

QC
Avro
C-105
P/WT/7
V4

QCX
Avro
CF105
P-WT-7

(3)

FILE IN VAULT

C105

P/WIND TUNNEL/7

G.A.L. TESTS SEPT. 1953.

ANALYZED

CORRECTED PLOTS

UNCLASSIFIED

CLASSIFIED 10/1/80
SECRET

C-105

P/WIND TUNNEL/7

C.A.L. TESTS - SEPT. 1953

CORRECTED PLOTSCONTENTS

	<u>Page</u>
<u>I LIFT</u>	
C_L vs Q for $\delta = 0$ (cambered wing)	1.1
C_L vs Q for $\delta = 0$ (uncambered wing)	1.2
C_L vs Q for $\delta = + 10^\circ$ (uncambered wing)	1.3
C_L vs Q for $\delta = - 5^\circ$ (uncambered wing)	1.4
C_L vs Q for $\delta = - 10^\circ$ (uncambered wing)	1.5
C_L vs Q for $\delta = - 20^\circ$ (uncambered wing)	1.6
C_L vs Q for $\delta = - 30^\circ$ (uncambered wing)	1.7
<u>II. FITCHING MOMENT</u>	
C_M vs Q for $\delta = 0$ (cambered)	2.1
C_M vs Q for $\delta = 0$ (uncambered)	2.2
C_M vs Q for $\delta = + 10^\circ$ to $- 30^\circ$ (as above) (uncambered)	2.3 to 2.7
C_M vs C_L for $\delta = 0$ (cambered)	2.8
C_M vs C_L for $\delta = 0$ (uncambered)	2.9
<u>III. DRAG</u>	
C_D vs C_L for $\delta = 0$ (cambered)	3.1
C_D vs C_L for $\delta = 0$ (uncambered)	3.2
C_D vs C_L for $\delta = + 10^\circ$ to $- 30^\circ$ (as above) (uncambered)	3.3 to 3.7
C_D vs C_L^2 for $\delta = 0$ (cambered)	3.8
C_D vs C_L^2 for $\delta = 0$ (uncambered)	3.9
C_D vs C_L^2 for $\delta = + 10^\circ$ to $- 30^\circ$ (as above) (uncambered)	3.10 to 3.14
<u>IV. ELEVATOR HINGE MOMENT</u>	
C_{h_e} vs Q for $\delta = 0$ (uncambered)	4.1
C_{h_e} vs Q for $\delta = + 10^\circ$ to $- 30^\circ$ (as above) (uncambered)	4.2 to 4.6

UNCLASSIFIED / NON CLASSIFIÉ

CONTENTS (Continued)

<u>V</u>	<u>HIGH INCIDENCE RANGE</u>	<u>Page</u>
	C_L vs Q for $\delta = 0$ (cambered $\neq$ uncambered)	5.1.1
	C_L vs Q for all δ (uncambered)	5.1.2
	C_M vs Q for all δ	5.2
	C_M vs C_L for $\delta = 0$ (cambered $\neq$ uncambered)	5.3.1
	C_M vs C_L for all δ (uncambered)	5.3.2
	C_{he} vs Q for all δ (uncambered)	5.4
<u>VI</u>	<u>HIGH REYNOLDS NO. EFFECTS</u>	
	C_L vs Q low $\neq$ high Reynolds No.	6.1
	C_M vs Q low $\neq$ high Reynolds No.	6.2
	C_M vs C_L low $\neq$ high Reynolds No.	6.3
	C_D vs C_L low $\neq$ high Reynolds No.	6.4
	C_{he} vs Q low $\neq$ high Reynolds No.	6.5

SEPT. 2/53

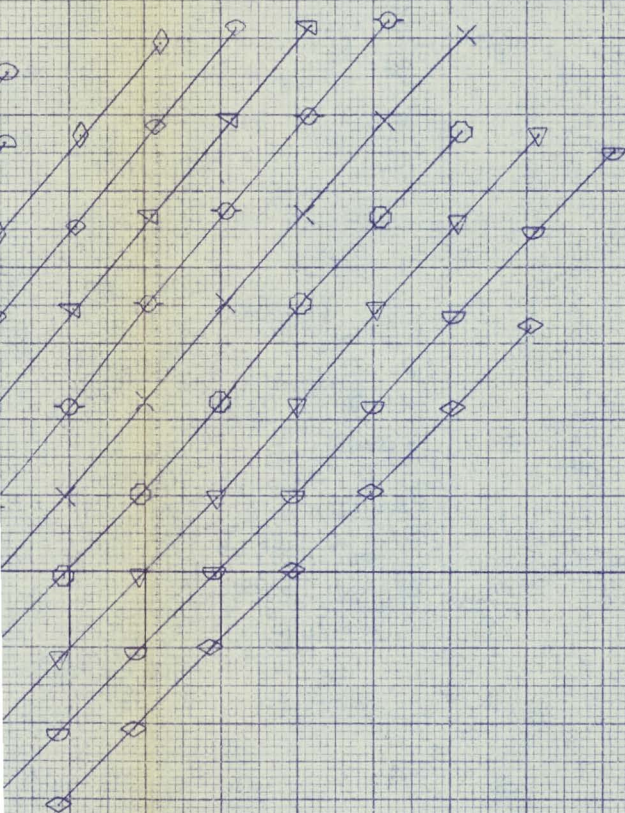
S. Knuthanki

C105

CORNELL W.T. TESTS

 C_L vs α CONF. BG, H, V, δ / UNCAMBERED / $\delta = 0$

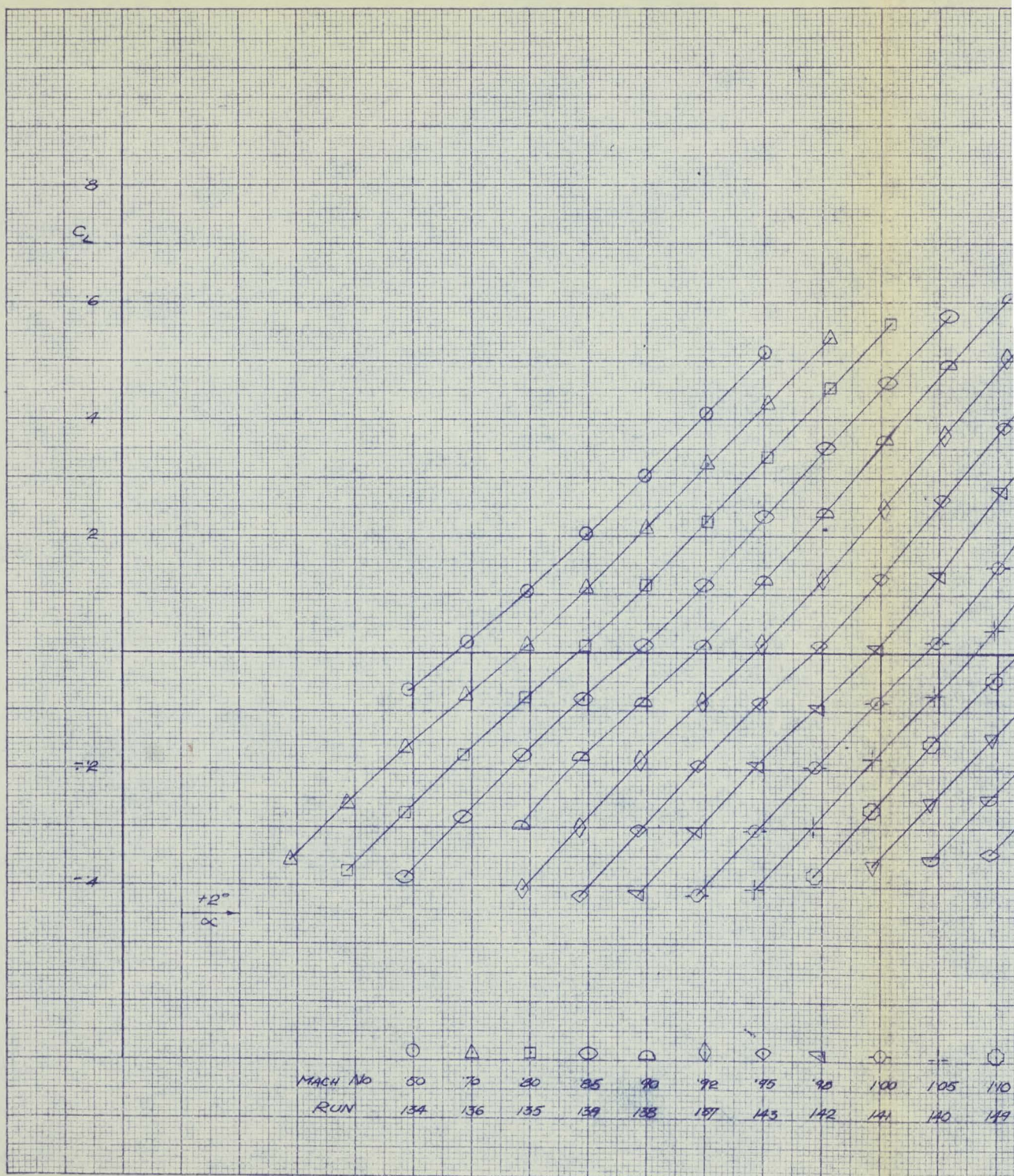
RUNS 101-117



	○	▽	◐	◇
5	110	115	120	125
	115	117	116	114

SECRET
UNCLASSIFIED

359-11L KEUFFEL & ESSER CO.
10 X 10 to the 1/16 inch, 5th lines centered.
MADE IN U.S.A.



P/WIND TUNNEL / 7

1.4.

