

QCX
Auro
CF105
P-AD-
78
C.2

22

C-105 CONFIDENTIAL Aero Data/78
N.A.E. LOW SPEED WIND TUNNEL TESTS
VARIATION OF LATERAL DERIVATIVES WITH α

UNCLASSIFIED

FILE IN VAULT
NRC - CISTI
J. H. PARKIN
BRANCH
MAY 11 1995
ANNEXE
J. H. PARKIN
CNRC - ICIST

UNCLASSIFIED

Classification category changed to
by authority of (date)
Signature *[Handwritten Signature]* Rank *[Handwritten Rank]*

UNCLASSIFIED



A. V. ROE CANADA LIMITED
MALTON - ONTARIO

TECHNICAL DEPARTMENT (Aircraft)

AIRCRAFT CF-105

REPORT NO. P/Aero Data/78

FILE NO

NO OF SHEETS

TITLE

CONFIDENTIAL
UNCLASSIFIED

VARIATION OF LATERAL DERIVATIVES WITH α

PREPARED BY D. B. Garland DATE Sept. 1956

CHECKED BY _____ DATE _____

SUPERVISED BY _____ DATE _____

APPROVED BY _____ DATE _____

ISSUE NO	REVISION NO	REVISED BY	APPROVED BY	DATE	REMARKS

TECHNICAL DEPARTMENT (Aircraft)

SHEET NO.

AIRCRAFT

C-105

N.A.E. L.S. W/T TESTS

PREPARED BY

DATE

D. B. Garland

Sept. 1956

CHECKED BY

DATE

.07 SCALE

INDEX

VARIATION OF LATERAL DERIVATIVES WITH α

	<u>SECTION</u>
1. <u>STABILITY DERIVATIVES</u>	
1. $C_{n\beta}$	1.1
2. $C_{l\beta}$	1.2
3. $C_{Y\beta}$	1.3
2. <u>RUDDER DERIVATIVES</u>	
1. $C_{n\delta_r}$	2.1
2. $C_{l\delta_r}$	2.2
3. $C_{Y\delta_r}$	2.3
3. <u>AILERON DERIVATIVES</u>	
1. $C_{n\delta_a}$	3.1
2. $C_{l\delta_a}$	3.2
3. $C_{Y\delta_a}$	3.3
4. $C_{m\delta_a}$	3.4
5. $C_{L\delta_a}$	3.5
6. c.p.	3.6
7. η c.p.	3.7

UNCLASSIFIED



AVRO AIRCRAFT LIMITED
MALTON - ONTARIO

TECHNICAL DEPARTMENT

REPORT NO. P/AERO DATA/78

SHEET NO.

AIRCRAFT

C-105

N.A.E. W/T TESTS

.07 SCALE

PREPARED BY

DATE

CHECKED BY

DATE

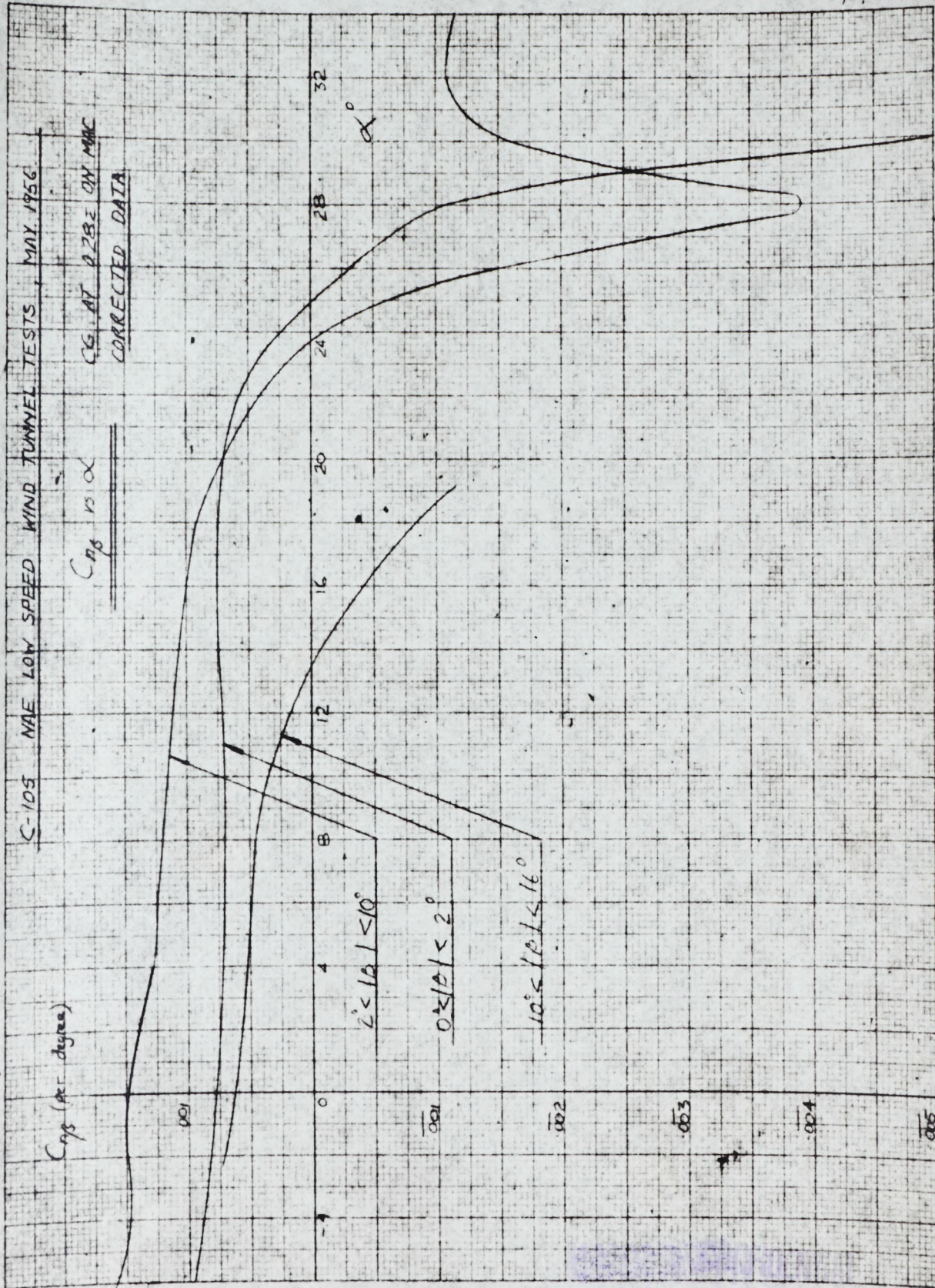
INDEX (Continued)

	<u>Effect Of Undercarriage On Derivatives</u>	<u>Section</u>
4.		
1.	$C_{n\beta}$	4.1
2.	$C_{l\beta}$	4.2
3.	$C_{y\beta}$	4.3

UNCLASSIFIED

UNCLASSIFIED

1/2" E 10 X 10 TO THE 1/2" INCH
KUFFLE & BERRY CO. 359-12
MAY 1956



DBC SEPT 14th 1952

1.1.1.

K&S 10 X 10 TO THE 1/2 INCH
KLUPPEL & LEBER CO.
MADE IN U.S.A.

