C-105 ANALYZED P/Aero Data/55

LATERAL STABILITY DERIVATIVES IN 4 'G' FLIGHT WING NOTCHED AND EXTENDED

21

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April 1955

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Report no.: QCX - AVRO - CF105 - P-AD-55

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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

TECHNICAL DEPARTMENT (Aircraft)

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C-105

LATERAL STABILITY DERIVATIVES

IN 4 "G" FLIGHT

WING NOTCHED AND EXTENDED

PREPARED BY DATE April 1955

CHECKED BY DATE

SUPERVISED BY DATE

APPROVED BY DATE

ISSUE No	REVISION No	REVISED BY	APPROVED BY	DATE	REMARKS

FORM 1316A

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LATERAL STABILITY DERIVATIVES

IN 4 'G' FLIGHT

				Section
1.	**Aileron Derivatives and Hinge Moments**			
	$C_{\ell\delta_a}$ *			1.1
	$C_{N\delta_a}$			1.2
	$C_{y\delta_a}$			1.3
	C_{h_o} *			1.4
	C_{h_α}			1.5
	C_{h_δ}			1.6
2.	**Rudder Derivatives and Hinge Moments**			
		$\lvert\beta\rvert<3^\circ$	$\lvert\beta\rvert>3^\circ$	
	$C_{N_{\delta_r}}$ ($\delta_R<10^\circ$)	2.1.1	2.1.2	2.1
	$C_{N_{\delta_r}}$ ($\delta_R>10^\circ$)	2.1.3	2.1.4 *	2.1
	$C_{l_{\delta_r}}$ ($\delta_R<10^\circ$)	2.2.1	2.2.2	2.2
	$C_{l_{\delta_r}}$ ($\delta_R>10^\circ$)	2.2.3	2.2.2	2.2
	$C_{y_{\delta_r}}$ ($\delta_R<10^\circ$)	2.3.1	2.3.2	2.3
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	C_{h_β} *			2.4
	C_{h_δ} *			2.5

* 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

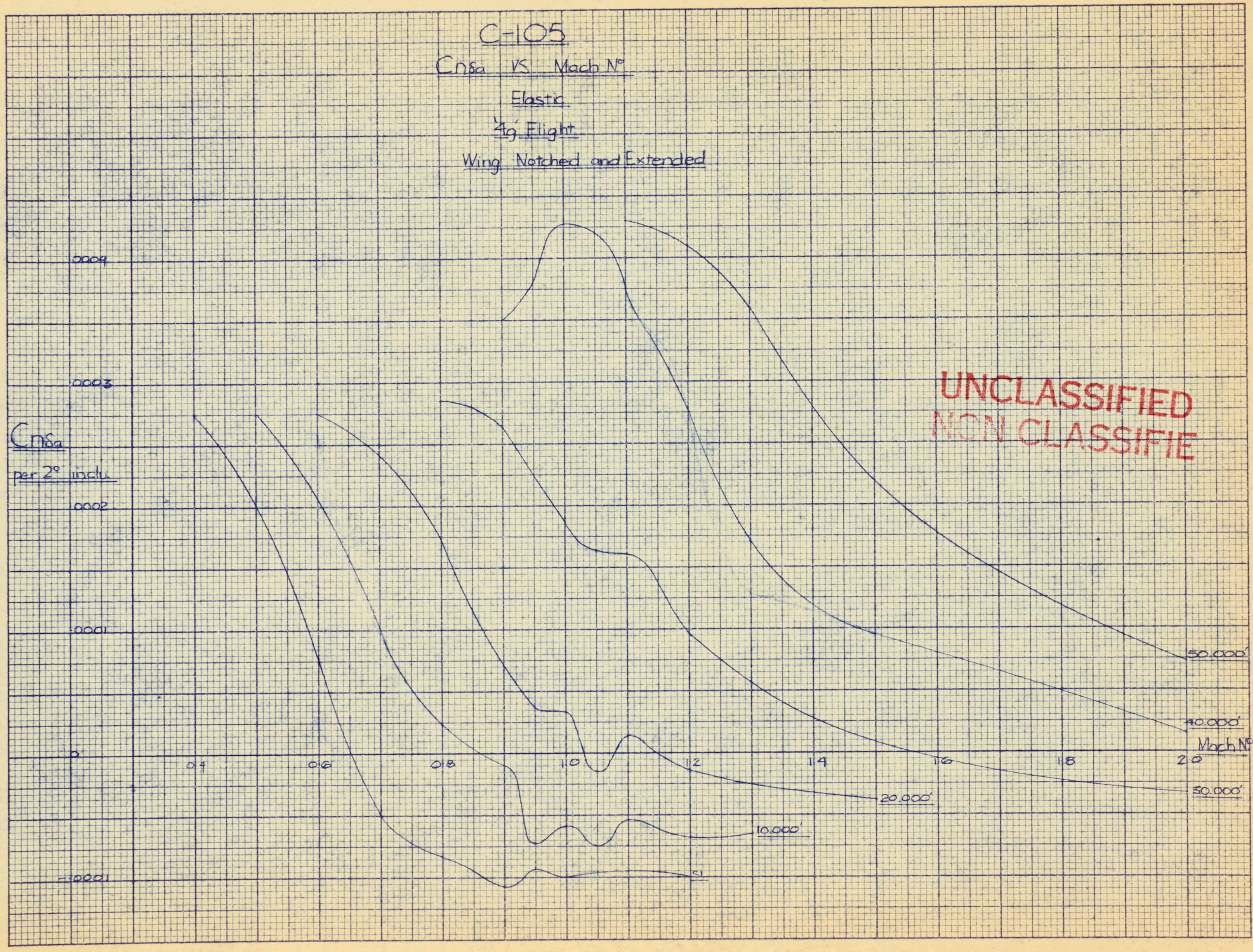
4. Yawing Derivatives

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



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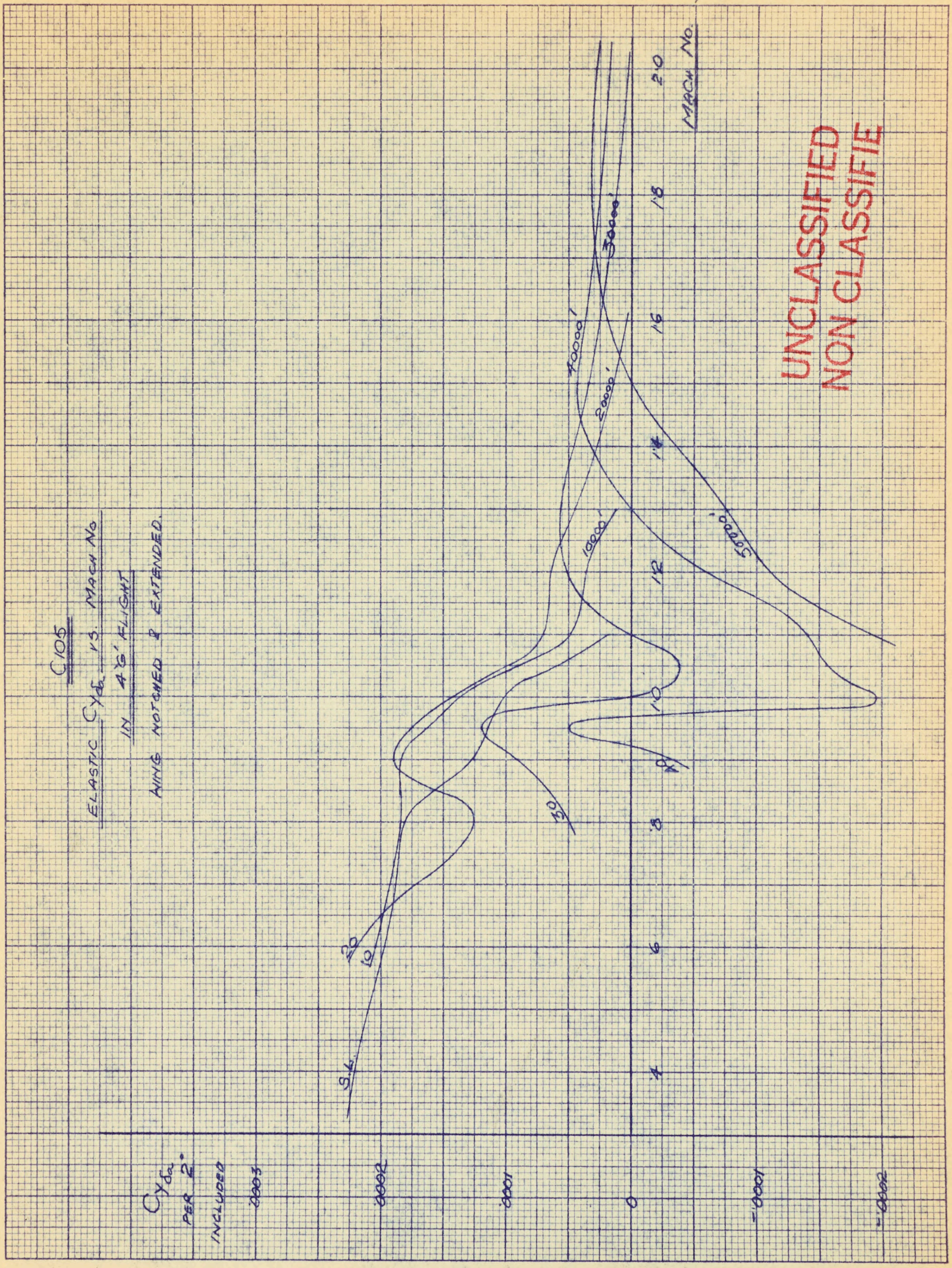
P/AD/55 1.2 ~~P/Stab/75~~ G.W.S.H ~~6.14~~