SEPT 3 / 53

S. Kristofor-6

C 105

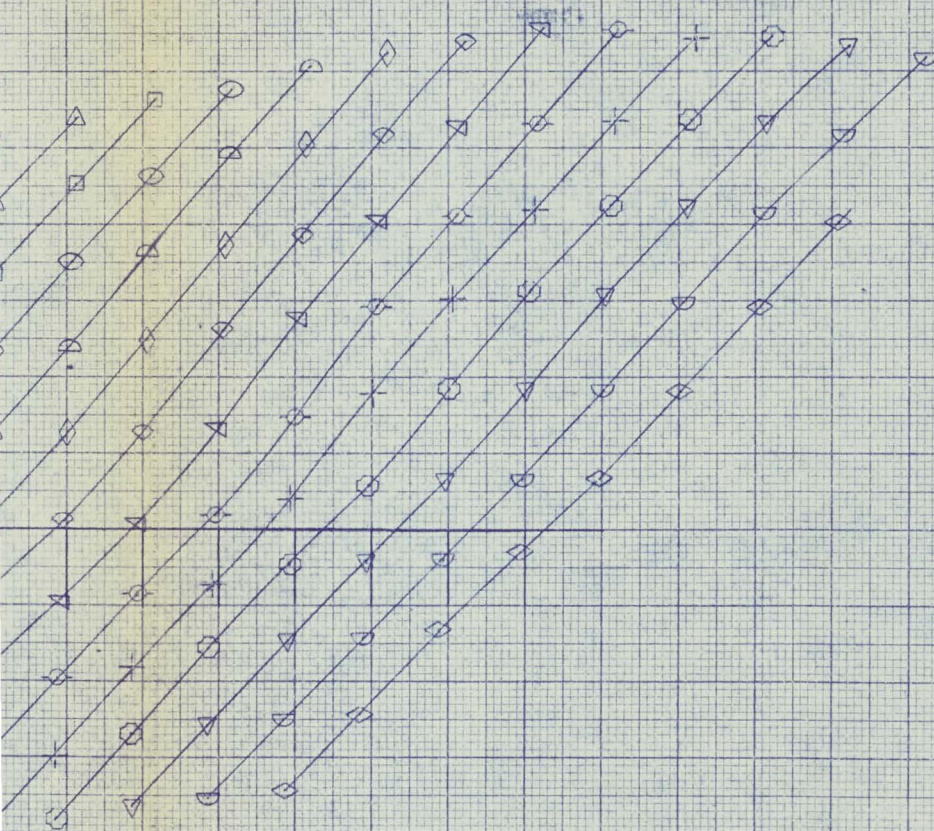
CORNELL W.T. TESTS.

C_L VS α .

CONF BC, W, VP, / UNCAMBERED /

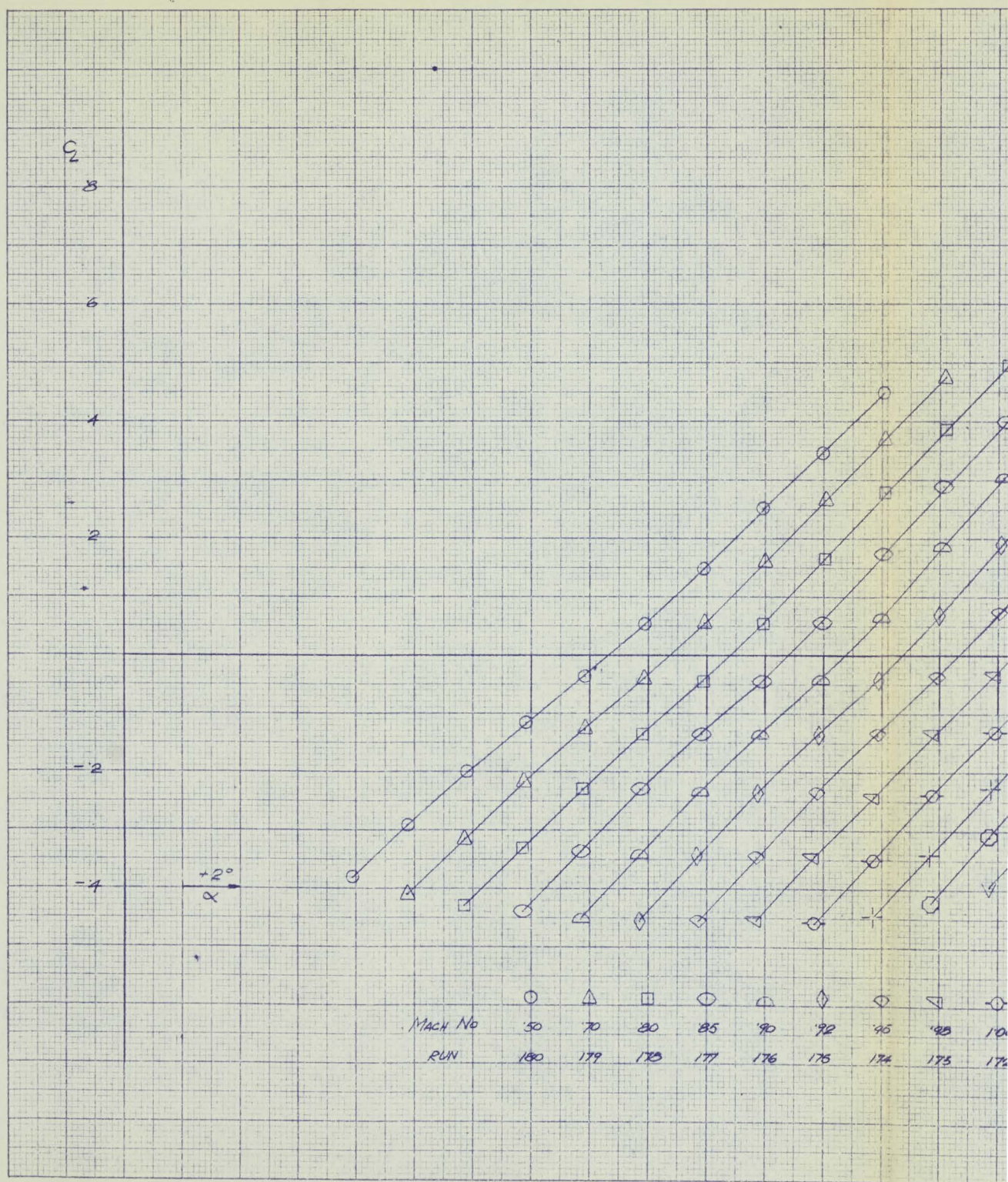
$\delta = -5^\circ$

RUNS 134-151.



UNCLASSIFIED
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CLASSIFIED

α	α	α	α	α	α	α
95	100	105	110	115	120	125
142	144	146	148	150	151	154



SEPT 3/53

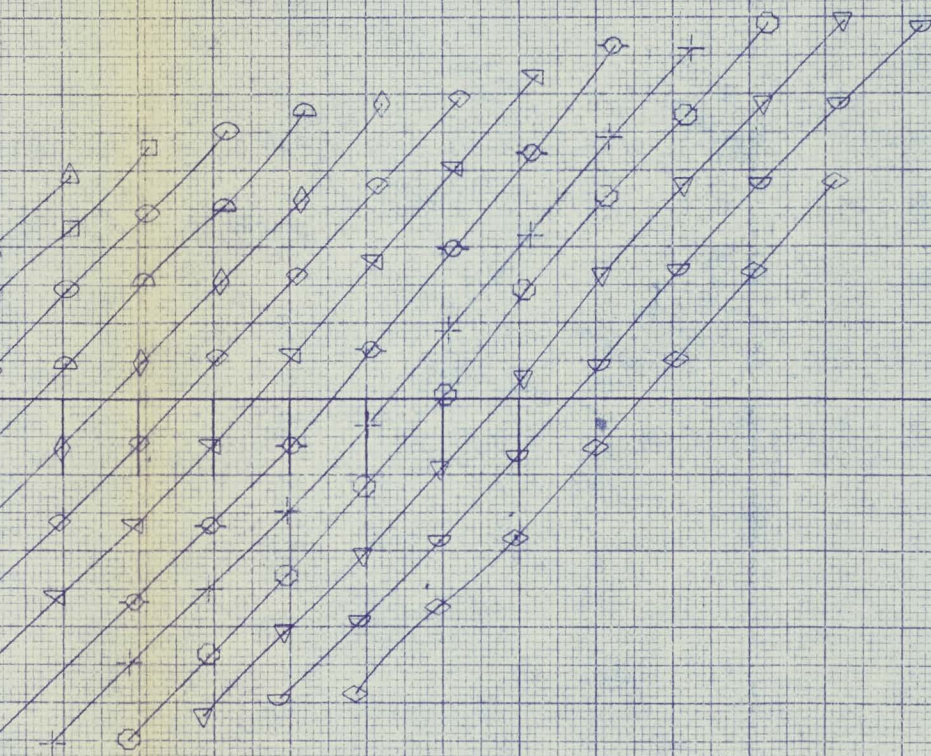
S. Knapkowski

C105

CORNELL W.T. TESTS

 C_L VS α CONF. BC, H, VP₀ / UNCAMBERED / $\delta = -30^\circ$

RUNS 152-166



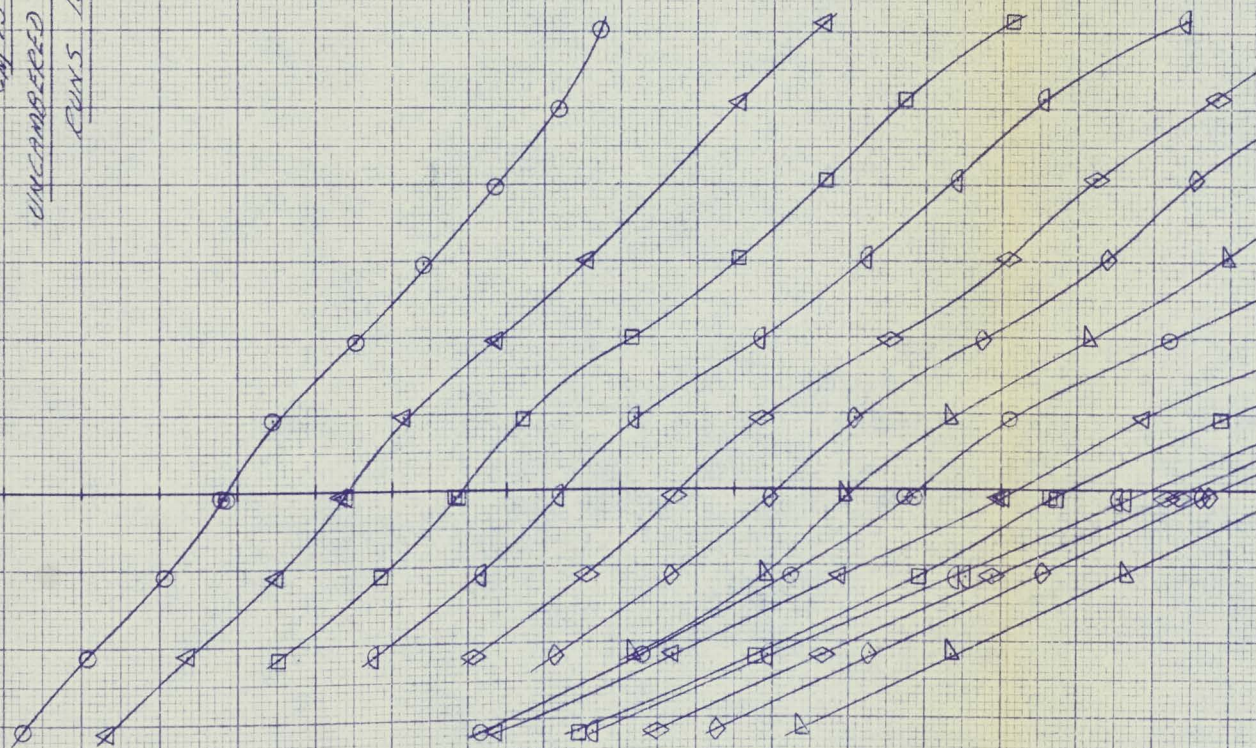
	▽	○	+	◇	▽	◇	◇
'88	140	145	140	145	140	145	143
156	148	154	152	153	156	165	