C-1195 NAF LOW SPEED WING TUNNEL TESTS MAY 52

~~C_{np} vs α~~

~~FIN OFF~~

CG AT 0.2812 ON MAIL
CORRECTED DATA

C_{np} FIN OFF
(per deg)

α°

-2 0 2 4 6 8 10 12 14 16 18 20

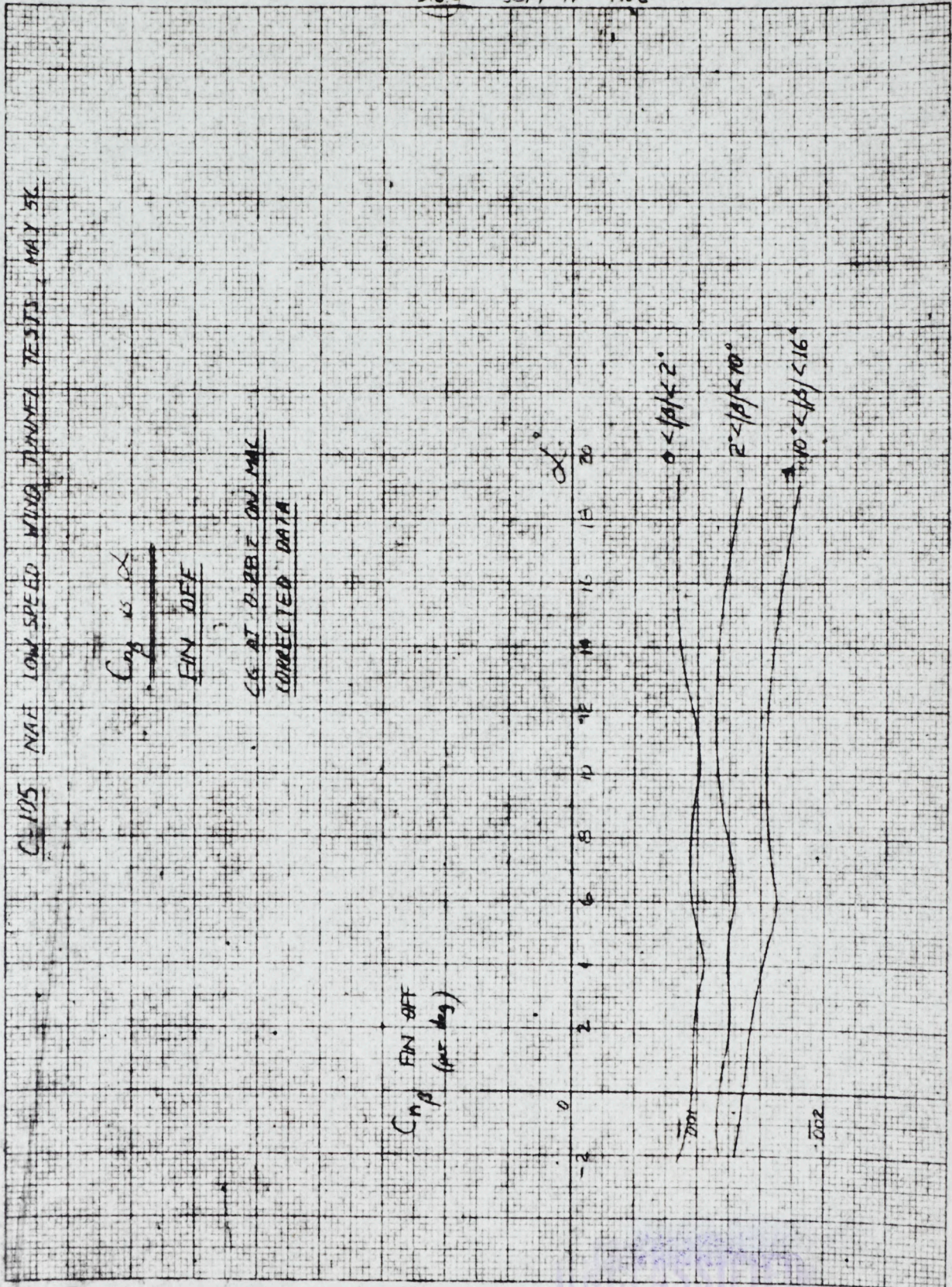
α < 10°

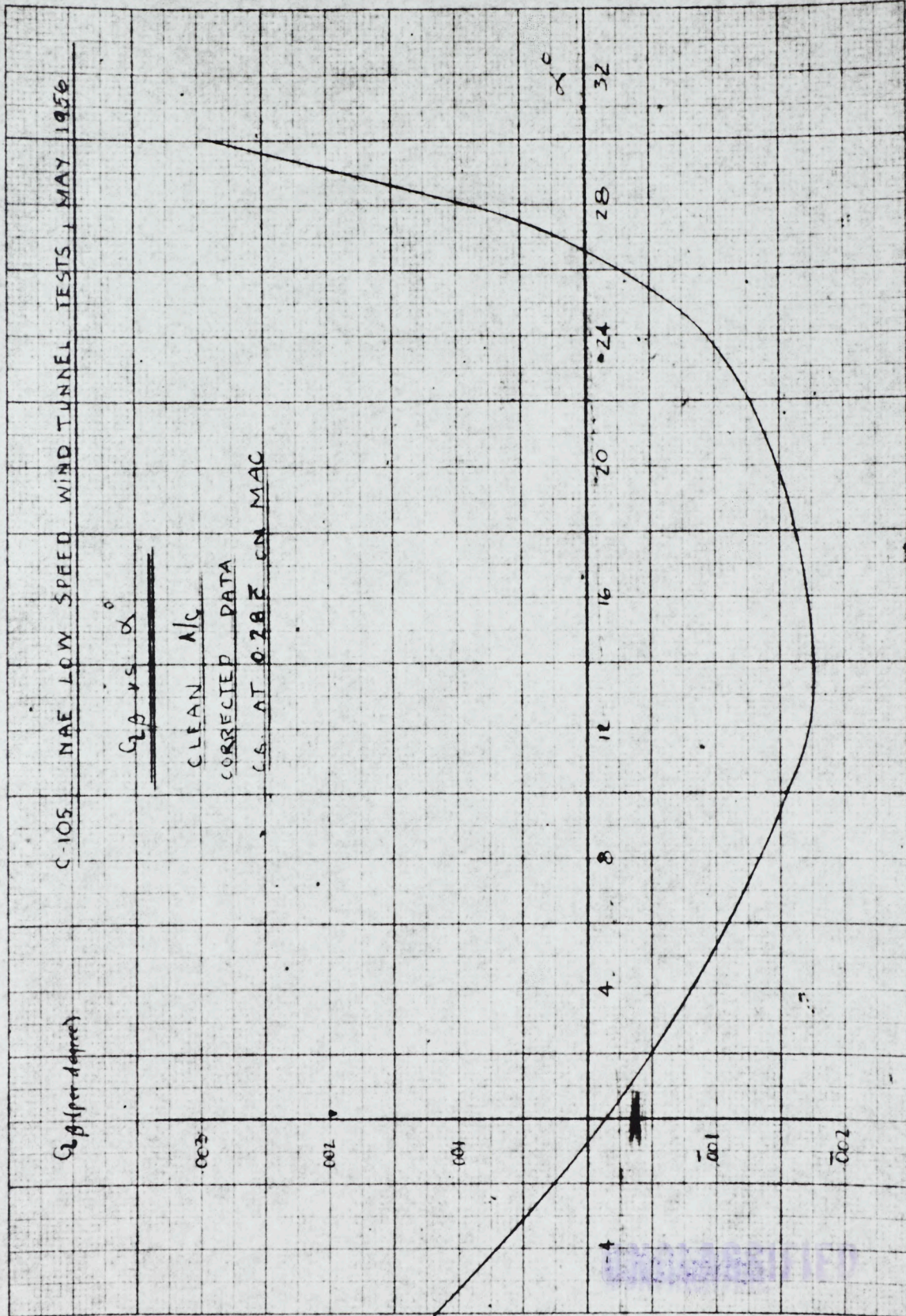
α < 10°

α < 10°

0.001

0.002





DBS SEP 13th 1956

121

C-105 NAE LOW SPEED WIND TUNNEL TESTS, JULY 1956

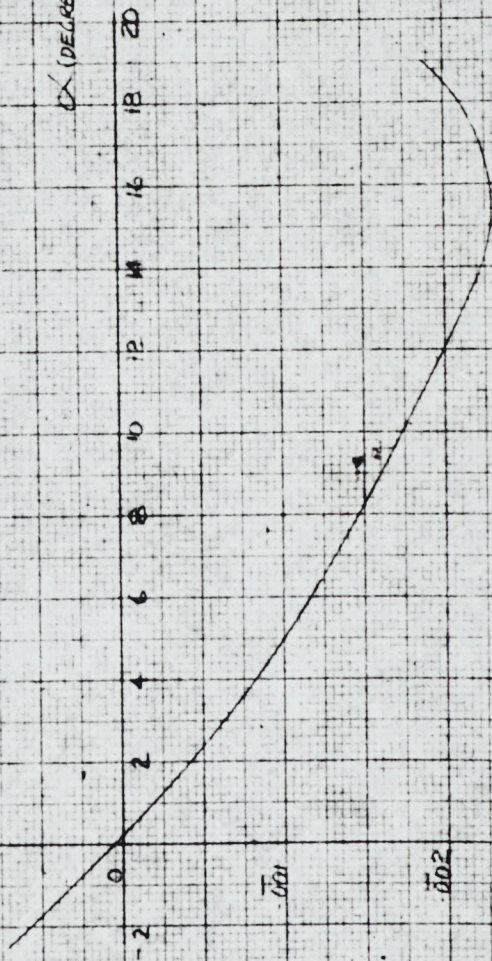
C_{Lp} vs α
(CORRECTED DATA)

