

QC
Auro
C-105
P/WT/20
Vol. I

QC X
Auro
CF105
P-WT-20
V. I

(23)

FILE IN VAULT

C-105

P/WIND TUNNEL/20

DERIVATIVES AND ZERO VALUES

ANALYZED VOLUME I

LONGITUDINAL STABILITY AND CONTROL

Copy No. 1

June 1954.

UNCLASSIFIED



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

ANALYZED

TO
A

DATE

Dec. 7, 1992

Report no.: QCX - AVRO - CF105- P-WT-20 V.1

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



45114

12416802



UNCLASSIFIED

A. V. ROE CANADA LIMITED
MALTON - ONTARIO

TECHNICAL DEPARTMENT (Aircraft)

AIRCRAFT: C-105

REPORT No. P/W.T./20

FILE NO:

NO OF SHEETS: _____

TITLE:

DERIVATIVES AND ZERO VALVES

VOLUME I

LONGITUDINAL STABILITY AND CONTROL

confirmed as:
 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: DSYS 3, Secretary CRAD HQ DRP

PREPARED BY

DATE June 54

CHECKED BY

DATE

SUPERVISED BY

DATE

APPROVED BY

DATE

ISSUE No	REVISION No	REVISED BY	APPROVED BY	DATE	REMARKS

FORM 1316A

TECHNICAL DEPARTMENT (Aircraft)

AIRCRAFT:

PREPARED BY

DATE

J. Clark

June 54

CHECKED BY

DATE

INDEX

UNCLASSIFIED
NON CLASSIFIE

<u>1. Lift</u>	<u>Section</u>
1. C_{Lq}	1. Clean aircraft 1.1.1
	2. Effects of tank and brakes 1.1.2
	3. Effect of sideslip 1.1.3
2. $C_{L\delta}$	1. Clean aircraft 1.2.1
	2. Effects of tank and brakes 1.2.2
	3. Effect of sideslip 1.2.3
	4. Non-linearities 1.2.4
3. q_0	1. Clean aircraft 1.3.1
	2. Effects of tank and brakes 1.3.2
	3. Effect of sideslip 1.3.3
<u>2. Pitching Moment</u>	
1. a.c.	1. Clean aircraft 2.1.1
	2. Effects of tank and brakes 2.1.2
	3. Effect of sideslip 2.1.3
2. $C_{M\delta}$ at constant q	
	1. Clean aircraft 2.2.1
	2. Effects of tank and brakes 2.2.2
3. $C_{M\delta}$ at constant C_L	
	1. Clean aircraft 2.3.1
	2. Effects of tank and brakes 2.3.2
	3. Effect of sideslip 2.3.3
4. c.p.	1. Clean aircraft 2.4.1
	2. Effects of tank and brakes 2.4.2
	3. Effect of sideslip 2.4.3
5. C_{M0}	1. Clean aircraft 2.5.1
	2. Effects of tank and brakes 2.5.2
	3. Effect of sideslip 2.5.3
6. <u>$\Delta\delta$ Trim due to tanks and brakes</u>	
	1. Fuselage brakes 2.6.1
	2. Fin brakes 2.6.2
	3. Fuselage brakes and tank 2.6.3

TECHNICAL DEPARTMENT (Aircraft)

REPORT No. P/W.T./20

SHEET No. 2

AIRCRAFT:

PREPARED BY

DATE

J. Clark

June 54

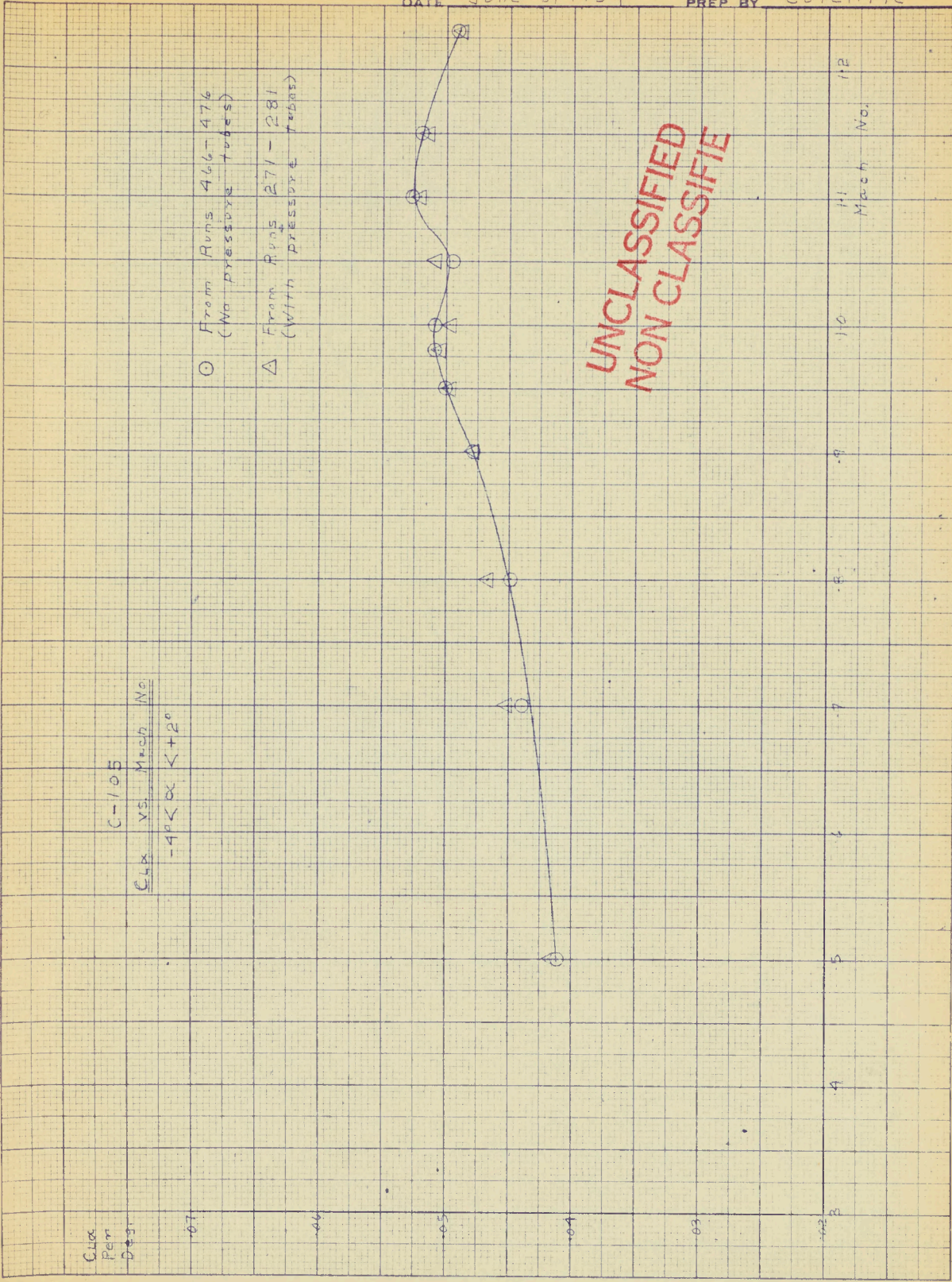
CHECKED BY

DATE

INDEX

<u>3. Elevator Hinge Moment</u>		<u>Section</u>
1. CH ₀	1. Clean aircraft	3.1.1
	2. Effect of brakes	3.1.2
2. CH _Q	1. Clean aircraft	3.2.1
	2. Non-linearities	3.2.2
	3. Effect of brakes	3.2.3
3. CH ₆	1. Clean aircraft	3.3.1
	2. Non-linearities	3.3.2
	3. Effect of brakes	3.3.3

UNCLASSIFIED
NON CLASSIFIE

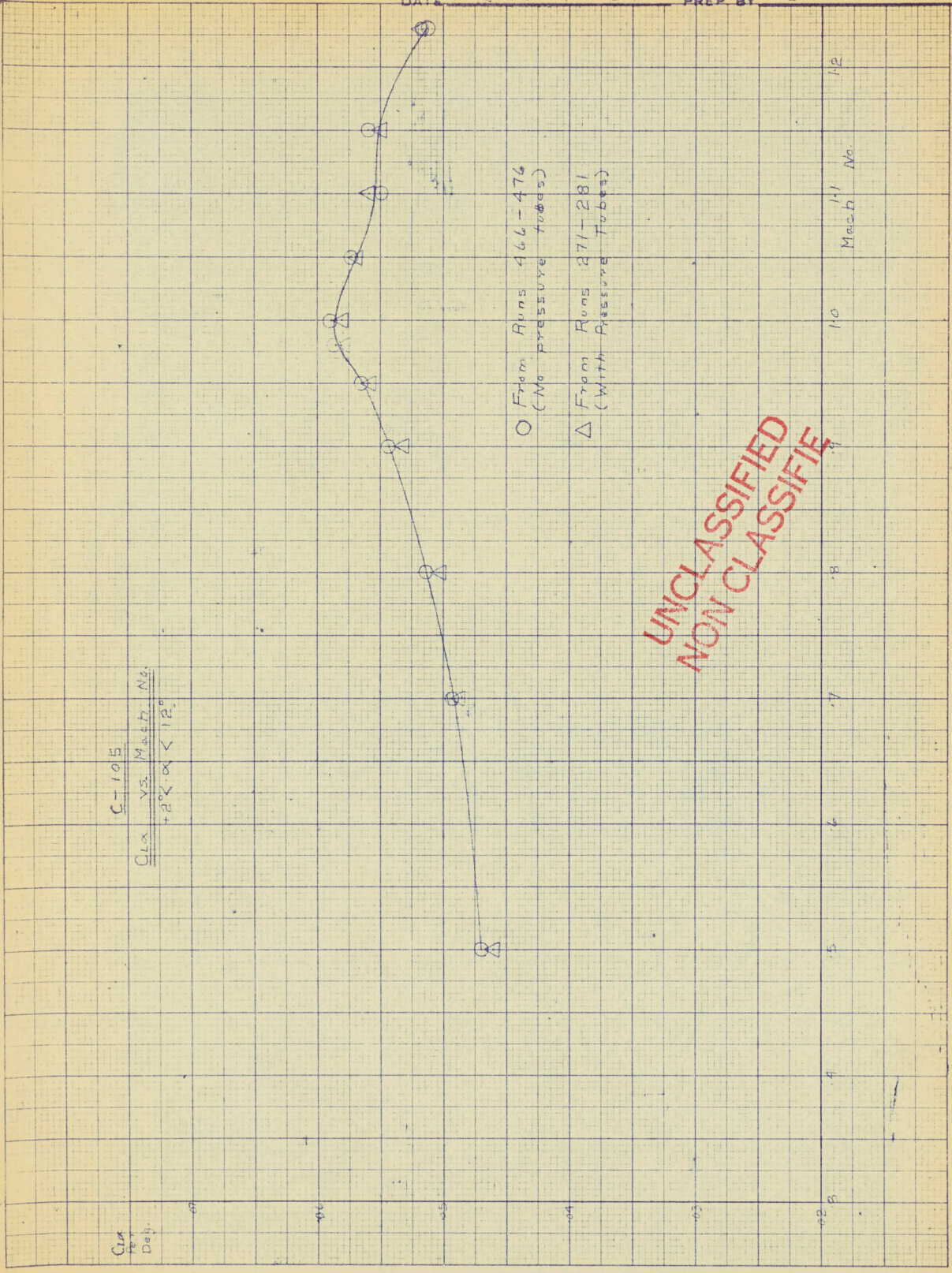


C-105
CLX VS Mach No.
-4° < α < +2°

○ From Runs 466-476
(No pressure tubes)
△ From Runs 271-281
(With pressure tubes)

UNCLASSIFIED
NON CLASSIFIE

55845 - KODAK PAPER CO.
10/10 to the 1/2 inch, 5th lines accented
MADE IN U.S.A.



C-105
 C_L vs. Mach No.
 $+2^\circ \alpha \leq 12^\circ$

○ From Runs 466-476
 (No Pressure Tubes)
 △ From Runs 271-281
 (With Pressure Tubes)

UNCLASSIFIED
 NON CLASSIFIED

3-417 25-11-54 EMBERS CO.
 10-10-54 2 inch. 50 lines actual.
 PAGE IN 11-54

AIRCRAFT
A. U. W.

COMPONENT

SHEET No.

1121

REPORT No.

P/W.T./20

DATE

JUNE 54.

PREP BY

CLARK

359-12 KEUFFEL & ESSER CO.
10 x 10 to the 1/2 inch, 515 lines accounted.
MADE IN U. S. A.

CLARK

PER DAG.

.07

.06

.05

.04

.03

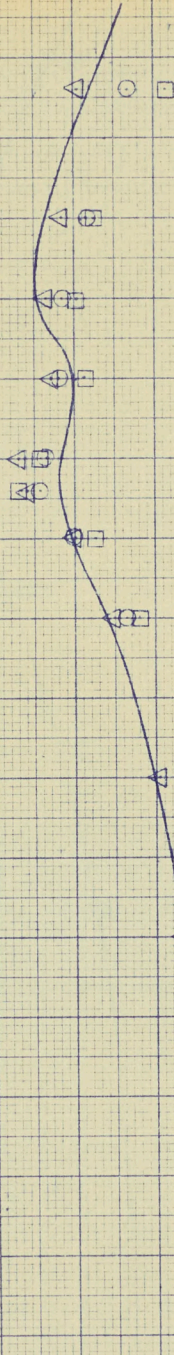
.02

CLARK

15 MIN IN AD.

- 4° to 5°

EFFECTS OF THICK & BROOKS.



UNCLASSIFIED
NON CLASSIFIED

CLEAN AIR

THICK

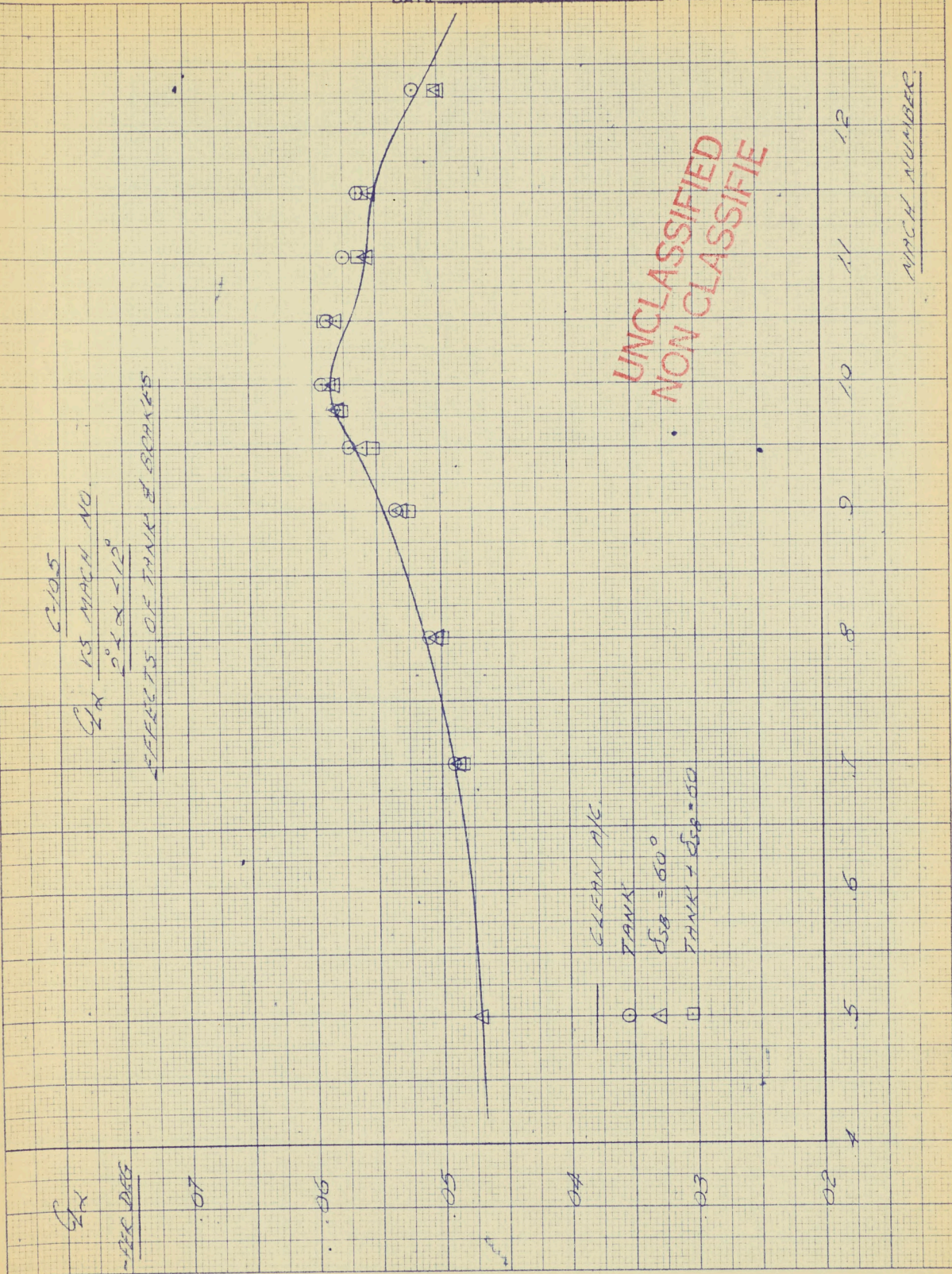
CLARK = 60°

THICK + CLARK = 60°

MARCH NUMBER

C-105
C/A 135 MACH NO.
2° X < 12°

EFFECTS OF TANK & BOARDS



UNCLASSIFIED
NON CLASSIFIE

CLEAN P/K.
TANK
58 = 60°
TANK + 58 = 50

FORM 12 - REPRODUCED BY FESSLER CO
10-5-50 TO 10-5-54, 50¢. 50¢. Lines accepted
MADE IN U.S.A.

AIRCRAFT
A. U. W.

COMPONENT

SHEET No. 1131

REPORT No. P/W.F/20

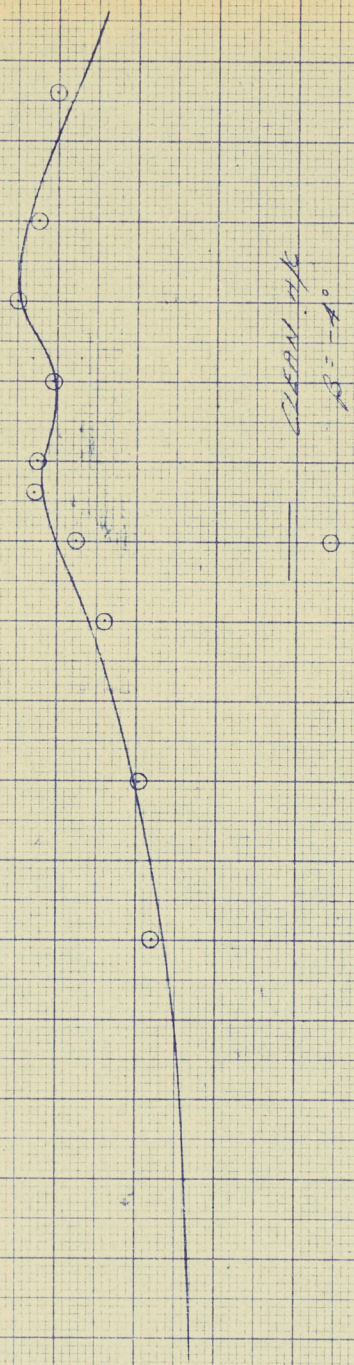
DATE JUNE 5A

PREP BY CLARK

C-108
BY 15 MARCH 1950
-8° IN K-2°
EFFECT OF SUBSIP

EX
-PERFECT

.07 .06 .05 .04 .03



UNCLASSIFIED
NON CLASSIFIED

12
11
10
9
8
7
6
5
4

MARCH NUMBER

FORM 1746
10 X 10 IN. (2 1/2 X 2 1/2 IN.) 48 THICK ASS'Y.
MADE IN U.S.A.

AIRCRAFT
A. U. W.

COMPONENT

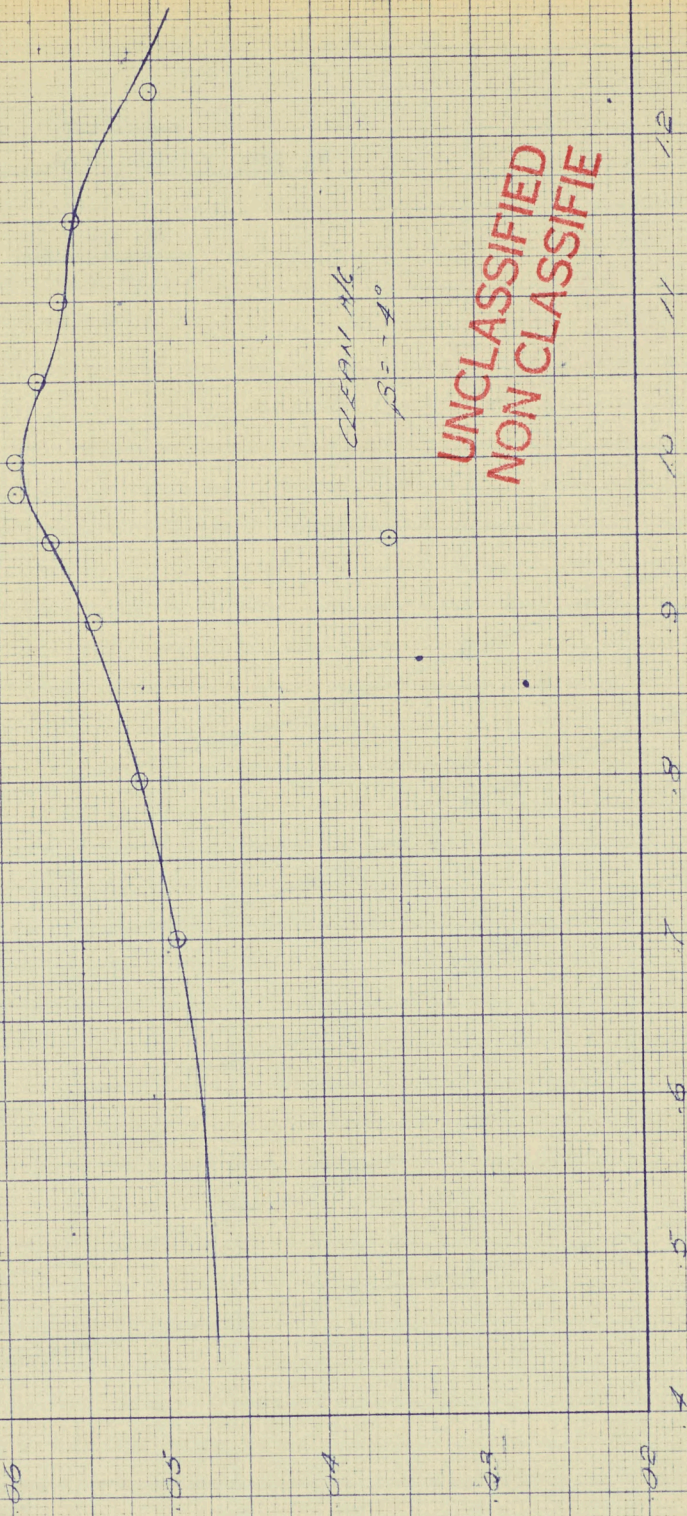
SHEET No. 1.1.3.2.

