Safety Regulation Group

Civil Aviation Authority

CAP 554

BCAR Section B

Airworthiness Procedures Where the CAA Does Not Have Primary Responsibility for Type Approval of the Product

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25 February 2008

ISBN 978 0 11790 997 7

Issue 6, 31 January 2003
Issue 6 incorporating amendment 1, 21 November 2003
Issue 6 incorporating amendment 2, 25 February 2008

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The latest version of this document is available in electronic format at www.caa.co.uk, where you may also register for e-mail notification of amendments.

Published by TSO (The Stationery Office) on behalf of the UK Civil Aviation Authority.

Printed copy available from:
TSO, PO Box 29, Norwich NR3 1GN
Telephone orders/General enquiries: 0870 600 5522
Fax orders: 0870 600 5533
www.tso.co.uk/bookshop
E-mail: book.orders@tso.co.uk
Textphone: 0870 240 3701

Amendment Record

Amendment Number	Amendment Date	Incorporated by	Incorporated on
2	25 February 2008	CAA	25 February 2008

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Revision History

Issue 6, amendment 1 21 November 2003

The purpose of this Amendment 1 to Issue 6 is to publish BCAR Working Draft Papers 913, 914, 915, 916, 917, 919, 920, 921, 922 and 923 as Requirements together with editorial changes convenient to be incorporated at this time.

Pages dated '31 January 2003 (Corr.)' indicate pages that have been corrected as a result of errors in the original 31 January 2003 issue. This indicates changing all occurrences of Constructor to Manufacturer in order to bring BCAR B into line with ICAO terminology. Marginal lines have been included to highlight where the corrections are.

Technical Changes

The following Chapters have been amended as shown:

Chapter	Description
Foreword	A caveat has been added to the Foreword to clarify that BCAR B does not apply to those aircraft that have been the responsibility of the European Aviation Safety Authority since 28th September 2003.
B1-2	'NOTE' in 2.1.2 amended to reflect recent changes to the Air Navigation Order.
B2-5	Deletion of the word 'instruments' from paragraph 1.1.
B2-3	Deletion of incorrect reference from paragraph 2.
B3-4	Incorporating Paper No 919. Updated to reflect current practices and LAMS 1999, there are no changes to the requirements. Editorial changes to clarify the text have also been embodied.
B3-5	Incorporation of Paper 913. Addition of new text to paragraph 1.3 a) ii) which focuses the concentration of airworthiness flight testing on older aircraft where more significant problems have been found to lie, as well as moving the previous NOTE to become a continuation of 1.3 a) ii) rather than a separate NOTE.
B3-11	Change of contact details in paragraph 1, removal of incorrect inform ation in paragraph 2.1 and removal of old contact name in paragraph 5.
B5-3	Deletion of an old reference from paragraph 5.1 d).
B5-6	Deletion of reference to cancelled material.
B5-7	In paragraph 9.3 reference to MMELs being 'despatched' has been removed, MMELs are now available on the CAA website. In paragraph 9.5 TRs are also now available via the CAA website, they are not necessarily accompanied by a 'list of effective Temporary Revisions' as the TRs themselves are incorporated in the MMEL download. TRs are no longer published on yellow paper.
B6-2, Appendix 1	Deletion of reference to cancelled material.
B6-4, Appendix 1	Deletion of paragraph reference from the title in paragraph 1.
B6-5	Change of cross-reference in paragraphs 1.3, 3 and 5.

B7-6	Insert new cross-reference in paragraph 3.
B7-10	Deletion of paragraph reference in title of paragraph 3.
A8-7	Deletion of reference to cancelled material.
A8-9 and its appendices	Incorporation of Paper 916. Changes made to increase clarity of existing text.
A8-15	Incorporation of Paper 917. This Chapter has been amended to reflect current practices. It now refers to the Groups I and II, and Procedures 1 and 2 of Chapters A3-4(B3-4). A reference to CAP 520 "Light Aircraft Maintenance", has been added.
A8-16	Deletion of cancelled reference.
A8-20	Incorporation of Paper 923.
A8-20, Appendix 1	Incorporation of Paper 922.
A8-20, Supplement 1	Incorporation of Paper 920.
A8-20, Supplement 2	Incorporation of Paper 921.
A8-20, Supplement 3	Incorporation of Paper 914.
A8-20, Supplement 4	Incorporation of Paper 915.

Issue 6, amendment 2 — 25 February 2008

The purpose of this Amendment 2 to Issue 6 is to withdraw the Supplement to Section B, Sub-Section A8 Approvals. Editorial changes convenient to be included at this time have also been incorporated.

Technical Changes

The following Chapters have been amended as shown:

Chapter	**Description**
Explanatory Note	The 'Explanatory Note' has been replaced by a 'Revision History', to keep the format in line with Civil Aviation Publications.
Foreword	NOTE b) to paragraph 1 deleted as no longer applicable and subsequent sub-paragraphs renumbered. NOTE c) to paragraph 1 updated to include reference number to European Commission Regulation (EC) No. 2042/2003. Paragraph 3.1 reference to Air Navigation Order updated to 2005. Paragraph 6.2 deleted as no longer applicable. Paragraph 8 word 'England' changed to 'UK'.
B1-2	Amended to reflect changes in Categories of Certificates of Airworthiness and update cross references to the Air Navigation Order.
Supplement to Section B	The Supplement to Section B, Sub-Section A8 Approvals, has been withdrawn. Sub-Section A8 is published in CAP 553, BCAR Section A. Copies are available from the CAA website at www.caa.co.uk/CAP553 Details for purchasing printed copy are given on the reverse of the inside cover of this publication.

Foreword

1 Effects of EASA

The following procedural requirements are applicable to all those aircraft and products for which British Civil Airworthiness Requirements are NOT superseded by Regulation (EC) No. 1592/2002 of the European Parliament and of the Council of 15 July 2002, or any Implementing Rules made under that Regulation.

For those aircraft and products for which an EASA Type Certificate has been issued, EASA Implementing Rule Part 21 provides the relevant procedural requirements.

NOTE: The CAA interprets that these British Civil Airworthiness Requirements apply only to those aircraft:

a) excluded from the EASA scope by Article 1 and Annex II of Regulation (EC) No. 1592/2002; or

b) those to which any derogation to national regulations applies under European Commission Regulation (EC) No. 1702/2003 "the Certification Regulation"; or

c) those to which any derogation to national regulations applies under European Commission Regulation (EC) No. 2042/2003 "the Continuing Airworthiness Regulation" established under Article 7 of the Regulation up until 28 September 2008.

2 Purpose

British Civil Airworthiness Requirements (hereinafter referred to as the "Requirements") of which Section B is a constituent part, are published by the Civil Aviation Authority (hereinafter referred to as the "CAA"). They comprise minimum requirements and constitute the basis for the issue of approvals and certificates required by the current Air Navigation Order.

3 General

3.1 It is the policy of the CAA to exercise its various discretionary powers by reference to certain documents with a view to ensuring effective implementation of International Civil Aviation Organisation (ICAO) standards. In order to ensure that all these ICAO standards are reflected in UK aviation legislation, this ICAO compliance statement to BCAR Section B (CAP 554) is issued.

This BCAR Section B (CAP 554) is published in support of the powers of the CAA contained in Part 3 of the Air Navigation Order 2005 as amended.

The document includes international standards contained in Annexes to the Chicago Convention.

It is the policy of the CAA to have reference to this document when exercising the discretionary powers referred to above and in particular it will normally exercise those powers so as to ensure effective implementation of any such international standards.

3.2 Compliance with the procedures in Section B is, normally required. The CAA may accept proposals to vary the procedures in a particular case, provided such variations give, at least, an equivalent level of safety to that intended by the requirements.

3.3 Section B contains Certification and Approval procedures for products, first certificated by an Authority other than the CAA, for which UK Certification or Approval is required. In this case, although CAA has responsibilities under the ANO in relation to the operation of such products on the UK Register, certain primary responsibilities defined in ICAO Annex 8 are those of the Authority of the State of Design.

NOTE: For products first certificated or approved by the CAA, for which the CAA has primary responsibility as the Authority of the State Design. BCAR Section A contains Certification and Approval procedures. This responsibility is of particular significance in relation to ensuring the continued airworthiness of the product in operation, whether in the UK or elsewhere.

3.4 Major aviation products are increasingly those of collaboration between manufacturers of more than one country. Nevertheless it remains important, particularly in the context of continued airworthiness, that the primary responsibility be identified with one Authority. The Procedures of Section A and B are intended to cover these circumstances.

3.5 Reflecting the collaborative nature of manufacture, the functions of the National Authorities are often also undertaken jointly or in collaboration. The provisions of Bilateral and Multilateral Agreements and Arrangements between nations on airworthiness matters have been developed more extensively and BCAR Sections A and B take account of the related procedures at least in principle; the details of these procedures have so far varied significantly according to the particular arrangements within which a project is undertaken.

3.6 Supply of Material to the CAA. Where, in compliance with the requirements, material (e.g. manuals, documents) is required to be sent to the CAA, the consignor shall ensure, before despatch, that he has paid, or has arranged to pay, all charges necessary to cover delivery of the material to the CAA Safety Regulation Group, at the address given at the end of this FOREWORD, in writing, without any charge to the CAA. (Free Domicile.).

4 Interpretation

4.1 The Requirements, with or without explanatory matter, should not be regarded as constituting a text book of current aeronautical knowledge. The interpretation of the Requirements against a background of such knowledge is essential.

4.2 Where necessary Appendices are supplied which provide acceptable interpretation of requirements, state recommended practices, or give additional information.

4.3 Some of the Chapters in Section B include Supplements which contain technical procedures applicable to the subjects in the associated Chapters.

4.4 Mandatory clauses are invariably denoted by the use of "shall" or "must"; "should" or "may" are used in the text to introduce permissive or recommended clauses.

4.5 Imperatives such as "ensure", "prevent" and "shall be designed", imply that the applicant, before claiming compliance with the requirement in question, will take all the steps that are deemed to be necessary in the light of the knowledge and techniques available at the time.

4.6 It is implicit in requirements expressed qualitatively (e.g. "readily visible", "adequately tested", etc.) that the CAA will adjudicate in cases where doubt exists.

5 Editorial Presentation

5.1 Section B is divided into seven Sub–sections numbered consecutively. The Sub–sections are further divided by subjects into Chapters, the numbering of each Chapter being associated with its Sub–section (e.g. Sub–section B2 contains Chapters B2–1, B2–2, etc.).

5.2 A list of the subjects and the numbers of the Chapters is given in the CONTENTS.

5.3 A system of progressive paragraph numbering is used, the number of digits being kept to a maximum of three by associating the system with paragraph headings. A paragraph heading applies to all succeeding paragraphs until another titled paragraph with the same, or a smaller number of digits occurs.

6 Amendment and Issue

6.1 The printed version of the Section, which is identified by an Issue No. and date (e.g. Issue 1 dated 1st July, 1989) will be deemed to be amended by each BCAR Amendment appropriate to the Section which is issued subsequent to the date of Issue of the printed version.

6.2 Material differences from the previous issue of each page are indicated with a marginal line.

6.3 The issue or revision date is shown at the foot of each page.

The significance of the wording is as follows:

a) **Date (in format dd Month yyyy)** – The first version to appear in the Section;

b) **Revised (date)** – Revisions, indicated by marginal lines, have been introduced at the revision date;

c) **Reissued (date)** – The text on the page has not changed from the previous issue or amendment, but the page has been reissued because of movement of text on the page.

NOTES: 1 In some instances although a Chapter has been revised and is annotated accordingly it may not have been necessary to make any amendment to its Appendix or Supplement, in such cases the Chapter and its Appendix or Supplement would bear different dates.

2 Pages that bear the issue date and the abbreviation 'corr.' indicate pages that have been corrected due to errors in the original issue.

7 Effective Date

New requirements and amendments in BCAR Amendments are effective from the date printed on them.

8 Applications and Enquiries

Applications for permission to reproduce any part of the Requirements and any enquiries regarding their technical content should be addressed to the CAA Safety Regulation Group, Aviation House, Gatwick Airport South, West Sussex, RH6 0YR, UK. This address should be used when requesting forms or when making applications for Certificates of Airworthiness, etc., and any services normally rendered by the Safety Regulation Group.

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Sub-Section B1
General

Chapter B1-2 Categories of Aircraft

1 Introduction

The Certificate of Airworthiness or Permit to Fly imposes conditions affecting the manner in which an aircraft may be maintained and operated, and the purposes for which it may be used. The conditions are imposed in the following manner:

a) By placing an aircraft in Categories which indicate the uses for which the aircraft is Approved;

b) By indicating either in the Certificate of Airworthiness or Permit to Fly or in their associated documents the detailed limitations which must be observed.

2 Categories and Purposes

2.1 The categories in which an aircraft may be placed are as follows:

2.1.1 **Certificates of Airworthiness**

a) Standard Category;

b) Special Category.

2.1.2 **Permit to Fly**

NOTE: A Permit to Fly may be issued or validated in respect of an aircraft, in accordance with Articles 11 or 13 of the Air Navigation Order. The CAA shall refuse the issue of a permit to fly if it appears to the CAA that the aircraft is eligible and ought to fly under and in accordance with a certificate of airworthiness.

2.2 The purposes for which the aircraft may fly are as follows:

a) **Standard Category:** Any purpose;

b) **Special Category:** Any purpose, other than public transport, specified in the Certificate of Airworthiness but not including the carriage of passengers unless expressly permitted;

c) **Permit to Fly:** Any purpose, other than public transport or unless expressly permitted aerial work, specified on the Permit to Fly.

NOTE: The Air Navigation Order Article 8(2)(e) restricts an aircraft in the respect of which a Permit to Fly has been issued to flights beginning and ending in the United Kingdom. The CAA may consider granting an exemption under Article 153 from this part of the Order.

Flights over or into another country by an aircraft in respect of which either a Special Category Certificate of Airworthiness or a Permit to Fly has been issued and, in the case of a Permit to Fly, an exemption has been granted, will normally require the permission of the Authority of that country.

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Sub-Section B2
Approval of the Type Design

Chapter B2-2 Type Certification

1 Introduction

1.1 A Type Certificate issued by the CAA constitutes a statement that the design of the aircraft type to which the Certificate refers and of the variants specified on the Data Sheet has been Approved by the CAA.

1.2 Applicants for the UK Certification of foreign constructed aircraft should be aware that, in accordance with the requirements of BCAR Section B, all such aircraft, irrespective of their size, will normally be subject to investigations by the CAA in order to establish, taking into account their design, construction, modification standard and original certification basis, that a level of airworthiness equivalent to that provided by United Kingdom airworthiness standards has been met. However, in order to achieve this, the principles of granting UK Type Certification by accepting (validating) the certification approval granted by the Authority of the state of manufacture, will be used as far as possible. The degree by which the certification of the Authority of the state of manufacture can be taken account of, and the amount of additional CAA investigation required, will depend on various criteria as covered in 4.1, 4.2 and 4.3. The CAA will also require knowledge of the arrangements for post-certification design support in order to be satisfied that this airworthiness standard may be expected to be sustained after certification.

1.3 When a UK Type Certification has been granted, all aircraft of a type which conform to the defined standard would qualify for a Certificate of Airworthiness, provided the condition of the aircraft concerned was acceptable to the CAA.

2 Scope of Application of the Type Certificate

The issue of a United Kingdom Type Certificate is a pre-requisite to the issue of a Certificate of Airworthiness in the Transport, Aerial Work or Private Category (see Chapter B1–2) for an aircraft of more than 2730 kg maximum authorised weight, where an aircraft of that type has not previously been issued with a United Kingdom Certificate of Airworthiness in that category. Where it is not intended to apply for a Certificate of Airworthiness, the CAA will issue a Type Certificate for type designs of aircraft of more that 2730 kg maximum authorised weight, subject to the appropriate requirements being met.

NOTE: The CAA will not normally issue Type Certificates for aircraft where maximum authorised weight is 2730 kg or less, or for a type of aircraft of which examples have previously been issued with a United Kingdom Certificate of Airworthiness.

3 Initial Procedure for Obtaining the Type Certificate

The application for the issue of a Certificate of Airworthiness on CA Form 3 (see Chapter B3–2) will also serve as an application for a Type Certificate. No separate application will be needed. Where the applicant is not seeking the issue of a Certificate of Airworthiness, application shall be made by letter to the CAA for the issue of a Type Certificate, and such a letter shall include an undertaking that the applicant will pay the CAA costs. Application should be made sufficiently in advance of the required certification date to allow time for the CAA investigations (including approval of the Flight Manual, see 4.4) to be completed. The CAA will, on request,

provide an estimate of the costs of an investigation, particularly where visits to a foreign manufacturer are involved.

4 Types for which a UK Type Certificate or Certificate of Airworthiness has Not Previously Been Issued

4.1 Design Investigation – General

4.1.1 The CAA investigation will be directed primarily to areas where the airworthiness standards as applied by the original certificating Authority may not in the view of the CAA, be equivalent to the UK airworthiness standards as reflected in the appropriate BCAR, JAR, CAA Airworthiness Notices, etc. Compliance with the requirements of the UK air navigation legislation in respect of mandatory equipment and operating performance will also be investigated.

4.1.2 The extent and depth of the CAA design investigation will vary according to the design features of the aircraft, including in particular the type of powerplant. (See paragraphs 4.2 and 4.3).

4.1.3 As a result of its design investigation, the CAA may prescribe Additional Requirements or Special Conditions, and the certificating Authority of the country of origin may be asked to certify that compliance with such Additional Requirements or Special Conditions has been established.

4.1.4 The associated procedures for certificating foreign engine and propeller types are contained in BCAR Chapters B4–2 and B4–4.

4.2 Design Investigation – Piston-engined Aircraft

4.2.1 Conventional piston-engined aeroplanes and rotorcraft, the Maximum Take-off Weight Authorised (MTWA) of which does not exceed 2730 kg in any Category and conventional piston-engined aeroplanes not exceeding 5700 kg in the Private Category or Aerial Work Category, which have been designed, constructed and certificated, and are likely to be supported, to airworthiness standards which the CAA accepts as being broadly equivalent to UK standards, will normally be investigated only in respect of appropriate CAA Airworthiness Notices, of Statutory requirements concerning noise certification, and of UK air navigation legislation for Transport Category certification. The engines and propellers of such aircraft types will be dealt with in the same way.

4.2.2 Aircraft as specified in paragraph 4.2.1 but having unconventional design features or which are pressurised, or are intended for aerobatics may be the subject of more detailed investigation, particularly in respect of matters related to these features.

4.2.3 For piston-engined aircraft not specified in paragraph 4.2.1 or 4.2.2 the general principles of paragraph 4.1 will be applied.

4.3 Design Investigation – Turbine-engined Aircraft

4.3.1 Turbine-engined aircraft in any certification category except for those specified in paragraph 4.3.2, will be subjected to investigation in depth in accordance with the principles of paragraph 4.1.

4.3.2 For single turbine-engined aircraft, the MTWA of which does not exceed 2730 kg, the principles of paragraph 4.1 will be applied. However, in considering the depth of the investigation (paragraph 4.1.2 above), those features of the design which are simple, conventional and similar to previously certificated types will not normally need to be investigated. However, the type will be investigated in respect of appropriate CAA

Airworthiness Notices, of Statutory requirements concerning noise certification, and the UK air navigation legislation for Transport Category certification.

4.4 **Performance and Flight Manual**

4.4.1 **Normal Design Investigation.** For aircraft (aeroplanes and rotorcraft) investigated in accordance with 4.1, a UK Flight Manual must be provided which contains the limitations, procedures and performance information in accordance with the BCAR or JAR regulations applicable to the type of aircraft being investigated. This Flight Manual will normally be produced by the manufacturer and the Authority of the state of manufacture will normally be asked to approve the UK Flight Manual on behalf of the CAA.

4.4.2 **Piston-Engined Light Aircraft (Aeroplanes and Rotorcraft) in the Private and Aerial Work Categories.** For aircraft as specified in 4.2.1 (except for those required to be certificated in the Transport Category) the Flight Manual or Pilot's Operating Handbook, as appropriate, (including all relevant supplements) which has been approved by the Authority of the state of manufacture for use on that aircraft, will be accepted by CAA without investigation.

4.4.3 **Piston-Engined Light Aircraft (Aeroplanes and Rotorcraft) in the Transport Category.** For aircraft as specified in 4.2.1 which are required to be certificated in the Transport Category, adequate information must be provided in the Flight Manual or Pilot's Operating Handbook, as appropriate, to satisfy the UK air navigation legislation. In particular, performance information shall be scheduled to satisfy the applicable performance operating rules. All other aspects of the Flight Manual, or Pilot's Operating Handbook, as appropriate, (including all relevant supplements), will be dealt with as in 4.4.2.

4.4.4 In all cases four copies of the Flight Manual or Pilot's Operating Handbook, as appropriate, are required to be submitted in English in accordance with BCAR Chapter B7–2.

4.5 **CAA Flight Testing** (See also BCAR Chapter B2–3). Regardless of the extent of the design investigation, an aircraft of the same design standard as that submitted for certification shall be placed at the disposal of the CAA so that, at its discretion, CAA test pilots may:

4.5.1 For aircraft other than those covered by 4.2.1 ,4.2.2, or 4.3.2:

a) carry out any flight tests necessary as part of the design investigation to confirm compliance with the appropriate BCAR, JAR, Special Conditions, Additional Requirements, or other regulations applicable to the type;

b) become familiar with the flight characteristics of the aircraft;

c) gain information for use in preparing CAA Airworthiness Flight Test Schedules.

4.5.2 For aircraft covered by 4.2.1:

a) carry out only those flight tests necessary to establish compliance with the relevant sections of the UK air navigation legislation when the aircraft is required to be certificated in the Transport Category;

b) accomplish items b) and c) from 4.5.1;

4.5.3 For aircraft covered by 4.2.2 or 4.3.2:

a) carry out any flight tests as for 4.5.1 a) above only as necessary to assess the special features of the design which are subject to detailed investigation;

b) carry out flight tests as for 4.5.2 a) above as necessary when the aircraft is required to be certificated in the Transport Category;

c) accomplish items b) and c) from 4.5.1.

4.6 **Post-Certification Design Support by Manufacturer and Certification Authority**

Unless the CAA is already aware of them, confirmation will be required of the arrangements made by the manufacturer and the Authority of the state of manufacture for providing the necessary continuing airworthiness support after certification.

5 Change of Category

5.1 Aircraft types investigated in accordance with 4.1 will be eligible for certification in any Category (Private, Aerial Work or Transport). In changing from Private to Aerial Work or Transport Category, modifications or additional equipment installations may be necessary to satisfy Airworthiness Notices or UK air navigation legislation. It is normal that the investigations carried out in accordance with 4.1 will have identified such changes.

5.2 Where a piston-engined aeroplane the MTWA of which is between 2730 kg and 5700 kg has been certificated in the Private or Aerial Work Category (in accordance with 4.2.1) and application is subsequently made for certification in the Transport Category, a design investigation (as in 4.1), flight testing and Flight Manual review will normally be necessary, as a result of which CAA may prescribe Additional Requirements or Special Conditions with which the Authority of the state of manufacture may be asked to establish compliance.

5.3 In the case of piston engined aircraft below 2730 kg MTWA certificated in the Private or Aerial Work Category, the additional design investigation necessary for certification in the Transport Category will be limited to differences arising out of the Airworthiness Notices and UK air navigation legislation.

6 Series Aircraft

Where an aircraft type has already been certificated in the UK, Series aircraft may normally be accepted without further technical investigation. However, for an aircraft to be accepted as a Series aircraft, it is essential that it and its equipment, build standard, and means of compliance with any specified CAA Special Conditions or Additional Requirements, should be demonstrated as being substantially similar to another aircraft of the type or variant thereof accepted for UK certification; significant differences must be identified and may necessitate further investigation (see 7 below).

7 Derivative and Modifications

7.1 **New Models and Derivatives**

Whenever new models or derivatives of a type previously accepted by CAA are submitted for certification, the need for any design investigation or Flight Manual review will follow the criteria and procedures in 4 and 5 above.

7.2 Modifications

7.2.1 Any modification (including STCs) incorporated on an aircraft of a type other than those investigated in accordance with 4.2.1, 4.2.2 or 4.3.2 and which has been approved by a foreign Authority, may be subject to investigation by CAA in accordance with 4.1.

7.2.2 Any modification (including STCs) incorporated on an aircraft of a type investigated in accordance with 4.2.1, which has been approved by an Authority which the CAA accepts as having airworthiness standards broadly equivalent to those of the CAA, will also be accepted without design investigation. Where such a modification is incorporated on an aircraft certificated in the Transport Category and is likely to be affected by the requirements of the UK air navigation legislation, the aircraft may be subject to a CAA inspection and the Flight Manual will be subject to review in accordance with 4.4.3 above.

7.2.3 Any modification (including STCs) incorporated on an aircraft of a type investigated in accordance with either 4.2.2 or 4.3.2 will be considered against the criteria of 4.2.2 or 4.3.2 to determine whether or not an investigation needs to be undertaken.

7.2.4 If a modification, which is subject to a CAA investigation as determined above, could affect the flying qualities, performance, crew procedures or flight deck layout, then flight testing in accordance with the relevant section of 4.5. above may be undertaken.

8 Documents and Manuals

Irrespective of the depth of investigation required by this Chapter, before an aircraft can be accepted for UK certification, all documents associated with the aircraft must be provided in English. This includes, all documents necessary for the design investigation and those for certification, operation and continued airworthiness of the aircraft.

9 The Type Certificate and Type Certificate Data Sheet

9.1 In most cases (see 2 above), with the co-operation of the applicant, the CAA will prepare and issue the Type Certificate together with the associated Data Sheet.

The Type Certificate will contain the following information:

a) The Type Certificate number;

b) The designation of the type;

c) The Manufacturer (Type Certificate Holder);

d) A statement that the type of aircraft concerned is acceptable for United Kingdom airworthiness certification;

e) A reference to the associated Type Certificate Data Sheet.

9.2 The Type Certificate Data Sheet associated with the Type Certificate will give the basis of certification and the designation of each aircraft variant certificated, and also define some general particulars of the design.

9.3 The Type Certificate and Data Sheet will be issued to the applicant.

9.4 Copies of Type Certificates and Data Sheets may be obtained from the CAA.

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Chapter B2-3 Flight Testing for Type Certification or Validation

1 General

1.1 The flight testing of Prototype aircraft under investigation for Type Certification or Validation shall comply with the procedures set out in this Chapter B2-3, as follows:

NOTE: Owners are required to arrange adequate insurance to cover damage to the aircraft and to third parties (see CAA Airworthiness Notice No. 66).

1.2 In order that the CAA may accept reports on flight test matters, the qualifications and experience of personnel involved in flight testing under the provisions of this Chapter shall be acceptable to the CAA. Flight test personnel shall be provided with adequate facilities and equipment for the effective performance of their duties.

2 Prototype Aircraft

The requirements and procedures of this paragraph 2 are applicable where application is made for the issue of a United Kingdom Certificate of Airworthiness or a Permit to Fly in respect of an aircraft for which a United Kingdom Type Certificate, Certificate of Airworthiness, Type Approval or Permit to Fly, as appropriate (Chapter B3-7), has not previously been issued.

2.1 Compliance shall be shown with a) and b):

a) Flight tests shall have been completed, under the jurisdiction of the Responsible Authority of the country of origin of the aircraft (hereinafter referred to as the Responsible Authority) to show compliance with the relevant airworthiness requirements and Special Conditions of the country of origin.

b) Except where otherwise agreed, flight tests shall have been completed, either under the jurisdiction of the Responsible Authority or under the supervision of an Organisation approved by the CAA, to show compliance with such United Kingdom Additional Requirements and Special Conditions as may have been prescribed provisionally as conditions of United Kingdom certification.

2.2 Full details of the results of the flight tests prescribed in paragraph 2.1 shall be made available, together with any additional information required by the CAA, in order to complete an assessment of the data and to conduct the work as prescribed in paragraph 2.3.

2.3 An aircraft of the same design standard as that submitted for certification shall be placed at the disposal of the CAA, in order that the CAA may:

a) carry out any flight tests considered necessary to confirm compliance with such United Kingdom Additional Requirements and Special Conditions as may have been prescribed provisionally as conditions of United Kingdom certification, and to establish any further Special Conditions which may need to be prescribed;

b) become familiar with the aircraft type;

c) gain information for use in preparing Airworthiness Flight Test Schedules (see Chapter B3-3).

2.4 Except where otherwise agreed, flight tests shall be completed, either under the jurisdiction of the Responsible Authority or under the supervision of an Organisation

approved by the CAA, to show compliance with such further United Kingdom Special Conditions as are prescribed in accordance with 2.3 a).

2.5 If at the time of United Kingdom Certification, little or no operational experience has been gained on the type, the CAA will decide what, if any, flying representative of operational use will be required before certification.

2.6 In certain circumstances, it may be necessary for some of the flight tests of 2.3 to be carried out in the United Kingdom or elsewhere, in which case the applicant will be notified and it may be a requirement that the tests be conducted by a person or Organisation acceptable to the CAA.

Chapter B2-4 Type Certification or Validation of a Variant

1 Introduction

1.1 A Variant is an aircraft which embodies certain design features, dissimilar to the Prototype aircraft, which are required to be investigated for certification purposes.

1.2 The issue of a Certificate of Airworthiness to a Variant will be subject to compliance with the procedures outlined in this Chapter B2–4.

1.3 In the case of a Variant to be investigated for the issue of a Certificate of Airworthiness in the Special Category, the CAA may accept proposals which would vary the procedures in this Chapter B2–4.

1.4 Before the issue of a Certificate of Airworthiness in the Transport, Aerial Work, or Private Category (see B1–2 for "Categories") type aircraft must qualify for a United Kingdom Type Certificate. The procedures for type certification are given in B2–2 and those for the issue of a C of A in B3–2.

NOTE: A Type Certificate is not normally required for an aircraft to be certificated in the Special Category.

2 Application

2.1 CA Form 3, copies of which may be obtained from the CAA Safety Regulation Group, shall be completed at an early stage of the design of the aircraft, and returned to the same address, together with the appropriate deposit, as detailed in the form.

2.2 The charges are prescribed in the CAA Scheme of Charges and also noted on CA Form 3. Subject to the payment of a minimum charge equivalent to that for a Series aircraft, the applicant shall pay a charge equal to the cost of the investigation. During the course of the investigation the CAA will normally render accounts at monthly intervals.

2.3 During the investigation, if it is necessary for a CAA Surveyor to travel outside the United Kingdom, or away from the residential area of an overseas office of the CAA Safety Regulation Group, the CAA will require the applicant to meet the additional costs involved.

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Chapter B2-5 Approval of Modifications

1 Introduction

1.1 **Modifications.** Modifications are changes made to a particular aircraft, including its components, engines, propellers, radio apparatus, accessories, instruments, equipment, and their installations. Substitution of one type for another when applied to components, engines, propellers, radio installations, accessories, instruments and equipment, is also considered to be a modification. The approval of modifications will be subject to compliance with the procedures outlined in this Chapter B2–5, but reference should also be made to the particular modification procedures for engines in B4–2, propellers in B4–4, accessories and equipment in B4–8, and radio apparatus in B4–10.

2 Modifications Not Previously Investigated and Approved

2.1 General

2.1.1 At an early stage of the design of a modification brief particulars shall be provided to the CAA Safety Regulation Group, so that the modification may be classified.

2.1.2 A modification will be classified as Minor or Major according to the nature and extent of the CAA investigation in connection with its approval. Where the investigation indicates that the particulars given in the Certificate of Airworthiness, or associated documents, will need amendment (even though no physical change to the aircraft is involved) the CAA may require Major modification procedure to be followed where the amendments are significant.

2.1.3 Where the modification is such that the CAA requires the aircraft to be investigated as a variant, the procedures of B2–4 will apply.

2.1.4 All modifications, excepting those which are agreed by the CAA to be of such a nature that airworthiness is not affected, shall be approved by the CAA, either directly, or through the modification procedures of an appropriately approved Organisation.

2.1.5 The applicant shall ensure, where necessary through the medium of an Organisation approved by the CAA for the purpose (see Supplement Sub-Section A8), that the proposed modification is such that the design of the aircraft, when modified, complies with:

a) the Requirements in force at the time the aircraft type was originally certificated;

b) such other requirements as the CAA may notify, in writing, in respect of the aircraft design.

2.1.6 All relevant design information, drawings and test reports shall be held at the disposal of the CAA. No such design records shall be destroyed without authorisation from the CAA.

2.1.7 Each design drawing shall bear a descriptive title, drawing number, issue number and date of issue. All alterations to drawings shall be made in accordance with a drawing amendment system such as will ensure amendment to design records.

2.1.8 Immediately an alteration is made to a drawing, whether the alteration is permanent or temporary, the drawing shall be identified with a new issue number and date.

Where an alteration affects the interchangeability of any item in any way, a new part number shall be issued such as to avoid confusion with the original item.

2.1.9 Modification documents shall bear a modification reference number, issue number and date, a description of the modification, together with a list of parts and assemblies affected by the modification and, where necessary, drawings giving particulars of the parts before and after modification.

2.1.10 Where modifications affect unit interchangeability, or are of such an extent as to require amendment of approval documents or any documents associated with the Certificate of Airworthiness, a separate type or designation reference shall be allocated to the modified unit.

2.1.11 Where modifications affect or impinge upon the content of the approved Master Minimum Equipment List (MMEL), applicants will be required to ensure that notification of these effects is provided to the CAA so that the necessary action can be taken to revise the relevant MMEL.

2.2 Major Modifications

The following procedures will apply in the case of a modification classified by the CAA as a Major modification.

2.2.1 CAA Form AD 282, copies of which may be obtained from the CAA Safety Regulation Group, shall be completed and returned to the same address. The total fee will be based on the cost of the investigation and the CAA will, during the course or upon completion of the investigation, notify the applicant in writing accordingly.

2.2.2 The CAA may require a Certificate of Design, which shall be signed by an approved signatory of an appropriately approved Organisation.

Please see example over page.

CERTIFICATE OF DESIGN (MODIFICATION)

Aircraft Designation .....

Registration Marks .....

Manufacturer's Serial Number of Aircraft .....

Certificate of Airworthiness Categories .....

.....

.....

Performance Group .....

Engine(s) type .....

I hereby certify that, except for the differences resulting from the modification(s) listed below, the design of the above aircraft has not been changed in any way.

Modification(s) .....

.....

.....

.....

I further certify that, with the exceptions listed below, the design of the modified aircraft complies with the CAA requirements as far as this particular type of aircraft is concerned.

Exceptions .....

.....

.....

.....

Signed .....

Firm .....

CAA Approval Ref No. .....

Date .....

2.2.3 The CAA may require an addendum to the Type Record to be prepared by an approved Organisation. The addendum shall contain particulars of design changes made and all consequent changes to the information given under each heading of the relevant Type Record.

2.2.4 The CAA will signify approval of a Major modification by forwarding a copy of the Airworthiness Approval Note to the applicant.

2.3 **Minor Modifications**

When the design of a modification, classified as Minor, is undertaken by other than an Approved Organisation the CAA will signify approval by forwarding a copy of CAA Form AD 261 to the applicant.

2.4 Civil Modification Record

When the design of a modification is undertaken by an Approved Organisation, a record of the following particulars shall be prepared and kept in a book or folder bearing the title 'Civil Modification Record':

a) Aircraft type;

b) Title and brief description of modification;

c) Modification reference number;

d) Modification class;

e) Airworthiness Approval Note number (in the case of a Major modification);

f) Reference to the associated Flight Manual amendment number;

g) Reference to the associated Maintenance, Overhaul and Repair Manuals, Crew Manual and Maintenance Schedule amendment numbers;

h) Reference to the associated MMEL revision (if appropriate).

2.4.1 The Civil Modification Record shall be made available to the CAA for examination.

3 Modifications Already Approved

3.1 Information concerning the conditions of acceptance of modifications previously approved by the CAA will not be confidential to the applicant and may be made available by the CAA on request. This does not apply to design information, including drawings and test reports; these are held by the CAA as confidential documents.

4 Mandatory Modifications

4.1 Modifications considered essential for airworthiness, will be classified as mandatory by the CAA in consultation, where appropriate, with the approved Organisation, and the compliance date, limiting flying hours, cycles, or details when the prescribed action must be taken, will be decided. In making this decision the degree of urgency and availability of modified parts will be taken into account (see B5–6).

NOTE: Mandatory modifications are promulgated in manufacturers' Service Bulletins, or equivalent documents, which contain a statement that the modification has been classified as mandatory by the CAA. These Mandatory Modifications are summarised in the CAA publication, 'Mandatory Aircraft Modifications and Inspections Summary' (CAP 476).

Sub-Section B3
Certificates of Airworthiness and other Provisions for Legal Flight

Chapter B3-2 Issue of Certificates of Airworthiness

1 Introduction

1.1 A Prototype Aircraft is an aircraft which is the first of the type to be investigated for the issue of a United Kingdom Certificate of Airworthiness.

1.2 A Variant Aircraft is the first aircraft on the register to embody changes to the type designation which requires an amendment to the information in the Type Certificate Data Sheet.

1.3 A Series Aircraft is an aircraft, including engines and equipment, the design of which is similar in every essential respect to the design of an aircraft for which a United Kingdom Certificate of Airworthiness has previously been issued.

1.4 The issue of a Certificate of Airworthiness is dependent on the aircraft being registered in the United Kingdom and will be subject to compliance with the procedures outlined in this Chapter B3–2.

1.5 In the case of aircraft to be investigated for the issue of a Certificate of Airworthiness in the Special Category, the CAA may accept proposals which would vary the procedures in this Chapter B3–2.

1.6 Before the issue of a Certificate of Airworthiness in the Transport, Aerial Work, or Private Category (see B1–2 for 'Categories'), aircraft above 2730 kg maximum authorised weight, must qualify for a United Kingdom Type Certificate. The procedures for type certification are given in B2–2.

NOTE: A Type Certificate is not normally required for an aircraft to be certificated in the Special Category.

2 Application

2.1 Form CA3, copies of which may be obtained from the Civil Aviation Authority, Safety Regulation Group, Applications and Certification Section, Aviation House, Gatwick Airport South, West Sussex, RH6 0YR, and shall be completed at an early stage, and returned together with the appropriate fee, as detailed in the CAA Scheme of Charges to the above address.

2.2 The applicant shall pay charges equal to the cost of the investigation, but not exceeding the amount prescribed in the CAA Scheme of Charges. During the course of the investigation the CAA will normally render accounts at monthly intervals.

2.3 During the investigation, if it is necessary for a CAA Surveyor to travel outside the United Kingdom, or away from the residential area of an overseas office of the CAA Safety Regulation Group, the CAA will require the applicant to meet the additional costs involved.

3 For New Aircraft

3.1 The applicant shall send to the CAA:

a) The Certificate of Airworthiness or Export Certificate of Airworthiness issued by the state of manufacture, within a period 60 days immediately preceding the date of application;

b) The Type Certificate Data Sheets where applicable (see B2–2);

c) A Flight Manual conforming to United Kingdom requirements in cases where a Flight Manual has been issued (See B7–2);

d) The National Requirements with which the aircraft complies, giving title, issue number and effective date;

e) Such deviations from the National Requirements as may have been authorised in writing by the Authority which issued the Certificate of Airworthiness.

3.2 During the investigation of the aircraft, the CAA may decide that additional requirements must be met and these will be listed as Additional Requirements for Import in writing to the applicant. Additional Requirements for Import, when established by the CAA, will not be confidential to the applicant and may be made available by the CAA on request.

4 For Used Aircraft

4.1 The applicant shall provide to the CAA:

a) the information specified in paragraph 3.1 b) to e);

b) the original Certificate of Airworthiness or Export Certificate of Airworthiness issued by the state of manufacture;

c) a Certificate of Airworthiness for Export issued by the exporting airworthiness authority within 60 days immediately preceding the date of application;

or

d) for aircraft imported from a full JAA member state, a Certificate of Airworthiness issued or renewed, by the state of registry within a period 60 days immediately preceding the date of application.

NOTE (1): When the documents referred to in paragraph 4.1 c) or d) are not obtainable, the CAA will accept the following documents in combination as a transfer document:

A current domestic Certificate of Airworthiness.

PLUS

The following statement signed by the National Aviation Authority of the last state of registry within a period 60 days immediately preceding the date of application:

"To whom it may concern:

REGISTRATION TYPE MANUFACTURER'S No.

The [National Aviation Authority (NAA)], having inspected the above aircraft and its records, hereby certifies that the aircraft is in accordance with: Type Certificate Data Sheet (TCDS) and is in an airworthy condition.

All Airworthiness Directives applicable to the type and all relevant maintenance activities have been addressed, with the exceptions previously agreed by the United Kingdom CAA listed below.

The [NAA] further declares that, had the aircraft been presented for issue/ renewal of it's Certificate of Airworthiness or the issue of an Export Certificate of Airworthiness, such a certificate would have been issued."

