

QCX
Avro
CF105
P-WT
119I

CF-105

P/WT/119

Classification cancelled / Changed to: UNCLASS

By authority of N.A.E. LOW SPEED W/T TESTS AYES

Date JULY 1956

Signature [Signature]

Unit / Rank / Appointment AYES

Copy 1

ANALYZED

NRC - CISTI
J. H. PARKIN
FC

JUN 8 1995

ANNEX
J. H. PARKIN
CNRC - ICIST

W = 3 1/2% Cambered Wing
 B = Fuselage
 V = Vertical Tail
 U = Undercarriage
 U₁ = Nose U/C Reversed
 C = Canopy Open
 T = Tank
 ★ = Right Aileron Only
 (+ve = Down)

INDEX

N.A.E. LOW SPEED

WIND TUNNEL TESTS

SHEET	1.	2	3	4	5	6	7	8	9	10
RUNS	55-62 72 120 145	63-71	73-76	77 (High RN)	78-81	82-85	86-89 107 108	90-93 104-106	94-97 102 103	98
α	-2 +19		+4 +15	+4	+4 +15					
β	-16 +16									
δ_e	0				-10	-10	0	0	-10	0
δ_a	0									
δ_r	0									-6
δ_{SB}	0									
CONFIG.	WBV	WB	WBVU ₁	WBVU ₁	WBVU ₁	WBVU ₁	WBVU ₁	WBV	WBV	WB
GROUND BOARD b/2	OUT					.465				
SECTION NO	PLOT									
1 C _M vs C _L			SEE 1.11							
2 C _D vs C _L			SEE 2.11							
3 C _D vs C _L ²										
4 C _L vs α			SEE 4.11							
5 C _M vs α										
6 C _D vs α										
7 C _N	β	β	SEE 7.11	β	β	β	β	β	β	β
8 C _Y	β	β	SEE 8.11	β	β	β	β	β	β	β
9 C _L	β	β	SEE 9.11	β	β	β	β	β	β	β

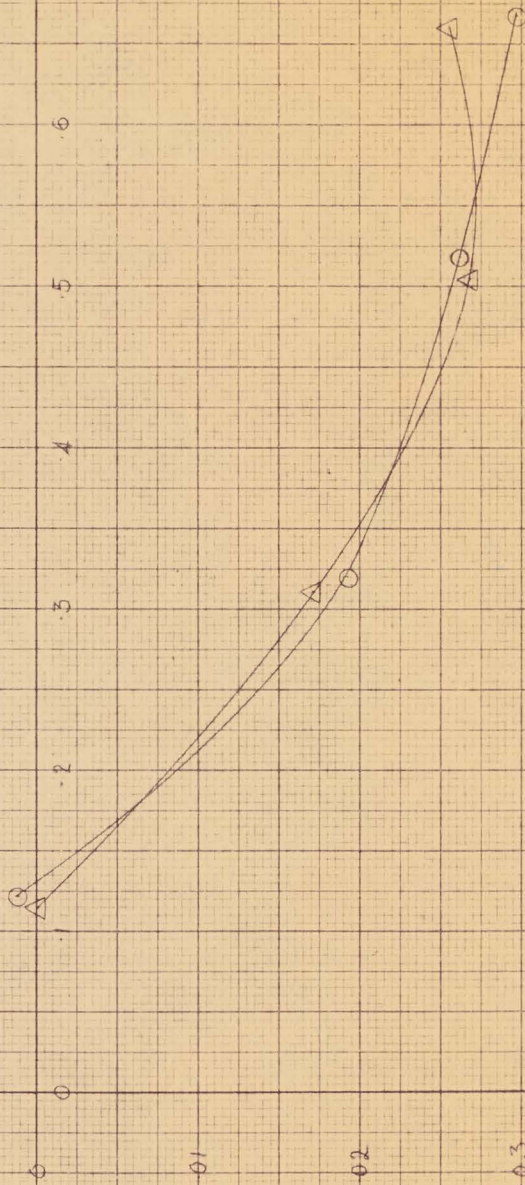
C-105
NA E LOW SPEED W/T TESTS
CM vs C_L (CORRECTED DATA)

COMPARISON OF CANOPY CLOSED & CANOPY OPEN
RUN 73-76 ① CANOPY CLOSED
RUN 109-112 Δ CANOPY OPEN
C.G. @ .282 ON M.A.C.

$\beta = 0$
 $\delta = 0$

CM

C_L



P/WT/119
JULY 1956

2-11
A. Schmidt

C-105
N.A.E. W.T. TESTS
MAY 1956

C_D VS C_L
(CORRECTED)

C.G. = 0.282 ON M.A.C.

$\beta = 0^\circ$

$\delta_e = 0^\circ$

KUN 73-76
RUN 109-112

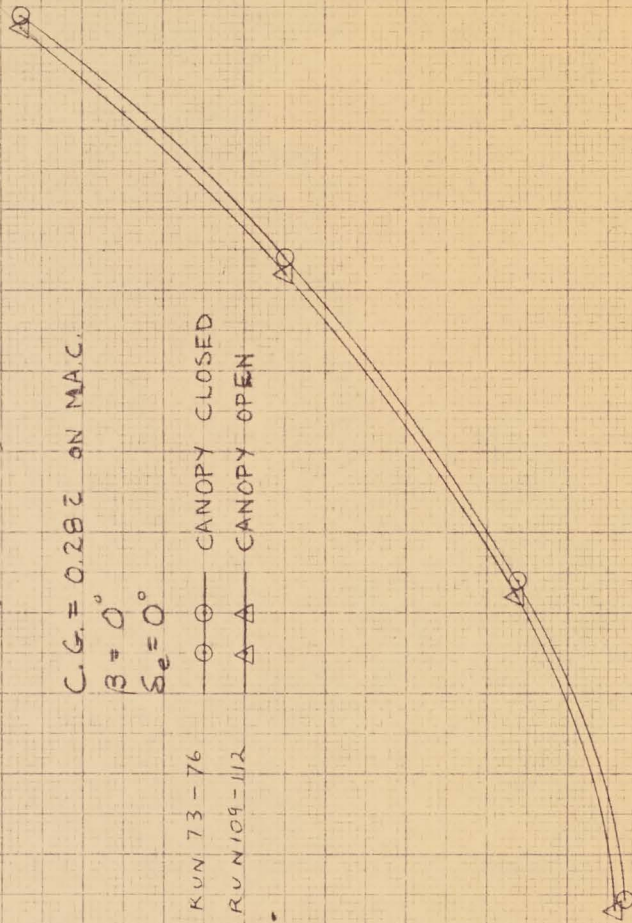
○ ○ CANOPY CLOSED

△ △ CANOPY OPEN

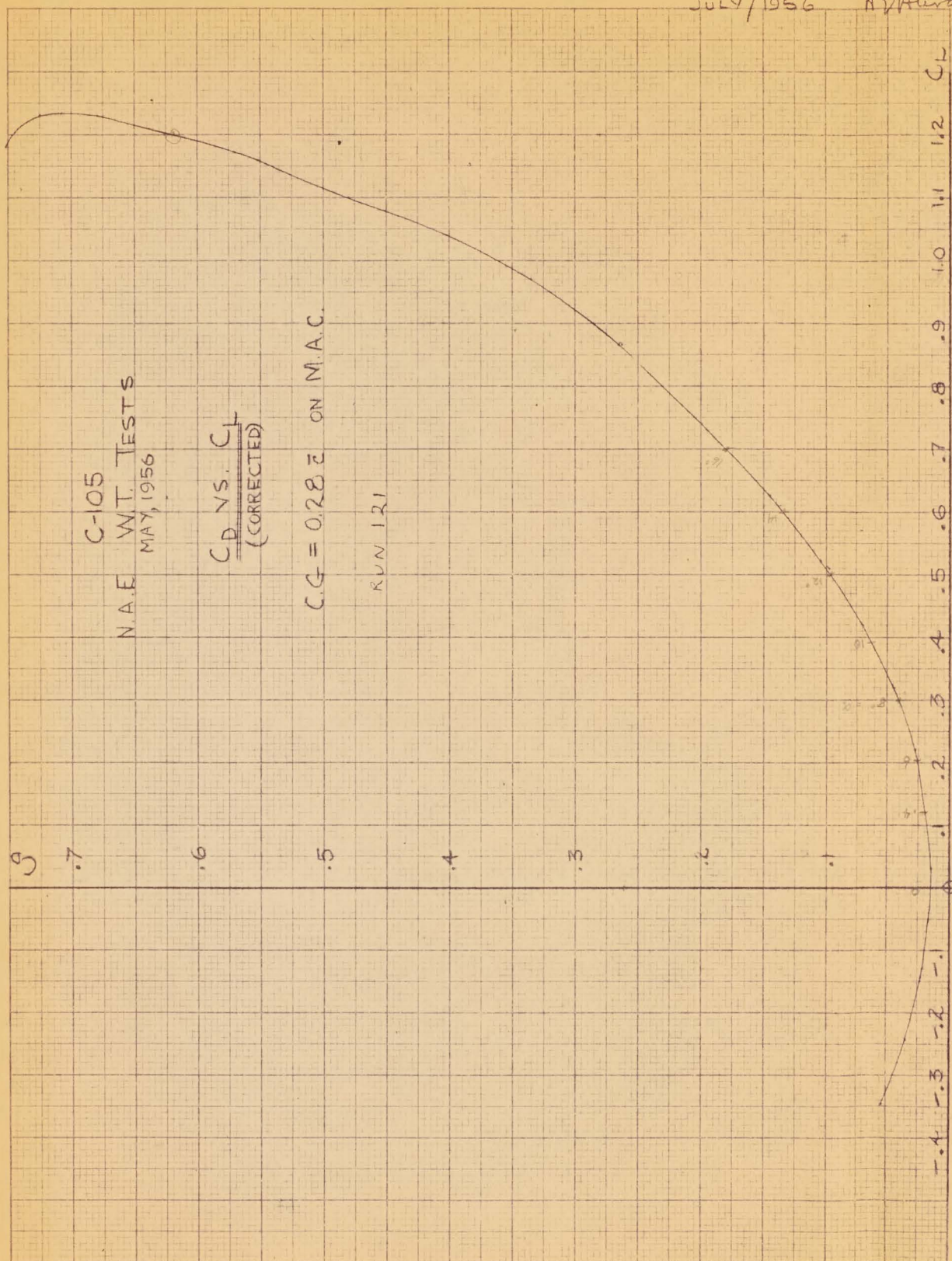
C_D

0.20
0.18
0.16
0.14
0.12
0.10
0.08
0.06
0.04
0.02

0.1 0.2 0.3 0.4 0.5 0.6 0.7 C_L



P/WT/119 2-13
JULY 1956 AS/Aund



RUN 121

C-105

NAE LOW SPEED W/T TESTS

C_L vs α (CORRECTED DATA)

COMPARISON OF CANOPY OPEN & CANOPY CLOSED

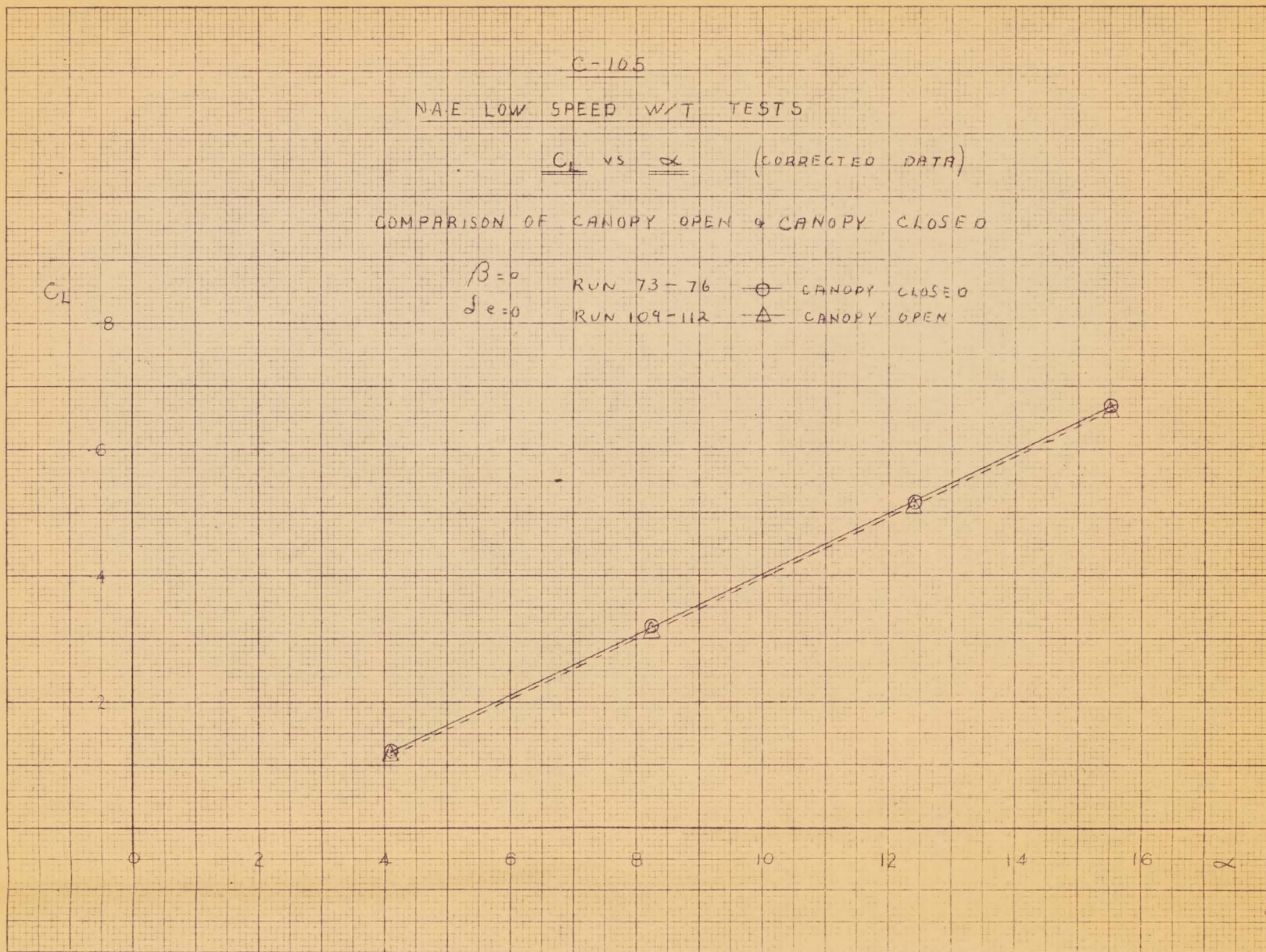
$\beta = 0$
 $\delta e = 0$

RUN 73-76

⊙ CANOPY CLOSED

RUN 109-112

△ CANOPY OPEN



P/W T/119 4-11
JUL 54

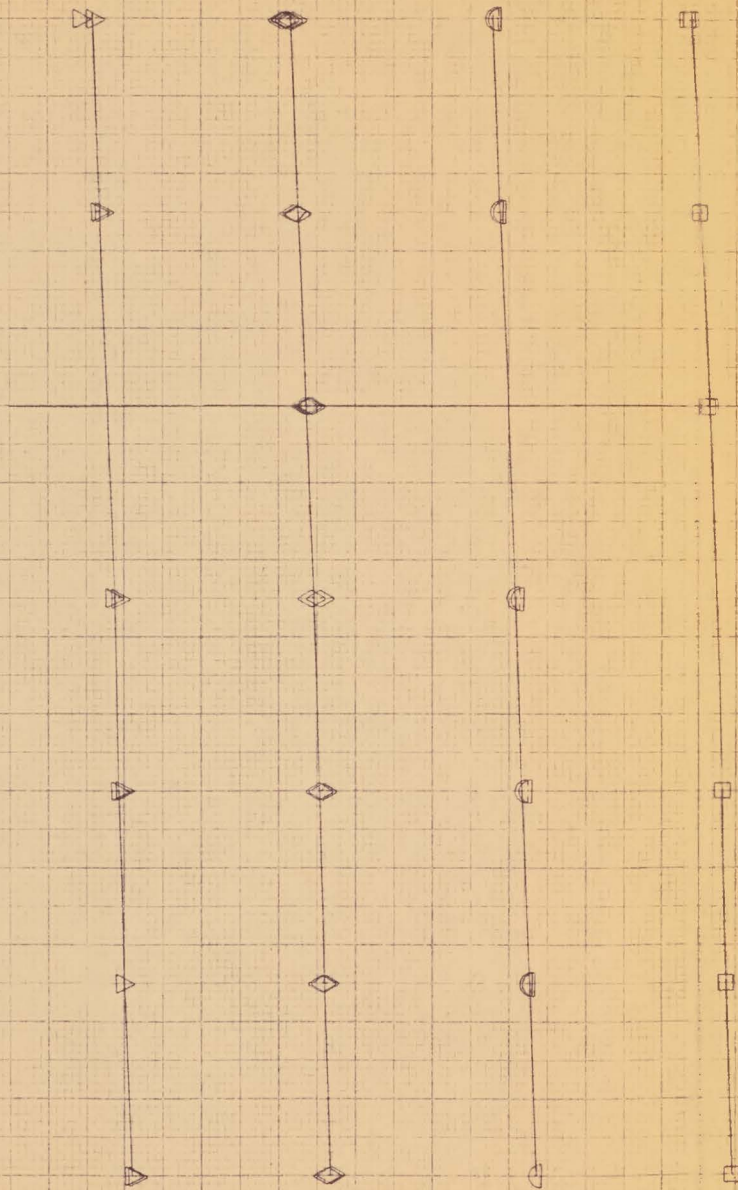
C-105
N.A.E. LOW SPEED W.T. TESTS
JULY, 1956

C_L vs ϵ_{ar}
(CORRECTED)

$C_G = 0.28$ ON M.A.C.

STARBOARD AILERON ONLY DEFLECTED

RUN NO.	ϵ_{ar}
122 158	+10
162	+5
157	+5
153	-10
152	-15
151	-20



P_{∞}

C-105

NAE WT TESTS MAY '56

C_n vs β (UNCORRECTED)

FIN OFF

C.G. = 280 on M.B.C

C_n

.002

Scale

○ NOM $\alpha = 19^\circ$
RUN 63

△ NOM $\alpha = 15^\circ$
RUN 71

◇ NOM $\alpha = 10^\circ$
RUN 70

◇ NOM $\alpha = 6^\circ$
RUN 68

△ NOM $\alpha = 4^\circ$
RUN 67

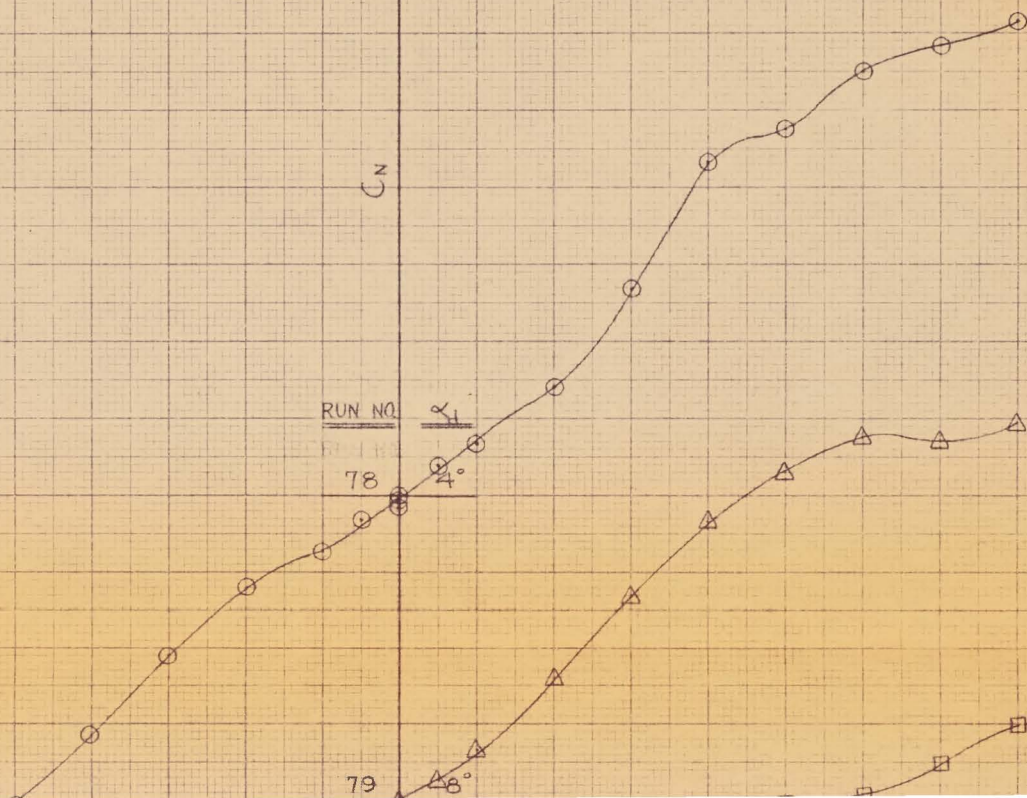
□ NOM $\alpha = 2^\circ$
RUN 66

△ NOM $\alpha = 0^\circ$

C-105
NAE W.T. TESTS
MAY, 1956

C_h vs. β
(UNCORRECTED)

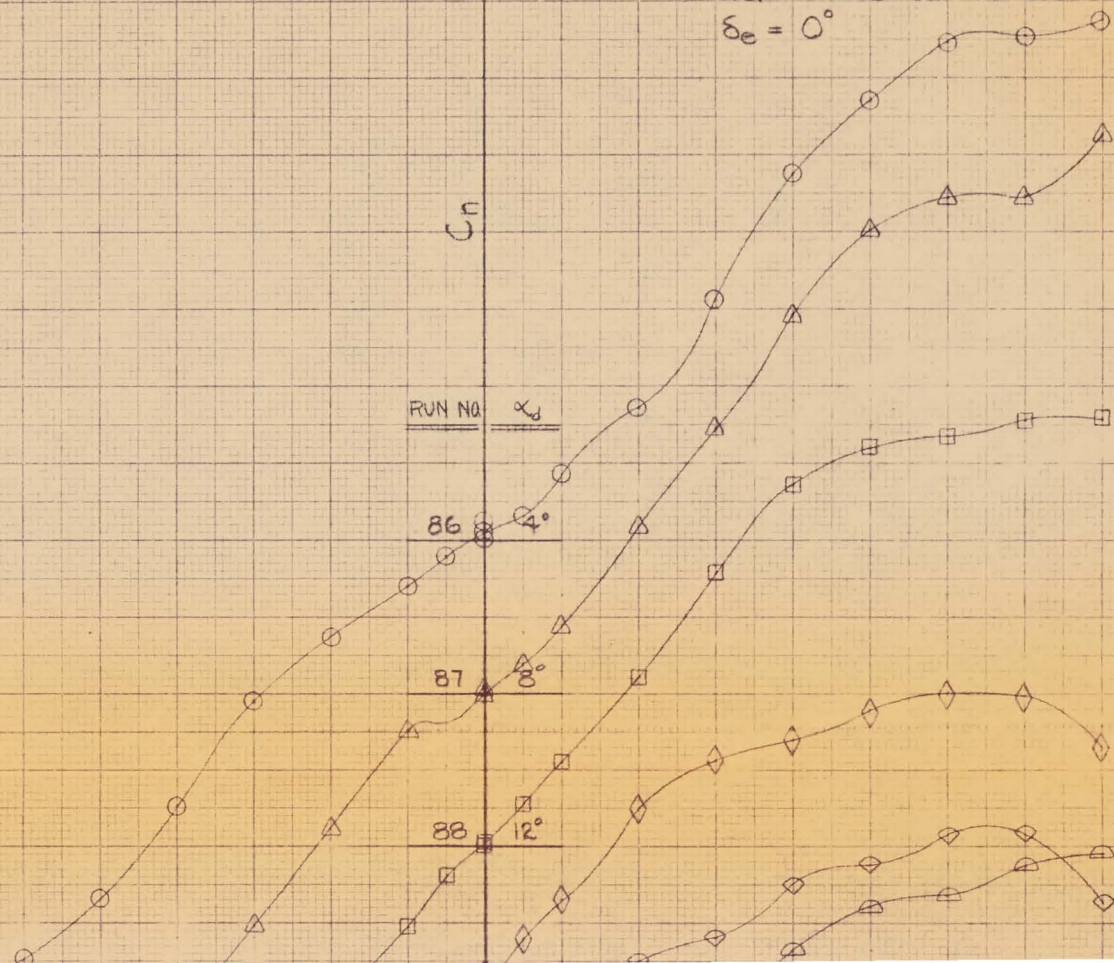
C.G. = 0.28 $\bar{c}$ ON MAC.
 $\delta_c = -10^\circ$



C-105
N.A.E. W.T. TESTS
MAY, 1956

C_m vs. β
(UNCORRECTED)

C.G. = 0.282 ON M.A.C.
 $\delta_e = 0^\circ$



C-105

N.A.E. LOW SPEED W/T TESTS

CN vs β (UNCORRECTED)

C.G. @ 28% ON H.A.C.

$S_e = -10$

G.B. at $465 \frac{1}{2}$

CONF. W.B.V.

Scale
↑
0.002

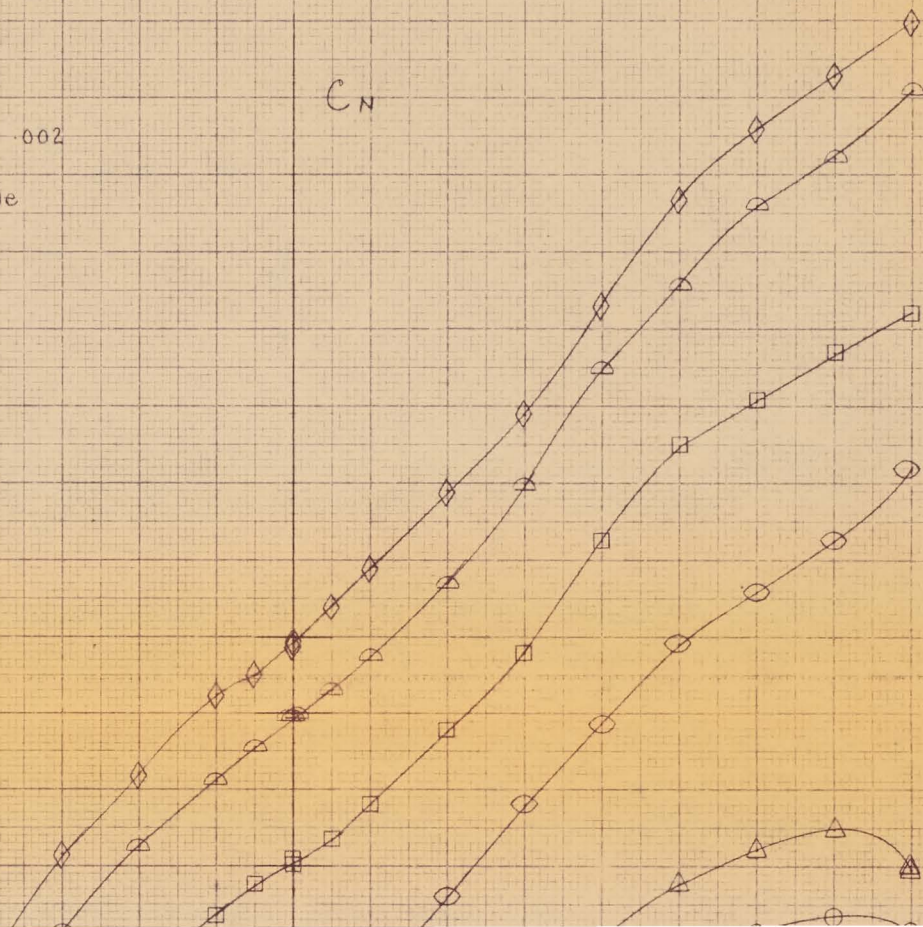
CN

ORIGIN

◇ $\alpha = 4^\circ$
RUN 103

△ $\alpha = 4^\circ$
RUN 94

□ $\alpha = 8^\circ$
RUN 95



C-105

NAE LOW SPEED W/T TESTS

(MAY 1956)

C_n vs β

CANOPY CLOSED AND OPEN

(UNCORRECTED DATA)

