C-105 P/Aero Data/54

LATERAL STABILITY DERIVATIVES IN 2 'G' FLIGHT WING NOTCHED AND EXTENDED

ANALYZED

Copy 6

April 1955

20

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TO

DATE

Report no.: QCX - AVRO - CF105 - P-AD-54

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

A. V. ROE CANADA LIMITED

MALTON · ONTARIO

UNCLASSIFIED

TECHNICAL DEPARTMENT (Aircraft)

AIRCRAFT:

REPORT No P/AERO DATA/54

FILE No

No OF SHEETS:

TITLE

ANALYZED

C-105

LATERAL STABILITY DERIVATIVES

IN 2 "G" FLIGHT

WING NOTCHED AND EXTENDED

confirmed as:
Classification ~~cancelled / changed to~~: UNCLASSSIFIED
By authority of: DRDA 7/DARFT 5-8/DAS Eng 6-4-5
Date: 5 Nov 1992
Signature: B. Aubrey
Unit / Rank / Appointment: DSTS 3, Secretary CRAD HQ DRP

PREPARED BY DATE April 1955

CHECKED BY DATE

SUPERVISED BY DATE

APPROVED BY DATE

45125

ISSUE No	REVISION No	REVISED BY	APPROVED BY	DATE	REMARKS

FORM 1316A

INDEX

C-105

LATERAL STABILITY DERIVATIVES

IN 28' FLIGHT

* Derivative independent of Angle of Attack.

FORM 1319A

3. Sideslip Derivatives

	$\beta < 3^\circ$	$\beta > 3^\circ$	
C_{N_β}	3.1.1	3.1.2	3.1
C_{l_β}	3.2.1		3.2
C_{y_β}	3.3.1	3.3.2 *	3.3

4. Yawing Derivatives

	$\beta < 3^\circ$	$\beta > 3^\circ$	
C_{N_r}	4.1.1	4.1.2	4.1
C_{l_r}	4.2.1	4.2.2	4.2
C_{y_r}	4.3.1	4.3.2	4.3

5. Rolling Derivatives

	$\beta < 3^\circ$	$\beta > 3^\circ$	
C_{N_p}	5.1.1	5.1.1	5.1
C_{l_p} *	5.2.1 *		5.2
C_{y_p}	5.3.1	5.3.1	5.3

* Derivatives independent of Angle of Attack

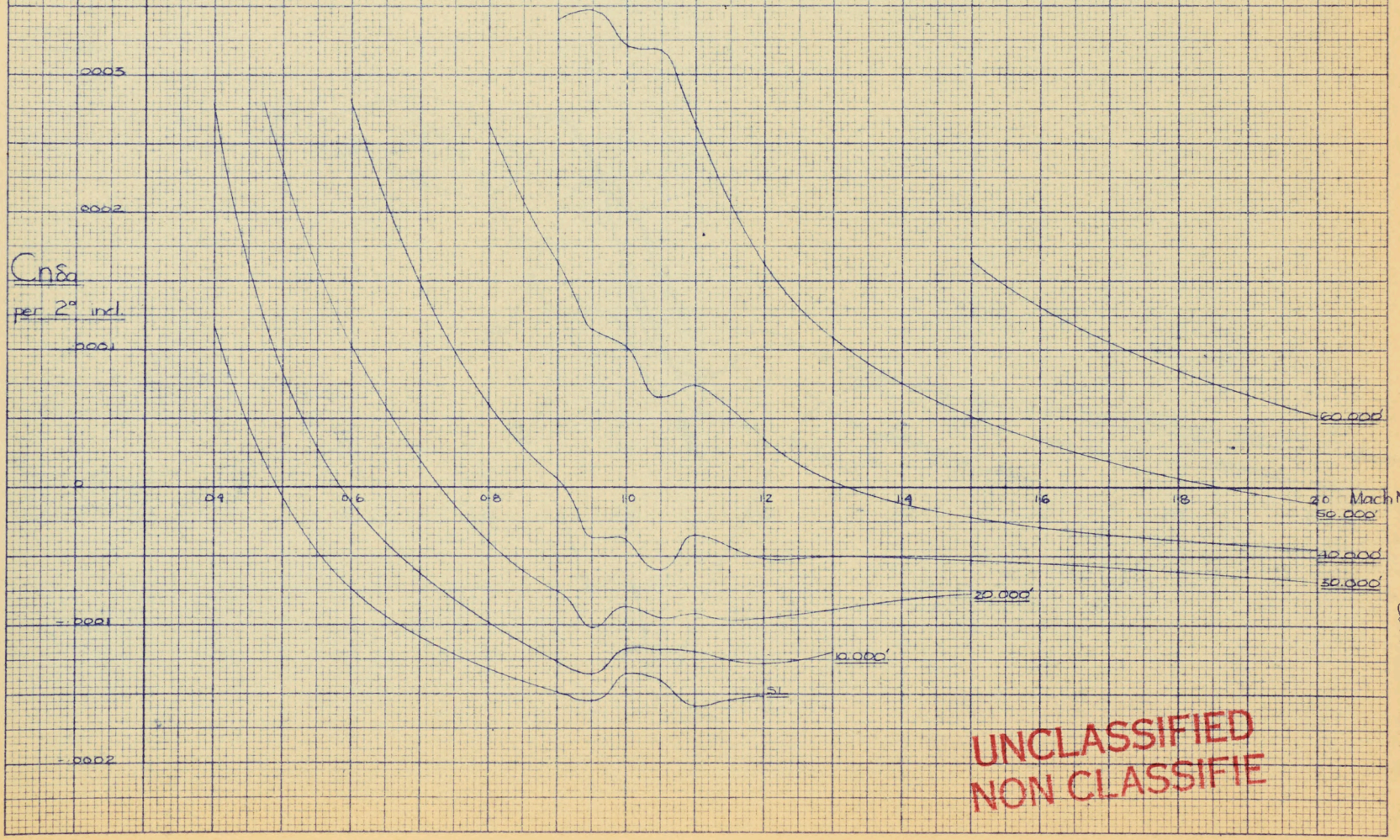
C-105

$C_{n\delta_a}$ vs Mach No.

Elastic

'2g' Flight

Wing Notched and Extended



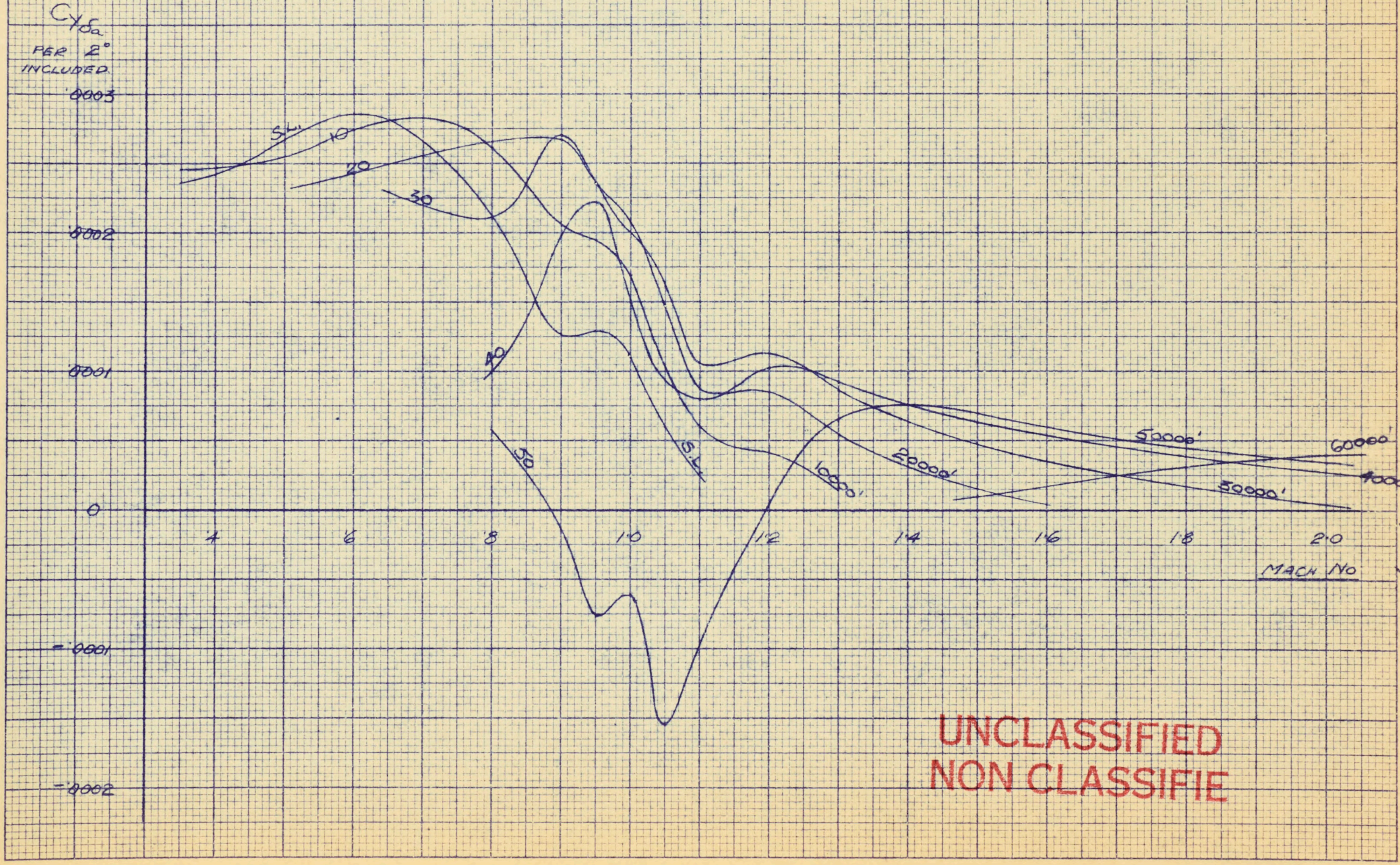
K+E 10 X 10 TO THE ½ INCH KEUFFEL & ESSER CO. 359-12 MADE IN U.S.A.