NOTE (2): When an applicant wishes to import an aircraft which was operated immediately prior to import under military control in the previous State of Registry, the Application and Certification Section of the CAA must be contacted at Aviation House to establish whether the aircraft will be eligible for the issue of a Certificate of Airworthiness.

4.2 **Reports**

4.2.1 For aircraft with a maximum take off weight above 15000 kg, the applicant through the medium of the Type Certificate Holder (if appropriate) or an Organisation approved in accordance with BCAR A8-8 Group E3, must provide reports (see Appendix No 1 to A8-8) confirming that the airworthiness and design standard of the aircraft, including its Flight Manual and instructions for continued airworthiness, conforms to a standard approved by the CAA for the aircraft type or differs in a defined manner from the CAA approved standard.

NOTE: In the case where the issue of a Certificate of Airworthiness is to be completed outside the United Kingdom at a place where an Organisation is not specifically approved to provide reports for the purpose, the overseas Organisation shall be one that is acceptable to the CAA.

4.2.2 For aircraft with a maximum take off weight below 15000 kg, the applicant shall, either through the medium of an E3 Design Organisation, or, the Type Certificate Holder (if appropriate), or, a suitably Approved Maintenance Organisation, provide reports and data confirming (see Appendix to A8-8) that the airworthiness and design standard of the aircraft, including its Flight Manual and instructions for continued airworthiness, conforms to a standard approved by the CAA for the aircraft type or differs in a defined manner from the CAA approved standard. Subject to CAA agreement, appropriately licensed aircraft maintenance engineers for aircraft types not listed in paragraph 14 of Airworthiness Notice No. 10 may produce such reports. The use of the services of an E3 approved Organisation is recommended, particularly where the work to establish compliance is significant.

4.3 The aircraft and the relevant records shall be reviewed to determine the work to be undertaken to maintain the airworthiness of the aircraft. The aircraft and associated records must be made available at facilities suitable for the purpose.

4.3.1 In determining the work to be undertaken on the aircraft, due account shall be taken of a) to f).

a) The age, areas and types of operation, and conditions of storage of the aircraft;

b) Compliance with the Type Certificate Holder's Instructions for Continued Airworthiness and Airworthiness Limitations;

c) Work already certified in the relevant records;

d) All repairs have been embodied with records adequate to establish compliance with an approved scheme or manual acceptable to the CAA;

e) All modifications have been embodied with records adequate to indicate either the source of approval or the Organisation responsible for embodiment;

f) Compliance with Airworthiness Directives, CAA Additional Directives, Mandatory Modifications/Inspections and Airworthiness Notices.

5 General

5.1 The applicant shall carry out any work on the aircraft which the CAA may decide is necessary.

5.2 All work undertaken in connection with the issue of the Certificate of Airworthiness for the aircraft shall be supervised by an Organisation appropriately approved by the CAA for the purpose or under the supervision of an appropriately licensed aircraft maintenance engineer.

NOTE: In the case of the inspection being completed abroad at a place where an Organisation is not specifically approved for the purpose, the overseas Organisation shall be one that is acceptable to the CAA.

5.3 The aircraft shall be in a condition acceptable to enable the CAA to inspect it as necessary.

5.4 The aircraft shall be weighed, and copies of the Weight and Centre of Gravity Schedule and, where appropriate the Weight and Balance Report shall be provided (see B5–4). The CAA may agree to the acceptance of weight and centre of gravity details obtained from current documents relating to the aircraft.

5.5 When required by the CAA, a Certificate of Fitness for Flight (see B3–8) shall be issued, and the aircraft shall be tested in flight to schedules approved by the CAA in accordance with B3–3. Particulars and results of such testing shall be provided to the CAA.

5.6 To facilitate delivery of aircraft to the United Kingdom, the CAA may, under appropriate circumstances, issue a United Kingdom Certificate of Airworthiness for Ferry purposes.

5.6.1 For New Aircraft – The Private Category Certificates of Airworthiness for Ferry purposes may be validated by the foreign Authority on behalf of the United Kingdom CAA, subject to initial issue by that Authority of the appropriate Certificate of Airworthiness.

5.6.2 For Used Aircraft – The Private Category Certificates of Airworthiness for Ferry purposes will only be issued following a survey by a United Kingdom CAA Surveyor, in order to be satisfied that the Type Design standard and condition of the aircraft are appropriate for the issue of a United Kingdom Certificate of Airworthiness.

6 Maintenance Review Board

To determine the initial maintenance and inspection requirements, a Maintenance Review Board (see B5–2) will normally be established for all prototype aircraft the MTWA of which exceeds 5700 kg, prior to United Kingdom Transport Category certification.

7 Maintenance, Overhaul and Repair Manuals

7.1 Copies of manuals required by B5–3 shall be provided. In the case of an aircraft of a type for which a United Kingdom Certificate of Airworthiness has not previously been granted, two additional copies of these documents shall be supplied to the CAA, together with a complete set of all Service Bulletins.

7.1.1 Before the issue of a United Kingdom Certificate of Airworthiness, all relevant manuals shall be amended, where necessary, in respect of modifications embodied

by the applicant before acceptance of the aircraft for certification, and two copies of the amendment shall be supplied to the CAA. In the case of an aircraft type for which a United Kingdom Certificate of Airworthiness has not previously been granted, the applicant shall supply two copies of each finally accepted manual to the CAA.

7.1.2 It shall be the responsibility of the applicant to make the necessary arrangements with the aircraft Manufacturer/Type Design Organisation to receive amendments to these manuals together with any service bulletins that may be issued from time to time.

7.1.3 It shall be the responsibility of the applicant to obtain, in respect of the aircraft, such additional technical information as the CAA may require.

8 Flight and Crew Manuals

8.1 Copies of the Flight Manual shall be provided (see B7–2).

8.2 Copies of the Crew Manual shall be provided (see B7–3).

9 Records and Log Books

9.1 In accordance with the Air Navigation Order a Certificate of Release to Service shall be entered in or attached to the appropriate log books or other maintenance records (see B6–7).

9.2 All relevant inspection records shall be made available to the CAA for examination, and shall not be destroyed without authorisation from the CAA.

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Chapter B3-3 Flight Testing for Issue of Certificate of Airworthiness or a Permit to Fly

1 General

1.1 The flight testing of Series aircraft under investigation for the issue of a Certificate of Airworthiness or a Permit to Fly shall comply with the procedures set out in this Chapter B3–3.

NOTE: Owners are required to arrange adequate insurance to cover damage to the aircraft and to third parties (see CAA Airworthiness Notice No. 66).

1.2 All owners of aircraft to be flown by a CAA Safety Regulation Group Test Pilot for any test purposes, are required to ensure that insurance policies covering damage to the aircraft and third parties are suitably endorsed to provide appropriate cover against any claims which may be made against the CAA or the Test Pilot, arising out of the test flight.

NOTE: It is understood that in general, insurers and underwriters are willing to extend the cover of their aircraft policies for this purpose on request and without further charge.

1.3 In order that the CAA may accept reports on flight test matters, the qualifications and experience of personnel involved in flight testing under the provisions of this Chapter shall be acceptable to the CAA. Flight test personnel shall be provided with adequate facilities and equipment for the effective performance of their duties.

NOTE: Organisations approved in accordance with Chapter A8–9 to fly aircraft under 'B' Conditions of the Air Navigation Order comply with this requirement.

2 Applications

2.1 The following requirements and procedures are applicable where first application is made for the issue of a United Kingdom Certificate of Airworthiness or a Permit to Fly in respect of a Series aircraft.

2.2 **General**

2.2.1 Flight tests shall be completed to establish that:

a) handling characteristics are satisfactory and typical of the type;

b) climb performance equals or exceeds the scheduled data;

NOTE: Data is necessary in order to assess any future deterioration of performance in service.

c) the aircraft and its equipment function satisfactorily;

d) additional Requirements and Special Conditions, where applicable, have been complied with.

2.2.2 Series aircraft shall be tested in accordance with a) or b), as appropriate.

a) **New Aircraft.** The flight tests shall be conducted under the supervision of the aircraft Type Design Organisation. The CAA will carry out a Series flight test on a sample of the aircraft in order to monitor the standard.

NOTE: On new imported aircraft, having completed the firm's production flight test, subject to satisfactory results on the first 10 series check of the type, subsequent aircraft may be sampled at a rate of 50%.

b) **Imported or Re-imported Aircraft.** Where the aircraft type and origin are well known to the CAA, the flight testing may be delegated to the applicant, importing agents or Operators, provided that the pilot and flight crew engaged in the testing have been associated previously with CAA airworthiness flight testing of aircraft of the same, or closely similar, type. However, the CAA may notify the applicant of its intention to carry out, or participate in, flight tests.

Where the CAA has notified the applicant of its intention to carry out, or participate in, flight tests, the applicant shall, when requested, provide adequate opportunities for the CAA to become re-familiar with the aircraft type.

2.2.3 Where the tests are carried out other than by the CAA, a flight test report, in a form acceptable to the CAA, shall be provided. The CAA may require any of the tests to be repeated, either by the applicant or by the CAA.

3 Flight Test Schedules

3.1 The flight tests shall be made to the CAA Airworthiness Flight Test Schedule for the type (see 3.2), or to such other schedule as may be agreed. Such a schedule shall contain details of the aircraft type to which it refers, shall be marked with a reference number, issue number, and date, and shall include the following:

a) Tests to check the aircraft performance;

b) Tests to check such handling qualities of the aircraft as have been agreed in consultation with the CAA;

NOTE: It is convenient for the flight test schedule to contain the following handling tests, as these combine, in a brief form, checks on various flight characteristics:

i) A qualitative assessment of the take-off;

ii) An assessment of the trim of the aircraft and the effectiveness of primary flight controls and trimmers in steady flight;

iii) Hover manoeuvres for helicopters;

iv) Flight at maximum speed;

v) Stalls in the take-off and landing configurations;

vi) A qualitative assessment of the landing.

c) Tests to check functioning of the aircraft equipment in flight;

d) Such other tests as are requested by the CAA.

NOTE: Controls, systems and equipment which are used regularly may be considered, for the purpose of this schedule, to have been checked on the basis of normal usage.

3.2 Flight Test Results

3.2.1 The flight test results, in a form acceptable to the CAA, shall be submitted for acceptance, as follows:

a) In respect of aircraft classified in Group I in accordance with B3–4: to the CAA;

b) In respect of an aircraft classified in Group II in accordance with B3–4: to the Organisation approved in accordance with A8–15 which is supervising the Certificate of Airworthiness renewal procedure. Once accepted by that Organisation, the results shall be forwarded to the CAA for record purposes;

c) In respect of an aircraft to which B3–7 is applicable: to the Organisation approved in accordance with A8–15 which is supervising the Permit to Fly renewal

procedure. Once accepted by that Organisation, the results shall be forwarded to the CAA for record purposes.

3.2.2 The flight test result shall include a certificate, in the following form, which shall be signed by the pilot who conducted the test.

FLIGHT TEST CERTIFICATE

Aircraft Type: .....
Registration: .....
Manufacturer's No.: .....

I CERTIFY that I have tested the above aircraft to Airworthiness Flight Test Schedule reference .....

The following deficiencies and unsatisfactory features were revealed by the flight tests or noted at other times during the flight(s) and I CONSIDER that those annotated 'R' and/or 'FT' should be dealt with as follows:

(a) Those annotated 'R' should be rectified prior to the issue of the Certificate of Airworthiness or flight for hire or reward, whichever occurs first.

(b) Those annotated 'FT' re-assessed in flight, following remedial action, before the defect can be considered to be rectified.

1 .....
2 .....
3 .....
4 (etc) .....

The above have been transcribed to ..... for rectification and clearance.

Pilot ..... Signed .....

Date ..... Licence No .....

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Chapter B3-4 Renewal of Certificate of Airworthiness

1 Introduction

1.1 General

1.1.1 The renewal of a Certificate of Airworthiness shall be subject to compliance with the procedures set out in this Chapter.

1.1.2 For the purpose of this Chapter, aircraft are grouped in accordance with the Maximum Total Weight Authorised (MTWA), type of design and Certificate of Airworthiness Category, as follows:

a) **Group I.** All aircraft not included in Group II;

b) **Group II.** Piston engined aeroplanes and rotorcraft the MTWA of which does not exceed 2730 kg, certificated in the Transport Category (Passenger), Transport Category (Cargo), Aerial Work Category and Private Category.

1.2 **Applicability.** For each Group, compliance shall be shown with the requirements, as follows:

a) **Group I.** The requirements of paragraphs 2, 3, 5, 6 and 7;

b) **Group II.** The requirements of paragraphs 2, 4, 5, 6 and 7.

2 Application

Form AD 200, copies of which may be obtained from the CAA Safety Regulation Group, shall be completed and returned. The application shall be accompanied by the appropriate fee which is prescribed in the CAA Scheme of Charges.

2.1 If, for the CAA investigation, travel outside the United Kingdom is necessitated, the Applicant will be required to meet the additional costs.

3 Procedure No. 1 for Group I Aircraft

3.1 The aircraft and its records shall be in a condition acceptable to the CAA, for such inspections that are considered necessary.

3.2 The aircraft inspection and the review of the records shall be carried out by an appropriately approved Organisation (see Note 1 to paragraph 3.2.2) to determine the work to be undertaken to maintain the airworthiness of the aircraft.

3.2.1 The physical inspection of the aircraft for the purpose of making a recommendation for the renewal of the Certificate of Airworthiness shall be completed in the 30 days prior to making the renewal recommendation.

3.2.2 Where an inspection is carried out on an aircraft, for the purpose of the renewal recommendation of the Certificate of Airworthiness, the inspection shall be carried out at the premises approved for the purpose and a report and renewal recommendation shall be prepared by an appropriately approved Organisation (see Chapter A8-3 Supplement 2 and Chapter A8-15 paragraph 3.1.1). A copy of the report detailing the work required shall be retained by the Organisation and made available to the CAA upon request.

NOTES: 1 It shall be the responsibility of the Approved Organisation, making the renewal recommendation, to determine the extent of any inspection required in order to be satisfied the aircraft remains in compliance with applicable certification and airworthiness requirements.

2 In the case of the renewal being completed abroad at a place where an Organisation is not specifically Approved for the purpose, the overseas Organisation shall be one that is acceptable to the CAA. The renewal process is to be predicated upon an inspection report prepared by an authorised person or an appropriately licensed aircraft maintenance engineer. A copy of the report detailing the work required shall be sent to the CAA. In such cases, the CAA may decide that Surveyor involvement is necessary (see paragraph 2.1).

3.2.3 In determining the work to be undertaken on the aircraft, account shall be taken of the following:

a) The age, storage conditions, total hours/cycles, areas and type of operation of the aircraft;

b) Compliance with the requirements of the Approved Maintenance Schedule (see Chapter B7–5);

c) Work certified in the relevant records;

d) The periods between overhauls and any finite or service life limits, prescribed or Approved by the CAA, in respect of the aircraft and its parts;

e) Such other requirements or instructions, Approved by the CAA (e.g. Mandatory Modifications and inspections) relating to the maintenance of airworthiness;

f) Foreign airworthiness directives adopted by the CAA, and CAA Additional Directives, where appropriate, in respect of the aircraft and its parts;

g) The manufacturer's recommendations in Service Bulletins, Maintenance Manuals, Maintenance Planning Documents (MPD) or equivalent documents.

h) Compliance with the TCDS (Type Certificate Data Sheet).

NOTE: Items b) to g) may be covered by a Condition Monitored Maintenance Programme Approved by the CAA (see Chapter B6–2, Appendix 1).

3.2.4 The CAA may determine the work required to be carried out on the aircraft.

3.3 All work undertaken in connection with the renewal of the Certificate of Airworthiness of the aircraft shall be supervised by an Organisation Approved by the CAA (see Chapter A8-3 supplement 2 and Chapter A8-15), at a place where the equipment, the general conditions, and the necessary supervisory procedures are to a standard approved by the CAA. Before the work is finally certified, the Approved Organisation shall be satisfied that the work has been carried out, inspected, and tested where necessary, for conformity with the specifications, drawings and instructions relating to the Approved design and with the requirements for the continuing airworthiness of the aircraft and its equipment.

3.4 The recommendation for the renewal of the Certificate of Airworthiness shall be made on form AD 202NR by the Approved Organisation. When completed two copies shall be forwarded to the appropriate CAA Regional Office, the original Certicate of Airworthiness should be returned to the CAA on expiry. A copy of Form AD 202NR shall be included in the aircraft records and an additional copy shall be retained by the Approved Organisation.

3.5 For Certificates of Airworthiness with a validity of 12 months, the renewal recommendation may be anticipated by a maximum of 30 days before the date of expiry without loss of validity. For Certificates of Airworthiness with a validity of 36 months, the renewal recommendation may be anticipated by a maximum of 62 days before the date of expiry without loss of validity. If the Certificate of Airworthiness has expired the validity will take effect from the date the submission is received and accepted by the CAA.

3.6 The aircraft shall have been tested in flight in accordance with Chapter B3–5. Where a flight test is necessary and the Certificate of Airworthiness has expired a Certificate of Fitness for Flight (see Chapter B3–8) shall have been issued to allow the aircraft to be flown under 'A' Conditions.

4 Procedure No. 2 for Group II Aircraft

4.1 The aircraft and its records shall be in a condition acceptable to the CAA for such inspections as are considered necessary.

4.2 A Star Inspection and the coincident annual inspection shall be carried out, at the premises of an Organisation Approved for the purpose in accordance with BCAR Chapter A8–15 and certified by holders of UK Aircraft Maintenance Engineers' Licences with Type Ratings valid for the particular aircraft type.

4.3 For aircraft operated for commercial air transport, the Star Inspection and the coincident annual inspection shall be carried out, at the premises of a suitably approved JAR-145 organisation which is also approved in accordance with BCAR Chapter A8-15 and certified by persons holding appropriate company authorisations valid for the particular aircraft type.

NOTE: In the case of the renewal being completed abroad at a place where an Organisation is not specifically Approved for the purpose, the overseas Organisation shall be one that is acceptable to the CAA. The renewal process is to be predicated upon an inspection report prepared at the agreed site by the Chapter A8–15 Organisation's nominated person. A copy of the report detailing the work required shall be sent to the CAA. In such cases, the CAA may decide that Surveyor involvement is necessary (see paragraph 2.1).

4.4 In deciding the depth of the Star Inspection and the extent of the work to be undertaken to maintain the airworthiness of the aircraft and to enable the recommendation for the renewal of the Certificate of Airworthiness to be made, the Approved Organisation shall take account of the following:

a) The age, storage conditions, total hours/cycles, areas and type of operation of the aircraft;

b) Compliance with the requirements of the Approved Maintenance Schedule;

c) Work certified in the relevant records;

d) The periods between overhaul and any finite or service life limits, prescribed or approved by the CAA, in respect of the aircraft and its parts;

e) Such other requirements or instructions, approved by the CAA (e.g. Mandatory Modifications and inspections) relating to the maintenance of airworthiness;

f) Foreign airworthiness directives adopted by the CAA, and CAA Additional Directives, where appropriate, in respect of the aircraft and its parts;

g) The manufacturer's recommendations in Service Bulletins, Maintenance Manuals, or equivalent documents;

h) Compliance with the Type Certificate Data Sheet (TCDS).

4.5 Following the Star Inspection, an Inspection Report, in which any work which has been undertaken is detailed, shall be prepared, certified, and included in the aircraft records.

4.6 All work undertaken in connection with the renewal of the Certificate of Airworthiness of the aircraft shall be supervised by an Organisation approved in accordance with Chapter A8–15. Before the work is finally certified, the Approved Organisation shall be satisfied that the work has been carried out, inspected, and tested where necessary, for conformity with the specifications, drawings and instructions relating to the Approved design, and with the requirements for the continuing airworthiness of the aircraft and its equipment.

4.7 The recommendation for the renewal of the Certificate of Airworthiness shall be made on Form AD 202NR by the Approved Organisation. When completed, two copies shall be forwarded to the appropriate CAA Regional office. The original Certificate of Airworthiness should be returned to the CAA on expiry. A copy of Form AD 202NR shall be included in the aircraft records and an additional copy shall be retained by the Approved Organisation.

4.8 The CAA may agree at the request of the applicant, to survey an aircraft during the Star Inspection. The CAA may then decide on the extent of the investigation and on any additional work required to permit renewal of the Certificate of Airworthiness. The cost of any such additional survey shall be met by the applicant.

4.9 The Certificate of Airworthiness renewal recommendation may be anticipated by a maximum of 62 days from the date of expiry without loss of validity. If the Certificate of Airworthiness has expired the validity shall take effect from the date the submission is received and accepted by the CAA.

4.10 The aircraft shall have been tested in flight, in accordance with Chapter B3–5. Where a flight test is necessary and the Certificate of Airworthiness has expired a Certificate of Fitness for Flight (see Chapter B3–8) shall have been issued to allow the aircraft to fly under 'A' Conditions.

5 Re-weighing of Aircraft (see Chapter B5-4)

5.1 Re-weighing of aircraft at the time of renewal of the Certificate of Airworthiness will be dependent on the date of the last weighing, and on the history of the aircraft.

NOTE: Aircraft are, normally, weighed when all manufacturing processes are completed.

5.1.1 Aircraft of more than 5700 kg MTWA shall be re-weighed within two years after the date of manufacture. Subsequent check weighing shall be carried out at intervals not exceeding five years, and at such other times as the CAA may require.

5.1.2 Aircraft of 5700 kg MTWA or less, shall be re-weighed at such times as the CAA may require.

5.1.3 The CAA shall be consulted if there is any doubt as to whether the aircraft ought to be re-weighed.

5.1.4 When re-weighing is necessary, an amended Weight and Centre-of-Gravity Schedule, or its equivalent as prescribed in Chapter B5–4, shall be prepared. During the course of any re-weighing procedures, the accuracy of all data previously recorded, for example lever arms, shall be checked e.g. against the appropriate manufacturer's current data.

5.1.5 At the time of a re-weighing or when a revised Weight and Centre-of-Gravity Schedule is raised following the addition, removal or relocation of equipment, a copy of the Weight and Centre-of-Gravity Schedule shall be retained by the Approved Organisation and made available to the CAA upon request.

NOTE: For an aircraft operated by a JAR-OPS Operator, weighing requirements shall be determined in accordance with Subpart J of JAR-OPS 1 or JAR-OPS 3 as appropriate.

6 Records and Log Books

6.1 Aircraft records in the form of log books, separate maintenance records forming part of log books, or maintenance records kept by any other method approved by the CAA, shall be made available if specifically requested by the CAA.

NOTE: The Air Navigation Order requires that log books, and other documents which are identified and referred to in the log books (therefore, forming part of the log books), shall be preserved for two years after the aircraft, engine or variable pitch propeller has been destroyed or permanently withdrawn from use.

6.2 All relevant inspection records shall be made available if specifically requested by the CAA.

6.2.1 Inspection records shall not be destroyed without authorisation from the CAA.

6.3 Full particulars of the work carried out relating to the renewal of the Certificate of Airworthiness shall be entered in the appropriate log book(s) or other Approved maintenance records, and a Certificate of Release to Service shall be completed and attached or included, as appropriate (see Chapter B6–7).

6.3.1 When it is more convenient, particulars of the work done may be entered in a separate maintenance record which shall be certified in the same manner as that required for entries in the log books. The reference number of this record, and the place where it may be examined, shall be entered in the log books under a brief description of the particular work. The record thereafter forms part of the log book and a copy should be supplied to the owner.

NOTE: Compliance with Airworthiness Directives, Service Bulletins, Modifications, Component Replacements and Scheduled Checks carried out at the time, must be individually referenced in the aircraft, engine or propeller log book as appropriate

7 Manuals

7.1 A check shall be made by the Approved Organisation to ensure that the Flight Manual is up to date, and any necessary action to bring it up to date shall be taken. Confirmation of the correct Flight Manual Amendment status shall be provided to the CAA. The Flight Manual shall be made available to the CAA, if specifically requested.

NOTE: The term 'Flight Manual' includes any document accepted in place of a Flight Manual.

7.2 Maintenance, Overhaul and Repair Manuals used shall be up to date, and they shall be amended in accordance with the procedures set out in Chapter B7–4 to incorporate such amendments necessary to cover the physical state of the aircraft.

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Chapter B3-5 Flight Testing for Renewal of Certificates of Airworthiness or Permits to Fly

1 General

1.1 Flight tests shall be completed periodically to ensure that the aircraft flight characteristics and the functioning in flight of the aircraft do not differ significantly from those acceptable to the CAA for the aircraft type.

NOTE: See Chapter B3–3, paragraph 1.2.

1.2 In order that the CAA may accept reports on flight test matters, the qualifications and experience of personnel involved in flight testing under the provisions of this Chapter shall be acceptable to the CAA. Flight test personnel shall be provided with adequate facilities and equipment for the effective performance of their duties.

NOTE: Organisations approved in accordance with Chapter A8–9 to fly aircraft under 'B' Conditions of the Air Navigation Order comply with this requirement.

1.3 Airworthiness Flight Tests shall be completed in accordance with a), b) or c) as appropriate:

a) In respect of aircraft classified in Group I in accordance with Chapter B3–4, either:

i) annually; or

ii) as defined by a fleet test programme agreed between the CAA and the Operator, maintenance Organisation or other Organisation acceptable to the CAA..

NOTES: 1 For some types of aircraft the individual examples of which are not included in fleet programmes, the CAA is prepared to extend the period between airworthiness flight tests from one to three years.

2 An aeroplane classified in Group I and with a MTWA exceeding 5700kg and of a type that has been found by CAA to have an acceptable and stable airworthiness standard (the list of such types will be made available through the CAA website) will be exempted from the requirements of BCAR A/B Chapter 3-5, sub-paragraph 1.3 a) for a period of 10 years from the year of manufacture for turbojets and 5 years from the year of manufacture for propeller-driven aircraft. At the end of the exemption period an aircraft will rejoin the fleet programme in accordance with BCAR A/B Chapter 3-5, paragraph 1.3 a). CAA reserves the right to conduct any flight test during the exempted period irrespective of process variations or easements previously granted or promised.

b) In respect of aircraft classified in Group II in accordance with Chapter B3–4, within the period of 62 days immediately preceding the date of renewal of the Certificate of Airworthiness;

c) In respect of aircraft to which Chapter B3–7 is applicable, within the period of 62 days immediately preceding the date of renewal of the Permit to Fly.

1.4 Airworthiness Flight Tests may normally be conducted under the supervision of the Operator or Maintenance Organisation or other Organisation acceptable to the CAA, provided that the pilot/flight crew are acceptable to the CAA for that purpose. In the case of turbo-jet aircraft with a Maximum Total Weight Authorised exceeding

15000 kg, the pilot shall have been specifically briefed and accepted for the task by the CAA.

NOTES: 1 The CAA may require to carry out a proportion of these flight tests, and will notify the Operator or Maintenance Organisation accordingly.

2 The acceptability of a pilot will be evaluated against his competence, having regard to his previous conduct and experience and his familiarity with the appropriate test schedule, flight test techniques and safety precautions.

2 Flight Test Schedules

2.1 **Airworthiness Flight Test Schedules.** The flight tests shall be made in accordance with a) or b):

a) To the appropriate Airworthiness Flight Test Schedule published by the CAA; or

b) To a schedule, approved by the CAA, containing, as a minimum, the tests laid down in the Airworthiness Flight Test Schedule. Such a schedule shall contain details of the aircraft type to which it refers, shall be marked with a reference number, issue number, and date, and shall include the following:

i) Tests to check the aircraft performance;

ii) Tests to check that the handling characteristics are satisfactory and have not deteriorated with time.

NOTES: 1 The tests will take account of the flying characteristics of the aircraft revealed during flight tests on the Prototype, the results of tests on Series aircraft and the history of the aircraft.

2 It is convenient for the flight test schedule to contain the following handling tests, as these combine, in a brief form, checks on various flight characteristics:

i) A qualitative assessment of the take-off;

ii) An assessment of the trim of the aircraft and the effectiveness of primary flight controls and trimmers, in steady flight;

iii) Hover manoeuvres for helicopters;

iv) Flight at maximum speed;

v) Stalls in the take-off and landing configurations;

vi) A qualitative assessment of the landing.

iii) Tests to check functioning of the aircraft equipment in flight.

NOTE: Controls, systems and equipment which are used regularly may be considered, for the purpose of this schedule, to have been checked on the basis of normal usage.

3 Flight Test Results

3.1 The flight test results, in a form acceptable to the CAA, shall be submitted for acceptance as follows:

a) In respect of aircraft classified in Group I in accordance with Chapter B3–4: to the CAA;

b) In respect of an aircraft classified in Group II in accordance with Chapter B3–4: to the Organisation approved in accordance with Chapter A8–15 which is supervising the Certificate of Airworthiness renewal procedure. Once accepted by that Organisation, the results shall be forwarded to the CAA for record purposes;

c) In respect of an aircraft to which Chapter B3–7 is applicable: to the Organisation approved in accordance with Chapter A8–15 which is supervising the Permit to Fly renewal procedure. Once accepted by that Organisation, the results shall be forwarded to the CAA for record purposes.

3.2 The flight test results shall include a certificate, in the following form, which shall be signed by the pilot who conducted the test.

FLIGHT TEST CERTIFICATE

Aircraft Type: .....

Registration: .....

Manufacturer's No.: .....

I CERTIFY that I have tested the above aircraft to Airworthiness Flight Test Schedule
reference .....

The following deficiencies and unsatisfactory features were revealed by the flight tests or noted at other times during the flight(s) and I CONSIDER that those annotated 'R' and/or 'FT' should be dealt with as follows:

(a) Those annotated 'R' should be rectified prior to the issue of the Certificate of Airworthiness or flight for hire or reward, whichever occurs first.

(b) Those annotated 'FT' re-assessed in flight, following remedial action, before the defect can be considered to be rectified.

1 . .....

2 . .....

3 . .....

4. (etc) .....

The above have been transcribed to ..... for rectification and clearance.

Pilot ..... Signed .....

Date ..... Licence No .....

4 Fleet Testing Programmes

4.1 As an alternative to periodic airworthiness flight testing of individual aircraft, a programme of flight testing of sample aircraft from a fleet may be agreed with the CAA, and such sampling will be accepted by the CAA as being representative of fleet characteristics.

4.2 **Basic Requirements.** To be acceptable as a fleet and eligible for a fleet testing programme, the aircraft shall:

a) be of an acceptably similar type;

b) be certificated in the Transport Category and have a Maximum Total Weight Authorised exceeding 2730 kg;

c) be controlled by an Organisation, or Organisations acceptable to the CAA;

d) have produced consistently satisfactory results in previous Airworthiness Flight Tests for an acceptable period of time.

NOTE: Each aircraft of the type will be subjected to an Airworthiness Flight Test at the end of its first year of operation and if data from such tests is sufficient to confirm compliance with d), those aircraft which have proved to be satisfactory may be considered as eligible for setting up a fleet test programme in accordance with paragraph 4.3. If the data in respect of a particular aircraft is insufficient to confirm compliance with d) then that aircraft will be subjected to further Airworthiness Flight Tests at the end of subsequent year(s). An aircraft may be added to an established fleet after one annual test, provided that the results of that test are satisfactory.

4.3 **General**

4.3.1 The size and make-up of each fleet shall be agreed with the CAA.

4.3.2 For each agreed fleet, a flight testing programme shall be agreed with the CAA.

4.3.3 The minimum annual sample required for each fleet shall be 20% of the fleet, or three aircraft, whichever is the lesser, but not less than one aircraft. The frequency and the maximum time period between consecutive tests on individual aircraft shall normally be as in Table 1, but the time period shall not exceed 10 years.

NOTE: Frequencies for some fleets of fixed-wing aircraft and for helicopter fleets may be set differently where the circumstances warrant testing at a higher frequency.

4.3.4 In addition to the reductions in test frequency resulting from fleet testing, the CAA may agree to reductions in the content of the Airworthiness Flight Test Schedules against which the sample aircraft are tested.

NOTE: The intent of the reductions is to eliminate any tests which have produced consistently satisfactory results over several years and to avoid duplication of tests between the Airworthiness Flight Test Schedule and the ground maintenance schedule, where such duplication cannot be justified. Continued duplication could be justified on grounds of unsatisfactory results from previous tests or limited validity of the ground check involved.

Please see following Table 1.

Table 1

NUMBER OF AIRCRAFT IN FLEET	YEAR						
	1	2	3	4	5	6	7
1(A)	A	A	A	A	A	A	A
2(AB)	A	B	A	B	A	B	A
3(A–C)	A	B	C	A	B	C	A
4(A–D)	A	B	C	D	A	B	C
5(A–E)	A	B	C	D	E	A	B
6(A–F)	AB	C	D	E	F	AB	C
7(A–G)	AB	C	DE	F	G	AB	C
8(A–H)	AB	C	DE	F	GH	AB	C
9(A–I)	AB	CD	EF	G	HI	AB	CD
10(A–J)	AB	CD	EF	GH	IJ	AB	CD
11(A–K)	ABC	DE	FG	HI	JK	ABC	DE
12(A–L)	ABC	DE	FGH	IJ	KL	ABC	DE
13(A–M)	ABC	DE	FGH	IJ	KLM	ABC	DE
14(A–N)	ABC	DEF	GHI	JK	LMN	ABC	DEF
15(A–O)	ABC	DEF	GHI	JKL	MNO	ABC	DEF
16(A–P)	ABC	DEF	GHI	JKL	MNO	PAB	CDE
17(A–Q)	ABC	DEF	GHI	JKL	MNO	PQA	BCD
18(A–R)	ABC	DEF	GHI	JKL	MNO	PQR	ABC
19(A–S)	ABC	DEF	GHI	JKL	MNO	PQR	SAB
20(A–T)	ABC	DEF	GHI	JKL	MNO	PQR	STA
21(A–U)	ABC	DEF	GHI	JKL	MNO	PQR	STU

NOTE: For fleets of more than 21 aircraft, the fleet annual sample size should remain at 3 aircraft and the time between consecutive tests on individual aircraft should increase accordingly, subject to the maximum interval laid down in paragraph 4.3.3.

4.3.5 The fleet testing programme shall be reviewed in the event of:

a) any significant change to the aircraft in the fleet (e.g. a change of engine rating or type);

b) any failure to maintain the standards on which the programme was based;

c) any failure to carry out the programme.

5 Operating the Programme

5.1 The CAA shall be given the opportunity to participate in any flight test associated with the programme.

5.2 The programme shall be controlled under arrangements acceptable to the CAA.

The programme may be controlled by:

a) the Operator of the aircraft in the fleet; or

b) the Organisation responsible for the maintenance of the aircraft in the fleet; or

c) in the case of an agreement between Operators to pool their fleets, a fleet co-ordinator nominated by the Operators.

5.3 The CAA shall be kept informed of any changes to the size or make-up of the fleet, so that the programme may be amended as necessary.

5.4 The CAA shall be kept informed of any failure to comply with the programme, so that the programme can be amended as necessary by the CAA.

5.5 The CAA may, where it is considered to be necessary, require an Airworthiness Flight Test to be carried out on any aircraft covered by the programme in any year (e.g. in order to correct for slippage, or to clarify any doubts about the flying qualities of individual aircraft or of the fleet).

5.6 Airworthiness Flight Tests shall be completed within the time period three months either side of the nominal date for the aircraft concerned.

Chapter B3-6 Certificates of Airworthiness for Export from the United Kingdom

1 Introduction

1.1 The issue of a Certificate of Airworthiness for Export (hereinafter referred to as the 'C of A for Export') shall be subject to compliance with the procedure set out in this Chapter B3–6.

1.2 The C of A for Export is not a statutory document, either internationally under ICAO or nationally under the Air Navigation Order. When issued in the United Kingdom it signifies, as at the date of issue, that, except for those significant derogations from the requirements listed on the front (see 4):

a) in respect of a new aircraft, the aircraft is such that a United Kingdom Certificate of Airworthiness could be issued in accordance with the Requirements;

b) in respect of a used aircraft, the aircraft is such that a United Kingdom Certificate of Airworthiness could be issued or renewed, as appropriate, in accordance with the Requirements.

1.3 The C of A for Export does not, by itself, give authority for the aircraft to be flown; such authority may, normally, be obtained in accordance with a) or b).

a) The Authority responsible for airworthiness in the country in which the aircraft is to be registered (hereinafter referred to as the Responsible Authority) may issue a Certificate of Airworthiness;

b) The CAA may (in conjunction with the C of A for Export) issue a Certificate of Airworthiness such as would cover the delivery of the aircraft to its destination.

2 Application

2.1 Form CA 1241, copies of which may be obtained from the CAA Safety Regulation Group, shall be completed and returned to the same address. The application shall be accompanied by the appropriate charge which is prescribed in the CAA Scheme of Charges.

2.2 During the investigation, if it is necessary for a CAA Surveyor to travel outside the United Kingdom, or away from the residential area of an overseas office of the CAA Safety Regulation Group, the CAA will require the applicant to meet the additional costs involved.

3 Compliance with Requirements

3.1 When the CAA is satisfied that compliance has been shown with this paragraph 3, the C of A for Export will be issued.

3.2 **Additional Requirements and Special Conditions**. Compliance shall be shown with any Additional Requirements or Special Conditions prescribed by the Responsible Authority and notified to the CAA in writing.

3.3 **CAA Requirements**. In addition to compliance with 3.2, compliance shall be shown with 3.3.1, 3.3.2 or 3.3.3 as appropriate.

3.3.1 **New Aircraft**. Compliance shall be shown with Chapters B2–2, B2–4 and B3–2 as appropriate.

3.3.2 **Used Aircraft of a Type Previously Certificated in the United Kingdom.** Compliance shall be shown with the requirements of Chapter B3–4 as applicable but with the addition of Surveyor involvement.

NOTES: 1 To qualify for the renewal of a Certificate of Airworthiness and hence the issue of a Certificate of Airworthiness for Export, aircraft below 2730 kg should have undergone a maintenance check, equivalent to an annual inspection and a Certificate of Release to Service issued in accordance with the Air Navigation Order Article 12. The inspection should have been performed and properly documented within the 30 days immediately prior to the issue of the Certificate of Airworthiness for Export. For aircraft above 2730 kg, consideration may be given to the maintenance check performed on an aircraft maintained in accordance with an approved maintenance inspection programme i.e. an equalised or progressive inspection programme.

2 In deciding the extent of rectification and overhaul work, account will be taken of maintenance history and the condition of the aircraft.

3 Where the extent of work to be done on the aircraft prior to export is the subject of a contract, the CAA may, where it is apparent that the full certification requirements are not intended to be met, require the applicant to obtain from the Responsible Authority, a written confirmation that the contractual arrangements are acceptable. The C of A for Export will be qualified accordingly.

3.3.3 **Used Aircraft of a Type Not Previously Certificated in the United Kingdom.** The requirements shall be decided in consultation with the CAA.

NOTE: In deciding the requirements to be met, account will be taken, amongst other things, of the needs of the Responsible Authority, the original certification status of the aircraft, its condition and maintenance history and the number of aircraft likely to be involved.

4 Derogations from the Requirements

4.1 The following will be listed on the front of the C of A for Export:

a) Significant deviations from the approved build standard;

b) Derogations from CAA requirements, Additional Requirements, and Special Conditions;

c) Mandatory modifications and inspections with which compliance has not been shown;

d) In respect of equipment prescribed in the Air Navigation Order:

i) such equipment which is fitted, but has not been approved by the CAA;

ii) equipment appropriate to the certification Category, where this is not fitted.

4.2 Any item listed in accordance with paragraph 4.1 shall be confirmed, in writing, to be acceptable to the Responsible Authority prior to the issue of the C of A for Export.

Chapter B3-7 Issue and Renewal of Permits to Fly

1 Introduction

The CAA has primary responsibility for any aircraft issued with a UK permit to fly. Consequently, the requirements concerning the issue and renewal of permits to fly are given in BCAR Section A, Sub-Section A3, Chapter A3-7.

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Chapter B3-8 'A' Conditions

1 Introduction

1.1 In accordance with Schedule 3 of the Air Navigation Order, under 'A' Conditions in the case of an aircraft which does not have a Certificate of Airworthiness duly issued or rendered valid under the law of the United Kingdom, an aircraft shall fly only for the purpose of enabling it to:

a) qualify for the issue or renewal of a Certificate of Airworthiness or the validation thereof after an application has been made for such issue, renewal or validation as the case may be, or to carry out a functional check of a previously approved modification of the aircraft;

NOTE: For the purposes of this BCAR, 'a previously approved modification' shall mean a modification which has previously been approved by the CAA in respect of that aircraft or another aircraft of the same type.

b) proceed to or from a place at which any inspection, repair, modification, maintenance, approval, test or weighing of, or the installation of equipment in, the aircraft is to take place or has taken place for a purpose referred to in sub-paragraph (a), after any relevant application has been made, or at which the installation of furnishings in, or the painting of, the aircraft is to be undertaken; or

c) proceed to or from a place at which the aircraft is to be or has been stored.