REPORT No. P/W.T 120

DATE JUNE 54.

PREP BY CLARK.

6105
ON 13 MARCH 54.
2° x 5 1/2°
EFFECT OF STRESSHIP



**UNCLASSIFIED
NON CLASSIFIE**

MARCH NUMBER

159-12 KUFFEL & ESSER CO
10 10 10 to the 3 inch 50 lines accuracy
MADE IN U.S.A.

CLARK
-REP DRS.

.07

.06

.05

.04

.03

.02

1-21-1

P/W.T./20

APRIL 21/54 J. Karalowski

C105

CORNELL H.T. TESTS APR 54

C_L vs δ

CONF. B₂ C₂ H₃ V₂ R₃

$\alpha = 2^\circ$

UNCLASSIFIED
NON CLASSIFIED

MACH NO
5 \odot

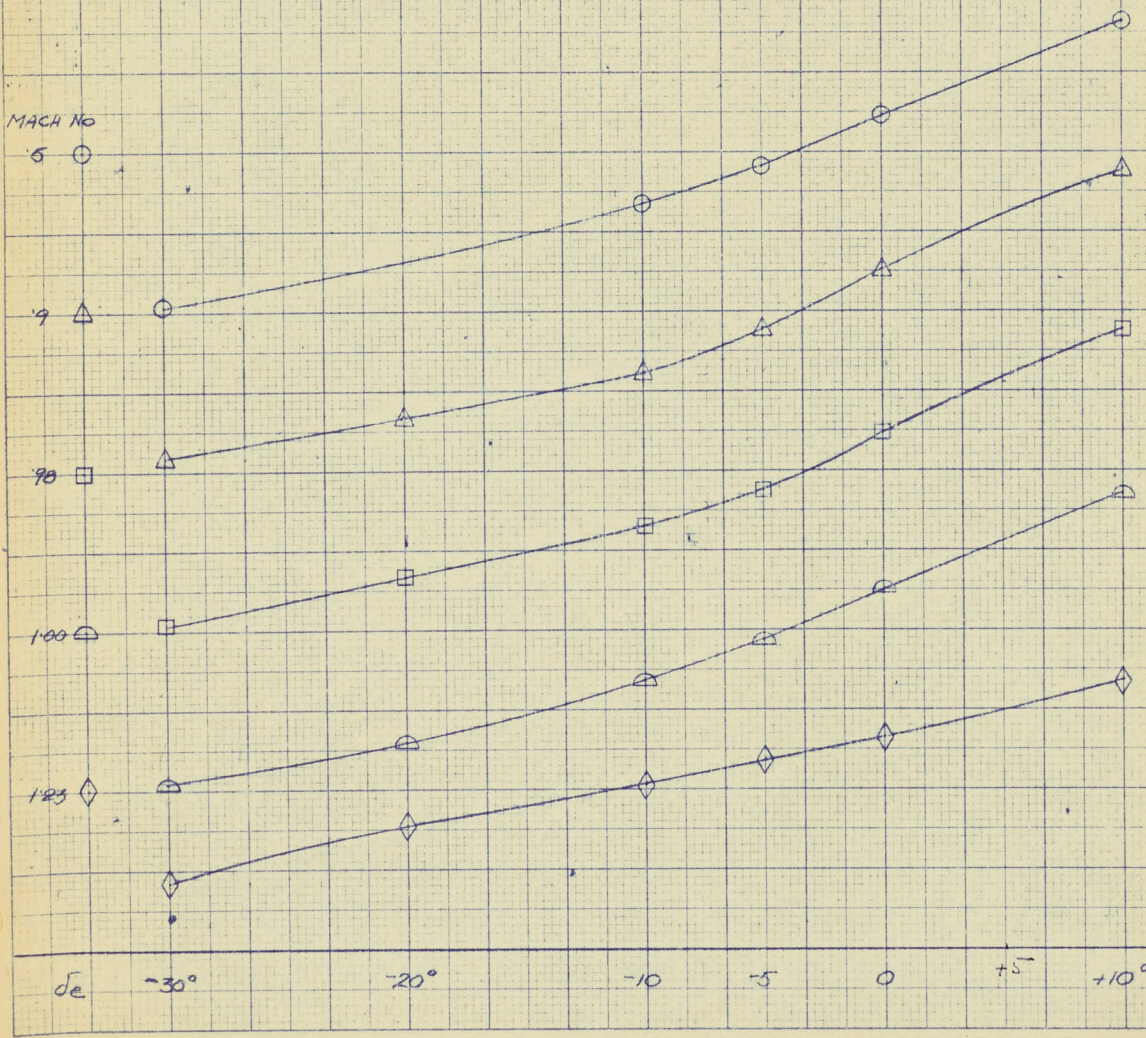
9 \triangle

90 \square

100 \circ

125 \diamond

δ -30° -20° -10 -5 0 +5 +10°



459 12 - BEUTEL & BASSER CO.
10 x 10 1/2 in. 5/8 in. grid lines, accented
MADE IN U.S.A.

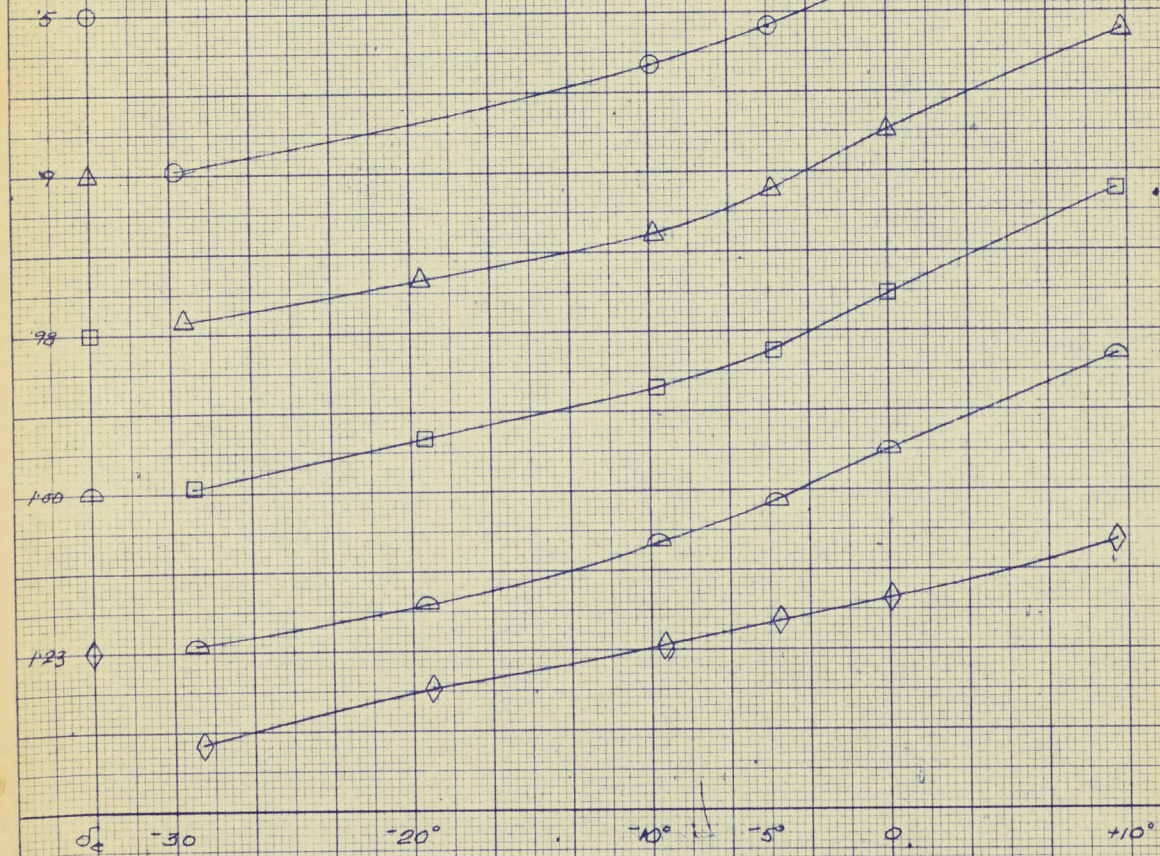
C105
CORNELL H.T. TESTS, APR. 57.

C_L vs δ
 CONF. $B_2 S W_3 V_3 R_3$
 $\alpha = 2^\circ$

HIT & HINGE MOMENT CORRECTION.

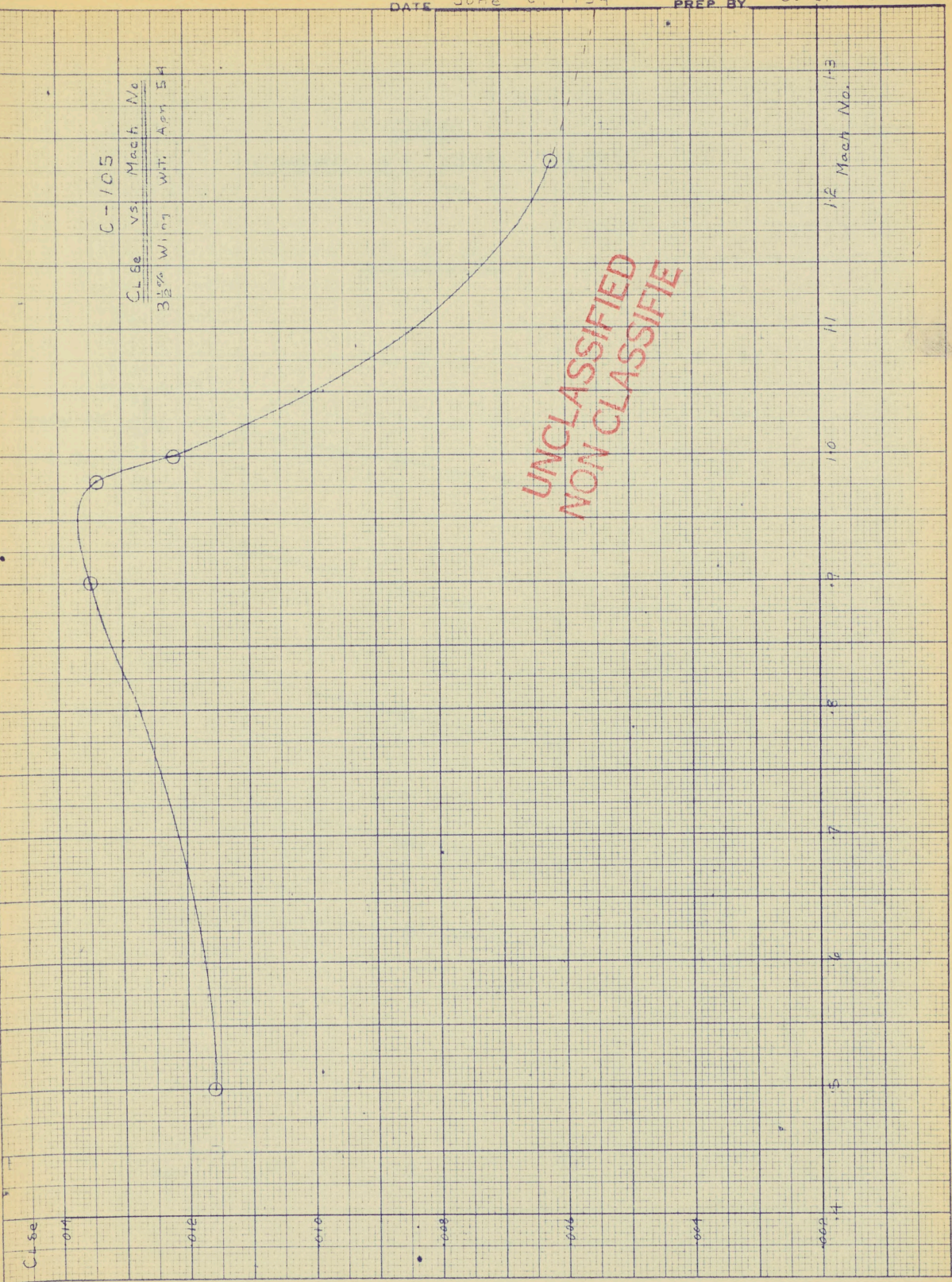
UNCLASSIFIED
 NON CLASSIFIED

MACH No



15-412 - GUFFEL & LESER CO.
 10 - 10 TO 100 - 1000 - 50 LBS. WEIGHT
 MADE IN U.S.A.

C-105
 CLSe vs. Mach No
 3 1/2% Wing WTR. APT 54



UNCLASSIFIED
 NON CLASSIFIED

4-9-12 - GIFFEL & ESSER CO.
 10 x 10 to 14 1/2 inch, 500 lines accuracy
 MADE IN U.S.A.

1.22.1

APRIL 30/54

P/H.T./20

S. Karathambi

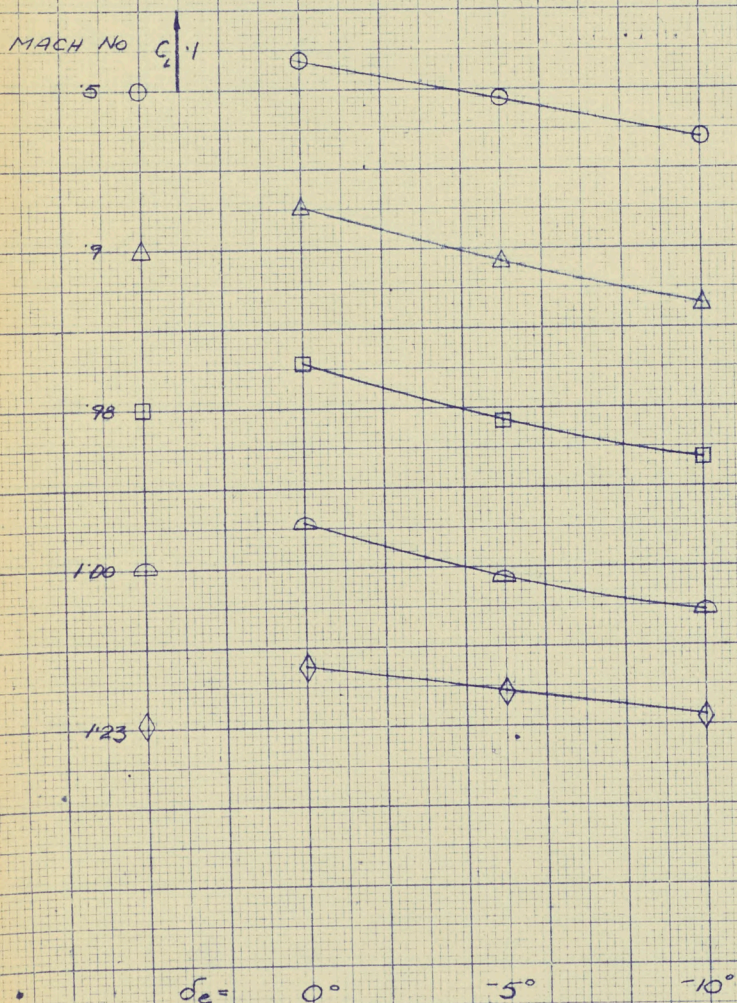
C105

CORNELL H.T. TESTS APR 52.

$\delta_B = 20^\circ$

C_L vs δ_e

UNCLASSIFIED
NON CLASSIFIE



1.2.2.3.

P/W.T./20

April 30/54

J. Kintkowski

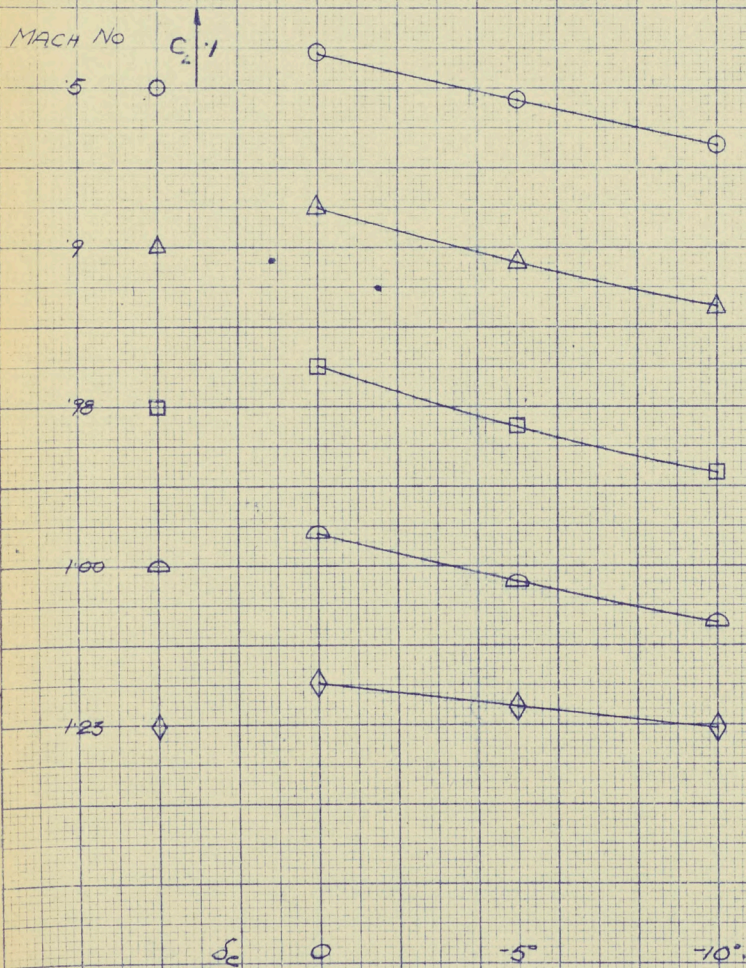
C105

CORNELL N.T. TESTS APR 54.

$\delta_B = 60^\circ$

C_L vs δ_c

UNCLASSIFIED
NON CLASSIFIE



3.6 12 KEUFFEL & ESSER CO.
10 101 10 101 101 101 101 101
MADE IN U.S.A.

1.2.2.4.

P/W.T./20

April/54

J. K. Kothandi

C105

CORNELL W.T. TESTS APR 54

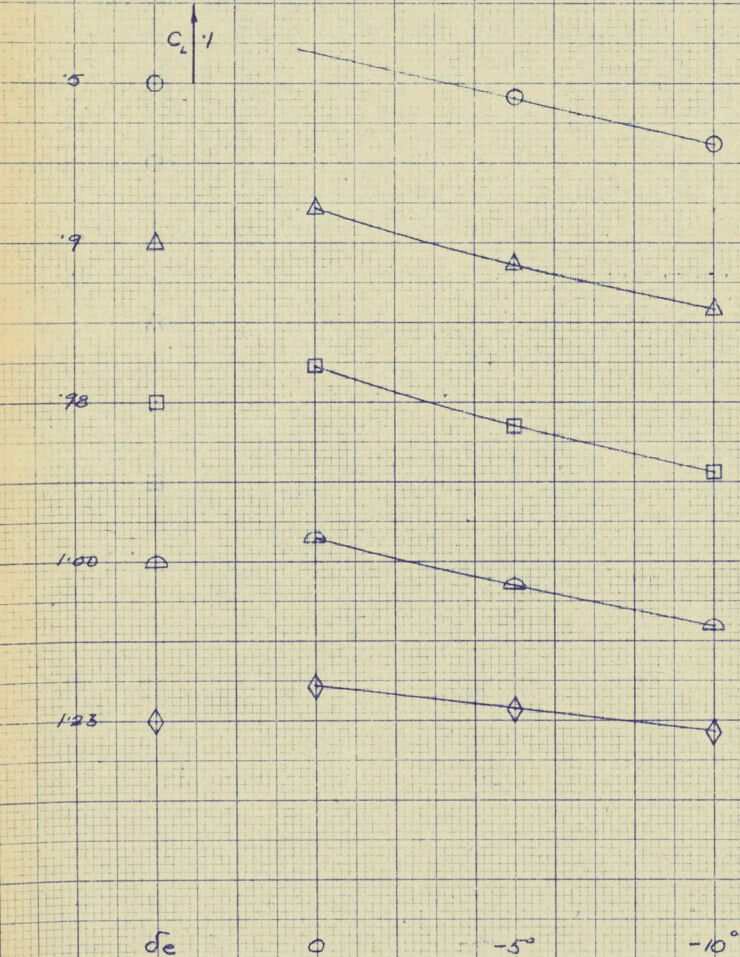
$\delta_B = 60^\circ$

WITH TANK

C_L vs δ_e

UNCLASSIFIED
NON CLASSIFIED

MACH No

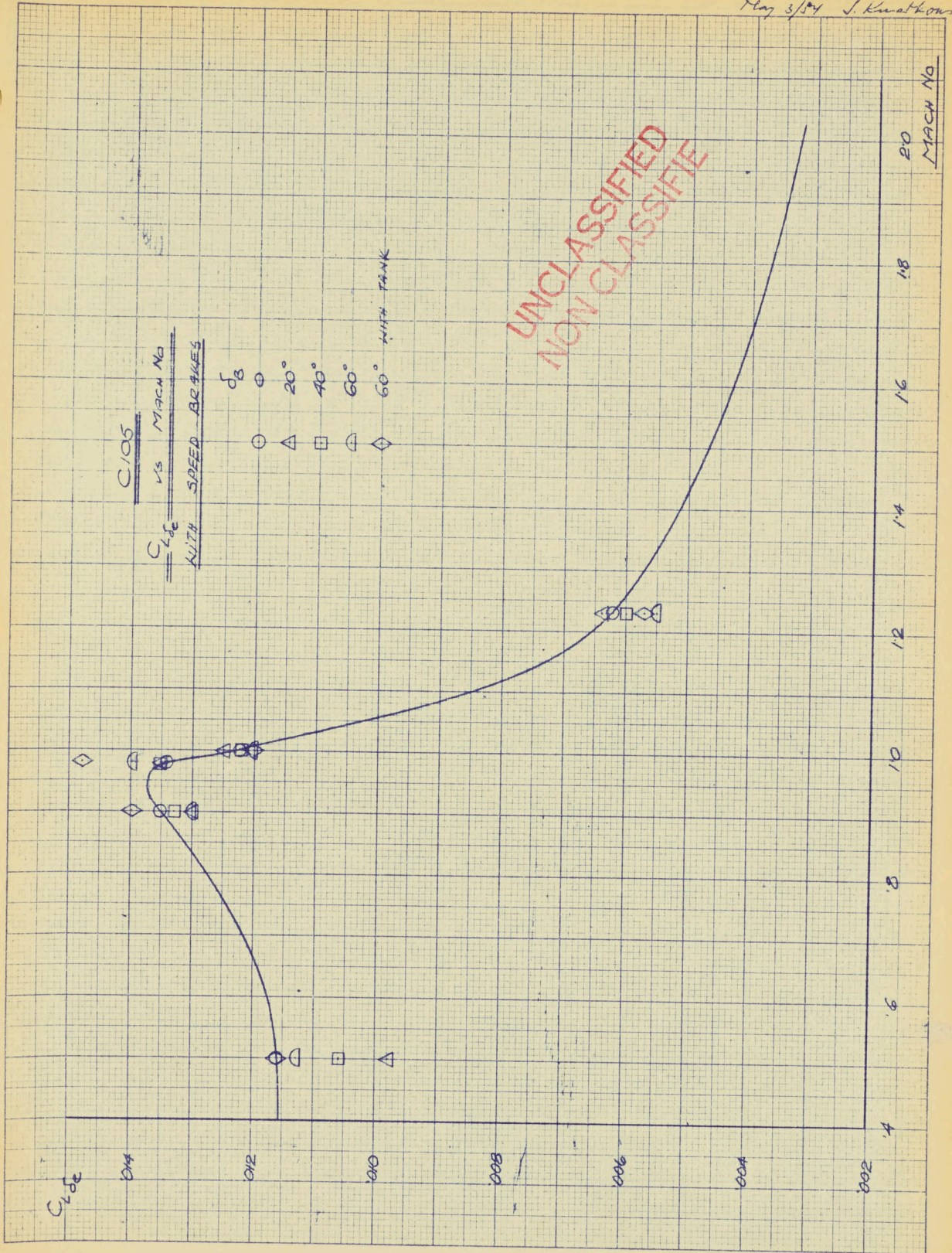


10 x 10 INCHES, 1/8" GRID, 500 LINES, ACCURATE, MADE IN U.S.A.

