

QC
AUTO
C-105
PPR
10

UNCLASSIFIED
CF-105 ANALYZED
PERIODIC PERFORMANCE REPORT
NO. 10
Dec. 1956



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Report no.: QC AVRO CF105 PPR-10

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by (Name): J.M.D. Henrie

(Dept.): DND Coordinator - Access to Information

Date: AUG 04 1992

Rene D. Henrie
Signature



A. V. ROE CANADA LIMITED
MALTON - ONTARIO

TECHNICAL DEPARTMENT (Aircraft)

AIRCRAFT: CF-105

REPORT No. 10

FILE No.

No. OF SHEETS:

TITLE:

ANALYZED

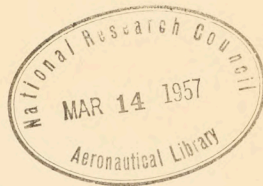
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UNLIMITED

CF-105 PERIODIC PERFORMANCE REPORT

This is Copy No ...9.....

Issued To ...R.C.R.F.....

Date of Issue .DEC..19/56.



PREPARED BY Performance Sect. DATE Dec. 1956.

CHECKED BY DATE

SUPERVISED BY DATE

APPROVED BY DATE

SECRET

ISSUE No.	REVISION No.	REVISED BY	APPROVED BY	DATE	REMARKS
					45144
					12416146

FORM 1316A

PERFORMANCE

DRAG

PROPULSION

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December 1956.

CF-105 PERIODIC PERFORMANCE REPORT - 10

Introduction

This is the tenth of a series of periodic performance reports for internal usage to be issued from the Aerodynamics Department, and is also the first performance report detailing predicted performance with the Iroquois engine with re-matched compressors (no model number has yet been furnished) and with the appropriate changes to the nozzle configuration.

The pertinent changes are noted in their appropriate sections. For more detailed discussion of the engine changes, see "Effect of N.A.C.A. Wind Tunnel and Free Flight Tests on the Estimated Performance of the CF-105".

As in the past, successive reports will present the latest data, with the alterations from the previous report noted. The report is divided into three major sections:

- 1) CF-105 Performance
- 2) CF-105 Drag
- 3) Propulsion

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PERFORMANCE

DRAG

PROPULSION

PERFORMANCE

DRAG

PROPUSION

1: CF-105 PERFORMANCE WITH OHENDA IROQUOIS ENGINES

(C.G. at 29.5% M.A.C.)

This estimate is the first to be prepared for the CF-105 Mk. 2 with the Iroquois engines with re-matched compressors (model number not available) and with the appropriate airframe nozzle changes.

As will be seen no significant change in performance at speeds up to $M = 1.5$ is predicted, but at speeds between $M = 1.5$ and $M = 2.0$ appreciable gains are made.

DRAG

PROPULSION

LOADING AND PERFORMANCE - 10

Extract P/Perf/122

Performance Under I.C.A.O. Standard Atmospheric Conditions

December, 1956.

To R.C.A.F. Specification AIR 7-4

With Two Iroquois Engines

WEIGHT:

Take-Off Weight with 15,672 Lbs. Fuel (78.9% Max).....	Lb.	59,336
Operation Weight Empty	Lb.	43,664
Combat weight	Lb.	51,500
Normal Design Landing Gross weight AIR 7-4 - MIL-S-5701	Lb.	45,854
Wing Loading at Normal Take-Off Weight	Lb/Sq.Ft.	48.4
Power Loading at Normal Take-Off Weight	Lb/Lb. Thrust	1.34

SPEED:

True Airspeed in Level Flight at Sea Level at Combat Weight		
Maximum Thrust A/B Lit	Kts.	700 *
Maximum Thrust A/B not Lit	Kts.	671
True Airspeed in Level Flight at 50,000 Ft. at Combat Weight		
Maximum Thrust A/B Lit	Kts.	1147 *

CEILING:

Combat Ceiling at Combat Weight, Rate of Climb = 500 F.P.M. Maximum Thrust at 2.0 M.N. A/B Lit	Ft.	63,300
---------------------------------------------------------------------------------------------------------	-----	--------

RATE OF CLIMB:

Steady Rate of Climb at Sea Level, Combat Weight		
Maximum Thrust at M.N. = .92 A/B Lit	F.P.M.	60,600
Maximum Thrust at 527 Kts. A/B not Lit	F.P.M.	27,200
Steady Rate of Climb at 50,000 Ft., Combat Weight		
Maximum Thrust at M.N. = 2.0 A/B Lit	F.P.M.	14,500

TIME TO HEIGHT:

Time to 50,000 Ft. M.N. = 1.5 from Engine Start at Take-Off Weight		
Maximum Thrust A/B Lit	Mins.	4.33

MANOEUVRABILITY:

Combat Load Factor at Combat Weight		
Maximum Thrust at M.N. = 1.50 at 50,000 Ft. A/B Lit		1.63
Maximum Thrust at M.N. = 2.00 at 50,000 Ft. A/B Lit		1.96

* AIR 7-4 Placard Speed

DRAG

PROPULSION

TAKE-OFF DISTANCE:

Take-Off Distance over 50 Ft. Obstacle at Sea Level at
 Take-Off Weight = 59,336 Lbs.
 Maximum Thrust A/B Lit Ft. 2,850
 Maximum Thrust A/B not Lit Ft. 4,430
 Maximum Thrust Hot Day A/B Lit Ft. 3,460

LANDING DISTANCE:

Landing Distance over 50 Ft. Obstacle at Sea Level at
 Normal Design Landing Gross Weight Ft. 4,810

STALLING SPEED:

True Stalling Speed in Landing Configuration at Combat Weight
 at Sea Level Kts. 111.5

RANGE:

Combat Radius of Action at 50,000 Ft. Climb at 527 Kts. T.A.S.,
 Accel. to M = 1.5 @ 30,000', Climb @ M = 1.5 to 50,000', Cruise-out
 at M.N. = 1.5, Combat for 5 Mins. at M.N. = 1.50, Cruise-back
 at M.N. = .92, 15 Min. Stack at 40,000 Ft., 5 Min. Fuel Reserve on Landing
 High Speed Mission with 15,672 Lbs. Fuel..... N.M. 200.0
 High Speed Mission with Full Internal Fuel (SG = 0.78)..... N.M. 302.0

Combat Radius of Action at 50,000' Mission as above except
 Cruise-out at M.N. = .92

Maximum Range Mission with 15,744 Lbs. Fuel N.M. 300.0
 Maximum Range Mission with Full Internal Fuel (SG = 0.78)..... N.M. 450.0

Ferry Range Mission at Economical Cruise Speed (Cruise climb from
 36,500' to 41,500' at M = .92) including 15 Mins. Stacking at 40,000
 Ft., 5 Min. Fuel Reserve on Landing

