SECTION 1 – REQUIREMENTS

1 *GENERAL*

This section contains the Requirements for Flight Crew Licensing.

2 *PRESENTATION*

2.1 **[**Each page is identified by the date of issue and the Amendment number under which it is amended or reissued.**]**

2.2 Sub-headings are italic typeface.

2.3 **[**New, amended and corrected text will be enclosed within heavy brackets until a subsequent amendment is issued.**]**

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SUBPART A – GENERAL REQUIREMENTS

JAR–FCL 1.001 Definitions and Abbreviations

(See IEM FCL 1.001)

Category (of aircraft):

Categorisation of aircraft according to specified basic characteristics, e.g. aeroplane, helicopter, glider, free balloon.

Conversion (of a licence):

The issue of a JAR–FCL licence on the basis of a licence issued by a non-JAA State.

Co-pilot:

"Co-pilot" means a pilot operating other than as pilot-in-command, an aircraft for which more than one pilot is required under the list of types of aeroplanes (see Appendix 1 to JAR-FCL 1.220) or the type certification of the aircraft, or the operational regulations under which the flight is conducted, but excluding a pilot who is on board the aircraft for the sole purpose of receiving flight instruction for a licence or rating.

Dual instruction time:

Flight time or instrument ground time during which a person is receiving flight instruction from a properly authorised instructor.

Flight Engineer:

A Flight Engineer is a person who complies with the requirements in JAR-FCL (also in Section 2).

Flight time:

[The total time from the moment an aircraft first moves for the purpose of taking off until the moment it finally comes to rest at the end of the flight.**]**

Instrument time:

Instrument flight time or instrument ground time.

Instrument flight time:

Time during which a pilot is controlling an aircraft in flight solely by reference to instruments.

Instrument ground time:

Time during which a pilot is receiving instruction in simulated instrument flight in synthetic training devices (STDs).

Multi-crew co-operation:

The functioning of the flight crew as a team of co-operating members led by the pilot-in-command.

Multi-pilot aeroplanes:

Aeroplanes certificated for operation with a minimum crew of at least two pilots.

Night:

The period between the end of evening civil twilight and the beginning of morning civil twilight, or such other period between sunset and sunrise as may be prescribed by the appropriate Authority.

Other training devices:

Training aids other than flight simulators, flight training devices or flight and navigation procedures trainers which provide means for training where a complete flight deck environment is not necessary.

Private pilot:

A pilot who holds a licence which prohibits the piloting of aircraft in operations for which remuneration is given.

Professional pilot:

A pilot who holds a licence which permits the piloting of aircraft in operations for which remuneration is given.

Proficiency checks:

Demonstrations of skill to revalidate or renew ratings, and including such oral examination as the examiner may require.

Rating:

An entry in a licence stating special conditions, privileges or limitations pertaining to that licence.

Renewal (of e.g. a rating or approval):

The administrative action taken after a rating or approval has lapsed that renews the privileges of the rating or approval for a further specified period consequent upon the fulfilment of specified requirements.

Revalidation (of e.g. a rating or approval):

The administrative action taken within the period of validity of a rating or approval that allows the holder to continue to exercise the privileges of a rating or approval for a further specified period consequent upon the fulfilment of specified requirements.

Route sector:

A flight comprising take-off, departure, cruise of not less than 15 minutes, arrival, approach and landing phases.

JAR-FCL 1.001 (continued)

Single-pilot aeroplanes:

Aeroplanes certificated for operation by one pilot.

Skill tests:

Skill tests are demonstrations of skill for licence or rating issue, including such oral examination as the examiner may require.

Solo flight time:

Flight time during which a student pilot is the sole occupant of an aircraft.

Student pilot-in-command (SPIC):

Flight time during which the flight instructor will only observe the student acting as pilot-in-command and shall not influence or control the flight of the aircraft.

Touring Motor Glider (TMG):

A motor glider having a certificate of airworthiness issued or accepted by a JAA Member State having an integrally mounted, non-retractable engine and a non-retractable propeller plus those listed in Appendix 1 to JAR-FCL 1.215.

It shall be capable of taking off and climbing under its own power according to its flight manual.

Type (of aircraft):

All aircraft of the same basic design, including all modifications except those modifications which result in a change of handling, flight characteristics or flight crew complement.

For abbreviations see IEM FCL 1.001.

[Amdt. 1, 01.06.00; Amdt. 2, 01.08.02; Amdt. 3, 01.07.03]

JAR–FCL 1.005 Applicability

(See Appendix 1 to JAR–FCL 1.005)
(See AMC FCL 1.005 & 1.015)

(a) *General*

(1) The requirements set out in JAR–FCL shall apply to all arrangements made for training, testing and applications for the issue of licences, ratings, authorisations, approvals or certificates received by the Authority from 1 July 1999.

(2) Whenever licences, ratings, authorisations, approvals or certificates are mentioned in JAR–FCL, these are meant to be licences, ratings, authorisations, approvals or certificates issued in accordance with JAR–FCL.

JAR-FCL 1.005(a)(2) (continued)

In all other cases these documents are specified as e.g. ICAO or national licences.

(3) Whenever a reference is made to JAA Member State for the purpose of mutual recognition of licences, ratings, authorisations, approvals or certificates, this means JAA full Member State.

(4) All synthetic training devices mentioned in JAR–FCL substituting an aircraft for training purposes are to be device qualified in accordance with JAR-STD and user approved in accordance with JAR-FCL by the Authority for the exercises to be conducted.

(5) Whenever a reference is made to aeroplanes this does not include microlights as defined nationally, unless otherwise specified.

(6) A licence issued on the basis of training performed outside a JAA Member State, except training performed according to JAR-FCL 1.055(a)(1), shall have an entry to limit the privileges to aircraft registered in the State of licence issue.

(7) Rating(s) issued on the basis of training performed outside a JAA Member State except training performed according to JAR-FCL 1.055(a)(1), shall be limited to aircraft registered in the State of licence issue.

(b) *Transitional arrangements*

(1) Training commenced prior to 1 July 1999 according to national regulations will be acceptable for the issue of licences or ratings under national regulations provided that training and testing is completed before 30th June 2002 for the applicable licence or rating.

(2) Licences and ratings, authorisations, approvals or medical certificates issued in accordance with the national regulations of JAA Member States before 1 July 1999 or issued in accordance with paragraph (1) above, shall continue to be valid with the same privileges, ratings and limitations, if any, provided that after 1 January 2000 all requirements for revalidation or renewal of such licences or ratings, authorisations, approvals or medical certificates shall be in accordance with the requirements of JAR–FCL, except as specified in sub paragraph (4).

(3) Holders of a licence issued in accordance with the national regulations of a JAA Member State before 1 July 1999 or in accordance with (b)(1) above, may apply to the State of licence issue for the issue of the equivalent licence specified in JAR–FCL 1 (Aeroplane) which extends the privileges to

JAR-FCL 1.005(b)(3) (continued)

other States as set out in JAR–FCL 1.015(a)(1). For the issue of such licences, the holder shall meet the requirements set out in Appendix 1 to JAR–FCL 1.005.

(4) Holders of a licence issued in accordance with the national regulations of a JAA Member State who do not fully meet the Section 1 requirements of JAR–FCL 3 (Medical) shall be permitted to continue to exercise the privileges of the national licence held.

(c) *Continuation of examiners holding national authorisations.*

Examiners holding national authorisations prior to implementation date, may be authorised as JAR–FCL 1 (Aeroplane) examiner provided that they have demonstrated a knowledge of JAR–FCL and JAR–OPS to the Authority. The authorisation will be for a maximum of 3 years. Thereafter re-authorisation will be subject to completion of the requirements set out in JAR-FCL 1.425(a) and (b).

[Amdt. 1, 01.06.00; Amdt. 2, 01.08.02]

JAR–FCL 1.010 Basic authority to act as a flight crew member

(a) *Licence and rating*

(1) A person shall not act as a flight crew member of a civil aeroplane registered in a JAA Member State unless that person holds a valid licence and rating complying with the requirements of JAR–FCL and appropriate to the duties being performed, or an authorisation as set out in JAR–FCL 1.085 and/or 1.230. The licence shall have been issued by:

(i) a JAA Member State; or

(ii) another ICAO Contracting State and rendered valid in accordance with JAR–FCL 1.015(b) or (c).

(2) Pilots holding national motor gliders licences/ratings/authorisations are also permitted to operate touring motor gliders under national regulations.

(3) Pilots holding a restricted national private pilot's licence are permitted under national regulations to operate aeroplanes registered in the State of licence issue within that State's airspace.

(b) *Exercise of privileges.* The holder of a licence, rating, or authorisation shall not exercise privileges other than those granted by that licence, rating, or authorisation.

JAR-FCL 1.010 (continued)

(c) *Appeals, Enforcement*

(1) A JAA Member State may at any time in accordance with its national procedures act on appeals, limit privileges, or suspend or revoke any licence, rating, authorisation, approval or certificate it has issued in accordance with the requirements of JAR–FCL if it is established that an applicant or a licence holder has not met, or no longer meets, the requirements of JAR–FCL or relevant national law of the State of licence issue.

(2) If a JAA Member State establishes that an applicant or licence holder of a JAR–FCL licence issued by another JAA Member State has not met, or no longer meets, the requirements of JAR–FCL or relevant national law of the State in which an aircraft is being flown, the JAA Member State shall inform the State of licence issue and the Licensing Division of the JAA Headquarters. In accordance with its national law, a JAA Member State may direct that in the interest of safety an applicant or licence holder it has duly reported to the State of licence issue and the JAA for the above reason may not pilot aircraft registered in that State or pilot any aircraft in that State's airspace.

[Amdt. 1, 01.06.00]

JAR–FCL 1.015 Acceptance of licences, ratings, authorisations, approvals or certificates

(See Appendix 1 to JAR–FCL 1.015)
(See Appendix 2 to JAR-FCL 1.015)
(See AMC FCL 1.005 & 1.015)

(a) *Licences, ratings, authorisations, approvals or certificates issued by JAA Member States*

(1) Where a person, an organisation or a service has been licensed, issued with a rating, authorisation, approval or certificate by the Authority of a JAA Member State in accordance with the requirements of JAR–FCL and associated procedures, such licences, ratings, authorisations, approvals or certificates shall be accepted without formality by other JAA Member States.

(2) Training performed after 8th October 1996 and in accordance with all the requirements of JAR–FCL and associated procedures shall be accepted for the issuance of JAR–FCL licence and ratings, provided that

JAR-FCL 1.015(a)(2) (continued)

licences in accordance with JAR–FCL shall not be issued until after 30th June 1999.

(b) *Licences issued by non-JAA States*

(1) A licence issued by a non-JAA State may be rendered valid at the discretion of the Authority of a JAA Member State for use on aircraft registered in that JAA Member State in accordance with Appendix 1 to JAR–FCL 1.015.

(2) Validation of a professional pilot licence and a private pilot licence with instrument rating shall not exceed one year from the date of validation, provided that the basic licence remains valid. Any further validation for use on aircraft registered in any JAA Member State is subject to agreement by the JAA Member States and to any conditions seen fit within the JAA. The user of a licence validated by a JAA Member State shall comply with the requirements stated in JAR–FCL.

(3) The requirements stated in (1) and (2) above shall not apply where aircraft registered in a JAA Member State are leased to an operator in a non-JAA State, provided that the State of the operator has accepted for the period of lease the responsibility for the technical and/or operational supervision in accordance with JAR–OPS 1.165. The licences of the flight crews of the non-JAA State operator may be validated at the discretion of the Authority of the JAA Member State concerned, provided that the privileges of the flight crew licence validation are restricted for use during the lease period only on nominated aircraft in specified operations not involving a JAA operator, directly or indirectly, through a wet lease or other commercial arrangement.

(c) *Conversion of a licence issued by a non-JAA State.*

(1) A professional pilot licence and/or IR issued by a non-JAA State may be converted to a JAR–FCL licence provided that an arrangement exists between the JAA and the non-JAA State. This arrangement shall be established on the basis of reciprocity of licence acceptance and shall ensure that an equivalent level of safety exists between the training and testing requirements of the JAA and the non-JAA State. Any arrangement entered into will be reviewed periodically, as agreed by the non-JAA State and the JAA. A licence converted according to such an arrangement shall have an entry indicating the non-JAA State upon which the conversion is based. Other Member States shall not be obliged to accept any such licence.

JAR-FCL 1.015(c) (continued)

(2) A private pilot licence issued by a non-JAA State may be converted to a JAR-FCL licence with a single-pilot aeroplane class/type ratings by complying with the requirements shown in Appendix 2 to JAR-FCL 1.015.

[(d) When an Authority issues a licence which deviates from JAR-FCL, an endorsement shall be made on the licence, under item XIII.**]**

[Amdt. 2, 01.08.02; Amdt. 3, 01.07.03]

JAR–FCL 1.016 Credit given to a holder of a licence issued by a non-JAA State

(a) An applicant for a JAR–FCL licence and IR, if applicable, already holding at least an equivalent licence issued in accordance with ICAO Annex 1 by a non-JAA State shall meet all the requirements of JAR–FCL, except that the requirements of course duration, number of lessons and specific training hours may be reduced.

The Authority may be guided as to the credits to be granted on the basis of a recommendation from an appropriate training organisation.

(b) The holder of an ATPL(A) issued in accordance with ICAO Annex 1 who meets the 1 500 hours flying experience requirements on multi-pilot aeroplanes as PIC or co-pilot of Appendix 1 to JAR-FCL 1.015 may be exempted from the requirements to undergo approved training prior to undertaking the theoretical knowledge examinations and the skill test, if that licence contains a valid multi-pilot type rating for the aeroplane to be used for the ATPL(A) skill test.

[Amdt. 1, 01.06.00; Amdt. 2, 01.08.02]

JAR–FCL 1.017 Authorisations/Ratings for special purposes

Authorisations/Ratings for special purposes associated with a licence (e.g. IMC flying, towing, aerobatics, dropping of parachutists, etc.) may be established by the Authority in accordance with the requirements of that JAA Member State for use solely within that Member State's airspace. The use of such an authorisation/rating in another JAA Member State's airspace requires the prior agreement of the State(s) visited, except where a bilateral agreement exists.

[Amdt. 1, 01.06.00]

JAR–FCL 1.020 Credit for military service
(See Appendix 1 to JAR–FCL 1.005)

Application for credit:

Military flight crew members applying for licences and ratings specified in JAR–FCL shall apply to the Authority of the State for which they serve(d). The knowledge, experience and skill gained in military service will be credited towards the relevant requirements of JAR–FCL licences and ratings at the discretion of the Authority. The policy for the credit given shall be reported to the JAA. The privileges of such licences shall be restricted to aircraft registered in the State of licence issue until the requirements set out in the Appendix 1 to JAR–FCL 1.005 are met.

[Amdt. 1, 01.06.00]

JAR–FCL 1.025 Validity of licences and ratings
(See IEM FCL 1.025)

(a) A licence holder shall not exercise the privileges granted by any licence or rating issued by a JAA Member State unless the holder maintains competency by meeting the relevant requirements of JAR–FCL.

(b) **[**Validity of the licence and revalidation of a rating**]**

[(1)**]** The validity of the licence is determined by the validity of the ratings contained therein and the medical certificate (see IEM FCL 1.025).

[(2) When issuing, revalidating or renewing a rating, the Authority may extend the validity period of the rating until the end of the month in which the validity would otherwise expire, that date remains the expiry date of the rating.**]**

(c) The licence will be issued for a maximum period of 5 years. Within this period of 5 years the licence will be re-issued by the Authority:

(1) after initial issue or renewal of a rating;

(2) when paragraph XII in the licence is completed and no further spaces remain;

(3) for any administrative reason;

(4) at the discretion of the Authority when a rating is revalidated.

Valid ratings will be transferred to the new licence document by the Authority.

JAR-FCL 1.025(c) (continued)

The licence holder shall apply to the Authority for the re-issue of the licence.

The application shall include the necessary documentation.

[Amdt. 1, 01.06.00; Amdt. 3, 01.07.03]

JAR–FCL 1.026 Recent experience for pilots not operating in accordance with JAR–OPS 1

(a) A pilot shall not operate an aeroplane carrying passengers as pilot-in-command or co-pilot unless he has carried out at least three take-offs and three landings as pilot flying in an aeroplane of the same type/class or a flight simulator of the aeroplane type/class to be used, in the preceding 90 days; and

(b) The holder of a licence that does not include a valid instrument rating (aeroplane) shall not act as pilot-in-command of an aeroplane carrying passengers at night unless during the previous 90 days at least one of the take-offs and landings required by JAR–FCL 1.026(a) above has been carried out by night.

[Amdt. 1, 01.06.00; Amdt. 2, 01.08.02]

JAR–FCL 1.030 Arrangements for testing

(a) *Authorisation of examiners.* The Authority will designate and authorise as examiners suitably qualified persons of integrity to conduct on its behalf, skill tests and proficiency checks. The minimum qualifications for examiners are set out in JAR–FCL 1 (Aeroplane), Subpart I. Examiners' responsibilities and privileges will be notified to them individually in writing by the Authority.

(b) *Number of examiners.* The Authority will determine the number of examiners it requires, taking account of the number and geographic distribution of its pilot population.

(c) *Notification of examiners* .

(1) The Authority will maintain a list of all examiners it has authorised stating for which roles they are authorised. The list will be made available to TRTOs, FTOs and registered facilities within the JAA Member State. The Authority will determine by which means the examiners will be allocated to the skill test.

(2) The Authority will advise each applicant of the examiner(s) it has designated for the conduct of the skill test for the issue of an ATPL(A).

JAR-FCL 1.030 (continued)

(d) Examiners shall not test applicants to whom flight instruction has been given by them for that licence or rating except with the expressed consent in writing of the Authority.

(e) *Pre-requisites for applicants undergoing a skill test.* Before a skill test for the issue of a licence or rating is taken the applicant shall have passed the associated theoretical knowledge examination, provided that exceptions may be made by the Authority for applicants undergoing a course of integrated flying training. Instruction for the associated theoretical knowledge examination shall always have been completed before such skill tests are taken. Except for ATPL issue, the applicant for a skill test shall be recommended for the test by the organisation/person responsible for the training.

[Amdt. 1, 01.06.00; Amdt. 2, 01.08.02]

JAR–FCL 1.035 Medical fitness
(See IEM FCL 1.035)

(a) *Fitness.* The holder of a medical certificate shall be mentally and physically fit to exercise safely the privileges of the applicable licence.

(b) *Requirement for medical certificate.* In order to apply for or to exercise the privileges of a licence, the applicant or the holder shall hold a medical certificate issued in accordance with the provisions of JAR–FCL 3 (Medical) and appropriate to the privileges of the licence.

(c) *Aeromedical disposition.* After completion of the examination the applicant shall be advised whether fit, unfit or referred to the Authority. The authorised medical examiner (AME) shall inform the applicant of any condition(s) (medical, operational or otherwise) that may restrict flying training and/or the privileges of any licence issued.

(d) *Operational Multicrew Limitation (OML – Class 1 only).*

(1) The limitation 'valid only as or with qualified co-pilot' is to be applied when the holder of a CPL or an ATPL does not fully meet the class 1 medical certificate requirements but is considered to be within the accepted risk of incapacitation (see JAR–FCL 3 (Medical), IEM FCL A, B and C). This limitation is applied by the Authority in the context of a multi-pilot environment. A 'valid only as or with qualified co-pilot' limitation can only be issued or removed by the Authority.

JAR-FCL 1.035(d) (continued)

(2) The other pilot shall be qualified on the type, not be over the age of 60, and not be subject to an OML.

(e) *Operational Safety Pilot Limitation (OSL – Class 2 only).* A safety pilot is a pilot who is qualified to act as PIC on the class/type of aeroplane and carried on board the aeroplane, which is fitted with dual controls, for the purpose of taking over control should the PIC holding this specific medical certificate restriction become incapacitated (see IEM FCL 1.035). An OSL can only be issued or removed by the Authority.

[Amdt. 1, 01.06.00]

JAR–FCL 1.040 Decrease in medical fitness
(See IEM FCL 3.040)

(a) Holders of medical certificates shall not exercise the privileges of their licences, related ratings or authorisations at any time when they are aware of any decrease in their medical fitness which might render them unable to safely exercise those privileges.

(b) Holders of medical certificates shall not take any prescription or non-prescription medication or drug, or undergo any other treatment, unless they are completely sure that the medication, drug or treatment will not have any adverse effect on their ability to perform safely their duties. If there is any doubt, advice shall be sought from the AMS, an AMC, or an AME. Further advice is given in JAR–FCL 3 (See IEM FCL 3.040).

(c) Holders of medical certificates shall, without undue delay, seek the advice of the AMS, an AMC or an AME when becoming aware of:

(1) hospital or clinic admission for more than 12 hours; or

(2) surgical operation or invasive procedure; or

(3) the regular use of medication; or

(4) the need for regular use of correcting lenses.

(d) Holders of medical certificates who are aware of:

(1) any significant personal injury involving incapacity to function as a member of a flight crew; or

(2) any illness involving incapacity to function as a member of a flight crew throughout a period of 21 days or more; or

JAR-FCL 1.040(d) (continued)

(3) being pregnant, shall inform the Authority in writing of such injury or pregnancy, and as soon as the period of 21 days has elapsed in the case of illness. The medical certificate shall be deemed to be suspended upon the occurrence of such injury or the elapse of such period of illness or the confirmation of the pregnancy, and:

(4) in the case of injury or illness the suspension shall be lifted upon the holder being medically examined under arrangements made by the Authority and being pronounced fit to function as a member of the flight crew, or upon the Authority exempting, subject to such conditions as it thinks fit, the holder from the requirement of a medical examination; and

(5) in the case of pregnancy, the suspension may be lifted by the Authority for such period and subject to such conditions as it thinks fit and shall cease upon the holder being medically examined under arrangements made by the Authority after the pregnancy has ended and being pronounced fit to resume her functions as a member of the flight crew.

[Amdt. 1, 01.06.00]

JAR–FCL 1.045 Special circumstances

(a) It is recognised that the provisions of all parts of JAR–FCL will not cover every possible situation. Where the application of JAR–FCL would have anomalous consequences, or where the development of new training or testing concepts would not comply with the requirements, an applicant may ask the Authority concerned for an exemption. An exemption may be granted only if it can be shown that the exemption will ensure or lead to at least an equivalent level of safety.

(b) Exemptions are divided into short term exemptions and long term exemptions (more than 6 months). The granting of a long term exemption may only be undertaken in agreement with the JAA Licensing Sectorial Team.

JAR–FCL 1.050 Crediting of flight time and theoretical knowledge

(See Appendix 1 to JAR–FCL 1.050)

(a) *Crediting of flight time*

(1) Unless otherwise specified in JAR–FCL, flight time to be credited for a licence or rating shall have been flown in the same

JAR-FCL 1.050(a) (continued)

category of aircraft for which the licence or rating is sought.

(2) *Pilot-in-command or under instruction*

(i) An applicant for a licence or rating is credited in full with all solo, dual instruction or pilot-in-command flight time towards the total flight time required for the licence or rating.

(ii) A graduate of an airline transport pilot integrated flying training course is entitled to be credited with up to 50 hours of student pilot-in-command instrument time towards the pilot-in-command time required for the issue of the airline transport pilot licence, commercial pilot licence and a multi-engine type or class rating.

(iii) A graduate of a CPL/IR integrated flying training course is entitled to be credited with up to 50 hours of the student pilot-in-command instrument time towards the pilot-in-command time required for the issue of the commercial pilot licence and a multi-engine type or class rating.

(3) *Co-pilot*

(i) The holder of a pilot licence, when acting as co-pilot, is entitled to be credited with all of the co-pilot time towards the total flight time required for a higher grade of pilot licence.

(ii) The holder of a pilot licence, when acting as co-pilot performing under the supervision of the pilot-in-command the functions and duties of a pilot-in-command, shall be entitled to be credited in full with this flight time towards the total flight time required for a higher grade of pilot licence, provided that the method of supervision is agreed with the Authority.

(b) *Crediting of theoretical knowledge*

(1) The holder of an IR(H) will be exempted from the theoretical knowledge instruction and examination requirement for an IR(A).

(2) The holder of the following licences will be exempted from the theoretical instruction and examination requirements provided they complete the revelant bridge instruction and pass the examination (see Appendix 1 to JAR–FCL 1.050).

JAR-FCL 1.050(b)(2) (continued)

(i) The holder of a helicopter licence for the issue of a PPL(A); or

(ii) the holder of an ATPL(H) not restricted to VFR for the issue of a CPL(A) or an ATPL (A); or

(iii) the holder of an ATPL(H) restricted to VFR or of a CPL(H) for the issue of a CPL(A).

(3) An applicant having passed the theoretical knowledge examination for an ATPL(A) is credited with the theoretical knowledge requirements for PPL(A), CPL(A) and IR(A).

(4) An applicant having passed the theoretical knowledge examination for CPL(A) is credited with the theoretical knowledge requirement for a PPL(A).

[Amdt. 1, 01.06.00]

JAR–FCL 1.055 Training organisations and registered facilities

(See Appendices 1a and 1b & Appendices 2 and 3 to JAR–FCL 1.055)
(See Appendix 2 to JAR–FCL 1.125)

(a) (1) Flying training organisations (FTOs) wishing to offer training for licences and associated ratings whose principal place of business and registered office is located in a JAA Member State, will be granted approval by that State when in compliance with JAR–FCL. Requirements for approval of FTOs are given in Appendix 1a to JAR–FCL 1.055. Part of the training may be performed outside the JAA Member States (see also Appendix 1b to JAR–FCL 1.055).

(2) FTOs wishing to offer training for licences and associated ratings whose principal place of business and registered office is located outside the JAA Member States, may be granted approval by a JAA full Member Authority in respect of any such location:

(i) if an arrangement has been agreed between the JAA and the non-JAA Authority of the State in which the FTO has its principal place of business and registered office, providing for the participation of that Authority in the approval process and provide regulatory oversight of the FTO;

JAR-FCL 1.055(a)(2) (continued)

or

(ii) (A) adequate jurisdiction and supervision by the approving Authority can be assured;

(B) the relevant additional requirements of Appendix 1c to JAR-FCL 1.055 are satisfied; and

(C) an approval process in accordance with the administrative procedures accepted by the JAA is applied by the approving Authority.

(b) (1) Type rating training organisations (TRTOs) located in a JAA Member State, wishing to offer training for type ratings will be granted approval when in compliance with JAR–FCL and the approval will be given by that State. Requirements for approval of TRTOs are given in Appendix 2 to JAR–FCL 1.055.

(2) For TRTOs located outside a JAA Member State approval will be granted, when in compliance with JAR–FCL, by the State which receives the application. Requirements for approval of TRTOs are given in Appendix 2 to JAR–FCL 1.055.

(c) Facilities wishing to offer training for PPL only and located in the JAA Member States shall register for that purpose with the Authority (see JAR–FCL 1.125).

[ ]

[Amdt. 1, 01.06.00; Amdt. 3, 01.07.03]

JAR–FCL 1.060 Curtailment of privileges of licence holders aged 60 years or more

(a) *Age 60–64.* The holder of a pilot licence who has attained the age of 60 years shall not act as a pilot of an aircraft engaged in commercial air transport operations except:

(1) as a member of a multi-pilot crew and provided that,

(2) such holder is the only pilot in the flight crew who has attained age 60.

(b) *Age 65.* The holder of a pilot licence who has attained the age of 65 years shall not act as a pilot of an aircraft engaged in commercial air transport operations.

JAR-FCL 1.060 (continued)

(CZ)JAR–FCL 1.060 Curtailment of privileges of licence holders aged 60 years or more (Czech Republic)

The holder of a pilot licence issued in the Czech republic who has attained the age of 62 years shall not act as a pilot of an aircraft engaged in commercial air transport operations.

[Amdt. 1, 01.06.00]

(F)JAR–FCL 1.060 Curtailment of privileges of licence holders aged 60 years or more (France)

The holder of a pilot licence who has attained the age of 60 shall not act as a pilot of an aircraft engaged in commercial air transport operations.

[Amdt. 1, 01.06.00]

(I)JAR-FCL 1.060 Curtailment of privileges of licence holders aged 60 years or more (Italy)

The holder of a pilot licence who has attained the age of 60 shall not act as a pilot of an aircraft engaged in commercial air transport operations.

[Amdt. 2, 01.08.02]

JAR–FCL 1.065 State of licence issue

(See JAR–FCL 1.010(c))

(a) An applicant shall demonstrate the satisfactory completion of all requirements for licence issue to the Authority of **[ ]** the 'State of licence issue' (see JAR–FCL 1.010(c)).

(b) **[**In circumstances agreed by both Authorities, an applicant who has commenced training under the responsibility of one Authority may be permitted to complete the requirements under the responsibility of the other Authority.**]**

[The agreement shall allow for:

(1) theoretical knowledge training and examinations;
(2) medical examination and assessment;
(3) flight training and testing,

JAR-FCL 1.065(b) (continued)

The Authorities shall agree the 'State of licence issue'.**]**

[(c)**]** Further ratings may be obtained under JAR–FCL requirements in any JAA Member State and will be entered into the licence by the State of licence issue.

[(d)**]** For administrative convenience, e.g. revalidation, the licence holder may subsequently transfer a licence issued by the State of licence issue to another JAA Member State, provided that employment or normal residency is established in that State (see JAR–FCL 1.070). That State would thereafter become the State of licence issue and would assume the responsibility for licence issue referred to in (a) above.

[(e)**]** An applicant shall hold only one JAR–FCL licence (aeroplane) and only one medical certificate at any time.

[Amdt. 1, 01.06.00; Amdt. 2, 01.08.02; Amdt. 3, 01.07.03]

JAR–FCL 1.070 Normal residency

Normal residency means the place where a person usually lives for at least 185 days in each calendar year because of personal and occupational ties or, in the case of a person with no occupational ties, because of personal ties which show close links between that person and the place where she or he is living.

JAR–FCL 1.075 Format and specifications for flight crew licences

(See Appendix 1 to JAR–FCL 1.075)

The flight crew licence issued by a JAA Member State in accordance with JAR–FCL will conform to the following specifications.

(a) *Content.* The item number shown will always be printed in association with the item heading. A standard JAA licence format is shown in Appendix 1 to JAR–FCL 1.075. Items I to XI are the 'permanent' items and items XII to XIV are the 'variable' items which may appear on a separate or detachable part of the main form. Any separate or detachable part shall be clearly identifiable as part of the licence.

(1) *Permanent items*

(I) State of licence issue.

(II) Title of licence.

(III) Serial number commencing with the postal code of the issuing State and followed by a code of numbers and/or

JAR-FCL 1.075(a)(1) (continued)

letters in Arabic numerals and in Roman script.

(IV) Name of holder (in Roman alphabet, if script of national language is other than Roman).

(V) Holder's address.

(VI) Nationality of holder.

(VII) Signature of holder.

(VIII) Authority and, where necessary, conditions under which the licence was issued.

(IX) Certification of validity and authorisation for the privileges granted.

(X) Signature of the officer issuing the licence and the date of issue.

(XI) Seal or stamp of the Authority.

(2) *Variable items*

(XII) Ratings – class, type, instructor, etc., with dates of expiry. Radio telephony (R/T) privileges may appear on the licence form or on a separate certificate.

(XIII) Remarks – i.e. special endorsements relating to limitations and endorsements for privileges.

(XIV) Any other details required by the Authority.

(b) *Material.* The paper or other material used will prevent or readily show any alterations or erasures. Any entries or deletions to the form will be clearly authorised by the Authority.

(c) *Colour.* White material will be used for pilot licences issued in accordance with JAR–FCL.

(d) *Language.* Licences shall be written in the national language and in English and such other languages as the Authority deems appropriate.

[Amdt. 1, 01.06.00]

JAR–FCL 1.080 Recording of flight time
(See IEM FCL 1.080)

(a) Details of all flights flown as a pilot shall be kept in a reliable record in a logbook format acceptable to the Authority (see IEM FCL 1.080). Details of flights flown under JAR–OPS 1, may be recorded in an acceptable computerised format maintained by the operator. In this case an operator shall make the records of all flights operated by the pilot, including differences and familiarisation training, available on request to the flight crew member concerned.

JAR-FCL 1.080(a) (continued)

(b) The record shall contain the following information:

(1) Personal details:

Name and address of the holder

(2) For each flight:

(i) Name of Pilot-in-command

(ii) Date (day, month, year) of flight

(iii) Place and time of departure and arrival (times (UTC) to be block time)

(iv) Type (aeroplane make, model and variant) and registration of aeroplane

(v) SE, ME

(vi) Total time of flight

(vii) Accumulated total time of flight

(3) For each flight simulator or FNPT session:

(i) Type and qualification number of training device

(ii) Synthetic training device instruction

(iii) Date (d/m/y)

(iv) Total time of session

(v) Accumulated total time

(4) Pilot function:

(i) Pilot-in-command (including solo, SPIC, PICUS time)

(ii) Co-pilot

(iii) Dual

(iv) Flight instructor / Flight examiner

(v) A remarks column will be provided to give details of specific functions e.g. SPIC, PICUS, instrument flight time*, etc.

* A pilot may log as instrument flight time only that time during which he operates the aircraft solely by reference to instruments, under actual or simulated instrument flight conditions.

(5) Operational conditions:

(i) Night

(ii) IFR

JAR-FCL 1.080 (continued)

(c) *Logging of time*

(1) Pilot-in-command flight time

(i) The holder of a licence may log as pilot-in-command time all of the flight time during which he is the pilot-in-command.

(ii) The applicant for or the holder of a pilot licence may log as pilot-in-command time all solo flight time and flight time as student pilot-in-command provided that such SPIC time is countersigned by the instructor.

(iii) The holder of an instructor rating may log as pilot-in-command all flight time during which he acts as an instructor in an aeroplane.

(iv) The holder of an examiner's authorisation may log as pilot-in-command all flight time during which he occupies a pilot's seat and acts as an examiner in an aeroplane.

(v) A co-pilot acting as pilot-in-command under the supervision of the pilot-in-command on an aeroplane on which more than one pilot is required under the type certification of the aeroplane or as required by JAR–OPS provided such pilot-in-command time under supervision (see (c)(5)) is countersigned by the pilot-in-command.

(vi) If the holder of a licence carries out a number of flights upon the same day returning on each occasion to the same place of departure and the interval between successive flights does not exceed thirty minutes, such series of flights are to be recorded as a single entry.

(2) Co-pilot flight time

The holder of a pilot licence occupying a pilot seat as co-pilot may log all flight time as co-pilot flight time on an aeroplane on which more than one pilot is required under the type certification of the aeroplane, or the regulations under which the flight is conducted.

(3) Cruise relief co-pilot flight time

A cruise relief co-pilot pilot may log all flight time as co-pilot when occupying a pilot's seat.

JAR-FCL 1.080(c) (continued)

(4) Instruction time

A summary of all time logged by an applicant for a licence or rating as flight instruction, instrument flight instruction, instrument ground time, etc. shall be certified by the appropriately rated and/or authorised instructor from whom it was received.

(5) PICUS (Pilot-in-command under supervision)

Provided that the method of supervision is acceptable to the Authority, a co-pilot may log as PIC flight time flown as PICUS, when all of the duties and functions of PIC on that flight were carried out, such that the intervention of the PIC in the interest of safety was not required.

(d) *Presentation of flight time record*

(1) The holder of a licence or a student pilot shall without undue delay present his flight time record for inspection upon request by an authorised representative of the Authority.

(2) A student pilot shall carry his flight time record logbook with him on all solo cross-country flights as evidence of the required instructor authorisations.

[Amdt. 1, 01.06.00]

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Appendix 1 to JAR–FCL 1.005
Minimum requirements for the issue of a JAR–FCL licence/authorisation on the basis of a national licence/authorisation issued in a JAA Member State
(See JAR–FCL 1.005(b)(3))
(See AMC FCL 1.005 & 1.015)
(See AMC FCL 1.125)

1 Pilot licences

A pilot licence issued by a JAA Member State in accordance with the national requirements of that State may be replaced by a JAR–FCL licence subject, where applicable, to conditions. For the replacement of such licences the holder shall:

(a) for ATPL(A) and CPL(A), complete as a proficiency check, type/class and instrument rating (IR if applicable) revalidation requirements of JAR-FCL 1.245(b)(1), JAR-FCL 1.245(c)(1)(i) or 1.245(c)(2) relevant to the privileges of the licence held.

(b) (i) for ATPL(A) and CPL(A) demonstrate to the satisfaction of the Authority that a knowledge of the relevant parts of JAR–OPS 1 and JAR–FCL (see AMC FCL 1.005 & 1.015) has been acquired;

(ii) for PPL(A) only demonstrate to the satisfaction of the Authority that a knowledge of the relevant parts of JAA Requirements (see AMC FCL 1.125) has been acquired;

(c) demonstrate a knowledge of English in accordance with JAR–FCL 1.200 if IR privileges are held;

(d) comply with the experience requirements and any further requirements as set out in the table below:

National licence held	Total flying hours experience	Any further JAA requirements	Replacement JAR–FCL licence and conditions *(where applicable)*	Removal of conditions	
(1)	(2)	(3)	(4)	(5)	
ATPL(A)	>1 500 as PIC on multi-pilot aeroplanes	None	ATPL(A)	Not applicable	(a)
ATPL(A)	>1 500 on multi-pilot aeroplanes	None	as in (c)(4)	as in (c)(5)	(b)
ATPL(A)	>500 on multi-pilot aeroplanes	demonstrate to the satisfaction of the Authority a knowledge of flight planning and performance as required by **[** Appendix 1 to JAR-FCL 1.470 **]**	ATPL(A), with type rating restricted to co-pilot	Demonstrate ability to act as PIC as required by JAR–FCL Appendix 2 to JAR–FCL 1.240.	(c)
CPL/IR(A) and passed an ICAO ATPL theory test in the JAA Member State of licence issue	>500 on multi-pilot aeroplanes, **[**or in multi-pilot operations on single-pilot aeroplanes JAR-FAR 23 commuter category in accordance with JAR-OPS 1 or equivalent national operational requirements.**]**	(i) demonstrate to the satisfaction of the Authority a knowledge of flight planning and performance as required by **[**Appendix 1 to JAR-FCL 1.470**]** (ii) meet remaining requirements of JAR–FCL 1.250(a)(1) & (2)	CPL/IR(A) with JAR–FCL ATPL theory credit	Not applicable	(d)
CPL/IR(A)	>500 on multi-pilot aeroplanes, **[**or in multi-pilot operations on single-pilot aeroplanes JAR/FAR 23 commuter category in accordance with JAR-OPS 1 or equivalent national operational requirements.**]**	(i) to pass an examination for JAR–FCL ATPL(A) knowledge in the JAA Member State of licence issue *(see text below table) (ii) meet remaining requirements of JAR–FCL 1.250(a)(1) & (2)	CPL/IR(A) with JAR–FCL ATPL theory credit	Not applicable	(e)

Appendix 1 to JAR–FCL 1.005 (continued)

National licence held	Total flying hours experience	Any further JAA requirements	Replacement JAR–FCL licence and conditions *(where applicable)*	Removal of conditions	
(1)	(2)	(3)	(4)	(5)	
CPL/IR(A)	>500 as PIC on single-pilot aeroplanes	none	CPL/IR(A) with type/class ratings restricted to single-pilot aeroplanes		(f)
CPL/IR(A)	<500 as PIC on single-pilot aeroplanes	demonstrate to the satisfaction of the Authority a knowledge of flight planning and flight performance as required by Appendix 1 to JAR-FCL 1.470	as (4)(f)	Obtain multi-pilot type rating as required by JAR–FCL 1.240	(g)
CPL(A)	>500 as PIC on single-pilot aeroplanes	night qualification, if applicable	CPL(A), with type/ class ratings restricted to single-pilot aeroplanes		(h)
CPL(A)	<500 as PIC on single-pilot aeroplanes	(i) night qualification, if applicable; (ii) demonstrate to the satisfaction of the Authority a knowledge of flight performance and planning as required by Appendix 1 to JAR-FCL 1.470	as (4)(h)		(i)
PPL/IR(A)	≥75 in accordance with IFR	night qualification if night flying privileges are not included in the instrument rating	PPL/IR(A) (the IR restricted to PPL)	demonstrate to the Authority a knowledge of flight performance and planning as required by Appendix 1 to JAR-FCL 1.470	(j)
PPL(A)	≥75 on aeroplanes	demonstrate the use of radio navigation aids	PPL(A)		(k)

* CPL holders already holding a type rating for a multi-pilot aeroplane are not required to have passed an examination for ATPL(A) theoretical knowledge whilst they continue to operate that same aeroplane type, but will not be given ATPL(A) theory credit for a JAR–FCL licence. If they require another type rating for a different multi-pilot aeroplane, they must comply with column (3), row (e) (i) of the above table.

2 Instructor ratings

National rating, authorisation or privileges held	Experience	Any further JAA requirements	Replacement JAR–FCL rating
(1)	(2)	(3)	(4)
FI(A)/IRI(A)/TRI(A)/CRI(A)	as required under JAR–FCL 1 (Aeroplane) for the relevant rating	demonstrate to the satisfaction of the Authority a knowledge of the relevant parts of JAR–FCL 1 (Aeroplane) and JAR–OPS as set out in AMC FCL 1.005 & 1.015	FI(A)/IRI(A)/TRI(A)/CRI(A)

* JAA Member States; instructors fulfilling all the above replacement requirements, but unable to obtain relevant JAR-FCL licence/rating(s) due to present implementation status of their State of licence issue, may be accepted to instruct for JAR-FCL licence and/or ratings.

Appendix 1 to JAR–FCL 1.005 (continued)

3 SFI authorisation

A SFI authorisation issued by a JAA Member State in accordance with the national requirements of that tate may be replaced by a JAR–FCL authorisation provided that the holder complies with the experience requirements and any further requirements as set out in the table below:

National authorisation held	Experience	Any further JAA requirements	Replacement JAR–FCL authorisation
(1)	(2)	(3)	(4)
SFI(A)	>1 500 hrs as pilot of MPA	(i) hold or have held a professional pilot licence (A) issued by a JAA Member State or a non JAR–FCL professional licence (A) acceptable to the Authority; (ii) have completed the flight simulator content of the applicable type rating course including MCC.	SFI(A)
SFI(A)	3 years recent experience as a SFI acceptable to the Authority	have completed the flight simulator content of the applicable type rating course including MCC	SFI(A)

This authorisation will be for a maximum period of 3 years.
Further re-authorisation will be subject to completion of the requirements set out in JAR–FCL 1.415.

4. Instructors on FTD and FNPT I

National authorisation held	Experience	Replacement JAR–FCL authorisation
(1)	(2)	(3)
Instructors on FTD and/or FNPT I	3 years recent experience as instructors on FTD and/or FNPT I acceptable to the Authority.	Instructions on FTD and/or FNPT I

[Amdt. 1, 01.06.00; Amdt. 3, 01.07.03]

Appendix 1 to JAR–FCL 1.015
Minimum requirements for the validation of pilot licences of non-JAA States
(See JAR–FCL 1.015)
(See AMC FCL 1.005 & 1.015)

1 The minimum requirements for the validation of a pilot licence of a non-JAA State by a JAA Member State are specified below.

Pilot licences for commercial air transportation and other professional activities

2 A pilot licence issued in accordance with ICAO Annex 1 by a non-JAA State may be validated subject to conditions by a JAA Member State in order to permit flights (other than flight instruction) in aeroplanes registered in that JAA Member State. To validate such licences, the holder shall:

(a) complete, as a skill test, the type or class rating revalidation requirements of JAR–FCL 1.245 relevant to the privileges of the licence held;

(b) demonstrate to the satisfaction of the Authority that a knowledge of the relevant parts of JAR–OPS and JAR–FCL (see AMC FCL 1.005 & 1.015) has been acquired;

(c) demonstrate a knowledge of English in accordance with JAR–FCL 1.200;

(d) hold a valid JAR–FCL Class 1 medical certificate;

(e) meet any published additional requirements that the JAA Member State deems necessary; and

(f) comply with the experience requirements set out in column (2) of the following table in relation to the validation conditions specified in column (3):

Licence held	Total flying hours experience	Validation conditions	
(1)	(2)	(3)	
ATPL(A)	>1 500 hours as PIC on multi-pilot aeroplanes	Commercial air transport in multi-pilot aeroplanes as PIC	(a)
ATPL(A) or CPL(A)/IR*	>1 500 hours as PIC or co-pilot on multi-pilot aeroplanes according to operational requirements	Commercial air transport in multi-pilot aeroplanes as co-pilot	(b)
CPL(A)/IR	>1 000 hours as PIC in commercial air transport since gaining an IR	Commercial air transport in single-pilot aeroplanes as PIC	(c)
CPL(A)/IR	>1 000 hours as PIC or as co-pilot in single-pilot aeroplanes according to operational requirements	Commercial air transport in single-pilot aeroplanes as co-pilot according to JAR–OPS	(d)
CPL(A)	>700 hours in aeroplanes other than TMGs, including 200 hours in the activity role for which validation is sought, and 50 hours in that role in the last 12 months	Activities in aeroplanes other than commercial air transport	(e)

*CPL(A)/IR holders on multi-pilot aeroplanes shall have demonstrated ICAO ATPL(A) level knowledge before validation

Private pilot licences with Instrument Rating

3 A private pilot licence with instrument rating issued in accordance with ICAO Annex 1 by a non-JAA State may be validated subject to conditions by a JAA Member State in order to permit flights (other than flight instruction) in aeroplanes registered in that JAA Member State. To validate such licences, the holder shall:

(a) complete, as a skill test, the type/class and instrument rating of Appendix 1 and 2 to JAR-FCL 1.210 and Appendix 3 to JAR-FCL 1.240;

(b) demonstrate to the satisfaction of the Authority in accordance with Subpart J, that a knowledge of Air Law and the Aeronautical Weather codes, subject number 050 10 03 01, as well as the Flight Planning & Performance (IR), subject number 030 00 00 00, Human Performance subject number 040 00 00 00 in accordance with Appendix 1 to JAR-FCL 1.470 has been acquired;

(c) demonstrate a knowledge of English in accordance with JAR-FCL 1.200;

(d) hold at least a valid JAR-FCL Class 2 medical certificate including hearing requirements in accordance with JAR-FCL 3.355(b);

Appendix 1 to JAR–FCL 1.015 (continued)

(e) hold R/T privileges acceptable to the Authority,

(f) comply with the experience requirements set out in column (2) of the following table:

Licence held	Total flying hours experience
(1)	(2)
PPL/IR	> 100 hrs PIC instrument flight time

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Appendix 2 to JAR-FCL 1.015
Conversion of a PPL issued by a non-JAA Member State to a JAR-FCL PPL
(See JAR-FCL 1.015(c)(2))

The minimum requirements for the conversion of a private pilot licence issued by a non-JAA Member State to a JAR-FCL licence are:

(a) the applicant shall hold a licence issued in accordance with ICAO Annex 1

(b) the applicant shall hold at least a JAR-FCL Class 2 medical certificate

(c) to hold R/T privileges acceptable to the Authority

(d) the applicant shall comply with the flying experience requirements set out in the table below

National licence held	Experience requirement	Any further JAR-FCL requirements
Current and valid national ICAO PPL	›100 hours as pilot of aeroplanes	(a) Pass a written examination in Air Law and Human Performance and Limitations (b) Pass the PPL skill test as set out in Appendix 1 to JAR-FCL 1.130 and 1.135 and Appendix 2 to JAR-FCL 1.135 (c) Fulfil the relevant requirements of Subpart F

[Amdt. 2, 01.08.02]

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Appendix 1 to JAR–FCL 1.050
Crediting of theoretical knowledge – Bridge instruction and examination syllabus
(See JAR–FCL 1.050)

1. Holder of a helicopter licence for the issue of a PPL(A):

From AMC-FCL 1.125 Syllabus of theoretical knowledge for the Private Pilot Licence (Aeroplane) all topics under the following subject heading:

Air Law; Aircraft General Knowledge; Flight Performance and Planning; Operational Procedures and Principles of flight.

Applicants shall pass a theoretical bridge examination in Air Law and ATC procedures as determined by the Authority and PPL(A) theoretical knowledge examinations in the other subjects (see JAR-FCL 1.130).

