

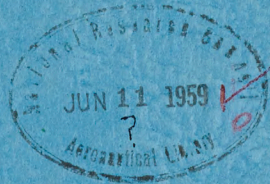
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Misc
14

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Preliminary Brochure
PROPOSED LONG-RANGE ALL-WEATHER FIGHTER

December, 1949

FILE IN VAULT



63085



National Research Council Canada / Conseil national de recherches Canada

Canada Institute for Scientific and Technical Information
J.H. Parkin Branch

Institut canadien de l'information scientifique et technique
Annexe J.H. Parkin

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B.J. Petzinger
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UNLIMITED

PRELIMINARY BROCHURE
PROPOSED LONG-RANGE ALL-WEATHER FIGHTER

December, 1949

A.V. Roe Canada Limited
MALTON, Ontario

INDEX

UNLIMITED

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INTRODUCTION**UNCLASSIFIED**

It was thought worth while to investigate the potentialities of the long-range, all-weather Fighter which could be expected to be realized, utilizing recent aerodynamic developments and the anticipated engine developments. For this purpose the specification on which the CF-100 is based has been used as a starting off point. This was on the assumption that the basic requirements against which this aircraft was designed will meet Canadian conditions for some time to come.

In order to make a worth while advance on the CF-100, the high-altitude, high-speed, long-range bomber which can be expected in the next four or five years was taken as the tactical datum and an endeavour was made to design a Fighter which would be able to attack such a bomber effectively. It has been assumed that suitable ground to air, and air to air, search radar will be available in conjunction with appropriate aircraft armament.

GENERAL DESCRIPTION

This study describes a long-range, high altitude, all-weather, search Fighter of advanced design. Alternative arrangements are illustrated on Sheets 4, 5, and 6. From these drawings it can be seen that the aircraft is a two-place, mid-wing monoplane, powered by twin gas turbines, each of 8,000 lbs. static thrust.

The wing is of swept back plan form having a quarter chord sweep back of 43° and an aspect ratio of 2.76. A similar swept back tailplane has been retained on this aircraft as it is felt that this is desirable in order to achieve adequate manoeuvrability.

In addition to the gas turbine engines, rocket motors are also provided in the tail for providing up to 6,000 lbs. of additional thrust under high altitude combat conditions.

The armament may be either four 30 m.m. cannon or, probably later on, long-range, large-calibre guns firing shells with proximity fuses.

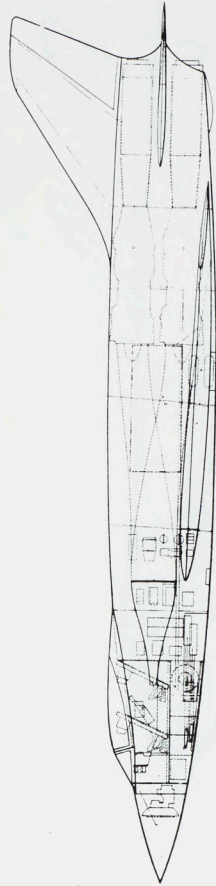
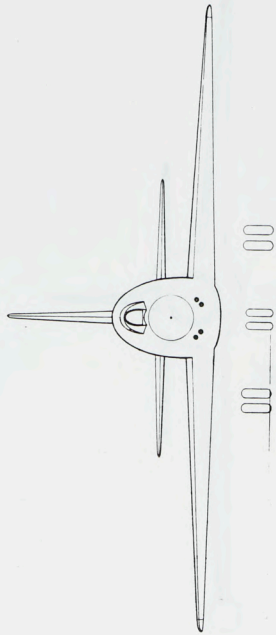
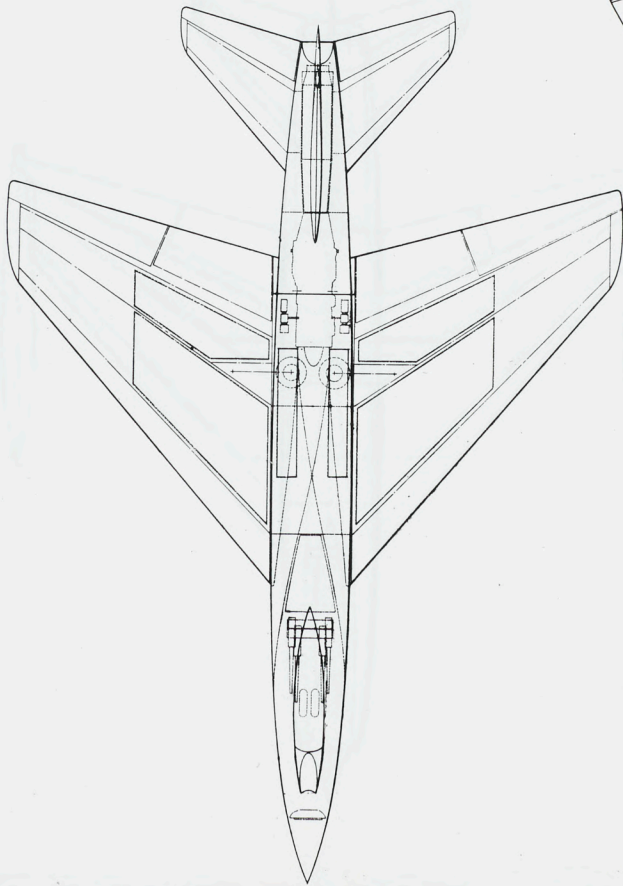
The tankage of the airplane will enable a normal range of over 1,500 miles to be achieved while ultimately additional tankage can be provided for the second rocket motor fuel. This will enable the aircraft to be developed for flight at super-sonic speeds.

In addition, after-burners are provided for the gas turbine engines to assist in take-off and climb and in combat.

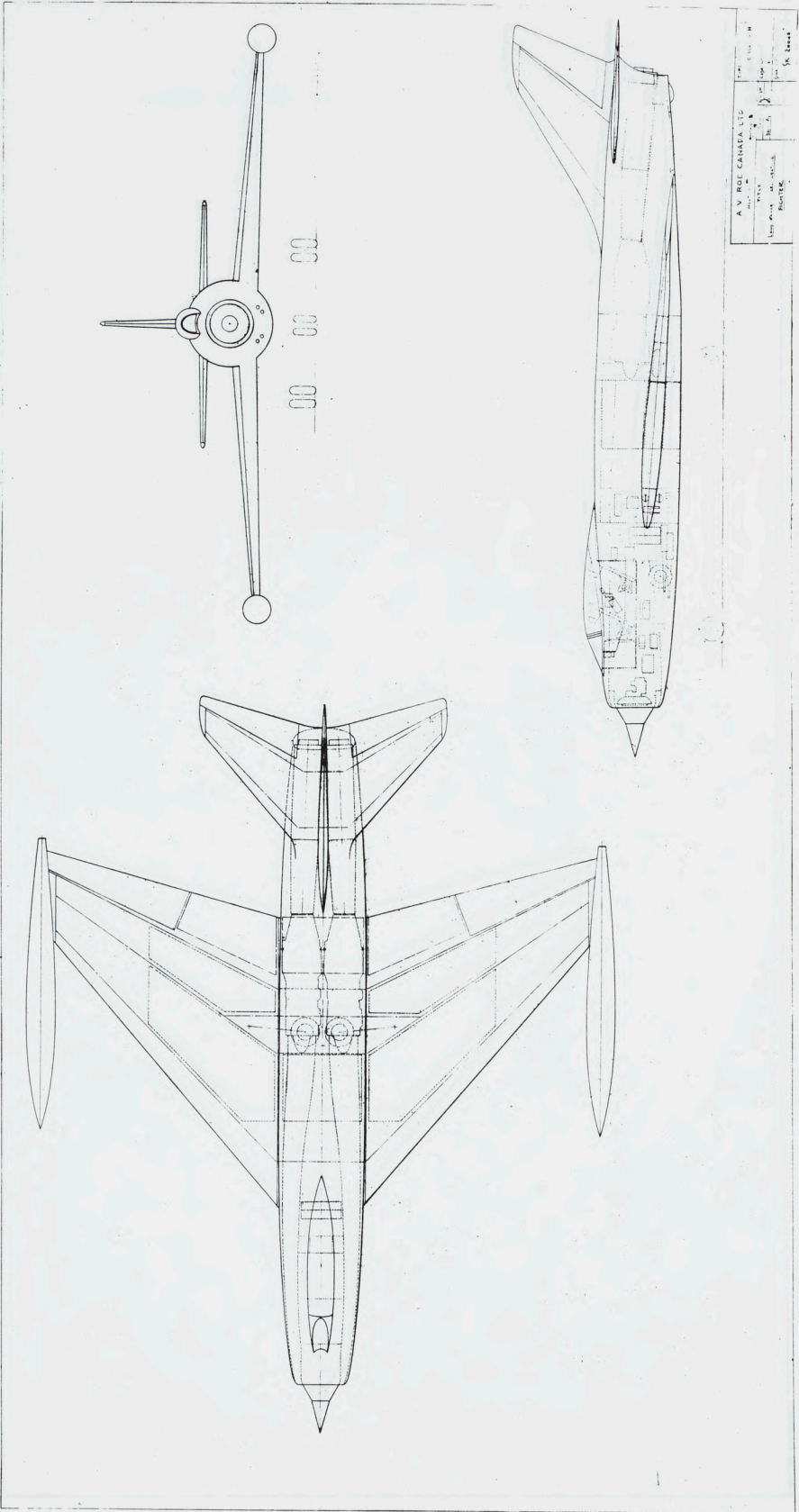
With the provisions described the aircraft can, therefore, climb to the approximate height of the bomber, say 45,000 ft. at which height it can patrol at a moderately high cruising speed. On making contact by radar with the bomber it can go into the attack using the rocket engines which will give the aircraft a short duration performance substantially superior to that of the bomber. The rocket engines will enable the aircraft to climb to 60,000 or 70,000 ft., if necessary, with a speed differential of at least 200 m.p.h. This should give ample margin for manoeuvrability and getting into position for the attack.

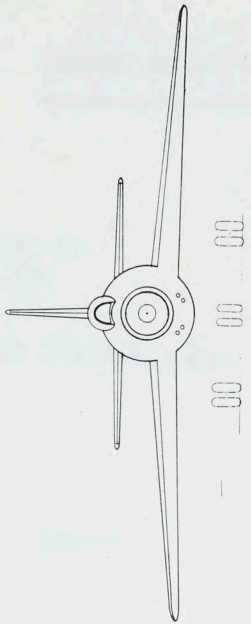
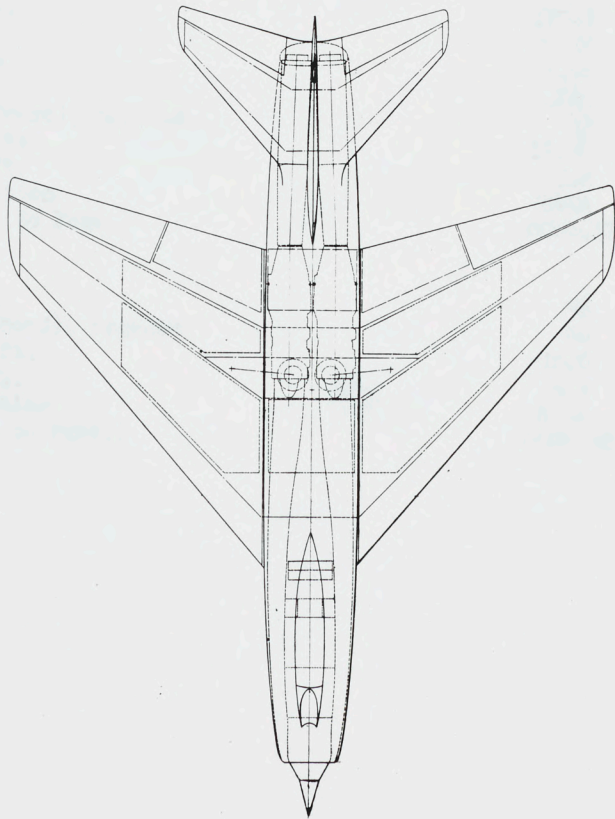
It is felt that the study as outlined suggests an aircraft which basically is of normal design but which has considerable potential development in it, in so far as it can utilize its supersonic possibilities by the addition of the rocket engines, in due course, when this superior performance is required operationally.