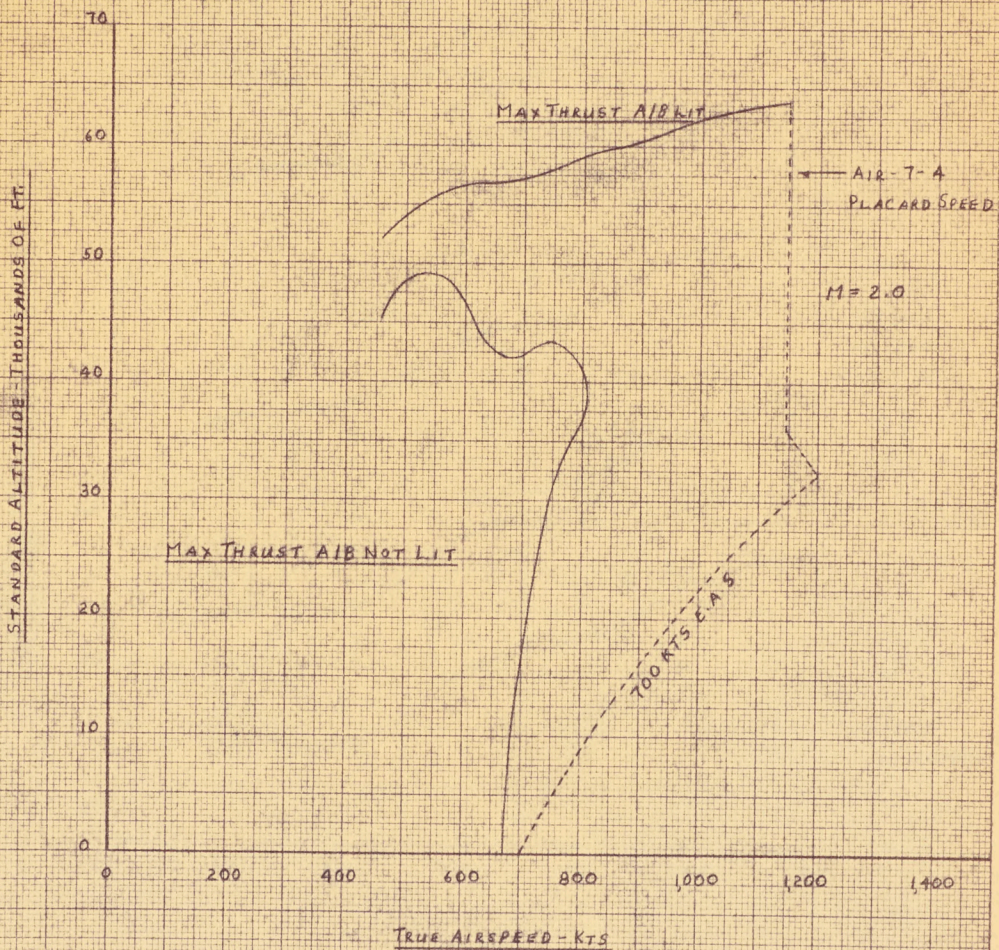
Range with Full Internal Fuel and 500 Gal. - External Tank
 (SG = 0.78) N.M. 1460.0

CF 105

MAX LEVEL SPEED

IRIDIUM ENGINES

COMBAT WEIGHT



Dec/56

[Signature]

DRAG

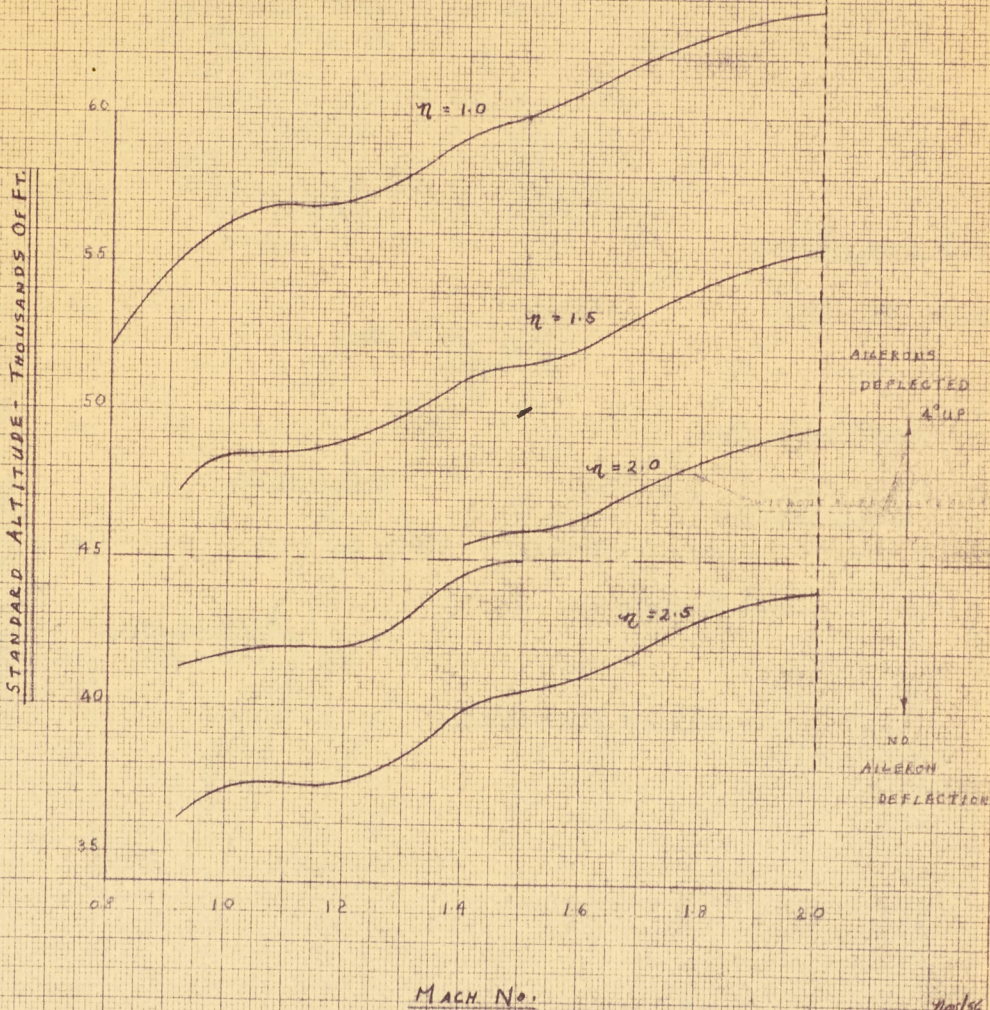
PROPULSION

CF105 MANOEUVRABILITY

REPORT NO. 9/PERF/122

AVAILABLE STEADY g 's AT COMBAT WEIGHT

IRROQUOIS ENGINES WITH AFTERBURNERS LIT



MACH No.

Handwritten initials: *Handwritten initials*

10 X 10 TO THE CM. 359-14

KLUFFEL & ESSERCO. PATENTED

K&E

DRAG

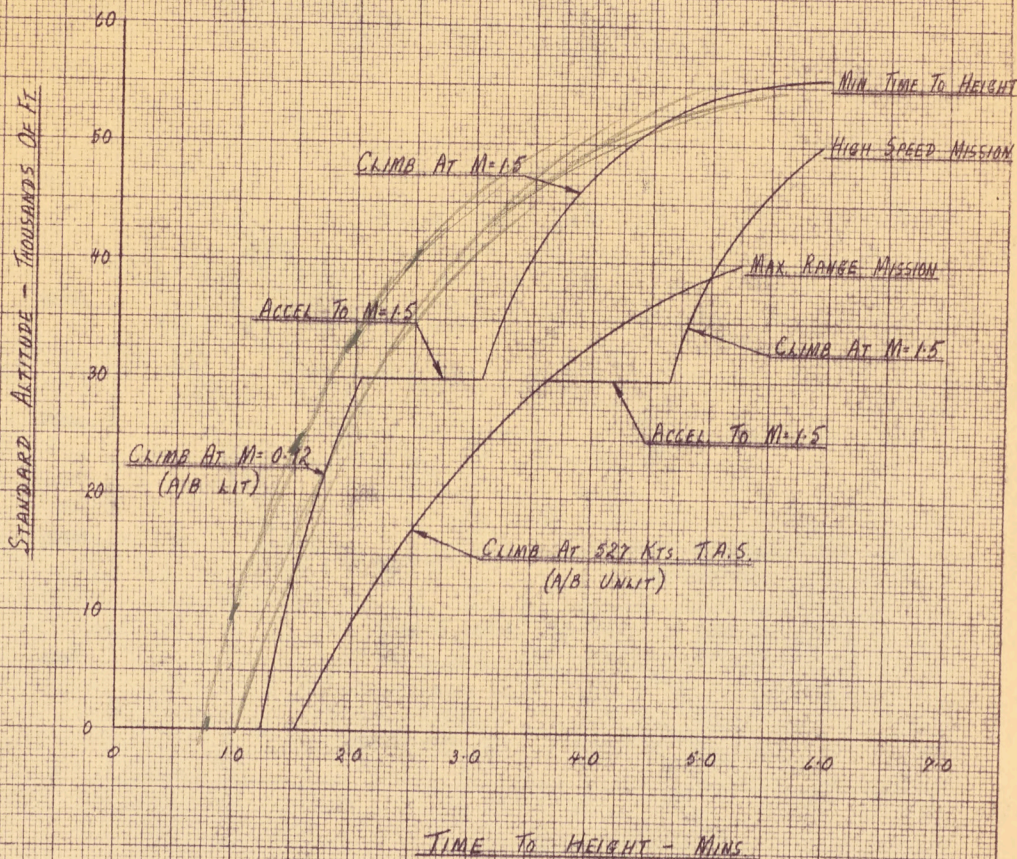
PROPOSITION

CF105 TIME TO HEIGHT

IROQUOIS ENGINES

NOTE - 1/2 MIN ALLOWED FROM ENGINE START TO MAX THRUST

ACCELERATION TO M=1.5 AND CLIMB
AT M=1.5 WITH A/B LIT.



