

QC
Auro
C-105
P/AD/54

QCX
Auro
CF105
P-AD-54

20

FILE IN VAULT

C-105 P/Aero Data/54

UNCLASSIFIED
LATERAL STABILITY DERIVATIVES

IN 2 'G' FLIGHT ANALYZED

WING NOTCHED AND EXTENDED

COPY 6

April 1955 20



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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: 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 April 1955

CHECKED BY

DATE

SUPERVISED BY

DATE

APPROVED BY

DATE

ISSUE NO. REVISION NO. REVISED BY APPROVED BY DATE REMARKS

45125



AVRO AIRCRAFT LIMITED

TECHNICAL DEPARTMENT (Aircraft)

REPORT NO. P/AERO DATA/ 54.

SHEET NO. _____

AIRCRAFT: _____

PREPARED BY _____

DATE _____

CHECKED BY _____

DATE _____

INDEXC-105UNCLASSIFIED
NON CLASSIFIEDLATERAL STABILITY DERIVATIVESIN 2G' FLIGHT

			<u>Section</u>
1.	<u>Aileron Derivatives and Hinge Moments</u>		
	$C_{l\delta_a}^*$		1.1
	$C_{N\delta_a}$		1.2
	$C_{Y\delta_a}^*$		1.3
	$C_{h\delta}^*$		1.4
	C_{nq}		1.5
	$C_{n\delta}$		1.6
2.	<u>Rudder Derivatives and Hinge Moments</u>		
		<u>$\beta < 3^\circ$</u>	<u>$\beta > 3^\circ$</u>
	$C_{N\delta_r} \begin{pmatrix} \delta_R < 10^\circ \\ \delta_R > 10^\circ \end{pmatrix}$	$\begin{matrix} 2.1.1 \\ 2.1.3 \end{matrix}$	$\begin{matrix} 2.1.2 \\ 2.1.4^* \end{matrix}$
	$C_{l\delta_r} \begin{pmatrix} \delta_R < 10^\circ \\ \delta_R > 10^\circ \end{pmatrix}$	$\begin{matrix} 2.2.1 \\ 2.2.3 \end{matrix}$	$\begin{matrix}) \\ 2.2.2 \end{matrix}$
	$C_{Y\delta_r} \begin{pmatrix} \delta_R < 10^\circ \\ \delta_R > 10^\circ \end{pmatrix}$	$\begin{matrix} 2.3.1 \\ 2.3.3^* \end{matrix}$	$\begin{matrix} 2.3.2 \\ 2.3.4^* \end{matrix}$
	$C_{h\beta}^*$		2.4
	$C_{n\delta}^*$		2.5

* Derivative independent of Angle of Attack.



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3. Sideslip DerivativesUNCLASSIFIED
NON CLASSIFIE

	<u>$\beta < 3^\circ$</u>	<u>$\beta > 3^\circ$</u>	
$C_{N\beta}$	3.1.1	3.1.2	3.1
$C_{L\beta}$	3.2.1		3.2
$C_{Y\beta}$	3.3.1	3.3.2 *	3.3

4. Yawing Derivatives

	<u>$\beta < 3^\circ$</u>	<u>$\beta > 3^\circ$</u>	
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

	<u>$\beta < 3^\circ$</u>	<u>$\beta > 3^\circ$</u>	
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