2. The holder of an ATPL(H) not restricted to VFR for the issue of a CPL(A) or an ATPL(A) and the holder restricted to VFR or of a CPL(H) for the issue of a CPL(A):

Subject : 010 AIR LAW AND ATC PROCEDURES	
REFERENCE	WORDING
010 01 01 01	Flight over territory of Contracting States
010 02 00 00	Annex 8 – Airworthiness of Aircraft
010 04 00 00	Annex 1 – Personnel licensing
010 05 01 00	Annex 2 – Essential definitions, applicability of the rules of the air, general rules
010 09 01 01	Aerodrome data
010 09 01 05	Emergency and other services

Subject : 021 AIRFRAME AND SYSTEMS	
REFERENCE	WORDING
021 01 00 00	Airframe and Systems – Aeroplanes
021 03 01 10	Propeller
021 03 02 02	Types of construction
021 03 03 06	Jet pipe
021 03 03 08	Reverse thrust
021 03 03 09	Performance and thrust augmentation
021 03 03 10	Bleed air
021 03 04 07	Thrust
021 03 04 08	Power plant operation and monitoring
021 03 05 02	Ram air turbine
021 04 01 00	Doors and emergency exits
021 04 05 00	Aircraft oxygen equipment

Appendix 1 to JAR–FCL 1.050 (continued)

Subject : 022 INSTRUMENTATION – AEROPLANES	
REFERENCE	WORDING
022 01 01 03	Airspeed indicator: maximum airspeed indicator, V_{MO} / M_{MO} pointer
022 01 01 04	Mach meter
022 02 01 00	Flight director
022 02 02 00	Auto-pilot
022 02 03 00	Flight envelope protection
022 02 04 00	Stability augmentation system
022 02 05 00	Automatic pitch trim
022 02 06 00	Thrust computation
022 02 07 00	Auto-thrust

Subject : 022 INSTRUMENTATION – AEROPLANES (contd/.)	
REFERENCE	WORDING
022 03 05 00	Overspeed warning
022 03 06 00	Stall warning
022 04 02 00	Ram rise, recovery factor
022 04 03 00	RPM indicator
022 04 04 00	High pressure line fuel flow meter
022 04 06 00	Meaning of coloured sectors
022 04 08 00	Vibration monitoring
022 04 10 00	Electronic displays

Subject : 031 MASS AND BALANCE – AEROPLANES	
REFERENCE	WORDING
031 01 01 02	Importance in regard to aircraft stability
031 01 02 00	Mass and balance limits
031 02 01 03	Zero Fuel Mass
031 02 04 00	Effects of overloading
031 03 01 04	Expression in percentage of mean aerodynamic chord
031 03 04 00	Area load, Running load, Supporting

Subject : 032 PERFORMANCE – AEROPLANES	
REFERENCE	WORDING
032 00 00 00	Performance - Aeroplanes

Appendix 1 to JAR–FCL 1.050 (continued)

Subject : 033 FLIGHT PLANNING AND FLIGHT MONITORING – AEROPLANES	
REFERENCE	WORDING
033 01 01 01	Selection of routes, speeds, heights (altitudes) and alternates
033 01 02 01	Computation of planned fuel usage for each leg and total fuel usage for the flight
033 01 02 02	Fuel for holding and diversion to alternates
033 01 02 03	Fuel reserves
033 01 02 04	Total fuel requirements for flight
033 02 03 05	Completion of pre-flight portion of fuel log
033 01 03 03	Revision of fuel reserve estimates
033 01 03 04	Selection of cruise altitude and power settings for new destination Fuel state, fuel requirements, fuel reserves
033 03 03 00	Simple fuel logs
033 05 00 00	Jet Aeroplanes Flight Planning (Additional considerations)
033 06 00 00	Practical completion of a flight plan

Subject : 050 METEOROLOGY	
REFERENCE	WORDING
050 02 07 00	Jet streams
050 09 02 02	CAT: Effects on flight
050 09 07 00	Stratospheric conditions

Subject : 061 GENERAL NAVIGATION	
REFERENCE	WORDING
061 04 06 00	Resolution of current DR problems by means of - Mercator Charts - Lambert Charts - Polar stereographic projections
061 06 00 00	Inertial Navigation Systems (INS)

Subject : 071 OPERATIONAL PROCEDURES – AEROPLANES	
REFERENCE	WORDING
071 00 00 00	Operational procedures – Aeroplanes

Subject : 081 PRINCIPLES OF FLIGHT – AEROPLANES	
REFERENCE	WORDING
081 00 00 00	Principles of flight – Aeroplanes

[Amdt. 1, 01.06.00; Amdt. 2, 01.08.02]

Appendix 1a to JAR–FCL 1.055
Flying Training Organisations for pilot licences and ratings

(See JAR–FCL 1.055)
(See IEM No. 1 to JAR–FCL 1.055)
(See IEM No. 2 to JAR–FCL 1.055)
(See IEM No. 3 to JAR–FCL 1.055)
(See AMC FCL 1.261(c)(2))

INTRODUCTION

1 A Flying Training Organisation (FTO) is an organisation staffed, equipped and operated in a suitable environment offering flying training, and/or synthetic flight instruction **[**and/or**]** theoretical knowledge instruction for specific training programmes.

2 A FTO wishing to offer approved training to meet JAR–FCL requirements shall obtain the approval of the Authority of a JAA Member State. No such approval will be granted by the Authority of the Member State unless:

(a) the Authority can enforce the JAR–FCL requirements; and

(b) the FTO meets all requirements of JAR–FCL.

This Appendix gives the requirements for the issue, revalidation and variation of the approval of a FTO. **[**A FTO needs only to meet the requirements to the instruction it is providing.**]**

OBTAINING APPROVAL

3 A FTO seeking approval shall provide to the Authority such operations and training manuals as required by paragraph 31. A FTO shall establish procedures acceptable to the Authority to ensure compliance with all relevant JAR-FCL requirements. The procedures shall include a quality system (see AMC FCL 1.055 and IEM FCL No. 1 to JAR–FCL 1.055) within the FTO to readily detect any deficiencies for self-remedial action. After consideration of the application the FTO will be inspected to ensure that it meets the requirements set out in this Appendix. Subject to satisfactory inspection, approval of the FTO will initially be granted for a period of one year, revalidation of the approval may be granted for further periods of up to three years. No Authority is obliged to grant an approval for a FTO outside the JAA Member States if the personnel resources are not available or the cost of processing the application for approval and inspections puts undue burden on the Authority.

4 All training courses shall be approved (see IEM FCL 1.055 (to be developed)).

5 The Authority will monitor course standards and will sample training flights with students. During such visits, access shall be given by the FTO to training records, authorisation sheets, technical logs, lectures, study notes and briefings and any other relevant material. A copy of the report on a visit to a FTO will be made available by the Authority to that FTO.

6 Approval will be varied, suspended or revoked by the Authority if any of the approval requirements or standards cease to be maintained to the minimum approved level.

7 If a FTO wishes to make changes to an approved course or to its operations or training manual the approval of the Authority shall be obtained before the changes are implemented. FTOs need not advise the Authority of minor changes in day-to-day operations. Where any doubt exists as to whether a proposed change is minor, the Authority shall be consulted.

8 A FTO may make training arrangements with other training organisations or make use of alternative base aerodromes as part of its overall training organisation, subject to the approval of the Authority.

Appendix 1a to JAR–FCL 1.055 (continued)

FINANCIAL RESOURCES

9 (a) A FTO shall satisfy the Authority that sufficient funding is available to conduct training to the approved standards (see IEM No. 2 to JAR–FCL 1.055).

(b) A FTO shall nominate a person acceptable to the Authority who shall satisfy the Authority that sufficient funding is available to conduct training to the approved standard. Such person shall be known as the accountable manager.

MANAGEMENT AND STAFFING

10 The management structure shall ensure supervision of all grades of staff by persons having the experience and qualities necessary to ensure the maintenance of high standards. Details of the management structure, indicating individual responsibilities, shall be included in the FTO's Operations Manual.

11 The FTO shall satisfy the Authority that an adequate number of qualified, competent staff are employed. For integrated courses, three persons on the staff shall be employed full time in the following positions:

Head of Training (HT)
Chief Flying Instructor (CFI)
Chief Ground Instructor (CGI)

For modular training courses, these positions may be combined and filled by one or two persons, full time or part time, depending upon the scope of training offered. At least one person on the staff must be full time. **[**At FTOs conducting theoretical knowledge instruction only, the positions of HT and CGI may be combined. The nominated person shall have a sound managerial capability, hold or have held a professional pilot licence related to the course to be conducted with ratings as appropriate and shall meet the requirements set out in paragraph 19 below.**]**

12 The number of part time instructors in relation to the scope of training offered shall be acceptable to the Authority.

13 The ratio of all students to flight instructors, excluding the HT, shall not normally exceed 6:1. Class numbers in ground subjects involving a high degree of supervision or practical work shall not normally exceed 12 students.

HEAD OF TRAINING (HT)

14 The HT shall have overall responsibility for ensuring satisfactory integration of flying training, synthetic flight training and theoretical knowledge instruction, and for supervising the progress of individual students. The HT shall have had extensive experience in training as a flight instructor for professional pilot licences and possess a sound managerial capability. The HT shall hold or have held in the three years prior to first appointment as a HT, a professional pilot licence and rating(s) issued in accordance with ICAO Annex 1, related to the flying training courses conducted.

CHIEF FLYING INSTRUCTOR (CFI)

15 The CFI shall be responsible for the supervision of flight and synthetic flight instructors and for the standardisation of all flight instruction and synthetic flight instruction. The CFI shall:

(a) hold the highest professional pilot licence related to the flying training courses conducted;

(b) hold the rating(s) related to the flying training courses conducted;

(c) hold a flight instructor rating for at least one of the types of aeroplane used on the course; and

(d) have completed 1 000 hours pilot-in-command flight time of which a minimum of 500 hours shall be on flying instructional duties related to the flying courses conducted of which 200 hours may be instrument ground time.

Appendix 1a to JAR–FCL 1.055 (continued)

INSTRUCTORS, OTHER THAN SYNTHETIC FLIGHT INSTRUCTORS

16 Instructors shall hold:

(a) a professional pilot licence and rating(s) related to the flying training courses they are appointed to conduct;

(b) an instructor rating relevant to the part of the course being conducted e.g. instrument rating instructor, flight instructor, type/class rating instructor, as appropriate; or

(c) an authorisation from the Authority to conduct specific training in a FTO (see JAR–FCL 1.300).

17 The maximum flying hours, maximum flying duty hours and minimum rest time between instructional duties of instructors shall be acceptable to the Authority.

INSTRUCTORS FOR SYNTHETIC FLIGHT TRAINING

18 For flight training duties on a FTD and a FNPT I, instructors shall hold or have held 3 years prior to the first appointment, a professional pilot licence and rating(s), except for instructors having an authorisation according to item 3 and/or 4 of Appendix 1 to JAR–FCL 1.005, appropriate to the training courses they are appointed to conduct, and have had instructional training experience. For flight training duties on a flight simulator and/or FNPT II, instructors shall hold a FI(A), TRI(A) or CRI(A) rating or a SFI(A) authorisation.

CHIEF GROUND INSTRUCTOR (CGI)

19 The CGI shall be responsible for the supervision of all ground instructors and for the standardisation of all theoretical knowledge instruction. The CGI shall have a practical background in aviation and have undergone a course of training in instructional techniques or have had extensive previous experience in giving theoretical knowledge instruction.

THEORETICAL KNOWLEDGE INSTRUCTORS

20 Theoretical Knowledge Instructors in licence and ratings examination subjects shall have appropriate experience in aviation and shall, before appointment, give proof of their competency by giving a test lecture based on material they have developed for the subjects they are to teach.

RECORDS

21 A FTO shall maintain and retain the following records for a period of at least 5 years, using appropriate administrative staff:

(a) details of ground, flying, and simulated flight training given to individual students;

(b) detailed and regular progress reports from instructors including assessments, and regular progress flight tests and ground examinations; and

(c) personal information, e.g. expiry dates of medical certificates, ratings, etc.

22 The format of the student training records shall be specified in the Training Manual.

23 The FTO shall submit training records and reports as required by the Authority.

TRAINING PROGRAMME

24 A training programme shall be developed for each type of course offered. This programme shall include a breakdown of flying and theoretical knowledge instruction in either a week-by-week or phase presentation, a list of standard exercises and a syllabus summary. In particular, synthetic flight training and theoretical knowledge instruction shall be phased in such a manner as to ensure that students shall be able to apply to flying exercises the knowledge gained on the ground. Arrangements should be made so that problems

encountered in instruction can be resolved during subsequent training. The content and sequence of the training programme shall be acceptable to the Authority.

TRAINING AEROPLANES

25 An adequate fleet of training aeroplanes appropriate to the courses of training shall be provided. Each aeroplane shall be fitted with duplicated primary flight controls for use by the instructor and the student. Swing-over flight controls shall not be acceptable. The fleet shall include, as appropriate to the courses of training, aeroplane(s) suitable for demonstrating stalling and spin avoidance and aeroplane(s) suitably equipped to simulate instrument meteorological conditions and suitably equipped for the instrument flight training required.

26 Only aeroplanes approved by the Authority for training purposes shall be used.

AERODROMES

27 The base aerodrome, and any alternative base aerodrome, at which flying training is being conducted shall have at least the following facilities:

(a) at least one runway or take-off area that allows training aeroplanes to make a normal take-off or landing at the maximum take-off or maximum landing mass authorised, as appropriate,

(i) under calm wind (not more than four knots) conditions and temperatures equal to the mean high temperature for the hottest month of the year in the operating area,

(ii) clearing all obstacles in the take-off flight path by at least 50 feet,

(iii) with the powerplant operation and the landing gear and flap operation (if applicable) recommended by the manufacturer, and

(iv) with a smooth transition from lift-off to the best rate of climb speed without exceptional piloting skills or techniques;

(b) a wind direction indicator that is visible at ground level from the ends of each runway;

(c) adequate runway electrical lighting if used for night training; and

(d) an air traffic control service except where, with the approval of the Authority, the training requirements may be satisfied safely by another means of air/ground communications.

FLIGHT OPERATIONS ACCOMMODATION

28 The following accommodation shall be available:

(a) An operations room with facilities to control flying operations.

(b) A flight planning room with the following facilities:

- appropriate current maps and charts
- current AIS information
- current meteorological information
- communications to ATC and the operations room
- maps showing standard cross-country routes
- maps showing current prohibited, danger and restricted areas
- any other flight safety related material.

(c) Adequate briefing rooms/cubicles of sufficient size and number.

(d) Suitable offices for the supervisory staff and room(s) to allow flying instructors to write reports on students, complete records, etc.

(e) Furnished crew-room(s) for instructors and students.

Appendix 1a to JAR–FCL 1.055 (continued)

THEORETICAL KNOWLEDGE INSTRUCTION FACILITIES

29 The following facilities for theoretical knowledge instruction shall be available:

(a) Adequate classroom accommodation for the current student population.

(b) Suitable demonstration equipment to support the theoretical knowledge instruction.

(c) An R/T training and testing facility.

(d) A reference library containing publications giving coverage of the syllabus.

(e) Offices for the instructional staff.

REQUIREMENTS FOR ENTRY TO TRAINING

30 A student accepted for training shall possess the appropriate medical certificate for the licence required and shall meet the entrance requirements set by the FTO, as approved by the Authority.

TRAINING MANUAL AND OPERATIONS MANUAL

31 A FTO shall prepare and maintain a Training Manual and an Operations Manual containing information and instructions to enable staff to perform their duties and to give guidance to students on how to comply with course requirements. A FTO shall make available to staff and, where appropriate, to students the information contained in the Training Manual, the Operations Manual and the FTO's approval documentation. The amendment procedure shall be stated and amendments properly controlled.

32 The Training Manuals shall state the standards, objectives and training goals for each phase of training that the students are required to comply with and shall include the following:

Part 1 – The Training Plan
Part 2 – Briefing and Air Exercises
Part 3 – Synthetic Flight Training
Part 4 – Theoretical Knowledge Instruction

For further guidance see IEM No. 3 to JAR–FCL 1.055.

33 The Operations Manual shall provide relevant information to particular groups of staff, e.g. FIs, synthetic flight instructors, ground instructors, operations and maintenance staff, etc., and shall include the following:

(a) General

(b) Technical

(c) Route

(d) Staff Training

For further guidance see IEM No. 3 to JAR–FCL 1.055.

[Amdt. 2, 01.08.02; Amdt. 3, 01.07.03]

Appendix 1b to JAR–FCL 1.055
Partial Training outside JAA Member States
(See JAR–FCL 1.055(a)(1))

FTOs partly training outside the territories of a JAA Member State may perform training according to the following:

(a) Provided the requirements set out in this Appendix are met, approval may be granted. Provided that the approving Authority considers proper supervision to be possible, training will be confined to all or part of the ATP integrated course (see Appendix 1 to JAR–FCL 1.300).

(b) The navigation progress test in Phase 3 of the ATP integrated course may be conducted by a locally based flight instructor not connected with the applicant's training, provided that the instructor holds a JAR–FCL licence containing FI(A) or CRI(A) privileges, as appropriate. On completion of the required training, the skill test for a CPL(A) in Phase 4 of the ATP course may be taken with a locally based Flight Examiner (Aeroplane) (FE(A)), provided that the examiner is authorised in accordance with JAR–FCL Subpart I and completely independent from the relevant FTO except with the express consent in writing of the Authority.

(c) The skill test for the instrument rating is to be taken in any JAA Member State at the discretion of the Authority that approves the training. A FTO providing approved training for the instrument rating outside JAA Member States will need to make arrangements for the approved course to include acclimatisation flying in the JAA Member State of the approving Authority or in the airspace of any JAA Member State at the discretion of the approving Authority prior to any student taking the instrument rating skill test.

(d) Training for ATPL theoretical knowledge may be given at an FTO conducting approved training outside JAA Member States. The theoretical knowledge examinations for licence or rating issue shall be conducted by the Authority of the State of licence issue (see JAR–FCL 1.485). The arrangements for testing (see JAR–FCL 1.030) shall be carefully considered in regard to their training outside JAA Member States.

(e) Instruction may only be given under the direct control of a CFI(A) or nominated deputy holding a JAR–FCL licence and instructor rating as set out in paragraph 16 of Appendix 1a to JAR–FCL 1.055, who is to be present when training is given in the non JAA Member State.

[Amdt. 1, 01.06.00; Amdt. 2, 01.08.02]

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Appendix 1c to JAR–FCL 1.055
Additional Requirements for training in FTOs whose principal place of business and registered offices are located outside the JAA States
(See JAR-FCL 1.055(a)(2)
(See Appendix 1 to JAR-FCL 1.300)

APPROVAL PROCESS

1 FTOs whose principal place of business and registered office are located outside the JAA States wishing to train for JAR-FCL licences and associated ratings shall apply for approval of such courses to a National Aviation Authority of any full JAA Member State. Approval will be subject to the following:

(a) The FTO shall meet the requirements of Appendix 1a to JAR-FCL 1.055 and any additional requirements of this Appendix; and

(b) The Authority to which application has been made considers it possible to discharge its regulatory responsibilities for the approval process and an adequate level of supervision as required by the agreed JAA procedures. The cost and process of approval and supervision shall not put undue burden on the resources of the Authority; and

(c) The approving JAA National Aviation Authority can ensure adequate jurisdiction over the FTO during the approval process and the conduct of subsequent training courses ; and

(d) The National Aviation Authority of the non-JAA State in which the FTO has its principal place of business and registered office may assist the Authority of a JAA Member State in the approval process and provide oversight of training courses subject to an arrangement being agreed between the JAA and that non- JAA State.

2 Subject to satisfactory inspection, the approval of the FTO will be granted for a period of one year, revalidation of the approval may be granted for further periods of one year.

JURISDICTION

3 In the context of approval of FTOs located outside JAA Member States, the term ‘adequate jurisdiction’ shall mean that the Authority of the approving State shall be able to:

(a) conduct initial and routine inspections of the FTO located in that non-JAA State to ensure compliance with the requirements of JAR-FCL; and

(b) conduct flight tests and other standardisation checks as deemed necessary by the approving Authority; and

(c) discharge its legal responsibilities for the grant, variation, suspension or revocation of approvals in accordance with the applicable law of the approving JAA Member State.

The approving Authority may, subject to an arrangement between the JAA and the non-JAA Authority of the State in which the FTO has its principal place of business and registered office, delegate responsibility for the provisions of paragraph 3(a) above to that non-JAA Authority.

FTOs TRAINING FOR PROFESSIONAL LICENCES AND RATINGS

4 Provided that the requirements set out in this Appendix are met, approval may be granted if the approving Authority considers adequate supervision in accordance with JAA procedures to be possible.

5 The skill test for the Instrument Rating shall be conducted in the JAA Member State of the approving Authority. FTOs shall make arrangements for the approved course to include acclimatisation flying within the JAA Member State of the approving Authority or any other JAA Member State at the discretion of the approving Authority prior to any student taking the instrument rating skill test with an examiner authorised by the approving Authority.

6 The navigation progress test in Phase 3 of the ATP(A) integrated course may be conducted by a locally-based FI(A) approved by the JAA approving Authority and not connected with the applicant’s training, provided that the instructor holds a JAR-FCL licence containing FI(A) privileges, as appropriate. On completion of the required training, the skill test for the CPL(A) in Phase 4 of the ATP integrated course may

be taken with a locally-based FE(A) designated and authorised by the JAA approving Authority, provided that the examiner is authorised in accordance with JAR-FCL Subpart I and completely independent from the FTO except with the expressed consent in writing of the approving Authority.

FTOs TRAINING FOR THE PPL(A) AND ASSOCIATED RATINGS ONLY

7 Provided that the requirements of this Appendix are met, approval to conduct courses for the JAR-FCL PPL(A) and associated ratings may be granted if the approving Authority considers adequate supervision in accordance with JAA procedures to be possible.

8 Training aeroplanes, airfields and navigation training routes used for PPL training shall be acceptable to the approving Authority.

9 On completion of the required training the PPL(A) skill test may be taken by a locally-based FE(A) authorised by the approving Authority provided that the examiner has taken no part in the student's flight instruction.

10 The Training and Operations Manuals required by Appendix 1a to JAR-FCL 1.055 may, for FTOs conducting training for the PPL(A) and associated ratings only, be combined and contain only those references relevant to training for the PPL(A).

THEORETICAL KNOWLEDGE

11 Training for theoretical knowledge may be given at a FTO conducting approved training outside the JAA Member States. The theoretical knowledge examinations for licence or rating issue shall be conducted by the approving Authority (see JAR-FCL 1.485).

[Amdt. 2, 01.08.02]

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Appendix 2 to JAR–FCL 1.055
Type Rating Training Organisations for the issue of type ratings only to pilot licence holders

(See JAR–FCL 1.055)
(See also JAR–FCL 1.261(c) & (d) for approval of courses)
(See IEM No. 1 to JAR–FCL 1.055)
(See IEM No. 2 to JAR–FCL 1.055
(See IEM No. 3 to JAR–FCL 1.055)
(See AMC FCL 1.261(c)(2))

INTRODUCTION

1 A Type Rating Training Organisation (TRTO) is an organisation staffed, equipped and operated in a suitable environment offering type rating training, and/or MCC-training, and/or synthetic flight instruction and, if applicable, theoretical instruction for specific training programmes.

2 A TRTO wishing to offer approved training to meet JAR–FCL requirements shall obtain the approval of the Authority of a JAA Member State. No such approval will be granted by the Authority of the Member State unless:

(a) the Authority can enforce the JAR–FCL requirements;

(b) the TRTO meets all requirements of JAR–FCL.

This Appendix gives the requirements for the issue, revalidation and variation of the approval of a TRTO.

OBTAINING APPROVAL

3 A TRTO seeking approval shall provide to the Authority operations and training manuals, including quality systems, and descriptions of its training schemes as required by paragraph 17 and 25 through 27. After consideration of the application, the TRTO will be inspected to ensure that it meets the requirements set out in this Appendix. Subject to satisfactory inspection, approval of the TRTO will initially be granted for a period of one year, revalidation of the approval may be granted for further periods of up to three years (see AMC FCL 1.055 and IEM FCL No. 1 to JAR–FCL 1.055). No Authority is obliged to grant an approval for a TRTO outside the JAA Member States if the personnel resources are not available or the cost of processing the application for approval and inspections puts undue burden on the Authority.

4 All training courses shall be approved (see IEM FCL 1.055 to be developed).

5 Approval will be varied, suspended or revoked by the Authority if any of the approval requirements or standards cease to be maintained to the minimum approved level.

6 If a TRTO wishes to make changes to an approved course or to its operations or training manual the approval of the Authority shall be obtained before the changes are implemented. TRTOs need not advise the Authority of minor changes in day-to-day operations. Where any doubt exists as to whether a proposed change is minor, the Authority shall be consulted.

7 A TRTO may make training arrangements with other training organisations or make use of alternative base aerodromes as part of its overall training organisation, subject to the approval of the Authority.

FINANCIAL RESOURCES

8 (a) A TRTO shall satisfy the Authority that sufficient funding is available to conduct training to the approved standards (see IEM No. 2 to JAR–FCL 1.055).

(b) A TRTO shall nominate a person acceptable to the Authority who shall satisfy the Authority that sufficient funding is available to conduct training to the approved standard. Such person shall be known as the accountable manager.

Appendix 2 to JAR–FCL 1.055 (continued)

INSPECTION

9 In addition to the initial inspection, the Authority will make certain inspections to determine the TRTO's compliance with JARs and the approval.

10 During such visits, access shall be given by the TRTO to training records, authorisation sheets, technical logs, lectures, study notes and briefings and any other relevant material. A copy of any report on a visit to a TRTO will be made available to that TRTO.

MANAGEMENT AND STAFFING

11 The management structure shall ensure supervision of all grades of staff by persons having the experience and qualities necessary to ensure the maintenance of high standards. Details of the management structure, indicating individual responsibilities, shall be included in the TRTO's Operations Manual.

12 A Head of Training (HT) acceptable to the Authority shall be nominated. The HT's responsibilities shall include ensuring that the TRTO is in compliance with JAR–FCL requirements. This person is ultimately directly responsible to the Authority.

13 The TRTO shall have adequate personnel necessary to accomplish the training objectives. The duties of each instructor shall be identified and documented.

TYPE RATING INSTRUCTOR

14 Type Rating Instructors (TRI) shall hold:

(a) a professional pilot licence and rating(s) related to the flying training courses they are appointed to conduct;

(b) a type rating instructor rating for the aeroplanes used on the course(s); or

(c) an authorisation from the Authority to conduct specific training in a TRTO (see JAR–FCL 1.300).

INSTRUCTORS FOR SYNTHETIC FLIGHT TRAINING

15 For flight training duties on a FTD, instructors shall have instructional experience appropriate to the training courses they are appointed to conduct and hold or have held 3 years prior to the first appointment, a professional pilot licence, except for instructors having an authorisation according to item 3 and/or 4 of Appendix 1 to JAR–FCL 1.005. For multi-pilot type rating and/or MCC flight training on a flight simulator and/or FTD and/or FNPT II, instructors shall hold a TRI rating or a SFI authorisation.

THEORETICAL KNOWLEDGE INSTRUCTION

16 The theoretical knowledge instruction shall be conducted by an authorised instructor holding the appropriate type/class rating or any instructor having appropriate experience in aviation and knowledge of the aircraft concerned, e.g. flight engineer, maintenance engineer, flight operations officer.

TRAINING STANDARDS

17 The TRTO shall establish a system to ensure that the training centre operations and training are run efficiently and effectively. The quality system shall determine the effectiveness of TRTO policies, procedures, and training.

RECORDS

18 A TRTO shall maintain the following records and retain for a period of at least 5 years, using appropriate administrative staff:

(a) pilot trainee's assessments before and during the course;

Appendix 2 to JAR–FCL 1.055 (continued)

(b) details of theoretical knowledge, flying, and simulated flight training given to individual trainees; and

(c) personal information, (expiry dates of medical certificates, ratings, etc.) related to TRTO's personnel.

19 The format of the trainee's training records shall be specified in the Training Manual.

20 The TRTO shall submit training records and reports as required by the Authority.

TRAINING PROGRAMME

21 A training programme shall be developed for each type of course offered. This programme shall include a breakdown of flying and ground training in either a week-by-week or phase presentation, a list of standard exercises and a syllabus summary. In particular, synthetic flight training and theoretical knowledge instruction shall be phased in such a manner as to ensure that trainees shall be able to apply to flying exercises the knowledge gained on the ground. Arrangements should be made so that problems encountered in instruction can be resolved during subsequent flight training.

TRAINING AEROPLANES

22 Each aeroplane must be equipped as required in the training specifications concerning the approved course in which it is used.

FACILITIES

23 Suitable training facilities shall be provided.

REQUIREMENTS FOR ENTRY TO TRAINING

24 The TRTOs shall be responsible for ensuring that trainees meet at least the pre-requisite conditions for type rating training as set out in JAR–FCL 1.250.

TRAINING MANUAL AND OPERATIONS MANUAL

25 A TRTO shall provide and maintain a Training Manual and an Operations Manual containing information and instructions to enable staff to perform their duties and to give guidance to trainees on how to comply with course requirements. A TRTO shall make available to staff and, where appropriate, to trainees the information contained in the Training Manual, the Operations Manual and the TRTO's approval documentation. The amendment procedure shall be stated and amendments properly controlled.

26 The Training Manual shall state the standards, objectives and training goal for each phase of training that the trainees are required to comply with, including stating the entry requirements for each course, as applicable. It shall include the following:

Part 1 – The Training Plan
Part 2 – Briefing and Air Exercises
Part 3 – Synthetic Flight Training
Part 4 – Theoretical Knowledge Instruction

For further guidance see IEM No. 3 to JAR–FCL 1.055.

27 The Operations Manual shall provide relevant information to particular groups of staff, e.g. TRIs, synthetic flight instructors, ground instructors, operations and maintenance staff, etc. and shall contain the following:

(a) General

(b) Technical

(c) Route

Appendix 2 to JAR–FCL 1.055 (continued)

(d) Staff Training

For further guidance see IEM No. 3 to JAR–FCL 1.055.

[Amdt. 1, 01.06.00]

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[Appendix 3 to JAR–FCL 1.055
Approval of Modular Theoretical Knowledge Distance Learning Courses
(See Appendix 1 to JAR-FCL 1.130 & 1.135)
(See Appendix 1 to JAR–FCL 1.160 & 1.165(a)(4))
(See Appendix 1 to JAR-FCL 1.205)
(See Appendix 1 to JAR-FCL 1.251)
(See Appendix 1 to JAR-FCL 1.285)
(See AMC FCL 1.055(a))

TRAINING ORGANISATION

1. Classroom accommodation shall be available either at the principal place of registration of the training organisation or, subject to the approval of the Authority, within a suitable facility elsewhere. In either case, both classrooms and all associated teaching facilities shall conform to the requirements for organisation approval. Before training commences, approval will be obtained from the Authority to conduct a modular course programme using distance learning.

2. The Head of Training or CGI of an FTO undertaking distance learning shall comply with the requirements of Appendix 1a to JAR-FCL 1.055. All theoretical knowledge instructors shall meet the requirements of JAR-FCL and have appropriate qualification or relevant experience which is satisfactory to the Authority.

3. FTOs delivering only theoretical knowledge training will be subject to the same approval and audit requirements as are applied to FTOs in accordance with Appendix 1a to JAR-FCL 1.055.

4. It is open to the approved FTO to provide some or all of these courses either on a full time attendance basis, or by distance learning. An element of classroom instruction shall be included in all subjects of modular distance learning courses. The amount of time spent in actual classroom instruction shall be not less than 10% of the total duration of the course.

INSTRUCTORS

5. All instructors shall be fully conversant in the requirements of the distance learning programme, including the quality assurance system. Their initial training shall take place at the principal place of registration; all subsequent training shall be to the same standard as for resident instructors. Wherever instructors are located, the Quality System shall provide a satisfactory means of monitoring individual performance and adhere to approved training programmes.

TRAINING COURSES

6. Distance Learning will only be approved as a component of a course of theoretical knowledge instruction for the following courses:

(a) modular courses of theoretical knowledge instruction for the PPL(A), CPL(A), IR(A) and ATPL(A).

(b) courses of additional theoretical knowledge for a class or type rating for a single pilot high performance aeroplane.**]**

[Amdt. 3, 01.07.03]

Appendix 1 to JAR–FCL 1.075
Specifications for flight crew licences
(See IEM FCL 3.100)

GENERAL

1 A valid licence including a valid medical certificate has always to be carried by the pilot when exercising the privileges of the licence.

2 A document containing a photo shall be carried for purposes of identification of the holder of the licence.

3 Any medical endorsements (e.g. use of spectacles, etc.) will be entered on the medical certificate (see JAR–FCL 3 IEM FCL 3.100) and at the discretion of the Authority in the licence.

4 In this subpart, the 'Authority' is the Authority of the State of licence issue.

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Appendix 1 to JAR–FCL 1.075 (continued)

STANDARD JAA LICENCE FORMAT

Cover page

Authority name and logo (English and national language) JOINT AVIATION AUTHORITIES (English only) FLIGHT CREW LICENCE (english and national language) Issued in accordance with ICAO and JAR-FCL standards (English and national language)	*Requirements* *Size of each page shall be not less than one eighth A4*

Page 2

I	**State of issue**	*Requirements*
III	**Licence number**	*Licence number will always commence with the U.N. country code of the State of licence issue.*
IV	**Last and first name of holder**	
XIV	**Date** (see instructions) and **Place of birth**	*Standard date format is to be used, i.e. day / month / year in full (e.g., 21/01/1995)*
V	**Address** Street, town, area, zip code	*See JAR–FCL 1.070*
VI	**Nationality**	
VII	**Signature of holder**	
VIII	**Issuing Authority** e.g. This CPL(A) has been issued on the basis of an ATPL issued by ….. (non-JAA State) …….	
X	**Signature of issuing officer and date**	
XI	**Seal or stamp of issuing Authority**	

Appendix 1 to JAR–FCL 1.075 (continued)

Page 3

II	**Titles of licences, date of initial issue and country code**	*Abbreviations used will be as used in JAR–FCL (e.g. PPL(H), ATPL(A), etc.)* *Standard date format is to be used, i.e. day / month / year in full (e.g., 21/01/1995)*
IX	**Validity:** This licence is to be re-issued not later than ..... The privileges of the licence shall be exercised only if the holder has a valid medical certificate for the required privilege. By the application of JAR–FCL 1.015(a)(1), the licence holder is entitled to exercise licence privileges on aircraft registered in any Member State of the Joint Aviation Authorities. A document containing a photo shall be carried for the purposes of identification of the licence holder.	*Re-issue is to be not later than 5 years from the date of initial issue shown in item II.* *This document is not specified, but a passport would suffice when outside the State of licence issue.*
XII	**Radiotelephony privileges:** The holder of this licence has demonstrated competence to operate R/T equipment on board aircraft in English (other languages specified).	
XIII	**Remarks:** e.g. valid only on aeroplanes registered in the State of licence issue.	*All additional licensing information required by ICAO, EC Directive / Regulations or JARs to be entered here*

Page 4

XII Ratings to be revalidated	
Class/Type/IR	***Remarks / Restrictions***
Instructors	

Requirements

These pages are intended for use by the Authority to state requirements following the initial issue of ratings, or the renewal of expired ratings.

Initial issues and renewal of ratings will always be entered by the Authority.

Operational limitations will be entered in the Remarks / Restrictions against the appropriate restricted privilege, e.g. IR skill test taken with co-pilot, restricted instruction privileges to one aircraft type, etc. Medical limitations, conditions and variations (e.g. valid only as co-pilot) will be entered as stated in the medical certificate (see IEM FCL 3.100).

Appendix 1 to JAR–FCL 1.075 (continued)

Pages 5, 6 and 7:

For revalidation of proficiency checks for type, class and instrument ratings, the standard JAA licence format allows for these pages to have entries made in the licence by the examiner undertaking the proficiency checks. Alternatively, at the discretion of the Authority, revalidating entries may only be made by that Authority.

If a proficiency check performed on a multi-engine aeroplane includes the IR part of the check, this will revalidate the IR (A) (with restrictions, if any). If the IR part of a proficiency check is not performed, and IR proficiency checks on other aeroplanes do not carry across corresponding IFR privileges, the Examiner will indicate 'VFR' against the revalidation of that rating.

Instructor ratings and SE piston class ratings may also at the discretion of the Authority be revalidated in the licence by the Examiner who forms a part of the revalidation process. If an Examiner is not involved in the revalidation process, the rating entry will be made by the Authority.

Ratings that are not validated will be removed from the licence at the discretion of the Authority and not later than 5 years from the last revalidation.

XII

Rating	Date of test	Valid until	Examiners authorisation no.	Examiners signature

(Each page will contain 10 spaces for initial issue and revalidation of ratings)

Page 8:

Abbreviations used in this licence	

e.g. ATPL (Airline Transport Pilot Licence), CPL (Commercial Pilot Licence), IR (Instrument rating), R/T (Radio Telephony), MEP (Multi-engine piston aeroplanes), FI (Flight Instructor), TRE (Type Rating Examiner), etc...

[Amdt. 1, 01.06.00; Amdt. 2, 01.08.02]

SUBPART B – STUDENT PILOT (Aeroplane)

JAR–FCL 1.085 Requirements

(a) A student pilot shall meet requirements specified by the Authority in the State in which the student intends to train. In prescribing such requirements the Authority shall ensure that the privileges granted would not permit student pilots to constitute a hazard to air navigation.

(b) A student pilot shall not fly solo unless authorised by a flight instructor.

JAR–FCL 1.090 Minimum age

A student pilot shall be at least 16 years of age before the first solo flight.

JAR–FCL 1.095 Medical fitness

A student pilot shall not fly solo unless that student pilot holds a valid Class 1 or Class 2 medical certificate.

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SUBPART C – PRIVATE PILOT LICENCE (Aeroplane) – PPL(A)

JAR–FCL 1.100 Minimum age

An applicant for a PPL(A) shall be at least 17 years of age.

JAR–FCL 1.105 Medical fitness

An applicant for a PPL(A) shall hold a valid Class 1 or Class 2 medical certificate. In order to exercise the privileges of a PPL(A) a valid Class 1 or Class 2 medical certificate shall be held.

JAR–FCL 1.110 Privileges and conditions

(a) *Privileges.* Subject to any other conditions specified in JARs, the privileges of the holder of a PPL(A) are to act, but not for remuneration, as pilot-in-command or co-pilot of any aeroplane engaged in non-revenue flights.

(b) *Conditions*

(1) An applicant for a PPL(A) who has complied with the conditions specified in JAR–FCL 1.100, 1.105, 1.120, 1.125(a) and (b), 1.130 and 1.135 shall have fulfilled the requirements for the issue of a PPL(A) including at least the class/type rating for the aeroplane used in the skill test.

(2) If the privileges of the licence are to be exercised at night, the holder shall have complied with JAR–FCL 1.125(c).

[ ]

[Amdt. 1, 00.00.00]

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[Amdt. 1, 00.00.00]

JAR–FCL 1.120 Experience and crediting

An applicant for a PPL(A) shall have completed at least 45 hours flight time as a pilot of aeroplanes; a total of 5 hours of this 45 hours may have been completed in a FNPT or a flight simulator. Holders of pilot licences or equivalent **[**privileges for helicopters, microlight helicopters, gyroplanes and microlights having**]** fixed wings and moveable aerodynamic control surfaces acting in all three dimensions, gliders, self-sustaining gliders or self-launching gliders may be credited with 10% of their total flight time as pilot-in-command in such aircraft up to a maximum of 10 hours towards a PPL(A).

JAR–FCL 1.125 Training course

(See Appendix 1, 2 & 3 to JAR–FCL 1.125)
(See AMC FCL 1.125)

(a) *General.* An applicant for a PPL(A) shall complete at an FTO or an accepted registered facility the required instruction in accordance with the syllabus as set out in Appendix 1 to JAR–FCL 1.125. The requirements for registration are set out in Appendix 2 and 3 to JAR–FCL 1.125.

(b) *Flight instruction.* An applicant for a PPL(A) shall have completed on aeroplanes, having a certificate of airworthiness issued or accepted by a JAA Member State, at least 25 hours dual instruction and at least 10 hours of supervised solo flight time, including at least five hours of solo cross-country flight time with at least one cross-country flight of at least 270 km (150 NM), during which full stop landings at two aerodromes different from the aerodrome of departure shall be made. When the applicant has been credited for pilot-in-command flight time on other aircraft in accordance with JAR–FCL 1.120, the requirement for dual instruction on aeroplanes may be reduced to not less than 20 hours.

(c) *Night qualification.* If the privileges of the licence are to be exercised at night, at least five additional hours flight time in aeroplanes shall be completed at night comprising 3 hours of dual instruction including at least 1 hour of cross-country navigation and five solo take-offs and five solo full-stop landings. This qualification will be endorsed on the licence.

JAR–FCL 1.130 Theoretical knowledge examination

(See Appendix 1 to JAR–FCL 1.130 & 1.135)

The applicant for a PPL(A) shall have demonstrated to the Authority a level of theoretical knowledge appropriate to the privileges granted to the holder of a PPL(A). The requirements and procedures for the theoretical knowledge examinations are set out in Appendix 1 to JAR–FCL 1.130 & 1.135.

[JAR–FCL 1.135 Skill]

[(See JAR–FCL 1.125(a))**]**
(See Appendix 1 to JAR–FCL 1.130 & 1.135, Appendix 2 to JAR–FCL 1.135 and Appendix 1 and 3 to JAR–FCL 1.240)

An applicant for a PPL(A) shall have **[**demonstrated the ability to perform, as pilot-in-command of an aeroplane, the relevant**]** procedures and manoeuvres described in **[**Appendix 1 to JAR–FCL 1.130 & 1.135 with a**]** degree of competency appropriate to the privileges granted to the holder of a PPL(A). The skill test shall be taken within six months of completing the flight instruction (see JAR–FCL 1.125(a)).

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Appendix 1 to JAR–FCL 1.125
PPL(A) training course – Summary

(See JAR–FCL 1.125)
(See AMC FCL 1.125)

1 The aim of the PPL(A) course is to train the student pilot to fly safely and efficiently under Visual Flight Rules.

THEORETICAL KNOWLEDGE INSTRUCTION

2 The theoretical knowledge syllabus of the PPL(A) course shall cover the following :

Air Law, Aircraft General Knowledge, Flight Performance and Planning, Human Performance and Limitations, Meteorology, Navigation, Operational Procedures, Principles of Flight and Communication.

Further details of all theoretical knowledge instruction are set out in AMC FCL 1.125.

FLIGHT INSTRUCTION

3 The PPL(A) flight instruction syllabus shall cover the following:

(a) pre-flight operations, including mass and balance determination, aeroplane inspection and servicing;

(b) aerodrome and traffic pattern operations, collision avoidance precautions and procedures;

(c) control of the aeroplane by external visual reference;

(d) flight at critically slow airspeeds, recognition of, and recovery from, incipient and full stalls;

(e) flight at critically high airspeeds, recognition of, and recovery from, spiral dives;

(f) normal and crosswind take-offs and landings;

(g) maximum performance (short field and obstacle clearance) take-offs, short-field landings;

(h) flight by reference solely to instruments, including the completion of a level 180 degrees turn (this training may be conducted by a FI(A));

[(i) cross-country flying using visual reference, dead reckoning and radio navigation aids;**]**

(j) emergency operations, including simulated aeroplane equipment malfunctions; and

(k) operations to, from and transiting controlled aerodromes, compliance with air traffic services procedures, communication procedures and phraseology.

TRAINING AEROPLANES

4 An adequate fleet of training aeroplane(s) appropriate to the courses of training, equipped and maintained to the relevant JAR standards shall be provided. Training conducted on aeroplanes having a certificate of airworthiness issued or accepted by a JAA Member State will enable an applicant to obtain a single-engine piston class rating for licence issue. Training conducted on a touring motor glider certificated to JAR–22 will enable an applicant to obtain a touring motor glider class rating for licence issue. Each aeroplane shall be fitted with duplicated primary flight controls for use by the instructor and the student: swing-over flight controls shall not be acceptable. The fleet should include, as appropriate to the courses of training, aeroplane(s) suitable for demonstrating stalling and spin avoidance and aeroplane(s) suitably equipped to simulate instrument meteorological conditions.

Aeroplanes used for training shall be approved by the Authority for training purposes.

Appendix 1 to JAR–FCL 1.125 (continued)

AERODROMES

5 The base aerodrome, and any alternative base aerodrome, at which training is being conducted shall meet the following requirements.

(a) Have at least one runway or take-off area that allows training aeroplane to make a normal take-off or landing at the maximum take-off or maximum landing mass authorised, as appropriate:

(i) under calm wind (not more than four knots) conditions and temperatures equal to the mean high temperature for the hottest month of the year in the operating area;

(ii) clearing all obstacles in the take-off flight path by at least 50 feet;

(iii) with the powerplant operation and the landing gear and flap operation (if applicable) recommended by the manufacturer; and

(iv) with a smooth transition from lift-off to the best rate of climb speed without exceptional piloting skills or techniques.

(b) Have a wind direction indicator that is visible at ground level from the ends of each runway.

[(c) Have adequate runway lights if used for night training.**]**

(d) Have available a means of air/ground communications acceptable to the Authority.

For all details see AMC FCL 1.125.

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Appendix 2 to JAR–FCL 1.125
[Registration of facilities for PPL instruction only]

(See JAR–FCL 1.125)

1 Application for acceptance of registration shall be made by the owner or responsible person in **[**charge of the facility to the Authority of the JAA Member State in which the facility is located which will**]** provide the applicant with a registration form.

2 The application form for registration shall contain the information as shown in Appendix 3 to JAR–FCL 1.125.

[3 Upon receipt of the completed application form the Authority of the JAA Member State in which the facility is located will register the facility to conduct PPL training within that State**,** without formal approval procedure, at the discretion of the Authority unless it has reason to doubt that the instruction can**]** be carried out safely. The Authority will inform the applicant to this effect.

4 Any changes to the information entered on this form shall be communicated to the Authority.

5 The facility will remain registered until the Authority is informed by its operator that PPL training is to cease, or the Authority establishes that instruction is not being carried out safely and/or in compliance with JAR–FCL. In both these situations the registration of the facility will be revoked.

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Appendix 3 to JAR–FCL 1.125
Contents of an application form for registration of a facility for PPL instruction

(See JAR–FCL 1.115)
(See JAR–FCL 1.125)

a	Name and address under which the facility operates, i.e. Club, School, Group;
b	Name of Owner(s);
c	Date of intended commencement of operations;
d	Name, address and telephone number of FI's and qualifications;
e	(i) Name and address of aerodrome, if applicable, from which training operations are to be conducted; (ii) Name of aerodrome operator;
f	List of aeroplanes to be used, including any means of synthetic flight instruction (if applicable) to be used by the facility, stating: Class**[ ]** of aeroplanes, Registration(s), Registered Owner(s), C of A Categories;
g	Type of training to be conducted by the facility: Theoretical instruction for PPL(A) Flight instructioin for PPL(A) Night qualification Single-engine **[**piston and TMG**]** Class ratings others (specify) (see JAR–FCL 1.017)
h	Details of aircraft insurance held;
i	State whether your facility intends to operate full or part time;
j	Any additional information the Authority may require;
k	A declaration below by the applicant that the information provided in (a) to (j) above is correct and that training will be conducted in accordance with JAR–FCL.
Date:	
Signature:	

[Amdt. 1, 00.00.00; Amdt. 2, 01.08.02]

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Appendix 1 to JAR–FCL 1.130 & 1.135
Theoretical knowledge examination and skill test for the PPL(A)

(See JAR–FCL 1.130 and 1.135)
[(See Appendix 1 to JAR–FCL 1.125)
(See IEM FCL 1.135)**]**

THEORETICAL KNOWLEDGE EXAMINATION

[1 This examination shall be in written form and may be taken on one or more days at the discretion of the Authority and shall comprise nine Subjects as indicated below. An examination paper may cover several Subjects. There shall be a total of at least 120 questions. The times shall not exceed the following:

Subject	**Time (not more than)**
Air Law and ATC Procedures	0h45
Aircraft General Knowledge	0h30
Flight Performance and Planning	1h00
Human Performance and Limitations	0h30
Meteorology	0h30
Navigation	1h00
Operational Procedures	0h30
Principles of Flight	0h45
Communications	0h30
Total	6h00

At the discretion of the Authority, Communication practical classroom testing may be conducted separately.

2 The majority of the questions shall be multiple choice.

3 The examinations will be provided in the language(s) considered appropriate by the Authority. The Authority shall inform applicants of the language(s) in which the examinations will be conducted.

4 A pass in a Subject will be awarded to an applicant achieving at least 75% of the marks allocated to that Subject. Marks shall only be awarded for correct answers.**]**

5 Subject to any other conditions in JAR–FCL, an applicant shall be deemed to have successfully completed the theoretical examinations for the PPL(A) when awarded a pass in all parts within a period of 12 months. A pass in the theoretical knowledge examination will be accepted for the grant of the private pilot licence during the 24 months from the date of successfully completing the examinations.

SKILL TEST

6 An applicant for a skill test for the PPL(A) shall have received instruction on the same class/type of aeroplane to be used for the skill test. The applicant shall be permitted to choose to take the test on a **[**single-engine aeroplane or, subject to the experience requirement in JAR–FCL 1.255 or 1.260 of 70 hours flight time as pilot-in-command, on a multi-engine aeroplane. The aeroplane used for the skill test shall meet the requirements for training aeroplanes (see Appendix 1 to JAR–FCL 1.125).**]**

7 The administrative arrangements for confirming the applicant's suitability to take the test, including disclosure of the applicant's training record to the examiner, will be determined by the Authority.

[8 An applicant shall pass sections 1 through 5 of the skill test, and section 6 if a multi-engine aeroplane is used. If any item in a section is failed, that section is failed. Failure in more than one section**]**

will require the applicant to take the entire test again. An applicant failing only one section shall take the failed section again. Failure in any section of the re-test, including those sections that have been passed on a previous attempt, will require the applicant to take the entire test again. All sections of the skill test shall be completed within six months.

9 Further training may be required following any one failed skill test. Failure to achieve a pass in all sections of the test in two attempts will require further training as determined by the Authority. There is no limit to the number of skill tests that may be attempted.