K&E 10 X 10 TO THE CM. 359.14
KEUFFEL & ESSER CO. MIT. PA. U.S.A.

Nov. 1956

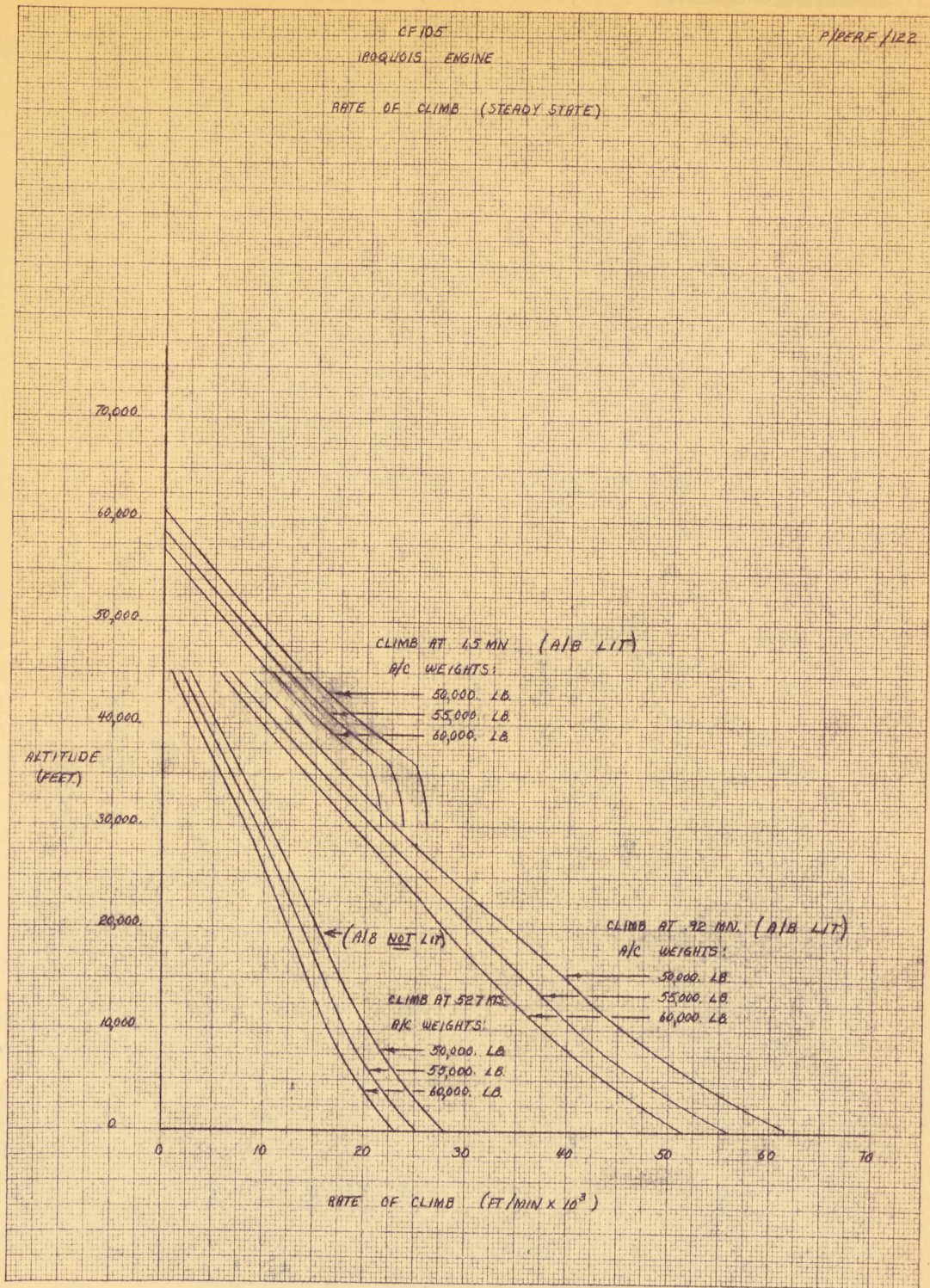
DRAG

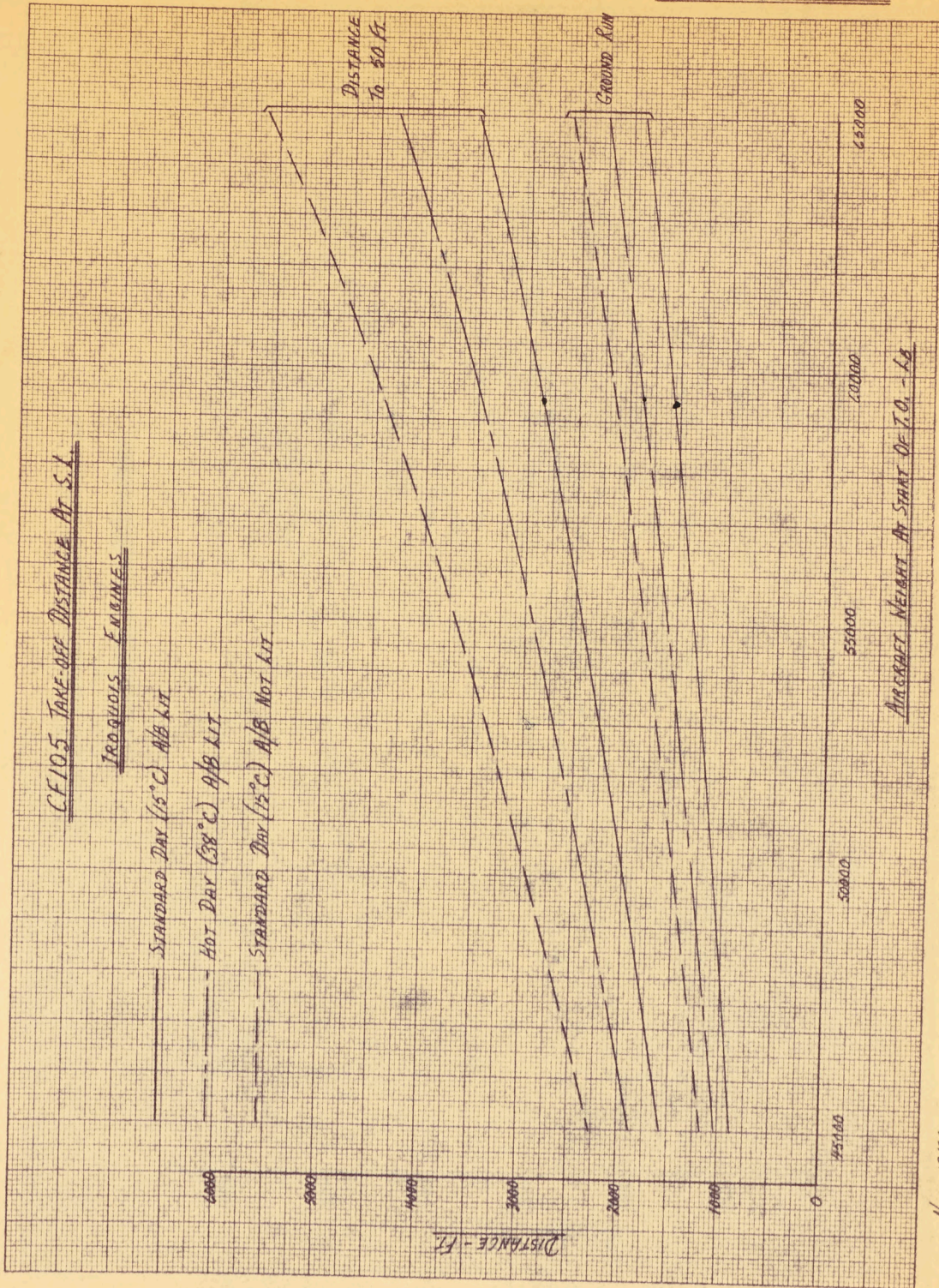
PROPULSION

CF105
180 QUOIS ENGINE

P/PERF/122

RATE OF CLIMB (STEADY STATE)

