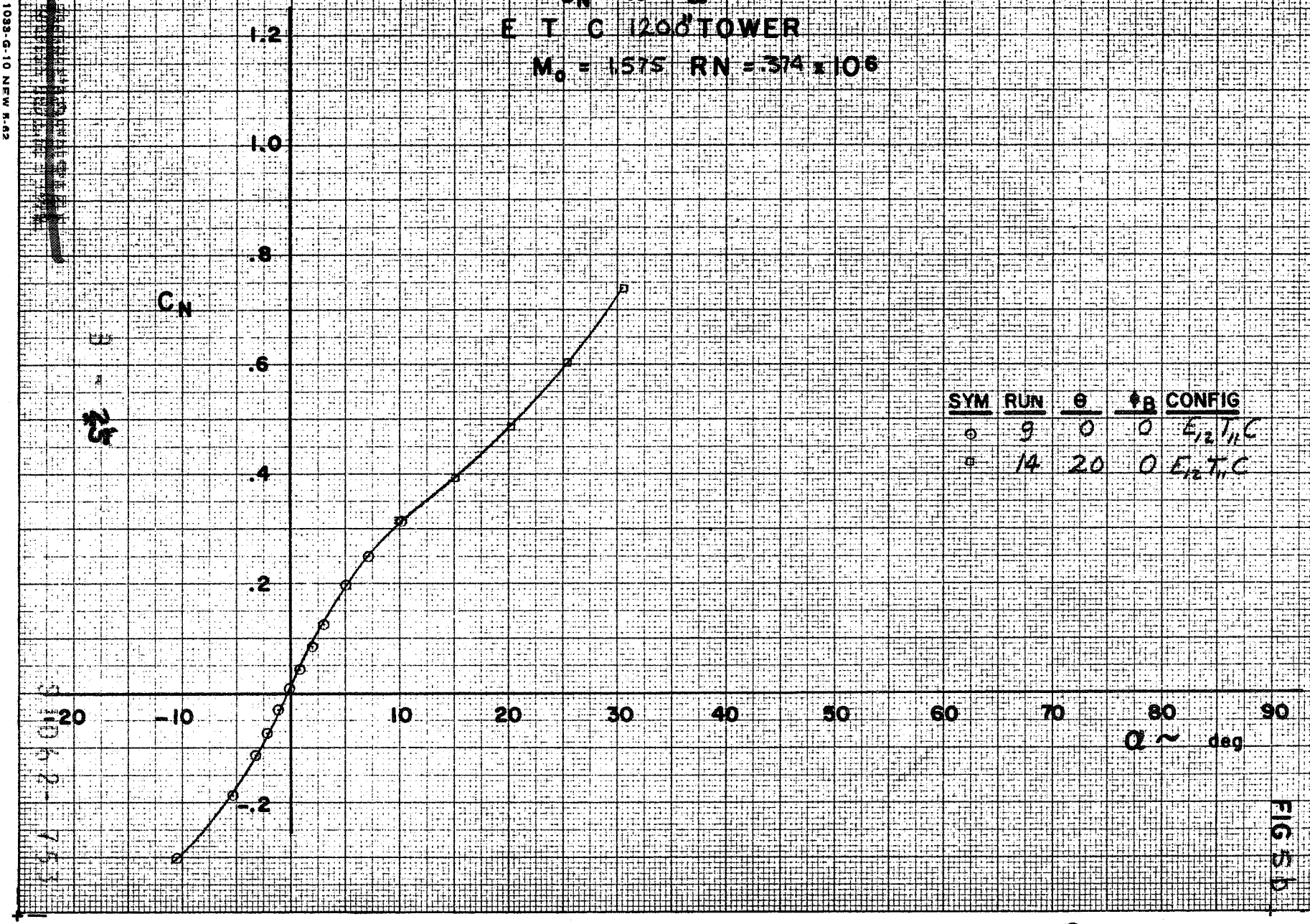
LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_N vs α

E T C 120δ TOWER

$M_o = 1.575$ $RN = .374 \times 10^6$



SYM	RUN	θ	ϕ_B	CONFIG
⊙	9	0	0	E,2 T,1 C
⊡	14	20	0	E,2 T,1 C

FIG 5b

C_N vs α 201-1

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LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_A vs α

E T C 120.0" TOWER

M_∞ = 1.575 RN = .374 x 10^6

SYM	RUN	θ	ψ	CONFIG
⊙	9	0	0	$E_{12}T_1C$
□	14	20	0	$E_{12}T_1C$

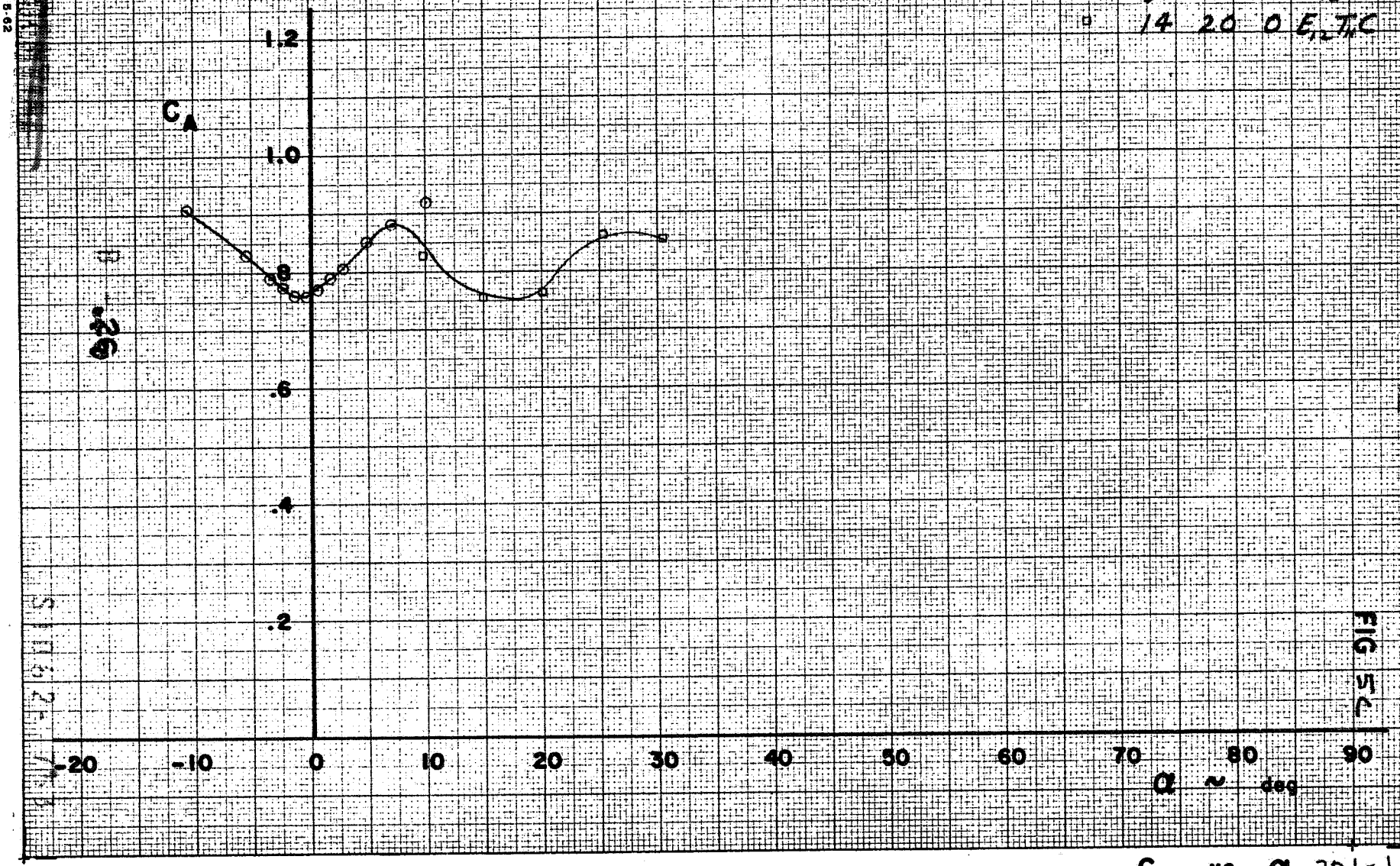

FIG 5C

C_A vs α 201-1

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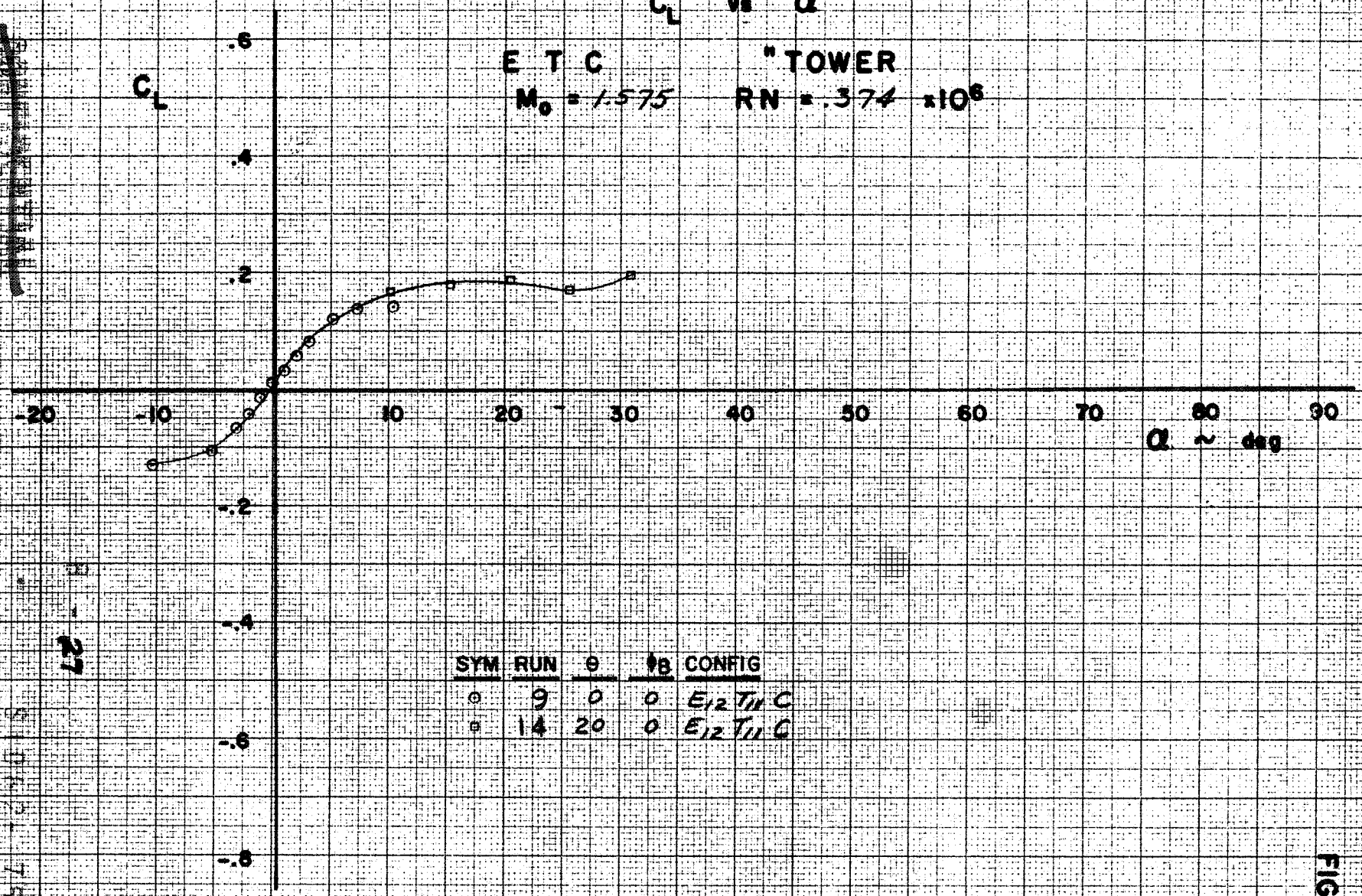
LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_L vs α

E T C "TOWER

$M_o = 1.575$ RN = .374 $\times 10^6$



SYM	RUN	θ	ϕ_B	CONFIG
○	9	0	0	$E_{12}T_{11}C$
□	14	20	0	$E_{12}T_{11}C$

FIG 5d

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C_L vs α 201 - 1

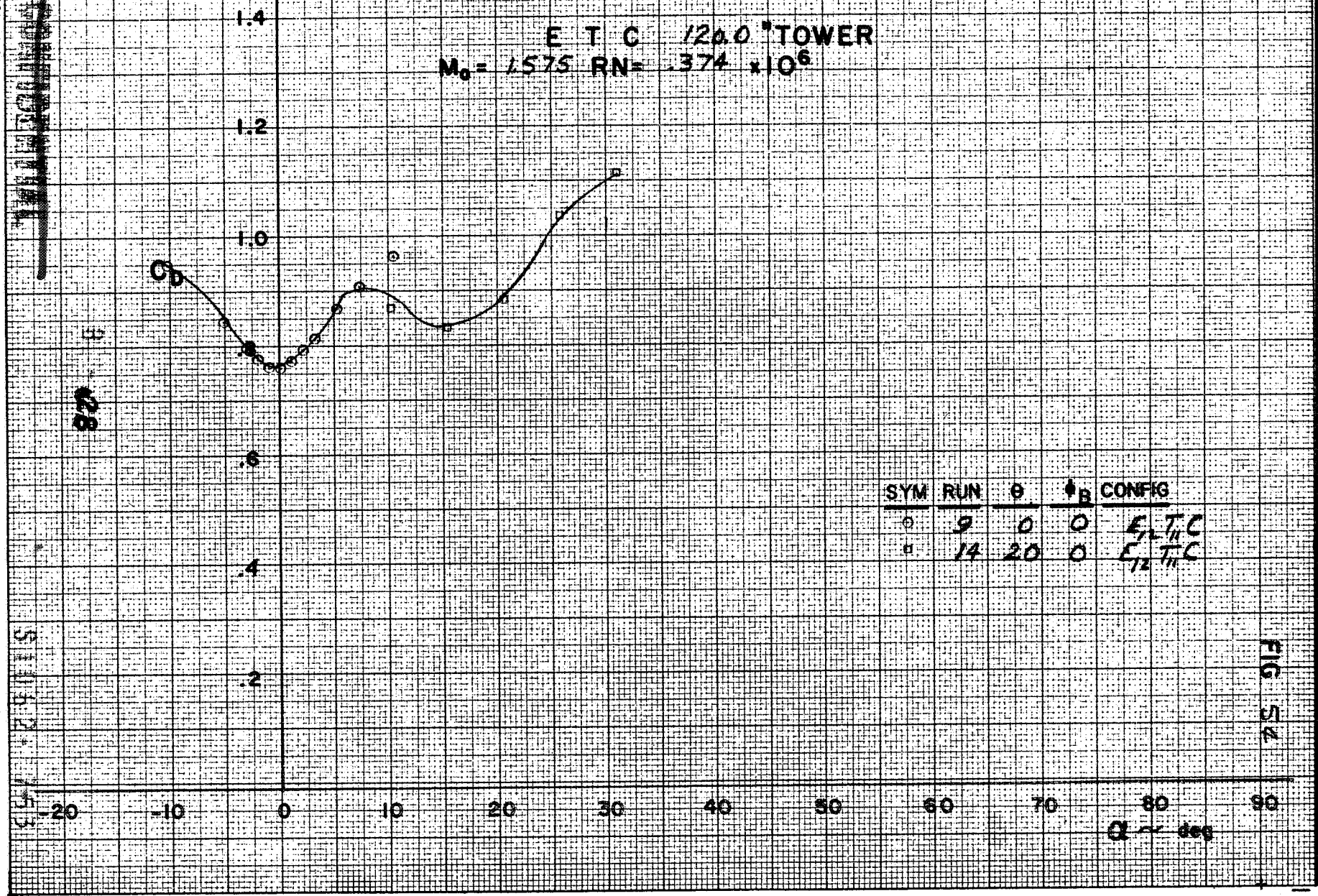
27

LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_D vs α

E T C 120.0" TOWER

M_α = 1.575 RN = .374 x 10^6



SYM	RUN	θ	ϕ_B	CONFIG
○	9	0	0	E_{12} T_{11} C
□	14	20	0	E_{12} T_{11} C

FIG 54

C_D vs α 201 - 1

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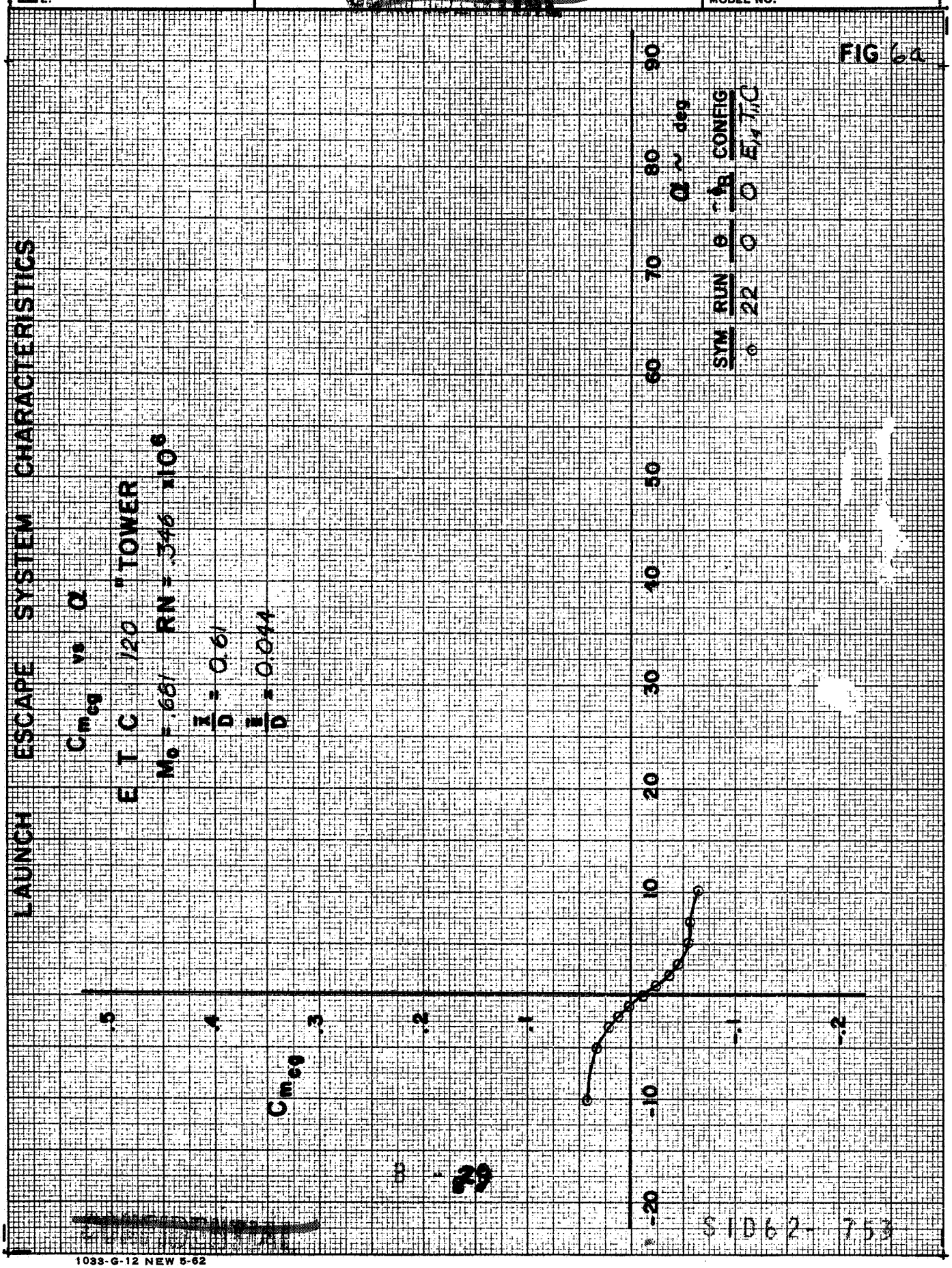

FIG 6a

$C_{m_{cg}}$ vs α 201-04

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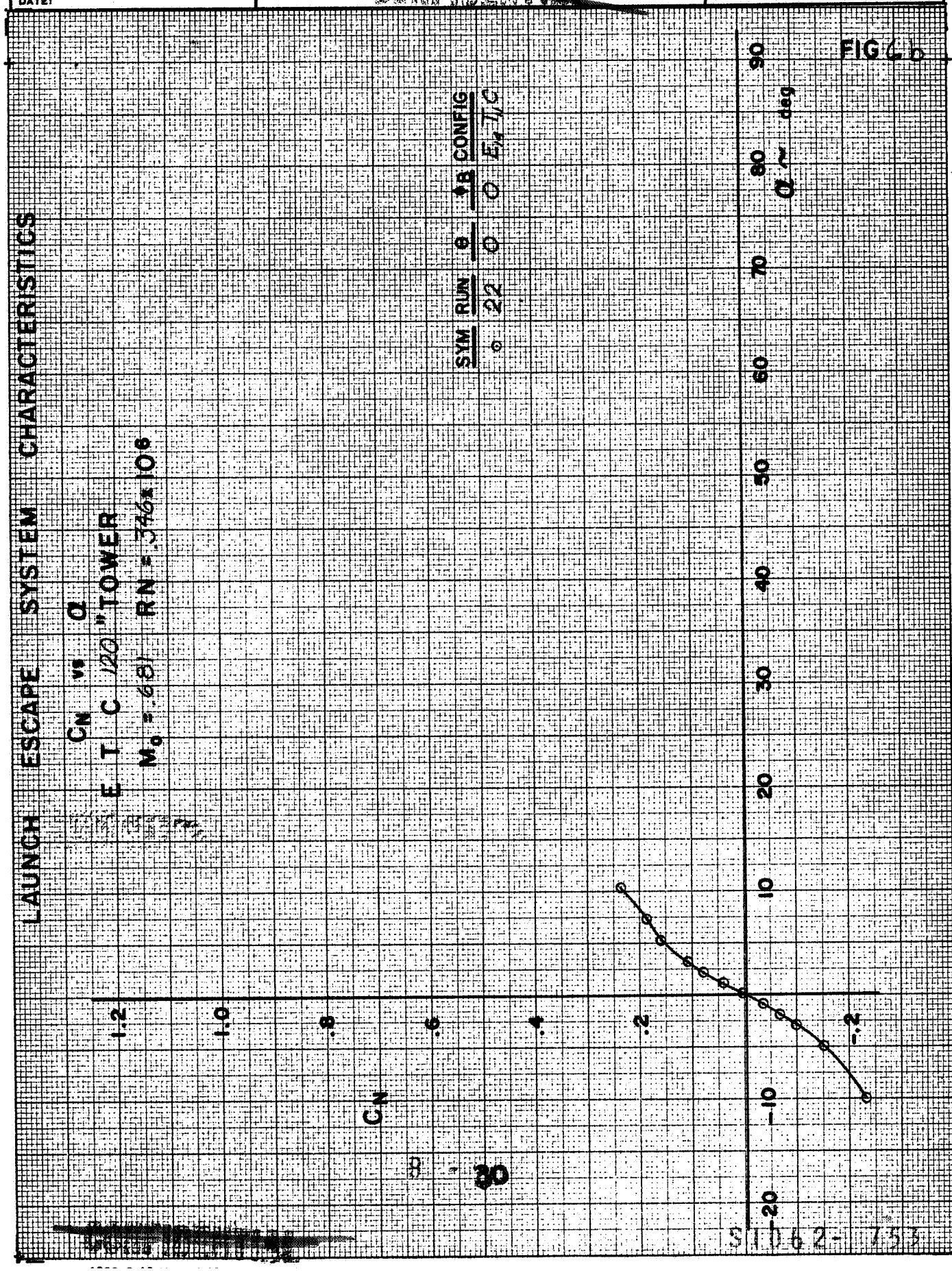

FIG 6b

C_N vs α 201-4

[redacted]

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LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_A vs α

E T C 120 "TOWER

M_0 = .681 RN = .346 x 10^6

SYM	RUN	θ	β	CONFIG
⊙	22	0	0	$E_{14}T_1C$

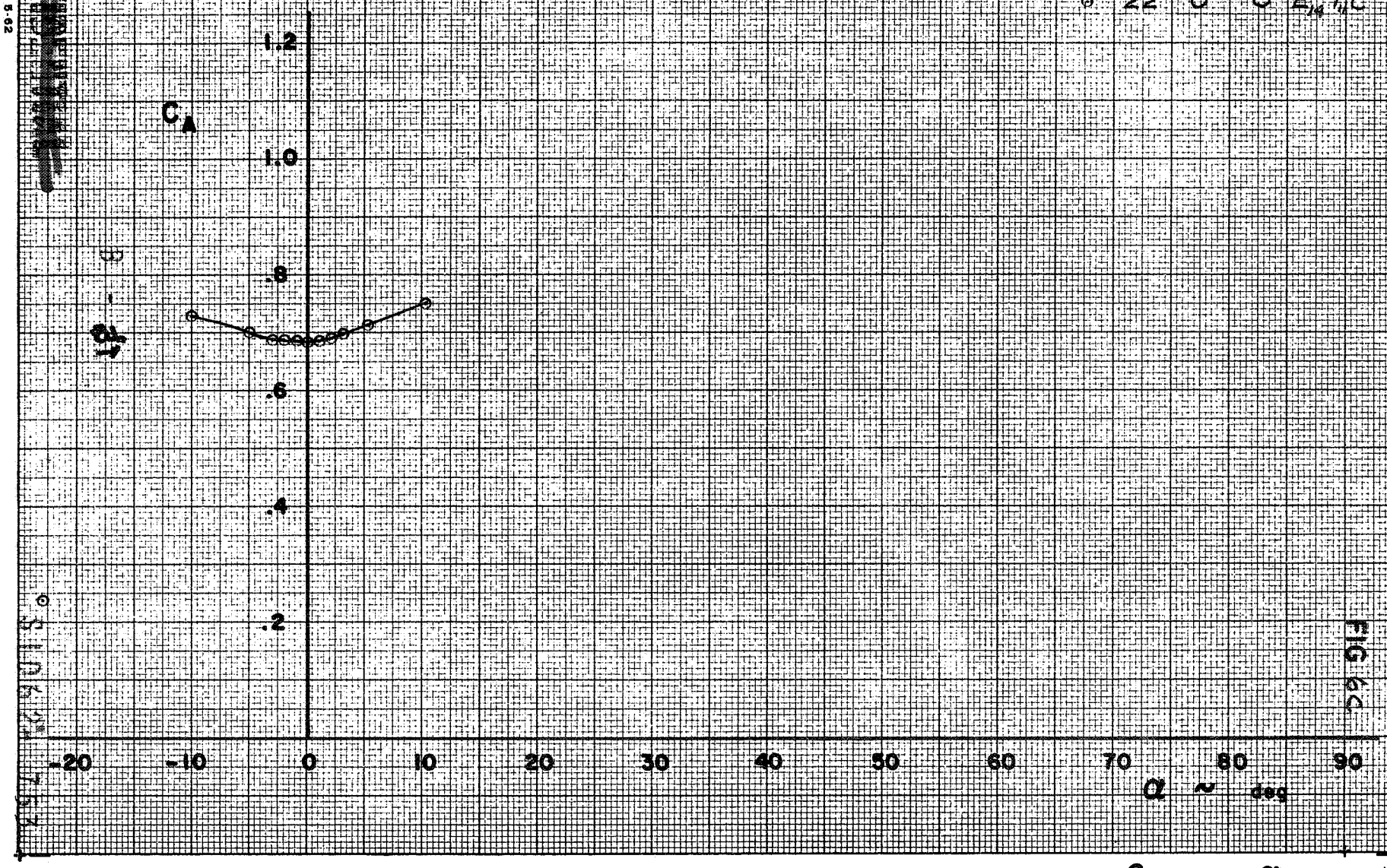

FIG 6C

C_A vs α 201-04

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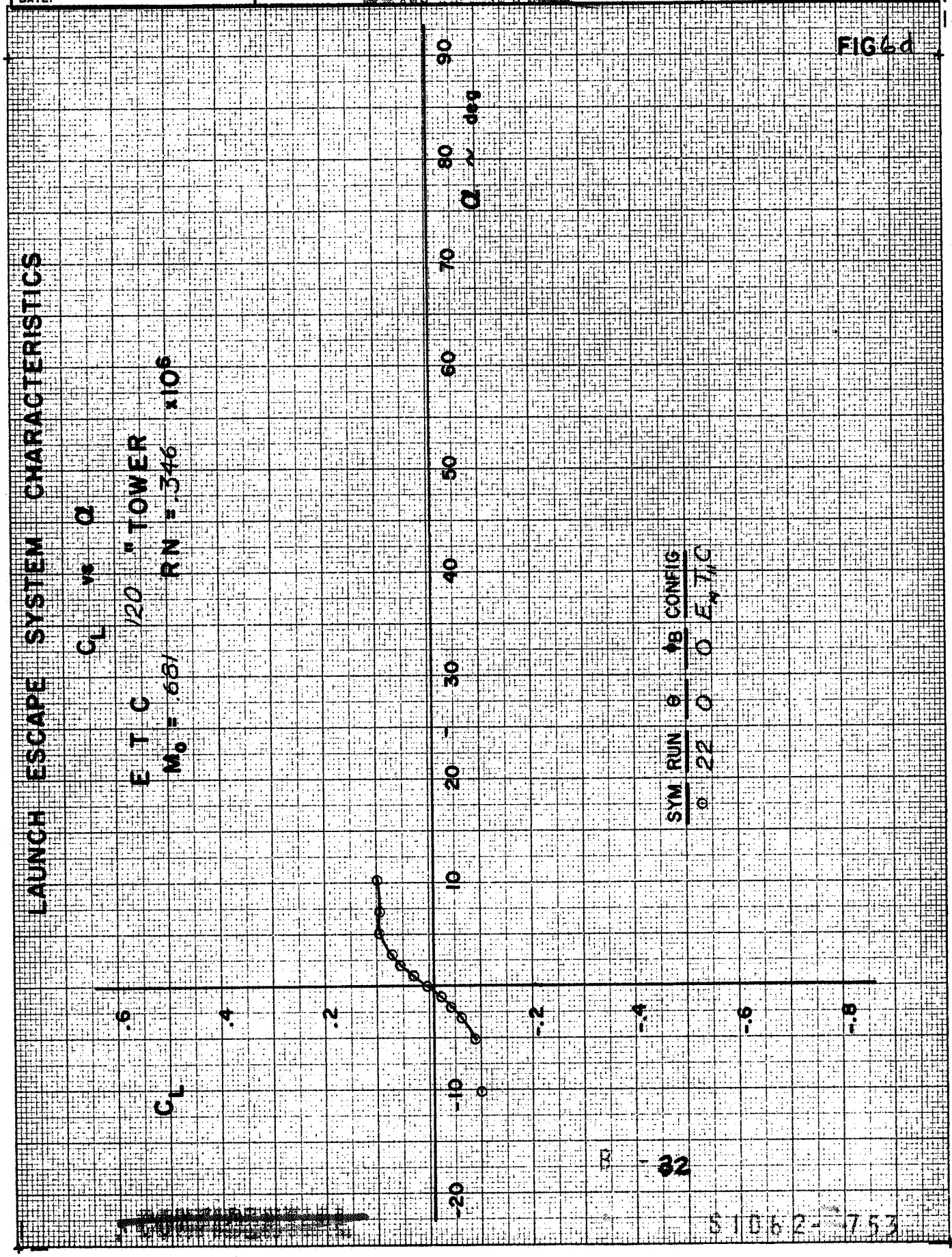
FIG 6d

C_L vs α 201-4



[redacted]

51062-753

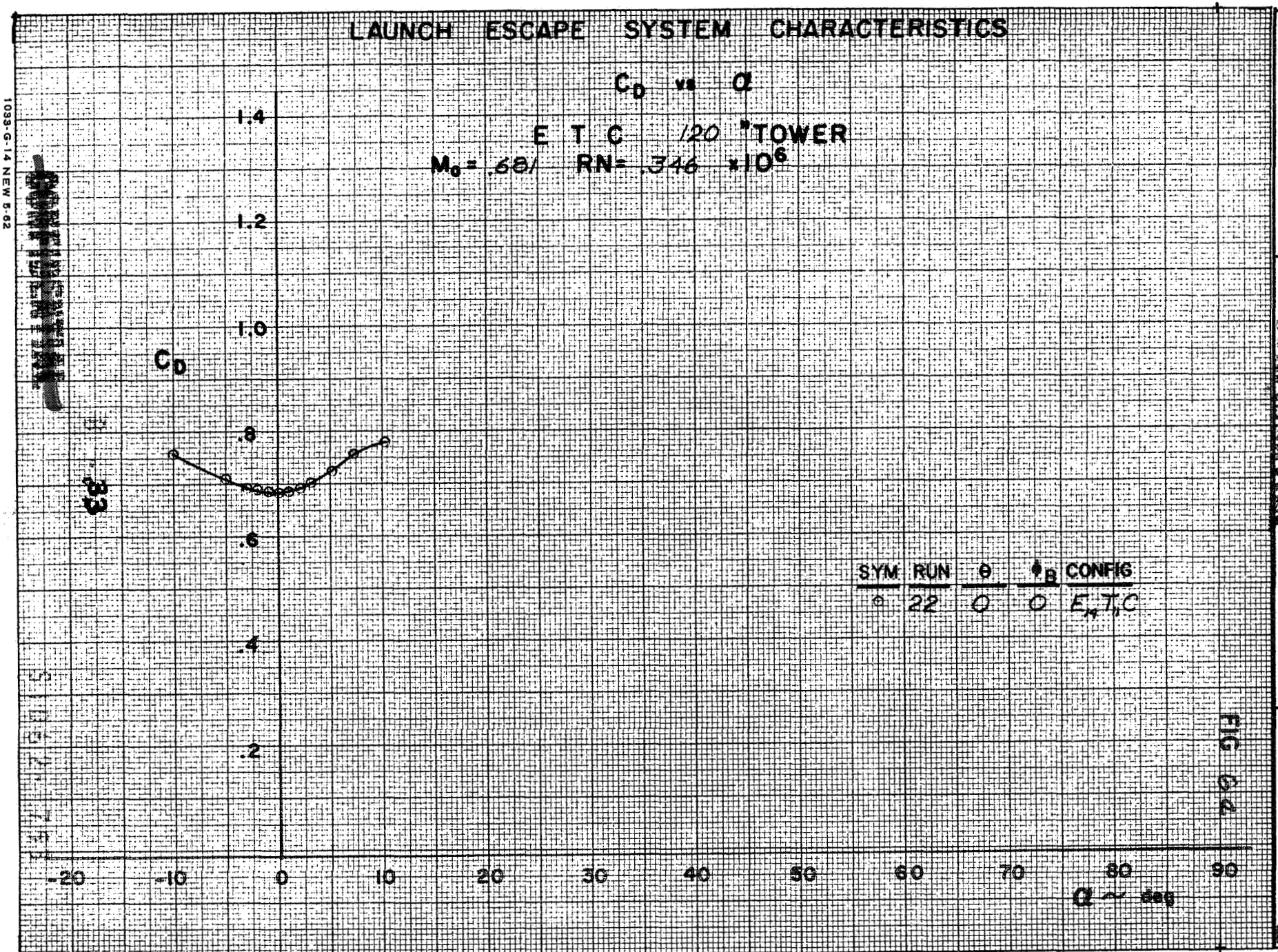


FIG 62

C_D vs α 201-4

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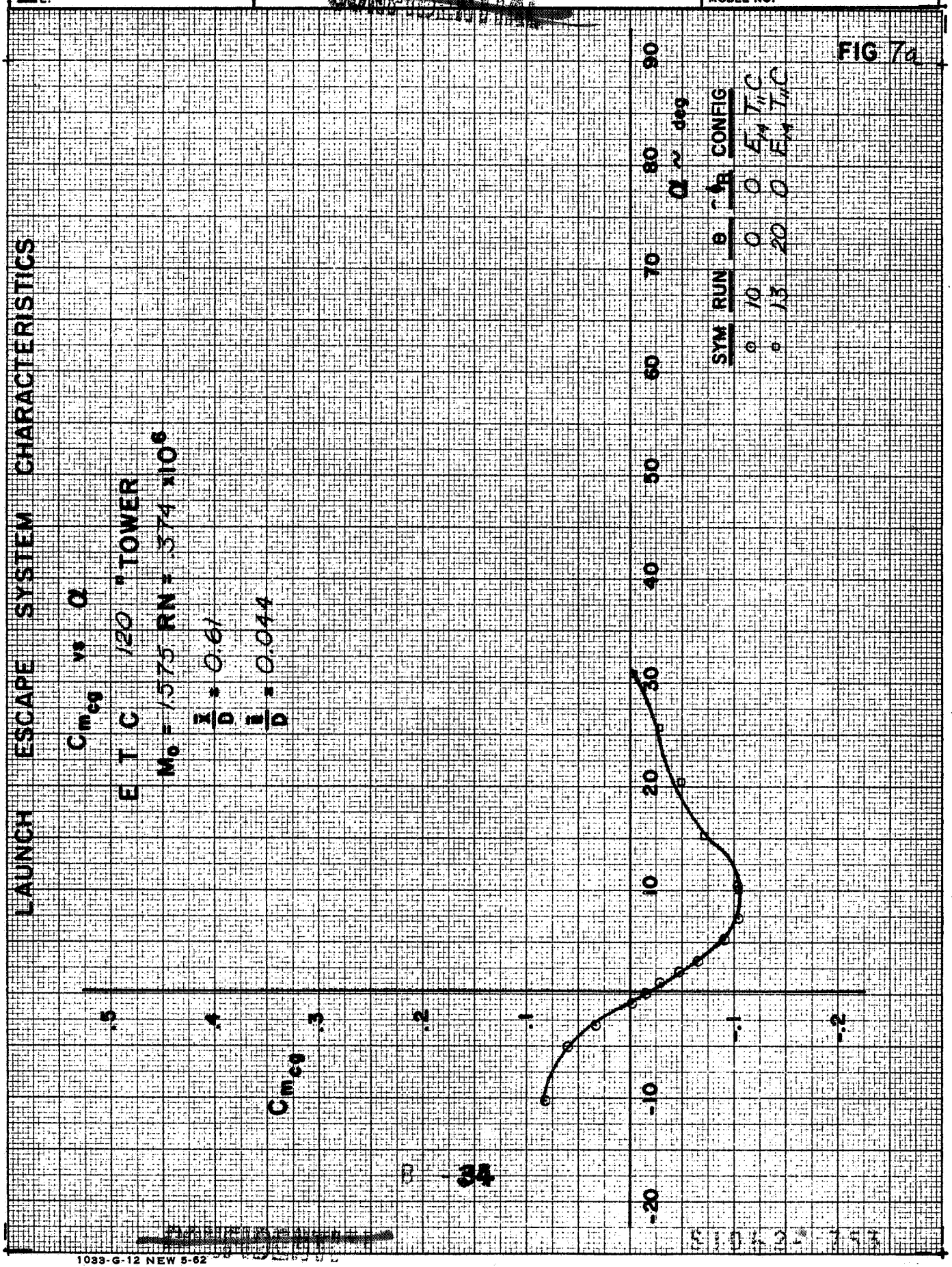

FIG 7a

$C_{m_{cg}}$ vs α 201-03

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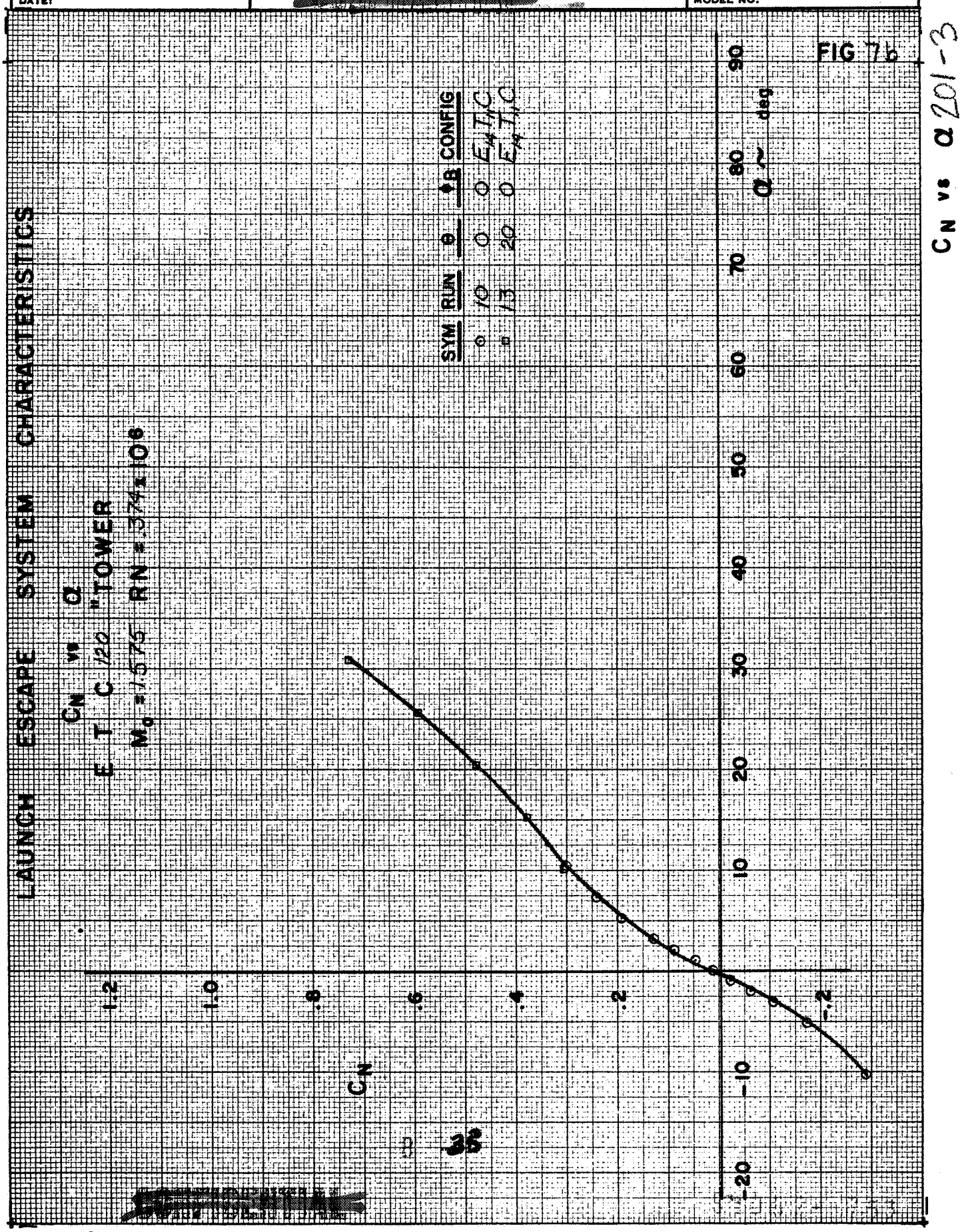

FIG 7b

C_N vs α 201-3

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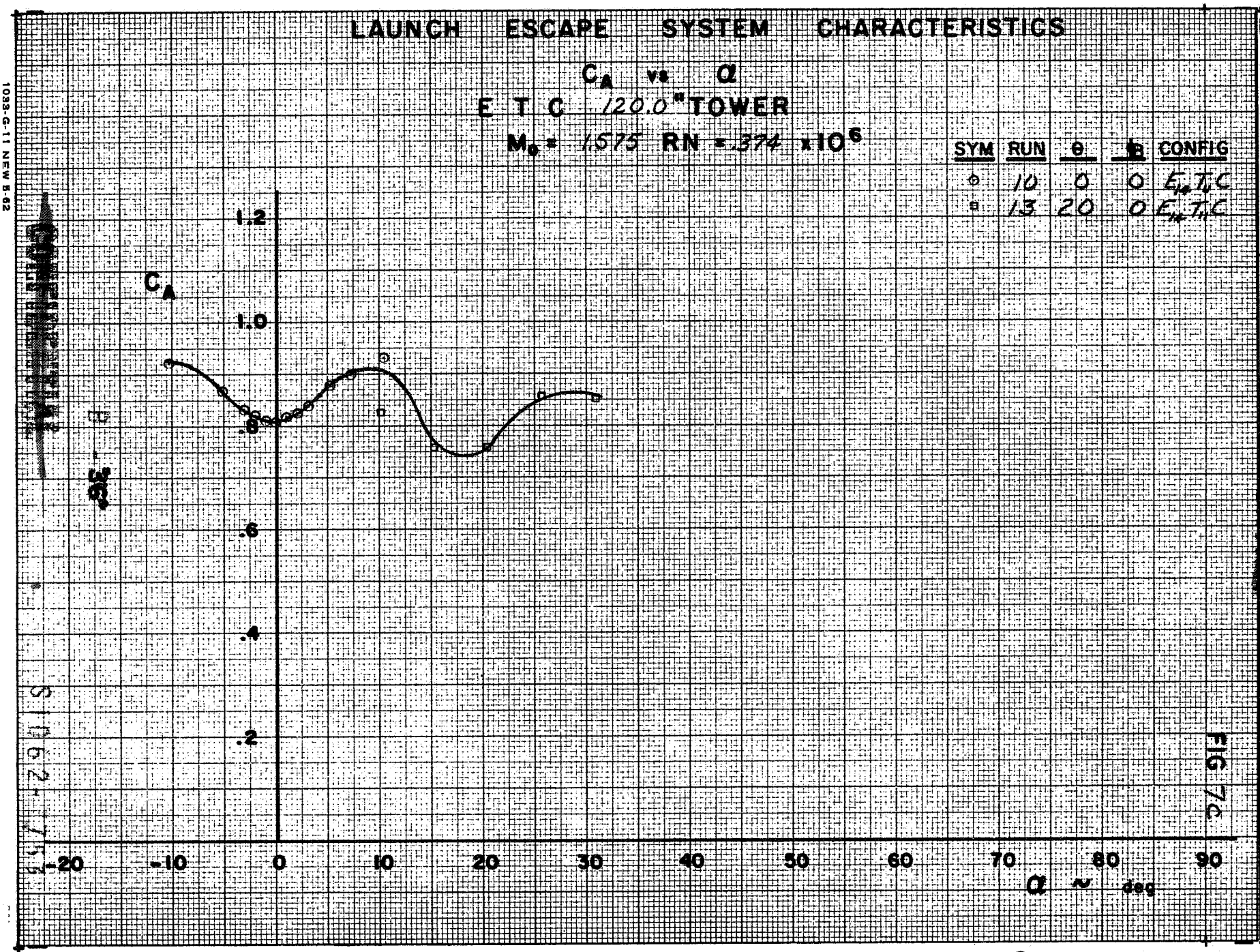

FIG 7c

C_A vs α

201-03

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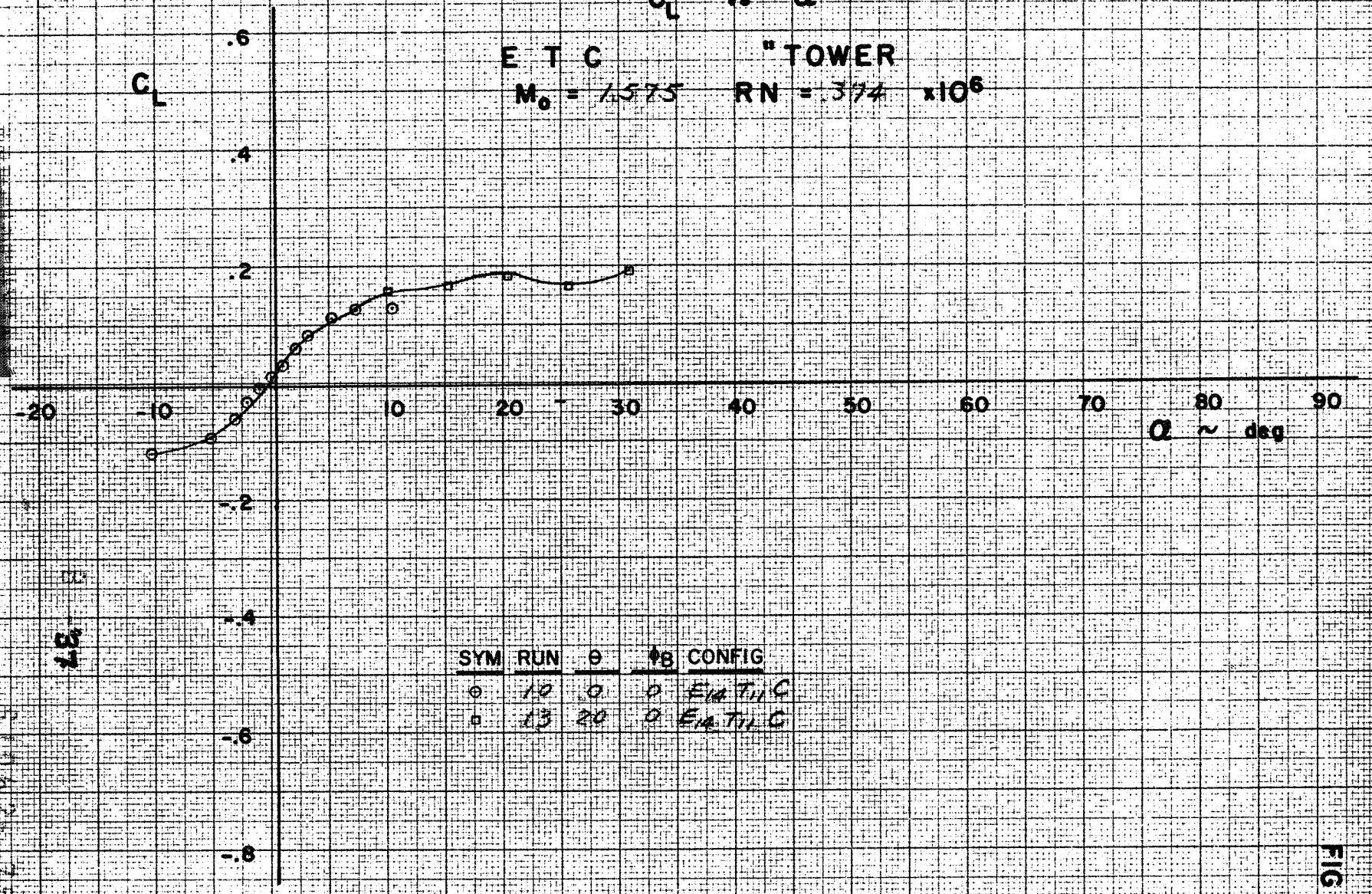
1033-G-11 NEW 5-62

LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_L vs α

E T C "TOWER

M_o = 1.575 RN = 3.74 x10^6



SYM	RUN	θ	ϕ_B	CONFIG
⊙	10	0	0	E_{14} T_{11} C
□	13	20	0	E_{14} T_{11} C

FIG 7d

C_L vs α 201-3

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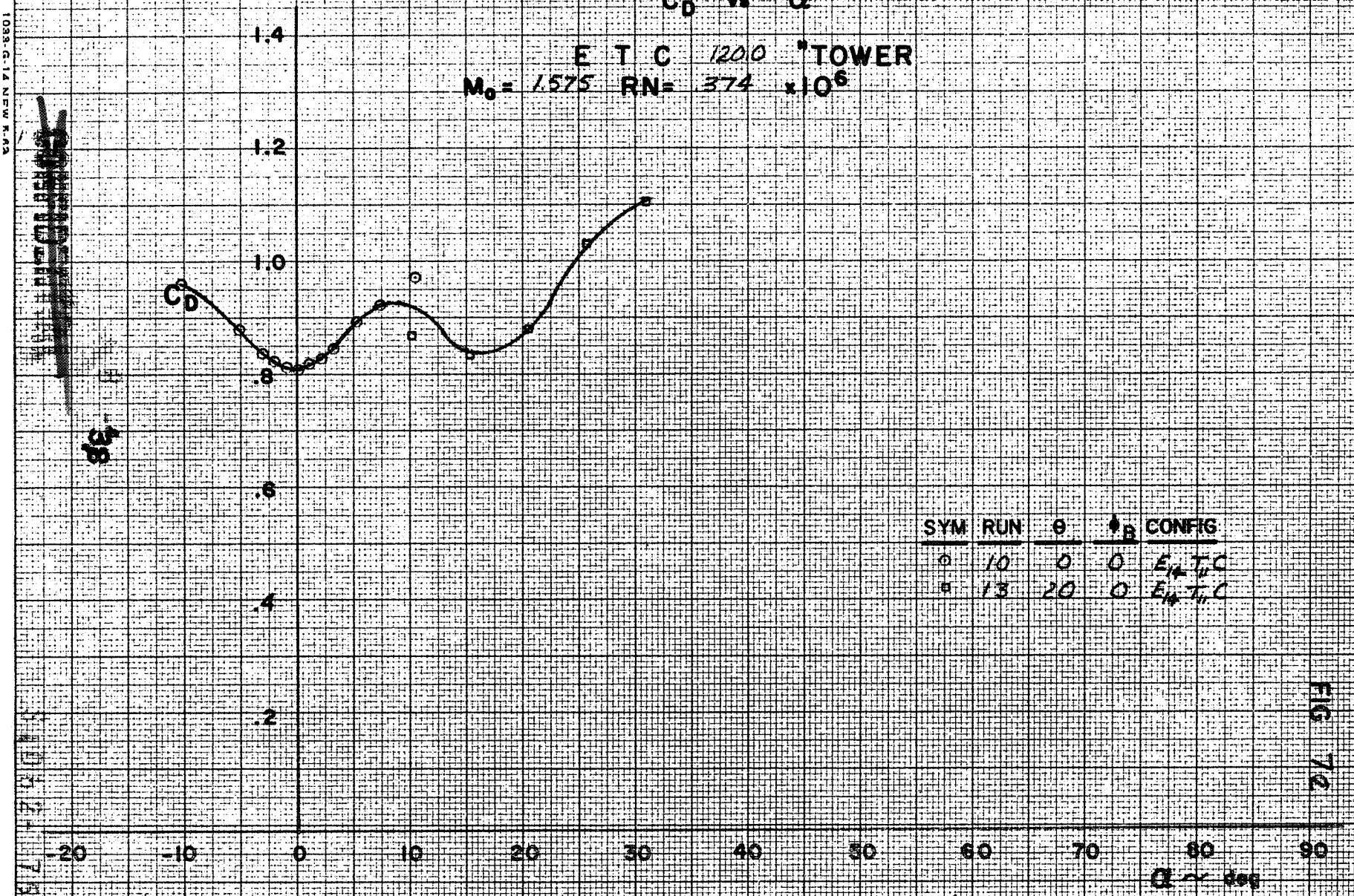
LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_D vs α

E T C 1200 "TOWER

M_o = 1.575 RN = 374 $\times 10^6$



SYM	RUN	θ	ϕ_B	CONFIG
○	10	0	0	$E_{14}T_{11}C$
□	13	20	0	$E_{14}T_{11}C$

FIG 72

C_D vs α 201-3

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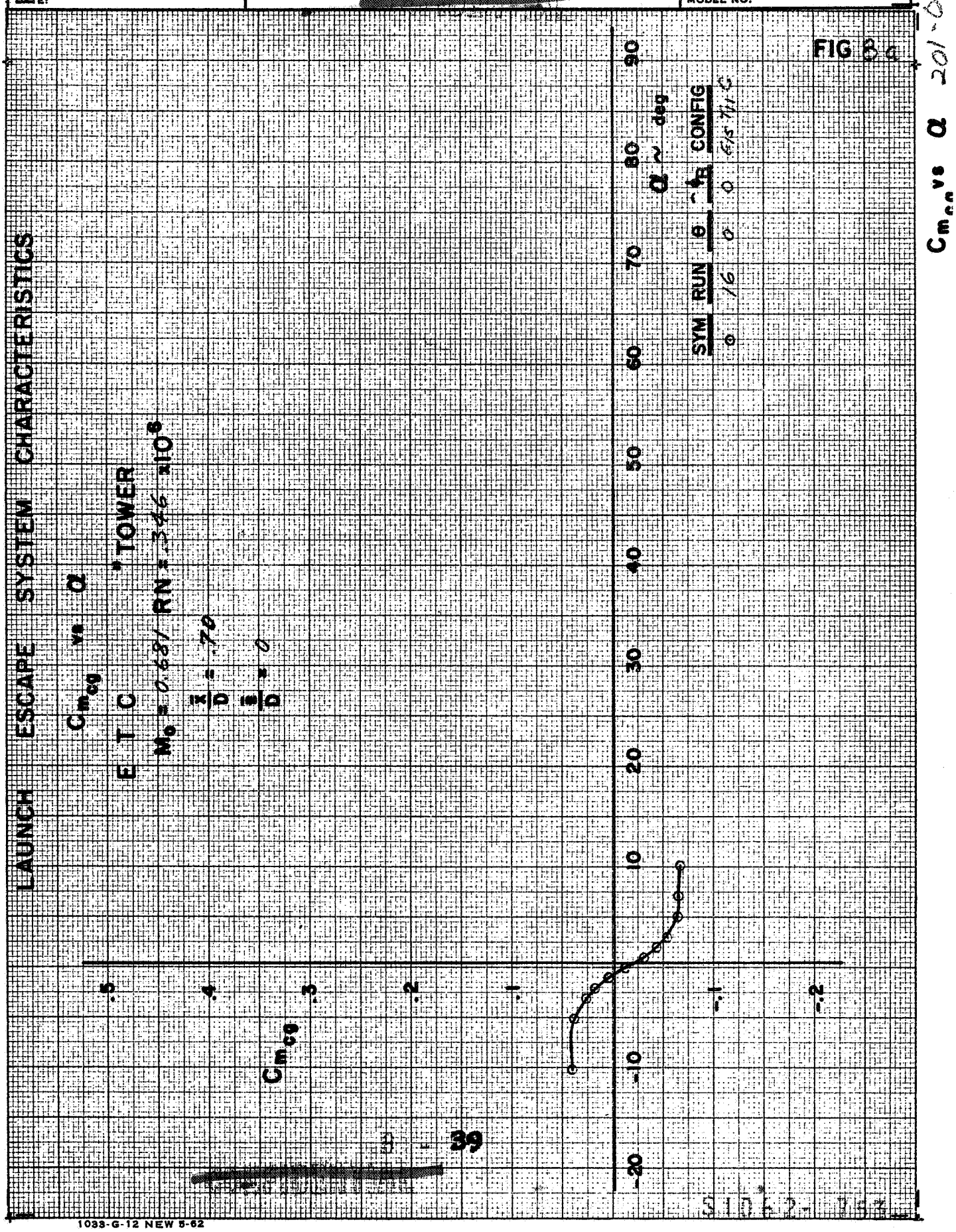

FIG 8a

$C_{m_{cg}}$ vs α 201-06

[redacted]

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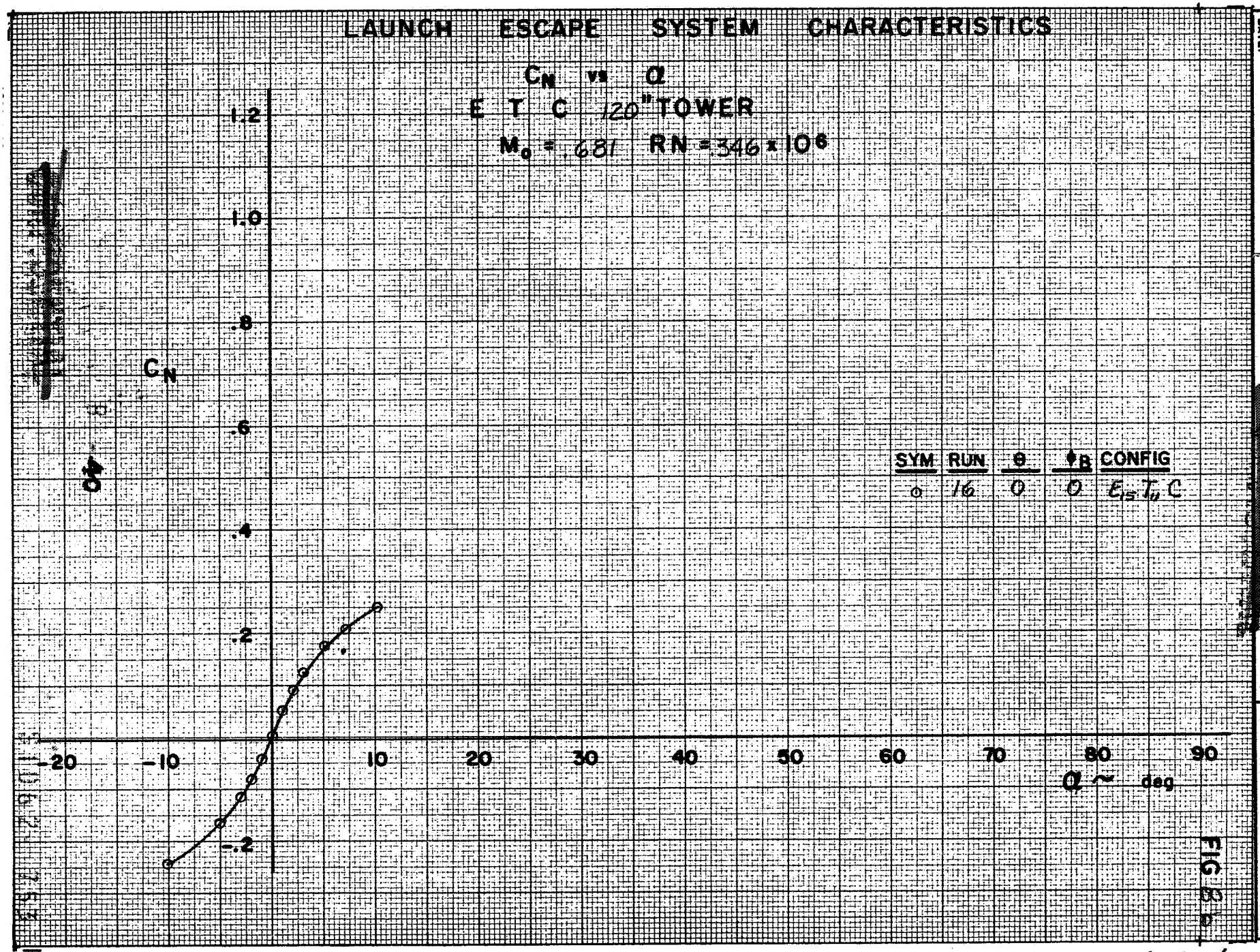

FIG 8-6

C_N vs α 201-6

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LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_A vs α

E T C 120" TOWER

M_∞ = .681 RN = .346 x 10^6

SYM	RUN	θ	ψ	CONFIG
⊙	16	0	0	$E_5 T_{11} C$

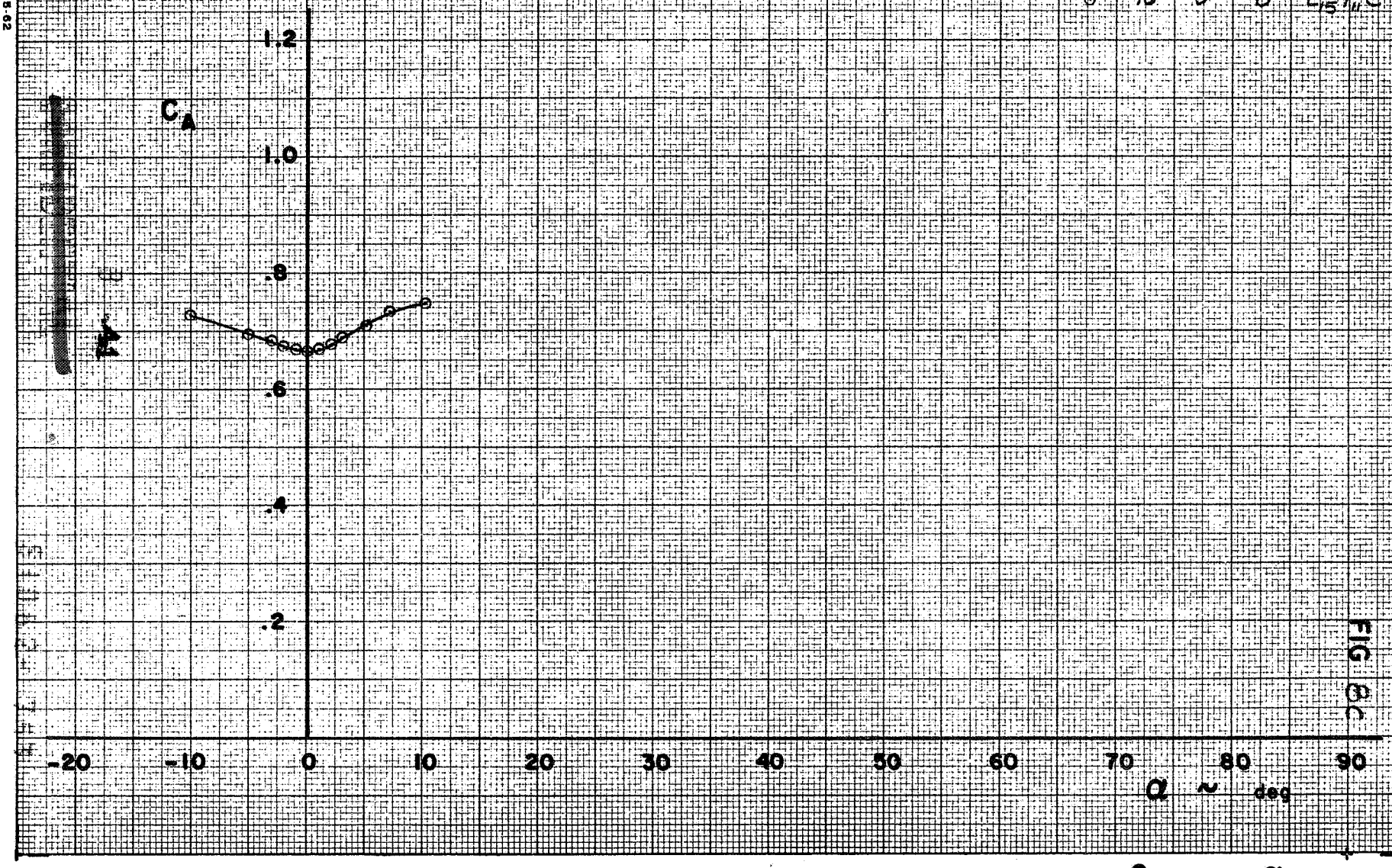

FIG 8C

C_A vs α 201-06

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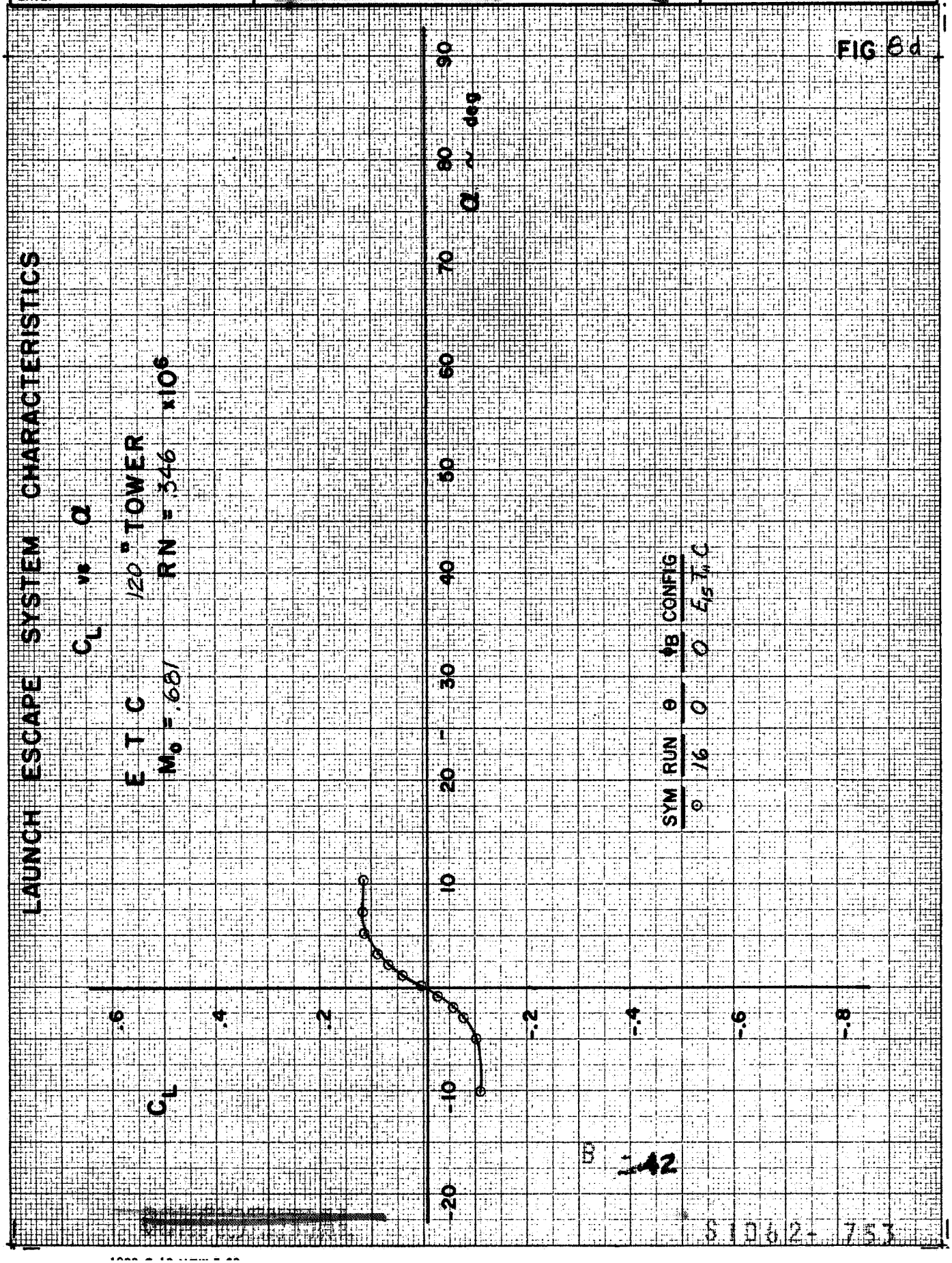
FIG 8d

C_L vs α 201-6



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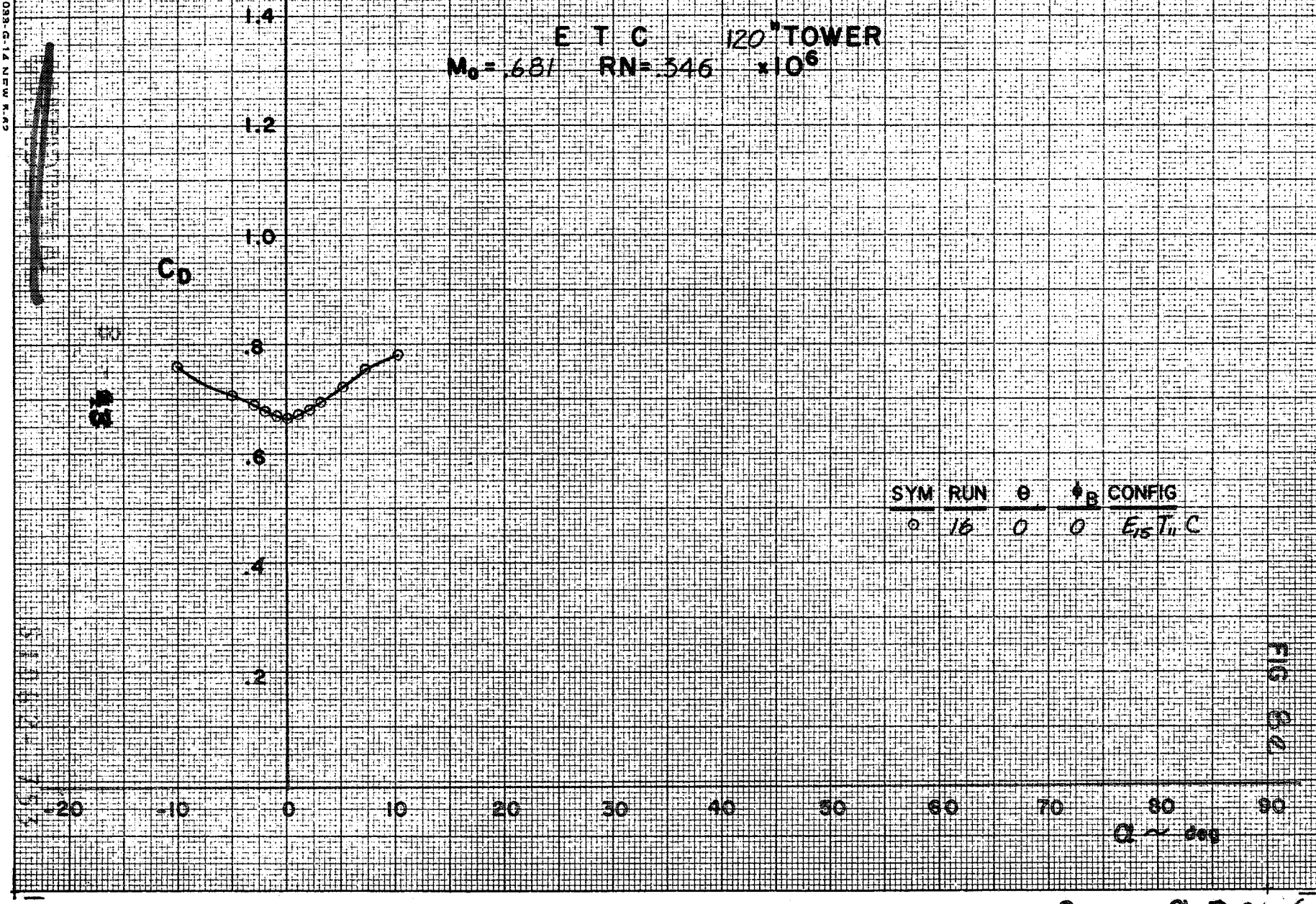
LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_D vs α

E T C 120" TOWER

M_0 = .681 RN = .546 $\times 10^6$



SYM	RUN	θ	ϕ_B	CONFIG
⊙	16	0	0	$E_{15} T_{11} C$

FIG 62

C_D vs α 201-6

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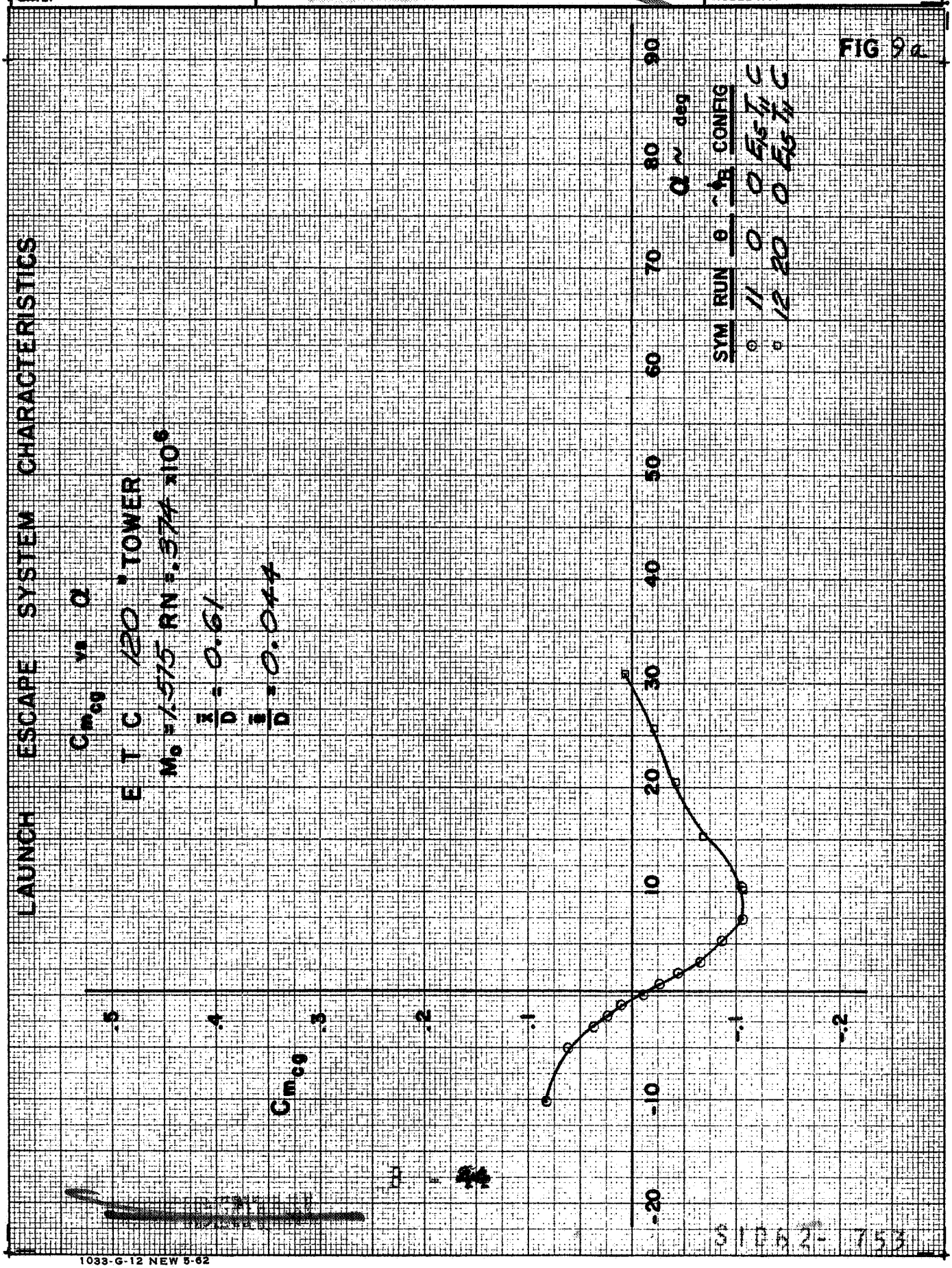
FIG 9a



$C_{m_{cg}}$ vs α 20L-05

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LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_N vs α

E T C 120" TOWER

M_0 = 1.575 RN = .374 x 10^6

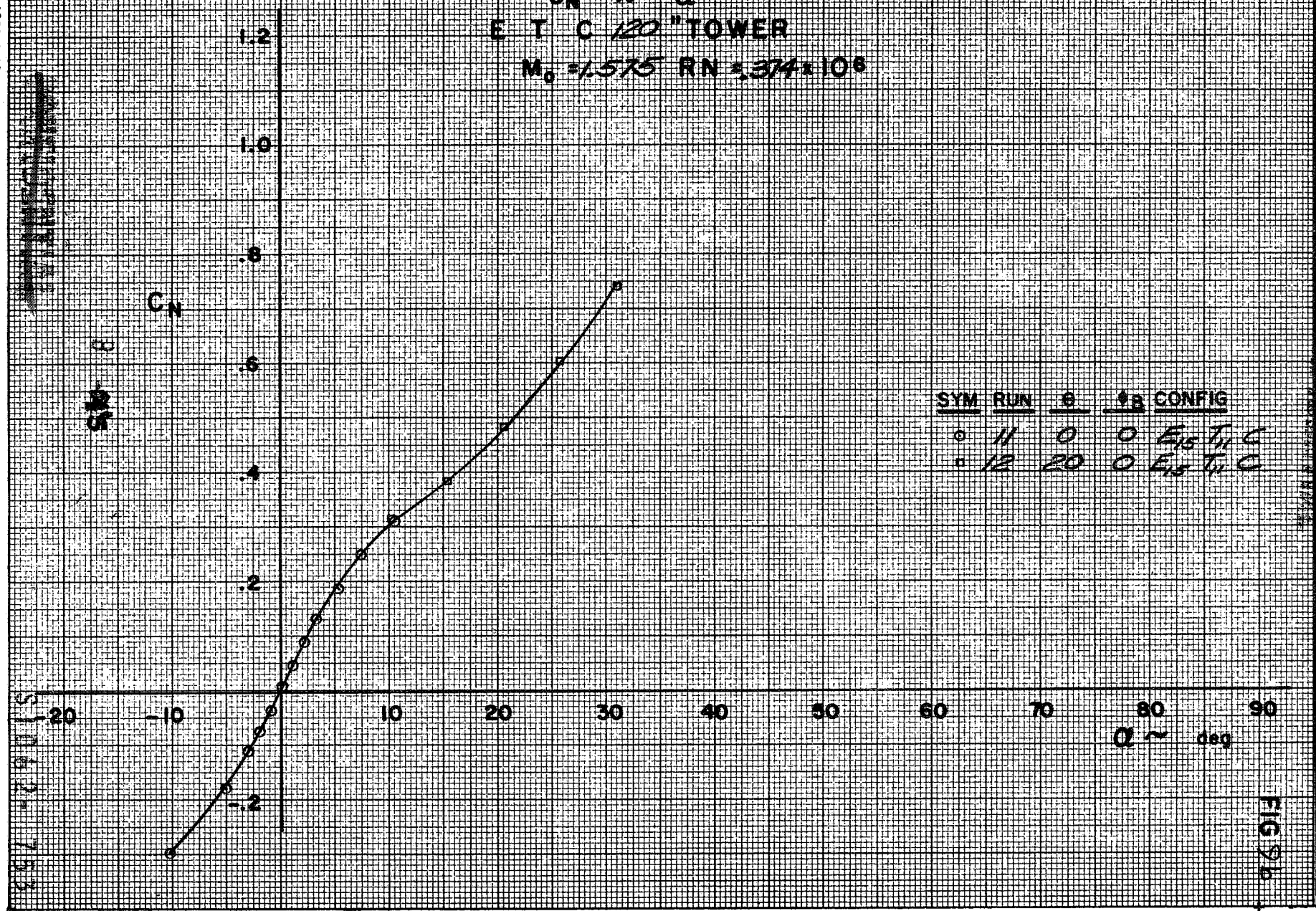

FIG 9

C_N vs α 201-5

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201-05

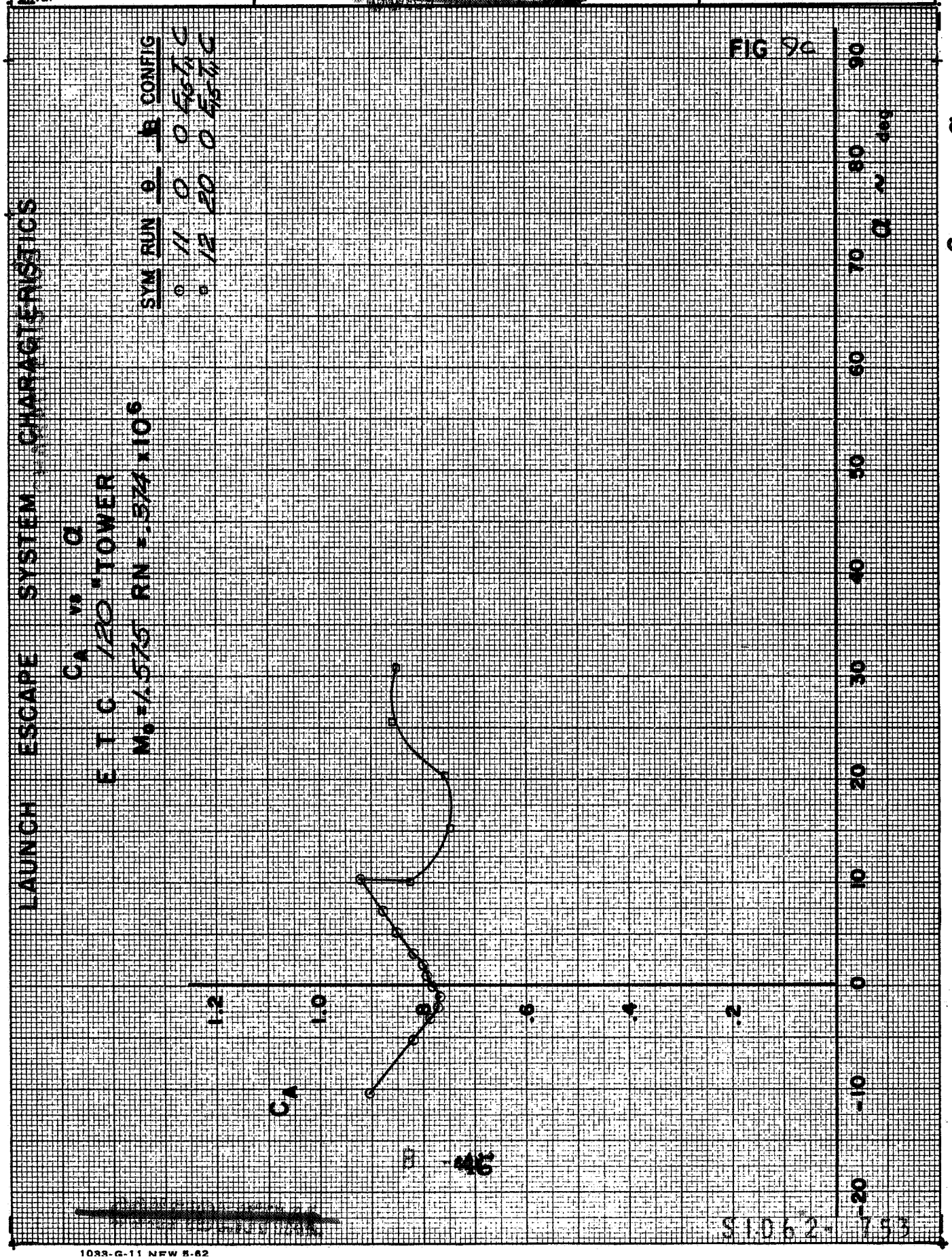

FIG 9c

C_A vs α

[redacted]