1.22.5.

P/W.T./20.

May 3/54 J. Kwatkowski



AIRCRAFT
A. U. W.

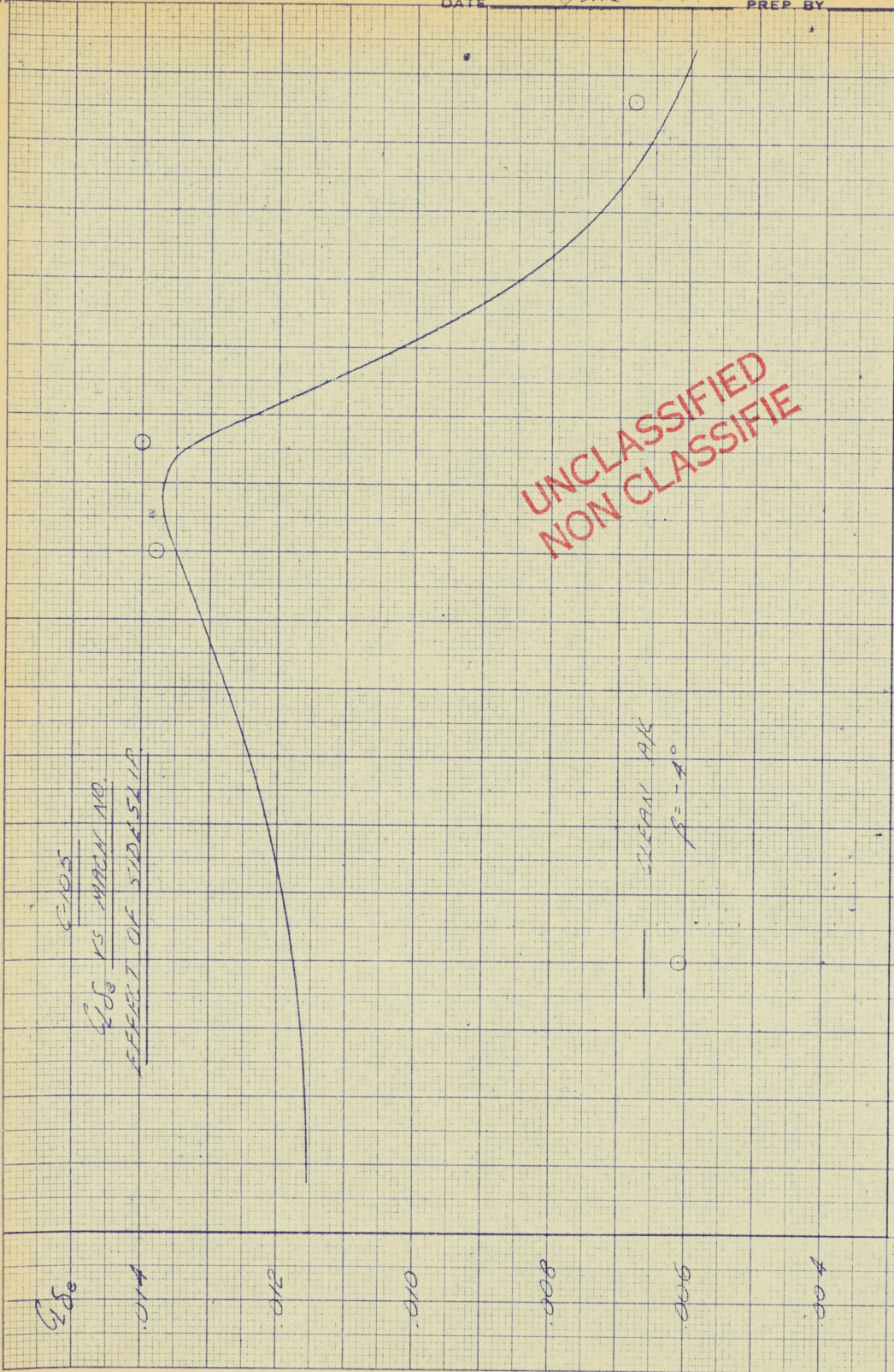
COMPONENT

SHEET No. 1232

REPORT No. P/M/T/20

DATE JUNE 54

PREP BY CLARK



6105
 400 15 MACH 110
 EFFECT OF SIDE SLIP

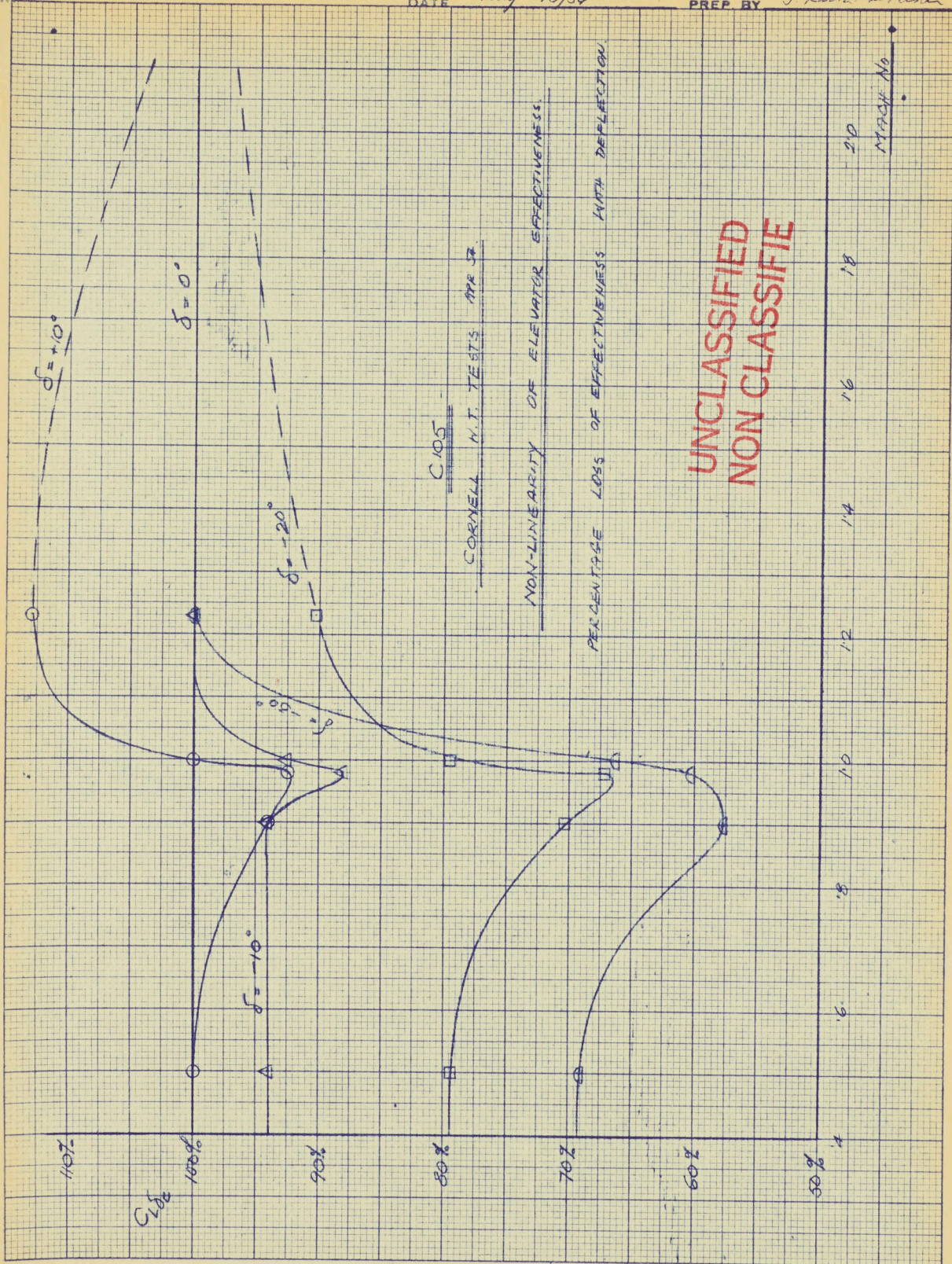
CLEAN PK
 $\beta = -4^\circ$

4
 5
 6
 7
 8
 9
 10
 11
 12

MARCH NUMBER

0.006
 0.014
 0.022
 0.030
 0.038
 0.046
 0.054

33-112 KLEUFEL & BESSER CO.
 10 x 10 to 100 x 50 inch, 500 lines resolution
 MADE IN U.S.A.



C105

CORNELL M.T. TESTS APR 32

NON-LINEARITY OF ELEVATOR EFFECTIVENESS

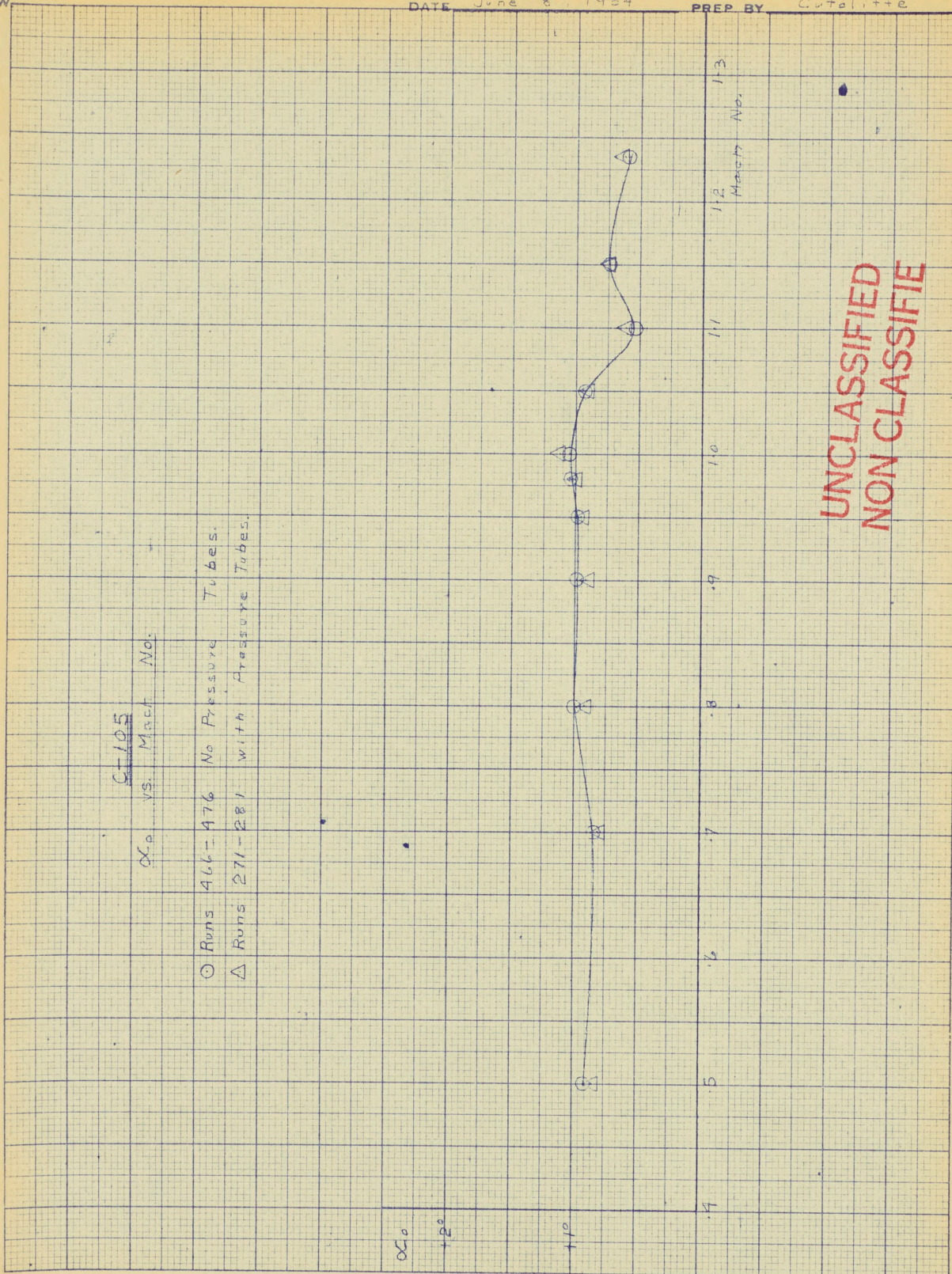
PERCENTAGE LOSS OF EFFECTIVENESS WITH DEFLECTION

UNCLASSIFIED
NON CLASSIFIED

MACH No

3-12 10-10-54 MODEL NUMBER CD
10-10-54 10-10-54 10-10-54 10-10-54
MADE IN U.S.A.

A. U. W.



C-105
 α_p vs Mach No.
 ○ Runs 466-476 No Pressure Tubes.
 △ Runs 271-281 with Pressure Tubes.

UNCLASSIFIED
NON CLASSIFIED

159-12 NEUPPEL & ESSER CO.
10 x 10 1/2 inch grid, 50 lines across,
MADE IN U.S.A.

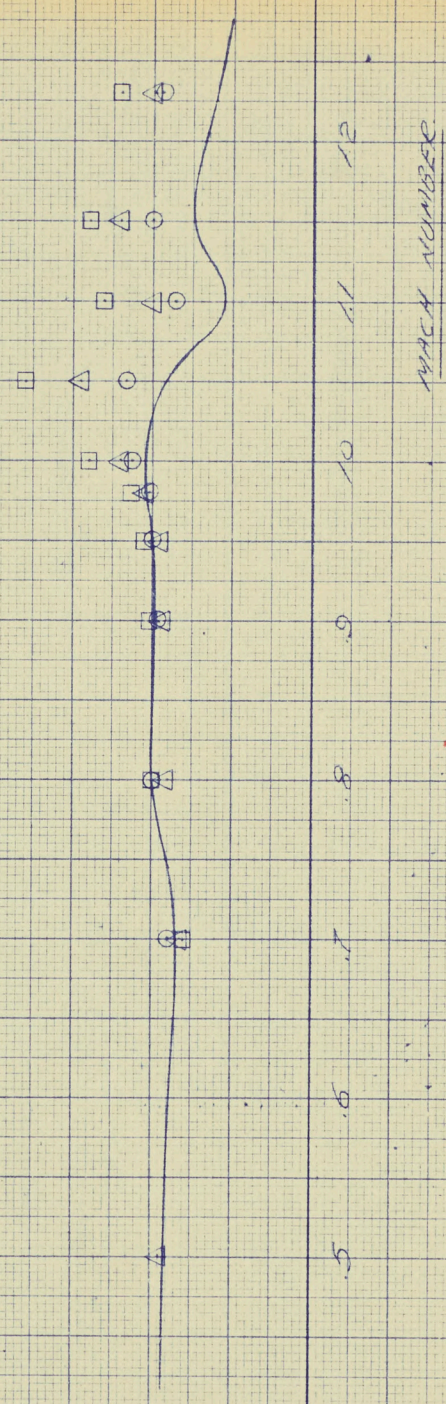
CP-105
No 15 MARCH NUMBER
EFFECTS OF TANK & BRACKETS.

CLEAN A/E
TANK
 $\psi_{50} = 80^\circ$
TANK + $\psi_{50} = 60^\circ$

○
△
□

No
2685

3
2
1
0
-1



UNCLASSIFIED
NON CLASSIFIED

AIRCRAFT

COMPONENT

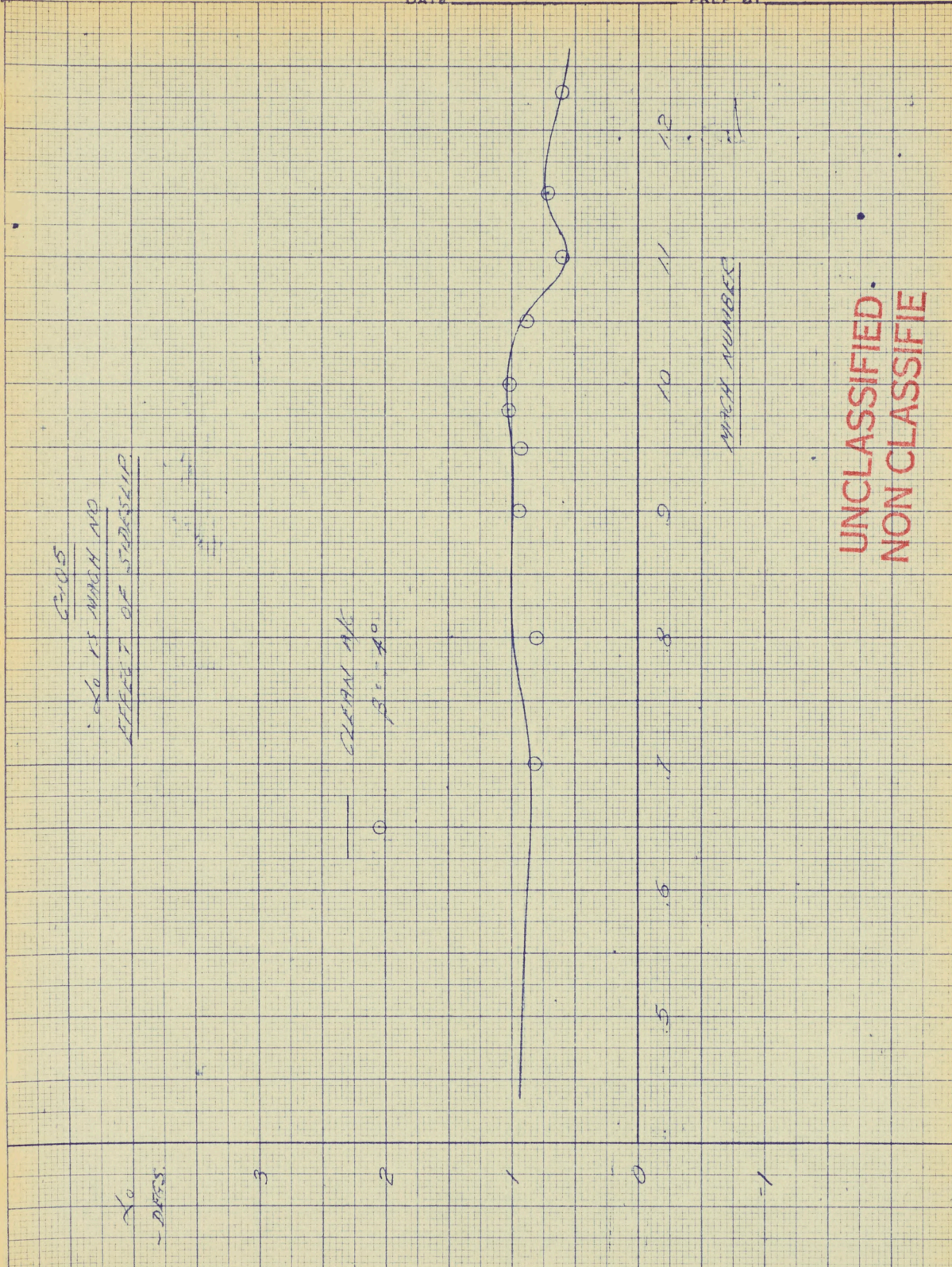
SHEET No. 1.3.3.1.

REPORT No. P/W/T/20.

A. U. W.

DATE JUNE 51.

PREP BY CLARK.



