QCX
Avro
CF105
P-Stab-146

17

(17)

FILE IN VAULT
UNCLASSIFIED

ANALYZED

C-105 P/STABILITY/146

OPEN CANOPY EFFECTS

[redacted]

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A V ROE CANADA LIMITED

MALTON - ONTARIO

TECHNICAL DEPARTMENT (Aircraft)

ANALYZED

AIRCRAFT: C-105

REPORT NO: P/Stability/146

FILE NO:

NO OF SHEETS:

TITLE:

Classification cancelled / changed to Unclassified
By authority of AVRO Arrow Declassif. Board
Date 28 Jul 87
Signature [signature], Co-Chairperson
Unit / Rank / Appointment DSIS 3

OPEN CANOPY EFFECTS

PREPARED BY J. Clark DATE June 1957

CHECKED BY DATE June 1957

SUPERVISED BY [signature] DATE June 1957

APPROVED BY [signature] DATE

[redacted]

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

FORM 1316A

AVRO AIRCRAFT LIMITED
MALTON - ONTARIO
TECHNICAL DEPARTMENT

REPORT NO P/Stability/146
SHEET NO

AIRCRAFT		PREPARED BY	DATE
C-105		J. P. Clark	June 1957
		CHECKED BY	DATE

OPEN CANOPY EFFECTS

1. Longitudinal Stability
    1. a.c. and C_{M_o}
    2. C_{L_α}
    3. Drag
2. Directional Stability
    1. C_{n_β}
    2. C_{l_β}
    3. C_{Y_β}
    4. a_1 vertical tail
3. Canopy Hinge Moments
    1. Hinge moments in pitch
    2. Hinge moments in yaw

AVRO AIRCRAFT LIMITED
MALTON ONTARIO
TECHNICAL DEPARTMENT

REPORT No. P/Stability/146
SHEET No.

AIRCRAFT		PREPARED BY	DATE
C-105	OPEN CANOPY EFFECTS	J. Clark	June 1957
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1. LONGITUDINAL STABILITY

1.1 a.c. and C_{M_o}

The effects of open canopy on pitching moment are minor. No appreciable change is apparent in the slope of C_M vs. C_L and therefore no change occurs in the position of the aerodynamic center. Comparisons are shown on sheets 1.1.1 to 1.1.3. A small positive change in C_{M_o} occurs with canopy open and this is plotted on sheet 1.1.4.

1.2 C_{L_α}

No effect. Comparisons are shown on sheets 1.2.1 to 1.2.3.

1.3 Drag

Drag is increased by opening the canopy as would be expected, but the increase with the rear canopy only open is slightly greater than the increase with both open. Comparisons are given in sheets 1.3.1 to 1.3.3 and the drag increments on sheet 1.3.4.

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2. LATERAL STABILITY

2.1 C_{n_β}

Opening the canopies reduces C_{n_β} . See sheet 2.1.5.

Comparisons are shown on sheets 2.1.1 to 2.1.4.

2.2 C_{l_β}

The effects of open canopy on C_{l_β} are negligible.

Comparisons are shown on sheets 2.2.1 to 2.2.4.

2.3 C_{y_β}

The effects of open canopy on C_{y_β} are small, since the increase in C_{y_β} due to canopy tends to cancel the loss in tail lift effectiveness. See sheet 2.3.5. Comparisons are shown on sheets 2.3.1 to 2.3.4.

2.4 $a_{l(V)}$

The loss in $a_{l(V)}$ due to open canopy is plotted on sheet 2.4.5. Comparisons are shown on sheets 2.4.1 to 2.4.4.

3. HINGE MOMENTS

Full scale canopy hinge moment is given by

$$HM = C_h \times q \times 15625 \quad \text{inch - pounds.}$$

The following plots are included in this section:

	Canopy Position		Canopy Leaf	Sheet
3.1	Hinge Moment in Pitch			
	Both closed		Left forward	3.1.1
	"		Right forward	3.1.2
	"		Left rear	3.1.3
	"		Right rear	3.1.4
	F'w'd closed, rear open		Left forward	3.1.5
	"		Right forward	3.1.6
	"		Left rear	3.1.7
	"		Right rear	3.1.8
	Both open		Left forward	3.1.9
	"		Right forward	3.1.10
	"		Left rear	3.1.11
	"		Right rear	3.1.12
3.2	Hinge Moment in Yaw			
	Both closed,	$\alpha = 2$	Left forward	3.2.1
	"	"	Right forward	3.2.2
	"	"	Left rear	3.2.3
	"	"	Right rear	3.2.4
	"	$\alpha = 10$	Left forward	3.2.5
	"	"	Right forward	3.2.6
	"	"	Left rear	3.2.7
	"	"	Right rear	3.2.8
	F'w'd closed, rear open,	$\alpha = 2$	Left forward	3.2.9
	"	"	Right forward	3.2.10
	"	"	Left rear	3.2.11
	"	"	Right rear	3.2.12
	"	$\alpha = 10$	Left forward	3.2.13
	"	"	Right forward	3.2.14
	"	"	Left rear	3.2.15
	"	"	Right rear	3.2.16

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REPORT No P/Stability/146
SHEET No

AIRCRAFT		PREPARED BY	DATE
C-105	OPEN CANOPY EFFECTS	J. Clark	June 1957
		CHECKED BY	DATE

Canopy Position		Canopy Leaf	Sheet
Both open,	$\alpha = 2$	Left forward	3.2.17
"	"	Right forward	3.2.18
"	"	Left rear	3.2.19
"	"	Right rear	3.2.20
"	$\alpha = 10$	Left forward	3.2.21
"	"	Right forward	3.2.22
"	"	Left rear	3.2.23
"	"	Right rear	3.2.24

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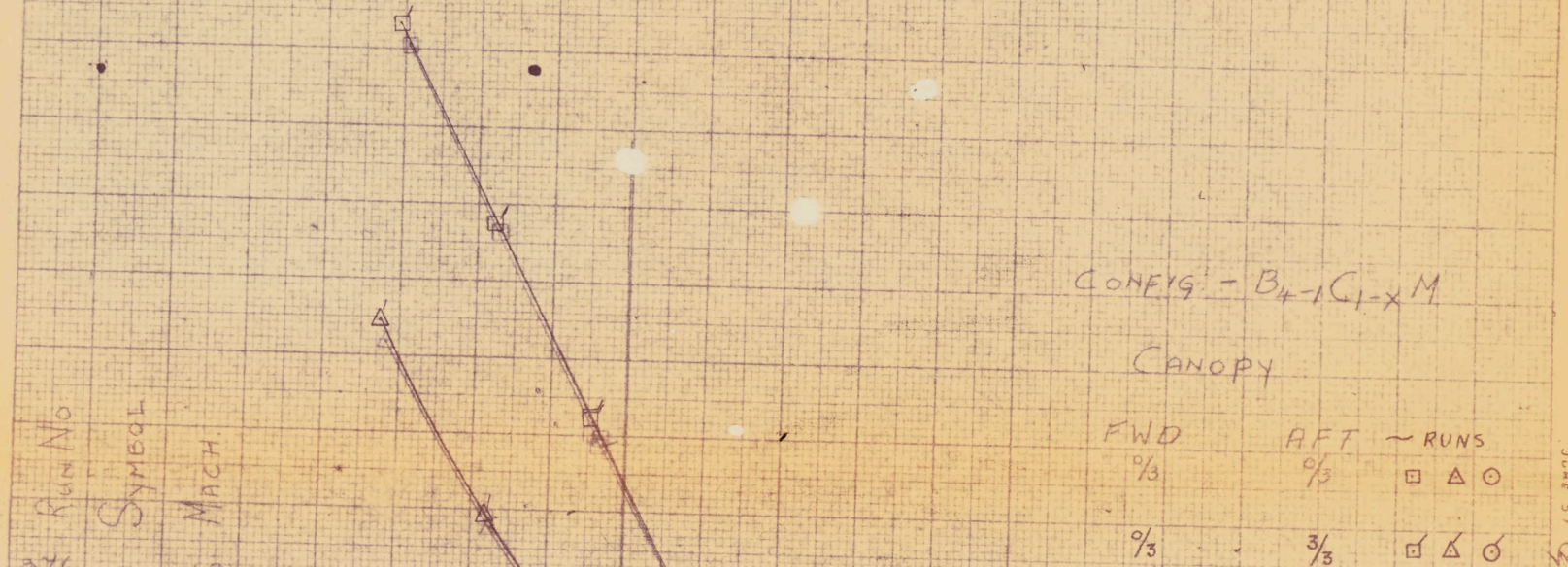
FORM 1319-A

C - 10.5

CAL W/T TESTS (MARCH '57)

C_m vs C_L

(δ_E = 10°)

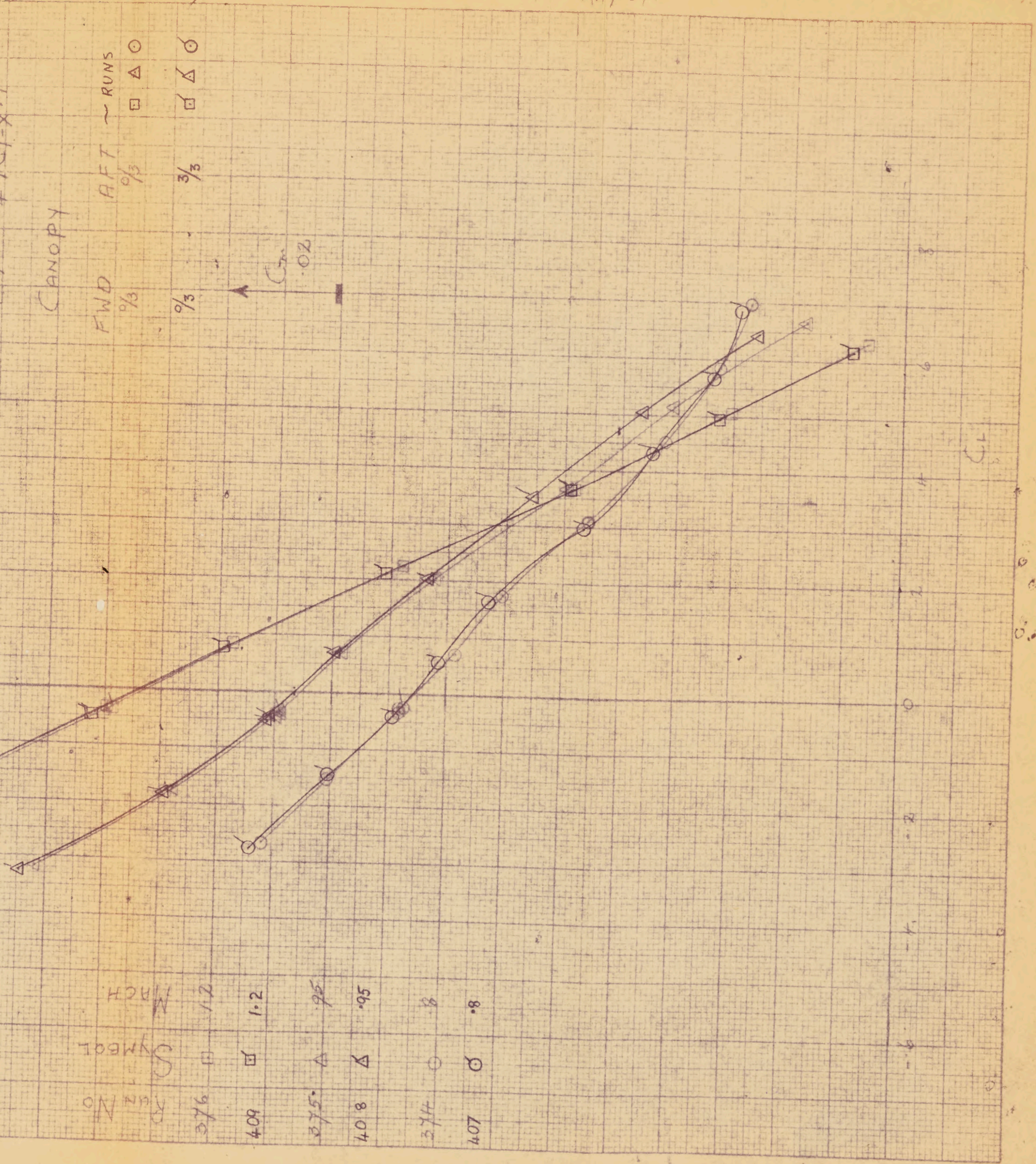


June, 57

June '57

H.N.
May '57

P/STAB/146 1.1.1



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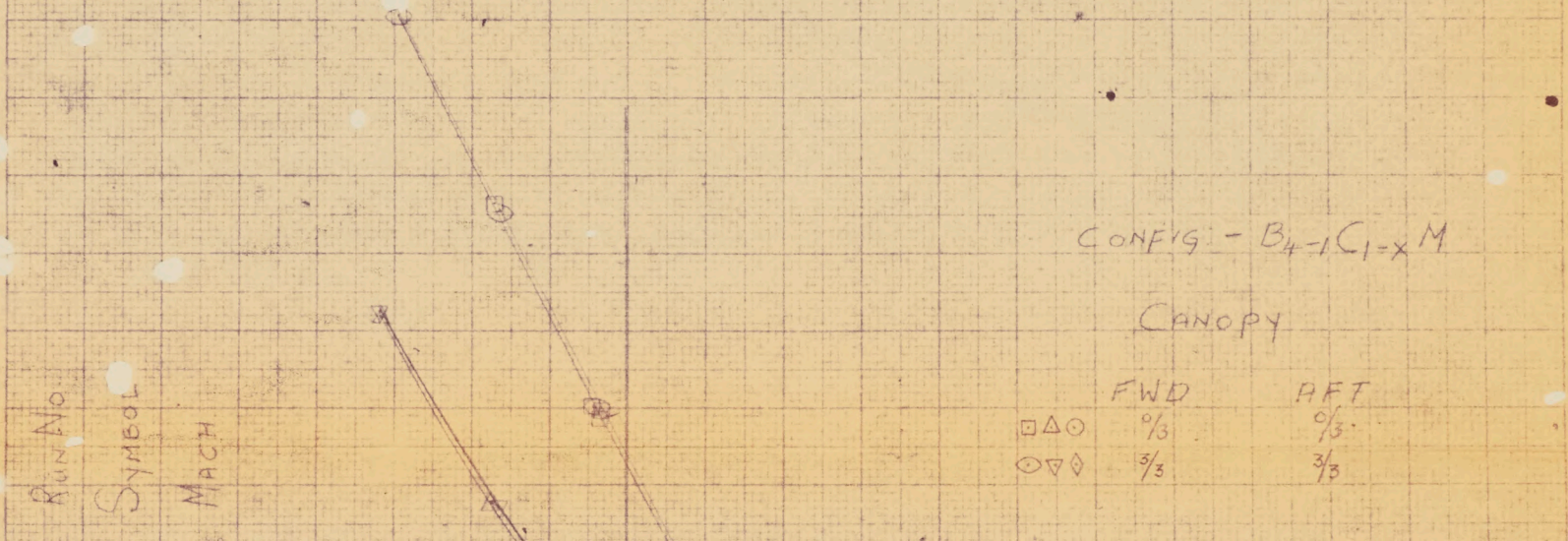
CAL W/T TESTS (MARCH '67)

C_m vs C_L

(δ_E 10°)



CONFIG - B_4-$1C_1$-x M

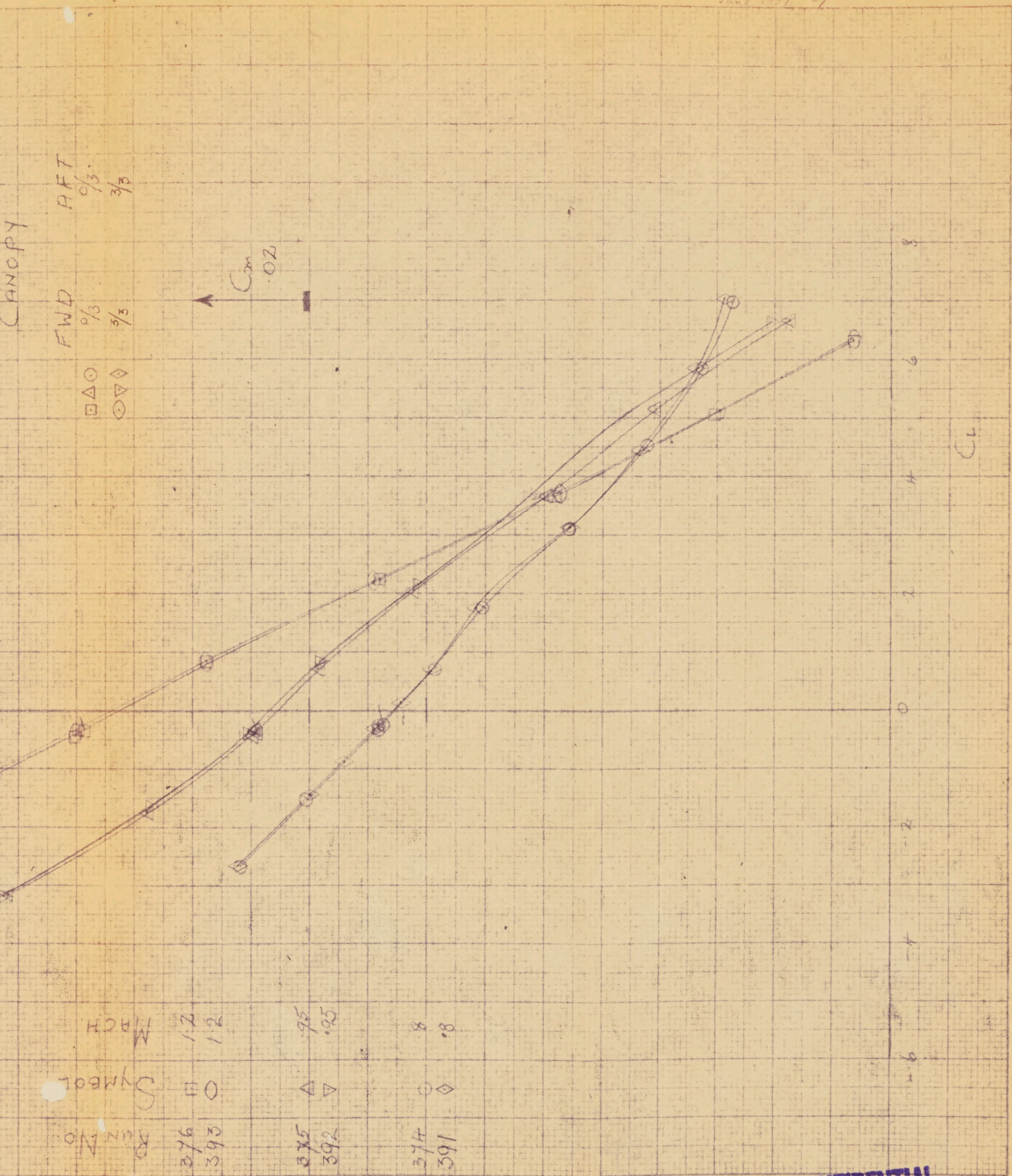
CANOPY

	FWD	AFT
□△○	0/3	0/3
⬭▽◇	3/3	3/3

P/STAB/146 3.2.9

HN
May '57

P/STAB/146 1.1.2
June 1957



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C-105

NAE LOW SPEED W/T TESTS

C_M vs C_L (CORRECTED DATA)

COMPARISON OF CANOPY CLOSED & CANOPY OPEN

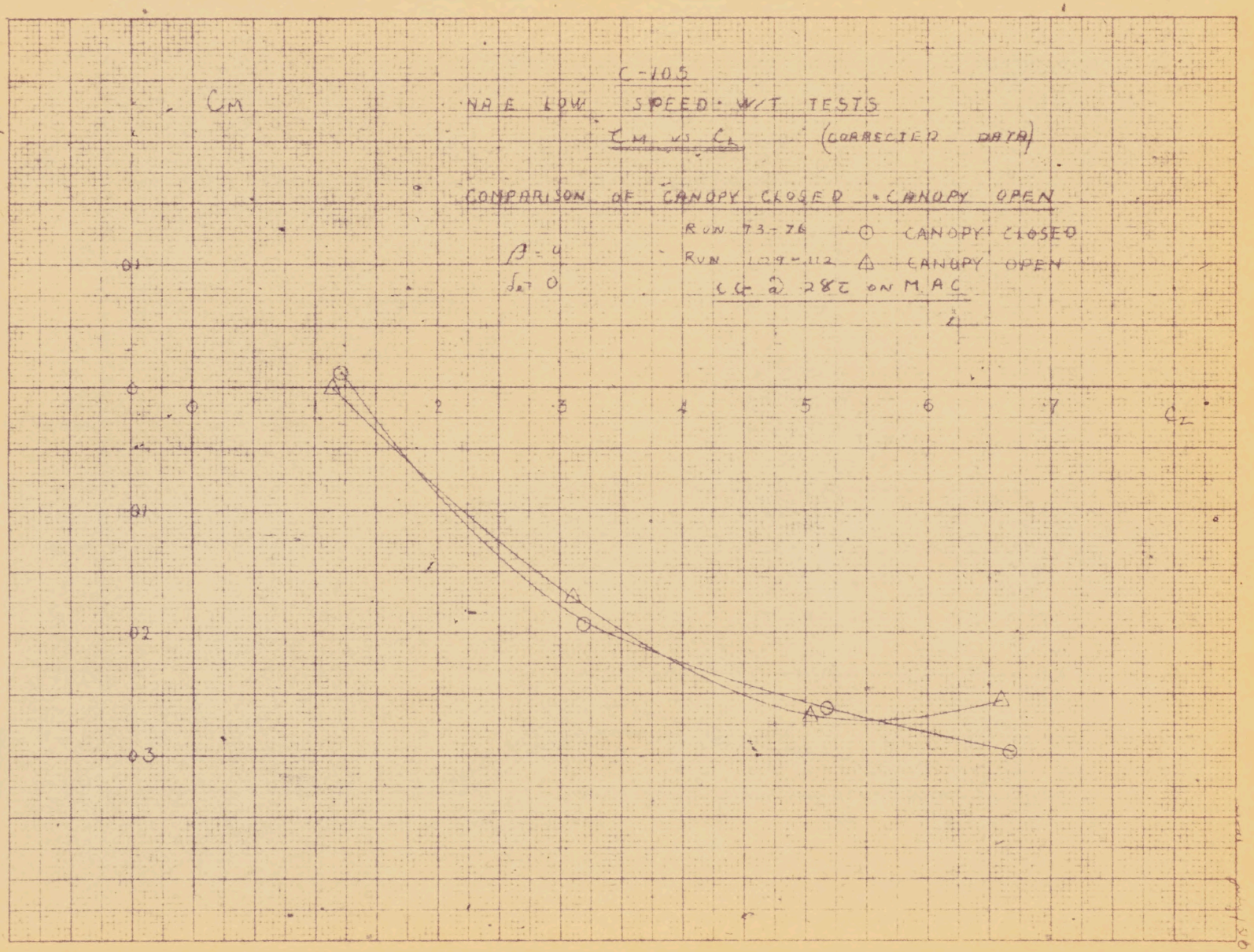
RUN 73-76 ① CANOPY CLOSED

RUN 109-112 △ CANOPY OPEN

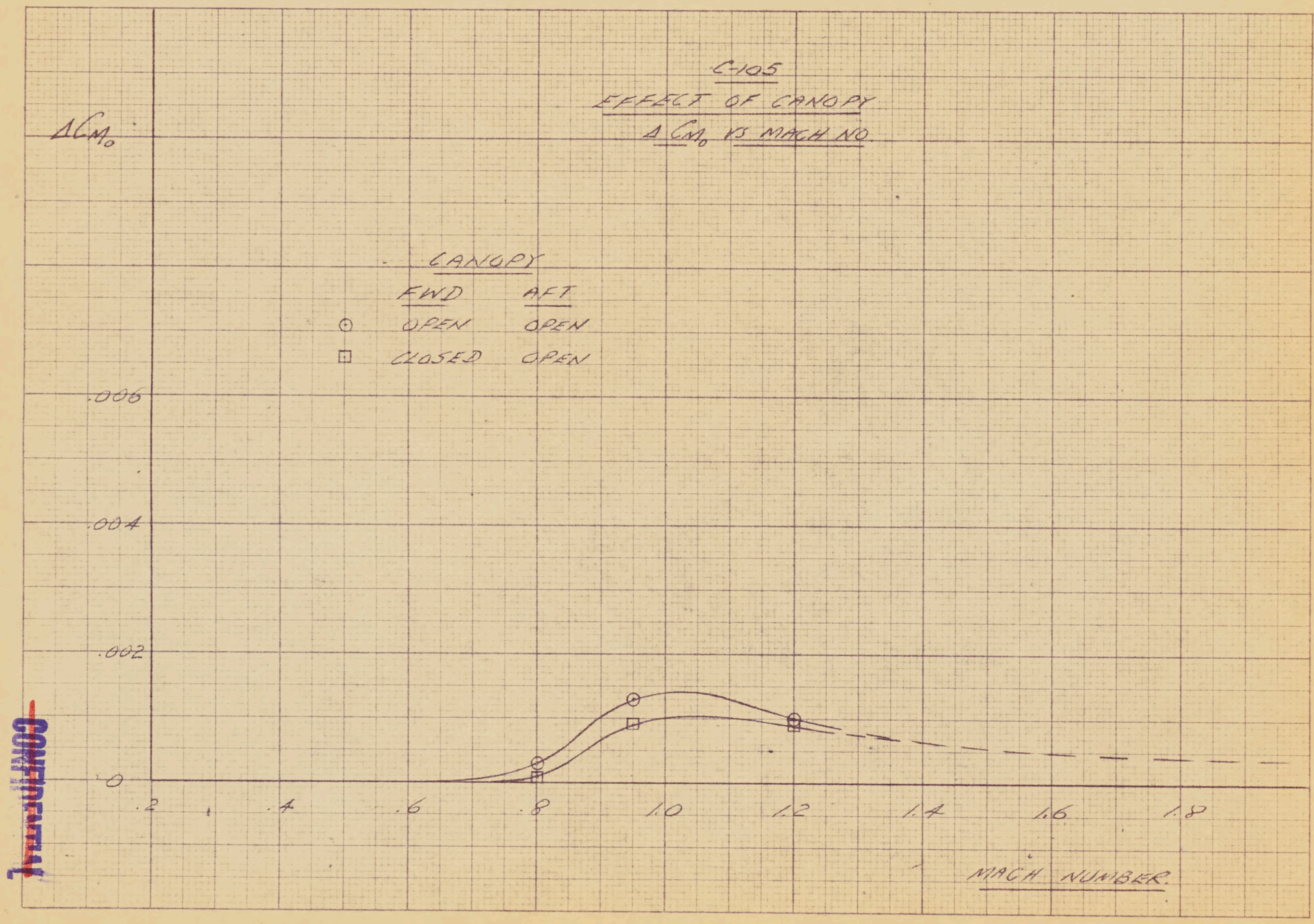
$\beta = 4$

$\delta_f = 0$

CG @ 28% ON MAC



P/WT/119



P/STAB/1-46 1.1.A
CLARK.

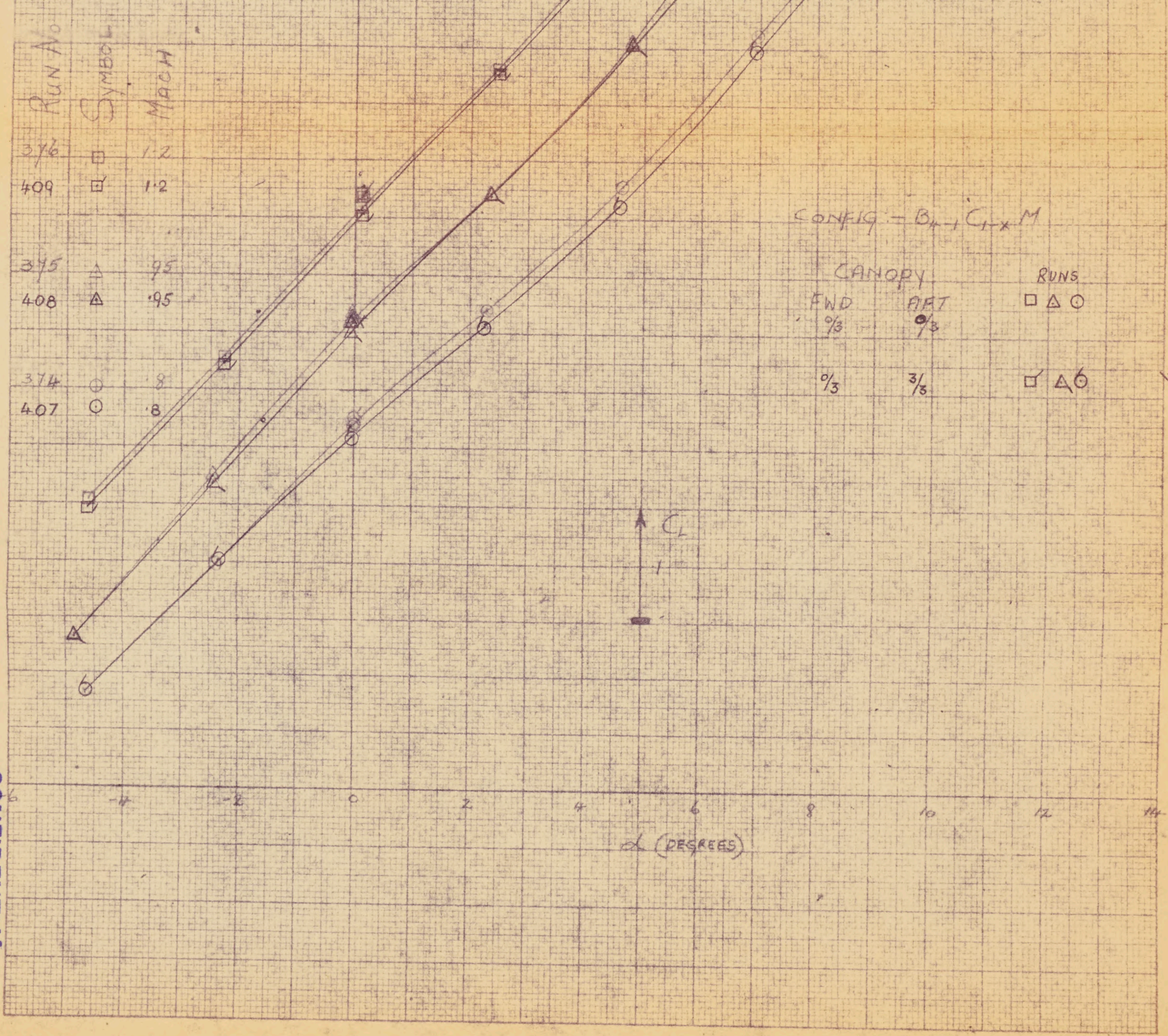
C-105

CAL W/T TESTS (MARCH '54)

C_L vs α

($\delta_f = 10°$)

RUN No.	SYMBOL	MACH
396	□	1.2
409	⊡	1.2



June '57

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MAY '57

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P/STAR/146 7.2.1

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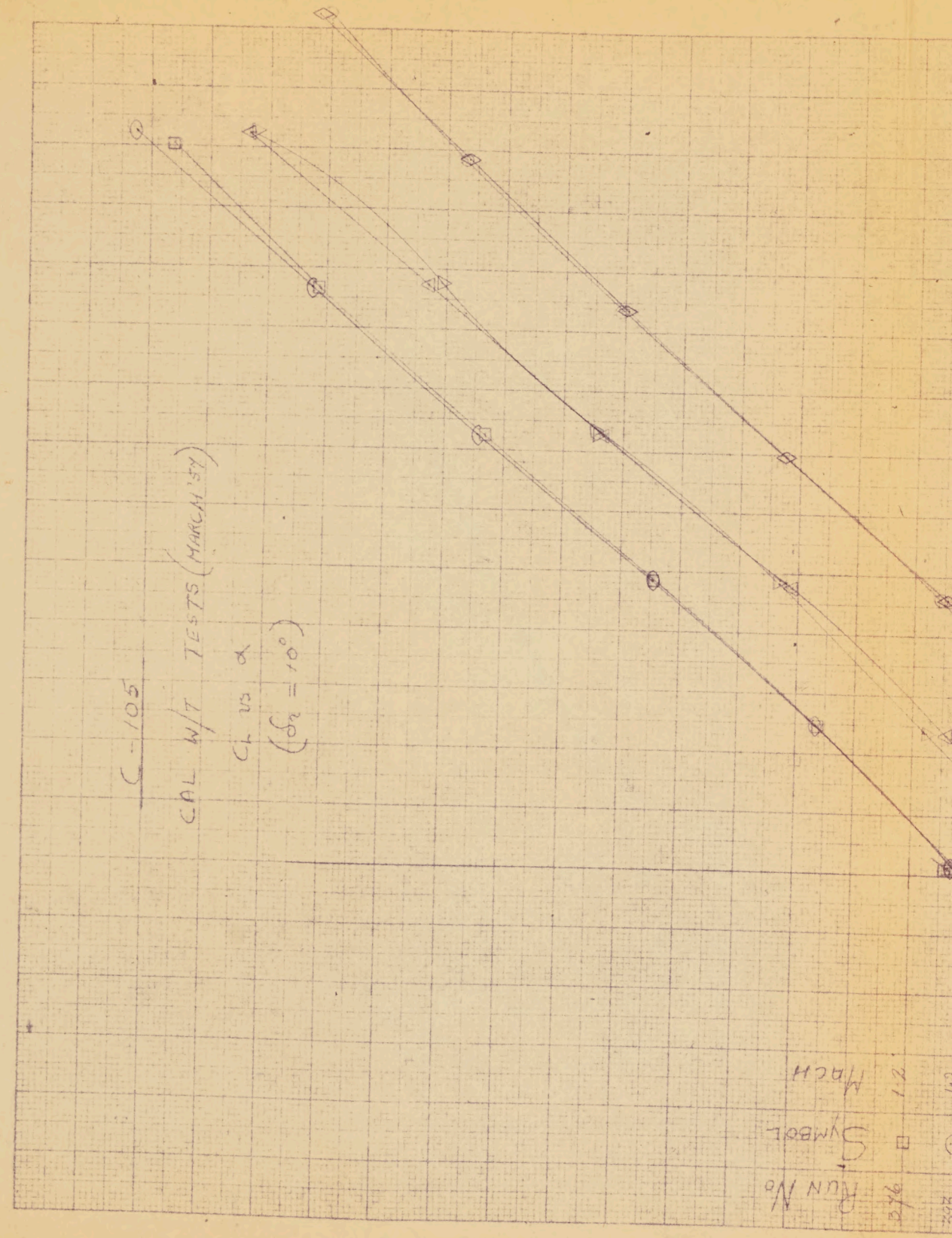
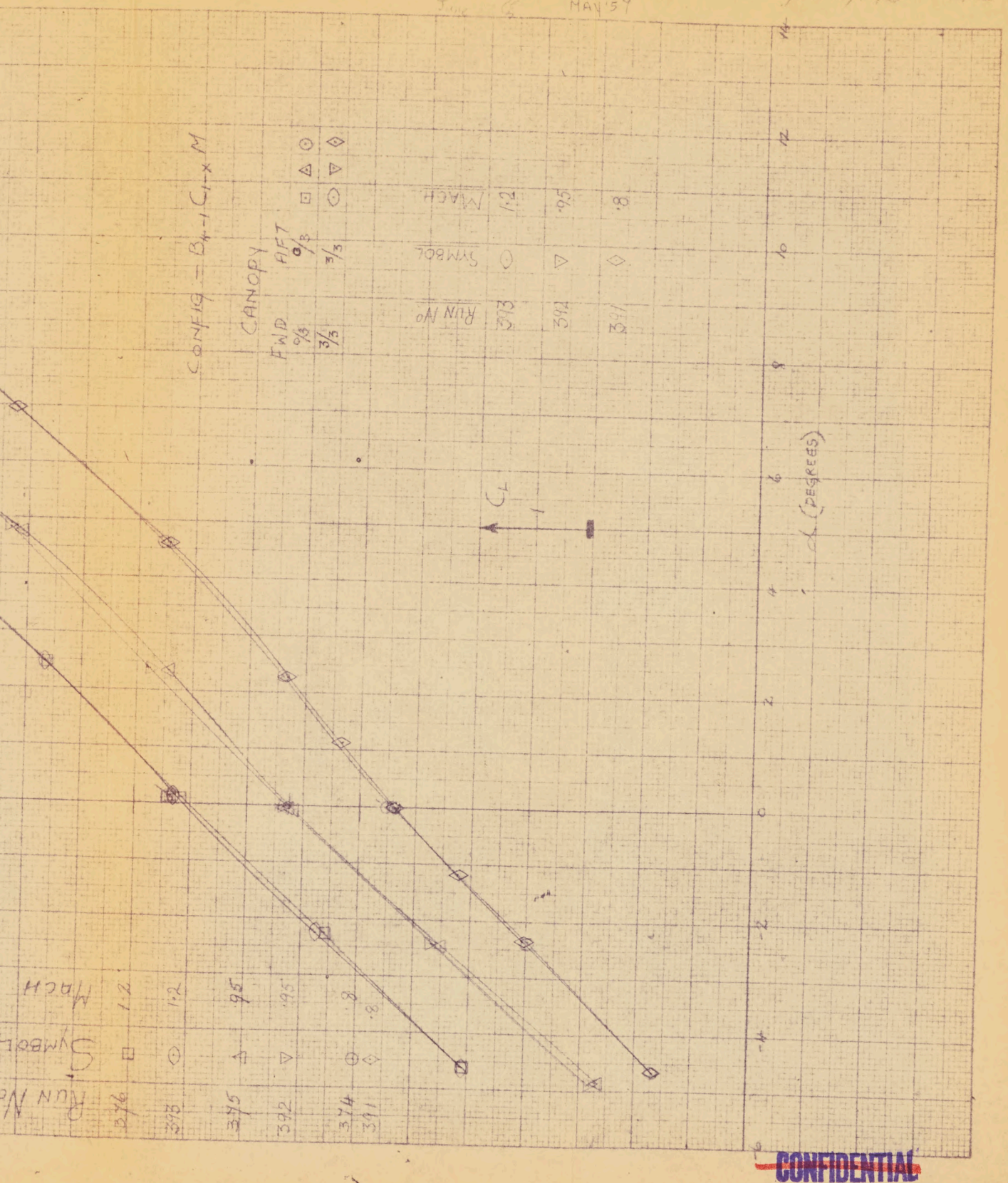




P/WT/119

C-105

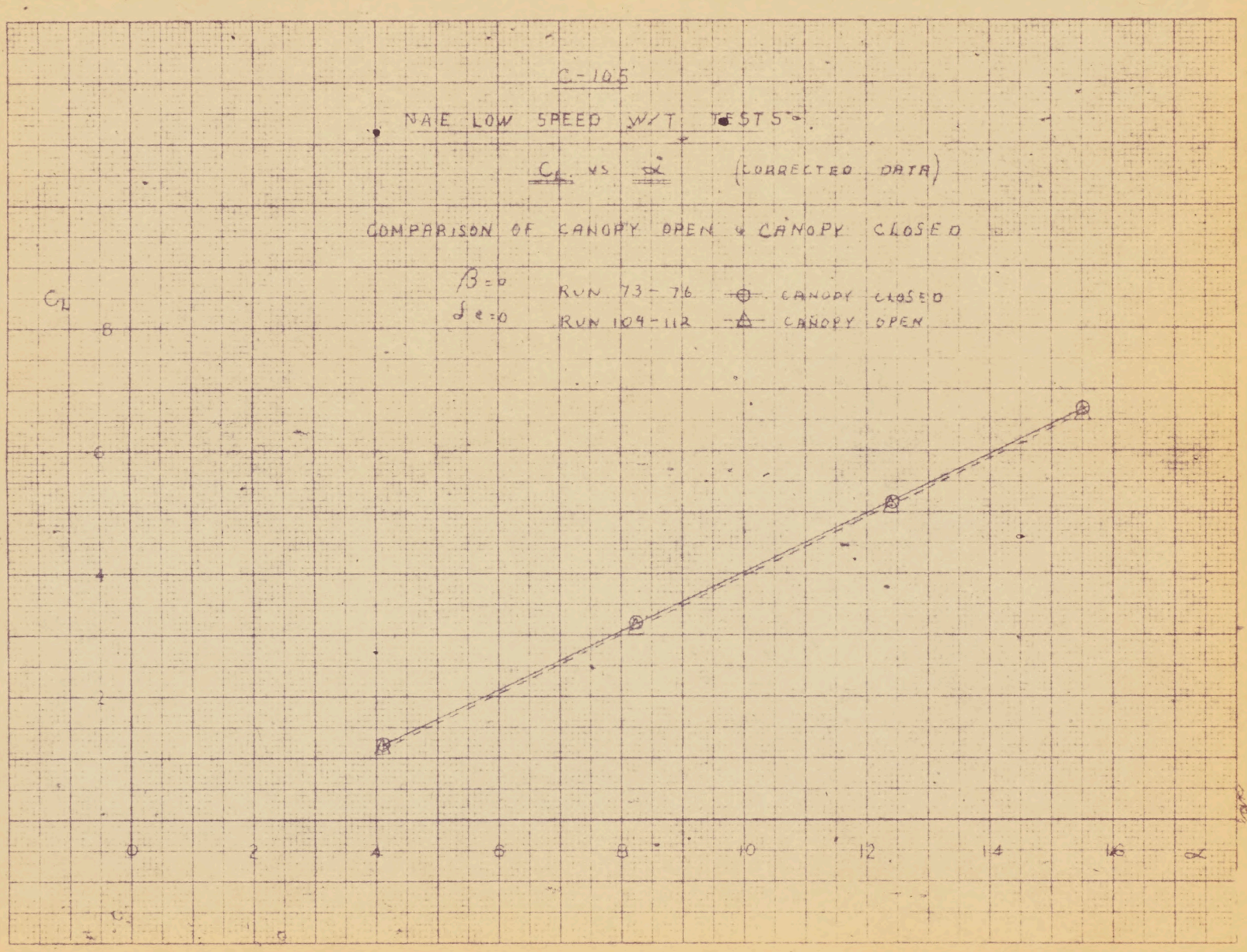
NAE LOW SPEED WT TEST 5

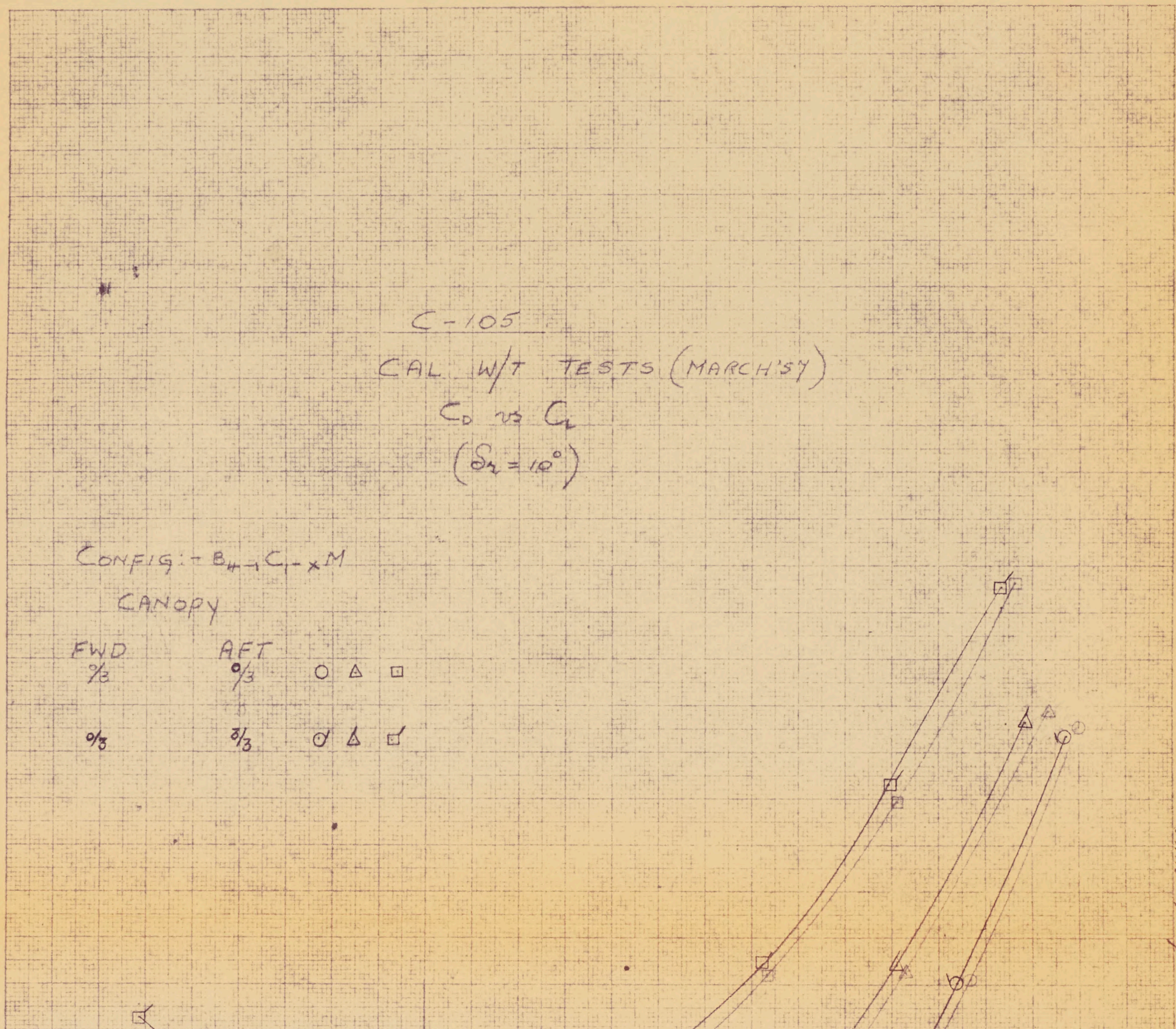
C_L vs α (CORRECTED DATA)

COMPARISON OF CANOPY OPEN & CANOPY CLOSED

$\beta = 0$ RUN 73 - 76 CANOPY CLOSED

$\delta_e = 0$ RUN 109 - 112 CANOPY OPEN





June '57 G

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May '57

June '57 G

Run No.	Model	Mach
376	1:2	.8
409	1:2	.95
376	1:2	.95
408	1:2	.95
374	1:2	.8
407	1:2	.8

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CAL W/T TESTS (MARCH '57)