P/STAB/75 ~~6.2.4.~~

P/AD/55 1.3 APRIL/55 Kwiatkowski



C-105

$C_{n\delta r}$ VS Mach N°

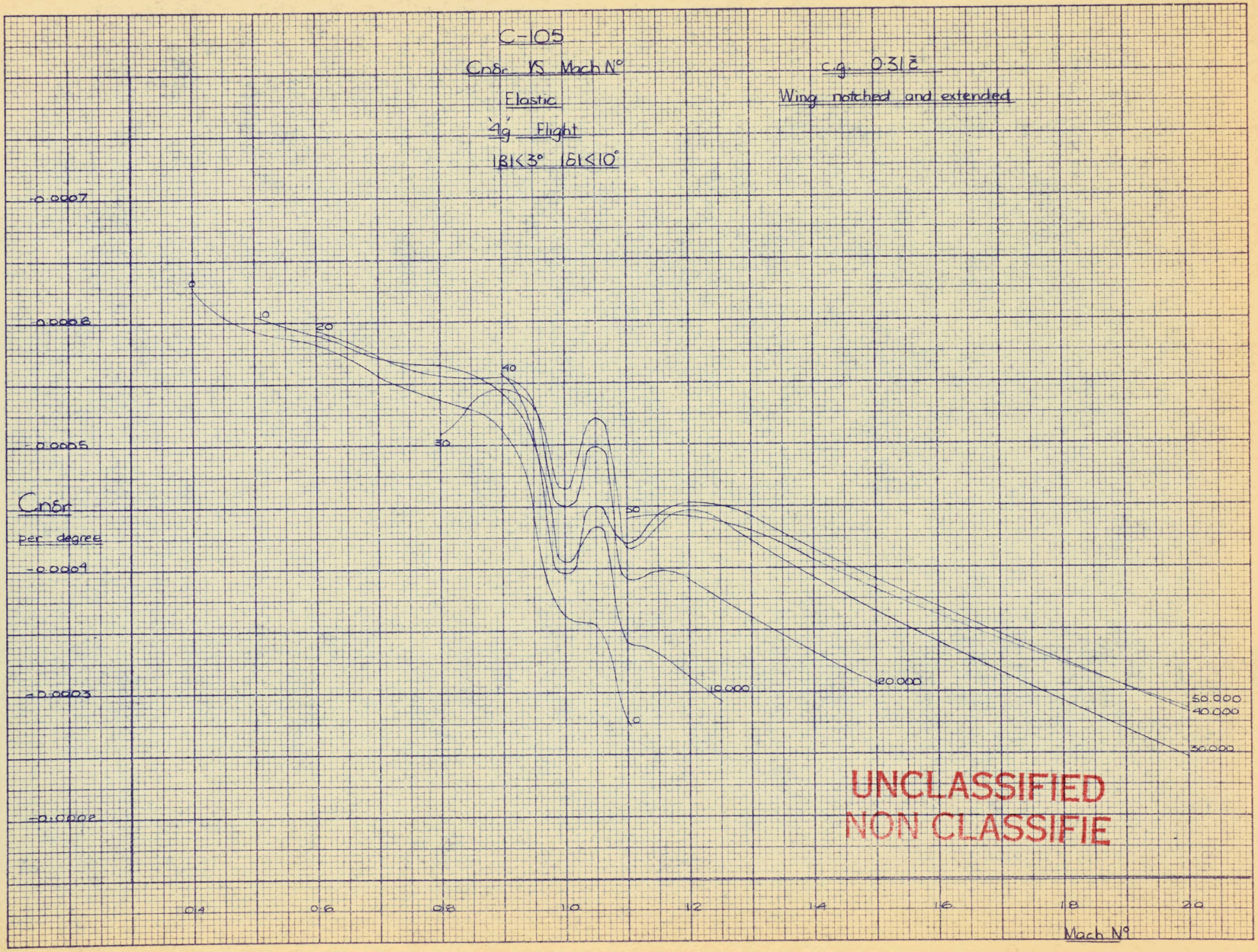
Elastic

'4g' Flight

$|\beta| < 3°$ $|\delta| \leq 10°$

c.g. 0.31 $\bar{c}$

Wing notched and extended



C-105

$C_{n\delta_r}$ VS Mach Nº

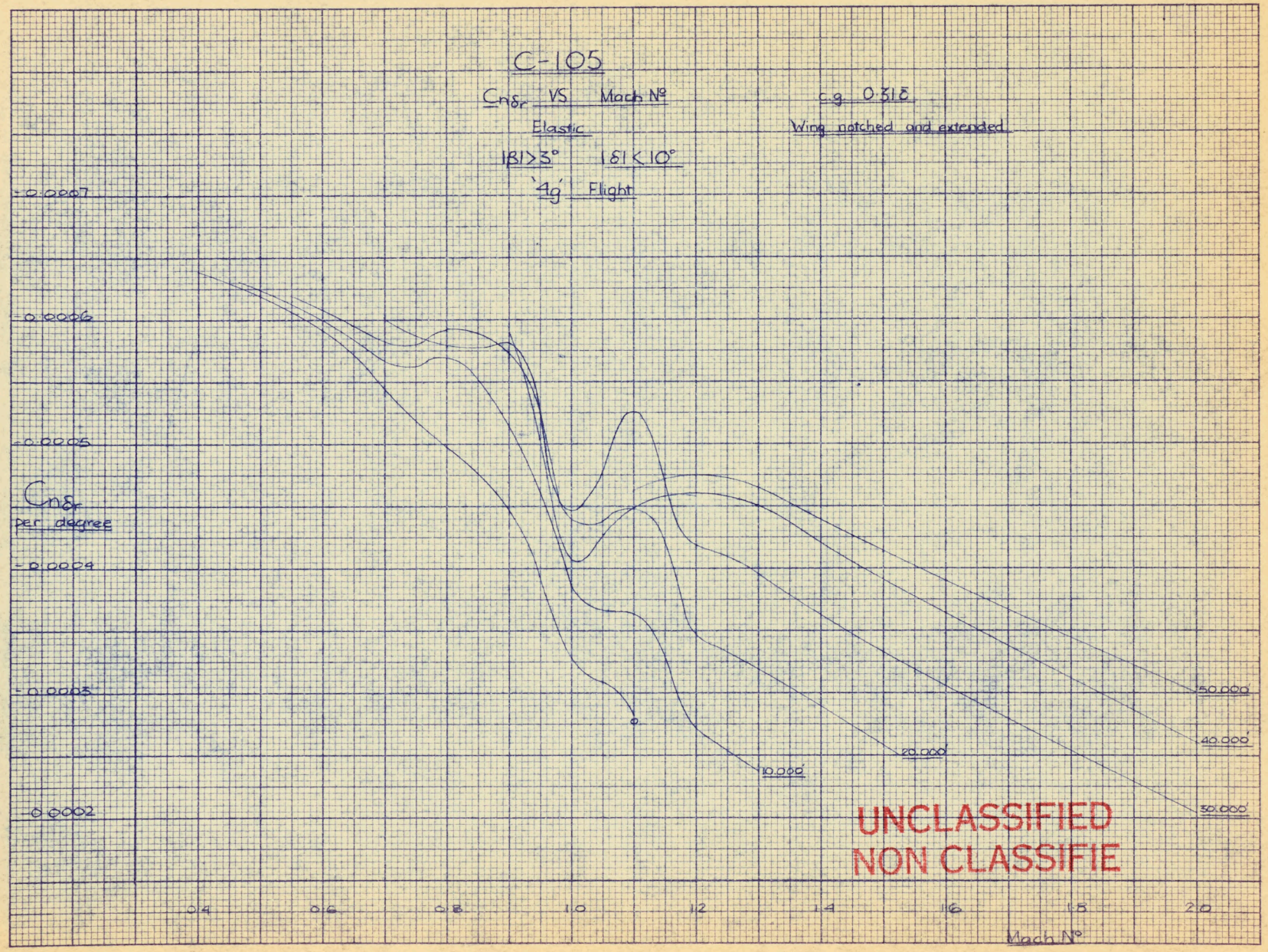
c.g. 0.31ē

Elastic

Wing notched and extended

$|\beta| > 3°$ $|\delta| < 10°$

'4g' Flight



