

QC
Avro
C-105
P/WT/108

QCX
Avro
CF105
P-WT-108

(14)

FILE IN VAULT

CF-105 ANALYZED P/WIND TUNNEL/108

~~UNCLASSIFIED~~ N.A.E. 100 SPEED WIND TUNNEL TESTS

JANUARY 1956

LONGITUDINAL DERIVATIVES AND

COMPARISON WITH C.A.L. (4)

Copy 3

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ANALYZED

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TO
A

DATE
Dec. 7, 1992

Report no.: QCX - AVRO - CF105- P-WT-108
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



48117

12417580



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A. V. ROE CANADA LIMITED
MALTON - ONTARIO

TECHNICAL DEPARTMENT (Aircraft)

AIRCRAFT CF-105

REPORT NO. P/WIND TUNNEL/108

FILE NO.

NO. OF SHEETS

TITLE

N.A.E. LOW SPEED WIND TUNNEL TESTS

JANUARY 1956

LONGITUDINAL DERIVATIVES AND

COMPARISON WITH C.A.L.

Classification cancelled / changed to: UNCLASSIFIED

By authority of: DRDA 7/DARFT 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 April 1956

CHECKED BY J. Clark

DATE April 1956

SUPERVISED BY *St. J. Matthews*

DATE June 1956

APPROVED BY *J. Matthews*

DATE June 1956

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ISSUE NO.	REVISION NO.	REVISED	APPROVED BY	DATE	REMARKS

C-105

LIFT CURVE SLOPE vs ANGLE OF ATTACK

LOW MACH NUMBER

HIGH REYNOLDS NUMBER

$\delta_c = 0^\circ$

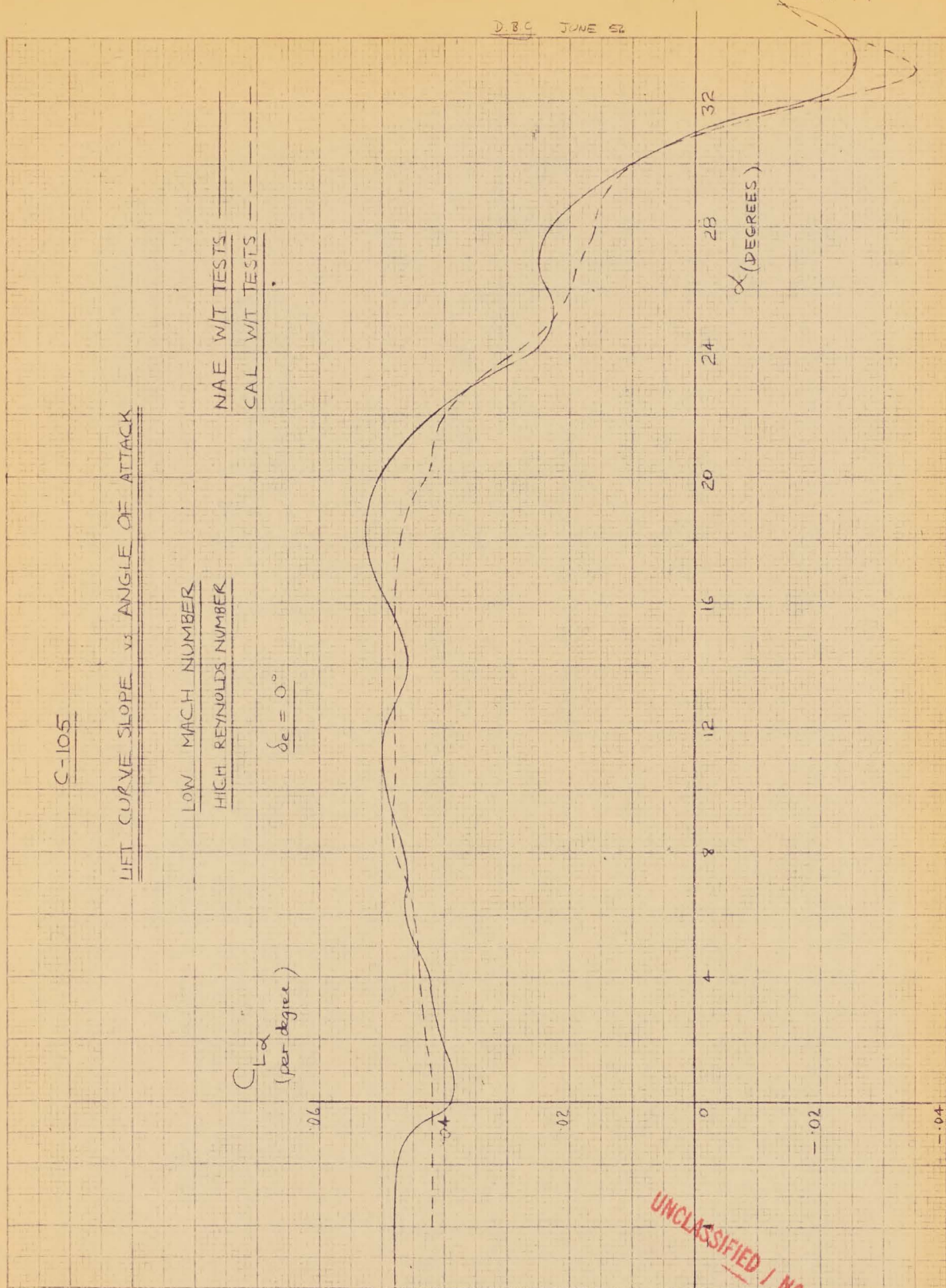
$C_{L\alpha}$
 (per degree)