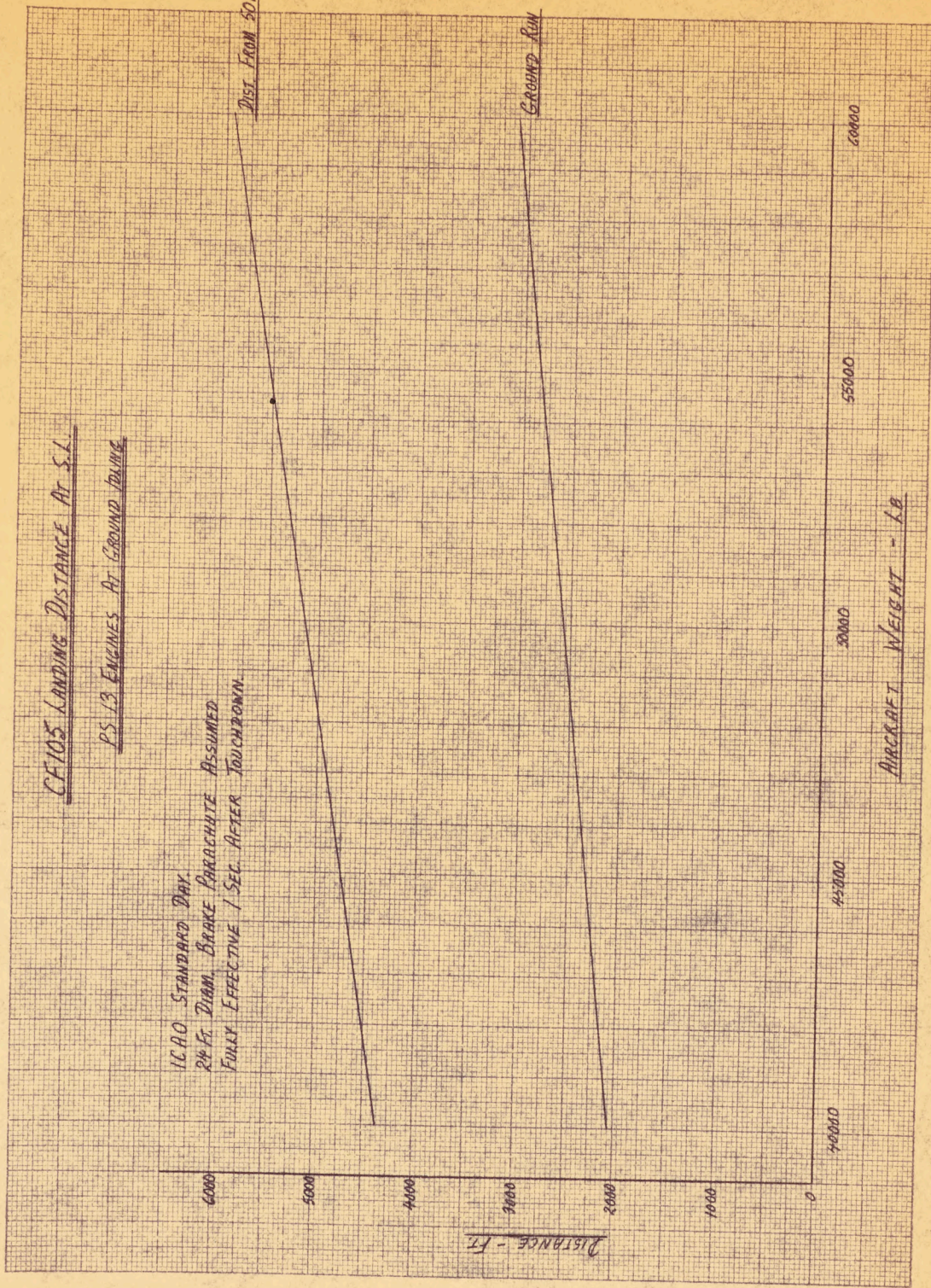




Nov 1951

DRAW

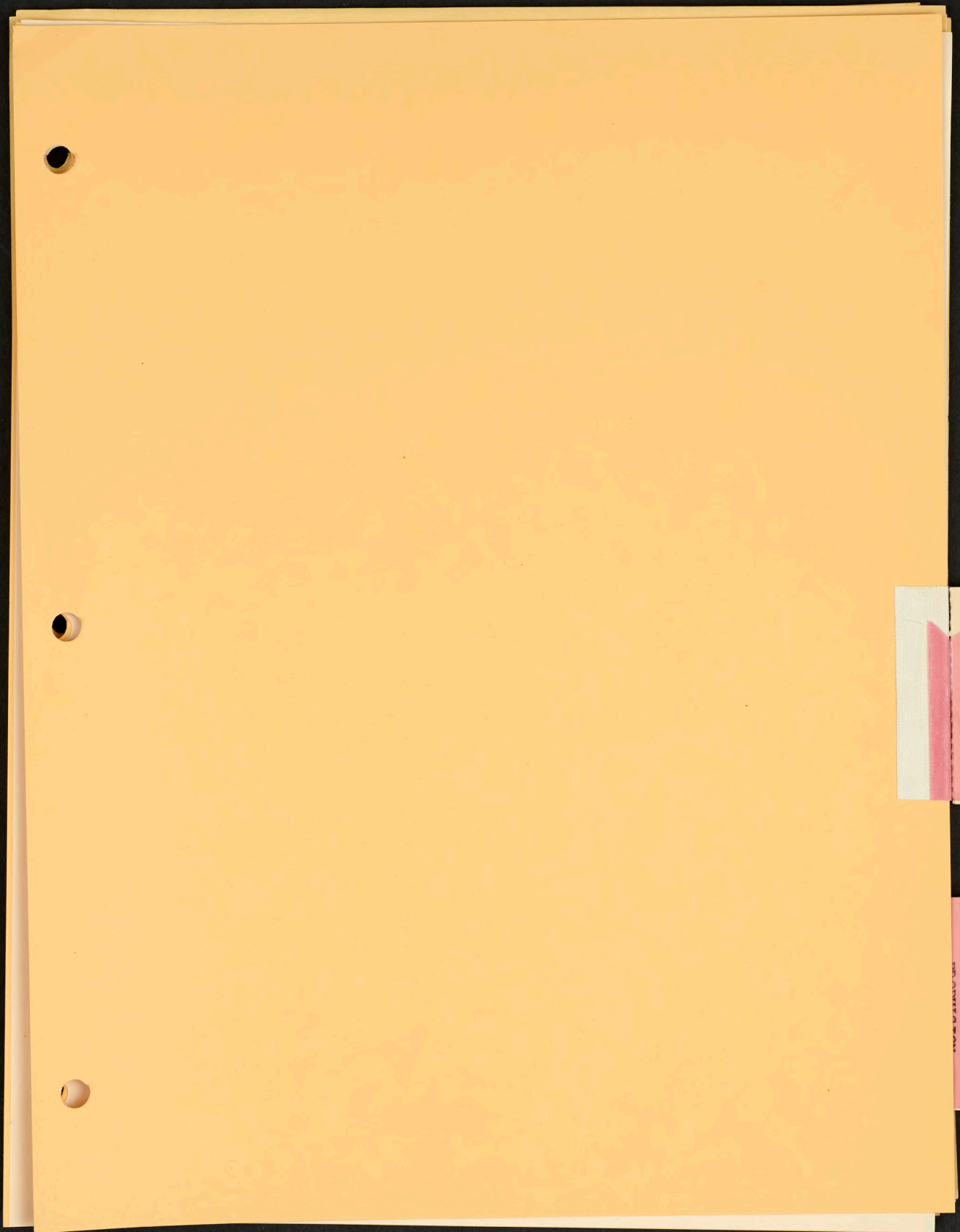
PROPULSION



DRAG

PROPULSION

OCT. 1956



DRAG

THE ANTIQUE BOOK

2: CF-105 DRAG DATA

No drag revision has been made since periodic report No. 9

PROPIUS ION

3. CF-105 PROPULSION DATA

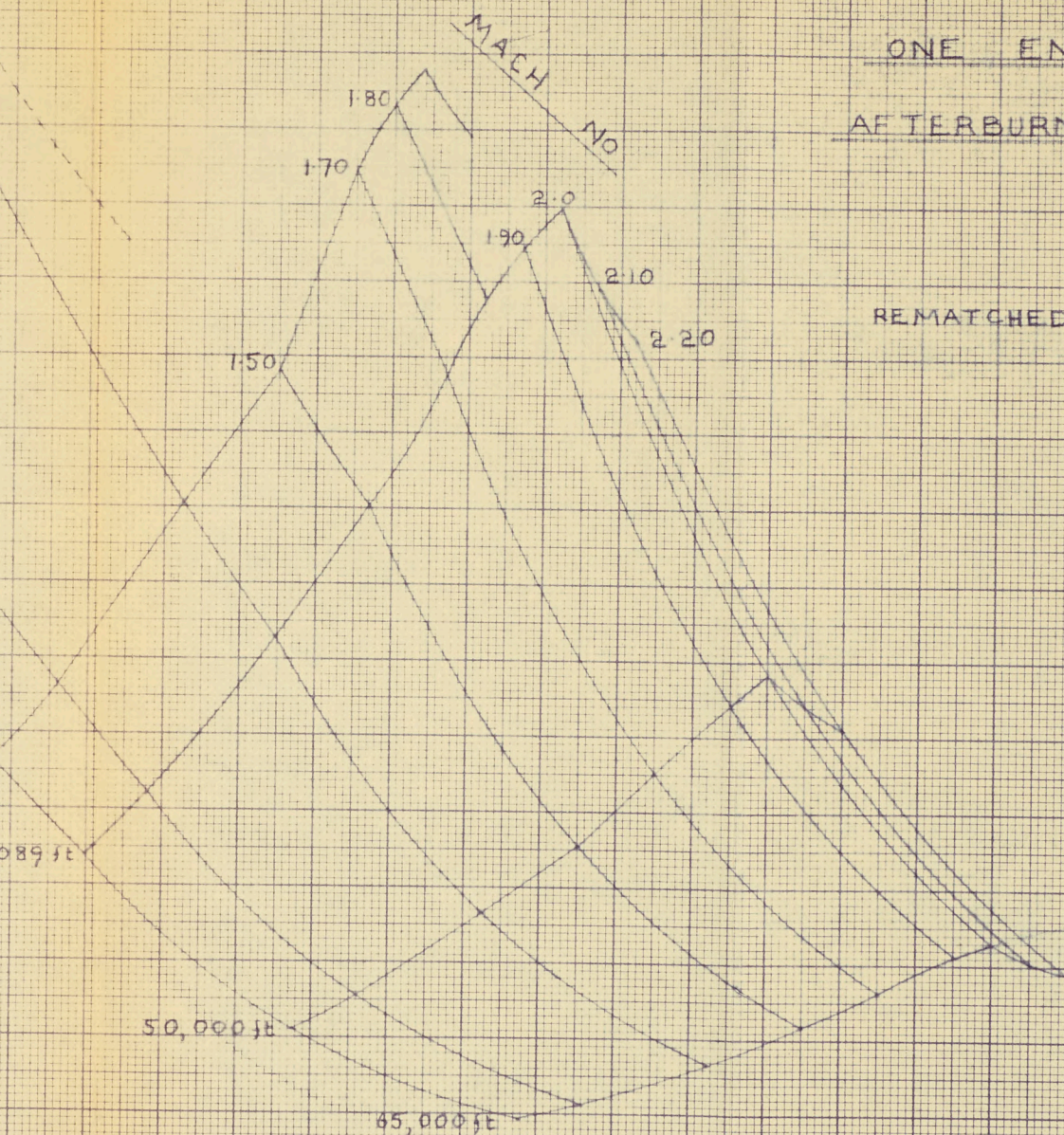