P/AD/54 1.3

C105

ELASTIC $Cy_{\delta a}$ vs. MACH No IN 2'G' FLIGHT

WING NOTCHED & EXTENDED.



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C-105

$C_{n_{\delta r}}$ VS MACH Nº

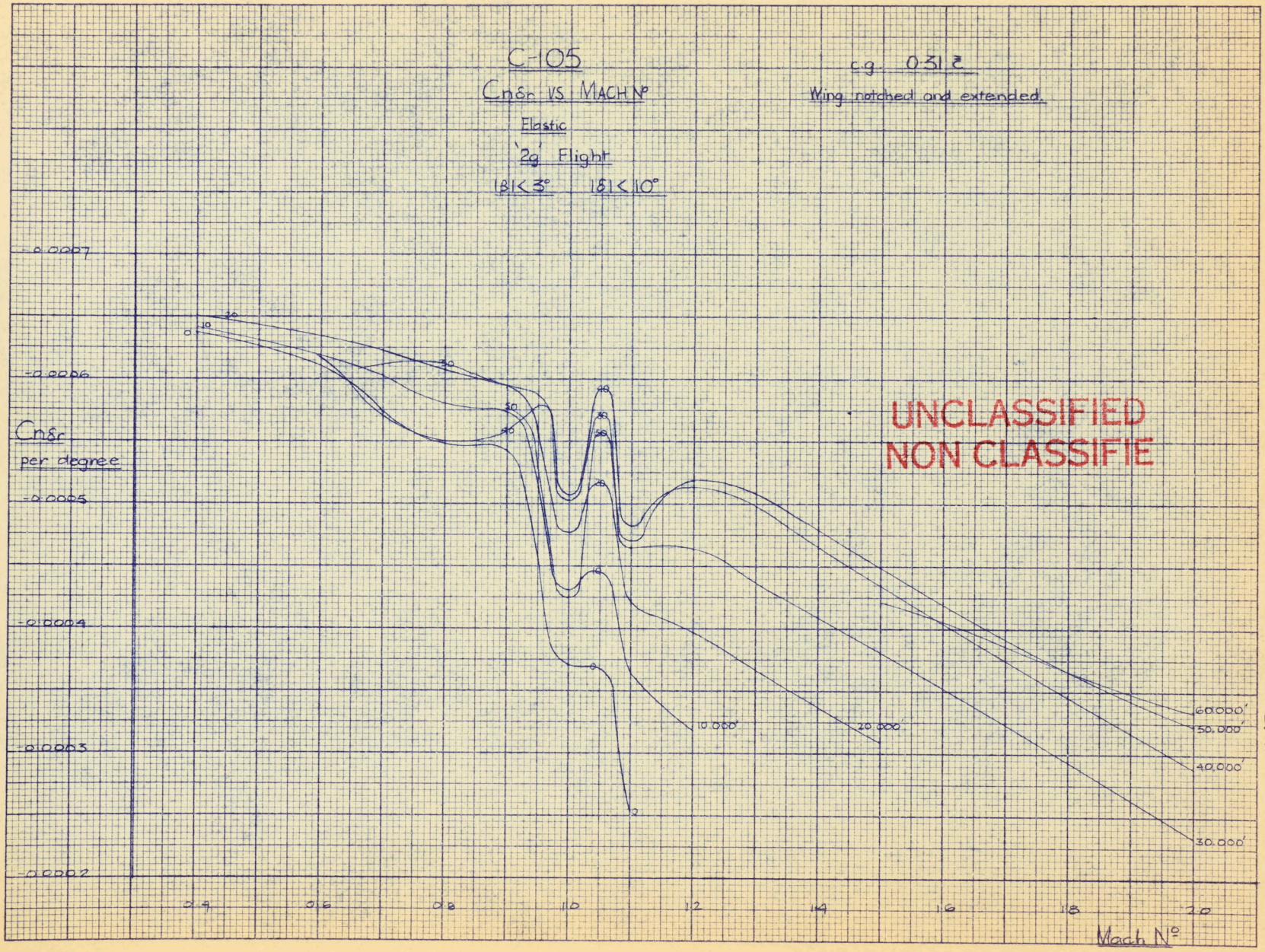
Elastic

'2g' Flight

$|\beta| < 3°$ $|\beta| < 10°$

c.g. 0.31 c̄

Wing notched and extended.



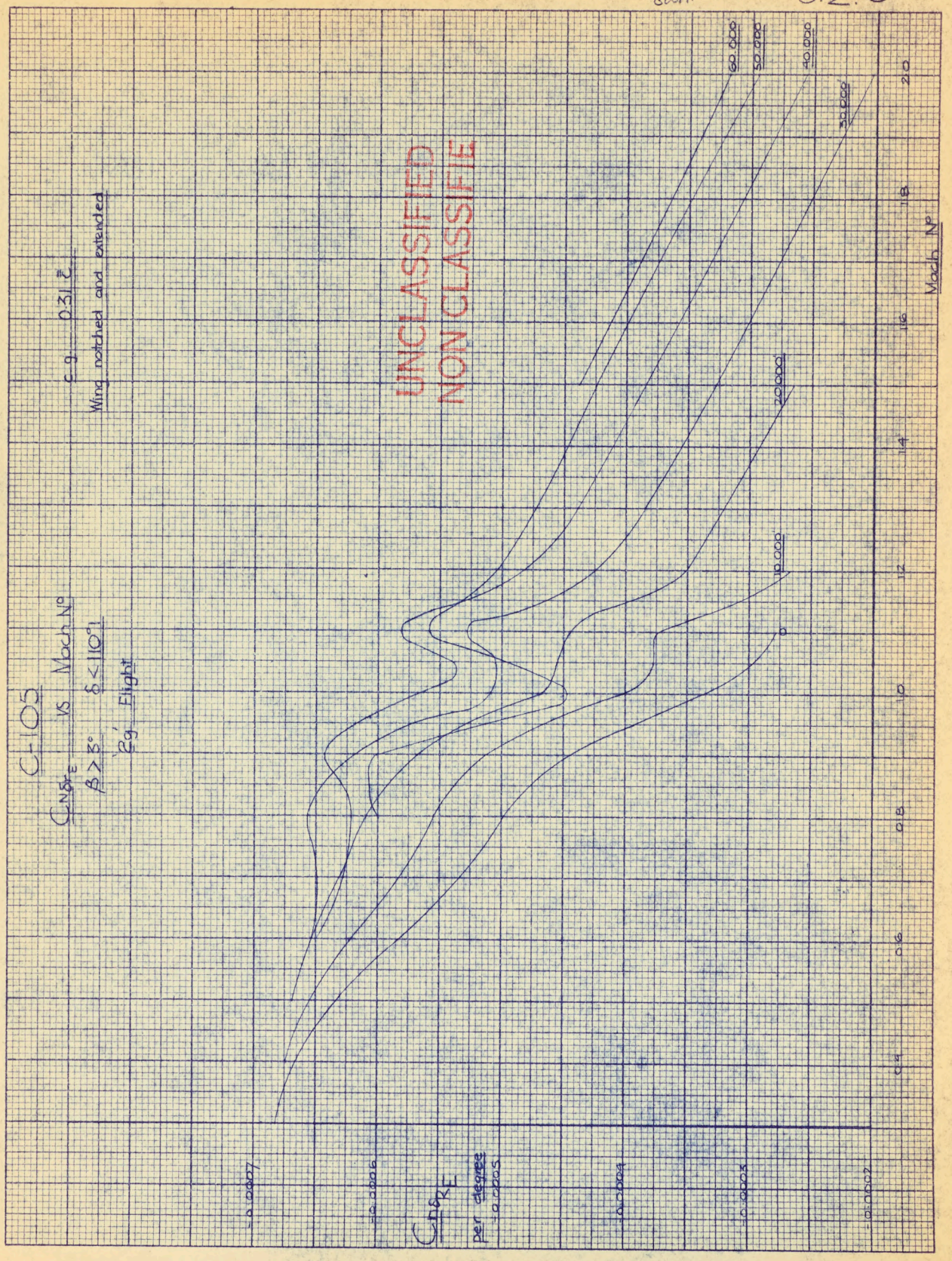
P/HD/154 2.1.1 P/Stab/75 GLSH 3.1.9

P/AD/54 2.1.2

~~P/Stab/75~~

GUSH.

