

QC
Auro
C-105
P/WT/31

QCX
Auro
CF105
P-WT-31
⑥

FILE IN VAULT

C-105 P/Wind Tunnel/3
~~SECRET~~
STABILITY DERIVATIVES
UNCLASSIFIED 7 JUN 1954 ANALYZED
C.A.L. WIND TUNNEL
JUNE 1954
COMPARISON WITH ESTIMATES

UNCLASSIFIED / NON CLASSIFIÉ
SECRET
UNCLASSIFIED

ANALYZED



National Research Council
Canada
C.I.S.T.I.
Aeronautical and
Mechanical
Engineering Library

Conseil national de recherches
Canada
I.C.I.S.T.
Bibliothèque
d'aéronautique
et de génie mécanique

TO

DATE

Report no.: QCX - AVRO - CF105 - P-WT-31

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



45118

12417355



UNCLASSIFIED / NON CLASSIFIÉ

UNCLASSIFIED

A. V. ROE CANADA LIMITED
MALTON - ONTARIO

TECHNICAL DEPARTMENT (Aircraft)

AIRCRAFT: C 105

REPORT NO. P/WT/31

FILE NO:

NO OF SHEETS: _____

TITLE:

LONGITUDINAL AND LATERAL STABILITY DERIVATIVES

EXTRAPOLATED TO M = 2.0

Comparison of theoretical estimates with C.A.L.
Wind Tunnel Tests.

JUNE 1954

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 S. Kwiatkowski DATE Sept. 1954

CHECKED BY _____ DATE _____

SUPERVISED BY _____ DATE _____

APPROVED BY _____ DATE _____

ISSUE NO	REVISION NO	REVISED BY	APPROVED BY	DATE	REMARKS

TECHNICAL DEPARTMENT (Aircraft)

REPORT NO. P/WT/31

SHEET NO. 1

AIRCRAFT:

C 105

UNCLASSIFIED / NON CLASSIFIÉ

PREPARED BY

DATE

S. Kwiatkowski

Sept. 1954

CHECKED BY

DATE

INDEX

LONGITUDINAL STABILITY

1. Lift

$C_{L\dot{\alpha}}$ 1.1

α_0 1.2

2. Pitching Moment

a.c. 2.1

C_{M_0} 2.2

LATERAL STABILITY

3. Sideslip Derivatives (Tail on & Off)

$C_{n\beta}$ 3.1

$C_{l\beta}$ 3.2

$C_{y\beta}$ 3.3

4. Rudder Derivatives

$C_{n\delta_r}$ 4.1

$C_{l\delta_r}$ 4.2

$C_{y\delta_r}$ 4.3

AIRCRAFT:

C 105

UNCLASSIFIED / NON CLASSIFIÉ

PREPARED BY

DATE

S. Kwiatkowski

Sept. 1954

CHECKED BY

DATE

5. Vertical Tail Effectiveness

$a_{1(v)}$	5.1
a.c.(v)	5.2
$\eta_{a.c.(v)}$	5.3

6. Rudder Effectiveness

a_2	6.1
c_p	6.2
η_{c_p}	6.3

HINGE MOMENTS

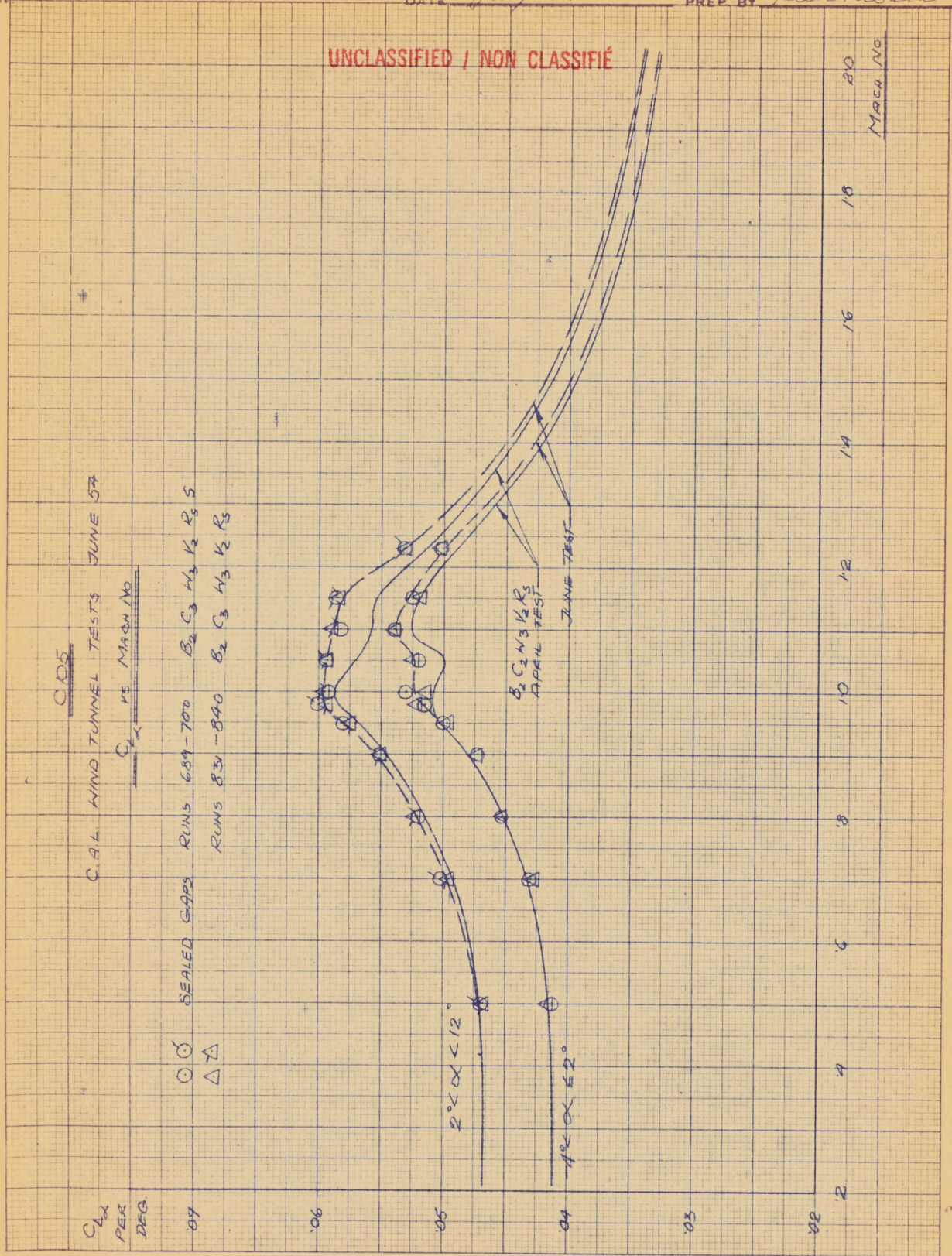
7. Elevator

C_{H_0}	7.1
$C_{H_0(\delta_e)}$	7.2
$C_{H_{e\beta}}$	7.3

8. Rudder

C_{H_β}	8.1
$C_{H_{\delta_r}}$	8.2

UNCLASSIFIED / NON CLASSIFIÉ



45913 KEDUFFEL & ESSER CO
10-10 10 IN. X 10 IN. 5000 PSI ALUM. ASS'Y.
MADE IN U.S.A.

UNCLASSIFIED / NON CLASSIFÉ

C105
S.A.L. WIND TUNNEL TESTS JUNE STA.

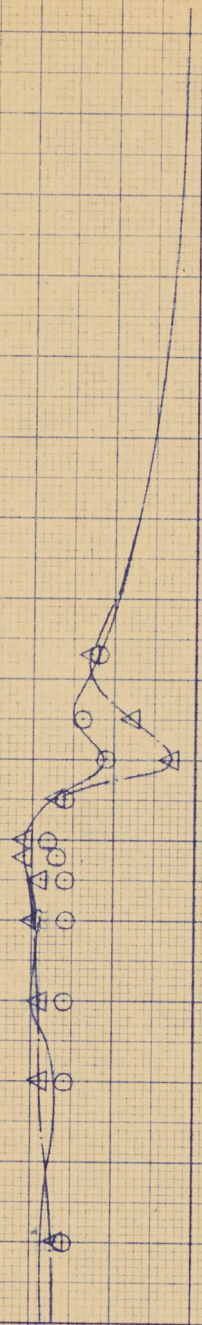
α_0 15 MACH No

○ RUNS 689-700
△ 1-331 - BAD
SERIAL GAPS
B₂ C₃ W₃ V₂ R₃
B₂ C₂ W₃ V₂ R₃

α_0
 α_0
10

210
MACH No

6 8 10 12 14 16 18



UNCLASSIFIED / NON CLASSIFIÉ

C105
C.A.L. WIND TUNNEL TESTS JUNE 52

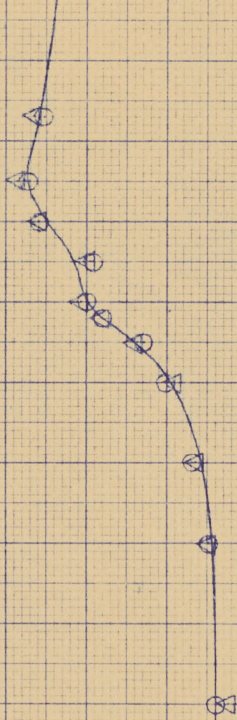
AERODYNAMIC CENTRE

A.C.
% MAC

$B_2 C_2 A_3 V_2 R_3$	APRIL TEST	RUNS	780, 781, 831 - BAD
$B_2 C_3 A_3 V_2 R_3$	JUNE TEST	RUNS	689 - 700 SEALED GAPS
$B_2 C_3 A_3 V_2 R_3 S$	" "		

60 50 40 30 20 10 8 6 4

18 16 14 12 10 8 6 4
MACH No.



UNCLASSIFIED / NON CLASSIFIED

C105
C.A.L. WIND TUNNEL TESTS

JUNE 57

C_{M0} vs MACH No

$B_2 C_2 W_2 R_2 S$

$B_2 C_3 W_3 R_3 S$

$B_2 C_3 W_3 R_3 S_2$

APRIL TEST ; ALL CONTROL SURFACES OPEN.

JUNE TEST ; MODIFIED INTAKES & CANOPY ; ONE WING SEALED

JUNE TEST ; --- ; BOTH WINGS & RUDDER SEALED

C_{M0}

0.5

0.2

0.1

0

0.4

0.6

0.8

1.0

1.2

1.4

1.6

1.8

2.0

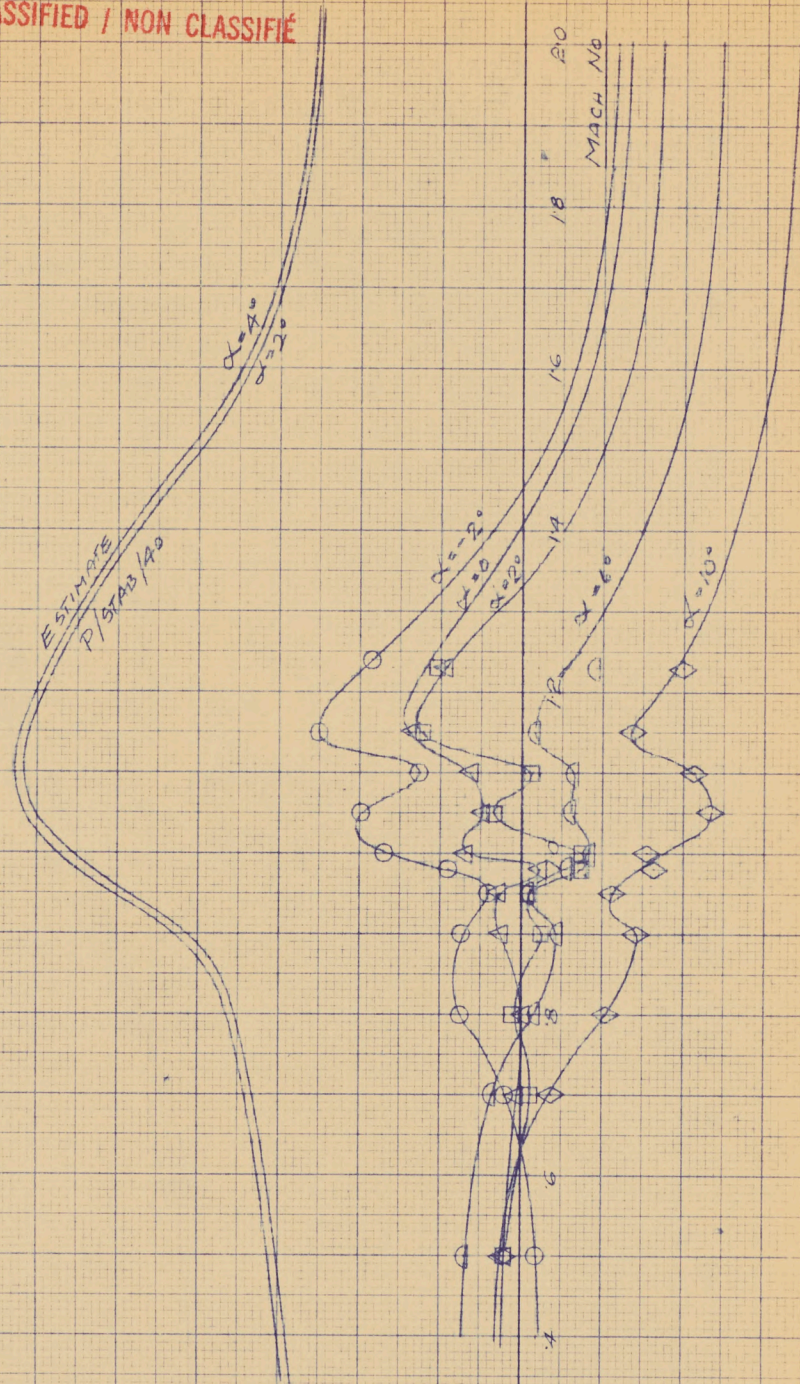
MARCH No

PO

UNCLASSIFIED / NON CLASSIFIÉ

C105
CAL WIND TUNNEL TESTS JUNE 54.

CN 13 MACH No
P/B₂ C₃ A₃ V₂ R₂
-2° < β < 2°
C.G. = 28 E



CN₃
PER DEG
0.004
0.002
0.000
0.008
0.016
0.024
0.032
0
-0.004
-0.008
-0.016

459412 - 510 FEEL & ESS 64 210
10. C 10 to the 3 inch 5th inch accuracy
MADE IN U.S.A.