P/AD154

1.2

P/Slab 175

GSH

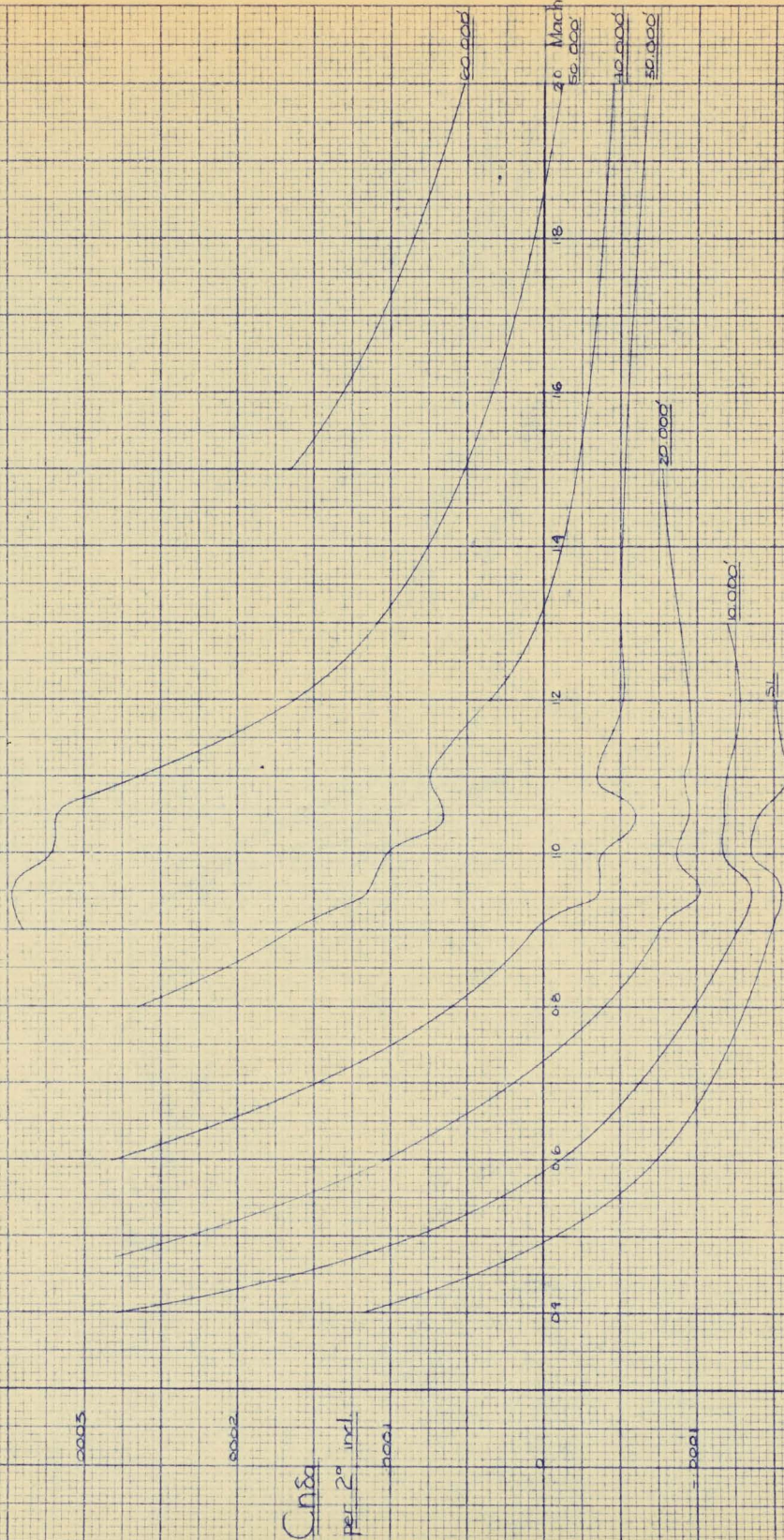
6.1.2

C-105
Cnδa vs Mach No

Elastic

2g Flight