This section is revised since Report No. 9 to give engine performance for the installed Iroquois with re-matched compressors and appropriate airframe nozzle changes.

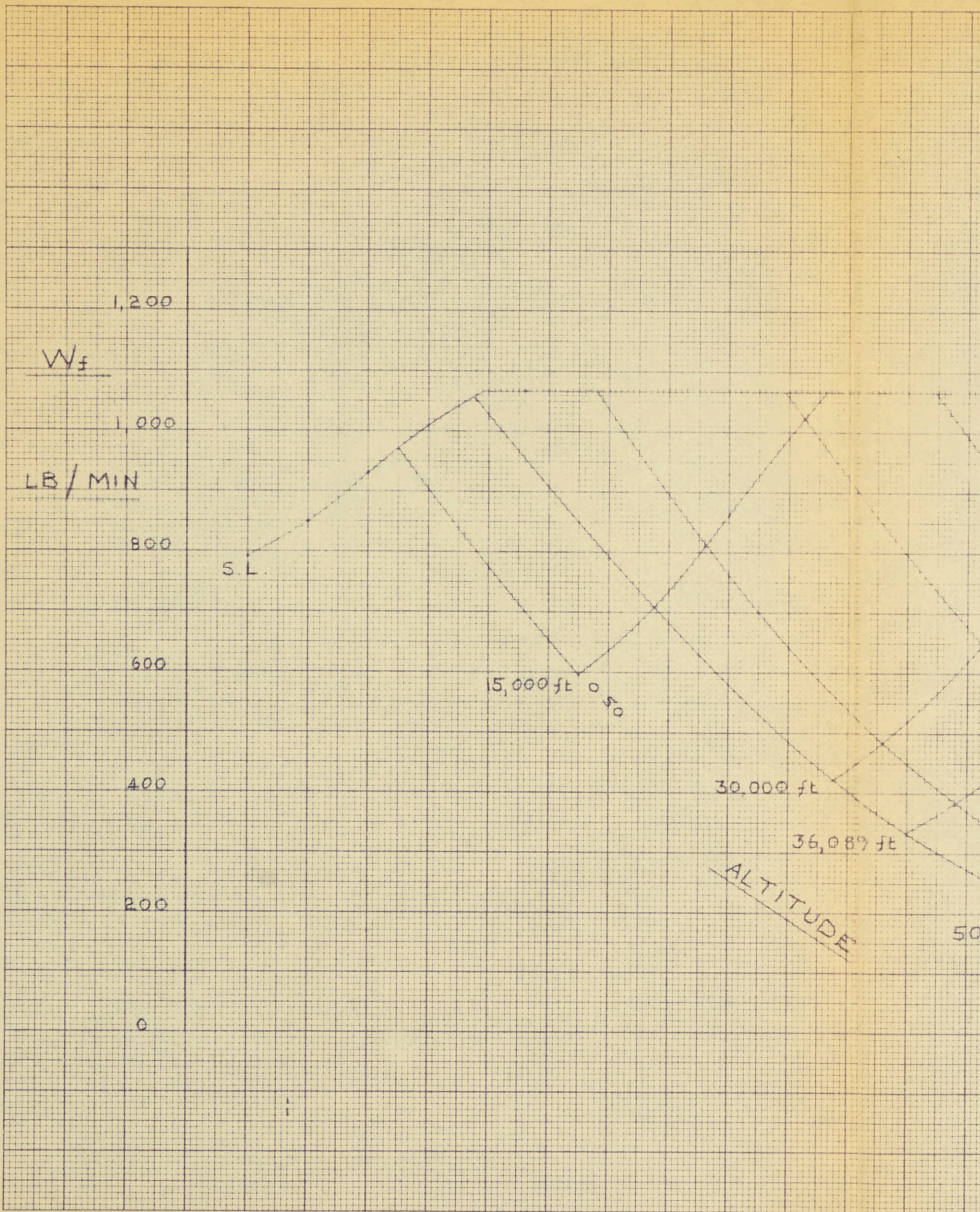
Since Orenda Engines Ltd. have not yet issued any formal data on this model of the engine, the information in this section should be treated as preliminary.