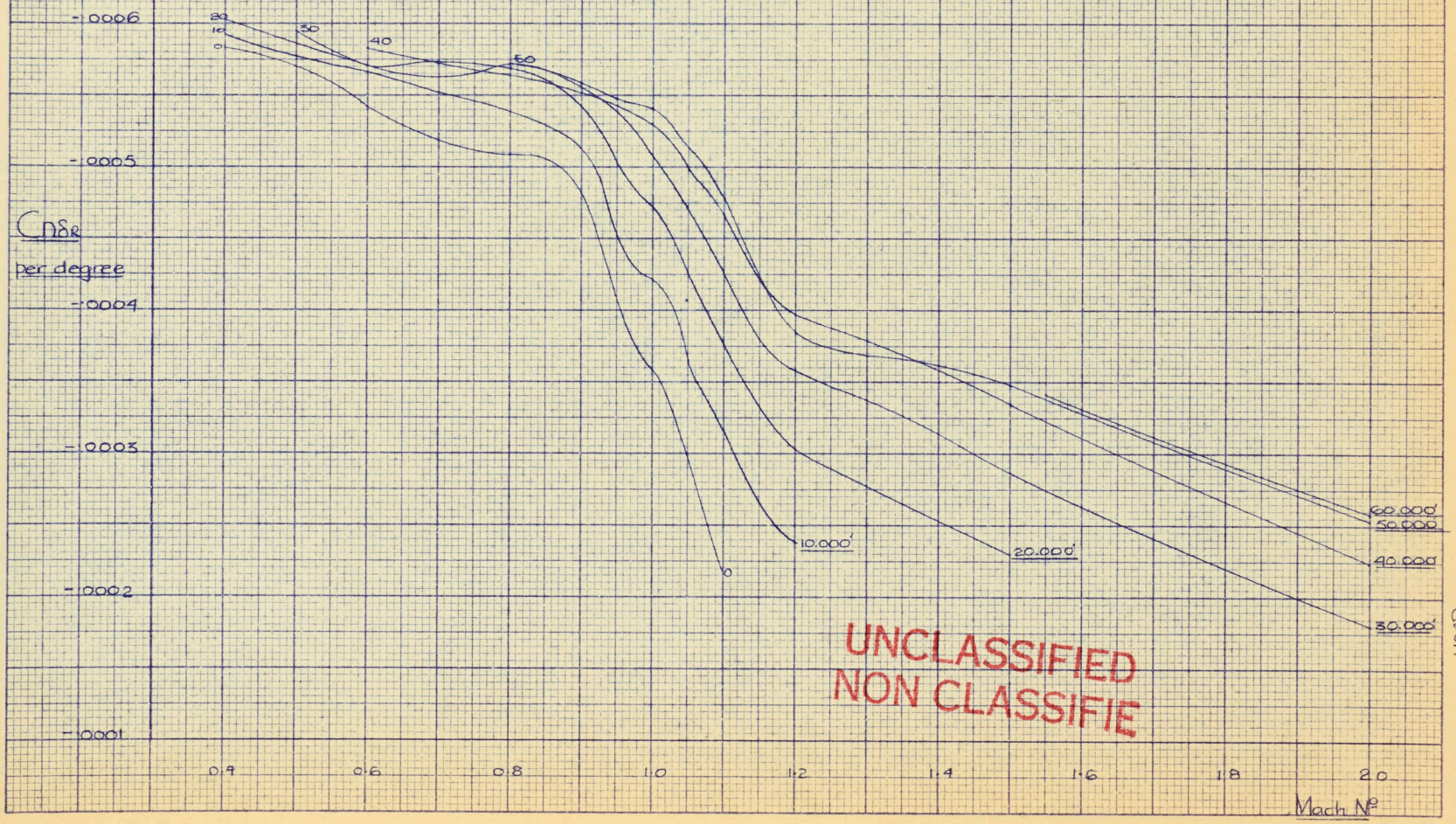
3.2.6



C-105

$C_{n\delta_R}$ vs Mach No

Elastic
2g Flight
c.g 0.31c̄
Wing Notched and Extended
$|\beta| < 3°$ $|\delta_R| > 10°$



P/AD/54 2.1.3
RSH 4/75 GSH 3.5.2

C-105

$C_{l\delta r}$ vs Mach No.

Elastic

$|\beta| \leq 3°$ $|\delta R| \leq 10°$

2g Flight

Wing notched and extended

$C_{l\delta r}$ per degree

.00015
.00010
.00005
0
-.00005

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

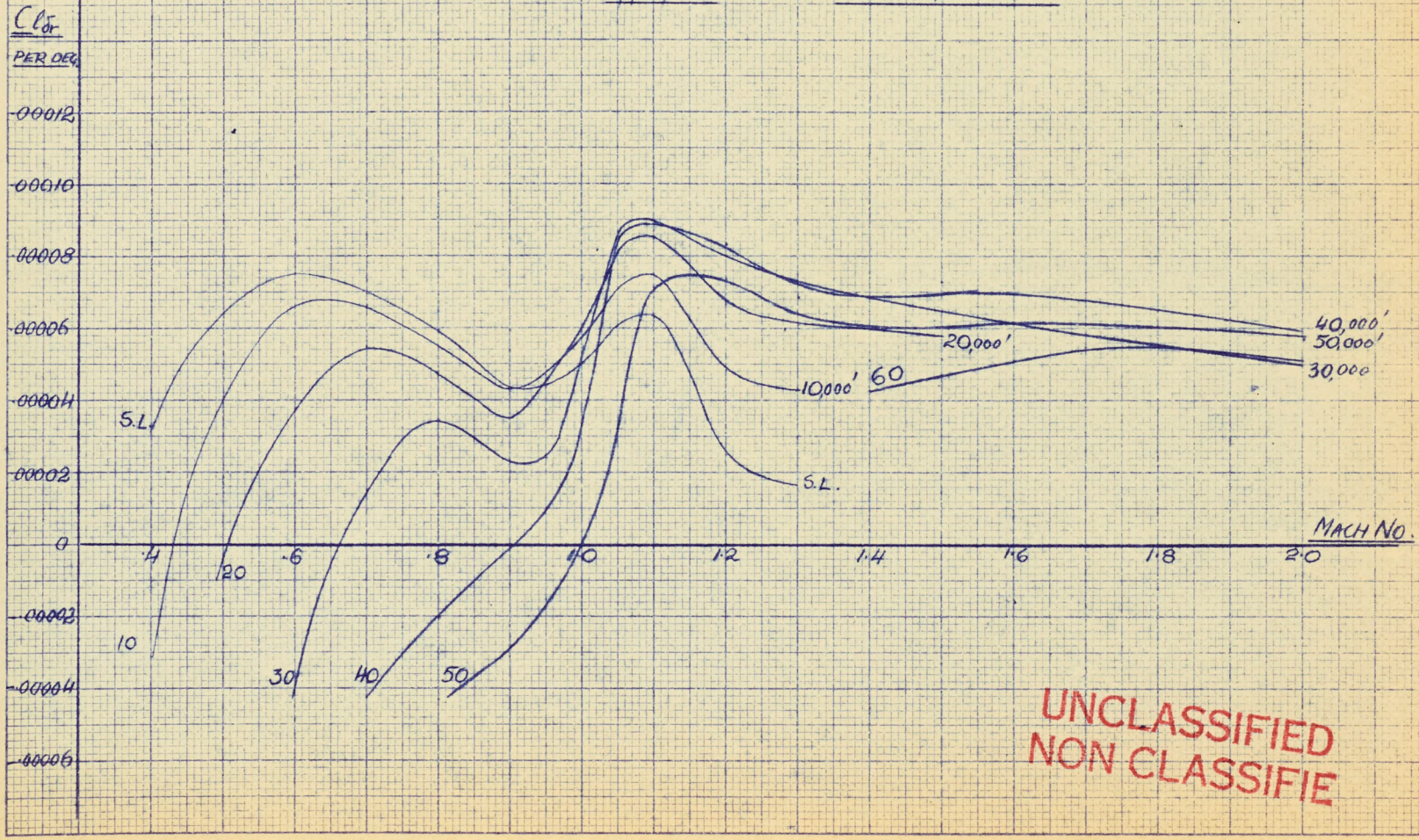
0
10.000
20.000
30000
40.000
50.000
10.000
20.000
30.000
40.000
50.000
60.000

C 105

$B_2C_3W_3V_3R_5$ - WING NOTCHED AND EXTENDED.

ELASTIC Cl_{δ_r} vs MACH NO. - IN 2"G" FLIGHT

$|\beta| > 3°$ FULL δ_r RANGE.