UNCLASSIFIED / NON CLASSIFÉ

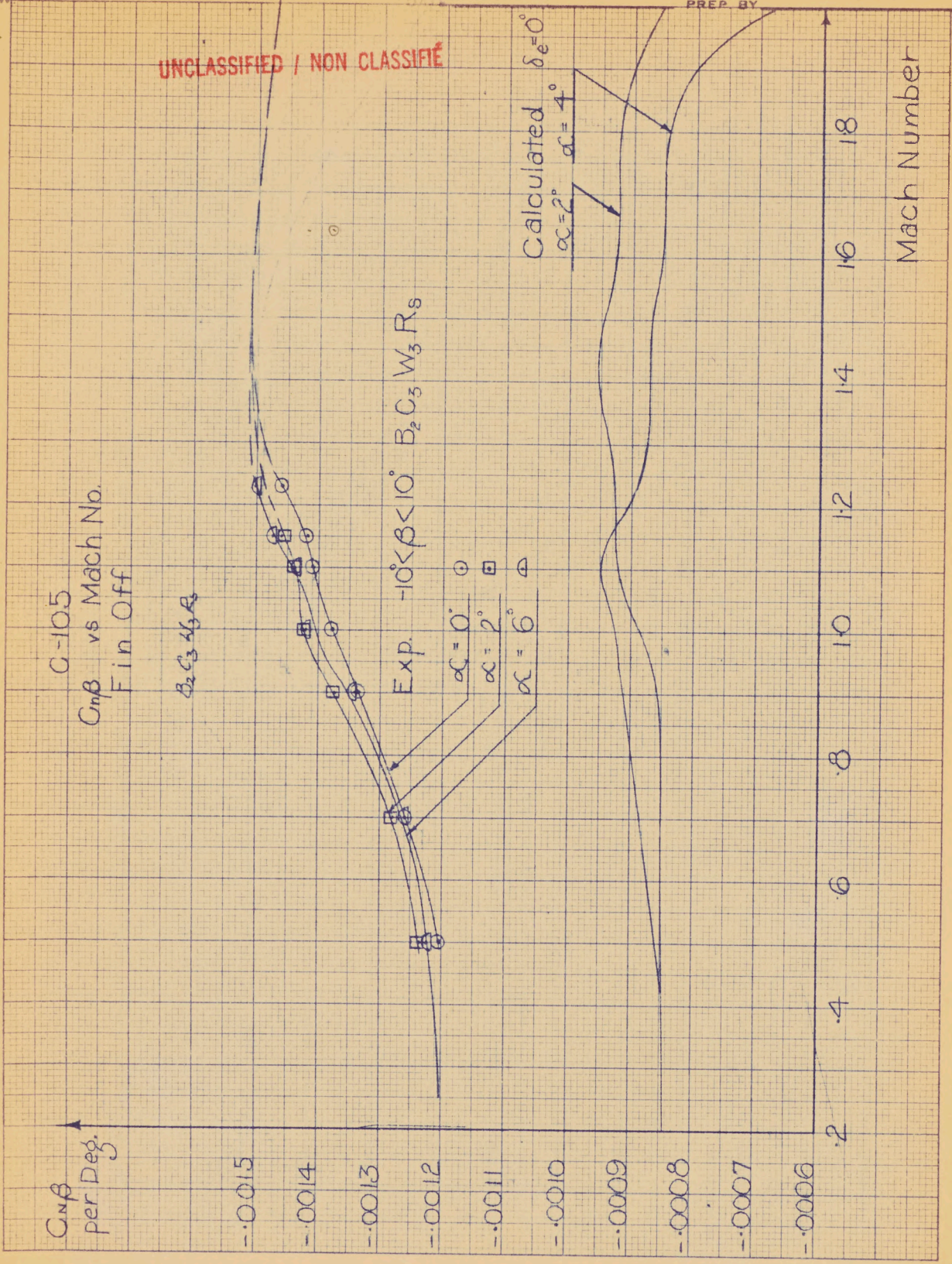
C-105
 $C_{n\beta}$ vs Mach No.
 Fin Off

$B_2 C_3 W_3 R_8$

Exp. $-10^\circ < \beta < 10^\circ$ $B_2 C_3 W_3 R_8$

$\alpha = 0^\circ$ ○
 $\alpha = 2^\circ$ □
 $\alpha = 6^\circ$ △

Calculated $\delta e = 0^\circ$
 $\alpha = 2^\circ$ / $\alpha = 4^\circ$



959-12 KEUFFEL & ESSER CO.
 10 x 10 to 10 x 15 inch, 5th class accuracy.
 MADE IN U.S.A.

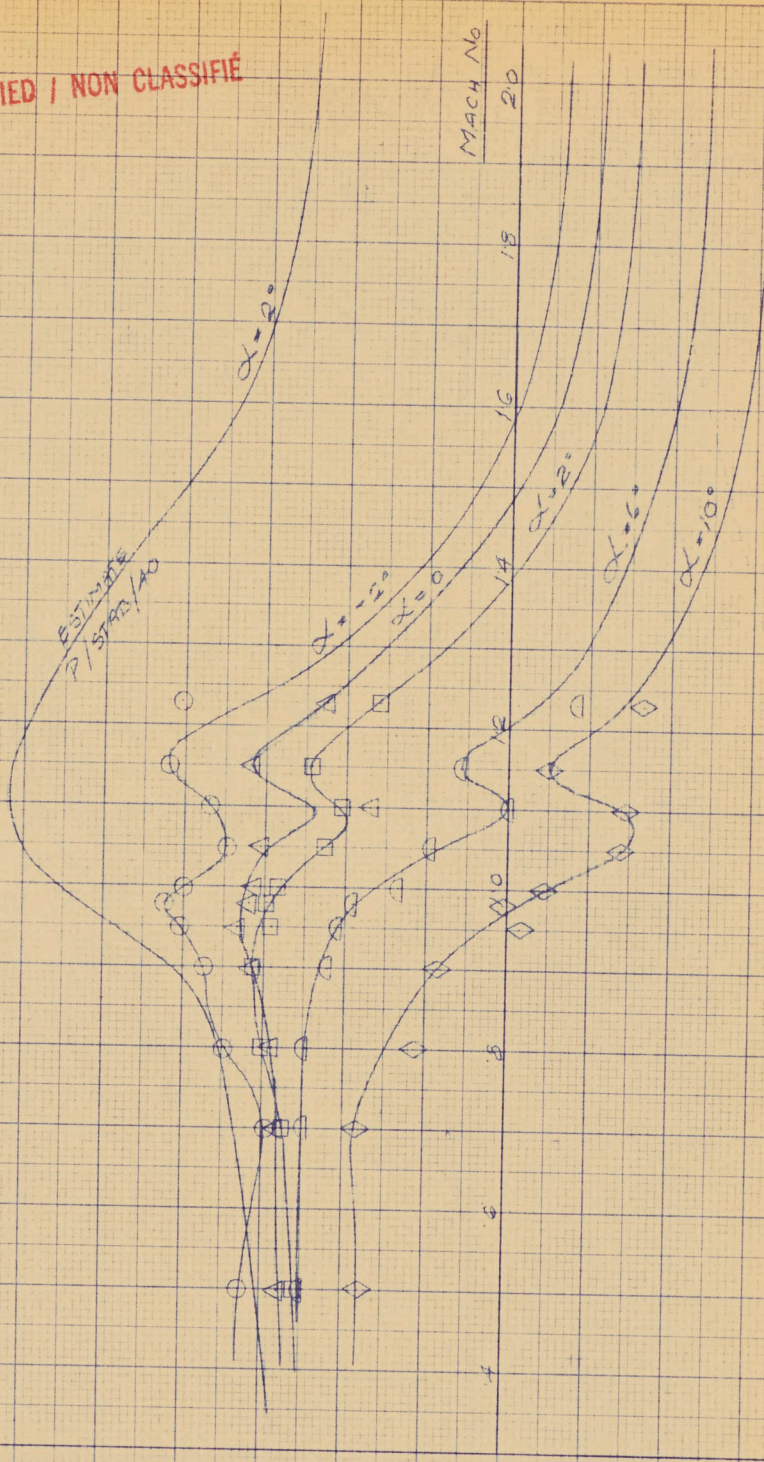
UNCLASSIFIED / NON CLASSIFIED

C105
CAL WIND TUNNEL TESTS June 52
C_{N3} VS MACH No
B₂C₃A₃K₃R₃
2° < β < 4°
C.G. = 28.2

C_{N3}
PER DEG

0002
0004
0006
0008
0010
0012
0014
0016
0018
0020

MACH No
20
15
16
14
12



UNCLASSIFIED / NON CLASSIFIE

C 105
 $C_{m\beta}$ vs Mach No.
 Fin Off

$B_2 C_3 W_3 R_s$

Exp. $-\dot{\beta} < \beta < 2^\circ$ $B_2 C_3 W_3 R_s$

$\alpha = 0^\circ$
 $\alpha = 2^\circ$
 $\alpha = 6^\circ$

Calculated $\delta_e = 0^\circ$
 $\alpha = 2^\circ$ $\alpha = 4^\circ$

$C_{m\beta}$
 per
 Degree

-0.0015
 -0.0014
 -0.0013
 -0.0012
 -0.0011
 -0.0010
 -0.0009
 -0.0008
 -0.0007
 -0.0006

0.2

0.4

0.6

0.8

1.0

1.2

1.4

1.6

1.8

Mach Number

C105.

UNCLASSIFIED / NON CLASSIFIÉ

3.2.1

P/W.T./31

ref. / 54.

Kurathowski

KEE 10 X 10 TO THE 1/2 INCH 359-12
KEUFFEL & ESSER CO. MADE IN U.S.A.

C105
CAL WIND TUNNEL TESTS JUNE 54
B₂C₃ H₃ K₂ B₃
C₁ P₁ M₁

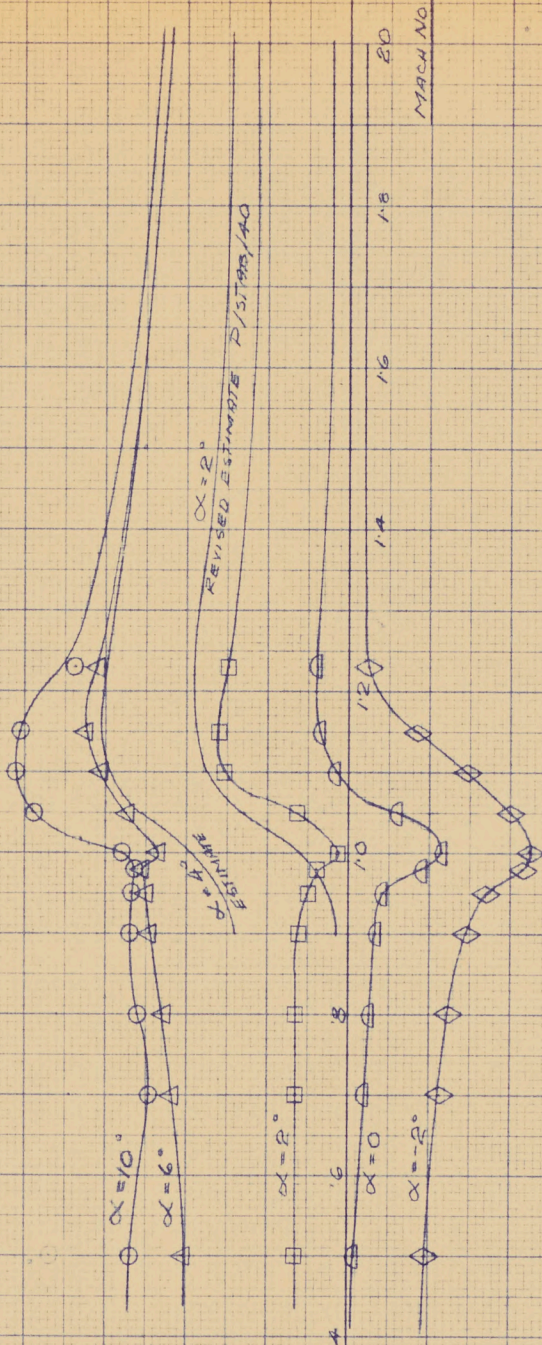
C₁ P₁
PER DEG.

-0030

-0020

-0010

+0010



MARCH NO.