C.G. @ .287 ON MAC

ORIGINS

$\alpha = 12^\circ$

$\alpha = 8^\circ$

C_n

SCALE .002

OPEN

CANOPY

110

DOWN

CANOPY

CLOSED

RUN 73

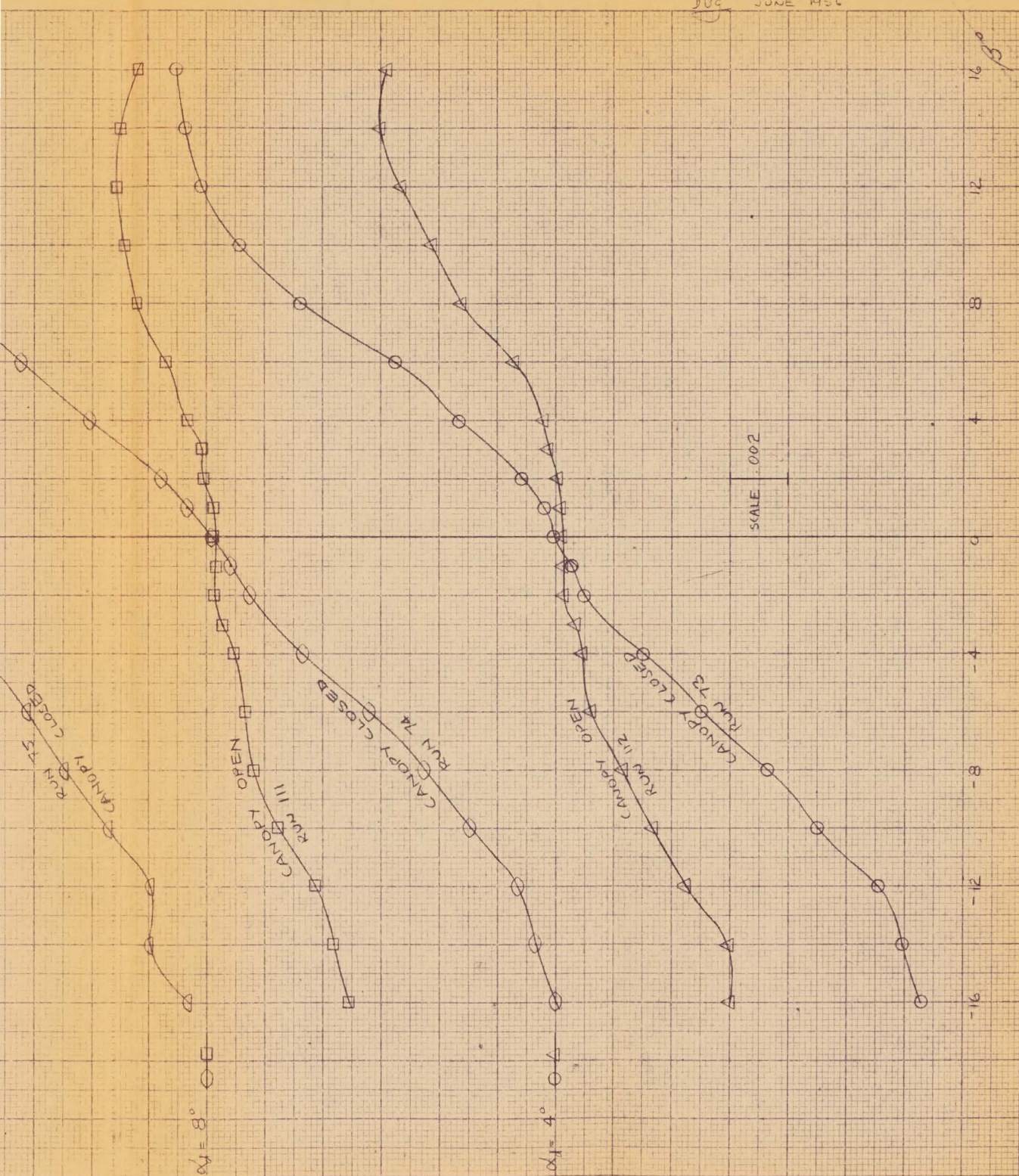
OPEN

OPEN

P/WT/119

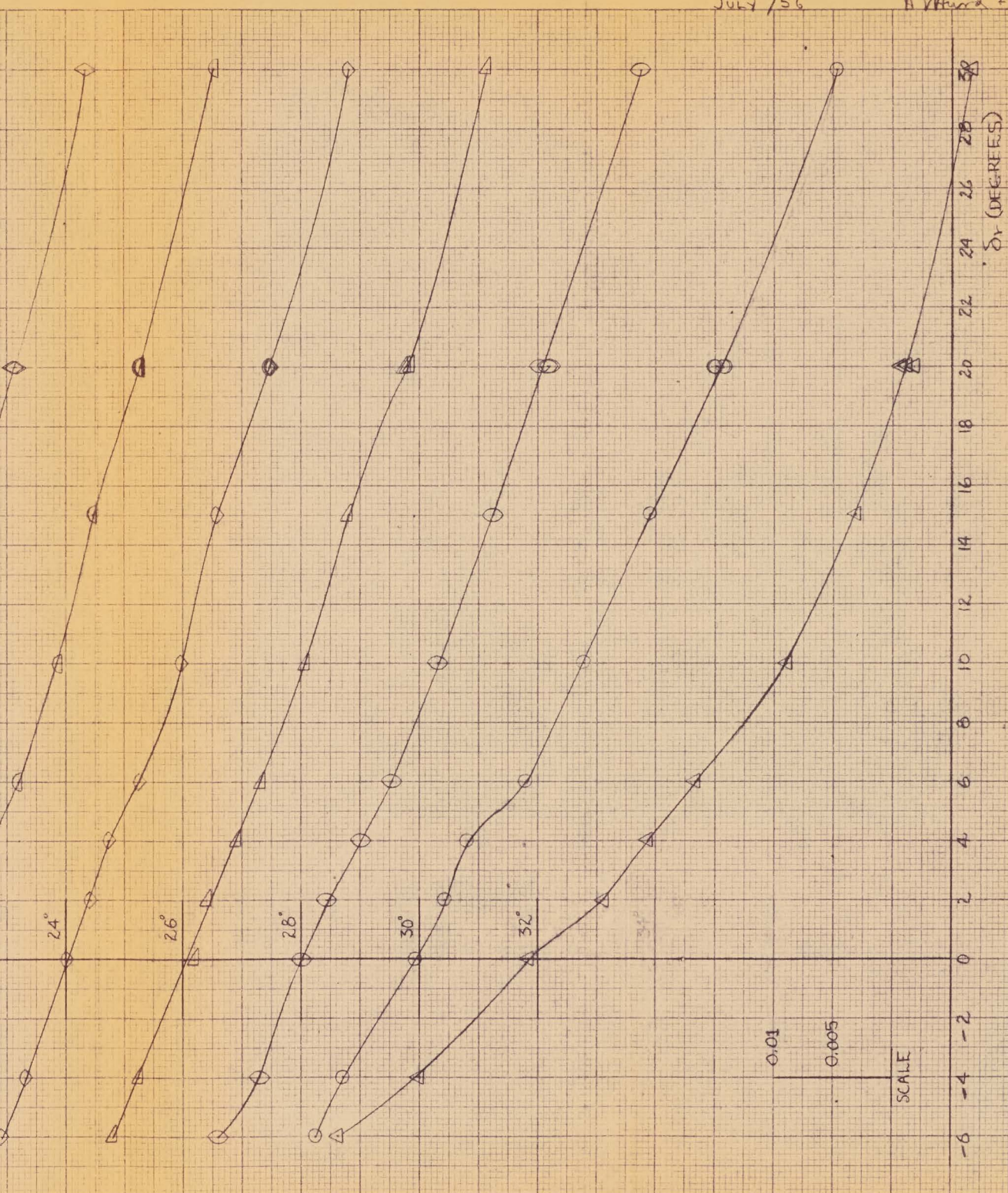
7-11

209 JUNE 1956



P/WT/119
JULY 56

7-12 (cont)
ATMOSPHERIC & V.L.



C-105

N A E LOW SPEED W/1 TESTS

CN vs β

(UNCORRECTED)
C.G. 282 ON H.A.C.

RUN 121

CN
Scale
0.002

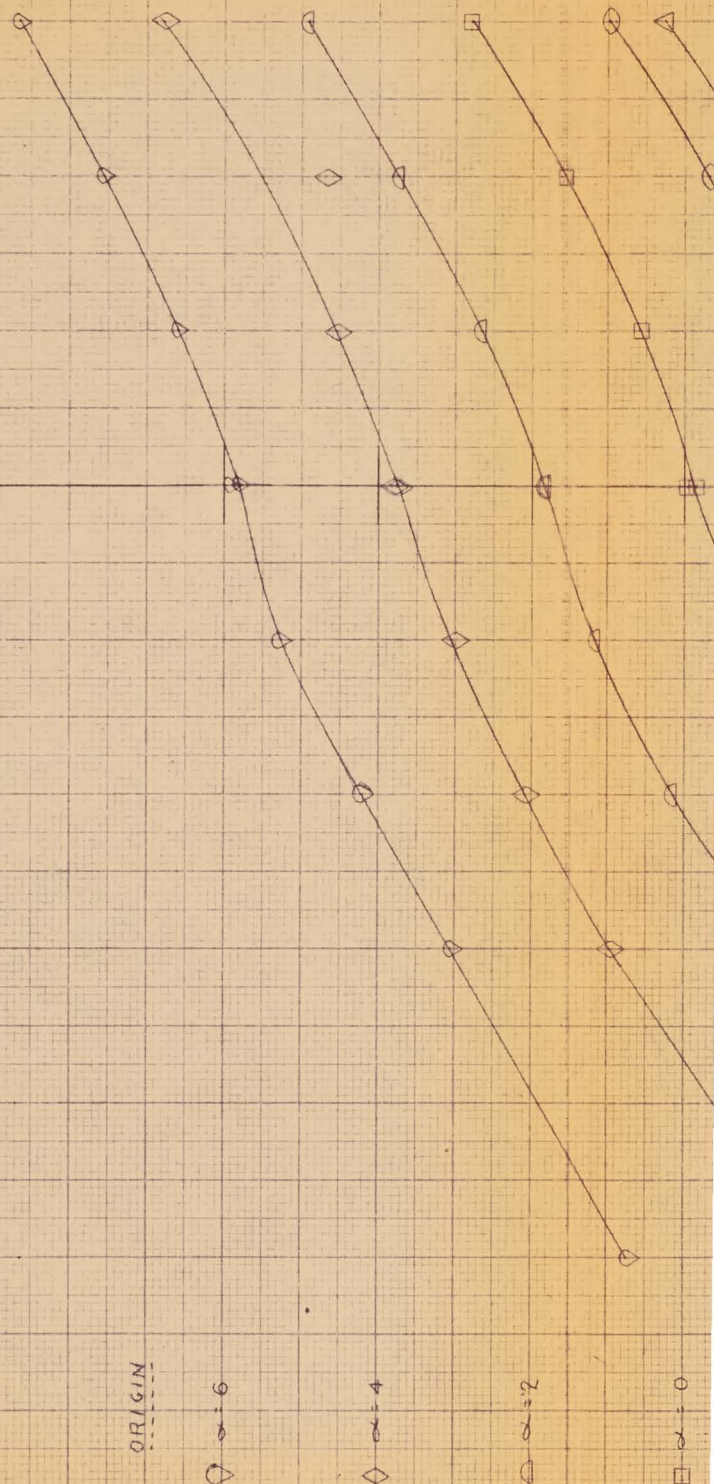
ORIGIN

$\alpha = 6$

$\alpha = 4$

$\alpha = 2$

$\alpha = 0$



C-105

N.A.E. LOW SPEED W/T TESTS

C_N vs β (UNCORRECTED)

RUN 121

$\approx 42.28\% \text{ on M.A.C.}$

SCALE .002

Scale

C_N

ORIGIN

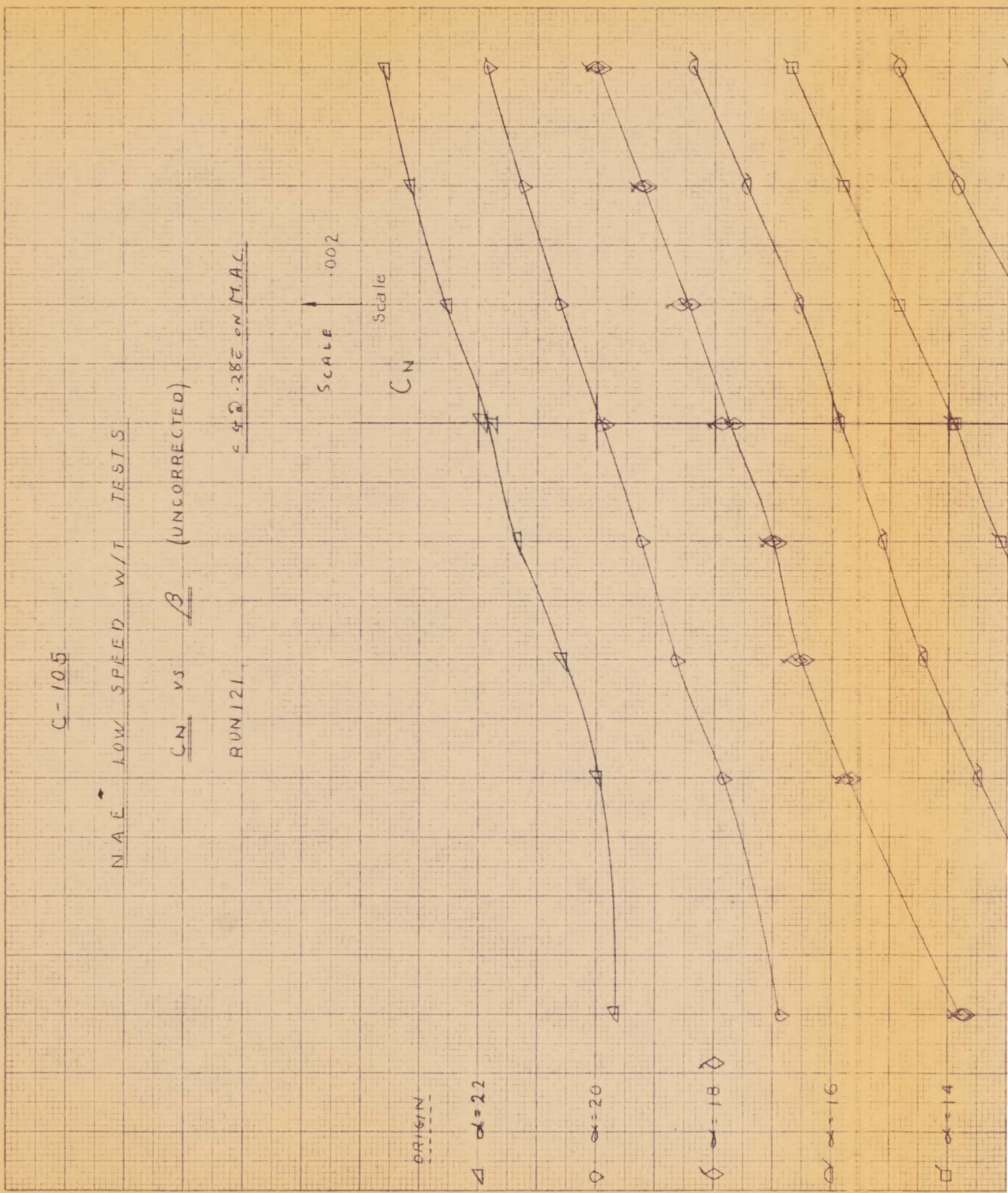
$\alpha = 22$

$\alpha = 20$

$\alpha = 18$

$\alpha = 16$

$\alpha = 14$



C-105

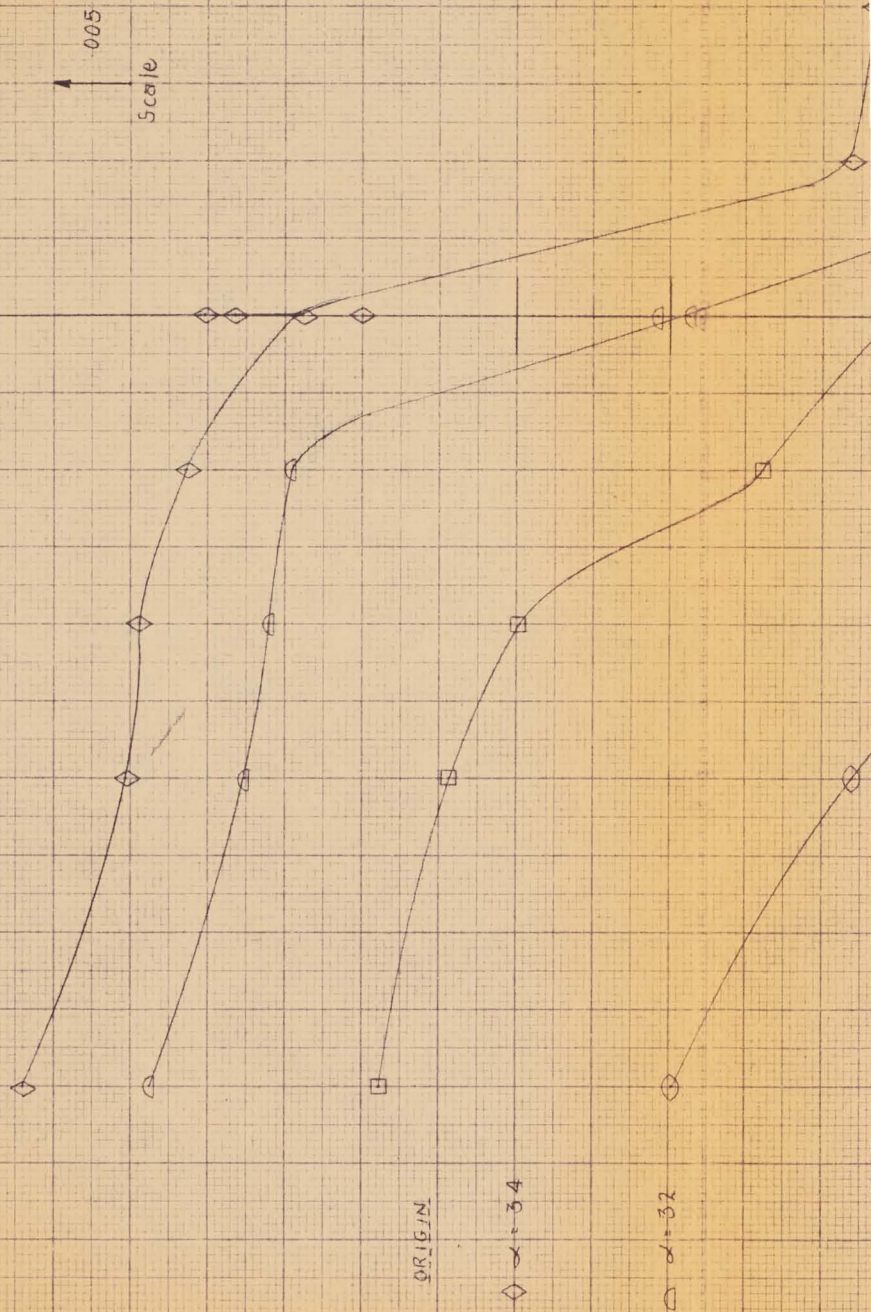
NAE LOW SPEED W/T TESTS

CN vs β (UNCORRECTED)

642.287 ON N.A.C.

RUN 121

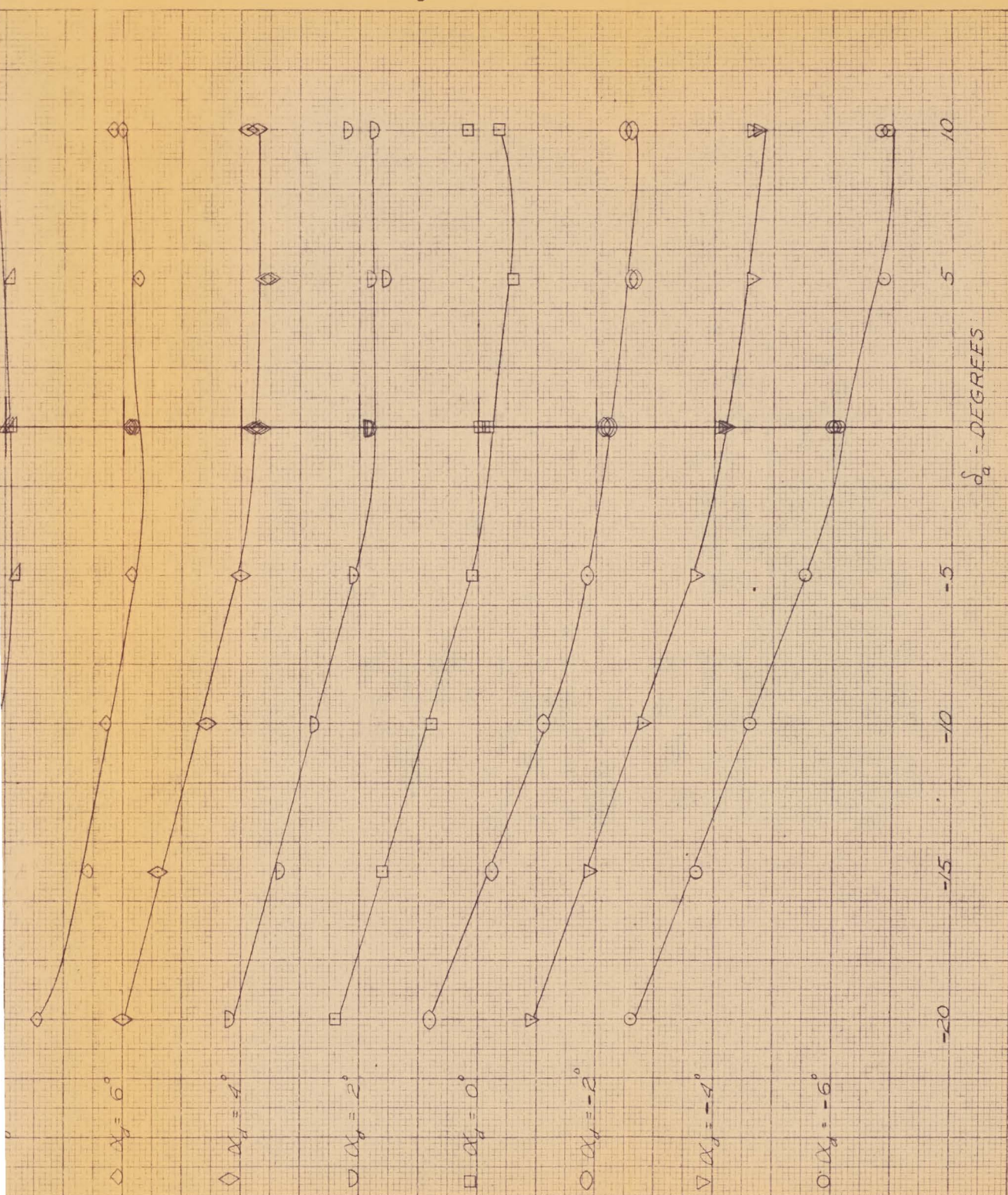
CN



SEPT./56 MB

P/WT/119

7.14.1



C-105
NAE LOW SPEED W/T TESTS JULY/56
 C_n VS. δ_a (STARBOARD ONLY) ($\beta = 0^\circ$)

UNCORRECTED

54.0 · 28E ON M.A.C.

RUN	δ_a
122	10°
151	-20°
152	-15°
153	-10°
157	-5°
158	10°
162	5°
121	0°

SCALE:
002

C_n

ORIGINS:

◇ $\alpha_f = 28^\circ$

X $\alpha_f = 26^\circ$

△ $\alpha_f = 24^\circ$

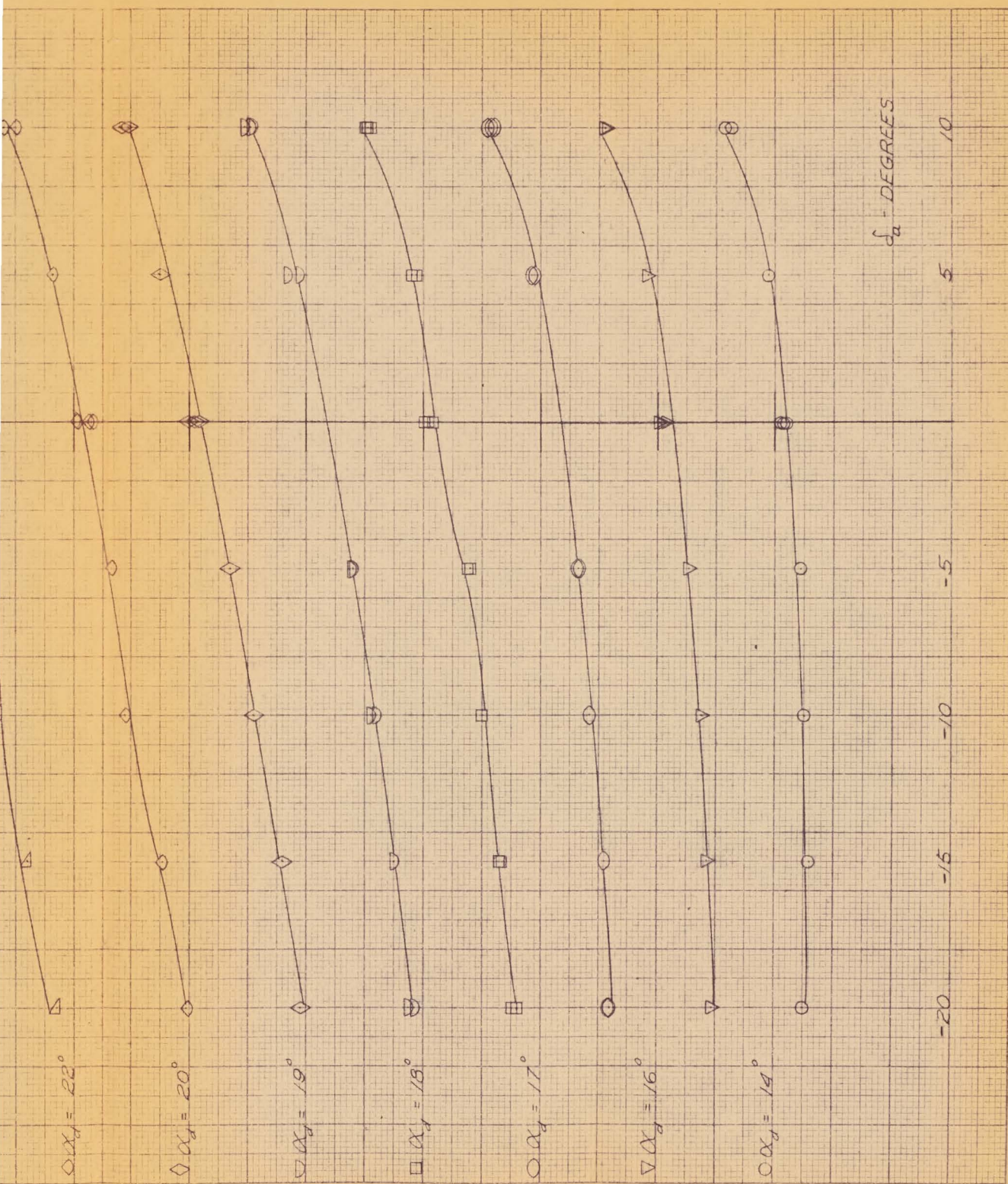
◇ $\alpha_f = 22^\circ$

◇ $\alpha_f = 20^\circ$

SEPT/56 MB

P/WT/119

7.14.2



C-105
NAE LOW SPEED W/T TESTS JULY/56
($B=0^\circ$) C_n vs. δ_a (STARBOARD ONLY)

UNCORRECTED

C.G. @ .282 ON M.A.L.