Wing Notched and Extended



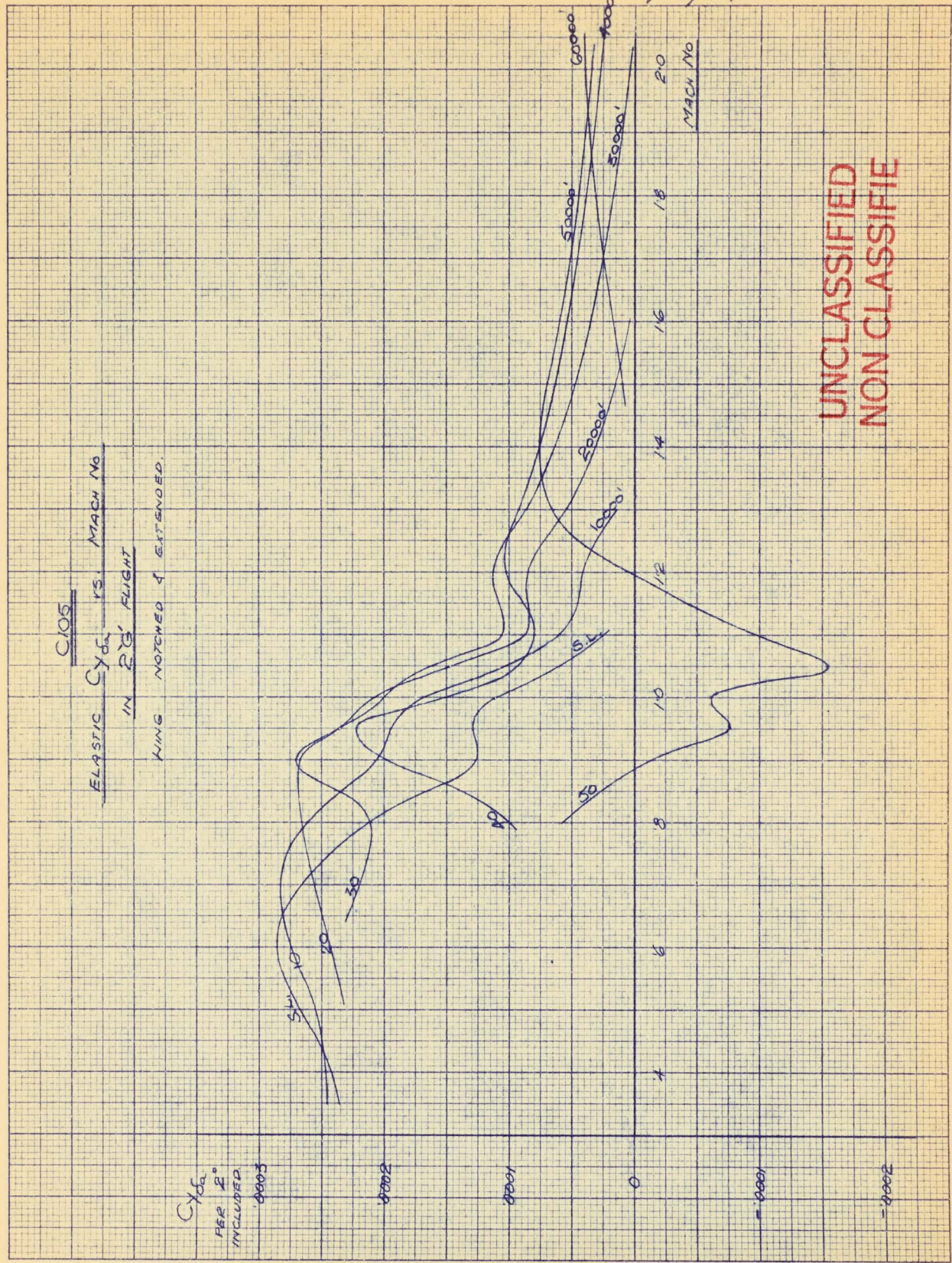
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P/A0154