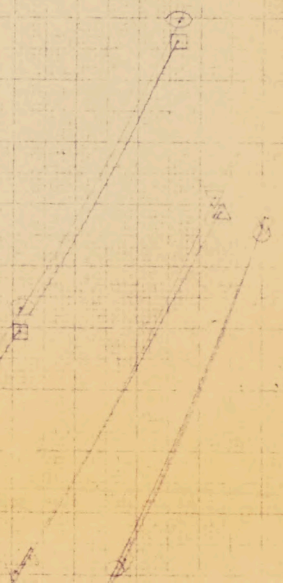
C_D vs C_L

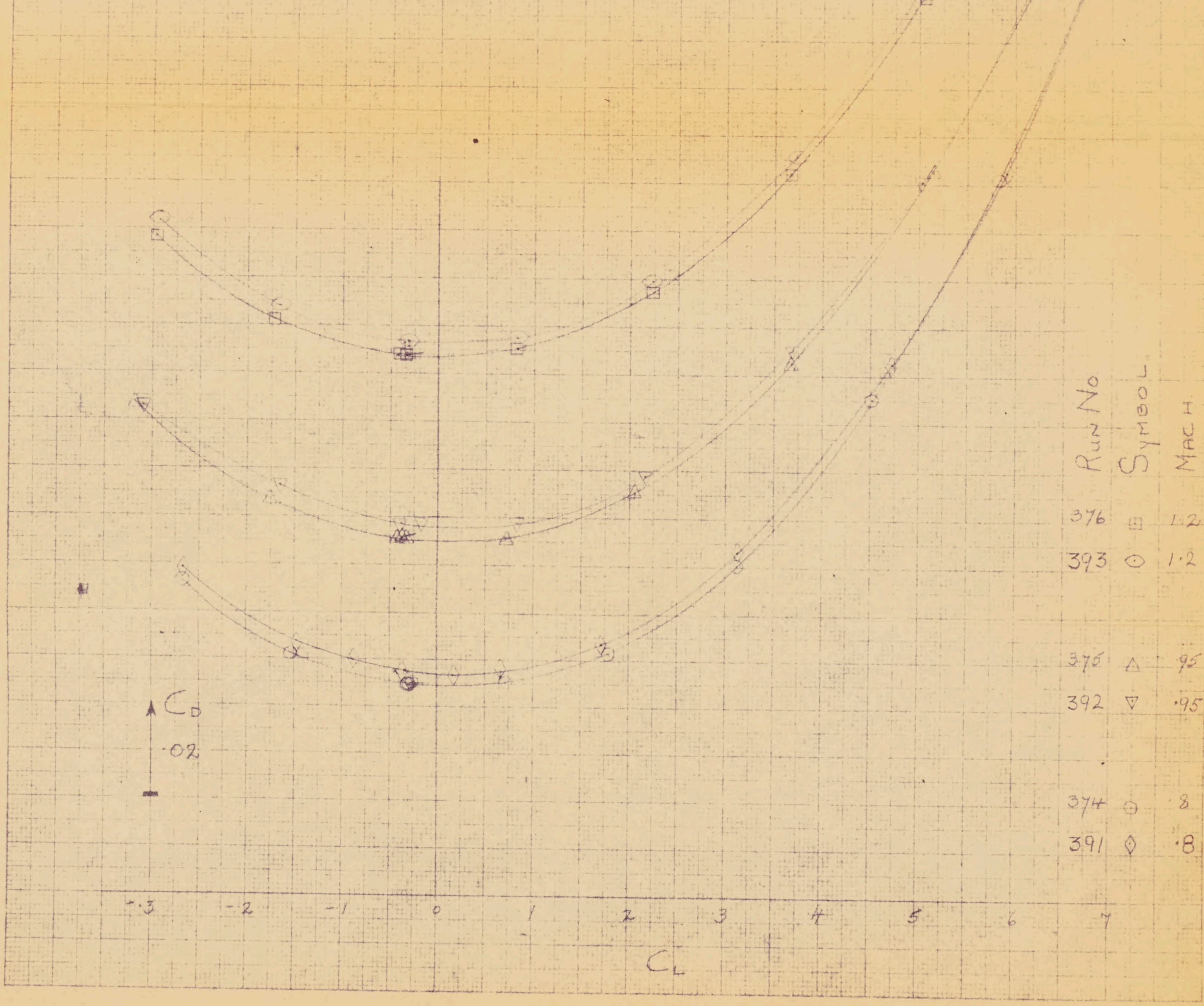
($\delta_2 = 10°$)

CONFIG:- $B_{4-1} C_{1-x} M$

CANOPY

FWD	AFT	
0/3	0/3	□ △ ○
3/3	3/3	◇ ▽ ◇





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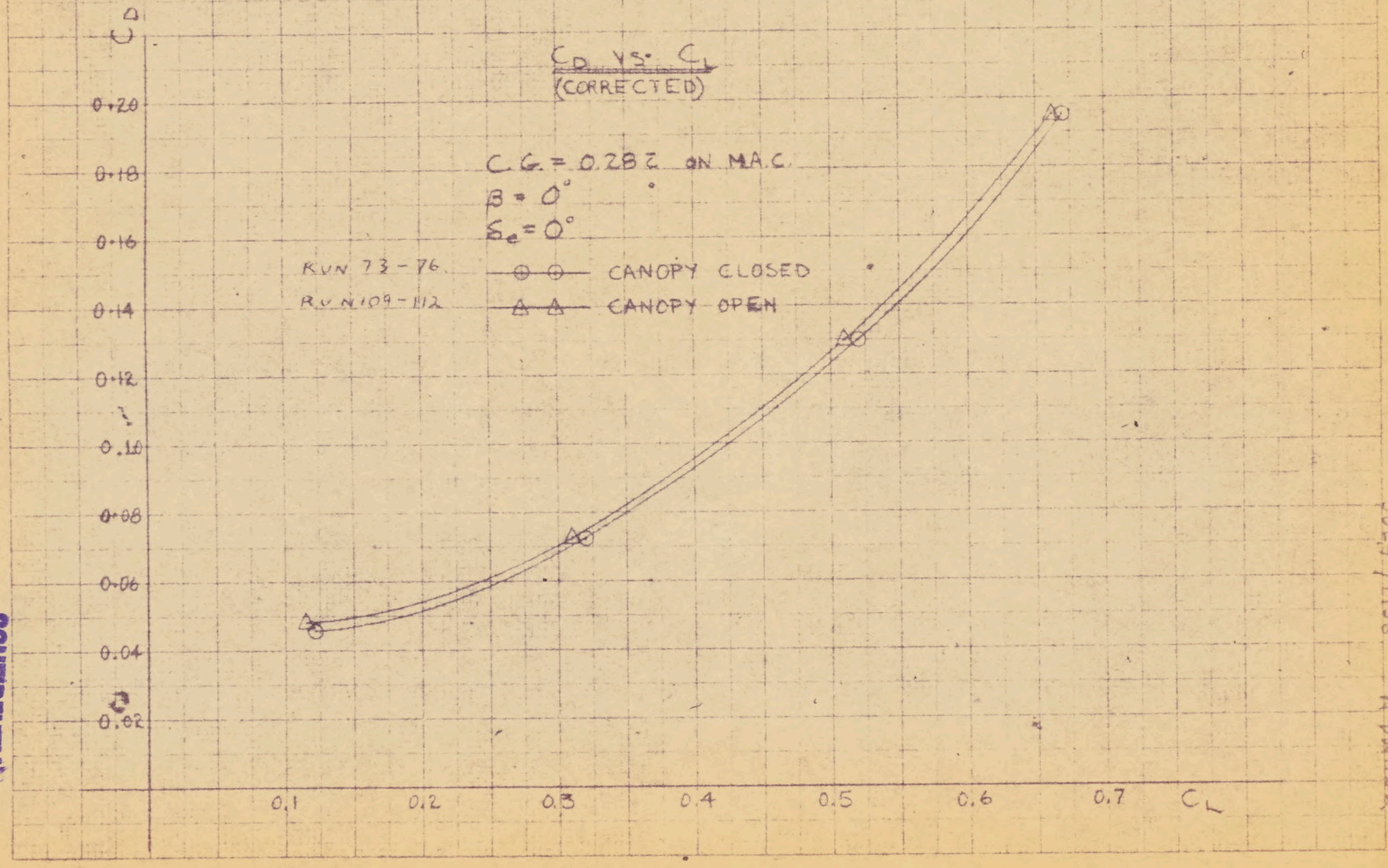
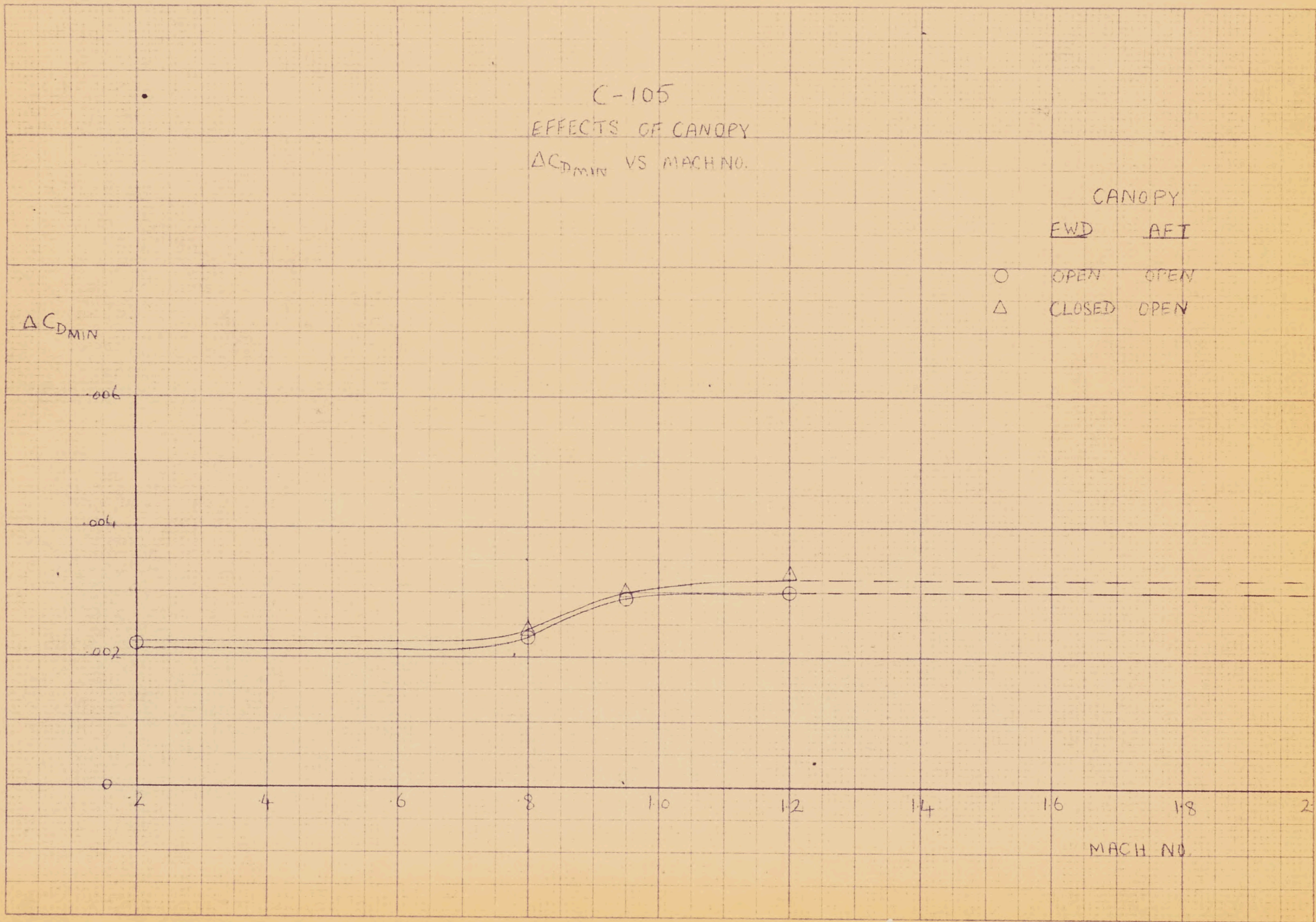
N.A.E. W.T. TESTS
MAY, 1956

C_D vs. C_L
(CORRECTED)

C.G. = 0.282 ON M.A.C.
$\beta = 0°$
$\varepsilon_c = 0°$

RUN 73-76 ⊖—⊖ CANOPY CLOSED
RUN 109-112 △—△ CANOPY OPEN





R.S.R. June D/Stab/146 1.3.4

PLOT 258

C-105

C.A.L. W/T TESTS (MARCH/57)

CONFIG: $B_4 - iMC_1 - x$

C_n vs β

⊙ △ ⊡ CANOPIES CLOSED

⊙ △ ⊡ CANOPIES OPEN

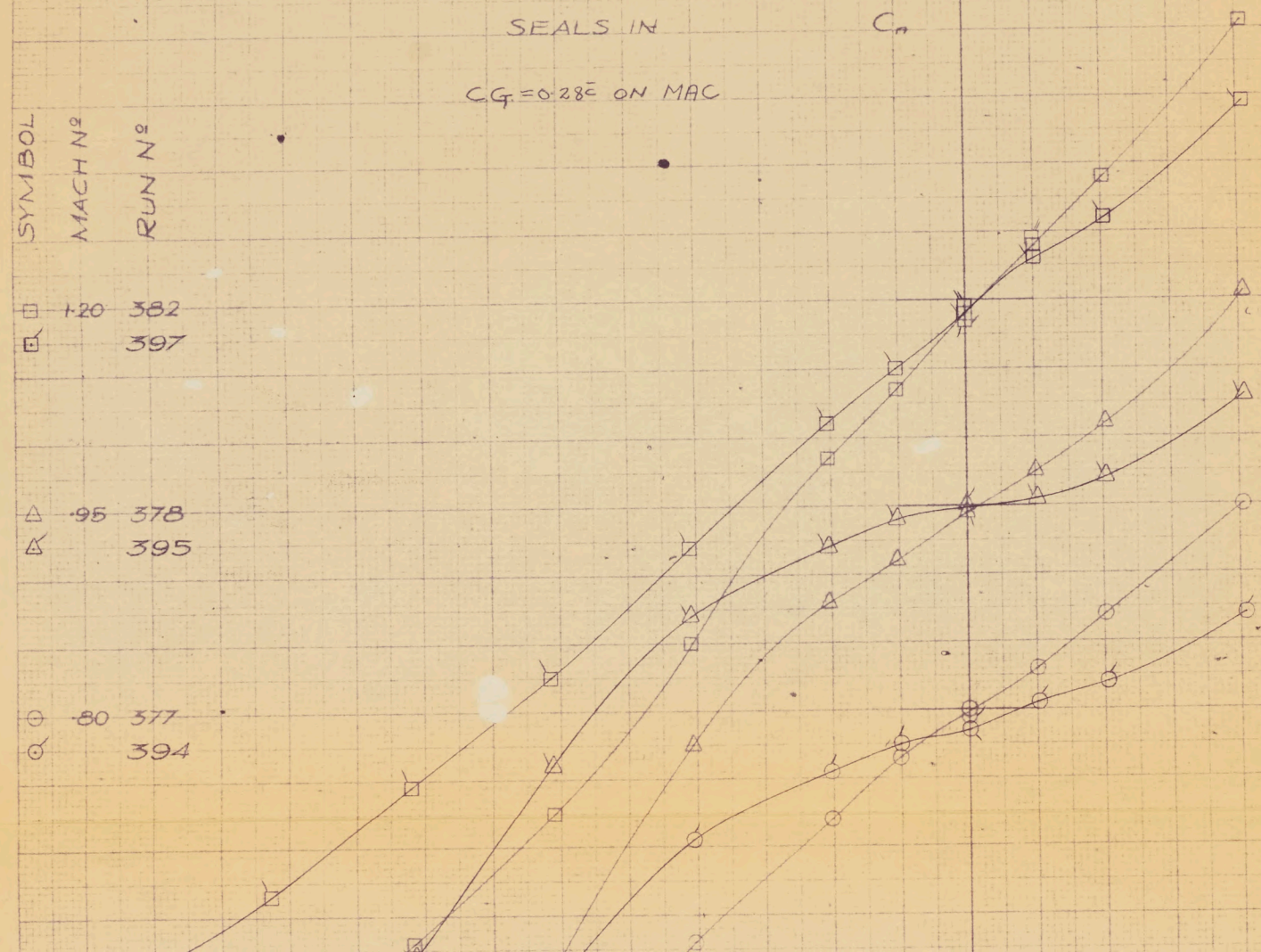
$\alpha \doteq 2.5°$

SEALS IN

C_n

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

SYMBOL	MACH Nº	RUN Nº
⊡	1.20	382
⊡		397
△	.95	378
△		395
⊙	.80	377
⊙		394



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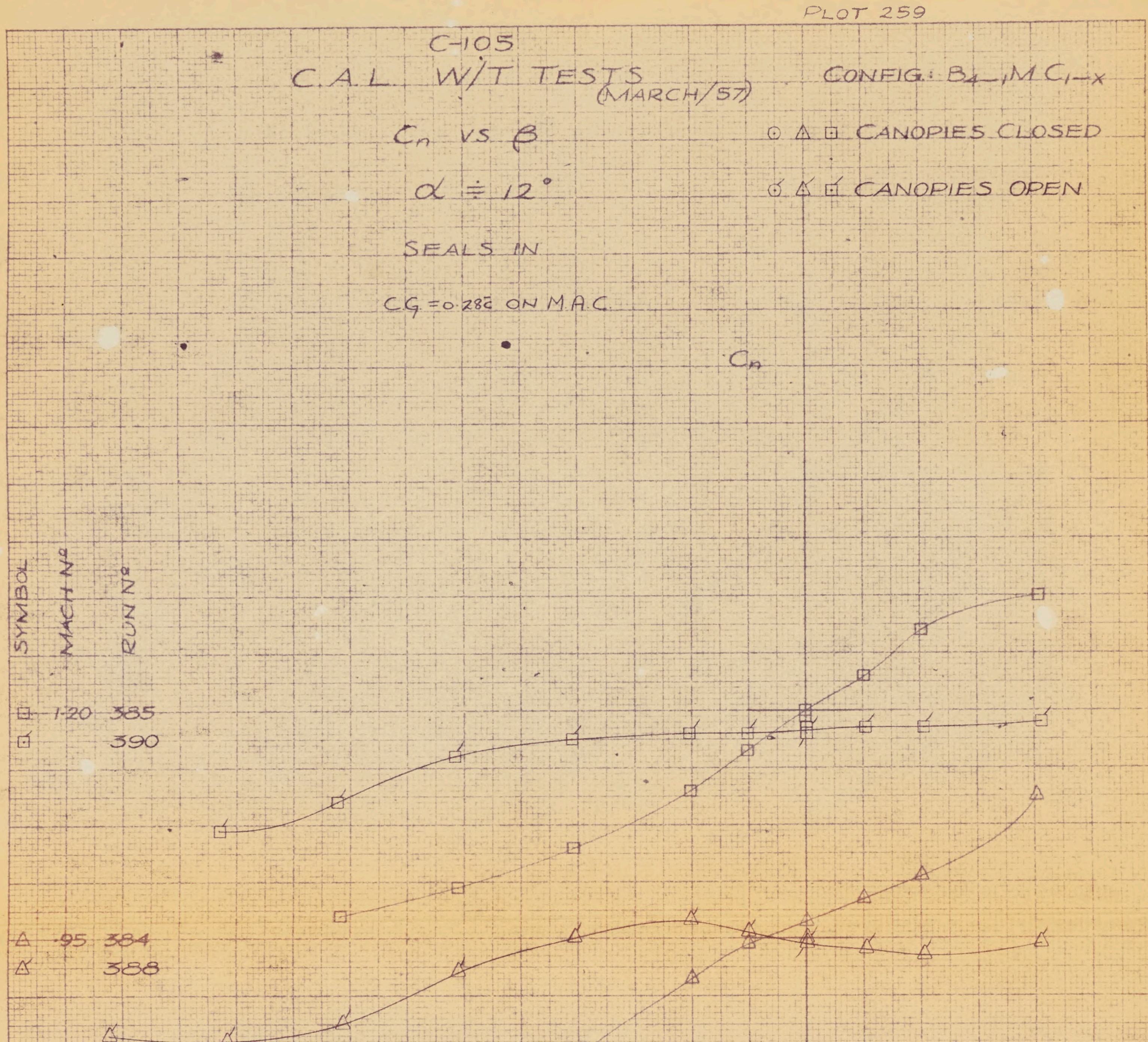
PLOT 259
C-105
C.A.L. W/T TESTS (MARCH/57)
CONFIG: B4-1 M C1-x
Cn VS β
α ≑ 12°
SEALS IN
CG = 0.28c̄ ON M.A.C.
CANOPIES CLOSED
CANOPIES OPEN
Cn
SYMBOL
MACH No
RUN No
1.20
385
390
.95
384
388

D/STAB/146 3.2.9

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2.1.2

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PLOT 258

C-105

C.A.L. W/T TESTS (MARCH/57)

CONFIG.: $B_4 - 1MC_1 - x$

C_n vs β

⊙ △ □ CANOPIES CLOSED

⊙ △ □ FWD CLOSED AFT OPEN

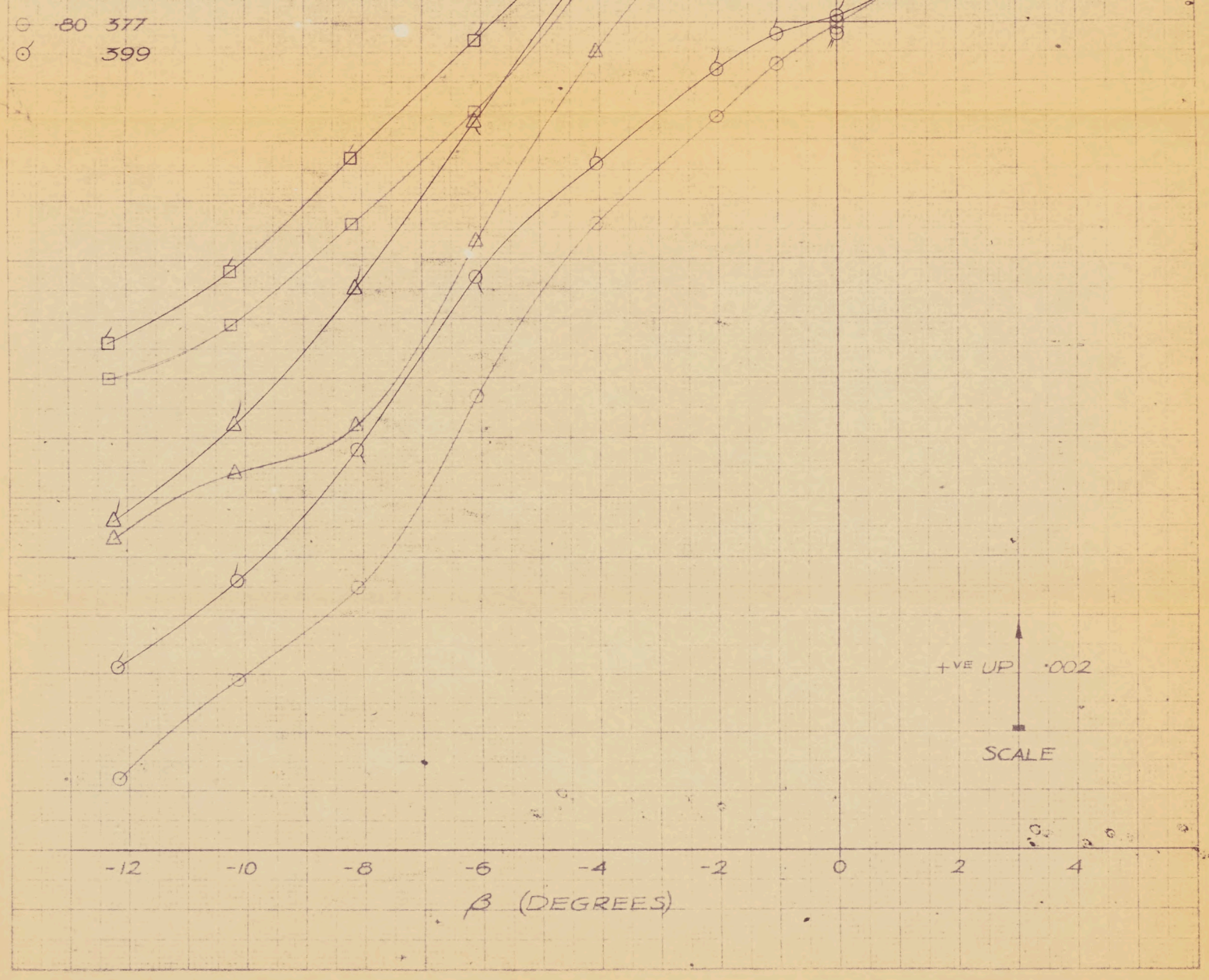
$\alpha \doteq 2.5°$

SEALS IN

C_n

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

SYMBOL	MACH Nº	RUN Nº
⊟	1.20	382
◪		402
△	.95	378
◬		400
⊖	.80	377
⊙		399



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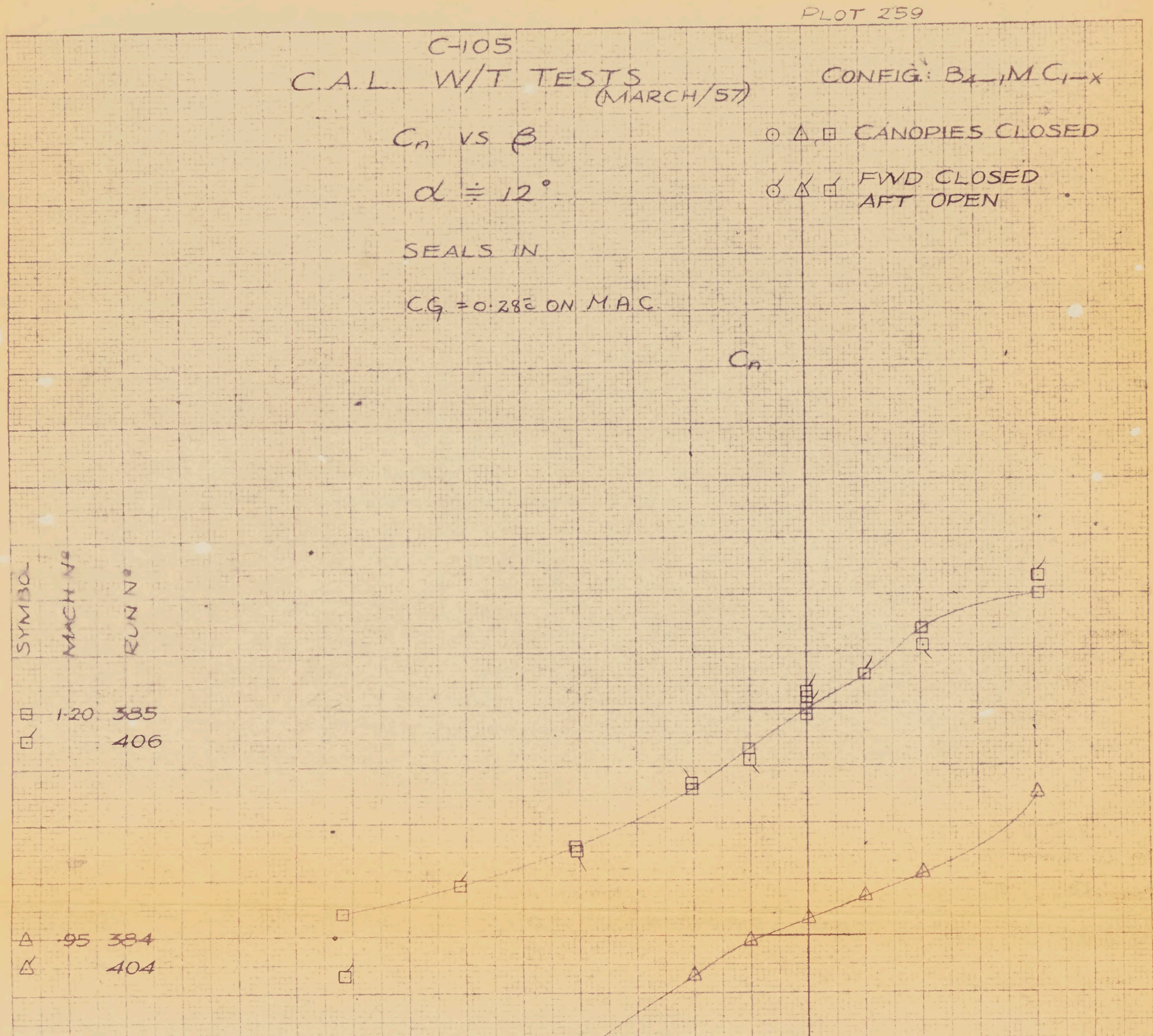
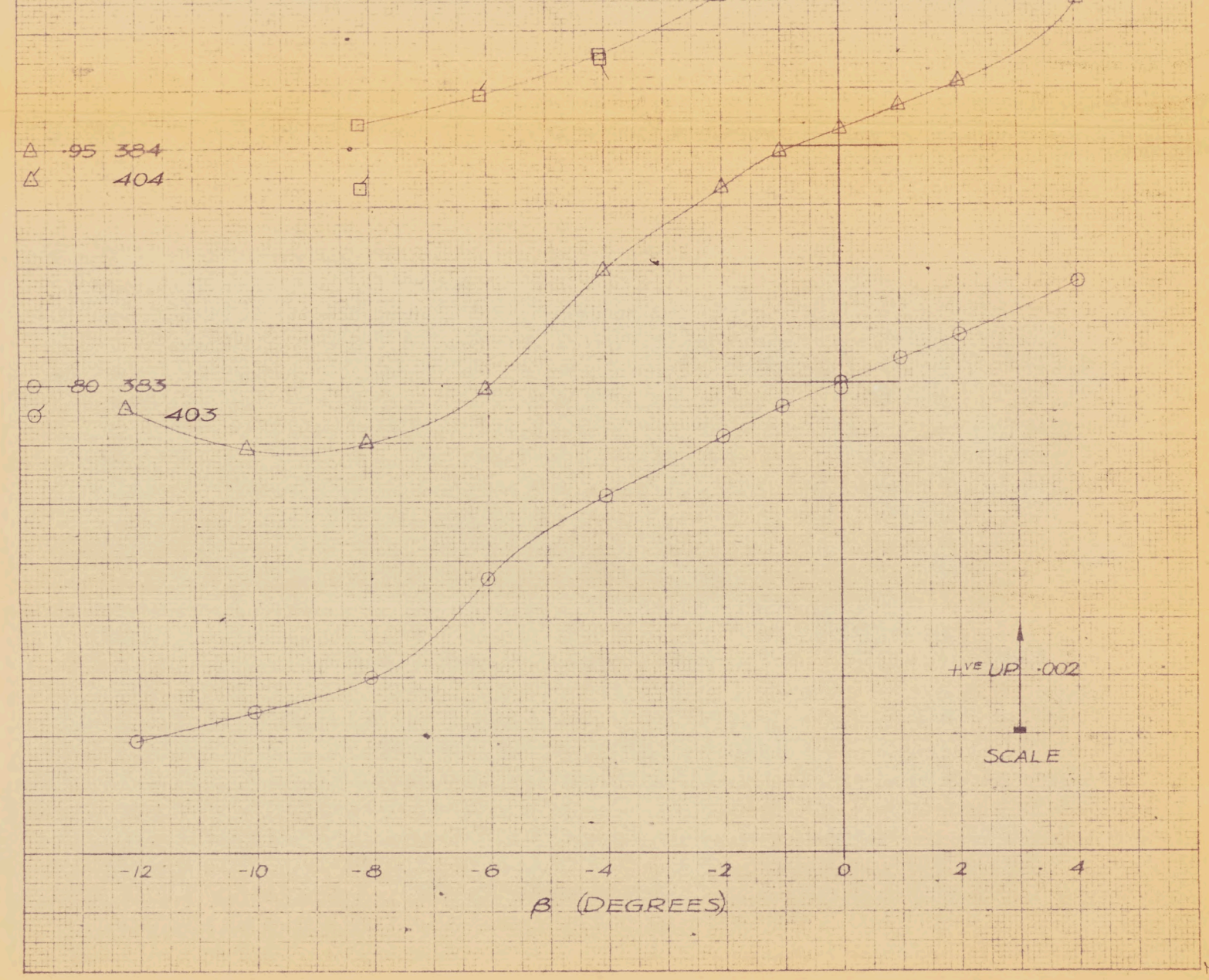
R/STAB 146 3.2.9

R/Stab/146

2.1.3


PLOT 259
C-105
C.A.L. W/T TESTS (MARCH/57)
CONFIG: B4-1M C1-x
Cn VS β
α ≑ 12°
SEALS IN
C.G. = 0.28c̄ ON M.A.C.
⊙ △ ⊡ CANOPIES CLOSED
FWD CLOSED AFT OPEN
Cn
SYMBOL
MACH Nº
RUN Nº
1.20 385
406
.95 384
404



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R/Stab/146

2.1.4

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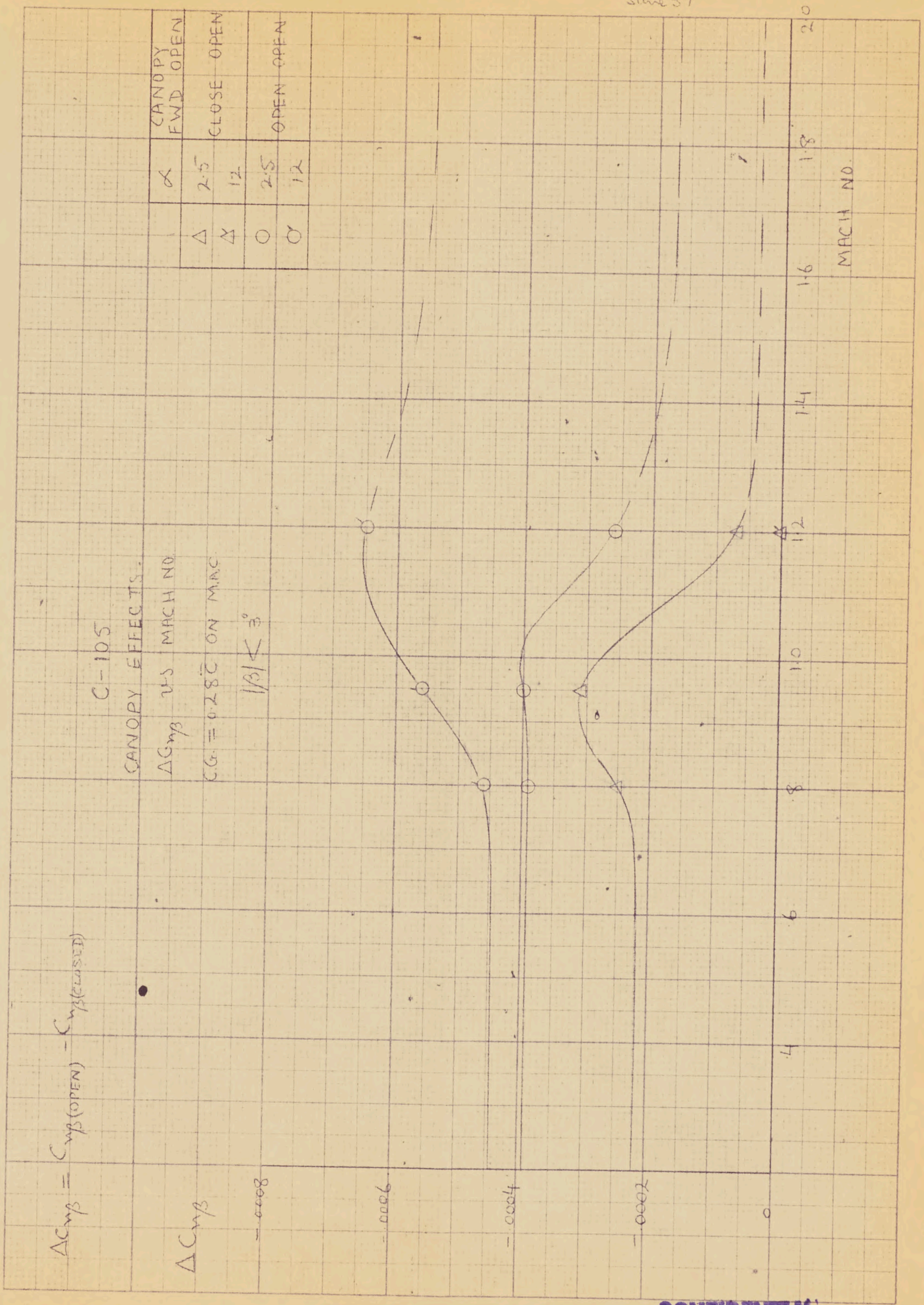
June 57

P/Stab/146

2.1.5



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PLOT 262

C-105

CAL W/T TESTS (MARCH/57)

CONFIG: $B_{4-1}MC_{1-x}$

C_l VS β

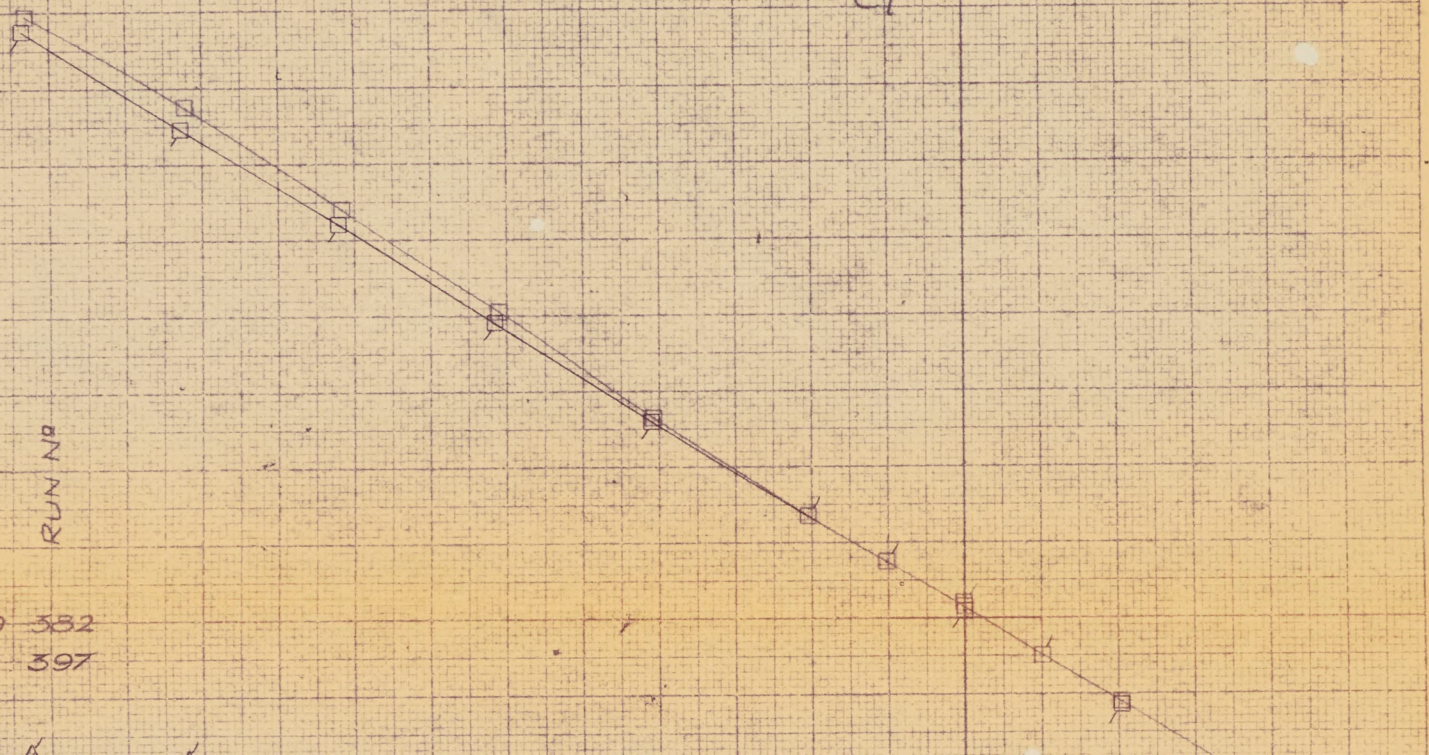
⊙ △ ⊞ CANOPIES CLOSED

⊙ △ ⊞ CANOPIES OPEN

$\alpha \doteq 2.5°$

SEALS IN

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



SYMBOL	MACH No	RUN No
□	1.20	352
⊟		397

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2.2.1

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PLOT 263

C-105

C.A.L. W/T TESTS (MARCH/57)

CONFIG: B_4, MC_1, $-x$

C_l VS β

$\alpha \div 12°$

⊙ △ □ CANOPIES CLOSED

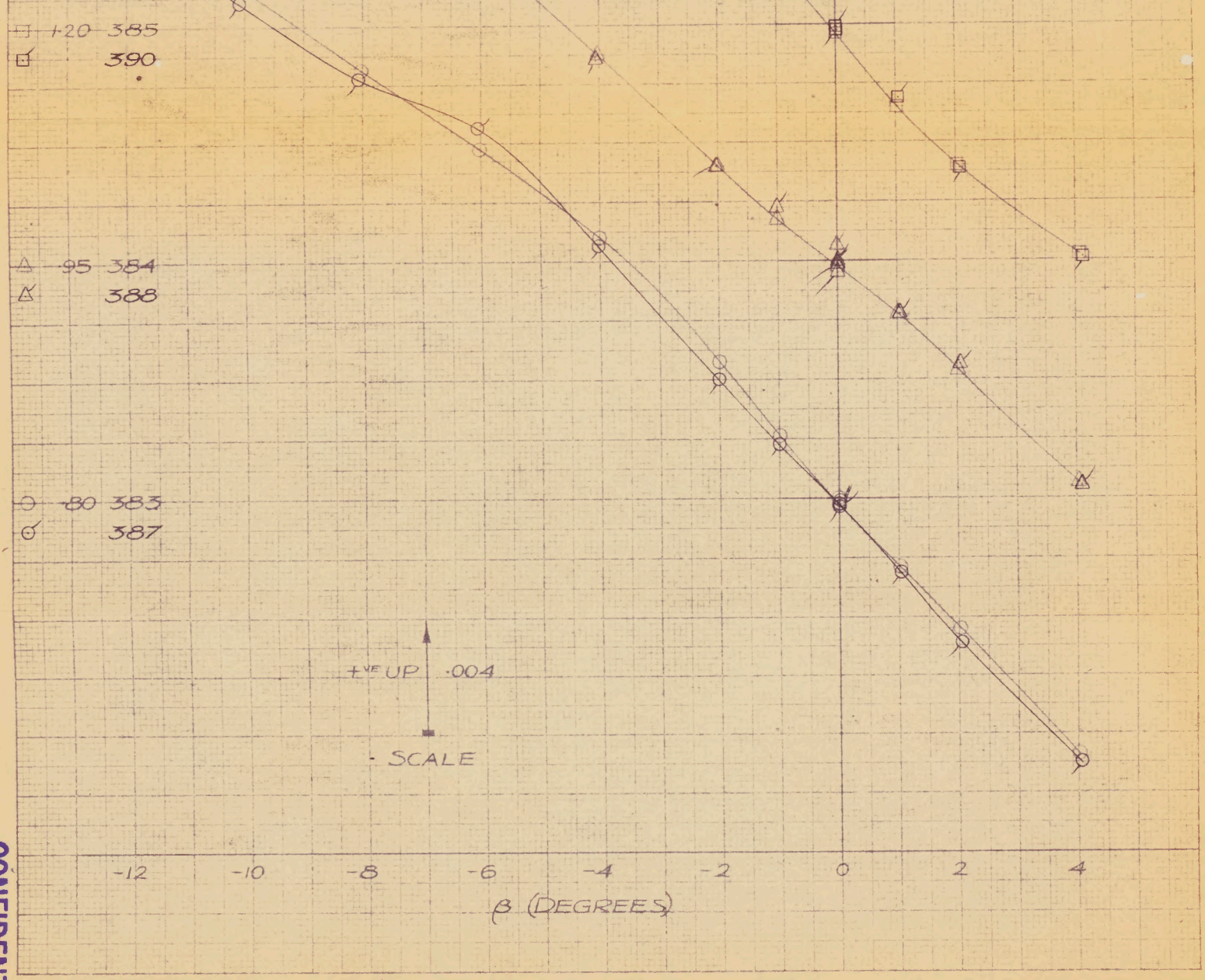
⊙ △ □ CANOPIES OPEN

SEALS IN

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

C_l

SYMBOL	MACH Nº	RUN Nº
□	1.20	385
⊡		390



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R/STAB 146 3.2.9

2.2.2

PLOT 263

C-105

C.A.L. W/T TESTS (MARCH/57)

CONFIG: $B_{4-1}MC_{1-x}$

C_l vs β

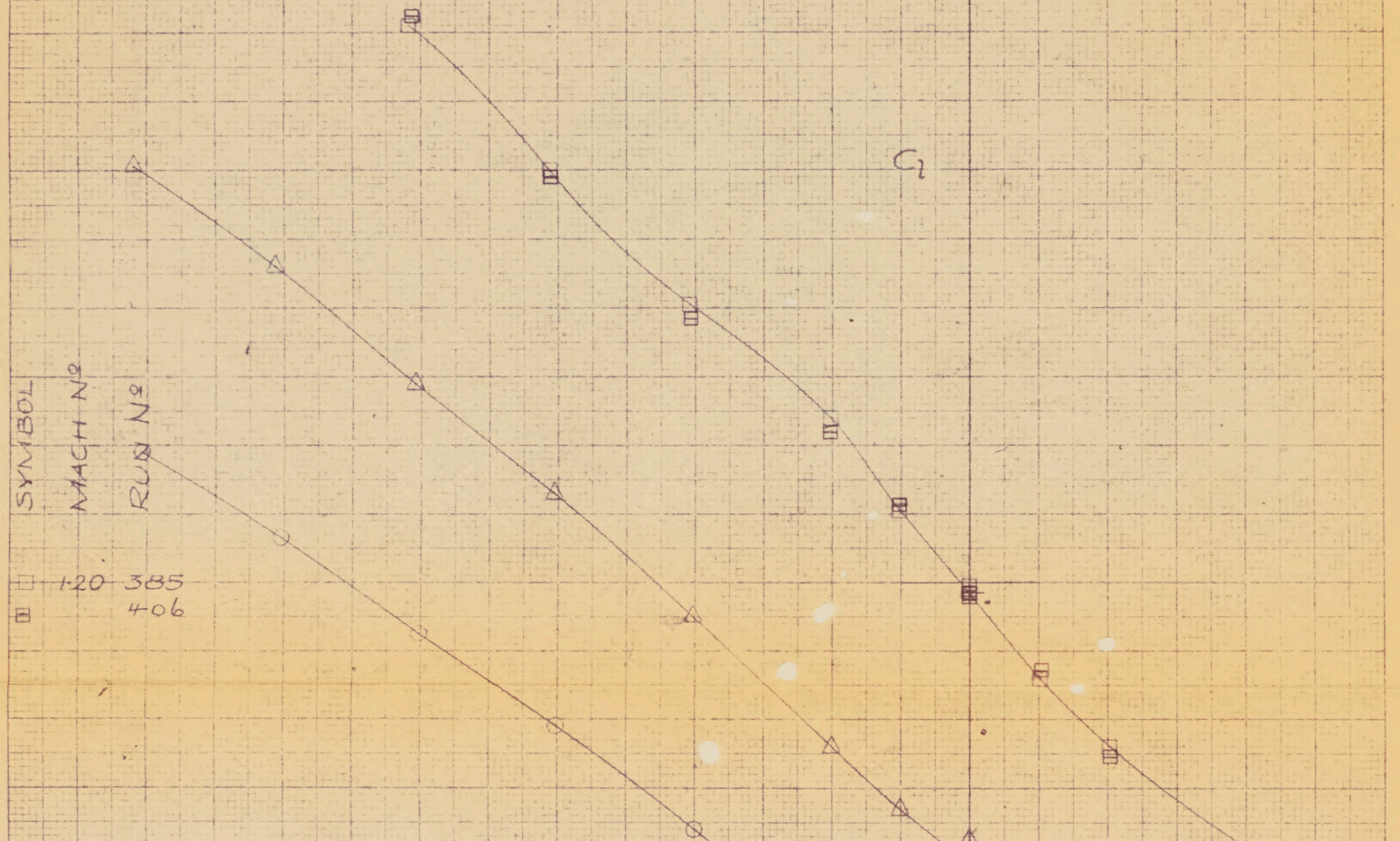
⊙ △ ⊡ CANOPIES CLOSED

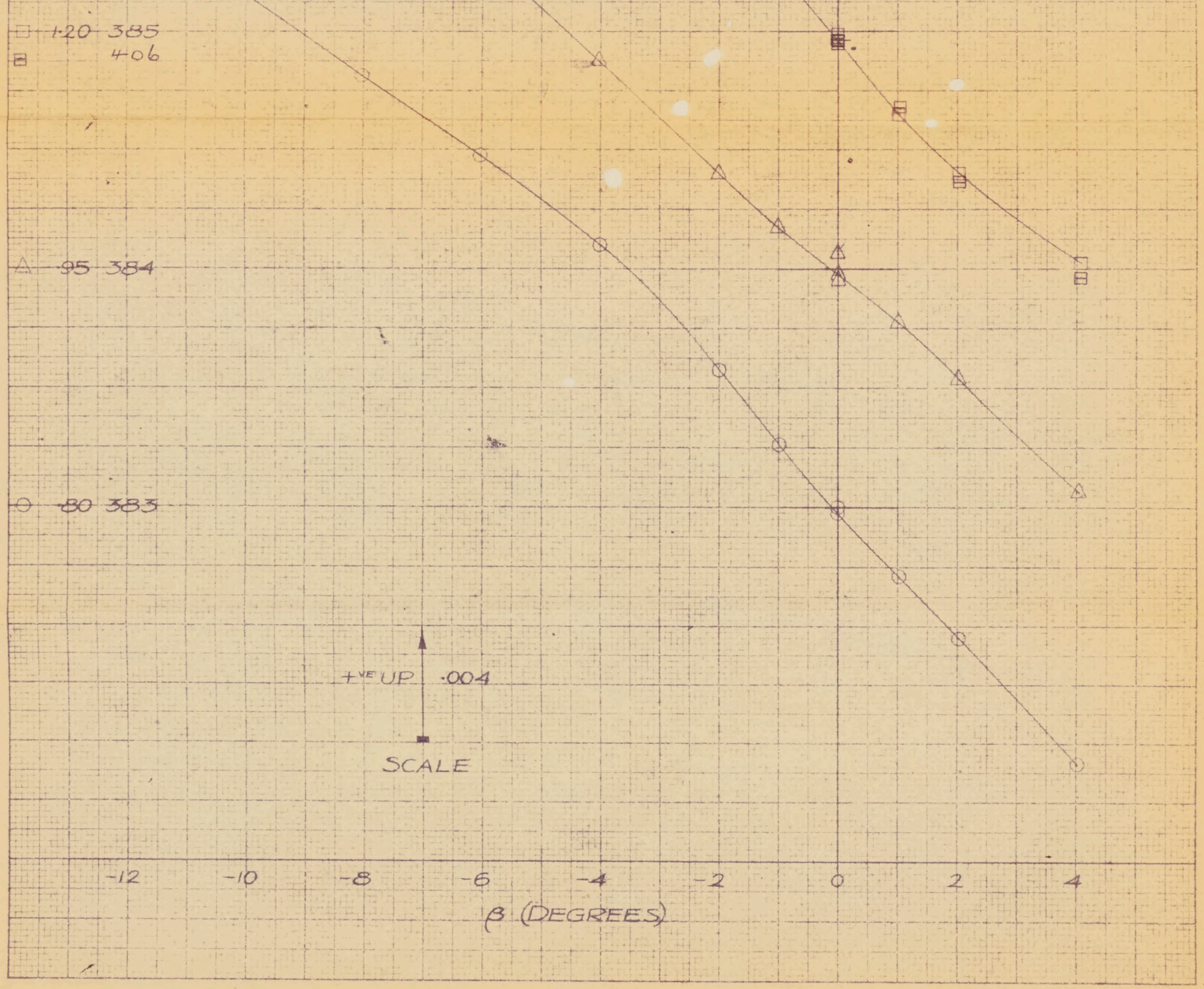
$\alpha \doteq 12°$

⊟ FWD CLOSED
AFT OPEN.