2105
X0 IS WASH NO
EFFECT OF STRESS

CLEAN AIR
B. - 40

MARCH NUMBER

UNCLASSIFIED
 NON CLASSIFIED

3915 F. L. LESTER CO.
 107 1010 BINGHAM AVE. ANN ARBOR
 MADE IN U.S.A.

21.11

1/10/20

CLACK

Q.C.
~ 1/2 MTC

C-105

Q.C. POSITION

CMS 466 ATG

(BENCH TA ~ PRESSURE TUBES
REMOVED)

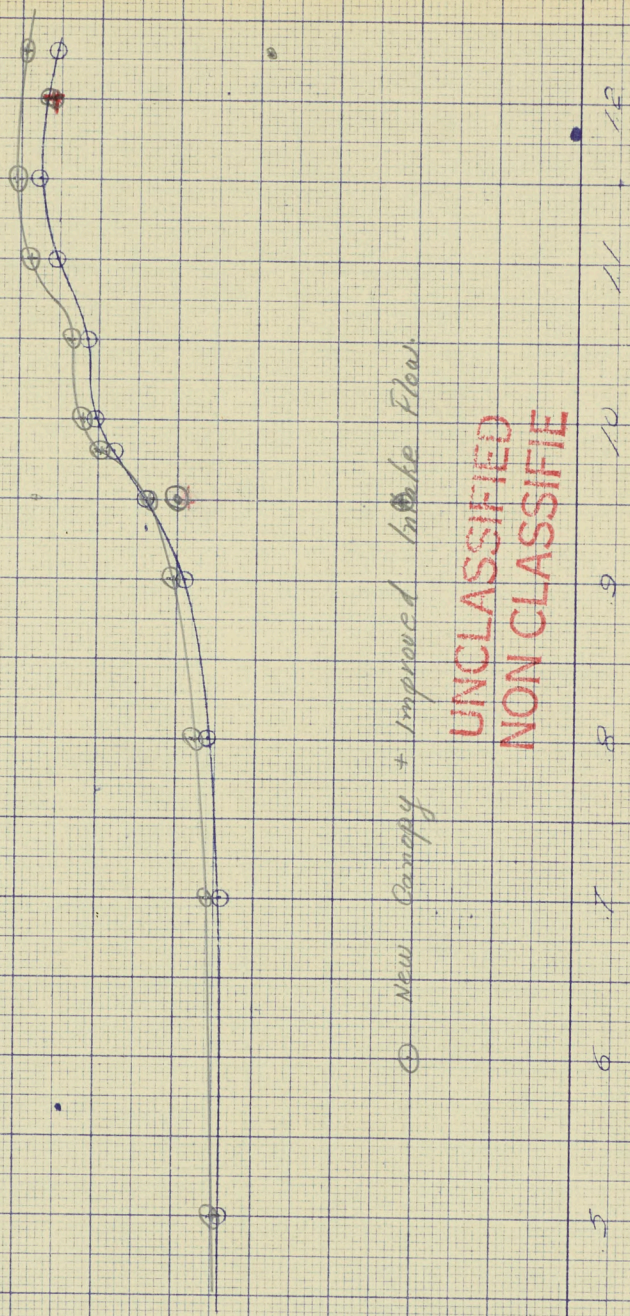
60

50

40

30

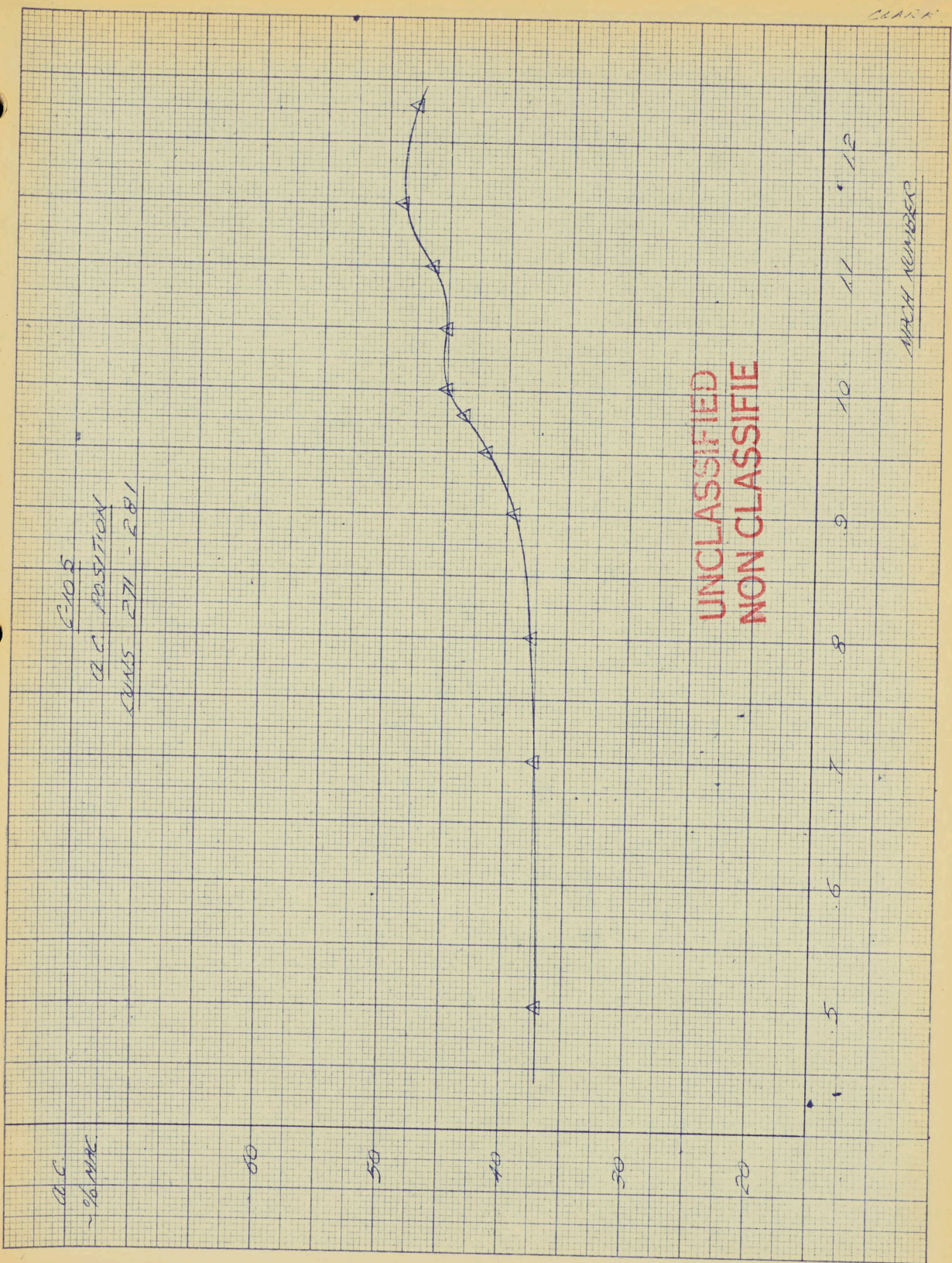
20



359-12 KEUFFEL & ESSER CO.
10 x 10 to the 1/2 inch, 5th lines accented.
MADE IN U.S.A.

Q.C.
- % MHC

E105
Q.C. POSITION
CAMS 271 - 281



UNCLASSIFIED
NON CLASSIFIE

MARCH NUMBER

C-105
AERODYNAMIC CENTRE

O BASIC A/C
A FIN D-B (50°)

UNCLASSIFIED
NON CLASSIFIE

A.C.

%MAC

60

50

40

30

20

4

6

8

10

12

14

16

18

20

M

50412 - AIRTEL - 4-5-54
10 - 10 TO RW 12 inch, 5th lines ascended
MADE IN U.S.A.

APRIL 1954

C. A. L. WIND TUNNEL TESTS

A.C. POS'N VS. M
CONFIG. - BRVST
 $\delta_{SB} = 40^\circ$

A.C. POS'N
% MAC

.5

.4

.3

.2

.1

0

.5

.6

.7

.8

.9

1.0

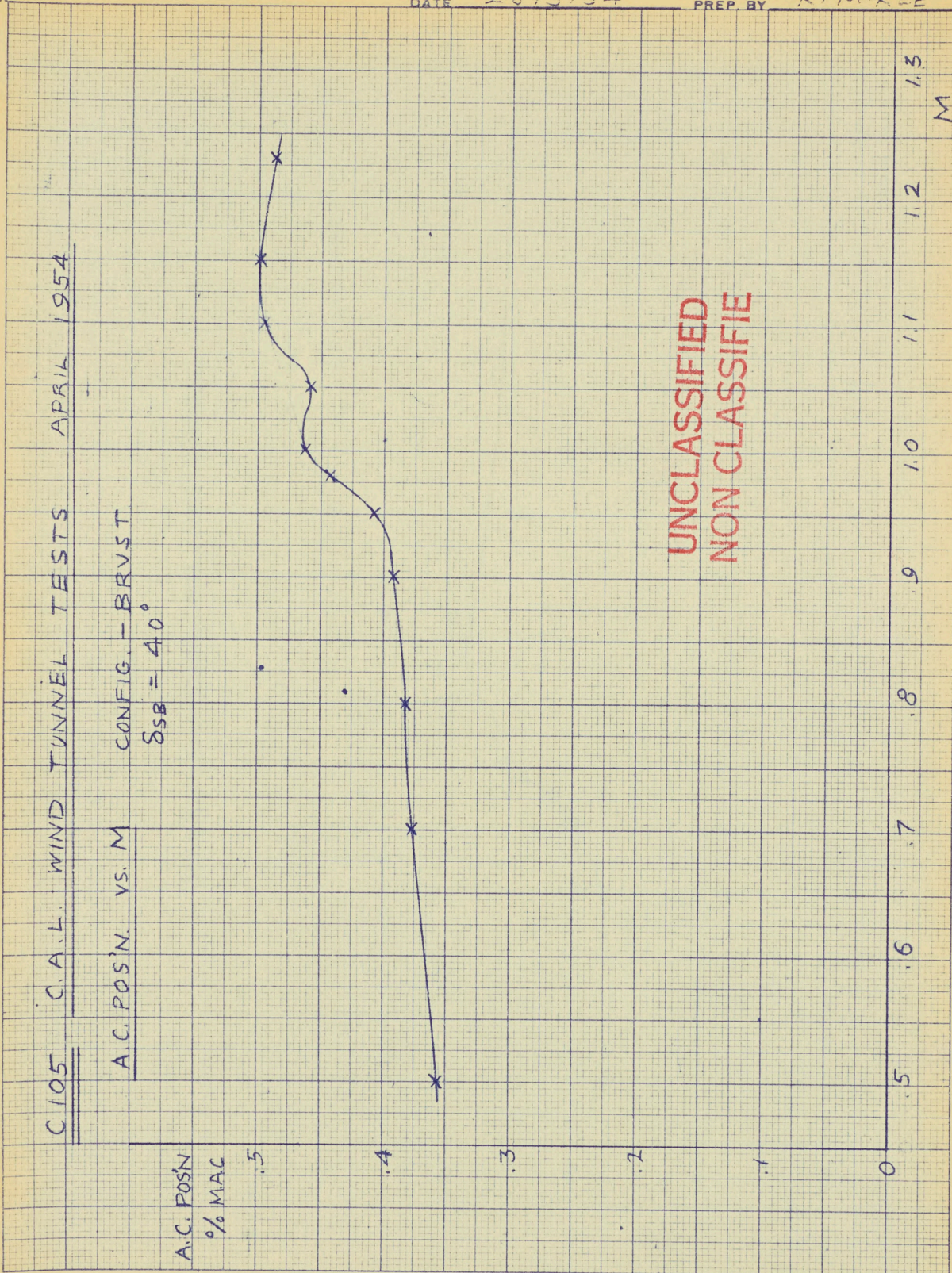
1.1

1.2

1.3

M

UNCLASSIFIED
NON CLASSIFIE



354-12 REUFEL & ESSER CO.
10 X 10 TO THE 1/2 INCH, 5th LINE ACCENTED.
MADE IN U.S.A.

C105
AERODYNAMIC CENTRE WITH SPEED BRAKES.

○ $\sigma_B = 60^\circ$
△ $\sigma_B = 60^\circ$ WITH TANK

a.c.
% MAC

60

50

40

30

20

4

6

8

10

12

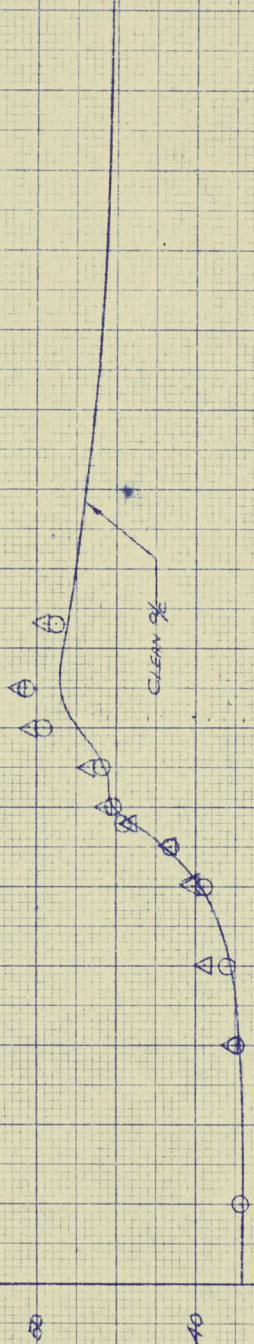
14

16

18

20

Mach No



UNCLASSIFIED
NON CLASSIFIE

C105
AERODYNAMIC CENTRE
EFFECT OF SIDESLIP

A.C.
% MAC.

60

50

40

30

20

4

6

8

10

12

14

16

18

20

MACH No

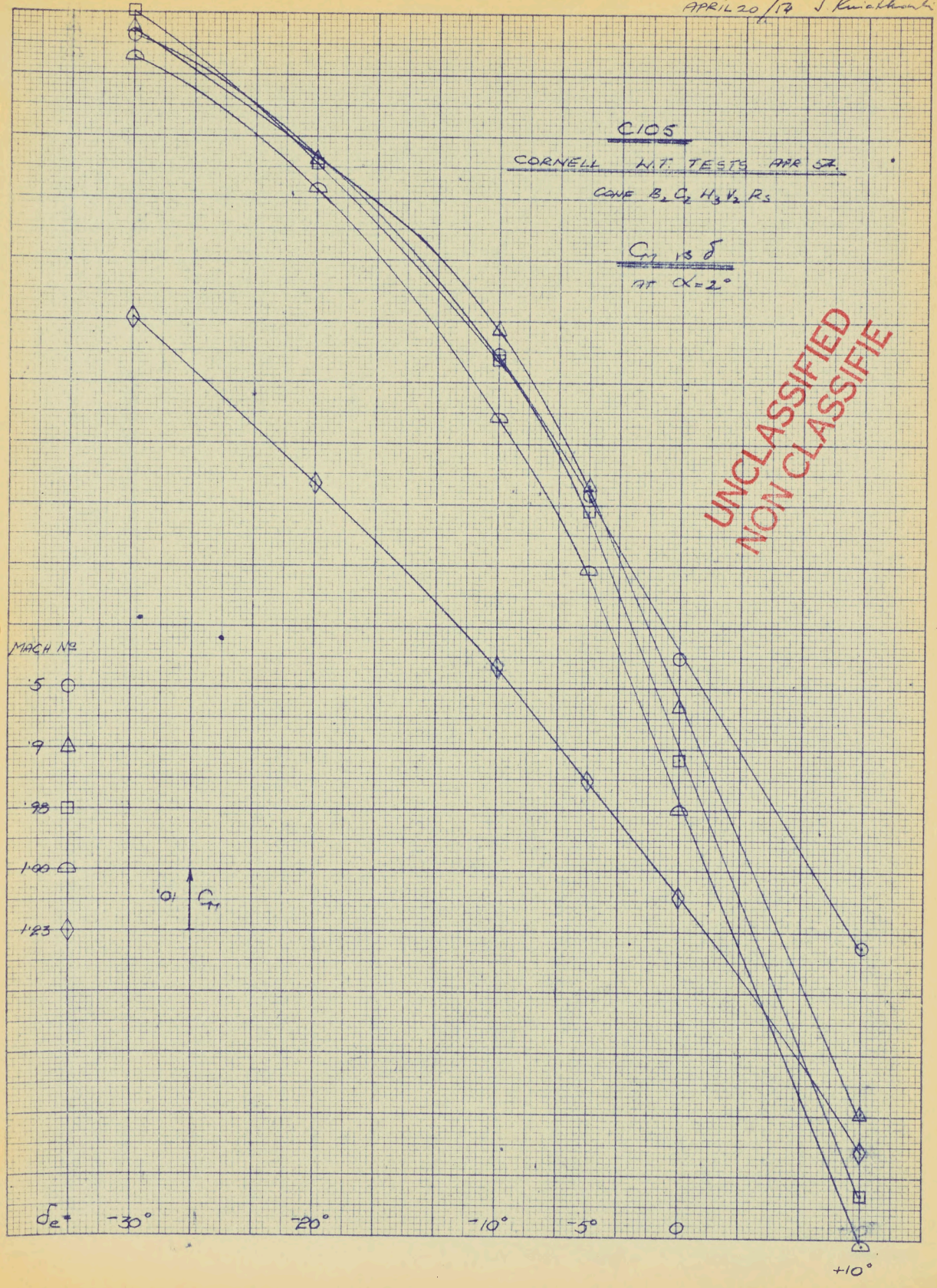
UNCLASSIFIED
NON CLASSIFIED

$\beta = 0$
 $\beta = 4^\circ$

221.1

P/W.T./20

APRIL 20/74 J. Kneibhauer



UNCLASSIFIED
NON CLASSIFIE

53412 KODAPAL A. ESSER CO.
10 X 10 IN. 2.5 MM. 500 LINES ACCURAC
MADE IN U.S.A.

AIRCRAFT
A. U. W.

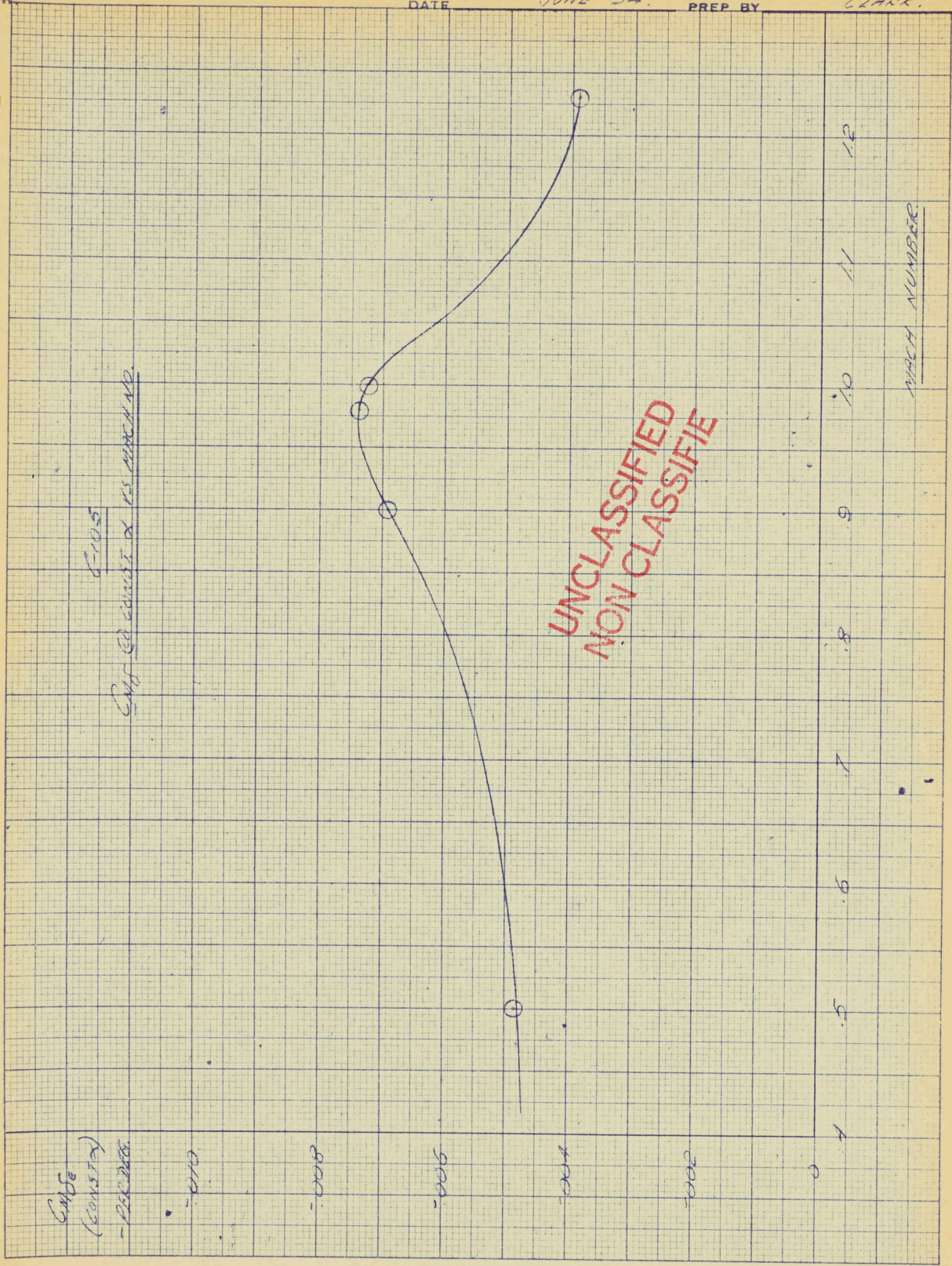
COMPONENT

SHEET No. 2.2.1.2.

REPORT No. P/W.T/20

DATE JUNE 54.

PREP BY CLARK.