NAE W/T TESTS
 CAL W/T TESTS

D.B.C. JUNE 52

P/W T/108

SW. 1-1



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C₁₈ vs α

AT LOW MACH NUMBER
AND HIGH REYNOLDS NUMBER

CAL NAE

$+10^\circ < \delta_e < -5^\circ$

$-5^\circ < \delta_e < -20^\circ$

$-20^\circ < \delta_e < -30^\circ$

CAL W/T TESTS

NAE W/T TESTS

C₁₈

0.14

0.12

0.10

0.08

0.06

0.04

0.02

0

0

0

0

32

28

24

20

16

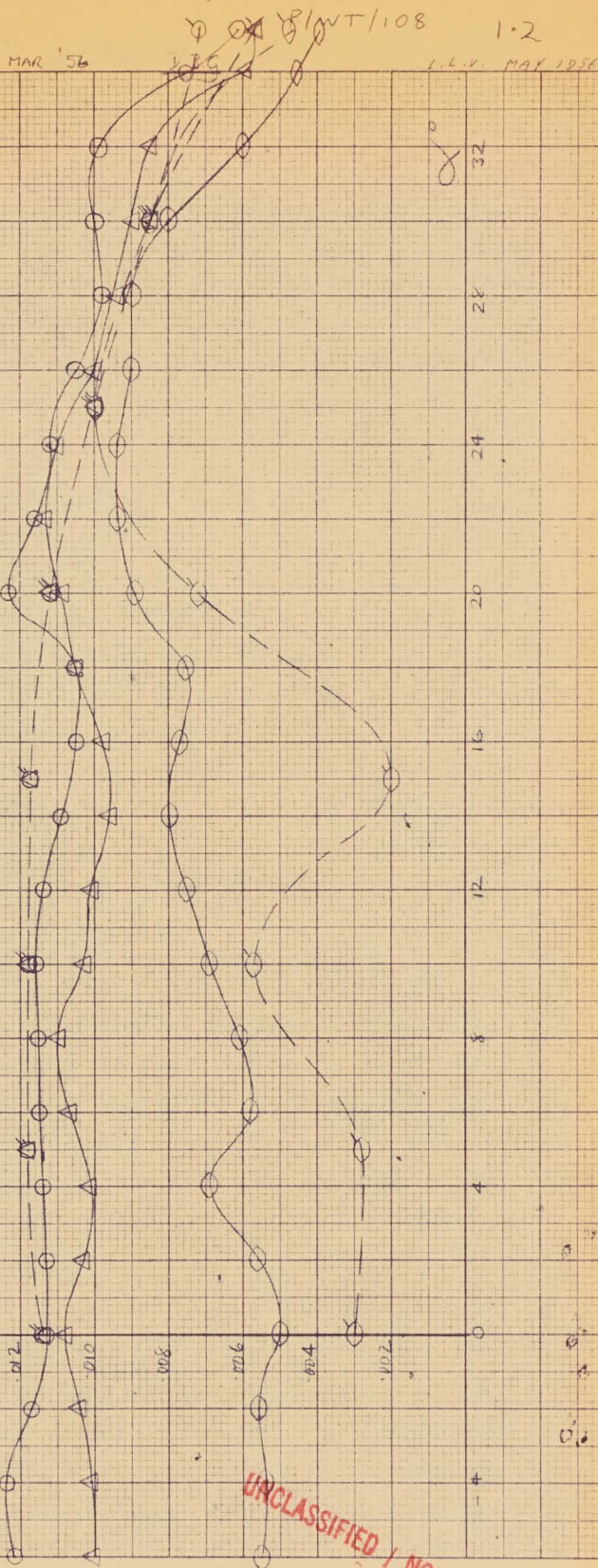
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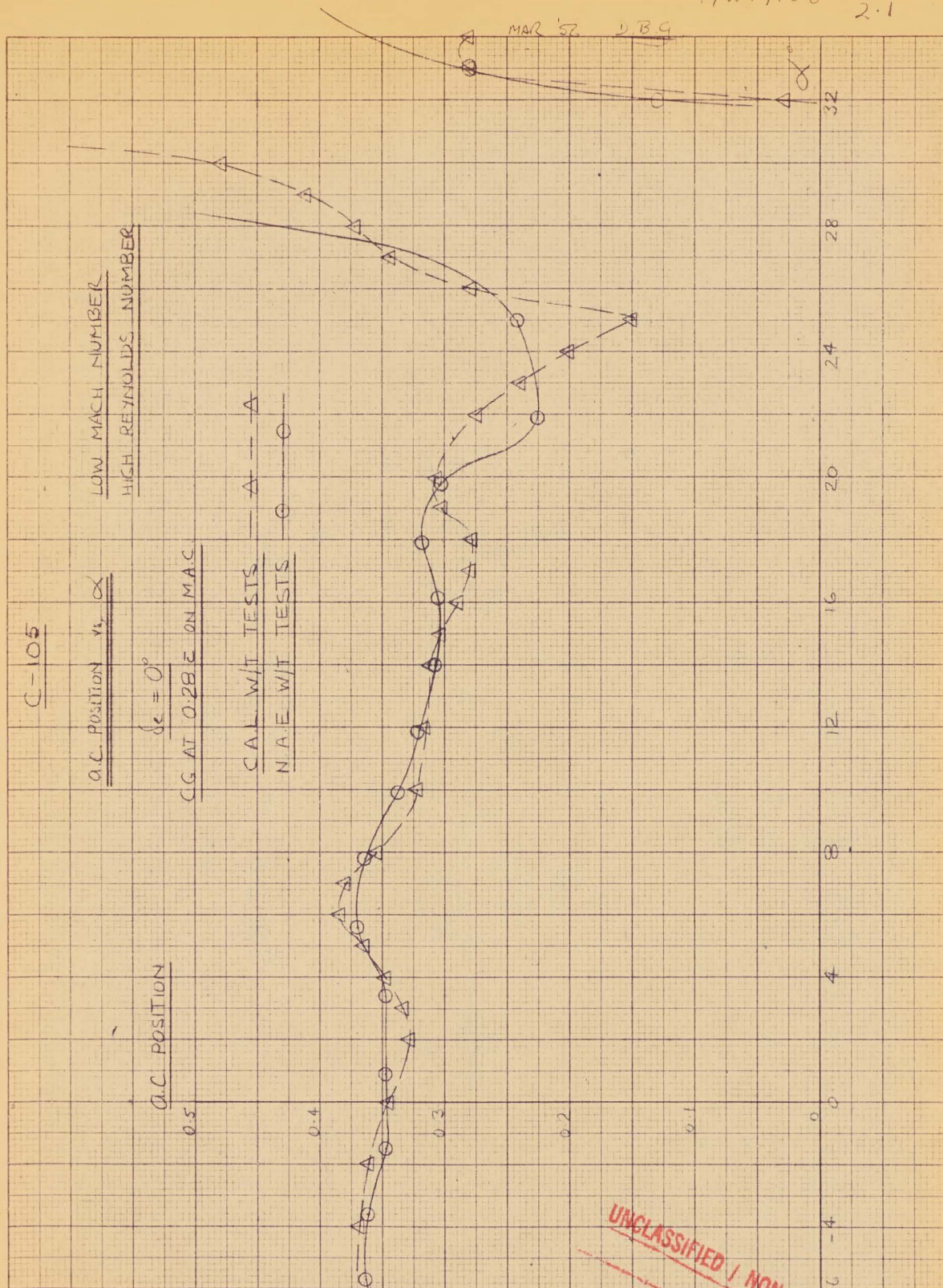
4