Under short range conditions the aircraft would be an extremely effective Interceptor Fighter having a sea level rate of climb with reheat of say 24,000 ft. a minute, with ample manoeuvrability.



| | | | |
|----------------------------|---------|----------|-------|
| A. V. ROE CONSULTANTS LTD. | | TYPE NO. | C 104 |
| PROJECT NO. | 1000000 | DATE | 1944 |
| REVISED | | BY | |
| APPROVED | | FOR | |
| DATE | | BY | |
| PROJECT | | FOR | |





A V ROE CANADA LTD
TYPE NO. 4
REV. 1
DATE 1/1/44
DRAWN BY
CHECKED BY
APPROVED BY
DATE

DIMENSIONS AND DATA

GENERAL

| | |
|------------------------------------|------|
| Span, ft. | 49.5 |
| Length, ft. | 64.0 |
| Height over Canopy, ft. | 12.5 |
| Height over Fin, ft. | 20.0 |
| Track, ft. | 13.0 |
| Tread, ft. | 24.0 |
| Engine Fuel, Total Internal, gals. | 1735 |

WING

| | |
|----------------------------|----------|
| Area, sq. ft. | 888 |
| Span, ft. | 49.5 |
| Aspect Ratio | 2.76 |
| Taper Ratio | .246 |
| Sweep (1/4 chord), degrees | 43 |
| Root Chord, ft. | 28.83 |
| Tip Chord, ft. | 7.1 |
| Aerofoil Section | NACA |
| (Parallel to Fuse.) | .0006.58 |

HORIZONTAL TAIL

| | |
|----------------------------|----------|
| Area, sq. ft. | 177.3 |
| Span, ft. | 22.07 |
| Aspect Ratio | 2.76 |
| Taper Ratio | .246 |
| Sweep (1/4 Chord), degrees | 43 |
| Root Chord, ft. | 12.87 |
| Tip Chord, ft. | 3.2 |
| Aerofoil Section | NACA |
| (Parallel to Fuse.) | .0006.58 |

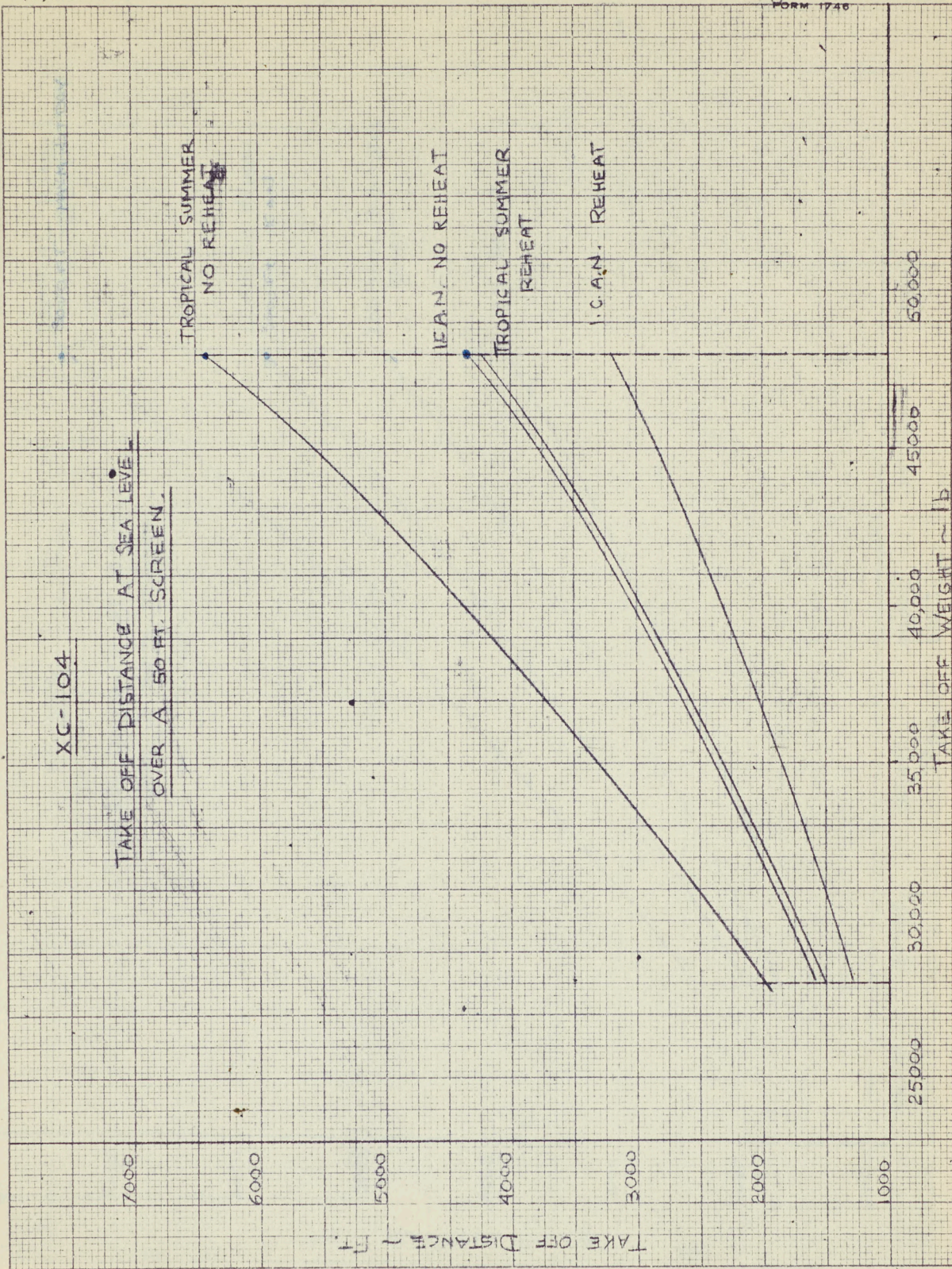
VERTICAL TAIL

| | |
|----------------------------|----------|
| Area, sq. ft. | 96 |
| Sweep (1/4 Chord), degrees | 50 |
| Root Chord, ft. | 16.0 |
| Tip Chord, ft. | 5.3 |
| Aerofoil Section | NACA |
| (Parallel to Fuse.) | .0006.58 |

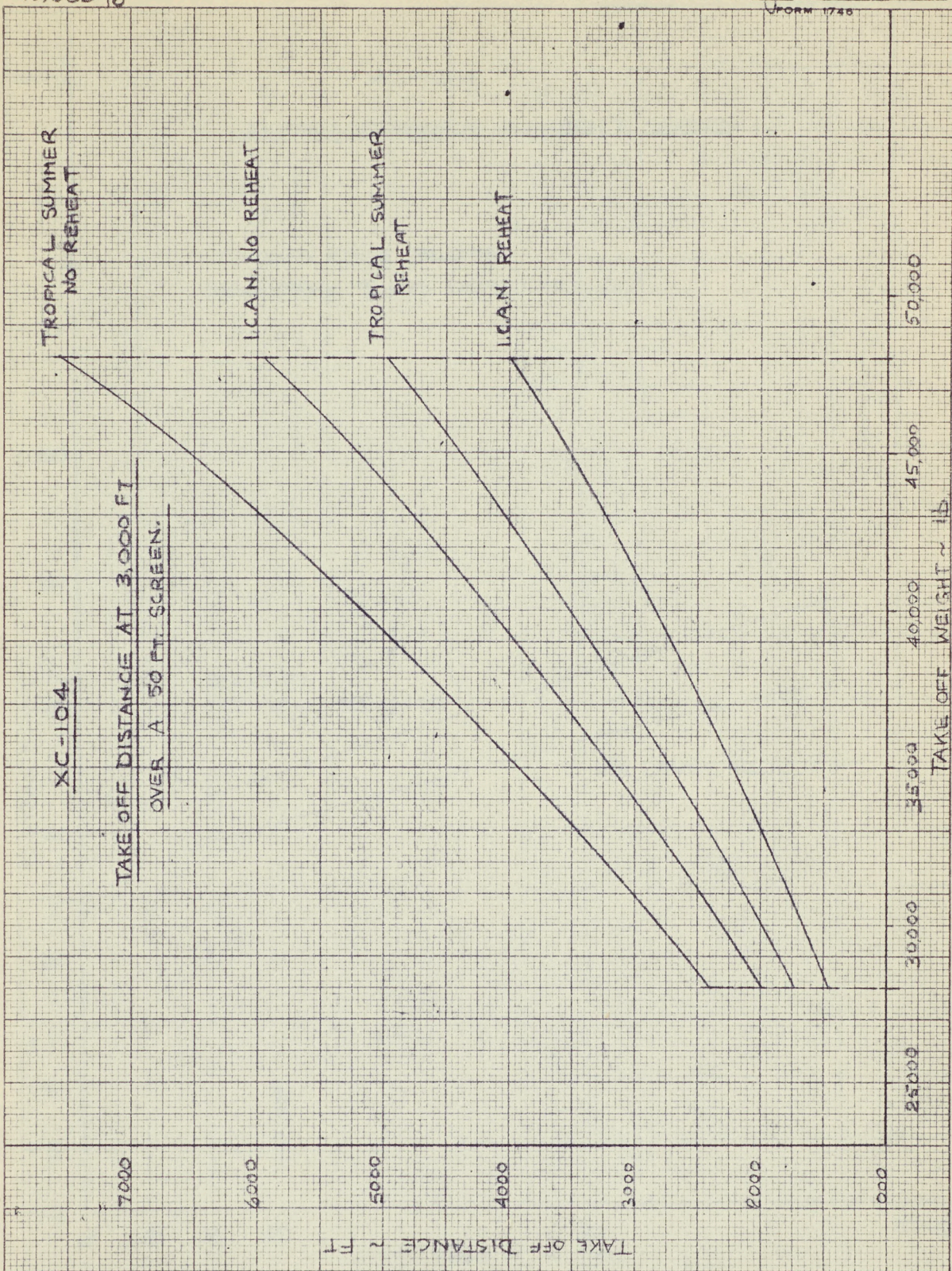
WEIGHT SUMMARY

Dec. 5, 1949

| | | |
|----------------------------------|--------------------|--------|
| STRUCTURE GROUP | | |
| Wings | 7,200 | |
| Fuselage | 3,180 | |
| Tailplane & Elevators | 1,030 | |
| Fin and Rudder | 326 | 11,736 |
| LANDING GEAR GROUP | | |
| Main Undercarriage (down) | 1,300 | |
| Nosewheel Undercarriage (down) | 350 | |
| Tail Bumper | 20 | 1,670 |
| POWER PLANT GROUP | | |
| 2 'Orenda' Engines (bare) | 6,009 ^x | |
| Accessory Gearboxes & Drives | 100 | |
| Generators, Pumps, Blowers, etc. | 250 [✓] | |
| After-Burners | 1,000 ^x | |
| Air-Intake Ducts | 200 ^x | |
| Engine Controls | 20 [✓] | |
| Engine Mountings | 90 ^x | |
| 2 Rockets | 1,000 ⁺ | 8,669 |
| EQUIPMENT GROUP | | |
| Radars | 600 | |
| Radio | 150 | |
| Fire Extinguisher System | 138 | |
| Air Conditioning System | 100 | |
| Electrical System | 850 | |
| Hydraulic System | 500 [✓] | |
| Oxygen System | 50 | |
| De-Icing System | 100 | |
| Flying Controls | 200 [✓] | |
| Fuel System and Tanks | 285 | |
| Instruments | 70 | |
| Auto-Pilot | 60 | |
| Crew Seats | 264 | |
| Armament | 1,025 | |
| Miscellaneous | 88 | 4,480 |
| CREW C/W PARACHUTES & G-SUITS | 414 | 414 |
| BASIC OPERATIONAL WEIGHT | | 26,969 |
| AMMUNITION | 1,000 | 1,000 |
| OPERATIONAL WEIGHT EMPTY | | 27,969 |
| FUEL AND OIL | | |
| Engine Fuel (1735 Gal.) | 14,000 | |
| Oil | 31 ^x | |
| Rocket Fuel | 6,000 | 20,031 |
| GROSS WEIGHT | | 48,000 |



KEUFFEL & ESSER CO., N. Y. NO. 359-12
 10 X 11 IN. 15, 1000, 500, 100, 50, 25, 10, 5, 2, 1
 MADE IN U.S.A.