C105

32.2. P/HT/31

oct/54. Kuvakhov

UNCLASSIFIED / NON CLASSIFÉ

C105
 S.A.L. WIND TUNNEL TESTS JUNE 57
 BR 3 AGR
 C_D'S MACH No
 TAIL OFF

C_D
 PER DEG
 TAIL OFF
 -0006
 -0004
 -0002
 -0000
 +0002
 +0004

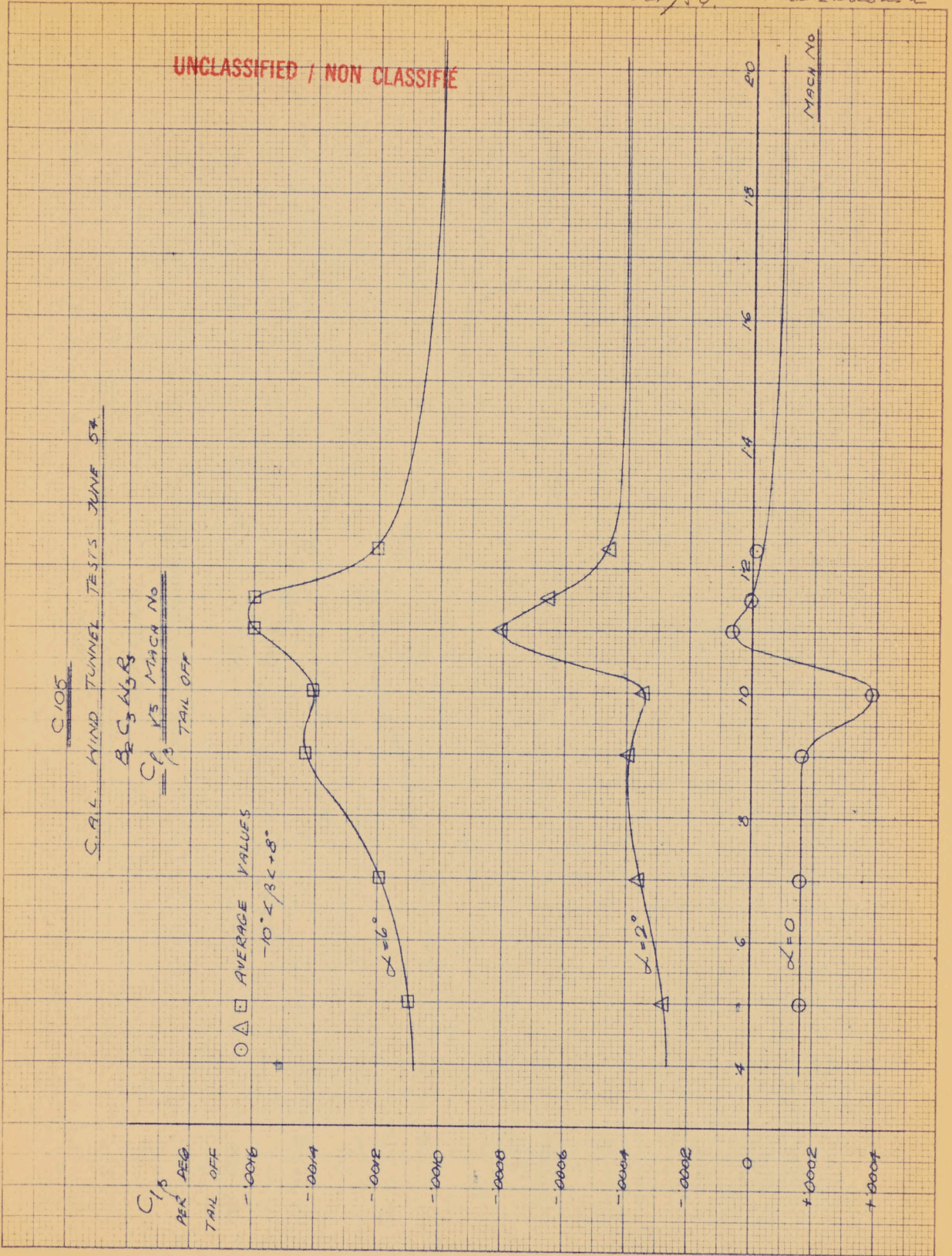
○ △ □ AVERAGE VALUES

-10° β \pm 8°

$\alpha = 6^\circ$

$\alpha = 2^\circ$

$\alpha = 0$



UNCLASSIFIED / NON CLASSIFIED

C105
C.A.L. KIND TUNNEL TESTS JAN 54
A. S. M. K. R.
C. Y. 13 Mach No

$C_{1/2}$
PER DEG

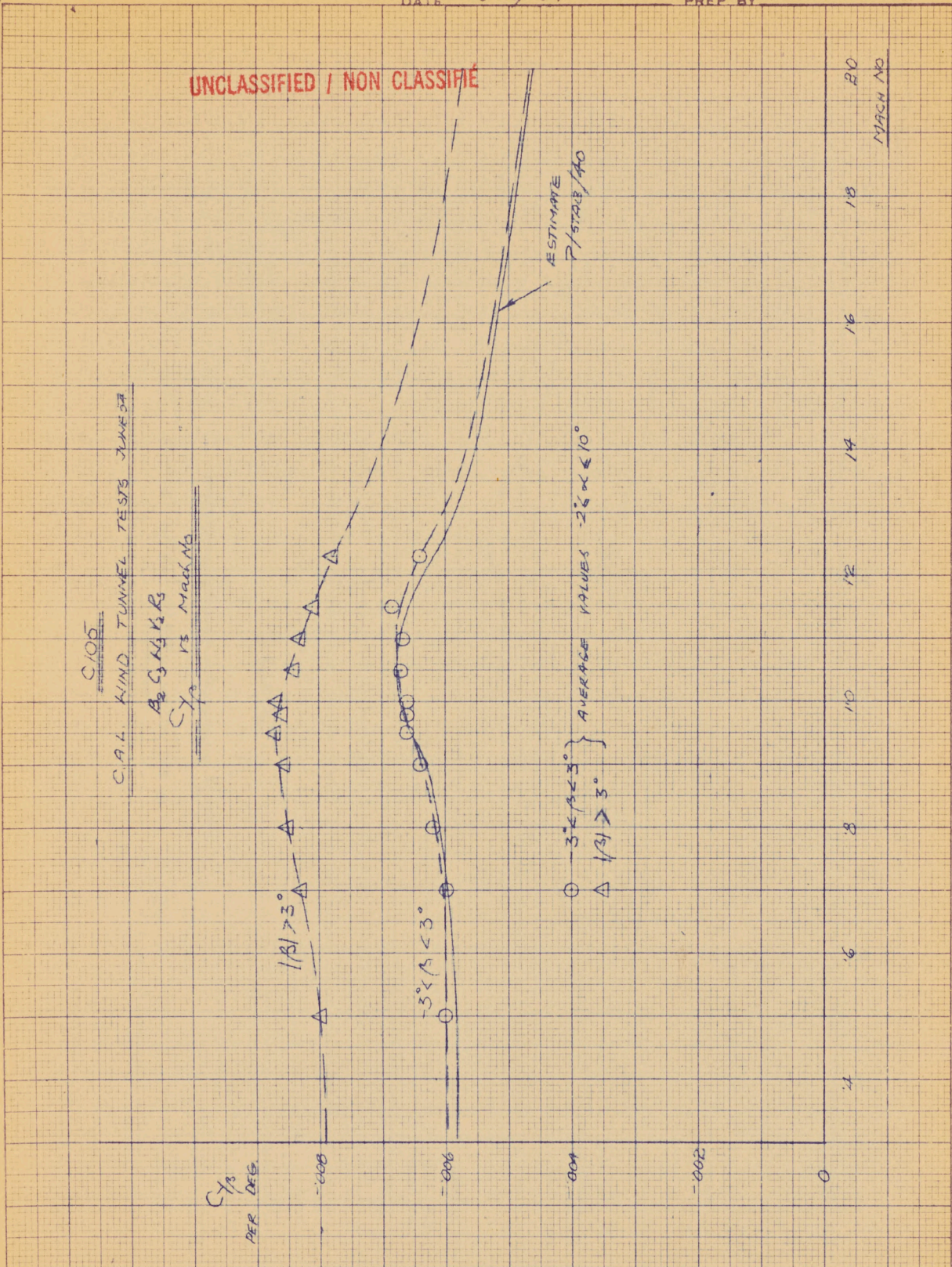
$1/21 > 3^\circ$

$-3^\circ < 1/21$

$3^\circ < 1/21 < 3^\circ$
 $1/21 > 3^\circ$

AVERAGE VALUES $-2^\circ < \alpha < 10^\circ$

ESTIMATE
P/STAB/MO



20
MACH NO

14

12

10

8

6

4

0

FORM 12, AUGUST 1953 EDITION
10 X 10 IN. GRID AND INCS. ACCURATE
MADE IN U.S.A.

UNCLASSIFIED / NON CLASSIFIÉ

C105
C.A.A. WIND TUNNEL TESTS JUNE 54
CY₃ TAIL OFF VS MASH No
B₂ S₂ A₂ K

CY₃
PER DEG
TAIL OFF
-003

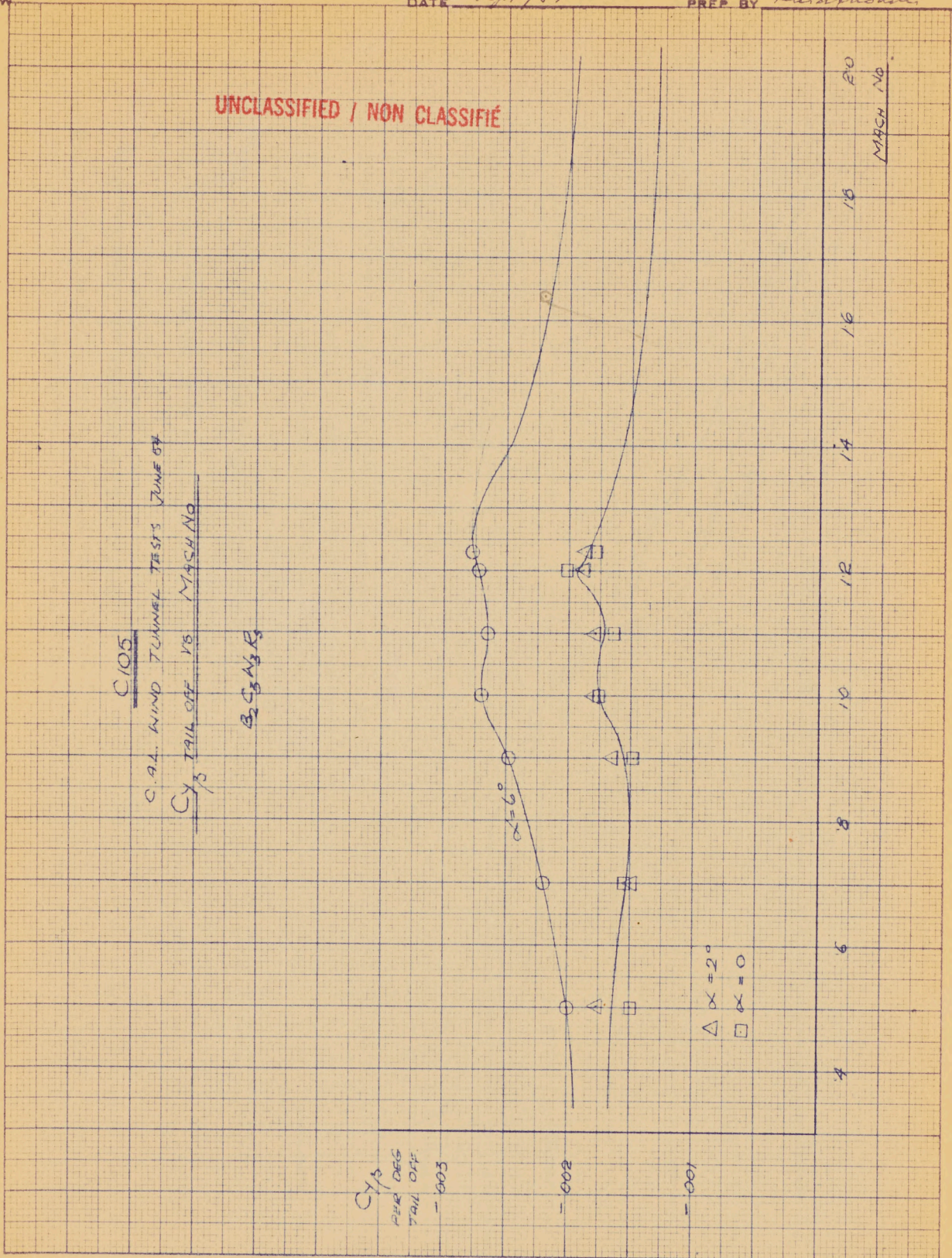
-002

-001

△ α = 2°
□ α = 0

α = 6°

4 6 8 10 12 14 16 18 20
MASH No



UNCLASSIFIED / NON CLASSIFIED

C-105
C.A.L. Wind Tunnel Tests, June 1954

Rudder Effectiveness vs. Mach No.

δ_r Outside $\pm 10^\circ$

$\beta = 0^\circ$

$C_G = .312$

$B_2 C_3 \frac{1}{2} K_2$

CN_{δr}

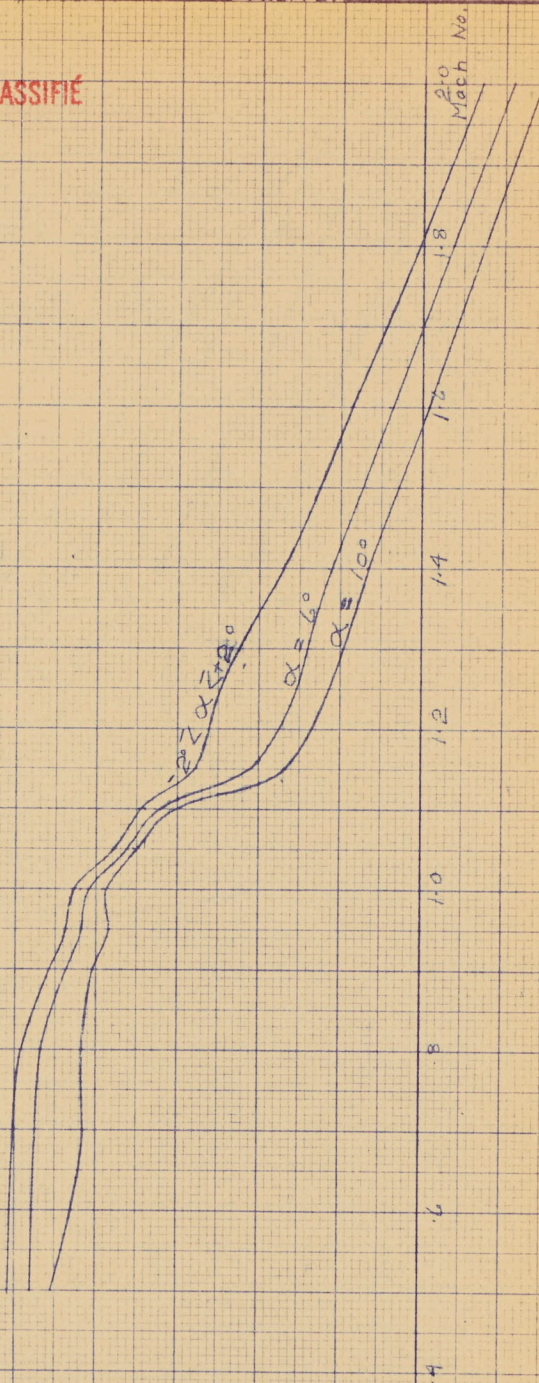
-.0007

-.0006

-.0005

-.0004

-.0003



C-105
C.A.L. Wind Tunnel Tests, June 1954
Rudder Effectiveness vs. Mach No.

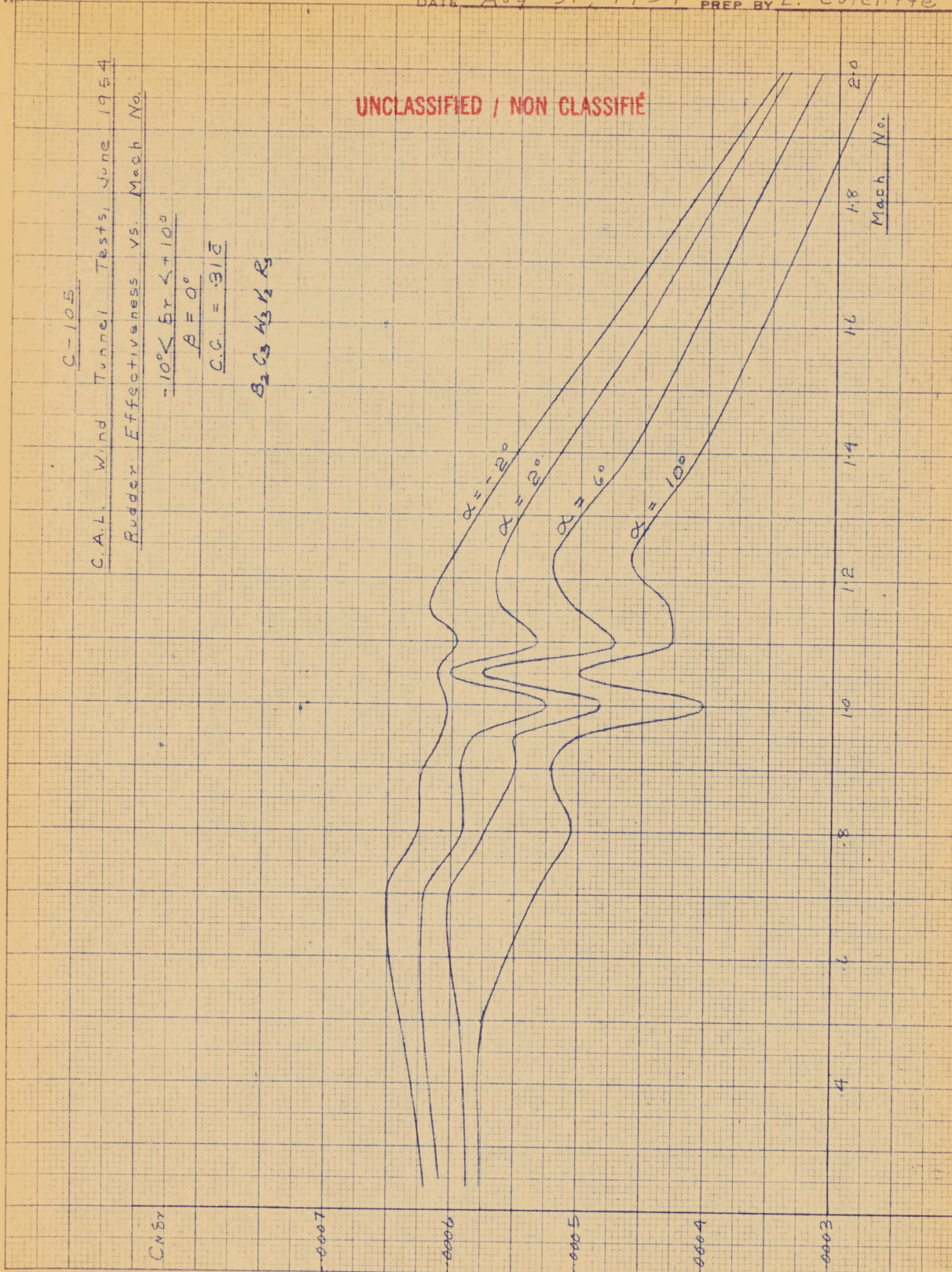
$-10^\circ < \delta r < +10^\circ$

$\beta = 0^\circ$

C.G. = .312

$B_2 C_3 N_3 \frac{1}{2} R$

UNCLASSIFIED / NON CLASSIFIÉ



UNCLASSIFIED / NON CLASSIFIÉ

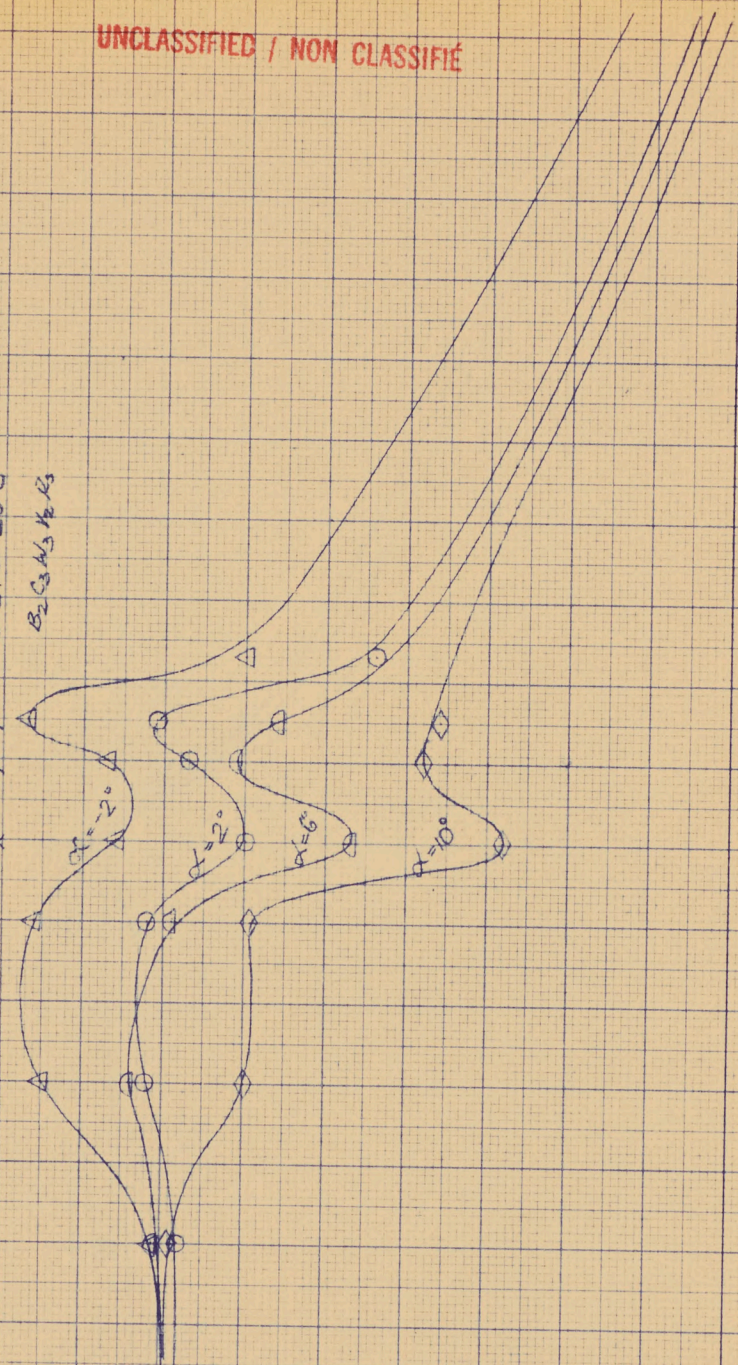
C105
C.A.L. WIND TUNNEL TESTS JUNE 57

RUDDER EFFECTIVENESS VS MACH No
 $\beta = -3^\circ$
 $\alpha_r < 10^\circ$
 C.G. = .28 \bar{c}
 B_2, C_3, M_3, R_3