CmBe
(CONST) x 10⁵

CmBe
(CONST)
- PER DATA

0.010

0.008

0.006

0.004

0.002

0

4

5

6

7

8

9

10

11

12

MACH NUMBER

UNCLASSIFIED
NON CLASSIFIED

35845 AIRCRAFT & REPAIR CO.
10 x 10 to 10.5 inch. Sp. Hubs and more
MADE IN U.S.A.

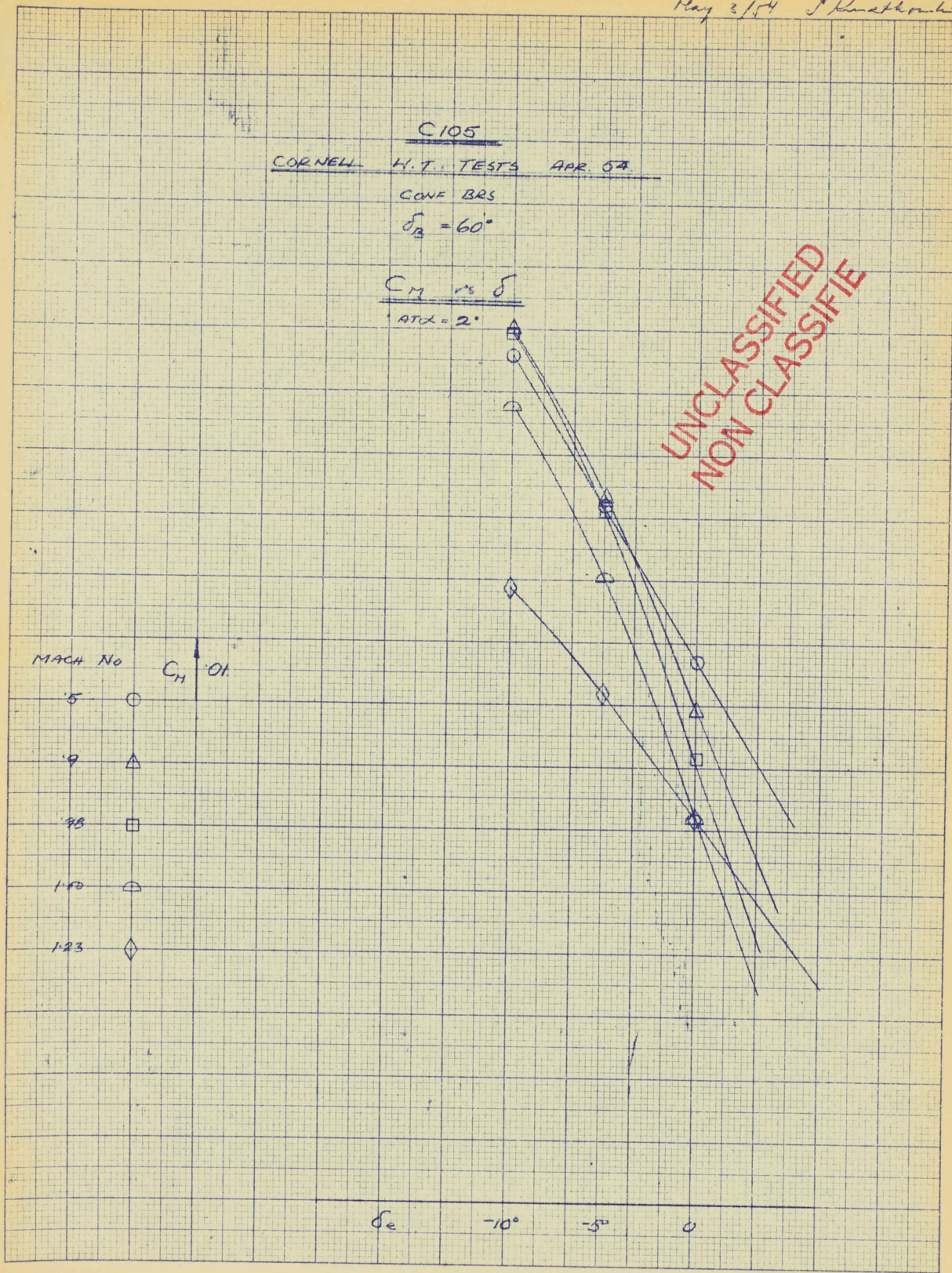
C105
CORNELL H.T. TESTS APR. 54
 CONF BRS
 $\delta_B = 60^\circ$

C_M vs δ
 $\alpha_{TX} = 2^\circ$

UNCLASSIFIED
 NON CLASSIFIED

MACH No	C_M	δ
.5	○	
.7	△	
.85	□	
1.0	◐	
1.23	◇	

δ_e -10° -5° 0



222.2.

P/W.T./20

May 5/54

I. Kwatkowski

C105

CORNELL W.T. TESTS APR. 54

CONF BRST.

$\delta_2 = 60^\circ$

C_M vs δ

at $\alpha = 2^\circ$

UNCLASSIFIED
NON CLASSIFIE

MACH NO C_M '91

.5 ○

.7 △

.98 □

1.50 ◐

1.23 ◇

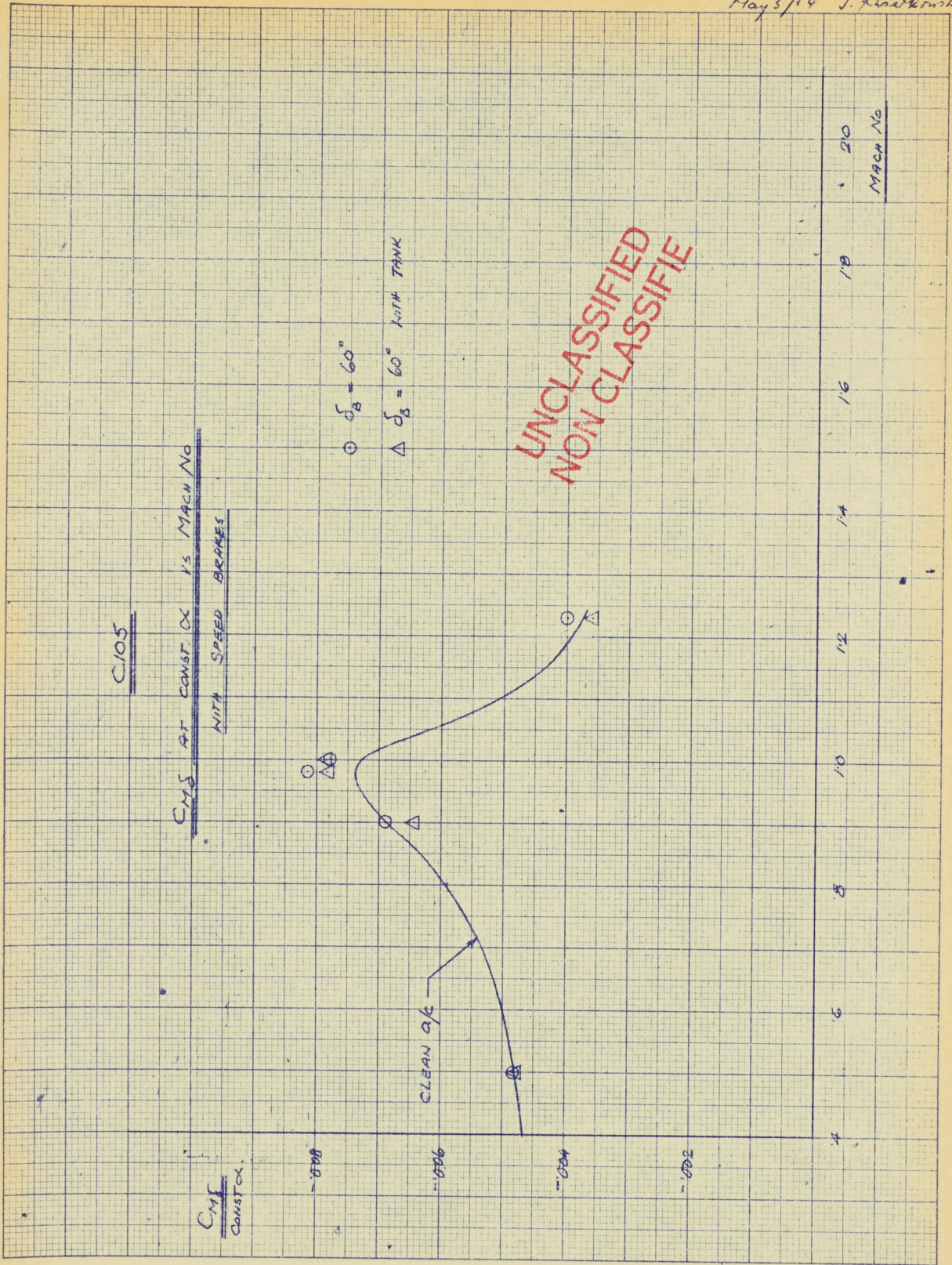
δ_2 -10° -5° 0

59-12 KEUFEL & ESSER CO
10 x 10 inch grid, 50 lines, uncut.
MADE IN U.S.A.

2.2.3.

P/N.T./20
May 3/54 J. Knatkovski

358-12 KEUFFEL & ESSER CO.
10 x 10 (in.) 1/4 inch, 5th class accuracy.
MADE IN U.S.A.



UNCLASSIFIED
NON CLASSIFIED

C105

Cm AT CONST. α 1/5 MACH No
WITH SPEED BRAKES

Cm
CONST. α

0.00

0.06

0.12

0.18

○ $\delta_2 = 60^\circ$

△ $\delta_2 = 60^\circ$ WITH TANK

CLEAN a/c

MACH No

20

18

16

14

12

10

8

6

4

23.1.1.

P/W.T./70

APRIL 20/57 P. Knollwink

C105
CORNELL W.T. TESTS APR 57

CONF $B_2 C_2 H_3 V_2 R_3$

C_M vs δ
AT $C_L = 1$

UNCLASSIFIED
NON CLASSIFIE

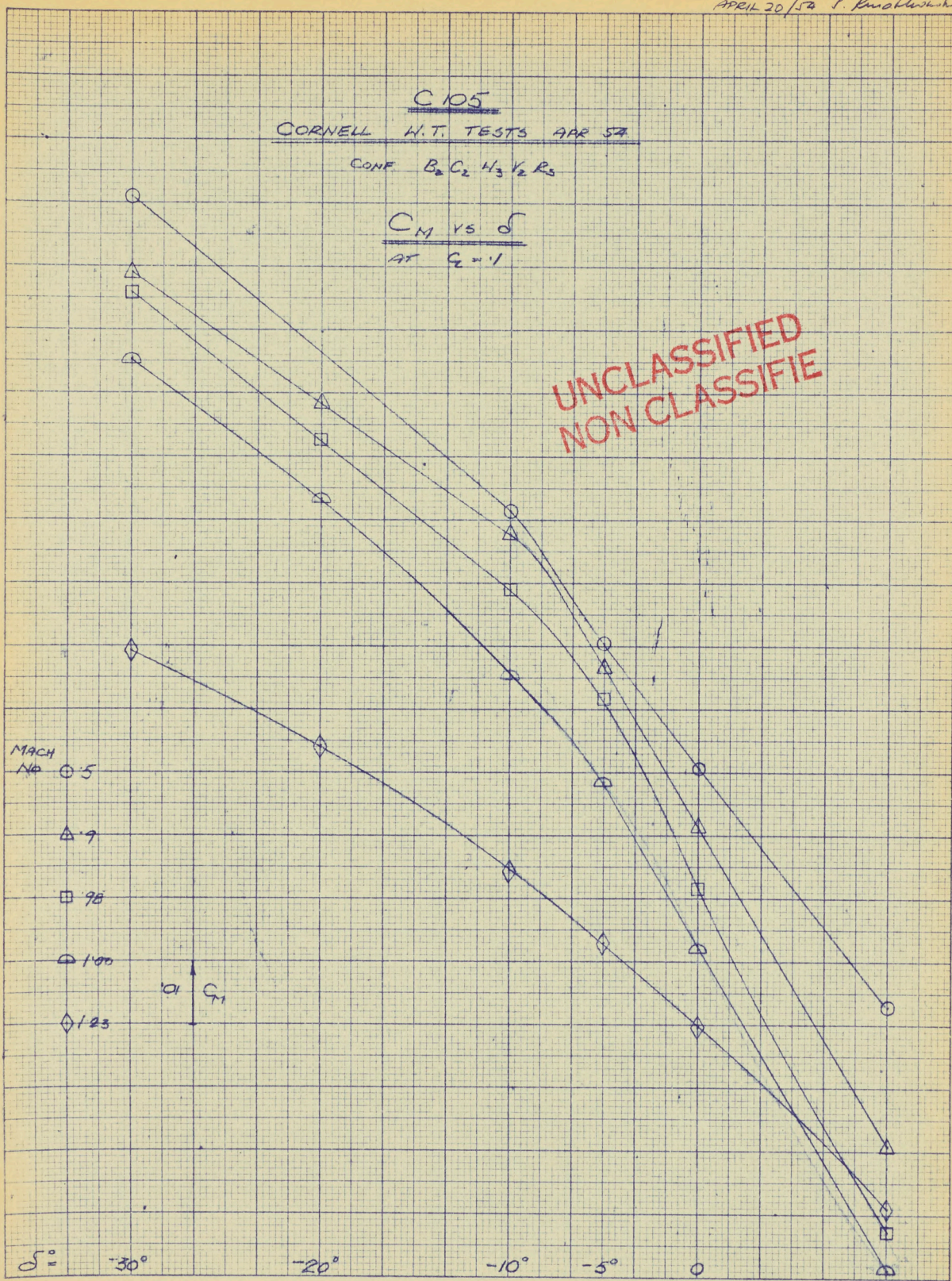
MACH
No

- 5
- △ 9
- 98
- ◐ 100
- ◇ 123

101 C_M

$\delta = 0^\circ$ -30° -20° -10° -5° 0 $+10^\circ$

10-10-10 IN. 3-10 IN. DIA. TYP. BOSSING
MADE IN U.S.A.



AIRCRAFT
A. U. W.

COMPONENT

SHEET No. 231.E

REPORT No. PWT/20

DATE JUNE 54.

PREP BY CLARK

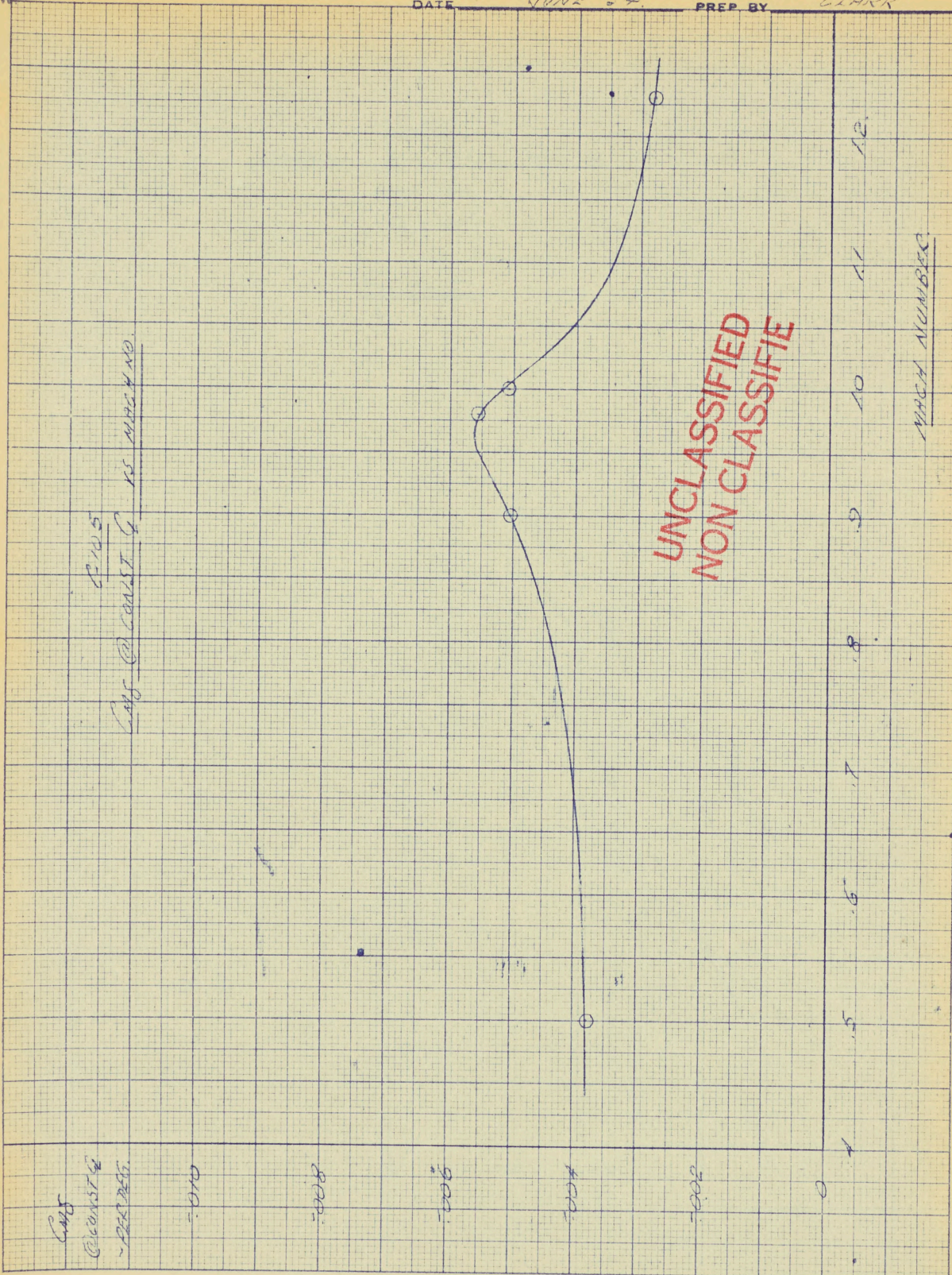


FIG 5
CAF @ CONST. & IS MACH NO.

UNCLASSIFIED
NON CLASSIFIE

MACH NUMBER

CAF
CONST.
IS MACH NO.

100

200

300

400

500

0

1

2

3

4

5

6

7

8

9

10

11

12

10 X 10 IN. 50 PERCENT STRETCHABLE
MADE IN U.S.A.

2321.

P/W.T./20

May 3/54 J. Knattrock

C105

CORNELL W.T. TESTS APR 57

CONF. BRS

$\delta_B = 60^\circ$

C_M vs δ

AT $C_L = 1$

UNCLASSIFIED
NON CLASSIFIE

MACH No

⊕ .5

△ .9

□ .98

⊖ 1.00

◇ 1.23

↑ C_M

δ_e

-10°

-5°

0

C105
CORNELL W.T TESTS APR 54

CONF BRST

$\delta_B = 60^\circ$

C_M vs δ_e

at $q = 1$

UNCLASSIFIED
NON CLASSIFIE

MACH No

5 ○

7 △

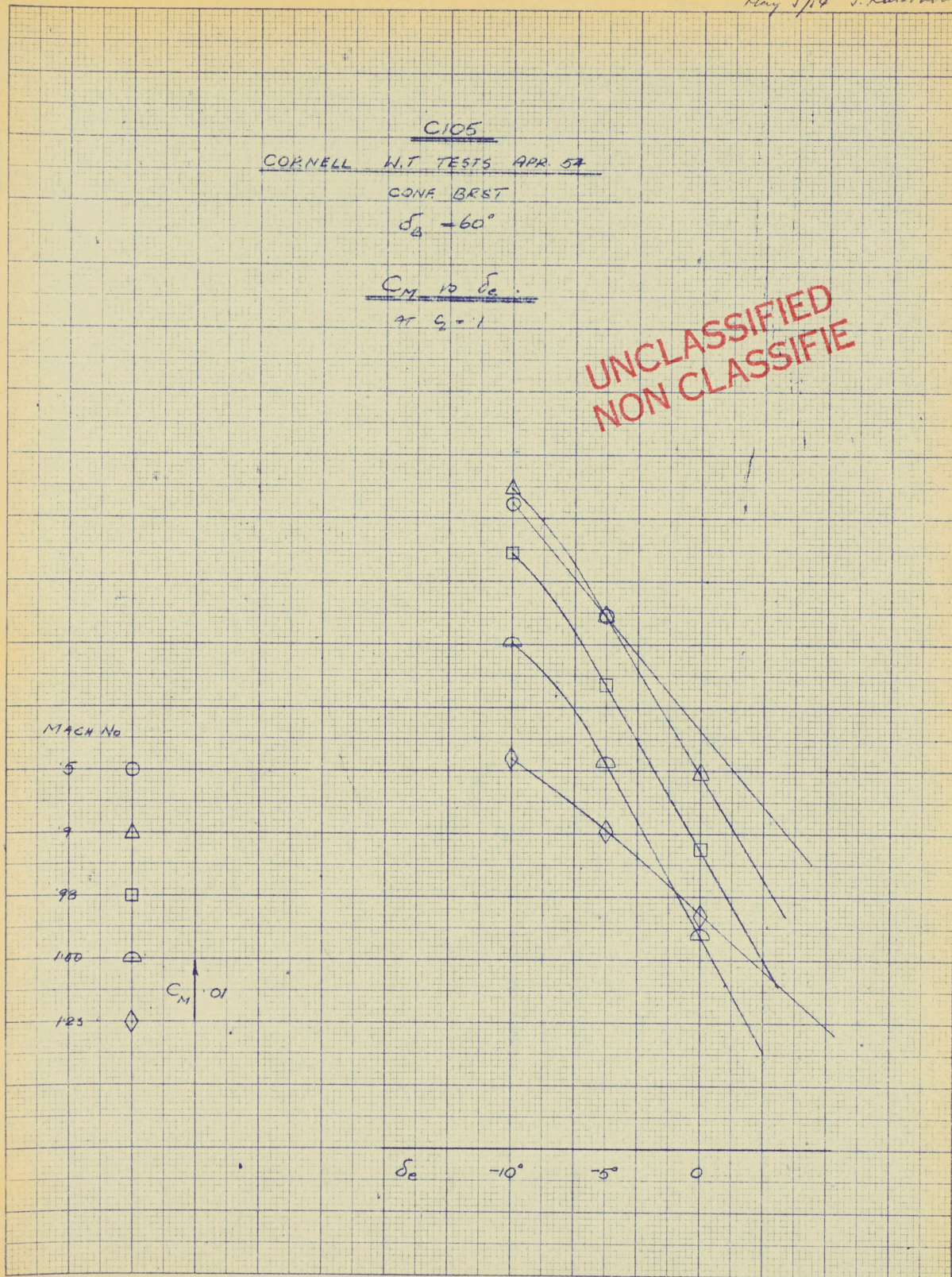
95 □

140 ◐

125 ◇

C_M ↑ 01

δ_e -10° -5° 0



159-12 NEUFEL & ESSER CO.
10 x 10 to 10 1/2 inch, 500 lines accuracy
MADE IN U.S.A.

C105

C_{mf} AT CONST C_L 15 MACH No
WITH SPEED BRAKES

C_{mf}
CONST C_L

-008

-006

-004

-002

○ δ_B = 60°

△ δ_B = 60°

WITH TANK

CLEAN UP

UNCLASSIFIED
NON CLASSIFIE

MACH No

20

18

16

14

12

10

8

6

4

C105

CORNELL N.T. TESTS APR 54

CONF. BRV

$\beta = -4^\circ$

C_M VS δ_e

AT $C_L = 1$

UNCLASSIFIED
NON CLASSIFIE

MACH No

9 \triangle

70 \square

125 \diamond

C_M '01

δ_e -10° -5° 0

359-12 KEUFFEL & ESSER CO.
10 X 10 to the 1/2 inch 5th lines centered
MADE IN U.S.A.

AIRCRAFT
A. U. W.