IROQUOIS CORRECTED THRUST

ONE ENGINE
AFTERBURNER LIT

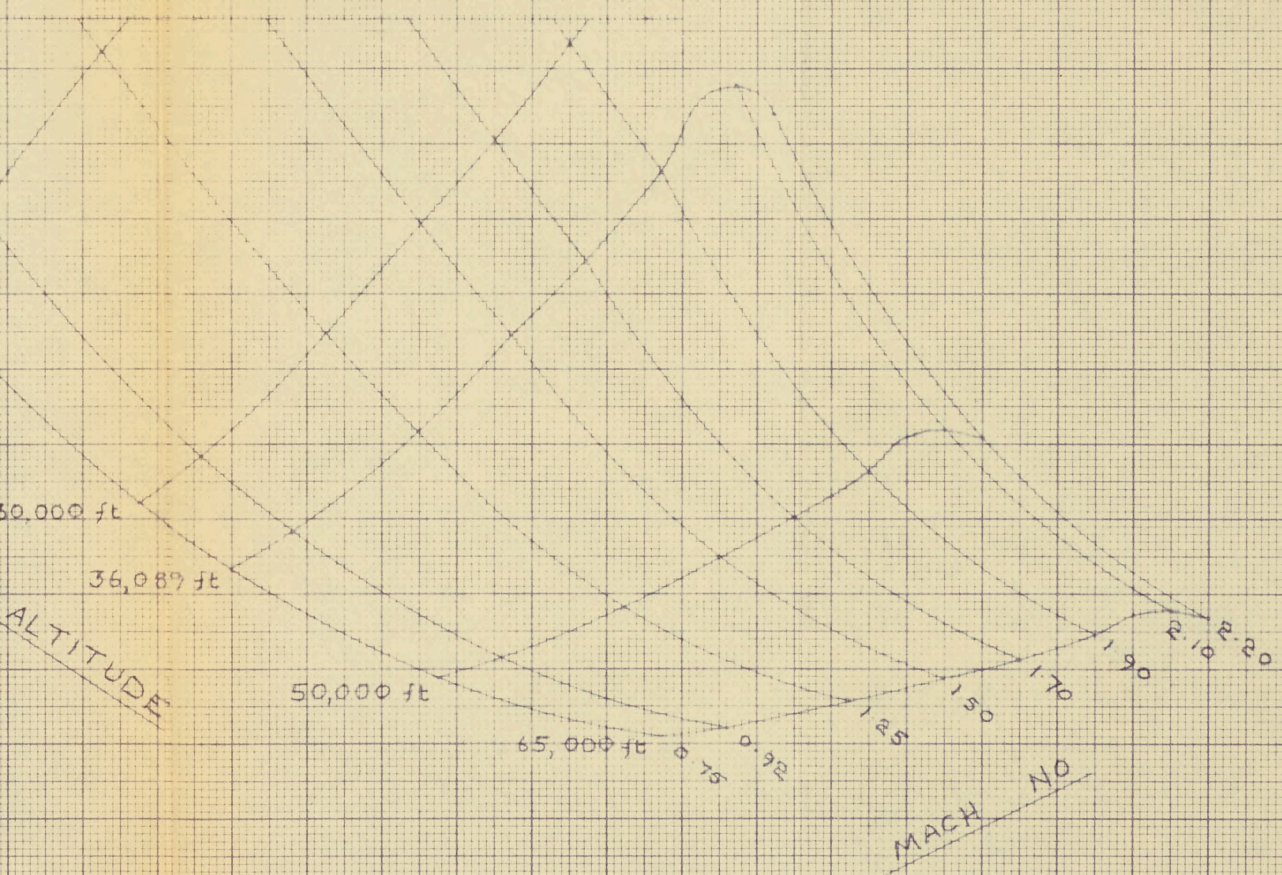
REMATCHED COMPRESSORS





IROQUOIS FUEL FLOW

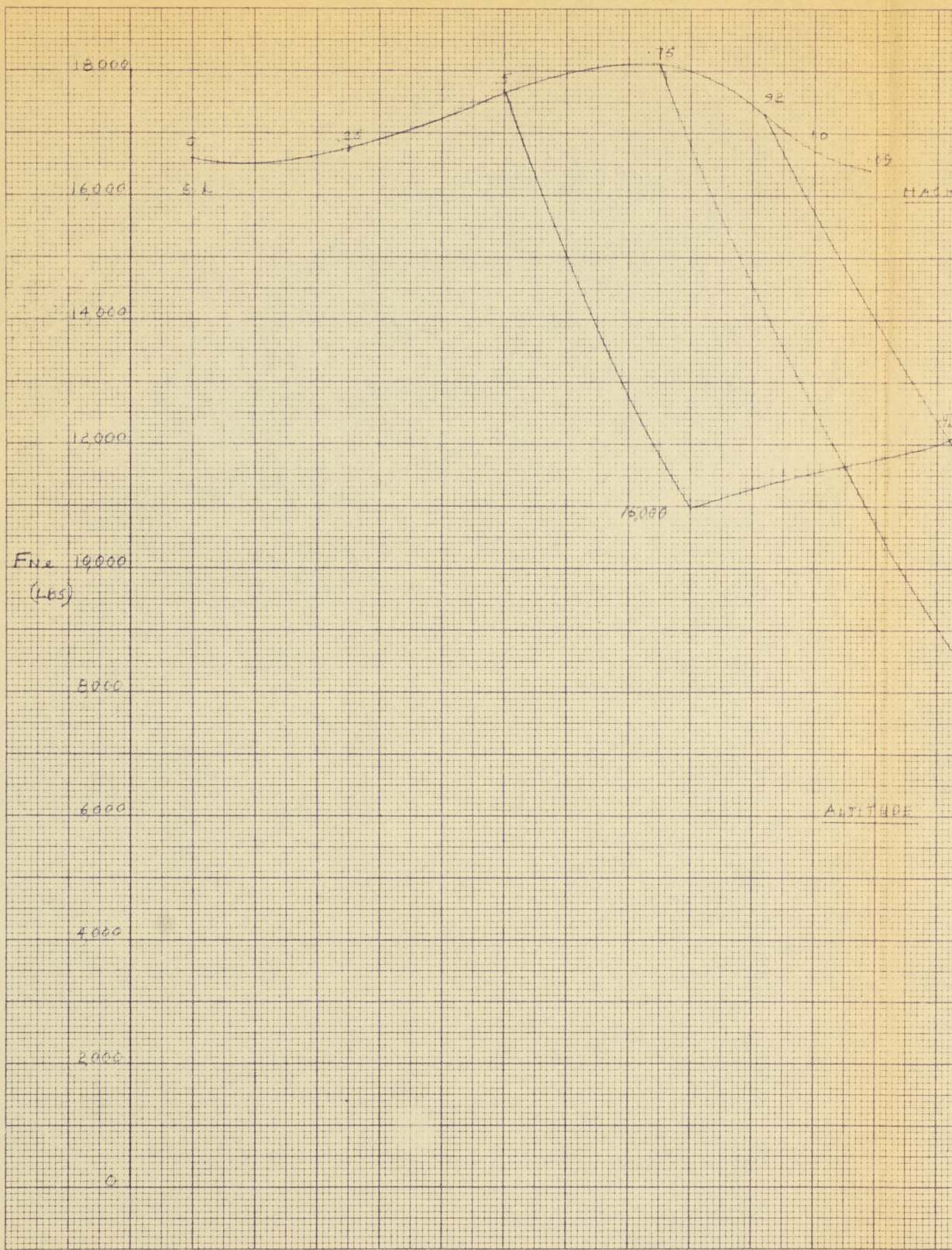