0

-4



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P/WT/108

2-18

APRIL 1956

E. R. Fish

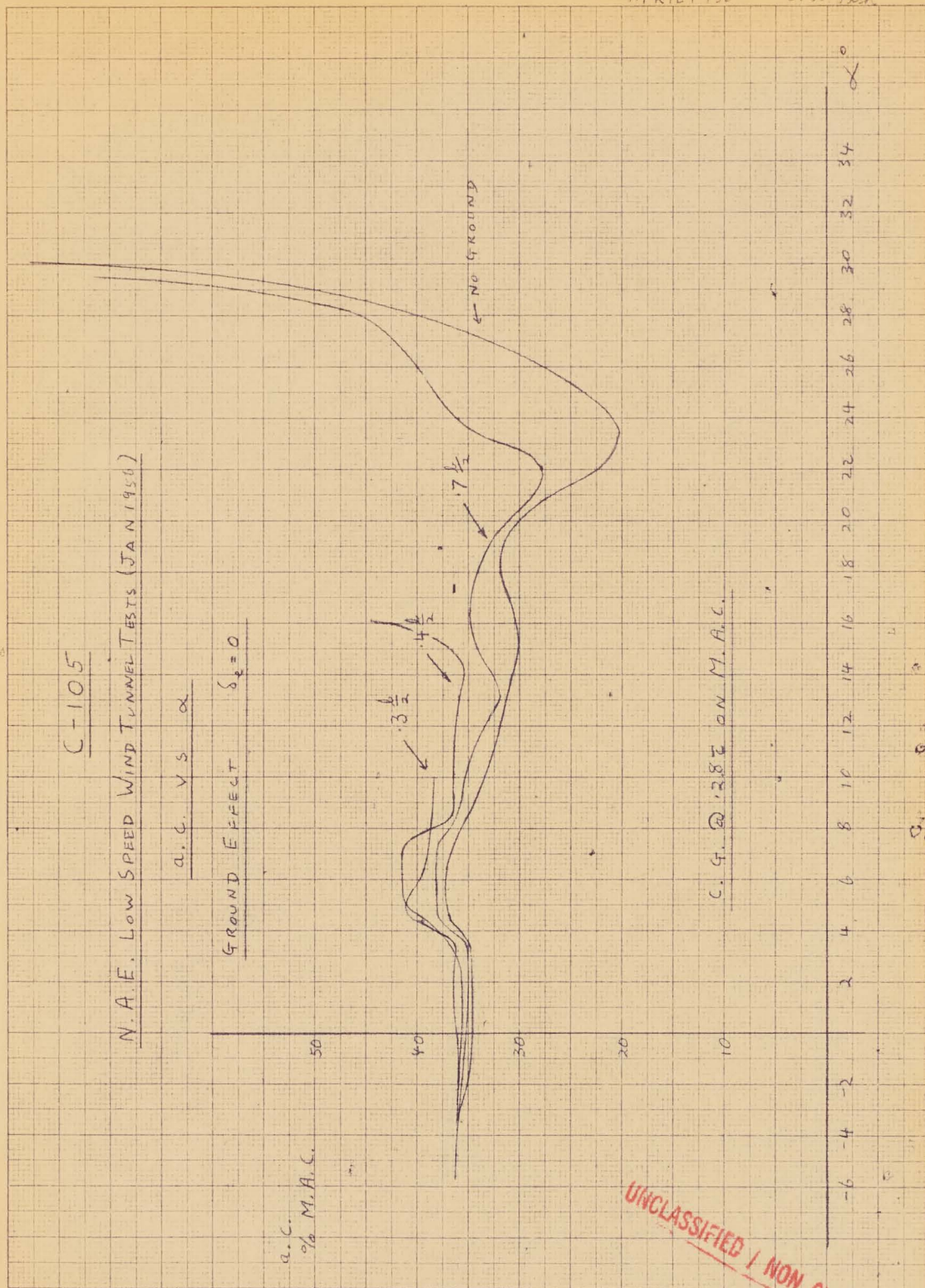
C-105

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

a.c. v s α

GROUND EFFECT $\delta_k = 0$

a.c.
% M.A.C.



C. G. @ 12.8% ON M.A.C.

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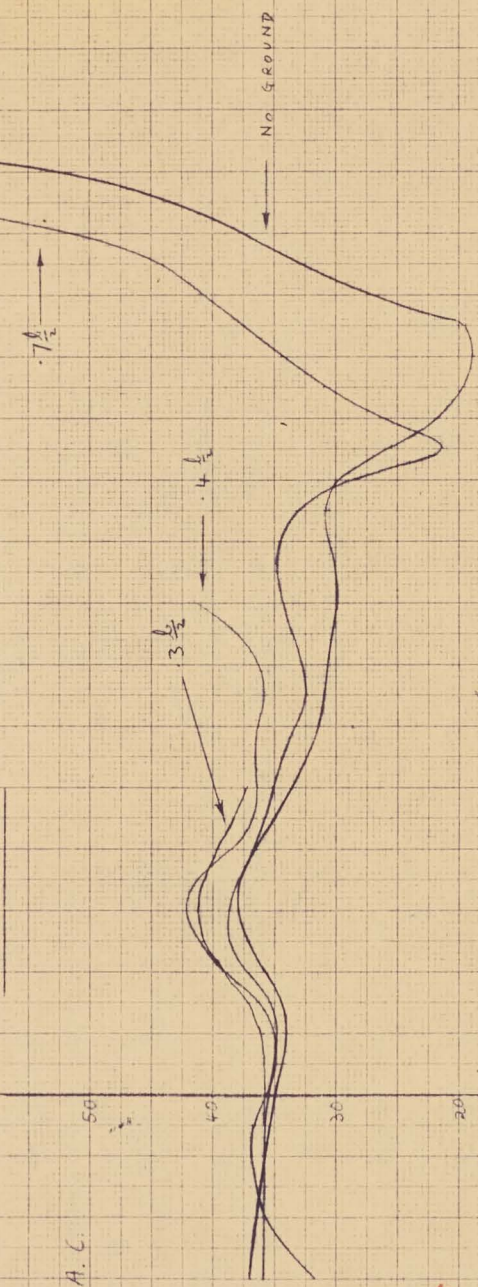
P/WT/108 2.10
April 1956 E. R. 3.

C-105
N.A.E. LOW SPEED WIND TUNNEL TESTS (JAN 1956)

GROUND EFFECT $\delta_0 = 0$

α, C_L vs α

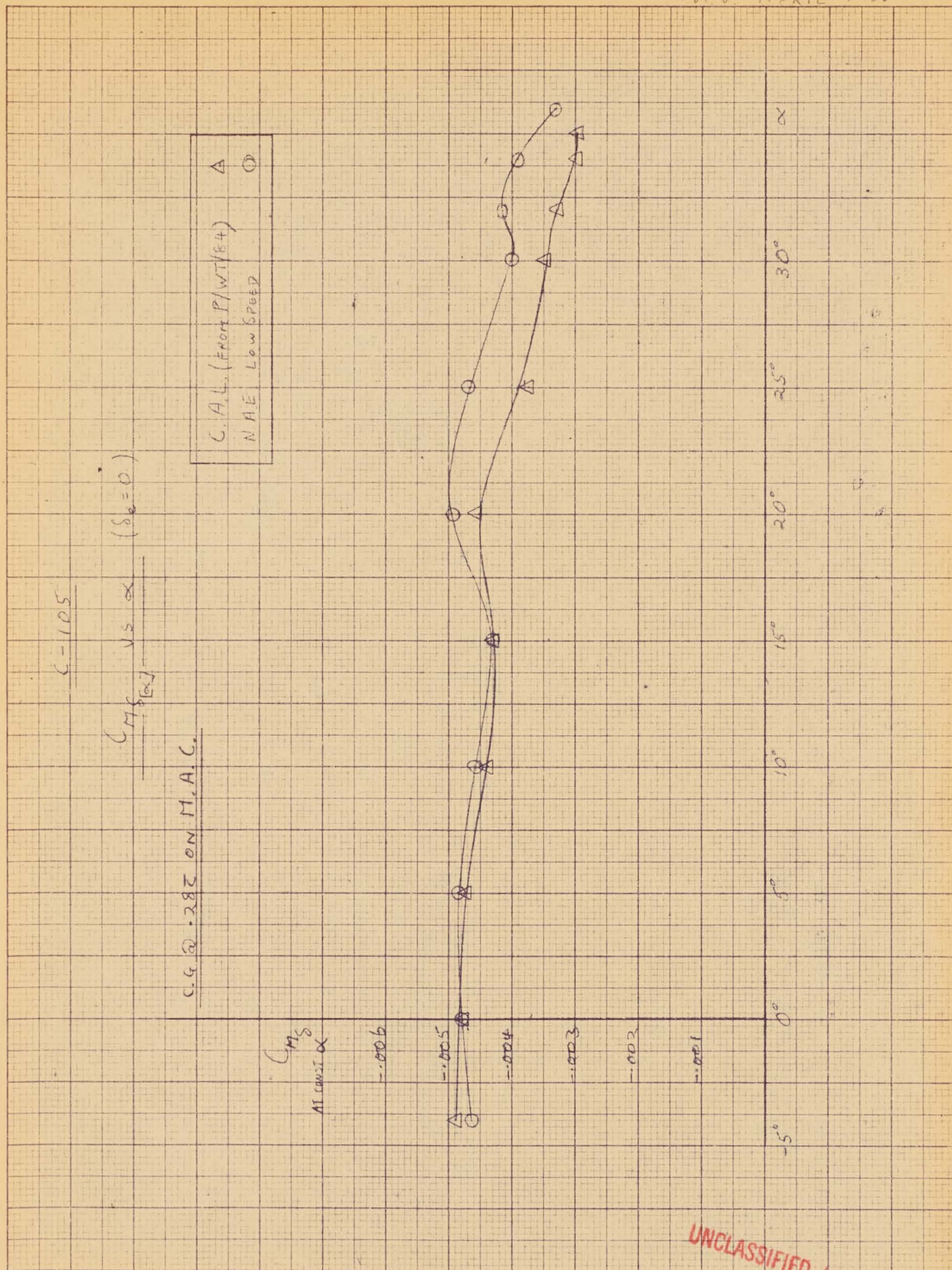
α, C_L
% M.A.C.