RUN	δ_a
122	10°
151	-20°
152	-15°
153	-10°
157	-5°
158	10°
162	5°
121	0°

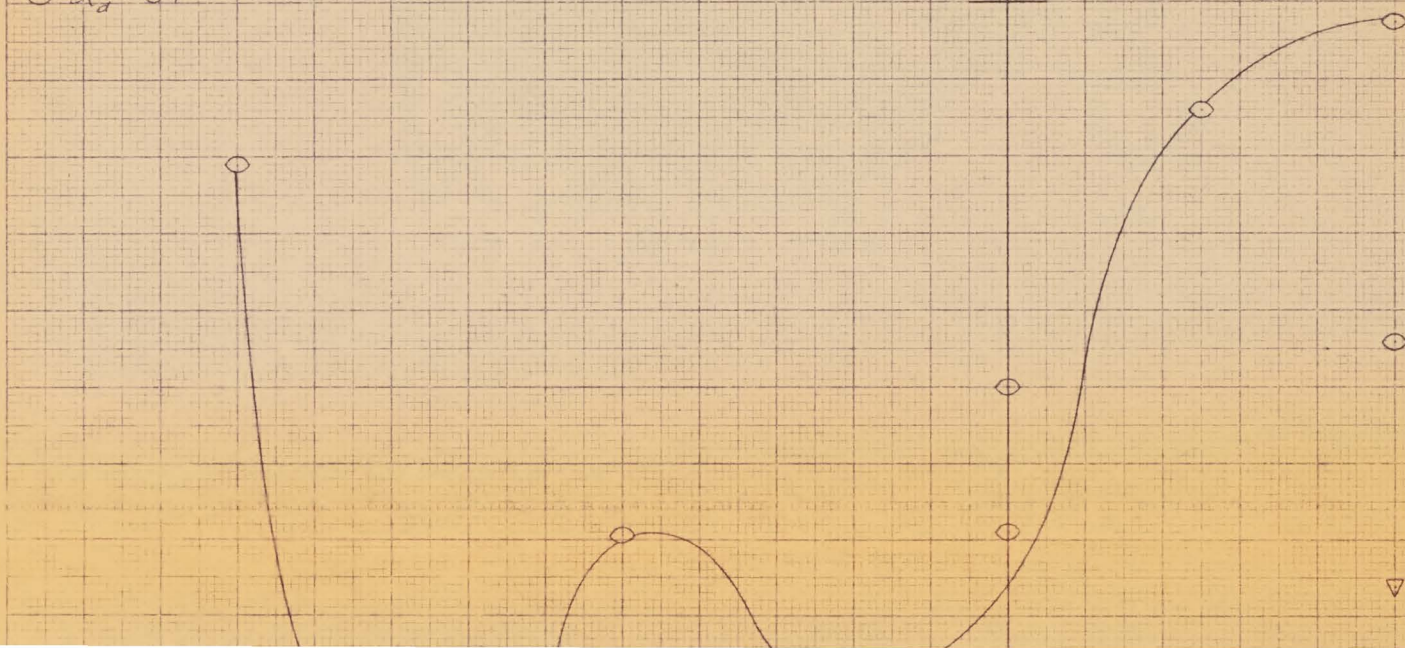
ORIGINS:

$\circ X_a = 34^\circ$

C_n

SCALE:

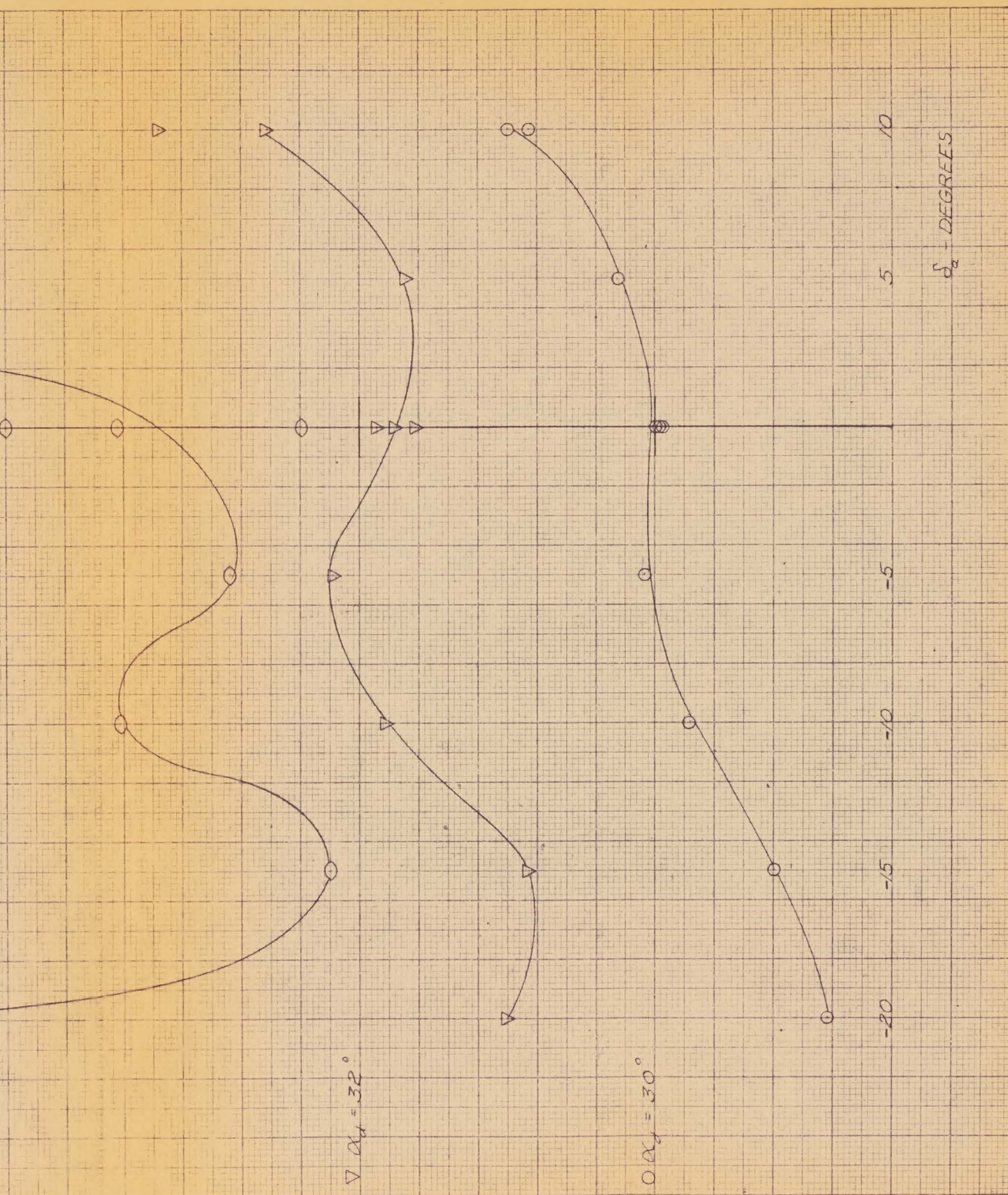
.002



SEPT/56 MB

P/WT/119

7.14.3



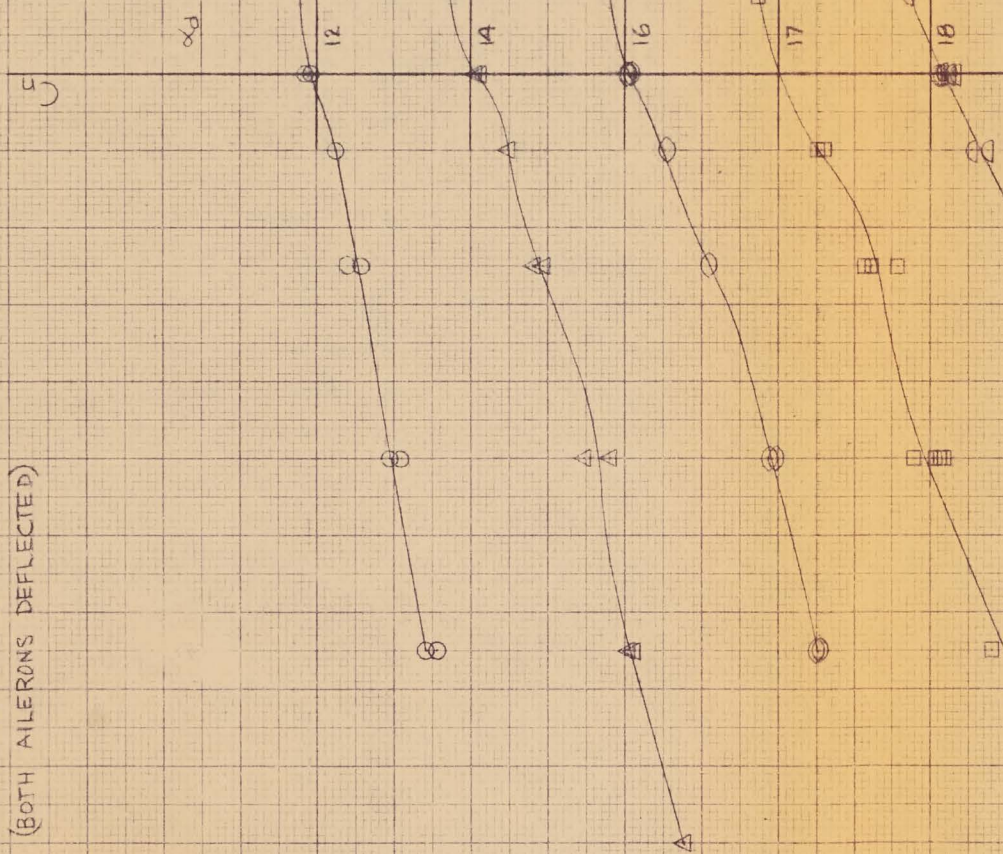
RUN NO.	δa
123, 160	+10
161	+5
155	+2
121	0
154	-2
159	-5
156	-10
150	-15
149	-20

(BOTHAILERONS DEFLECTED)

C-105
N.A.E. W.T. TESTS
JULY, 1956

C_n VS δa
(UNCORRECTED)

$C_n @ .28 \bar{c}$ ON M.A.C.



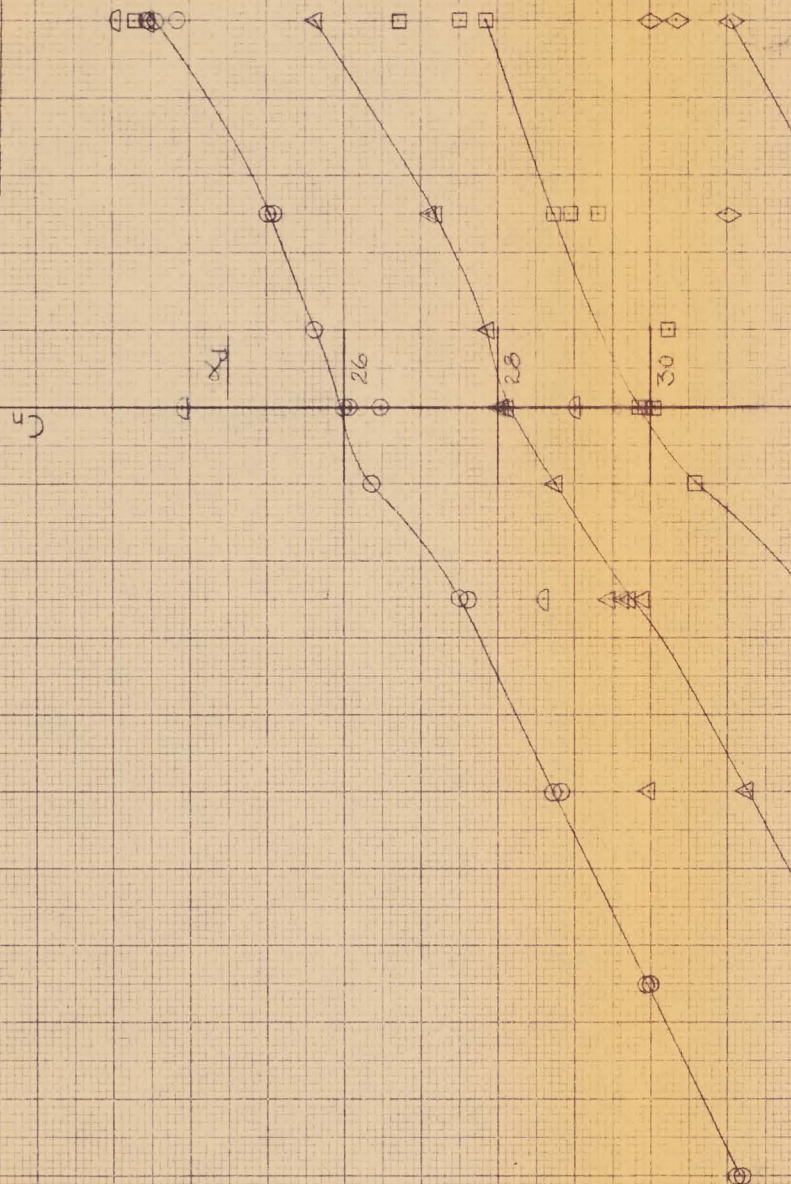
RUN NO.	δ_a
123, 140	+10
161	+5
155	+2
121	0
154	-2
159	-5
156	-10
150	-15
149	-20

(BOTH ALERONS DEFLECTED)

C-105
N.A.E. W.T. TESTS
JULY, 1956

C_h VS δ_a
(UNCORRECTED)

C_h @ 28% ON M.A.C.



C-105
N.A.E. LOW SPEED W.T. TESTS
MAY, 1956

C_h vs. β
(UNCORRECTED)

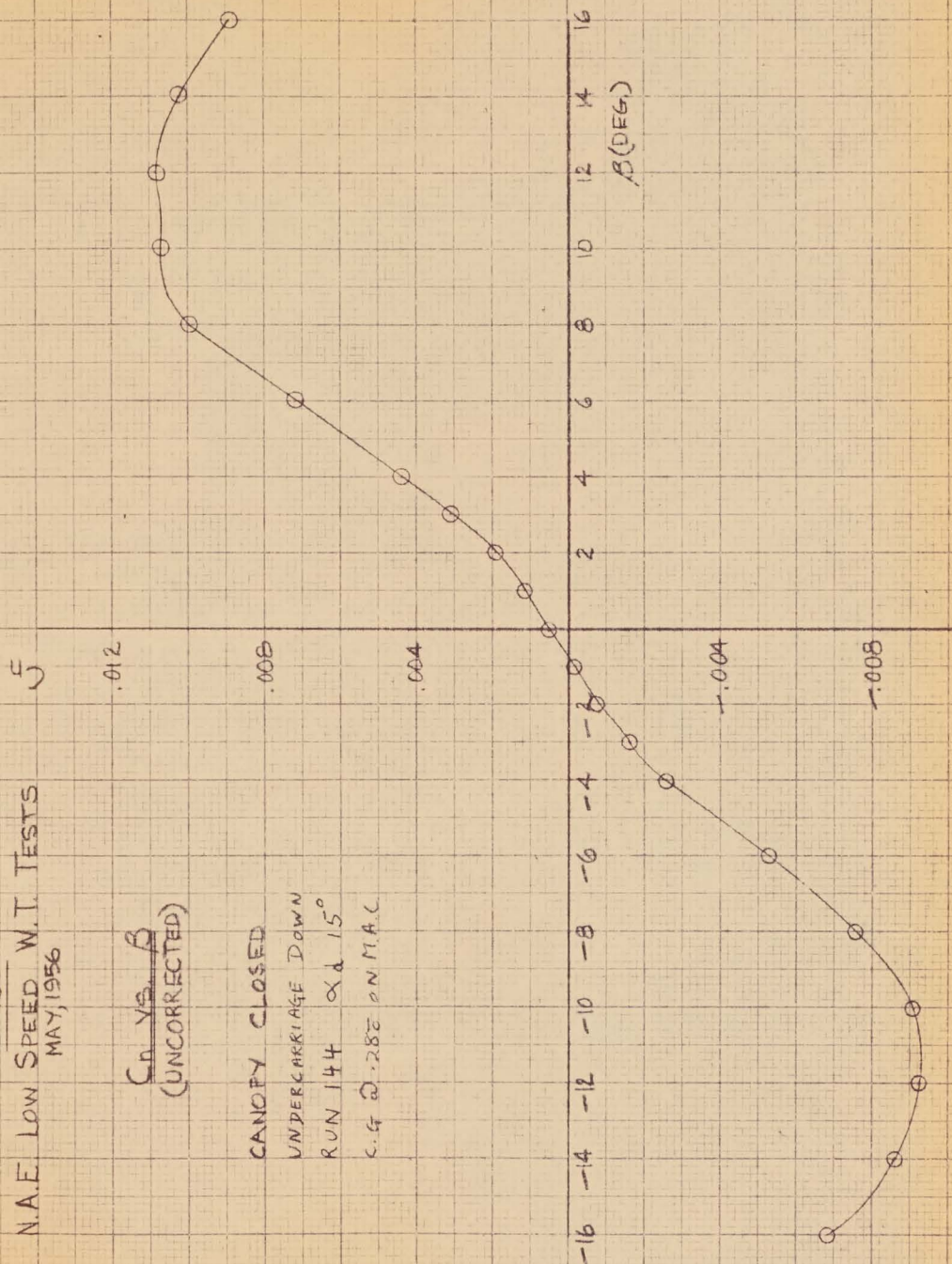
CANOPY CLOSED
UNDERCARRIAGE DOWN
C.G. @ .282 ON N.A.C.



C-105
N.A.E. LOW SPEED W.T. TESTS
MAY, 1956

C_D VS. β
(UNCORRECTED)

CANOPY CLOSED
UNDERCARRIAGE DOWN
RUN 144 α & 15°
C.G. 2.282 IN M.A.C.



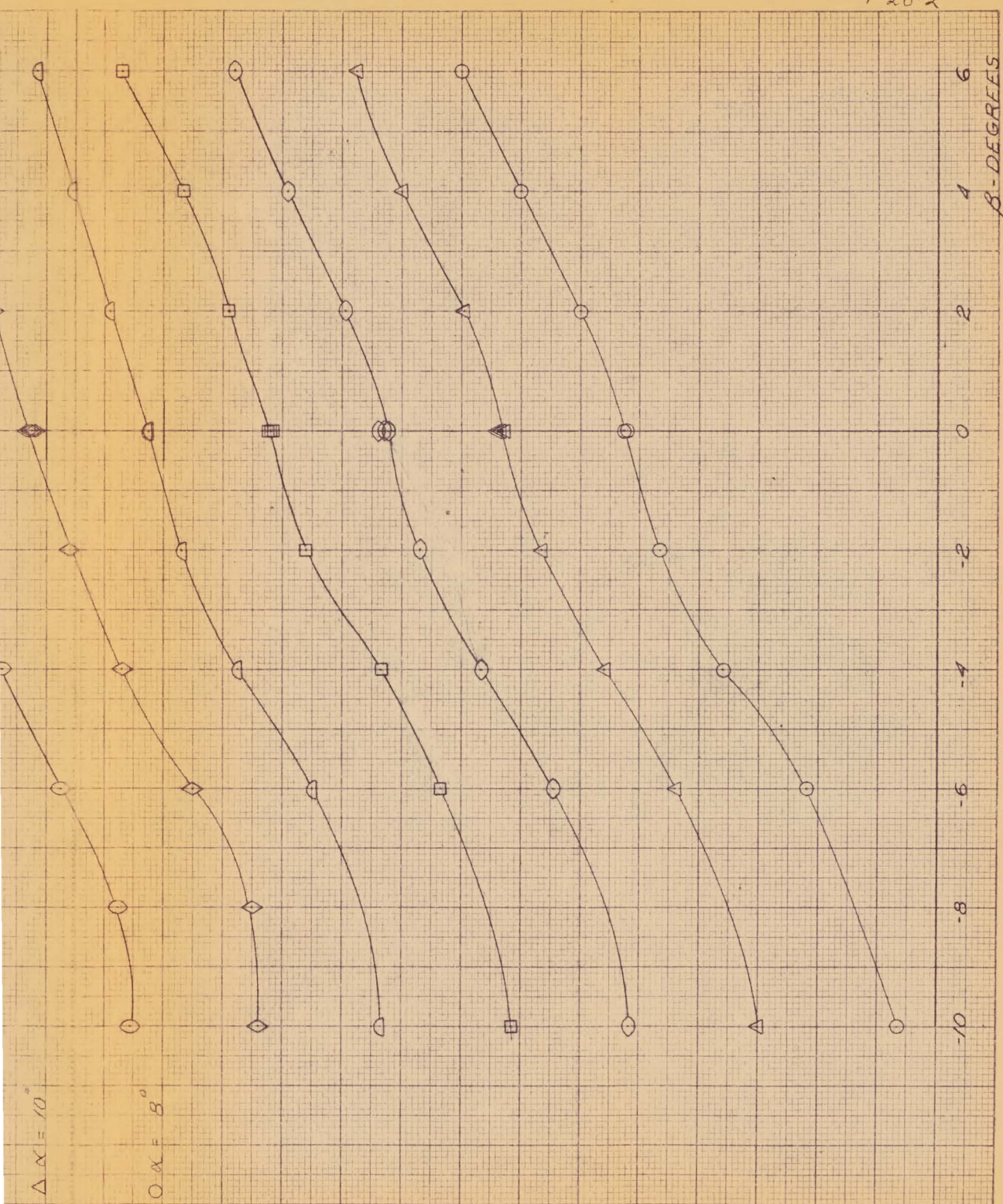
P/WT/119
AUG/56

7-24-2
R. M. H. 2

AUG/56 MB

P/WT/119

7.26.2

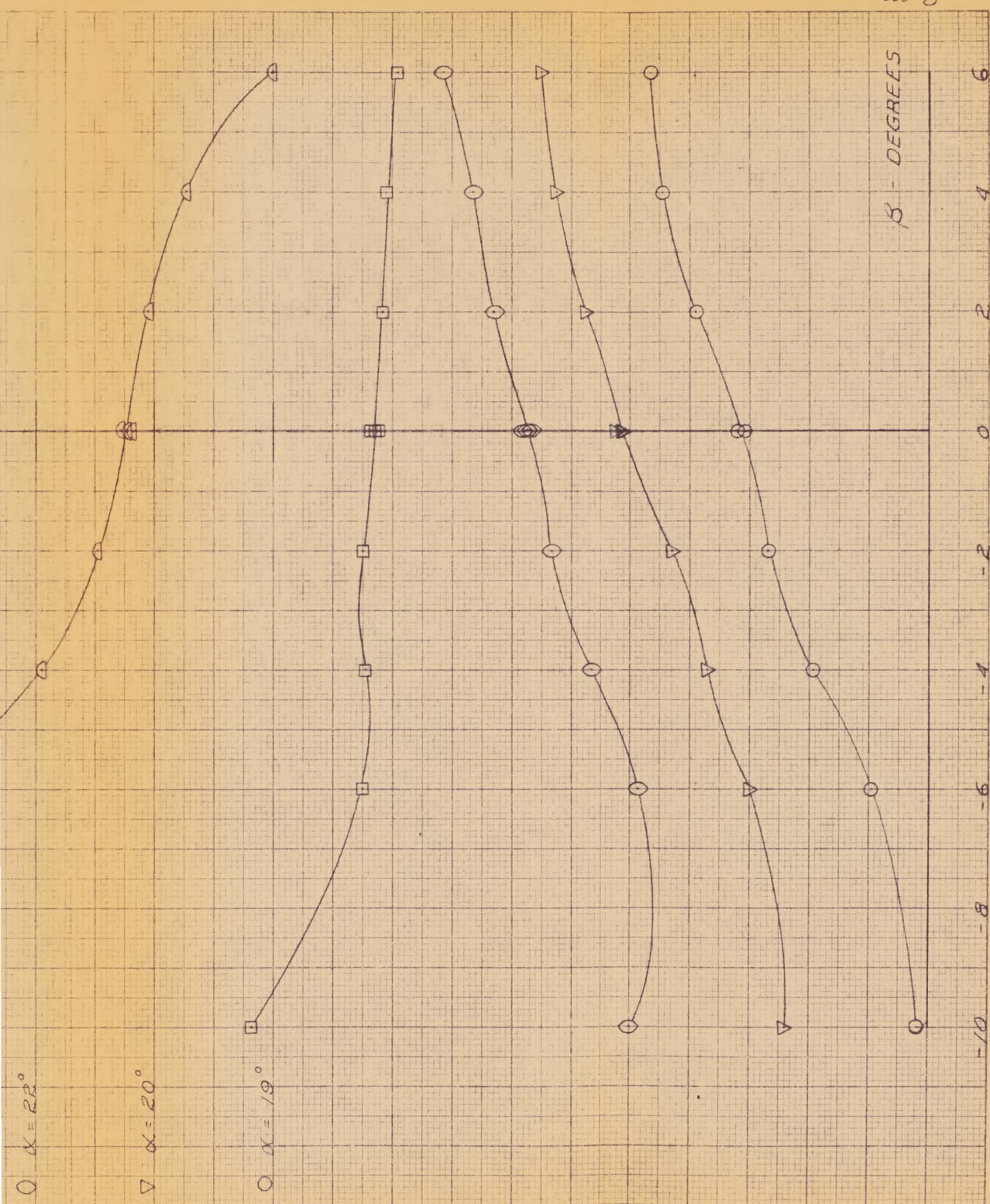


AUG/56

MB

P/WT/119

7.26.3

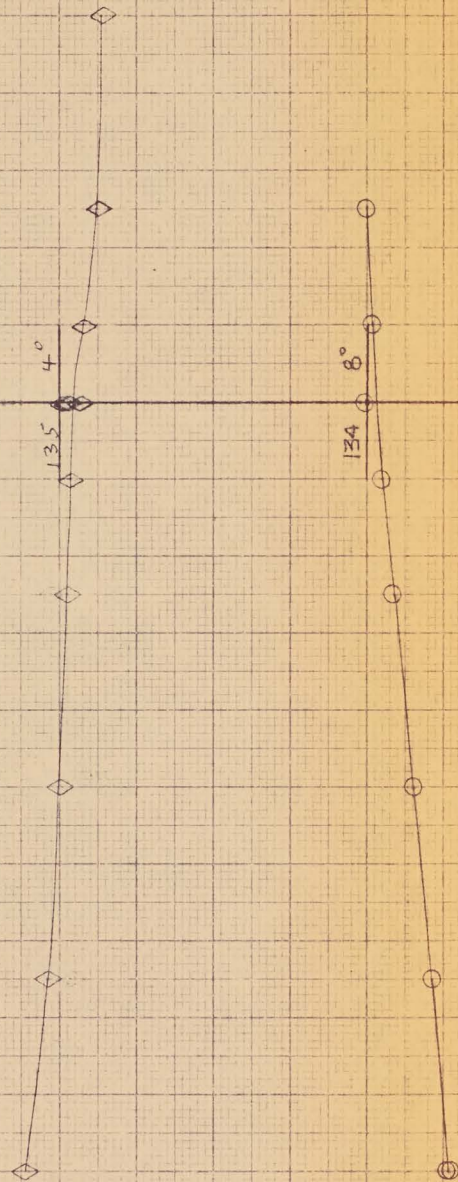


C-105
N.A.E. W.T. TESTS
MAY 1956

CN VS. SA
(UNCORRECTED)

C.F. 2.282 ON M.A.C.

RUN NO 28



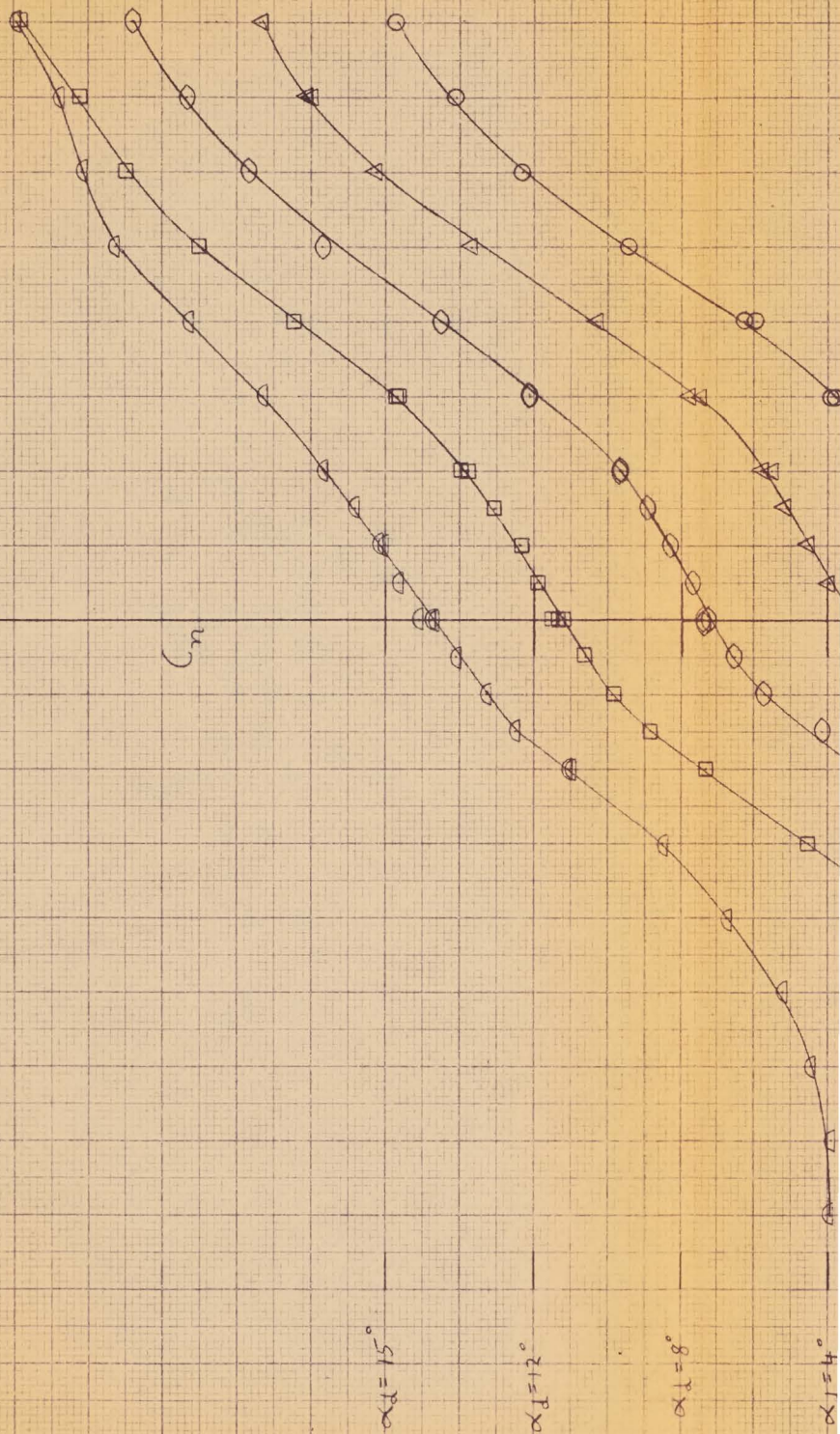
C-105

N.A.E. LOW SPEED WIND TUNNEL TESTS (JULY 1956)

C_n vs β (UNCORRECTED)

C.G. 20.28% ON M.A.C.

(CLEAN AIRCRAFT RUN 177)
SYMBOLS $\circ$ Δ $\square$ $\diamond$

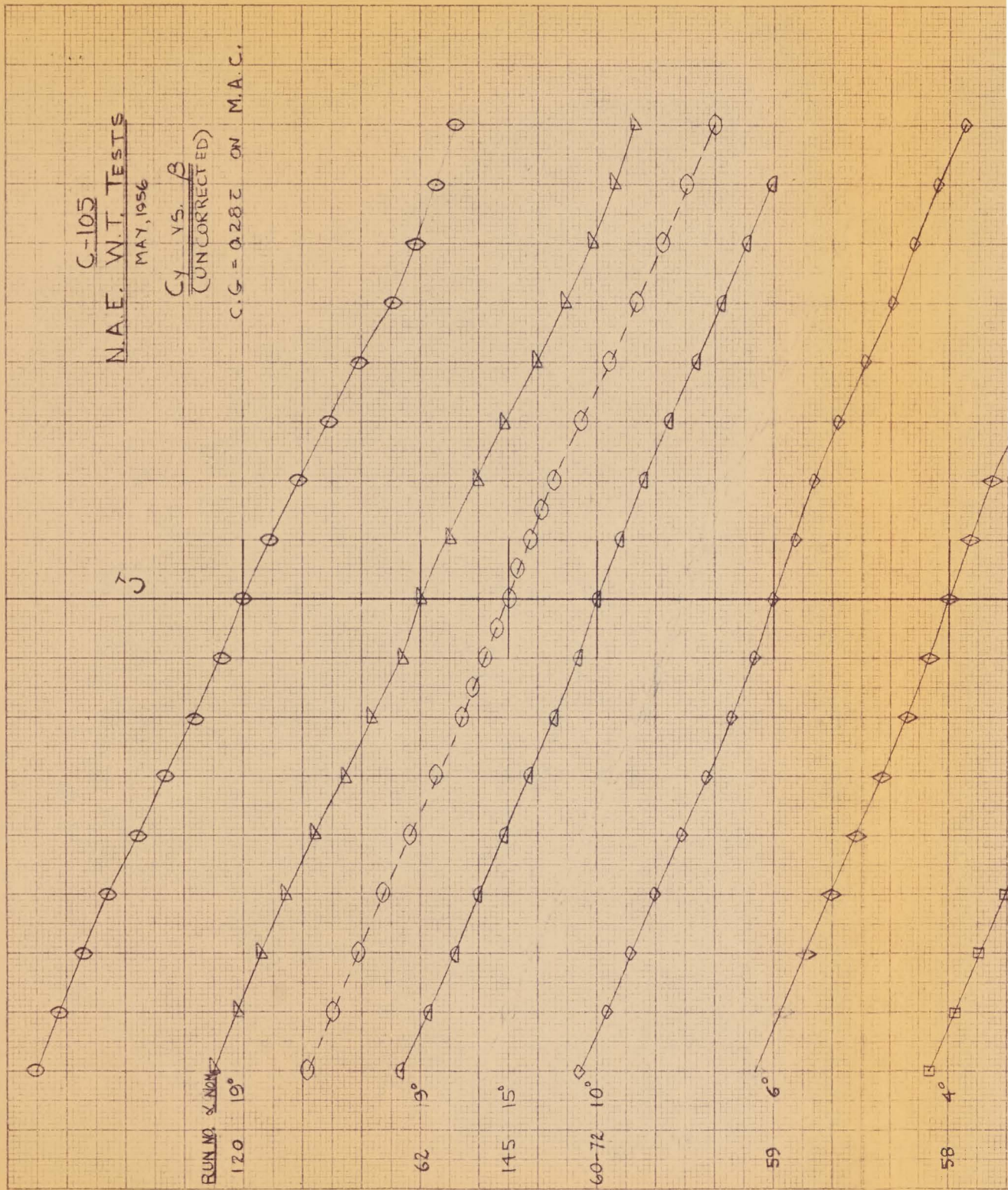


C-105
N.A.E. W.T. TESTS

MAY, 1956

CY VS. β
(UNCORRECTED)

C.G. = 0.282 ON M.A.C.