1.2 In the case of an aircraft for which the Certificate of Airworthiness or Certificate of Validation issued in respect of the aircraft has ceased to be in force by virtue of any of the matters specified in Article 9(7) of the Air Navigation Order, shall fly only for the purpose of enabling it to:

a) proceed to a place at which any inspection or maintenance required by virtue of Article 9(7)(b)(ii) of the Air Navigation Order is to take place; or

b) proceed to a place at which any inspection, maintenance or modification required by virtue of Article 9(7)(b)(i) or (c) of the Air Navigation Order is to take place and in respect of which flight the CAA has given per mission in writing;

c) carry out a functional check, test or in-flight adjustment in connection with the carrying out in a manner approved by the CAA of any overhaul, repair, previously approved modification, inspection or maintenance required by virtue of Article 9(7) of the Air Navigation Order.

1.3 Before an aircraft flies under 'A' Conditions the aircraft and its engines shall be certified as fit for flight. This chapter details the type of certificate required.

NOTE: 'A' conditions for flight are prescribed in the Air Navigation Order but should only be used for United Kingdom airspace related operations.

2 Certificate of Fitness for Flight

2.1 The Certificate shall be as follows:

AIRCRAFT ..... CON NO ..... ENGINE ..... S/No(s) .....

It is hereby certified that the aircraft defined hereon has been inspected and is fit for flight provided it is properly loaded.

This Certificate is valid until ..... or until the airworthiness condition of the aircraft is altered, whichever is earlier.

..... **'A' Licence No .....**

Signed ..... **'C' Licence No .....**

Signed ..... **CAA Approval No .....**

2.2 The period of validity shall be stated but shall not exceed 7 days.

2.3 The Certificate shall be issued in duplicate and one copy kept elsewhere than in the aircraft.

2.4 A Certificate of Fitness for Flight shall be issued only by the following:

a) The holder of an appropriate aircraft maintenance engineer's licence granted or rendered valid in the United Kingdom.

b) A firm approved by the CAA under BCAR Chapter A8–1, Chapter A8–3, A8–13 and A8–18 where the Terms of Approval refer to particular types of aircraft.

2.5 If the original airworthiness condition of the aircraft is affected during the period of validity, the Certificate shall be re-issued.

Chapter B3-9 'B' Conditions

1 Introduction

Flight under 'B' Conditions as prescribed in Schedule 3 of the Air Navigation Order, may only be undertaken by Organisations Approved in accordance with BCAR A8–9.

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Chapter B3-11 Aircraft Radio Installations

1 Application for Radio Installation licence

1.1 An application form, copies of which may be obtained from WT Radio Licensing, Surveillance and Spectrum Management, Directorate of Airspace Policy, K6 Gate 6, CAA House, 45-59 Kingsway, London WC2B 6TE, Telephone: 0207 453 6529, Fax: 0207 453 6546, e-mail radio.licensing@dap.caa.co.uk, shall be completed and returned to that address. The Directorate of Airspace Policy will forward a licence to the applicant, which becomes valid only when Form AD 917 (see paragraph 3.5), "Certificate of Approval of Aircraft Radio Installation", is issued by the CAA, except that the licence authorises the applicant to carry out such ground and flight tests, before the CAA issue the Certificate of Approval, as are necessary to comply with paragraph 3.2.

2 Application for Certificate of Approval of Aircraft Radio Installation

2.1 For an aircraft not having a Certificate of Airworthiness, the application for a Certificate of Approval of Radio Installation is a routine matter after the applicant has completed a formal application, on Form CA 3 (see Chapter B3–2), for a Certificate of Airworthiness.

2.2 Where the aircraft has already been issued with a Certificate of Airworthiness, and a Certificate of Approval of Aircraft Radio Installation is desired, the applicant shall complete CAA Form AD 282 in accordance with the Major Modification procedures in Chapter B2–5.

2.3 Where a modification, previously approved by the CAA, has been incorporated in the aircraft introducing a radio installation and a Certificate of Approval of Aircraft Radio Installation is desired, the applicant shall send to the CAA Safety Regulation Group such documents as are necessary to give details of the modification, and also to show that the work has been certified in accordance with the procedures in Chapter B6–7.

3 Approval of Aircraft Radio Installations

3.1 **Design.** The applicant shall ensure that the design of the installation complies with:

a) the Requirements in force at the time the application for a Certificate of Approval of Aircraft Radio Installation is received by the CAA;

b) such other requirements as the CAA may notify in writing, for a particular installation.

3.1.1 All relevant design information, drawings and test reports shall be held at the disposal of the CAA. No such design records shall be destroyed without authorisation from the CAA.

3.1.2 Each design drawing shall bear a descriptive title, drawing number, issue number and date of issue. All alterations to drawings shall be made in accordance with a drawing amendment system which will ensure amendment to design records.

3.1.3 Immediately an alteration is made to a drawing, whether the alteration is permanent or temporary, the drawing shall be identified with a new issue number and date. Where an alteration affects the interchangeability of an item in any way, a new part number shall be issued such as to avoid confusion with the original item.

3.2 **Survey, Ground and Flight Tests.** The approval of an aircraft radio installation is based on a survey by the CAA, followed by such ground and flight tests as are required in respect of the particular installation, to prove the satisfactory functioning of the installation.

3.2.1 The applicant shall arrange with the CAA in the appropriate area, a convenient time, date, and place, for making the survey.

3.2.2 The applicant shall carry out the flight test, in accordance with the requirements prescribed in the Communications Section (COM) of the United Kingdom Aeronautical Information Publications, "Air Pilot", together with such other ground and flight tests as may be required by the CAA, in respect of the particular radio installation.

3.3 **Radio Flight Test Report.** On the satisfactory completion of the survey and the ground and flight tests, a Radio Flight Test Report shall be forwarded to the CAA Safety Regulation Group. The Radio Flight Test Report shall include information under the following headings, together with such additional information as is required by the CAA in a particular case:

a) Type and registration marks of aircraft;

b) Type of installation;

c) Modification reference number;

d) Date and time of test;

e) Position and height of the aircraft and details of the radio tests, including particulars of aerials and transmitter(s) used.

3.4 **Radio Flight Test Certificate.** A certificate in the following form shall be signed by the pilot,or radio operator, as appropriate, at the conclusion of the flight tests:

I hereby certify that, with the exceptions stated below, the radio installation in the above designated aircraft has been proved to perform satisfactorily in flight the functions for which it is approved.

Exceptions ..... **Signed** .....

..... **Date** .....

3.5 **Notification of Approval.** The CAA will issue a "Certificate of Approval of Aircraft Radio Installation" (Form AD 917) to signify approval of the radio installation.

4 Modifications to Aircraft Radio Installations

4.1 Application for approval of a modification to an aircraft radio installation shall be made in accordance with the Major Modification procedures in B2–5.

4.2 The applicant shall ensure that the design of the modification complies with:

a) the Requirements in force at the time the application for the Major Modification is received by the CAA.

b) such other requirements as the CAA may notify, in writing, for a particular modification.

4.3 When a change is made to a component which has already been the subject of a Mandatory Modification and this produces a new or modified component which achieves all the objectives of the previous Mandatory Modification, then the latter

modification becomes an acceptable alternative to the previous one, and shall be shown in the Company's modification system and associated documentation.

5 Change of Ownership

5.1 A change of aircraft ownership invalidates the Radio Installation Licence; the new owner shall apply for a new licence.

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Sub-Section B4
Design and Manufacture of Products other than Aircraft

Chapter B4-2 Type Validation of Engines and Associated Equipment

1 General

The requirements of this paragraph 1 are, except where otherwise indicated, applicable to all engines and associated equipment first type certificated by a foreign Authority. Approval of engines and associated equipment designed and constructed outside the United Kingdom is by means of validation of the certification issued by the Responsible Authority of the State of Construction.

1.1 **Introduction.** Engines and associated equipment for use in civil aircraft for which a Certificate of Airworthiness is required must be of approved types. The approval of such engines and equipment will be subject to compliance with the procedures set out in this Chapter B4–2.

NOTE: In respect of engines and associated equipment for use in civil aircraft, for which a Certificate of Airworthiness is required in the Special Category, the CAA may accept proposals which would vary the procedures in this Chapter B4–2.

1.1.1 The procedures of this Chapter also apply, in principle, to the approval of Auxiliary Power Units, except that, where appropriate, references to JAR–E should be read as being to JAR-APU.

1.2 **Definition of Engine.** An engine used, or intended to be used, for aircraft propulsion. It consists of, at least, those components and equipment necessary for satisfactory functioning and control, but excludes the propeller and its associated equipment.

1.3 **Application.** The application for CAA approval of an engine shall be made in accordance with paragraph 2.

1.4 **Engine Type Identity.** All engines of the same basic type shall have a common designation, and variants thereof shall be identified in a manner acceptable to the CAA, and all such details shall be listed on the Engine Type Certificate, or equivalent approval documents. The designation shall differ from that of any similar engine designed and built to requirements other than JAR–E.

1.4.1 If the ratings of the engine are changed significantly after the engine has been approved, or a significant alteration to the physical standard is made, the identification shall be changed and the approval documents shall be amended accordingly.

1.5 **Modular Engines.** Details shall be provided in the relevant engine manuals of the division of the engine into modules (see JAR–I for definition) giving the nomenclature and clearly defining the boundaries for each module.

2 Application for Approval

2.1 Application for the approval of an engine shall be made in writing to the CAA Safety Regulation Group.

2.2 The application shall be made through, or with the knowledge of, the Responsible Authority of the State of construction.

2.3 The applicant is responsible for the provision of the information specified in paragraph 3 and such other information as may be required by the CAA.

2.4 The application shall include an undertaking to meet the costs incurred by the CAA during its investigations resulting in validation, the rejection of the application, or until the application is withdrawn.

2.5 The application shall also include an undertaking that the costs incurred by the CAA for work in maintaining the validity of the Type Certificate will be met by the applicant.

3 Type Approval of Engines Designed and Manufactured outside the United Kingdom

3.1 In addition to compliance with paragraph 1, engines designed and manufactured outside the United Kingdom shall comply with this paragraph 3.

NOTE: No separate validation is necessary in respect of piston engines of conventional design not exceeding 260 kW (350 BHP) installed in an aeroplane or helicopter, the Maximum Total Weight Authorised of which does not exceed 2730 kg, for which an application for aircraft certification of no higher status than that granted by the Responsible Authority has been made to the CAA.

3.2 In seeking validation of approval, the applicant shall follow any procedures laid down in bilateral or multilateral agreements involving the CAA and the Responsible Authority.

3.3 In the absence of an agreement in accordance with sub-paragraphs 3.2, a) to d) shall apply.

a) A comparison will be made between the requirements to which the engine has been approved and the equivalent CAA requirements;

b) Any differences resulting from the comparison will be evaluated by the CAA, and 'Additional Requirements' may be prescribed by the CAA in writing;

c) Sufficient information shall be supplied to the CAA so that any novel or unusual design features which are not covered by the current CAA requirements may be identified. If, as a result of this consideration, it is necessary to prescribe further requirements, these will be notified in writing as 'Special Conditions';

d) The Responsible Authority shall accept responsibility for establishing that compliance is shown with any Additional Requirements and Special Conditions and for notifying the CAA accordingly.

3.4 In addition to compliance with paragraph 3.2 or 3.3, as appropriate, the applicant shall comply with paragraphs 3.4.1 to 3.4.3.

3.4.1 All documents required by the CAA for validation of approval of engines, and for their continued airworthiness, shall be provided in the English language, unless otherwise agreed by the CAA.

3.4.2 For the purpose of the investigation, and unless otherwise agreed in writing, the following information shall be provided:

a) A brief description of the engine and one copy of cross-section assembly drawings;

b)

i) One copy of the Type Approval documents detailing all the relevant ratings, operating limitations, etc;

ii) Where specifically requested, a copy of the requirements to which the engine was approved;

iii) Details of any deviation from, or failure to comply with, any other requirements, and of any Special Conditions which have been imposed by the Responsible Authority;

iv) Where the certification documents do not provide a clear statement of the minimum acceptance power and/or thrust of a new, or newly overhauled engine, a statement of this information, together with the conditions under which the power and/or thrust should be achieved.

c) One copy of a report summarising the development history and service experience, including a statement of any novel or unusual design features;

d) One copy of the Type Certification Compliance Table or equivalent documents which includes details of any Special Conditions/Additional Requirements imposed by the Responsible Authority.

3.4.3 The following shall also be provided for retention by the CAA:

a) Two copies of each manual referred to in paragraph 6.1;

b) For engines intended for use in aircraft designed in the United Kingdom, one copy of the Approved installation drawings and data together with such information regarding engine performance as may be necessary to enable the aircraft performance to be assessed for the purpose of the Flight Manual;

c) Two copies of all relevant Service Bulletins, Modification Bulletins, etc., issued by the manufacturer, and Mandatory Instructions issued, or applied, by the Responsible Authority;

d) Written confirmation that arrangements are in force to ensure that subsequent issues and/or amendments to the documents referred to in a), b) and c) will continue to be supplied until the arrangements are terminated in writing by the CAA;

e) Two specimen copies of the release documents, in which the Category of Release will be specified, which will be issued by the manufacturer, or the Responsible Authority, both for complete units and for spare parts;

f)

i) A statement of the recommended initial overhaul period (or details of the equivalent maintenance programme) together with details of any associated inspections, checks, etc;

ii) A list of all component retirement or ultimate (scrap) life limitations agreed by the Responsible Authority.

3.5 The manufacturer and the Responsible Authority will be informed where it is considered necessary for the manufacturer's Organisation to be approved by the CAA. Where such approval is not necessary all data provided in accordance with paragraph 3.4 shall contain an indication that it is acceptable to the Responsible Authority.

3.6 When satisfied that compliance has been shown with all requirements the CAA will validate the approval given by the Responsible Authority and notify the applicant and Responsible Authority in writing. The validation documents will state any additional limitations which will apply when the engine is installed in an aircraft registered in the United Kingdom.

4 Design and Manufacture

4.1 Engines and equipment shall have been designed, constructed and tested under airworthiness procedures acceptable to the CAA.

4.2 **Modifications.** Modifications shall be approved in accordance with paragraph 4.2.2 or 4.2.3 or 4.2.4 to ensure that the proposed modification is such that the engine or equipment when modified complies with a) and b).

a) The relevant design and test requirements in force at the time the engine or equipment was originally approved;

b) Such other design and test requirements as the CAA may have notified in writing to the applicant, as being applicable to the engine, or items of equipment concerned.

4.2.1 Salvage/Repair schemes shall be classified as modifications, and shall normally be approved through the medium of the original Approval Organisation, or through an Organisation specifically approved for the purpose by the CAA.

4.2.2 Manufacturer's modifications shall be approved in accordance with the Certificating Authority's procedures. Additional investigation will not normally be undertaken by CAA, unless notified that the modification does not satisfy paragraph 4.2 a) or b).

4.2.3 Modifications by other than the manufacturers, but under the control of the Certificating Authority will be acceptable in accordance with paragraph 4.2.2.

4.2.4 Modifications not subject to paragraphs 4.2.2 and 4.2.3 will require CAA approval in accordance with the requirements of BCAR Section A Chapter A4–2 paragraph 4.6.

5 Engine Equipment Designed and Manufactured outside the United Kingdom

Engine equipment designed and manufactured outside the United Kingdom, which is intended for use on engines designed and constructed within the United Kingdom, shall be approved or accepted in accordance with paragraph 5.1 or 5.2 as appropriate.

5.1 **Group 1 Equipment.** For approval as an integral part of the engine, all Group 1 equipment shall comply with the design and test requirements of JAR–E and with a) or b), as appropriate.

a) Items of Group 1 equipment for which the engine manufacturer takes full responsibility (Group 1 a)), shall have been designed and manufactured in accordance with the airworthiness design and test requirements of the relevant specification.

b) Items of Group 1 equipment for which the engine manufacturer does not accept the responsibility for full technical control (Group 1 b)), shall have been approved initially in accordance with a procedure similar to the Accessory Procedure of Chapter B4-8, and shall be accepted by the engine manufacturer on the basis of the related Declaration of Design and Performance or equivalent document.

5.2 **Group 2 Equipment.** Group 2 equipment will be accepted for use on an engine subject to:

a) the design meeting the interface requirements specified by the engine manufacturer, or otherwise acceptable to the CAA. Conformity with the interface requirements shall be certified by an Organisation appropriately approved by the CAA;

b) evidence of satisfactory operation of the engine fitted with the equipment during tests acceptable to the CAA.

NOTE: The procedure for the approval of Group 2 equipment in its own right will be in accordance with B4–8.

6 Manuals

6.1 Approved manuals shall be provided containing instructions for installing, operating, maintaining and overhauling the engine and its associated equipment (see B6–2 and B6–7).

6.2 Engine performance data, compatible with the engine acceptance and operating limitations, shall be provided for aircraft certification performance, handling and stressing purposes. The data should be such that the power/thrust of a 'minimum' and a 'maximum' engine can be derived and shall include means of determining the effects on performance of variations of engine bleed and power off-take, forward speed, ambient pressure, temperature, humidity.

7 Variation or Cancellation

7.1 At suitable times the CAA will review with the respective design Organisation and Responsible Authority the engines and associated equipment which have been approved, to determine whether the approvals are still required or justified, or whether a variation is necessary. On the basis of their review the CAA will make such changes or cancellations as may be appropriate to the circumstances.

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Chapter B4-4 Type Certification or Validation of Propellers

1 General

The requirements of this paragraph 1 are, except where otherwise indicated, applicable to all propellers and associated equipment.

1.1 **Introduction.** Propellers and associated equipment for use in civil aircraft for which a Certificate of Airworthiness is required, must be of approved types. The approval of such propellers and equipment will be subject to compliance with the procedures set out in this Chapter B4–4.

NOTE: In respect of propellers and associated equipment for use in civil aircraft for which a Certificate of Airworthiness is required in the Special Category, particularly amateur-built and ultra-light aircraft, the CAA may accept proposals which would vary the procedures in this Chapter B4-4.

1.2 **Application.** Application for CAA approval of a propeller shall be made in writing to the CAA, and shall be accompanied by a declaration giving details of the propeller design together with details of the engine or engine/aircraft combination for which approval is sought. The applicant shall include an undertaking to meet the costs incurred by the CAA during its investigation resulting in propeller approval, the rejection of the application after investigation, or until the application is withdrawn, and also subsequent work in maintaining the validity of the approval through modifications to the propeller type and/or amendments to the Type Approval.

NOTE: Propellers are finally approved in association with a defined engine/aircraft application. However, if requested by the applicant the CAA will be prepared to indicate Preliminary Approval when compliance has been established with those requirements which can be met prior to the propeller being selected for, and fitted to, a particular aircraft, i.e. those requirements applicable to a propeller/engine combination only.

1.3 **Propeller Type Identity.** All propellers of the same basic type shall have a common designation, and variants thereof shall be identified in a manner acceptable to the CAA.

1.3.1 If the rating(s) of the engine and/or the flight envelope of the aircraft to which the propeller approval relates are changed significantly after the propeller has received Preliminary or Final approval, or a significant alteration to the physical standard of any feature of the installation is made, the approval will be reviewed, and if necessary, the identification shall be changed.

2 Compliance

2.1 A propeller of a type not previously approved by the CAA, but which has been approved by the Responsible Authority of the State of Design (hereinafter referred to as the 'Responsible Authority') may have such approval validated subject to compliance with the procedures of this paragraph.

NOTE: No separate validation is necessary in respect of propellers of conventional design, fitted to piston engines not exceeding 260 kW (350 BHP), installed in an aeroplane the Maximum Total Weight Authorised of which does not exceed 2730 kg, for which an application for aircraft certification of no higher status than that granted by the Responsible Authority has been made to the CAA.

2.1.1 The application for CAA validation of approval of a propeller shall be in accordance with 1.2.

2.1.2 Propellers shall have been designed, constructed and tested under airworthiness procedures acceptable to the CAA.

2.2 In seeking validation of approval, the applicant shall follow any procedures laid down in bilateral or multilateral agreements involving the CAA and the Responsible Authority.

2.3 In the absence of an agreement in accordance with 2.2, a) to c) shall apply:

a) On the basis of a comparison made between the requirements to which the propeller has been approved and relevant CAA requirements, 'Additional Requirements' may be prescribed by the CAA in writing;

b) Sufficient information shall be supplied to the CAA so that any novel or unusual design features which are not covered by the current CAA requirements may be identified. If, as a result of this consideration, it is necessary to prescribe further requirements, these will be notified in writing as 'Special Conditions';

c) The Responsible Authority will accept responsibility for establishing that compliance is shown with any Additional Requirements and Special Conditions and for notifying the CAA accordingly.

2.4 Once the requirements of 2.2 or 2.3, as appropriate, have been met, the applicant shall comply with 2.4.1 to 2.4.3.

2.4.1 All documents required by the CAA for validation of approval of propellers, and for their continued airworthiness, shall be provided in the English language, unless otherwise agreed by the CAA.

2.4.2 For the purpose of the investigation, and unless otherwise agreed in writing, the following information shall be provided:

a) A brief description of the propeller and one copy of cross-section assembly drawings;

b)

i) One copy of the design specification detailing all the relevant limitations, etc;

ii) Where specifically requested, a copy of the requirements to which the propeller was approved;

iii) Details of any deviation from, or failure to comply with, any of the requirements, and of any Special Conditions which have been imposed by the Responsible Authority;

c) One copy of a report summarising the development history and service experience, including a statement of any novel or unusual design features;

d) One copy of the Type Certificate Compliance Table or equivalent document which includes details of any Special Conditions imposed by the Responsible Authority.

2.4.3 The following shall also be provided for retention by the CAA:

a) Two copies of each manual referred to in 3;

b) For propellers intended for use in aircraft designed in the United Kingdom, one copy of the approved installation drawings and data;

c) Two copies of all relevant Service Bulletins, Modification Bulletins, etc., issued by the manufacturer, and Mandatory Instructions issued, or applied, by the Responsible Authority;

d) Written confirmation that arrangements are in force to ensure that subsequent issues and/or amendments to the documents referred to in a), b) and c) will continue to be supplied until the arrangements are terminated in writing by the CAA;

e) Two specimen copies of the release documents, in which the Category of Release will be specified, which will be issued by the manufacturer, or the Responsible Authority, both for complete units and for spare parts;

f)

i) A statement of the recommended initial overhaul period (or details of the equivalent maintenance programme) together with details of any associated inspections, checks, etc;

ii) A list of all component retirement or ultimate (scrap) life limitations agreed by the Responsible Authority.

2.5 The manufacturer and the Responsible Authority will be informed where it is considered necessary for the manufacturer's Organisation to be approved by the CAA. Where such approval is not necessary all data provided in accordance with paragraph 2.4 shall be acceptable to the Responsible Authority, and shall contain an indication that it is so.

2.6 When satisfied that compliance has been shown with all requirements the CAA will validate the approval given by the Responsible Authority, and will state any additional limitations which will apply when the propeller is installed in an aircraft registered in the United Kingdom.

3 Manuals

Approved Manuals shall be provided containing instructions for installing, operating, maintaining and overhauling the propeller and its associated equipment (see Chapters B5–3 and B7–4).

4 Associated Propeller Equipment Designed and Manufactured outside the United Kingdom

Propeller equipment designed and manufactured outside the United Kingdom, which is intended for use on propellers designed and manufactured within the United Kingdom, shall be approved in accordance with paragraph 2.2, taking into account any existing approval of the equipment by the Responsible Authority and any agreement which exists between the Responsible Authority and the CAA.

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Chapter B4-8 Design and Approval of Aircraft Equipment and Accessories

1 General

1.1 **Introduction.** This Chapter B4–8 sets out procedures whereby aircraft equipment and accessories may be registered and certified as suitable for installation in aircraft for which a UK Certificate of Airworthiness is desired.

1.2 **Applicability.** The requirements and procedures set out in this Chapter are applicable to:

a) all aircraft equipment and accessories intended for installation in aircraft, excluding:

i) Engines, auxiliary power units, propellers and radio apparatus (see Chapters B4–2, B4–4 and B4–10 respectively).

ii) Items wholly designed by an aircraft manufacturer, where such items are intended to be installed only in that aircraft manufacturer's own specific aircraft design, in which case they will be covered by the aircraft type record. (See Chapter B3-2.)

NOTE: Such items could include standard parts or components (e.g. electronic components).

b) the approval or registration, as appropriate, of items, which are required to be approved;

c) the acceptance and certification of items, which are not required to be approved;

d) the installation of items into aircraft registered in the United Kingdom.

1.3 **Applications.** Applications in respect of the procedures of this Chapter B4–8 will be accepted only from Organisations not approved by the CAA but responsible to the Responsible Authority of the country of origin.

2 Definitions

For the purposes of this Chapter B4–8 the following definitions shall apply.

NOTE: To provide for the differences in regulatory procedures and terminology which exist between the United Kingdom and certain foreign countries, and in order to be consistent with the terminology of bilateral agreements, the following terms should be taken as having identical meanings:

a) 'Item', 'Equipment', 'Appliance';

b) 'Certification', 'Appliance Registration'.

2.1 **Items.** Airframe parts and equipment intended to be installed in aircraft (excluding engines, propellers and radio apparatus).

2.1.1 **Component.** An item for which the procedure followed is that prescribed in paragraph 5.3.

2.1.2 **Accessory.** An item for which the procedure followed is that prescribed in paragraph 5.4.

2.2 **Uncontrolled Items.** Those airframe parts and equipment, the installation or failure of which would not adversely affect the airworthiness and the safe operation of an aircraft and as such are not required to be approved together with those items specifically exempted from approval by the Air Navigation Order (ANO).

2.3 **Controlled Items.** Those airframe parts and equipment:

a) prescribed in the Air Navigation Order and not specifically exempted from approval;

b) prescribed in the Requirements;

c) on which the airworthiness and safe operation of an aircraft depend;

d) the installation or failure of which could adversely affect the airworthiness and safe operation of an aircraft.

2.4 **Responsible Authority.** The body in any country which exercises control in a similar manner to the CAA in respect of regulatory procedures and airworthiness control of the item under consideration.

3 Standard Parts

3.1 The procedure prescribed in this Chapter B4–8 need not be followed for AGS and other standard parts complying with national or international specifications or standards recognised by the CAA or the appropriate Responsible Authority.

NOTE: This is intended to cover minor items complying with AGS, SBAC, BSI or similar standards, where these are limited to manufacturing drawings from which the Organisation can assess the Items as suitable for the intended application.

3.2 The Organisation using such standard parts shall accept responsibility for the manner of their use.

4 Uncontrolled Items

Uncontrolled Items, regardless of the country of manufacture, are not required to be approved, but when installed in an aircraft registered in the United Kingdom, compliance shall be shown with the requirements of this paragraph 4.

NOTE: An Organisation responsible for the installation of Uncontrolled Items in aircraft may require these Items to be manufactured under the supervision of an appropriately approved Organisation.

4.1 General

4.1.1 An Organisation, responsible to the Responsible Authority in the country of origin, shall submit to the CAA for acceptance, a certificate that it has satisfied itself that no Uncontrolled Items installed in the aircraft will, in themselves, constitute a danger to the aircraft, together with a list of the Items (except for those which obviously could have no safety significance). When so requested, the Organisation shall supply to the CAA a summary of evidence on which the certification was based.

4.1.2 An Organisation approved for design incorporating Uncontrolled Items in an aircraft, shall submit to the CAA for acceptance a certificate that it has satisfied itself that the installation of such Items does not adversely affect the airworthiness and safe operation of the aircraft concerned, and that they are so installed that in the event of their failure or malfunction, the Items will not endanger the aircraft or its occupants.

NOTE: For new aircraft types the certifications in paragraphs 4.1.1 and 4.1.2 are covered by the usual Certificate of Design for the aircraft type. Where items are introduced as modifications, the CAA may require a further Certificate of Design. (See Chapter B6–6.)

5 Controlled Items - Designed and Manufactured under the Supervision of Organisations in Foreign Countries not Approved by the CAA but Responsible to the Responsible Authority

The procedures of this paragraph 5 are applicable only to Items which have been designed, tested, manufactured, documented and certificated in accordance with the relevant airworthiness requirements, applicable specifications and procedures of the country of origin, under the supervision of Organisations not approved by the CAA but responsible to the Responsible Authority.

5.1 **Continuity of Quality.** Assurance of continuity of quality may be provided by evidence that procedures acceptable to the Responsible Authority were used. Where continuity of quality is not so assured, such inspections and tests as are considered necessary shall be made under the supervision of an Organisation approved by the CAA, to the satisfaction of the CAA.

5.2 **Procedure to be Adopted.** Where foreign equipment is intended for use in United Kingdom constructed or registered aircraft, the procedure to be followed for acceptance or registration shall be the Component Procedure prescribed in 5.3 or the Appliance Registration Procedure prescribed in 5.4, as determined by 5.2.1 to 5.2.4.

5.2.1 Where the Item is designed for a particular use in a particular aircraft type, the Component Procedure shall normally apply. Where it is proposed that the Appliance Registration Procedure should be used for such an Item, the prior agreement of the CAA shall be sought.

5.2.2 Where the Item is classified as Mandatory Equipment as defined in the Air Navigation Order or in the appropriate Section of the Requirements, e.g. Section G for rotorcraft, the Appliance Registration Procedure shall apply, unless agreed otherwise by the CAA.

5.2.3 Where the Item is designed for general use other than as described in 5.2.1 or 5.2.2, either the Appliance Registration Procedure or the Component Procedure shall be applied at the discretion of the Applicant, subject to the agreement of the CAA.

5.2.4 Where the Responsible Authority is unable or unwilling to operate the Appliance Registration Procedure, the Component Procedure shall apply.

5.3 **Component Procedure**

5.3.1 Where the Component Procedure is applied, the CAA will not normally be involved in the investigation of the component. The CAA does, however, reserve the right to carry out such investigations as it considers necessary in a particular case. In the event of the CAA becoming involved, the Organisation making use of the component will be advised. Any costs incurred by the CAA in the investigation will be charged to that Organisation, unless other specific arrangements have been agreed between the Organisation(s) concerned and the CAA.

5.3.2 The Organisation approved by the CAA which is accepting responsibility for the installation of components produced in accordance with this paragraph 5 into products or aircraft of its own design, shall follow procedures equivalent to those specified in A4–8. In addition, this approved Organisation shall establish to its own satisfaction and to the satisfaction of the CAA, the adequacy of the control of the continued design, manufacture, modification and quality assurance procedures applicable to the component.

5.4 Appliance Registration Procedures[1]

5.4.1 **Application.** Where the Appliance Registration Procedure is applied, the Applicant shall complete CAA Form AD 70, and shall forward it to the CAA Safety Regulation Group together with the correct fee, in accordance with the CAA Scheme of Charges. The CAA will charge to the Applicant all cost involved in the investigation of the Appliance, including fees, subsistence and travelling where appropriate. The total charge will be based on the cost of the investigation (regardless of the outcome) and the CAA will, during the course, or upon completion of the investigation, notify any further charges in writing. The Applicant shall, normally, deal direct with the CAA throughout the Registration process.

5.4.2 **General.** The Appliance shall conform to a Specification (frequently the maker's own specification or a specification issued by the Responsible Authority) acceptable to the CAA, and shall be certificated by a DDP (see 6) by an Organisation accepted by the Responsible Authority for the design of such Appliances. The CAA will accept that an Appliance has those characteristics set out in the DDP and vouched for by the Responsible Authority. The CAA shall have the right to disclose the contents of a DDP relating to the Appliance to persons interested in the installation of such an Appliance. The manufacturer of the Appliance is normally expected to make the DDP available to such persons.

5.4.3 **Procedure.** The procedure to be followed for CAA Appliance Registration shall be as set out in this paragraph 5.4.3.

a) **Documentation.** The Applicant shall provide the following:

i) CAA Form AD 70, the correct fee and a letter requesting Registration, addressed to CAA, Safety Regulation Group, with a copy to the Responsible Authority;

ii) Written confirmation from the Responsible Authority that it is willing to support the application for Appliance Registration;

iii) A copy of the Specification(s) with which the Appliance complies;

iv) Drawings and such descriptive information as will adequately define the Appliance to the CAA.

NOTE: It may be necessary for the CAA to require a physical examination of the item.

v) A Declaration of Design and Performance (DDP) (see 6);

vi) Type test or other evidence showing conformance with the Specification(s) with which the Appliance complies;

vii) One copy of the Maintenance, Overhaul and Repair Manuals and a copy of Service Bulletins and the Installation Manual, where appropriate;

viii) A Statement of Conformance signed by the Applicant certifying that:

- The Appliance conforms to the Specification(s) and also complies with the appropriate requirements of the Responsible Authority. A statement of any agreed exceptions or deviations shall be made.
- The Appliance will be manufactured under the quality control procedures declared to, and accepted by the Responsible Authority.
- The CAA will continue to be advised of any modifications affecting the airworthiness of the Appliance.

1. The procedure will be based on agreement between the CAA and the Responsible Authority.

- A revision service for publications prescribed in vii) will be provided.

ix) Where the Appliance has been approved by the Responsible Authority, a copy of the original letter of approval.

b) United Kingdom CAA Additional Requirements

i) After examination of the documentation required by a), the CAA may prescribe Additional Requirements.

ii) Additional Requirements will be limited to the minimum found necessary:

- to provide a level of safety equivalent to that provided for by United Kingdom Requirements, Specifications and practices, and to enable compliance to be shown with the United Kingdom Air Navigation Order.
- to cover unusual features not covered by existing United Kingdom Requirements, Specifications and practices.

iii) In order to determine Additional Requirements the CAA may require the Applicant to provide such failure analyses as are considered necessary.

iv) Where Additional Requirements are prescribed, the Applicant and the Responsible Authority will be so advised and sent copies of all related correspondence. The Applicant shall then submit an amended Statement of Conformance, any additional evidence and a certificate that the Additional Requirements have been met. The Statement shall be accompanied by a letter from the Responsible Authority certifying that the design requirements for the particular Appliance, including the prescribed Additional Requirements, have been met.

c) Registration

i) Upon CAA acceptance of the documentation required by (a), and also, where applicable, receipt of satisfactory additional statements and evidence as required by (b)(iv), the Appliance will be registered by the CAA as suitable for use within the limitations of the DDP and this Registration will be signified by issue of a CAA Appliance Registration reference 'AR' number. The Registration will apply only to the Applicant, at his address at the time of Registration.

ii) The CAA will provide the Responsible Authority with a copy of the formal letter of Registration of the Appliance.

d) Acceptance of Individual Appliances

i) Individual Appliances of a type registered in accordance with the procedure of this paragraph 5.4 shall be released to the United Kingdom user under cover of an Airworthiness Approval Certificate issued by the Responsible Authority or by the Applicant, if authority has been delegated to him by the Responsible Authority and that Authority assumes full responsibility for the Certification. The Registration Number (AR) issued by the CAA shall be quoted on the Airworthiness Approval Certificate.

ii) An Organisation with appropriate terms of approval for design may then incorporate the Appliance into products or aircraft of its own design, provided that the DDP shows the Appliance to be suitable.

6 Declaration of Design and Performance

6.1 A standard form of DDP for international use is given in ISO Recommendation No. R224 and a British version is given in BS 3G100:[1] Part 1, entitled 'Declaration Identifications and Construction'. This will require to be adapted according to the nature of the Item. The Declaration shall contain at least the following information:

a) Particulars identifying the Item, its design standard, including reference to the specification(s) to which it is designed, and a record of drawings;

b) The rated performance of the Item, either directly or by reference to other supplementary documents where necessary;

c) The degree of compliance with the Requirements stating the issue number of the Section concerned;

d) Reference to relevant test reports;

e) Any limiting conditions applying to the use of the Item. This shall include limitations implicit in the design (e.g. working and ultimate pressure or loads, rating, working and maximum voltage and current, accuracy of instruments) declarations required by the governing specifications (e.g. by British Standard 3G100)[1] and the ability of the Item to work under various environmental conditions (e.g. acceleration, vibration, altitude, temperature and humidity).

NOTE: For example, an item of electrical Equipment may require the following information:

i) Voltage range;

ii) Frequency range;

iii) Time rating and duty cycle;

iv) Altitude and temperature range appropriate to rating;

v) Climatic test classification and waterproofness grade, as defined in BS 3G100[1];

vi) Vibration grading, acceleration class and grade, explosion-proofness category, fire resistance classification, compass safe distance and radio interference characteristics, all as defined in BS 3G100[1];

vii) Minimum life or overhaul period in hours or cycles of operations;

viii) Fluid resistance;

ix) Any departures from the governing specifications.

6.2 The Declaration shall bear the following statement made and signed by an authorised signatory:

I hereby certify that the information contained in this Declaration of Design and Performance is accurate and is made under the authority of the Civil Aviation Authority, Approval Ref: ..... (Company Name) cannot accept responsibility for the satisfactory operation of Items used outside the conditions given above without their agreement.

7 Manuals

7.1 In respect of Items to which the Accessory or Appliance Registration Procedure has been applied, the Applicant shall prepare the appropriate Maintenance, Overhaul and Repair Manuals as required by B5–3.

1. EUROCAE ED14A and RTCA DO 160 are other environmental test Standards which are specifically recognised.

7.2 In respect of Items to which the Component Procedure has been applied, the appropriate Organisation responsible to the Responsible Authority shall prepare the Maintenance, Overhaul and Repair Manuals, or such parts thereof as are appropriate, as required by Chapter B5–3.

8 Modifications

8.1 Modifications to Items to which the procedures of this Chapter B4–8 have been applied may affect the original approval, registration or certification. The Applicant shall notify the CAA or the user, as appropriate, of the intention to change or modify the design, or where a new 'Mark' is to be introduced. Where required by the CAA, CAA Form AD 70 shall be completed and forwarded to the CAA.

NOTE: The procedures for approval of modifications to aircraft are prescribed in Chapter B2–5.

8.2 Where modifications of Items to which the procedures of this Chapter B4–8 have been applied affect physical or functional interchangeability, a separate type (or part) number shall be allocated to the modified Item. Less significant changes shall be identified in an acceptable manner.

8.3 Where the modification invalidates any of the information included in the Type Record for the Item or the Declaration of Design and Performance, the document(s) shall be re-issued with account taken of the modification.

8.4 The Applicant shall keep a master record of all modifications and this shall be made available to the CAA on request.

9 Mandatory Modifications and Inspections

Modifications and inspections considered essential for airworthiness will be classified as mandatory by the CAA in consultation with the Approved Organisations concerned and the aircraft manufacturer, as appropriate, in accordance with the procedures of Chapter B5-6.

10 Equipment Register

10.1 The Applicant shall maintain a register of Items designed for use on aircraft. The register shall be in a form acceptable to the CAA, and shall be made available to the CAA on request.

10.2 Arrangements shall be made to keep the register up to date in respect of new or modified Items. An overall review of Items listed in the register shall be made at periods not exceeding three years, with a view to recommending to the CAA cancellations of approval, registration or restriction of use of obsolete or obsolescent Items.

NOTE: The terms of approval in accordance with Sub-Section A8 are such that essential records may not be destroyed without authorisation from the CAA.

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Chapter B4-10 Radio Apparatus

1 Introduction

The requirements and procedures prescribed in this Chapter B4–10 are applicable to radio (and radar) apparatus, i.e. apparatus concerned with information transfer by the use of radiated electro-magnetic waves.

2 Definition

Radio Apparatus is defined as a discrete radio appliance which can readily be connected into, and removed from, an aircraft radio system.

NOTE: The term radio apparatus is intended to include such associated devices as aerials, transducers, service selection systems, radio navigational computers, display systems and power supply units concerned with the radio installation.

3 Prototype Apparatus

3.1 The acceptance of Radio Apparatus is based on examination of the design and quality in order to establish compliance with BCAR Section R and with such other United Kingdom requirements as are applicable.

NOTE: The CAA will consider an application for approval of apparatus for use in a restricted category, where the apparatus has not been approved by the competent Authority in the country of manufacture.

3.2 **Application for Approval.** Form AD 70, copies of which may be obtained from CAA, shall be completed and returned, together with the data and information prescribed in 3.3. Applications must also be accompanied by the correct fee, in accordance with the CAA Scheme of Charges. The total fee is based on the cost of investigation, whether or not formal approval is granted. The CAA will, during the course, or upon completion of the investigation, notify the applicant in writing of any charges due.

3.3 **General.** As a minimum to support the initial application for approval, the applicant shall provide the following:

a) Evidence that the apparatus is of a type approved by the competent Authority of the country in which it was manufactured, together with a copy of the type approval test report for the apparatus;

b) Evidence of the approval standard to which the apparatus has been certified, together with a DDP (see BCAR Section R, Chapter R3–1);

c) Two copies of manuals covering Installation, Maintenance and Overhaul;

d) A copy of the production test specification for the apparatus and evidence of the quality control procedures used in production;

e) Information regarding procedures for notification of modifications, the availability of spare parts, and the servicing arrangements which could be made available in the United Kingdom.

3.3.1 Should the information provided in accordance with 3.3 be insufficient to establish the acceptability of the apparatus, the CAA shall have the right to make such further

investigations, and to prescribe such further tests, as are necessary to establish whether or not compliance can be shown with the relevant requirements.