SECRET IN CLASSIFIED

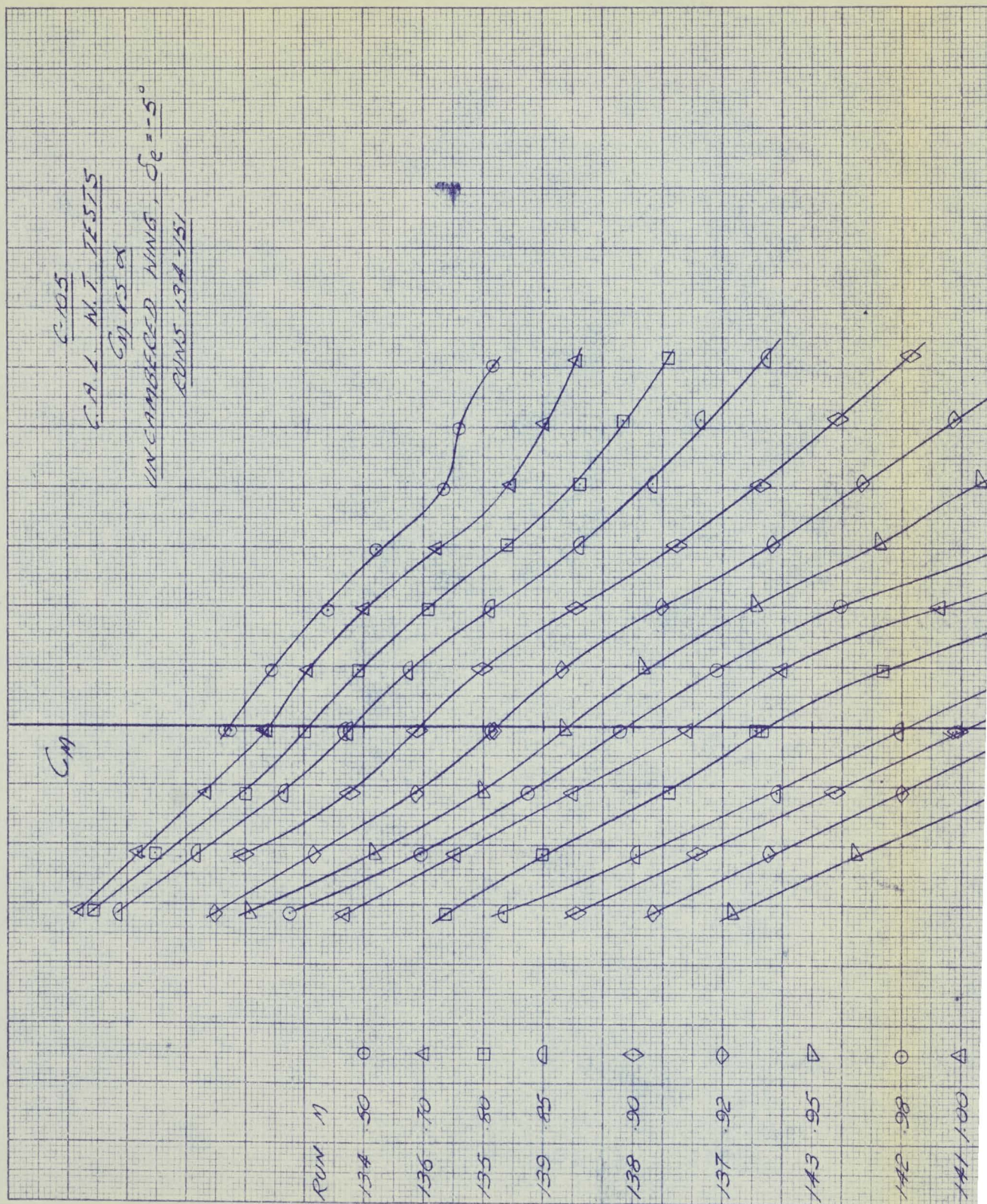
CN05
CAL NIT TESTS
CAL 1502
UNCAMBERED WING, $\delta_e = +10$
CUNS 181-194

181 50
 182 70
 183 80
 184 85
 185 90
 186 92
 187 95
 188 98
 190 100
 189 105
 192 110
 194 115
 193 120
 191 123
 RUN 11