SEALS IN

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





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2.2.3

PLOT 262

C-105

C.A.L. W/T TESTS (MARCH/57)

CONFIG: B_4, MC_1-x

C_l vs β

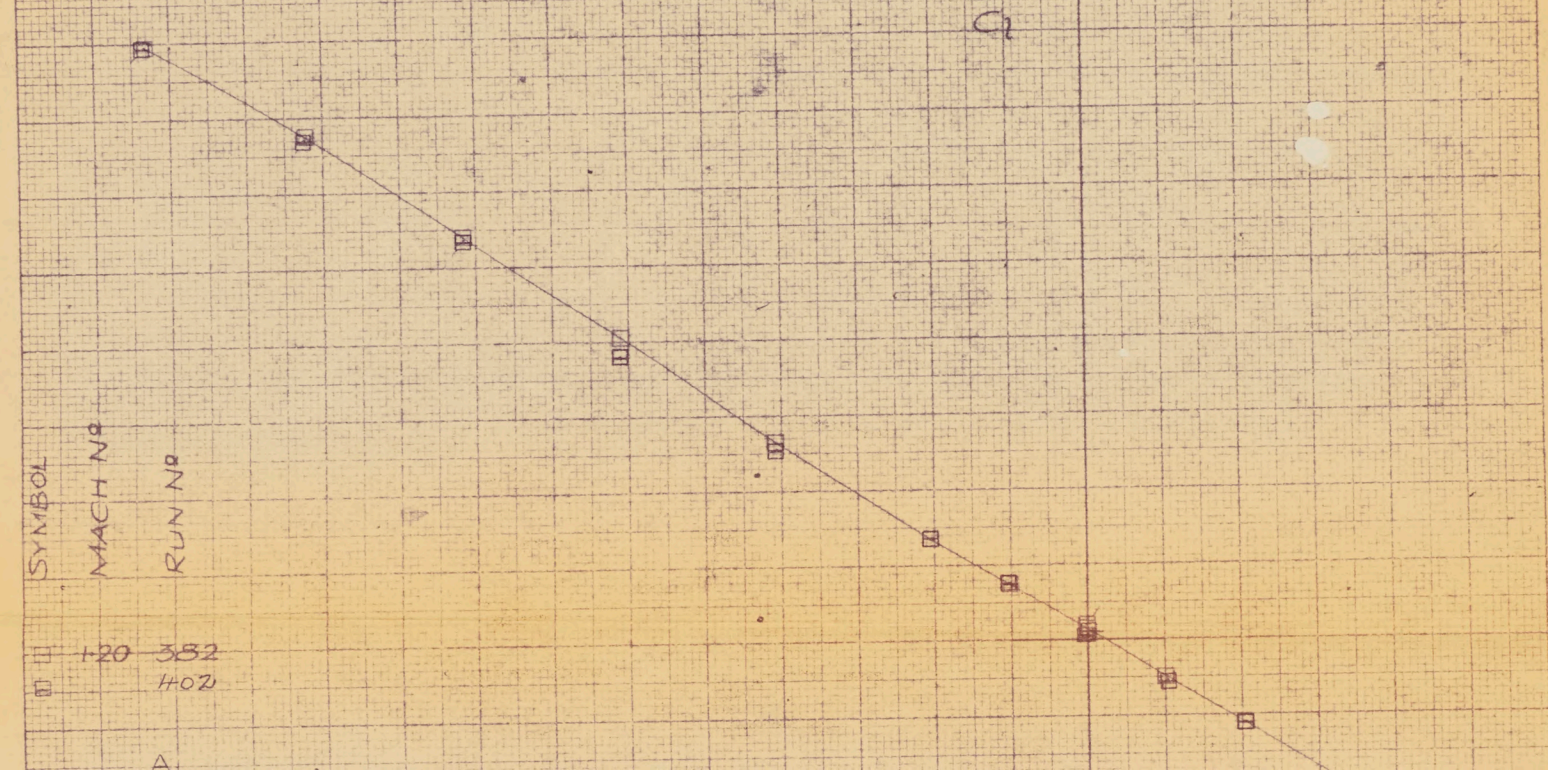
⊙ △ □ CANOPIES CLOSED

$\alpha \doteq 2.5°$

⊙ △ ⊟ FWD CLOSED AFT OPEN

SEALS IN

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



D/STAR 146 3.2.9

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P/Stab/146

2.2.4

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PLOT 262

C-105

C.A.L. W/T TESTS (MARCH/57)

CONFIG: $B_{4-1} MC_{1-x}$

C_l vs β

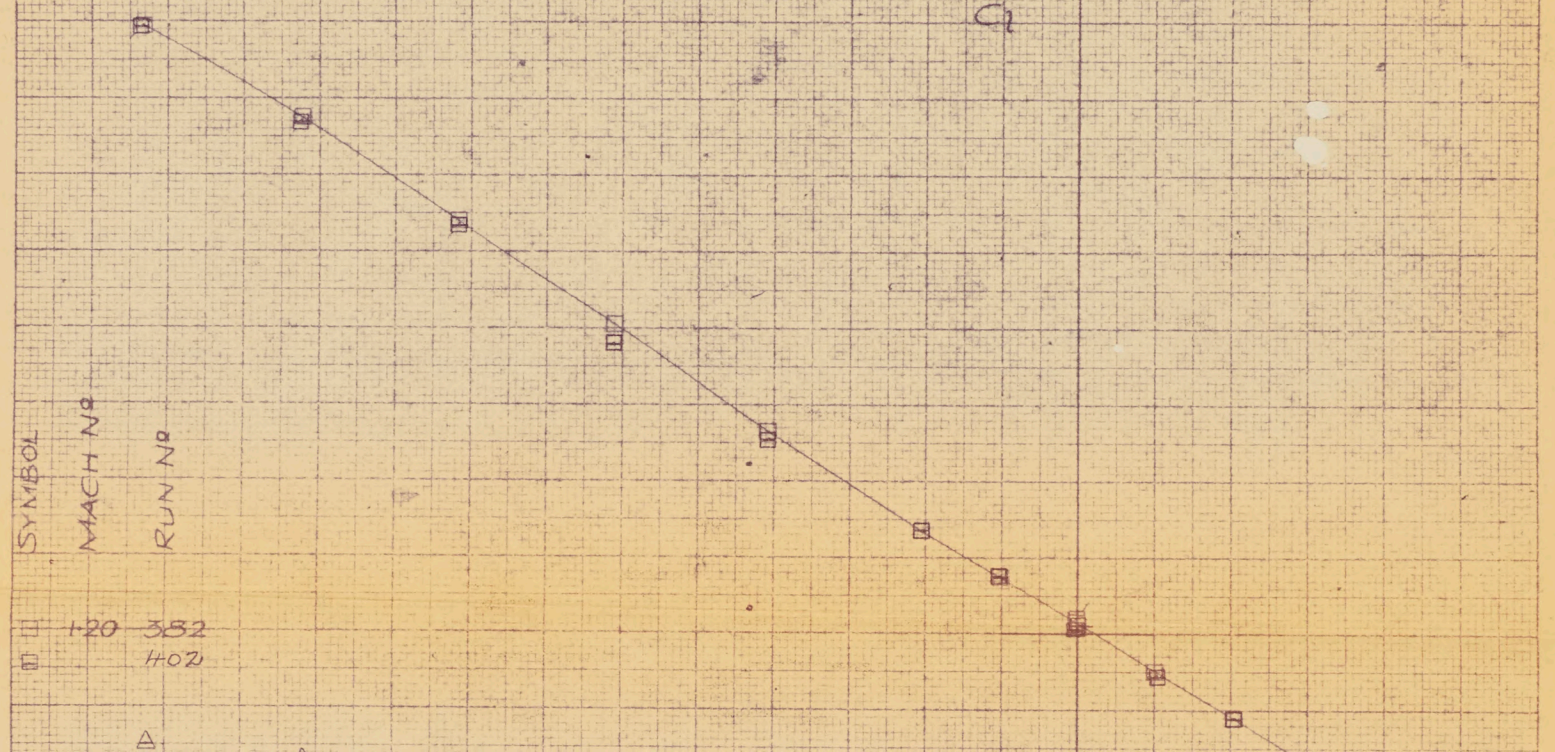
$\alpha \div 2.5°$

SEALS IN

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

⊙ △ □ CANOPIES CLOSED

⊖ ⊿ ⊟ FWD CLOSED AFT OPEN



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2.2.9

2.2.H

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C-105

CANOPY EFFECTS

ΔC_{l_β} VS MACH NO.

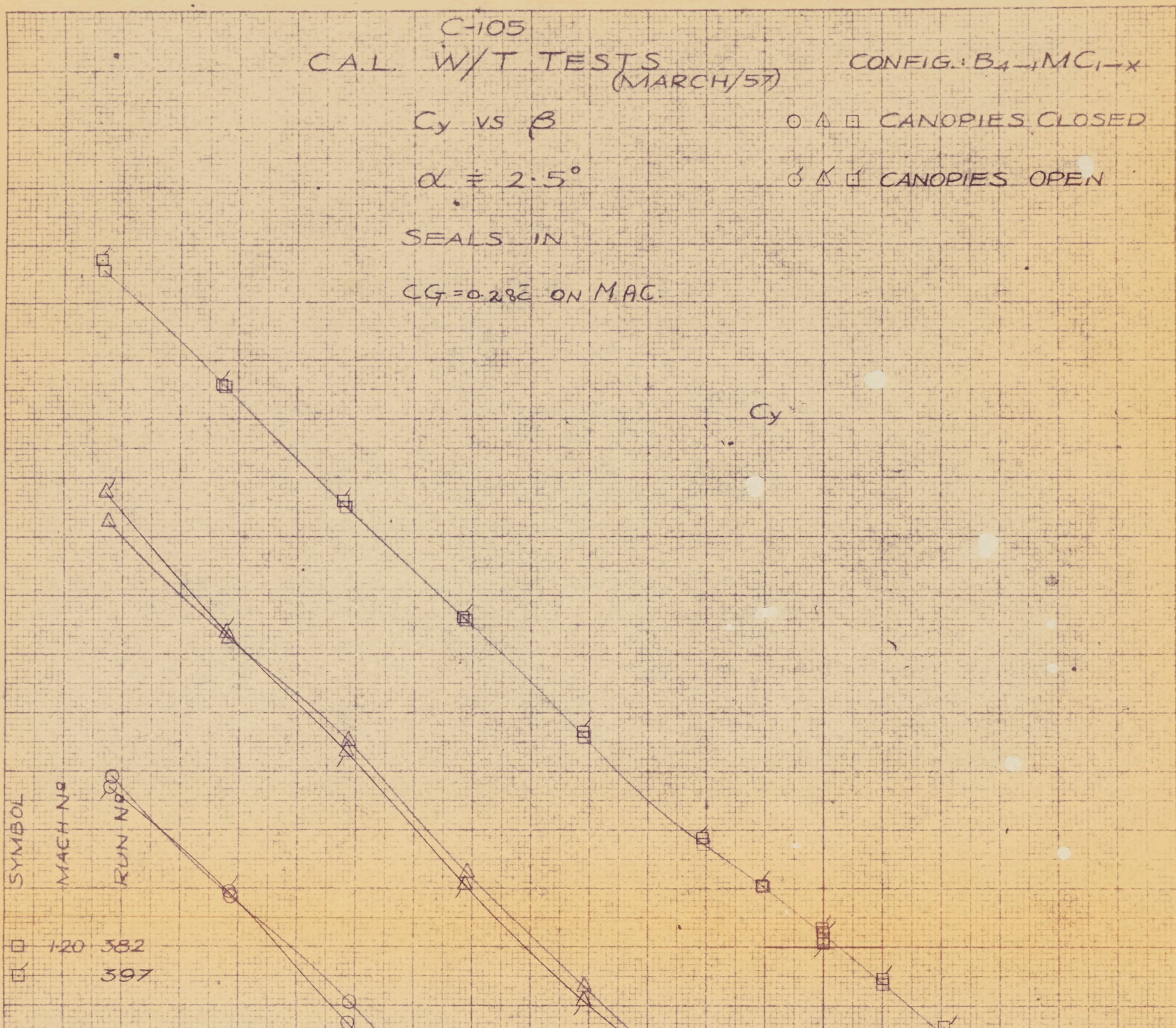
C.G. = 0.28 $\bar{C}$ ON MAC

$|\beta| \leq 3^\circ$

ΔC_{n_β} IS NEGLIGIBLE

RSR P/Stab/146 2.2.5
June 57

PLOT 260


C-105
C.A.L. W/T TESTS (MARCH/57)
CONFIG.: B_4 – MC_1 – x
C_y VS β
α = 2·5°
SEALS IN
CG = 0.28c̄ ON MAC.
○ △ □ CANOPIES CLOSED
○ △ □ (flagged) CANOPIES OPEN
C_y
SYMBOL
MACH No
RUN No
□ 1·20 382
□ (flagged) 397

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P/Stab/1146

2.3.1

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PLOT 261

C-105

C.A.L. W/T TESTS (MARCH/57)

CONFIG: $B_4 - MC_1 - x$

C_y vs β

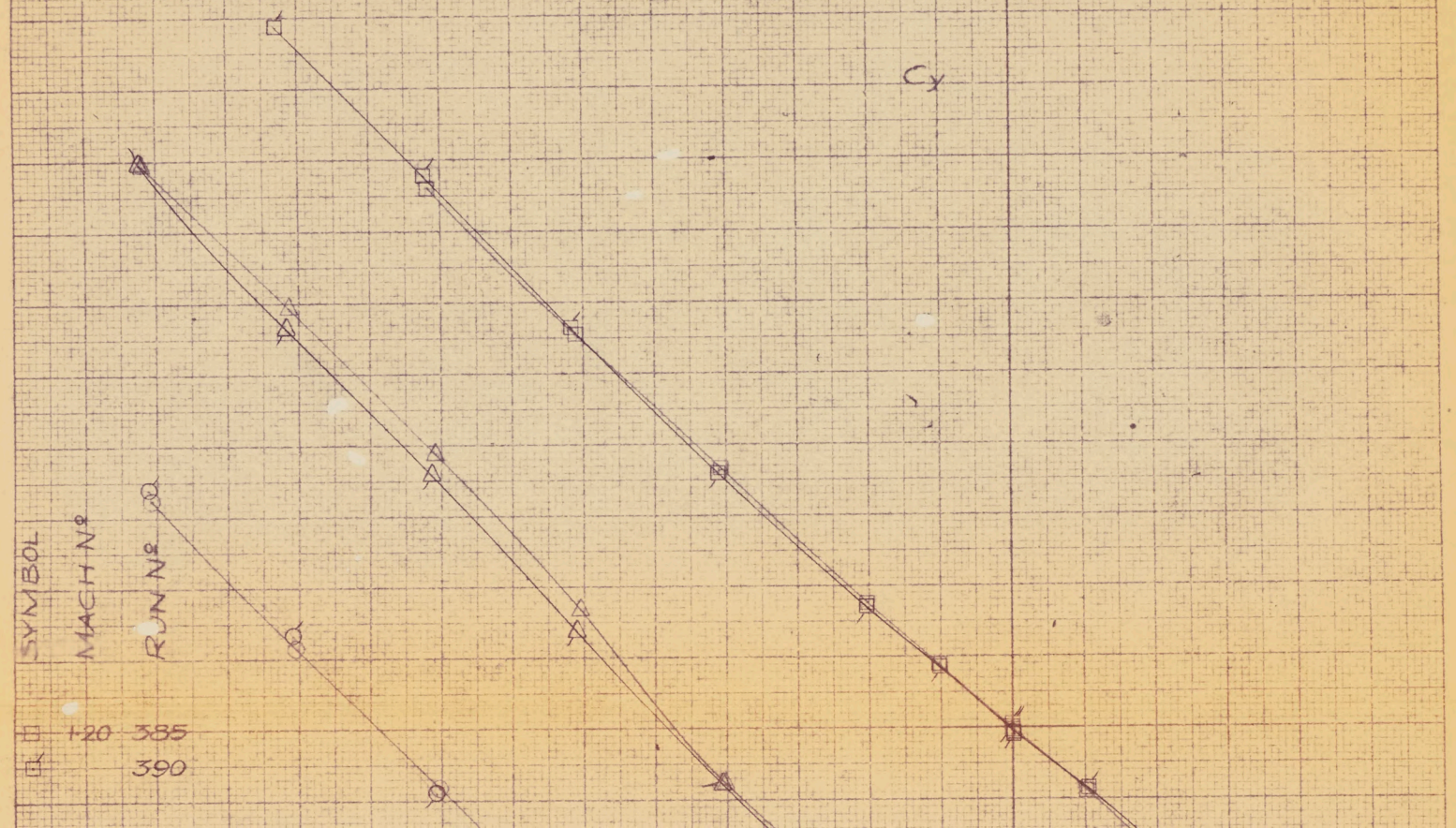
⊙ △ □ CANOPIES CLOSED

⊙ △ □ CANOPIES OPEN

$\alpha \doteq 12°$

SEALS IN

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



W. H. INNES
APR/57

P/S Stalw/146

2.3.2

CONFIDENTIAL

PLOT 260

C-105

C.A.L. W/T TESTS (MARCH/57)

CONFIG.: $B_4 - MC_1 - x$

C_y vs β

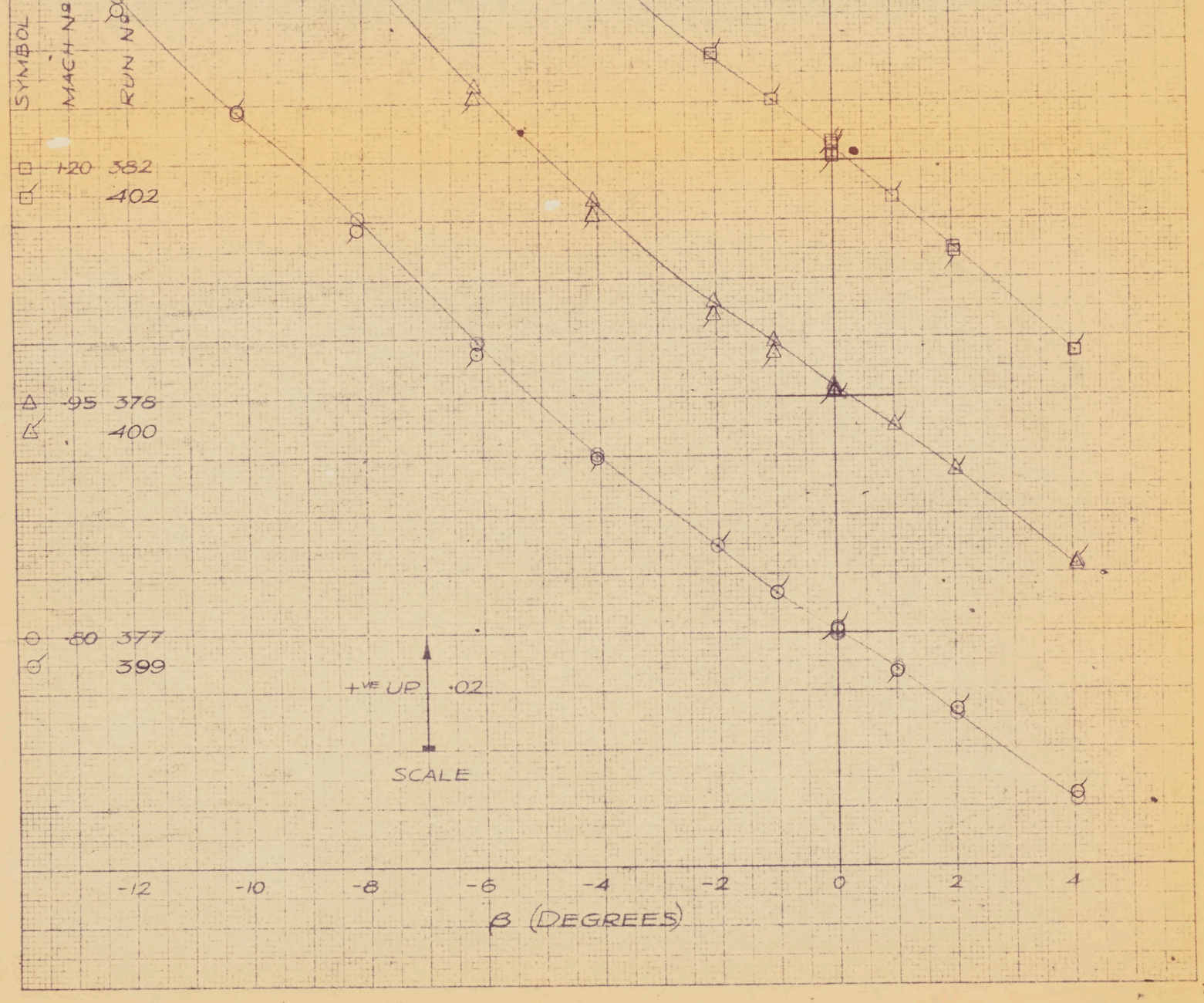
$\alpha \doteq 2.5°$

SEALS IN

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

⊙ △ ⊡ CANOPIES CLOSED

⊙ △ ⊡ FWD CLOSED AFT OPEN



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APR/57

P/Stab/146

2.3.3

PLOT 261

C-105

CAL W/T TESTS (MARCH/57)

CONFIG: B_4 _ $M.C_1$ - x

C_y vs β

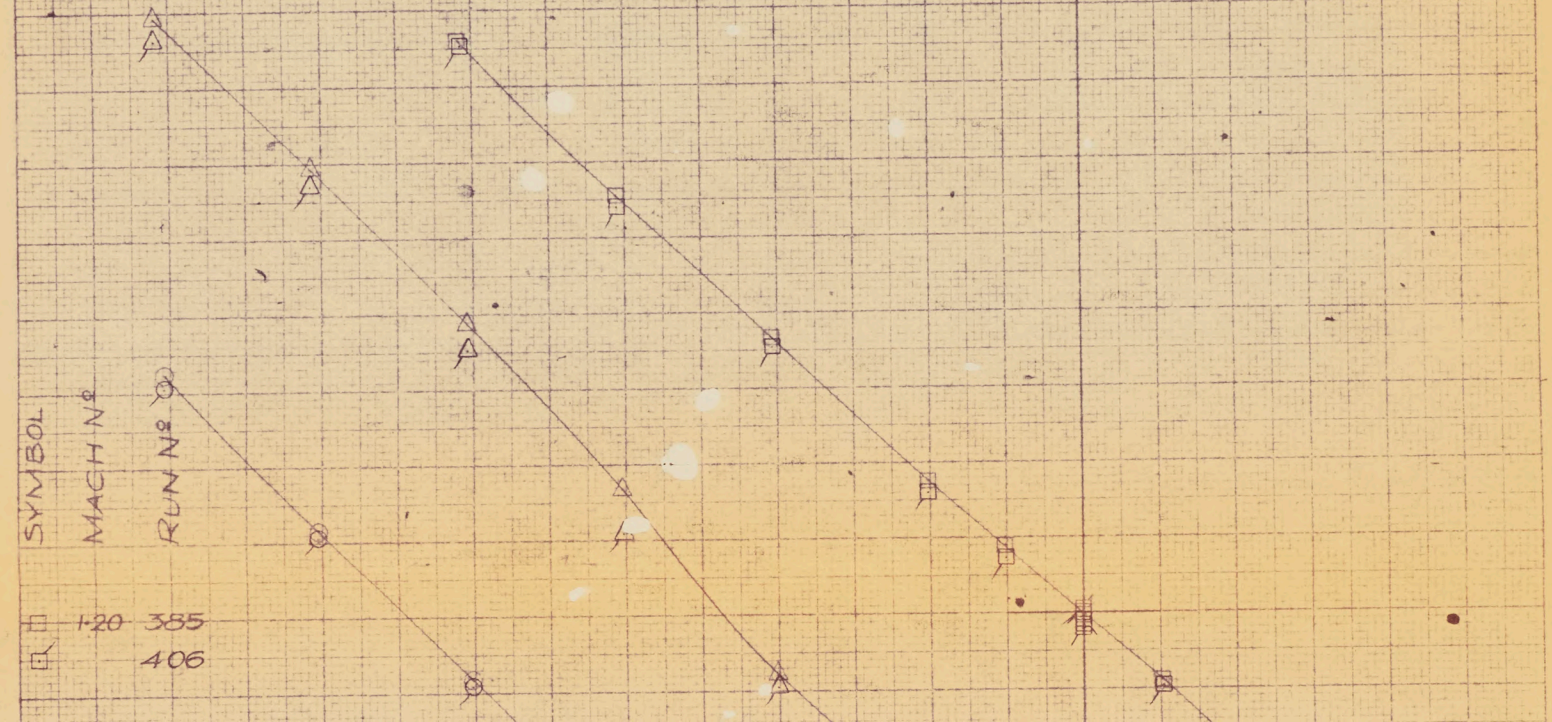
⊙ △ ⊡ CANOPIES CLOSED

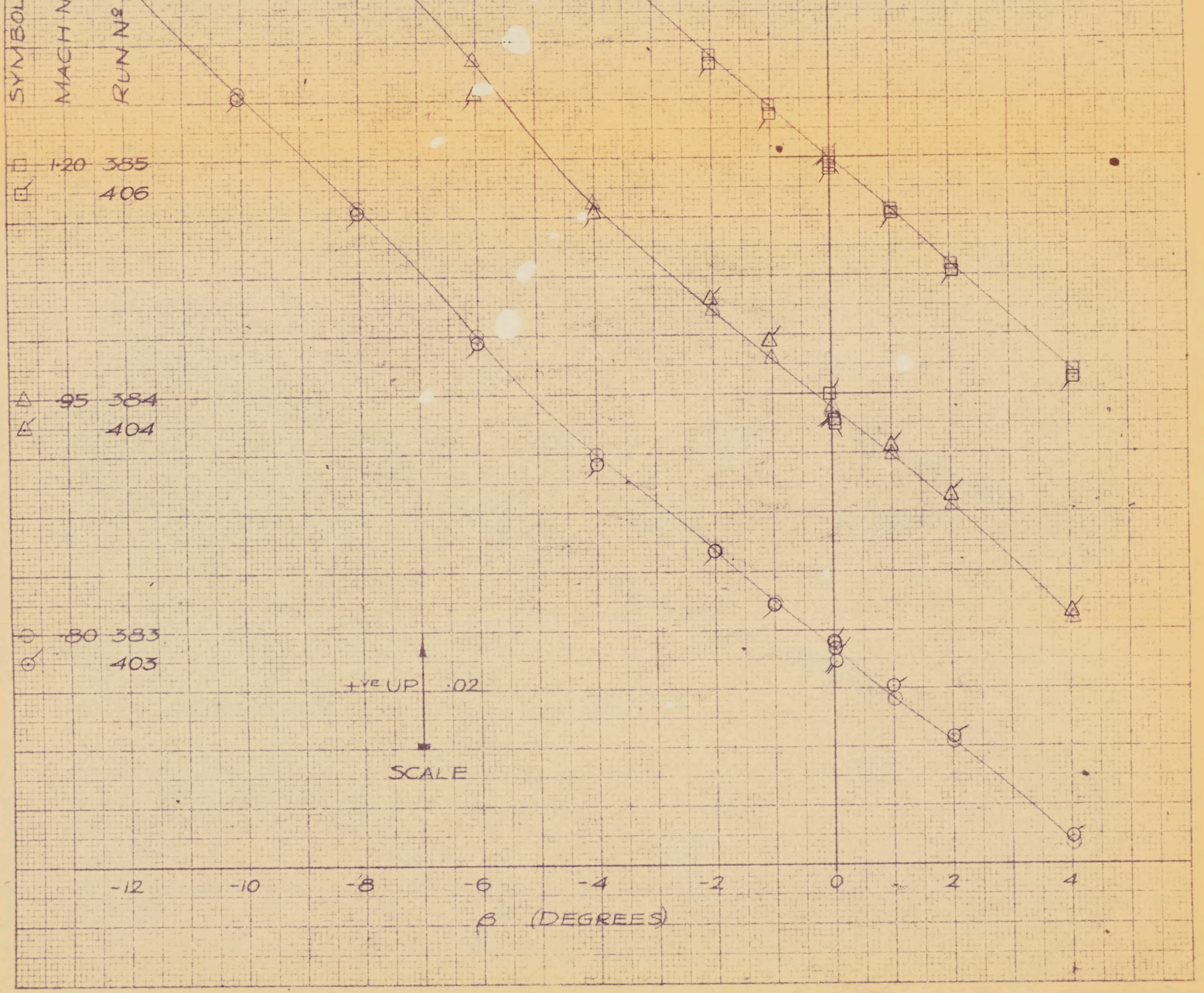
⊙ △ ⊡ FWD CLOSED AFT OPEN

$\alpha \doteq 12°$

SEALS IN

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





C-105

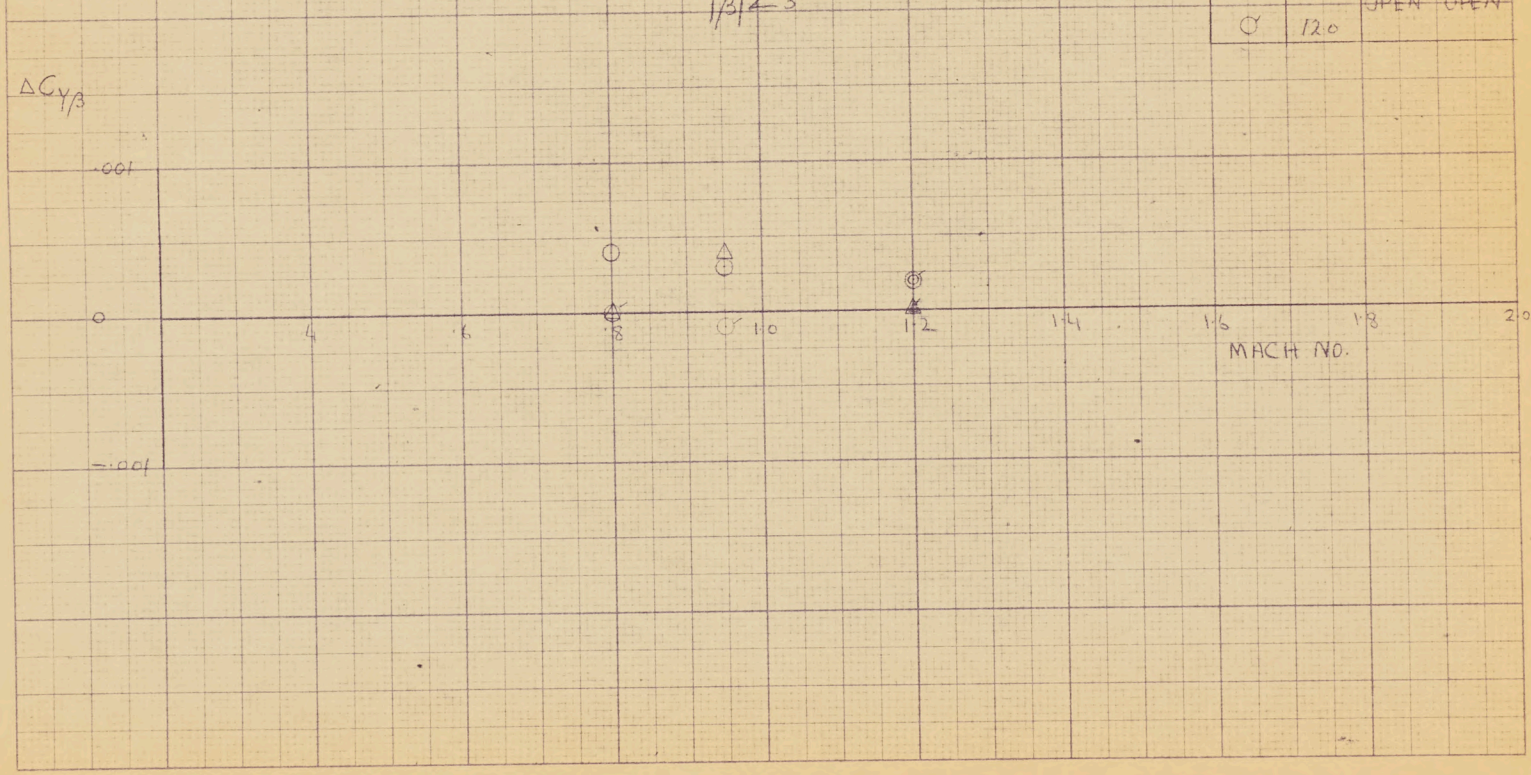
CANOPY EFFECTS

$\Delta C_{Y_\beta} = C_{Y_\beta (OPEN)} - C_{Y_\beta (CLOSED)}$

ΔC_{Y_β} vs MACH NO.

$|\beta| < 3°$

	α	CANOPY FWD	CANOPY AFT
△	2·5	CLOSED	OPEN
△	12·0		
○	2·5	OPEN	OPEN
○	12·0		



RSR
June 57
P/STAB/146
2·3·5

PLOT 252

C-105

C.A.L. W/T TESTS (MARCH/57)

CONFIG.: $B_{4-1}MC_{1-x}$

$C_{Y(V)}$ VS β

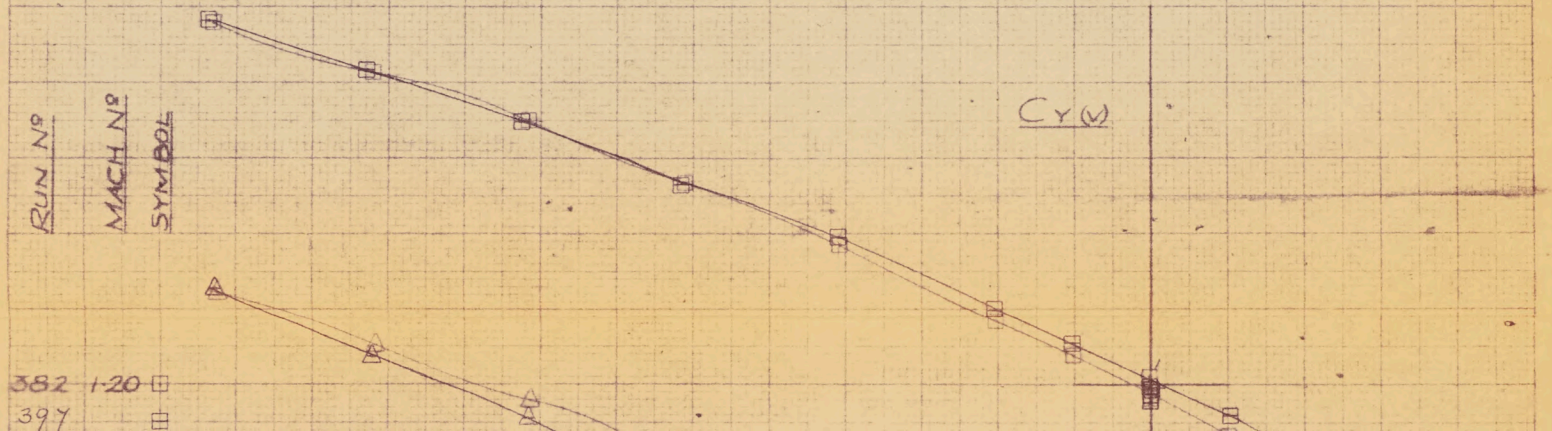
$\alpha \doteq 2.5°$

⊙ △ ⊞ CANOPIES CLOSED

⊖ △ ⊞ CANOPIES OPEN

SEALS IN

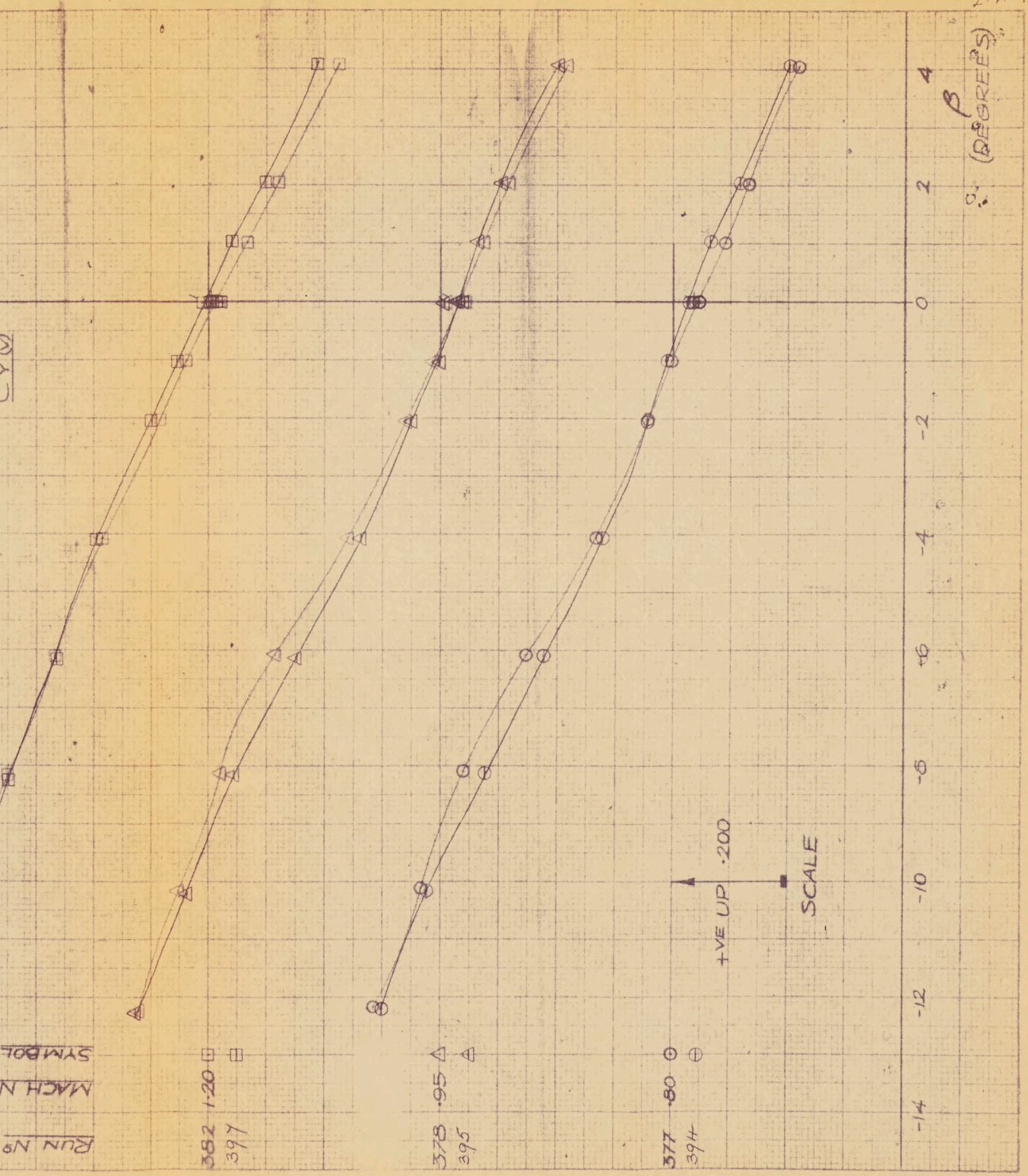
C.G. = 0.28$\bar{c}$ on M.A.C.



W.H. INNES
W. H. INNES
APR/57

P/S Stab/1146

2.4.1



CONFIDENTIAL

PLOT 253

C-105
C.A.L. W/T TESTS (MARCH/57)

CONFIG: $B_{A-1}MC_{1-x}$

$C_{Y(V)}$ VS β

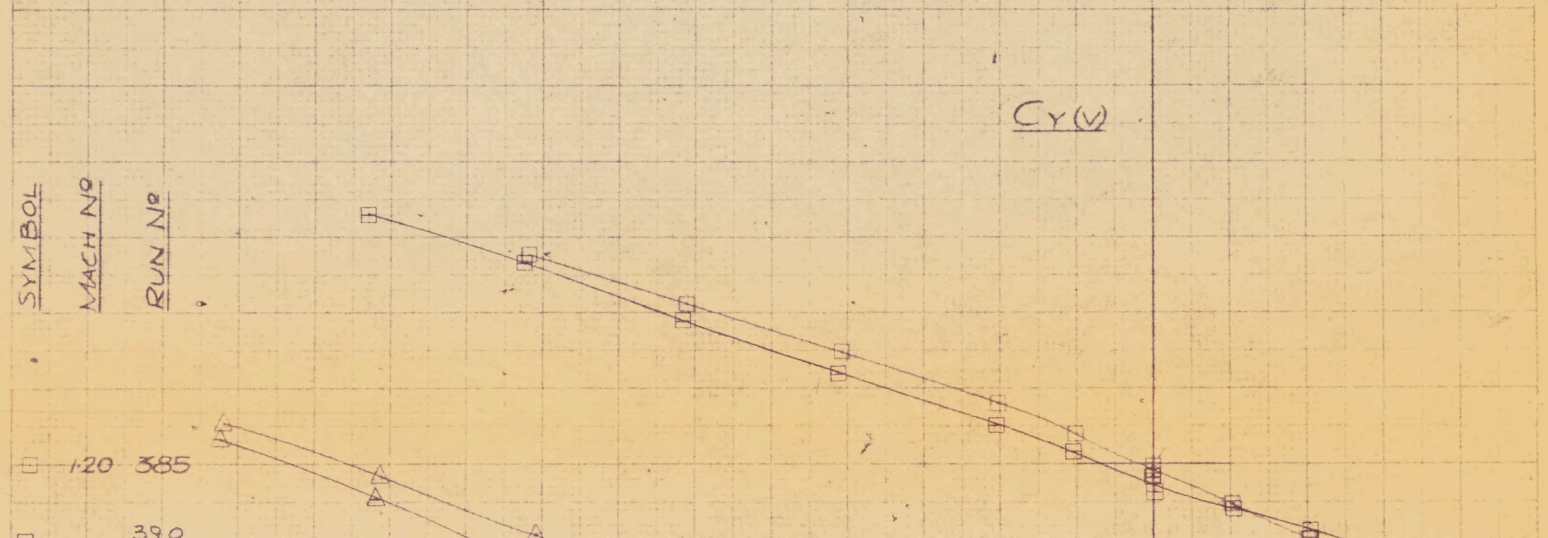
$\alpha \doteq 12°$

⊖ △ ⊞ CANOPIES CLOSED

⊖ △ ⊟ CANOPIES OPEN

SEALS IN

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



W.H. INNES
APR/57

P/Stab/146.