ONE ENGINE
AFTERBURNER LIT

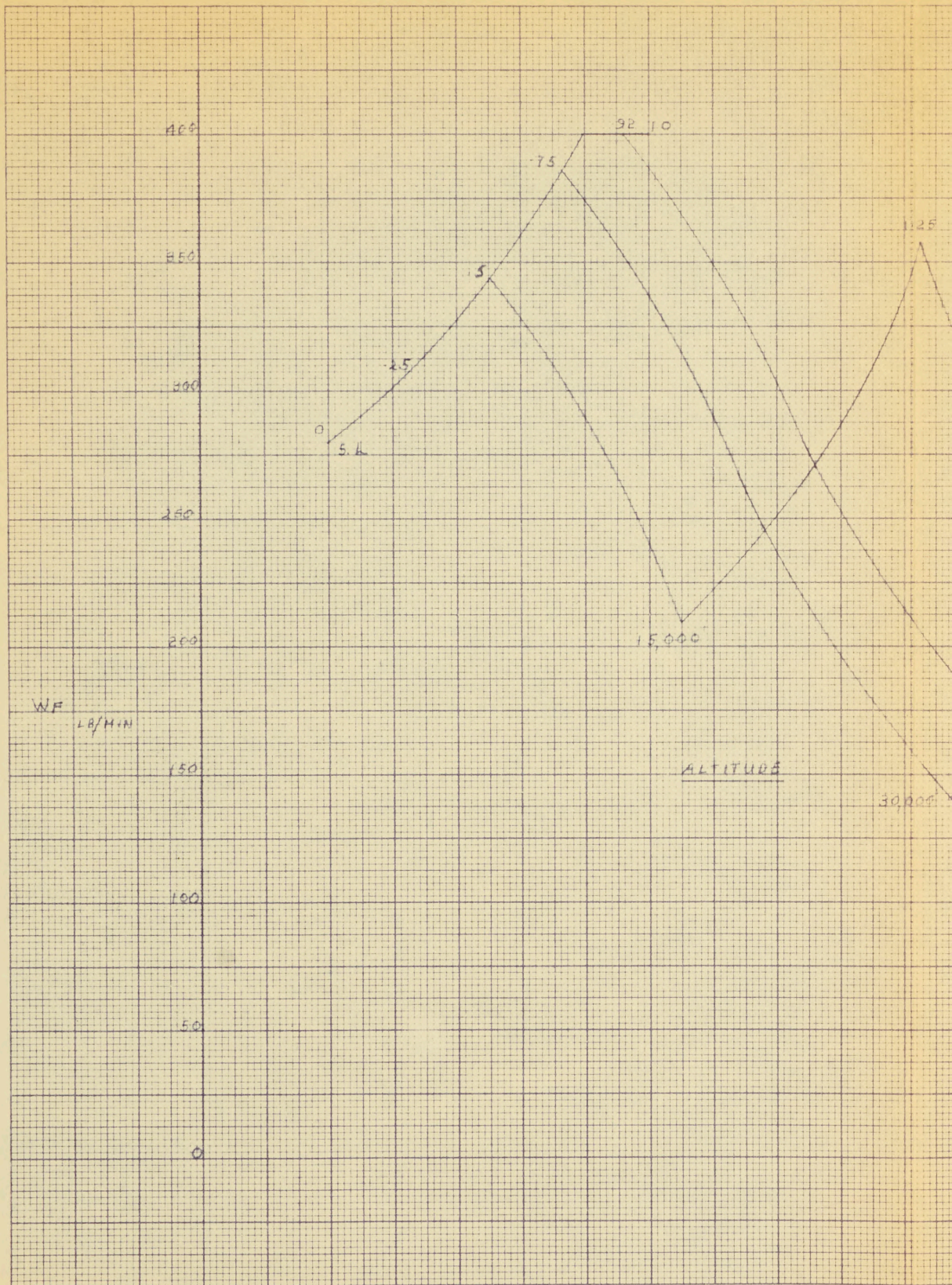


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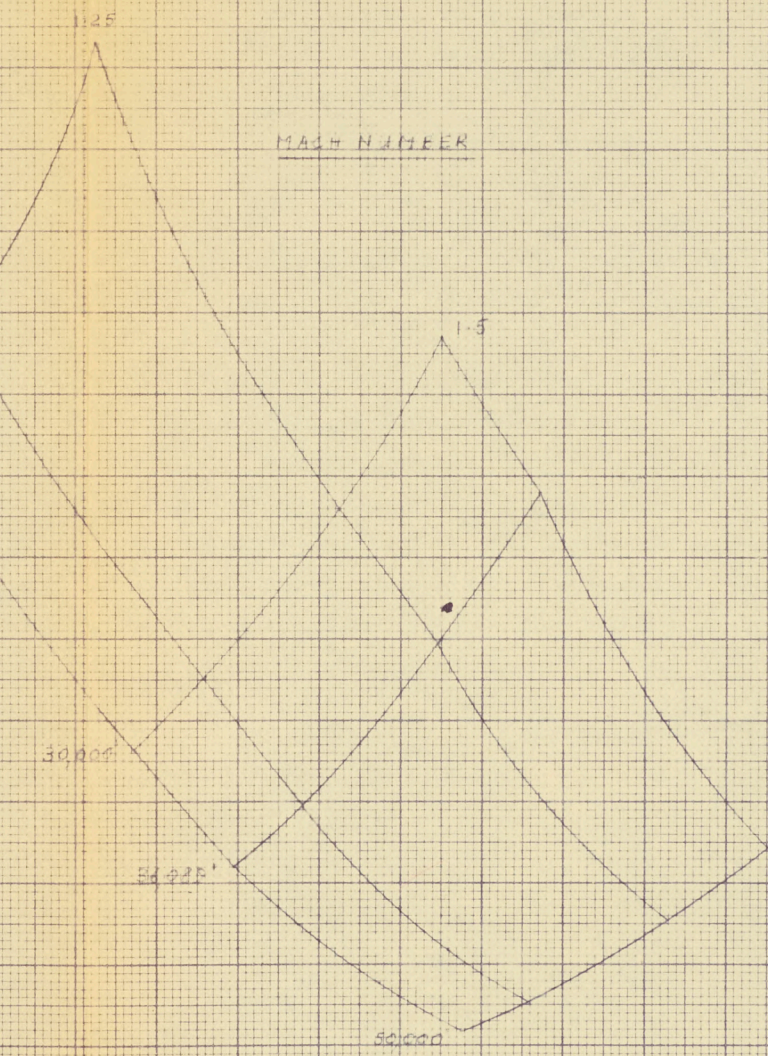