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1033-G-11 NEW 5-62

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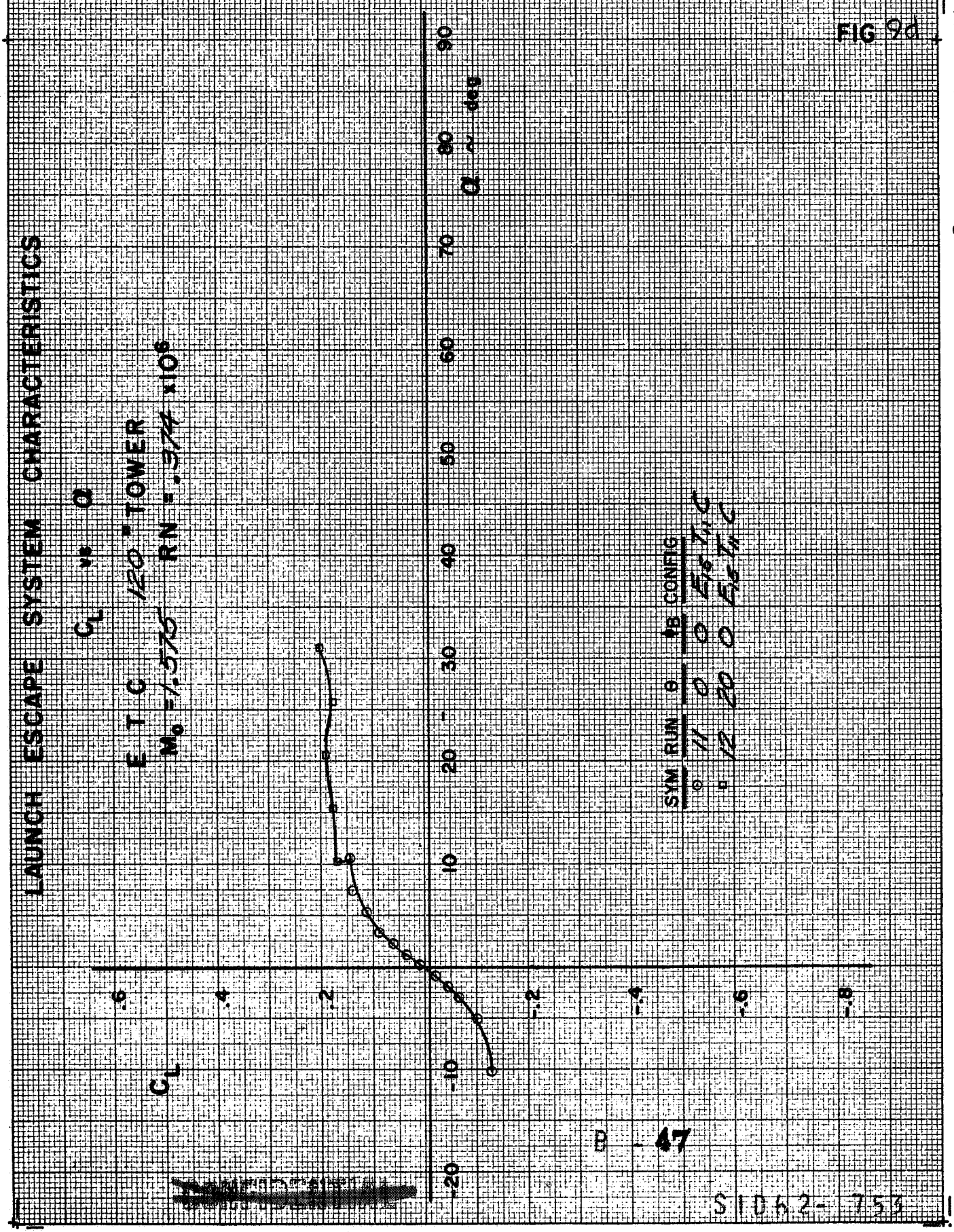
FIG 9d

C_L vs α 201-5



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[redacted]

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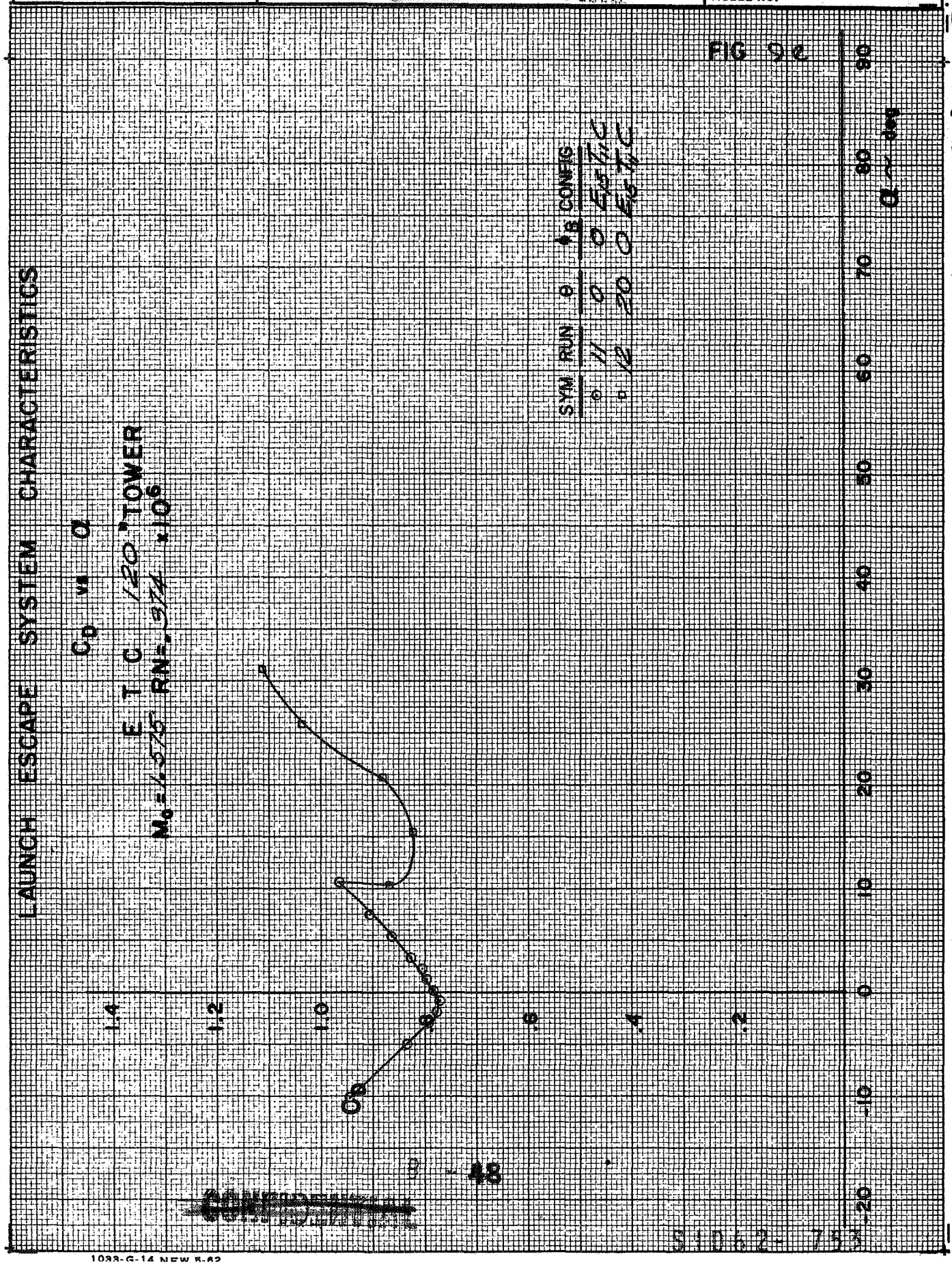

FIG 9e

C_D vs α 201-5

[redacted]

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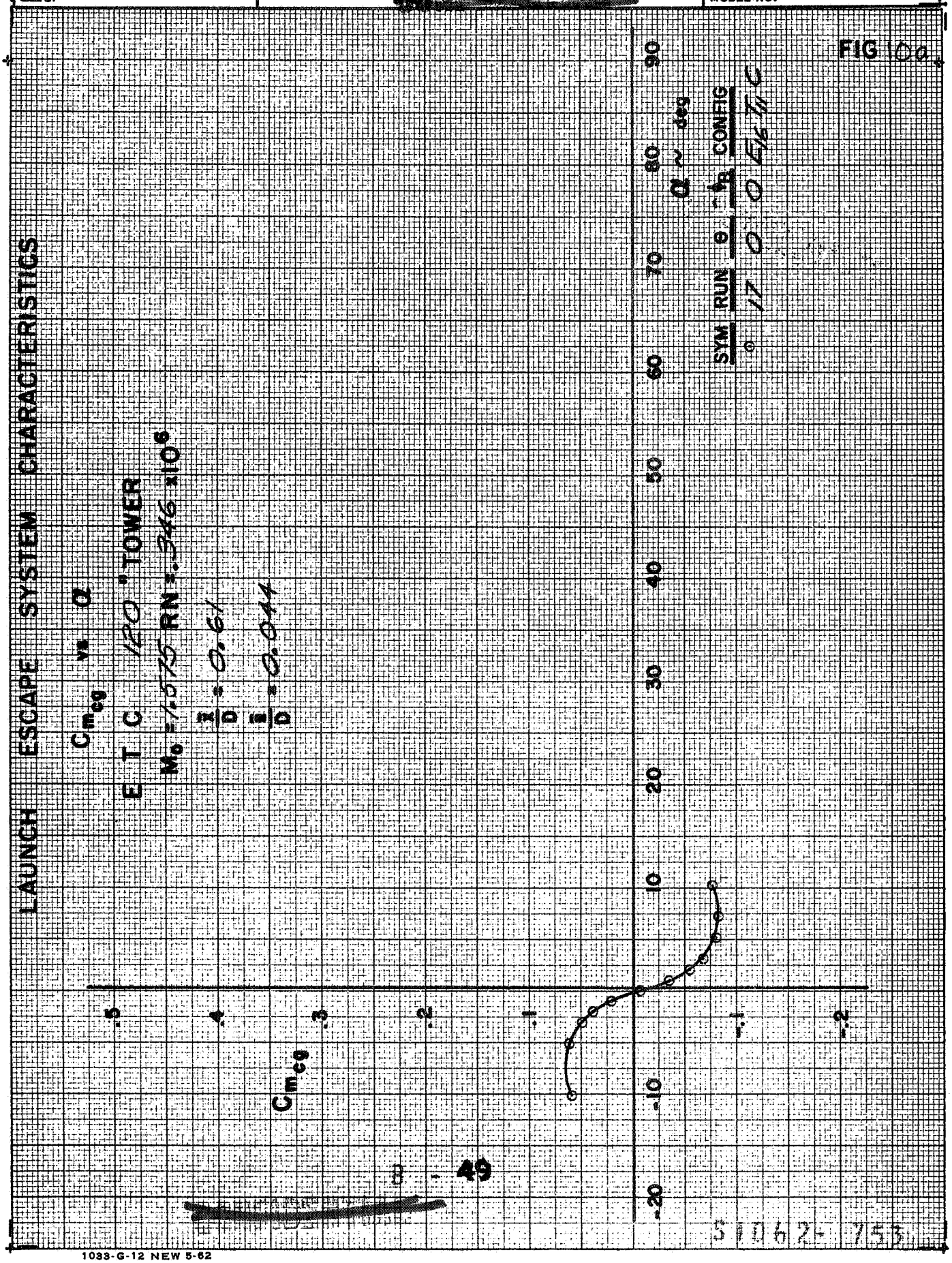

FIG 10a

$C_{m_{cg}}$ vs α 201-07

[redacted]

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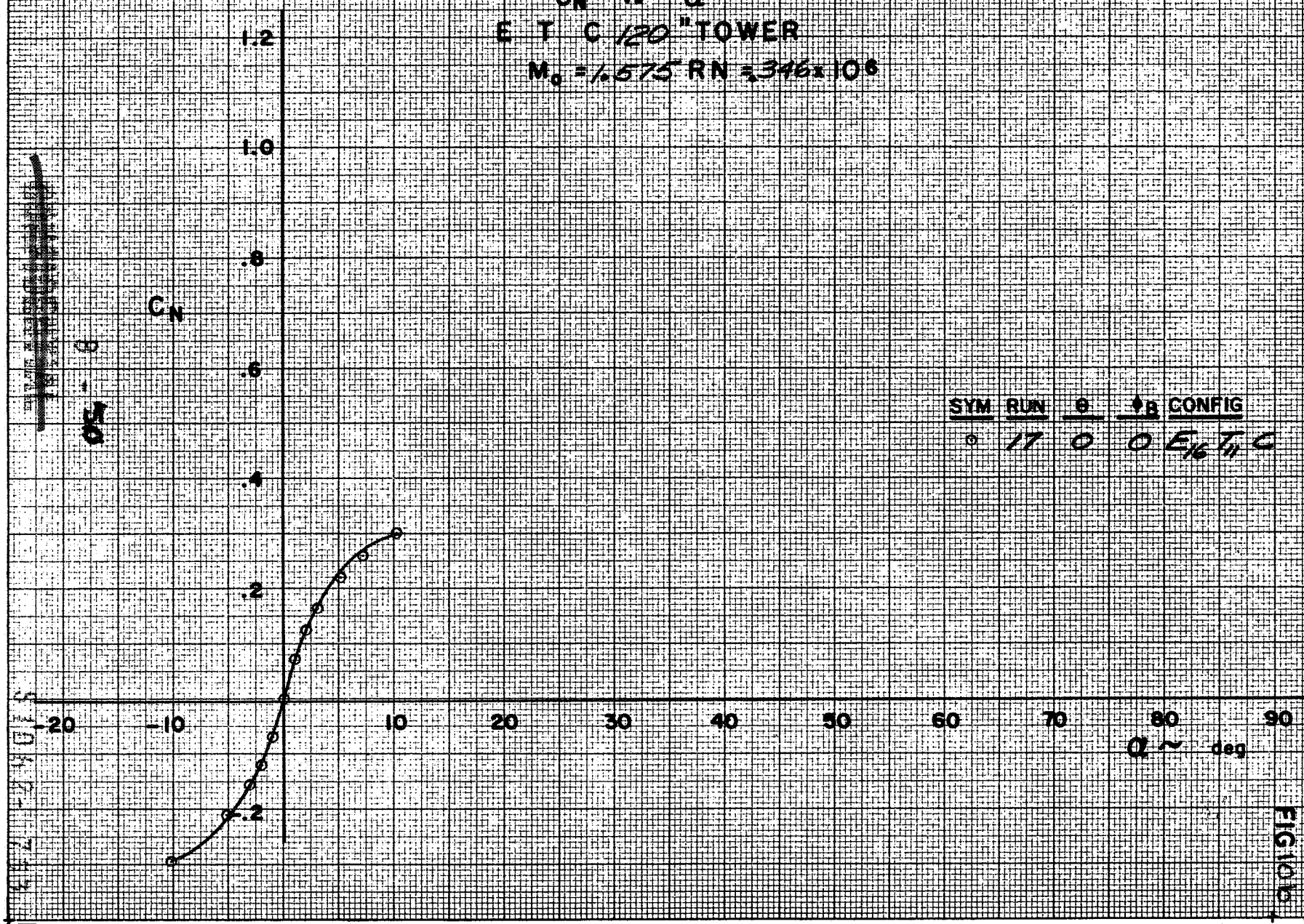
1033-G-12 NEW 5-62

LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_N vs α

E T C 120" TOWER

$M_0 = 1.575$ RN $= .346 \times 10^6$



SYM	RUN	θ	ϕ_B	CONFIG
○	17	0	0	E_{16} T_{11} C

FIG 10b

C_N vs α 201-7

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LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_A vs α

E T C 120" TOWER

M_∞ = 1.575 RN = .346 x 10^6

SYM	RUN	θ	β	CONFIG
○	17	0	0	E16T4C

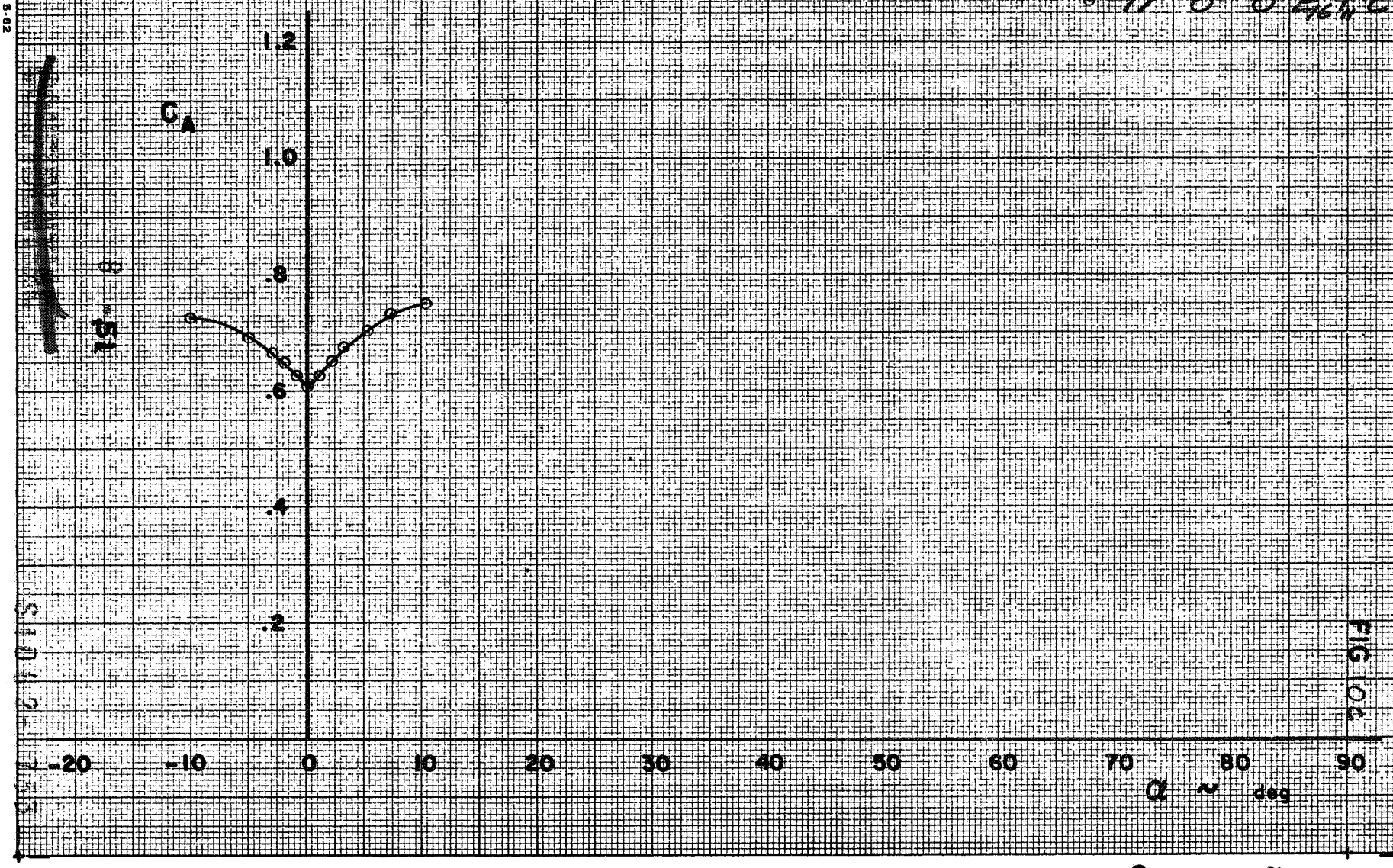

FIG 104

C_A vs α 201-07

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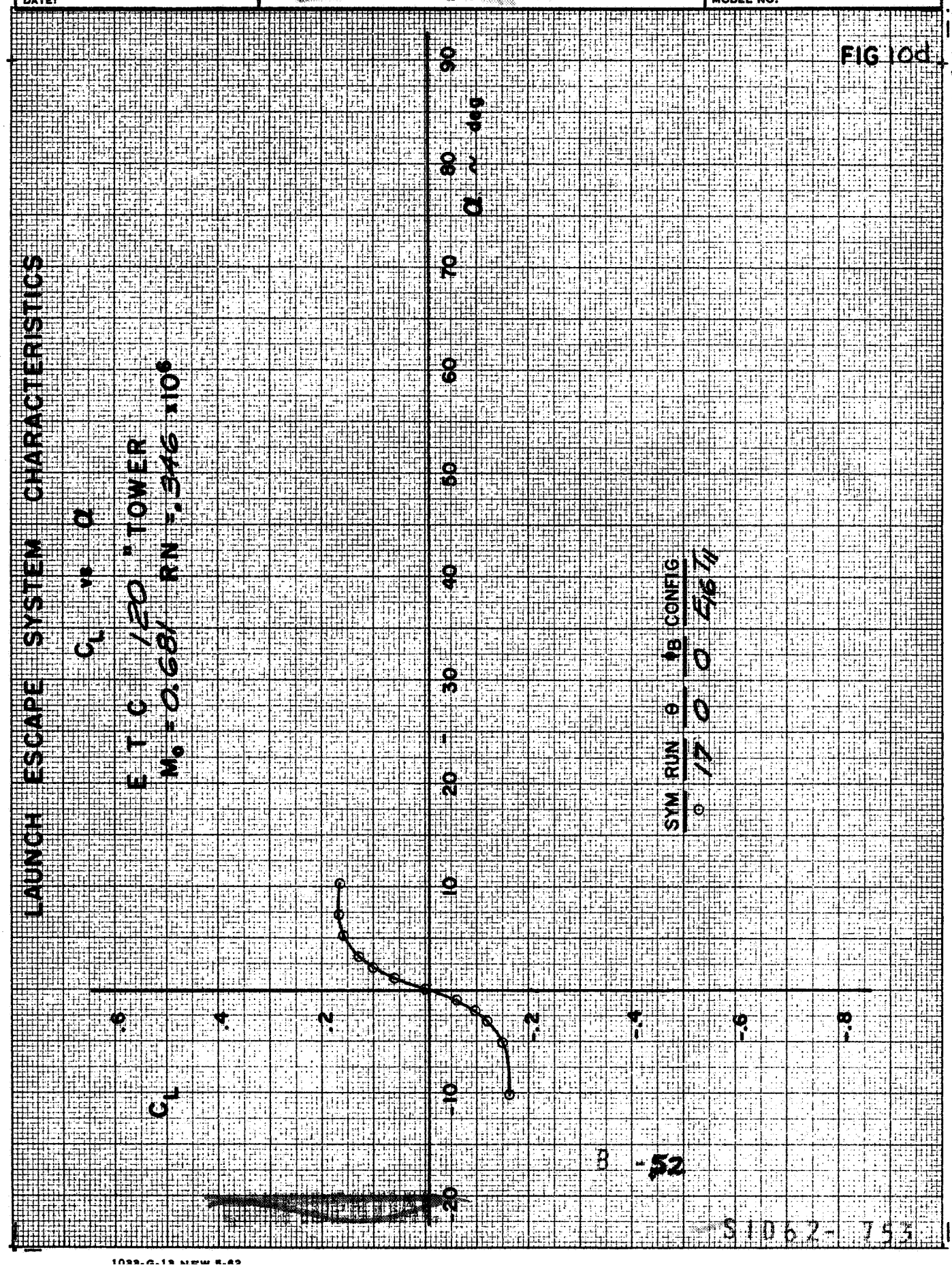

FIG 10d

C_L vs α 201-7

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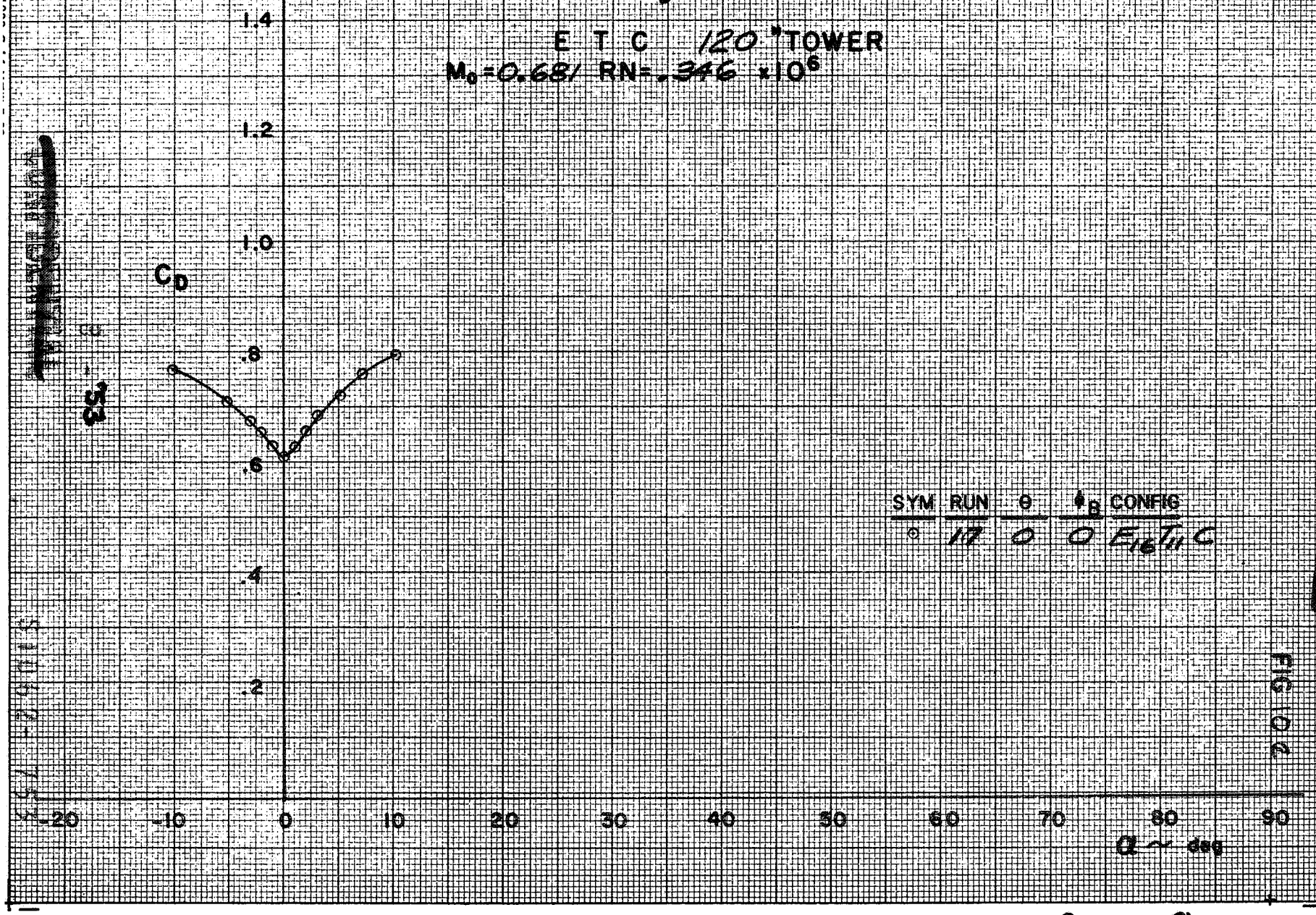
1033-G-13 NEW 5-62

LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_D vs α

E T C 120" TOWER

M_0 = 0.681 RN = .346 $\times 10^6$



SYM	RUN	θ	ϕ_B	CONFIG
⊙	117	0	0	$E_{16}T_{11}C$

FIG 102

C_D vs α 201-7

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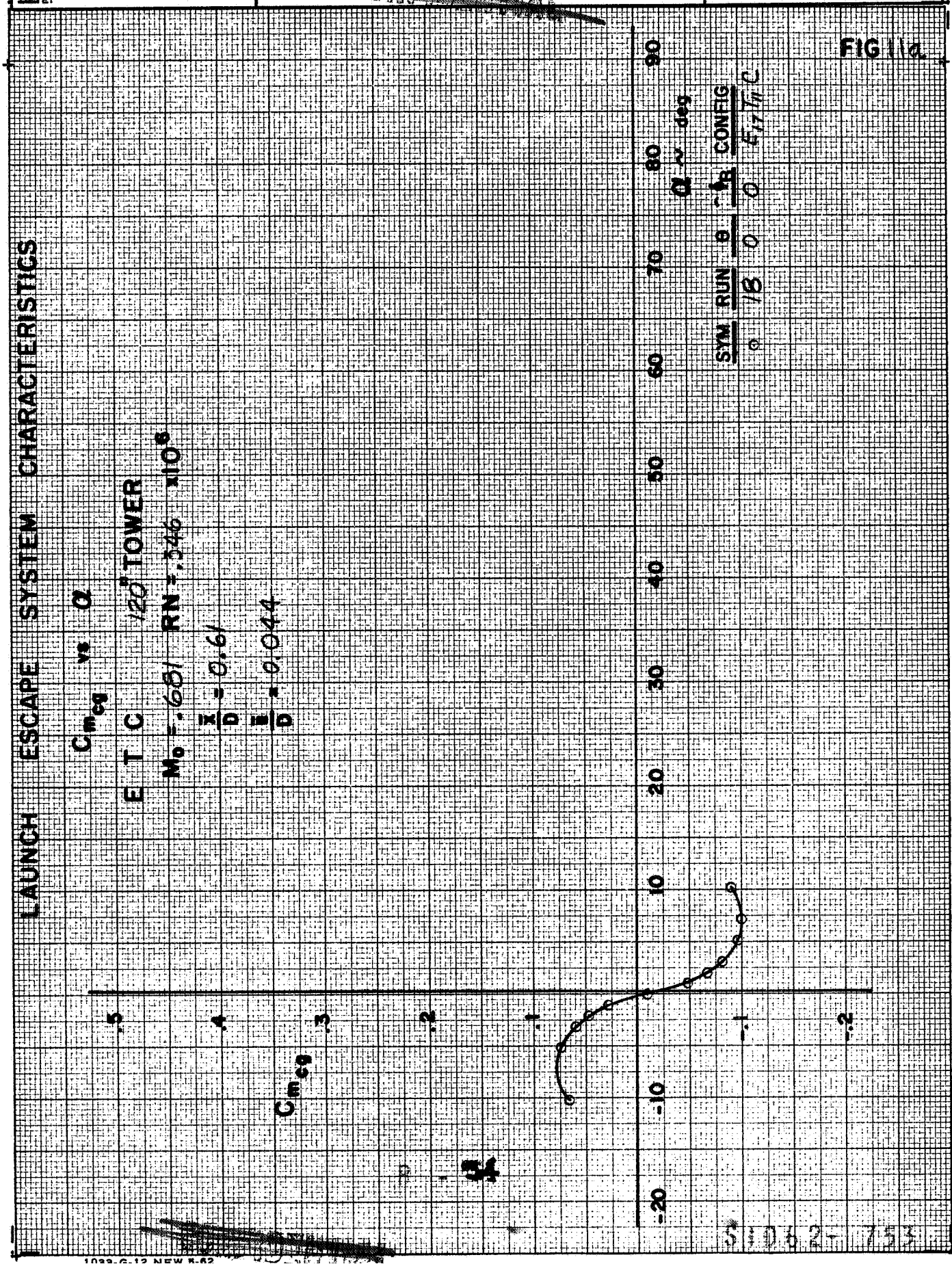

FIG 11a

$C_{m_{cg}}$ vs α 201-08

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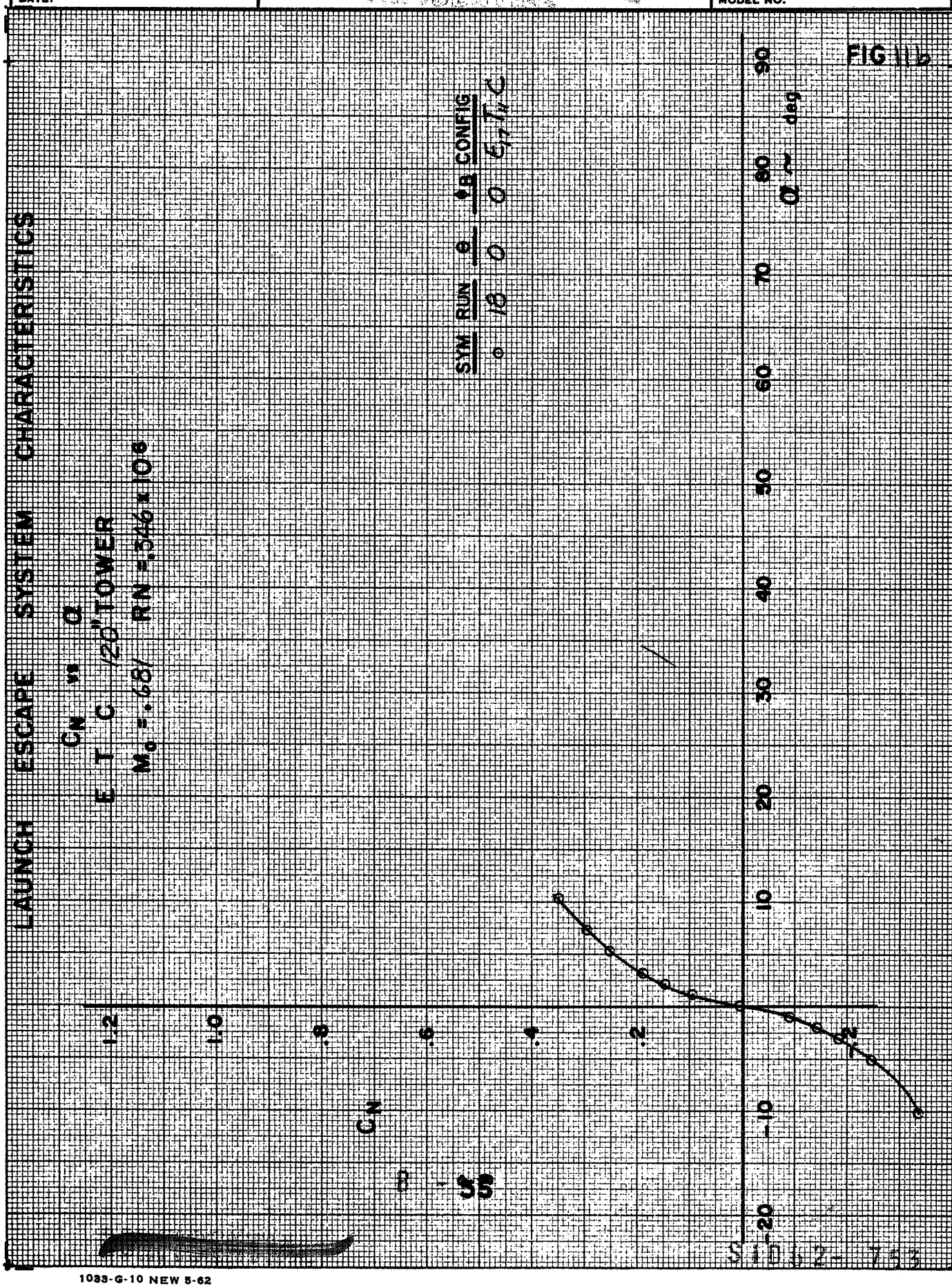

FIG 11b

C_N vs α 201-8

[redacted]

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1033-G-10 NEW 5-62

LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_A vs α

E T C 120" TOWER

$M_\infty = .681$ RN $= .346 \times 10^6$

SYM	RUN	θ	β	CONFIG
⊙	18	0	0	E_1, T_1, C

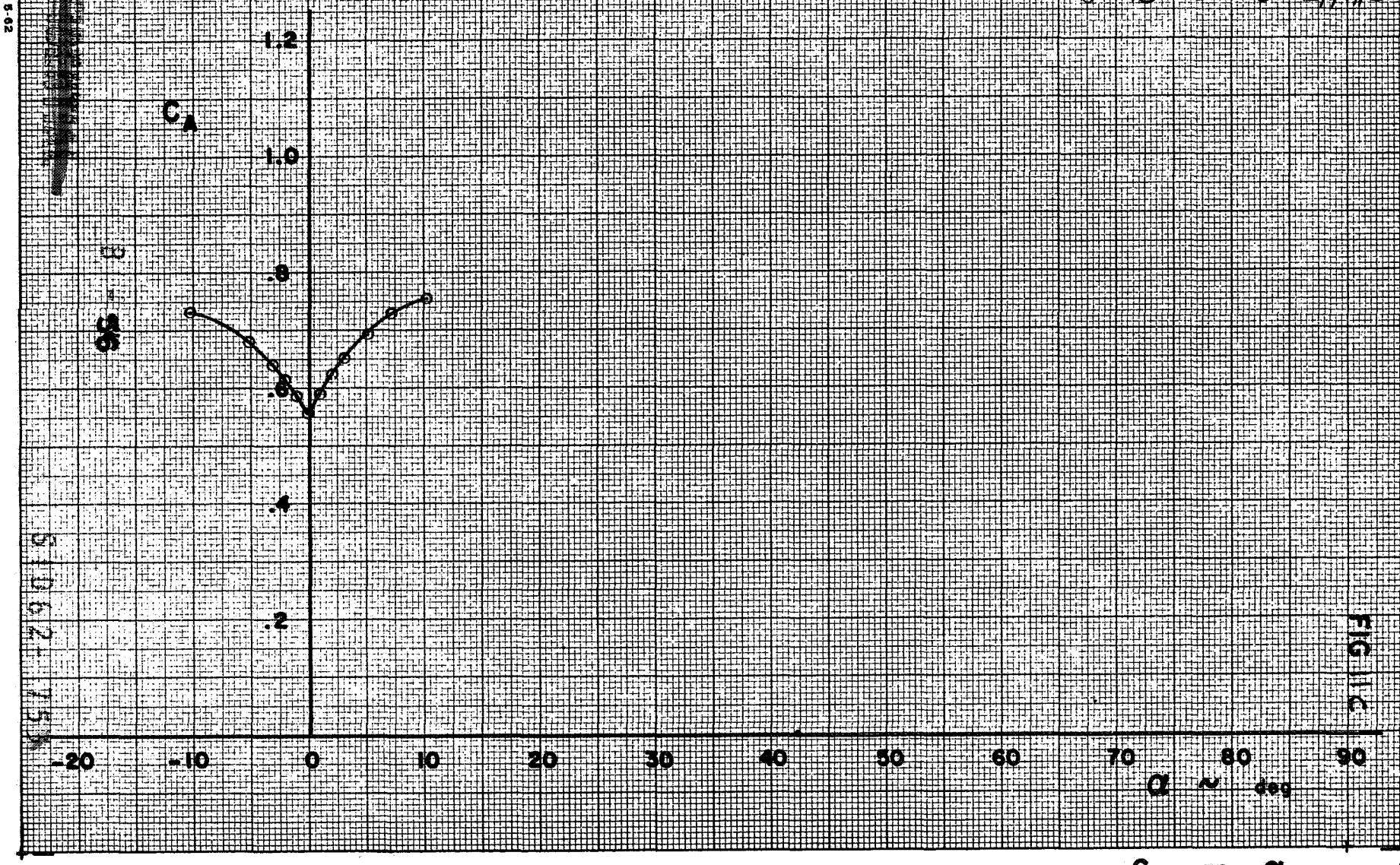

FIG 11C

C_A vs α 201-08

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1033-G-11 NEW 5-62

LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_L vs α

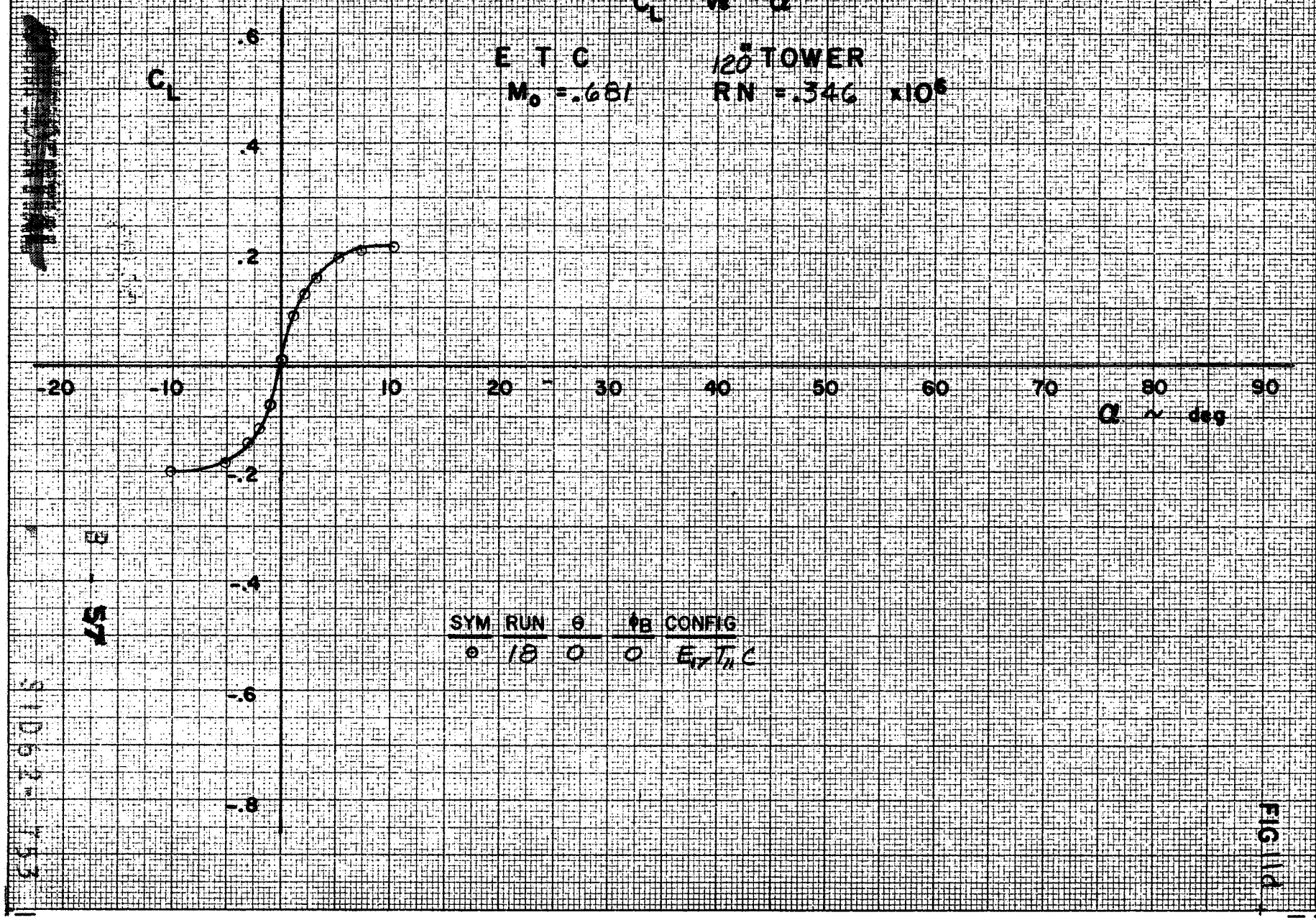

FIG 11a

C_L vs α 201-8

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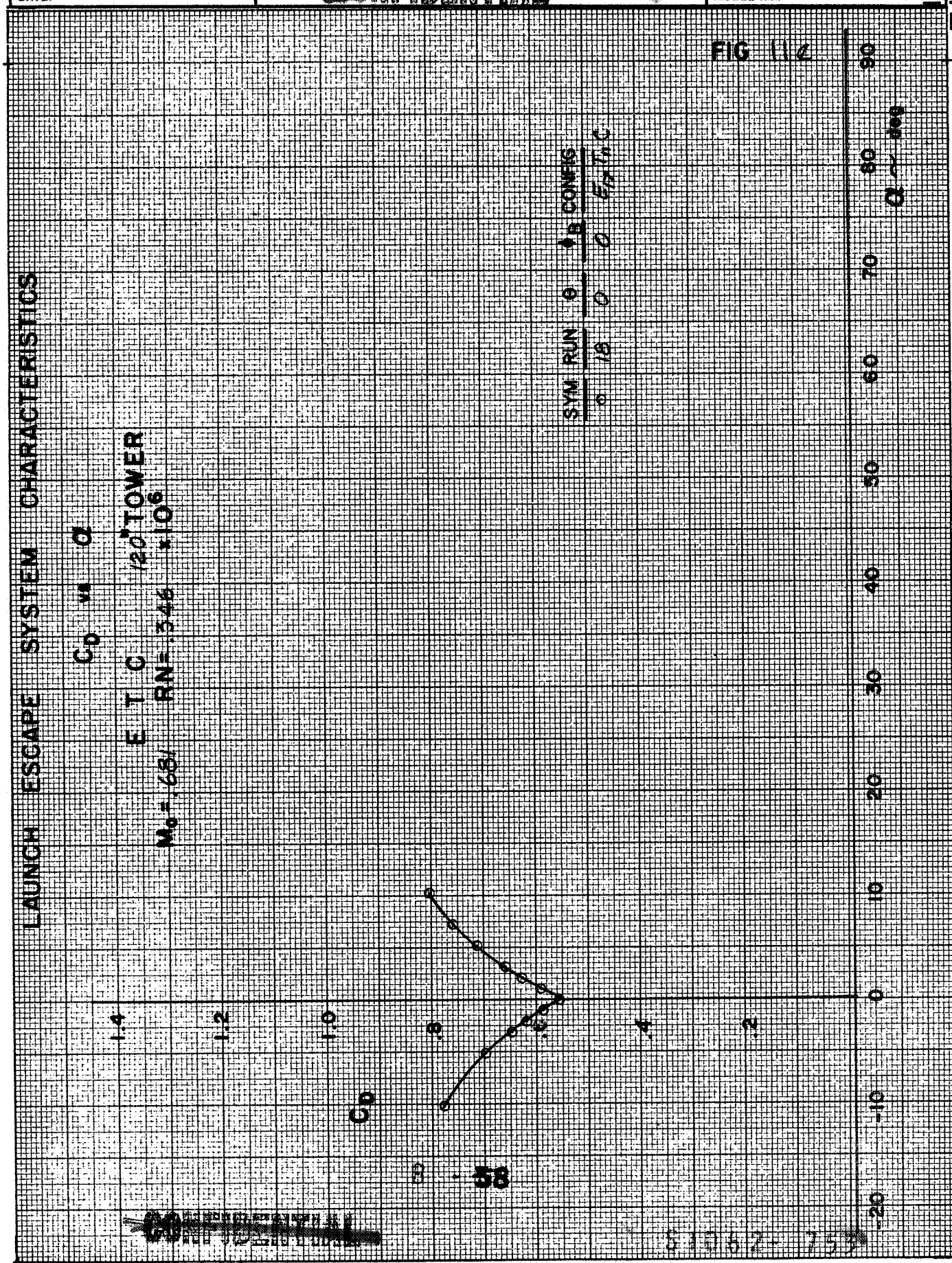

FIG 11e

C_D vs α 210-8

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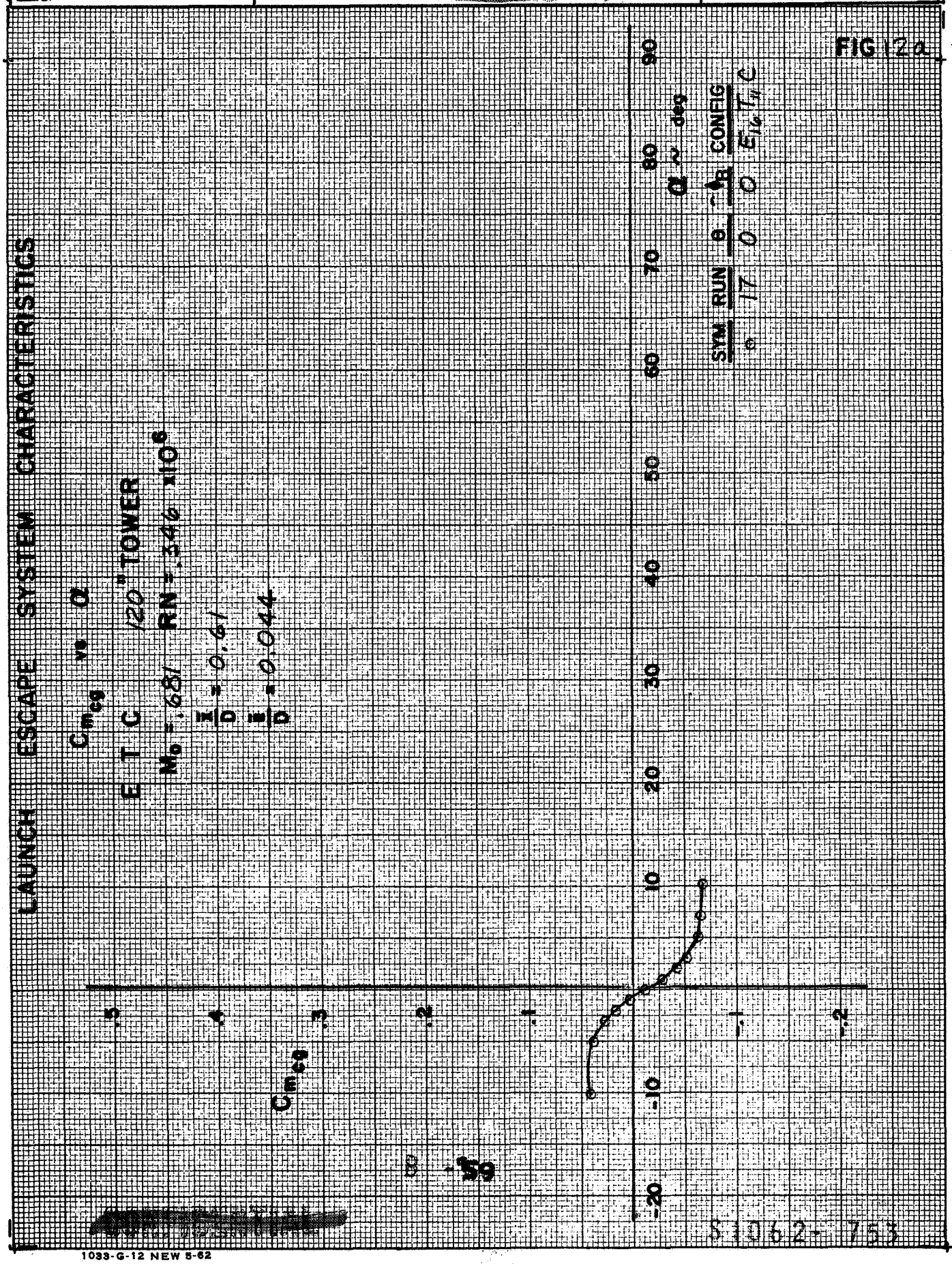

FIG 12a

$C_{m_{cg}}$ vs α 201-09

[redacted]

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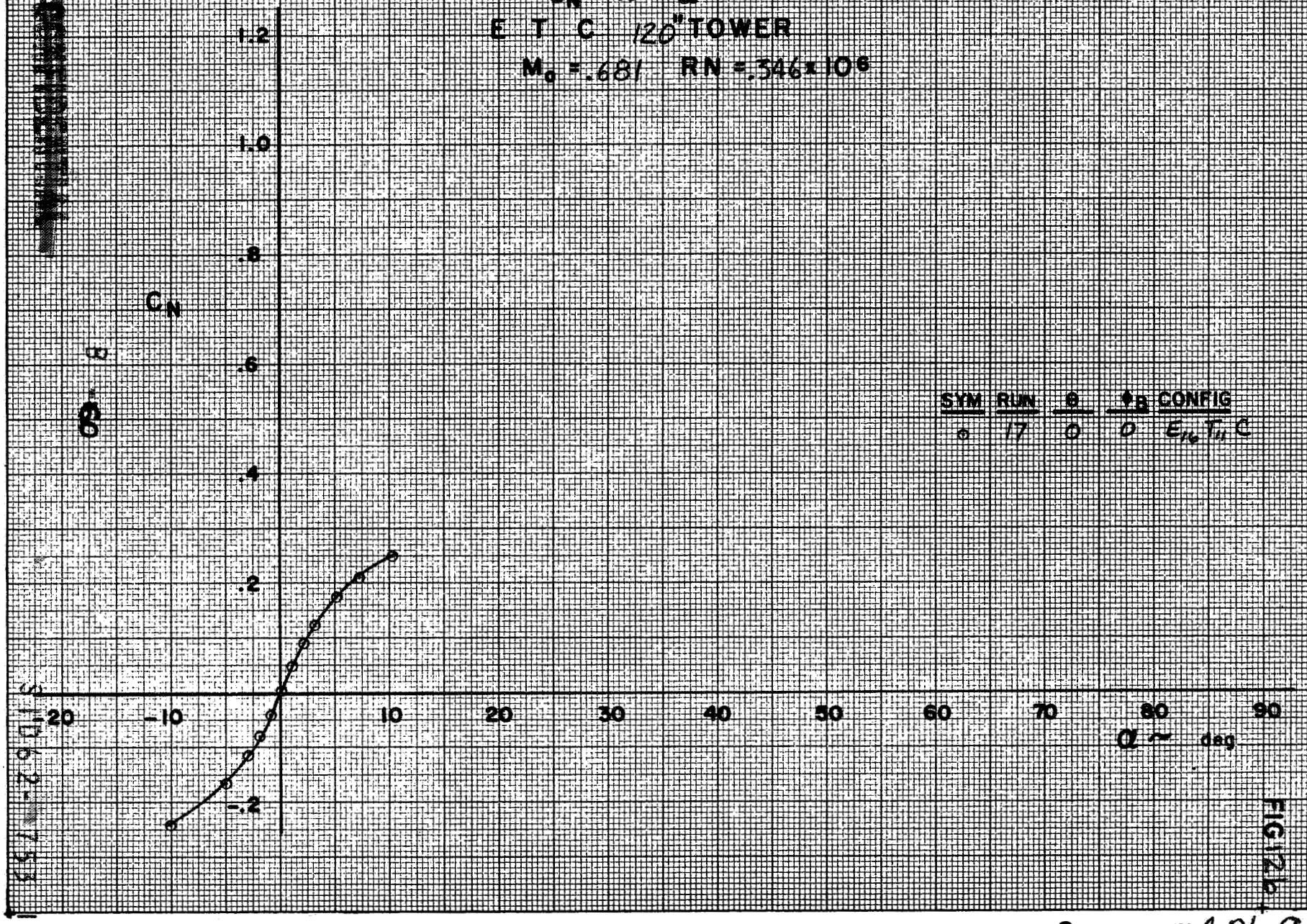
1033-G-12 NEW 5-62

LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_N vs α

E T C 120" TOWER

$M_0 = .681$ $RN = .346 \times 10^6$



SYM	RUN	θ	ϕ_B	CONFIG
⊙	17	0	0	$E_{16} T_{11} C$

FIG 126

C_N vs α 201-9

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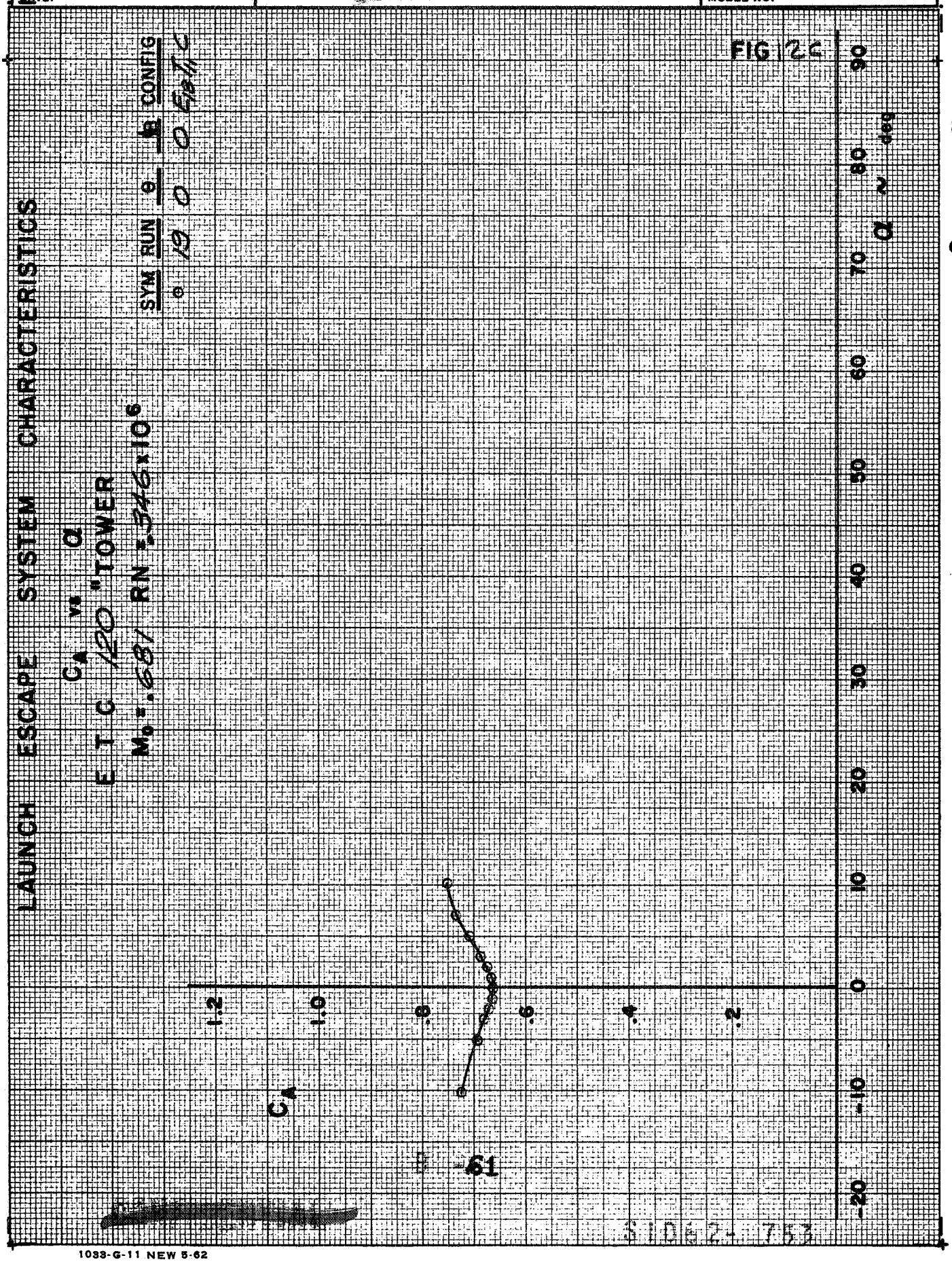

C_A vs α 201-09

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[redacted]

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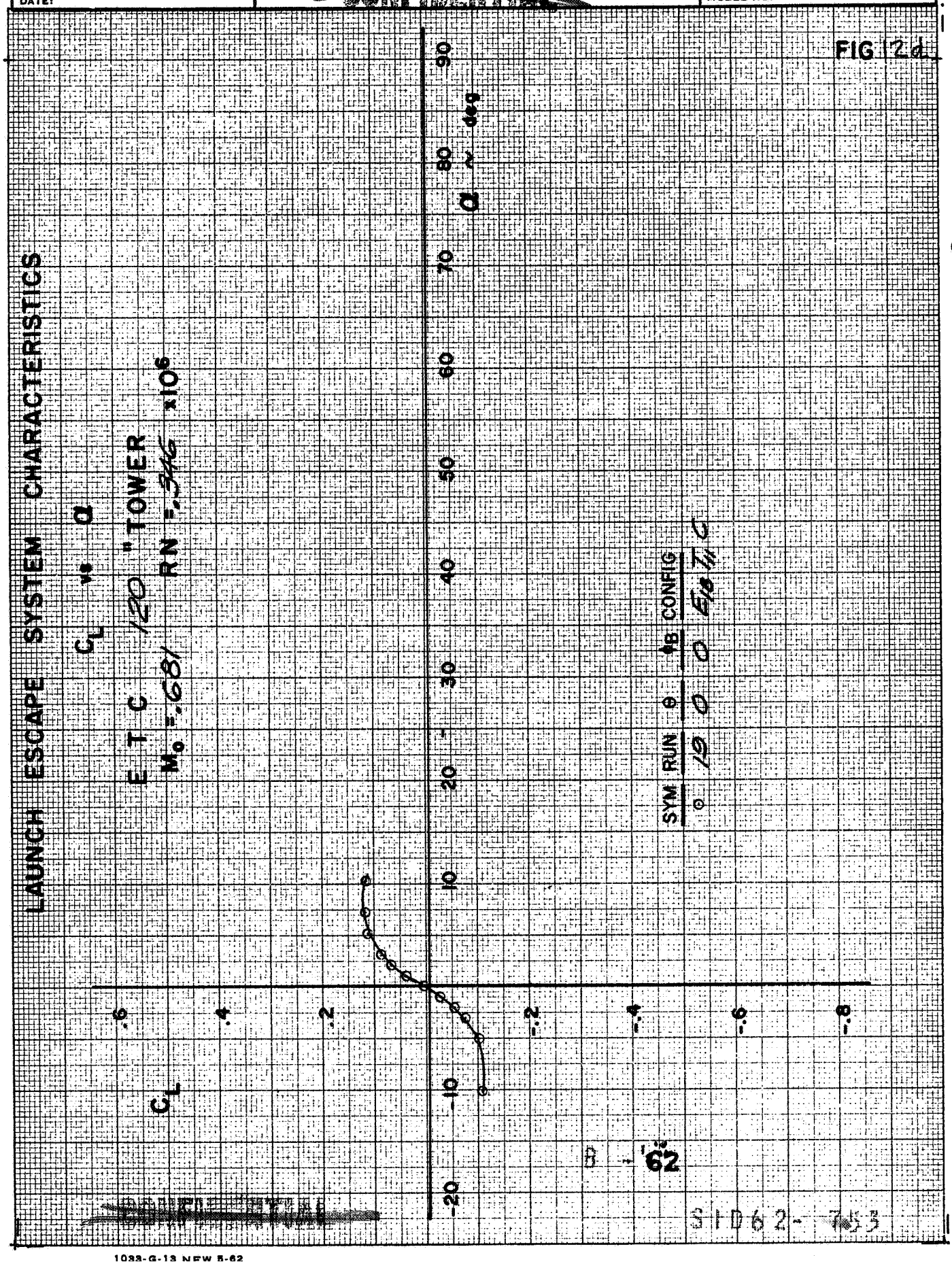
FIG 12d

C_L vs α 201-9



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1033-G-13 NEW 5-62

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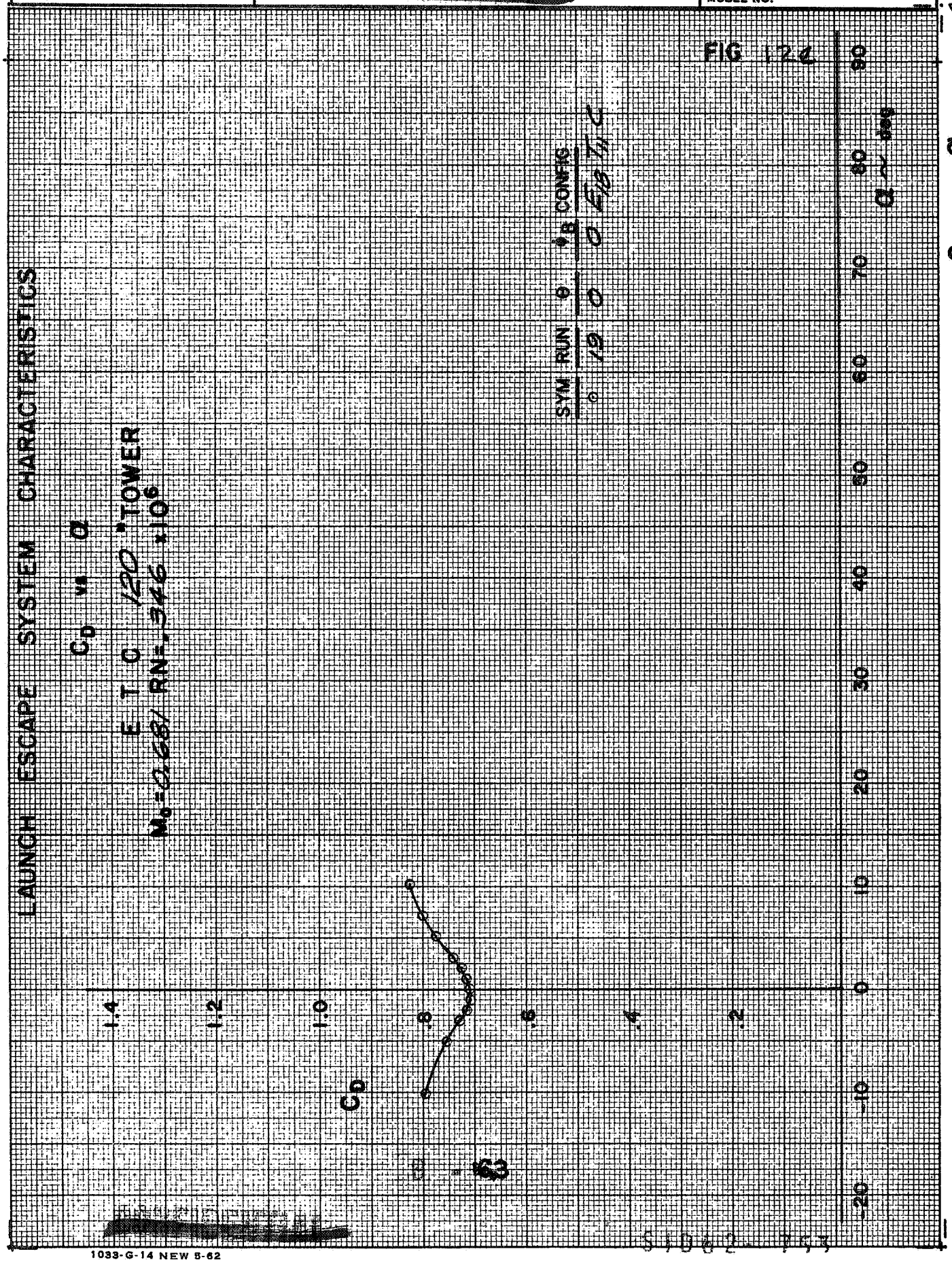

FIG 12e

C_D vs α 201-9

[redacted]

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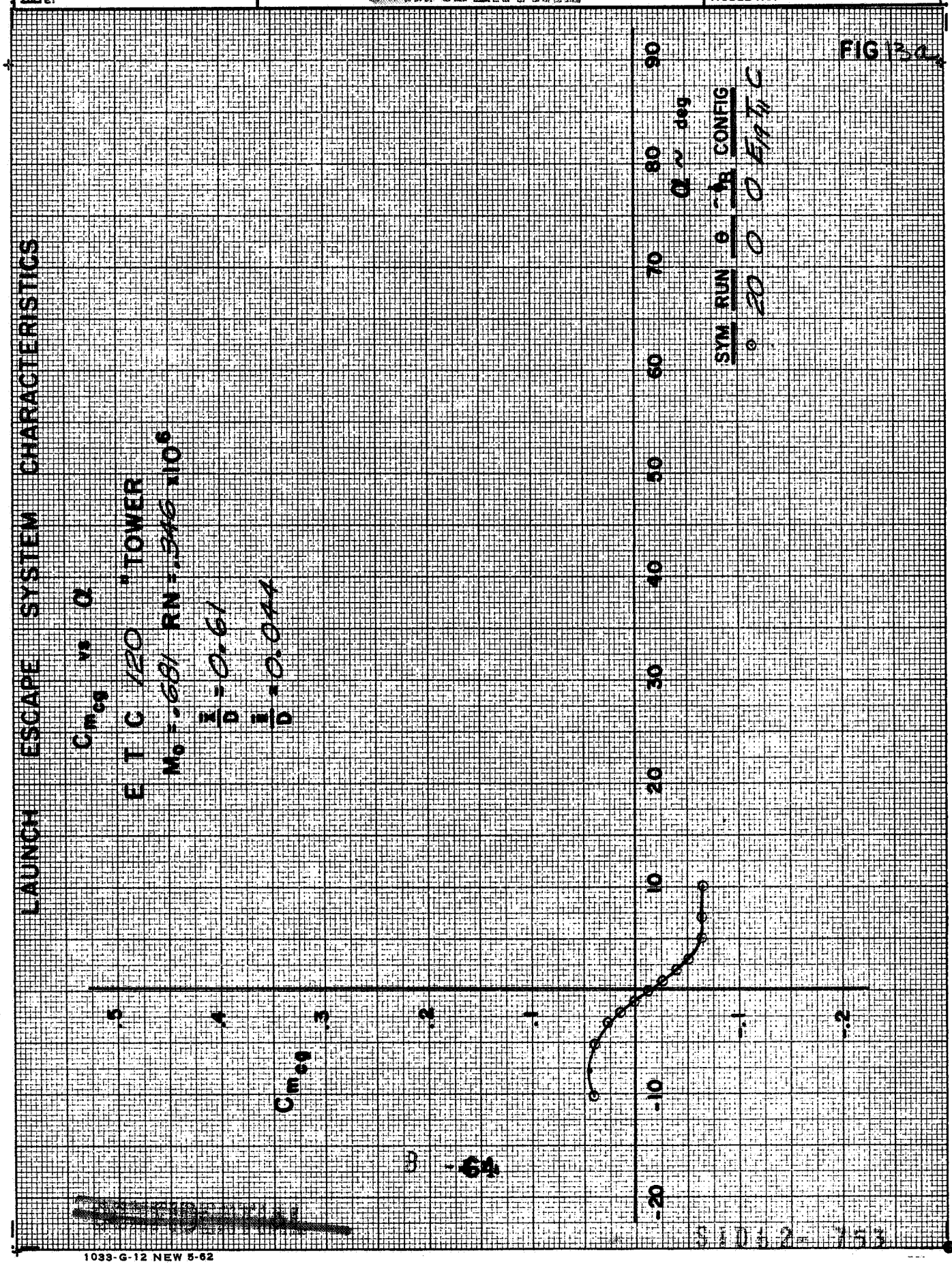

FIG 13a

$C_{m_{cg}}$ vs α 201-10

B -64

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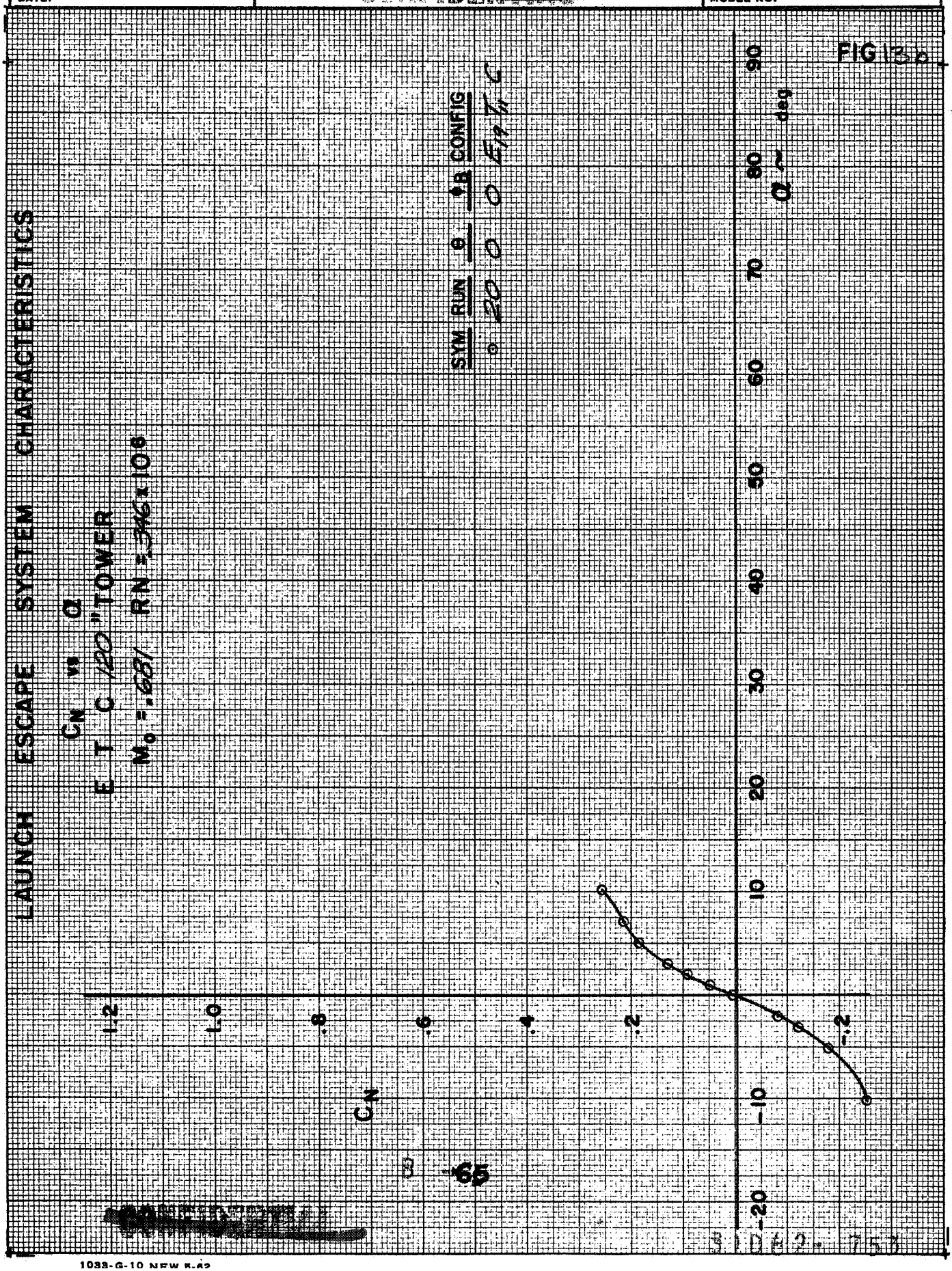

FIG 13b

C_N vs α 201-10

8 -65

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1033-G-10 NEW 5-62

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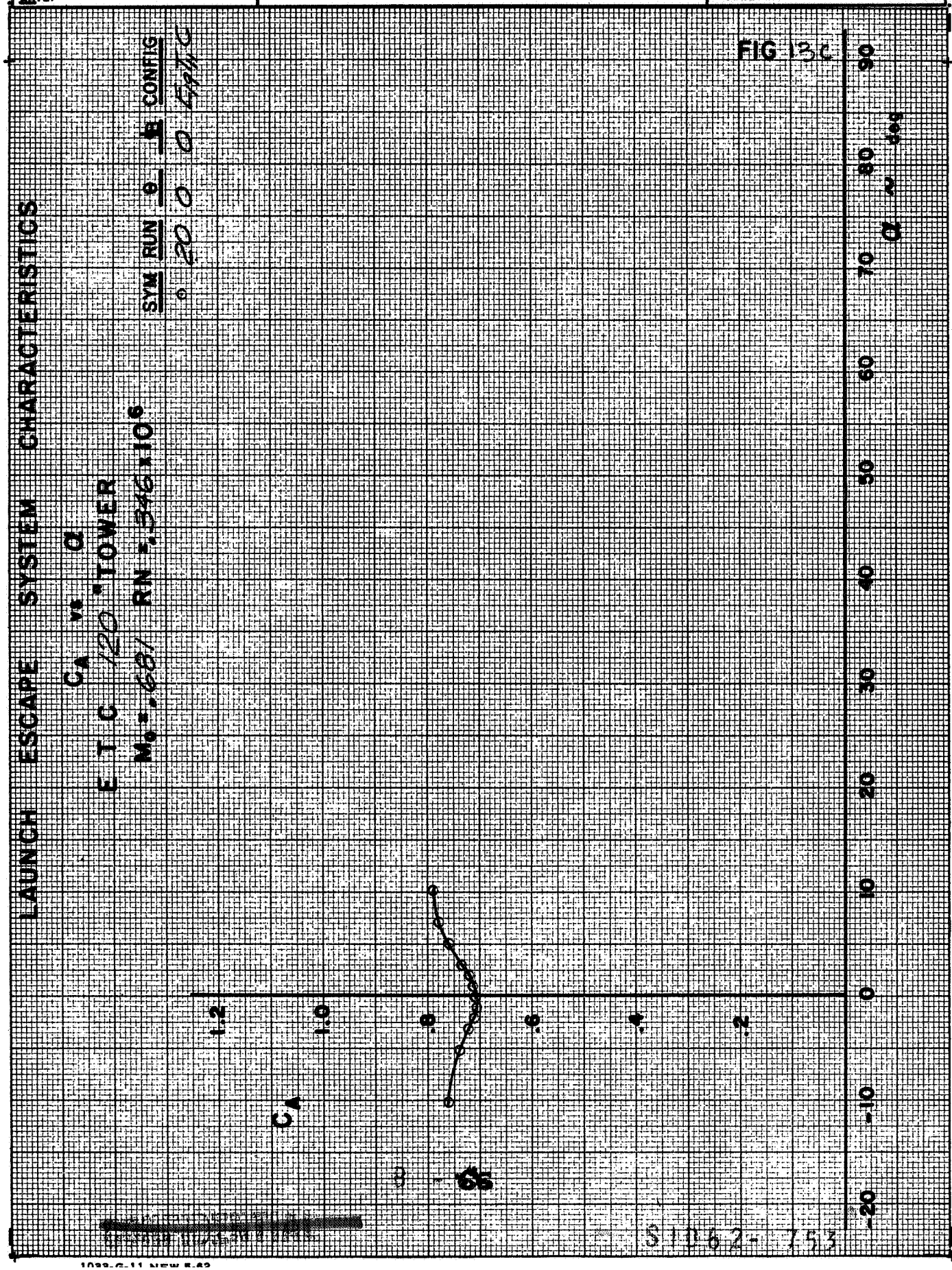

FIG 13c

C_A vs α 201-10

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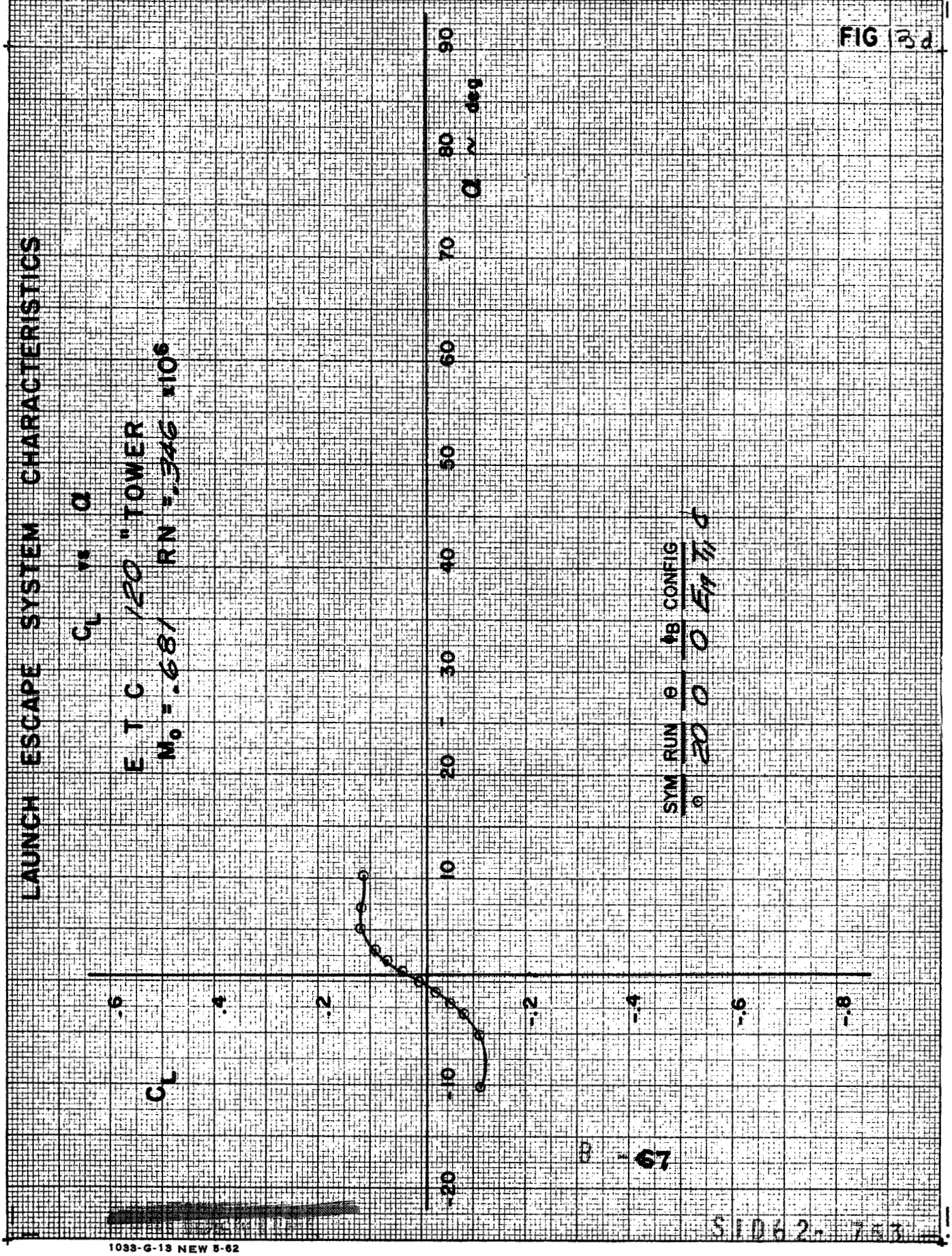
FIG 13d

