

QC 40
Avro
C-105
P/AD/51

QC X
Avro
CF105
P-AD-51

(14)

FILE IN VAULT

C-105

P/Aero Data/51

UNCLASSIFIED
LATERAL STABILITY DERIVATIVES

ANALYZED IN LEVEL FLIGHT

WING NOTCHED AND EXTENDED

copy 6

April 1955



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TO
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DATE

Report no.: QCX - AVRO - CF105 - P-AD-51

has been ☐ downgraded to : _____
☒ de-classified

by (Name): Michel W. Drapeau

(Dept.): A/DND Coordinator, Access to Information

Date: Dec. 7, 1992

Signature



A. V. ROE CANADA LIMITED
MALTON - ONTARIO

TECHNICAL DEPARTMENT (Aircraft)

UNCLASSIFIED

AIRCRAFT:

REPORT NO. P/AERO DATA/51

FILE NO

NO OF SHEETS: _____

TITLE:

C-105

ANALYZED

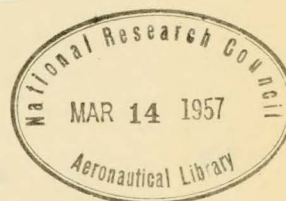
LATERAL STABILITY DERIVATIVES

IN LEVEL FLIGHT

WING NOTCHED AND EXTENDED

UNCLASSIFIED
NON CLASSIFIED

Classification ^{confirmed as} ~~cancelled~~ / changed to: UNCLASSIFIED
By authority of: DRDA 7/DARET 5-8/DAS Eng 6-4-5
Date: 5 Nov 1992
Signature: S. Aubrey
Unit / Rank / Appointment: DSIS 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

45126

12422320



AVRO AIRCRAFT LIMITED

TECHNICAL DEPARTMENT (Aircraft)

REPORT NO. P/AERO DATA/51

SHEET NO. _____

AIRCRAFT: _____

PREPARED BY _____

DATE _____

CHECKED BY _____

DATE _____

INDEXC-105LATERAL STABILITY DERIVATIVESIN LEVEL FLIGHTUNCLASSIFIED
NON CLASSIFIED

		<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
$C_{h\dot{o}}$ *		1.4
$C_{h\dot{q}}$		1.5
$C_{h\dot{\delta}}$		1.6
2. <u>Rudder Derivatives and Hinge Moments</u>		
	<u>$\beta < 3^\circ$</u>	<u>$\beta > 3^\circ$</u>
$C_{N\delta_r}$ ($\delta_R < 10^\circ$)	2.1.1	2.1.2
($\delta_R > 10^\circ$)	2.1.3	2.1.4 *
		2.1
$C_{l\delta_r}$ ($\delta_R < 10^\circ$)	2.2.1	) 2.2.2
($\delta_R > 10^\circ$)	2.2.3	
		2.2
$C_{Y\delta_r}$ ($\delta_R < 10^\circ$)	2.3.1	2.3.2
($\delta_R > 10^\circ$)	2.3.3 *	2.3.4 *
		2.3
$C_{h\dot{\beta}}$ *		2.4
$C_{h\dot{\delta}}$ *		2.5

* Derivative independent of Angle of Attack.



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3. Sideslip DerivativesUNCLASSIFIED
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	<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

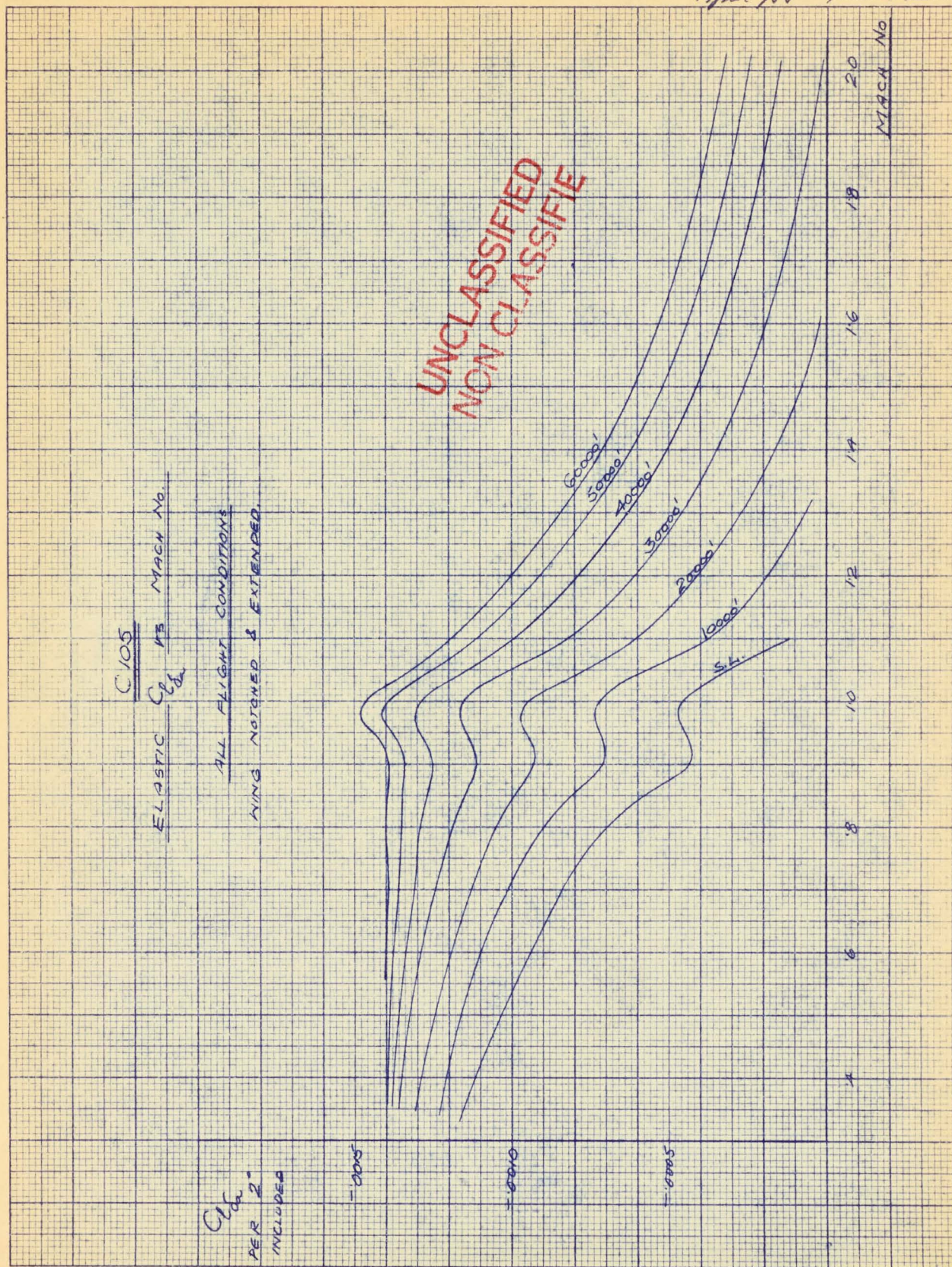
* Derivatives independent of Angle of Attack

P/AD/51

1.1

P/STAB/71 13.3-3.