1.3

P/S-413/75

April 15th Knechtel 6-23



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P/AD/54

2.1.1

P/Stab/75

GLSH

3.1.9

eg 0.312
Wing notched and extended

C-105
Cn_δ vs MACH²

Plastic

2g Flight

15 < β < 3° 15 < 10°

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-0.0007

-0.0006

Cn_δ

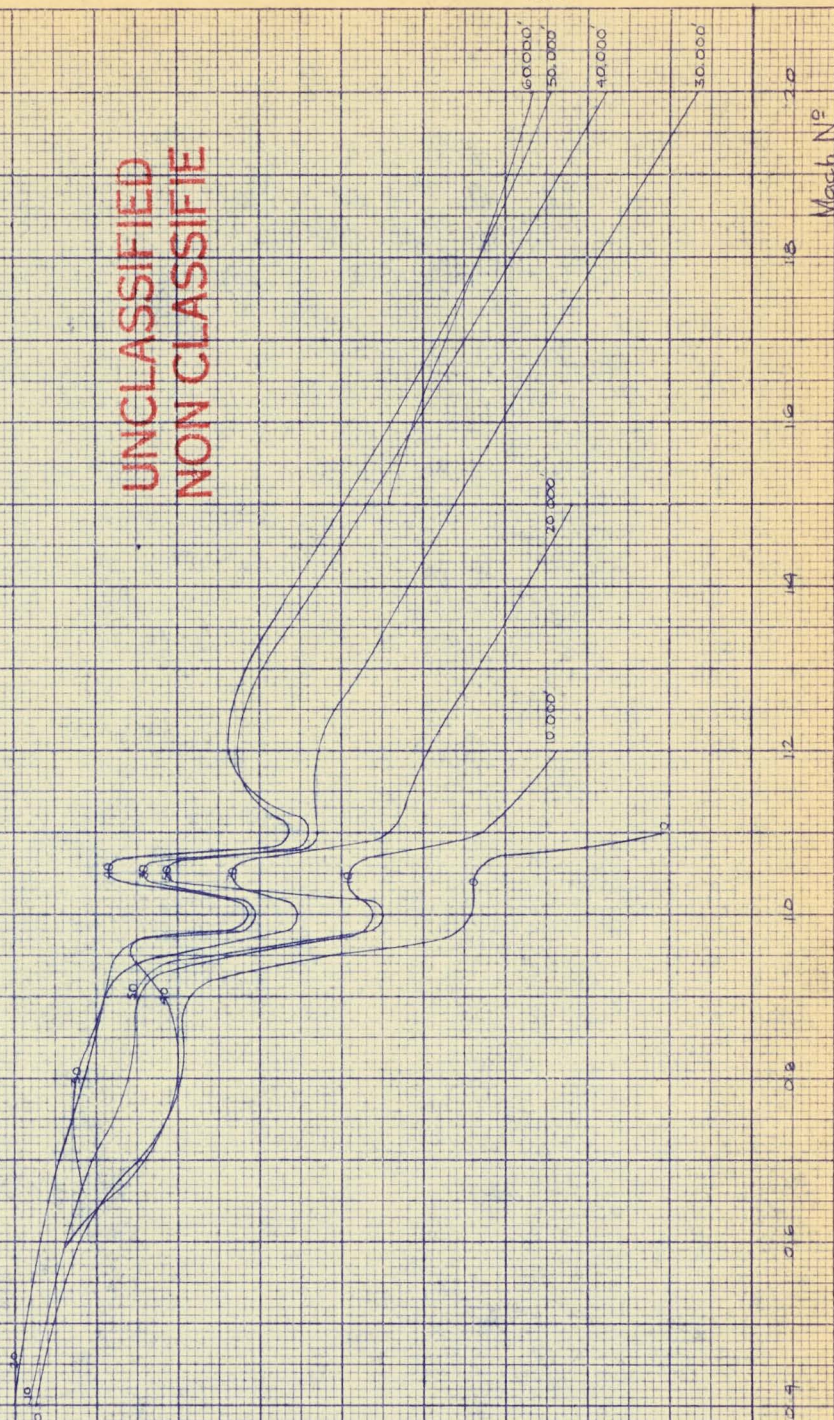
