UK Civil Aviation Authority

British Civil Airworthiness Requirements

Section L Licensing - Aircraft Maintenance Engineers

CAP 468

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Foreword

1. Purpose

British Civil Airworthiness Requirements of which Section L is a constituent part, are published by the Civil Aviation Authority (hereinafter referred to as the 'CAA'). Section L covers the grant, extension and renewal of an Aircraft Maintenance Engineer's Licence, as applicable to non-Part 21 aircraft.

The requirements for the grant and extension of an Aircraft Maintenance Licence, as applicable to Part 21 aircraft, are prescribed in UK Regulation (EU) No 1321/2014, Annex III (Part-66).

Note: Non-Part 21 aircraft are those referred to in UK Regulation (EU) 2018/1139, Article 2(3), paragraph (d). Also refer to CAP747, Section 1, Part 1.

2. International Standards

The requirements of this Section L recognise the Standards prescribed by the International Civil Aviation Organisation (ICAO) for the grant and extension of licences.

3. Interpretation

3.1. Where reference is made to a Statutory Instrument or document, e.g. the Air Navigation Order or other Sections of British Civil Airworthiness Requirements (BCAR), such reference shall be taken to refer to the relevant Statutory Instrument or document as amended, as published on legislation.gov.uk (in the case of Statutory Instruments) or the CAA website (in the case of CAA documents including CAP document and the BCAR).

3.2. Where reference is made to leaflets published in CAP 562, Civil Aircraft Airworthiness Information and Procedures (CAAIP), such reference shall be taken as a reference to refer to the current issue of the CAP, or supplementary amendment of the leaflet(s), as published on the CAA website.

3.3. Mandatory clauses are denoted by the use of 'must' whereas 'should' or 'may' are used in the text to introduce permissive or recommended clauses.

3.4. It is implicit in requirements expressed qualitatively (e.g 'acceptable') that the CAA will adjudicate in cases where doubt exists.

4. Editorial Presentation

4.1. It is the intention that Section L will serve as a comprehensive guide to licensing procedures as a whole, related information having been included. The Chapters and their subject matter are arranged in a progressive sequence, supplemented by a series of Appendices.

4.2. Related subject matter is highlighted by cross-referencing between Chapters and Appendices.

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4.3. The type rating oral examination syllabus in subject modules is detailed in Appendix 1. The modules appropriate to the licence Categories are set out in tabular form.

4.4. A list of the subjects covered by the Chapters and of all Appendices is given in the CONTENTS.

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

5. Issue and Amendment

5.1. If this document is printed, it should be treated as an 'Uncontrolled' document. Reference should be made to the CAA website for the current version of CAP 468.

5.2. The marginal lines in BCAR Amendments indicate material differences between them and the text in the previous version of the Section.

6. Effective Date

New requirements and amendments promulgated in BCAR Amendments are effective from the date of publication unless otherwise specified. Thus, any application made on or after the date of publication will need to comply with the requirements as published.

7. Enquiries

Applications for permission to reproduce any part of the Requirements and any enquiries regarding their content should be addressed to the Civil Aviation Authority, Airworthiness Policy, Aviation House, Beehive Ring Road, Crawley, West Sussex RH6 0YR.

Chapter L1 Licences and Categories

1. General

1.1. Under Part 4, Chapter 1, Article 36(1) of the Air Navigation Order (ANO) 2016, the CAA must grant an Aircraft Maintenance Engineer's Licence (AMEL) 'subject

to such conditions as it deems appropriate, if it is satisfied that an applicant is (a) a fit person to hold the Licence; and (b) qualified by having the knowledge, experience, competence and skill in aeronautical engineering to act in the capacity to which the licence relates'.

1.2. Licences issued under BCAR Section L (here after referred to a 'licence') are applicable to aircraft regulated under the Air Navigation Order, and are referred to as non-Part 21 aircraft. These are aircraft excluded from UK Regulation (EU) 2018/1139, as referred to in Article 2(3), paragraph (d).

1.3. Licences are granted and extended within the defined Categories. Generally, there are two parts to each Category:

a) Licence Without Type Rating (LWTR) (refer to Appendix 1, table 1).
b) Type Ratings (refer to Appendix 4).

Note: Unless already held, a Licence Without Type Rating will only be issued concurrently with a Type Rating.

1.4. The CAA no longer has written exams for the grant or extension of a BCAR Section L licence. To qualify for the issue or extension of a licence, the applicant must first hold a UK Part 66 licence in the appropriate category or sub-category (B1.1, B1.2, B1.3, B1.4, B2, B2L, B3, L2, L4 or L5). Refer to Appendix 3.

1.5. A category A & C licence (aeroplanes, rotorcraft or airships) will only be issued based on an unrestricted UK Part 66 B1, B3, L2, L4 or L5 licence, as applicable. For example, the CAA will not issue a BCAR category A, C or A & C licence based on a UK Part 66 B1 licence with limitations 10 (airframe), 11 (engine) or 1 (electrical power generation and distribution). The only exception to this is where the applicant has protected rights from previously holding a BCAR licence in the category for which they are applying for. The same applies to categories X and R, which will only be issued based on an unrestricted UK Part 66 B2 or B2L licence.

1.6. Where an applicant wishes to add a type rating to a licence, they will need to pass an oral exam on the specific aircraft type, group or system.

2. Licence Without Type Rating (LWTR)

2.1. This Licence does not in itself confer any certification responsibilities or privileges. It is, however, a prerequisite for the grant of the relevant Type Ratings which confer the privileges of certification appropriate to that Type Rating.

2.2. For a list of the available licences without type ratings, refer to Appendix 1, table 1.

3. Type Ratings (See Appendix 4 and CAP 562 Leaflet H-30)

3.1. **General.** Type Ratings confer on the holder of a Licence privileges and certification responsibilities in respect of certain non-Part 21 aircraft

registered in the United Kingdom. The certification responsibilities are described in CAP 562 Leaflet H-20.

3.2. A licence with Type or Group Ratings may also be used as the basis for the issue of an individual certification authorisation within a BCAR A8-23 or A8-24 approved maintenance organisation.

3.3. A Licence holder may not certify for work under a Type Rating or Group Type Rating unless he or she is familiar with the latest manufacturer's maintenance information and current airworthiness data. The licence holder may not certify beyond the privileges permitted by CAP 562 Leaflet H20 in respect of the Type Ratings held.

3.4. Type Ratings granted in Category 'C' Engines – Aeroplanes, cannot be used to certify engines in rotorcraft or airships.

3.5. For a list of the available type ratings, refer to Appendix 4 and CAP 562, leaflet H-30

4. Validity of Licences

4.1. Licences are initially issued for a period of 5 years and may be renewed for a period of 5 years.

4.2. Use of a Licence with a Type Rating to issue a certification requires that, during the 24 months preceding the date of the certification, the holder has been engaged in work affording experience comparable with that required for the grant of the Licence for periods totalling at least 6 months.

4.3. The Licence holder must be satisfied that the Licence Ratings are correct at the point of issue of the Licence and throughout the period of the Licence.

4.4. Paper licences are not valid until signed by the holder.

4.5. Under Part 4, Chapter 1, Article 36(8) of the Air Navigation Order 2016, Licence holders must not exercise the privileges of a Licence if they know or suspect their physical or mental condition renders them unfit to exercise such privileges. Advice on the subject of personal responsibility when medically unfit or under the influence of drink or drugs is given in CAP 562, Leaflet H-60.

Chapter L2 Application for the Grant or Extension of a Licence

1. General

1.1. This Chapter prescribes the minimum age and requirements, including any qualifications, experience and training required as part of the process of determining whether a Licence can be granted, or extended to include additional ratings.

1.2. The applicant's experience of maintenance of aircraft will be required to be of an extent and recency according to the application being made.

1.3. Licences will only be granted or extended if the applicant holds a UK Part 66 licence in the appropriate category or sub-category.

1.4. Type ratings will only be granted based on holding a BCAR Section L licence without type rating (LWTR), and demonstration of appropriate experience and recency. Applications for a type rating and a LWTR are acceptable when submitted at the same time. In most cases applicants will also be required to pass an oral exam on the aircraft type, group or system.

1.5. For the issue of the first type rating, the oral exam will include an element of legislation applicable to non-Part 21 aircraft, as detailed in Appendix 1, Module 1.

1.6. The charges payable for the grant and extension of Licences are set out in the CAA Scheme of Charges: Personnel Licencing, and are published on the CAA website.

2. Eligibility

2.1. To be eligible for the issue of a BCAR licence, applicants must be at least 21 years of age.

2.2. An applicant for the grant/extension of a Licence must:

2.2.1 submit an application which is acceptable to the CAA in content and presentation;

2.2.2 provide evidence of an unrestricted UK Part 66 licence in the appropriate category / sub-category, and experience relevant to the application;

2.2.3 pay the appropriate fee.

3. Application for a Licence Without Type Rating (LWTR)

3.1. Before applying for the grant or extension of a LWTR, an applicant must hold a valid UK Part 66 licence in the applicable category / sub-category.

3.2. Applications for the issue or extension of a licence which includes a LWTR will only be accepted if an application for a Type Rating is made at the same time. Refer to paragraph 5 below.

3.3. An application for the grant or extension of a Licence Without Type Rating should be made using Form SRG1005 (AD300). Applicants should ensure they use the current version of the form on the CAA website.

3.4. Form SRG1005 (AD300) requires information on the nature of experience, the periods during which the experience has been gained and the signatures required in confirmation. Documents pertaining to completion of aeronautical engineering courses, UK Part 66 licence and professional qualifications should be submitted to the CAA in support of the application when relevant. If copy documents are submitted these must be certified as a true copy by the person who confirms the experience on the Form SRG1005 (AD300). A document in the style of the Aircraft Maintenance Engineers Logbook (CAP741) can be used to record their experience in a structured way which will assist licence applicants to demonstrate that they meet the experience requirements for an LWTR or type rating.

3.5. LWTR categories / sub-categories (refer to Appendix 1, table 1) may be applied for in any order with the exception of:

a) Category ‘A’ Aeroplanes 1 which will be granted only in combination with either Category ‘C’ Piston Engines – Aeroplanes or Category ‘C’ Turbine Engines – Aeroplanes, as requested and according to experience.

b) Category ‘C’ Piston Engines – Aeroplanes or Turbine Engines – Aeroplanes which will be granted only in combination with Category ‘A’ Aeroplanes 1.

c) Category ‘R’ which requires that the LWTR Sub-category Radio Communication and Navigation is held before the Licence can be extended to include Category ‘R’ Radar Systems.