CONDUCT OF THE TEST

10 The Authority will provide the FE with adequate safety advice to ensure that the test is conducted safely.

11 Should the applicant choose to terminate a skill test for reasons considered inadequate by the FE, the applicant shall retake the entire skill test. If the test is terminated for reasons considered adequate by the FE, only those sections not completed shall be tested in a further flight.

12 Any manoeuvre or procedure of the test may be repeated once by the applicant. The FE may stop the test at any stage if it is considered that the applicant's demonstration of flying skill requires a complete re-test.

13 An applicant shall be required to fly the aeroplane from a position where the pilot-in-command functions can be performed and to carry out the test as if there is no other crew member. Responsibility for the flight shall be allocated in accordance with national regulations.

14 The route to be flown for the navigation test shall be chosen by the FE. The route may end at the aerodrome of departure or at another aerodrome. The applicant shall be responsible for the flight planning and shall ensure that all equipment and documentation for the execution of the flight are on board. The duration of the navigation section of the test, as set out in Appendix 2 to JAR–FCL 1.135 shall be at least 60 minutes and may, as agreed between applicant and FE, be flown as a separate test.

15 An applicant shall indicate to the FE the checks and duties carried out, including the identification of radio facilities. Checks shall be completed in accordance with the authorised check list for the aeroplane on **[**which the test is being taken. During pre-flight preparation for the test the applicant is required to determine power settings and speeds. Performance data for take-off, approach and landing shall be calculated by the applicant in compliance with the operations manual or flight manual for the aeroplane used.**]**

16 The FE will take no part in the operation of the aeroplane except where intervention is necessary in the interests of safety or to avoid unacceptable delay to other traffic.

FLIGHT TEST TOLERANCE

17 The applicant shall demonstrate the ability to:

- operate the aeroplane within its limitations;
- complete all manoeuvres with smoothness and accuracy;
- exercise good judgement and airmanship;
- apply aeronautical knowledge; and
- maintain control of the aeroplane at all times in such a manner that the successful outcome of a procedure or manoeuvre is never seriously in doubt.

18 The following limits are for general guidance. The FE will make allowance for turbulent conditions and the handling qualities and performance of the aeroplane used.

Height

normal flight	± 150 feet
with simulated engine failure	± 200 feet

Appendix 1 to JAR–FCL 1.130 & 1.135 (continued)

Heading / Tracking of radio aids

normal flight	± 10°
with simulated engine failure	± 15°

Speed

take-off and approach	+15/–5 knots
all other flight regimes	± 15 knots

CONTENT OF THE SKILL TEST

19 The skill test contents and sections set out in Appendix 2 to JAR–FCL 1.135 shall be used for the **[**skill test for the issue of a PPL(A) on single-engine and multi-engine aeroplanes. The format and**]** application form for the skill test may be determined by the Authority (see IEM FCL 1.135).

[Amdt. 1, 00.00.00]

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[Appendix 2 to JAR–FCL 1.135
Contents of the skill test for the issue of a PPL(A)

(See JAR–FCL 1.135)
(See IEM FCL 1.135)

SECTION 1 **PRE-FLIGHT OPERATIONS AND DEPARTURE**	
Use of checklist, airmanship (control of aeroplane by external visual reference, anti/de-icing procedures, etc.) apply in all sections.	
a	Pre-flight documentation and weather brief
b	Mass and balance and performance calculation
c	Aeroplane inspection and servicing
d	Engine starting and after starting procedures
e	Taxiing and aerodrome procedures, pre take-off procedures
f	Take-off and after take-off checks
g	Aerodrome departure procedures
h	ATC liaison – compliance, R/T procedures
SECTION 2 **GENERAL AIRWORK**	
a	ATC liaison – compliance, R/T procedure
b	Straight and level flight, with speed changes
c	Climbing: i. Best rate of climb ii. Climbing turns iii. Levelling off
d	Medium (30° bank) turns
e	Steep (45° bank) turns (including recognition and recovery from a spiral dive)
f	Flight at critically low airspeed with and without flaps
g	Stalling: i. Clean stall and recover with power ii. Approach to stall descending turn with bank angle 20°, approach configuration iii. Approach to stall in landing configuration

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Appendix 2 to JAR–FCL 1.135 (continued)

[

h	Descending: i. With and without power ii. Descending turns (steep gliding turns) iii. Levelling off
SECTION 3 EN-ROUTE PROCEDURES	
a	Flight plan, dead reckoning and map reading
b	Maintenance of altitude, heading and speed
c	Orientation, timing and revision of ETAs, log keeping
d	Diversion to alternate aerodrome (planning and implementation)
e	Use of radio navigation aids
f	Basic instrument flying check (180° turn in simulated IMC)
g	Flight management (checks, fuel systems and carburettor icing, etc.) ATC liaison – compliance, R/T procedures
SECTION 4 APPROACH AND LANDING PROCEDURES	
a	Aerodrome arrival procedures
b	* Precision landing (short field landing), cross wind, if suitable conditions available
c	* Flapless landing
d	* Approach to landing with idle power (SINGLE ENGINE ONLY)
e	Touch and go
f	Go-around from low height
g	ATC liaison – compliance, R/T procedures
h	Actions after flight

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Appendix 2 to JAR–FCL 1.135 (continued)

[

SECTION 5 ABNORMAL AND EMERGENCY PROCEDURES	
This section may be combined with Sections 1 through 4.	
a	Simulated engine failure after take-off (SINGLE-ENGINE ONLY)
b	* Simulated forced landing (SINGLE-ENGINE ONLY)
c	Simulated precautionary landing (SINGLE-ENGINE ONLY)
d	Simulated emergencies
SECTION 6 SIMULATED ASYMMETRIC FLIGHT AND RELEVANT CLASS/TYPE ITEMS	
This section may be combined with Sections 1 through 5.	
a	Simulated engine failure during take-off (at a safe altitude unless carried out in a flight simulator)
b	Asymmetric approach and go-around
c	Asymmetric approach and full stop landing
d	Engine shutdown and restart
e	ATC liaison – compliance, R/T procedures, Airmanship
f	As determined by the Flight Examiner – any relevant items of the class/type rating skill test to include, if applicable: i. Aeroplane systems including handling of auto pilot ii. Operation of pressurisation system iii. Use of de-icing and anti-icing system
g	Oral questions

* some of these items may be combined at the discretion of the Flight Examiner.**]**

[Amdt. 1, 00.00.00]

SUBPART D – COMMERCIAL PILOT LICENCE (Aeroplane) – CPL(A)

JAR–FCL 1.140 Minimum age

An applicant for a CPL(A) shall be at least 18 years of age.

JAR–FCL 1.145 Medical fitness

An applicant for a CPL(A) shall hold a valid Class 1 medical certificate. In order to exercise the privileges of the CPL(A) a valid Class 1 medical certificate shall be held.

JAR–FCL 1.150 Privileges and conditions

(a) *Privileges*. Subject to any other conditions specified in JARs, the privileges of the holder of a CPL(A) are to:

(1) exercise all the privileges of the holder of a PPL(A);

(2) act as pilot-in-command or co-pilot of any aeroplane engaged in operations other than commercial air transportation;

(3) act as pilot-in-command in commercial air transportation of any single-pilot aeroplane;

(4) act as co-pilot in commercial air transportation.

(b) *Conditions*. An applicant for a CPL(A) who has complied with the conditions specified in JAR–FCL 1.140, 1.145 and 1.155 through 1.170 shall have fulfilled the requirements for the issue of at least a CPL(A) containing the class/type rating for the aeroplane used on the skill test and, if an instrument rating course and test completed in accordance with JAR-FCL 1 Subpart E are included, the instrument rating.

[Amdt. 2, 01.08.02]

JAR–FCL 1.155 Experience and crediting

(See JAR–FCL 1.050(a)(3))
(See Appendix 1 to JAR–FCL 1.160 & 1.165(a)(1) through (3)
(See AMC FCL 1.160 & 1.165(a)(1) through (3))

(a) *Integrated courses*

(1) *Experience*. An applicant for a CPL(A) who has satisfactorily followed and completed an integrated flying training course shall have completed as a pilot of aeroplanes having a certificate of airworthiness issued or accepted by a JAA Member State at least 150 hours of flight time.

(2) *Crediting*. For details on crediting of flight time required in (a)(1), see paragraph 4 in Appendix 1 to JAR-FCL 1.160 and 1.165(a)(1), paragraph 4 in Appendix 1 to JAR-FCL 1.160 and 1.165(a)(2) or paragraph 4 in Appendix 1 to JAR-FCL 1.160 and 1.165(a)(3).

(b) *Modular course.*

(1) *Experience*. An applicant for a CPL(A) who is not a graduate from an integrated flying training course shall have completed as a pilot on aeroplanes having a certificate of airworthiness issued or accepted by a JAA Member State at least 200 hours of flight time.

(2) *Crediting*. From the 200 hours of flight time:

(i) 30 hours as pilot-in-command holding a PPL(H) on helicopters; or

(ii) 100 hours as pilot-in-command holding a CPL(H) on helicopters; or

(iii) 30 hours as pilot-in-command in touring motor gliders or gliders.

(c) *Flight time*. The applicant shall have completed in aeroplanes during the integrated course 150 hours of flight time (see also JAR–FCL 1.050(a)(3)) and the modular course 200 hours of flight time including at least:

(1) 100 hours as pilot-in-command, or 70 hours as pilot-in-command if completed during a course of integrated flying training as set out in Appendix 1 to JAR–FCL 1.160 & 1.165(a) (1) through (3) and AMC FCL 1.160 & 1.165(a) (1), (2) and (3);

JAR-FCL 1.155(c) (continued)

(2) 20 hours of cross-country flight time as pilot-in-command, including a cross-country flight totalling at least 540 km (300 NM) in the course of which full-stop landings at two aerodromes different from the aerodromes of departure shall be made;

(3) 10 hours of instrument instruction time, of which not more than 5 hours is to be instrument ground time; and

(4) 5 hours of night flight time, as set out in JAR–FCL 1.165(b).

[Amdt. 1, 01.06.00; Amdt. 2, 01.08.02]

JAR–FCL 1.160 Theoretical knowledge
(See Appendix 1 to JAR–FCL 1.160 & 1.165(a)(1) through (4))

(a) *Course*. An applicant for a CPL(A) shall have received theoretical knowledge instruction on an approved course at an approved flying training organisation (FTO) **[ ]**. The course should be combined with a flying training course as set out in JAR–FCL 1.165.

(b) *Examination*. An applicant for a CPL(A) shall have demonstrated a level of knowledge appropriate to the privileges granted to the holder of a CPL(A) and shall meet the requirements set out in JAR–FCL 1 (Aeroplane) Subpart J.

(c) An applicant who has undertaken an integrated flying training course shall demonstrate at least the level of knowledge required by that course, as set out in the relevant Appendix 1 to JAR–FCL 1.160 & 1.165(a) (1) through (3).

[Amdt. 1, 01.06.00; Amdt. 3, 01.07.03]

JAR–FCL 1.165 Flight instruction
(See Appendix 1 to JAR–FCL 1.160 & 1.165(a)(1) through (4) and AMC FCL 1.160 & 1.165(a)(1) through (4))

(a) *Course*. An applicant for a CPL(A) shall have completed an approved course of integrated or modular flying training on aeroplanes having a certificate of airworthiness issued or accepted by a JAA Member State at an approved flying training organisation. The course should be combined with a theoretical knowledge training course. For details of the approved courses see as follows:

JAR-FCL 1.165(a) (continued)

(1) ATP(A) integrated course – Appendix 1 JAR–FCL 1.160 and 1.165(a)(1) and AMC FCL 1.160 & 1.165(a)(1);

(2) CPL(A)/IR integrated course – Appendix 1 to JAR–FCL 1.160 and 1.165(a)(2) and AMC FCL 1.160 & 1.165(a)(2);

(3) CPL(A) integrated course – Appendix 1 to JAR–FCL 1.160 & 1.165(a)(3) and AMC FCL 1.160 & 1.165(a)(3); and

(4) CPL(A) modular course – Appendix 1 to JAR–FCL 1.160 & 1.165(a)(4) and AMC FCL 1.160 & 1.165(a)(4).

(b) *Night training*. The applicant shall have completed at least 5 hours flight time in aeroplanes at night comprising at least 3 hours of dual instruction, including at least 1 hour of cross-country navigation, and 5 solo take-offs and 5 full-stop landings.

JAR–FCL 1.170 Skill
(See Appendices 1 and 2 to JAR–FCL 1.170)
(See Appendix 1 to JAR–FCL 1.160 and 1.165(a)(1) through (4))

An applicant for a CPL(A) shall have demonstrated the ability to perform, as pilot-in-command of an aeroplane, the relevant procedures and manoeuvres described in Appendices 1 and 2 to JAR–FCL 1.170 with a degree of competency appropriate to the privileges granted to the holder of a CPL(A). An applicant shall take the skill test as required by the relevant Appendix 1 to JAR–FCL 1.160 & 1.165(a)(1) through (4).

[Amdt. 1, 01.06.00]

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Appendix 1 to JAR–FCL 1.160 & 1.165(a)(1)
ATP(A) integrated course
(See JAR–FCL 1.160, 1.165 & 1.170)
(See Appendix 1 and 2 to JAR–FCL 1.170)
(See Appendix 1 and 2 to JAR–FCL 1.210)
(See AMC FCL 1.160 & 1.165(a)(1))
(See Appendix 1 to JAR-FCL 1.470)
(See IEM FCL 1.170)

1 The aim of the ATP(A) integrated course is to train pilots to the level of proficiency necessary to enable them to operate as co-pilot on multi-pilot, multi-engine aeroplanes in commercial air transportation and to obtain the CPL(A)/IR.

2 An applicant wishing to undertake an ATP(A) integrated course shall, under the supervision of the Head of Training of an approved flying training organisation (FTO), complete all the instructional stages in one continuous approved course of training as arranged by that FTO.

3 The course shall last for between 12 and 36 months. Special arrangements may be made with the approval of the Authority to extend the course beyond 36 months where additional flying training or ground instruction is provided by the FTO.

4 An applicant may be admitted to training either as an ab-initio entrant, or as a holder of a PPL(A) issued in accordance with ICAO Annex 1. An ab-initio entrant shall meet the student pilot requirements of JAR–FCL Subpart B. In the case of a PPL(A) entrant, 50% of the aeroplane hours flown by the entrant prior to the course may be credited towards the required flight instruction (JAR-FCL 1.165(a)(1) and Appendix 1 to JAR-FCL 1.165(a)(1), paragraph 13) up to a credit of 40 hours flying experience or 45 hours if an aeroplane night flying qualification has been obtained, of which up to 20 hours may be dual instruction. This credit for the hours flown shall be at the discretion of the FTO and entered into the applicant's training record. In the case of a student pilot who does not hold a pilot licence and with the approval of the Authority a FTO may designate certain dual exercises (see AMC FCL 1.160 & 1.165(a)(1), phase 2 & 3) to be flown in a helicopter or a TMG up to a maximum of 20 hours.

5 An applicant failing or unable to complete the entire ATP(A) course may apply to the Authority for the theoretical knowledge examination and skill test for a lower licence and, if applicable, an instrument rating.

6 Any applicant wishing to transfer to another FTO during a course of training shall apply to the Authority for a formal assessment of the further hours of training required at another FTO.

7 The FTO shall ensure that before being admitted to the course the applicant has sufficient knowledge of Mathematics, Physics and English, to facilitate an understanding of the theoretical knowledge instruction content of the course. The required level of English shall be in accordance with Appendix 1 to JAR–FCL 1.200.

8 The course shall comprise:

(a) theoretical knowledge instruction to the ATPL(A) knowledge level;

(b) visual and instrument flying training; and

(c) training in multi-crew co-operation for the operation of multi-pilot aeroplanes.

9 The successful completion of the theoretical knowledge examination(s) at paragraph 12 and of the skill test(s) at paragraph 14 fulfil the theoretical knowledge and skill requirements for the issue of a CPL(A) including a class or type rating for the aeroplane(s) used in the test(s) and a multi-engine instrument rating (A).

THEORETICAL KNOWLEDGE

10 The theoretical knowledge syllabus is set out in Appendix 1 to JAR-FCL 1.470. An approved ATP(A) theoretical knowledge course shall comprise at least 750 hours (1 hour = 60 minutes instruction) of instruction which can include classroom work, inter-active video, slide/tape presentation, learning carrels, computer based training, and other media as approved by the Authority, in suitable proportions.

Appendix 1 to JAR–FCL 1.160 & 1.165(a)(1) (continued)

The 750 hours of instruction shall be divided in such a way that in each subject the minimum hours are:

Subject	*hours*
Air Law	40
Aircraft General Knowledge	80
Flight Performance & Planning	90
Human Performance & Limitations	50
Meteorology	60
Navigation	150
Operational Procedures	20
Principles of Flight	30
Communications	30

Other sub-division of hours may be agreed between the Authority and the FTO.

11 MCC course shall comprise at least 25 hours of theoretical knowledge instruction and exercises.

Theoretical knowledge examination

12 An applicant shall demonstrate the level of knowledge appropriate to the privileges of the holder of an ATPL(A), in accordance with the requirements in JAR–FCL 1 (Aeroplane) Subpart J.

FLYING TRAINING

13 The flying training, not including type rating training, shall comprise a total of at least 195 hours, to include all progress tests, of which up to 55 hours for the entire course may be instrument ground time. Within the total of 195 hours, applicants shall complete at least:

(a) 95 hours of dual instruction of which up to 55 hours may be instrument ground time;

(b) 100 hours as pilot-in-command including 50 hours VFR flight and 50 hours instrument flight time as student pilot-in-command (SPIC). (SPIC time shall be credited as pilot-in-command time, unless the flight instructor had to influence or control any part of the flight. A ground de-briefing by the flight instructor does not affect the crediting as pilot-in-command time);

(c) 50 hours of cross-country flight as pilot-in-command including a VFR cross-country flight totalling at least 540 km (300 NM) in the course of which full stop landings at two aerodromes different from the aerodrome of departure shall be made;

(d) 5 hours flight time in aeroplanes shall be completed at night comprising 3 hours of dual instruction including at least 1 hour of cross-country navigation and 5 solo take-offs and 5 solo full stop landings; and

(e) 115 hours of instrument time comprising:

(i) 50 hours of instrument flight instruction of which up to 25 hours may be instrument ground time in a FNPT I, or 40 hours if all the instrument ground training is conducted in an FNPT II or flight simulator;

(ii) 50 hours as SPIC; and

(iii) 15 hours multi-crew co-operation, for which a flight simulator or FNPT II may be used.

See AMC-FCL 1.160 & 1.165(a)(1) for the flight instruction syllabus.

SKILL TESTS

14 On completion of the related flying training the applicant shall take the CPL(A) skill test on either a single-engine or a multi-engine aeroplane in accordance with Appendix 1 and 2 to JAR–FCL 1.170 and the instrument rating skill test on a multi-engine aeroplane in accordance with Appendix 1 and 2 to JAR–FCL 1.210 and such other tests as are required by JAR–FCL 1.262(c).

[Amdt. 1, 01.06.00; Amdt. 2, 01.08.02]

Appendix 1 to JAR–FCL 1.160 & 1.165(a)(2)
CPL(A)/IR integrated course
(See JAR–FCL 1.160, 1.165 & 1.170)
(See Appendix 1 and 2 to JAR–FCL 1.170)
(See Appendix 1 and 2 to JAR–FCL 1.210)
(See AMC FCL 1.160 & 1.165(a)(2))
(See Appendix 1 to JAR-FCL 1.470)
(See IEM FCL 1.170)

1 The aim of the CPL(A) and IR(A) integrated course is to train pilots to the level of proficiency necessary to operate single-pilot single-engine or multi-engine aeroplanes in commercial air transportation and to obtain the CPL(A)/IR.

2 An applicant wishing to undertake a CPL(A)/IR integrated course shall, under the supervision of the Head of Training of an approved flying training organisation (FTO), complete all the instructional stages in one continuous approved course of training as arranged by that FTO.

3 The course shall last for between 9 and 30 months.

4 An applicant may be admitted to training either as an ab-initio entrant, or as a holder of a PPL(A) issued in accordance with ICAO Annex 1. An ab-initio entrant shall meet the student pilot requirements of JAR–FCL Subpart B. In the case of a PPL(A) entrant, 50% of the aeroplane hours flown by the entrant prior to the course may be credited towards the required flight instruction (JAR-FCL 1.165(a)(2) and Appendix 1 to JAR-FCL 1.165(a)(2), paragraph 12) up to a credit of 40 hours flying experience or 45 hours if an aeroplane night flying qualification has been obtained, of which up to 20 hours may be dual instruction. This credit for the hours flown shall be at the discretion of the FTO and entered into the applicant's training record. In the case of a student pilot who des not hold a pilot licence and with the approval of the Authority a FTO may designate certain dual excercises (see AMC FCL 1.160 & 1.165(a)(2), phase 2 & 3) to be flown in a helicopter or a TMG up to a maximum of 20 hours.

5 An applicant failing or unable to complete the entire CPL(A)/IR course may apply to the Authority for the theoretical knowledge examination and skill test for a lower licence and, if applicable, an instrument rating.

6 Any applicant wishing to transfer to another FTO during a course of training shall apply to the Authority for a formal assessment of the further hours of training required at another FTO.

7 The FTO shall ensure that before being admitted to the course the applicant has sufficient knowledge of Mathematics, Physics and English to facilitate an understanding of the theoretical knowledge instruction content of the course. The required level of English shall be in accordance with Appendix 1 to JAR–FCL 1.200.

8 The course shall comprise:

(a) theoretical knowledge instruction to CPL(A) and IR knowledge level; and

(b) visual and instrument flying training.

9 The successful completion of the theoretical knowledge examination(s) at paragraph 11 and of the skill test at paragraph 13 fulfil the theoretical knowledge and skill requirements for the issue of a CPL(A) including a class or type rating for the aeroplane(s) used in the test(s) and **[**either**]** a multi-engine **[**or a single engine**]** instrument rating (A).

THEORETICAL KNOWLEDGE

10 The theoretical knowledge syllabus is set out in Appendix 1 to JAR-FCL 1.470. An approved CPL(A)/IR theoretical knowledge course shall comprise at least 500 hours of instruction which can include classroom work, inter-active video, slide/tape presentation, learning carrels, computer based training, and other media as approved by the Authority, in suitable proportions. The 500 hours (1 hour = 60 minutes instruction) of instruction shall be divided in such a way that in each subject the minimum hours are:

Appendix 1 to JAR-FCL 1.160 & 1.165(a)(2) (continued)

Subject	*hours*
Air Law	30
Aircraft General Knowledge	50
Flight Performance & Planning	60
Human Performance & Limitations	15
Meteorology	40
Navigation	100
Operational Procedures	10
Principles of Flight	25
Communications	30

Other sub-divisions of hours may be agreed between the Authority and the FTO.

THEORETICAL KNOWLEDGE EXAMINATION

11 An applicant shall demonstrate a level of knowledge appropriate to the privileges of the holder of a CPL(A) and an instrument rating, in accordance with the requirements in JAR–FCL 1 (Aeroplane) Subpart J.

FLYING TRAINING

12 The flying training, not including type rating training, shall comprise a total of at least 180 hours, to include all progress tests, of which up to 40 hours for the entire course may be instrument ground time. Within the total of 180 hours, applicants shall complete at least:

(a) 80 hours of dual instruction of which up to 40 hours may be instrument ground time;

(b) 100 hours as pilot-in-command including 50 hours VFR flight and 50 hours instrument flight time as student pilot-in-command (SPIC). (SPIC time shall be credited as pilot-in-command time, unless the flight instructor had to influence or control any part of the flight. A ground de-briefing by the flight instructor does not affect the crediting as pilot-in-command time);

(c) 50 hours of cross-country flight as pilot-in-command including a VFR cross-country flight totalling at least 540 km (300 NM) in the course of which full stop landings at two aerodromes different from the aerodrome of departure shall be made;

(d) 5 hours flight time in aeroplanes shall be completed at night comprising at least 3 hours of dual instruction including at least one hour of cross-country navigation and 5 solo take-offs and 5 solo full stop landings; and

(e) 100 hours of instrument time comprising:

(i) 50 hours of instrument flight instruction of which up to 25 hours may be instrument ground time in a FNPT I or 40 hours if all the instrument ground training is conducted in an FNPT II or flight simulator;

(ii) 50 hours as SPIC.

See AMC FCL 1.160 & 1.165(a)(2) for the flight instruction syllabus.

SKILL TESTS

13 On completion of the related flying training the applicant shall take the CPL(A) skill test on either a multi-engine aeroplane or a single-engine aeroplane in accordance with Appendix 1 and 2 to JAR–FCL 1.170 and the instrument rating skill test on **[**either**]** a multi-engine aeroplane **[**or a single-engine**]** in accordance with Appendix 1 and 2 to JAR–FCL 1.210.

[Amdt. 1, 01.06.00; Amdt. 2, 01.08.02; Amdt. 3, 01.07.03]

Appendix 1 to JAR–FCL 1.160 & 1.165(a)(3)
CPL(A) integrated course
(See JAR–FCL 1.160, 1.165 & 1.170)
(See Appendix 1 and 2 to JAR–FCL 1.170)
(See AMC FCL 1.160 & 1.165(a)(3))
(See Appendix 1 to JAR-FCL 1.470)
(See IEM-FCL 1.170)

1 The aim of the CPL(A) integrated course is to train pilots to the level of proficiency necessary for the issue of a CPL(A), and any further aerial work training that the applicant wishes to receive, excluding flight instructor training and instrument rating instruction.

2 An applicant wishing to undertake a CPL(A) integrated course shall, under the supervision of the Head of Training of an approved flying training organisation (FTO), complete all the instructional stages in one continuous approved course of training as arranged by that FTO.

3 The course shall last for between 9 and 24 months.

4 An applicant may be admitted to training either as an ab-initio entrant, or as the holder of a PPL(A) issued in accordance with ICAO Annex 1. An ab-initio entrant shall meet the student pilot requirements of JAR–FCL Subpart B. In the case of a PPL(A) entrant, 50% of the aeroplane hours flown by the entrant prior to the course may be credited towards the required flight instruction (JAR-FCL 1.165(a)(3) and Appendix 1 to JAR-FCL 1.165(a)(3), paragraph 12) up to a credit of 40 hours flying experience, or 45 hours if an aeroplane night flying qualification has been obtained, of which up to 20 hours may be dual instruction. This credit for the hours flown shall be at the discretion of the FTO and entered into the applicant's training record. In the case of a student pilot who does not hold a pilot licence and with the approval of the Authority a FTO may designate certain dual exercises (see AMC FCL 1.160 & 1.165(a)(3), phase 2 & 3) to be flown in a helicopter or a TMG up to a maximum of 20 hours.

5 An applicant failing or unable to complete the entire CPL(A) course may apply to the Authority for the theoretical knowledge examination and skill test for a lower licence.

6 Any applicant wishing to transfer to another FTO during a course of training shall apply to the Authority for a formal assessment of the further hours of training required at another FTO.

7 The FTO shall ensure that before being admitted to the course the applicant has sufficient knowledge of Mathematics and Physics to facilitate an understanding of the theoretical knowledge instruction content of the course.

8 The course shall comprise:

(a) theoretical knowledge instruction to CPL(A) knowledge level; and

(b) visual and instrument flying training.

9 The successful completion of the theoretical knowledge examinations at paragraph 11 and of the skill test(s) at paragraph 13 fulfil the knowledge and skill requirements for the issue of a CPL(A) including a class or type rating for the aeroplane(s) used in the test(s).

THEORETICAL KNOWLEDGE

10 The theoretical knowledge syllabus for the CPL(A) is set out in Appendix 1 to JAR-FCL 1.470. An approved CPL(A) theoretical knowledge course shall comprise at least 300 hours (1 hour = 60 minutes instruction) of instruction (or 200 hours if the applicant is the holder of a PPL) which can include classroom work, inter-active video, slide/tape presentation, learning carrels, computer based training, and other media as approved by the Authority, in suitable proportions.

Theoretical knowledge examination

11 An applicant shall demonstrate a level of knowledge appropriate to the privileges of the holder of a CPL(A) in accordance with the requirements in JAR–FCL 1 (Aeroplane) Subpart J.

Appendix 1 to JAR-FCL 1.160 & 1.165(a)(3) (continued)

FLYING TRAINING

12 The flying training not including the type rating training shall comprise a total of at least 150 hours, to include all progress tests, of which up to 5 hours for the entire course may be instrument ground time. Within the 150 hours total, applicants shall complete at least:

(a) 80 hours of dual instruction of which up to 5 hours may be instrument ground time;

(b) 70 hours as pilot-in-command;

(c) 20 hours of cross-country flight as pilot-in-command including a VFR cross-country flight totalling at least 540 km (300 NM) in the course of which full stop landings at two different aerodromes from the aerodrome of departure shall be made;

(d) 5 hours flight time in aeroplanes shall be completed at night comprising 3 hours of dual instruction including at least 1 hour of cross-country navigation and 5 solo take-offs and 5 full stop landings; and

(e) 10 hours of instrument flight instruction of which up to 5 hours may be instrument ground time in a FNPT I or II or flight simulator.

(f) 5 hours to be carried out in an aeroplane certificated for the carriage of at least four persons and have a variable pitch propeller and retractable landing gear.

See AMC FCL 1.160 & 1.165(a)(3) for the flight instruction syllabus.

SKILL TEST

13 On completion of the flying training the applicant shall take the CPL(A) skill test on a single-engine or a multi-engine aeroplane in accordance with Appendix 1 and 2 to JAR–FCL 1.170.

[Amdt. 1, 01.06.00; Amdt. 2, 01.08.02]

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Appendix 1 to JAR–FCL 1.160 & 1.165(a)(4)
CPL(A) modular course
(See JAR–FCL 1.125(c))
(See JAR–FCL 1.160, 1.165 & 1.170)
(See Appendix 1 and 2 to JAR–FCL 1.170)
(See AMC FCL 1.160 & 1.165(a)(4))
(See Appendix 1 to JAR-FCL 1.470)
(See IEM-FCL 1.170)

1 The aim of the CPL(A) modular course is to train PPL(A) holders to the level of proficiency necessary for the issue of a CPL(A).

2 (a) Before commencing a CPL(A) modular course an applicant shall be the holder of a PPL(A) issued in accordance with ICAO Annex 1;

(b) Before commencing the flight training an applicant shall:

(i) have completed 150 hours flight time as a pilot; and

(ii) have complied with JAR–FCL 1.225 and 1.240 if a multi-engine aeroplane is to be used on the skill test.

3 An applicant wishing to undertake a modular CPL(A) course shall, under the supervision of the Head of Training of an approved flying training organisation (FTO), complete all the instructional stages in one continuous approved course of training as arranged by that FTO. The theoretical knowledge instruction may be given at **[**an approved FTO conducting theoretical knowledge instruction only**]**, in which case the Head of Training of that organisation shall supervise that part of the course.

4 The course of theoretical knowledge shall be completed within 18 months. The flight instruction and skill test shall be completed within the period of validity of the pass in the theoretical examinations, as set out in JAR–FCL 1.495.

5 The FTO shall ensure that before being admitted to the course the applicant has sufficient knowledge of mathematics and physics to facilitate an understanding of the theoretical knowledge instruction content of the course.

6 The course shall comprise:

(a) theoretical knowledge instruction to CPL(A) knowledge level; and

(b) visual and instrument flying training.

7 The successful completion of the theoretical knowledge examination at paragraph 9 and of the skill test at paragraph 13 fulfil the knowledge and skill requirements for the issue of a CPL(A) including a class or type rating for the aeroplane used in the test.

THEORETICAL KNOWLEDGE

8 The theoretical knowledge syllabus for the CPL(A) is set out in Appendix 1 to JAR-FCL 1.470. An approved CPL(A) theoretical knowledge course shall comprise at least 200 hours (1 hour = 60 minutes instruction) of instruction, which can include classroom work, inter-active video, slide/tape presentation, learning carrels, computer based training, and other media as approved by the Authority, in suitable proportions. Approved distance learning (correspondence) courses may also be offered as part of the course at the discretion of the Authority.

Theoretical knowledge examination

9 An applicant shall demonstrate a level of knowledge appropriate to the privileges of the holder of a CPL(A) in accordance with the requirements in JAR–FCL 1 (Aeroplane) Subpart J.

Appendix 1 to JAR–FCL 1.160 & 1.165(a)(4) (continued)

FLYING TRAINING

10 Applicants without an instrument rating shall be given at least 25 hours dual flight instruction (see AMC FCL 1.160 & 1.165(a)(4)), including 10 hours of instrument instruction of which up to 5 hours may be instrument ground time in a FNPT I or II or a flight simulator (See AMC FCL 1.160 & 1.165(a)(4)). Applicants holding a valid IR(A) shall be fully credited towards the dual instrument instruction time. Applicants holding a valid IR(H) may be credited up to 5 hours of the dual instrument instruction time, in which case at least 5 hours dual instrument instruction time shall be given in an aeroplane.

11 (a) Applicants with a valid instrument rating shall be given at least 15 hours dual visual flight instruction.

(b) Applicants without a night flying qualification aeroplane shall be given additionally at least 5 hours night flight instruction (see JAR–FCL 1.125(c)).

12 At least five hours of the flight instruction shall be carried out in an aeroplane certificated for the carriage of at least four persons and have a variable pitch propeller and retractable landing gear.

See AMC FCL 1.160 & 1.165(a)(4) for the flight instruction syllabus.

SKILL TEST

13 On completion of the flying training and relevant experience requirements the applicant shall take the CPL(A) skill test on either a multi-engine or a single-engine aeroplane in accordance with Appendix 1 and 2 to JAR–FCL 1.170.

[Amdt. 1, 01.06.00; Amdt. 2, 01.08.02; Amdt 3, 01.07.03]

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Appendix 1 to JAR–FCL 1.170
Skill test for the issue of a CPL(A)
(See JAR–FCL 1.170)
(See Appendix 2 to JAR–FCL 1.170)
(See IEM FCL 1.170)

1 An applicant for a skill test for the CPL(A) shall have satisfactorily completed all of the required training, including instruction on the same type/class of aeroplane to be used in the test. The applicant shall be permitted to choose to take the test on a single-engine aeroplane or, subject to the experience requirement in JAR–FCL 1.255 or JAR–FCL 1.260 of 70 hours flight time as pilot-in-command of aeroplanes, on a multi-engine aeroplane. The aeroplane used for the skill test shall meet the requirements for training aeroplanes set out in Appendix 1a to JAR–FCL 1.055 and shall be certificated for the carriage of at least four persons, have a variable pitch propeller and retractable landing gear.

2 The administrative arrangements for confirming the applicant's suitability to take the test, including disclosure of the applicant's training record to the examiner, will be determined by the Authority.

3 An applicant shall pass sections 1 through 5 of the skill test, and section 6 if a multi-engine aeroplane is used. If any item in a section is failed, that section is failed. Failure in more than one section will require the applicant to take the entire test again. An applicant failing only one section shall take the failed section again. Failure in any section of the re-test, including those sections that have been passed on a previous attempt, will require the applicant to take the entire test again. All sections of the skill test shall be completed within six months.

4 Further training may be required following any failed skill test. Failure to achieve a pass in all sections of the test in two attempts shall require further training as determined by the Authority. There is no limit to the number of skill tests that may be attempted.

CONDUCT OF THE TEST

5 The Authority will provide the FE with adequate safety advice to ensure that the test is conducted safely.

6 Should the applicant choose to terminate a skill test for reasons considered inadequate by the FE, the applicant shall retake the entire skill test. If the test is terminated for reasons considered adequate by the FE, only those sections not completed shall be tested in a further flight.

7 At the discretion of the FE, any manoeuvre or procedure of the test may be repeated once by the applicant. The FE may stop the test at any stage if it is considered that the applicant's demonstration of flying skill requires a complete re-test.

8 An applicant shall be required to fly the aeroplane from a position where the pilot-in-command functions can be performed and to carry out the test as if there is no other crew member. Responsibility for the flight shall be allocated in accordance with national regulations.

9 The route to be flown shall be chosen by the FE and the destination shall be a controlled aerodrome. The route may end at the aerodrome of departure or at another aerodrome. The applicant shall be responsible for the flight planning and shall ensure that all equipment and documentation for the execution of the flight are on board. The duration of the flight shall be at least 90 minutes.

10 An applicant shall indicate to the FE the checks and duties carried out, including the identification of radio facilities. Checks shall be completed in accordance with the authorised check list for the aeroplane on which the test is being taken. During pre-flight preparation for the test the applicant is required to determine power settings and speeds. Performance data for take-off, approach and landing shall be calculated by the applicant in compliance with the operations manual or flight manual for the aeroplane used.

11 The FE shall take no part in the operation of the aeroplane except where intervention is necessary in the interests of safety or to avoid unacceptable delay to other traffic.

Appendix 1 to JAR-FCL 1.170 (continued)

FLIGHT TEST TOLERANCES

12 The applicant shall demonstrate the ability to:

- operate the aeroplane within its limitations;
- complete all manoeuvres with smoothness and accuracy;
- exercise good judgement and airmanship;
- apply aeronautical knowledge; and
- maintain control of the aeroplane at all times in such a manner that the successful outcome of a procedure or manoeuvre is never seriously in doubt.

13 The following limits are for general guidance. The FE shall make allowance for turbulent conditions and the handling qualities and performance of the aeroplane used.

Height	
normal flight	±100 feet
with simulated engine failure	±150 feet
Tracking on radio aids	±5°
Heading	
normal flight	±10°
with simulated engine failure	±15°
Speed	
take-off and approach	±5 knots
all other flight regimes	±10 knots

CONTENT OF THE TEST

14 The skill test contents and sections set out in Appendix 2 to JAR–FCL 1.170 shall be used for the skill test. The format and application form for the skill test may be determined by the Authority (see IEM FCL 1.170). Items in Section 2 paragraphs c and e(iv), and the whole of Sections 5 and 6 may beperformed in a FNPT II or a flight simulator.

[Amdt. 1, 01.06.00]

Appendix 2 to JAR–FCL 1.170
Contents of the skill test for the issue of a CPL(A)
(See JAR–FCL 1.170)
(See IEM FCL 1.170)

SECTION 1 **PRE-FLIGHT OPERATIONS AND DEPARTURE**	
Use of checklist, airmanship (control of aeroplane by external visual reference, anti/de-icing procedures, etc.) apply in all sections.	
a	Pre-flight, including: Documentation, Mass and balance determination, Weather brief
b	Aeroplane inspection and servicing
c	Taxiing and take-off
d	Performance considerations and trim
e	Aerodrome and traffic pattern operations
f	Departure procedure, altimeter setting, collision avoidance (lookout)
g	ATC liaison – compliance, R/T procedures
SECTION 2 **GENERAL AIRWORK**	
a	Control of the aeroplane by external visual reference, including straight and level, climb, descent, lookout
b	Flight at critically low airspeed including recognition of and recovery from incipient and full stalls
c	Turns, including turns in landing configuration. Steep turns 45°
d	Flight at critically high airspeeds, including recognition of and recovery from spiral dives
e	Flight by reference solely to instruments, including: i. Level flight, cruise configuration, control of heading, altitude and airspeed ii. Climbing and descending turns with 10°– 30° bank iii. Recoveries from unusual attitudes iv. Limited panel instruments
f	ATC liaison – compliance, R/T procedures

Appendix 2 to JAR–FCL 1.170 (continued)

SECTION 3 EN ROUTE PROCEDURES	
a	Control of aeroplane by external visual reference, including cruise configuration Range / Endurance considerations
b	Orientation, map reading
c	Altitude, speed, heading control, lookout
d	Altimeter setting. ATC liaison – compliance, R/T procedures
e	Monitoring of flight progress, flight log, fuel usage, assessment of track error and re-establishment of correct tracking
f	Observation of weather conditions, assessment of trends, diversion planning
g	Tracking, positioning (NDB or VOR), identification of facilities (instrument flight). Implementation of diversion plan to alternate aerodrome (visual flight)
SECTION 4 APPROACH AND LANDING PROCEDURES	
a	Arrival procedures, altimeter setting, checks, lookout
b	ATC liaison: compliance, R/T procedures
c	Go-around action from low height
d	Normal landing, crosswind landing (if suitable conditions)
e	Short field landing
f	Approach and landing with idle power (single-engine only)
g	Landing without use of flaps
h	Post flight actions
SECTION 5 ABNORMAL AND EMERGENCY PROCEDURES	
This section may be combined with sections 1 through 4.	
a	Simulated engine failure after take-off (at a safe altitude), fire drill
b	Equipment malfunctions Including alternative landing gear extension, electrical and brake failure
c	Forced landing (simulated)
d	ATC liaison: compliance, R/T procedures

Appendix 2 to JAR–FCL 1.170 (continued)

SECTION 6 SIMULATED ASYMMETRIC FLIGHT AND RELEVANT CLASS/TYPE ITEMS	
This section may be combined with Sections 1 through 5.	
a	Simulated engine failure during take-off (at a safe altitude unless carried out in a flight simulator)
b	Asymmetric approach and go-around
c	Asymmetric approach and full stop landing
d	Engine shutdown and restart
e	ATC liaison – compliance, R/T procedures, Airmanship
f	As determined by the Flight Examiner – any relevant items of the class/type rating skill test to include, if applicable: i. Aeroplane systems including handling of autopilot ii. Operation of pressurisation system iii. Use of de-icing and anti-icing system
g	Oral questions

[Amdt. 1, 01.06.00]

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SUBPART E – INSTRUMENT RATING (Aeroplane) – IR(A)

JAR–FCL 1.174 Medical fitness

An applicant for an IR(A) shall be medically fit in accordance with JAR-FCL 3.355(b).

[Amdt. 2, 01.08.02]

JAR–FCL 1.175 Circumstances in which an IR(A) is required

(a) The holder of a pilot licence (A) shall not act in any capacity as a pilot of an aeroplane under Instrument Flight Rules (IFR), except as a pilot undergoing skill testing or dual training, unless the holder has an instrument rating (IR(A)) appropriate to the category of aircraft issued in accordance with JAR–FCL.

(b) In JAA Member States where national legislation requires flight in accordance with IFR under specified circumstances (e.g. at night), the holder of a pilot licence may fly under IFR, provided that pilot holds a qualification appropriate to the circumstances, airspace and flight conditions in which the flight is conducted. National qualifications permitting pilots to fly in accordance with IFR other than in VMC without being the holder of a valid IR(A) shall be restricted to use of the airspace of the State of licence issue only.

[Amdt. 1, 01.06.00]

JAR–FCL 1.180 Privileges and conditions

(a) *Privileges*

(1) Subject to the rating restrictions imposed by use of another pilot functioning as a co-pilot (multi-pilot restriction) during the skill test set out in Appendices 1 and 2 to JAR–FCL 1.210, and any other conditions specified in JARs, the privileges of a holder of a multi-engine IR(A) are to pilot multi-engine and single-engine aeroplanes under IFR with a minimum decision height of 200 feet (60 m). Decision heights lower than 200 feet (60 m) may be authorised by the Authority after further training and testing in accordance with JAR–OPS, AMC FCL 1.261(a) paragraph 6 and with Appendix 2 to JAR–FCL 1.240, section 6.

(2) Subject to the skill test conditions set out in Appendices 1 and 2 to JAR–FCL 1.210, and any other conditions specified in JARs, the privileges of a holder of a single-engine IR(A) shall be to pilot single-engine

JAR-FCL 1.180(a) continued

aeroplanes under IFR with a minimum decision height of 200 feet (60 m).

(b) *Conditions*.

An applicant who has complied with the conditions specified in JAR-FCL 1.185 through 1.210 shall have fulfilled the requirements for the issue of an IR(A).

[Amdt. 1, 01.06.00]

JAR–FCL 1.185 Validity, revalidation and renewal

(a) An IR(A) is valid for one year. If an IR(A) for a multi-engine aeroplane is to be revalidated the holder shall complete the instrument requirements of JAR–FCL 1.245(b)(1), which may be conducted in a flight simulator or FNPT II. If an IR(A) for single-engine aeroplanes is to be revalidated the holder shall complete, as a proficiency check, the skill test set out in Appendices 1 and 2 to JAR–FCL 1.210, except for Section 6.

(b) If the IR(A) is valid for use in single-pilot operations, the revalidation shall be completed in either multi-pilot operations or single-pilot operations. If the IR(A) is restricted for use in multi-pilot operations only, the revalidation shall be completed in multi-pilot operations.

(c) An applicant who fails to achieve a pass in all sections of a proficiency check before the expiry date of an instrumement rating shall not exercise the privileges of that rating until the proficiency check has successfully been completed.

(d) If the rating is to be renewed, the holder shall meet the requirements above and any additional requirements as determined by the Authority.

(e) If the IR(A) has not been revalidated/renewed within the preceding 7 years, the holder will be required to retake the IR(A) theoretical knowledge examination.

[Amdt. 1, 01.06.00]

JAR–FCL 1.190 Experience

An applicant for an IR(A) shall hold a PPL(A) including a night qualification or CPL(A) and shall have completed at least 50 hours cross-country flight time as pilot-in-command in aeroplanes or helicopters of which at least 10 hours shall be in aeroplanes.

JAR–FCL 1.195 Theoretical knowledge

(a) *Course*. An applicant for an IR(A) shall have received theoretical knowledge instruction on an approved course at an approved flying training organisation **[**(FTO)**]**. The course should, wherever possible, be combined with a flying training course.

(b) *Examination*. An applicant shall demonstrate a level of knowledge appropriate to the privileges granted to the holder of an IR(A) and shall meet the requirements set out in JAR–FCL 1 (Aeroplane) Subpart J.

[Amdt. 1, 01.06.00; Amdt.3, 01.07.03]

JAR–FCL 1.200 Use of English language
(See Appendix 1 to JAR–FCL 1.200)

(a) An applicant for an IR(A) or validation shall have demonstrated the ability to use the English language as set out in Appendix 1 to JAR–FCL 1.200.

(b) The holder of an IR(A) issued in accordance with Appendix 1 to JAR-FCL 1.200 shall have the PPL(A), CPL(A) or ATPL(A) extended with radiotelephony privileges in English.

[Amdt. 2, 01.08.02]

JAR–FCL 1.205 Flight instruction
(See Appendix 1 to JAR–FCL 1.205)

(a) An applicant for an IR(A) shall have participated in a course of integrated flying training which includes training for the IR(A) (see JAR–FCL 1.165) or shall have completed an approved modular flying training course as set out in Appendix 1 to JAR–FCL 1.205.

(b) If the applicant is the holder of an IR(H) the total amount of flight instruction required by Appendix 1 to JAR–FCL 1.205 may be reduced to 10 hours on single-engine or multi-engine aeroplanes, as applicable.

[Amdt. 1, 01.06.00]

JAR–FCL 1.210 Skill
(See Appendices 1 and 2 to JAR–FCL 1.210)

(a) *General*. An applicant for an IR(A) shall have demonstrated the ability to perform the procedures and manoeuvres as set out in Appendices 1 and 2 to JAR–FCL 1.210 with a

JAR-FCL 1.210(a) (continued)

degree of competency appropriate to the privileges granted to the holder of an IR(A).

(b) *Multi-engine aeroplanes*. For a multi-engine aeroplane instrument rating the test shall be taken in a multi-engine aeroplane.

An applicant wishing to obtain a type/class rating for the aeroplane used in the skill test shall also meet the requirements of JAR–FCL 1.262.

(c) *Single-engine aeroplanes*. For a single-engine aeroplane instrument rating the test shall be taken in a single-engine aeroplane. A multi-engine centreline thrust aeroplane shall be considered a single-engine aeroplane for the purposes of a single-engine aeroplane IR.

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Appendix 1 to JAR–FCL 1.200
IR(A) – Use of English language
(See JAR–FCL 1.200)
(See Appendix 1 to JAR–FCL 1.005)
(See Appendix 1 to JAR–FCL 1.015)

USE OF ENGLISH LANGUAGE

1 An applicant for or the holder of the IR(A) shall have the ability to use the English language for the following purposes:

(a) flight:

radio telephony relevant to all phases of flight, including emergency situations.

This item in considered to be fulfilled, if the applicant has passed an IR or ATPL skill test or proficiency check during which the two-way radiotelephony communication is performed in English.

(b) ground:

all information relevant to the accomplishment of a flight, e.g.

* be able to read and demonstrate an understanding of technical manuals written in English, e.g. an Operations Manual, an Aeroplane Flight Manual, etc.
* pre-flight planning, weather information collection, NOTAMs, ATC Flight Plan, etc.
* use of all aeronautical en-route, departure and approach charts and associated documents written in English.

This item in considered to be fulfilled, if the applicant has graduated from an IR or ATP course given in English or if he has passed the theoretical IR or ATPL examination in English.

(c) communication:

be able to communicate with other crew members in English during all phases of flight, including flight preparation

This item is considered to be fulfilled, if the applicant for or the holder of an IR(A) has graduated from an MCC course given in English and is holding a certificate of satisfactory completion of that course in accordance with JAR-FCL 1.250(a)(3) or if he has passed a multi-pilot skill test/proficiency check in accordance with Appendix 1 to JAR-FCL 1.240 & 1.295, during which the two-way radiotelephony communication and the communication with other crew members are performed in English.

2 Alternatively, the above stated requirements may be demonstrated by having passed a specific examination given by or on behalf of the Authority after having undertaken a course of training enableing the applicant to meet all the objectives listed in 1(a), (b) and (c) above.