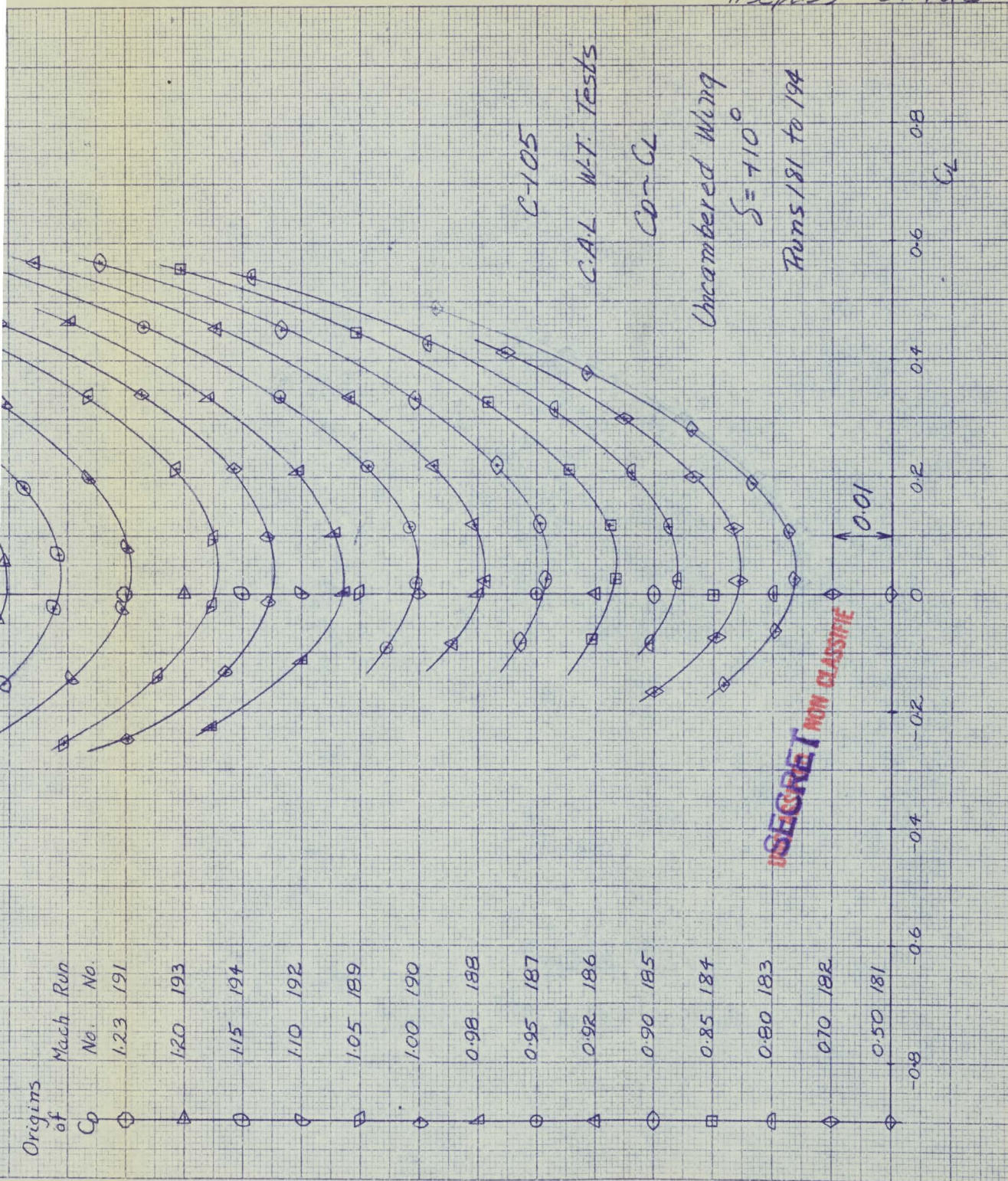
CN



C-105
C.A.L. N.T. TESTS
G₁ 15 α
UNCAMBERED WINGS, δ_e = -5°
RUNS 134-151

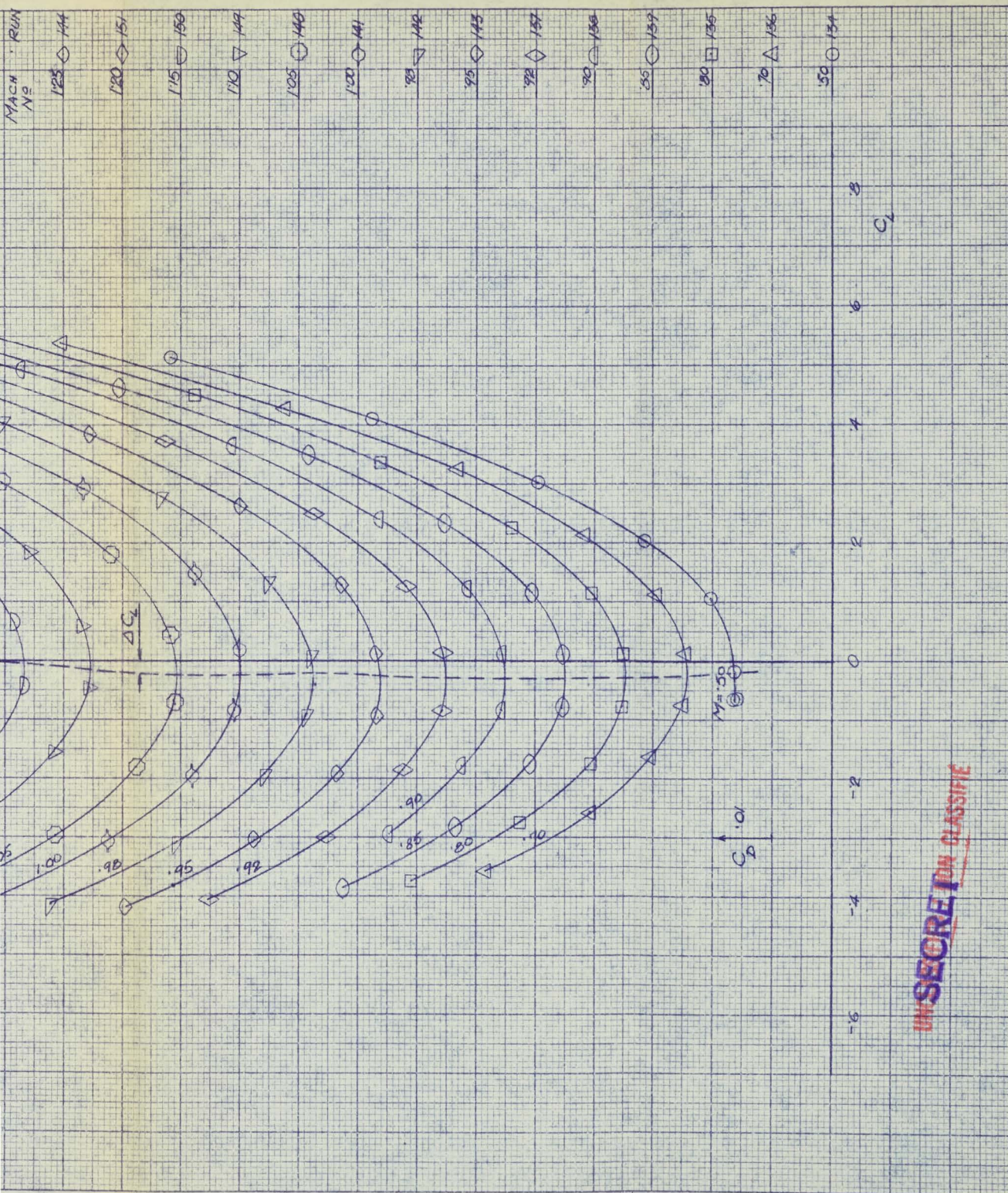


11 Sept. 53 C.A. Ford

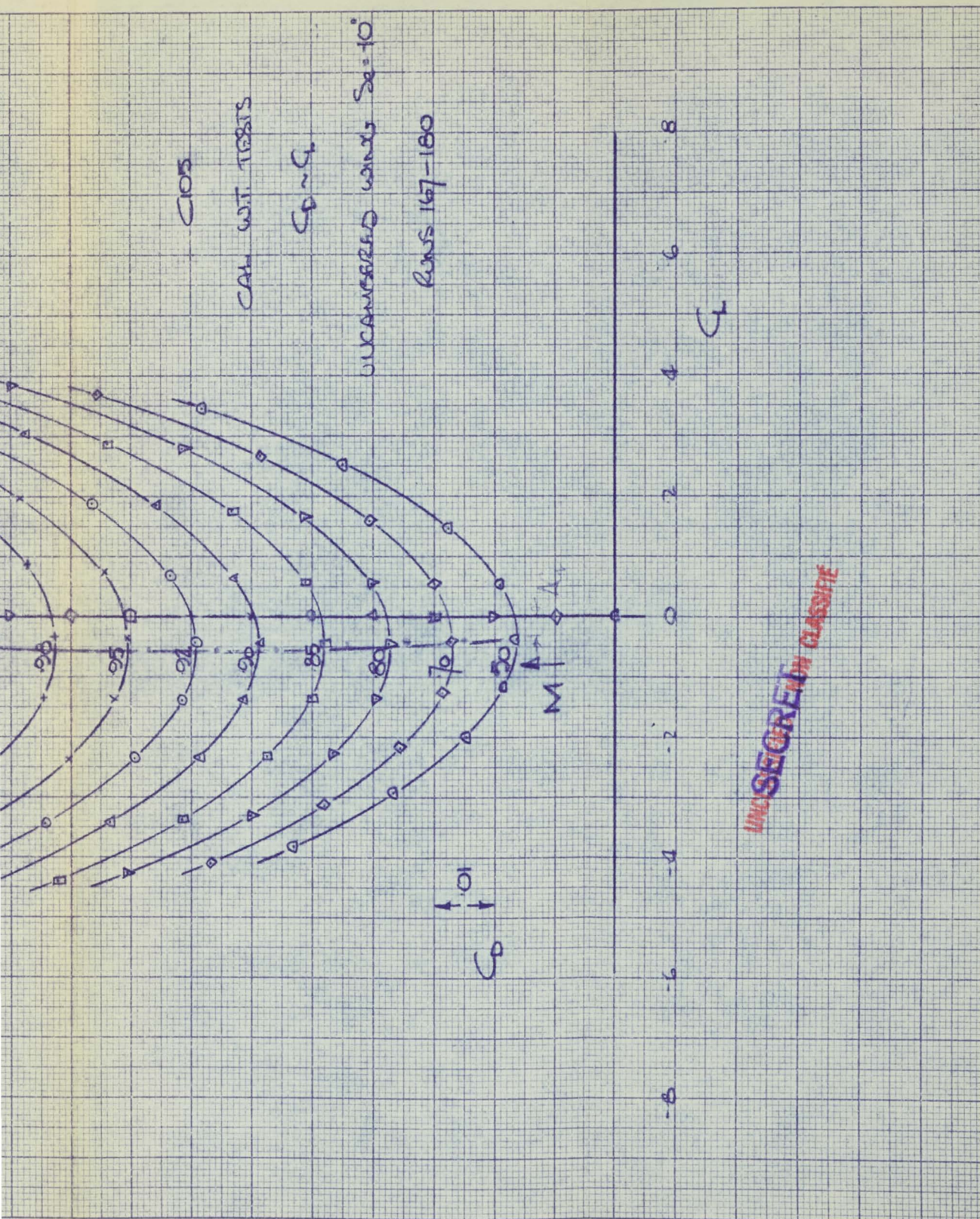


P/W-T/7 3.3

P/W-T/7 3.3



UNCLASSIFIED

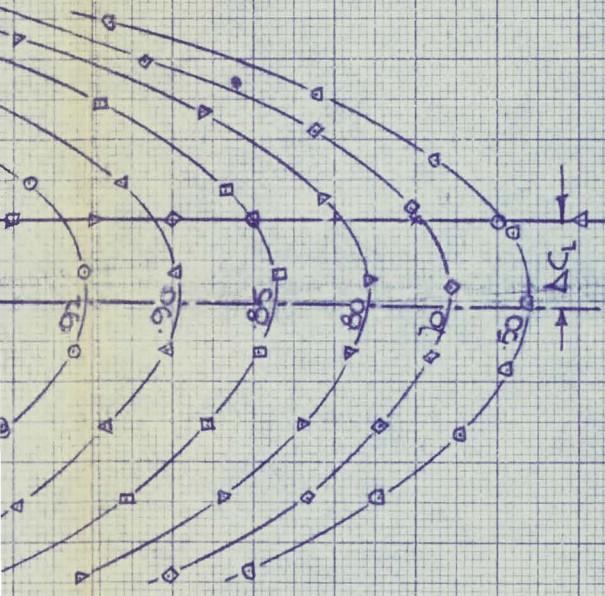


CLOS
CAL W.T. TESTS

$C_D \sim C_L$

UNCAMBERED WING $S_e = -30^\circ$

Rus 152-166



C_D

0.6

4

2

0.2

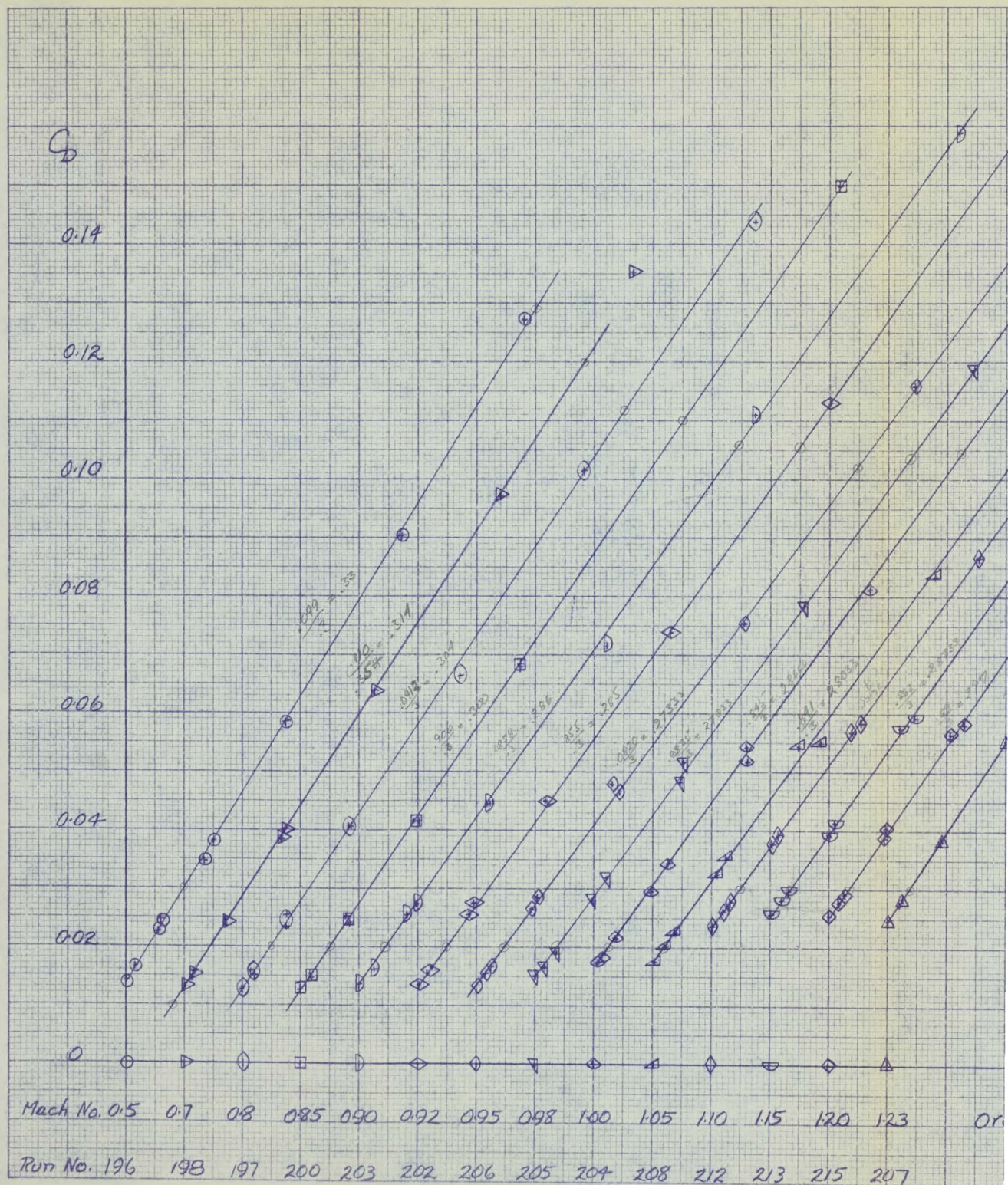
-0.2

-0.6

C_L

SECRET
UNCLASSIFIED / NON CLASSIFIED

P/W.T. 13.7



11 Sept. 1953 C.A. Ford

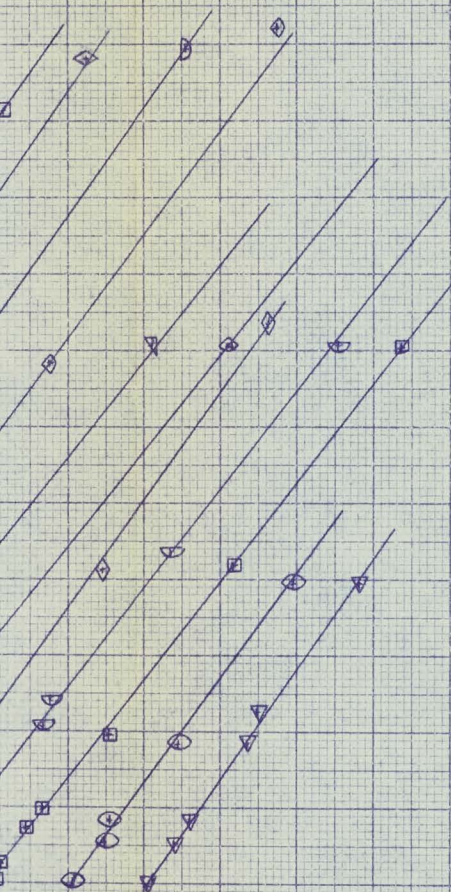
C-105

Cornell W-T. Tests

C_p vs C_L^2

Uncambered Wing $\delta = +10^\circ$

Runs 181 to 194



$\longleftrightarrow 0.1 \longrightarrow$

5 120 123
4 123 121
Origins
of C_L^2

C_L^2