KEUFFEL & ESSER CO., N. Y. NO. 35912
10 X 15 in. 50% REPRODUCED
MADE IN U.S.A.

AIRCRAFT
A. U. W. 48000 LBS.

COMPONENT

SHEET NO. 11

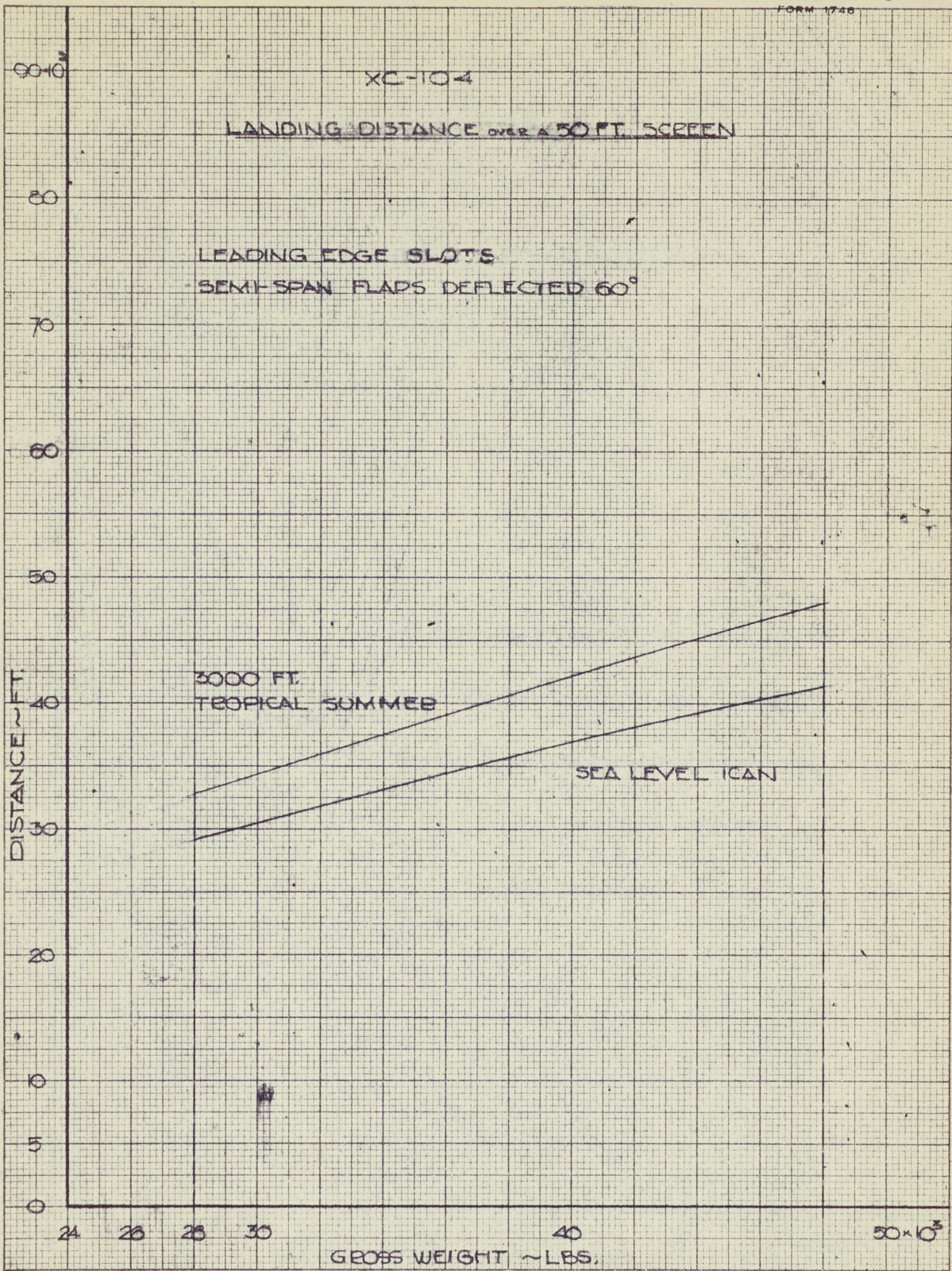
REPORT NO.