4. Experience Requirements – LWTR

Categories – A, C, A&C, X and R

Holding a UK Part 66 licence in the appropriate category / sub-category is a prerequisite for the grant or extension of a Licence in any of these categories. As a result, the experience requirements to hold a BCAR LWTR would already be met by the holding of a UK Part 66 licence.

5. Application for a Type Rating

5.1. Type Ratings are designated within Appendix 4 and CAP 562 Leaflet H-30, and the paragraphs relate to the various Licence Categories.

5.2. For the purpose of this Chapter, the Types/Systems covered by the Type Ratings are summarised in Appendix 4.

5.3. An application for a Type Rating in respect of the type of aircraft, engine, or system will be considered provided that:

5.2.1 the applicant holds a UK Part 66 licence in the relevant category / sub-category.

5.2.2 the appropriate LWTR is held or is being applied for simultaneously (see Appendix 1, table 1). In the latter case the Type Rating will not be granted until the appropriate LWTR is held;

5.2.3 the aircraft is of a type, or the engine or system is installed in a type that is registered in the United Kingdom and in respect of which a United Kingdom Certificate of Airworthiness is in force or has been applied for;

5.4. For Type Ratings indicated '+' in Appendix 4, an application may be made for the complete paragraph or for specific types of Aeroplanes, Rotorcraft or Engines within the paragraph.

5.5. The Type Ratings within paragraphs 5.6, 5.8, 5.9, 6.4, 6.5, 6.6 and 7.4 of Appendix 4 and CAP 562 Leaflet H-30 are available only as specific types of Aeroplane, Rotorcraft or Engine and therefore are not available as a complete paragraph.

5.6. The assessment procedure for the grant of a Type Rating varies according to the particular Type Rating required and will normally take the form of an oral examination, however it may be based on an assessment of experience alone.

5.7. The application procedure to extend a licence to include a Type Rating is similar to that described in paragraph 3, except that the application Form SRG1005 (AD300) must be accompanied by Forms SRG1007 (AD301) Type Rating Record of Experience. As an alternative to the SRG1007 Type Rating Record of Experience, applicants for a Type Rating can use the CAP741 Aircraft Maintenance Engineers Logbook.

5.8. The certification required on Form SRG1005 (AD300) must be made by an engineer, acceptable to the CAA, who must normally have had regular professional contact with the applicant and who holds a valid BCAR licence in the same category for which application is made and has held it for a minimum period of 24 months. Alternatively, the signatory may be a post holder within the BCAR approved maintenance organisation in which the applicant is currently employed.

6. Experience Requirements – Type Ratings

6.1. Subject to paragraph 6.2, extension of a Licence to include a Type Rating normally requires a minimum of 3-months experience on type to be demonstrated before a Type Rating will be granted. A satisfactory Record of Experience appropriate to the Type applied for must be submitted as part of the application for a Type Rating (see paragraph 5.6). The experience shown on it must have been gained within the three years before the application.

6.2. Appendix 2 provides details of the applicable systems and ATA chapters that need to be covered for the aircraft, engine, type or group, in the type rating record of experience.

6.3. **Category 'A', 'C' and 'A&C' Type Ratings**

6.2.1 For

Category 'A' – Aeroplanes in paragraphs 5.0, 5.0.1, 5.0.2, 5.0.3, 5.1, 5.1.1, 5.1.2, 5.1.3, 5.7, 5.7.1, 5.7.2, 5.7.3, 5.9 and 5.9.1 of CAP 562 Leaflet H-30;

Category 'C' – Engines in paragraphs 6.0 or 6.3 of CAP 562 Leaflet H-30;

Categories 'A&C' – Rotorcraft in paragraph 7.1 of CAP 562 Leaflet H-30. a) A Type Rating will normally be granted subject to a satisfactory oral examination on those items in the modular syllabus applicable to the Category/Type Rating.

b) Where application is made for the paragraph itself, the Record of Experience referred to in paragraph 6.1 must provide satisfactory evidence of relevant experience of at least 1 year on a minimum of three types of aeroplanes, rotorcraft and/or engines, as appropriate, of different manufacturers within that paragraph. The types must be representative of those within the paragraph.

Where application is made for a specific type only, the Record of Experience need only cover that specific type.

6.2.2 For:

Category 'A' – Aeroplanes in paragraph 5.6 and 5.8 of CAP 562 Leaflet H30.

Category 'C' – Engines in paragraphs 6.4, 6.5 and 6.6 of CAP 562 Leaflet H-30.

Category 'A&C' – Rotorcraft in paragraphs 7.3 and 7.4 of CAP 562 Leaflet H-30.

a) A Type Rating will normally be granted subject to a satisfactory oral examination on those items in the modular syllabus applicable to the Type Rating.

b) Application may be made only for specific types of Aeroplanes, Rotorcraft and/or Engines listed in paragraphs 5.6, 5.8, 5.9, 6.4, 6.5, 6.6 and 7.4 and not for the complete paragraph.

c) Applications will be considered for paragraph 7.3 or for specific type of Rotorcraft covered by the paragraph. Where application is made for the paragraph, the Record of Experience must provide satisfactory evidence of relevant experience of at least 1 year on a minimum of three types of Engines and/or Rotorcraft by two different manufacturers within that paragraph.

d) The types must be representative of the paragraph. Where application is made for a specific type only, the Record of Experience need only cover that specific type.

6.2.3 Application for one of the complete paragraphs 5.0 (Category A only) 5.0.1, 5.0.2, 5.0.3, 5.1, 5.1.1, 5.1.2, 5.1.3, 5.7, 5.7.1, 5.7.2, 5.7.3, 5.9.1, 6.0, 6.3, 7.1 or 7.3, may be accepted without examination for the complete paragraph provided that:

a) The applicant has obtained three Type Ratings of aeroplanes, rotorcraft and/or engines of different manufacturers, representative of types within the paragraph, and

b) For paragraph 7.3, engine types from two different manufacturers is required.

c) The applicant must show confirmed experience of 2 years maintenance of aeroplanes, rotorcraft and/or engines within the paragraph.

6.3 Category 'X' Type Ratings

6.3.1 Category 'X' – Instruments.

A Type Rating for any of the paragraphs 8.1, 8.2, 8.3 or 8.4 of CAP 562 Leaflet H-30 will normally be granted subject to a satisfactory oral examination on those items in the modular syllabus applicable to the Category and to the Type Ratings.

6.3.2 Category 'X' – Electrical

A Type Rating for any of the paragraphs 9.1, 9.2, 9.3 or 9.4 of CAP 562 Leaflet H-30 will normally be granted subject to a satisfactory oral examination on those items in the modular syllabus applicable to the Category and to the Type Ratings.

6.3.3 Category 'X' – Automatic Pilots – Aeroplanes or Rotorcraft.

A Type Rating for any of the paragraphs 13.1, 13.2, 13.3, 13.4 and 13.5 of CAP 562 Leaflet H-30 will normally be granted subject to a satisfactory oral examination on those items in the modular syllabus applicable to the Category and to the Type Ratings.

6.3.3 Category 'X' – Compass Compensation and Adjustment.

1) For holders of Category 'X' – instruments LWTR, a Type Rating for paragraph 8.8 of CAP 562 Leaflet H-30 will be granted.
2) For holders of Category 'X' – Compass Compensation and Adjustment LWTR a Type Rating for paragraph 15 of CAP 562 Leaflet H-30 will be granted.

These Type Ratings will normally be granted subject to the provision of evidence of compass swings, which have included the compensation and adjustment of compasses, on four aircraft within the preceding 12 months.

6.3.4 Category 'R' - Radio Radar.

A Type Rating for any of the paragraphs 12.2, 12.2.1, 12.3 or 12.3.1 of CAP 562 Leaflet H-30, will normally be granted subject to a satisfactory oral examination on those items in the modular syllabus applicable to the Category and to the Type Ratings.

Note: a Type Rating in paragraph 12.3 or 12.3.1 can only be granted subject to holding a Type Rating in paragraph 12.2.

Chapter L3 Examinations

1 General

1.1 Due to the similarities between the syllabuses of Part 66 and BCAR Section L, the CAA took a decision that it no longer supports written exams under BCAR Section L for the issue of a BCAR licence.

2 Licence Without Type Rating

2.1 To qualify for the issue of a BCAR licence, applicants must first hold a UK Part 66 Category B or L licence in the appropriate category / subcategory.

2.2 Refer to Appendix 3 for further details.

3 Type Ratings

3.1 The assessment procedure for Type Ratings is set out in paragraphs 5 and 6 of Chapter L2. Where an oral examination is required, it will cover those items of the modular syllabus appropriate to the Type Rating.

3.2 For the grant of the first type rating, the oral exam will also cover any applicable aviation legislation. Refer to Appendix 1, Module 1.

4 Oral Examinations

4.1 **General**. Information on oral examinations is given below. Candidates should expect to be examined according to the syllabus in Appendix 1 appropriate to the rating and systems, regardless of whether they have experience on systems or not. Note: Candidates must show proof of identity, such as a passport or a recognised identity document when attending an oral examination.

4.2 Where an application for a licence requires an oral examination (i.e. applications for type ratings),candidates should be ready to take that examination when submitting the application.

4.3 Oral examinations are carried out by Surveyors at a CAA Office or, at the discretion of the CAA, at the applicant's workplace, at times mutually agreed with the applicant. Applications for oral examinations are made on Form SRG1005 (AD300)

4.4 An oral examination for a Type Rating is based on those items of the syllabus applicable to the Category and Type Rating (see Appendix 1), emphasis being placed on the practical application of the knowledge. The candidate will be

expected to demonstrate a knowledge of the aircraft, systems or components relevant to the Type Rating being sought, the manufacturer's maintenance documentation, relevant airworthiness data including Airworthiness Directives and modifications, typical defects and where applicable typical repair and inspection procedures for the Type. In addition, the candidate will be expected to show a familiarity with the checking and adjustment procedures for the various systems.

Areas of work itemised by the candidate in the Type Rating Record of Experience will be included in the examination.

5 Failure and Partial Passes

5.1 **Type Rating**. A candidate who has failed a Type Rating oral examination and wishes to be re-examined should complete further Forms SRG1005 (AD300) and SRG1007 (AD 301) listing items of experience since the previous application. A minimum of three months of additional experience will be required for re-application.

5.2 **Failure Guidance** Candidates may request guidance following failure of an oral examination. Requests must be made in writing to the CAA Personnel Licensing Department and guidance will be supplied only in writing.