[Amdt. 1, 01.06.00; Amdt. 2, 01.08.02]

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Appendix 1 to JAR–FCL 1.205
IR(A) – Modular flying training course
(See JAR–FCL 1.205)
[(See Appendix 1 to JAR-FCL 1.470)**]**

1 The aim of the IR(A) modular flying training course is to train pilots to the level of proficiency necessary to operate aeroplanes under IFR and in IMC in accordance with ICAO PANS-OPS Document 8168.

2 An applicant for a modular IR(A) course shall be the holder of a PPL(A) or a CPL(A), either licence to include the privileges to fly by night, issued in accordance with ICAO Annex 1.

3 An applicant wishing to undertake a modular IR(A) course shall be required, under the supervision of the Head of Training of an approved flying training organisation (FTO), to complete all the instructional stages in one continuous approved course of training as arranged by that FTO. The theoretical knowledge instruction may be given at **[**an approved FTO conducting theoretical knowledge instruction only**]**, in which case the Head of Training of that organisation shall supervise that part of the course.

4 The course of theoretical instruction shall be completed within 18 months. The flight instruction and the skill test shall be completed within the period of validity of the pass in the theoretical examinations, as set out in JAR–FCL 1.495.

5 The course shall comprise :

(a) theoretical knowledge instruction to the instrument rating knowledge level;

(b) instrument flight instruction.

6 The successful completion of the theoretical knowledge examination(s) at paragraph 8 and of the skill test at paragraph 14 fulfil the knowledge and skill requirements for the issue of an IR(A).

THEORETICAL KNOWLEDGE

7 The theoretical knowledge syllabus for the IR(A) is set out in Appendix 1 to JAR-FCL 1.470. An approved modular IR(A) course shall comprise at least 200 hours (1 hour = 60 minutes instruction) of instruction, which can include classroom work, inter-active video, slide/tape presentation, learning carrels, computer based training, and other media as approved by the Authority, in suitable proportions. Approved distance learning (correspondence) courses may also be offered as part of the course at the discretion of the Authority

THEORETICAL KNOWLEDGE EXAMINATION

8 An applicant shall demonstrate a level of knowledge appropriate to the privileges of an IR(A) in accordance with the procedures in JAR–FCL Subpart J.

FLYING TRAINING

9 A single-engine IR(A) course shall comprise at least 50 hours instrument time under instruction of which up to 20 hours may be instrument ground time in a FNPT I, or up to 35 hours in a flight simulator or FNPT II, if agreed by the Authority.

10 A multi-engine IR(A) course shall comprise at least 55 hours instrument time under instruction of which up to 25 hours may be instrument ground time in a FNPT I, or up to 40 hours in a flight simulator or FNPT II, if agreed by the Authority. The remaining instrument flight instruction shall include at least 15 hours in multi-engine aeroplanes.

11 The holder of a single-engine IR(A) who also holds a multi-engine type or class rating wishing to obtain a multi-engine IR(A) for the first time shall satisfactorily complete a course at an approved FTO/TRTO comprising at least five hours instruction in instrument flying in multi-engine aeroplanes, of which 3 hours may be in a flight simulator or FNPT II.

12 The holder of a CPL(A) issued in accordance with ICAO may have the total amount of training required in paragraphs 9 or 10 above reduced by 5 hours.

13 The flying exercises up to the IR(A) skill test shall comprise:

(a) pre-flight procedures for IFR flights, including the use of the flight manual and appropriate air

Appendix 1 to JAR-FCL 1.205 (continued)

traffic services documents in the preparation of an IFR flight plan;

(b) procedure and manoeuvres for IFR operation under normal, abnormal and emergency conditions covering at least:

– transition from visual to instrument flight on take off
– standard instrument departures and arrivals
– en route IFR procedures
– holding procedures
– instrument approaches to specified minima
– missed approach procedures
– landings from instrument approaches, including circling;

(c) in flight manoeuvres and particular flight characteristics;

(d) if required, operation of a multi-engine aeroplane in the above exercises, including operation of the aeroplane solely by reference to instruments with one engine simulated inoperative and engine shut down and restart (the latter exercise to be carried out at a safe altitude unless carried out in a flight simulator or FNPT II).

SKILL TESTS

14 (a) On completion of the related flying training and completion of the experience requirements as stated in JAR–FCL 1.190, the applicant shall take the IR(A) skill test on either a multi-engine aeroplane or a single-engine aeroplane in accordance with Appendix 1 and 2 to JAR–FCL 1.210.

(b) On completion of the course mentioned in paragraph 11 above, the applicant shall take a skill test on a multi-engine aeroplane in accordance with Appendix 1 and 2 to JAR–FCL 1.210.

[Amdt. 1, 01.06.00; Amdt. 3, 01.07.03]

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Appendix 1 to JAR–FCL 1.210
IR(A) – Skill test and proficiency check
(See JAR–FCL 1.185 and 1.210)
(See IEM FCL 1.210)

1 An applicant for a skill test for the IR(A) shall have received instruction on the same class or type of aeroplane to be used for the skill test. The aeroplane used for the skill test shall meet the requirements for training aeroplanes set out in Appendix 1a to JAR–FCL 1.055.

2 The administrative arrangements for confirming the applicant's suitability to take the test, including disclosure of the applicant's training record to the examiner, will be determined by the Authority which approved the applicant's training.

3 An applicant shall pass sections 1 through 5 of the test/check, and section 6 of Appendix 2 to JAR–FCL 1.210 if a multi-engine aeroplane is used. If any item in a section is failed, that section is failed. Failure in more than one section will require the applicant to take the entire test again. An applicant failing only one section shall take the failed section again. Failure in any section of the re-test, including those sections that have been passed on a previous attempt, will require the applicant to take the entire test again. All sections of the skill test shall be completed within six months.

4 Further training may be required following any failed test/check. Failure to achieve a pass in all sections of the test in two attempts shall require further training as determined by the Authority. There is no limit to the number of skill tests that may be attempted.

CONDUCT OF THE TEST

5 The test is intended to simulate a practical flight. The route to be flown shall be chosen by the examiner. An essential element is the ability of the applicant to plan and conduct the flight from routine briefing material. The applicant shall undertake the flight planning and shall ensure that all equipment and documentation for the execution of the flight are on board. The duration of the flight shall be at least one hour.

6 The Authority will provide the examiner with safety advice to be observed in the conduct of the test.

7 Should the applicant choose to terminate a skill test for reasons considered inadequate by the examiner, the applicant shall retake the entire skill test. If the test is terminated for reasons considered adequate by the examiner, only those sections not completed shall be tested in a further flight.

8 At the discretion of the examiner, any manoeuvre or procedure of the test may be repeated once by the applicant. The examiner may stop the test at any stage if it is considered that the applicant's demonstration of flying skill requires a complete re-test.

9 An applicant shall fly the aeroplane from a position where the pilot-in-command functions can be performed and to carry out the test as if there is no other crew member. The examiner shall take no part in the operation of the aeroplane, except when intervention is necessary in the interests of safety or to avoid unacceptable delay to other traffic. Whenever the examiner or another pilot functions as a co-pilot during the test, the privileges of the instrument rating will be restricted to multi-pilot operations. This restriction may be removed by the applicant carrying out another initial instrument rating skill test acting as if there was no other crew member on a single-pilot aeroplane. Responsibility for the flight shall be allocated in accordance with national regulations.

10 Decision heights/altitude, minimum descent heights/altitudes and missed approach point shall be determined by the applicant and agreed by the examiner.

11 An applicant for IR(A) shall indicate to the examiner the checks and duties carried out, including the identification of radio facilities. Checks shall be completed in accordance with the authorised check list for the aeroplane on which the test is being taken. During pre-flight preparation for the test the applicant is required to determine power settings and speeds. Performance data for take-off, approach and landing shall be calculated by the applicant in compliance with the operations manual or flight manual for the aeroplane used.

During the proficiency check for revalidation or renewal of the IR(A) according to JAR–FCL 1.185(a) the licence holder has to demonstrate the same as above to the examiner involved.

Appendix 1 to JAR–FCL 1.210 (continued)

FLIGHT TEST TOLERANCES

12 The applicant shall demonstrate the ability to:

- operate the aeroplane within its limitations;
- complete all manoeuvres with smoothness and accuracy;
- exercise good judgement and airmanship;
- apply aeronautical knowledge; and
- maintain control of the aeroplane at all times in such a manner that the successful outcome of a procedure or manoeuvre is never seriously in doubt.

13 The following limits are for general guidance. The examiner shall make allowance for turbulent conditions and the handling qualities and performance of the aeroplane used.

Height

Generally	±100 feet
Starting a go-around at decision height	+50 feet/–0 feet
Minimum descent height/MAP/altitude	+50 feet/–0 feet

Tracking

on radio aids	±5°
Precision approach	half scale deflection, azimuth and glide path

Heading

all engines operating	±5°
with simulated engine failure	±10°

Speed

all engines operating	±5 knots
with simulated engine failure	+10 knots/–5 knots

CONTENT OF THE TEST

14 The skill test contents and sections set out in Appendix 2 to JAR–FCL 1.210 shall be used for the skill test. The format and application form for the skill test may be determined by the Authority (see IEM FCL 1.210). Section 2 item d, and Section 6 of the skill test and the proficiency check may, for safety reasons, be performed in a flight simulator or FNPT II.

[Amdt. 1, 01.06.00; Amdt. 2, 01.08.02]

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Appendix 2 to JAR–FCL 1.210
Contents of the skill test/proficiency check for the issue of an IR(A)
(See JAR–FCL 1.185 and 1.210)
(See IEM FCL 1.210)

SECTION 1 **PRE-FLIGHT OPERATIONS AND DEPARTURE**	
Use of checklist, airmanship, anti/de-icing procedures, etc., apply in all sections.	
a	Use of flight manual (or equivalent) especially a/c performance calculation, mass and balance
b	Use of Air Traffic Services document, weather document
c	Preparation of ATC flight plan, IFR flight plan/log
d	Pre-flight inspection
e	Weather Minima
f	Taxiing
g	Pre-take off briefing. Take off
h	Transition to instrument flight
i	Instrument departure procedures, altimeter setting
j	ATC liaison - compliance, R/T procedures
SECTION 2 **GENERAL HANDLING**	
a	Control of the aeroplane by reference solely to instruments, including: level flight at various speeds, trim
b	Climbing and descending turns with sustained Rate 1 turn
c	Recoveries from unusual attitudes, including sustained 45° bank turns and steep descending turns
d*	Recovery from approach to stall in level flight, climbing/descending turns and in landing configuration
e	Limited panel, stabilised climb or descent at Rate 1 turn onto given headings, recovery from unusual attitudes.

* May be performed in a Flight Simulator or FNPT II
\+ May be performed in either Section 4 or Section 5

Appendix 2 to JAR–FCL 1.210 (continued)

SECTION 3 EN-ROUTE IFR PROCEDURES	
a	Tracking, including interception, e.g. NDB, VOR, RNAV
b	Use of radio aids
c	Level flight, control of heading, altitude and airspeed, power setting, trim technique
d	Altimeter settings
e	Timing and revision of ETAs (En-route hold – if required)
f	Monitoring of flight progress, flight log, fuel usage, systems management
g	Ice protection procedures, simulated if necessary
h	ATC liaison and compliance, R/T procedures
SECTION 4 PRECISION APPROACH PROCEDURES	
a	Setting and checking of navigational aids, identification of facilities
b	Arrival procedures, altimeter checks
c	Approach and landing briefing, including descent/approach/landing checks
d+	Holding procedure
e	Compliance with published approach procedure
f	Approach timing
g	Altitude, speed heading control, (stabilised approach)
h+	Go-around action
i+	Missed approach procedure / landing
j	ATC liaison – compliance, R/T procedures

* May be performed in a Flight Simulator or FNPT II
\+ May be performed in either Section 4 or Section 5

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Appendix 2 to JAR–FCL 1.210 (continued)

SECTION 5 **NON-PRECISION APPROACH PROCEDURES**	
a	Setting and checking of navigational aids, identification of facilities
b	Arrival procedures, altimeter settings
c	Approach and landing briefing, including descent/approach/landing checks
d+	Holding procedure
e	Compliance with published approach procedure
f	Approach timing
g	Altitude, speed, heading control, (stabilised approach)
h+	Go-around action
i+	Missed approach procedure/landing
j	ATC liaison – compliance, R/T procedures
SECTION 6 (if applicable) **Simulated asymmetric flight**	
a	Simulated engine failure after take-off or on go-around
b	Asymmetric approach and procedural go-around
c	Asymmetric approach and landing, missed approach procedure
d	ATC liaison: compliance, R/T procedures

* May be performed in a Flight Simulator or FNPT II
\+ May be performed in either Section 4 or Section 5

[Amdt. 1, 01.06.00]

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SUBPART F – CLASS AND TYPE RATING (Aeroplane)

JAR–FCL 1.215 Class ratings (A)
(See Appendix 1 to JAR-FCL 1.215)

(a) *Divisions*. Class ratings shall be established for single-pilot aeroplanes not requiring a type rating as follows:

(1) all single-engine piston aeroplanes (land);

(2) all single-engine piston aeroplanes (sea);

(3) all touring motor gliders;

(4) each manufacturer of single-engine turbo-prop aeroplanes (land);

(5) each manufacturer of single-engine turbo-prop aeroplanes (sea);

(6) all multi-engine piston aeroplanes (land); and

(7) all multi-engine piston aeroplanes (sea).

(b) *Listings*. Class ratings for aeroplanes will be issued according to the list of class of aeroplanes (see Appendix 1 to JAR-FCL 1.215). In order to change to another type or variant of the aeroplane within one class rating, differences or familiarisation training is required (see Appendix 1 to JAR-FCL 1.215).

(c) The requirements for the issue, the revalidation, renewal for the following class ratings are at the discretion of the Authority:

(1) sea-planes

(2) multi-engine centreline thrust **[**aeroplanes**]**.

[(3) single seat aeroplanes.**]**

[Amdt. 1, 01.06.00; Amdt. 2, 01.08.02; Amdt. 3, 01.07.03]

JAR–FCL 1.220 Type ratings (A)
(See Appendix 1 to JAR-FCL 1.220)

(a) *Criteria*. For the establishment of type ratings for aeroplanes other than those included in JAR–FCL 1.215, all of the following shall be considered:

(1) airworthiness type certificate;

(2) handling characteristics;

(3) certificated minimum flight crew complements;

(4) level of technology.

(b) *Divisions*. Type ratings for aeroplanes shall be established for:

(1) each type of multi-pilot aeroplane; or

(2) each type of single-pilot multi-engine aeroplane fitted with turbo-prop or turbojet engines; or

(3) each type of single-pilot single-engine aeroplane fitted with a turbojet engine; or

(4) any other type of aeroplane if considered necessary.

(c) *Listing*. Type ratings for aeroplanes will be issued according to the list of types of aeroplanes (see Appendix 1 to JAR-FCL 1.220). In order to change to another variant of the aeroplane within one type rating, differences or familiarisation training is required (see Appendix 1 to JAR-FCL 1.220).

[Amdt. 1, 01.06.00]

[JAR-FCL 1.221 High performance single pilot aeroplanes
(See Appendix 1 to JAR-FCL 1.215 and 1.220)

(a) *Criteria*. For the establishment of a class or type rating of a single-pilot aeroplane designated as high performance, all the following shall be considered:

(1) type of power plant;

(2) provision and capabilities of airframe systems;

(3) cabin pressurisation;

(4) capabilities of navigation systems;

(5) performance both airfield and en route;

(6) handling characteristics.

(b) *Listings*. Aeroplanes designated as high performance shall be listed as such within the relevant class or type rating list using the annotation HPA (see Appendix 1 to JAR-FCL 1.215 and 1.220). **]**

[Amdt. 3, 01.07.03]

JAR–FCL 1.225 Circumstances in which type or class ratings are required

The holder of a pilot licence shall not act in any capacity as a pilot of an aeroplane except as a pilot undergoing skill testing or receiving flight instruction unless the holder has a valid and appropriate class or type rating. When a class or type rating is issued limiting the privileges to acting as co-pilot only, or to any other conditions agreed within JAA, such limitations shall be endorsed on the rating.

JAR–FCL 1.230 Special authorisation of type or class ratings

For the non-revenue special purpose flights e.g. aircraft flight testing, special authorisation may be provided in writing to the licence holder by the Authority in place of issuing the class or type rating in accordance with JAR–FCL 1.225. This authorisation shall be limited in validity to completing a specific task.

[Amdt. 1, 01.06.00]

JAR–FCL 1.235 Type and class ratings – Privileges, number and variants

(See Appendix 1 to JAR-FCL 1.215 and Appendix 1 to JAR-FCL 1.220)

(a) *Privileges.* Subject to JAR–FCL 1.215(b) and (c) above, the privileges of the holder of a type or class rating are to act as a pilot on the type or class of aeroplane specified in the rating.

(b) *Number of type/class ratings held.* There is no JAR–FCL limit to the number of ratings that may be held at one time. JAR–OPS, however, may restrict the number of ratings that can be exercised at any one time.

(c) *Variants.* If the variant has not been flown within a period of 2 years following the differences training, further differences training or a proficiency check in that variant will be required except for types or variants within the SEP class rating.

(1) Differences training requires additional knowledge and training on an appropriate training device or the aeroplane.

The differences training shall be entered in the pilot's logbook or equivalent document and signed by a CRI/TRI/SFI(A) or FI(A) as appropriate.

(2) Familiarisation training requires the acquisition of additional knowledge.

[Amdt. 1, 01.06.00]

JAR–FCL 1.240 Type and class ratings – Requirements

(See Appendices 1 to 3 to JAR–FCL 1.240)

(a) *General*

(1) An applicant for a type rating for a multi-pilot type of aeroplane shall comply with the requirements for type ratings set out in JAR–FCL 1.250, 1.261 and 1.262;

(2) An applicant for a type rating for a single-pilot type of aeroplane shall comply with the requirements set out in JAR–FCL 1.255, 1.261(a), (b) and (c) and 1.262(a), **[**and if applicable JAR-FCL 1.251.**]**

(3) An applicant for a class rating for a class of aeroplanes shall comply with the requirements set out in JAR–FCL 1.260, 1.261(a), (b) and (c) and 1.262(a), **[**and if applicable JAR-FCL 1.251**]**.

(4) The type rating course, including theoretical kowledge, shall be completed within the 6 months preceding the skill test.

(5) At the discretion of the Authority, an aeroplane class or type rating may be issued to an applicant who meets the requirements for that rating of a non-JAA State, provided JAR–FCL 1.250, 1.255 or 1.260 as applicable, are met. Such a rating will be restricted to aeroplanes registered in that non-JAA State, or operated by an operator of that non-JAA State. The restriction may be removed when the holder has completed at least 500 hours of flight as a pilot on the type/class and complied with the revalidation requirements of JAR–FCL 1.245, **[**and if applicable JAR-FCL 1.251**]**.

(6) A valid type rating contained in a licence issued by a non-JAA State may be transferred to a JAR-FCL licence, subject to the appropriate proficiency check, provided the applicant is in current flying practice and has not less than 500 hours flying experience as a pilot on that type, provided JAR-FCL 1.250, **[**1.251,**]** 1.255 or 1.260 as applicable, are met.

(7) A valid class rating contained in a licence issued by a non-JAA State may be transferred to a JAR-FCL licence, subject to the appropriate proficiency check provided the applicant is in current flying practice and has not

JAR-FCL 1.240(a)(7) (continued)

less than 100 hours flying experience as a pilot in that class, provided JAR-FCL **[**1.251 or**]** 1.260, as applicable, **[**are**]** met.

(8) A valid class/type rating contained in a licence issued by a JAA Member State may be transferred to a JAR FCL licence provided it is currently valid and the last revalidation/renewal of the rating was performed in accordance with the requirements of JAR FCL and JAR-FCL 1.250, 1255 or 1.260, as applicable.

(b) *Skill test*

(1) The skill test contents and sections for a rating for multi-engine multi-pilot aeroplanes are set out in Appendices 1 and 2 to JAR–FCL 1.240; and

(2) the skill test contents and sections for a rating for multi-engine single-pilot aeroplanes and for single-engine aeroplanes are set out in Appendices 1 and 3 to JAR–FCL 1.240.

Each applicable item in the appropriate skill test shall be satisfactorily completed within the six months immediately preceding the date of receipt of the application for the rating.

[Amdt. 1, 01.06.00; Amdt. 2, 01.08.02; Amdt. 3, 01.07.03]

JAR–FCL 1.245 Type and class ratings – Validity, revalidation and renewal

(See Appendices 1 to 3 to JAR–FCL 1.240)

(a) *Type ratings and multi-engine class ratings, aeroplane – Validity.* Type ratings and multi-engine class ratings for aeroplanes are valid for one year from the date of issue, or the date of expiry if revalidated within the validity period.

(b) *Type ratings and multi-engine class ratings, aeroplane – Revalidation.* For revalidation of type ratings and multi-engine class ratings, aeroplane, the applicant shall complete:

(1) a proficiency check in accordance with Appendix 1 to JAR–FCL 1.240 in the relevant type or class of aeroplane within the three months immediately preceding the expiry date of the rating; and

(2) at least ten route sectors as pilot of the relevant type or class of aeroplane, or one route sector as pilot of the relevant type or class of aeroplane flown with an examiner during the period of validity of the rating.

JAR-FCL 1.245(b) (continued)

(3) The revalidation of an IR(A), if held, should be combined with the type/class rating proficiency check in accordance with Appendix 1 to JAR–FCL 1.240 & 1.295.

(c) *Single-pilot single-engine class ratings – Validity and Revalidation.* Single-pilot single-engine class ratings are valid for two years from the date of issue, or the date of expiry if revalidated within the validity period.

(1) *All single-engine piston aeroplane class ratings (land) and all touring motor glider's ratings – Revalidation.* For revalidation of single-pilot single-engine piston aeroplane (land) class ratings and/or touring motor glider class ratings the applicant shall **[ ]**:

(i) within the three months preceding the expiry date of the rating, pass a proficiency check in accordance with Appendix 1 and 3 to JAR-FCL 1.240 or Appendix 1 and 2 to JAR-FCL 1.210 with an authorised examiner **[**in the relevant class**]**; or

(ii) within the 12 months preceding the expiry of the rating complete 12 hours flight time in the **[**relevant**]** class including:

(A) 6 hours of pilot-in-command time;

(B) 12 take-offs and 12 landings; and

(C) a training flight of at least one hour's duration with a FI(A) or CRI(A). This flight may be replaced by any other proficiency check or skill test **[ ]**.

[(iii) When the applicant holds both a single-engine piston aeroplane (land) class rating and a touring motor glider rating, he may complete the requirements in (i) above in either class or in (ii) above in either class or a mixture of the classes, and achieve a revalidation of both ratings.**]**

(2) *Single-engine turbo-prop aeroplanes (land) single-pilot – Revalidation.* For revalidation of single-engine turbo-prop (land) class ratings the applicant shall within the three months preceding the expiry date of the rating, pass a proficiency check with an authorised examiner on the relevant class of aeroplane.

(d) An applicant who fails to achieve a pass in all sections of a proficiency check before the expiry date of a type or class rating shall not exercise the

JAR-FCL 1.245(d) (continued)

privileges of that rating until the proficiency check has successfully been completed.

(e) Extension of the validity period or revalidation of ratings in special circumstances:

(1) When the privileges of an aircraft type, class or instrument rating are being exercised solely on an aeroplane registered in a non-JAA State, the Authority may at its discretion extend the validity period of the rating, or revalidate the rating provided the requirements of that non-JAA State are fulfilled.

(2) When the privileges of an aircraft type, class or instrument rating are being exercised in a JAA registered aeroplane being operated by an operator of a non-JAA State under the provisions of Article 83bis of the International Convention on Civil Aviation, Chicago, the Authority may at its discretion extend the validity period of the rating, or revalidate the rating provided the requirements of that non-JAA State are fulfilled.

(3) Any rating extended or revalidated under the provisions of (1) or (2) above shall be revalidated in accordance with JAR–FCL 1.245(b) or (c) and, if applicable, JAR–FCL 1.185 before the privileges are exercised on aircraft registered in and operated by an operator of a JAA Member State.

(4) A rating issued or used in a non-JAA State may remain in a JAR–FCL licence at the discretion of the Authority provided the requirements of that State are fulfilled and the rating is restricted to aircraft registered in that State.

(f) *Expired Ratings*

(1) If a type rating or multi-engine class rating has expired, the applicant shall meet any refresher training requirements as determined by the Authority and complete a proficiency check in accordance with Appendices 1 and 2 or 3 to JAR–FCL 1.240. The rating will be valid from the date of completion of the renewal requirements.

(2) If a single-pilot single-engine class rating has expired, the applicant shall complete the skill test in Appendices 1 and 3 to JAR–FCL 1.240.

[Amdt. 1, 01.06.00; Amdt. 2, 01.08.02; Amdt. 3, 01.07.03]

JAR–FCL 1.250 Type rating, multi-pilot – Conditions

(See AMC FCL 1.261(d))
(See Appendix 1 to JAR-FCL 1.261(d))

(a) *Pre-requisite conditions for training:* An applicant for the first type rating for a multi- pilot aeroplane type shall:

(1) have at least 100 hours as pilot-in-command of aeroplanes;

(2) have a valid multi-engine instrument rating (A);

(3) hold a certificate of satisfactory completion of multi-crew co-operation (MCC). If the MCC course is to be added to the type rating course (see JAR–FCL 1.261 and 1.262 and AMC FCL 1.261(d) and Appendix 1 to JAR-FCL 1.261(d), this requirement is not applicable; and

(4) have met the requirements of JAR–FCL 1.285.

(b) Applicants having:

(1) either a certificate of satisfactory completion of MCC in accordance with JAR-FCL 2 and experience of more than 100 hours as a pilot of a multi-pilot helicopter, or

(2) experience of more than 500 hours as a pilot on multi-pilot helicopter shall be considered to meet the requirement of MCC.

(c) The level of knowledge assumed to be held by holders of the PPL(A) or CPL(A) and type ratings for multi-pilot aeroplanes issued under requirements other than JAR–FCL will not be a substitute for showing compliance with the requirements of (4) above.

(d) The issue of an additional multi-pilot type ratings requires a valid multi-engine instrument rating.

[Amdt. 1, 01.06.00; Amdt. 2, 01.08.02]

[JAR-FCL 1.251 Type, class ratings for single pilot high performance aeroplanes – Conditions

(See Appendix 1 to JAR-FCL 1.251)
(See AMC FCL 1.251)

(a) *Pre-requisite conditions for training:* An applicant for a first type or class rating for a single-pilot high performance aeroplane (HPA) shall:]

JAR-FCL 1.251(a) (continued)

[(1) have at least 200 hours total flying experience;

(2) have met the requirements of JAR-FCL 1.255 or 1.260, as appropriate; and

(3) (i) hold a certificate of satisfactory completion of a pre-entry approved course in accordance with Appendix 1 to JAR-FCL 1.251 to be conducted by a FTO or a TRTO; or

(ii) have passed at least the ATPL(A) theoretical knowledge examinations in accordance with JAR-FCL 1.285; or

(iii) hold a valid ICAO ATPL(A) or CPL/IR with theoretical knowledge credit for ATPL(A);

(b) The holder of a licence issued by a JAA Member State which includes a class or type rating for a high performance single pilot aeroplane shall be credited with the theoretical knowledge requirement of paragraph (a)(3) above when that rating is transferred to a JAR-FCL licence issued by the State.**]**

[Amdt. 3, 01.07.03]

JAR–FCL 1.255 Type rating, single-pilot – Conditions

Experience – multi-engine aeroplanes only

An applicant for a first type rating on a single-pilot multi-engine aeroplane shall have completed at least 70 hours as pilot-in-command of aeroplanes.

JAR–FCL 1.260 Class rating – Conditions

Experience – multi-engine aeroplanes only

An applicant for a class rating for a single-pilot multi-engine aeroplane shall have completed at least 70 hours as pilot-in-command of aeroplanes.

JAR–FCL 1.261 Type and class ratings – Knowledge and flight instruction

(See Appendix 1 to JAR–FCL 1.261 (a) and AMC FCL 1.261 (a))
(See Appendix 1 to JAR-FCL 1.261 (c)(2)
(See Appendices 1, 2 and 3 to JAR–FCL 1.240)
(See Appendix 1 to JAR-FCL 1.261(d))
(See Appendix 2 to JAR–FCL 1.055)
(See AMC FCL 1.261(c)(2))
(See AMC FCL 1.261(d))
[(See JAR-FCL 1.251)
(See AMC 1.251)**]**

(a) *Theoretical knowledge instruction and checking requirements*

(1) An applicant for a class or type rating for single- or multi-engine aeroplanes shall have completed the required theoretical knowledge instruction (see Appendix 1 to JAR–FCL 1.261(a) and AMC FCL 1.261(a)) and demonstrated the level of knowledge required for the safe operation of the applicable aeroplane type.

(2) *Multi-engine aeroplanes only.* An applicant for a single-pilot multi-engine class rating shall have completed not less than 7 hours theoretical knowledge instruction in multi-engine aeroplane operation.

(b) *Flight instruction*

(1) An applicant for a class/type rating for single-engine and multi-engine single-pilot aeroplanes shall have completed a course of flight instruction related to the class/type rating skill test (see Appendix 3 to JAR–FCL 1.240).

(2) *Multi-engine aeroplanes only*. An applicant for a single-pilot multi-engine class/type rating shall have completed not less than 2 hrs 30 min dual flight training under normal conditions of multi-engine aeroplane operation, and not less than 3 hrs 30 min dual flight training in engine failure procedures and asymmetric flight techniques;

(3) An applicant for a type rating for multi-pilot aeroplanes shall have completed a course of flight instruction related to the type rating skill test (see Appendix 2 to JAR–FCL 1.240).

JAR-FCL 1.261 (continued)

(c) *Conduct of training courses*

(1) Training courses for the above purpose shall be conducted by a FTO or a TRTO. Training courses may also be conducted by a facility or a sub-contracted facility provided by an operator or a manufacturer or, in special circumstances, by an individually authorised instructor.

(2) Such courses shall be approved by the Authority (see AMC FCL 1.261(c)(2)) and such facilities shall meet the relevant requirements of Appendix 2 to JAR–FCL 1.055, as determined by the Authority. For Zero Flight time Training (ZFTT) see Appendix 1 to JAR-FCL 1.261 (c)(2)).

(3) Notwithstanding paragraphs (c)(1) and (2) above, training courses for a single-engine aeroplane class rating or touring motor glider class rating may be conducted by an FI or a CRI.

(d) *Multi-crew co-operation training* (see also JAR–FCL 1.250(a)(3)

(1) The course is intended to provide MCC training in two circumstances:

(i) for students attending an ATP integrated course in accordance with the aim of that course (see Appendix 1 to JAR–FCL 1.160 & 1.165(a)(1))

(ii) for PPL/IR or CPL/IR holders, who have not graduated from an ATP integrated course but who wish to obtain an initial type rating on multi-pilot aeroplanes (see JAR–FCL 1.250(a)(3)).

The MCC course shall comprise at least 25 hours of theoretical knowledge instruction and exercises and 20 hours of MCC training. Students attending an ATP integrated course may have the practical training reduced by 5 hours. Wherever possible, the MCC training should be combined with the initial type rating course on multi-pilot aeroplanes.

(2) The MCC training shall be accomplished within six months under the supervision of either the Head of Training of an approved FTO or an approved TRTO or on an approved training course conducted by an operator. A course conducted by an operator shall meet the relevant requirements of Appendix 2 to JAR–FCL 1.055, as determined by the Authority. For further details on MCC training see Appendix 1 to JAR-FCL 1.261(d)) and AMC FCL 1.261(d). A FNPT II or a flight simulator shall be used. [Wherever possible, the MCC training should be combined with the

JAR-FCL 1.261(d)(2) (continued)

initial type rating training for a multi-pilot aeroplane, in which case the practical MCC training may be reduced to not less than 10 hours if the same flight simulator is used for both the MCC and type rating training.

[Amdt. 1, 01.06.00; Amdt. 2, 01.08.02; Amdt. 3, 01.07.03]

JAR–FCL 1.262 Type and class ratings – Skill

(See Appendices 1, 2 and 3 to JAR–FCL 1.240)
(See Appendix 1 to AMC FCL 1.261(d))

(a) *Single-pilot skill test.* An applicant for a type or class rating for a single pilot aeroplane shall have demonstrated the skill required for the safe operation of the applicable type or class of aeroplane, as set out in Appendices 1 and 3 to JAR–FCL 1.240.

(b) *Multi-pilot skill test.* An applicant for a type rating for a multi-pilot aeroplane shall have demonstrated the skill required for the safe operation of the applicable type of aeroplane in a multi-crew environment as a pilot-in-command or a co-pilot as applicable, as set out in Appendices 1 and 2 to JAR–FCL 1.240.

(c) *Multi-crew co-operation.* On completion of the MCC training the applicant shall either demonstrate the ability to perform the duties of a pilot on multi-pilot aeroplanes by passing the type rating skill test on multi-pilot aeroplanes as set out in Appendices 1 and 2 to JAR–FCL 1.240, or shall be given a certificate of completion of MCC as shown in Appendix 1 to AMC FCL 1.261(d).

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Appendix 1 to JAR-FCL 1.215
List of Class of aeroplane
See JAR-FCL 1.215

Explanation of table refer to JAR-FCL 1.235(c):

(a) the symbol (D) in column 3 indicates that differences training is required when moving between variants or other types of aeroplane which are separated by the use of a line in column 2.

(b) although the licence endorsement (column 4) contains all aeprolanes listed in column 2, the required familiarisation or differences training has still to be completed;

(c) the specific variant on which the skill test for the class rating has been completed will be recorded according to JAR-FCL 1.080.

(d) the symbol HPA (High Performance Aeroplane) in column 3 indicates that additional knowledge instruction (to be developed) is required for this type of aeroplane if the applicant for the type rating is not the holder of an ATPL(A) or has no theoretical knowledge credit at ATPL(A) level.

Aeroplanes not listed may be entered into a JAR-FCL licence, but the rating privileges are restricted to aeroplanes on the register of the State of rating issue.

1. Single/multi engine piston aeroplane (land/sea) - Single-pilot (SP) (A)

1 Manufacturer	2 Aeroplanes	3	4 Licence Endorsement
All manufacturers	Single-engine piston (land)	(D)	SEP (land)
	Single-engine piston (land) with Variable pitch propellers (VP)		
	Single-engine piston (land) with Retractable undercarriage (RU)		
	Single-engine piston (land) with Turbo/super charged engines (T)		
	Single-engine piston (land) with Cabin pressurisation (P)		
	Single-engine piston (land) with Tail Wheel (TW)		
	Single-engine piston (sea)	(D)	SEP (sea)
	Single-engine piston (sea) with Variable pitch propellers (VP)		
	Single-engine piston (sea) with Turbo/super charged engines (T)		
	Single-engine piston (sea) with Cabin pressurisation (P)		

1 Manufacturer	2 Aeroplanes	3	4 Licence Endorsement
All Manufacturers	Multi-engine piston (land)	(D)	MEP (land)
	Multi-engine piston (sea)	(D)	MEP (sea)

Appendix 1 to JAR-FCL 1.215 (continued)

2. Single-engine turboprop (land) - Single-pilot

1 Manufacturer	2 Aeroplanes	3	4 Licence endorsement
Aerospatiale (Socata)	TBM 700	(HPA)	AerospatialeSET
Snow/Rockwell/Ayres	S2R turbo thrush		Snow/Ayres SET
Cessna	206 A/T Soloy 207 A/T Soloy	(D)	CessnaSET
	208		
De Havilland(AirTech Canada) (Bombardier)	DHC-3 Turbo-Otter		DHC3
	DHC-2 Turbo-Beaver		DHC2
Gulfstream	Am.G-164D		GulfstreamSET
Pilatus	PC-6 series PC6 B2H2	(D)	Pilatus SET
	PC-7		
Rhein Flugzeugbau	FT 600		Rhein FlugzeugbauSET

3. Single-engine piston touring motor gliders (land) - Single-pilot

1 Manufacturer	2 Aeroplanes	3	4 Licence endorsement
All manufacturers	All Touring Motor Gliders having an integrally mounted, non-retractable engine and a non-retractable propeller		TMG

[Amdt. 2, 01.08.02]

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Appendix 1 to JAR-FCL 1.220
List of Type of aeroplane
See JAR-FCL 1.220(c)

This Appendix includes aeroplanes type certificated in JAA Member States and does not include:

(i) aeroplanes not type certificated in accordance with FAR/JAR 23, FAR/JAR 23 Commuter Category , FAR/JAR 25, BCAR or AIR 2051;

(ii) aeroplanes type certificated in a JAA Member State under special registration such as military, ex-military, experimental or vintage aeroplanes;

Aeroplanes not listed may be entered into a JAR-FCL licence, but the rating privileges are restricted to aeroplanes on the register of the State of rating issue.

Explanation of table refer to JAR-FCL 1.235(c):

(a) the symbol (D) in column 3 indicates that differences training is required when moving between variants or other types of aeroplane which are separated by the use of a line in column 2;

(b) although the licence endorsement (column 4) contains all aeroplanes listed in column 2, the required familiarisation or differences training has still to be completed;

(c) the specific variant on which the skill test for the type rating has been completed will be recorded according to JAR-FCL 1.080.

(d) the symbol HPA (High Performance Aeroplane) in column 3 indicates that additional knowledge instruction (to be developed) is required for this type of aeroplane if the applicant for the type rating is not the holder of an ATPL(A) or has no theoretical knowledge credit at ATPL(A) level.

(e) SP* means Single Pilot certificated in some JAA Member States.

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Appendix 1 to JAR-FCL 1.220 (continued)

A. Single-pilot aeroplanes

1. Multi-engine turboprop aeroplane (land) : single-pilot (SP) (A)

1 Manufacturer	2 Aeroplanes	3	4 Licence endorsement
Asta GAF	Nomad-22B -24A		AstaMET
Beechcraft	90 series	(HPA) (D)	BE90/99/100/200
	99 series		
	100 series		
	200 series		
	300 series	(HPA) (D)	BE300/1900
	1900 series		
Cessna/Reims Aviation	F406 425	(HPA)	C406/425
	441	(HPA)	C441
De Havilland – Canada (Bombardier)	DHC6 series		DHC6
Dornier	DO 128-6		D128
	DO 228 series		D228
Embraer	Bandeirante EMB 110		EMB110
Grumman	Tracker S2FT		S2FT
Mitsubishi	MU 2B series	(HPA)	MU2B
Piaggio	P166		Piaggio166
	P180	(HPA)	Piaggio180
Pilatus Britten	BN2T Turbine Islander	(D)	BN2T
	BN2T – 4R MSSA BN2T – 4S Defender		
Piper	PA31 series Cheyenne I/II	(HPA) (D)	PA31/42
	PA42 series Cheyenne III		
Rockwell	AC 680T AC 690 series AC 900 series	(HPA)	Rockwell MET
Short(Bombardier)	SC7Skyvan		SC7Skyvan
Swearingen/Fairchild	226 T 226 T(B)	(HPA) (D)	SA226/227
	226AT 226TC		
	227TT		
	227 AC 227 AT 227 BC		

Appendix 1 to JAR-FCL 1.220 (continued)

2. Single engine – single-pilot

1 Manufacturer	2 Aeroplanes	3	4 Licence endorsement
Pilatus	PC-7 MkII PC-9 PC-9 (M)	(HPA)	PC9/PC7MkII
	PC-12 series	(HPA)	PC12
Piper	PA-46 Malibu	(HPA) (D)	PA46
	PA-46 Malibu Turbine		
Walter Extra	Extra 400	(HPA)	Extra400

3. Multi-engine turbo-prop (sea) – single-pilot

1 Manufacturer	2 Aeroplanes	3	4 Licence endorsement
Canadair(Bombardier)	CL215T		CL215T

4. Multi-engine turbo-jet (land) – single-pilot (SP)

1 Manufacturer	2 Aeroplanes	3	4 Licence endorsement
Aerospatiale	MS 760 Paris	(HPA)	S760
Cessna	C501/500SP*	(HPA) (D)	C501/551
	C551/550SP*		
	C525	(HPA)	C525

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Appendix 1 to JAR-FCL 1.220 (continued)

B. MULTI-PILOT AEROPLANES

1 Manufacturer	2 Aeroplanes	3	4 Licence endorsement
Aerospatiale/Sud Aviation	SN601 Corvette		SN601
	SE 210 III IIIR VIN	(D)	SE210/10B3/11/12
	SE 10B3		
	SE 11		
	SE 12		
Aerospatiale/BAC	Concorde		Concorde
Aerospatiale/Nord Aviation	Nordatlas 2501		ND25
	C160 P Transall		ND16
	260A Nord 262 A-B-C Nord		ND26
Aero Spaceline	377 SGTF Super Guppy		SuperGuppy
Airbus	A300-B1 -B2 series -B4 series -C4-200 series -F4-200 series		A300
	A300-FFCC		A300FFCC
	A310 -200 series -300 series A300-B4 600 series -C4 600 series -F4 600 series		A310/300-600
	A319-100 series A320-100 series -200 series A321-100 series -200 series		A319/320/321
	A330-300 series -200 series		A330
	A340-200 series -300 series		A340
	A300-600ST/Beluga		A300-600ST

Appendix 1 to JAR-FCL 1.220 (continued)

1 Manufacturer	2 Aeroplanes	3	4 Licence endorsement
ATR	ATR 42 200/300/400	(D)	ATR42/72
	ATR 42 500 72 series		
Mitsubishi/Beech/Raytheon	Beechjet 400 series MU 300		Beech400/MU300
Boeing	B707-100 series -300 series	(D)	B707/720
	B720		
	B717 series		B717
	B727-100 series -200 series		B727
	B737-100 series -200 series		B737 100-200
	B737-300 series -400 series -500 series	(D)	B737 300-800
	-600 series -700 series -800 series		
	B747-100 series -200 series -300 series	(D)	B747 100-300
	B747-SP		
	B747-400 series		B747 400
	B757-200 series -300 series	(D)	B757/767
	B767-200 series -300 series		
	B777-200 series -300 series		B777
Bombardier	Global Express		BD700

Appendix 1 to JAR-FCL 1.220 (continued)

1 Manufacturer	2 Aeroplanes	3	4 Licence endorsement
British Aerospace / AVRO	ATP Jetstream 61		BAe/ATP/Jetstream 61
	AVRO RJ series 146-100 series -200 series -300 series		AVRORJ/Bae146
British Aerospace / AVRO	BAC 1-11-200 series -400 series -500 series		BAC1-11
Hawker Siddeley/Bae/Raytheon	HS125 series	(D)	HS125
	Bae 125-800series -1000 series		
	HS 748 series		HS748
Hawker Siddeley/Bae	Jetstream 3100 series 3200 series		Jetstream31/32
Bae / Avro	Jetstream 41		Jetstream41
Canadair(Bombardier)	CL 415		CL415
	(Challenger series) CL 600 CL 601-1A CL 601-3A		CL600/601
	(Challenger) CL 604		CL604
	(Regional Jet series) CRJ -100 -200	(D)	CRJ 100
	-700		
	C212 series		C212
Casa	CN-235		CN235

Appendix 1 to JAR-FCL 1.220 (continued)

1 Manufacturer	2 Aeroplanes	3	4 Licence endorsement
Cessna	C 500	(D)	C500/550/560
	C 550 CS 550		
	CS 550 Bravo		
	C 560 Encore		
	C 560XL		C560XL
	C650 Citation III Citation VI Citation VII		C650
	C750 Citation X		C750
Consolidated Vultee Aircraft	CV 240-4	(D)	CV240/340/440
	CV 340 CV 440		
	CV 580		CV580
Dassault	Falcon 10	(D)	Falcon10/100
	Falcon 100		
	Falcon 20 series	(D)	Falcon20/200
	Falcon 200		
	Falcon 50	(D)	Falcon50/900
	Falcon 900		
	Falcon 900 EX		
	Falcon 2000		Falcon2000
De Havilland – Canada (Bombardier)	DHC7		DHC7
	DHC8-100 series -200 series -300 series	(D)	DHC8
	DHC8-400 series		
Dornier	DO 328-100		DO328-100
	DO 328-300		DO328-300
McDonnel-Douglas	Douglas A-26B		DCA26
	Douglas -3A-S1C3G		DC3
	DC4		DC4
	DC6 series		DC6
	DC7C		DC7

Appendix 1 to JAR-FCL 1.220 (continued)

1 Manufacturer	2 Aeroplanes	3	4 Licence endorsement
McDonnel-Douglas/Boeing	DC8-33 -50, 60,70 series		DC8
	DC9 10-50 series		DC9 10-50
	DC9 80 series	(D)	DC9 80/MD88/MD90
	MD 88 series MD 90 series		
	DC10 series		DC10
	MD 11		MD11
Embraer	EMB 120 Brasilia		EMB120
	EMB 145 - 135,145 series		EMB 135/145
Fokker/Fairchild	FH227 F27A/F/J F27 series		F27
	F28 series		F28
	F50		F50
	F70 F100		F70/100
Grumman Gulfstream	Grumman G-159		GulfstreamI
	Grumman G-1159	(D)	GulfstreamII/III
	Grumman G-1159A		
	Gulfstream 1159C		GulfstreamIV
	Gulfstream V		GulfstreamV
Handley Page	Herald series		Herald
Israel Aircraft Industry	IAI -1121 Jetcommander -1123 Commodore Jet -1124 Westwind		IAI1121/23/24
	IAI -1125 Astra		IAI1125
Junkers	Junkers 52		JU52
Lockheed	L188 Electra series A	(D)	L188 Electra
	L188 Electra series C		
	L382 G (C 130)		Hercules
	L1011 series		L1011
	L1329		Jetstar

Appendix 1 to JAR-FCL 1.220 (continued)

1 Manufacturer	2 Aeroplanes	3	4 Licence endorsement
Learjet(Bombardier)	Learjet-20 series	(D)	Learjet20/30
	-30 series		
	Learjet-45 series		Learjet45
	Learjet-55 series		Learjet55
	Learjet-60 series		Learjet60
Leteckee	L410 UVP		LetL410
MBB	HFB 320		HFB320
	VFW 614		VFW-614
PT Industry	IPTN CN 235-110		IPTNCN235
Rockwell International	NA-265 series		NA265
Saab	SAAB SF340 series		SAAB340
	SAAB 2000		SAAB2000
Short Brothers(Bombardier)	SD3 -30	(D)	SD3-30/60
	-60		
	SC5 Belfast		Belfast
Vickers-Armstrong	Vanguard		Vanguard
	Viscount		Viscount

[Amdt. 2, 01.08.02]

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Appendix 1 to JAR–FCL 1.240 & 1.295
Skill test and proficiency check for aeroplane type/class ratings and ATPL
(See JAR–FCL 1.240 through 1.262 and 1.295)
(See Appendix 1 to JAR-FCL 1.261(a))
(See AMC FCL 1.261(a))
(See IEM FCL 1.240(1) and (2))

1 The applicant shall have completed the required instruction in accordance with the syllabus (see also Appendix 1 to JAR–FCL 1.261(a) and Appendices 2 & 3 to JAR–FCL 1.240). The administrative arrangements for confirming the applicant's suitability to take the test, including disclosure of the applicant's training record to the examiner, shall be determined by the Authority.

2 Items to be covered in skill tests/proficiency checks are given in the applicable Appendix 2 & 3 to JAR–FCL 1.240. With the approval of the Authority, several different skill test/proficiency check scenarios may be developed containing simulated line operations. The examiner will select one of these scenarios. Flight simulators, if available and other training devices as approved shall be used.

3 (a) For SPA: The applicant shall pass all sections of the skill test/proficiency check. If any item in a section is failed, that section is failed. Failure in more than one section will require the applicant to take the entire test/check again. Any applicant failing only one section shall take the failed section again. Failure in any section of the re-test/re-check including those sections that have been passed at a previous attempt will require the applicant to take the entire test/check again.

(b) For MPA: The applicant shall pass all sections of the skill test/proficiency check. Failure of more than five items will require the applicant to take the entire test/check again. Any applicant failing 5 or less items shall take the failed items again. Failure in any item on the re-test/check including those items that have been passed at a previous attempt will require the applicant to take the entire check/test again.

(c) In case the applicant fails only or does not take Section 6, the type rating will be issued without Cat II or III privileges.

(d) Section 6 is not part of the ATPL skill test.

4. Further training may be required after a failed test/check. Failure to achieve a valid pass in all sections in two attempts shall require further training as determined by the examiner. There is no limit to the number of skill tests/proficiency checks that may be attempted.

CONDUCT OF THE TEST/CHECK – GENERAL

5 The Authority will provide the examiner with safety criteria to be observed in the conduct of the test/check.

6 Should an applicant choose not to continue with a test/check for reasons considered inadequate by the examiner, the applicant will be regarded as having failed those items not attempted. If the test/check is terminated for reasons considered adequate by the examiner, only those items not completed shall be tested in a further flight.

7 At the discretion of the examiner any manoeuvre or procedure of the test/check may be repeated once by the applicant. The examiner may stop the test/check at any stage if it is considered that the applicant's competency requires a complete re-test/re-check.

8 Checks and procedures shall be carried out/completed in accordance with the authorised check list for the aeroplane used in the test/check and, if applicable, with the MCC concept. Performance data for take-off, approach and landing shall be calculated by the applicant in compliance with the operations manual or flight manual for the aeroplane used. Decision heights/altitude, minimum descent heights/altitudes and missed approach point shall be determined by the applicant for the ATPL(A) and/or for the type/class rating holder during the proficiency check, as applicable.