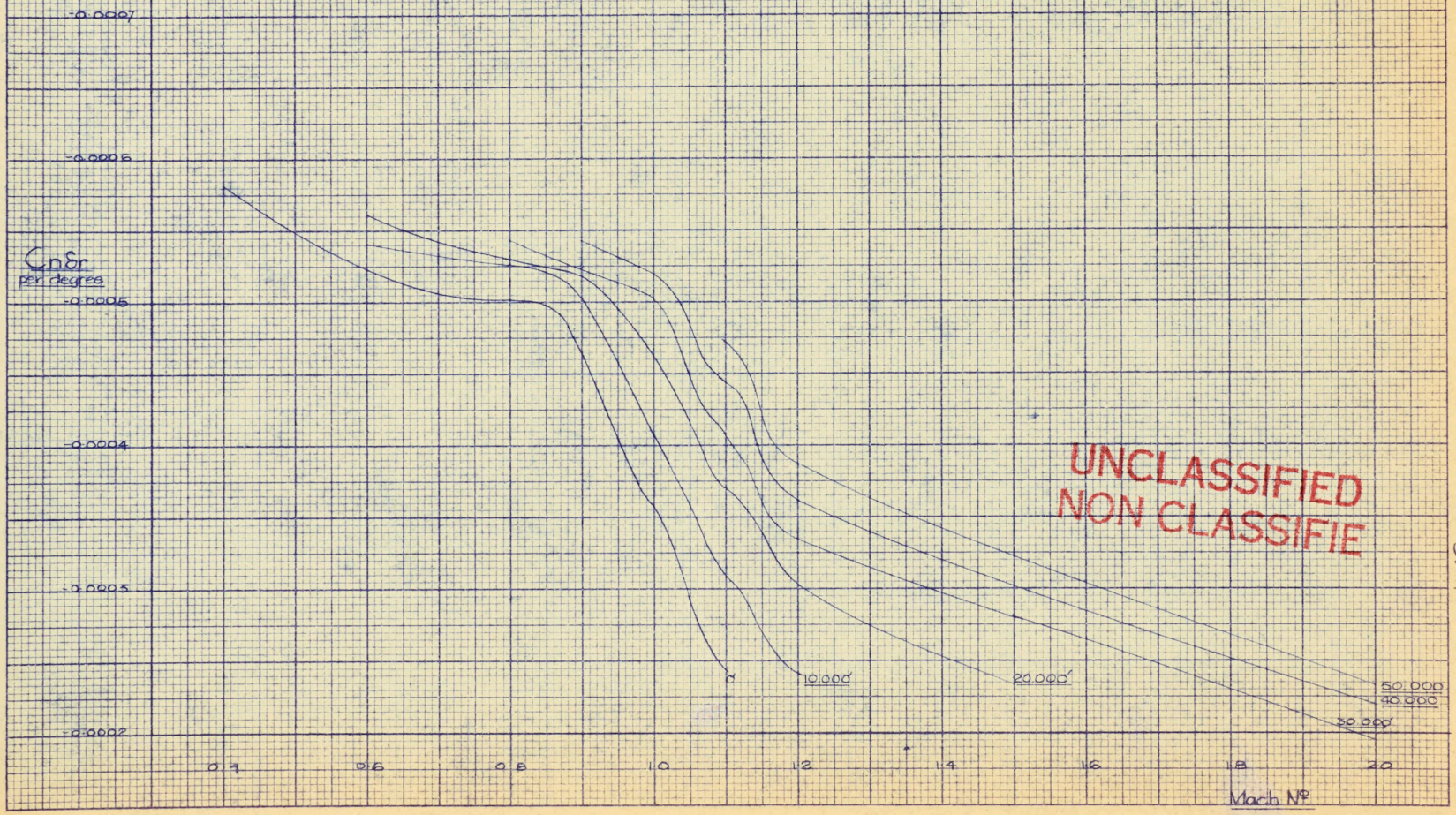
C-105

$C_{n\delta r}$ vs Mach N°

Elastic

$|\beta| < 3°$ $|\delta r| > 10°$

4g' Flight



C-105

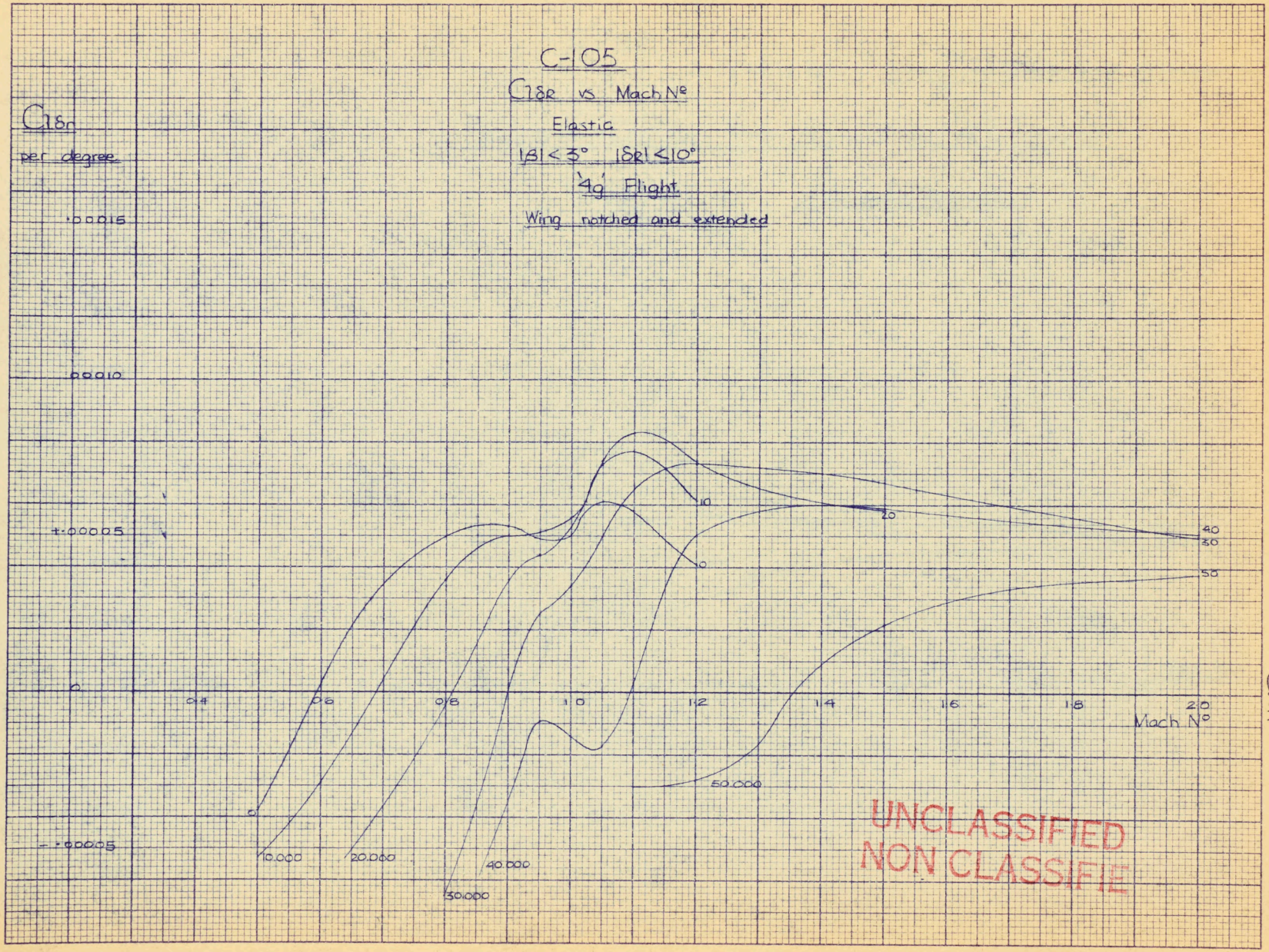
$C_{l\delta R}$ vs Mach No

Elastic

$|\beta| < 3°$ $|\delta R| < 10°$

'4g' Flight

Wing notched and extended

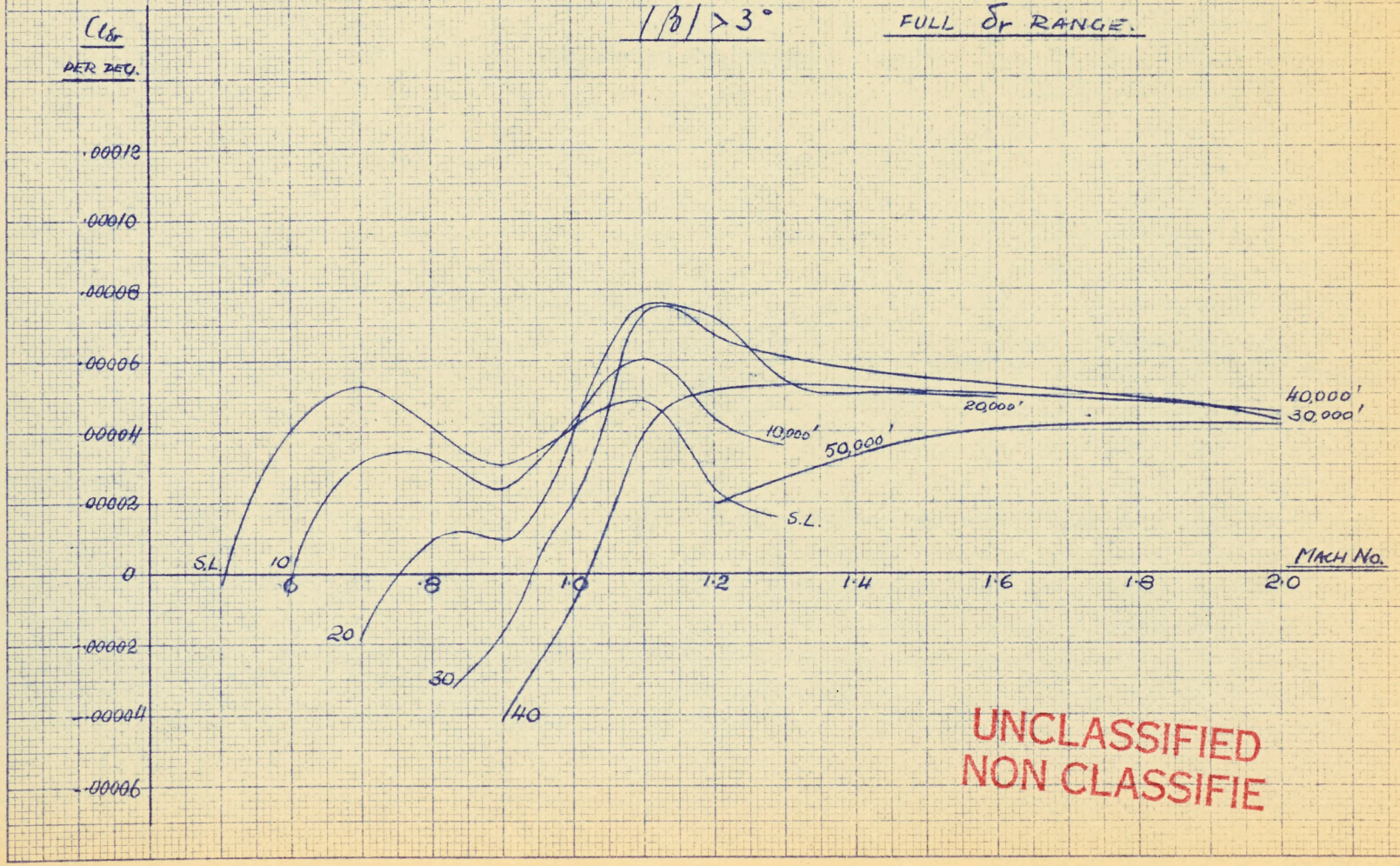


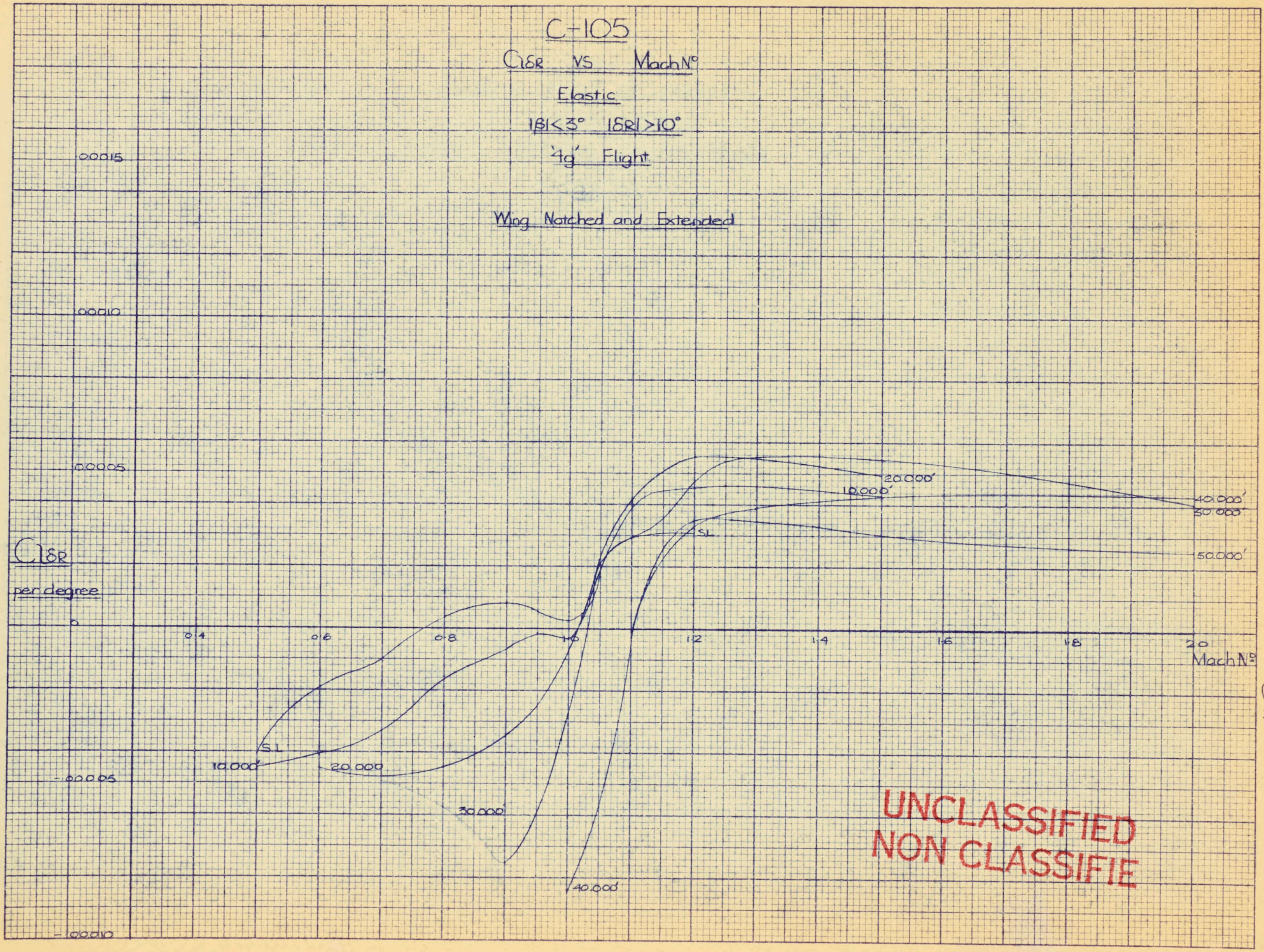
C 105

$B_2 C_3 W_3 V_3 R_5$ – WING NOTCHED AND EXTENDED.