C.G. @ .312 8" ABOVE FUSELAGE DATUM

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ER 7 APRIL 1956



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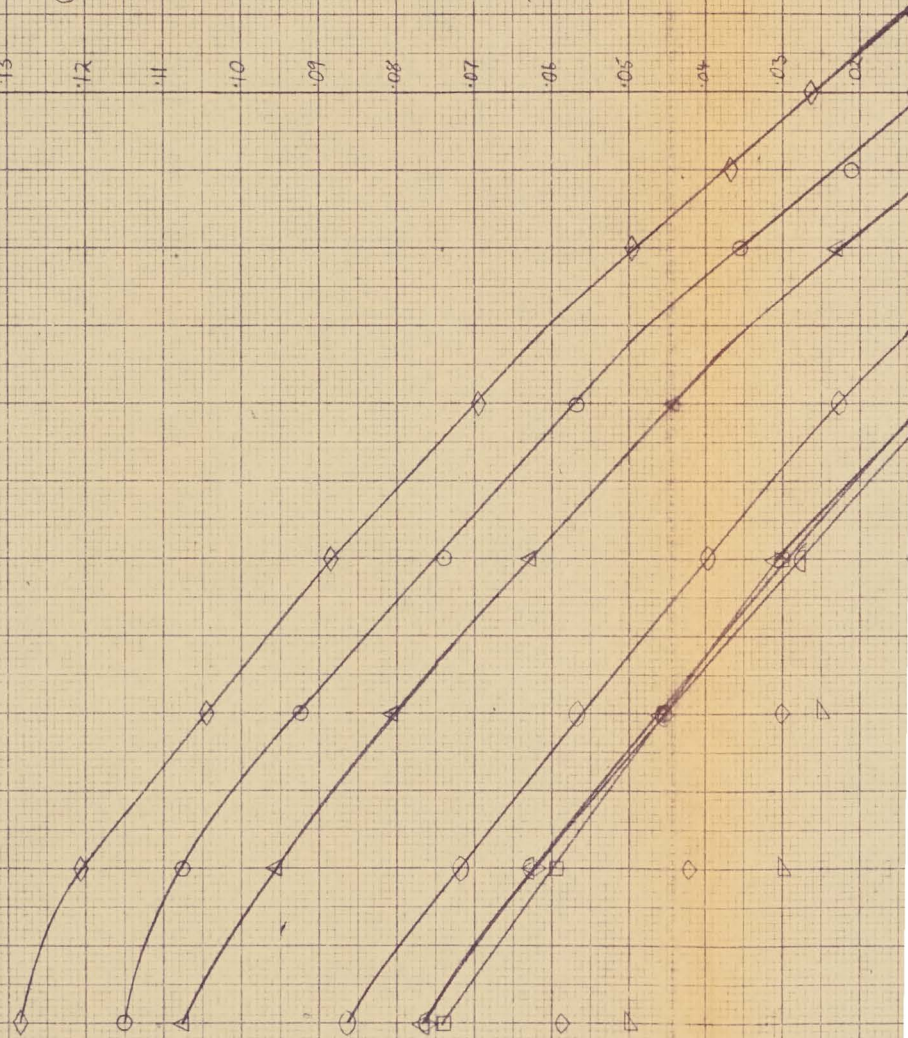
N.A.E. LOW SPEED WIND TUNNEL TESTS (JAN 1956)

C_M VS S_e (α CONSTANT α)

C.4 @ .282 ON MAX.

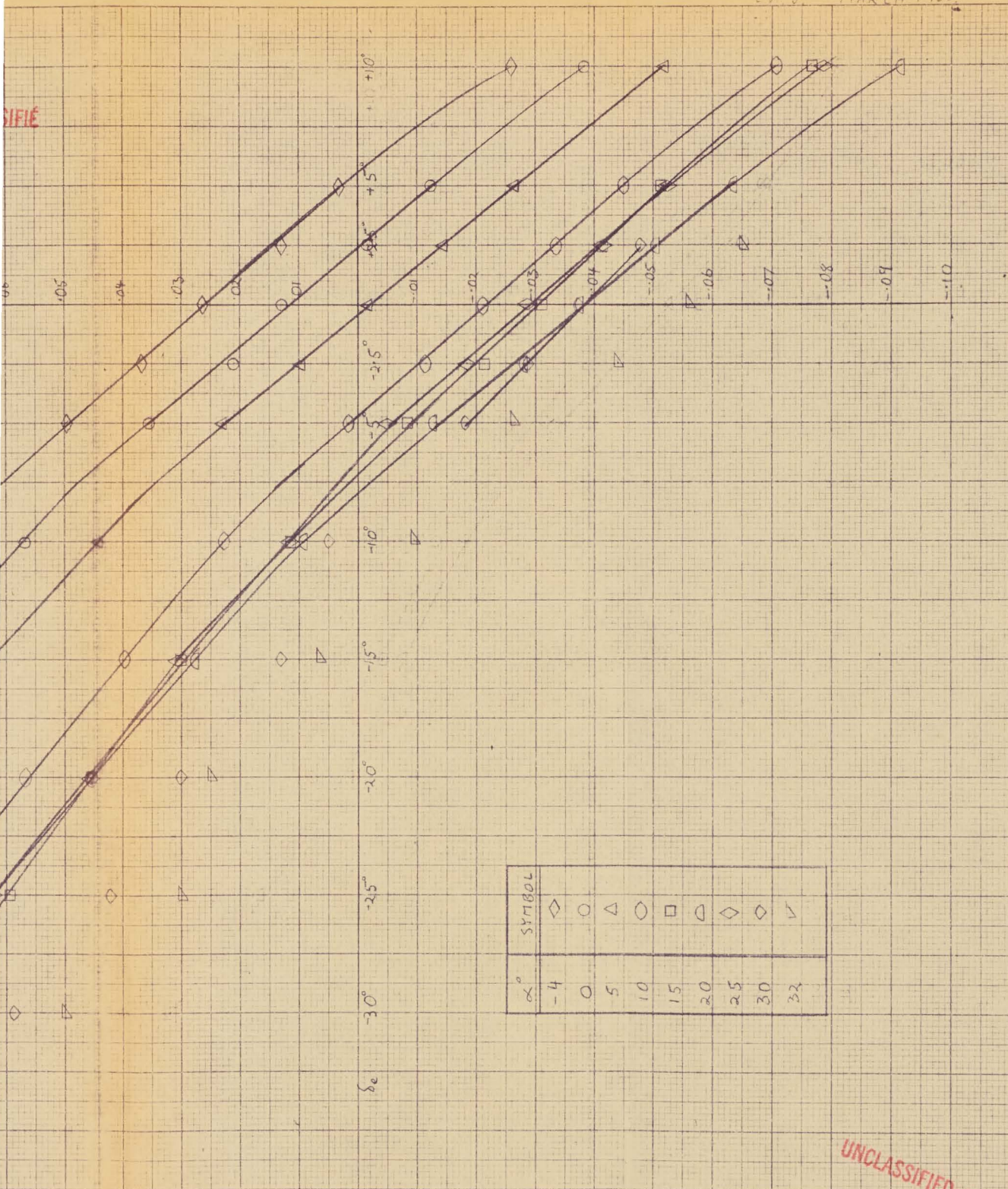
C_M

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P/WT/108 2.2.2

ED 7 MARCH 1956



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C_M AT CONSTANT C_L VS C_L

CG AT 0.28 $\bar{x}$ ON M.A.C.