per degree

-0.0005

-0.0004

-0.0003

-0.0002



Mach N°

P/AD/54

2.1.3

P/Std/75

GSH

352

C-105
Cnδe vs Mach No

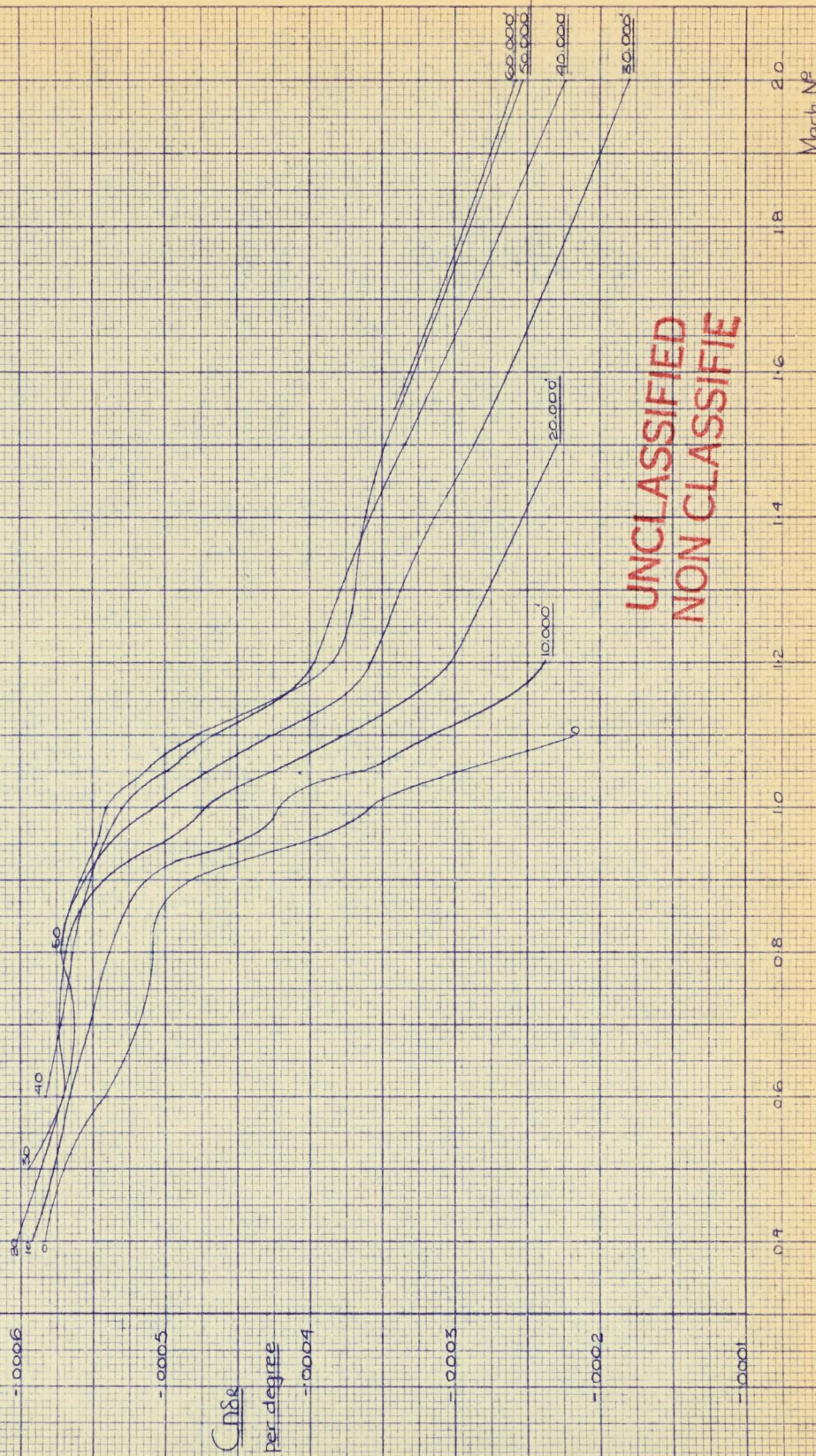
Elastic

2g Flight

c.g. 0.312

Wing Notched and Extended

$|\delta| < 3^\circ$ $|\delta R| > 10^\circ$

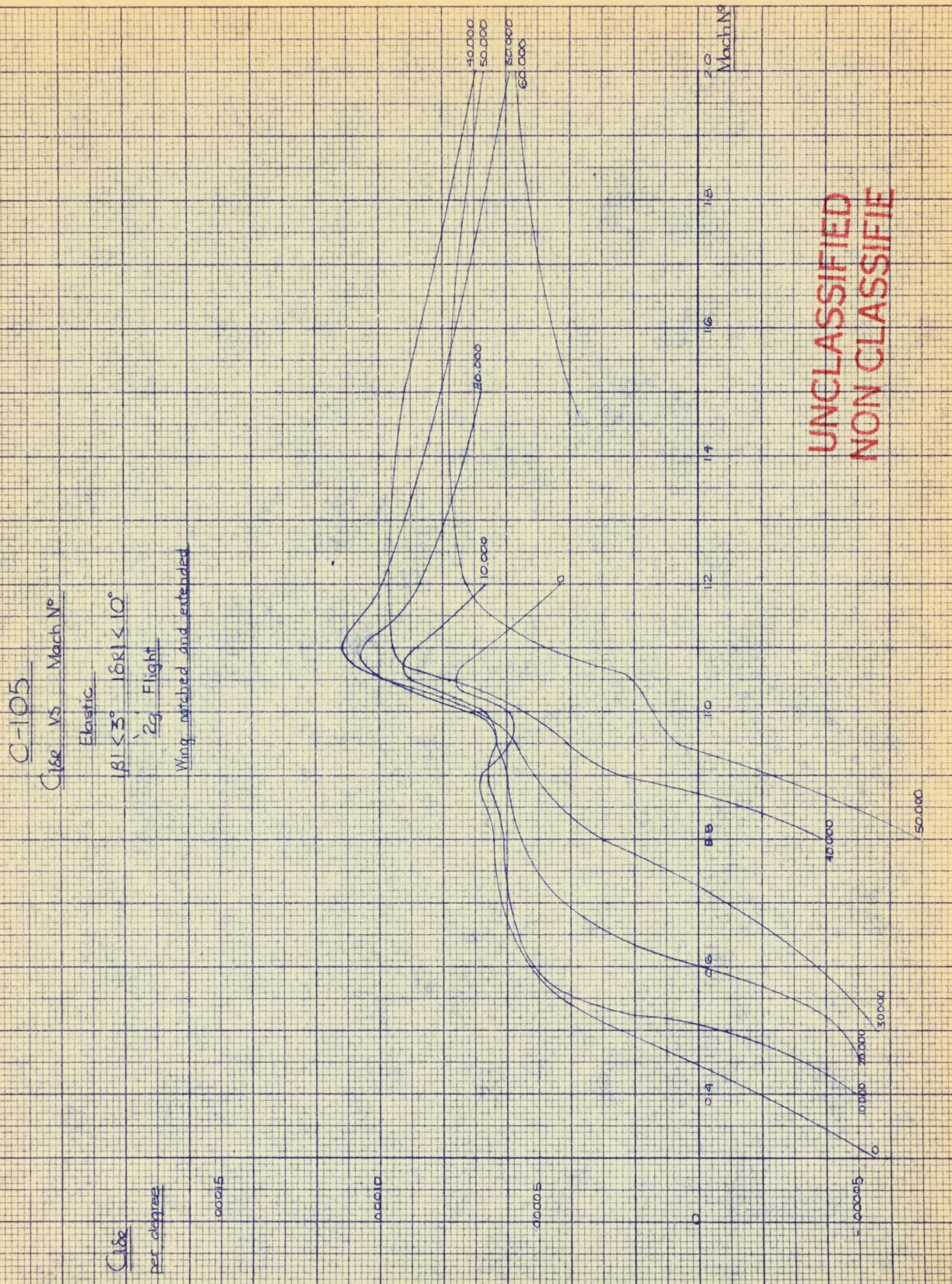


P/AD/54 2.2.1

P/Stab/75

GUSH.

