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A.P. 4700A, B, D-O.D.

MASTER

OPERATING DATA

LIGHTNING

2 X AVON MK. 210 ENGINES

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AL.13, NOVEMBER 1975

LIGHTNING F.
Mks.1,1A, 2&T.Mk.4
AIRCRAFT
(2x AVON Mk.210 ENGINES)
OPERATING DATA MANUAL

BY COMMAND OF THE DEFENCE COUNCIL

Michael Caw

MINISTRY OF DEFENCE

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NOTE TO USERS

This information is subject to the Limitations and Restrictions on aircraft and engine speeds and on all-up-weight given in Pilot's Notes and must be used in conjunction with these.

IMPORTANT

Comments, queries and any questions on the information contained in this Publication should be addressed directly to:

The Officer Commanding,
Royal Air Force Handling Squadron,
Boscombe Down,
Salisbury,
Wiltshire,
SP4 OJF.

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34		
35		
36		
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38		
39		
40		
41		
42		
43		
44		
45		
46		
47		
48		

LIST OF CONTENTS

- PART 1. CORRECTION CHARTS
- PART 2. TAKE-OFF
- PART 3. CLIMB
- PART 4. CRUISE
- PART 5. TACTICAL
- PART 6. DESCENT
- PART 7. APPROACH & LANDING
- PART 8. MISCELLANEOUS

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Comments and suggestions should be forwarded to
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INTRODUCTION

The performance information in this book, subsonic and supersonic, applies to Lightning F Mk.1 and F Mk.2 with two Avon 210 engines, also to the F Mk.1A when the refuelling probe is not fitted. The subsonic data up to 0.9M applies also to the F Mk.1A and T Mk.4. ~~Supersonic~~ data for the T Mk.4 have been added on coloured sheets placed opposite the corresponding data on the white sheets, and distinguished by the affix T to the figure number.

The data are given primarily for two configurations, aircraft + ventral tank and aircraft + ventral tank + 2 Firebreaks for which the abbreviations VT and VT + 2F have been used. The data must be regarded as provisional until further tests have been made.

Unless otherwise stated all information is based upon the International Standard Atmosphere (I.S.A. or I.C.A.O.). In data for non-standard temperatures height refers always to altimeter, or pressure height, not geometrical height. Fuel is assumed to be AVTAG at a specific gravity of 0.76 corresponding to specification D. Eng. RD. 2486 (in practice the specific gravity of this fuel may vary between 0.751 and 0.802 at 15°C).

Presentation of data : carpet graphs

The figures have been made as self-explanatory as possible; notes and examples are provided where necessary. In some cases the graphical data have been presented in the form of 'carpets' to separate the individual curves and to assist interpolation to intermediate values of the variables.

The advantages of this form of presentation will be clear from the following example taken from fig.3.2 in the Climb Section.

In this case the horizontal (*time*) scale is 1 large square to 1 minute and the vertical (*height*) scale is 1 large square to 10,000 ft. If the three curves were plotted on the same axes they would lie close to each other. To form the 'carpet' graph the curve for a temperature of I.C.A.O. + 20°C has been lowered 1 square and that for I.C.A.O. - 20°C has been raised 1 square. Then points corresponding to the same height on adjacent curves are staggered at vertical intervals of 1 large square. This fact is used to draw curves for varying temperature at constant height (*with a temperature scale of 1 large square to 20°C*) as shown. We now have two intersecting families of curves, one family showing the effect of height at various temperatures, the other showing the effect of temperature at various heights, forming a 'carpet' from which the performance at any temperature and height can be obtained.

Then, for instance, the time to climb to 34,000 ft without reheat in an atmosphere in which the temperature is I.C.A.O. - 16°C would be obtained as follows. First, a curve is drawn through the points corresponding to 34,000 ft on the three curves for I.C.A.O. + 20°C, I.C.A.O. and I.C.A.O. - 20°C. Then a second curve is drawn through the point corresponding to I.C.A.O. - 16°C on each of the curves for constant height. The point where these two curves intersect gives the required conditions, and it will be seen that it takes 2.3 minutes to climb to 34,000 ft.

Other examples of the use of 'carpets' are given in the Climb Section.

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for LIGHTNING F.MKS. 1, 1A, 2 & T. Mk. 4 AIRCRAFT

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Remove and destroy the existing Title Card and insert new Title Card attached.

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