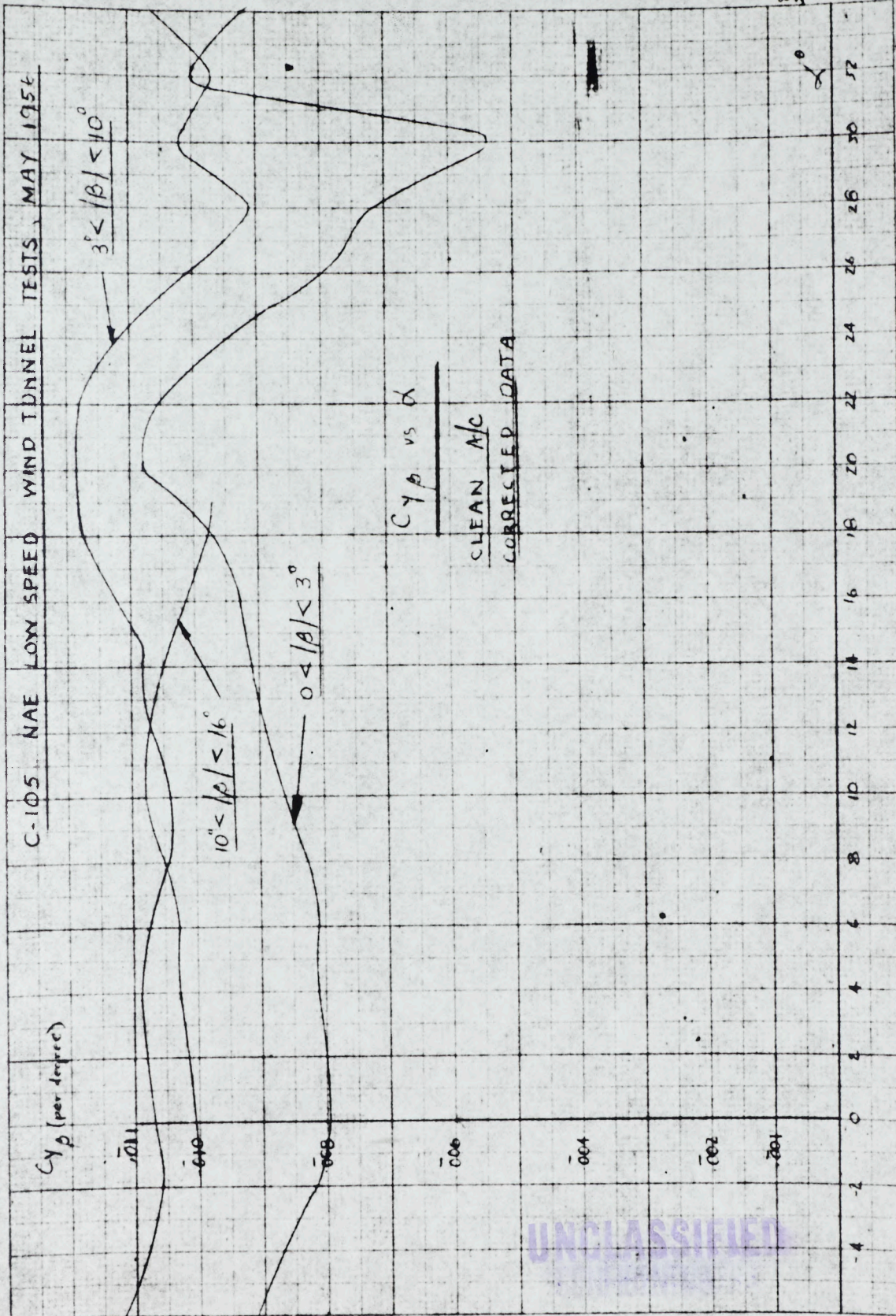
FIN OFF

CG AT 0.232 OW MAC

C_{Lp} (per degree)

α (DEGREES)