April 15 Kinkadee



P/AD/51

1.2

P/Stability

QSH

13.1.2.

C-105

Cn_{sa} vs Mach No

Elastic

level flight

Wing Notched and Extended

0.003

0.002

Cn_{sa}

per degree in

0.001

0

-0.001

-0.002

0.4

0.6

0.8

1.0

1.2

1.4

1.6

1.8

2.0

Mach No

60,000

50,000

40,000

30,000

20,000

10,000

SL

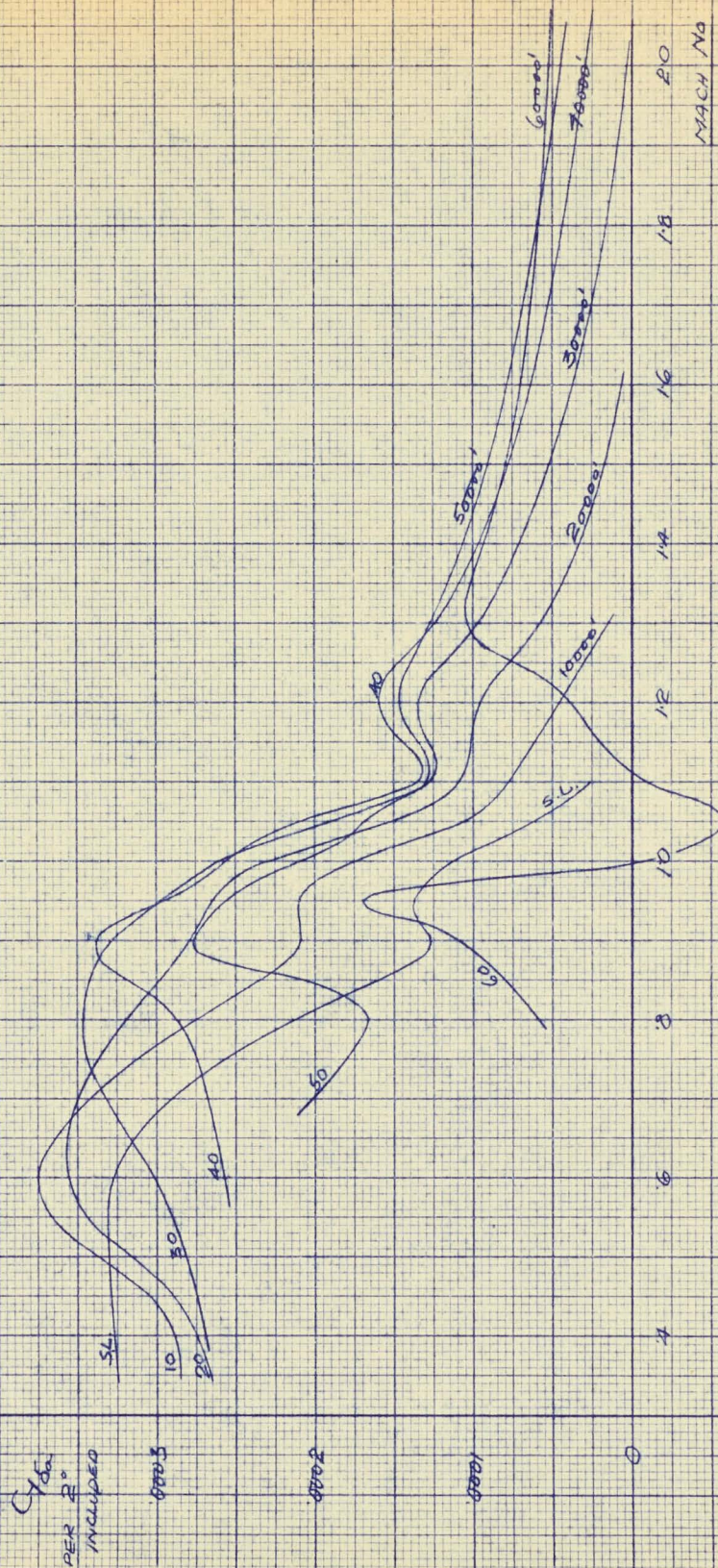
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P/AD151

1.3

P/ST22/71 13.2.4
Mach/ST Knot/hour

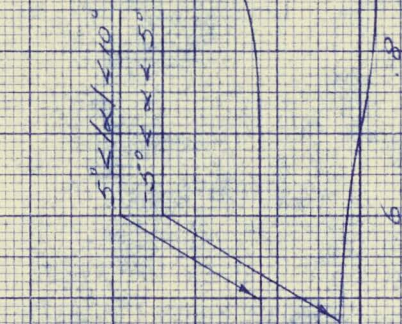
C105
ELASTIC C_{da} VS MACH No
IN LEVEL FLIGHT
WINGS NOTCHED & EXTENDED