$C_{N\delta_r}$

-0007
-0006
-0005
-0004
-0003

MACH No
4 5 6 8 10 12 14 16 18 20



UNCLASSIFIED / NON CLASSIFIÉ

C105
CAL HIND TUNNEL TESTS JUNE 57

RUDDER EFFECTIVENESS VS MACH NO

$\beta = 30$

$\epsilon_2 > 10^\circ$

C.G. = 28.5

$\beta_2 = 1/2 \beta$

$\alpha = 0^\circ$
 -2°
 2°
 6°
 10°

5000

-0006

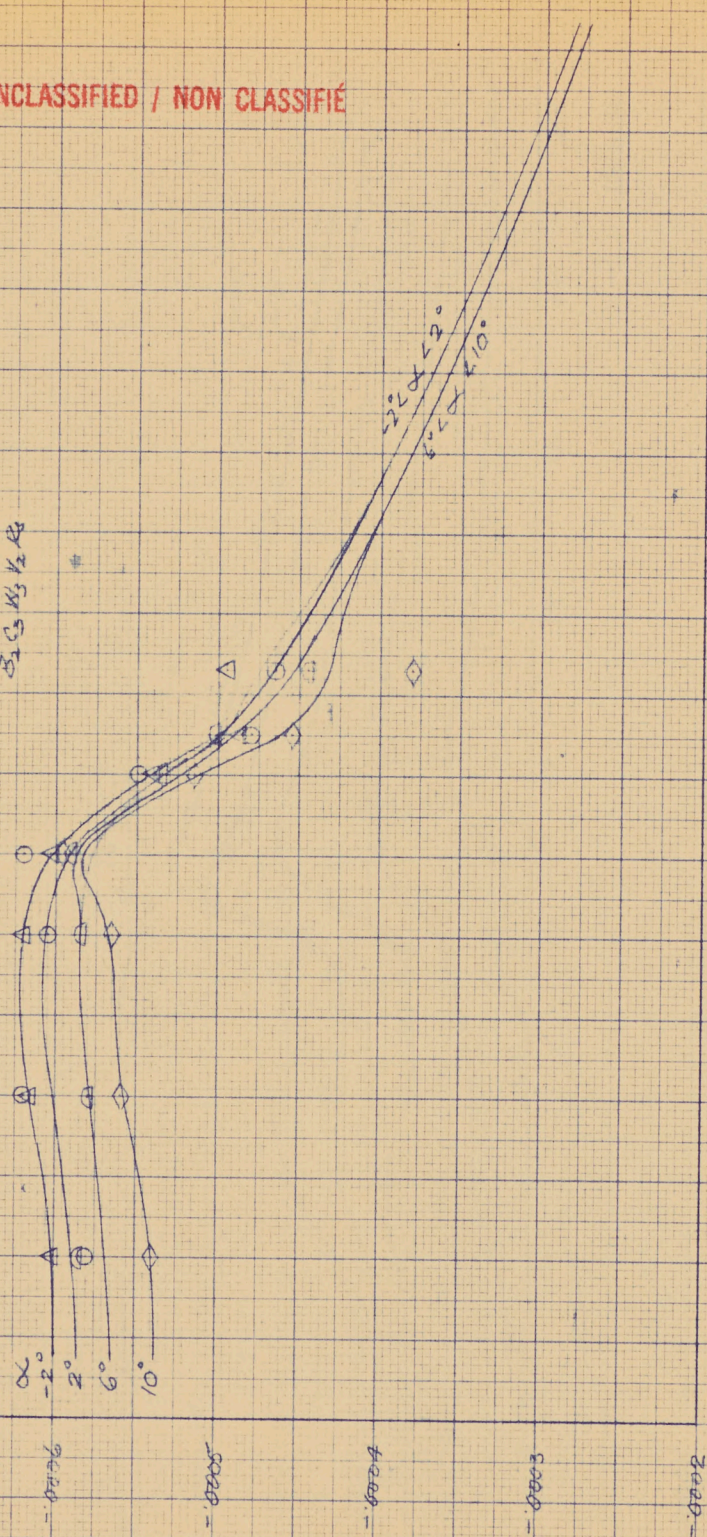
-0005

-0004

-0003

-0002

Mach No
18
19
20

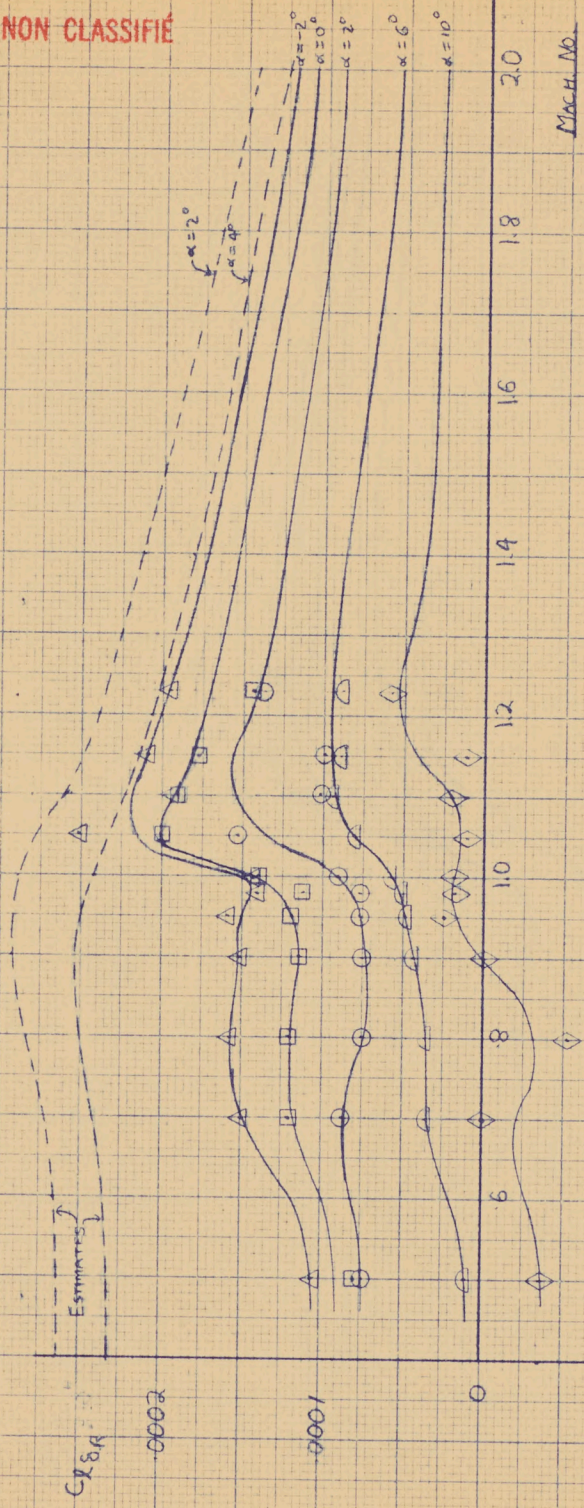


UNCLASSIFIED / NON CLASSIFIÉ

C-105
CAL. WIND TUNNEL TESTS JUNE 1954

C_{LR} VS MACH No.
 $\beta = 0$

B_2, B_3, B_4, B_5



Mach No.

C_{LR}

0.001

UNCLASSIFIED / NON CLASSIFIÉ

G-105
CAL. WIND TUNNEL TESTS JUNE 54

C_{DR} vs. Mach No.

SR > 11091 $\beta = 0^\circ$

C_{DR} vs. $K_2 R_3$

$C_{DR} (10^4)$

ESTIMATES

0.0002

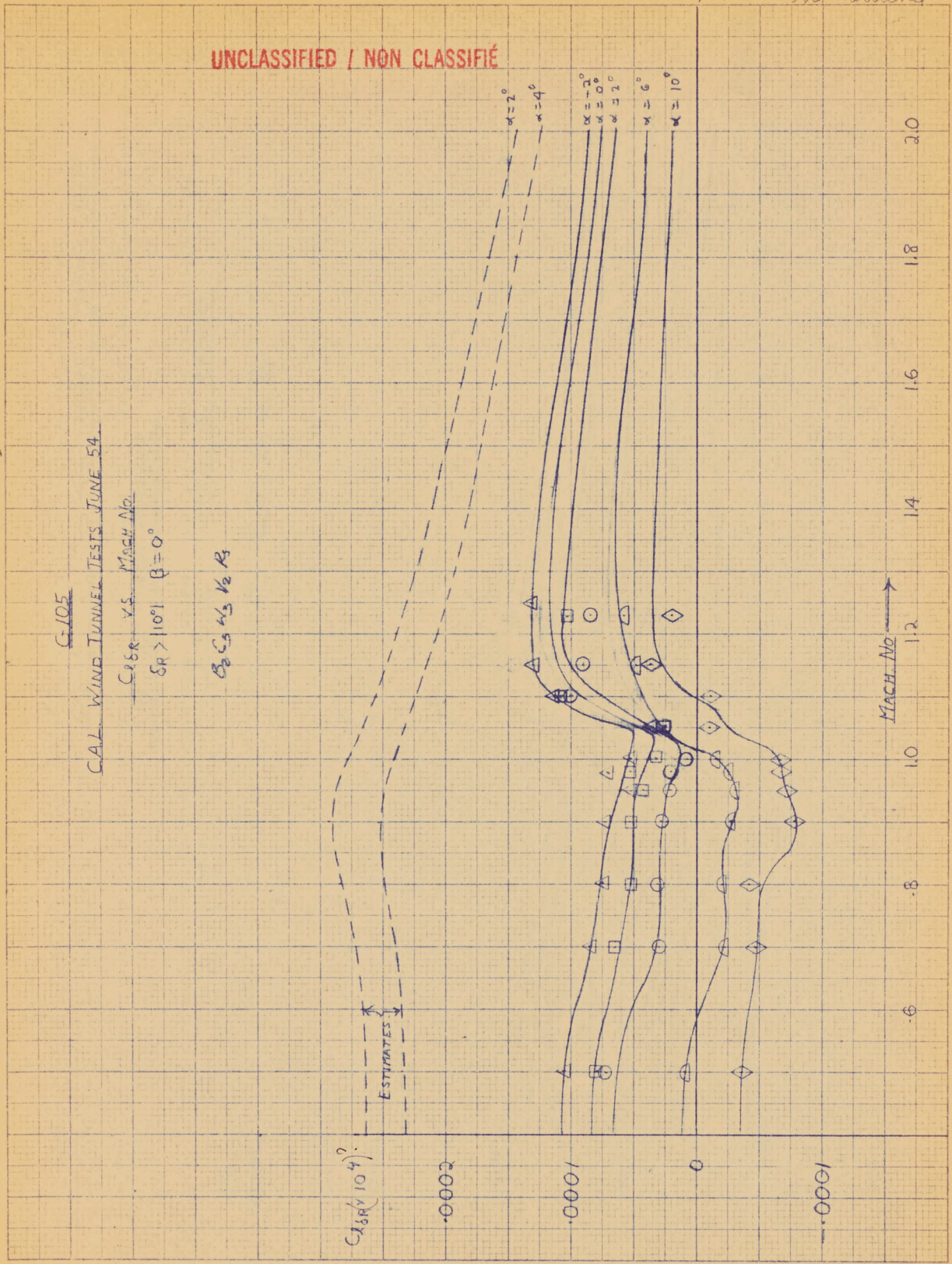
0.0001

0.0001

$\alpha = 2^\circ$
 $\alpha = 4^\circ$
 $\alpha = 6^\circ$
 $\alpha = 8^\circ$
 $\alpha = 10^\circ$
 $\alpha = 12^\circ$
 $\alpha = 10^\circ$
 $\alpha = 6^\circ$
 $\alpha = 10^\circ$

MACH. No.

0.6 0.8 1.0 1.2 1.4 1.6 1.8 2.0



UNCLASSIFIED / NON CLASSIFIÉ

C 105
 CAL HIND TUNNEL TESTS JUNE 1954

C_{fc} vs MACH NUMBER
 $\beta_0 = -3^\circ$, FULL δ_f RANGE

B₂ C₃ W₃ V₂ R₅

C_{fc}
 PER DEG.

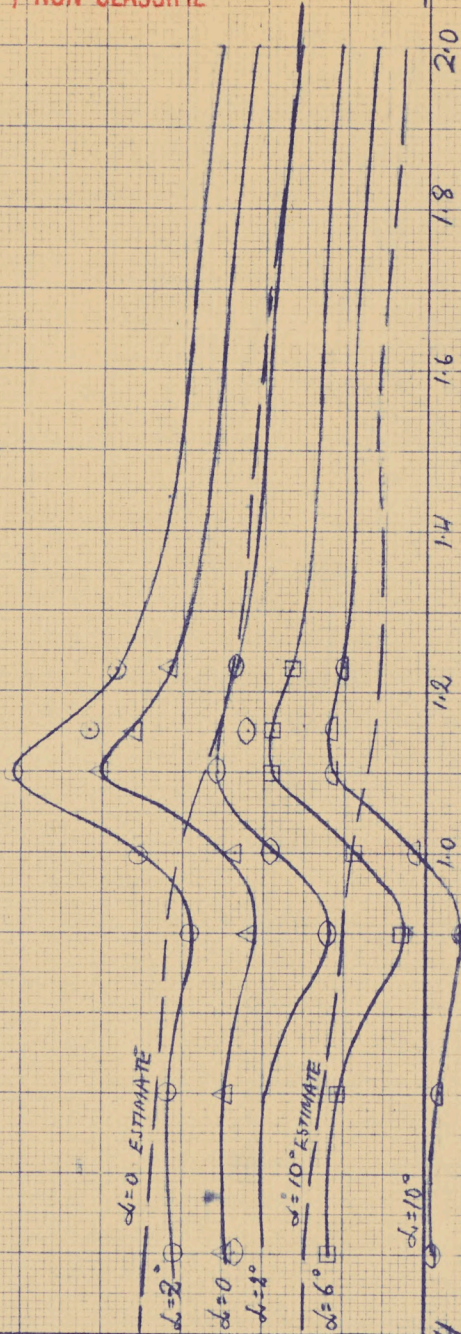
0.003

0.002

0.001

0

-0.001



UNCLASSIFIED / NON CLASSIFIED

C-105
C.A.L. Wind Tunnel Tests, June 1954

Cx Br vs. Mach No.