C_L vs α 201-10



B - 67

[redacted]

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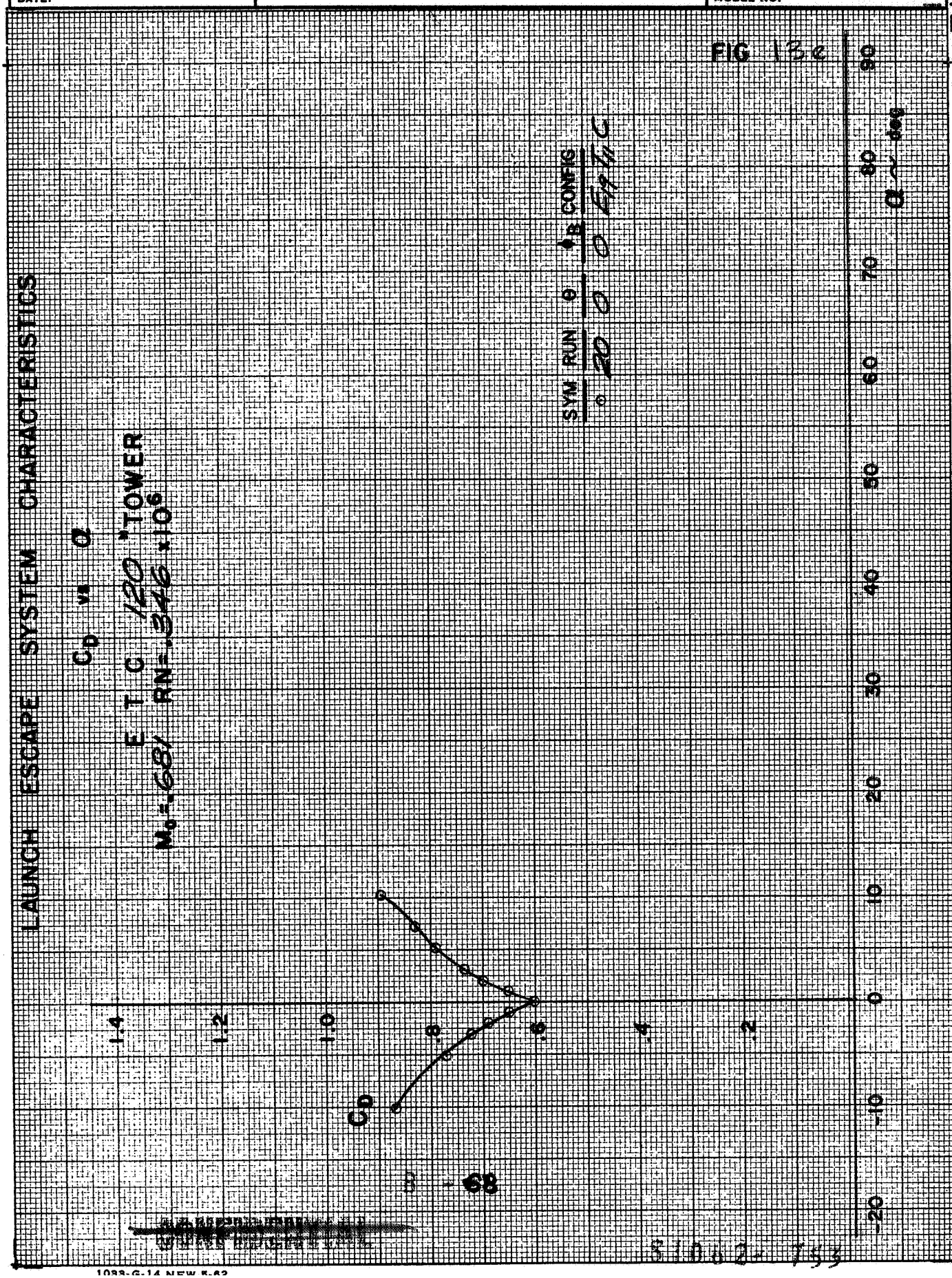

FIG 13e

C_D vs α 201-10

B - 68

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1033-G-14 NEW 5-62

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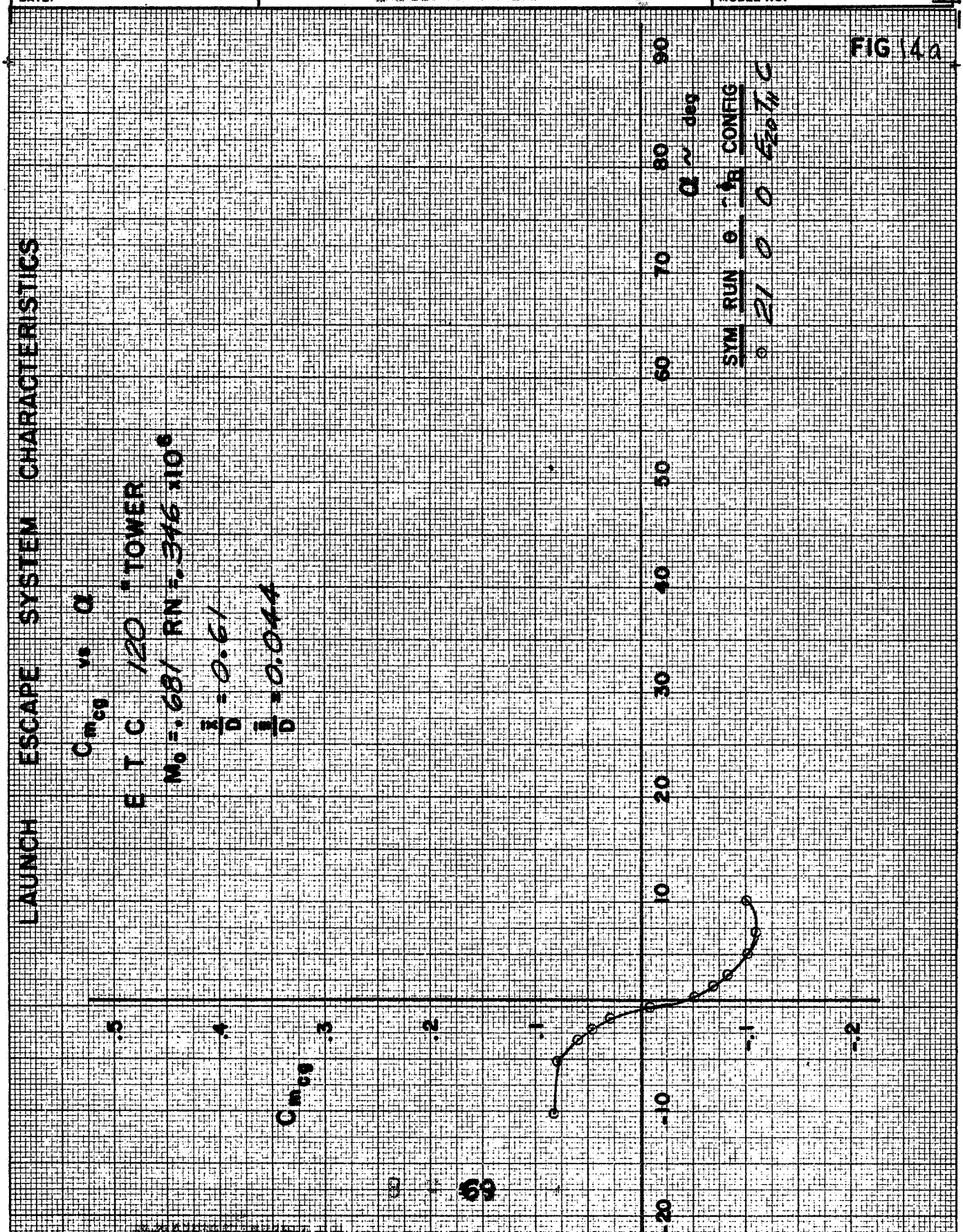
FIG 14a



$C_{m_{cg}}$ vs α 201-11

[redacted]

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1033-G-12 NEW 5-62

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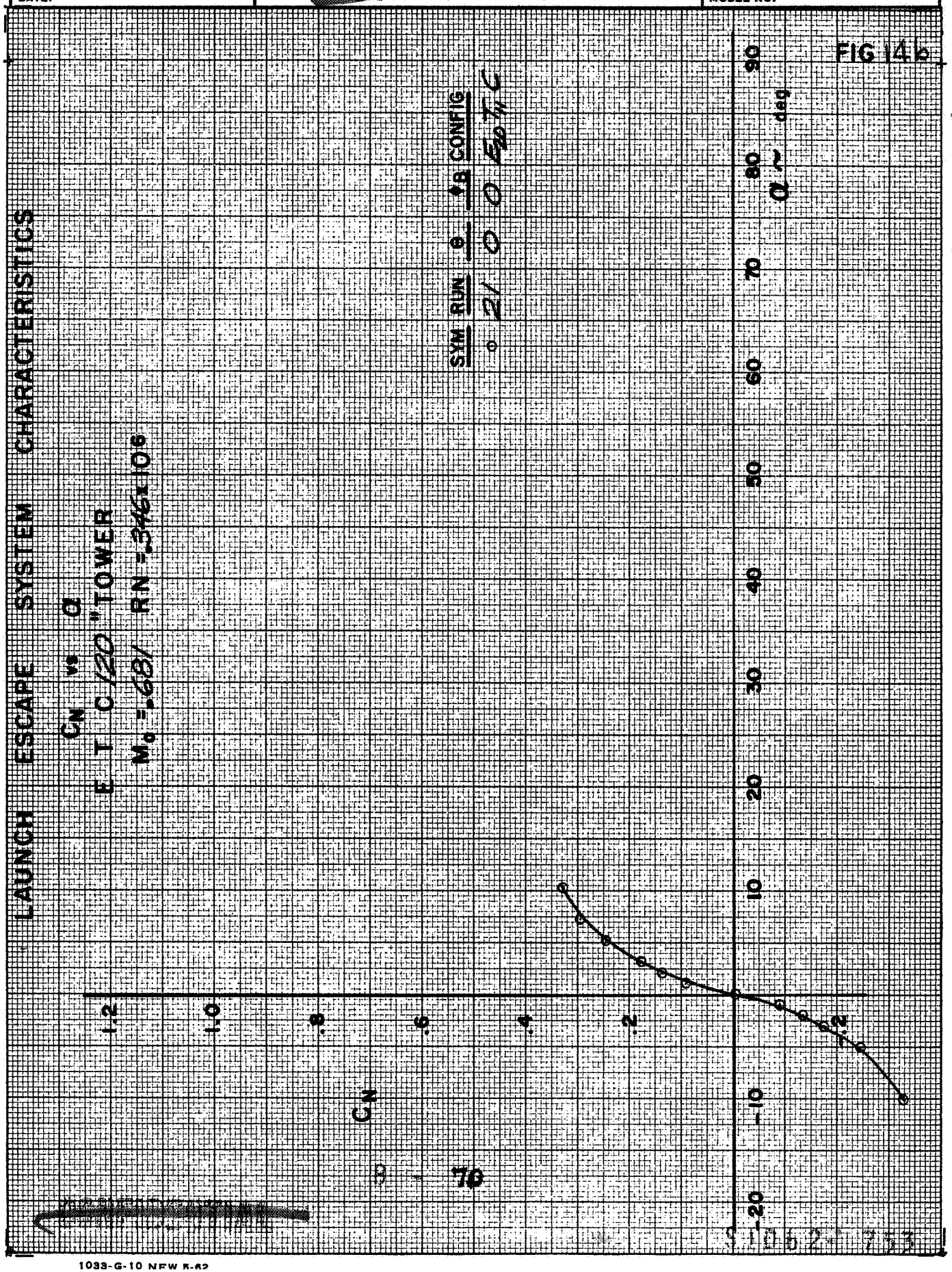

FIG 14b

C_N vs α 201-11

8 - 70

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S10621 753

1033-G-10 NEW 5-62

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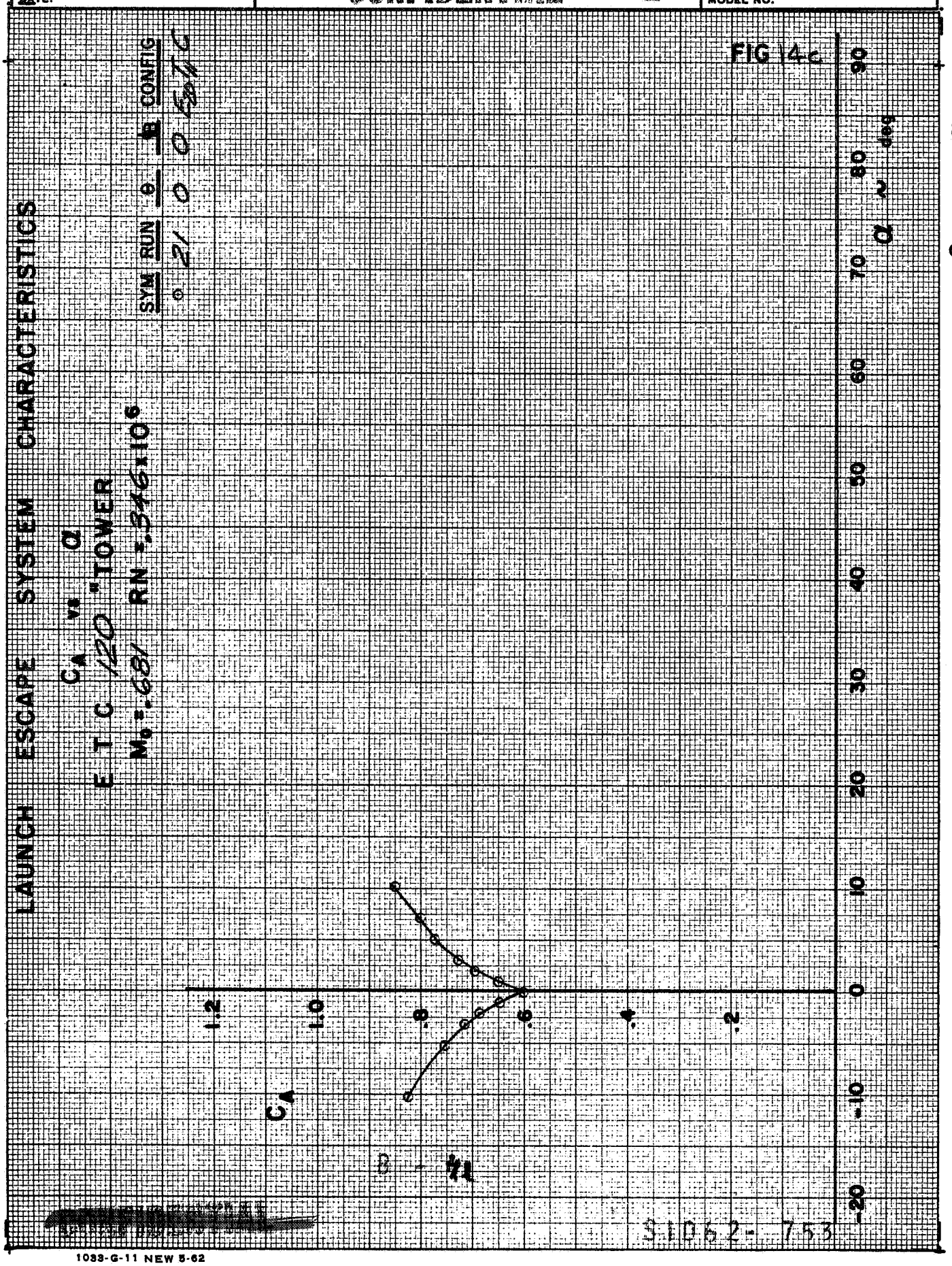

FIG 14c

C_A vs α

201-11

B - 41

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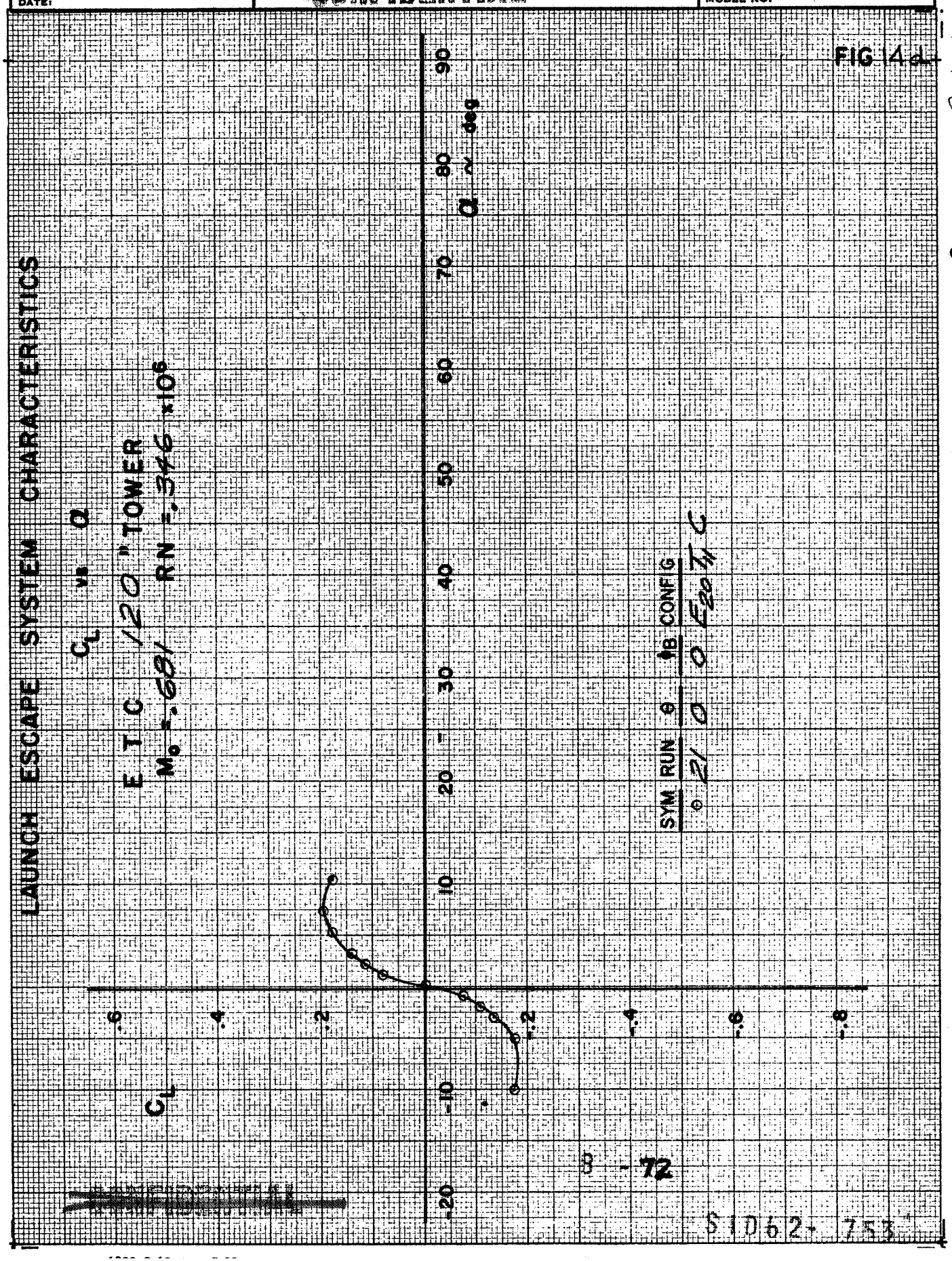

FIG 14d

C_L vs α 201-11

B - 72

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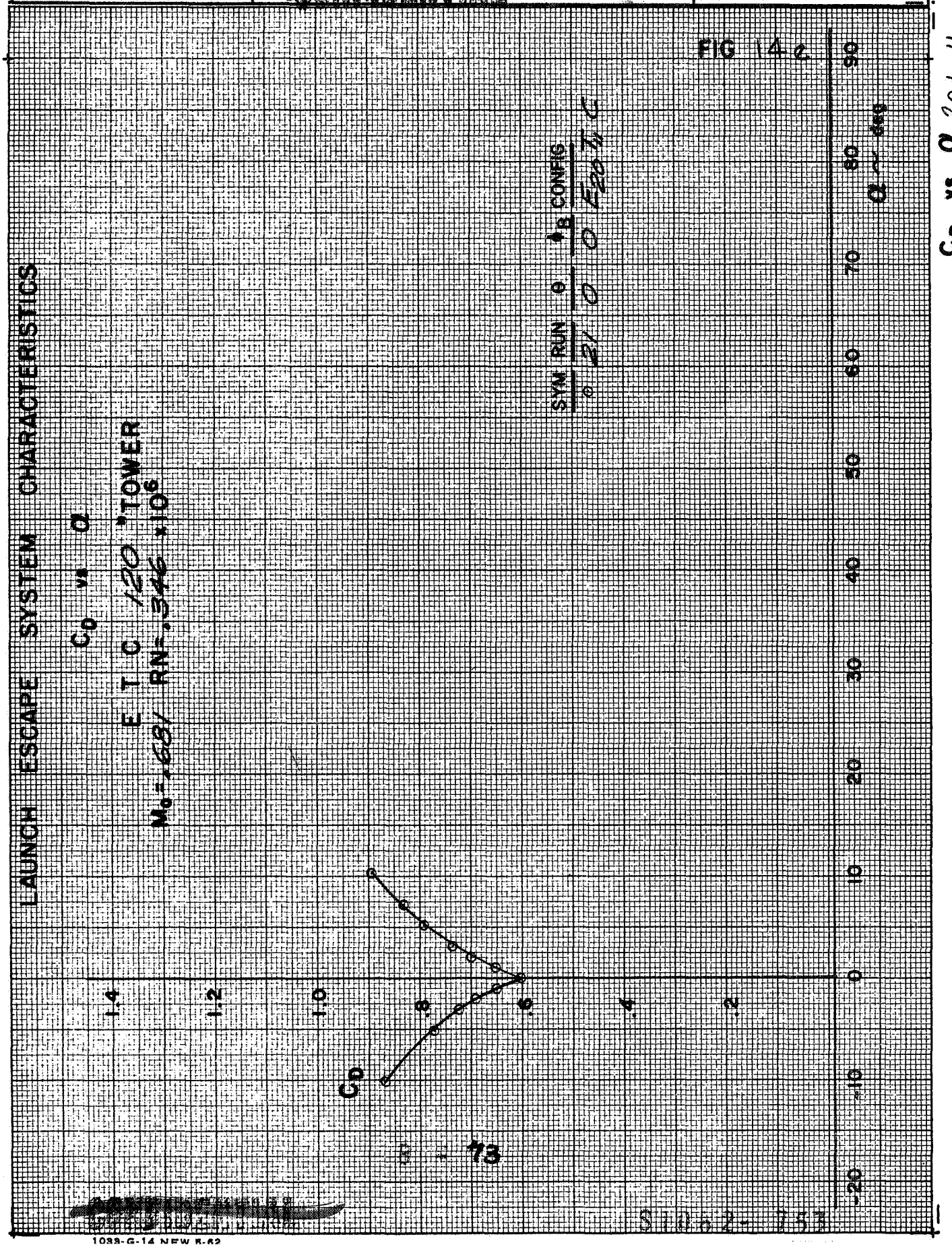

FIG 14e

C_D vs α 201-11

[redacted]

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1033-G-14 NEW 5-62

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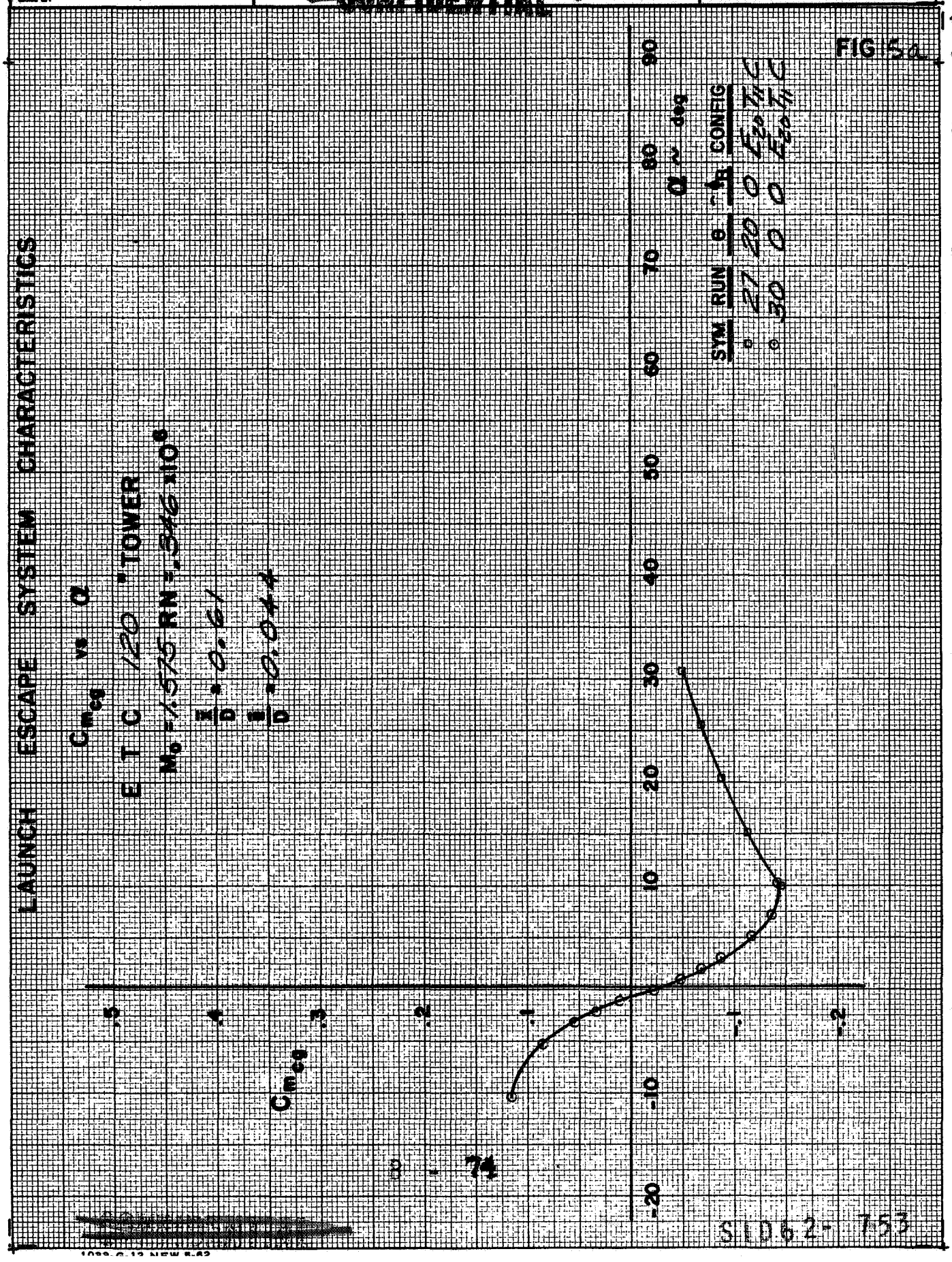

FIG 15a

$C_{m_{cg}}$ vs α 20b-12

SID62-753

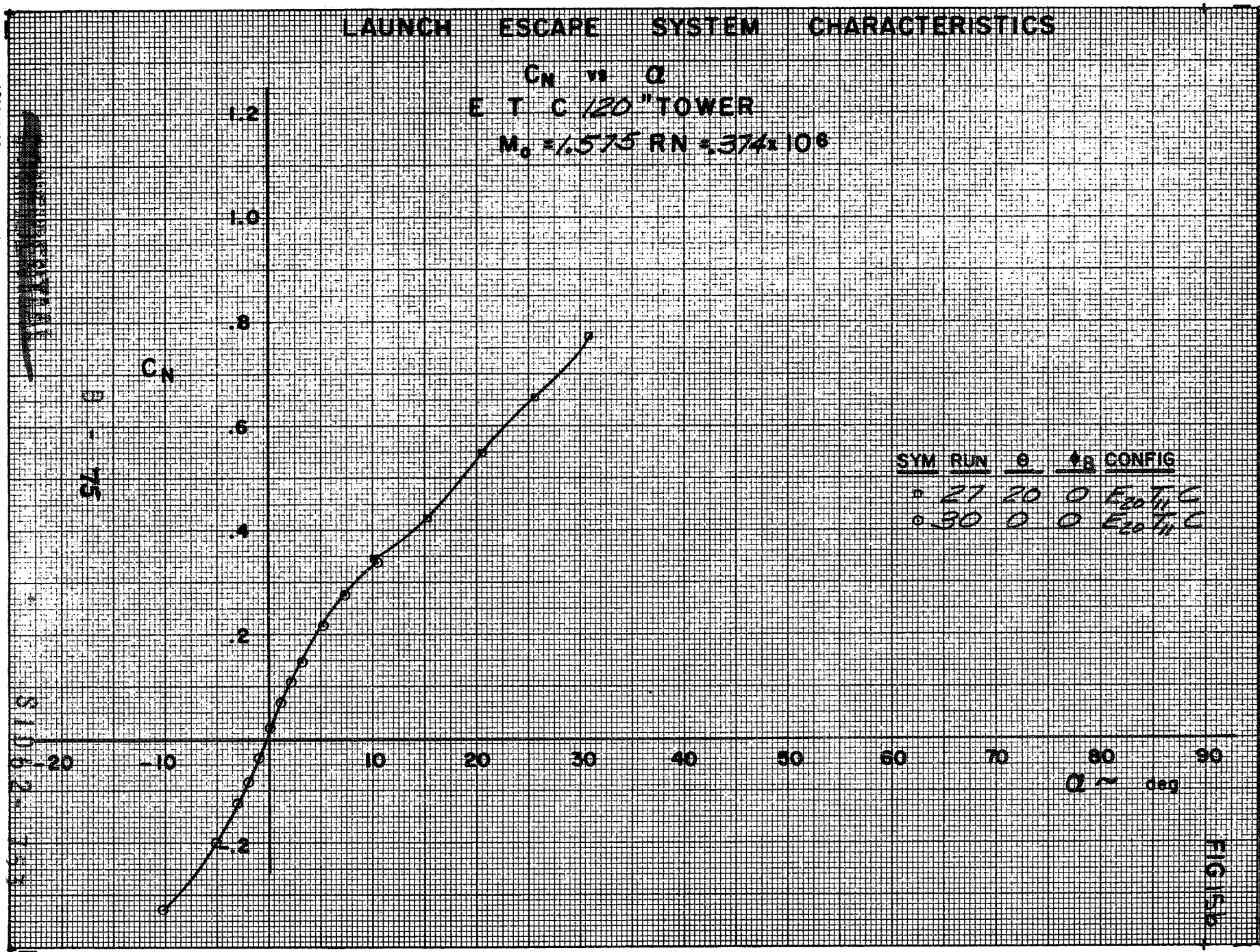

FIG 15-8

C_N vs α 201-12

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201-12

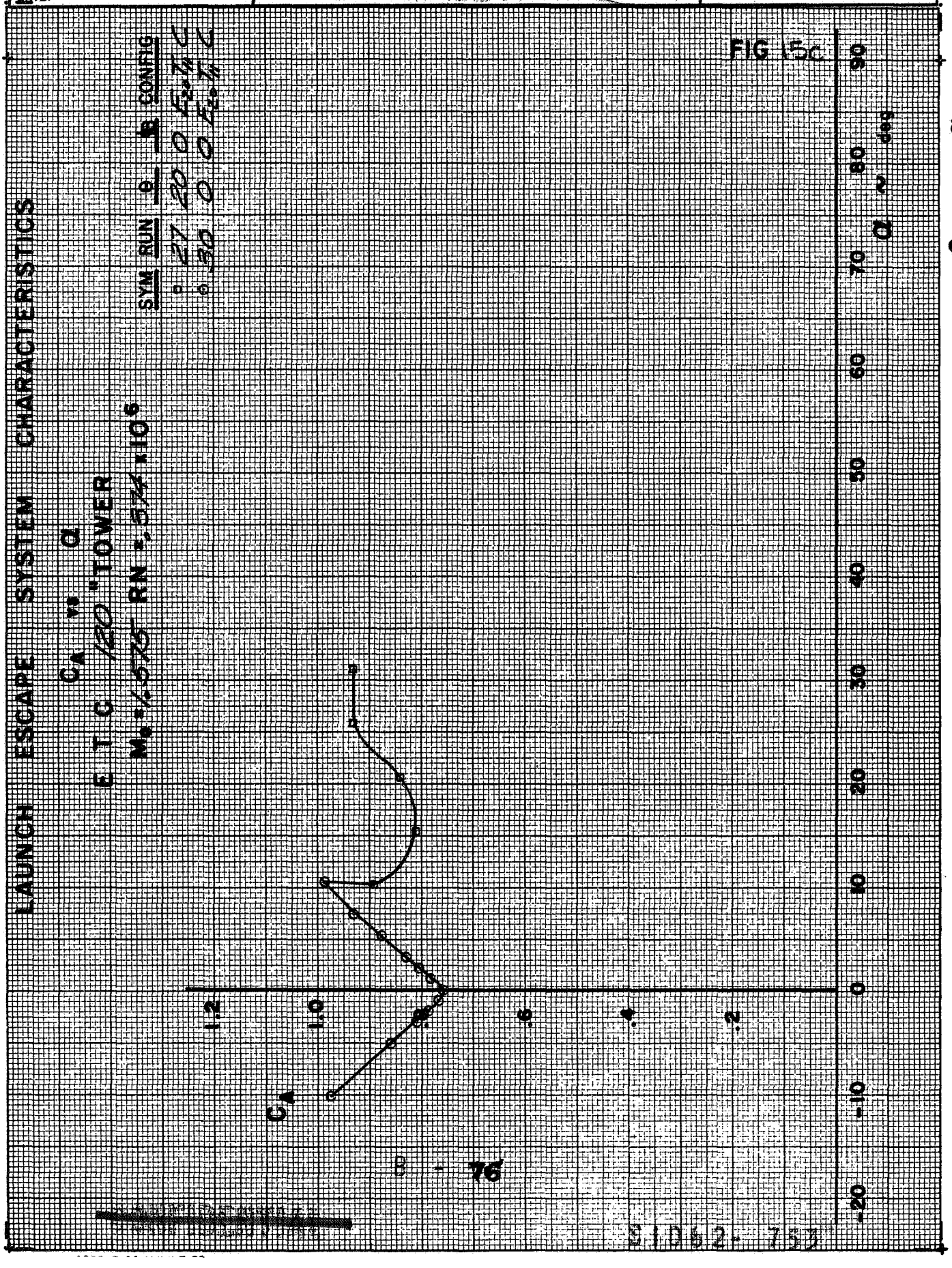

FIG 15c

C_A vs α

[redacted]

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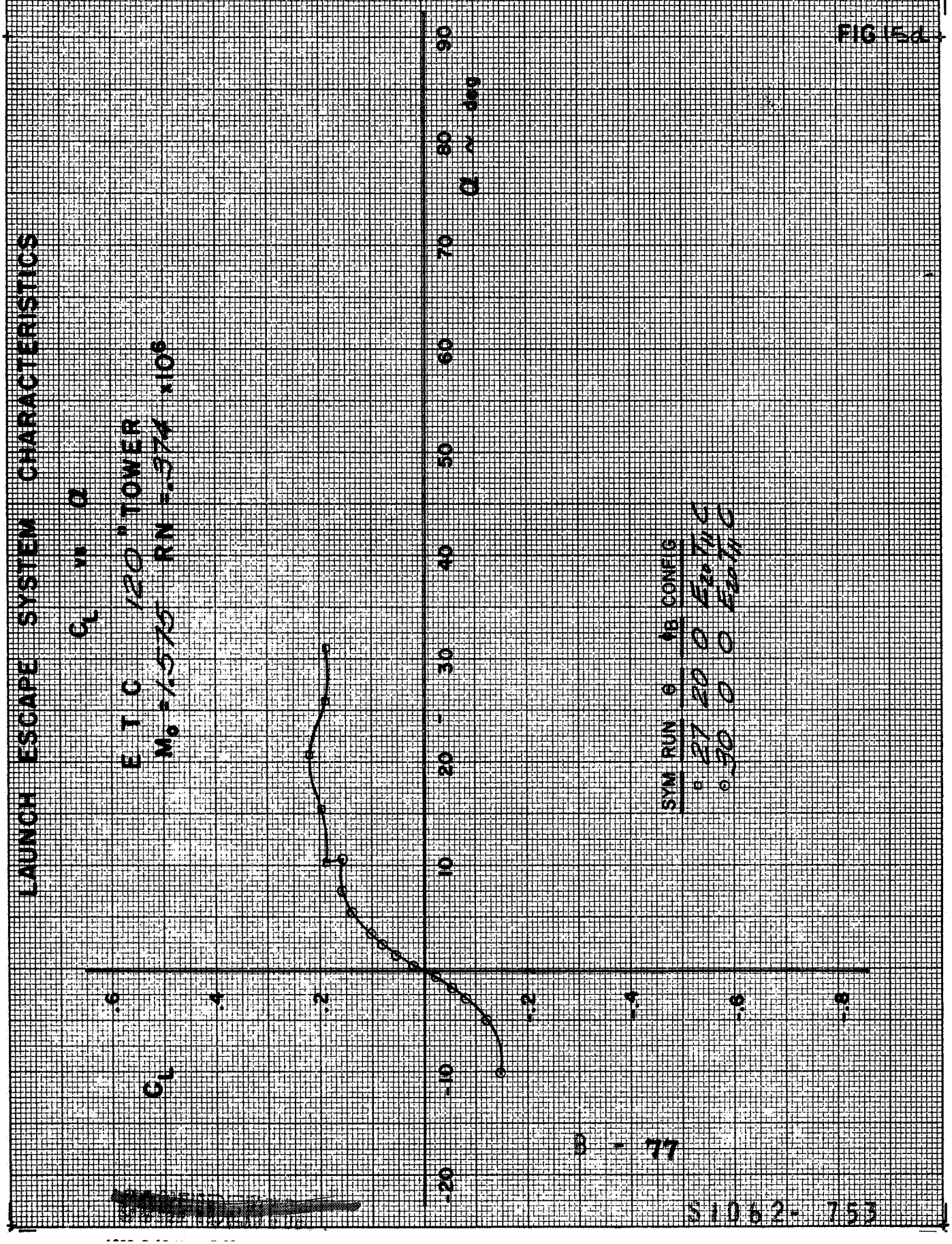
FIG 15d

C_L vs α 201-12



B - 77

[redacted]

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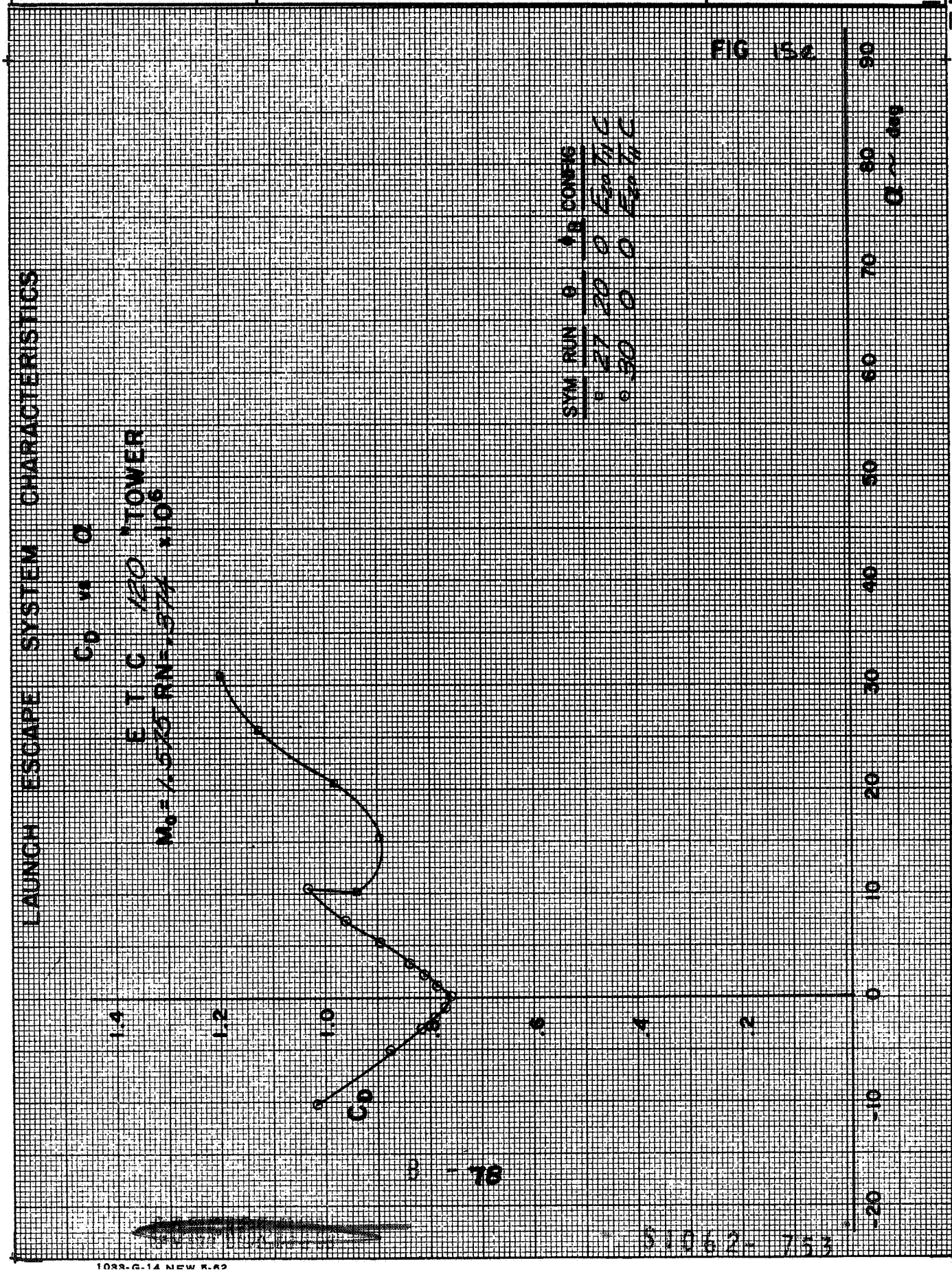

FIG 15e

C_D vs α 201-12

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[redacted]

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LAUNCH ESCAPE SYSTEM CHARACTERISTICS

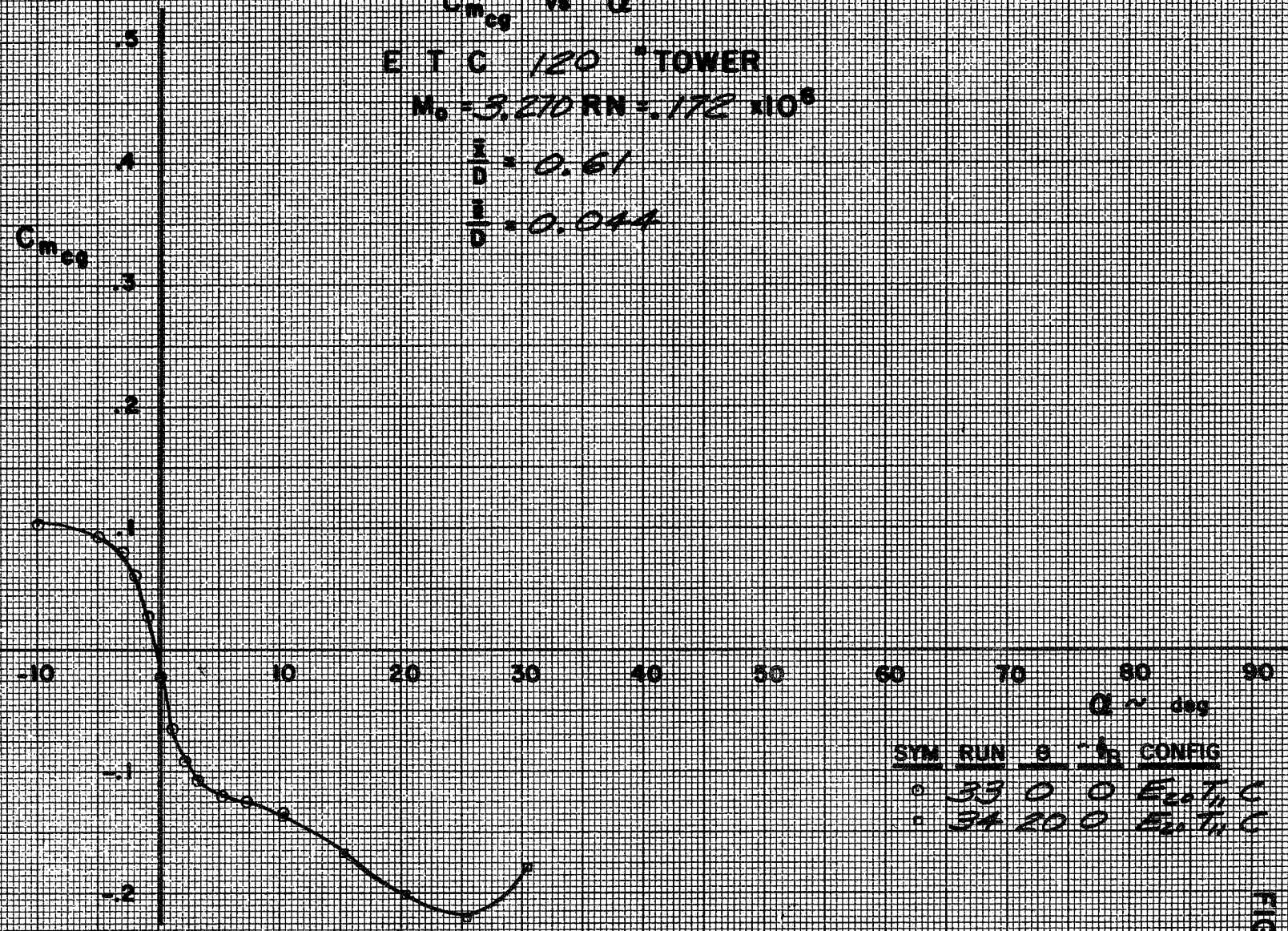
$C_{m_{cg}}$ vs α

E T C 120 " TOWER

$M_\infty = 3.210$ RN $= .172 \times 10^6$

$\frac{x}{D} = 0.61$

$\frac{z}{D} = 0.044$



SYM	RUN	θ	δ_B	CONFIG
⊙	33	0	0	E_{20} T_{11} C
⊙	34	20	0	E_{20} T_{11} C

FIG 6A

$C_{m_{cg}}$ vs α 201-13

1033-G-12 NEW 5-62

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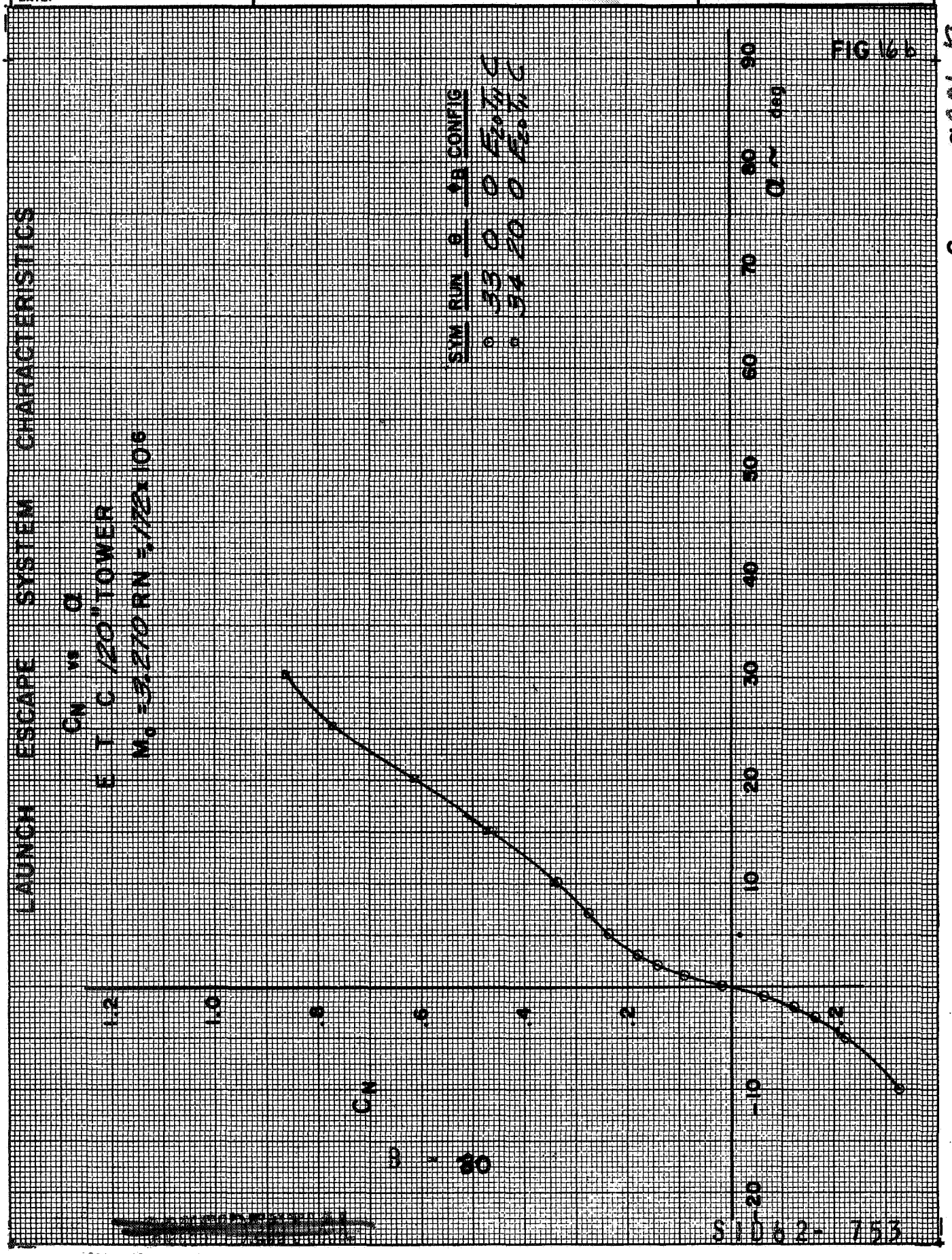

FIG 16b

C_N vs α 201-13

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LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_A vs α

E T C 120 "TOWER

$M_\infty = 3.270$ RN $= .172 \times 10^6$

SYM	RUN	θ	β	CONFIG
○	33	0	0	E_{20} TC
●	34	20	0	E_{20} TC

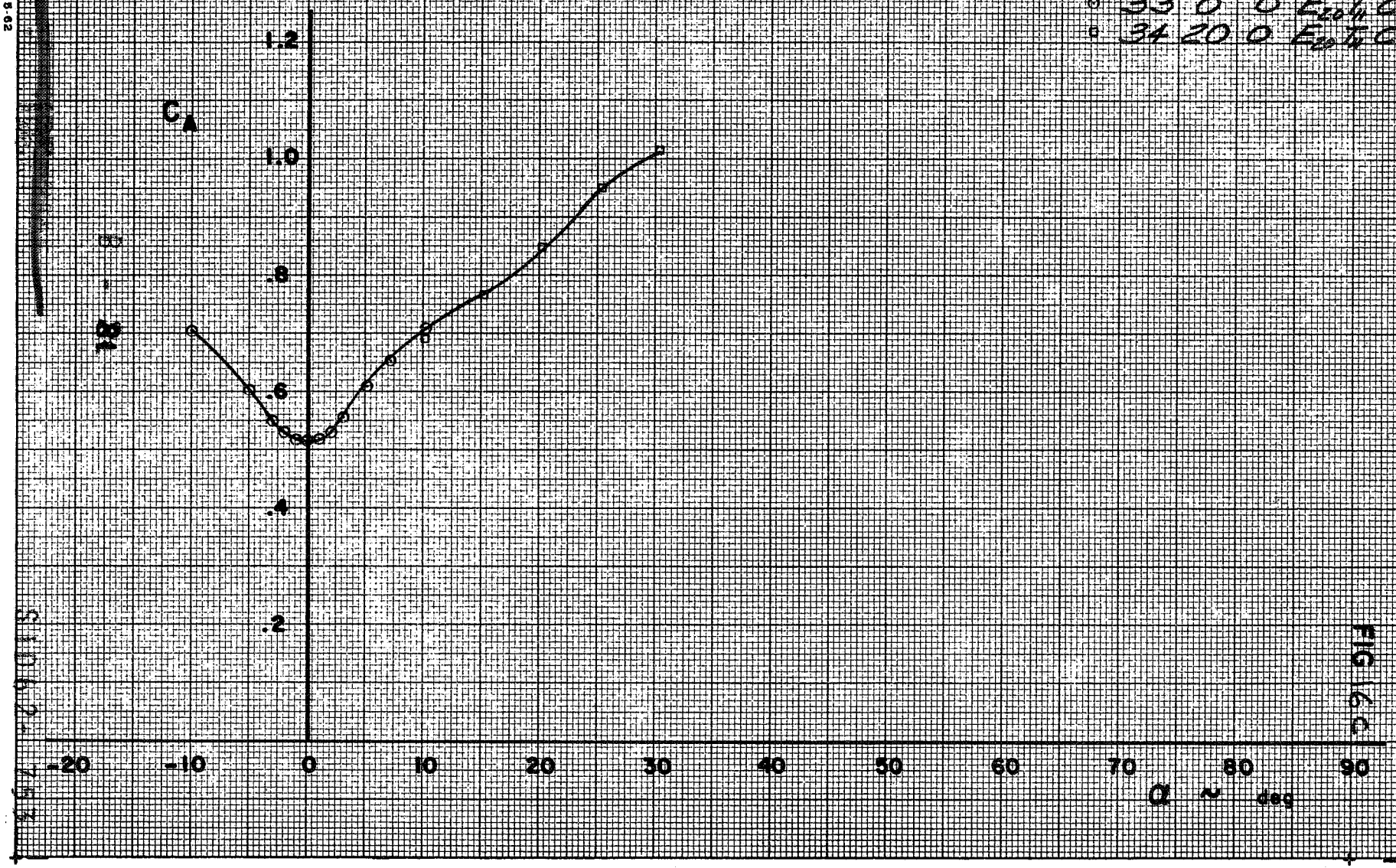

FIG 16C

C_A vs α 201-13

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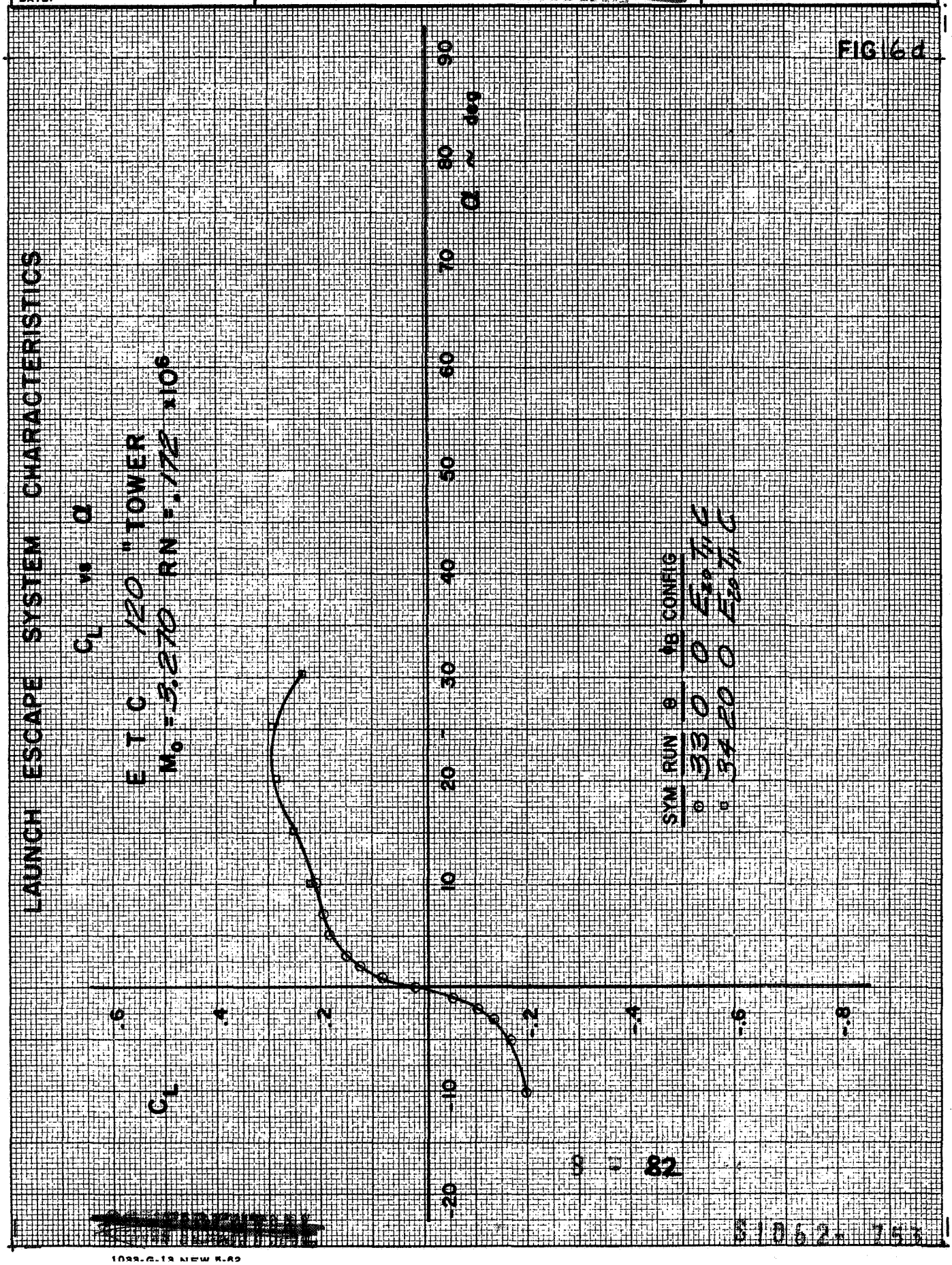

FIG 16d

C_L vs α 201-13

8 - 82

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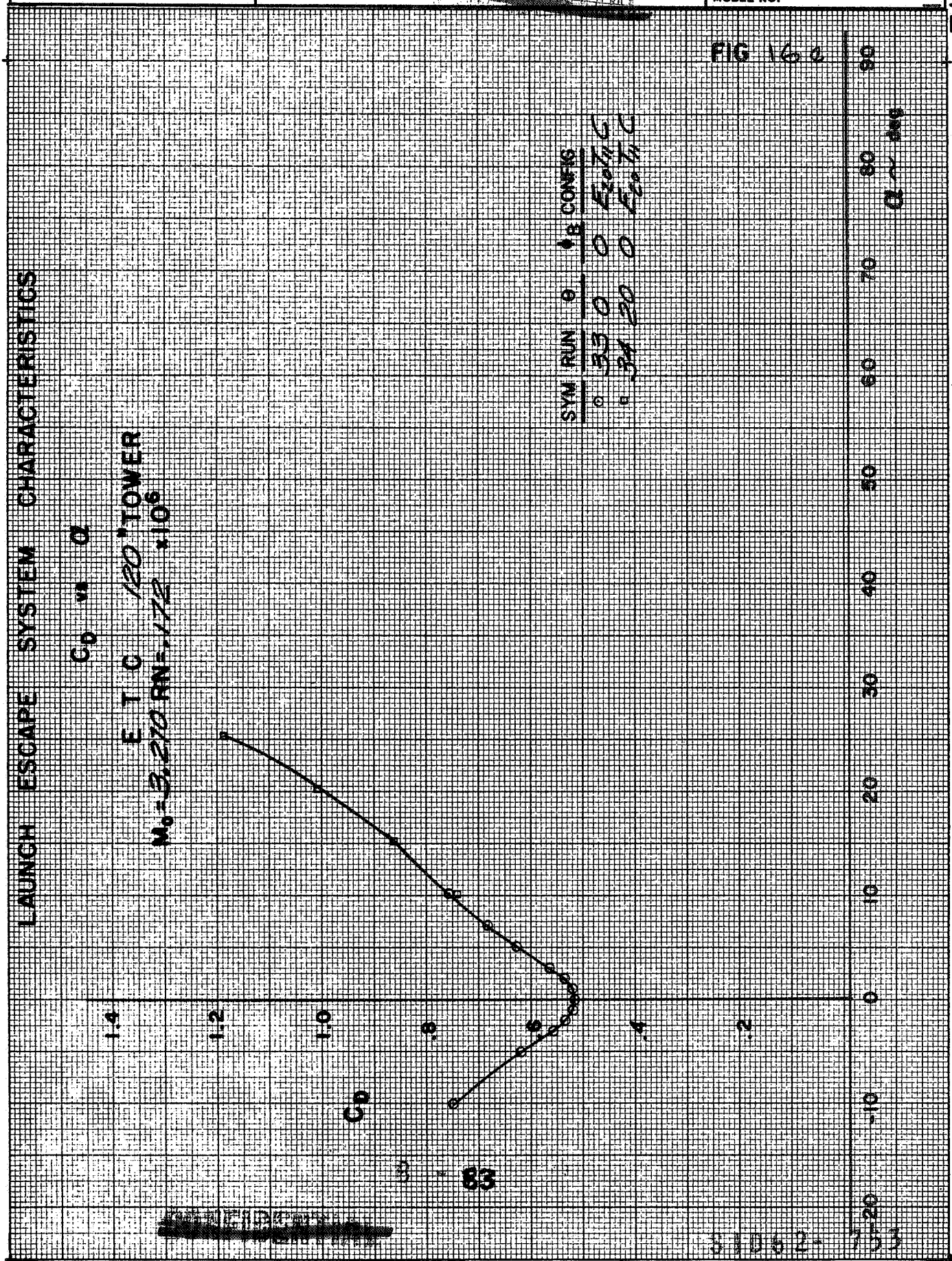
FIG 16e



C_D vs α 201-13

[redacted]

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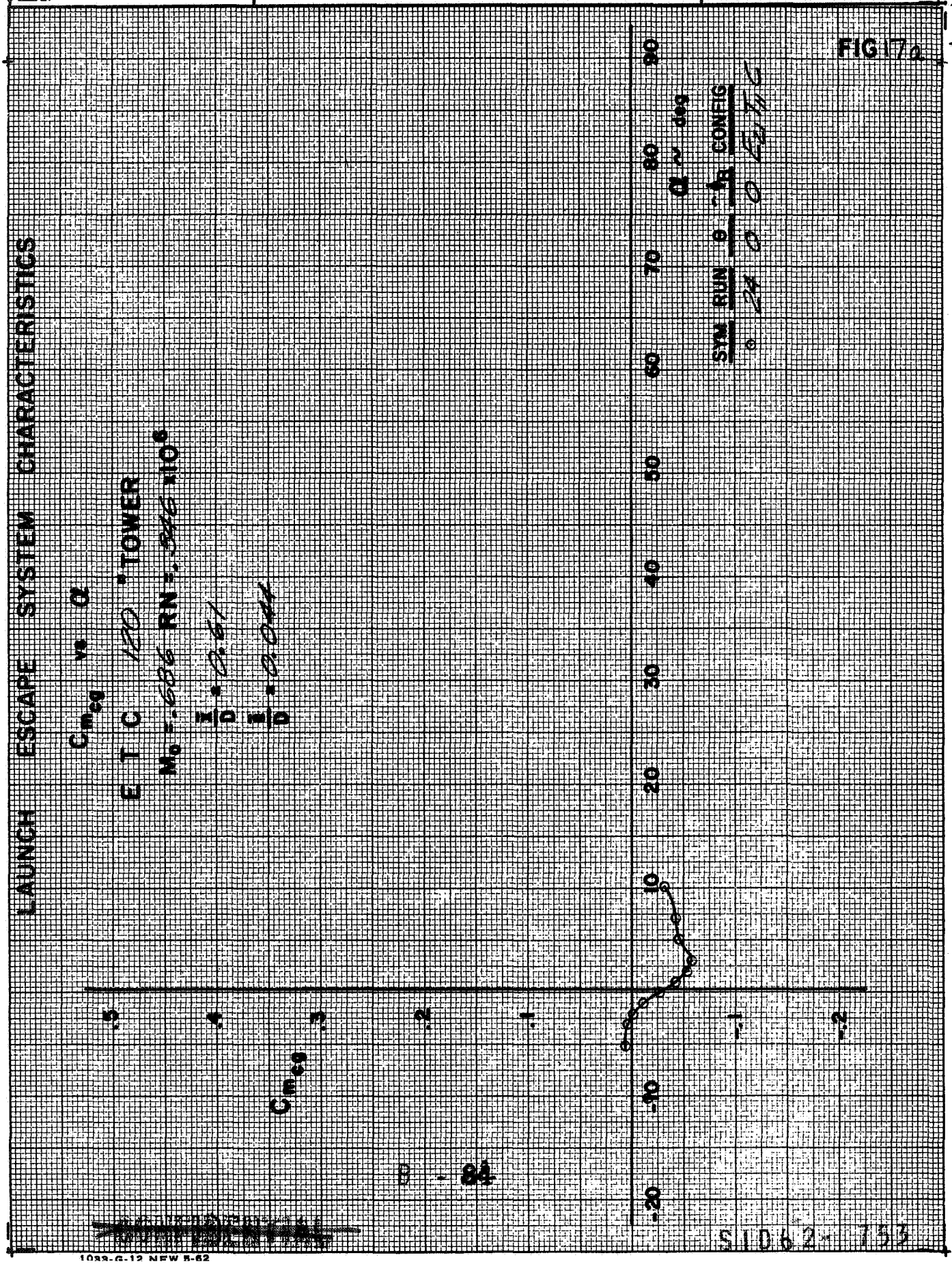

FIG 17a

$C_{m_{cg}}$ vs α 201-14

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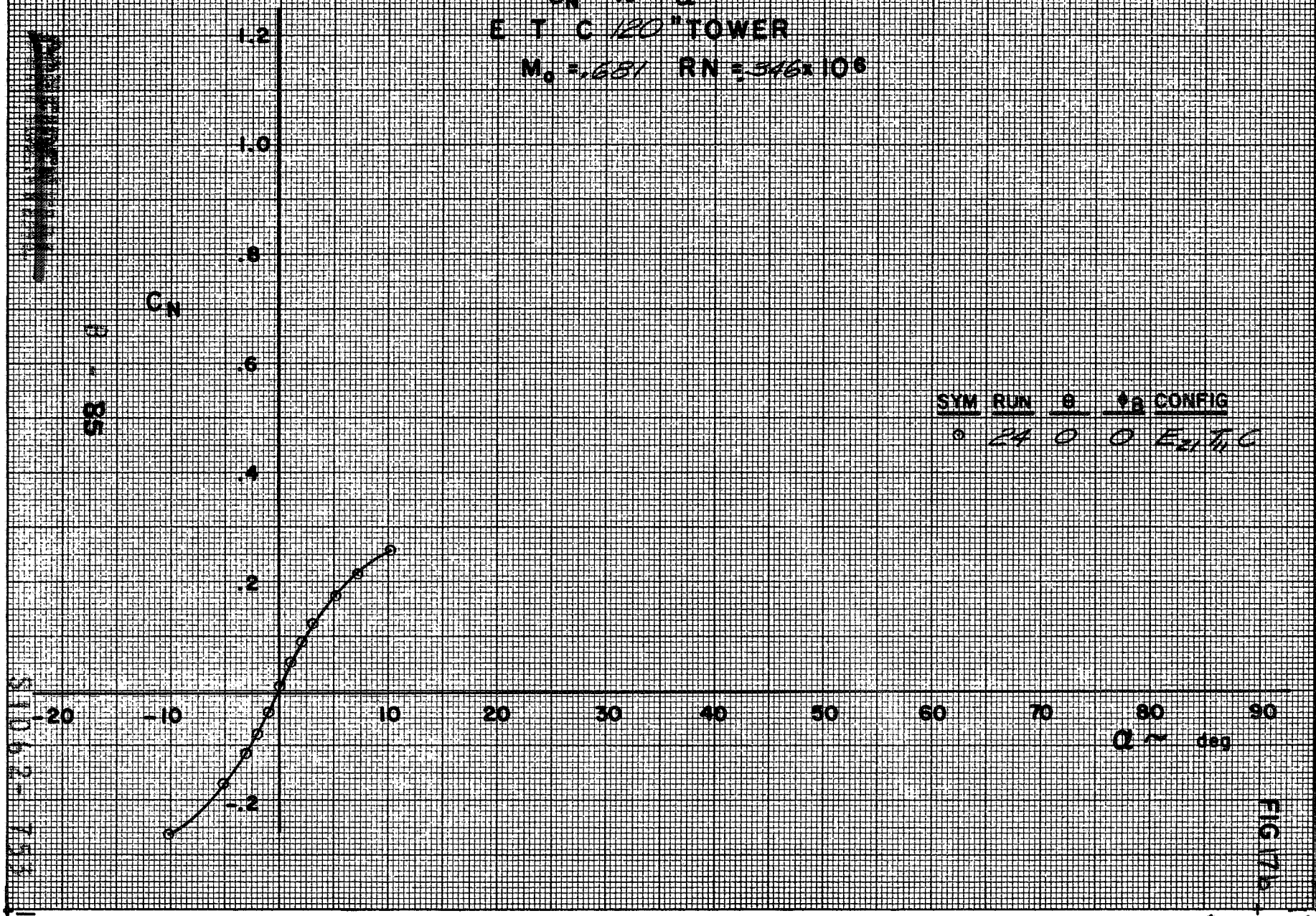
LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_N vs α

E T C 120" TOWER

M_0 = .681 RN = .346 x 10^6



SYM	RUN	θ	ϕ_B	CONFIG
⊙	24	0	0	E, T, C

FIG 15

C_N vs α 201-14

1033-G-10 NEW 5-62

LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_A vs α

E T C 120" TOWER

$M_\infty = .681$ RN $= .346 \times 10^6$

SYM	RUN	θ	ψ	CONFIG
○	24	0	0	ETC

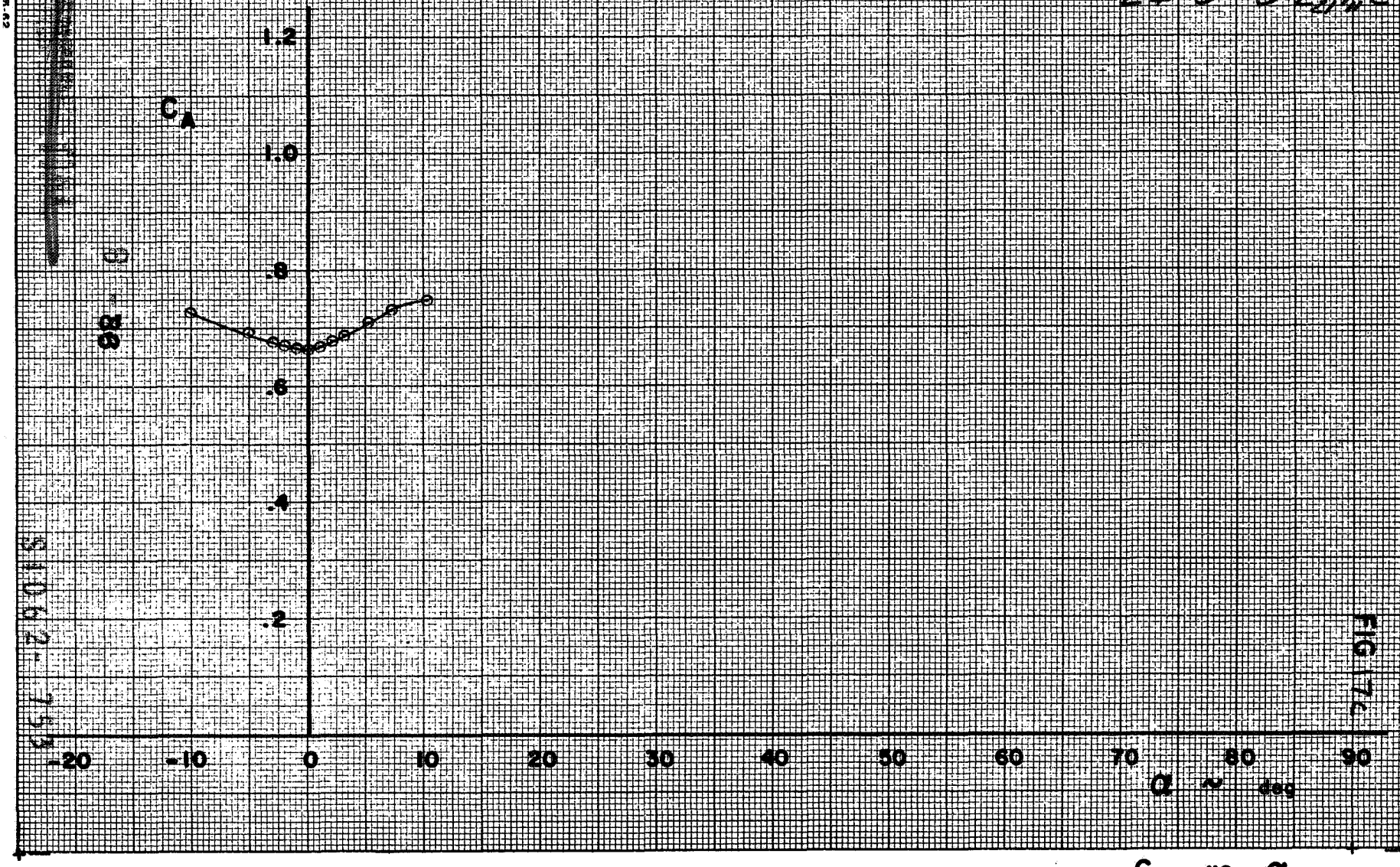


FIG 17C

C_A vs α

201-14

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FIG 17a

C_L vs α 201-19

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1033-G-13 NEW 5-62

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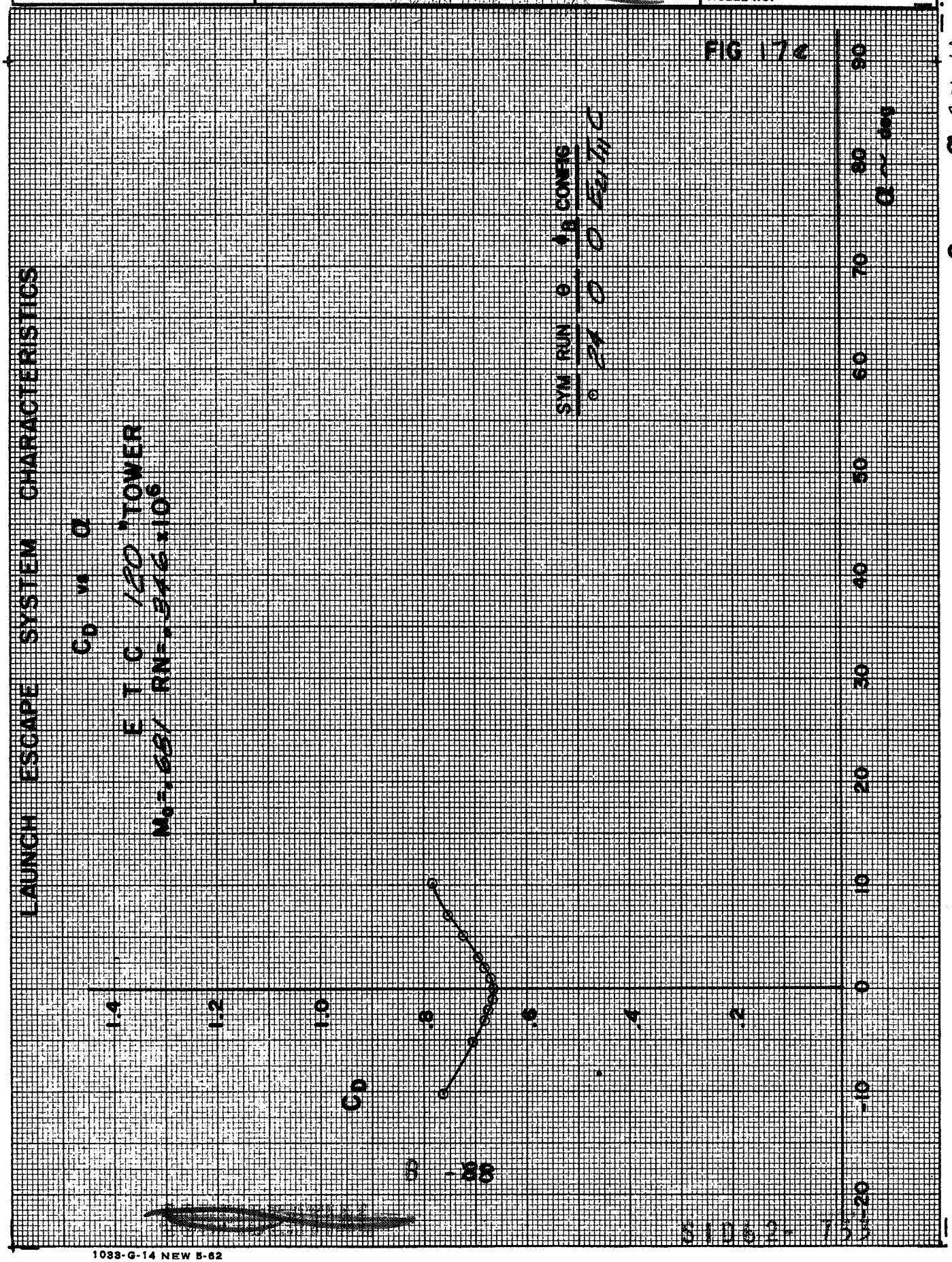

FIG 17c

C_D vs α 201-14

8 -88

[redacted]

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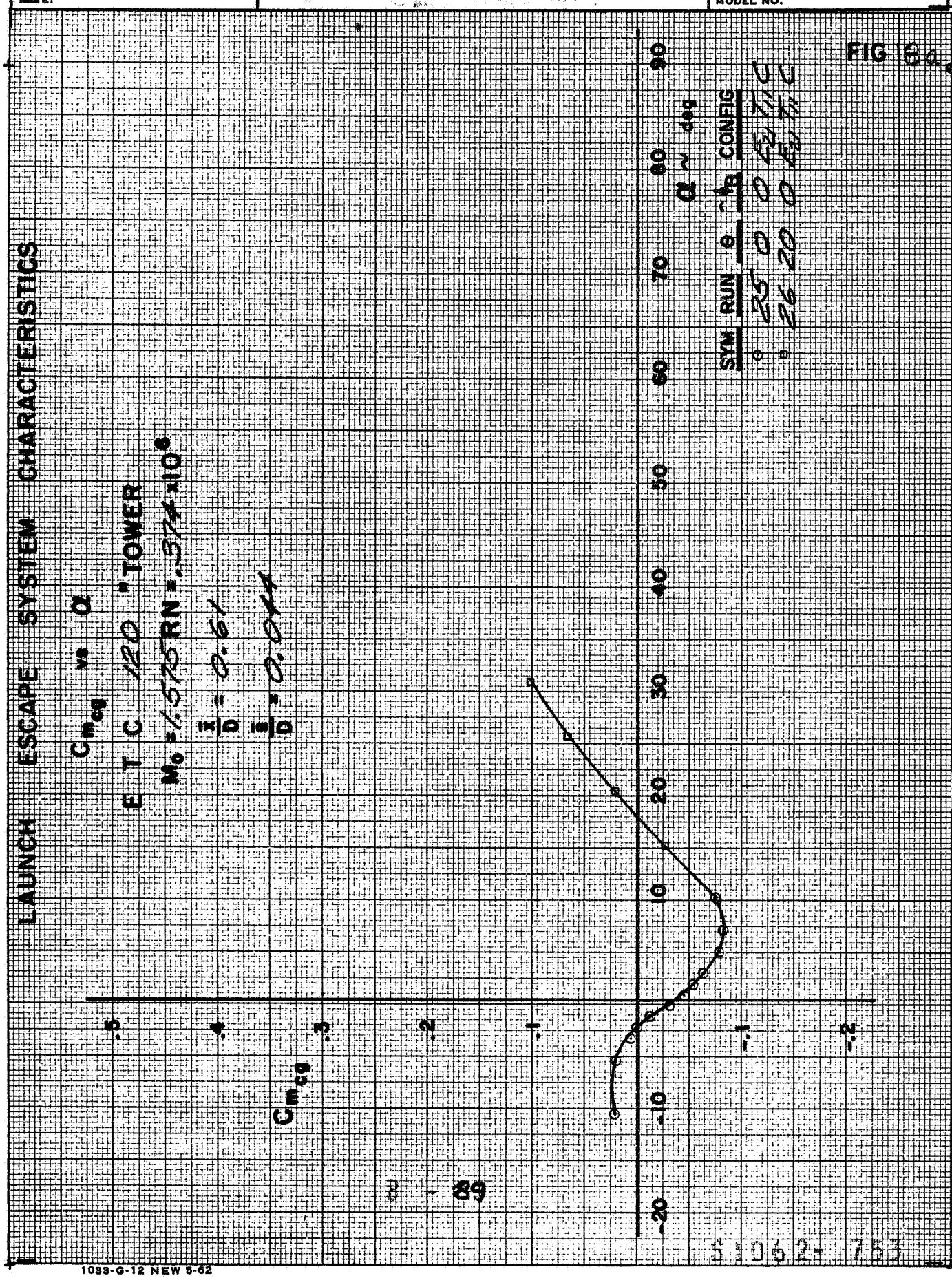
FIG 18a