UNCLASSIFIED
NON CLASSIFIE

2/10

6-10.5" 45 KICK NO



MR. H. W. BEE

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P/A D/51

157

~~U.S. AIR FORCE DATA / 72~~
APR. 55 CLARK

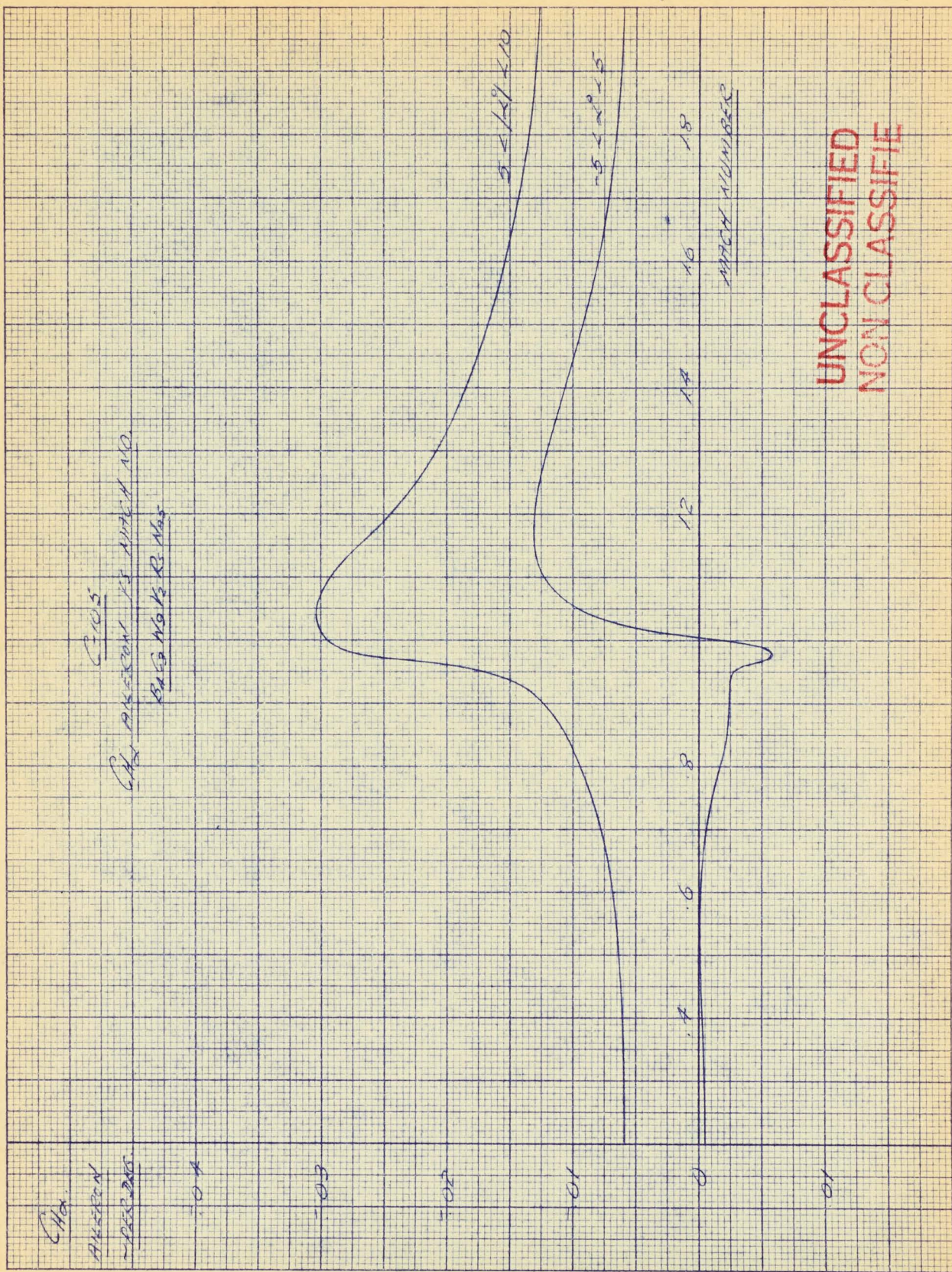
APR 55

CLARK

P/A D/51

1.5
JAN 55

~~PHOTO COPY~~
C. W. R.



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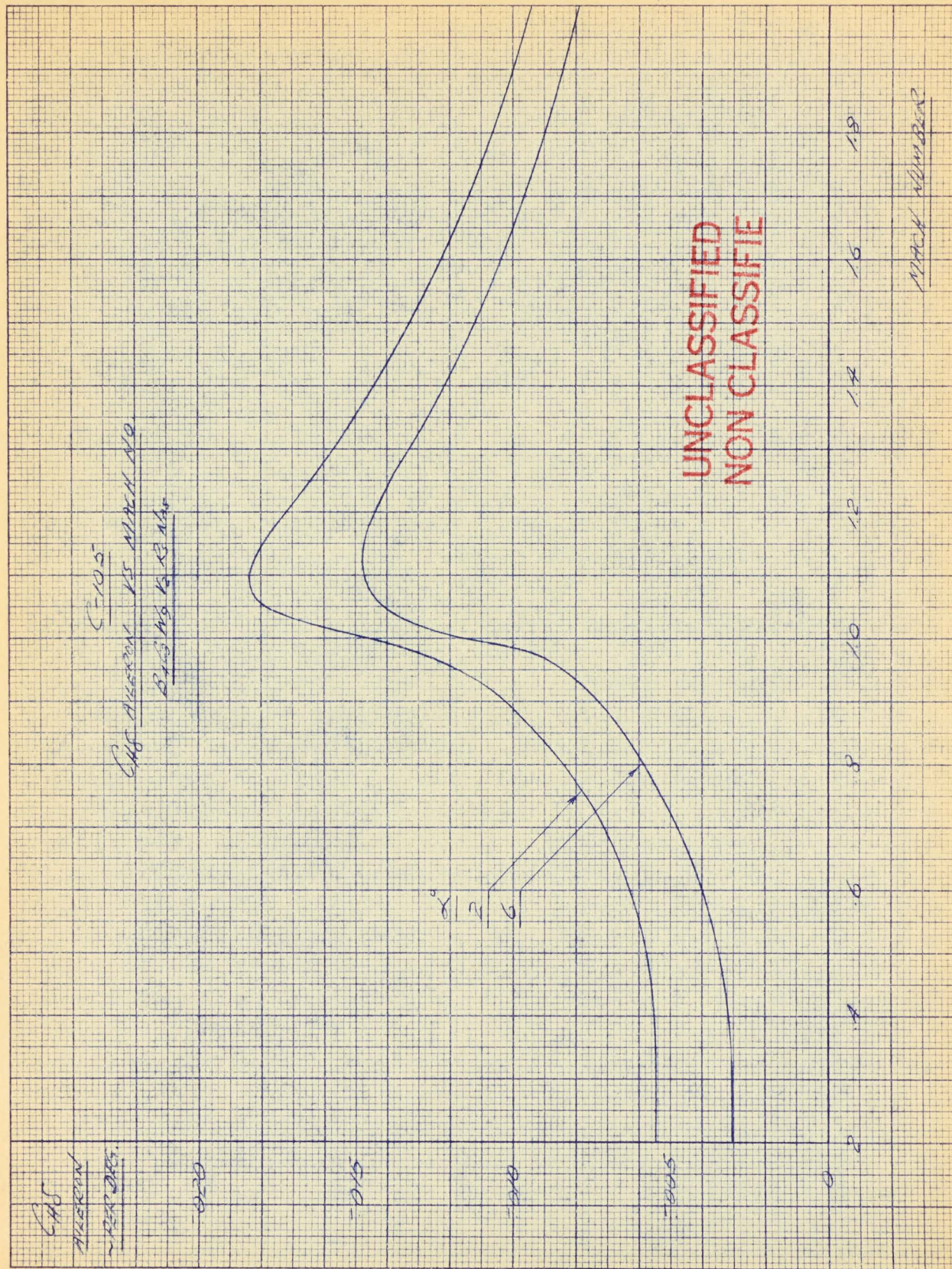
P/A D/51

1.6.

~~PHASE DATA~~ 1.2

1/2 IN 25

CLARK.