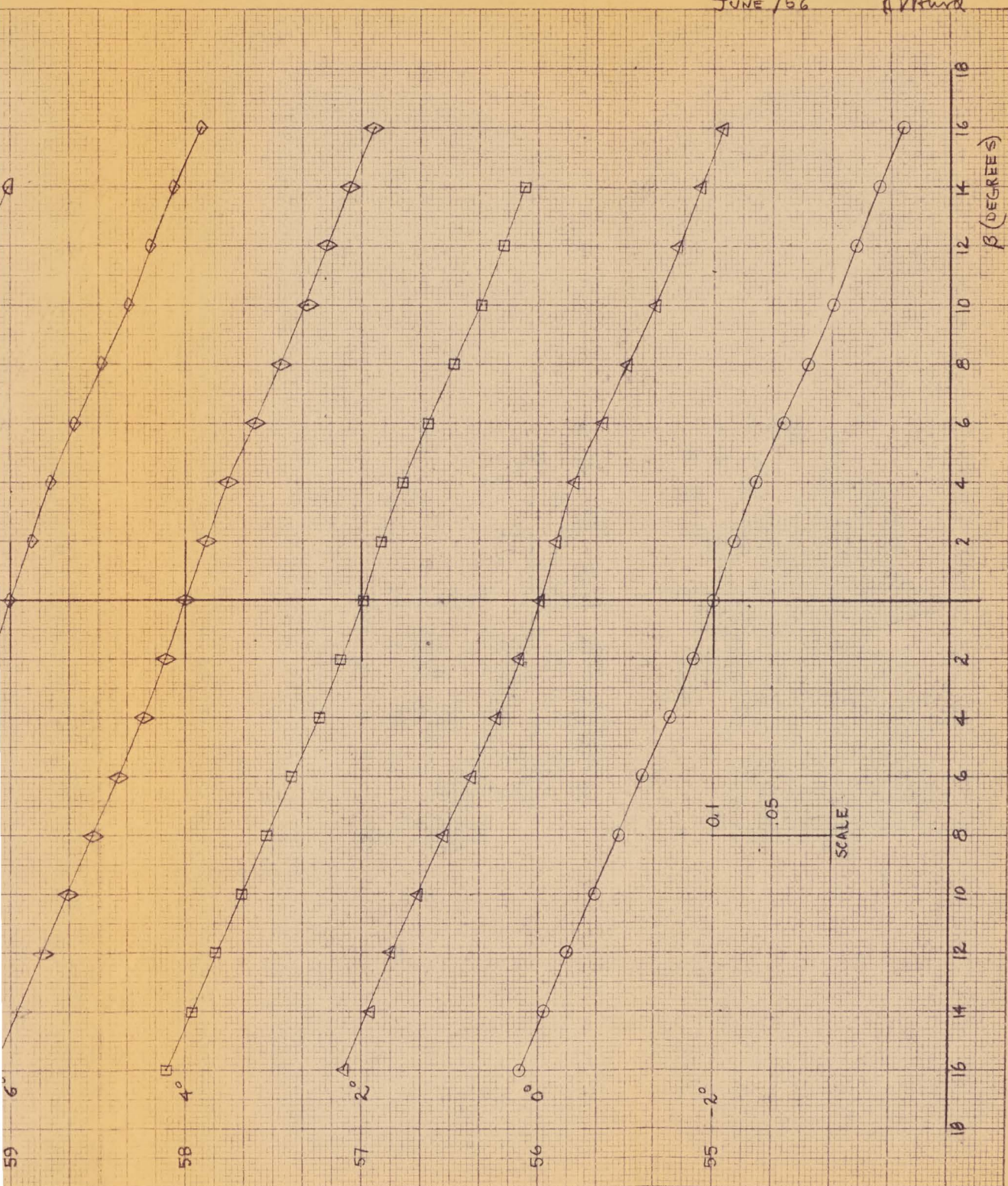


P/WT/119

8-1

JUNE /56

Hand



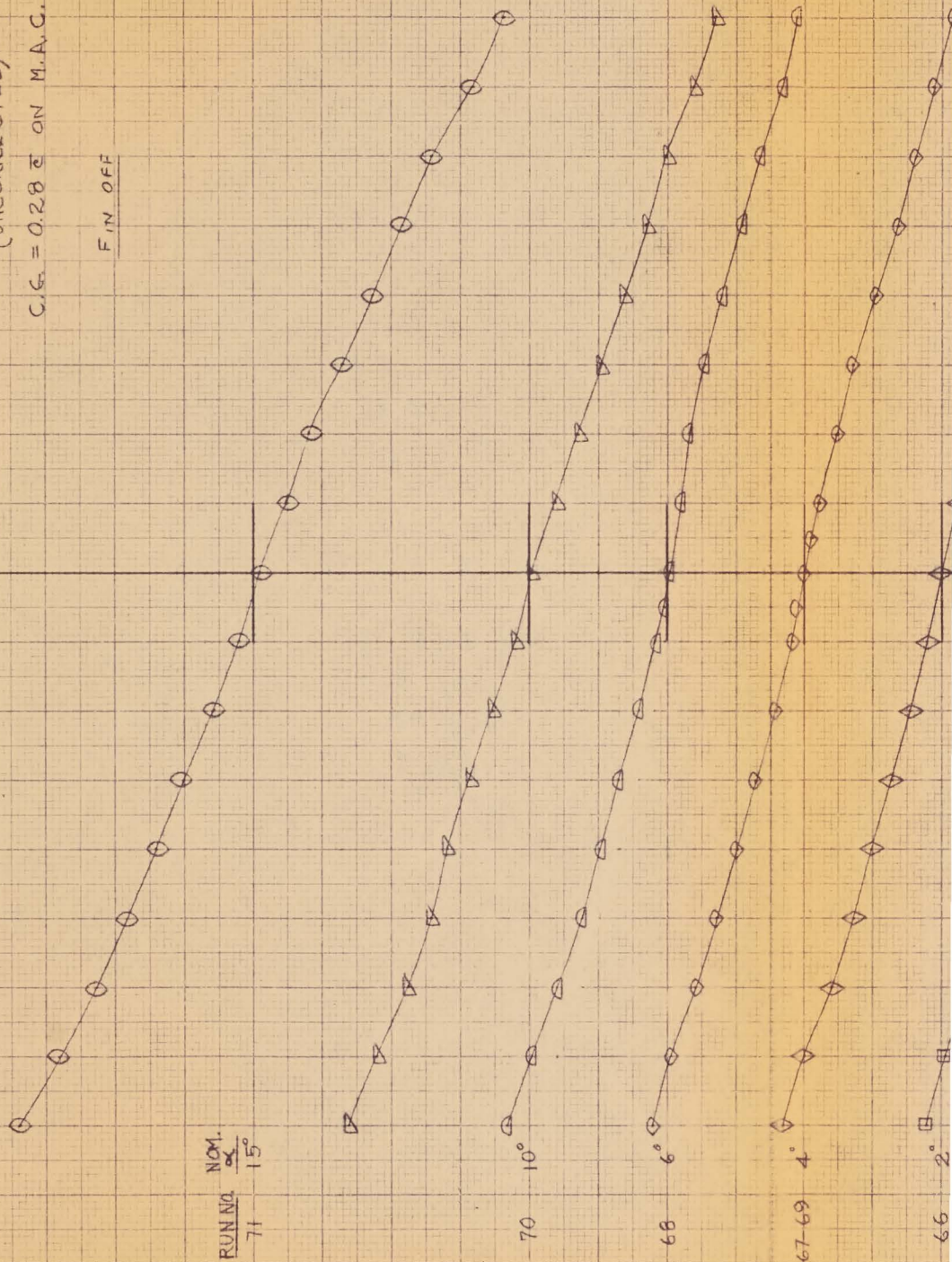
C-105
N.A.E. W.T. TESTS
MAY, 1956

CY VS. β
(UNCORRECTED)

C.G. = 0.28 $\bar{x}$ ON M.A.C.

FIN OFF

RUN NO. 71
NOM. $\frac{90}{15}^{\circ}$



P/WT/119

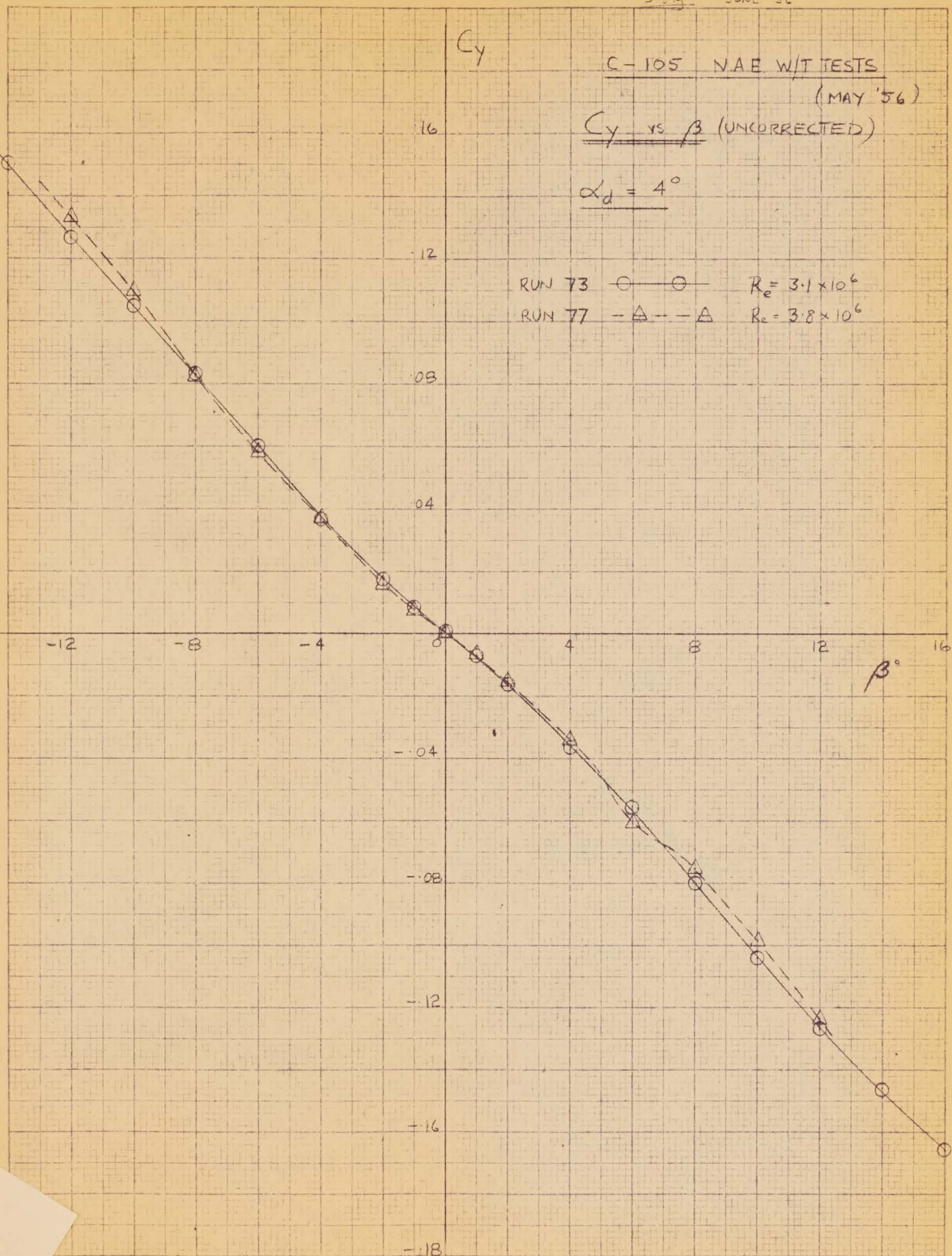
8.4

D.B.G. JUNE 56

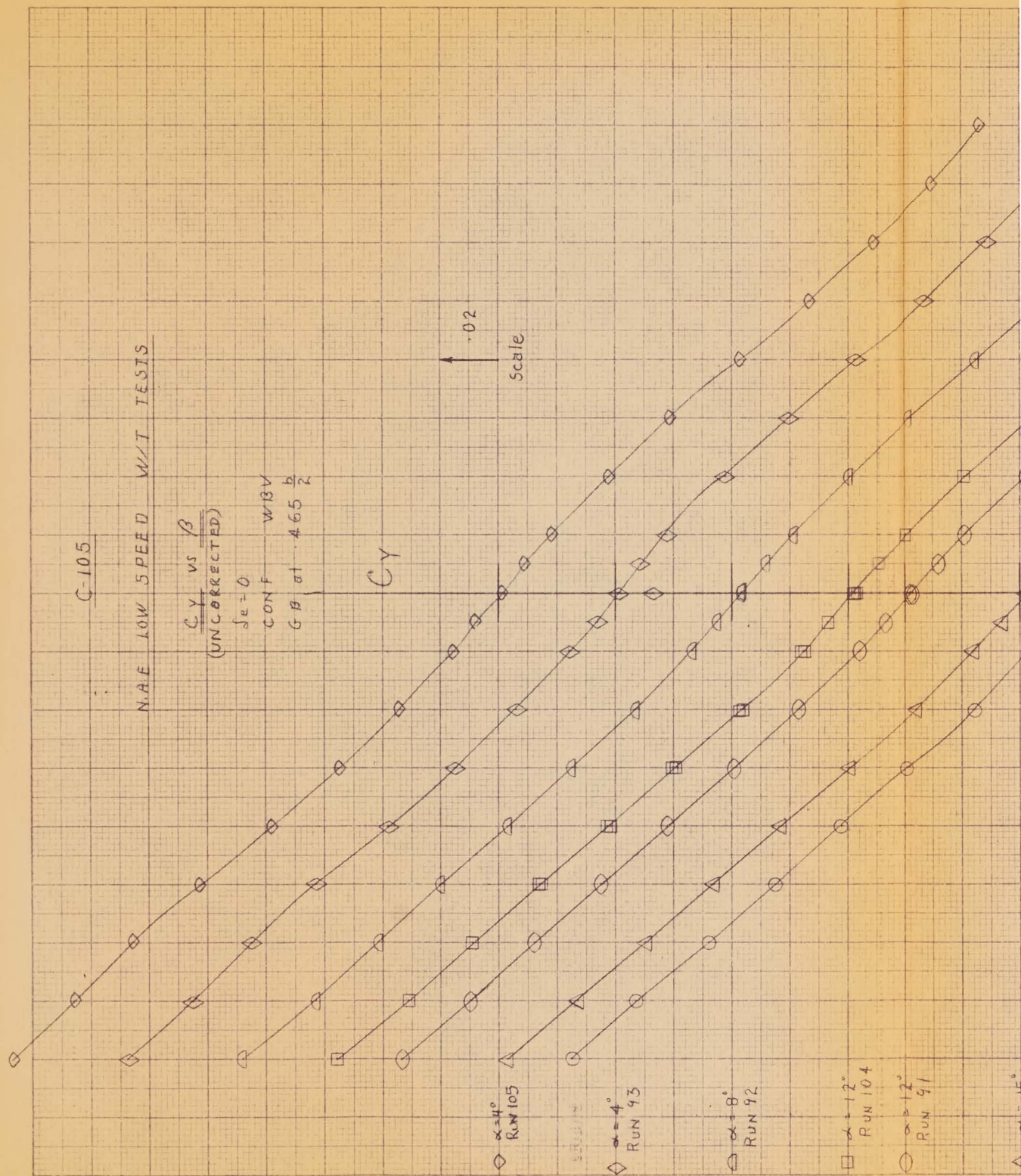
 C_y

C-105 NAE W/T TESTS

(MAY '56)

 C_y vs β (UNCORRECTED) $\alpha_d = 4^\circ$ RUN 73 $\circ$ — $\circ$ $R_e = 3.1 \times 10^6$ RUN 77 $\triangle$ — $\triangle$ $R_e = 3.8 \times 10^6$ 359-12
MADE IN U.S.A.10 X 10 TO THE 1/2 INCH
KROFFEL & FESSER CO.

K&F



C-105

N.A.E. LOW SPEED W/T TESTS

C_Y vs β
UNCORRECTED

$S_e = -10$

GB at 1.465 $\frac{b}{2}$

CONF. WBV

C_Y

0.2

Scale

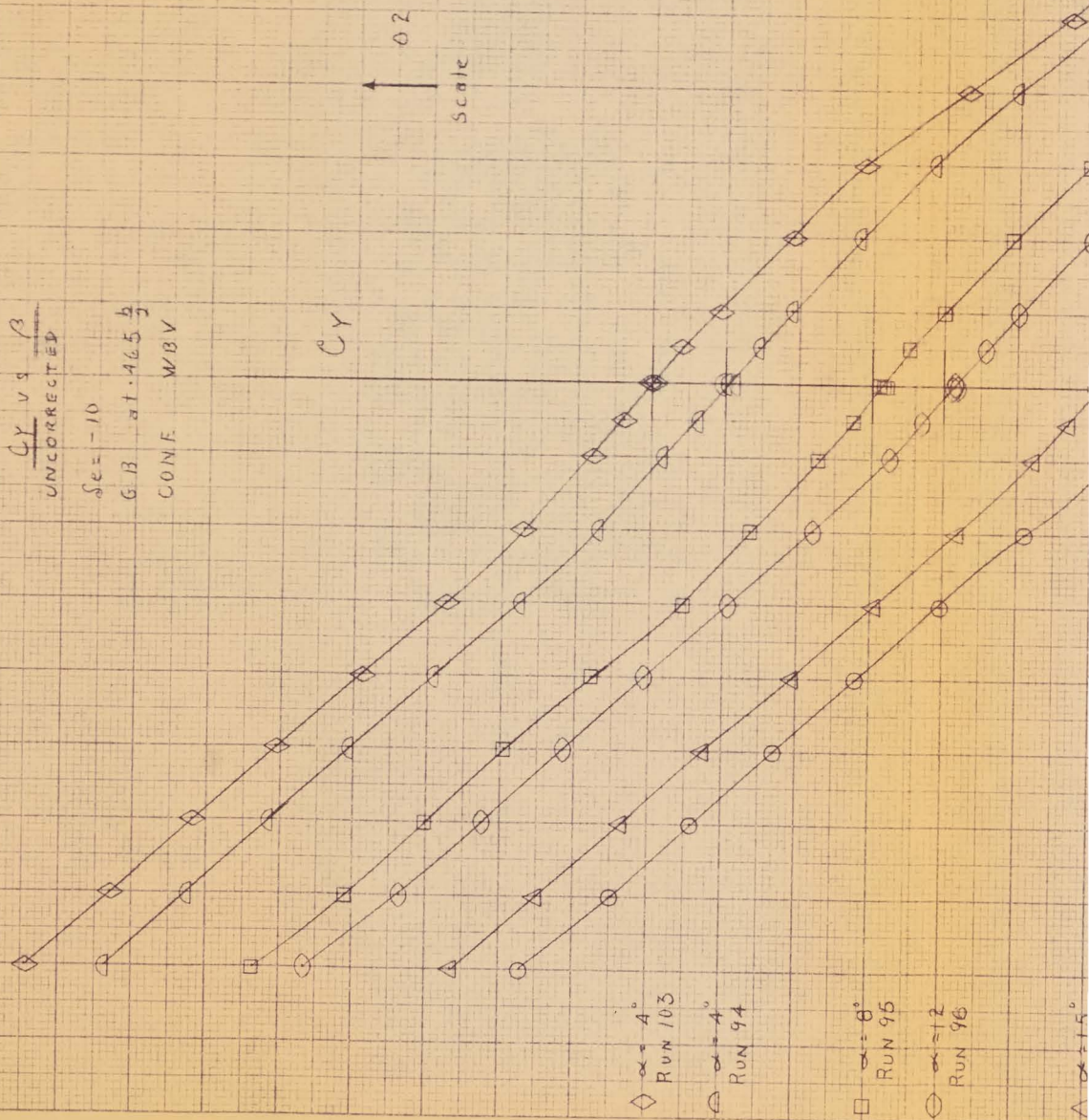
$\alpha = 4^\circ$
RUN 103

$\alpha = 4^\circ$
RUN 94

$\alpha = 8^\circ$
RUN 95

$\alpha = 12^\circ$
RUN 96

$\alpha = 15^\circ$



C-105
N.A.E. W.T. TESTS
MAY, 1956

C_y vs. S_r
(UNCORRECTED)

C.G. = 0.282 ON M.A.C.

$\delta_e = 0^\circ$

$\beta = 0^\circ$

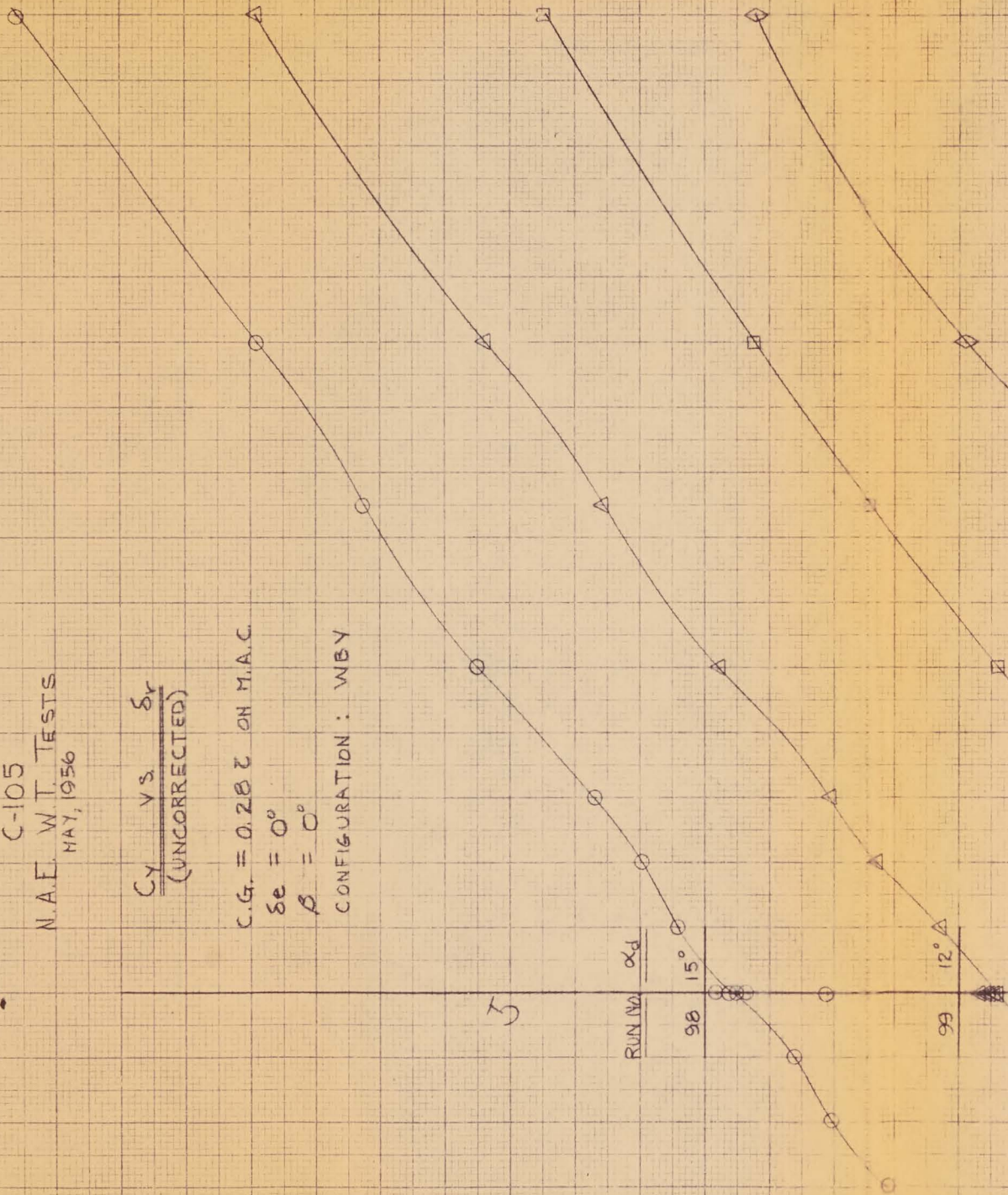
CONFIGURATION: WBV

5

RUN NO. α_d

98 15°

99 12°



C-10'S
NAE LOW SPEED W/T TESTS, MAY 56

Cy vs β

CANOPY CLOSED
CANOPY OPEN

(UNCORRECTED DATA)

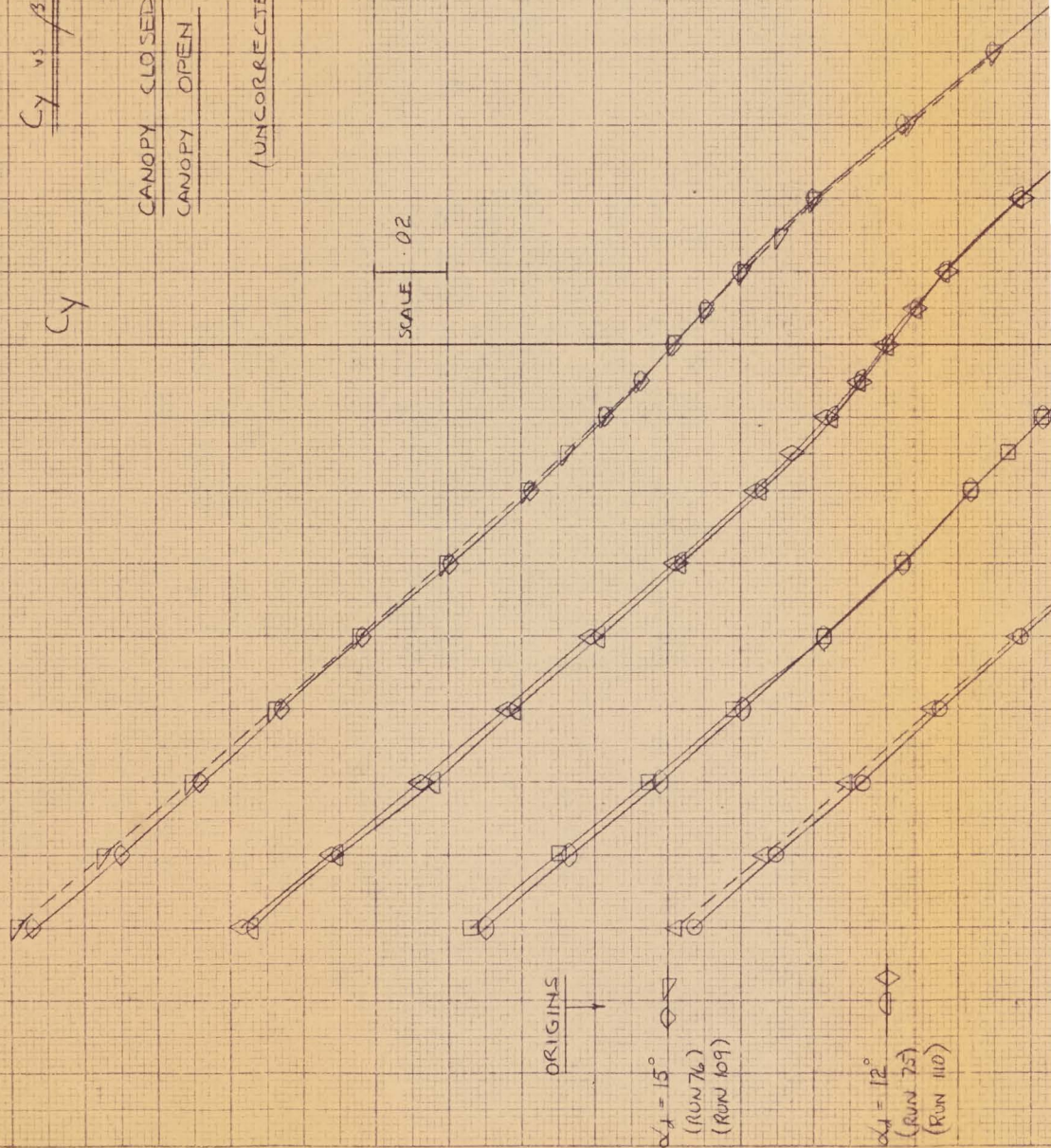
Cy

SCALE .02

ORIGINS

$\alpha_1 = 15^\circ$
(RUN 76)
(RUN 109)

$\alpha_1 = 12^\circ$
(RUN 75)
(RUN 110)



C-105
N.A.E. W/T TESTS - JULY/56

C_y vs δ_r
(UNCORRECTED)
C.G. = 0.28 ON M.A.C.