$C_{m_{cg}}$ vs α

201-15

B - 89

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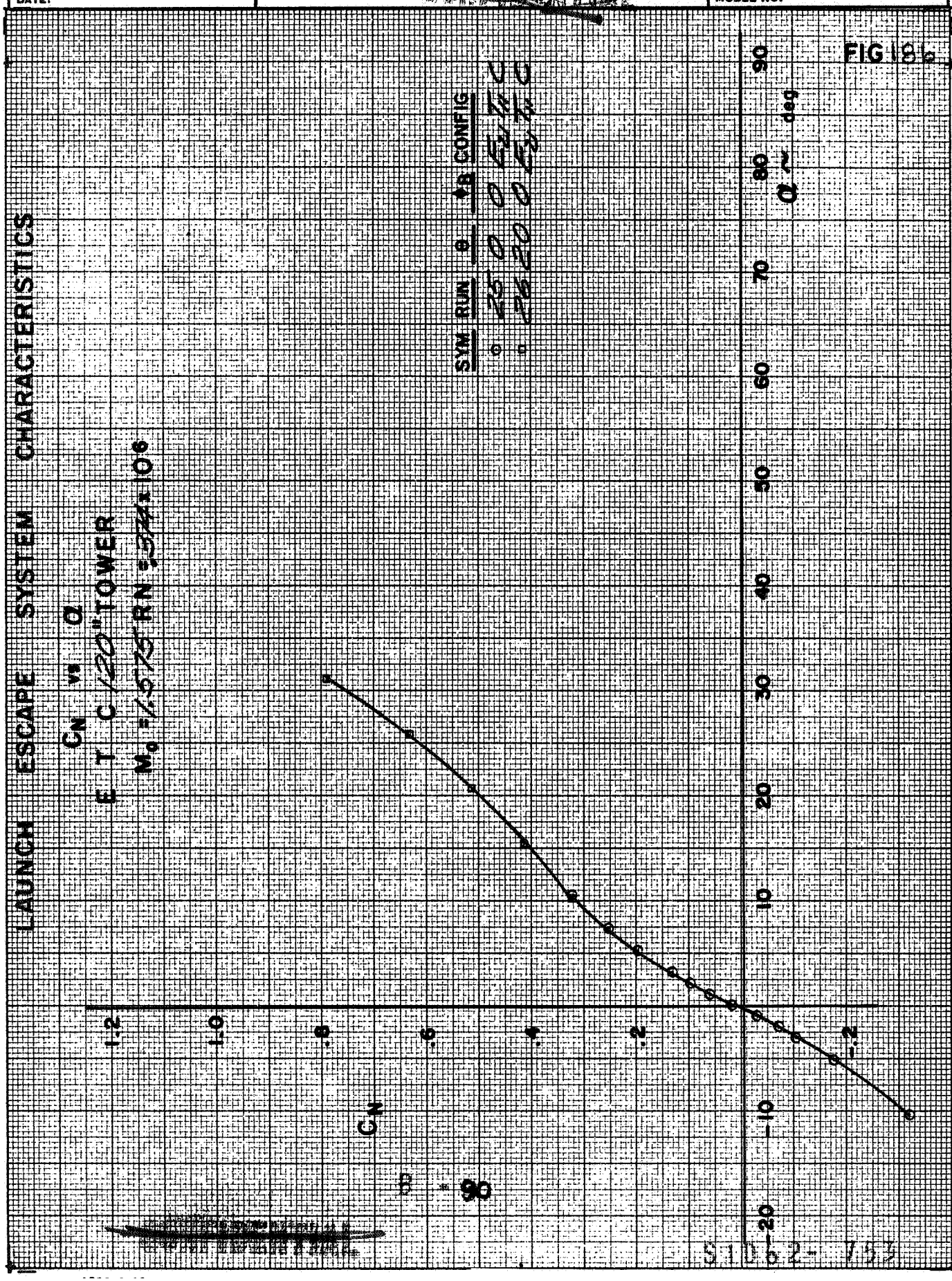

FIG 186

C_N vs α 201-15

[redacted]

S1062-753

LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_A vs α

E T C 120" TOWER

M_∞ = 1.575 RN = .374 x 10^6

SYM	RUN	θ	ψ	CONFIG
○	25	0	0	E2 T4 C
○	26	20	0	E2 T4 C

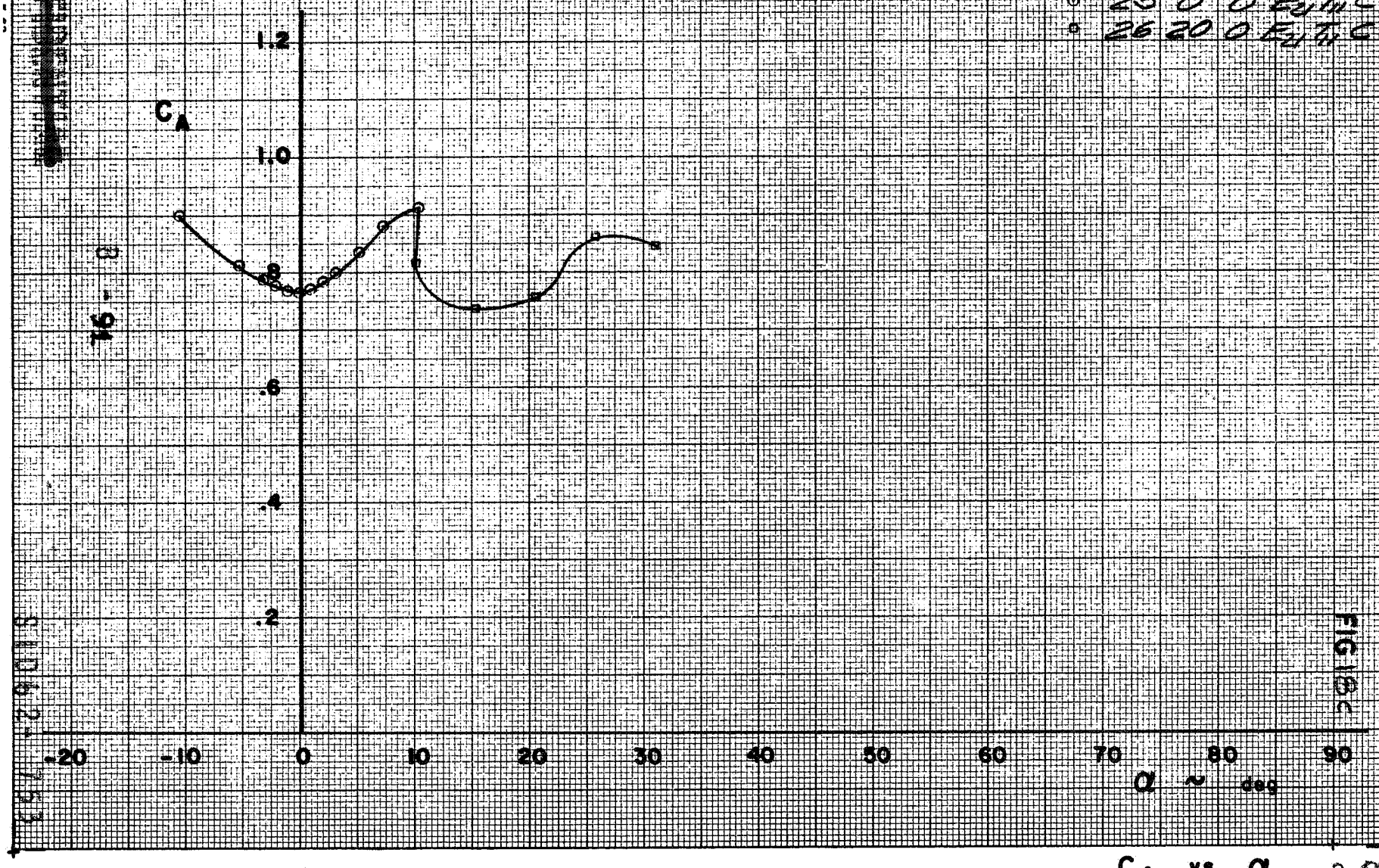

FIG 15C

C_A vs α 20-15

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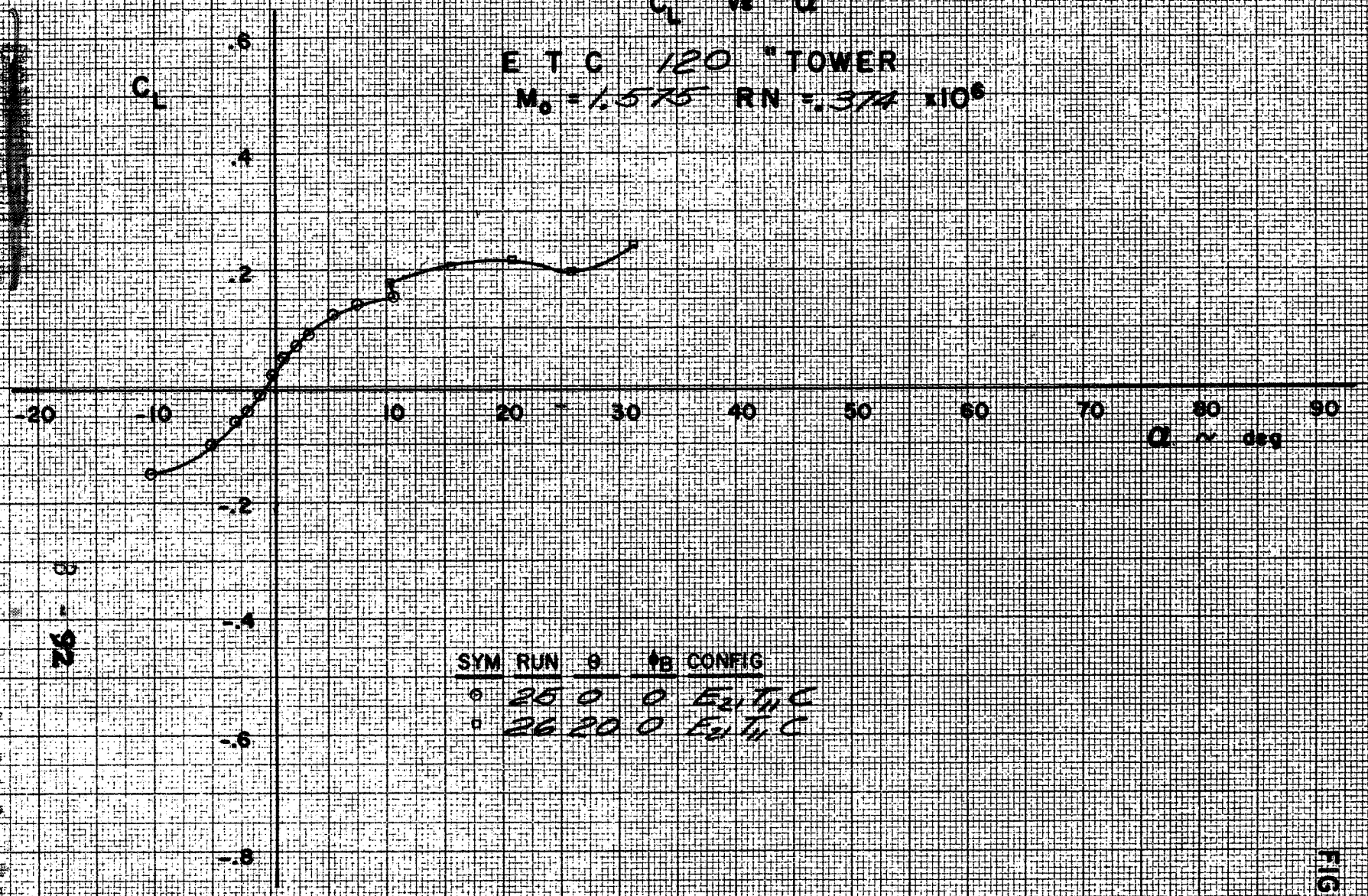
LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_L vs α

E T C 120" TOWER

M_0 = 1.575 RN = .374 x10^6



SYM	RUN	θ	ϕ_B	CONFIG
○	25	0	0	$E_{21}T_{11}C$
□	26	20	0	$E_{21}T_{11}C$

FIG 62

C_L vs α 201-15

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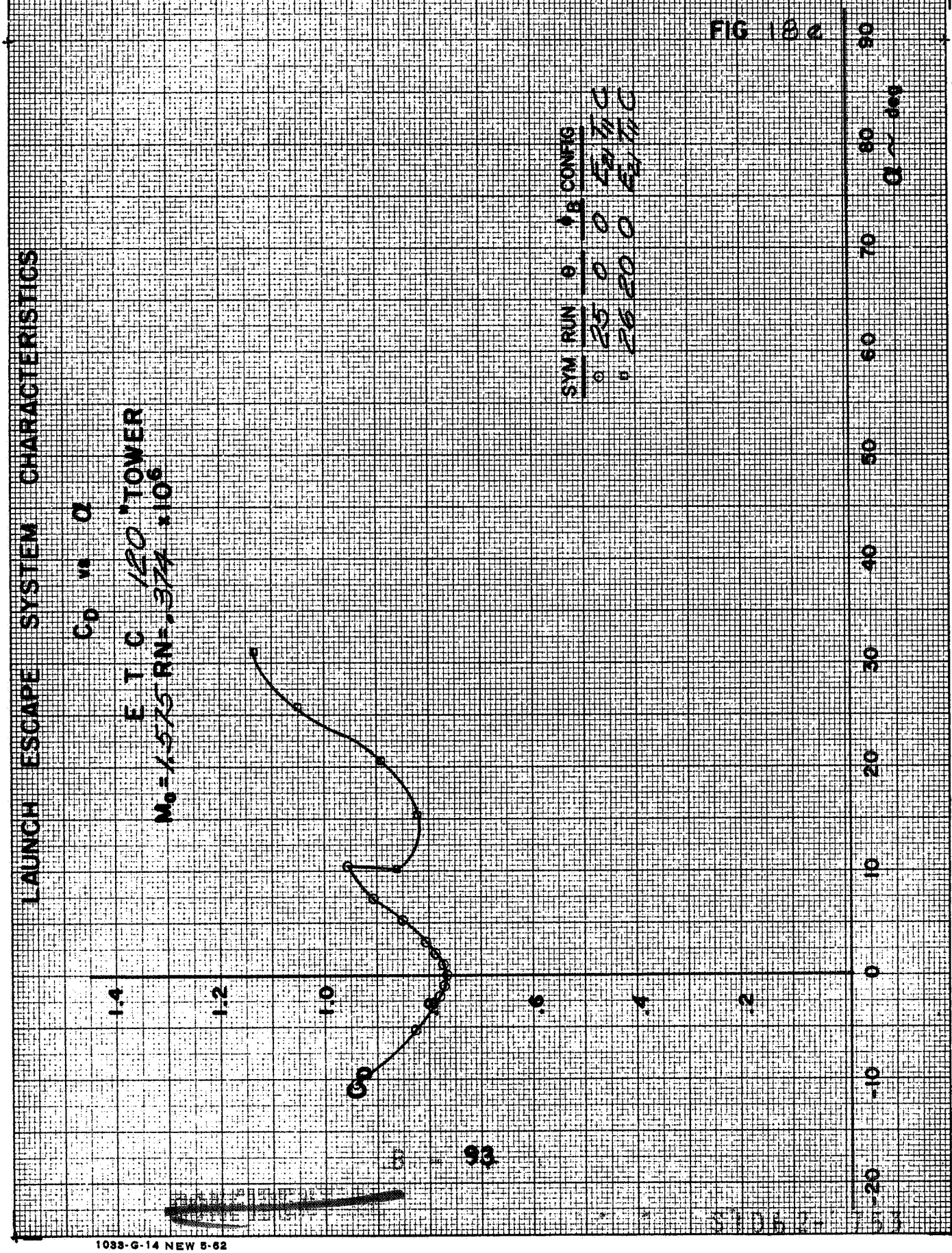
FIG 18e



C_D vs α 201-15

[redacted]

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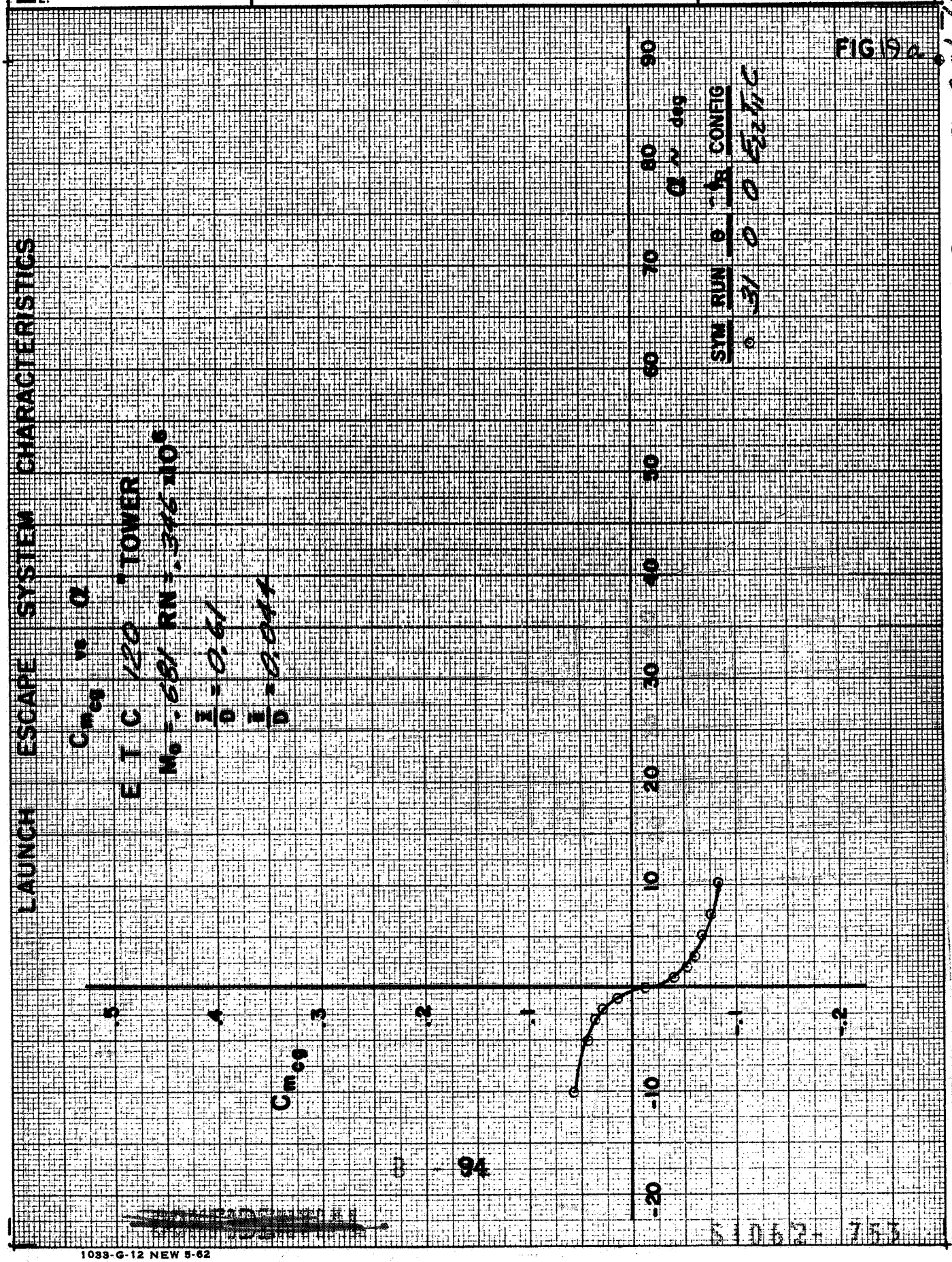
FIG 19a



$C_{m_{cg}}$ vs α 201-16

[redacted]

51062-753

1033-G-12 NEW 5-62

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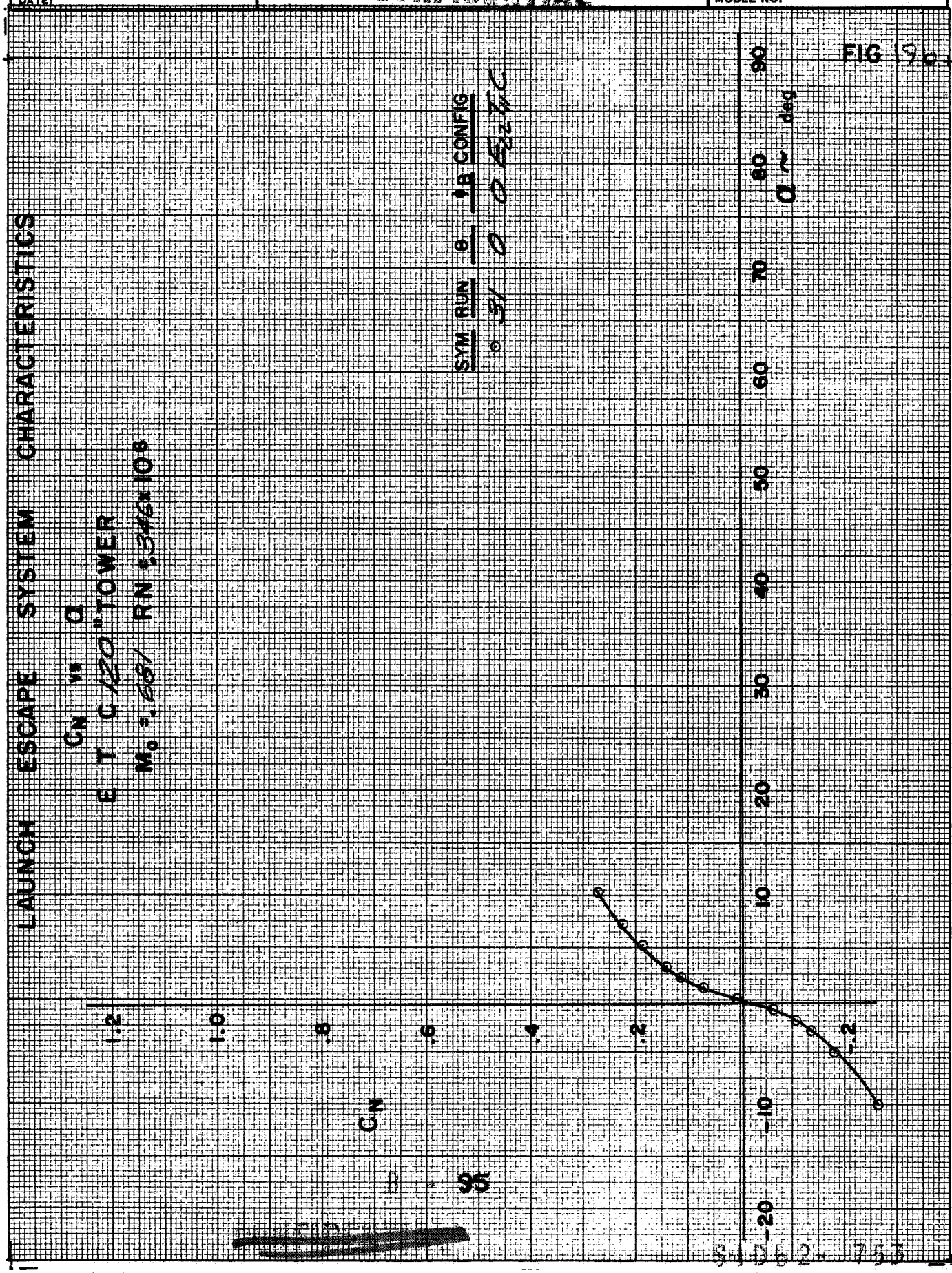
FIG 196



C_N vs α 201-16

B - 95

[redacted]

S-D62-753

1033-G-10 NEW 5-62

LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_A vs α

E T C 120" TOWER

M_∞ = .681 RN = .345 x 10^6

SYM	RUN	θ	ψ	CONFIG
○	31	0	0	E2T4C

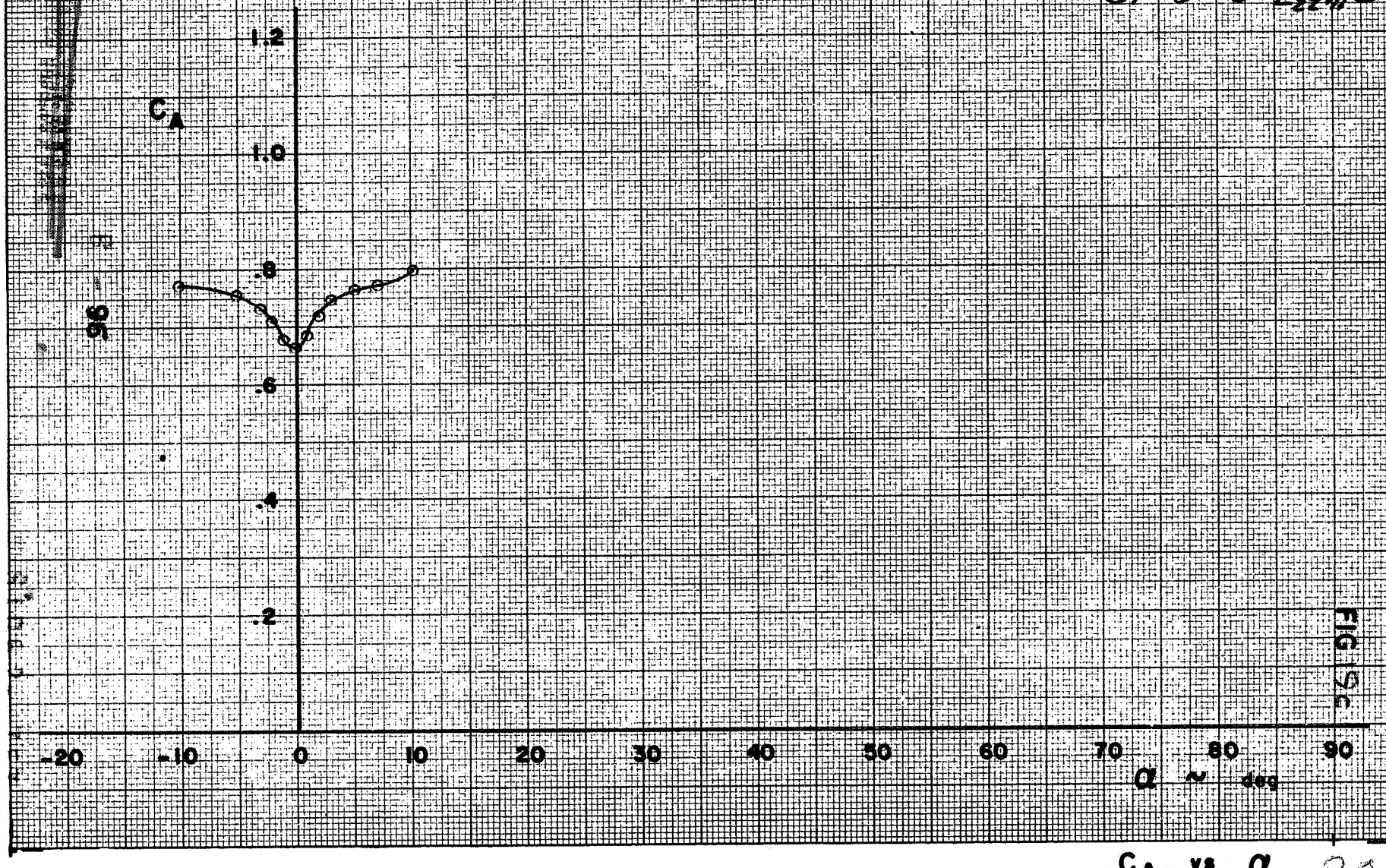


FIG 15c

C_A vs α 201-16

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1039-G-11 NEW 5-62

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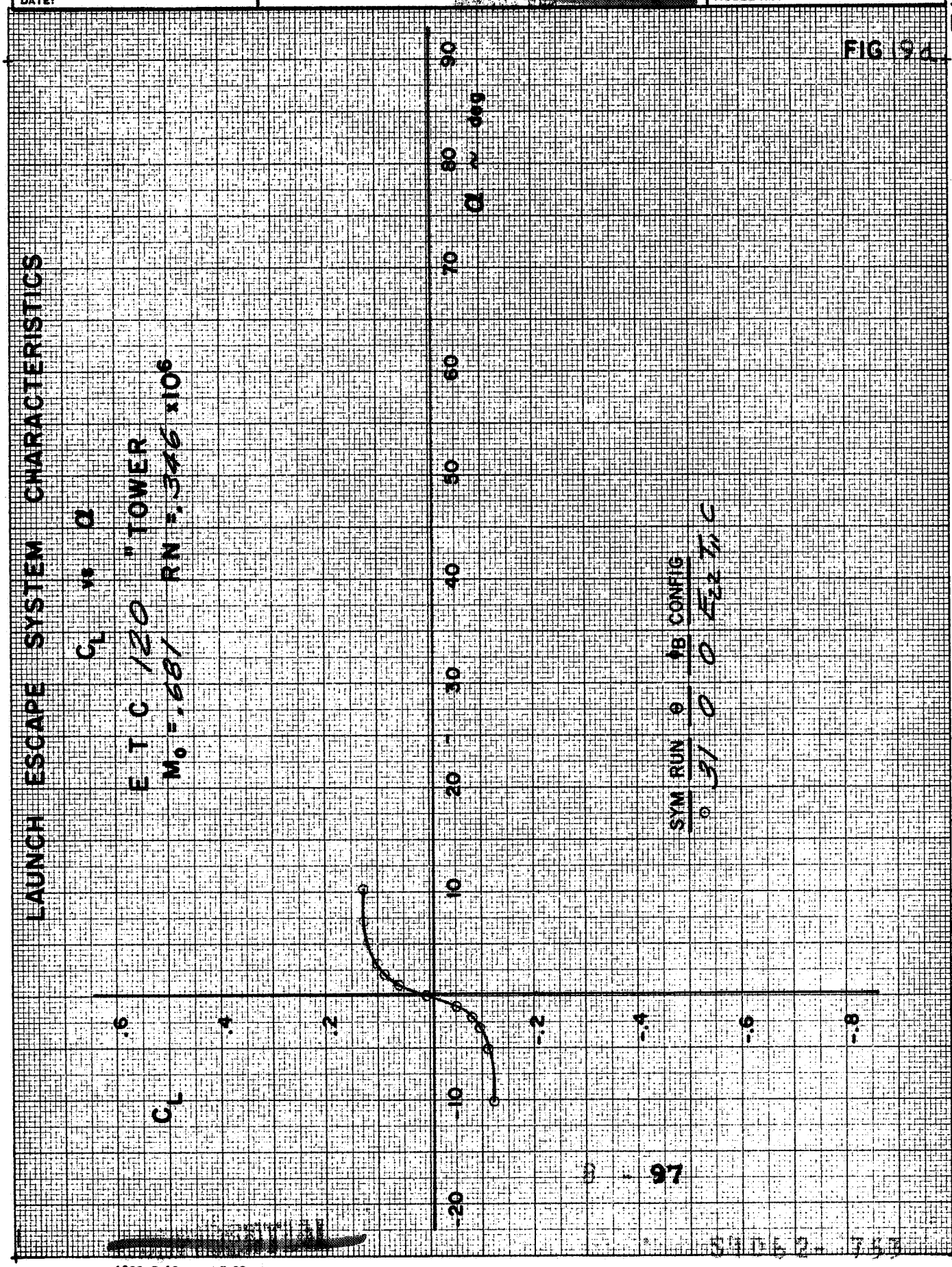
FIG 19d

C_L vs α 201-16



[redacted]

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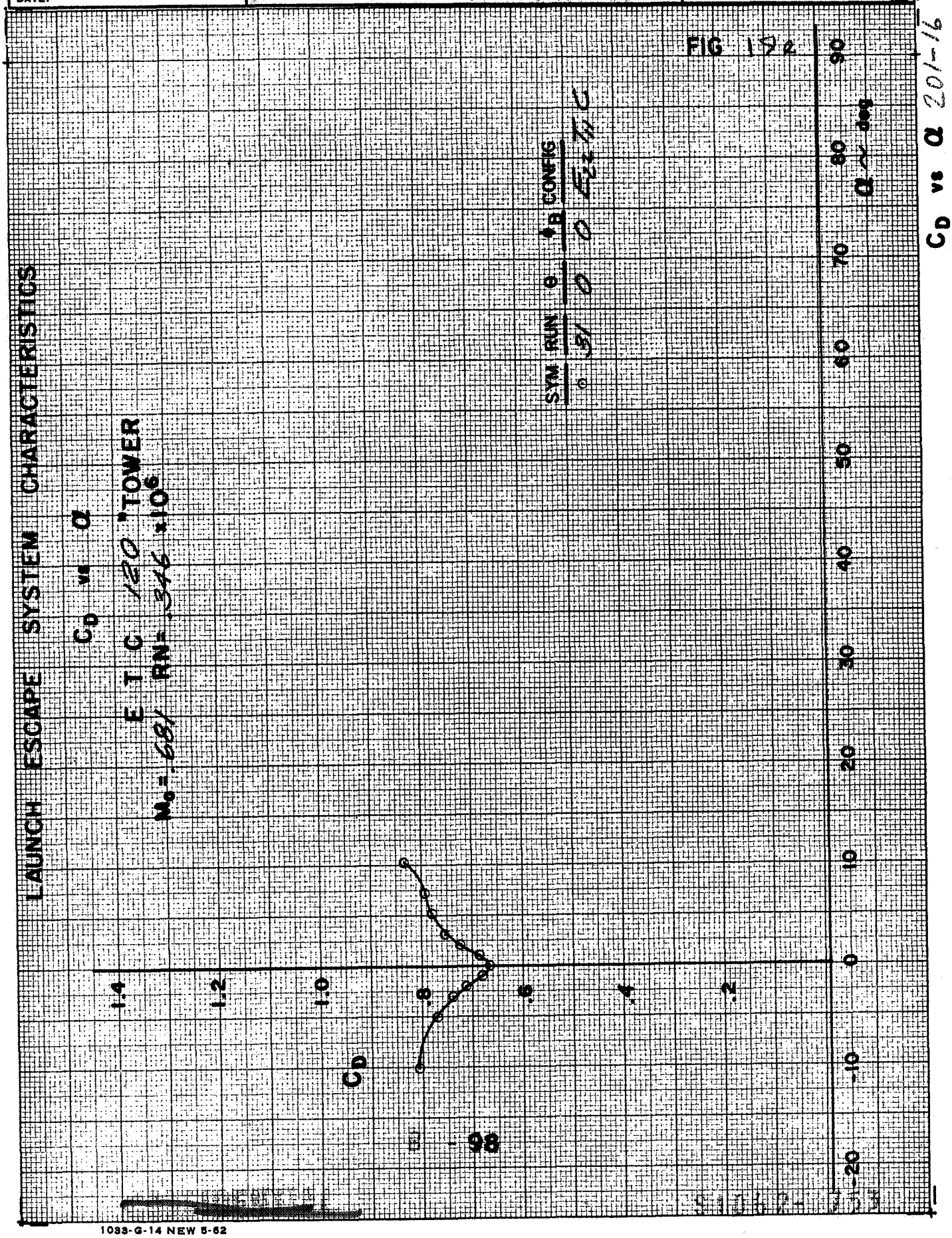

FIG 152

C_D vs α 201-16

1033-G-14 NEW 5-62

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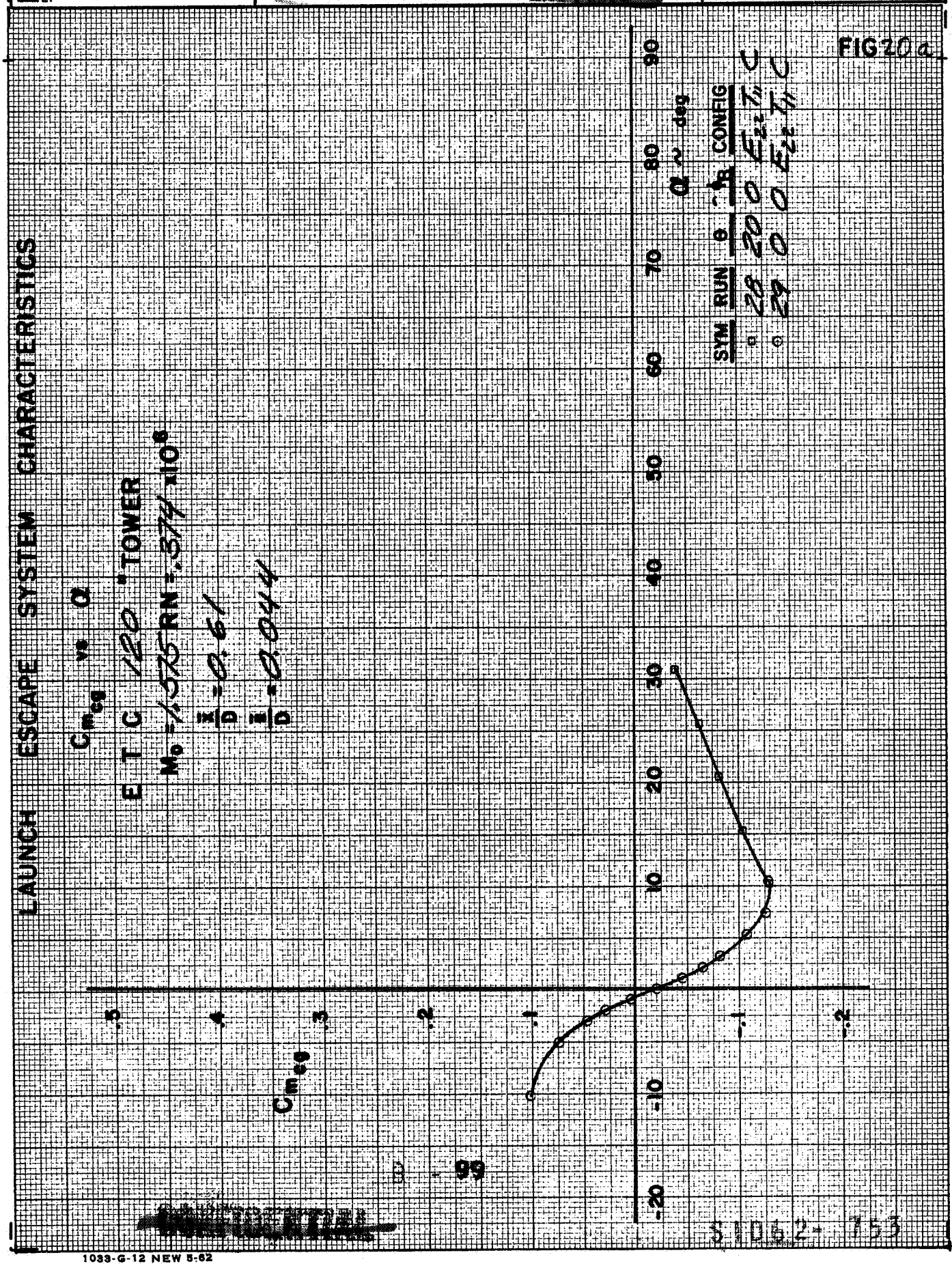
FIG 20a



$C_{m_{cg}}$ vs α 201-17

[redacted]

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1033-G-12 NEW 5-62

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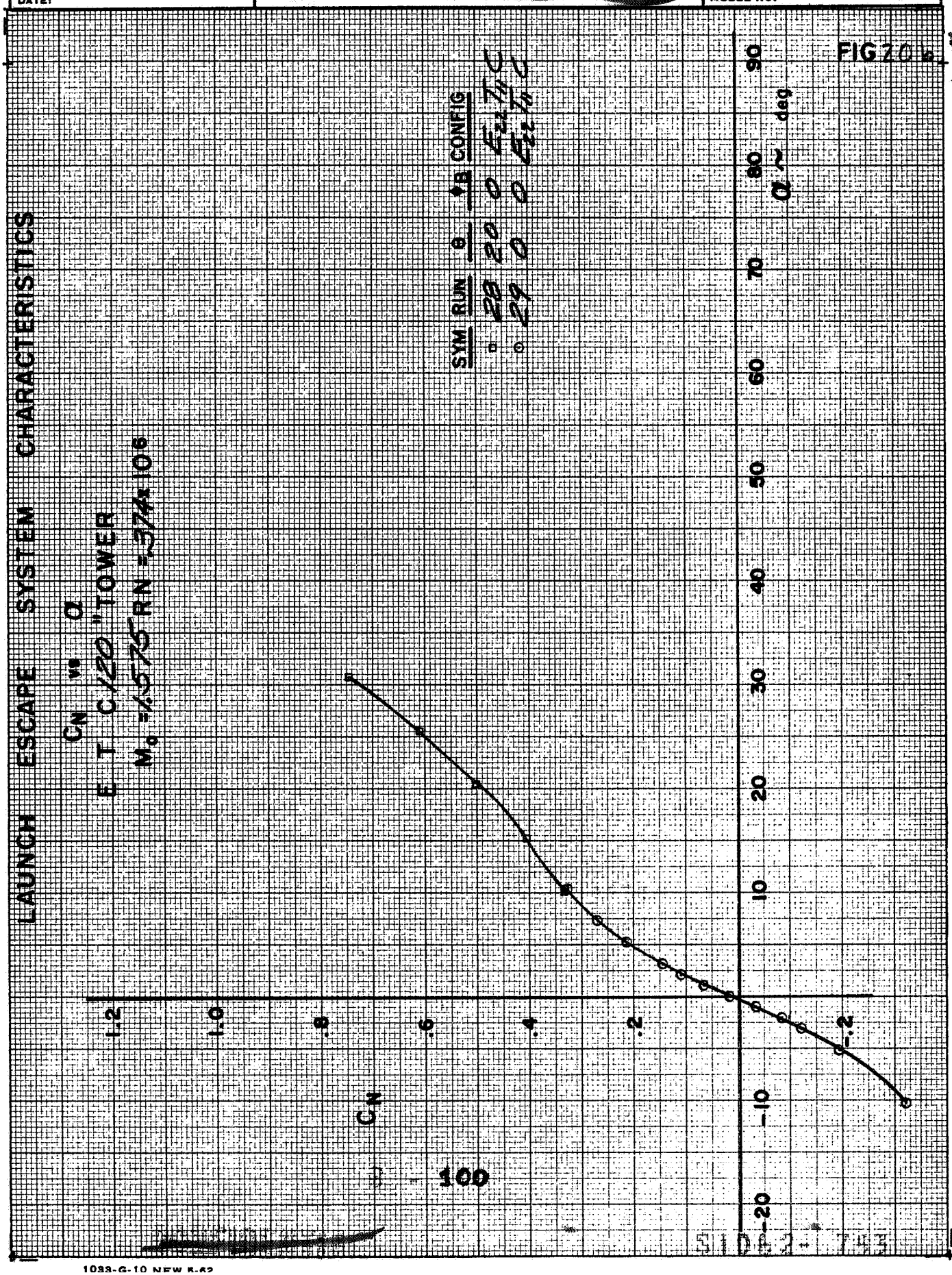

FIG 20 b

C_N vs α 201-17

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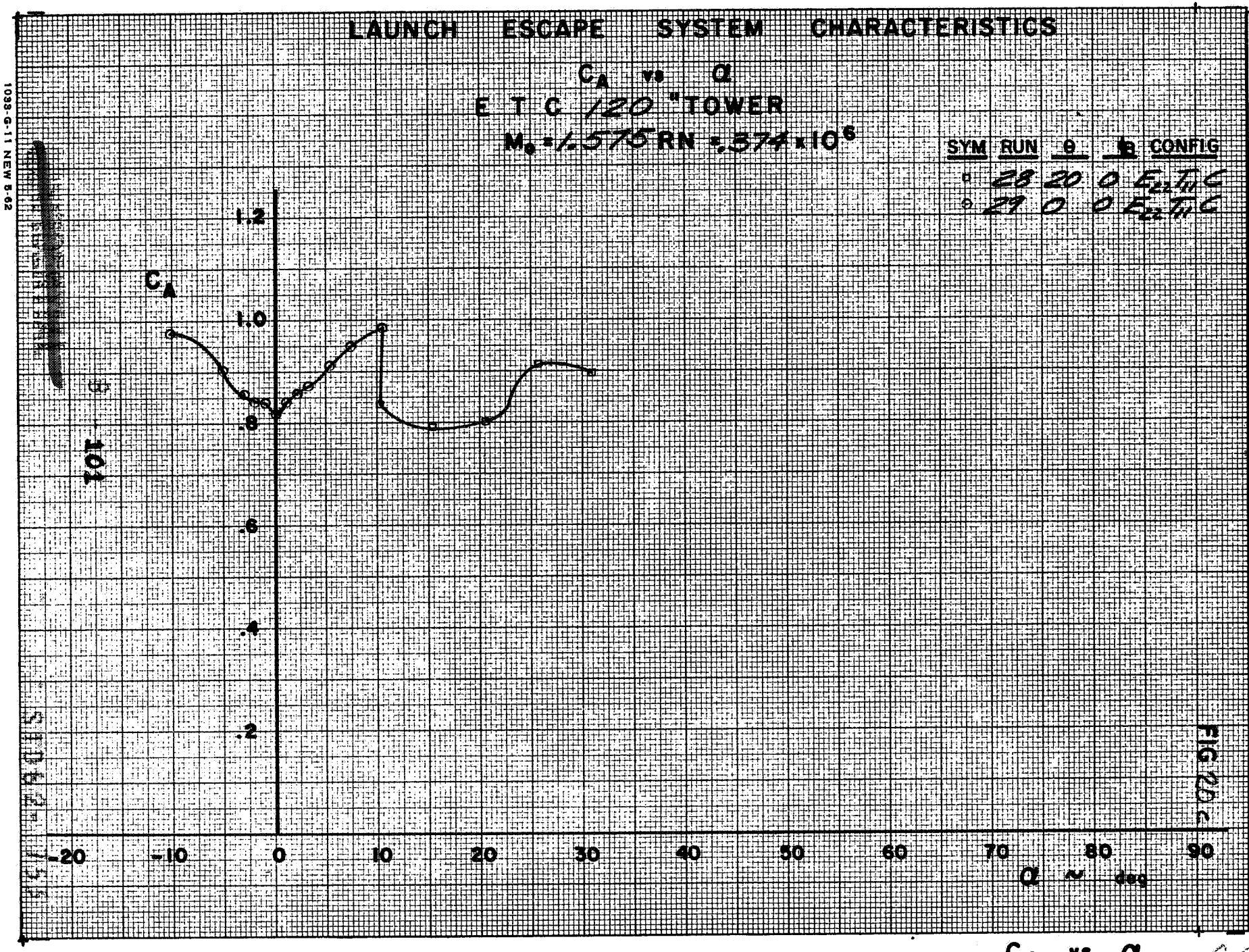

FIG 20 c

C_A vs α

201-17

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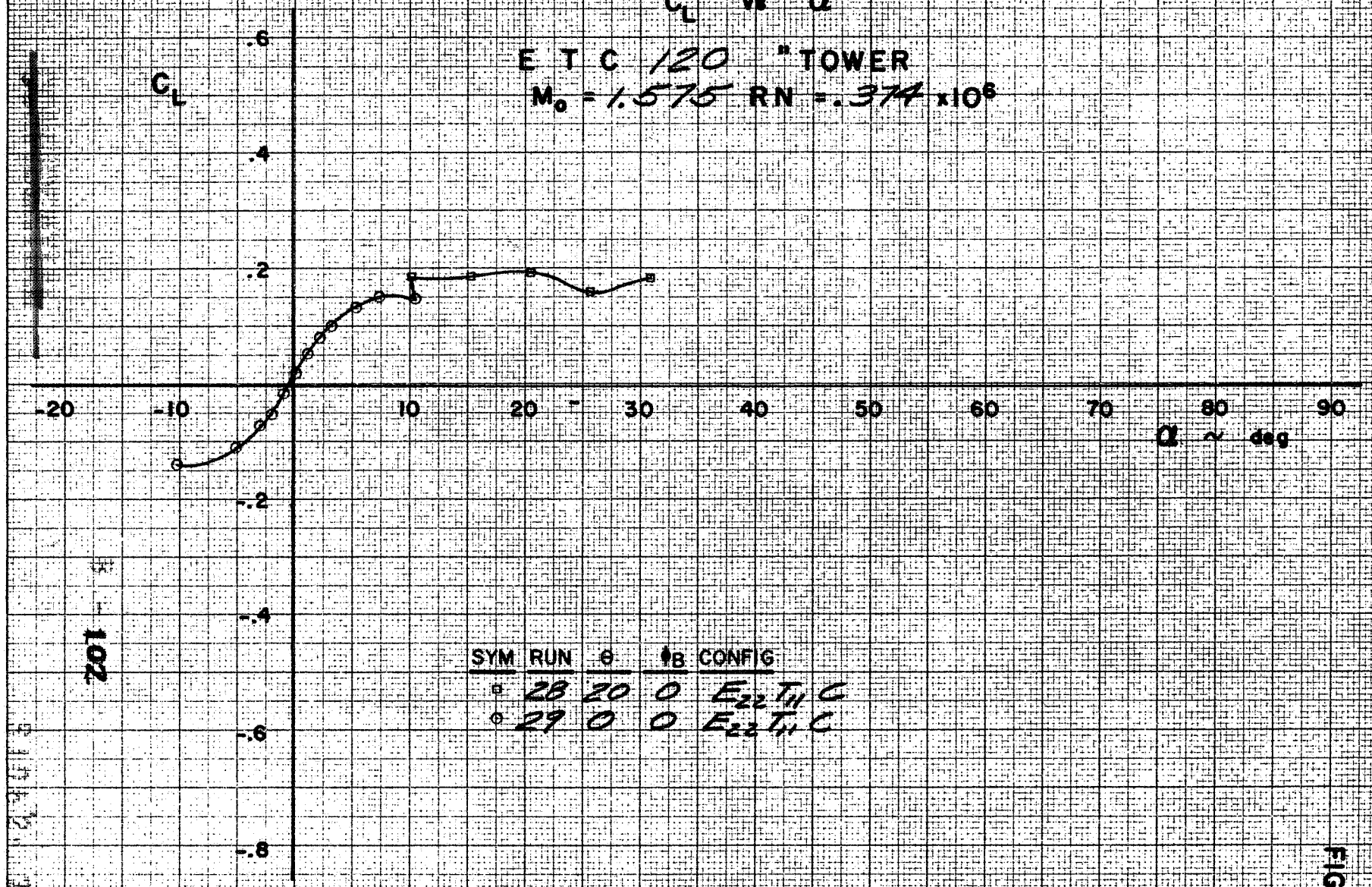
LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_L vs α

E T C 120 " TOWER

M_o = 1.575 RN = .374 x 10^6



SYM	RUN	θ	ϕ_B	CONFIG
⊡	28	20	0	$E_{22}T_{11}C$
⊙	27	0	0	$E_{22}T_{11}C$

FIG 20a

C_L vs α 201-17

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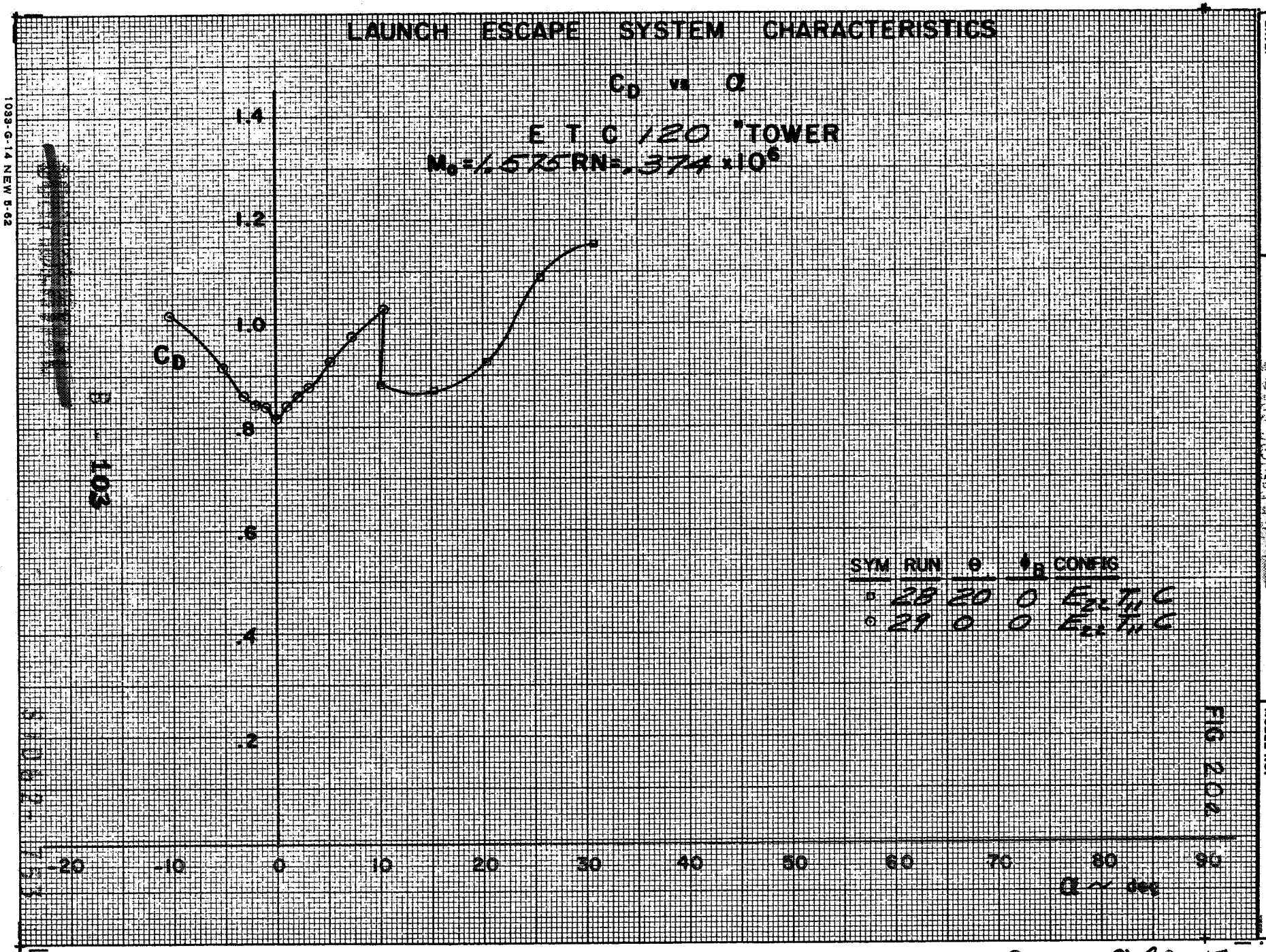

FIG 204

C_D vs α 201-17

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LAUNCH ESCAPE SYSTEM CHARACTERISTICS

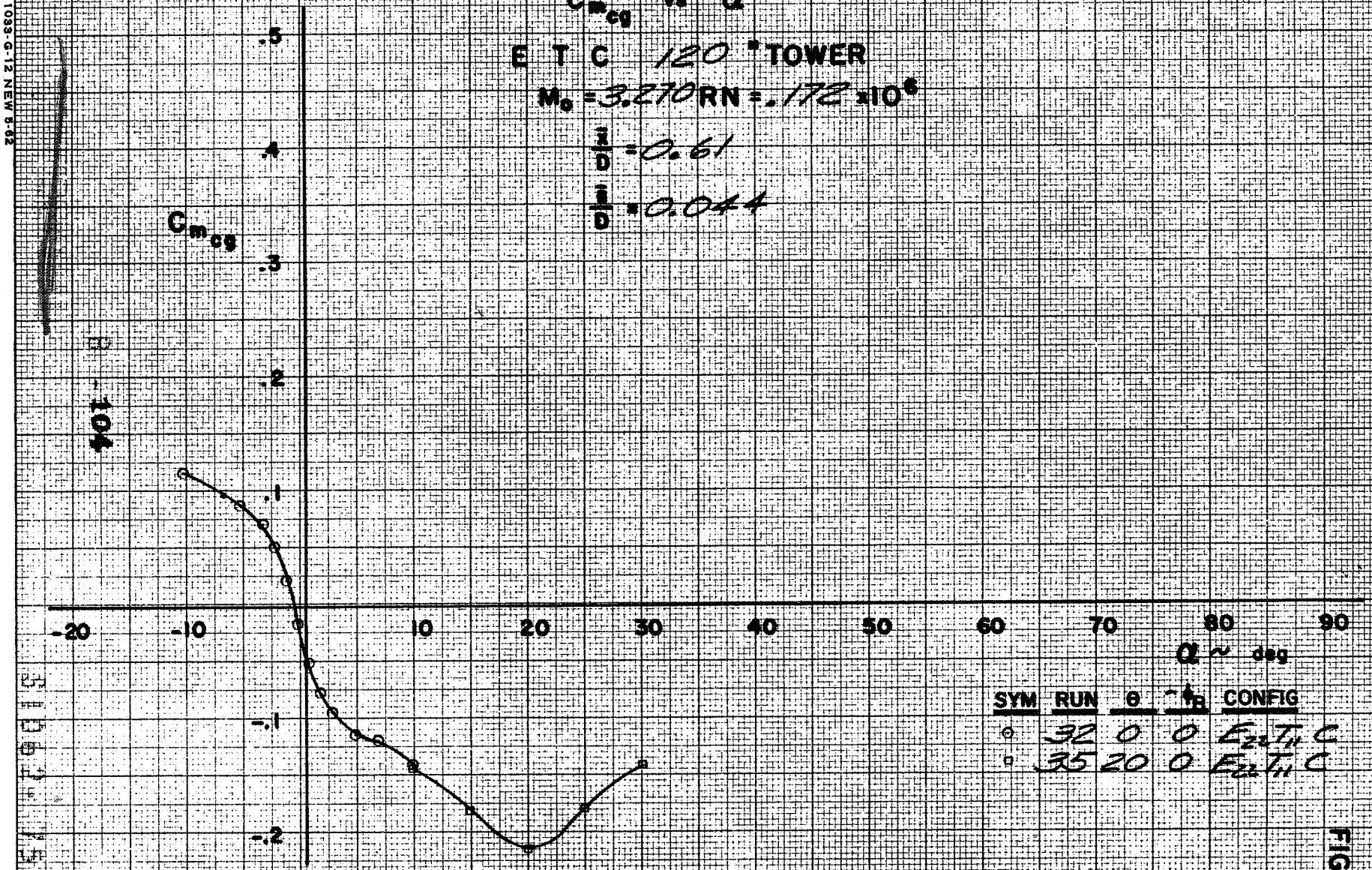
$C_{m_{cg}}$ vs α

E T C 120" TOWER

$M_\infty = 3.270$ RN $= .172 \times 10^6$

$\frac{x_{cg}}{D} = 0.61$

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



SYM	RUN	θ	τ_R	CONFIG
⊙	32	0	0	$E_{22}T_{11}C$
▫	35	20	0	$E_{22}T_{11}C$

FIG 2-10

$C_{m_{cg}}$ vs α

201-18

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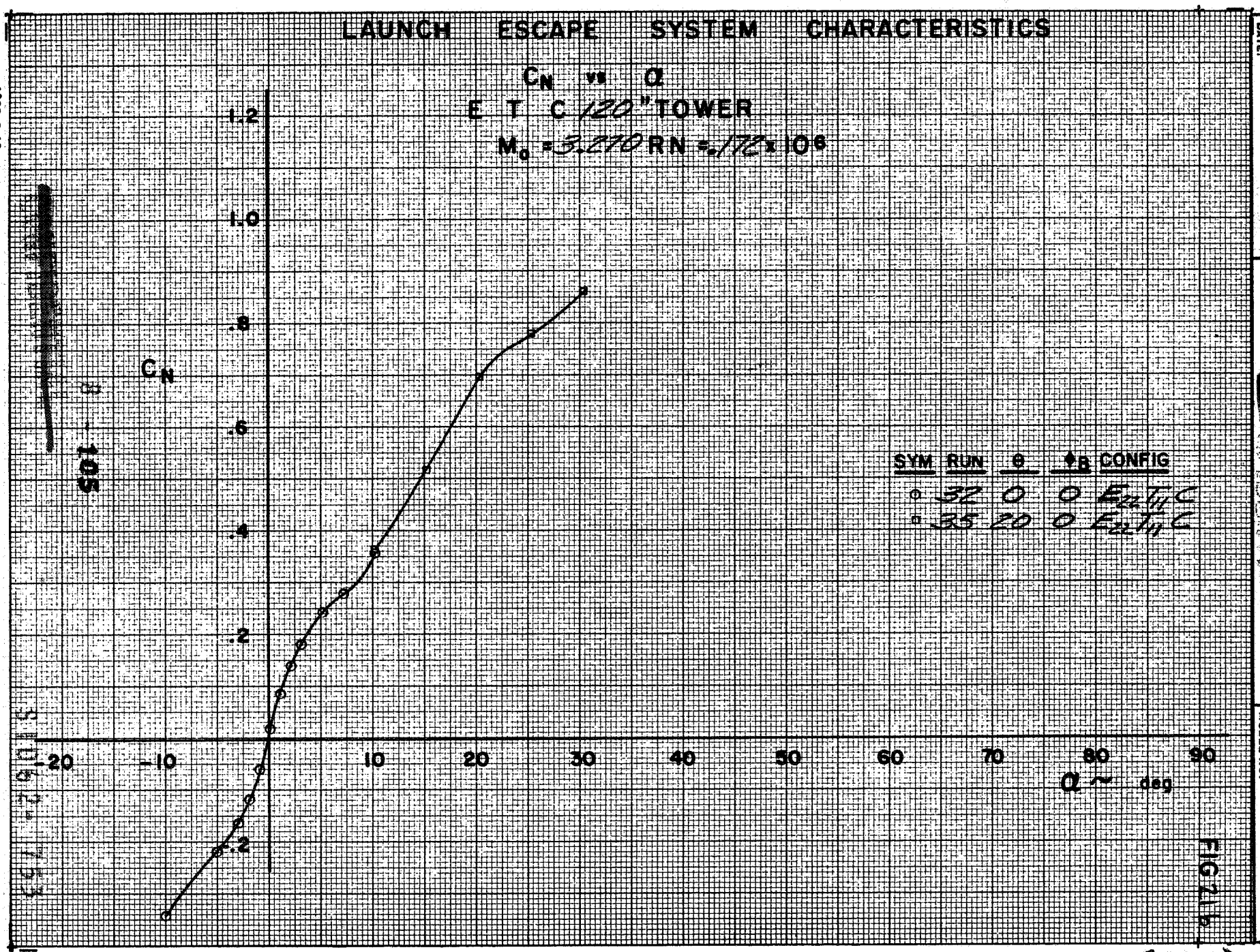

[redacted]

FIG 216

C_N vs α 201-18

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LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_A vs α

E T C 120 "TOWER

$M_\infty = 3.270$ RN $= .172 \times 10^6$

SYM	RUN	θ	β	CONFIG
○	32	0	0	$E_{22}T_{11}C$
▫	35	20	0	$E_{22}T_{11}C$

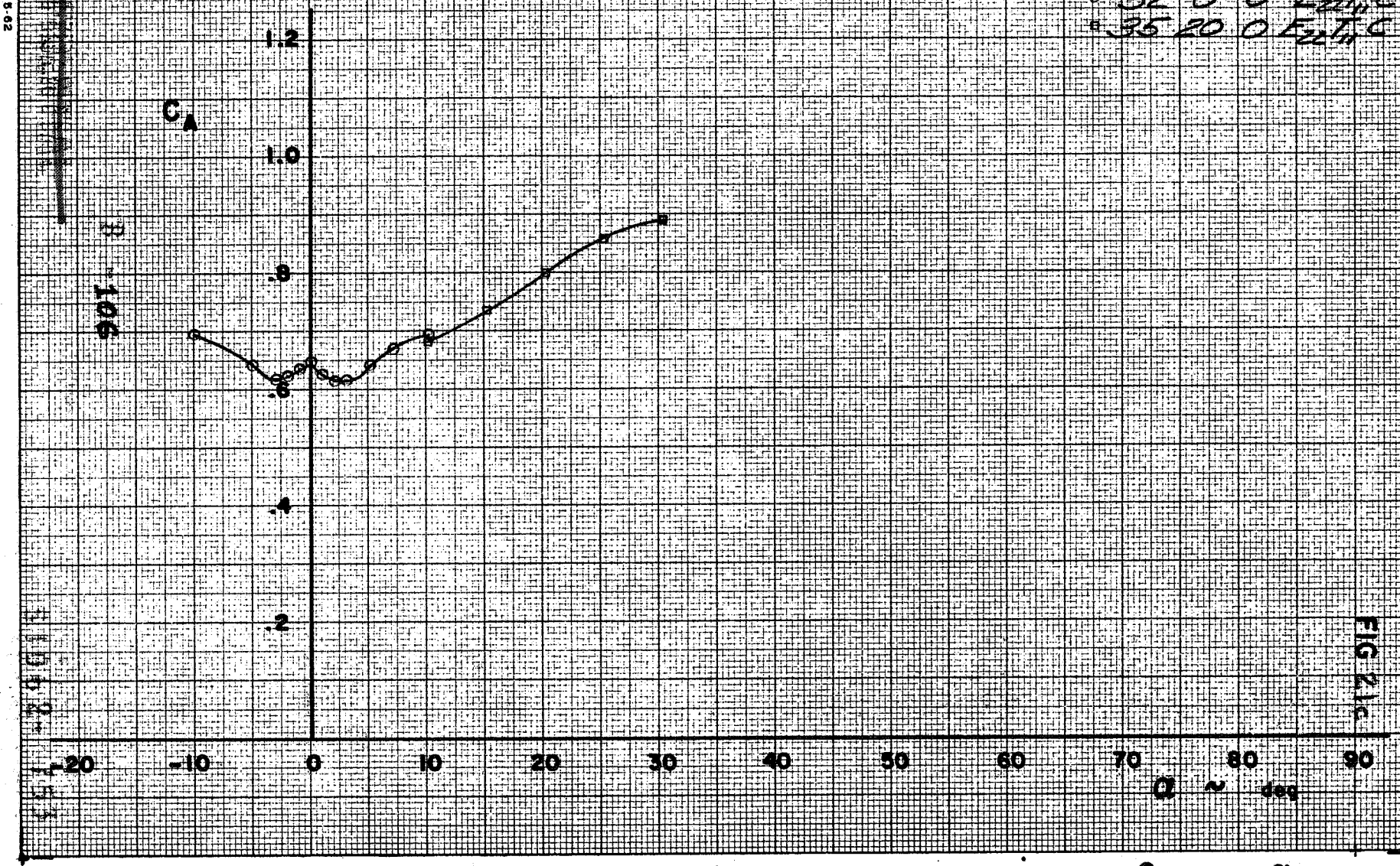

FIG 21c

C_A vs α

201-18

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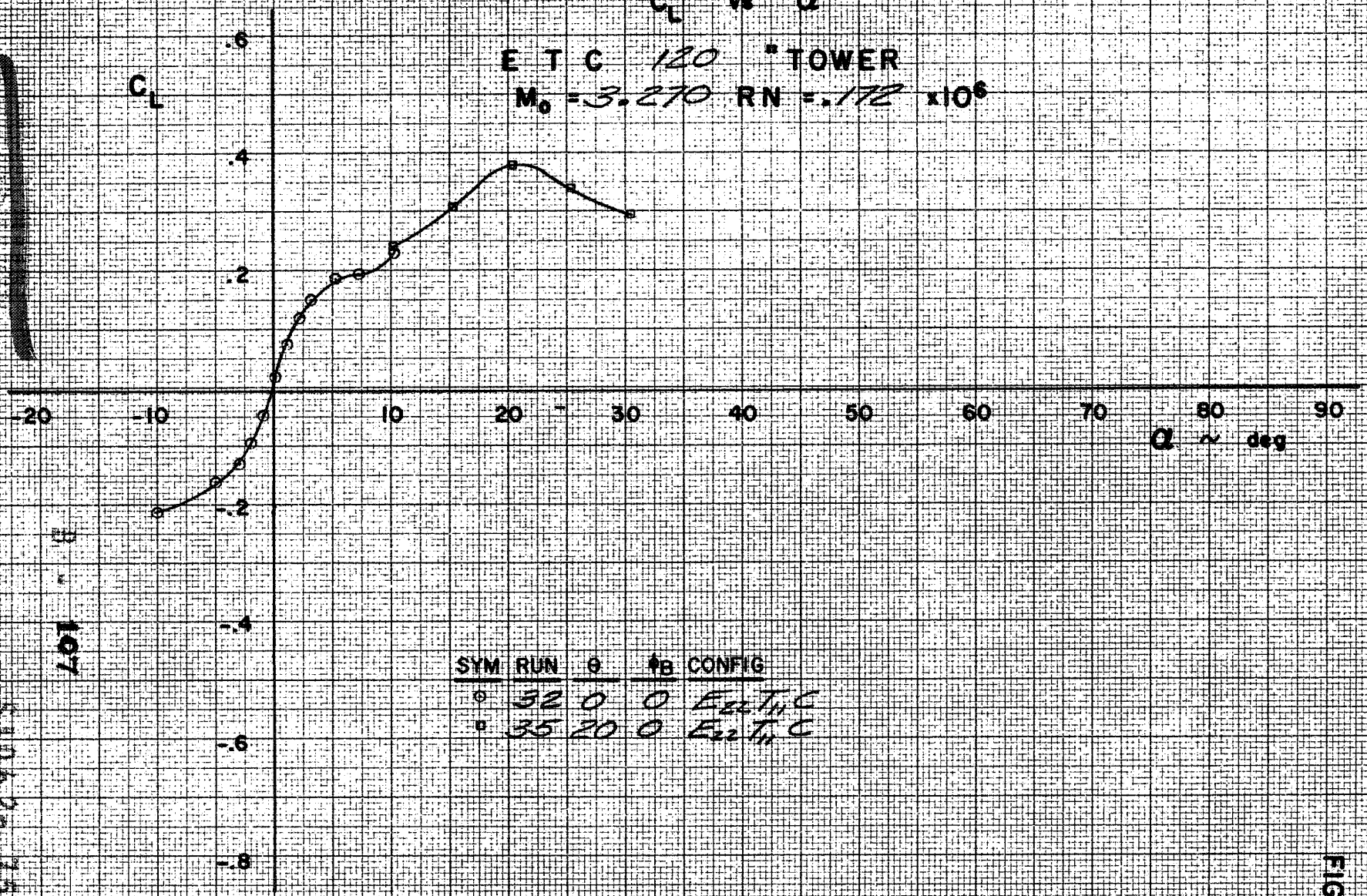
LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_L vs α

E T C 120 " TOWER

M_0 = 3.270 RN = .172 x10^6



SYM	RUN	θ	ϕ_B	CONFIG
⊙	32	0	0	$E_{22}T_{11}C$
□	35	20	0	$E_{22}T_{11}C$

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FIG 21d

C_L vs α 201-18

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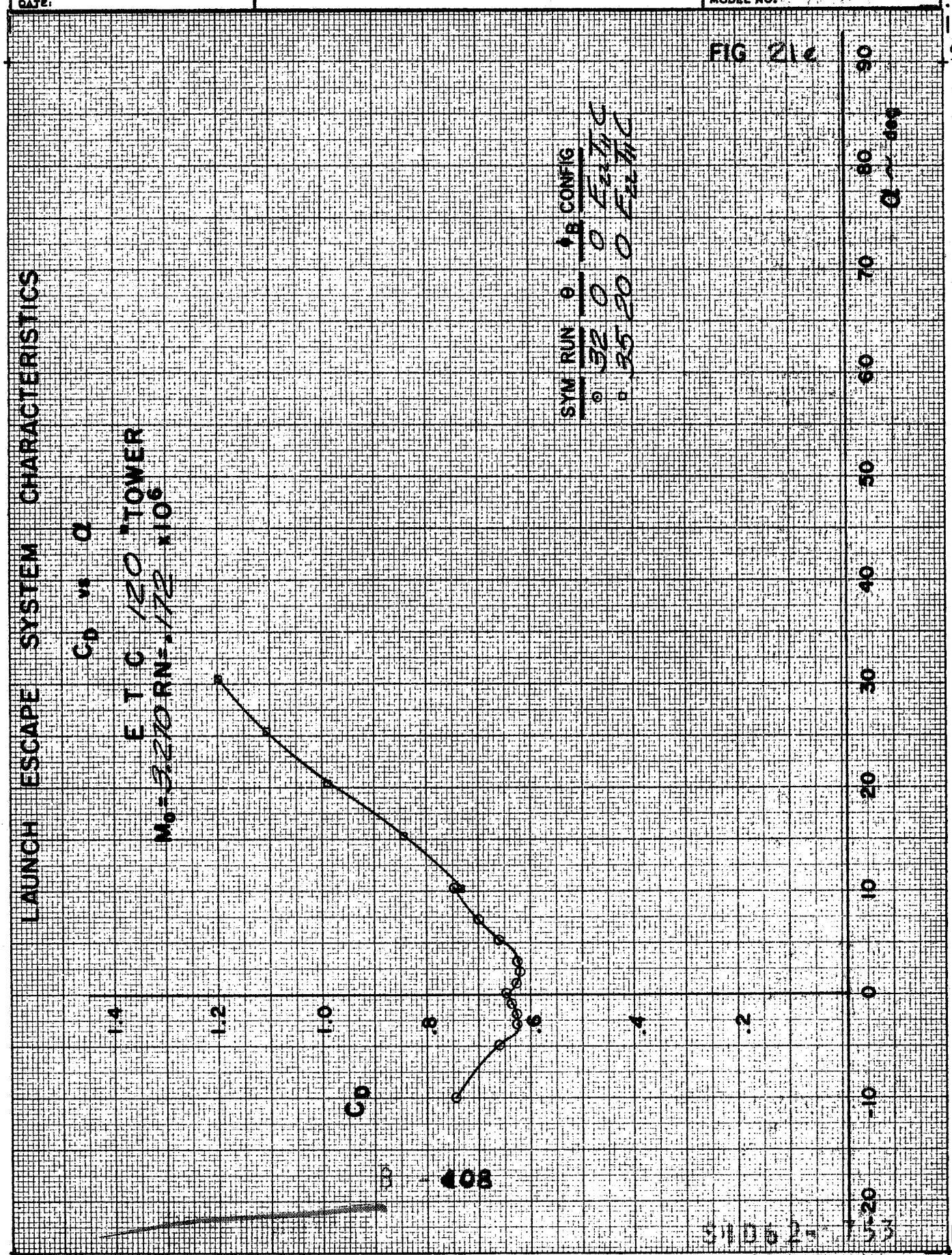
FIG 21e



C_D vs α 201-18

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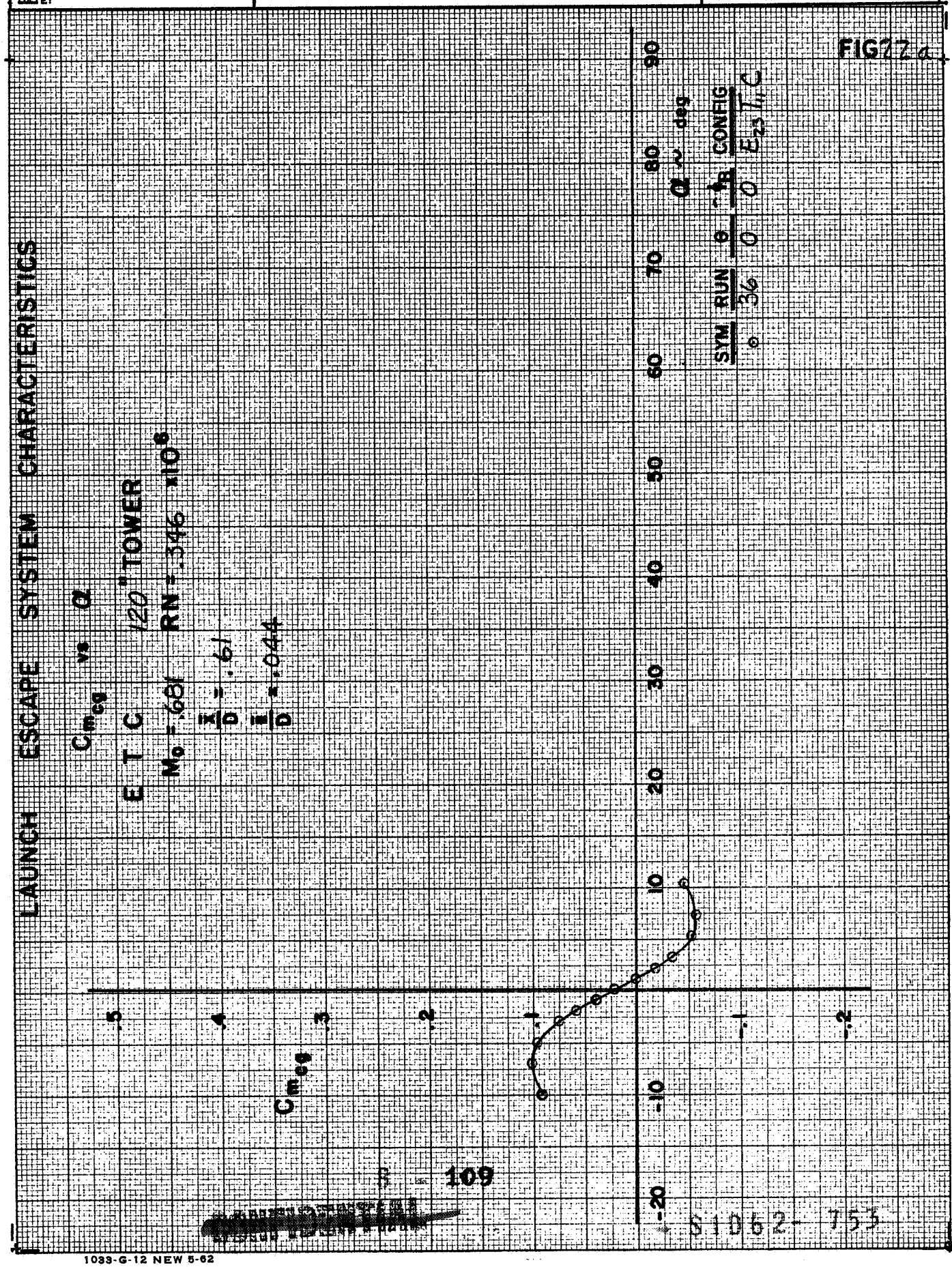
FIG 22a



$C_{m_{cg}}$ vs α 201-36

[redacted]

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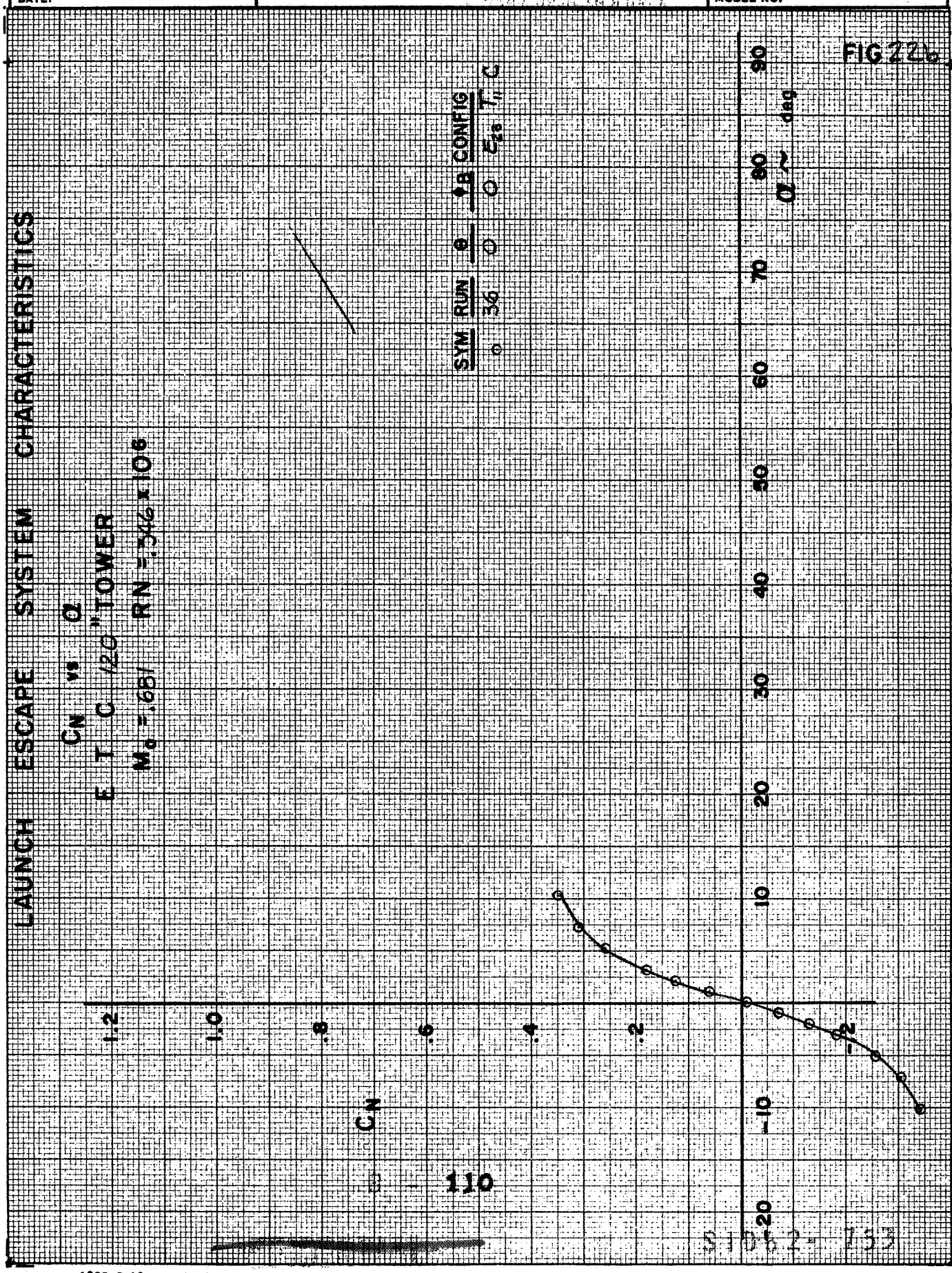

FIG 22b

C_N vs α 201-36

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LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_A vs α