P/A D/51 2.1.1

~~P/STAB/71~~ ~~TI 2~~
March/15 Khatkhat

C105

ELASTIC CHORD 18 MACH NO
IN LEVEL FLIGHT

HING NOTCHED AND EXTENDED

1/31 + 3 - C.B. = .312

$\beta_R \approx 10^\circ$

COND. PER DEG

-0007

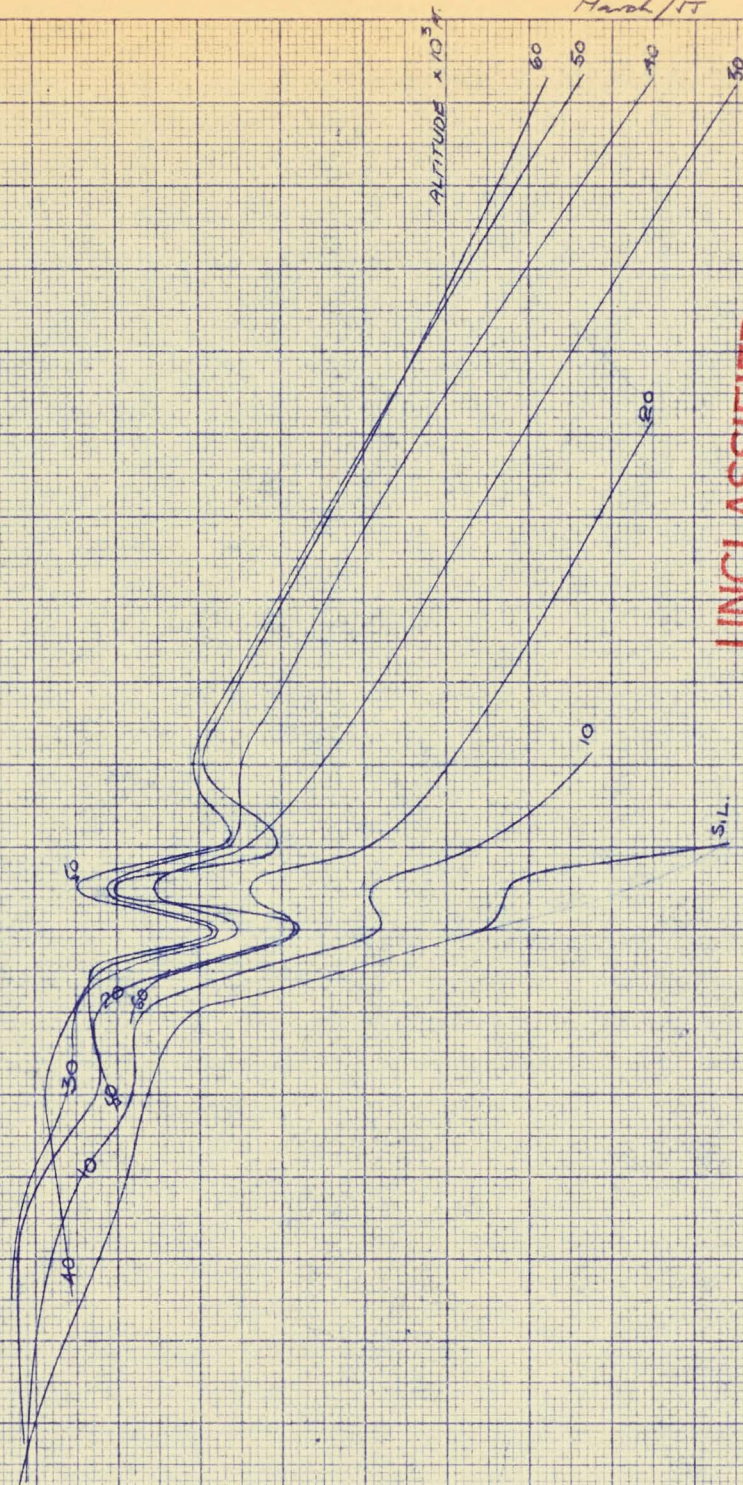
-0006

-0005

-0004

-0003

-0002

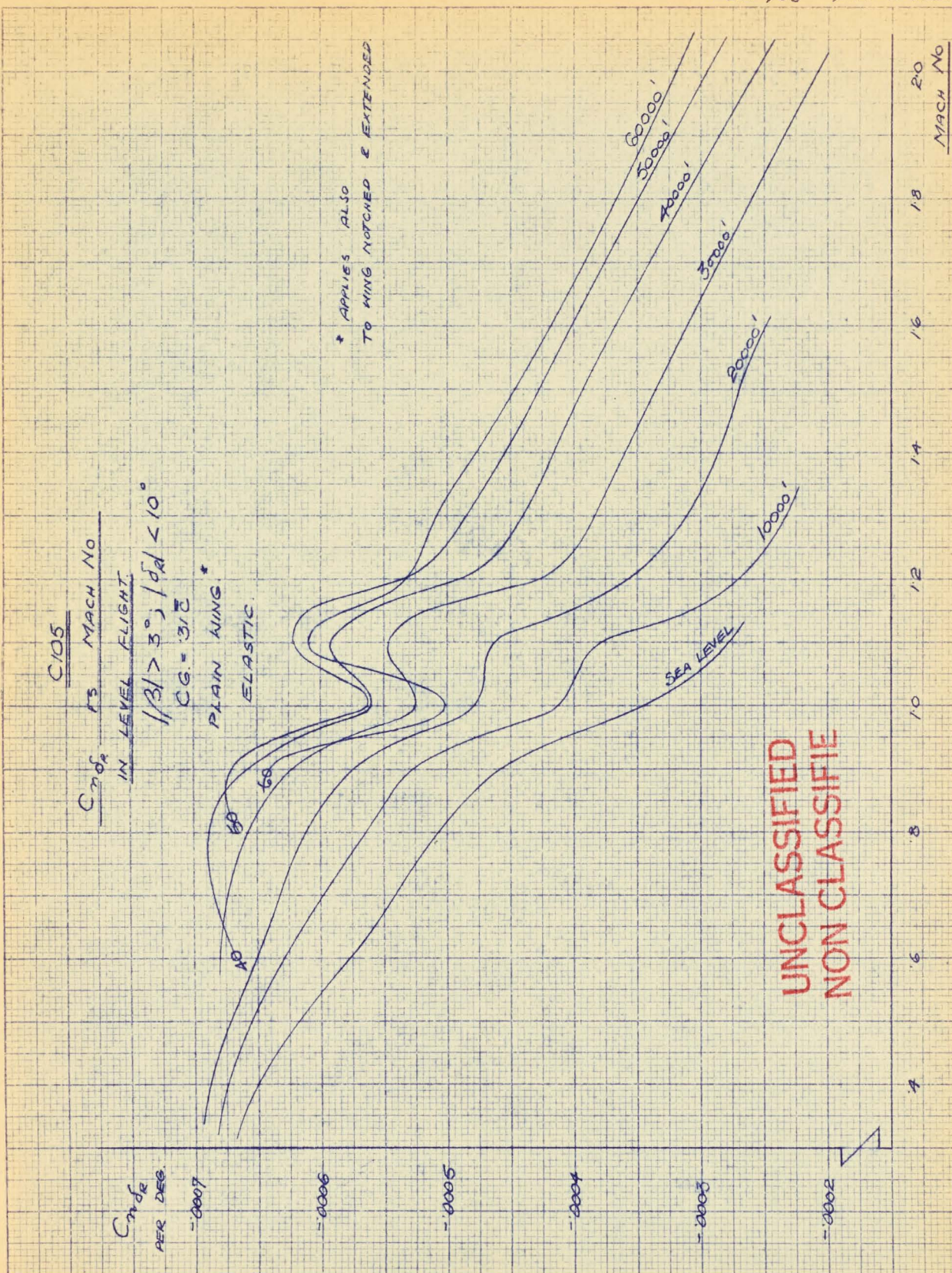


UNCLASSIFIED
NON CLASSIFIE

20