UNCLASSIFIED

D.B.G. SEPT 14th 1956

13.1

C-105 NAE LOW SPEED WIND TUNNEL TESTS, MAY 1956

$C_{y, \alpha}$

FIN OFF

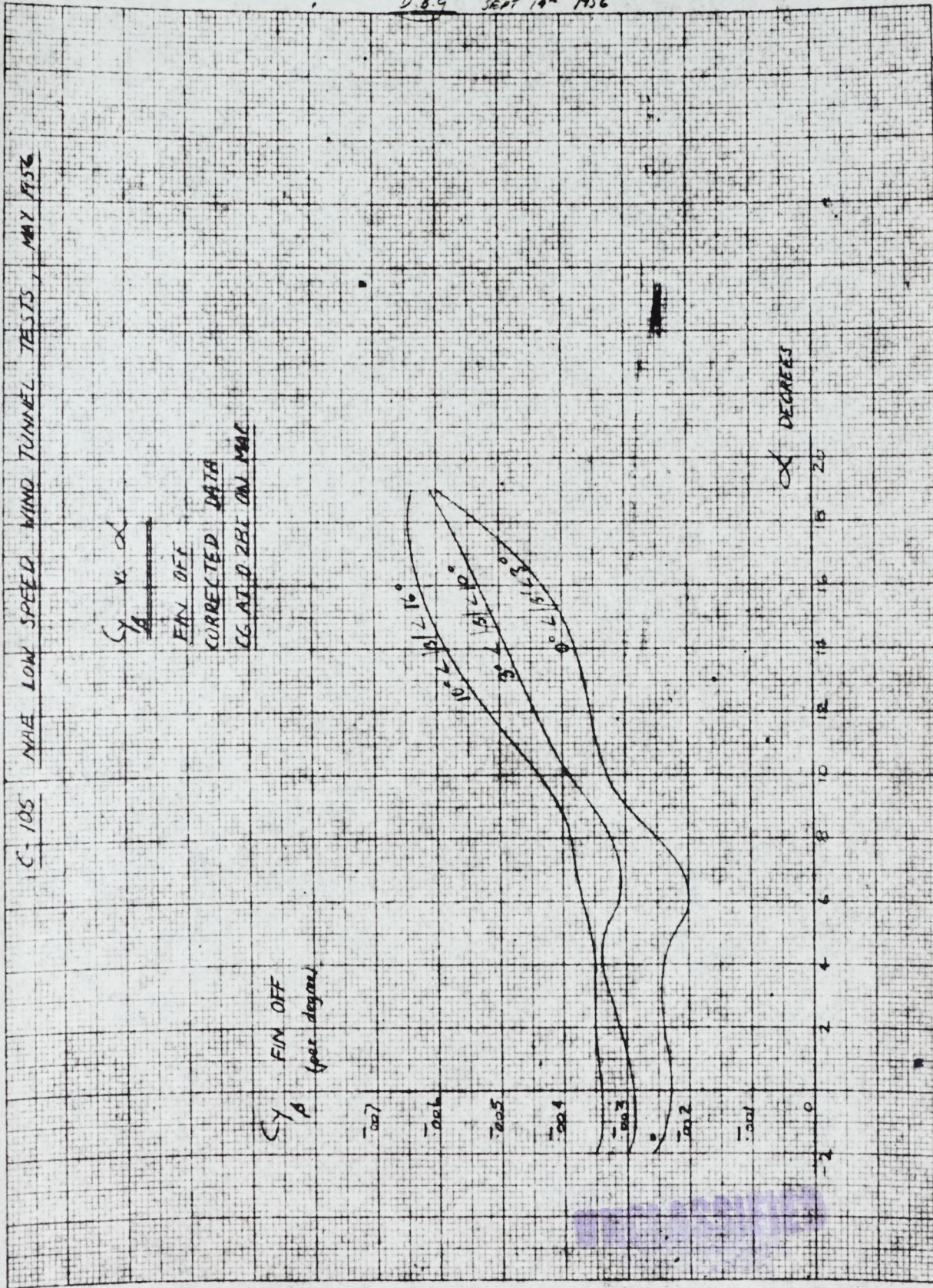
CORRECTED DATA

CG AT 0.281 ON MAC

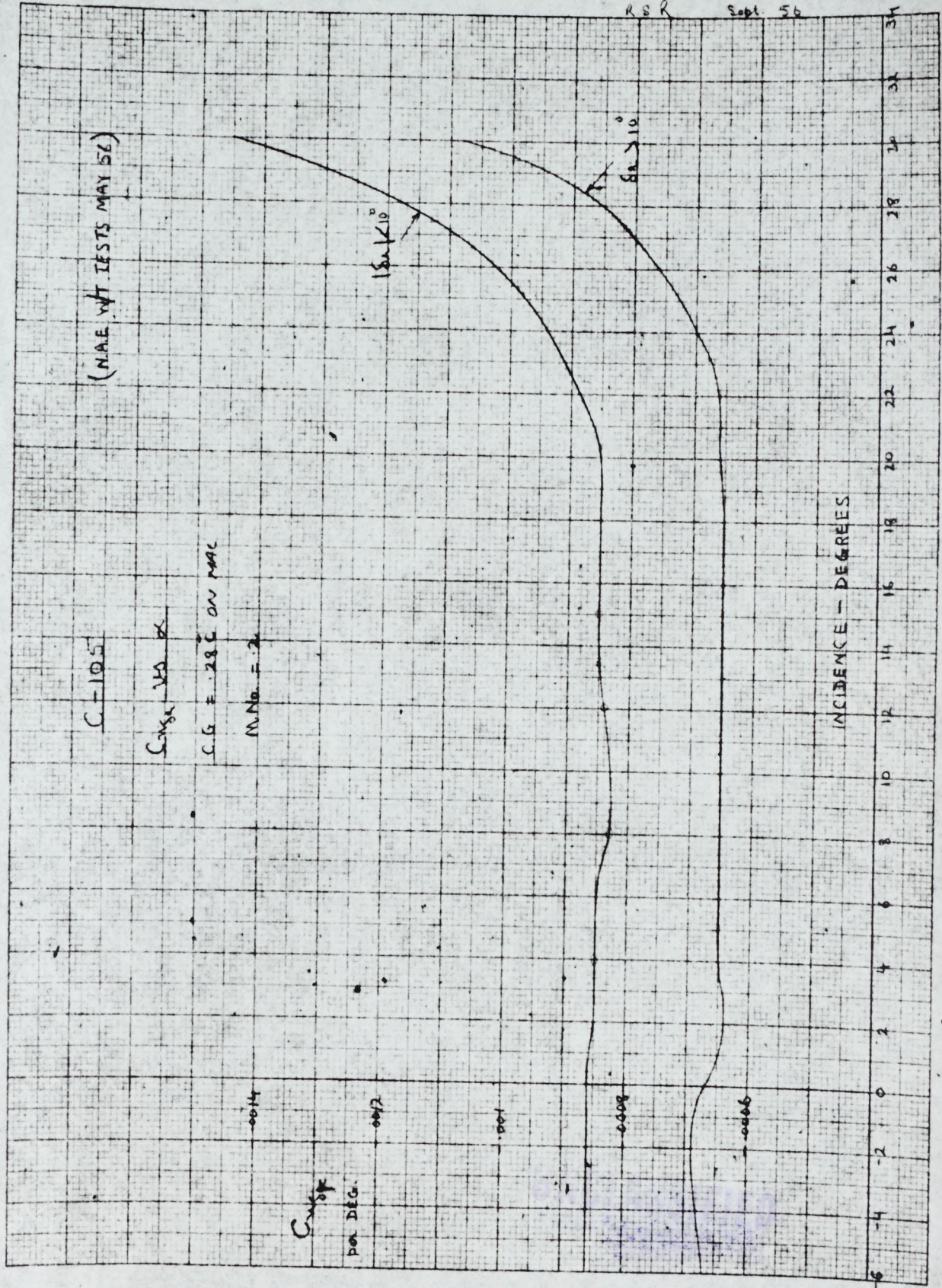
$C_{y, \alpha}$ FIN OFF
(per degree)

0.007
0.006
0.005
0.004
0.003
0.002
0.001

α DEGREES



RSR Sept. 56



2.

R.S.R. Sept 56

(NAME AND TEST DATE)

C-105

$C_{L_{max}}$ vs α

$C_{D_{max}} = 0.012$

$\alpha_{MIN} = 2$

$C_{L_{max}}$
PER DEG.

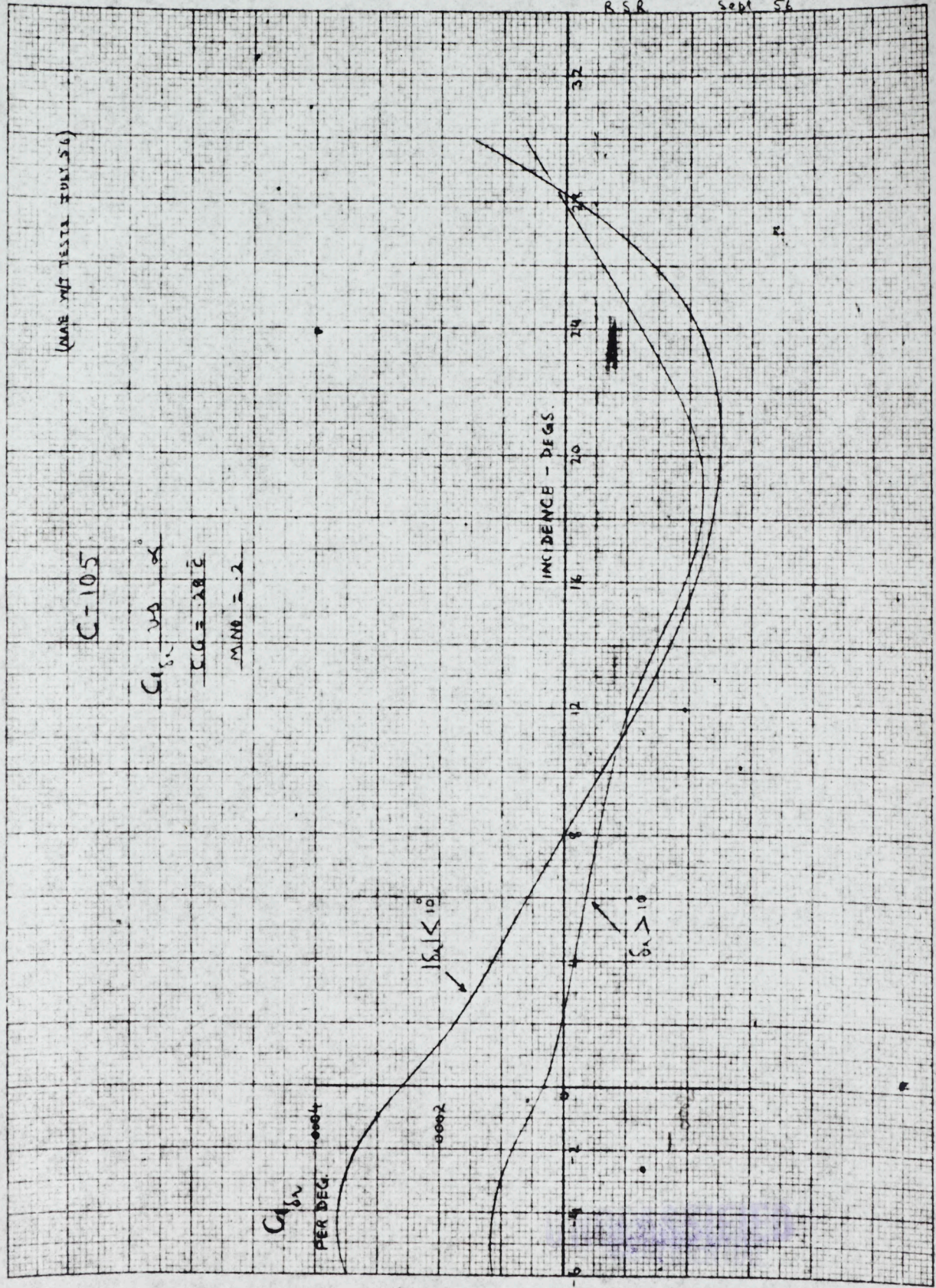
0.004

0.002

$\delta_{L} < 10^\circ$

$\delta_{L} > 10^\circ$

INCIDENCE - DEGS.