LOW MACH NUMBER
HIGH REYNOLDS NUMBER

NAE W/T TESTS δ_e
 $\circ$ 0° $\pm 10^\circ$
 Δ 0° $\pm 10^\circ$
 $\ominus$ 0° $\pm 20^\circ$
 $\square$ 0° $\pm 30^\circ$

CAL. W/T TESTS
 $\circ$ -5° $\pm 10^\circ$
 Δ 0° $\pm 10^\circ$
 $\ominus$ 0° $\pm 20^\circ$
 $\square$ 0° $\pm 30^\circ$

C_M [c.]

- .006

- .002



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2.3

APR 56 D.B.G.

C-105
NAE LOW SPEED WIND TUNNEL TESTS

$C_{M\delta}(\text{CONST } C_L)$ VS C_L AND δ_a

NO GROUND BOARD

(DERIVED FROM P/WT/98 5.3)
(SECOND DERIVATIVE FROM $\delta = 0^\circ$)

C_L AT 0.282 AND 8" ABOVE FUSELAGE DATUM

$C_{M\delta}[C_L]$

-0.06

-0.04

-0.02

0

2

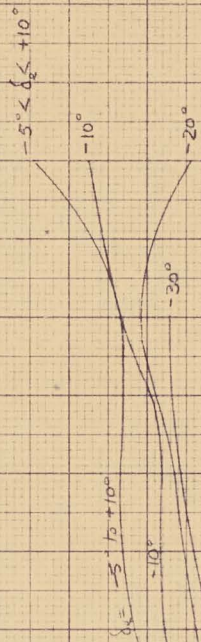
4

6

8

10

C_L



C-105

NAE LOW SPEED WIND TUNNEL TESTS (JAN 1952)

EFFECT OF GROUND ON $C_{Mg}(C_L)$ vs C_L WITH $\delta_e = -10^\circ$

GROUND BOARD POSITION SYMBOL

0.4 1/2 0.7 1/2 ∞

CG AT 28% AND 8" ABOVE FUSELAGE DATUM
(SECANTS DRAWN FROM $\alpha = 0^\circ$)

$C_{Mg}(C_L)$

-0.006

-0.004

-0.002

0

0

2

4

6

8

10

C_L

C-105

NAE LOW SPEED WIND TUNNEL TESTS (JAN 1956)

EFFECT OF GROUND ON $C_{Mg}(C_L)$ VS C_L WITH $\delta_e = -20^\circ$

<u>GROUND BOARD POSITION</u>	<u>SYMBOL</u>
0.4 b/h	$\diamond$
0.7 b/h	$\square$
∞	$\circ$

CG AT 0.28 E AND 8" ABOVE FUSELAGE DATUM
(SECANTS DRAWN FROM $\delta_e = 0^\circ$)

$C_{Mg}(C_L)$

-0.006

-0.004

-0.002

0

2

4

6

8

10

C_L

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2.3c

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NAE LOW SPEED WIND TUNNEL TESTS (JAN 1956)

EFFECT OF GROUND ON $C_{M_y}(C_L)$ vs C_L WITH $\delta_e = -30^\circ$

GROUND BOARD POSITION SYMBOL

0.4 $\frac{b}{c}$ 0.7 $\frac{b}{c}$ ∞

C.S. AT 0-28 IN AND 8" ABOVE FUSELAGE DATUM
(SECANTS DRAWN FROM $\delta_e = 0^\circ$)

$C_{M_y}(C_L)$

-0.06

-0.04

-0.02

0

2

4

6

8

10

C_L

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NAE. LOW SPEED WIND TUNNEL TESTS (JAN 1956)