DATE

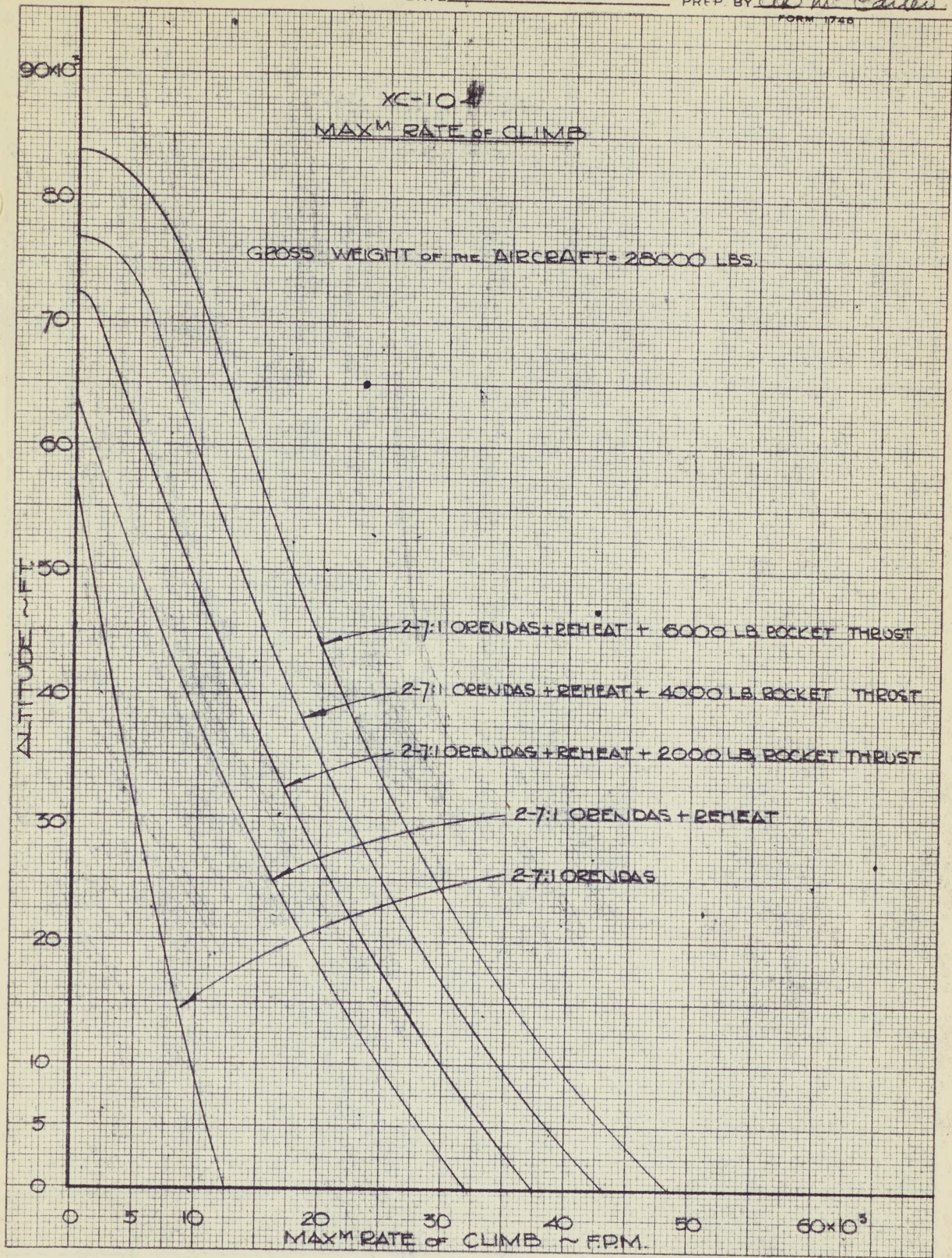
PREP BY

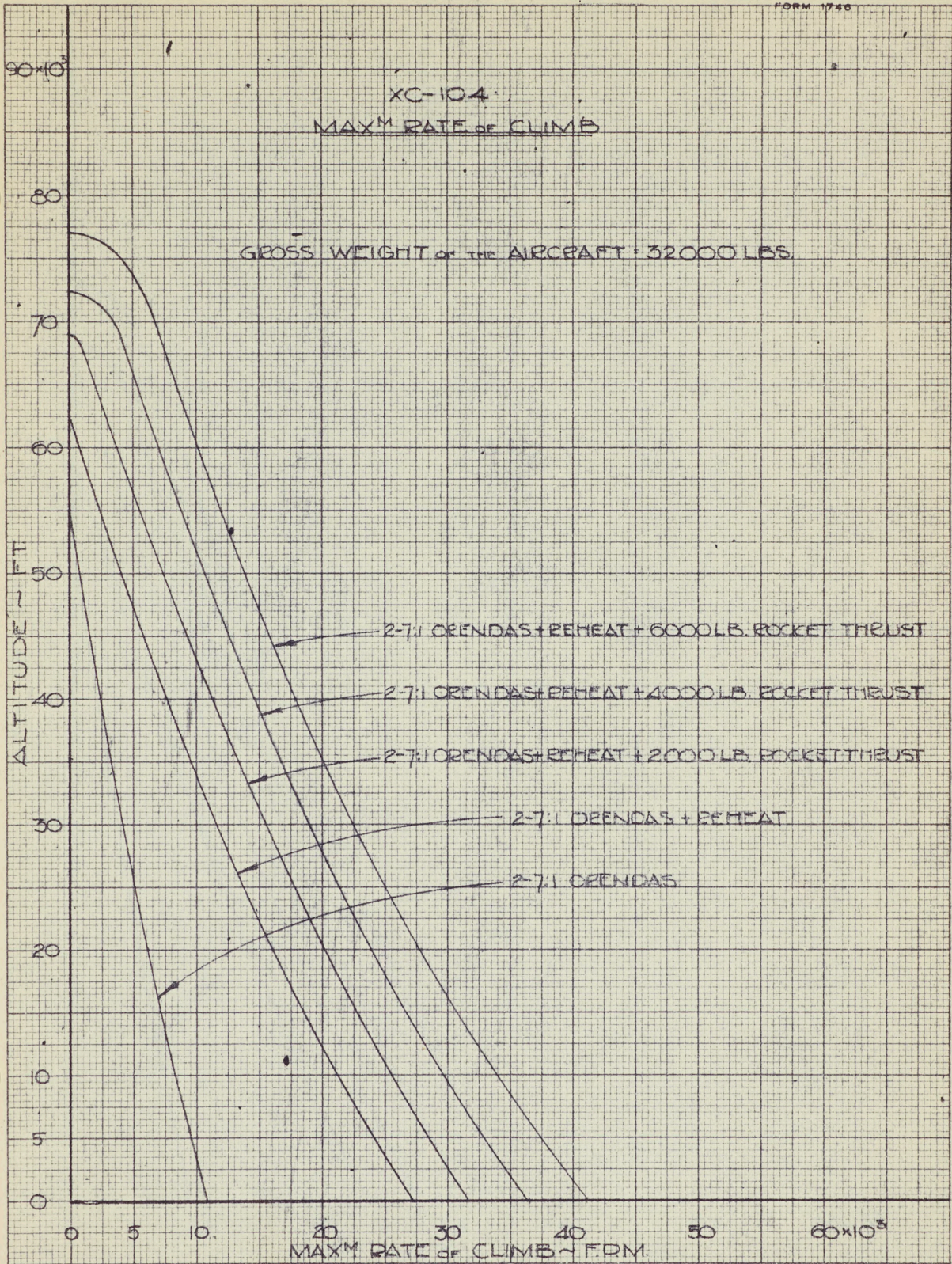
FORM 1740

W. B. Carter

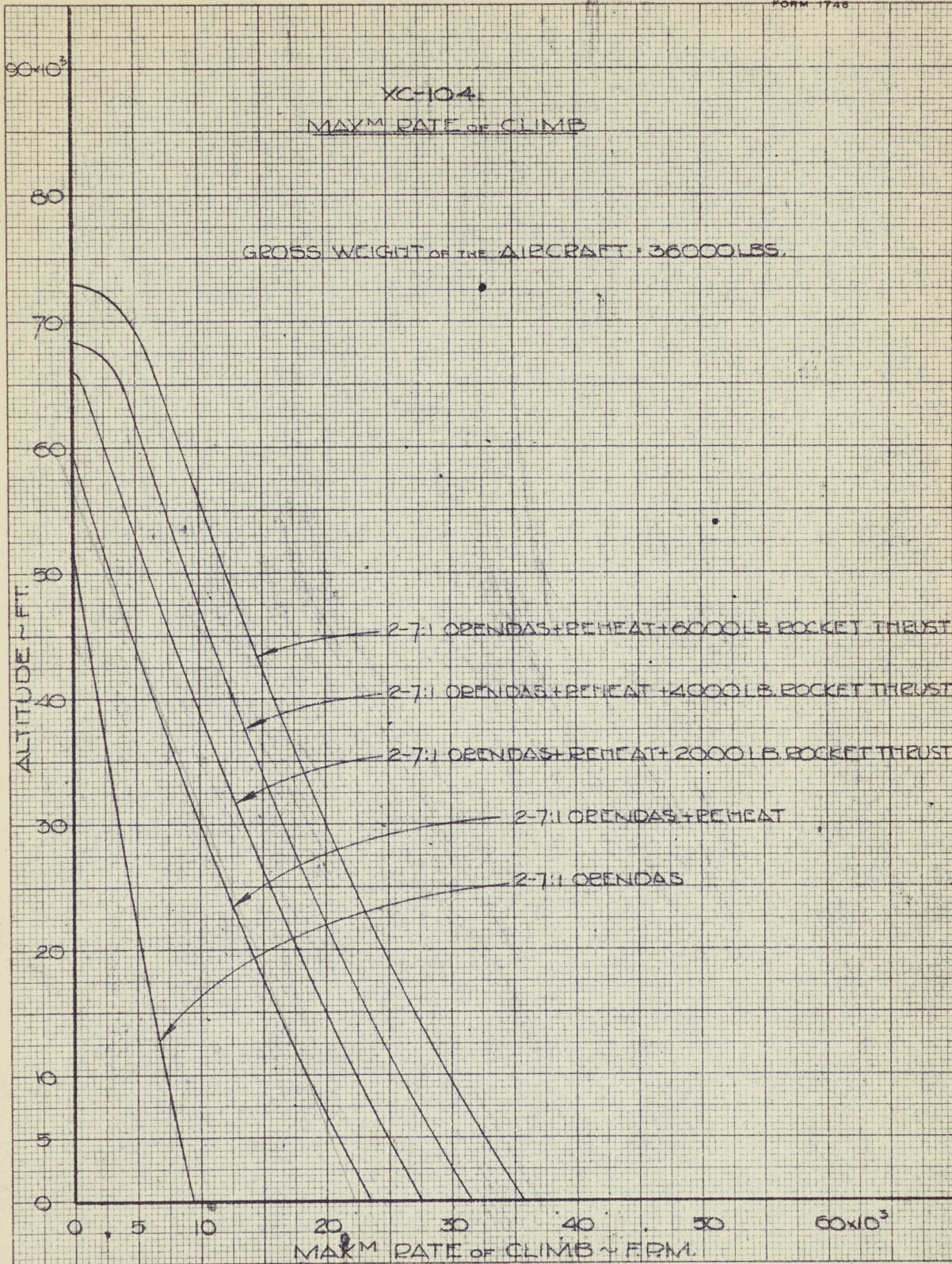


KEUFFEL & ESSER CO., N. Y. NO. 359-12
10 X 10 IN. 1/4 IN. 1/4 IN. 1/4 IN. 1/4 IN.
MADE IN U.S.A.