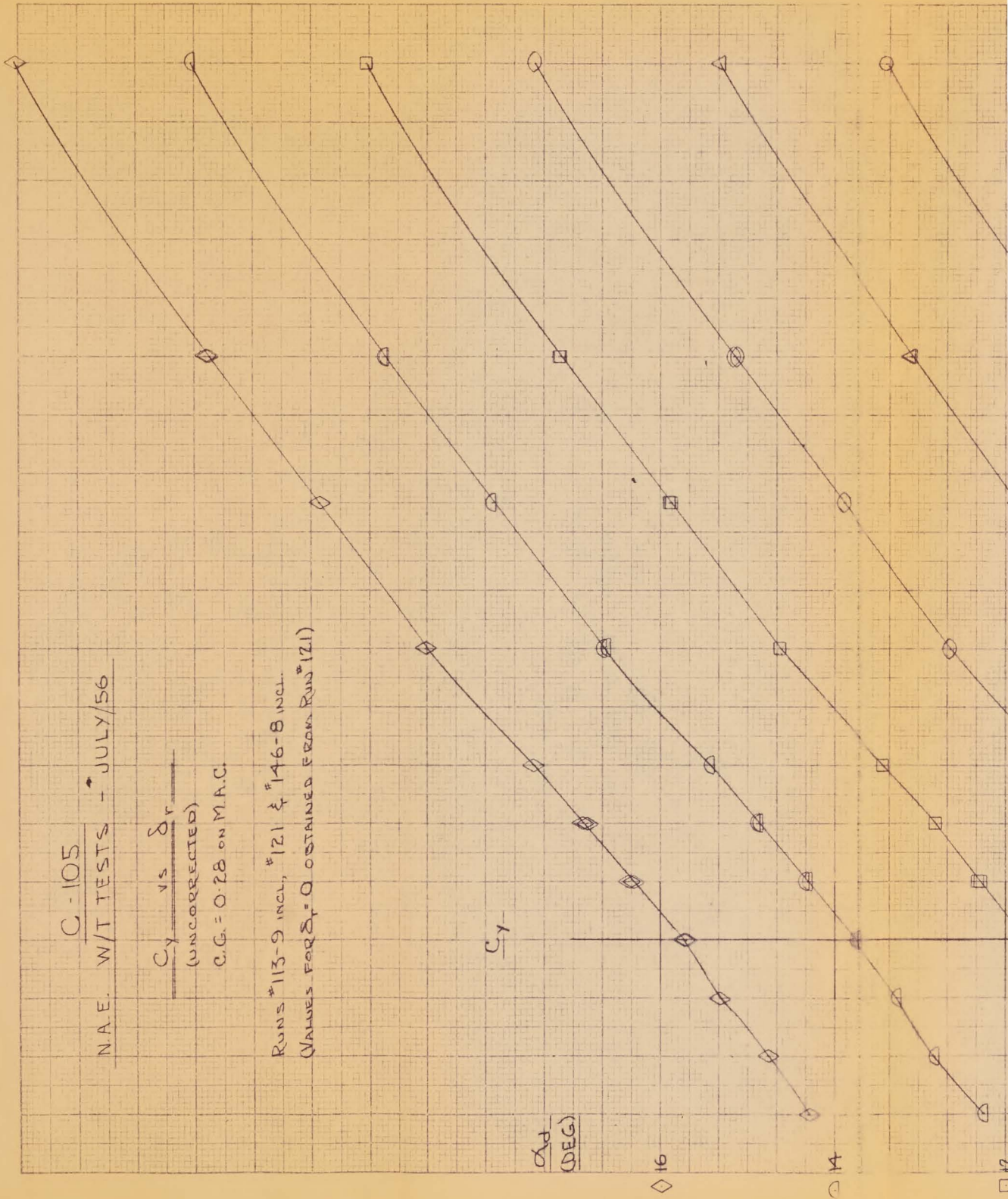
RUNS #113-9 INCL. #121 & #146-8 INCL.
(VALUES FOR $\delta_r = 0$ OBTAINED FROM RUN #121)

C_y

α_d
(DEG)

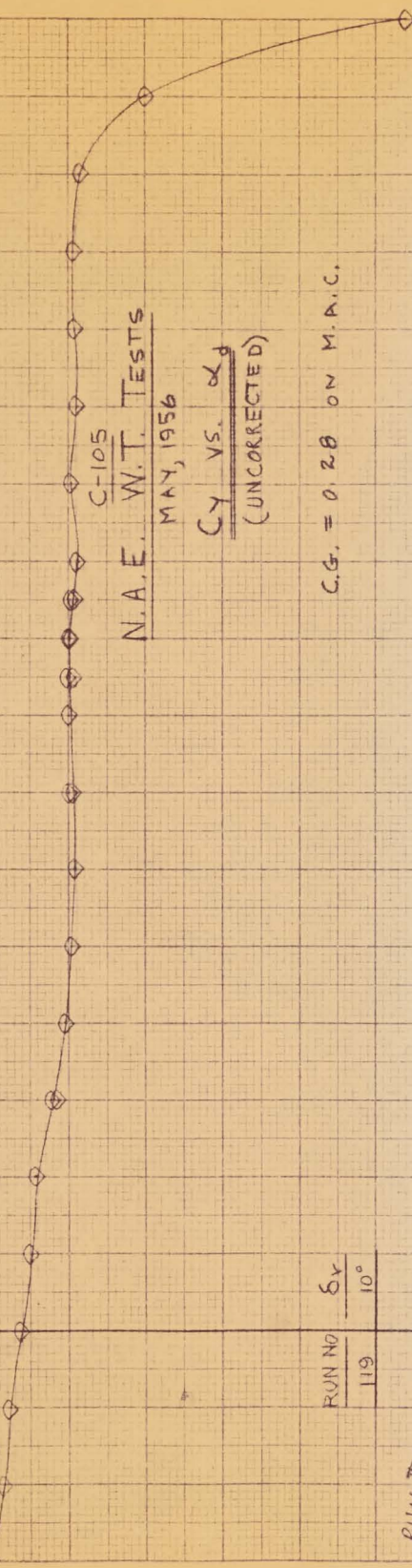
16

14



5

RUN # 119

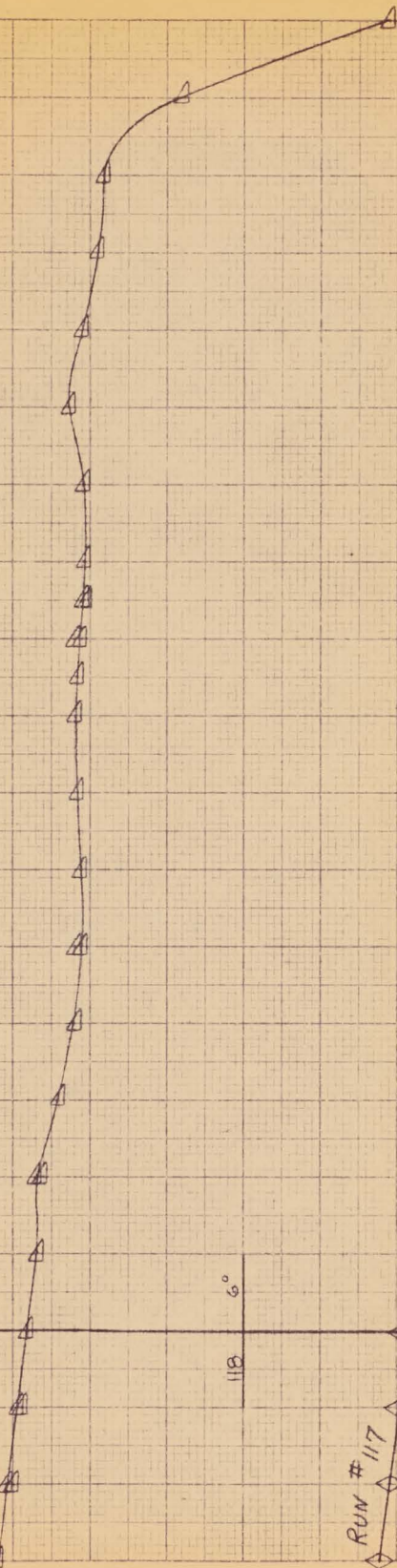


C-105
N.A.E. W.T. TESTS
MAY, 1956
CY VS. α_d
(UNCORRECTED)

RUN NO	δ_v
119	10°

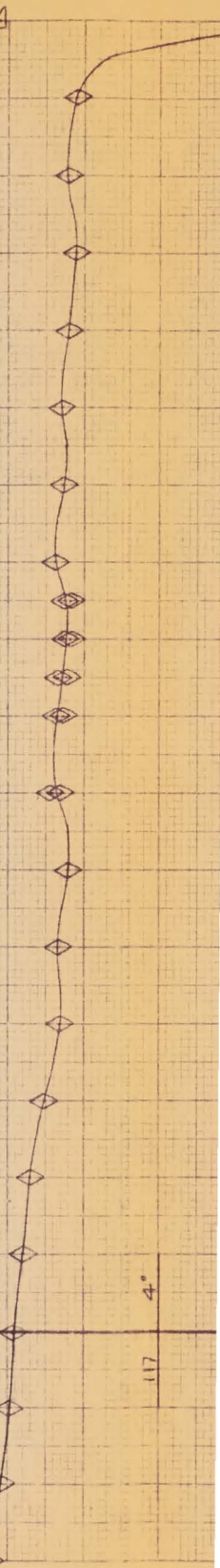
C.G. = 0.28 ON M.A.C.

RUN # 118



118 6°

RUN # 117



117 4°

C-105

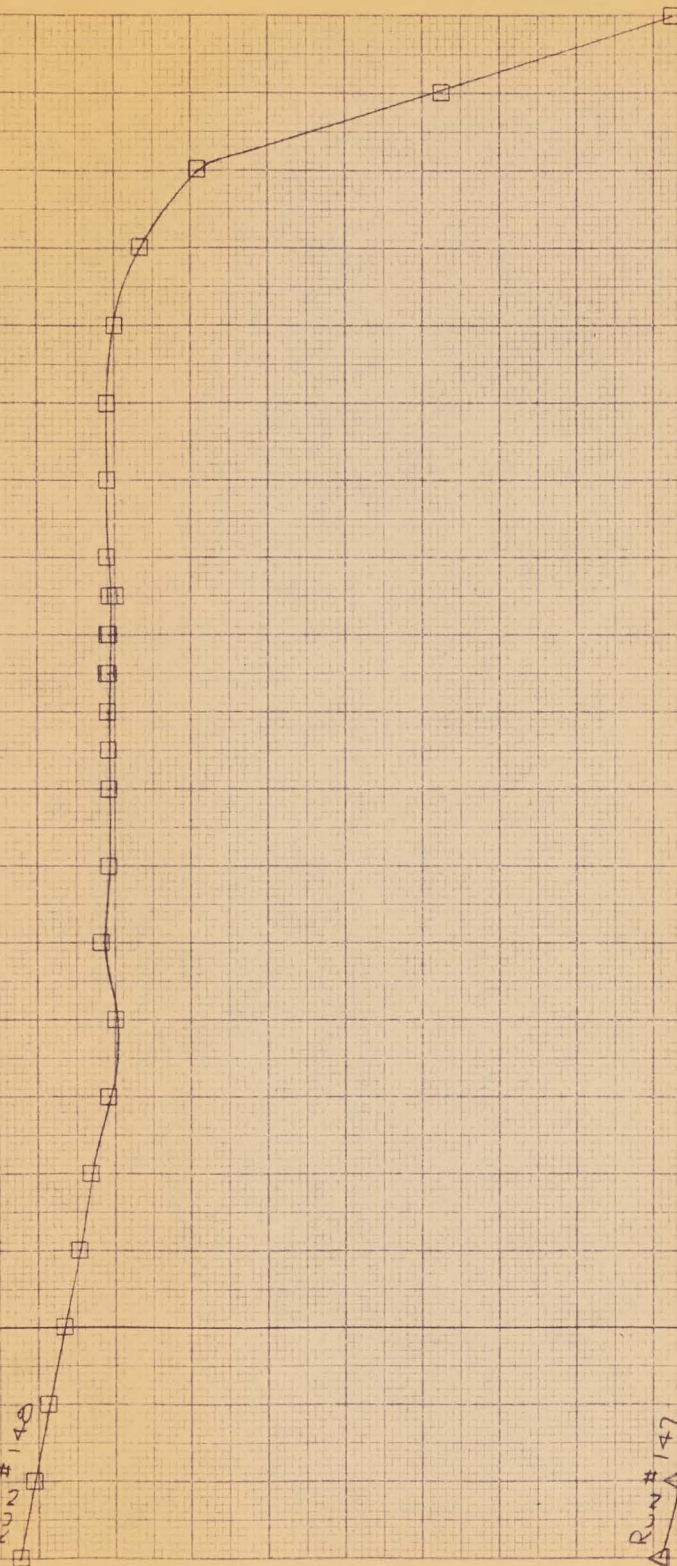
N.A.E. W/T TESTS - JULY/56

C_y vs α_d (UNCORRECTED)

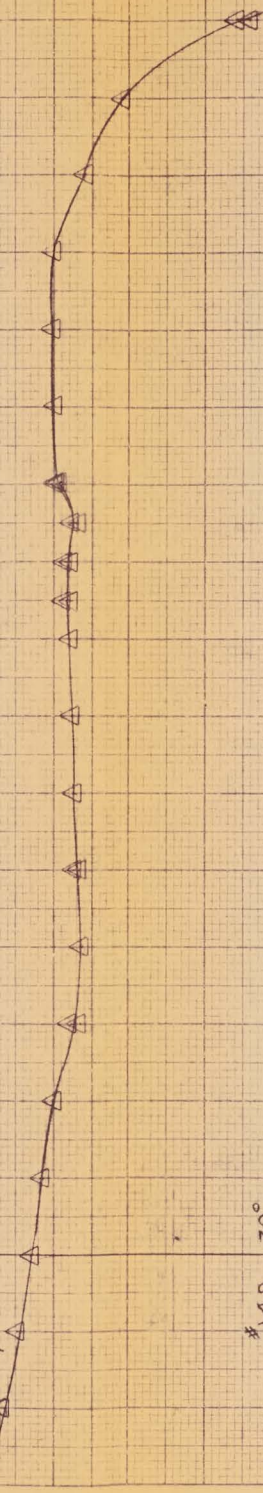
C.G. = 0.28 ON M.A.C.

C_y
RUN 8r

RUN #146



RUN #147



#148 30°

C-105

NAE LOW SPEED W/T TESTS

C_y vs β (UNCORRECTED)

RUN 121

C_y
scale
↑
.02

ORIGIN

◇ α = 16

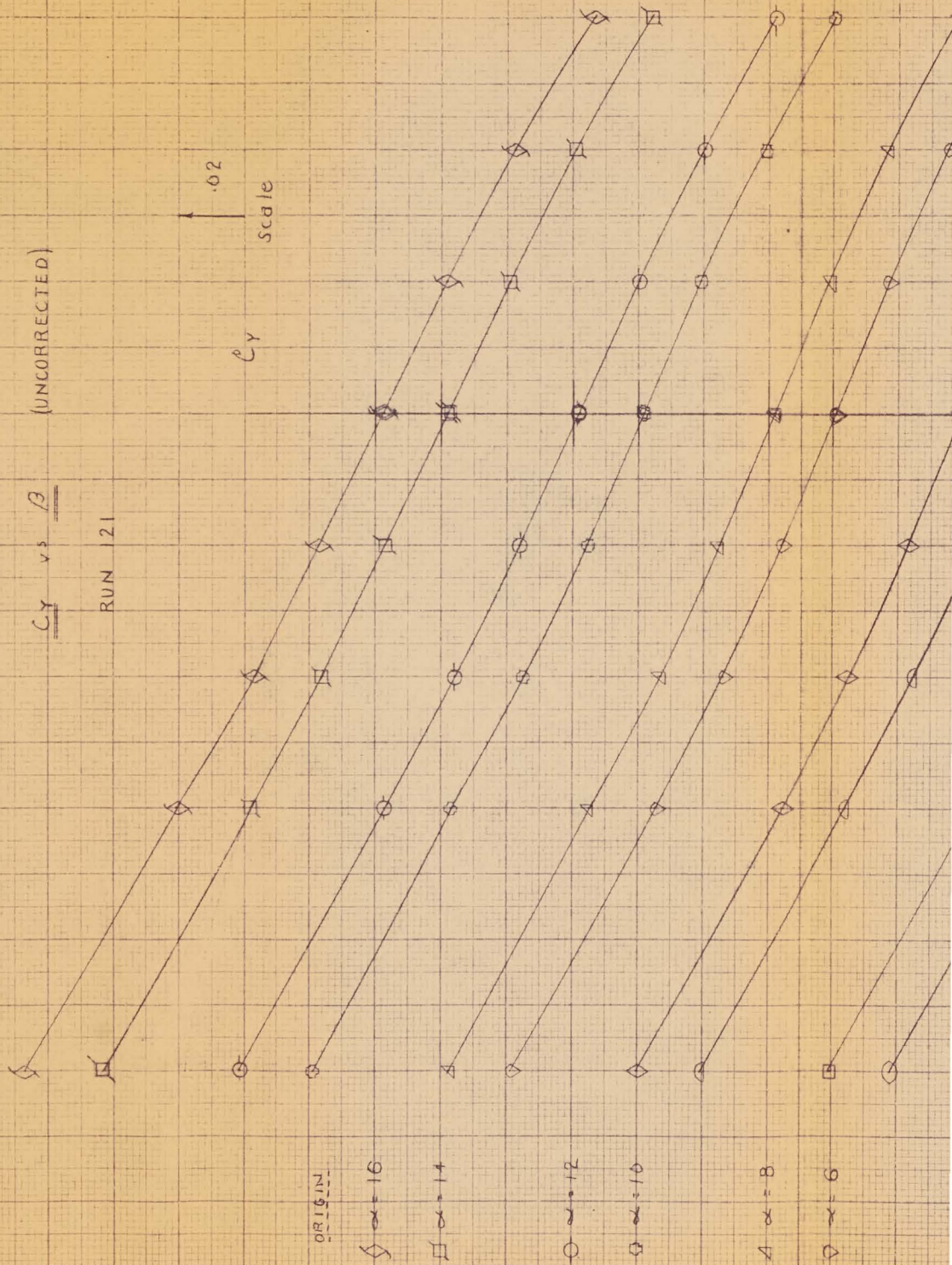
□ α = 14

○ α = 12

● α = 10

△ α = 8

▽ α = 6



C-105
NAE LOW SPEED W/T TESTS JULY/56
C_y VS δ_a (STARBOARD ONLY) ($\beta=0^\circ$)

UNCORRECTED

RUN	δ_a
122	10°
151	-20°
152	-15°
153	-10°
157	-5°
158	10°
162	5°
121	0°

SCALE:  .005

C_y

ORIGINS:

✧ $\alpha_d = 28^\circ$

X $\alpha_d = 26^\circ$

△ $\alpha_d = 24^\circ$

◇ $\alpha_d = 22^\circ$

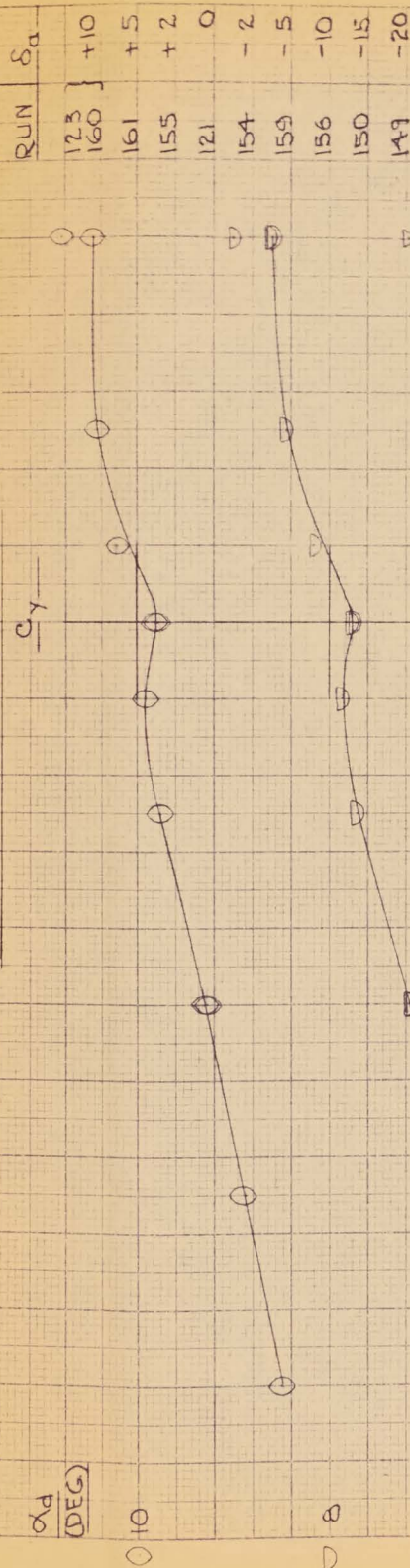
C - 105

N.A.E. W/T TESTS - JULY/56

C_y vs δ_a
(UNCORRECTED)

C.G. = 0.782

RUNS 149-50, 154-56, 159-61, 121 & 123
(VALUES FOR $\delta_a = 0$ OBTAINED FROM RUN 121)
BOTH AILERONS DEFLECTED



C-105

N.A.E. W/T TESTS - JULY/56

C_y vs δ_a
(uncorrected)

C.G. = 0.282

RUNS 149-50, 154-56, 159-61, 121 & 123

(VALUES FOR $\delta_a = 0$ OBTAINED FROM RUN 121)

BOTH AIRERONS DEFLECTED

RUN	δ_a
123	+10
160	+10
161	+5
155	+2
121	0
154	-2
159	-5
156	-10
150	-15
149	-20

0.01

0.005

SCALE

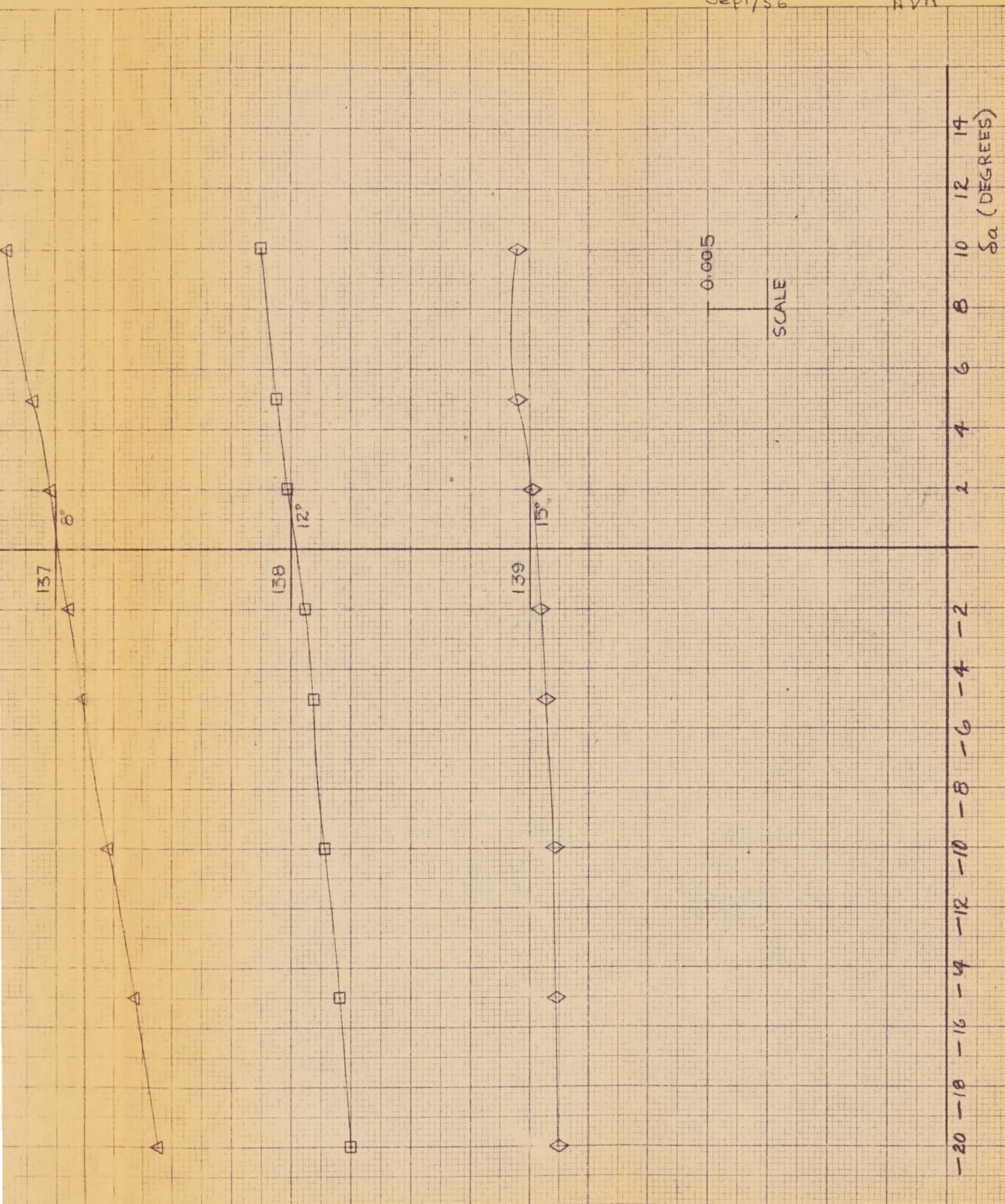
C_y

α_D
(DEG.)

34

P/WT/119
Sept/56

8.23
AVA

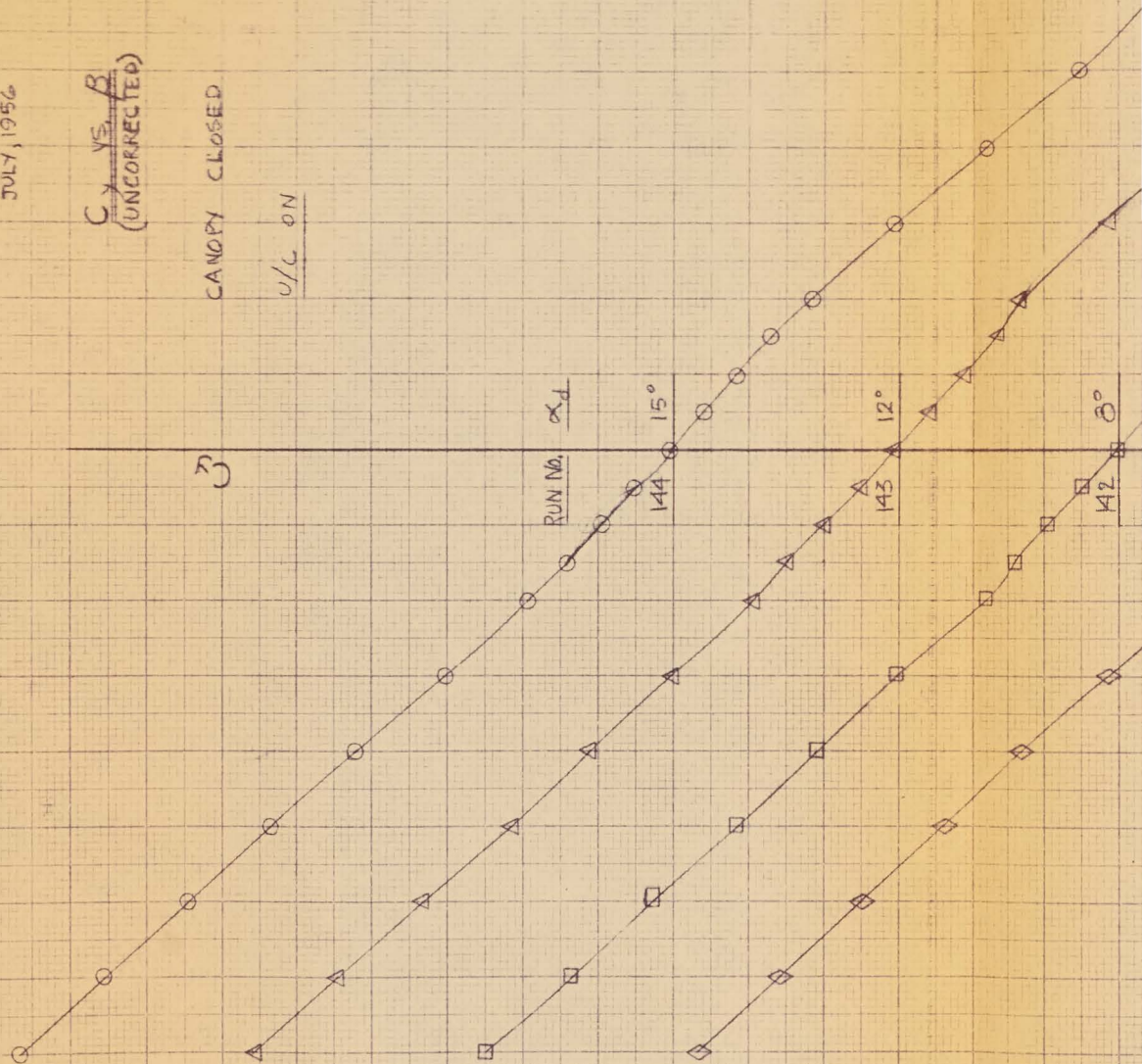


C-105
N.A.E. LOW SPEED W.T. TESTS
JULY, 1956

C_y vs. β
(UNCORRECTED)

CANDY CLOSED

U/C ON



AUG/56 J.L.