C_M vs δ_a AT CONSTANT C_L

C_L AT 0.282 ON MAC

C_M

.14

.12

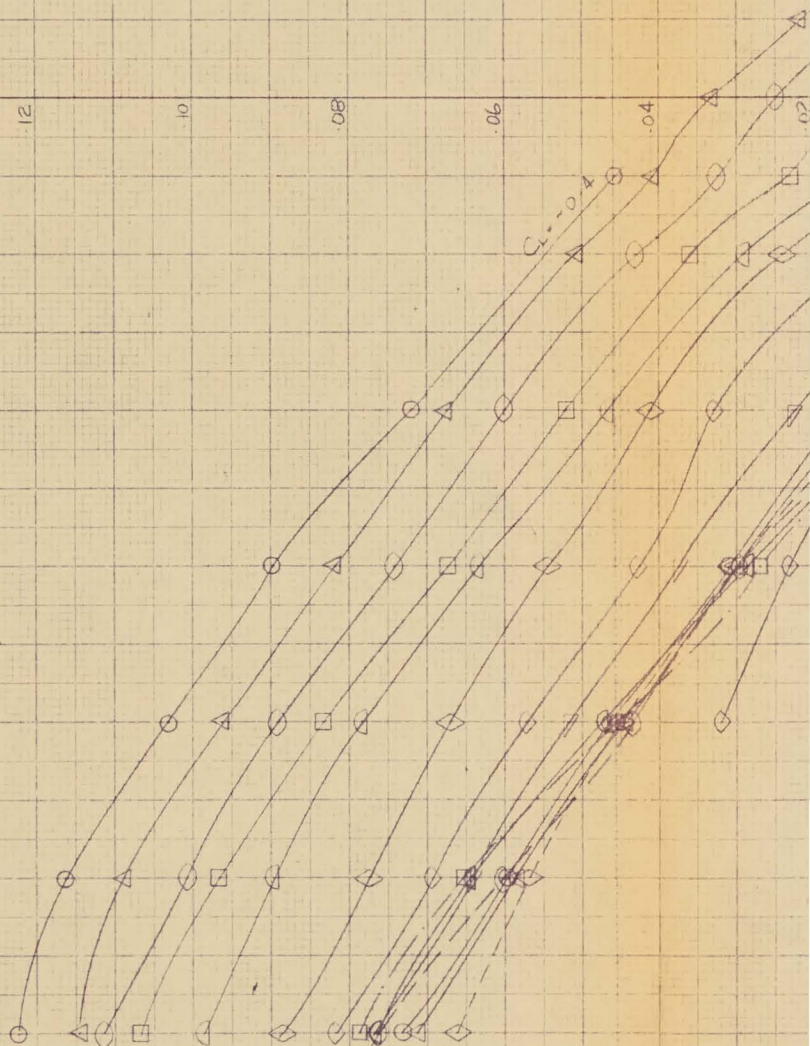
.10

.08

.06

.04

.02



Nov 56 039

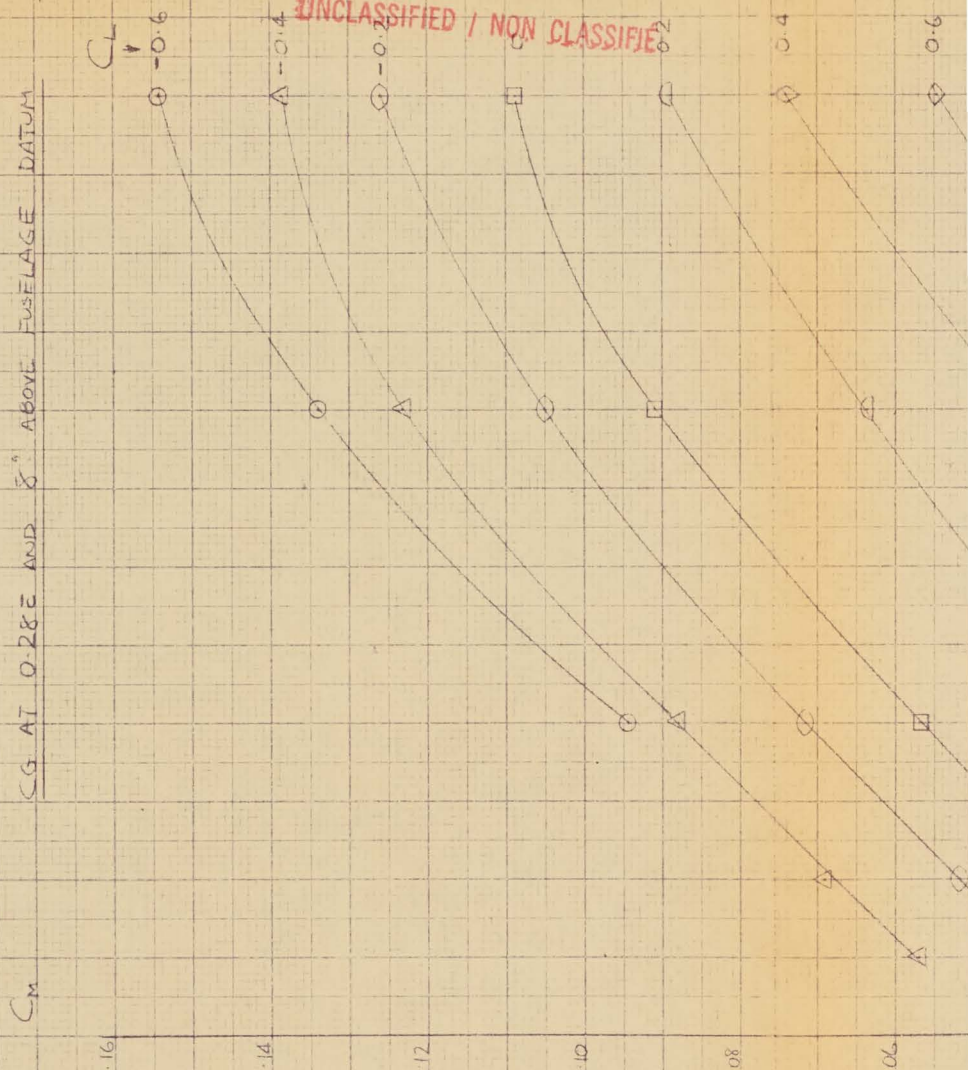
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NAE LOW SPEED WIND TUNNEL TESTS (JAN 1956)

C_m vs δ_e (AT CONST C_L)

GROUND BOARD AT 0.4 $\frac{b}{2}$

C_L AT 0.282 AND 8° ABOVE FUSELAGE DATUM



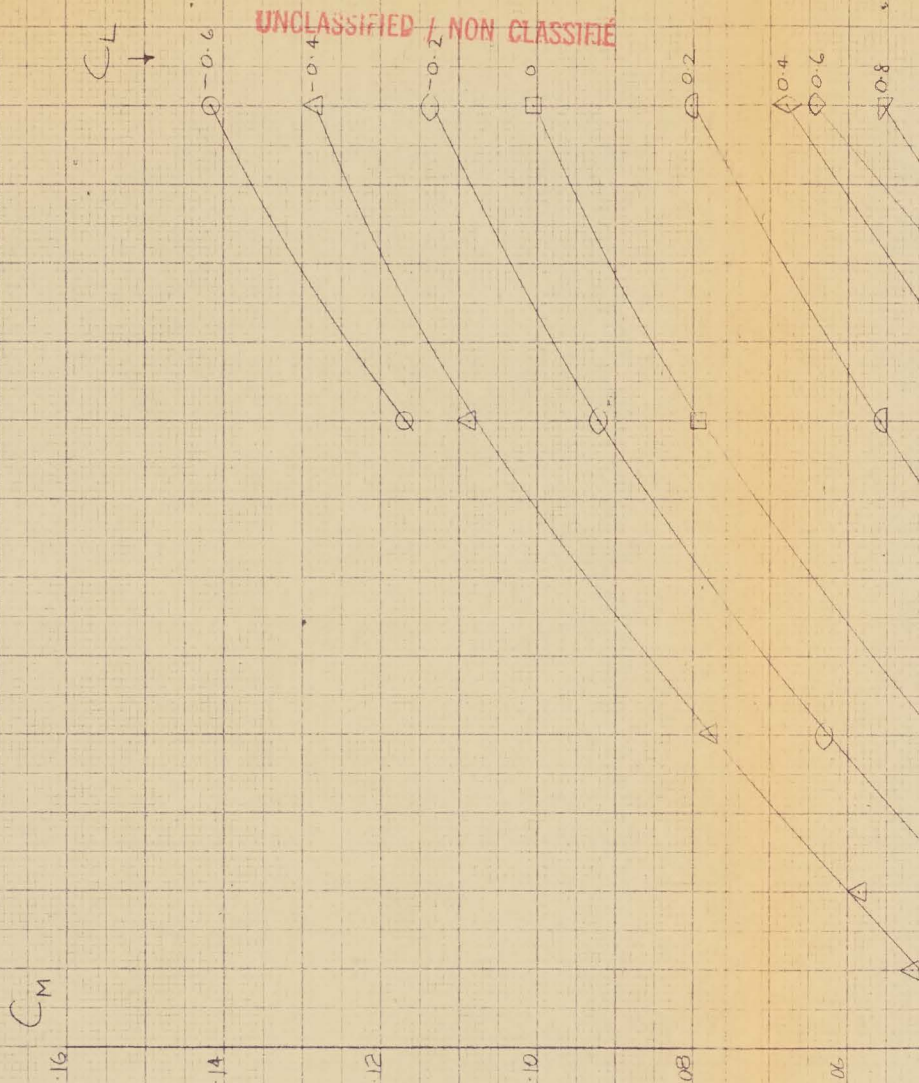
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NAE WIND TUNNEL TESTS (LOW SPEED) (JAN 1952)