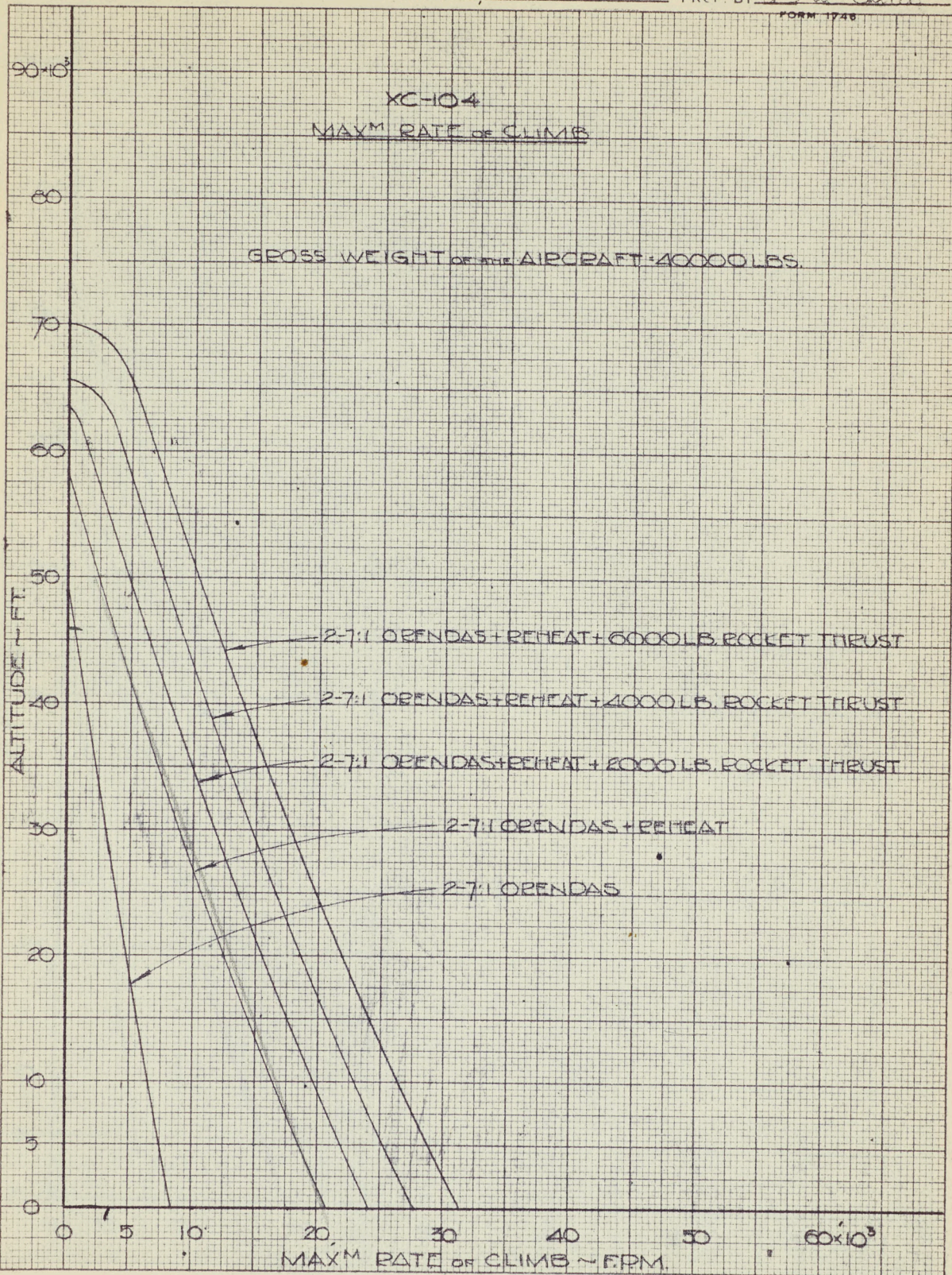




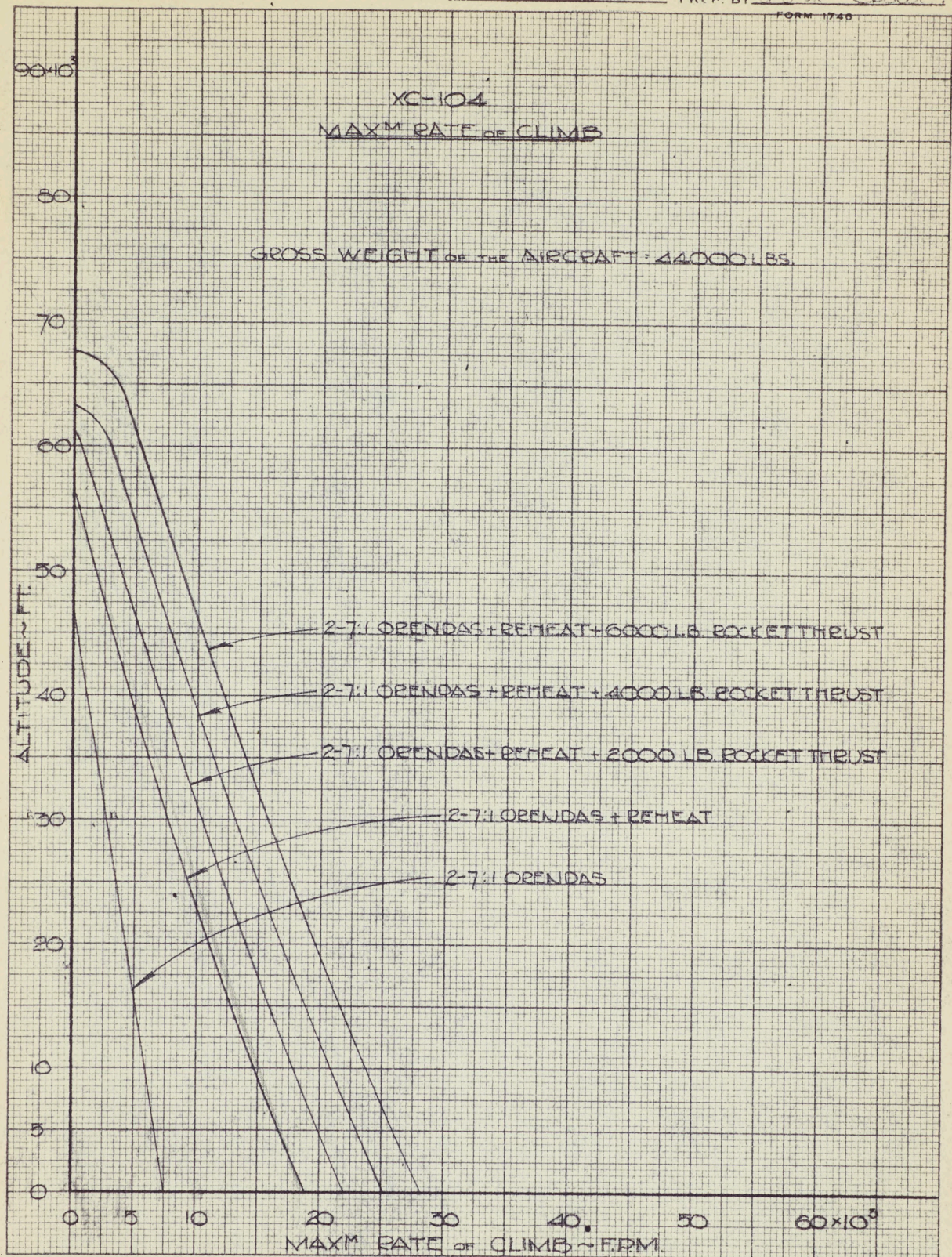
W. B. Carter



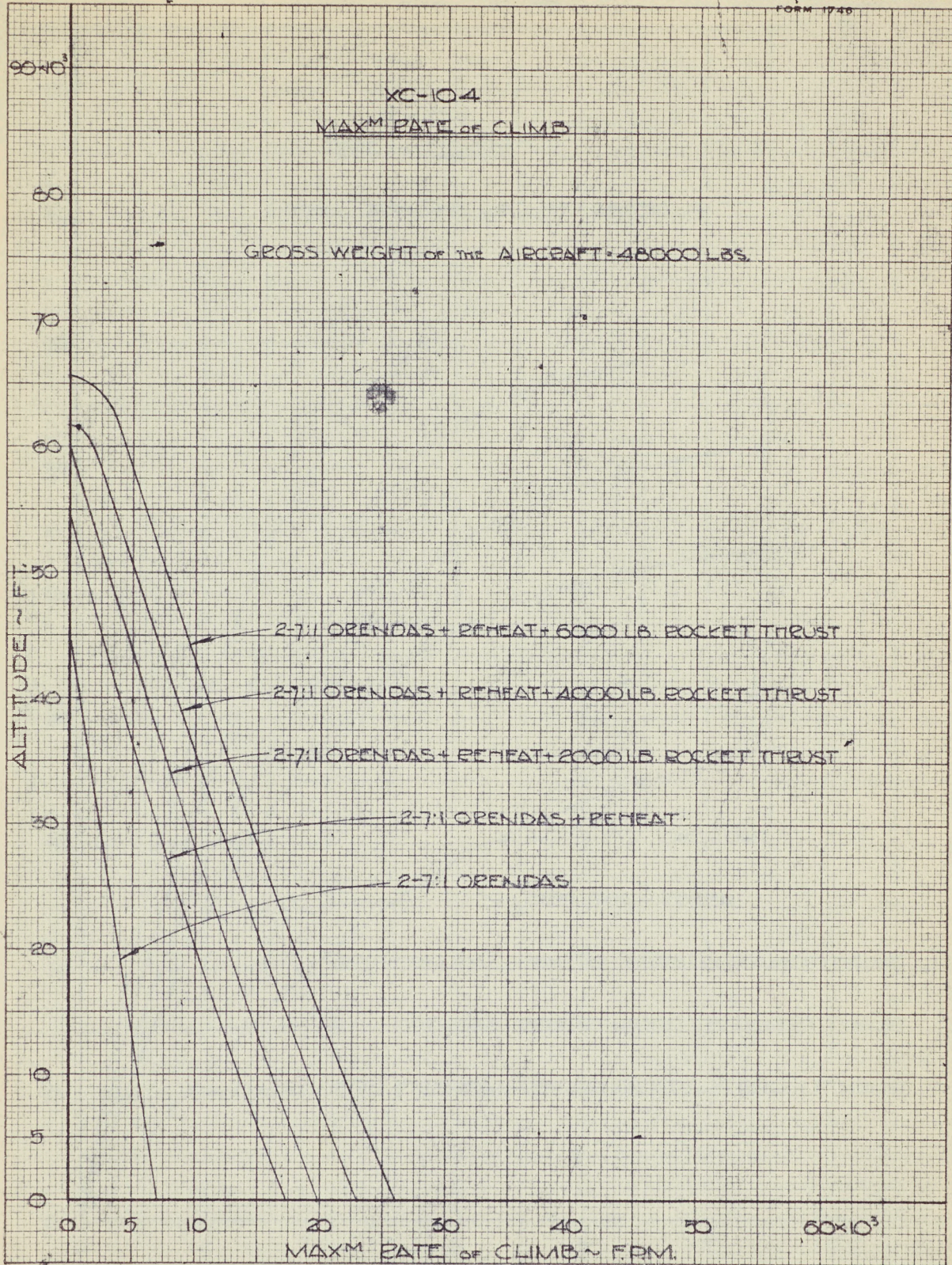
KEUFFEL & ESSER CO., N. Y. NO. 389-12
10 X 11 1/2 inch. grid
MADE IN U.S.A.

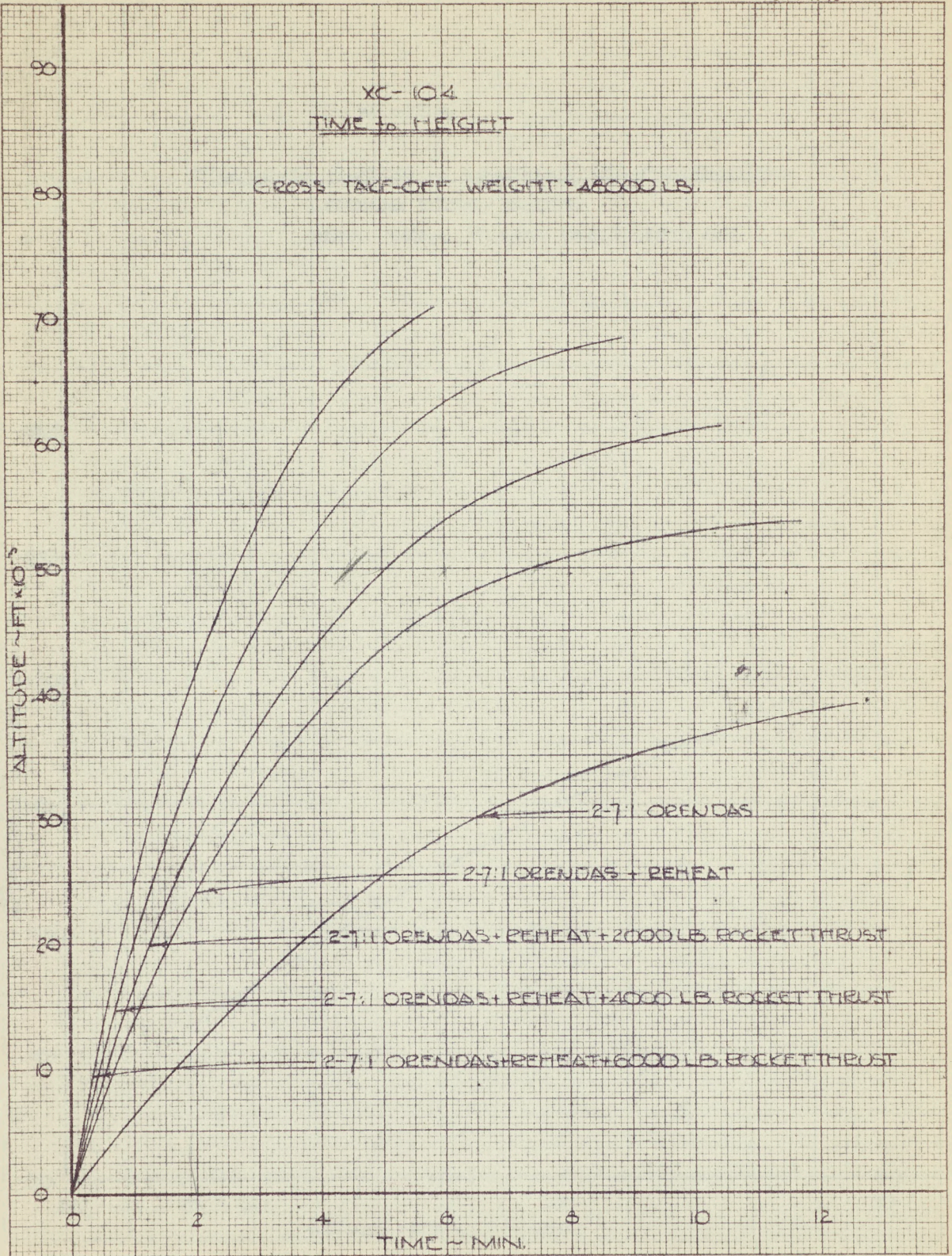


Bob Carter



KEUFFEL & ESSER CO., N. Y. NO. 35B-12
10 X 10" Grid
Made in U. S. A.