E T C 120" TOWER

$M_\infty = .681$ RN = .346 x 10^6

SYM	RUN	θ	ψ	CONFIG
○	36	0	0	$E_{23}T_4C$

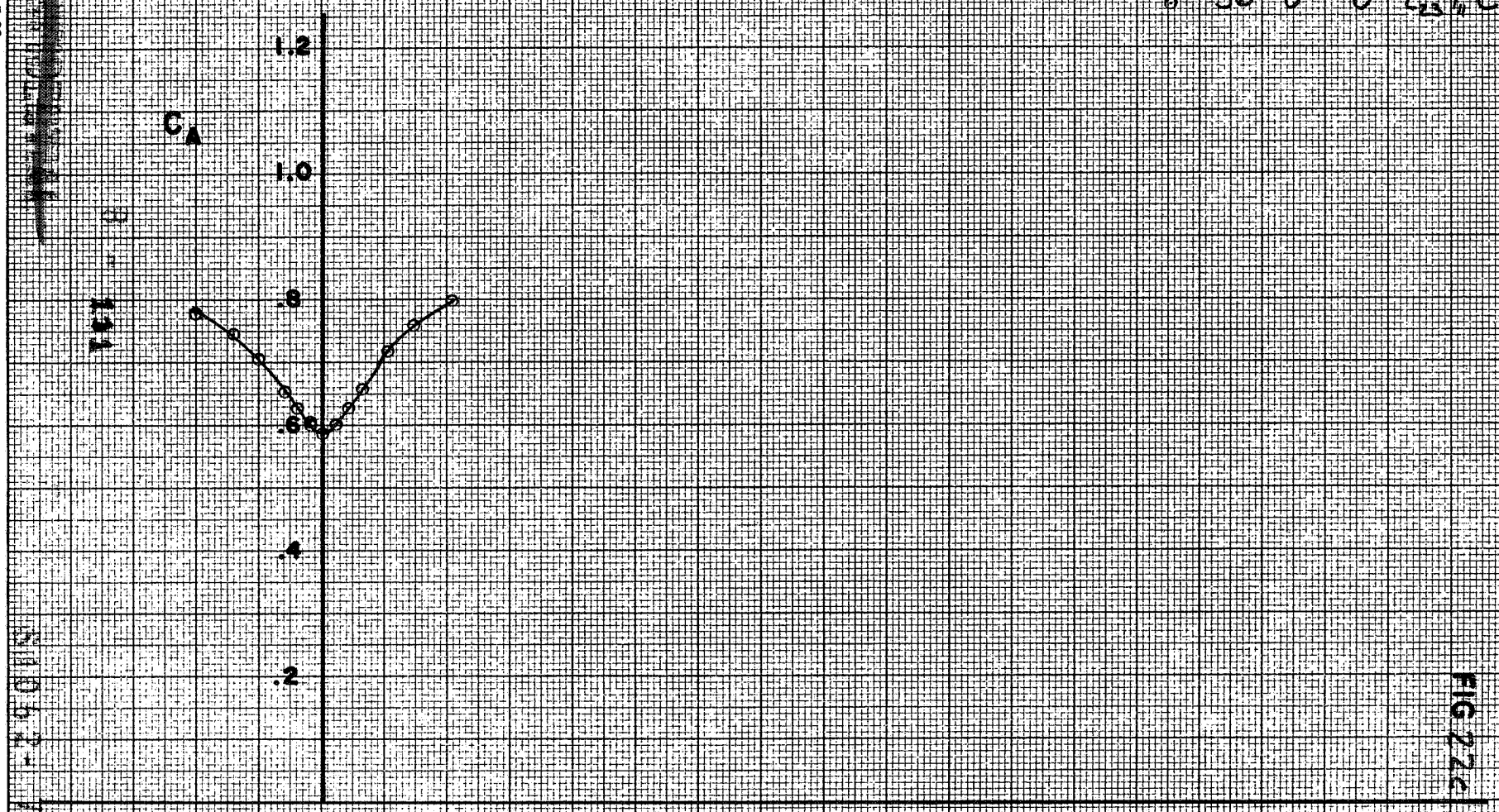

FIG 22

C_A vs α 201-36

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FIG 22d

201-36

C_L vs α

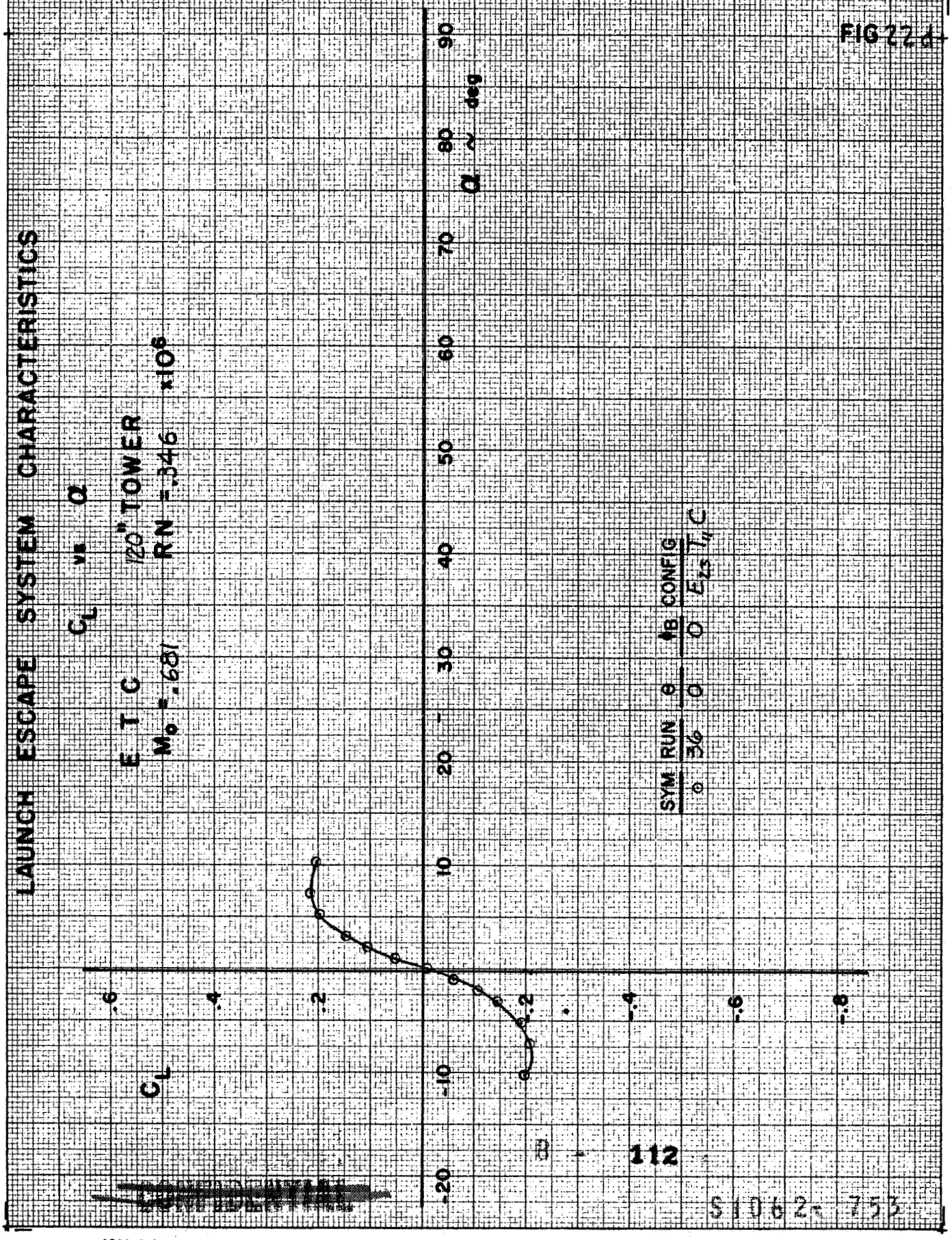

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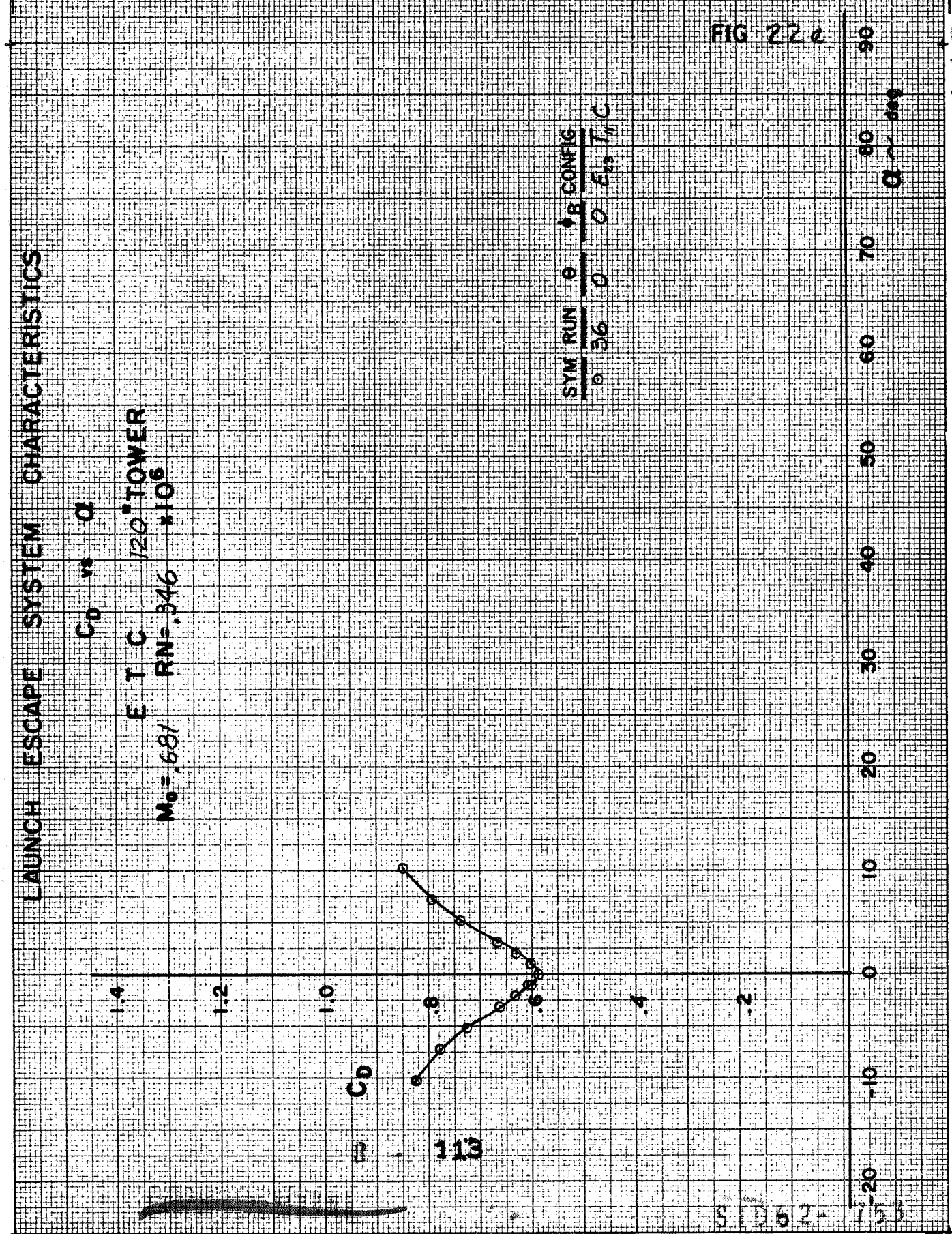
FIG 22e



C_D vs α 201-36

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LAUNCH ESCAPE SYSTEM CHARACTERISTICS

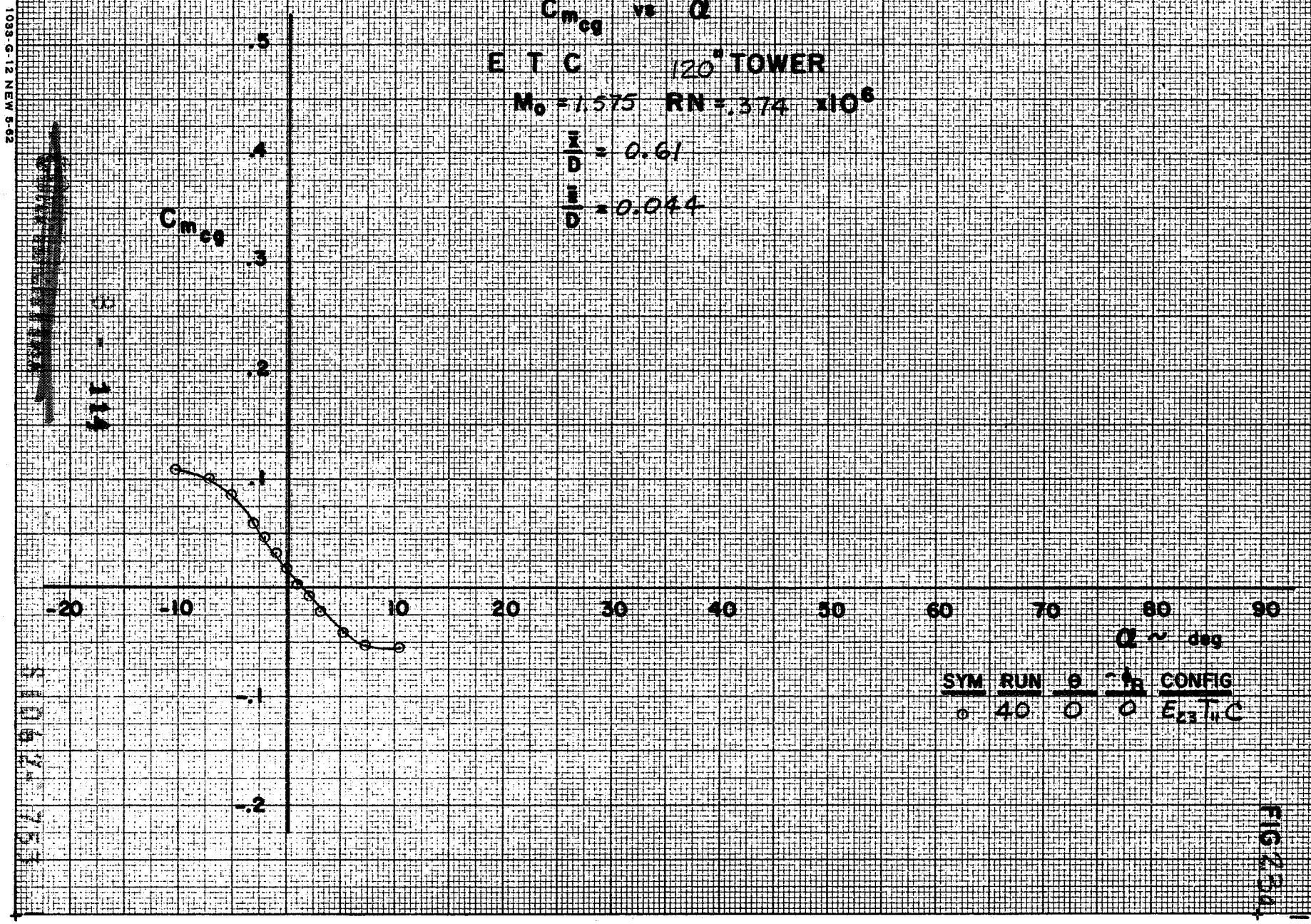
$C_{m_{cg}}$ vs α

E T C 120" TOWER

$M_0 = 1.575$ RN $= .374 \times 10^6$

$\frac{\bar{x}}{D} = 0.61$

$\frac{\bar{z}}{D} = 0.044$



SYM	RUN	θ	τ_B	CONFIG
○	40	0	0	$E_{23}T_{11}C$

FIG 22

$C_{m_{cg}}$ vs α 201-40

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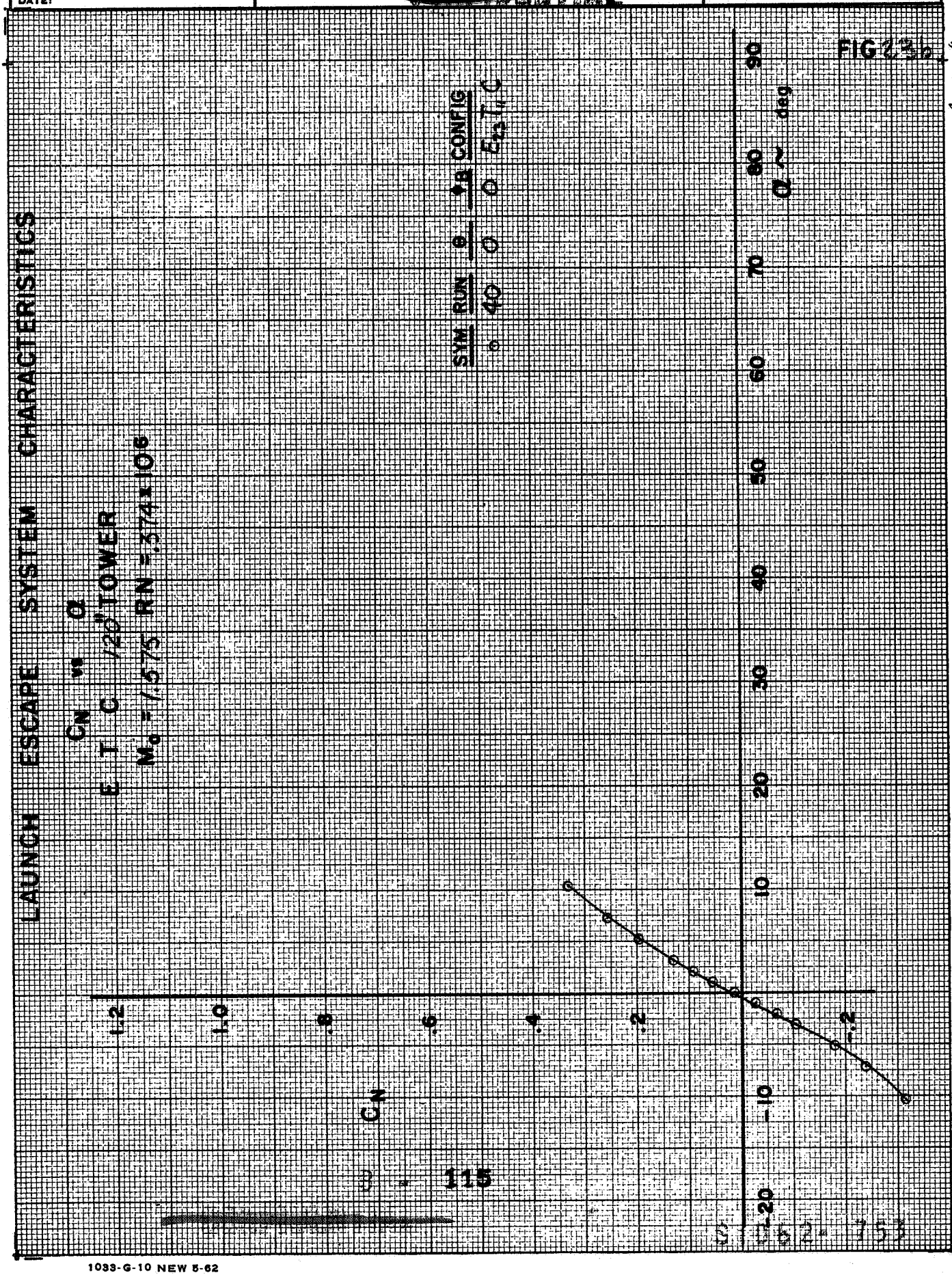

FIG 23b

C_N vs α 201-40

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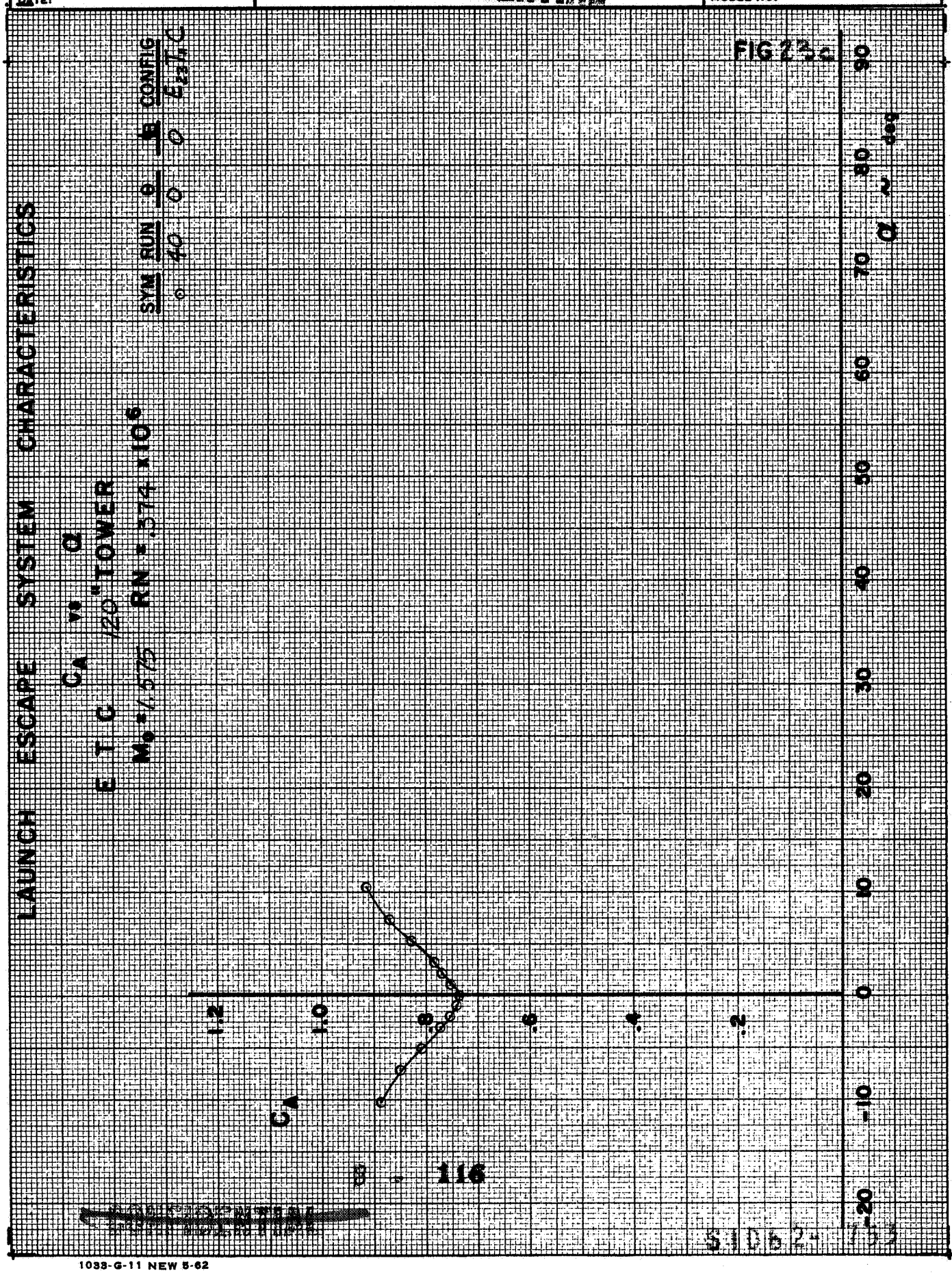

C_A vs α 201-40

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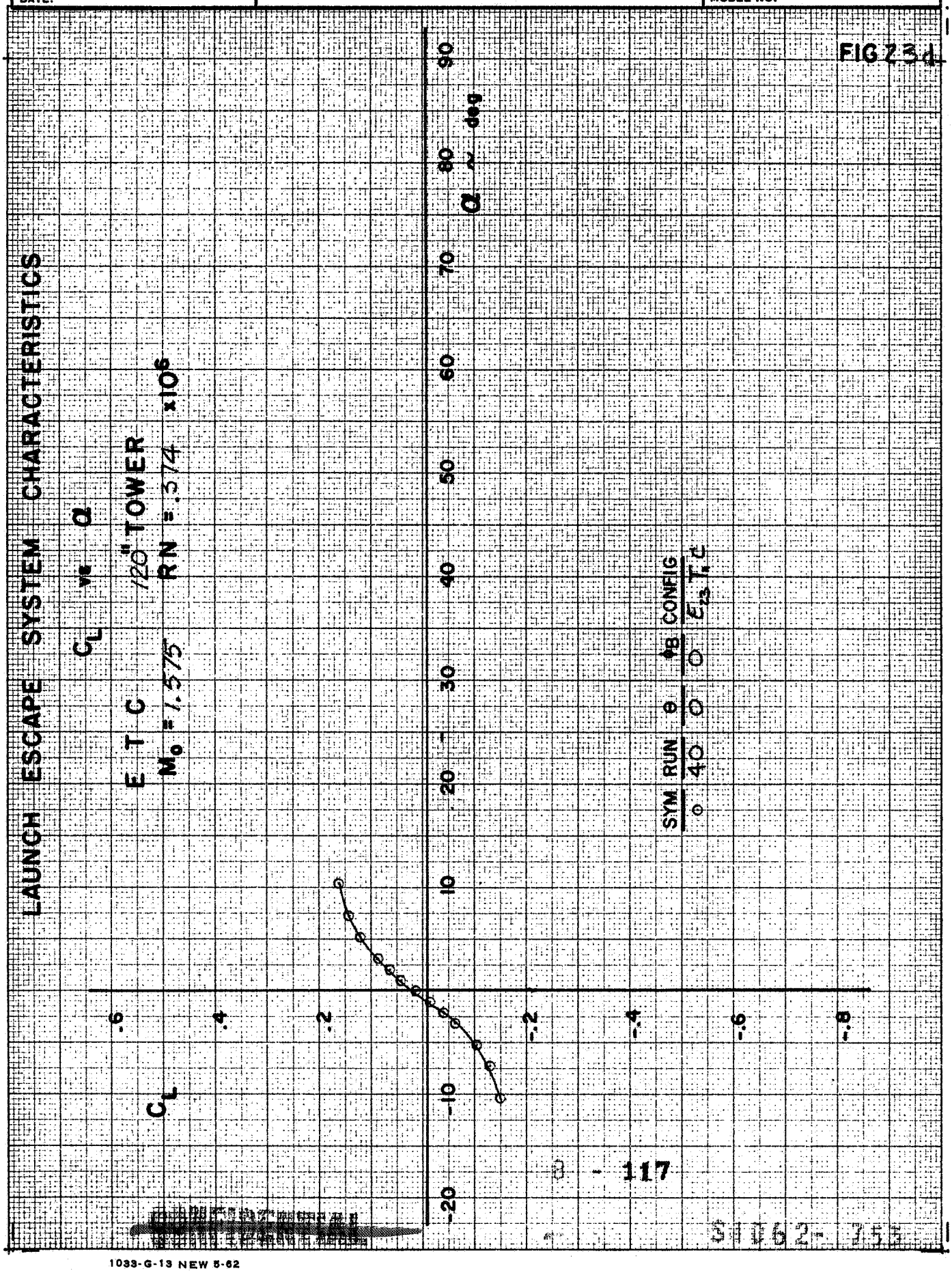
FIG 23d

C_L vs α 201-40



[redacted]

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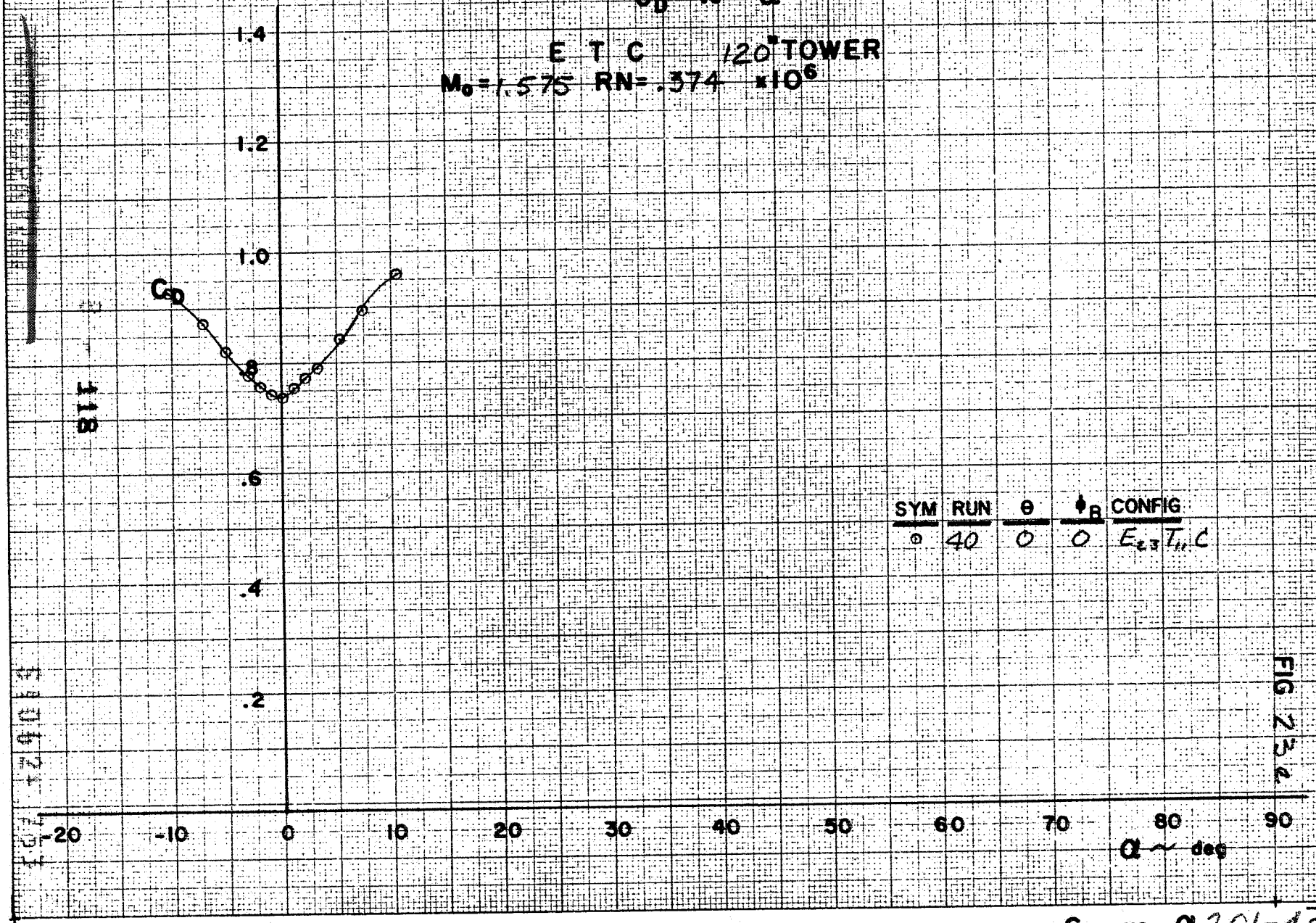
LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_D vs α

E T C 120" TOWER

$M_0 = 1.575$ RN = .374 $\times 10^6$



SYM	RUN	θ	ϕ_B	CONFIG
⊕	40	0	0	$E_{t3} T_{11} C$

FIG 23a

C_D vs α 201-40

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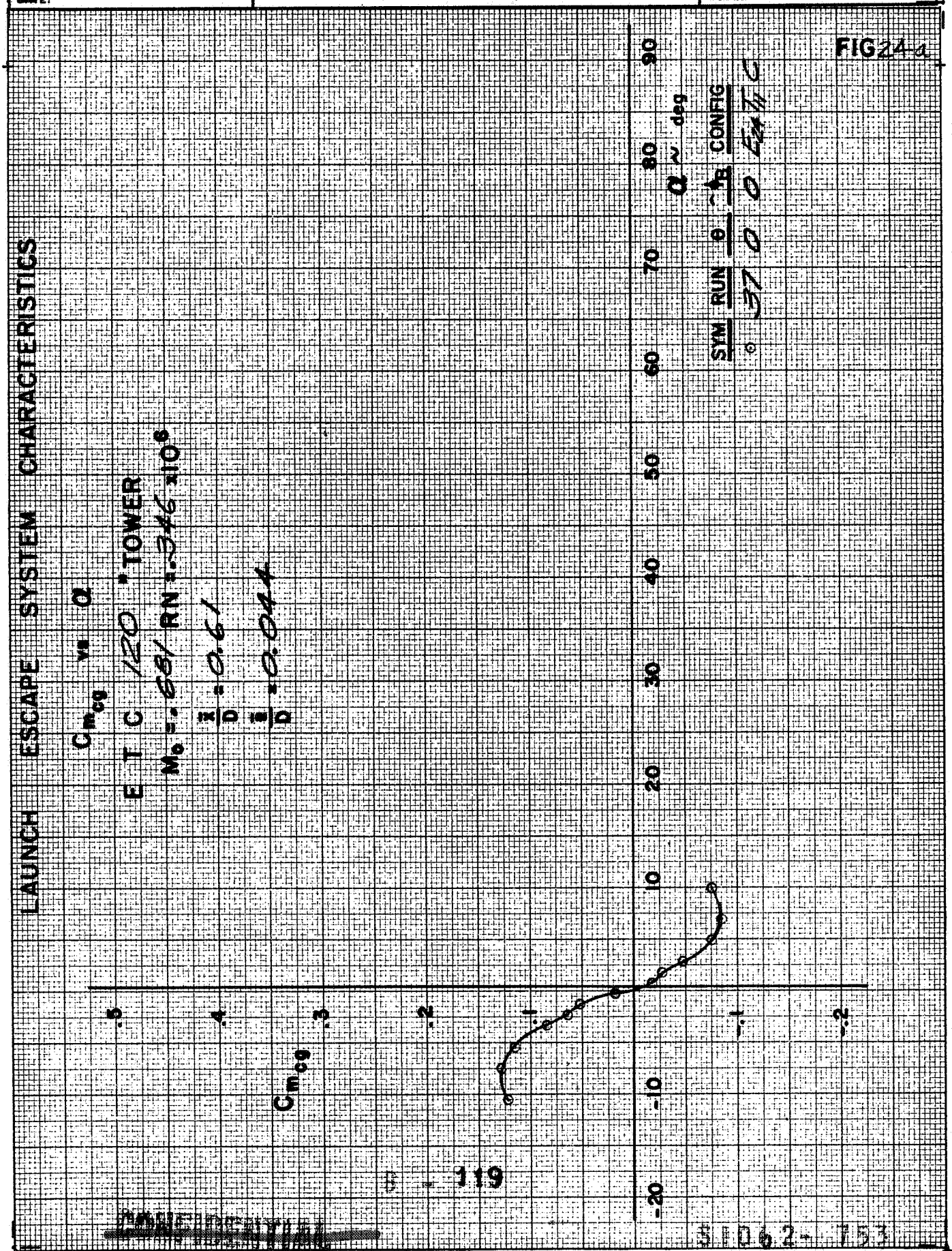

FIG 24-a

$C_{m_{cg}}$ vs α 201-37

[redacted]

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LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_N vs α

E T C 120" TOWER

M_0 = .681 RN = .316 x 10^6

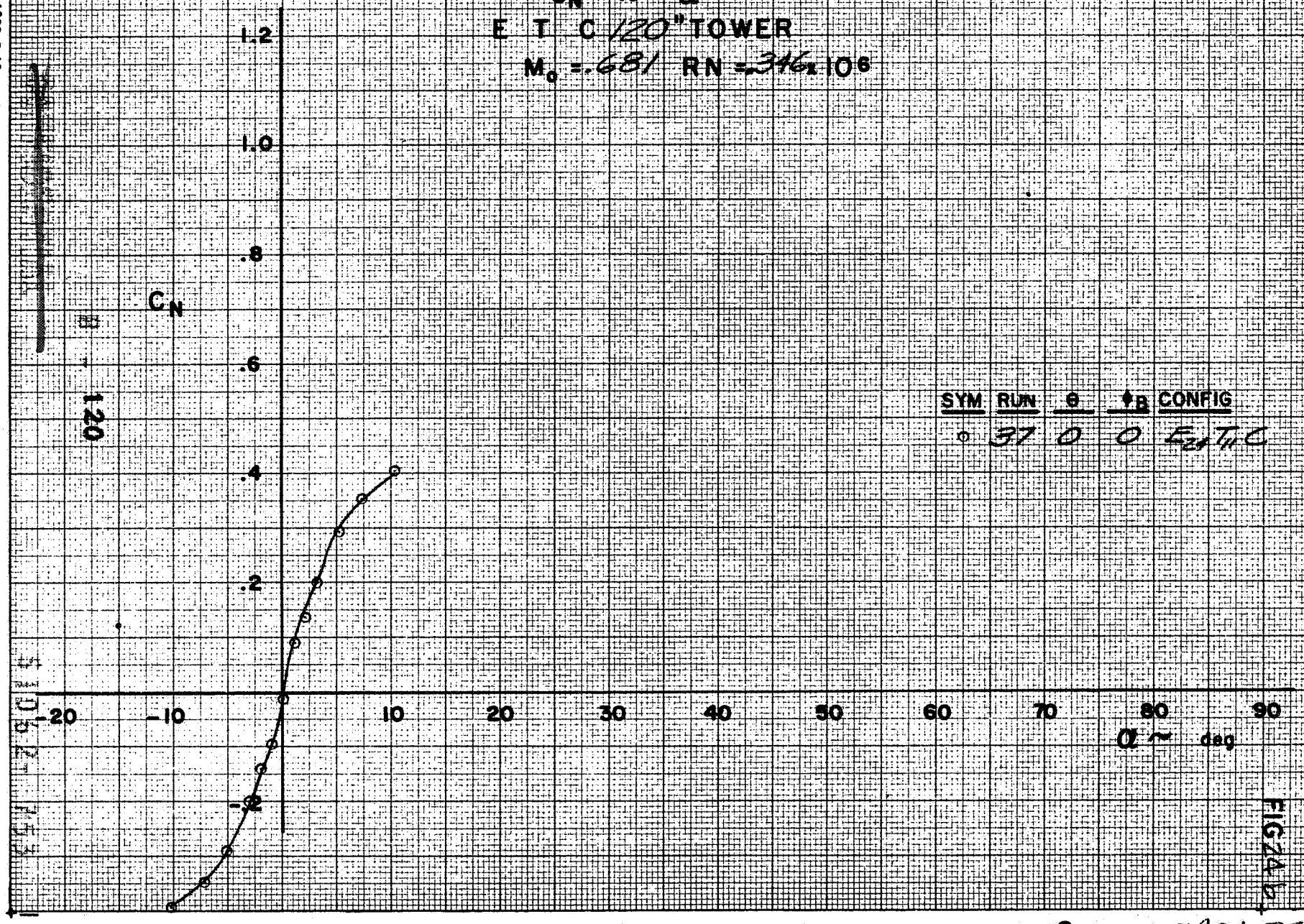

FIG 24-C

C_N vs α 201-37

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LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_A vs α

E T C 120" TOWER

M_0 = .681 RN = .346 x 10^6

SYM	RUN	θ	ψ	CONFIG
○	37	0	0	ETC

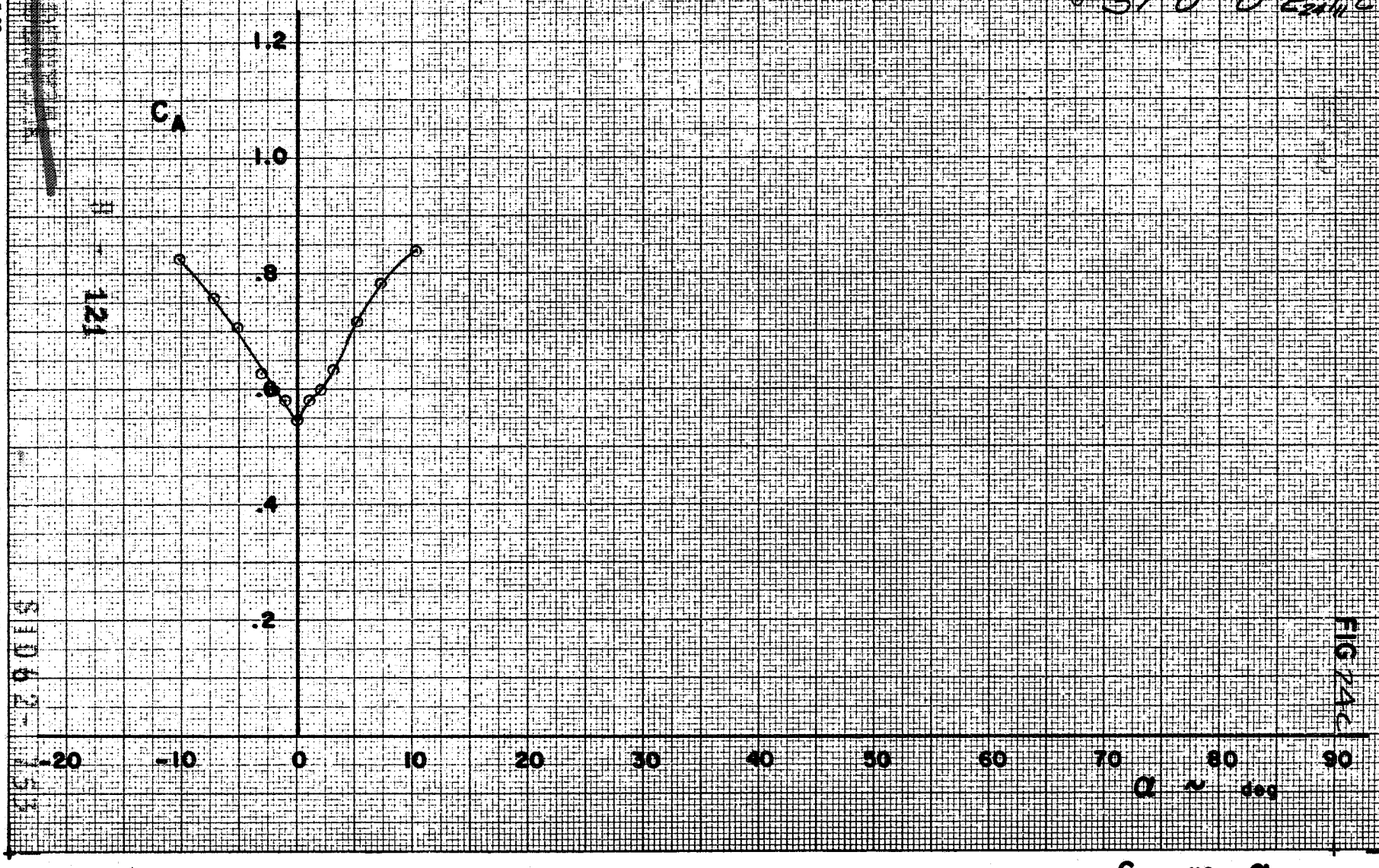

FIG 24C

C_A vs α

201-37

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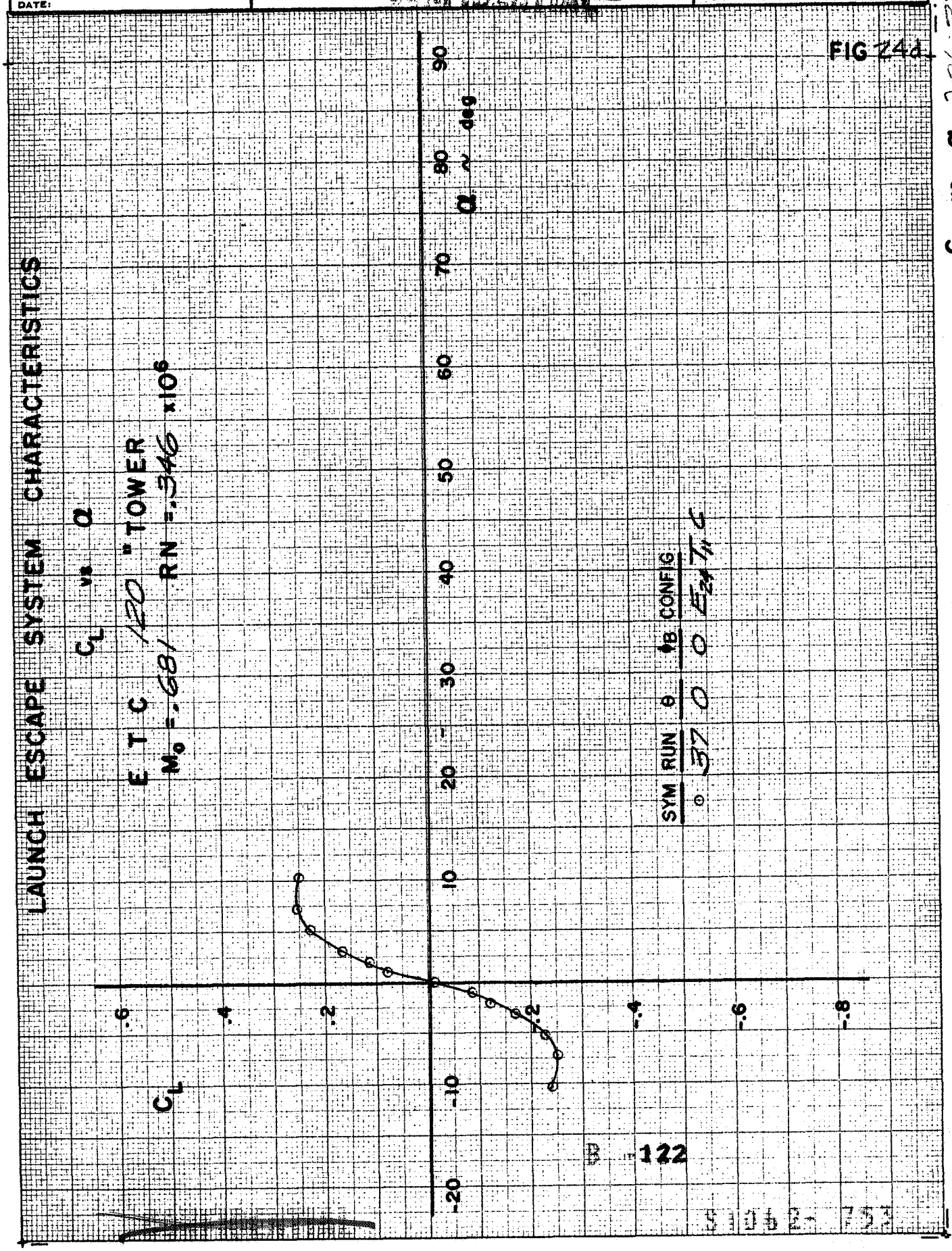
FIG 24d

C_L vs α 201-37



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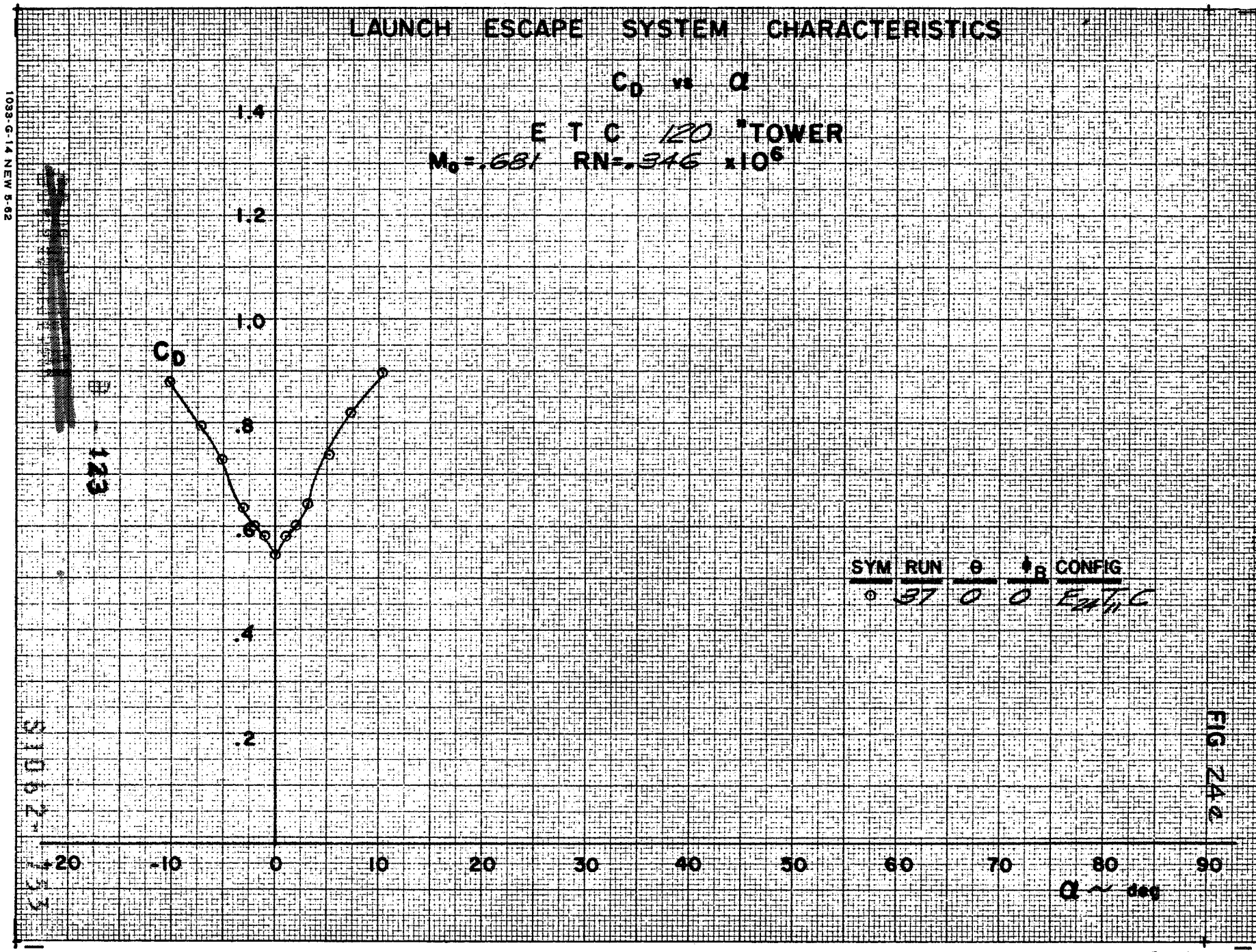

FIG 242

C_D vs α 201-37

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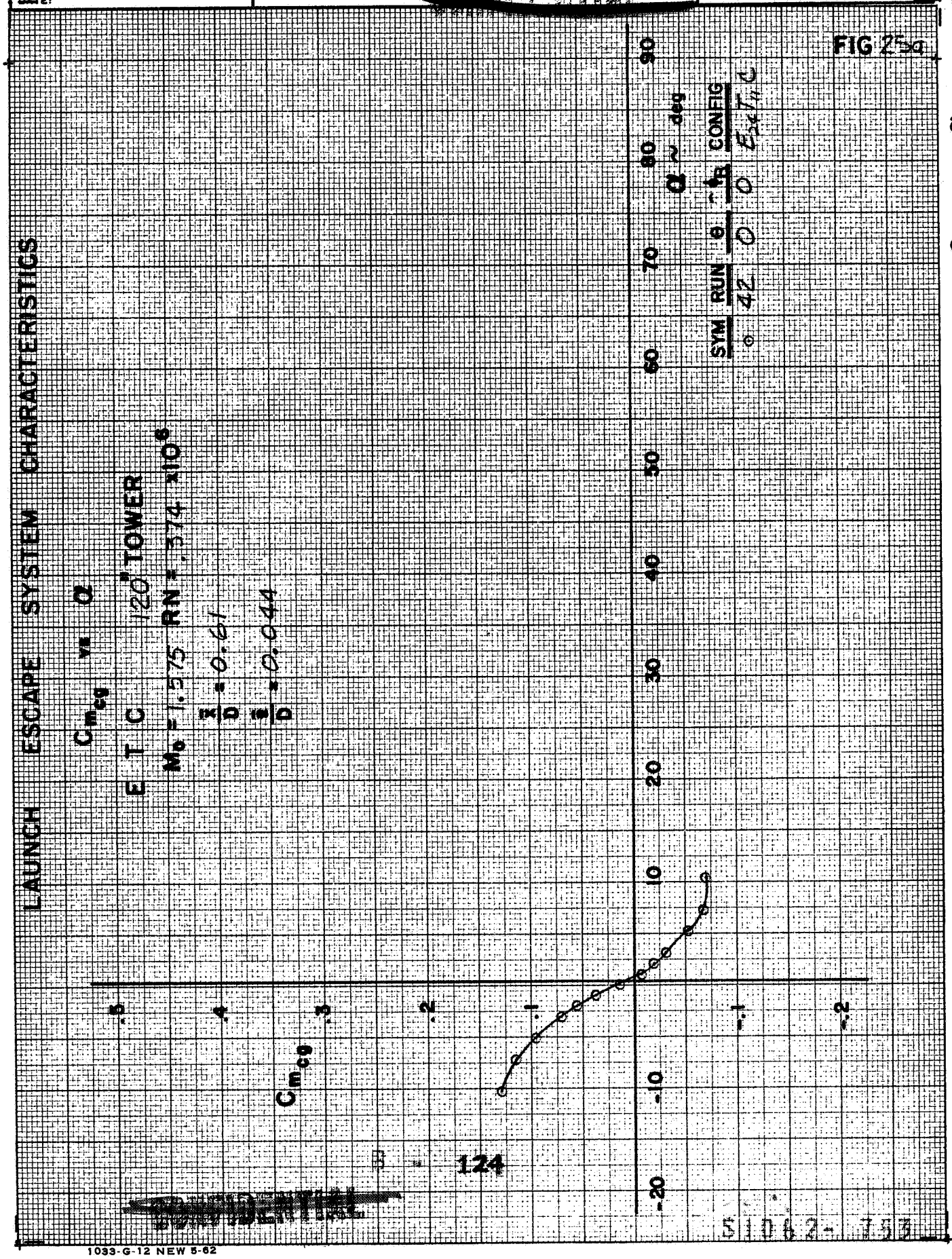
201-42

FIG 25a



$C_{m_{cg}}$ vs α

[redacted]

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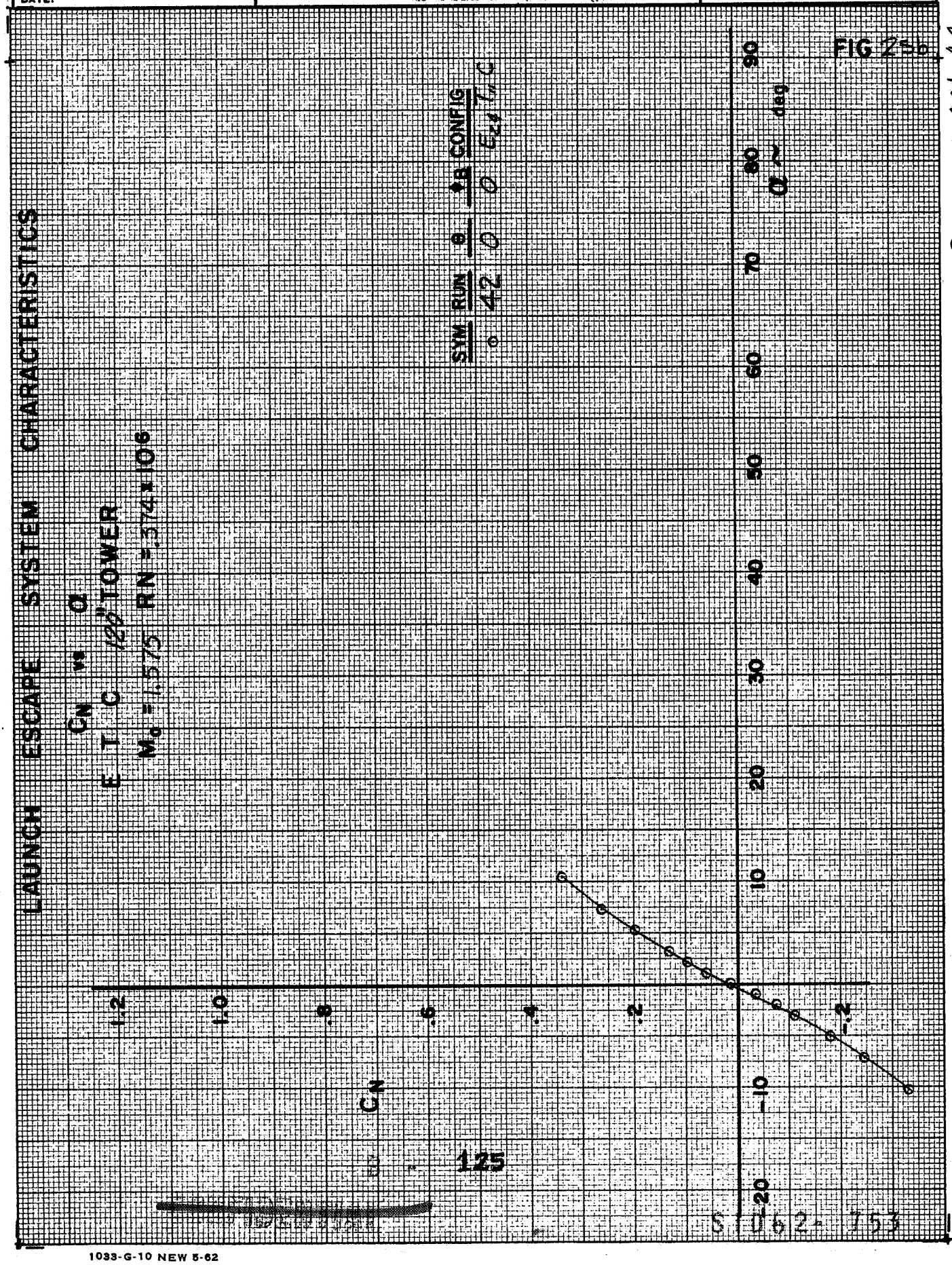

FIG 256

C_N vs α 201-42

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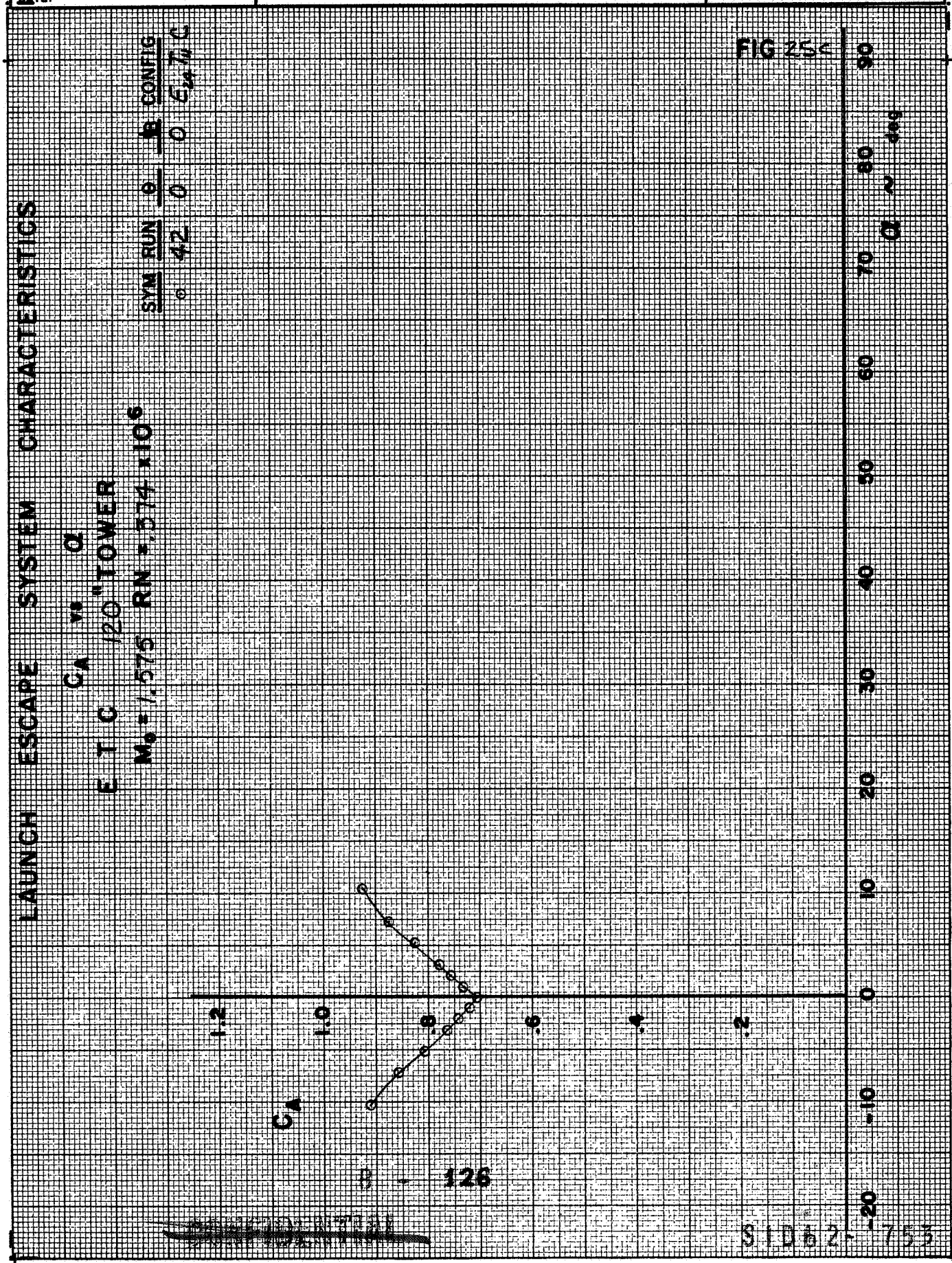

FIG 25c

C_A vs α 201-42

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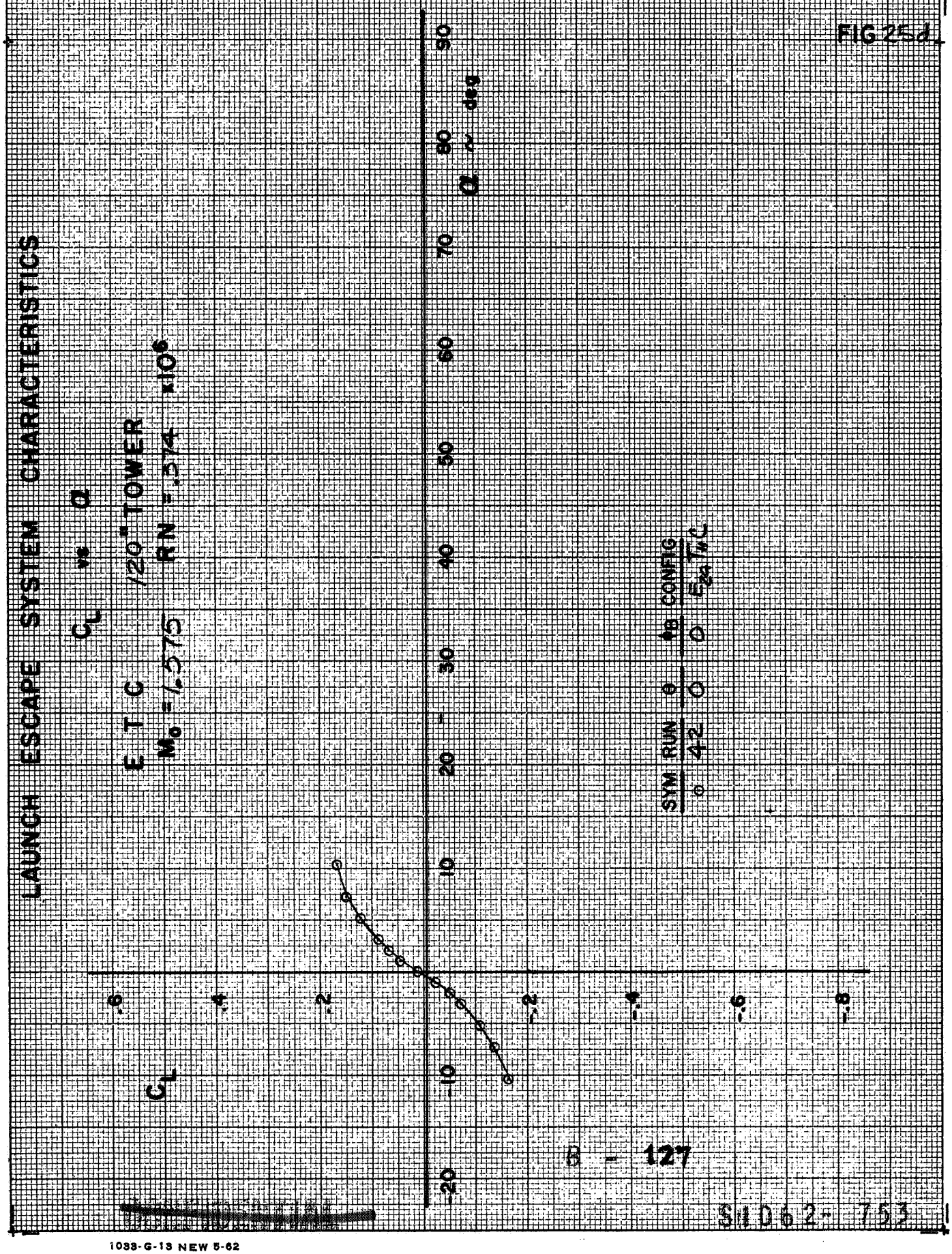
FIG 25d

C_L vs α 201-42



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[redacted]

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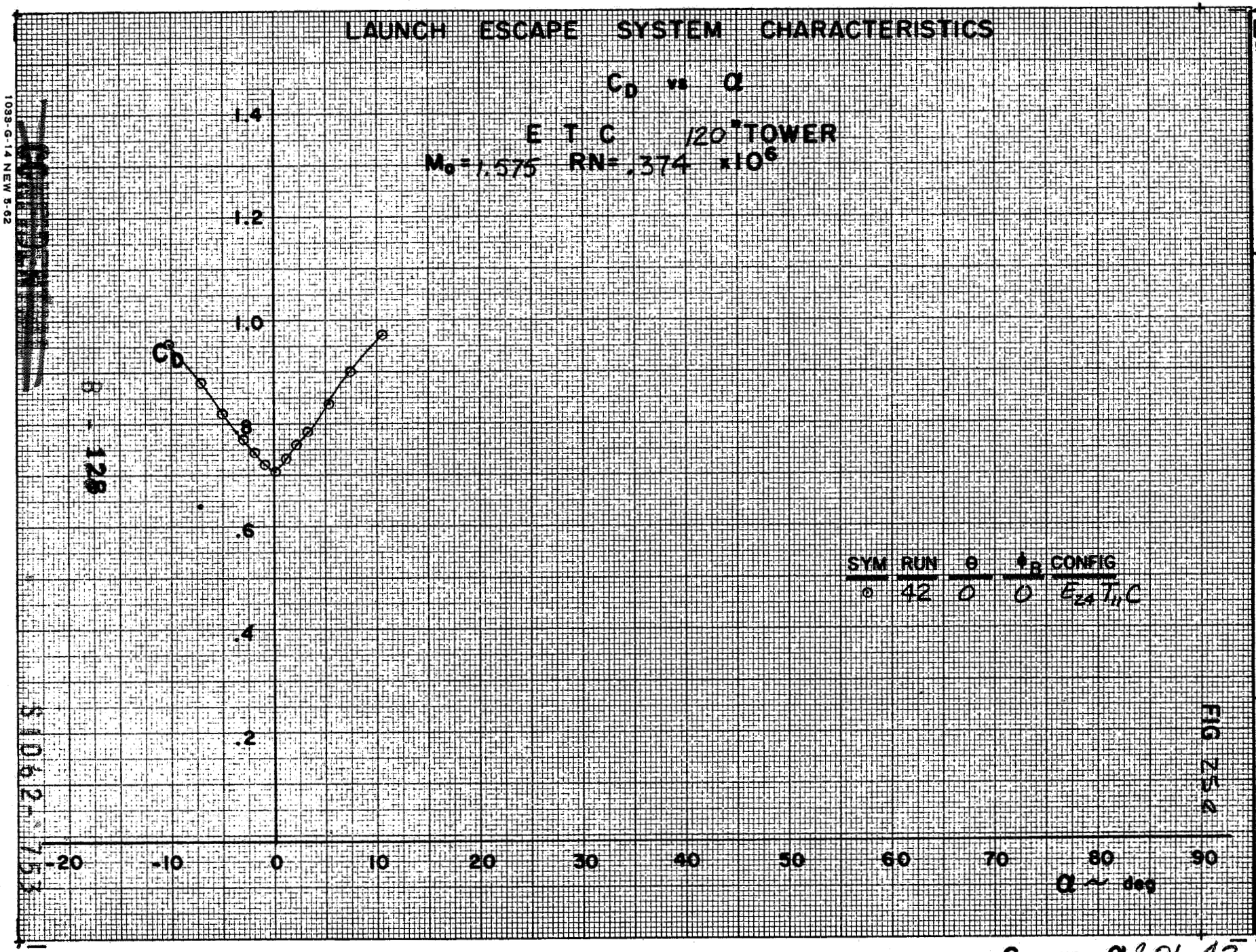

FIG 25a

C_D vs α 201-42

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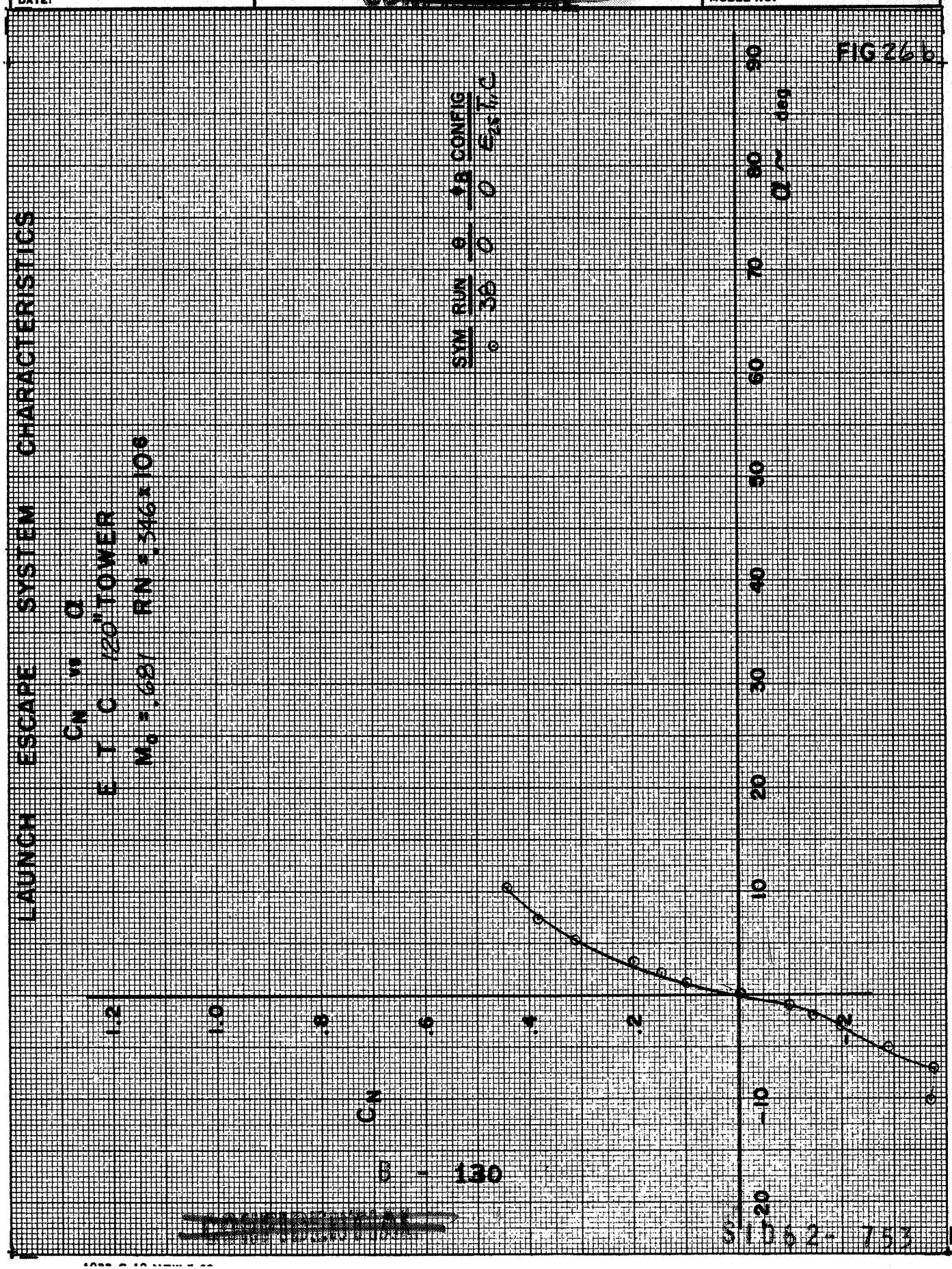
FIG 26b



C_N vs α 201-38

[redacted]

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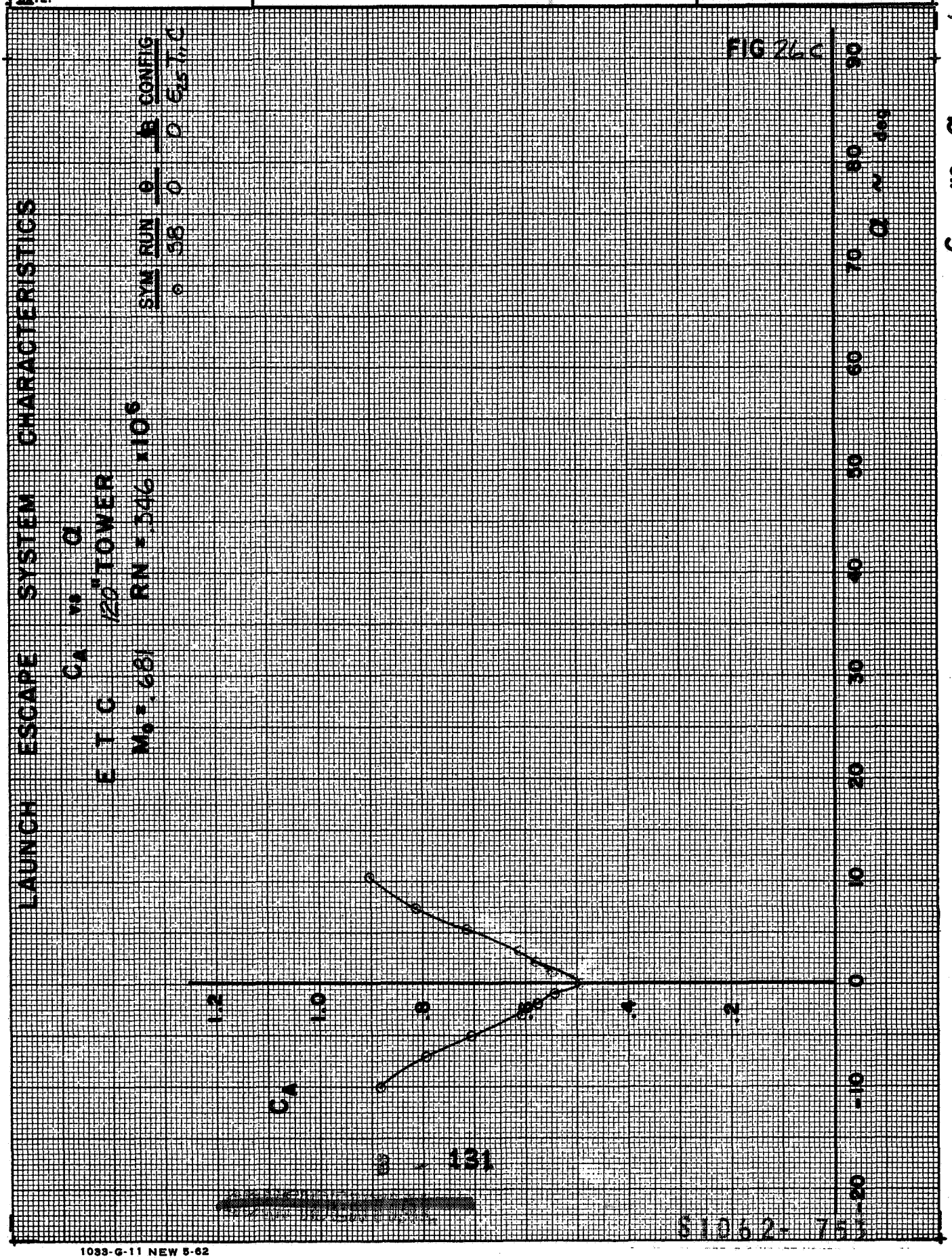
FIG 26c

C_A vs α

20/-38



[redacted]

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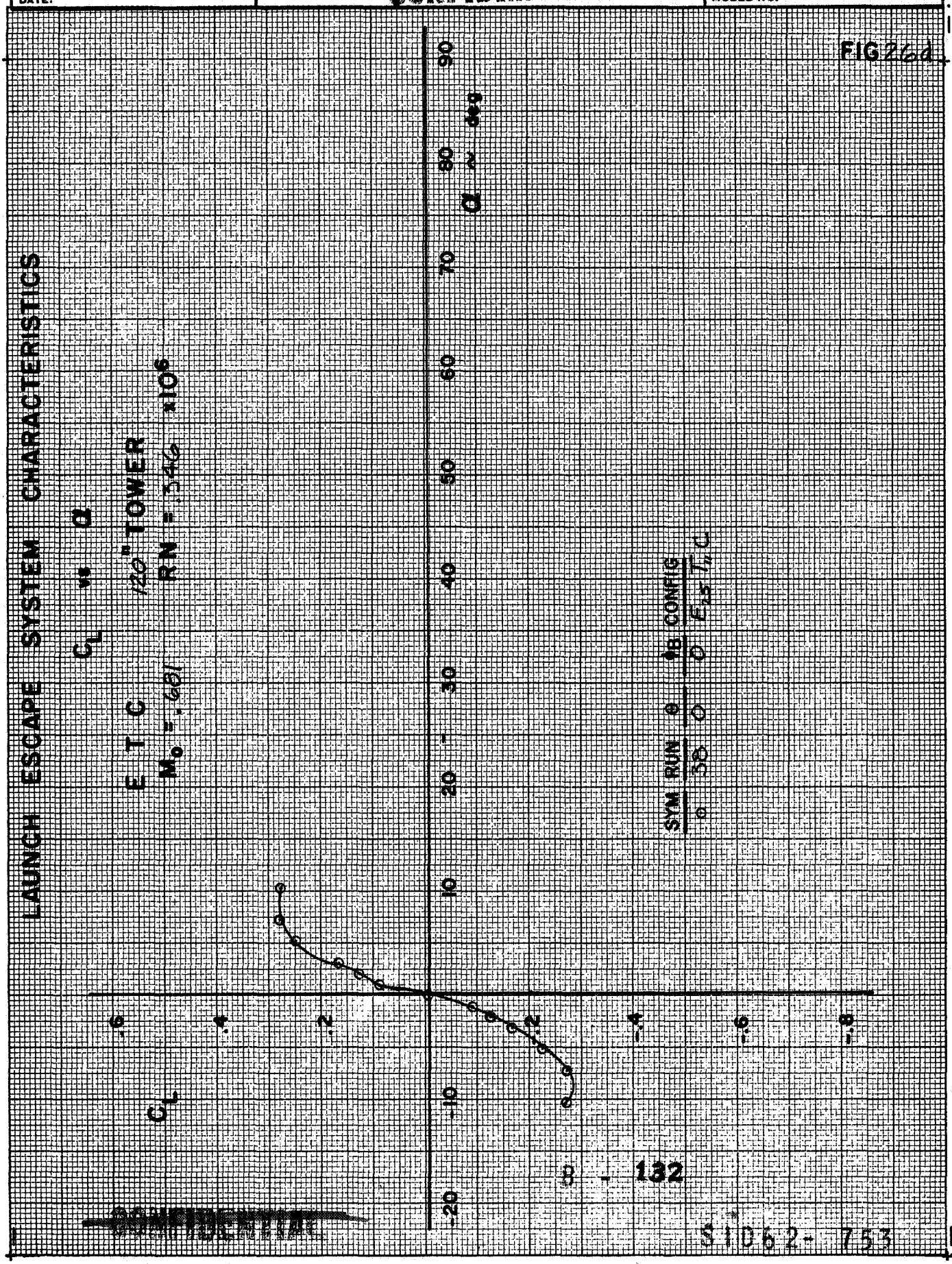
FIG 26d

C_L vs α 201-38



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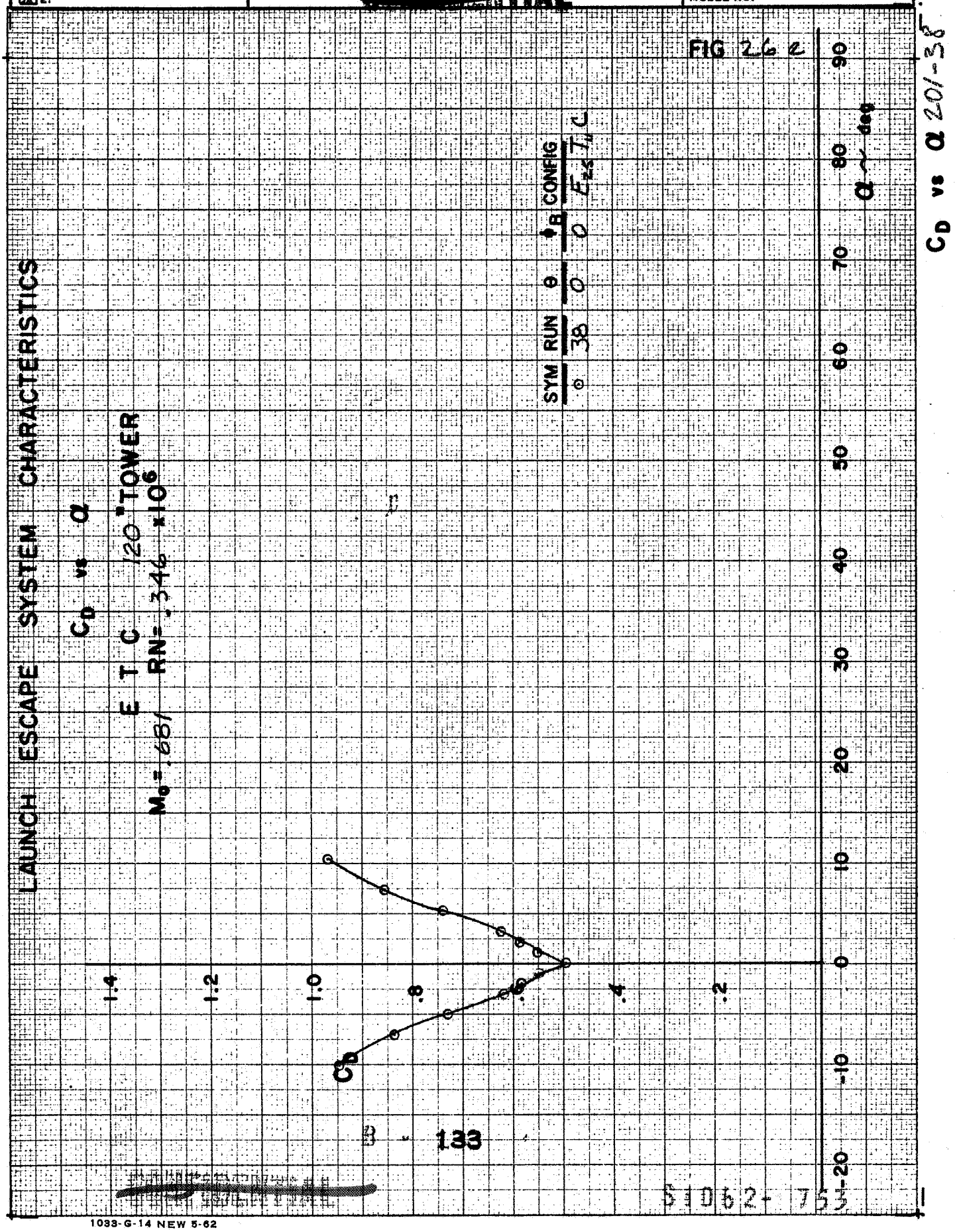

[redacted]