ELASTIC $C_{l_{\delta r}}$ VS. MACH NO. – IN 4"G" FLIGHT

$|\beta| > 3°$ FULL δ_r RANGE.





P/AD/5.5 2,2,3 P/Stab/75 GLSH 4.13

D/AD/55 Z.3.1 ~~P/STAB/75~~ 146

March/55 Kwiatkowski

C105

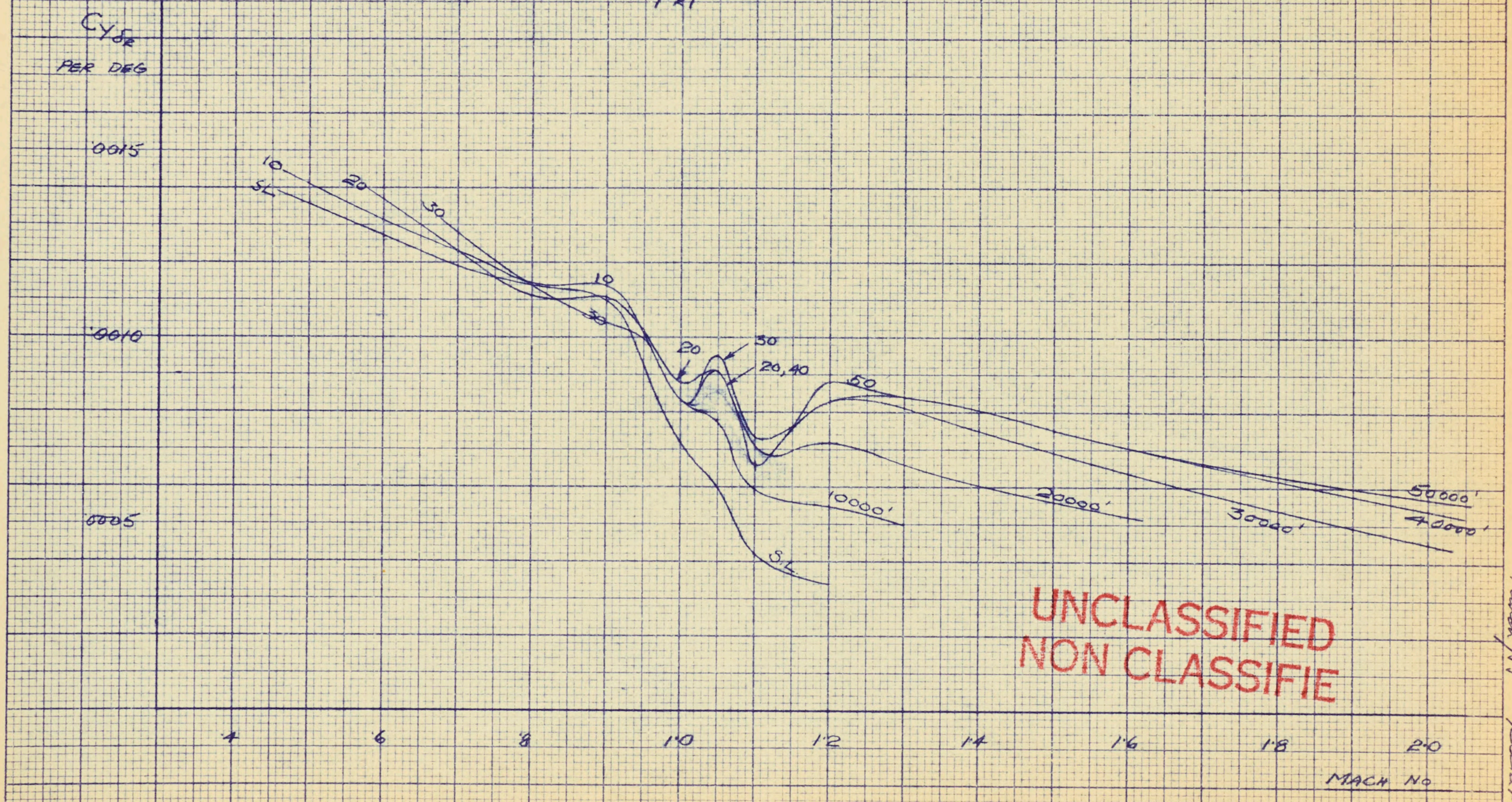
ELASTIC $C_{Y\delta_R}$ VS MACH NO

IN '4G' FLIGHT

WING NOTCHED AND EXTENDED

$|\beta| < 3°$ C.G. - .31 $\bar{c}$

$|\delta_R| < 10°$



C-105

ELASTIC $C_{Y_{\delta r}}$ VS MACH N°

IN 4 G FLIGHT

WING NATCHED & EXTENDED

$\beta > 3°$: $\delta r < 10°$

$C_{Y_{\delta r}}$ PER DEG

.0015

.0010

.0005

10 20 30 40 50

S.L.

10000'

20000'

30000'

40000'

50000'

S.L.