MACH NO

P/AD/51 2.1.2

~~P/STAB/68 13-17~~
Feb/55 Kinnakham



P/AD/51 2.1.3 P/stab/71-
GWT 12.1.3

C-105

Cn_{δr} VS Mach N°

Elastic

18.1 < 3° 18.1 > 10°

Level Flight

UNCLASSIFIED
NON CLASSIFIE

-0.0007

-0.0006

-0.0005

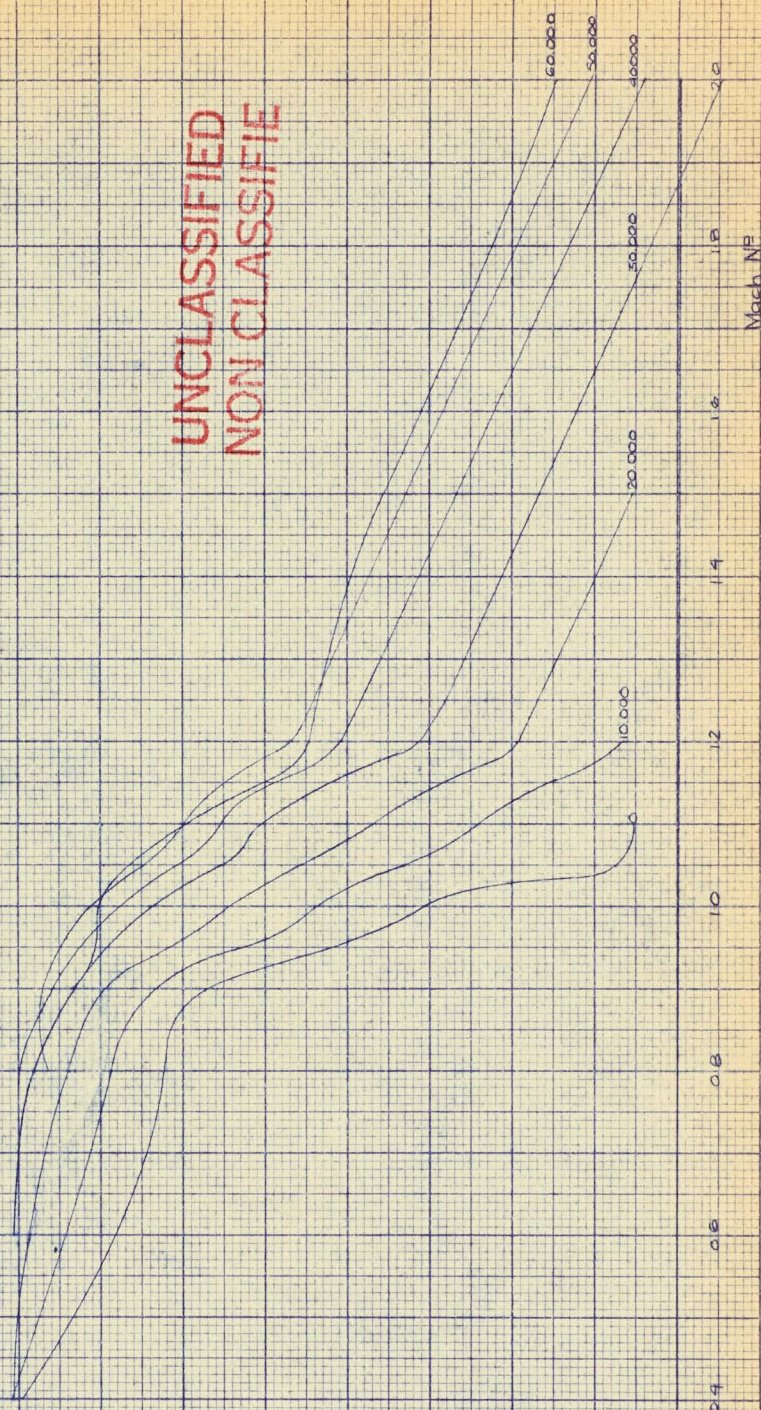
Cn_{δr}

per degree

-0.0004

-0.0003

-0.0002



P/A D/51 2.2.3

P/Stab/71

GASH

11-11