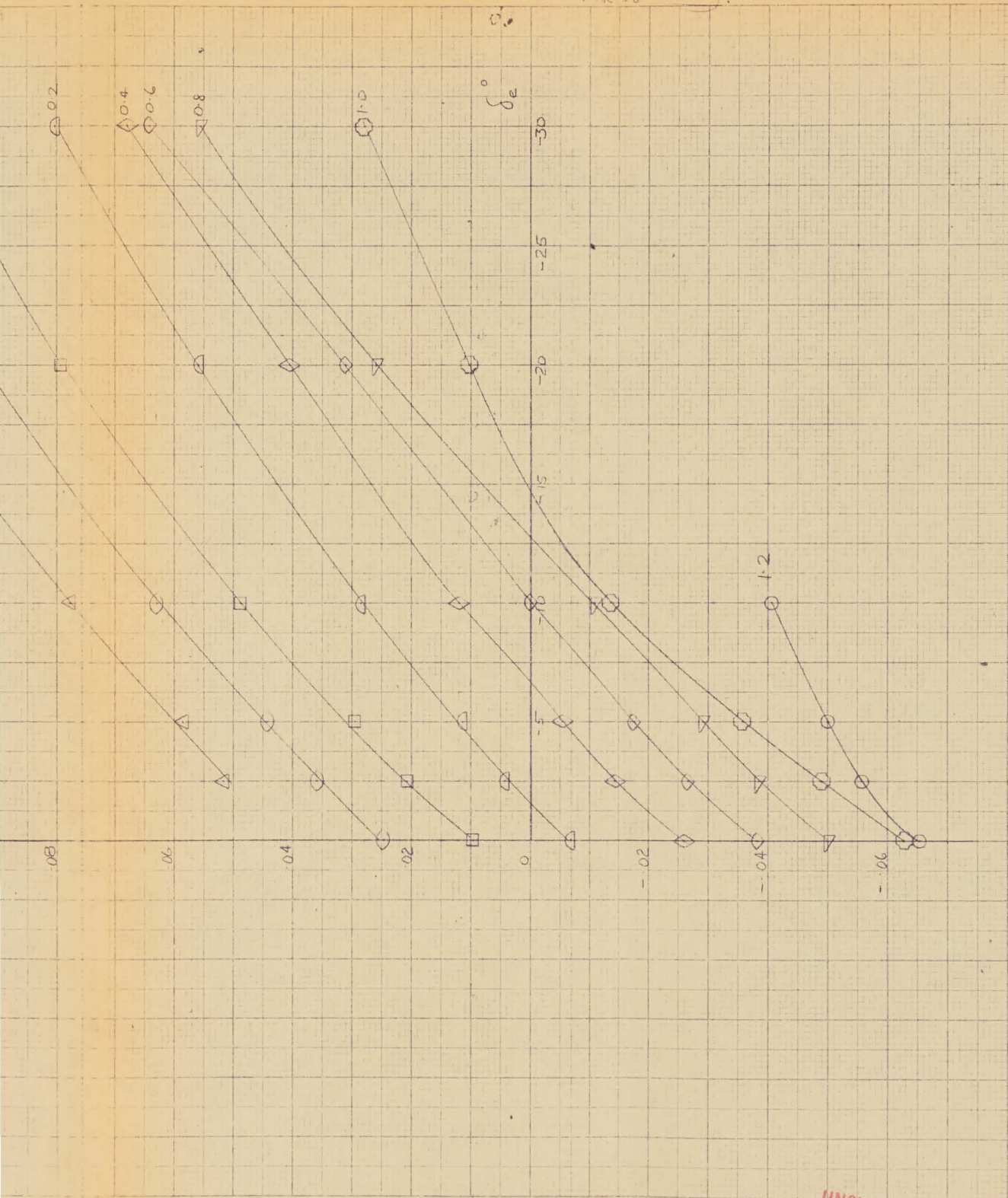
C_M vs δ_R (AT CONST C_L)

GROUND BOARD AT: $0.7 \frac{b}{2}$

C_L AT 0.283 AND 8" ABOVE FUSELAGE DATUM



MAR 56 D.B.G.

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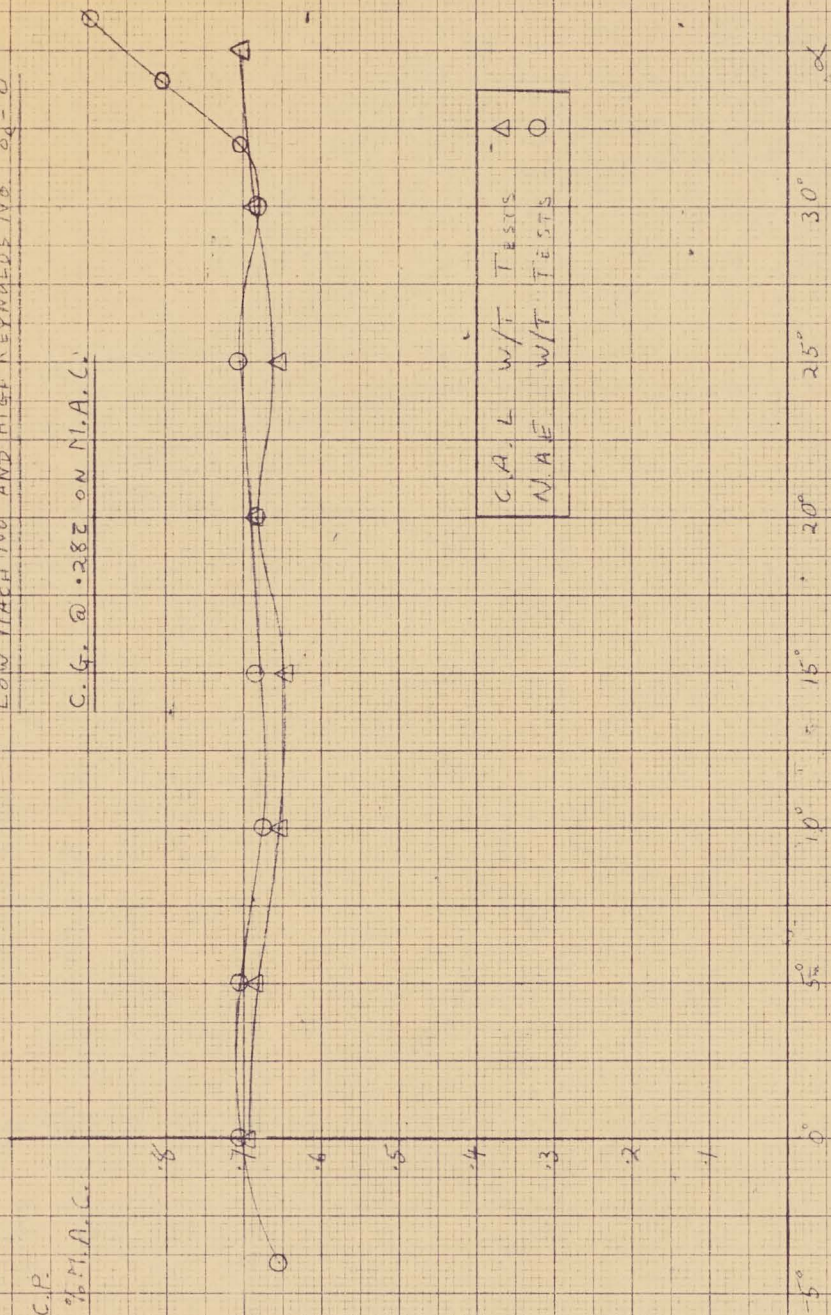
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C.P. POSITION VS α

LOW MACH NO AND HIGH REYNOLDS NO. $S_L = 0$

C.G. @ .282 ON N.A.C.



