

QC
Avro
C-105
P/WT/119

FILE IN VAULT

QCX
Avro
CF105
P-WT-119

(15)

CF-105

P/WIND TUNNEL/119

N.A.E. LOW SPEED WIND TUNNEL TESTS

JULY 1956

BASIC PLOTS

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TO
A

DATE

Dec. 7, 1992

Report no.: QCX - AVRO - CF105- P-WT-119

has been ☐ downgraded to : _____

☒ de-classified

by (Name): Michel W. Drapeau

(Dept.): A/DND Coordinator, Access to Information

Date: Dec. 7, 1992

R. Auger
Signature



48113

12417931



A V ROE CANADA LIMITED
MALTON - ONTARIO

TECHNICAL DEPARTMENT (Aircraft)

AIRCRAFT: CF-105

REPORT NO. P/WIND TUNNEL/119

FILE NO.

NO OF SHEETS

TITLE

N.A.E. LOW SPEED WIND TUNNEL TESTS

JULY 1956

BASIC PLOTS

Classification cancelled / changed to: UNCLASSIFIED

By authority of: DRDA 7/DARET 5-8/DAS Eng 6-4-5

Date: 5 Nov 1992

Signature: B. Aubrey

Unit / Rank / Appointment: DSIS 3, Secretary CRAD HQ DRP

PREPARED BY Stability and Control Group DATE August '56

CHECKED BY J. Clark DATE August '56

SUPERVISED BY St. Matthews DATE Sept. '56

APPROVED BY Thambuli DATE Sept. '56

ISSUE NO.	REVISION NO.	REVISED BY	APPROVED BY	DATE	REMARKS

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AURO AIRCRAFT LIMITED
MALTON - ONTARIO

TECHNICAL DEPARTMENT

REPORT NO. P/WIND TUNNEL/119

SHEET NO. 1

AIRCRAFT:

CF-105

N.A.E. LOW SPEED

.07 Scale Model

WIND TUNNEL TESTS

PREPARED BY

DATE

CHECKED BY

DATE

TEST PERIOD 11 AND 111

PURPOSE

These tests were a continuation of the low speed tests started in test period I. The following lateral and longitudinal characteristics were investigated: effects of undercarriage with and without ground effect; effect of open canopy in yaw; rudder and aileron effectiveness with and without ground effect; the effect of rudder in yaw, the ailerons in yaw and control interference; and the effects of tanks and dive brakes.

CONFIGURATION

The model configurations used during these tests were as follows:

- B₃ - area rule body (B₂) with 30° nose cone
- V₁ - fin with separate rudder
- W₁ - 31% cambered wing.
- E₁₀ - 10% extended leading edge outboard of transport joint of wing.
- N₅ - 5% deep wing transport joint notch.
- D₈₋₄ - 80 leading edge droop inboard of notch, 40 droop outboard of notch.
- U₁ - nose undercarriage reversed
- U - undercarriage.
- C₀ - open canopy - closed canopy otherwise understood.
- T - fuselage tank
- S_B - speed brakes.

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2486 N.A.A. AIRCRAFT DIVISION WASHINGTON, D.C. TECHNICAL DEPARTMENT

AIRCRAFT

CF-105

.07 Scale Model

N.A.E. LOW SPEED

WIND TUNNEL TESTS

REPORT NO. P/WIND TUNNEL/119

SHEET NO. 11

PREPARED BY

DATE

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DATE

The ground board was located at .465 b/2 and .7 b/2 from a point .096 below the MAC at .276.

CONTROL DEFLECTIONS

Test Period II

Elevator: -10, 0
 Aileron : 10, 0
 Rudder : -6, -4, -2, 0, 2, 4, 6, 10, 15, 20, 30

Test Period III

Elevator: -20, -10, 0
 Aileron : -20, -15, -10, -5, -2, 0, 2, 5, 10, (both)
 Aileron : -20, -15, -10, -5, 5, 10 (right only)
 Rudder : 0, 15, 20, 30.

SPEED RANGE

Mach number = .21, Reynolds Number = 3.1×10^6
 and Mach number = .27, Reynolds Number = 4.0×10^6

BASIC PLOTS

The curves in this report were based on the data obtained in Runs 55 to 123 (Test Period II), and 124 to 181 (Test Period III). The plots included are listed in the index by section number and sheet number.

Corrections have been applied to account for wall and blockage effects. However, since all of these tests except Runs 175 to 181 were made using the single strut support, for which no inverted or dummy runs could be obtained, strut tare and interference effects were not included. For this reason most of the plots in this report are labelled "uncorrected". Strut tare and interference corrections were estimated from the earlier twin strut data and applied to some of the curves, especially longitudinal data, but there was some doubt as to the validity of these corrections for the lateral data. Curves giving the estimated strut tare and interference corrections that can be applied to the curves are included at the end of this report.

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MALTON - ONTARIO

TECHNICAL DEPARTMENT

REPORT No P/WIND TUNNEL/119

SHEET No iii

AIRCRAFT:

CF-105

N.A.E. LOW SPEED

.07 Scale Model

WIND TUNNEL TESTS

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DATE

CHECKED BY

DATE

The nose undercarriage configuration U_1 was obtained inadvertently, and the tests were repeated with the proper configuration (U) for those conditions where the nose undercarriage was effective, e.g., basic runs in yaw. Where the effect of the reversed nose undercarriage were not predominant the U_1 data was utilized.

The data were reduced to $.28\bar{c}$ on the M.A.C., and $.28\bar{c}$, $.31\bar{c}$, and $.35\bar{c}$ at 8 inches above the fuselage datum but only the data for $.28\bar{c}$ on the M.A.C. has been completely plotted.

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

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I N D E X

N.A.E. LOW SPEED

WIND TUNNEL TESTS

A. V. R

AIRCRAFT

WEIGHT

C. G. POS

SHEET	1	2	3	4	5	6	7	8	9	10	11
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	98-101	102
α	-2 +19		+4 +15	+4	+4 +15						
β	-16 +16									0	-16
δ_e	0				-10	-10	0	0	-10	0	
δ_a	0										
δ_r	0									-6 +30	
δ_{SB}	0										
CONFIG.	WBV	WB	WBVU ₁	WBVU ₁	WBVU ₁	WBVU ₁	WBVU ₁	WBV	WBV	WBV	WBV
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	β	SEE 7.11	β	β	β	β	β	β	δ_r	β
8 C _Y } β	β	β	SEE 8.11	β	β	β	β	β	β	δ_r	β
9 C _L } β	β	β	SEE 9.11	β	β	β	β	β	β	δ_r	β

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)

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A. V.

INDEX

N.A.E. LOW SPEED

WIND TUNNEL TESTS

AIRCRAFT

WEIGHT

C. G.

SHEET	1	2	3	4	5	6	7	8	9	10
	20	21	22	23	24	25	26	27	28	29
RUNS	156	150	149	136-139	140 142-144	141 (High RN)	147	124-127	128-131	132-135
α	-6 +34			+4 +15		+4	-6 +34	+4 +15		
β	0 +10			0	-16 +16		-6 +10	-16 +16		0
δ_e	0								-10	0
δ_a	-10	-15	-20	-20 +10	0					-20 +10
δ_r	0						+20	0		
δ_{SB}	0									
CONFIG.	WBV	WBV	WBV	WBV	WBVU	WBVU	WBV	WBVU	WBVU	WBV
GROUND BOARD $b/2$	OUT			.700	OUT			.465		
SECTION NO / PLOT										
1 C_M vs C_L										
2 C_D vs C_L										
3 C_D vs C_L^2										
4 C_L vs α										
5 C_M vs α										
6 C_D vs α										
7 C_N				δ_a	β	β	β'	β	β	δ_a
8 C_Y				δ_a	β	β	β	β	β	δ_a
9 C_L				δ_a	β	β	β	β	β	δ_a

223H

July 1956

C-105

N.A.E. LOW SPEED WIT TESTS

C_M vs. C_L (CORRECTED DATA)

RUN 121 C.G. 10.285 ON M.A.C.

$\delta_c = 0$

$\beta = 0$

C_M

0.4

0.2

0

-0.2

-0.4

-0.6

13

12

11

10

9

8

7

6

5

4

3

2

1

0

-1

-2

-3

-4

C_L

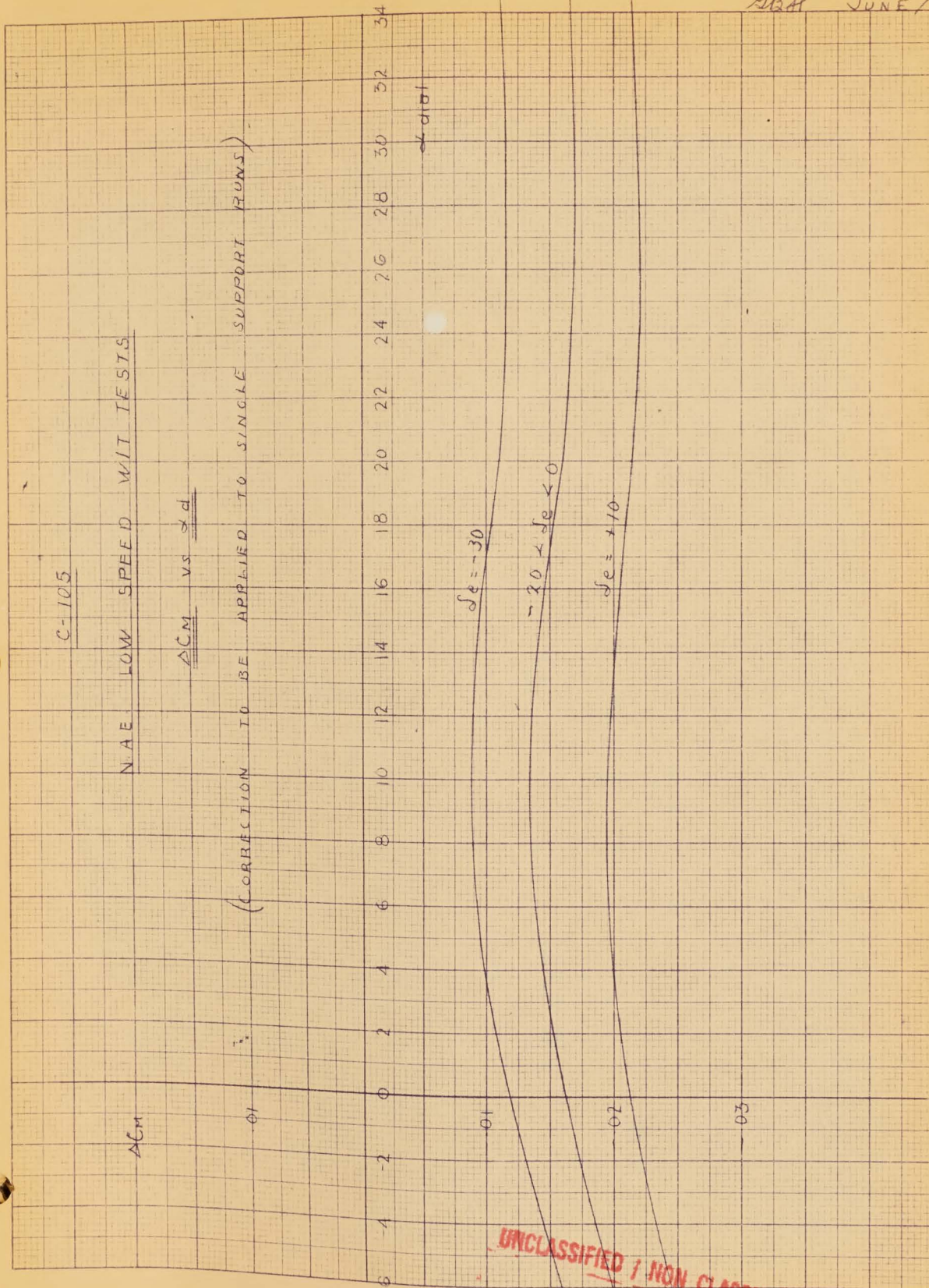
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C-105

N.A.E. LOW SPEED WIT TESTS

ΔC_M vs Δd

(CORRECTION TO BE APPLIED TO SINGLE SUPPORT RUNS)

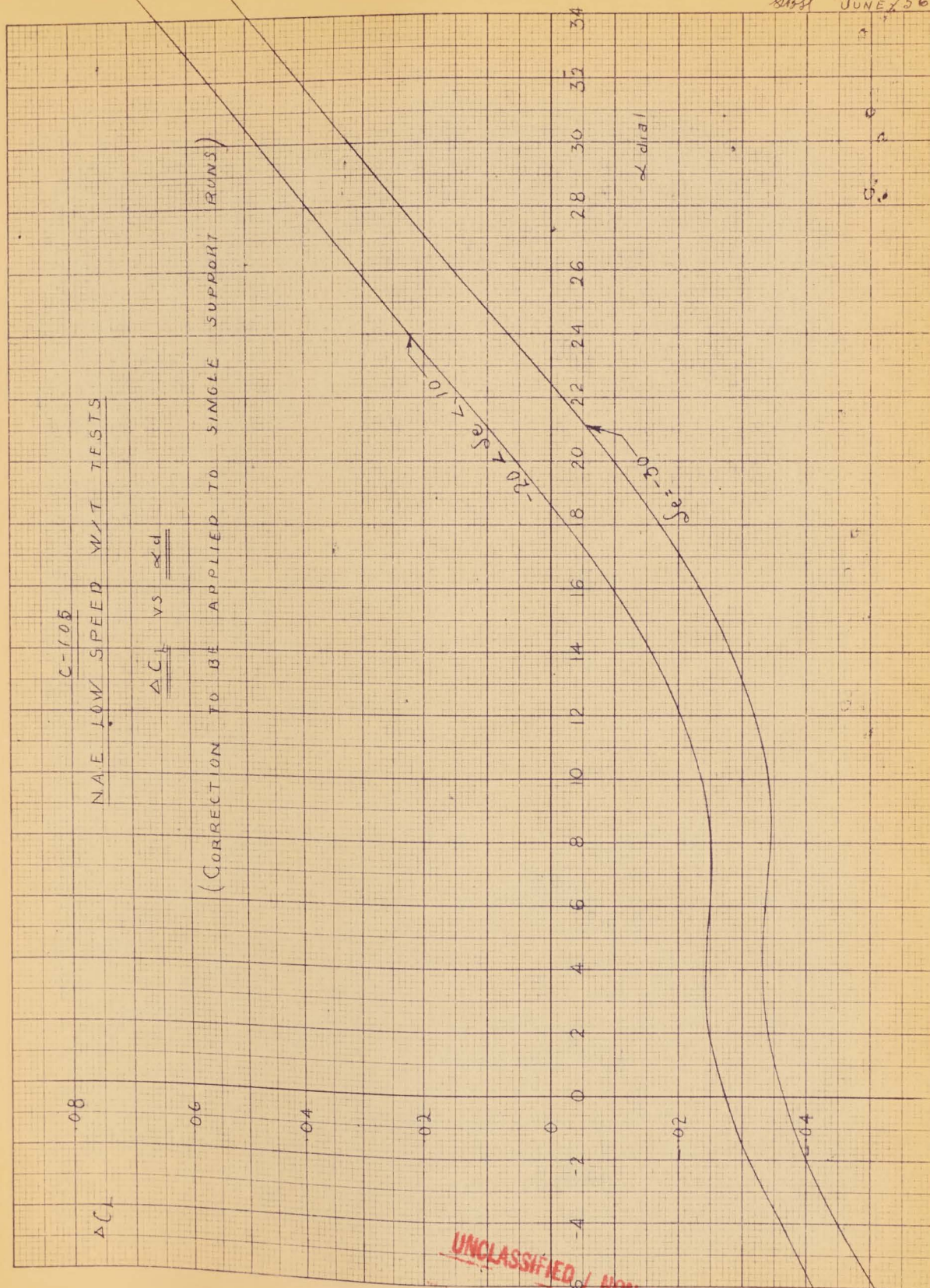


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NAE LOW SPEED W/T TESTS

ACL VS α_d

(CORRECTION TO BE APPLIED TO SINGLE SUPPORT RUNS)



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NAE LOW SPEED W/T TESTS

ΔC_D vs α_d

(CORRECTION TO BE APPLIED TO SINGLE SUPPORT RUNS)

ΔC_D

04

03

02

01

0

-01

-02

-03

34

32

30

28

26

24

22

20

18

16

14

12

10

8

6

4

2

0

-2

-4

P/W 7/116

27

2138 JUNE 56

1018

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NARF LOW SPEED WIT TESTS

$\Delta CN/B$ vs α

(CORRECTION TO BE APPLIED TO SINGLE SUPPORT RUNS)

$\Delta CN/B$

0
-2
-4
-6
-0001
-0002
-0003
-0004
-0005
-0006
-0007

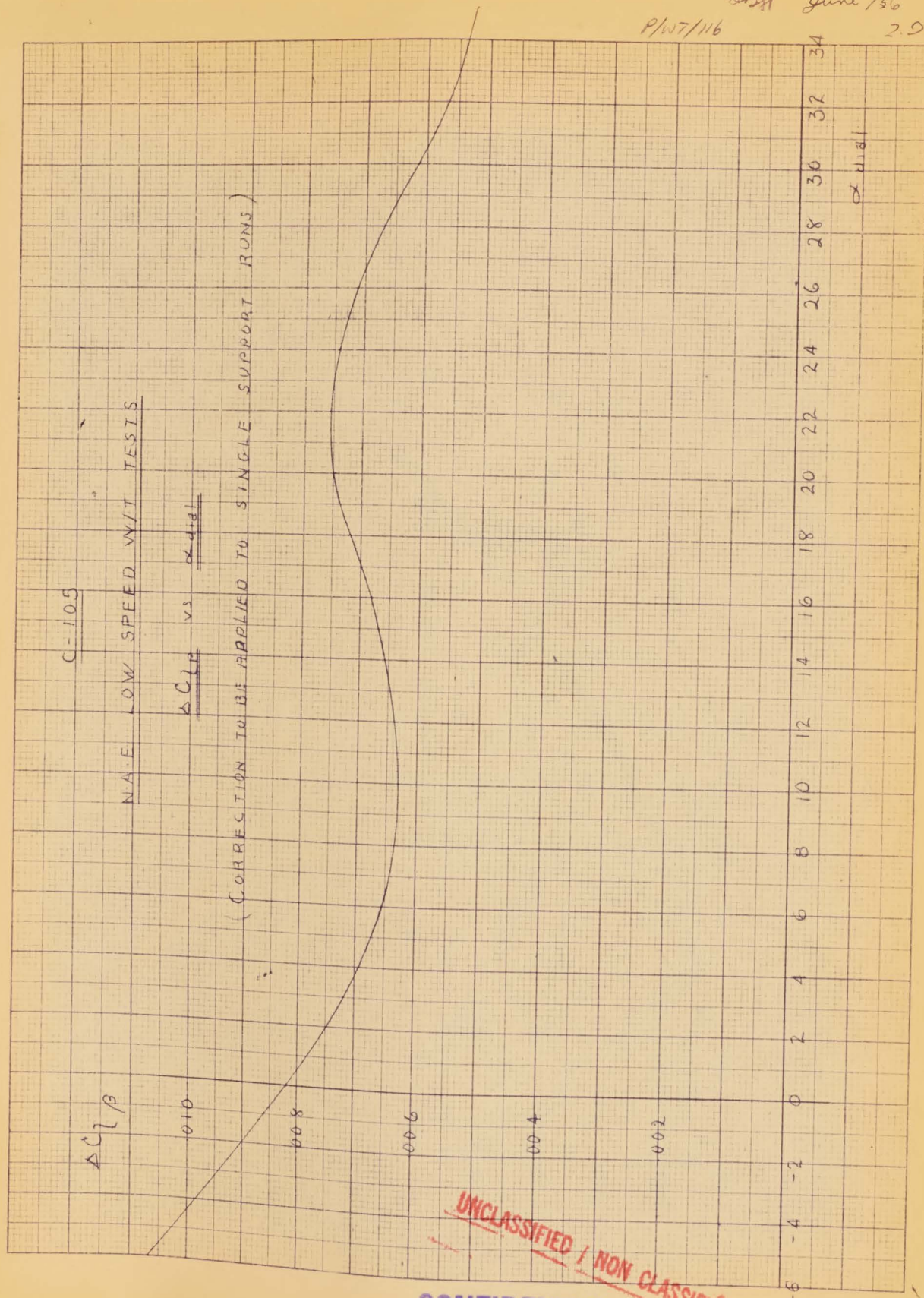
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0

α in 1

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MWF/116 2.8
staff June 56

W388 June 1960
P/107/116 2.0



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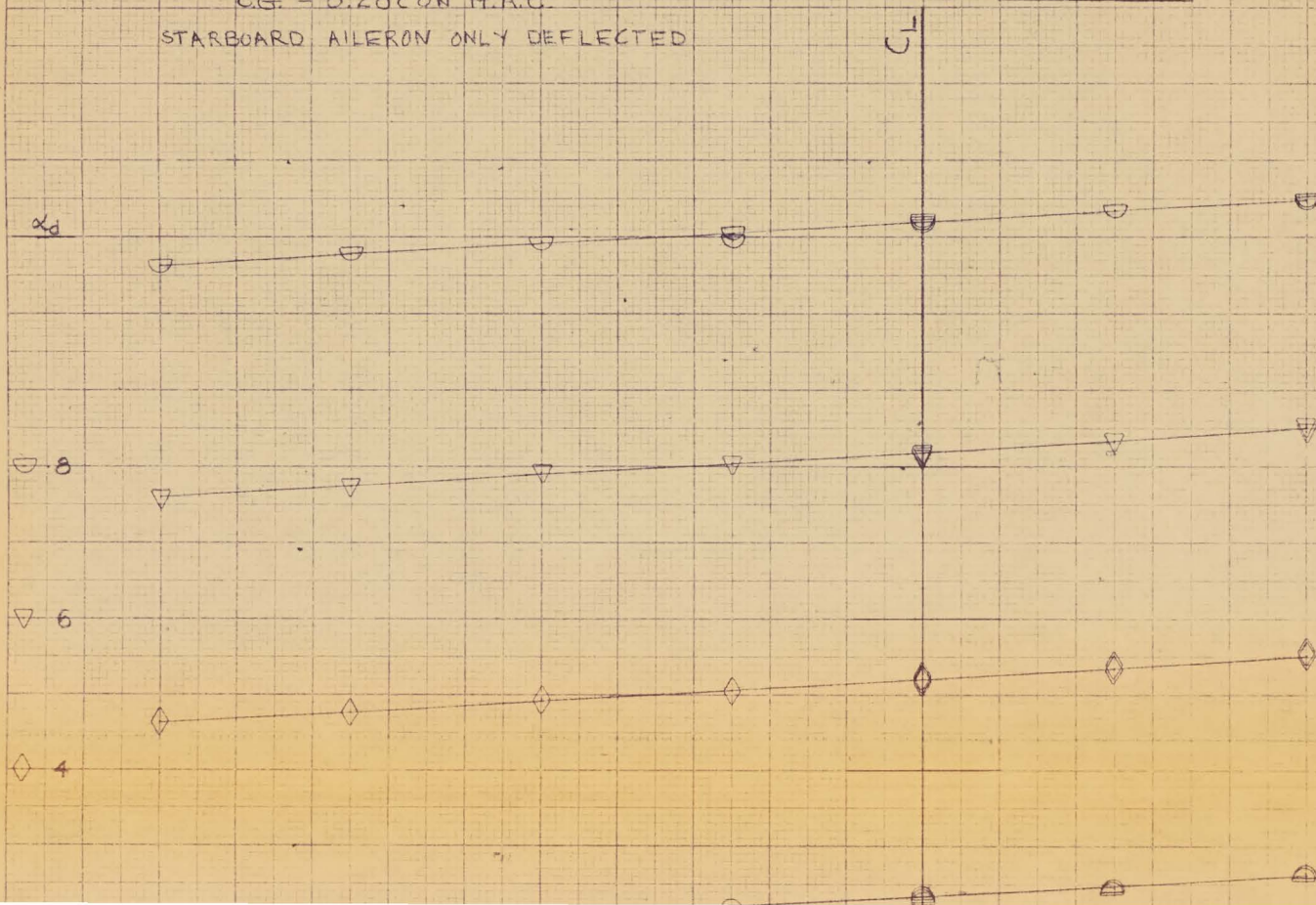
C-105
N.A.E. LOW SPEED W.T. TESTS
JULY, 1956

C_L vs δ_{ar}
(CORRECTED)

CG = 0.287 ON M.A.C.

STARBOARDAILERON ONLY DEFLECTED

RUN NO.	δ_{ar}°
122, 150	+10
162	+5
157	-5
153	-10
152	-15
151	-20



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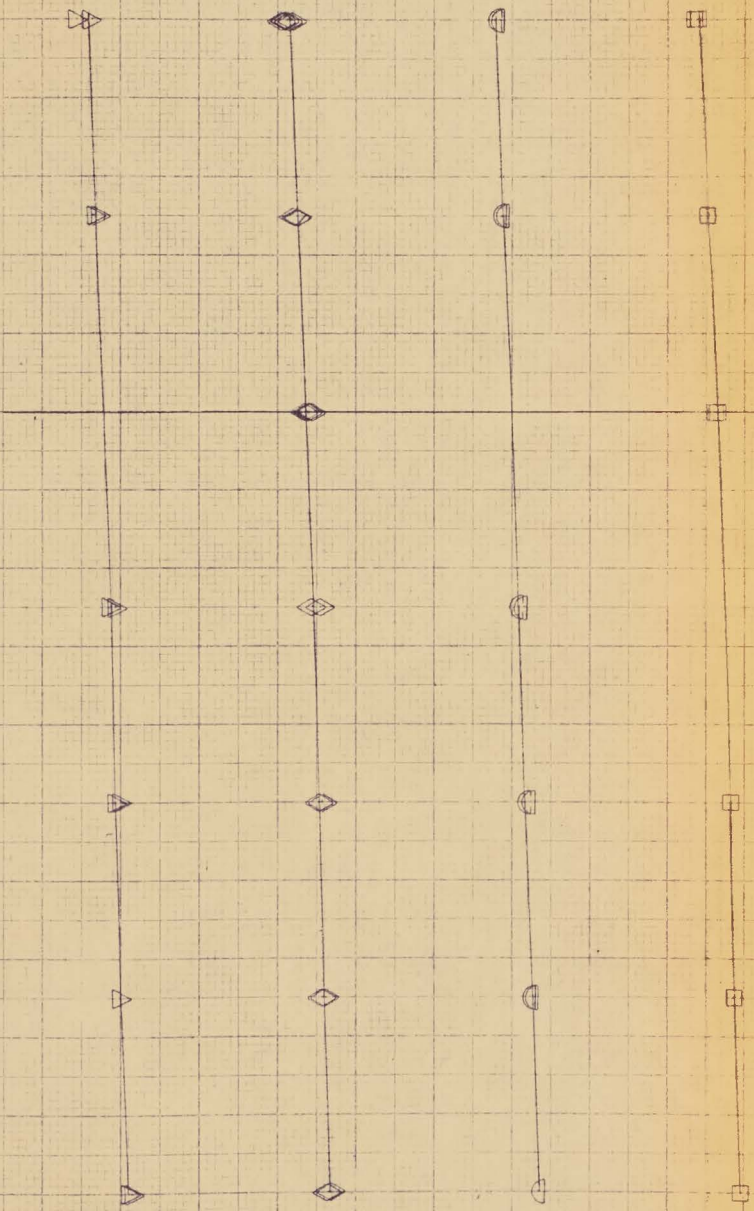
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N.A.E. LOW SPEED W.T. TESTS
JULY, 1956

$\frac{C_L}{C_D}$ VS δ_{ay}
(CORRECTED)

$C_G = 0.282$ ON M.A.C.

STARBOARD AILERON ONLY DEFLECTED

RUN NO	δ_{ay}
122, 150	+10
162	+5
157	+5
153	-10
152	-15
151	-20



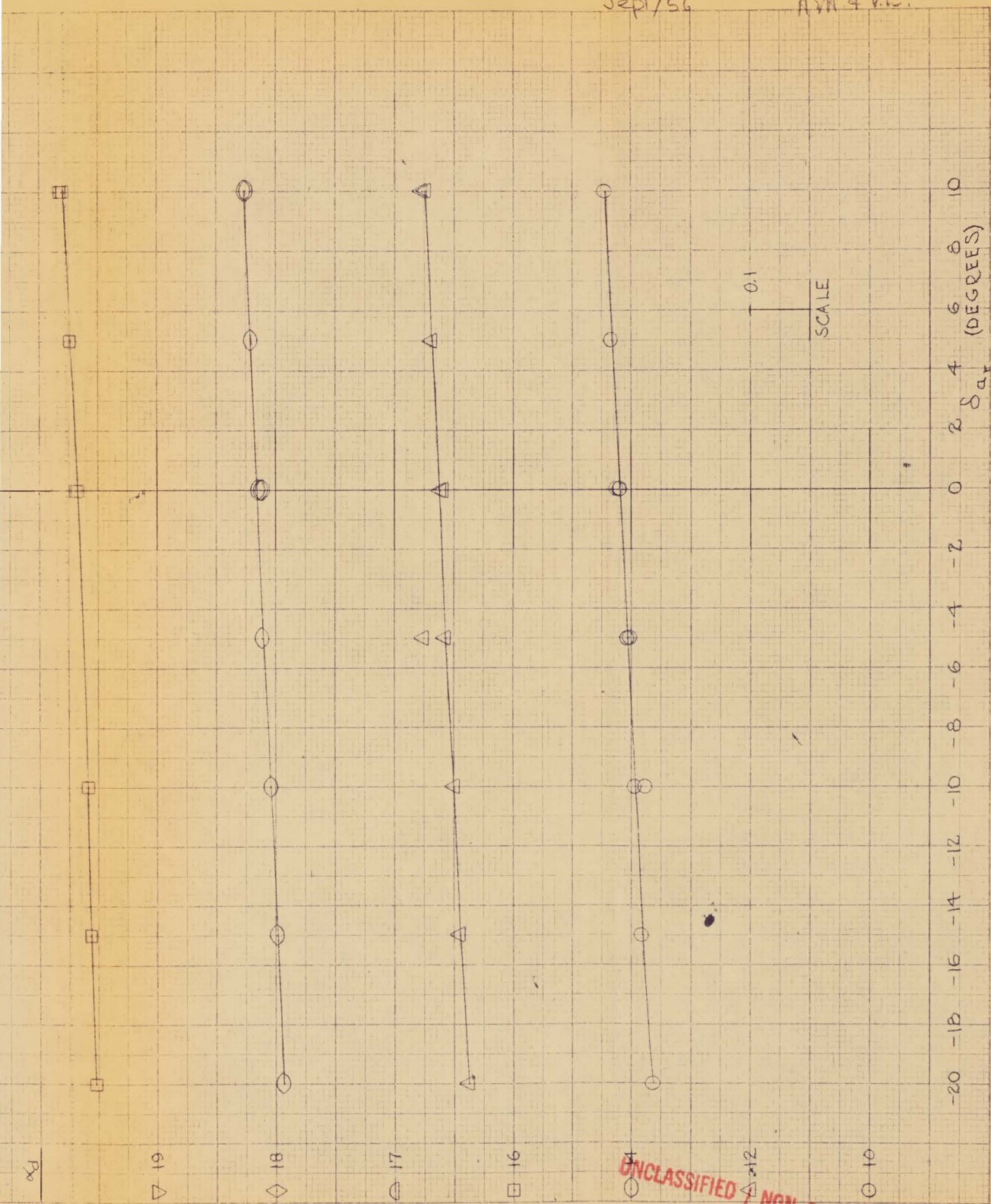
P_0

61 19

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Sept/56

4.14.2
ASM + V.L.



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

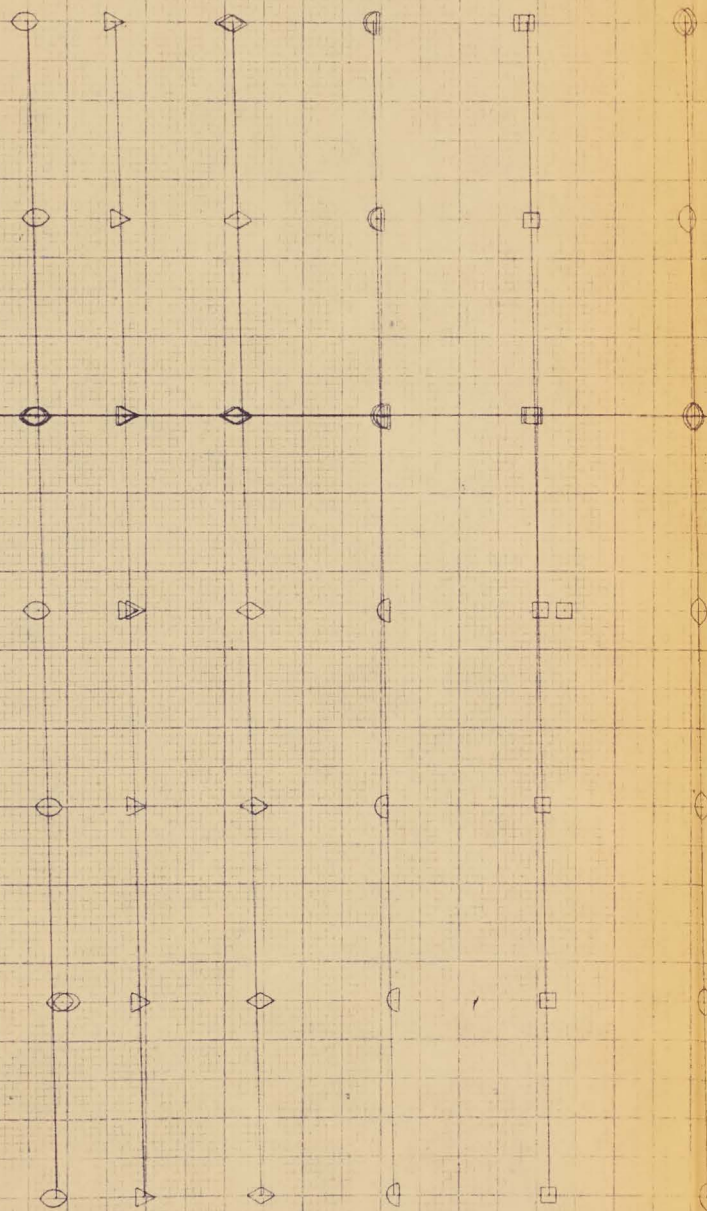
C_L VS δ_{av}
(CORRECTED)

C.G. = 0.202 ON MAC.
STARBOARD ALERON ONLY DEFLECTED

α_d
(DEG)

RUN NO.	δ_{av}
122, 153	+10
162	+5
157	-5
158	-10
152	-15
151	-20

C_L



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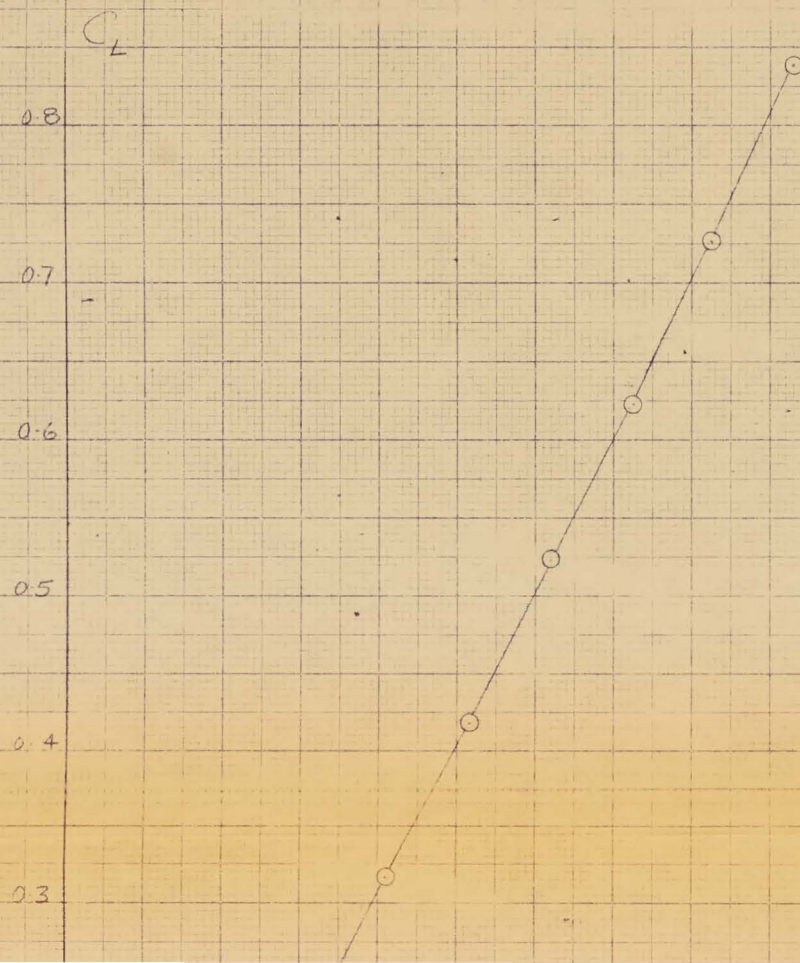
C-105

07 SCALE NAE LOW SPEED WIND TUNNEL TESTS, JULY 1956

C_L vs α (UNCORRECTED)

TWIN STRUT SUPPORT SYSTEM

CLEAN AIRCRAFT — ○ — ○ (RUN 178)



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

CORRECTED

c.g. @ .28E ON M.A.C.