Appendix 1 to JAR–FCL 1.240 & 1.295 (continued)

SPECIAL REQUIREMENTS FOR THE SKILL TEST/PROFICIENCY CHECK FOR A MULTI-PILOT AEROPLANE AND FOR THE SKILL TEST REQUIRED FOR THE ATPL(A)

9 The test/check for a multi-pilot aeroplane shall be performed in a multi-crew environment. Another applicant or another pilot, may function as second pilot. If an aeroplane, rather than a simulator, is used for the test/check, the second pilot shall be an instructor.

10 An applicant for the initial issue of a multi-pilot aeroplane type rating or ATPL(A) shall be required to operate as 'pilot flying' (PF) during all sections of the test/check (in accordance with Appendix 2 to 1.240 & 1.295). The applicant shall also demonstrate the ability to act as 'pilot not flying' (PNF). The applicant may choose either the left hand or the right hand seat for the test/check.

11 The following matters shall be specifically checked when testing/checking applicants for the ATPL(A) or a type rating for multi-pilot aeroplanes extending to the duties of a pilot-in-command, irrespective of whether the applicant acts as PF or PNF:

(a) management of crew co-operation;

(b) maintaining a general survey of the aeroplane operation by appropriate supervision; and

(c) setting priorities and making decisions in accordance with safety aspects and relevant rules and regulations appropriate to the operational situation, including emergencies.

12 The test/check should be accomplished under IFR and as far as possible in a simulated commercial air transport environment. An essential element is the ability to plan and conduct the flight from routine briefing material.

FLIGHT TEST TOLERANCE

13 The applicant shall demonstrate the ability to:

(a) operate the aeroplane within its limitations;

(b) complete all manoeuvres with smoothness and accuracy;

(c) exercise good judgement and airmanship;

(d) apply aeronautical knowledge;

(e) maintain control of the aeroplane at all times in such a manner that the successful outcome of a procedure or manoeuvre is never in doubt;

(f) understand and apply crew co-ordination and incapacitation procedures, if applicable; and

(g) communicate effectively with the other crew members, if applicable.

14 The following limits are for general guidance. The examiner shall make allowance for turbulent conditions and the handling qualities and performance of the type of aeroplane used.

Height	
Generally	±100 feet
Starting a go-around at decision height	+ 50 feet/-0 feet
Minimum descent height/ altitude	+ 50 feet/-0 feet
Tracking	
on radio aids	± 5°
Precision approach	half scale deflection, azimuth and glide path
Heading	
all engines operating	± 5°
with simulated engine failure	± 10°
Speed	
all engines operating	± 5 knots
with simulated engine failure	+10 knots/ -5 knots

Appendix 1 to JAR–FCL 1.240 & 1.295 (continued)

CONTENT OF THE SKILL TEST/PROFICIENCY CHECK

15 (a) The skill test and proficiency check contents and sections are set out in Appendix 2 to JAR–FCL 1.240 for multi-pilot aeroplanes and at Appendix 3 to JAR–FCL 1.240 for single-pilot aeroplanes. The format and application form to the skill test may be determined by the Authority (See IEM FCL 1.240(1) and (2)).

(b) When the type rating course includes less than 2 hours flight training on the aeroplane, the skill test may be flight simulator only and may be completed before the flight training on the aeroplane. In that case, a certificate of completion of the type rating course including the flight training on the aeroplane shall be forwarded to the Authority before the new type rating is entered in the applicant's licence.

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Appendix 2 to JAR–FCL 1.240 & 1.295
Contents of the ATPL/type rating/training/skill test and proficiency check on multi-pilot aeroplanes
(See JAR–FCL 1.240 through 1.262 and 1.295)

1 The following symbols mean:

P = Trained as Pilot-in-command or Co-pilot and as Pilot Flying (PF) and Pilot Not Flying (PNF) for the issue of a type rating as applicable.

X = Simulators shall be used for this exercise, if available, otherwise an aircraft shall be used if appropriate for the manoeuvre or procedure.

2 The practical training shall be conducted at least at the training equipment level shown as (P), or may be conducted up to any higher equipment level shown by the arrow (----->).

The following abbreviations are used to indicate the training equipment used:

A = Aeroplane
FS = Flight Simulator
FTD = Flight Training Device
OTD = Other Training Devices

3 The starred items (*) shall be flown solely by reference to instruments. If this condition is not met during the skill test or proficiency check, the type rating will be restricted to VFR only.

4 Where the letter 'M' appears in the skill test/proficiency check column this will indicate the mandatory exercise.

5 A flight simulator shall be used for practical training and testing if the simulator forms part of an approved type-rating course. The following considerations will apply to the approval of the course:

(a) the qualification of the flight simulator or FNPTII as set out in JAR–STD;

(b) the qualifications of the instructor and examiner;

(c) the amount of line-orientated simulator training provided on the course;

(d) the qualifications and previous line operating experience of the pilot under training; and

(e) the amount of supervised line flying experience provided after the issue of the new type rating.

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Appendix 2 to JAR–FCL 1.240 & 1.295 (continued)

	PRACTICAL TRAINING					**ATPL/TYPE-RATING SKILL TEST/PROF CHECK**	
Manoeuvres/Procedures (including Multi-Crew Cooperation)	OTD	FTD	FS	A	Instructor's initials when training completed	Chkd in FS A	Examiner's initials when test completed
SECTION 1							
1 Flight preparation							
1.1 Performance calculation	P						
1.2 Aeroplane ext. visual inspect.; location of each item and purpose of inspection				P			
1.3 Cockpit inspection		P					
1.4 Use of checklist prior to starting engines, starting procedures, radio and navigation equipment check, selection and setting of navigation and communication frequencies	P----->	----->	----->	----->		M	
1.5 Taxiing in compliance with air traffic control or instructions of instructor			P----->	----->			
1.6 Before take-off checks		P----->	----->	----->		M	
SECTION 2							
2 Take-offs							
2.1 Normal take offs with different flap settings, including expedited take off			P----->	----->			
2.2* Instrument take-off; transition to instrument flight is required during rotation or immediately after becoming airborne			P----->	----->			
2.3 Cross wind take-off (A, if practicable)			P----->	----->			
2.4 Take-off at maximum take-off mass (actual or simulated maximum take-off mass)			P----->	----->			
2.5 Take-offs with simulated engine failure			P----->	----->			
2.5.1* shortly after reaching V_2,							

Appendix 2 to JAR–FCL 1.240 & 1.295 (continued)

	PRACTICAL TRAINING					**ATPL/TYPE-RATING SKILL TEST/PROF CHECK**	
Manoeuvres/Procedures (including Multi-Crew Cooperation)	OTD	FTD	FS	A	Instructor's initials when training completed	Chkd in FS A	Examiner's initials when test completed
(In aeroplanes which are not certificated as transport category aeroplanes (JAR/FAR 25) or as commuter category aeroplanes (SFAR 23), the engine failure shall not be simulated until reaching a minimum height of 500ft above runway end. In aeroplanes having the same performance as a transport category aeroplane regarding take-off mass and density altitude, the instructor may simulate the engine failure shortly after reaching V_2.)							
2.5.2* between V_1 and V_2			P	X		M FS Only	
2.6 Rejected take-off at a reasonable speed before reaching V_1.			P----->	-----> X		M	
SECTION 3							
3 Flight Manoeuvres and Procedures							
3.1 Turns with and without spoilers			P**----->**	----->			
3.2 Tuck under and Mach buffets after reaching the critical Mach number, and other specific flight characteristics of the aeroplane (e.g. Dutch Roll)			P----->	-----> X An aircraft may not be used for this exercise			
3.3 Normal operation of systems and controls engineer's panel	P----->	----->	----->	----->			

Appendix 2 to JAR–FCL 1.240 & 1.295 (continued)

	PRACTICAL TRAINING					ATPL/TYPE-RATING SKILL TEST/PROF CHECK	
Manoeuvres/Procedures (including Multi-Crew Cooperation)	OTD	FTD	FS	A	Instructor's initials when training completed	Chkd in FS A	Examiner's initials when test completed
3.4 Normal and abnormal operations of following systems:						M	A mandatory minimum of 3 abnormal shall be selected from 3.4.0 to 3.4.14 inclusive.
3.4.0 Engine (if necessary propeller)	P----->	----->	----->	----->			
3.4.1 Pressurisation and air-conditioning	P----->	----->	----->	----->			
3.4.2 Pitot/static system	P----->	----->	----->	----->			
3.4.3 Fuel system	P----->	----->	----->	----->			
3.4.4 Electrical system	P----->	----->	----->	----->			
3.4.5 Hydraulic system	P----->	----->	----->	----->			
3.4.6 Flight control and Trim-system	P----->	----->	----->	----->			
3.4.7 Anti- and de-icing system, Glare shield heating	P----->	----->	----->	----->			
3.4.8 Autopilot/Flight director	P----->	----->	----->	----->			
3.4.9 Stall warning devices or stall avoidance devices, and stability augmentation devices	P----->	----->	----->	----->			
3.4.10 Ground proximity warning system Weather radar, radio altimeter, transponder		P----->	----->	----->			
3.4.11 Radios, navigation equipment, instruments, flight management system	P----->	----->	----->	----->			
3.4.12 Landing gear and brake	P----->	----->	----->	----->			
3.4.13 Slat and flap system	P----->	----->	----->	----->			
3.4.14 Auxiliary power unit	P----->	----->	----->	----->			
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Appendix 2 to JAR–FCL 1.240 & 1.295 (continued)

	PRACTICAL TRAINING					**ATPL/TYPE-RATING SKILL TEST/PROF CHECK**	
Manoeuvres/Procedures (including Multi-Crew Cooperation)	OTD	FTD	FS	A	Instructor's initials when training completed	Chkd in FS A	Examiner's initials when test completed
3.6 Abnormal and emergency procedures:						M	A mandatory minimum of 3 items shall be selected from 3.6.1 to 3.6.9 inclusive
3.6.1 Fire drills e.g. Engine, APU, cabin, cargo compartment, flight deck, wing and electrical fires including evacuation.		P----->	----->	----->			
3.6.2 Smoke control and removal		P----->	----->	----->			
3.6.3 Engine failures, shut-down and restart at a safe height		P----->	----->	----->			
3.6.4 Fuel dumping (simulated)		P----->	----->	----->			
3.6.5 Windshear at Take off/ landing			P	X		FS only	
3.6.6 Simulated cabin pressure failure/Emergency descent			P----->	----->			
3.6.7 Incapacitation of flight crew member		P----->	----->	----->			
3.6.8 Other emergency procedures as outlined in the appropriate aeroplane Flight Manual		P----->	----->	----->			
3.6.9 ACAS event	P→	----->	- - >			FS only	
3.7 Steep turns with 45° bank, 180° to 360° left and right		P----->	----->	----->			
3.8 Early recognition and counter measures on approaching stall (up to activation of stall warning device) in take-off configuration (flaps in take-off position), in cruising flight configuration and in landing configuration (flaps in landing position, gear extended) 3.8.1 Recovery from full stall or after activation of stall warning device in climb, cruise and approach configuration			P-----> P	-----> X			

Appendix 2 to JAR–FCL 1.240 & 1.295 (continued)

	PRACTICAL TRAINING					ATPL/TYPE-RATING SKILL TEST/PROF CHECK	
Manoeuvres/Procedures (including Multi-Crew Cooperation)	OTD	FTD	FS	A	Instructor's initials when training completed	Chkd in FS A	Examiner's initials when test completed
3.9 Instrument flight procedures							
3.9.1* Adherence to departure and arrival routes and ATC instructions		P----->	----->	----->		M	
3.9.2* Holding procedures		P----->	----->	----->			
3.9.3* Precision approaches down to a a decision height (DH) not less than 60 m (200 ft)							
3.9.3.1*manually, without flight director			P----->	----->		M (skill test only)	
3.9.3.2*manually, with flight director			P----->	----->			
3.9.3.3* with autopilot			P----->	----->			
3.9.3.4* manually, with one engine simulated inoperative; engine failure has to be simulated during final approach from before passing the outer marker (OM) until touchdown or through the complete missed approach procedure In aeroplanes which are not certificated as transport category aeroplanes (JAR/FAR 25) or as commuter category aeroplanes (SFAR 23), the approach with simulated engine failure and the ensuing go-around shall be initiated in conjunction with the non-precision approach as described in 3.9.4. The go-around shall be initiated when reaching the published obstacle clearance height (OCH/A), however, not later than reaching a minimum descent height/altitude (MDH/A) of 500 ft above runway threshold elevation. In aeroplanes having the same performance as a transport category aeroplane regarding take-off mass and density altitude, the instructor may simulate the engine failure in accordance with 3.9.3.4.			P----->	----->		M	

Appendix 2 to JAR–FCL 1.240 & 1.295 (continued)

	PRACTICAL TRAINING					**ATPL/TYPE-RATING SKILL TEST/PROF CHECK**	
Manoeuvres/Procedures (including Multi-Crew Cooperation)	OTD	FTD	FS	A	Instructor's initials when training completed	Chkd in FS A	Examiner's initials when test completed
3.9.4* NDB or VOC/LOC-approach down to the MDH/A			P*----->	----->		M	
3.9.5 Circling approach under following conditions: (a) * approach to the authorised minimum circling approach altitude at the aerodrome in question in accordance with the local instrument approach facilities in simulated instrument flight conditions; <u>followed by:</u> (b) circling approach to another runway at least 90° off centreline from final approach used in item a), at the authorised minimum circling approach altitude; Remark: if a) and b) are not possible due to ATC reasons a simulated low visibility pattern may be performed			P*----->	----->			
SECTION 4 **4 Missed Approach Procedures** 4.1 Go-around with all engines operating* after an ILS approach on reaching decision height.			P*----->	----->			
4.2 Other missed approach procedures			P*----->	----->			
4.3* Manual Go-around with the critical engine simulated inoperative after an instrument approach on reaching DH, MDH or MAPt			P*----->	----->		M	
4.4 Rejected landing at 15 m (50 ft) above runway threshold and go-around			P----->	----->			

Appendix 2 to JAR–FCL 1.240 & 1.295 (continued)

	PRACTICAL TRAINING					ATPL/TYPE-RATING SKILL TEST/PROF CHECK	
Manoeuvres/Procedures (including Multi-Crew Cooperation)	OTD	FTD	FS	A	Instructor's initials when training completed	Chkd in FS A	Examiner's initials when test completed
SECTION 5							
5 Landings 5.1 Normal landings* also after an ILS approach with transition to visual flight on reaching DH.			P				
5.2 Landing with simulated jammed horizontal stabiliser in any out-of-trim position.			P----->	An aircraft may not be used for this exercise			
5.3 Cross wind landings (a/c, if practicable).			P----->	----->			
5.4 Traffic pattern and landing without extended or with partly extended flaps and slats.			P----->	----->			
5.5 Landing with critical engine simulated inoperative.			P----->	----->		M	
5.6 Landing with two engines inoperative – Aeroplanes with three engines: the centre engine and one outboard engine as far as prcticable according to data of the AFM. – Aeroplanes with four engines, two engines at one side.			P	X		M FS only (skill test only)	

General remarks:

Special requirements for extension of a type rating for instrument approaches down to a decision height of less than 200 feet (60 m), i.e. Cat II/III operations.

(Refer to Subpart E, JAR–FCL 1.180)

Appendix 2 to JAR–FCL 1.240 & 1.295 (continued)

	PRACTICAL TRAINING					**ATPL/TYPE-RATING SKILL TEST/PROF CHECK**	
Manoeuvres/Procedures (including Multi-Crew Cooperation)	OTD	FTD	FS	A	Instructor's initials when training completed	Chkd in FS A	Examiner's initials when test completed
SECTION 6							
6 Additional authorisation on a type rating for instrument approaches down to a decision height of less than 60 m (200 ft) (CAT II/III) The following manoeuvres and procedures are the minimum training requirements to permit instrument approaches down to a DH of less than 60 m (200 ft). During the following instrument approaches and missed approach procedures all aeroplane equipment required for type certification of instrument approaches down to a DH of less than 60 m (200 ft) shall be used.. 6.1* Rejected take-off at minimum authorised RVR			P*----->	----->X An aircraft may not be used for this exercise		M*	
6.2* ILS Approaches In simulated instrument flight conditions down to the applicable DH, using flight guidance system. Standard procedures of crew co-ordination (task sharing, call out procedures, mutual surveillance, information exchange and support) shall be observed.			P----->	----->		M	

Appendix 2 to JAR–FCL 1.240 & 1.295 (continued)

	PRACTICAL TRAINING					ATPL/TYPE-RATING SKILL TEST/PROF CHECK	
Manoeuvres/Procedures (including Multi-Crew Cooperation)	OTD	FTD	FS	A	Instructor's initials when training completed	Chkd in FS A	Examiner's initials when test completed
6.3* Go-around after approaches as indicated in 6.2 on reaching DH. The training also shall include a go-around due to (simulated) insufficient RVR, wind shear, aeroplane deviation in excess of approach limits for a successful approach, and ground/airborne equipment failure prior to reaching DH and, go-around with simulated airborne equipment failure			P----->	----->		M*	
6.4* Landing(s) with visual reference established at DH following an instrument approach. Depending on the specific flight guidance system, an automatic landing shall be performed			P----->	----->		M	

NOTE: CAT II/III operations shall be accomplished in accordance with Operational Rules.

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Appendix 3 to JAR–FCL 1.240
Contents of the class/type rating/training/skill test and proficiency check on single-engine and multi-engine single-pilot aeroplanes
(See JAR–FCL 1.240 through 1.262 and 1.295)

1 The following symbols mean:

P = Trained as Pilot-in-Command for the issue of the class/type rating as applicable.

X = Flight simulators shall be used for this exercise, if available, otherwise an aeroplane shall be used if appropriate for the manoeuvre or procedure.

2 The practical training shall be conducted at least at the training equipment level shown as (P), or may be conducted on any higher level of equipment shown by the arrow (---->)

The following abbreviations are used to indicate the training equipment used:

A = Aeroplane

FS = Flight Simulator

FTD = Flight Training Device (including FNPT II for ME class rating)

3 The starred (*) items of section 3B and, for mulit engine Section 6, shall be flown solely by reference to instruments if revalidation/renewal of an instrument rating is included in the skill test or proficiency check. If the starred (*) items are not flown solely by reference to instruments during the skill test or proficiency check, the type/class rating will be restricted to VFR only.

4 Section 3A shall be completed to revalidate a type or multi-engine class rating, VFR only, where the required experience of 10 route sectors within the previous 12 months has not been completed. Section 3A is not required if section 3B is completed.

5 Where the letter ‘M’ appears in the skill test/proficiency check column this will indicate the mandatory exercise or a choice where more than one exercise appears.

6 When a proficiency check on a single-pilot aeroplane is performed in a multi-pilot operation in accordance with JAR-OPS, the type/class rating will be restricted to muli-pilot.

7 A flight simulator or FNPT II shall be used for practical training for type or multi-engine class ratings if the simulator or FNPT II forms part of an approved type or class rating course. The following considerations will apply to the approval of the course:

(a) the qualification of the flight simulator or FNPT II as set out in JAR–STD;

(b) the qualifications of the instructors and examiner;

(c) the amount of flight simulator or FNPT II training provided on the course; and

(d) the qualifications and previous experience of the pilot under training.

Appendix 3 to JAR-FCL 1.240 (continued)

	PRACTICAL TRAINING				TYPE/CLASS RATING SKILL TEST/ PROF CHECK	
Manoeuvres/Procedures	FTD	FS	A	Instructors initials when training completed	Chkd in FS A	Examiners initials when test completed
SECTION 1						
1 Departure 1.1 Pre-flight including: Documentation Mass and Balance Weather briefing						
1.2 Pre-start checks External/internal			P		M	
1.3 Engine starting: Normal Malfunctions	P---->	---->	---->		M	
1.4 Taxiiing		P---->	---->		M	
1.5 Pre-departure checks: Engine run-up (if applicable)	P---->	---->	---->		M	
1.6 Take-off procedure: Normal with Flight Manual flap settings Crosswind (if conditions available)		P---->	---->			
1.7 Climbing: Vx/Vy Turns onto headings Level off		P---->	---->		M	
1.8 ATC liaison – Compliance, R/T procedure						
SECTION 2						
2 Airwork (VFR) 2.1 Straight and level flight at various airspeeds including flight at critically low airspeed with and without flaps (including approach to V_{MCA} when applicable)		P---->	---->			
2.2 Steep turns (360° left and right at 45° bank)		P---->	---->		M	
2.3 Stalls and recovery: i. clean stall ii. Approach to stall in descending turn with bank with approach configuration and power iii. Approach to stall in landing configuration and power iv. Approach to stall, climbing turn with take-off flap and climb power (single engine aeroplane only)		P---->	---->		M	

Appendix 3 to JAR-FCL 1.240 (continued)

		PRACTICAL TRAINING				TYPE/CLASS RATING SKILL TEST/ PROF CHECK	
Manoeuvres/Procedures					Instructors initials when training completed	Chkd in	Examiners initials when test completed
		FTD	FS	A		FS A	
2.4	Handling using autopilot and flight director (may be conducted in Section 3) if applicable		P---->	---->		M	
2.5	ATC liaison – Compliance, R/T procedure						
SECTION 3A							
3A	**En route procedures VFR (see Appendix 3 to JAR-FCL 1.240 note 3 and 4)**						
3A.1	Flight plan, dead reckoning and map reading						
3A.2	Maintenance of altitude, heading and speed						
3A.3	Orientation, timing and revision of ETAs						
3A.4	Use of radio navigation aids (if applicable)						
3A.5	Flight management (flight log, routine checks including fuel, systems and icing						
3A.6	ATC liaison – Compliance, R/T procedure						
SECTION 3B							
3B	**Instrument flight**		P---->	---->			
3B.1*	Departure IFR					M	
3B.2*	En route IFR		P---->	---->		M	
3B.3*	Holding procedures		P---->	---->		M	
3B.4*	ILS to DH/A of 200′ (60 m) or to procedure minima (autopilot may be used to glideslope intercept)		P---->	---->		M	
3B.5*	Non-precision approach to MDH/A and MAP		P---->	---->		M	
3B.6*	Flight exercises including simulated failure of the compass and attitude indicator: Rate 1 turns Recoveries from unusual attitudes	P---->	---->	---->		M	
3B.7*	Failure of localiser or glideslope	P---->	---->	---->			

Appendix 3 to JAR-FCL 1.240 (continued)

	PRACTICAL TRAINING				TYPE/CLASS RATING SKILL TEST/ PROF CHECK	
Manoeuvres/Procedures	FTD	FS	A	Instructors initials when training completed	Chkd in FS A	Examiners initials when test completed
3B.8* ATC liaison – Compliance, R/T procedure						
SECTION 4						
4 Arrival and landings 4.1 Aerodrome arrival procedure		P---->	---->		M	
4.2 Normal landing		P---->	---->		M	
4.3 Flapless landing		P---->	---->		M	
4.4 Crosswind landing (if suitable conditions)		P---->	---->			
4.5 Approach and landing with idle power from up to 2000′ above the runway (single engine aeroplane only)		P---->	---->			
4.6 Go-around from minimum height		P---->	---->		M	
4.7 Night go-around and landing (if applicable)	P---->	---->	---->			
4.8 ATC liaison – Compliance, R/T procedure						
SECTION 5						
5 Abnormal and emergency procedures (This Section may be combined with Sections 1 through 4)						
5.1 Rejected take-off at a reasonable speed		P---->	---->		M	
5.2 Simulated engine failure after take-off (single engine aeroplanes only)			P		M	
5.3 Simulated forced landing without power (single engine aeroplanes only)			P		M	
5.4 Simulated emergencies: i. Fire or smoke in flight ii. Systems malfunctions as appropriate	P---->	---->	---->			
5.5 Engine shutdown and restart (ME skill test only)	P---->	---->	---->			
5.6 ATC liaison – Compliance, R/T procedure						

Appendix 3 to JAR-FCL 1.240 (continued)

	PRACTICAL TRAINING				TYPE/CLASS RATING SKILL TEST/ PROF CHECK	
Manoeuvres/Procedures	FTD	FS	A	Instructors initials when training completed	Chkd in FS A	Examiners initials when test completed
SECTION 6						
6 Simulated asymmetric flight 6.1* (This Section may be combined with Sections 1 through 5) Simulated engine failure during take-off (at a safe altitude unless carried out in FS or FNPT II)	P---->	---->	---->X		M	
6.2* Asymmetric approach and go-around	P---->	---->	---->		M	
6.3* Asymmetric approach and full stop landing	P---->	---->	---->		M	
6.4 ATC liaison – Compliance, R/T procedure						

[Amdt. 1, 01.06.00; Amdt. 2, 01.08.02]

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[Appendix 1 to JAR-FCL 1.251
Course of additional theoretical knowledge for a class or type rating for high performance single-pilot aeroplane
(See Appendix 3 to JAR-FCL 1.055)
(See JAR-FCL 1.251)
(See Appendix 1 to JAR-FCL 1.285)
(See AMC FCL 1.055(a))
(See AMC JAR-FCL 1.251)

HIGH PERFORMANCE AEROPLANE TRAINING

1 The aim of the theoretical knowledge course is to provide the applicant with sufficient knowledge of those aspects of the operation of aeroplanes capable of operating at high speeds and altitudes, and the aircraft systems necessary for such operation.

2 The holder of an ICAO ATPL(A) or a pass in the theoretical knowledge examinations at ATPL(A) level is credited with meeting the requirement of JAR-FCL 1.251(a)(3).

3 A pass in any theoretical knowledge subjects as part of the HPA course will not be credited against meeting future theoretical examination requirements for issue of a CPL(A), IR(A) or ATPL(A).

COURSE PROVIDERS

4 Theoretical knowledge instruction for the HPA may be provided by an FTO approved to conduct theoretical knowledge training for the ATPL(A). Courses may also be provided by TRTOs offering training for HPA class and type ratings, in which case the course will be subject to specific approval. Course providers will be required to certify completion of the training and demonstration of knowledge by the applicant as a pre-requisite for training for an initial type or class rating for aeroplanes designated as high performance.

COURSE SYLLABUS

5 There is no mandatory minimum or maximum duration of the theoretical knowledge instruction, which may be conducted by distance learning. The subjects to be covered in the course and written examination are shown in the accompanying table.

Main subject headings are shown in Capital type, syllabus coverage by subject number in normal type. Subject numbers refer to those of the aeroplane syllabus of theoretical knowledge instruction contained in Appendix 1 to JAR-FCL 1.470. Syllabus content is a general indication of areas to be covered and examination content should cover all subject numbers irrespective of their relevance to any specific type or class of aeroplane. **]**

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Appendix 1 to JAR-FCL 1.251 (Continued)

[

Subject Ref:	Syllabus Content:
021 00 00 00	AIRFRAME AND SYSTEMS, ELECTRICS, POWERPLANT
021 02 02 01 to 021 02 02 03	Alternating current - general Generators AC power distribution
021 01 08 03	Pressurisation (Air driven systems - piston engines)
021 01 09 04	Pressurisation (Air driven systems - turbojet and turbopropellor)
021 03 01 06 021 03 01 07 021 03 01 08 021 03 01 09	Engine performance - piston engines Power augmentation (turbo/supercharging) Fuel Mixture
021 03 02 00 to 021 03 04 09	Turbine engines
021 04 05 00	Aircraft oxygen equipment
032 02 00 00	PERFORMANCE CLASS B - ME AEROPLANES
032 02 01 00 to 032 02 04 01	Performance of multi-engine aeroplanes not certificated under JAR/FAR 25 – Entire subject
040 02 00 00	HUMAN PERFORMANCE
040 02 01 00 to 040 02 01 03	Basic human physiology and High altitude environment
050 00 00 00	METEOROLOGY - WINDS AND FLIGHT HAZARDS
050 02 07 00 to 050 02 08 01	Jetstreams CAT Standing waves
050 09 01 00 to 050 09 04 05	Flight hazards Icing and turbulence Thunderstorms
062 02 00 00	BASIC RADAR PRINCIPLES
062 02 01 00 to 062 02 05 00	Basic radar principles Airborne radar SSR
081 00 00 00	PRINCIPLES OF FLIGHT – AEROPLANES
081 02 01 00 to 081 02 03 02	Transonic aerodynamics - Entire subject Mach number/shockwaves buffet margin/aerodynamic ceiling

EXAMINATION

6. The written examination should consist of not less than 60 multi-choice questions, and may be split into individual subject papers at the discretion of FTO/TRTO. The pass mark for the examination will be 75%. **]**

[Amdt. 3, 01.07.03]

Appendix 1 to JAR–FCL 1.261(a)
Theoretical knowledge instruction requirements for skill test/proficiency checking for class/type ratings
(See JAR–FCL 1.261(a))
(See AMC FCL 1.261(a))

1 The theoretical knowledge instruction shall be conducted by an authorised instructor holding the appropriate type/class rating or any instructor having appropriate experience in aviation and knowledge of the aircraft concerned, e.g. flight engineer, maintenance engineer, flight operations officer.

2 The theoretical knowledge instruction shall cover the syllabus in AMC FCL 1.261(a), as appropriate to the aeroplane class/type concerned. Depending on the equipment and systems installed, the instruction shall include but is not limited to the following content:

(a) Aeroplane structure and equipment, normal operation of systems and malfunctions

- Dimensions
- Engine including auxiliary power unit
- Fuel system
- Pressurisation and air-conditioning
- Ice protection, windshield wipers and rain repellent
- Hydraulic systems
- Landing gear
- Flight controls, lift devices
- Electrical power supply
- Flight instruments, communication, radar and navigation equipment
- Cockpit, cabin and cargo compartment
- Emergency equipment

(b) Limitations

- General limitations
- Engine limitations
- System limitations
- Minimum equipment list

(c) Performance, flight planning and monitoring

- Performance
- Flight planning
- Flight monitoring

(d) Load, balance and servicing

- Load and balance
- Servicing on ground

(e) Emergency procedures

(f) Special requirements for extension of a type rating for instrument approaches down to a decision height of less than 200 ft (60 m)

- Airborne equipment, procedures and limitations

(g) Special requirements for “glass cockpit” aeroplanes

- Electronic flight instrument systems (e.g. EFIS, EICAS)

(h) Flight Management systems (FMS)

3 For the initial issue of type ratings for multi-pilot aeroplanes the written or computer based examination shall at least comprise one hundred multi-choice questions distributed appropriately across the main subjects of the syllabus. The pass mark shall be 75% in each of the main subjects of the syllabus.

4 For the initial issue of type and class ratings for single-pilot multi-engine aeroplanes the number of multi-choice questions in the written or computer based examination shall depend on the complexity of the aeroplane. The pass mark shall be 75%.

Appendix 1 to JAR-FCL 1.261(a) (continued)

5 For single-engine single-pilot aeroplanes the examiner may conduct the theoretical knowledge part of the skill test and proficiency check orally and shall determine whether or not a satisfactory level of knowledge has been achieved.

6 For proficiency checks multi-pilot and single-pilot multi-engine aeroplanes theoretical knowledge shall be verified by a multi-choice questionnaire or other suitable methods.

[Amdt. 1, 01.06.00; Amdt. 2, 01.08.02]

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Appendix 1 to JAR-FCL 1.261(c)(2)
Approval of Aeroplane Zero Flight Time Type Rating Training Courses

1 APPROVAL OF ZERO FLIGHT TIME TRAINING (ZFTT)

For approval of a type rating course using ZFTT the following criteria will apply:

(a) The flight simulator to be used shall be qualified in accordance with JAR–STD and user approved by the Authority. User approval will only be given if the flight simulator is representative of the aeroplane flown by the operator.

(b) The flight simulator shall be fully serviceable during ZFTT (see JAR–STD).

(c) Additional take-off and landing exercises shall be included in the type rating course and at least six take-offs and landings shall be conducted under the instruction of a TRI(A).

(d) For an initial approval to conduct ZFTT an operator shall have held a JAR–OPS Air Operator's Certificate for not less than one year.

(e) Approval for ZFTT for a further type of aeroplane shall only be given if the operator has not less than 90 days operational experience of that aeroplane type.

(f) Approval for ZFTT will only be given to a training organisation provided by an operator or a training organisation having a specific approved arrangement with a JAR–OPS 1 Air Operator assuring that student pre-requisites are met and the type rating will be restricted to that operator until flying under supervision has been accomplished.

2 REQUIRED PILOT EXPERIENCE

ZFTT will only be approved for type rating training for pilots of multi-pilot aeroplanes who meet the minimum flying experience specified for the level of flight simulator to be used on the course, as follows:

(a) Pilots undertaking ZFTT shall have completed not less than 1500 hours flight time or 250 route sectors on a relevant aeroplane type if a flight simulator qualified to Level CG or C is used during the course. If a Level DG, Interim D or D qualified flight simulator is used the pilot shall have not less than 500 hours flight time or 100 route sectors on a relevant type;

(b) A relevant type of aeroplane is a turbo-jet, transport category aeroplane with a MTOM of not less than 10 tons or an approved passenger seating configuration for not less than 20 passengers.

(c) Instructor Qualification: For the additional specific take-off and landing exercises the instructor shall hold a TRI(A) rating.

3 LINE FLYING AFTER ZFTT

(a) Line Flying under supervision shall commence as soon as possible but not later than 15 days after completing the ZFTT;

(b) The first four take-offs and landings carried out by a pilot following ZFTT shall be flown under the supervision of a TRI(A) occupying a pilot’s seat.

[Amdt. 1, 01.06.00]

Appendix 1 to JAR-FCL 1.261(d)
Multi-crew co-operation course (Aeroplane)
(See JAR-FCL 1.261(d))
(See AMC FCL 1.261(d))

1 The aim of the course is to become proficient in multi-crew co-operation (MCC) in order to operate safely multi-pilot multi-engine aeroplanes under IFR and, for that purpose, to ensure that:

a. The pilot-in-command fulfils his managing and decision-making functions irrespective whether he is PF or PNF.

b. The tasks of PF and PNF are clearly specified and distributed in such a manner that the PF can direct his full attention to the handling and control of the aircraft.

c. Co-operation is effected in an orderly manner appropriate to the normal, abnormal or emergency situations encountered.

d. Mutual supervision, information and support is ensured at all times.

INSTRUCTORS

2 Instructors for MCC training shall be thoroughly familiar with human factors and crew resource management (CRM). They should be current with the latest developments in human factors training and CRM techniques.

THEORETICAL KNOWLEDGE

3 The theoretical knowledge syllabus is set out in AMC FCL 1.261(d). An approved MCC theoretical knowledge course shall comprise not less than 25 hours.

FLYING TRAINING

4 The flying training syllabus is set out in AMC FCL 1.261(d).

CERTIFICATE OF COMPLETION

5 On completion of the course, the applicant may be issued with a certificate of satisfactory completion of the course.

CROSS-CREDITING

6 A holder of a certificate of completion of MCC training on helicopters shall be exempted from the requirement to complete the theoretical knowledge syllabus as set out in AMC FCL 1.261(d).

[Amdt. 2, 01.08.02]

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SUBPART G – AIRLINE TRANSPORT PILOT LICENCE (Aeroplane) – ATPL(A)

JAR–FCL 1.265 Minimum age

An applicant for an ATPL(A) shall be at least 21 years of age.

JAR–FCL 1.270 Medical fitness

An applicant for an ATPL(A) shall hold a valid Class 1 medical certificate. In order to exercise the privileges of the ATPL(A) a valid Class 1 medical certificate shall be held.

[Amdt. 1, 01.06.00]

JAR–FCL 1.275 Privileges and conditions

(a) *Privileges*. Subject to any other conditions specified in JARs, the privileges of the holder of an ATPL(A) are to:

(1) exercise all the privileges of the holder of a PPL(A), a CPL(A) and an IR(A); and

(2) act as pilot-in-command or co-pilot in aeroplanes engaged in air transportation.

(b) *Conditions*. An applicant for an ATPL(A) who has complied with the conditions specified in JAR–FCL 1.265, 1.270 and 1.280 through 1.295 shall have fulfilled the requirements for the issue of an ATPL(A) containing a type rating for the aeroplane type used on the skill test.

JAR–FCL 1.280 Experience and crediting
(See JAR–FCL 1.050(a)(3))

(a) An applicant for an ATPL(A) shall have completed as a pilot of aeroplanes at least 1500 hours of flight time (see also JAR-FCL 1.050(a)(3)). **[**Of the 1 500 hours flight time, up to 100 hours of flight time may have been completed in FS and FNPT of which a maximum of 25 hours may have benn completed in FNPT,**]** including at least:

(1) 500 hours in multi-pilot operations on aeroplanes type certificated in accordance with the JAR/FAR–25 Transport category or the JAR/FAR–23 Commuter category, or BCAR or AIR 2051;

(2) 250 hours either as pilot-in-command or at least 100 hours as pilot-in-command and 150 hours as co-pilot

JAR–FCL 1.280(a)(2) (continued)

performing, under the supervision of the pilot-in-command the duties and functions of a pilot-in-command provided that the method of supervision is acceptable to the Authority;

(3) 200 hours of cross-country flight time of which at least 100 hours shall be as pilot-in-command or as co-pilot performing under the supervision of the pilot-in-command the duties and functions of a pilot-in-command, provided that the method of supervision is acceptable to the Authority;

(4) 75 hours of instrument time of which not more than 30 hours may be instrument ground time; and

(5) 100 hours of night flight as pilot-in-command or as co-pilot.

(b) (1) Holders of a pilot licence or equivalent document for other categories of aircraft will be credited with flight time in such other categories of aircraft as set out in JAR–FCL 1.155 except flight time in helicopters which will be credited up to 50% of all the flight time requirements of sub-paragraph (a).

(2) Holders of a flight engineer licence will be credited with 50% of the flight engineer time up to a maximum credit of 250 hours. This 250 hours may be credited against the 1 500 hours requirement of sub-paragraph (a), and the 500 hours requirement of sub-paragraph (a)(1), provided that the total credit given against any of these sub-paragraphs does not exceed 250 hours.

(c) The experience required shall be completed before the skill test given in JAR–FCL 1.295 is taken.

[Amdt. 1, 01.06.00; Amdt. 3, 01.07.03]

JAR–FCL 1.285 Theoretical knowledge
(See AMC FCL 1.285)

(a) *Course*. An applicant for an ATPL(A) shall have received theoretical knowledge instruction on an approved course at an approved flying training organisation (FTO) **[ ]**. An applicant who has not received the theoretical knowledge instruction during an integrated course of training shall take the course set out in Appendix 1 to JAR–FCL 1.285.

(b) *Examination*. An applicant for an ATPL(A) shall have demonstrated a level of

JAR–FCL 1.285(b) (continued)

knowledge appropriate to the privileges granted to the holder of an ATPL(A) and in accordance with the requirements in JAR–FCL 1 (Aeroplane) Subpart J.

[Amdt. 1, 01.06.00; Amdt. 3, 01.07.03]

JAR–FCL 1.290 Flight instruction

(See Appendix 1 to JAR-FCL 1.261(d))
(See AMC FCL 1.261(d))

An applicant for an ATPL(A) shall be the holder of a CPL(A), **[ ]** a multi-engine instrument rating(A) and have received instruction in multi-crew co-operation as required by JAR–FCL 1.261(d) (see Appendix 1 to JAR-FCL 1.261(d) and AMC FCL 1.261(d)).

[Amdt. 3, 01.07.03]

JAR–FCL 1.295 Skill

(a) An applicant for an ATPL(A) shall have demonstrated the ability to perform, as pilot-in-command of an aeroplane type certificated for a minimum crew of two pilots under IFR (see Appendix 1 to JAR-FCL 1.220 part B), the procedures and manoeuvres described in Appendices 1 and 2 to JAR–FCL 1.240 and 1.295 with a degree of competency appropriate to the privileges granted to the holder of an ATPL(A).

(b) The ATPL(A) skill test may serve at the same time as a skill test for the issue of the licence and a proficiency check for the revalidation of the type rating for the aeroplane used in the test and may be combined with the skill test for the issue of a multi-pilot type rating.

[Amdt. 1, 01.06.00]

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Appendix 1 to JAR–FCL 1.285
ATPL(A) – Modular theoretical knowledge course
(See JAR–FCL 1.285)
(See Appendix 1a to JAR-FCL 1.055)
(See Appendix 1 to JAR-FCL 1.470)

1 The aim of this course is to train pilots who have not received the theoretical knowledge instruction during an integrated course, to the level of theoretical knowledge required for the ATPL(A).

2 An applicant wishing to undertake an ATPL(A) modular course of theoretical knowledge instruction shall be required under the supervision of the Head of Training of an approved FTO to complete 650 hours (1 hour = 60 minutes instruction) of instruction for ATPL theory within a period of 18 months. An applicant shall be the holder of a PPL(A) **[**issued in accordance with ICAO Annex 1**]**.

Holders of a CPL(A)/IR may have the theoretical instruction hours reduced by 350 hours.

Holders of a CPL(A) may have the theoretical instruction hours reduced by 200 hours and holders of an IR may have the theoretical instruction hours reduced by 200 hours.

[ ]

3 The FTO shall ensure that before being admitted to the course the applicant has a sufficient level of knowledge of Mathematics and Physics to facilitate an understanding of the content of the course.

4 The instruction shall cover all items in the relevant syllabi set out in the Appendix 1 to JAR-FCL 1.470. An approved course should include formal classroom work and may include the use of such facilities as inter-active video, slide/tape presentation, learning carrels, computer based training and other media as approved by the Authority. Approved distance learning (correspondence) courses may also be offered as part of the course at the discretion of the Authority.

[Amdt. 1, 01.06.00; Amdt. 3, 01.07.03]

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SUBPART H – INSTRUCTOR RATINGS (Aeroplane)

JAR–FCL 1.300 Instruction – General

(a) A person shall not carry out the flight instruction required for the issue of any pilot licence or rating unless that person has:

(1) a pilot licence containing an instructor rating; or

(2) a specific authorisation granted by a JAA Member State in cases where:

(i) new aeroplanes are introduced; or

(ii) vintage aeroplanes or aeroplanes of special manufacture are registered, for which no person has an instructor rating; or

(iii) training is conducted outside JAA Member States by instructors not holding a JAR–FCL licence (see Appendix 1 to JAR–FCL 1.300).

(b) A person shall not carry out synthetic flight instruction unless holding a FI(A), TRI(A), IRI(A), CRI(A) rating or **[**a MCCI(A),**]** SFI(A) authorisation. Paragraph (a)(2) above is also valid for the synthetic flight instruction.

[Amdt. 1, 01.06.00; Amdt. 3, 01.07.03]

JAR–FCL 1.305 Instructor ratings and authorisation – Purposes

[Six**]** instructor categories are recognised.

(a) Flight instructor rating – aeroplane (FI(A)).

(b) Type rating instructor rating – aeroplane (TRI(A)).

(c) Class rating instructor rating – aeroplane (CRI(A)).

(d) Instrument rating instructor rating – aeroplane (IRI(A)).

(e) Synthetic flight instructor authorisation – aeroplane (SFI(A)).

[(f) Multi crew Co-operation instructor Authorisation Aeroplanes (MCCI(A)).**]**

[Amdt. 3, 01.07.03]

JAR–FCL 1.310 Instructor ratings – General

(a) *Pre-requisites*. All instructors shall hold at least the licence, rating and qualification for which instruction is being given (unless specified otherwise) and shall be entitled to act as pilot-in-command of the aircraft during such training.

(b) *Multiple roles.* Provided that they meet the qualification and experience requirements set out in this Subpart for each role undertaken, instructors are not confined to a single role as flight instructors (FIs), type rating instructors (TRIs), class rating instructors (CRIs) or instrument rating instructors (IRIs).

(c) *Credit towards further **[**authorisations or**]** ratings.* Applicants for further instructor **[**authorisations or**]** ratings may be credited with the teaching and learning skills already demonstrated for the instructor **[**authorisation or**]** rating held.

[Amdt. 3, 01.07.03]

JAR–FCL 1.315 Instructor ratings and authorisations – Period of validity

(a) All instructor ratings and **[ ]** authorisations are valid for a period of 3 years.

(b) The validity period for a specific authorisation shall not exceed 3 years.

(c) An applicant who fails to achieve a pass in all sections of a proficiency check before the expiry date of an instructor rating shall not exercise the privileges of that rating until the proficiency check has successfully been completed.

[Amdt. 1, 01.06.00; Amdt. 3, 01.07.03]

JAR–FCL 1.320 Flight Instructor rating (aeroplane) (FI(A)) – Minimum age

An applicant for a flight instructor rating shall be at least 18 years of age.

JAR–FCL 1.325 FI(A) – Restricted privileges

(a) *Restricted period.* Until the holder of a FI(A) rating has completed at least 100 hours flight instruction and, in addition, has supervised at least 25 student solo flights, the privileges of the rating are restricted. The restrictions will be removed from the rating when the above requirements have been met and on the recommendation of the supervising FI(A).

(b) *Restrictions*. The privileges are restricted to carrying out under the supervision of a FI(A) approved for this purpose:

(1) flight instruction for the issue of the PPL(A) – or those parts of integrated courses at PPL(A) level – and class and type ratings for single-engine aeroplanes, excluding approval of first solo flights by day or by night and first solo navigation flights by day or by night; and

(2) night flying, provided a night qualification is held, the ability to instruct at night has been demonstrated to an FI(A) authorised to conduct FI(A) training in accordance with JAR-FCL 1.330(f) and the night currency requirement of JAR-FCL 1.026 is satisfied.

[Amdt. 1, 01.06.00; Amdt. 2, 01.08.02]

JAR–FCL 1.330 FI(A) – Privileges and requirements

(See JAR-FCL 1.325)
(See Appendix 1 to JAR–FCL 1.330 & 1.345)
(See Appendix 1 to JAR-FCL 1.395)
(See AMC FCL 1.395)

The privileges of the holder of a FI(A) rating (for restrictions see JAR–FCL 1.325) are to conduct flight instruction for:

(a) the issue of the PPL(A) and class and type ratings for single-engine aeroplanes, provided that for type ratings the FI(A) has completed not less than 15 hours on the relevant type in the preceding 12 months;

(b) the issue of a CPL(A), provided that the FI(A) has completed at least 500 hours of flight time as a pilot of aeroplanes including at least 200 hours of flight instruction;

(c) night flying, provided a night qualification is held, the ability to instruct at night has been demonstrated to an FI(A) authorised to conduct FI(A) training in accordance with JAR-FCL 1.330(f) and the night currency requirement of JAR-FCL 1.026 is satisfied;

JAR–FCL 1.330(c) (continued)

[(d) (1) the issue of an IR(A) single engine aeroplanes;

(2) the issue of an IR(A) multi-engine aeroplanes, provided that the instructor meets the requirements of JAR-FCL 1.380(a);

provided that the instructor has;**]**

[(i)**]** At least 200 hours flight time in accordance with instrument flight rules, of which up to 50 hours may be instrument ground time in a flight simulator or FNPT II; and

[(ii)**]** completed as a student an approved course comprising at least 5 hours of flight instruction in an aeroplane, flight simulator or FNPT II (see Appendix 1 to JAR-FCL 1.395 and AMC FCL 1.395) and has passed the appropriate skill test as set out in Appendix 1 to JAR–FCL 1.330 & 1.345;

(e) the issue of a single-pilot multi-engine type or class rating, provided that the instructor meets the requirements of JAR–FCL 1.380(a);

(f) the issue of a FI(A) rating, provided that the instructor:

(1) has completed at least 500 hours of instruction in aeroplanes; and

(2) has demonstrated to a FI(A) examiner the ability to instruct a FI(A) during a skill test conducted in accordance with Appendix 1 to JAR–FCL 1.330 & 1.345; and

(3) is authorised by the Authority for this purpose.

[Amdt. 1, 01.06.00; Amdt. 2, 01.08.02; Amdt. 3, 01.07.03]

JAR–FCL 1.335 FI(A) – Pre-requisite requirements

(See Appendix 3 to JAR-FCL 1.240)
(See Appendix 1 to JAR-FCL 1.470)

Before being permitted to begin an approved course of training for a FI(A) rating an applicant shall have:

(a) completed at least 200 hours of flight time of which at least 100 hours shall be as pilot-in-command if holding an ATPL(A) or CPL(A) or 150 hours as pilot-in-command if holding a PPL(A);

JAR-FCL 1.335 (continued)

(b) met the knowledge requirements for a CPL(A) as set out in Appendix 1 to JAR-FCL 1.470;

(c) completed at least 30 hours on single-engine piston powered aeroplanes of which at least five hours shall have been completed during the six months preceding the pre-entry flight test set out at (f) below;

(d) received at least 10 hours instrument flight instruction of which not more than five hours may be instrument ground time in a FNPT or a flight simulator;

(e) completed at least 20 hours of cross-country flight as pilot-in-command, including a flight totalling not less that 540 km (300 nm) in the course of which full stop landings at two different aerodromes shall be made; and

(f) passed a specific pre-entry flight test with an FI qualified as in JAR–FCL 1.330(f) based upon the proficiency check as set out in Appendix 3 to JAR–FCL 1.240 within the six months preceding the start of the course. The flight test will assess the ability of the applicant to undertake the course.