C-105

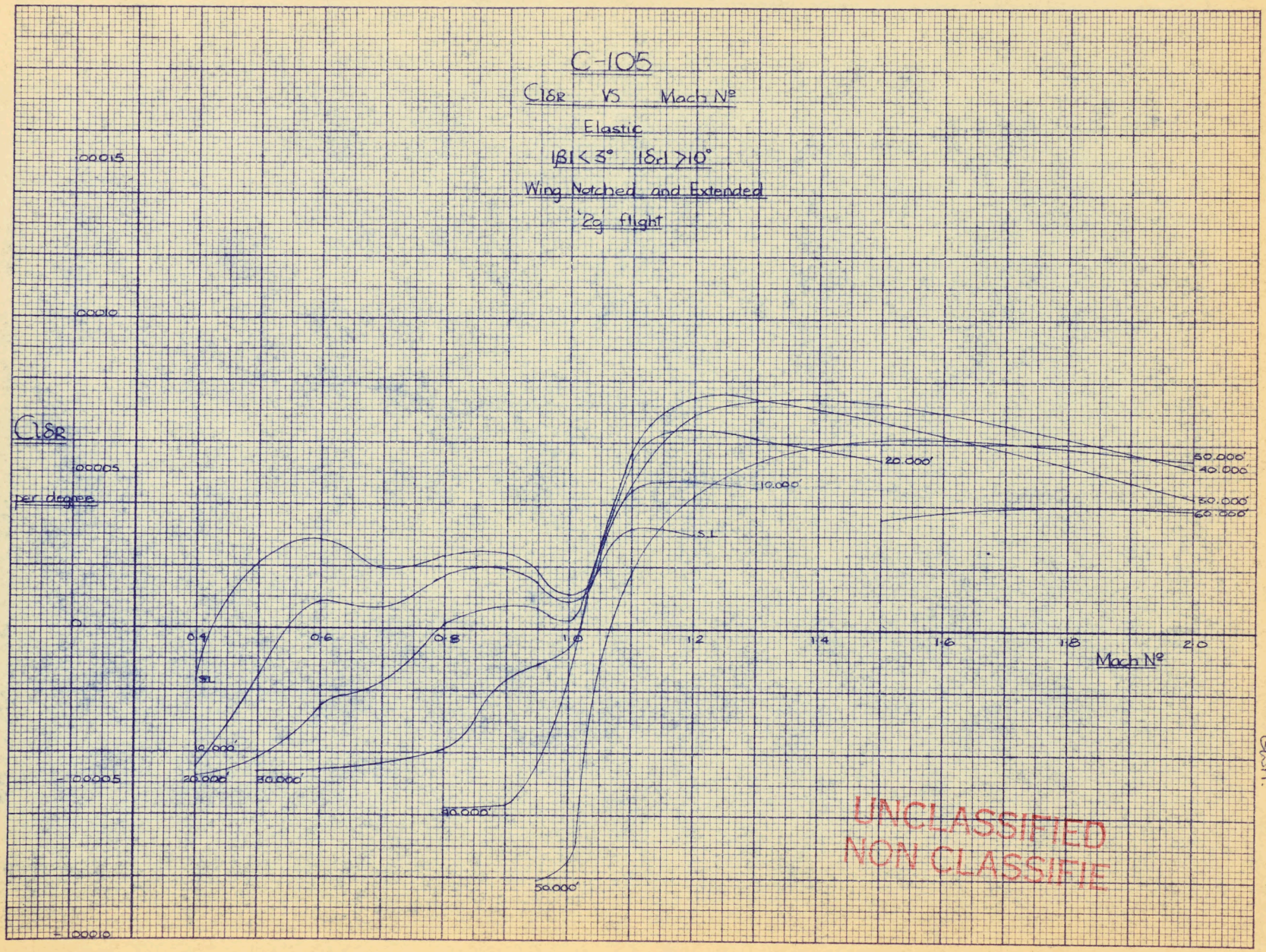
$C_{l\delta R}$ vs Mach Nº

Elastic

$|\beta| < 3°$ $|\delta_R| > 10°$

Wing Notched and Extended

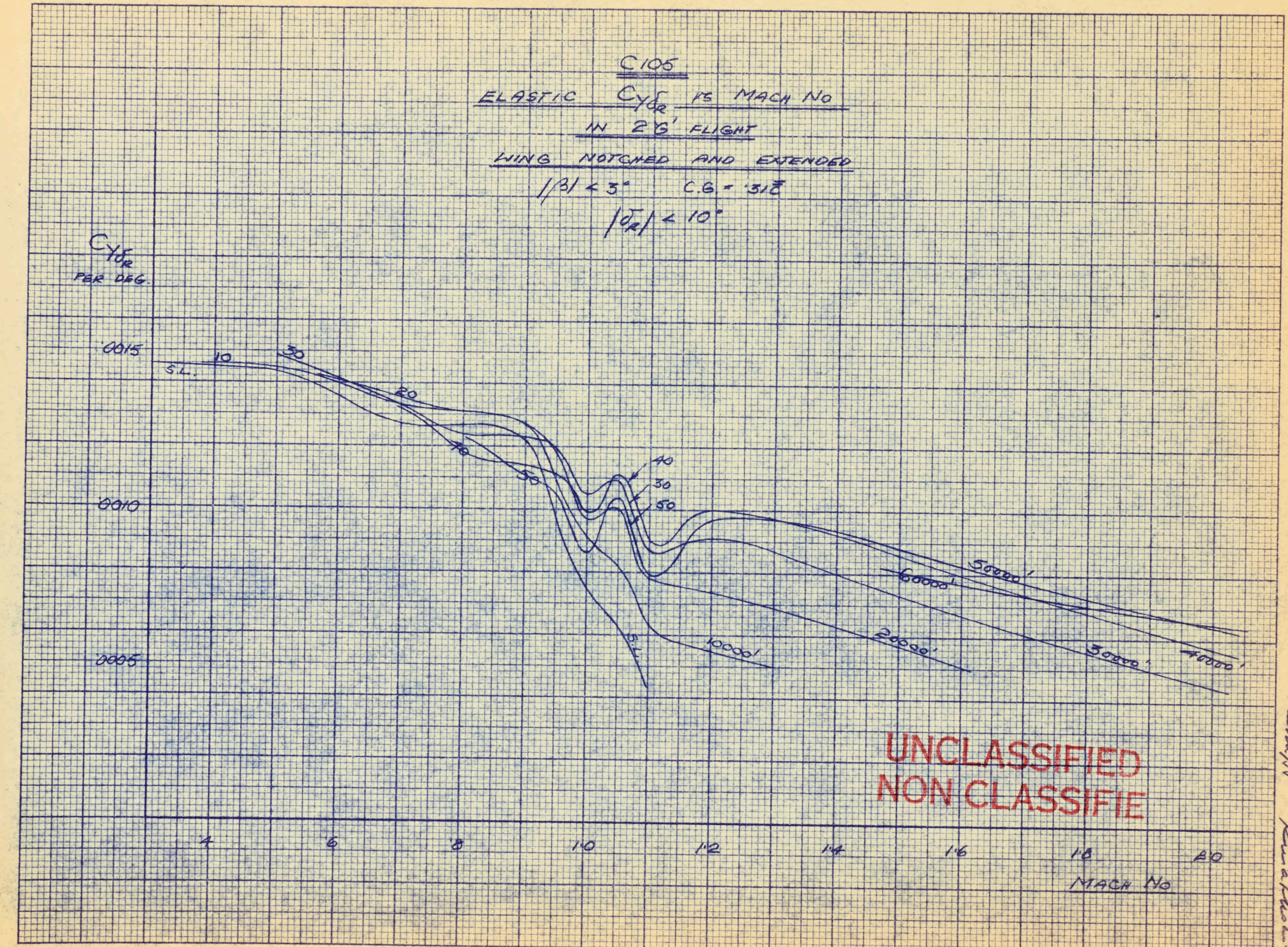
2g flight



P/AD/54 2.3.1 ~~P/STABS/75~~ ~~1.15~~

March/55

10 X 10 TO THE ½ INCH 359-12
KEUFFEL & ESSER CO. MADE IN U.S.A.



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C-105

ELASTIC $C_{y\delta r}$ vs MACH N°
IN 2G FLIGHT
WING NOTCHED & EXTENDED
$\beta > 3°$: $\delta_r < 10°$

$C_{y\delta_r}$ (E)
PER DEGREE

.0015
.0010
.0005

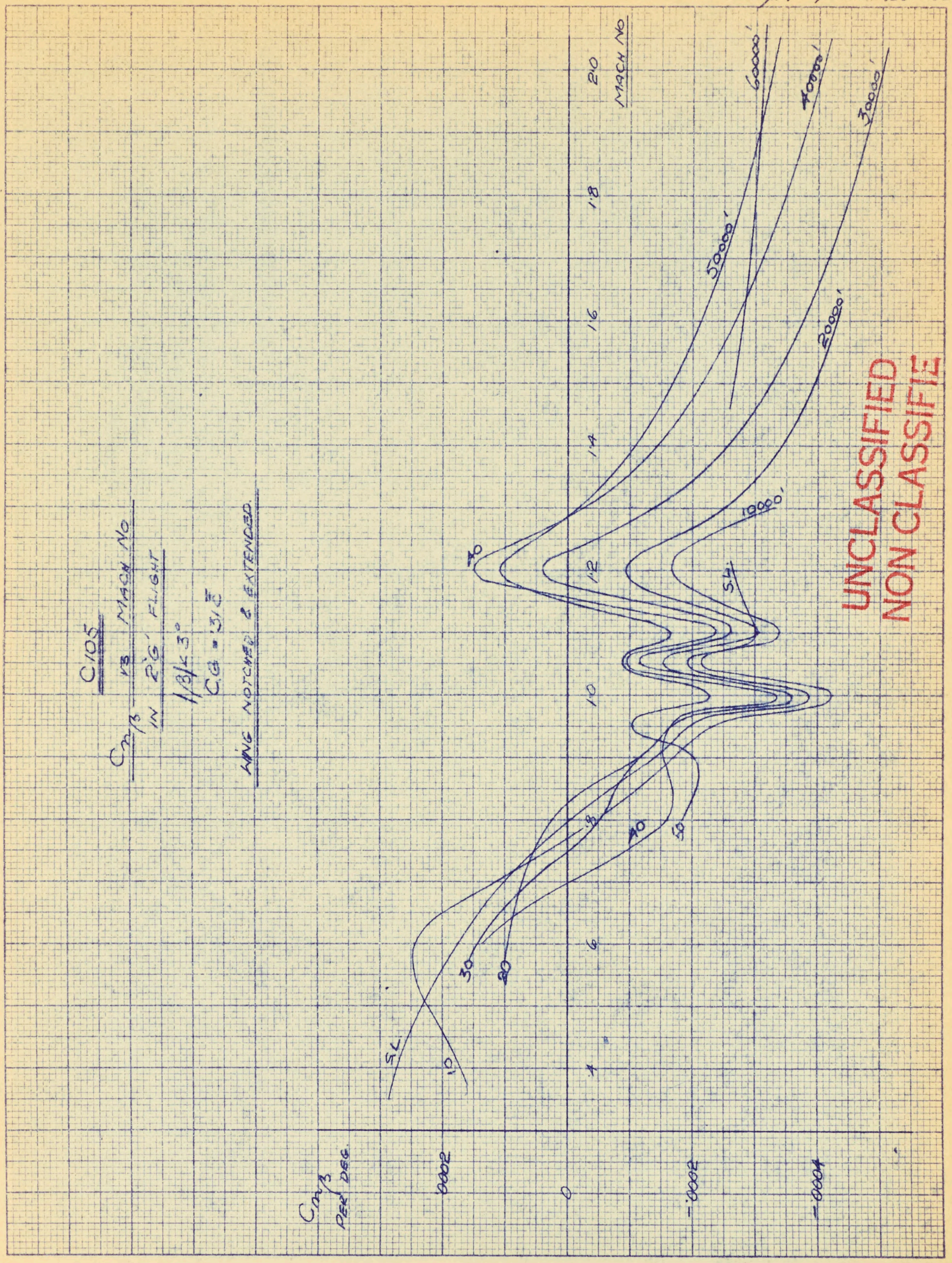
G.L. 10 30 40 40 30 20 50 60

60000'
50000'
40000'
30000'
20000'
10000'
S.L.

.4 .6 .8 1.0 1.2 1.4 1.6 1.8 2.0
MACH N°

P/AD/54 3.1.1 P/STAB/75 2.12.