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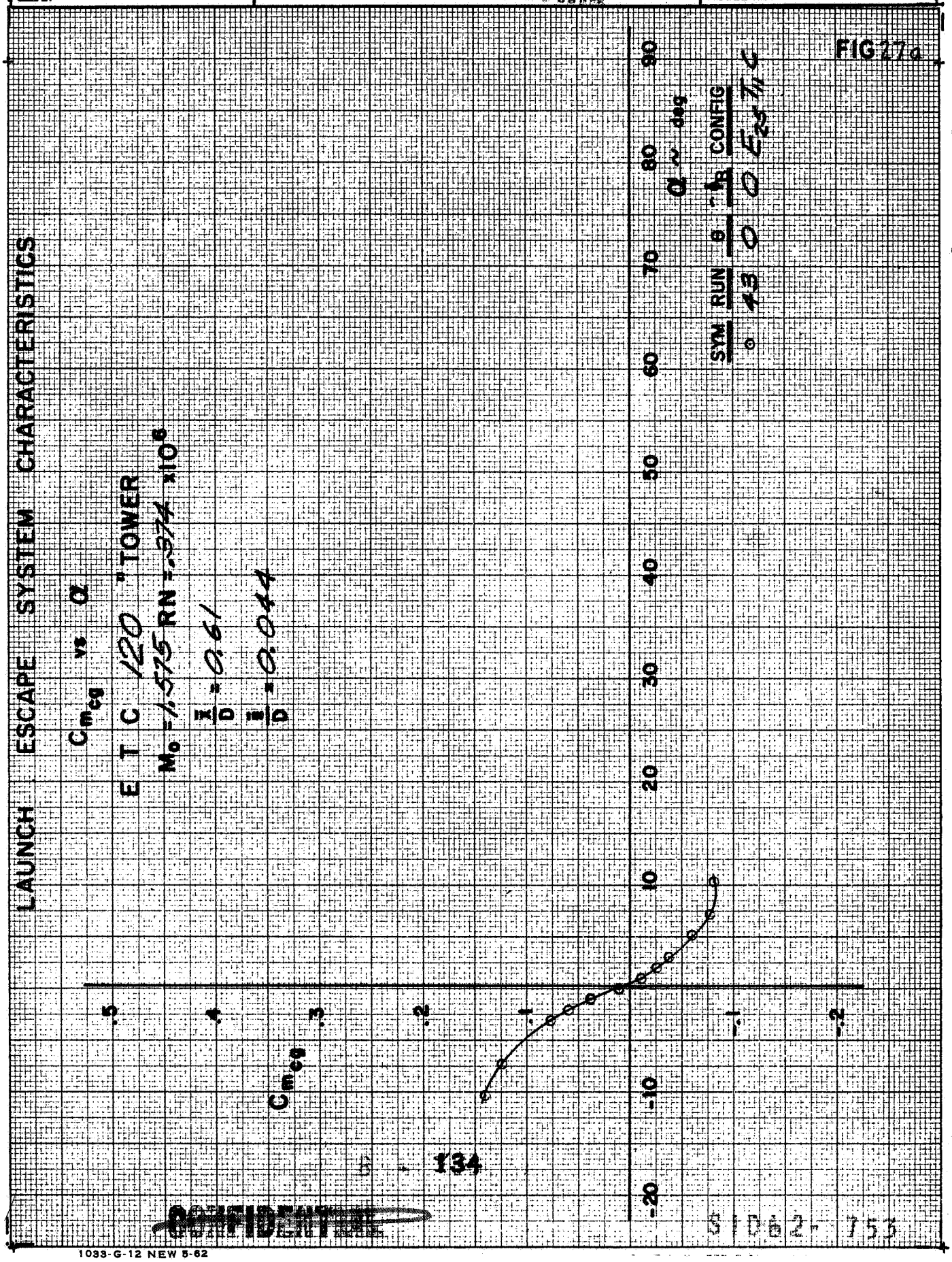
FIG 27a



$C_{m_{cg}}$ vs α 201-43

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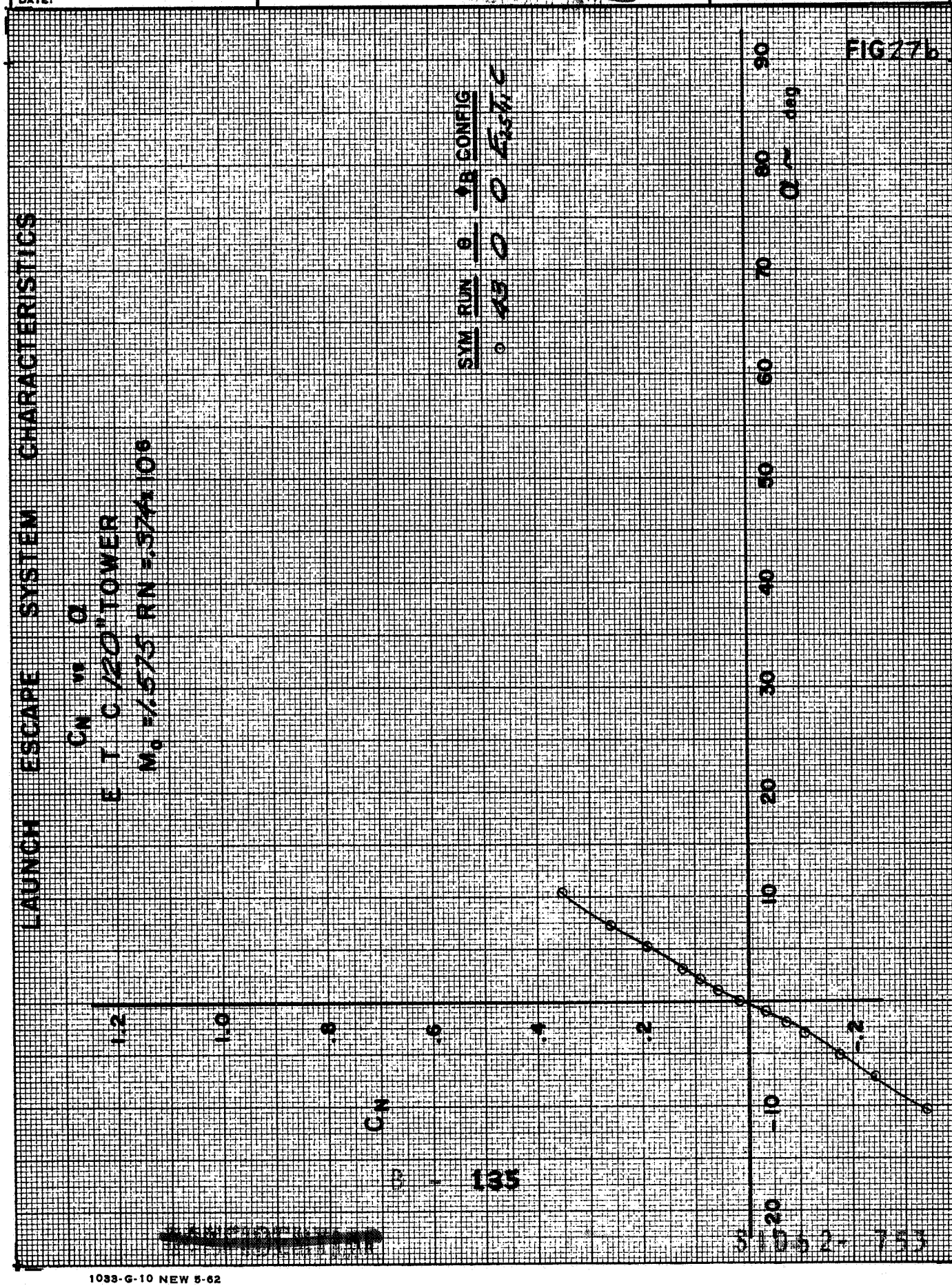

FIG 27b

C_N vs α 201-43

[redacted]

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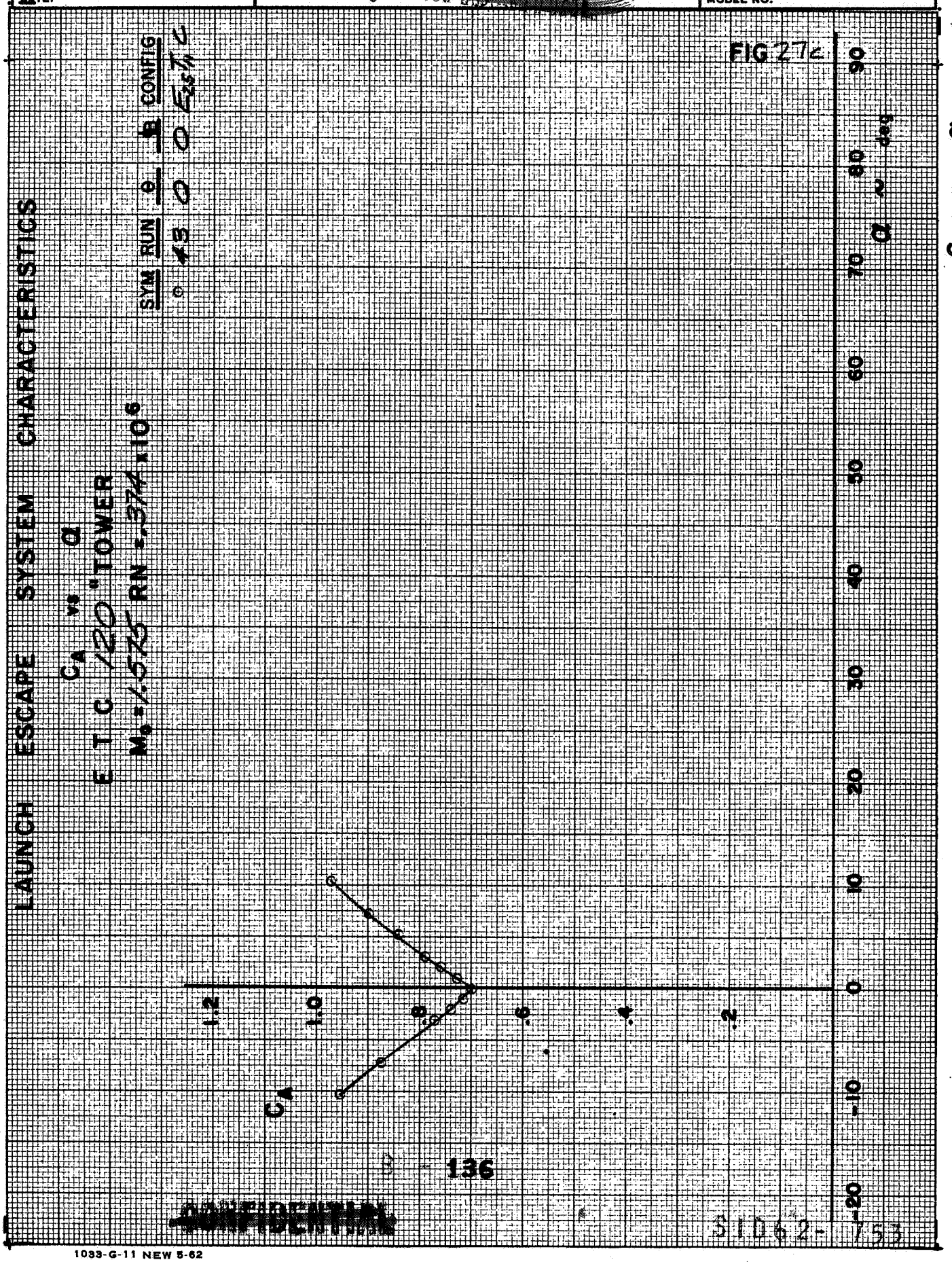

FIG 27c

C_A vs α 201-43

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S1062-753

1033-G-11 NEW 5-62

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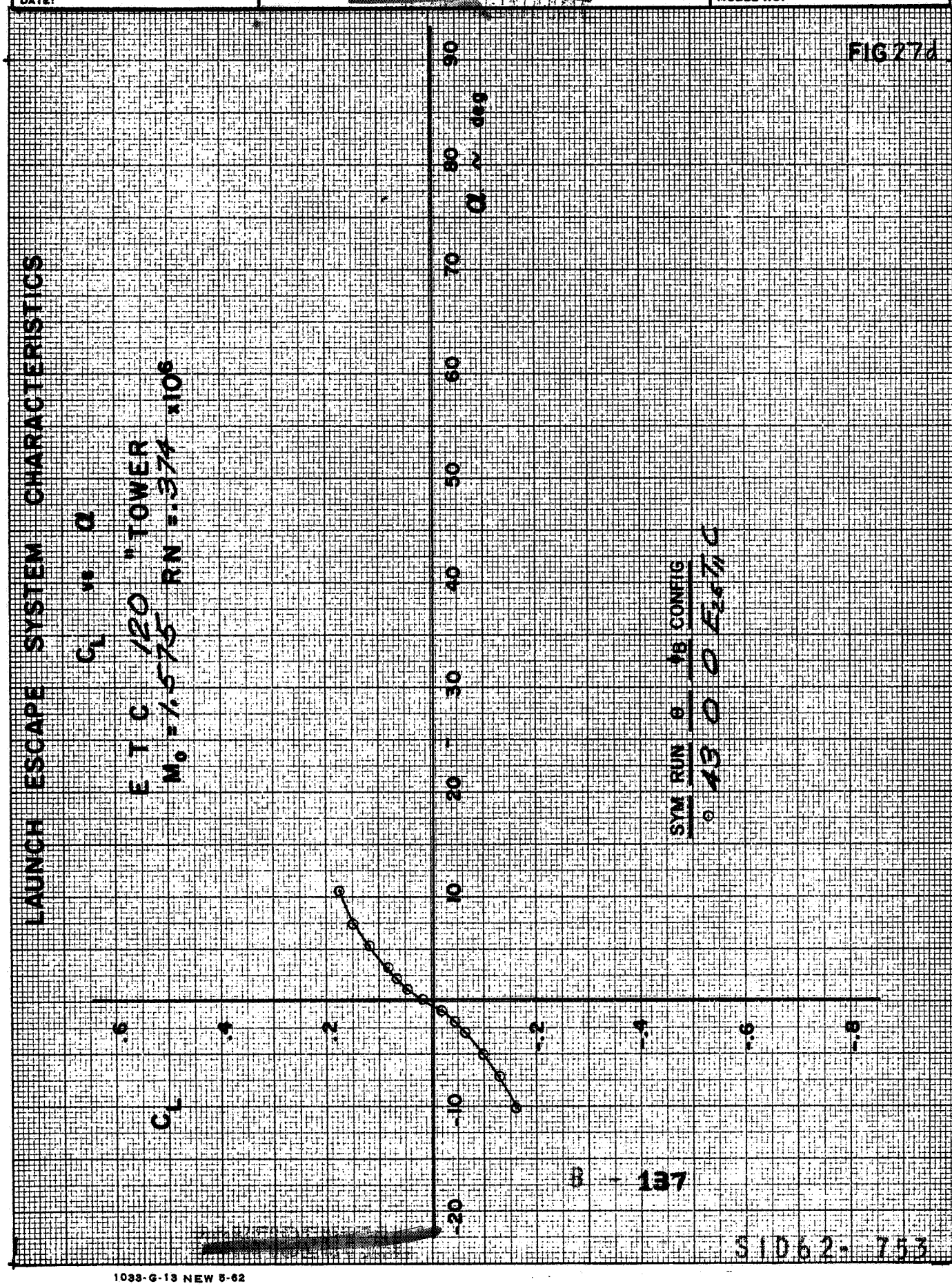
FIG 27d

C_L vs α 201 = 43



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[redacted]

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1033-G-13 NEW 5-62

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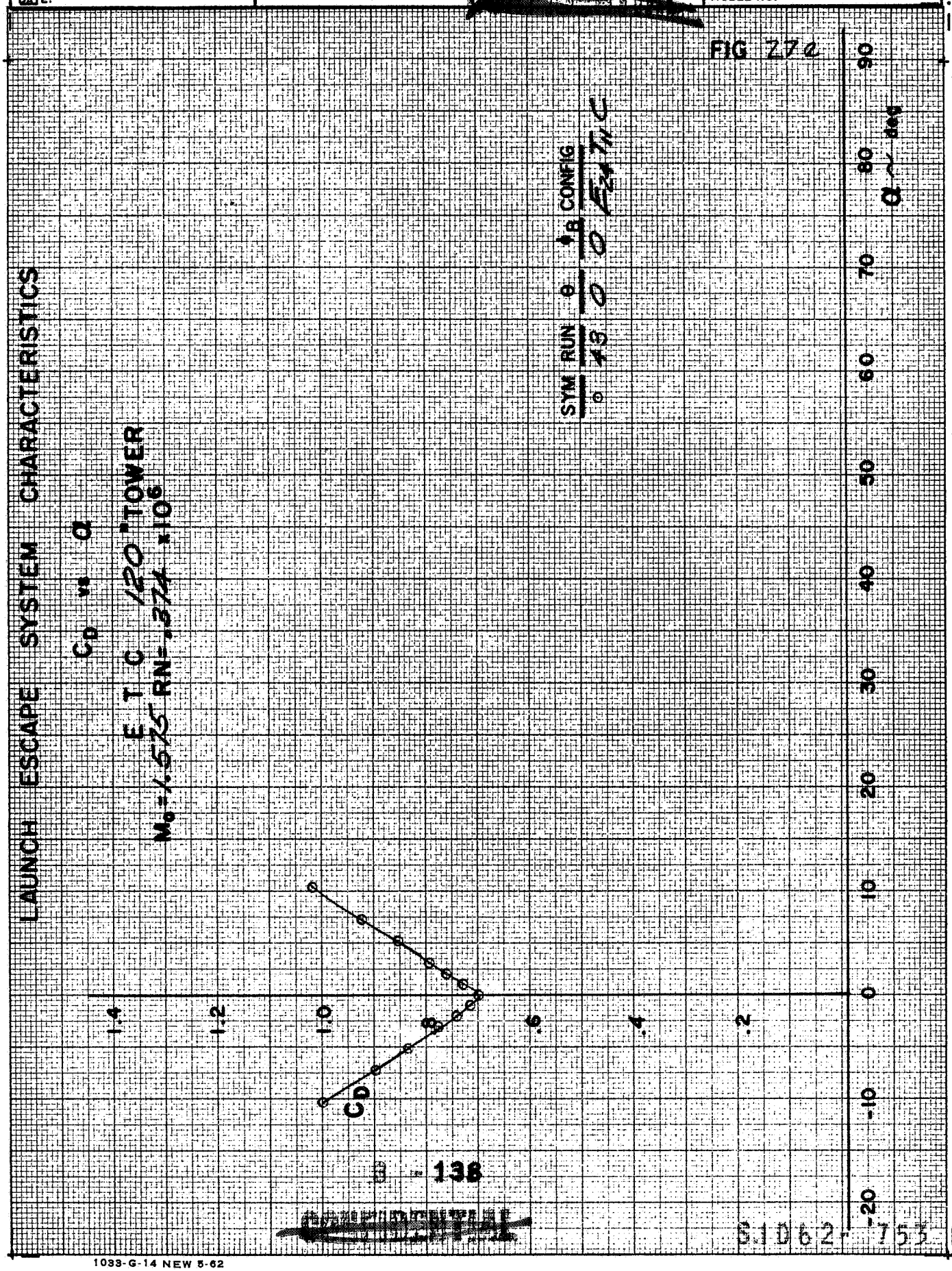
FIG 27e



C_D vs α 201-43

[redacted]

S1062-753

1033-G-14 NEW 5-62

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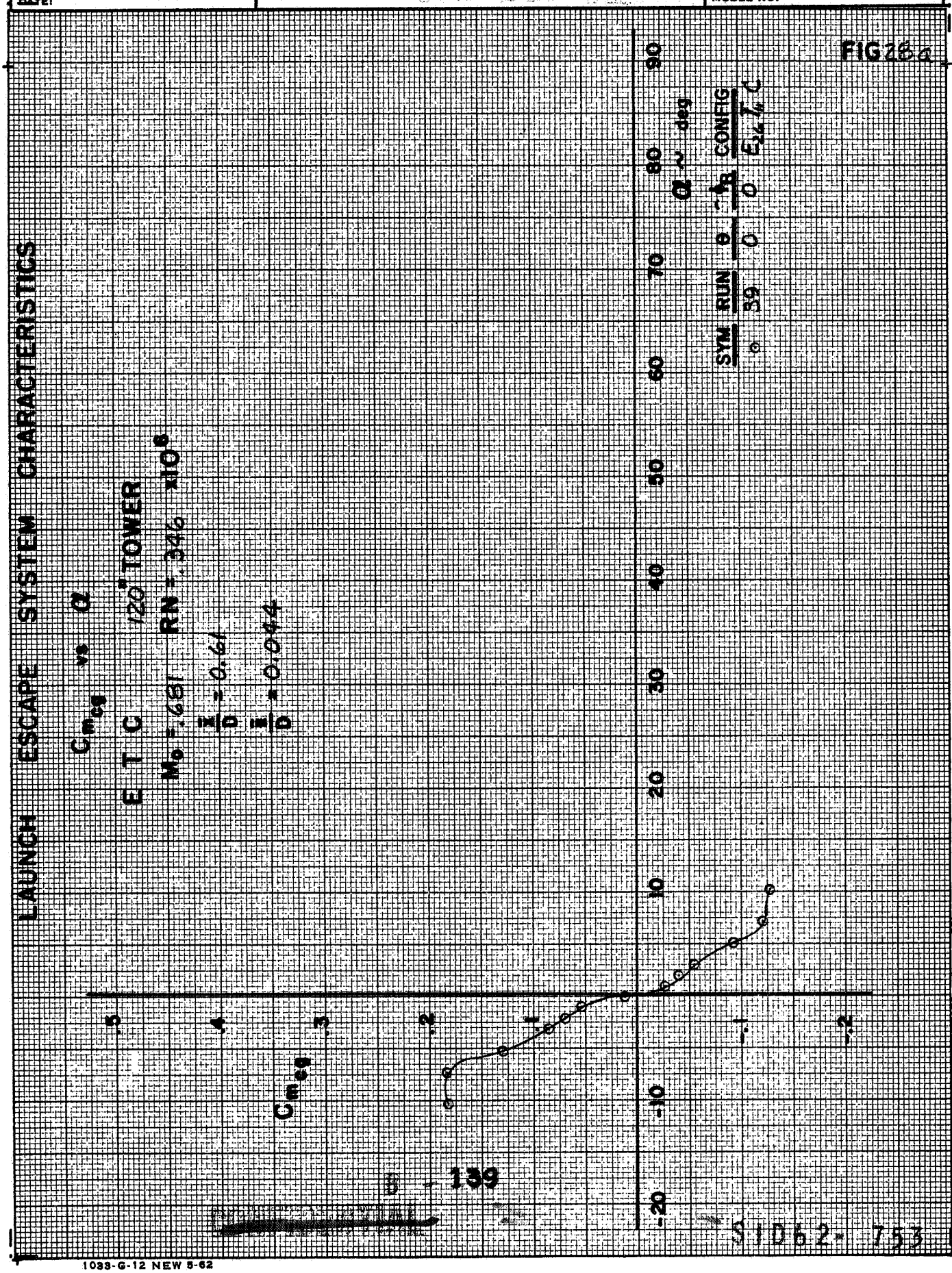
FIG 28a



$C_{m_{cg}}$ vs α 201-39

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[redacted]

SID62-753

1033-G-12 NEW 5-62

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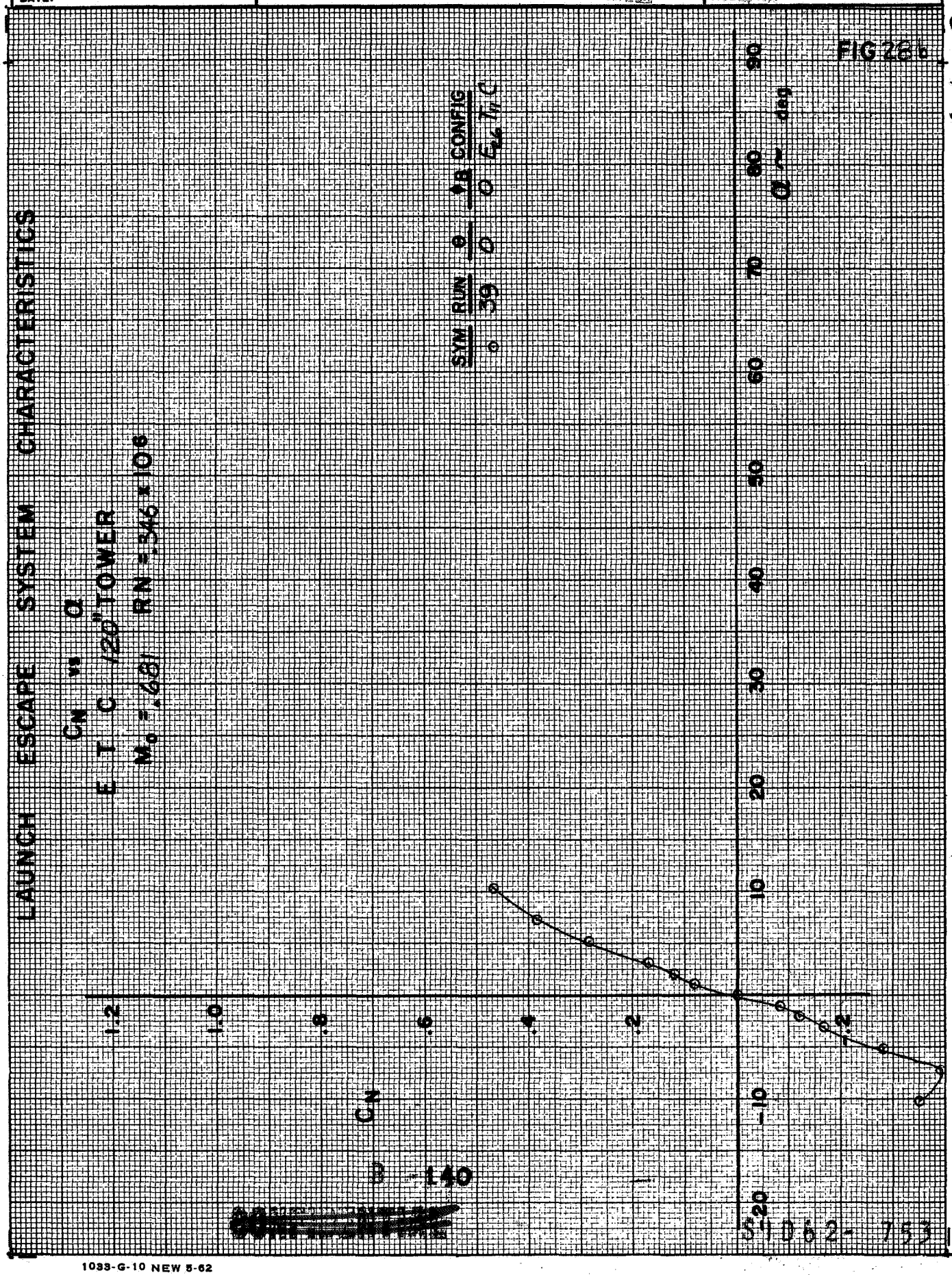

FIG 28b

C_N vs α 201-39

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[redacted]

S1D62-753

1033-G-10 NEW 5-62

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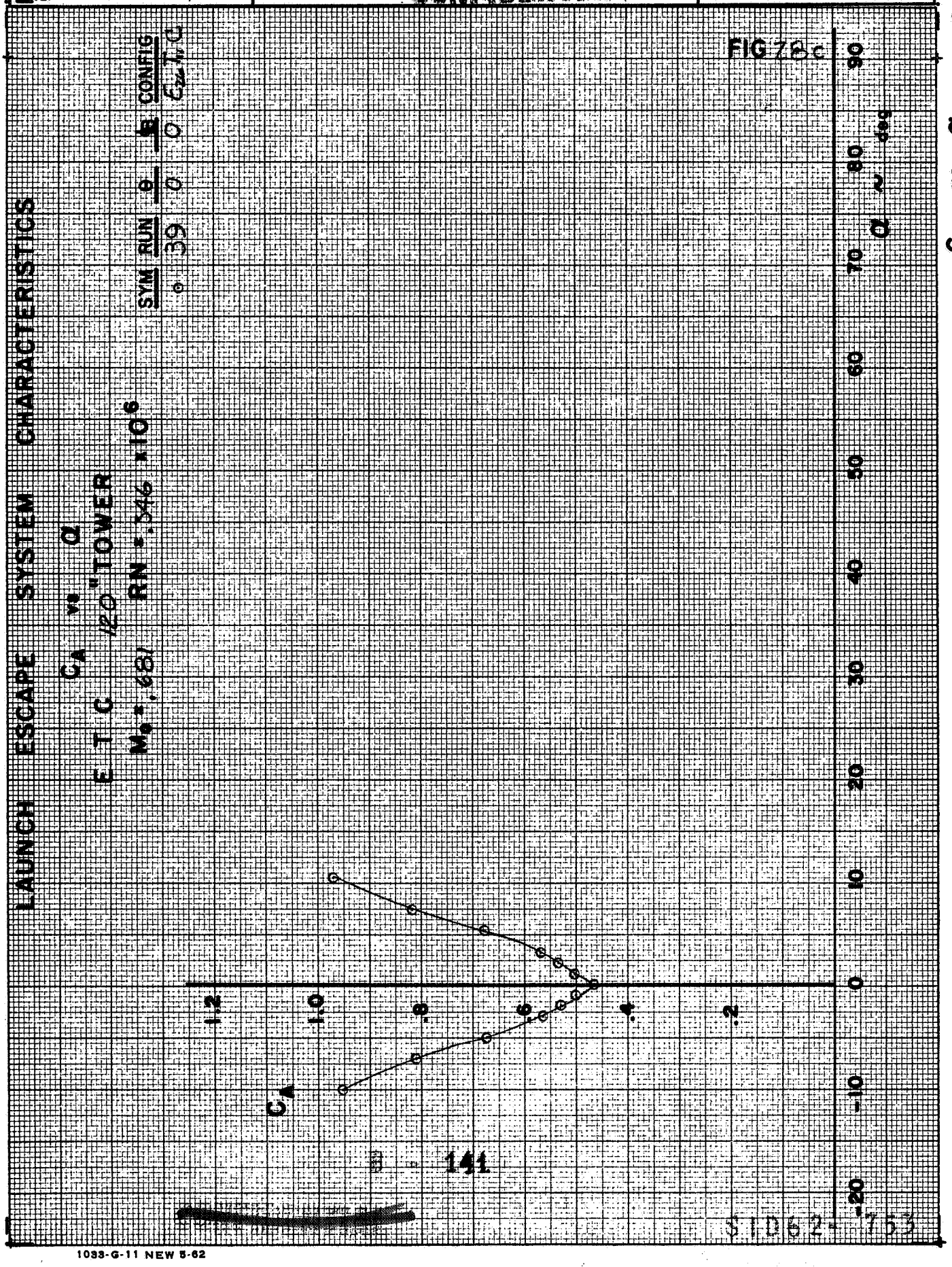
201-39



[redacted]

SID62-753

1033-G-11 NEW 5-62

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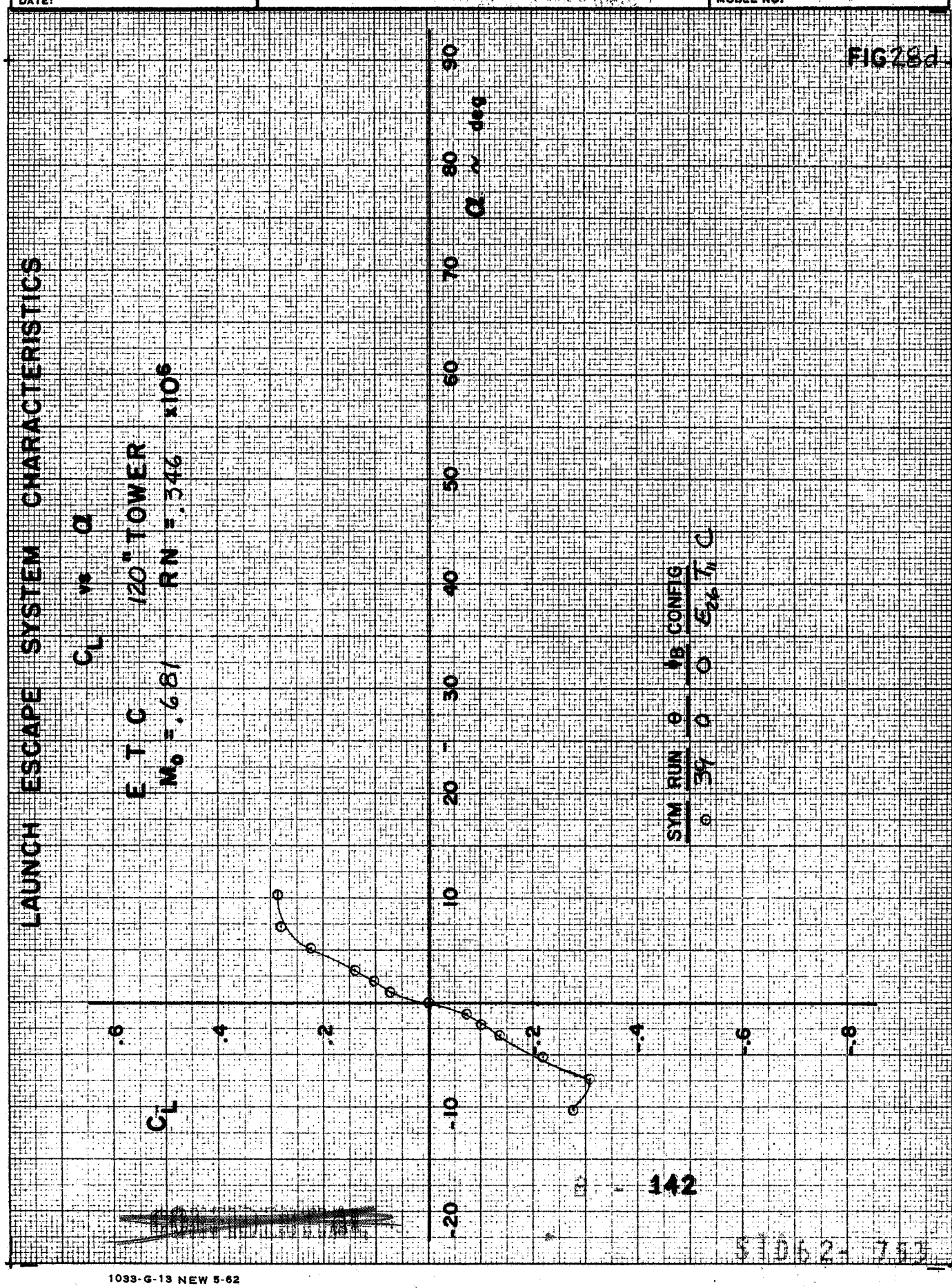
FIG 28d

C_L vs α 201-39



51062-763

1033-G-13 NEW 5-62

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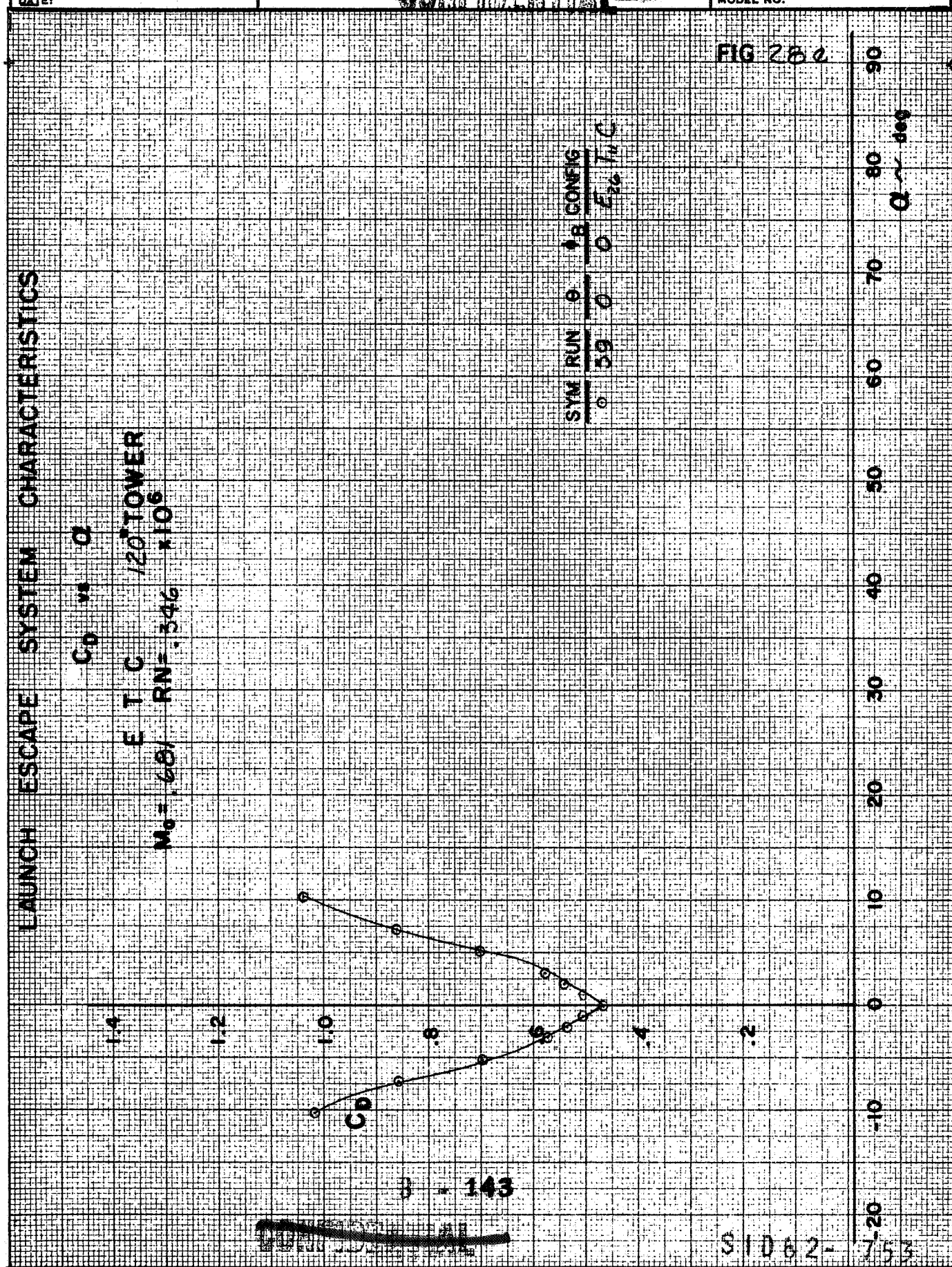

C_D vs α 201-39

[redacted]

S1062-753

1033-G-14 NEW 5-62

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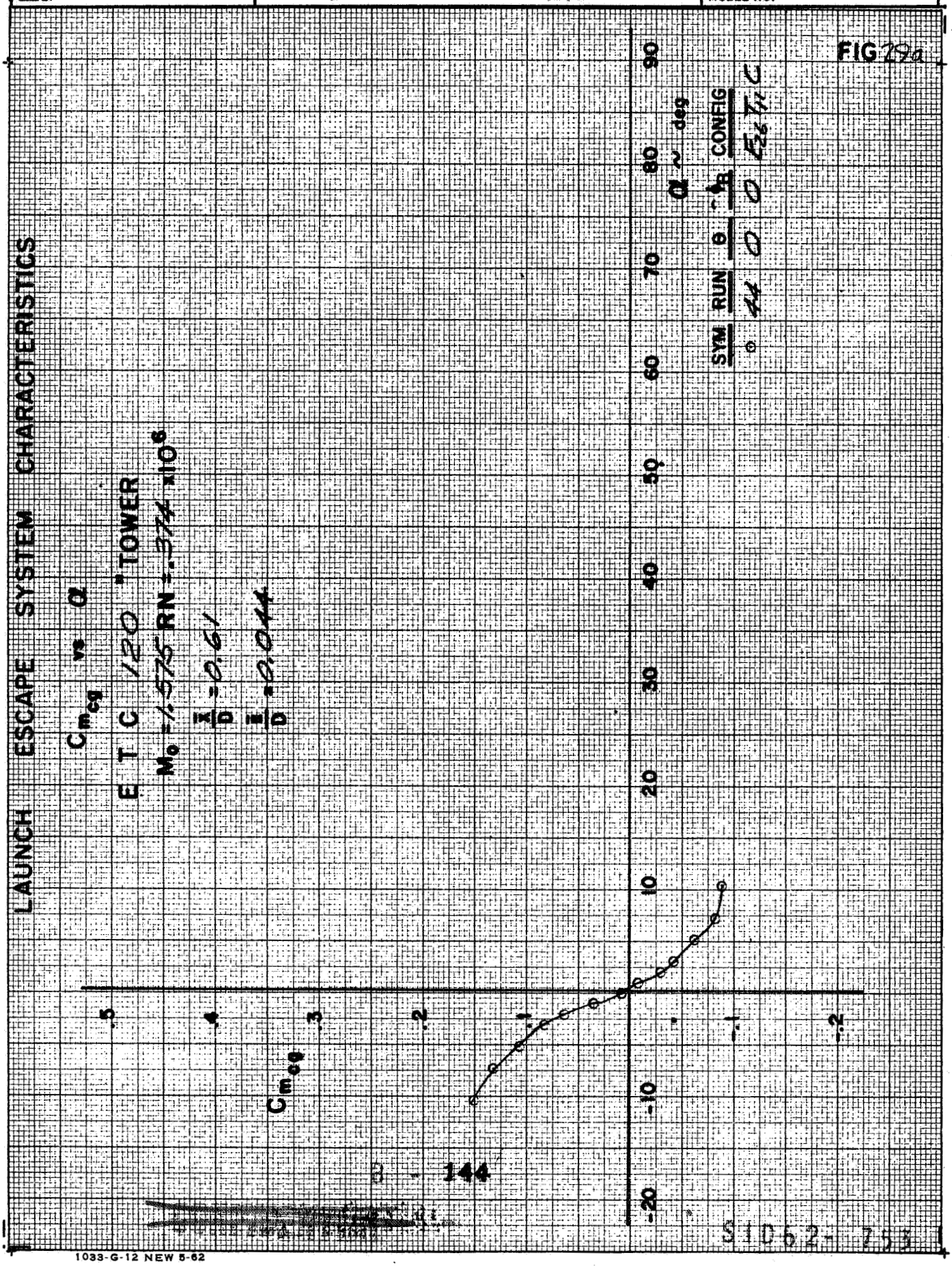
FIG 29a



$C_{m_{cg}}$ vs α 201-44

[redacted]

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1033-G-12 NEW 5-62

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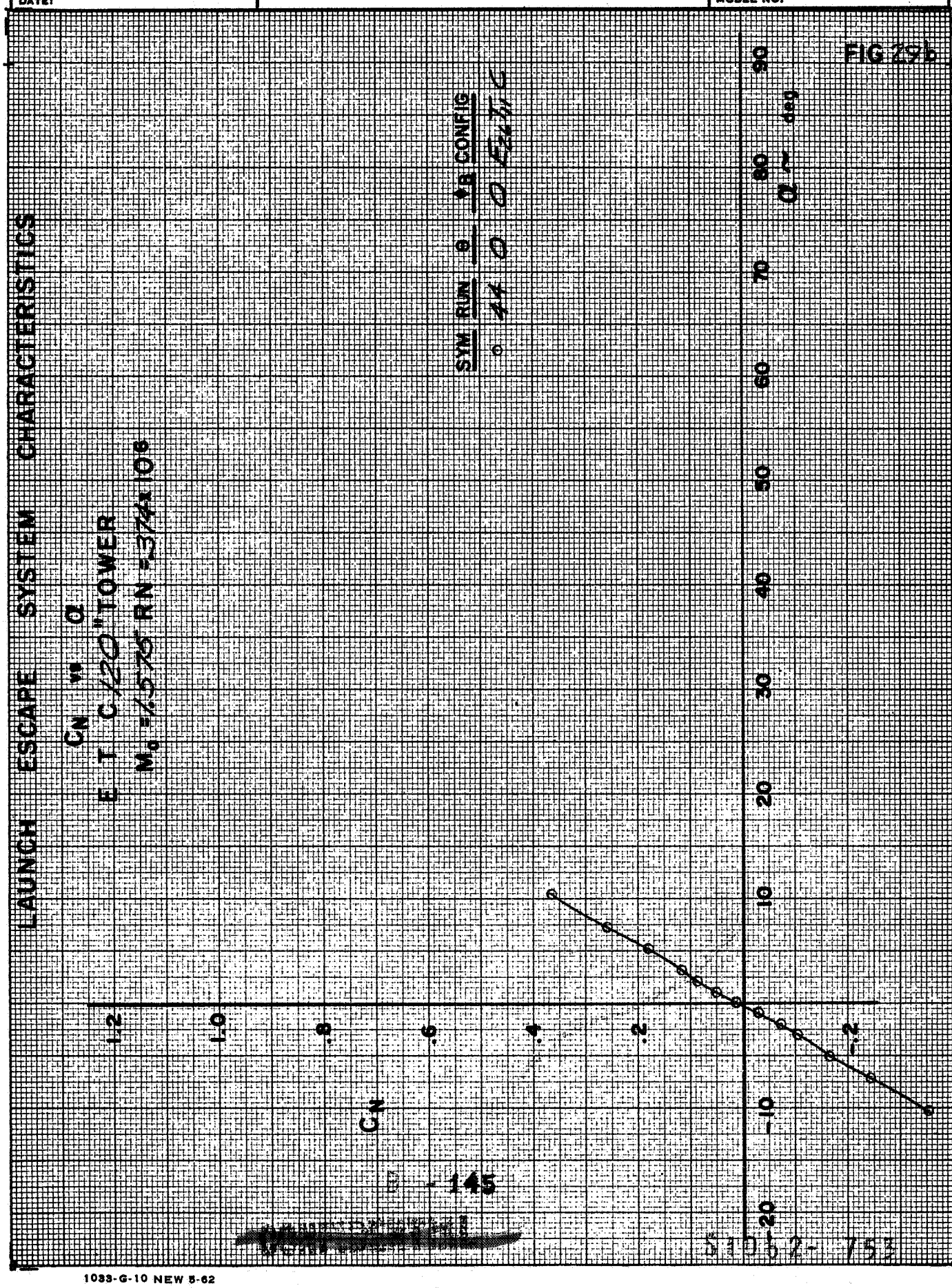

FIG 29b

C_N vs α 201-44

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1033-G-10 NEW 5-62

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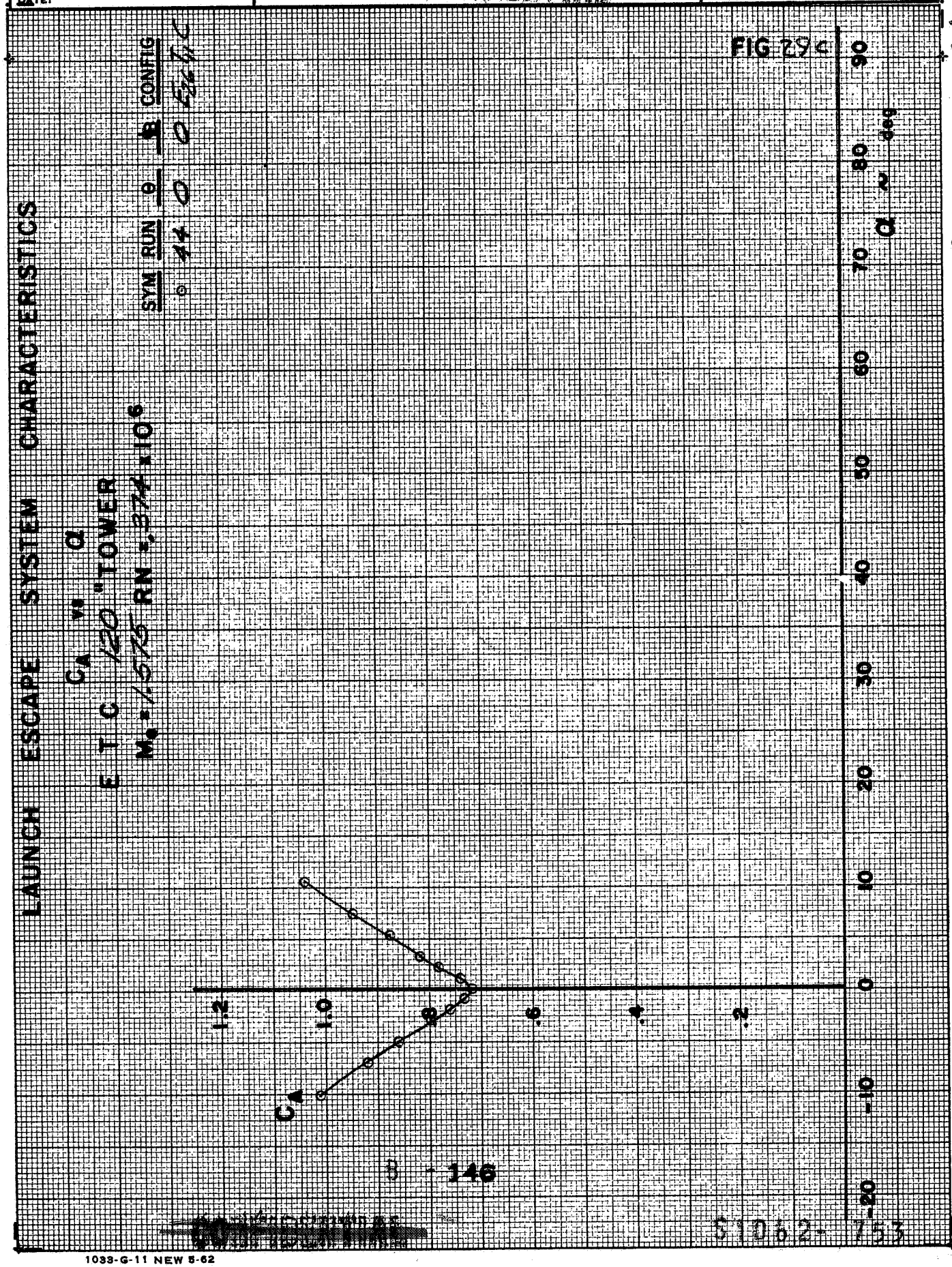

FIG 29c

C_A vs α 201-44

[redacted]

S1062-753

1033-G-11 NEW 5-62

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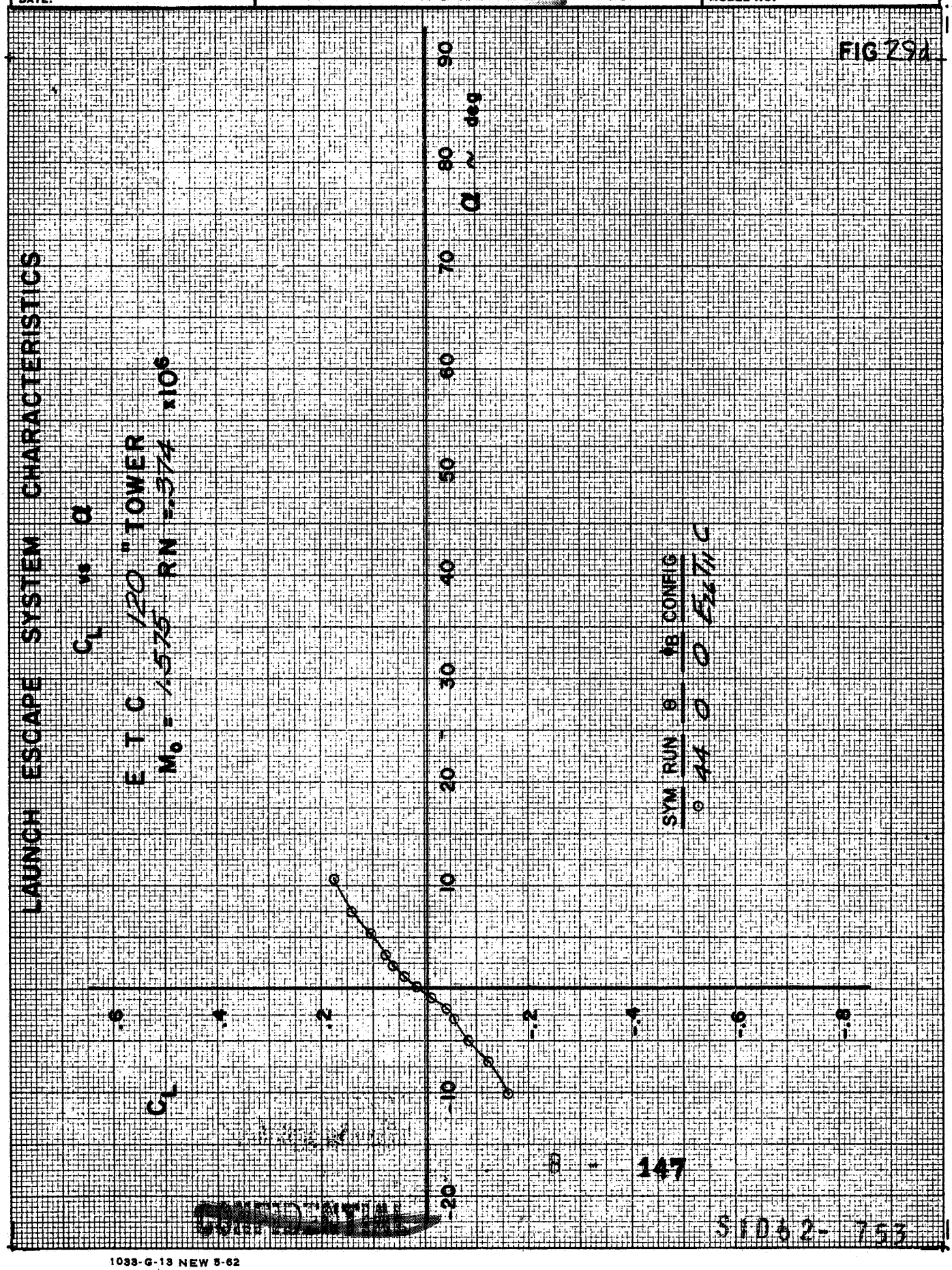
FIG 29d

C_L vs α 201-44



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1033-G-13 NEW 5-62

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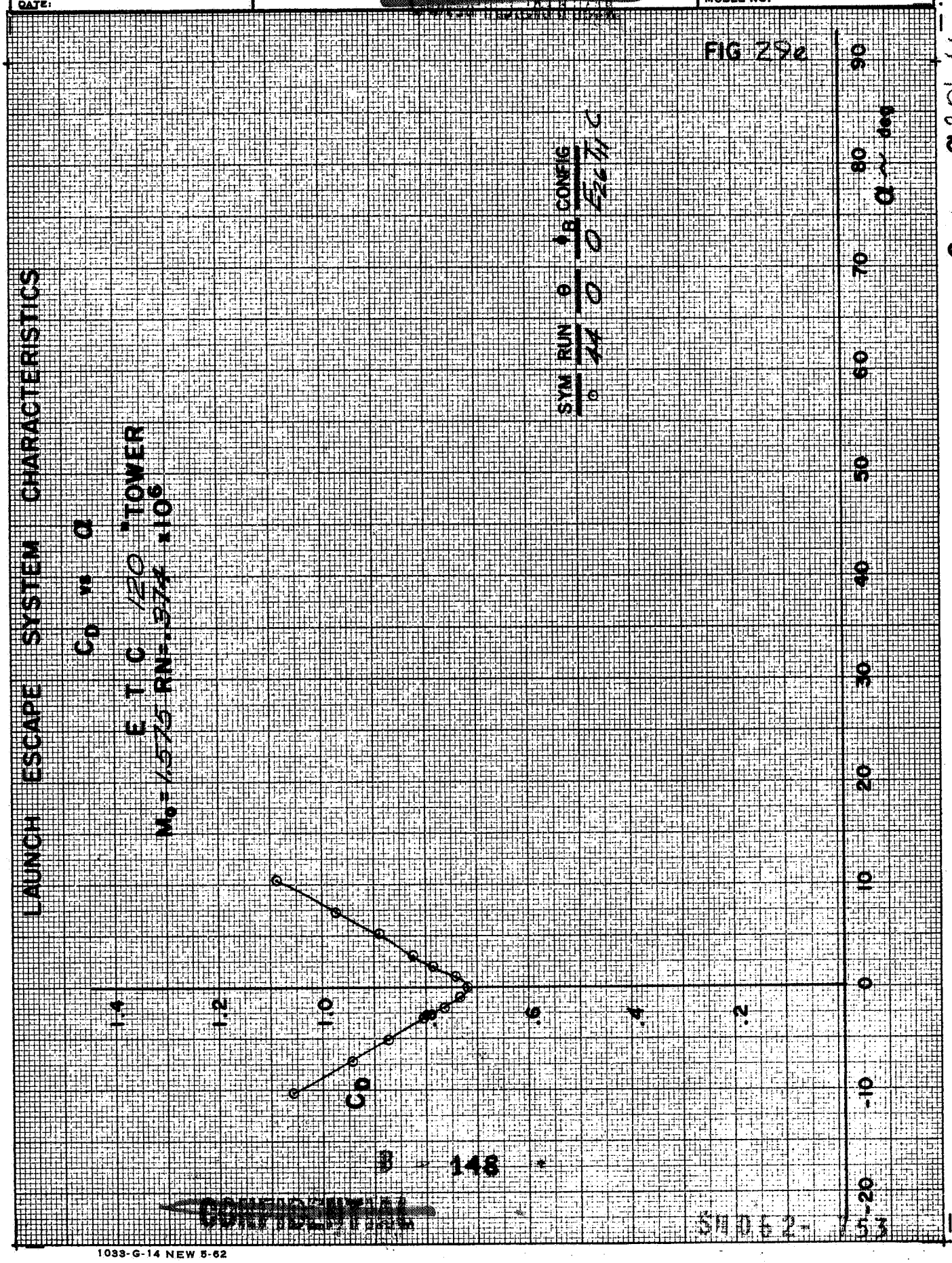

FIG 29e

C_D vs α 201-44

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1033-G-14 NEW 5-62

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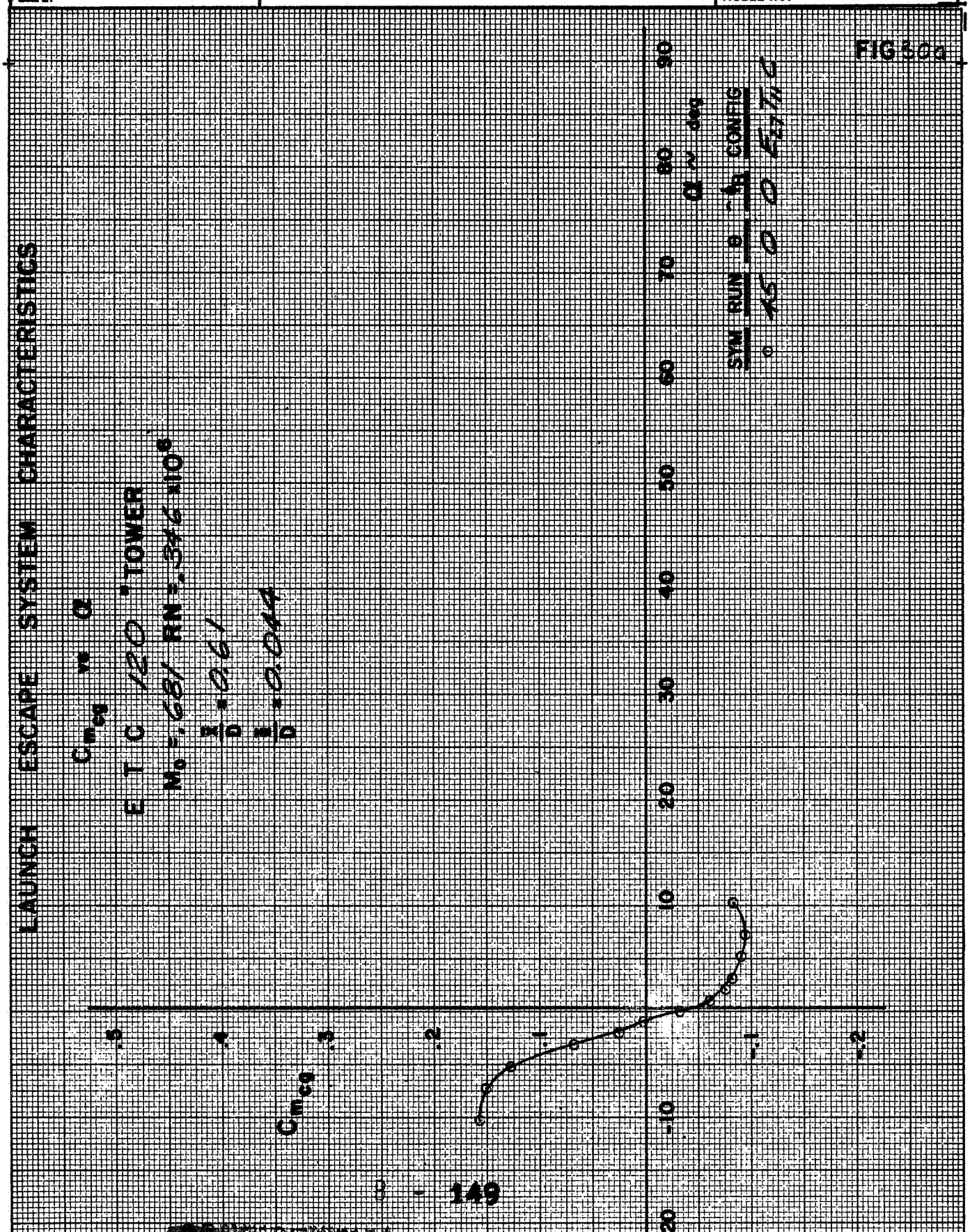
FIG 30a



$C_{m_{cg}}$ vs α 201-45

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S1062-753

1033-G-12 NEW 5-62

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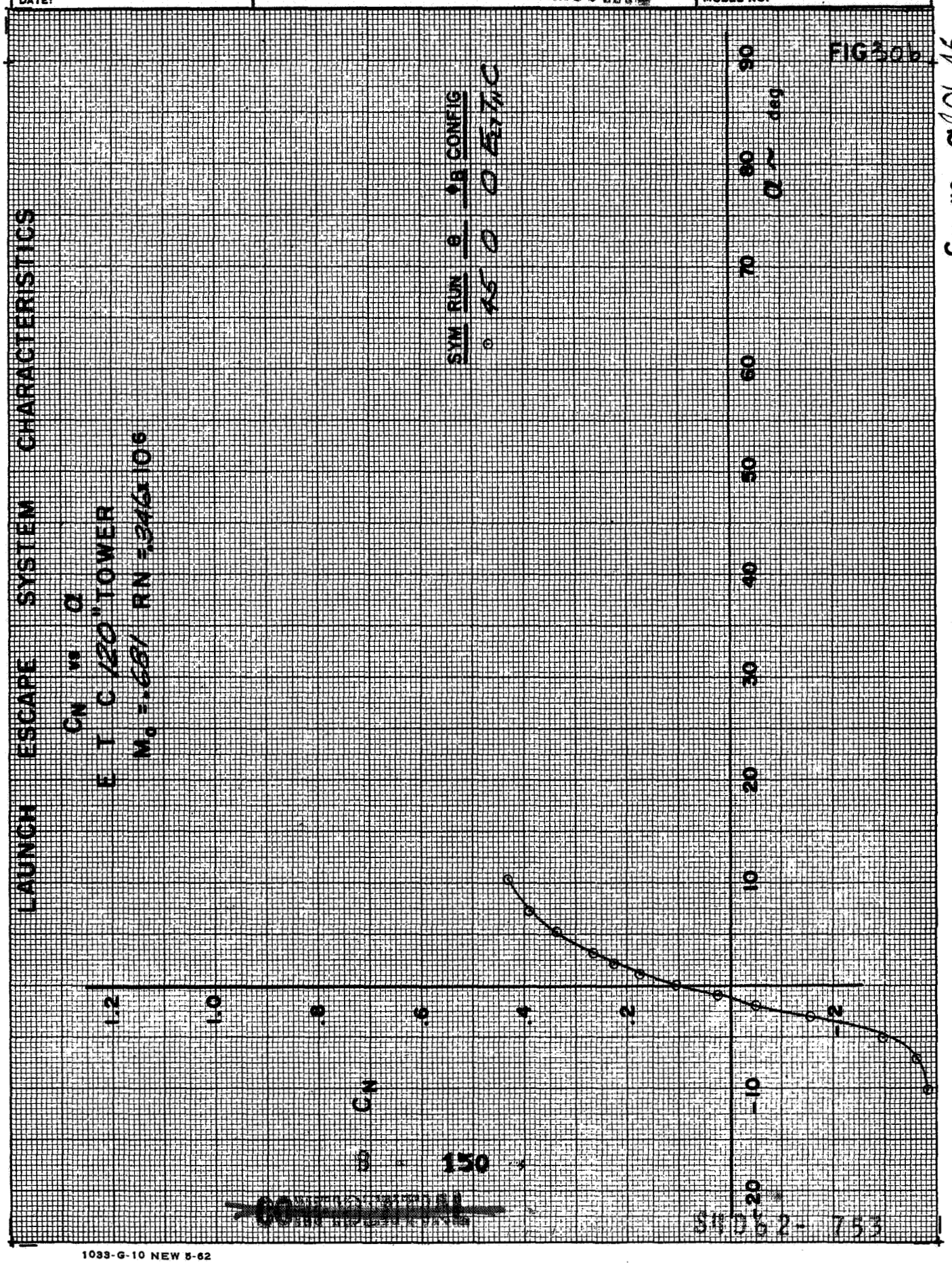

FIG 30b

C_N vs α 201-45

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SUD62-753

1033-G-10 NEW 5-62

LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_A vs α

E T C 120" TOWER

M_∞ = .681 RN = .346 x 10^6

SYM	RUN	θ	ϕ	CONFIG
○	15	0	0	5% C

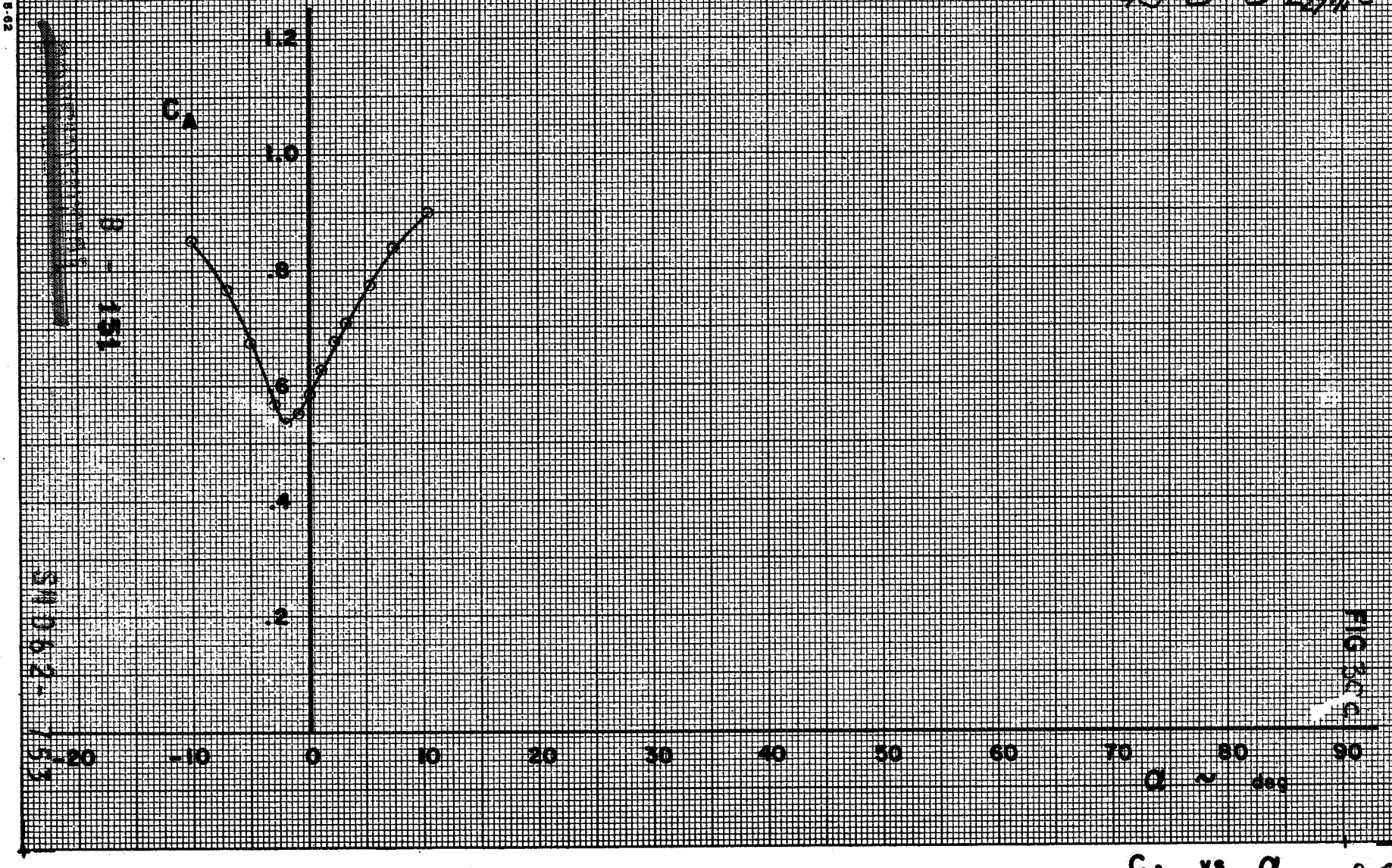

FIG 25 C

C_A vs α

201-45

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1033-G-11 NEW 8-62

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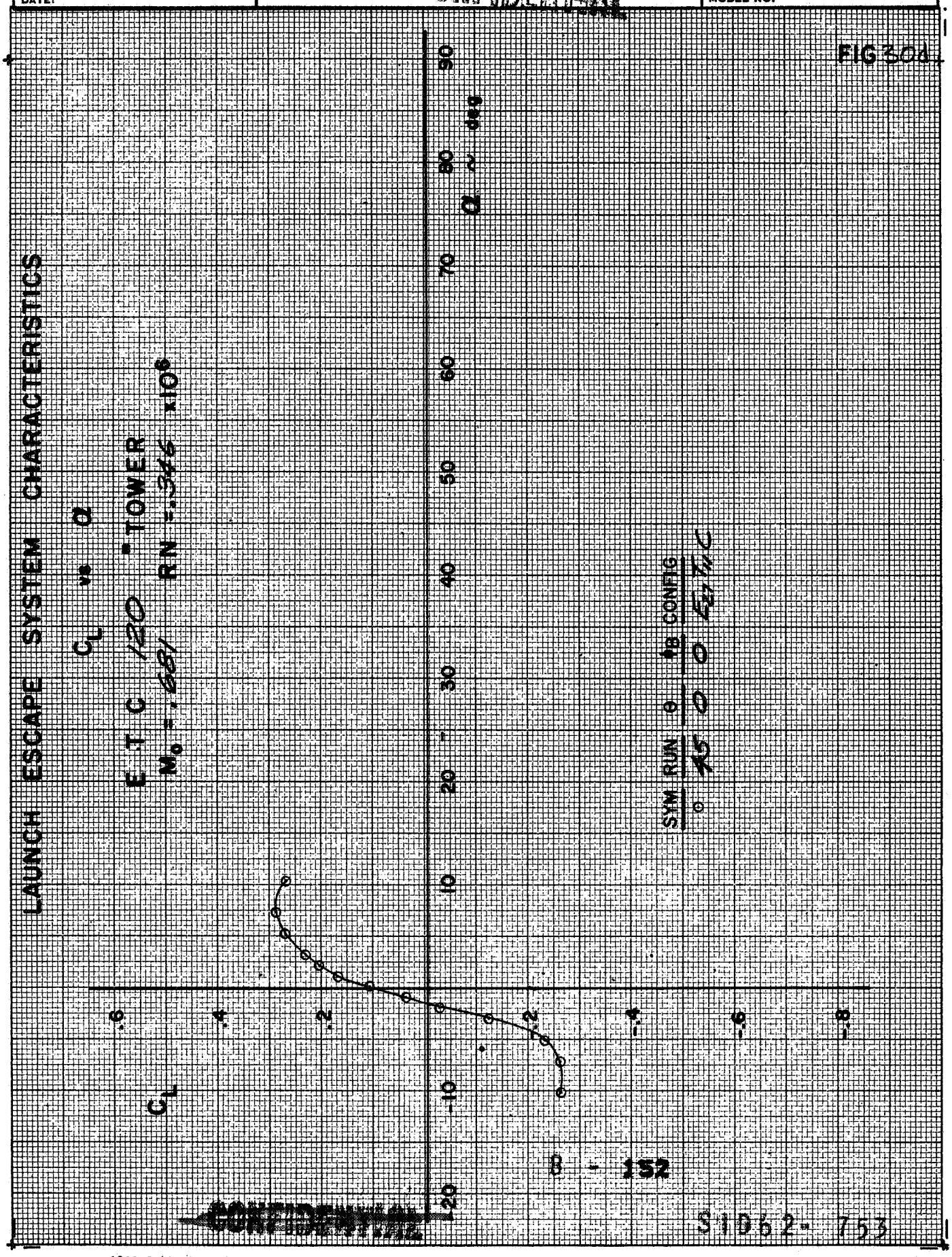

FIG 30d

201-45

C_L vs α

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1033-G-13 NEW 5-62

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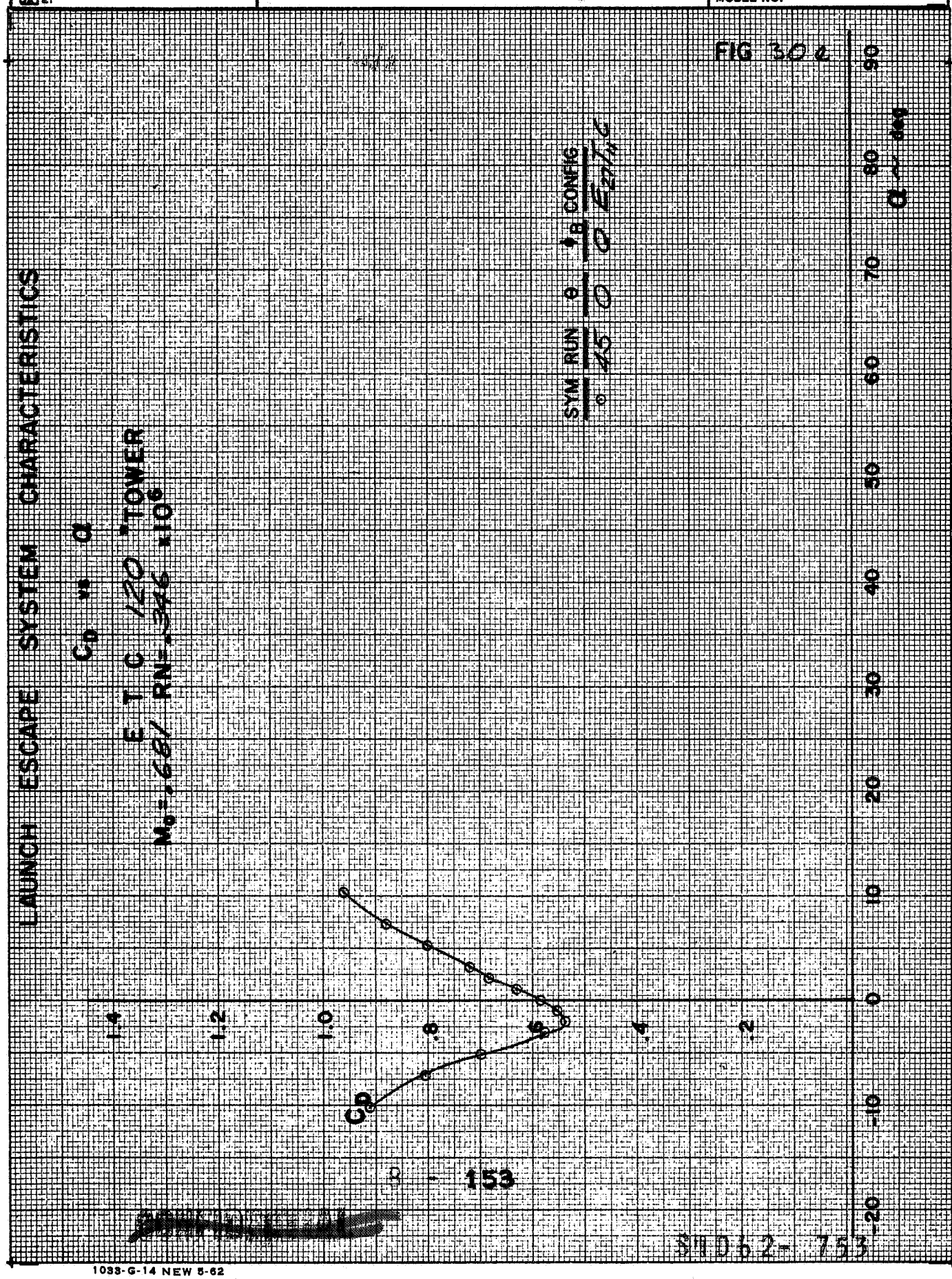

C_D vs α 201-45

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1033-G-14 NEW 5-62

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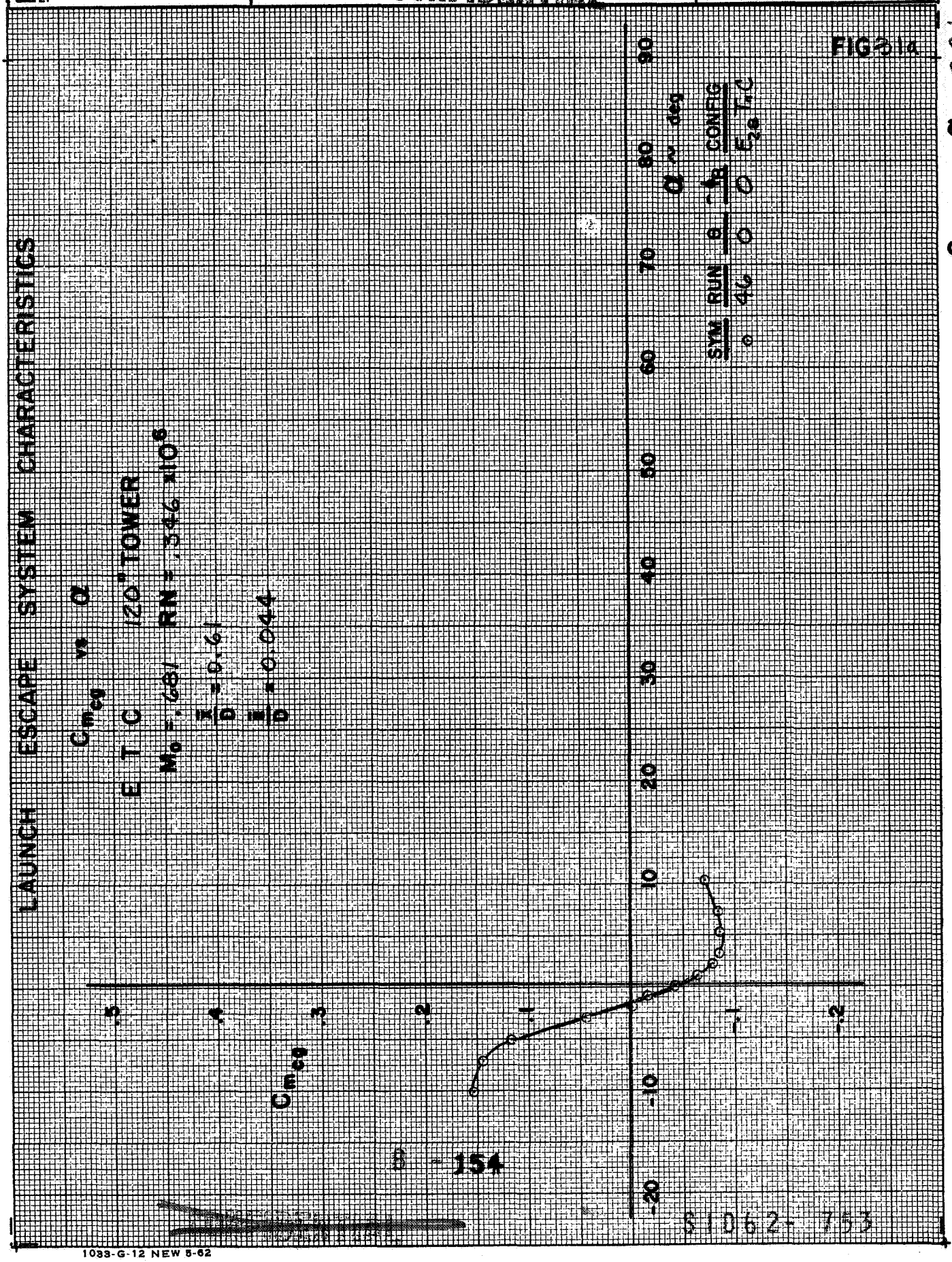

FIG 31a

$C_{m_{cg}}$ vs α 201-46

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1033-G-12 NEW 5-62

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LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_N vs α