C-105

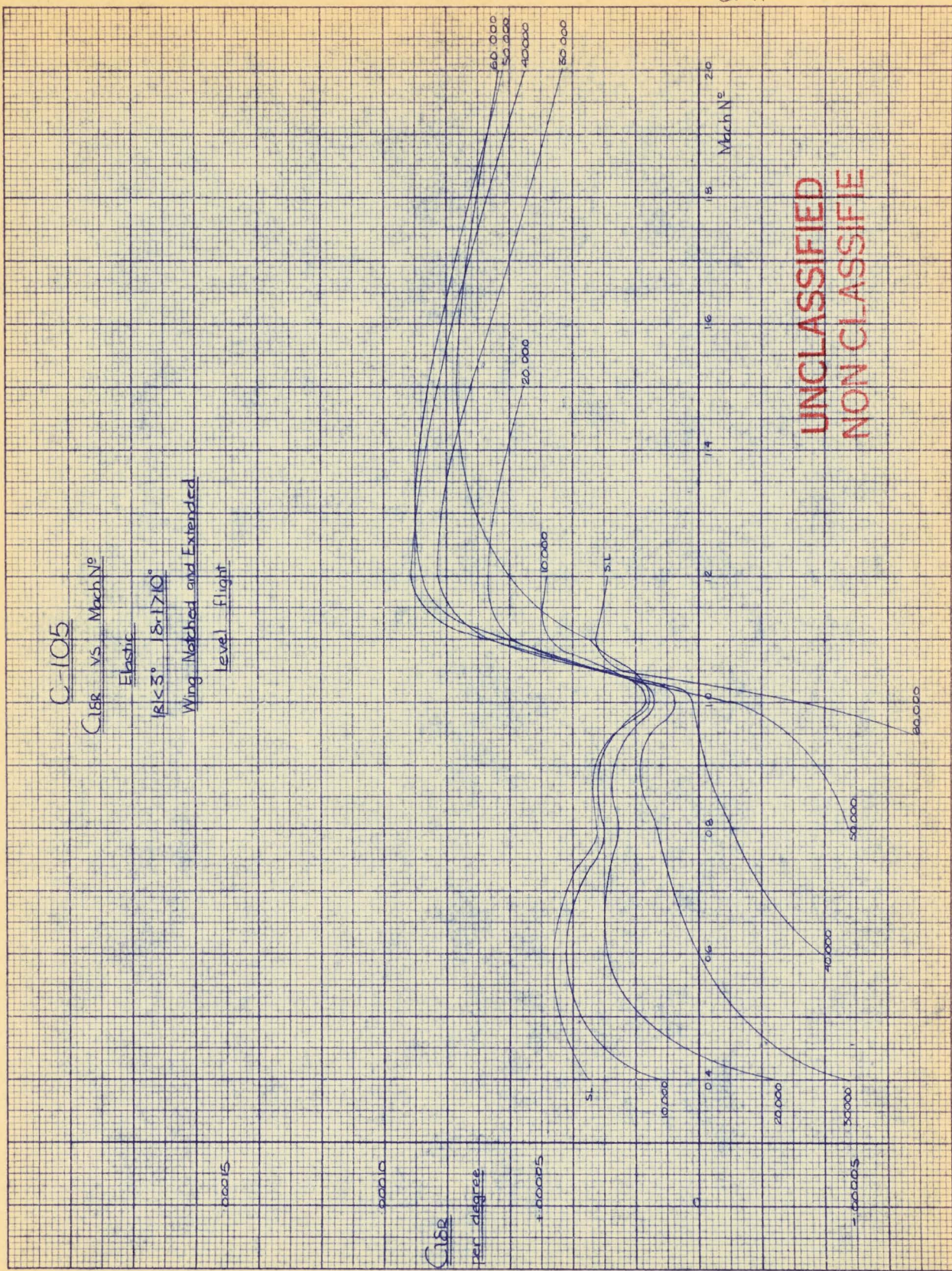
C_{LB} vs Mach N°

Elastic

R < 3° 18.170°

Wing Method and Extended

Level Flight



UNCLASSIFIED
NON CLASSIFIE

P/AD/51 2.3.2

15.9. P/STAB/68.

FEB. 1955

J. Payis.

C 105

CONF. $B_L C_3 W_3 V_3 R_3$

$C_{Y_{(B)}}$ vs MACH NO.

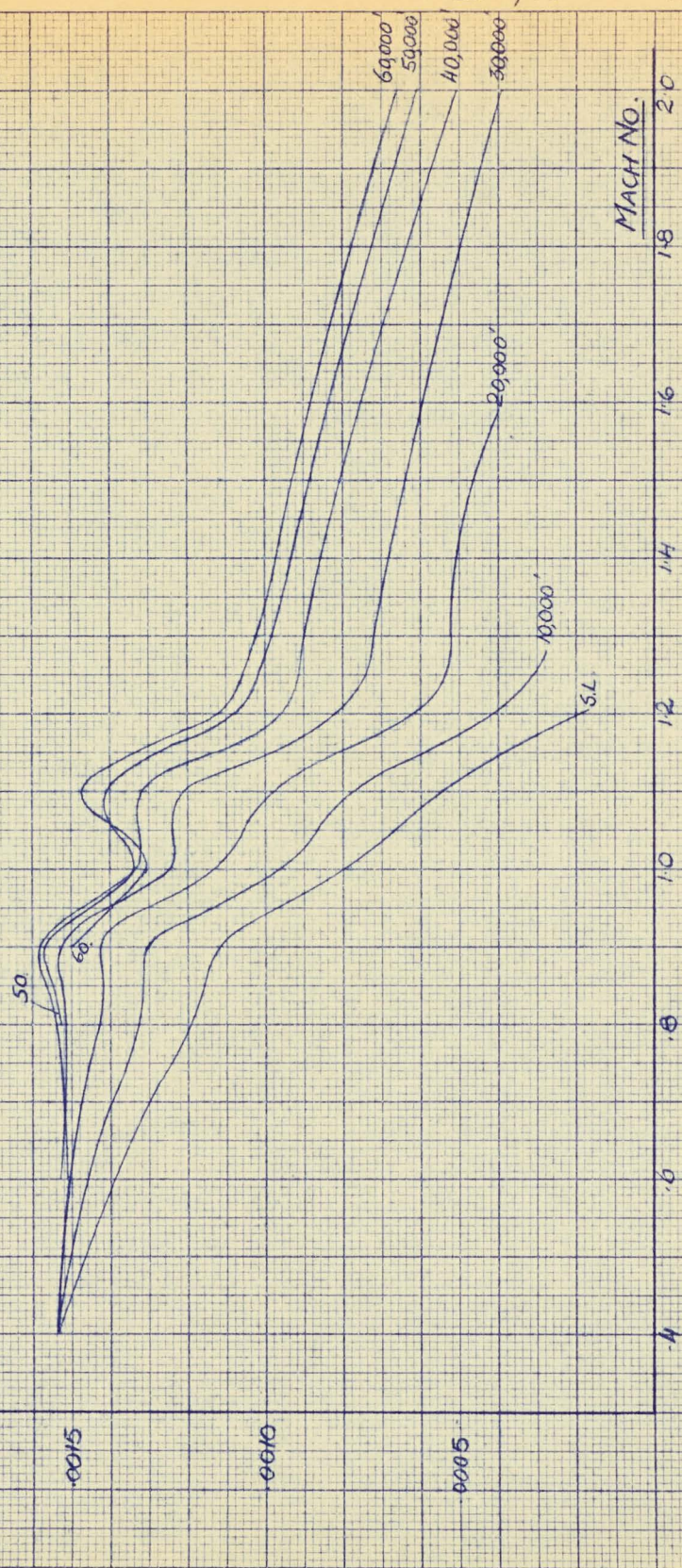
AEROELASTIC AIRCRAFT

LEVEL FLIGHT.