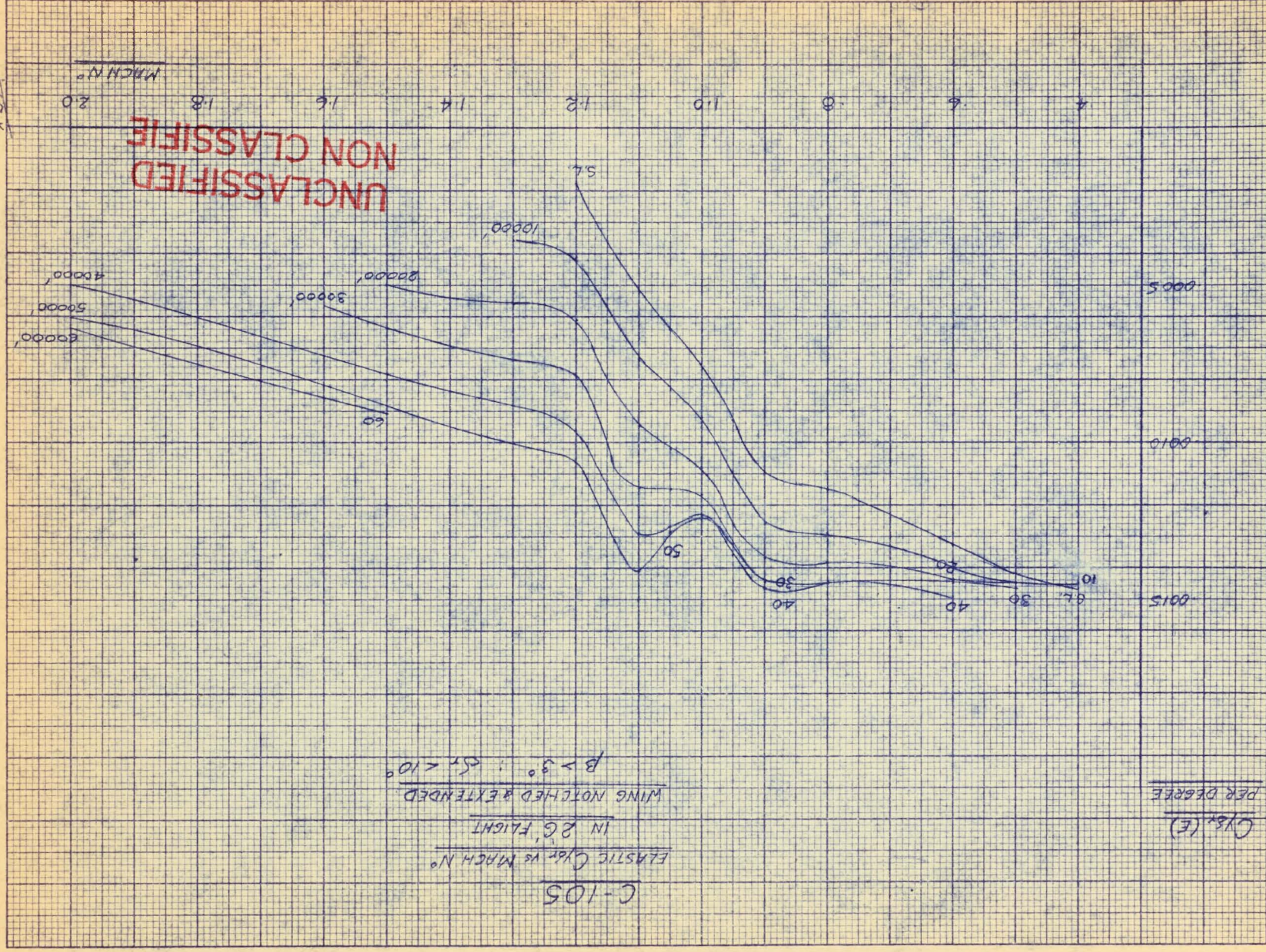
47



UNCLASSIFIED
NON CLASSIFIE

PIAD154 2.3.2
 PIAD154 2.3.2
 MARCH 55. RLB

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