[Amdt. 1, 01.06.00]

JAR–FCL 1.340 FI(A) – Course

(See Appendix 1 to JAR-FCL 1.340)
(See AMC FCL 1.340)

(a) An applicant for the FI(A) rating shall have completed an approved course of theoretical knowledge instruction and flight training at an approved FTO (see Appendix 1 to JAR-FCL 1.340 and AMC FCL 1.340).

(b) The course is intended to train the applicant to give instruction on single-engine aeroplanes up to PPL(A) standard. The flight instruction shall comprise at least 30 hours of flight training, of which 25 hours shall be dual flight instruction. The remaining five hours may be mutual flying (that is, two applicants flying together to practice flight demonstrations). Of the 25 hours, five hours may be conducted in a flight simulator or FNPT approved for the purpose by the Authority. The skill test is additional to the course training time.

[Amdt. 1, 01.06.00]

JAR–FCL 1.345 FI(A) – Skill

(See Appendix 1 and 2 to JAR–FCL 1.330 & 1.345)

An applicant for a FI(A) rating shall demonstrate to an examiner notified by the Authority for this

JAR-FCL 1.345 (continued)

purpose the ability to instruct a student pilot to the level required for the issue of a PPL(A), including pre-flight, post-flight and theoretical knowledge instruction, in accordance with the requirements of Appendices 1 and 2 to JAR–FCL 1.330 & 1.345.

[Amdt. 1, 01.06.00]

JAR–FCL 1.350 FI(A) – Rating issue

An applicant for a FI(A) rating who has complied with the conditions specified in JAR–FCL 1.310, 1.315 and 1.335 through 1.345 shall have fulfilled the requirements for the issue of a FI(A) rating, subject to the initial restrictions set out in JAR–FCL 1.325.

JAR–FCL 1.355 FI(A) – Revalidation and renewal

(See Appendices 1 and 2 to JAR–FCL 1.330 & 1.345)
(See AMC FCL 1.355(a)(2))
(See IEM FCL 1.355)

(a) For revalidation of a FI(A) rating the holder shall fulfil two of the following three requirements:

(1) completed at least 100 hours of flight instruction on aeroplanes as FI, CRI, IRI or as examiner during the period of validity of the rating, including at least 30 hours of flight instruction within the 12 months preceding the expiry date of the FI rating, 10 hours of this 30 hours shall be instruction for an IR if the privileges to instruct for IR are to be revalidated;

(2) attended a FI refresher seminar (see AMC FCL 1.355(a)(2)), as approved by the Authority, within the validity period of the FI rating;

(3) passed, as a proficiency check, the skill test set out in Appendices 1 and 2 to JAR–FCL 1.330 and 1.345 within the 12 months preceding the expiry date of the FI rating.

(b) **[**For at least each alternate revalidation of a FI(A) rating the holder shall pass, as a proficiency check, the skill test set out in Appendices 1 and 2 to JAR-FCL 1.330 & 1.345 as one of the two requirements to be fulfilled to comply with JAR-FCL 1.355(a).**]**

[(c)**]** If the rating has lapsed, the applicant shall meet the requirements as set out in (a)(2) and (a)(3) above within the last 12 months before renewal .

[Amdt. 1, 01.06.00; Amdt. 2, 01.08.02; Amdt. 3, 01.07.03]

JAR–FCL 1.360 Type rating instructor rating (multi-pilot aeroplane) (TRI(MPA)) – Privileges
(See JAR-FCL 1.261(d))
(See Appendix 1 to JAR-FCL 1.261(d))
(See AMC FCL 1.261(d))

(a) The privileges of the holder of a TRI(MPA) rating are to instruct licence holders for the issue of a MPA type rating, and the instruction required for multi-crew co-operation (see JAR–FCL 1.261(d), Appendix 1 to JAR-FCL 1.261(d) and AMC FCL 1.261(d)).

(b) If the TRI(A) training is carried out in a flight simulator only, the TRI(A) rating will be restricted to exclude emergency/abnormal procedure training in an aircraft. To remove this restriction the holder of a TRI(A) rating shall perform the training contained in AMC FCL 1.365 Part 2 Paragraph 8 in an aeroplane.

[Amdt. 1, 01.06.00; Amdt. 2, 01.08.02]

JAR–FCL 1.365 TRI(MPA) – Requirements
(See Appendix 1 to JAR-FCL 1.365)
(See AMC FCL 1.365)

An applicant for the initial issue of a TRI(MPA) rating shall have:

(a) (1) successfully completed an approved TRI course at an approved FTO or TRTO (see Appendix 1 to JAR-FCL 1.365 and AMC FCL 1.365);

(2) completed at least 1500 hours flight time as a pilot of multi-pilot aeroplanes;

(3) completed within the 12 months preceding the application at least 30 route sectors, to include take-offs and landings as pilot-in-command or co-pilot on the applicable aeroplane type, or a similar type as agreed by the Authority, of which not more than 15 sectors may be completed in a flight simulator; and

(4) conducted on a complete type rating course at least 3 hours of flight instruction related to the duties of a TRI on the applicable type of aeroplane and/or flight simulator under the supervision and to the satisfaction of a TRI notified by the Authority for this purpose.

(b) Before the privileges are extended to further MPA types, the holder shall have:

(1) completed, within the 12 months preceding the application, at least 15 route

JAR-FCL 1.365(b)(1) (continued)

sectors, to include take-offs and landings as pilot-in-command or co-pilot on the applicable aeroplane type, or a similar type as agreed by the Authority, of which not more than 7 sectors may be completed in a flight simulator;

(2) satisfactorily completed the relevant technical training content of an approved TRI course at an approved FTO or TRTO (see AMC FCL 1.365); and

(3) conducted on a complete type rating course at least 3 hours of flight instruction related to the duties of a TRI(MPA) on the applicable type of aeroplane and/or flight simulator under the supervision and to the satisfaction of a TRI(A) notified by the Authority for this purpose.

[Amdt. 1, 01.06.00]

JAR–FCL 1.370 TRI(MPA) – Revalidation and renewal
(See Appendix 1 to JAR-FCL 1.365)
(See AMC FCL 1.365)

(a) For revalidation of a TRI(MPA) rating, the applicant shall within the last 12 months, preceding the expiry date of the rating:

(1) conduct one of the following parts of a complete type rating/refresher/recurrent training course:

(i) one simulator session of at least 3 hours; or

(ii) one air exercise of at least 1 hour comprising a minimum of 2 take offs and landings;

or

(2) receive TRI(A) refresher training acceptable to the Authority.

(b) If the rating has lapsed the applicant shall have:

(1) completed within the 12 months preceding the application at least 30 route sectors, to include take-offs and landings as pilot-in-command or co-pilot on the applicable aeroplane type, or a similar type as agreed by the Authority, of which not more than 15 sectors may be completed in a flight simulator;

(2) successfully completed the relevant parts of an approved TRI(MPA) course, agreed by the Authority (see Appendix 1 to JAR-FCL 1.365 and AMC FCL 1.365), taking into account the recent experience of the applicant; and

JAR-FCL 1.370(b) (continued)

(3) conducted on a complete type rating course at least 3 hours of flight instruction related to the duties of a TRI(MPA) on the applicable type of aeroplane and/or flight simulator under the supervision and to the satisfaction of a TRI(A) notified by the Authority for this purpose.

[Amdt. 1, 01.06.00]

JAR–FCL 1.375 Class rating instructor rating (single-pilot aeroplane) (CRI(SPA)) – Privileges
(See JAR-FCL 1.310(a))

The privileges of the holder of a CRI(SPA) rating are to instruct licence holders for the issue of a type or class rating for single-pilot aeroplanes. The holder may instruct on single-engine or multi-engine aeroplanes, subject to being appropriately qualified (see JAR–FCL 1.310(a)).

[Amdt. 1, 01.06.00]

JAR–FCL 1.380 CRI(SPA) – Requirements
(See Appendix 1 to JAR–FCL 1.330 & 1.345)
(See Appendices 1 and 2 to JAR-FCL 1.380)
(See AMC FCL 1.380)

(a) *Multi-engine aeroplanes.* An applicant for the issue of a CRI(SPA) rating for multi-engine aeroplanes shall have:

(1) completed at least 500 hours flight time as a pilot of aeroplanes;

(2) completed at least 30 hours as PIC on the applicable type or class of aeroplane of which at least 10 hours shall be in the last 12 months;

(3) completed an approved course at an approved FTO or TRTO including at least five hours flight instruction on the aeroplane or a flight simulator given by an instructor approved for this purpose (see Appendix 1 to JAR-FCL 1.380 and AMC FCL 1.380); and

(4) passed a skill test in accordance with Appendix 1 and Sections 1, 2, 3, 5 and 7 of Appendix 2 to JAR–FCL 1.330 & 1.345.

(b) *Single-engine aeroplanes.* An applicant for the issue of a CRI(SPA) rating for single-engine aeroplanes shall have:

(1) completed at least 300 hours flight time as a pilot of aeroplanes;

(2) completed at least 30 hours as PIC on the applicable type or class of aeroplane of

JAR-FCL 1.380(b)(2) (continued)

which at least 10 hours shall be in the last 12 months;

(3) completed an approved course at an approved FTO or TRTO of at least three hours flight instruction on the aeroplane or a flight simulator given by an instructor approved for this purpose (see Appendix 2 to JAR-FCL 1.380); and

(4) passed a skill test in accordance with Appendix 1 and Sections 1, 2, 3, 4 and 7 of Appendix 2 to JAR–FCL 1.330 & 1.345.

(c) Before the privileges of the rating are extended to another type or class of aeroplane, the holder shall within the past 12 months have completed at least 10 hours flight time on aeroplanes of the applicable class or type or similar type as agreed by the Authority. For an extension of a CRI(A) from SE to ME aeroplanes the requirements of (a) above shall be met.

[Amdt. 1, 01.06.00; Amdt. 2, 01.08.02]

JAR–FCL 1.385 CRI(SPA) – Revalidation and renewal
(See Appendix 1 to JAR–FCL 1.330 & 1.345)

(a) For revalidation of a CRI(SPA) rating the applicant shall within the 12 months preceding the expiry date of the rating:

(1) conduct at least 10 hours flight instruction; or

(2) conduct refresher training to the satisfaction of the Authority; or

(3) receive a refresher training as a CRI(A).

(b) If the rating has lapsed, the applicant shall have within the 12 months preceding the application:

(1) received refresher training as a CRI(A) to the satisfaction of the Authority; and

(2) passed as a proficiency check the relevant part (i.e. ME or SE) of the skill test set out in Appendix 1 and 2 to JAR–FCL 1.330 & 1.345.

[Amdt. 1, 01.06.00]

JAR–FCL 1.390 Instrument rating instructor rating (aeroplane) (IRI(A)) – Privileges

The privileges of the holder of an IRI(A) rating are limited to conduct flight instruction for **[**:**]**

[(a) the issue of an IR(A) single-engine aeroplanes;

(b) the issue of an IR(A) multi-engine aeroplanes, provided that the instructor meets the requirements of JAR-FCL 1.380(a).**]**

[Amdt. 3, 01.07.03]

JAR–FCL 1.395 IRI(A) – Requirements
(See Appendix 1 to JAR–FCL 1.330 & 1.345)
(See Appendix 1 to JAR-FCL 1.395)
(See AMC FCL 1.395)

An applicant for an IRI(A) rating shall have:

(a) completed at least 800 hours flight time under IFR, of which at least 400 hours shall be in aeroplanes;

(b) successfully completed at an approved FTO an approved course (see Appendix 1 to JAR-FCL 1.395 and AMC FCL 1.395) comprising theoretical knowledge instruction and at least ten hours of flight instruction on an aeroplane, flight simulator or FNPT II; and

(c) passed a skill test as set out in Appendices 1 and 2 to JAR–FCL 1.330 & 1.345.

[Amdt. 1, 01.06.00]

JAR–FCL 1.400 IRI(A) – Revalidation and renewal

(a) For revalidation of an IRI(A) rating the holder shall meet the requirements set out in JAR–FCL 1.355(a).

(b) If the rating has lapsed, the holder shall meet the requirements of JAR–FCL 1.355(b), and any other requirements determined by the Authority.

JAR–FCL 1.405 Synthetic flight instructor authorisation (aeroplane) (SFI(A)) – Privileges
(See JAR-FCL 1.261(d))

The privileges of the holder of a SFI(A) authorisation are to carry out synthetic flight instruction for type ratings, and the instruction required for multi-crew co-operation (see JAR–FCL 1.261(d)).

[Amdt. 1, 01.06.00]

JAR–FCL 1.410 SFI(A) – Requirements
(See Appendix 1 to JAR–FCL 1.240)
(See Appendix 1 to JAR-FCL 1.365)
(See AMC FCL 1.365)

(a) An applicant for a SFI(A) authorisation shall:

(1) hold or have held a professional pilot licence issued by a JAA Member State or a non JAR–FCL professional licence acceptable to the Authority;

(2) have completed the simulator content of the applicable type rating course at an approved FTO or TRTO;

(3) have at least 1500 hours flying experience as pilot on multi-pilot aeroplanes;

(4) have completed an approved TRI(A) course (see Appendix 1 to JAR-FCL 1.365 and AMC FCL 1.365);

(5) have conducted on a complete type rating course at least 3 hours of flight instruction related to the duties of a TRI(A) on the applicable type of aeroplane under the supervision and to the satisfaction of a TRI(A) notified by the Authority for this purpose;

(6) have completed within a period of 12 months, preceding the application, a proficiency check as set out in Appendix 1 and 2 to JAR–FCL 1.240 on a flight simulator of the applicable type; and

(7) have completed within a period of 12 months, preceding the application, at least three route sectors as an observer on the flight deck of the applicable type **[**or similar type as agreed by the Authority**]**.

(b) If the privileges are to be extended to further types of multi-pilot aeroplanes the holder shall have:

JAR-FCL 1.410(b) (continued)

(1) satisfactorily completed the simulator content of the relevant type rating course; and

(2) conducted on a complete type rating course at least 3 hours of flight instruction related to the duties of a TRI(A) on the applicable type of aeroplane under the supervision and to the satisfaction of a TRI(A) notified by the Authority for this purpose.

[Amdt. 1, 01.06.00; Amdt. 3, 01.07.03]

JAR–FCL 1.415 SFI(A) – Revalidation and renewal
(See Appendix 1 to JAR-FCL 1.240)
(See Appendix 1 to JAR-FCL 1.365)
(See AMC FCL 1.365)

(a) For revalidation of a SFI(A) authorisation the applicant shall within the last 12 months of the validity period of the authorisation :

(1) conduct one simulator session of at least 3 hours as part of a complete type rating/refresher/recurrent training course

and

(2) have completed a proficiency check as set out in Appendix 1 and 2 to FCL 1.240 on a flight simulator of the appropriate type.

(b) If the authorisation has lapsed the applicant shall have:

(1) completed the simulator content of the applicable type rating course;

(2) successfully completed an approved TRI(A) course as agreed by the Authority (see Appendix 1 to JAR-FCL 1.365 and AMC FCL 1.365)

(3) conducted on a complete type rating course at least 3 hours of flight instruction related to the duties of a TRI(A) on the applicable type of aeroplane under the supervision and to the satisfaction of a TRI(A) notified by the Authority for this purpose.

(4) have completed a proficiency check as set out in Appendix 1 to JAR-FCL 1.240 on a flight simulator of the appropriate type.

[Amdt. 1, 01.06.00; Amdt. 2, 01.08.02]

[JAR-FCL 1.416 Multi Crew Co-operation Course Instructor authorisation(aeroplane) MCCI(A) – Privileges

The privileges of the holder of a MCCI(A) are to carry out instruction for the practical part of MCC-courses when not combined with type rating training.**]**

[Amdt. 3, 01.07.03]

[JAR- FCL 1.417 MCCI(A)-Requirements
(See AMC FCL 1.417)

An applicant for a MCCI(A) authorisation shall:

(1) hold or have held a professional pilot licence issued by a JAA Member State or a non- JAR-FCL professional licence acceptable to the Authority.

(2) have at least 1500 hours flying experience as pilot on multi-pilot aeroplanes

(3) have completed on a FNPT II or a flight simulator an approved MCCI course (see AMC FCL 1.417).

(4) have conducted on a complete MCC course at least 3 hours of flight instruction /MCC- instruction on the relevant FNPT II or flight simulator under the supervision and to the satisfaction of a TRI(A), SFI(A) or MCCI(A) notified by the Authority for this purpose.

(b) If the privileges are to be extended to another type of FNPT II or flight simulator the holder shall complete (a) (4) above on that type of FNPT II or FS.**]**

[Amdt. 3, 01.07.03]

[JAR-FCL 1.418 MCCI(A)- Revalidation and renewal.

(a) For revalidation of a MCCI(A) authorisation the applicant shall within the last 12 months of the validity period of authorisation have completed the requirement in JAR-FCL 1.417(a)(4)

(b) If the authorisation has lapsed the applicant shall:

(1) meet any requirement of refresher training at the discretion of the Authority; and

(2) have completed the requirement in JAR-FCL 1.417(a)(4). **]**

[Amdt. 3, 01.07.03]

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Appendix 1 to JAR–FCL 1.300
Requirements for a specific authorisation for instructors not holding a JAR–FCL licence to instruct in a TRTO outside JAA Member States or in a FTO partial training outside JAA Member States in accordance with Appendix 1b to JAR-FCL 1.055
(See JAR–FCL 1.300(a)(2)(iii))

1 (a) Instructors seeking to instruct for a JAR–FCL licence including class and instrument ratings shall:

(i) hold at least a CPL and ratings issued in accordance with ICAO Annex I required by the respective non JAA State for the instruction to be given on aircraft registered in that State;

(ii) have completed at least 500 hours of flight time as a pilot of aeroplanes of which at least 200 hours shall be as a flight instructor relevant to the intended training to be given and meet the experience requirements of JAR–FCL 1.330(a), (b), (c), (d) and/or (e);

(iii) have completed in accordance with JAR–FCL the approved relevant course(s) of theoretical instruction and flight training. The course may be modified, as approved by the Authority, taking into account the previous training and the experience of the applicant, but shall comprise at least 30 hours of ground instruction and 15 hours of dual flight instruction performed by a flight instructor holding a JAR–FCL licence and rating in accordance with JAR–FCL 1.330(f);

(iv) have passed the skill test set out in JAR–FCL 1.345;

(v) validity period of the authorisation is at the discretion of the Authority but not exceeding 3 years;

(vi) revalidation or renewal of any authorisation issued in accordance with para (i) - (iv) above shall be in accordance with JAR–FCL 1.355.

(b) The authorisation will be restricted as follows:

(i) no instruction for the issue of any instructor ratings;

(ii) no instruction within a JAA Member State;

(iii) instruction to students only who have sufficient knowledge of the language in which the instruction is given;

(iv) to those parts of the ATP integrated course where the instructor can demonstrate the experience relevant to the intended training according to paragraph 1(a)(ii);

(v) no instruction for MCC training as defined in Appendix 1 to JAR-FCL 1.261(d) and AMC FCL 1.261(d).

2 (a) Instructors seeking to instruct for a JAR–FCL type rating shall:

(i) hold at least the licence and ratings issued in accordance with ICAO Annex I required by the respective non JAA Member State for the instruction to be given on aircraft registered in that State;

(ii) comply with the experience requirements of JAR–FCL 1.365(a)(2) and (3) in order to act as TRI (A) or with JAR–FCL 1.410(a)(3) and (7) in order to act as SFI(A).

(iii) have completed as a type rating instructor (TRI(A) or equivalent) at least 100 hours of flight or simulator instruction time;

(iv) validity period of the authorisation is at the discretion of the Authority but not exceeding 3 years;

(v) have complied with the revalidation requirements of JAR–FCL 1.370 acting as TRI(A) or JAR–FCL 1.415 acting as SFI(A).

(b) The authorisation will be restricted as follows:

(i) no instruction for the issue of any instructor ratings;

(ii) no instruction within a JAA Member State

(iii) instruction to students only who have sufficient knowledge of the language in which the instruction is given

Appendix 1 to JAR-FCL 1.300 (continued)

(iv) no instruction for MCC training as defined in Appendix 1 to JAR-FCL 1.261(d) and AMC-FCL 1.261(d).

[Amdt. 1, 01.06.00; Amdt. 2, 01.08.02]

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Appendix 1 to JAR–FCL 1.330 & 1.345
Arrangements for the flight instructor rating (FI(A)) skill test, proficiency check and oral theoretical knowledge examination
(See JAR–FCL 1.330, 1.345, 1.355, 1.380, 1.385 and 1.395)

1 The skill test for a FI(A) rating is set out in Appendix 2 to JAR–FCL 1.330 & 1.345. The test comprises oral theoretical examinations on the ground, pre-flight and post flight briefings and in-flight FI(A) demonstrations during skill tests in an aeroplane.

2 An applicant for the skill test shall have received instruction on the same type or class of aeroplane used for the test. The aeroplane used for the test shall meet the requirements set out in Appendix 1a to JAR–FCL 1.055, paragraph 25.

3 Before taking the skill test an applicant shall have completed the required training. The FTO shall produce the applicant's training records when required by the examiner.

4 Section 1, the oral theoretical knowledge examination part of the skill test, is sub-divided into two parts:

(a) the applicant is required to give a lecture under test conditions to other 'student(s)', one of whom will be the examiner. The test lecture is to be selected from items a–h of Section 1. The amount of time for preparation of the test lecture shall be agreed beforehand with the examiner. Appropriate literature may be used by the applicant. The test lecture should not exceed 45 minutes.

(b) the applicant is tested orally by an examiner for knowledge of items a–i of Section 1 and the 'teaching and learning' content given in the FI(A) courses.

5 Section 2, 3 and 7 are for a FI(A) rating for single engine (SE) single pilot aeroplanes (SPAs). These sections comprise exercises to demonstrate the ability to be a FI(A) (ie. instructor demonstration exercises) chosen by the examiner from the flight syllabus of the FI(A) training courses (see AMC FCL 1.340, 1.380 and 1.395). The applicant will be required to demonstrate FI(A) abilities, including briefing, flight instruction and de-briefing.

6 Section 4 is intentionally blank and may be used for the inclusion of other FI(A) demonstration exercises, as decided by the examiner and acknowledged by the applicant before the skill test.

7 Section 5 comprises additional instructor demonstration exercises for a FI(A) rating for multi-engine (ME) SPAs. This section, if required, shall use a ME SPA, simulator or FNPT II. If a simulator or FNPT is used, this shall simulate a ME aeroplane. This section shall be completed in addition to Section 2, 3 and 4 (if applicable) and 7.

8 Section 6 is intentionally blank. This part will include additional FI(A) rating demonstration exercises, as decided by the examiner and agreed with the applicant before the skill test, for a FI(A) rating for instrument ratings (IR). These exercises will be related to the training requirements for the initial issue of an IR.

9 During the skill test the applicant shall occupy the seat normally occupied by the FI(A). The examiner or another FI(A) shall function as the 'student'. The applicant shall be required to explain the relevant exercises and to demonstrate their conduct to the 'student', where appropriate. Thereafter, the 'student' shall execute the same manoeuvre including typical mistakes of inexperienced students. The applicant is expected to correct mistakes orally and/or, if necessary, by intervening.

10 Section 1 and 2 through 7 (as relevant) shall be completed within a period of six months but all Sections should, wherever possible, be completed on the same day. Failure in any exercise within Sections 2, 3 and 4 (if applicable) and 5/6 (if relevant) requires a re-test covering all exercises. Section 1, if failed, may be retaken separately.

11 The examiner may terminate the test at any stage if it is considered that the applicant's demonstration of flying or instructional skills require a re-test.

12 The examiner shall be the pilot-in-command, except in circumstances agreed by the examiner when another FI(A) is designated as pilot-in-command for the flight. Responsibility for the flight shall be allocated in accordance with national regulations.

13 The skill test contents and sections set out in Appendix 2 to JAR–FCL 1.330 & 1.345 shall be used for the skill test. The format and application form for the skill test may be determined by the Authority (see IEM FCL 1.130).

[Amdt. 1, 01.06.00; Amdt. 2, 01.08.02]

Appendix 2 to JAR–FCL 1.330 & 1.345
Contents of the flight instructor rating (FI(A)) skill test, oral theoretical knowledge examination and proficiency check
(See JAR–FCL 1.330, 1.345)
(See IEM FCL 1.330)

	SECTION 1 THEORETICAL KNOWLEDGE ORAL
a	Air law
b	Aircraft General Knowledge
c	Flight Performance and Planning
d	Human Performance and Limitations
e	Meteorology
f	Navigation
g	Operational Procedures
h	Principles of Flight
i	Training Administration

SECTIONS 2 AND 3 SELECTED MAIN EXERCISE:

	SECTION 2 PRE-FLIGHT BRIEFING
a	Visual Presentation
b	Technical Accuracy
c	Clarity of Explanation
d	Clarity of Speech
e	Instructional Technique
f	Use of Models and Aids
g	Student Participation

Appendix 2 to JAR–FCL 1.330 & 1.345 (continued)

SECTION 3 FLIGHT	
a	Arrangement of Demo
b	Synchronisation of Speech with Demo
c	Correction of Faults
d	Aeroplane Handling
e	Instructional Technique
f	General Airmanship/Safety
g	Positioning, use of Airspace
SECTION 4 OTHER EXERCISES	
a	
b	
c	
d	
e	
f	
g	
SECTION 5 MULTI-ENGINE EXERCISES	
a	[1]Actions following an Engine failure shortly after take-off
b	[1]A single-engine approach and go around
c	[1]A single-engine approach and landing
d	
e	
f	
g	

[1] These exercises shall be demonstrated at the skill test for the single-pilot multi-engine class rating instructor rating.

Appendix 2 to JAR–FCL 1.330 & 1.345 (continued)

SECTION 6 INSTRUMENT EXERCISES	
a	
b	
c	
d	
e	
f	
g	
SECTION 7 POSTFLIGHT DE-BRIEFING	
a	Visual Presentation
b	Technical Accuracy
c	Clarity of Explanation
d	Clarity of Speech
e	Instructional Technique
f	Use of Models and Aids
g	Student Participation

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Appendix 1 to JAR-FCL 1.340
Flight instructor rating (aeroplane) (FI(A)) course
(See JAR-FCL 1.340)
(See AMC FCL 1.340)

COURSE OBJECTIVE

1 The aim of the FI(A) course is to train aeroplane licence holders to the level of proficiency necessary for the issue of a FI(A) rating and, for that purpose, to

a. refresh and bring up to date the technical knowledge of the student instructor;

b. train the student instructor to teach the ground subjects and air exercises;

c. ensure that the student instructor's flying is of a sufficiently high standard; and

d. teach the student instructor the principles of basic instruction and to apply them at the PPL level.

2 With the exception of the section on Teaching and Learning, all the subject detail contained in the Ground and Flight Training Syllabus is complementary to the PPL(A) course syllabus and should already be known by the applicant.

3 The FI(A) course should give particular stress to the role of the individual in relation to the importance of human factors in the man-machine and theoretical knowledge environment interaction. Special attention should be paid to the applicant's maturity and judgement including an understanding of adults, their behavioural attitudes and variable levels of education.

4 During the course, the applicants shall be made aware of their own attitudes to the importance of flight safety. Improving safety awareness shall be a fundamental objective throughout the course. It will be of major importance for the course of training to aim at giving applicants the knowledge, skills and attitudes relevant to a flight instructor's task.

5 On successful completion of the course and final test the applicant may be issued with a FI(A) rating.

TEACHING AND LEARNING

6 The syllabus is set out in AMC FCL 1.340, Part 1. An approved FI(A) theoretical knowledge course shall comprise not less than 125 hours including progress tests. Pilots holding or having held a FI(H) rating are credited with 75 hours towards the 125 hours of the Teaching and Learning Part 1 of the FI(A) course.

FLYING TRAINING

7 The flying training syllabus is set out in AMC FCL 1.340, Part 2. An approved FI(A) course shall comprise not less than 30 hours of flight instruction.

SKILL TEST

8 On completion of the course, the applicant shall take the skill test in accordance with Appendices 1 and 2 to JAR-FCL 1.330 & 1.345.

[Amdt. 2, 01.08.02]

Appendix 1 to JAR-FCL 1.365
Course for the type rating instructor rating for multi-pilot aeroplane (TRI) (MPA)
(See JAR-FCL 1.365)
(See AMC FCL 1.365)

COURSE OBJECTIVE

1 The aim of the TRI(A) course is to train aeroplane licence holders with more than 1 500 hours as pilots of multi-pilot aeroplanes to the level of proficiency necessary for the issue of a TRI(A) rating. The course shall be designed to give adequate training to the applicant in theoretical knowledge instruction, flight instruction and synthetic flight instruction in order to instruct for any multi-pilot aeroplane type rating for which the applicant is qualified (see JAR-FCL 1.365).

TEACHING AND LEARNING

2 The syllabus is set out in AMC FCL 1.365. An approved TRI(A) Teaching and Learning course shall comprise not less than 25 hours. Pilots holding or having held one of the following ratings are credited for the TRI(A) Teaching and Learning part of the TRI course:

FI(A), CRI(A), IRI(A)
FI(H), TRI(H), IRI(H), SFI(H)

FLIGHT TRAINING

3 The flight training syllabus is set out in AMC FCL 1.365.

[Amdt. 2, 01.08.02]

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Appendix 1 to JAR-FCL 1.380
Course for the single-pilot multi-engine class rating instructor rating (Aeroplane) (CRI(SPA))
(See JAR-FCL 1.380)
(See AMC FCL 1.380)

1 The aim of this course is to train aeroplane licence holders with at least 500 hours as pilot of aeroplanes to the level of proficiency necessary for the issue of a CRI(A) rating for single-pilot multi-engine aeroplanes. The course shall be designed to give adequate training to the applicant in theoretical knowledge instruction, flight instruction and synthetic flight instruction in order to instruct for any single-pilot multi-engine aeroplane class or type rating for which the applicant is qualified (see JAR-FCL 1.380).

TEACHING AND LEARNING

2 The syllabus is set out in AMC FCL 1.380. An approved CRI(A) Teaching and Learning course shall comprise not less than 25 hours. Pilots holding or having held one of the following ratings are credited for the CRI(A) Teaching and Learning part of the CRI course:

FI(A), IRI(A), TRI(A), SFI(A)
FI(H), TRI(H), IRI(H), SFI(H)

FLYING TRAINING

3 An applicant for the issue of a CRI(SPA) rating for multi-engine aeroplanes shall complete not less than 5 hours of flying training given by an instructor, approved for this purpose. The flight training shall be aimed at ensuring that the applicant is able to teach the air exercises safely and efficiently to students undergoing a course of training for the issue of a single-pilot multi-engine class/type rating. The flying training syllabus is set out in AMC FCL 1.380.

SKILL TEST

4 On completion of the course, the applicant shall take the skill test in accordance with Appendix 1 and Sections 1, 2, 3, 5 and 7 of Appendix 2 to JAR-FCL 1.330 & 1.345.

[Amdt. 2, 01.08.02]

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Appendix 2 to JAR-FCL 1.380
Course for the single-pilot single engine class rating instructor rating (aeroplane) (CRI(SPA))
(See JAR-FCL 1.380)

1 The aim of this course is to train aeroplane licence holders with more than 300 hours as pilot of aeroplane to the level of proficiency necessary for the issue of a CRI(A) rating for single engine aeroplanes. The course shall be designed to give adequate training to the applicant in theoretical knowledge instruction, flight instruction and synthetic flight instruction in order to instruct for any single pilot single engine aeroplane class or type rating for which the applicant is qualified (see JAR FCL 1.380)

TEACHING AND LEARNING

2 An approved CRI(A) Teaching and Learning course shall comprise not less than 25 hours. Pilots holding or having held one of the following ratings credited for the CRI(A) Teaching and Learning part of the CRI course:

FI(A), IRI(A), TRI(A), SFI(A)
FI(H), TRI(H), IRI(H), SFI(H)

FLYING TRAINING

3. An applicant for the issue of a CRI(SPA) rating for single engine aeroplanes shall complete not less than 3 hours of flying training given by an instructor, approved for this purpose. The flight training shall be aimed at ensuring that the applicant is able to teach the air exercises safely and efficiently to students undergoing a course of training for the issue of a single pilot single engine class or type rating.

SKILL TEST

4. On completion of the course, the applicant shall take the skill test in accordance with Appendix 1 and Sections 1, 2, 3, 4 and 7 of Appendix 2 to JAR FCL 1.330 & 1.345.

[Amdt. 2, 01.08.02]

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Appendix 1 to JAR FCL 1.395
Course for the instrument rating instructor rating (Aeroplane) (IRI(A))
See JAR-FCL 1.395
See AMC FCL 1.395

1 The aim of this course is to train aeroplane licence holders to the level of proficiency necessary for the issue of an IRI(A) rating. The course shall be designed to give the applicant adequate training in ground and flying instructional techniques based upon established teaching methods.

TEACHING AND LEARNING

2 Syllabus is set out in AMC FCL 1.395. An approved IRI(A) Teaching and Learning course shall comprise not less than 25 hours. Pilots holding or having held one of the following ratings are credited for the IRI(A) Teaching and Learning part of the IRI course:

FI(A), CRI(A), TRI(A), SFI(A)

FI(H), TRI(H),SFI(H)

Pilots holding a IRI(H) who meet the requirements set out in JAR-FCL 1.395(a) are credited of the course except for the “Long Briefing 2”, “Air Exercise 2” and Skill Test.

FLIGHT TRAINING

3 An approved IRI(A) course shall comprise not less than 10 hours or 5 hours in the case of a FI(A) of flight training on an aeroplane, flight simulator or FPNT II.

SKILL TEST

4 On completion of the course, the applicant shall take the skill test in accordance with Appendices 1 and 2 to JAR FCL 1.330 & 1.345.]

[Amdt. 2, 01.08.02]

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SUBPART I – EXAMINERS (Aeroplane)

JAR–FCL 1.420 Examiners – Purposes

Six roles of an examiner are recognised:

(a) Flight examiner – aeroplane (FE(A)).

(b) Type rating examiner – aeroplane (TRE(A)).

(c) Class rating examiner – aeroplane (CRE(A)).

(d) Instrument rating examiner – aeroplane (IRE(A)).

(e) Synthetic flight examiner – aeroplane (SFE(A)).

(f) Flight instructor examiner – aeroplane (FIE(A)).

[Amdt. 1, 01.06.00]

JAR–FCL 1.425 Examiners – General
(See Appendix 1 to JAR-FCL 1.425)
(See AMC FCL 1.425)
(See IEM FCL 1.425)

(a) *Pre-requisites*

(1) Examiners shall hold a licence and rating at least equal to the licence or rating for which they are authorised to conduct skill tests or proficiency checks and, unless specified otherwise, the privilege to instruct for this licence or rating.

(2) Examiners shall be qualified to act as pilot-in-command of the aircraft during a skill test or proficiency check and shall meet the applicable experience requirements set out in JAR–FCL 1.435 through 1.460. Where no qualified examiner is available and, at the discretion of the Authority, examiners/ inspectors may be authorised without meeting the relevant instructor/type/class rating requirements as mentioned above.

(3) The applicant for an examiner authorisation shall have conducted at least one skill test in the role of an examiner for which authorisation is sought, including briefing, conduct of the skill test, assessment of the applicant to whom the skill test is given, de-briefing and recording/documentation. This 'Examiner Authorisation Acceptance Test' will be supervised by an inspector of the Authority or by a senior examiner specifically authorised by the Authority for this purpose.

(b) *Multiple roles.* Provided that they meet the qualification and experience requirements set out in this Subpart for each role undertaken, examiners are not confined to a single role as FE(A), TRE(A), CRE(A), IRE(A) or FIE(A).

(c) *Compliance with JARs.* Examiners will be authorised in accordance with JAR–FCL 1.030. The examiner shall comply with appropriate examiners' standardisation arrangements made or approved by the Authority (see Appendix 1 to JAR-FCL 1.425, AMC FCL 1.425 and IEM FCL 1.425).

(d) *Entries in the licence.* In licences where revalidation entries may be made by the examiner, the examiner will:

(1) complete the following details: ratings, date of check, valid until, authorisation number and signature;

(2) submit the original of the skill test/proficiency check form to the issuing Authority and hold one copy of the check form on personal file.

[Amdt. 1, 01.06.00]

JAR–FCL 1.430 Examiners – Period of validity

An examiner's authorisation is valid for not more than three years. Examiners are re-authorised at the discretion of the Authority, **[**and in accordance with Appendix 1 to JAR-FCL 1.425**]**.

[Amdt. 2, 01.08.02]

JAR–FCL 1.435 Flight examiner (aeroplane) (FE(A)) – Privileges/Requirements

The privileges of a FE(A) are to conduct:

(a) skill tests for the issue of the PPL(A) and skill tests and proficiency checks for the associated single-pilot class/type rating provided that the examiner has completed not less than 1000 hours flight time as a pilot of aeroplanes, including not less than 250 hours flight instruction;

(b) skill tests for the issue of a CPL(A) and skill test and proficiency checks for the associated single-pilot class/type ratings provided that the examiner has completed not less than 2000 hours flight time as a pilot of aeroplanes, including not less than 250 hours flight instruction.

[Amdt. 1, 01.06.00]

JAR–FCL 1.440 Type rating examiner (aeroplane) (TRE(A)) – Privileges/Requirements

The privileges of a TRE(A) are to conduct:

(a) skill tests for the issue of type ratings for multi-pilot aeroplanes;

(b) proficiency checks for revalidation or renewal of multi-pilot type and instrument] ratings;

(c) skill tests for ATPL(A) issue;

provided that the examiner has completed not less than 1 500 hours flight time as a pilot of multi-pilot aeroplanes of which at least 500 hours shall be as pilot-in-command, and holds or has held a TRI(A) rating or authorisation.

[Amdt. 1, 01.06.00]

JAR–FCL 1.445 Class rating examiner (aeroplane) (CRE(A)) – Privileges/Requirements

The privileges of a CRE(A) are to conduct:

(a) skill tests for the issue of class and type ratings for single-pilot aeroplanes;

(b) proficiency checks for revalidation or renewal of class and type ratings for single- pilot aeroplanes and revalidation of instrument ratings;

provided that the examiner holds **[**or has held**]** a professional pilot licence**[**(A) and holds a PPL(A)**]** and has completed not less than 500 hours as a pilot of aeroplanes.

[Amdt. 1, 01.06.00; Amdt. 2, 01.08.02]

JAR–FCL 1.450 Instrument rating examiner (aeroplane) (IRE(A)) – Privileges/ Requirements

The privileges of an IRE(A) are to conduct skill tests for the initial issue and proficiency checks for the revalidation or renewal of instrument ratings, provided that the examiner has completed not less than 2 000 hours flight time as a pilot of aeroplanes, including not less than 450 hours flight time under IFR of which 250 hours shall be as a flight instructor.

[Amdt. 1, 01.06.00]

JAR–FCL 1.455 Synthetic flight examiner (aeroplane) (SFE (A)) – Privileges/Requirements

The privileges of an SFE(A) are to conduct type and instrument rating proficiency checks on multi-pilot aeroplanes in a flight simulator, provided that the examiner holds an ATPL(A), has completed not less than 1 500 hours of flight time as a pilot of multi-pilot aeroplanes and is entitled to exercise the privileges of a SFI(A) (see JAR–FCL 1.405).

JAR–FCL 1.460 Flight instructor examiner (aeroplane) (FIE(A)) – Privileges/Requirements

The privileges of an FIE(A) are to conduct skill tests and proficiency checks or renewals for the issue and revalidation of flight instructor ratings, provided that the examiner has completed not less than 2 000 hours as a pilot of aeroplanes, including not less than 100 hours flight time instructing applicants for a FI(A) rating.

[Amdt. 1, 01.06.00]

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[Appendix 1 to JAR-FCL 1.425
Standardisation arrangements for examiners
See JAR-FCL 1.425 & 1.430
See AMC FCL 1.425

GENERAL

1 Each JAA Member State will publish and submit to JAA a list of authorised examiners specifying each role and any additional matters for which they have been authorised.

2 Examiners shall consistently apply JAR-FCL standards during a test/check. However, as the circumstances of each test/check conducted by an examiner may vary, it is also important that an examiner's test/check assessment takes into account any adverse condition(s) encountered during the test/check.

EXAMINERS DESIGNATION AND AUTHORISATION

3 An examiner will be designated and authorised in accordance with JAR-FCL and will be:

(a) a flight inspector from an Authority; or

(b) an instructor from a Registered Facility, FTO, TRTO; manufacturer's facility or subcontracted facility; or

(c) a pilot holding a specific authorisation from a JAA Member State.

4 All Examiners must be suitably trained, qualified and experienced for their role on the relevant type/class of aeroplane. No specific rules on qualification can be made because the particular circumstance of each organisation will differ. It is important, however, that in every instance, the Examiner should, by background and experience, have the professional respect of the aviation community.

EXAMINER RE-AUTHORISATION

5 Examiners may be re-authorised in accordance with JAR-FCL 1.430. To be re-authorised, the examiner shall have conducted at least two skill tests or proficiency checks in every yearly period within the three year authorisation period. One of the skill tests or proficiency checks given by the examiner within the validity period of the authorisation shall have been observed by an inspector of the Authority or by a senior examiner specifically authorised for this purpose.**]**

[Amdt. 2, 01.08.02]

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SUBPART J – THEORETICAL KNOWLEDGE REQUIREMENTS AND PROCEDURES FOR THE CONDUCT OF THEORETICAL KNOWLEDGE EXAMINATIONS FOR PROFESSIONAL PILOT LICENCES AND INSTRUMENT RATINGS

JAR–FCL 1.465 Requirements

An applicant for a professional pilot licence or an instrument rating shall demonstrate a level of knowledge appropriate to the privileges of the licence or rating for which application is made by passing theoretical knowledge examinations in accordance with the procedures set out in JAR–FCL 1.470 through 1.495.

JAR–FCL 1.470 Contents of theoretical knowledge examinations

(See Appendix 1 to JAR-FCL 1.470)

(a) An applicant for the ATPL(A) shall demonstrate a level of knowledge appropriate to the privileges granted in the following subjects : Air Law; Aircraft General Knowledge; Flight Performance and Planning; Human Performance and Limitations; Meteorology; Navigation; Operational Procedures; Principles of flight; Communications. The breakdown of subjects into examination papers and times allowed will be agreed within JAA Member States.

(b) An applicant for the CPL(A) shall demonstrate a level of knowledge appropriate to the privileges granted in the following subjects: Air Law; Aircraft General Knowledge; Flight Performance and Planning; Human Performance and Limitations; Meteorology; Navigation; Operational Procedures; Principles of flight; Communications. The breakdown of subjects into examination papers and times allowed will be agreed within JAA Member States.

(c) An applicant for an IR(A) shall demonstrate a level of knowledge appropriate to the privileges granted in the following subjects: Air Law/Operational Procedures; Aircraft General Knowledge; Flight Performance and Planning; Human Performance and Limitations; Meteorology; Navigation; Communications. The breakdown of subjects into examination papers and times allowed will be agreed within JAA Member States.

JAR–FCL 1.475 Questions

(See IEM FCL 1.475 (a) and (b))
(See Appendix 1 to JAR-FCL 1.470)

(a) *The Central Question Bank*. Questions appropriate to the syllabuses (see Appendix 1 to JAR–FCL 1.470) will be held in a JAA Central Question Bank (CQB). Questions entered in the CQB will be composed in English, according to a method described in IEM FCL 1.475(a), using abbreviations (see IEM FCL 1.475(b)), and compiled in a computer compatible format. The questions will be in multiple choice format. An Authority may exercise discretion in the presentation of questions in an examination according to JAR–FCL 1.480.

(b) *Publication*. Samples of questions and multiple choice answers will be published from time to time by JAA.

[Amdt. 1, 01.06.00]

JAR–FCL 1.480 Examination procedure

(See Appendix 1 to JAR–FCL 1.470)

(a) *Frequency*. A JAA Member State will provide the opportunity for an applicant to complete the required examinations in accordance with the procedures set out in this Subpart. A complete examination for a licence or instrument rating will comprise an examination in each of the subjects detailed in Appendix 1 to JAR– FCL 1.470. **[ ]**

(b) *Language*. The examinations will be provided in the language(s) considered appropriate by the Authority. The Authority will inform applicants of the language(s) in which that Authority's examinations will be conducted.

(c) *Content*. Questions for an examination will be selected by the Authority from the CQB according to a common method which allows coverage of the entire syllabi in each subject. The content of the questions will not be changed other than, where necessary, to facilitate translation into the national language(s). The style of answer to questions requiring numerical computation or graphical interpretation may be varied to other forms considered appropriate by the Authority. The examination in Communications may be provided separately from those in other subjects, as decided by the Authority. An applicant who has previously passed either or both of the examinations in VFR

JAR-FCL 1.480(c) (continued)

and IFR Communications will not be re-examined in the relevant sections.

(d) *Oral Examinations.* Oral examinations will not be conducted in lieu of written or computer based examinations.

(e) *Facilities*. The Authority will determine how to provide suitable charts, maps, data sheets and equipment as required, to answer the questions. **[ ]**

(f) *Security*. The identity of the applicant will be established before an examination is taken.

(g) *Confidentiality*. The contents of the examination papers will retain a confidential status.

[Amdt. 1, 01.06.00; Amdt. 3, 01.07.03]

JAR–FCL 1.485 Responsibilities of the applicant

(a) An applicant shall take the entire set of examinations in one JAA Member State.

(b) **[**An applicant shall be recommended for an examination by the approved FTO responsible for applicant's training when the applicant has completed the appropriate elements of the course of theoretical knowledge instruction to a satisfactorily standard. An applicant who has failed to complete the examination within the limits imposed by JAR-FCL 1.490 will in addition be required to produce evidence from an approved Training Organisation of further training.**]**

(c) If the Authority considers that the applicant is not complying with examination procedures during the examination, this misconduct will be considered with a view to failing the applicant, either in the examination of a single subject or in the examination as a whole.

[Amdt. 1, 01.06.00; Amdt. 3, 01.07.03]

JAR–FCL 1.490 Pass standards

(a) A Pass in an examination paper will be awarded to an applicant achieving at least 75% of the marks allocated to that paper. There is no penalty marking.

[(b)**]** Subject to any other conditions in JARs, an applicant will be deemed to have successfully completed the required theoretical knowledge examination for the appropriate pilot licence or rating when awarded a pass in all of the required subjects within a period of **[ ]** 18 months **[ ]** counted from the end of the calendar month when the applicant first attempted an examination.

JAR-FCL 1.490 (continued)

[(c) An applicant shall re-enter the complete examination as though far an initial attempt if he has failed to pass any single examination paper within four attempts, or has failed to pass all papers within either six sittings or the period mentioned in paragraph (b) above. Before re-entry to the examinations the applicant shall undertake further training as determined by the Authority.**]**

[Amdt. 1, 01.06.00; Amdt. 2, 01.08.02; Amdt. 3, 01.07.03]

JAR–FCL 1.495 Acceptance period

(a) A pass in the theoretical knowledge examinations given in accordance with JAR–FCL 1.490 will be accepted for the grant of the CPL(A) or IR(A) during the 36 months from the date of**[ ]** gaining a Pass **[ ]** in **[**all**]** the required examination **[**papers**]**.

(b) Provided that an IR(A) is obtained in accordance with (a) above, a pass in the ATPL(A) **[**theoretical**]** knowledge examination will remain valid for a period of 7 years from the last validity date of the IR(A) entered in the CPL(A) for the issuance of an ATPL(A).

(c) A pass in the ATPL(A) theoretical knowledge examination will remain valid for a period of 7 years from the last validity date of a type rating entered in a F/E licence.

[Amdt. 1, 01.06.00; Amdt. 3, 01.07.03]

[Appendix 1 to JAR-FCL 1.470
Theoretical knowledge examination subjects / sections and length of examinations – ATPL, CPL and IR
(See JAR-FCL 1.470)

	Aeroplane (A)						Helicopter (H)					
	ATPL Airline Transport Pilot Licence		**CPL** Commercial Pilot Licence		**IR** Instrument Rating (Aircraft)		**ATPL** Airline Transport Pilot Licence		**CPL** Commercial Pilot Licence		**IR** Instrument Rating (Aircraft)	
Subject	Paper no	Exam length time	Paper no	Exam length time	Paper no	Exam length time	Paper no	Exam length time	Paper no	Exam length time	Paper no	Exam length time
010 Air Law (B)	1	**1.40**	1	**0.45**			1	**1.40**	1	**1.00**		
010 Air Law / Operational Procedures					1	**1.00**					1	**1.00**
020 Aircraft General Knowledge (B)			2	**2.30**	2	**1.15**			2	**2.30**	2	**1.15**
airframe/systems/power plant	2	**2.00**		(1.30)		(0.15)	2	**2.00**		(1.30)		(0.15)
instruments/electronics	3	**1.30**		(1.00)		(1.00)	3	**1.30**		(1.00)		(1.00)
030 Flight Performance and Planning (B)			3	**3.00**	3	**2.00**			3	**3.30**	3	**2.00**
mass and balance	4	**1.00**		(0.45)			4	**1.00**		(1.00)		
Performance	5	**1.00**		(0.45)			5	**1.00**		(1.00)		
flight planning & monitoring	6	**3.00**		(1.30)		(2.00)	6	**3.00**		(1.30)		(2.00)
040 Human Performance & Limitations	7	**1.00**	4	**0.30**	4	**0.30**	7	**1.00**	4	**0.30**	4	**0.30**
050 Meteorology (B)	8	**2.30**	5	**1.30**	5	**1.30**	8	**2.30**	5	**1.00**	5	**1.30**
060 Navigation (B)			6	**1.30**	6	**2.00**			6	**1.30**	6	**2.00**
general navigation	9	**2.00**		(1.00)		(0.30)	9	**2.00**		(1.00)		(0.30)
radio navigation	10	**1.30**		(0.30)		(1.30)	10	**1.30**		(0.30)		(1.30)
070 Operational Procedures (B)	11	**1.20**	7	**0.45**			11	**1.20**	7	**1.20**		
080 Principles of Flight (B)	12	**1.00**	8	**0.45**			12	**1.00**	8	**1.00**		
090 Communications			9	**0.30**	7	**0.30**			9	**0.30**	7	**0.30**
VFR communications	13	**0.30**		(0.30)			13	**0.30**		(0.30)		
IFR communications	14	**0.30**				(0.30)	14	**0.30**				(0.30)
Total	**14**	**20.30**	**9**	**11.45**	**7**	**8.45**	**14**	**20.30**	**9**	**12.50**	**7**	**8.45**

Note 1: refer to JAR-FCL 1.050(b) and 2.050(b) for crediting of flight time and theoretical knowledge.