Conf B₂ C₂ W₃ V₂ B₅

CR INSIDE 110°

β=0

B₂ C₂ W₃ K₂ R₃

α
○ -2°
△ 0°
○ 2°
□ 6°
D 10°

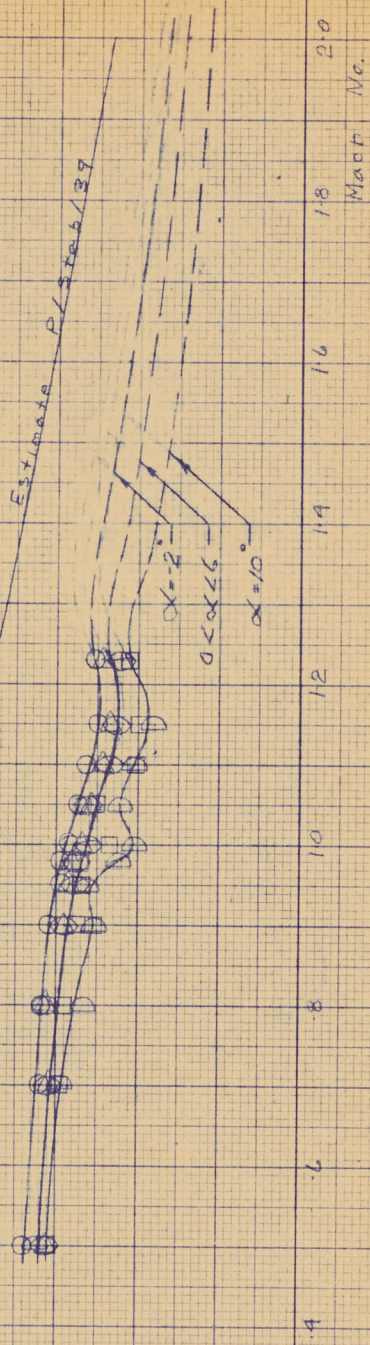
Cx Br
for degree

.003

.002

.001

0



1.8
1.6
1.4
1.2
1.0
.8
.6
.4
0

1.8
1.6
1.4
1.2
1.0
.8
.6
.4
0

1.8
1.6
1.4
1.2
1.0
.8
.6
.4
0

1.8
1.6
1.4
1.2
1.0
.8
.6
.4
0

1.8
1.6
1.4
1.2
1.0
.8
.6
.4
0

1.8
1.6
1.4
1.2
1.0
.8
.6
.4
0

1.8
1.6
1.4
1.2
1.0
.8
.6
.4
0

1.8
1.6
1.4
1.2
1.0
.8
.6
.4
0

1.8
1.6
1.4
1.2
1.0
.8
.6
.4
0

1.8
1.6
1.4
1.2
1.0
.8
.6
.4
0

UNCLASSIFIED / NON CLASSIFIÉ

C105
C.A.L. WIND TUNNEL TESTS JUNE 54

Cy₀₂ vs. MACH No.

$dR < 110^\circ$

$3x-3^\circ$

$B_0 C_3 N_3 K R$

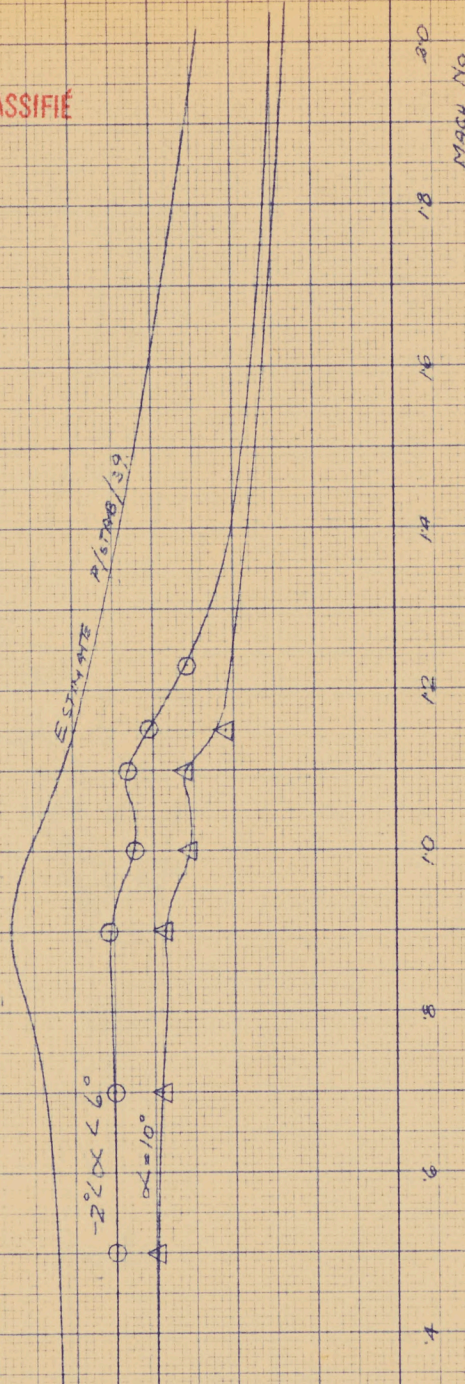
Cy₀₂
PER DEG.

003

002

001

0



MACH No.
20
18
16
14
12
10
8
6
4

UNCLASSIFIED / NON CLASSIFIÉ

C105

CAL. WIND TUNNEL TESTS JUNE '54

CIV VS. MACH No.

CONFIG. B₁ C₃ W₃ V₂ R₅

-3° < β < 3°

B₂ C₃ W₃ V₂ R₅

ESTIMATE P/CONF/37

- α = -2°
- △ α = 0°
- ◇ α = 2°
- α = 6°
- ∩ α = 10°

*CIV PER°

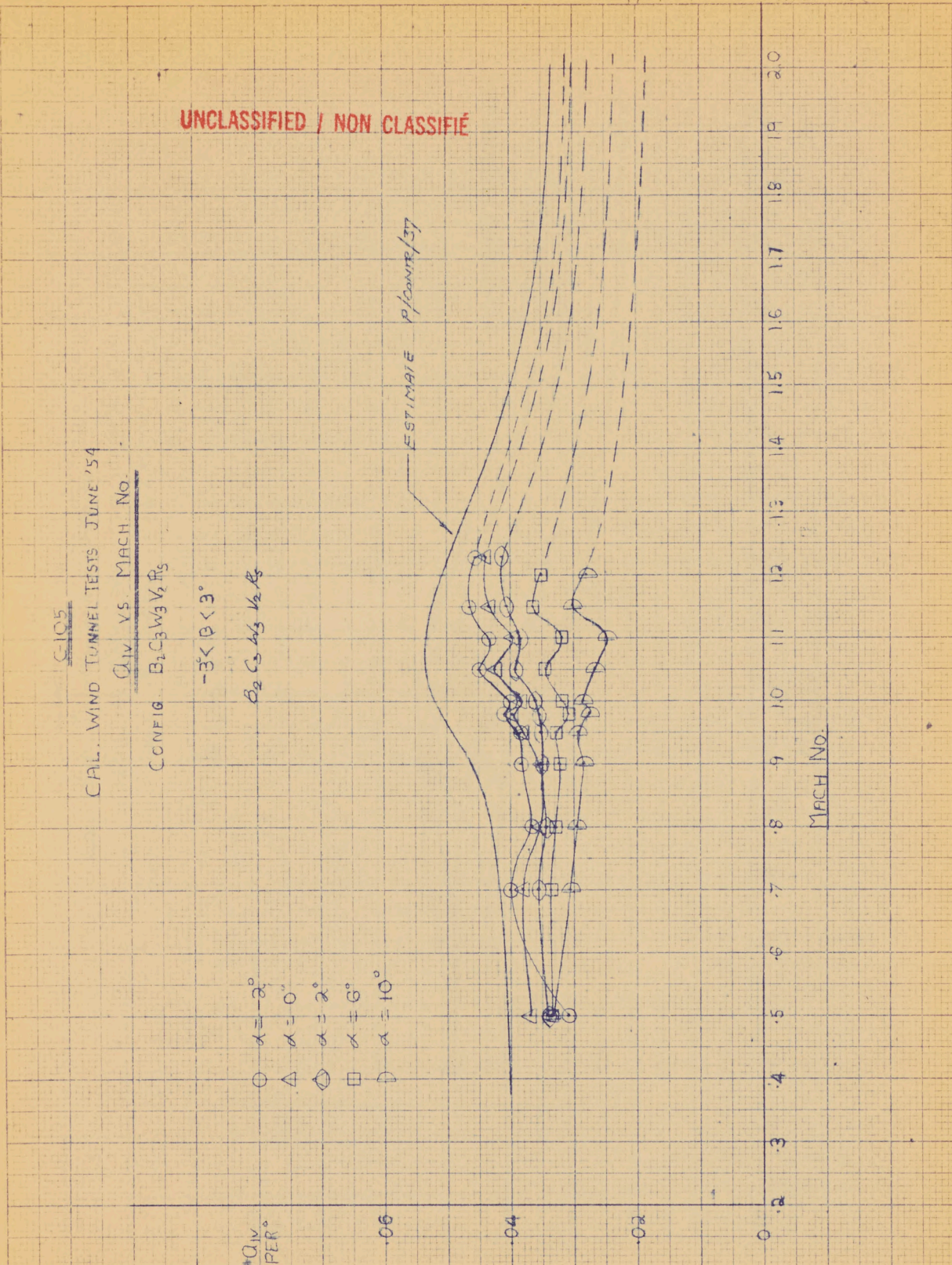
0.06

0.04

0.02

0

MACH No. 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0



UNCLASSIFIED / NON CLASSIFIÉ

C-105

CAL. WIND TUNNEL TEST - JUNE '54

Q_{IV} VS MACH NO.

CONFIG. B₁C₃W₃R₃ 10174°

B₂S₃W₃K₃

Q_{IV}
PER °

-06

-04

-02

-01

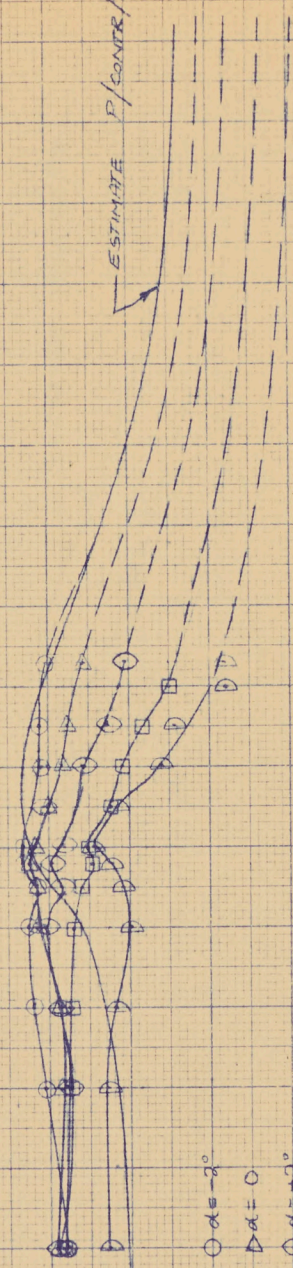
0

0 .2 .4 .6 .7 .8 .9 1.0 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2.0

MACH NO.

- α = -2°
- ▷ α = 0
- α = +2°
- α = +6°
- ◇ α = 10°

ESTIMATE P/CONF/37



P/W. 1.130
July 154

5.13
SCManshel

UNCLASSIFIED / NON CLASSIFIED

C-105

CAL. MINE TUNNEL TESTS - JUNE 54

Q_{IV} VS MARCH NO.

CONFIG. B₂ C₃ W₃ V₂ R₃ $\alpha = 2^\circ$

Q_{IV}
PER °

06

04

02

0

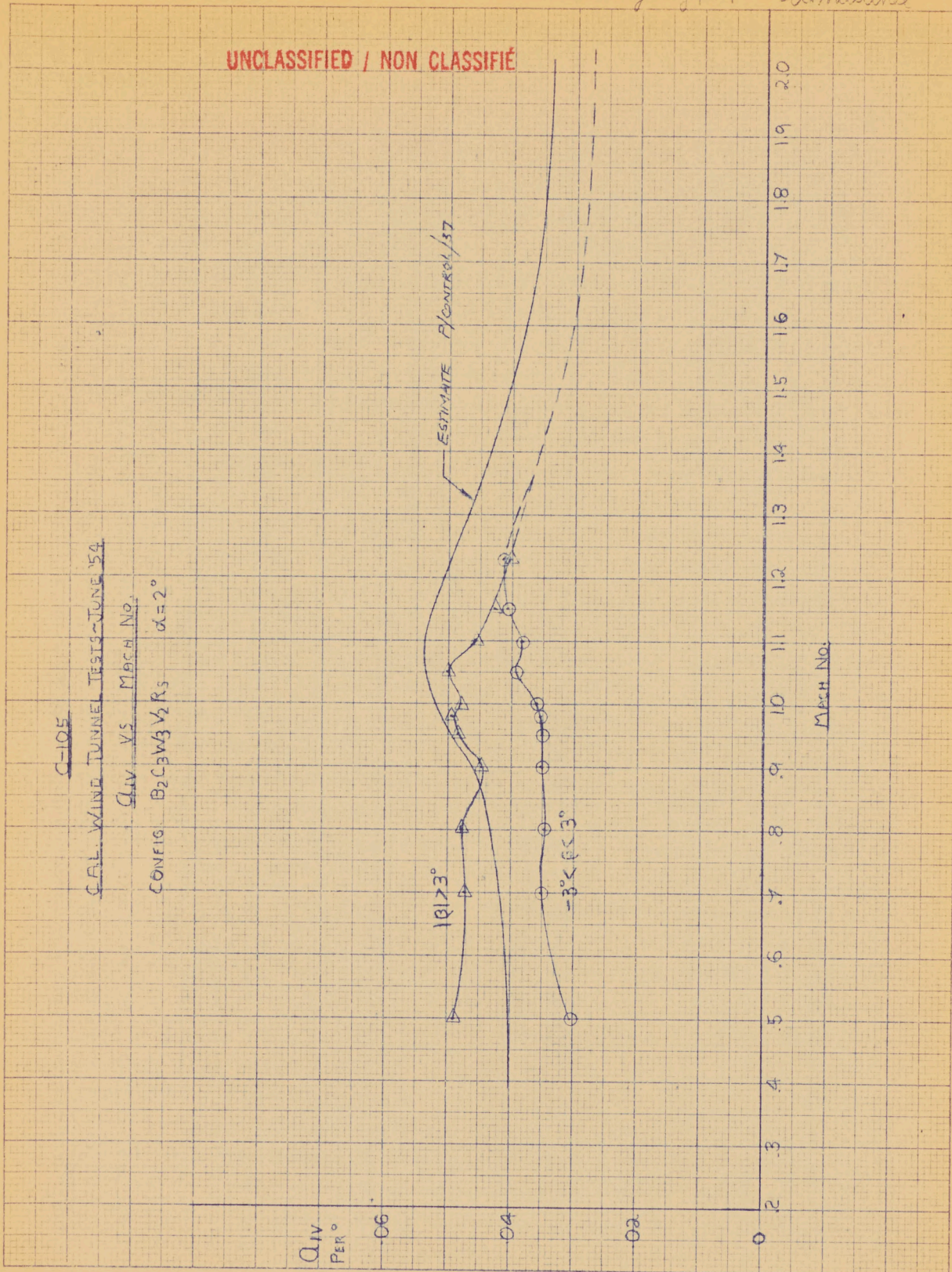
181.73°

-32.653°

ESTIMATE $P_{CONTROL}/157$

MARCH NO.