3.3.2 The CAA may require additional information to that provided in accordance with 3.3, and the provision of such information shall be the responsibility of the applicant. In cases where the applicant is not the manufacturer or the designer of the apparatus, the CAA reserves the right to consult the manufacturer, or the designer, directly on any matters concerning the approval of the apparatus.

3.3.3 It is preferable that the information provided for the CAA is in English.

3.3.4 Where continuity of quality cannot be vouched for by a competent Authority in the country in which the apparatus is manufactured, then such inspections and testing of series units as are necessary to establish quality shall be carried out by an appropriately approved Organisation in the United Kingdom.

3.3.5 The applicant shall ensure that the CAA is informed of modifications of the apparatus.

4 Series Apparatus

4.1 Series Radio Apparatus shall be certified by an appropriately Approved Organisation (see Sub-Section A8).

4.2 Each item of series Radio Apparatus shall be marked as follows:

a) Manufacturer's name;

b) Manufacturer's type designation;

c) Manufacturer's serial number;

d) Modification state;

e) Power supply characteristics;

f) The compass safe distance when this exceeds 30 cm (12 in);

g) To show any special requirements for installation, e.g. specific orientation.

5 Design Records

All relevant design information, drawings and test reports shall be held at the disposal of the CAA. No such design records shall be destroyed without authorisation from the CAA.

5.1 Each design drawing shall bear a descriptive title, drawing number, issue number, and date of issue. All alterations to drawings shall be made in accordance with a drawing amendment system such as will ensure amendment to design records.

5.2 Immediately an alteration is made to a drawing, whether the alteration is permanent or temporary, the drawing shall be identified with a new issue number and date. Where an alteration affects the interchangeability of any item in any way, a new part number shall be issued such as to avoid confusion with the original item.

5.3 The Production Test Specification shall constitute part of the design records.

6 Overhaul, Repair and Replacement

The procedures for overhaul, repair and replacement are given in B6–7.

7 Modifications

Where modifications affect the performance or other airworthiness characteristics of an item, a Form AD 70 shall be completed and returned as detailed in 3.1. Two copies of the details of the modification shall be forwarded to the CAA, preferably at an early stage in the design.

7.1 Where modifications are classified as mandatory by the CAA, a date shall be agreed with the CAA by which all affected apparatus is to be modified, that date to be quoted in the modification documents.

7.2 The DDP and the appropriate Manuals shall be amended where the modification affects the information in these documents.

NOTE: The general procedures for approval of modifications are prescribed in B2-5.

8 Inspection of Apparatus

Radio apparatus shall be made available to enable the CAA to inspect it, as necessary, for the purpose of approval.

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Sub-Section B5
Continued Airworthiness - Responsibilities of the Type Design Organisation

Chapter B5-2 Maintenance Review Board (MRB)

1 Introduction

1.1 This Chapter B5–2 gives guidance on the procedures for conducting a Maintenance Review Board (MRB) for a new aircraft type, to establish an initial Maintenance Programme prior to certification. Industry involvement in MRB procedures and the production of the MRB Report are also described.

2 General Procedures

2.1 CAA Safety Regulation Group will decide in consultation with the Type Design Organisation whether an MRB is to be established for a new aircraft type. Prior consultation will take place with the Type Design Organisation and the following procedures will normally apply to aircraft, the MTWA of which exceeds 5700 kg, intended for Transport Category certification (see B3–2).

2.2 MRB procedures may also be applied to individual types of powerplant and major equipment where alternative fits are available for the new aircraft, or for retrofit action to previously certificated aircraft. Individual MRB Reports will, where applicable, be referred to in the MRB Report for the aircraft.

2.3 The MRB Report resulting from these procedures will contain the initial maintenance and inspection requirements which form the basis for each Operator to produce and develop his Maintenance Programme. (See B7–5 and CAP 418.[1]) The Type Design Organisation will produce the Report for submission to the CAA for approval and subsequent revisions must also be approved by the CAA.

2.4 The published MRB Report does not constitute a complete maintenance schedule/programme in a form that an intended Operator may submit to the CAA for approval for his operation. The Type Design Organisation is required to produce its recommended maintenance programme, e.g. Recommended Maintenance Schedule, Maintenance Planning Guide, which will reflect the MRB Report requirements together with the additional activities needed to maintain the aircraft in service (see B7–5).

2.5 Operators, may, as an alternative to themselves producing a maintenance programme based on this MRB Report, submit the Type Design Organisation's Recommended Programme to the CAA for approval to satisfy the requirements of B7–5.

3 MRB Membership and Policy Management

3.1 The MRB Chairman will be appointed by the Regulatory Authority for the Country in which the Type Design Organisation (or powerplant/major equipment manufacturer as appropriate) is located.

3.2 The MRB will be composed of Regulatory Authority staff of the particular disciplines and numbers to reflect the size and complexity of the aircraft/powerplant/equipment

1. CAP 418 entitled "Condition Monitored Maintenance – an Explanatory Handbook", is available from the CAA's printers, whose details are given on the inside cover of this publication.

under review. Observers to the various industry Working Groups (see 4.2) will be nominated by the Chairman, where necessary, from the MRB members.

3.3 Representatives from foreign Airworthiness Authorities may be invited by the Chairman to provide MRB members where the initial or early delivery of the aircraft is to an overseas Operator.

3.4 Maintenance Proposals (MP) produced by the industry Steering Committee (see 4.1) will be assessed by the MRB. When all outstanding items have been resolved, the Type Design Organisation will produce and submit the MRB Report to the Chairman for approval.

3.5 The Chairman will be responsible for the establishment and control of MRB programme policy, attendance, time scales and standards to be applied by industry. He will co-ordinate activities such that guidance and consultation are made available by attending Steering Committee meetings when necessary.

4 Maintenance Programme Development and Procedures

To produce the MRB Report, which contains the initial maintenance and inspection requirements, the procedures and processes defined in Airline/Manufacturer Maintenance Program Planning Document – MSG3, or an alternative procedure agreed by the Airworthiness Authority will be applied.

4.1 Industry Steering Committee

4.1.1 Management of the detailed activities of the programme is the responsibility of the Steering Committee. This Committee should consist of representatives/specialists from the following, as appropriate:

Type Design Organisation
Engine/APU Manufacturers
Major Equipment Manufacturers
Airlines/Operators
Airworthiness Authorities (part time)
Other members as decided by the Steering Committee or MRB Chairman

4.1.2 The Steering Committee should establish the types of Working Groups and their participants, that are to be used to generate the technical and operational information for the programme. Details of the Working Group subjects and membership should be supplied to the MRB Chairman, who will nominate the Airworthiness Authority observers.

4.1.3 In addition to directing the activities of the Working Groups and other supporting tasks, the Steering Committee is responsible for ensuring that all committee and group members are familiar with MSG procedures and logic analysis, and that training is made available where necessary, including technical subjects if applicable.

4.1.4 The Maintenance Proposals produced by the Working Groups should be assessed by the Steering Committee, revised where necessary, and the completed MP presented to the MRB Chairman, together with all necessary supporting information, for MRB consideration.

4.2 Working Groups

4.2.1 Each Working Group is responsible for proposing the initial maintenance and inspection tasks for their nominated subject areas. The Chairman and members are nominated by the Steering Committee and should normally consists of representatives from:

Manufacturer/Type Design Organisation
Airlines/OperatorsObservers

4.2.2 Individual groups should apply the MSG (or equivalent) analyses, as decided by the MRB, to the following areas, as appropriate:

Airframe general (Zonal)
Structures
Propulsion
Systems and Components
Avionics

4.2.3 Within each Working Group the manufacturer is responsible for the major input and effort regarding logic analysis, the supply of test data and the provisioning of technical information. The types of test programmes, the validity of safety assessment methods, structural tests and inspection criteria, etc., must be accepted by the MRB Chairman, through the Steering Committee, before Working Group activities proceed.

4.2.4 The Working Groups should progressively supply to the Steering Committee the maintenance proposals, supporting analysis data and other justification for each completed area of responsibility.

4.2.5 Occasionally, the Steering Committee may request a group to re-assess a particular proposal or vary the original concept of establishing a task. The group Chairman is responsible for co-ordinating and controlling such activities and should ensure that the Steering Committee is kept informed of any problems, delays, etc., in addition to supplying routine progress reports.

5 MRB Report Approval and Revision

5.1 When the MRB is satisfied that all outstanding points resulting from the MP have been resolved, the MRB Chairman will inform the Type Design Organisation that the Report may be produced for approval and publication.

5.2 The Type Design Organisation should publish the MRB Report, endorsed with Airworthiness Authority/MRB approval, and distribute it as part of the continued airworthiness material, e.g. Maintenance Manuals, Service Bulletins, required for Type Certification.

5.3 Periodic revisions to the MRB Report may be necessary to reflect service experience, Type Design Organisation's continuing test programmes and, where applicable, changes to the philosophy or methods by which maintenance tasks are derived.

5.4 Prior to the Report being published, the MRB will normally decide whether the full, or part, re-convening of the MRB is necessary to implement the revision process. Where a regular revision programme is not deemed necessary, the CAA or Industry may request revisions to the Report based on individual or joint experience.

5.5 Regular revision action should be processed under normal MRB procedures. Non-regular revision requests should be co-ordinated by the Type Design Organisation and submitted with full supporting evidence to the CAA for assessment and approval.

6 Maintenance Review Board Report

6.1 **General.** The purpose of the Report is to provide an acceptable basis from which individual Operators may produce their Maintenance Programmes as required by the CAA.

6.2 Production and Contents of the Report

6.2.1 **Maintenance Proposals**. Maintenance Proposals (MP) shall be produced jointly by the Type Design Organisation, major equipment manufacturers and, if possible, intended Operators, using a logic analysis process agreed by the CAA. The Type Design Organisation shall submit the completed MP to the MRB for review, and shall provide any necessary supporting information. The MRB will notify the Type Design Organisation of any changes required to the MP which, in the finally accepted form, will constitute the MRB Report.

6.2.2 **Report Content.** The Report shall contain at least the following:

a) A reference number, issue number and date;

b) A title identifying the particular aircraft type and model(s);

c) An Index using ATA Specification 100, or a format acceptable to the CAA in accordance with B7–4 for subject presentation;

d) An introduction stating the standard against which the document has been produced (e.g. MSG–3, EMSG);

e) Where an aircraft type has significant optional or alternative systems, equipment or installations, these shall be identified in the Report;

f) A statement in flying time, cycles or calendar time, as applicable, for any limitation in the initial period of aircraft operation at the time of issue of the Report, e.g. the structural inspection programme may have been established for the first 12,000 cycles of operation only;

g) A definition of the operating duty cycle and approximate annual utilisation assumed in production of the maintenance requirements, together with a statement of action to be taken in respect of aircraft using significantly different operating criteria;

h) A description of any rules relating to sampling programmes where these form a part of the maintenance programme;

i) Aircraft Zone or Area designation, Access and Panel charts. These may be identified by reference to some other document controlled by the manufacturer;

j) Procedures by which the inherent safety and reliability of the aircraft, its systems and equipment will be assured on a continuing basis;

k) A listing in ATA Specification 100 order (or an alternative acceptable to the CAA) of all items, systems or structures where analysis has shown that a maintenance task is required. A description of the task is to be given in each case together with the periods, stated in flying hours and/or cycles or elapsed time, at which the task is to be applied;

l) A listing of all zones or areas to which a maintenance task has been found by analysis, to apply together with a description of the task in each case and periods, stated in flying hours and/or cycles or elapsed time at which the task is to be applied;

m) Identification of those tasks which analysis has shown to be required for safety and also task required for compliance with certification requirements;

n) A Glossary of Terms including, in particular, definitions of the maintenance tasks specified in the Report;

o) A statement requiring that the effectiveness of the application of Maintenance Programmes based upon the MRB Report is to be monitored, either by individual

Operators, or by the Type Design Organisation. Such monitoring may be achieved by a Condition Monitored Maintenance Programme, (see B6–2 Appendix No.1) or by any other method accepted by the CAA in a particular case, but shall include, as a minimum, all items identified by the Report as significant in respect of their failure effect on safety or reliability.

7 Report Approval

The Report will be approved by the MRB Chairman on behalf of the CAA.

8 Report Publication

The Type Design Organisation shall publish and distribute the Report. Copies shall be provided to the CAA as required.

9 Report Review and Revision

The Report shall be reviewed periodically by the CAA and Type Design Organisation in the light of experience gained during its application. Where changes to the Report are necessary these shall be notified by Service Bulletin action, or by other means acceptable to the CAA, pending revision of the Report. Major changes to the Report may necessitate the re-convening of the MRB and could result in the Report being revised or re-issued. All revisions or re-issue will be approved by the CAA.

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Chapter B5-3 Maintenance, Overhaul and Repair Manuals

1 Introduction

1.1 Manuals containing information and recommendations necessary for the maintenance, overhaul and repair of aircraft, including engines and auxiliary power units, propellers, components, accessories, instruments, electrical and radio apparatus and their associated systems, and radio station fixed fittings, shall be provided by the manufacturer/Type Design Organisation to comply with the procedures outlined in this Chapter for aircraft to be granted a United Kingdom Certificate of Airworthiness.

1.2 All relevant manuals must be available, unless otherwise agreed by the CAA, for issue to a standard of completion acceptable to the CAA at the time of issue of the Certificate of Airworthiness.

2 General

2.1 Except as otherwise agreed by the CAA, manuals, produced in accordance with this Chapter, shall be certificated and published under the authority of the appropriate Type Design Organisation and shall accurately reflect the design and production standard of the item concerned (see paragraph 1.1).

2.1.1 The CAA reserves the right to investigate the content of any certified manual and to require the embodiment of any revision or amendment which is considered necessary to satisfy the Requirements.

2.2 Engine, auxiliary power unit and propeller manufacturers of other components shall provide the aircraft Type Design Organisation with certified manuals which relate to those of their products installed in the aircraft. In the case of products approved under the Component Procedure in Chapter B4–8 the certified manuals shall be provided by the manufacturer, or produced by the aircraft Type Design Organisation in collaboration with the manufacturer.

2.3 All manuals shall be adequately illustrated and include such instructions and information considered necessary to meet the requirements of this Chapter. Manuals complying with the applicable recommendations in Chapter B7–4 would fulfil the requirements or other methods would be acceptable with the agreement of the CAA.

2.4 Manuals conforming with the Specification for Manufacturers' Technical Data – Air Transport Association of America – Specification No.100, would also be acceptable as a basis for complying with this Chapter, subject to the inclusion of any variations from the Specifications which may be required by the CAA and which are defined to the applicant.

3 Mandatory Life Limitations

3.1 The certification of aircraft, engines, propellers and auxiliary power units, often depends on safe lives being established for certain parts, failure of which could hazard the aircraft. They have previously been described in a number of ways; e.g. retirement, ultimate, or scrap lives, but are hereafter referred to as Mandatory Life Limitations.

3.2 There is no universal international convention for the location of an authoritative source of Mandatory Life Limitations in the aircraft publications. Because it is important for users of the equipment to be able positively to locate the information, a statement will be made in respect of each aircraft on the United Kingdom register in the CAA Additional Airworthiness Directives published in "Foreign Airworthiness Directives", giving a reference for each aircraft, engine, propeller and auxiliary power unit to the publications in accordance with 3.3, 3.4 and 3.5 in which this information is promulgated.

3.3 For new certifications the Mandatory Life Limitations required under 3.1 shall be located in accordance with 3.3.1 to 3.3.4 as applicable.

3.3.1 In the "Airworthiness Limitations" section of the Maintenance Manual or other agreed document which forms part of the Instructions for Continued Airworthiness where such a document is required by the regulations under which certification is awarded.

3.3.2 Where an approved "Airworthiness Limitations" section (or equivalent) does not exist, in agreed document(s)[1] which will be identified in accordance with 3.2.

3.3.3 Where the aircraft, or other product is of foreign origin and the CAA wishes to impose limitations which are in addition to, or different from, those approved by the certificating Authority of the country of origin, then these changes shall be promulgated by:

a) in the case of aircraft having an approved "Airworthiness Limitations" section (or equivalent) in an agreed document by incorporation of amendments or change sheets which are CAA approved;

b) in the case of aircraft which do not have an approved "Airworthiness Limitations" section (or equivalent), in an agreed document identified as in 3.2.

3.3.4 For any component for which a Mandatory Life Limitation has been established (engines, propellers, helicopter rotor head, airframe structure etc.) the definition of a "typical cycle" or "typical flight" (engine/propeller parameters, aircraft weight, forward speed, altitude, duration, etc.), in terms of the relevant parameters on which this life determination has been based, shall be stated in the document required under 3.3.1 or 3.3.2. The definition of a typical cycle of flight should be based on the best information (e.g. from development and certification flight testing) at the time of certification, and updated, as necessary, following service experience.

3.4 Where these Mandatory Life Limitations have been established in units other than flying hours or landings (e.g. cycles) and published in accordance with 3.1, 3.2 and 3.3, the procedure for converting flying hours or landings, as applicable, into these units shall be given in the same documents.

3.5 Whatever the source, each Mandatory Life Limitation must be approved by the CAA or by the responsible Authority of the country of origin. No alteration or deletion shall be made to any of the published CAA Mandatory Life Limitations without prior approval of the CAA.

3.6 Where any alterations in the published Mandatory Life Limitations are required by the CAA, these shall be promulgated as follows:

1. In the case of engines, propellers and auxiliary power units it is recommended that these limitations are stated in the Overhaul Manual (see B7–4, 5.2.9 and 6.2). Additionally, the definition of a "typical cycle" shall be stated in the Maintenance Manual (see B7–4, 4.1.10, 5.1.8 and Appendix) and a cross reference included in the Overhaul Manual.

3.6.1 **Normal Amendments to Mandatory Lives**

a) In the case of aircraft or products having an approved "Airworthiness Limitations" document, by incorporation of a CAA approved amendment to that document.

b) In the case of products which do not have a CAA approved "Airworthiness Limitations" section or equivalent, by means of an amendment to the documents specified in accordance with paragraph 3.3.3 b), or, if this cannot be achieved, by a notification in the CAA Additional Airworthiness Directives.

3.6.2 **Reductions in Mandatory Lives**

Immediate attention must be drawn to any reduction in a Mandatory Life Limitation. In order to achieve this, promulgation shall, in the first instance be by a specific CAA Additional Airworthiness Directive.

4 Review and Amendment of Manuals

4.1 Certified manuals shall be reviewed by the originator and where changes have been made affecting maintenance, overhaul and repair, permanent revisions or amendments shall be published. A copy of each revision or amendment shall be forwarded to the CAA.

4.2 Permanent revisions or amendments or temporary revisions or amendments shall be distributed by the Type Design Organisation or manufacturer to registered holders of the manuals, together with the necessary instructions for embodiment and recording in the manuals. Each manual shall contain a statement which will indicate that the changing of data by uncertified revisions or amendments or temporary revisions or amendments invalidates the initial certification of the manual relative to the part revised.

4.3 Operators with appropriate approval may amend manuals without reference to the Type Design Organisation, provided that the technical substance of the change is within the terms of their approval. In this case the Operator shall proceed as follows:

a) Prepare a temporary or permanent revision or amendment in compliance with this Chapter;

b) Provide the CAA with a copy;

c) Incorporate the revision or amendment in the manuals and record the embodiment in a revision or amendment record, which is separate from that provided by the Type Design Organisation.

NOTE: Where Operators wish to amend manuals, co-operation with the Type Design Organisation is recommended. This also applies where amendments to manuals are necessary due to the incorporation of Minor Modifications under the CAA Form AD 261 procedure (see Chapter B2–5).

4.4 The registered holder will be responsible for making the necessary arrangements with Type Design Organisations or manufacturers to ensure receipt of revisions or amendments to manuals and any Service Bulletins, or similar documents that may be issued from time to time.

5 Maintenance Programmes

5.1 The Type Design Organisation (see Chapter B6–2 Appendix 1), shall be responsible for:

a) the compilation of a list of the Maintenance Significant Items from an evaluation of the functions, failure modes and failure effects of the engine/APU and related systems;

b) taking account of a), the establishment of a list of maintenance actions together with recommended frequencies and sampling points;

c) the establishment of a programme for monitoring engine critical parts (see JAR–E) at the prescribed intervals;

d) the evaluation of the effect of the Operator's flight profile on engine/APU rotating parts or the provision of information on which such evaluation can be based;

e) the preparation of a submission for the aircraft Type Design Organisation's Minimum Equipment List (MEL) and co-operation in subsequent changes (see Chapter B7-6).

5.2 When establishing the list of maintenance actions with recommended frequencies which should be carried out on the engine and APU, the total evidence available should be assessed, account being taken of:

a) the evaluation required by paragraph 5.1 a);

b) any similarity of the design to existing types;

c) the experience already gained, either as a result of flight testing or from route proving under conditions reasonably similar to those which will exist in service, or from previous service experience;

d) the experience gained during simulated flight plan testing (e.g. durability bench tests);

e) the experience gained on components during engine and rig testing;

f) the extent of the provisions made for Engine Health Monitoring; and

g) the submitted Minimum Equipment List.

Chapter B5-4 Weight and Balance of Aircraft

1 Introduction

This Chapter B5–4 prescribes the requirements for the weighing of aircraft, the determination of the corresponding centre-of-gravity position and the provision of information from which the loading for flight can be correctly determined.

NOTE: The Operator's responsibilities are prescribed in the Air Navigation Order and the Air Navigation (General) Regulations.

2 Definitions

2.1 **Basic Weight.** Basic Weight is the weight of the aircraft and all its basic equipment, plus that of the declared quantity of unusable fuel and unusable oil. In the case of turbine engined aircraft, the Maximum Total Weight Authorised of which does not exceed 5700 kg, it may also include the weight of usable oil.

2.2 **Basic Equipment.** Basic Equipment is the unconsumable fluids, and the equipment which is common to all roles for which the Operator intends to use the aircraft.

2.3 **Variable Load.** Variable Load is the weight of the crew, of items such as the crew's baggage, removable units, and other equipment the carriage of which depends upon the role for which the Operator intends to use the aircraft for the particular flight.

2.4 **Disposable Load.** Disposable Load is the weight of all persons and items of load, including fuel and other consumable fluids, carried in the aircraft, other than the Basic Equipment and Variable Load.

NOTE: To obtain the total loaded weight, it is necessary to add to the Basic Weight, the weights of those Variable and Disposable Load items which are to be carried for the particular role for which the aircraft is to be used.

3 General

3.1 Aircraft shall be weighed when all manufacturing processes have been completed, and in accordance with the procedures in this paragraph 3.

NOTE: The CAA will consider applications from aircraft manufacturers and Operators to weigh certain types of aircraft on a sampling basis (i.e. representative aircraft, as weighed, would be acceptable for others of the same standard).

3.1.1 Aircraft, the Maximum Total Weight Authorised of which exceeds 5700 kg shall be re-weighed within two years after the date of manufacture, and subsequent check weighing shall be made at intervals not exceeding five years, and at such times as the CAA may require.

3.1.2 Aircraft, the Maximum Total Weight Authorised of which does not exceed 5700 kg, shall be re-weighed at such times as the CAA may require.

3.2 When an aircraft is weighed, the condition of the aircraft (i.e. the equipment and other items of load such as fluids in tanks) shall be recorded. The equipment installed should not differ from that included in the declared list of Basic Equipment associated with the Weight and Centre-of-Gravity Schedule or the Loading and Distribution Schedule as appropriate.

3.3 The Basic Weight and the corresponding c.g. position shall be determined and entered in the Weight and Centre-of-Gravity Schedule or in the Loading and Distribution Schedule as appropriate.

3.4 The CAA may require that the actual weight of the items of Variable Load be ascertained.

3.5 A Weighing Record, containing records of the weighing and the calculations involved, shall be made available to the CAA, and such records shall be retained by the Operator. When the aircraft is again weighed, the previous Weighing Record shall be retained with the aircraft records.

4 Weight and Balance Report - Aircraft Exceeding 5700 kg

4.1 A Weight and Balance Report shall be produced for each Prototype, Variant and Series aircraft, the Maximum Total Weight Authorised of which exceeds 5700 kg.

5 Weight and Centre-of Gravity Schedule - Aircraft Exceeding 2730 kg (see B7–10 Appendix No.1)

A Weight and Centre-of-Gravity Schedule shall be provided for each aircraft, the Maximum Total Weight Authorised of which exceeds 2730 kg, except that for an aircraft, the Maximum Total Weight Authorised of which exceeds 5700 kg, the information contained in Parts B and C of the Schedule may, for a new aircraft, be given as part of the Weight and Balance Report.

6 Weight and Centre-of Gravity Schedule - Aircraft Not Exceeding 2730 kg (see B7–10 Appendix No.2)

For aircraft, the Maximum Total Weight Authorised of which does not exceed 2730 kg, either a Weight and Centre-of-Gravity Schedule which complies with 5 and shall contain instructions for the determination of the loaded weight, the total load moments and resultant c.g. positions, or a Loading and Distribution Schedule which complies with Paragraph 3, B7–10 shall be provided.

Chapter B5-6 Mandatory Modifications and Inspections: Procedure for Classifications

1 Introduction

1.1 This Chapter contains information concerning classification, notification and identification of Mandatory Modifications and inspections and of availability of associated publications. Mandatory inspections, for the purpose of this Chapter B5-6 are those inspections classified as mandatory by the CAA, where the inspection itself is the work.

1.2 The provisions of Article 9(7) of the Air Navigation Order are such that, a Certificate of Airworthiness in respect of an aircraft registered in the United Kingdom, will cease to be in force until any modifications or inspection, being a modification or inspection required by the CAA, is completed.

2 Classification

2.1 The following modifications and inspections are classified as mandatory:

a) Those notified in a CAA Airworthiness Directive. These are normally notified initially by the product manufacturers documents[1] using an annotation in the following terms: "This modification/inspection has been classified as mandatory by the Civil Aviation Authority". The allocated CAA Airworthiness Directive number may not appear in the manufacturers documents but will be quoted when it is published in the Mandatory Modifications and Inspections Summary (see NOTE to paragraph 2.4);

b) Those notified in a CAA Emergency Airworthiness Directive;

c) Those necessary to comply with CAA Airworthiness Notices of a mandatory character (e.g. Nos. 41, 81).

2.2 Modifications and inspections are classified as mandatory by the CAA in consultation with the approved organisation concerned and, at the same time, the criterion for embodiment or compliance, e.g. a date, a number of hours or cycles, is decided.

2.3 In deciding a criterion for embodiment or compliance, the following are taken into account:

a) The degree of urgency;

b) The availability of modified parts and factors affecting their delivery, e.g. the number of products concerned and their geographical location;

c) The amount of work required to complete the modification/inspection.

2.4 Wherever possible, the criterion for embodiment or compliance is fixed to coincide with periodical inspections or overhauls so that the Operator has a reasonable amount of time for carrying out the work. In addition, consideration is given to the possibility of a special inspection procedure as, at least, a temporary alternative to the embodiment of a modification. Operators and their contracted maintenance organisations are expected, when necessary, to make priority arrangements to achieve compliance within the period specified.

1. Documents such as Service Bulletins, Technical News Sheets, etc. are used for this purpose.

NOTE: Mandatory modifications and inspections are promulgated in manufacturers' Service Bulletins, or equivalent documents, which contain a statement that the modification/ inspection has been classified as mandatory by the Civil Aviation Authority. These Mandatory Modifications and inspections are summarised in the CAA publication, "Mandatory Aircraft Modifications and Inspections Summary".

2.5 The initial notification of a Mandatory Modification or inspection by the manufacturer (e.g. Service Bulletins, Technical News Sheet) is distributed to all known Operators of the aircraft and to all Airworthiness Authorities to whom those Operators are responsible.

2.6 In addition to the initial notification by the manufacturer (see paragraph 2.5), the CAA will advise the Responsible Authority of all ICAO Contracting States listed in the current edition of ICAO Circular 95–AN/78/3. The method of notification (e.g. telex, cable or airmail) will depend upon the urgency of the information. A further notification is made to those Responsible Authorities by the transmission of amendments to the publication "Mandatory Modifications and Inspections Summary" which they receive in accordance with Airworthiness Notice No. 22.

3 Documentation

3.1 The wording of documents (e.g. Modification Bulletins, Service Bulletins, Technical News Sheets) used to notify Mandatory Modifications and inspections shall be agreed by the CAA, and the documents shall be certified and published and distributed by the appropriate manufacturer's Approved Organisation. The documents shall have a title, reference number, issue or serial number, date, and contain the following:

a) A statement in the following form, or such other form as may be agreed by the CAA, to signify CAA Approval of the classification of the modification/inspection: "This modification/inspection has been classified as mandatory by the Civil Aviation Authority";

b) A statement of the type of aircraft, engine(s), equipment, etc., affected;

c) The compliance date, limiting flying hours, cycles, or details when the prescribed action must be taken;

d) Details of the work to be undertaken;

e) A statement that the Maintenance, Overhaul and Repair Manual, Crew Manual, Flight Manual and Maintenance Schedule is, or is not, affected by the modification/ inspection.

3.2 The documents notifying Mandatory Modifications shall be distributed, where such information is available to the manufacturer, to:

a) all owners or Operators of the particular type(s) of aircraft concerned;

b) those Airworthiness Authorities to whom these owners or Operators are responsible;

c) where the modification or inspection derives from, other than the aircraft manufacturer (e.g. an engine manufacturer), to any aircraft manufacturer(s) whose aircraft are fitted with the item concerned and to the responsible Airworthiness Authority.

NOTES: 1 Owners, Operators, and Organisations undertaking overhaul/maintenance on aircraft should ensure that the manufacturer of each type of aircraft is informed of their names and addresses to facilitate distribution of the documents notifying Mandatory Modifications and inspections.

2 Information distributed in accordance with this paragraph 3.2 is summarised in the CAA Publication entitled "Mandatory Aircraft Modifications and Inspections Summary" which will be supplied to foreign airworthiness authorities on application to the Civil Aviation Authority (see CAA Airworthiness Notice No. 22).

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Chapter B5-7 Master Minimum Equipment Lists

1 Introduction

1.1 Article 16 of the UK Air Navigation Order 2000, as amended, requires the permission of the CAA to be obtained before an aircraft may be despatched with an unserviceability.

1.2 Information and instructions intended to enable the determination of the measure of unserviceable equipment and systems which may exist at the commencement of a flight, while still allowing the safe operation of the affected aircraft shall be provided in the form of a Master Minimum Equipment List (MMEL) for the type, for approval by the CAA. Operators of aircraft of the appropriate type will use the information and instructions provided in the MMEL to produce their own Minimum Equipment List (MEL) or an equivalent document (see CAP 549).

1.3 For information regarding the format of MMELs – see Chapter B7–6.

2 Applicability and Scope

2.1 This requirement is applicable to any aircraft of other than United Kingdom design and construction for which a Certificate of Airworthiness (C of A) is in force, or, for which an application for issue of a C of A has been made, and which has an authorised MTWA exceeding 2730 kg, with the exception of those certificated in the Special Category, unless otherwise determined by the CAA.

2.2 **Scope of Master Minimum Equipment Lists**. The intent of an MMEL is that it should be relevant to the build standard of aircraft of that particular type and, with any necessary revisions, to any variants of that type.

NOTE: The MMEL is not intended to be used as an Operator's MEL.

3 Application for Approval of a Master Minimum Equipment List

3.1 Application may be made to the CAA for the approval of an MMEL. The applicant shall normally be the actual or the intended aircraft Type Certificate holder.

3.2 For types or variants for which application is made to the CAA for either the issue of a new UK Type Certificate or the extension of an existing Type Certificate, the provision of the approved MMEL may be considered to be an integral part of the Type Certification process. In such cases a separate application for approval of the MMEL will not be necessary.

3.3 An application for the approval of an MMEL, which is submitted separately from an application for Type Certification (or the extension of an existing Type Certificate), will be considered to constitute a modification (see 4 b)).

4 Charges

CAA charges for the investigation and approval of an MMEL will be levied as follows:

a) For a type which is the subject of a Type Certification programme such charges will be included in the Type Certification charges;

b) For a type for which application is made separately from that for Type Certification, such charges will be in accordance with the CAA Scheme of Charges appropriate to modifications current at the time of application.

5 CAA Investigation

The CAA reserves the right to investigate, in consultation as necessary with the manufacturer, the contents of the proposed MMEL and to require the embodiment of any revision or amendment it considers necessary to satisfy the requirements. When a standard acceptable to the CAA has been achieved the Type Design Organisation will be informed. The CAA will then arrange for the publication of an MMEL document conforming to the approved standard.

6 CAA Approval of Initial Master Minimum Equipment List for a Type

6.1 When the CAA has informed the Type Design Organisation that the proposed initial MMEL for the type has been approved, the document shall carry a statement indicating that approval, and shall be worded as follows:

Approved by the UK CIVIL AVIATION AUTHORITY

Signed: .....

For and on behalf of the CIVIL AVIATION AUTHORITY

Date: .....

Following signature on behalf of the CAA, this statement shall appear on the title page of each affected Master Minimum Equipment List (MMEL).

6.2 If an MMEL is published in part before completion, or before the appropriate aircraft type is certificated, it will be marked 'DRAFT' on the page and in the position normally occupied by the Approval Statement.

7 Issue of Approved Master Minimum Equipment Lists

7.1 In the case of new aircraft type of foreign construction, the CAA will assume the responsibility for the compilation and publication of the UK MMEL.

7.2 In the case of existing aircraft types for which no MMEL has previously been approved by the CAA, the CAA will assume the responsibility for the compilation and publication of the UK MMEL.

NOTE: In compiling the MMEL the CAA will take account of any existing MMEL, which has previously been approved by another Airworthiness Authority known to have standards broadly equivalent to those of the CAA. The CAA will need to make such changes to the already approved Foreign Airworthiness Authority MMEL as are necessary to satisfy those areas where UK legislation or CAA policies differ from those of the Authority of the State of Manufacture.

8 Content and Format of Master Minimum Equipment Lists

8.1 The instructions and information given in the MMEL must be presented in a manner which will enable the Operator to prepare the MEL, giving sufficient detail for a proper understanding of each subject, such that a decision on the extent of permissible unserviceabilities of equipment and systems at the commencement of a flight or series of flights can be reached by the Operator. See Master Minimum Equipment Lists (MMEL) and Minimum Equipment Lists (MEL) – Procedures (CAP 549).

NOTE: Where the data contained in an MMEL conflicts with data contained in the approved Flight Manual for an aircraft of the type, the limitations and information given in the Flight Manual shall be overriding.

8.2 The MMEL should utilise an agreed referencing system such as ATA 100 and be presented in a format acceptable to the CAA. It shall contain a list of Effective Pages, a Preamble which explains the scope, purpose and validity of the document, and an explanation of any coding or terminology used (see BCAR Chapter B7–6).

9 Amendment of Master Minimum Equipment Lists

9.1 Proposed revisions or amendments (regardless of their originator) which are introduced after the date of approval of an MMEL by the CAA, shall be separately approved. (See also paragraph 9.6.)

9.2 Applications for the approval of amendments to a Master Minimum Equipment List may be submitted by:

a) the Type Design Organisation approved for the design of the appropriate aircraft type;

b) an Operator of aircraft of that type (or his agent); or

c) the CAA.

Each such application shall be accompanied by a statement giving technical justification for the proposed amendment and any new or amended procedures (whether Maintenance (M) or Operational (O)). Any such amendments will be approved by the CAA in consultation with the Type Design Organisation or the Airworthiness Authority of the State of Manufacture.

9.3 When approved, revisions to an MMEL will be compiled by the CAA and made available to all registered holders of that MMEL, together with instructions for embodiment into the appropriate MMEL. The revision status and date of the affected page(s) shall be given in a revised List of Effective Pages.

9.4 When appropriate, Temporary Revisions (TRs) will be prepared by the CAA and inserted into an MMEL in cases where urgent change in the information and/or instructions presented is required. Such TRs must be recorded in a separate list of Effective Temporary Revisions which will identify the date of the TR, the permanent page affected, the means, if any, by which it is superseded and any relevant remarks. This list of TR's will be revised and updated when permanent revisions are approved and published.

9.5 TRs shall be made available to all registered holders of the appropriate MMEL, together with instructions for the embodiment and recording in the MMEL.

9.6 Revisions to MMELs approved by the Foreign Airworthiness Authority responsible for the aircraft type will normally be accepted and approved by the CAA without

investigation, other than in those areas where United Kingdom legislation varies or where different policies are applied by the CAA.

10 Modification of Aircraft

Applicants for approval of modifications to aircraft (Chapter B2–5) shall, at the time application is made, consider the effects of the proposed modification upon the information and instructions contained in the MMEL for the type, and shall inform the CAA of any revisions likely to be required as a consequence of the incorporation of the modification.

Chapter B5-8 Mandatory Action on Aircraft Operating in Accordance with a Permit to Fly

1 Introduction

1.1 This Chapter B5–8 prescribes the requirements and procedure for reporting, promulgating and implementing action declared as mandatory by the CAA in respect of aircraft registered in the United Kingdom and operating in accordance with a Permit to Fly.

1.2 Where service experience reveals a design or manufacturing problem on an aircraft operating in accordance with a Permit to Fly and the CAA considers that corrective action is required to restore acceptable levels of safety, a Mandatory Permit Directive (MPD) will be issued by the CAA.

1.3 The Permit to Fly for an aircraft registered in the United Kingdom will cease to be in force if any required action, compliance end date or flying time limitations specified by the MPD have not been complied with.

2 Work and Certifications

2.1 Work undertaken in incorporating a Mandatory Permit Directive shall be supervised by an Organisation approved by the CAA for the purpose (see Sub-section A8) or by a person appropriately authorised by the CAA.

2.2 Full particulars of the work undertaken to incorporate the modification, or details, results and work arising from the mandatory inspection, shall be entered in the appropriate log book, quoting the reference number of the appropriate document, e.g. Airworthiness Approval Note for a Major Modification, Service Bulletin for a mandatory inspection.

2.3 All relevant records of modifications and mandatory inspection shall be made available to the CAA for examination on request, and these shall not be destroyed without authorisation from the CAA.

NOTE: The Air Navigation Order requires that log books, and other documents which are identified and referred to in the log books (therefore forming part of the log books) shall be preserved until a date two years after the aircraft, the engine or the variable pitch propeller, as the case may be, has been destroyed, or permanently withdrawn from use.

2.4 Where an owner or Operator wishes to develop an alternative means of compliance, the written agreement of the CAA will be required. The aircraft technical records and where applicable the Organisation's modification system shall reflect the change from the MPD.

3 Promulgation

3.1 A collated volume of MPDs will be available from CAA Printing and Publications, Cheltenham. Individual MPDs of an emergency nature will be distributed to all registered owners of the type of aircraft concerned.

4 Reporting

4.1 The CAA should be notified of any unsafe condition that has occurred, whether or not this was identified from an incident or an occurrence.

The following Organisations, will need to notify the CAA of incidents of airworthiness significance:

a) A CAA Approved Design Organisation or manufacturer of an aircraft type (including microlights);

b) Any Maintenance Organisation or nominated person(s) engaged in the maintenance of such aircraft (e.g. PFA, BMAA, etc. or A8–15(M3), A8–20(M5), JAR–145 Approved Organisations);

c) In the case of ex-military aircraft, Organisations holding A8-20(E4) approval for a type where, through their liaison with the responsible Design Organisation (where such an Organisation still provides design support) they have knowledge of newly promulgated mandatory action (e.g. Special Flying Instructions, Special Technical Instructions).

4.2 The purveyor or manufacturer of an aircraft kit should notify the CAA of any unsafe condition of which he has knowledge.

4.3 The owner, pilot or operator of an aircraft operating on a Permit to Fly should notify the appropriate Organisation in 4.1 or 4.2 above of an unsafe condition but may also voluntarily notify the CAA directly via the CAA Occurrence Reporting Scheme or other appropriate means.

4.4 All incidents should be reported to the CAA as soon as possible, preferably within 96 hours to:

The Civil Aviation Authority, Safety Regulation Group, The CAA Occurrence Reporting Scheme, Safety Investigation & Data Department, 2W Aviation House, Gatwick Airport South, West Sussex RH6 0YR

Sub-Section B6
Continued Airworthiness - Responsibilites of the Operator

Chapter B6-2 Maintenance of Aircraft

1 Introduction

1.1 In accordance with the Air Navigation Order, an aircraft registered in the United Kingdom in respect of which a Certificate of Airworthiness in the Transport Category (Passenger), Transport Category (Cargo) or Aerial Work Category is in force, shall not fly unless it has been maintained in accordance with a Maintenance Schedule Approved by the CAA and Certificates of Maintenance Review issued, certifying that a maintenance review has been carried out. Approved Maintenance Schedules are also required by this Chapter for all aircraft in the Private Category and where directed in a particular case for any other aircraft in the Special Category.

NOTE: The term **Maintenance Programme**, is intended to embrace both scheduled maintenance tasks and the associated procedures (including reliability monitoring). The term **Maintenance Schedule** is intended to embrace a document which includes the maintenance tasks alone (including any associated approval documents), it would not normally include maintenance procedures. JAR–OPS uses the term **Maintenance Programme** though the document referred to may only contain scheduling information (including associated approval documents) and not include the associated procedures, other than by reference.