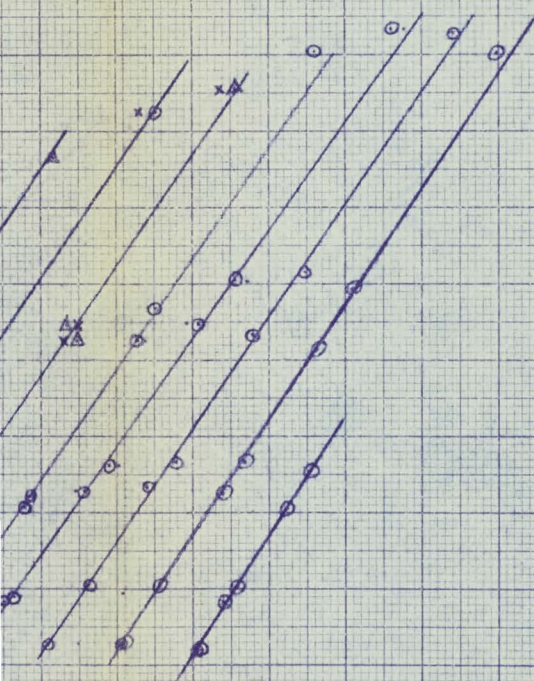
UNCLASSIFIED NON CLASSIFIED
SECRET

P/W-T/7

3.10

3.10

P/W-T/7



C_p
10

115 120 123 M

COS

ALL W.T. TESTS

$C_D \sim C_L^2$

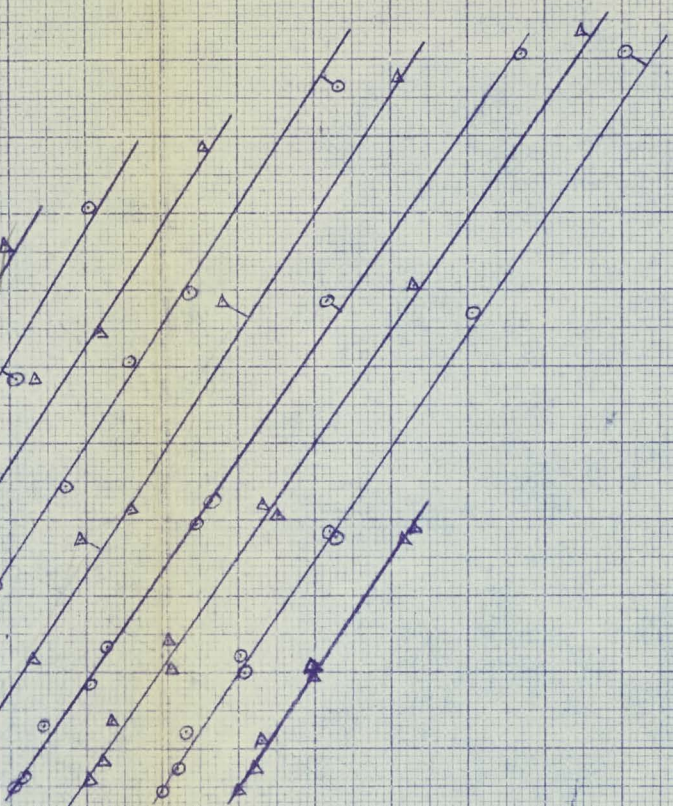
UNCAMBERED WING

$\alpha = -10^\circ$

Runs 167-180

UNCLASSIFIED
SECRET
NON CLASSIFIED

Plot. 17 3.12



0
1
2

110 115 120 125

CLOS

CAL W.T. TESTS

$C_D \sim C_L^2$

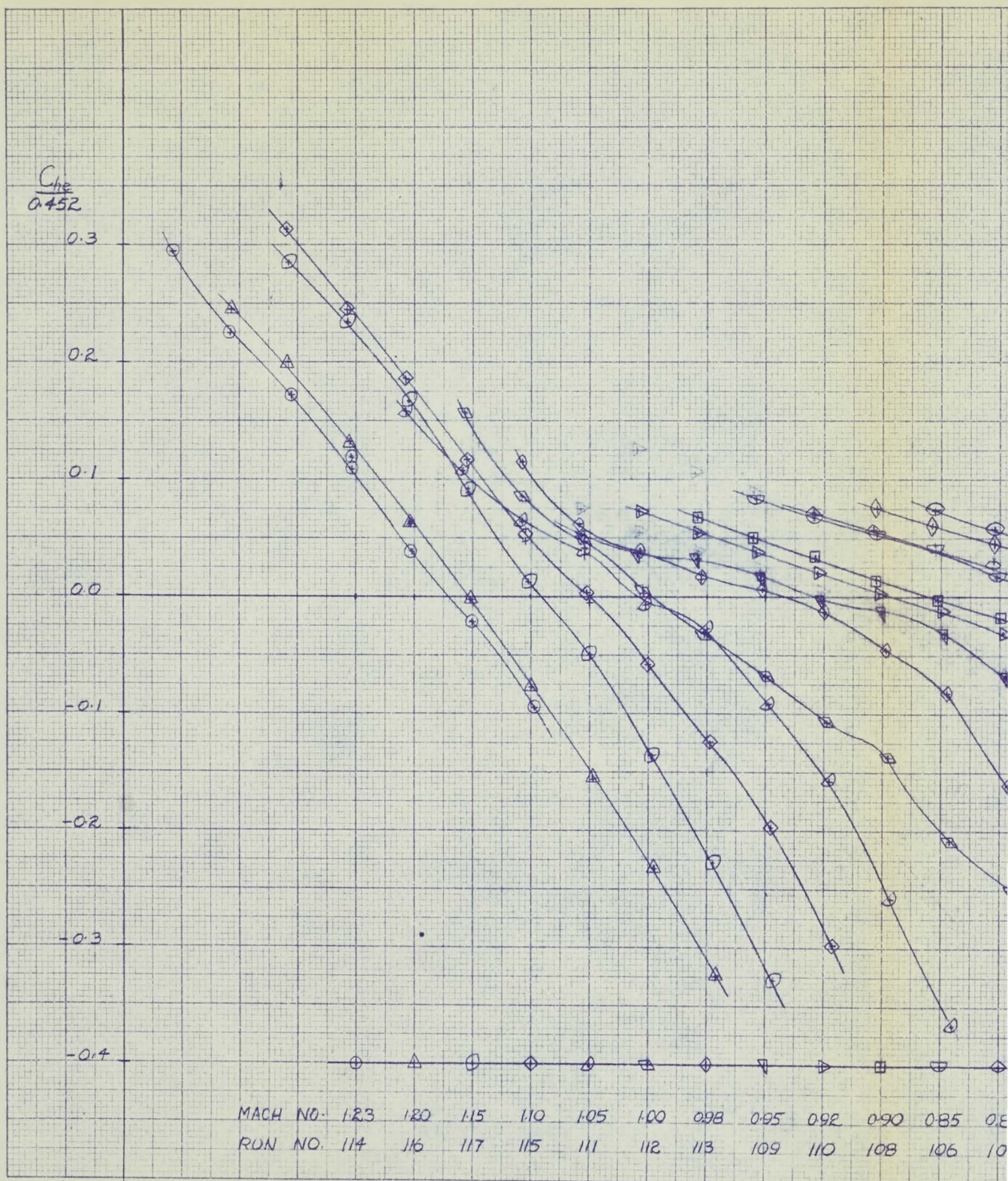
UNCAMBERED WING $\delta_c = -30^\circ$

RNS 152-106

UNCLASSIFIED NON CLASSIFIED

SECRET

Plot 17 3.14



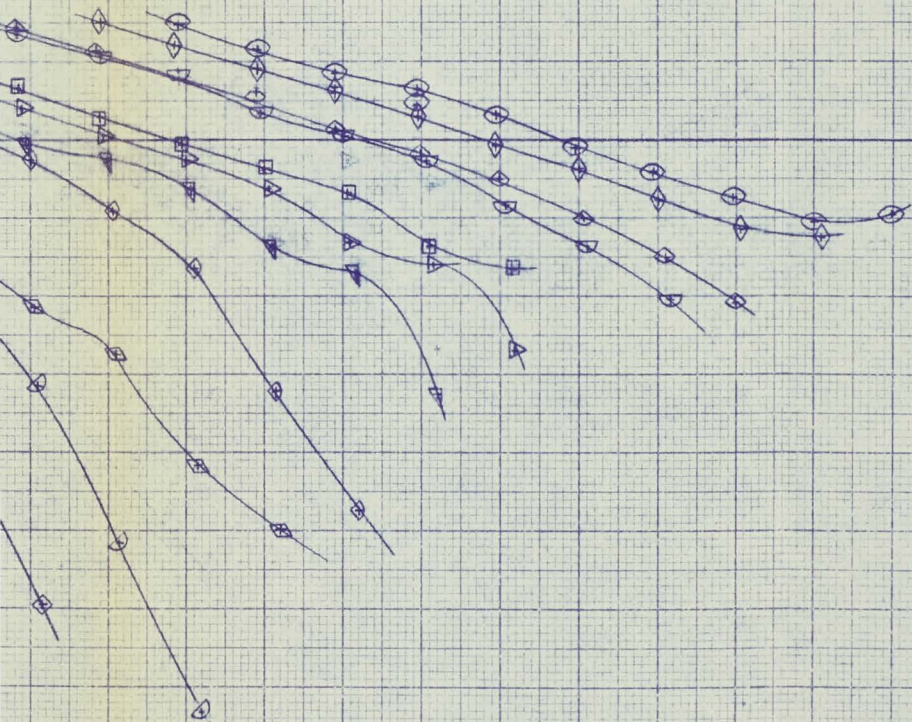
4 SEPT. 53 CA FORD

C-105

$C_{LW} \alpha$
 $\delta = 0^\circ$

RUNS 101 TO 117
 (102, 103, AND 107)
 VOID

CONFIGURATION BCW/VB
 (UNCAMBERED)



2°
 α°

UNCLASSIFIED NOW CLASSIFIED
SECRET

ORIGINS OF α

0.92	0.90	0.85	0.80	0.70	0.50