March/55 Kwiatkowski



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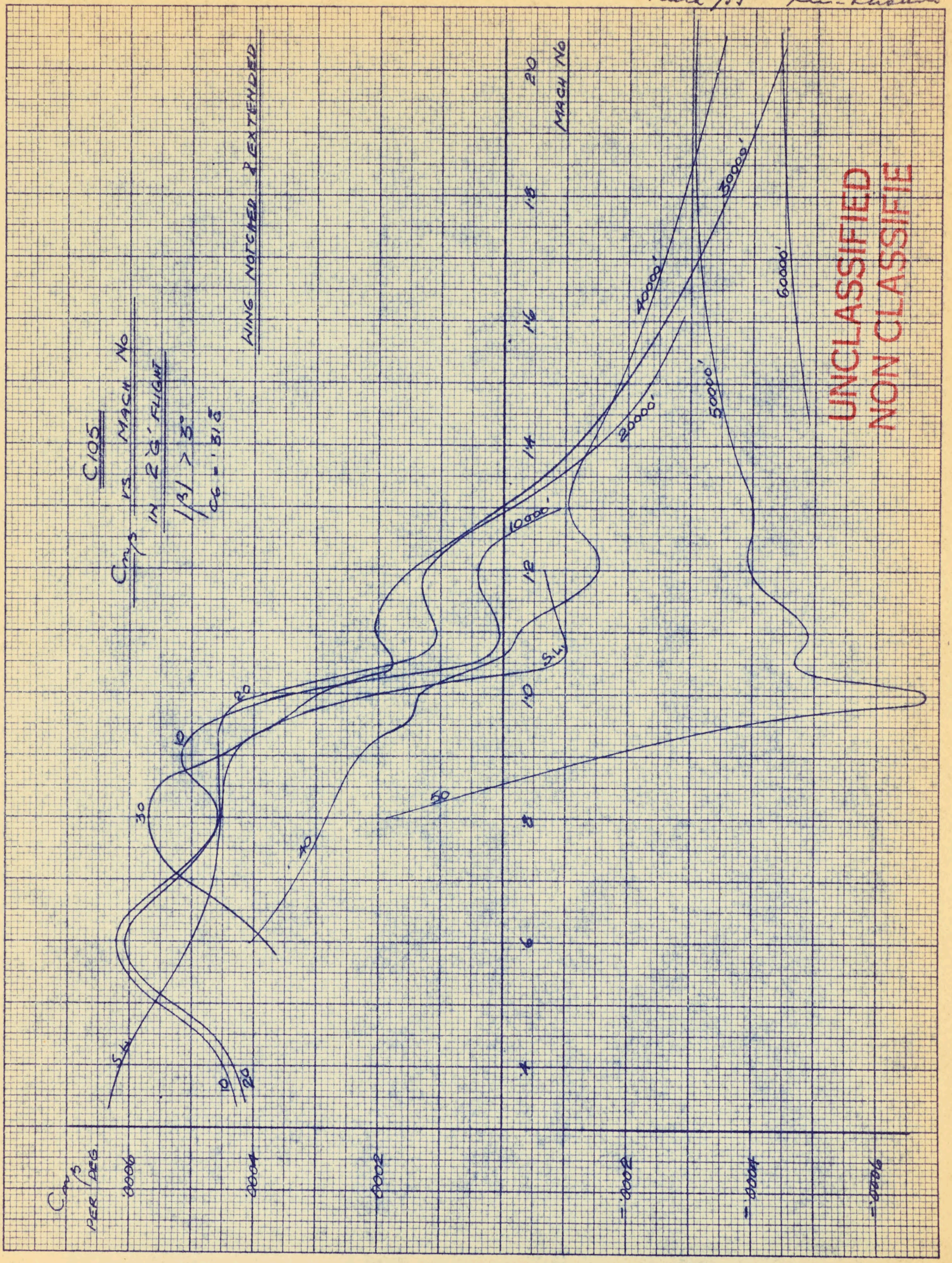
NON CLASSIFIE

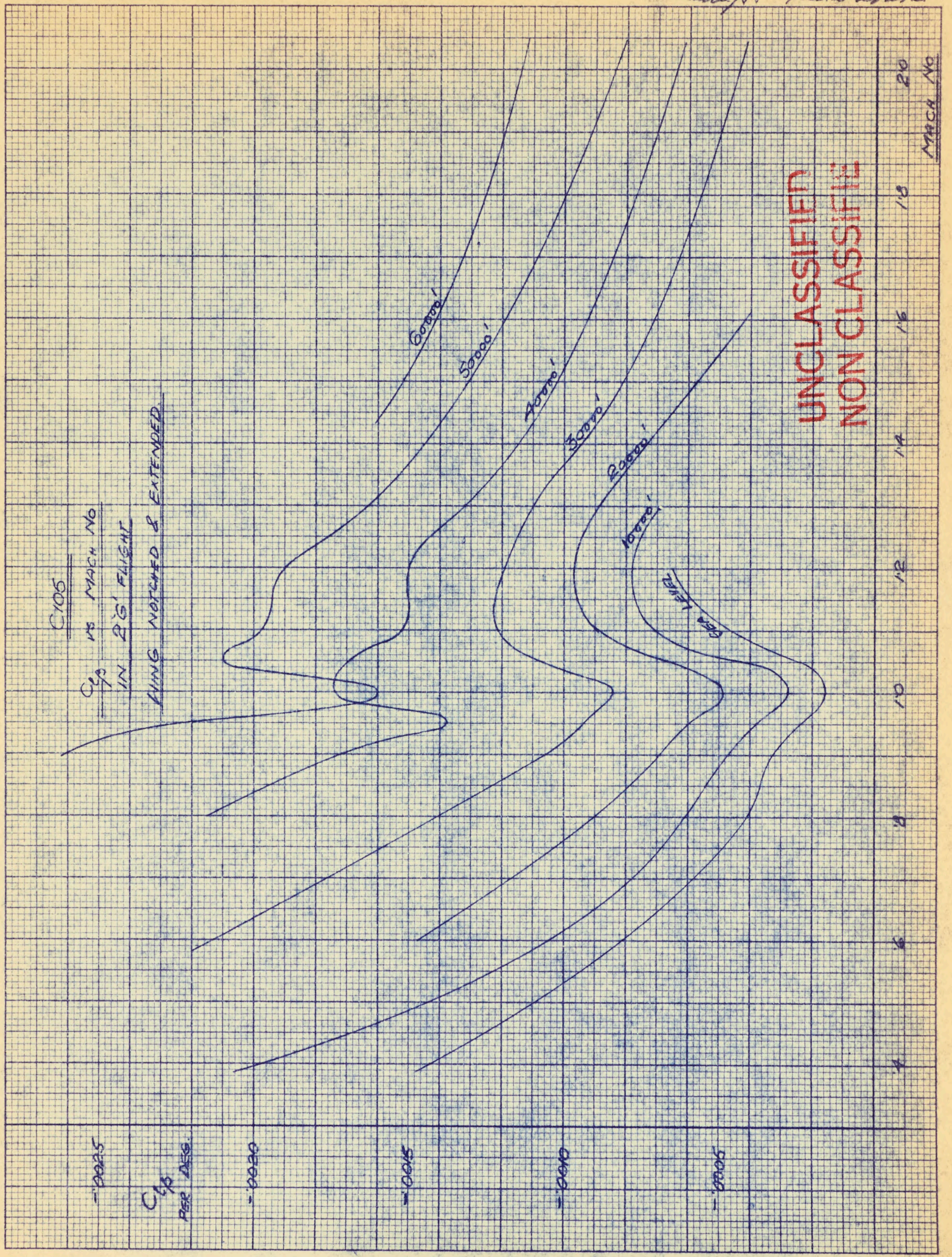
359-12 10 X 10 TO THE ½ INCH KEUFFEL & ESSER CO. MADE IN U.S.A.

P/AD/54 3.1.2 P/STAB/75 2.20



P/ADISA 3.2.1 P/STAB/75 5.4.

March/55 Kwiatkowski



$C_{l\beta}$

C_{y_β} VS MACH NO

IN 26' FLIGHT

$|\beta| < 3°$

WING NOTCHED & EXTENDED

ELASTIC FIN.

C_{y_β} PER DEG

-.008

-.006

-.004

-.002

SL

10000'

20000'

30000'

40000'

50000'

60000'

4 6 8 10 12 14 16 18 20

MACH NO

P1AD154 3.3.1 P/STAB/75 5.12.

Handling Qualities

C-105

C_{NY_E} VS MACH NO.

