

MAIN FILE No. 10382C-80 T.D. No. 8230

DEPARTMENT OF NATIONAL DEFENCE

AIR FORCE TEMPORARY DOCKET

100

T.D. No.

103862-20

बुधवार

[illegible]

..000001 ..

IN REPLY PLEASE QUOTE

No. 1038EC-13-1 (ENG)

Department of National Defence

Royal Canadian Air Force

P.O.Box 6087,
Montreal, Que.
14 Aug 58

Ref: TSD 1038EC-13-1(ENG) 30 Jul 58

8230

Chief of the Air Staff,
Air Force Headquarters,
Ottawa, Ontario.

Attention: CAE/DAEng

CC-109 Aircraft - Range/Payload
Performance for the 40 seat Version

Refer	<i>DA Eng</i>
...	AUG 18 1958
File No.	1038EC-80
Chg'd to	RTCL-3 3/6/58

1 Enclosed are ^{FIVE} ~~six~~ copies of Canadair Aerodynamic Memorandum #AM-66-13 dated 6 Aug 58, which presents the latest information on the a/n subject.

2 It is to be noted that the previous issue of such information, Canadair Aerodynamic Memorandum #AM-66-6 dated 30 Apr 58, has a performance basis taken from Canadair Aerodynamic Memorandum #AM-66-2 dated 15 Apr 58, which in turn was based on two-engined flight test drag data obtained from Napier Technical Note on the single engine climb performance of the Eland Convair, dated 12 Aug 57, with curves plotting two engines drag.

3 The enclosed Memorandum represents the best analysis possible at this time by Canadair of the Flight Test Data available from both Napier and C.E.P.E.

4 Comparison of the payload-range curves of AM-66-13 and AM-66-6 shows that there has been a reduction in performance over the past three months, to the following extent:

(a) At the design range of 1200 n.miles, the payload has been reduced from 8860 lb. to 8000 lb. This latter figure should be compared with the RCAF requirement of 8800 lb. at this range.

(b) At the maximum fuel point, the range has been reduced from 1730 n.miles to 1630 n.miles. The RCAF requirement here is 1700 n.miles.

5 The reasons for this deterioration in performance are outlined as follows:

(a) Drag.
The original Napier analysis of its flight test data ignored net jet thrust, so giving an optimistic figure for aircraft drag.

(b) Engine specific fuel consumption.

This has increased by 2% compared with AM-66-6.

REFERENCED LETTER PLACED ON

.....2

1038EC-80...TD.8.2.13-8212

AND PASSED TO...D.A.Eng

- 2 -

CAS
AFHQ


1038EC-13-1 (ENG)

14 Aug 58

(c) Aircraft operating weight empty.

This has changed from 35,610 lb. to 36,000 lb, a net increase of 390 lb. This has resulted from the improved definition of the equipment to be carried. Weight savings of about 720 lb. have been rejected during this period, on cost grounds.

6 The above has been forwarded to keep AFHQ fully informed and as additional information becomes available you will be advised accordingly.


(C.I. McKinstry) F/L
for Detachment Commander,
1102 TSD,
Canadair Ltd.

Encls. 

UNCLASSIFIED



AERODYNAMIC MEMORANDUM NO. AM-66-13

DATE August 6th, 1958.

SUBJECT PAYLOAD RANGE CURVE WITH NAPIER ELAND 506A ENGINES

MODEL NO. CL-66B

SUMMARY

A payload range curve is presented for the CL-66B aircraft fitted with Napier Eland 506A engines.

The latest engine data (Ref.1) and drag data (Ref.2) are used.

The RCAF requirement of 8800 lb. payload at 1200 n. mi. with a take-off weight of 57,500 lb. is not met. The payload at 1200 n. mi. is short by 800 lb.

BASIC DATA

2.1 Weight Data

Take off gross weight	57,500 lb.
Max. fuel weight (2150 Imp. Galls)	16,770 lb.
Max. zero fuel weight	45,000 lb.
Max. landing weight	50,670 lb.
Operating weight empty	36,000 lb.

The fuel tankage is based on the latest Airesearch calibrations of the outboard and inboard fuel tank arrangements. This information has been obtained from the Power Plant Section.

2.2 Engine Data

JP4 fuel has been used. The installed engine performance and jet thrust have been obtained directly from Ref. 1 and an allowance of 70 S.H.P. per engine has been made for auxiliaries.

2.3 Aerodynamic Data

The drag-polar $C_D = .0252 + .0308 C_L^2$ from Ref. 2 has been used for level speed estimation. The fuel used and distance covered in climb and descent, and the fuel used for holding have been obtained from Ref. 3. Propeller efficiencies have been estimated using the S.B.A.C. method.

2.4 Reserve Fuel Allowances

The reserve fuel allowances are based on the following: 300 n.mi. diversion at 20,000 ft., descent to 5,000 ft., 45 minutes loiter at 5,000 ft. and 5% of initial fuel to allow for navigational errors.

AUG 6 1958

-2-

UNCLASSIFIED
AM-66-13

3. DISCUSSION

The payload range curve presented on page 3 is for a constant cruise altitude of 20,000 ft., under standard day conditions.

The average cruise speed is 249 Kts TAS at a cruising RPM of 11,500.

4. REFERENCES

1. Model Specification of Napier Eland 506A turbo-Prop
PS 141A/9 June 1958.
2. Canadair Aerodynamic Memorandum AM-66-7.
Cruise Drag Polar from Flight Test Results, dated June 5th, 1958.
3. Napier Eland Convair Turbo-Prop Transports for the R.C.A.F.
Publication 284.