2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 2.0



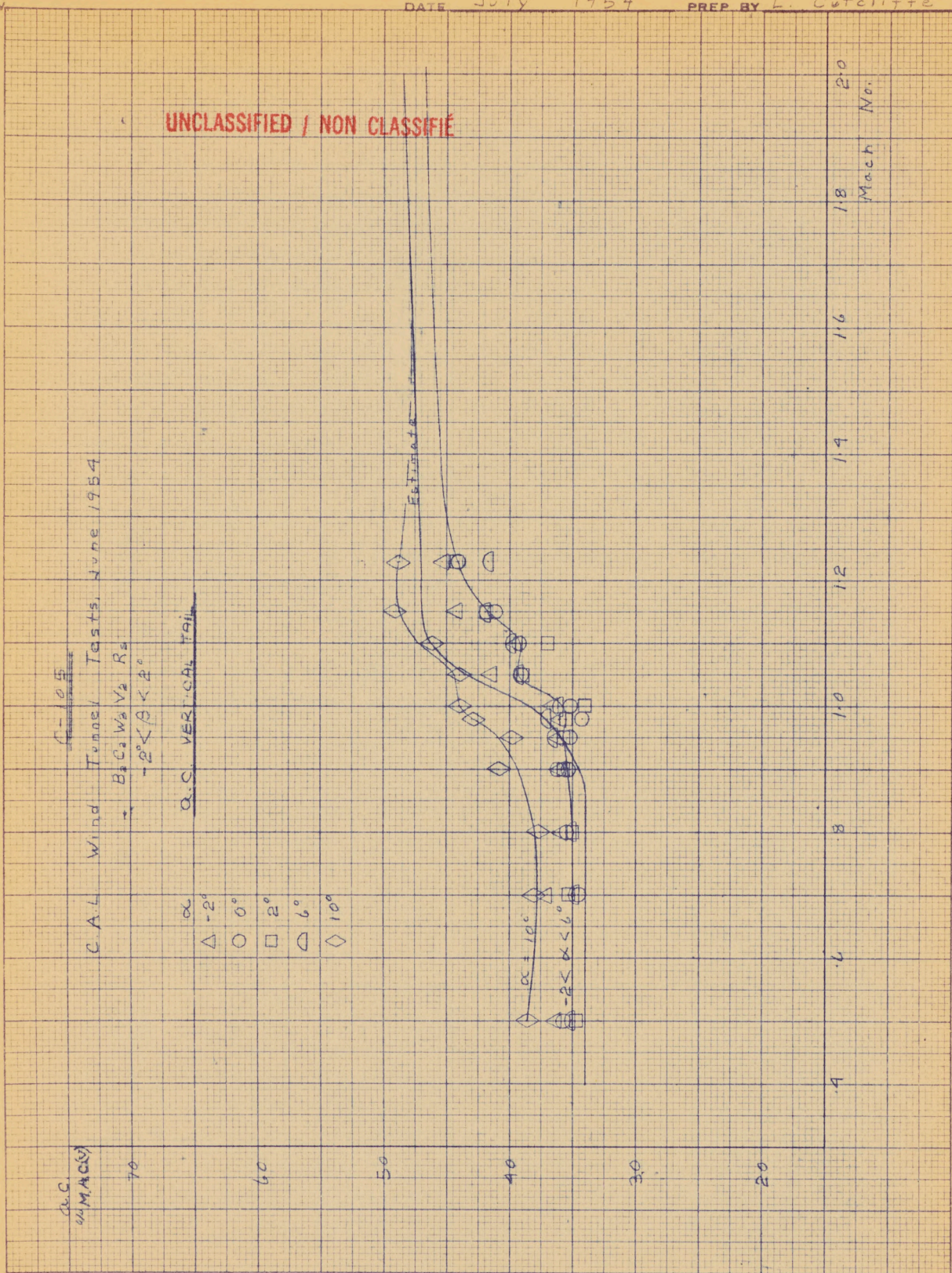
UNCLASSIFIED / NON CLASSIFIÉ

C-105
C.A.L. Wind Tunnel Tests, June 1954
B₁ C₀ W_{1/2} V₂ R_s
-2° < β < 4°

Q.C. VERTICAL TAIL

- α
- △ -2°
 - 0°
 - 2°
 - ◇ 6°
 - ◇ 10°

- α = 10°
- ◇ -2° < β < 6°



59912 - GUFFEL WESSER CO
10 X 10 1/2 IN. SHEET, 5/8" LINES ASS'Y
MADE IN U.S.A.

UNCLASSIFIED / NON CLASSIFIED

C-105
C.A.L. Wind Tunnel Tests, June, 1954
Vertical Tail a.c. vs. Mach No.
B₂C₃V₃R₅
B>#201

α
-2° Δ
0° \circ
2° \square
6° \triangleleft
10° \diamond

a.c.
%MAC(0)

70

60

50

40

30

20

10

8

6

4

2

0

-2

-4

Estimate

Mach No.
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4

UNCLASSIFIED / NON CLASSIFIÉ

C105
VERTICAL TAIL SPANWISE Q.C. POSITION
-2 x 1342°

B₂ C₂ 1/3 1/3 R₃

WIND TUNNEL

$\alpha = 10^\circ$

-2° x 5.6°

ESTIMATE

MACH
26 SPAN

60

50

40

30

20

4

6

8

10

12

14

16

18

20

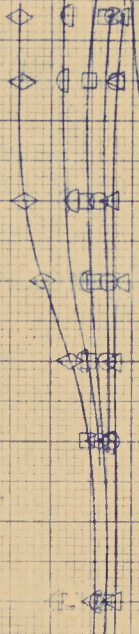
MACH No

UNCLASSIFIED / NON CLASSIFIÉ

C105
VERTICAL TAIL SPANNISE Q.C. POSITION
B₁ C₁ M₁ V₁ R
-0.4° < 8°

Q.C.
% SPAN

60
40
20



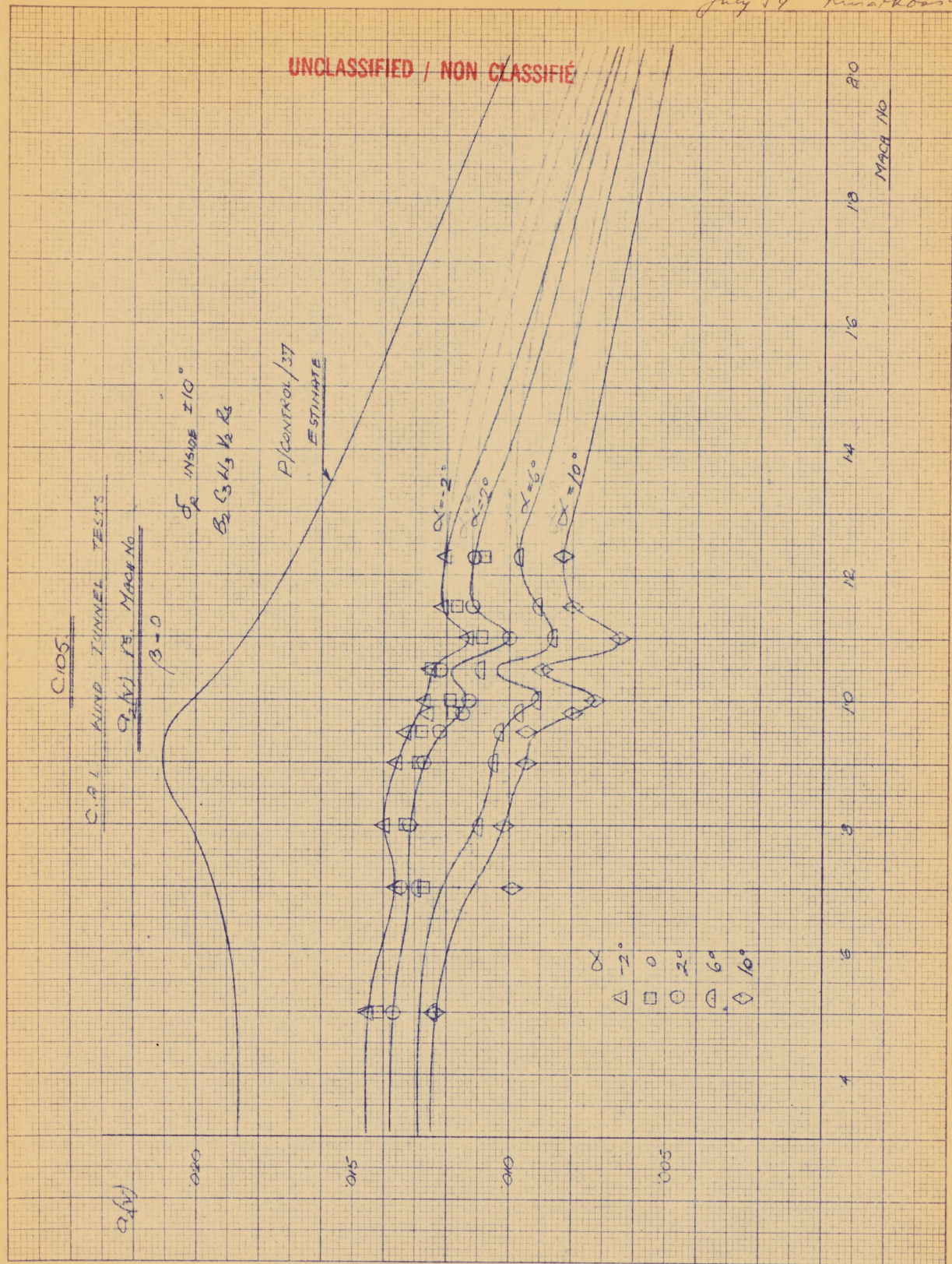
α
-2°
0
2°
6°
10°

20
18
16
14
12
10
8
4
MACH NO

462-12 KENTZEL & ESCOFF CO.
10 x 10 1/2 inch grid lines accord
MADE IN U.S.A.

6.1.1. T.H.T./31.
 July 54 Kniatkovski

UNCLASSIFIED / NON CLASSIFIE

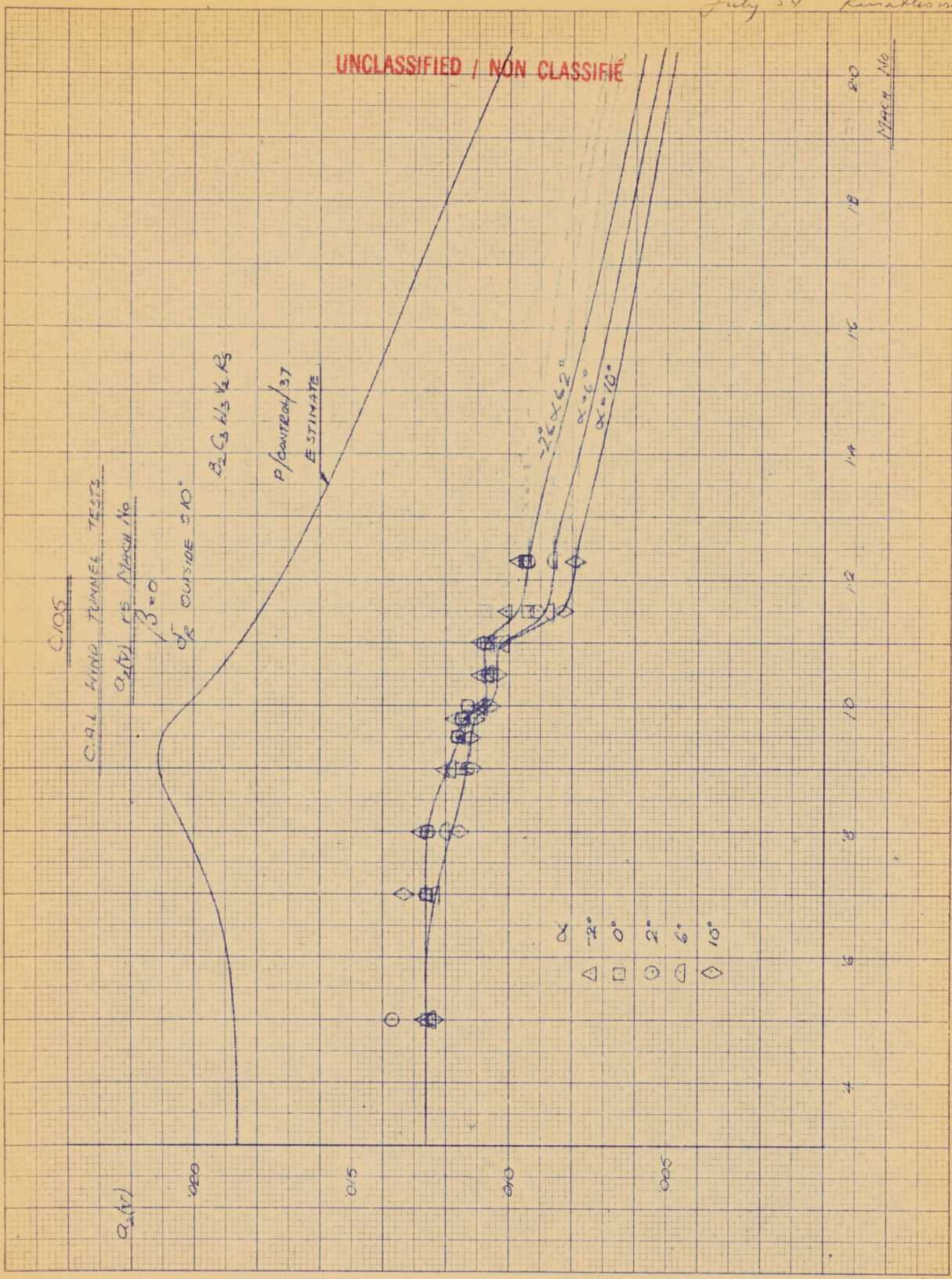


6.1.2.

P/W.T./31

July 54 Kivathoorli

UNCLASSIFIED / NON CLASSIFIED



MARCH 1960

18

16

14

12

10

8

6

4

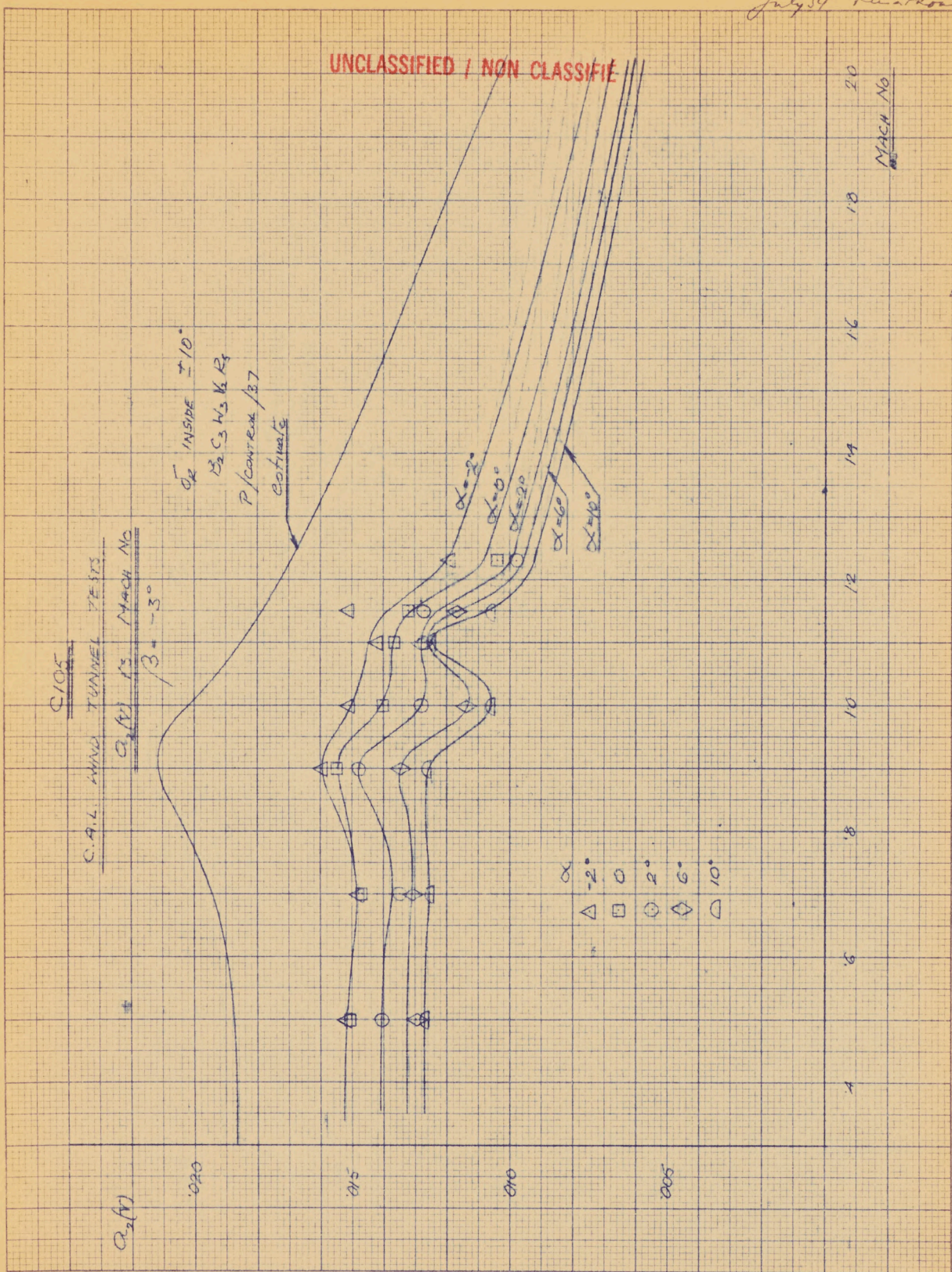
- α
- \triangle -2°
- \square 0°
- \circ 2°
- ∇ 6°
- \diamond 10°