110	108	106	105	104	101

2 SEPT 53 C.A.FORD

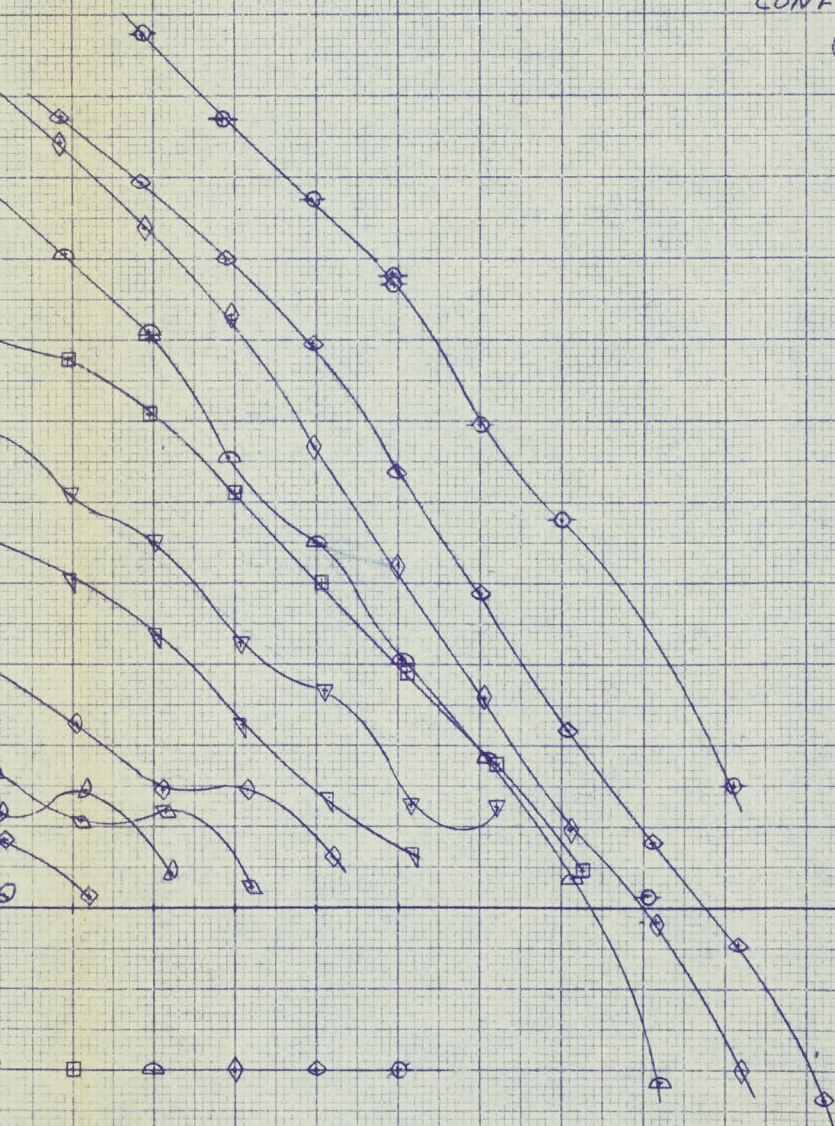
C-105

CORNELL W/T TESTS

 C_{he} vs α

$\delta = -5^\circ$

RUNS 134 TO 151

CONFIGURATION BCW/VP₅
(UNCAMBERED)UNCLASSIFIED NON CLASSIFIÉ
SECRET

105	110	115	120	123	} α ORIGINS
140	149	150	151	144	

P/W-T/7

sh. 4.3

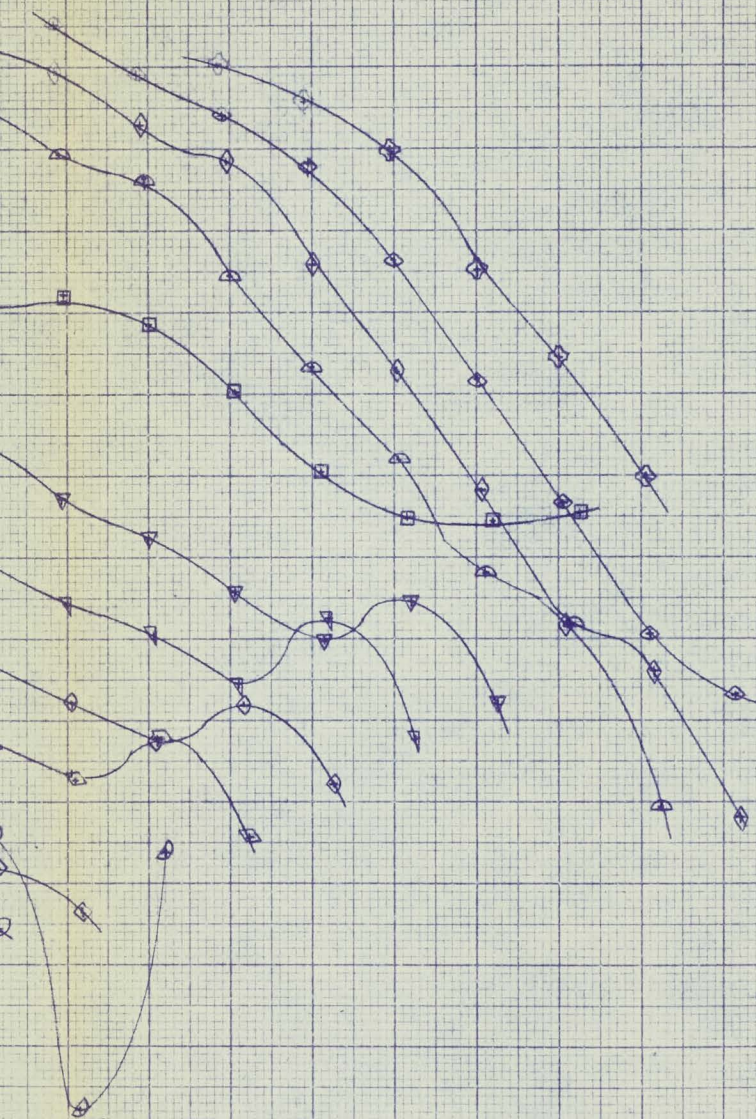
3 SEPT. 53 C.A. FORD

C-105

CORNELL W/T TESTS

 C_{he} vs α $\delta = -10^\circ$

RUNS 167 TO 180

CONFIGURATION BCW, VR₃
(UNCAMBERED)UNCLASSIFIED NON CLASSIFIÉ
SECRET 2° 2° ORIGINS OF α

0	105	110	115	120	123
2	171	170	169	168	167

C_{he}
0.452

1.3

1.2

1.1

1.0

0.9

0.8

0.7

0.6

MACH No.	0.5	0.7	0.8	0.85	0.90	0.92	0.95	0.98	1.00	1.05	1.10
Run No.	163	162	161	160	159	158	157	156	155	154	152

12

C_L

10

8

6

4

2

-2

-4

RUNS:

① 101

△ 196

② 34

△ 22

$\alpha = 0$

$+2^\circ$
 α

$\alpha = 0$

$\alpha = 10^\circ$

$\alpha = 10^\circ$

UNCAMBERED

CAMBER

C_m .16

C105

CAL WT TESTS SEPT. 1953

C_m vs α FOR HIGH α RANGE

UNCAMBERED WING $M=0.5$

Run No.	δ
134	-5
33	-5
101	0
34	0
181	+10
36	+10

Run No.	δ
163	-30°
37	-30
120	-20
31	-20
180	-10
35	-10

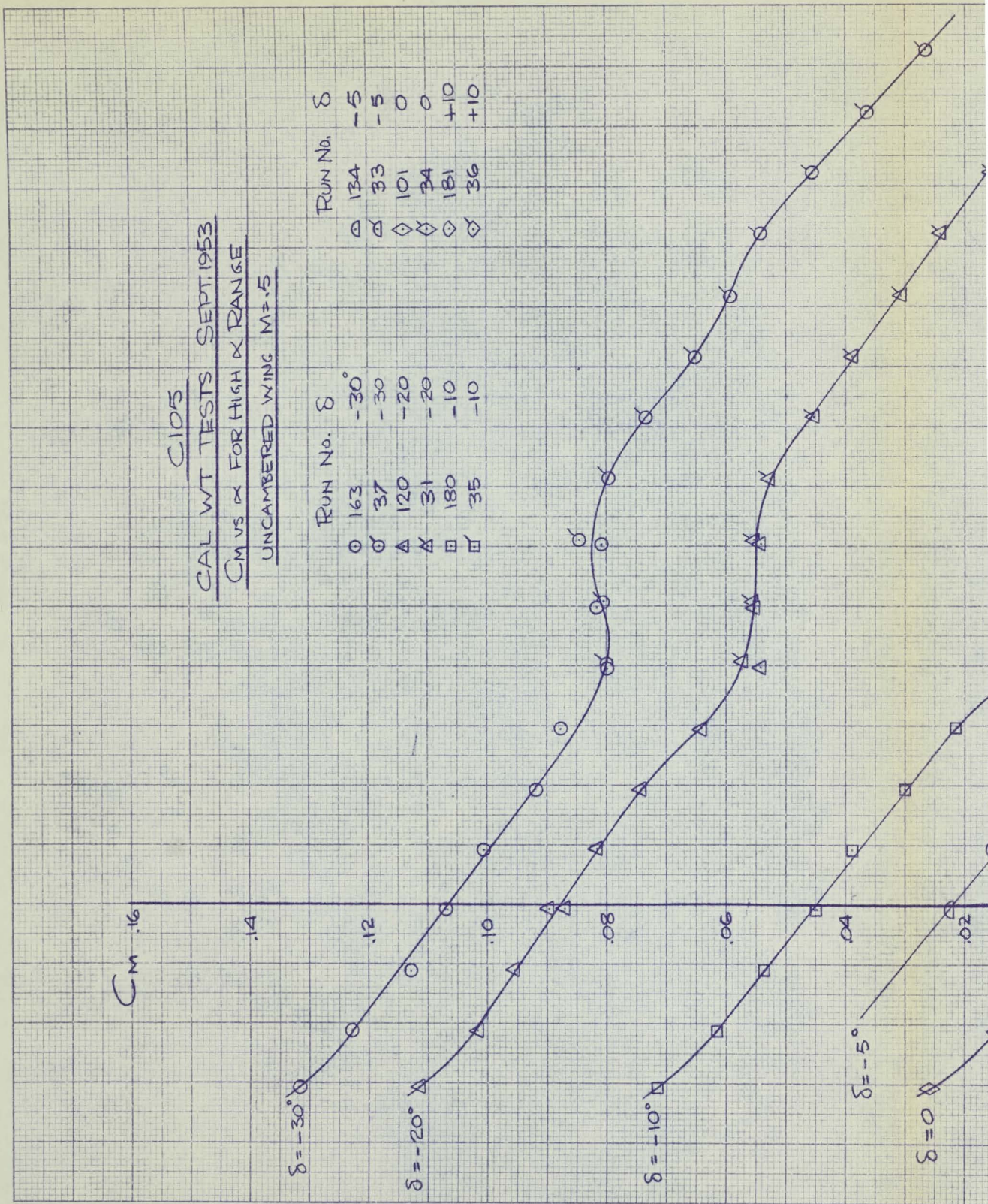
$\delta = -30^\circ$

$\delta = -20^\circ$

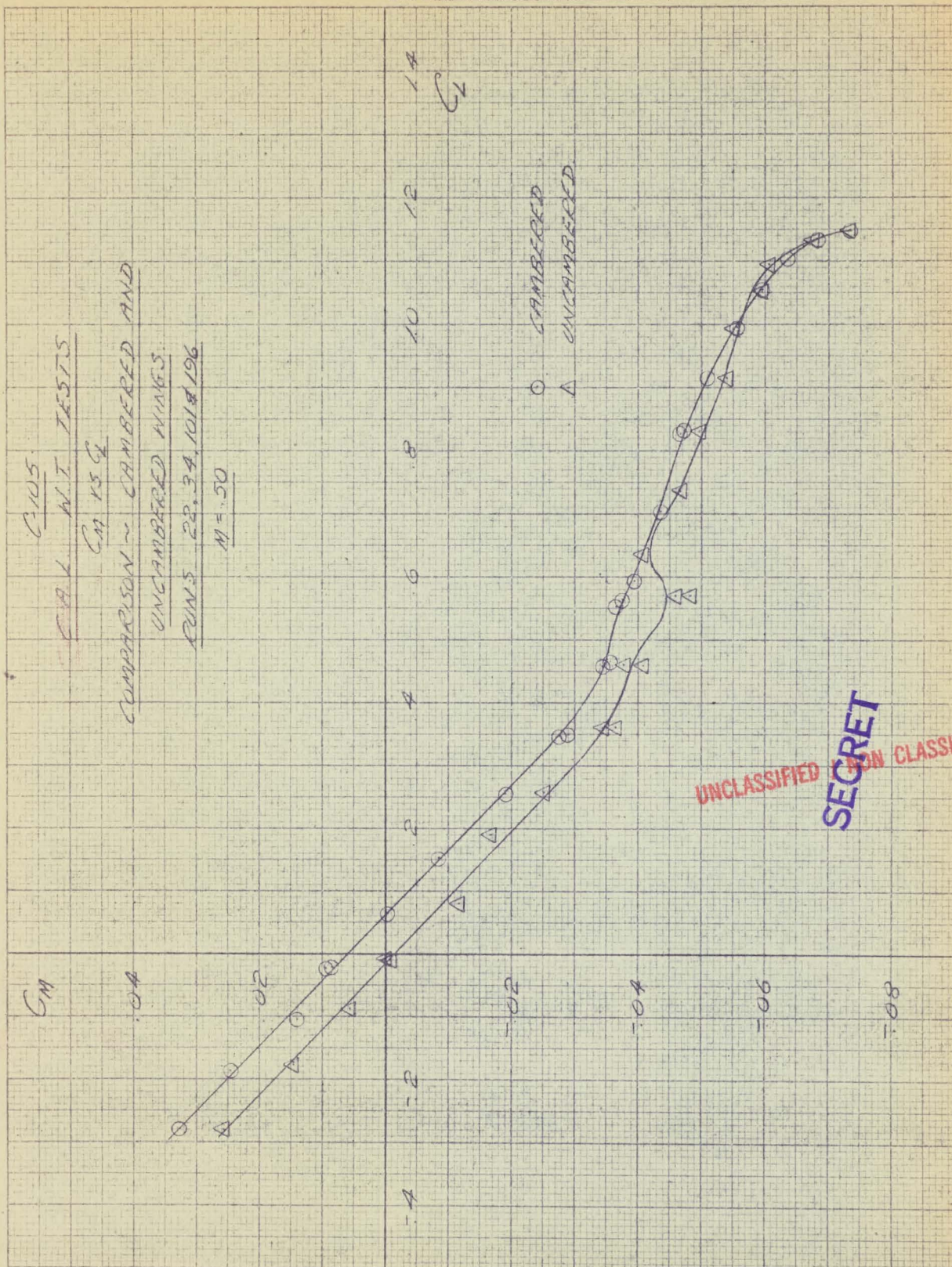
$\delta = -10^\circ$

$\delta = -5^\circ$

$\delta = 0$

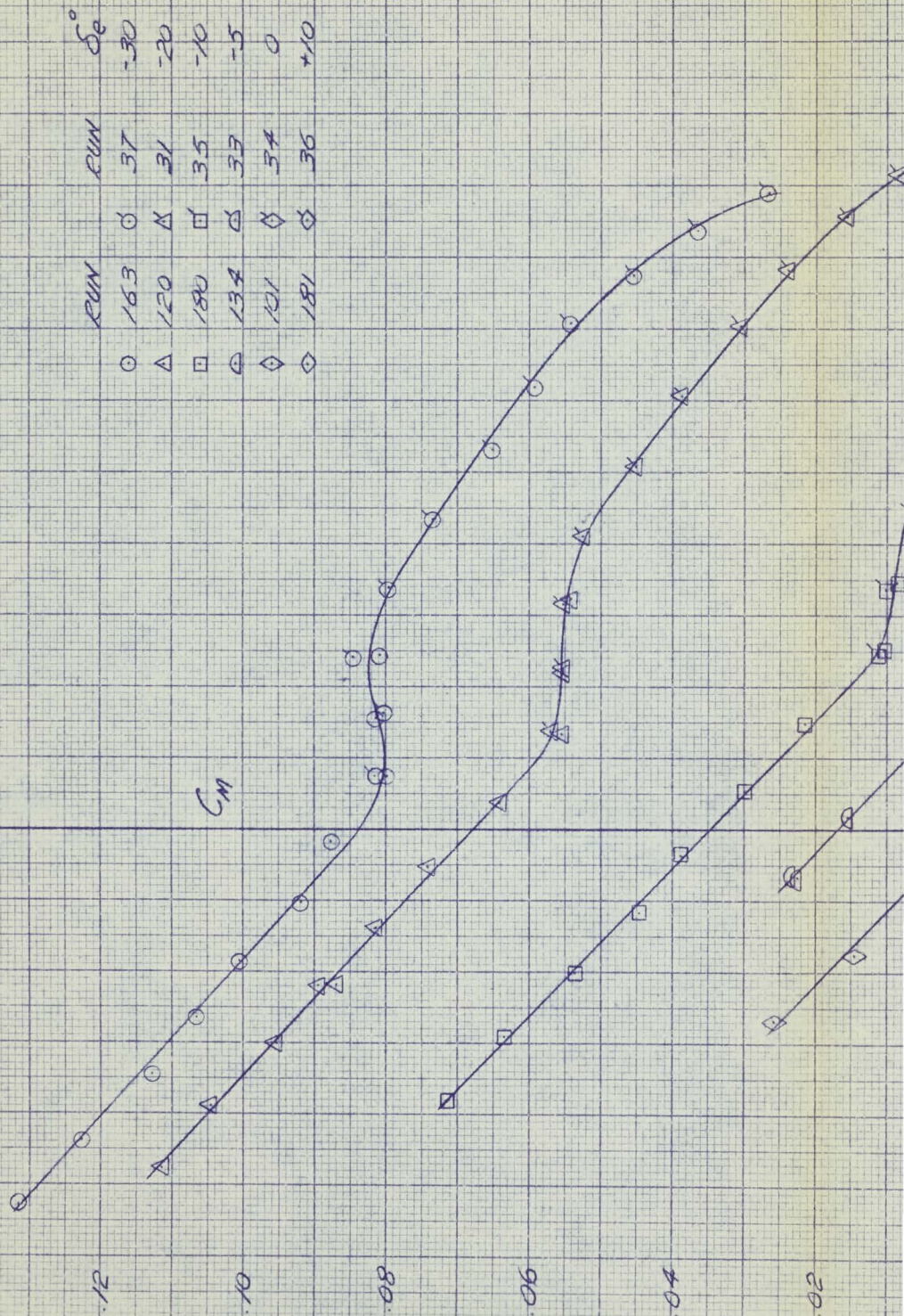


C105
CAL. N.T. TESTS
CM 15 G
COMPARISON ~ CAMBERED AND
UNCAMBERED WINGS.
RUNS 22, 34, 101 & 196