C-105 NAE LOW SPEED WIND TUNNEL TESTS, JULY 1956

$C_{Y_{br}}$ (per degree)

$C_{Y_{br}} \propto \alpha$
 $\beta = 0^\circ$
 CLEAN AIRCRAFT

0022

0020

0018

0016

0014

0012

0010

0008

0006

0004

0002

0

$0^\circ < \delta_r / \delta_l < 4^\circ$

$10^\circ < \delta_r / \delta_l < 20^\circ$

$20^\circ < \delta_r / \delta_l < 30^\circ$

SEPT 7 1956

DBG

P/AERO DATA/78

2.3

α (DEGS)

32

28

24

20

16

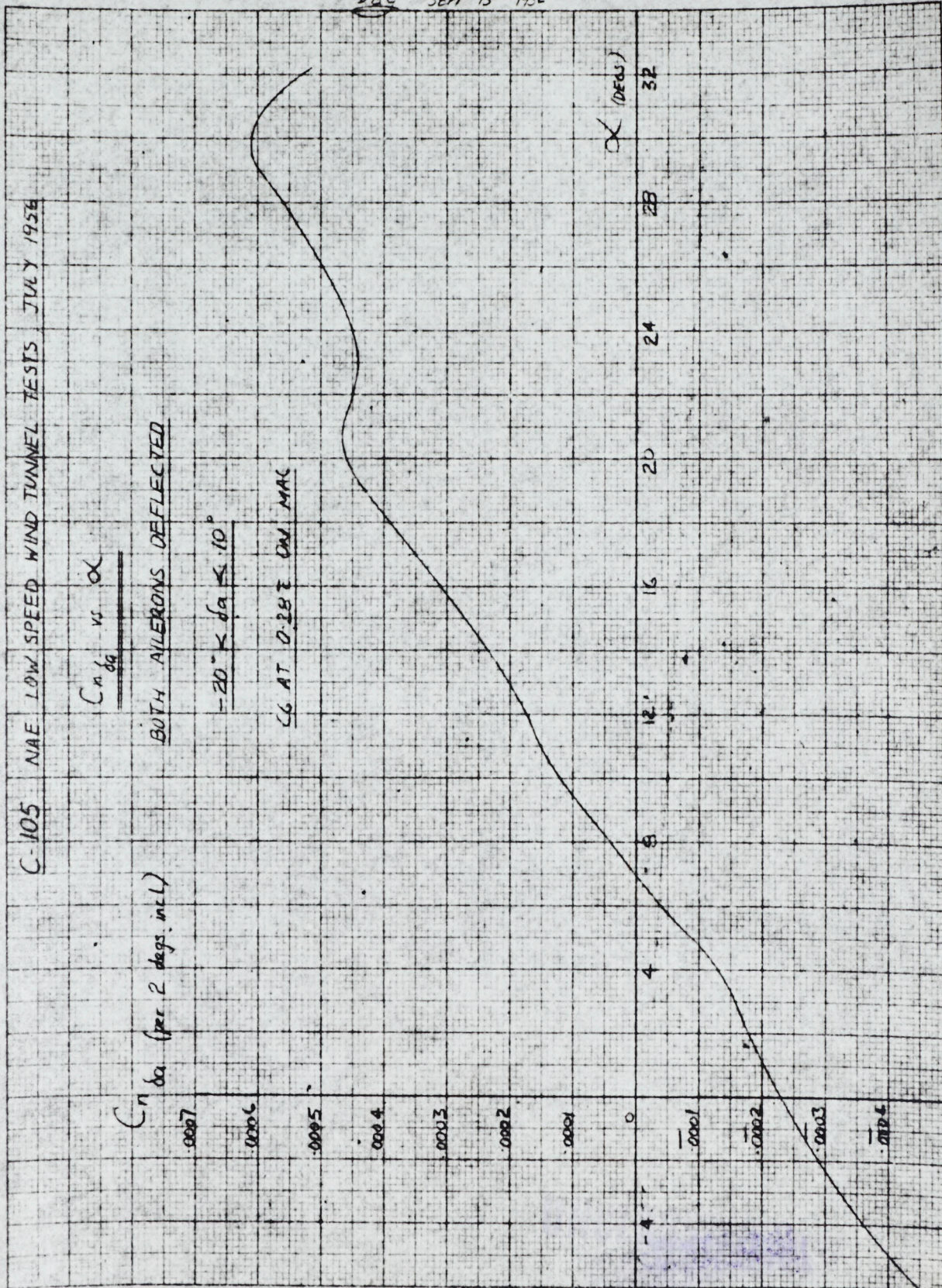
12

8

4

0

DBC SEPT 13th 1952



JULY 1952

TESTS

LOW SPEED WIND TUNNEL

NAE

C-105

$C_n da$ vs α

BOTH ALLERONS DEFLECTED

$-20^\circ < \alpha < 10^\circ$

CG AT 0.257 CM MAC

$C_n da$ (per 2 degs. incl)

α (DEGS)

C-105 AWE LOW SPEED WIND TUNNEL TESTS JULY 1956

$C_{L\alpha}$ vs α

(BOTH AILERONS DEFLECTED)

CG AT 0.282 ON MAC

$-20^\circ < \alpha < 10^\circ$

$C_{L\alpha}$ (per 2 degrees incl)

0.018

0.016

0.014

0.012

0.010

0.008

0.006

0.004

0.002

0

α (DEGREES)