6.1.3. P/W.T./31
 July 54 Kuntzowski

UNCLASSIFIED / NON CLASSIFIED

C105
 C.A.L. WIND TUNNEL TESTS
 C₂(α) vs MACH No
 $\beta = -3^\circ$

σ_{R} INSIDE $\pm 10^\circ$
 B₂ S₃ M₃ K₂ R₂
 P/CONTINUA/87
 continue



MACH No
 20
 18
 16
 14
 12
 10
 8
 6
 4

C₂(α)
 0.020
 0.015
 0.010
 0.005

6.1.4 P/U.T. 131
 July 54, Kirtland

UNCLASSIFIED / NON CLASSIFIÉ

C105

C.A.L. WIND TUNNEL TESTS

$\alpha = 11^\circ$ MACH 10

$\beta = -3^\circ$

C_R OUTSIDE $\pm 10^\circ$

$B_2 C_3 N_3 \frac{1}{2} R_3$

P/CONTROL/ESTIMATE

C_R (1)

0.00

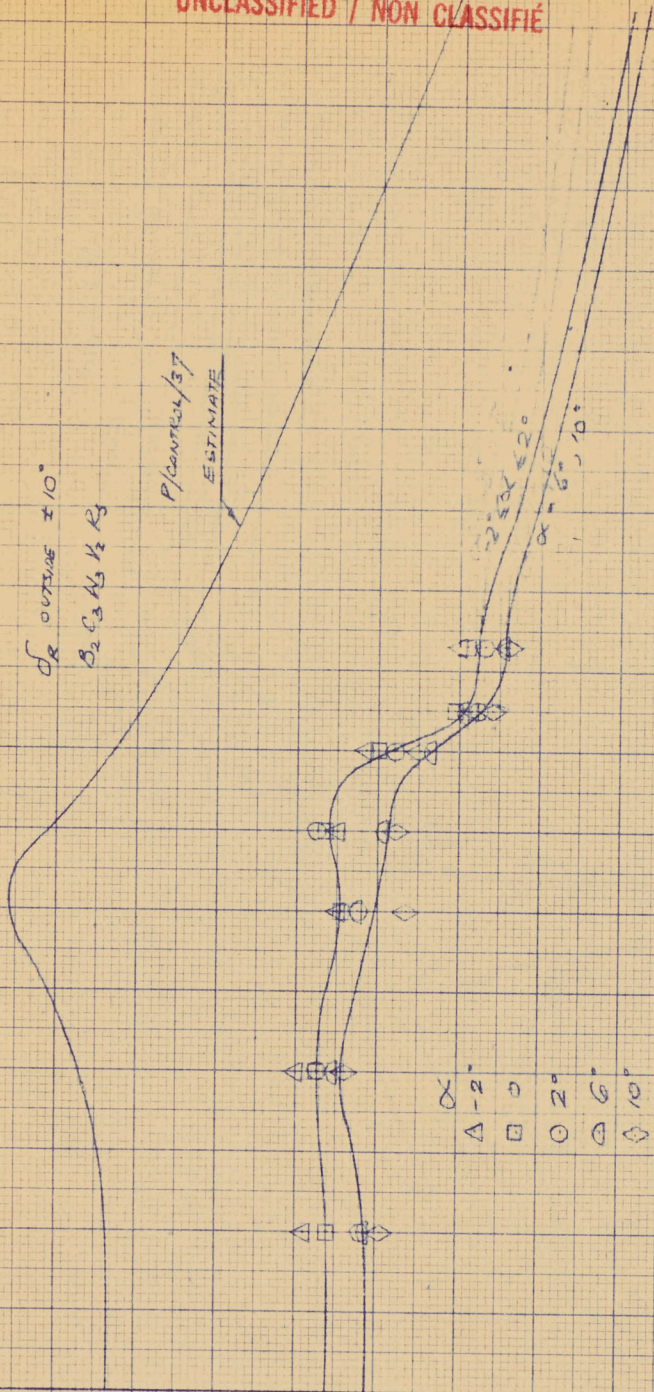
0.05

0.10

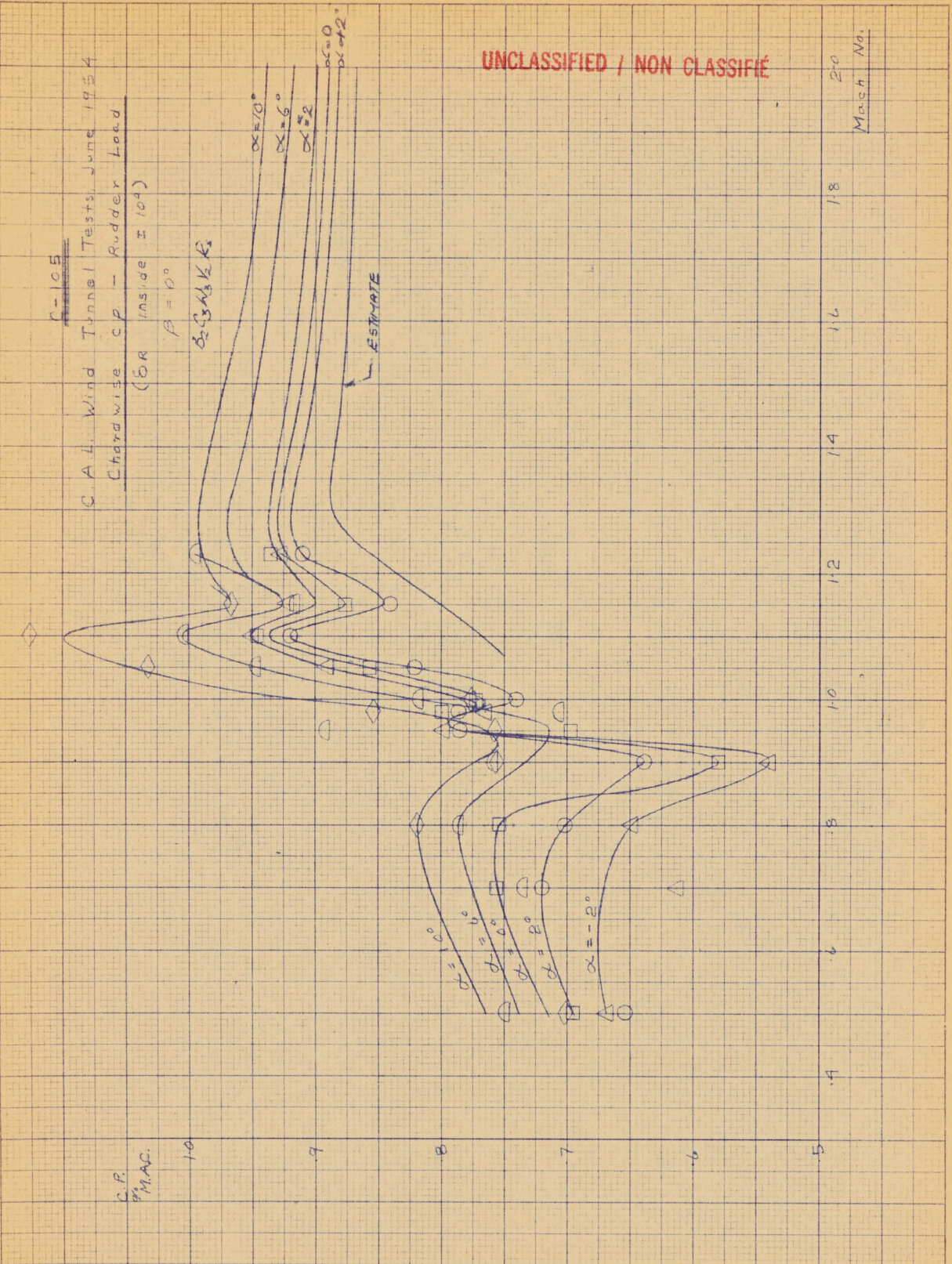
0.05

- $\alpha = 2^\circ$
- $\alpha = 0^\circ$
- $\alpha = 2^\circ$
- $\alpha = 6^\circ$
- $\alpha = 10^\circ$

4 6 8 10 12 14 16 18 20
 MACH 10



UNCLASSIFIED / NON CLASSIFIÉ



C-105
C.A.L. Wind Tunnel Tests. June 1954

Chordwise C.P. - Rudder load
(8R outside $\pm 10^\circ$)

$\beta = 0^\circ$

$B_2 C_3 A_3 \frac{1}{2} B$

ESTIMATE

UNCLASSIFIED / NON CLASSIFIÉ

C.P.
MAC.

10

9

8

7

6

5

α
-2° 0° 2° 6° 10°
△ □ ○ ◐ ◇

2.0
Mach No

1.8

1.6

1.4

1.2

1.0

8

6

4

C-105
C.A.L. Wind Tunnel Tests, June 1954

Chordwise c.p. - Rudder load

(b.a. inside $\pm 10^\circ$)

$\beta = -3^\circ$

B.S.M. 1/2 R₃

UNCLASSIFIED / NON CLASSIFIED

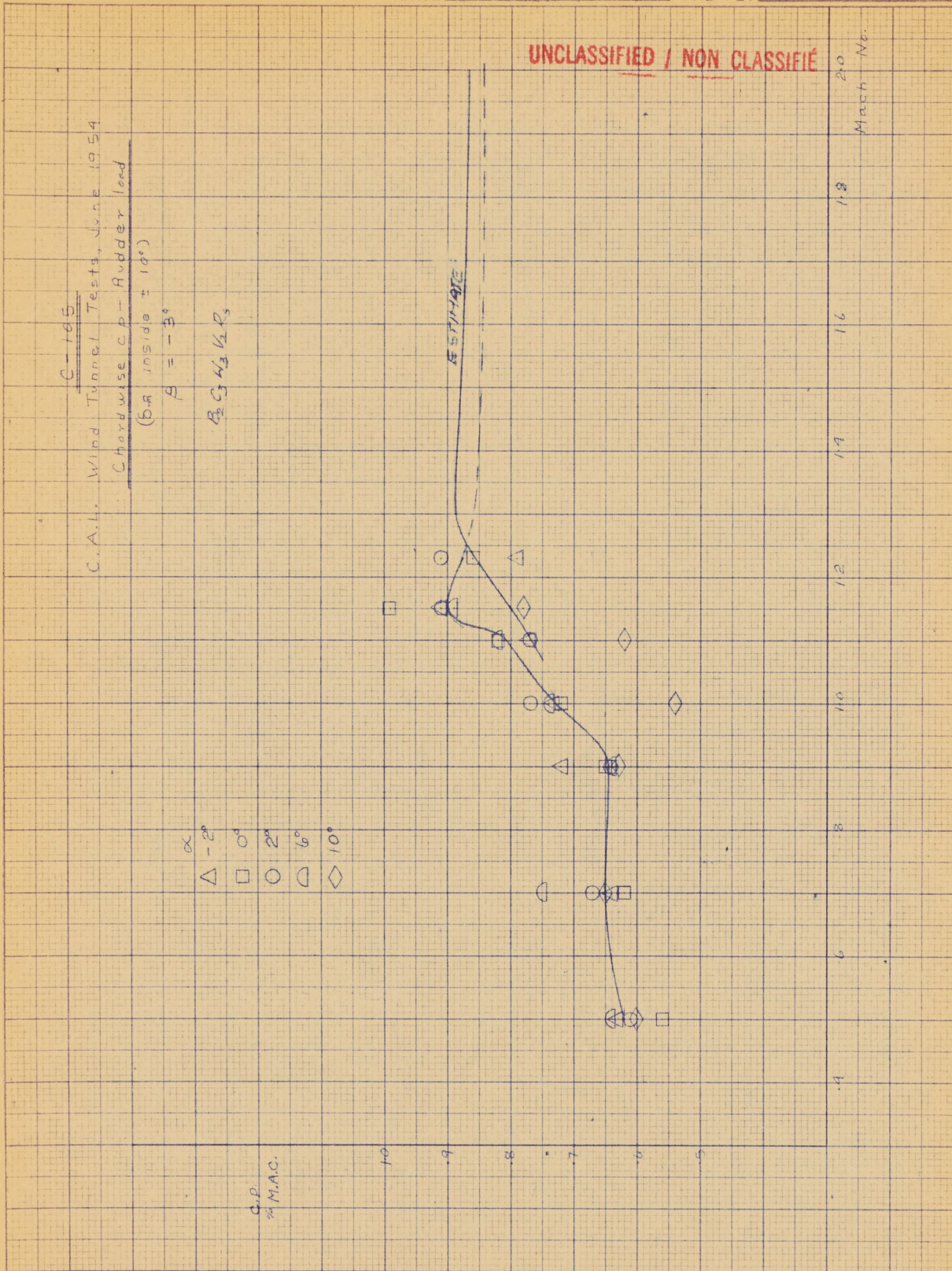
α
 $\triangle -2^\circ$
 $\square 0^\circ$
 $\circ 2^\circ$
 $\ominus 6^\circ$
 $\diamond 10^\circ$

c.p.
% M.A.C.

10
9
8
7
6
5

ESTIMATE

Mach No.
20
18
16
14
12
10
8
6
4



UNCLASSIFIED / NON CLASSIFIÉ

C-105
C.A.L. Wind Tunnel Tests, June 1954

Chordwise C.P. - Rudder load
(BR outside $\pm 100^\circ$)

$\beta = -3^\circ$

$B_2 C_3 N_3 \frac{1}{2} R$

- ∞
- $\Delta -2^\circ$
- $\square 0^\circ$
- $\circ 2^\circ$
- $\triangle 6^\circ$
- $\diamond 10^\circ$

C.P.
% M.A.C.