Throughout this Chapter and Appendix the term Programme is intended to include both the scheduled tasks and the associated procedures.

1.2 Manufacturer's Maintenance Programmes (see B5–3, JAR 25.1529, JAR 23.1529) are not approved by the CAA in accordance with the procedures set out in B7–5, which refers to this BCAR. This Chapter B6–2 may be used by the Manufacturer however, for guidance on the required content of an Operator's Maintenance Schedule.

2 General

2.1 An aircraft registered in the United Kingdom shall be maintained in accordance with a Maintenance Schedule or Maintenance Programme Approved by the CAA in the following circumstances:

a) For aircraft in respect of which a Certificate of Airworthiness in the Transport Category (Passenger), Transport Category (Cargo), Aerial Work Category or Private Category is in force;

b) For aircraft in respect of which a Certificate of Airworthiness in the Special Category is in force, when so prescribed on the particular Certificate of Airworthiness.

NOTE: For aircraft, the Maximum Total Weight Authorised of which does not exceed 2730 kg maintained in accordance with the Light Aircraft Maintenance Scheme, maintenance shall be in accordance with Schedule CAA/LAMS/A/1999 for fixed wing and Schedule CAA/LAMS/H/1999 for rotary wing aircraft unless the Operator makes a specific application for approval of an alternative Maintenance Schedule or Maintenance Programme (see paragraph 3 or 4 as appropriate).

2.2 A reliability programme is required when specified by the Manufacturer's Maintenance Planning Document or a Maintenance Review Board Report. Operators may, however, develop their own reliability monitoring programme when it may be deemed beneficial from a maintenance planning point of view.

3 Maintenance Schedule - Non-JAR OPS

3.1 General. Schedules and Programmes submitted for approval shall comply with this paragraph 3 as appropriate. The procedures which are required to be followed to obtain CAA Approval of Maintenance Schedules are set out in B7–5.

NOTE: B6–2 Appendix No. 1 contains supplementary information for Condition Monitored and Reliability Centred Maintenance Programmes including those associated with engines and auxiliary powerunits, installed in aircraft certificated in the Public Transport, Aerial Work or Private Categories.

3.2 **Maintenance Schedule**. The Schedule which is submitted to the CAA for approval shall contain the basic information prescribed in a), b), c), d) and e).

a) General

i) Reference number, issue number and date;

ii) Registered name(s) and address(es) of the Owner(s)/Operator(s);

iii) Type and model(s) of aircraft, engines, auxiliary power units, and, where applicable, propellers;

iv) Areas of operation of the aircraft;

v) Class of work in relation to the areas of operation;

vi) Registration Marks of aircraft maintained in accordance with the schedule;

vii) Details of any arrangements involving the co-operation of more than one Operator, or which involve the combination of information from other aircraft fleets for the purpose of providing additional statistical and sampling material: see also Appendix 1, 2.6.

NOTE: The CAA will consider accepting a group of Operators, who are operating similar aircraft, combining for the purpose of sampling, provided that:

– they can demonstrate similarity of operations, procedures, modification standards and maintenance requirements;

– they are subject to similar overhaul procedures, and

– the sampling is not confined to any particular Operator.

b) **Primary Maintenance Processes**. In respect of each part of the aircraft, its engines and auxiliary power-units, propellers, components, accessories, equipment, instruments, electrical and radio apparatus, and all associated systems and installations (hereinafter referred to as "an Item"), a list of the primary maintenance processes in terms of i) to vi):

i) Cross reference, where applicable, to the source of the task (e.g. Maintenance Review Board Report (MRB) and Maintenance Planning Document (MPD));

ii) Periods at which the item shall be inspected, together with the type and degree of inspection;

iii) Periods at which the item shall, as appropriate, be checked, cleaned, lubricated, adjusted and tested;

iv) Periods at which the item shall be overhauled or replaced by a new or overhauled item, expressed in terms of:

- a criterion related to usage, e.g. a period of time, number of cycles, number of landings;
- a criterion related to conditions, e.g. limits of wear, limiting dimensions.

NOTE: Where actual criteria are not included in the Schedule, they should be defined by cross reference to acceptable documents e.g. Approved Maintenance Manual or Maintenance Planning Document.

v) The Mandatory Life Limitations to which certain parts of aircraft, engines, propellers, auxiliary power units and systems, the failure of which could have a hazardous effect on the aircraft, are subject. For foreign products these limitations, unless otherwise agreed by CAA, shall be identical to those specified in the Mandatory Life Limitations section of the Manufacturer's Recommended Maintenance Programme (see B5–3). The limitations may be itemised in the schedule, or included by reference to the appropriate airworthiness data;

vi) Such other processes as are agreed by the CAA, e.g. condition monitoring (see Appendix).

c) **Record of Amendments.** Provision for a record of the amendments incorporated in the Schedule;

d) Reference to the source of the content of the schedule e.g. MRB, MPD, Maintenance Manual;

e) **Check cycle criteria.** The criteria for 'packaging' checks shall be described (e.g. A Check – 400FH, B Check – 800 FH etc.).

4 Maintenance Programme - JAR-OPS

For aircraft operated for the purpose of Commercial Air Transport in accordance with JAR–OPS, the Operator shall submit for approval a Maintenance Programme which complies with JAR–OPS Subpart M and other UK National Requirements (e.g. CAP 455 Airworthiness Notices and JAA Information Leaflets). The procedures which are required to be followed to obtain CAA Approval of Maintenance Schedules or JAR-OPS Maintenance Programmes are set out in B7–5.

NOTE: B6–2 Appendix No. 1 contains supplementary information for Condition Monitored and Reliability Centred Maintenance Programmes including those associated with engines and auxiliary power units in aircraft operated for the purposes of Commercial Air Transport in accordance with JAR–OPS.

5 Certificate of Maintenance Review

5.1 An aircraft registered in the United Kingdom in respect of which a Certificate of Airworthiness in the Transport Category (Passenger), Transport Category (Cargo) or Aerial Work Category is in force, shall be subject to a maintenance review at intervals specified in the Approved Maintenance Schedule or the relevant Approval Document of the Maintenance Schedule, as appropriate. At the completion of a review, a Certificate of Maintenance Review shall be issued.

NOTE: An aircraft operated for the purpose of Commercial Air Transport, in accordance with JAR–OPS shall be maintained in accordance with JAR–OPS Subpart M which does not require the issuance of a Certificate of Maintenance Review. Such Operator's aircraft shall be granted Exemption from the requirements of the Air Navigation

Order, Article 10(1)(b) in respect of the Certificate of Maintenance Review detailed in paragraphs 5, 6 and 7 of this Chapter.

5.2 The Signatory shall only issue a Certificate of Maintenance Review when satisfied, at the time of the review, that the following aspects of maintenance have been carried out:

a) All maintenance specified in the Approved Maintenance Schedule has been carried out within the prescribed time period and any extension to limiting periods is in accordance with Civil Aviation Authority Approved procedures;

b) All modifications and inspections deemed mandatory by the Civil Aviation Authority have been carried out within the prescribed time periods and any extension to limiting periods has been authorised by the Civil Aviation Authority. Due account must be taken of any repetitive inspections;

c) All defects entered in the Technical Log have been rectified or deferred in accordance with Civil Aviation Authority Approved procedures;

d) All Certificates of Release to Service required have been issued in accordance with the procedures of Chapter B6–7 or JAR–145 as necessary.

NOTES: 1 The time intervals for the Certificate of Maintenance Review will be specified on a calendar 'not exceed' basis only and therefore, it is not necessarily intended to align with any check.

2 For aircraft maintained in accordance with the Light Aircraft Maintenance Scheme, the maintenance review will coincide with the annual check.

3 The Certificate of Maintenance Review requires only one signature.

6 Certificate of Maintenance Review Format

6.1 The Certificate of Maintenance Review shall be in the following format:

CERTIFICATE OF MAINTENANCE REVIEW

Aircraft Type .....

Nationality & Registration Mark .....

Certified that a maintenance review of this aircraft and such of its equipment as is necessary for its airworthiness has been carried out in accordance with the requirements of the Air Navigation Order for the time being in force.

The next maintenance review is due .....

Signed .....

CAA Approval/Licence .....

Date .....

Organisation .....

7 Certificate of Maintenance Review Signatories

7.1 A Certificate of Maintenance Review shall be issued only by:

a) the holder of an aircraft maintenance engineer's licence granted under the Air Navigation Order being a licence which entitles the holder to issue that certificate; or

b) the holder of an aircraft maintenance engineer's licence granted under the law of a country other than the United Kingdom and rendered valid under the Air Navigation Order in accordance with the privileges endorsed on the licence; or

c) the holder of an aircraft maintenance engineer's licence granted under the law of any such country as may be prescribed in accordance with the privileges endorsed on the licence and subject to any conditions which may be prescribed; or

d) a person whom the CAA has authorised to issue a Certificate of Maintenance Review in a particular case and in accordance with that authority; or

e) a person authorised by an Organisation Approved by the CAA as being competent to issue such a certificate and in accordance with that authorisation and approval.

NOTE: Notwithstanding the foregoing in approving a Maintenance Schedule, the Civil Aviation Authority will specify who may issue a Certificate of Maintenance Review. For an Organisation Approved in accordance with JAR–145, Airworthiness Notice 14 sets out the CAA requirement for the Authorisation of Personnel. For all other cases the signatory will be an engineer possessing a Type Rated Licence valid in at least two categories (other than Category X Compasses), each category being appropriate to the particular aircraft type.

8 Certificate of Release to Service - Non Commercial Air Transport

NOTE: Certificate of Release to Service for Commercial Air Transport shall be in accordance with JAR–145.

8.1 A Certificate of Release to Service shall be issued after overhauls, repairs, replacements, modifications and mandatory inspections have been carried out on an aircraft, which is registered in the United Kingdom and has a Certificate of Airworthiness in force, except as follows:

a) A Certificate of Release to Service is not required for certain prescribed repairs or replacements carried out on an aircraft not exceeding 2730 kg Maximum Total Weight Authorised with a Certificate of Airworthiness in the Private or Special Categories, provided the work has been carried out personally by the owner or Operator holding a pilot's licence. Details of the prescribed repairs or replacements permitted are contained in the Air Navigation (General) Regulations;

b) If a repair or replacement of a part of an aircraft is carried out when the aircraft is at such a place that it is not reasonably practicable:

i) to carry out the work in a manner that a Certificate of Release to Service may be issued, or

ii) for the Certificate to be issued at that particular place, the Commander may fly the aircraft, if, in his opinion, it is safe to do so, to the nearest place at which a Certificate may be issued.

NOTE: The ANO prescribes that in such cases, written particulars of the flight and the reasons for making it are to be given to the CAA within ten days thereafter.

8.2 A Certificate of Release to Service shall be issued at the completion of any Scheduled Maintenance Tasks specified by an Approved Maintenance Schedule on an aircraft which is registered in the United Kingdom and has a Certificate of Airworthiness in any category (except Special Category) except that:

a) a Certificate of Release to Service is not required for certain Scheduled Maintenance Tasks carried out on an aircraft not exceeding 2730 kg Maximum Total Weight Authorised with a Certificate of Airworthiness in the Private Category, provided the inspection has been carried out personally by the owner or Operator holding a pilot's licence;

b) the Certificate of Release to Service issued at the completion of any Scheduled Maintenance Tasks shall be signed in each of the licence/authorisation categories relevant to the work speciality of the particular Scheduled Maintenance Tasks, except that the CAA may direct, for specific aircraft types, that some 'X' category certifications are not required.

8.3 A Certificate of Release to Service shall only be issued for a particular overhaul, repair, replacement, modification, mandatory inspection or Scheduled Maintenance Tasks when the signatory is (signatories are) satisfied that the work has been properly carried out, having due regard to the use of:

a) up-to-date and approved airworthiness data including manuals, drawings, specifications, CAA Mandatory Modifications/inspections and where applicable, company procedures;

b) recommended tooling and test equipment which is currently calibrated where applicable; and

c) a working environment appropriate to the work being carried out.

8.4 The Certificate of Release to Service shall contain particulars of work done or the inspection completed and the Organisation and place at which the work was carried out. Depending upon the application of the certificate, details of the aircraft type, registration, component type, part number and serial number shall be recorded as applicable. The certification shall be worded in the following manner:

"The work recorded above has been carried out in accordance with the requirements of the Air Navigation Order for the time being in force and in that respect the aircraft/equipment is considered fit for release to service."

NOTES: 1 Mandatory inspections, for the purpose of this Chapter B6–2, are those inspections classified as mandatory by the CAA, where the inspection itself is the work.

2 For Organisations Approved in accordance with JAR–145, the certification may be issued in accordance with procedures specified in the Organisation Exposition.

8.5 The Certificate of Release to Service shall be signed by a person specified in paragraph 9, except that the CAA may direct which of these persons shall sign in a particular case. The signatory/signatories shall record licence/approval/authorisation reference number as appropriate, together with the date.

9 Certificate of Release to Service Signatories

9.1 For aircraft operated for the purpose of Commercial Air Transport, a Certificate of Release to Service shall only be issued by appropriately authorised staff on behalf of the JAR–145 Approved Maintenance Organisation, in accordance with procedures specified in the Maintenance Organisation Exposition.

9.2 For Non Commercial Air Transport purposes, a Certificate of Release to Service shall be issued only by one of the following:

a) The holder of an aircraft maintenance engineer's licence granted under the Air Navigation Order, being a licence which entitles the holder to issue that certificate;

b) The holder of an aircraft maintenance engineer's licence granted under the law of a country other than the United Kingdom and rendered valid under the Air Navigation Order in accordance with the privileges endorsed on the licence;

c) The holder of an aircraft maintenance engineer's licence granted under the law of any such country as may be prescribed in accordance with the privileges endorsed on the licence and subject to any conditions which may be prescribed;

d) The holder of an aircraft maintenance engineer's licence or authorisation as such an engineer granted or issued by or under the law of any Contracting State other than the United Kingdom in which the overhaul, repair, replacement, modification or inspection has been carried out, but only in respect of aircraft of which the Maximum Total Weight Authorised does not exceed 2730 kg and in accordance with the privileges endorsed on the licence;

NOTE: "Contracting State" means any State which is a party to the Convention on International Civil Aviation signed on behalf of the Government of the United Kingdom at Chicago on 7th December 1944.

e) A person, approved by the CAA as being competent to issue such Certificates, and in accordance with that approval;

f) A person authorised by the CAA to issue the Certificate in a particular case, and in accordance with that authority;

g) A person authorised by an Organisation Approved in accordance with JAR–145 as being competent to issue such a certificate and in accordance with that authorisation and approval.

9.3 In relation only to the adjustment and compensation of direct reading magnetic compasses, the holder of an Airline Transport Pilot's Licence (Aeroplanes), or a Flight Navigator's Licence granted or rendered valid under the Air Navigation Order may also issue a Certificate of Release to Service.

10 Duplicate Inspection

10.1 The procedures outlined in this paragraph shall be applied following initial assembly or any disturbance of a control system.

10.2 **Definitions**

10.2.1 **Control System.** A system by which the flight path, attitude, or propulsive force of an aircraft is changed, including the flight, engine and propeller controls, the related system controls and the associated operating mechanisms.

10.2.2 **Duplicate Inspection.** An inspection first made and certified by one qualified person and subsequently made and certified by a second qualified person.

10.3 **Procedures – General**

10.3.1 A duplicate inspection of all control systems in an aircraft shall be made after initial assembly and before a Certificate of Release to Service has been issued after overhaul, repair, replacement, modification or adjustment and, in any case, before the first flight.

NOTE: Depending on the extent of the work it may be possible to limit the duplicate inspection of a control system to that part of the system which has been disturbed.

10.3.2 The first and second inspections must take account of the full extent of the work undertaken and not simply the immediate area of disturbance. This is to ensure that distant or remote parts of the system that may have been affected by the disturbance are also subject to duplicate inspections. Where work has been carried out on other systems for safety precautions, or to enhance accessibility, the need to carry out a duplicate inspection on these systems shall be considered. Persons who carry out and certify duplicate inspections are therefore required to undertake an independent review of the complete task, as detailed in the maintenance manual and by reference to worksheets used, including shift hand-over records, to assess the scope of the duplicate inspection(s) required.

10.3.3 It may not be possible to inspect the complete control system when assembled in the aircraft, due to routeing the controls through conduits or boxed-in sections and the pre-sealing of various units. In these cases the persons certifying the duplicate inspection shall be satisfied that a duplicate inspection has been made previously on the units and covered sections and that the sealed units are acceptable for the particular use. Such tests as are necessary shall, be completed to determine that these particular units and sections have full, free and correct directional movement.

10.3.4 Control systems subject to duplicate inspection must not be disturbed or re-adjusted after the first certified inspection and the second part of the duplicate inspection must, as nearly as possible, follow immediately after the first part.

NOTES: (1) In some circumstances, due to peculiarities of assembly or accessibility, it may be necessary for both parts of the inspection to be made simultaneously.

(2) It is desirable that the inspections of a control system are made as near as is practicable to the time of the intended flight and that the full extent of the disturbance is understood by both persons who carry out the duplicate inspections.

10.3.5 If a control system is disturbed after completion of the duplicate inspection, that part which has been disturbed shall again be inspected in duplicate and a Certificate of Release to Service issued before the aircraft flies.

10.3.6 The duplicate inspection shall be the final operation to establish the integrity of the control system when all the work has been completed and shall take into account all the relevant instructions and information contained in the associated technical data.

10.3.7 The inspections prescribed for control systems in this Chapter shall include an inspection to ensure that full, free and correct movement of the controls is obtained throughout the systems relative to the movements of the crew controls. An additional inspection shall be made, when all covers and fairings are finally secured, to ensure that full, free and correct movement of the controls is obtained.

10.3.8 Persons qualified to make the first and/or second part of a duplicate inspection are as follows:

a) Aircraft engineers appropriately licensed in Categories A, B, C, D and X;

b) Persons employed by Approved Organisations, who are appropriately authorised to make such inspections and to certify the task itself in accordance with company procedures. For aircraft used for the purpose of Commercial Air Transport an Organisation will be required to hold JAR–145 Approval.

NOTE: Certification responsibilities in relation to the Air Navigation Order affecting Licensed Aircraft Maintenance Engineers and members of Approved Organisations are given in CAA Airworthiness Notice No. 3.

10.3.9 Should a minor adjustment of the control system be necessary when the aircraft is away from base, the second part of the duplicate inspection may be completed by a pilot or flight engineer licensed for the type of aircraft concerned, providing that Authorisation is granted by the responsible JAR–145 Approved Maintenance Organisation, if the aircraft is being used for the purpose of Commercial Air Transport.

10.4 **Procedures – Control System Units or Components**

10.4.1 Where appropriate to the type of unit or component forming part of a control system, a schedule of inspections and functioning tests shall be compiled at manufacture, overhaul and repair, and the following shall be certified:

a) Duplicate inspection of the section/parts of the units or components which will be concealed during bench assembly and which cannot be proved during inspections and functioning tests when installed in the aircraft control system;

NOTE: Where such work is a sub-contract order, instructions regarding all inspections/tests should be stated on the order, the release documentation from the sub-contractor being certified appropriately.

b) Duplicate inspection of the completed assembly of the unit or component, functioning and checking for correct relative movement.

10.4.2 Persons qualified to make the first and/or second part of the duplicate inspection required at paragraph 10.4 are as follows:

a) For Approved Manufacturing Organisations, persons employed who are appropriately authorised and qualified to make such inspections in accordance with company procedures. Persons employed by a sub-contracting firm, not directly approved by CAA, who are appropriately authorised by the primary Approved Organisation with a Quality Control Surveillance System (see A8–1 and A8–2) controlling the sub-contractor, qualified to make such inspections;

b) For Approved Maintenance Organisations who release control system units and components, both inspections and the subsequent Certificates of Release to Service must be issued by persons authorised by the Maintenance Organisation Approved under JAR–145 or BCAR A8.

11 Retention of Records

11.1 When all the relevant work has been carried out, a Certificate of Release to Service shall be entered in/attached to the appropriate log book and signed by the authorised persons.

a) Where it is more convenient, the required particulars may be entered in a separate record, but an entry shall be made in the appropriate log book, containing a summary of the work carried out and a cross-reference to the document containing the Certificate of Release to Service.

b) Where an alternative record system has been agreed, the format and location of such certificates shall be in accordance with that agreement.

c) Certificates of Maintenance Review shall be issued in duplicate. One copy shall be carried in the aircraft and the other copy shall be kept elsewhere than in the aircraft for a period of not less then two years from the date of issue or for such periods as may be otherwise agreed.

NOTES: (1) The Air Navigation Order requires that log books, and other documents which are identified and referred to in the log books (therefore forming part of the log books) shall be preserved until a date two years after the aircraft, the engine or the variable pitch propeller, as the case may be, has been destroyed, or permanently withdrawn from use, except that the CAA may consider a different retention period in a particular case.

(2) For aircraft operated for the purpose of Commercial Air Transport in accordance with JAR–OPS, the Operator shall ensure that maintenance records are retained in accordance with JAR–OPS and/or JAR–145 as appropriate.

Appendix 1 to B6-2 Maintenance Programmes - Reliability Centred Maintenance and Condition Monitored Maintenance Programmes

1 Introduction

1.1 This Appendix describes an acceptable means of compliance with the requirements of B6–2 and JAR–OPS Subpart M in respect of Reliability Centred and Condition Monitored Maintenance Programmes where maintenance task selection and frequency are based upon reliability predictions. The word Programme is used throughout and refers to the reliability monitoring procedures. Condition Monitored Maintenance concepts were fundamental to earlier Maintenance Steering Group (MSG) derived programmes (e.g. MSG 2) and where appropriate, the MSG analysis resulted in a condition monitoring task: Condition Monitored Maintenance is a form of Reliability Centred Maintenance. The Condition Monitor task was not used in later MSG revisions (e.g. MSG 3) but the concept of Reliability Centred Maintenance is, however, central to the continuing effectiveness of these later programmes where maintenance task selection and frequency are based upon reliability predictions.

1.2 MSG analysis and the attendant MRB procedures, are used by type certificate applicants to develop scheduling information to meet the JAR (FAR) 25.1529 instructions for continuing airworthiness. The MRB procedures may be found in JAA Administrative and Guidance Material Section 2, Part 2 Chapter 16, FAA AC 121.22A or B5–2. For type certification prior to the adoption of JAR–25, requirement for continuing airworthiness information is to be found in B5–3.

NOTES: 1 Further guidance on these concepts of maintenance control is contained in CAP 418 entitled "Condition Monitored Maintenance Programmes, an Explanatory Handbook", published by the Civil Aviation Authority.

2 This appendix additionally describes an acceptable means of achieving compliance with the requirements of JAR–OPS Subpart M in relation to the approval of reliability programmes and procedures. This guidance will eventually be superseded by appropriate JAR–OPS guidance material.

3 JAR OPS (Sub-Part M) 1.910 requires that a Maintenance Programme includes a reliability programme when required by the CAA.

1.3 A description of how each part of the requirement of B6–2 will be met, should be included in the Preface of the Approved Maintenance Schedule. This description may, by agreement with the CAA, be presented in another form provided that full cross reference to associated documentation is made in the Approved Maintenance Schedule. In the case of the JAR–OPS Maintenance Programme, compliance with JAR–OPS is indicated and referenced in the Standard Maintenance Practice (SMP 20 or 21, see CAP 562) which should be appended to the Operator's programme.

2 The Programme

2.1 In preparing the Programme details for compliance with B6–2 or JAR–OPS Subpart M, account should be taken of this paragraph, and for engines and auxiliary power-units, account should also be taken of paragraph 3 of this appendix. All associated

procedures should be clearly defined. In the case of JAR–OPS approval, the contents of these paragraphs are an acceptable means of meeting the requirement, pending the introduction of related JAR–OPS guidance material.

2.2 **Objectives**. A statement should be included summarising as precisely as possible the prime objectives of the Programme. The extent of the objectives should be directly related to the scope of the Programme, which could vary from a component defect monitoring system to an integrated maintenance management programme. The manufacturer's maintenance planning documents may give guidance on the objectives and should be consulted in every case.

2.3 **Identification of Items.** The Items controlled by the Programme should be stated. Where some items (e.g. aircraft structure, engines, APU) are controlled by separate inspection and development procedures, the associated procedures will be subject to individual approval by the CAA, e.g. individual Sampling or Life Development Programmes, Manufacturer's Structure Sampling Programmes. In the case of a JAR-OPS Approved programme, these supplemental documents shall form part of the Approved Maintenance Management Exposition (MME) or Maintenance Organisation Exposition (MOE) as appropriate and should be cross referenced in the programme.

2.4 **Terms and Definitions.** The significant terms and definitions applicable to the Programme should be clearly identified. Terms already defined in the World Airlines Technical Glossary of Terms and CAP 418 should be used. The number of other defined terms should be kept to a minimum.

2.5 **Information Sources and Collection**

2.5.1 Sources of information should be listed, and the procedures for the transmission of information from the sources, together with the procedure for collecting and receiving it, should be set out in detail. In the case of a JAR–OPS approval, these procedures should be listed in the MME or MOE as appropriate.

2.5.2 The type of information to be collected should be related to the objectives of the Programme and should be such that it enables both an overall broad based assessment of the information to be made and also allows for assessments to be made as to whether any reaction, both to trends and to individual events, is necessary. The following are examples of the normal prime sources:

a) Pilots Reports;

b) Technical Logs;

c) Aircraft Maintenance Access Terminal/On-board Maintenance System readouts;

d) Maintenance Worksheets;

e) Workshop Reports;

f) Reports on Functional Checks;

g) Reports on Special Inspections;

h) Stores Issues/Reports;

i) Air Safety Reports;

j) Reports on Technical Delays.

2.5.3 In addition to the normal prime sources of information, due account should be taken of continuing airworthiness and safety information promulgated by Airworthiness Authorities and Manufacturers.

2.6 Pooling Arrangements

In some cases, in order that sufficient data may be analysed, it may be desirable to "pool" data: i.e. collate data from a number of Operators of the same type of aircraft, engine or APU. For the analysis to be valid, the aircraft concerned, mode of operation, and maintenance procedures applied must be substantially the same. Variations in utilisation between two Operators may more than anything, fundamentally corrupt the analysis. Although not exhaustive, the following list gives guidance on the primary factors which need to be taken into account:

a) Aircraft, engine or APU design commonality;

b) Modification embodiment state, including SB compliance;

c) Operational Environment, route structure, engine hour/cycle ratio;

d) Aircraft Age;

e) Utilisation, e.g. Low/High/Seasonal etc;

f) Respective fleet size;

g) Operating Rules applicable (e.g. ETOPS/RVSM/All Weather/JAR– OPS etc.);

h) Operating Procedures;

i) Maintenance Procedures;

j) Maintenance Standards applicable;

k) Lubrication Programme;

l) MPD Revision or escalation applied or maintenance programme/schedule applicable;

m) Data Collection procedures;

n) Engine/APU refurbish/rework specification.

Although it may not be necessary for all of the foregoing to be completely common, it is necessary for a substantial amount of commonality to prevail. Changes by any one of the Operators to the above, requires assessment in order that the pooling benefits can be maintained. Where an Operator wishes to pool data in this way, the approval of the CAA should be sought prior to any formal agreement being signed between Operators.

2.7 Displays

2.7.1 Collected information may be displayed in either graphical or tabular presentations or a combination of both. The rules governing any separation or discarding of information prior to incorporation into these displays should be stated. The format of any display should be such that the identification of trends, specific highlights and related arisings would be readily apparent.

2.7.2 Displays should include provisions for "nil returns" to aid the examination of the total information.

2.7.3 Where "standards" or "alert levels" are included in the Programme, the display information should be oriented accordingly.

2.8 Examination, Analysis and Interpretation of Information

2.8.1 The method employed for examining, analysing and interpreting the Programme information should be explained.

a) **Examination.** Methods of examination of information may be varied according to the content and quantity of information of individual Programmes. These can range from examination of the initial indication of performance variations to formalised detailed procedures at specified periods and the methods should be fully described in the Programme documentation.

b) **Analysis and Interpretation.** The procedures for analysis and interpretation of information should be such as to enable the performance of the items controlled by the Programme to be measured. They should also facilitate recognition, diagnosis and recording of significant problems. The whole process should be such as to enable a critical assessment to be made of the effectiveness of the Programme as a total activity. Such a process may involve:

i) comparisons of operational reliability with established or allocated standards (in the initial period these could be obtained from in-service experience of similar equipment or aircraft types);

ii) analysis and interpretation of trends;

iii) the evaluation of repetitive defects;

iv) confidence testing of expected and achieved results;

v) studies of life-bands and survival characteristics;

vi) reliability predictions;

vii) other methods of assessment.

2.8.2 The range and depth of engineering analysis and interpretation should be related to the particular Programme and to the facilities available. The following, at least, should be taken into account:

a) Flight defects and reductions in operational reliability;

b) Defects occurring on-line and at main base;

c) Deterioration observed during routine maintenance;

d) Workshop and overhaul facility findings;

e) Modification evaluations;

f) Sampling programmes;

g) The adequacy of maintenance equipment and publications;

h) The effectiveness of maintenance procedures;

i) Staff training;

j) Service bulletins, technical instructions, etc.

2.8.3 Where the Operator relies upon contracted maintenance and/or overhaul facilities as input to the Programme, the arrangements for availability and continuity of such information should be established and details should be included.

2.9 Corrective Actions

2.9.1 The procedures and time scales both for implementing corrective actions and for monitoring the effects of corrective actions should be fully described. Corrective actions should correct any reduction in reliability revealed by the Programme and could take the form of:

a) changes to operational procedures or techniques;

b) maintenance changes involving inspection frequency and content, function checks, overhaul requirements and time limits, which will require amendment of the scheduled maintenance periods or tasks in the Approved Programme;

c) amendments to approved manuals (e.g. Maintenance Manual, Crew Manual);

d) initiation of modifications;

e) special inspections or fleet campaigns;

f) spares provisioning;

g) staff training;

h) manpower and equipment planning.

2.9.2 The procedures for effecting changes to the Programme should be described, and the associated documentation should include a planned completion date for each corrective action, where applicable.

2.10 **Organisational Responsibilities.** The Organisational structure and the departments responsible for the administration of the Programme should be stated. The chains of responsibility for individuals and departments (Engineering, Production, Quality Control, Operations, etc.) in respect of the Programme, together with the formation and functions of any Programme control committees, should be defined. In the case of a JAR–OPS Maintenance Programme, this information should be contained in the MME or MOE as appropriate, as required by JAR–OPS.

2.11 **Presentation of Information to the CAA.** The production of reports and the notification of Programme events to the CAA will have to be agreed with the CAA. As the information to be supplied to the CAA will vary for individual Programmes, the Programme and its associated documentation should define at least the following:

a) The format and content of routine and event reports;

b) The time scales for the production of reports together with their distribution;

c) Details of any special reports (Annual Reports, special investigations, etc.);

d) Reports supporting requests for increases in periods between maintenance (escalation) and for amendments to the Programme. These reports should contain sufficient detailed information to enable the CAA to make its own evaluation where necessary;

e) The production and distribution of agenda and minutes of various meetings related to the Programme and its functions;

f) The identification of the availability of any non-reportable information which may be used to support the Programme (e.g. "in-house" information);

g) Any relationship between the reporting procedures of the Programme and the requirements for Mandatory Occurrence Reporting.

2.12 **Evaluation and Review**

2.12.1 Each Programme should describe the procedures and individual responsibilities in respect of continuous monitoring of the effectiveness of the Programme as a whole. The time periods and the procedures for both routine and non-routine reviews of maintenance control should be detailed (progressive, monthly, quarterly, or annual reviews, procedures following reliability "standards" or "alert levels" being exceeded, etc.).

2.12.2 Each Programme should contain procedures for monitoring and, as necessary, revising the reliability "standards" or "alert levels". The Organisational

responsibilities for monitoring and revising the "standards" should be specified together with associated time scales.

2.12.3 Although not exhaustive, the following list gives guidance on the criteria to be taken into account during the review:

a) utilisation;

b) fleet commonality;

c) alert level adjustment criteria;

d) adequacy of data;

e) reliability procedure audit;

f) staff training;

g) operating and maintenance procedures.

2.13 **Condition Monitored Maintenance.** Condition monitoring is not acceptable as the primary maintenance process for any items, the failure of which can produce:

a) a hazardous increase in crew work load; or

b) degradation of flight qualities, performance or strength of the aircraft; or

c) fire; or

d) the necessity for an unscheduled landing, marginal conditions for occupants or injury to occupants.

NOTE: This prohibition is not applicable to 'real-time' installed condition monitoring systems such as Helicopter Usage Monitoring system.

2.14 **Operator Reliability Programmes**

2.14.1 Operators who select to submit for approval a reliability centred maintenance programme, even though the TC holder may not require it, must include in the programme a classification listing which will indicate the importance of each item to continued airworthiness of the aircraft in the event of failure of the item so classified. Normally, this classification is applied after consultation between the Operator, Manufacturer and the CAA, but, alternatively, due account may be taken of MRB findings and MSG logic analysis in arriving at the appropriate classification.

NOTE: The classification listing criteria may also be applied to maintenance schedules/ programmes which do not employ an associated reliability programme, since the classifications have been found useful in determining airworthiness significance of escalation revisions.

2.14.2 Classifications should be as follows:

a) Items, the failure of which, would reduce the airworthiness of the aircraft to an unacceptable level. The reliability of such items will be controlled by the allocation of an overhaul period and/or Failure Rate Monitoring;

b) Items, the failure of which, may reduce the airworthiness of the aircraft but not to an unacceptable level. Such items will be controlled by Failure Rate Monitoring. Where it is known that an item is subject to wear or deterioration, the allocation of an overhaul period may be necessary;

c) Items, the single failure of which does not affect the airworthiness of the aircraft.

NOTE: There are certain items in the aircraft, the failure of which, when associated with an emergency, could endanger the aircraft, e.g. warning circuits normally dormant.

Such items may not be included in the above classification but are monitored in accordance with scheduled check inspection, functioning or test procedures.

3 Maintenance Programmes - Engines and Auxiliary Power Units

3.1 **Introduction.** This paragraph 3 defines an acceptable means of compliance with the requirements of Chapter B6–2 and JAR–OPS Sub part M for engines and auxiliary power units (engine/APU) in respect of Reliability Centred Maintenance and Condition Monitored Maintenance Programmes.

NOTE: In the case of programmes which are intended to comply with JAR–OPS Sub part M, this guidance material will eventually be superseded by appropriate JAR-OPS guidance material.

3.2 **Applicability.** A Reliability Centred Maintenance and Condition Monitored Maintenance Programme for an engine/APU is required when the restoration task for the engine/APU is not defined as either a Hot Section Inspection (HSI) and/or overhaul in accordance with the Manufacturer's approved engine overhaul manual.

3.3 **Approval**. Engine/APU Programmes should comply with this paragraph 3 and form part of the associated aircraft Programme. The procedures which are to be followed to obtain CAA approval of Programmes, and amendments to them, are set out in Chapter B7-5.

3.4 **The Programme**

3.4.1 **Introduction.** An engine/APU Reliability Centred Maintenance and Condition Monitored Maintenance Programme provides for the integration of Reliability Analysis, Hard Time Control, On Condition and Condition Monitoring into one Programme. It may vary in size and scope depending on the complexity and number of different engine and APU types being controlled by the Programme. The Programme sets out the means to identify both on-wing and off-wing maintenance tasks. On-wing engine/APU maintenance tasks and their intervals are initially established from Maintenance Review Boards (MRBs). Off-wing maintenance tasks and intervals are initially established by means of threshold and opportunity samples, Manufacturer's Engine Maintenance Planning Guides and the inspection requirements of the Engine Manuals. The on-wing and off-wing maintenance tasks and intervals may be changed as a result of reviewing the experience gained by operating the Programme and information provided in Service Bulletins, Manual Revisions, Service Letters, Airworthiness Directives and other relevant sources.

NOTE: For the purposes of this Appendix, off-wing maintenance tasks are defined as the content of engine/APU rework or refurbish specifications and their associated time related intervals.

3.4.2 **Objectives.** A statement should be included summarising the objectives of the Programme, together with a definition of the engines/APU types controlled by the Programme and the associated aircraft in which those engine/APU types are installed.

3.4.3 **Identification.** The engine/APU Programme document can be unique and separate from the associated aircraft Programme or it can form part of the aircraft Programme. If it is a separate document, it should be identified by a reference number, issue number and date and be cross referred from the appropriate part of the aircraft Programme.

3.4.4 **Data Pooling Arrangements**. See paragraph 2.6 of the Appendix for the primary factors which, where appropriate, should be taken into account for engines and APUs.

3.4.5 **Sub-contract.** Both CAP 360 and JAR–OPS make provision for the Operator to enter into a sub-contract arrangement with an Organisation which has the necessary resources and experience on the engine/APU type, to manage the Programme, and is acceptable to the CAA. However, this sub-contract arrangement does not absolve the Operator from the overall responsibility for ensuring the safe operation and continuing airworthiness of the aircraft to which the engine/APU is installed.

3.4.6 **Data Collection, Analysis and Interpretation.** (See also paragraphs 2.5 and 2.8 of this Appendix.) The data required for analysis and control of the engine/APU Programme together with associated procedures for the collection analysis and interpretation of the data should be defined in the Programme. In the case of a JAR-OPS approval, these procedures should be listed in the MME or MOE as appropriate. The following is typical of the data which should be collected for an engine/APU Programme:

a) Oil consumption trend monitoring;

b) Pilots Reports;

c) Aircraft Maintenance Access Terminal/On-board Maintenance System readouts;

d) Boroscope inspection findings;

e) Magnetic Chip Detector findings;

f) In flight shut down, abandoned take-off, unscheduled removal rates and causes;

g) Delay and cancellation rates and causes;

h) Performance trend analysis;

i) Engine and APU removal reports;

j) Airworthiness Directives;

k) Manufacturer's information and publications, e.g. Service Bulletins, Service Letters, All Operator Wires, etc;

l) Engine/APU and Component Workshop Strip and Condition reports;

m) Vibration monitoring;

n) Sampling programme findings;

o) Reliability Programme (statistical displays).

The final list of data to be collected, analysed and interpreted should be related to the objectives of the Programme and experience of operating the particular engine/APU type.

3.4.7 **Sampling Programme.** The Programme should define a threshold life at which a sample engine/module or APU should be scheduled for removal if sufficient data regarding engine/module or APU internal conditions has not been generated by previous scheduled or unscheduled removals. Subsequent requirements should be based upon a review of all applicable evidence e.g. defect investigations, workshop investigations, health monitoring data and evidence from other Operators.

3.4.8 **Technical Record Keeping and Life Limited Components.** The Programme should give details of the method used and organisational responsibilities for recording flying hours, engine/APU cycles, training "touch and go" landings etc. which are needed to show compliance with the mandatory life limitations of the engine/APU and for controlling 'hard' and 'soft' time intervals.

3.4.9 **Refurbish and Rework Specifications.** Every engine, module and APU whose restoration task is not defined as either a HSI or Overhaul in accordance with an appropriate Overhaul Manual (Engine Manual) should have a rework or refurbish specification established in accordance with the procedures defined in the Programme. The Specification should define the minimum modification standard and the degree of strip inspection and rework necessary to release an engine, module or APU for specified periods of service usage. The content of the Specification should be based upon the appropriate Manufacturer's Maintenance Planning Guides, threshold and opportunity samples, the inspection requirements of the engine manuals and the review and analysis of the data collected by the Programme.

3.4.10 **Repair and Overhaul Organisations.** The Programme should define the nominated JAR–145 Approved engine and APU repair and overhaul Organisations which are to be used, together with any contractual instructions to which the Organisations will be required to work. In the case of a JAR– OPS Programme, this information should be contained in the MME or MOE as appropriate.

3.4.11 **Corrective Actions.** (See also paragraph 2.9 of this Appendix). The Programme should define the means by which the collected data is routinely analysed and interpreted in order to monitor the effectiveness of the current on-wing and off-wing maintenance tasks and airworthiness of the fleet and so identify the need for any remedial action and appropriate timescales. The procedure for changing or escalating any of the on and off-wing tasks, inspections and time intervals should also be defined in the Programme.

3.4.12 **Organisational Responsibilities.** The Organisational structure of the Operator and where appropriate the sub-contracted maintenance, repair and overhaul Organisations responsible for the administration and control of the Programme should be defined. The responsibilities for decision making with respect to both the on-wing and off-wing elements of the Programme shall be clearly defined in the Programme. In the case of a JAR–OPS Programme, this information should be contained in the MME or MOE as appropriate, as required by JAR–OPS.