32

28

24

20

16

12

8

4

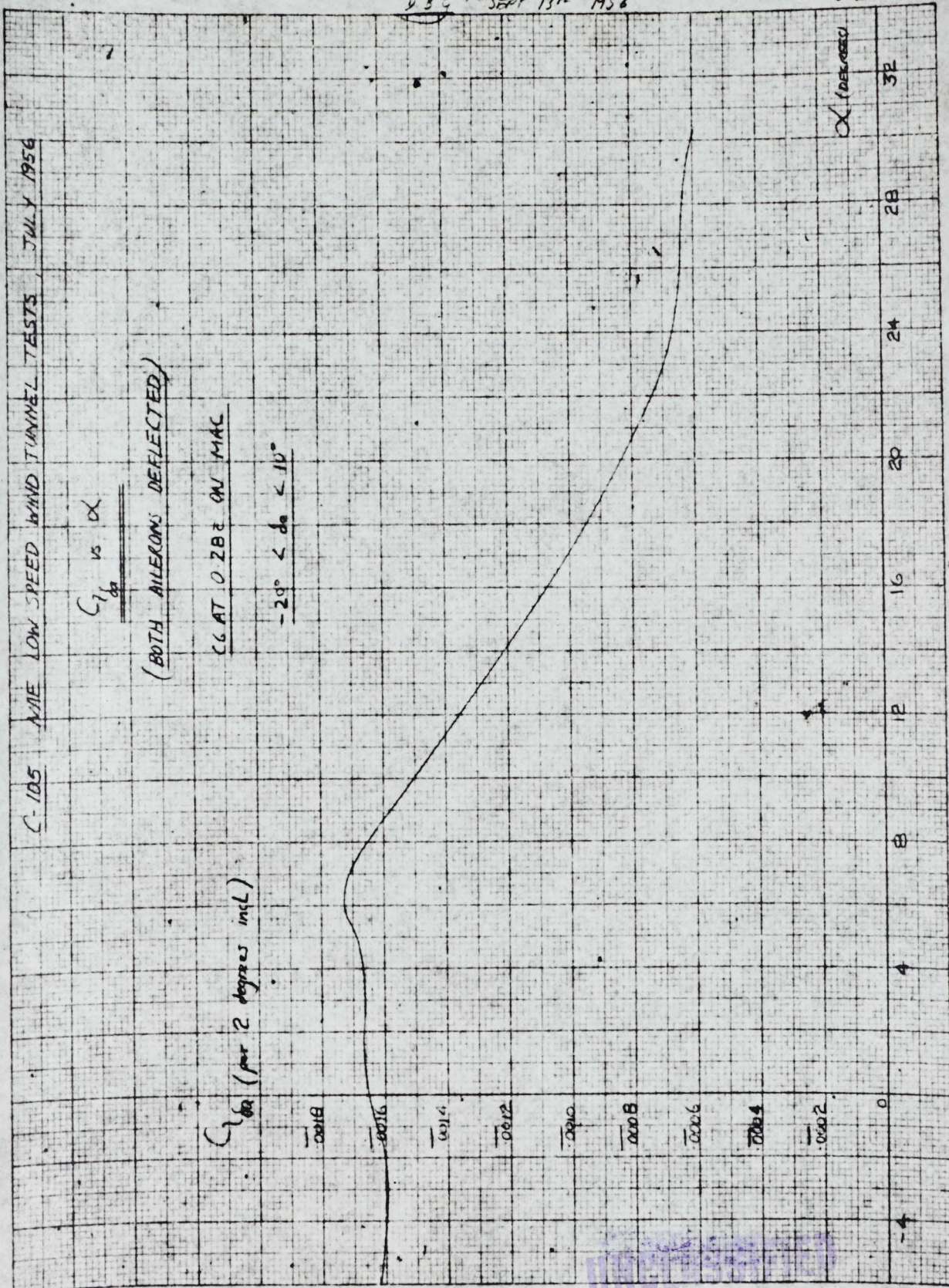
0

-4

439 SEPT 13th 1956

P/HERO DATA/76

32



JBC SEPT 13th 1956

3.3

ME 10 X TO THE 1/2 INCH
PEUFFEL & ESSER CO.
359-12
MILWAUKEE

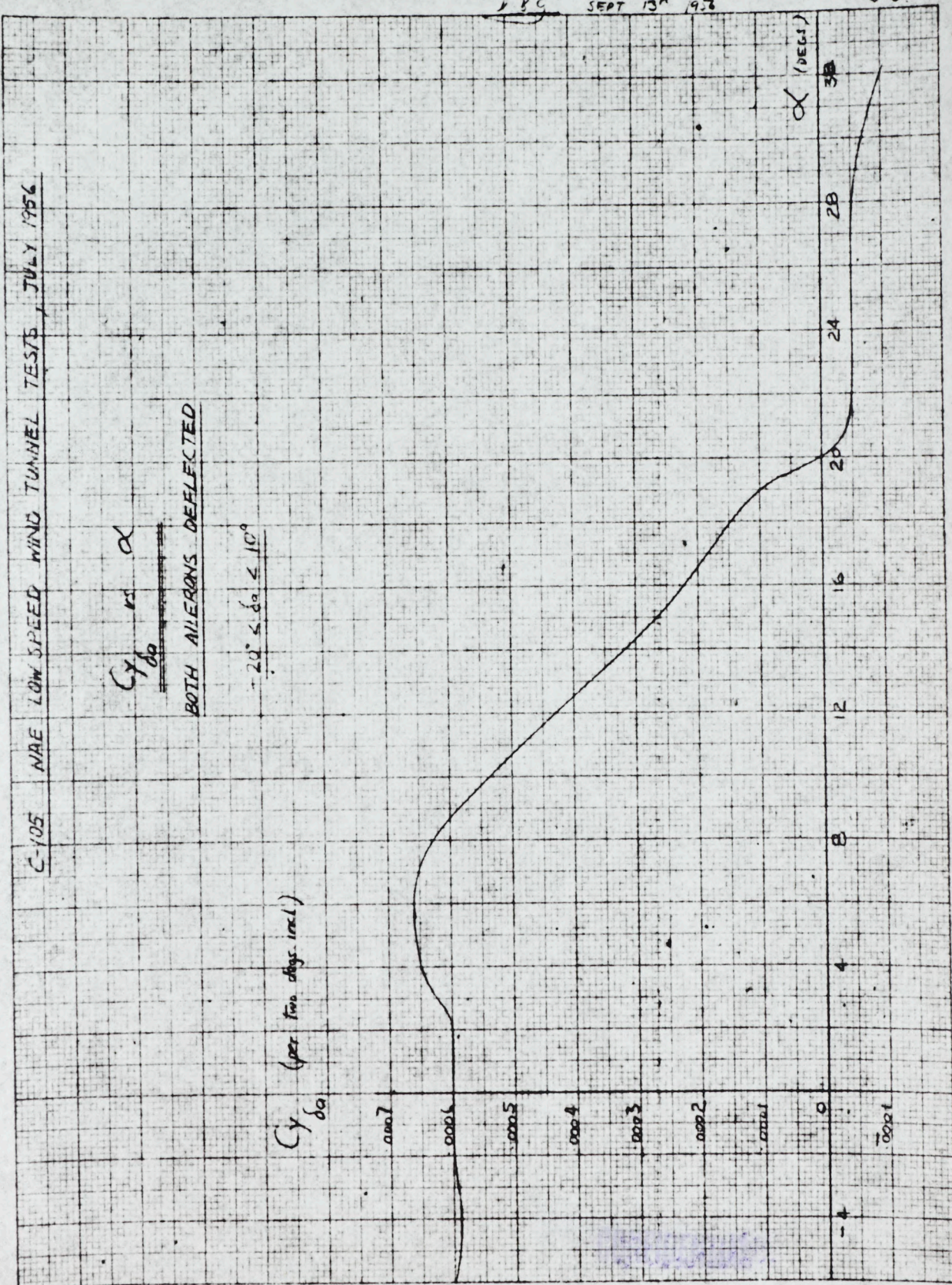
C-105 NAE LOW SPEED WIND TUNNEL TESTS, JULY 1956

$C_{y_{\delta a}}$ vs α

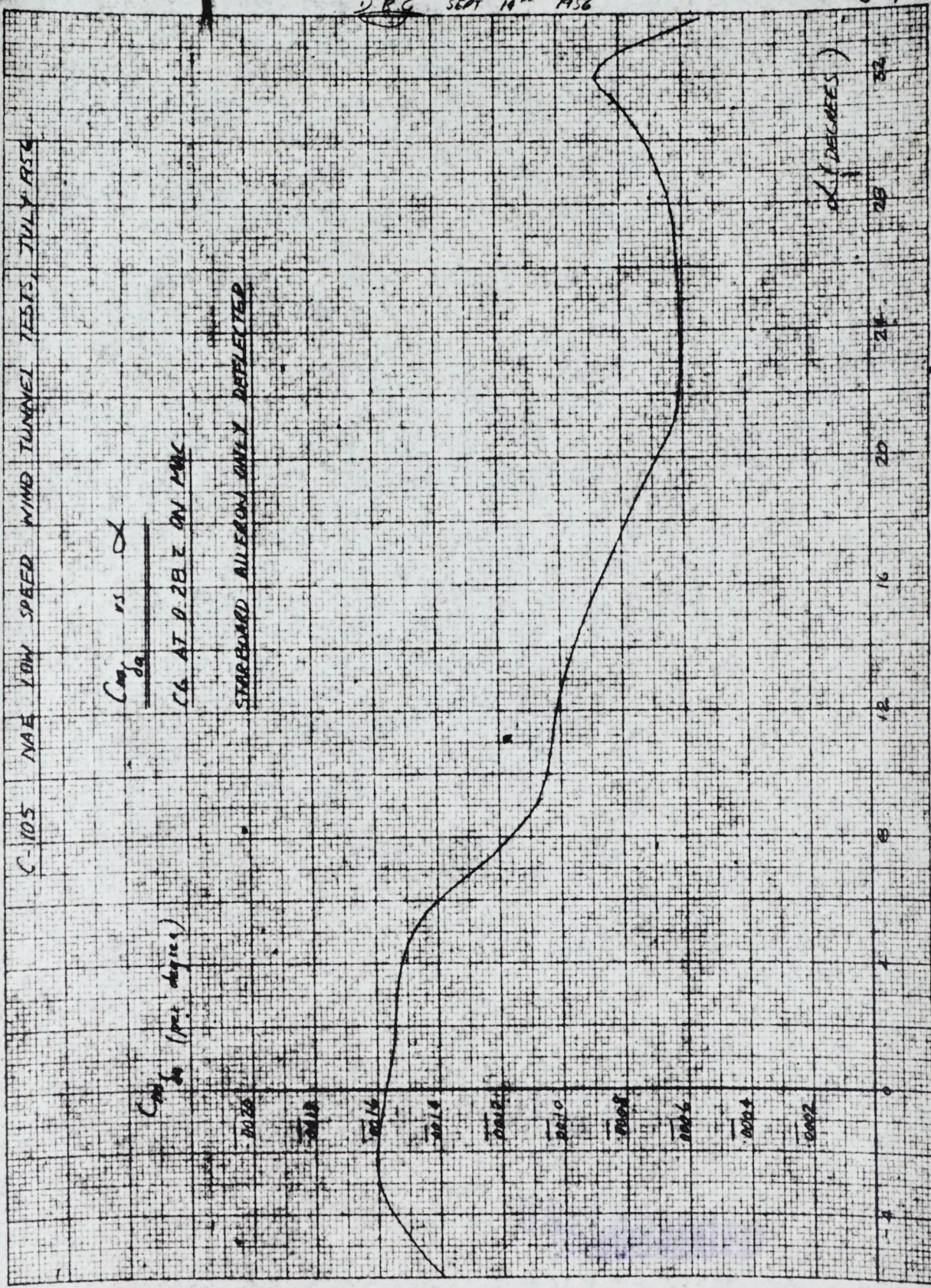
BOTH ALIENS DEFLECTED

$-20^\circ \leq \delta a \leq 10^\circ$

$C_{y_{\delta a}}$ (per two deg. incl.)