$\beta \approx 3$

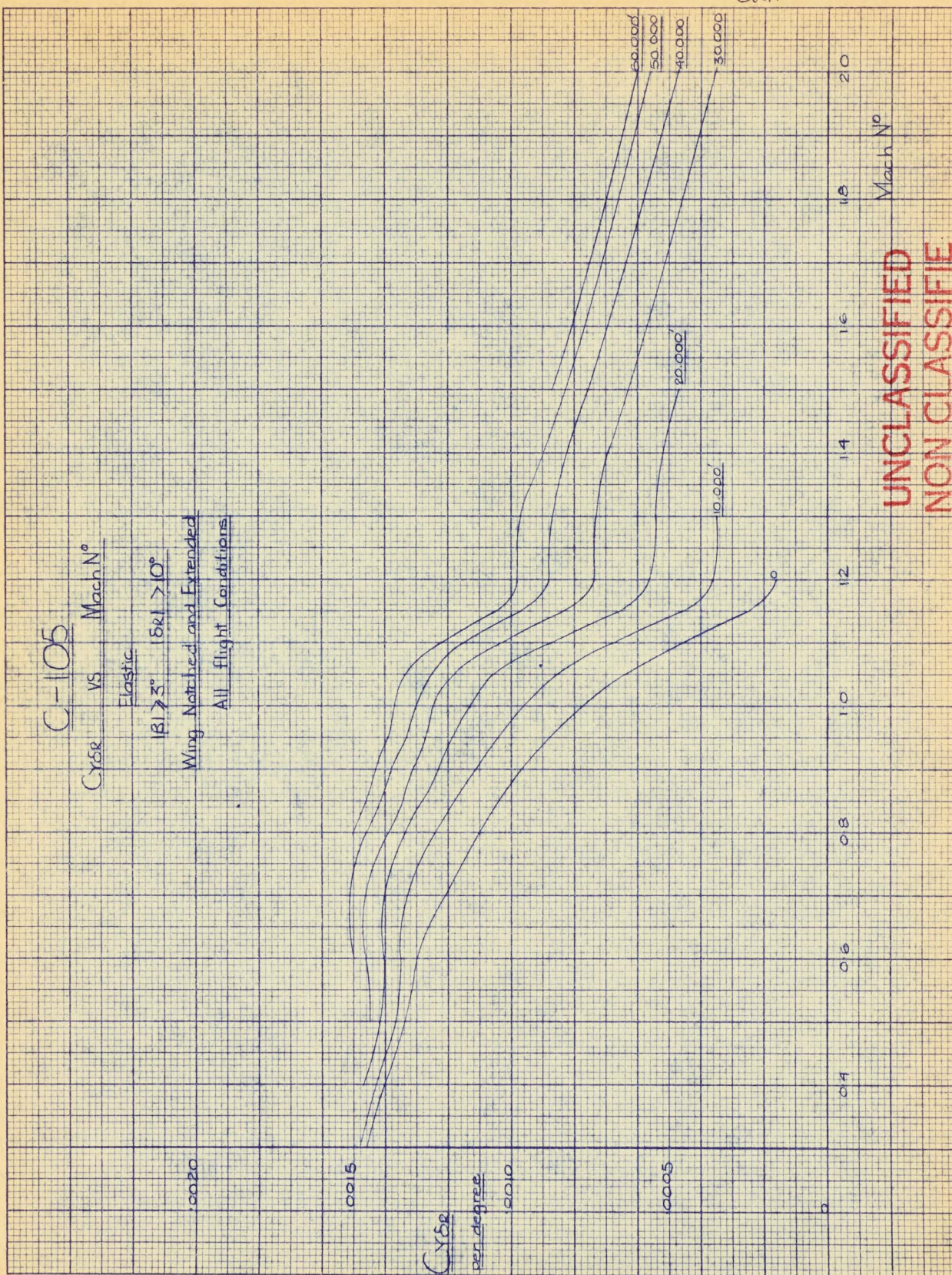
$\delta_r < 110^\circ$

$C_{Y_{(B)}}$
PER DISTANCE



UNCLASSIFIED
NON CLASSIFIE

P/A D/5-1 2,3,4 P/Stab 175 1.22.
GWH



P/AD/51 2.5

15.7. P/STAB/68
Feb. 1955. T. Papis

C 105

CONF B₂ C₃ W₃ V₃ R₅

Ch_δ vs MACH NUMBER

α = 2°

Ch_δ
PER DEGREE

Mach No.

2.0

1.8

1.6

1.4

1.2

1.0

.8

.6

.4

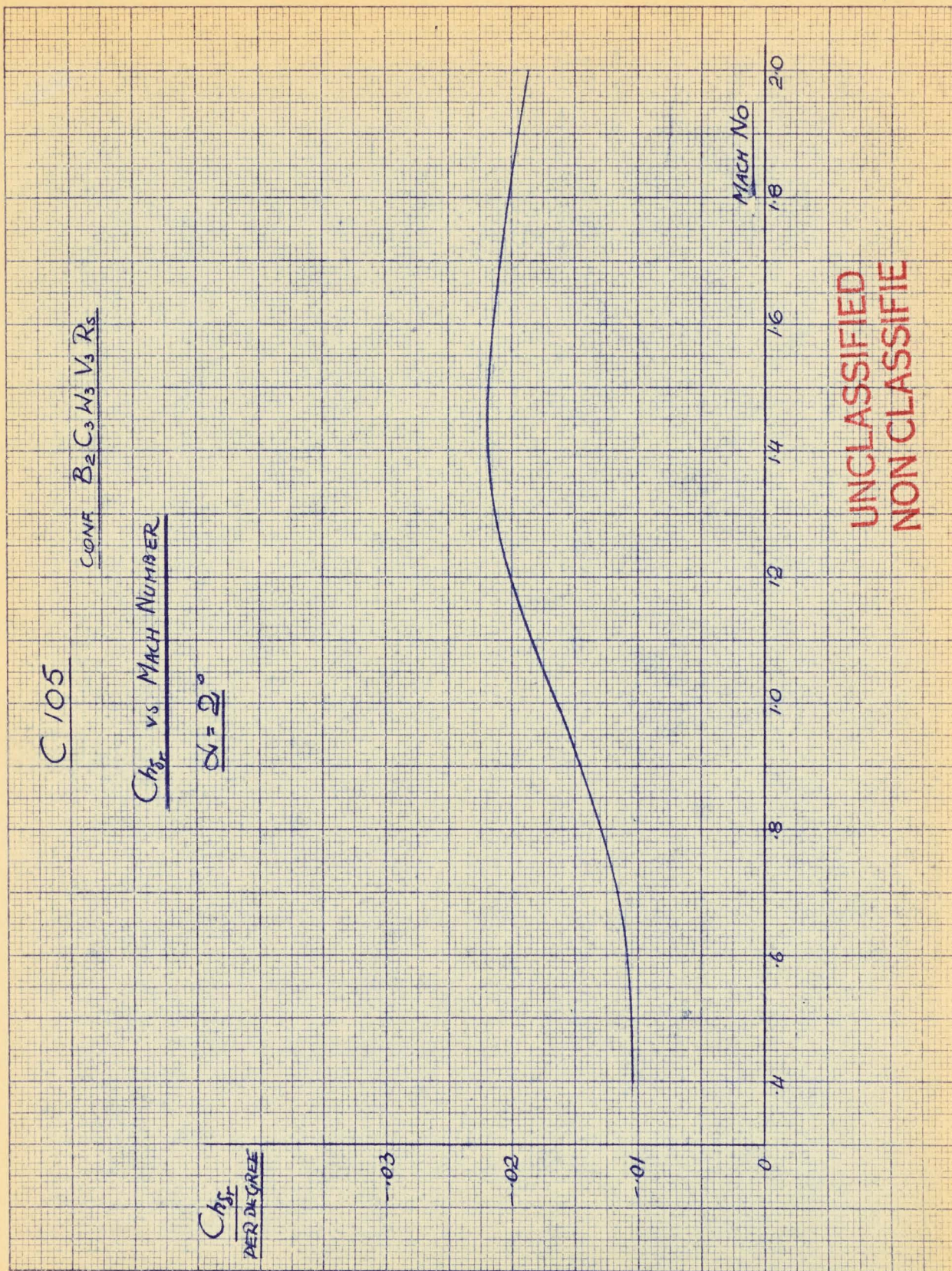
0

-.03

-.02

-.01

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P/AD/51 3.3.2

P/STAB/71 2.5
Feb/55 Kuznetsov

C105
C_Y/3 1.8 MACH No
ALL FLIGHT CONDITIONS

$\beta > 3^\circ$

ELASTIC FIN.

CONF. B₄ C₃ H₉ V₃ R₅ N₄
WING NOTCHED & EXTENDED.

C_Y/3
PER DEG.