Chapter L4 Licence Renewal

1 General

A Licence may be renewed as described below provided that the holder provides evidence of having been engaged on the maintenance of operating non-Part 21 aircraft for periods totalling at least 6 months during the 24 months before application for renewal. Where a Licence holder is unable to show such experience but has been involved actively for the same minimum period in matters concerned with aircraft maintenance (e.g. as a chief engineer, quality engineer, quality manager, or BCAR Section L licence holder in the appropriate category) consideration will be given to renewing the Licence.

2 Renewal

2.1 It is the responsibility of the Licence holder to ensure that his or her Licence remains valid. The CAA does not send reminders of licence expiry. The onus is on the licence holder to ensure their licence remains valid prior to the certification of any aircraft maintenance.

2.2 To renew a Licence, holders must complete the SRG1005. On completion of the SRG1005 form, it should be returned with the appropriate fee to the address shown on it. Applications for renewal will not be accepted more than 90 days before expiry of the Licence.

2.3 A Licence cannot be backdated and to ensure continuity of Licence coverage an acceptable application for renewal must be received by the CAA at least 10 working days before expiry of the Licence. Any lack of continuity in the validity of the Licence will be recorded on the renewed Licence. Any certifications issued after a Licence has lapsed could affect the validity of the Certificate of Airworthiness of the aircraft for which those certifications were issued.

a) If certification has been made under the authority of a Licence which has lapsed, the Licence will not be renewed until a statement has been made that all such certifications have been recertified by the holder of a valid Licence. This statement must be made by the owner of the aircraft or by the maintenance organisation(s) responsible for the maintenance of the aircraft since the invalid certification was made.

b) If certification has been made under the authority of a Company Authorisation based upon the certifier holding a valid Licence which had lapsed at the time the certification was made, the Licence will not be renewed until a statement has been made that all such certifications have been recertified by the holder of a valid Company Authorisation. This statement must be made by the Quality

Manager of the approved maintenance organisation(s) responsible for the maintenance of the aircraft since the invalid certification was made.

2.4 The CAA can only renew a Licence upon being satisfied with the renewal submission and upon the receipt of the statutory fee. The charge payable will be shown on the application form.

Chapter L4 Licence Renewal

2.5 Licences are renewed for a period of five years.

3 Expired Licences

3.1 For the renewal or reissue of a BCAR licence which has expired or lapsed, the requirements of paragraph 1 apply.

Appendix 1 Oral Examination Syllabus

1 The syllabus relevant to oral examinations for all Licence Categories is presented in Appendix 1 as a series of subjects or combinations of subjects referred to as Modules. The content of each of the Modules is detailed in this Appendix.

2 The oral examinations for each Category of Licence, (and its Sub-categories where appropriate) are based on a number of the Modules, and the Module/Category relationship is set out below. It will be noted that the modular arrangements recognise that major areas of the syllabus are common to more than one Licence Category and/or its Sub-category. Thus, when an existing Licence is to be extended to include another Category or Sub-category, those Modules which have been satisfied by previous examinations may be excluded.

3 Each module is numbered and contains a series of syllabus subject headings. Each subject is then further expanded in more detail against 'level numbers' corresponding to Type Rating (TR). This expansion of detail provides an indication of the degree/level of knowledge, experience, competence and skill in aeronautical engineering required by the CAA.

4 The modules applicable to each licence category, sub-category and type rating are shown in table 1.

There are three knowledge levels, and they are defined as follows:

Level 1: General appreciation of principles and familiarisation of the subject. **Level 2**: Comprehension of principles and salient features with a practical ability to assess operational condition.

Level 3: Detailed knowledge of all aspects of the subject.

4.1 In applying the above levels to the subjects which, in particular relate to aircraft, engines, systems and items of equipment, the following aspects should be taken into account:

a) theoretical principles;
b) constructional arrangements, functional and design features;
c) maintenance practices;
d) normal, deteriorated and failed conditions.

Table 1

Categories	Licence Without Type Rating Sub-categories	Type Ratings as defined in Appendix 4 and CAP562, leaflet H-30	Oral Exam Type Rating Syllabus Modules
'A' – Aeroplanes	Aeroplanes 1 (Unpressurised aeroplane types of any weight or pressurised aeroplane types not exceeding 5700 kg)	Paragraphs 5.0, 5.0.1, 5.0.2, 5.0.3, 5.1, 5.1.1, 5.1.2, 5.1.3, 5.7, 5.7.1, 5.7.2, 5.7.3, 5.8, 5.9, 5.9.1	1, 2, 3, 4
	Aeroplanes 2 (Pressurised aeroplane types exceeding 5700 kg)	Paragraph 5.6	1, 2, 3, 5
'B' – Aeroplanes	No LWTR - Type Rating only	No longer available for new issue	N/A
'B' – Rotorcraft	No LWTR - Type Rating only	No longer available for new issue	N/A
'C' – Engines	Piston Engines – Aeroplanes	Paragraphs 6.0, 6.1, 6.2, 6.3, 6.3.1	1, 2, 6, 7
	Turbine Engines – Aeroplanes	Paragraphs 6.4, 6.5, 6.6	1, 2, 7, 8
'A' & 'C' – Rotorcraft	Piston-engine Rotorcraft	Paragraph 7.1	1, 2, 3, 6, 9
	Turbine-engine Rotorcraft	Paragraph 7.3, 7.4	1, 2, 3, 8, 9
'A' & 'C' – Airships	Piston-engine Airships	Paragraph 14	1, 2, 3, 6, 7, 10
	Turbine-engine Airships	Paragraph 14	1, 2, 3, 7, 8, 10
'D' – Piston Engines	Type Rating only	No longer available for new issue	N/A
'X' – Electrical	Electrical	Paragraphs 9.1, 9.2, 9.3, 9.4	1, 2, 21
'X' – Instruments	Instruments	Paragraphs 8.1, 8.2, 8.3, 8.4, 8.8	1, 2, 22, 23, 30

'X' – Automatic Pilots	Automatic Pilots – Aeroplanes	Paragraphs 13.1, 13.2, 13.3	1, 2, 23, 24, 25
	Automatic Pilots – Rotorcraft	Paragraphs 13.4, 13.5	1, 2, 23, 25, 26

Categories	**Licence Without Type Rating Sub-categories**	**Type Ratings as defined in Appendix 4 and CAP562, leaflet H-30**	**Oral Exam Type Rating Syllabus Modules**
'X' – Combined Category	Combined Category Instruments/ Automatic Pilots	No longer available for new issue	N/A
'X' – Compass Compensation	Compass Compensation and Adjustment	Paragraph 15	1, 30
'R' – Radio	Communication and Navigation	Paragraphs 12.2, 12.2.1	1, 2, 31
'R' – Radio	Radar	Paragraphs 12.3, 12.3.1	32

Module 1 Regulations

Syllabus Subject	Level	
Maintenance Engineers' Licences	2	Air Navigation Order requirements Relevant statutory and other legal requirements and responsibilities, including those set out in the Air Navigation Order. Statutory penalties for breach of relevant statutory and legal requirementsCategories – applicability Area and extent of limitations and privileges within categories Overlap of Category applicability Relevant CAAIP leaflets
Certifications	2	Air Navigation Order requirements; BCAR Sections A and B Certificates of; Release to Service; Fitness for Flight Duplicate (Independent) inspections Contributory certifications and reliance on other documentation and persons Certification – acceptance investigation and judgement procedures
Aircraft, Engine and VP Propeller Logbooks	2	Air Navigation Order requirements; BCAR Sections A and B CAA Approval, Light aircraft, large aircraft Worksheets; Technical Log Data to be entered in logbooks Condition reports – e.g. heavy landings checks, defect investigations, NDT and other inspections, mandatory and non-mandatory Maintenance checks and inspections Cross-reference to other files/records Preservation of documents; ANO
Technical Log	2	Air Navigation Order requirements; BCAR Sections A and B Technical Log – Air Operator's Certificate requirements

Aircraft Documentation and Requirements	2	Type Certification
		Weight schedule
		External, and internal markings and signs, e.g. nationality and registration no smoking and fasten seat belt, placards and requirements, doors and exits
		Certificate of Airworthiness
		Airworthiness Review Certificates
		Certificate of Registration
		Air Operator's Certificate
		Schedule 5 requirements for equipment
		Radio licence
		Change of ownership
		Glider/banner towing
Approvals	1	Design Organisations
	2	Inspection Organisations
		Maintenance Schedules / Programmes
		AOC interface
		Light Aircraft Maintenance Schedule (LAMS)
		Stores: systems, release of parts
Defect Reporting	2	Air Navigation Order requirements
		Defects which are to be reported
		Reportable incidents and accidents
CAA Requirements	2	BCAR Sections A and B
		BCAR Section L
		CAP 562 Civil Aircraft Airworthiness Information and Procedures
		CAP 747 Mandatory Requirements (Aircraft, Engines, Propellers and Equipment)

Module 2 Basic Engineering Practices

Syllabus Subject	Level	
Engineering Drawings and Technical Information	2	Drawing details – common practices: plan, elevations, isometric, sections, scale, dimensional and indicating presentation
	2 2	Use, validity control, interpretation
		Maintenance Manuals, Parts Catalogues, Overhaul Manuals
		Service bulletin and modification data
	2	Maintenance progrmmes: approved and otherwise
		Wiring diagram manuals, Interconnection charts, Schematic diagrams, Symbols
Common Parts	2	Control cables and fittings
		Fastening devices – threaded, riveted and swaged
		V-band clamps and couplings
		Locking: parts and methods
		Washers
		Bearings
		Pipes: rigid and flexible
		Keys and key ways
		Worm drive and other types of band clips
Gases and Compounds	2	Air, nitrogen, carbon dioxide, oxygen, helium
		Acetylene
		Safety aspects
		Adhesives, oils, greases, sealing compounds, solvent

Syllabus Subject	Level	
Basic Electrics	2	Ground services ac and dc Batteries, application and handling Insulators and Insulation, Conductors and conductivity Common items used in aircraft applications, e.g. resistors, potentiometers, solenoids Transformers, single phase and auto Semi-conductors, capacitors, relays Micro switches Proximity detectors Fuses, circuit breakers Motors/actuators Principles of frequency wild, constant frequency a.c. power

Syllabus Subject	Level	
Environmental Aspects	2	Effects of snow, ice, lightning and turbulence