D.R.G. SEPT 19th 1956



C-105 N/AE WIND TUNNEL TESTS, JULY 1956

Cg vs α

CG AT 0.28 Z ON MKC

STARBOARD AILERON ONLY DETELECTED

Cg (percent degrees)

(ALPHA DEGREES)

DB 9. SEPT 14' 1952

3.5

350-12
MAY 1951

10 X 10 TO THE 1/8 INCH
KEUFFEL & ESSER CO.

H-E

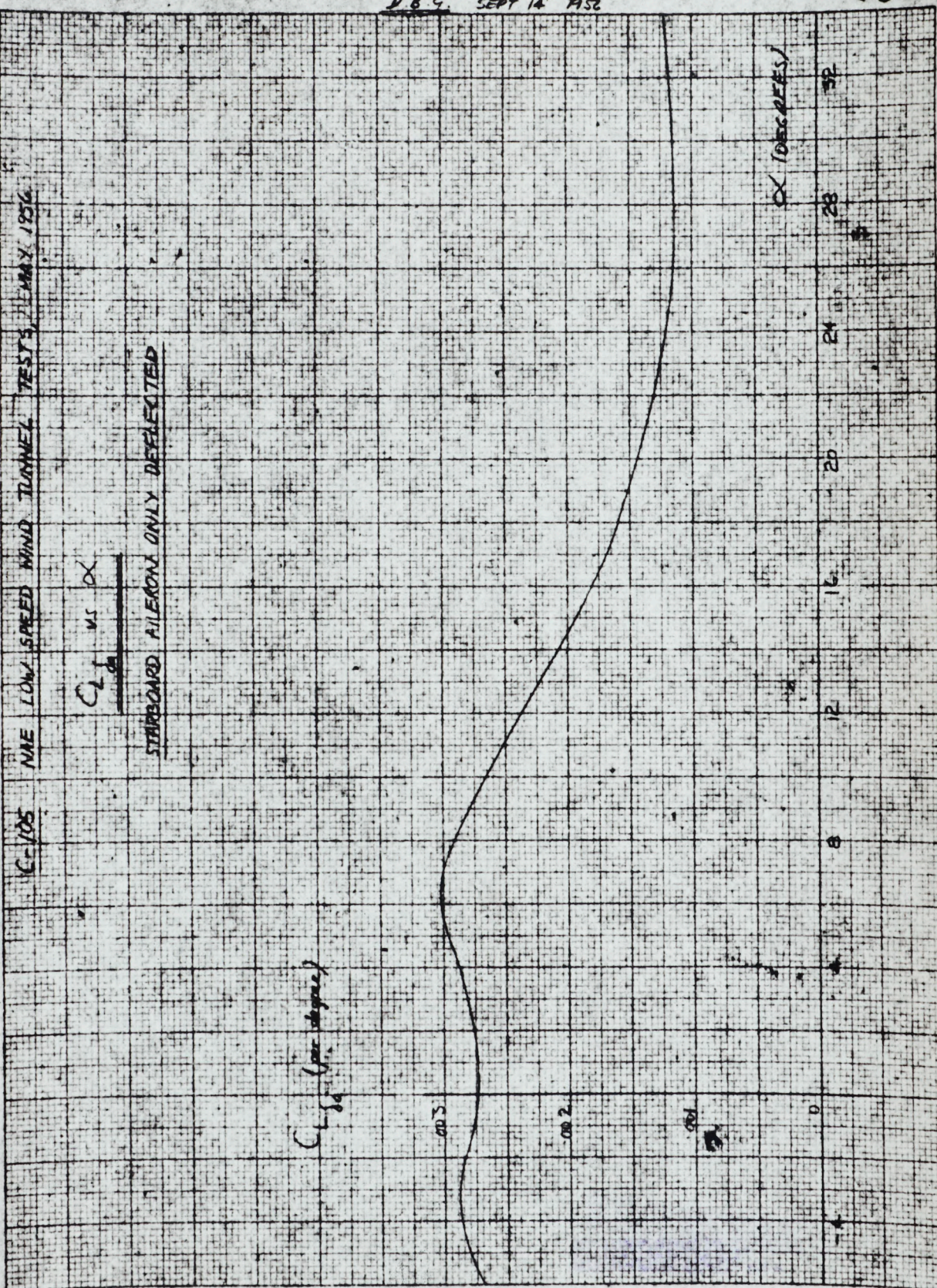
C-105 NAE LOW SPEED WIND TUNNEL TESTS, MAY 1951

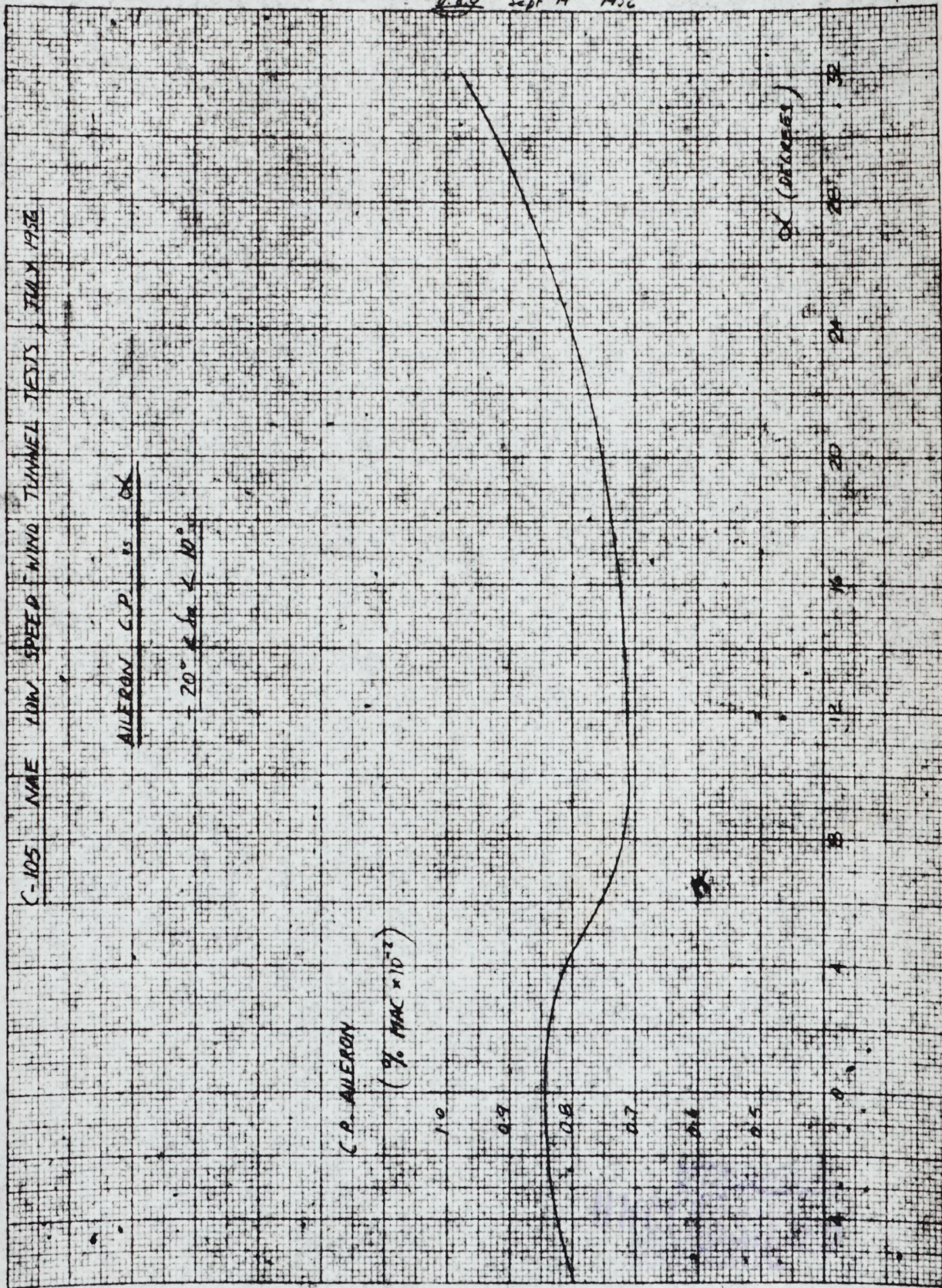
$C_{L_{\alpha}}$ vs α

STARBOARD AILERON ONLY DEFLECTED

$C_{L_{\alpha}}$ (PER DEGREE)