P/WT/119 8.25

C-105

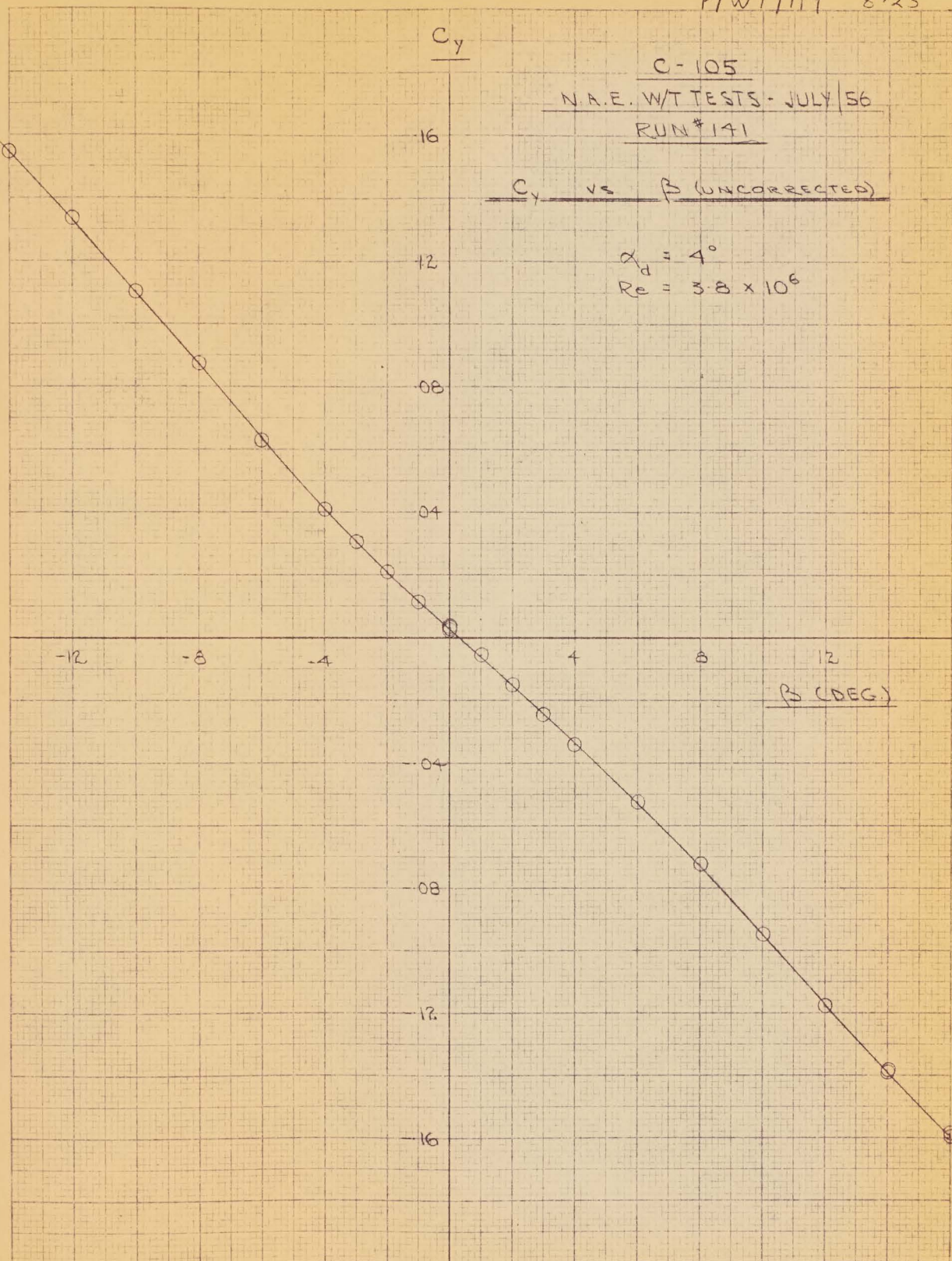
N.A.E. W/T TESTS - JULY/56

RUN #141

C_y vs β (UNCORRECTED)

$\alpha_d = 4^\circ$

$Re = 3.8 \times 10^6$



359-12

10 X 10 TO THE 1/2 INCH
KEUFFEL & ESSER CO.

K&E

C-105
NAE LOW SPEED W/T TESTS JULY/56
RUN 147 $\delta_r = 20^\circ$
 C_y VS. β

UNCORRECTED

C_y

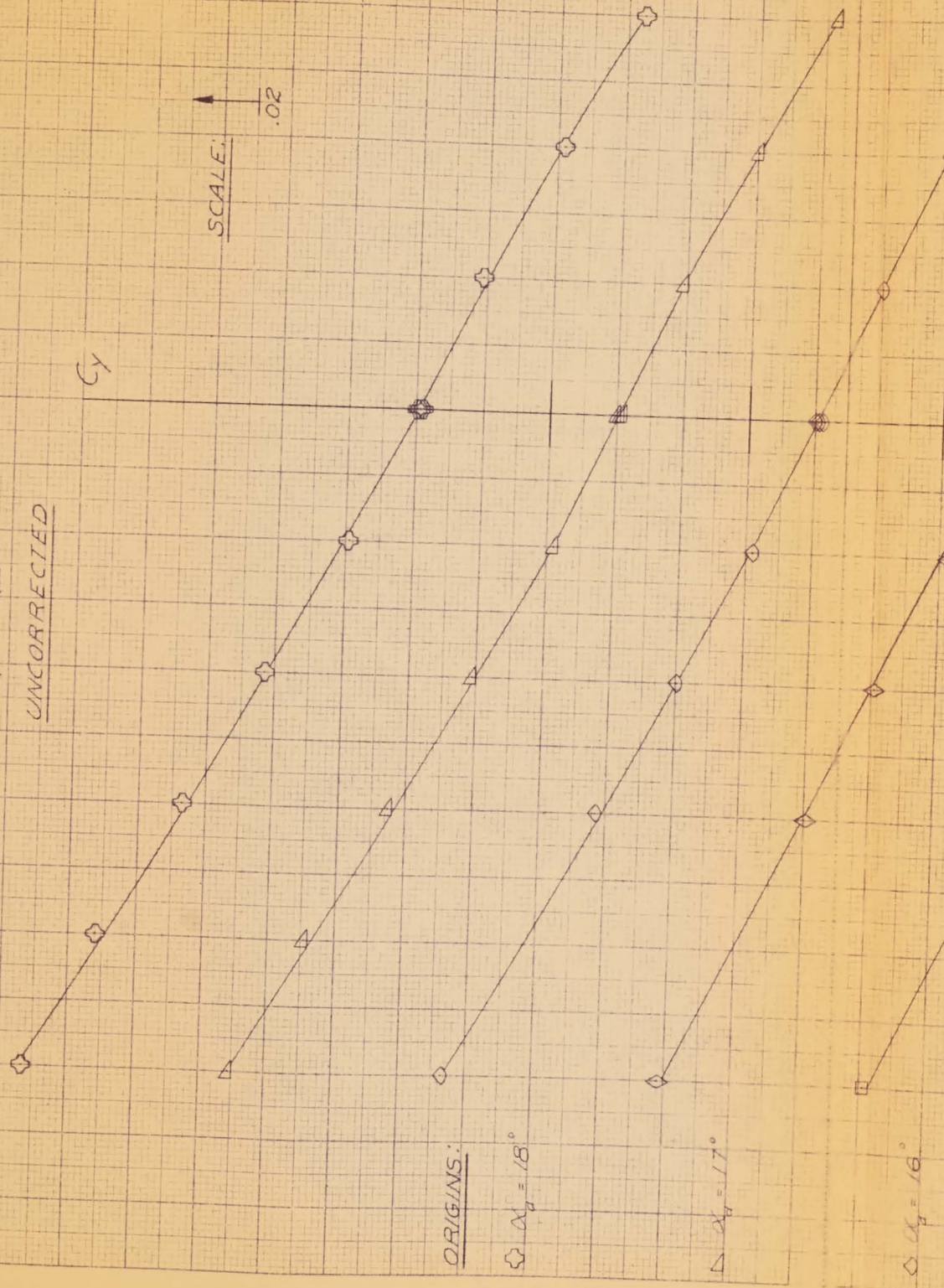
SCALE: $\frac{1}{.02}$

ORIG/INS:

$\star \alpha_y = 18^\circ$

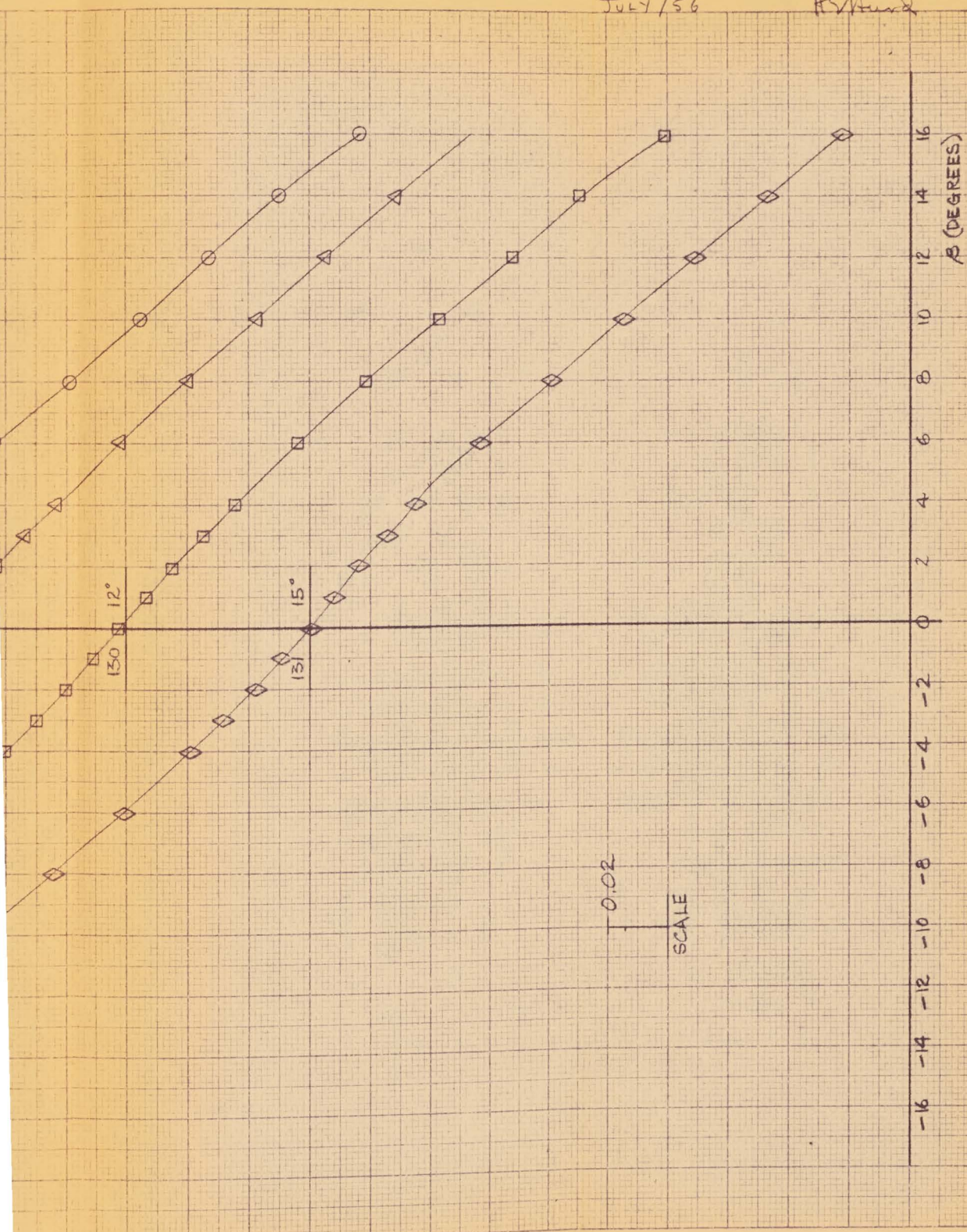
$\triangle \alpha_y = 17^\circ$

$\diamond \alpha_y = 16^\circ$



P/WT/119
JULY/56

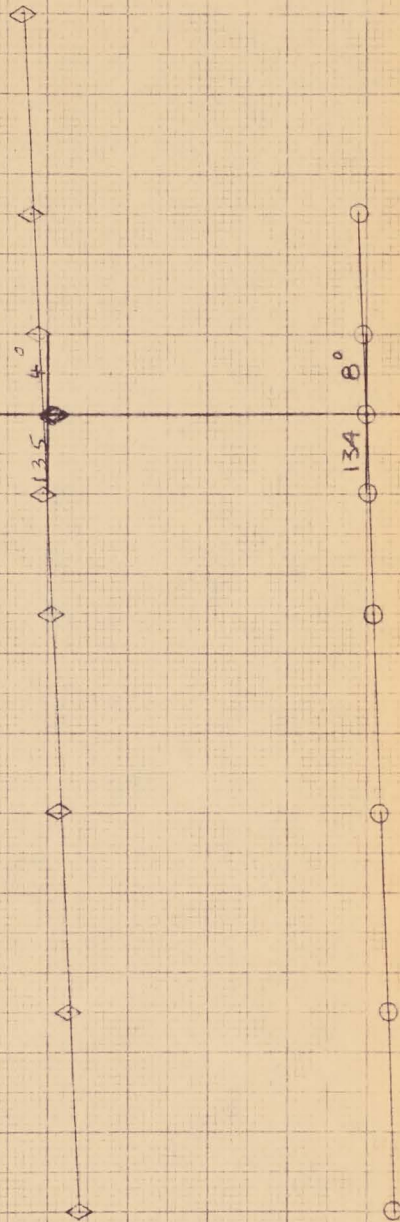
8.28
AS/Hand



C-105
N.A.E. WT. TESTS
MAY, 1956

C_y VS S_A
(UNCORRECTED)

RUN. NO. 4



133

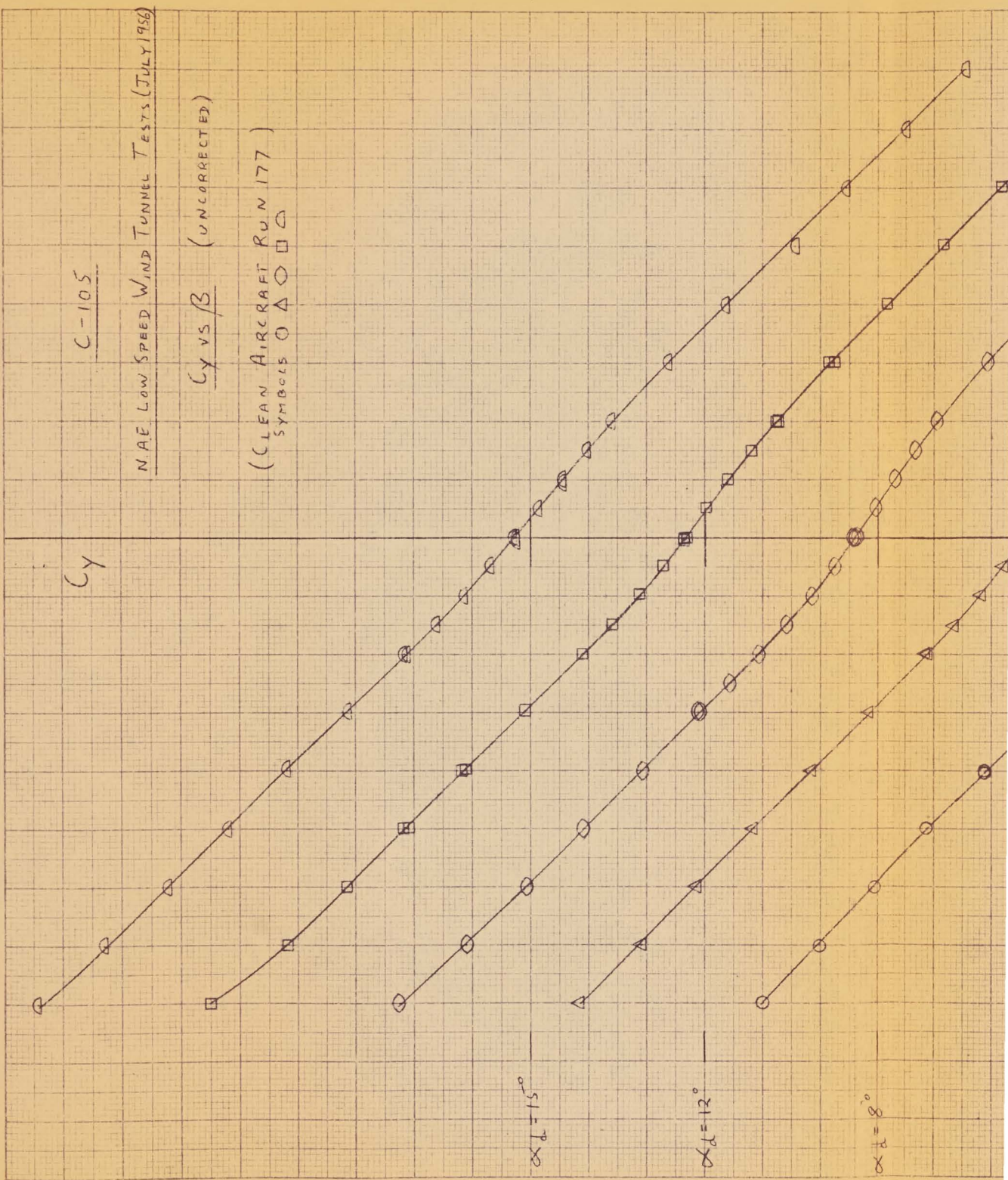
12°

C-105

N.A.E. LOW SPEED WIND TUNNEL TESTS (JULY 1956)

Cy vs β (UNCORRECTED)

(CLEAN AIRCRAFT RUN 177)
SYMBOLS Δ $\square$ $\circ$ ∇



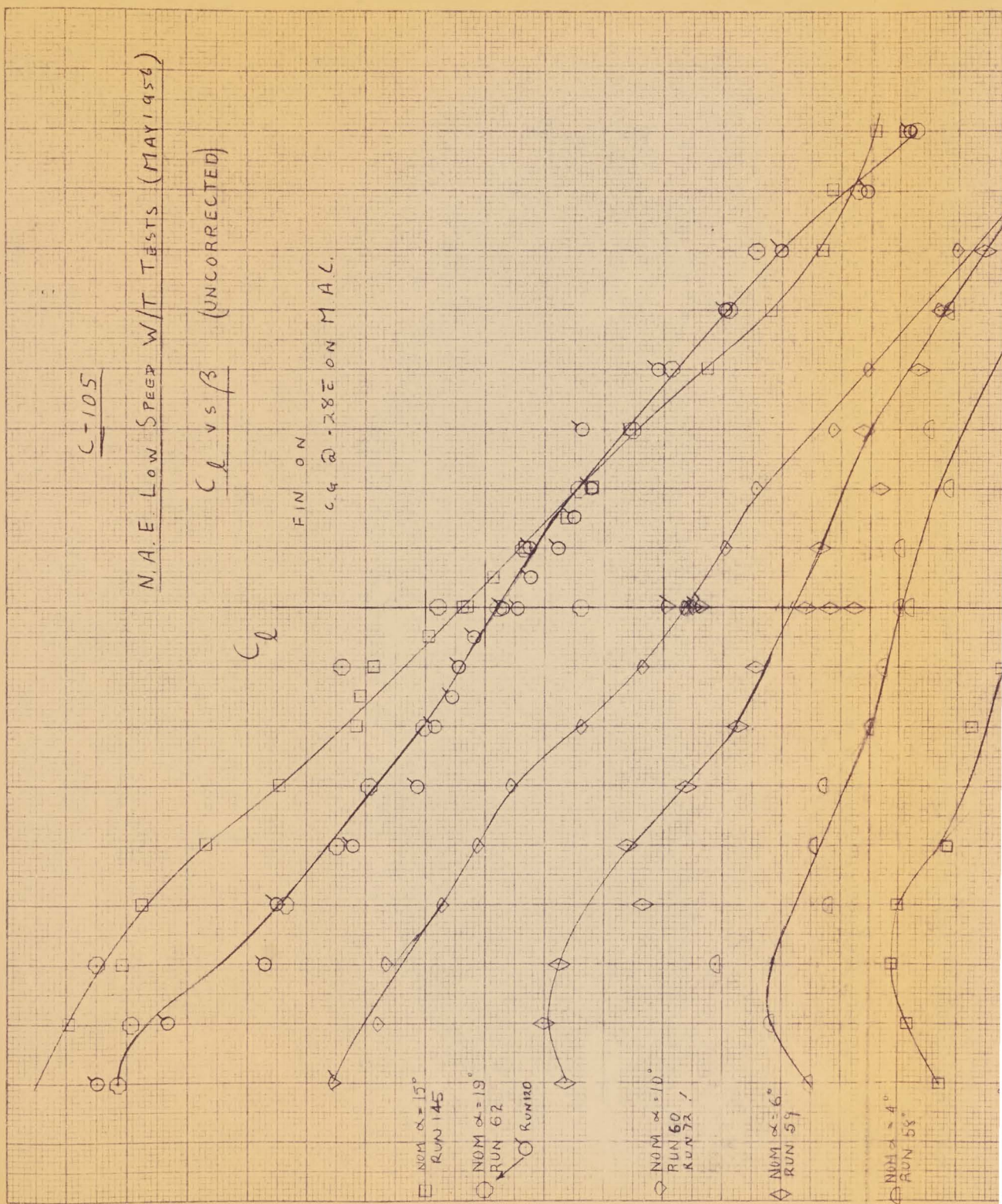
C-105

N.A.E. LOW SPEED W/T TESTS (MAY 1956)

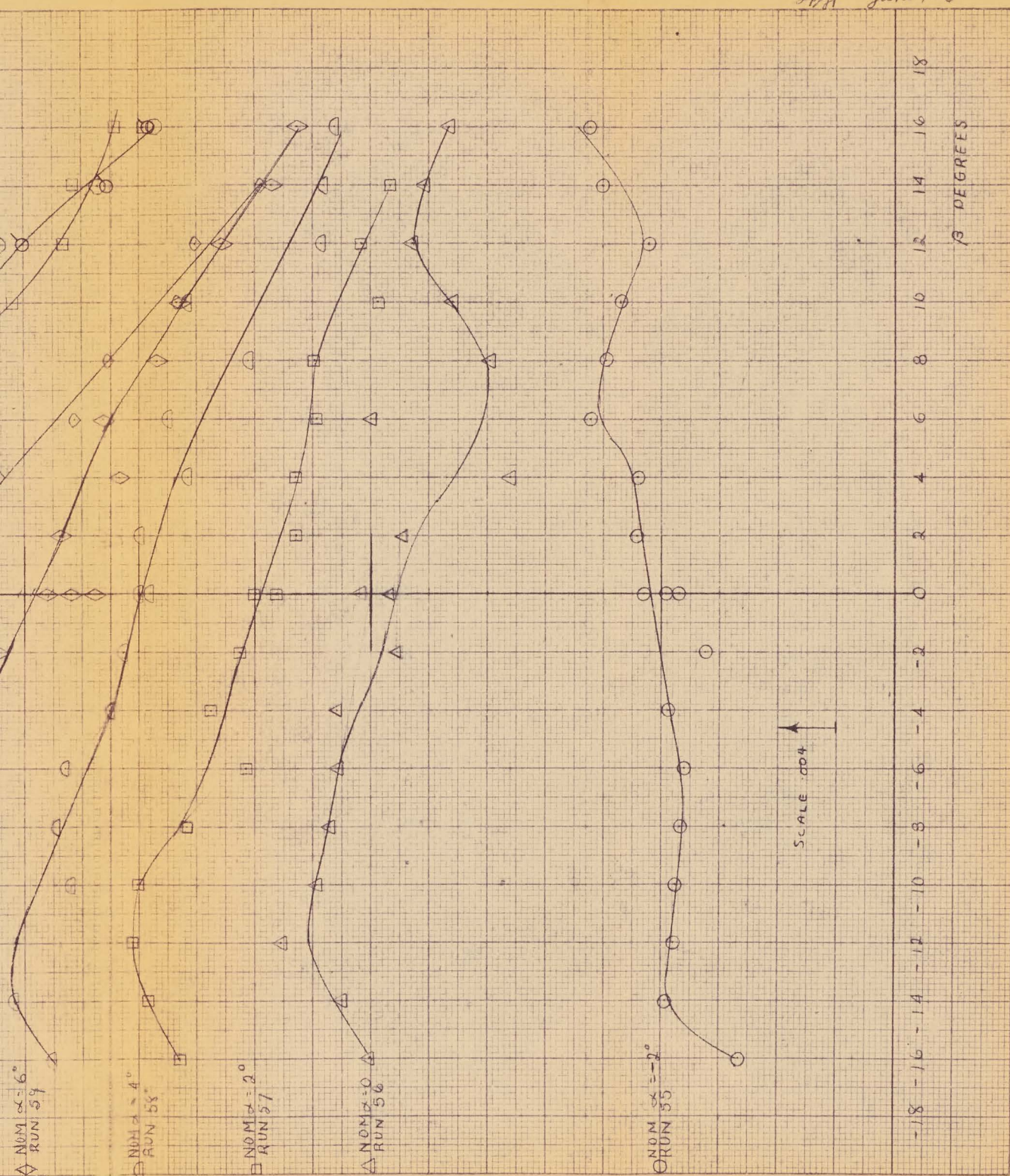
C_L vs β (UNCORRECTED)

FIN ON
C. 4 2-282 ON MAL.

C_L



Diff June 1956



C-105
NAE W/T TESTS, MAY '56

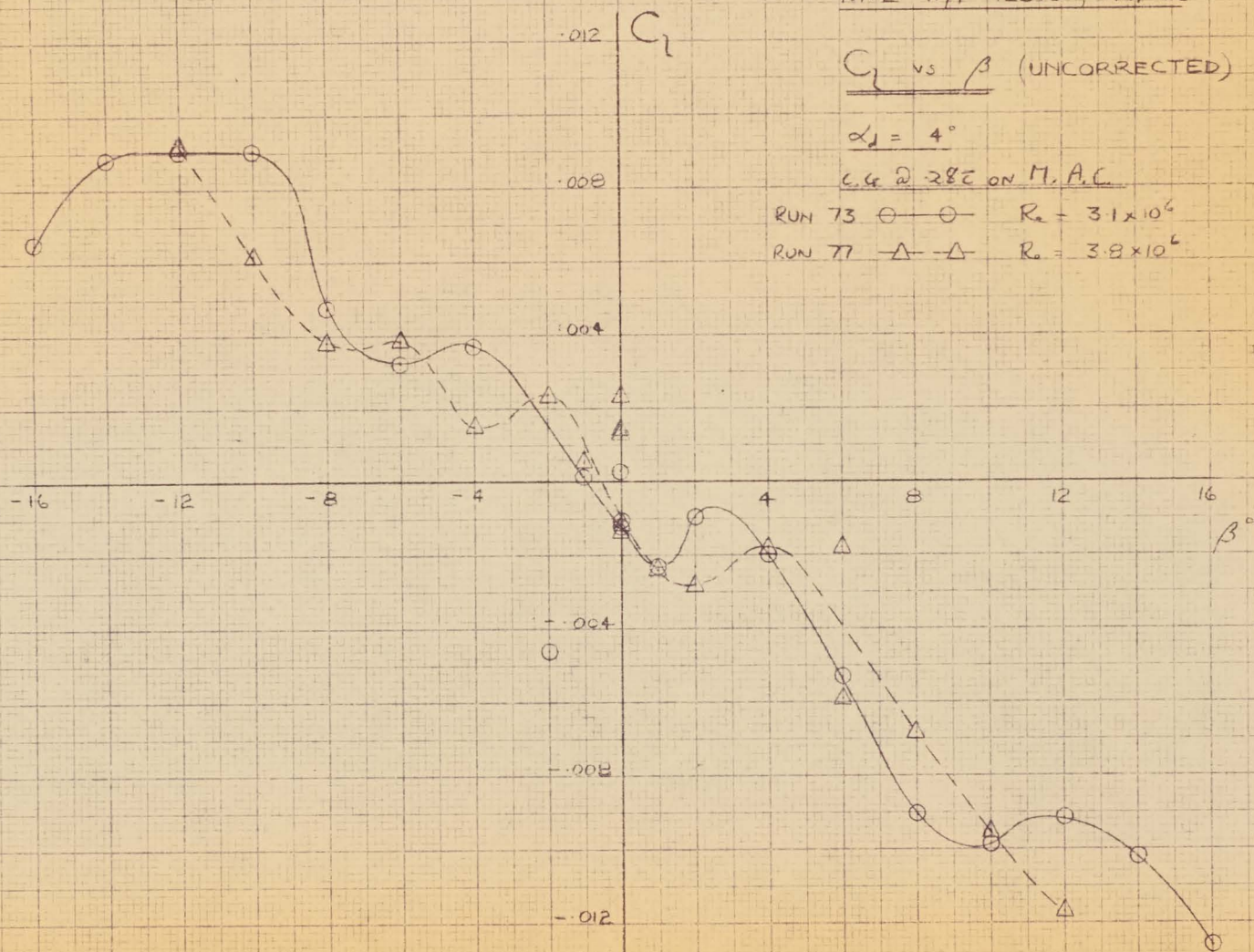
C_L vs β (UNCORRECTED)

$\alpha_d = 4^\circ$

C.G. @ 2.382 ON M.A.C.