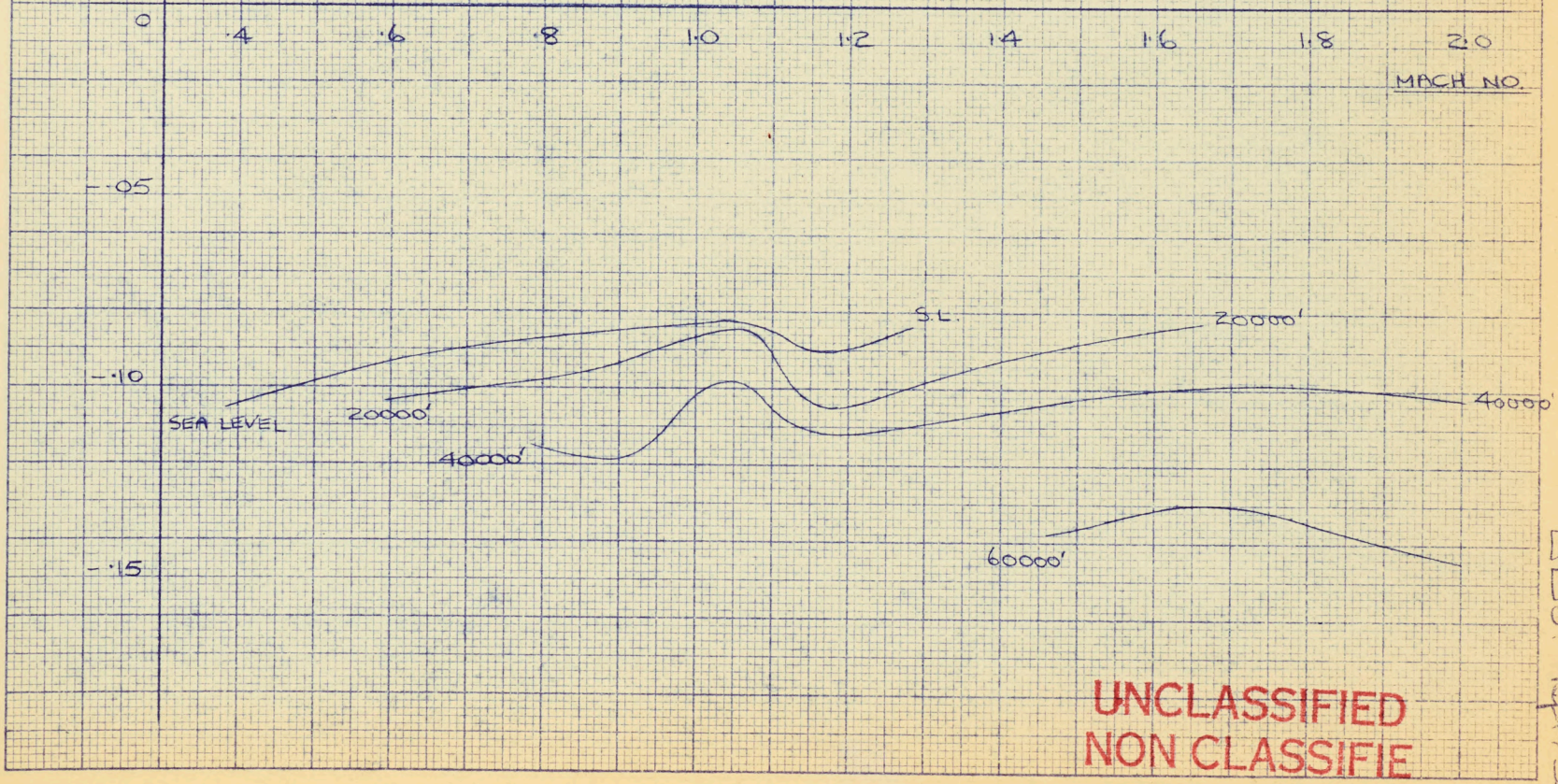
TAIL ELASTICS INCLUDED

$n = 2$

$|\beta| < 2°$

NOTCHED & EXTENDED WING

C.G. AT 31% M.A.C.



C-105

$C_{N_{Y_E}}$ VS MACH NO.

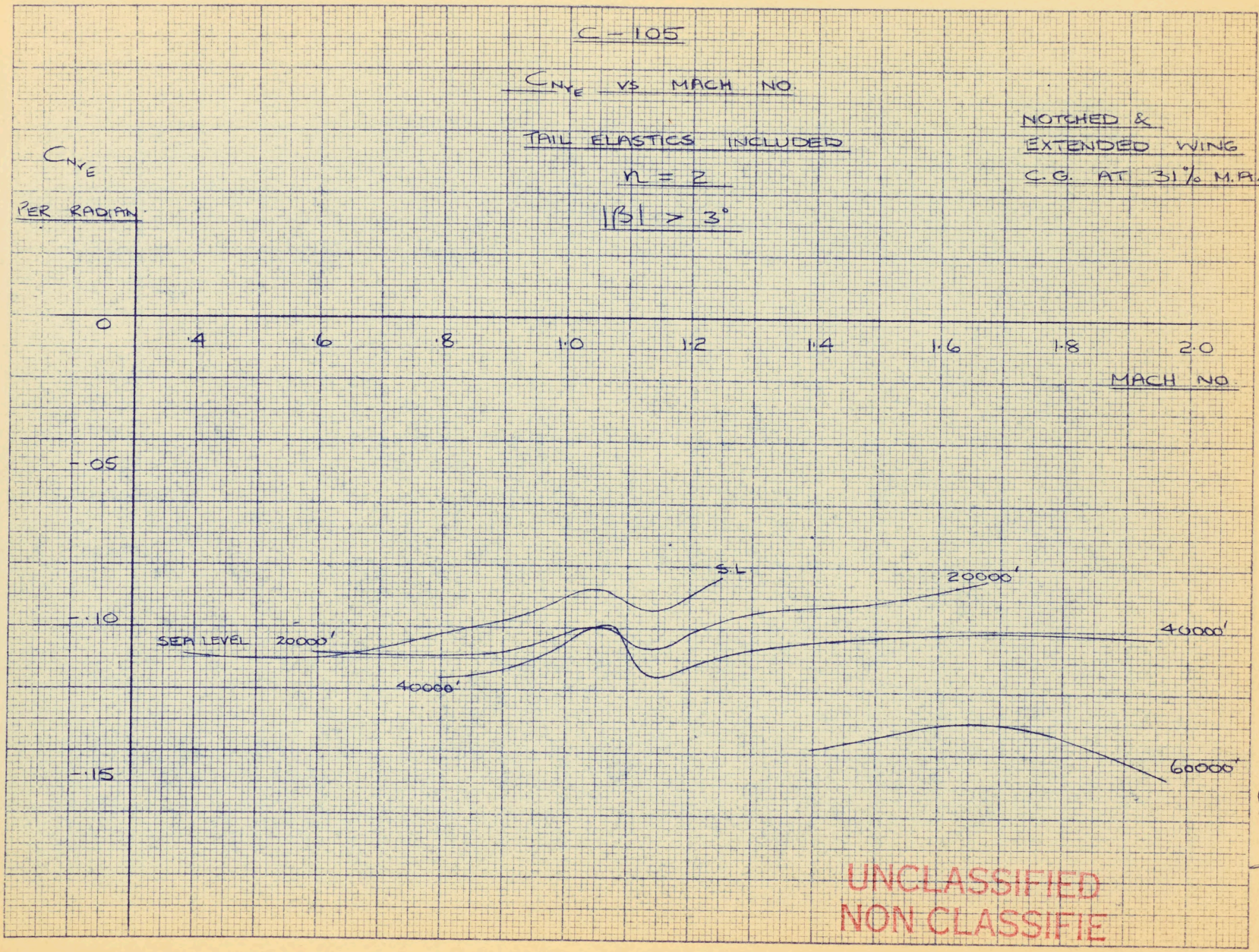
TAIL ELASTICS INCLUDED

$n = 2$

$|\beta| > 3°$

NOTCHED & EXTENDED WING

C.G. AT 31% M.A.C.



C-105

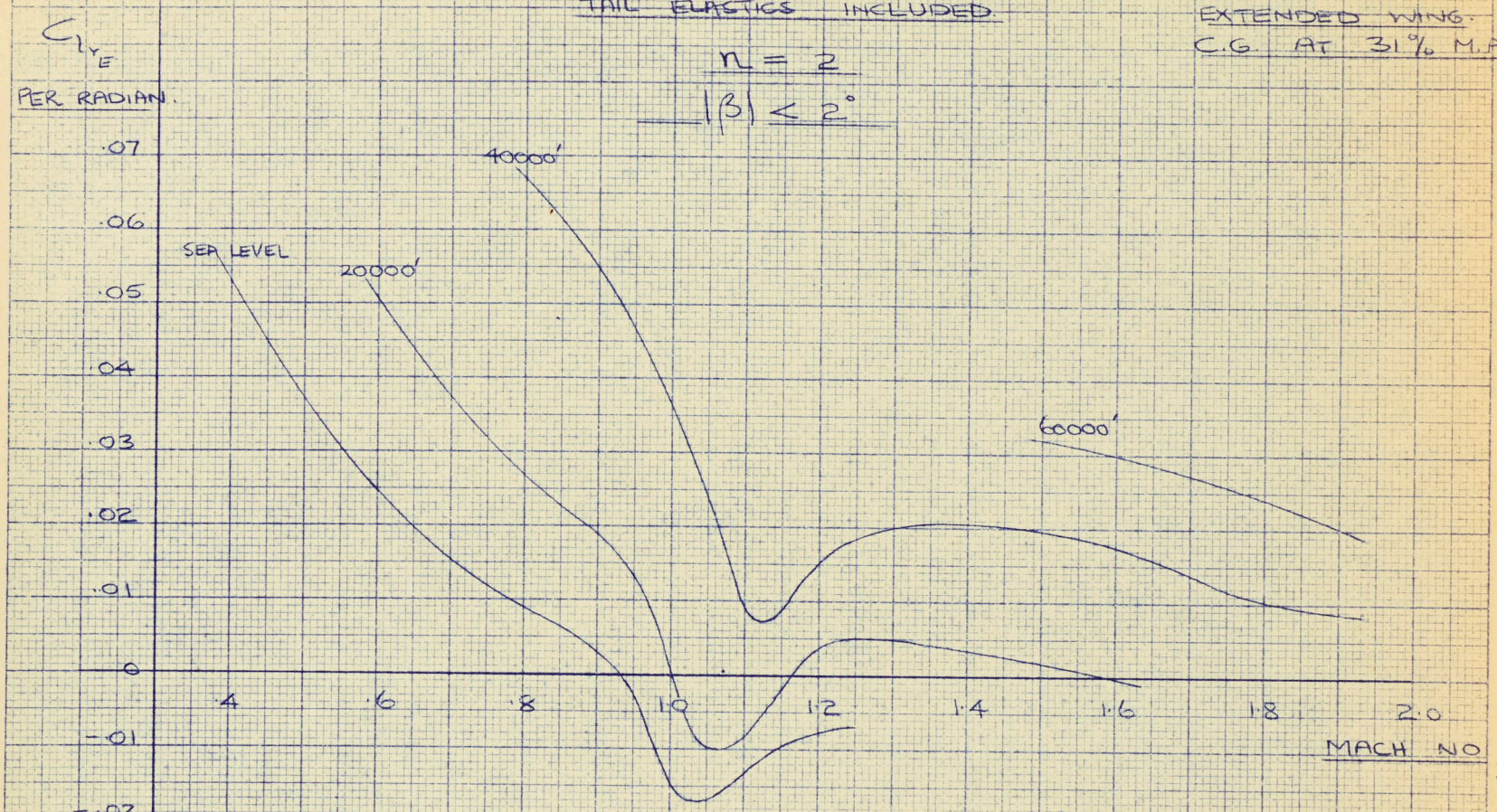
$C_{l_{Y_E}}$ VS MACH NO.

TAIL ELASTICS INCLUDED

$n = 2$

$|\beta| \leq 2°$

NOTCHED & EXTENDED WING.
C.G. AT 31% M.A.C.