E T C 120" TOWER

$M_o = .681$ $RN = .346 \times 10^6$

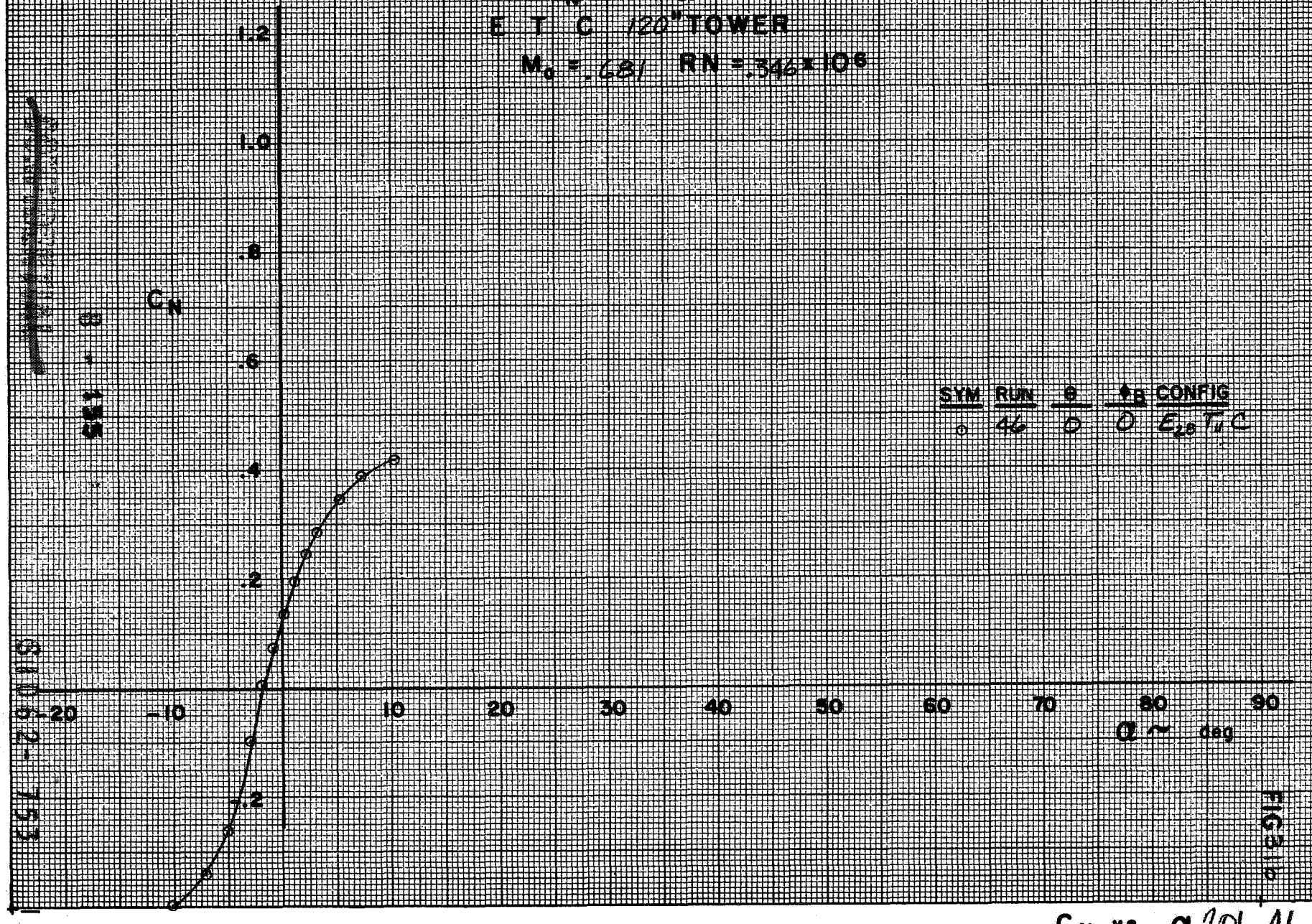

FIG 3.10

C_N vs α 201-46

1033-G-10 NEW 5-62

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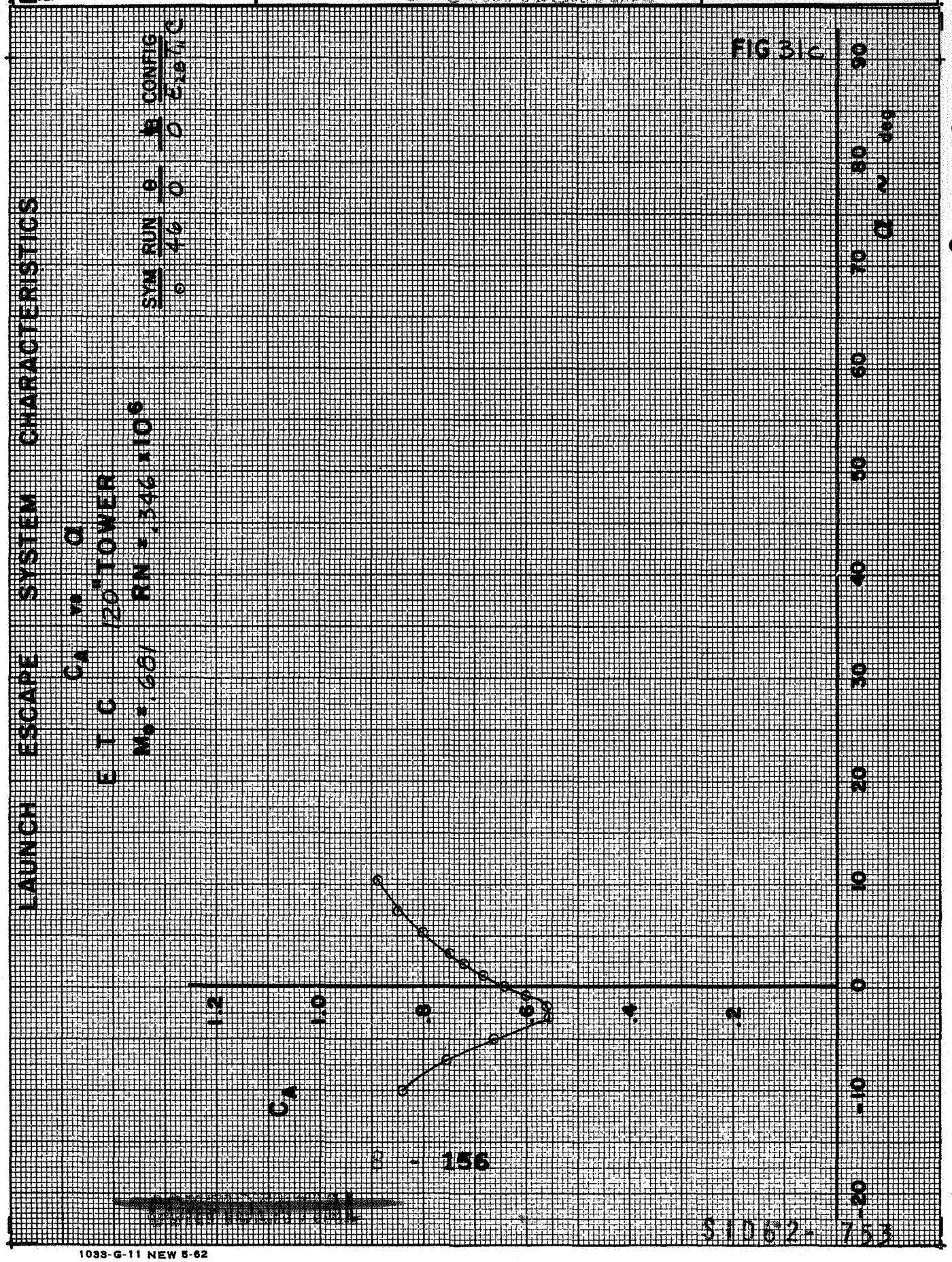

FIG 31c

C_A vs α 201-46

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1033-G-11 NEW 5-62

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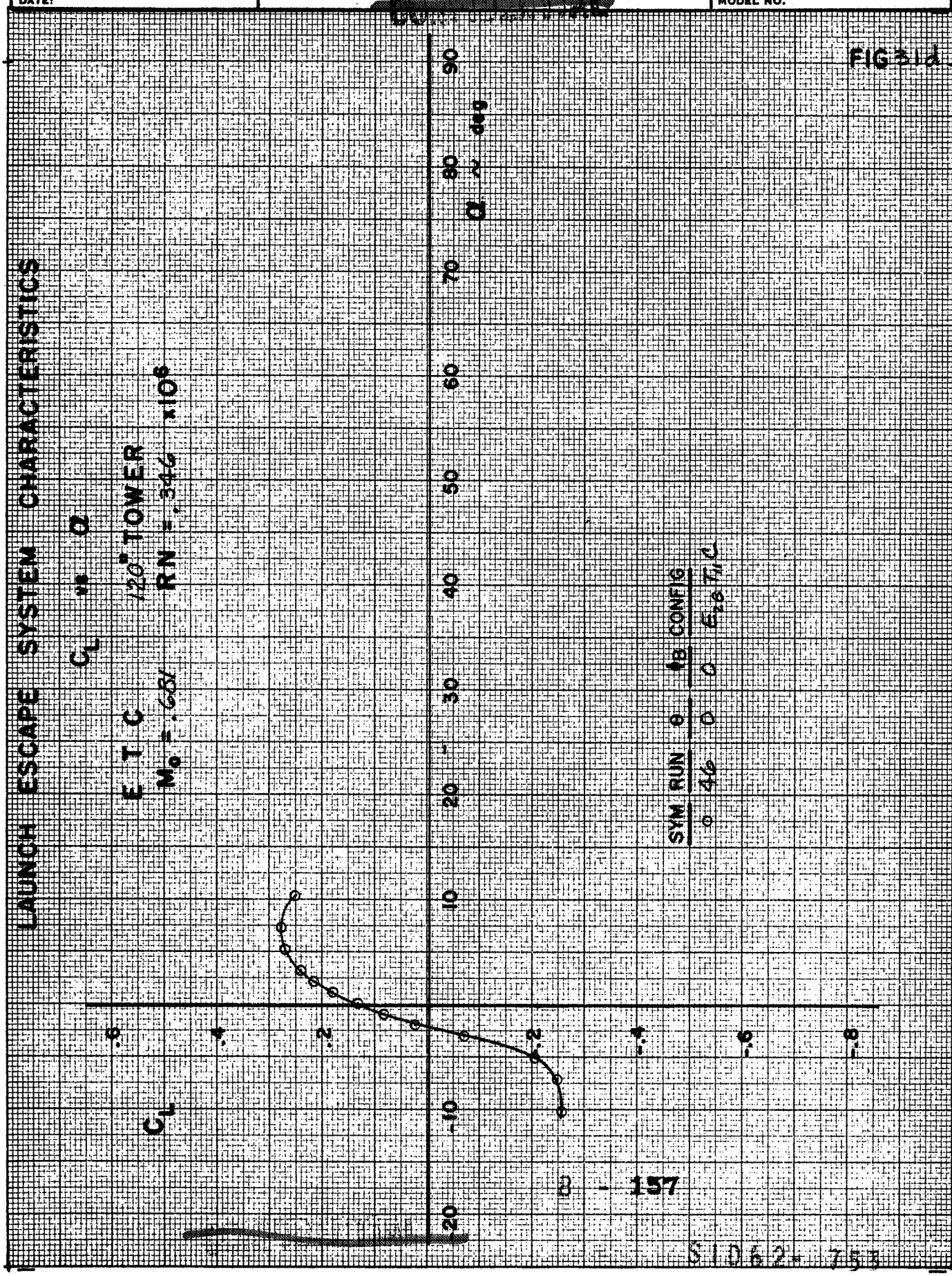
201-46

FIG 31d



C_L vs α

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1033-G-13 NEW 5-62

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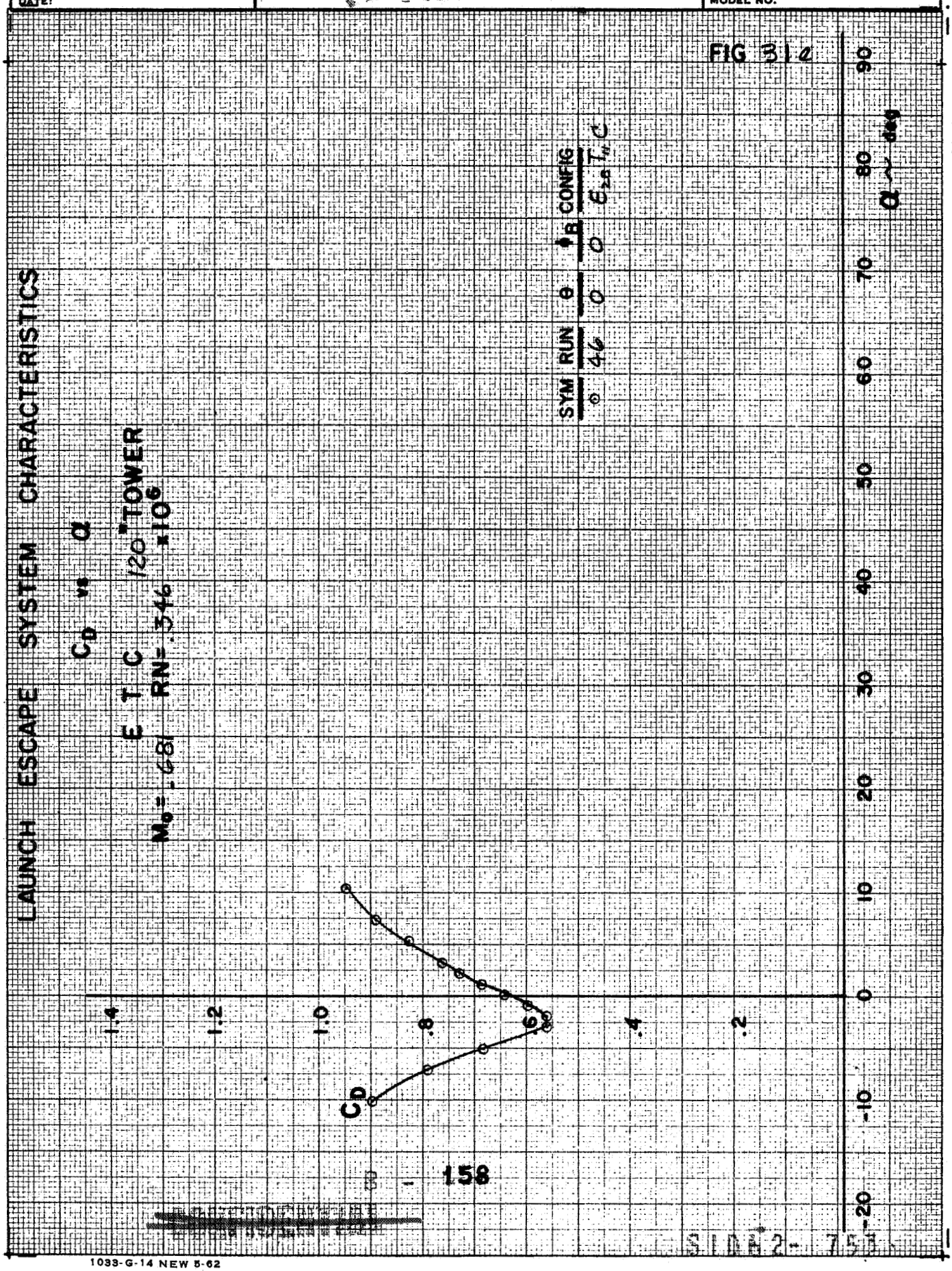

FIG 31e

C_D vs α 201-46

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1033-G-14 NEW 5-62

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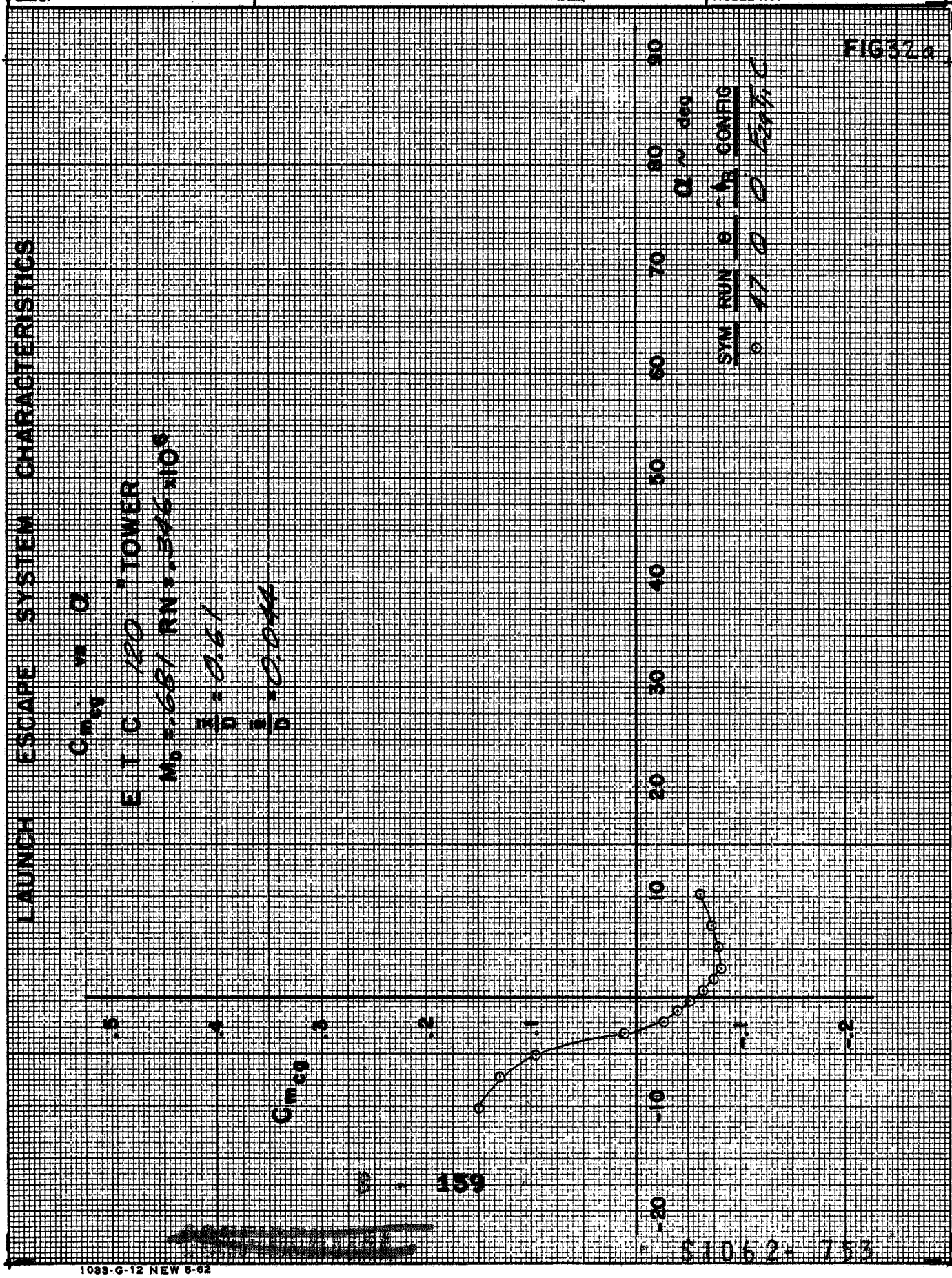
FIG 32a



$C_{m_{cg}}$ vs α 201-47

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1033-G-12 NEW 5-62

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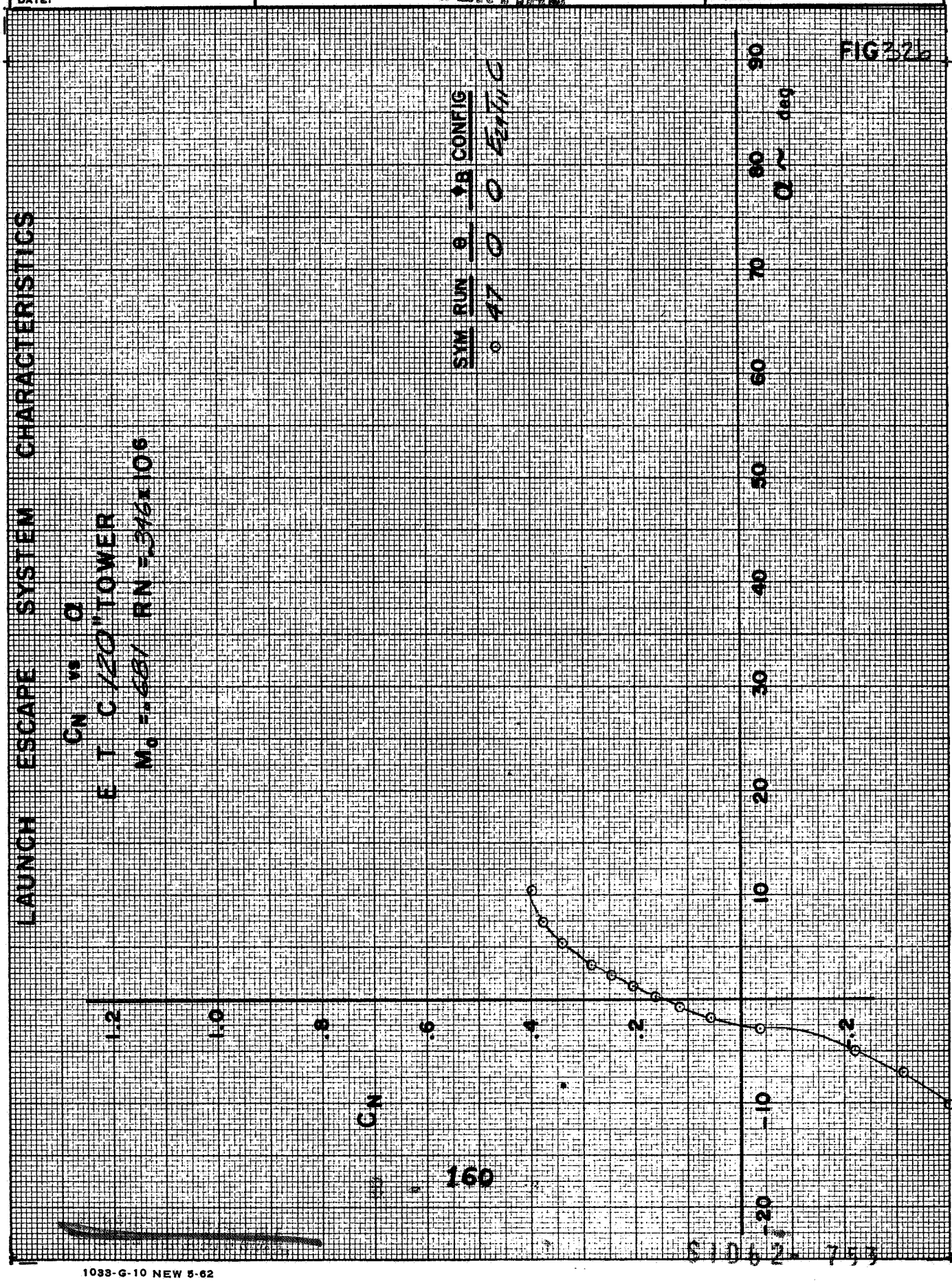

FIG 326

C_N vs α 201-47

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1033-G-10 NEW 5-62

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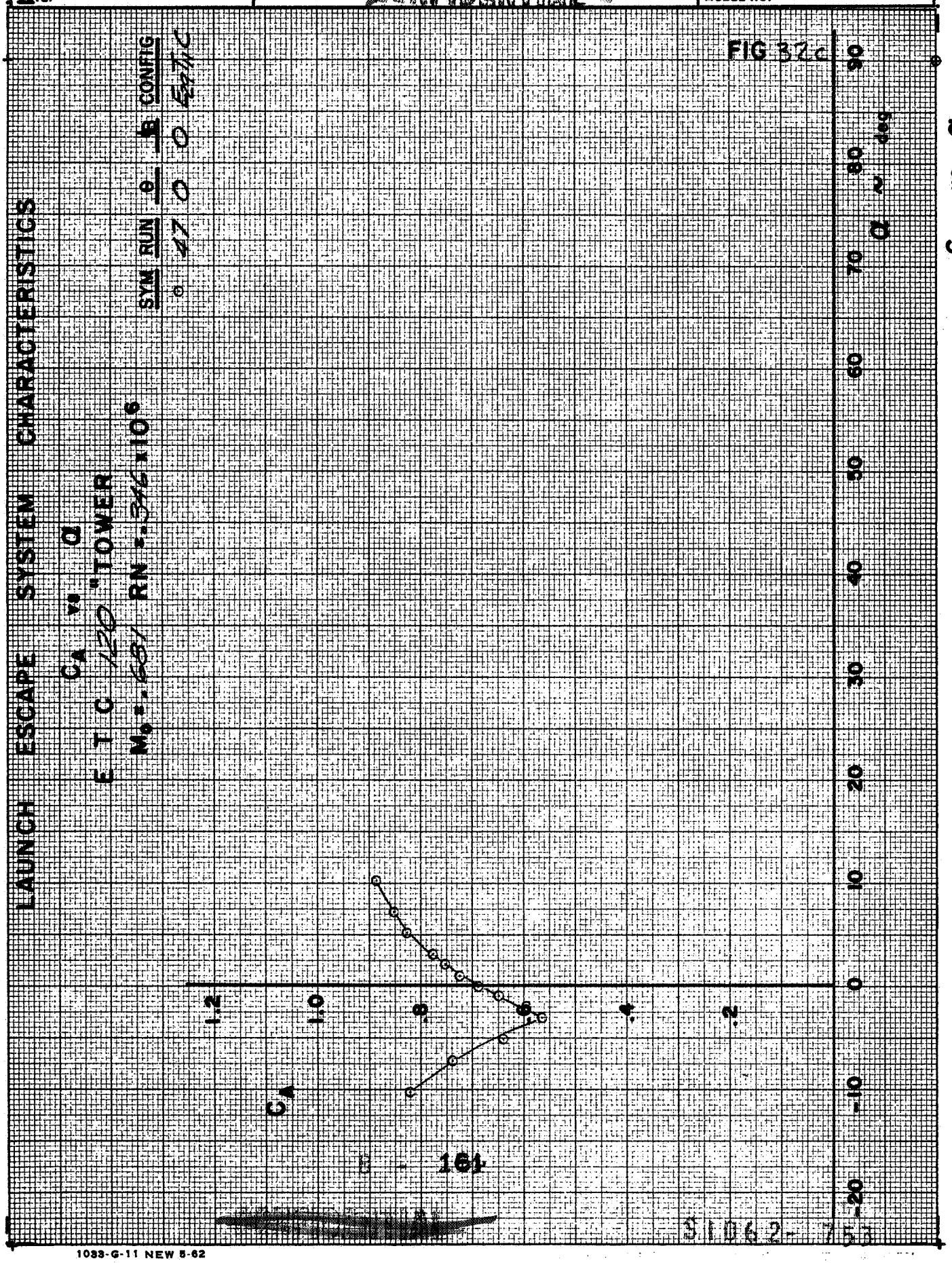

C_A vs α

201-47

[redacted]

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1033-G-11 NEW 5-62

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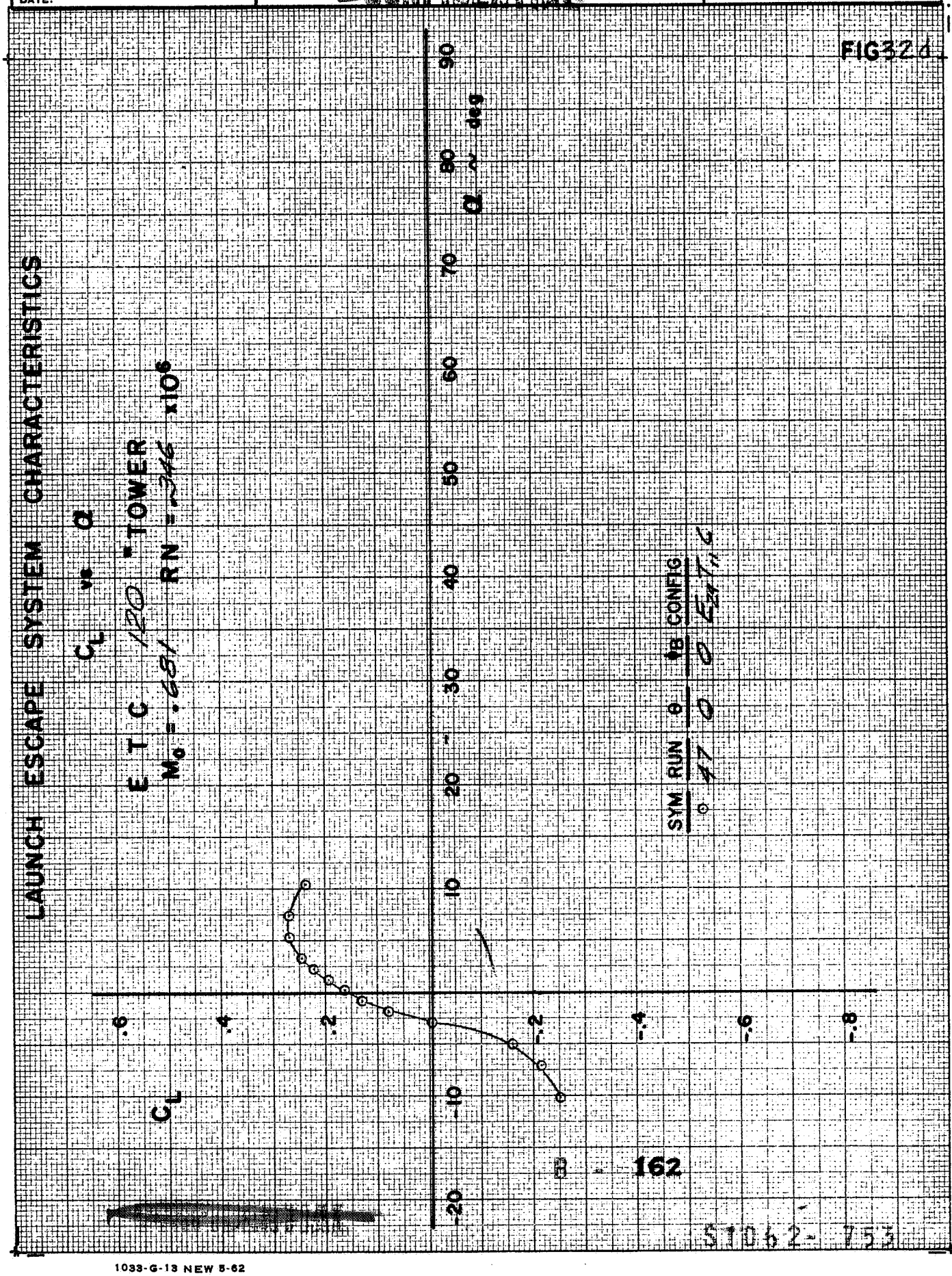
FIG 32d

C_L vs α 201-47



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[redacted]

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1033-G-13 NEW 5-62

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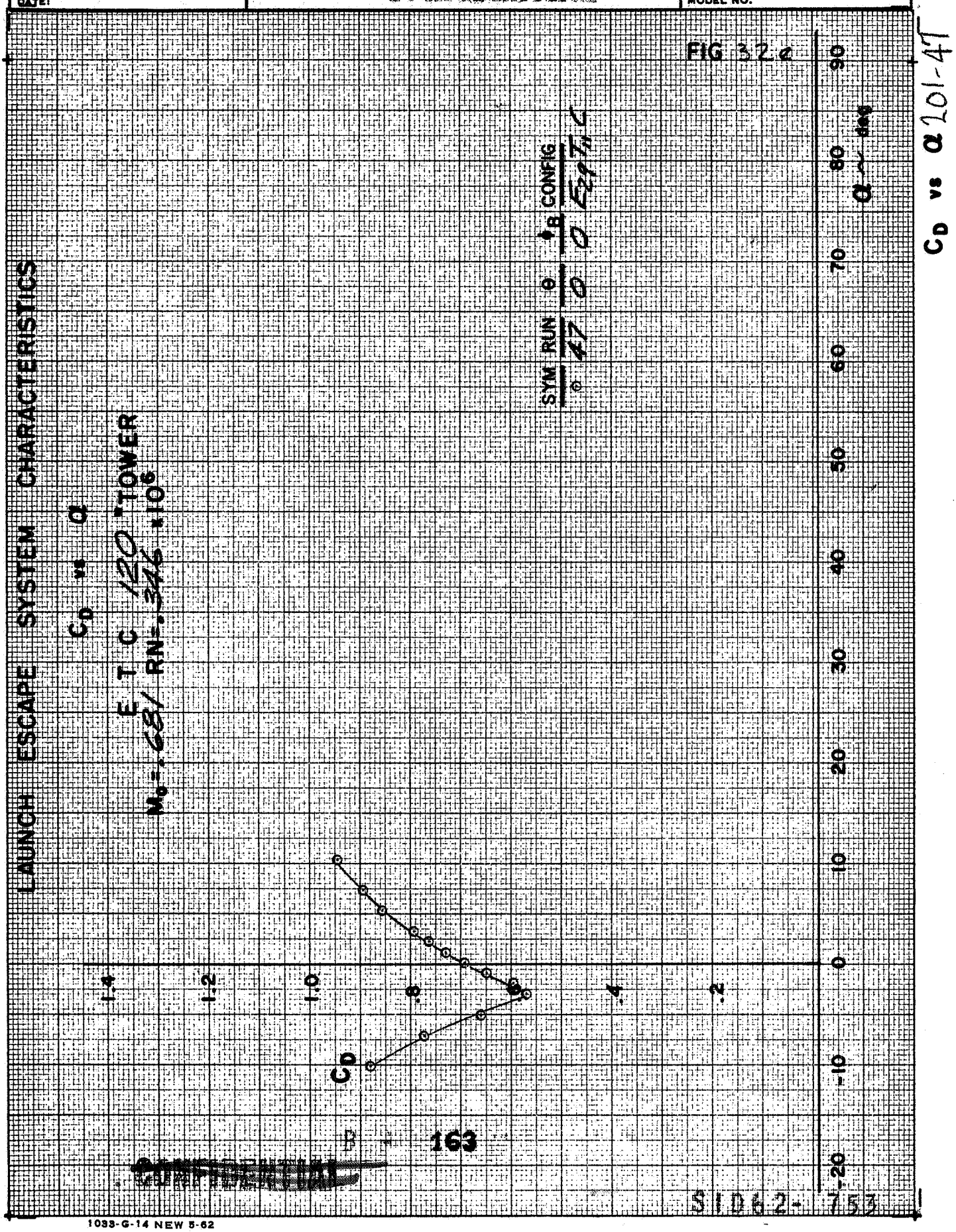

[redacted]

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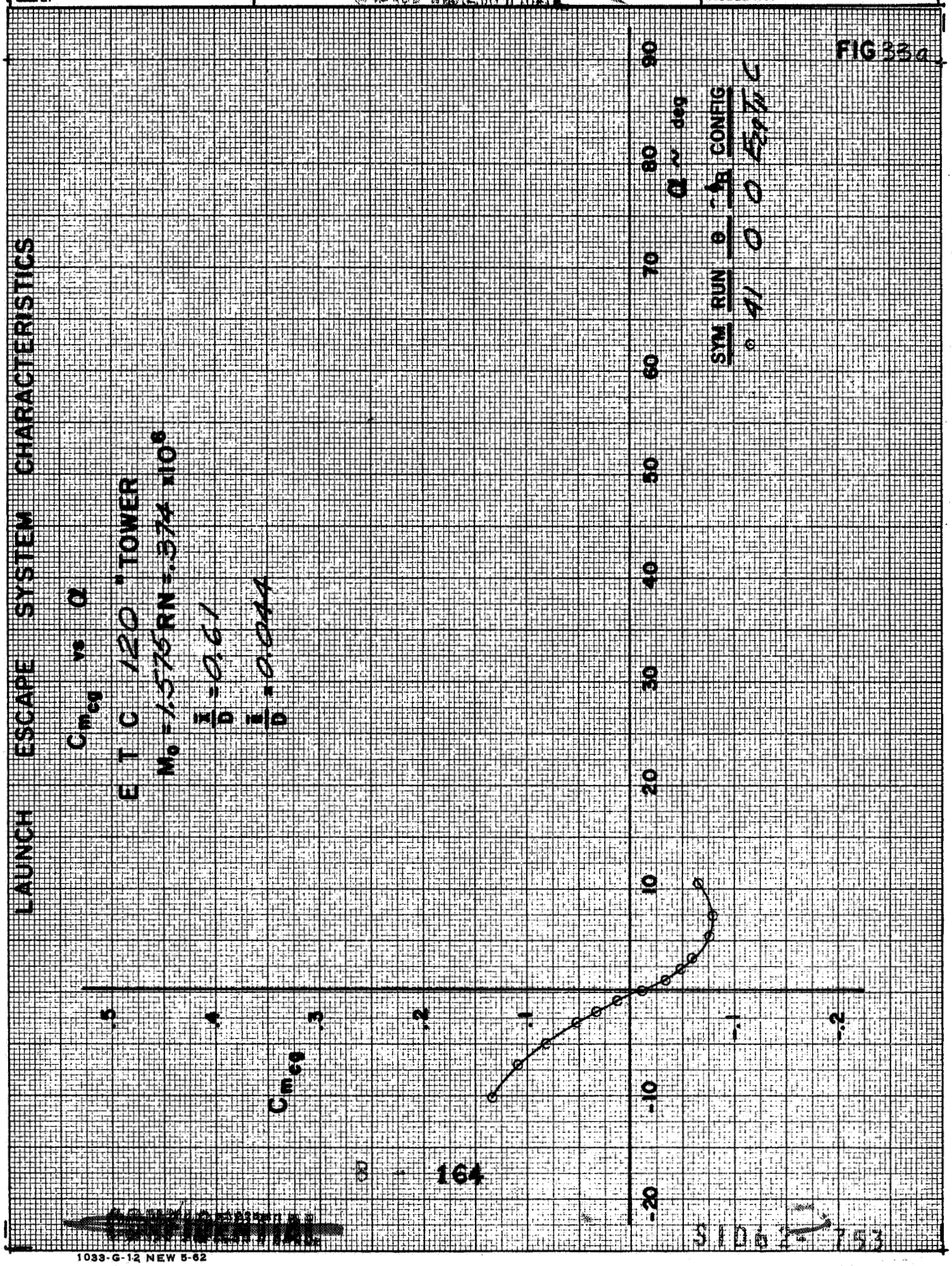

FIG 33a

$C_{m_{cg}}$ vs α 201-41

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1033-G-12 NEW 5-62

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LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_N vs α

E T C 120" TOWER

M_∞ = 1.575 RN = 3.74 x 10^6

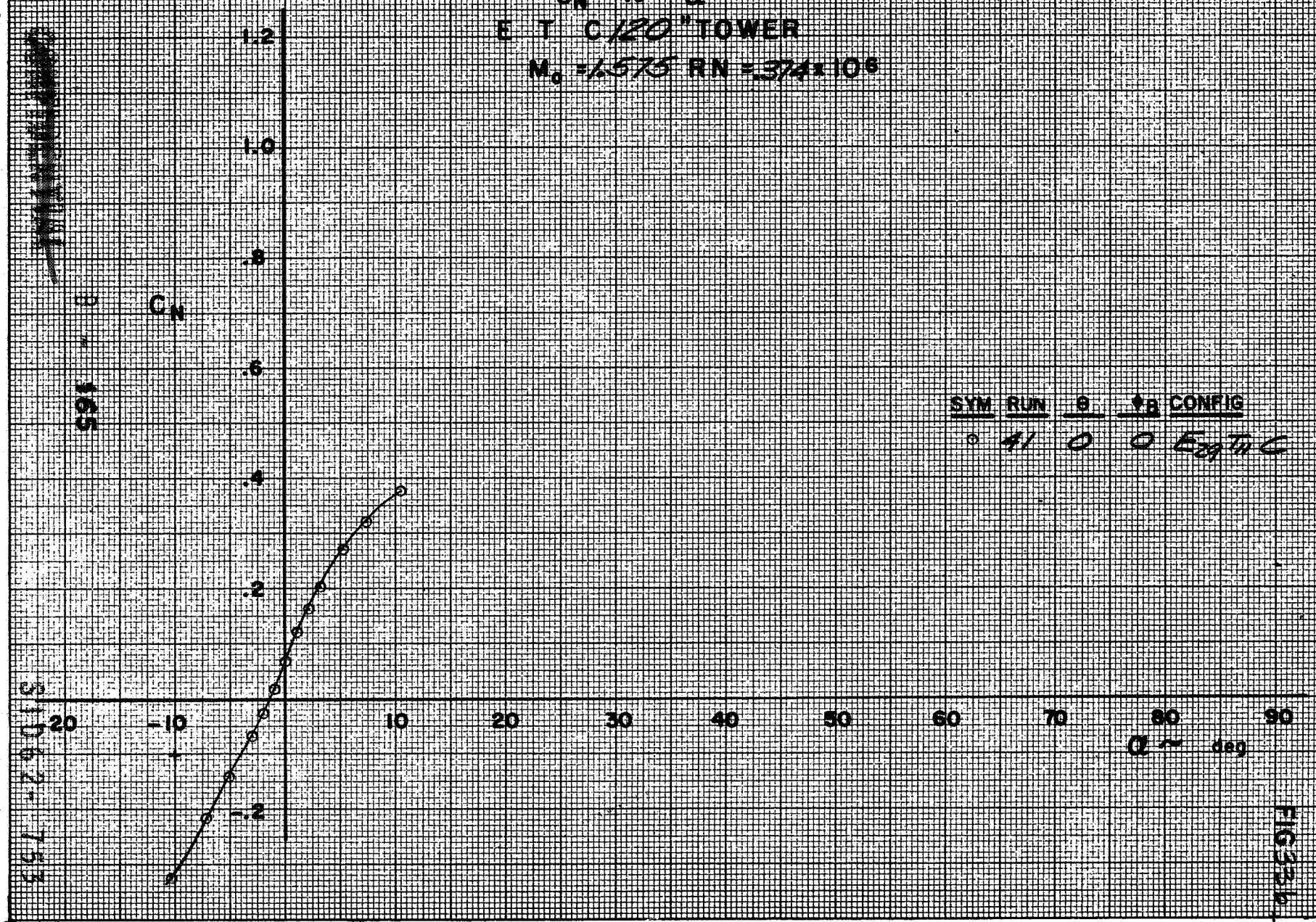

FIG 32b

C_N vs α 201-41

1033-G-10 NEW 5-62

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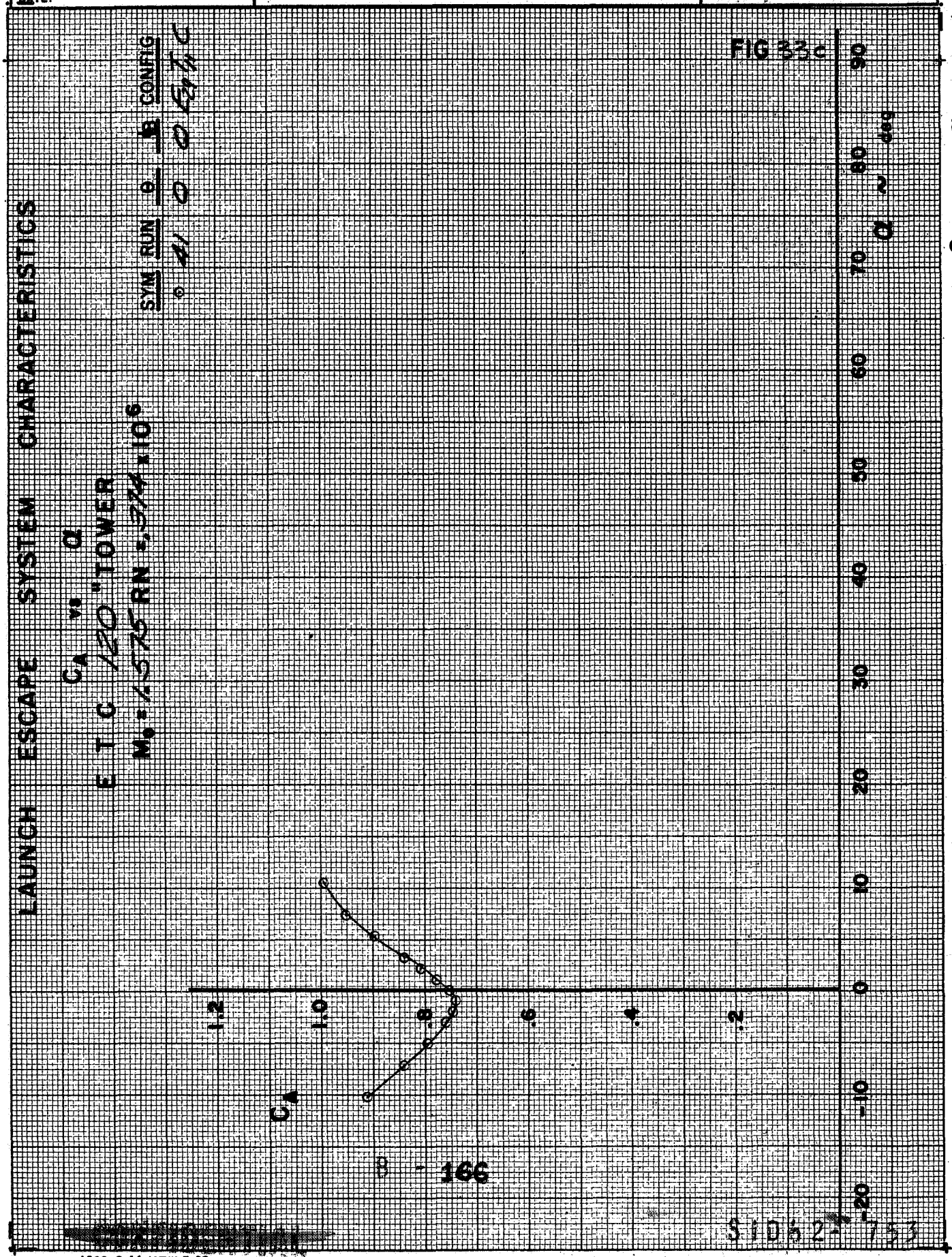

C_A vs α 201-41

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1033-G-11 NEW 5-62

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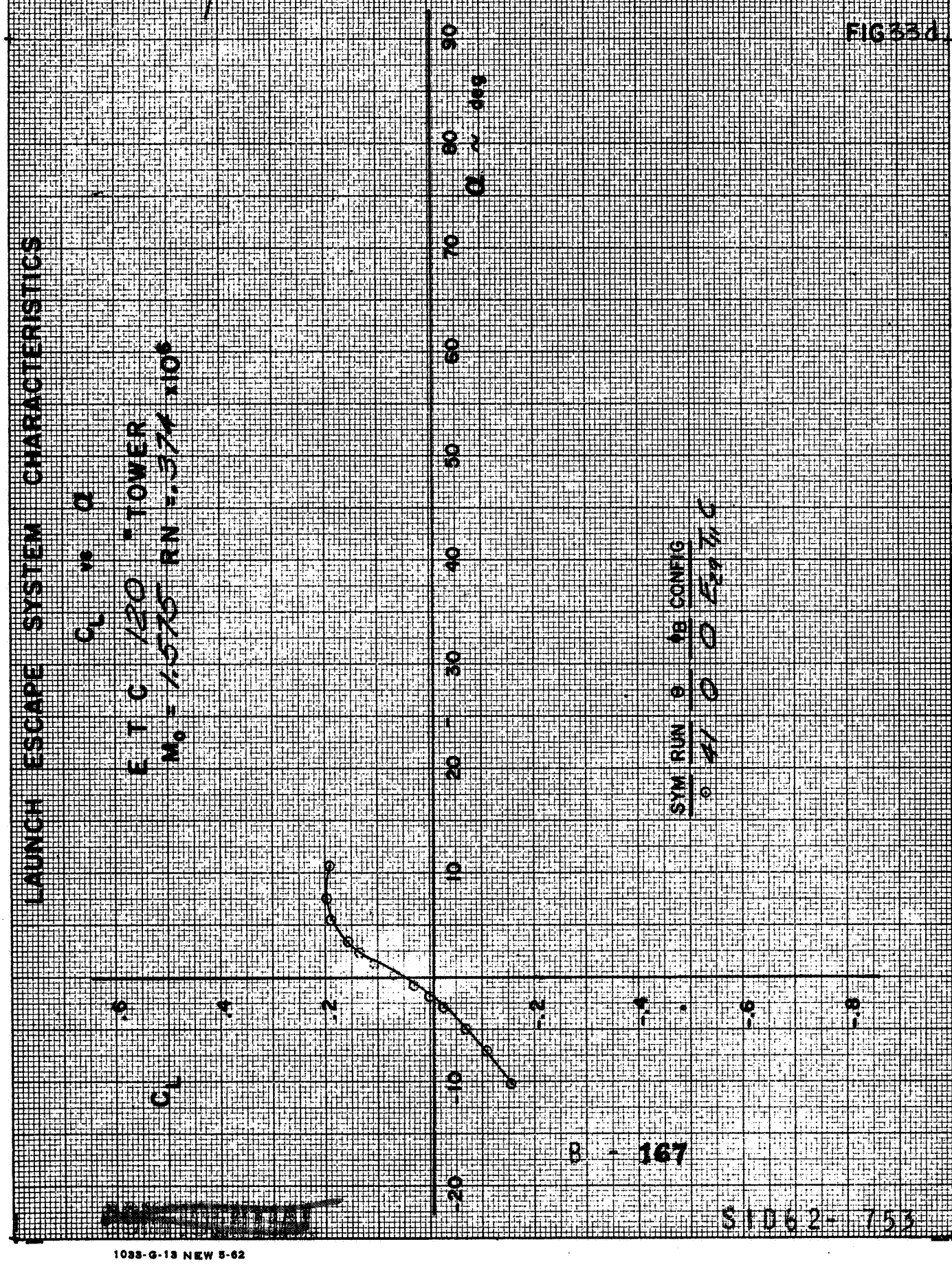
FIG 33d

C_L vs α 201-41



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1033-G-13 NEW 5-62

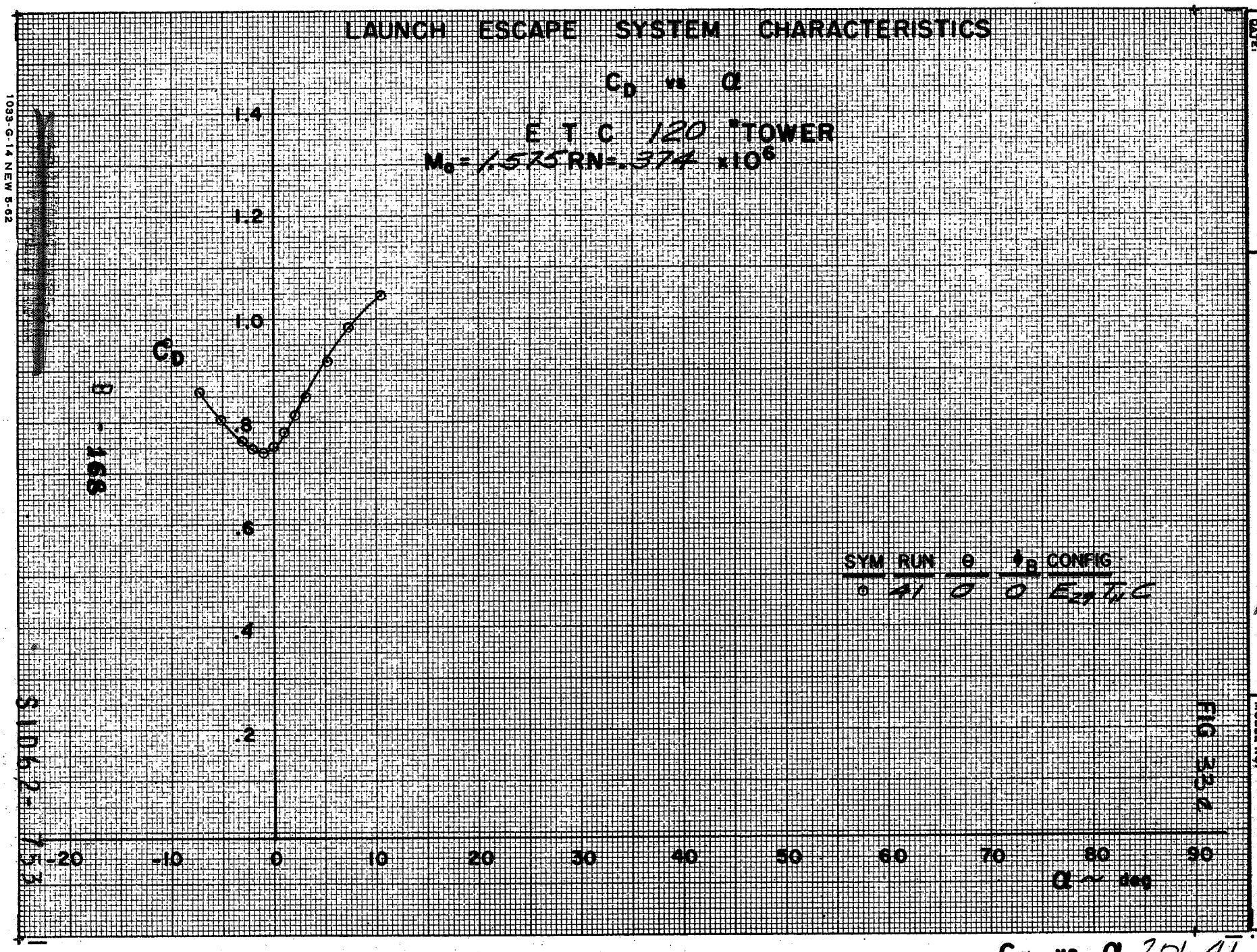

FIG 322

C_D vs α 201-41

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1033-G-14 NEW 5-62

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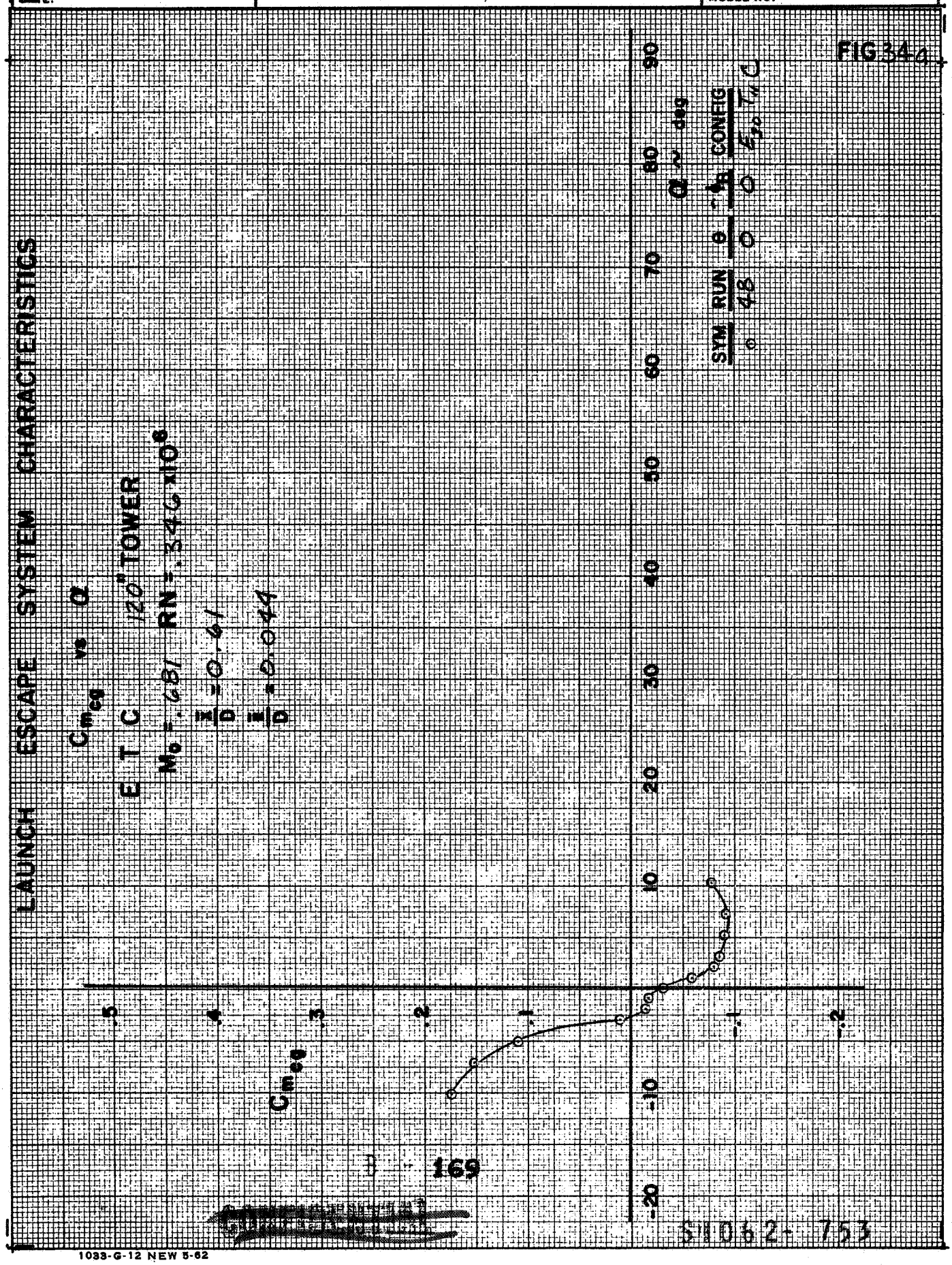

FIG 34a

$C_{m_{cg}}$ vs α 201-48

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S1062-753

1033-G-12 NEW 5-62

LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_N vs α

E T C 120" TOWER

$M_o = .681$ $RN = .346 \times 10^6$

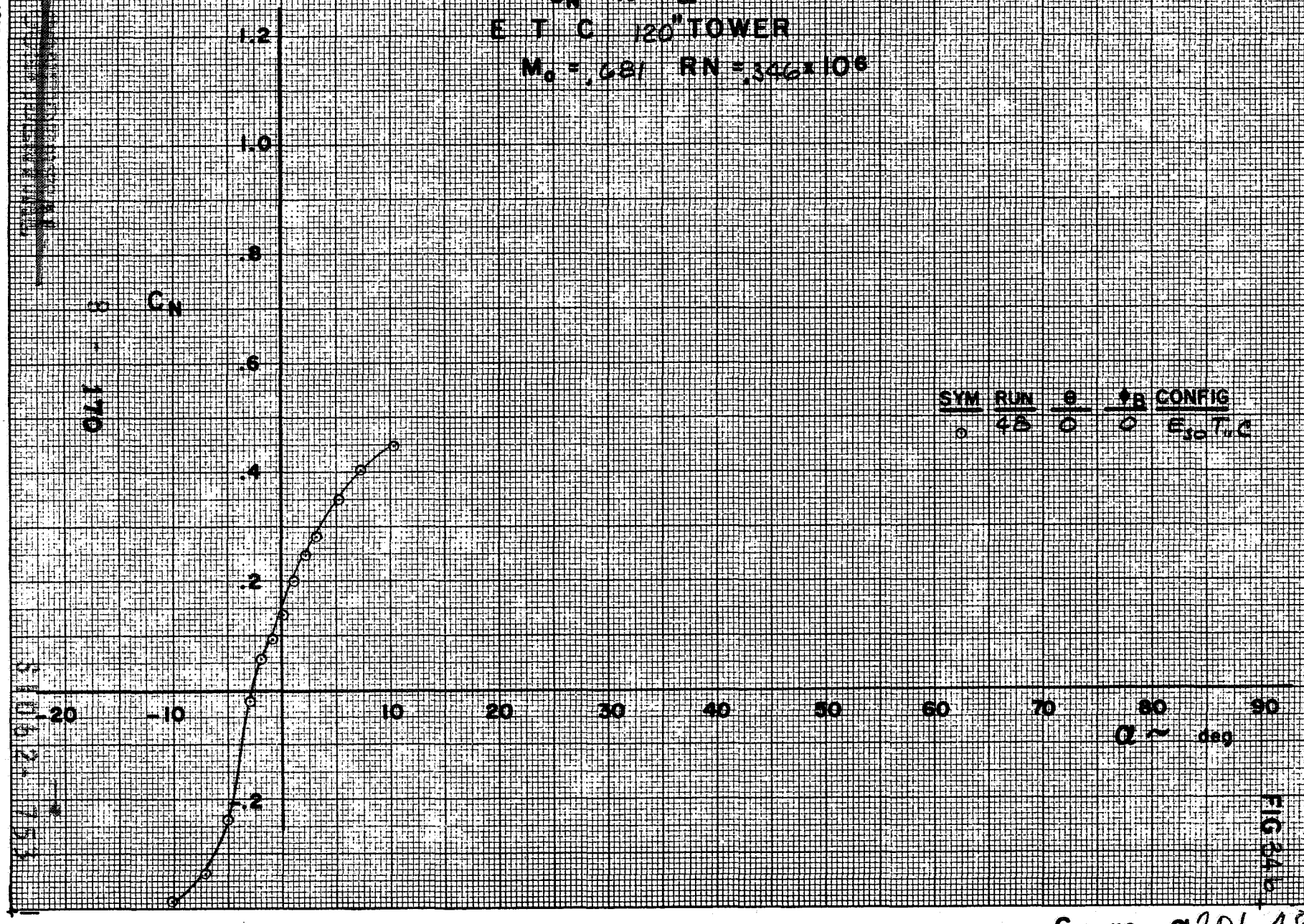

FIG 24.6

C_N vs α 201-48

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1033-G-10 NEW 5-62

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201-48

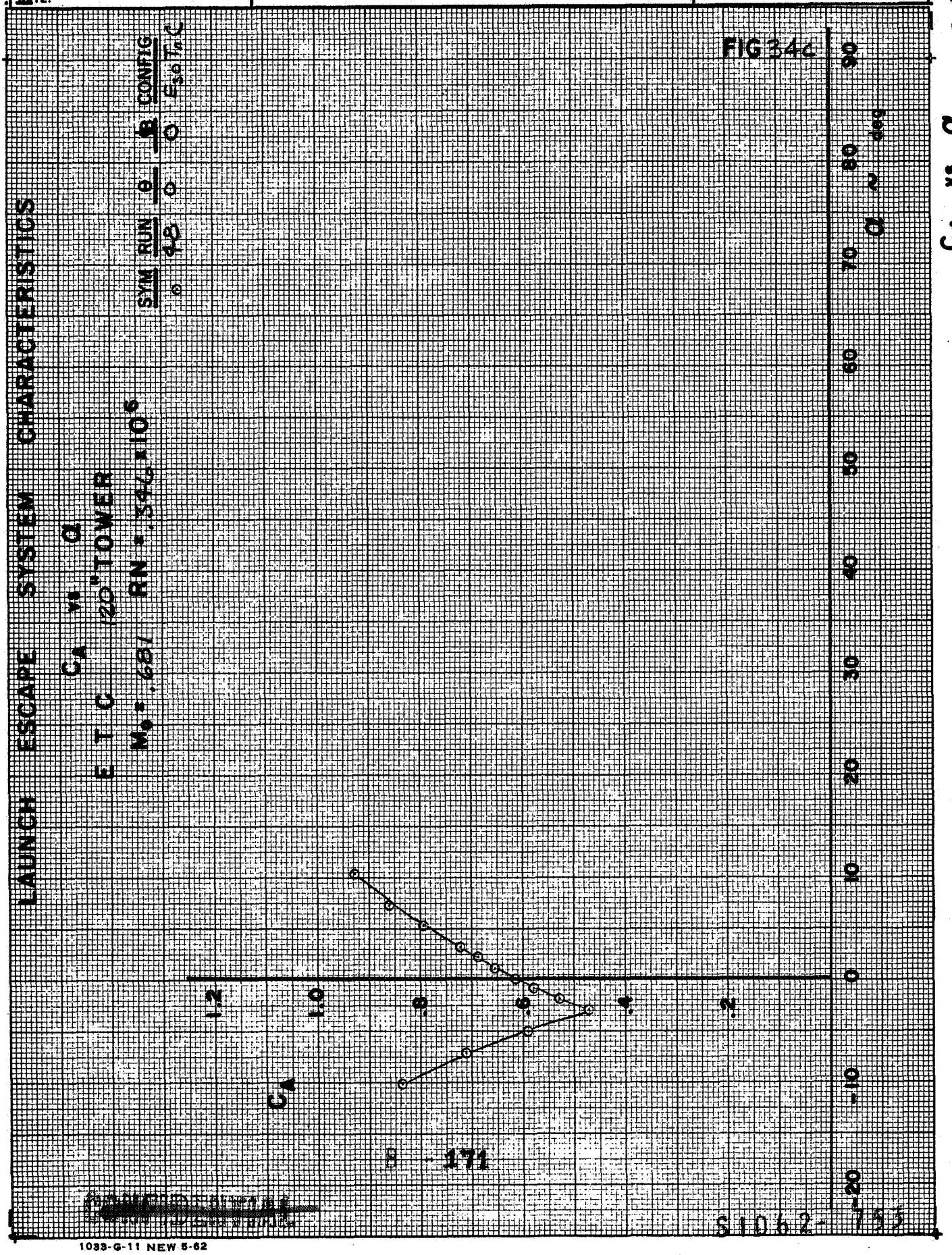

FIG 34c

C_A vs α

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1033-G-11 NEW 5-62

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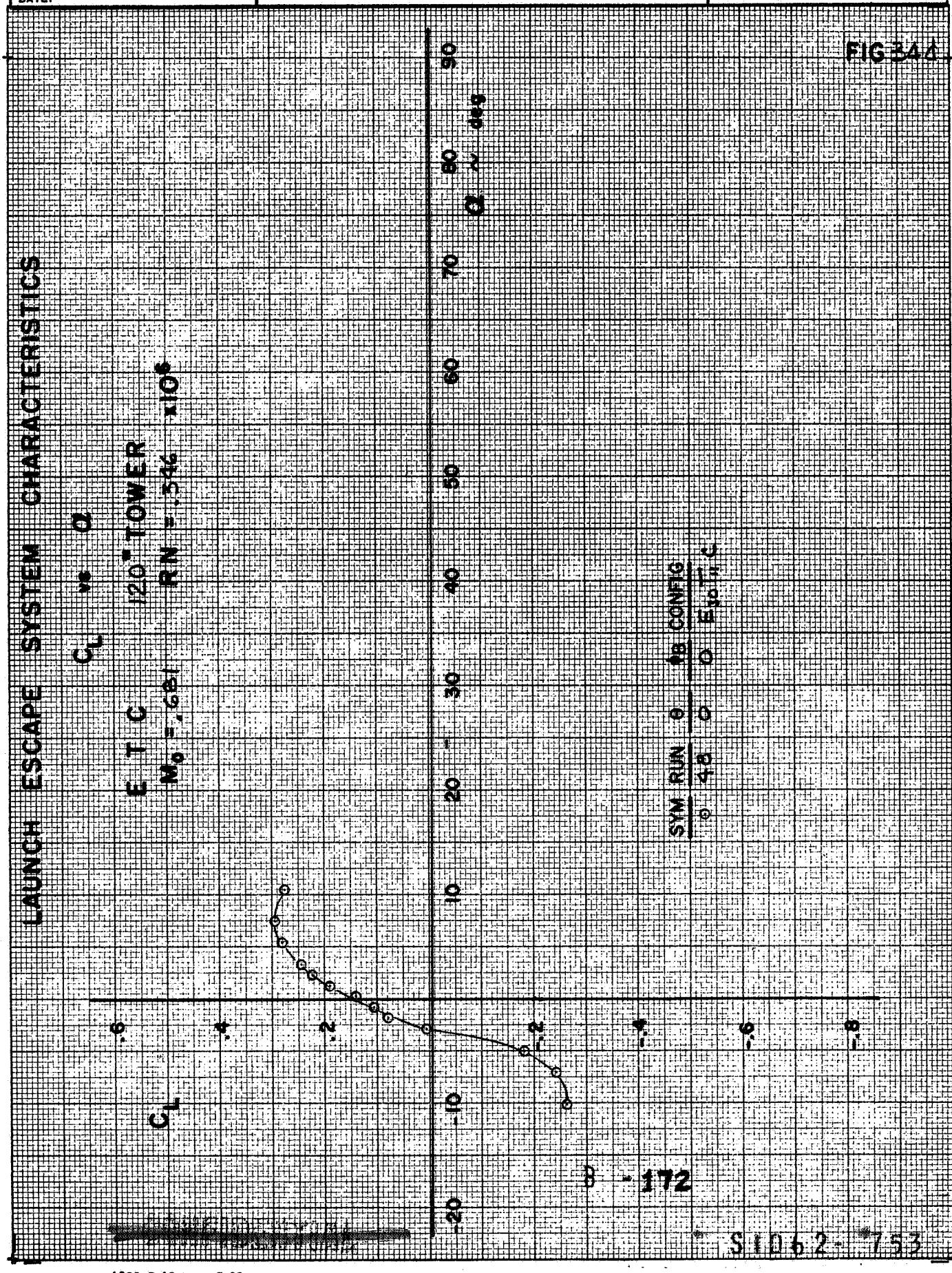
FIG 344



C_L vs α

201-48

B - 172

[redacted]

S1062-753

1033-G-13 NEW 5-62

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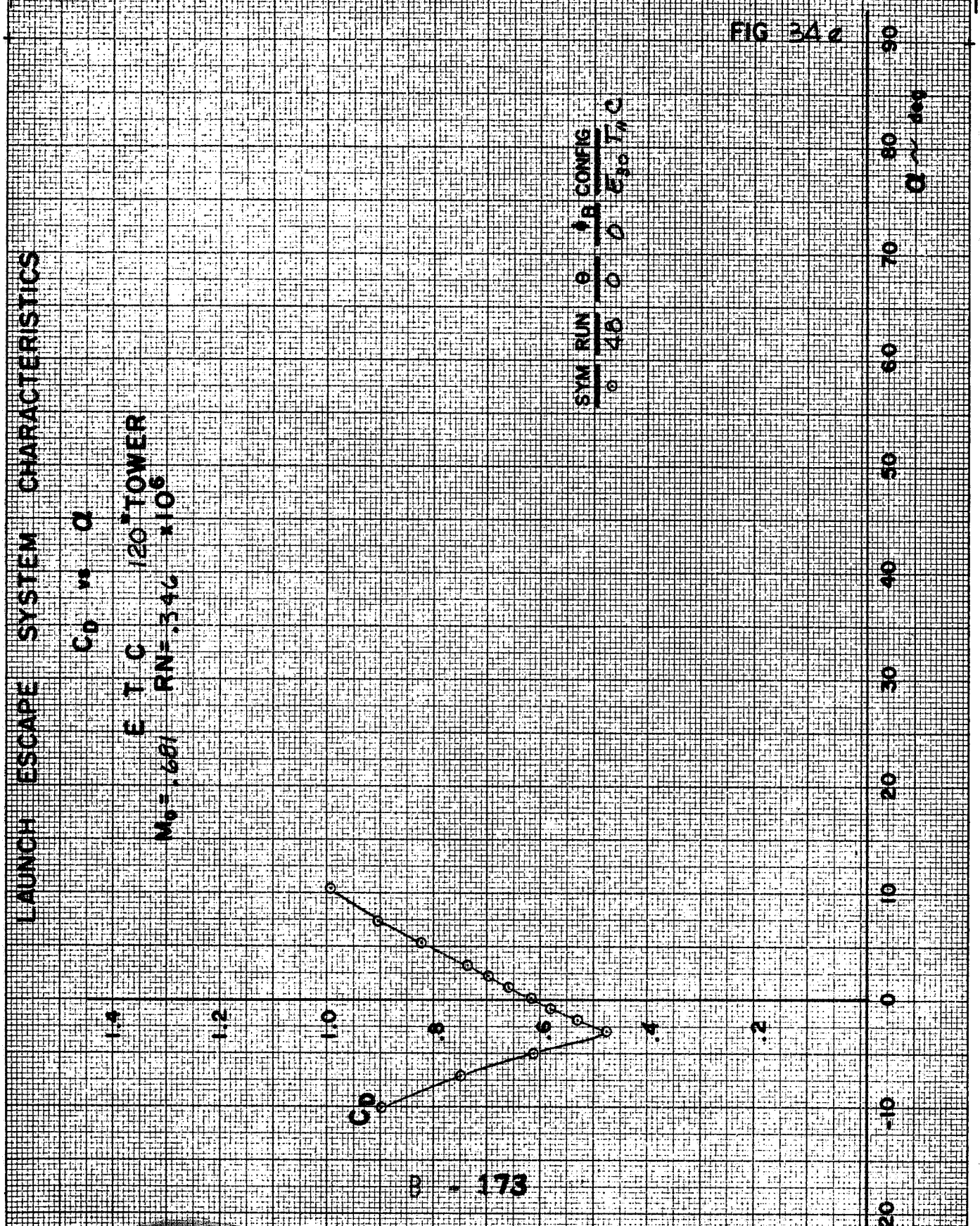
FIG 34e



C_D vs α 201-48

CONFIDENTIAL

SID62-753

1033-G-14 NEW 5-62

LAUNCH ESCAPE SYSTEM CHARACTERISTICS

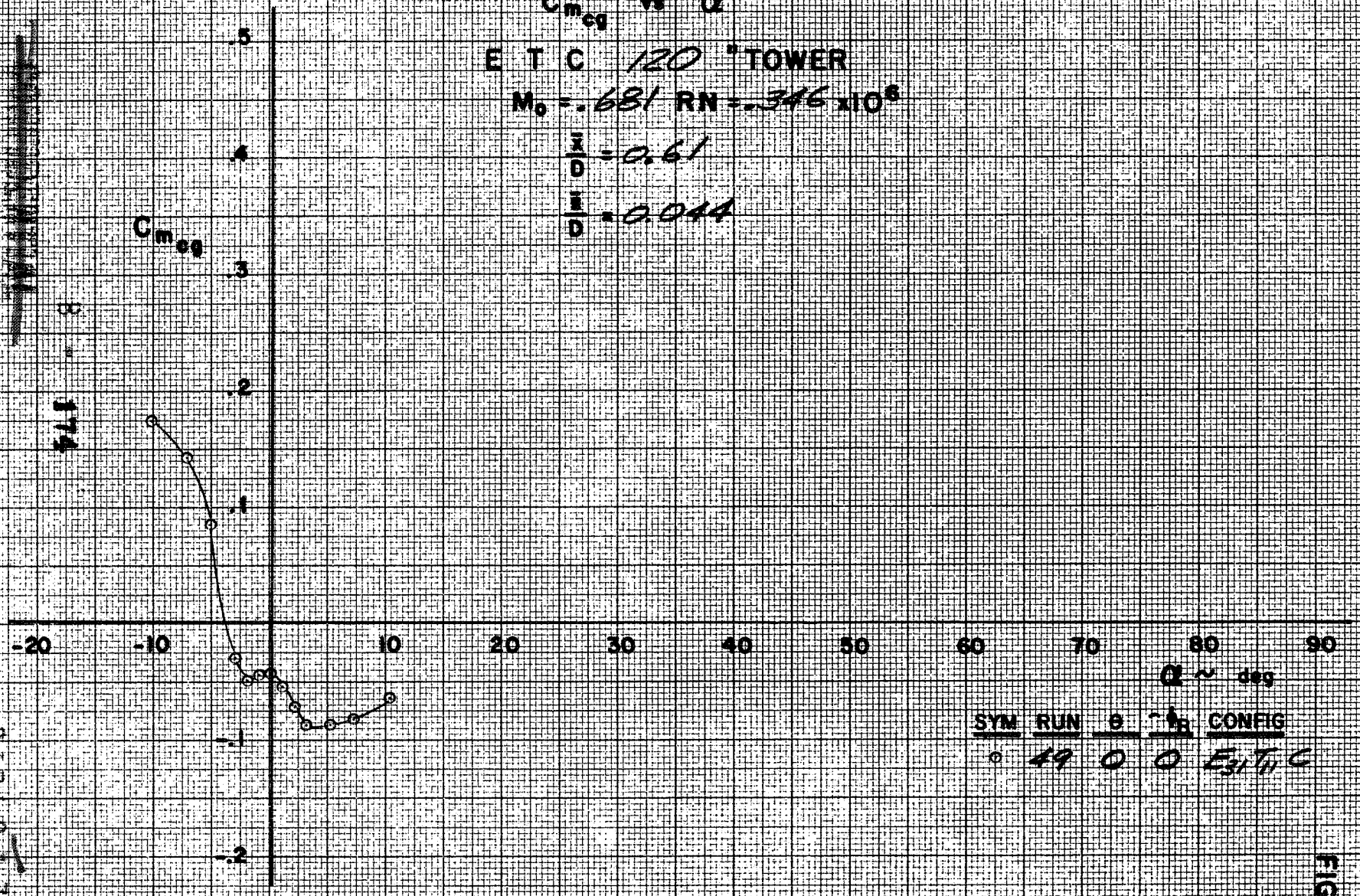
$C_{m_{cg}}$ vs α

E T C 120" TOWER

M_0 = .681 RN = .346 x 10^6

$\frac{x}{D}$ = 0.61

$\frac{z}{D}$ = 0.044



SYM	RUN	δ	δ_R	CONFIG
○	49	0	0	ETC

FIG 35

$C_{m_{cg}}$ vs α 201-49

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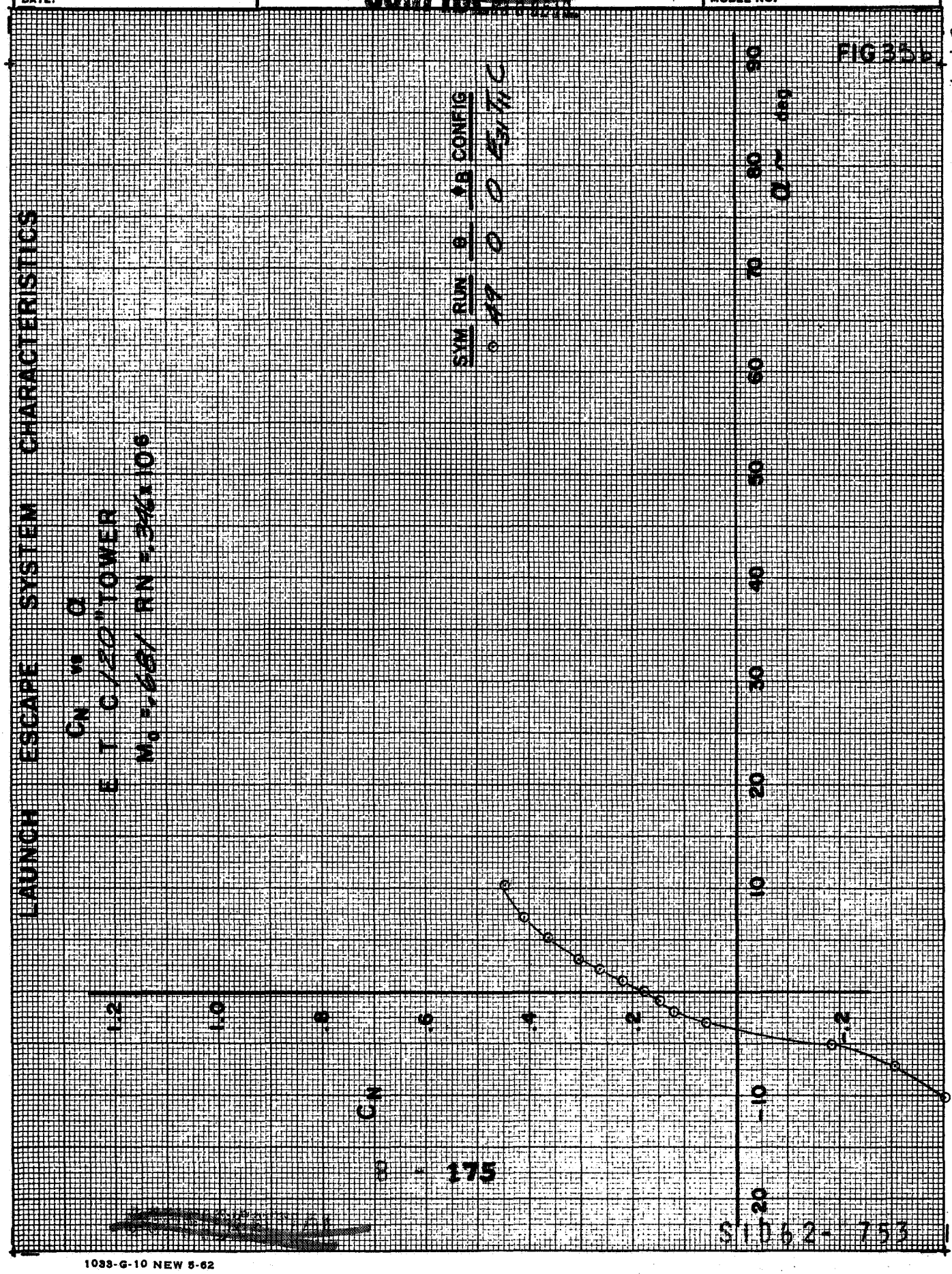

FIG 35b

C_N vs α 201-49

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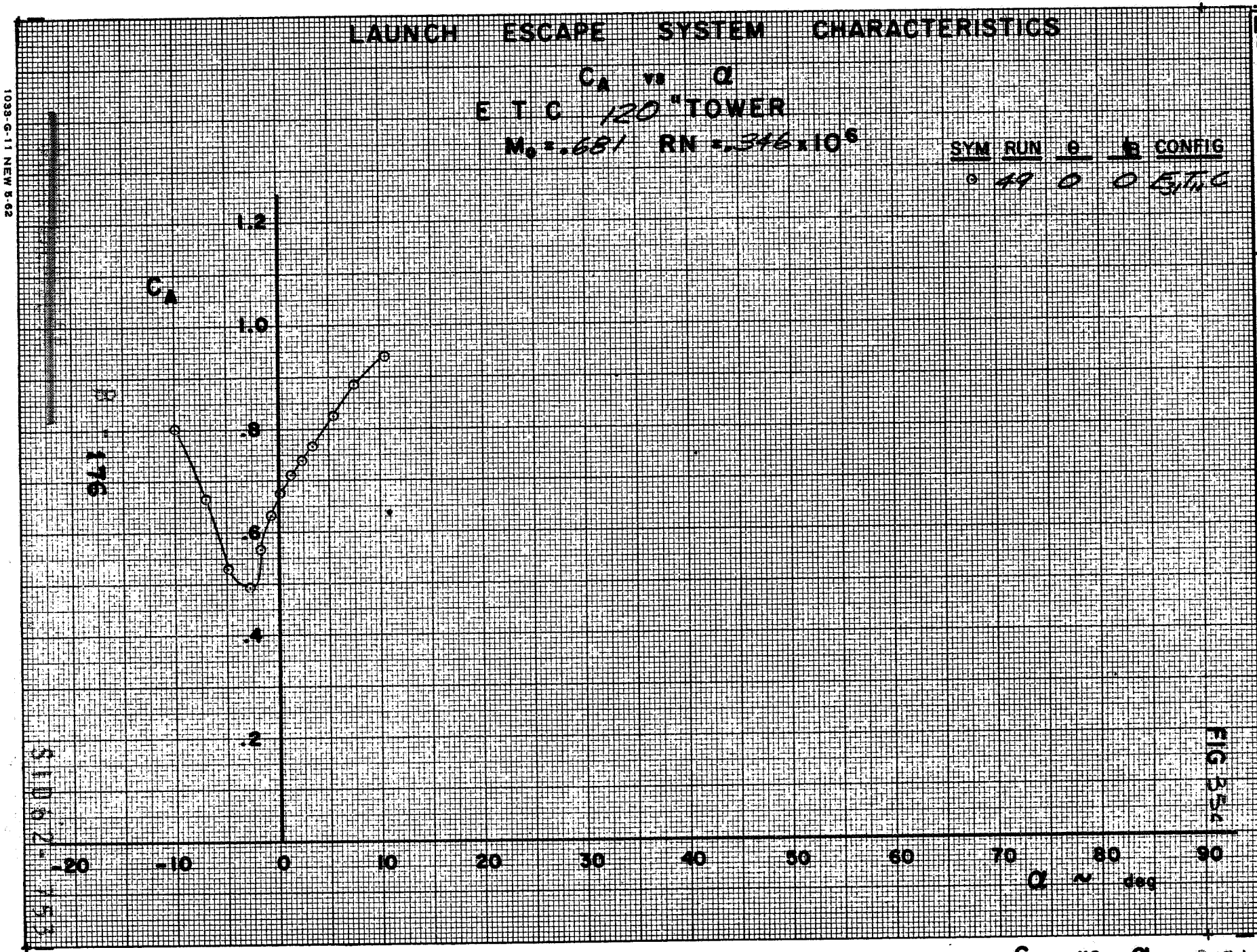