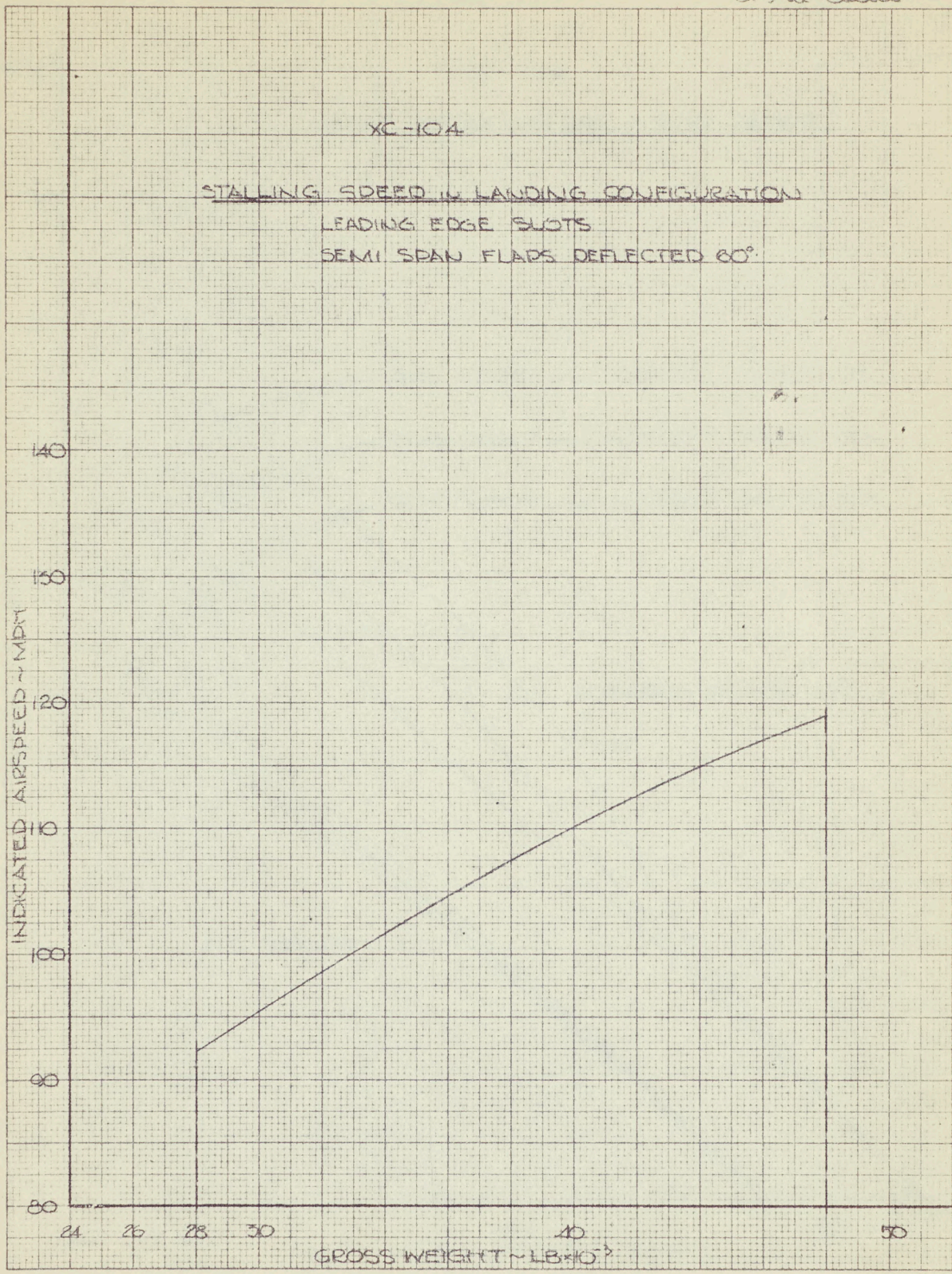


BUFFEL & CO., N. Y.
10 X 10 LB
Inch. 6th line
U.S.A.

W. B. Carter

XC-104

STALLING SPEED IN LANDING CONFIGURATION
LEADING EDGE SLOTS
SEMI SPAN FLAPS DEFLECTED 80°



KEUFFEL & ESSER CO., N. Y. NO. 389-12
10 x 10 inch, 50 lb. 100 sheets
MADE IN U.S.A.

AIRCRAFT COMPONENT
A. U. W. 48000 LBS.

SHEET No. 20

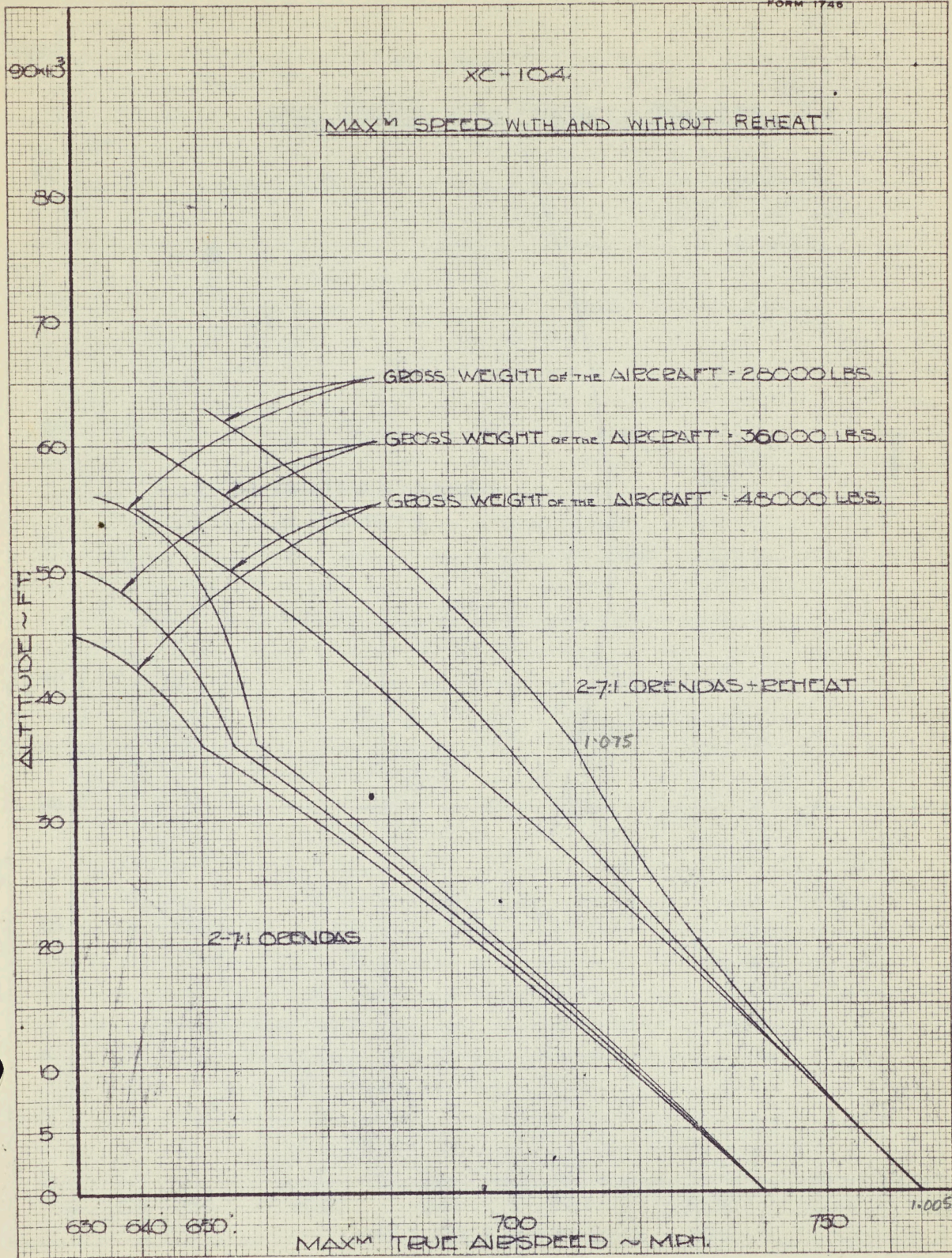
REPORT No.

DATE

PREP BY

A-ROSE

FORM 1746



KEUFFEL & ESSER CO., N. Y. NO. 350-12
10 X 11 1/2 Inch. Grid
MADE IN U.S.A.

AIRCRAFT.

COMPONENT

SHEET No. 21

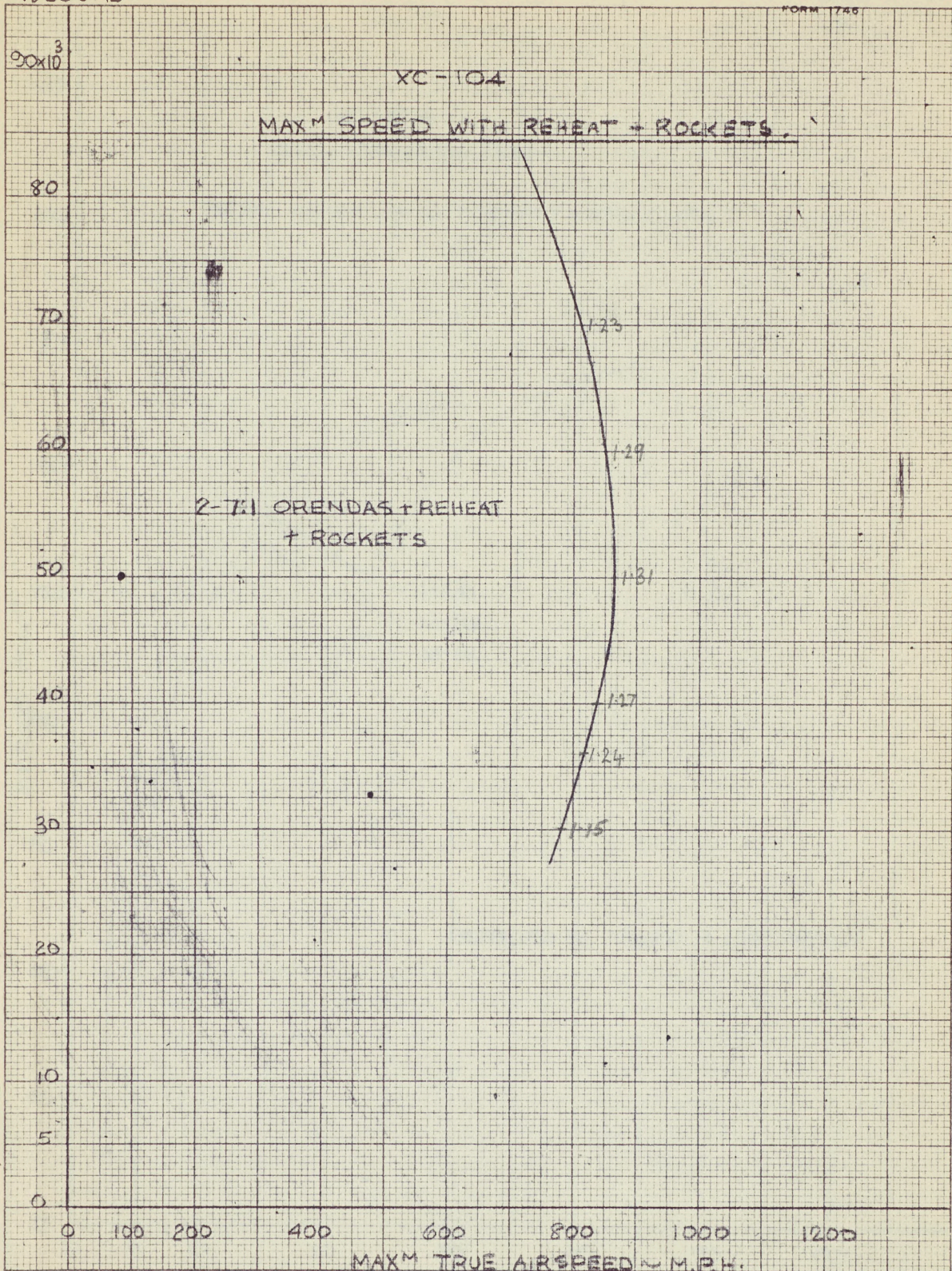
REPORT No.