Note 2: (B) indicates that 'Bridge' examinations are required to convert from an Aeroplane licence to an Helicopter licence, and vice-versa. See Appendix 1 to JAR–FCL 1.050 and Appendix 1 to JAR-FCL 2.050.

Note 3: the syllabus combines the theoretical knowledge syllabuses for Aeroplane and Helicopter. Column boxes marked with a cross ('x') indicate that knowledge of the relevant *topic* is required to be taught for the particular licence level. Column boxes marked with a bullet point (•) indicate that the *sub-topic* is NOT applicable to the particular licence level.**]**

Appendix 1 to JAR-FCL 1.470 (continued)

		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
010 00 00 00	**AIR LAW AND ATC PROCEDURES**	**x**	**x**	**x**	**x**	**x**	**x**
010 01 00 00	**INTERNATIONAL AGREEMENTS AND ORGANISATIONS**	**x**	**x**	**x**	**x**	**x**	**x**
010 01 01 00	The Convention of Chicago	x	x	x	x	x	x
010 01 01 01	Part I Air Navigation – general principles and application: sovereignty, territory – flight over territory of Contracting States: right of non-scheduled flight, scheduled air services, cabotage, landing at customs airports, applicability of air regulations, rules of the air, search of aircraft – measures to facilitate air navigation: customs duty, conditions to be fulfilled with respect to aircraft: certificates of airworthiness, licences of personnel, recognition of certificates and licences, cargo restrictions, photographic apparatus: documents to be carried in aircraft – international standards and recommended practices: adoption of international standards and procedures, endorsement of certificates and licences, validity of endorsed certificates and licences: departure from international standards and procedures (notification of differences)	x	x	x	x	x	x
010 01 01 02	Part II The International Civil Aviation Organisation – objectives and composition	x	x	x	x	x	x
010 01 01 03	Regional structure and offices	x	x		x	x	
010 01 01 04	Duties in relation to: – annexes to the convention – standards and recommended practices – procedures for air navigation services – regional supplementary procedures – regional air navigation – manuals and circulars	x			x	x	
010 01 02 00	Other International agreements	x	x	x	x	x	x
010 01 02 01	The International Air Transport Agreement: – the five freedoms	x	x		x	x	
010 01 02 02	The Convention of Tokyo, La Haye, Montreal – jurisdiction – authority of the pilot-in-command of the aircraft	x	x		x	x	
010 01 02 03	European organisations name, composition, objectives and relevant documents – European Civil Aviation Conference (ECAC), including Joint Aviation Authorities (JAA) – Eurocontrol – European Commission (EC)	x	x	x	x	x	x
010 01 02 04	Warsaw Convention	x	x		x	x	
010 01 03 00	PIC authority and responsibility regarding safety and security	x	x		x	x	
010 01 04 00	Operators and pilots liabilities towards persons and goods on the ground, in case of damage and injury caused by the operation of the aircraft.	x	x		x	x	

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Appendix 1 to JAR-FCL 1.470 (continued)

		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
010 01 05 00	Commercial practices and associated rules (leasing) – Dry lease – Wet lease	x	x		x	x	
010 02 00 00	**ANNEX 8 – AIRWORTHINESS OF AIRCRAFT** – applicability	**x**	**x**		**x**	**x**	
010 03 00 00	**ANNEX 7 – AIRCRAFT NATIONALITY AND REGISTRATION MARKS** – applicability	**x**	**x**		**x**	**x**	
010 04 00 00	**ANNEX 1 – PERSONNEL LICENSING** – applicability – relation between ANNEX 1 and JAR–FCL	**x**	**x**	**x**	**x**	**x**	**x**
010 05 00 00	**RULES OF THE AIR (based on ANNEX 2)**	**x**	**x**	**x**	**x**	**x**	**x**
010 05 01 00	Annex 2: – essential definitions, applicability of the rules of the air, general rules (except water operations), visual flight rules, instrument flight rules, signals, interception of civil aircraft, table of cruising levels	x	x	x	x	x	x
010 06 00 00	**PROCEDURES FOR AIR NAVIGATION – AIRCRAFT OPERATIONS Doc. 8168-OPS/611, VOLUME 1**	**x**	**x**	**x**	**x**	**x**	**x**
010 06 01 00	Foreword – introduction	x		x	x		x
010 06 02 00	Definitions and abbreviations (see general statements)	x		x	x		x
010 06 03 00	Departure procedures – general criteria – standard instrument departures – omnidirectional departures – published information – simultaneous operations on parallel or near-parallel instrument runways – area navigation (RNAV) departure procedures based on VOR/DME – use of FMS/RNAV equipment to follow conventional departure procedures	x		x	x		x

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Appendix 1 to JAR-FCL 1.470 (continued)

		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
010 06 04 00	Approach procedures – general criteria (except tables) – approach procedure design: instrument approach areas, accuracy of fixes (only intersection fix tolerance factors, other fix tolerance factors, accuracy of facility providing track, approach area splays, descent gradient) – arrival and approach segments: general, standard instrument arrival, initial approach segment (only general), intermediate approach segment, final approach segment (except tables), missed approach segment (only general)	x		x	x		x
	– visual manoeuvring (circling) in the vicinity of the aerodrome: general, the visual manoeuvring (circling) area (except table), visual manoeuvring (circling) area not considered for obstacle clearance (except table), minimum descent altitude/height, visual flight manoeuvre, missed approach whilst circling – simultaneous ILS operations on parallel or near-parallel runways – area navigation (RNAV) approach procedures based on VOR/DME – use of FMS/RNAV equipment to follow conventional non-precision approach procedures						
010 06 05 00	Holding procedures – in flight procedures (except table), entry, holding – obstacle clearance (except table)	x		x	x		x
010 06 06 00	Altimeter setting procedures (including ICAO Doc. 7030 – regional supplementary procedures) – basic requirements (except tables), procedures applicable to operators and pilots (except tables)	x	x	x	x	x	x
010 06 07 00	Secondary surveillance radar transponder operating procedures (including ICAO Doc. 7030 – regional supplementary procedures) – operation of transponders – operation of ACAS equipment – phraseology	x	x	x	x	x	x
010 07 00 00	**AIR TRAFFIC SERVICES (based on ANNEX 11 and Doc. 4444)**	**x**	**x**	**x**	**x**	**x**	**x**
010 07 01 00	Air Traffic Services – Annex 11 – definitions (see general statements)	x	x	x	x	x	x
010 07 01 01	General – objectives of ATS, divisions of ATS, designation of the portions of the airspace and controlled aerodromes where ATS will be provided, classification of airspaces (appendix 4 of annex 11), required navigation performance (RNP), establishment and designation of the units providing ATS, specifications for flight information regions, control areas and control zones, minimum flight altitudes, priority in the event of an aircraft in emergency, in-flight contingencies, time in ATS	x	x	x	x	x	x
010 07 01 02	Air Traffic Control – application – provision of air traffic control service, operation of air traffic control service, separation minima, contents of clearances, co-ordination of clearances, control of persons and vehicles at aerodromes	x	x	x	x	x	x

Appendix 1 to JAR-FCL 1.470 (continued)

		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
010 07 01 03	Flight Information Service – application – scope of flight information service – operational flight information service broadcasts	x	x	x	x	x	x
010 07 01 04	Alerting Service – application, notification of rescue co-ordination centres (only INCERFA, ALERFA, DETRESFA), information to aircraft operating in the vicinity of an aircraft in a state of emergency	x	x	x	x	x	x
010 07 01 05	Principles governing the identification of RNP types and the identification of ATS routes other than standard departure and arrival routes (Appendix 1)	x	x	x	x	x	x
010 07 03 00	Rules of the air and air traffic services (ICAO Doc. 4444 – RAC/501/11 and ICAO Doc. 7030 – Regional supplementary procedures) – definitions (see general statements) – relationship to other document	x	x	x	x	x	x
010 07 03 01	General provisions – general air traffic services operating practices: submission of a flight plan, change from IFR to VFR flight, clearances and information, control of air traffic flow, altimeter setting procedures, indication of heavy wake turbulence category and MLS capacity, position reporting, air traffic incident report, procedures in regard to aircraft equipped with airborne collision avoidance systems (ACAS) – Appendix 1	x	x	x	x	x	x
010 07 03 02	Area Control Service – general provisions for the separation of controlled traffic – vertical separation: vertical separation application, vertical separation minimum, minimum cruising level, assignment of cruising level, vertical separation during ascent or descent – horizontal separation: lateral separation application, lateral separation application, longitudinal separation application (except between supersonic aircraft) – reduction in separation minima – air traffic control clearances: contents, description of air traffic control clearances, clearance to fly maintaining own separations while in visual meteorological conditions, essential traffic information, clearance of a requested change in flight plan – emergency and communication failure: emergency procedures (only general priority, emergency descent, action by pilot-in-command), air-ground communication failure (only concerning the actions by pilot-in-command), interception of civil aircraft	x	x	x	x	x	x
010 07 03 03	Approach Control Service – departing aircraft: general procedures for departing aircraft, clearances for departing aircraft to climb maintaining own separation while in visual meteorological conditions, information for departing aircraft – arriving aircraft: general procedures for arriving aircraft, clearance to descend subject to maintaining own separation in visual meteorological conditions, visual approach, instrument approach, holding, approach sequence, expected approach time, information for arriving aircraft	x	x	x	x	x	x

Appendix 1 to JAR-FCL 1.470 (continued)

		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
010 07 03 04	Aerodrome Control Service – functions of aerodrome control towers: general, alerting service provided by aerodrome control towers, suspension of VFR operations by aerodrome control towers – traffic and taxi circuits: selection of runway-in-use – information to aircraft by aerodrome control towers: information related to the operation of the aircraft, information on aerodrome conditions – control of aerodrome traffic: order of priority for arriving and departing aircraft, control of departing and arriving aircraft, wake turbulence categorisation of aircraft and increased longitudinal separation minima, authorisation of special VFR flights	x	x	x	x	x	x
010 07 03 05	Flight Information Service and Alerting Service – flight information service – alerting service	x	x	x	x	x	x
010 07 03 06	Use of radar in Air Traffic Services – general provisions: limitations in the use of radar, identification procedures (only establishment of radar identity), position information, radar vectoring – use of radar in the air traffic control service	x		x	x	x	x
010 08 00 00	**AERONAUTICAL INFORMATION SERVICE (based on ANNEX 15)**	**x**	**x**	**x**	**x**	**x**	**x**
010 08 01 00	Annex 15 – essential definitions – applicability	x	x	x	x	x	x
010 09 00 00	**AERODROMES (based on ANNEX 14, VOL 1 & 2)**	**x**	**x**	**x**	**x**	**x**	**x**
010 09 01 00	Annex 14 – definitions	x	x	x	x	x	x
010 09 01 01	Aerodrome data: – conditions of the movement area and related facilities	x	x	x	x	x	x
010 09 01 02	Visual aids for navigation – indicators and signalling devices – markings – lights – signs – markers	x	x	x	x	x	x
010 09 01 03	Visual aids for denoting obstacles – marking of objects – lighting of objects	x	x	x	x	x	x
010 09 01 04	Visual aids for denoting restricted use of areas	x	x	x	x	x	x
010 09 01 05	Emergency and other services – rescue and fire fighting – apron management service – ground servicing of aircraft	x	x	x	x	x	x
010 09 01 06	Attachment A to Annex 14 – calculation of declared distances – radio altimeter operating areas – approach lighting systems	x	x	x	x	x	x

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Appendix 1 to JAR-FCL 1.470 (continued)

		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
010 10 00 00	**FACILITATION (based on ANNEX 9)** – definitions	**x**	**x**	**x**	**x**	**x**	**x**
010 10 01 00	Entry and departure of aircraft – description, purpose and use of aircraft documents: general declaration	x	x	x	x	x	x
010 10 02 00	Entry and departure of persons and their baggage – entry requirement and procedures crew and other operator's personnel	x	x	x	x	x	x
010 11 00 00	**SEARCH AND RESCUE (based on ANNEX 12)**	**x**	**x**	**x**	**x**	**x**	**x**
010 11 01 00	Annex 12 – definitions	x	x	x	x	x	x
010 11 01 01	Organisation – establishment and provision of SAR service – establishment of SAR regions – establishment and designation of SAR services units	x	x	x	x	x	x
010 11 01 02	Co-operation – co-operation between States – co-operation with other services	x	x	x	x	x	x
010 11 01 03	Operating procedures – procedures for pilots-in-command at the scene of an accident – procedures for pilots-in-command intercepting a distress transmission – search and rescue signals	x	x	x	x	x	x
010 11 01 04	Search and rescue signals: – signals with surface craft – ground/air visual signal code – air/ground signals	x	x	x	x	x	x
010 12 00 00	**SECURITY (based on ANNEX 17)**	**x**	**x**		**x**	**x**	
010 12 01 00	Annex 17	x	x		x	x	
010 12 01 01 010 12 01 02	General: – aims and objectives Organisation – co-operation and co-ordination	x x	x x		x x	x x	
010 12 01 03	Operators: operators security programme	x	x		x	x	
010 13 00 00	**AIRCRAFT ACCIDENT INVESTIGATION (based on ANNEX 13)**	**x**	**x**	**x**	**x**	**x**	**x**
010 13 01 00	Annex 13 – definitions – applicability	x	x		x	x	
010 14 00 00	**JAR–FCL**	**x**	**x**	**x**	**x**	**x**	**x**
010 15 00 00	**NATIONAL LAW**	**x**	**x**	**x**	**x**	**x**	**x**
010 15 01 00	National law and differences to relevant ICAO Annexes and JARs	x	x	x	x	x	x

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
020 00 00 00	**AIRCRAFT GENERAL KNOWLEDGE**	**x**	**x**	**x**	**x**	**x**	**x**
021 00 00 00	**AIRFRAME AND SYSTEMS, ELECTRICS, POWERPLANT, EMERGENCY EQUIPMENT – AEROPLANES**	**x**	**x**				
021 00 00 00	**AIRFRAME AND SYSTEMS, ELECTRICS, POWERPLANT, EMERGENCY EQUIPMENT – HELICOPTERS**				**x**	**x**	
021 00 00 00	**AIRFRAME AND SYSTEMS, ELECTRICS, POWERPLANT, EMERGENCY EQUIPMENT – AIRCRAFT**			**x**			**x**
021 01 00 00	**AIRFRAME AND SYSTEMS – AEROPLANES**	**x**	**x**	**x**			**x**
021 01 01 00	Fuselage – types of construction – structural components and materials – stress	x	x				
021 01 02 00	Cockpit and cabin windows – construction (laminated glass) – structural limitations	x	x				
021 01 03 00	Wings – types of construction – structural components and materials – stress relief of engines, etc. – stress	x	x •				
021 01 04 00	Stabilising surfaces – vertical, horizontal and V-tail surfaces – construction materials – efforts – 'flutter' – compensation system – mach trim	x	x •				
021 01 05 00	Landing Gear – types – construction – locking devices and emergency extension systems – accidental retraction prevention devices – position, movement lights and indicators – nose wheel steering – wheels and tyres (construction, limitations) – braking systems – construction – parking brake – mode of operation of anti-skid system – mode of operations of auto brake system – operation, indications and warning systems	x	x				

Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
021 01 06 00	Flight Controls (construction and operation)	x	x				
021 01 06 01	Primary controls: – elevator, aileron and rudder – trim – mode of actuation (mechanical, hydraulic, electrical, fly-by-wire) – operation, indicators, warning devices and controls – efforts to transmit	x	x				
021 01 06 02	Secondary controls: – leading and trailing edge lift augmentation devices – lift dumping and speed brakes – variable elevator – mode of actuation (mechanical, hydraulic, electrical, fly-by-wire) – operation, indicators, warning devices – danger situations and potential failures	x	x				
021 01 07 00	Hydraulics	x	x				
021 01 07 01	Basic principles of hydromechanics – hydraulic fluids – schematic construction and functioning of hydraulic systems	x	x				
021 01 07 02	Hydraulic systems – main, standby and emergency systems – operation, indicators, warning systems – ancillary systems	x	x				
021 01 08 00	Air driven systems (piston engines only)	x	x	x			x
021 01 08 01	Pneumatic systems – power sources – schematic construction and functioning of pneumatic systems	x	x				
021 01 08 02	Air conditioning system – heating and cooling – construction, functioning and controls	x	x				
021 01 08 03	Pressurisation – cabin altitude, maximum cabin altitude, differential pressure – pressurised zones in the aircraft – operation and indicators – safety devices and warning systems – rapid decompression, cabin altitude warning – emergency procedures	x	x				
021 01 08 04	De-ice systems – pneumatic leading edge de-icing of wings and control surfaces – schematic construction – operational limitations – initiation/timing of de-icing system usage	x	x	x			x

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
021 01 09 00	Air Driven Systems (Turbopropeller and Jet aircraft)	x	x	x			x
021 01 09 01	Pneumatic system – power sources – schematic construction – potential failures, warning devices – operation, indicators, warning systems – pneumatic operated systems	x	x				
021 01 09 02	Air conditioning system – construction, functioning, operation, indicators and warning devices – heating and cooling – temperature regulation – automatic and manual – ram air ventilation – schematic construction	x	x				
021 01 09 03	Anti-ice systems – aerofoil (Aeroplane), aerofoil/rotors (Helicopter) and control surfaces, powerplant, air intakes, windshield – schematic construction, operating limitations and initiation, timing of de-icing system usage – ice warning system	x	x	x			x
021 01 09 04	Pressurisation – cabin altitude, maximum cabin altitude, differential pressure – pressurised zones in the aircraft – operation and indicators – safety devices and warning systems – rapid decompression, cabin altitude warning – emergency procedures	x	x				
021 01 10 00	Non-pneumatic operated de-ice and anti-ice systems	x	x	x			x
021 01 10 01	Schematic construction, functioning and operation of: – air intake – propeller (Aeroplane); propeller/rotors (Helicopter) – pitot, static pressure sensor and stall warning devices – windshield – weeping wing system – rain repellent system	x	x	x			x
021 01 11 00	Fuel system	x	x				
021 01 11 01	Fuel tanks – structural components and types – location of tanks on single-and multi-engine aircraft – sequence and types of refuelling – unusable fuel	x	x				
021 01 11 02	Fuel feed – gravity and pressure feed – crossfeed – schematic construction	x	x				
021 01 1 03	Fuel dumping system	x	x				

Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
021 01 11 04	Fuel system monitoring – operation, indicators, warning systems – fuel management (sequencing of fuel tank switching) – dip stick	x	x				
021 02 00 00	**ELECTRICS**	**x**	**x**	**x**	**x**	**x**	**x**
021 02 01 00	Direct Current (DC) (ATPL and CPL); Direct/Alternating Current (DC/AC) (IR)	x	x	x	x	x	x
021 02 01 01	General – electric circuits – voltage, current, resistance – Ohm's law – resistive circuits – resistance as a function of temperature – electrical power, electrical work – fuses (function, type and operation) – the electrical field – the capacitor (function)	x	x	x	x	x	x
021 02 01 02	Batteries – types, characteristics – capacity – uses – hazards	x	x	x	x	x	x
021 02 01 03	Magnetism – permanent magnetism – electromagnetism: – relay, circuit breaker, solenoid valve (principle, function and applications) – electromagnetic power – electromagnetic induction	x	x	x	x	x	x
021 02 01 04	Generators – alternator: – principle, function and applications – monitoring devices – regulation, control and protection – modes of excitation – starter generator	x	x	x	x	x	x
021 02 01 05	Distribution – current distribution (buses) – monitoring of electrical flight instruments/systems: – ammeter, voltmeter – annunciators – electrical consumers – DC power distribution: – construction, operation and system monitoring – elementary switching circuits	x	x	x	x	x	x
021 02 01 06	Inverter (applications)	x	x	x	x	x	x
021 02 07]	The aircraft structure as an electrical conductor	x	x		x	x	

Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
021 02 02 00	Alternating Current (AC)	x	x		x	x	
021 02 02 01	General – single and multi-phase AC – frequency – phase shift – AC components	x	x		x	x	
021 02 02 02	Generators – 3-phase generator – brushless generator (construction and operation) – generator drive: – constant speed drive – integrated drive	x	x		x	x	
021 02 02 03	AC power distribution – construction, operation and monitoring – protection circuits, paralleling of AC-generators	x	x		x	x	
021 02 02 04	Transformers – function – types and applications	x	x		x	x	
021 02 02 05	Synchronous and asynchronous motors – operation – application	x	x		x	x	
021 02 02 06	Transformer/rectifier units	x	x		x	x	
021 02 03 00	Semiconductors – principles of semiconductors – semiconductor resistors (properties and application) – rectifier (function and applications) – transistor (function and applications) – diode (function and applications)	x	x		x	x	
021 02 04 00	Basic knowledge of computers	x	x		x	x	
021 02 04 01	Logic circuits	x	x		x	x	
021 02 04 02	Logical symbols	x	x		x	x	
021 02 04 03	Switching circuits and logical symbols	x	x		x	x	
021 02 05 00	Basic radio propagation theory	x	x	x	x	x	x
021 02 05 01	Basic principles – electromagnetic waves – wave length, amplitude, phase angle, frequency – frequency bands, sideband, single sideband – pulse characteristics – carrier, modulation, demodulation – kinds of modulation (amplitude, frequency, pulse, multiplex) – oscillation circuits	x	x	x	x	x	x
021 02 05 02	Antennas – characteristics – polarisation – types of antennas	x	x	x	x	x	x

Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
021 02 05 03	Wave propagation – ground waves – space waves – propagation with the frequency bands – frequency prognosis (MUF) – fading – factors affecting propagation (reflection, absorption, interference, twilight, shoreline, mountain, static)	x	x	x	x	x	x
021 03 00 00	**POWERPLANT**	**x**	**x**		**x**	**x**	
021 03 01 00	Piston engine	x	x		x	x	
021 03 01 01	General – design types – principles of the 4-stroke internal combustion engine – mechanical components	x	x		x	x	
021 03 01 02	Lubrication system – function – schematic construction – monitoring instruments and indicators – lubricants	x	x		x	x	
021 03 01 03	Air cooling – system monitoring – cylinder head temperature – cowl flaps	x	x		x	x	
021 03 01 04	Ignition – schematic construction and function – types of ignition – magneto check	x	x		x	x	
021 03 01 05	Engine fuel supply – carburettor (construction and mode of operation, carburettor icing) – fuel injection (construction and mode of operation) – alternate air	x	x		x	x	
021 03 01 06	Engine performance – pressure/density altitude – performance as a function of pressure and temperature	x	x		x	x	
021 03 01 07	Power augmentation devices – turbocharger, supercharger (construction and effect on engine performance)	x	x		x	x	
021 03 01 08	Fuel – types, grades – detonation characteristics, octane rating – colour coding	x	x		x	x	
	– additives – water content, ice formation – fuel density – alternate fuels, differences in specifications, limitations						
021 03 01 09	Mixture – rich and lean mixture – maximum power and fuel economy mixture setting	x	x		x	x	

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
021 03 01 10	Propeller – fixed pitch and constant speed propeller – principles and operation of propellers on single and multi-engine aircraft – propeller check – propeller efficiency as a function of airspeed – aircraft and engine protection (propeller operation: ground/air, coarse/fine pitch limitations)	x	x				
021 03 01 11	Engine handling and manipulation – power setting, power range – mixture setting – operational limitations	x	x		x	x	
021 03 01 12	Operational criteria – maximum and minimum RPM – (induced) engine vibration and critical RPM – remedial action by abnormal engine start, run-up and in-flight	x	x		x	x	
021 03 02 00	Turbine engine	x	x		x	x	
021 03 02 01	Principles of operation	x	x		x	x	
021 03 02 02	Types of construction – centrifugal – axial flow – free turbine – single shaft turbine – turboprop – turbojet – turbofan	x • •	x • •		x • • •	x • • •	
021 03 03 00	Engine construction	x	x		x	x	
021 03 03 01	Air inlet – function	x	x		x	x	
021 03 03 02	Compressor – function – construction and mode of operation – effects of damage – compressor stall and surge (cause and avoidance) – compressor characteristics	x	x		x	x	
021 03 03 03	Diffusor – function	x	x		x	x	
021 03 03 04	Combustion chamber – function, types and working principles – mixing ratios – fuel injectors – thermal load	x	x		x	x	
021 03 03 05	Turbine – function, construction and working principles – thermal and mechanical stress – effects of damage – monitoring of exhaust gas temperature	x	x		x	x	

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
021 03 03 06	Jet pipe – function – different types – noise silencing devices	x	x				
021 03 03 07	Pressure, temperature and airflow in a turbine engine	x	x		x	x	
021 03 03 08	Reverse thrust – function, types and principles of operation – degree of efficiency – use and monitoring	x	x				
021 03 03 09	Performance and thrust augmentation – water injection, principles of operation – use and system monitoring	x	x				
021 03 03 10	Bleed air – effect of use of bleed air on thrust, exhaust temperature, RPM and pressure ratio – effect of use of bleed air on performance	x	x		x •	x •	
021 03 03 11	Auxiliary gearbox – function	x	x		x	x	
021 03 04 00	Engine systems	x	x		x	x	
021 03 04 01	Ignition – function, types, components, operation, safety aspects	x	x		x	x	
021 03 04 02	Starter – function, type, construction and mode of operation – control and monitoring – self sustaining and idle speeds	x	x		x	x	
021 03 04 03	Engine start malfunctions – cause and avoidance	x	x		x	x	
021 03 04 04	Fuel system – construction, components – operation and monitoring – malfunctions	x	x		x	x	
021 03 04 05	Lubrication – construction, components – operation and monitoring – malfunctions	x	x		x	x	
021 03 04 06	Fuel – effects of temperature – impurities – additives	x	x		x	x	
021 03 04 07	Thrust – thrust formula – flat rated engine – thrust as a function of airspeed, air density, pressure, temperature and RPM	x	x				
021 03 04 08	Powerplant operation and monitoring	x	x		x	x	

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
021 03 04 09	Power – power sharing engines – function of density – flat rated engine				x	x	
021 03 05 00	Auxiliary Power Unit (APU)	x	x		x	x	
021 03 05 01	General – function, types – location – operation and monitoring	x	x		x	x	
021 03 05 02	Ram air turbine – function	x	x				
021 04 00 00	**EMERGENCY EQUIPMENT**	**x**	**x**		**x**	**x**	
021 04 01 00	Doors and emergency exits – accessibility – normal and emergency operation – markings – floor exit markings – crew emergency exits – passenger emergency exits – evacuation slides, general usage or as life rafts or flotation devices	x	x		x •	x •	
021 04 02 00	Smoke detection – location, indicators, function test	x	x		x	x	
021 04 03 00	Fire detection – location, warning mode, function test	x	x		x	x	
021 04 04 00	Fire fighting equipment – location, operation, contents, gauge, function test	x	x		x	x	
021 04 05 00	Aircraft oxygen equipment – principles of operation	x	x		x	x	
	– protection and surveillance devices – drill, use of equipment in case of rapid decompression – comparison of constant flow and demand outlet masks – oxygen generators – dangers of oxygen use, safety measures				 • • 	 • • 	
021 04 06 00	Emergency equipment – portable, hand-held fire extinguisher – smoke mask, smoke protection hood – portable oxygen system – emergency locator beacon, transmitter – life jacket, life raft – pocket lamp, emergency lighting – megaphone – crash axe – fireproof gloves – emergency flotation system	x •	x •		x	x	

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
021 05 00 00	**AIRFRAME AND SYSTEMS – HELICOPTERS**				**x**	**x**	
021 05 01 00	Helicopter configurations – single rotor – tandem rotor – coaxial rotor – side by side rotor				x	x	
021 05 02 00	Controls and rotors				x	x	
021 05 02 01	Control systems – types – components – adjustments – primary controls (cyclic, collective, directional)				x	x	
021 05 02 02	Rotorheads – types – components – material				x	x	
021 05 02 03	Tailrotors/Notar – types – components – material				x	x	
021 05 02 04	Blades – types – section – construction – material – adjustment				x	x	
021 05 02 05	Control surfaces – vertical horizontal – construction – material				x	x	
021 05 03 00	Fuselage – types of construction – structural components, materials, limitations				x	x	
021 05 04 00	Cockpit and cabin – construction – structural limitations				x	x	
021 05 05 00	Landing gear – types e,g floats, skids, wheels, etc,,, – construction – locking devices and emergency extension systems – accidental retraction prevention devices – position, movement lights and indicators – wheels and tyres – braking systems : – construction – parking brake – operation, indications and warning systems				x	x	

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
021 05 06 00	Transmission systems				x	x	
021 05 06 01	Drive shafts – types – components – material				x	x	
021 05 06 02	Gearboxes – types – construction – material – lubrication – indications				x	x	
021 05 06 03	Clutches – types – components				x	x	
021 05 06 04	Freewheeling – types – components				x	x	
021 05 07 00	Rotorbrake – components – construction				x	x	
021 05 08 00	Inspection – vibration – balancing – tracking				x	x	
021 05 09 00	Hydraulics				x	x	
021 05 09 01	Basic principles of hydromechanics – hydraulic fluids – schematic construction and functioning of hydraulic systems				x	x	
021 05 09 02	Hydraulic systems – main, standby and emergency systems – operation, indicators, warning systems – ancillary systems – auxiliary systems				x	x	
021 05 10 00	Air driven systems				x	x	
021 05 10 01	Pneumatic systems – power sources – schematic construction – potential failures, safety devices – operation, indicators, warning systems – pneumatic operated systems				x	x	
021 05 10 02	Air conditioning system – construction, functioning, operation, indicators and warning devices – heating and cooling – temperature regulation – automatic and manual – ram air ventilation				x	x	

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
021 05 11 00	De ice and anti-ice systems – schematic construction, functioning and operation of – air intake – rotors (main tailrotor) – pitot, static pressure sensor – windshield – control surfaces (horizontal stabiliser) – rain repellent system – ice warning systems				x	x	
021 05 12 00	Fuel system				x	x	
021 05 12 01	Fuel tanks (main and auxiliary) – structural components and types – location of tanks on single and multi-engine helicopter – sequence and types of refuelling – unusable fuel – crashworthiness				x	x	
021 05 12 02	Fuel feed – gravity and pressure feed – crossfeed – schematic construction				x	x	
021 05 12 03	Fuel dumping system				x	x	
021 05 12 04	Fuel system monitoring – operation, indicators, warning systems – fuel management (sequencing of fuel tank switching) – dip stick				x	x	

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
022 00 00 00	**INSTRUMENTATION – AEROPLANES**	**x**	**x**				
022 00 00 00	**INSTRUMENTATION – AIRCRAFT**			**x**			**x**
022 00 00 00	**INSTRUMENTATION – HELICOPTERS**				**x**	**x**	
022 01 00 00	**FLIGHT INSTRUMENTS**	**x**	**x**	**x**	**x**	**x**	**x**
022 01 01 00	Air data instruments	x	x	x	x	x	x
022 01 01 01	Pitot and static system – pitot tube, construction and principles of operation – static source – malfunction – heating – alternate static source	x	x	x	x	x	x
022 01 01 02	Altimeter – construction and principles of operation – display and setting – errors – correction tables – tolerances	x	x	x	x	x	x
022 01 01 03	Airspeed indicator – construction and principles of operation – speed indications (IAS) – meaning of coloured sectors – maximum speed indicator, Vmo/Mmo pointer – errors	x	x	x	x	x	x
022 01 01 04	Mach meter – mach number formula – construction and principles of operation – display – construction types – errors	x					
022 01 01 05	Vertical Speed Indicator (VSI) – aneroid and instantaneous VSI (IVSI) – construction and principles of operation – display	x	x	x	x	x	x
022 01 01 06	Air Data Computer (ADC) – principles of operation – input and output data, signals – uses of output data – block diagram – system monitoring	x			x	x	

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
022 01 02 00	Gyroscopic instruments	x	x	x	x	x	x
022 01 02 01	Gyro fundamentals – theory of gyroscopic forces (stability, precession) – types, construction and principles of operation: – vertical gyro – directional gyro – rate gyro – rate integrating gyro – single degree-of-freedom gyro – ring laser gyro – apparent drift – random drift – mountings – drive types, monitoring	x	x	x	x	x	x
022 01 02 02	Directional gyro – construction and principles of operation	x	x	x	x	x	x
022 01 02 03	Slaved gyro compass – construction and principles of operation – components – mounting and modes of operation – turn and acceleration errors – application, uses of output data	x	x	x	x	x	x
022 01 02 04	Attitude indicator (vertical gyro) – construction and principles of operation – display types – turn and acceleration errors – application, uses of output data	x	x	x	x	x	x
022 01 02 05	Turn and bank indicator (rate gyro) – construction and principles of operation – display types – application errors – application, uses of output data – turn co-ordinator	x	x	x	x	x	x
022 01 02 06	Gyro stabilised platform (gimballed platform) – types in use – accelerometer, measurement systems – construction and principles of operation – platform alignment – applications, uses of output data	x			x	x	
022 01 02 07	Fixed installations (strap down systems) – construction and principles of operation – types in use – input signals – application, uses of output data	x			x	x	
022 01 03 00	Magnetic compass – construction and principles of operation – errors (deviation, effect of inclination)	x	x	x	x	x	x

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
022 01 04 00	Radio Altimeter – components – frequency band – principle of operation – display – errors	x	x	x	x	x	x
022 01 05 00	Electronic Flight Instrument System (EFIS) – information display types – data input – control panel, display unit – example of a typical aircraft installation	x	x	x	x	x	x
022 01 06 00	Flight Management System (FMS) – general principles – inputs and outputs of data	x			x	x	
022 02 00 00	**AUTOMATIC FLIGHT CONTROL SYSTEMS**	**x**	**x**	**x**	**x**	**x**	**x**
022 02 01 00	Flight Director – function and application – block diagram, components – mode of operation – operation set-up for various flight phases – command modes (bars) – mode indicator – system monitoring – limitations, operational restrictions	x	x	x	x	x	x
022 02 02 00	Autopilot – function and application – types (different axes) – block diagram, components – lateral modes – longitudinal modes – common modes – autoland, sequence of operation – system concepts for autoland, go around, take-off, fail passive, fail operational (redundant) – control modes – signal interfacing to control surfaces – operation and programming for various flight phases – system monitoring – limitations, operational restrictions	x	x	x • • 	x • •	x • •	x • •
022 02 03 00	Flight envelope protection – function – input data, signals	x			x	x	
	– output data, signals – system monitoring						
022 02 04 00	Yaw Damper / Stability augmentation system – function – block diagram, components – signal interfacing to vertical stabiliser	x	x	x •	x	x	x

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
022 02 05 00	Automatic pitch trim – function – input data, signals – mode of operation – horizontal stabiliser, trim tab actuator – system monitoring, safety of operation	x					
022 02 06 00	Thrust computation – function – components – input data, signals – output data, signals – system monitoring	x					
022 02 07 00	Auto-thrust – function and applications – block diagrams, components – mode of operation – automatic operation mode selection – signal interfacing to throttle level mechanism – operation and programming for various flight phases – system monitoring – limitations, operational restrictions	x					
022 03 00 00	**WARNING AND RECORDING EQUIPMENT**	**x**	**x**		**x**	**x**	
022 03 01 00	Warnings general – classification of warning – display, indicator systems	x	x		x	x	
022 03 02 00	Altitude alert system – function – block diagram, components – operation and system monitoring	x			x	x	
022 03 03 00	Ground proximity warning system (GPWS) – function – block diagram, components – input data, signals – warning modes – system integrity test	x			x	x	
022 03 04 00	Traffic collision avoidance system (TCAS) – function – warning modes	x			x	x	
022 03 05 00	Overspeed warning – function – input data, signals – display, indicators – function test – effects on operation in case of failure	x					
022 03 06 00	Stall warning – function – constituent components of a simplified system – block diagram, components of a system with angle-of-attack indicator – operation	x	x				
022 03 07 00	Flight data recorder	x			x	x	

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
	– function – block diagram, components – operation – system monitoring						
022 03 08 00	Cockpit voice recorder – function – block diagram, components – operation	x			x	x	
022 03 09 00	Rotors and engine over/underspeed warning – function – input data, signals – display, indicators – function test – effects on operation in case of failure				x	x	
022 04 00 00	**POWERPLANT AND SYSTEM MONITORING INSTRUMENTS**	**x**	**x**		**x**	**x**	
022 04 01 00	Pressure gauge – sensors – pressure indicators – meaning of coloured sectors	x	x		x	x	
022 04 02 00	Temperature gauge – sensors – ram rise, recovery factor – temperature indicators – meaning of coloured sectors	x	x		x •	x •	
022 04 03 00	RPM indicator – interfacing of signal pick-up to RPM gauge – RPM indicators, piston and turbine engines – meaning of coloured sectors	x	x		x	x	
022 04 04 00	Consumption gauge – fuel flowmeter (function, indicators) – high pressure line fuel flowmeter (function, indications, failure warnings)	x	x		x •	x •	
022 04 05 00	Fuel gauge – measurement of volume/mass, units – measuring sensors – content, quantity indicators – reasons for incorrect indications	x	x		x	x	
022 04 06 00	Torque meter – indicators, units – meaning of coloured sectors	x	x		x	x	
022 04 07 00	Flight hour meter – drive source – indicators	x	x		x	x	
022 04 08 00	Vibration monitoring – indicators, units – interfacing to bypass turbofan engines – warning system	x	x				

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
022 04 09 00	Remote (signal) transmission system – mechanical – electrical	x	x		x	x	
022 04 10 00	Electronic Displays – EFIS – EICAS – ECAM	x •	x •		x	x	
022 04 11 00	Chip detection – indicators – principles				x	x	

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
030 00 00 00	**FLIGHT PERFORMANCE AND PLANNING**	**x**	**x**	**x**	**x**	**x**	**x**
031 00 00 00	**MASS AND BALANCE – AEROPLANES**	**x**	**x**				
031 00 00 00	**MASS AND BALANCE – HELICOPTERS**				**x**	**x**	
031 01 00 00	**INTRODUCTION TO MASS AND BALANCE**	**x**	**x**		**x**	**x**	
031 01 01 00	Centre of gravity (cg)	x	x		x	x	
031 01 01 01	Definition	x	x		x	x	
031 01 01 02	Importance in regard to aircraft stability (Aeroplane); Importance in regard to helicopter stability (cyclic stick – travel/limitations) (Helicopter)	x	x		x	x	
031 01 02 00	Mass and balance limits	x	x		x	x	
031 01 02 01	Consult aeroplane/helicopter flight manual for: – cg limits for take-off, landing, cruise configurations	x	x		x	x	
031 01 02 02	Maximum floor load	x	x		x	x	
031 01 02 03	Maximum ramp and taxi mass (Aeroplane); Maximum taxi mass (Helicopter)	x	x		x	x	
031 01 02 04	Factors determining maximum permissible mass: – structural limitations – performance limitations such as: runway available for take-off and landing – weather conditions (temperature, pressure, wind, precipitation); rate-of-climb and altitude requirements for obstacle clearance; engine-out performance requirements	x	x		x	x	
031 01 02 05	Factors determining cg limits: – aircraft stability, helicopter stability; ability of flight controls and surfaces to overcome mass and lift pitching moments under all flight conditions – changes in cg location during flight due to consumption of fuel, raising and lowering of undercarriage, and intentional relocation of passengers or cargo, transfer of fuel – movement of centre of lift because of changes in position of wing flaps (Aeroplane); Influence of hoist and external load operation (Helicopter)	x	x		x	x	
031 02 00 00	**LOADING**	**x**	**x**		**x**	**x**	
031 02 01 00	Terminology	x	x		x	x	
031 02 01 01	Empty mass	x	x		x	x	
031 02 01 02	Dry Operating Mass (empty mass + crew + operating items + unusable fuel)	x	x		x	x	
031 02 01 03	Zero Fuel Mass	x	x		x	x	
031 02 01 04	Standard mass – crew, passengers and baggage – fuel, oil, water (volume/mass conversion factors) – carry-on luggage	x	x		x	x	
031 02 01 05	Useful load (traffic load + usable fuel)	x	x		x	x	

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
031 02 02 00	Aircraft mass checks	x	x		x	x	
031 02 02 01	Procedure (in general terms, details not necessary)	x	x		x	x	
031 02 02 02	Requirements for re-weighing of aircraft	x	x		x	x	
031 02 02 03	Equipment lists	x	x		x	x	
031 02 03 00	Procedures for determining aeroplane mass and balance documentation; Procedures for determining helicopter mass and balance documentation	x	x		x	x	
031 02 03 01	Determine Dry Operating Mass (crew, equipment, etc.)	x	x		x	x	
031 02 03 02	Intentionally left blank	x	x		x	x	
031 02 03 03	Add mass of passengers and cargo (including passengers baggage) (standard mass)	x	x		x	x	
031 02 03 04	Add mass of fuel	x	x		x	x	
031 02 03 05	Check that applicable maximum gross mass limits are not exceeded (mass within legal limits)	x	x		x	x	
031 02 04 00	Effects of overloading	x	x		x	x	
031 02 04 01	Higher take-off and safety speeds	x	x		x	x	
031 02 04 02	Longer take-off and landing distances	x	x		x	x	
031 02 04 03	Lower rate-of-climb	x	x		x	x	
031 02 04 04	Influence on range and endurance (Aeroplane); Decreased range and endurance (Helicopter)	x	x		x	x	
031 02 04 05	Decreased engine-out performance	x	x		x	x	
031 02 04 06	Possible structural damage in extreme cases	x	x		x	x	
031 03 00 00	**CENTRE OF GRAVITY (cg)**	**x**	**x**		**x**	**x**	
031 03 01 00	Basis of cg calculations (load and balance documentation)	x	x		x	x	
031 03 01 01	Datum – explanation of term – location – use in cg calculation	x	x		x	x	
031 03 01 02	Moment arm – explanation of term – determination of algebraic signs – use	x	x		x	x	
031 03 01 03	Moment – explanation – moment = mass x moment arm	x	x		x	x	
031 03 01 04	Expression in percentage of mean aerodynamic chord (% MAC)	x	x				
031 03 01 05	Expression of distance from Datumline				x	x	
031 03 02 00	Calculation of cg (Aeroplane); Calculation of cg longitudinal and lateral (including computer calculations) (Helicopter)	x	x		x	x	
031 03 02 01	Cg at empty mass – determined when aircraft is weighed; determined when helicopter is weighed – recorded in aircraft documentation cg at Dry Operating Mass (Aeroplane); recorded in helicopter documentation cg at Dry Operating Mass	x	x		x	x	

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
031 03 02 02	Movement of cg with addition of fuel, load and ballast	x	x		x	x	
031 03 02 03	Practical methods of calculation – computation method using either mathematical computations or specially designed slide rule – graph method – table method	x	x		x	x	
031 03 02 04	Intentional relocation of passengers or cargo to remain within cg limits				x	x	
031 03 03 00	Securing of load	x	x		x	x	
031 03 03 01	Importance of adequate tie-down – equipments for cargo compartment and cargo aircraft – container – pallet	x	x		x • 	x • 	
031 03 03 02	Effect of loadshift – movement of cg, possible out of limits – possible damage due to inertia of a moving load – effect of acceleration of the aircraft load	x	x		x	x	
031 03 04 00	Area Load, Running Load, Supporting	x	x		x	x	

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
032 00 00 00	**PERFORMANCE – AEROPLANES**	**x**	**x**				
032 01 00 00	**PERFORMANCE OF SINGLE-ENGINE AEROPLANES NOT CERTIFIED UNDER JAR/FAR 25 – PERFORMANCE CLASS B**	**x**	**x**				
032 01 01 00	Definitions of terms and speeds used	x	x				
032 01 02 00	Take-off and landing performance	x	x				
032 01 02 01	Effect of aeroplane mass, wind, density, altitude, runway slope, runway conditions	x	x				
032 01 02 02	Use of aeroplane flight manual data	x	x				
032 01 03 00	Climb and cruise performance	x	x				
032 01 03 01	Use of aeroplane flight data	x	x				
032 01 03 02	Effect of density altitude and aeroplane mass	x	x				
032 01 03 03	Endurance and the effects of the different recommended power settings	x	x				
032 01 03 04	Still air range with various power settings	x	x				
032 02 00 00	**PERFORMANCE OF MULTI-ENGINE AEROPLANES NOT CERTIFIED UNDER JAR/FAR 25 – PERFORMANCE CLASS B**	**x**	**x**				
032 02 01 00	Definitions of terms and speeds	x	x				
032 02 01 01	Any new terms used for multi-engine aeroplane performance (032 01 01 00)	x	x				
032 02 02 00	Importance of performance calculations	x	x				
032 02 02 01	Determination of performance under normal conditions	x	x				
032 02 02 02	Consideration of effects of pressure altitude, temperature, wind, aeroplane mass, runway slope, and runway conditions	x	x				
032 02 03 00	Elements of performance	x	x				
032 02 03 01	Take-off and landing distances – obstacle clearance at Take-off	x	x				
032 02 03 02	Rate of climb and descent – effects of selected power settings, speeds, and aircraft configuration	x	x				
032 02 03 03	Cruise altitudes and altitude ceiling – en-route requirements	x	x				
032 02 03 04	Payload/range trade-offs	x	x				
032 02 03 05	Speed/economy trade-offs	x	x				
032 02 04 00	Use of performance graphs and tabulated data	x	x				
032 02 04 01	Performance section of flight manual	x	x				

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
032 03 00 00	**PERFORMANCE OF AEROPLANES CERTIFIED UNDER JAR/FAR 25 – PERFORMANCE CLASS A**	**x**					
032 03 01 00	Take-off	x					
032 03 01 01	Definitions of terms and speeds used – appropriate speed definitions associated with take-off performance, with emphasis on: – V_1: decision speed in event of engine failure on take-off – V_R: rotation speed	x					
	– V_2: take-off safety speed – appropriate distance definitions associated with take-off: – balanced field length – take-off run available (TORA) – take-off distance available (TODA) – accelerate stop distance available (ASDA) – clearways, stopways – mass/altitude/temperature limits – other appropriate speeds: – V_{MCG} – V_{MCA} – V_{MU} – V_{LOF} – V_{MBE}						
032 03 01 02	Runway variables – length, slope, surface – strength of runway (load classification number, single isolated wheel loading)	x					
032 03 01 03	Aeroplane variables – mass – flap angle – reduced power settings – increased V_2 – use of anti-ice and de-ice – use of bleed air (ECS)	x					
032 03 01 04	Meteorological variables – pressure altitude and temperature (density altitude), wind gust factor, surface conditions (standing water, snow, ice etc.)	x					
032 03 01 05	Take-off speeds – computation of V_1, V_R and V_2; initial climb speed, landing gear and flap retraction speeds	x					
032 03 01 06	Take-off distance – computations of take-off distance – include consideration of aeroplane, runway, and meteorological variables when computing take-off distance and take-off speed – effects of early or late rotation on take-off distance; possibility of ground stall with early rotation	x					

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
032 03 02 00	Accelerate-stop distance	x					
032 03 02 01	Concept of balanced field length – review of definitions (032 03 00 00) – relationship between balanced/unbalanced field length and V_1	x					
032 03 02 02	Use of flight manual charts – computing accelerate-stop distances – decision time and deceleration procedure assumptions: – time-to-decide allowance – use of brakes – use of reverse thrust	x					
	– brake energy absorption limits: – delayed temperature rise – tyre limitations						
032 03 03 00	Initial climb	x					
032 03 03 01	Climb segments – undercarriage and flap retraction – take-off mass limitation with regard to climb requirements	x					
032 03 03 02	All engines operating – climb speed – rate of climb – noise abatement procedure	x					
032 03 03 03	Engine inoperative operation – best angle-of-climb speed – best rate-of-climb speed – rates of climb: – effect of density altitude on climb performance	x					
032 03 03 04	Obstacle clearance requirements – climb to clear obstacles – turning to avoid obstacles: – effect turns have on climb performance	x					
032 03 04 00	Climb	x					
032 03 04 01	Use of flight manual performance charts – effect of aeroplane mass – effect of density altitude change – time-to-climb calculations for reaching cruise altitude	x					
032 03 04 02	Significant airspeeds for climb – flap retraction speeds – normal (all engines operating) climb speeds: – best angle-of-climb – best rate-of-climb	x					
032 03 04 03	One engine inoperative climb – climb airspeeds: – best rate-of-climb – best angle-of-climb – maximum cruise height	x					