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

MACH N°

P/AD1555 2.3.2 P/STAB/75 4/9 MARCH 55 CORB

C105

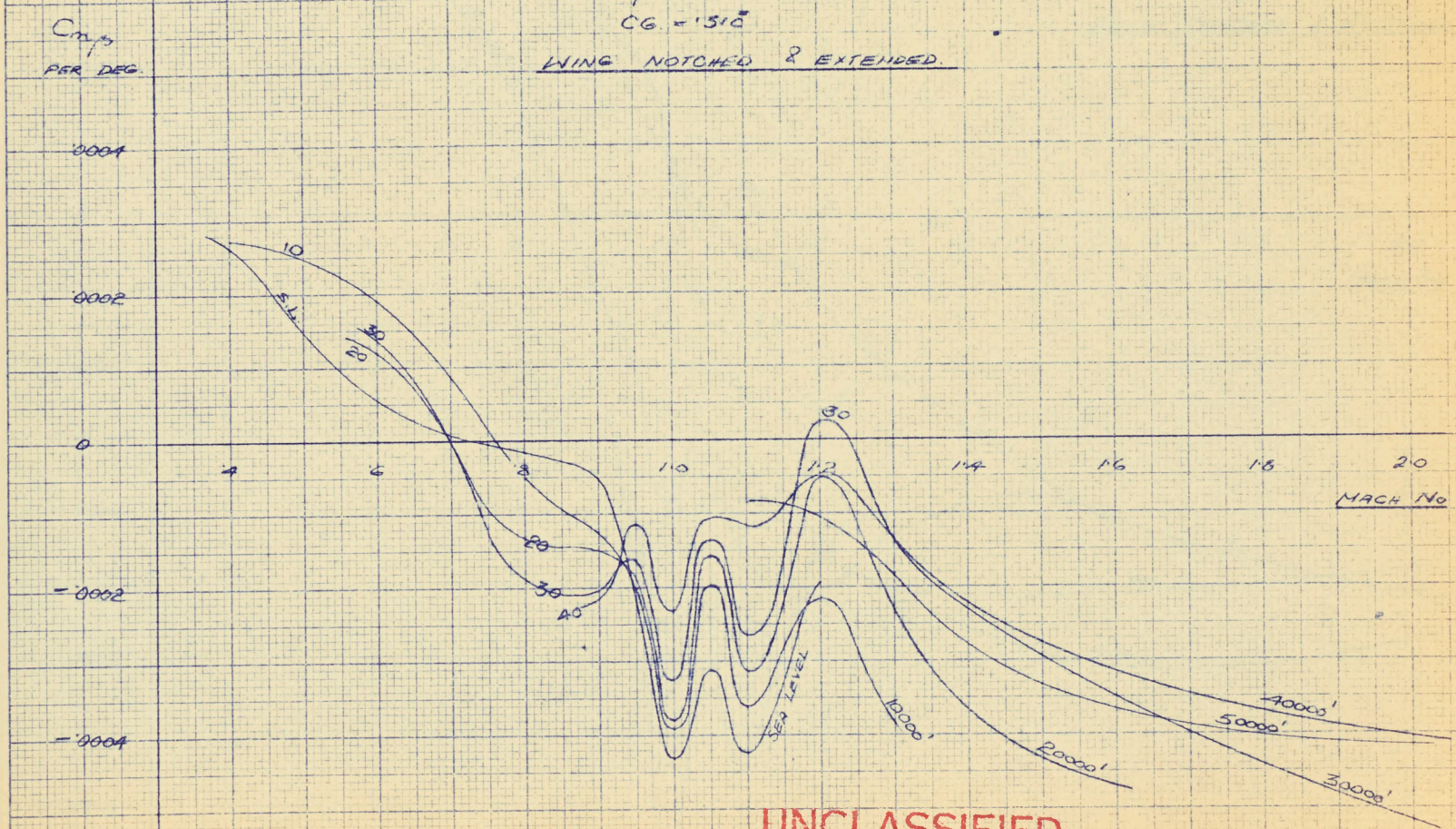
C_{m_β} VS MACH No

IN 4 G' FLIGHT

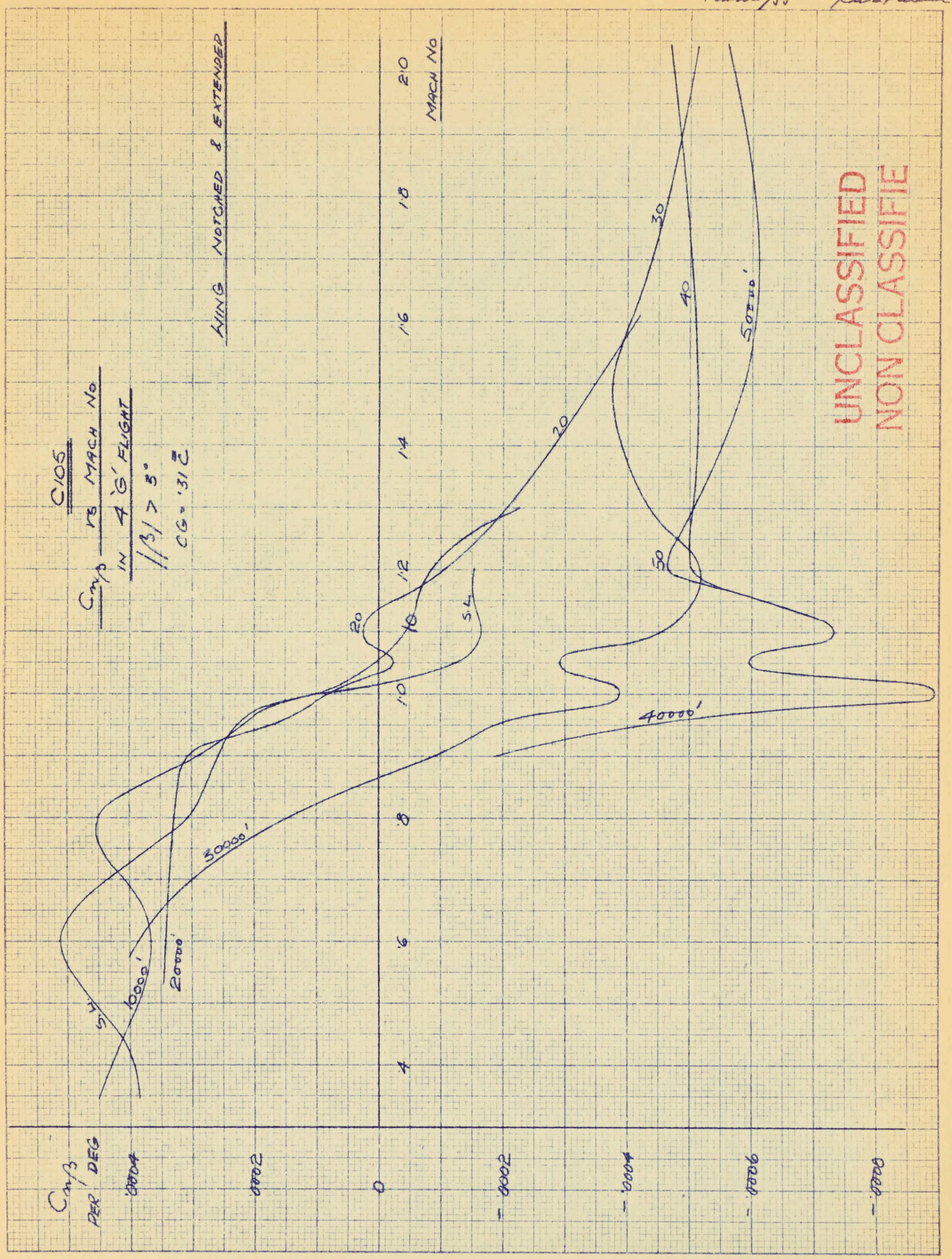
$|\beta| < 5°$

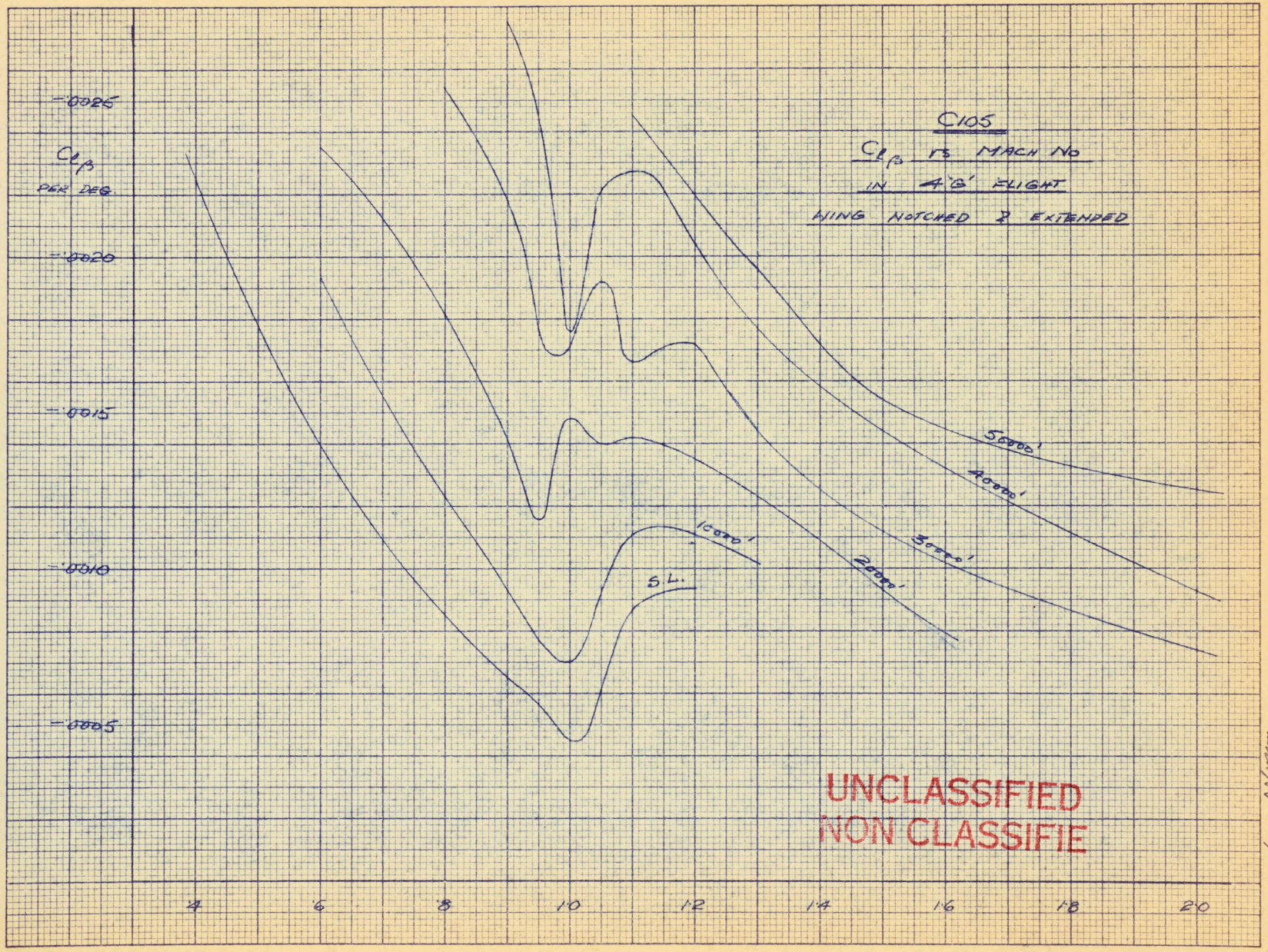
CG = .51 c̄

WING NOTCHED & EXTENDED



P/AD/55 3.1.2 ~~P/STAB/75 2.34~~
March/55 Kwiatkowski





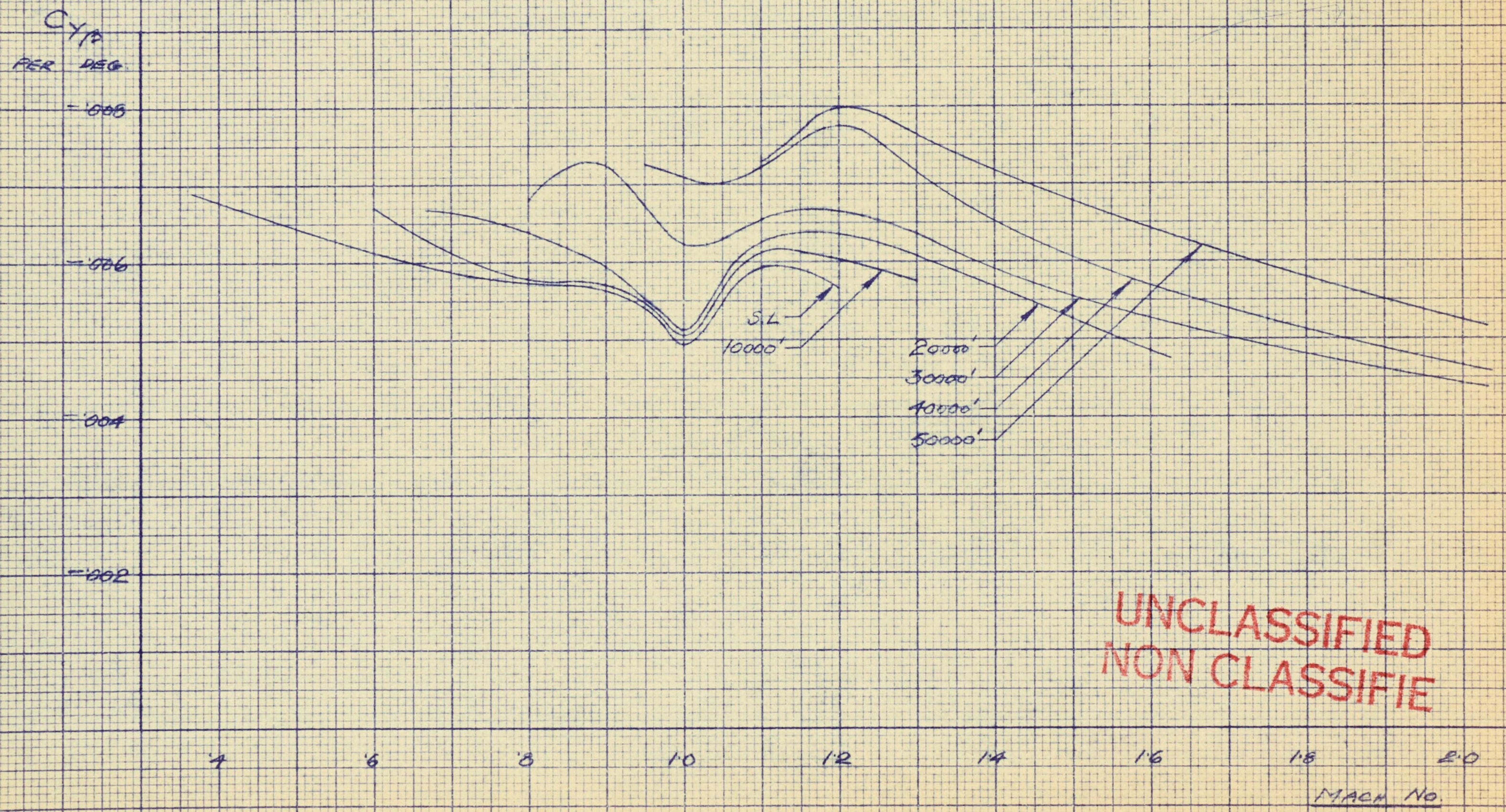
P/AD/55 3.3.1 ~~P/STAB/75~~ ~~F.13~~

March /JT Kuia Mesuds

C105

C_{Y_β} vs MACH No IN 4'G' FLIGHT $|\beta| < 3°$

WING NOTCHED & EXTENDED.