Module 3 Category 'A' Common – Aeroplanes, Rotorcraft and Airships

Syllabus Subject	Level	
Basic Aerofoil Theory	2	Lift/thrust/drag/weight Stalling of an Aerofoil Induced and parasitic drag Boundary layer Aerofoil shapes Chord/span/aspect ratio
Sub-Structures	2	Folded metal, sheet metal, extrusions, tubing Effect of swaging, lightening holes Use of different metals Commonly used fasteners and joint methods Protective treatments and precautions Honeycomb Reinforced plastic/epoxy materials, applications Floors Seats – crew, passenger – 'crash' situation Aerials, Pitot probes, drain masts, air intakes and similar structural fitments Instrument panels and consoles Radio equipment racks and stowages
Metals	2	Titanium Application and use of metals The purpose of heat treatments Use of different heat-treated materials Anodic treatments Corrosion treatments during manufacture Identification of corrosion
Non-destructive Condition-Testing	2	Visual probes Eyeglass equipment: usefulness, effectiveness of various magnifications

Materials – non Metal Reinforced Plastics/Epoxy Composites	2	Glass, fibre and filament reinforcement Materials used Cold setting, hot setting systems Construction principles used, aircraft applications Failure characteristics

Syllabus Subject	Level	
		Honeycomb, foam sandwich
Hydraulic	2	Types of pump Differing fluids – mineral/fire resistant Control and indication methods
Landing Gear and Brakes	2	Wheels, tyres, shock absorbers, castering, steering methods Brake discs and callipers
Electrical	2	Simpler type systems Batteries, generators, relays, wiring, switch gear Voltage control Current limiting, circuit protection devices Paralleling a/c from inverters Crimping Soldered joints Control and indications, magnetic indicators and annunciators
Instruments (other than Engine)	2	Pitot/static systems and associated instruments Gyro instruments – vacuum/pressure/ electrical Pressure and temperature indication Position indication Compasses
Safety Equipment	2	Fire extinguishers – hand Life jackets Life rafts Seat belts/harnesses – passenger/crew 3-point, 4-point, inertial, lap straps
	3	Mandatory requirements for upper torso restraint

Ground Handling	2	Weighing and centre of gravity determination – weighing report BCARs Scale positions Basic Weight Unusable fuel Oil and other consumable liquids – quantities Role variations Hold/seat row/removable equipment
Syllabus Subject	**Level**	
		Station identification C of G datum

Module 4 Category 'A' – Aeroplanes 1

Syllabus Subject	Level	
Theory of Flight and Control	2	
		Stability and control
		Equilibrium
		Stalling of the aircraft
		Flaps and slats
		Aerodynamic balance
		Mass balance
		Aileron/elevator/rudder control
		Tabs – servo/anti-servo/balance/anti-balance/trim/spring Canard/foreplanes
Aircraft Structures	2	
		Main structures – fuselage/wing
		Stressed skin – diaphragms and longerons
		Tubular structures
		Skin, frames and stiffening
		Wing: spar and rib structures
		Integral fuel tanks
		Load paths
		Empennage
		Windows, doors and hatches
Materials – non Metal:		
(1) Wood	2	
		Types, application and uses
		Diseases – environmental effects
		Plywoods
		Glues – past and present
		Storage and condition control
		Damage – failure modes
		Painting/protective finishes
(2) Fabrics	2	
		Natural and man-made materials – types, applications and uses
	1	Techniques used during covering

	2	Repairs Paint finishes and protective treatments Butrate and nitrate paints Ageing Tautening, heat shrinking Strength considerations

Syllabus Subject	Level	
		Drainage and apertures Stitching, stringing, adhesives Testing
Systems:		
(1) Flight Controls	2	Aileron, elevator rudder Operating systems and surfaces – manually operated Trim operating systems and surfaces – manual and electric Flap systems – electrical, hydraulic and manual
	2	Flap systems – pneumatic
	2	Simple asymmetric protection Slat systems – automatic, and manual
	2	Hydraulic
	2	Tab systems – trim, balance, servo, anti- servo, anti-balance, spring servo Stall sensing and warning – simple systems, e.g. vane or reed types Basic auto pilots – simple systems Inputs into main controls – function testing – attitude, heading and height sensing
(2) Ice and Rain Protection	2	Liquid, electric and boot systems Power source, control and indication Windscreen wipers
	2	Electrically-heated windscreens
(3) Heating and Ventilation	2	Combustion heaters, exhaust heat exchangers Ram air Ventilation fans

(4) Oxygen	2	Bottle storage, distribution, regulation
		Masks
(5) Pressurisation	2	Simple systems – bleed air, turbo-charger bleed
		Passenger environmental requirements for the control of:
		oxygen, heating, ventilation, rate of change, humidity
		Mass flow control
	2	Temperature control
		Differential pressure – maximum, negative

Syllabus Subject	**Level**	
		Control and indication
		Cabin structure, windows and doors for pressurised flight
(6) Vacuum/Pressure	2	Dry and wet pump systems
		Oil separation
		Gyro supply
		Relief valve
		Filtering
		Aerofoil anti-icing
(7) Pneumatic	2	Landing gear/flaps/brakes
		Operating systems
		Basic theory and common practices

Module 5 Category 'A' – Aeroplanes 2

Syllabus Subject	Level	
Theory of Flight and Control	2	Transonic effects, swept wings, wing fences, spoilers, high lift devices, vortex generators.
		High speed stall
		Shock wave
		Speed of sound – Mach numbers
		Wake turbulence
	2	Supersonics – Sound waves
		Delta wing forms
		Kinetic heating
		C of G control
	2	Active controls – computerised flight management systems – general principles
Aircraft Structures	2	Failsafe operation
		Fatigue effects and control
		Wing: box/integral tank construction
		Pressure-loaded skin, bulkheads, windows, windscreens, doors
		Milling/chemical etch constructed structures
		Bonded type construction
		Fasteners – close tolerance
		Sealing compounds
		Maintenance programmes – structural surveys
		NDT programmes
		Large aircraft paint and protective finishes
		Cargo holds
		Venting and draining
		Soundproofing
Materials – non Metal:		
Furnishings	2	Fire resistance/escape requirements
		Passenger seats
		Crew seats – cabin and flight crew

Systems:

(1) Flight Controls	2	Powered controls
		Spoiler, air/speed brake, lift dump
		Lift augmentation – LE droop, slats/flaps
		Flap operating systems – large transport aircraft

Syllabus Subject	Level	
		Flap asymmetric and alternate operation
		Stall sensing – stick shake
	2	Stick push/nudge
	1	Electronic control systems
(2) Hydraulic	2	Variable delivery systems
		Accumulator/cut-out dependent systems
		Pressure/volume control
		Pressure reducing valves
		Fire-resistant fluids – temperature, contamination, compatibility Pressurised reservoirs
		Multiple system provision
		Alternate systems – HYRAT/hydraulic motors
		Electrically powered and air-driven systems
		Leak protection systems – system isolation, ‘fused’ systems, priority control
		Internal leakage – cause and effects - acceptability
(3) Landing gear	2	Multiple axles and wheels
		Bogey beams
		Door sequencing
		Main and alternate braking provision
		Anti-skid system – electric and mechanical - aquaplaning
		Landing gear unsafe protection
		Alternate lowering
		Weight on / weight off sensing
		Fire protection
		Powered steering – retraction – self centring
	2	Auto braking

(4) Pneumatic (ATA 36)	2	Bleed air pneumatic systems System supplied Bleed air valves Mass, flow, pressure and temperature control and indication Ducting Leak detection Alternate supply – APU and ground cart

Syllabus Subject	Level	
(5) Ice and rain protection	2	Mainplane/tail hot air anti-ice systems Control and indication Leak/overheat-detection/protection
	2	Ice detection Rain repellent Windscreen wipers Laminated windscreen heating Waste water discharge Pitot/static heaters
(6) Environmental and passenger systems		
6.1 Air conditioning	2	Cabin blower/bleed air supply Heat exchangers Cold air units/air cycle machines Vapour cycle systems Humidity control systems Mass, flow, pressure and temperature control and indication Leakage detection and protection Ventilation requirements Passenger service unit air supply Water extraction Recirculation

6.2 Pressurisation	2	Outflow control – electric, electronic and pneumatic Maximum differential pressure and negative pressure control Cabin altitude and rate of change Emergency dump and manual dump control Ditching Cabin altitude warning Entrance/access/baggage door sealing and locking, indications and warnings
6.3 Oxygen	2	Storage, distribution and charging Drop-out systems Chemical systems Therapeutic provision Masks – passenger/crew/smoke
	3	Bottle checks and precautions

Syllabus Subject	Level	
6.4 Toilets, Waste and water, Galley services	2	Toilet flushing systems – pump over-heat protection Water – washing, hot/cold, potable Potable water – health protection Pressure control Water heating systems – safety provisions Waste collection and drainage Galleys – refrigerators, food and drink, ice – health protection Lifts. Safety factors Catering trolleys
6.5 Baggage	2	Automatic systems – pallets and containers Restraining and securing
(7) Equipment, Safety	2	Slides, rafts, dinghies Portable oxygen Loud hailers Smoke masks/hoods Survival equipment Notices/placards

Module 6 Category 'C'– Piston Engines in Aeroplanes, Rotorcraft and Airships

Syllabus Subject	Level	
Principles. Terminology. Definitions and Laws	2	Normally aspirated and supercharged operation Two and Four stroke cycles Ignition timing, mixture, fuel grade detonation. Power Overhaul periods/continuation in service beyond overhaul recommendation Ground running – principles and problems Effect of altitude, humidity, temperature, and icing Standard atmosphere, pressure altitude Fixed and variable pitch propeller effects Vibration characteristics and damping Type certification
Constructional Arrangements	2	General arrangement – external Crankcase breathing Propeller shaft sealing Materials Propeller attachment provision Power take-off provision Cooling Cylinders, pistons and valve gear Hydraulic tappets Camshaft Casings, mountings and accessories drive Vibration damping
Systems:		
(1) Carburation and Induction	2	Air intake – normal/alternate – filtering Manifolds Anti-icing provision Float type and injection systems Engine driven fuel pumps Priming systems Mixture/idle cut-off/throttle control

(2) Ignition	2	Magnetos Ignition harness

Syllabus Subject	Level	
		Spark plugs – reach variations, operating temperatures – long life Switch control Timing (internal/external) Advancing and retarding mechanisms Screening Starting aids – impulse couplings and ignition boosting
(3) Starting	2	Starter motors – manual, Bendix, solenoid, preengaged – engagement methods Non-engagement indication and effects Starter relays Earth straps Cooling Effects on battery
(4) Fire Protection and Indication	2	Extinguishant, bottles, cartridges, ‘life control’ Detection systems and warnings Two shot provision
(5) Lubrication	2	Wet and dry sump systems System arrangement Pressure control Effects of hot and cold weather Filtering Straight, detergent, ash dispersant oils Engine condition assessment using oil system analysis Oil coolers – temperature control valves Hoses, rigid pipes, internal passages, splash – oil jet Cooling functions of the oil system
(6) Supercharging / Turbocharging	2	Directly driven and exhaust driven superchargers Manual and automatic control Lubrication and hydraulic power Controls and indication Automatic control systems