α (DEGREES)





2.85 Sept 14th 1952

AERO DATA/78

3.6

C-105 NAE LOW SPEED WIND TUNNEL TESTS, JULY 1956

MEAN DEPR. VS α

$\alpha_{CR} (\approx 7/8)$

0.7

0.6

0.5

0.4

0

α (DEGREES)

0

25

50

75

100

125

150

175

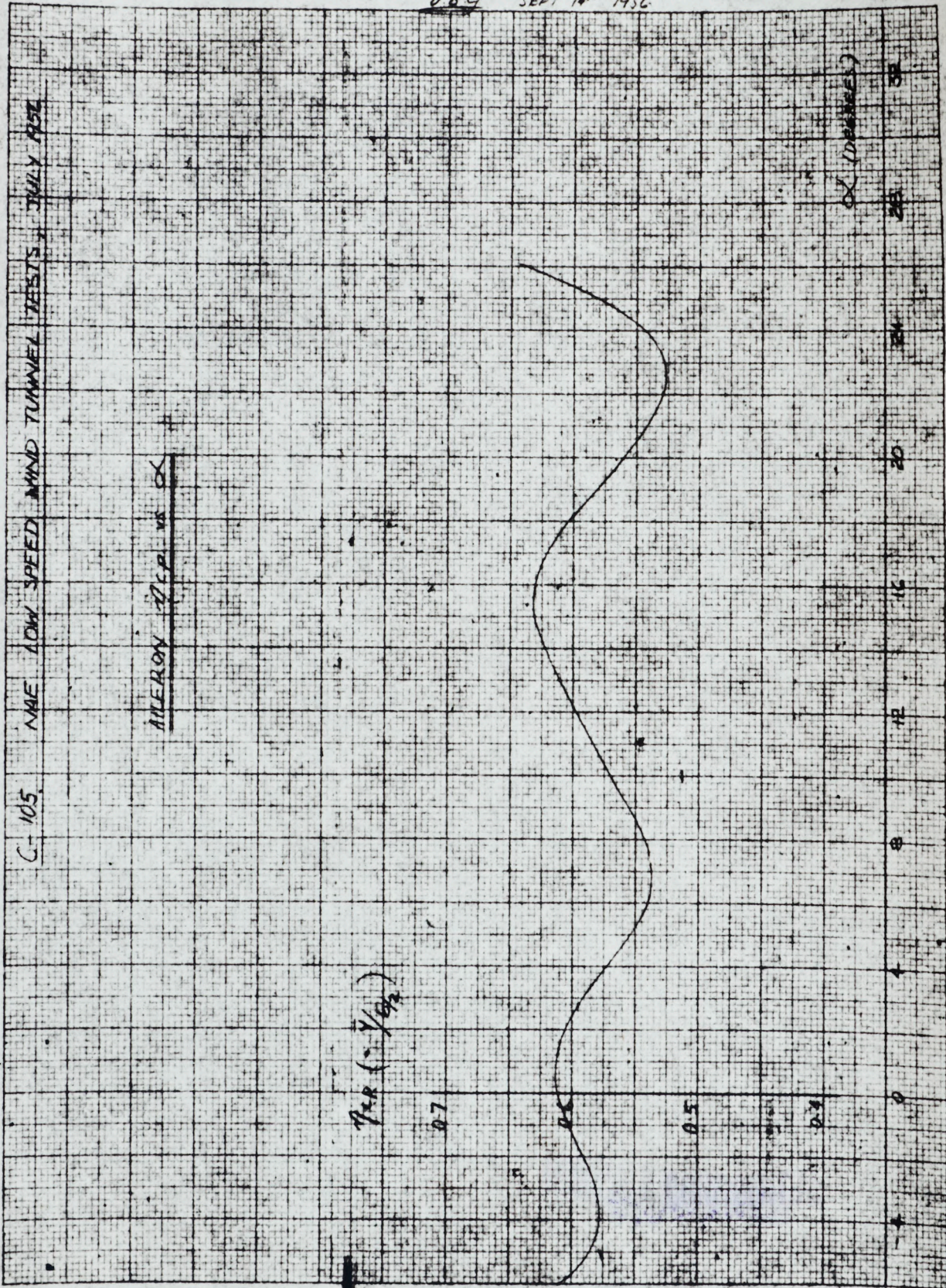
200

225

250

DBG SEPT 19th 1956

37



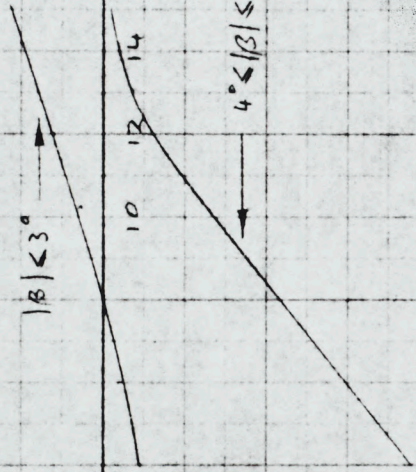
C-105
N.A.E. LOW SPEED W/T TESTS (MAY 1956)

Comp. P/F TO U/C VS α

$\Delta C_{N\beta}$ PER DEG

1.0002
1.0001
1.0000
-.0001
-.0002
-.0003
-.0004

2 10 12 14 16 18 α°



C.G. @ .3128" ABOVE F.D.

UNCLASSIFIED

EUGENE DIEZGEN CO.

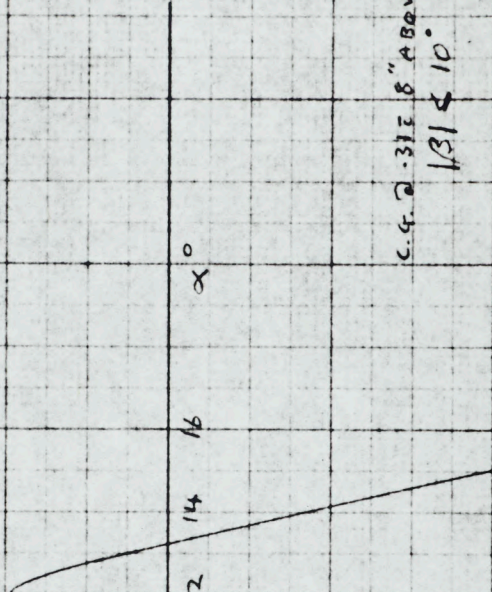
NO. 340R 20 DIETZGEN GRAPH PAPER
20 X 20 PER INCH

C-105
N.A.E. LOW SPEED W/T TESTS (MAY 1956)
C_B DUE TO U/C vs α

D C_B
PER DEG

+0.0003
+0.0002
+0.0001
-0.0001
-0.0002
-0.0003
-0.0004
-0.0005

2 8 10 12 14 16 α°



C.G. 2.31E 8" ABOVE F.D.
131 & 10"

UNCLASSIFIED

P/WT/129.

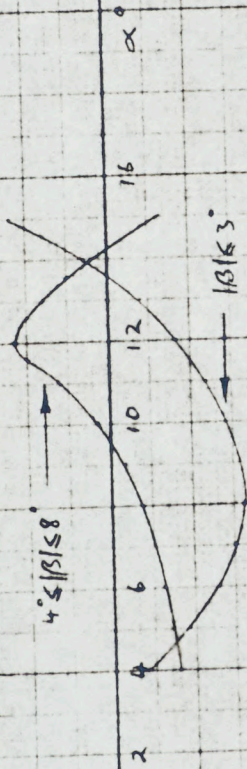
C-105

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

$C_{T/B}$ DUE TO U/C vs α

$\Delta C_{T/B}$ PER DEG

1.001



1.001

C. 4 @ .312 8" ABOVE F.D.

UNCLASSIFIED



DUO TANG
NO. 1533
MADE IN U.S.A.