2 H 2

CONFIDENTIAL

PLOT 252

C-105

C.A.L. W/T TESTS (MARCH/57)

CONFIG.: $B_{4-1}MC_{1-x}$

$C_{Y_{(V)}}$ VS β

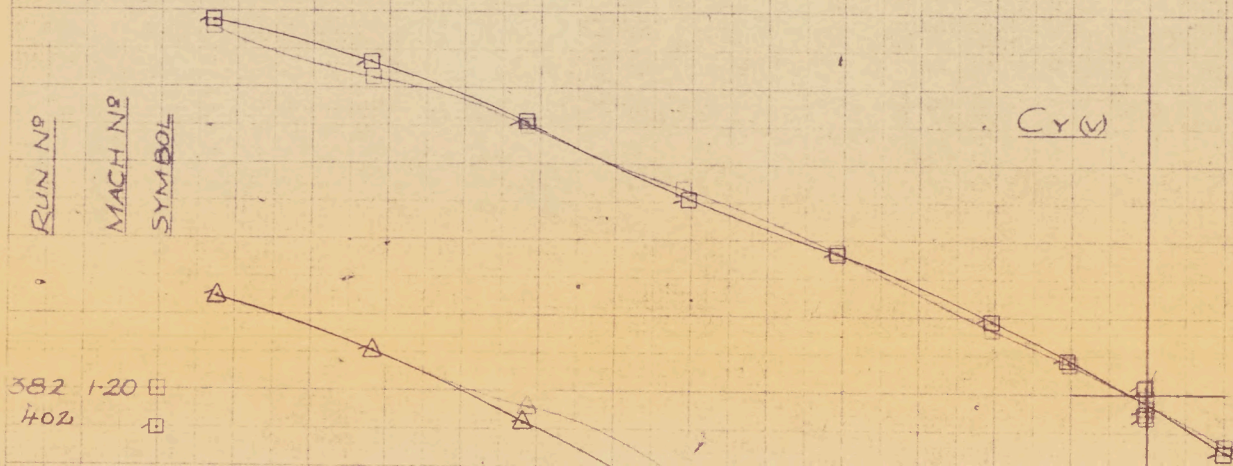
⊙ △ ⊡ CANOPIES CLOSED

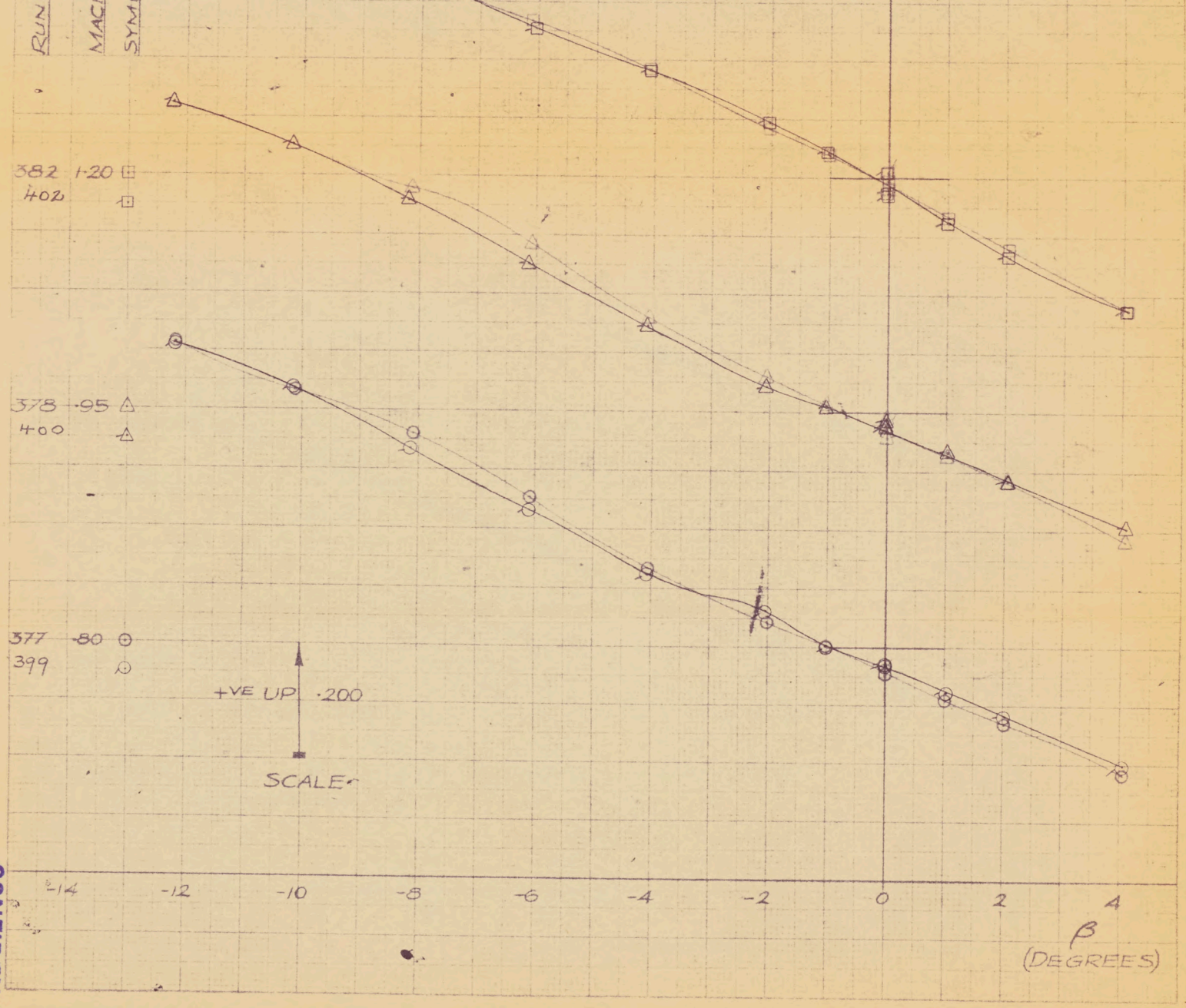
⊙ △ ⊡ CANOPIES F 0/3 A 3/3

$\alpha \div 2.5°$

SEALS IN

C.G. = 0·28$\bar{c}$ ON M.A.C.





W. H. INNES
APR/57

P/Shelf 1146

2·4·3

PLOT 253

C-105

C.A.L. W/T TESTS (MARCH/57)

CONFIG: $B_{4-1}MC_{1-x}$

$C_{Y(V)}$ VS β

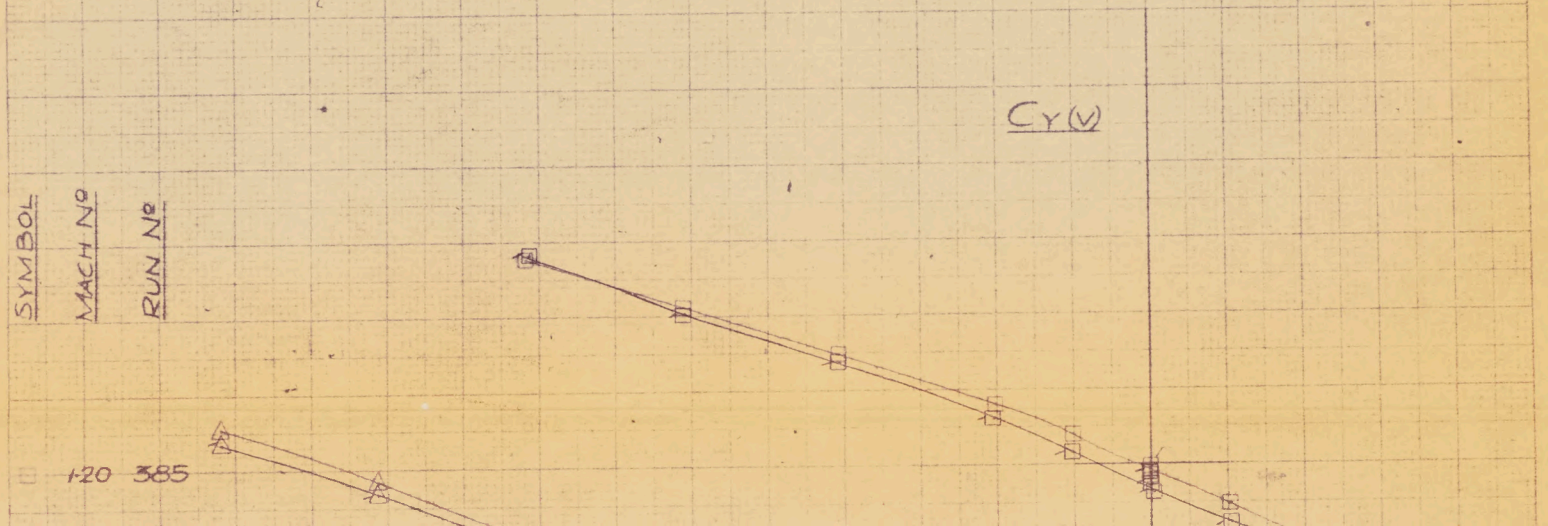
$\alpha \div 12°$

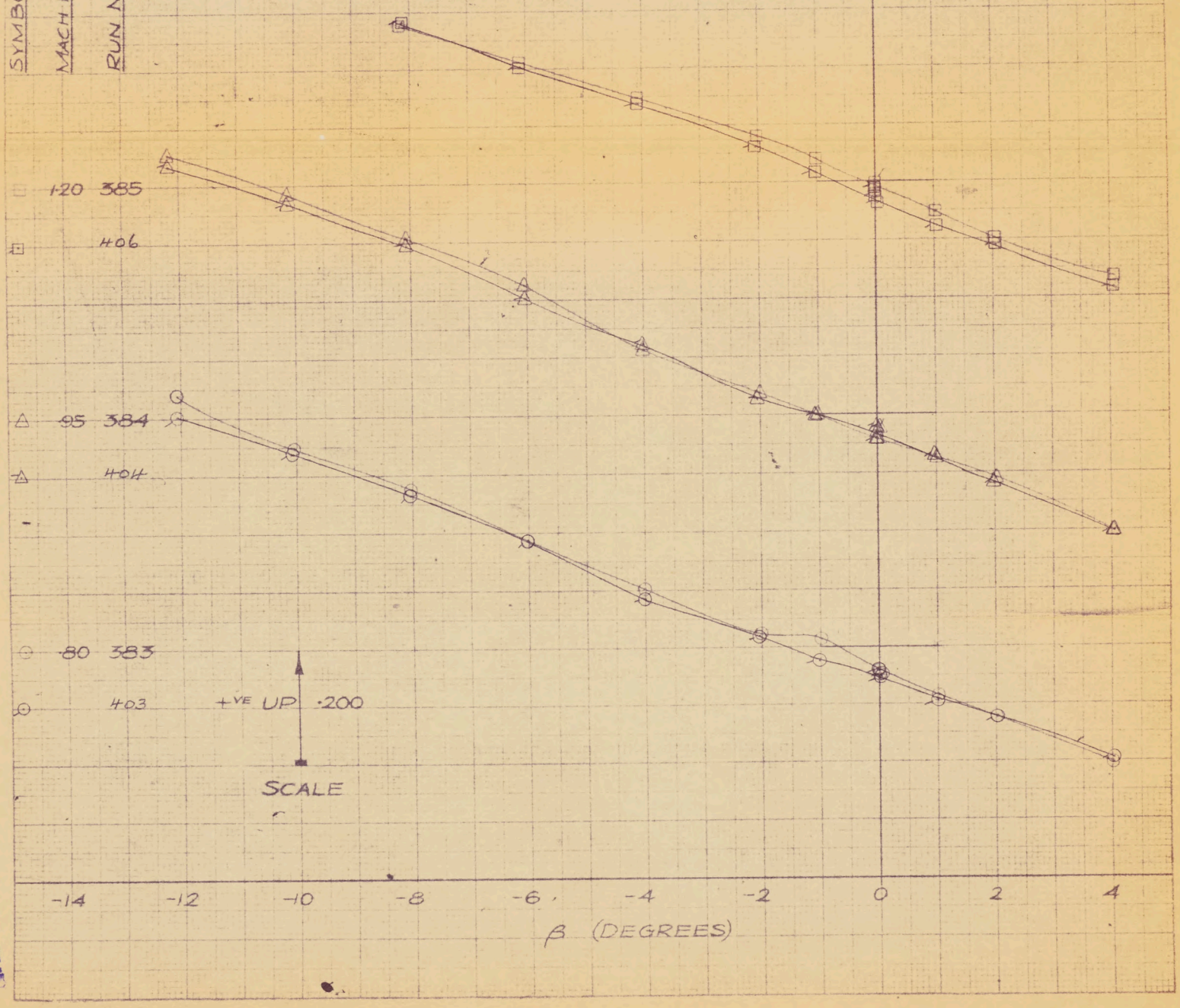
SEALS IN

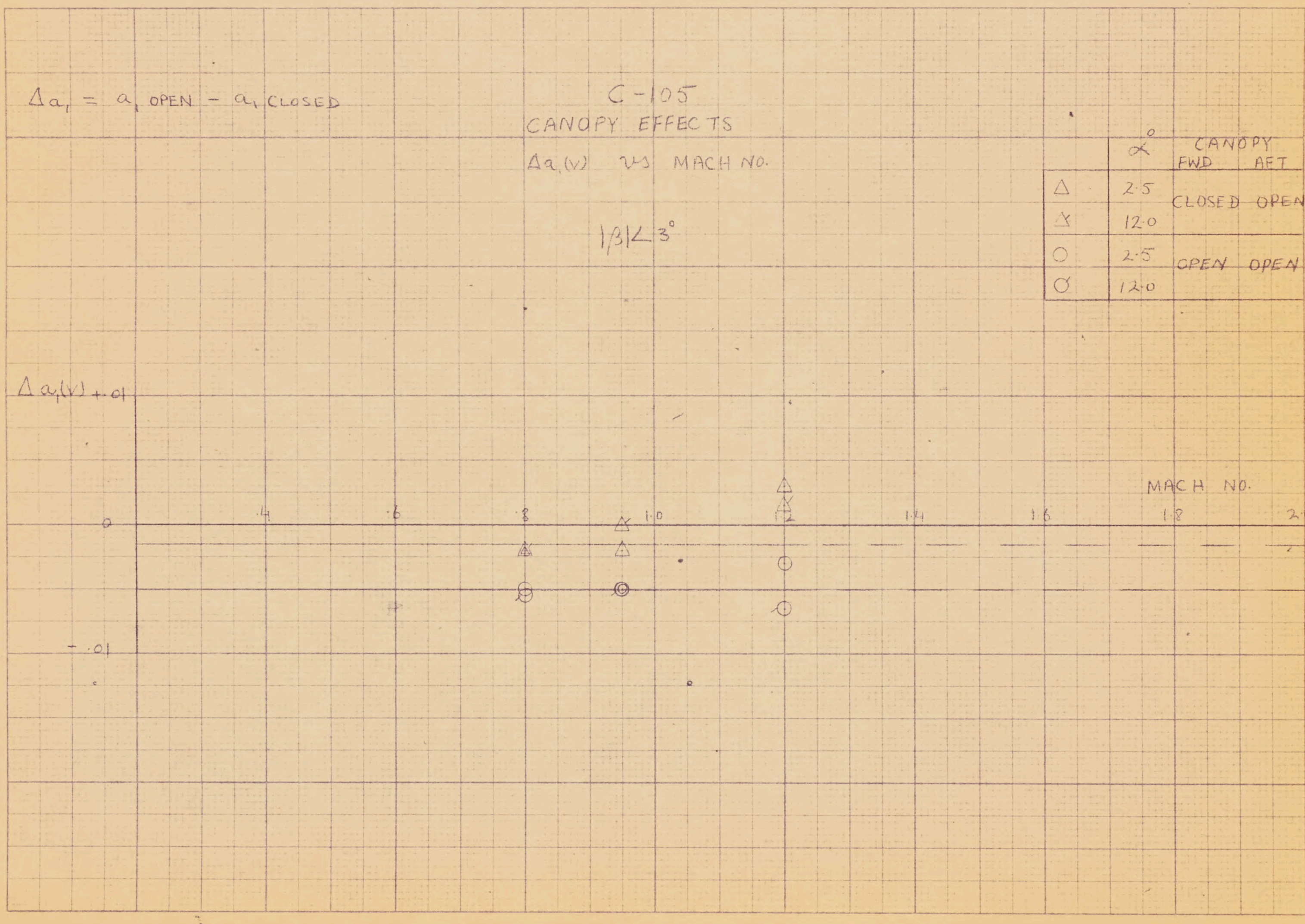
C.G. = 0.28 $\bar{c}$ ON M.A.C.

⊙ △ □ CANOPIES CLOSED

⊙ △ □ CANOPIES $F_{0/3}$ $A_{3/3}$







R.S.R.
June 57

P/Stab/146
2·4·5

PROT 234

C-105

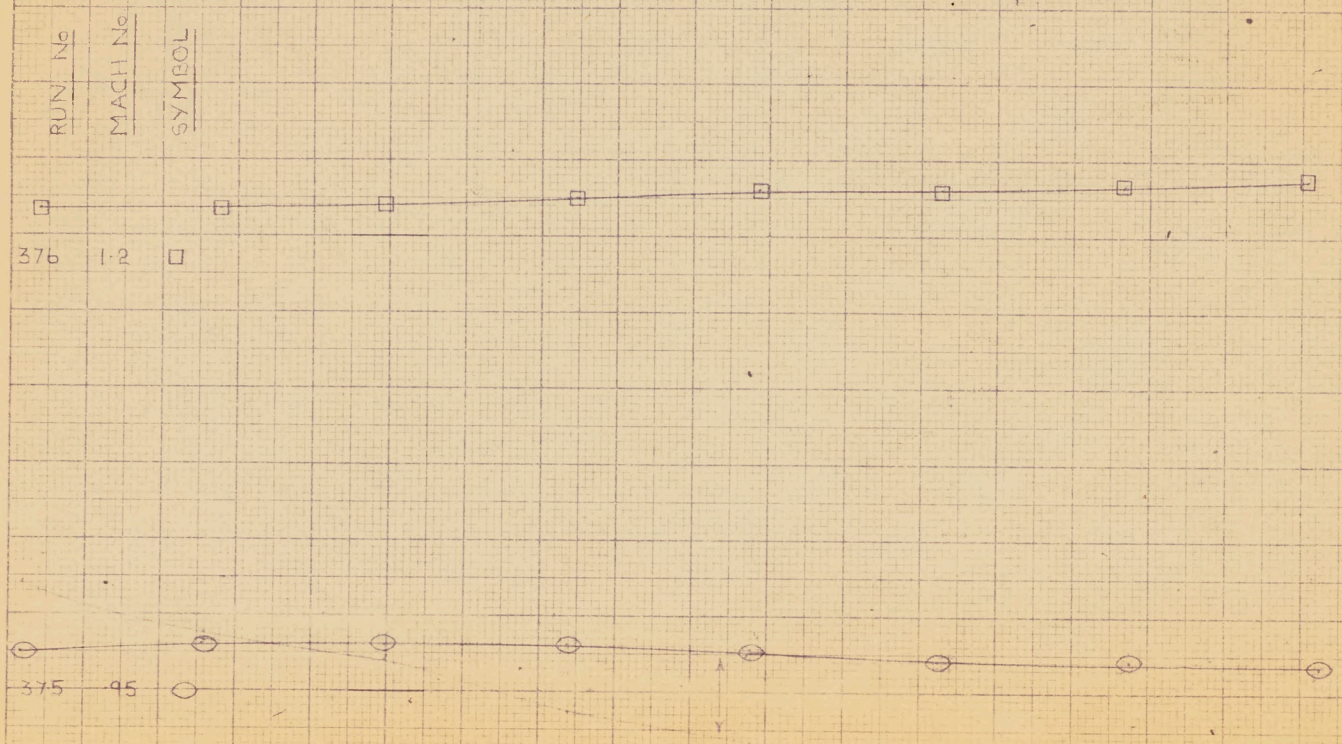
C.A.L. W/T TESTS FEBRUARY 1957

BOTH CAB DOORS CLOSED

C_{h_β} VS α

$\beta = 0$

COCKPIT SEALED



P/STAB/146 3·1·1

CONFIDENTIAL

PLOT 235

C – 105

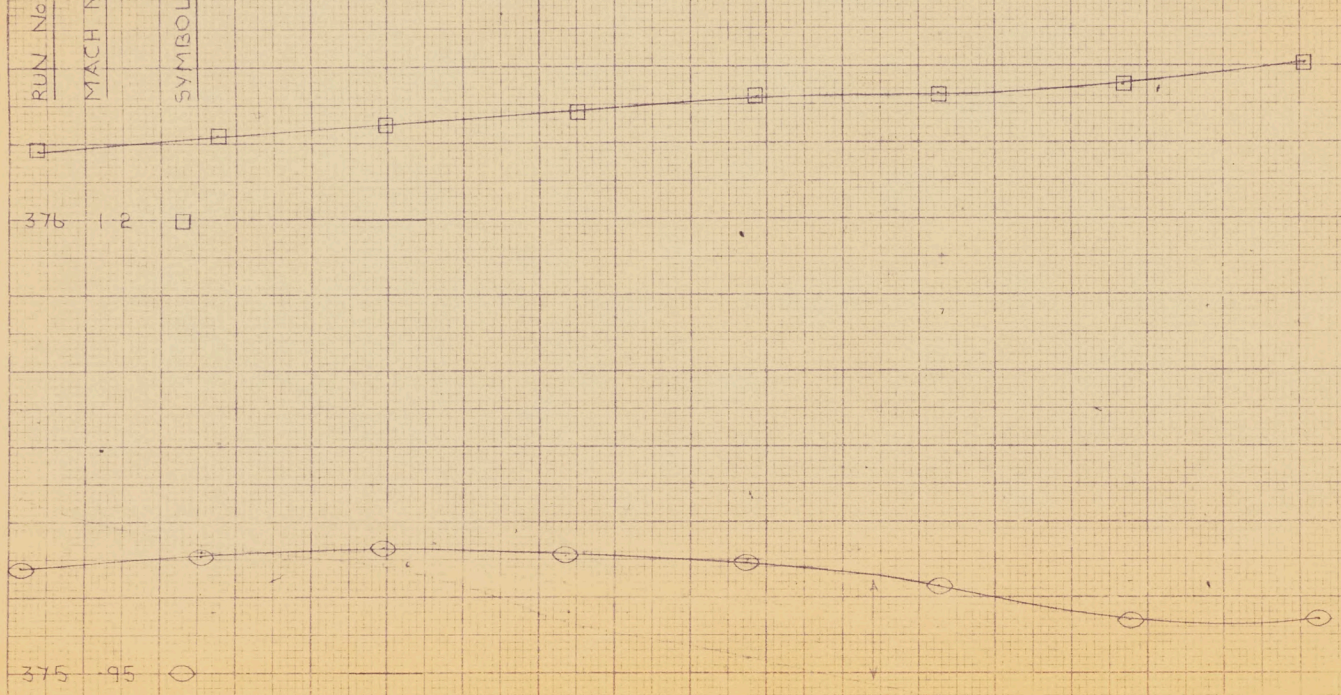
C.A.L. W/T TESTS FEBRUARY 1957

C_{m_q} VS. α

$\beta = 0$

COCKPIT SEALED

BOTH CANOPIES CLOSED



P/STAB/146 3.1.2

CONFIDENTIAL

PLOT 236

C - 105

C.A.L. W/T TESTS FEBRUARY 1957

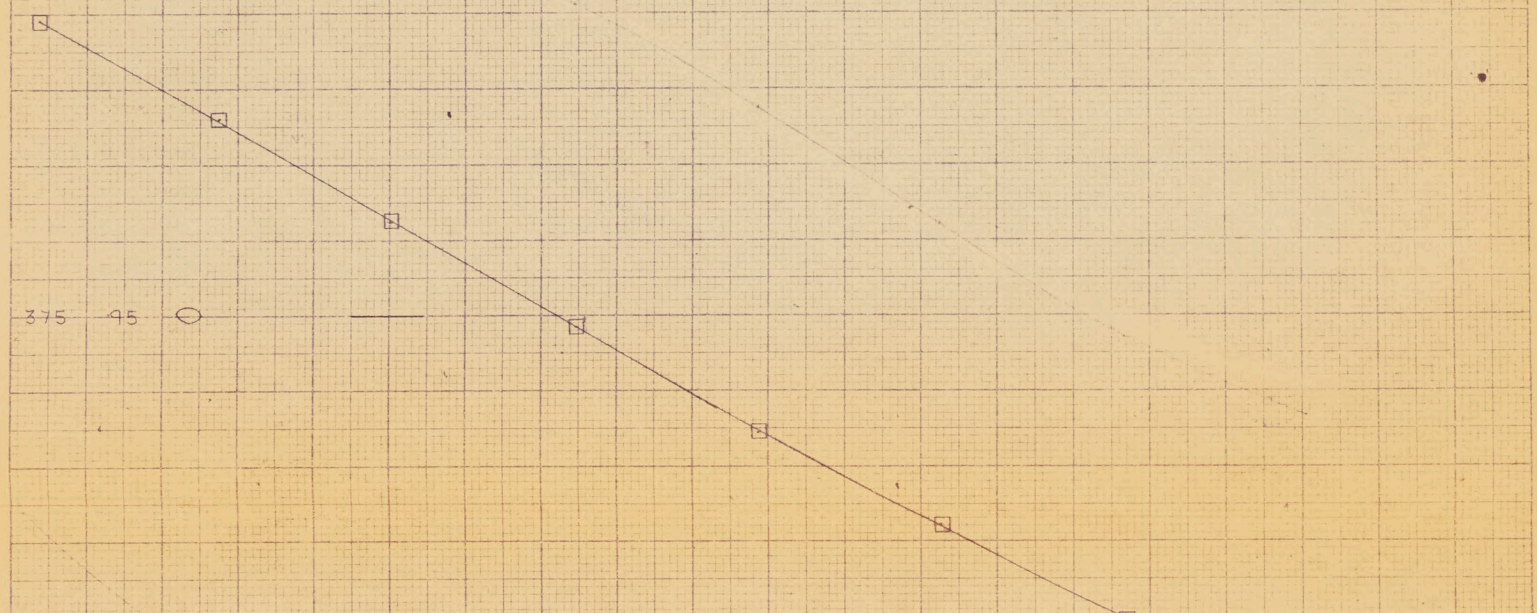
$C_{h_{10}}$ VS α

$\beta = 0$

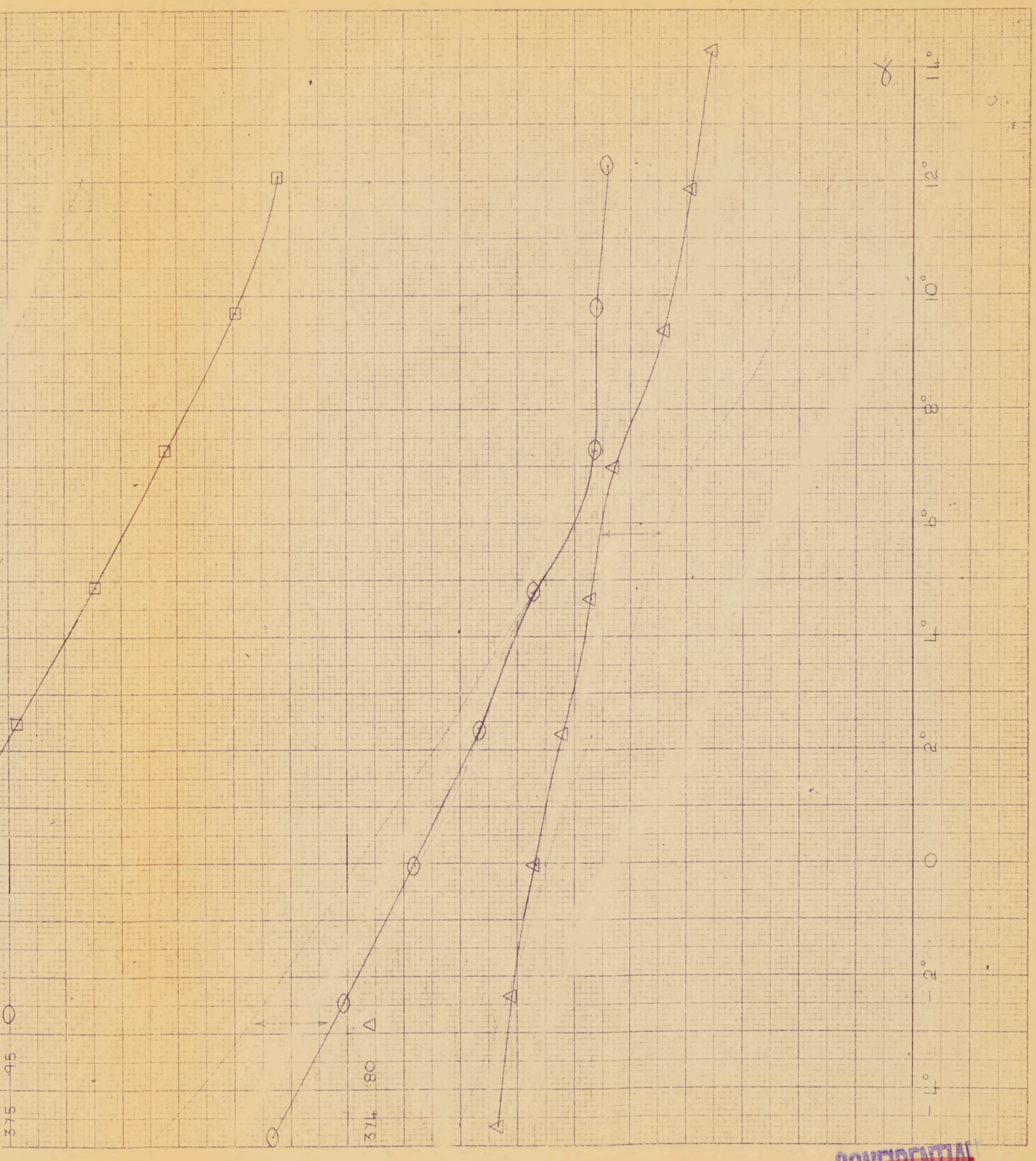
COCKPIT SEALED

BOTH CANOPIES CLOSED

RUN No.	MACH No.	SYMBOL
376	1.2	□
375	.95	○



P/STAB/146 3.1.3



PLOT 237

C-105

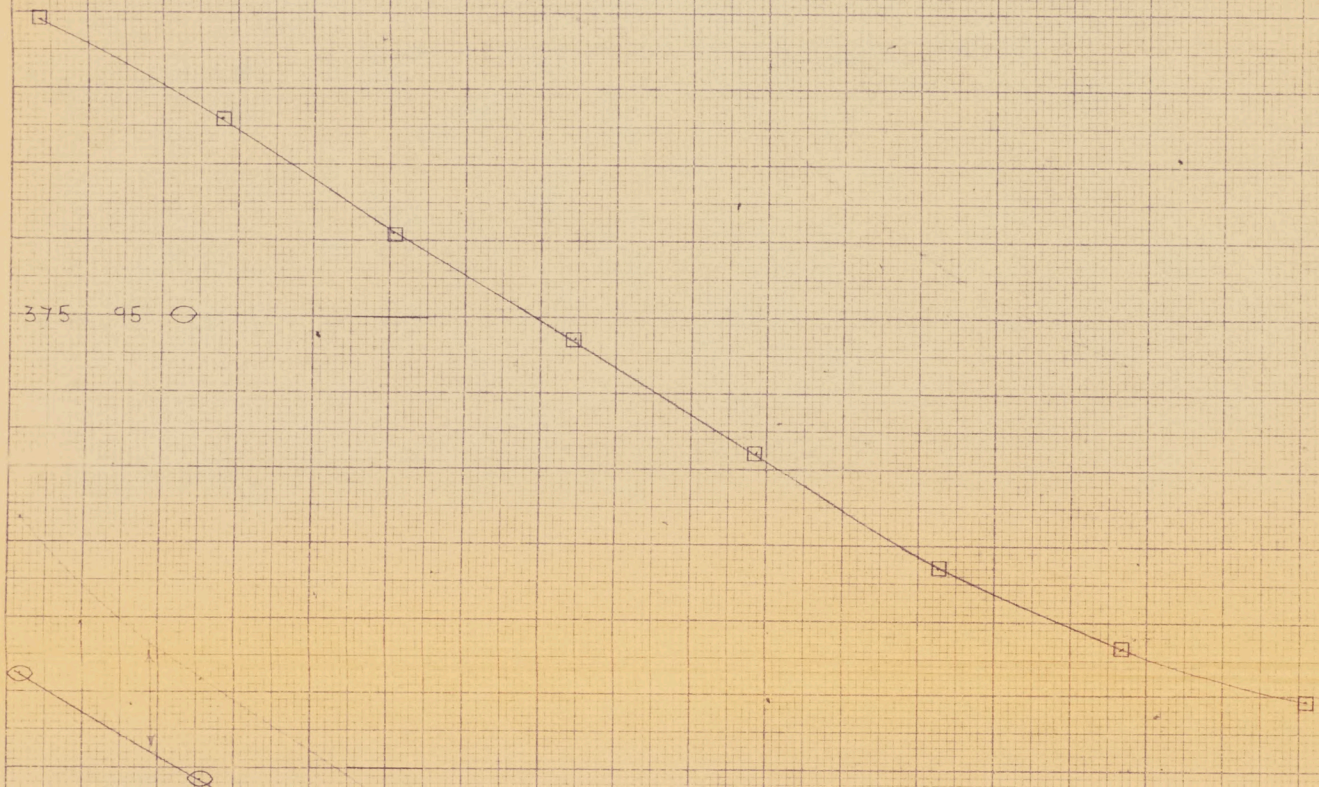
C.A.L. W/T TESTS FEBRUARY 1957

$C_{h_{\alpha}}$ vs α

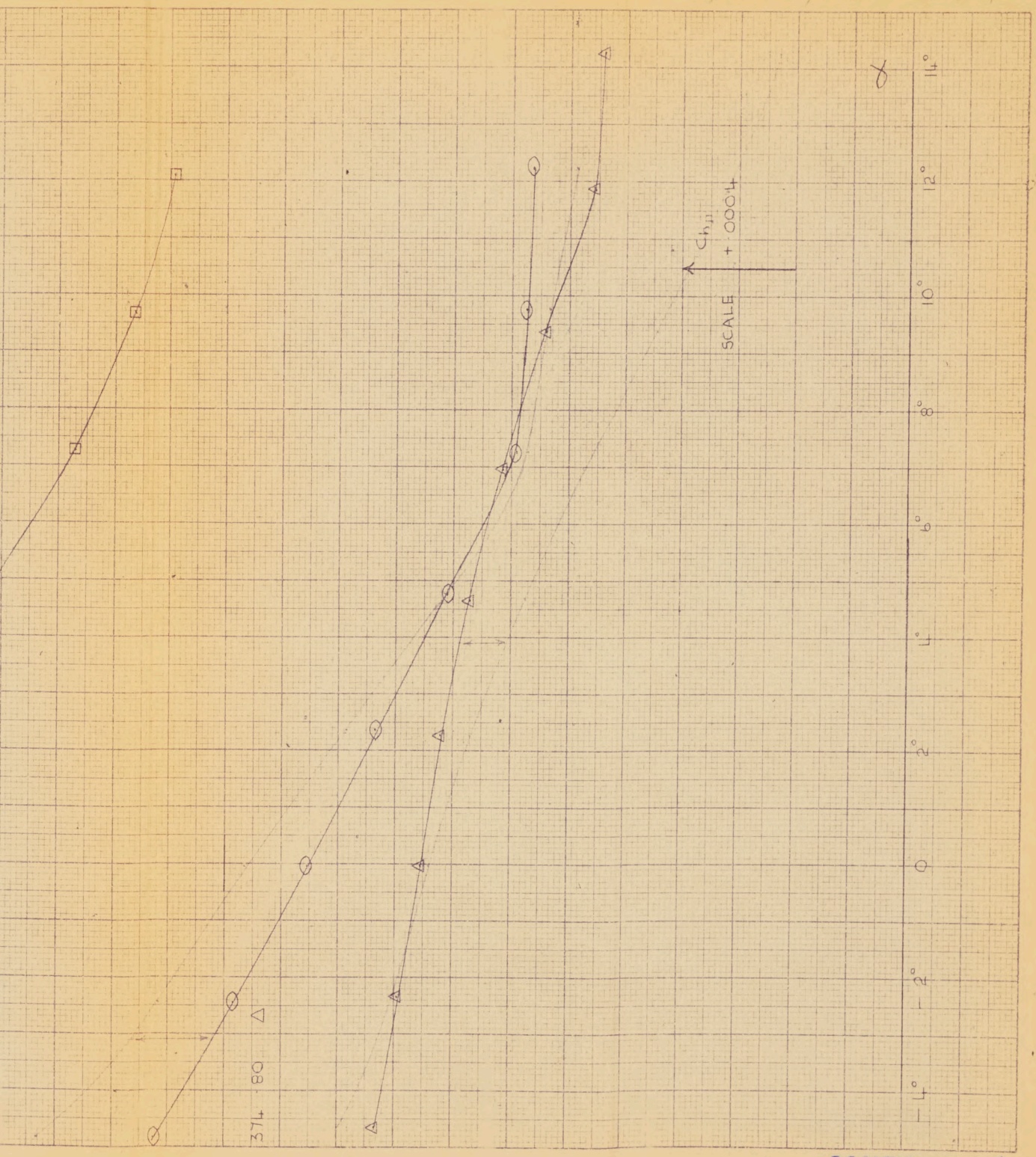
$\beta = 0$

COCKPIT SEALED

RUN No	MACH No	SYMBOL
376	1.2	□
375	.95	○



P/STAB/140 3·1·74



CONFIDENTIAL

PLOT 240

C-105

CAL W/T TESTS FEBRUARY 1957

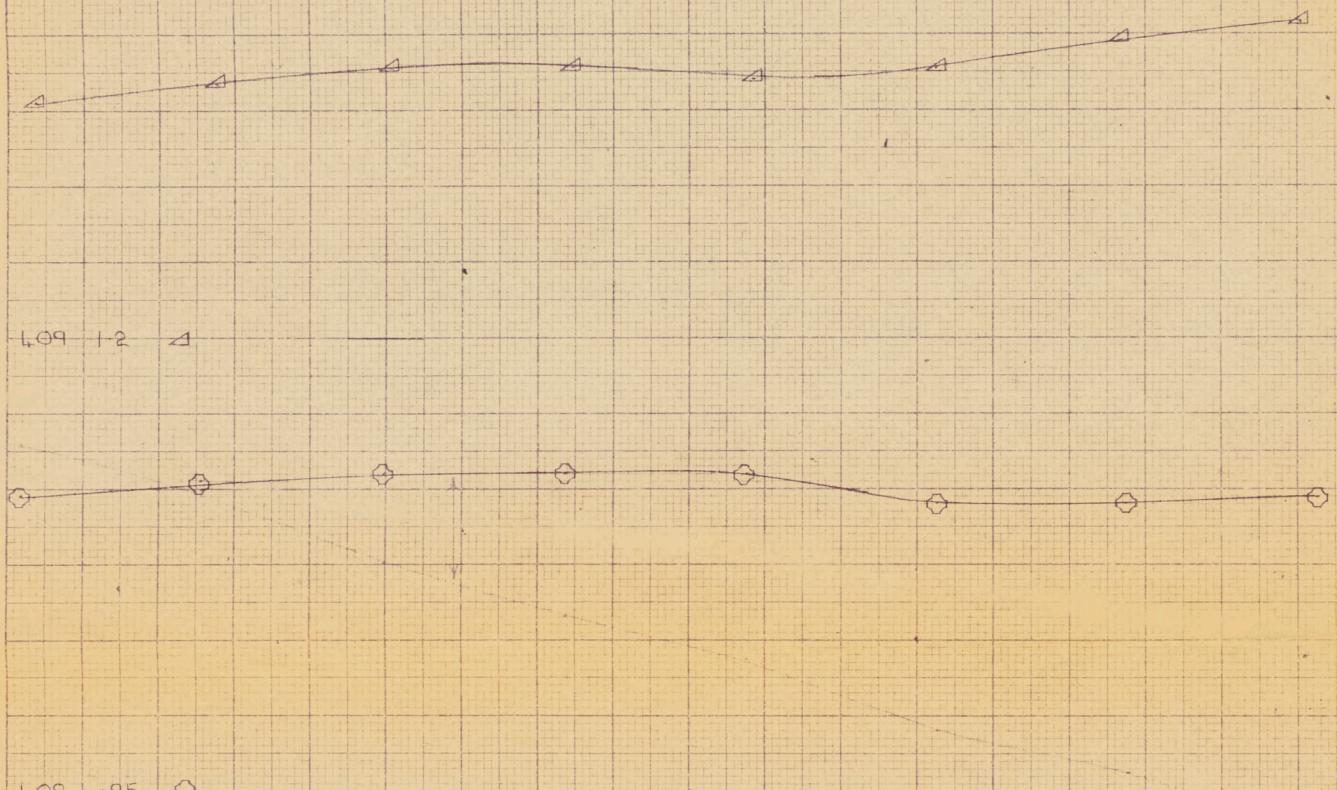
C_{h_δ} vs α

$\beta = 0$

COCKPIT SEALED

FORWARD CANOPY CLOSED

C_m δ_e



P/STAB/146 3·1·5

CONFIDENTIAL

CONFIDENTIAL

PLOT 241

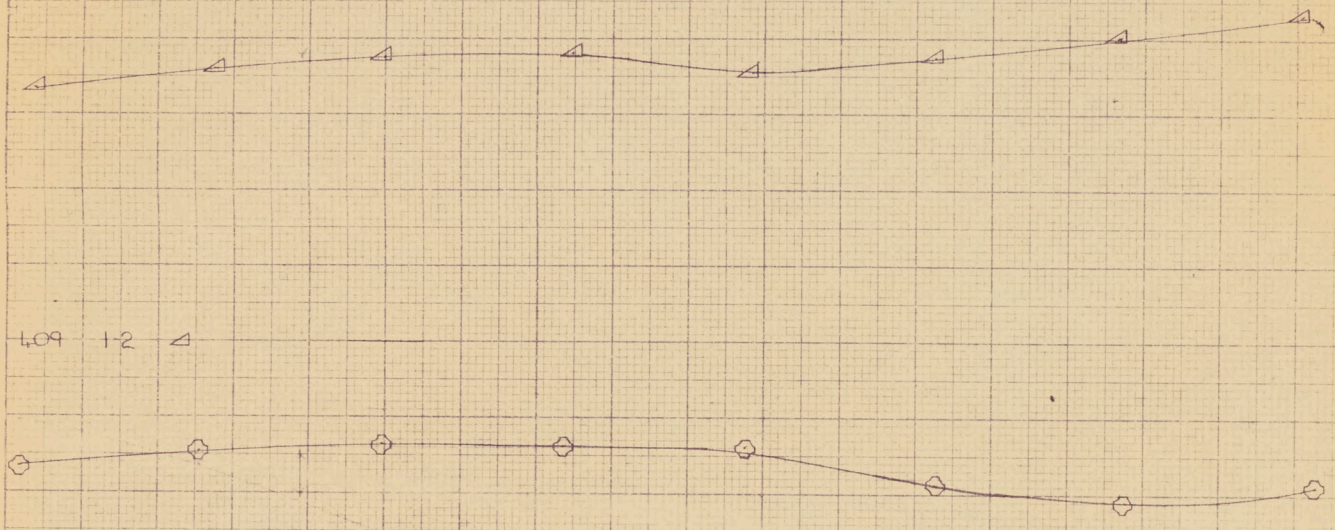
C-105

CAL W/T TESTS FEBRUARY 1957

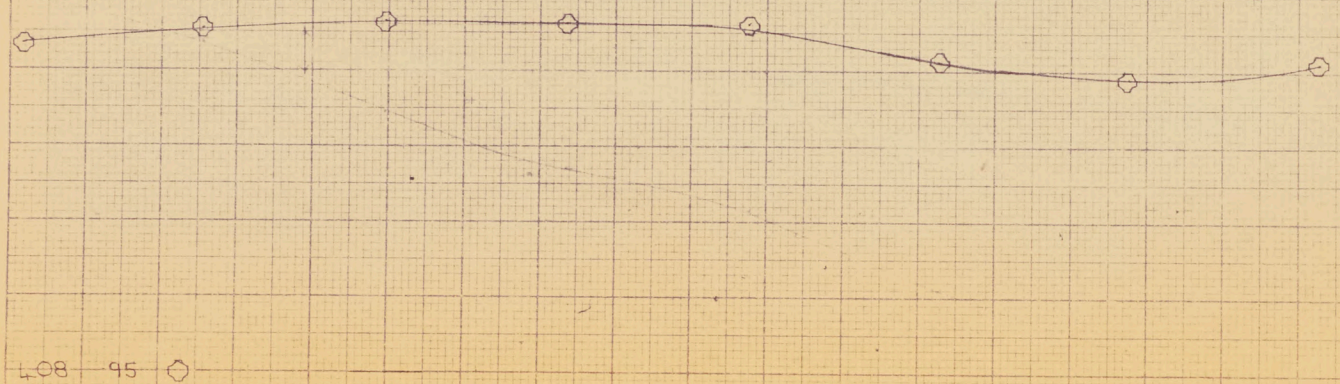
C_{hq} vs α

$\beta = 0$

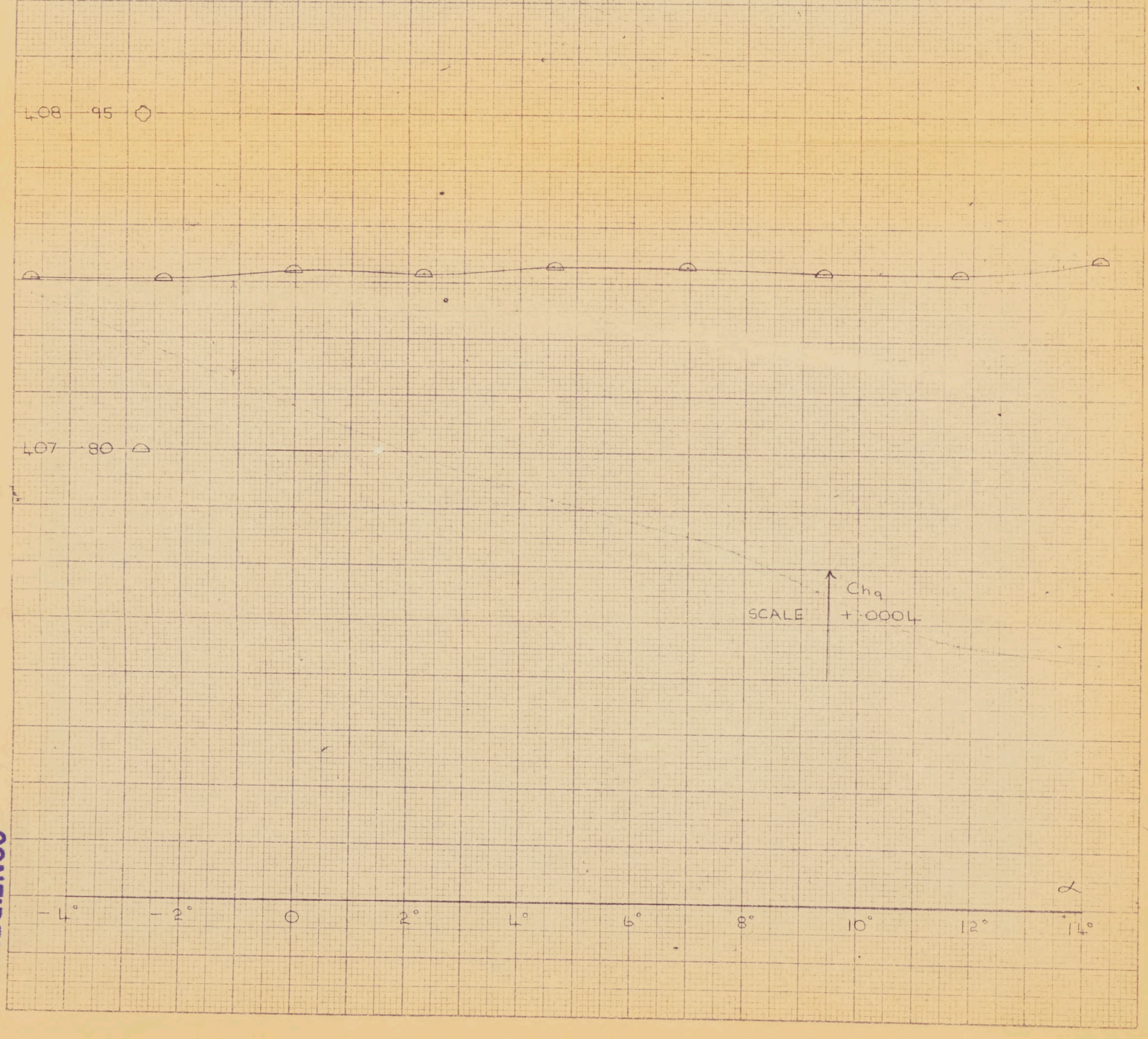
COCKPIT SEALED



409 1-2



408 95



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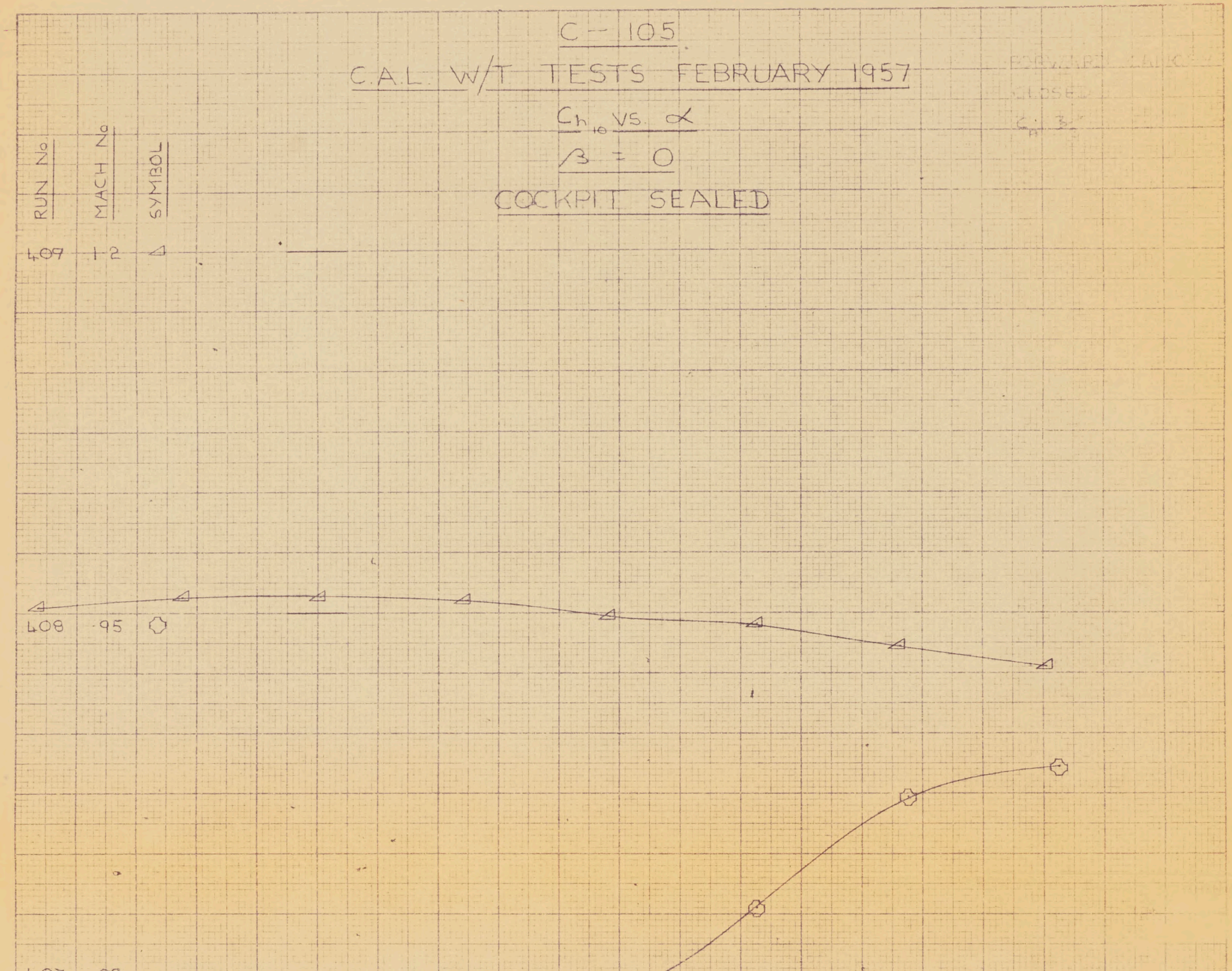
P/STAB/146 3.1.6