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

C_m

SCALE:

.02

ORIGINS:

$\star \alpha_d = 28^\circ$

$\times \alpha_d = 26^\circ$

$\triangleright \alpha_d = 24^\circ$

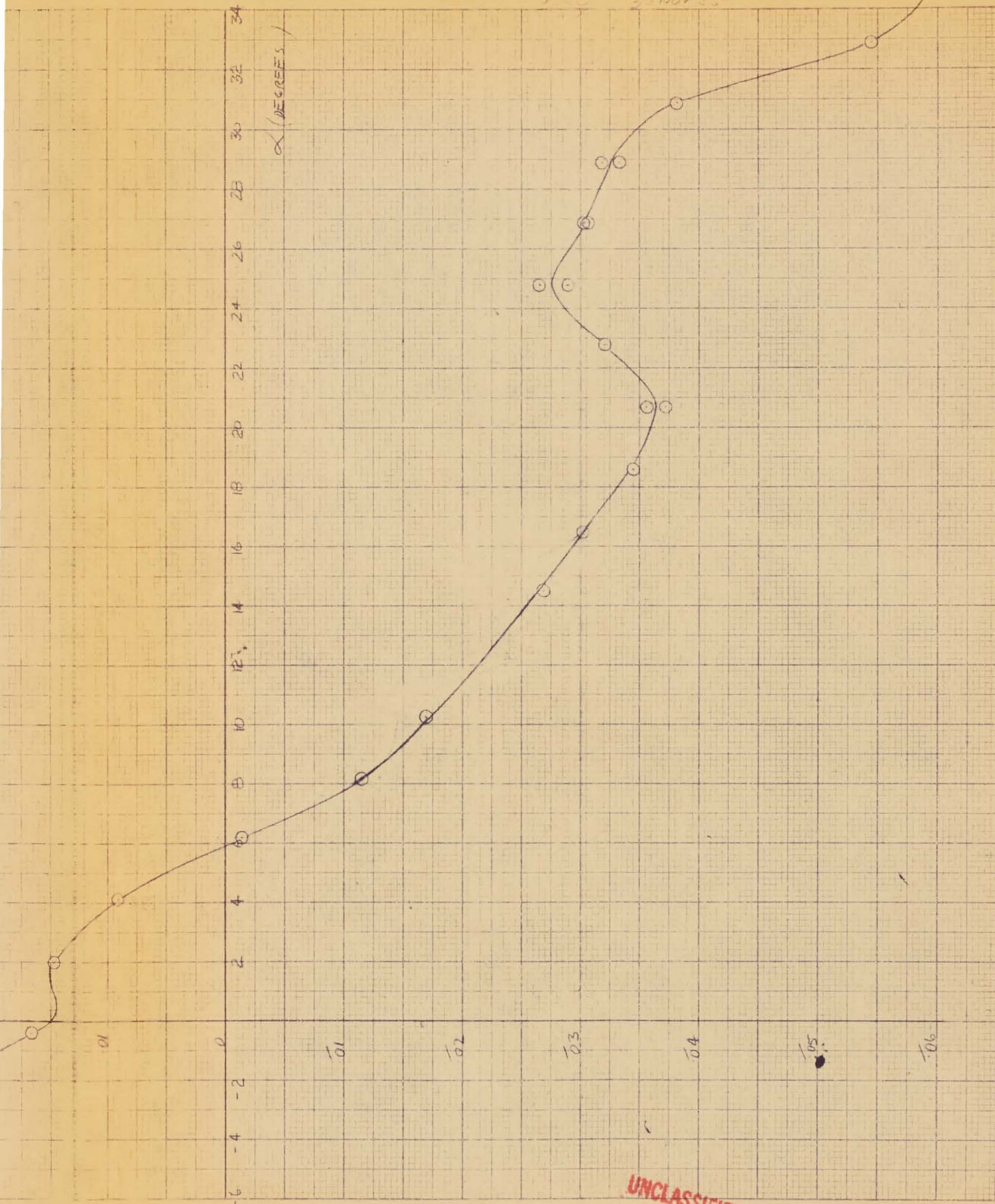
$\circ \alpha_d = 22^\circ$

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5.35

1-C 3-NOV-53



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C-105

NAE W/T TESTS (MAY 56)

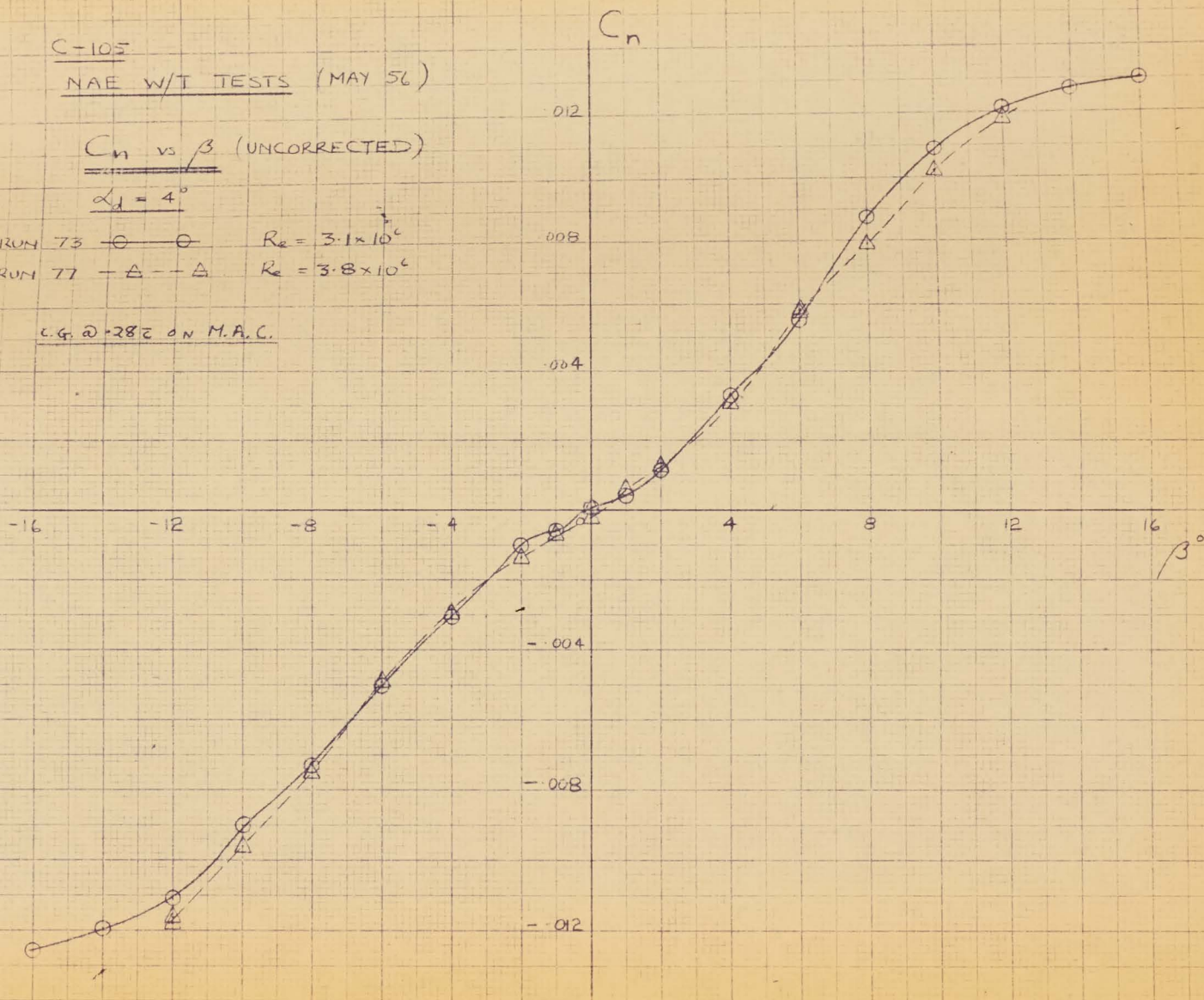
C_n vs β (UNCORRECTED)

$\alpha_d = 4^\circ$

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

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

C.G. @ -28° ON M.A.C.



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236 JUNE 56

P/W/117

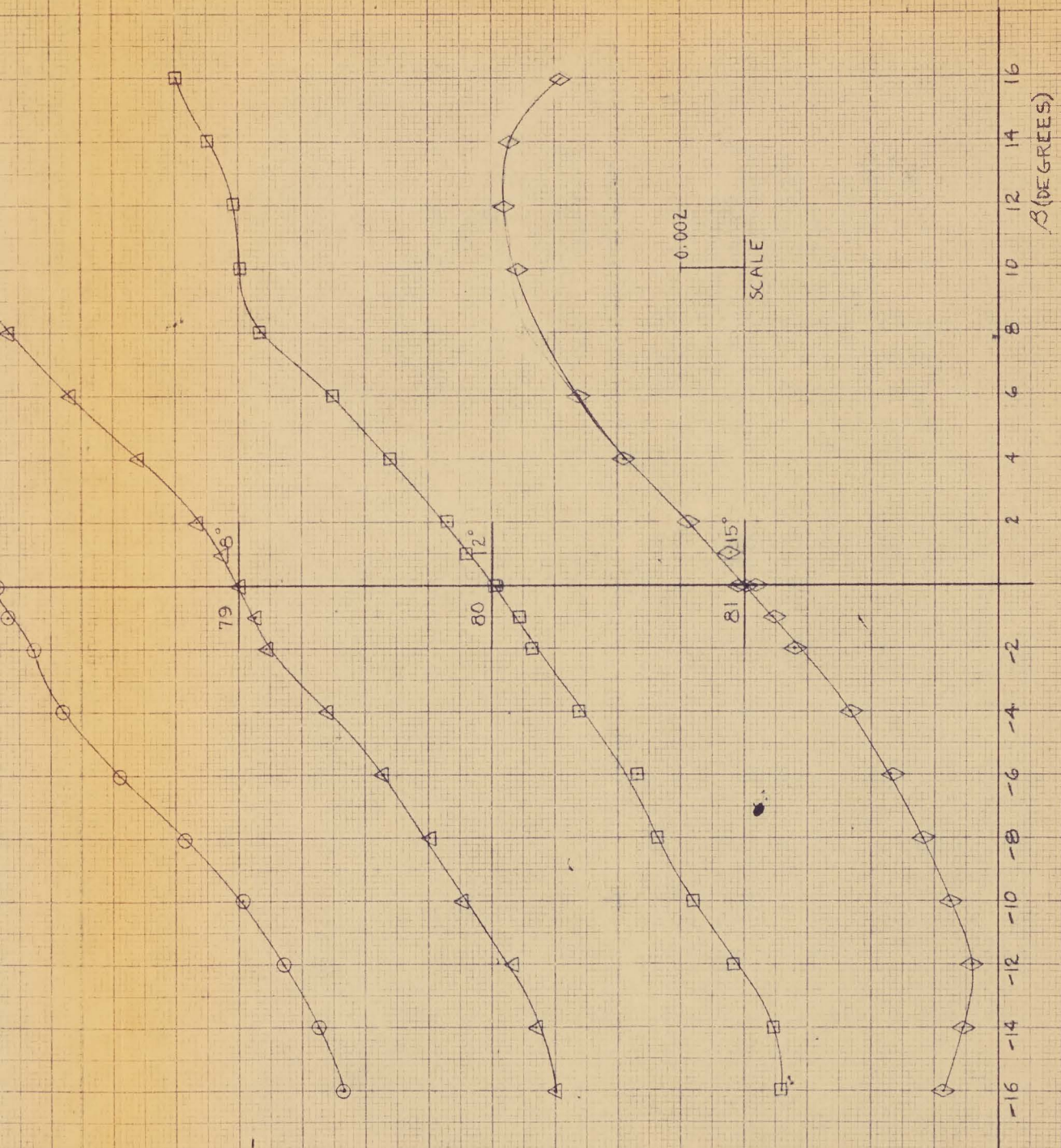
74

P/WT/119

JULY/56

7-5

AS/Hand



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

C_p vs. β
(UNCORRECTED)

$C.G. = 0.28 \Sigma$ ON M.A.C.
 $\delta_e = 0^\circ$

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Σ

RUN NO. α

86

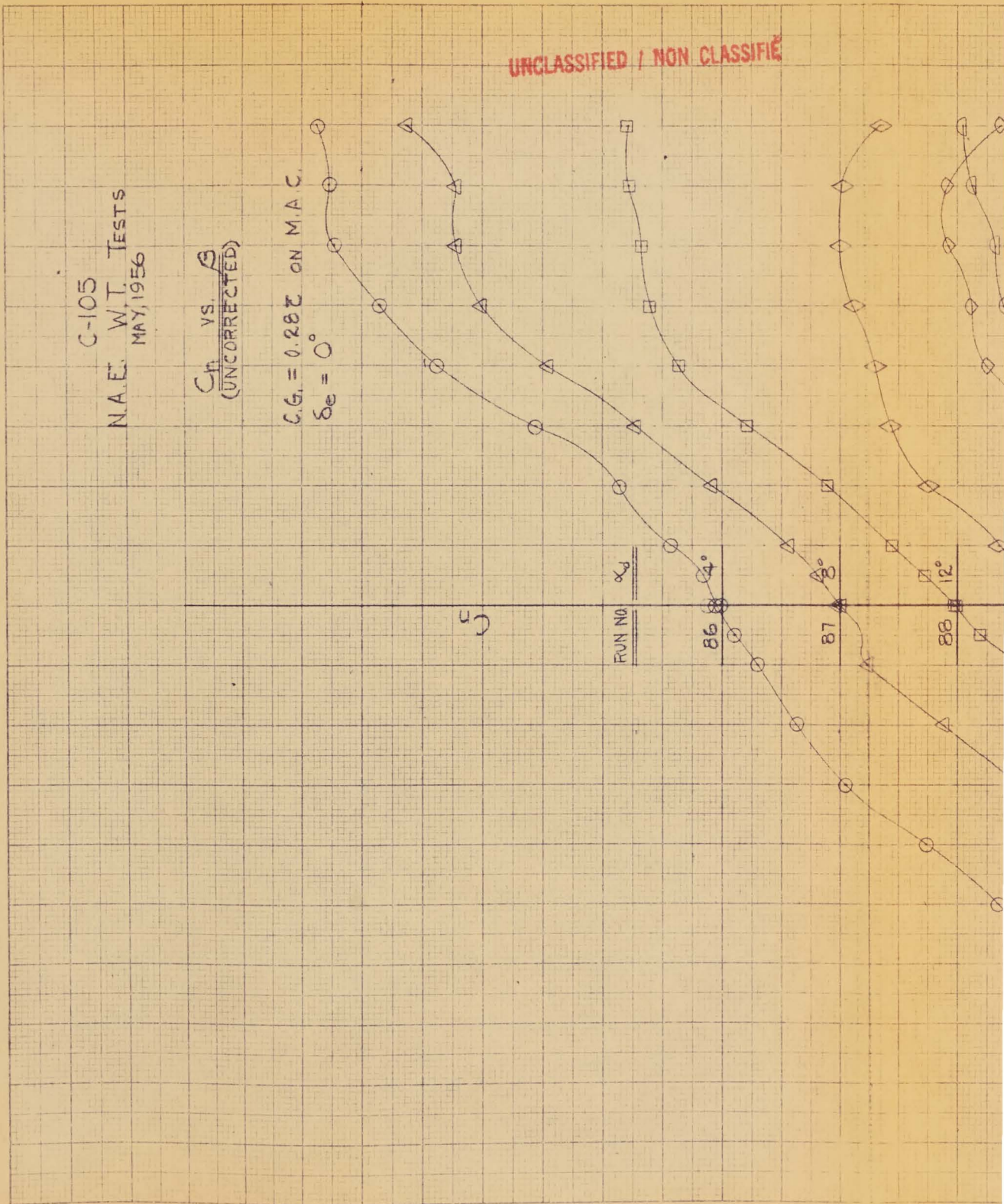
87

88

4°

8°

12°



C-105

N A E LOW SPEED WIT TESTS

CN vs β (UNCORRECTED)

$S_e = 0$
CONF. W/B V
G.B. at .465 $\frac{b}{2}$

C.G.D. 28 $\pm$ on H.A.G.

CN

0.02

Scale

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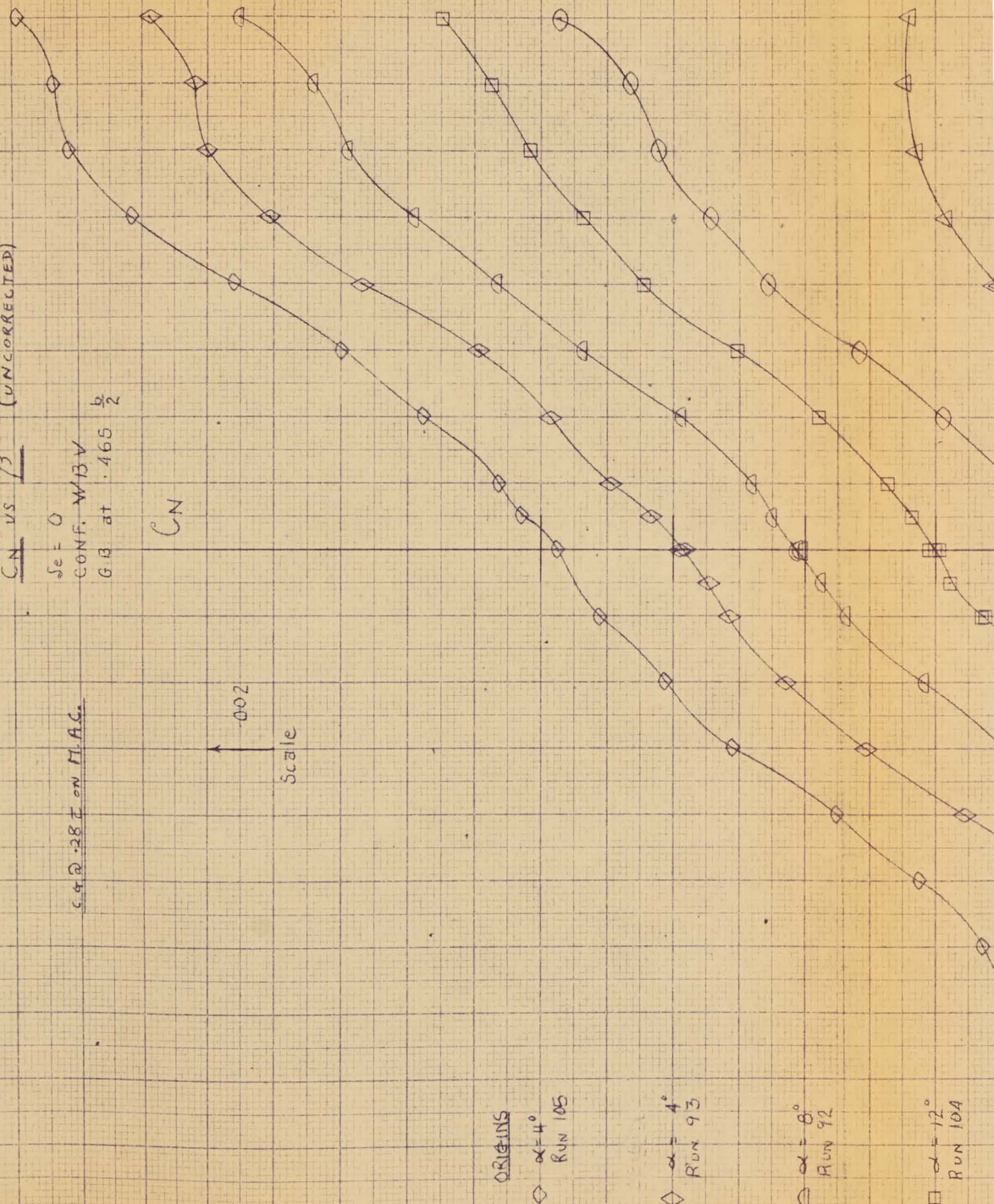
ORIGINS

$\alpha = 4^\circ$
RUN 105

$\alpha = 8^\circ$
RUN 93

$\alpha = 8^\circ$
RUN 92

$\alpha = 12^\circ$
RUN 104



C-105

NAE LOW SPEED W/T TESTS (MAY 56)

C_n vs β (UNCORRECTED)

C40-282 ON 17 AC

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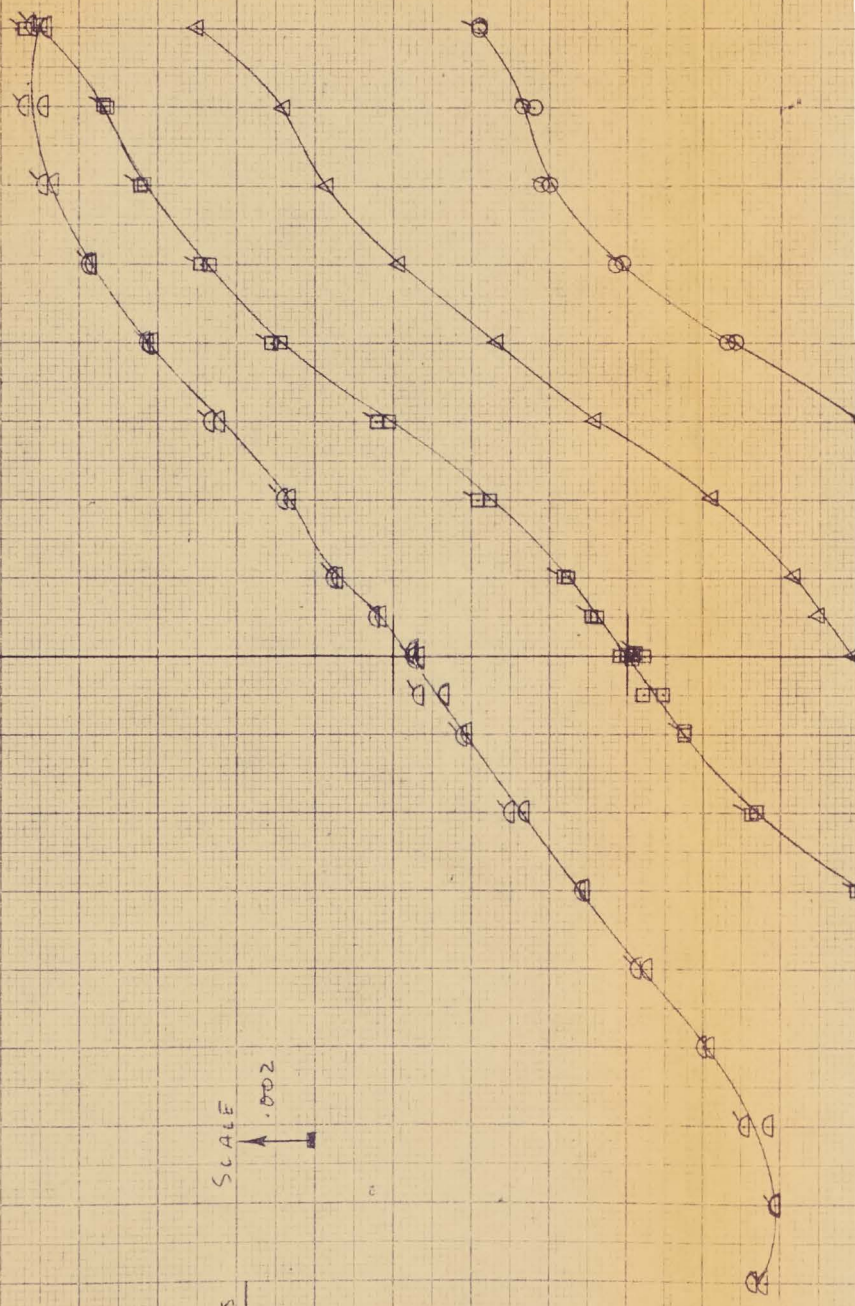
SCALE
↑ .002

ORIGINS

$\alpha_1 = 15^\circ$

$\alpha_2 = 12^\circ$

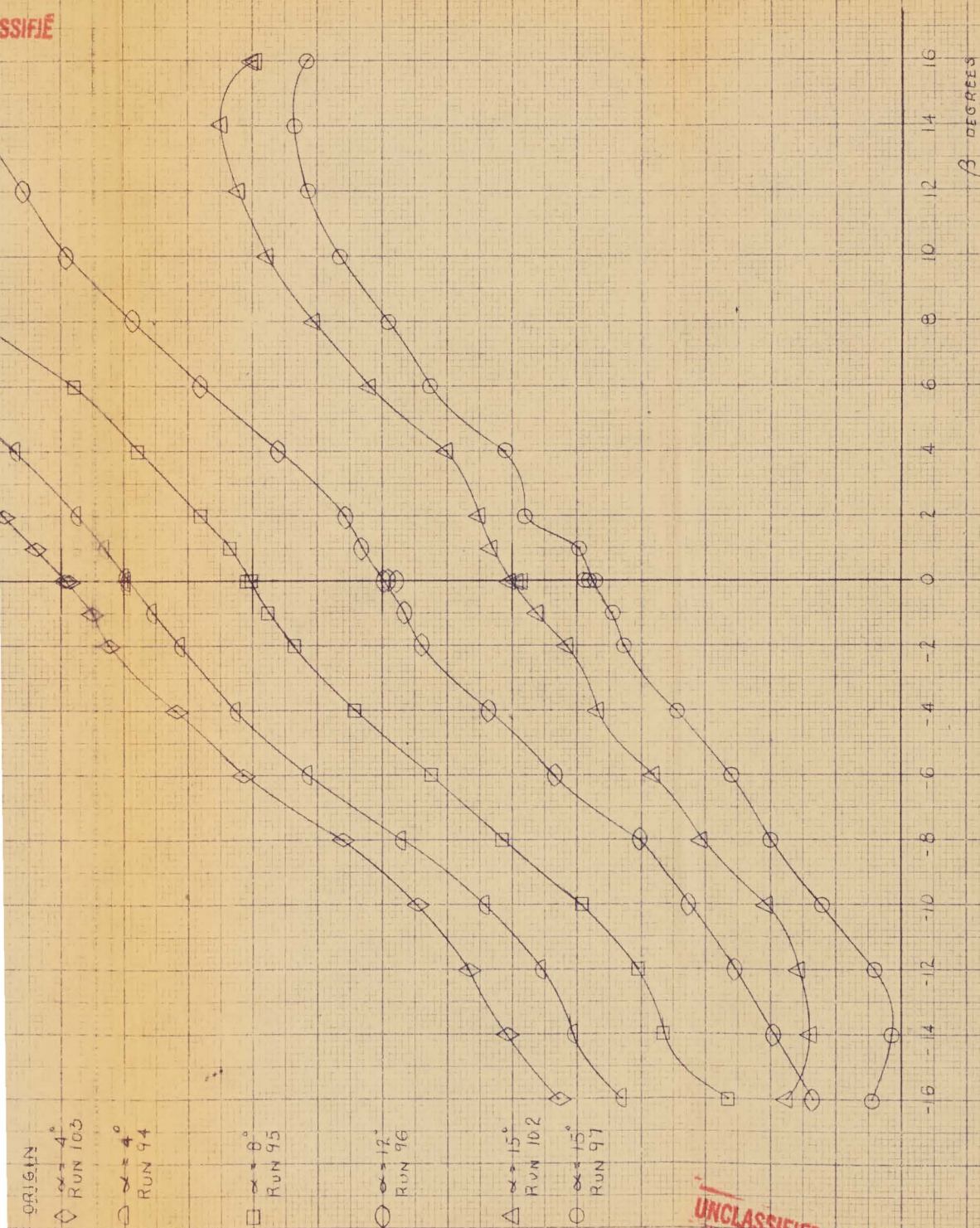
$\alpha_3 = 8^\circ$



P/W7/119 7.9

2288 July/56

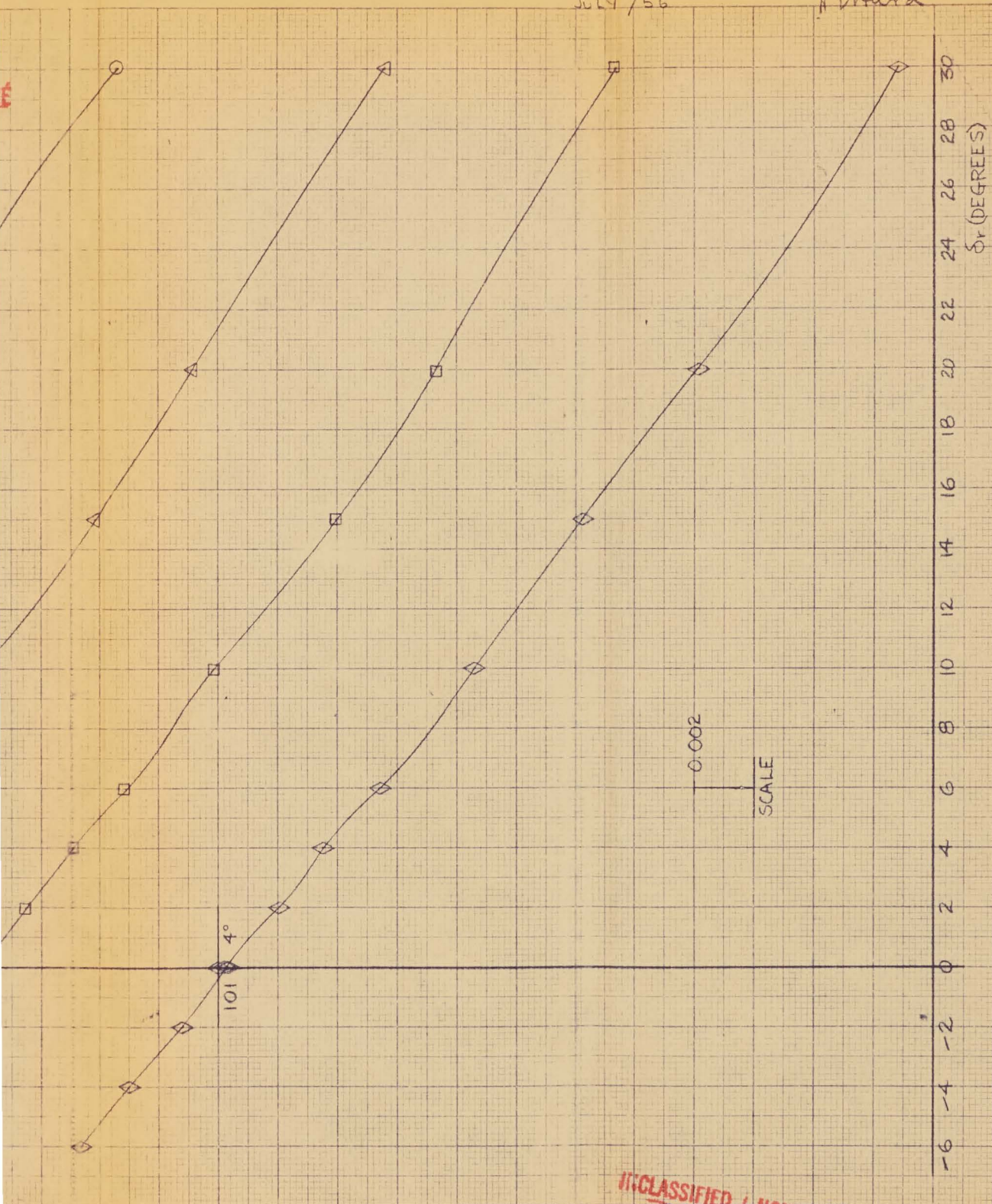
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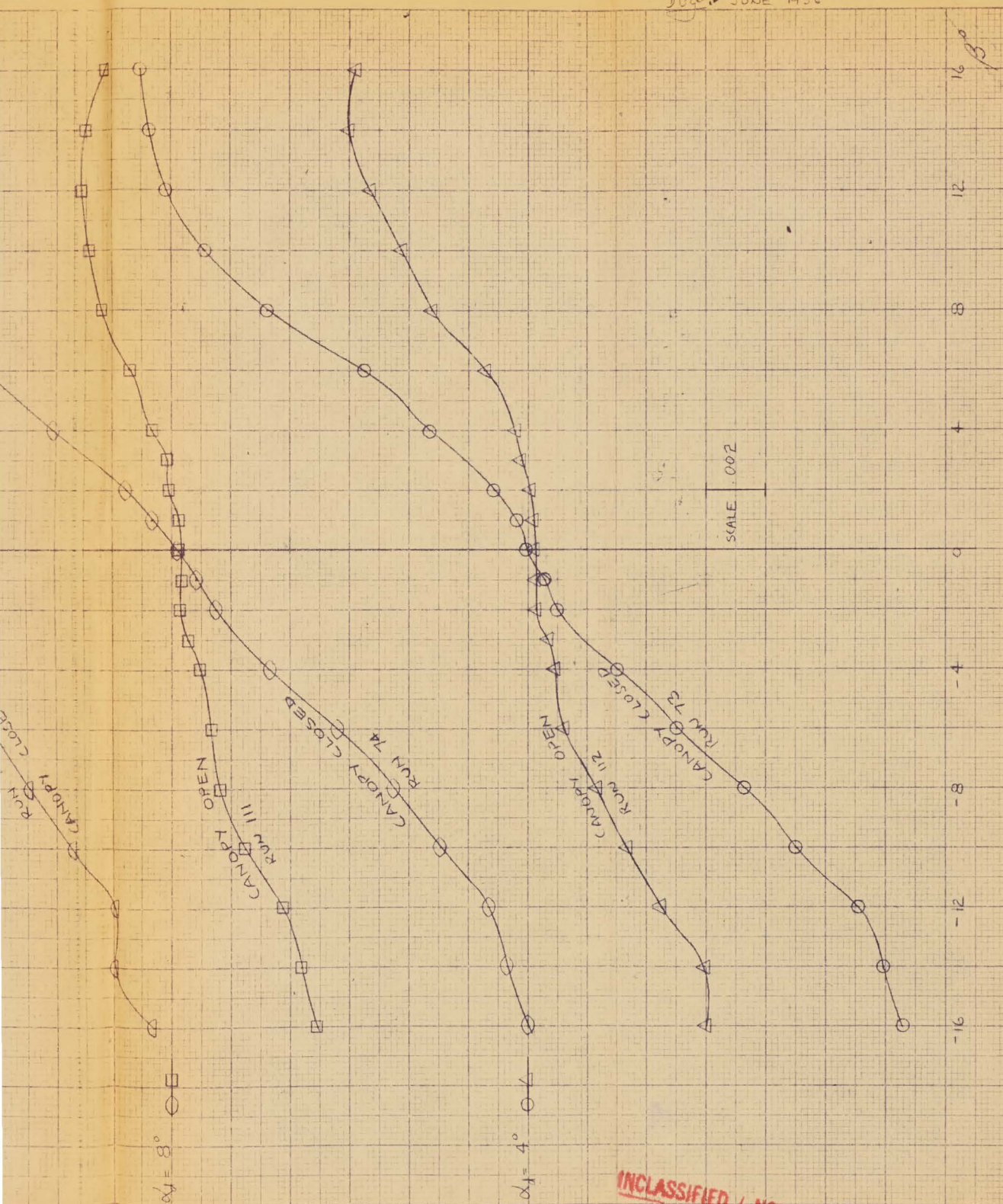
P/WT/119
JULY /56