3.4.13 **Management Evaluation and Review.** (See also paragraph 2.12 of this Appendix). The Programme should be managed effectively and ensure that good communications prevail between the various technical and quality departments of the Operator and if appropriate, the sub-contracted maintenance, engine and APU repair and overhaul Organisations. The Programme should define how the review, agreement, co-ordination and communication are ensured in the following areas:

a) **Contractual Arrangements.** Where the Operator sub-contracts any of the on-wing or off-wing engine/APU maintenance, repair and overhaul, both non JAR-OPS and JAR–OPS Programmes require the details of the arrangements for maintenance, repair and overhaul to be clearly defined in a written maintenance contract. This is necessary to ensure that the technical and quality personnel of all the sub-contract Organisations which are involved in the application of the contract have a common understanding of the technical requirements of the Programme and of their respective duties and responsibilities;

b) **Engine/APU Workscopes.** Each engine, module and APU upon removal from an aircraft, should have an individual workscope prepared. The workscope should detail the reason for removal, engine/APU hours and cycles accrued in service, list any outstanding defects and define the required work to be carried out during the shop visit, cross referring, where appropriate, to the refurbish specification. The content of the workscope should also reflect any corrective actions which the Programme has previously identified as needing to be carried out at this shop visit. Where sub-contract arrangements exist, the content of the workscope should be

agreed by the Operator and the sub-contract maintenance, engine repair and overhaul Organisation as appropriate;

c) **Rework and Refurbish Specification.** Regular liaison between the technical and quality personnel of the Operator and where appropriate, the sub-contract maintenance, engine/APU repair and overhaul Organisation should take place to review, and update the content of the engine, module and APU rework and refurbish specifications. The review should be based upon the results of the analysis conducted upon the data collected in accordance with paragraph 3.4.6 of this Appendix;

d) **Technical and Quality Review.** It is necessary for the Operator and where appropriate the sub-contracted maintenance, engine repair and overhaul Organisations to periodically review all of the data inputs and reliability analysis defined in the Programme together with any adverse quality audit findings and action taken. The review should seek to adjust "alert levels", identify trends, address any reduction in reliability or increase of in-flight shut down rate, delays, and cancellations and so implement any necessary remedial action.

e) **Management Overview.** Every Programme should have a controlling body which is responsible for the implementation, decision making and overall running of the Programme. Management at a senior level (Quality Manager, Engineering Manager etc.) should periodically review the effectiveness of the Programme, and where necessary, implement changes.

3.4.14 **Changes to the Programme.** Any significant changes to the Programme will require approval of the CAA. (See also paragraph 3.3 of this Appendix).

Chapter B6-4 Weight and Balance of Aircraft

1 Introduction

This Chapter B6–4 prescribes the requirements for the weighing of aircraft, the determination of the corresponding centre-of-gravity position and the provision of information from which the loading for flight can be correctly determined.

NOTE: The Operator's responsibilities are prescribed in the Air Navigation Order and the Air Navigation (General) Regulations.

2 Definitions

2.1 **Basic Weight.** Basic Weight is the weight of the aircraft and all its basic equipment, plus that of the declared quantity of unusable fuel and unusable oil. In the case of turbine-engined aircraft and aircraft the Maximum Total Weight Authorised of which does not exceed 5700 kg, it may also include the weight of usable oil.

2.2 **Basic Equipment.** Basic Equipment is the unconsumable fluids, and the equipment which is common to all roles for which the Operator intends to use the aircraft.

2.3 **Variable Load.** Variable Load is the weight of the crew, of items such as the crew's baggage, removable units, and other equipment, the carriage of which depends upon the role for which the Operator intends to use the aircraft for the particular flight.

2.4 **Disposable Load.** Disposable load is the weight of all persons and items of load, including fuel and other consumable fluids, carried in the aircraft, other than the Basic Equipment and Variable Load.

NOTE: To obtain the total loaded weight it is necessary to add to the Basic Weight the weights of those Variable and Disposable Load items which are to be carried for the particular role for which the aircraft is to be used.

3 General

3.1 Aircraft shall be weighed when all manufacturing processes have been completed, and in accordance with the procedures in this paragraph 3.

NOTE: The CAA will consider applications from aircraft manufacturers and Operators to weigh certain types of aircraft on a sampling basis (i.e. representative aircraft, as weighed, would be acceptable for others of the same standard).

3.1.1 Aircraft, the Maximum Total Weight Authorised of which exceeds 5700 kg, shall be re-weighed within two years after the date of manufacture, and subsequent check weighing shall be made at intervals not exceeding five years, and at such times as the CAA may require.

3.1.2 Aircraft, the Maximum Total Weight Authorised of which does not exceed 5700 kg, shall be re-weighed at such times as the CAA may require.

3.2 When an aircraft is weighed, the condition of the aircraft (i.e. the equipment and other items of load such as fluids in tanks) shall be recorded. The equipment installed should not differ from that included in the declared list of Basic Equipment associated with the Weight and Centre-of-Gravity Schedule or the Loading and Distribution Schedule as appropriate.

3.3 The Basic Weight and the corresponding c.g. position shall be determined and entered in the Weight and Centre-of-Gravity Schedule or in the Loading and Distribution Schedule as appropriate.

3.4 The CAA may require that the actual weight of the items of Variable Load be ascertained.

3.5 A Weighing Record containing records of the weighing and the calculations involved shall be made available to the CAA, and such records shall be retained by the Operator. When the aircraft is again weighed the previous Weighing Record shall be retained with the aircraft records.

3.6 Operators shall maintain records of all known weight and c.g. changes which occur after the aircraft has been weighed, and such records shall be retained by the Operator.

4 Weight and Balance Report - Aircraft Exceeding 5700 kg

4.1 A Weight and Balance Report shall be produced for each Prototype, Variant and Series Aircraft, the Maximum Total Weight Authorised of which exceeds 5700 kg.

5 Weight and Centre-of-Gravity Schedule - Aircraft Exceeding 2730 kg (see B7–10 Appendix No. 1)

A Weight and Centre-of-Gravity Schedule shall be provided for each aircraft, the Maximum Total Weight Authorised of which exceeds 2730 kg, except that for an aircraft, the Maximum Total Weight Authorised of which exceeds 5700 kg, the information contained in Parts B and C of the Schedule may, for a new aircraft, be given as part of the Weight and Balance Report.

6 Weight and Centre-of-Gravity Schedule - Aircraft Not Exceeding 2730 kg (see B7–10 Appendix No. 2)

For aircraft, the Maximum Total Weight Authorised of which does not exceed 2730 kg, either a Weight and Centre-of-Gravity Schedule which complies with 5 and shall contain instructions for the determination of the loaded weight, the total moments and resultant c.g positions, or a Loading and Distribution Schedule which complies with B7–10 Paragraph 3 shall be provided.

Appendix 1 to B6-4

Weight and Balance of Aircraft - Fleet Mean Weight and Fleet Mean Centre-of-Gravity

1 Introduction (see Chapter B6–4)

An alternative arrangement to the periodical check weighing of individual aircraft is to establish a Fleet Mean Weight and Fleet Mean Centre-of-Gravity-Position, and this method is acceptable to the CAA where an Operator uses three or more aircraft of the same type. Application for acceptance of this arrangement should be made in writing to the CAA Safety Regulation Group, giving a table of aircraft weights which it is intended will form the basis of the Fleet Mean Weight. Where such an arrangement is adopted, the provisions of this Appendix No. 1 will apply.

2 General

The Initial Fleet Mean Weight should be based on the mean of the weights of all the aircraft of the same type in the fleet, and this should be reviewed annually by sample weighing (see paragraph 3).

2.1 The Fleet Mean Weight is the greatest of the following weights:

a) The mean Basic Weight of all aircraft of the same type in the fleet;

b) The mean Basic Weight of aircraft of the same type in the most recent sample weighings;

c) The Basic Weight of the heaviest aircraft in the fleet, less 0.5% of the Maximum Landing Weight.

2.2 If a Fleet Mean Weight is used, a weight control system should be established to account for modifications and repairs. Where there is a weight increase greater than 0.2%, the CAA should be informed in order to consider the validity of the established Fleet Mean Weight.

2.3 Where the weight of an aircraft differs significantly from the remainder of the fleet it is acceptable to exclude this from the fleet. Separate fleets may be established each with differing Fleet Mean Weights.

2.4 To establish a Fleet Mean Weight for an existing fleet of aircraft, to which will be added other aircraft of the same type, the new Fleet Mean Weight should be based on an up-to-date sample in accordance with the sampling procedures (see paragraph 3) drawn in proportion to the relative sizes of the original fleet and the additional aircraft.

3 Periodical Sampling Procedures

3.1 The number of aircraft to be weighed each year is:

Number in Fleet	Number to be Weighed
3	3
4 and 5	4
6 and 7	5
8 to 13	6
14 to 23	7
24 and over	6 plus 10% of the number of aircraft over 9

3.2 The number of samples may be reduced, by prior agreement with the CAA, where it can be shown that the variation in fleet weights is not significant from year to year.

3.3 Periodical sample weighings should be made in accordance with 3.1 from those aircraft in the fleet which show the greatest elapsed time between weighings.

4 Fleet Mean Centre-of-Gravity Position

This should be established by using the same appropriate procedures as for the Fleet Mean Weight, except that an aircraft with a c.g. position greater than 0.5% SMC from the Fleet Mean C.G. Position should not be included in the fleet.

Chapter B6-5 Minimum Equipment Lists

1 Introduction

1.1 Article 16 of the United Kingdom (UK) Air Navigation Order (ANO) 2000 requires the permission of the Civil Aviation Authority (CAA) to be obtained before an aircraft may be despatched with an unserviceability.

1.2 Information and instructions intended to enable the determination of the extent of unserviceable equipment and systems which may exist at the commencement of a flight while still allowing the safe operation of the affected aircraft shall be provided in the form of a Minimum Equipment List (MEL). See CAP 360 Part One. The MEL shall be prepared by the Operator and shall be no less restrictive than the approved MMEL for the same aircraft type (see CAP 549).

1.3 Unless otherwise determined by the CAA the format in which the MEL is to be presented should conform to that prescribed in paragraph 3 of BCAR Chapter B7–6 and Chapter 4 paragraph 7 of CAP 360 Part One.

2 Applicability

See BCAR Chapter B5–7 paragraph 2.

3 Submission of MEL

See CAP 360 Part One Chapter 4 paragraph 7.

4 Charges

CAA charges for the investigation of the MEL will form an integral part of the charges levied for the issue or renewal of the Air Operator's Certificate (AOC).

5 Acceptance of the MEL

Following investigation by the CAA, acceptance of the MEL will be signified to the Operator by means of the issue of the Permission referred to in Article 16 of the UK ANO.

6 Amendment of Minimum Equipment List

6.1 Amendment of the MEL will be required in all cases where the MMEL has been amended such that it becomes more restrictive. In such cases where the Operator's MELs are in line with the MMEL they must be amended and re-submitted for acceptance by the CAA within 30 days of the publication of the corresponding amendment to the MMEL.

6.2 The amendment of the MEL to reflect an already approved change to the MMEL which is less restrictive will be at the discretion of the Operator.

7 Reference Documents

Reference to BCAR Chapters B5–7 and B7–6, CAP 360 Part One and Part Two, CAP 450 and CAP 549 is recommended.

Chapter B6-6 Mandatory Modifications and Inspections: Procedure for Implementation

1 Introduction

1.1 Mandatory inspections, for the purpose of this Chapter are those inspections classified as mandatory by the CAA, where the inspection itself is the work.

1.2 Modifications and inspections, considered essential for airworthiness, will be classified as mandatory by the CAA in consultation, where appropriate, with the approved Organisation, and the compliance date, limiting flying hours, cycles, or details when the prescribed action must be taken, will be decided. In making this decision the degree of urgency and availability of modified parts will be taken into account.

NOTE: Mandatory modifications and inspections are promulgated in manufactures' Service Bulletins, or equivalent documents, which contain a statement that the modification/ inspection has been classified as mandatory by the Civil Aviation Authority. These mandatory modifications and inspections are summarised in the CAA publication, "Mandatory Aircraft Modifications and Inspections Summary".

1.3 The provisions of Article 9(7) of the Air Navigation Order (2000) are such that a Certificate of Airworthiness in respect of an aircraft registered in the United Kingdom will cease to be in force until any modifications or inspection, being a modification or inspection required by the CAA, is completed.

1.4 For the purpose of compliance with Article 9(7) a "modification or inspection required by the CAA" is one which has been classified as mandatory by the CAA. It is, therefore, incumbent on the Operator to ensure that he is aware of the published information (Service Bulletins, Technical News Sheets, etc.) concerning Mandatory Modifications and inspections in respect of his aircraft including its engines, propellers, radio, accessories, instruments and equipment and to act accordingly.

NOTE: The Operator is advised to institute a procedure for the assessment of published information in order to ensure that an adequate and timely response will be made.

1.5 In certain instances, requirements for Mandatory Modifications and inspections are issued in respect of foreign manufactured engines and equipment fitted to British constructed aircraft. Likewise requirements for Mandatory Modifications and inspections are issued in respect of British manufactured engines and equipment fitted to foreign constructed aircraft on the British register. Operators are, therefore, reminded that the total requirements for a complete aircraft including its equipment may, in this case, only be ascertained by making reference to the paragraphs of this Chapter B6–6 together with Chapter A6–6 for British constructed products.

1.6 If, in the course of work connected with matters dealt with in this Chapter, the Operator becomes aware of any potential airworthiness problems he should, without delay, advise the local CAA Area Office (see Airworthiness Notice No. 29 for list).

2 Products of Foreign Manufacture

2.1 The following modifications and inspections are classified as mandatory:

a) Those notified as mandatory in a foreign Airworthiness Directive or equivalent notification issued by the Responsible Authority of the State of Construction, unless notification by the CAA is made to the contrary;

b) Those notified in a CAA Additional Airworthiness Directive;

c) Those notified in a CAA Emergency Airworthiness Directive;

d) Those necessary to comply with CAA Airworthiness Notices of a mandatory character (e.g. Nos. 41, 81).

2.2 Wherever possible, the criterion for embodiment or compliance is fixed to coincide with periodical inspections or overhauls so that the Operator has a reasonable amount of time for carrying out the work. In addition, consideration is given to the possibility of a special inspection procedure as, at least, a temporary alternative to the embodiment of a modification. Operators and their contracted maintenance organisations are expected, when necessary, to make priority arrangements to achieve compliance within the period specified.

2.3 The initial notification of a Mandatory Modification or inspection by the manufacturer (e.g. Service Bulletins, Technical News Sheet) is distributed to all known Operators of the aircraft and to all Airworthiness Authorities to whom those Operators are responsible.

2.4 In addition to the initial notification by the manufacturer (see paragraph 2.3), the CAA will advise the Responsible Authority of all ICAO Contracting States listed in the current edition of ICAO Circular 95–AN/78/3. The method of notification (e.g. telex, cable or airmail) will depend upon the urgency of the information. A further notification is made to those Responsible Authorities by the transmission of amendments to the publication "Mandatory Modifications and Inspections Summary" (see paragraph 2.5), which they receive in accordance with Airworthiness Notice No. 22.

NOTES: 1 In view of the notification procedure described in paragraph 2.3, Operators and Organisations undertaking maintenance or overhaul of aircraft have a duty to ensure that their names and addresses are known to the manufacturers of the aircraft for which they are responsible.

2 As a general rule modifications and inspections notified by an equipment manufacturer as mandatory will have been the subject of discussion and agreement between the equipment manufacturer and the aircraft manufacturer and would have allowed the aircraft manufacturer to issue a covering bulletin, where this is appropriate. (However, see paragraph 1.5.)

2.5 Information on Mandatory Modifications and inspections applicable to British manufactured products is summarised in the publication "Mandatory Aircraft Modifications and Inspections Summary", published by the CAA. Details are given in Airworthiness Notice No. 6.

3 CAA Additional Airworthiness Directives

3.1 The CAA may vary the content or application of a foreign Airworthiness Directive, in which case details will be promulgated in a CAA Additional Airworthiness Directive[1] preceded, if necessary, by a CAA Emergency Airworthiness Directive. Where the CAA has issued a CAA Additional Airworthiness Directive in advance of the

1. Issued in the CAA Publication 'Foreign Airworthiness Directives'.

notification by the Responsible Authority of the State of Construction, the CAA Directive shall be observed, unless subsequently revoked.

3.2 In respect of large transport aircraft (MTWA exceeding 5700 kg), the investigation to establish the need for a CAA Additional Airworthiness Directive is carried out by the CAA in close co-operation with the Operators of the type. Except where urgency is involved which merits the issue of a CAA Emergency Airworthiness Directive, Operators concerned will be formally notified of the intention of the CAA to issue an Additional Airworthiness Directive, and a period of 21 days will be allowed for them to comment.

3.3 Notification of Mandatory Modifications and inspections applicable to foreign manufactured products (both foreign Airworthiness Directives and CAA Additional Airworthiness Directives) is by issue of amendments to the three volumes of the publication "Foreign Airworthiness Directives" published by the CAA. This publication deals separately with products of USA manufacture and those manufactured in foreign countries other than the USA. Details are given in Airworthiness Notice No. 6. Because of delays inherent in the system, for any product the definitive list will have to be agreed with the CAA.

NOTES: 1 It is important that Operators of foreign constructed products on the British register arrange to receive copies of "Foreign Airworthiness Directives" and use the latest issue so that any requirements additional to the previous issue can be complied with.

2 Foreign Airworthiness Directives usually refer to manufacturer bulletins, etc., therefore owners, Operators and Organisations undertaking maintenance or overhaul of aircraft should ensure that their names and addresses are known to manufacturers of the aircraft for which they are responsible.

4 CAA Emergency Airworthiness Directives

4.1 CAA Emergency Airworthiness Directives can be issued for both British and Foreign constructed products. They are used to notify Mandatory Modifications and inspections where the degree of urgency is such that is not practical to use the normal channels.

4.2 CAA Emergency Airworthiness Directives are sent by the CAA to British Operators of aircraft of the type and to the CAA Area and Overseas offices having supervision responsibility for aircraft of the type. In the case of foreign constructed products, copies are also sent to the Responsible Authority of the State of Construction and to the foreign manufacturer. Transmission to Operators is by Telex or by first class mail, as appropriate.

4.3 Unless inappropriate (e.g. a single, immediate inspection) the normal publication action will be taken in due course.

5 Work and Certifications

5.1 Work undertaken in incorporating a Mandatory Modification, or in carrying out a mandatory inspection, shall be supervised by an Organisation Approved by the CAA for the purpose (see Sub-Section A8) or by an appropriately licensed aircraft maintenance engineer.

5.2 Where it is necessary to amend the particulars in the Certificate of Airworthiness or Flight Manual, the Certificate or Manual shall, unless agreed otherwise by the CAA, be forwarded to the local area office of the CAA.

5.3 Full particulars of the work done to incorporate the modification, or details, results and work arising from the mandatory inspection, shall be entered in the appropriate log book, quoting the reference number of the appropriate document, e.g. Airworthiness Approval Note for a Major modification, Service Bulletin for a mandatory inspection. A Certificate of Release to Service shall be completed, where appropriate, and attached thereto.

5.4 All relevant records of modifications and mandatory inspection shall be made available to the CAA for examination on request, and these shall not be destroyed without authorisation from the CAA.

NOTE: The Air Navigation Order requires that log books, and other documents which are identified and referred to in the log books (therefore forming part of the log books) shall be preserved until a date two years after the aircraft, the engine or the variable pitch propeller, as the case may be, has been destroyed, or permanently withdrawn from use.

5.5 When a change is made to a component which has already been the subject of a Mandatory Modification and this produces a new or modified component which achieves all the objectives of the previous Mandatory Modification, then the latter modification becomes an acceptable alternative to the previous one, and shall be shown in the Company's modification system and associated documentation.

6 Airworthiness Notices

Where the subject matter does not lend itself to expression in terms of Paragraphs 2, 3 and 4 notification may be effected by means of an Airworthiness Notice. The normal CAA Airworthiness Directive publication action will be taken, when appropriate, in due course.

Chapter B6-7 Certification of Inspections, Overhauls, Modifications, Repairs and Replacements

1 Introduction

In accordance with the Air Navigation Order, an aircraft registered in the United Kingdom being an aircraft in respect of which a Certificate of Airworthiness issued or rendered valid under the Air Navigation Order is in force, shall not fly unless there is in force a Certificate of Release to Service issued in respect of any overhauls, repairs, replacements, modifications, maintenance, mandatory inspections or scheduled maintenance inspections to the aircraft or any part of the aircraft or such of its equipment as is necessary for the airworthiness of the aircraft. In addition, a Certificate of Release to Service is required for all such work carried out on radio equipment and equipment specified in Schedule 5 of the Air Navigation Order. Certain exclusions are identified in paragraphs 2.1 and 2.2. This Chapter B6–7 concerns inspections, overhauls, modifications, repairs and replacements applicable to aircraft and, where appropriate, to components, engines, propellers, radio apparatus, accessories, instruments, equipment, their installations and the issue of certificates of release to service thereto.

NOTES: 1 Owners, Operators, and Organisations undertaking overhaul/maintenance on aircraft should ensure that the manufacturer of each type of aircraft is informed of their names and addresses to facilitate distribution of the documents notifying Mandatory Modifications and inspections.

2 Information distributed in accordance with Airworthiness Notice No. 36, is summarised in the CAA Publication entitled "Mandatory Aircraft Modifications and Inspections Summary" which will be supplied to foreign airworthiness authorities on application to the Civil Aviation Authority (see CAA Airworthiness Notice No. 22).

2 Inspections, Overhauls, Modifications, Repairs and Replacements

2.1 General

2.1.1 Inspections, overhauls, modifications, repairs, and replacements shall be carried out in accordance with the Approved Manuals, drawings and schedules related thereto, and any other documents required or recognised, by the CAA.

2.1.2 Further, in the case of structural repairs to an aircraft, where the repairs are of a major nature, or not covered in the particular Approved Manual, the approved Organisation or the appropriately licensed aircraft maintenance engineer concerned, shall advise the nearest CAA Area Office of the nature of the repairs before the work commences (see CAA Airworthiness Notice No. 29 for list of addresses). Repair schemes, not previously approved by the CAA, will be investigated as modifications in accordance with the procedures in Chapter B2–5.

2.1.3 Replacement parts shall be certified by an Organisation Approved by the CAA for the purpose, or by an alternative procedure agreed by the CAA.

2.2 **Work and Certifications**

2.2.1 Inspection, overhaul, modification, repair, and replacement work shall be supervised by an Organisation Approved by the CAA for the purpose (see Sub-Section A8) or by an appropriately licensed aircraft maintenance engineer.

2.2.2 Where the work is to be carried out on an aircraft registered in the United Kingdom by a foreign Organisation not Approved by the CAA, suitable arrangements shall be agreed with the CAA Safety Regulation Group (see paragraph 6).

2.2.3 Depending on the nature of the overhaul, modification, repair, or replacement made to the aircraft, the following may be required by the CAA:

a) The aircraft to be weighed, and an amended Weight and Centre-of-Gravity Schedule, or its equivalent as prescribed in Chapter B7–10 to be prepared;

b) A Certificate of Fitness for Flight issued (See Chapter B3–8) and the aircraft to be tested in flight to schedules Approved by the CAA in accordance with Chapter B6-8.

2.2.4 Before a Certificate of Release to Service or its foreign equivalent is issued, the work shall have been inspected, and tested where necessary, in conformity with the specifications, drawings and instructions relating to the modification or mandatory inspection. Where appropriate, the instructions shall include a copy of the original Airworthiness Approval Note for a Major Modification, or a copy of the CAA Form AD 261 for a Minor Modification.

2.2.5 The aircraft shall be made available to enable the CAA to inspect it as necessary.

2.2.6 When the work has been fully inspected, and tested where necessary, for conformity with the specifications, drawings and instructions relating to the overhaul, modification, repair or replacement, the necessary certification and, where appropriate, log book entries shall be completed in accordance with paragraph 5. Where applicable, the instructions shall include a copy of the original Airworthiness Approval Note for a Major Modification, or a copy of the CAA Form AD 261 for a Minor Modification. Where the work has been carried out by a foreign Organisation, in accordance with paragraph 2.2.2, the Organisation for whom the work has been carried out shall raise a Certificate of Release to Service where such is required, using the foreign certificate as evidence that an acceptable standard has been achieved.

3 Certificate of Release to Service

3.1 A Certificate of Release to Service shall be issued after overhauls, modifications, repairs, replacements, modifications and mandatory inspections have been carried out on an aircraft, which is registered in the United Kingdom and has a Certificate of Airworthiness in force, except as follows:

a) A Certificate of Release to Service is not required for certain prescribed repairs or replacement carried out on an aircraft not exceeding 2730 kg Maximum Total Weight Authorised with a Certificate of Airworthiness in the Private or Special Categories, provided the work has been carried out personally by the owner or Operator holding a pilot's licence. Details of the prescribed repairs or replacements permitted are contained in the Air Navigation (General) Regulations;

b) If a repair or replacement of a part of an aircraft is carried out when the aircraft is at such a place that it is not reasonably practicable:

i) to carry out the work in a manner that a Certificate of Release to Service may be issued, or

ii) for the Certificate to be issued at that particular place, the Commander may fly the aircraft, if, in his opinion, it is safe to do so, to the nearest place at which a Certificate may be issued.

NOTE: The ANO prescribes that in such cases written particulars of the flight and the reasons for making it are to be given to the CAA within ten days thereafter.

c) A Certificate of Release to Service is not required for any overhaul, repair, or modification, carried out on items specified in the Air Navigation Order, Schedule 4, paragraph 3.

3.2 A Certificate of Release to Service shall only be issued for a particular inspection, overhaul, modification, repair or replacement when the signatory is (signatories are) satisfied that the work has been properly carried out, having due regard to the use of:

a) up-to-date instructions including manuals, drawings, specifications, CAA Mandatory Modifications/inspections and company procedures;

b) recommended tooling and test equipment which is currently calibrated where applicable; and

c) a working environment appropriate to the work being carried out.

3.3 The Certificate of Release to Service shall contain particulars of the work done or the inspection completed and the organisation and place at which the work was carried out. Depending upon the application of the certificated, details of the aircraft type, registration, component type, part number and serial number shall be recorded as applicable. The certification shall be worded in the following manner:

'The work recorded above has been carried out in accordance with the requirements of the Air Navigation Order for the time being in force and in that respect the aircraft/equipment is considered fit for release to service.'

3.4 The Certificate of Release to Service shall be signed by a person specified in paragraph 4 except that the CAA may direct which of these person shall sign in a particular case. The signatory/signatories shall record licence/approval/authorisation reference number as appropriate, together with the date.

4 Certification of Release to Service Signatories

4.1 A Certificate of Release to Service shall be issued only by one of the following:

a) The holder of an aircraft maintenance engineer's licence granted under the Air Navigation Order, being a licence which entitles the holder to issue that certificate;

b) The holder of an aircraft maintenance engineer's licence granted under the law of a country other than the United Kingdom and rendered valid under the Air Navigation Order, in accordance with the privileges endorsed on the licence;

c) The holder of an aircraft maintenance engineer's licence granted under the law of any such country as may be prescribed, in accordance with the privileges endorsed on the licence and subject to any conditions which may be prescribed;

d) The holder of an aircraft maintenance engineer's licence or authorisation as such as an engineer granted or issued by or under the law of any Contracting State other than the United Kingdom in which the overhaul, repair, replacement, modification or inspection has been carried out, but only in respect of aircraft of which the Maximum Total Weight Authorised does not exceed 2730 kg and in accordance with the privileges endorsed on the licence;

NOTE: "Contracting State" means any State which is a party to the Convention on International Civil Aviation signed on behalf of the Government of the United Kingdom at Chicago on 7th December 1944.

e) A person, approved by the CAA as being competent to issue such Certificates, and in accordance with that Approval;

f) A person authorised by the CAA to issue the Certificate in a particular case, and in accordance with that authority;

g) A person Approved in accordance with JAR–145, and in accordance with that Approval.

4.2 In relation only to the adjustment and compensation of direct reading magnetic compasses, the holder of an Airline Transport Pilot's Licence (Aeroplanes), or a Senior Commercial Pilot's Licence (Aeroplanes), or a Flight Navigator's Licence granted or rendered valid under the Air Navigation Order may also issue a Certificate of Release to Service.

5 Retention of Records

5.1 When all the relevant work has been carried out, a Certificate of Release to Service shall be entered in/attached to the appropriate log book and completed in accordance with this Chapter B6–7.

a) Where it is more convenient, the required particulars may be entered in a separate record, but an entry shall be made in the appropriate log book, containing a summary of the work carried out and a cross-reference to the document containing the Certificate of Release to Service.

b) Where an alternative record system has been agreed then the format and location of such certificates shall be in accordance with that agreement.

c) Where work has been carried out in accordance with the provision of 3.1 (b) then the details of such work together with the date, pilot's licence number and signature of the person who carried out the work shall be entered in the appropriate log book.

5.2 Full particulars of work done to incorporate modifications shall be entered in the appropriate log book, quoting the reference number of the appropriate document, e.g. Airworthiness Approval Note for a Major Modification, Service Bulletin for a mandatory inspection. A Certificate of Release to Service shall be issued, where appropriate, and attached thereto (see 2.2.6).

5.3 When it is more convenient, the information required by 5.2 may be entered in a separate record which shall be certified in the same manner as that required for entry in the appropriate log book. The reference number of this record, and the place where it may be examined, shall be entered in the log book under a brief description of the particular modification. A similar record shall be kept when log books are not required.

5.4 All relevant records of mandatory inspections, overhauls, modifications, repairs and replacements shall be made available to the CAA for examination on request, and these shall not be destroyed without authorisation from the CAA.

NOTE: The Air Navigation Order requires that log books, and other documents which are identified and referred to in the log books (therefore forming part of the log books) shall be preserved until a date two years after the aircraft, the engine or the variable pitch propeller, as the case may be has been destroyed, or permanently withdrawn from use.

6 Manuals

6.1 Amendments to Manuals, i.e. the Flight Manual (see B7–2), Maintenance, Overhaul and Repair Manuals (see B7–4) or the Crew Manual (see B7–3) or the Maintenance Schedule (see B7–5) arising from the incorporation of a Major or Minor Modification in an aircraft shall be made in accordance with the requirements of the particular Chapters. In the case of Minor Modifications Approved under CAA Form AD 261 procedure the applicant shall submit details of the proposed amendments to the CAA for Approval.

6.2 Where it is necessary to amend the particulars in the Certificate of Airworthiness or Flight Manual, the Certificate or Manual shall, unless agreed otherwise by the CAA, be forwarded to the local area office of the CAA.

7 Work by Foreign Organisations not Approved by the CAA

7.1 Where the CAA has entered into a special arrangement with a foreign country, the supervision and associated release documentation should follow the terms of that agreement.

7.2 In the absence of a special arrangement in accordance with 7.1, 7.2.1 or 7.2.2 may be applied.

7.2.1 Where the airworthiness arrangements in the foreign country achieve a standard acceptable to the CAA, work may be accepted from Organisations within that country provided it is accompanied by a suitable certificate supported by the Responsible Authority of the state concerned. The type of work, detail arrangements and form of certification required should be agreed in consultation with the CAA.

7.2.2 Work from other foreign Organisations not in countries covered by 2.2.1 may be accepted on an ad hoc basis, and the arrangements should be agreed, case by case, with the CAA.

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Chapter B6-8 Flight Testing after Modification or Repair

1 General

1.1 The flight testing of aircraft shall comply with the procedures set out in this Chapter B6–8, as follows:

a) Modifications to aircraft and Variants under investigation for the issue of a Certificate of Airworthiness or a Permit to Fly;

b) Aircraft which have undergone structural repairs which could affect their flight characteristics.

NOTE: Owners are required to arrange adequate insurance to cover damage to the aircraft and to third parties (see CAA Airworthiness Notice No. 66).

1.2 In order that the CAA may accept reports on flight test matters, the qualifications and experience of personnel involved in flight testing under the provisions of this Chapter shall be acceptable to the CAA. Flight test personnel shall be provided with adequate facilities and equipment for the effective performance of their duties.

NOTE: Organisations approved in accordance with A8–9 to fly aircraft under "B" Conditions of the Air Navigation Order comply with this requirement.

2 Modifications and Repairs to Aircraft and Variants

2.1 The requirements and procedures of this paragraph 2 are applicable:

a) in respect of modifications to aircraft;

b) in respect of repairs to aircraft.

2.2 If in the opinion of the CAA, the design of an aircraft is so modified as to affect the flight characteristics or the functioning in flight of the aircraft, the CAA may decide that a flight test evaluation is required; in which case the procedures of B2-3 shall be followed, except where any part is clearly inapplicable. The schedule of flight testing shall include:

a) the flight tests necessary to re-establish compliance with the appropriate airworthiness requirements;

b) the flight tests necessary to provide new or revised information for inclusion in the documents associated with the Certificate of Airworthiness (or Permit to Fly);

c) flight tests as contained in the approved Airworthiness Flight Test Schedule for an aircraft of the basic type concerned (B3–3) except where these tests are covered by the tests referred to in a) and b).

2.3 Where no specific flight test evaluation is required, the aircraft shall be flight tested as a Series aircraft in accordance with B3–3.

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Sub-Section B7
Procedures for the Approval of Documents and Manuals for Operation and Maintenance of Aircraft

Chapter B7-2 Flight Manuals

1 Introduction

1.1 A Flight Manual is a document prescribed by the International Civil Aviation Organisation and is intended primarily for use by the flight crew. The Manual contains limitations, recommended procedures and information of a nature such that adherence to it will enable the level of safety which is intended by the Airworthiness Requirements and the Air Navigation legislation to be regularly achieved. The Flight Manual, by definition in the Air Navigation Order, forms part of the Certificate of Airworthiness.

NOTES: 1) The requirements of this Chapter do not apply to aircraft of which the Prototype was certified before 5th April, 1949.

2) In this Chapter, the term 'Flight Manual' includes any documents accepted in place of a Flight Manual.

1.2 Flight Manuals and amendments thereto shall be approved, amended, and published in accordance with the procedures set out in this Chapter B7–2.

2 Aircraft Designed and Constructed Outside the United Kingdom

2.1 **Applicability** The requirements and procedures of this Chapter B7–2 are applicable to Flight Manuals which are required to be provided as part of the certification documentation of a type of aircraft new to the United Kingdom and to new Flight Manuals for Variants or Series aircraft designed and constructed outside the United Kingdom for which an application has been made for a United Kingdom Certificate of Airworthiness, except for those aircraft designed by an Organisation approved by the CAA, in which case the procedures of A7–2 shall apply.

2.1.1 In respect of aircraft, the Maximum Total Weight Authorised of which does not exceed 2730 kg, a Flight Manual need not be supplied provided that:

a) a Flight Manual is not prescribed as a mandatory part of the Certificate of Airworthiness by the Responsible Authority of the State of Origin of the aircraft; and

b) the limitations, procedures and information necessary for the operation of the aircraft in accordance with the Air Navigation Order are promulgated in an acceptable document other than a Flight Manual.

2.2 **General**

2.2.1 Flight Manuals and all amendments thereto shall be subject to acceptance or approval, as appropriate, by the CAA.

2.2.2 Flight Manuals provided in compliance with this paragraph 2 shall be approved in accordance with procedures acceptable to the Responsible Authority of the State of Origin of the aircraft (hereinafter referred to as the 'Responsible Authority'), and in addition shall comply with any Special Conditions prescribed by the CAA.

NOTE: It is the usual practice for Flight Manuals to be prepared and published by the manufacturer[1], but a Manual prepared and published by some other body[1] will be acceptable provided that it complies with paragraph 2.2.2.

2.2.3 For Flight Manuals provided in compliance with this paragraph 2, the applicant shall be responsible for, and shall make the necessary arrangements to ensure, the supply of any amendments which are necessary to keep the Flight Manual up to date for as long as an aircraft of the type remains registered in the United Kingdom (see paragraph 2.4).

2.2.4 Flight Manuals provided in compliance with this paragraph shall be in the English language.

2.3 **Acceptance and Publication of Initial Manual**

2.3.1 The CAA will, after taking account of the size and complexity of the aircraft, advise the applicant of the CAA timetable for Approving the Flight Manual.

2.3.2 The Flight Manual shall be identified either by a unique reference number, or by the exact designation of all the aircraft to which the Manual is to apply.

2.3.3 Five copies of the Flight Manual shall be supplied to the CAA for examination and acceptance in accordance with the agreed timetable.

2.3.4 When the CAA has completed its examination of the Flight Manual, the applicant will be notified of CAA acceptance or of any alterations to it which are considered necessary prior to such acceptance.

2.3.5 When the Flight Manual is acceptable to the CAA, copies, in the final form, shall be sent to the CAA as follows:

a) One copy appropriate to each aircraft for which application for a Certificate of Airworthiness has been made; each copy to include the registration marks and manufacturer's serial number of the particular aircraft;

b) Four copies for retention by the CAA.

2.4 **Acceptance or Approval and Publication of Amendments.** The procedure for the amendment of Flight Manuals accepted and published in accordance with paragraph 2.3 shall be in accordance with this paragraph 2.4.

2.4.1 The applicant shall supply such amendment material as is necessary to maintain compliance with paragraph 2.2.3, and shall indicate to which aircraft the proposed amendments are applicable.

2.4.2 Amendments which are initiated by the Originator of the Manual shall be processed and accepted in accordance with paragraph 2.4.4.

2.4.3 Changes which are initiated by an applicant other than the Originator of the Manual or the CAA shall be processed and accepted in accordance with paragraph 2.4.4, and shall be effected either by means of a Change Sheet or by a Supplement.

a) Each Change Sheet or Supplement shall, unless agreed otherwise by the CAA, be produced by, and shall be submitted for approval through, the medium of an Organisation Approved for the purpose, and shall comply with the appropriate requirements.

1. Hereinafter referred to as the Originator of the Manual.

NOTES: 1 Where the amendment involves the copying of a previously approved amendment or alterations to reflect changes of relatively small significance, material may be accepted from suitable Organisations not formally approved by the CAA.

2 A Change Sheet, which consists of an additional page or pages, is normally used to cover simple changes to existing data. It is embodied in the Flight Manual adjacent to the basic page to which the change relates.

3 A Supplement is normally used to introduce a new role for the aircraft or the installation of major items of equipment.

2.4.4 The requirements of this paragraph 2.4.4 are applicable to amendments initiated in accordance with paragraph 2.4.2 or 2.4.3.

a) Five copies of the proposed amendments shall be sent to the CAA for acceptance or approval, at least three weeks in advance of the desired date for publication.

NOTE: In the respect of amendments already approved by the Responsible Authority, the investigation by the CAA will normally be limited to the extent necessary to ensure that the amendments are consistent with:

i) The basis upon which the type of aircraft was certificated.

ii) Current United Kingdom Air Navigation legislation.

b) The applicant shall make any alterations which the CAA may consider necessary at this stage.

c) When the amendments have been approved by the CAA, one copy of the amendments to be made to the Flight Manual of each particular aircraft, together with embodiment instructions, shall be sent by the Originator of the Manual or applicant, as appropriate, to the owner or Operator of each aircraft affected, and the CAA shall be informed when this has been done.

d) Four copies of the amendments as approved or accepted, as appropriate, shall be supplied to the CAA for retention.

e) The Operators shall, in accordance with the instructions provided, incorporate the amendments.

2.4.5 **Series Aircraft.** At least seven days before the date on which certification of a Series aircraft is desired, the applicant shall send to the CAA, for examination, a copy of the Flight Manual relating to the aircraft; the manual to include the United Kingdom registration marks and manufacturer's serial number. This copy shall include all applicable amendments embodied in accordance with paragraph 2.4.4. If the Flight Manual contains any material or amendments which have not previously been accepted or approved by the CAA, the procedure of paragraph 2.4.4 shall be followed. When the Flight Manual has been examined and found to be satisfactory, it will be issued to the applicant with the Certificate of Airworthiness.

3 Certificate of Airworthiness Renewal

The requirements concerning the Flight Manual at Certificate of Airworthiness renewal are prescribed in Chapter B3–4.

NOTE: In respect of an aircraft which, before renewal of the Certificate of Airworthiness, has been registered in a foreign State and is to be registered in the United Kingdom, it may be necessary to obtain a new Flight Manual, to a standard acceptable for the type, in accordance with 2.3.

Chapter B7-3 Crew Manuals

1 Introduction

Information and instructions necessary to enable the crew to acquire an understanding of the aircraft essential for its safe operation shall be provided by the Type Design Organisation of a public transport aircraft to be granted a United Kingdom Certificate of Airworthiness. The information and instructions may form part of the Operations Manual, or may be produced as a separate document, which shall be entitled 'Crew Manual'.

NOTE: In this Chapter the word 'manual' is used to indicate 'Crew Manual', or the information and instructions to the crew which may be part of the Operations Manual.

1.1 The manual must be available for issue to a standard of completion acceptable to the CAA at the time of issue of the Certificate of Airworthiness, unless otherwise agreed by the CAA.

2 General

2.1 Except as otherwise agreed by the CAA the manual shall be certified and published under the authority of the Organisation approved for design of the aircraft. The CAA reserves the right to investigate the contents of the certified manual and to require the embodiment of any revision or amendment which it considers necessary to satisfy the requirements.