C-105

$C_{N_{\dot{r}_E}}$ VS MACH NO.

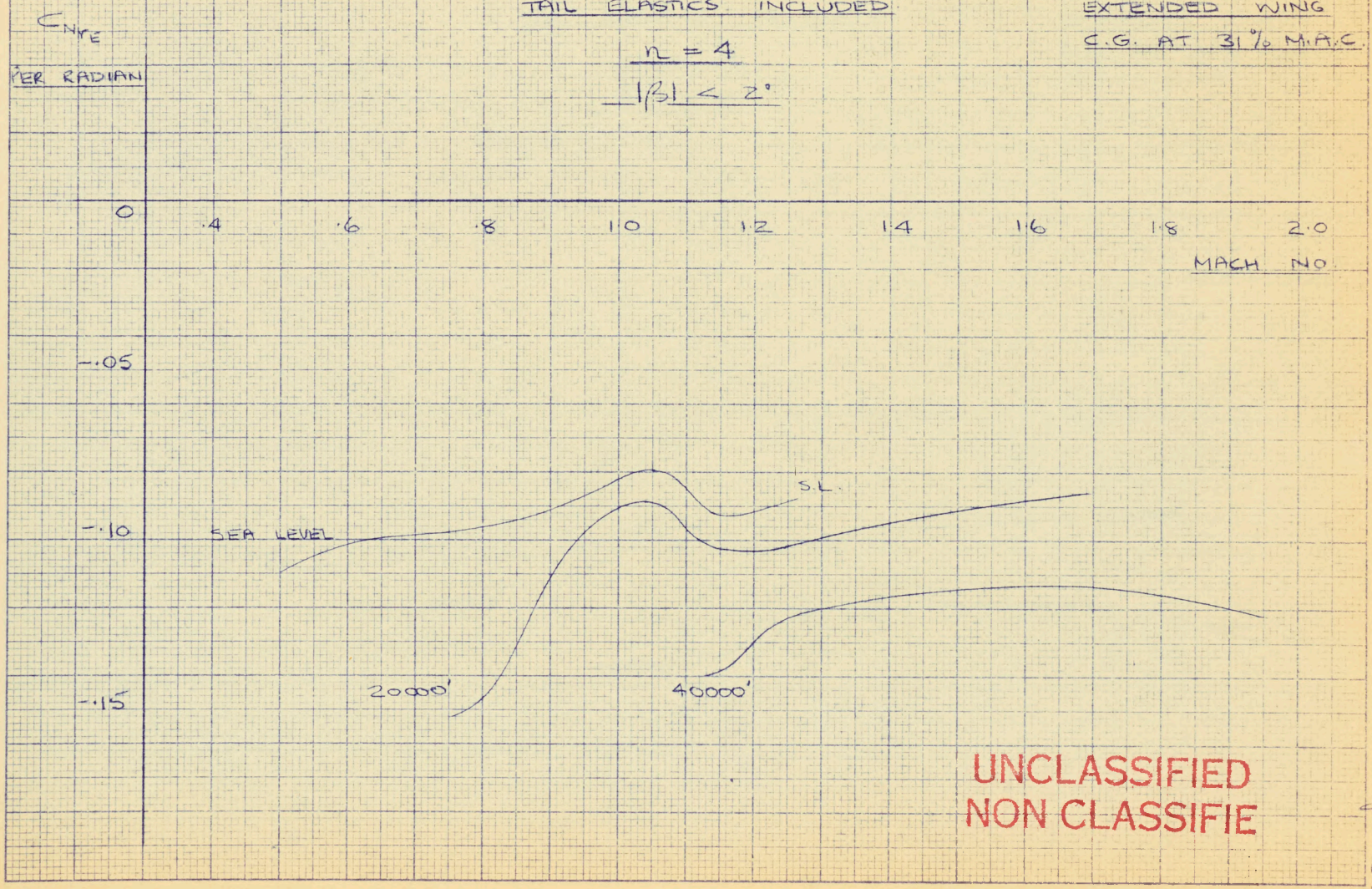
TAIL ELASTICS INCLUDED

$n = 4$

$|\beta| < 2°$

NOTCHED & EXTENDED WING

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



C-105

$C_{N_{\gamma_E}}$ VS MACH NO.

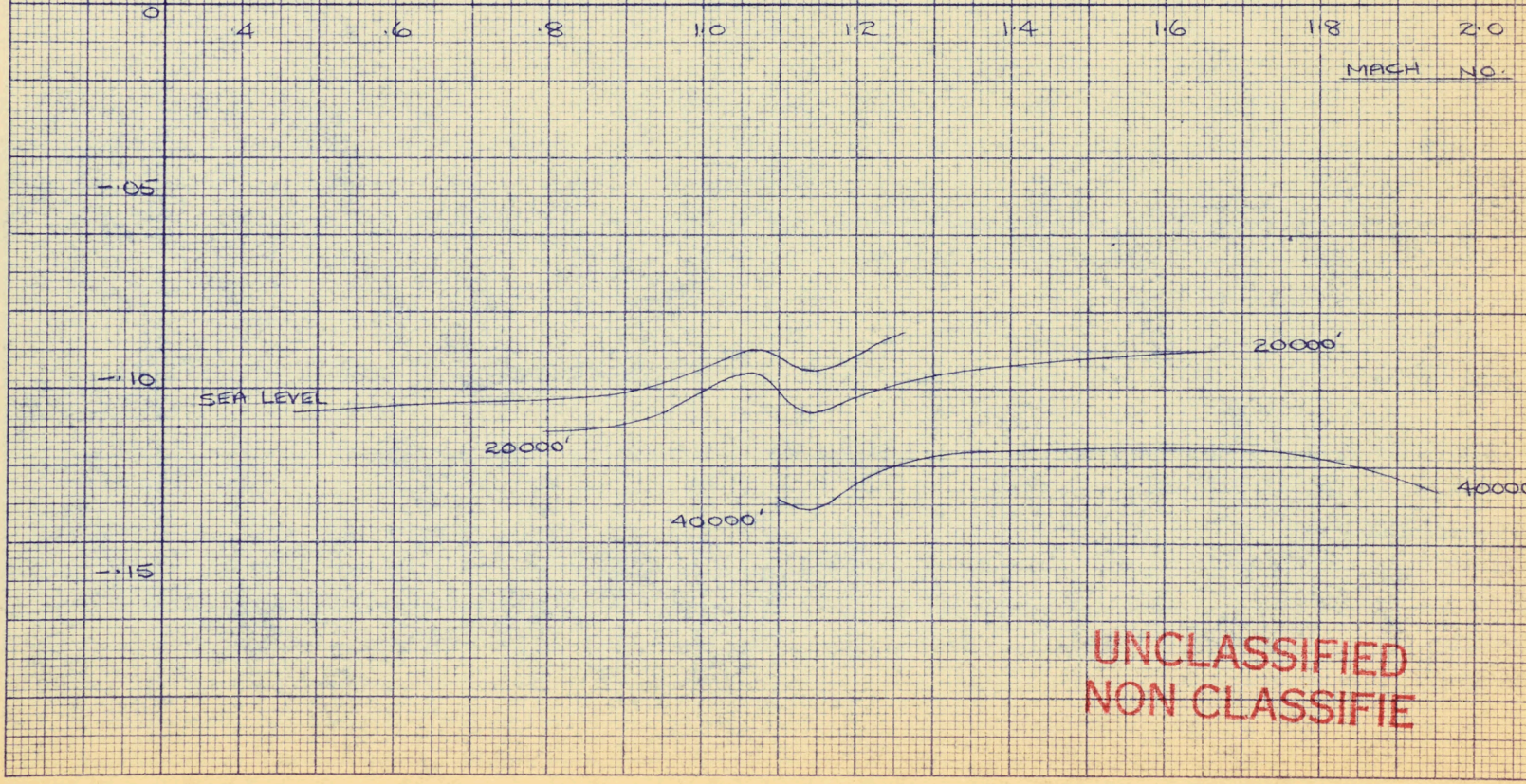
TAIL ELASTICS INCLUDED

$n = 4$

$|\beta| > 3°$

NOTCHED & EXTENDED WING

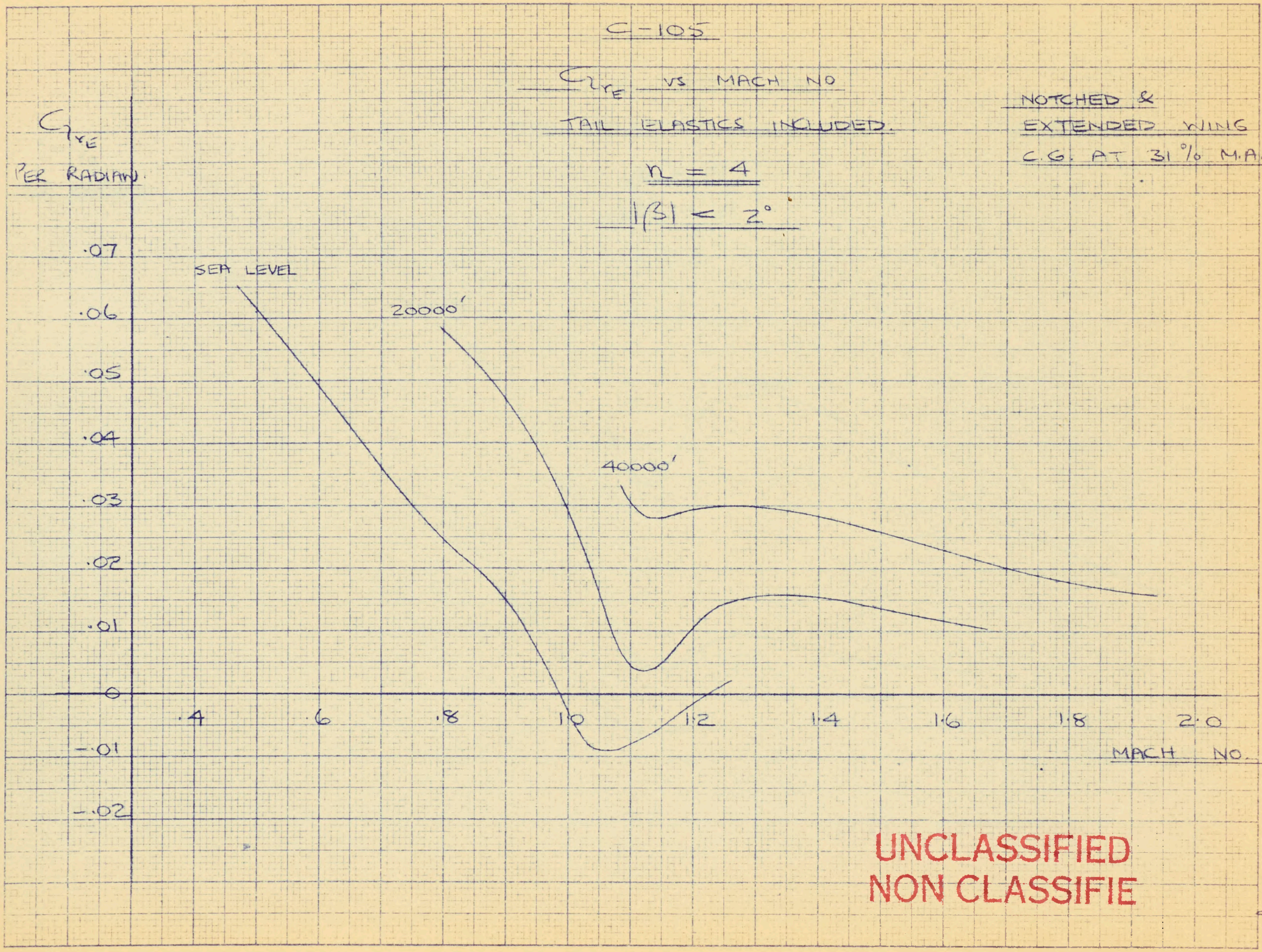
C.G. AT 31% M.A.C.