(7) Aircraft Fuel	2	Tanks, cells and integral systems Fuel tank heating and monitoring Venting Fuel pumps – electrical

Syllabus Subject	Level	
		Fuel grades and quality MOGAS Water contamination – drains Filtering Controls and indication
(8) Engine Controls	2	Throttle Electronic controls Mixture Propeller Alternate air Manual controls for turbocharger
(9) Engine Instruments	2	Manifold pressure Rotational speed Pressure and temperature Cylinder head temperature Exhaust gas temperature Electronic Condition Monitoring
(10) Diagnostic Tools	2	Equipment Use and analysis

Module 7 Category C – Fixed and Variable Pitch Propellers

Syllabus Subject	Level

Constructional Arrangement	2	Pitch change mechanism single/double acting CSUs/governors Spinners Balance control Materials Diameter – minimum and maximum Pitch stops – fixed, centrifugal, manual and electrical Protective finishes – contour control
	3	Damage acceptance areas Cropping
	2	Attachment and assembly methods Oil transfer – governor/propeller/sump Safety visibility
Automatic and Manual Pitch Control Systems	2	Pilot control and governor sensing Feathering
Ice Protection	2	Liquid and electrical
System Turbine Engine Application	2	Auto-feathering Synchronising/ synchrophasing Braking Automatic and manually controlled pitch limiting systems Beta control Permitted balancing

Module 8 Category ‘C’ – Turbine Engines in Aeroplanes, Rotorcraft and Airships

Syllabus Subject	Level

Principles. Terminology. Definitions and Laws	2	Gas flow path – temperature, velocity and pressure
		Compression
		Combustion
		Turbine power extraction
		Effects of atmospheric variations in temperature, density, pressure altitude on engine and on engine/aircraft combination
		Single shaft, two and three shaft engines
		Centrifugal and axial flow compressors
		Fan engines
		By-pass engines
		Water/water methanol injection
		Power turbines
		Surge/compressor stalling
		Propeller turbines
		Gas producers
		APU applications
		Thrust reversal
		Power assessment
Constructional Arrangements	2	Casings, shafts, bearings, accessories drive
		Air intakes and compressors
		Combustion section
		Turbines and exhaust
		Materials
		Modular construction
	3	Engine inspection capability and condition assessment provision
	3	Principles of ‘condition monitored’ and ‘on condition’ maintenance programmes
	2	Supersonic flight air intake geometry control systems
Propeller and Shaft Power Provisions	2	Gas producers
		Reduction gearing
		Power and auxiliary drive
		Rotational speed and power control, safety systems

Syllabus Subject	**Level**

Systems:

(1) Thrust Reversing	2	General arrangements
		Control/interlocks
		Safety features
		Operating systems – hydraulic/pneumatic mechanical
		Turbine and fan applications
(2) APUs	2	General arrangements
		Intake and exhausts systems – door operation
		Load control
		Electrical output control and management
		Speed control
		Fuel control
		Safety features
		Ground/flight/altitude-limiting factors
		Mounting
		Fire protection and indication
		Bay cooling
		Ground running
(3) Fuel Control	2	Principles – parameters
		Mechanical/electronic control
		Power speed – control and limiting
		Temperature and power factors
		Burners – primary and secondary provision
	2	Burners – shaft injection, torch ignition
	2	Governor speed sensing

(4) Fuel Systems	2	Tanks – cells and integral systems Refuelling/defueling, cross feed, jettison, venting, transfer Scavenging – jet pumps Boost pumps, backing pumps LP/HP valves and control Tank selection Internal/external pipes, hoses, connectors Fuel types Static electricity – effects and control Leak assessment and control Fuel quantity indication – ‘Level Sticks’

Syllabus Subject	Level	
(5) Water Injection	2	Water contamination – effects and control SG/Density/volume/weight Filtering and heating Fuel systems in pressurised cabin areas Water/water methanol applications Sensing, control and safety provision Power effects Tankage Replenishing /dumping Pumps Effects on fuel control Pipes and pipelines

(6) Lubrication	2	Tanks, storage, venting, contents indication Pressure/scavenge pumps Filters, screens and magnetic plugs/chip detectors Pressure/flow control Heat exchangers oil/fuel, oil/air Sealing – labyrinth seals, carbon seals, etc. Overboard drains – drains systems Lubrication of mains bearings, accessories and gear trains Supply to propeller systems Contamination by hydraulic fluid/fuel Types of oil Internal/external pipes, hoses and passages – effects of heat Use of oil for ice protection – intake and fuel control
(7) Cooling, Sealing and Bleed Air Services	2	Internal cooling, external cooling, sealing air Overboard dump – temperature monitoring Off-takes for other services – air conditioning, anti-icing, equipment drive, pressurising of hydraulic reservoirs, water systems, etc. Centrifugal filters
(8) Surge Protection and Airflow Control	2	Bleed valves – operating system Variable inlet guide vanes – scheduling, operating systems Surge sensing ‘Surge margins’

Syllabus Subject	**Level**	
	2	Supersonic flight air intake geometry control
(9) Ice Protection	2	Hot air systems – struts and intakes Electrical systems – engine and intakes Use of oil and air bleeds Pressure sensor heating Control and indication

(10) Fire Protection	2	Fire detection
		Overheat warning
		Fire extinguishing
		Bay and zone isolation
		Fire walls, bulkheads, cladding
		Fire wires, detector units
		Single/dual detection
		Extinguishants
		First and second shot capability
		Warnings and indications – lights, aural warnings, fuse types, squib test
		‘Bottle gone’ indicators
		Operating systems
		Over pressure
		Cartridges – life control
		Electric and electronic systems
(11) Ignition	2	High energy ignition systems
	2	Torch ignition
		Glow plug systems
	2	Igniter plugs and leads
		Operation inside and outside the starting cycle
(12) Starting	2	Starting cycle
		Initiation – HP valves, termination, bleed valves, starter valves, power lever, self-sustaining speeds
		Starter motors – electrical, pneumatic, starter/generators – HP air, impingement air
		Clutch provision, overspeed sensing
		Manual operation starter cooling/resting
		Ground power electrical/pneumatic provisions
(13) Controls	2	Power/throttle/thrust reverse
		HP/LP valve controls – manual and electric

Syllabus Subject	**Level**	
		Condition control systems
		Propeller control
		Auto control of throttle
		Control runs

(14) Pods, Pylons, Cowlings and Mountings	2	General arrangements Services and controls – input/exit Materials Venting Zone demarcation Mountings Pylon and pod structural features Torque, vibration, expansion provisions Bay venting Cooling air intakes
(15) Electrical	2	a.c generators – CSDs/IDGs Starter/generators Starter motor high current circuits CSDs – principles of operation, disconnect/reconnect, lubrication/hydraulic operation, filters, coolers
(16) Instruments	2	Rotational speed indication; a.c. generator and pulse probe systems Temperature and pressure systems Pressure ratio systems Turbine temperature systems Instrument system amplifier Fuel flow indication Torque indication Fuel contents/oil contents – electrical and electronic Vibration indication
Ground Handling	2	Storage and inhibiting Spare engine carriage Ground running – noise control – power checking Functional checks of engine associated services

Module 9 Category ‘A’/‘C’ – Rotorcraft

Syllabus Subject	Level

Syllabus Subject	Level	
Theory of Flight and Control	2	Rotor disc: forces acting, lift, drag centrifugal force, weight, rotor useful force, phase lag; advance angle non-constant speed drive (Hookes Joint) effect
		Articulated/semi-rigid/rigid rotors
		Flapping/dragging/feathering
		Climbing/losing height/horizontal flight
		Main and anti-torque rotors – control inputs – cyclic and collective
		Effects of aircraft speed on rotors
		Directional control
		Translational lift/inflow/ground effect
		Vortex ring effect
		Retreating blade stall
		Reverse flow
		Auto-rotation; auto-rotative force/blade section
		Auto-rotation rev/min
	2	Twin rotors
Constructional Arrangements	2	Rotorcraft structures, load paths, vibration effects
		Landing gear configurations: skids/wheels/floats
		Fuselages, tail cones, pylons, engine mounts
		Gearbox and transmission mountings
		Doors and windows
Systems:		
(1) Flight Controls	2	Collective/cyclic/directional
		Hydraulic
		Rotor heads – main and tail rotor
	2	Articulated, rigid, semi-rigid, teetering
		Swash plate/spider control input methods
		Blades: construction and materials; balancing: static, dynamic, span wise, chord wise
		Tracking: flag and in-flight methods
		Tabs/trailing edge bending
		Vibration – effects and analysis
		BIM indicators
		Automatic Pilots/Auto stabilisers – Control interface
		System components – component replacement and subsequent testing

(2) Ice and Rain Protection	2	Windscreen wipers Electrically-heated windscreens
(3) Heating and Ventilation	2	Exhaust heat exchangers Ram air Ventilation fans
Transmission Systems	2	Engines to rotors: shafts, clutches, free wheel units; reduction gearboxes; main transmission/ gearboxes, combining gearboxes Tail rotor drive: drive shafts, intermediate gearboxes, tail rotor gearboxes Lubrication systems: oils, coolers, cooling fans, filters, magnetic plugs, chip detectors, pumps, pressure control Universal drive provision Splined shafts, type of gears – tooth pattern Instrumentation Rotor brake systems
Equipment	2	Hoists and winches External load carrying Emergency floatation systems and fixed floats Survival systems Specialised role equipment, aerial spraying, cameras
Instruments	2	Health and Usage Monitoring (HUMS) and Vibration Health Monitoring (VHM)

Module 10 Category ‘A’/’C’ – Airships

Syllabus Subject	Level	
Principles of Lift	1	Bodies immersed in fluids Gases: free to expand/constant volume/ constant temperature/constant pressure Mixture of gases in a containing vessel