2.2 The manual, when published by an approved Organisation, must bear a statement that it complies with this Chapter. Two copies of the certified manual must be given to the CAA.

2.3 The certification, and the NOTE associated with the certification, must appear on the title page of each manual. The certification and the NOTE shall be worded as follows:

STATEMENT OF INITIAL CERTIFICATION

This manual complies with British Civil Airworthiness Requirements, Section B, Chapter B7–3.

Signed .....

Date .....

CAA Approval No. .....

NOTE: The above certification does not apply to revisions or amendments made after the date of initial certification, by other approved Organisations. Revisions or amendments made by other approved Organisations must each be separately certified and recorded on separate record sheets.

2.4 The aircraft Type Design Organisation shall obtain from the manufacturers of engines, auxiliary power units, propellers, radio and radar apparatus, and from the manufacturers of products which are approved under either the Accessory Procedure or the Component Procedure prescribed in Chapter B4–8, such certified information relating to their products necessary for the completion of the manual. Should the

aircraft Type Design Organisation wish to depart from the information supplied, the agreement of the original manufacturer shall be sought. The CAA shall be informed of disagreement and will adjudicate where necessary.

2.5 The manual shall be adequately illustrated and include such instructions and information considered necessary to meet the requirements of this Chapter. Manuals complying with the applicable recommendations in paragraph 3 would fulfil the requirements.

2.6 The manual shall contain those parts specified under paragraph 3.15, headed "Flight Planning Data", which are not part of the Flight Manual.

2.7 Any other instructions and information may be omitted from the manual only if the Flight Manual contains all (not parts) of the information specified under any item of a subject. In the event of any such omissions appropriate cross-references must be made to the Flight Manual.

2.8 The instructions and information in the manual must be presented in a manner suitable for use by the crew, giving sufficient detail for a proper understanding of each subject, and shall be consistent with the Flight Manual, with particular emphasis on the instruments and controls in the flight crew compartment. The manual should not contain superfluous matter regarding engineering and construction. The advice of the CAA should be sought in cases of doubt.

2.9 A manual must be marked "Provisional" on the page and in the position normally occupied by the "Statement of Initial Certification" if it is published in parts before completion, or before the aircraft is certified and the Flight Manual is issued.

3 Format

Some, possibly all, of the contents of the Crew Manual will be repeated in an Operations Manual. There are obvious advantages, therefore, in producing the Crew Manual in a format that will permit the contents to be incorporated in an Operations Manual without being changed or rewritten. The CAA has published a document, CAP 450, "Specifications for Operations Manuals" giving guidelines on the preparation of these manuals. It is recommended that this document be studied before the Crew Manual is prepared and that it is produced in conformity with those guidelines. The following information is for guidance in compiling a manual to comply with the requirements of this Chapter B7–3.

3.1 **Title Page.** The "Statement of Initial Certification" in accordance with paragraph 2.2.

3.2 **Notes to Readers.** The conventions used in the manual (e.g. where words are in capital letters this indicates a placarded marking in the aircraft, similarly statements that all speeds given are 'indicated airspeeds') scope and purpose of the manual and list of contents.

3.3 **Index of Amendments (Permanent) Issued by Type Design Organisation**

3.4 **Index of Amendments (Temporary) Issued by Type Design Organisation**

3.5 **Index of Amendments (Permanent) Issued by Operator**

3.6 **Index of Amendments (Temporary) Issued by Operator**

3.7 **List of Associated Publications**

3.8 **Introduction.** A brief introduction to the aircraft, its structure, systems, equipment and roles, including a three-view general arrangement drawing giving dimensions and

such illustrations as may be necessary to cover panel coding, bulkhead numbering and nomenclature.

3.9 **Flight Crew Compartment.** Lay-out, crew stations, controls, equipment, instruments and lights with appropriate illustrations.

3.10 **Systems and Equipment.** As appropriate: air conditioning; auto-pilot; flight systems; communications; electrical power distribution; fire protection systems including warning and extinguishing devices; flight control; fuel; hydraulic power; ice and rain protection; landing gear; navigation equipment including radio aids; instruments and radar; oxygen system including portable sets; pitot static system; fatigue meters; ice-detection, etc.; power-plant; auxiliary power units; starter pods; oil systems; emergency and survival equipment with locations and working instructions; cabin accommodation; galleys; warning lights; all of which should be covered in the following way:

a) Description, consisting of location of main components in diagrammatic or table form; technical description of the system or installation; system and component functioning; controls, indicators and instruments, and power (electric, hydraulic and/or pneumatic) supplies in diagrams or table form (structural information should be given only where necessary for clarity);

b) Management, consisting of normal conditions before flight, in flight and after flight, and abnormal conditions (i.e. malfunctioning and abnormal external conditions which do not constitute an emergency (see paragraph 3.13));

c) Ground Servicing, consisting of items of system ground servicing that the crew may be required to supervise or carry out in the event of a stop where full servicing facilities are not available; location of system ground servicing points in diagram form, and system replenishing and off-loading.

3.11 **Limitations.** As prescribed in the Flight Manual.

3.12 **Handling Procedures.** General handling techniques applicable to all procedures; departure, starting, taxying and take-off; flight handling, normal climb and cruise and flight in adverse weather, arrival, descent, field approach and landing; abnormal conditions, feathering, unfeathering, re-lighting, assymetric flight, auto-rotation, etc., crew training, procedures outside normal operation but necessary for crew training; and ground handling, ground running and testing, ground manoeuvring, parking and mooring.

NOTE: Standard procedures, such as holding patterns and VOR procedures, which are considered to be part of basic piloting knowledge, may be omitted, except for those items of equipment which introduce new concepts.

3.13 **Emergencies.** Essential operating procedures for emergency conditions (but excluding abnormal conditions (see paragraph 3.12)). An emergency in this context is defined as a foreseeable but unusual situation in which immediate and precise action will substantially reduce the risk of a catastrophe; those steps in which immediate action is essential to safety shall be distinguished from the steps which are taken subsequently.

3.14 **Check Lists.** Crew check lists with transit checks where applicable.

3.15 **Flight Planning Data.** Example calculations and flight plans, performance, fuel and oil consumption, etc.

3.16 **Loading and CG Data.** Definitions, data, example calculations and typical loading examples and instructions for using the Weight and Centre-of-Gravity Schedule (Chapter B7–10) for all reasonable combinations of loading. In the case of aircraft in

which provision is made for the carriage of freight, floor loading limitations and adequate information to enable the Operator to position and secure freight.

4 Review and Amendment of Manuals

4.1 The aircraft Type Design Organisation shall review certified manuals at periods not exceeding six months and where changes have been made by them, permanent revisions or amendments shall be published.

4.1.1 The certification of permanent revisions or amendments shall be as follows:

This permanent revision/amendment complies with British Civil Airworthiness Requirements, Section B, Chapter B7–3.

Signed .....

Date .....

CAA Approval No. .....

Two copies of each revision or amendment shall be forwarded to the CAA.

4.2 Essential information, which has to be issued in the shortest possible time, may be published by a serialised system of temporary revisions or amendments which shall be certified and printed on pages readily distinguishable from ordinary pages, and subsequently embodied in the permanent revision or amendment procedure.

4.2.1 The certification of temporary revisions or amendments shall be as follows:

This temporary revision/amendment complies with British Civil Airworthiness Requirements, Section B, Chapter B7–3.

Signed .....

Date .....

CAA Approval No. .....

4.3 The details of the system and the manner in which amendments are to be incorporated and recorded shall be adequately explained.

4.4 Permanent revisions or amendments or temporary revisions or amendments shall be distributed by the Type Design Organisation to holders of the manual, together with the necessary instructions for embodiment and recording in the manual. Each manual shall contain a statement which will indicate that the changing of data by uncertified revisions or amendments or temporary revisions invalidates the initial certification of the manual relative to the part revised. The statement shall appear on the revision or amendment sheet in the following form:

The introduction of data by revision or amendments or temporary revisions or amendments not certified in accordance with British Civil Airworthiness Requirements, Section B, Chapter B7–3 will invalidate the initial certification on the title page of the manual relative to the part revised. Revisions or amendments, or temporary revisions or amendments embodied in this manual which have been certified by an appropriately Approved Organisation, other than that applicable to the initial certification, must be recorded on separate record sheets.

4.5 Operators with appropriate approval may amend manuals without reference to the Type Design Organisation, provided that the technical substance of the change is within the terms of their approval. In this case the Operator shall proceed as follows:

a) Prepare a temporary or permanent revision or amendment in compliance with this Chapter;

b) Provide the CAA with a copy;

c) Incorporate the revision or amendment in the manuals and record the embodiment in a revision or amendment record, which is separate from that provided by the Type Design Organisation.

NOTE: Where Operators wish to amend manuals, co-operation with the Type Design Organisation is recommended. This also applies where amendments to manuals are necessary due to the incorporation of Minor modifications under the Form AD 261 procedure (see Chapter B2–5).

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Chapter B7-4 Maintenance, Overhaul and Repair Manuals

1 Introduction

Manuals containing information and recommendations necessary for the maintenance, overhaul and repair of aircraft, including engines and auxiliary power units, propellers, components, accessories, equipment, instruments, electrical and radio apparatus and their associated systems, and radio station fixed fittings, shall be provided by the manufacturer as required by Chapter B5–3. This Chapter B7–4 is to provide guidance in the compilation of such Manuals.

2 Aircraft Maintenance Manual

This should include the information described in paragraphs 2.1 to 2.11.

2.1 **Introduction.** A brief survey of the aircraft features and data of general interest.

2.2 **Description.** The construction of the aircraft including its control surfaces, landing gear, flying control systems and all other systems, e.g. hydraulic, pneumatic, vacuum and de-icing; all installations, e.g. engine, auxiliary power unit, propeller, instrument, electrical, and radio station fixed fittings and all equipment installations, e.g. lifebelts, dinghies, fire detection and prevention. Where necessary, the purpose of individual parts should be described.

2.3 **Operation**. The method whereby the components, systems and installations achieve their designed purpose.

2.4 **Control.** The method of operating the components, systems and installations together with any special procedures and limitations.

2.5 **Servicing.** Details regarding servicing points, capacities of tanks, reservoirs, etc., types of fluid to be used, with details of any anti-corrosive measures to be taken, pressures applicable to the various systems, position of access or inspection panels, walkways and drain locations, lubrication points and the lubricants to be used. Details of servicing equipment, ground handling details such as taxying, towing, parking, mooring, jacking and levelling, and loading data including loading limitations. Details of ground de-icing fluids and other fluids where contamination could cause a dangerous deterioration in airworthiness.

NOTE: Suitable de-icing and cleaning fluids which are approved for use by the aircraft manufacturer may be listed, together with information concerning the means to counteract any detrimental action which might result from their use.

2.5.1 Procedures for the ground de-icing and anti-icing of aircraft should be included in the Maintenance Manual or in a separate document referred to in the Maintenance Manual.

2.6 **Maintenance**

2.6.1 **Schedule.** The recommended periods at which each part of the aircraft, engine, auxiliary power units, propellers, the accessories, instruments and equipment, should be cleaned, inspected, adjusted, tested and lubricated, and the degree of inspection recommended at the periods quoted. The recommended periods at which components and accessories should be overhauled, the Mandatory Life Limitations identified in Chapter B5–3, paragraph 3, and a cross-reference to the section of the Overhaul Manual which lists the Mandatory Life Limitations of engine or propeller

parts. A procedure for converting flying hours or landings, as applicable, into life units (e.g. cycles) together with the assumptions made with regard to the "typical cycle" on which the lives are based.

2.6.2 **Procedures.** The methods to be used for implementing the recommended schedule, e.g. methods of access to specified parts, methods of inspection, including those of carrying out duplicate inspections of vital points control systems (see Chapter B5–3).

2.6.3 **Faults and Rectification.** The faults which may arise during service or those which may be found as a result of inspection, together with suggested causes and recommended methods of rectification.

2.6.4 **Adjustments and Testing.** The methods of completing the adjustments or tests which may be required during service or to correct faults, e.g. control movements with permissible tolerances.

2.7 **Removal and Assembly.** The order and method of removing and refitting components and accessories, together with details of any special precautions to be observed.

2.8 **Line Repairs.** Repairs of a temporary or minor nature which, in the opinion of the manufacturer, could be applied to the aircraft whilst remote from suitable facilities.

2.9 **General Procedures.** The method of applying general procedures such as system testing during ground running, checks after a heavy landing, change of role, symmetry checks, weighing and determination of centre-of-gravity and salvage considerations, such as lifting and shoring.

2.10 Details of crating and unpacking of components, as considered necessary; conditions of storage, with recommended limiting periods, and component dimensions and weights.

2.11 **Compliance.** The manner of complying with the above should be such that it is primarily directed to those persons who will be responsible for maintaining a complete aircraft in a state of airworthiness.

NOTE: The aircraft Maintenance Manual should not contain data relating to the complete overhaul of a component.

3 Aircraft Overhaul Manual

This should include the information described in paragraphs 3.1 to 3.5.

3.1 **Aircraft Structures and Control Surfaces**. The extent of overhaul data for structures including control surfaces should be such as to ensure that owners and Operators are made aware at an early stage of the recommended standard of overhaul required initially to ensure the continued airworthiness of the structures including control surfaces over a stated period of hours flying and/or elapsed calendar time, or at the termination of a specified number of flights and/or landings. Subsequent amendments should be made as necessary to acquaint owners and Operators of the latest findings or experience so that the manual reflects current knowledge of the aircraft thereby enabling increases or decreases, as appropriate, to be made in the recommended periods.

3.2 **Integrity of Structures.** Information, as detailed below, should be provided initially for the main aircraft structures.

3.2.1 Illustrations which show clearly the construction of the structures, with descriptive text to clarify the illustrations and draw attention to those parts which require detailed attention during overhaul.

3.2.2 Diagrams showing those parts of the structure to which access cannot be gained through the normal inspection doors and panels, the diagrams being supplemented by a table defining the limits of inaccessibility.

3.2.3 Diagrams showing structures classified as primary and secondary.

3.2.4 Table showing the recommended limiting periods at which designated parts of the structure should be overhauled in compliance with the standards given in the following paragraphs.

3.2.5 Information giving the methods and the extent of dismantling necessary to gain access to normally inaccessible structure, e.g. whether by removal of skin, by provision of additional panels, removal of fuel tanks, etc., and detailing any special opportunities of gaining access to normally inaccessible structure, e.g. during any component change programme.

3.2.6 A tabulated schedule of overhaul, relating to paragraphs 3.2.2 and 3.2.4, which defines the overhaul work and inspections and tests necessary after the normally inaccessible structure has been reached, and the method of implementing the schedule.

3.2.7 Details on the application of special inspection techniques, e.g. radiographic and ultrasonic testing, with a proven technique of examination where such processes are required. The limitations of such processes and limits of their applicability should be clearly defined. Any special techniques necessary for proving the serviceability of castings, forgings, tubular members, etc., should be given.

3.2.8 Details of the protective treatment to be used to restore the original standard of protection, the final inspection of the structure or control surfaces, and the methods of closing structure which has been opened.

3.2.9 Details regarding the correlation of the bolt/joint overhaul programme (see paragraph 3.3.1) with the prescribed sampling programme, and the necessity to overhaul accessories and equipment in normally inaccessible structure at the structure overhaul periods.

3.3 Integrity of Attachments and Joint Assemblies

3.3.1 Diagrams showing the positions of bolt and stud holes in spar booms and other primary structure, and in such secondary structure where, if failure occurs the associated primary structure may be affected. The diagrams should be annotated or marked to show the bolt or stud holes which are accessible and those normally inaccessible; the size of the holes and whether bushed; the materials forming the mating surfaces; fits and clearances and dimensional limits and a reference to identify the holes.

3.3.2 Using the reference identifying the holes, tables giving the total number of holes, recommended number of bolts or studs to be withdrawn from each group for Operators having fleets of 2, 5, 10 and 20 aircraft, recommended number of bushes to be withdrawn, and recommended number of hours flying, flights, landings and/or the elapsed time at which bolts, studs or bushes should be withdrawn, having regard to the possibility of fatigue, fretting and corrosion.

NOTE: Where an arrangement has been made between Operators by the manufacturers for a shared programme of bolt and hole sampling, it is recommended that details of the programme be provided in Service Bulletins, etc.

3.3.3 Details of the methods and extent of dismantling necessary to gain access to the nominated bolts or studs where this differs from paragraph 3.2.5.

3.3.4 Details of the precautions necessary during the removal of bolts or studs, special tools or equipment necessary, the recommended inspection and crack detection procedure, e.g. penetrant or fluorescent dyes, special optical instruments, etc., salvage methods and limitations, schedule of oversize bolts, studs, and bushes available, protective treatment, methods of re-assembly and locking, including torque loading data, and details of recording schemes to identify the bolts, studs or holes examined.

3.4 **Mandatory Life Limitations.** A Schedule detailing those parts of the aircraft and the aircraft structure which are to be replaced by new parts and the mandatory periods of renewal.

3.5 **Aircraft Systems.** Details of recommended overhaul practices of aircraft systems such as flying controls, hydraulic and electrical installations.

4 Aircraft Repair Manual

4.1 This manual should be confined to a description of the repairs applicable to the aircraft structure and components, and to those parts of the systems and installations which are the design responsibility of the aircraft manufacturer, and should include the information described in paragraphs 4.2 to 4.11.

4.2 **Introduction.** General notes on the contents and usage of the manual.

4.3 **General Information.** Details of recommended repair procedures and practices which have a general application, with diagrams showing:

a) structures classified as primary and secondary with areas or parts where repairs are not permissible clearly defined;

b) the construction of main structures and components with station positions which define the extent of skin panels, and the construction of primary longitudinals, frames, stringers and ribs, with details of the dimensions and materials used;

c) tables of standard and special extruded sections with, where applicable, approved alternatives;

d) tables of fasteners for each part of the structure, with information on the areas where oversize fasteners may be used.

4.3.1 Details of process specifications, heat treatment procedures, protective treatment requirements, precautions necessary during repairs, e.g. damage by drilling into hidden structures and building in assembly stresses, details of special processes such as metal-to-metal bonding, welding, sealing of pressurised structures, etc.

4.4 **Preparation for Repair.** Details of, for example, the inspection necessary before repair, damage assessment standards, methods of supporting the structure, alignment and geometry checks, material allowance for dressing of damage, and limits of wear.

4.5 **Tools and Equipment.** A list of tools and equipment necessary for applying repairs, with details of their purpose and method of use.

4.6 **Temporary Repairs.** Details of repairs of a temporary nature which would permit the aircraft to return to base for a permanent repair.

4.7 **Standard Repairs.** Details of repairs which can, within defined limits, be applied as applicable, to various structures, systems and installations.

4.8 **Minor Repairs.** Details of permanent repairs which apply only to specified parts of the structure or particular components. Each part of the aircraft structure, its systems and installations should be considered, the sub-divisions of this section following the same sequence as that used in the Maintenance Manual. Only minor repairs, which do not require extensive dismantling or the use of special jigs or equipment, should be included.

4.9 **Major Repairs.** Details of permanent repairs which would normally only be completed at the main base, e.g. those which would require the use of special jigs and equipment.

4.10 **Checking and Testing after Repair.** Details of those checks or tests necessary after repair, e.g. structure alignment checks, adjustment of control surface balance and fuselage pressure testing.

4.11 **General.** The repair schemes specified in paragraphs 4.6 to 4.9 should, as far as possible, be diagrammatically presented with the text adjacent, giving details of negligible damage, the limits of repairable damage, the applicability of the particular repair and the procedure involved in its embodiment.

5 Engine and Auxiliary Power Unit Manuals

Engine and Auxiliary Power Unit Manuals should contain the following descriptive, servicing, maintenance and overhaul data relating to the engine, and similar data relating to those components and accessories either on the engine or in the power unit, in respect of which an application for design approval has been made by the engine manufacturer. Such data should conform to the recommendations of paragraph 7.

5.1 Engine and Auxiliary Power Unit Maintenance Manuals

5.1.1 **Introduction.** A brief description of the engine and engine systems.

5.1.2 **Description.** A detailed description of the construction of the engine, including the systems and, where necessary, the purpose of the individual parts. For modular engines, details of the division of the engine into modules (see JAR–E Section C, Chapter C1–2 for definition) giving the nomenclature and clearly defining the boundaries for each module.

5.1.3 **Operation.** The method whereby the components, systems and installations achieve their design purpose.

5.1.4 **Installation.** Methods of uncrating, acceptance checking, de-inhibiting, lifting, and installing an engine into a power unit, the method of attaching accessories to an engine or power unit, and the checks necessary after such installation.

5.1.5 **Control.** Methods of starting, running, testing and stopping the engine and its components, systems and installations, with any special procedures and limitations.

5.1.6 **Servicing.** Details regarding servicing procedures, capacities of tanks, reservoirs, etc., types of fluid to be used, and the draining of collector tanks.

5.1.7 **Maintenance**

a) **Schedule and Procedures.** Compliance with the recommendations in paragraphs 2.6.1 and 2.6.2.

b) **Faults and Rectification.** Compliance with the recommendations in paragraph 2.6.3, together with inspections necessary after abnormal circumstances, such as

shock loading, sudden stoppage, excessive out of balance, fire, over-speed, over-temperature, or any other excursions outside approved limitations.

c) **Adjustments, Component Removals and Testing.** The method of completing those adjustments, tests or removal of components, e.g. cylinders or combustion chambers, which may be required during service or to correct faults.

d) **Modular Engines.** In respect of modular engines, in addition to a), b) and c):

i) In carrying out a module change, the means of checking the serviceability of the other modules fitted to the engine (e.g. establishing that they have not been adversely affected by blade damage, oil contamination, internal air system contamination);

ii) The compatible modification standards for the interchange of modules;

iii) Details of the methods, tests and equipment by means of which adequate engine performance, functioning and mechanical integrity (e.g. freedom from leaks, oil consumption, oil pressure, run down time) may be established following a module change on an installed engine.

5.1.8 **Removal.** The order and method of removing the engine from a power unit, and the removal of accessories from either the engine or the power unit, with the methods of engine lifting, inhibiting and crating for return to manufacturer or base.

5.1.9 **Tools and Equipment.** Tools and equipment necessary for maintenance with details of their purpose and method of use.

5.1.10 **Mandatory Life Limitations.** A procedure for converting flying hours, or landings, as applicable, into life units (e.g. cycles) together with the assumptions made with regard to the "typical cycle" on which the lives are based.

5.2 **Engine and Auxiliary Power Unit Overhaul Manuals**

5.2.1 **Tools and Equipment.** Tools and equipment necessary for overhaul and testing, with details of their purpose and method of use.

5.2.2 **Dismantling.** The order and method of dismantling for overhaul.

5.2.3 **Cleaning and Inspection.** The materials, equipment and methods to be used for cleaning. The materials and equipment to be used, and the standards and methods of inspection to be applied, during overhaul, and also after abnormal circumstances such as shock loading, sudden stoppage, excessive out of balance, fire, over-speed, over-temperature or any other excursions outside approved limitations.

5.2.4 **Fits and Clearances.** Details of all relevant fits and clearances.

5.2.5 **Repair and Salvage Schemes.** Details of all applicable repair and salvage schemes.

5.2.6 **Re-assembly.** Description of the order and method of assembly at overhaul.

5.2.7 **Testing.** Details of the standards to be observed, the method of completing tests, and a list of faults which may occur during testing, together with possible causes and methods of rectification.

5.2.8 **Storage Conditions and Limiting Period.** Details of the conditions of storage and the recommended limiting storage periods.

5.2.9 **Mandatory Life Limitations.** A list of the relevant parts, with details of the Mandatory Life Limitations, with a cross reference to the Maintenance Manual for the procedure for converting flying hours or landings, as applicable, into life units (e.g. cycles) together with the assumptions made with regard to the "typical cycle" on which the lives are based.

6 Propeller Manuals

Propeller manuals should contain descriptive, servicing maintenance and overhaul data relating to the propeller and similar data relating to those accessories concerned with the functioning and control of the propeller in respect of which an application for design approval has been made, as outlined in paragraphs 6.1 and 6.2; such accessory data should conform to the recommendations of paragraph 7.

6.1 **Propeller Maintenance Manual**

6.1.1 **Introduction.** A brief description of the propeller and propeller systems.

6.1.2 **Description.** A detailed description of the construction of the propeller.

6.1.3 **Operation.** The method whereby the propeller and the propeller systems achieve their designed purpose.

6.1.4 **Installation.** The method of uncrating, acceptance checking, lifting and installing the propeller.

6.1.5 **Control.** The method of checking the operation of the propeller during engine running, with details of any special procedures and limitations.

6.1.6 **Maintenance**

a) **Schedule and Procedures.** Compliance with the recommendations in paragraphs 2.6.1 and 2.6.2.

b) **Faults and Rectification.** Compliance with the recommendations in paragraph 2.6.3.

c) **Adjustments.** The methods of completing those adjustments which are necessary during service or to correct faults.

6.1.7 **Removal.** The order and method of removing the propeller from the engine.

6.1.8 **Mandatory Life Limitations.** A procedure for converting flying hours or landings, as applicable, into life units (e.g. cycles) together with the assumptions made with regard to the "typical cycle" on which the lives are based.

6.2 **Propeller Overhaul Manual.** Compliance to the standards recommended in paragraph 5.2.

7 Accessory, Instrument and Electrical Equipment Manuals

Separate manuals should normally be provided by the accessory, instrument or equipment manufacturer for a) Maintenance and b) Overhaul, the manuals containing data which conforms to the standard indicated by the subjects detailed below, where applicable.

7.1 **Maintenance Manuals**

7.1.1 **Description, Operation and Data**

Description
Operation
Data

7.1.2 **Unpacking**

7.1.3 **Acceptance Checks**

7.1.4 **Storage Instructions**

Conditions
Limiting Periods (recommended)

7.1.5 **Checks/Tests Before Installation**

7.1.6 **Installation**

7.1.7 **Checks/Tests After Installation**

7.1.8 **Operation Instructions**

7.1.9 **Maintenance Schedule.** To include recommendations in respect of overhaul periods and/or Mandatory Life Limitations, as appropriate.

NOTE: In certain circumstances life limitations may become mandatory; in such cases these must be indicated.

7.1.10 **Trouble Shooting Procedures**

7.1.11 **Removal**

7.1.12 **Bench Checks**

7.1.13 **Return to Manufacturer or Base**

7.2 **Overhaul Manuals**

7.2.1 **Description, Operation and Data**

Description
Operation
Data

7.2.2 **Disassembly.** To include any checks or tests considered necessary before disassembly, and a list of items which are to be discarded and replaced by new parts at overhaul.

7.2.3 **Cleaning**

7.2.4 **Inspection/Check**

7.2.5 **Repair**

7.2.6 **Assembly**

7.2.7 **Fits and Clearances**

7.2.8 **Testing**

7.2.9 **Trouble Shooting Procedures**

7.2.10 **Storage Instructions**

Conditions
Limiting Periods (recommended)

7.2.11 **Special Tools, Fixtures and Equipment**

8 Replacement Parts

8.1 Unless Manuals include detailed part identification of all replacement parts appropriate to the work described in the Manual, a statement should be included in each appropriate Manual specifying the documents which identify these parts.

8.1.1 Each Manual should also contain a statement that all replacement parts must be either those parts detailed in the manufacturers' publications or documents, or approved alternative parts.

Appendix 1 to B7-4

Automatic Test Equipment Software

1 Introduction

1.1 The requirements of this Appendix are applicable to any Automatic Test Equipment (ATE) Software, which is essential to the use of ATE in testing a specific airborne equipment, where the ATE Software is provided as an alternative to, or in place of, conventional test procedures in Maintenance, Overhaul or Repair Manuals. The requirements do not apply to either ATE Software used by a manufacturer as part of the process leading to certification of a new product or test equipment which is an integral part of airborne equipment (built-in test equipment – BITE).

2 Definitions

2.1 **ATE Software Design Control Authority.** The ATE Software Design Control Authority is the original producer of ATE software or, if the software has been revised, the organisation certifying the revisions.

2.2 **Data Processing Terms.** The terms used in this Appendix are in accordance with British Standard BS 3527, Glossary of Terms used in Data Processing.

3 General

3.1 Except as otherwise agreed by the CAA, software produced in accordance with this Appendix shall be certified and published under the authority of an appropriately approved Organisation and shall relate accurately to the design and production standard of both the specific airborne equipment to be tested and the ATE itself. In particular, programs shall be allocated a coding or part number which can be directly related to the build standards of both the ATE and the unit under test (UUT). Failing adequate protection being provided within the ATE, object program content shall include protection against unauthorised editing.

3.2 The CAA reserves the right to require the re-assessment of the content of any certified software and to require the embodiment of any revision or amendment which is considered necessary to satisfy the requirements of 3, 4, 5, and 6.

3.3 Software, produced by an Approved Organisation, must be associated with a statement that it complies with the requirements of this Appendix.

3.4 Software, when used with the automatic test equipment to which it relates, shall be such as to ensure that all specified tests of the specific airborne equipment are either completed satisfactorily or result in an unambiguous indication to the contrary.

3.5 The certification shall be worded as follows and must appear on the relevant record sheet:

The software identified ..... complies with BCAR Section B Chapter B7–4, Appendix No. 1.

Signed .....

Date .....

CAA Approval No. .....

NOTE: The above certification does not apply to revisions or amendments made by other Approved Organisations after the date of initial certification. Revisions or amendments made by other Approved Organisations must each be separately certified. Suitable records shall be maintained of all revisions or amendments (whether temporary or permanent) to ATE software.

The following information is for guidance in preparing Automatic Test Equipment (ATE) software to comply with the requirements of this Appendix. It is biased towards systems which are computer controlled but the principle can also be applied to sequential tape controlled equipment.

4 Software Related to the Testing of Specific Airborne Equipment

4.1 The software should normally consist of three main parts, together with associated record and control documentation, as follows:

a) A test specification in plain English or the Abbreviated Test Language for Avionic Systems (ATLAS) which will normally be that contained in the Overhaul Manual for the airborne equipment under test;

b) A test sequence in a test program format suitable for the particular automatic test equipment (SOURCE PROGRAM);

c) A test sequence in the media (e.g. magnetic disc, tape) used to control the particular automatic test equipment (OBJECT PROGRAM).

4.2 Each of the above parts should separately be subject to issue control and modification procedure.

4.3 Programs should be specified in a manner which satisfies the requirements of 2.1 a), having due regard to the characteristics of the equipment under test and taking account of the inherent limitations of the automatic test equipment. Particular attention should be paid to ensure that programs do not lead to circumstances which induce incipient damage into the equipment under test.

4.4 All programs should be fully debugged and validated prior to certification.

5 Software Related to Specific Automatic Test Equipment

5.1 All software, e.g. assemblers, compilers, self test programs, should be fully documented, debugged and validated prior to certification.

6 Review and Amendment of Software

6.1 Certified software shall be reviewed by the ATE software design control authority at periods not exceeding six months and where changes have been made affecting the validity of the software, permanent revisions or amendments shall be published.

6.1.1 The certification of permanent revisions or amendments shall be as follows:

STATEMENT OF REVISION/AMENDMENT

Software Identification .....

This permanent revision/amendment complies with British Civil Airworthiness Requirements, Section B, Chapter B7–4.

Signed .....

Date .....

CAA Approval No. .....

6.2 Operators with appropriate approval may amend ATE software without reference to the originating ATE software design control authority, provided that the amendment of ATE software is within the terms of their CAA Approval. However, co-operation with the appropriate airborne equipment manufacturer should normally be undertaken in order to ensure that ATE software adequately meets the test requirement of the UUT. Any Operator undertaking amendment of ATE software shall proceed as follows:

a) Prepare a revision or amendment in compliance with this Chapter B7–4;

b) Incorporate the revision or amendment in the program and retain an appropriate record of the details of the amendment. The record can be in any convenient form, e.g. log book, record sheets or retention of pre-revision tapes for comparison.

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Chapter B7-5 Approval of Maintenance Programmes & Schedules

1 Introduction

1.1 **Applicability.** The requirements of this Chapter B7–5 are applicable to Maintenance Schedules and Maintenance Programmes (hereinafter referred to as the "Schedule" and the "Programme") submitted for Approval as required by the Air Navigation Order (Maintenance Schedule) or JAR OPS 1/3 (Maintenance Programme).

1.2 **Purpose.** This Chapter B7–5 provides an applicant intending to gain CAA Approval of a Schedule or Programme, or amendments thereto, with:

i) procedures to follow when seeking to gain CAA Approval of a Schedule or Programme.

ii) procedures for the control and approval of amendments to Schedules or Programmes.

1.3 **Approval.** When satisfied with the content of the Schedule or Programme, the CAA will signify this approval by issuing a CAA Approval Document AD 271 to the applicant.

NOTES: 1) It is not intended that the Type Certificate (TC) Holder should also submit the maintenance inspection programme required by B5–3 or the JAR 25/23 codes for Approval in accordance with this procedure. B6–2 lists the minimum content of the Schedule or Programme and a TC Holder may use that list as guidance for the acceptable content of the Scheduled Inspection Programme submitted as part of the Type Certification procedure. Such Programmes are not specifically approved by the CAA, but they are accepted when considered satisfactory by the Authority issuing the Type Certificate as part of the procedure leading to the issue of the Type Certificate (or Certificate of Airworthiness when required).

2) The content of a Programme submitted to comply with JAR OPS 1/3 will be found in JAR OPS 1/3, Appendix 1 to AMC OPS 1.910(a) & (b).

2 Maintenance Schedule Approval Procedures

2.1 Procedure 1 – Maintenance Schedule Approval (non–JAR OPS)

2.1.1 To comply with the Air Navigation Order, aircraft with a Certificate of Airworthiness in the Transport Category (Passenger), Transport Category (Cargo), Aerial Work, or Private Category, the Applicant shall submit for approval a Maintenance Schedule and, where applicable, all of the associated procedures intended to ensure that the airworthiness of the aircraft will be preserved on a continuing basis. These procedures shall, as a minimum, ensure a review of the effectiveness of the Schedule on a continuing basis. Schedules shall be submitted and approved in accordance with this paragraph 2.1.

2.1.2 Normally the CAA expects that all Schedules will be based upon the TC Holder's recommendations. The Schedule may use the traditional processes of inspection, servicing, and replacement/overhaul at stated periods, or such processes may be

combined with other processess which permit the adjustment of the work content and periods in accordance with information derived from the operation and maintenance of the aircraft concerned.

2.1.3 Notwithstanding 2.1.2 it may be possible for the Operator to develop or escalate the TC Holder's Programme in accordance with procedures Approved by the CAA (see 3.1 below).

NOTE: Where it is proposed that such maintenance processes be monitored by a statistical reliability procedure of a condition monitored, (see CAP 418 Condition Monitoring Maintenance: an Explanatory Handbook) or reliability centred Maintenance Programme, such a procedure will need the approval of the CAA, and will be deemed part of the Schedule (see B6–2 Appendix).

2.1.4 Where Maintenance Review Board (MRB) procedures are applicable to the Type Certification of a particular type, then these procedures will be applied as stated in B5–2 or JAR–145 as applicable. (See Note 1).

NOTES: 1) Guidance on the MRB report content and on MRB procedures are contained in B5–2 and JAA Administrative and Guidance Material Section 2 Part 2 Chapter 16 as appropriate.

2) Where TC Holder's maintenance planning data developed from an MRB is used, this should be clearly identified in the schedule.

3) Certification Maintenance Requirements (CMR) may arise as a result of the System Safety Assessment necessary for compliance with JAR (FAR) 25.1309. The associated tasks should be clearly identified as being separate from MRB tasks. (See also paragraph 3.1.4).

2.1.5 **Application.** Application for approval of the Schedule shall be made in the first instance to the CAA Safety Regulation Group, Applications and Certification Section, Aviation House, Gatwick Airport South, West Sussex, RH6 OYR, using CAA form AD981B. A CAA Maintenance Schedule Approval Reference number will be allocated by the CAA and the applicant will be advised of the CAA Safety Regulation Group Regional Office responsible for the investigation and grant of approval of the Maintenance Schedule. Amendments to Schedules shall be submitted directly to the Regional Office responsible for the approval of the Schedule. Two copies each of the Schedule or amendment, and any other documents or procedures, required in a particular case, shall be forwarded by the applicant to the CAA Safety Regulation Group (SRG) Regional Office as advised.

2.1.6 For aircraft with a Certificate of Airworthiness in the Transport (Passenger or Cargo) category operated for the purpose of Public Transport, prior to the implementation date of JAR–OPS, or an aircraft with a Certificate of Airworthiness in the Aerial work category, the Operator shall complete and submit a copy of Standard Maintenance Practice (SMP) 9 (see CAP 562, CAAIP Part 14) along with the Schedule to the CAA SRG Regional Office as advised.

2.1.7 For aircraft with a Certificate of Airworthiness in the Transport (Passenger or Cargo) or Private category, not used for the purpose of Commercial Air Transport, the Operator shall complete and submit a copy of SMP 19 (see CAP 562, CAAIP Part.14) together with a copy of the applicable Type Certificate Holder's recommended maintenance scheduling data, to the advised CAA SRG Regional Office, for approval. If the applicant chooses to submit a Schedule that is an alternative to that recommended by the TC Holder, then the applicant must demonstrate that the proposed alternative will result in an equivalent level of safety. This alternative may result in a detailed assessment by the CAA.

NOTE: An applicant wishing to make an application for the approval of a Maintenance Schedule in accordance with paragraph 2.1.7 alternative to that recommended by the TC Holder, shall pay a charge for assessment and approval.

2.1.8 The applicant shall nominate a person (keeper or controller) who shall be responsible for the upkeep or control of the Schedule, including ensuring that the Schedule is suitably amended where applicable following the regular review (see also CAP 360, Part 2 Chapter 4 paragraph 2.2).

2.2 Procedure 2 - Maintenance Programme Approval (JAR–OPS)

2.2.1 For aircraft operated for the purpose of Commercial Air Transport in accordance with JAR–OPS, the applicant shall submit for approval a Programme in accordance with JAR–OPS Subpart M, and complete SMP 20 or SMP 21 as applicable (see CAP 562, CAAIP Part 14). Programmes shall be submitted for approval in accordance with this paragraph 2.2.

2.2.2 Application for approval of the Programme shall be made using CAA Form AD981A addressed to CAA SRG Applications and Certification Section, 1E Aviation House, Gatwick Airport South, West Sussex, RH6 0YR. The CAA will allocate a Maintenance Programme Approval reference number and advise the applicant of the CAA SRG Regional Office responsible for the approval of the Programme. Two copies of the Programme (or amendment), together with any applicable substantiating data shall be submitted by the applicant to the CAA SRG Regional Office as advised.

2.2.3 The applicant shall nominate a person (keeper or controller) who shall be responsible for the upkeep or control of the Programme including ensuring that the Programme is suitably amended where applicable following the regular review (see also JAR–OPS AMC OPS 1.910(b) 3.2).

3 General

3.1 Amendments to Approved Schedules and Programmes

3.1.1 Amendments to Approved Schedules or Programmes may only be approved when the CAA is satisfied with the content or when the approval is obtained in accordance with CAA Approved procedures (see paragraph 3.1.2). The data in an Approved Schedule or Programme shall, where appropriate, be amended by the Operator to reflect the embodiment of mandatory and non-mandatory modifications and inspections, the incorporation of manufacturers requirements (bulletins, etc.), and the effects of maintenance experience. Amendments shall not be incorporated without the approval of the CAA, unless an alternative method of approving such amendments has been accepted by the CAA.

3.1.2 An Organisation may be approved to provide reports and certify that the content of a Schedule or Programme amendment complies with the appropriate requirements, when the Organisation complies with the procedures set out in Supplement No. 1 to this Chapter. In such cases the approval of the amendment may take place in accordance with the Organisation's Approved procedures.

3.1.3 Amendments required by the CAA shall be incorporated in the Approved Schedule or Programme.

3.1.4 For aircraft types where CMR tasks are identified as part of the TC process, these tasks are subject to separate procedures for escalation: (JAR–25, AMJ 25–19 should be referred to for guidance).

3.2 **Applicability to Individual Aircraft.** The Schedule or Programme submitted to the CAA for approval, must contain a list of the registration marks of the aircraft intended

to be maintained in accordance with the Schedule or Programme, (see Chapter B6–2 paragraph 3.2 a) or JAR–OPS 1/3.910 AMC, Appendix A paragraph 1.1.1): changes to the list of aircraft constitute an amendment to the Schedule or Programme and as such requires the approval of the CAA. The introduction of aircraft to the Schedule or Programme, will also require an assessment by the applicant, of those (that) aircrafts' maintenance records, to determine what work must be carried out to align the aircraft concerned with the Schedule or Programme. The agreement of the CAA should be sought for the content of this alignment check when such amendments are anticipated.