C.P. L	W/T	TESTS
NAE	W/T	TESTS

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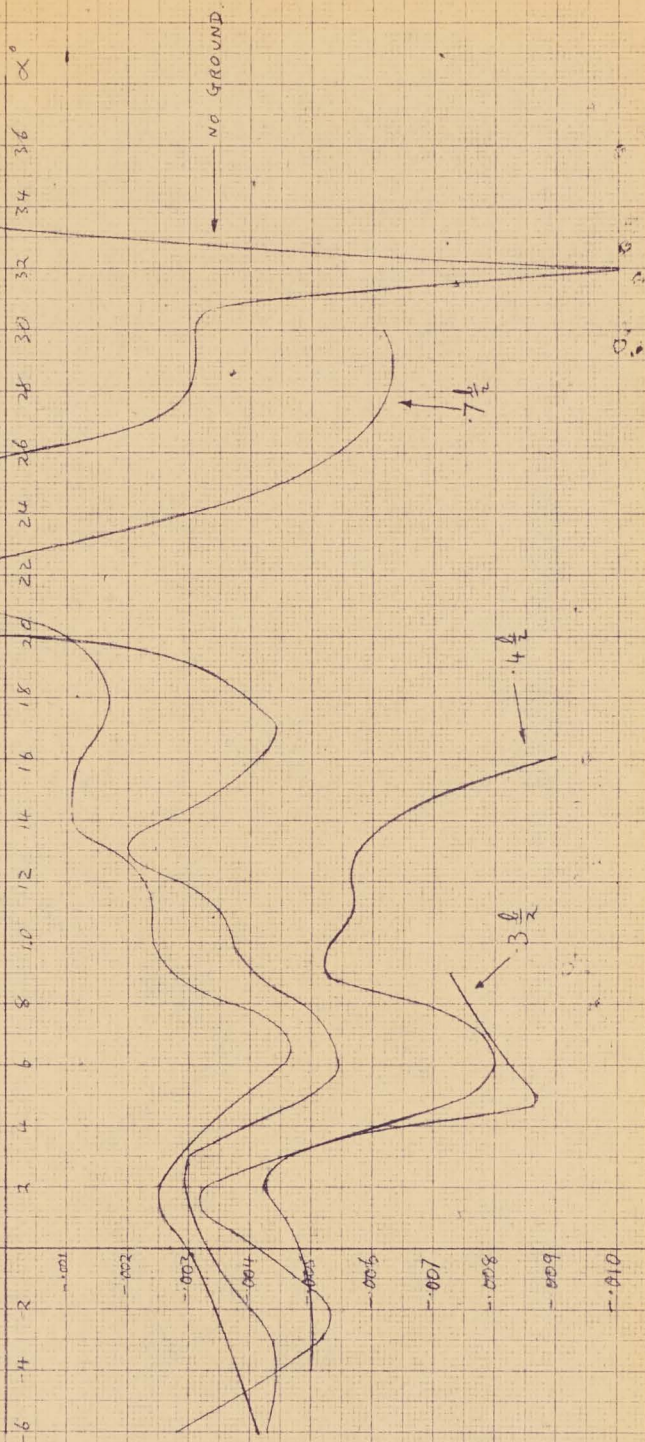
N.A.E. LOW SPEED WIND TUNNEL TESTS (JAN 1956)

GROUND EFFECT $\delta_e = 0$

$C_M \alpha$	vs	α
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C. G. 2.285 on M. A. C.

$C_{M\alpha}$ PER DEG



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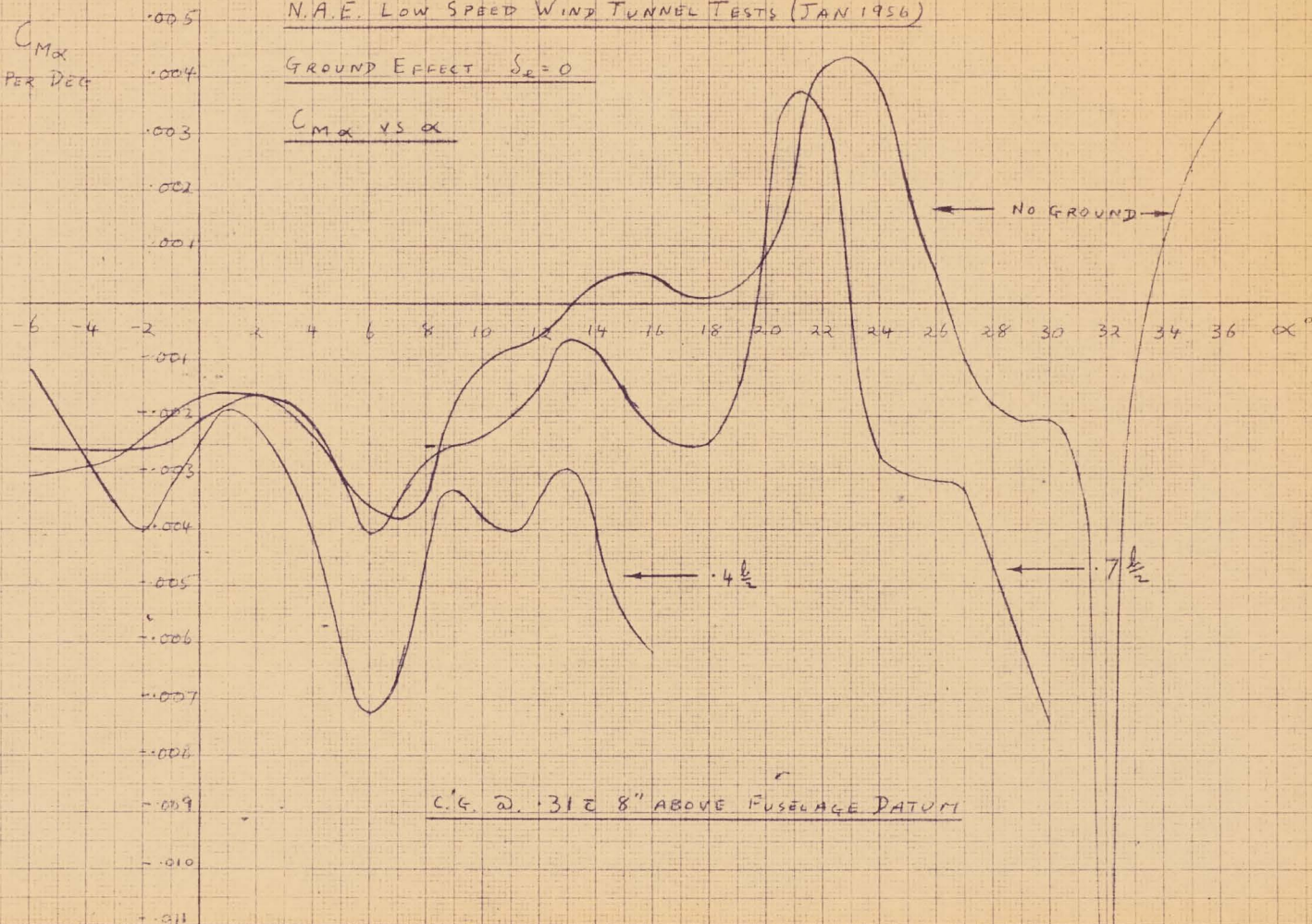
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N.A.E. LOW SPEED WIND TUNNEL TESTS (JAN 1956)

GROUND EFFECT $\delta_R = 0$

$C_{M\alpha}$ VS α

$C_{M\alpha}$
PER DEG



C.G. @ .31 ± .8" ABOVE FUSELAGE DATUM

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P/WT/108
APRIL 1956
2.53
ERR 7th