	2	Centre of gravity, centre of buoyancy, static heaviness, static lightness, static trim
		Ballonet ceiling, pressure height
		Superpressure, superheat
		Porosity
		Equilibrium
		Ballast-shot/water
Theory of Flight and Control	1	Aerodynamic lift, aerodynamic balance
		Stability and control
		Free ballooning
		Fins, rudders, elevators
		Tabs: balance/servo/trim/spring
		Powered flying controls
Envelope	2	Materials: fabrics, Kevlar
	1	Ultra-violet light effects
		Gas-tight membranes
		Ballonets, gases, load curtains, shear curtains, support cables, gas valves, air valves, entry ports, inspection domes, charge adaptors, load patches, handling lines, nose cone
		Charging, purging, porosity checks
		Lightning protection
		Airs systems: ram air scoops, ballonet fans, dampers, transfer fans
Gondola	2	
		Main Structures
		Materials: Kevlar laminate, Fibrelam, sandwich panels, metal skin frames and stiffening
	1	Moulding/bonding techniques
		Support cables, support cable attachment, bulkheads, equipment attachment
		Furnishings
		Doors, windows and hatches

Syllabus Subject	**Level**	
		Fire protection – skinning
		Lightning protection

Systems:		
(1) Flight Control	1	Fins, rudders, elevators Operating systems and surfaces – manually/power operated Trim operating systems – manual and electric
(2) Ice and Rain Protection	1	Windscreen wipers
(3) Heating and Ventilation	1	Exhaust heat exchanges Ventilation system
(4) Vacuum/Pressure	1	Supply and associated system
(5) Landing Gear	1	Geometric arrangement Structural arrangements Castering/pivoting/locking Shock absorbers Weight sensing/measurement
Ducted Propellers	1	Principles of operation Propeller forces: aerodynamic/centrifugal Pitch variation/control Positive/negative vectoring Power conversion Control systems: electronic control, emergency forward coarse selection Balance Clutches Materials Protective finish: contour control, visibility Duct pivoting systems: drive and control, motors, limit control, gear boxes, inter- connection, emergency manual
Ground Handling	1	Attaching to/releasing from/mast Ground power Fuelling Ballasting Helium: charging, purifying, leak testing Pressure watch techniques Mooring – mobile/portable Engine running

Syllabus Subject	**Level**

	Hangaring
	Adverse weather

Module 21 Basic: Electrical Equipment and Systems

Syllabus Subject	Level	
Batteries	3	Methods of charging batteries in aircraft
Direct Current Generation	2	Voltage regulation Control Load sharing Paralleling System layouts Interlock circuits
Power Conversion Equipment	2	Static and rotary inverters Transformer rectifier units
Fire Protection	2	Detection systems Fire and overheat warning Smoke detectors – principles and applications Overheat sensors Extinguishing systems Warnings
Flight Controls	2	Motors and actuators – clutches and brakes Limit switches, micro switches and proximity detectors Power control units Flap motors protection and control Trim motors
Fuel Systems	2	Boost pumps control and indication Jettison systems Refuel/defuel systems Fuel heaters Cross-feed, supply and shut-off valves – normal and emergency

Hydraulic Systems	2	Pump control and isolation Pressure switches Overheat warnings Electrically operated priority valves Fluid reservoir components Low level warnings
Landing Gear Systems	2	Actuation motors – selection and control Indication – proximity sensors micro switches Air/ground sensor systems

Syllabus Subject	Level	
		Anti-skid systems – operation, control and override Automatic braking systems – inputs; control and override
Lighting Systems	2	External systems: landing, navigation, anti-collision and inspection, etc. Internal systems: normal and emergency, fluorescent tubes, reading and passenger information systems, multiplex function
Pneumatics	2	Control – indication and protection
Engine and Propeller Control	2	Fuel control valves Temperature and speed limiting systems Propeller feathering controls Electronic engine control
Starting and Ignition	2	System types Control Principles of operation of high energy ignition units Aircraft and engine applications and related systems, e.g. stall warning

Alternating Current Power Generation	2	Constant and variable frequency Constant speed drive units Paralleling Load sharing Load shedding Generator control unit Voltage regulation Load controller Differential protection Fault and test panels Voltage, frequency and excitation control and protection
Alternating Current Power Distribution Systems	2	Bus-bar layouts Split and parallel systems Transfer relay interlocks Emergency conditions APU and GPU interlocks Warnings Maintenance panels

Syllabus Subject	Level	
Air Conditioning Systems	2	Control Indication Protection
Ice and Rain Protection Systems	2	Windscreen heating: control, indication and failure Engine/propeller and airframe anti-ice protection: thermal, electrical and pneumatic Warnings and indications Overhead indications and protection Ground operations Windscreen wiper, washer and rain repellent systems Sensor protection – angle of airflow, pitot head, static plate and temperature probes Waste water heaters – thermal anti-icing protection Aerial heaters

Auxiliary Power Units	2	Starting, control, protection
		Power generation
		Fire protection
Ground Power Supplies	2	Interlocks and protection of aircraft supplies
		Control
Centralised Warning and Indication Systems	2	Inputs
		Output warnings
		Priority philosophy

Module 22 Basic: Instruments Category 'X'

Syllabus Subject	Level	
Pitot-Static Systems and Instruments	2	Pitot probes, static plates and heaters
	2	Pipelines and flexible hoses
	2	Drain traps, associated equipment
		Altitude and airspeed switches
Rate of Turn and Slip Indication	2	Rotor speed; display
Vacuum Systems	2	Control and adjustment
		Indication
Temperature Measurement	2	Variable resistance
		Thermocouples; compensation; limits and values; servo indicators; control system inputs
Rotational Speed Measurement	2	Direct drive indicators; tacho-generator and indicator systems; pulse probe systems
		Displays
Position Measurement	2	d.c. and a.c. systems
Quantity Measurement	2	Direct reading
	2	Compensation
		Power supplies

Flow Measurement	2	Indicators
		Transmitters
		Power supplies
Compasses	2	Direct reading compass installation; safe distance
		Flux detectors and remote sensors remote system components
		Heading reference outputs
Reduced Vertical Separation Minima	2	Signal sources and interface with other systems
	2	Maintenance practices
Flight Path Computation	2	Modes, computation
		Displays
Electronic Display Systems	2	EADI; EHSI; symbol generators
		Control panels
		Comparators and monitors

Syllabus Subject	Level	
		Engine indicating and crew alerting systems
		Electronic centralised aircraft monitors
Flight Data Recorders	2	Requirements
	2	Sensors and inputs
		Cockpit Voice Recorder inputs
		Interface with aircraft systems
	2	Signal processing
		Entry panels
		Computer principles
		Data recording methods
		Retrieval and verification
	2	Failure monitors
Inertial Navigation systems and Inertial Reference Systems	2	Displays and interface with aircraft equipment
		Mode selector and CDU
		Failure/fault indicators
		Power supplies and cooling
Ground Proximity Warning Systems	2	Inputs and interface with other aircraft systems

Vibration Measurement	2	Types of pick–up Signal conditioning Displays Alarm levels and warnings
Compass Compensation	1	Base survey techniques Compass swinging areas Aircraft magnetism Terrestrial magnetism – variation Methods and procedures for swinging compasses
	3	Deviation: calculations and effects on a compass Compensation and adjustment procedures

Module 23 Basic Gyroscopes and Servomechanisms Category ‘X’

Syllabus Subject	Level	
Gyroscopes	2	Types and methods of operation – vacuum, electrical, or laser
Electronics	2	Transistors Biasing, Simple circuit arrangements
	2	Amplifiers Signal amplifiers, feedback
Attitude sensing	2	Errors, correction Remote gyros, interconnection and transfers Limits
Direction sensing	2	Errors, compensation Remote gyros, interconnection and transfers
Rate sensing	2	Alignment Rotor speeds
Accelerometers	2	Basic principles

Synchros	2	CTs, Differential, Torque synchros and resolvers
Servomechanisms	2	Rate and position sensing and control Integrators Response and damping Power requirements Clutches Override and lockout protection Null and loop error sensing Synchronisation systems Force rebalance systems
Digital Techniques	2	Multiplex systems

Module 24 Automatic Pilots – Aeroplanes Category 'X'

Syllabus Subject	Level	
Theory of Flight (Fixed Wing)	2	Forces on the aircraft Stability – dihedral, sweepback, etc. Control axis Primary control surfaces – operation and effect on the aircraft Secondary controls Forces during turns Functions of trim tabs, balance tabs and servo tabs High speed buffet and stall conditions Auto-pilot control axis Auto-stabilisers – wing levellers Co-ordinated turns, aileron/rudder cross feed Versine generation and application Sideslip monitors – Slip and skid in a turn Turbulence penetration and the effect on autopilot control

Yaw Dampers	2	Dutch Roll phenomenon Yaw sensing Yaw signal processing Synchronisation Series and parallel systems Cockpit indication Aileron/rudder control interaction in turns Rudder PCU, LRUs Interlocks with autopilot systems
Pitch Trim Systems	2	Longitudinal axis stability High speed tuck Mach No. inputs
Mach Trim	2	Mach trim actuators computation Connections with aircraft controls Warnings
Alpha Trim	2	Angle of attack sensing Computation Interface with other aircraft systems: e.g. N1 computers – stall warning systems

Syllabus Subject	Level	
		Flight directors
Auto-Stabilisers	2	Trim actuators – control and safety interlocks Speed change systems for trim actuators Interlocks Elevator/stabiliser interaction
C of G Trimmers	2	Computation Indication
Demand Signals	2	Control wheel steering systems Touch wheel steering systems

Module 25 Automatic Pilots – Common – Category 'X'

Syllabus Subject	Level	
Error Signals	2	Rate system – errors and control Displacement system – errors and control Heading and course error inputs Radio beam deviation inputs Attitude inputs CADC/autopilot interface – e.g. q or % adaptation Sideslip sensors and monitors
Signal Processing	2	Typical channel signal flow path Buffer amps Input signal modulation Summing points Signal sensors and switching functions Integrators Limiters Gain programmers Dual channel monitors Voter systems

Demand Signals	2	Mode selectors Control display units Turn controllers Control column transducers Command override systems Mode compatibility Mode annunciators Failure and disconnect lights and aural warnings Interlocks – pre- and post-engage Pitch attitude trim Roll out/heading-hold, engage Synchronisation Trim monitors and indicators Altitude hold inputs Vertical speed control Mach/IAS hold Altitude acquire or change systems

Syllabus Subject	Level	
Command Signal Outputs	2	Power control units – line replaceable units Solenoid valves Transfer valves Position sensors Servomotors – construction, interconnection with control runs Clutches – torque settings Brakes Tachogenerators – feedback and damping Position feedback – indication Torque limiting Hardover sensing – disconnection Jam detection Runaway conditions – disconnection Pilot override – disconnection

Module 26 Automatic Pilots – Rotorcraft – Category 'X'