PLOT 242



P/STAB/146 3.1.7

PLOT 243

C - 105

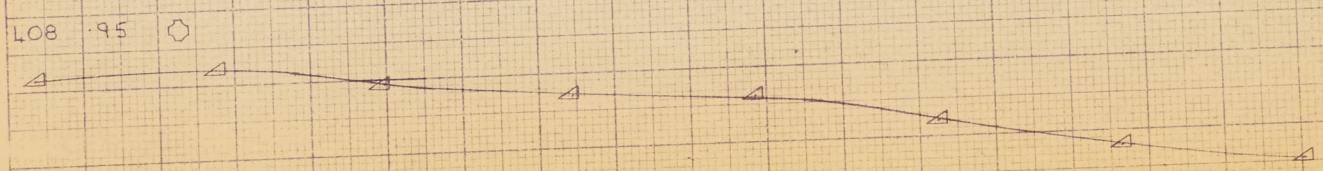
C.A.L. W/T TESTS FEBRUARY 1957

$C_{h_{\alpha}}$ VS. α

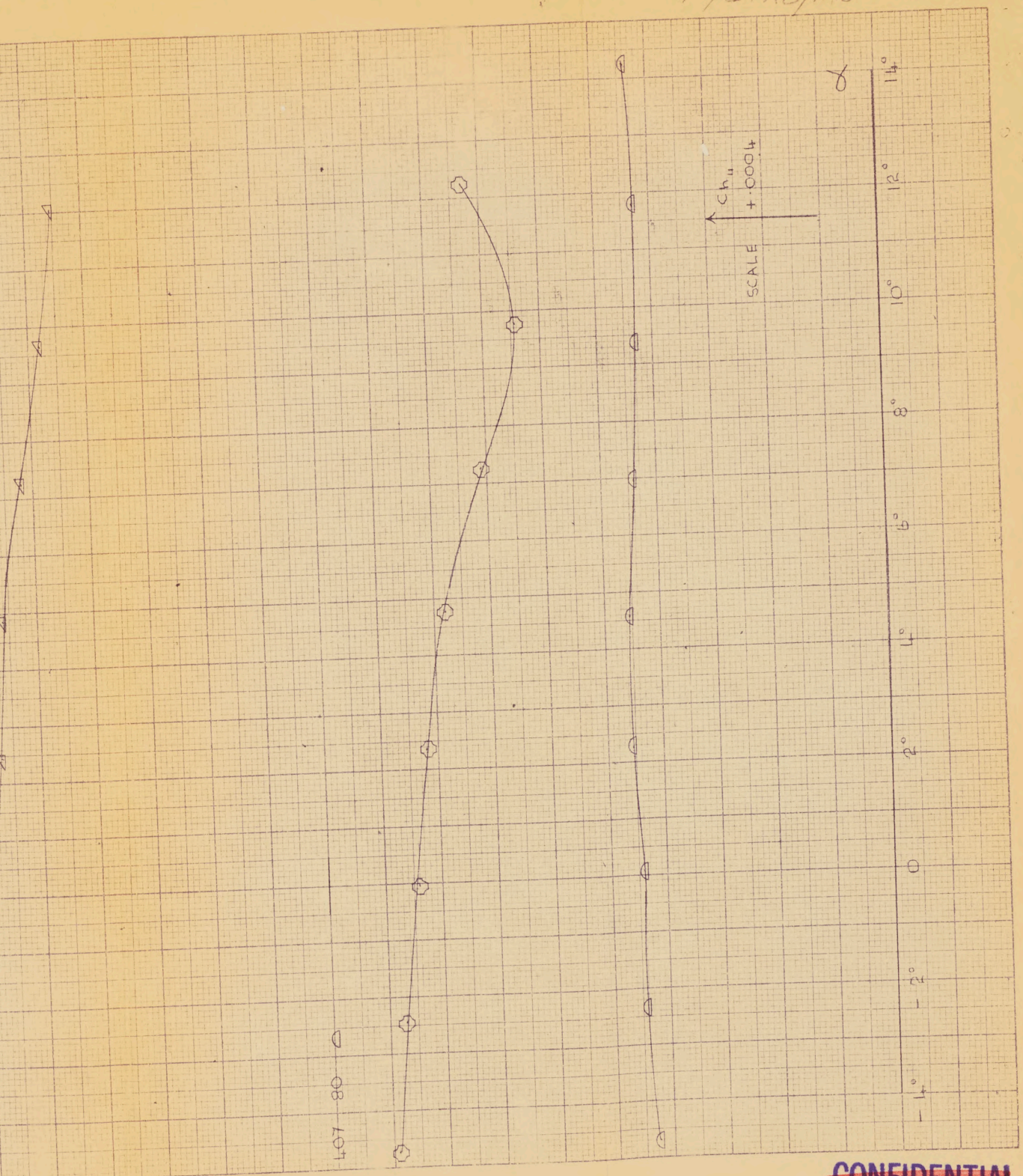
$\beta = 0°$

COCKPIT SEALED

RUN No	MACH No	SYMBOL
509	1.2	△
408	.95	○



P/STAB/146 3.1.8



CONFIDENTIAL

~~CONFIDENTIAL~~

PHOT 246

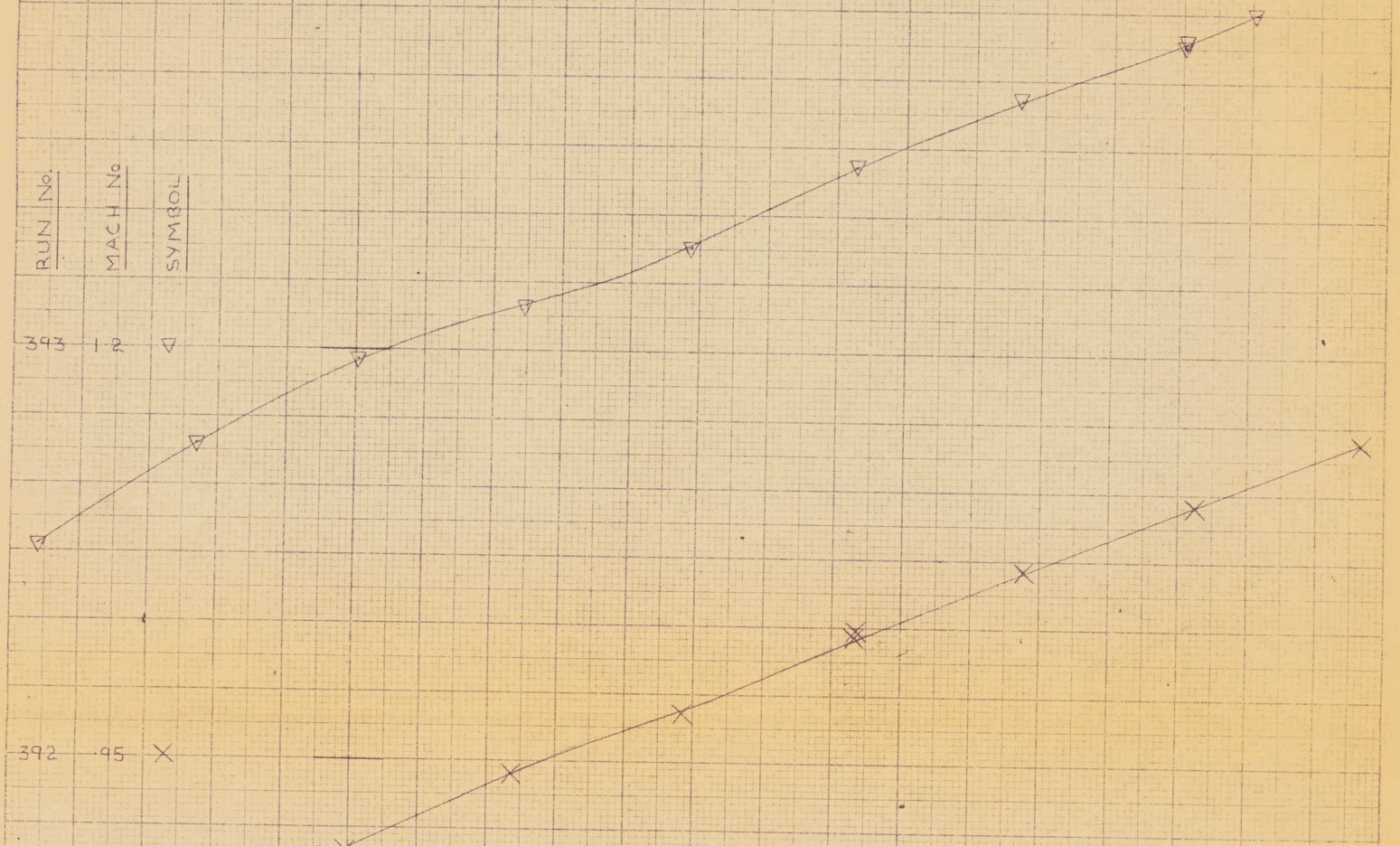
C-105

C.A.L. W/T TESTS FEBRUARY 1957

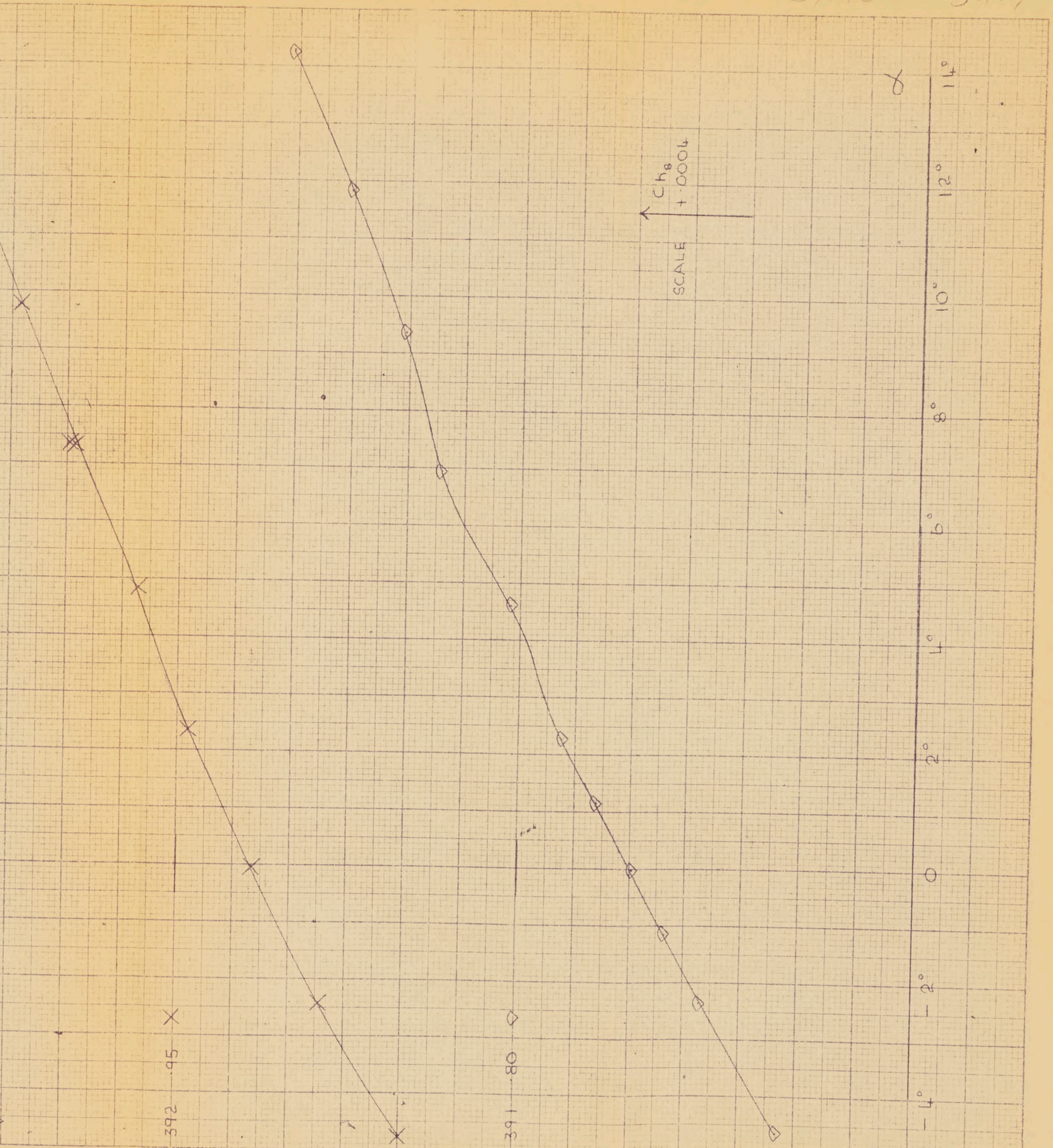
C_{h_δ} vs α.

$\beta = 0$

COCKPIT SEALED



P/STAB/146 3.1.4



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PLOT 247

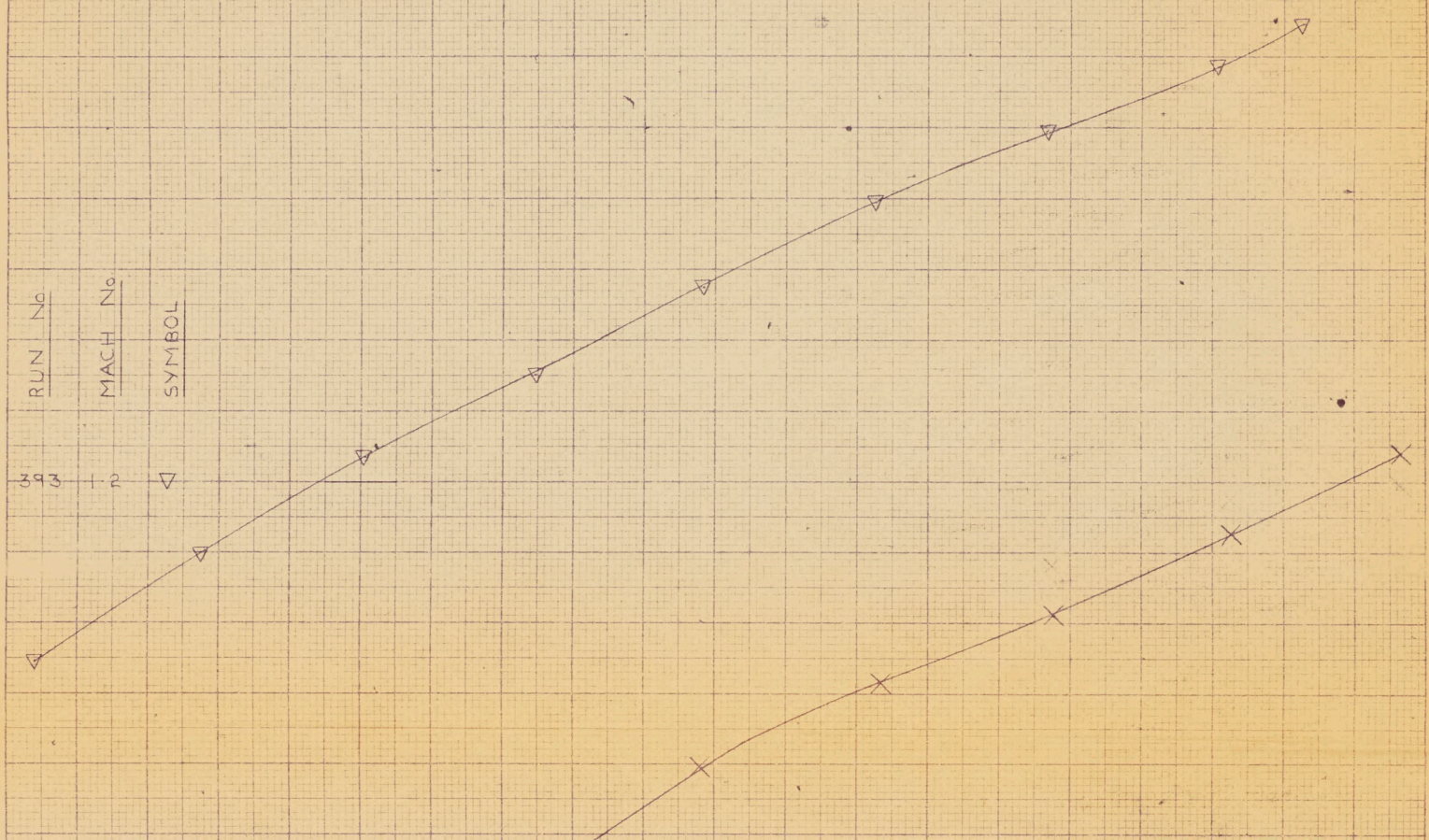
C-105

C.A.L. W/T TESTS FEBRUARY 1957

C_{l_q} VS. α

$\beta = 0$

COCKPIT SEALED



P/STAB/146 3.1.10

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PLOT 248

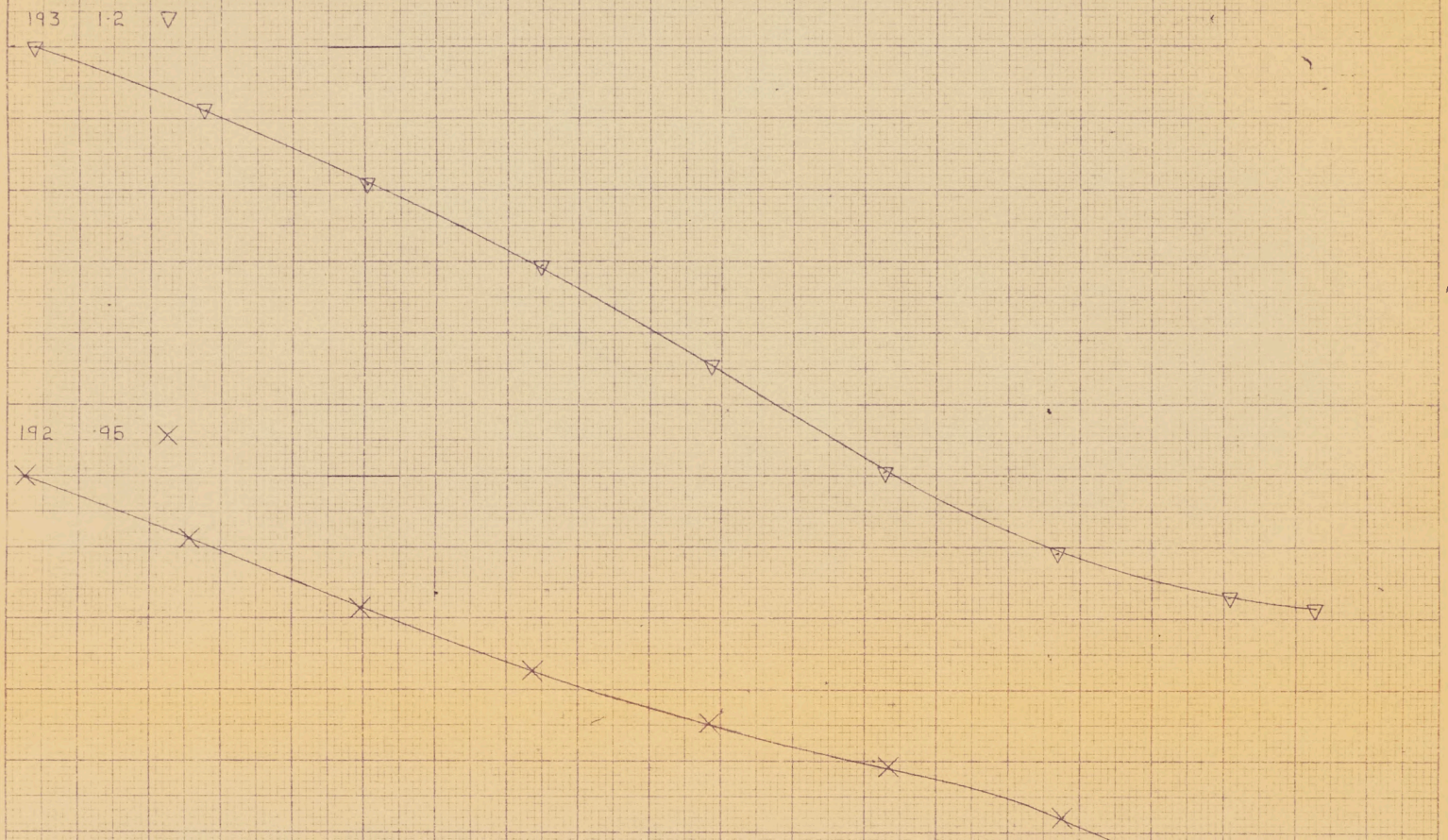
C-105

C.A.L W/T TESTS FEBRUARY 1957

$C_{h_{10}}$ VS α

$\beta = 0$

COCKPIT SEALED



P/STAB/146 3.1.11

CONFIDENTIAL

PLOT 249

C-105

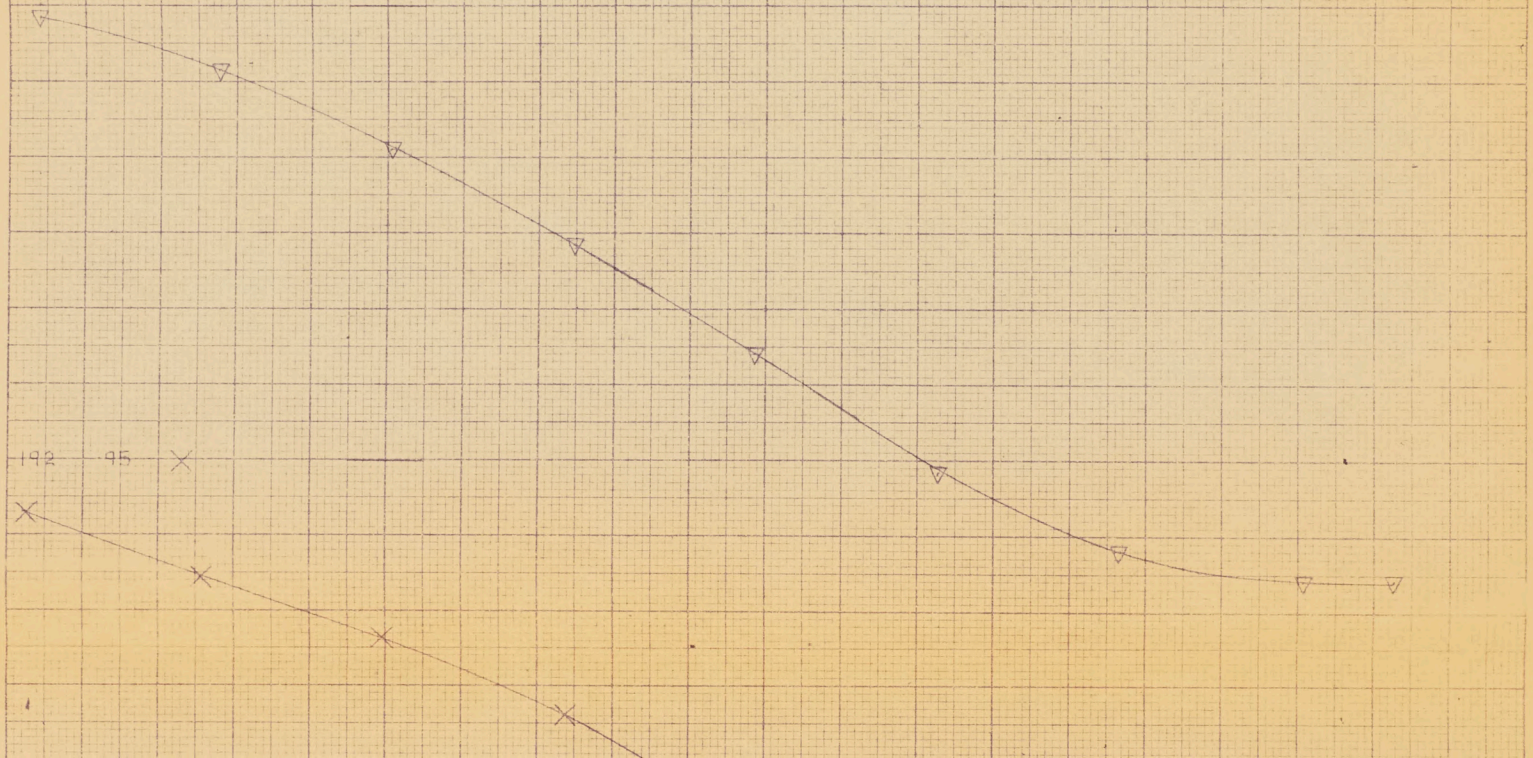
C.A.L. W/T TESTS FEBRUARY 1957

$C_{h_{\beta}}$ vs. α

$\beta = 0$

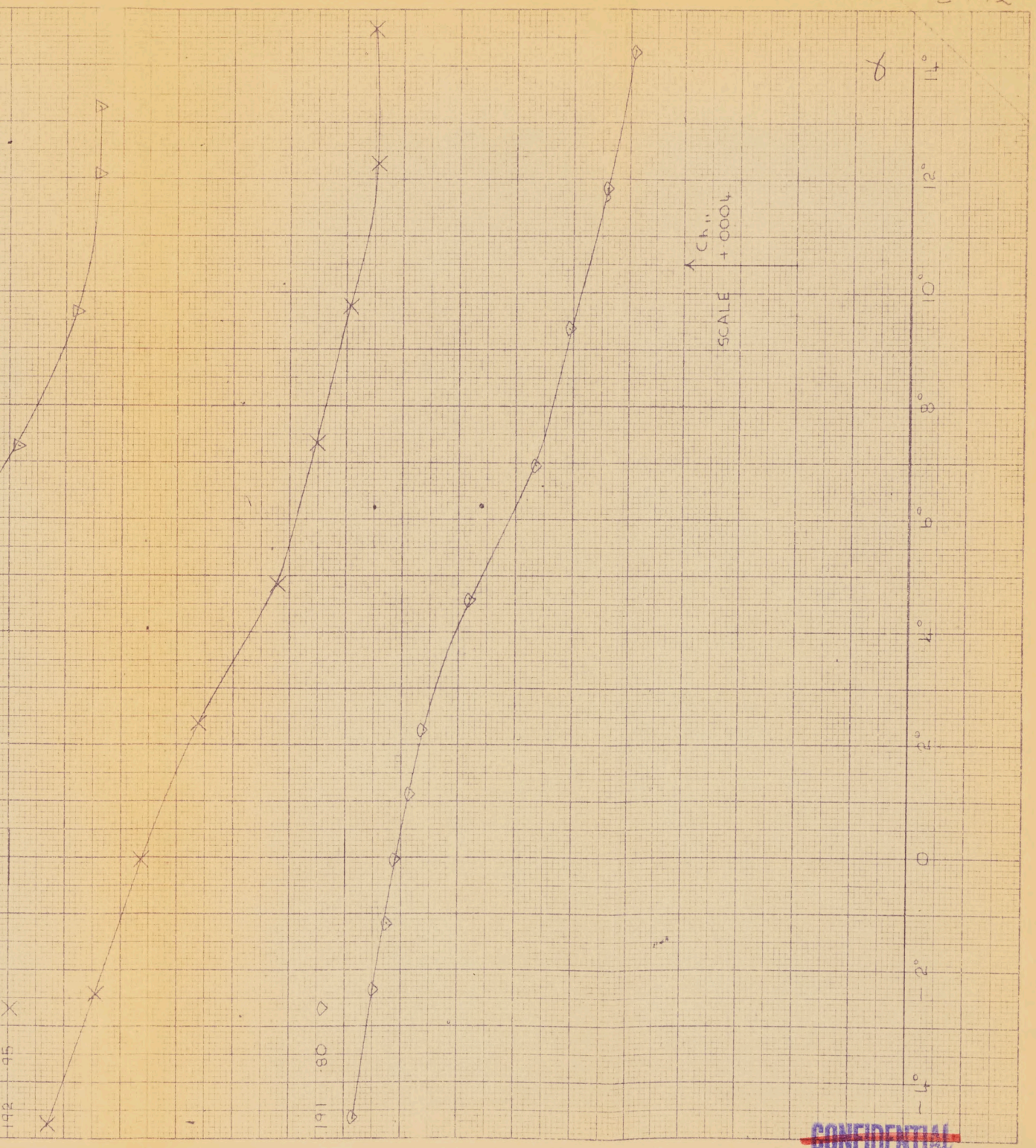
COCKPIT SEALED

RUN No	MACH No	SYMBOL
193	1.2	▽
192	.95	X



P/STAB/146 3.2.1

P/STAB/146 3.1.12



Plot 13
174

C-105

C.A.L. W/T. TESTS FEBRUARY 1957

C_{h_8} VS. β

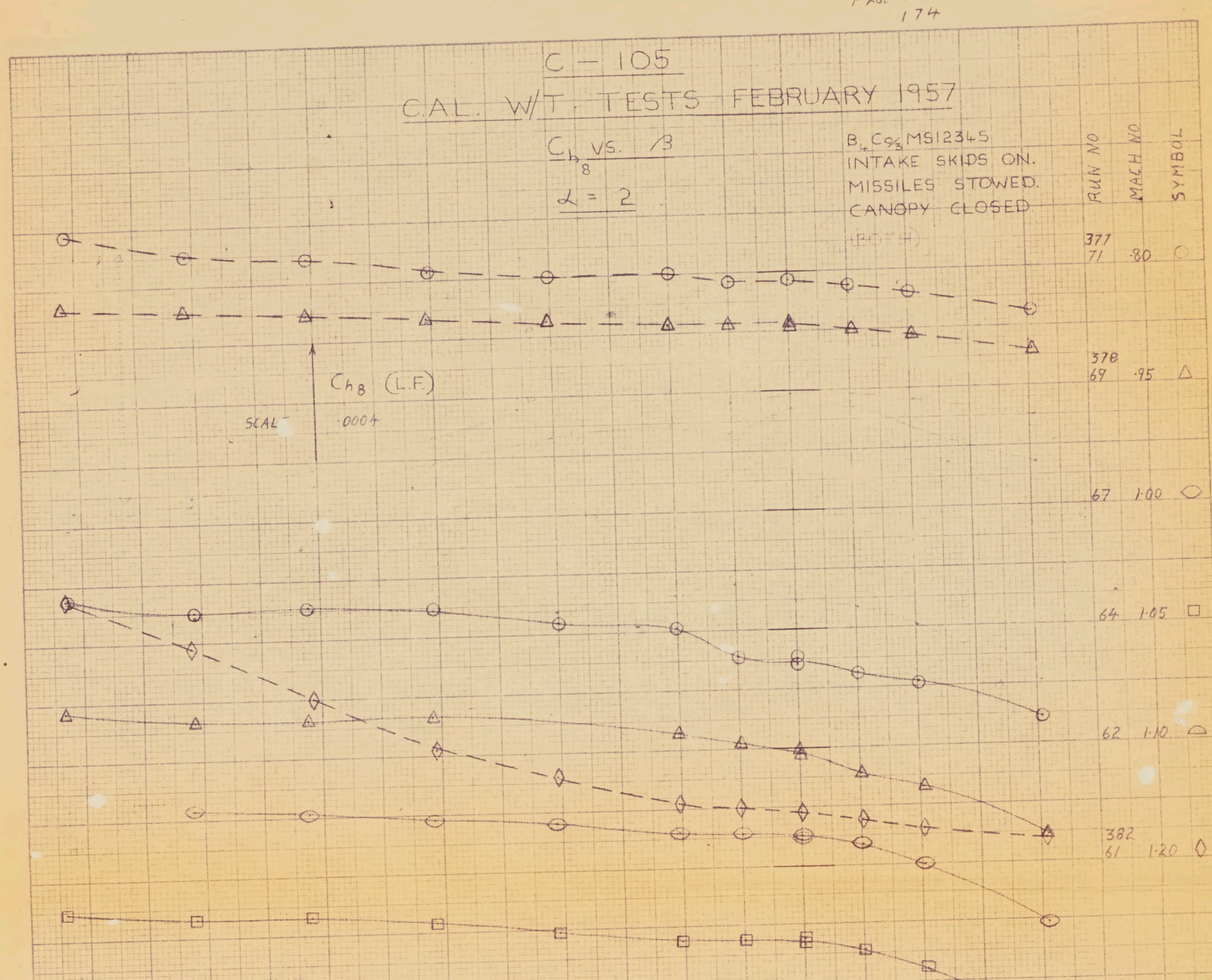
$\alpha = 2$

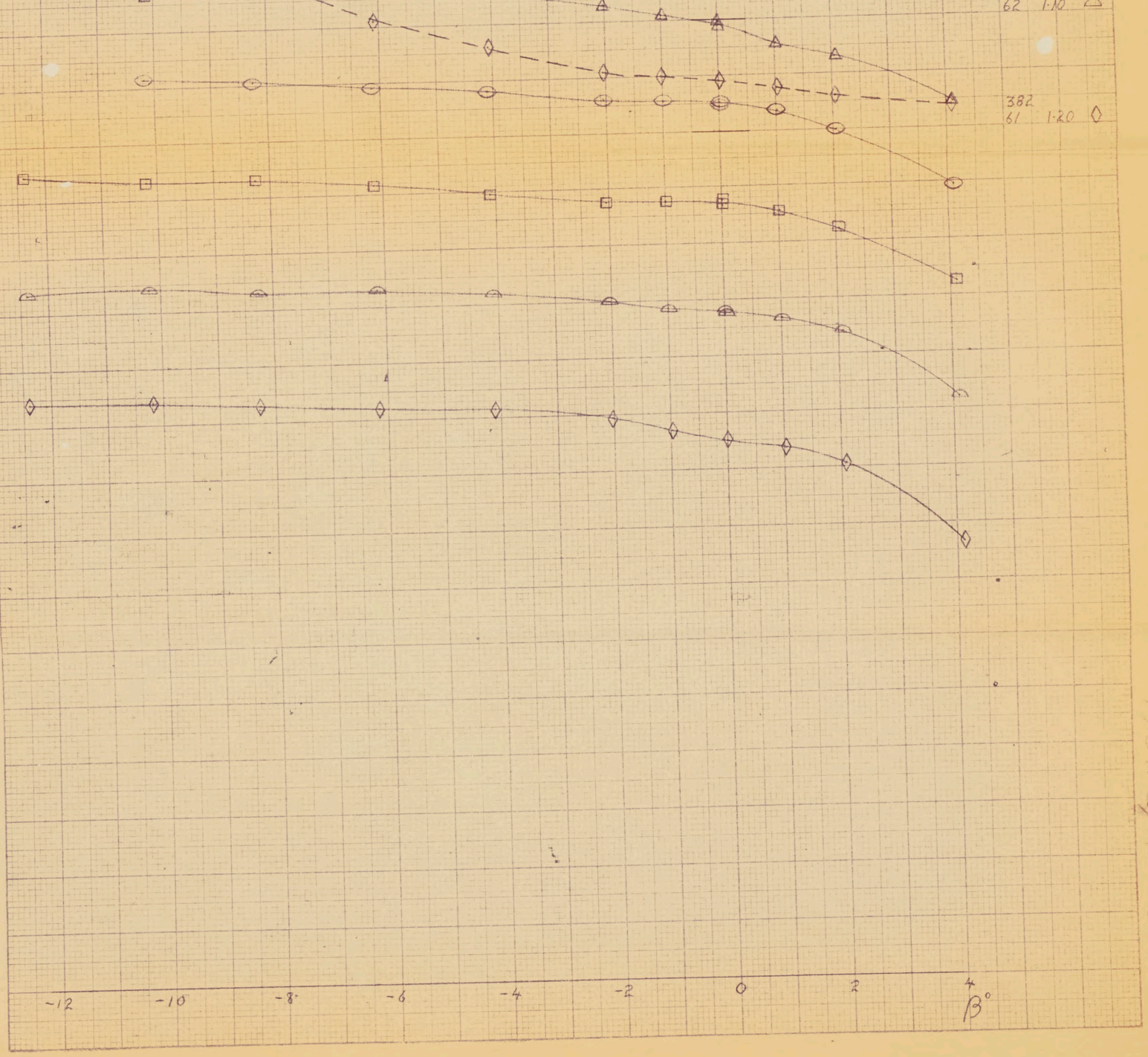
$B_+ C_{8/3}$ MS12345
INTAKE SKIDS ON.
MISSILES STOWED.
CANOPY CLOSED

RUN NO	MACH NO	SYMBOL
377	.80	○
378	.95	△
67	1.00	⬭
64	1.05	□
62	1.10	⌓
382	1.20	◇
61		

C_{h_8} (L.F.)