A. U. W. 48000 lb

DATE

PREP. BY A. ROSE

FORM 745



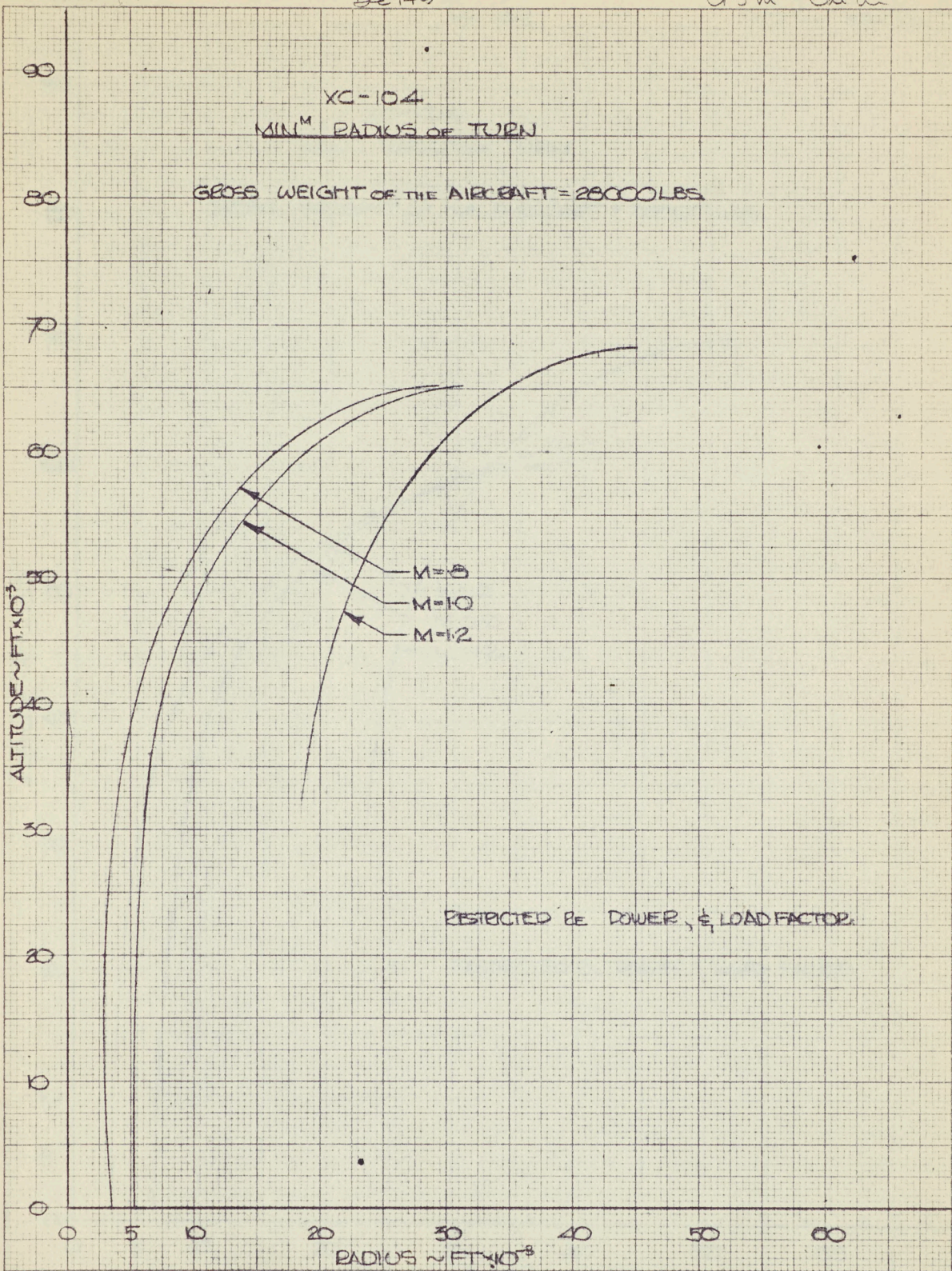
KEUFFEL & ESSER CO., N. Y. NO. 359-12
 10 X 10 in. 1/2 inch grid
 MADE IN U.S.A.

Dec 140

Wm. Carter

XC-104
MIN^M RADIUS OF TURN

GROSS WEIGHT OF THE AIRCRAFT = 28000 LBS.

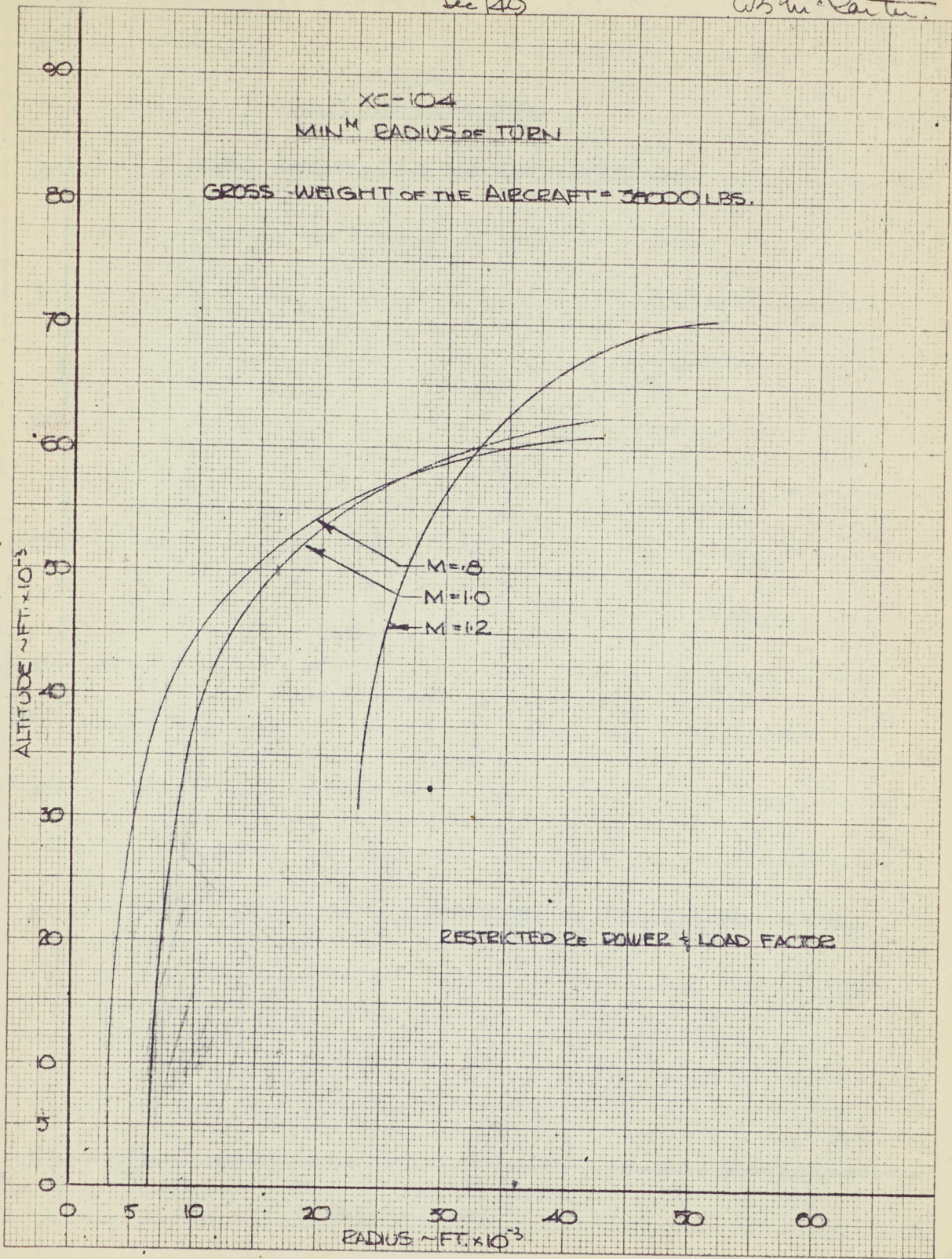


KEUFFEL & ESSER CO., N. Y. NO. 350-12
10 X 11 1/2" 5 inch grid
MADE IN U.S.A.

RESTRICTED BY POWER & LOAD FACTOR

Dec 140

W. B. Carter



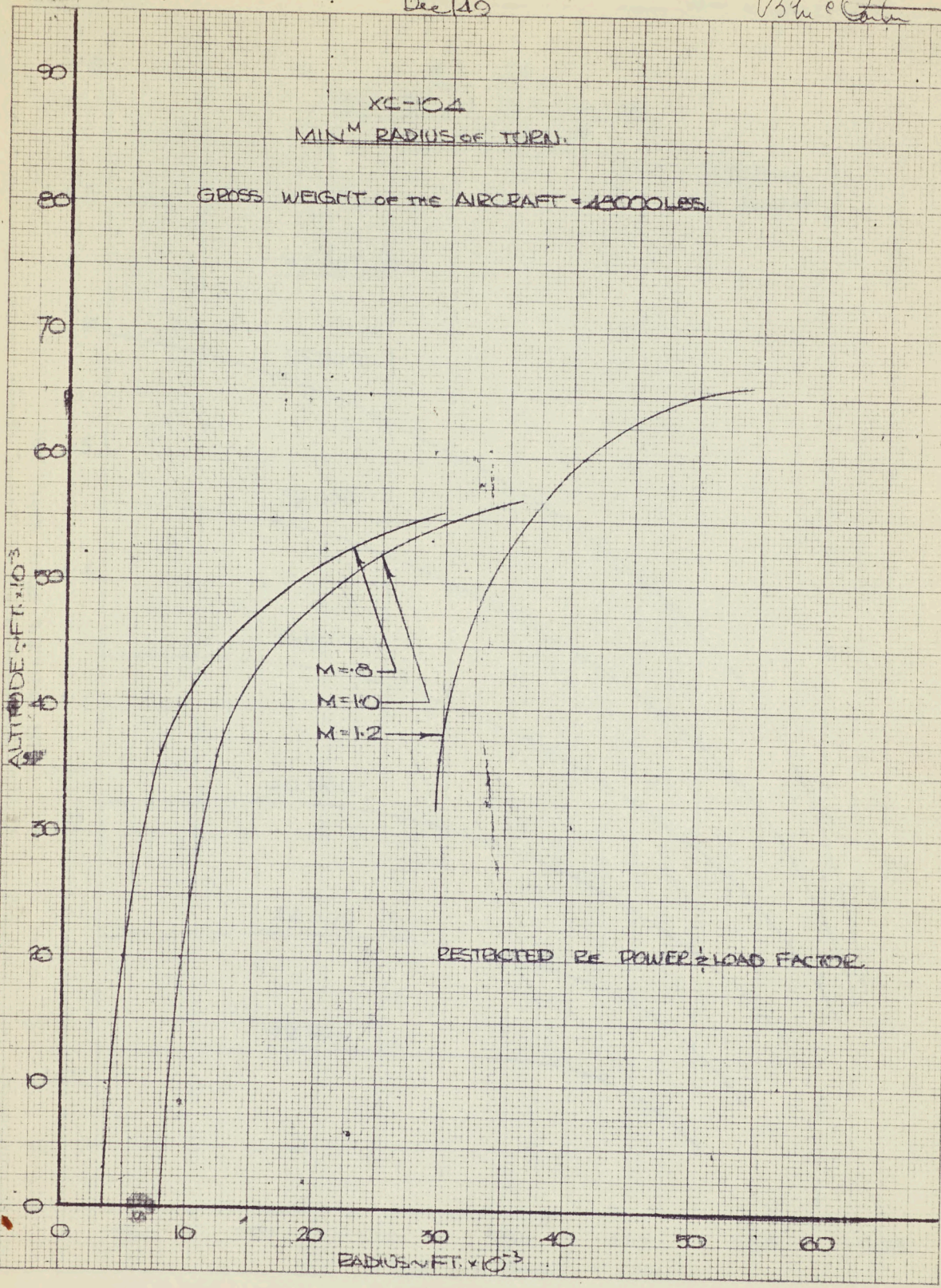
KEUFFEL & CO., N. Y.
10 X 10 (1)
INCORPORATED
L. I. N. Y. S. A.

Dec 19

V. B. e. Carter

XC-104
MIN^M RADIUS OF TURN.