FIG 35

C_A vs α 201-49

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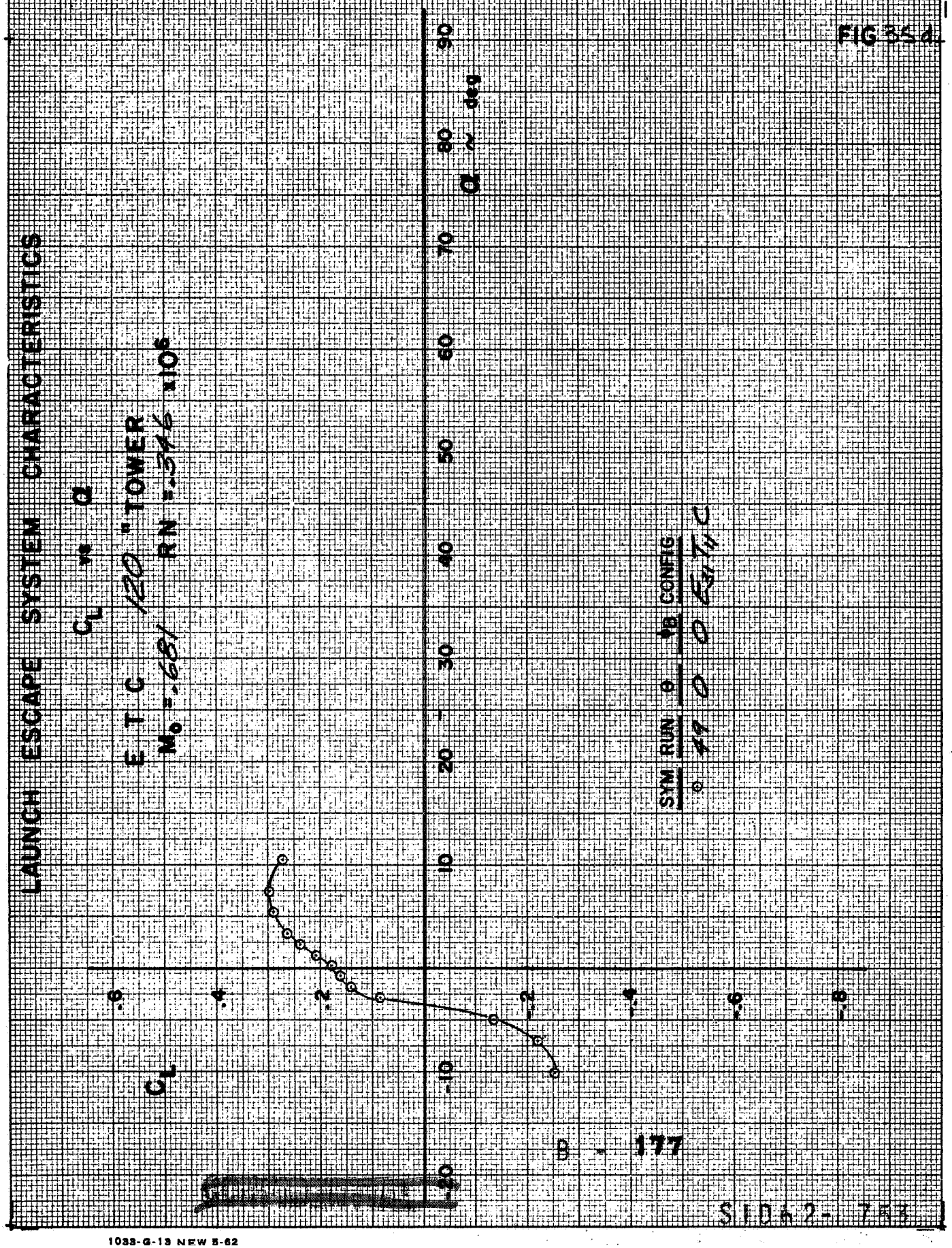
FIG 35d

C_L vs α 201-49



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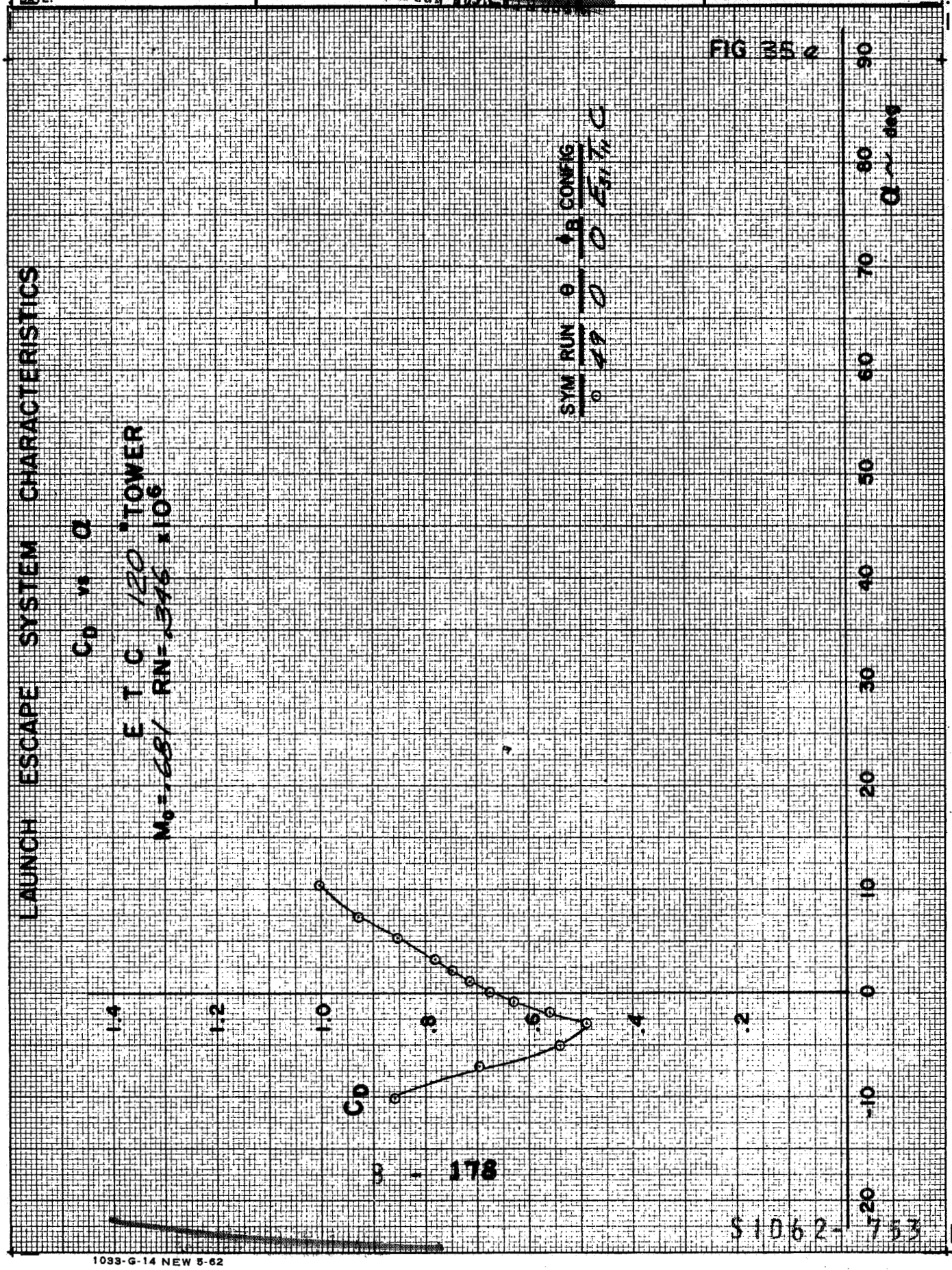

FIG 35 e

C_D vs α 201-49

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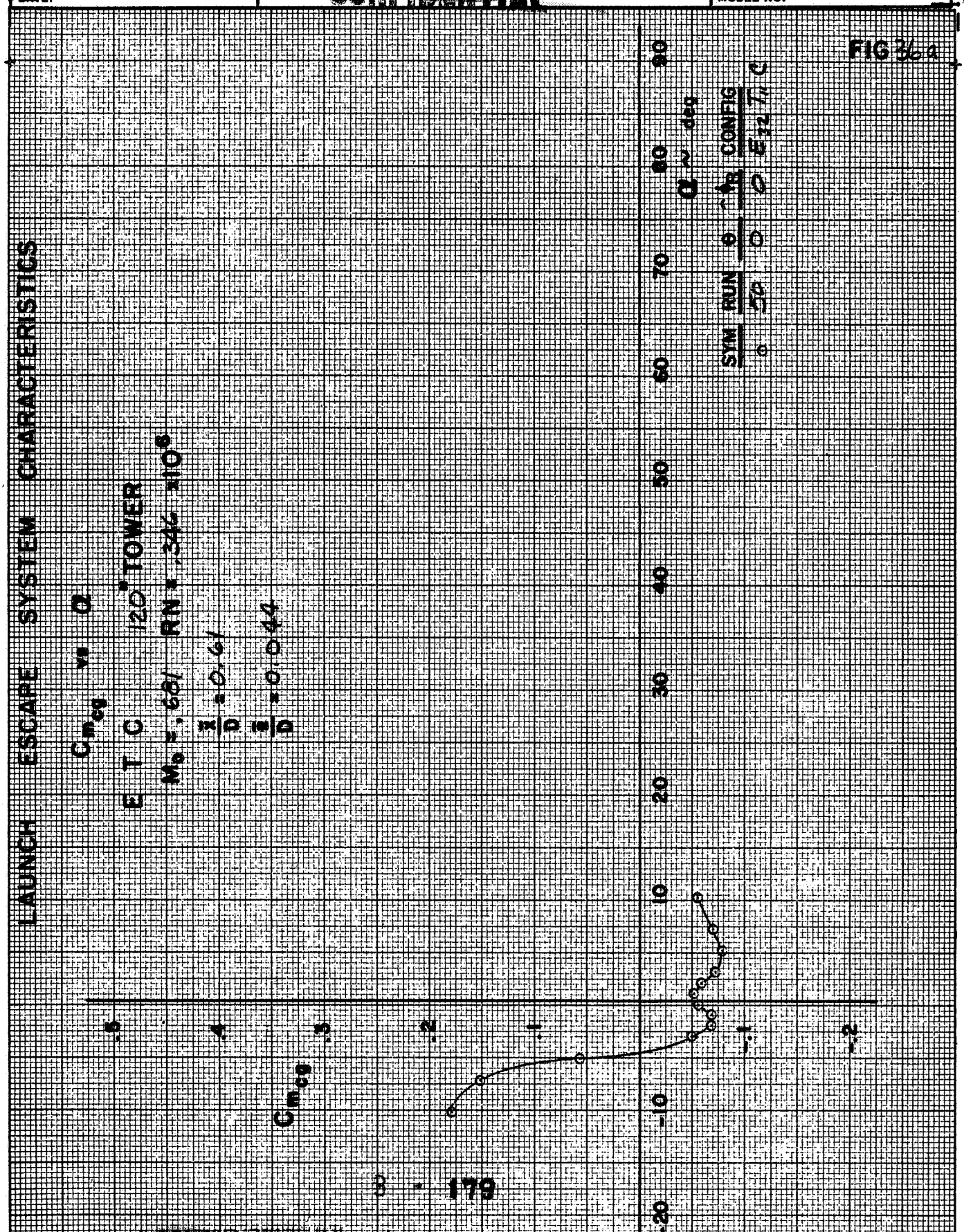

FIG 36a

$C_{m_{cg}}$ vs α 201-50

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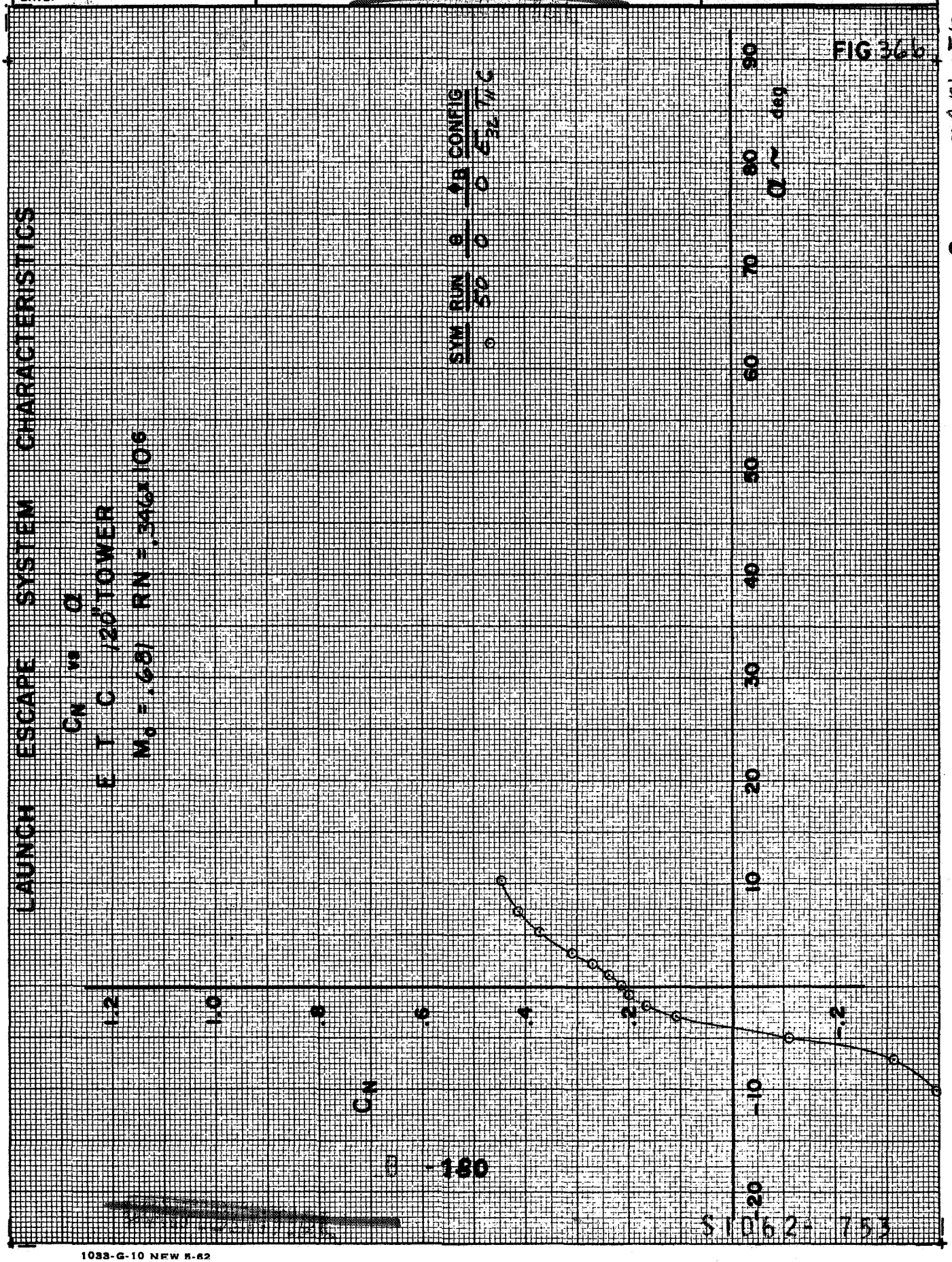

FIG 36b

C_N vs α 201-50

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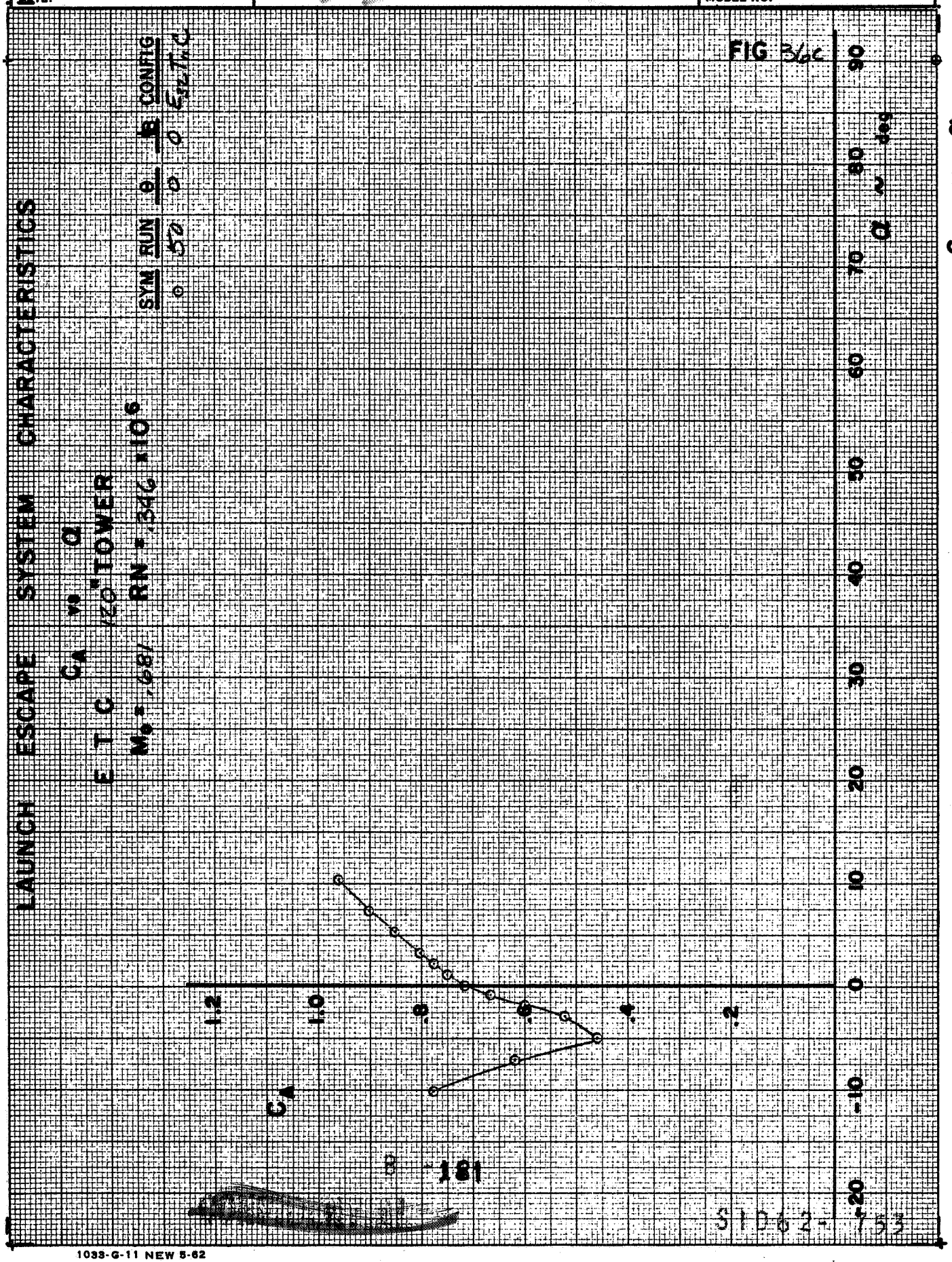
201-50



[redacted]

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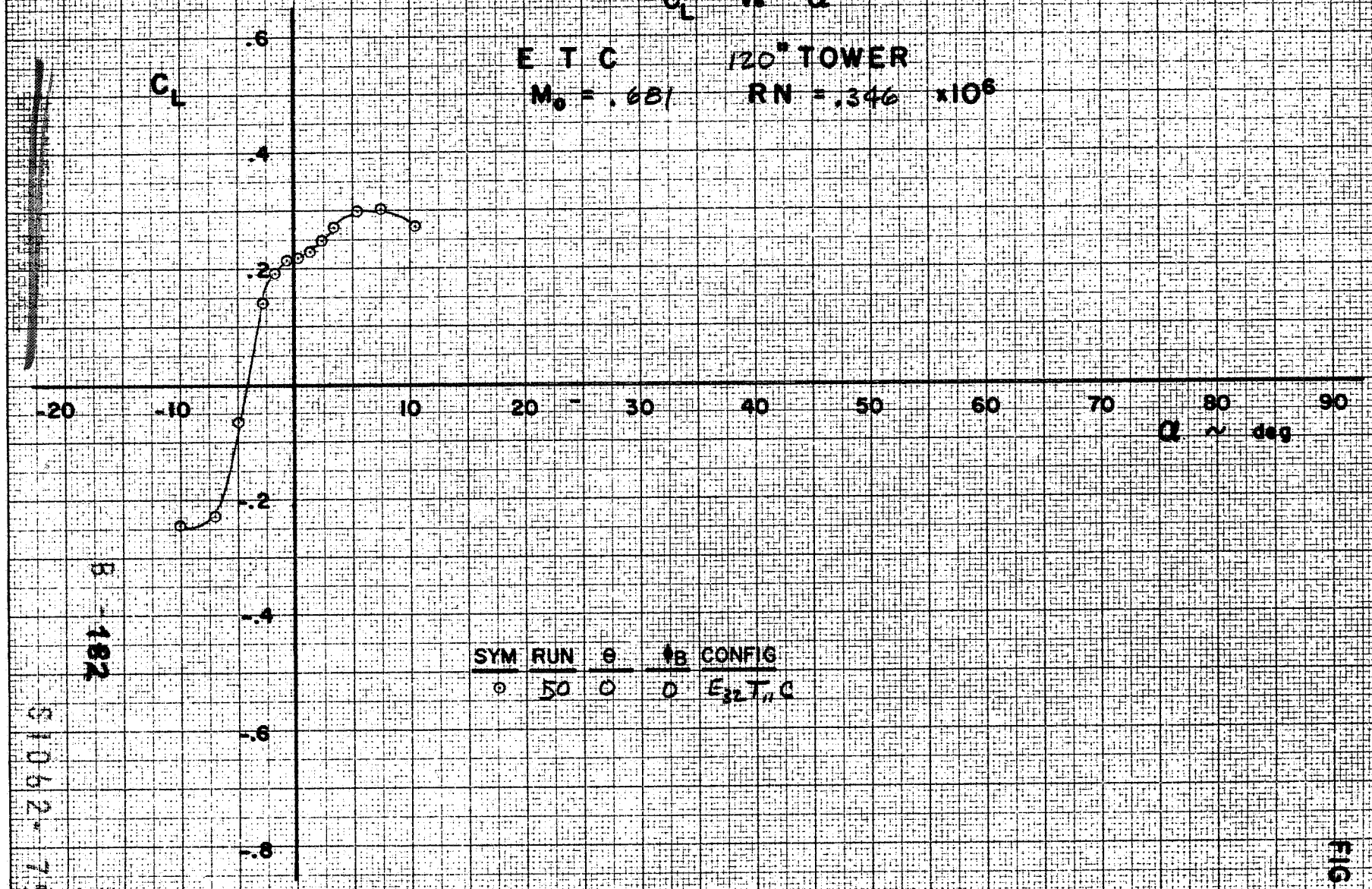
1033-G-11 NEW 5-62

LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_L vs α

E T C 120" TOWER

M_0 = .681 RN = .346 $\times 10^6$



SYM	RUN	θ	ϕ_B	CONFIG
⊙	50	0	0	$E_{32}T_{11}C$

FIG 34

C_L vs α 201-50

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810427 753

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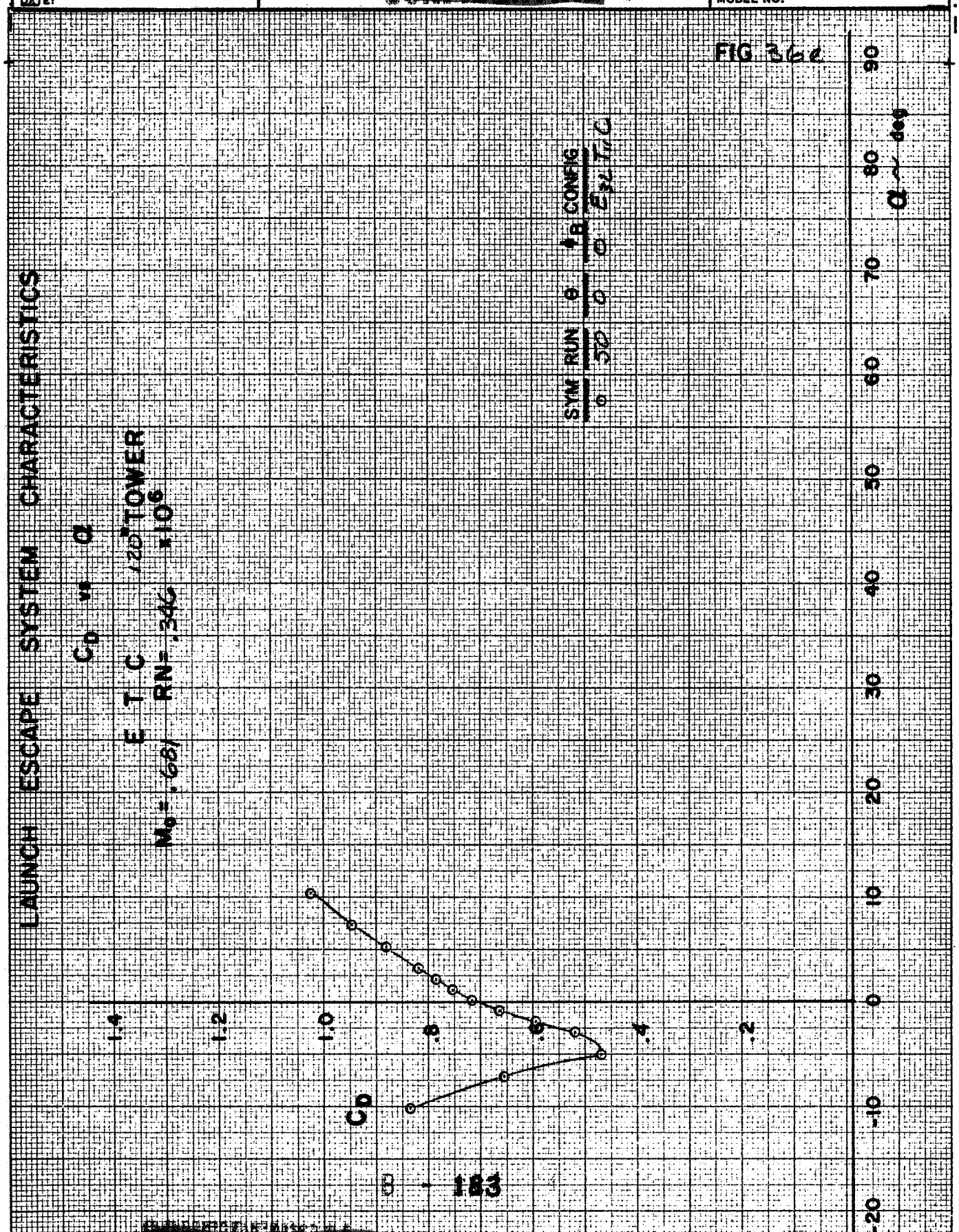
FIG 36e



C_D vs α 201-50

[redacted]

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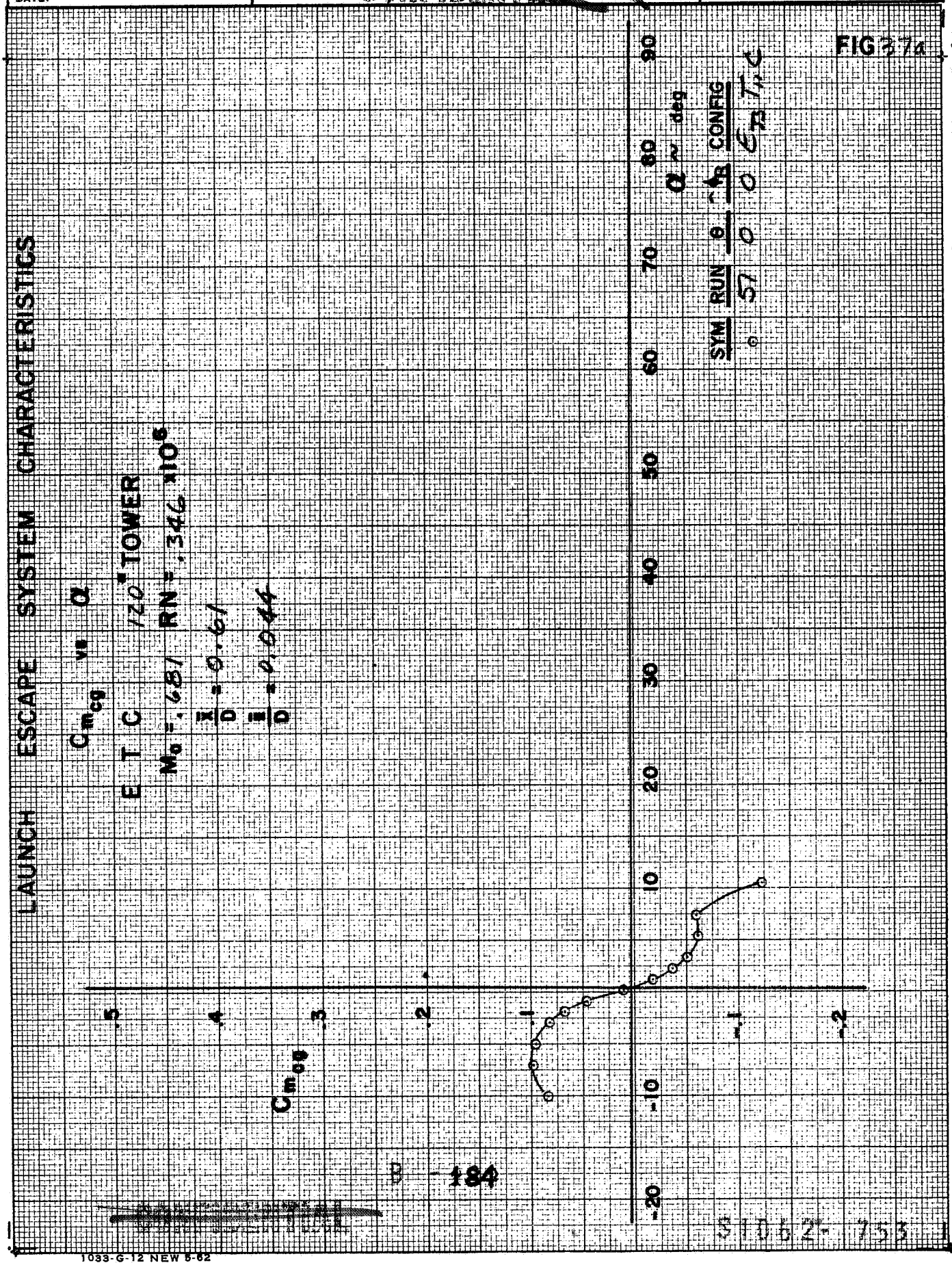
FIG 37a



$C_{m_{cg}}$ vs α 201-51

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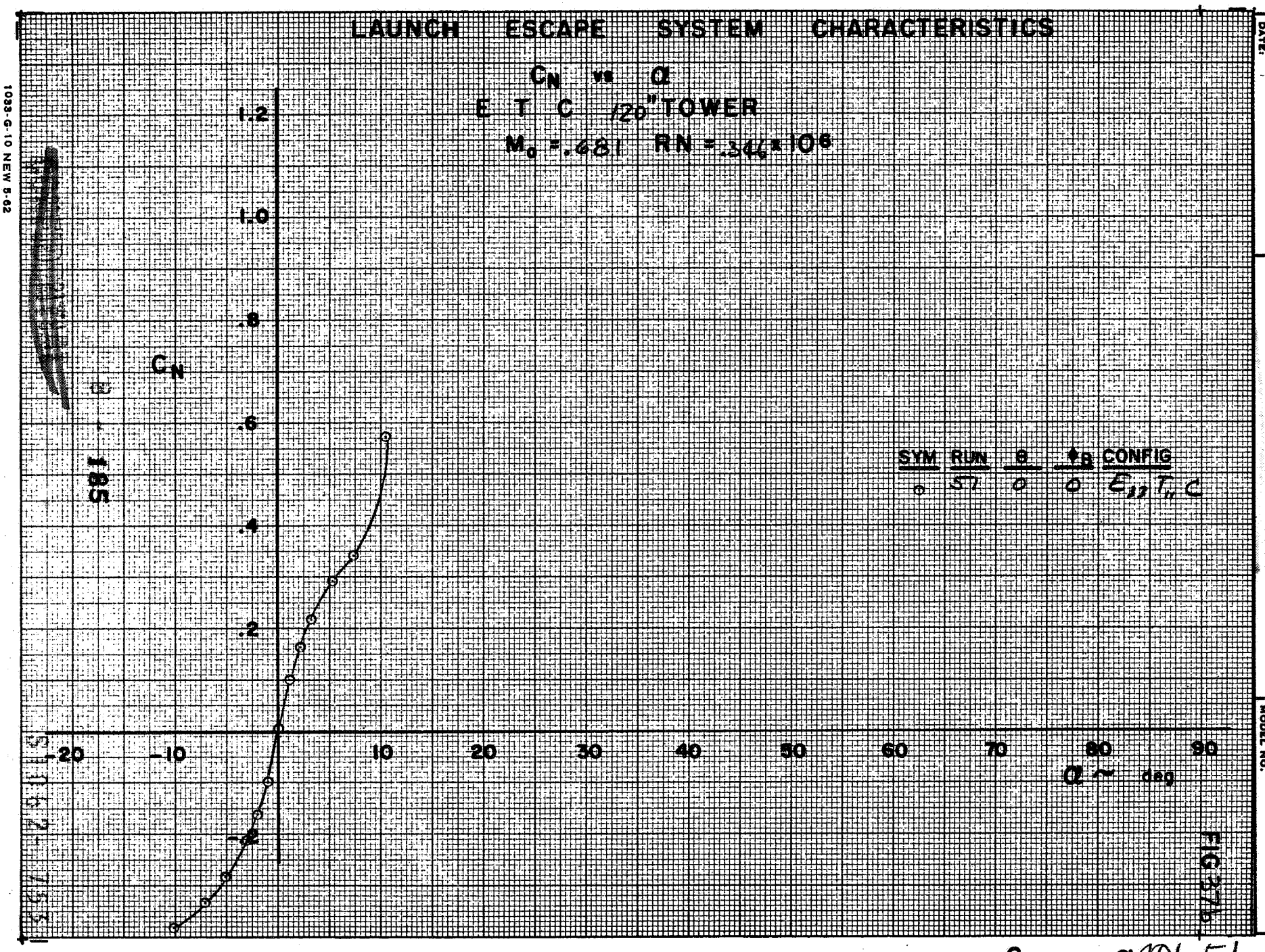

FIG 27

C_N vs α 201-51

LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_A vs α

E T C 120" TOWER

$M_\infty = .681$ RN = .346 $\times 10^6$

SYM	RUN	θ	ϕ	CONFIG
○	51	0	0	$E_{35} T_{11} C$

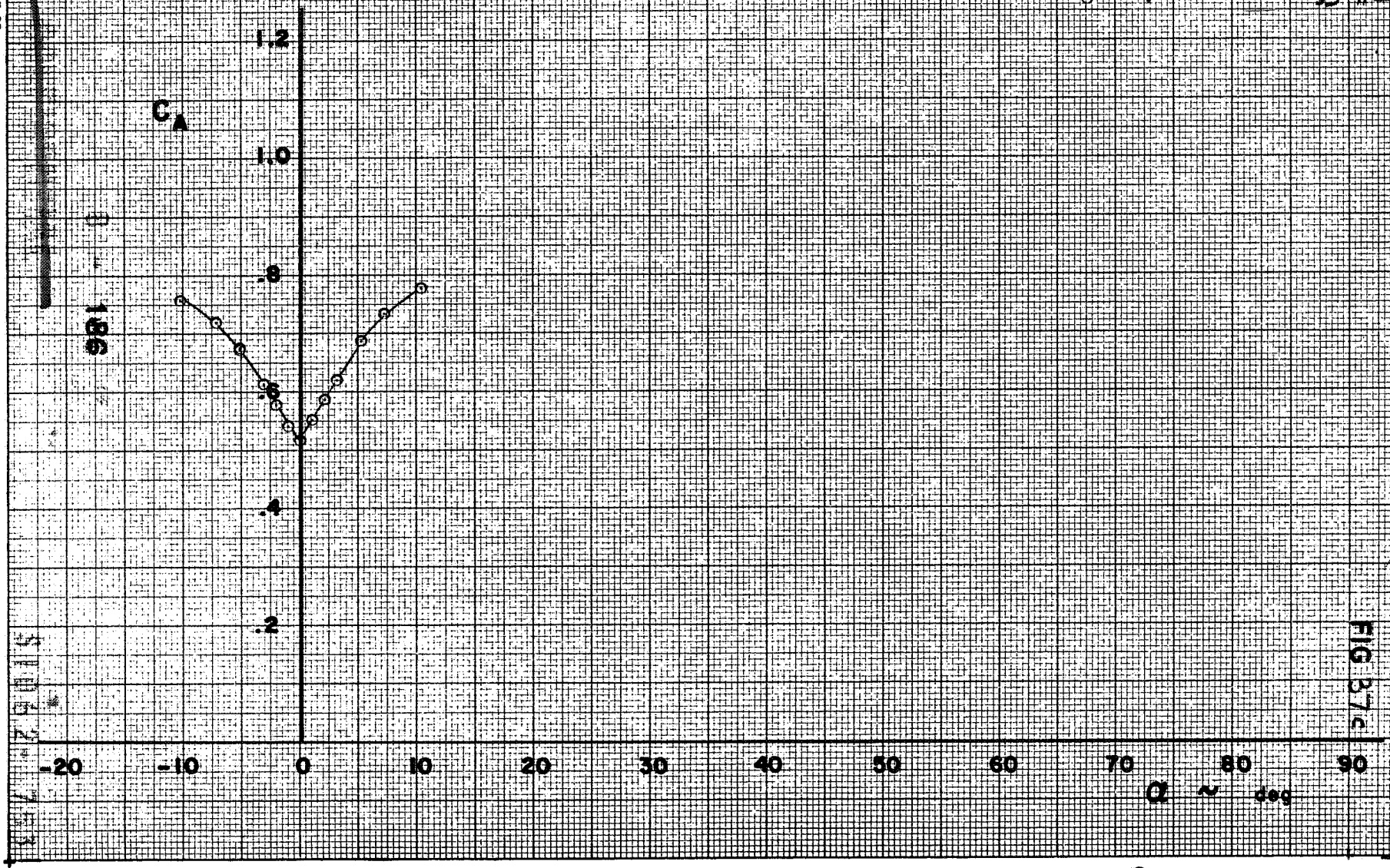

FIG 37c

C_A vs α 201-51

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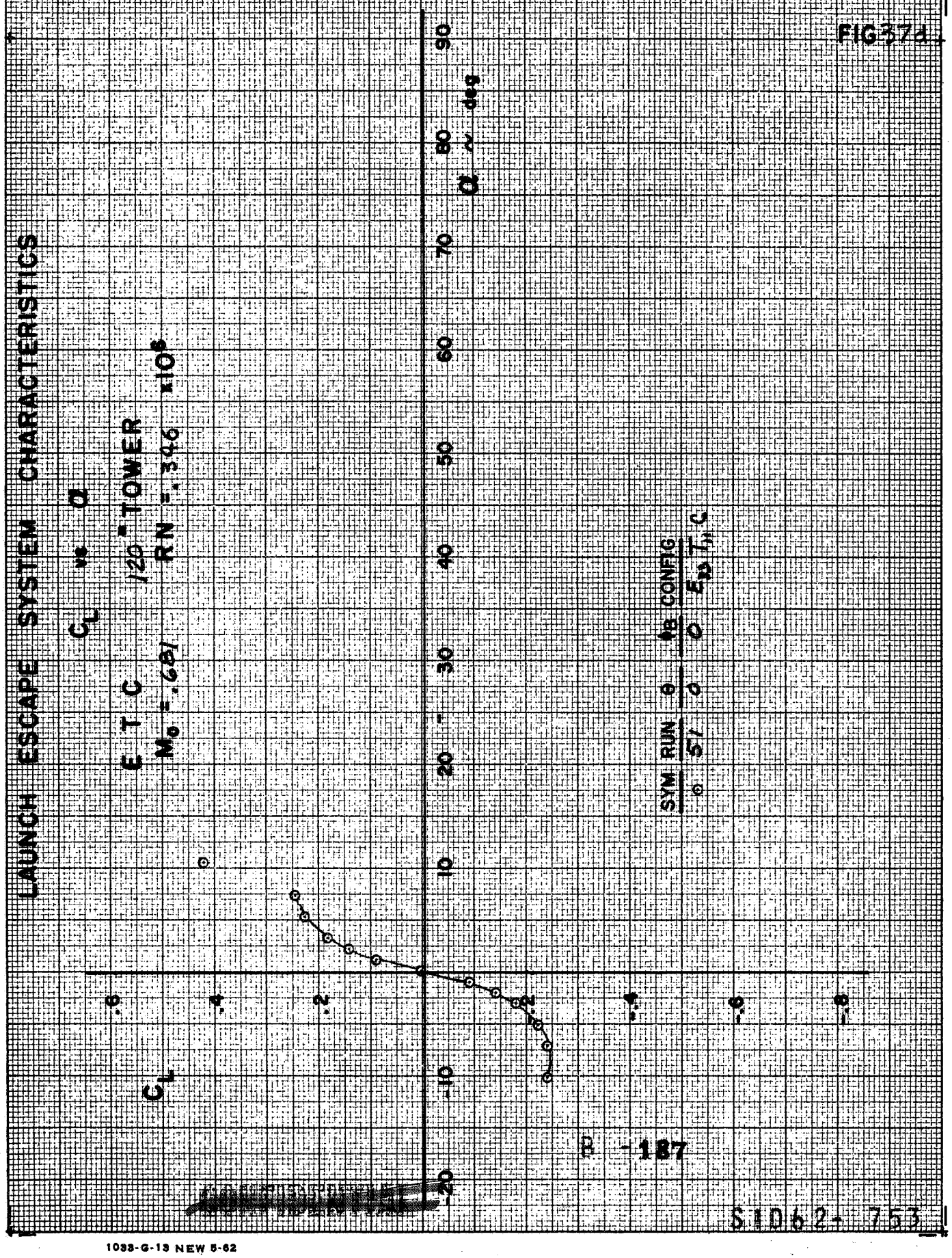
FIG 37d

C_L vs α 201-51



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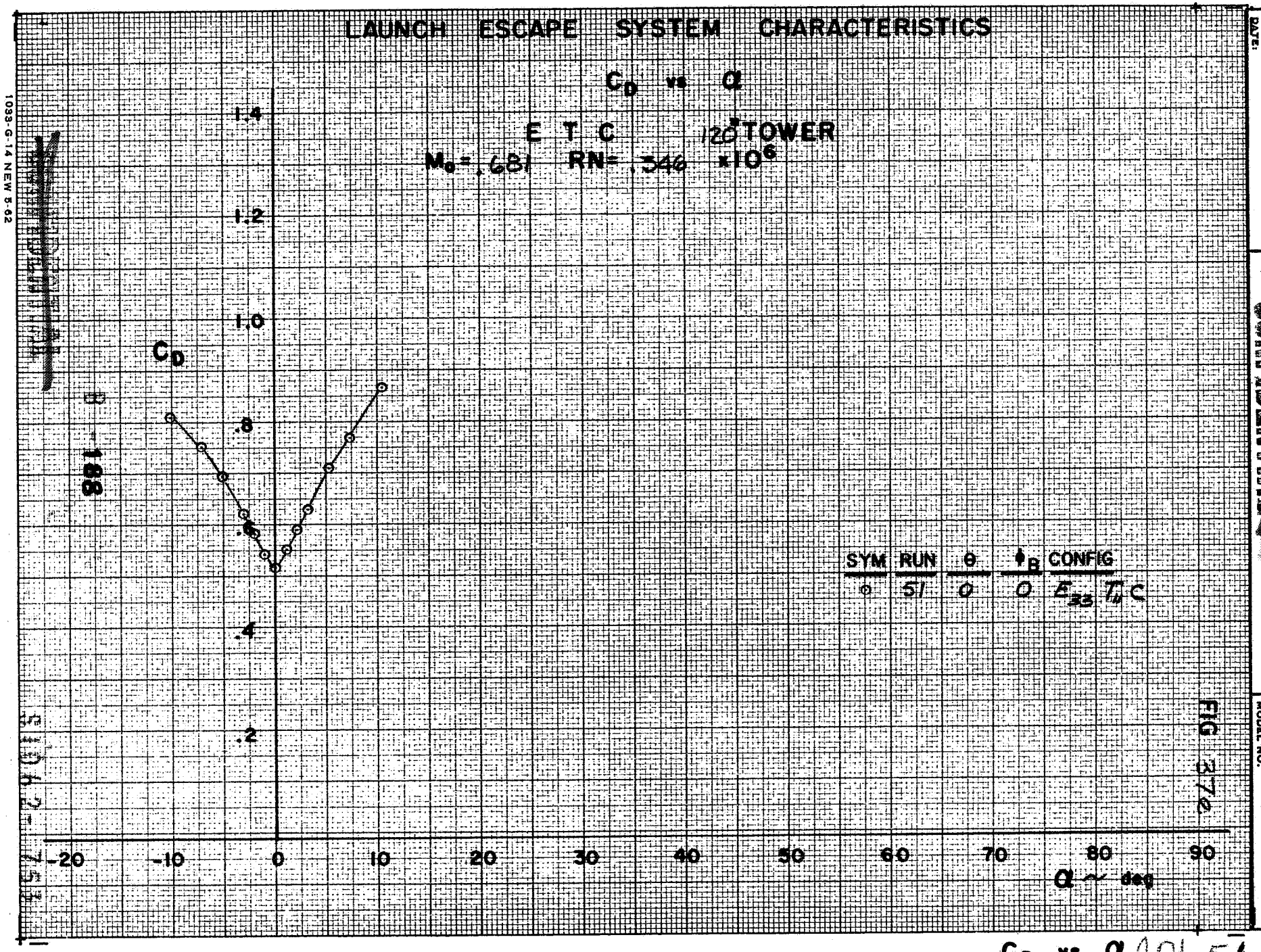

FIG 372

C_D vs α 201-51

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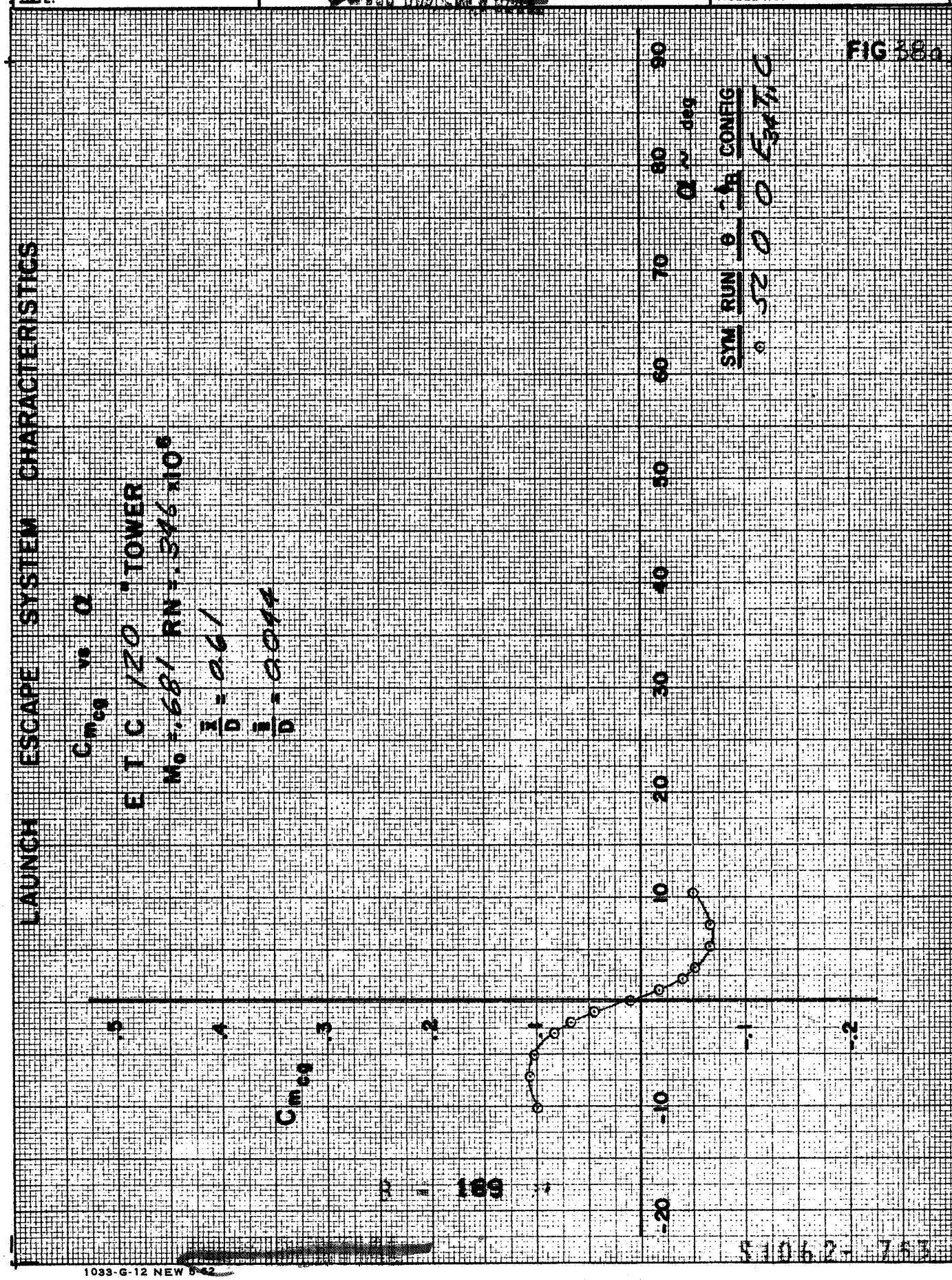
FIG 38a



$C_{m_{cg}}$ vs α 201-52

[redacted]
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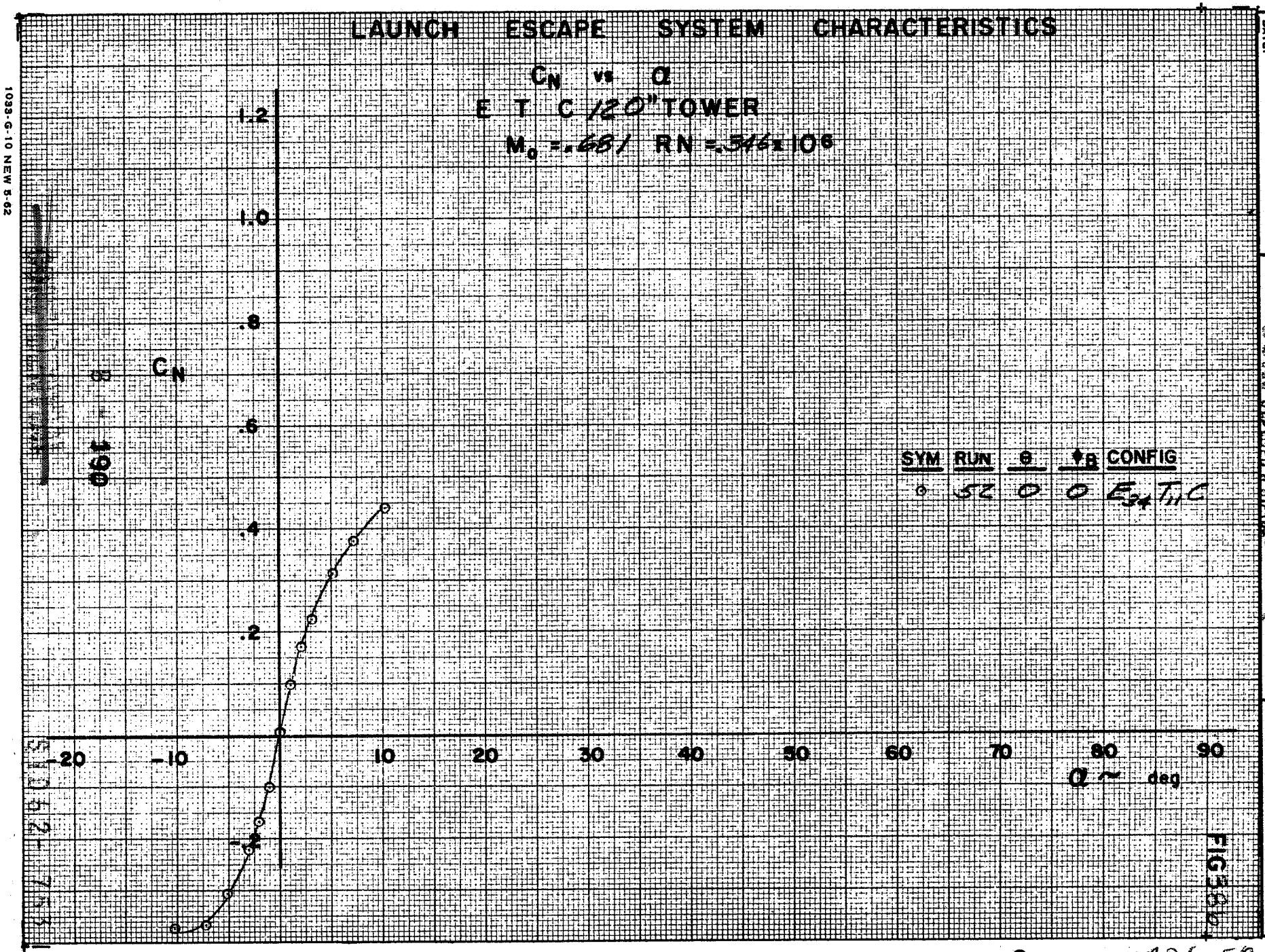

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FIG 90

C_N vs α 201-52

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

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LAUNCH ESCAPE SYSTEM CHARACTERISTICS

C_A vs α

E T C 120 "TOWER

M_∞ = .681 RN = .346 x 10^6

SYM	RUN	θ	β	CONFIG
⊙	52	0	0	Ex

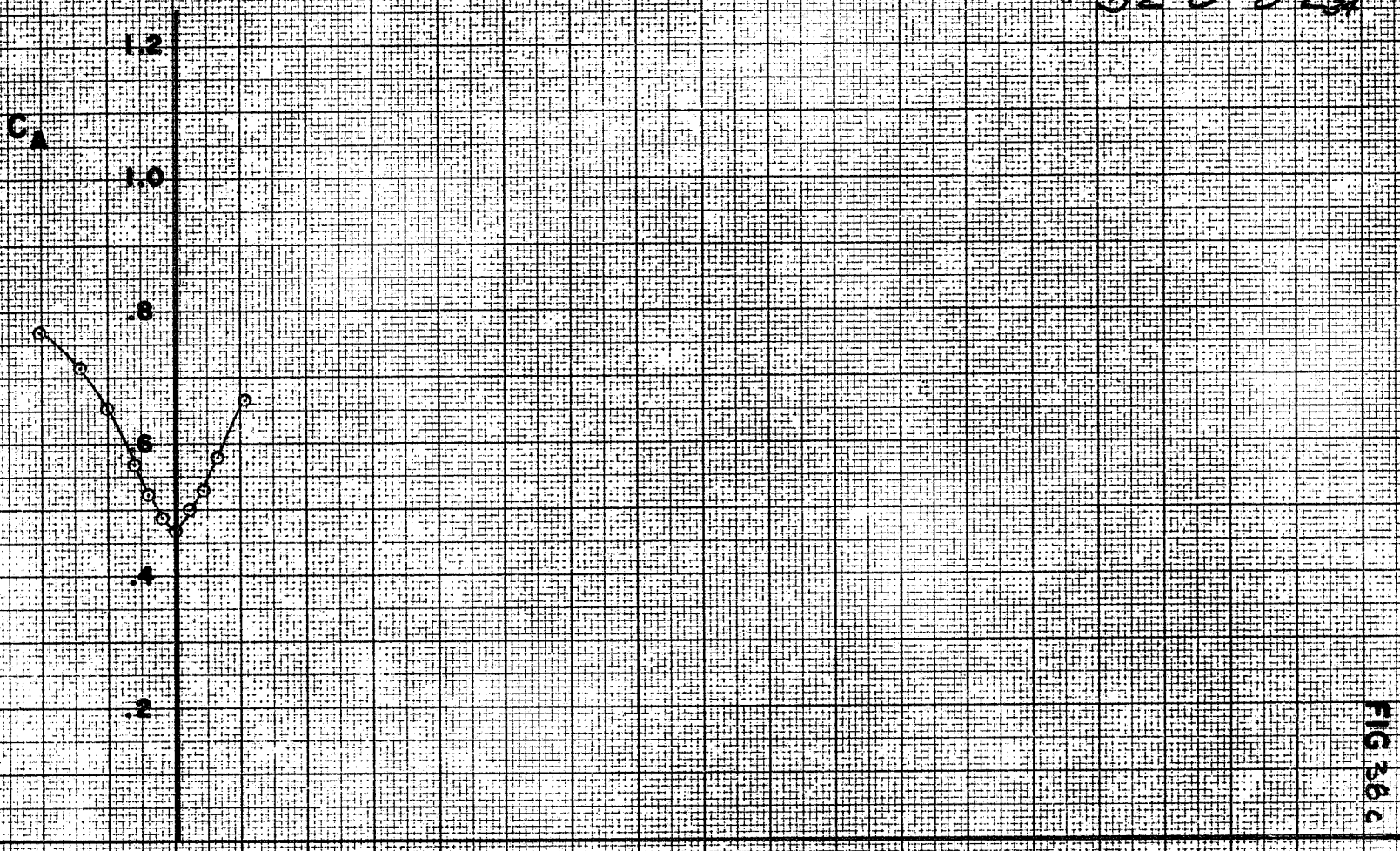

FIG 36c

C_A vs α 201-52

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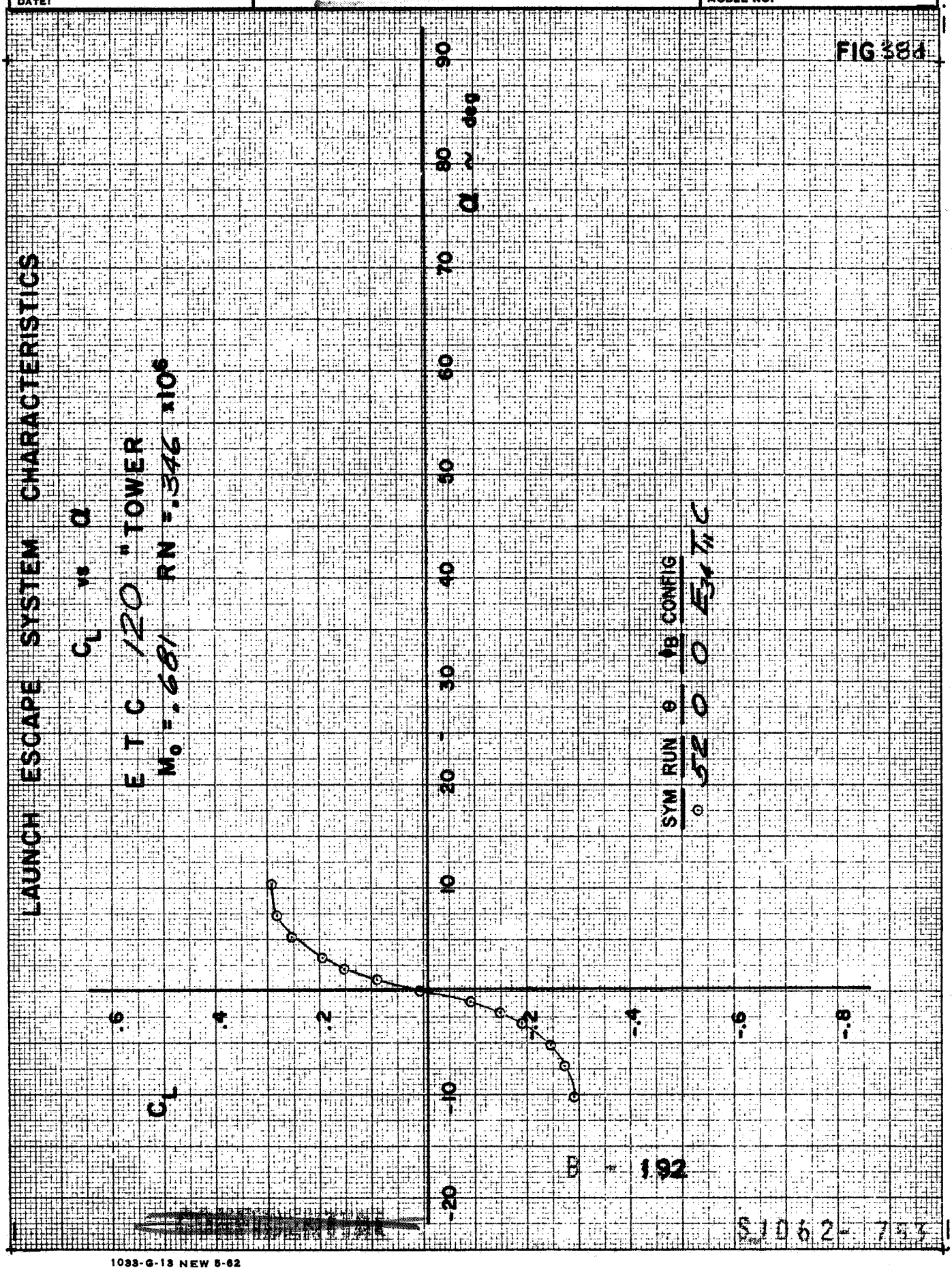
FIG 38d



C_L vs α 201-52

[redacted]

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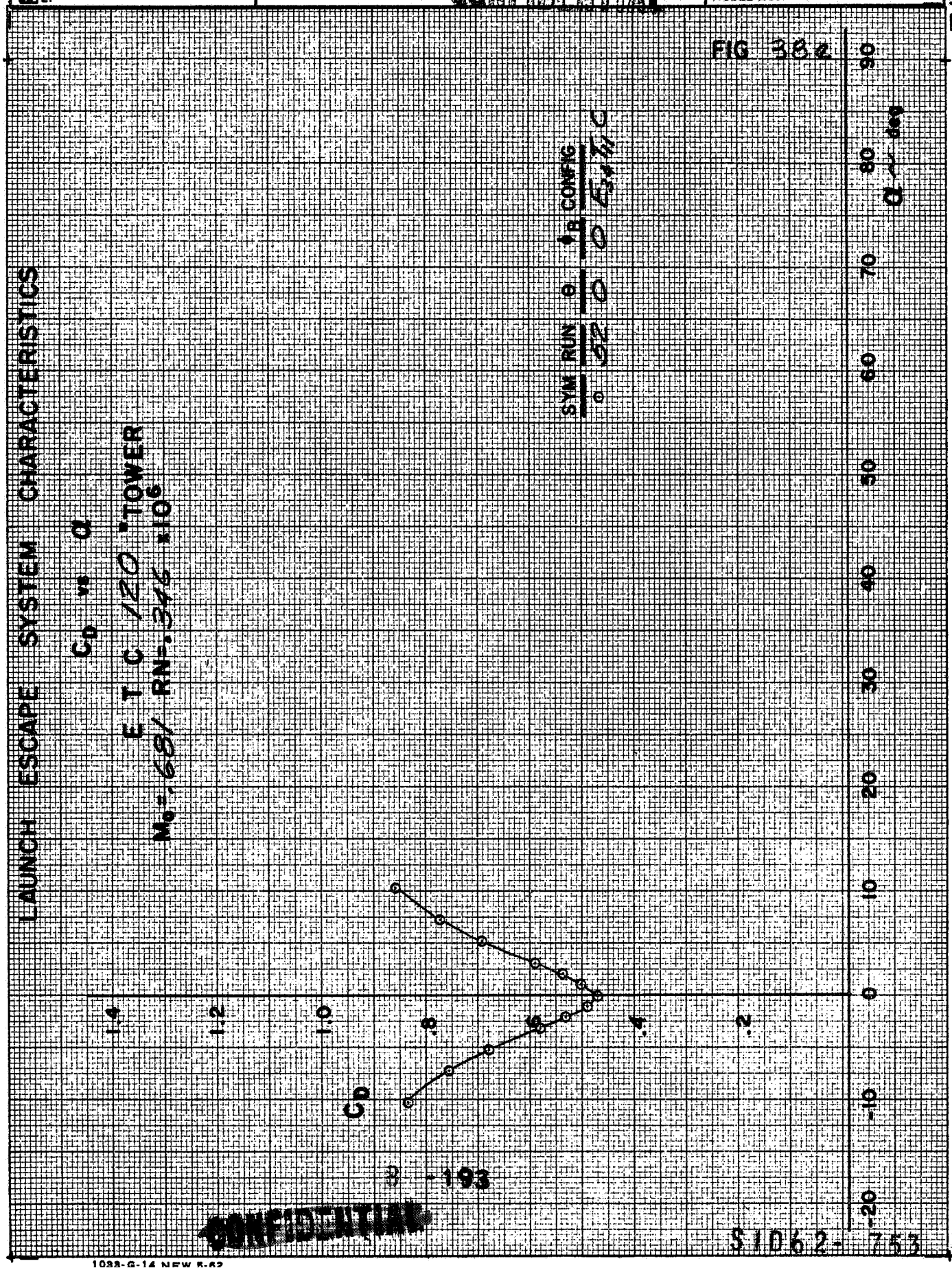

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APPENDIX C

MODEL & SCHLIEREN

PHOTOGRAPHS

Typical model and Schlieren photographs are shown in this section.

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1.	$E_{17}T_{11}C$	C-3
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4.	$E_{18}T_{11}C$	C-6
	TYPICAL SCHLIEREN PHOTOGRAPHS	
5.	$E_{21}T_{11}C$, M = 1.575, = 20	C-7
6.	$E_{22}T_{11}C$, M - 1.575, = 30	C-7
7.	$E_{25}T_{11}C$, M = 1.575, = 0	C-7
10.	$E_{26}T_{11}C$, M = 1.575, = -10	C-7

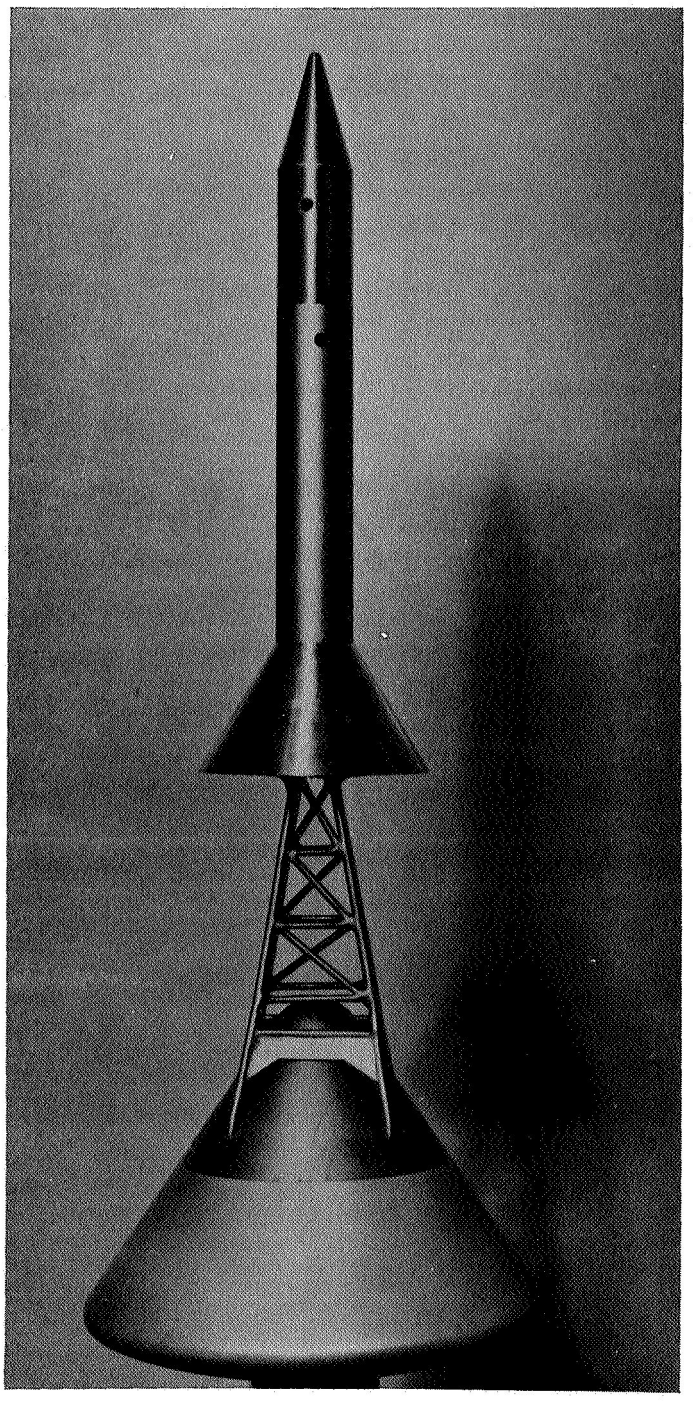

FIGURE 1. TYPICAL MODEL PHOTOGRAPH, $E_{17}T_{11}C$

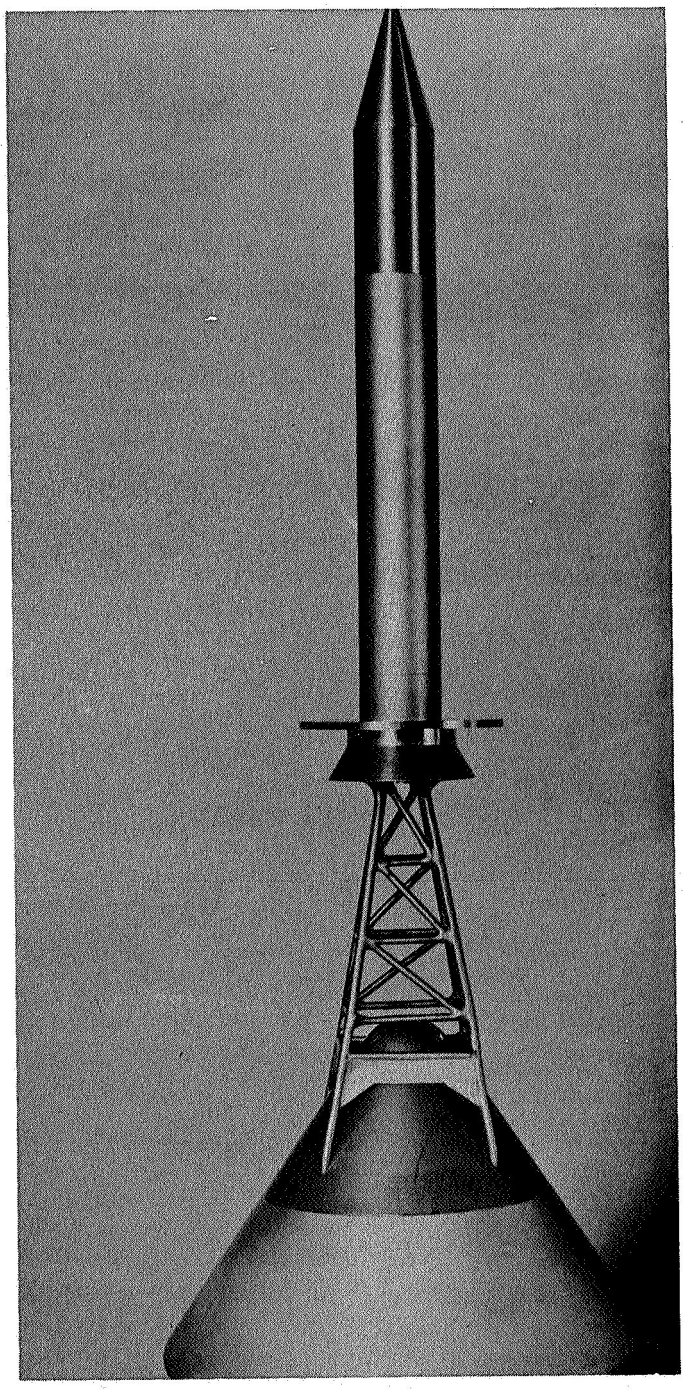

FIGURE 2. TYPICAL MODEL PHOTOGRAPH, $E_{20}T_{11}C$

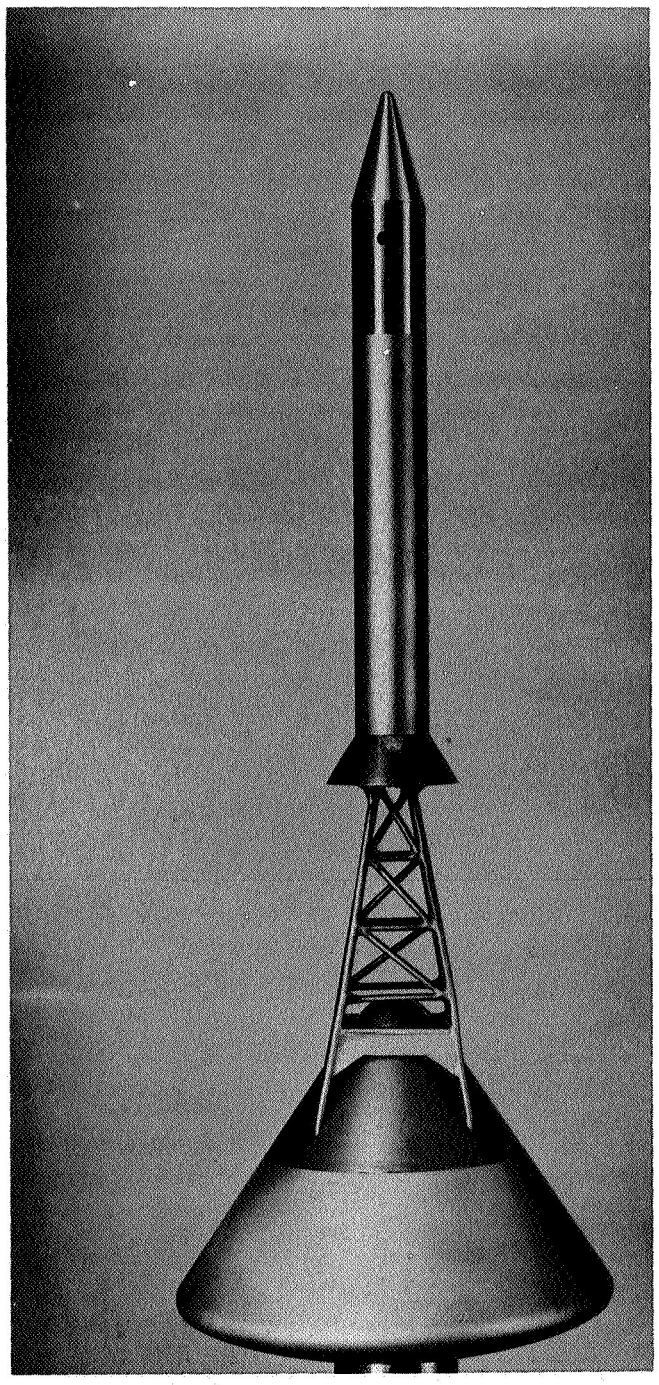

FIGURE 3. TYPICAL MODEL PHOTOGRAPH, $E_{14}T_{11}C$

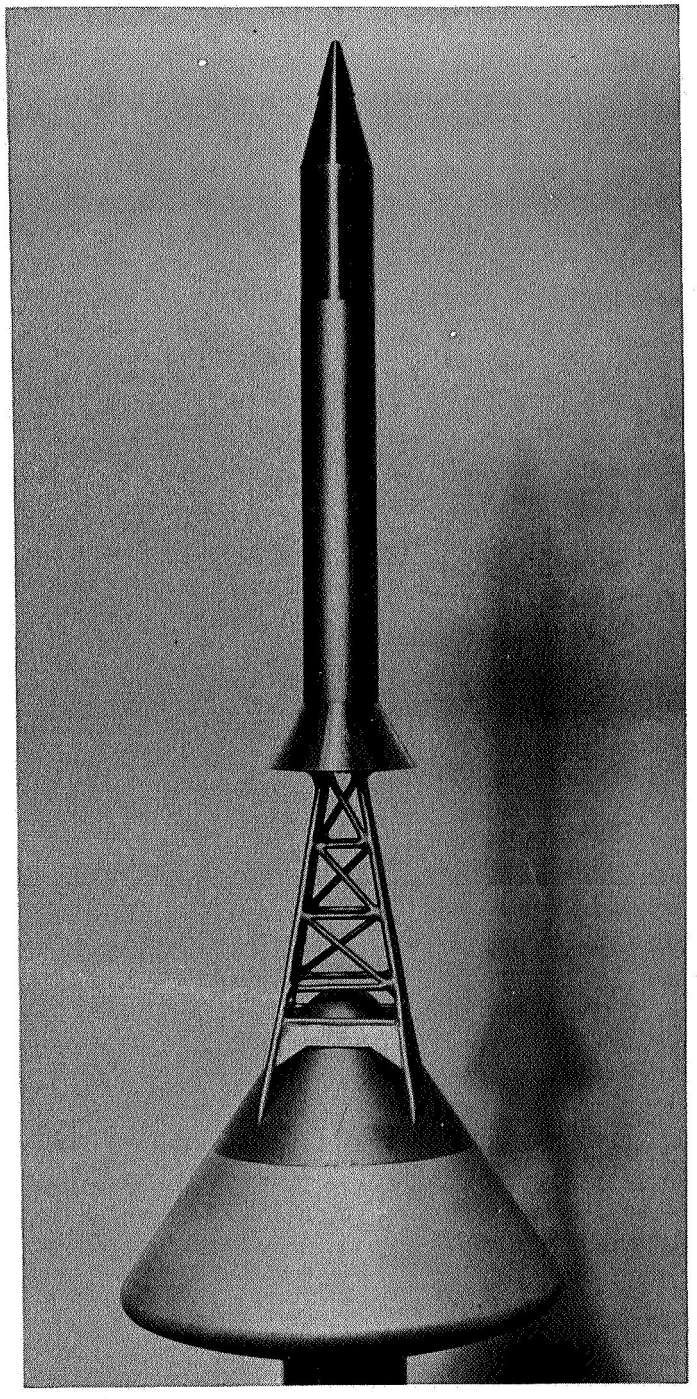

FIGURE 4. TYPICAL MODEL PHOTOGRAPH, $E_{18}T_{11}C$

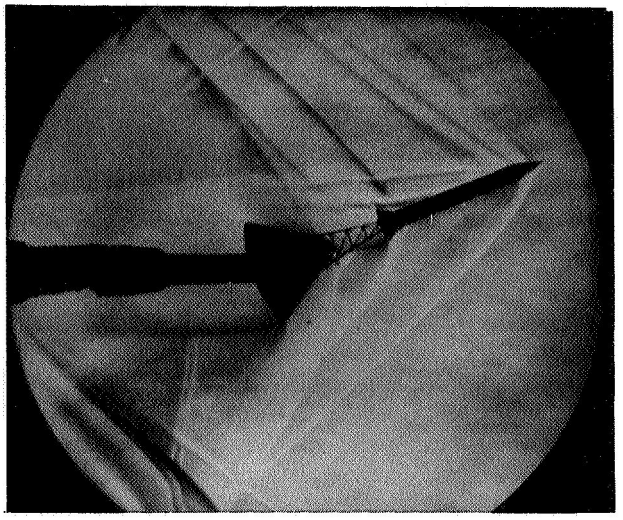

FIGURE 5. TYPICAL SCHLIEREN
$E_{21}T_{11}C$, M = 1.575, = 20°

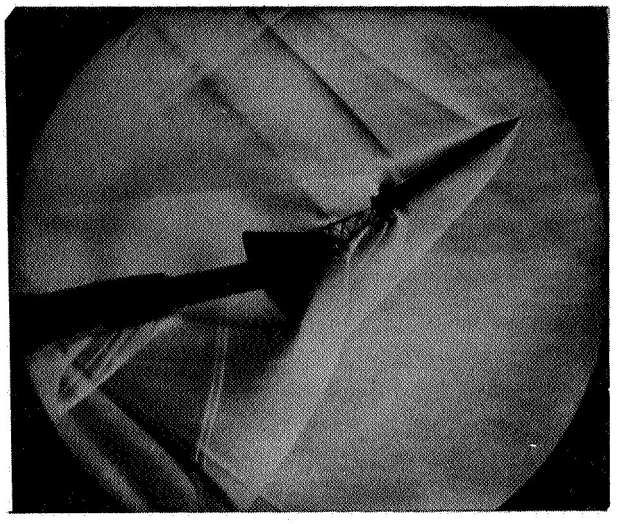

FIGURE 6. TYPICAL SCHLIEREN
$E_{22}T_{11}C$, M = 1.575, = 30°

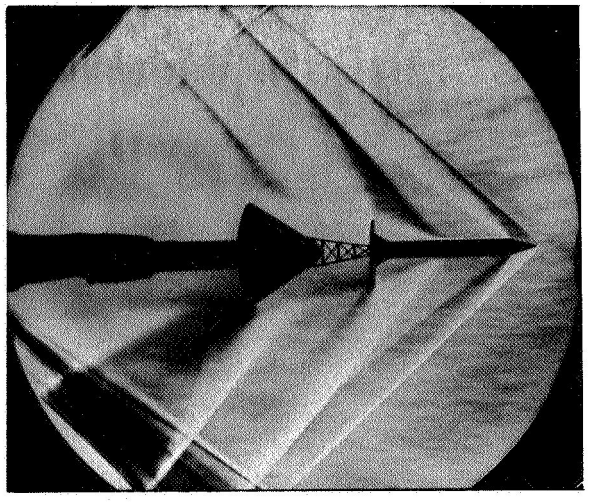

FIGURE 7. TYPICAL SCHLIEREN
$E_{25}T_{11}C$, M = 1.575, = 0°

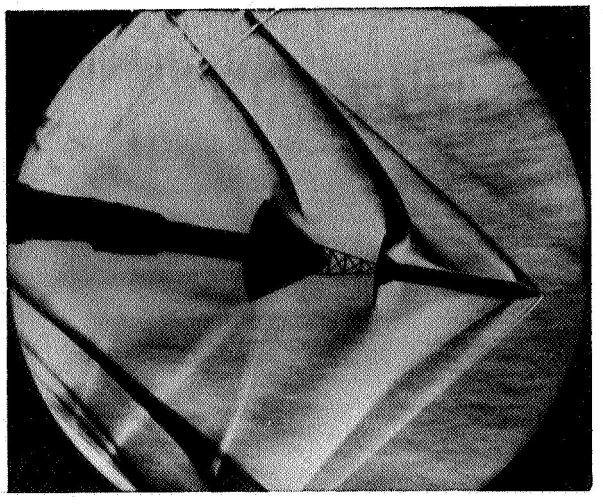

FIGURE 8. TYPICAL SCHLIEREN
$E_{26}T_{11}C$, M = 1.575, = -10