SCALE .0004





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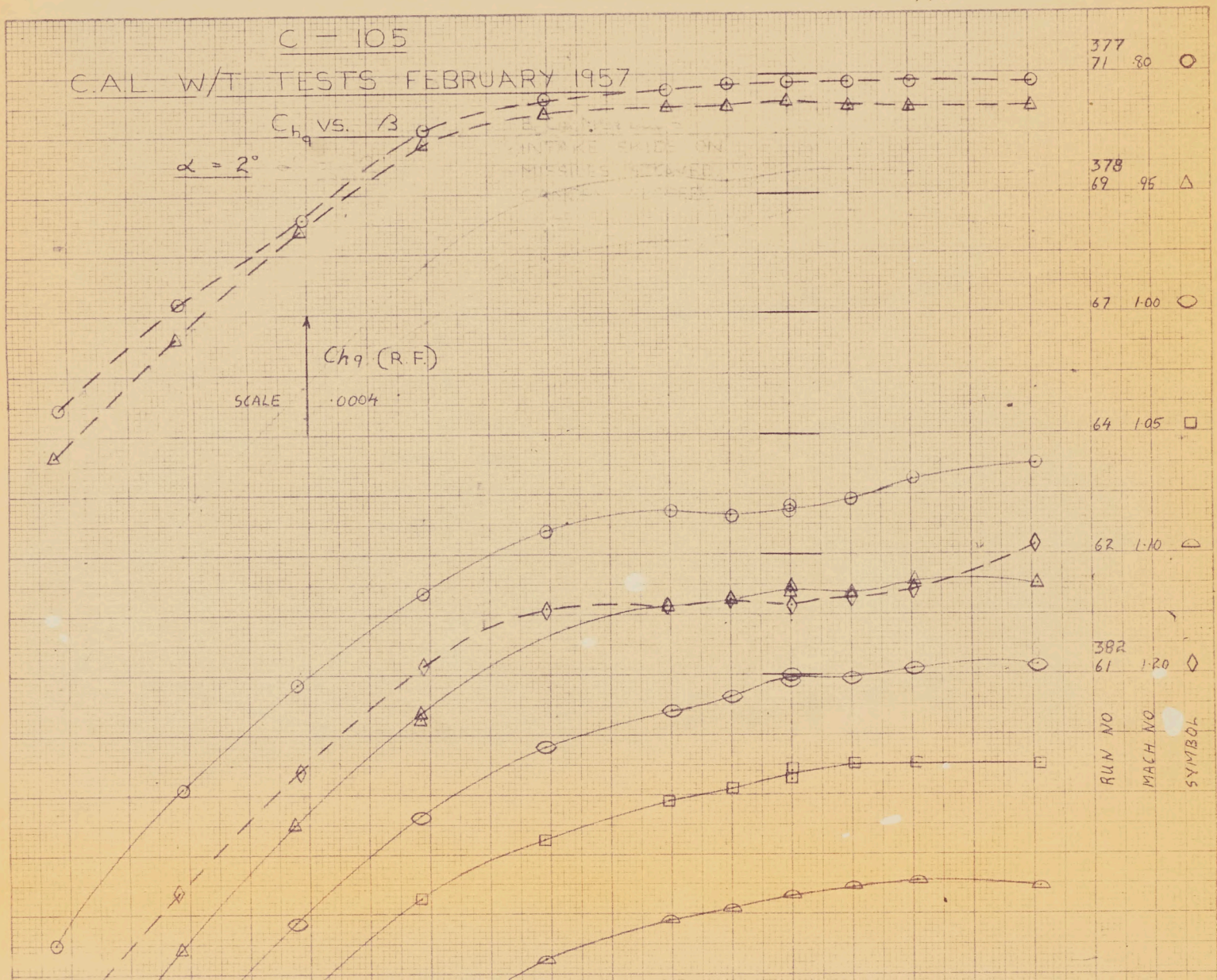
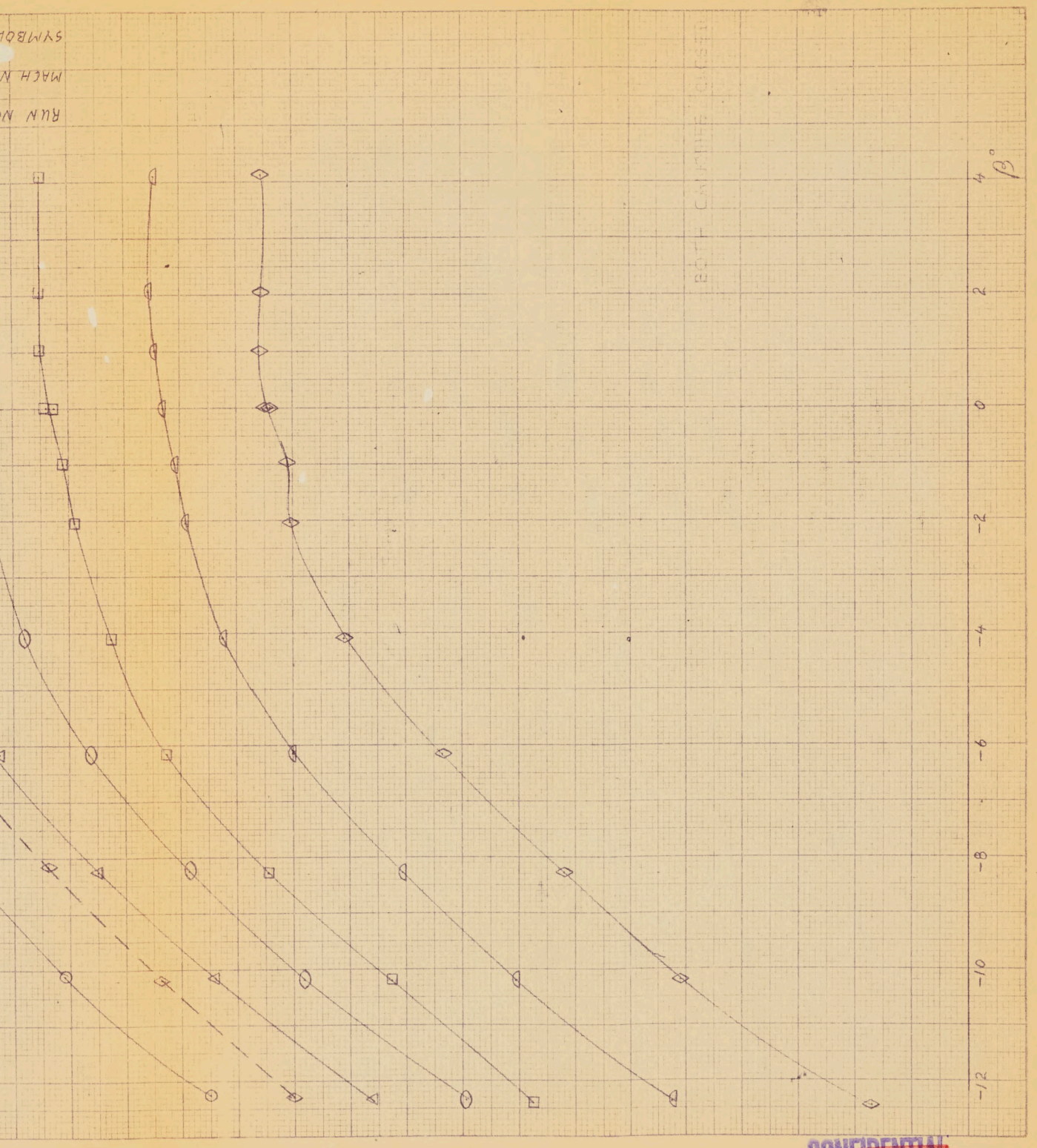
P/STAB/146 3.2.1

Plot 15
175



P/STAB/146 3·2·2



PLOT 17

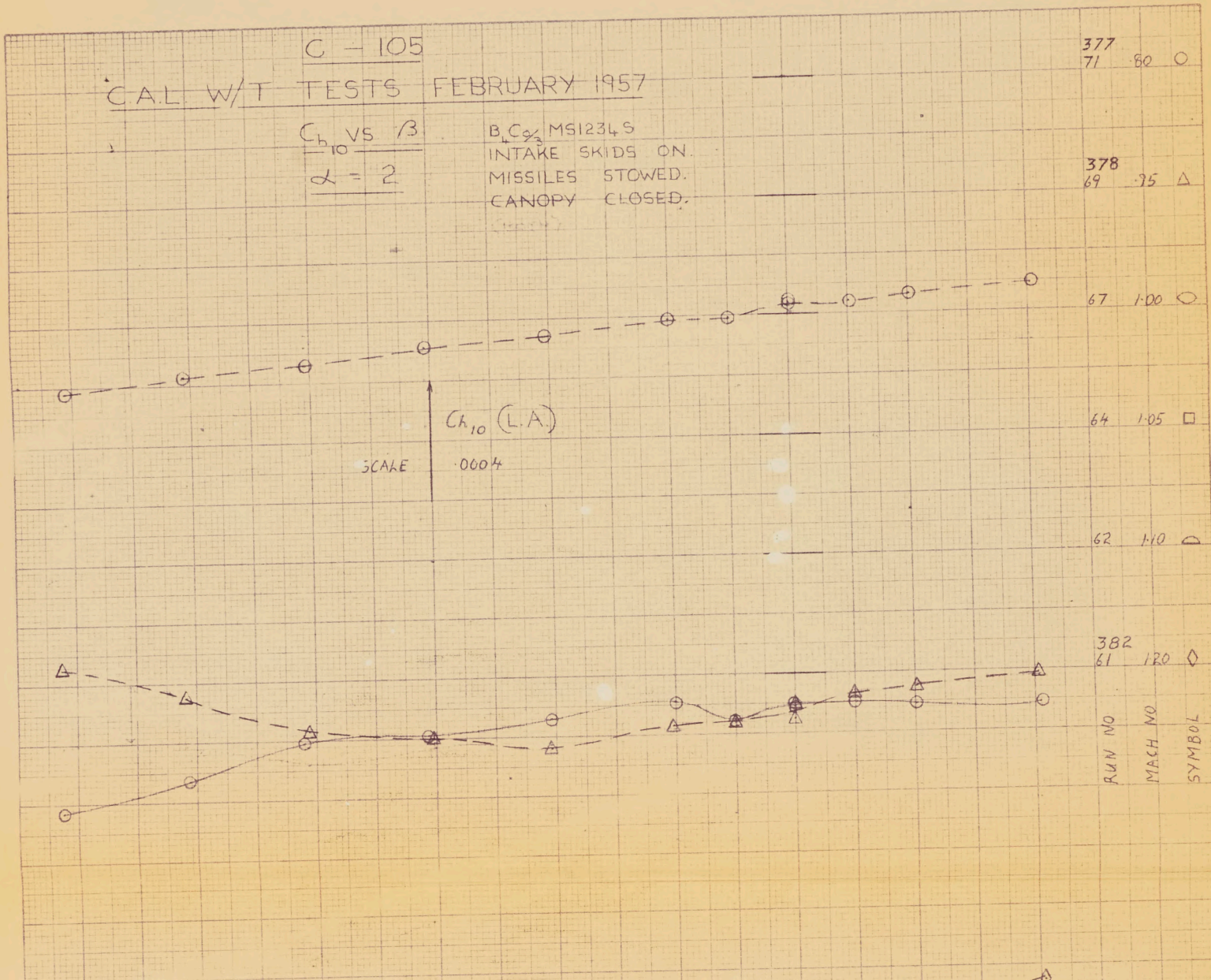
C - 105

CAL W/T TESTS FEBRUARY 1957

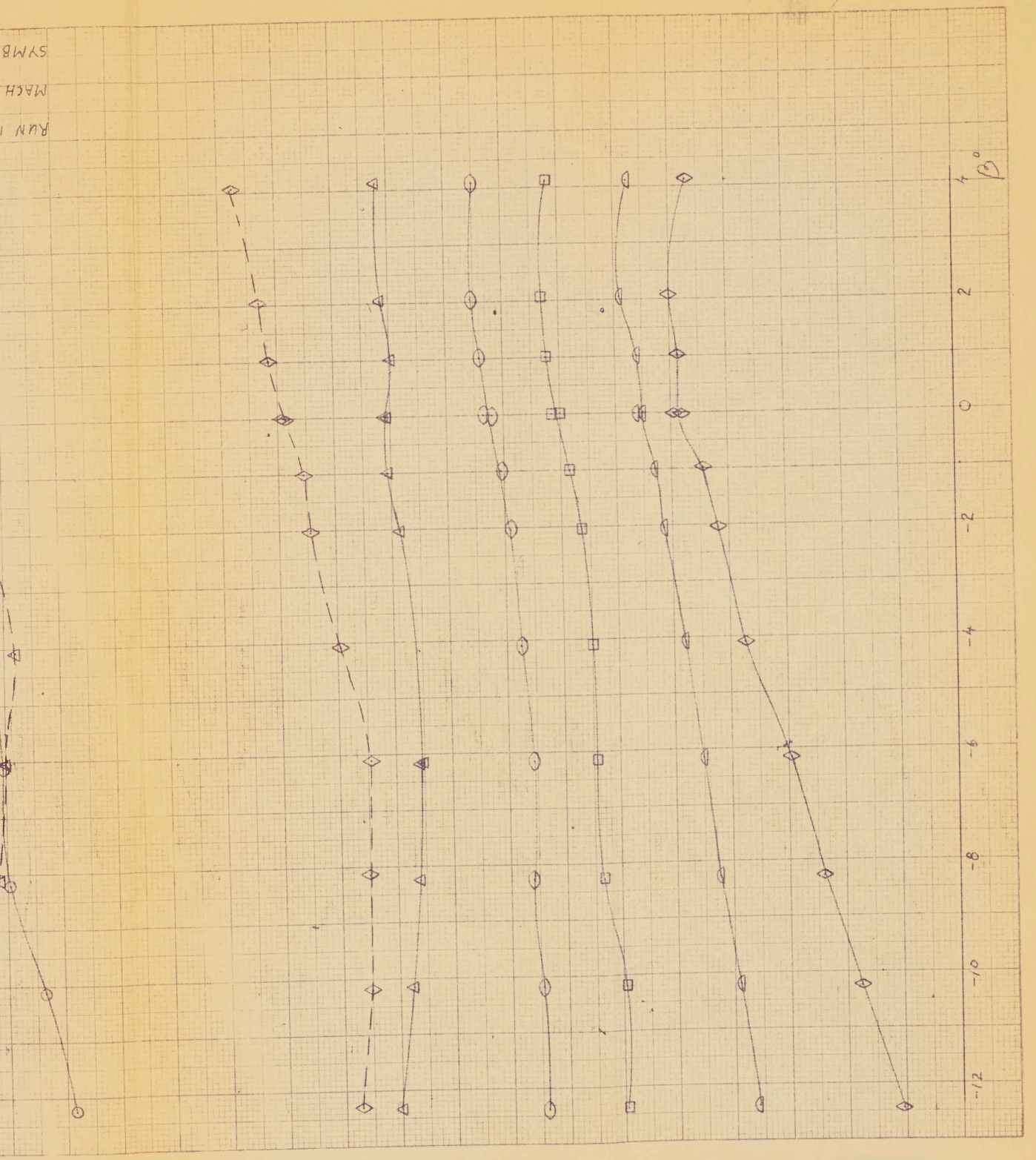
$C_{h_{10}}$ VS β

$\alpha = 2$

$B_4 C_{2/3}$ MS1234S
INTAKE SKIDS ON.
MISSILES STOWED.
CANOPY CLOSED.



P/STAB/146 3·2·3



CONFIDENTIAL

PLOT 19
177

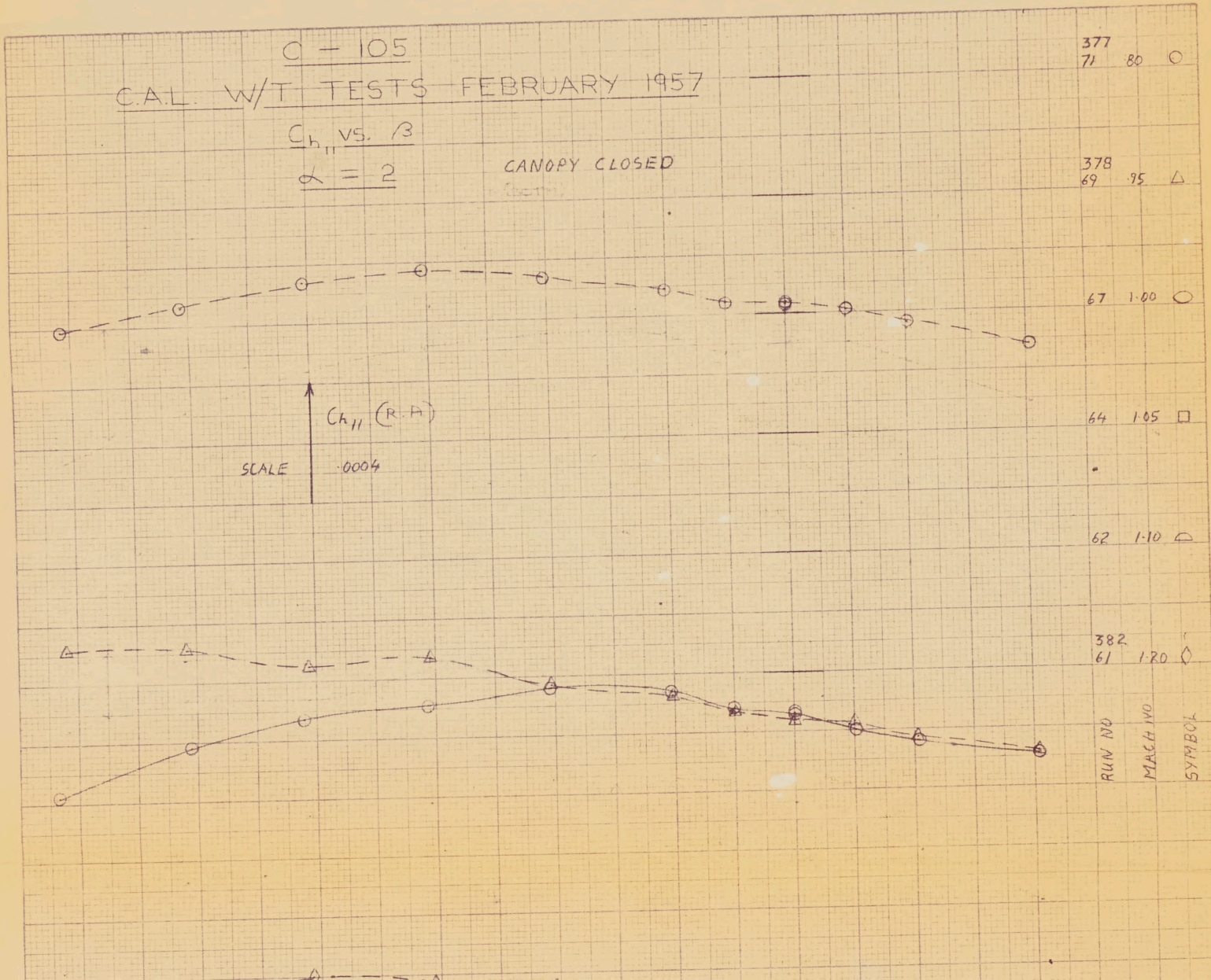
C – 105

C.A.L. W/T TESTS FEBRUARY 1957

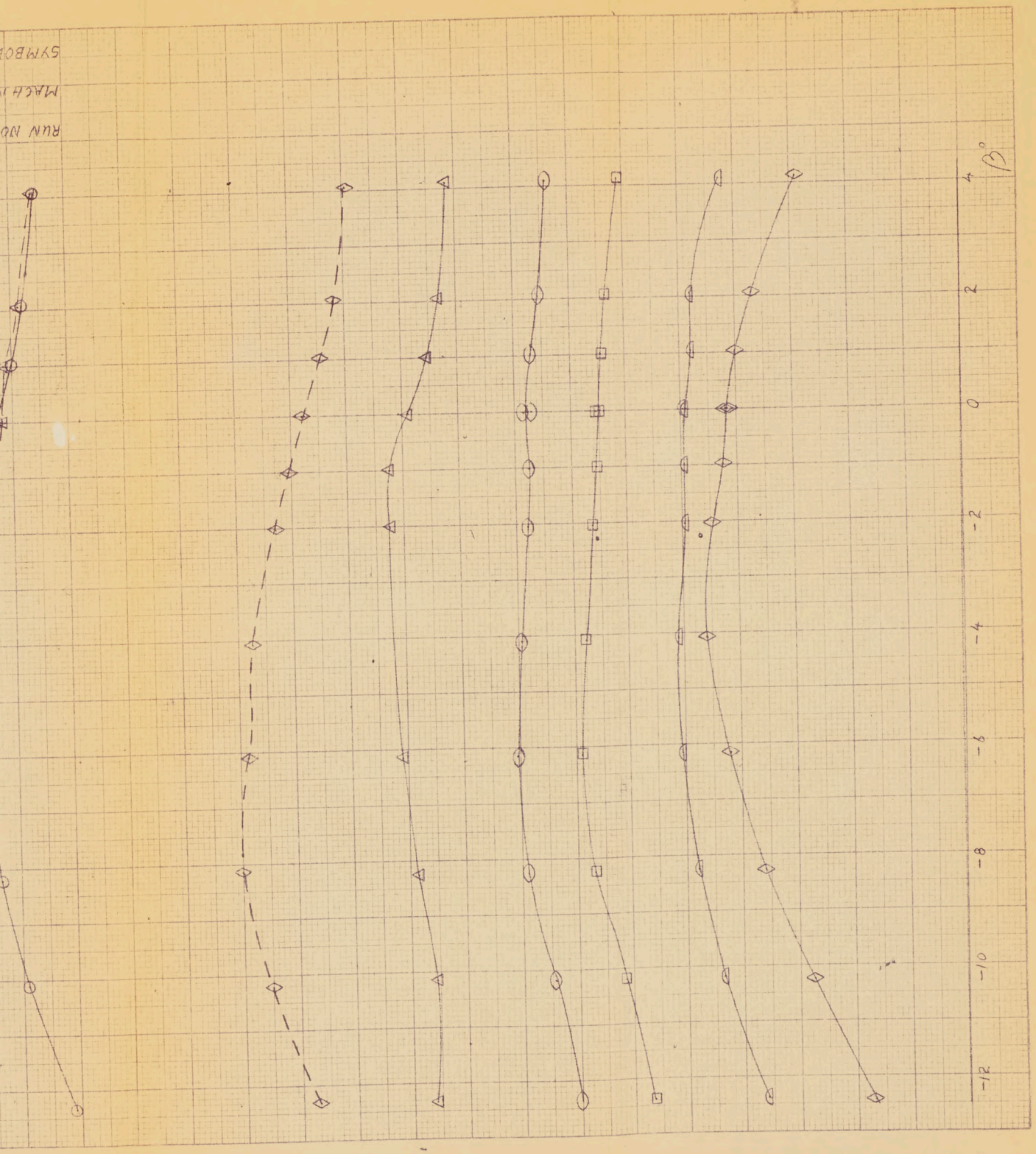
$C_{h_{11}}$ VS. β

$\alpha = 2$

CANOPY CLOSED



P/ST.B/146 3.2.4



CONFIDENTIAL

PLOT 14
180

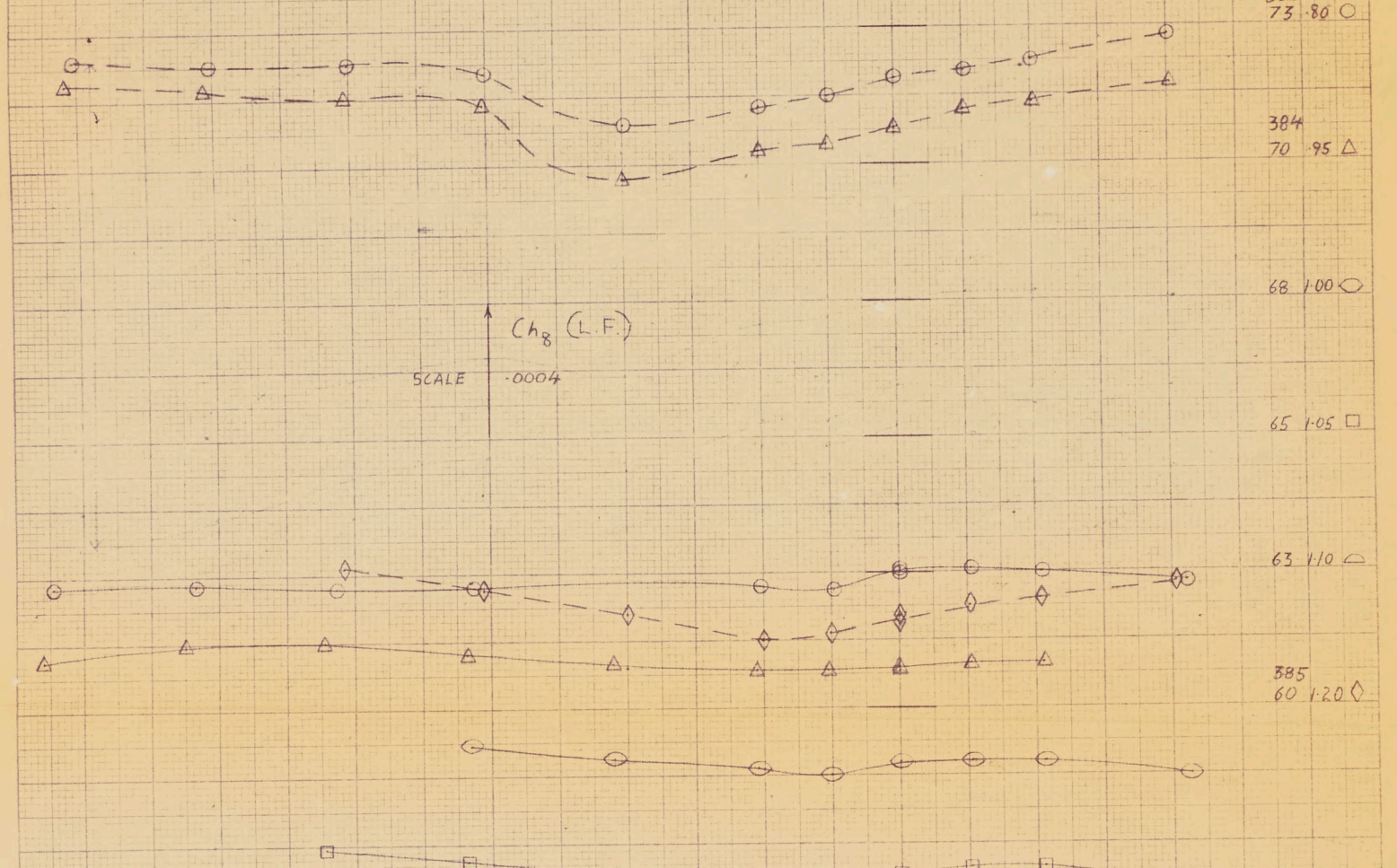
C – 105

C.A.L. W/T TESTS FEBRUARY 1957

C_{h_8} VS. β

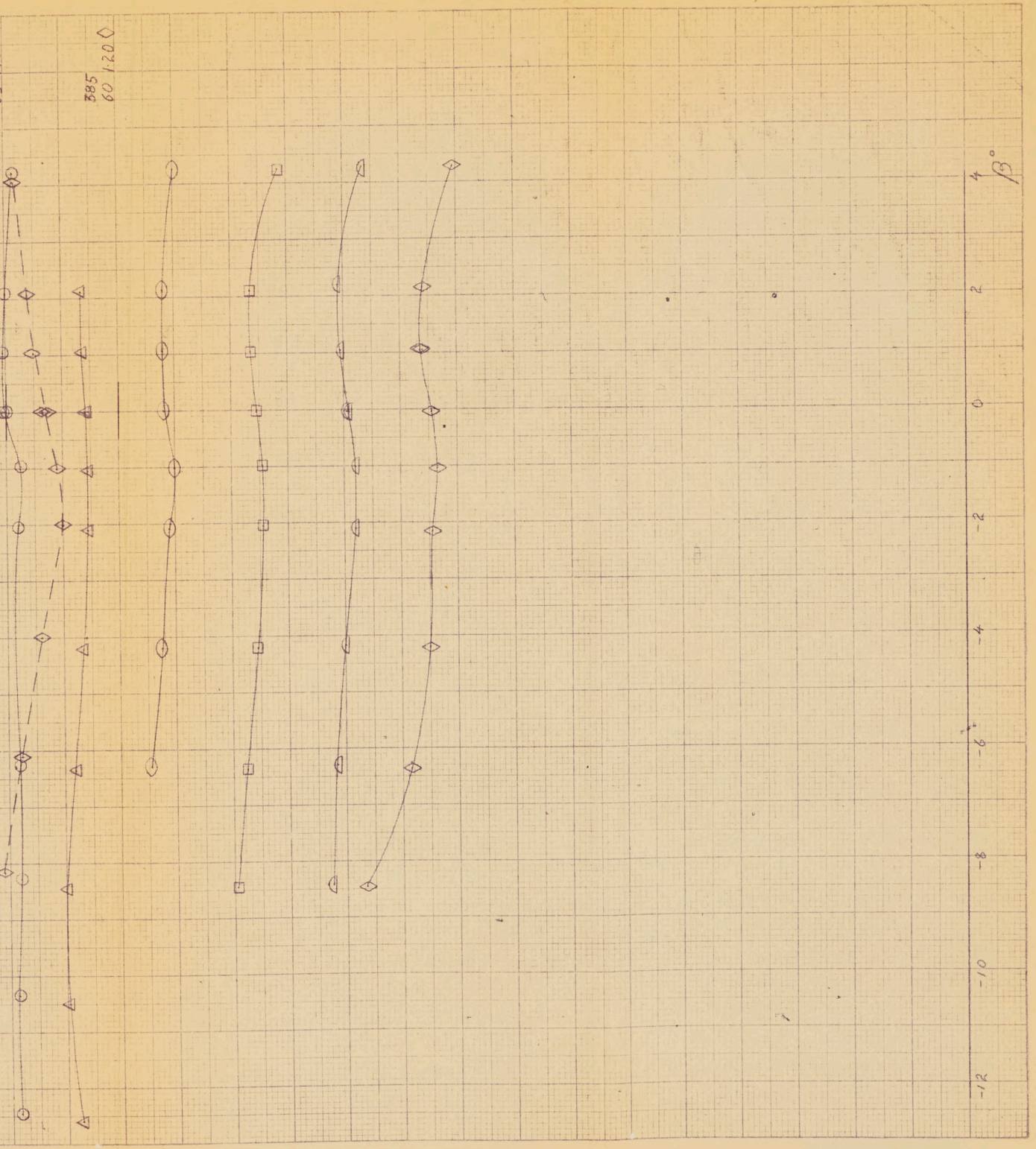
$\alpha = 2.10°$

$B_L C_{\frac{2}{3}} MS123LS$
INTAKE SKIDS ON.
MISSILES STOWED.
CANOPY CLOSED.



RUN NO.	MACH NO.	SYMBOL
383	.73 .80	○
384	.70 .95	△
	.68 1.00	◇
	.65 1.05	□
	.63 1.10	⌓
385	.60 1.20	◊

P/STAB/146 3·2·5



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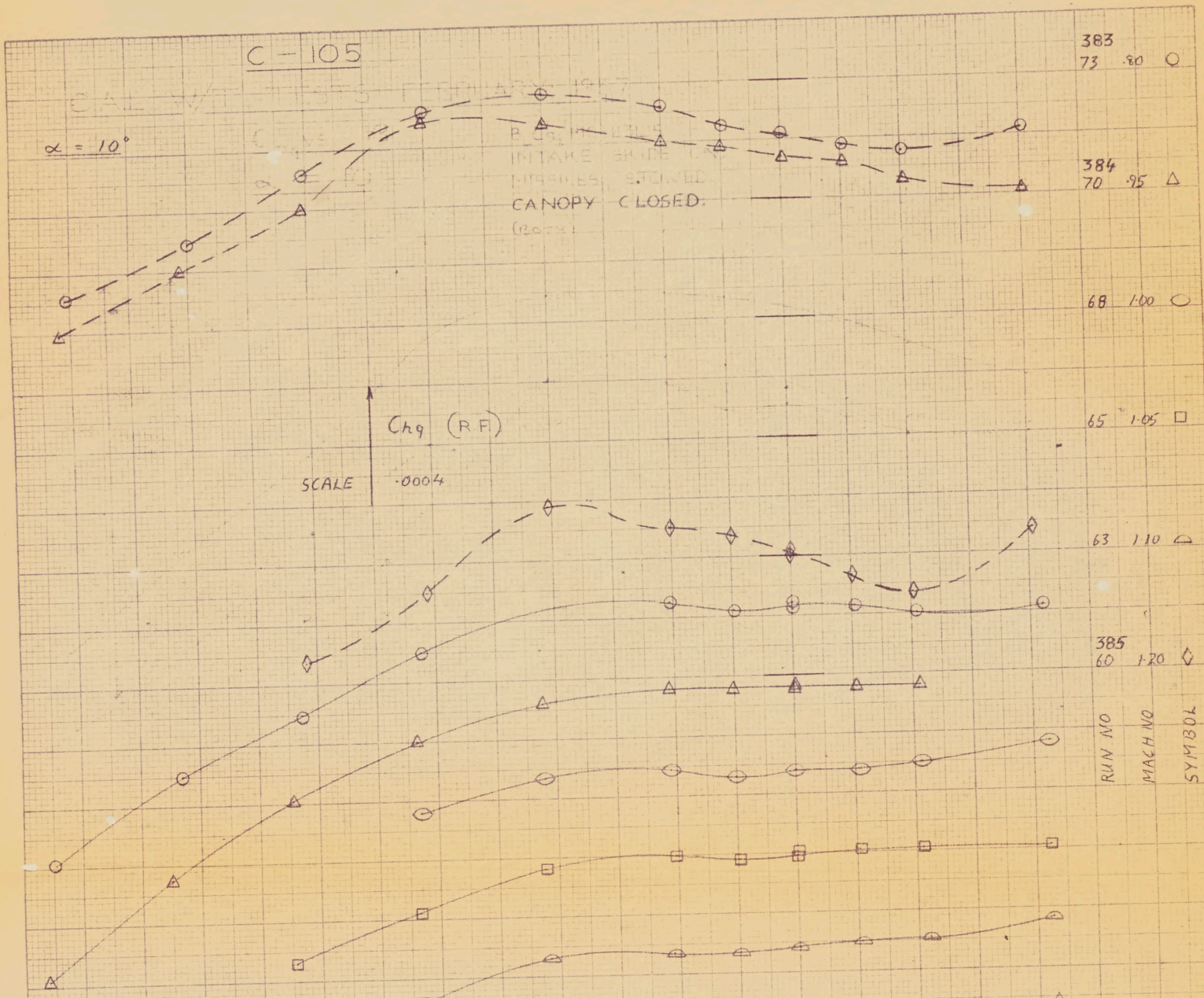
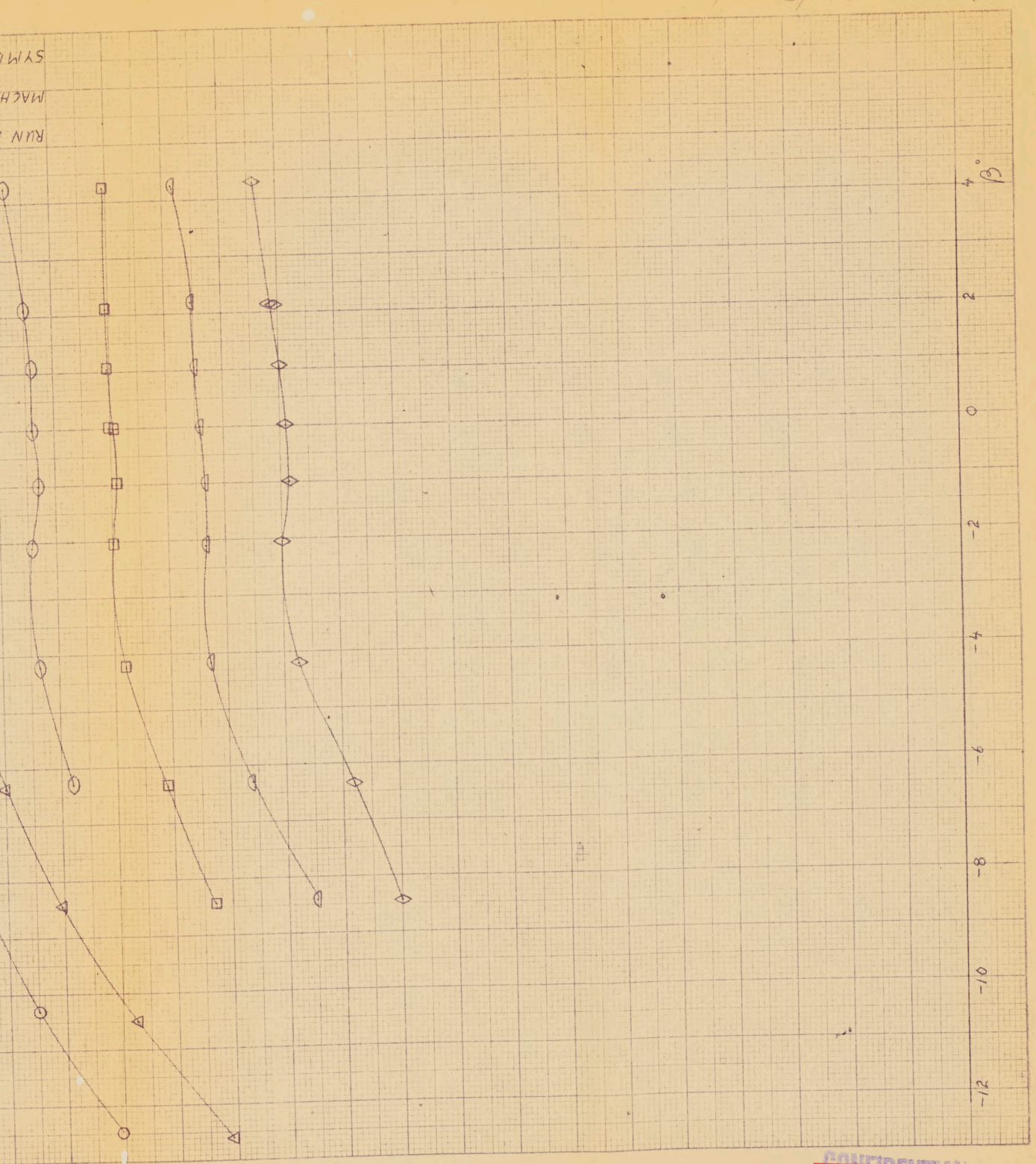
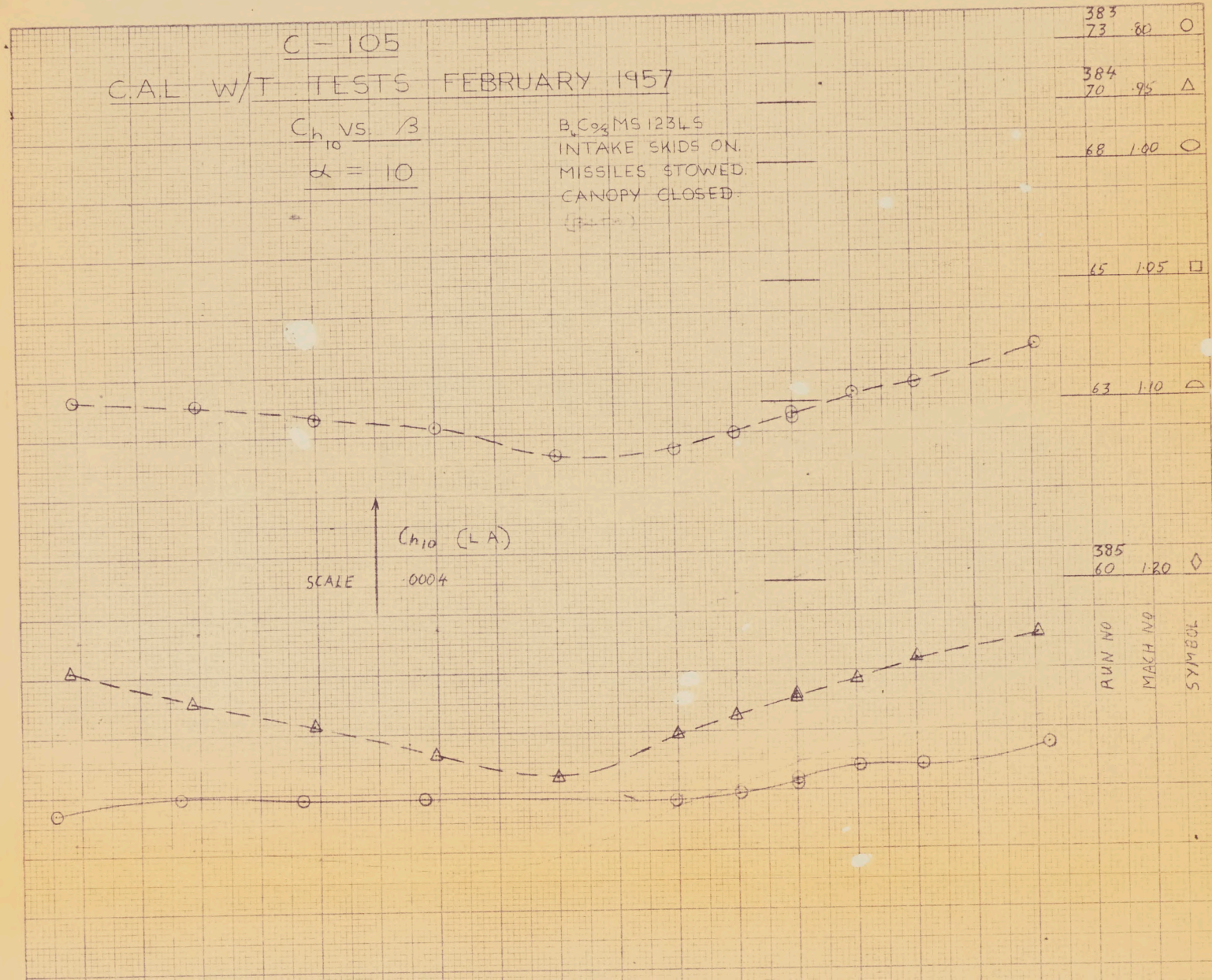
PLOT 16
181



P/STAB/146 3·2·6.