7-10
AS/Hand



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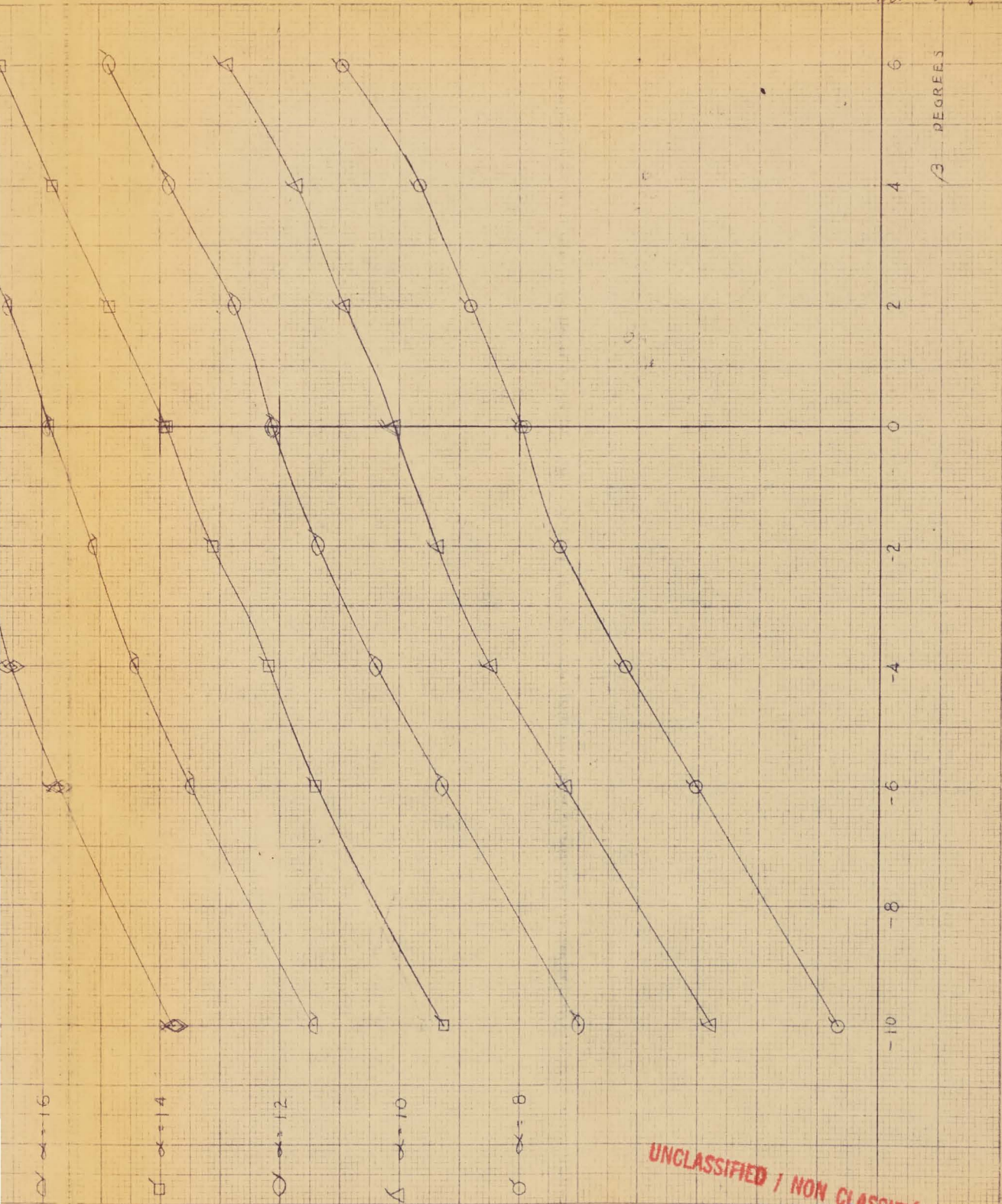


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2138 July 156



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

UNCORRECTED

0.420282 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_m

ORIGINS:

$\diamond \alpha_f = 28^\circ$

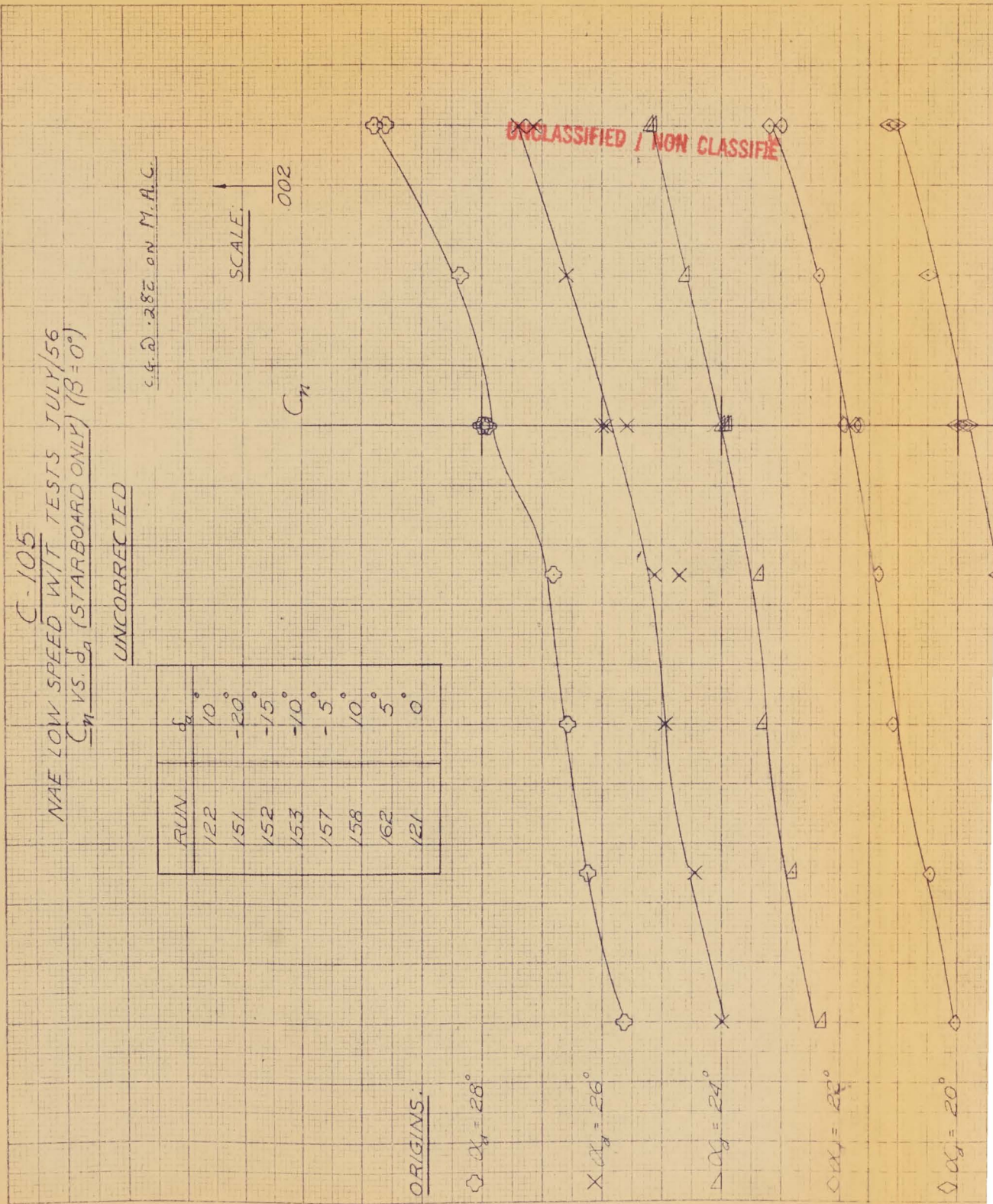
$\times \alpha_f = 26^\circ$

$\nabla \alpha_f = 24^\circ$

$\square \alpha_f = 22^\circ$

$\circ \alpha_f = 20^\circ$

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

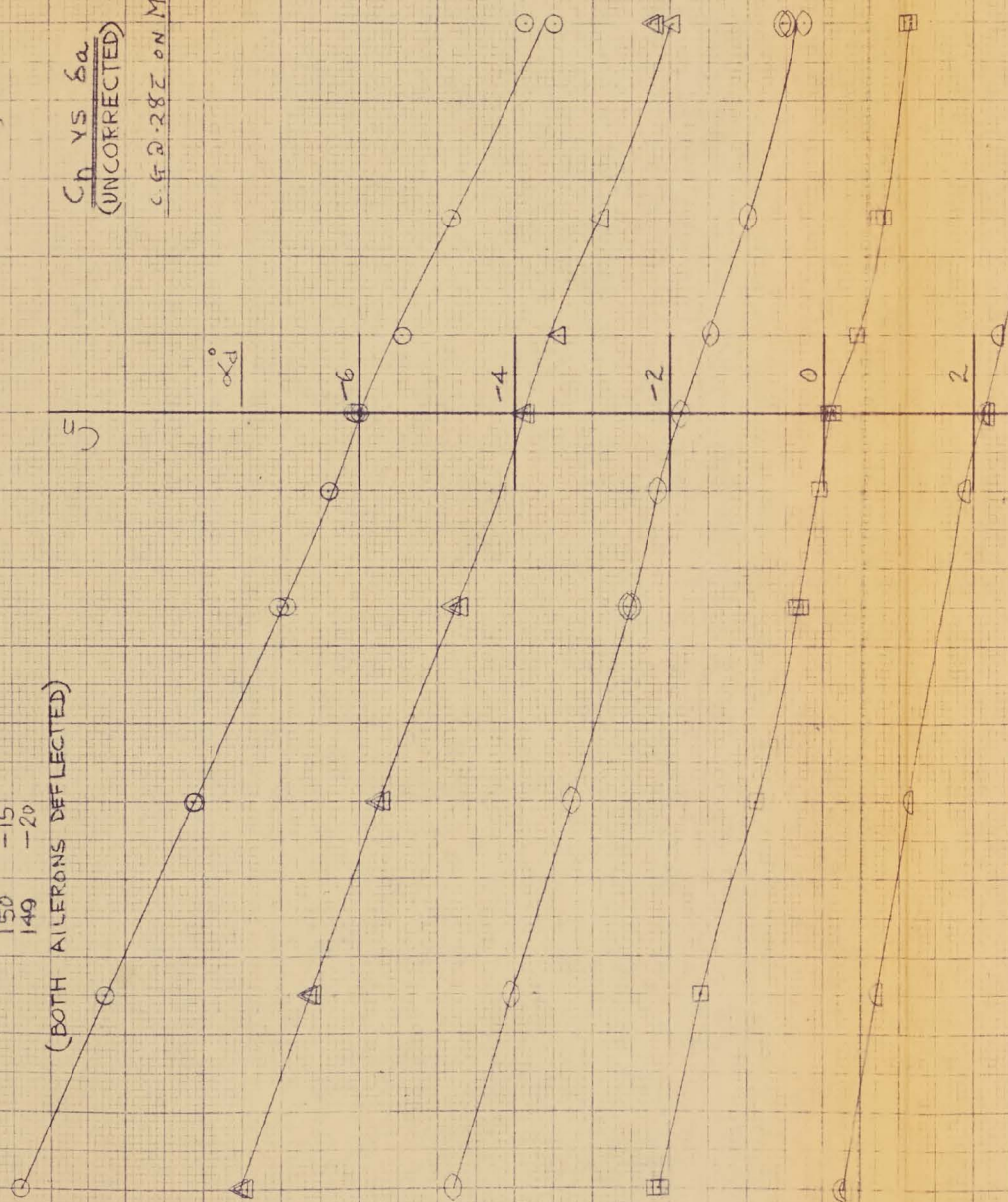
(BOTH ALERONS DEFLECTED)

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

C_D VS δa
(UNCORRECTED)

$C_F D-28Z$ ON M.A.C.

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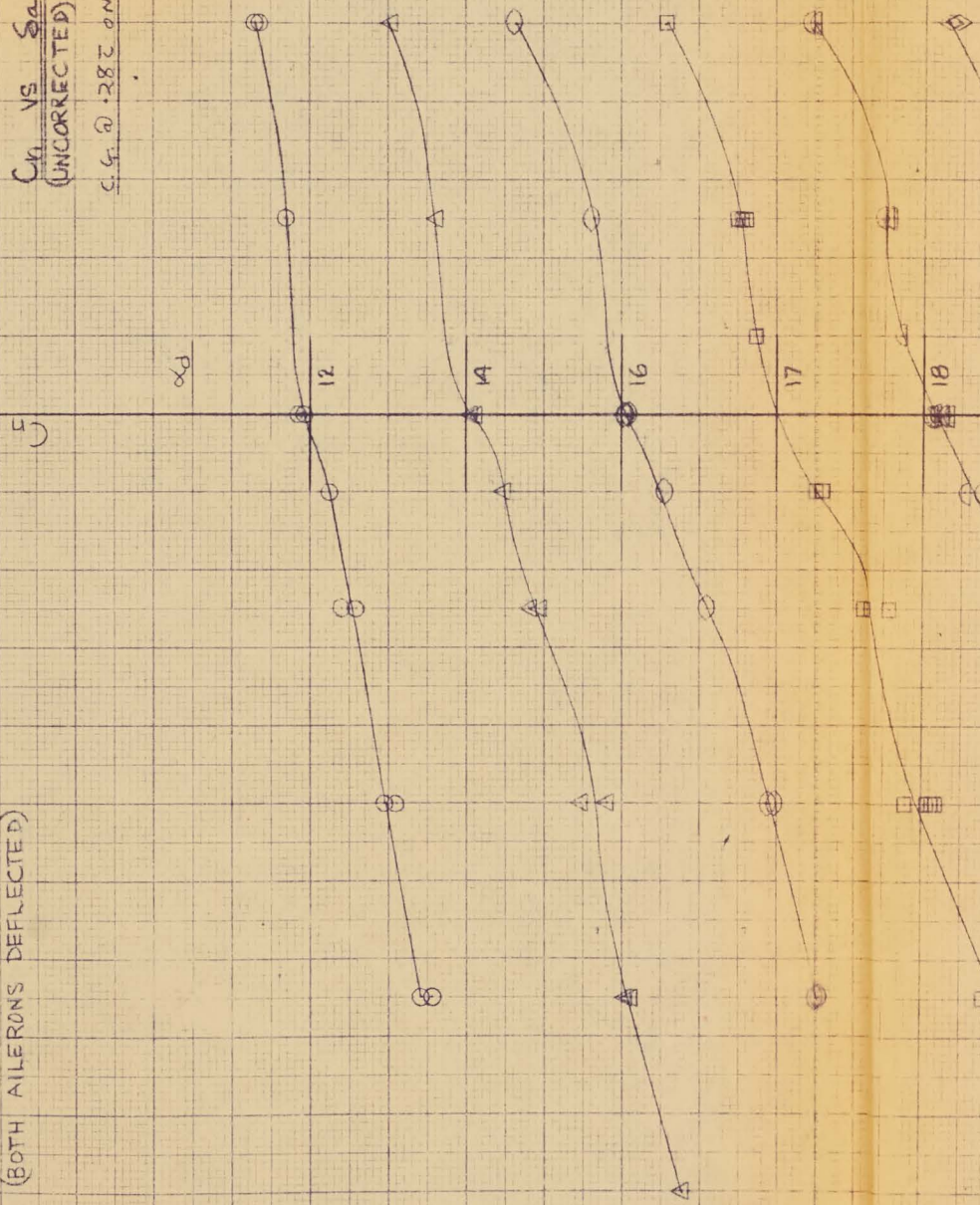
RUN NO.	δa
123, 160	+10
161	+5
155	+2
121	0
154	-2
159	-5
156	-10
150	-15
149	-20

(BOTH ALERONS DEFLECTED)

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

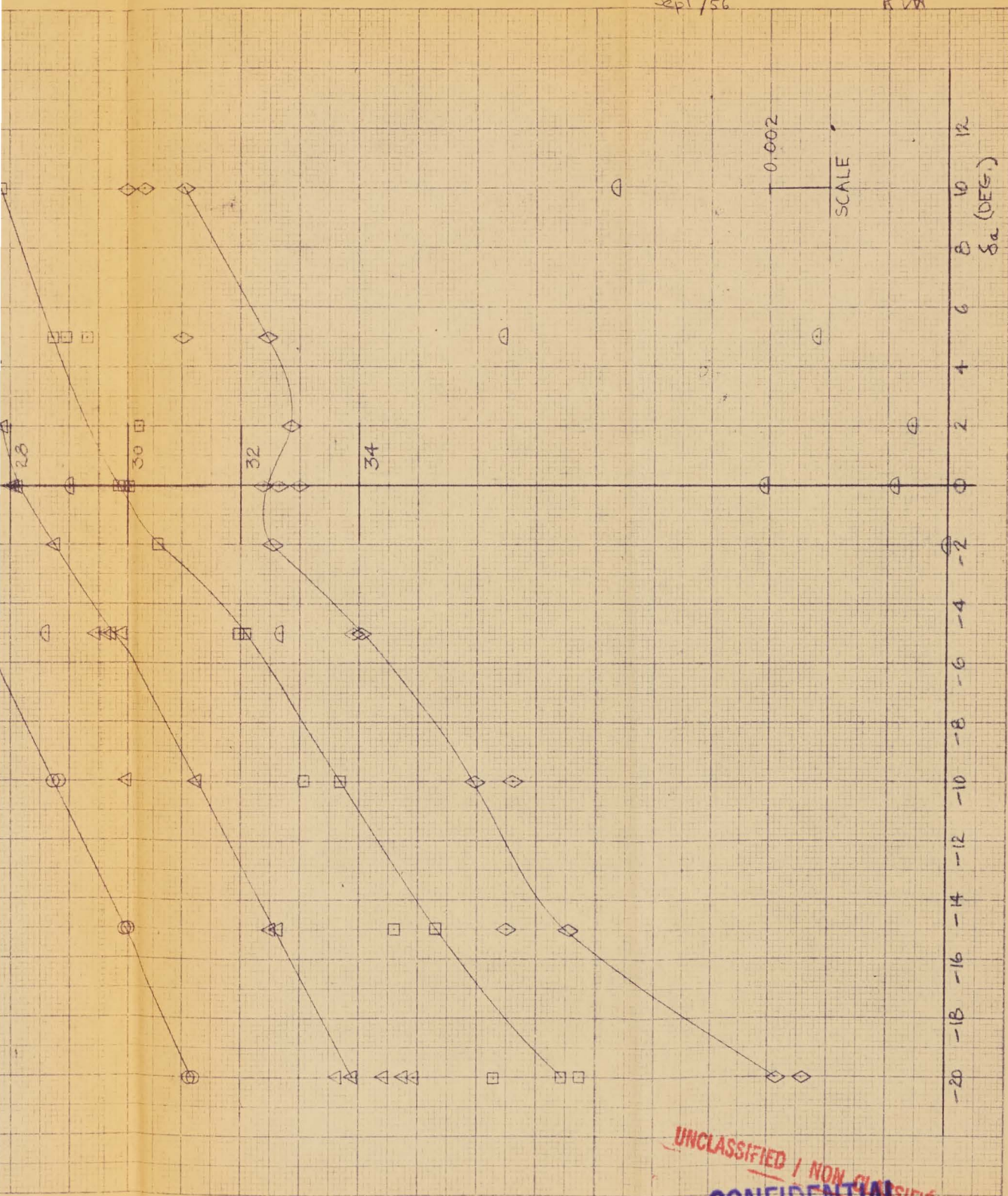
C_{LH} VS δa
(UNCORRECTED)
CLG @ 28.2 ON M.A.C.

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P/WT/119
Sept/56

7.15.3
AWA



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

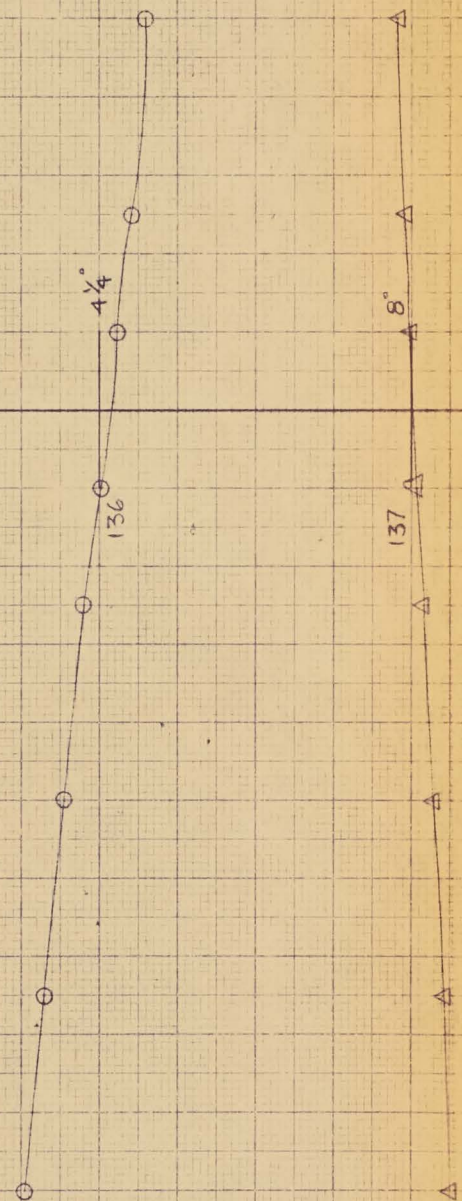
C_D VS δa
(UNCORRECTED)

$G.B. = 0.7 \frac{b}{2}$

$C_D \approx 2.8 \pm$ on M.A.C.

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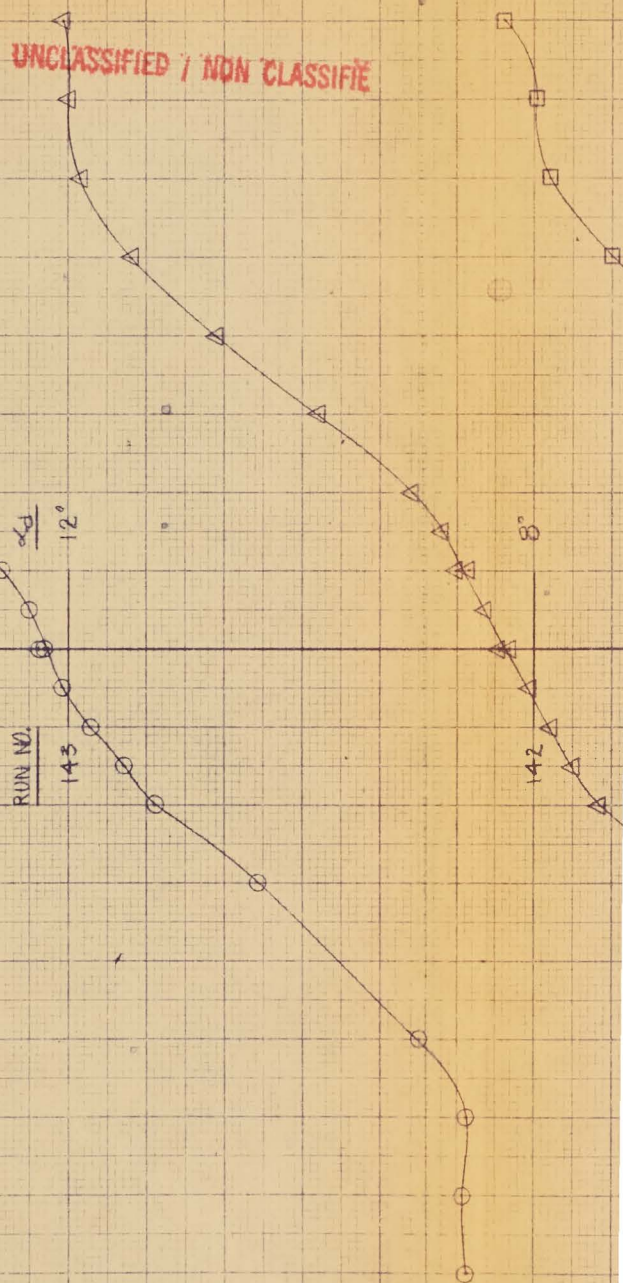
C_D
RUN NO. δa



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 M.A.C.



ORIGINS:

○ $\alpha = 6^\circ$

◇ $\alpha = 4^\circ$

○ $\alpha = 2^\circ$

□ $\alpha = 0^\circ$

○ $\alpha = -2^\circ$

△ $\alpha = -4^\circ$

○ $\alpha = -6^\circ$

C-105

NAE LOW SPEED W/T TESTS

C_N VS β

RUN 147

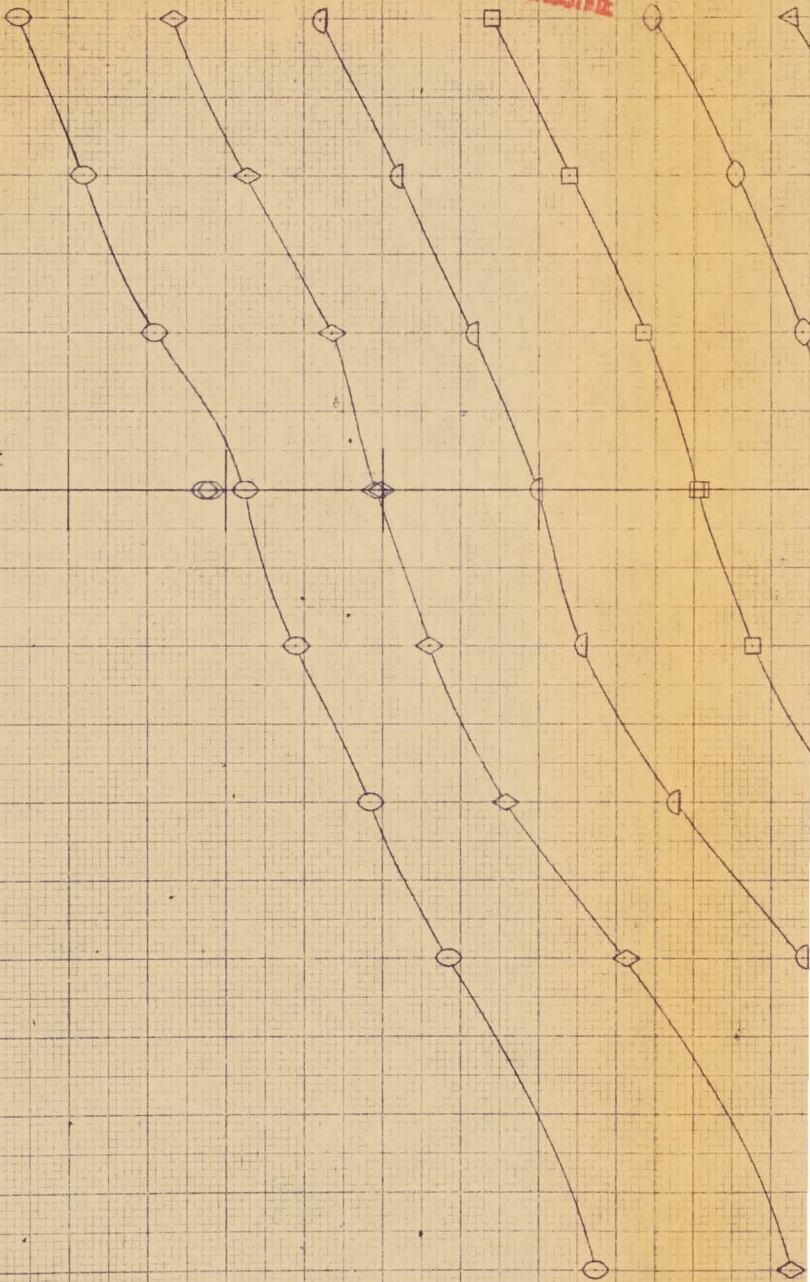
$d_f = 20^\circ$

(UNCORRECTED)

C & D 282 ON M.A.C.

C_N

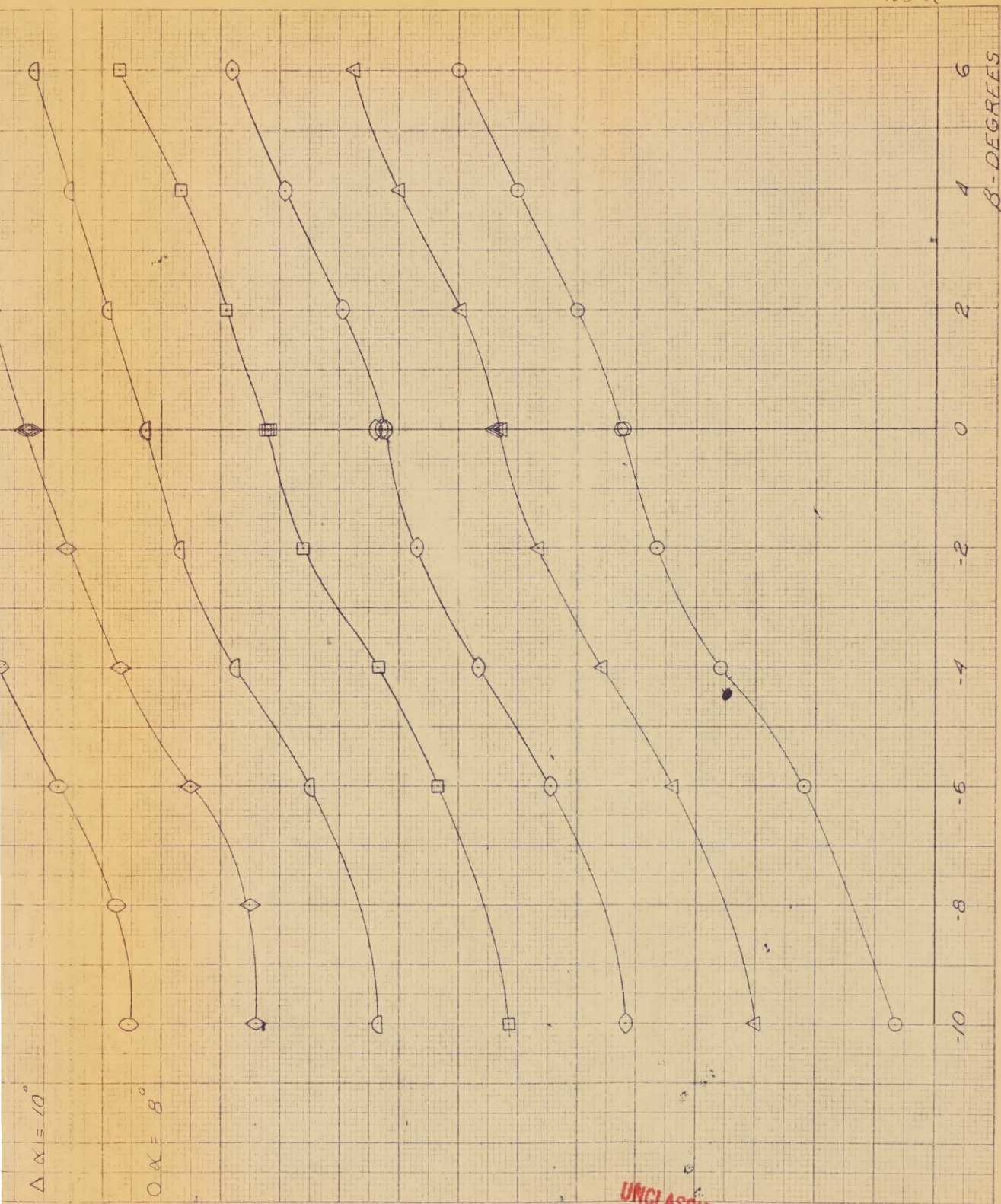
UNCLASSIFIED / NON-CLASSIFIED



AUG/56 MB

P/WT/119

7.26.2



UNCLASSIFIED
CONFIDENTIAL

C-105

NAE LOW SPEED WIT TESTS JULY/56

RUN 147

$\alpha = 20^\circ$

C_N VS β

(UNCORRECTED)

1.42-2.82 ON M.A.C.

SCALE

ORIGINS:

$\square \alpha = 26^\circ$

$\square \alpha = 24^\circ$

$\square \alpha = 22^\circ$

$\square \alpha = 20^\circ$

002

UNCLASSIFIED / NON CLASSIFIÉ

C_N

4

4

4

4

4

4

4

4

AUG/56

MG

P/WT/119

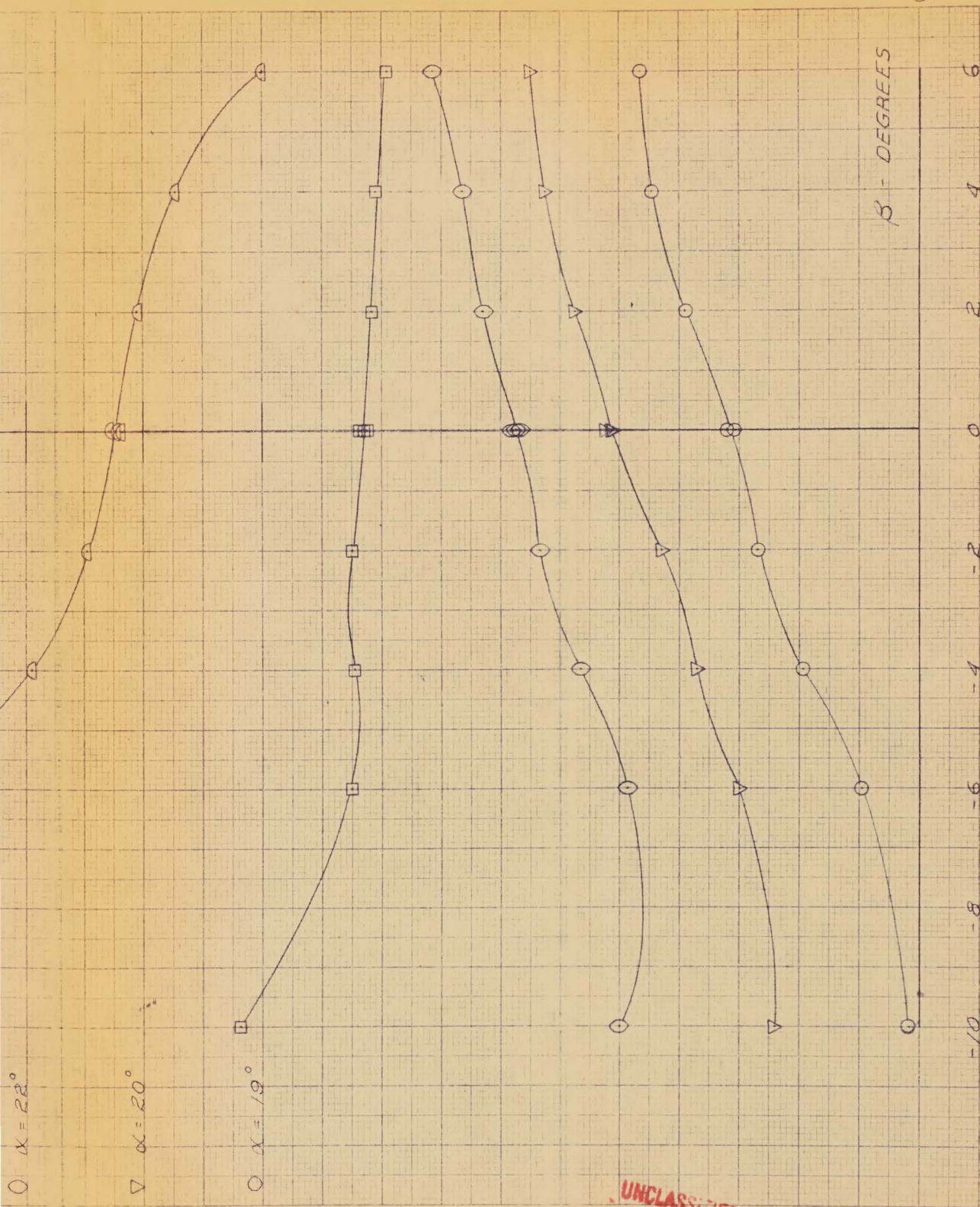
7-26-3

$\alpha = 22^\circ$

$\alpha = 20^\circ$

$\alpha = 18^\circ$

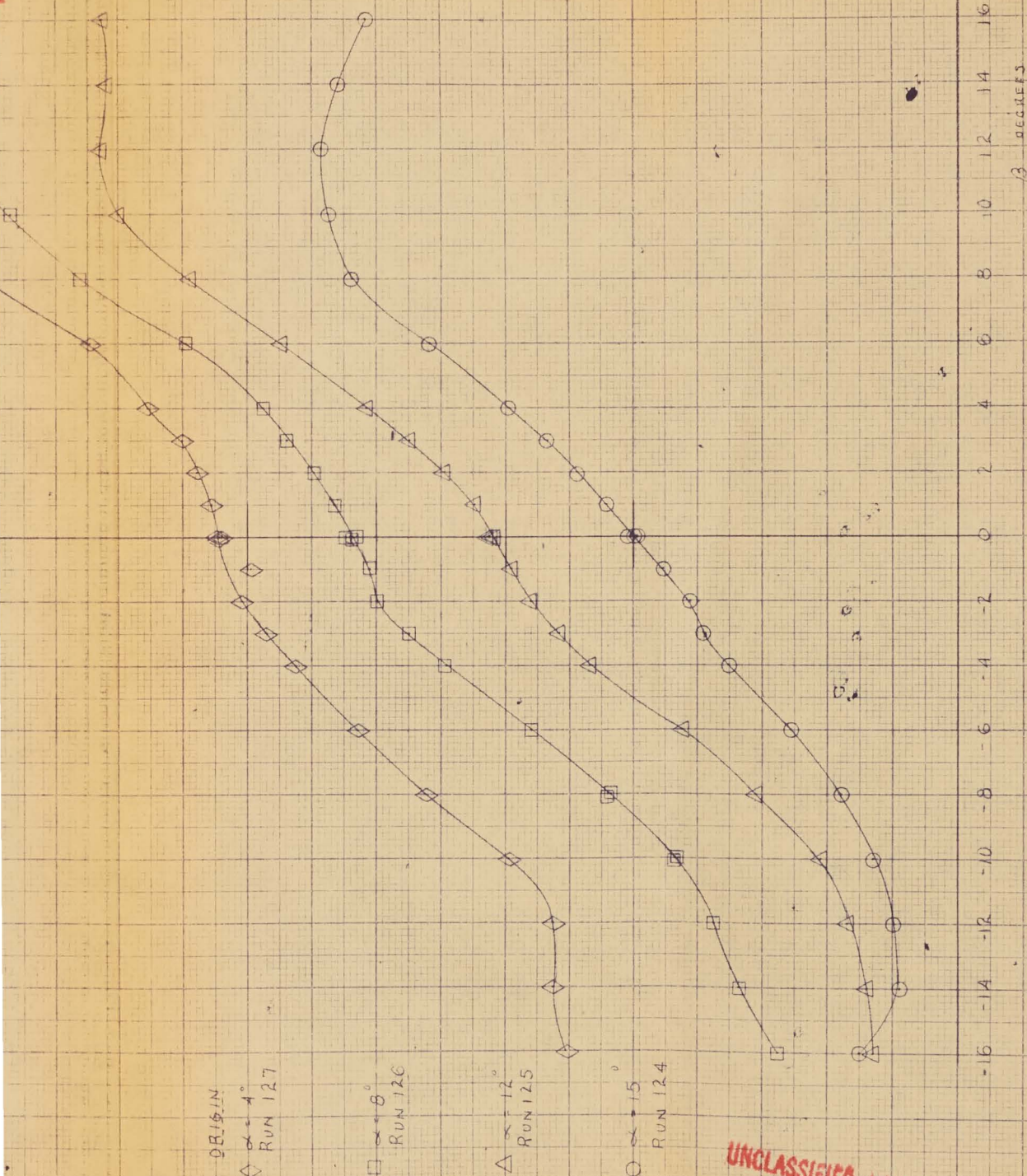
β - DEGREES



UNCLASSIFIED / NON-CLASSIFIED
CONFIDENTIAL

P/WT/119 7.27

21288 July 56



UNCLASSIFIED / NOT CONFIDENTIAL

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

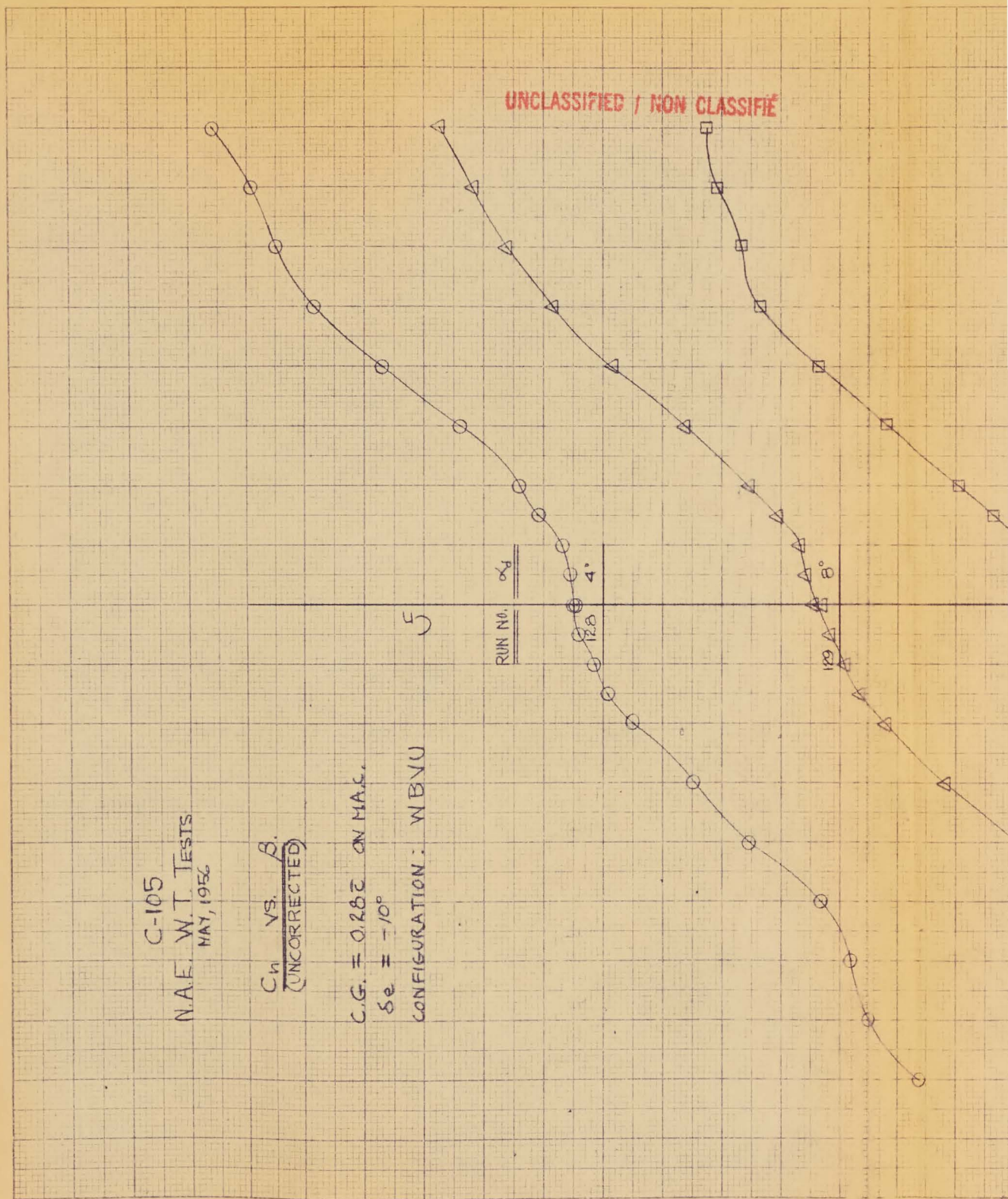
C_n VS. β
(UNCORRECTED)

C.G. = 0.882 ON H.A.S.
 $\delta e = -10^\circ$

CONFIGURATION: WBNU

RUN NO. α_4

UNCLASSIFIED / NON CLASSIFIED



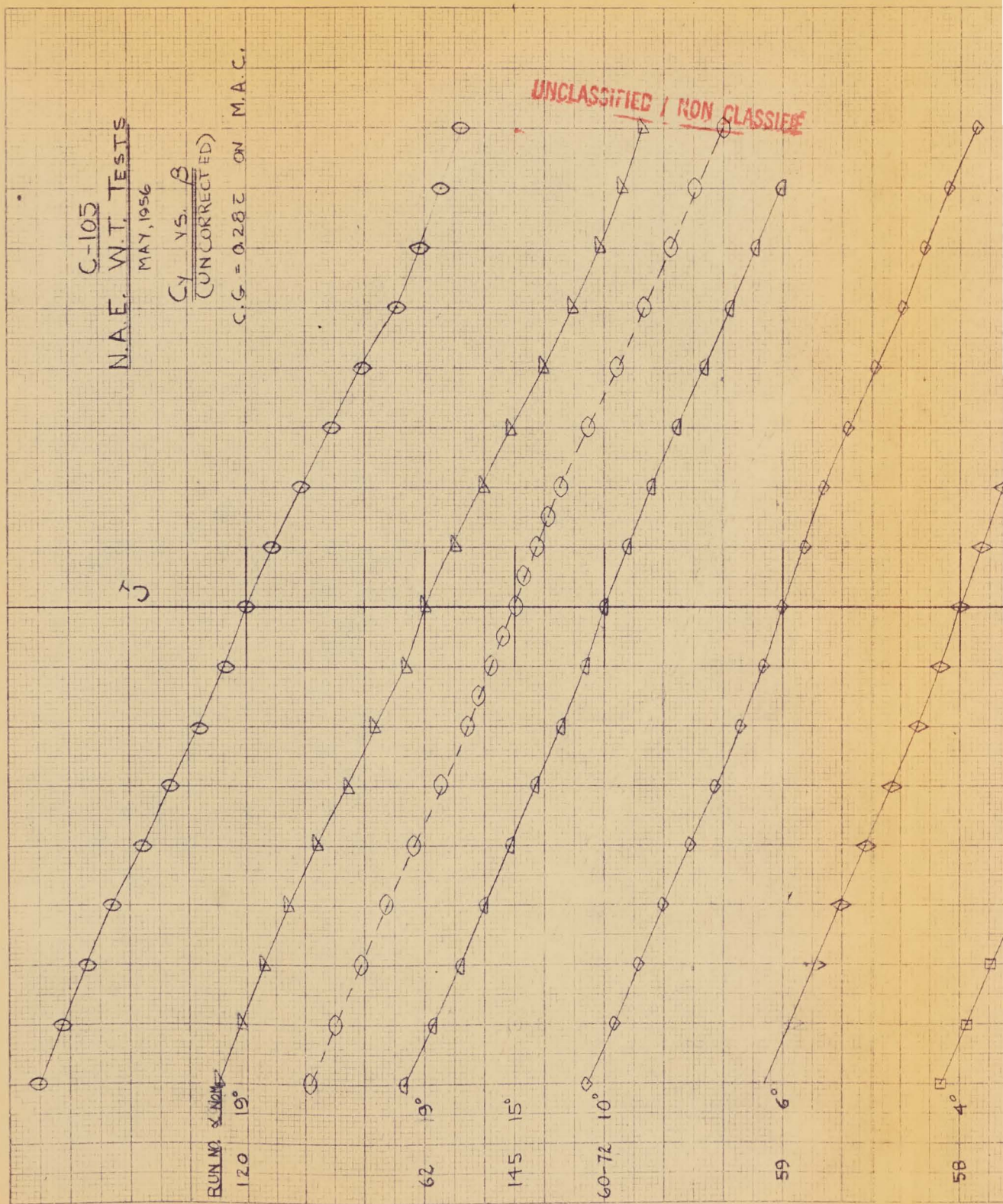
C-105
N.A.E. W.T. TESTS

MAY, 1956

Cy vs. β
(UNCORRECTED)

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

UNCLASSIFIED / NON CLASSIFIED



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

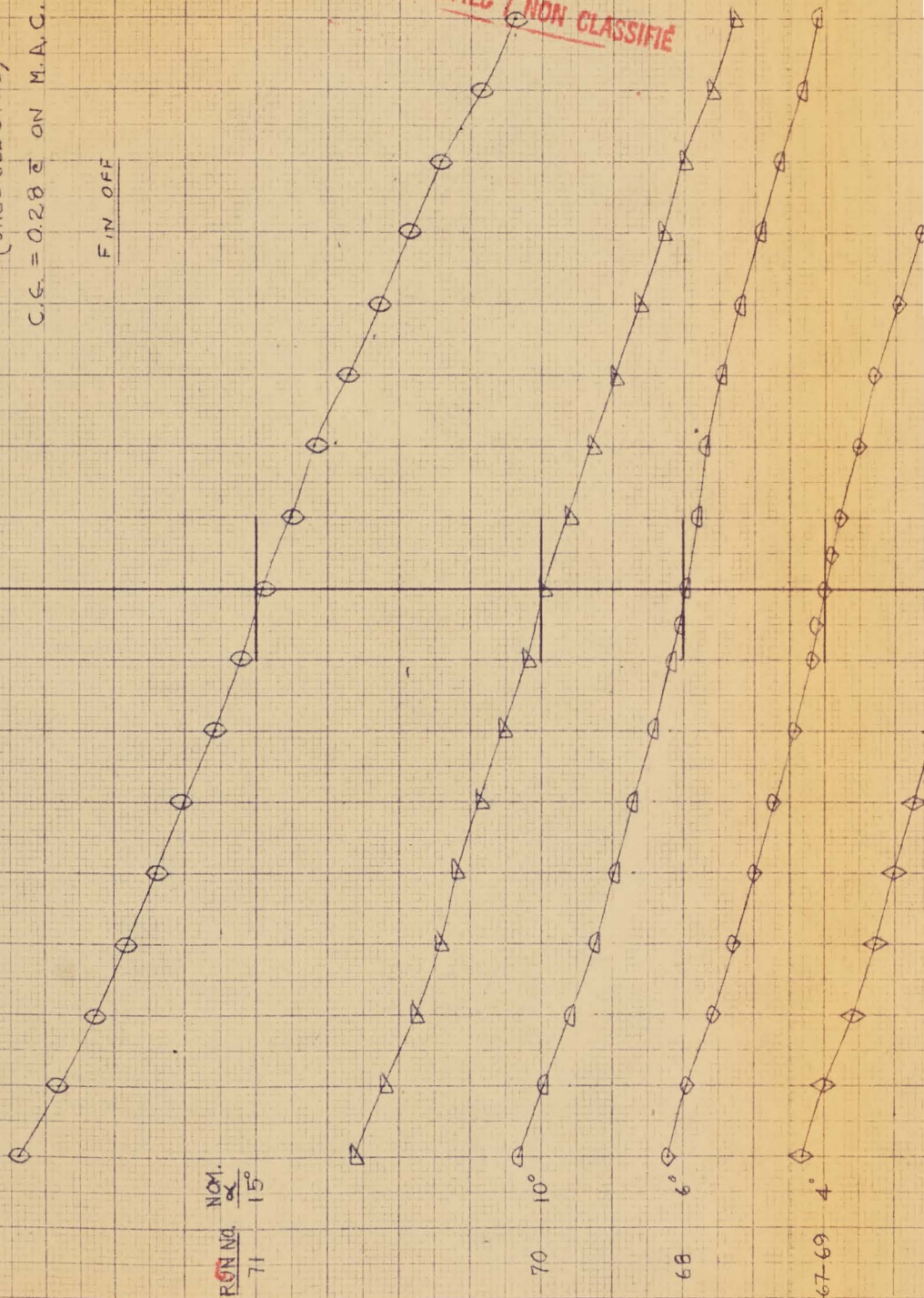
CY VS. B
(UNCORRECTED)

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

F IN OFF

RON NO. 71
NOM. $\frac{\alpha}{15^\circ}$

UNCLASSIFIED / NON CLASSIFIED

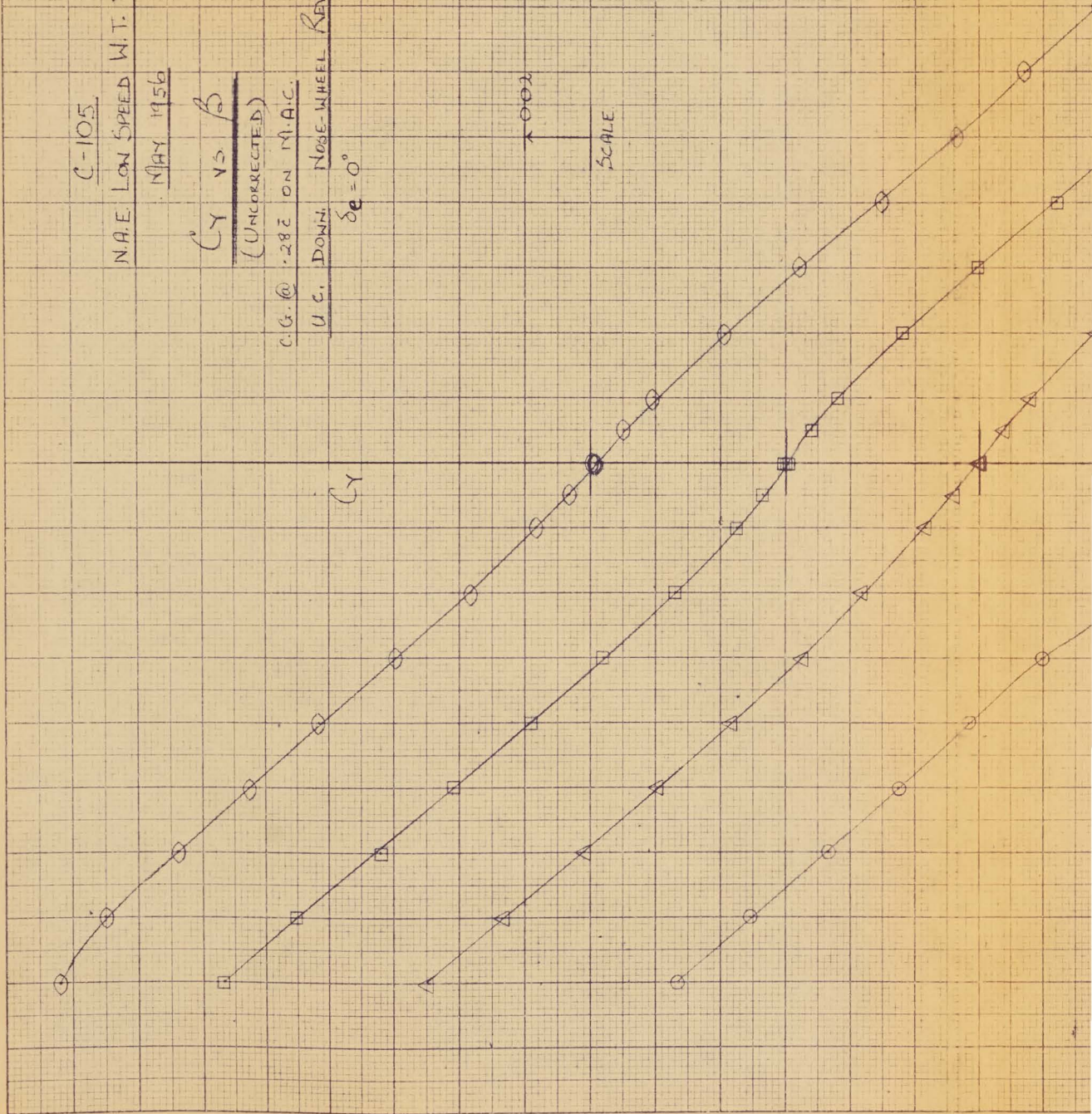


C-105.
N.A.E. LOW SPEED W.T. TESTS.
MAY 1956

C_Y vs β
(UNCORRECTED)

C.G. @ .282 ON M.A.C.
U.C. DOWN. NOSE-WHEEL REVERSED.
 $\delta e = 0^\circ$

UNCLASSIFIED / NON CLASSIFIÉ



D.B.G. JUNE 56

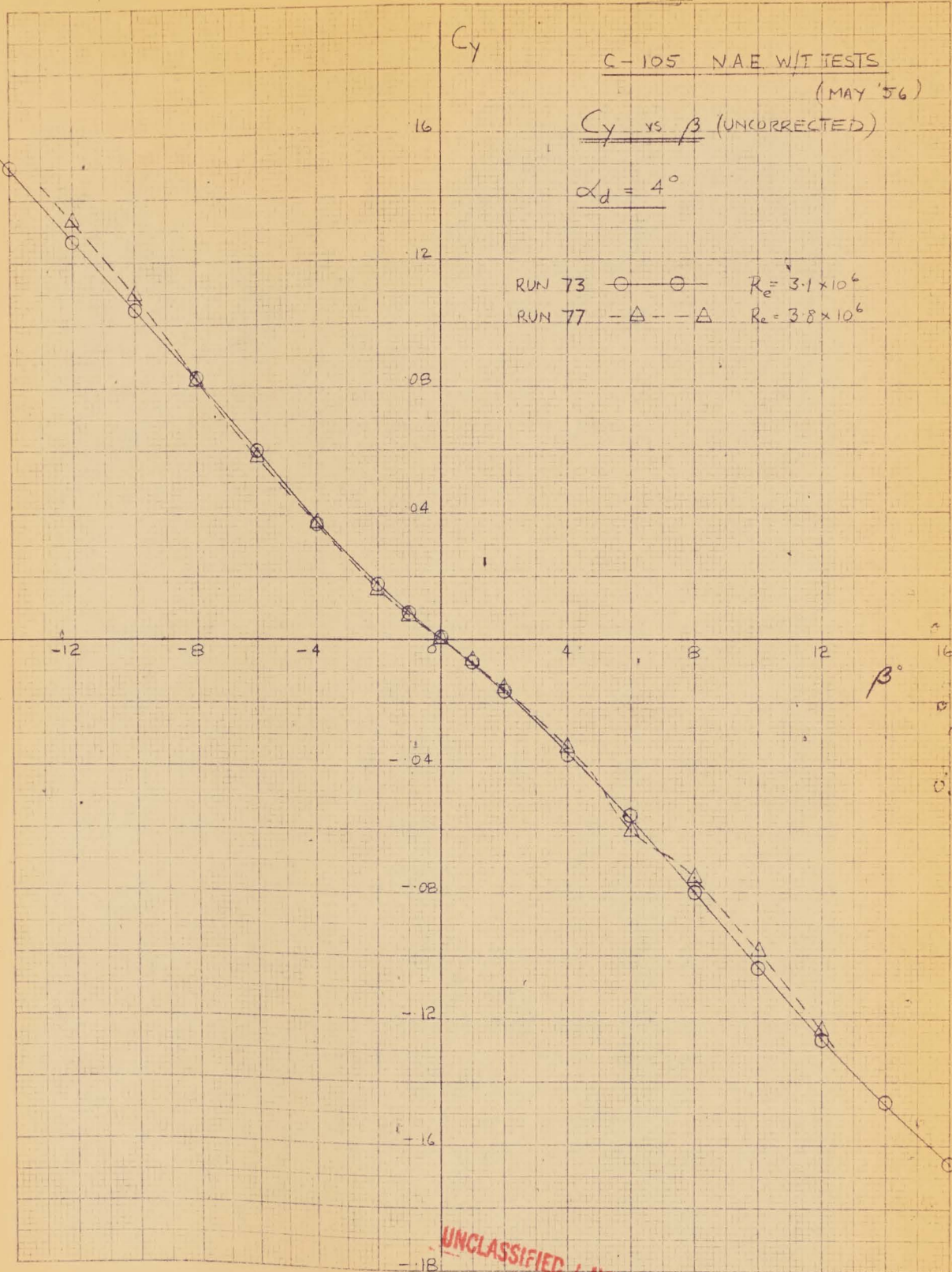
 C_y

C-105 NAE W/T TESTS

(MAY '56)

 C_y vs β (UNCORRECTED)

$$\alpha_d = 4^\circ$$

RUN 73 $\circ$ — $R_e = 3.1 \times 10^6$ RUN 77 $\triangle$ — $R_e = 3.8 \times 10^6$ UNCLASSIFIED / NON CLASSIFIED
CONFIDENTIAL

359.12

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

H.E.

C-105

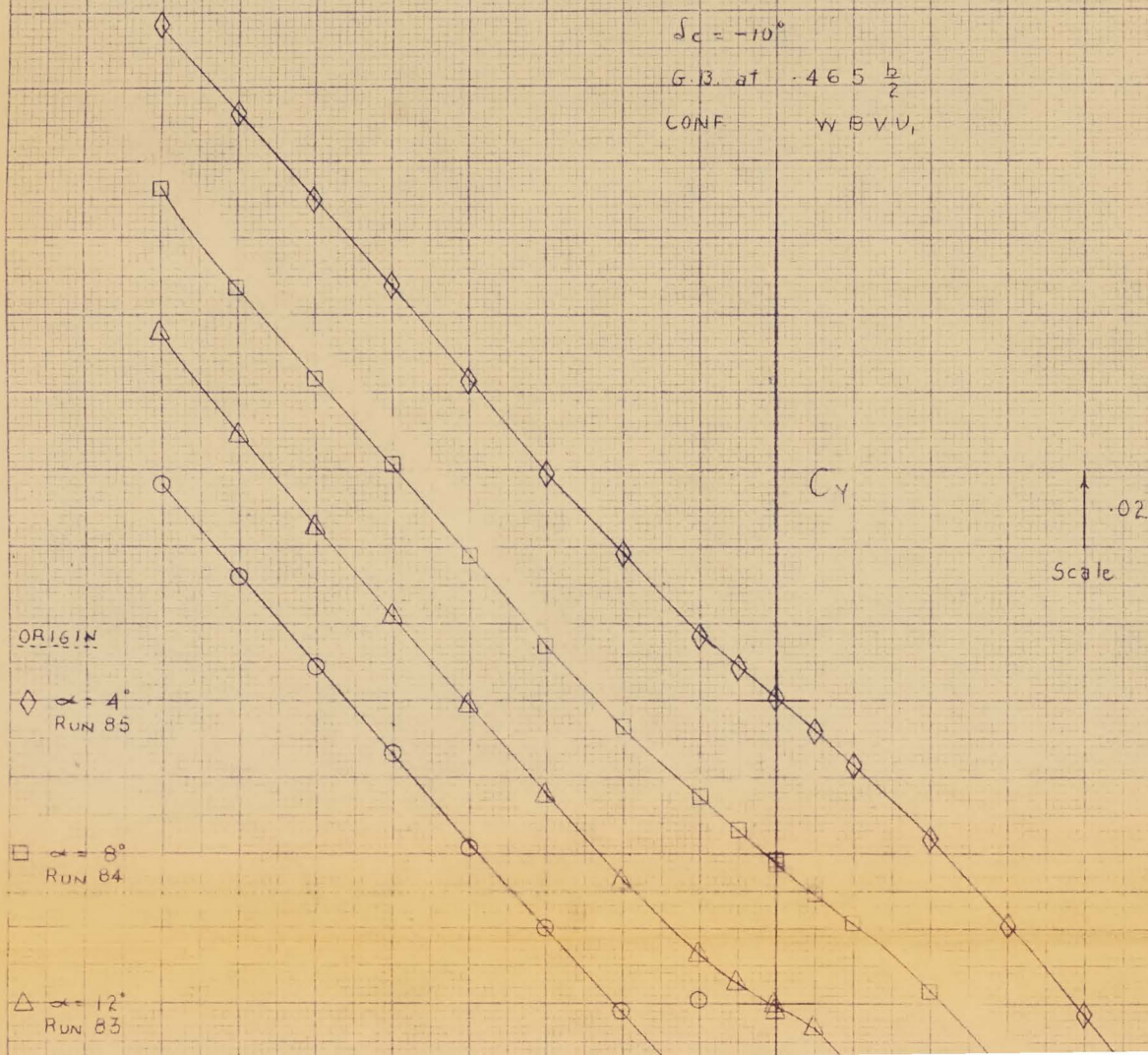
N.A.E. LOW SPEED W/T TESTS

C_y vs β (UNCORRECTED DATA)

$\delta_c = -10^\circ$

G.B. at $-46.5 \frac{b}{2}$

CONF. W.B.V.V.



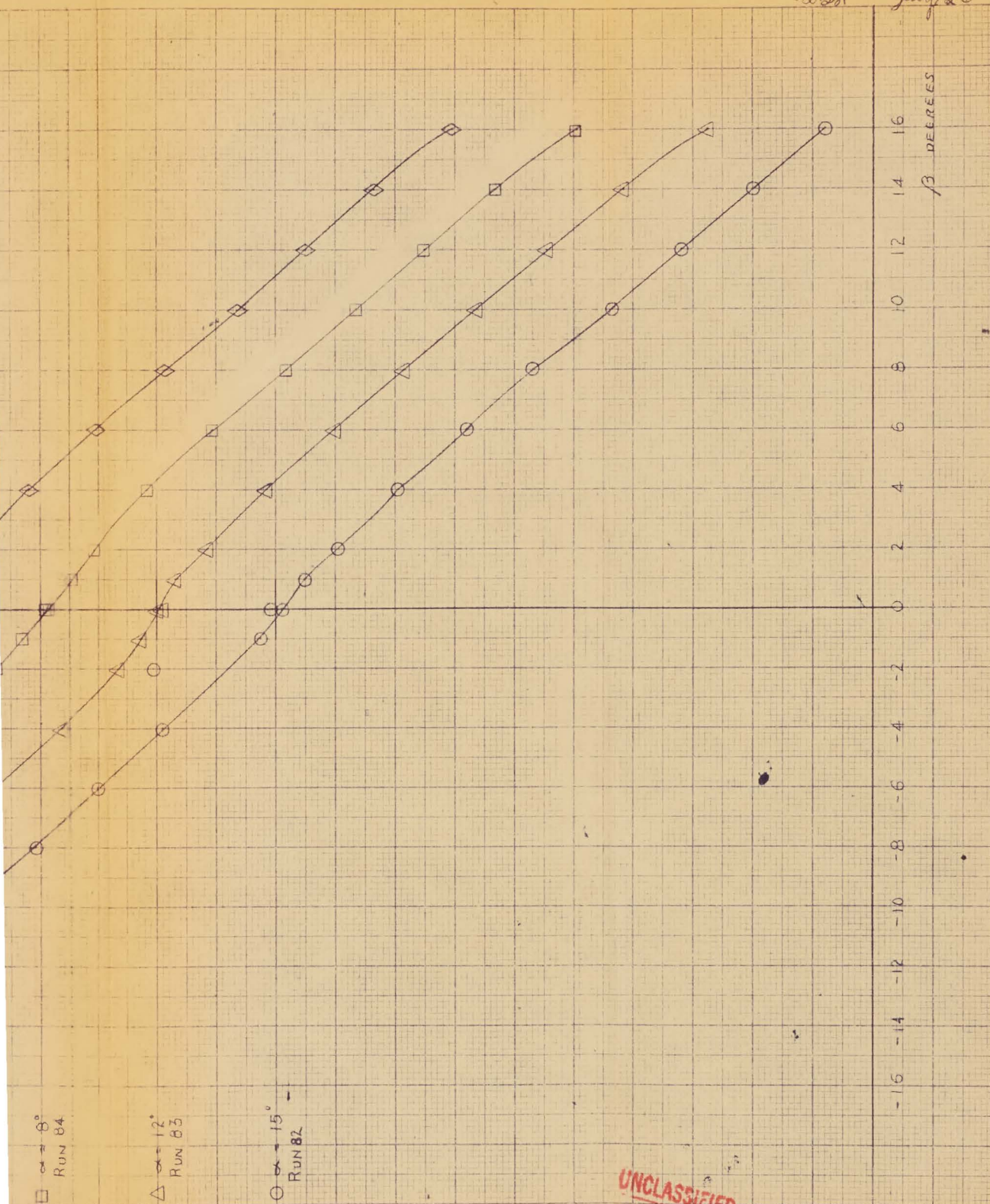
UNCLASSIFIED / NON DISSEMINATE

P/WT/119

8.6

WBF

July/56



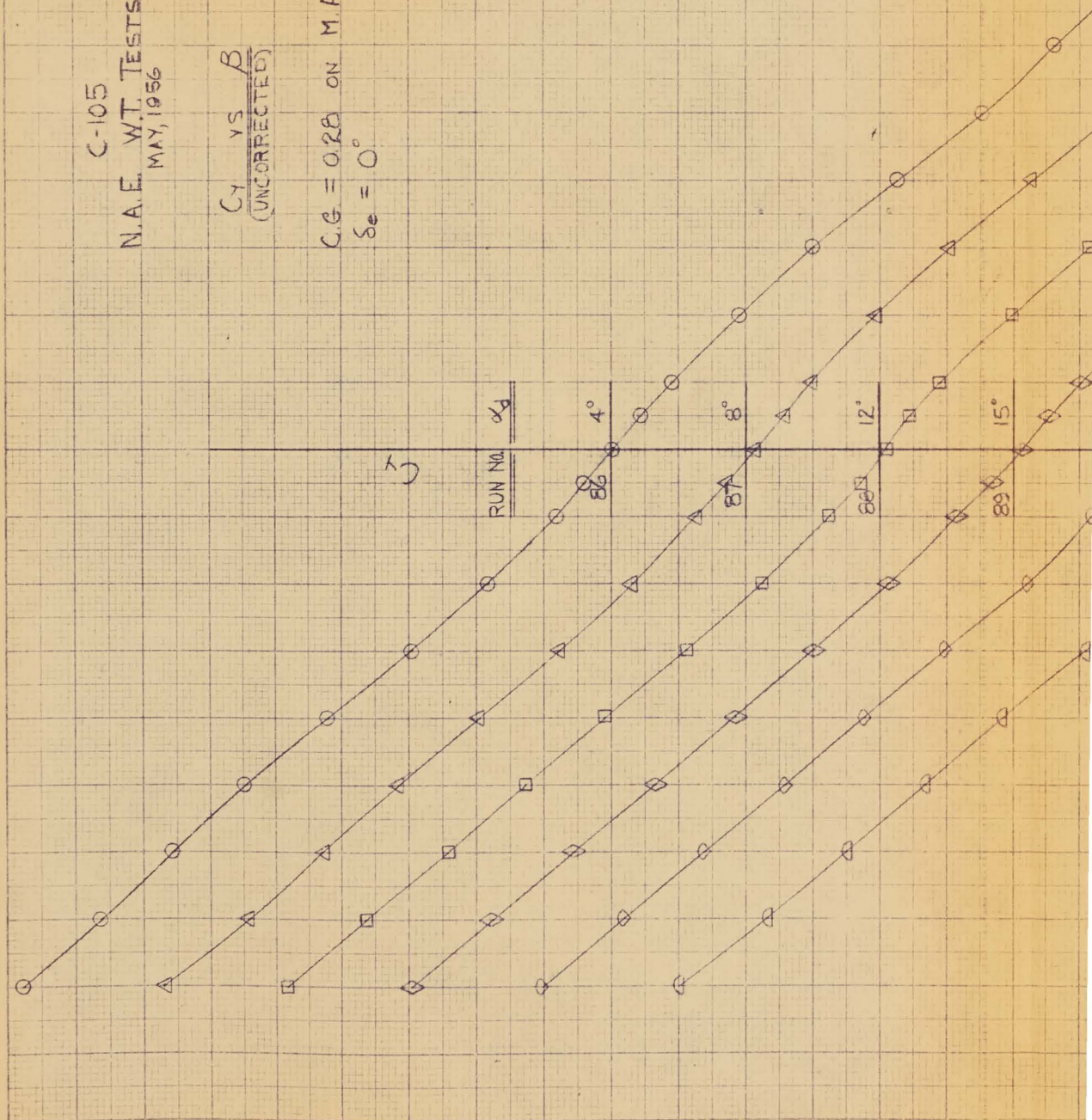
UNCLASSIFIED / NON CONFIDENTIAL

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

C_y vs B
(UNCORRECTED)

C.G. = 0.28 ON M.A.C.
 $\delta_e = 0^\circ$

UNCLASSIFIED / NON CLASSIFIÉ



C-105

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

C_Y vs β
(UNCORRECTED)