1.0
-9
-8
-7
-6
-5

ESTIMATE

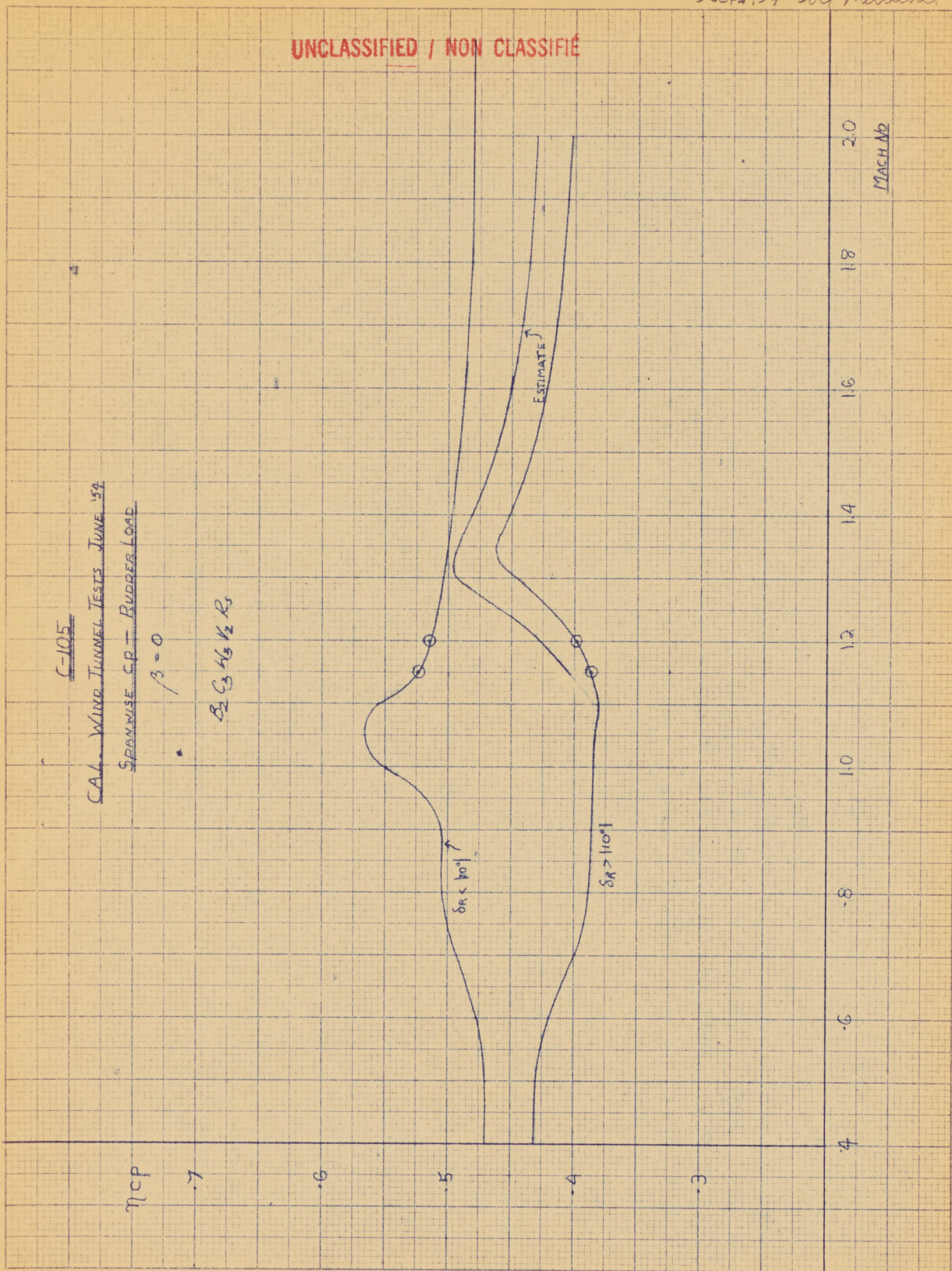
2.0
1.8
1.6
1.4
1.2
1.0
.8
.6
.4

March
Ma

6-3.1 P/W.T./31

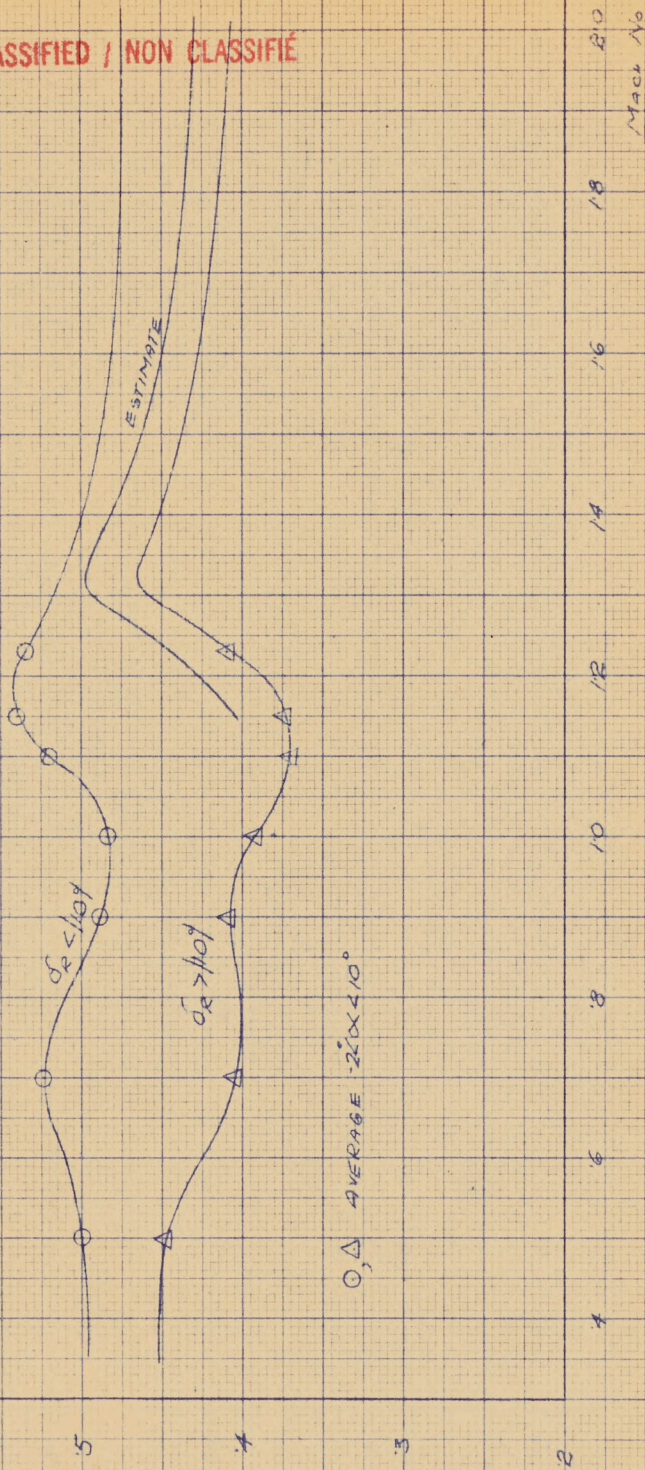
1 SEPT, 54 *LD Mawchel*

UNCLASSIFIED / NON CLASSIFIÉ



UNCLASSIFIED / NON CLASSIFIÉ

C105
C.A.L. WIND TUNNEL TESTS JUNE 54
SPANWISE CP - RUDDER LOAD
 $\beta > 3^\circ$
 $C_{L3} \approx 1/2 A_3$



UNCLASSIFIED / NON CLASSIFIÉ

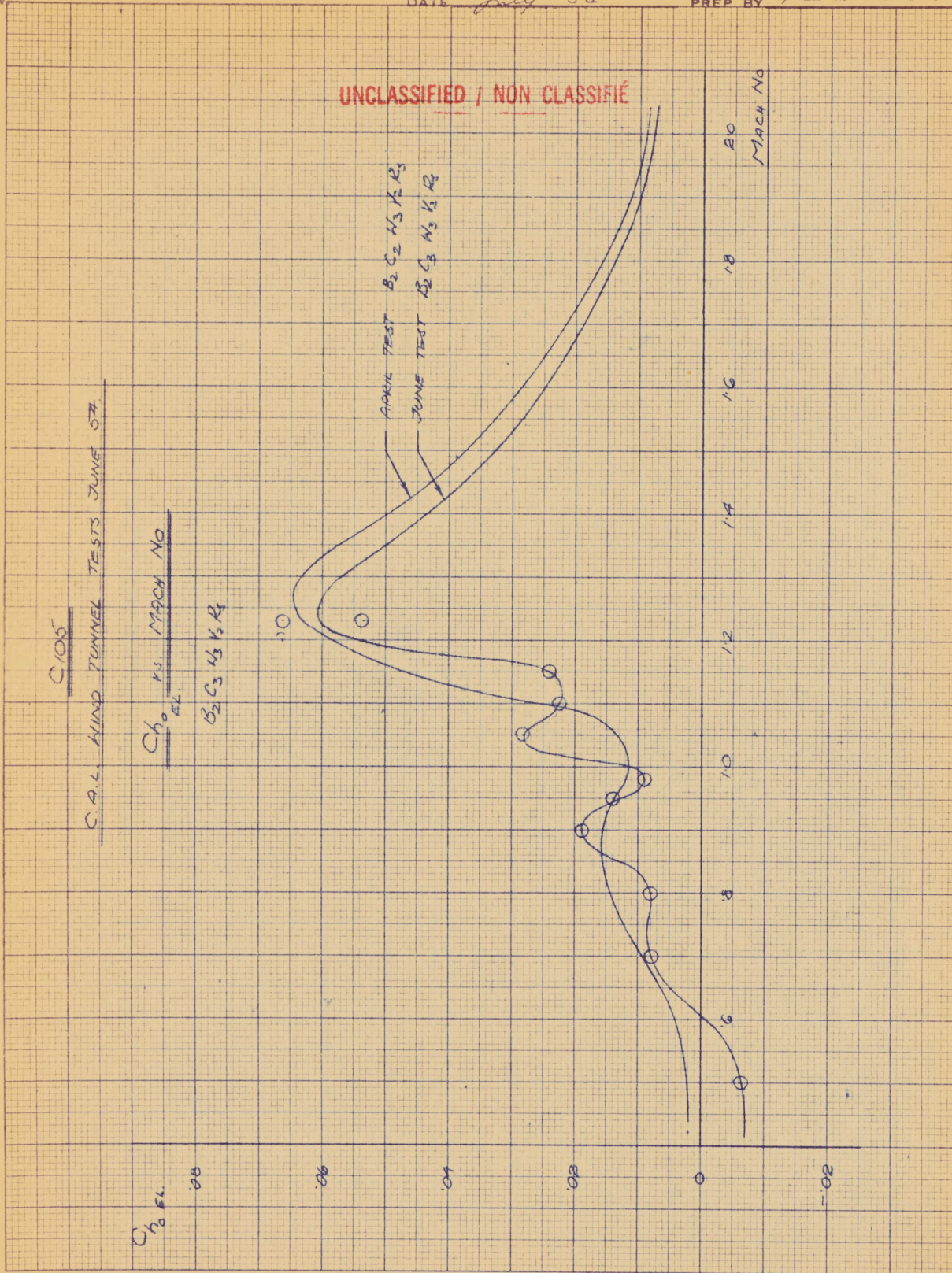
C105
C.A.L. WIND TUNNEL TESTS JUNE 54

Ch₀ K₃ MACH No

B₂ C₃ K₃ R

APRIL TEST B₂ C₂ K₃ R₃
JUNE TEST B₂ C₃ K₃ R₂

MACH No



UNCLASSIFIED / NON CLASSIFIED

C105
C.A.L. WIND TUNNEL TESTS JUNE 57

Chose 15 MACH No.

B₂ C₃ M₃ 1/2 R₂

APRIL TEST B₂ C₃ M₃ 1/2 R₂

JUNE TEST B₂ C₃ M₃ 1/2 R₂

Chose

-0.020

-0.015

-0.010

-0.005

4

6

8

10

12

14

16

18

20

MACH No

59-12 KULPER & LESSER CO.
10 x 10 to the 15 inch, 5th. line's accented.
MADE IN U.S.A.

UNCLASSIFIED / NON CLASSIFIÉ

C 105
CAL MIND TUNNEL TESTS JUNE 57.

B₂ G₂ K₂ K₂ H₂

Cher 15 Mach No

β ≤ 6° for α ≤ 6°
β ≤ 2° for α = 10°

Cher 3
PER DEG.

-010

-008

-006

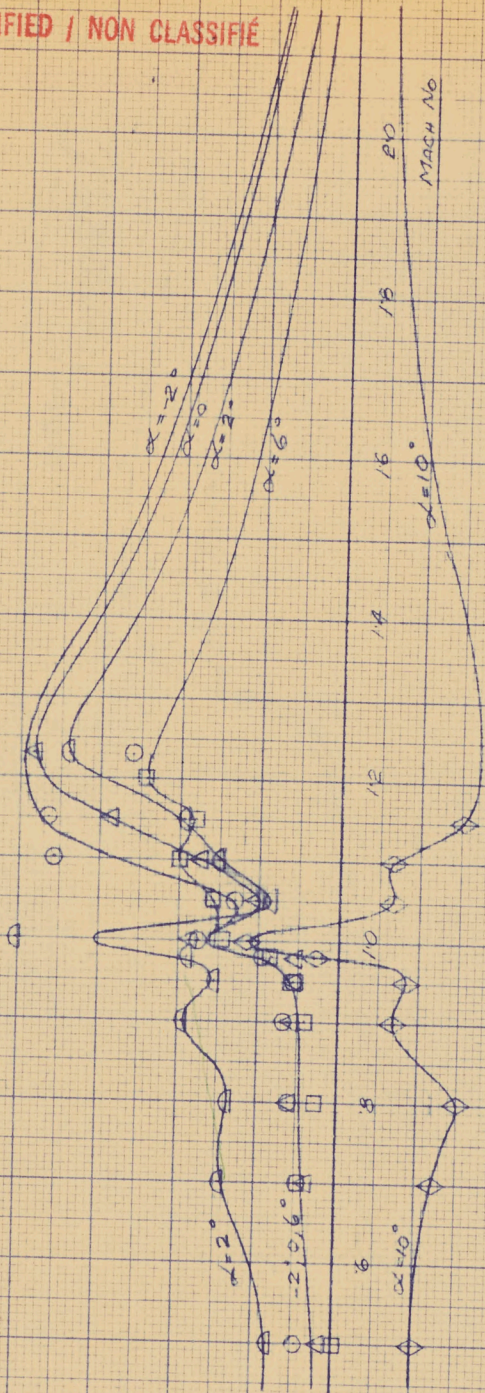
-004

-002

0

002

004



MACH NO

20

18

16

14

12

10

8

6

α = 10°

A. U. W.

UNCLASSIFIED / NON CLASSIFIED

C-105

Chp (Rudder) vs Mach Number

April W-T Tests Modified for New Canopy

C_2, C_3, H_3, H_4, R

$\alpha = 2^\circ$

Chp per degree

.015

.010

.005

0

.2

.4

.6

.8

1.0

1.2

1.4

1.6

1.8

2.0

Mach Number

Wind Tunnel

Estimate
P/Control/37

UNCLASSIFIED / NON CLASSIFIÉ

C-105

Chr vs Mach Number

April Wind Tunnel Tests Modified
for New Canopy

B₂ C₃ K₃ K₄

Chr
per
degree

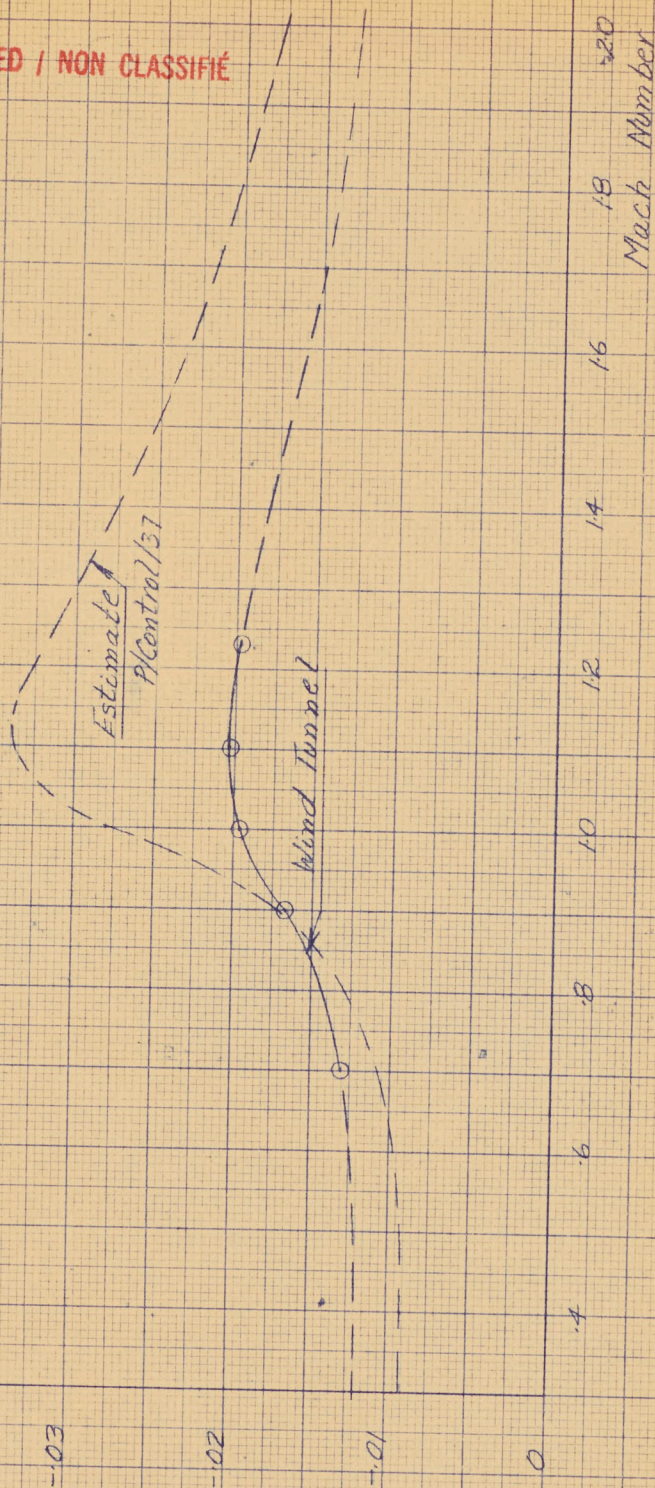
-0.4

-0.3

-0.2

-0.1

0



Mach Number

16

14

12

10

8

6

4

0

UNCLASSIFIED / NON CLASSIFIÉ

1880
35-33
MADE IN U.S.A.