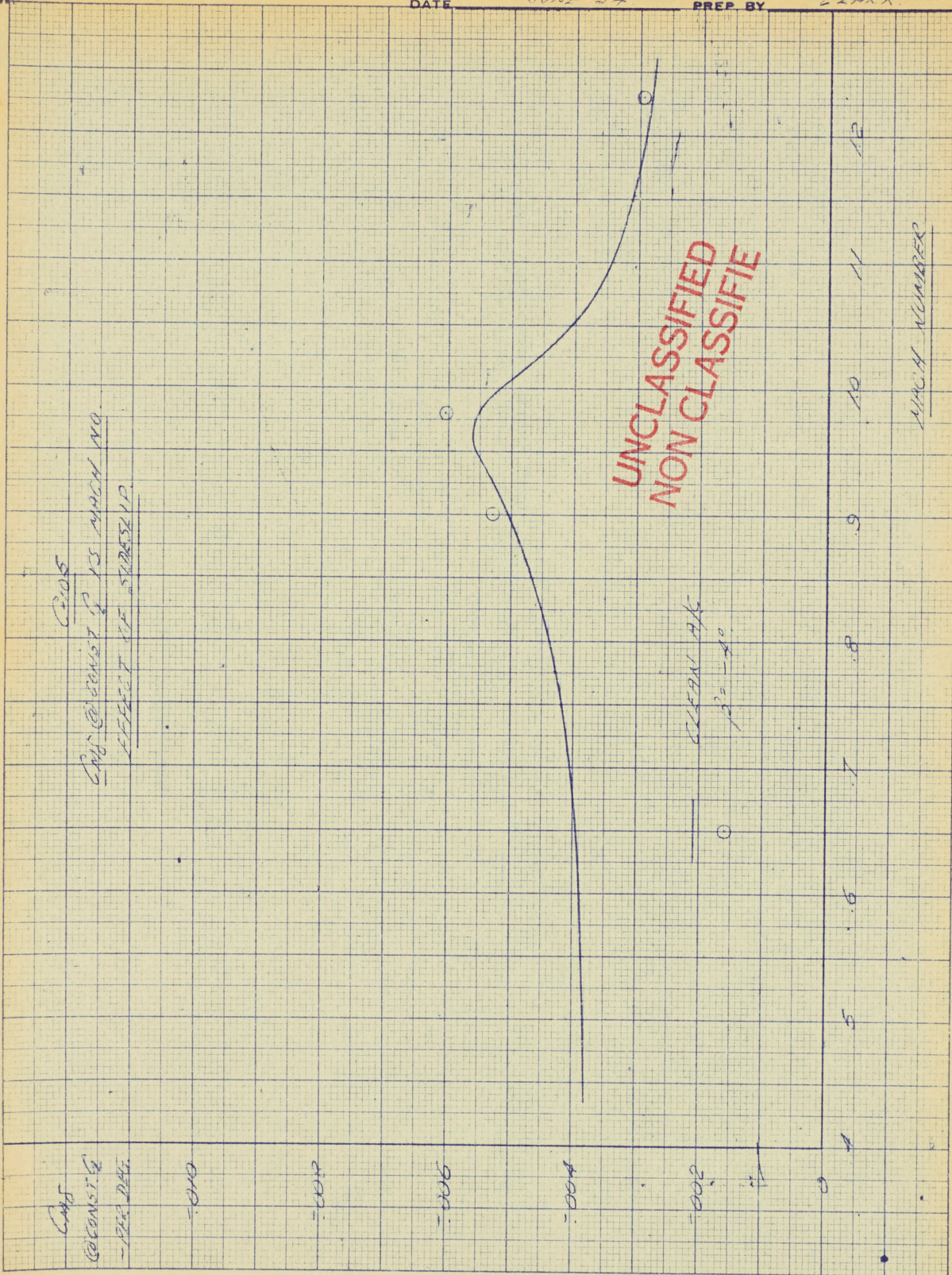
COMPONENT

SHEET No. 2332

REPORT No. P/N 7/20

DATE JUNE 54

PREP BY CLARK



FORM 1746 PREVIOUS EDITIONS
ARE OBSOLETE
MADE IN U.S.A.

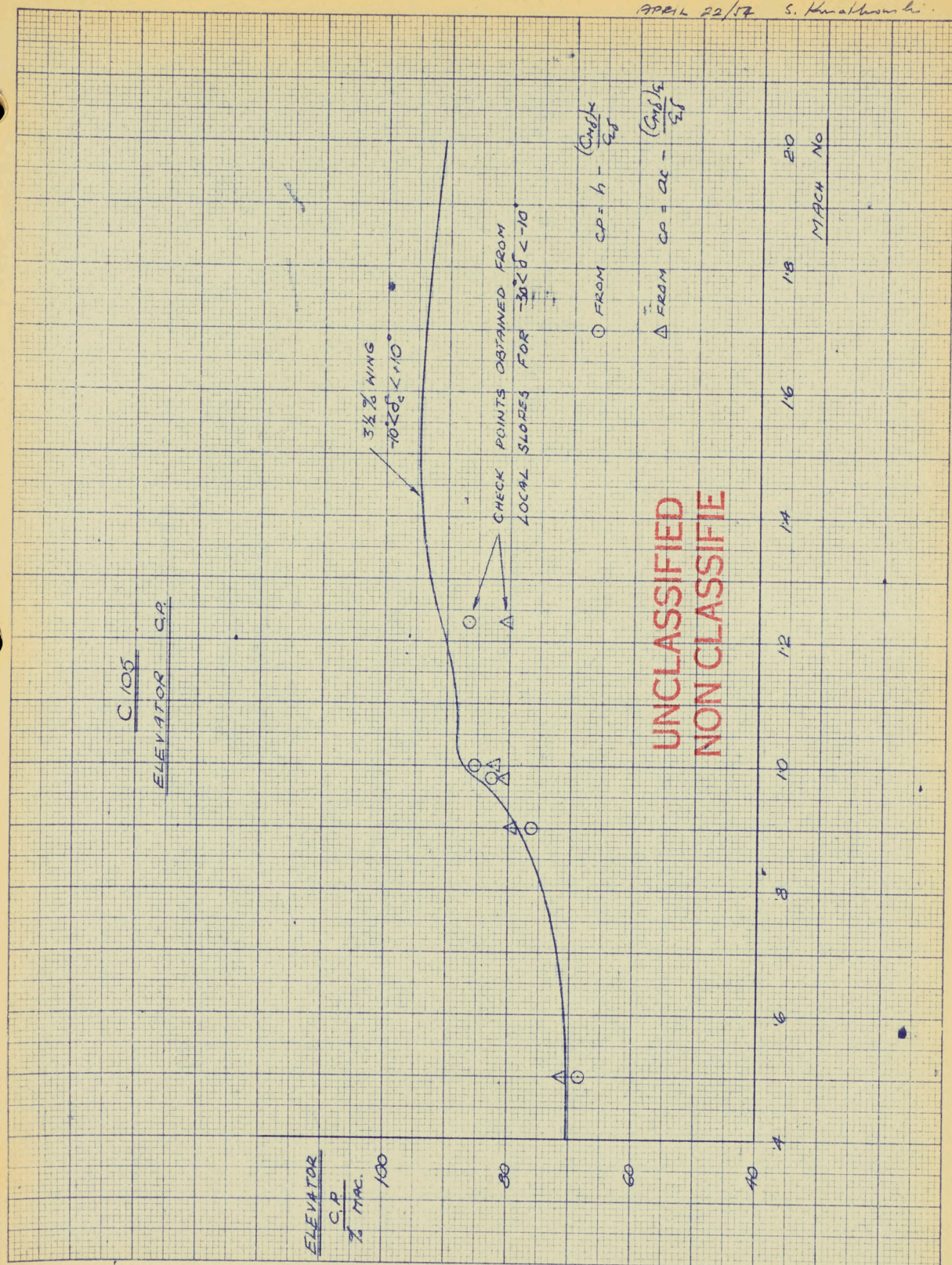
2.4.1.3.

P/W.T./20

APRIL 22/72

S. Hamalshon h.

59-12 827116-1 RES. 100-10
10.5 10 TO 100 1/2 INCH SHEET THICK ASS. CHD.
MADE IN U.S.A.



C 105
ELEVATOR C.P.

ELEVATOR
C.P.
7/2 MAC.
100

3 1/2% WING
-10 to 0° < 10°

CHECK POINTS OBTAINED FROM
LOCAL SLORES FOR 30° < -10°

O FROM CP = $h - \frac{(C \cos \frac{1}{2})}{2f}$

A FROM CP = $C_c - \frac{(C \cos \frac{1}{2})}{2f}$

UNCLASSIFIED
NON CLASSIFIE

4 6 8 10 12 14 16 18 20
MARCH No

C/105
CORNELL A.I. TESTS APA 57

ELEVATOR CP
WITH SPEED BRAKES

$\alpha_B = 60^\circ$

CP
% MAC

100

80

60

40

8

$\alpha_B = 60^\circ$ { Δ FROM CP = $h \frac{C_{Lmax}}{C_L}$
 Δ FROM CP = $ac - \frac{C_{Mmax}}{C_L}$

CLEAN a/c

UNCLASSIFIED
NON CLASSIFIED

MARCH NO
18 20

14

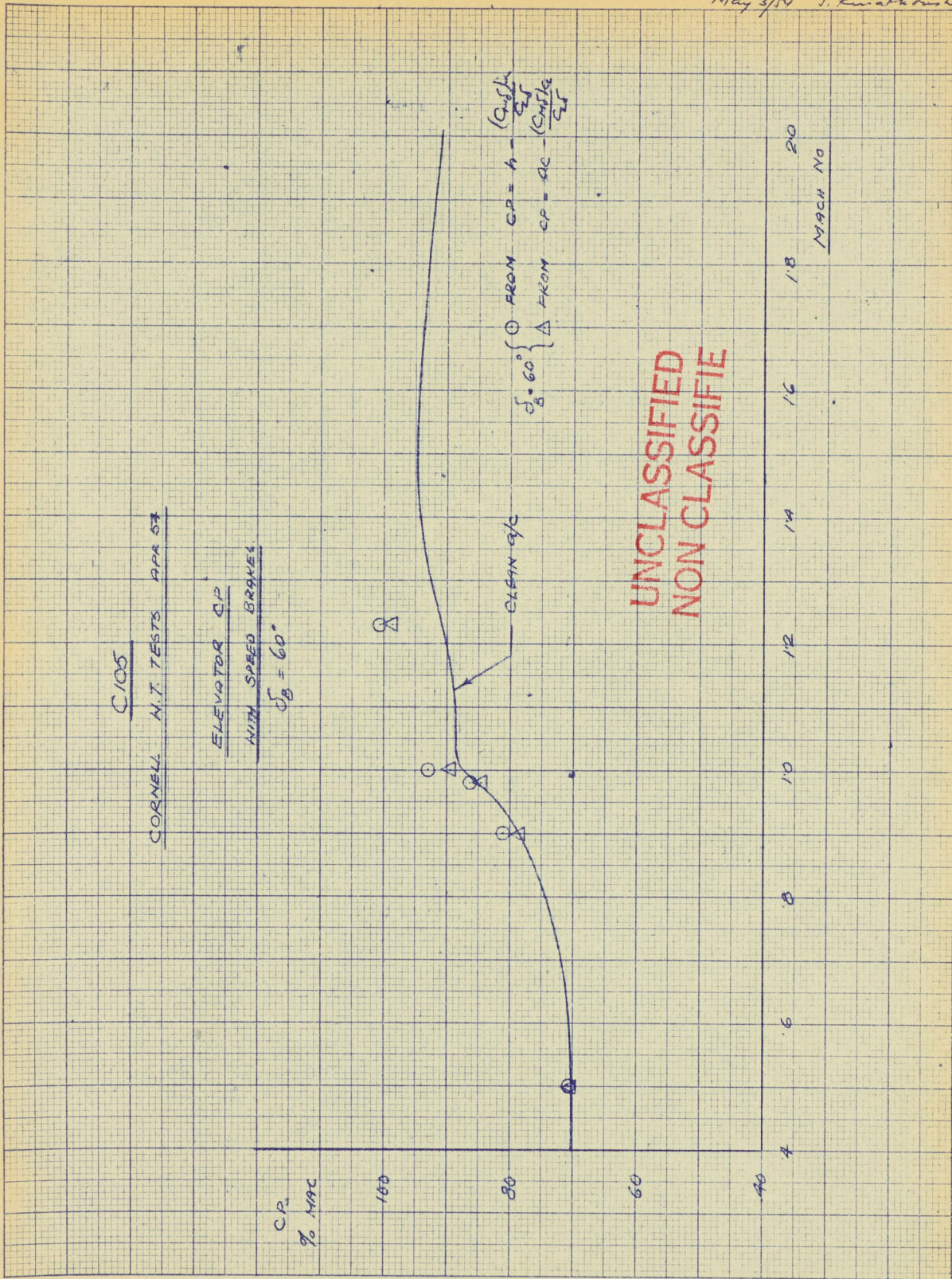
12

10

8

6

4



C105
CORNELL KIT TESTS APR 57
ELEVATOR CP
WITH SPEED BRAKES AND TANK
 $\alpha_B = 60^\circ$

CP
% MAC

100

80

60

40

4

6

8

10

12

14

16

18

20

MAC# No

$\alpha_B = 60^\circ$ { \circ FROM $CH = 1 - \frac{C_{LTK}}{C_{L0}}$
 Δ FROM $CP = AC - \frac{C_{LTK}}{C_{L0}}$

CLEAN a/c

UNCLASSIFIED
NON CLASSIFIED

AIRCRAFT
A. U. W.

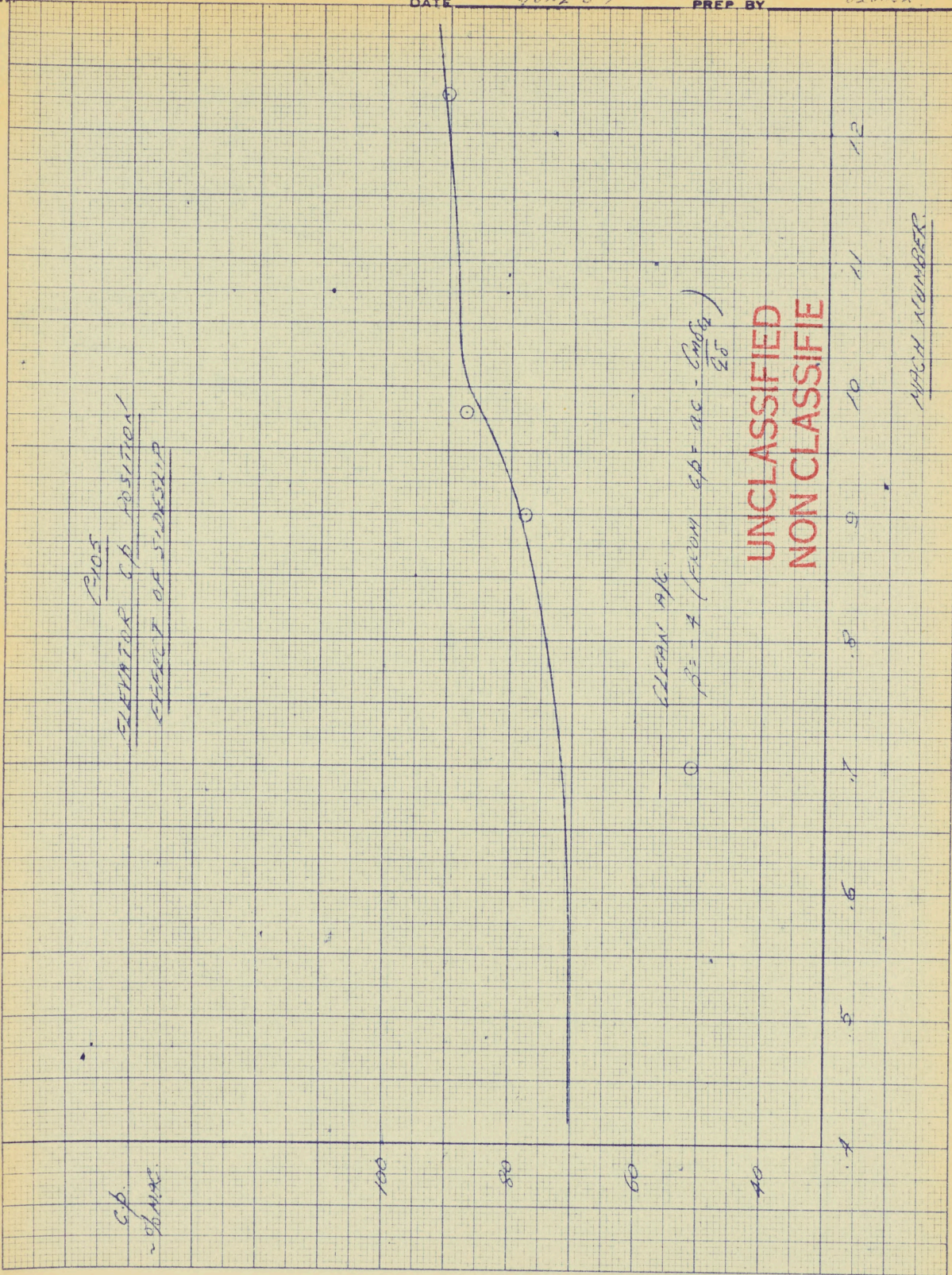
COMPONENT

SHEET No. 2432

REPORT No. P/N.T. 120

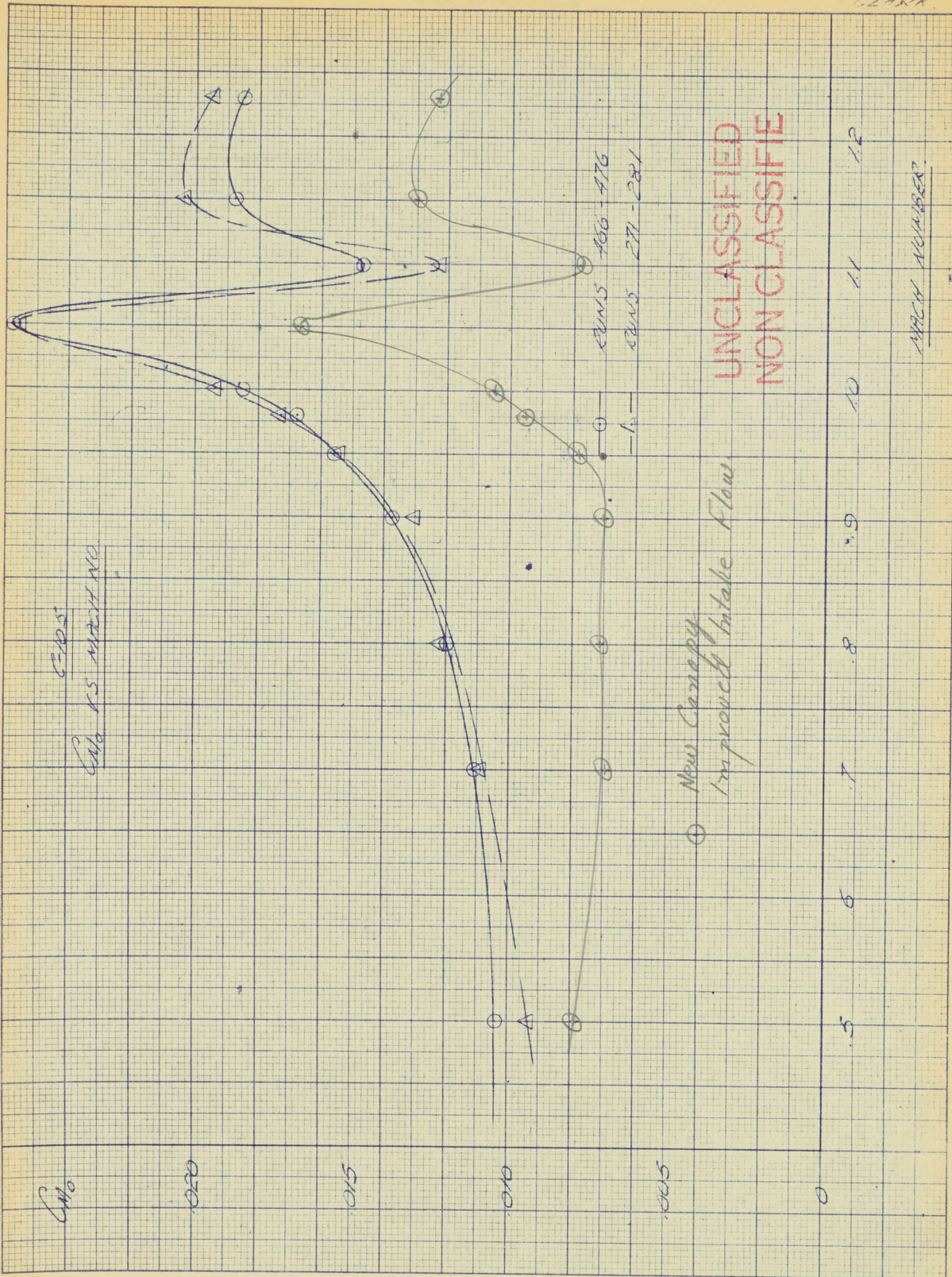
DATE JUNE 54

PREP BY CLARK



49242 - MATHEMATICAL CENTER
10 - 10 TO 100, 100, 500 HIGHS ACQUAINT.
MADE IN U.S.A.

10-2-10-10, INC. 15, 10th, 5th FLOOR, NEW YORK, N.Y.
MADE IN U.S.A.