P/AD/54 4.2.1

P/Stab-170 Rev. 55

C-105

$C_{l_{Y_E}}$ VS MACH NO

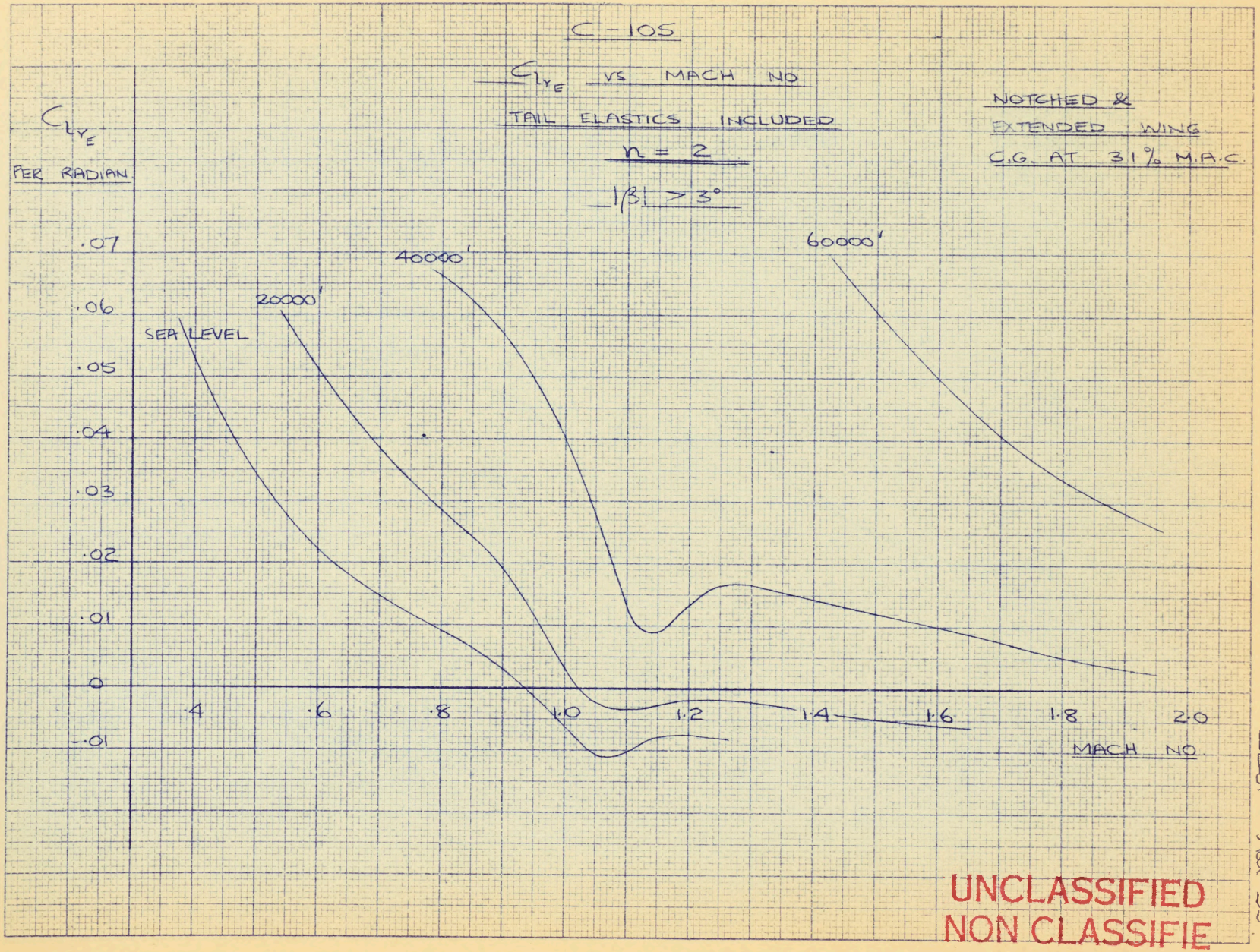
TAIL ELASTICS INCLUDED

$n = 2$

$|\beta| > 3°$

NOTCHED & EXTENDED WING

C.G. AT 31% M.A.C.



P/AD/54 4.2.2

P/Stab/70 Sheet 1 Jan '55

C-105

$C_{Y_{\beta E}}$ VS MACH NO.

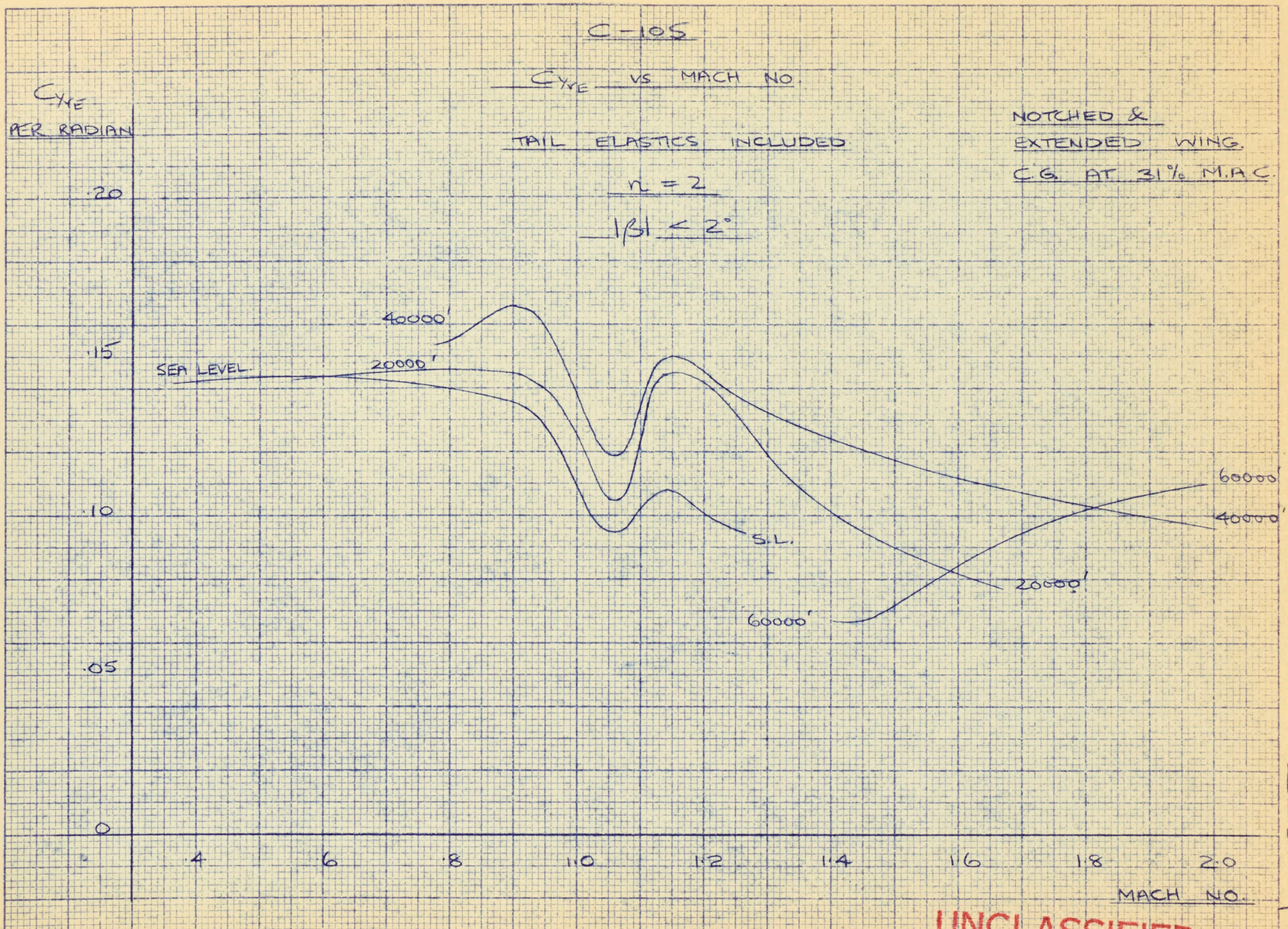
TAIL ELASTICS INCLUDED

$n = 2$

$|\beta| < 2°$

NOTCHED & EXTENDED WING.

C.G. AT 31% M.A.C.



C-105

$C_{Y_{r_E}}$ VS MACH NO.