-010

-008

-006

-004

-002

ALTITUDE:

60000'

50000'

40000'

30000'

20000'

10000'

SEA LEVEL

UNCLASSIFIED
NON CLASSIFIED

4

6

8

10

12

14

16

18

20

MACH No

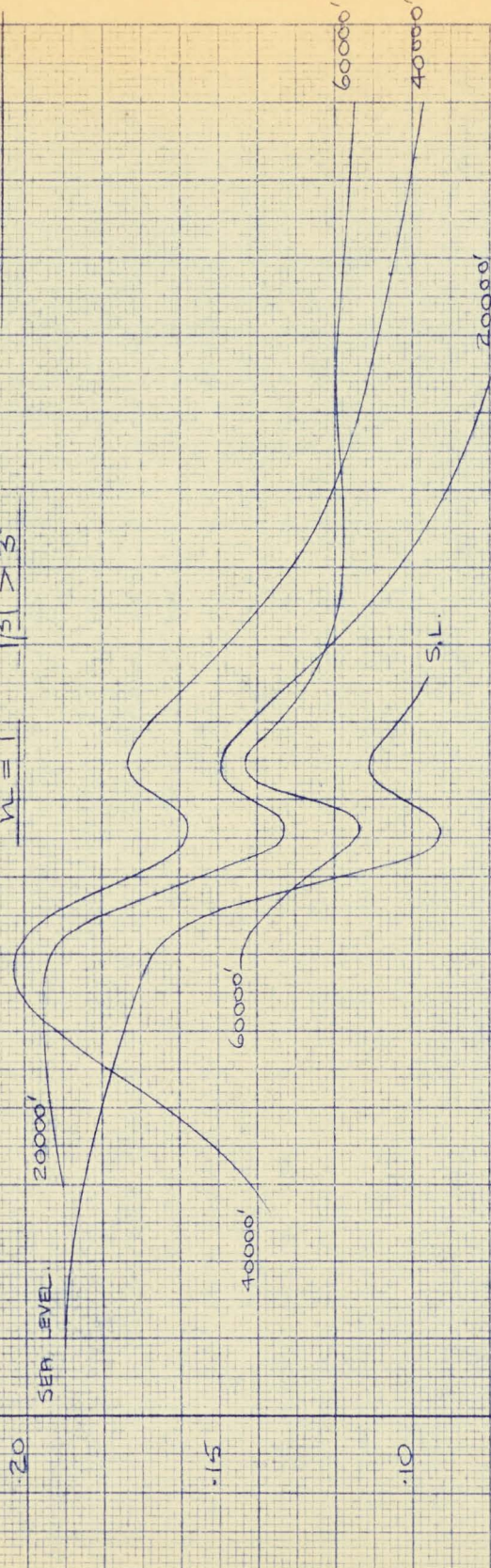
C-105

C_{Y_E} VS MACH NO.

TAIL ELASTICS INCLUDED.

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

$n = 1$ $|\beta| > 3^\circ$



MACH NO.

UNCLASSIFIED
NON CLASSIFIED

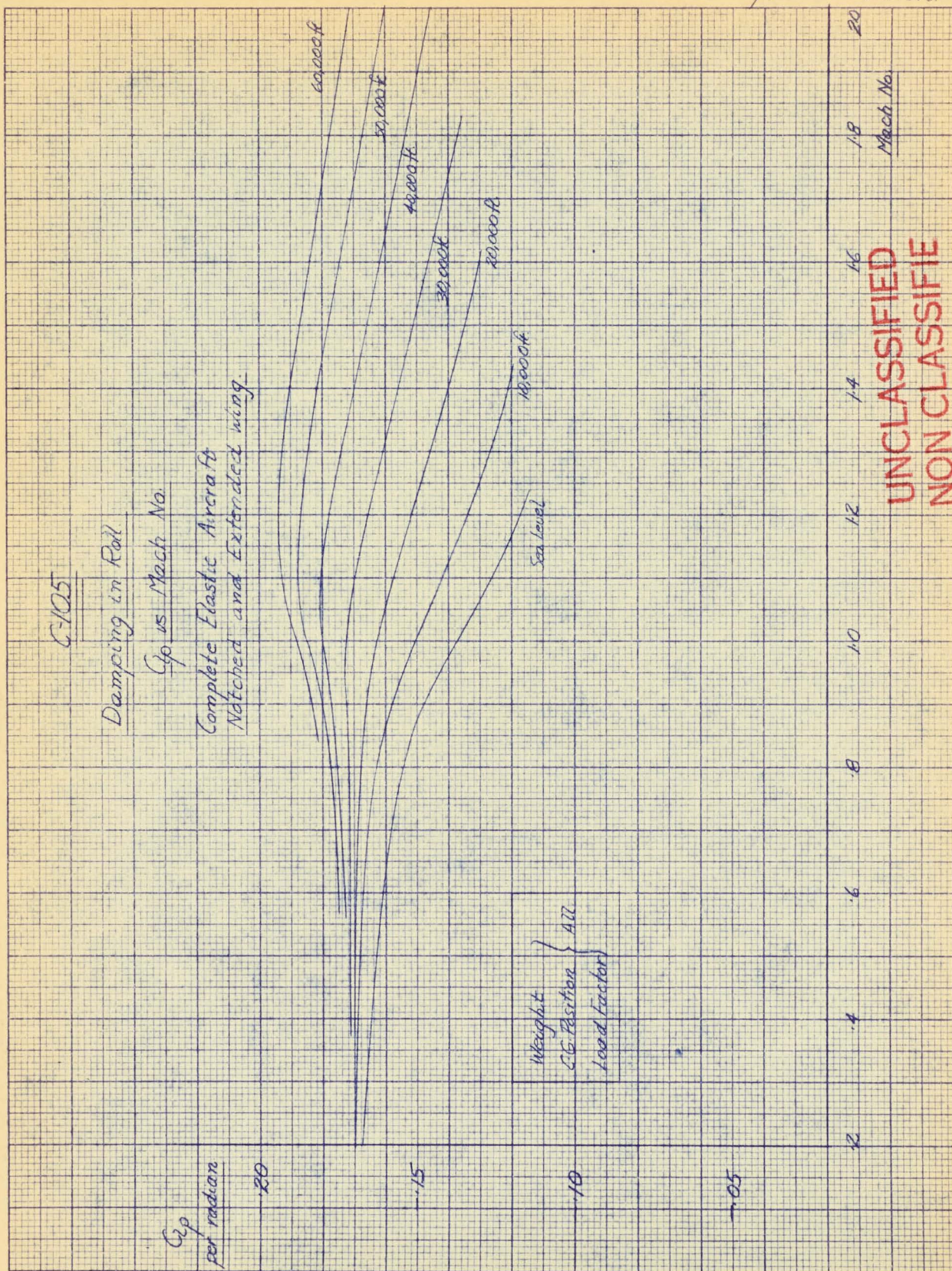
P/AD/51 A. 3. 2

P/Srady 70
LSDO.

Apr. 55

P/AD/51 5.2.1

175tab/76 1-7
April 1955 C.A.Ford



UNCLASSIFIED
NON CLASSIFIE

Mach No.

P/AD/51, 5, 3, 1

11/5/58

320

Feb 55

C.A. Ford.

C-105

Aerodynamic Side-force due to Rolling.

C_{Yp} vs Mach No.

Plain, Notched, or Notched
and Extended Wing

Complete Aircraft
Load Factor = 1
Weight = 47,000 lbs
C.G. at 31°

13/13°

13/13°

Wing W_3
or W_9 N_{AS}

C_{Yp}
per radian

30

20

10

0

60,000 ft

40,000 ft

20,000 ft

Sea Level

14

12

10

8

6

4

2

20

18

16

Mach No

UNCLASSIFIED
NON CLASSIFIED