3.3 **Maintenance Schedule and Maintenance Programme Review Procedures**

3.3.1 The applicant shall submit for approval to the CAA, procedures to ensure that the Schedule or Programme is reviewed for effectiveness on a regular basis (see in particular JAR–OPS Sub Part M, AMC OPS 1/3.910(b), 3.2 and CAP 360 Air Operators Certificate, Part 2: Arrangements for Maintenance Support) with the review carried out, as a minimum, once in every 12 months. When the effectiveness of the Programme or Schedule falls below the established criteria, the Programme or Schedule shall be amended as necessary to take into account the findings of such reviews.

3.3.2 The review procedures may include the Operator's escalation procedures which ensures that the Schedule or Programme is developed to reflect current operating experience and the TC holder's recommendations.

3.3.3 All procedures intended to meet the intent of this paragraph 3.3 shall be submitted to the CAA for approval.

3.4 **Maintenance Task Card and Maintenance Instruction Development Procedures**

3.4.1 The applicant may choose to develop Task Cards or Maintenance Instructions from the Schedule or Programme for ease of interpretation. These Task Cards or Instructions shall be developed using procedures Approved by the CAA. It is important that the content of the Task Cards or Instructions accurately reflects the content of the Approved Schedule/Programme and the content of the aircraft maintenance manual. Task Cards and Maintenance Instructions must be revised to reflect revisions to source documents. There shall be a continuing audit of the effectiveness and applicability of these cards or instructions and the associated development procedures.

3.4.2 Task Cards may additionally be developed by the applicant for non-scheduled or non-routine tasks. The procedures used to develop these non-routine cards shall be submitted for approval in accordance with paragraph 3.4.1 above.

3.4.3 Where Maintenance Tasks or Maintenance Manual procedures are broken down into discrete maintenance steps or maintenance instructions, in particular for complex tasks, then the procedures used to develop these instructions shall be approved in accordance with paragraph 3.4.1 above.

3.4.4 All Task Cards and any associated Maintenance Instructions shall be separately identified and be controlled by a revision identification system. Each task or instruction should clearly cross refer to the relevant Schedule or Programme task or maintenance manual reference as applicable.

3.5 **CAA Requirements.** Schedules or Programmes and all associated airworthiness data, including that data used for the substantiation of escalation programmes (in particular where alternative procedures in accordance with paragraph 3.1.2 above are employed) shall be made available to the CAA upon request.

Supplement 1 to B7-5 Organisation Approval for the Approval of Maintenance Schedule or Programme Amendments

1 Introduction

This Supplement does not replace the applicable operating requirements. This Supplement defines the requirement for applicants wishing to obtain CAA Organisation Approval for the control of Schedule or Programme amendments. Appendix No.1 to this Chapter B7–5 sets out minimum content required when submitting Schedules or Programmes and their associated amendment procedures for approval to the CAA in such cases.

2 Organisation

2.1 The Organisation shall demonstrate to the satisfaction of the CAA that it has competence, and has in place procedures (see paragraph 3 of this Supplement) and record keeping provisions which will enable the Organisation to analyse aircraft reliability, TC Holder's instructions, and other related operating and maintenance criteria, to generate sound and logical proposals for changes to Schedules or Programmes. To this end, the Organisation shall:

a) be the holder of an AOC, or JAR–145 Approval, valid or rated for the type of aircraft for which the Schedule or Programme is intended; and

b) meet the requirement of this Supplement.

2.2 In addition to the respective requirement (JAR–OPS, CAP 360, or JAR–145) the Organisation must satisfy the CAA that it has adequate manpower resources and facilities to enable it to fulfil the intended role in relation to this Supplement.

2.3 A senior person or group of persons acceptable to the CAA, whose responsibilities include ensuring that the Organisation remains in compliance with the requirement shall be nominated.

2.4 A person or persons (Schedule or Programme controller) acceptable to the CAA, whose responsibility includes ensuring that the Schedule(s) or Programme(s) controlled by the Organisation remains in compliance with the applicable requirements, shall be nominated.

2.5 Personnel shall be competent, capable of fulfilling their respective role, and shall be adequately trained to carry out the particular function for which they are responsible. Training shall be given where necessary in the procedures and development of Schedules or Programmes. The personnel should demonstrate a sufficient familiarity with:

a) Reliability Centred Maintenance processes;

b) MSG Analysis and MRB procedures (where applicable to the type);

c) Type Certification requirements;

d) Aircraft or System or component type;

e) Organisation Procedures relating to Schedule or Programme amendment control;

f) Requirements applicable to the control of Schedules or Programmes.

2.6 Records shall be kept such that the Organisation is able to demonstrate that the development of the Schedule or Programme is justified by approved data and in accordance with the approved procedures.

2.7 The Organisation shall be maintained to the standard necessary to undertake the work for which it is approved, and the CAA shall at all reasonable times, have access to the Organisation for the purpose of assessing the standard in use.

2.8 The CAA may revoke, suspend or vary the Terms of Approval if the conditions prescribed for the Approval are not maintained.

3 Maintenance Schedule or Programme Amendment Procedures

Maintenance Schedule and Maintenance Programme amendment procedures are required for compliance with CAP 360 Air Operator Certificate Part 2 Arrangements for Maintenance Support and JAR–OPS 1/3.905 Operator's Maintenance Management Exposition.

3.1 The procedures should contain reliability centred maintenance procedures which comply with B6–2 Appendix 1 and additionally have procedures relating to the Schedule or Programme control which contain the following provisions:

a) Task escalation or adjustment;

b) Maintenance Schedule or Maintenance Programme review;

c) Independent Quality Audit;

d) Service Bulletin or Service Information assessment;

e) Component, equipment and structures in-service performance review;

f) Maintenance Schedule or Maintenance Programme revision;

g) Maintenance procedure effectiveness review and amendment;

h) Manufacturer Maintenance Planning Document review and assessment;

i) Mandatory Airworthiness Directive review and assessment;

j) Operations/maintenance liaison;

k) Sub-contract and supplier evaluation;

l) Training.

3.2 The implementation of such procedures requires the management, assessment and integration of a wide spread of data from a wide range of sources. As a consequence, the Organisation should be able to effectively manage procedures which affect a number of different departments within the Organisation. Such maintenance procedures are sometimes known as maintenance control or maintenance integration procedures.

3.3 The Approved procedures shall make provision for a fully representative committee or group to meet on a regular basis to consider all of the operating and maintenance implications arising from the reviews set out in the above paragraph 3.2 and be able to collectively approve any associated Schedule or Programme amendments arising. Records shall be kept of the meeting and the associated minutes.

3.4 The Organisation shall make provision for the attendance of a representative of the CAA at any meetings held in accordance with 3.3. If, in the opinion of the CAA, the

decisions reached regarding the amendment to the Schedule or Programme are not fully justified by the criteria presented, then the CAA may require that further substantiation is provided before the amendment may be incorporated.

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Appendix 1 to B7-5 Maintenance Schedule and Maintenance Programmes

1 Introduction

In preparing the Maintenance Schedule or Maintenance Programme for initial approval by the CAA, account should be taken of this paragraph. The Schedule or Programme shall be presented in two Parts as follows:

1.1 **Maintenance Schedule or Maintenance Programme – Part 1.** Part 1 shall not be varied or amended without direct CAA Approval (with the exception of item c) the revision record) and should contain the following information:

a) CAA AD 271 Approval Document;

b) Standard Maintenance Practices (SMP) as appropriate, including applicable aircraft registrations;

c) Schedule or Programme Revision Record;

d) Check Cycle criteria (e.g. A Check–400 FH, B Check–800 FH etc.);

e) Certification Maintenance Requirement, Mandatory Life Limits, Mandatory Regulatory Requirements;

f) MRB Safety Route (e.g. route 5 or 8) tasks (if applicable) or equivalent;

g) Reference to the applicable maintenance control procedures or documents;

h) Sampling Programme details or procedures;

i) Schedule or Programme general particulars (see B6–2, 3.2 a)).

1.2 **Maintenance Schedule or Maintenance Programme – Part 2.** This part of the Schedule or Programme is that part which, subject to approved procedures (see B7-5, 3), may be varied by the applicant in accordance with those procedures. CAA approval will be in accordance with an arrangement made by the CAA SRG Regional Office responsible for the approval of the Schedule or Programme and associated procedures. Part 2 may contain the following:

a) Maintenance tasks recommended by the MRB or Manufacturer's maintenance planning guide (excluding those listed in Part 1 above);

b) Operator requirements (e.g. Operator supplemental inspections);

c) Recommended or optional SB/SIL etc;

d) Lubrication Programme (other than Lubrication tasks arising from Part 1, see 1.1);

e) Passenger entertainment and aircraft appearance tasks.

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Chapter B7-6 Minimum Equipment Lists

1 Introduction

The information in this Chapter is for guidance in compiling Minimum Equipment Lists to comply with the requirements of Chapter B6–5.

2 Purpose

2.1 The purpose of the approved Master Minimum Equipment List (MMEL) required by Chapter B5–7 is to provide a Master List of permitted unserviceable equipment and systems for any aircraft of that given type at the time of despatch, which is certificated in the categories referred to in paragraph 2 of Chapter B5–7 and is within the weight limits referred to in that paragraph. Such MMELs will constitute the maximum permissible level of unserviceabilities for affected aircraft of the given type.

2.2 Operators of aircraft to which paragraph 2 of Chapter B5–7 applies can produce their own Minimum Equipment List (MEL) to enable the Permission required by Article 16 of the UK ANO to be granted (see CAP 360 and CAP 549). The MEL shall be no less restrictive than the MMEL.

3 Format - MEL

Unless otherwise determined by the CAA the format of the MEL prepared by an Operator shall comply in general with that of the approved MMEL (Chapter A7-6, paragraph 3) for the particular aircraft type. Variations in the layout used to take account of varying equipment and systems installations, differences due to aircraft variants within a given type and Operators circumstances, experience, capabilities, route structures and practices etc., will be permitted within the overall constraint that an MEL shall be no less restrictive than the corresponding MMEL. (See CAP 360 Part One and CAP 549.)

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Chapter B7-8 Technical Logs

1 Introduction

The Air Navigation Order requires that a Technical Log shall be kept for an aircraft registered in the United Kingdom in respect of which a Certificate of Airworthiness in either the Transport or Aerial Work Categories is in force. The Air Navigation Order further requires that a Technical Log shall contain details of the time the aircraft took off and landed, particulars of defects and any other information affecting the airworthiness or safe operation of the aircraft.

NOTE: In the case of an aircraft not exceeding 2730 kg Maximum Total Weight Authorised which is not operated by a person who is the holder of an Air Operator's Certificate or required to hold such a Certificate, an alternate form of record may be approved by the CAA.

2 Basic Technical Log Requirements

2.1 The Technical Log shall contain the following:

a) A title page with the registered name and address of the Operator, the aircraft type and the full international registration marks of the aircraft;

b) A valid Certificate of Maintenance Review as specified in Chapter B6–2;

c) A Maintenance Statement of the next inspection due to comply with the inspection cycle of the Approved Maintenance Schedule and any out of phase inspection or component change due before that time;

NOTE: CAP 360 Part Two gives an example of a Maintenance Statement which includes the Certificate of Release to Service required by Chapter B6–2 and which would be acceptable to the CAA.

d) A readily identifiable section containing sector record pages. Each page shall be pre-printed with the Operator's name and page serial number and shall make provision for recording the following:

i) The aircraft type and registration mark;

ii) The date and place of take-off and landing;

iii) The times at which the aircraft took off and landed;

iv) Particulars of any defect in any part of the aircraft affecting the airworthiness or safe operation of the aircraft which is known to the Commander or, if no such defect is known to him, an entry to that effect;

v) The date and signature of the Commander following completion of item d) iv);

vi) The arrival fuel state;

vii) A Certificate of Release to Service as required by B6–2 in respect of any work carried out for the rectification of defects. This certificate shall be entered in such a position and manner as to be readily identifiable with the entry of the defect to which it relates;

viii) The quantities of fuel and oil uplifted, and the quantity available in each tank, or combination of tanks, at the beginning of each flight;

ix) The running total of flying hours, such that the hours to the next inspection can be readily determined;

x) Provision for pre-flight and daily inspection signatures;

xi) The times when ground de-icing was started and completed.

NOTES: 1) Where sector record pages are of the multi-sector "part-removable portion" type then such "part-removable portions" shall contain any of the above information necessary plus all relevant data from 3, if applicable, to ensure the safe operation of the aircraft.

2) Examples of sector record pages which would be acceptable to the CAA are shown in CAP 360 Part Two.

e) A readily identifiable section containing acceptable deferred defect record pages. Each page shall be pre-printed with the Operator's name and page serial number and shall make provision for recording the following:

i) A cross reference for each deferred defect such that the original defect can be clearly identified in the sector record page section;

ii) The original date of occurrence of the defect deferred;

iii) Brief details of the defect;

iv) A cross reference for each deferred defect such that the action in respect of such deferred defect can be readily identified on the sector record page.

NOTE: An example of a deferred defect record page which would be acceptable to the CAA is shown in CAP 360 Part Two.

2.2 The format of all sector record pages shall be submitted to the CAA for acceptance, and agreement in respect of the supplementary information required (see 3).

3 Supplementary Technical Log Requirements

3.1 It will be necessary to record additional information for a specified aircraft. The following items are typical of what is required, where appropriate, but the list is not intended to be exhaustive:

a) **Maximum or Intermediate Contingency Power.** It is necessary to record the duration of maximum and intermediate contingency power usage, and subsequently to transfer the information to the engine log book or maintenance record. For rotorcraft the record of each use of these powers must also subsequently be transferred to the log cards or other appropriate documents applicable to those components of the transmission which always transmit the power from a single engine only, i.e. components upstream of any combining gearbox.

b) **Landings.** The number of landings carried out will be necessary for undercarriage component life consideration.

c) **Flight Pressure Cycles.** The number of pressure cycles will be necessary for fuselage life considerations.

3.2 Supplementary information shall be assessed by the Operator and agreed by the CAA.

4 Retention of Records

4.1 All entries in the Technical Log shall be made in duplicate, with provision for one copy of each entry to be removed and retained on the ground before the next flight, except that, in the case of an aeroplane of which the maximum total weight authorised does not exceed 2730 kg, or a helicopter, if it is not reasonably practicable for the copy of the technical log to be kept on the ground it may be carried in the aeroplane or helicopter, as the case may be, in a box approved by the CAA for that purpose. Adequate arrangements shall be made to extract information recorded in the Technical Log for use by the maintenance organisation and component overhaul organisation.

4.2 All entries in the Technical Log shall be retained by the Operator for a period not less than two years after the particular aircraft has been destroyed or permanently withdrawn from service except that the CAA may consider a different retention period in a particular case.

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Chapter B7-9 Modification Record Book

1 Introduction

1.1 The Modification Record Book is a statement of the modification history of the aircraft to which it relates.

1.2 The format of the Book complies with the Recommendations of the European Civil Aviation Conference (5th Plenary Session).

NOTE: Modification Record Books, for United Kingdom registered aircraft, were introduced on 1st January 1969.

1.3 A Modification Record Book must be kept for each aircraft of more than 2730 kg maximum authorised weight, registered in the United Kingdom.

NOTE: The word 'aircraft' used in the context of this Chapter, does not apply to engines and propellers where suitable modification records are maintained in appropriate log books. The Modification Record Book is considered an addition to the aircraft log book.

1.4 Modification Record Books may be purchased from CAA publishers, see inside cover for details.

2 Contents of the Modification Record Book

The following shall be recorded in the Modification Record Book:

a) Modifications made to those parts of the aircraft on which airworthiness depends;

b) Modifications made to the aircraft which affect modifications already listed in the Record Book;

c) Major repairs, which have significantly altered the design affecting the airworthiness of the aircraft.

3 Commencing and Maintaining the Modification Record Book

3.1 **New Aircraft Initially Registered in the United Kingdom.** The applicant for issue of a United Kingdom Certificate of Airworthiness (see Chapter B3–2), shall obtain from the aircraft manufacturer information necessary to comply with the requirements of this Chapter relevant to commencement for these aircraft, by stating the modification embodied, additional to the basic design, at the time of certification.

3.2 **Used Aircraft.** The applicant for the issue of a United Kingdom Certificate of Airworthiness (see Chapter B3–2) for a used aircraft shall be responsible for starting a Modification Record Book at the time of United Kingdom registration, and shall, at that time, record such of the modification history of the aircraft as is considered necessary by the CAA.

3.3 A Modification Record Book which is valid in the exporting country, and supplied with an aircraft to be imported and registered in the United Kingdom, may be acceptable in place of the Modification Record Book required by this Chapter. Such a book shall be certified as accurate and up to date by the competent airworthiness authorities of the exporting country, and shall be acceptable to the CAA in all other particulars.

3.4 The Modification Record Book must be up to date at the issue of the Certificate of Airworthiness for a new aircraft, at the renewal of the Certificate (see B3–4), and at the time of sale or lease of the aircraft.

3.5 The Modification Record Book shall be kept by the owner or Operator of the aircraft, and shall be made available for examination, when required by the CAA.

Chapter B7-10 Weight and Balance Report

Introduction

This Chapter B7–10 contains guidance for compiling weight and balance reports and weight and centre-of-gravity schedules as required by Chapter B5–4

1 Weight and Balance Report – Aircraft Exceeding 5700 kg

1.1 A Weight and Balance Report shall be produced for each Prototype, Variant and Series aircraft the Maximum Weight Authorised of which exceeds 5700 kg.

1.2 The Weight and Balance Report shall record such loading data as is essential to enable the particular aircraft to be correctly loaded, and shall include sufficient information for an Operator to produce written loading instructions in compliance with the requirements of the Air Navigation Order.

1.3 The Weight and Balance Report shall apply to the aircraft in the condition in which it is to be delivered to the user.

1.4 One copy of the Weight and Balance Report shall be sent to the CAA Safety Regulation Group.

1.5 The Weight and Balance Report shall include the following items:

a) Reference number and date;

b) Designation, nationality, and registration marks of the aircraft, or if these are not known, the manufacturer's serial number;

c) A copy of the Weighing Record, produced in accordance with Chapter B5–4, paragraph 3.5;

d) A copy of the Weight and Centre-of-Gravity Schedule including the list of Basic Equipment, if this is separate from Part A of the Schedule (see paragraph 2.7.2);

e) A diagram and a description of the datum points which are used for weighing and loading and an explanation of the relationship of these points to the fuselage frame numbering system or other identifiable points, and, where applicable, to the standard mean chord (SMC);

f) Information on the lever arms appropriate to items of Disposable Load. (This should include the lever arms of fuel, oil and other consumable fluids or substances in the various tanks (including agricultural material in hoppers), which, if necessary, should be shown diagrammatically or graphically; lever arms of passengers in seats appropriate to the various seating layouts; mean lever arms of the various baggage holds or compartments);

g) Details of any significant effect on the aircraft c.g. of any change in configuration, such as retraction of the landing gear.

2 Weight and Centre-of-Gravity Schedule-Aircraft Exceeding 2730 kg (see Chapter B7–10 Appendix No.1)

A Weight and Centre-of-Gravity Schedule shall be provided for each aircraft the Maximum Total Weight Authorised of which exceeds 2730 kg, except that for an aircraft the Maximum Total Weight Authorised of which exceeds 5700 kg the

information contained in Parts B and C of the Schedule may, for a new aircraft, be given as part of the Weight and Balance Report.

NOTES: 1 The Weight and Centre-of-Gravity Schedule may be in the form set down in Chapter B7–10 Appendix No.1, but variations are permitted within the Requirements.

2 Where reference is made in Chapter B7–10 Appendix No.1, to the Flight Manual, but such a document has not been issued, it will be necessary to refer to the Certificate of Airworthiness.

2.1 Each Schedule shall be identified by the aircraft designation, nationality and registration marks, or if these are not known, by the manufacturer's serial number. The date of issue of the Schedule shall be given and the Schedule shall be signed by a representative of an Approved Organisation or a person acceptable to the CAA. A statement shall be included indicating that the Schedule supersedes all previous issues.

2.2 The date and reference number of the Weight and Balance Report, or, as appropriate to the weight, other acceptable information upon which the Schedule is based, shall be given.

NOTE: For aircraft for which a Weight and Balance Report is not mandatory, the Weighing Record would normally be used (see Chapter B5–4, paragraph 3.5).

2.3 A copy of each issue of the Schedule shall be retained by the Operator, and where the Schedule is re-issued the previous issue shall be retained with the aircraft records. A copy of the current Schedule and any related list of Basic Equipment (see paragraph 2.7), shall be sent to the CAA Safety Regulation Group.

2.3.1 For aircraft the Maximum Total Weight Authorised of which does not exceed 5700 kg, a copy of the Schedule shall be included in the Flight Manual, if a Flight Manual is applicable, or if this is not the case, displayed or retained in the aircraft in a suitably identified stowage.

2.4 Operators shall issue a revised Weight and Centre-of-Gravity Schedule when the weight and c.g. is known to have changed to an extent greater than that which has been agreed by the CAA as applicable to a particular aircraft type.

2.5 If the aircraft has not been re-weighed, the revised Weight and Centre-of-Gravity Schedule shall contain a statement that calculations have been based on the last Weight and Balance Report, or other information (see paragraph 2.2), and the known weight and c.g. changes.

2.6 The datum to which the c.g. limits relate is defined in Part A (see paragraph 2.7) and this may be different from the datum defined in the Certificate of Airworthiness or Flight Manual. When a different datum is used it shall be adequately defined, its precise relationship to the datum in the Certificate of Airworthiness or Flight Manual shall be given, and any lever arms and moments which appear in any part of the Schedule shall be consistent with the datum so declared.

NOTE: In the case of helicopters, it may be necessary to present lever arms and moments about more than one axis, depending on the c.g. limits specified in the Flight Manual.

2.7 Part A Basic Weight

The Basic Weight and the associated position of the c.g. of the aircraft as derived from the most recent Weight and Balance Report or other information together with any subsequent weight and c.g. changes, shall be stated. The position (retracted or extended) of the landing gear associated with this information shall be stated.

2.7.1 Where the Maximum Total Weight Authorised does not exceed 5700 kg, Part A shall also include the list of Basic Equipment showing the weight and lever arm of each item, or this information may form separate pages attached to the Weight and Centre-of-Gravity Schedule, with a suitable reference in Part A of the Schedule to this procedure.

2.7.2 Where the Maximum Total Weight Authorised exceeds 5700 kg, Part A shall include the list of Basic Equipment showing the weight, lever arm and moment of each item, or shall make reference to the document in which such a list is included.

2.8 **Part B Variable Load.** The Variable Load may be detailed for as many roles as the Operator wishes, but for every role the weights and moments shall be given. Weights of crew members may be assumed to be not less than the weights shown in the Air Navigation (General) Regulations, provided that the Maximum Total Weight Authorised exceeds 5700 kg, or the aircraft has a total seating capacity for 12 or more persons. Otherwise the weight of each person must be determined by weighing.

2.9 **Part C Loading Information.** This shall include all relevant information so that, knowing the Disposable Load which is intended to be carried, the weight and the position of the centre-of-gravity of the aircraft can be calculated. At least the following shall be given:

a) The lever arm of the c.g. of a passenger in each seat;

b) The mean lever arm of each compartment or area in the aircraft where Disposable Load, such as luggage or freight, may be placed;

c) Any significant change in the c.g. of the aircraft (change in moment) which will result from a change in configuration, such as the retraction and extension of the landing gear;

d) The lever arm of the c.g. of fuel, oil and other consumable fluids or substances in each tank, including any significant variation of the lever arm with the quantity loaded;

e) The maximum total usable capacities of the tanks for fuel, oil and other consumable fluids or substances and the weight of fluids or substances when the tanks are filled to their capacities assuming typical densities.

2.10 A statement shall be made in the Schedule to the effect that it is a requirement of the Air Navigation Order that the commander satisfies himself before take-off that the load is of such weight, and is so distributed and secured, that it may safely be carried on the intended flight.

2.11 The weights, distances, moments and quantities may be given in any units provided that these are used consistently and do not conflict with the markings and placards on the aircraft.

3 Weight and Centre-of-Gravity Schedule-Aircraft Not Exceeding 2730 kg

(see Chapter B7–10 Appendix No.2)

For aircraft the Maximum Total Weight Authorised of which does not exceed 2730 kg, either a Weight and Centre-of-Gravity Schedule which complies with paragraphs 2 and 3.2, or a Loading and Distribution Schedule which complies with paragraph 3.1 shall be provided.

3.1 **Loading and Distribution Schedule** (See Chapter B7–10 Appendix No.2, paragraph 2)

3.1.1 The Loading and Distribution Schedule (hereinafter in this paragraph 3.1 referred to as "the Schedule") shall contain at least the information in Chapter B7–10 Appendix No.2.

3.1.2 Each Schedule shall be identified by the aircraft designation, nationality and registration marks, or if these are not known, by the manufacturer's serial number.

3.1.3 A copy of each issue of the Schedule shall be retained by the Operator, and when the Schedule is re-issued the previous issue shall be retained with the aircraft records. A copy of the current Schedule and any related list of Basic Equipment shall be sent to the CAA Safety Regulation Group.

a) A copy of the Schedule shall be included in the Flight Manual, if a Flight Manual is applicable, or, if this is not the case, the Schedule shall be displayed or retained in the aircraft in a suitably identified stowage.

3.1.4 Operators shall issue a revised Schedule when:

a) the Basic Weight of the aircraft is known to have undergone changes in excess of 0.5% of the Maximum Total Weight Authorised; or

b) the total moment applicable to the Basic Weight is known to have changed to an extent greater than that which has been agreed by the CAA as applicable to a particular aircraft type.

3.1.5 If the aircraft has not been re-weighed the revised Schedule shall contain a statement that calculations have been based on the last Weighing Record and the known weight and moment changes.

3.1.6 Instructions for the use of the Schedule, together with the Loading Graphs, shall be included.

3.1.7 A statement shall be given in the Schedule to the effect that it is a requirement of the Air Navigation Order that the commander satisfies himself before the aircraft takes off that the load is of such a weight, and is so distributed and secured that it may safely be carried on the intended flight.

3.1.8 The weight, distances, moments and quantities may be given in any units provided that these are used consistently and do not conflict with the markings and placards on the aircraft.

3.1.9 **Part A Basic Data.** Part A shall contain the following:

a) The Basic Weight and the associated moment, and c.g. position of the aircraft, as derived from the most recent Weighing Record, together with any subsequent changes;

b) The Maximum Total Weight Authorised appropriate to each permitted use (e.g. aerobatics);

c) The definition of the c.g. datum;

d) The date and reference number of the Weighing Record and list of Basic Equipment upon which the Schedule is based;

e) The date and reference of the Loading Graphs of the Loading and Distribution Schedule shall be given;

f) A statement of the date of preparation and validity of the Schedule, signed by a representative of an Approved Organisation, or a person acceptable to the CAA. A statement shall also be included indicating that the Schedule supersedes all previous issues;

3.1.10 **Part B Loading.** Columns shall be provided which list all standard items of Variable Load and make provision for the associated weight and c.g. moments to be recorded and totalled for a particular flight. Columns shall also be provided for recording an example of a typical aircraft loading calculation. This example shall employ the same weight and c.g. moment figures as recorded in the Loading Graphs (see paragraph 3.1.11).

3.1.11 **Part C Loading Graphs.** Graphs, sufficient to ascertain moments, and to enable the Operator to determine that the aircraft loaded weight and c.g. moment are within the prescribed limits shall be provided. The graphs shall be identified by aircraft designation, date of compilation and source. Suitable sources are the aircraft manufacturer or other competent person. An example application shall be included using the same figures as employed in the Loading and Distribution Schedule example.

3.2 **Weight and Centre-of-Gravity Schedule** (See Chapter B7–10 Appendix No.2, paragraph 3). In addition to compliance with paragraph 2 the Weight and Centre-of-Gravity Schedule for aircraft the Maximum Total Weight Authorised of which does not exceed 2730 kg, shall contain instructions for the determination of the loaded weight, the total load moments and resultant c.g. positions.

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Appendix 1 to B7-10

Weight and Centre-of-Gravity Schedules for Aircraft Exceeding 2730 kg

1 Introduction (see Chapter B5–4, paragraph 5)

This Chapter B7–10 Appendix No.1 presents a specimen Weight and Centre-of-Gravity Schedule which constitutes an acceptable means of compliance with the appropriate requirements of Chapter B5–4, paragraph 5, and where elected with Chapter B5–4, paragraph 6.

NOTE: Imperial Units are shown on the specimen. Where it is necessary to use S.I. Units these should be used throughout.

SPECIMEN SCHEDULE

Reference	NAL/286
Produced by	Loose Aviation Ltd.
Aircraft Designation	Flynow 2E
Nationality and Registration Marks	G–BZZZ
Manufacturer	F.L.Y. Co. Ltd.
Manufacturer's Serial Number	44
Maximum Total Weight Authorised	7300 lb
Centre-of-Gravity Limits	Refer to Flight Manual reference number 90/946

Part A Basic Weight

The Basic Weight of the aircraft as calculated from Weight and Balance Report/ Weighing Record[1]

NAL/W/95 dated 31 August 1988 is	: 5516 lb
The c.g. of the aircraft in the same condition at this weight and with the landing gear extended is	: 127 in aft of datum
The total moment about the datum in this condition in lb in/100 is	: 7015

NOTE: The datum is at fuselage station 0 situated 114 inches forward of the wing leading edge. This is the datum defined in the Flight Manual. All lever arms are distances in inches aft of datum.

The Basic Weight includes the weight of 5 gal unusable fuel and 1 gal unusable oil and the weight of the following items which comprise the list of Basic Equipment:

1. Delete as appropriate.

	WEIGHT	LEVER ARM
	(lb)	(in)
Two Marzell propeller type BL–H3Z30	127 each	76
Two engine driven 100 ampere alternators type GE–361	27 each	117
One 13 Ah Ni-Cd battery CB–7	31	153
etc.	etc.	etc.

Part B Variable Load

The weight, lever arms and moments of items of Variable Load are shown below. The Variable Load depends upon the equipment carried for the particular role.

	WEIGHT (lb)	LEVER ARM (in)	MOMENT (100 lb in)
Pilot (one)		108	
De-icing fluid 1.5 gal	12	140	17
Life-jackets (7)	14	135	19
Row 1 passenger seats (two)	60	173	104
Row 2 passenger seats (two)	60	215	129
Row 3 passenger seats (two)	60	248	149
Table	8	256	20
One stretcher and attachments (in place of seat rows 2 and 3)	45	223	100
Medical stores	15	250	37

Part C Loading Information (Disposable Load)

The total moment change when the landing gear is retracted in lb in/100 is: –18.

The appropriate lever arms are:

	WEIGHT (lb)	LEVER ARM (in)	CAPACITY (Imp.gal)
Fuel in tanks 1 and 2	1368[1]	145	190
Engine Oil	50[1]	70	5.5
Forward baggage		21	
Rear baggage		261	
Passengers in Row 1 seats		171	
Passengers in Row 2 seats		213	
Passengers in Row 3 seats		246	
Patient in stretcher		223	

NOTE: To obtain the total loaded weight of aircraft, add to the Basic Weight the weights of the items of Variable and Disposable Load to be carried for the particular role.

1. Densities – Petrol 7.2 lb Imp. gal; Kerosone 8.1 lb Imp. gal; Oil 9.0 lb Imp. gal.

This Schedule was prepared (date) ..... and supersedes all previous issues.

Signed .....Inspector/Engineer

on behalf of .....

Approval Reference .....

NOTE: (Not part of the specimen Schedule) In Part B, Variable Load, of this Schedule the actual weight of the pilot is required in accordance with the Air Navigation (General) Regulations for aircraft the Maximum Total Weight Authorised of which does not exceed 5700 kg or with less than 12 persons seating capacity. Hence the pilot's weight and calculated moment are omitted in the example.

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Appendix 2 to B7-10 Weight and Centre-of-Gravity and Loading and Distribution Schedules for Aircraft Not Exceeding 2730 kg

1 Introduction (see B5–4, 6)

This Appendix No. 2 contains acceptable means of compliance in respect of Weight and Centre-of-Gravity and Loading and Distribution Schedules provided in accordance with B5–4, 6.

2 Loading and Distribution Schedule (See B5–4, 6)

The Schedule (including the graphs) and the List of Basic Equipment should, as far as is practical, take the form of Figures 1, 2 and 3.

AIRCRAFT LOADING AND DISTRIBUTION SCHEDULE FOR AIRCRAFT NOT EXCEEDING 2730 kg.

Aircraft Type: | Aircraft Registration or Manufacturer's Serial No: | Aircraft Nationality:

PART A BASIC DATA

ITEM		WEIGHT	MOMENT	C.G. POSITION
Basic Aircraft				
MTWA	Normal use		The C.G. datum is defined as	
	Aerobatic use		.....	

Note: Basic Aircraft Weight and C.G. Position were determined from the following documents contained in the aircraft record.

a) Weighting Record Ref: ..... Date: .....

b) Basic Equipment List Ref: ..... Date: .....

c) Loading and Distribution Charts Figs 1 and 2 Ref: ..... Date: .....

This Schedule was prepared and the Loading and Distribution Charts Figs. 1 and 2 were current on..... and supersede all previous issues.
Signed.....
Authority .....

PART B LOADING

1. To obtain moments of items refer to Fig. 1, and read off moment from corresponding weight. Repeat this for all items of load, and record both weight and moment in the appropriate columns below.
2. Total the weight column.TOTAL THE MOMENT COLUMNS, ASCERTAIN THE RESULTANT MOMENT, and apply the results to Fig. 2 in order to ascertain that the resulting intersection point falls within the permissible loading envelope, appropriate to the certification Category. The envelope(s) take account of fuel usage in flight . Examples of the use of the Figures are shown by arrowed lines.

ITEM	EXAMPLE AIRCRAFT			YOUR AIRCRAFT		
	WEIGHT	MOMENT		WEIGHT	MOMENT	
		(+)	(-)		(+)	(-)
Basic Weight (See Part A)						
Fuel - Standard (@7.2lb/Imp gallon) (@ 6.0 lb/US gallon)						
Fuel - Long Range (@7.2lb/Imp gallon) (@ 6.0 lb/US gallon)						
Pilot and Passenger (Row 1)						
Passenger (Row 2)						
Passenger (Row 3)						
Baggage						
TOTALS OF MOMENTS						
TOTAL WEIGHT & RESULTANT MOMENT						

In accordance with the ANO, it is a requirement that the pilot satisfies himself before take-off that the load is of such a weight, and is so distributed and secured, that it may safely be carried on the intended flight.
Full conformity with the instructions contained in this document will ensure compliance with the Flight Manual in respect of aircraft loading.

Figure 1 (Chapter B7–10 Appendix No.2) Front of Schedule

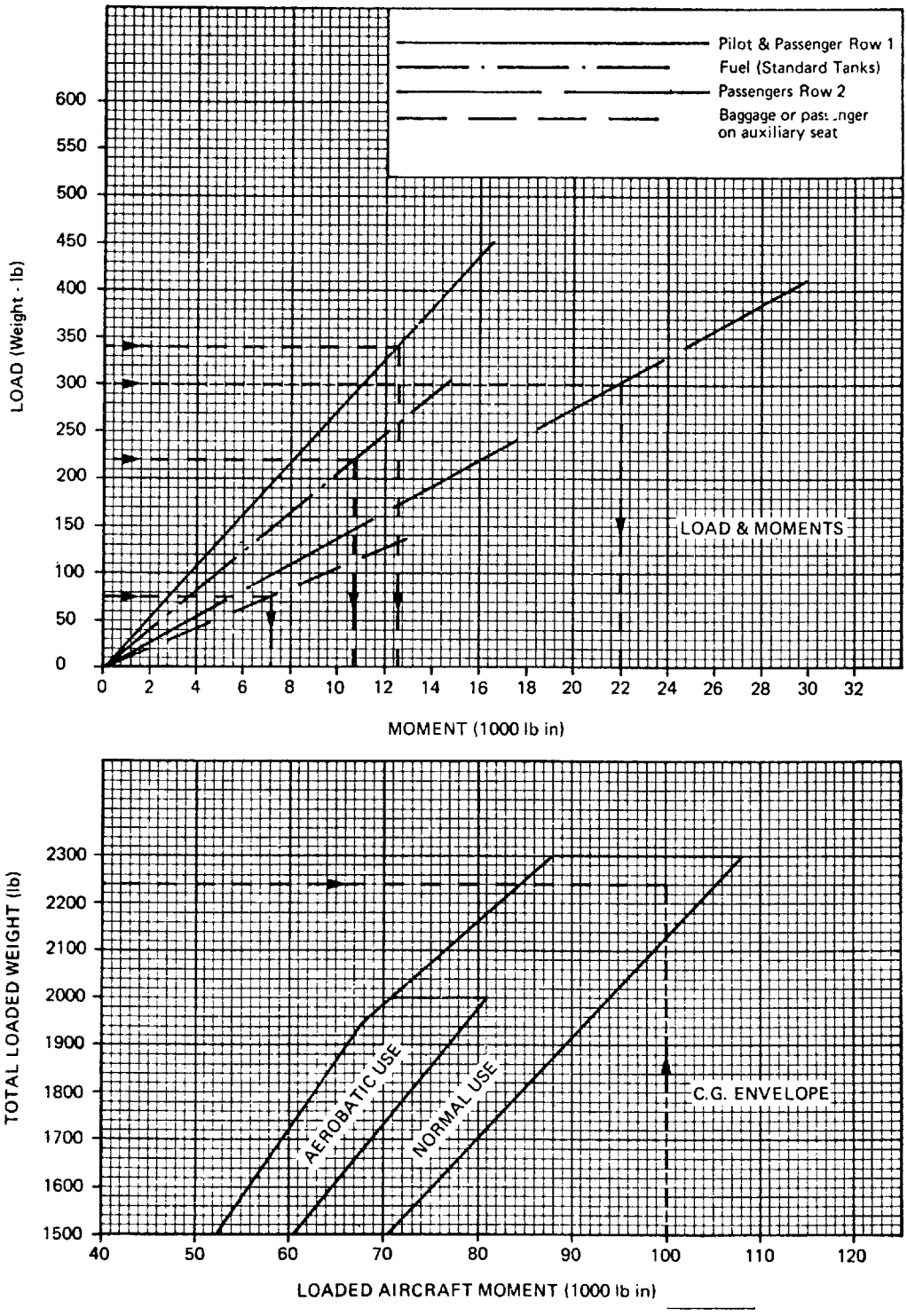

Figure 2 (B7–10 Appendix No.2) Reverse of Schedule

LIST OF BASIC EQUIPMENT Ref: Date:

Aircraft Type: | Aircraft registration or Manufacturer's Serial No. | Aircraft Nationality:

PART A BASIC DATA

1. The aircraft is as defined in Type Certificate Data Sheet (or equivalent) .....
2. The Weighing Record from which the Basic Aircraft Weight is calculated is
   Ref: .....Date: .....
3. The Basic Aircraft Weight is ..... made up as follows:
   (a) Basic aircraft, including standard equipment (e.g. seat lap straps)
   (b) Items of non-standard equipment, as listed in Part B.
4. The moment of the aircraft as at 3 is .....

PART B NON-STANDARD EQUIPMENT INCLUDED IN WEIGHT STATED IN PART A

ITEM	WEIGHT	MOMENT		DATE OF CHANGE OR EMBODIMENT	REMARKS
		(+)	(–)		

PART C NON-STANDARD EQUIPMENT NOT INCLUDED IN WEIGHT STATED IN PART A

NOTE: When re-calculation of Basic Aircraft Weight is made (see BCAR Section B, Chapter B5–4), items in Part C should be included in the re-calculation and moved to Part B

Figure 3 (Chapter B7–10 Appendix No.2) List of Basic Equipment

3 Weight and Centre-of-Gravity Schedule (See B7-10, 3.2)

An acceptable means of compliance with A7–10, 3.2 would be to include in the Schedule instructions on the following lines:

SPECIMEN INSTRUCTIONS

1 By reference to Weight and Centre-of-Gravity Schedule, ascertain the lever arm of each item (Basic Weight, Variable Load, Disposable Load).

2 To obtain moment of an item, multiply the weight of the item by the corresponding lever arm, and record the moment for each item of load, giving the moment a positive sign if the item is aft of the datum, and a negative sign if it is forward of the datum. Enter the weight of the item in the weight column.

3 Total the weight column.

4 Total the moment columns. If (+) and (-) moments are recorded total each column and obtain the total resultant moment, by subtracting the lesser from the greater.

5 Divide the total (or total resultant) moment by the total weight to obtain c.g. position, positive or negative, relative to the datum, and check that this is within the prescribed c.g. limits.

6 To check that the fuel consumed during a flight does not cause the c.g. position to be outside the prescribed limits, re-total the weights in 3 and the moments in 4, but omitting the total fuel weight and the corresponding moment(s), respectively. Add the weight and moment of the fuel expected to remain in the tanks at the end of the flight. Divide the final total resultant moment by the final total weight to obtain the c.g. position, and check that it is still within the prescribed c.g. limits.

NOTE: Where there are any other significant quantities of consumable fluids or substances (e.g. crop spraying), similar account should be taken of them.

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