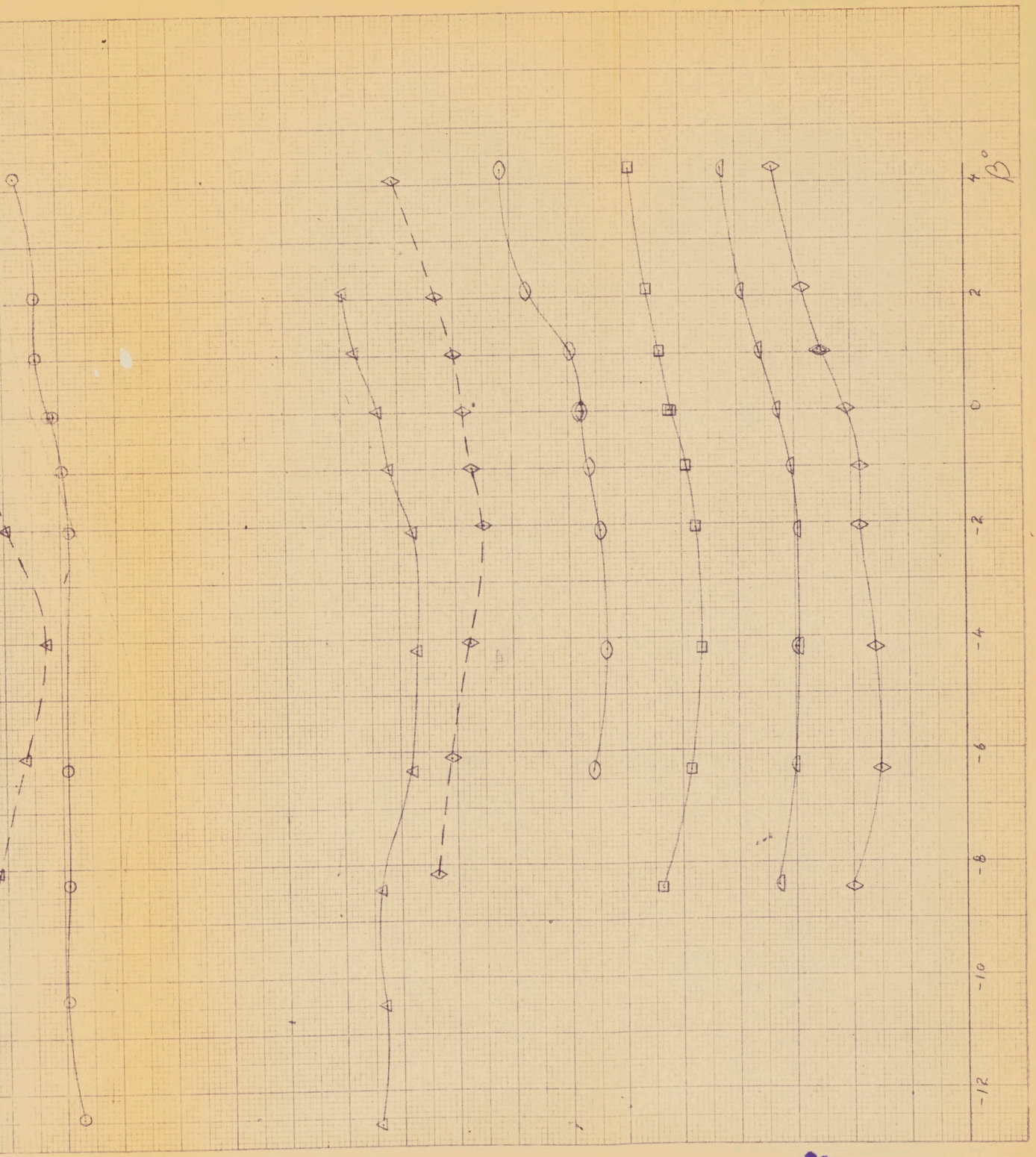


PLOT 18



P/STAB/146 3·2·9

P/STAB/146 3·2·7



PLOT 20
183

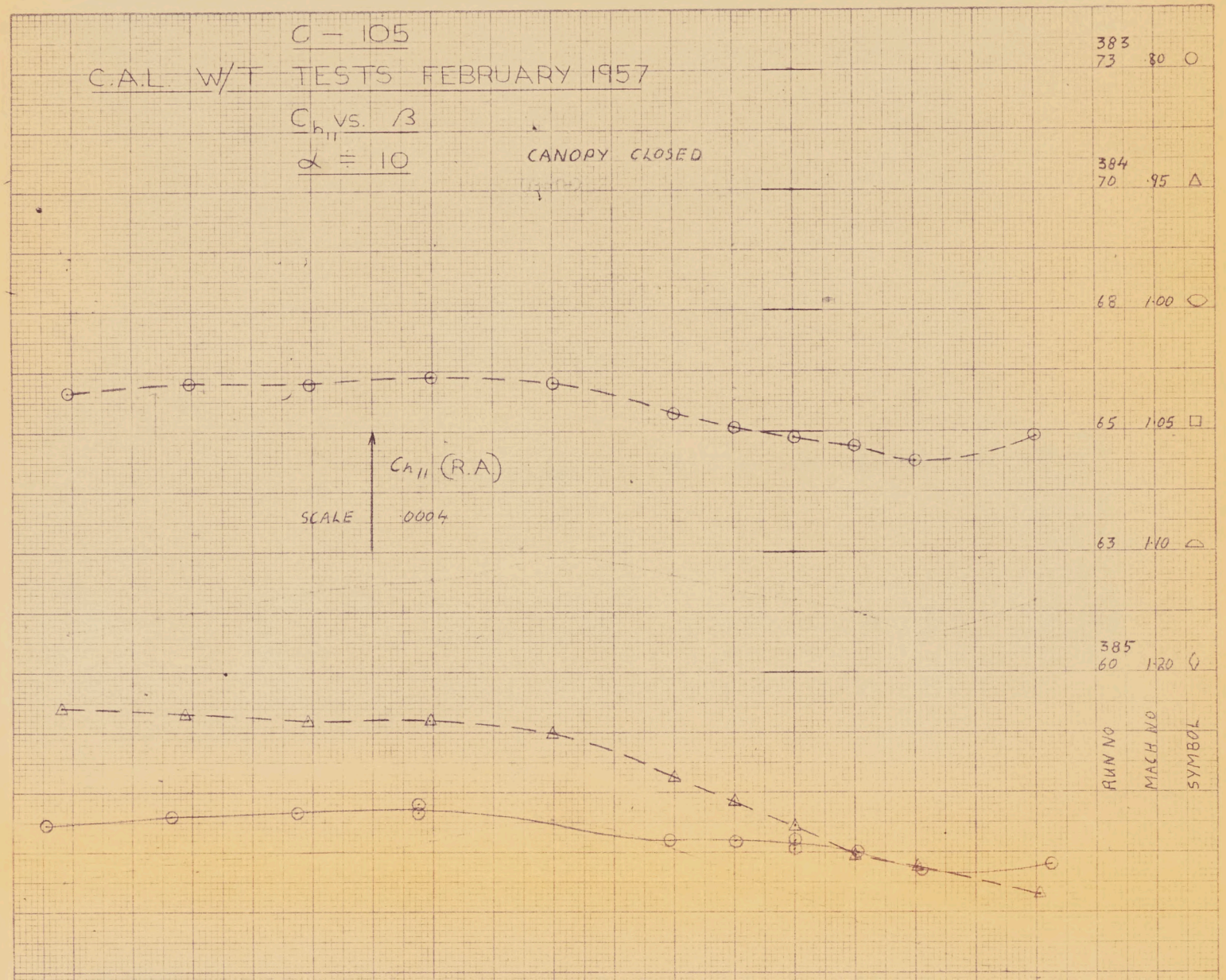
C – 105

C.A.L. W/T TESTS FEBRUARY 1957

$C_{h_{11}}$ VS. β

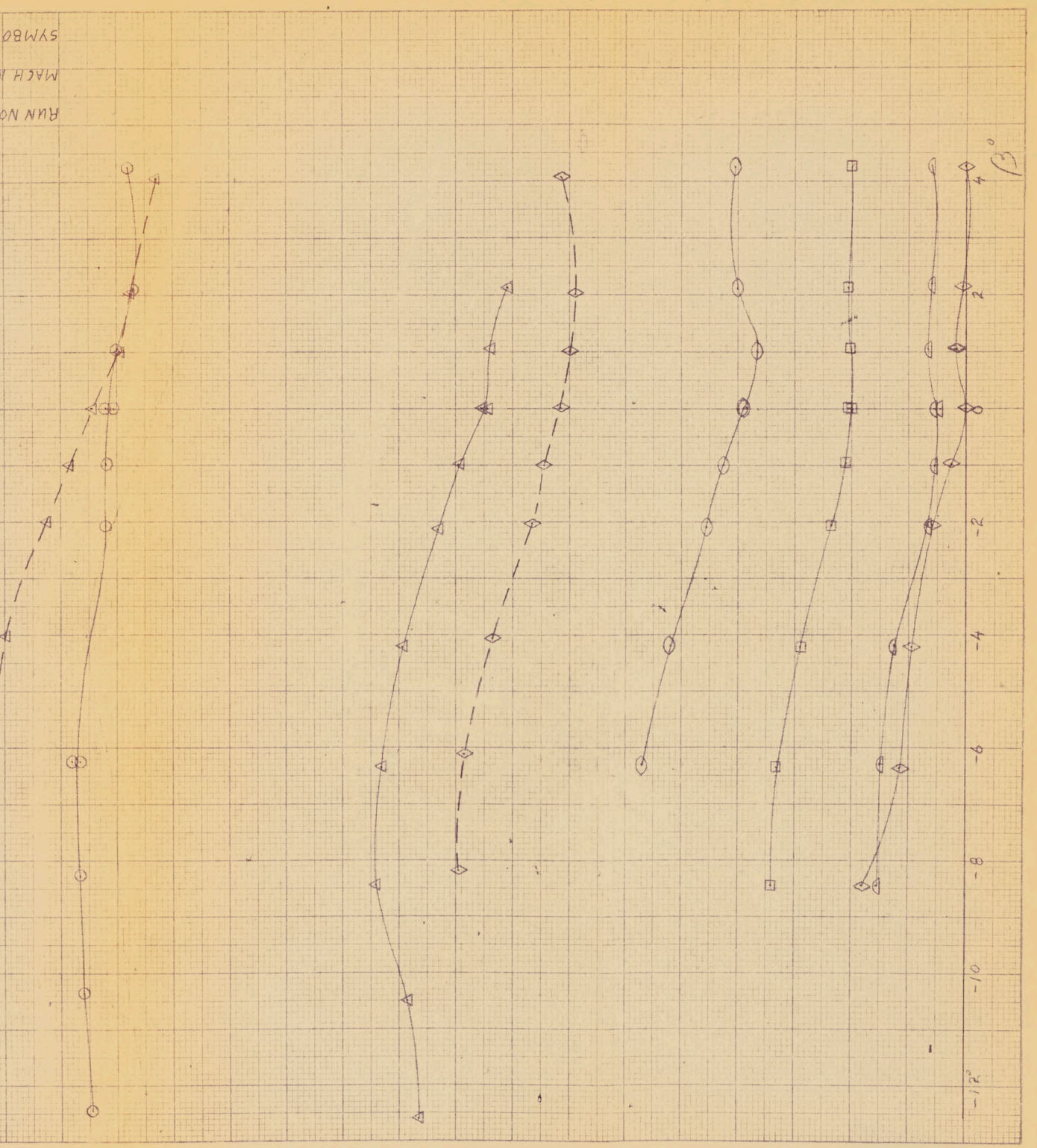
$\alpha \doteq 10$

CANOPY CLOSED



P/STAB/146 3·2·9

P/STAB/146 3·2·8



PLOT 186

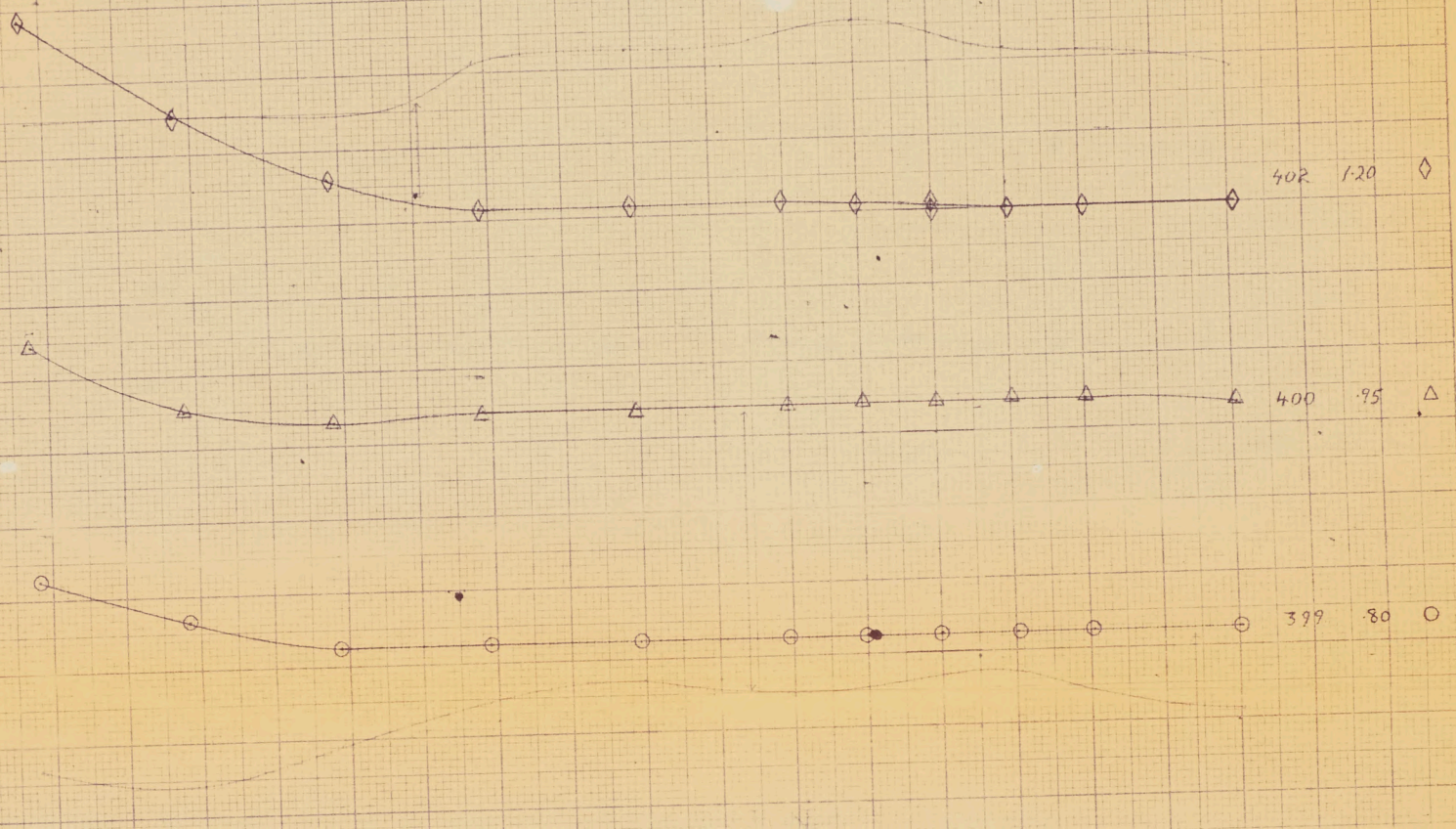
C-105

C.A.L. W/T TESTS FEBRUARY 1957

C_{h_8} VS β

$\alpha = 2$

INTAKE SEALED



P/STAB/146 3·2·9

CONFIDENTIAL

PLOT 187

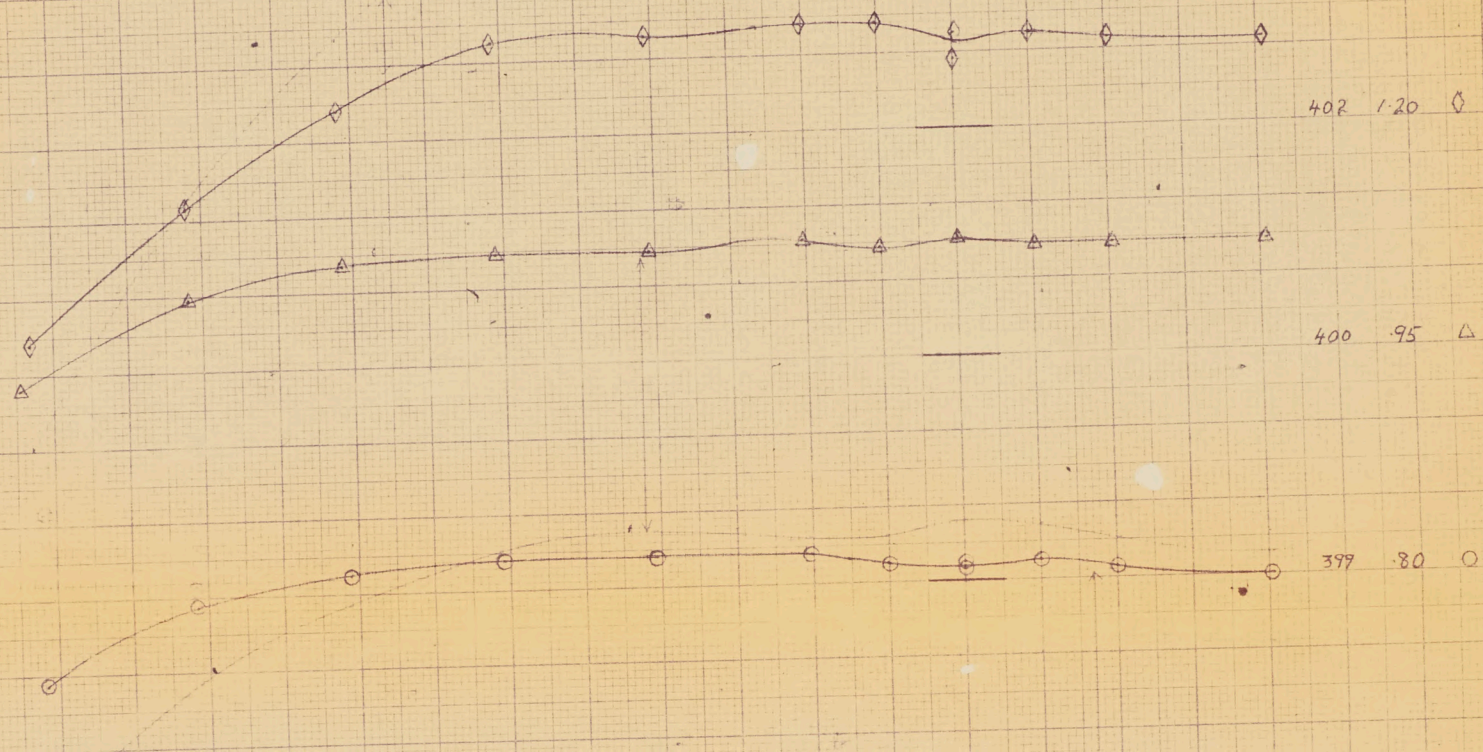
C - 105

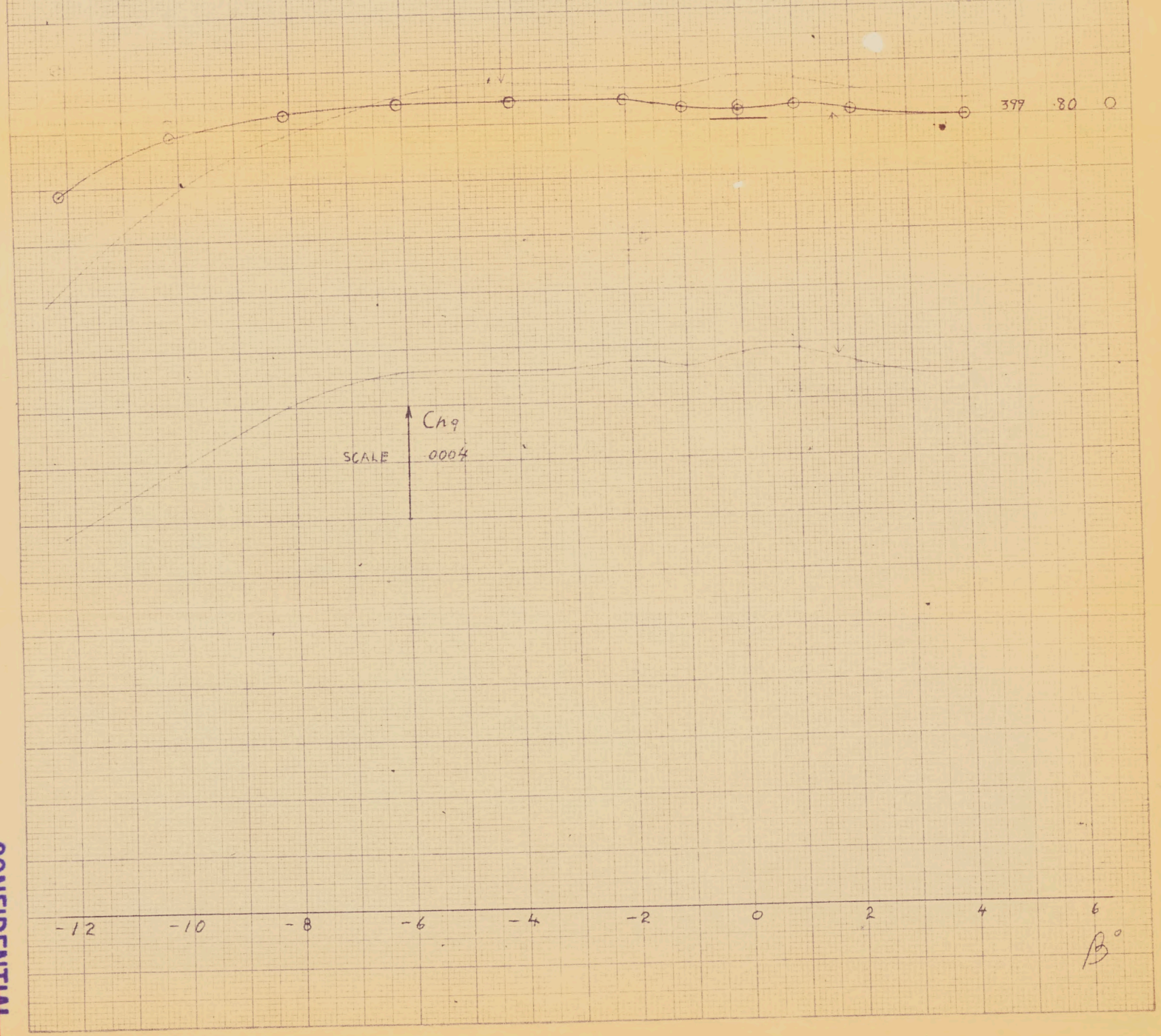
C.A.L. W/T TESTS FEBRUARY 1957

C_{n_q} VS. β

$\alpha = 2°$

INTAKE SEALED





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P/STAB/146 3.2.10

PLOT 188

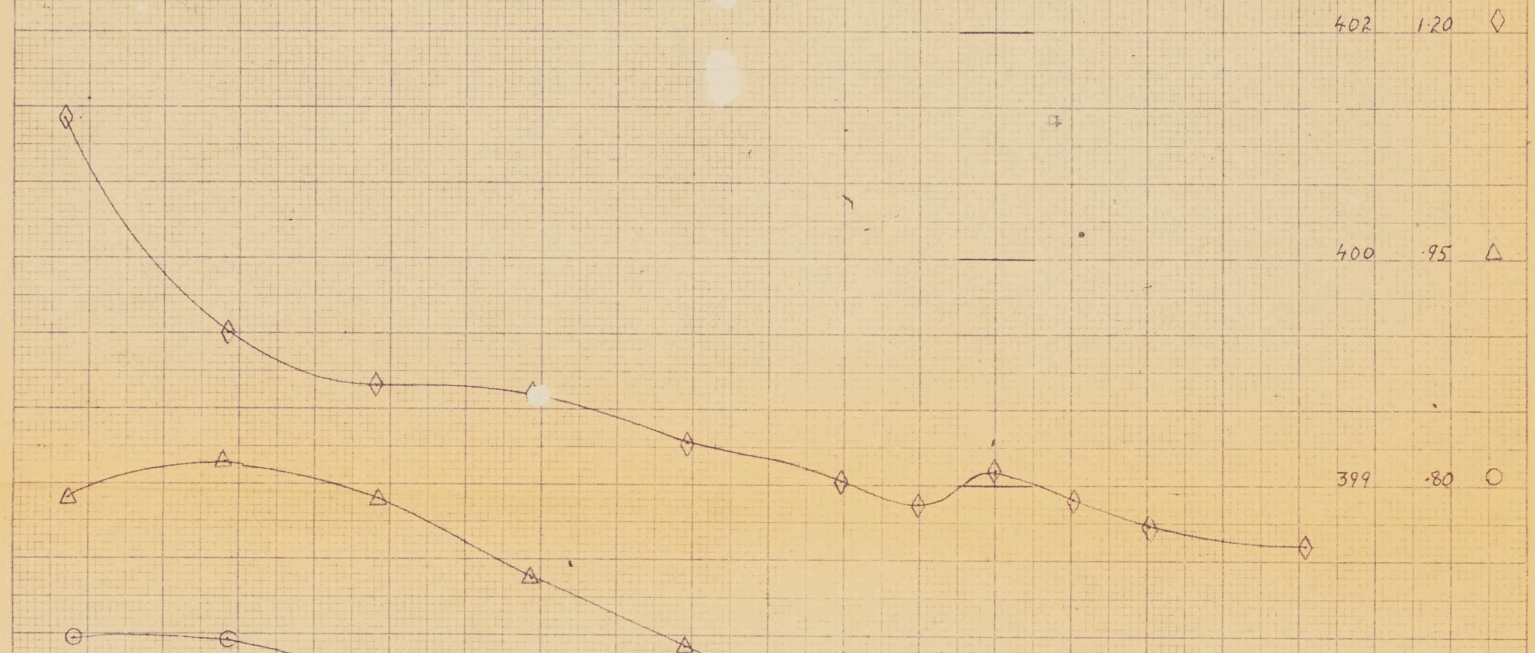
C-105

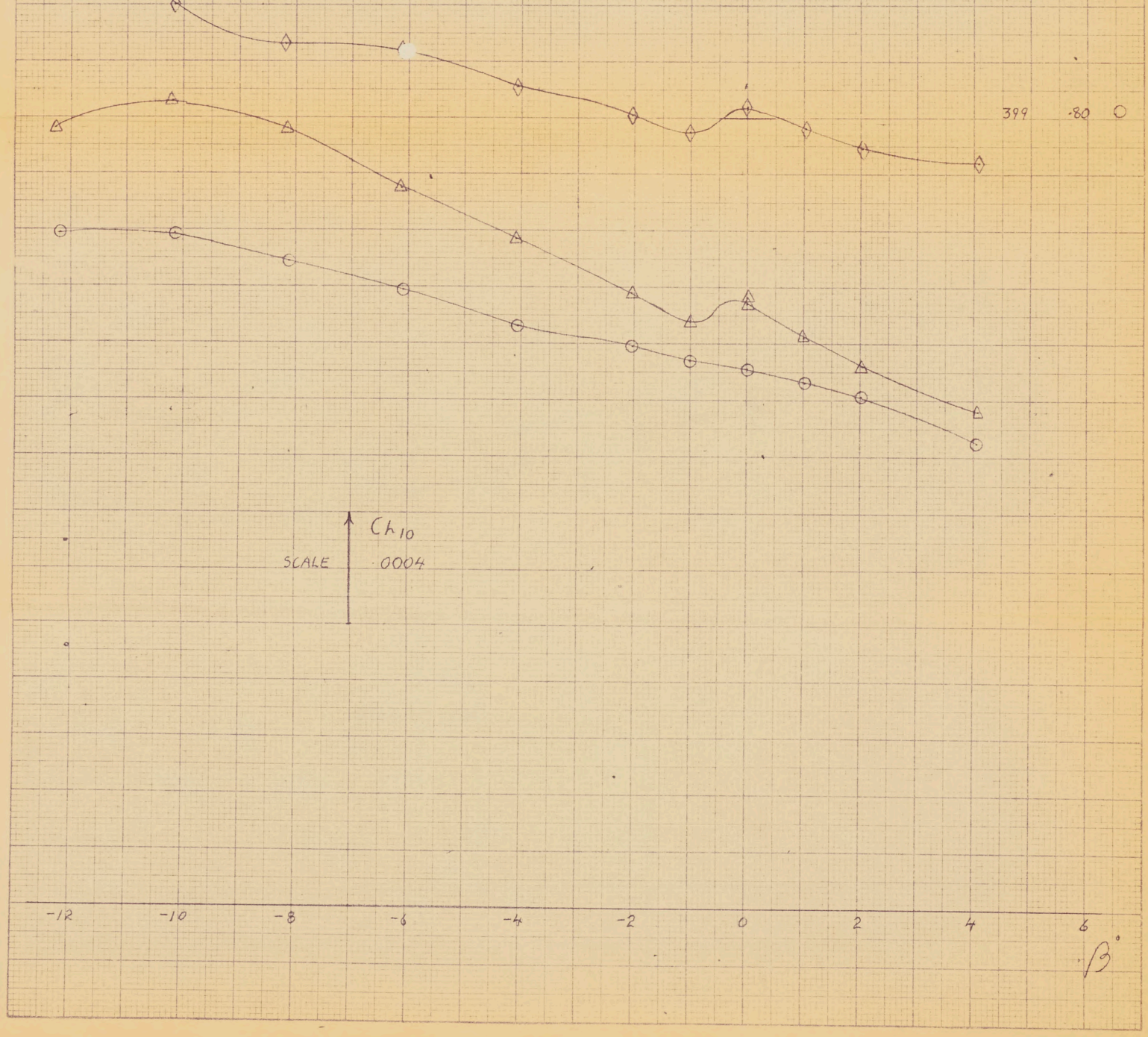
C.A.L W/T TESTS FEBRUARY 1957

$C_{h_{10}}$ VS β

$\alpha = 2°$

INTAKE SEALED





P/STAB/146 3.2.11

CONFIDENTIAL

PLOT 187

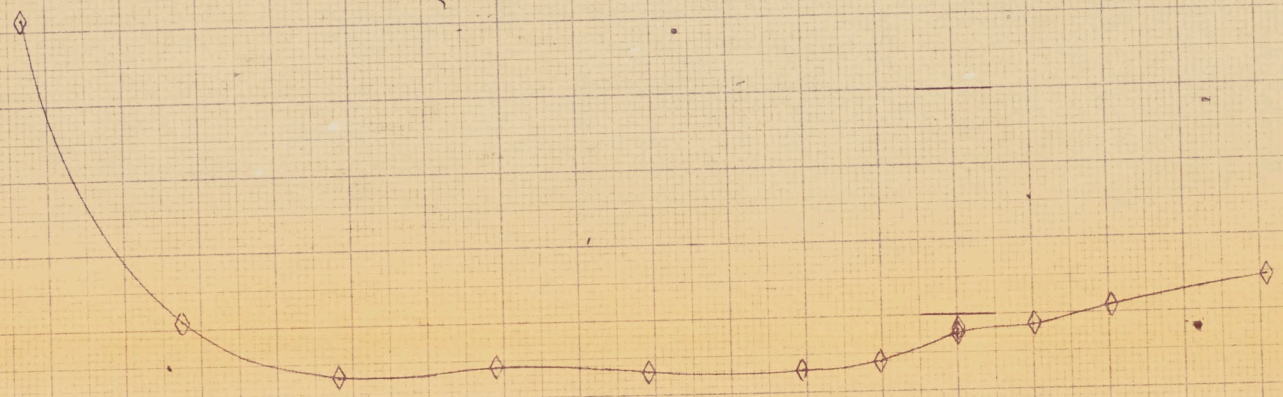
C - 105

C.A.L. W/T TESTS FEBRUARY 1957

C_{h_1} vs: β

$\alpha = 2°$

INTAKE SEALED



402	1.20	◇
400	.95	△
394	.80	○

P/STAB/146 3.2.12

CONFIDENTIAL

Plot 172

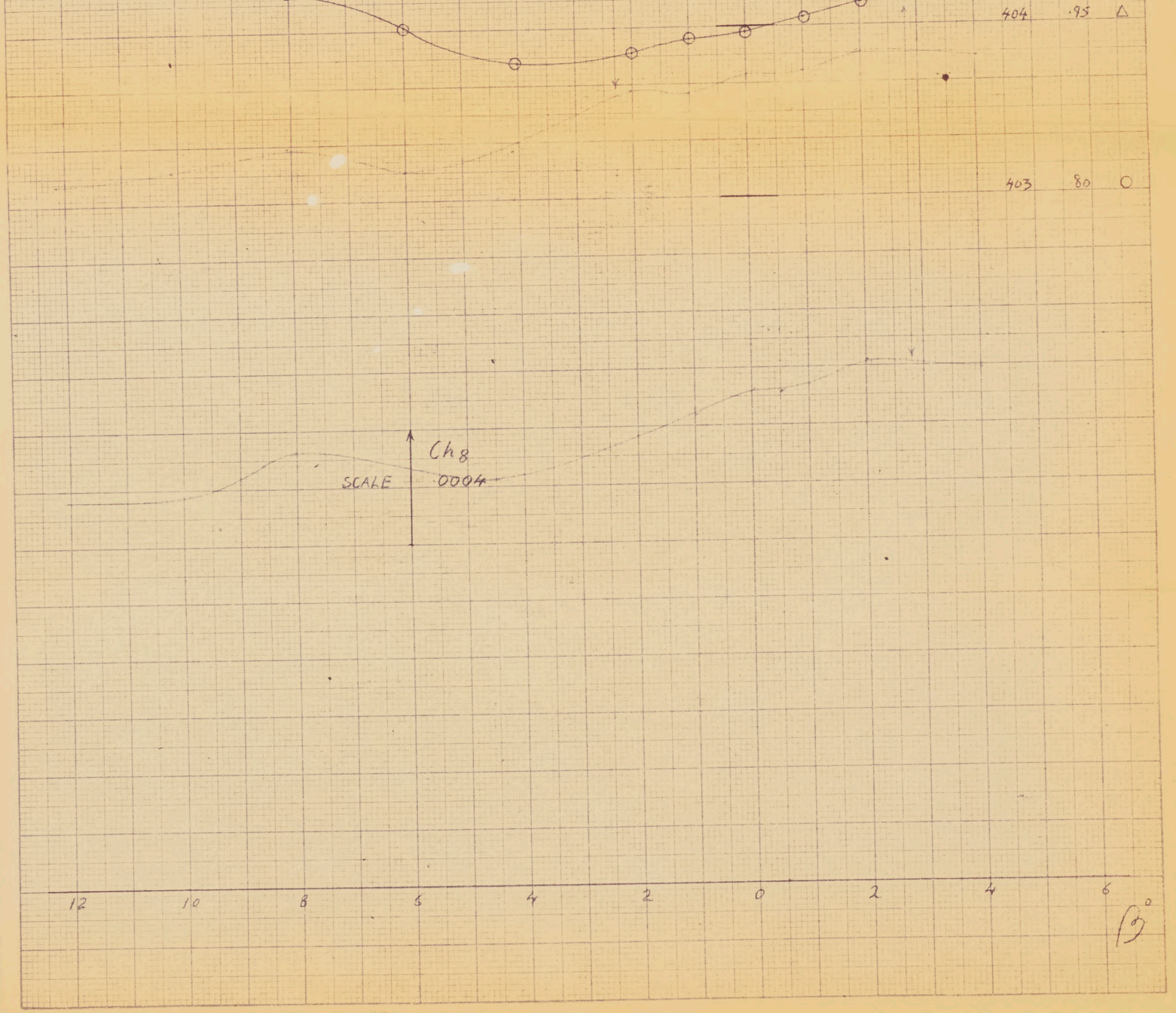
C = 105

C.A.L. W/T TESTS FEBRUARY 1957

C_{h_δ} VS β

α = 10

RUN No	MACH No	SYMBOL
406	1.20	◇
404	.95	△
403	.80	○



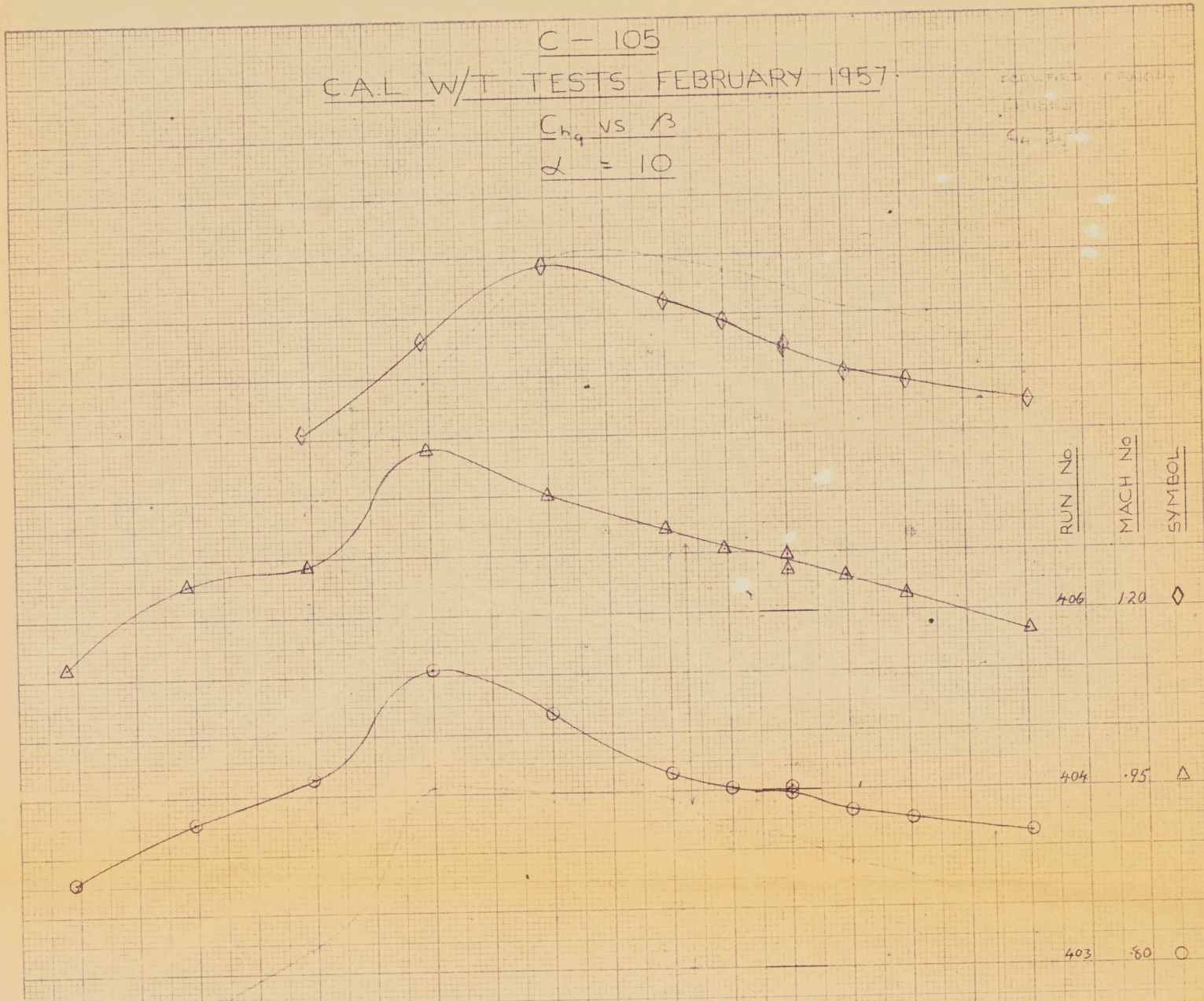
Part 173

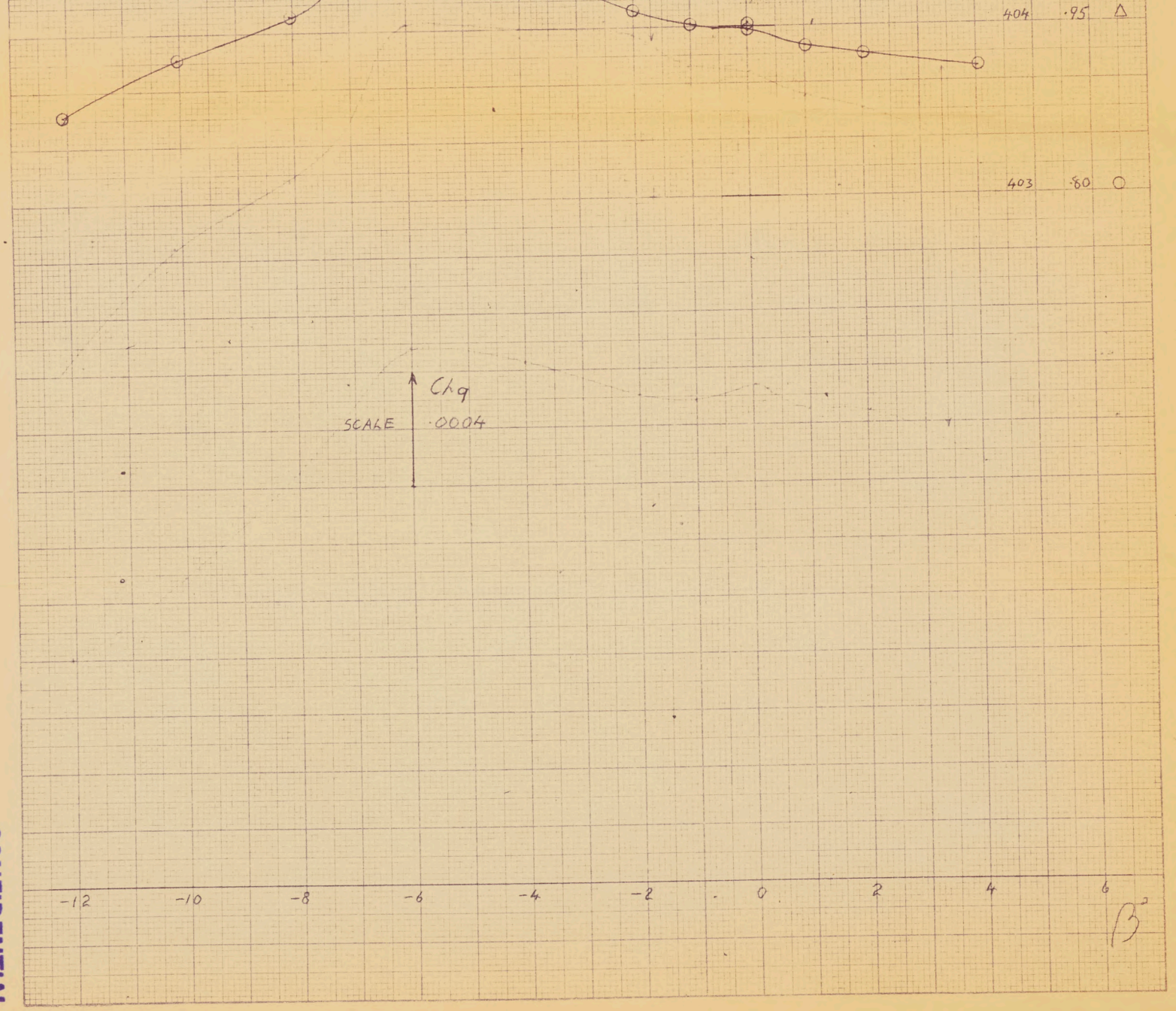
C – 105

C.A.L. W/T TESTS FEBRUARY 1957

C_{h_q} vs β

α = 10





CONFIDENTIAL

P/STAB/146 3.2.14

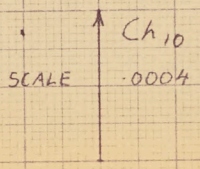
PLOT 194

C-105

C.A.L. W/T TESTS FEBRUARY 1957

$C_{n_{10}}$ VS. β

$\alpha = 10$



RUN No.	MACH No.	SYMBOL
406	1.20	◇
404	.95	△
403	.80	○

P/STAB/146 3.2.15

CONFIDENTIAL

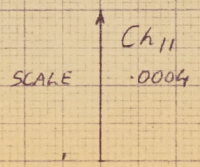
PLOT 1 of 5

C-105

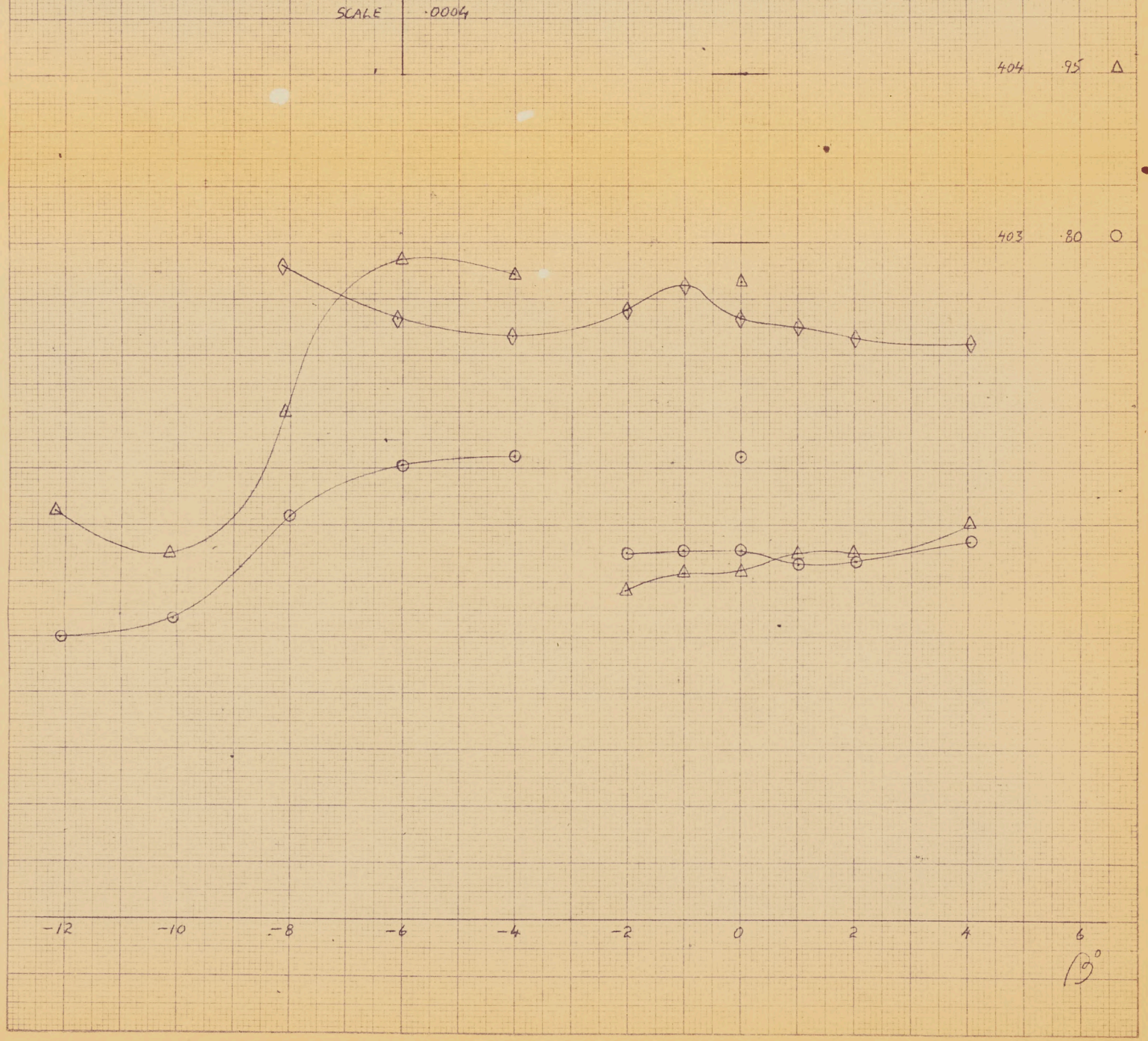
C.A.L. W/T TESTS FEBRUARY 1957

$C_{h_{11}}$ VS. β

$\alpha = 10$



RUN No	MACH No	SYMBOL
406	1.20	◇
404	.95	△
403	.80	○



CONFIDENTIAL

P/STAB/146

3.2.16

PLOT 67
PLOT 198

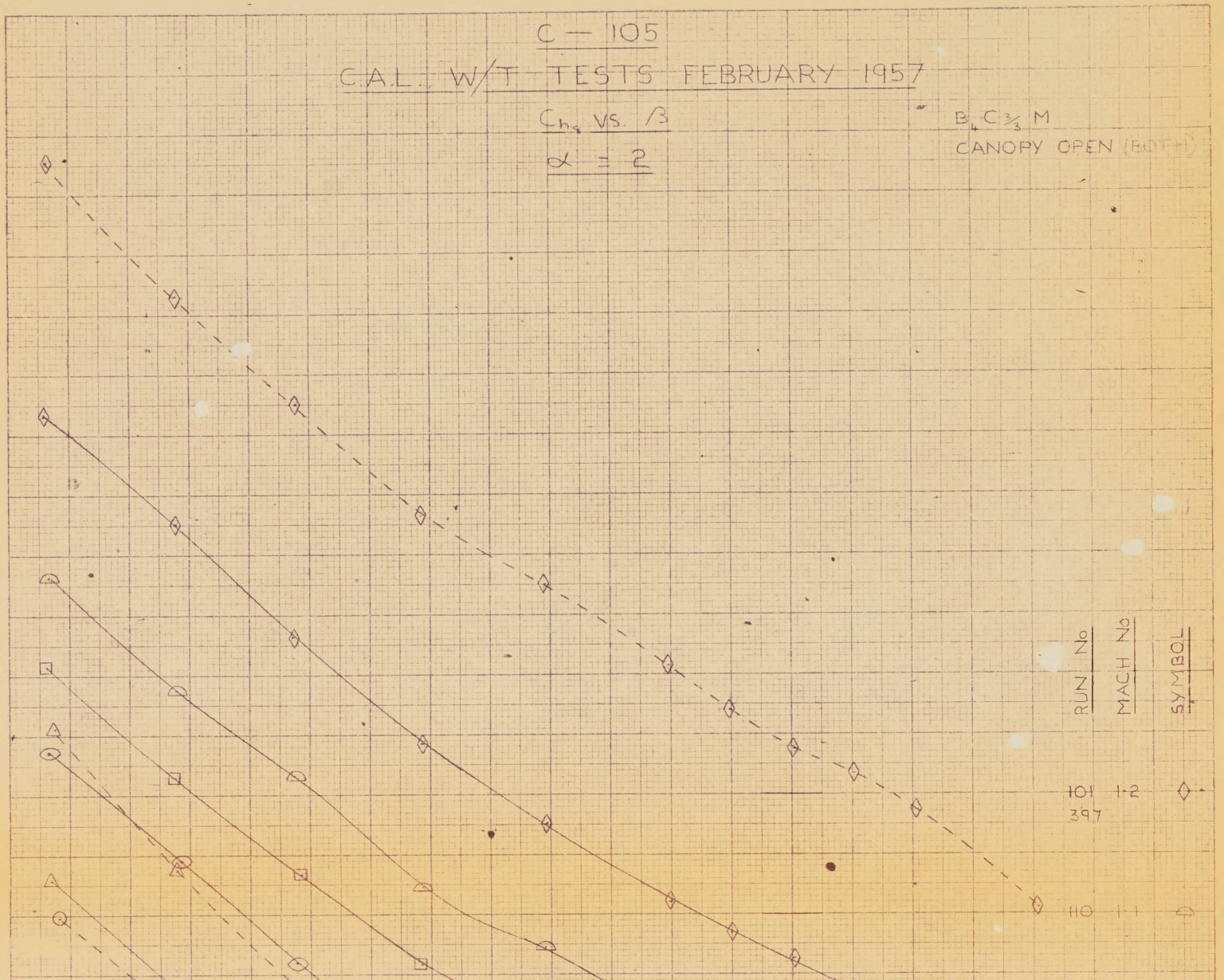
C — 105

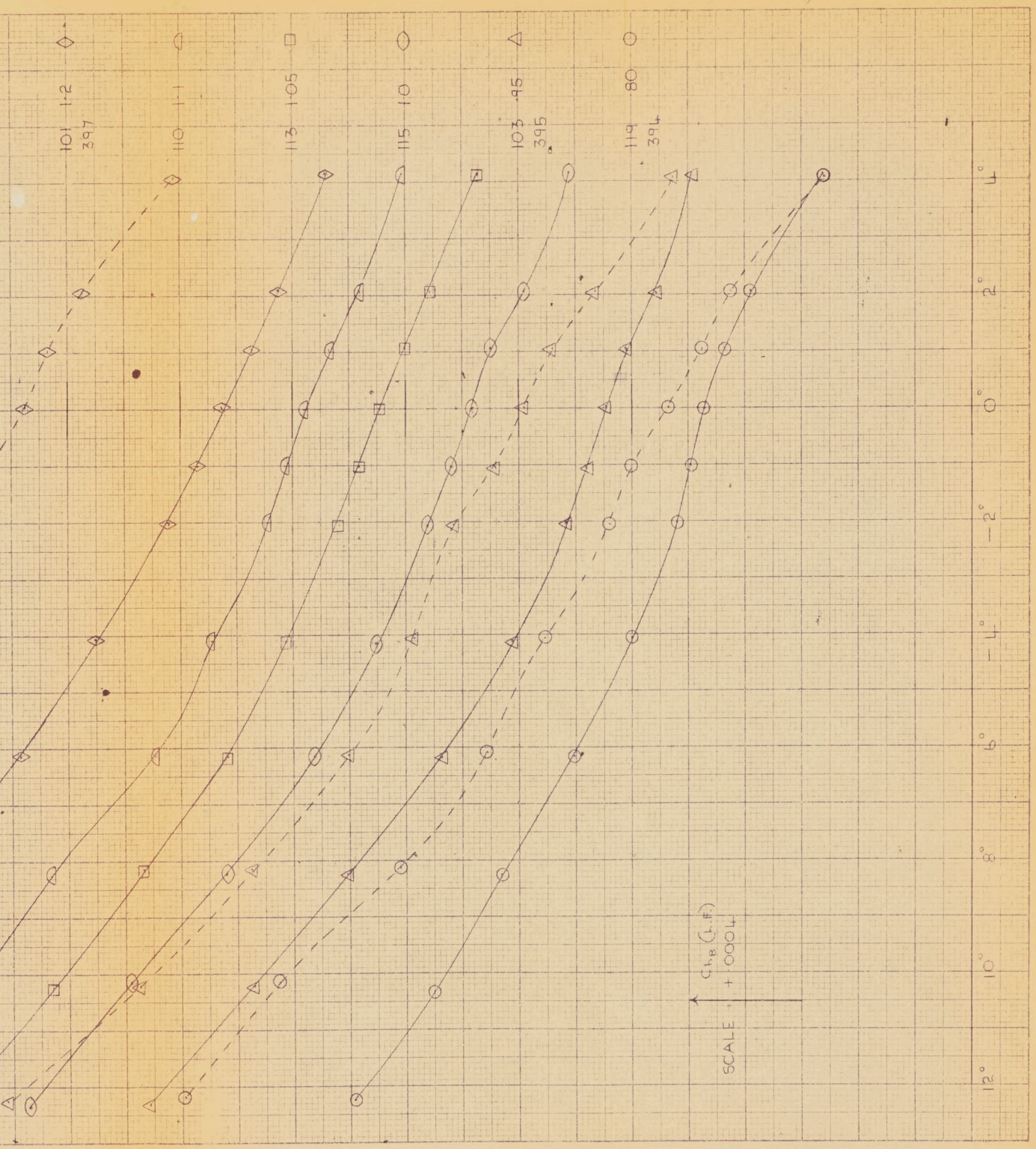
C.A.L. W/T TESTS FEBRUARY 1957

C_{h_4} VS. β

$\alpha = 2$

$B_4 C_{3/3} M$
CANOPY OPEN (BOTH)