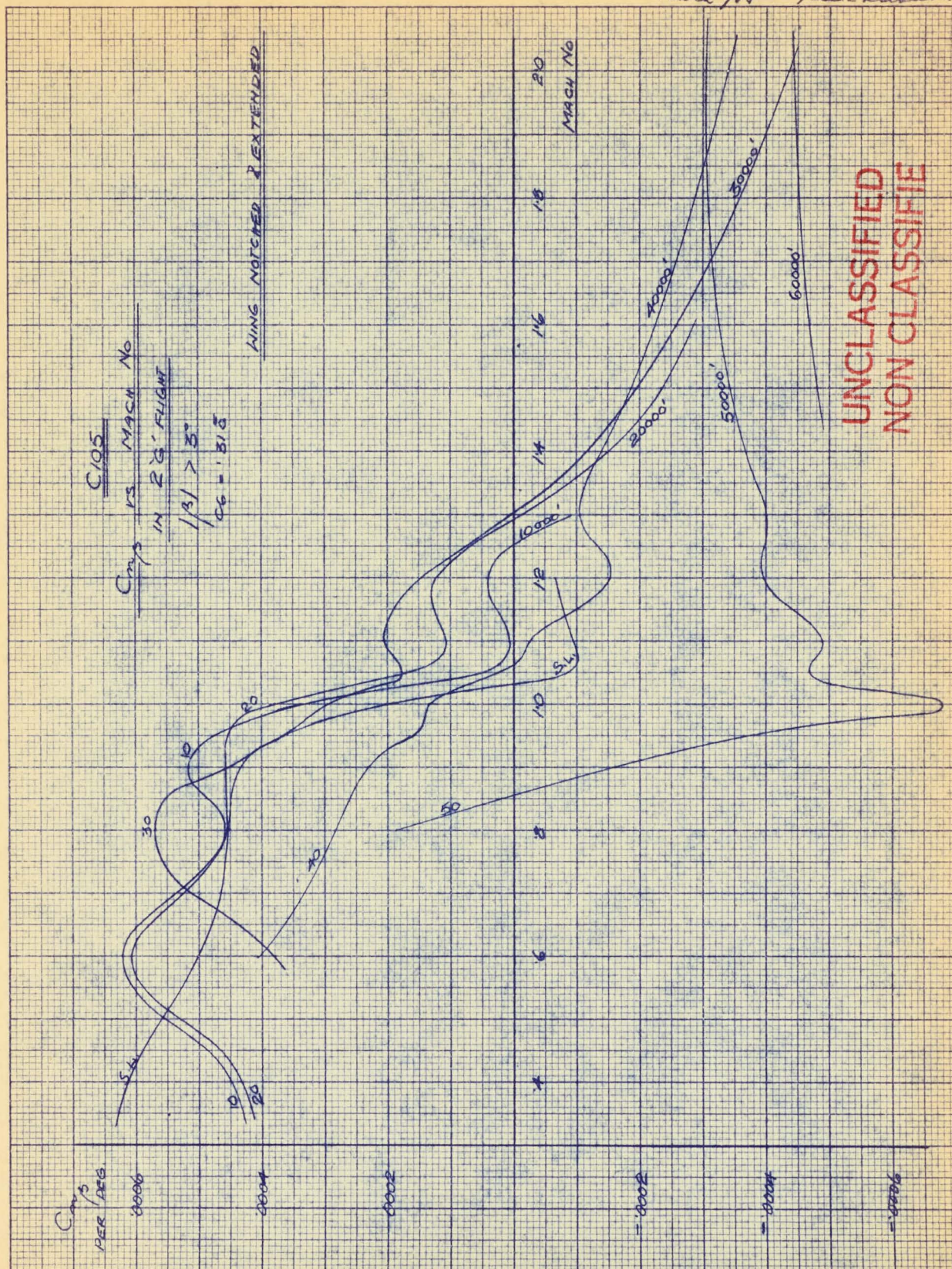
C-105
 ELASTIC Cyl vs MACH No
 IN 2G FLIGHT
 WING NOTCHED & EXTENDED
 $B > 3^\circ$: $Sr < 10^\circ$

P/AD/54

3.1.2

P/STAT/75 2.23.