$S_e = 0$

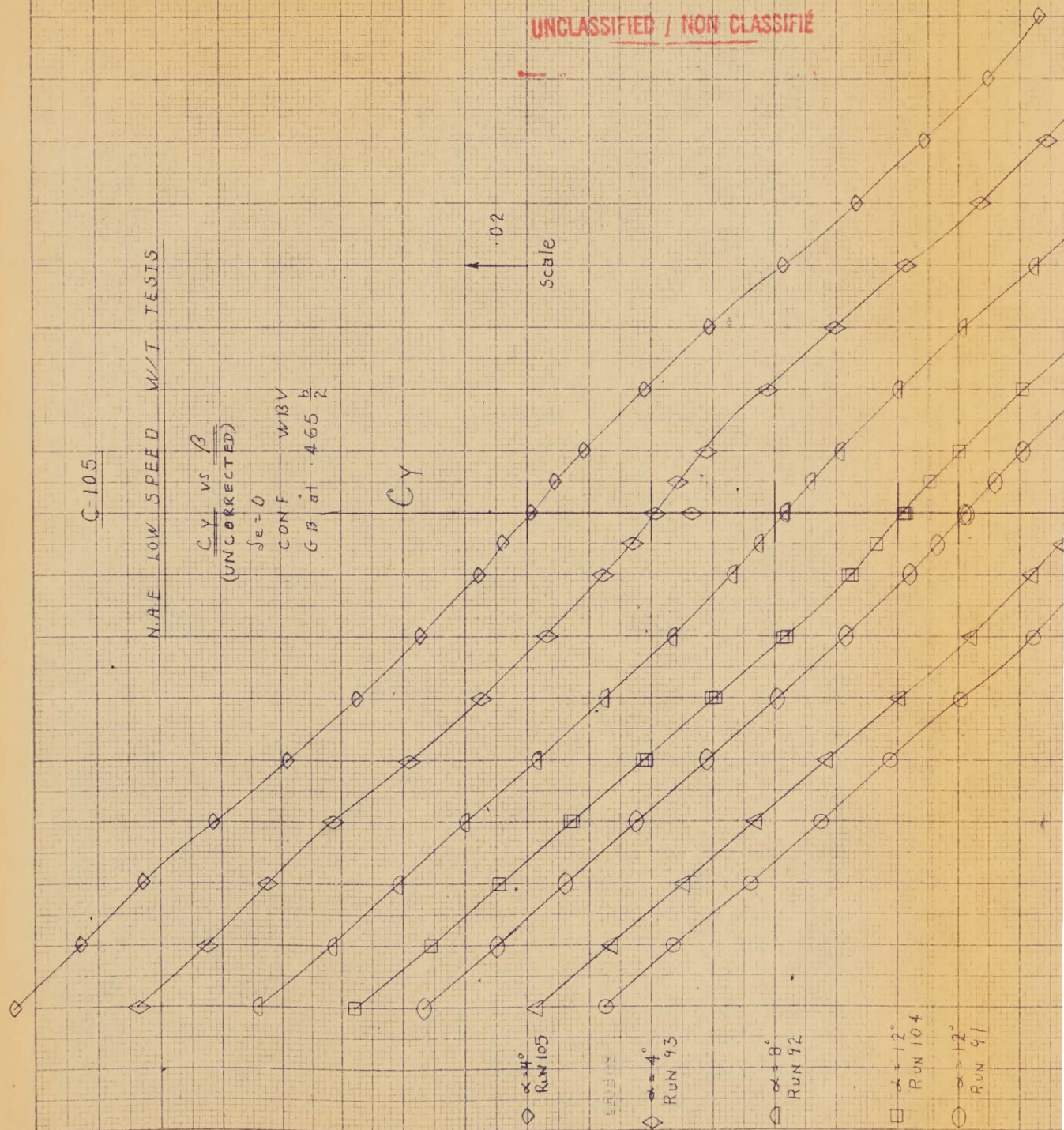
CONF. WBV
GB at .465 $\frac{b}{2}$

C_Y

.02

Scale

UNCLASSIFIED / NON CLASSIFIED

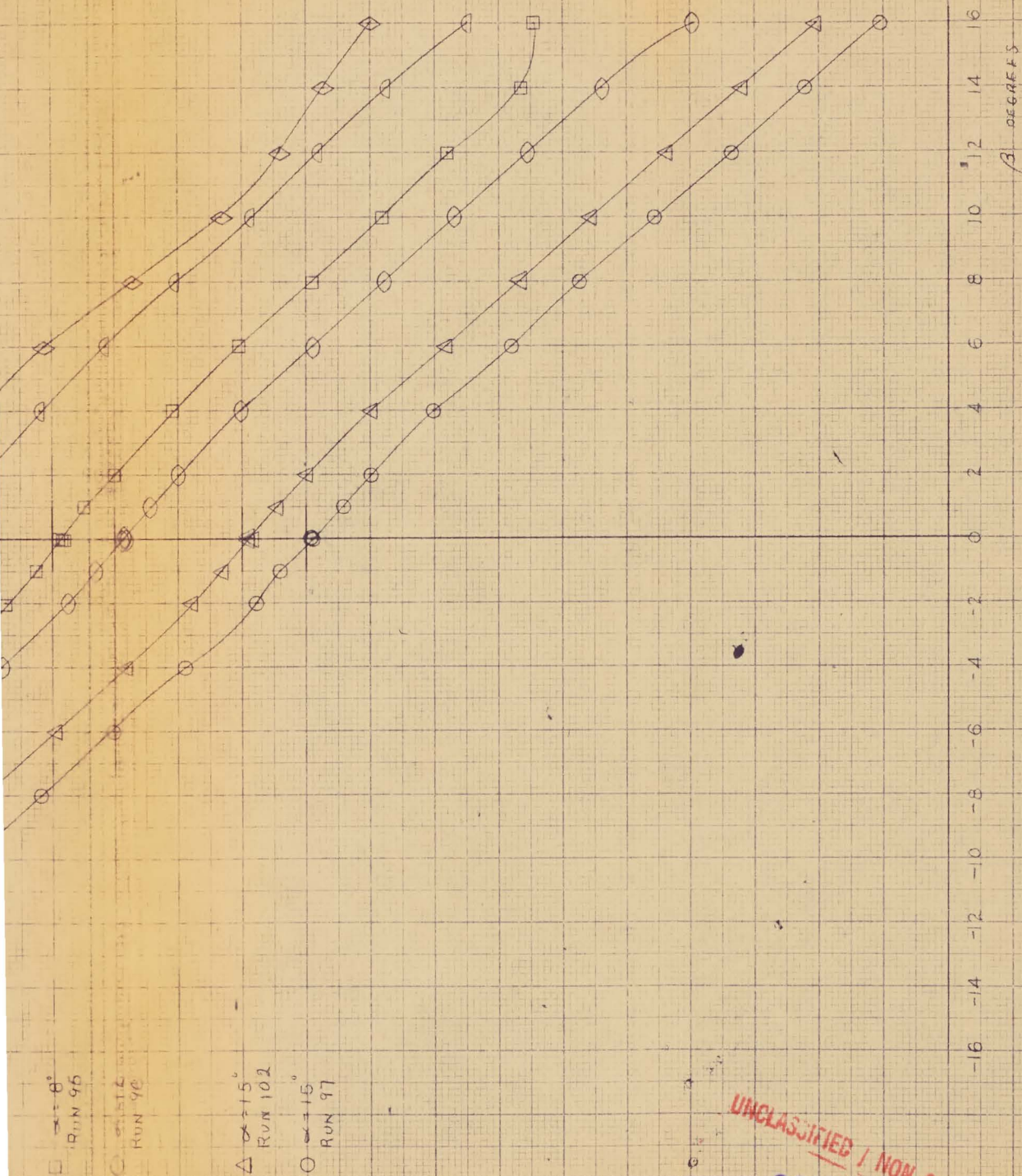


P/WT/119

8.9

gbs

July/56



UNCLASSIFIED / NON-CONFIDENTIAL

CONFIDENTIAL

C-105
NAE LOW SPEED W/T TESTS, MAY 56

C_y vs β

C_y

— CANOPY CLOSED
--- CANOPY OPEN

(UNCORRECTED DATA)

SCALE .02

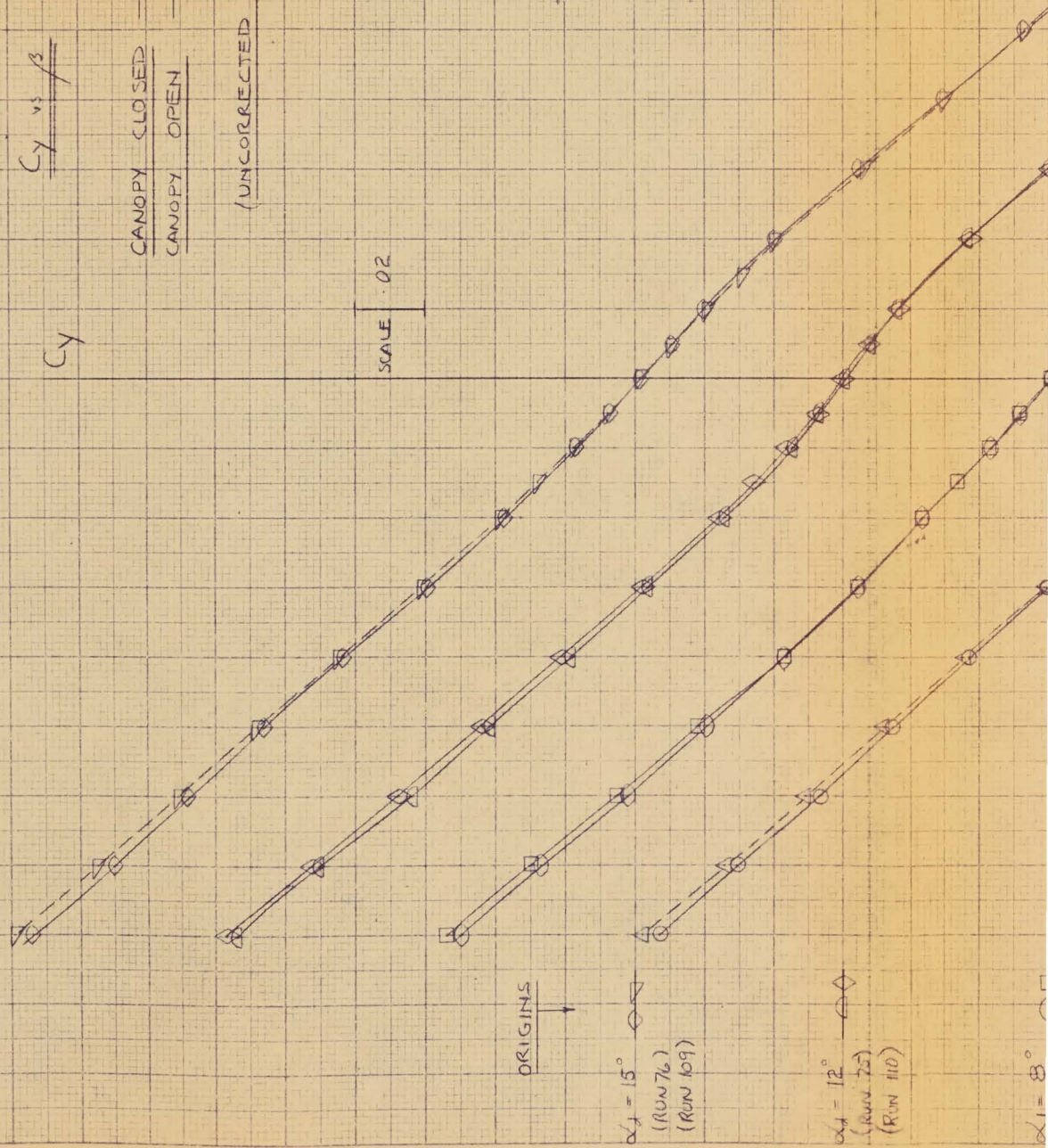
UNCLASSIFIED / NON CLASSIFIÉ

ORIGINS

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

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

$\alpha_f = 8^\circ$



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 #13-9 INCL. #121 & #146-8 INCL.
(VALUES FOR $\delta_r = 0$ OBTAINED FROM RUN #121)

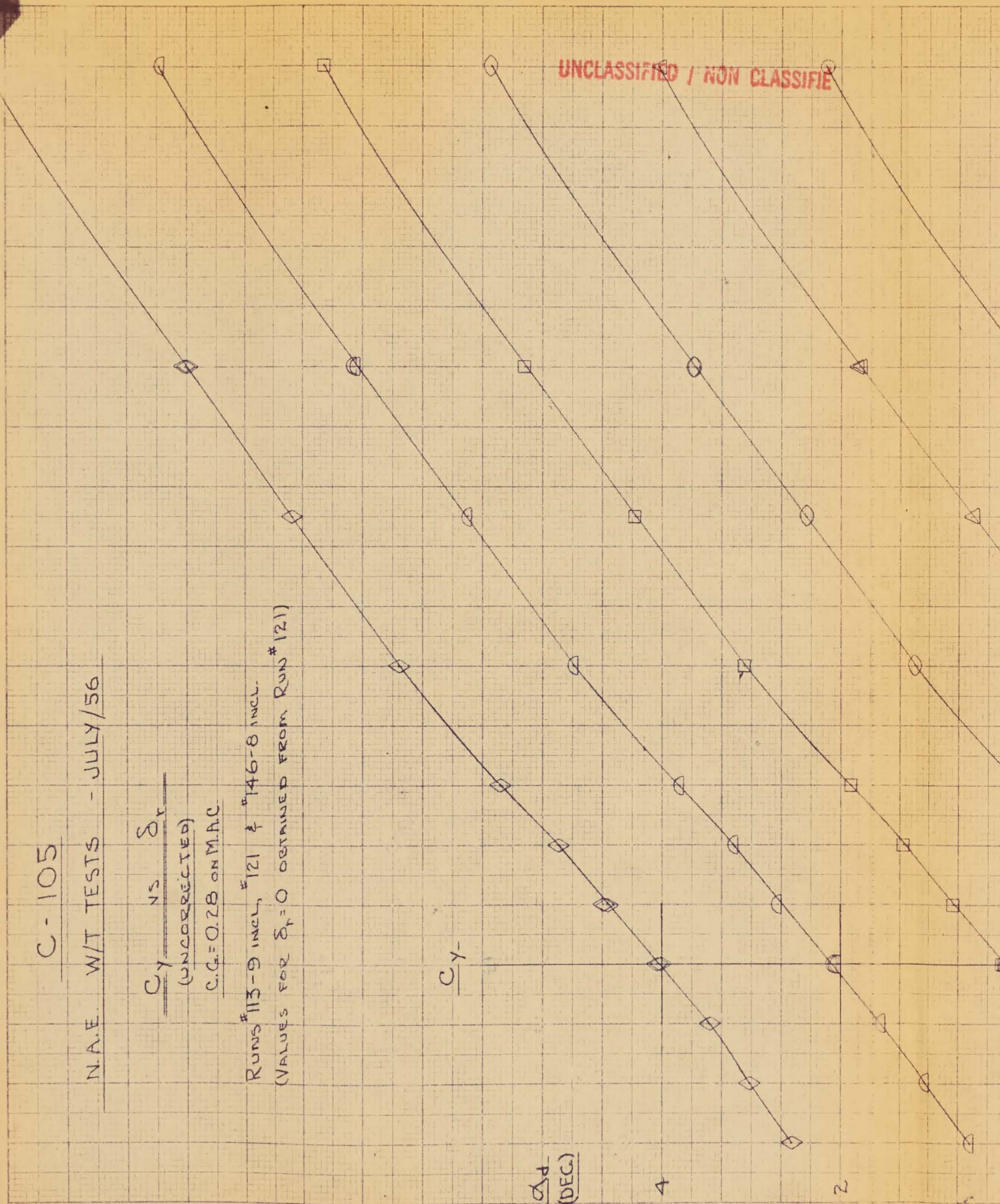
C_Y

$\frac{\Delta P}{(\text{DEC})}$

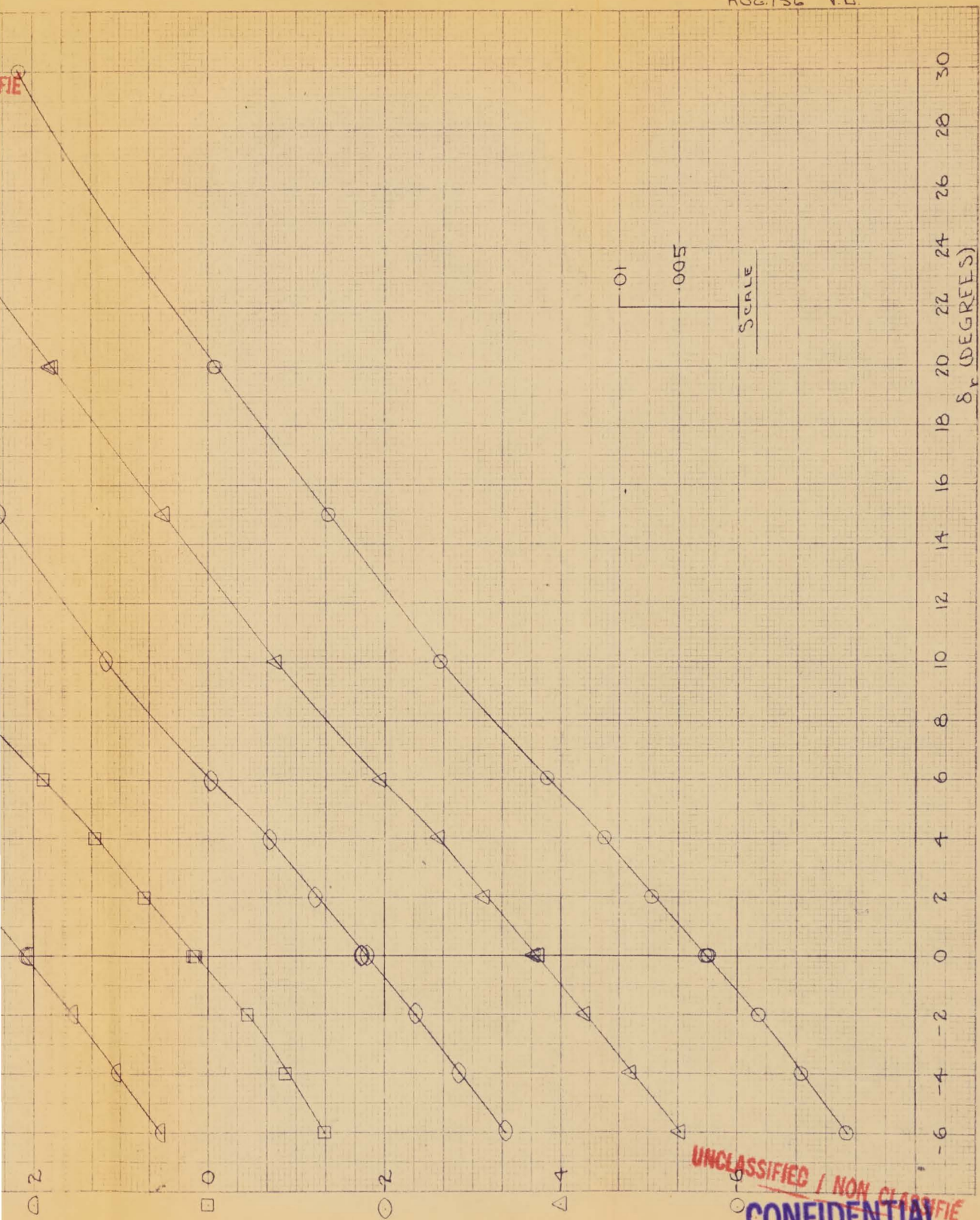
4

2

UNCLASSIFIED / NON CLASSIFIED



P/WT/119 8-12-1
 AUG. 156 V.L.



UNCLASSIFIED / NON CLASSIFIED
 CONFIDENTIAL

C-105
NAE. 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)

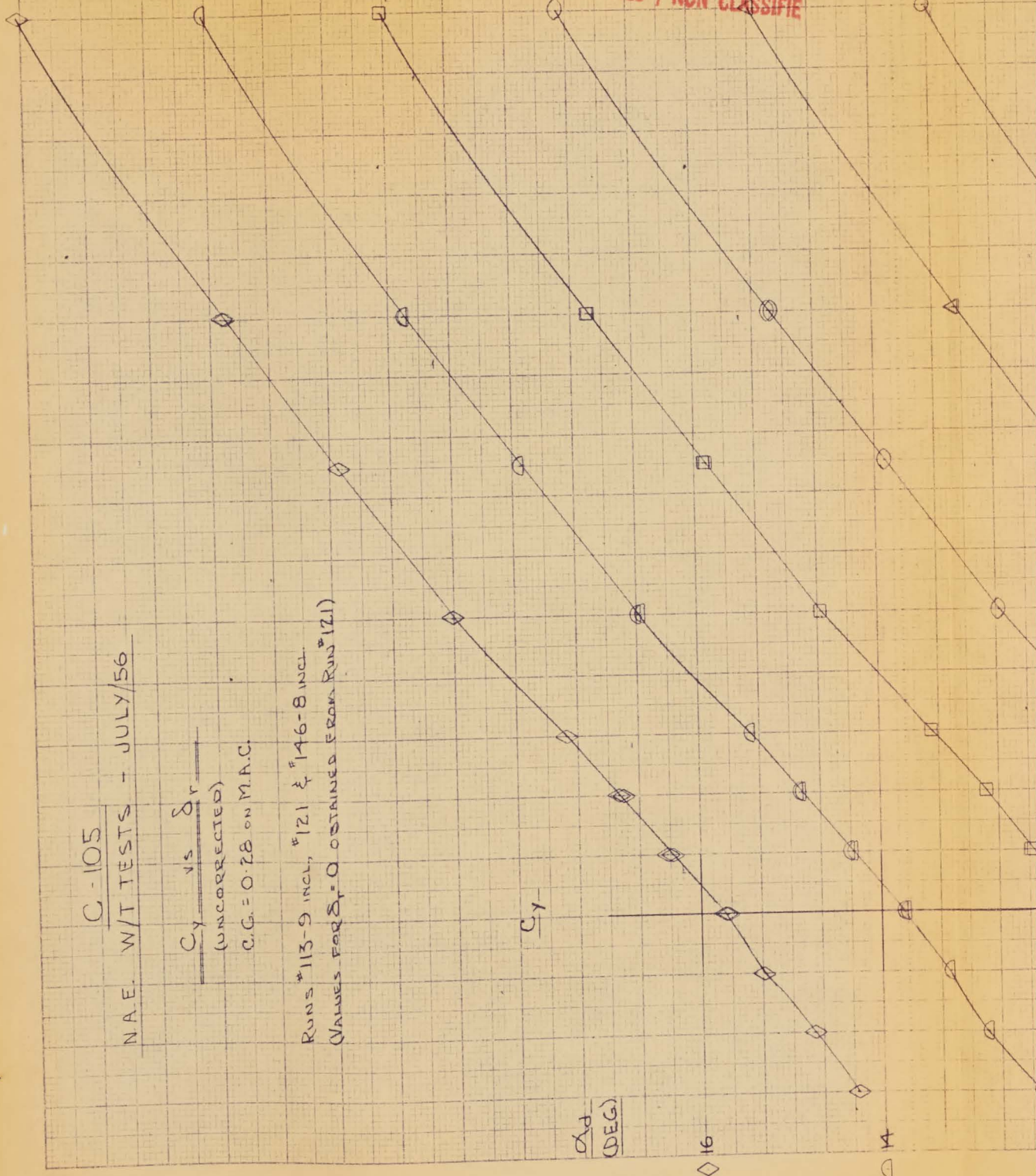
UNCLASSIFIED / NON CLASSIFIÉ

C_y

α_d
(DEG)

16

14



C-105

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

C_y vs δ

(UNCORRECTED)

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

RUNS #113-9 INCL., #121 & #146-8 INCL.
(VALUES FOR δ OBTAINED FROM RUN #121)

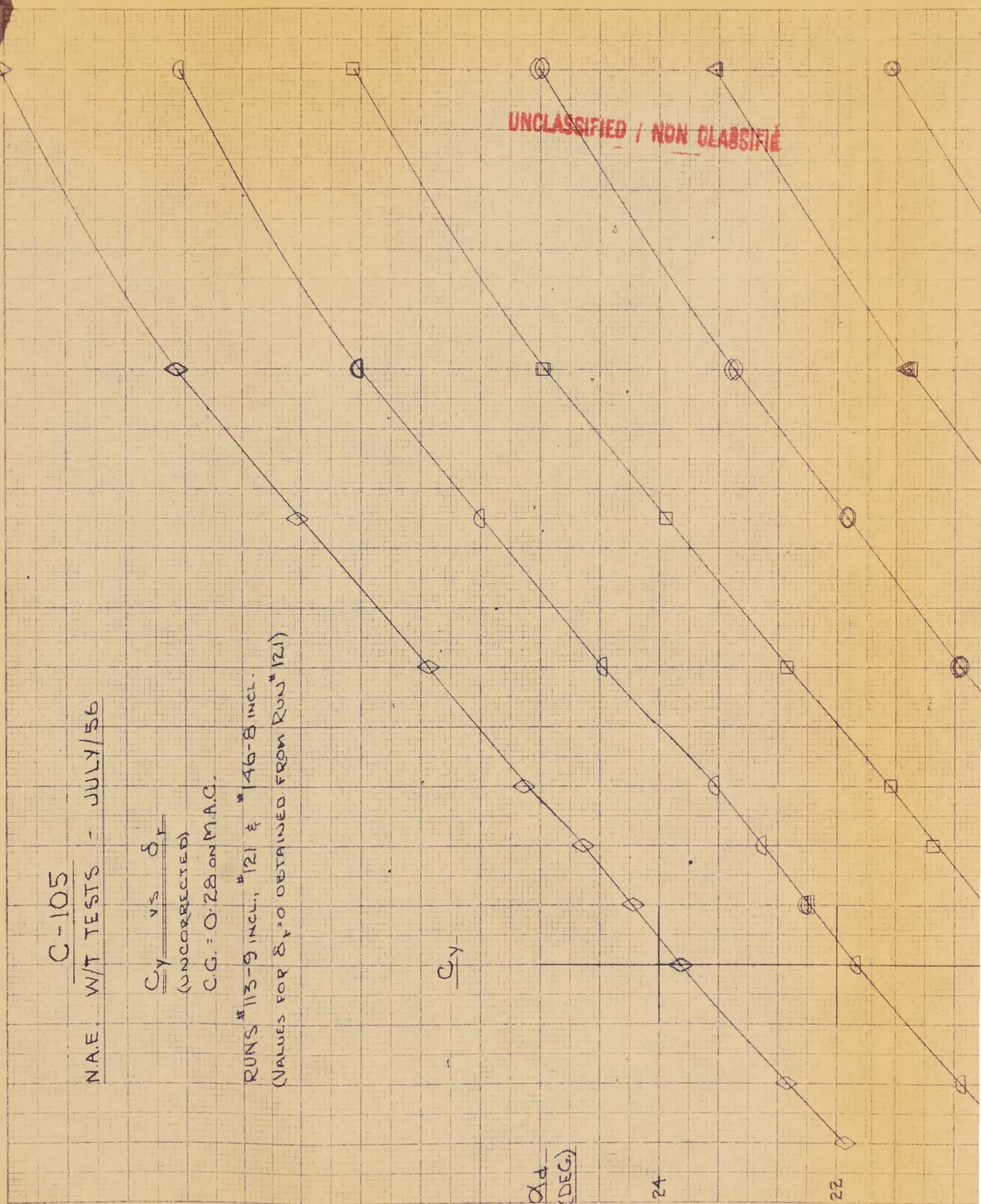
C_y

α_d
(DEG.)

24

22

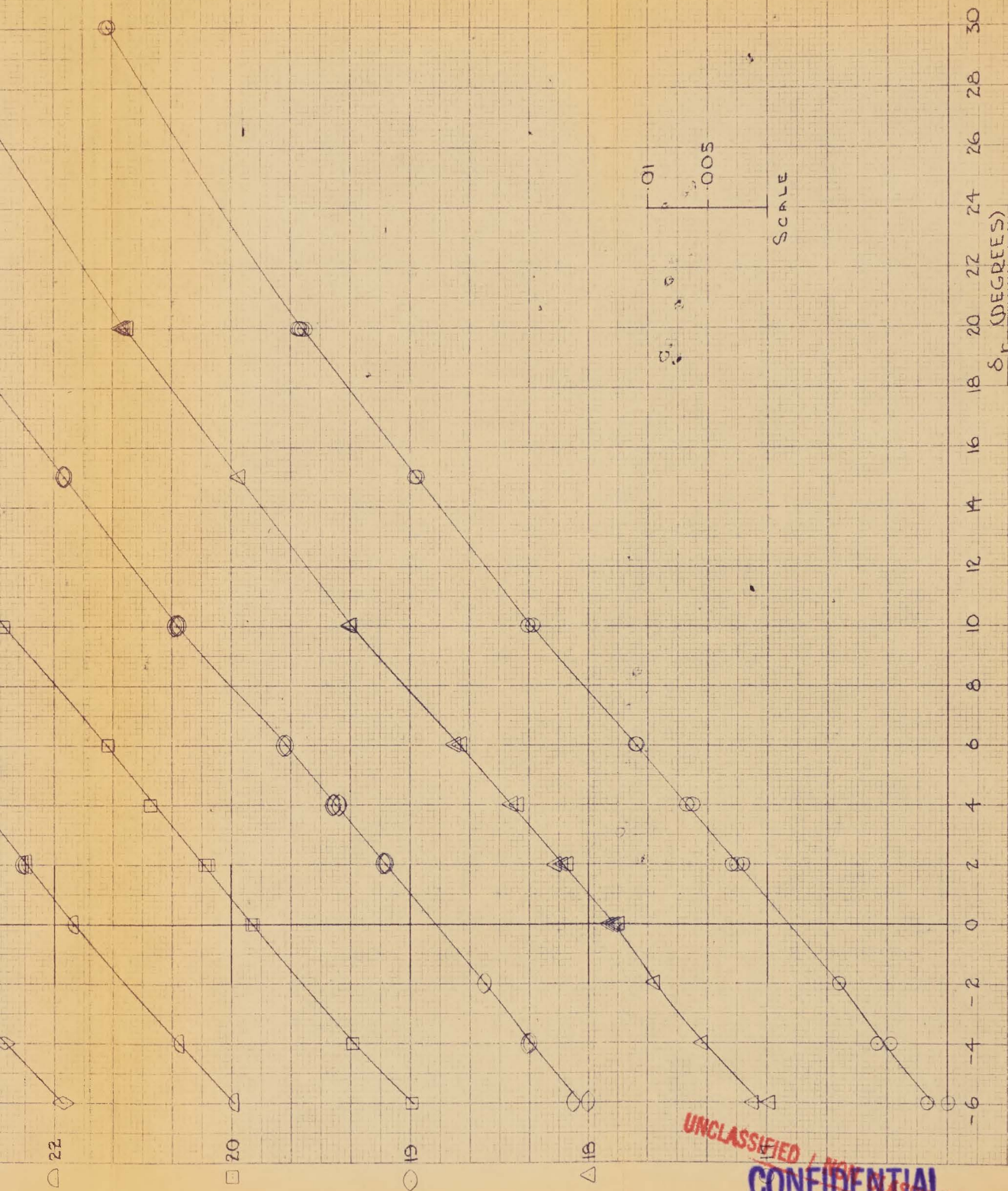
UNCLASSIFIED / NON CLASSIFIED



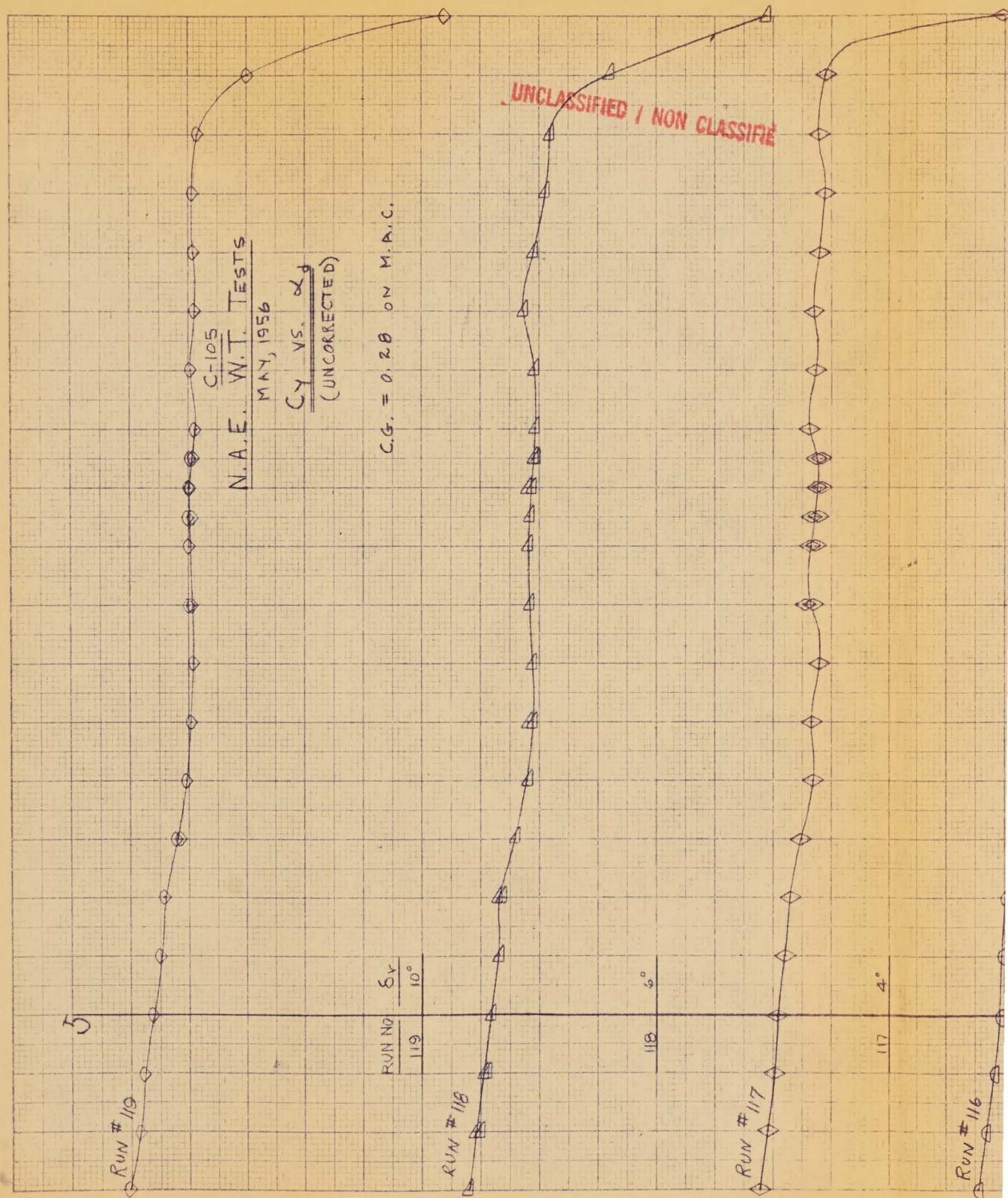
P/WT/119

8.12.3

SEPT/56 J. Lambo



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CONFIDENTIAL



RUN NO	δ_v
119	10°

118 6°

117 4°

C-105

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

C_T vs α_d (uncorrected)

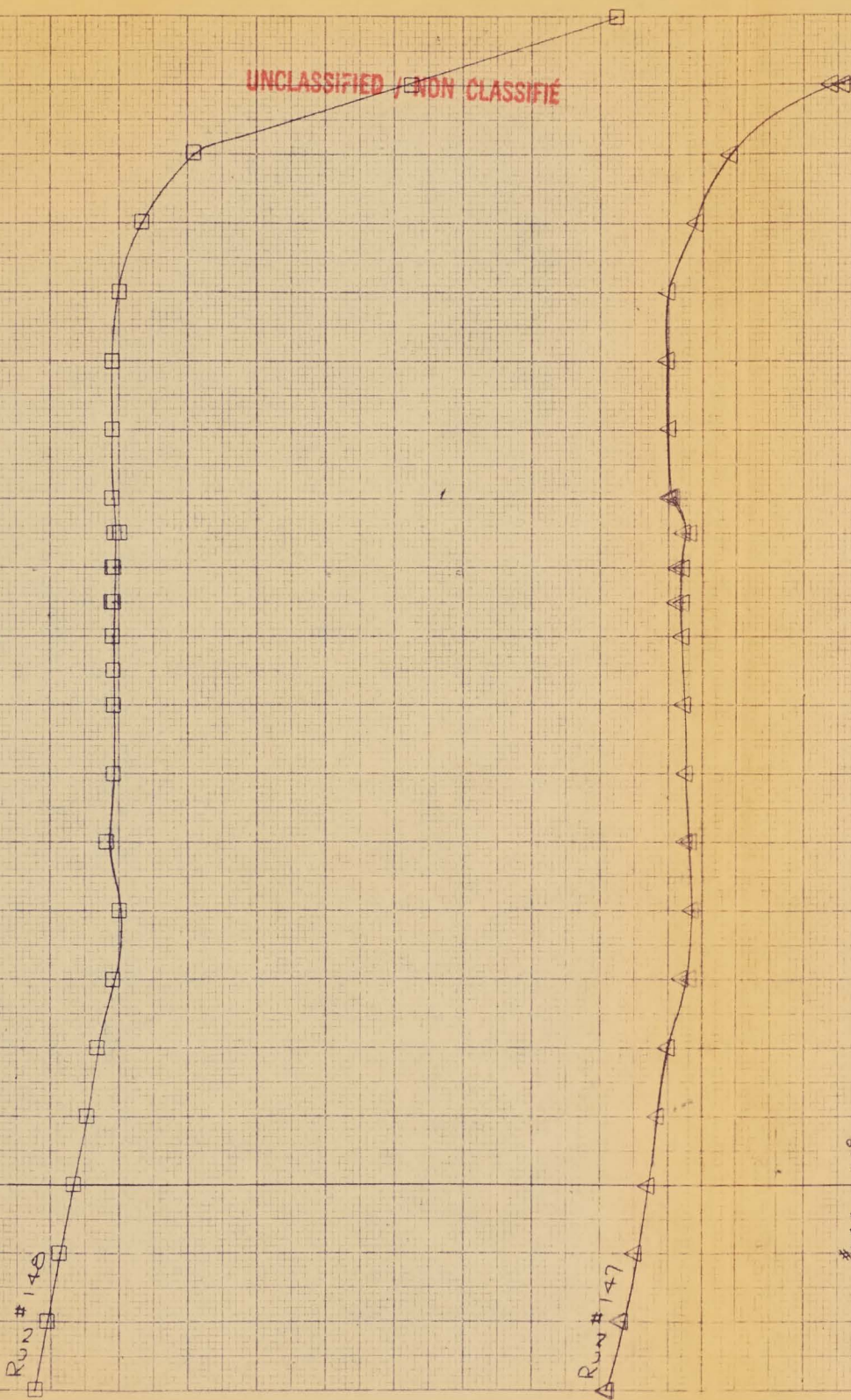
C.G. = 0.28 ON M.A.C.