Syllabus Subject	Level	
Theory of Flight (Rotorcraft)	2	Rotor disc: forces, lift, drag, centrifugal force, weight, phase lag Articulated/semi-rigid/rigid rotors flapping/ dragging/feathering Vertical and translational flight Main and anti-torque rotors, control inputs cyclic, collective, rudder pedals Directional control Autorotation Forward speed effects
Command Outputs	2	Actuators Indicators
Trim Systems	2	Manual/Automatic Indication
Stability Augmentation Systems	2	Actuators Indicators Computation

Module 30 Compass Compensation

Syllabus Subject	Level	
Compass Compensation	2	Base survey techniques Compass swinging areas Aircraft magnetism Terrestrial magnetism – variation Methods and procedures for swinging compasses
	1	Flux valve operation
	3	Deviation: calculations and effects on a compass Compensation and adjustment procedures

1	Various compass types

Module 31 Radio Communication and Navigation – Category 'R'

Syllabus Subject	Level	
Radio Theory	1	Propagation of radio waves Polarisation Radiation patterns Transmitters and receivers RF Amps, IF Amps Oscillators, frequency synthesisers Frequency multipliers Mixers, detectors, BFO, AGC Noise limiters, muting circuits, audio amplifiers Modulators, RF power amplifiers matching units Filters and tuned circuits
Interference	2	Principles and methods used to minimise the effects of conducted and radiated interference Methods used to minimise the effects of lightning strikes and static on aerials
Aerials and Feeders	2	Diplexers, baluns and matching stubs Fixed and variable matching arrangements Locations and types of aerials – communication and navigation Bandwidth and effective height of an aerial
Communication	2	Calculation of standing wave ratio Control and monitoring circuits
Audio Systems	2	Intercommunication Audio mixing and distribution systems Public address and entertainment systems Headsets and microphones
Cockpit Voice Recorder	2	Signal sources Control circuitry; hot microphone Requirements
VHF/HF Communications	2	Airborne installations
VOR/ILS	1	Ground station signals

	2	Airborne installations Control Monitors Indicators Loading
Syllabus Subject	**Level**	
		AFCS and instrument interface
Marker	1	Ground installations
	2	Airborne systems
Automatic Direction Finding	2	Receiver Loop and sense aerials and feeders Bearing errors and correction devices Loop swings
Satellite Communication and Navigation (GPS) Systems	1	Airborne installations Receiver, computer
	2	Displays Interface with other systems
Flight Compartment Electronic Display Systems	2	EADI; EHSI; symbol generators Control panels Comparators and monitors
Microwave Landing Systems (TRSB)	1	Receiver, computer Interface with other systems
RNAV	1	Computer Interface with other systems Indications

Module 32 Radar Systems – Category ‘R’

Syllabus Subject	**Level**

Pulse Techniques	1	Radar transmitter/receiver Pulse modulation Peak power, average power Duty cycle, pulse shape, pulse width Pulse rise time and repetition frequency Range accuracy and resolution Receiver bandwidth Noise
Primary Radar	2	Weather radar: Control and monitoring circuits Indicators; displays Scanners; waveguides
	1	Doppler: Aerials Indicators Interface with other equipment
	2	Radio altimeters: Pulse and FM CW systems
Secondary Radar	2	DME: Indicators Control and monitor circuits Interface with other aircraft systems
	2	ATC Transponders: Instrument system interface Control and monitor circuits
	1	TCAS: Indicators Control and monitor circuits Interface with other aircraft systems

Appendix 2 - Type Rating Record of Experience — Form SRG1007 (AD 301)

1 **General**

As stated in Chapter L2, a satisfactory Record of Experience must be submitted as part of an application for a Type Rating. Details of this form, methods of completion, and confirming signatories required are given in this Appendix.

2 **Items to be Recorded**

2.1 The Record of Experience items should be grouped under suitable headings appropriate to the Licence Category (see Tables 1 and 2 of this Appendix) in order that distribution and depth of coverage can be assessed. The experience shown must have been gained within the three years prior to the application.

2.2 The amount of detail should be related to the construction and complexity of the type / group of aircraft, engine or equipment concerned. Account should also be taken of maintenance procedures, defect rectification and the duties and responsibilities which devolve on the holder of the Type Rated Licence.

2.3 It is not sufficient to make such simple statements as, for example, ‘No. 1 inverter replaced’, ‘Hydraulic pump replaced’ or, ‘50-hour check carried out’. The replacement of items requires subsequently that specific functional checks be carried out, and therefore evidence of such checks must also be given in the Type Rating Record of Experience. In the case of time-cycled checks, reference should also be made to the extent of work involved relevant to the systems and/or equipment covered by the checks. Checking/inspection items are of limited worth, but the work items which follow from such checks/inspections provide the greater experience.

2.4 If an oral examination is to be conducted for the Type Rating, the Record of Experience will be used as a basis for questions on the practical aspects of items included in it.

3 **Confirming Signatories**

Items and dates entered in the Record of Experience should be countersigned by a person of supervisory status to whom the applicant is responsible in relation to the work experience recorded and who should confirm that the experience is reflected accurately in the document. See also Chapter L2, concerning the certification required on of Form SRG1005 (AD 300).

4 Assessment by the CAA

It should be assumed that the person assessing the Record of Experience within the CAA is not acquainted either with the applicant or the company by whom he or she is employed. For this reason, emphasis is placed on the way in which work is recorded against specific registered types of aircraft, on overall practical experience and on countersigned certifications.

Table 1 Classification of Items of Work for Completion of Type Rating Record of Experience (Categories 'A' and 'C')

Sub-headings under which representative selection of items of work carried out or participated in	Licence Categories			ATA Chapter
	'A' - Aeroplanes	'C' - Engines	'A' & 'C' Rotorcraft	
Airframe Structure, including doors and windows	X		X	51
Flight Control Systems	X		X	27
Flaps and Lift Control Systems	X			27
Hydraulic Systems	X		X	29
Pneumatic Systems	X		X	36
Landing Gear Systems	X		X	32
Air Conditioning Systems	X		X	21
Pressurisation Systems	X			21
Ice and Rain Protection Systems	X		X	30
Oxygen Systems	X		X	35
Life-saving and Safety Equipment	X		X	25
Fire Detection and Extinguishing Systems	X	X	X	26
Electrical Systems	X*	X*	X*	24
Instrument Systems	X*	X*	X*	31
Automatic Pilot Systems	X*		X*	22
Airframe Fuel Systems		X	X	28
Main Engines and Power Plant		X	X	71
Engine Fuel Systems		X	X	73
Oil Systems		X	X	79
Ignition Systems		X	X	74
Propeller Systems		X		61
Air Intake Systems		X		72
Thrust Reverser and Exhaust Systems		X		78
Rotor Systems			X	65
Transmission Systems			X	65

Replacements of Systems Components	X	X	X	ALL
Replacement of Main Engines		X	X	71
Replacements of APUs		X		49
Ground Handling	X		X	9/10
Ground Running and Adjustments		X	X	76
Minor Repairs	X		X	51
Defect Diagnosis and Rectification	X	X	X	ALL
Current Mandatory Requirements	X	X	X	ALL

*In accordance with the responsibilities and privileges defined in CAP 562, Leaflet H-20.

Table 2 Classification of Items of Work for Completion of Type Rating Record of Experience (Categories 'X' and 'R')

Sub-headings under which representative selection of items of work carried out or participated in	**Licence Categories**		**ATA Chapter**
	'X' – Electrical	**'X' – Compass Compensation and Adjustment**	
Main ac. Power Generation Systems	X		24
Main dc. Power Generation Systems	X		24
Power Distribution Systems	X		24
Batteries	X		24
Secondary Power Generation Systems	X		24
External Power Supply Systems	X		24
Auxiliary Power Units	X		49
Warning and Alerting Systems	X		All
Circuit Installation and Testing	X		All
Engine Starting Systems	X		74/80
Engine and Propeller Control Systems	X		61/76
Rotor Control Systems	X		22
Fuel Systems	X		28/73
Oil Systems	X		79
Fire Detection and Extinguishing Systems	X		26

Ice and Rain Protection Systems	X		30
Air Conditioning Systems	X		21
Pressurisation Systems	X		21
Flight Control Systems	X		27
Hydraulic and/or Pneumatic Systems	X		29/36
Landing Gear Systems	X		32
Lighting Systems	X		24
Passenger Service Systems	X		25
Multiplex Systems	X		31/All
Indicating Systems	X		31/All
Replacement of systems Components	X		All
BITE checks	X		All
Defect diagnosis and Rectification	X		All

Table 2 Classification of Items of Work for Completion of Type Rating Record of Experience (Categories 'X' and 'R')

Sub-headings under which representative selection of items of work carried out or participated in	**Licence Categories**		**ATA Chapter**
	'X' – Electrical	**'X' – Compass Compensation Chapter and Adjustment**	
Current Mandatory Requirements	X		All
Warning and Alerting Systems	X	X	All
Circuit Installation and Testing	X	X	All
Direct and Remote-reading Compass swings		X	34
Sub-headings under which representative selection of items of work carried out or participated in	**Licence Categories**		**ATA Chapter**
	'X' – Instruments		
Indicating Systems:			
Pressure	X		77
Temperature	X		77/79
Engine Speed	X		77

Quantity	X		28/29/79
Flow	X		73
Position	X		All
Vibration	X		77
Pitot-static Instrument Systems	X		34
Gyroscopic Flight Instrument Systems	X		34
Compasses Direct-reading and/or Remote-Reading	X		34
Flight Director Systems	X		34
Air Data Computer Systems	X		34
Inertial Navigation Systems	X		34
Ground Proximity Warning Systems	X		34
CRT Display System	X		31
Flight Director Systems	X		31
Replacement of System Components	X		All
BITE Checks	X		All
Defect Diagnosis and Rectification	X		All
Current Mandatory Requirements	X		All

Table 2 Classification of Items of Work for Completion of Type Rating Record of Experience (Categories 'X' and 'R')

Sub-headings under which representative selection of items of work carried out or participated in	**'X' Automatic Pilots Aeroplanes**	**'X' Automatic Pilots Rotorcraft**	**R Radio Comm / Nav**	**'R' Radio Radar**	**ATA Chapter**
Yaw Damper Systems	X				22
Pitch Trim Systems	X	X			22
Automatic Pilot Systems	X	X			22
Yaw systems		X			22
Stability Augmentation Systems		X			22
Trim Systems		X			22

Warning And Alerting Systems	X	X	X	X	All
Circuit Installation and Testing	X	X	X	X	All
Replacement of System Components	X	X	X	X	All
Defect Diagnosis and Rectification	X	X	X	X	All
BITE Checks	X	X	X	X	All
HF Communication Systems			X*		23
VHF Communication Systems			X		23
Intercommunication			X		23
Service Interphone/Public Address Systems			X		23
Passenger Entertainment Systems			X*		23
Multiplex Systems			X*		31
Cockpit Voice Recorder			X*		31
VHF Navigation Systems			X		34
Marker Systems			X*		34
ADF Systems			X		34
Sat Comm			X*		34
GPS			X*		34

* Experience is not required in these areas for Paragraph 12.2.1

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Table 2 Classification of Items of Work for Completion of Type Rating Record of Experience (Categories 'X' and 'R')

Sub-headings under which representative selection of items of work carried out or participated in	**'X' Automatic Pilots Aeroplanes**	**'X' Automatic Pilots Rotorcraft**	**R Radio Comm / Nav**	**'R' Radio Radar**	**ATA Chapter**
Weather Radar Systems				X+	34
Radio Altimeter Systems				X	34
DME Systems				X	34
Transponder Systems				X	34
TCAS				X+	34
Microwave Landing Systems				X+	34
Current Mandatory Requirements	X	X	X	X	All

+ Experience is not required in these areas for Paragraph 12.3.1.