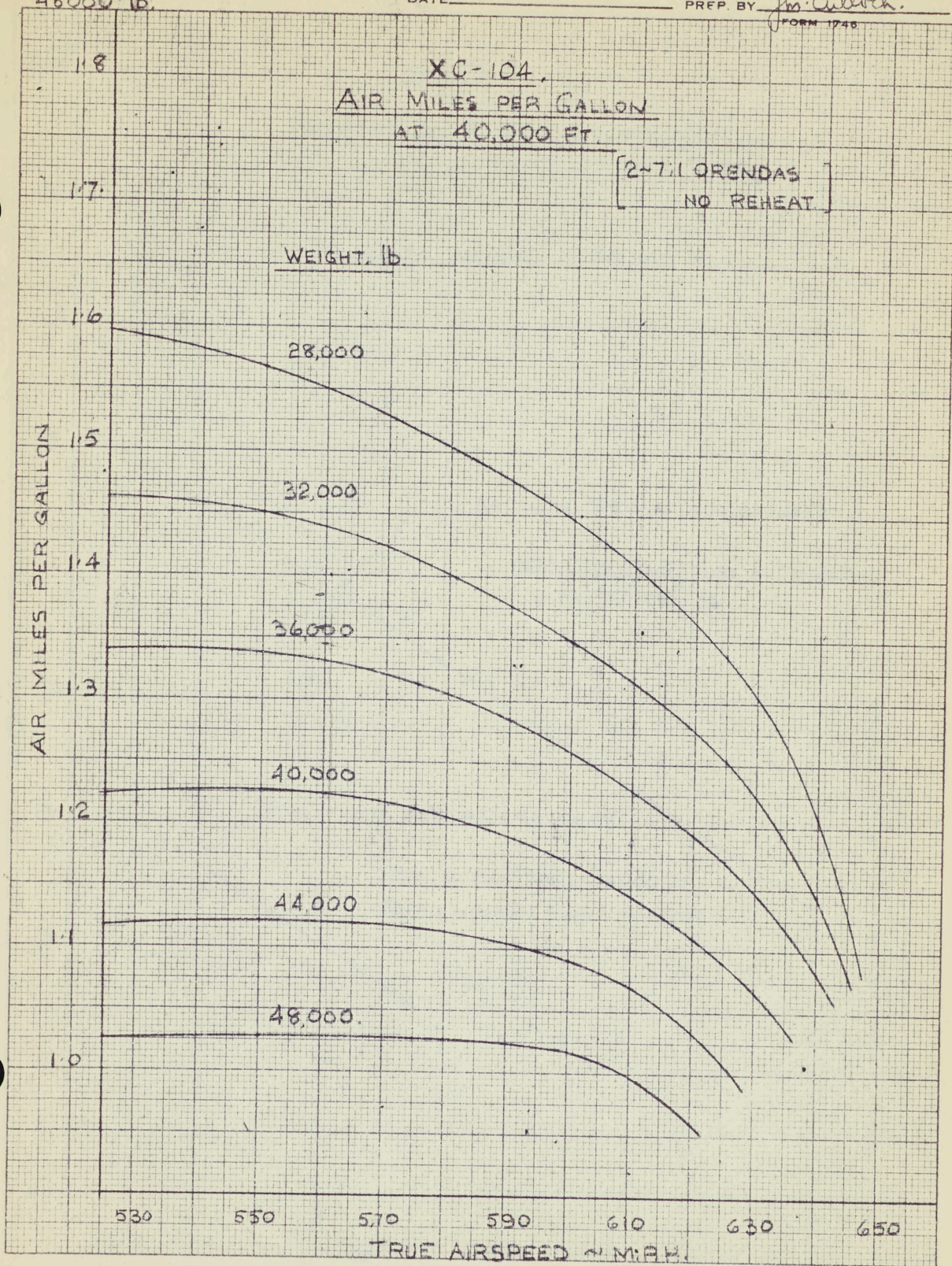
GROSS WEIGHT OF THE AIRCRAFT = 48000 LBS.

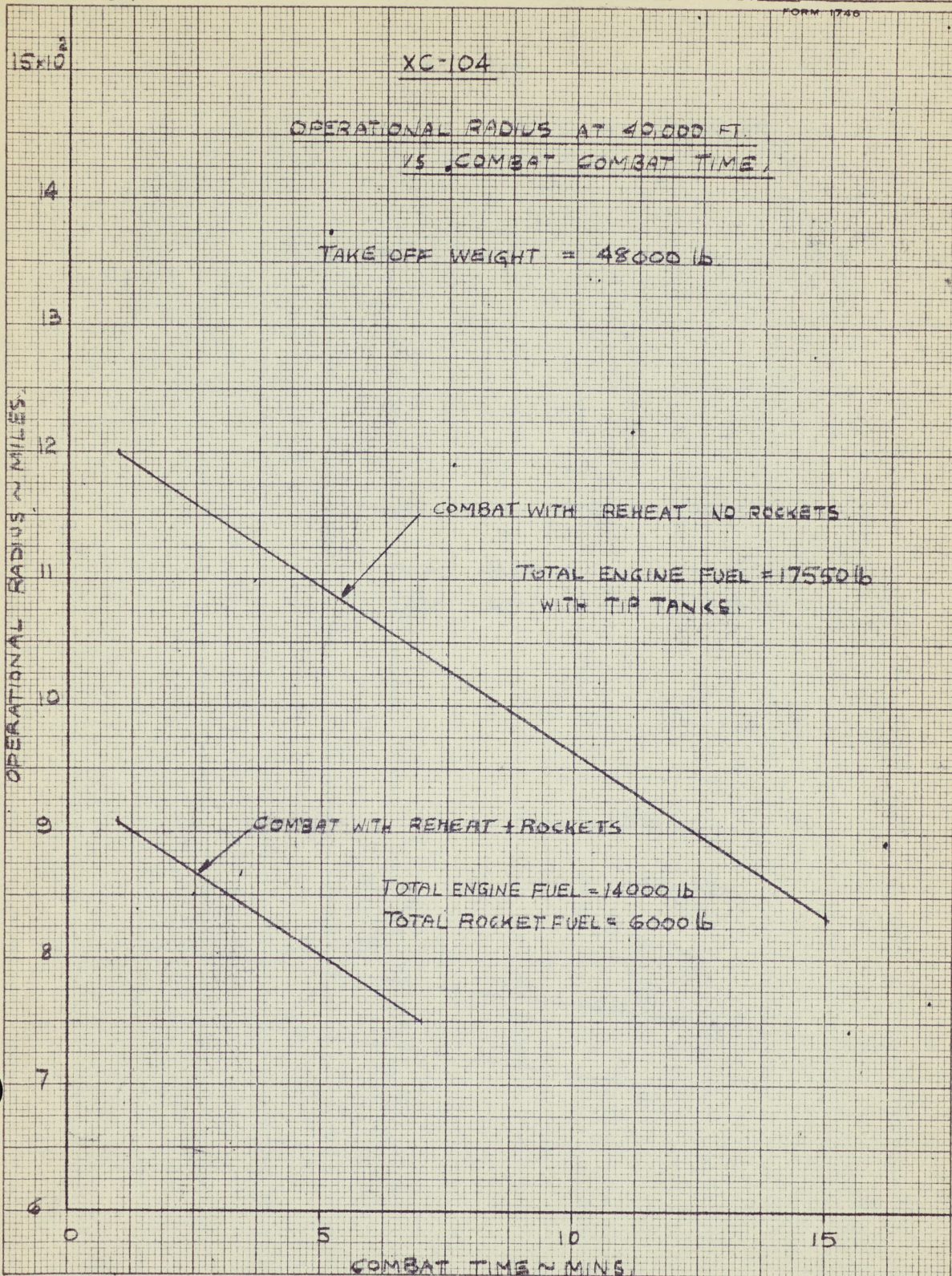


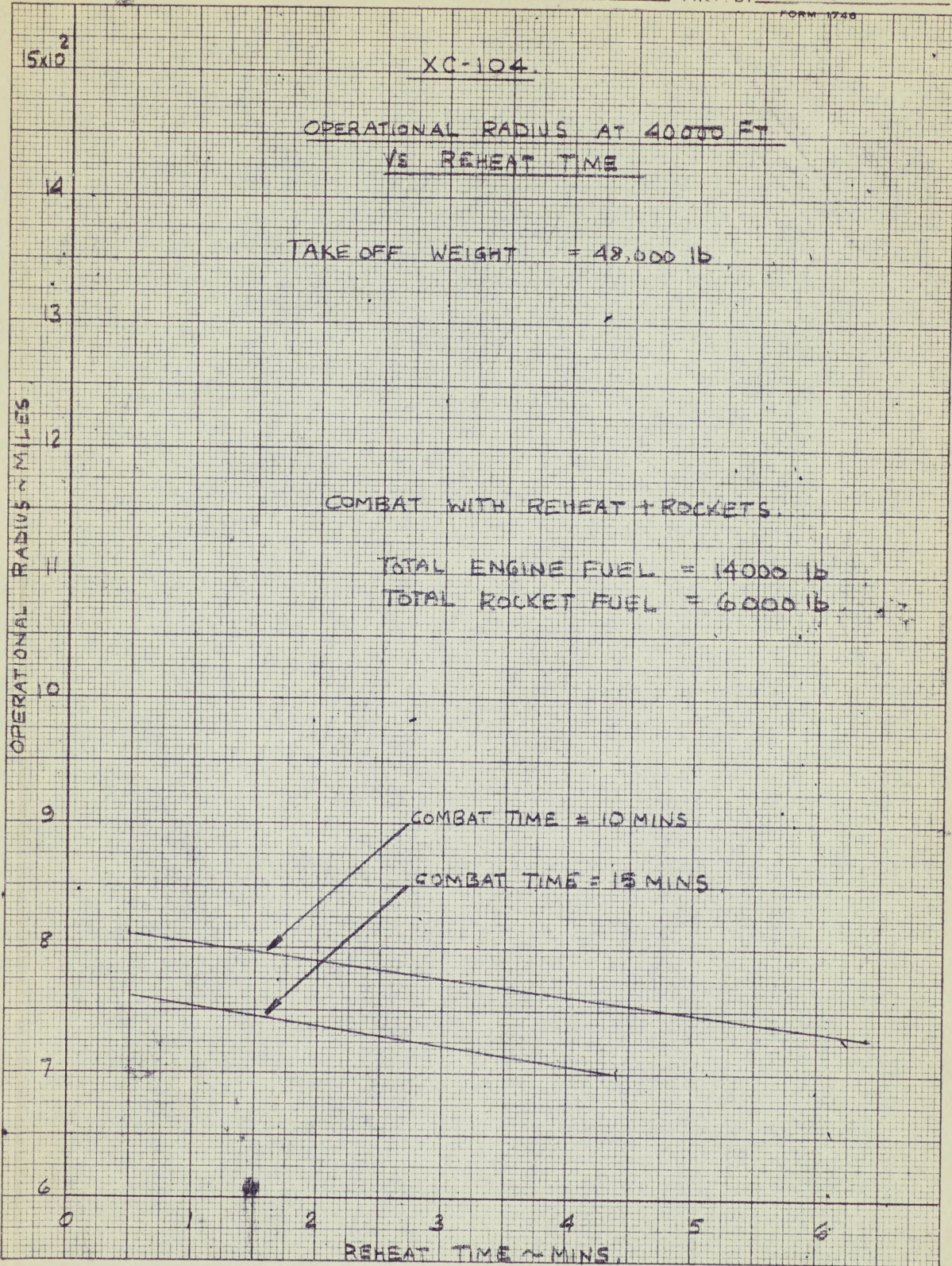
RESTRICTED RE POWER = LOAD FACTOR.

KEUFFEL & ESSER CO., N. Y. PNO. 330412
10 x 10" 1/4 inch grid, 100 squares
MADE IN U.S.A.

48000 lb.







KEUFFEL & ESSER CO., INC. NO. 359-12
 10 X 10 IN. GRID PAPER
 MADE IN U.S.A.

WHEATON
MADE IN U.S.A.