EUNS
100-476

EUNS 100-476
EUNS 277-281

○ New Canopy
△ Improved Intake Flow

UNCLASSIFIED
NON CLASSIFIED

MACH NUMBER

C105 C.A.L. WIND TUNNEL TESTS APRIL 1954

C_{M_0} VS. M

CONFIG. - BRVST
 $\delta_{SB} = 40^\circ$

C_{M_0}

.04

.03

.02

.01

0

.6

.7

.8

.9

1.0

1.1

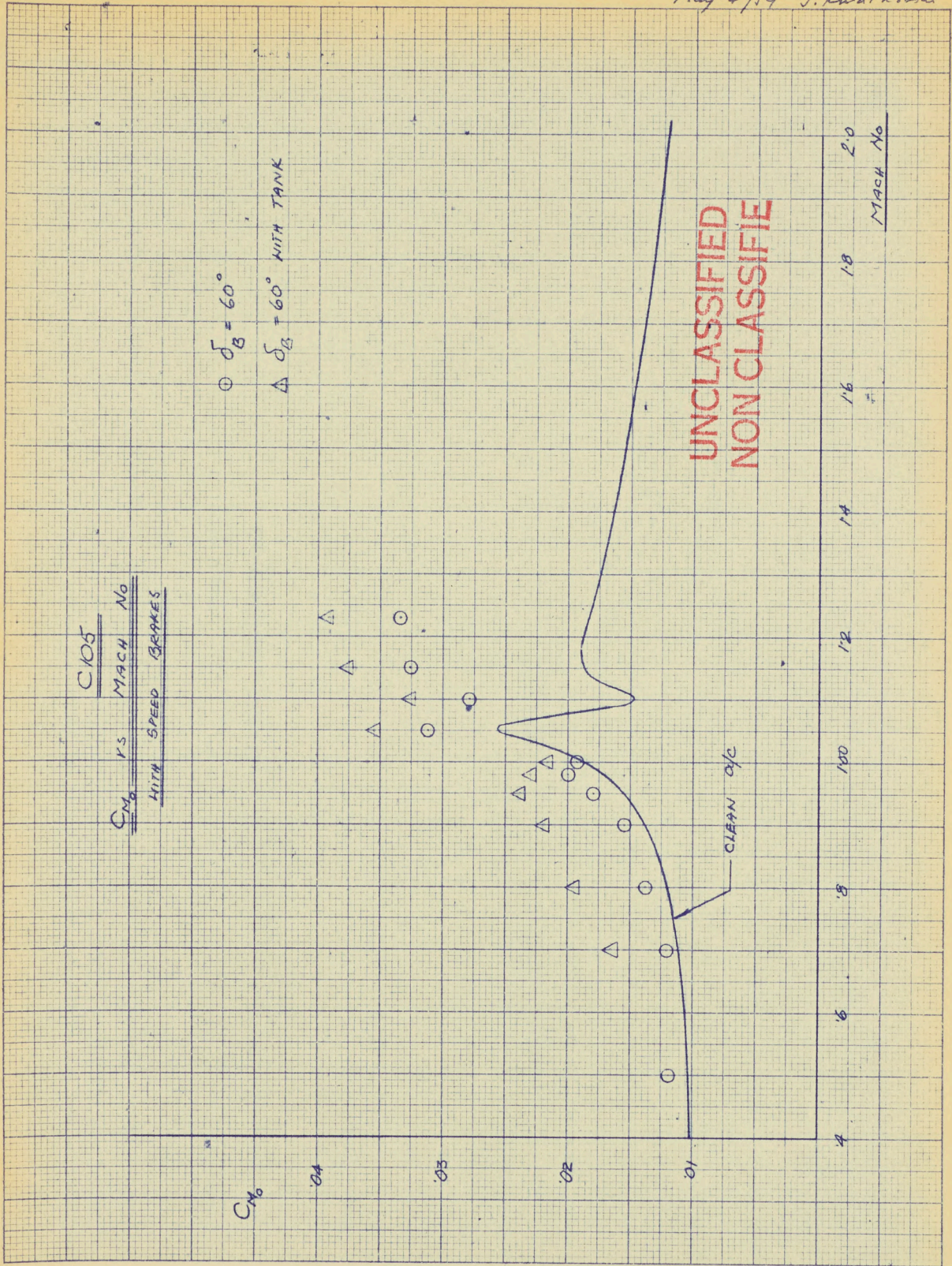
1.2

1.3

M

UNCLASSIFIED
NON CLASSIFIED

539-12 NEUFEL & ESSER CO.
10 X 10 to 1/2 inch, 5th lines accented.
MADE IN U.S.A.



C105

C_{M_0} vs. MACH No
AFFECT OF SIDESLIP

C_{M_0}

03

02

01

0

4

6

8

10

12

14

16

18

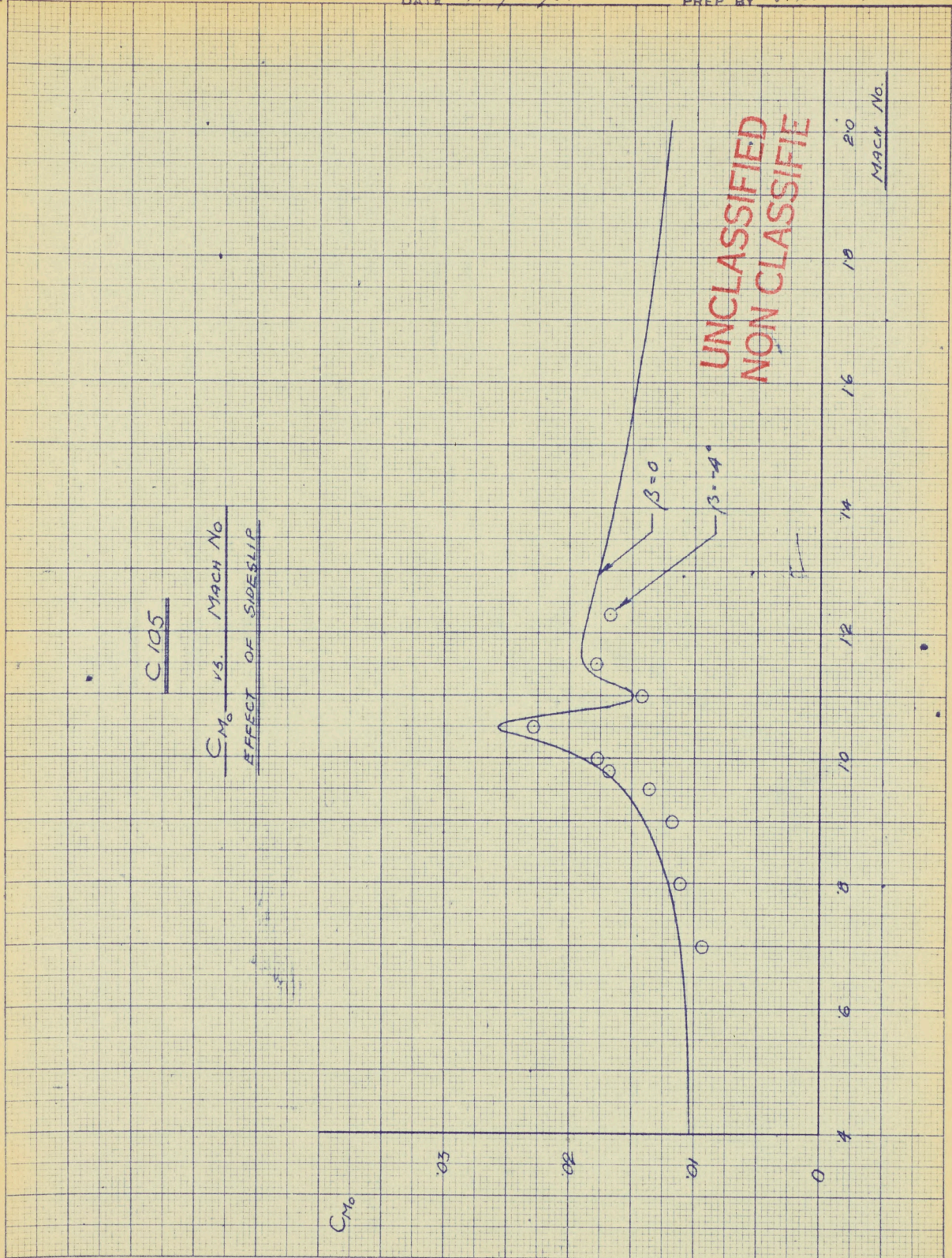
20

MACH No.

UNCLASSIFIED
NON CLASSIFIE

$\beta = 0$

$\beta = 4^\circ$



559-12 KUFFEL & ESSER CO.
10 - 10 to the 12 inch, 5th times accented.
MADE IN U.S.A.

26.1.5.

P/H.7./20
 May 4/54 J. Kwiatkowski

C106

$\Delta \delta_{TRIM}$ SPEED BRAKES

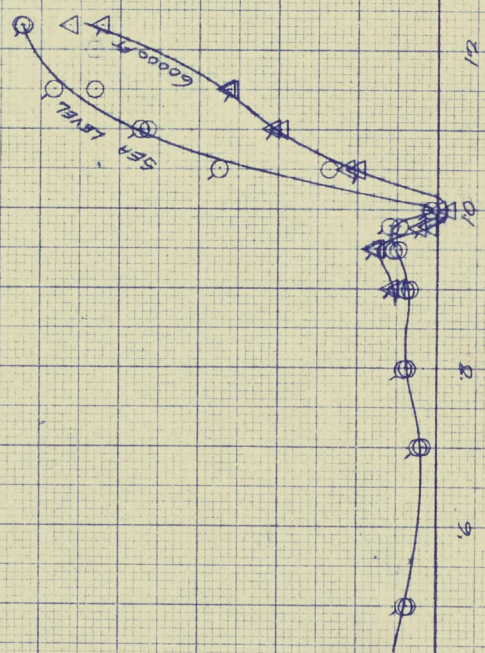
C.G. = 28.5
 $N = 40000/16$

$\delta_B = 60^\circ$

SEA LEVEL { \circ FROM DERIVATIVES
 \odot FROM DIRECT PLOTS
 60000 FT { Δ FROM DERIVATIVES
 \triangle FROM DIRECT PLOTS

$\Delta \delta_{TRIM}$

6°
5°
4°
3°
2°
1°



UNCLASSIFIED
 NON CLASSIFIED

Mach No

4 6 8 10 12 14 16 18 20

C105

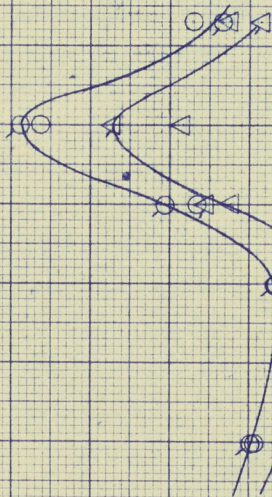
$\Delta \delta_{TRIM}$ FIN SPEED BRAKES

C.G. = 28%
W = 47000 LB
 $\delta_{FB} = 50^\circ$

$\Delta \delta_{TRIM}$

8°
7°
6°
5°
4°
3°
2°
1°

SEA LEVEL { ○ FROM DERIVATIVES
○ FROM DIRECT PLOTS
GOODMAN { △ FROM DERIVATIVES
△ FROM DIRECT PLOTS



UNCLASSIFIED
NON CLASSIFIE

MACH No

18

16

14

12

10

8

6

4

2.6.33.

P/W.T./20

May 6/54 J. Kwiatkowski

C105
Δδ TRIM SPEED BRAKES AND TANK

$C_{L0} = 28.3$

$M = 470000L$

$\delta_B = 60^\circ$

$\Delta\delta_{TRIM}$

7°

6°

5°

4°

3°

2°

1°

4

'6

'8

'10

'12

'14

'16

'18

'20

MACH No

SEA LEVEL { ○ FROM DERIVATIVES
○ FROM DIRECT PLOTS

60000 FT { △ FROM DERIVATIVES
△ FROM DIRECT PLOTS

UNCLASSIFIED
NON CLASSIFIE

AIRCRAFT C105

COMPONENT

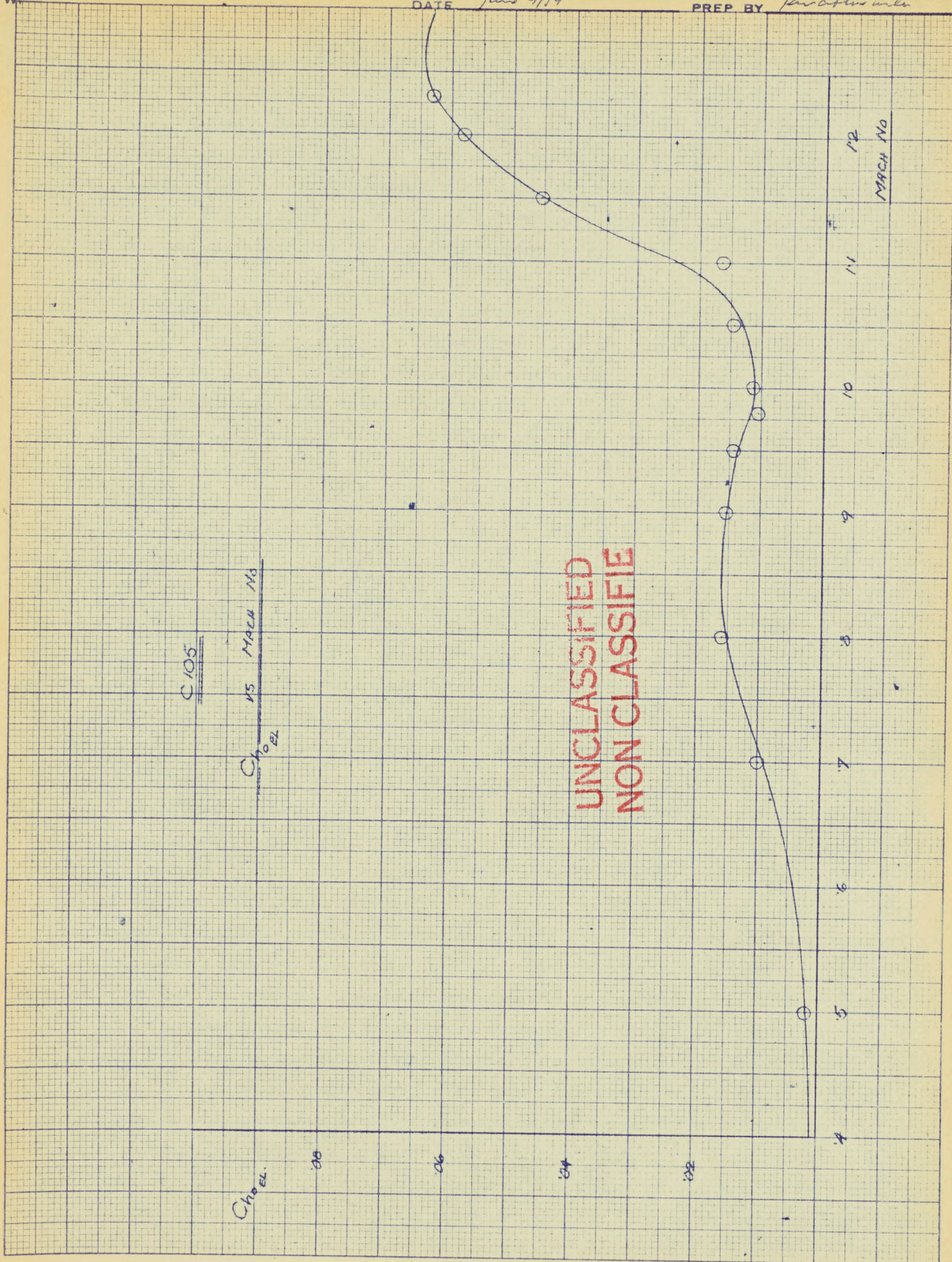
SHEET No. 31.1.1.

REPORT No. P/W.T./20

A. U. W.

DATE June 9/14

PREP BY Kwathusuli



C105

Chord vs MARCH No

UNCLASSIFIED
NON CLASSIFIED

Chord

MARCH No

350-10 KEUFFEL & ESSER CO.
10 x 10 to 1/2 inch, 5th lines accented.
MADE IN U.S.A.

C105

C_{H_0} ELEVATOR
AUTO SPEED BRAKES

$\alpha - \delta_B = 60^\circ$

UNCLASSIFIED
NON CLASSIFIED

CLEAN A/C

Mach No

C_{H_0} EL.

08

06

04

02

6

8

10

12

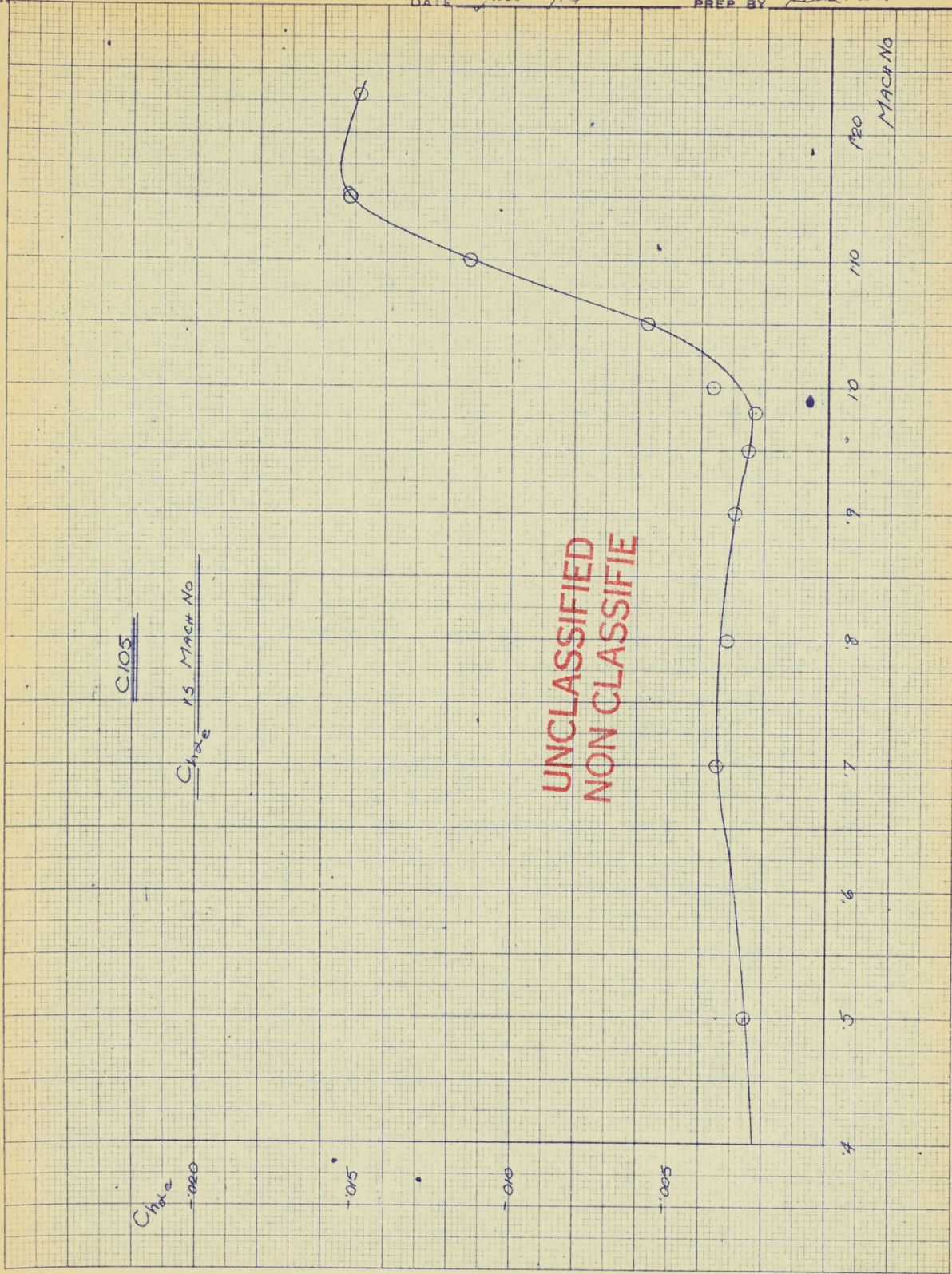
14

16

18

20

3-15 REPRODUCED BY SHIP CO
10 x 10 IN. PER. 50% MIN. DISCOUNT
MADE IN U.S.A.



C105

Chose 15 Mach No

Chose -0.05

-0.15

-0.10

-0.05

35942 REUFFEL BESSER CO.
10 x 10 to dia. 12 inch. Slip lines included.
MADE IN U.S.A.

C105
CORNELL A.I.T. TESTS APR 57
NON-LINEARITY OF ELEVATOR HINGE MOMENT

$\frac{C_{m\alpha}}{C_{m\alpha=0}}$

40

30

20

10

4

.6

1.0

1.00

1.2

1.4

1.6

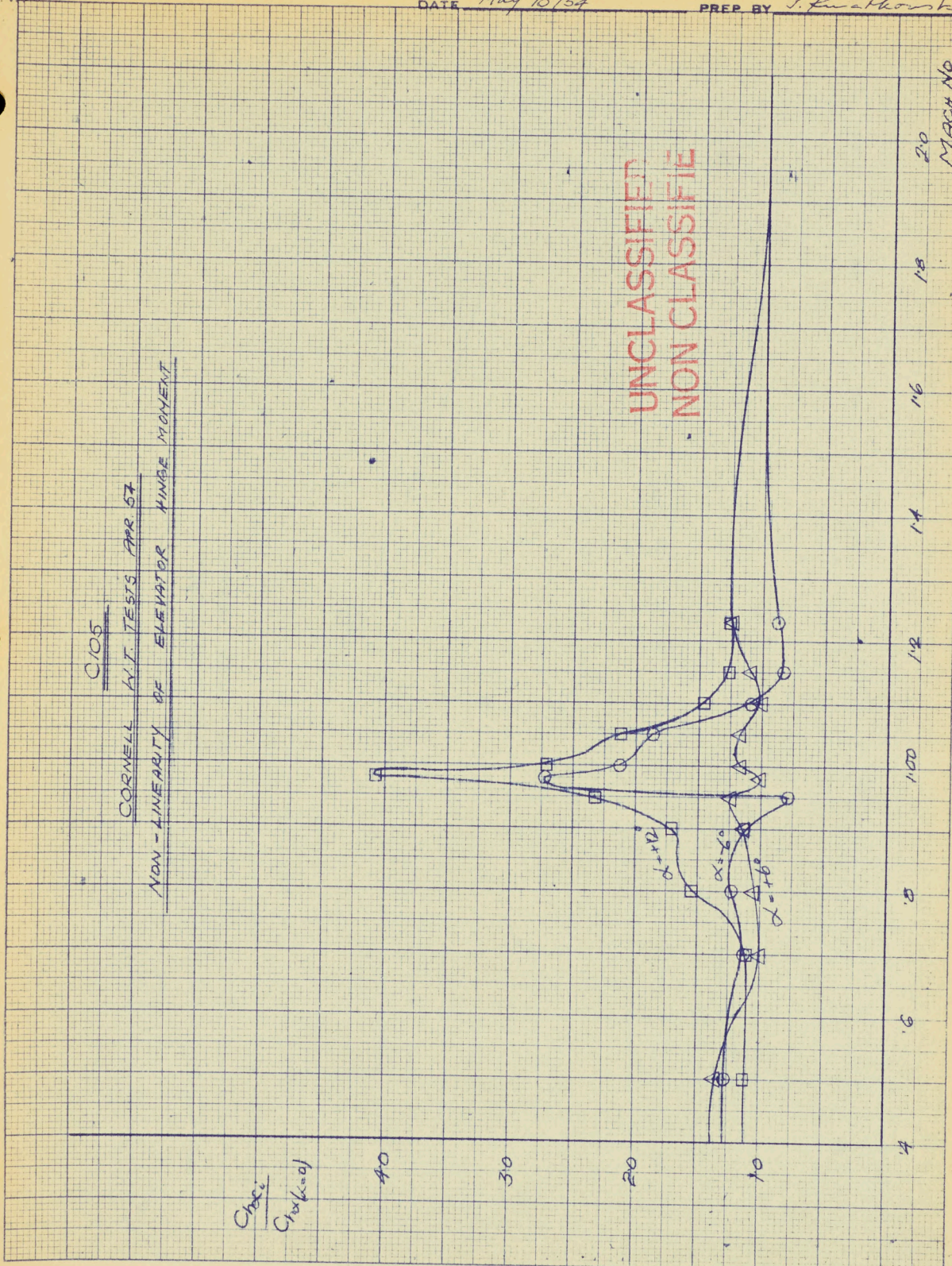
1.8

2.0

MACH No

UNCLASSIFIED
NON CLASSIFIED

$\alpha = 2^\circ$
 $\alpha = 4^\circ$
 $\alpha = 6^\circ$



UNCLASSIFIED
NON CLASSIFIE

C105

CLAX ELEVATOR
WITH SPEED BRAKES.