P/AD/55.

4.1.2

Ref. 55.



P/AD/55

4.2.1

~~P/Stab/70~~

[initials] Apr '55

C-105

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

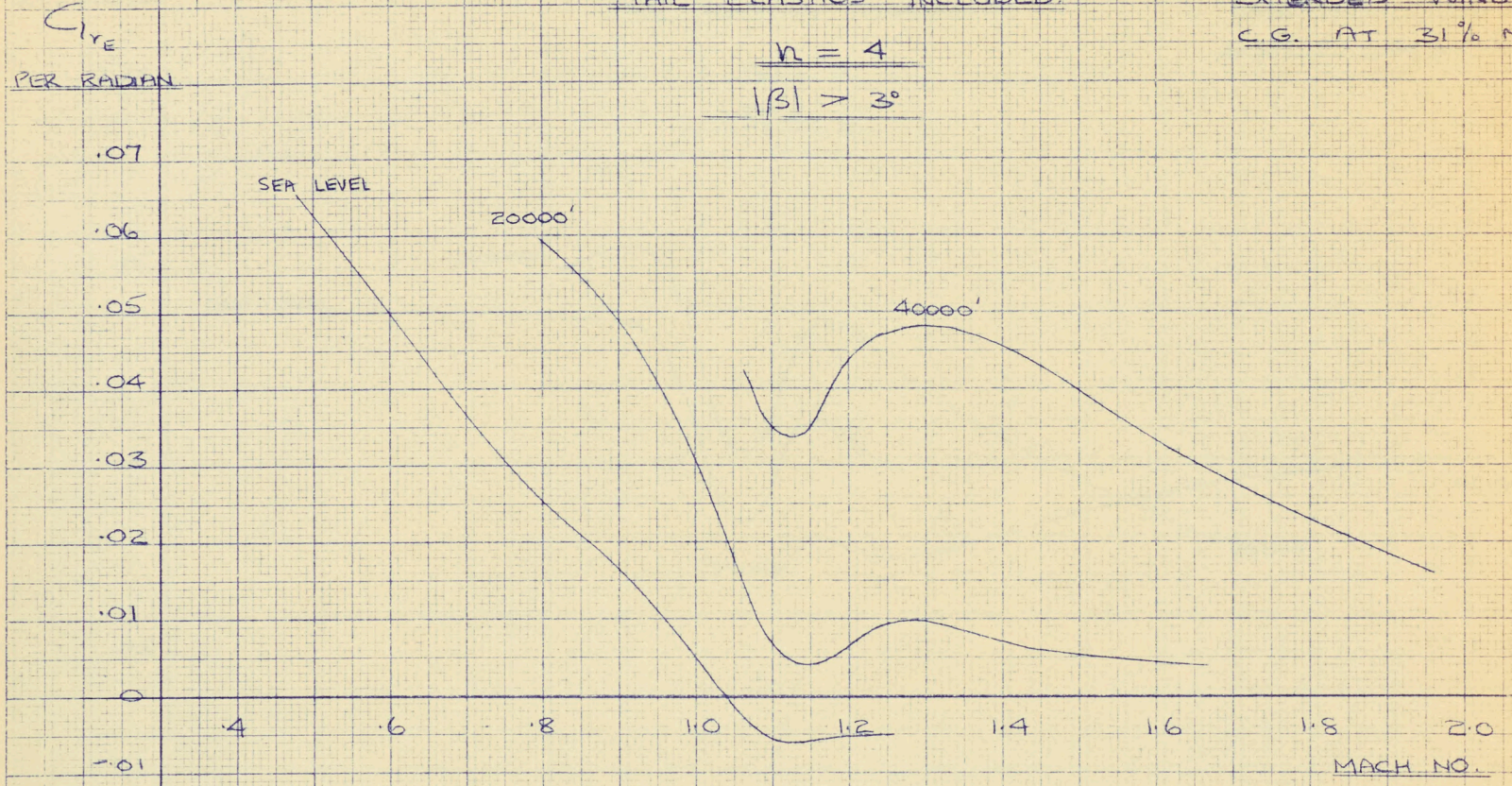
TAIL ELASTICS INCLUDED.

$n = 4$

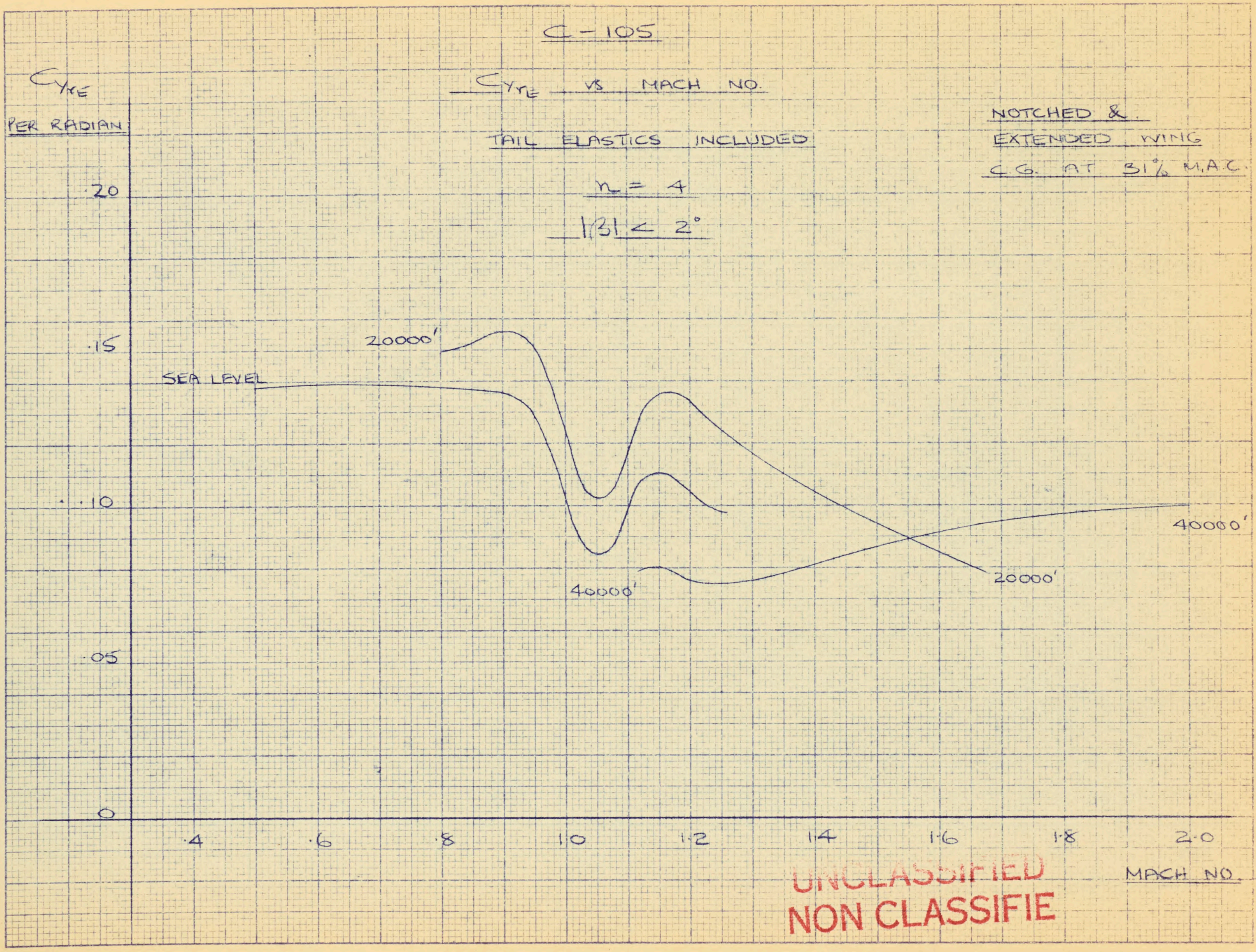
$|\beta| > 3°$

NOTCHED & EXTENDED WING

C.G. AT 31% MAC.



PMD155 4.2.2



P/AD/55

4.3.1

~~R/Stab/70~~ ~~45~~

DB&. Apr. 55.