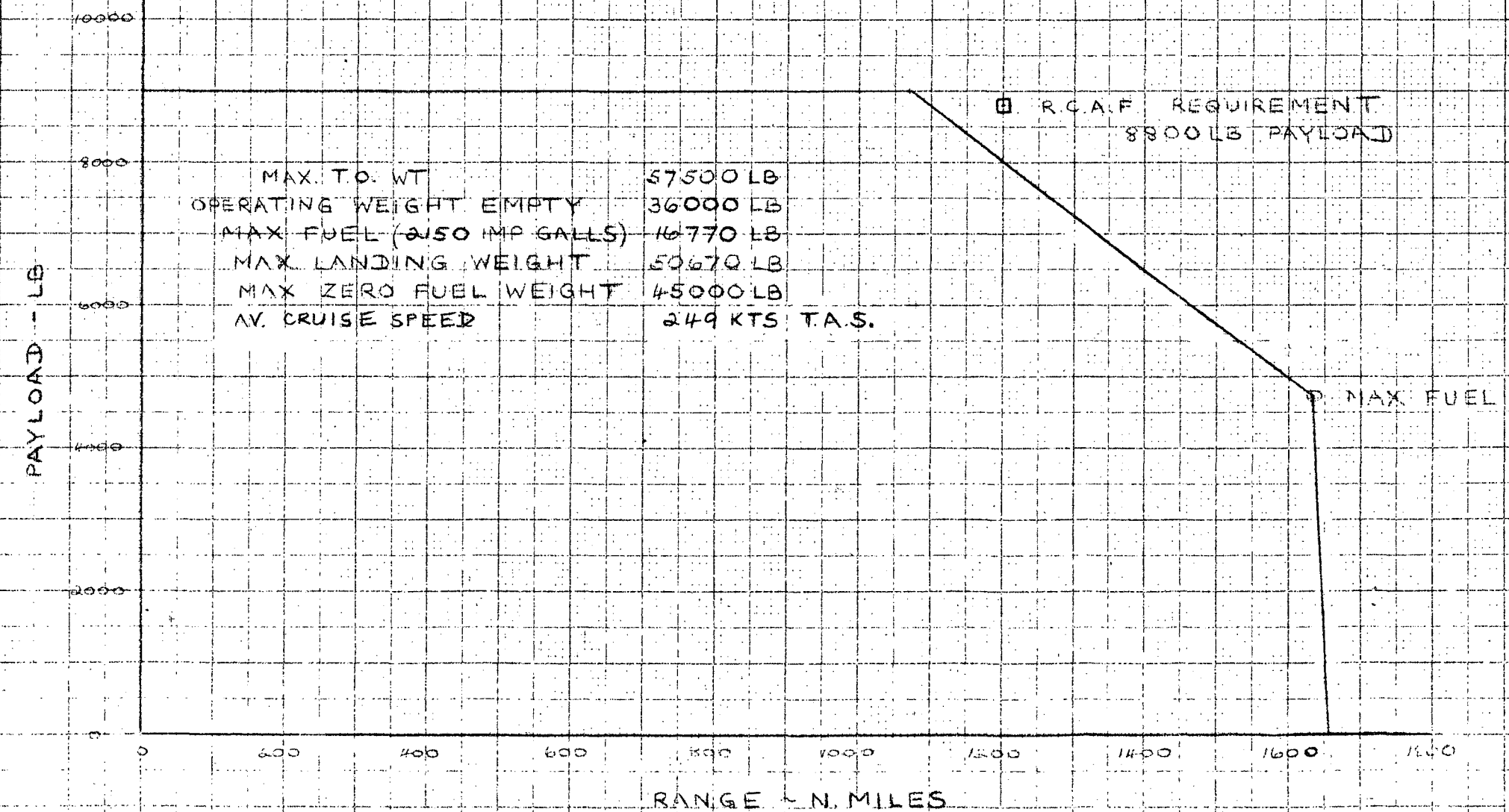
DISTRIBUTION

W. K. Ebel
B. J. Kaganov
E. H. Higgins
M. J. Shaffer
K. H. Larrison
T. A. Harvie
S. J. Pope (1+6 RCAF)
R. J. Hebert
S. Bernstein
E. McConachie
R. J. Ross
W. C. Langlois
J. K. Turek (2)

000005

CL-66B
MILITARY MISSION
NAPIER ELAND ENGINE (G.R. = .0912)
DE H. 62950 SZ PROPELLER (A.E. 121)

- GENERAL NOTES
1. TAKE-OFF FUEL ALLOWANCE 5 MINS AT MAX CONTINUOUS POWER
 2. CLIMB TO CRUISE ALTITUDE
 3. CRUISE AT 20000FT
 4. RESERVE FUEL FOR A 300NM DIVERSION: CRUISE AT 20000FT, DESCEND TO 5000FT AND HOLD FOR 45 MINS. AT 5000FT
 5. AN ALLOWANCE OF 5% OF INITIAL FUEL LOAD HAS BEEN MADE TO ALLOW FOR NAVIGATIONAL ERRORS
 6. MINIMUM ENGINE PERFORMANCE FROM BROCHURE PS-141A/4
CRUISING RPM=11500 ENGINE N.E.L. 526A
- PARTICULAR NOTES
1. DRAG DATA FROM AERODYNAMIC MEMO AM-66-7
 2. FUEL TYPE JPM



CL-66B	AM 66-13	PAGE 3	OF
STILL AIR RANGE (ISA)			
CANADAIR LIMITED			
MONTREAL			
CALC. K.P.	REVISED DATE	JOB NO.	
CHECK FMK	5/8/13		
APR.			
APR.			

F.16766