CLEFAN q/c

$\alpha = \alpha_B = 60^\circ$

Choc

-020

-040

-060

-080

4

6

8

10

12

14

16

18

20

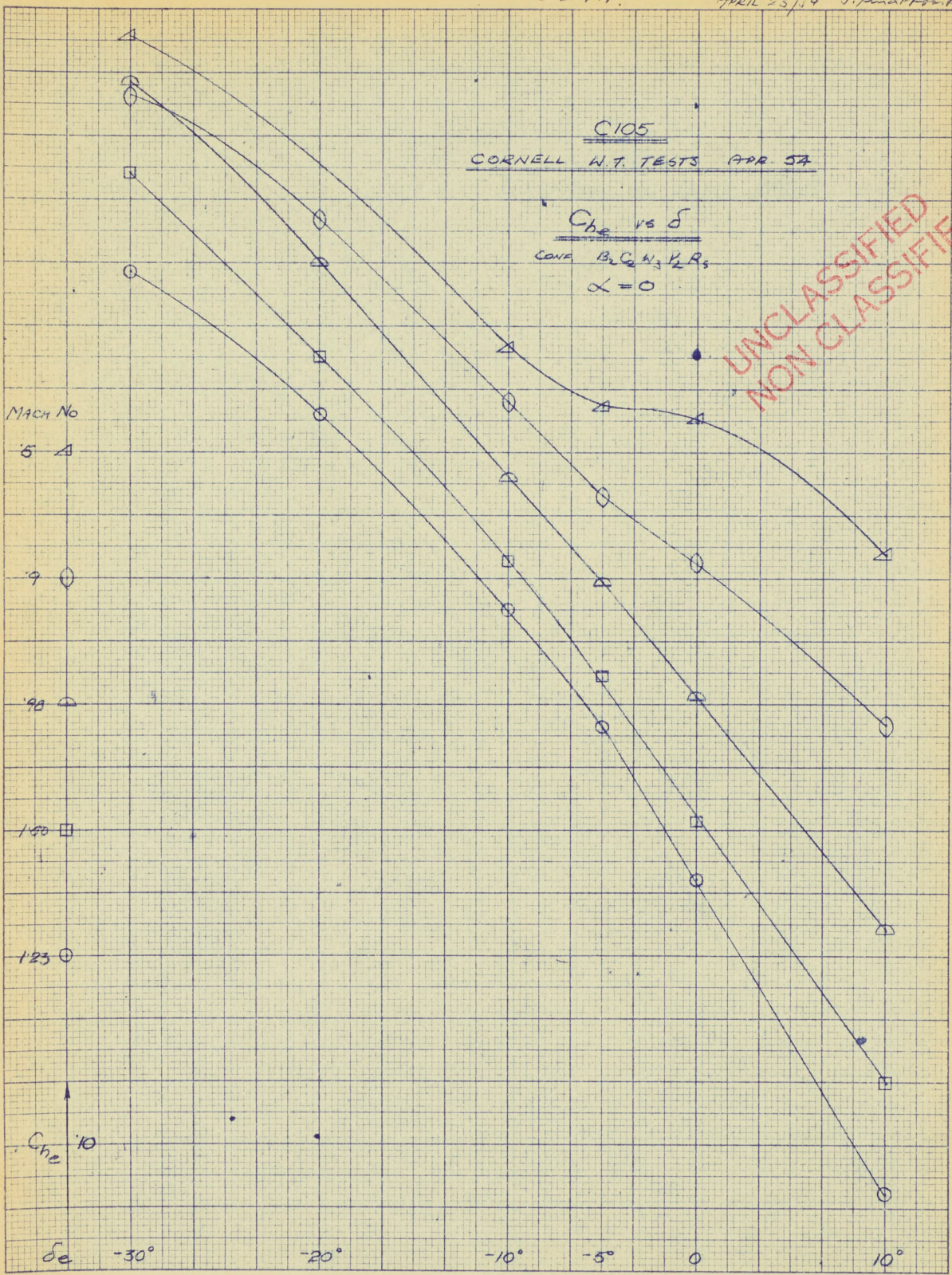
Mass No

32.1.1.

P/W.T.120

APRIL 23/54

J. Kuntz

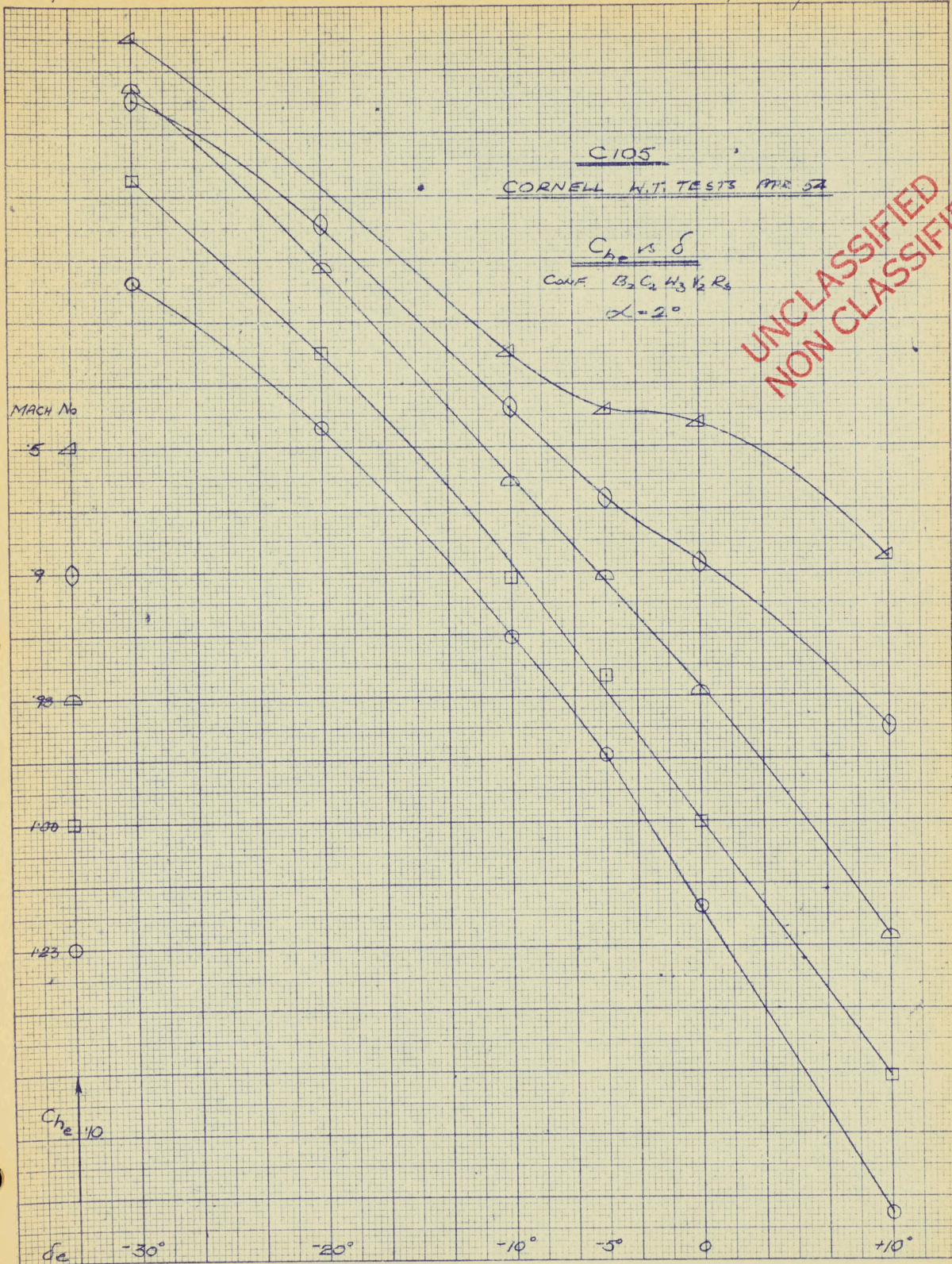


30512 ZEUTHEN & BOESER CO.
10, 2-10 10th St., Wash., D.C. 20004
MADE IN U.S.A.

3.3.1.2.

P/H.T./20

APRIL 23/74 J. K. K. K.

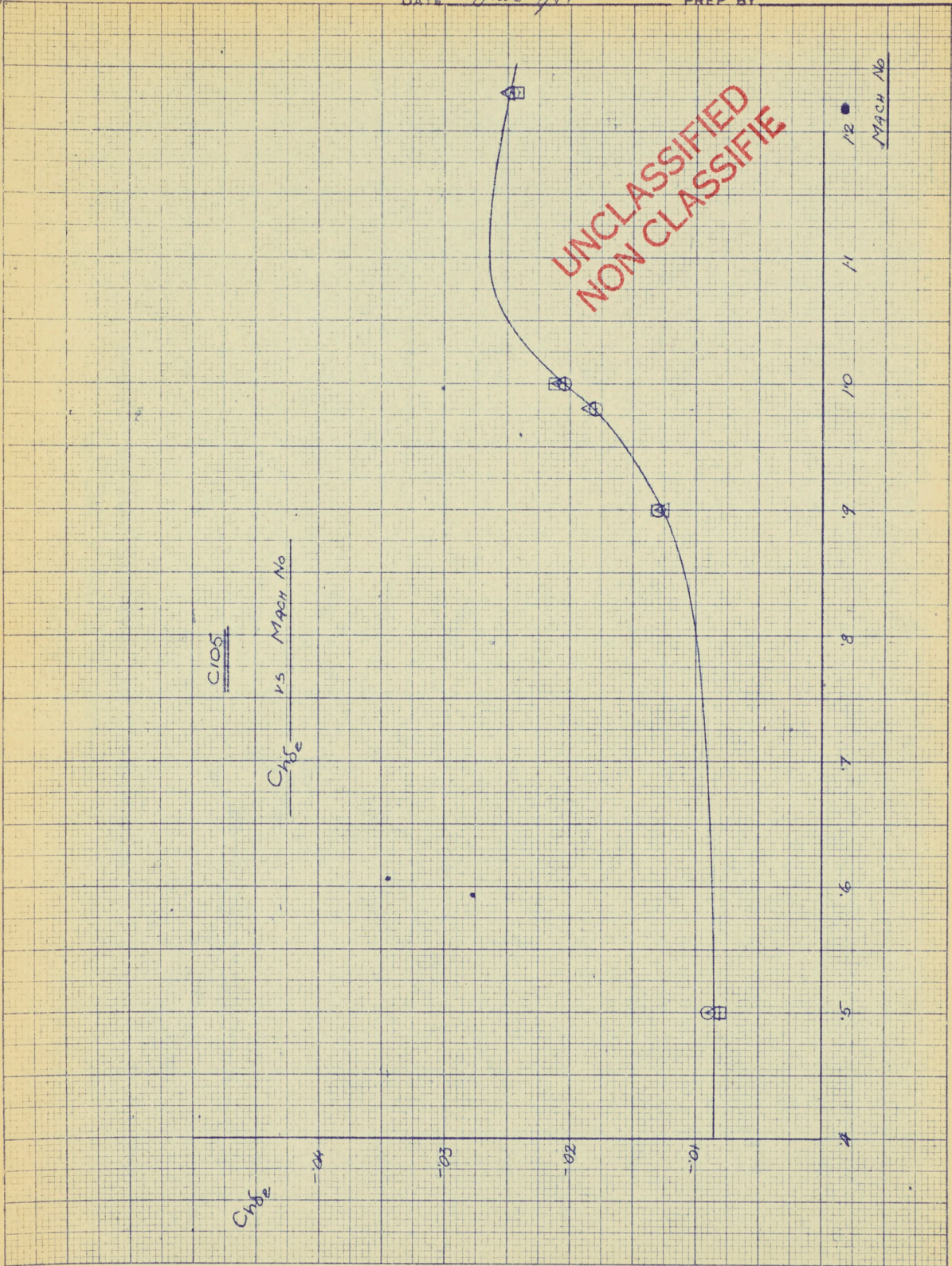


UNCLASSIFIED
NON CLASSIFIED

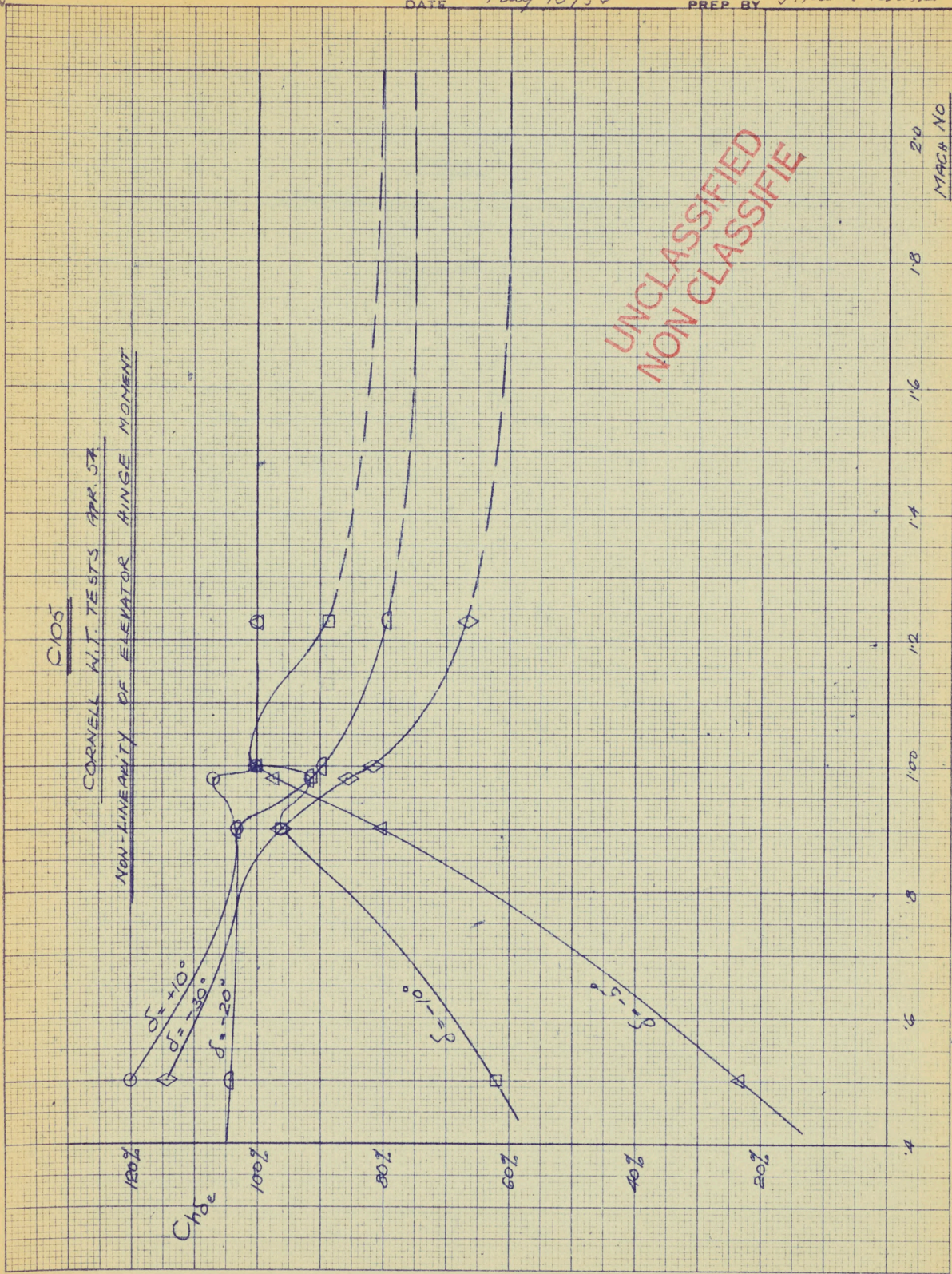
AIRCRAFT C105
A. U. W.

COMPONENT

SHEET No. 3314 REPORT No. P/W.T./20
DATE June 9/54 PREP BY Kniazhevskii



35912 REPRODUCTION BY PER CO.
10 X 10 TO 10 X 10 BY PER CO. UNLESS ACCORD
MADE IN U.S.A.



C105
 CORNELL A.I.T. TESTS APR 54
 NON-LINEARITY OF ELEVATOR HINGE MOMENT

UNCLASSIFIED
 NON CLASSIFIED

MACH NO
 20
 18
 16
 14
 12
 100
 8
 6
 4

359-12 NEUFREL & ESSER CO.
 10 x 10 to 10 x 10 in. 50 mil. 50 mil. tubes accented.
 MADE IN U.S.A.

C-105

CORNELL W.T. TESTS APR. 57.

CONF. BRS

C_{he} vs δ

$\alpha = 2^\circ$

$\delta_B = 60^\circ$

UNCLASSIFIED
NON CLASSIFIED

MACH No

5 Δ

9 \diamond

98 \triangle

100 \square

123 \oplus

C_{he} 10

δ_e -10° 5° 0

100% COPY RIGHTS RESERVED
10 10 10 10 10 10 10 10 10 10
MADE IN U.S.A.

C105

C_{DB} VS MACH No
WITH SPEED BRAKES

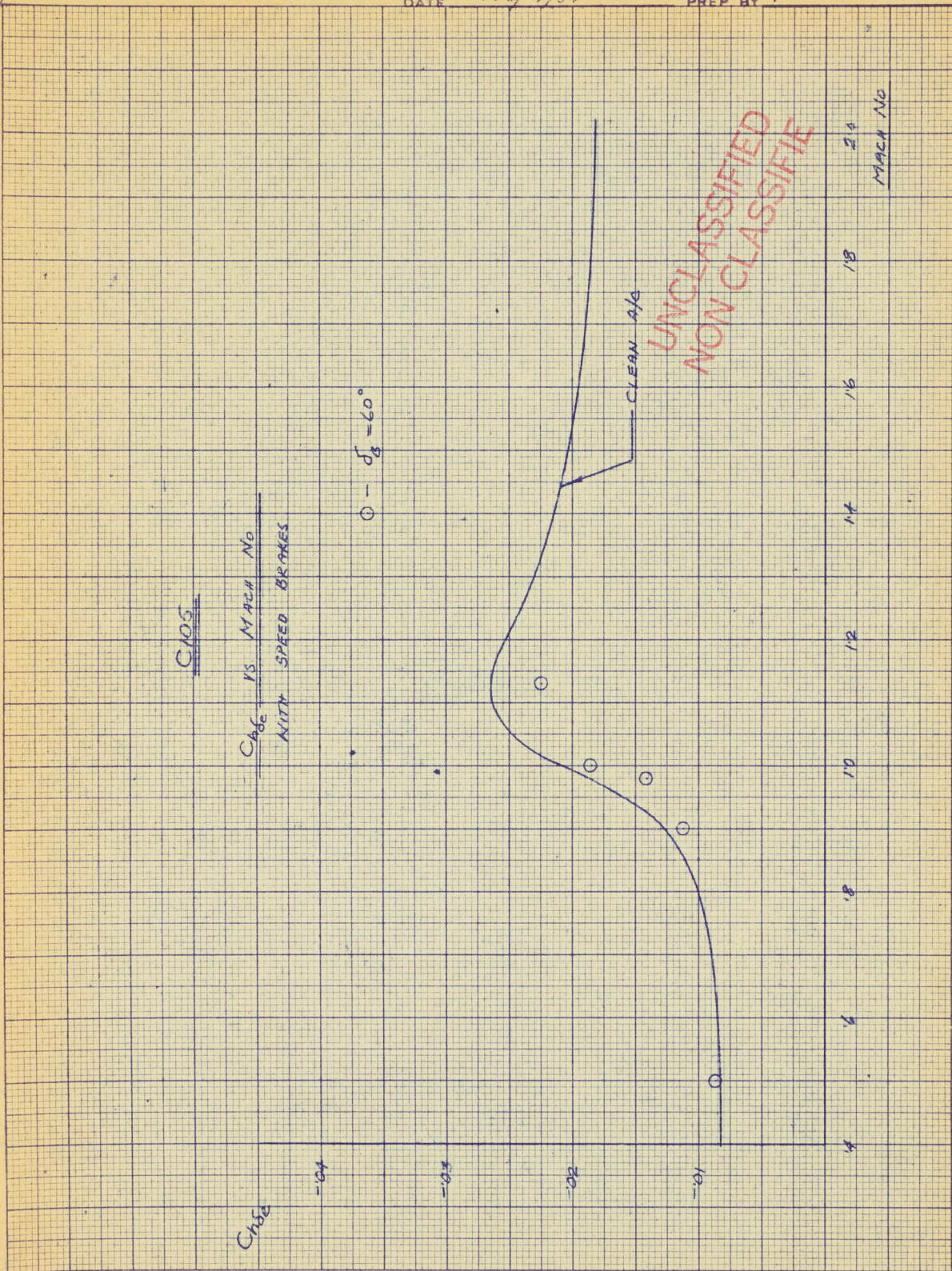
○ - $\alpha_g = 60^\circ$

CLEAN A/G

UNCLASSIFIED
NON CLASSIFIE

MACH No

359-12 - KRUPP & ESSER CO.
10 X 10 to the 15 inch, 5th lines accounted.
MADE IN U.S.A.





DUB-TANG
355
MADE IN USA