SLIP 11-11-47

CF-105

INDUCTED FUEL FLOW V MACH NUMBER AND ALTITUDE

AFTER BURNER NOT LIT

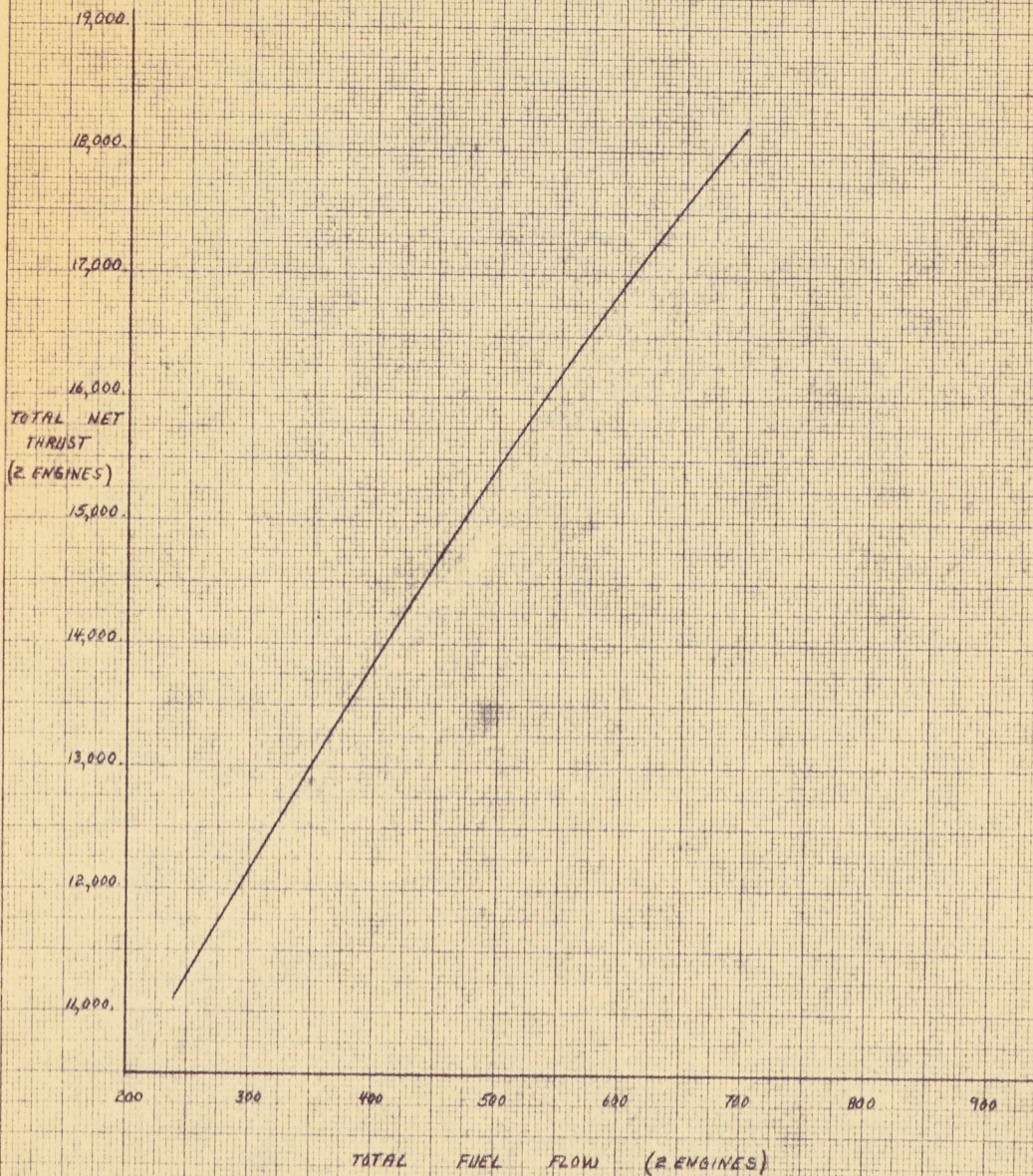


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May 1947

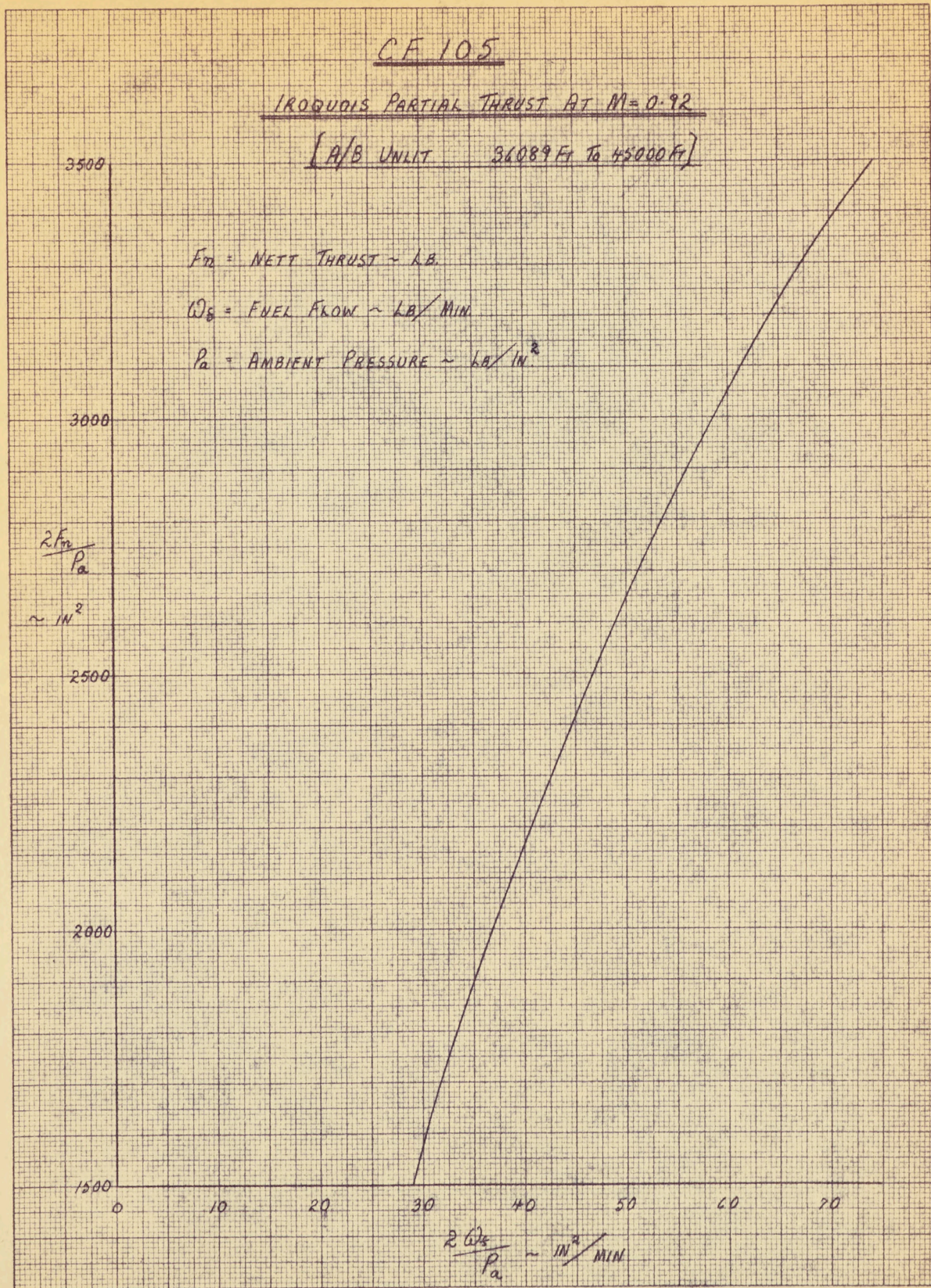
IRAGLUIS AIRCRAFT
PARTIAL AFTERBURNING
1.5 MIN AT 50,000 FT.

P/POWER/87

TOTAL NET THRUST VS. TOTAL FUEL FLOW



10 X 10 TO THE CM.
359-14
K&E
KUPFER & ESSER CO.
PHOTOGRAPHY

CF 105IROQUOIS PARTIAL THRUST AT M=0.92[A/B UNLIT 36089 Ft To 45000 Ft]

DUN TANG
NO. 1556
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