C_T
RUN δ_r

RUN #146

RUN #147

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C-105

NA-E. LOW SPEED W/T TESTS

C_y vs β (UNCORRECTED)

RUN 121

C_y
scale
0.02

UNCLASSIFIED / NON CLASSIFIED

ORIGIN

$\beta = 16$

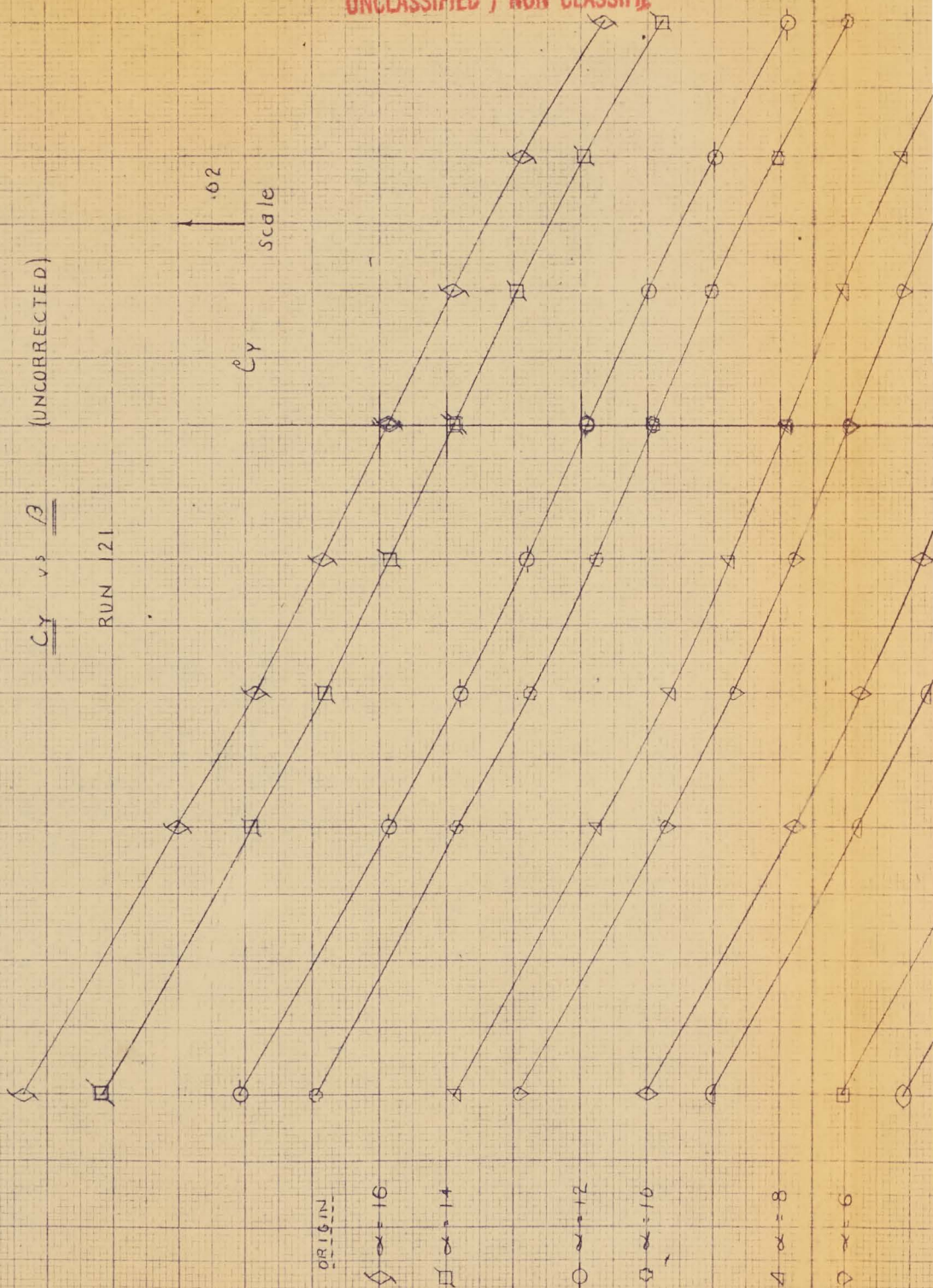
$\beta = 14$

$\beta = 12$

$\beta = 10$

$\beta = 8$

$\beta = 6$

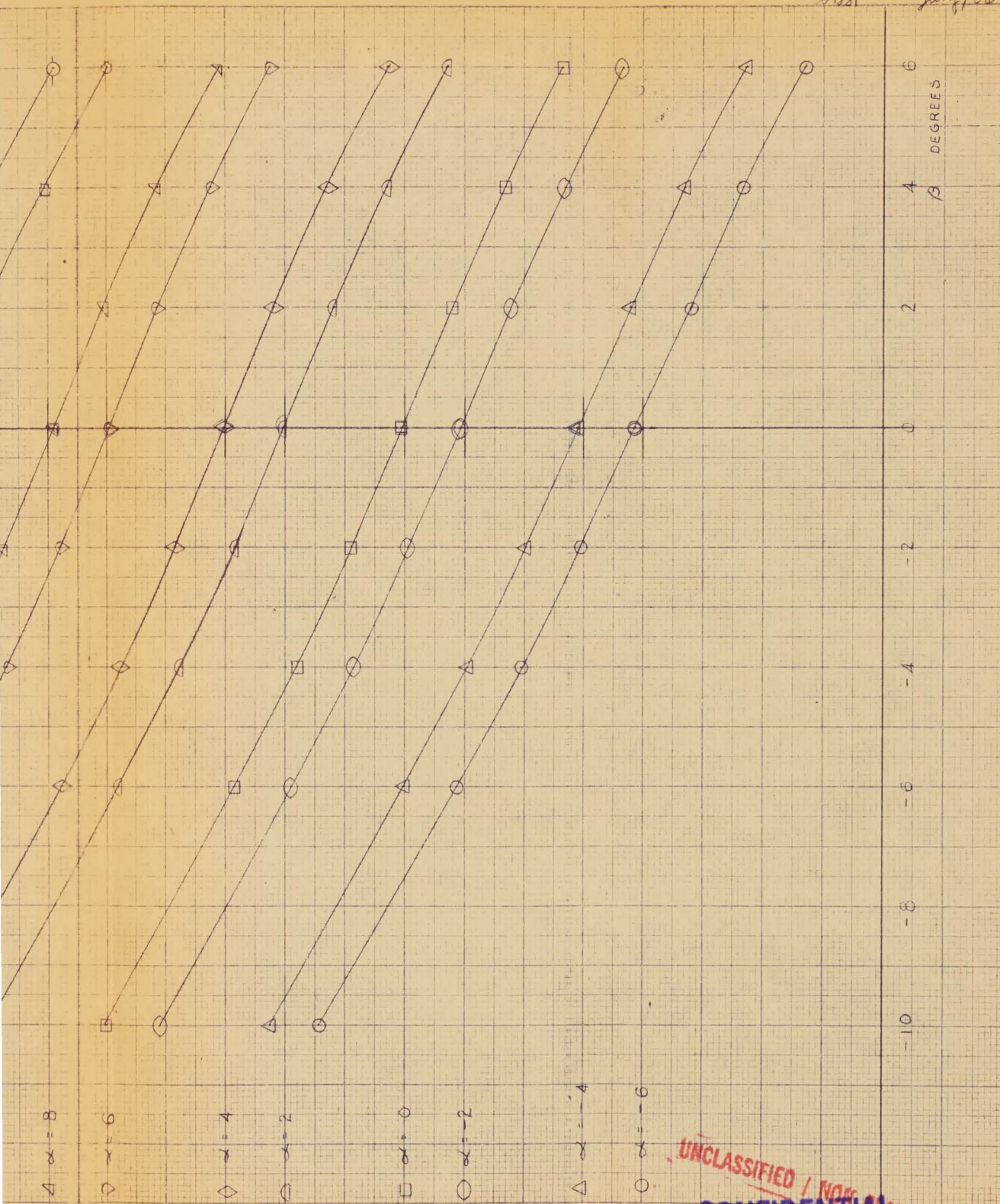


P/WT/119

8.13.1

20881

July/56



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C-105

N.A.F. LOW SPEED WT TESTS

CY vs β (UNCORRECTED)

RUN 121

CY

0.02
Scale

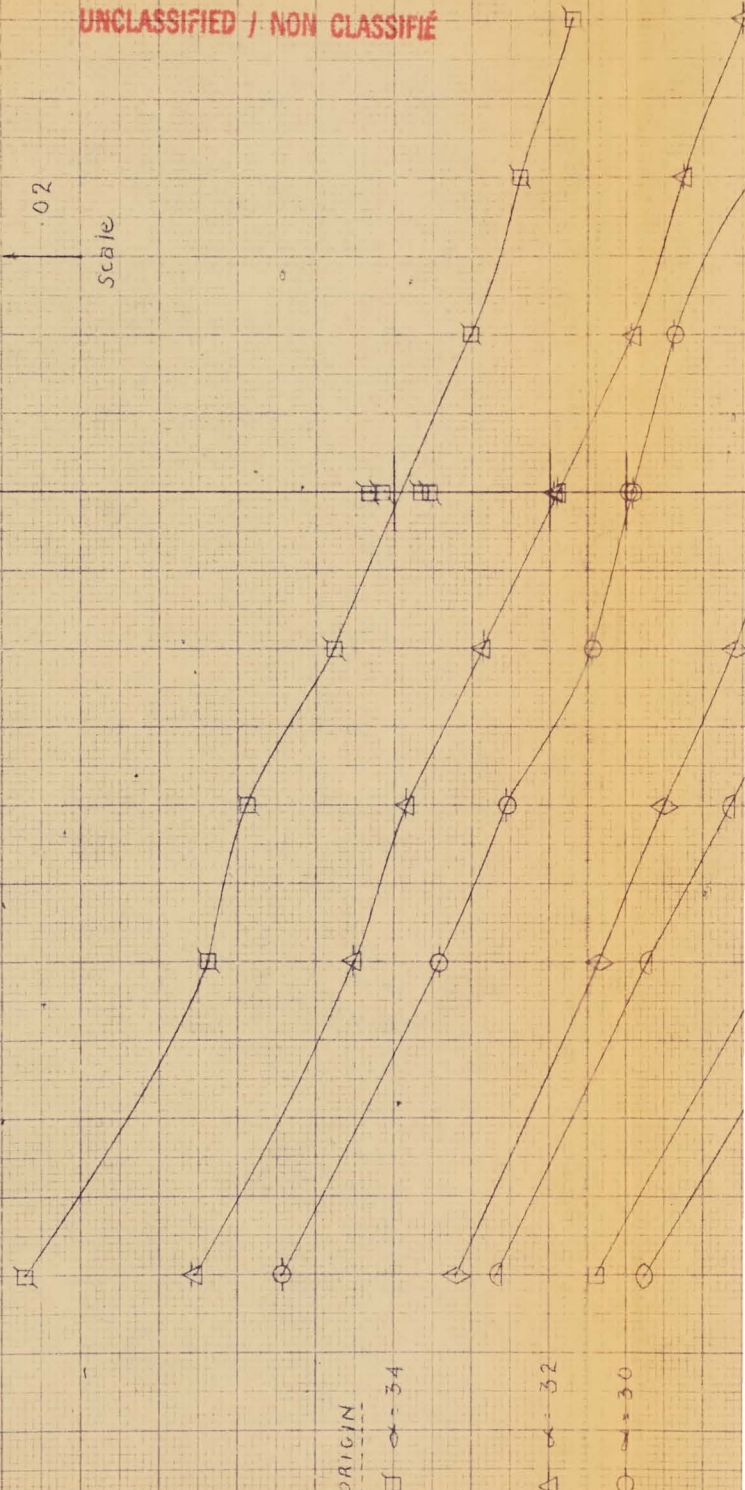
UNCLASSIFIED / NON CLASSIFIÉ

ORIGIN

$\square$ $\alpha = 34$

$\triangle$ $\alpha = 32$

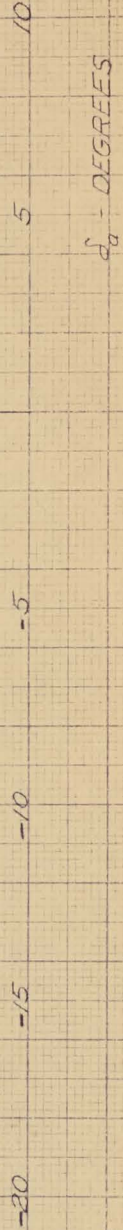
$\circ$ $\alpha = 30$



SEPT. 1956 MB

P/WT/119

8.14.3



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CONFIDENTIAL

C-105
NAE. W/T TESTS - JULY/56

$\frac{C_Y}{\text{(UNCORRECTED)}}$ vs δ_a

C.G. = 0.282

BOTH AILERONS DEFLECTED

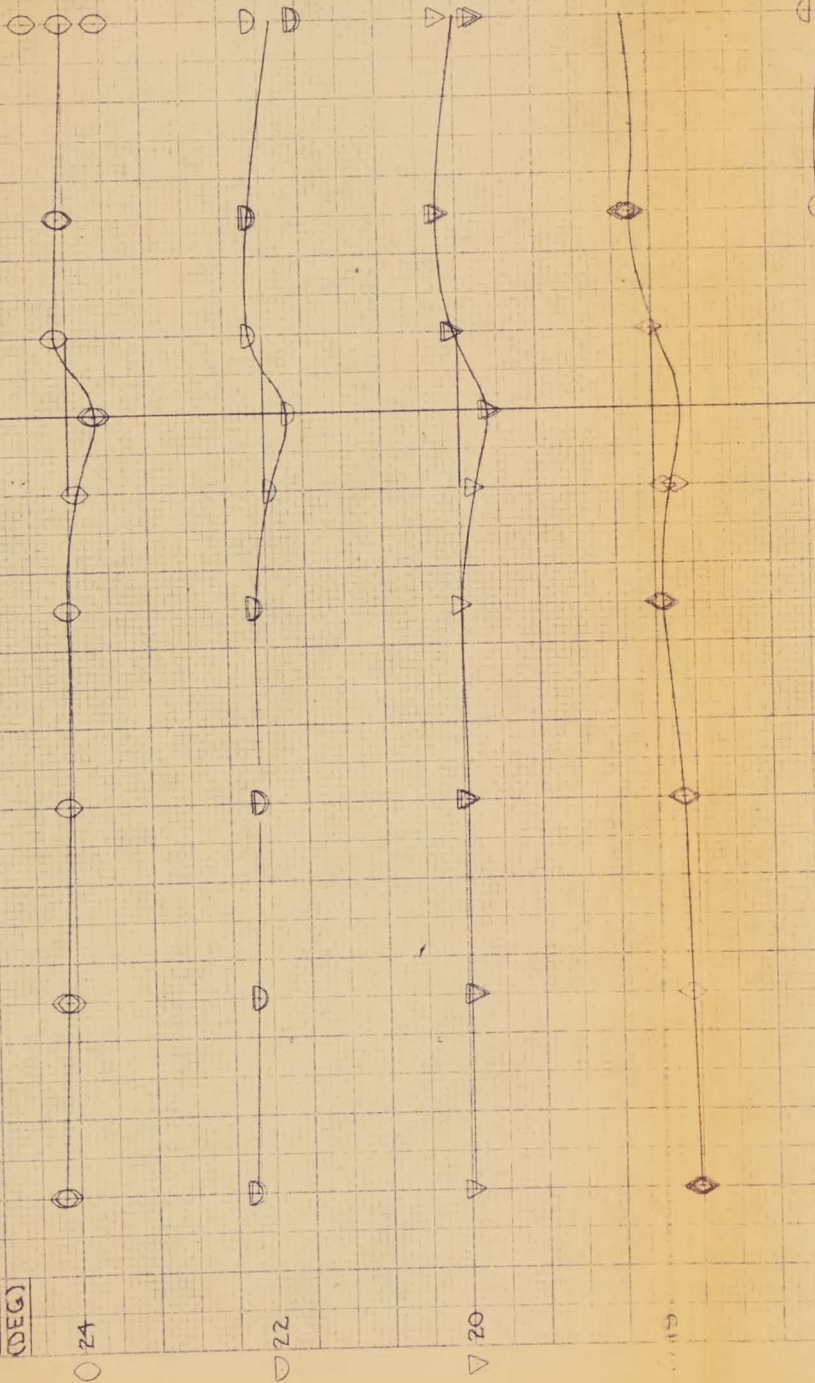
RUNS 149-50, 154-56, 159-61, 121 & 123
(VALUES FOR $\delta_a = 0$ OBTAINED FROM RUN 121)

C_Y

α_d
(DEG)

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

UNCLASSIFIED / NON CLASSIFIED



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)
BOTHAILERONS DEFLECTED

01
005

SCALE

α_d
(DEG)

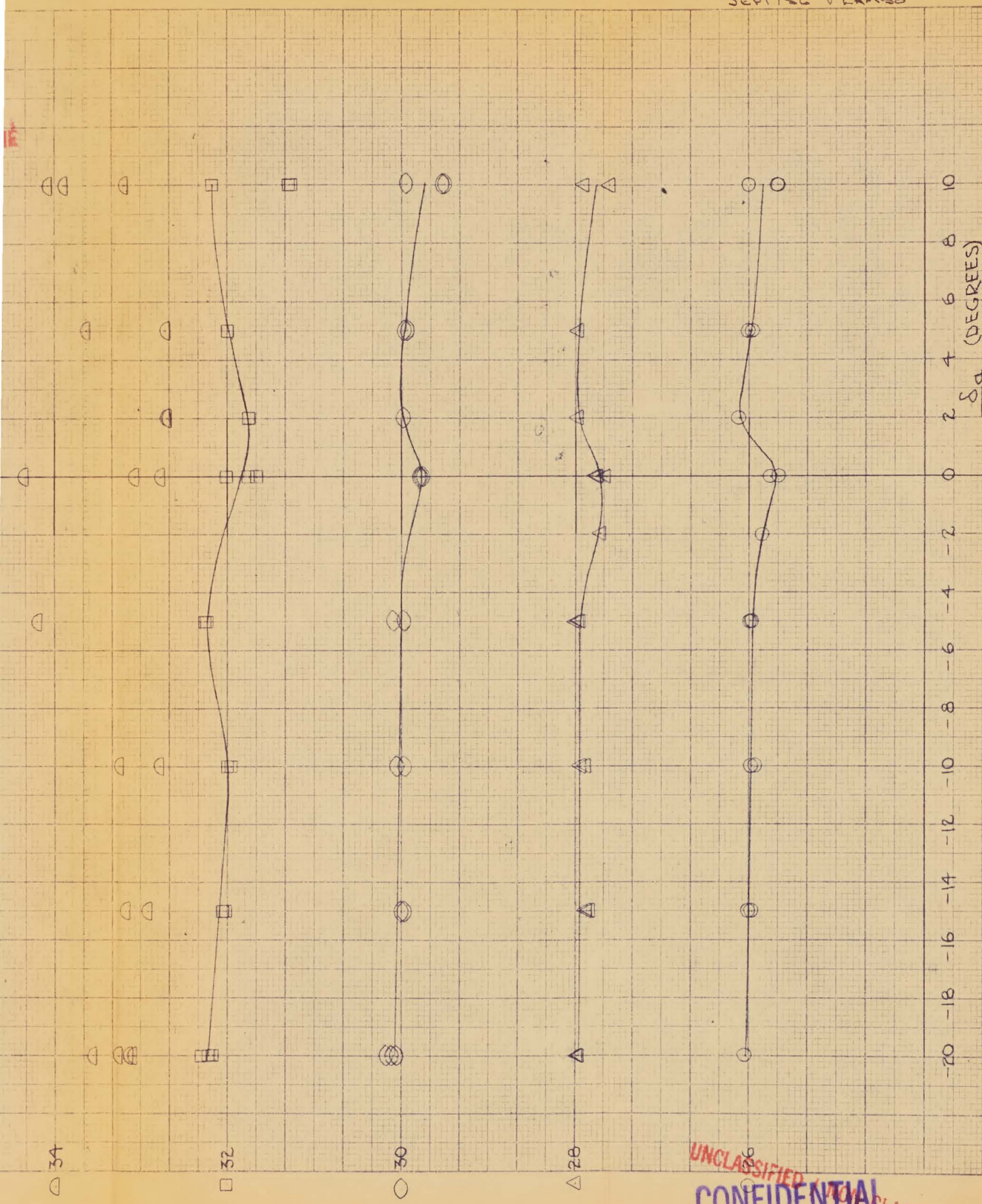
RUN	δ_a
123 } +10	
160 }	
161	+5
155	+2
121	0
154	-2
159	-5
156	-10
150	-15
149	-20

UNCLASSIFIED / NON CLASSIFIED

0.

P/WT/119 8.15.3

SEPT 156 J Lango



UNCLASSIFIED
CONFIDENTIAL
CLASSIFIED

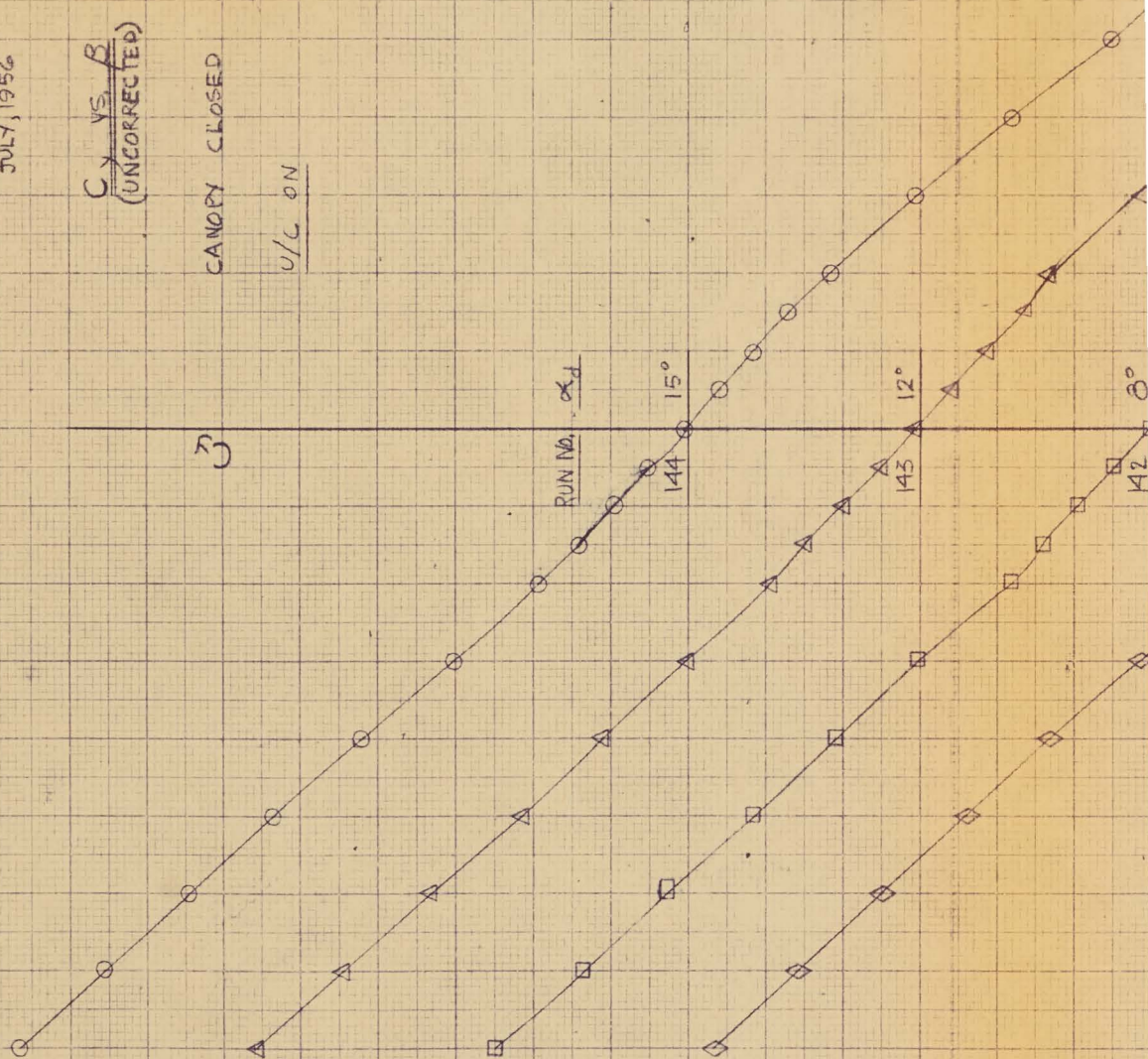
C-105
N.A.E. LOW SPEED W.T. TESTS
JULY, 1956

C_y vs. β
(UNCORRECTED)

CANOPY CLOSED

$U/C ON$

UNCLASSIFIED / NON CLASSIFIÉ



AUG 156 J.L.

P/WT/119 8-25

C_y

C-105

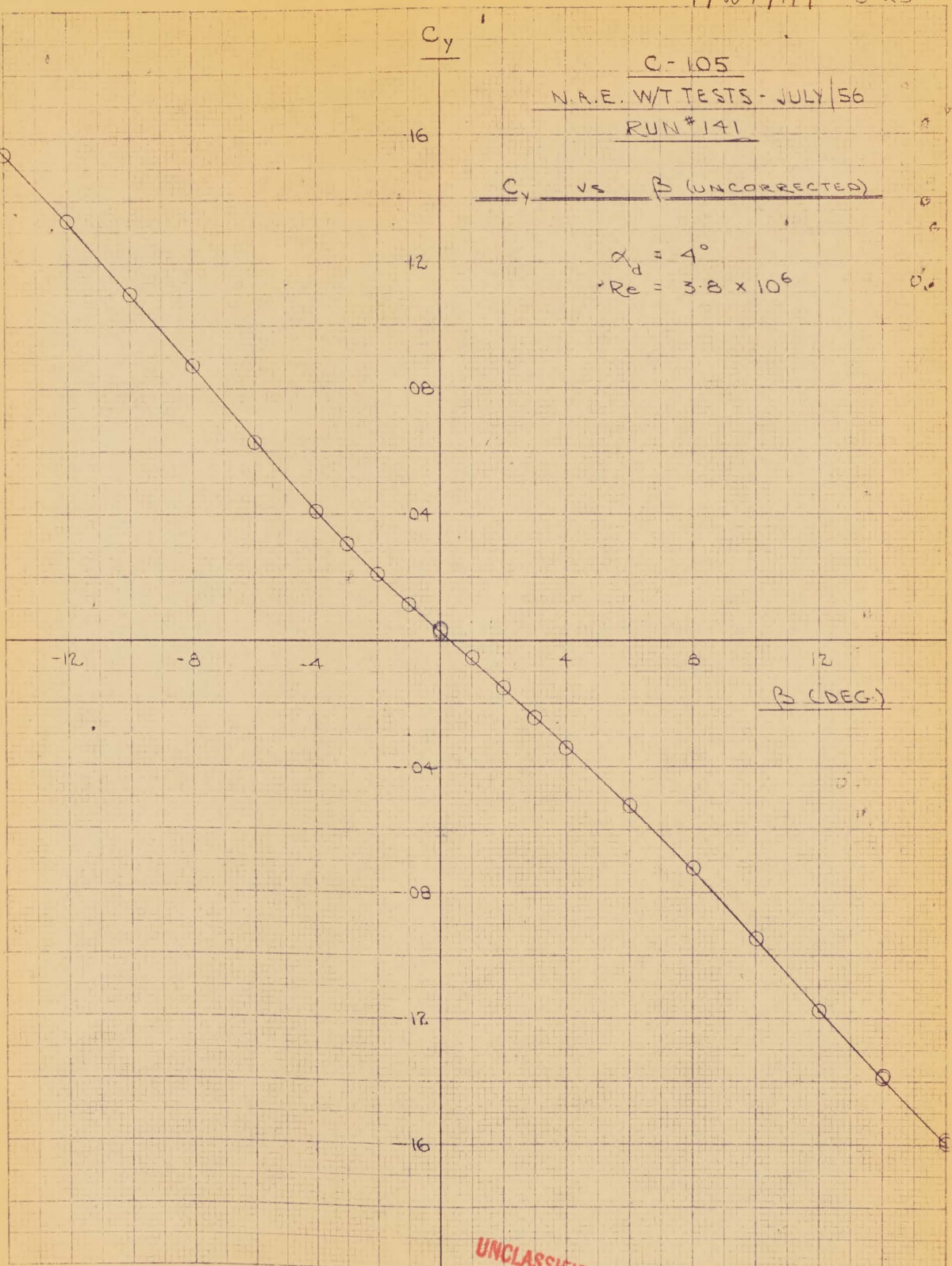
N.A.E. W/T TESTS - JULY 56

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
KOPPEL & CO.

UNCLASSIFIED
CONFIDENTIAL
CONFIDENTIAL

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

UNCORRECTED

C_y

SCALE:

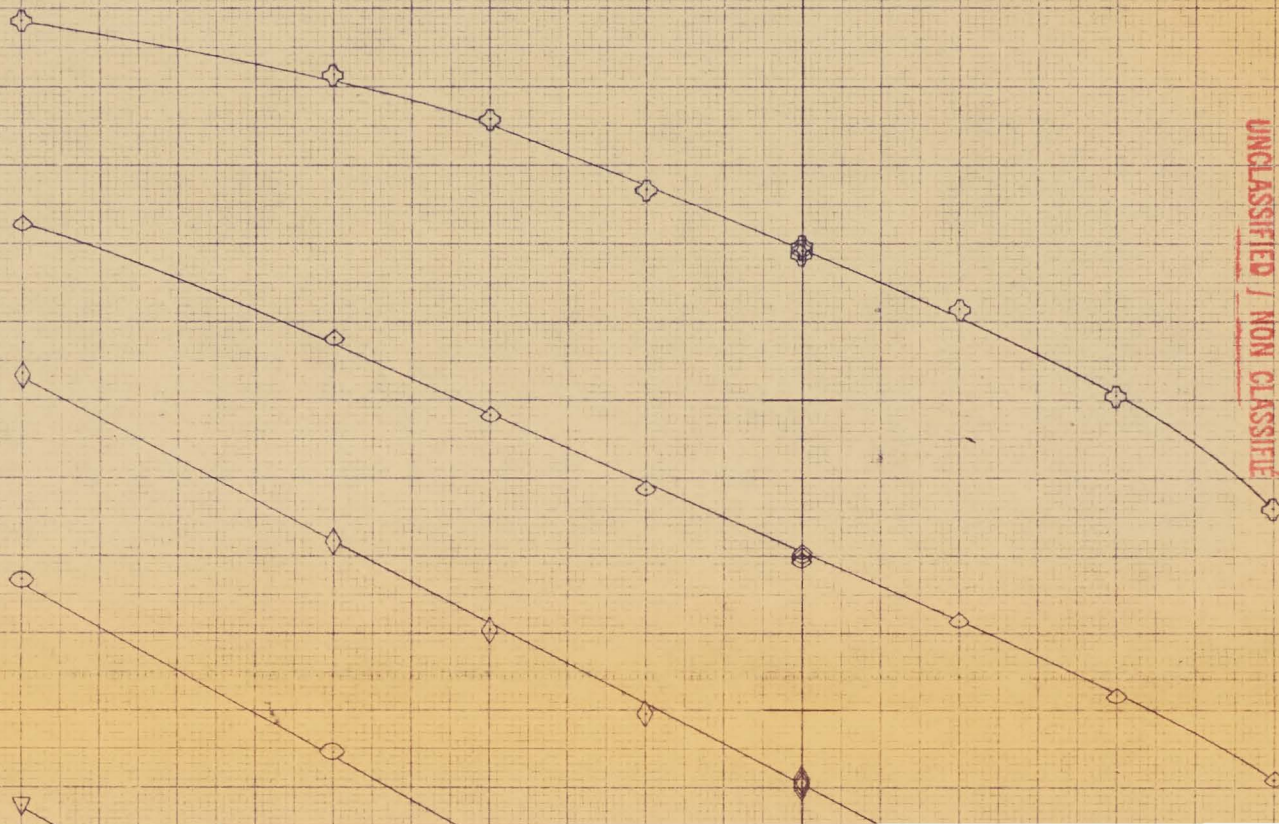
.02

ORIGINS:

$\diamond \alpha_r = 28^\circ$

$\diamond \alpha_r = 26^\circ$

UNCLASSIFIED / NON CLASSIFIED



C-105
NAE LOW SPEED W/T TESTS JULY/56
RUN 147 $\delta_p = 20^\circ$
Cy vs B

UNCORRECTED

Cy

SCALE:

.02

ORIGINS:

$\diamond - \alpha_p = 34^\circ$

UNCLASSIFIED / NON GLASSIFIED

SEF

UNCLASSIFIED / NON CLASSIFIÉ

C-105

N.A.E. LOW SPEED WIT TESTS

CY VS β (UNCORRECTED DATA)

$\delta c = 0$

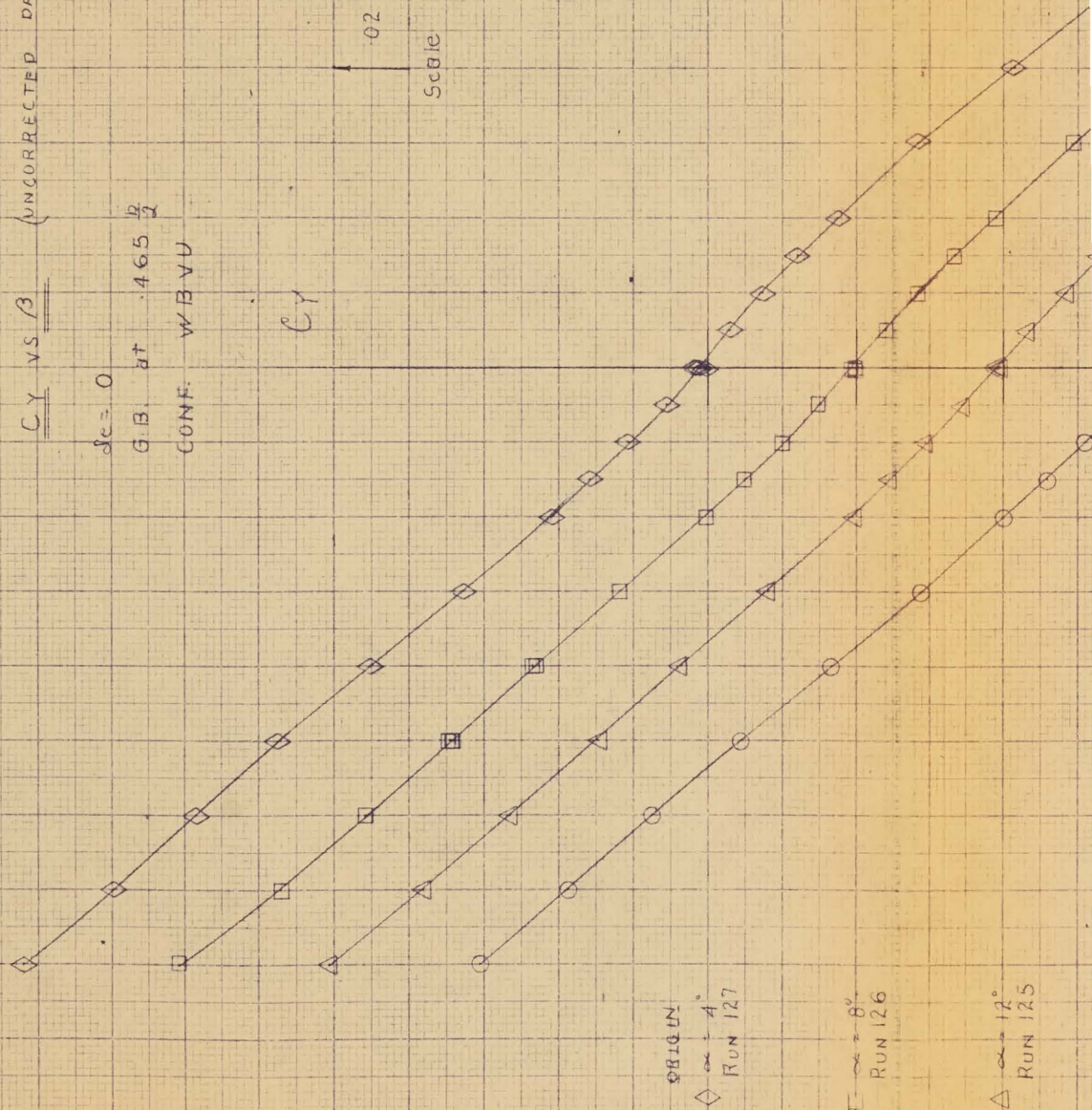
G.B. BT 465 $\frac{1}{2}$

CONF. WBBVU

CY

02

Scale

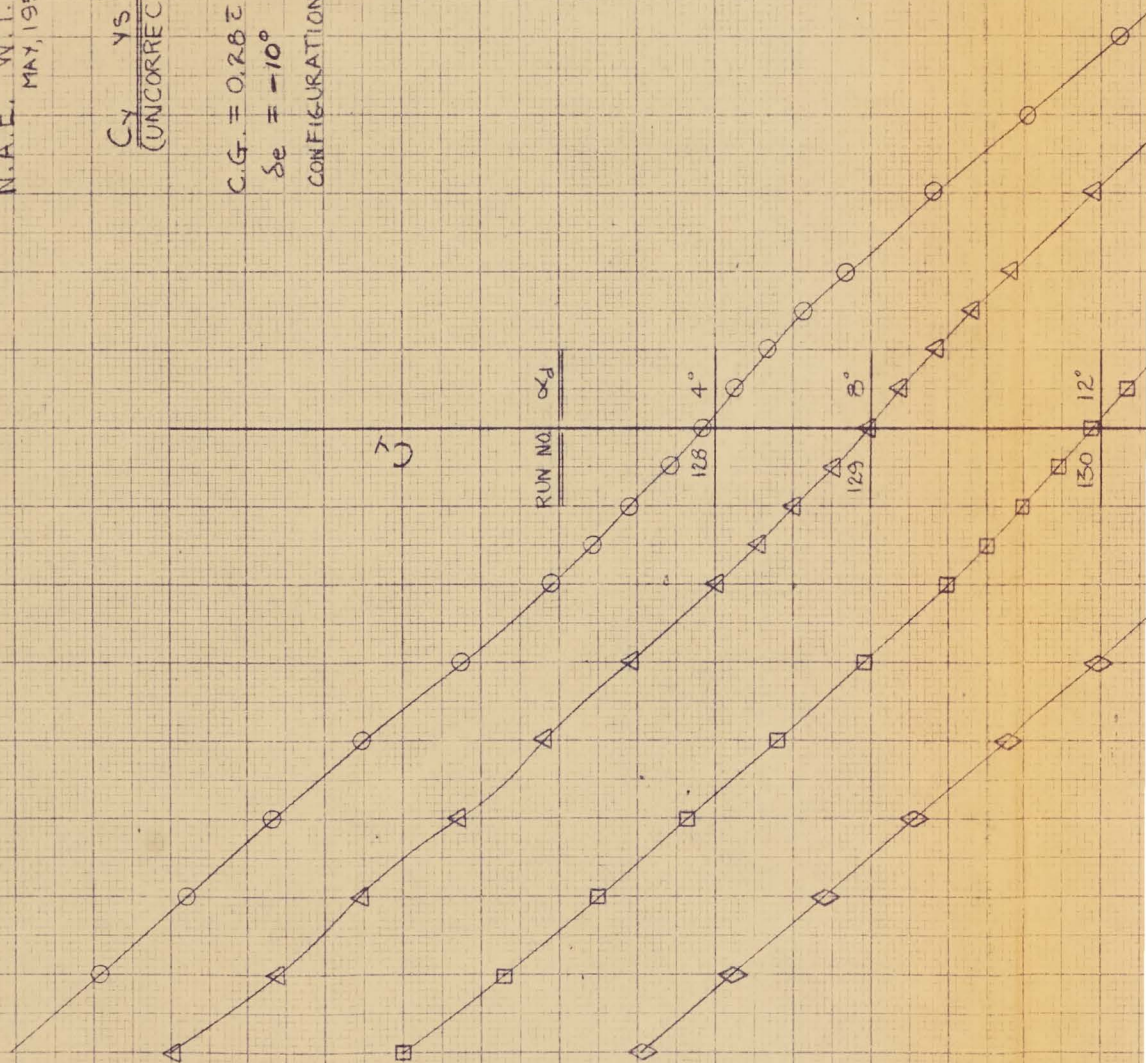


C-105
N.A.E. W.T. TESTS
MAY, 1956

C_x vs β
(UNCORRECTED)