RUN 73 $\bigcirc$ — $\bigcirc$ $R_e = 3.1 \times 10^6$

RUN 77 $\triangle$ — $\triangle$ $R_e = 3.8 \times 10^6$



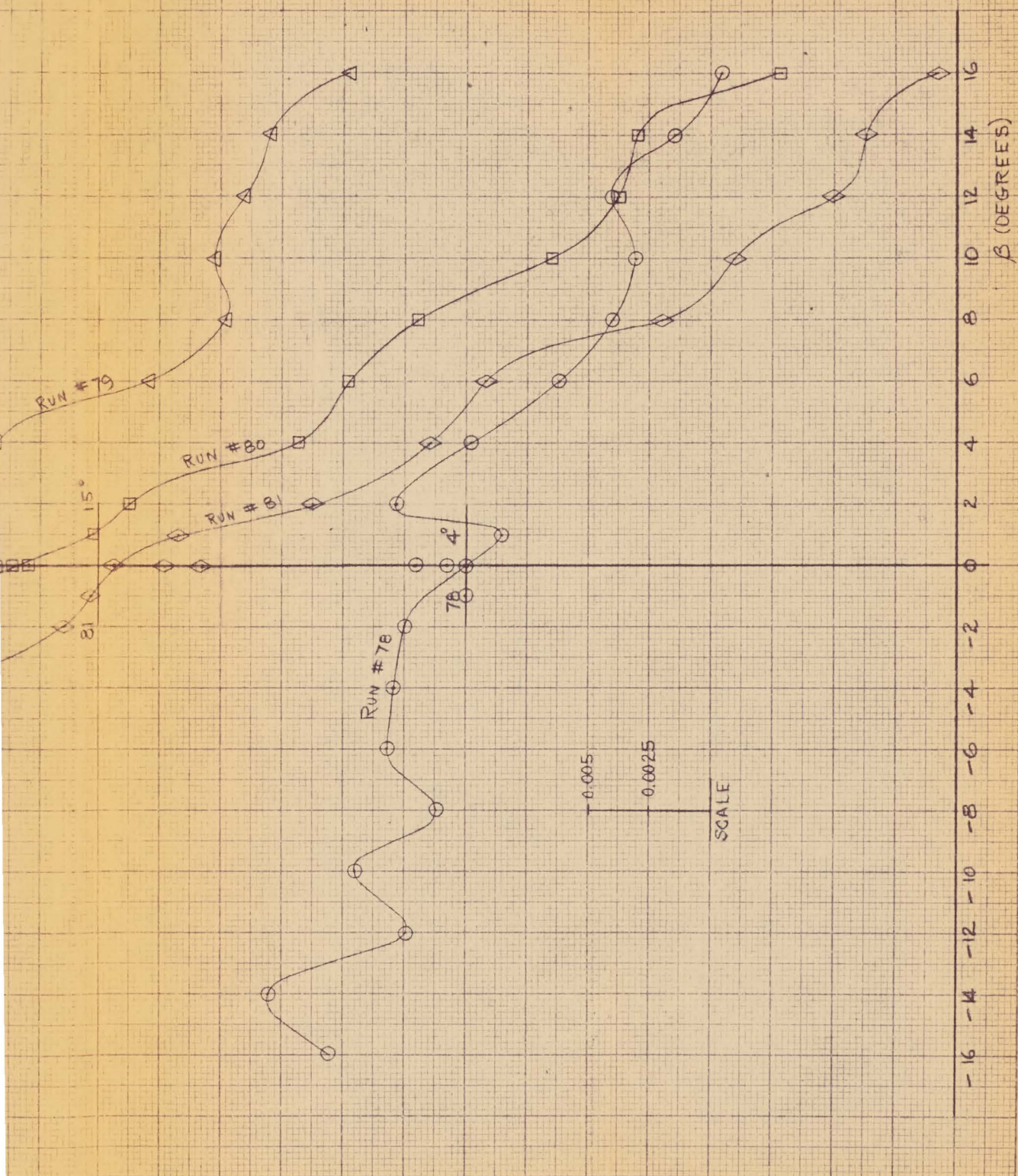
DBS
JUNE 56

P/WT/119

94

P/WT/119
JULY/56

9-5
AS/Hand



C-105
N.A.E. W.T. TESTS
MAY, 1956

C_L vs. δ_r
(UNCORRECTED)

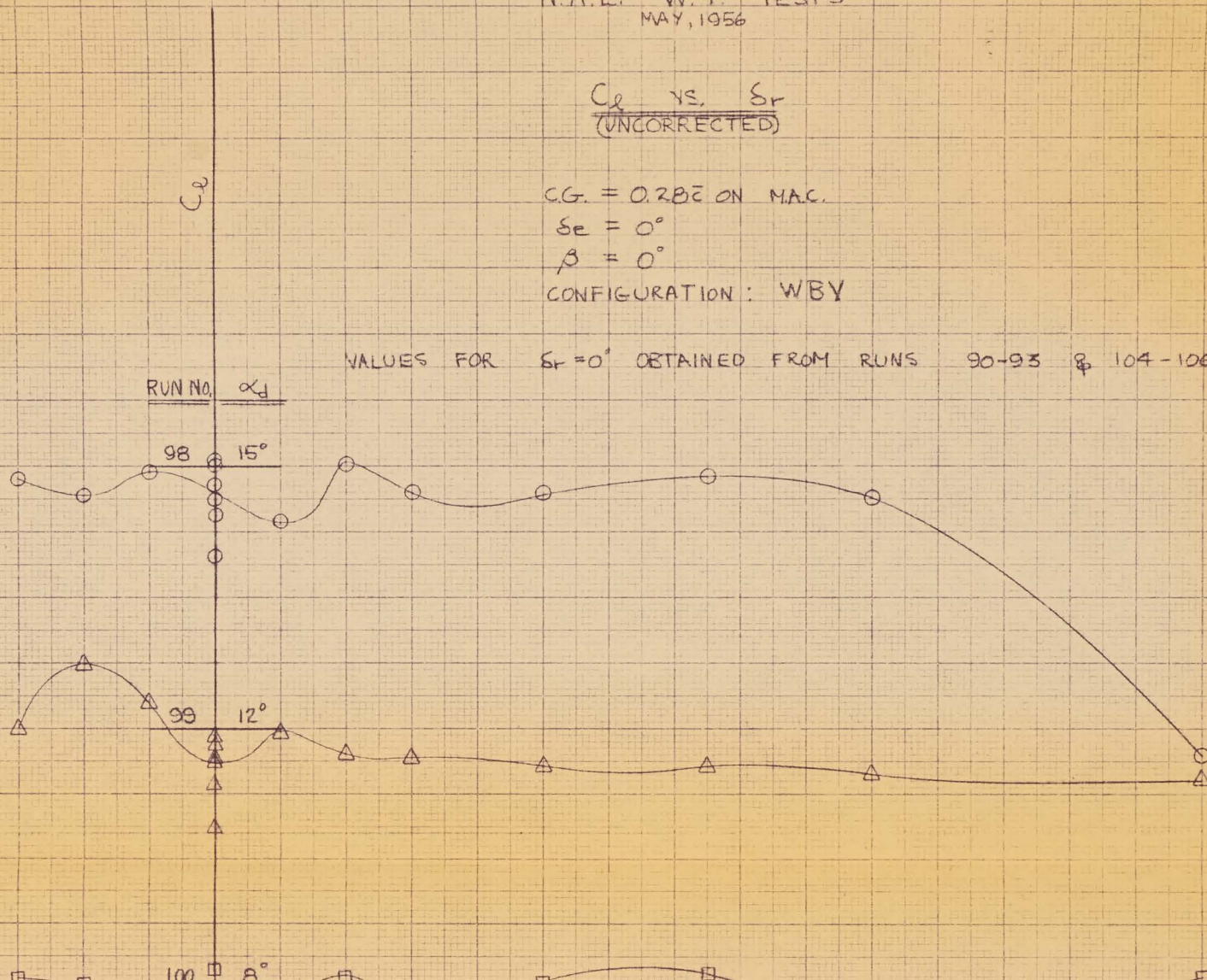
C.G. = 0.28 $\bar{c}$ ON MAC.

$\delta_e = 0^\circ$

$\beta = 0^\circ$

CONFIGURATION: WBV

VALUES FOR $\delta_r = 0^\circ$ OBTAINED FROM RUNS 90-93 & 104-106



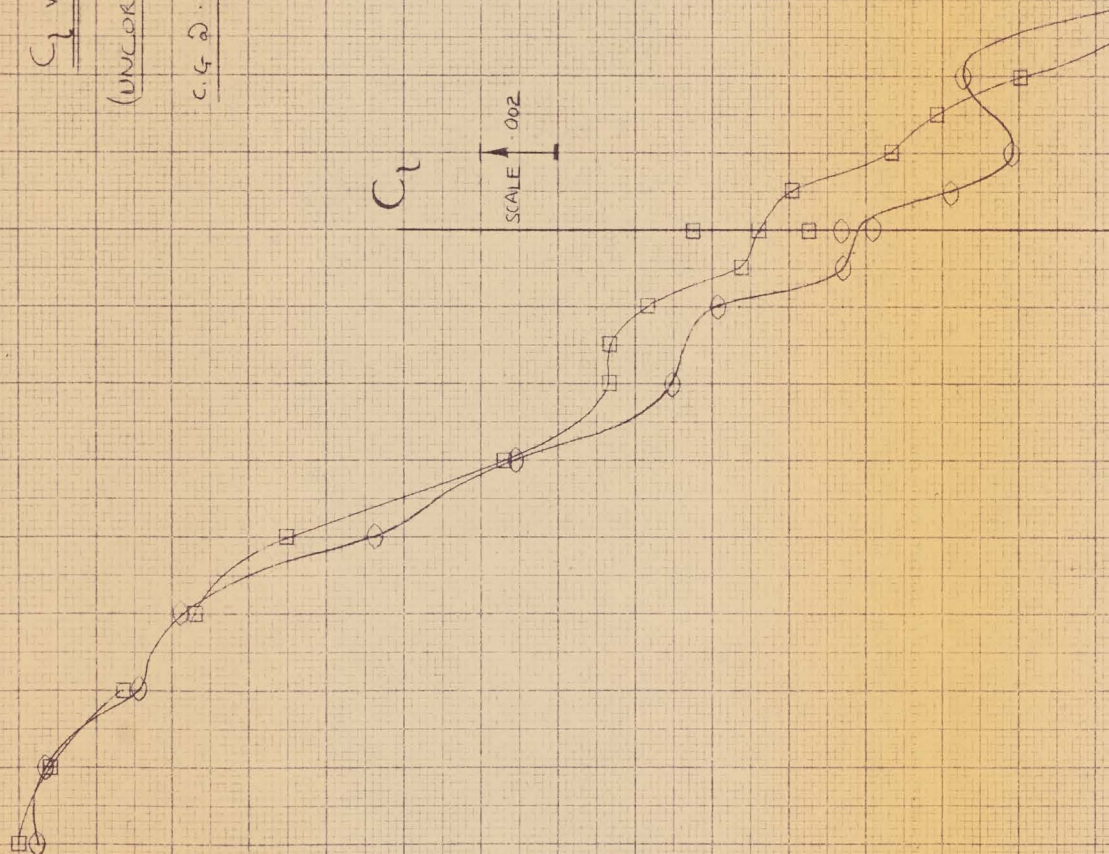
C-105

NAE LOW SPEED W/T TESTS , MAY 1956

C_L vs β

(UNCORRECTED DATA)

C.G. @ .287 ON MAC



$\alpha = 8^\circ$

C-105

NAE LOW SPEED W/T TESTS, MAY 1956

C_L vs β

(UNCORRECTED DATA)

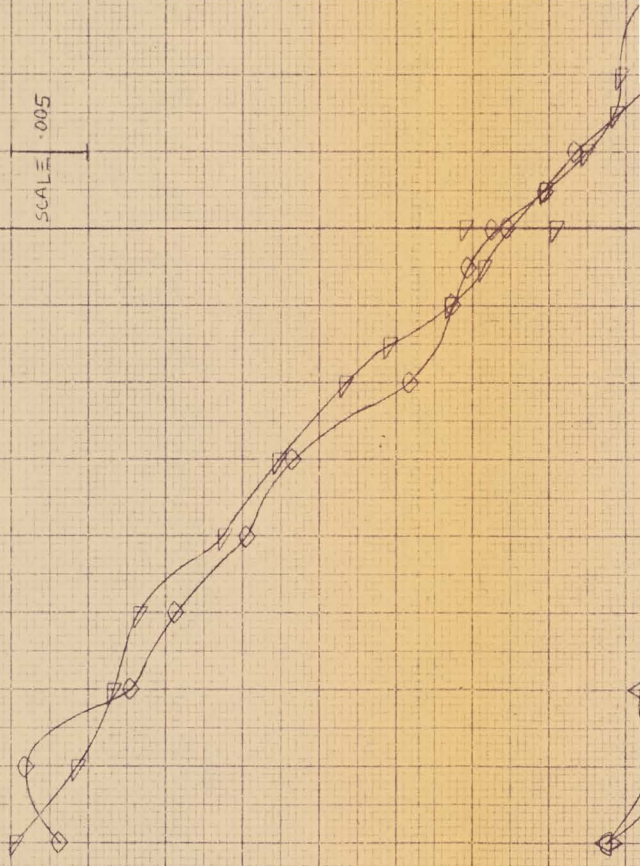
CIR W. 28° ON MAC

C_L

SCALE .005

ORIGINS

$\alpha = 15^\circ$



C-105

N.A.E. W/T TESTS - JULY, 1956

~~C₁ vs δ_r~~
~~UNCORRECTED~~

C.C. = 0.282 ON M.A.C.

$\delta_c = 0^\circ$

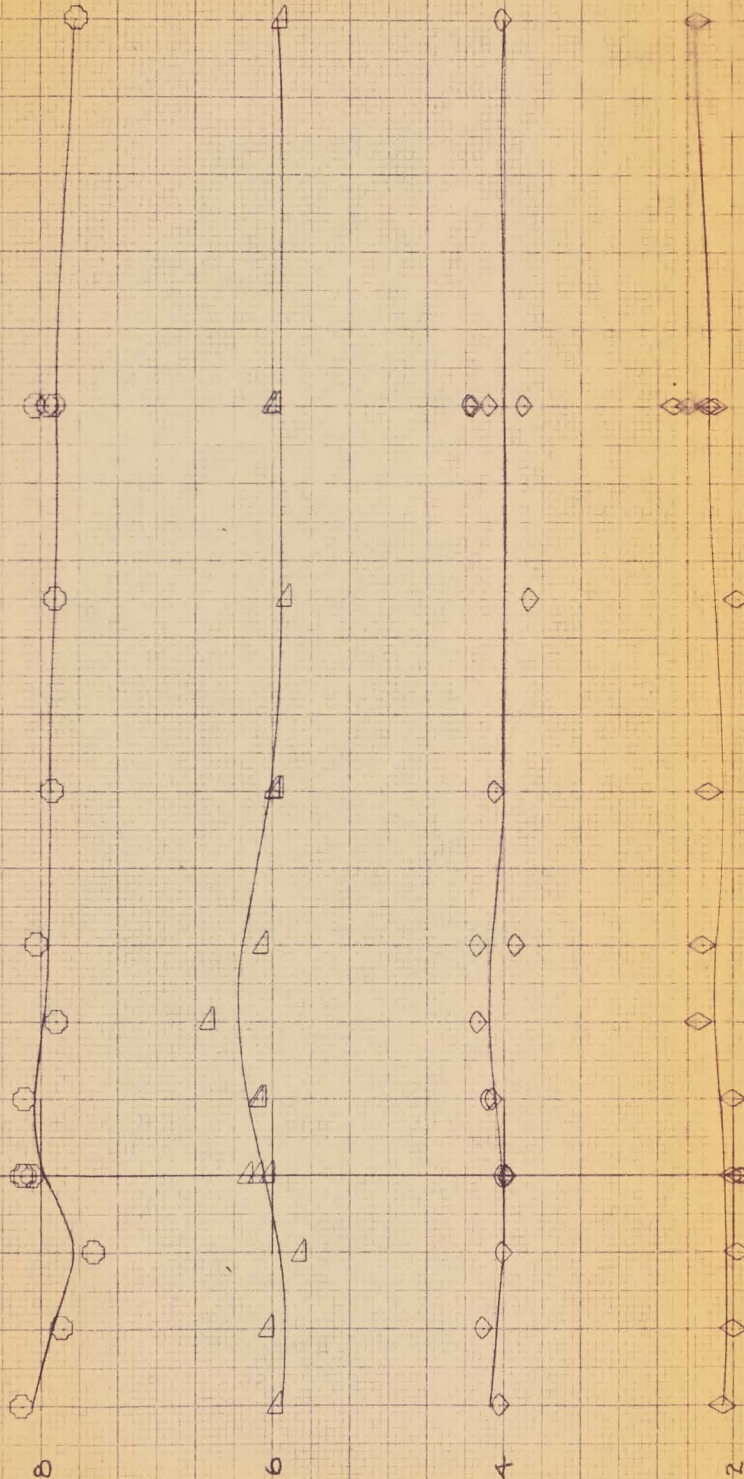
$\beta = 0^\circ$

CONFIG. - W B V

RUNS #113-119 INCL. #121 & #146-148 INCL.
(VALUES FOR $\delta_r = 0$ OBTAINED FROM RUN #121)

C₁

α_d
(DEG)



C-105

NAE. LOW SPEED W/T TESTS

C_l vs β (UNCORRECTED DATA)

RUN 121

C. G. D. 282 PN TLA. C_l

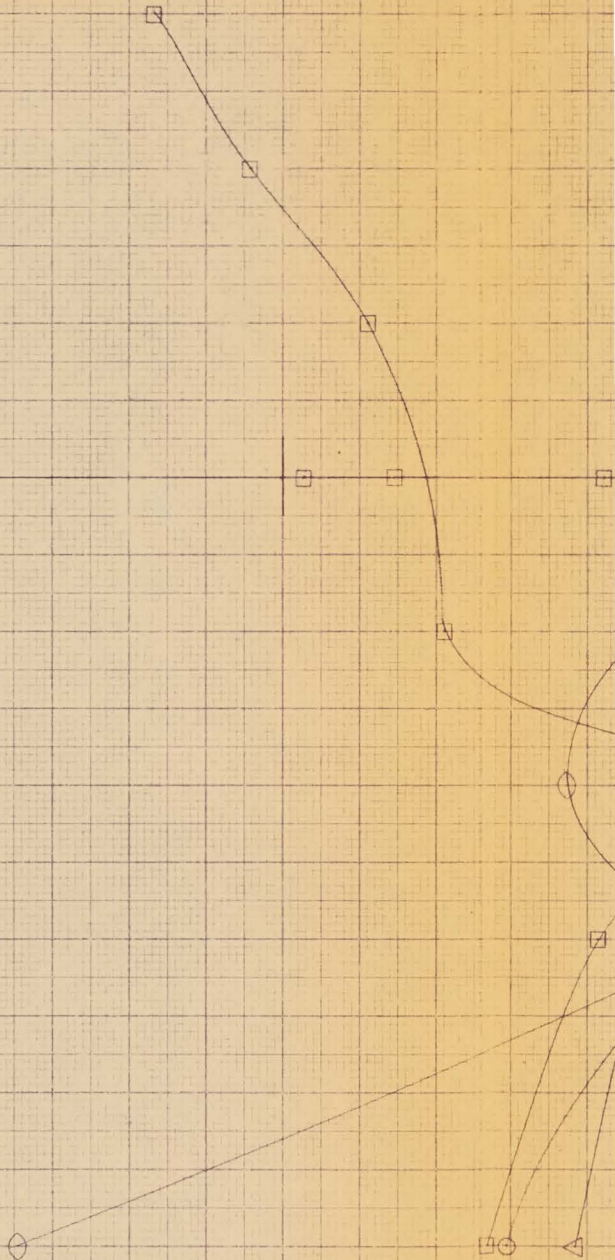
SCALE 002

scale

C_l

ORIGIN

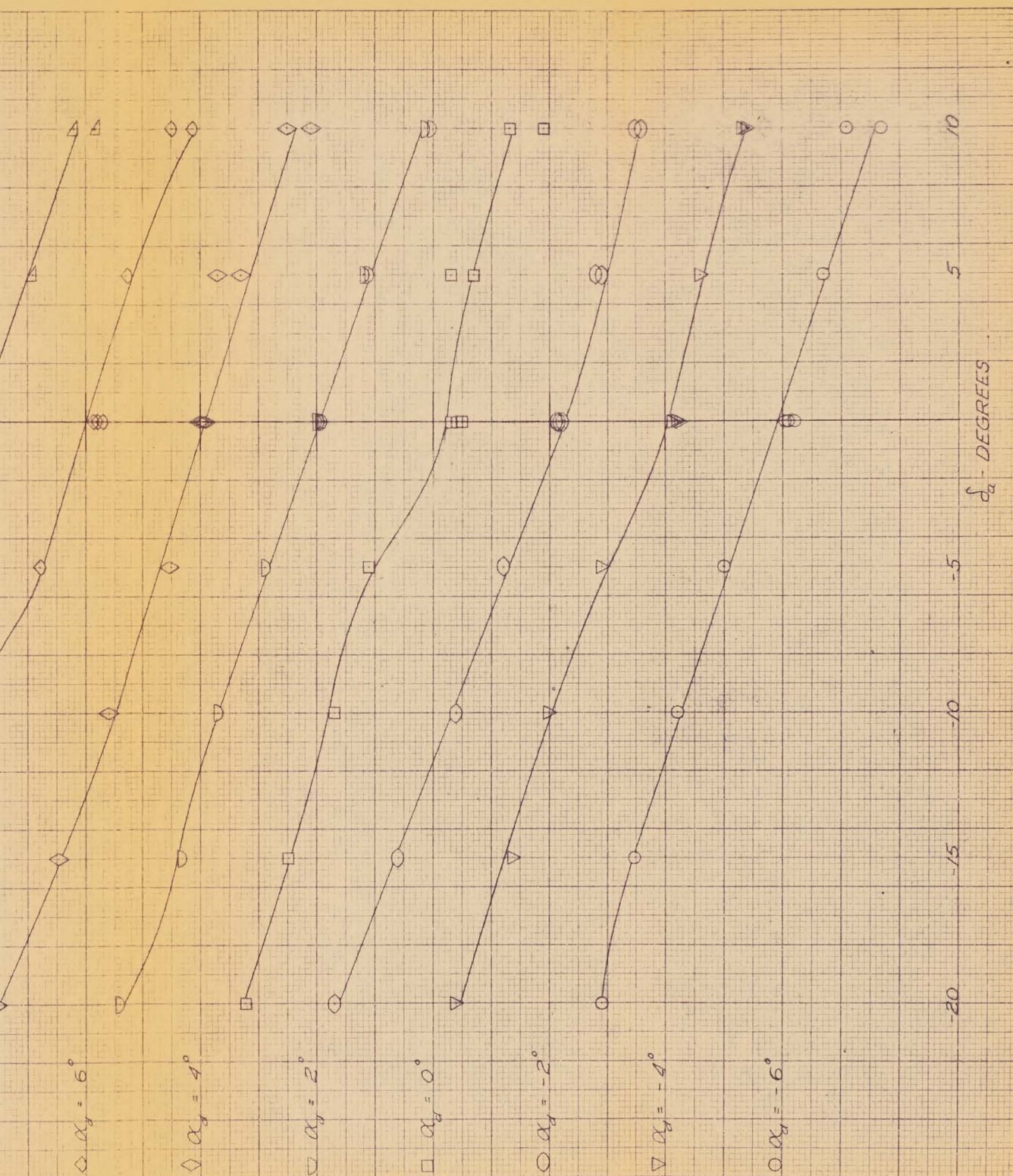
□ $\alpha = 28$



SEPT/56 MG

P/WT/119

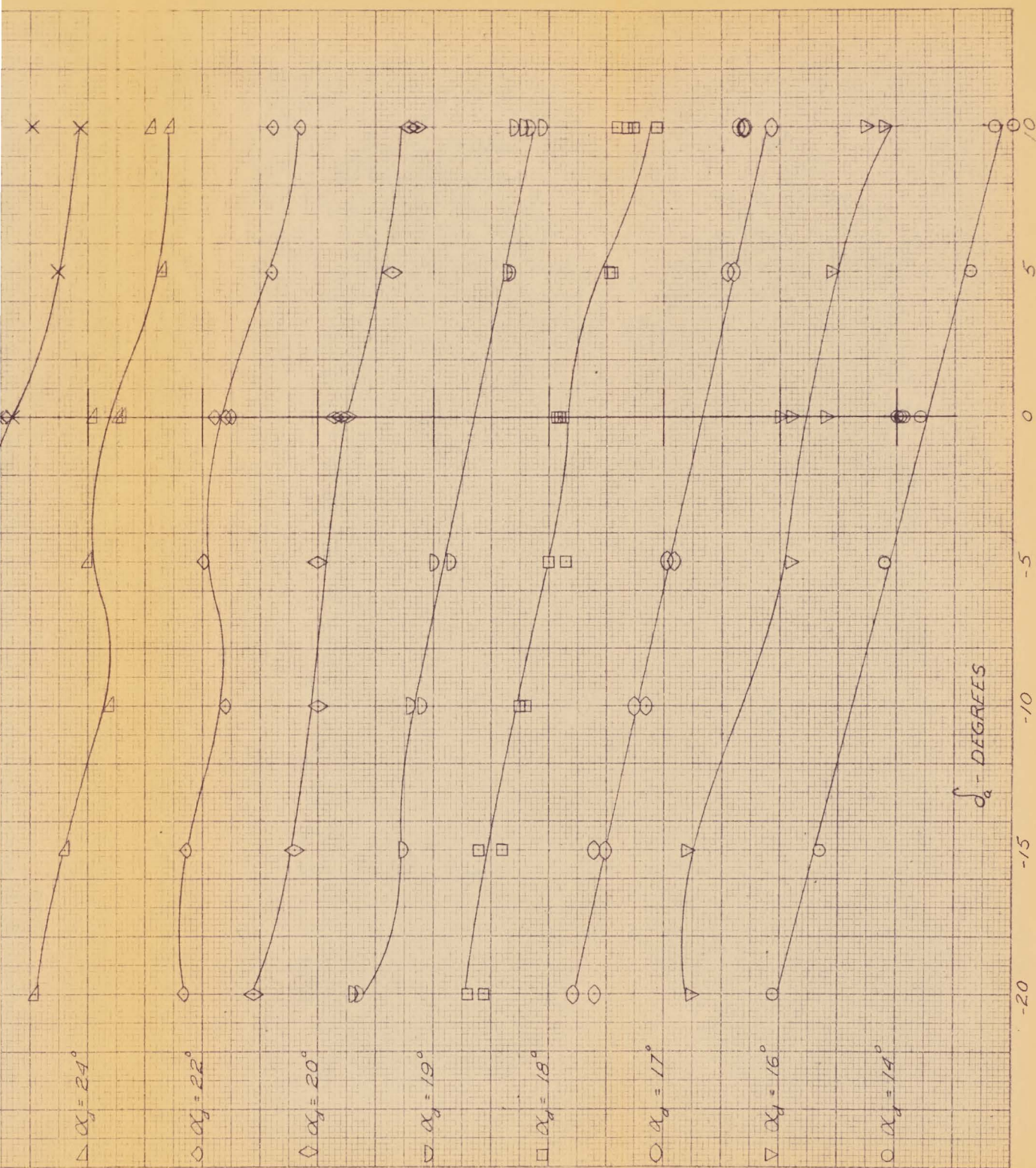
9-14-1



SEPT/56 NG

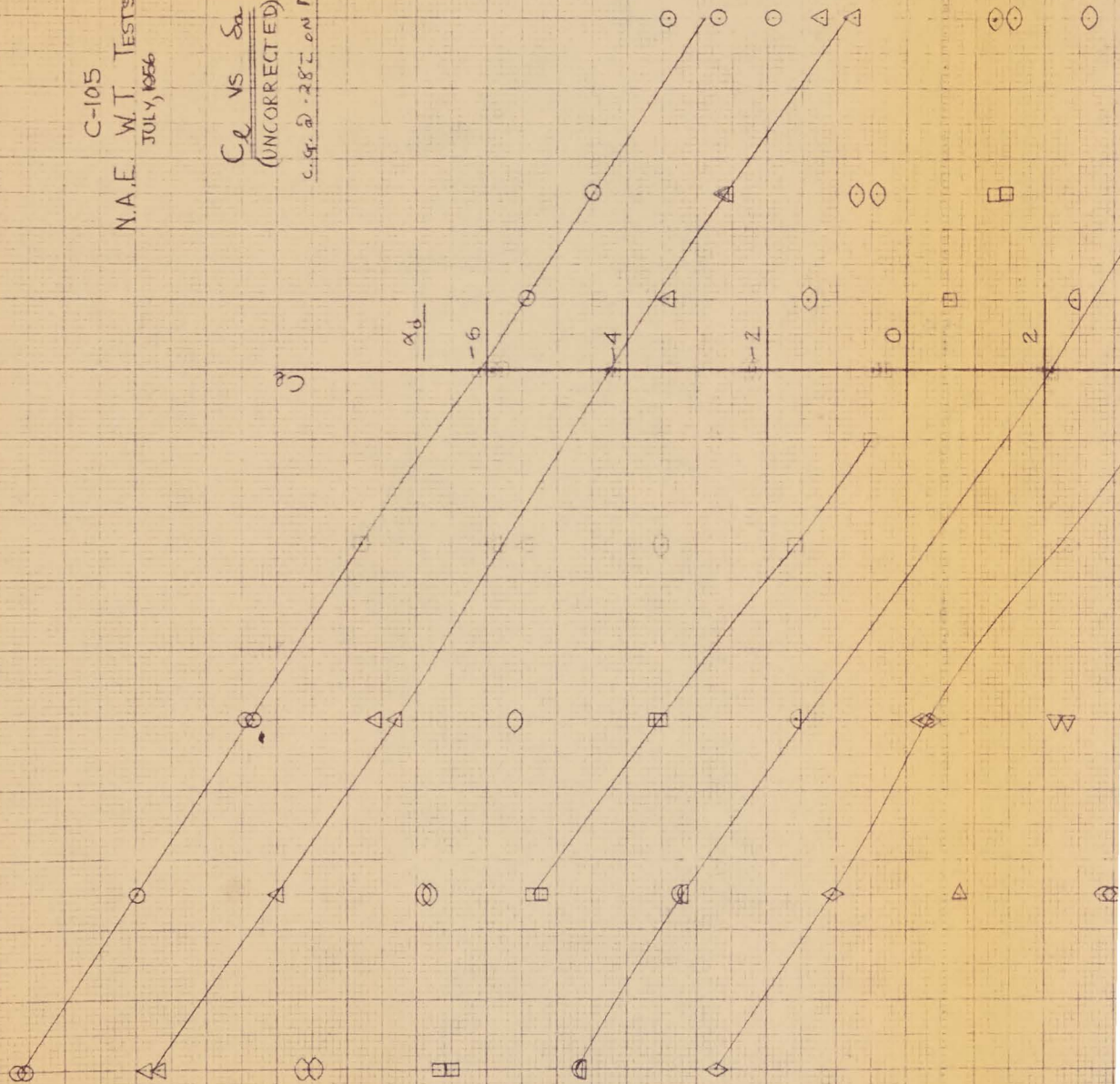
P/WT/119

9.14.2



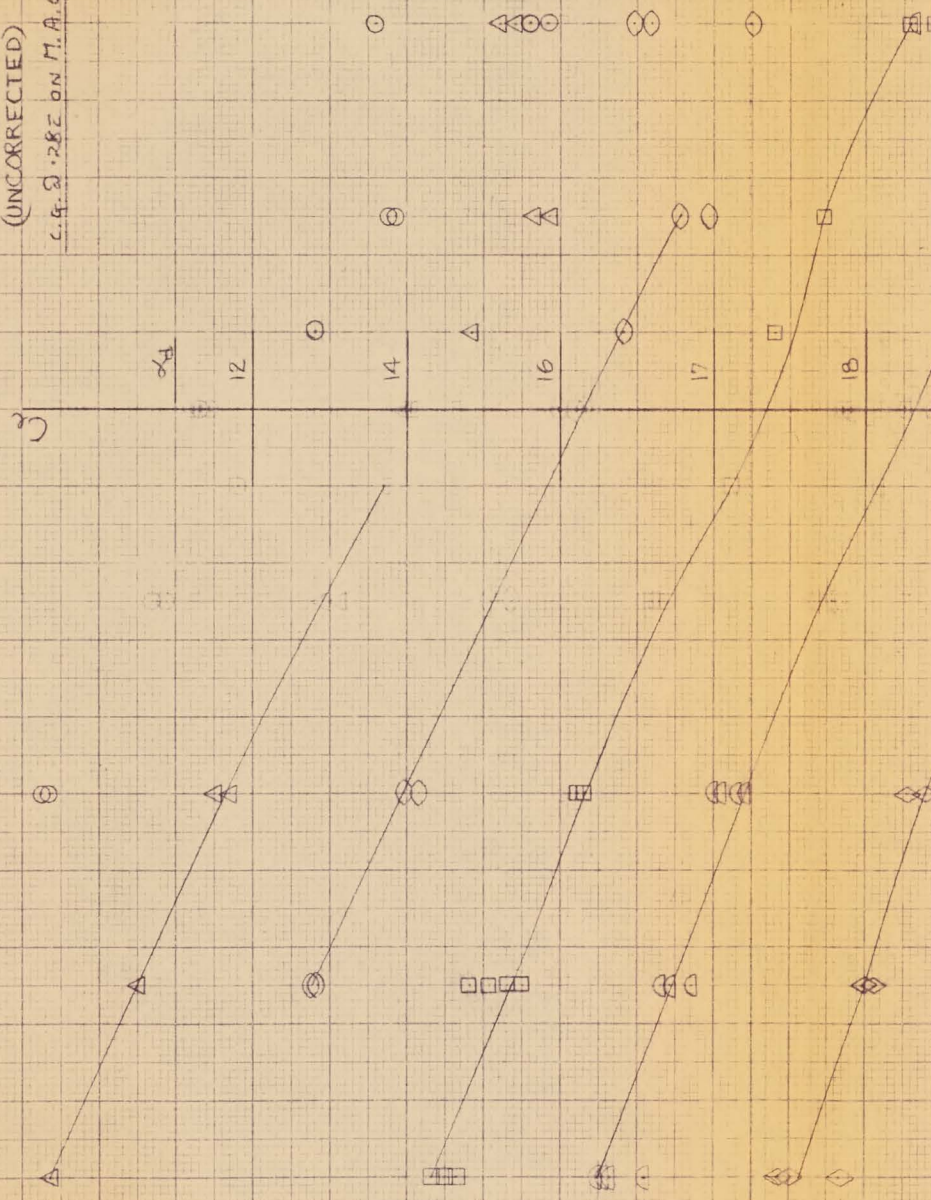
C-105
N.A.E. W.T. TESTS
JULY, 1956

C_u VS S_a
(UNCORRECTED)
C.G. @ -28° ON P.A.C.