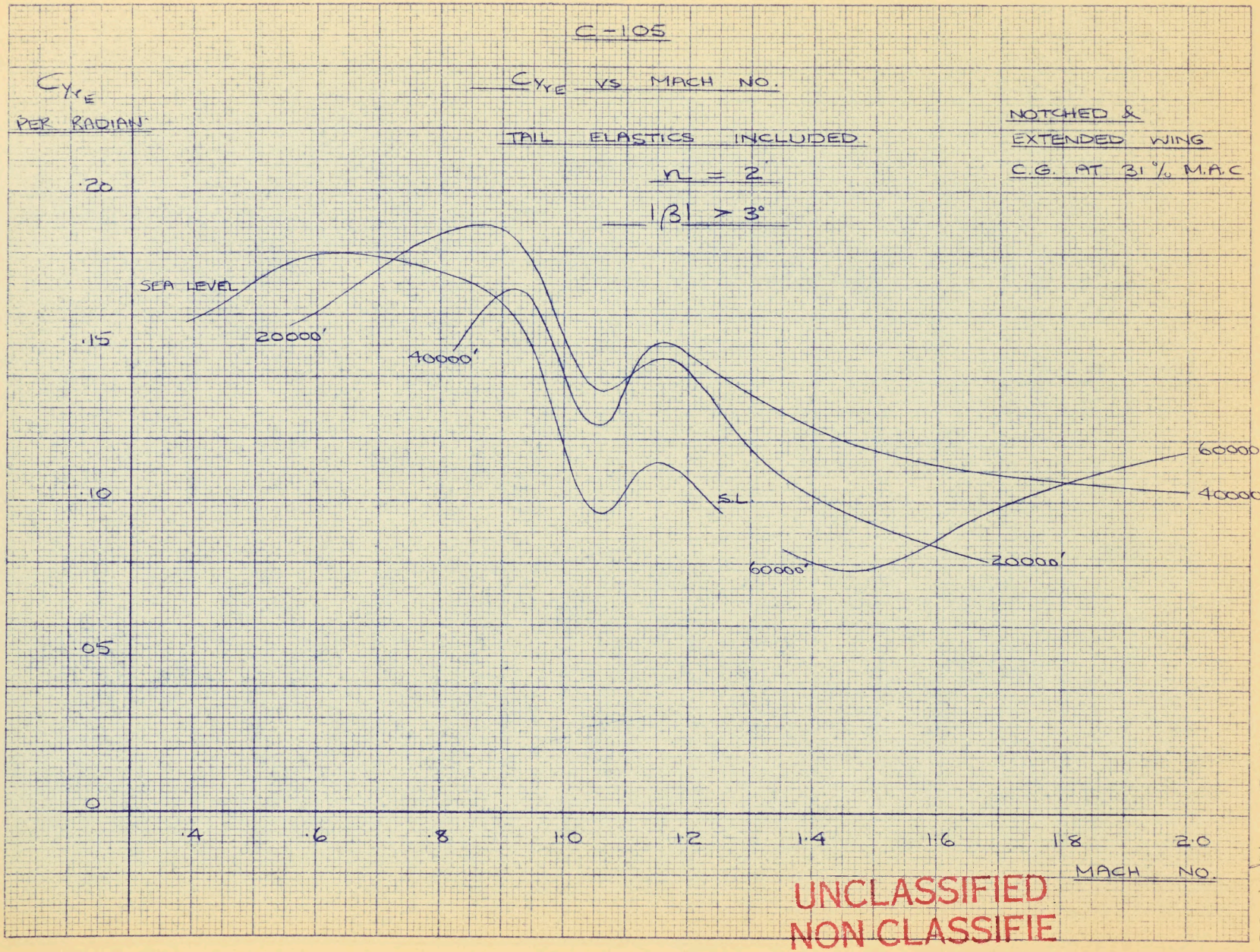
TAIL ELASTICS INCLUDED

$n = 2$

$|\beta| > 3°$

NOTCHED & EXTENDED WING

C.G. AT 31 % M.A.C



C-105

Yawing-in-Roll

C_{np} vs Mach No.

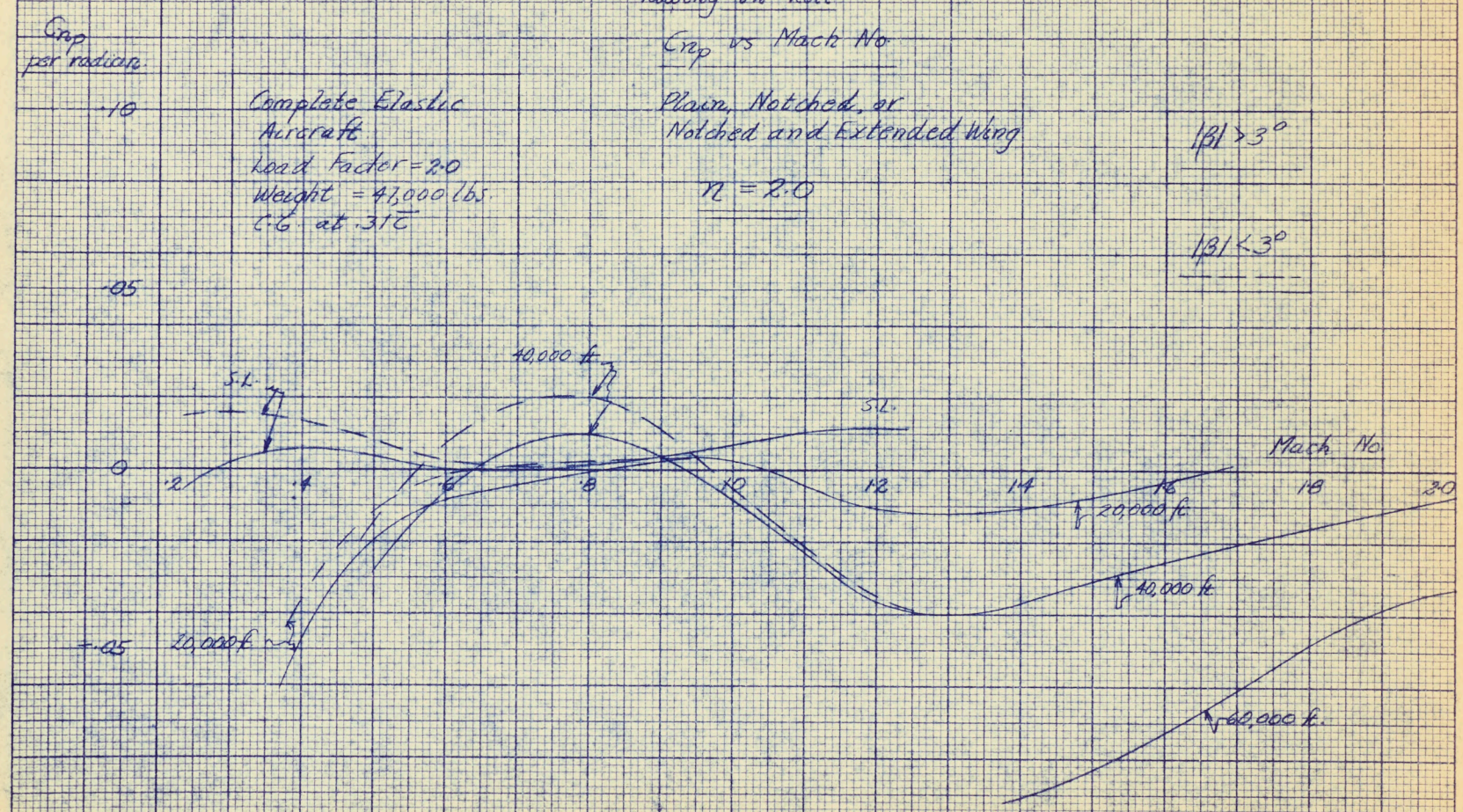
Plain, Notched, or Notched and Extended Wing

$n = 2.0$

Complete Elastic Aircraft
Load Factor = 2.0
Weight = 47,000 lbs.
C.G. at .31$\bar{c}$

$|\beta| > 3°$

$|\beta| < 3°$



C-105

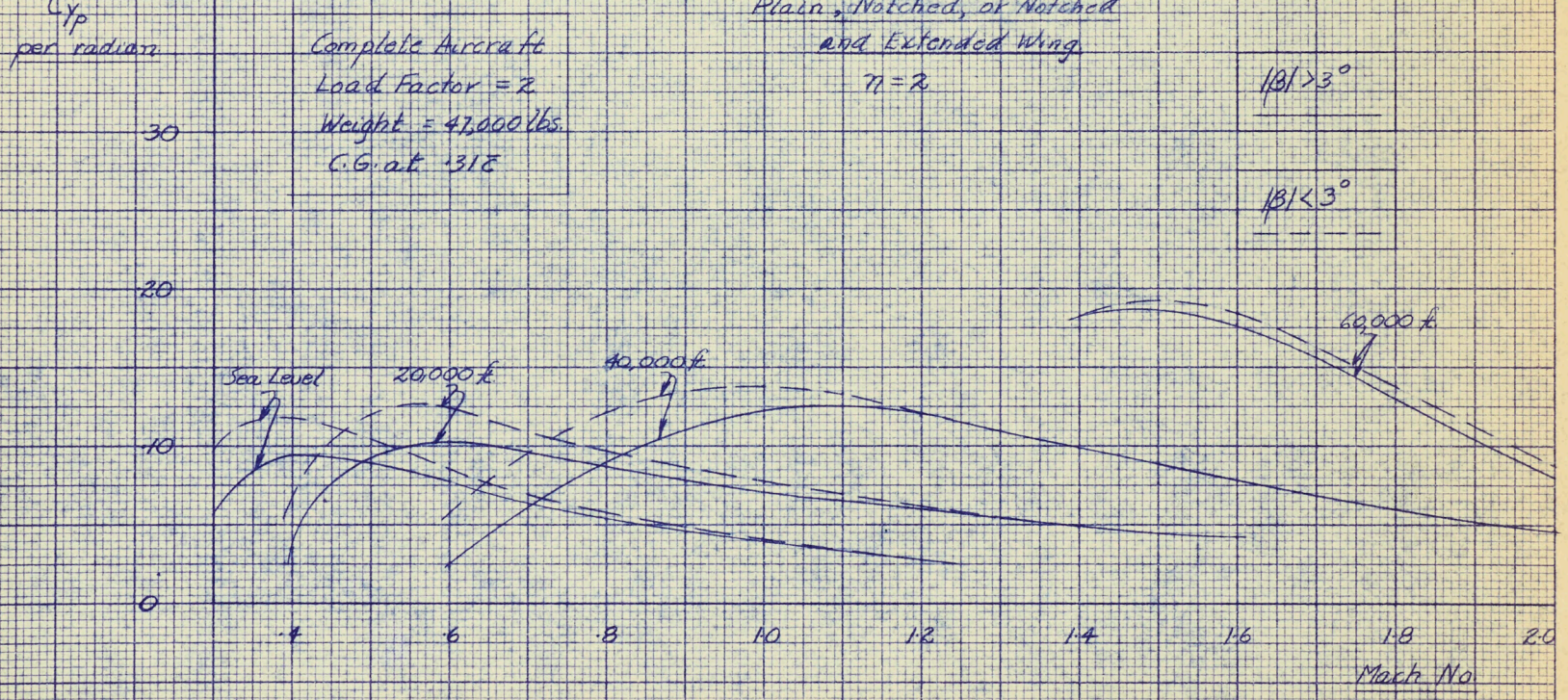
Aeroelastic Sideforce-in-Roll

C_{y_p} vs Mach No.

Plain, Notched, or Notched and Extended Wing

$n = 2$

Complete Aircraft
Load Factor = 2
Weight = 47,000 lbs.
C.G. at .31 $\bar{c}$



P/AD/54 5, 3, 1 25/3/55 C.A.Ford P/Stab/76 3.15

A