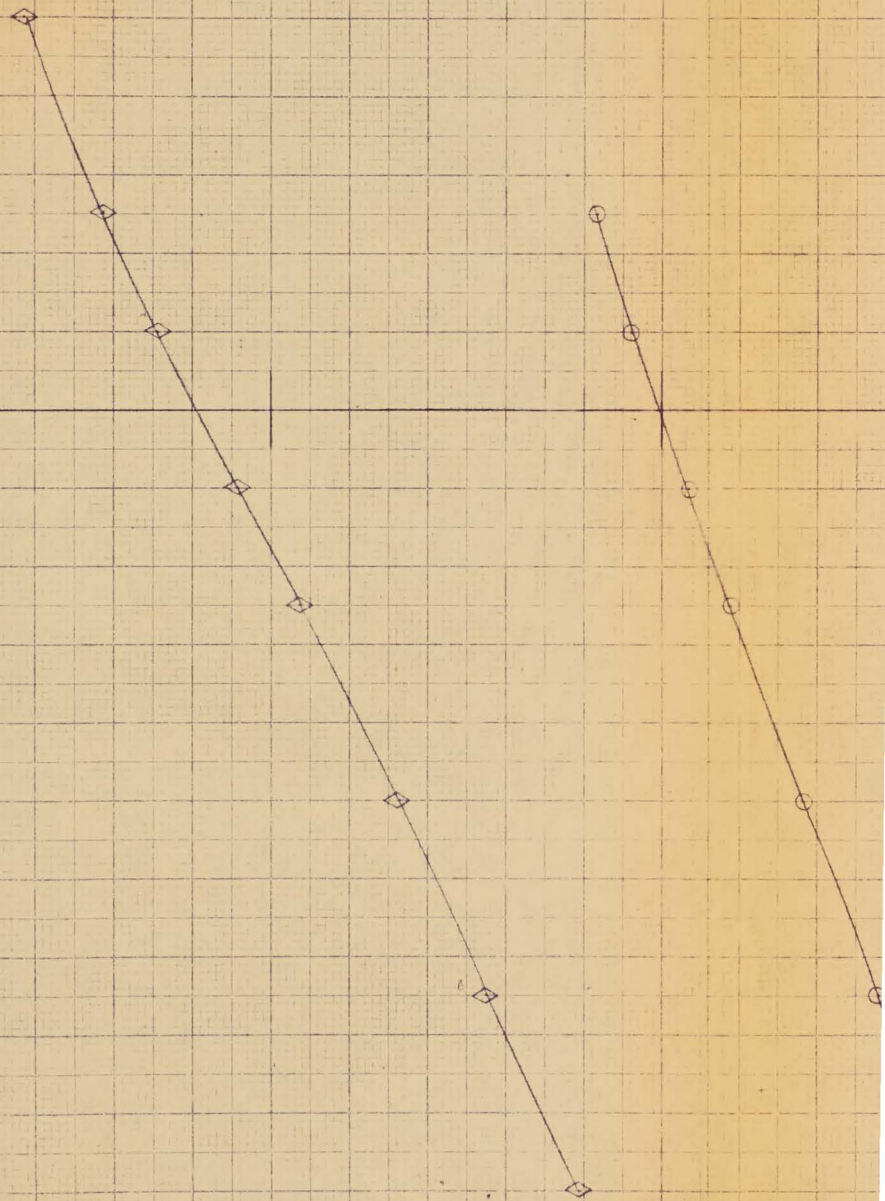
C.G. = 0.282 ON H.A.C.
 $\delta_e = -10^\circ$
CONFIGURATION: WBVU

UNCLASSIFIED / NON CLASSIFIED



C-105
 NAE WIT TESTS
 MAY 1956
 CY VS δA
 (UNCORRECTED)
 CY

Run	δA	Symbol	G/B.
132	15°	□	$465 \frac{b}{2}$
133	12°	△	$465 \frac{b}{2}$
134	8°	○	$465 \frac{b}{2}$
135	4°	◇	$465 \frac{b}{2}$



C_y

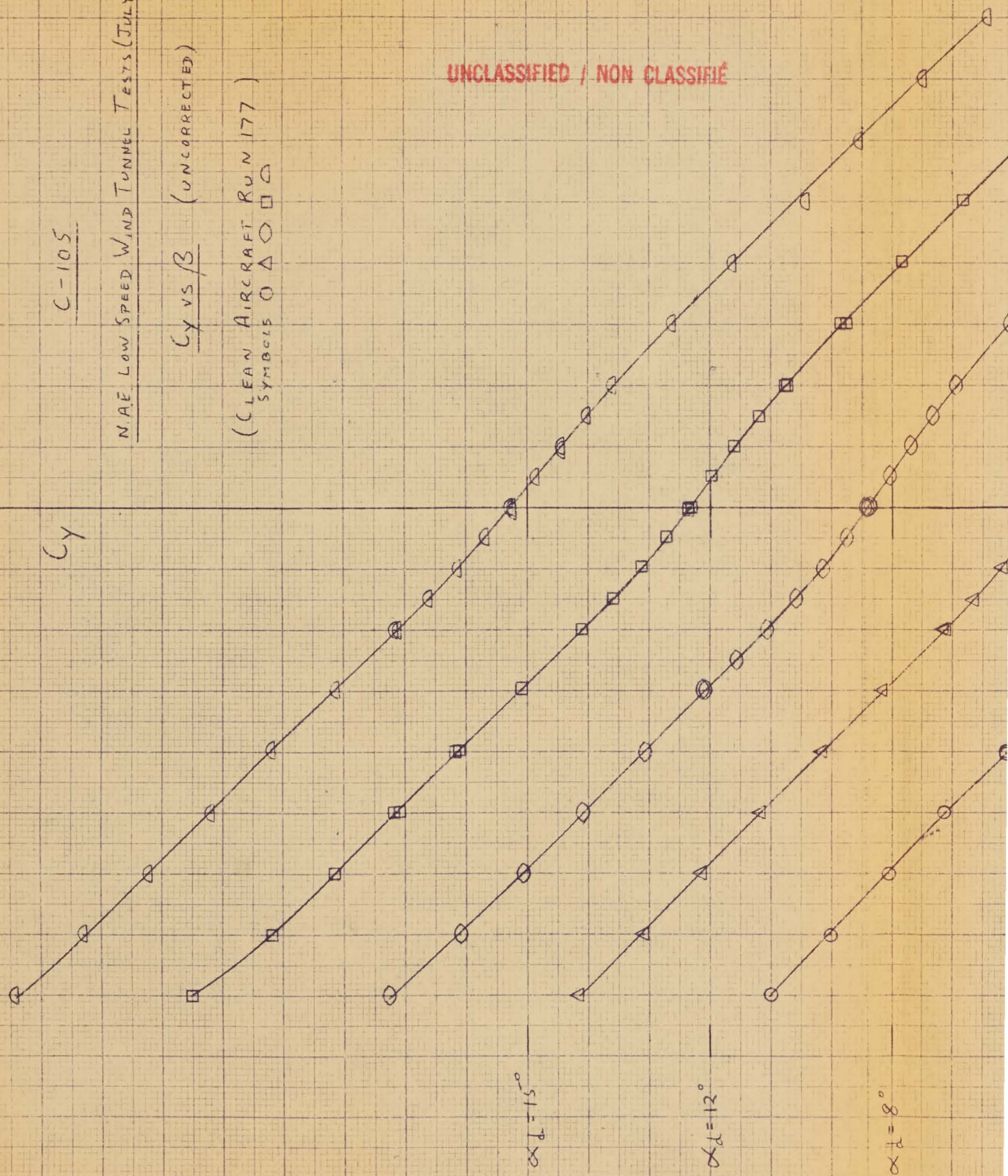
C-105

NAE LOW SPEED WIND TUNNEL TESTS (JULY 1959)

C_y vs β (UNCORRECTED)

(CLEAN AIRCRAFT RUN 177)
SYMBOLS $\circ \Delta \square \nabla$

UNCLASSIFIED / NON CLASSIFIÉ



C-105
NAE WT TESTS MAY/56
Cl vs β (UNCORRECTED)
FIN OFF

C.G. = .282 on M.A.C

C_e

Scale
-004

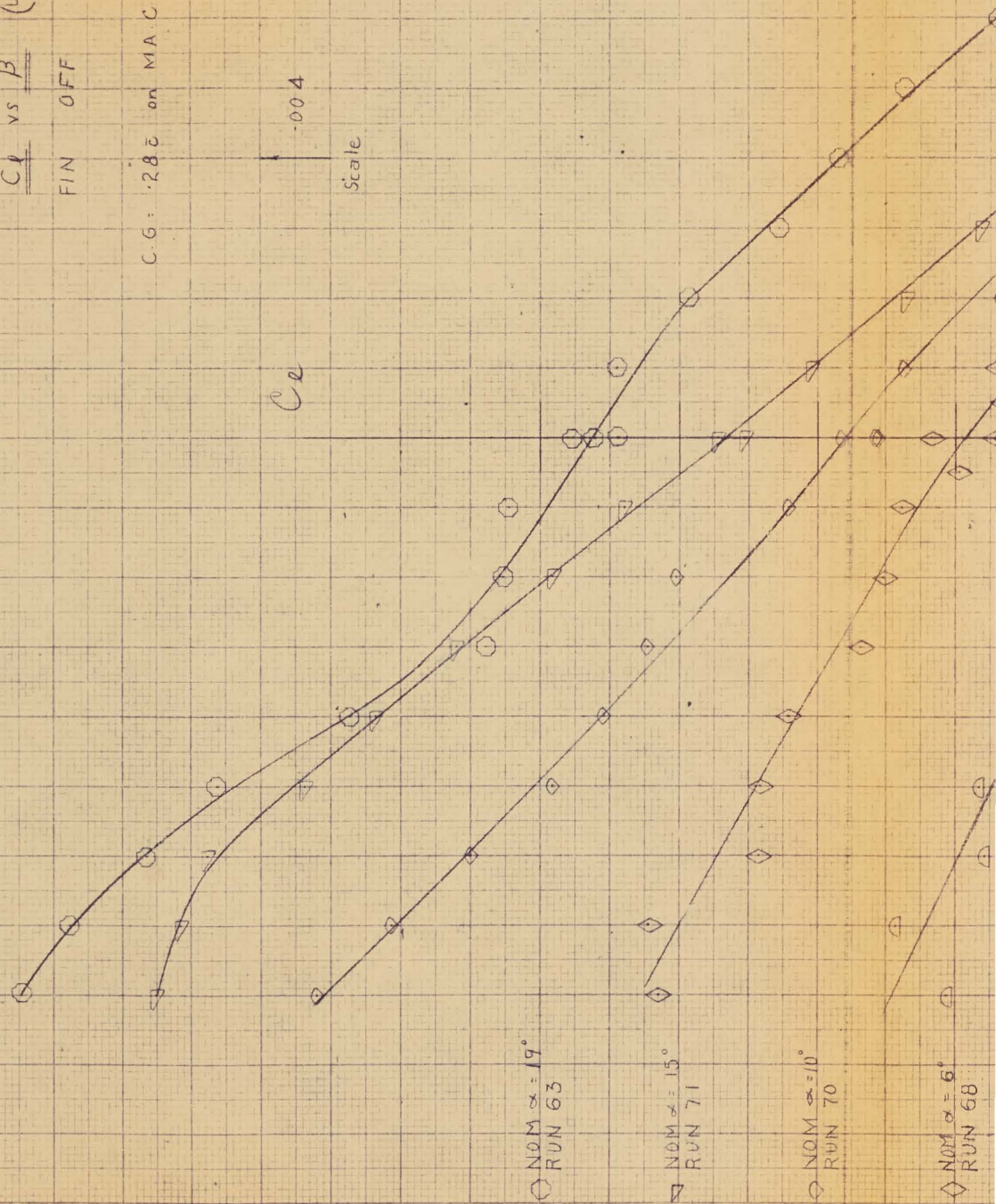
UNCLASSIFIED / NON CLASSIFIED

$\circ$ NOM $\alpha = 19^\circ$
RUN 63

∇ NOM $\alpha = 15^\circ$
RUN 71

$\diamond$ NOM $\alpha = 10^\circ$
RUN 70

$\diamond$ NOM $\alpha = 6^\circ$
RUN 68



C-105

NAE W/T TESTS MAY '56

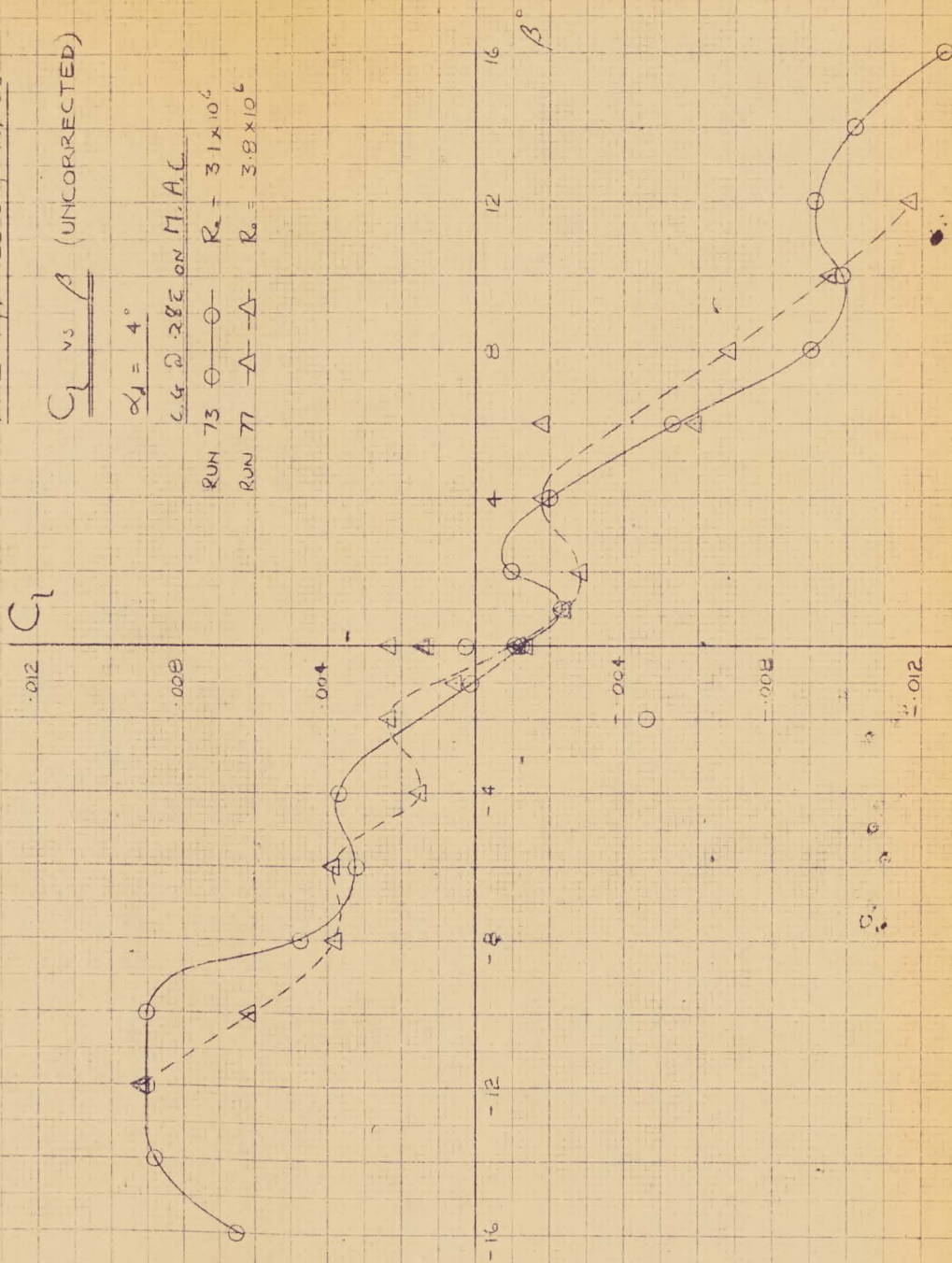
G_1 vs β (UNCORRECTED)

811

C. G. D. 28E on M. A. C.

RUN 73 ○ — ○

Run 77 Δ Δ Δ $R_0 = 3.9 \times 10^6$



DBO

P / WT / 119

JUNE 52

9. 4

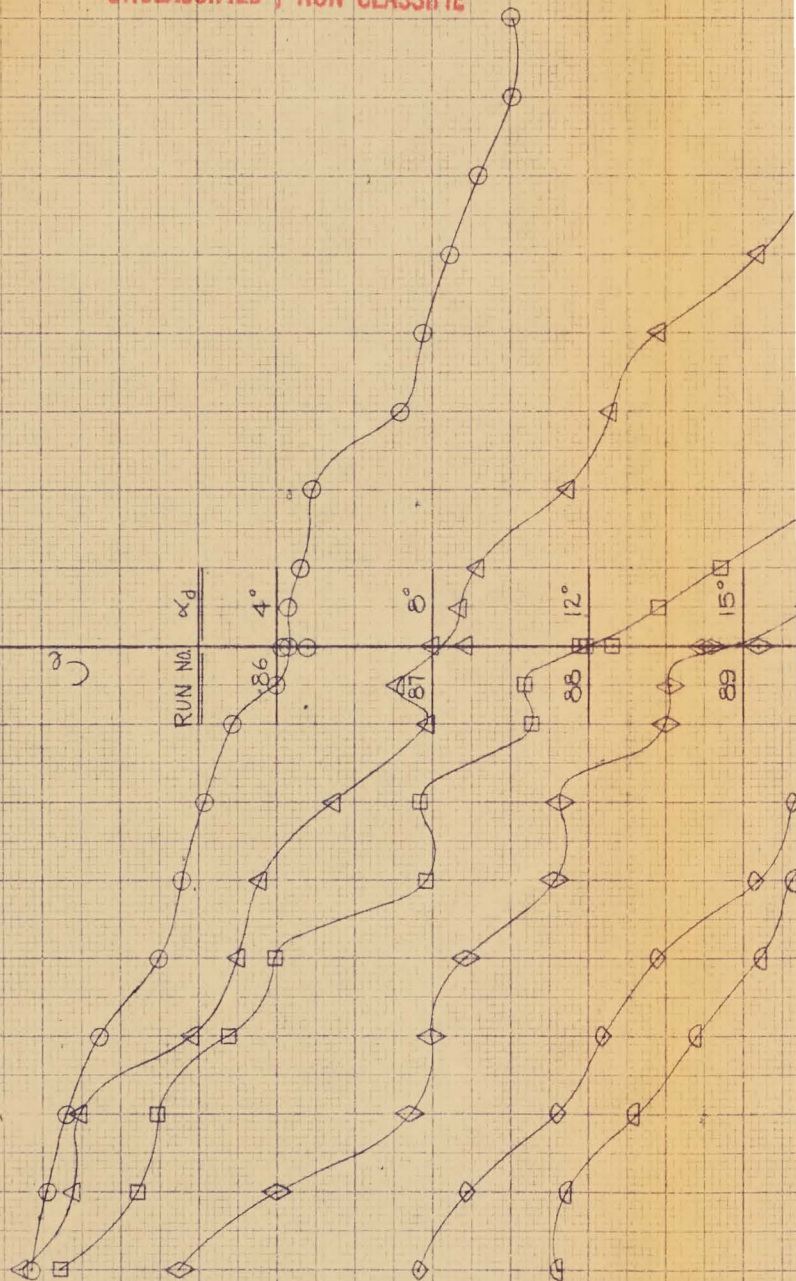
UNCLASSIFIED / NON-CONFIDENTIAL

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

C_p vs β
(UNCORRECTED)

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

UNCLASSIFIED / NON CLASSIFIED



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

C_L $\frac{1}{2} \delta_r$
(UNCORRECTED)

C.G. = 0.283 ON M.A.C.

$\delta_e = 0^\circ$

$\beta = 0^\circ$

CONFIG. = WBV

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

01
005
SCALE

C_L

α_d
(DEG)

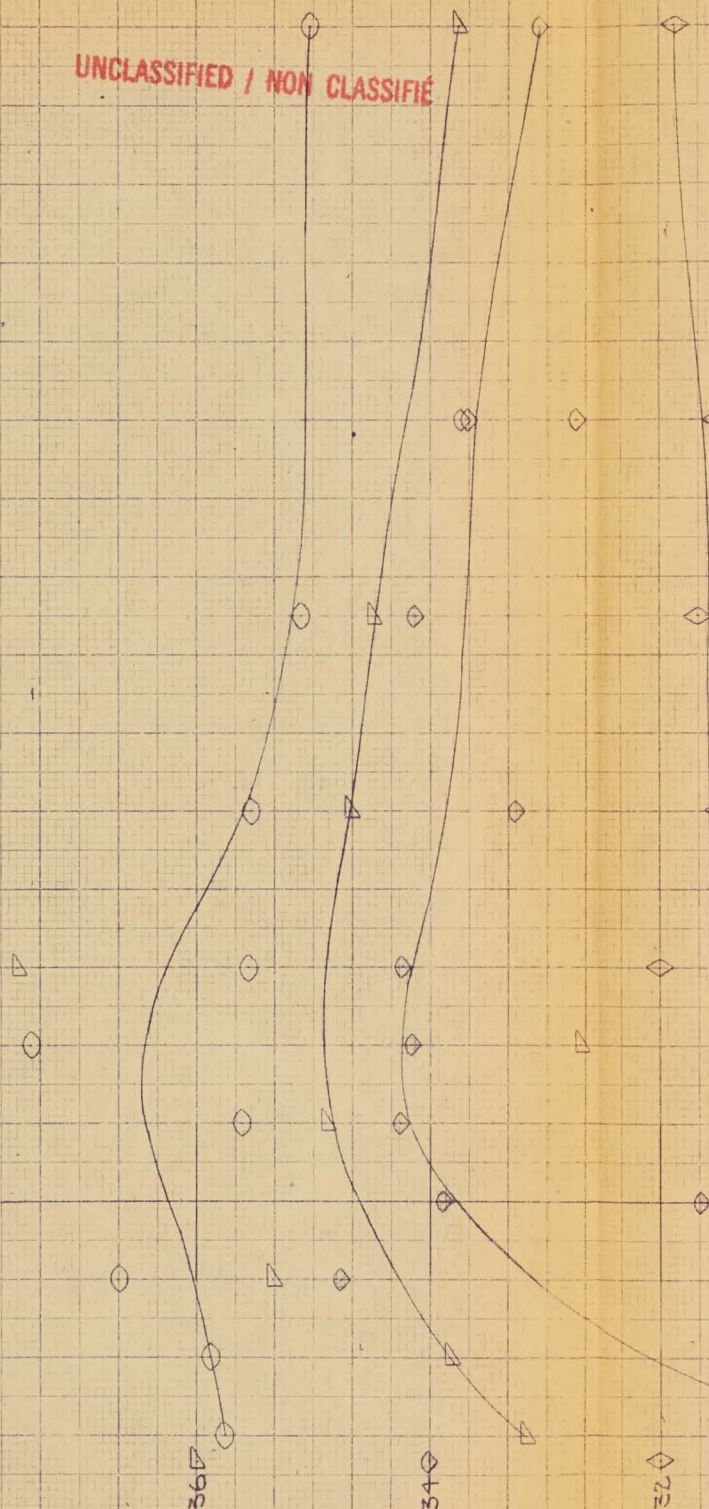
380

360

340

320

UNCLASSIFIED / NON CLASSIFIE



C-105

NAE LOW SPEED WIT TESTS

C₂ vs β (UNCORRECTED DATA)

RUN 121

C.4.2.283 ON M.A.C.

C₁

-002

Scale

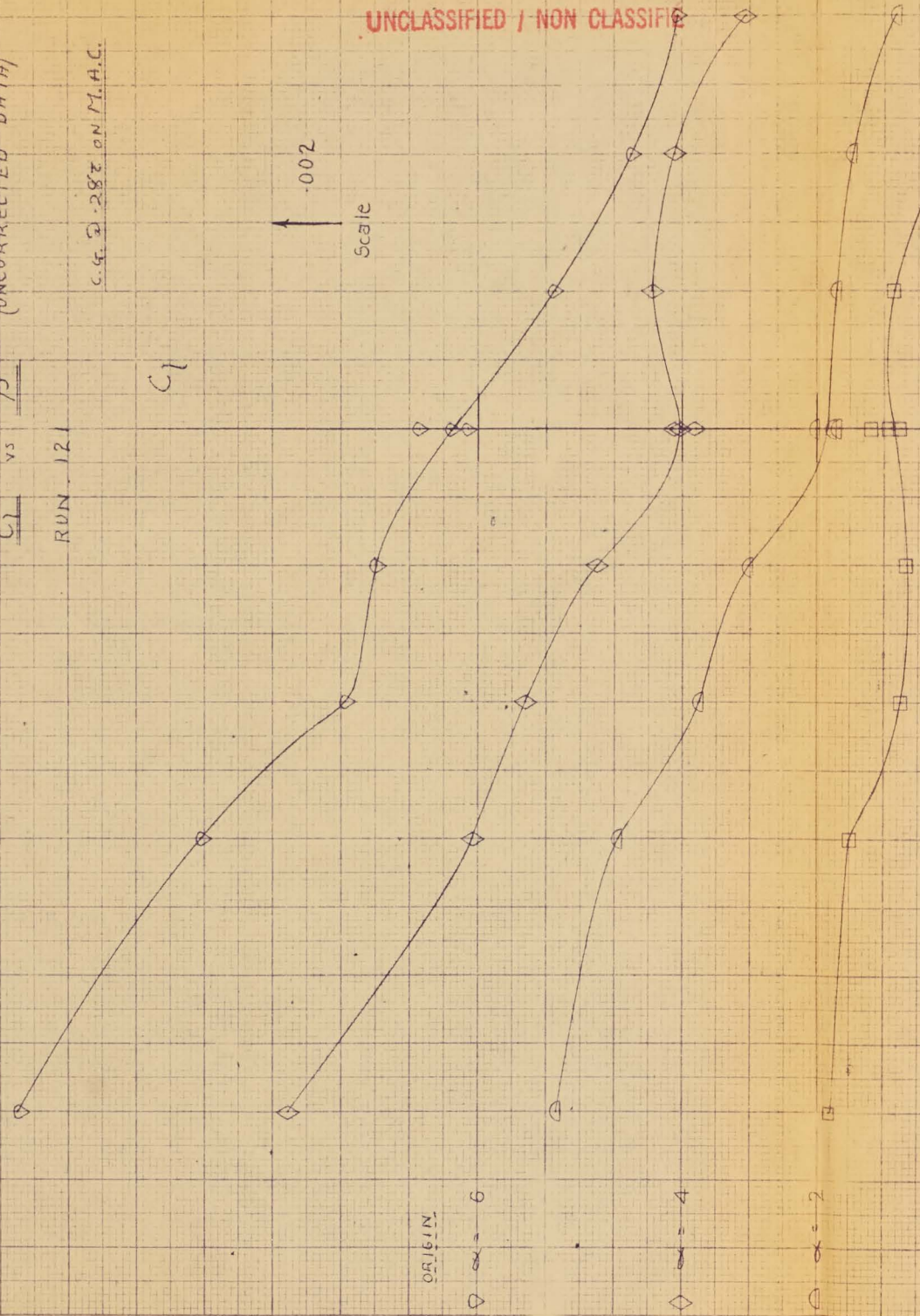
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ORIGIN

$\alpha = 6$

$\alpha = 4$

$\alpha = 2$



C-105

NAE LOW SPEED W/T TESTS

CL vs β (UNCORRECTED DATA)

RUN 121

C. 4. 2-28 E ON H.A.C.

C_i

Scale
↑ .002

UNCLASSIFIED / NON CLASSIFIED

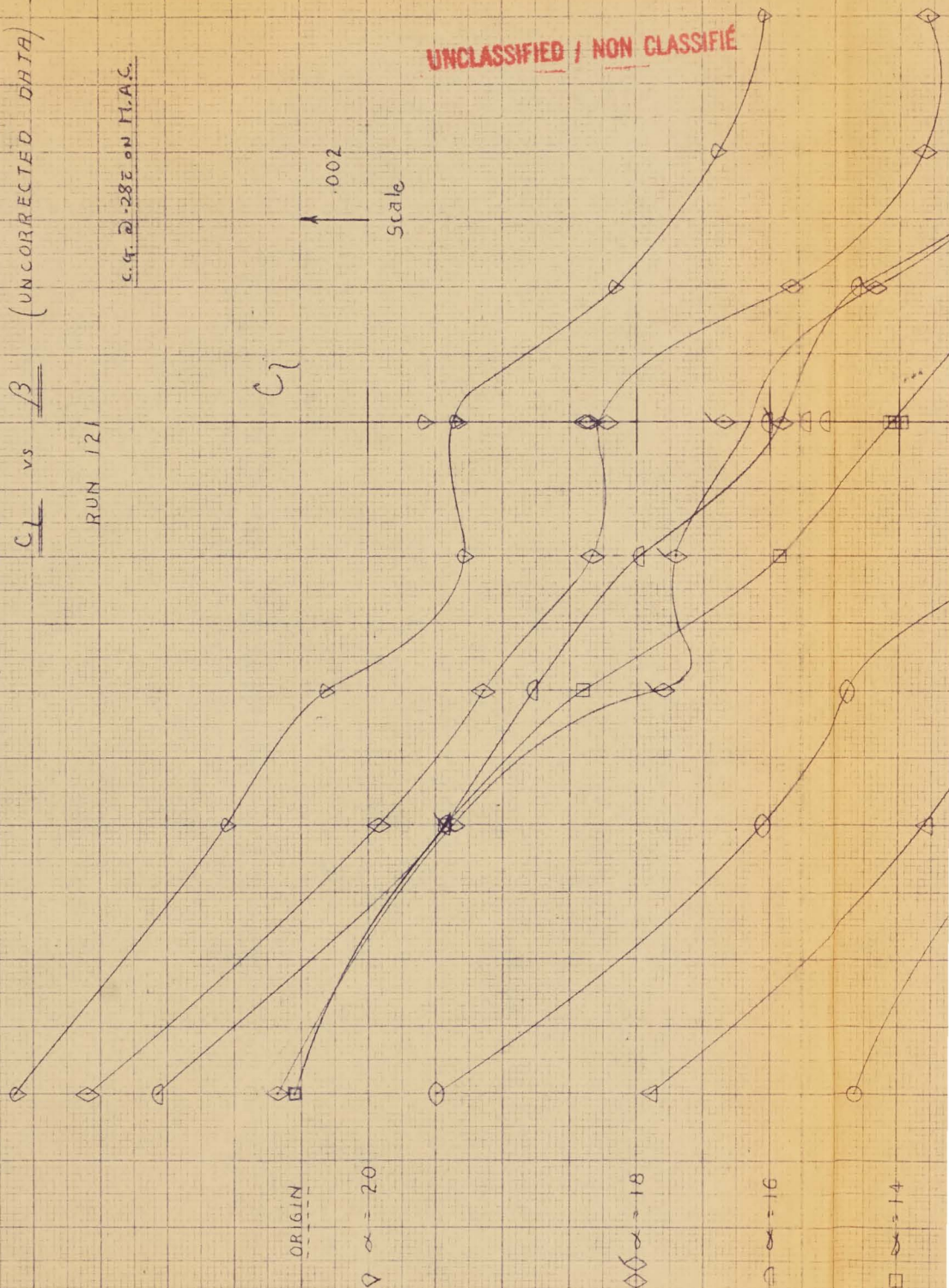
ORIGIN

$\alpha = 20$

$\alpha = 18$

$\alpha = 16$

$\alpha = 14$

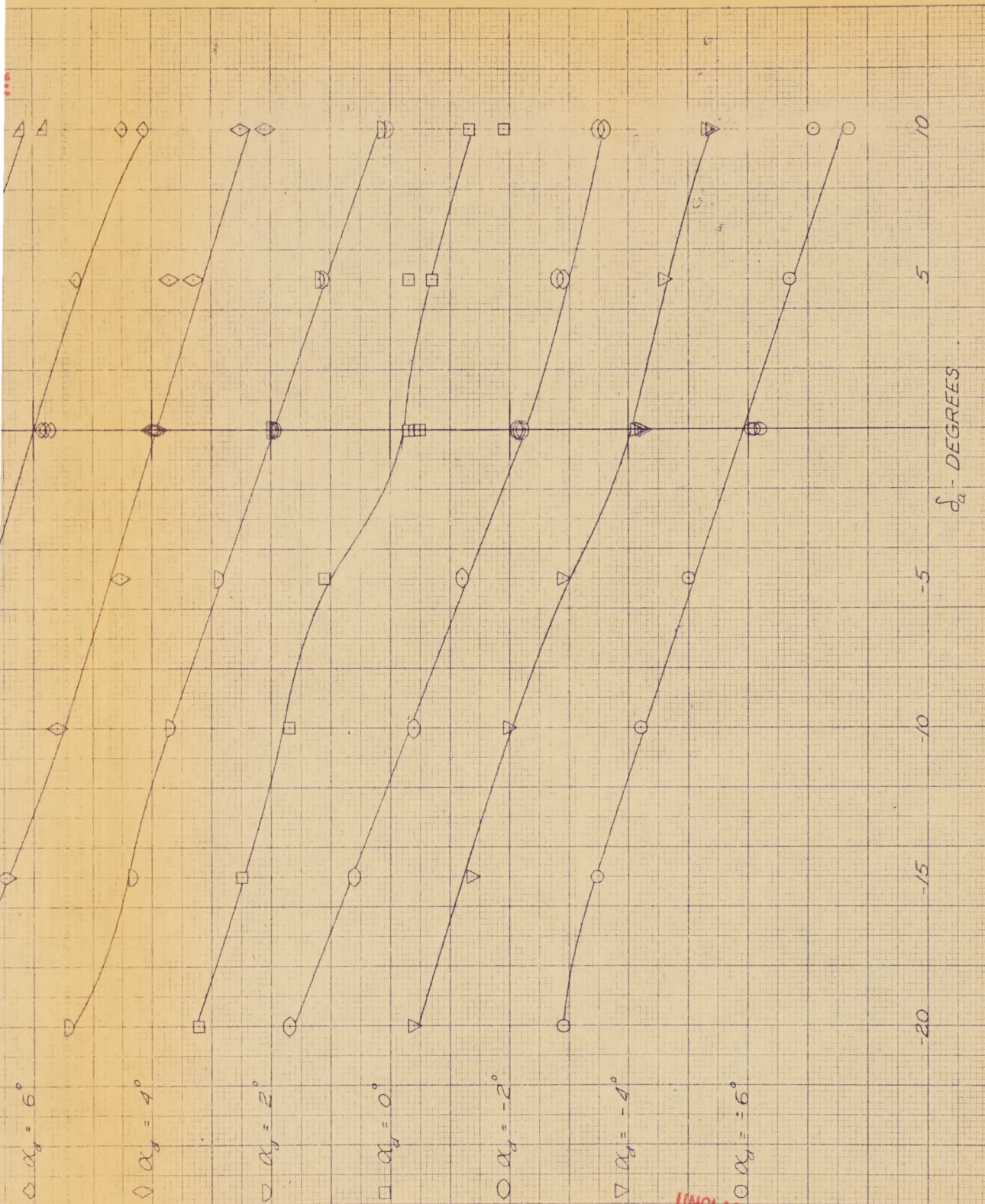


SEPT/56

16

P/WT/119

9.14-1



UNCLASSIFIED / NON CLASSIFIÉ
CONFIDENTIAL

C-105
NAE LOW SPEED W/T TESTS ($\beta=0$)
JULY/56
 C_f vs. δ_a (STARBOARD ONLY)