C-105
NAE. W.T. TESTS
JULY, 1956

C_p VS. S_a
(UNCORRECTED)
C.F. 0.282 ON M.A.C.

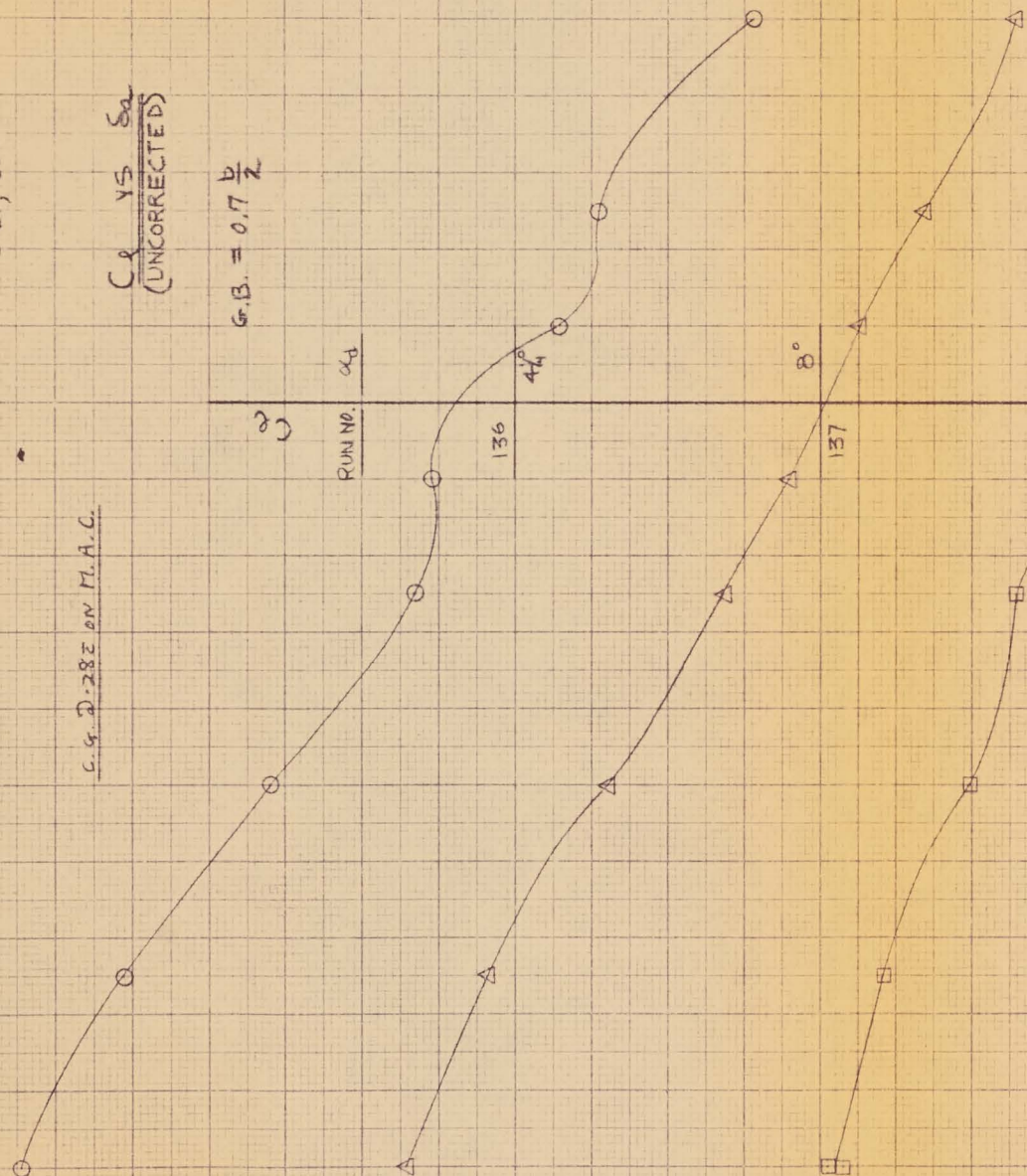


C-105
N.A.E. LOW SPEED W.T. TESTS
JULY, 1956

C.G. D-282 ON M.A.C.

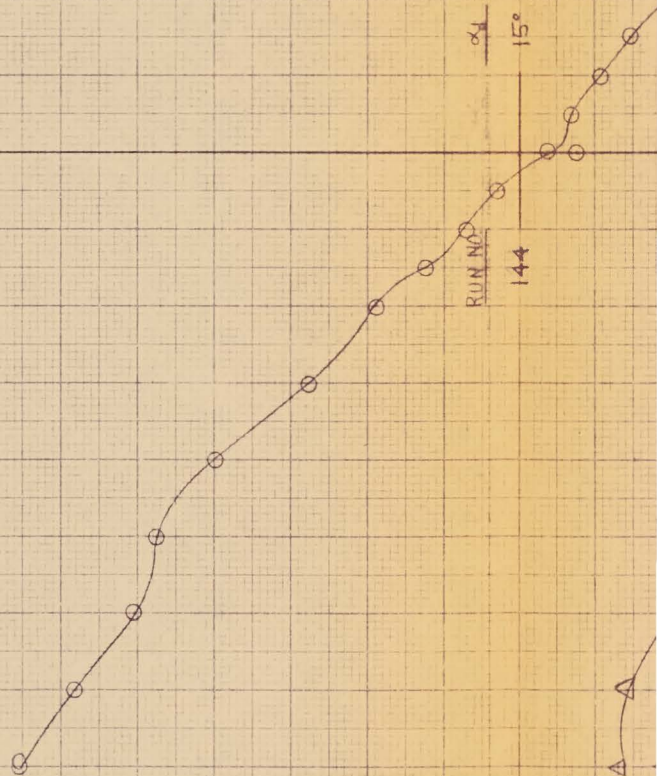
C_L VS S_a
(UNCORRECTED)

G.B. = $0.17 \frac{V}{Z}$



C-105
NAE. LOW SPEED W.T. TESTS
AUG, 1956

C_D vs β
(UNCORRECTED)
C.G. 0.282 ON M.A.C.



Aug. 15 L.J.W.
P/WT/119 9.25

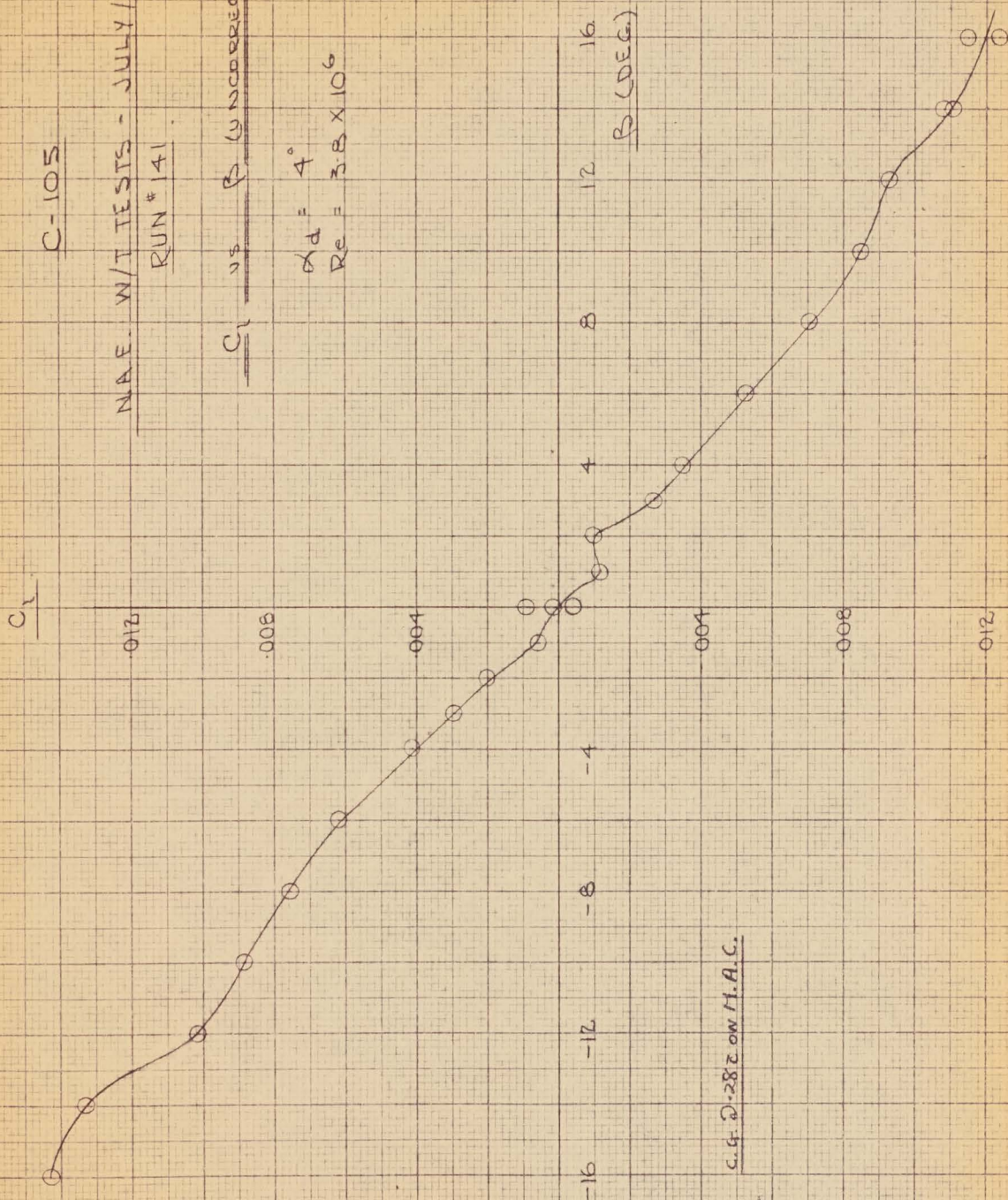
C-105

N.A.E. W/T TESTS - JULY 1956

RUN # 141

C_L vs β (UNCORRECTED)

$\alpha_d = 4^\circ$
 $Re = 3.8 \times 10^6$



C.L. 2.282 ON M.A.C.

C-105
NAE LOW SPEED WIT TESTS JULY/56
RUN 147 $\delta_r = 20^\circ$
 C_L VS β (UNCORRECTED)
C.G. D-28E ON M.A.C.

SCALE:

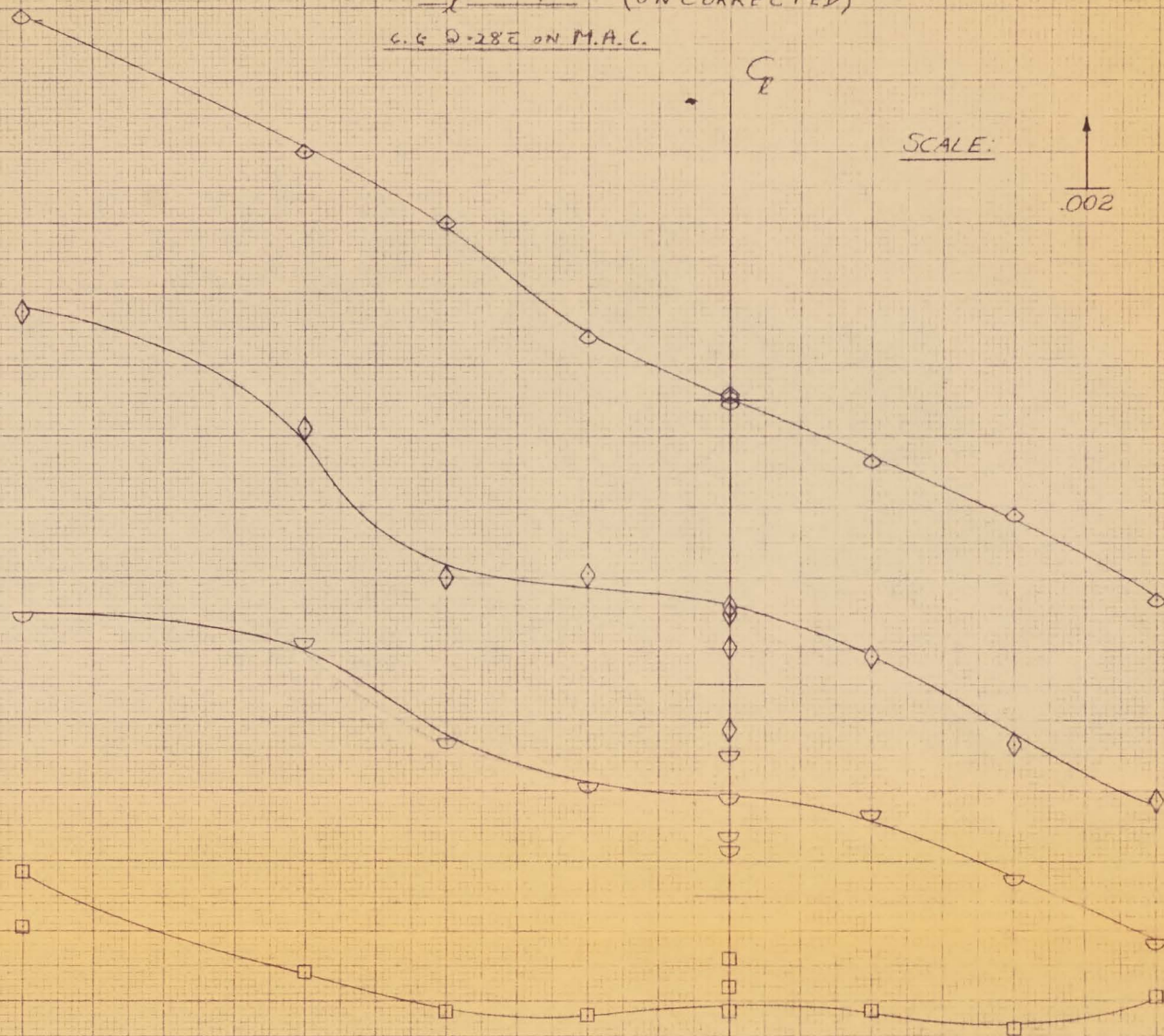
↑
0.002

ORIGINS:

◇ $\alpha_i = 6^\circ$

◇ $\alpha_i = 4^\circ$

◇ $\alpha_i = 2^\circ$



SEPT/56

C-105
NAE LOW SPEED W/T TESTS JULY/56

RUN 147 $\alpha_f = 20^\circ$

C_d VS β

(UNCORRECTED)

C. G. D-28E ON M.L.A.C.

C_d

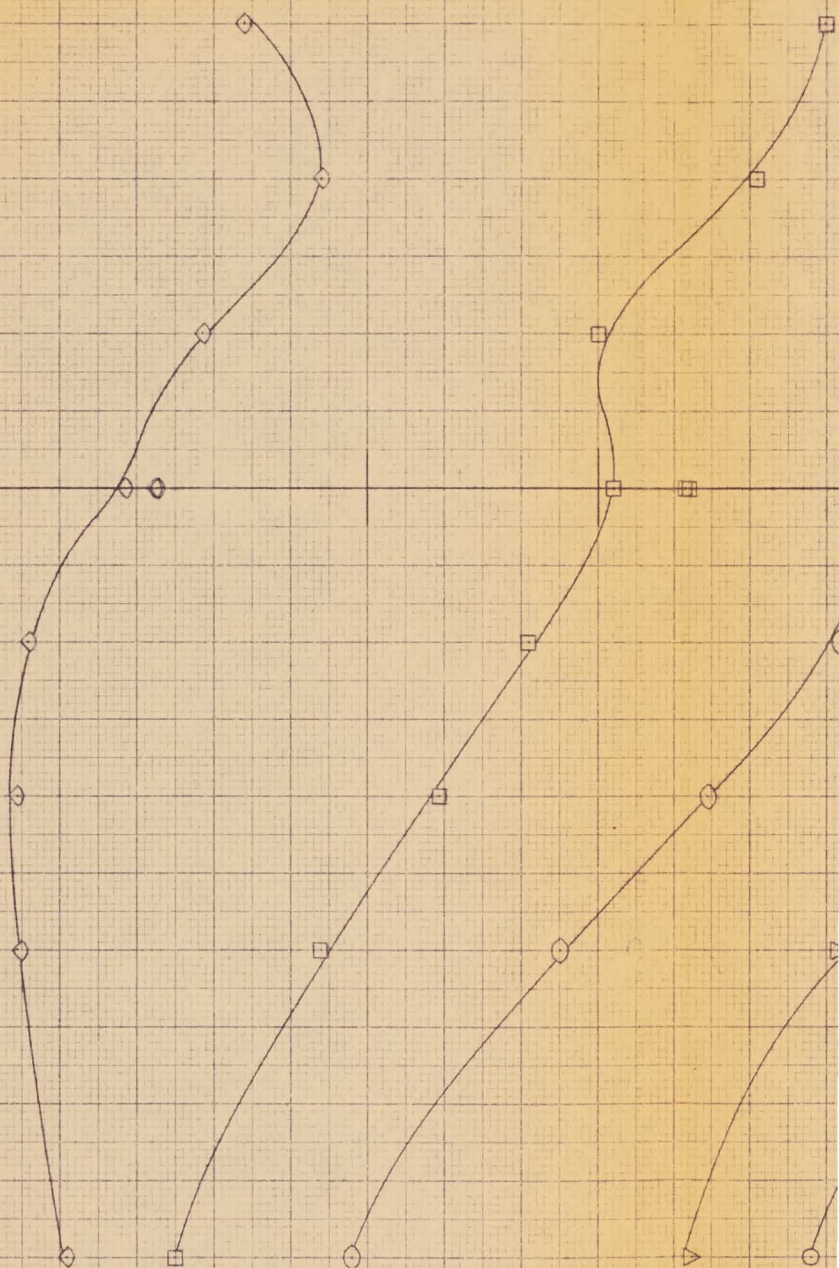
SCALE: $\uparrow$
.002

ORIGINS:

$\diamond \alpha_f = 26^\circ$

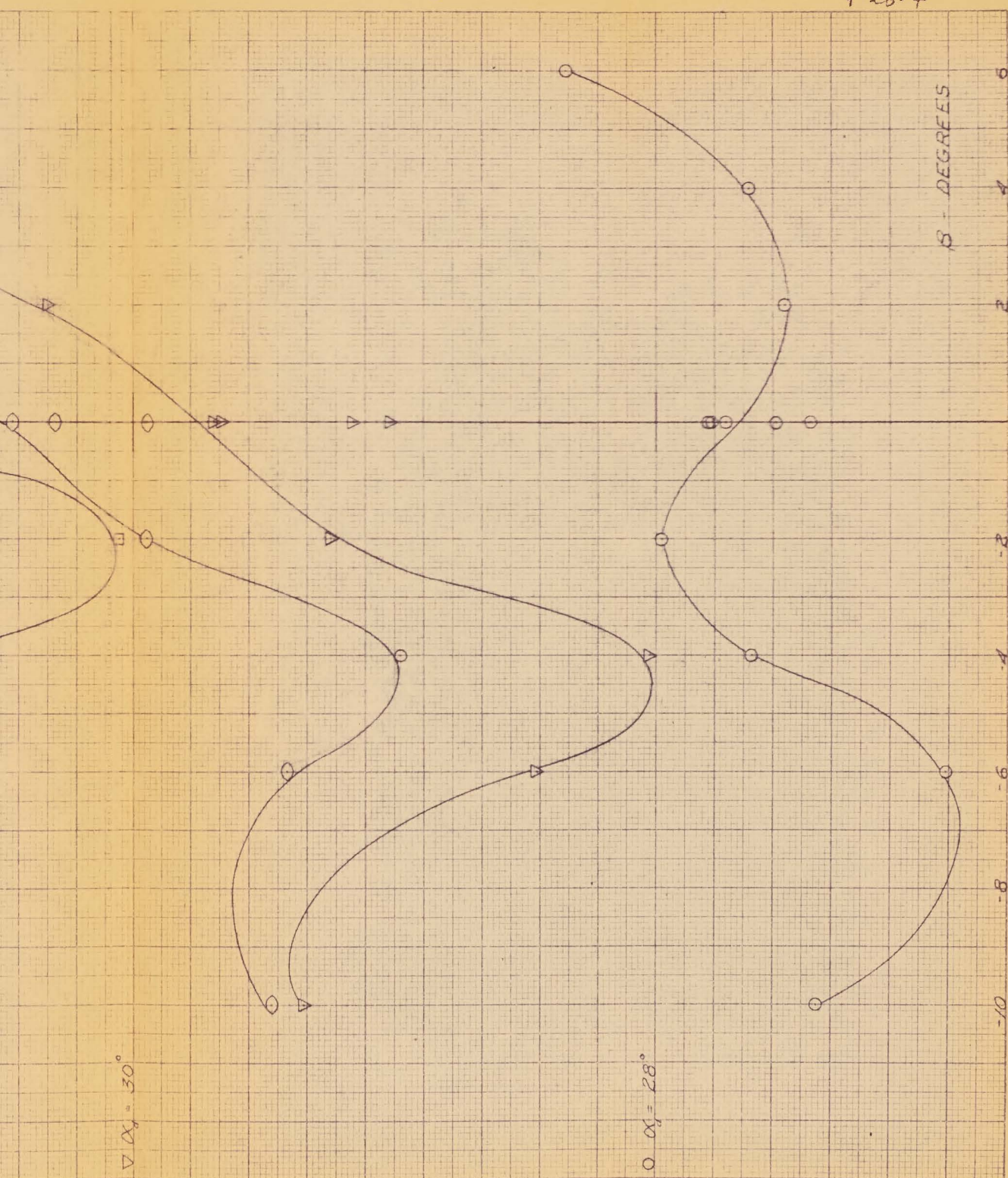
$\square \alpha_f = 24^\circ$

$\circ \alpha_f = 22^\circ$



SEPT/56 MB

P/WT/1119
9.26.4



C-105
N.A.E. W.T. TESTS
MAY, 1956

C_L VS β
(UNCORRECTED)

$C_G = 0.20 \bar{c}$ ON M.A.C.
 $\delta e = 0^\circ$
CONFIGURATION: WBVU

C_L

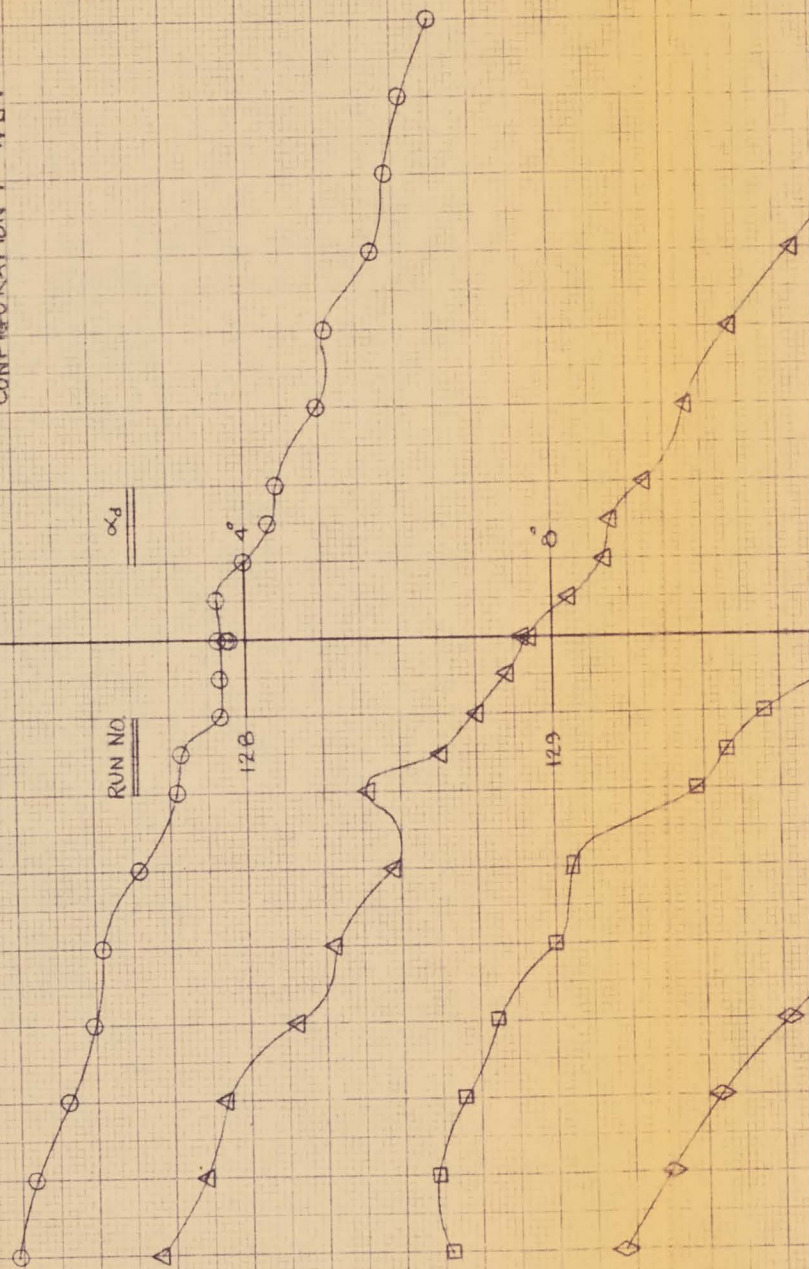
RUN NO.

α_d

128

129

δ°



P/WT/119
 JUL 4 / 56

9.29
 ASMund

ZEROS FROM RUNS 93, 105, 92, 91, 104, 95,
 90, 106.