C-105

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

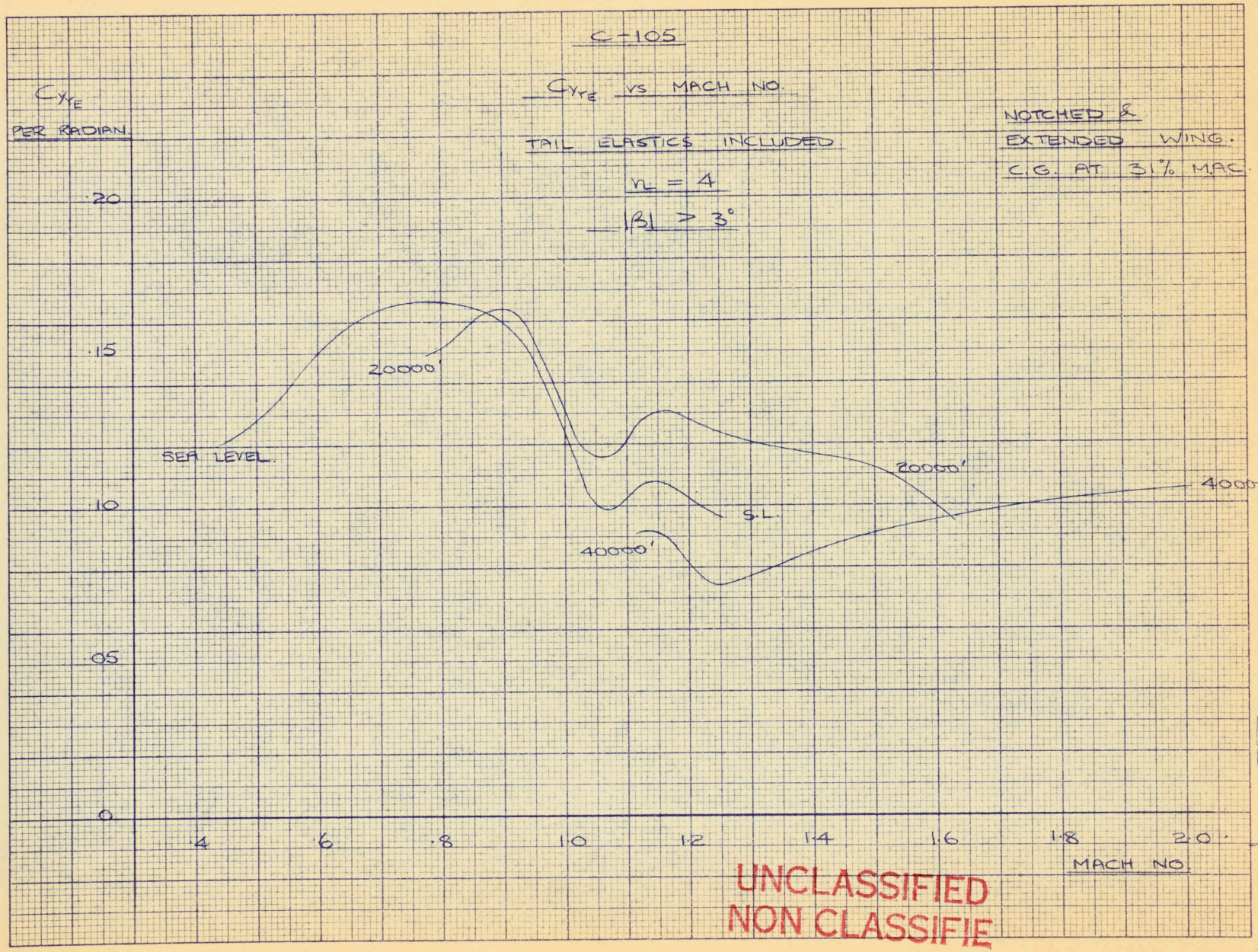
TAIL ELASTICS INCLUDED

$n_L = 4$

$|\beta| > 3°$

NOTCHED & EXTENDED WING.

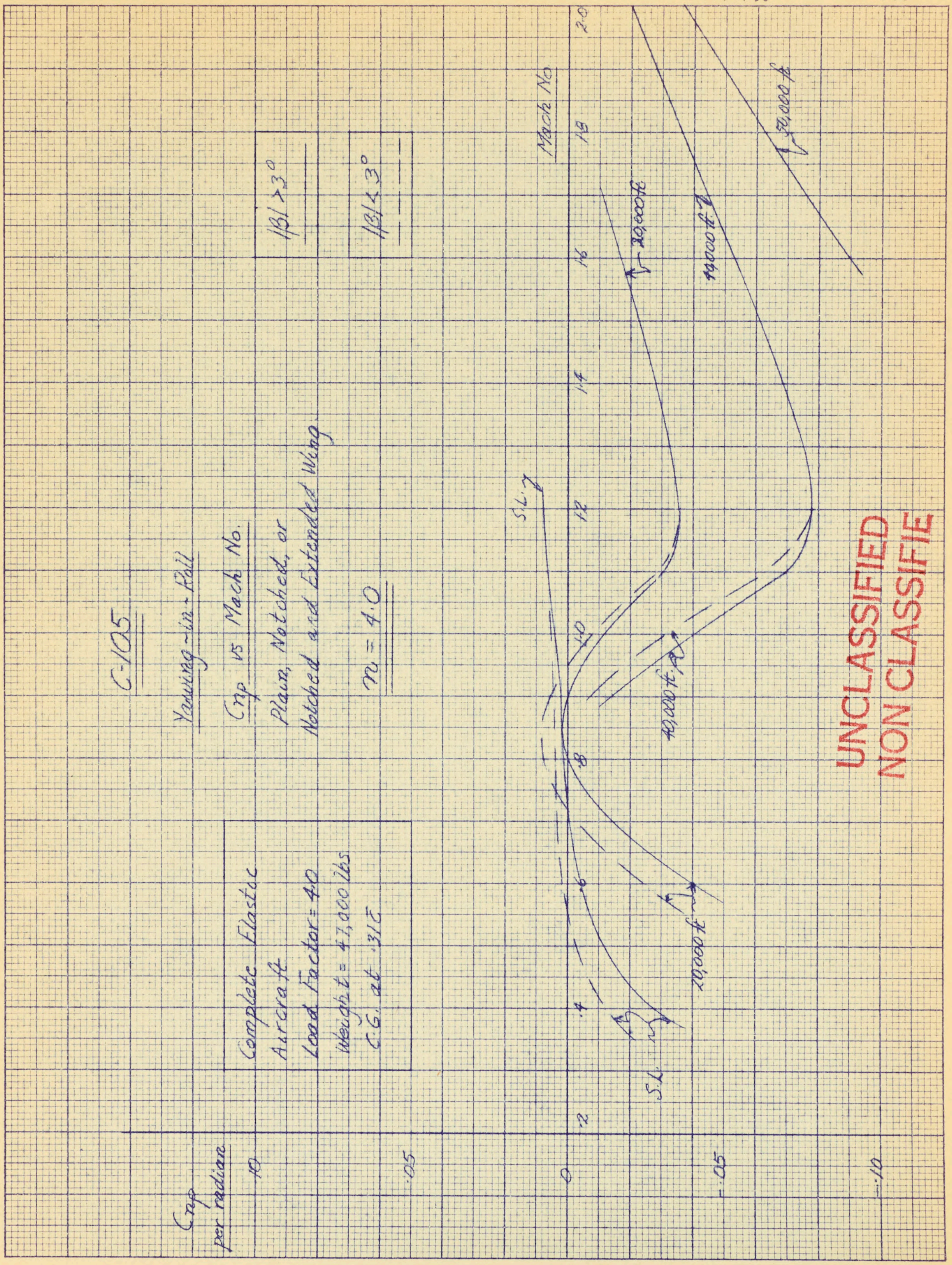
C.G. AT 31% M.A.C.

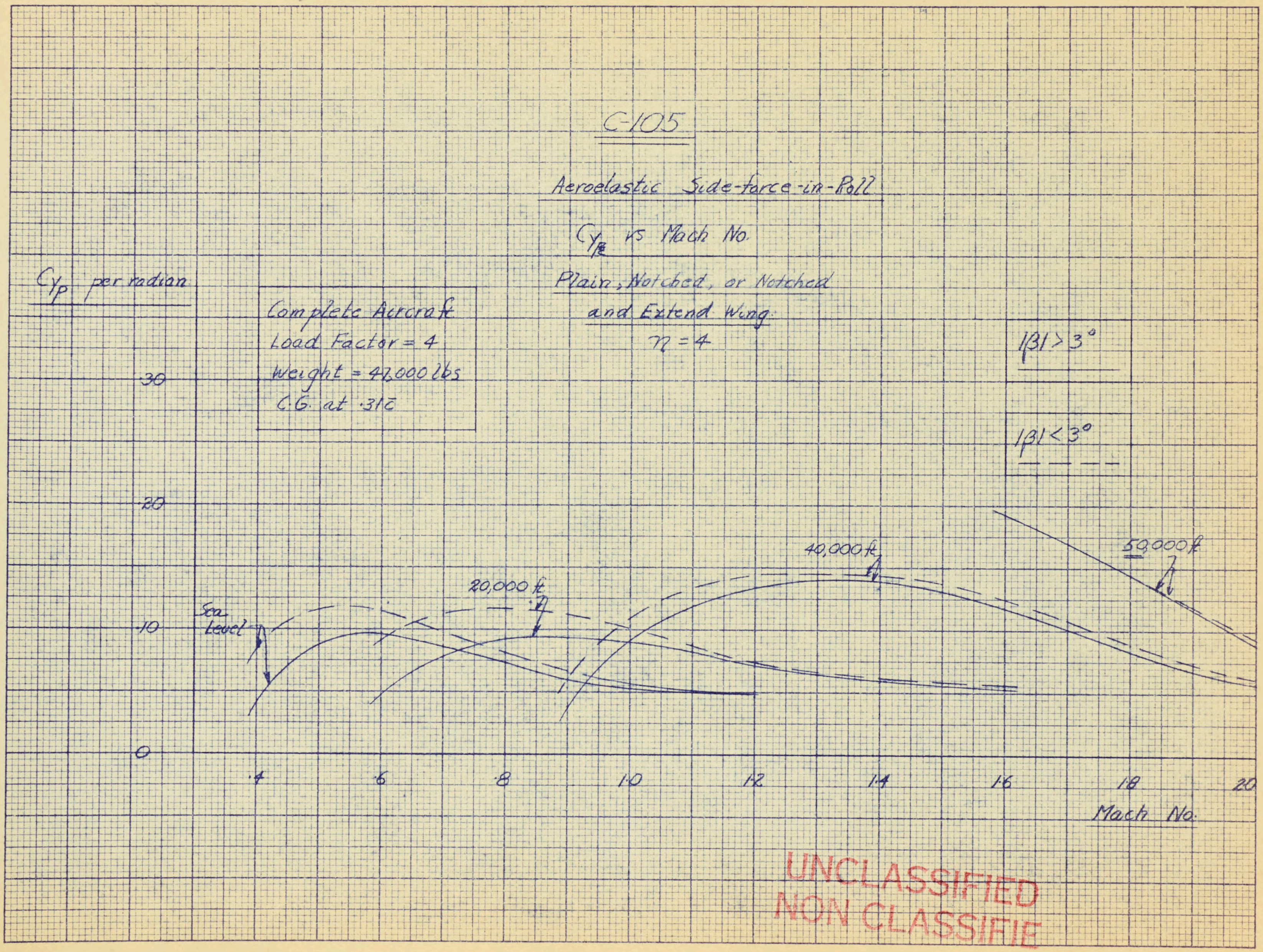


P/AD/55 5.3.1

May 1955 ~~P/Stab/76~~

C.A Ford ~~218~~





P/AD/155
5.1.1
25/3/55
C.A. Ford.
~~P/Stab/76~~
~~316~~