M = .50



UNCLASSIFIED
SECRET
NON CLASSIFIÉ

C-105
C.A.L. W.T. TESTS
C_q 15 G
UNCHAMBERED WING, M=0.5



C105

CORNELL W.T. TESTS

C_{pe} vs α

CONF. BC, W, VP₂ /UNCAMBERED/

AT $M=0.50$

HIGH α RANGE

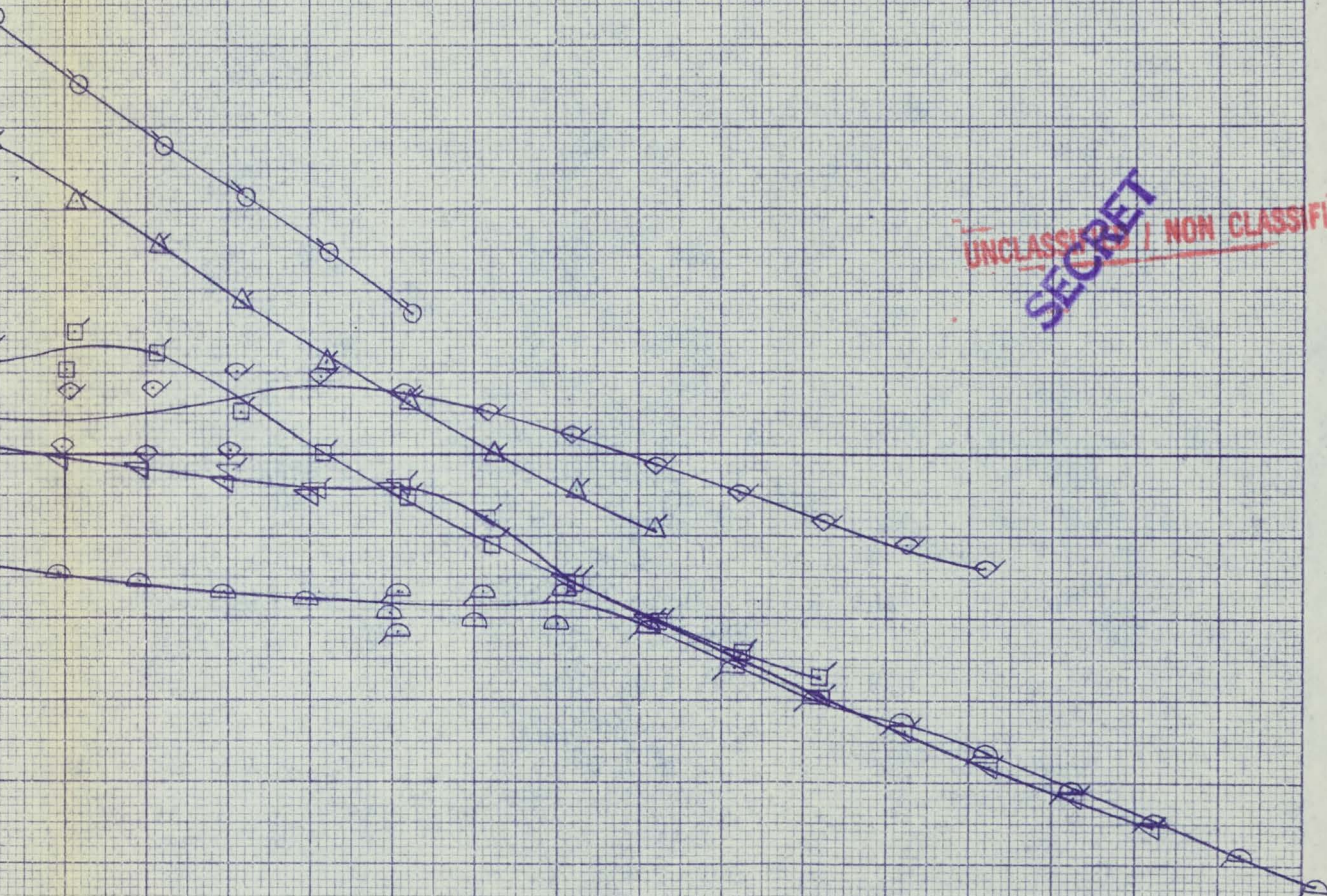
$\alpha = -30^\circ, -20^\circ, -10^\circ, -5^\circ, 0^\circ, +10^\circ$

UNCLASSIFIED / NON CLASSIFIÉ
SECRET

$+10^\circ$

Δ 181

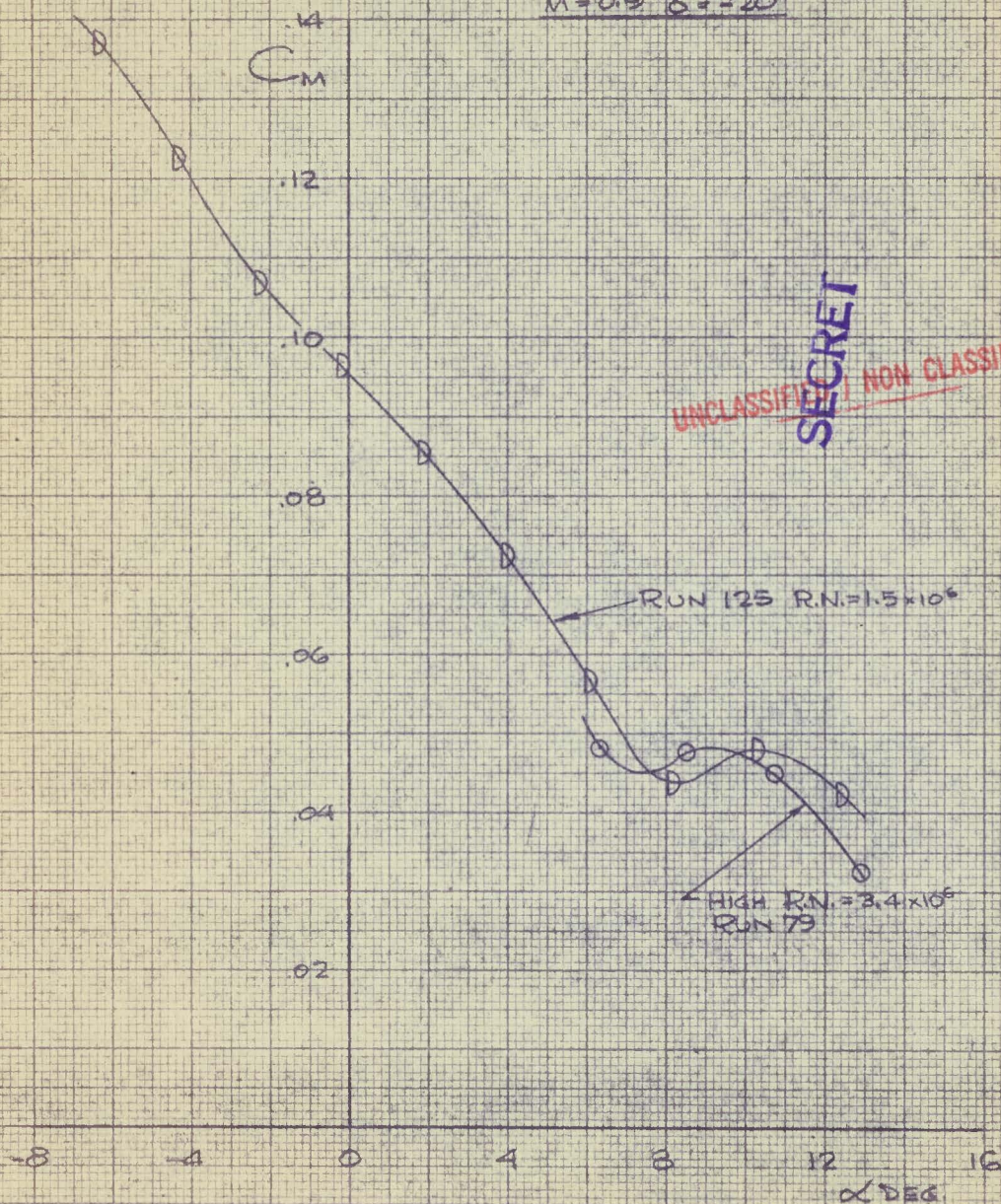
Δ 36



C105
CAL WT TESTS SEPT. 1953
EFFECT OF REYNOLDS NO ON C_m vs α

UNCAMBERED WING

$M=0.9$ $\delta=-20^\circ$



C105

CAL WT TESTS SEPT. 1953

EFFECT OF REYNOLDS NO. ON C_m vs C_L

UNCAMBERED WING

$M=0.9$ $\delta=-20^\circ$