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Appendix 3 - Part 66 LWTR requirements for the issue of a BCAR AMEL

Categories	**BCAR Licence Without Type Rating Sub-categories**	**UK Part 66 Licence Without Type Rating categories / subcategories**
'A' – Aeroplanes	Aeroplanes 1 (Unpressurised aeroplane types of any weight or pressurised aeroplane types not exceeding 5700 kg)	B1.1, B1.2, B3* or L2** as applicable depending on the engine type (piston or turbine). * B3 limited to aeroplanes below 2000Kg MTOM **L2 limited to aeroplanes below 1200Kg MTOM
	Aeroplanes 2 (Pressurised aeroplane types exceeding 5700 kg)	B1.1 or B1.2 as applicable depending on the engine type (piston or turbine)
'C' – Engines	Piston Engines – Aeroplanes	B1.2, B3*, L2** * B3 limited to engines fitted in aeroplanes below 2000Kg MTOM **L2 limited to engines fitted in aeroplanes below 1200Kg MTOM
	Turbine Engines – Aeroplanes	B1.1
'A' & 'C' – Rotorcraft	Piston-engine Rotorcraft	B1.4
	Turbine-engine Rotorcraft	B1.3
'A' & 'C' – Airships	Piston-engine Airships	L4/L5 as applicable to the type
	Turbine-engine Airships	L4/L5 as applicable to the type
'X' – Electrical	Electrical	B1.1, B1.2, B2 , B2L
'X' – Instruments	Instruments	B2, B2L
'X' – Automatic Pilots	Automatic Pilots – Aeroplanes	B2, B2L
	Automatic Pilots – Rotorcraft	B2, B2L
'X' – Compass Compensation	Compass Compensation and Adjustment	B2, B2L

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'R' – Radio	Communication and Navigation Radar	B2, B2L

Appendix 4 – List of Aircraft Type Ratings (Refer to CAP 562, Leaflet H-30)

Category	Type Rating endorsement	Types/Systems Covered
Category A - Aeroplanes 1	5.0+	Composite materials aeroplanes not exceeding 5700 Kg MTOM.
	5.0.1+	Composite materials aeroplanes not exceeding 2730 Kg MTOM.
	5.0.2+	Composite materials aeroplanes not exceeding 2000 Kg MTOM.
	5.0.3+	Composite materials aeroplanes not exceeding 1200 Kg MTOM.
	5.1+	Wooden and wood and metal aeroplanes (Aeroplanes where the primary structure is manufactured from wood or combinations of wood and metal).
	5.1.1+	Wooden and wood and metal aeroplanes (Aeroplanes where the primary structure is manufactured from wood or combinations of wood and metal) not exceeding 2730 Kg MTOM.
	5.1.2+	Wooden and wood and metal aeroplanes (Aeroplanes where the primary structure is manufactured from wood or combinations of wood and metal) not exceeding 2000 Kg MTOM.
	5.1.3+	Wooden and wood and metal aeroplanes (Aeroplanes where the primary structure is manufactured from wood or combinations of wood and metal) not exceeding 1200 Kg MTOM.
	5.2*	Unpressurised metal aeroplanes not exceeding 2730 Kg MTOM.
	5.2.1*	Unpressurised metal aeroplanes not exceeding 2730 Kg MTOM with fixed landing gear.
	5.3*	Unpressurised metal aeroplanes not exceeding 5700 Kg MTOM.
	5.3.1*	Unpressurised metal aeroplanes not exceeding 5700 Kg MTOM with fixed landing gear.
	5.4*	Unpressurised metal aeroplanes.
	5.5*	Pressurised metal aeroplanes not exceeding 5700 Kg MTOM and all unpressurised metal aeroplanes.
	5.5.1*	Pressurised and unpressurised metal aeroplanes not exceeding 5700 Kg MTOM.

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	5.7+	Unpressurised metal aeroplanes not exceeding 5700 Kg MTOM.
	5.7.1+	Unpressurised metal aeroplanes not exceeding 2730 Kg MTOM.
	5.7.2+	Unpressurised metal aeroplanes not exceeding 2000 Kg MTOM.
	5.7.3+	Unpressurised metal aeroplanes not exceeding 1200 Kg MTOM.
	5.8++	Unpressurised metal aeroplanes exceeding 5700 Kg MTOM.

	5.9++	Individual pressurised metal aeroplanes exceeding 2730 Kg MTOM, but not exceeding 5700 Kg MTOM.
	5.9.1+	Pressurised metal aeroplanes not exceeding 2730 Kg MTOM.
Category A – Aeroplanes 2	5.6++	Pressurised metal aeroplanes exceeding 5700 Kg MTOM.

* Not available as a new endorsement on a licence.

+ Available as individual type ratings or as a complete paragraph.

++ Only available as an individual type listed on the licence. Not available as a complete paragraph

Category	**Type Rating endorsement**	**Types/Systems Covered**
Category C - Engines	6.0+	Diesel engines in aeroplanes
	6.1*	Unsupercharged reciprocating piston engines, excluding diesel engines, fitted with a fixed pitch propeller.
	6.2*	Unsupercharged reciprocating piston engines, excluding diesel engines, fitted with fixed or variable pitch propeller.
	6.3+	Piston engines in aeroplanes, excluding diesel engines.
	6.3.1*	Piston engines, excluding diesel engines, in aeroplanes not exceeding 2730 Kg MTOM.
	6.4++	Jet-turbine engines in aeroplanes not exceeding 22.25 Kn (5000 lbs) static thrust, including where so endorsed, the associated APU installation.
	6.5++	Individual types of propeller turbine engines in aeroplanes (including, where so endorsed, the associated APU installation.
	6.6* ++	Jet turbine engines in aeroplanes, exceeding 22.25 Kn (5000 lbs) static thrust, including where so endorsed, the associated APU installation.

* Not available as a new endorsement on a licence.

+ Available as individual type ratings or as a complete paragraph.

++ Only available as an individual type listed on the licence. Not available as a complete paragraph.

Category	**Type Rating endorsement**	**Types/Systems Covered**
Category A&C - Rotorcraft	7.1+	Piston-engine rotorcraft.
	7.2	Reserved.
	7.3+	Turbine-engine rotorcraft not exceeding 2730 Kg MTOM

	7.4++	Individual turbine-engine rotorcraft exceeding 2730 Kg MTOM

+ Available as individual type ratings or as a complete paragraph.

++ Only available as an individual type listed on the licence. Not available as a complete paragraph.

Category	Type Rating endorsement	Types/Systems Covered
Category X - Instruments	8.1	General aircraft instrument systems but excluding instruments installed on any aircraft which has installed a Flight Director system.
	8.2	Smiths Flight system Sperry Zero Reader ZL1, ZL2 Flight Director.
	8.3	Flight Director systems employing vacuum driven gyroscopes (attitude)
	8.4	Flight Director systems employing electrically driven gyroscope systems (attitude), but excluding those systems defined in subparagraph 8.2.
	8.5	Reserved.
	8.6	Reserved.
	8.7	Reserved.
	8.8	Compensation and adjustment of airborne compass and compass systems.

Category	Type Rating endorsement	Types/Systems Covered
Category X - Electrical	9.1	Aircraft in which the main generation system output is DC (including alternators having a selfcontained rectifier system) and in which secondary alternators having an individual power rating not exceeding 1.5 kVA may be fitted.
	9.2	Aircraft in which the main generating system output is DC and which have installed ‘frequency wild’ alternators with an individual power rating exceeding 1.5 kVA for auxiliary services.
	9.3	Aircraft in which the main generation system output is ‘frequency wild’ AC and DC is supplied from transformer rectifier units.

	9.4	Aircraft in which the main generation system output is 'constant frequency' AC supplied from alternators driven by constant speed drive units, or variable speed constant frequency (VSCF) generator / converter systems and DC power is supplied from transformer rectifier units.

Category	Type Rating endorsement	Types/Systems Covered
Category R - Radio	12.1*	Airborne Communication Systems
	12.2	Airborne Communication Systems, Airborne Navigation Systems
	12.2.1	Airborne Communication Systems and Airborne Navigation systems installed in aircraft not exceeding 5700 Kg MTOM, excluding HF communication systems, passenger entertainment systems, multiplex systems, CVR and satellite communication systems.
	12.3	Airborne radar systems
	12.3.1	Airborne radar systems installed in aircraft not exceeding 5700 Kg MTOM, excluding weather radar and TCAS systems.

* Not available as a new endorsement on a licence.

Category	Type Rating endorsement	Types/Systems Covered
Category X - Automatic Pilots	13.1	Non-Radio-Coupled Automatic Pilots (aeroplanes).
	13.2	Radio-Coupled Automatic Pilots (aeroplanes), excluding ILS Coupled (LOC and GS) Automatic Pilots.
	13.3	ILS Coupled (LOC and GS) Automatic Pilots (aeroplanes).
	13.4	Non-Radio-Coupled Automatic Pilots (Rotorcraft).
	13.5	Radio-Coupled Automatic Pilots (Rotorcraft).

Category	Type Rating endorsement	Types/Systems Covered
Category A&C – Airships	14	Individual hot-air or gas airship.

Category	Type Rating endorsement	Types/Systems Covered

Category X - Compass compensation	15	Compensation and adjustment of airborne compass and compass systems.