Hand/OT Kin-kin



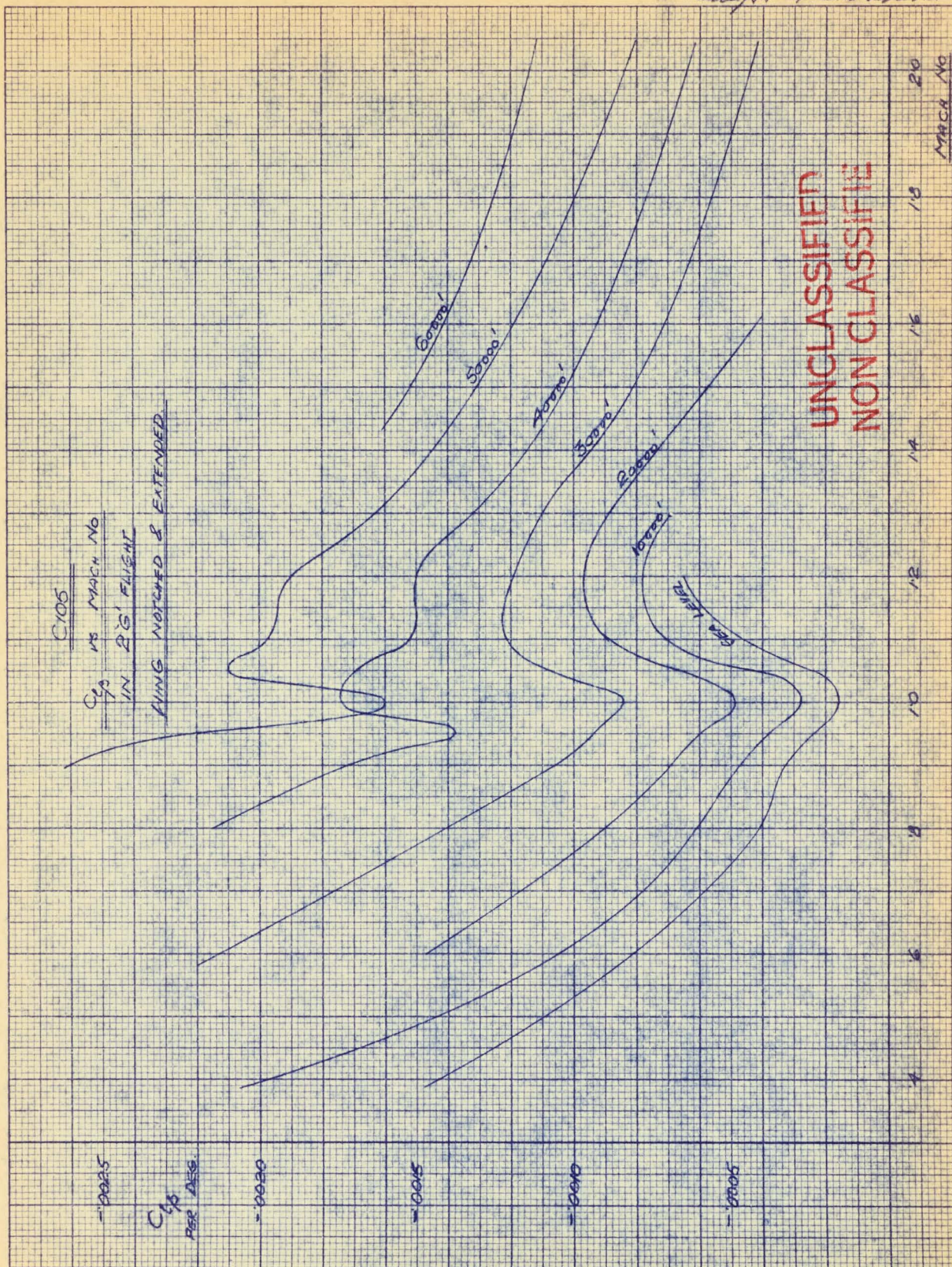
PIAD154

3.2.1

P/5792/7-

5.4.

March/57 Kuratthapusi



P/AD/54

4.2.2

P/Stab/70 Sheet.

18. Mar '55

C-105

$C_{L_{YE}}$ VS MACH NO
TAIL ELASTICS INCLUDED

$n = 2$

$|\beta| > 3^\circ$

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

$C_{L_{YE}}$

PER RADIAN

.07

.06

.05

.04

.03

.02

.01

0

-.01

SEA LEVEL

20000'

40000'

60000'

.4

.6

.8

1.0

1.2

1.4

1.6

1.8

2.0

MACH NO

UNCLASSIFIED
NON CLASSIFIED

P/AD/5A

A. 3. 2

P/State/70

58

Apr. '55

C-105

C_{X_E} VS MACH NO.

TAIL ELASTICS INCLUDED

$n = 2$

$|\beta| > 3^\circ$

NOTCHED &
EXTENDED WING

C.G. AT $31\% \text{ MAC}$

C_{X_E}
PER RADIAN

.20

.15

.10

.05

0

SEA LEVEL

20000'

40000'

60000'

40000'

20000'

60000'

SL

.4

.6

.8

1.0

1.2

1.4

1.6

1.8

2.0

MACH NO.

UNCLASSIFIED
NON CLASSIFIED

PIAD/SA

5, 3, 1

25/3/55

p/stab/76

C.A. Ford

3.15

C-105

Aeroelastic Sideforce in Roll

C_{Yp} vs Mach No.

Plain, Notched, or Notched
and Extended Wing

$\eta = 2$

$|B| > 3^\circ$

$|B| < 3^\circ$

C_{Yp}
per radian

Complete Aircraft

Load Factor = 2

Weight = 42,000 lbs.

C.G. at 131E

30

20

10

0

Sea Level

20,000 ft

40,000 ft

60,000 ft

4

6

8

10

12

14

16

18

20

Mach No.

UNCLASSIFIED
NON CLASSIFIE