UNCORRECTED

C.G. @ 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:

↑
0.005

ORIGINS:

⊕ $\alpha_j = 28^\circ$

X $\alpha_j = 26^\circ$

△ $\alpha_j = 24^\circ$

◇ $\alpha_j = 22^\circ$

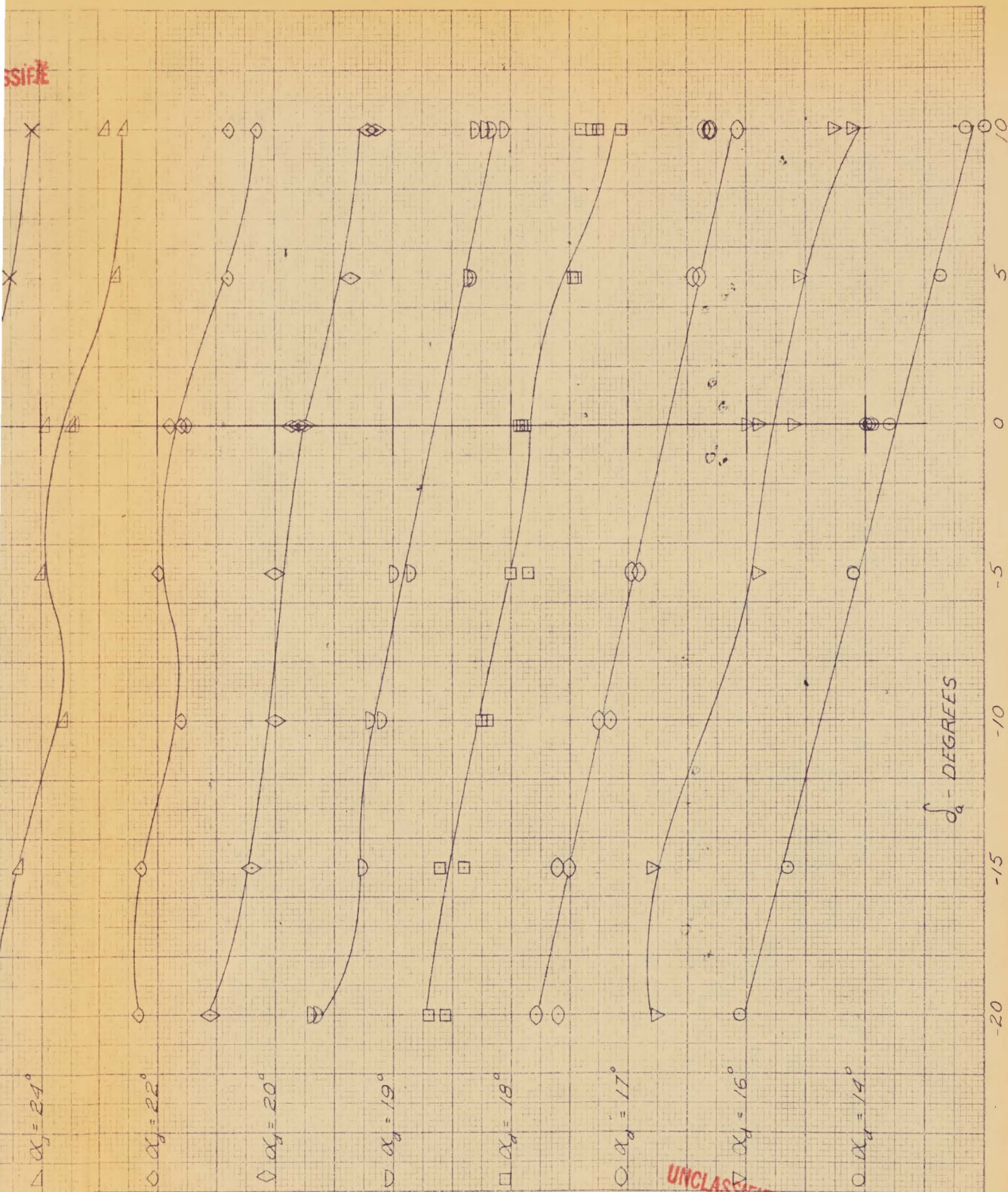
UNCLASSIFIED 17101-CLASSIFIED

SEPT/56 MG

P/WT/119

9.14.2

CONFIDENTIAL

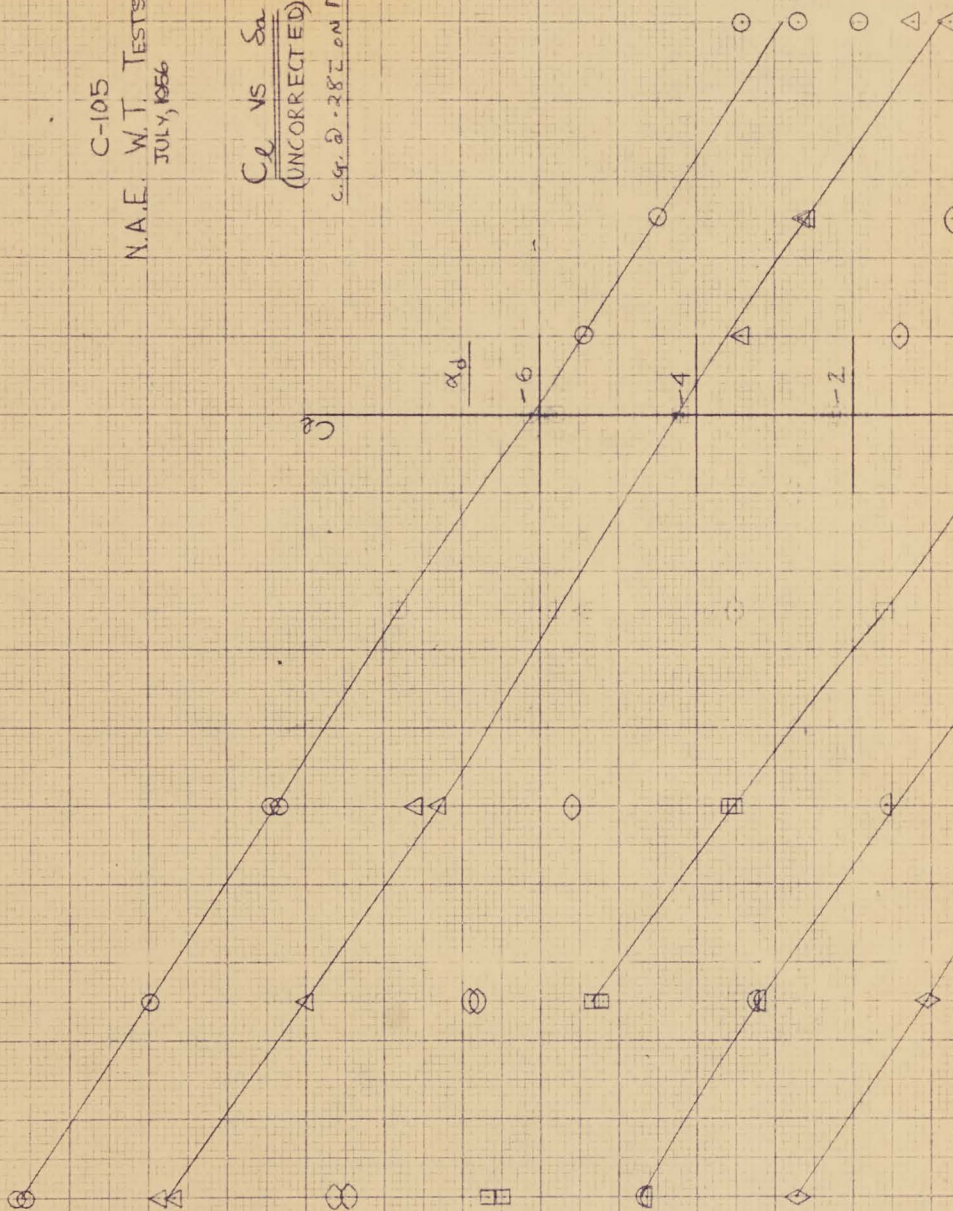


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C-105
N.A.E. W.T. TESTS
JULY, 1956

C_e VS S_a
(UNCORRECTED)
C.G. @ -28° ON T.T.A.C.

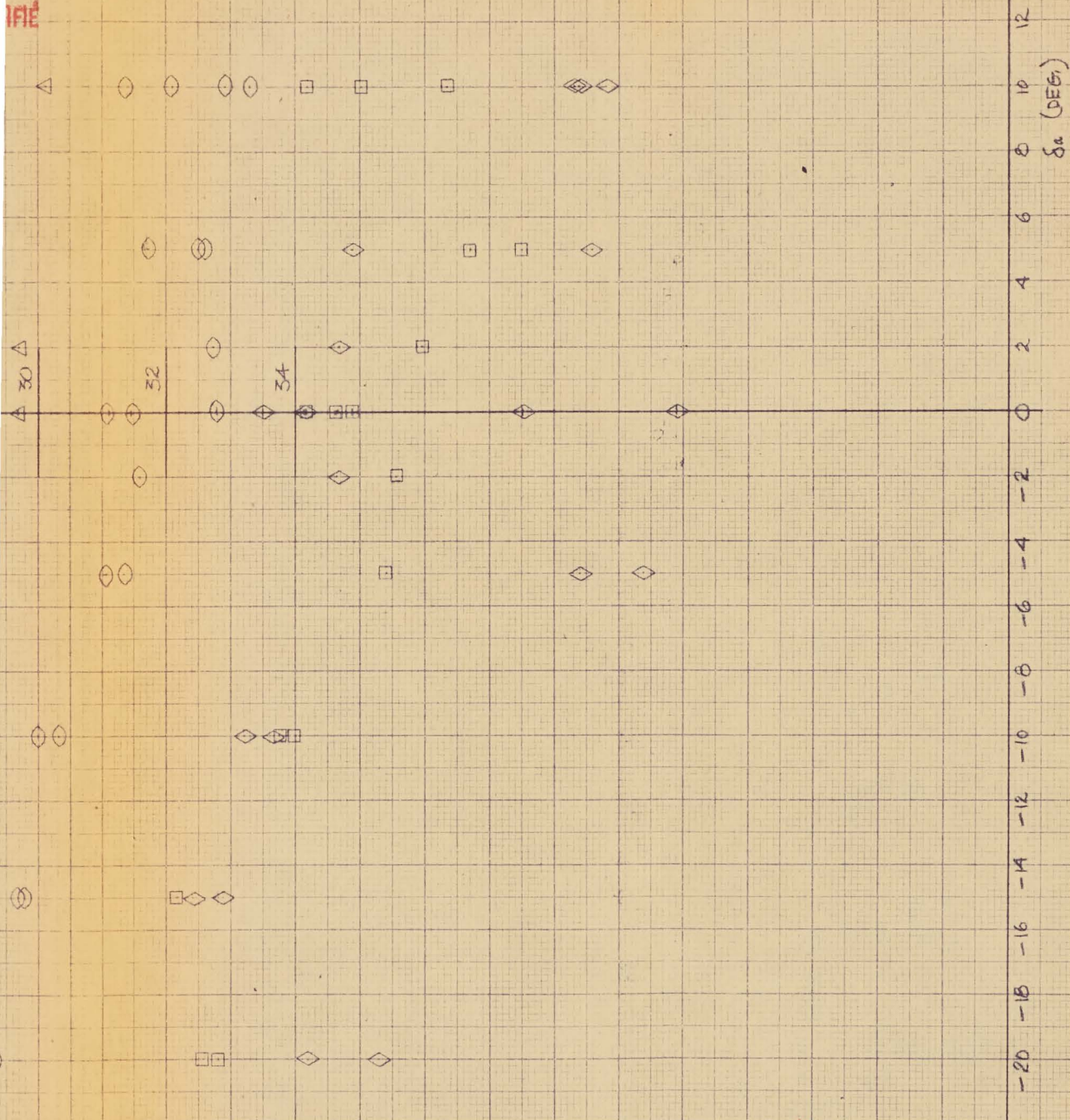
UNCLASSIFIED // NON CLASSIFIÉ



P/WT/119
Sept/56
D.

9.15.3
ASVA

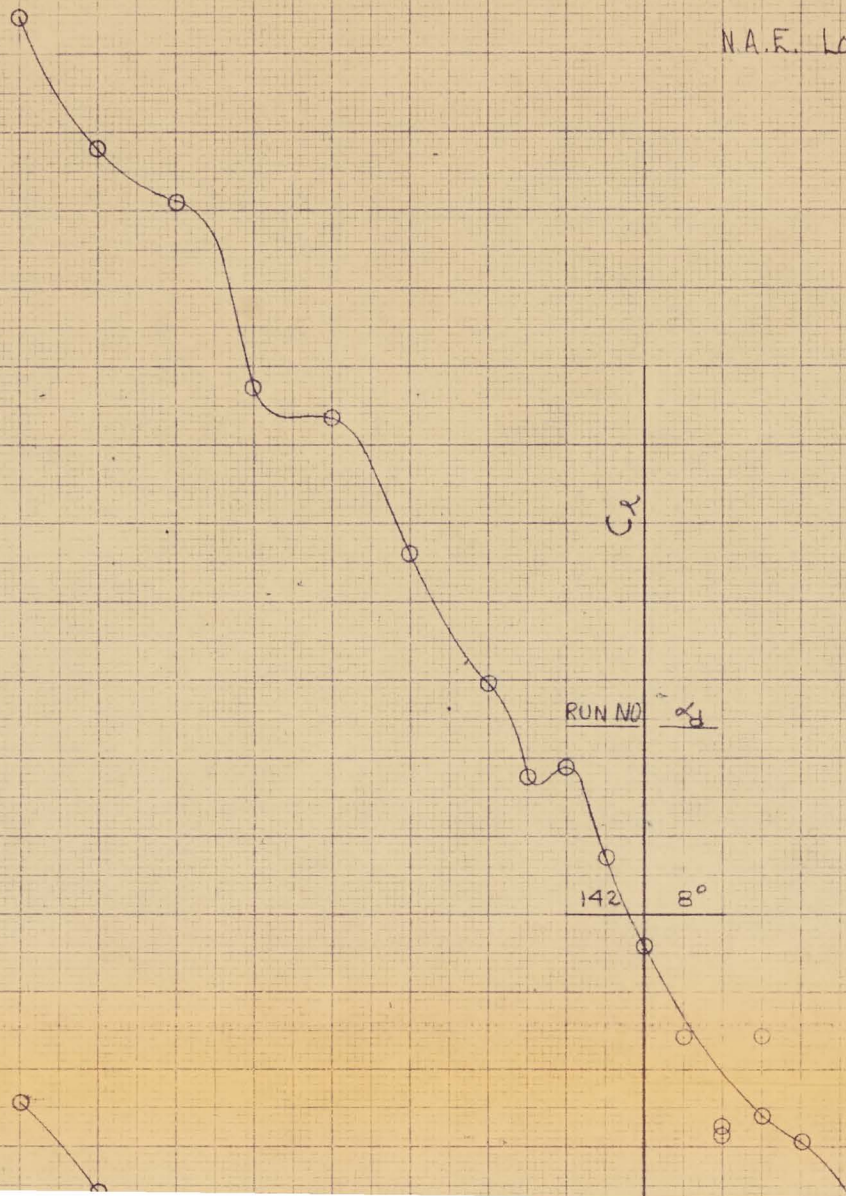
171E



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

C_L VS β
(UNCORRECTED)

c.g. @ .280 ON M.A.C.



UNCLASSIFIED / NON CLASSIFIED

C-105

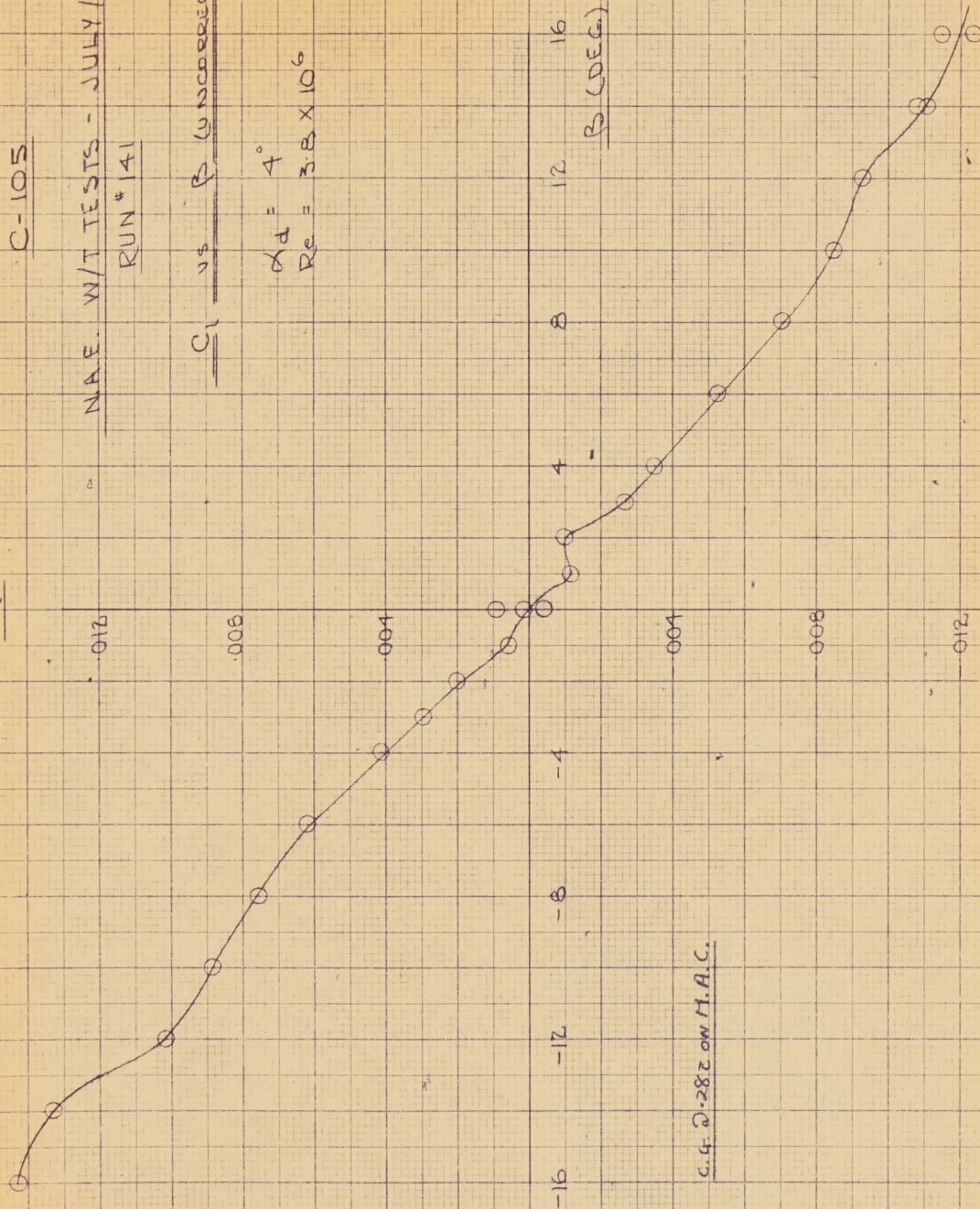
NAE. W/T TESTS - JULY/56
RUN #141

C₁ vs β (UNCORRECTED)

$$\alpha_d = 4^\circ$$

$$R_e = 3.8 \times 10^6$$

C₁



C.G. 2.282 ON H.A.C.

Aug. 156 J.W.
P/WT/119 9.25

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CONFIDENTIAL

C-105
NAE LOW SPEED WIT TESTS JULY 1956
RUN 147 $\delta_1 = 20^\circ$
 C_L VS β (UNCORRECTED)
S.E. 0-28 E ON M.A.C.

C_L

SCALE:
↑
0.002

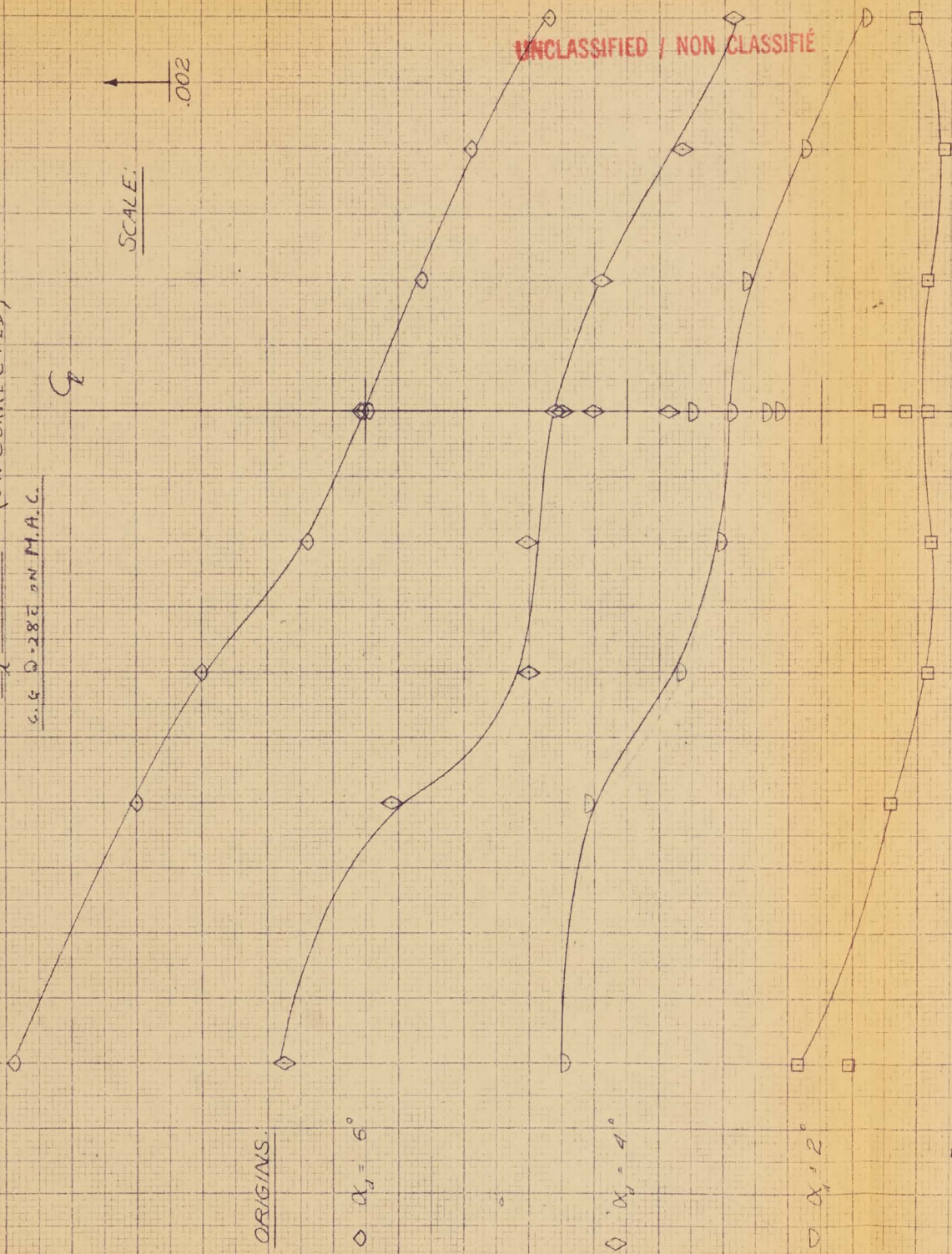
ORIGINS:

$\diamond \alpha_1 = 6^\circ$

$\diamond \alpha_1 = 4^\circ$

$\diamond \alpha_1 = 2^\circ$

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C-105
 NAE LOW SPEED W/T TESTS JULY/56
 RUN 147 $\alpha_f = 20^\circ$
 C_L VS β (UNCORRECTED)
 C.G. 2.38E ON M.A.C.

SCALE
 002

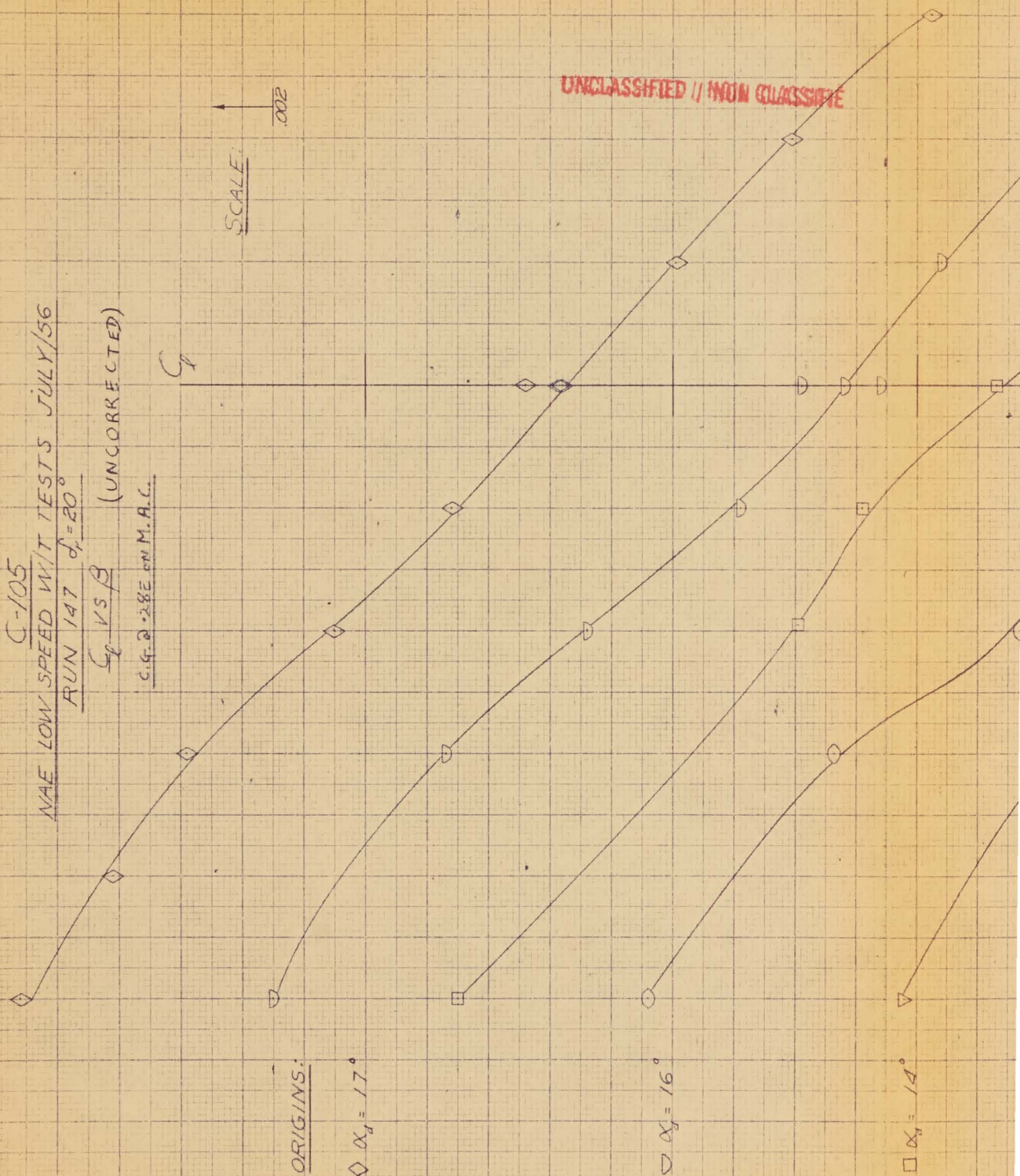
ORIGINS:

$\diamond \alpha_f = 17^\circ$

$\triangleright \alpha_f = 16^\circ$

$\square \alpha_f = 14^\circ$

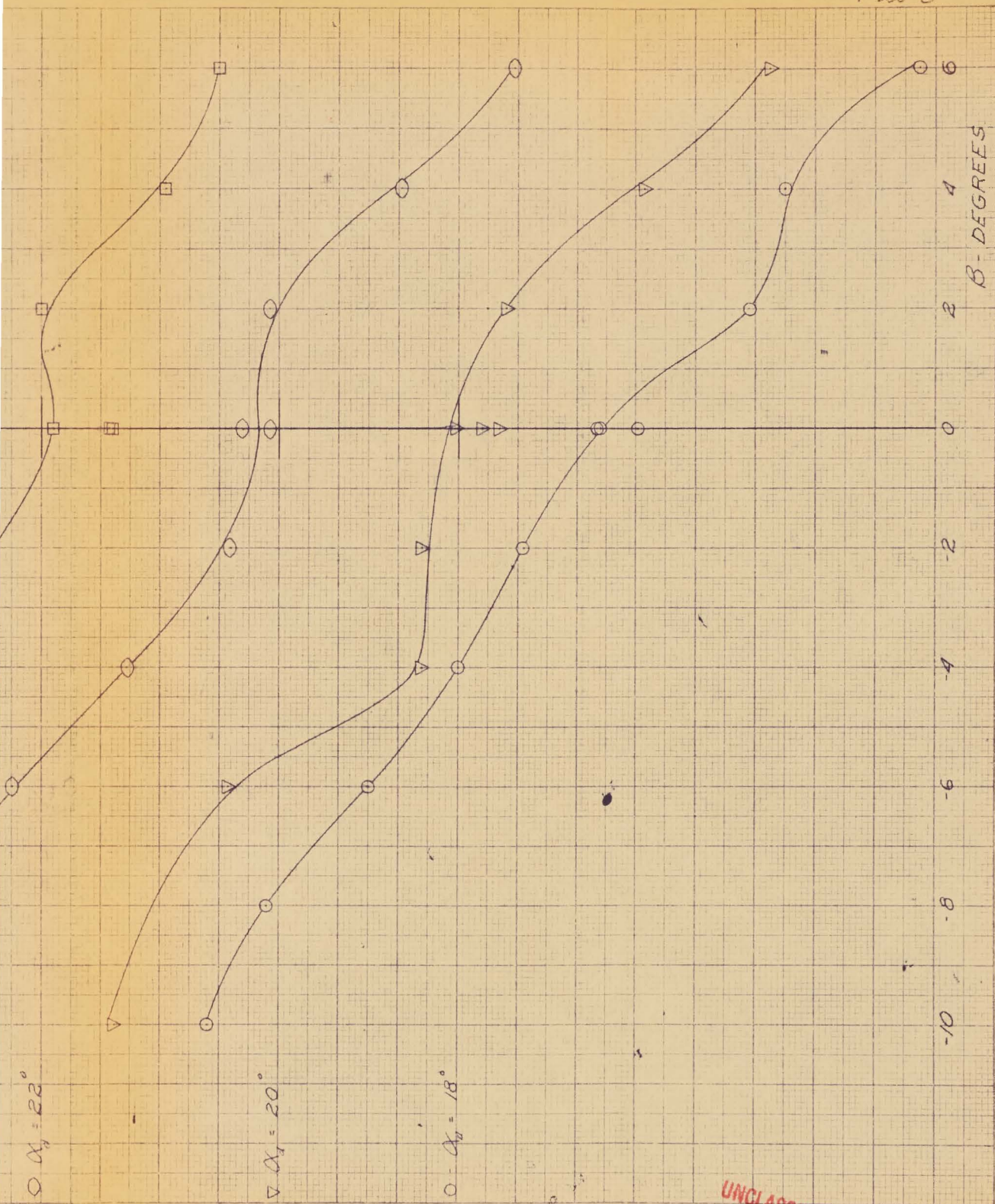
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SEPT/56 MB

P/WT/119

9-26-3



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C-105
N.A.E. LOW SPEED W/T TESTS

C_L VS β (UNCORRECTED DATA)

$\beta = 0$
G.B. at .465 $\frac{\beta}{2}$
CONF. WB VU

2.5 D-28E ON M.A.C.

005
Scale

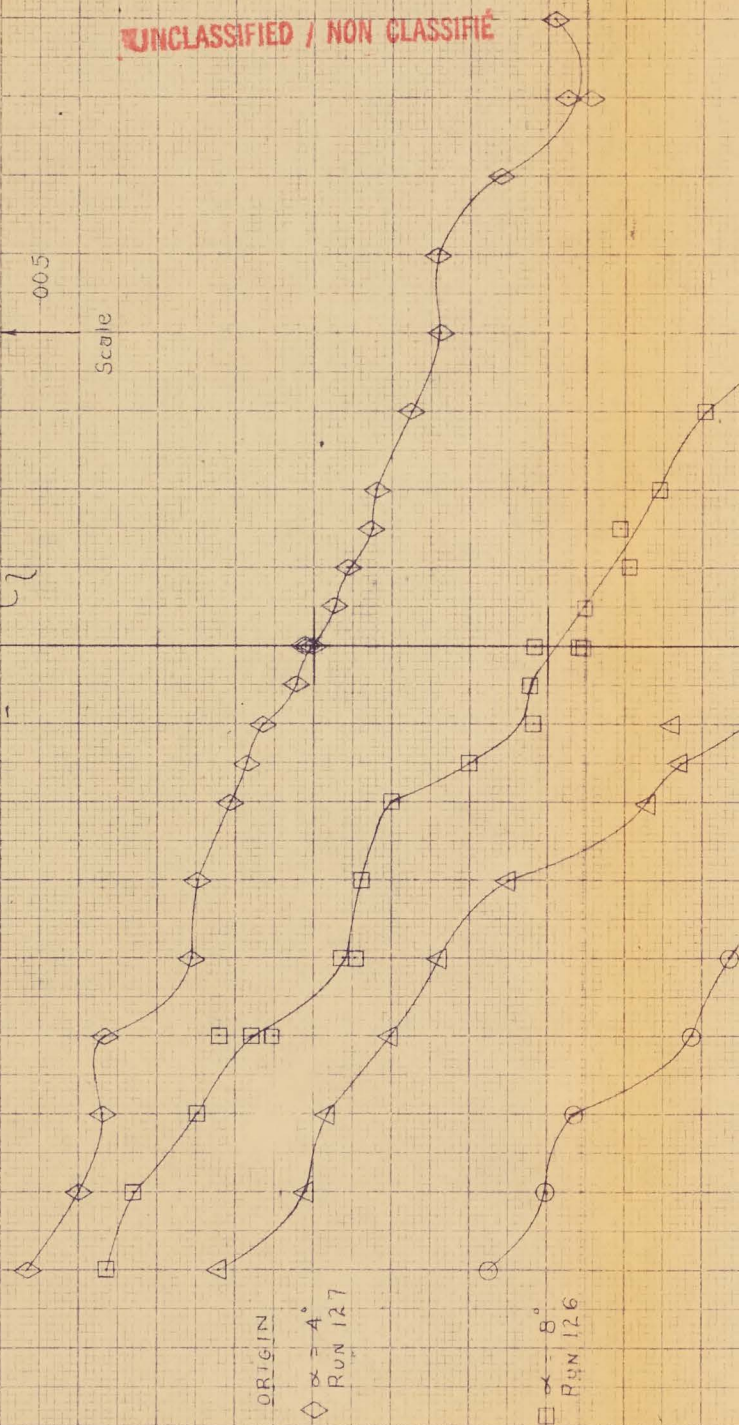
C_L

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ORIGIN

$\alpha = 4^\circ$
Run 127

$\alpha = 8^\circ$
Run 126



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

C.G. YS. SA
(UNCORRECTED)
C.G. 0.283 ON M.A.C.

RUN NO

26

UNCLASSIFIED / NON CLASSIFIÉ