PLOT 69
PLOT 199

C – 105

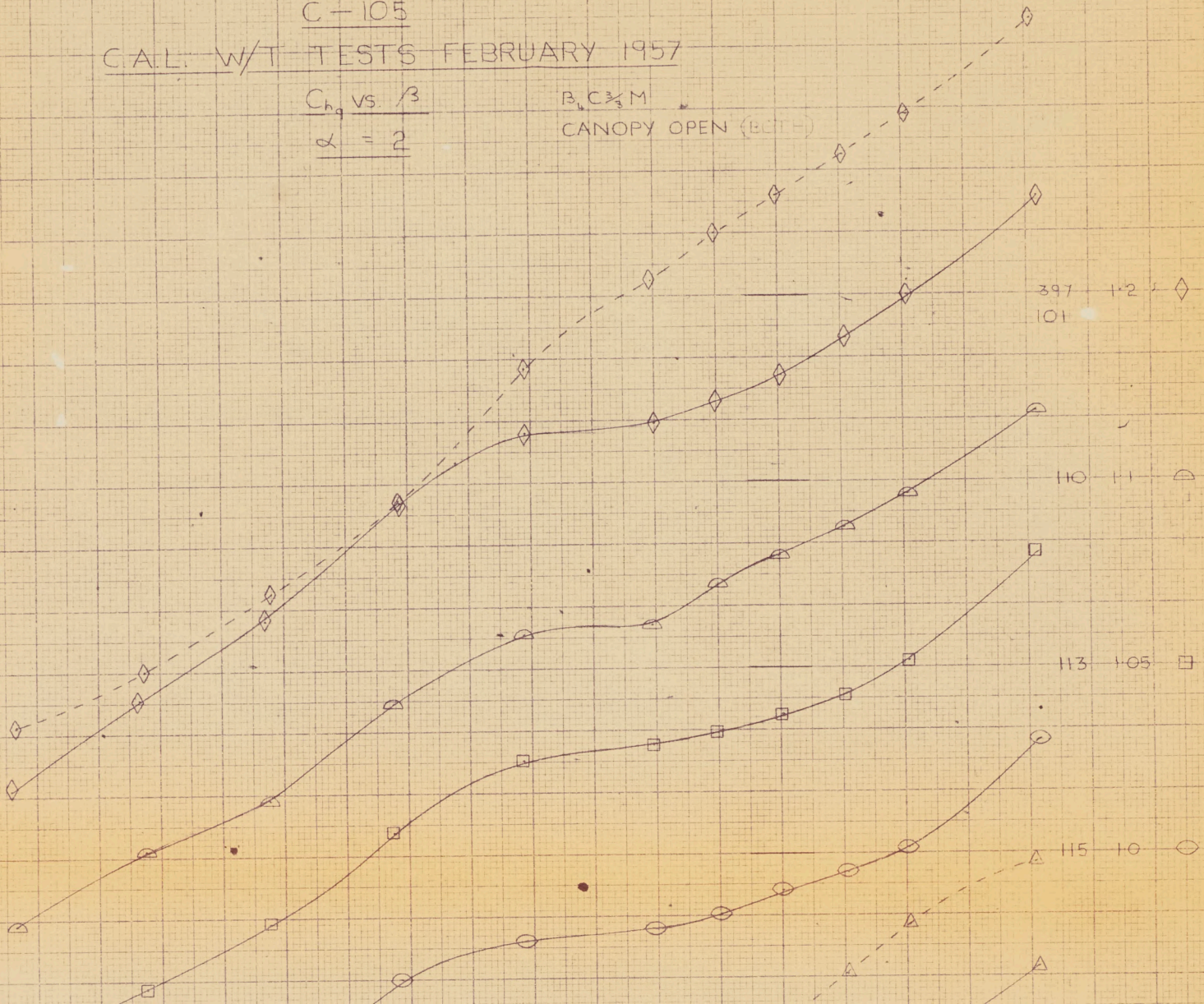
C.A.L. W/T TESTS FEBRUARY 1957

C_{h_q} VS. β

$\alpha = 2$

$B_4 C\frac{3}{3} M$

CANOPY OPEN (BOTH)



3.2.21

P/STAB/146 3.2.18

CONFIDENTIAL

PLOT 73

C-105

CAL. W/T TESTS FEBRUARY 1957

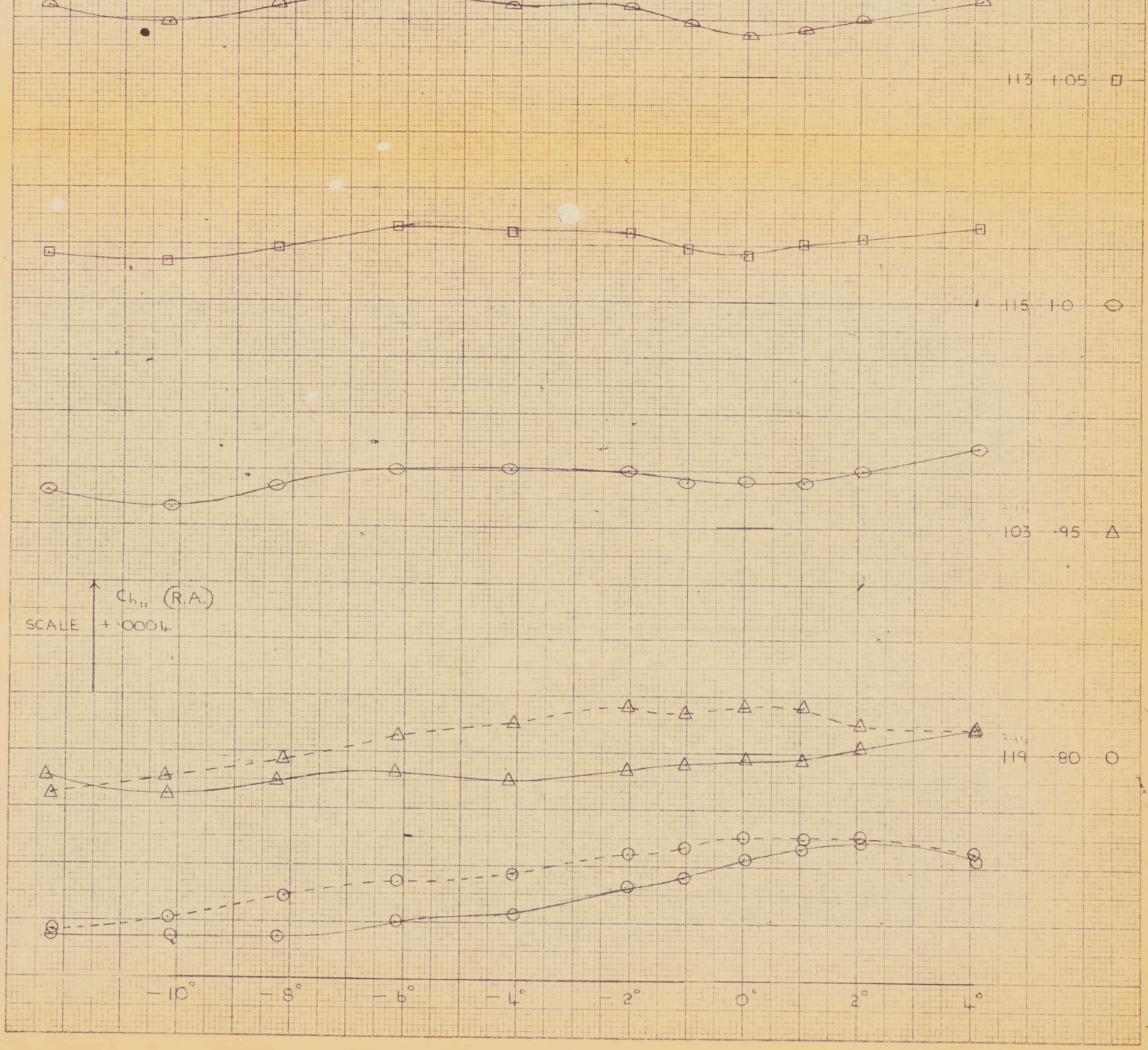
$C_{h_{11}}$ VS. β

$\alpha = 2$

$B_4 C_{3/3} M$

CANOPY OPEN

RUN No.	MACH No.	SYMBOL
101	1.2	◇
110	1.1	○
113	1.05	□



PLOT 206
PLOT 72

C-105

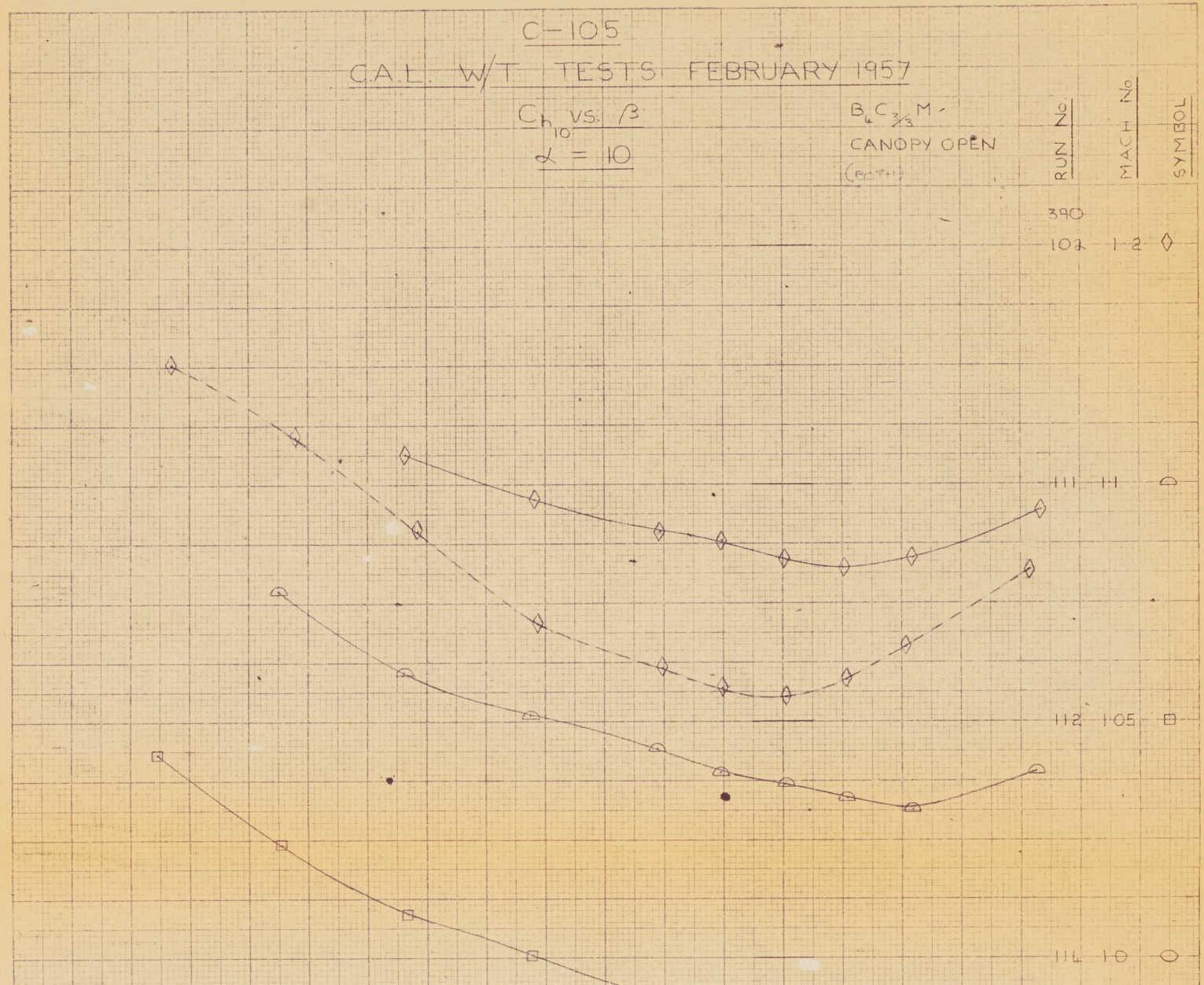
C.A.L. W/T TESTS FEBRUARY 1957

$C_{h_{10}}$ VS. β

$\alpha = 10$

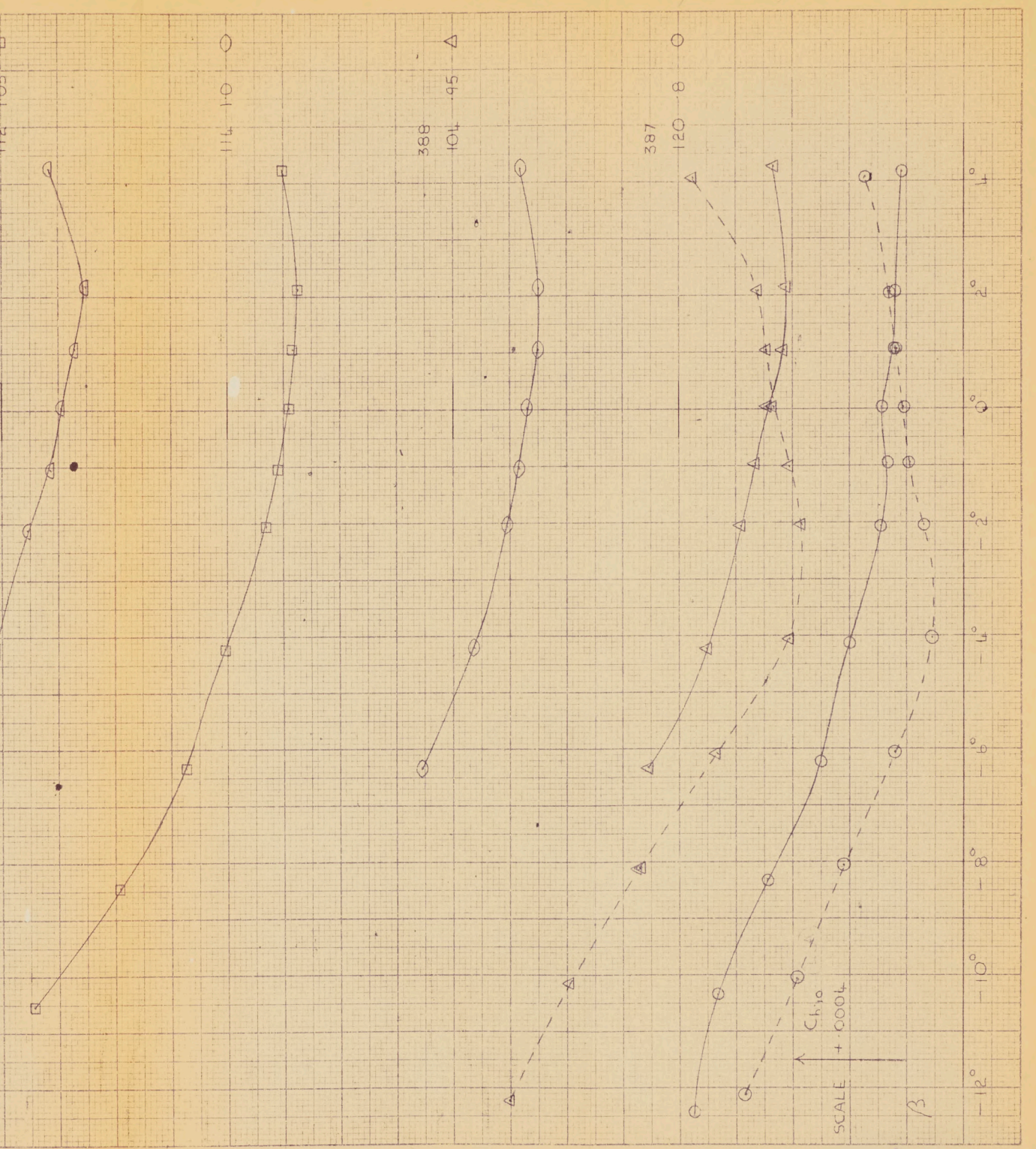
$B_4 C_{3/3} M$ -
CANOPY OPEN
(Rdt+1)

RUN No	MACH No	SYMBOL
390		
107	1·2	◇
111	1·1	○
112	1·05	□
114	1·0	○

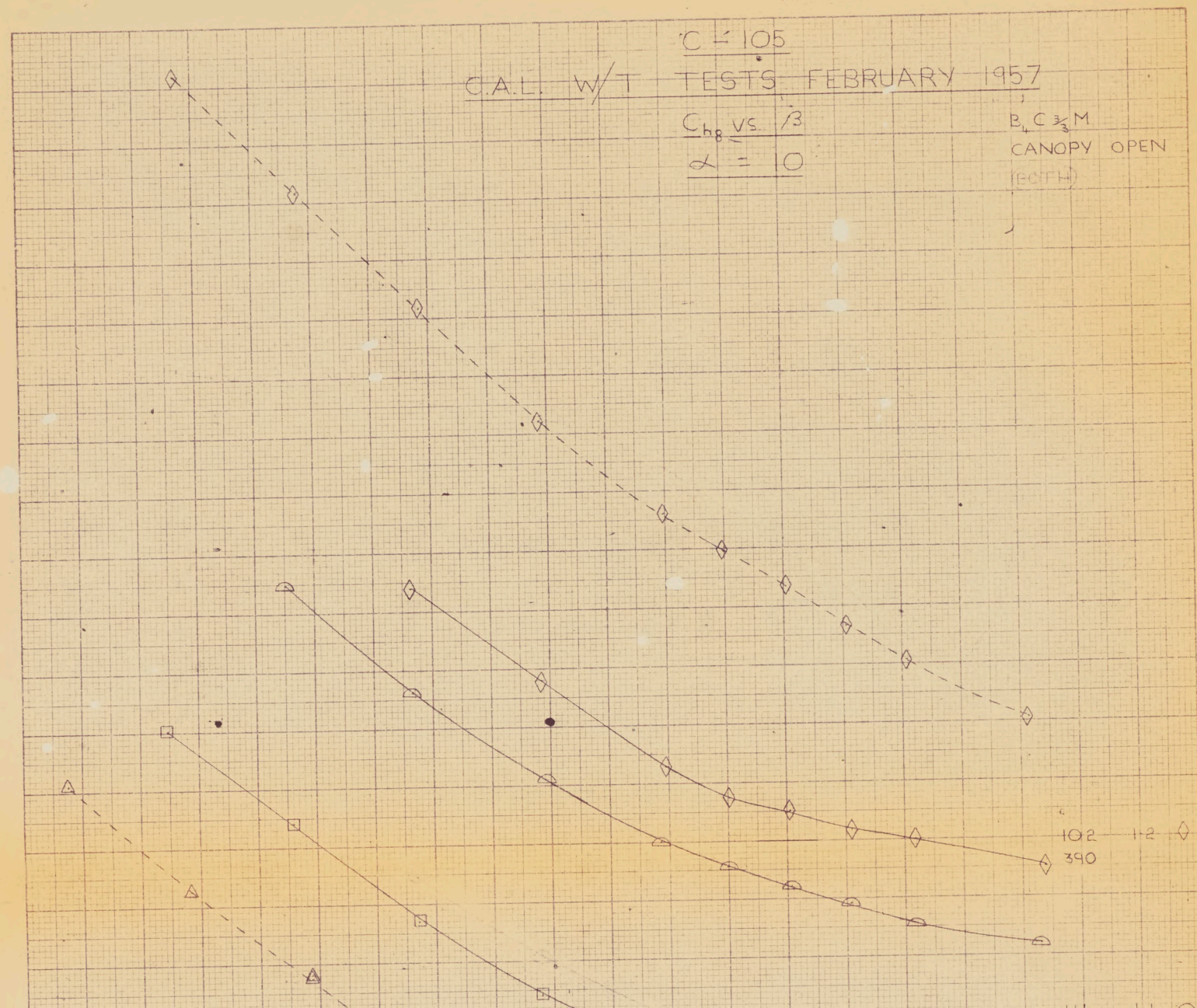


P/STAB/146 3·2·21

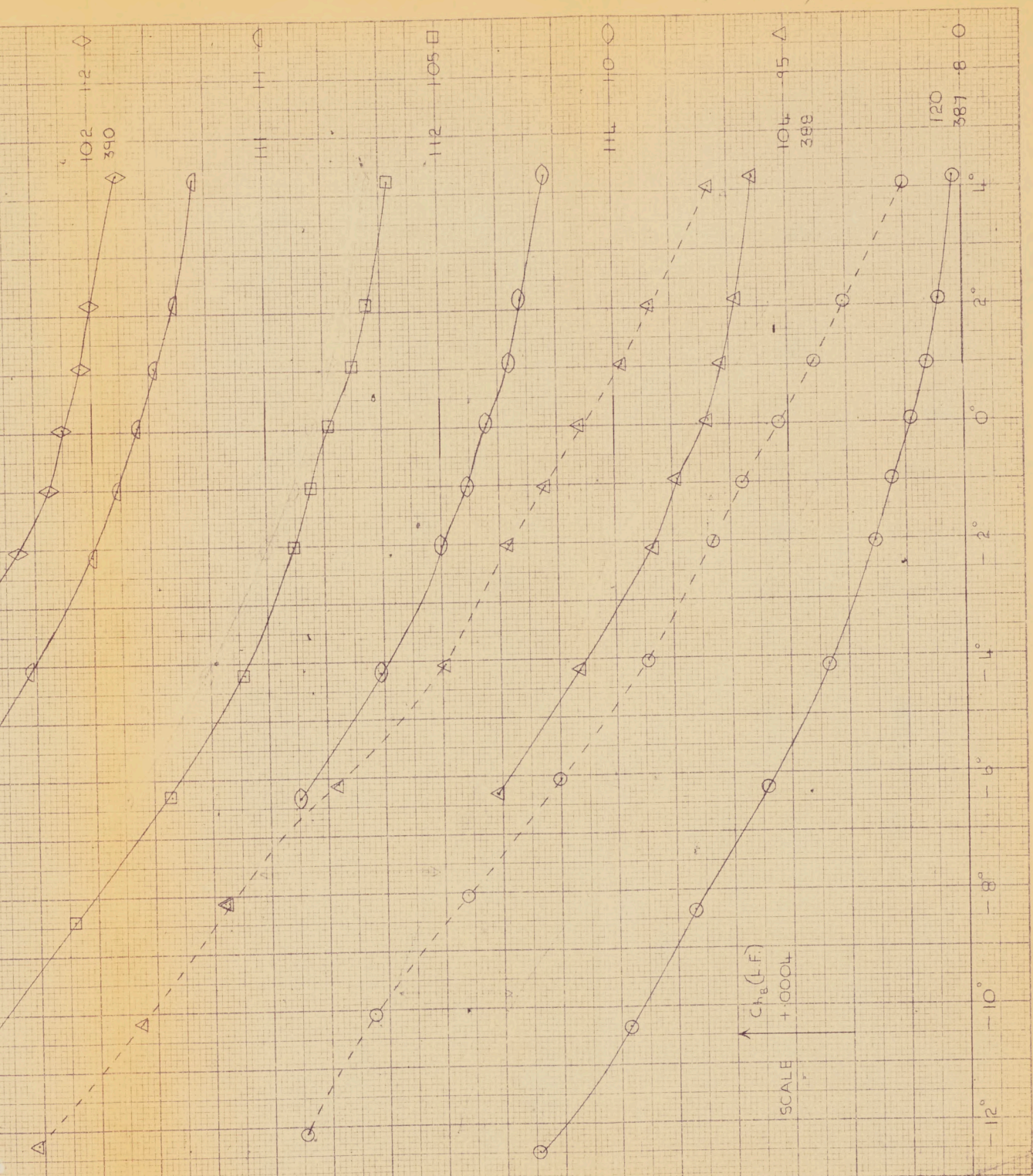
P/STAB/146 3·2·20



PLOT 68
PLOT 204



P/STAB/146 3·2·21



PLOT 7'

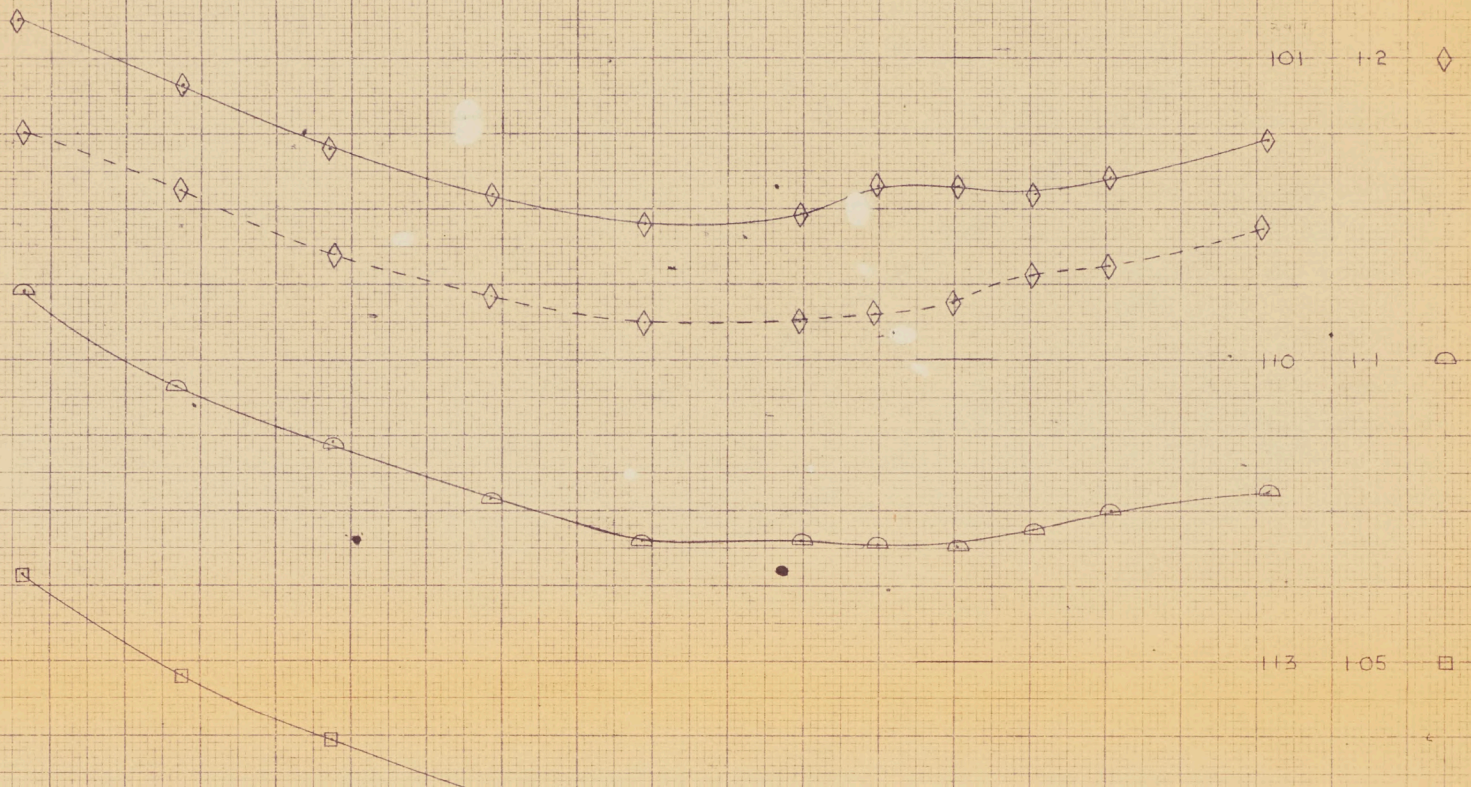
C-105

C.A.L. W/T TESTS FEBRUARY 1957

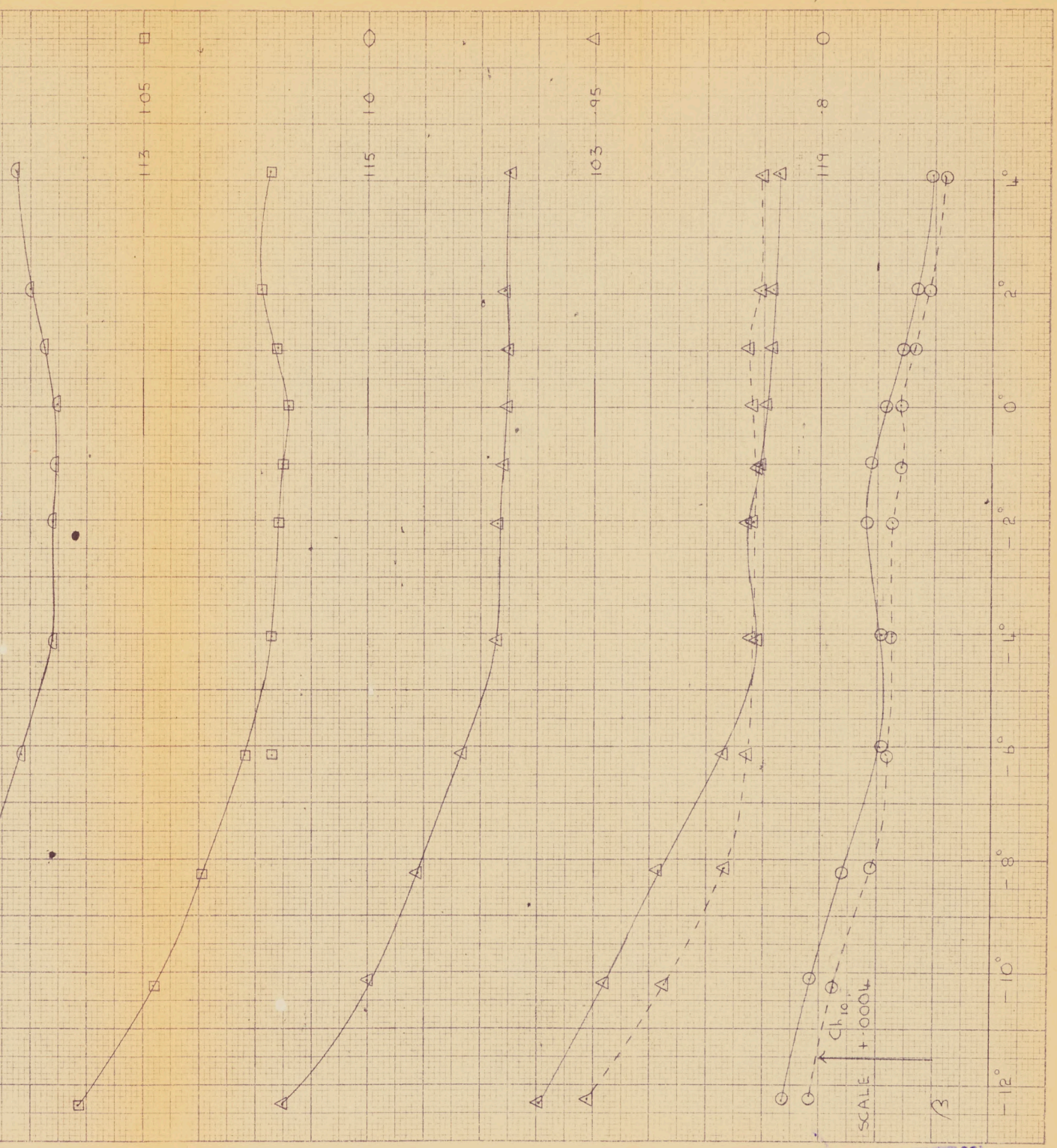
$B_4 C_{\frac{3}{3}} M$
CANOPY OPEN

$C_{b_{10}}$ VS. β

$\alpha = 2$



P/STAB/146 3·2·22



PLOT 70
PLOT 205

C-105

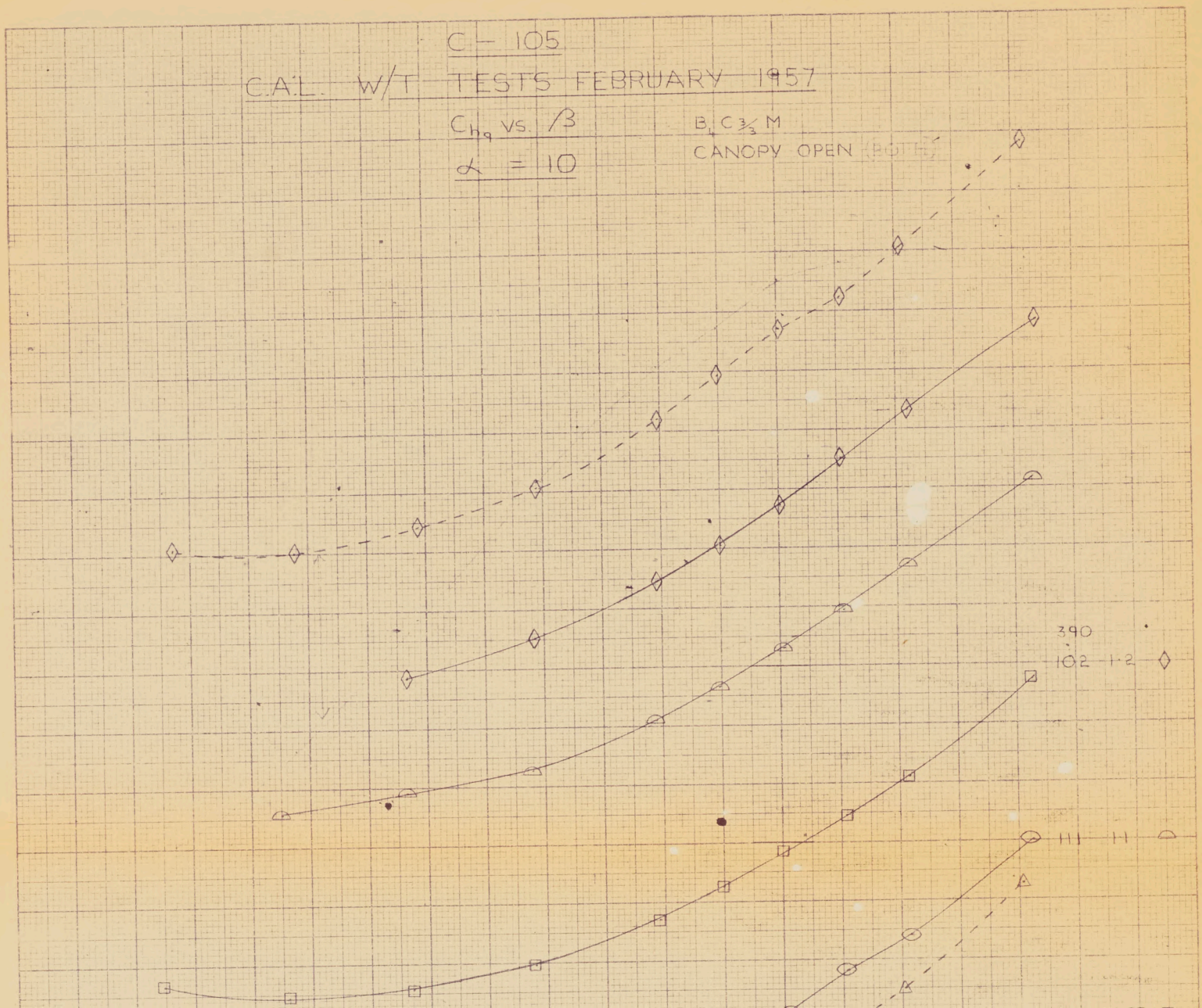
C.A.L. W/T TESTS FEBRUARY 1957

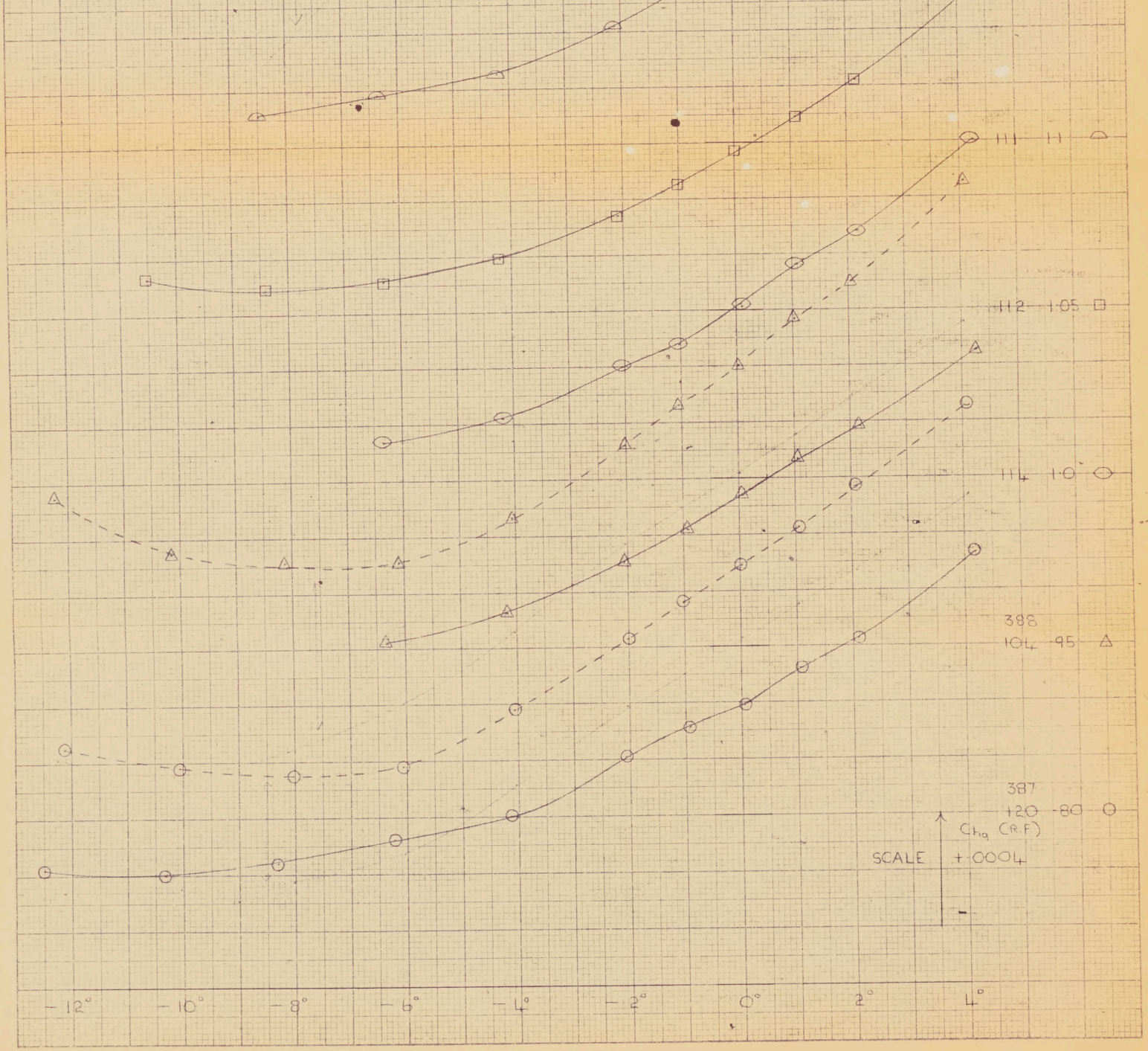
C_{h_q} vs. β

$\alpha = 10$

$B_4 C\frac{3}{3} M$

CANOPY OPEN (BOTH)





PLOT 74.

C-105

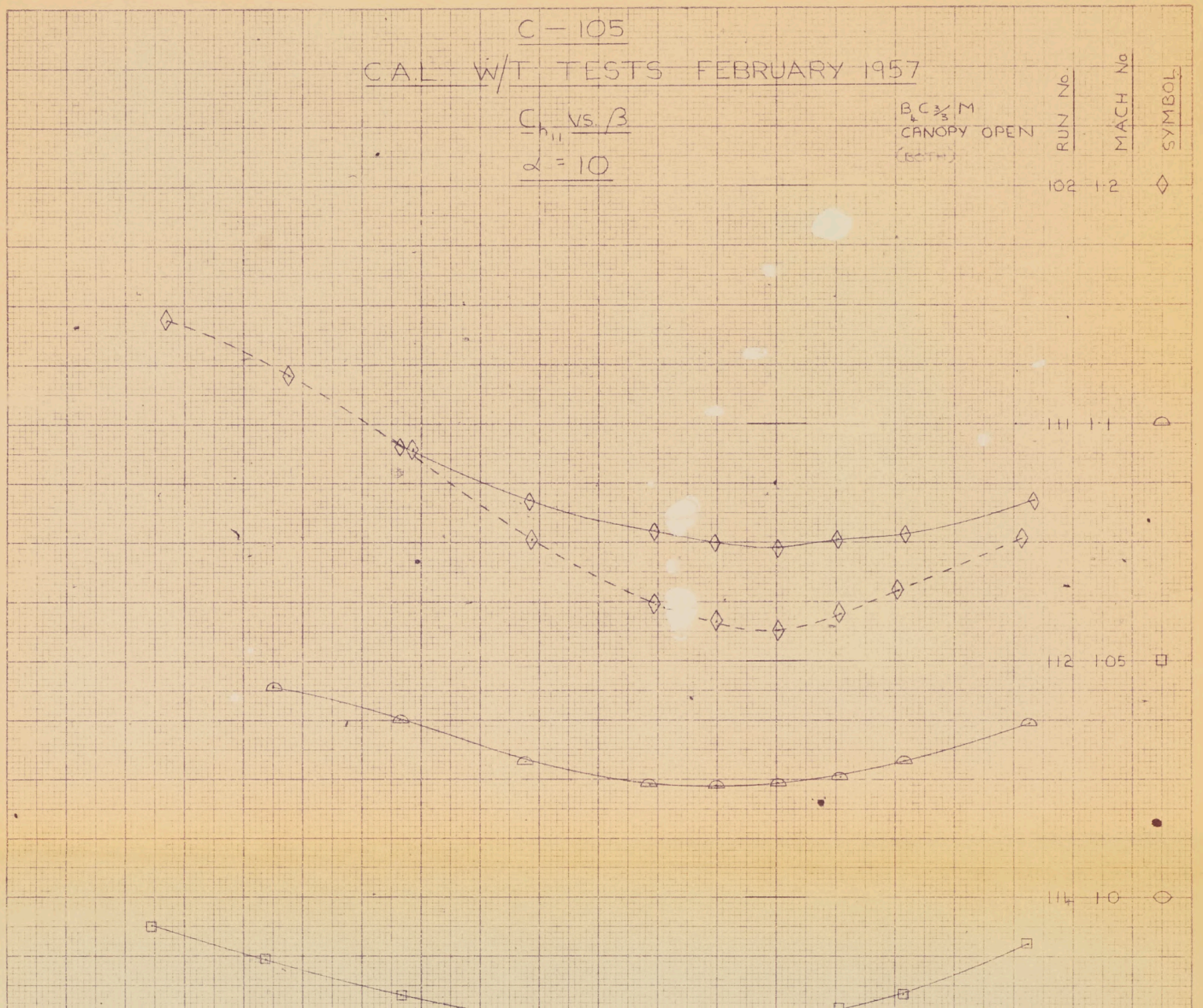
C.A.L. W/T TESTS FEBRUARY 1957

$C_{h_{11}}$ VS. β

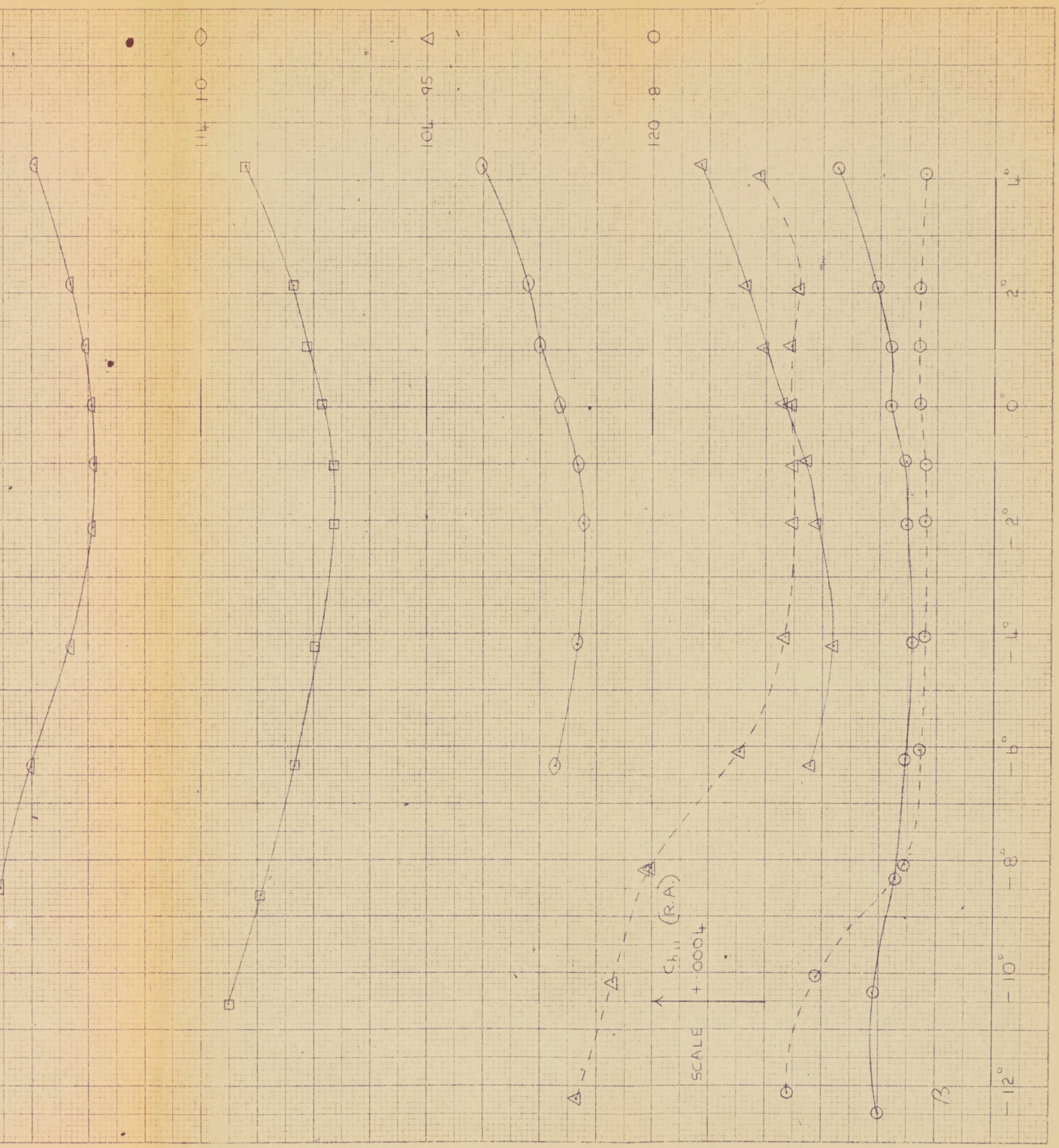
$\alpha = 10$

$B_4 C_{3/3} M$
CANOPY OPEN
(BOTH)

RUN No.	MACH No	SYMBOL
102	1.2	◇
111	1.1	○
112	1.05	□
114	1.0	⬭



P/STAB/146 3.2.24.



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