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
032 03 05 00	Cruise	x					
032 03 05 01	Use of cruise charts – determination of cruise heights – maximum attainable cruise height – increase of maximum cruise speeds and power settings	x					
032 03 05 02	Cruise control – maximum range: power settings, speeds, fuel consumption – maximum endurance: power settings, speeds, fuel consumption – speed/range trade-offs, for cruise power settings – maximum cruise power settings: resultant speeds, fuel consumption	x					
032 03 05 03	En-route One Engine Inoperative – engine inoperative charts – range and endurance – One-engine Out Service Ceiling: – maximum continuous power settings – ETOPS operations	x					
032 03 05 04	Obstacle clearance en-route – net flight path – vertical and horizontal – overhead mass limitations – drift-down procedures	x					
032 03 05 05	Enroute – Aeroplanes with Three or More Engines, two engines inoperative – requirements and limitations	x					
032 03 06 00	Descent and landing	x					
032 03 06 01	Use of descent charts – time to start descent – fuel consumption in descent – limiting speed, e.g. – normal operating airspeed – maximum operating airspeed – speed for max glide ratio – maximum rate of descent speed (cabin pressure rate of descent)	x					
032 03 06 02	Maximum permitted landing mass – structural limit specified by aircraft manufacturer and the State airworthiness authorities	x					

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
032 03 06 03	Approach and Landing data calculations – suitability of selected landing runway: – landing distance available – computation of maximum landing mass for the given runway conditions – computation of minimum runway length for the given – other factors: runway slope, surface conditions, wind temperature, density altitude – computation of expected actual landing mass – computations of approach and landing speeds – computations should be completed for alternate aerodromes as well – definitions of terms and speed used: – VTH, Threshold speed – Discontinued Approach Climb – Landing climb – Landing distance, Dry, Wet and Contaminated runways – Landing Distance required – Destination airport – Alternate airport – Landing – – Landing configuration (all engine) – Approach configuration (one engine out)	x					
032 03 07 00	Practical application of an airplane performance manual	x					
032 03 07 01	Use of typical turbojet or turboprop aeroplane performance manual – take-off and landing mass calculations – take-off data computations: – effects of runway variables, aeroplane variables and meteorological variables – computation of the various 'V' speeds for take-off and initial climb – computation of runway distance factors – rate and gradient of initial climb – obstacle clearance – appropriate engine-out calculations – climb computations: – climb rates and gradients – time-to-climb – fuel used – engine-out calculations	x					

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
032 03 07 02	Cruise computations – power settings and speeds for maximum range, maximum endurance and normal cruise – fuel consumption – engine-out operation; pressurisation failure, effect of lower altitude on range and endurance – ETOPS flight – additional considerations concerning fuel consumption: – effects of altitude and aircraft mass – fuel for holding, approach and cruise to alternate – in normal and abnormal conditions – after jet engine failure – after decompression	x					

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
033 00 00 00	**FLIGHT PLANNING AND FLIGHT MONITORING – AEROPLANES**	**x**	**x**				
033 00 00 00	**FLIGHT PLANNING AND FLIGHT MONITORING – HELICOPTERS**				**x**	**x**	
033 00 00 00	**FLIGHT PLANNING AND FLIGHT MONITORING – AIRCRAFT**			**x**			**x**
033 01 00 00	**FLIGHT PLANS FOR CROSS-COUNTRY FLIGHTS**	**x**	**x**	**x**	**x**	**x**	**x**
033 01 01 00	Navigation plan	x	x	x	x	x	x
033 01 01 01	Selection of routes, speeds, heights (altitudes) and alternate airfield/landing sites – terrain and obstacle clearance – cruising levels appropriate for direction of flight – navigation check points, visual or radio	x	x	x	x	x	x
033 01 01 02	Measurement of tracks and distances	x	x	x	x	x	x
033 01 01 03	Obtaining wind velocity forecast for each leg	x	x	x	x	x	x
033 01 01 04	Computations of headings, ground speeds, and time en-route from tracks, true airspeed and wind velocities	x	x	x	x	x	x
033 01 01 05	Completion of pre-flight portion of navigation flight log	x	x	x	x	x	x
033 01 02 00	Fuel plan	x	x	x	x	x	x
033 01 02 01	Computation of planned fuel usage for each leg and total fuel usage for the flight – flight manual figures for fuel flow during climb , en-route and during descent – navigation plan for times en-route	x	x	x	x	x	x
033 01 02 02	Fuel for holding and diversion to alternate airfield	x	x	x	x	x	x
033 01 02 03	Reserves	x	x	x	x	x	x
033 01 02 04	Total fuel requirements for flight	x	x	x	x	x	x
033 01 02 05	Completion of pre-flight portion of fuel log	x	x	x	x	x	x
033 01 03 00	Flight monitoring and in-flight replanning	x	x	x	x	x	x
033 01 03 01	In-flight fuel computations – recording of fuel quantities remaining at navigational checkpoints	x	x	x	x	x	x
033 01 03 02	Calculation of actual consumption rate – comparison of actual and planned fuel consumption and fuel state	x	x	x	x	x	x
033 01 03 03	Revision of fuel reserve estimates	x	x	x	x	x	x
033 01 03 04	In-flight replanning in case of problems – selection of cruise altitude and power settings for new destination – time to new destination – fuel state, fuel requirements, fuel reserves	x	x	x	x	x	x
033 01 04 00	Radio communication and navigation aids	x	x	x	x	x	x
033 01 04 01	Communication frequencies and call signs for appropriate control agencies and in-flight service facilities such as weather stations	x	x	x	x	x	x

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
033 01 04 02	Radio navigation and approach aids, if appropriate – type – frequencies – identification	x	x	x	x	x	x
033 02 00 00	**ICAO ATC FLIGHT PLAN**	**x**	**x**	**x**	**x**	**x**	**x**
033 02 01 00	Types of flight plan	x	x	x	x	x	x
033 02 01 01	ICAO flight plan – format – information included in completed plan – repetitive flight plan	x	x	x	x	x	x
033 02 02 00	Completing the flight plan	x	x	x	x	x	x
033 02 02 01	Information for flight plan obtained from – navigation flight plan – fuel plan – operator's records for basic aircraft information – mass and balance records	x	x	x	x	x	x
033 02 03 00	Filing the flight plan	x	x	x	x	x	x
033 02 03 01	Procedures for filing	x	x	x	x	x	x
033 02 03 02	Agency responsible for processing the flight plan	x	x	x	x	x	x
033 02 03 03	Requirements of the State concerning when a flight plan must be filed	x	x	x	x	x	x
033 02 04 00	Closing the flight plan	x	x	x	x	x	x
033 02 04 01	Responsibilities and procedures	x	x	x	x	x	x
033 02 04 02	Processing agency	x	x	x	x	x	x
033 02 04 03	Checking slot time	x	x	x	x	x	x
033 02 05 00	Adherence to flight plan	x	x	x	x	x	x
033 02 05 01	Tolerances allowed by the State for various types of flight plans	x	x	x	x	x	x
033 02 05 02	In-flight amendment of flight plan – conditions under which a flight plan must be amended – pilot's responsibilities and procedures for filing an amendment – agency to which amendments are submitted	x	x	x	x	x	x
033 03 00 00	**PRACTICAL FLIGHT PLANNING**	**x**	**x**	**x**	**x**	**x**	**x**
033 03 01 00	Chart preparation	x	x	x	x	x	x
033 03 01 01	Plot tracks and measure directions and distances	x	x	x	x	x	x
033 03 02 00	Navigation plans	x	x	x	x	x	x
033 03 02 01	Completing the navigation plan using: – tracks and distances from prepared charts	x	x	x	x	x	x
	– wind velocities as provided – true airspeeds as appropriate						

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
033 03 03 00	Simple fuel plans	x	x	x	x	x	x
033 03 03 01	Preparation of fuel logs showing planned values for: – fuel used on each leg – fuel remaining at end of each leg – endurance, based on fuel remaining and planned consumption rate, at end of each leg	x	x	x	x	x	x
033 03 04 00	Radio planning practice	x	x	x	x	x	x
033 03 04 01	Communications – frequencies and call signs of air traffic control agencies and facilities and for in-flight services such as weather information	x	x	x	x	x	x
033 03 04 02	Navigation aids – frequencies and identifiers of en-route terminal facilities, if appropriate	x		x	x	x	x
033 04 00 00	**IFR (AIRWAYS) FLIGHT PLANNING**	**x**		**x**	**x**		**x**
033 04 01 00	Meteorological considerations	x		x	x		x
033 04 01 01	Analysis of existing weather patterns along possible routes	x		x	x		x
033 04 01 02	Analysis of winds aloft along prospective routes	x		x	x		x
033 04 01 03	Analysis of existing and forecast weather conditions at destination and possible alternates	x		x	x		x
033 04 02 00	Selection of routes to destination and alternates	x		x	x		x
033 04 02 01	Preferred airways routings	x		x	x		x
033 04 02 02.	Extraction of tracks and distances from RAD/NAV chart	x		x	x		x
033 04 02 03	Frequencies and identifiers of en-route radio navigation aids	x		x	x		x
033 04 02 04	Minimum en-route altitudes, minimum crossing and reception altitudes	x		x	x		x
033 04 02 05	Standard Instrument Departures (SIDs) and Standard Arrival Routes (STARs)	x		x	x		x
033 04 03 00	General flight planning tasks	x		x	x		x
033 04 03 01	Checking of AIP and NOTAM for latest airfield and en-route status information	x		x	x		x
033 04 03 02	Selection of altitudes or flight levels for each leg of the flight	x		x	x		x
033 04 03 03	Application of wind velocity on each leg to obtain heading and ground speeds	x		x	x		x
033 04 03 04	Calculation of en-route times for each leg to the destination and to the alternate and determination of total time en-route	x		x	x		x
033 04 03 05	Completion of fuel plan	x		x	x		x
033 04 03 06	Preliminary study of instrument approach procedures and minima at destination and alternate	x		x	x		x
033 04 03 07	Filling out and filing air traffic flight plan	x		x	x		x

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
033 05 00 00	**JET AEROPLANES FLIGHT PLANNING (Additional considerations) – JAR–OPS 1**	**x**					
033 05 01 00	Additional flight planning aspects for jet aeroplanes (advanced flight planning)	x					
033 05 01 01	Fuel planning – en-route contingency fuel – destination, holding and diversion fuel – island reserves – importance of altitude selection when planning for diversion to alternate – use of performance chart to plan fuel usage and requirements based on planned climb, en-route cruise and descent – reserve fuel requirements – influence of centre of gravity on fuel consumption	x					
033 05 01 02	Computation of point-of-equal-time (PET) and point-of-safe-return (PSR)	x					
033 05 02 00	Computerised flight planning	x					
033 05 02 01	General principles of present systems – advantages – shortcomings and limitations	x					
033 06 00 00	**PRACTICAL COMPLETION OF A 'FLIGHT PLAN' (flight plan, flight log, nav log ATC plan, etc.)**	**x**	**x**	**x**	**x**	**x**	**x**
033 06 01 00	Extraction of data	x	x	x	x	x	x
033 06 01 01	Extraction of navigational data	x	x	x	x	x	x
033 06 01 02	Extraction of meteorological data	x	x	x	x	x	x
033 06 01 03	Extraction of performance data	x	x	x	x	x	x
033 06 01 04	Completion of navigation flight plan	x	x	x	x	x	x
033 06 01 05	Completion of fuel plan – time and fuel to top-of-climb – cruise sector times and fuel used – total time and fuel required to destination – fuel required for missed approach, climb en-route altitude, and cruise alternate – reserve fuel	x	x	x	x	x	x
033 06 01 06.	Computation of PET (point-of-equal-time), including equi-fuel and equi-time points, and PSR (point-of-safe-return)	x			x	x	
033 06 01 07	Completion of air traffic flight plan	x	x	x	x	x	x

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
033 07 00 00	**OFFSHORE OR REMOTE AREA OPERATION**				**x**	**x**	
033 07 01 00	Additional flight planning aspects for offshore or remote area operation				x	x	
033 07 01 01	Fuel planning – en route contingency fuel – destination holding and diversion fuel				x	x	
	– destination onshore reserve – use of performance chart to plan fuel usage and requirements based on planned climb en-route cruise and descent – reserve fuel requirements – one engine out (OEI) considerations						
033 07 01 02	Computation of point-of-equal-time (PET) and point-of-safe-return (PSR)				x	x	
033 07 02 00	Computerised flight planning				x	x	
033 07 02 01	General principles of present systems – advantages – shortcomings and limitations				x	x	

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
034 00 00 00	**PERFORMANCE – HELICOPTERS**				**x**	**x**	
034 01 00 00	**AIRWORTHINESS – REQUIREMENTS**				**x**	**x**	
034 01 01 00	Definitions of terms and speeds used in: – JAR/FAR part 27 & 27.1 applicability – JAR/FAR part 29 & 29.1 applicability				x	x	
034 02 00 00	**DEFINITIONS OF TERMS** – masses – velocities : V_{LE}, V_{LO}, V_x, V_y, V_{toss} : (V_1) V_{NE} V_{NO} V_{mini} – velocity of best range and of maximum endurance – power limitations AEO OEI – altitudes – performance class 1, 2, 3 operations (see ICAO Annex 6 Part III and JAR OPS 3 Subpart F, G, H and I)				**x**	**x**	
034 03 00 00	**TAKE OFF – CRUISE – LANDING PERFORMANCE** – Use and interpretation of diagrams and tables associated with CAT A, CAT B, procedures in order to select and develop class 1, 2, 3 performance profiles according to available heliport size and location (surface or elevated). See JAR–OPS 3 Subpart F, G , H , I				**x**	**x**	
034 04 00 00	**PERFORMANCE OF HELICOPTERS JAR OPS 3, SUBPARTS F, G, H, I**				**x**	**x**	
034 04 01 00	Applicability – Performance Class 1, 2 and 3				x	x	
034 04 02 00	General – helicopter mass – approved performance data in Helicopter Flight Manual				x	x	
034 04 03 00	Terminology – terms used in Subpart F, G, H and I and not defined in JAR–1				x	x	
034 05 00 00	**PERFORMANCE CLASS 1 SUBPART G**				**x**	**x**	
034 05 01 00	General and Applicability – take off from surface level heliports – take-off from elevated heliports/helidecks – critical power unit failure prior to TDP and after TDP				x	x	
034 05 02 01	Account of : – take-off mass – pressure altitude – ambient temperature – take-off technique – head-wind component – tail-wind component				x	x	
034 05 02 02	Take-off flight path – Critical power unit inoperative take-off flight path – Obstacle vertical and lateral margins and change of direction clearance margins				x	x	

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
034 05 03 00	En route critical power unit inoperative				x	x	
034 05 03 01	En route flight path – out of sight of the surface – areas of mountainous terrain – Visual meteorological conditions and, in sight of surface – flight path altitudes – effects of winds on the flight path – fuel jettisons – width margins flight path reductions				x	x	
034 05 04 00	Landing: to surface level heliports; to elevated heliports/helidecks; with critical power failure prior LDP and after LDP				x	x	
034 05 04 01	Account of : – landing mass – pressure altitude – ambient temperature – landing technique – head-wind component – tail-wind component				x	x	
034 06 00 00	**SUBPART H – PERFORMANCE CLASS 2**				**x**	**x**	
034 06 01 00	General and Applicability				x	x	
034 06 02 00	Take-off – surface level heliports – elevated heliports/helidecks				x	x	
034 06 02 01	Take-off flight path – critical power unit failure prior and/or after DPATO				x	x	
034 06 03 00	En route – critical power unit inoperative				x	x	
034 06 04 00	Landing – critical power unit failure prior to/or after DPBL				x	x	
034 06 04 01	Landing mass – surface level heliports – elevated heliports and helidecks				x	x	
034 07 00 00	**SUBPART 1 PERFORMANCE CLASS 3**				**x**	**x**	
034 07 01 00	General applicability aircraft certificated in either Category A or B – operation conducted only from aerodromes – heliports and route areas and diversions that permit a safe forced landing in the event of a power unit failure				x	x	
034 07 01 01	Operations – ceiling and visibility limits – overwater in a hostile environment limits				x	x	
034 07 01 02	Operations with exposure time				x	x	
034 07 02 00	Take-off				x	x	
034 07 03 00	En route				x	x	
034 07 04 00	Landing				x	x	

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
040 00 00 00	**HUMAN PERFORMANCE AND LIMITATIONS**	**x**	**x**	**x**	**x**	**x**	**x**
040 01 00 00	**Human Factors: basic concepts**	**x**	**x**	**x**	**x**	**x**	**x**
040 01 01 00	Human Factors in aviation	x	x	x	x	x	x
040 01 01 01	Competence and limitations	x	x	x	x	x	x
040 01 01 02	Becoming a competent pilot – the traditional approach towards 'proficiency' – the human factors approach towards 'professionalism'	x	x	x	x	x	x
040 01 02 00	Accident statistics	x	x	x	x	x	x
040 01 03 00	Flight safety concepts	x	x	x	x	x	x
040 02 00 00	**Basic aviation physiology and health maintenance**	**x**	**x**	**x**	**x**	**x**	**x**
040 02 01 00	Basics of flight physiology	x	x	x	x	x	x
040 02 01 01	The atmosphere – composition – gas Laws – oxygen requirement of tissues	x	x	x	x	x	x
040 02 01 02	Respiratory and circulatory systems – functional anatomy – hypobaric environment – pressurisation, decompression – rapid decompression – entrapped gases, barotrauma – counter measures, hypoxia – symptoms – time of useful consciousness – hyperventilation – accelerations	x	x	x	x	x	x
040 02 01 03	High altitude environment – ozone – radiation – humidity	x			x		
040 02 02 00	Man and Environment: the sensory system	x	x	x	x	x	x
040 02 02 01	Central and peripheral nervous system – sensory threshold, sensitivity, adaptation – habituation – reflexes and biological control systems	x	x	x	x	x	x
040 02 02 02	Vision – functional anatomy – visual field, foveal and peripheral vision – binocular and monocular vision – monocular vision cues – night vision	x	x	x	x	x	x
040 02 02 03	Hearing – functional anatomy – flight related hazards to hearing	x	x	x	x	x	x

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
040 02 02 04	Equilibrium – functional anatomy – motion, acceleration, verticality – motion sickness	x	x	x	x	x	x
040 02 02 05	Integration of sensory inputs – spatial disorientation – illusions – physical origin – physiological origin – psychological origin – approach and landing problems	x	x	x	x	x	x
040 02 03 00	Health and hygiene	x	x	x	x	x	x
040 02 03 01	Personal hygiene	x	x	x	x	x	x
040 02 03 02	Common minor ailments – cold – influenza – gastro-intestinal upset	x	x	x	x	x	x
040 02 03 03	Problem areas for pilots – hearing loss – defective vision – hypotension, hypertension, coronaric disease – obesity – nutrition hygiene – tropical climates – epidemic diseases	x	x	x	x	x	x
040 02 03 04	Intoxication – tobacco – alcohol – drugs and self-medication – various toxic materials	x	x	x	x	x	x
040 02 03 05	Incapacitation – symptoms and causes – recognition – operating coping procedures	x	x	x	x	x	x
040 03 00 00	**BASIC AVIATION PSYCHOLOGY**	**x**	**x**	**x**	**x**	**x**	**x**
040 03 01 00	Human information processing	x	x	x	x	x	x
040 03 01 01	Attention and vigilance – selectivity of attention – divided attention	x	x	x	x	x	x
040 03 01 02	Perception – perceptual illusions	x	x	x	x	x	x
	– subjectivity of perception – ‘bottom-up’/‘top-down’ processing						
040 03 01 03	Memory – sensory memory – working memory – long term memory – motor memory (skills)	x	x	x	x	x	x

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
040 03 01 04	Response selection – learning principles and techniques – drives – motivation and performance	x	x	x	x	x	x
040 03 02 00	Human error and reliability	x	x	x	x	x	x
040 03 02 01	Reliability of human behaviour	x	x	x	x	x	x
040 03 02 02	Hypotheses on reality – similarity, frequency – completion causality	x	x	x	x	x	x
040 03 02 03	Theory and model of human error	x	x	x	x	x	x
040 03 02 04	Error generation – internal factors (cognitive styles) – external factors – ergonomics – economics – social environment (group, organisation)	x	x	x	x	x	x
040 03 03 00	Decision making	x	x	x	x	x	x
040 03 03 01	Decision-making concepts – structure (phases) – limits – risk assessment – practical application	x	x	x	x	x	x
040 03 04 00	Avoiding and managing errors: cockpit management	x	x	x	x	x	x
040 03 04 01	Safety awareness – risk area awareness – identification of error proneness (oneself) – identification of error sources (others) – situational awareness	x	x	x	x	x	x
040 03 04 02	Co-ordination (multi-crew concepts)	x			x		
040 03 04 03	Co-operation – small group dynamics – leadership, management styles – duty and role	x			x		
040 03 04 04	Communication – communication model(s) – verbal and non-verbal communication – communication barriers – conflict management	x	x	x	x	x	x
040 03 05 00	Personality	x	x	x	x	x	x
040 03 05 01	Personality and attitudes – development – environmental influences	x	x	x	x	x	x
040 03 05 02	Individual differences in personality – self-concepts (e.g., action vs. state-orientation)	x	x	x	x	x	x
040 03 05 03	Identification of hazardous attitudes (error proneness)	x			x		

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
040 03 06 00	Human overload and underload	x	x	x	x	x	x
040 03 06 01	Arousal	x	x	x	x	x	x
040 03 06 02	Stress – definition(s), concept(s), model(s) – anxiety and stress – effects of stress	x	x	x	x	x	x
040 03 06 03	Fatigue – types, causes, symptoms – effects of fatigue	x	x	x	x	x	x
040 03 06 04	Body rhythm and sleep – rhythm disturbances – symptoms, effects, management	x	x	x	x	x	x
040 03 06 05	Fatigue and stress management – coping strategies – management techniques – health and fitness programmes – relaxation techniques – religious practices – counselling techniques	x	x	x	x	x	x
040 03 07 00	Advanced cockpit automation	x	x	x	x	x	x
040 03 07 01	Advantages and disadvantages (criticalities)	x	x	x	x	x	x
040 03 07 02	Automation complacency	x	x	x	x	x	x
040 03 07 03	Working concepts	x			x		

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
050 00 00 00	**METEOROLOGY**	**x**	**x**	**x**	**x**	**x**	**x**
050 01 00 00	**THE ATMOSPHERE**	**x**	**x**	**x**	**x**	**x**	**x**
050 01 01 00	Composition, extent, vertical division	x	x	x	x	x	x
050 01 01 01	Composition, extent, vertical division	x	x	x	x	x	x
050 01 02 00	Temperature	x	x	x	x	x	x
050 01 02 01	Vertical distribution of temperature	x	x	x	x	x	x
050 01 02 02	Transfer of heat – solar and terrestrial radiation – conduction – convection – advection and turbulence	x	x	x	x	x	x
050 01 02 03	Lapse rate, stability and instability	x	x	x	x	x	x
050 01 02 04	Development of inversions, types of inversions	x	x	x	x	x	x
050 01 02 05	Temperature near the earth's surface, surface effects, diurnal variation, effect of clouds, effect of wind	x	x	x	x	x	x
050 01 03 00	Atmospheric pressure	x	x	x	x	x	x
050 01 03 01	Barometric pressure, isobars	x	x	x	x	x	x
050 01 03 02	Pressure variation with height, contours (isohypses)	x	x	x	x	x	x
050 01 03 03	Reduction of pressure to mean sea level, QFF	x	x	x	x	x	x
050 01 03 04	Surface low/upper-air low, surface high/upper-air high	x	x	x	x	x	x
050 01 04 00	Atmospheric density	x	x	x	x	x	x
050 01 04 01	Interrelationship of pressure, temperature and density	x	x	x	x	x	x
050 01 05 00	International Standard Atmosphere (ISA)	x	x	x	x	x	x
050 01 05 01	International Standard Atmosphere	x	x	x	x	x	x
050 01 06 00	Altimetry	x	x	x	x	x	x
050 01 06 01	Pressure altitude, true altitude	x	x	x	x	x	x
050 01 06 02	Height, altitude, flight level	x	x	x	x	x	x
050 01 06 03	Altimeter settings: QNH, QFE, 1013.25 hPa	x	x	x	x	x	x
050 01 06 04	Calculation of terrain clearance, lowest usable flight level, rule of thumb for temperature and pressure influences	x		x	x		x
050 01 06 05	Effect of accelerated airflow due to topography	x	x	x	x	x	x
050 02 00 00	**WIND**	**x**	**x**	**x**	**x**	**x**	**x**
050 02 01 00	Definition and measurement	x	x	x	x	x	x
050 02 01 01	Definition and measurement	x	x	x	x	x	x
050 02 02 00	Primary cause of wind	x	x	x	x	x	x
050 02 02 01	Primary cause of wind, pressure gradient, coriolis force, gradient wind	x	x	x	x	x	x
050 02 02 02	Relationship between isobars and wind	x	x	x	x	x	x
050 02 02 03	Effects of convergence and divergence	x			x	x	

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
050 02 03 00	General circulation	x	x	x	x	x	x
050 02 03 01	General circulation around the globe	x	x	x	x	x	x
050 02 04 00	Turbulence	x	x	x	x	x	x
050 02 04 01	Turbulence and gustiness, types of turbulence	x	x	x	x	x	x
050 02 04 02	Origin and location of turbulence	x	x	x	x	x	x
050 02 05 00	Variation of wind with height	x	x	x	x	x	x
050 02 05 01	Variation of wind in the friction layer	x	x	x	x	x	x
050 02 05 02	Variation of the wind caused by fronts	x			x	x	
050 02 06 00	Local winds	x	x	x	x	x	x
050 02 06 01	Anabatic and catabatic winds, land and sea breezes, venturi effects	x	x	x	x	x	x
050 02 07 00	Jet streams	x			x		
050 02 07 01	Origin of jet streams	x			x		
050 02 07 02	Description and location of jet streams	x			x		
050 02 07 03	Names, heights and seasonal occurrence of jet streams	x			x		
050 02 07 04	Jet stream recognition	x			x		
050 02 07 05	CAT: cause, location and forecasting	x			x		
050 02 08 00	Standing waves	x	x	x	x	x	x
050 02 08 01	Origin of standing waves	x	x	x	x	x	x
050 03 00 00	**THERMODYNAMICS**	**x**	**x**	**x**	**x**	**x**	**x**
050 03 01 00	Humidity	x	x	x	x	x	x
050 03 01 01	Water vapour in the atmosphere	x	x	x	x	x	x
050 03 01 02	Temperature/dewpoint, mixing ratio, relative humidity	x	x	x	x	x	x
050 03 02 00	Change of state of aggregation	x		x	x	x	x
050 03 02 01	Condensation, evaporation, sublimation, freezing and melting, latent heat	x		x	x	x	x
050 03 03 00	Adiabatic processes	x		x	x	x	x
050 03 03 01	Adiabatic processes	x		x	x	x	x
050 04 00 00	**CLOUDS AND FOG**	**x**	**x**	**x**	**x**	**x**	**x**
050 04 01 00	Cloud formation and description	x	x	x	x	x	x
050 04 01 01	Cooling by adiabatic expansion and by advection	x		x	x	x	x
050 04 01 02	Cloud types, cloud classification	x	x	x	x	x	x
050 04 01 03	Influence of inversions on cloud development	x	x	x	x	x	x
050 04 01 04	Flying conditions in each cloud type	x		x	x		x
050 04 02 00	Fog, mist, haze	x	x	x	x	x	x
050 04 02 01	Radiation fog	x	x	x	x	x	x
050 04 02 02	Advection fog	x	x	x	x	x	x
050 04 02 03	Steaming fog	x	x	x	x	x	x

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
050 04 02 04	Frontal fog	x	x	x	x	x	x
050 04 02 05	Orographic fog	x	x	x	x	x	x
050 05 00 00	**PRECIPITATION**	**x**	**x**	**x**	**x**	**x**	**x**
050 05 01 00	Development of precipitation	x	x	x	x	x	x
050 05 01 01	Development of precipitation	x	x	x	x	x	x
050 05 02 00	Types of precipitation	x	x	x	x	x	x
050 05 02 01	Types of precipitation, relationship with cloud types	x	x	x	x	x	x
050 06 00 00	**AIRMASSES AND FRONTS**	**x**	**x**	**x**	**x**	**x**	**x**
050 06 01 00	Types of airmasses	x	x	x	x	x	x
050 06 01 01	Description, factors affecting the properties of an airmass	x	x	x	x	x	x
050 06 01 02	Classification of airmasses, modifications of airmasses, areas of origin	x	x	x	x	x	x
050 06 02 00	Fronts	x	x	x	x	x	x
050 06 02 01	Boundaries between airmasses (fronts), general situation, geographic differentiation	x	x	x	x	x	x
050 06 02 02	Warm front, associated clouds and weather	x	x	x	x	x	x
050 06 02 03	Cold front, associated clouds and weather	x	x	x	x	x	x
050 06 02 04	Warm sector, associated clouds and weather	x	x	x	x	x	x
050 06 02 05	Weather behind the cold front	x	x	x	x	x	x
050 06 02 06	Occlusions, associated clouds and weather	x	x	x	x	x	x
050 06 02 07	Stationary front, associated clouds and weather	x	x	x	x	x	x
050 06 02 08	Movement of fronts and pressure systems, life cycle	x	x	x	x	x	x
050 07 00 00	**PRESSURE SYSTEMS**	**x**	**x**	**x**	**x**	**x**	**x**
050 07 01 00	Location of the principal pressure areas	x	x	x	x	x	x
050 07 01 01	Location of the principal pressure areas	x	x	x	x	x	x
050 07 02 00	Anticyclone	x	x	x	x	x	x
050 07 02 01	Anticyclones, types, general properties, cold and warm anticyclones, ridges and wedges, subsidence	x	x	x	x	x	x
050 07 03 00	Non frontal depressions	x	x	x	x	x	x
050 07 03 01	Thermal-, orographic– and secondary depressions, cold air pools, troughs	x	x	x	x	x	x
050 07 04 00	Tropical revolving storms	x			x	x	
050 07 04 01	Development of tropical revolving storms	x			x	x	
050 07 04 02	Origin and local names, location and period of occurrence	x			x	x	
050 08 00 00	**CLIMATOLOGY**	**x**	**x**	**x**	**x**	**x**	**x**
050 08 01 00	Climatic zones	x			x	x	
050 08 01 01	General seasonal circulation in the troposphere and lower stratosphere	x			x	x	

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
050 08 01 02	Tropical rain climate, dry climate, mid-latitude climate, sub-arctical climate with cold winter, snowclimate	x			x	x	
050 08 02 00	Tropical climatology	x			x	x	
050 08 02 01	Cause and development of tropical showers: humidity, temperature, tropopause	x			x	x	
050 08 02 02	Seasonal variations of weather and wind, typical synoptic situations	x			x	x	
050 08 02 03	Intertropical convergence zone (ITCZ), weather in the ITCZ, general seasonal movement	x			x	x	
050 08 02 04	Climatic elements relative to the area (monsoon, tradewinds, sandstorms, cold air outbreaks)	x			x	x	
050 08 02 05	Easterly waves	x			x	x	
050 08 03 00	Typical weather situations in mid-latitudes	x	x	x	x	x	x
050 08 03 01	Westerly waves	x	x	x	x	x	x
050 08 03 02	High pressure area	x	x	x	x	x	x
050 08 03 03	Uniform pressure pattern	x	x	x	x	x	x
050 08 03 04	Cold pool	x	x	x	x	x	x
050 08 04 00	Local seasonal weather and wind	x	x	x	x	x	x
050 08 04 01	Local seasonal weather and wind – Foehn, Mistral, Bora, Scirocco – Khamsin, Harmattan, Ghibbli and Pampero	x	x •	x •	x	x	x •
050 09 00 00	**FLIGHT HAZARDS**	**x**	**x**	**x**	**x**	**x**	**x**
050 09 01 00	Icing	x	x	x	x	x	x
050 09 01 01	Weather conditions for ice accretion, topographical effects	x	x	x	x	x	x
050 09 01 02	Types of ice accretion	x		x	x	x	x
050 09 01 03	Hazards of ice accretion, avoidance	x		x	x	x	x
050 09 02 00	Turbulence	x	x	x	x	x	x
050 09 02 01	Effects on flight, avoidance	x	x	x	x	x	x
050 09 02 02	CAT: effects on flight	x			x	x	
050 09 03 00	Windshear	x	x	x	x	x	x
050 09 03 01	Definition of windshear	x	x	x	x	x	x
050 09 03 02	Weather conditions for windshear	x	x	x	x	x	x
050 09 03 03	Effects on flight	x	x	x	x	x	x
050 09 04 00	Thunderstorms	x	x	x	x	x	x
050 09 04 01	Structure of thunderstorms, squall lines, life history, storm cells, electricity in the atmosphere, static charges	x	x	x	x	x	x
050 09 04 02	Conditions for and process of development, forecast, location, type specification	x	x	x	x	x	x
050 09 04 03	Thunderstorm avoidance, ground/airborne radar, stormscope	x	x	x	x	x	x
050 09 04 04	Development and effect of downbursts	x	x	x	x	x	x

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
050 09 04 05	Development of lightning discharges and effect of lightning strike on aircraft and flight execution	x	x	x	x	x	x
050 09 05 00	Tornadoes	x			x	x	
050 09 05 01	Occurrence	x			x	x	
050 09 06 00	Low and high level inversions	x	x	x	x	x	x
050 09 06 01	Influence on aircraft performance	x	x	x	x	x	x
050 09 07 00	Stratospheric conditions	x			x	x	
050 09 07 01	Tropopause influence on aircraft performance	x			x	x	
050 09 07 02	Effect of ozone, radioactivity				x		
050 09 08 00	Hazards in mountainous areas	x	x	x	x	x	x
050 09 08 01	Influence of terrain on clouds and precipitation, frontal passage	x	x	x	x	x	x
050 09 08 02	Vertical movements, mountain waves, windshear, turbulence, ice accretion	x	x	x	x	x	x
050 09 08 03	Development and effect of valley inversions	x	x	x	x	x	x
050 09 09 00	Visibility reducing phenomena	x	x	x	x	x	x
050 09 09 01	Reduction of visibility caused by mist, smoke, dust, sand and precipitation	x	x	x	x	x	x
050 09 09 02	Reduction of visibility caused by low drifting and blowing snow	x	x	x	x	x	x
050 09 09 03	Micro meteorology				x	x	
050 10 00 00	**METEOROLOGICAL INFORMATION**	**x**	**x**	**x**	**x**	**x**	**x**
050 10 01 00	Observation	x	x	x	x	x	x
050 10 01 01	On the ground – surface wind, visibility and runway visual range, transmissometers; Clouds – type, amount, height of base and tops, movement; Weather – including all types of precipitation, air temperature, relative humidity, dewpoint, atmospheric pressure	x	x	x	x	x	x
050 10 01 02	Upper air observations	x		x	x	x	x
050 10 01 03	Satellite observations, interpretation	x		x	x	x	x
050 10 01 04	Weather radar observations ground and airborne, interpretation	x		x	x	x	x
050 10 01 05	Aircraft observations and reporting, data link systems, PIREPS	x	x	x	x	x	x
050 10 02 00	Weather charts	x	x	x	x	x	x
050 10 02 01	Significant weather charts	x	x	x	x	x	x
050 10 02 02	Surface charts	x	x	x	x	x	x
050 10 02 03	Upper air charts	x	x	x	x	x	x
050 10 02 04	Symbols and signs on analysed and prognostic charts	x	x	x	x	x	x
050 10 03 00	Information for flight planning	x	x	x	x	x	x
050 10 03 01	Aeronautical codes: METAR, TAF, SPECI, SIGMET, SNOWTAM, runway report	x	x	x	x	x	x

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
050 10 03 02	Meteorological broadcasts for aviation: VOLMET, ATIS, HF-VOLMET, ACARS	x	x	x	x	x	x
050 10 03 03	Content and use of pre-flight meteorological documents	x	x	x	x	x	x
050 10 03 04	Meteorological briefing and advice	x	x	x	x	x	x
050 10 03 05	Measuring and warning systems for low level windshear, inversion	x	x	x	x	x	x
050 10 03 06	Special meteorological warnings	x	x	x	x	x	x
050 10 03 07	Information for computer flight planning	x			x	x	

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
060 00 00 00	**NAVIGATION**	**x**	**x**	**x**	**x**	**x**	**x**
061 00 00 00	**GENERAL NAVIGATION**	**x**	**x**	**x**	**x**	**x**	**x**
061 01 00 00	**BASICS OF NAVIGATION**	**x**	**x**		**x**	**x**	
061 01 01 00	The solar system – seasonal and apparent movements of the sun	x	x		x	x	
061 01 02 00	The earth – great circle, small circle, rhumb line – convergency, conversion angle – latitude, difference of latitude – longitude, difference of longitude – use of latitude and longitude co-ordinates to locate any specific position	x	x		x	x	
061 01 03 00	Time and time conversions – apparent time – UTC – LMT – standard times – dateline – determination of sunrise, sunset and civil twilight	x	x		x	x	
061 01 04 00	Directions – terrestrial magnetism: declination, deviation and compass variations – magnetic poles, isogonals, relationship between true and magnetic – gridlines, isogrives	x	x		x	x	
061 01 05 00	Distance – units of distance and height used in navigation: nautical miles, statute miles, kilometres, metres, yards and feet – conversion from one unit to another – relationship between nautical miles and minutes of latitude	x	x		x	x	
061 02 00 00	**MAGNETISM AND COMPASSES**	**x**	**x**		**x**	**x**	
061 02 01 00	General principles – terrestrial magnetism – resolution of the earth's total magnetic force into vertical and horizontal components – the effects of change of latitude on these components – directive force – magnetic dip – variation	x	x		x	x	
061 02 02 00	Aircraft magnetism – hard iron and vertical soft iron – the resulting magnetic fields – the variation in directive force – change of deviation with change of latitude and with change in the aircraft's heading – turning and acceleration errors – keeping magnetic materials clear of the compass	x	x		x	x	

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
061 02 03 00	Knowledge of the principles, standby and landing or main compasses and remote reading compasses – detailed knowledge of the use of these compasses – serviceability tests – advantages and disadvantages of the remote indicating compass – adjustment and compensation of direct reading magnetic compass	x	x		x	x	
061 03 00 00	**CHARTS**	**x**	**x**	**x**	**x**	**x**	**x**
061 03 01 00	General properties of miscellaneous types of projections – Mercator – Lambert conformal conic – polar stereographic – transverse mercator – oblique mercator	x	x • • •		x	x • • •	
061 03 02 00	The representation of meridians, parallels, great circles and rhumb lines – direct Mercator – Lambert conformal conic – polar stereographic	x	x •		x	x	
061 03 03 00	The use of current aeronautical charts – plotting positions – methods of indicating scale and relief – conventional signs – measuring tracks and distances – plotting bearings	x	x	x	x	x	x
061 04 00 00	**DEAD RECKONING NAVIGATION (DR)**	**x**	**x**		**x**	**x**	
061 04 01 00	Basics of dead reckoning – track – heading (compass, magnetic, true, grid) – wind velocity – airspeed (IAS, CAS, TAS, Machnumber) – groundspeed – ETA – drift, wind correction angle – DR-position, fix	x	x		x	x	
061 04 02 00	Use of the navigational computer – speed – time – distance – fuel consumption – conversions	x	x		x	x	
	– heading						
	– airspeed – wind velocity						

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
061 04 03 00	The triangle of velocities, methods of solution for the determination of – heading – ground speed – wind velocity – track and drift angle, track error – time and distance problems	x	x		x	x	
061 04 04 00	Determination of DR position – need for DR – confirmation of flight progress (mental DR) – lost procedures – heading and TAS vector since last confirmed position – application of wind velocity vector – last known track and ground speed vector – assessment of accuracy of DR position	x	x		x	x	
061 04 05 00	Measurement of DR elements – calculation of altitude, adjustments, corrections, errors – determination of temperature – determination of appropriate speed – determination of mach number	x	x		x •	x •	
061 04 06 00	Resolution of current DR problems by means of – Mercator charts – Lambert charts – polar stereographic projections	x	x •				
061 04 07 00	Measurements of – maximum range – radius of action – point-of-safe-return and point-of-equal-time	x	x		x	x	
061 04 08 00	Miscellaneous DR uncertainties and practical means of correction	x	x		x	x	
061 05 00 00	**IN-FLIGHT NAVIGATION**	**x**	**x**		**x**	**x**	
061 05 01 00	Use of visual observations and application to in-flight navigation	x	x		x	x	
061 05 02 00	Navigation in climb and descent – average airspeed – average wind velocity – ground speed/distance covered during climb or descent	x	x		x	x	
061 05 03 00	Navigation in cruising flight, use of fixes to revise navigation data as – ground speed revision – off-track corrections – calculation of wind speed and direction – ETA revisions	x	x		x	x	
061 05 04 00	Flight log (including navigation records)	x	x		x	x	
061 05 05 00	Purposes of FMS (flight management systems)	x			x	x	

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
061 06 00 00	**INERTIAL NAVIGATION SYSTEMS (INS)**	**x**					
061 06 01 00	Principles and practical application – gyroscopic principles – platform mounting – accelerometer principles – integrator principles – Shuler-tuned platform – navigation computer – strapdown systems	x					
061 06 02 00	Alignment procedures – gyroscompassing – levelling	x					
061 06 03 00	Accuracy, reliability, errors and coverage	x					
061 06 04 00	Flight deck equipment and operation – mode selector unit (MSU) – control display unit (CDU) – horizontal situation indicator (HSI)	x					
061 06 05 00	INS operation – normal flight, postion and waypoint entries – flight plan changes – bypassing waypoint – change of waypoint data – system check and updating	x					

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
062 00 00 00	**RADIO NAVIGATION**	**x**	**x**	**x**	**x**	**x**	**x**
062 01 00 00	**RADIO AIDS**	**x**	**x**	**x**	**x**	**x**	**x**
062 01 01 00	Ground D/F (including classification of bearings) – principles – presentation and interpretation – coverage – range – errors and accuracy – factors affecting range and accuracy	x	x	x	x	x	x
062 01 02 00	ADF (including associated beacons and use of the radio magnetic indicator) – principles – presentation and interpretation – coverage – range – errors and accuracy – factors affecting range and accuracy	x	x	x	x	x	x
062 01 03 00	VOR and Doppler-VOR (including the use of the radio magnetic indicator) – principles – presentation and interpretation – coverage – range – errors and accuracy – factors affecting range and accuracy	x	x	x	x	x	x
062 01 04 00	DME (distance measuring equipment) – principles – presentation and interpretation – coverage – range – errors and accuracy – factors affecting range and accuracy	x	x	x	x	x	x
062 01 05 00	ILS (instrument landing system) – principles – presentation and interpretation – coverage – range – errors and accuracy – factors affecting range and accuracy	x		x	x		x
062 01 06 00	MLS (microwave landing systems) – principles – presentation and interpretation – coverage – range – errors and accuracy – factors affecting range and accuracy	x		x	x		x
062 02 00 00	**BASIC RADAR PRINCIPLES**	**x**	**x**	**x**	**x**	**x**	**x**
062 02 01 00	Pulse techniques and associated terms	x		x	x	x	x
062 02 02 00	Ground radar	x		x	x	x	x

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
	– principles – presentation and interpretation – coverage – range – errors and accuracy – factors affecting range and accuracy						
062 02 03 00	Airborne weather radar – principles – presentation and interpretation – coverage – range – errors and accuracy – factors affecting range and accuracy – application for navigation	x		x	x		x
062 02 04 00	SSR secondary surveillance radar and transponder – principles – presentation and interpretation – modes and codes, including mode S	x	x	x	x	x	x
062 02 05 00	Use of radar observations and application to in-flight navigation	x			x	x	
062 05 00 00	**AREA NAVIGATION SYSTEMS**	**x**		**x**	**x**	**x**	**x**
062 05 01 00	General philosophy – use of radio navigation systems or an inertial navigation system	x		x	x		x
062 05 02 00	Typical flight deck equipment and operation – means of entering and selecting waypoints and desired course information (keyboard entry system) – means of selecting, tuning and identifying ground stations – instrumentation for en-route course guidance – for some types of systems, instrumentation for presenting distance travelled, distance to go and, if necessary, ground speed information – instrumentation for presenting current position data	x		x	x		x
062 05 03 00	Instrument indications	x		x	x		x
062 05 04 00	Types of area navigation system inputs – self-contained on-board systems (inertial navigation systems, doppler) – external sensor systems (VOR/DME, LORAN-C, Decca) – air data inputs (true airspeed, altitude, magnetic heading)	x		x	x		x
062 05 05 00	VOR/DME area navigation (RNAV) – principle of operation – advantages and disadvantages – accuracy, reliability, coverage – flight deck equipment	x		x	x		x
062 05 06 00	Flight director and autopilot coupling	x			x	x	

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
062 06 00 00	**SELF-CONTAINED AND EXTERNAL-REFERENCED NAVIGATION SYSTEMS**	**x**	**x**	**x**	**x**	**x**	**x**
062 06 01 00	Doppler – principles of operation (airborne system) – ground speed and drift calculation – advantages and disadvantages – accuracy and reliability – flight deck equipment	x			x		
062 06 03 00	Loran-C – principle of operation	x			x	x	
062 06 04 00	Decca navigation system – principle of operation	x			x	x	
062 06 05 00	Satellite assisted navigation : GPS/GLONASS/DGPS – principle of operation – advantages and disadvantages	x	x	x	x	x	x

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
070 00 00 00	**OPERATIONAL PROCEDURES**	**x**	**x**	**x**	**x**	**x**	**x**
071 00 00 00	**OPERATIONAL PROCEDURES – AEROPLANE**	**x**	**x**				
071 00 00 00	**OPERATIONAL PROCEDURES – SPECIAL AND EMERGENCY PROCEDURES –**				**x**	**x**	
071 00 00 00	**OPERATIONAL PROCEDURES – AIRCRAFT**			**x**			**x**
071 01 00 00	**GENERAL**	**x**	**x**	**x**	**x**	**x**	**x**
071 01 01 00	ICAO Annex 6, Parts I, II and III (as applicable – – definitions – applicability – general framework and contents	x	x		x	x	
071 01 02 00	JAR–OPS – Requirements	x	x	x	x	x	x
071 01 02 01	General requirements about : – quality system – additional crew members – method of carriage of persons – admission to flight deck – unauthorised carriage – portable electronic devices – endangering safety – additional informations and forms to be carried – informations retained on ground – power to inspect – production of documentation and records – preservation of documentation – leasing	x	x		x	x	
071 01 02 02	Operator certification and supervision requirements : – general rules for Air Operator Certification – issue – variation and continued validity of an AOC – administrative requirements	x	x		x	x	
071 01 02 03	Operational procedures requirements : – operational control and supervision – use of Air Traffic Services – instrument departure and approach procedures – carriage of person with reduced mobility – carriage of inadmissible passengers, deportees or persons in custody – stowage of baggages and cargo – passengers seating – securing of passenger cabin and galley(s) – smoking on board – take-off conditions – application of take-off minimas	x	x		x	x	

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
071 01 02 04	All weather operations requirements: low visibility operations	x	x	x	x	x	x
	– Aerodrome Operating Minimas – General		•			•	
	– Terminology		•			•	
	– Low visibility operations – General operating rules		•			•	
	– Low visibility operations – Aerodrome considerations		•			•	
	– Low visibility operations – Training and qualifications		•			•	
	– Low visibility operations – Operating procedures		•			•	
	– Low visibility operations – Minimum equipment		•			•	
	– VFR Operating minima						
071 01 02 05	Instrument and safety equipment requirements:	x	x		x	x	
	– general introduction						
	– circuit protection devices						
	– windshield wipers						
	– airborne weather radar equipment						
	– flight crew interphone system						
	– public address system						
	– internal doors and curtains						
	– first aid kits						
	– emergency medical kit						
	– first aid oxygen						
	– supplemental oxygen – pressurised aeroplanes						
	– supplemental oxygen – non-pressurised aeroplanes						
	– crew protective breathing equipment						
	– hand fire extinguishers						
	– crash axes and crowbars						
	– marking of break-in points						
	– means for emergency evacuation						
	– megaphones						
	– emergency lightings						
	– automatic emergency locator transmitter						
	– life jackets						
	– life rafts and survival ELTs for extended overwater flights						
	– survival equipment						
071 01 02 06	Communication and navigation equipment requirements:	x	x		x	x	
	– radio equipment						
	– audio selector panel						
	– radio equipment VFR		•			•	
	– communication and navigation IFR and VFR		•			•	
071 01 02 07	Aircraft maintenance:	x	x		x	x	
	– terminology						
	– application for and approval of the operator's maintenance system						
	– maintenance management						
	– quality system						
	– operator's maintenance management exposition						
	– operator's aircraft maintenance program						
	– continued validity of the Air Operator's certificate in respect of maintenance system						
	– equivalent safety case						
071 01 02 08	Flight crew	x	x		x	x	

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
071 01 02 09	Flight and Duty Time limitations and rest requirements (Reserved)	x	x		x	x	
071 01 02 10	Cabin crew	x	x		x	x	
071 01 03 00	Navigation requirements for long-range flights	x					
071 01 03 01	Flight management – navigation planning procedures – completion of flight plans – choice of route, speed, altitude – selection of alternate aerodrome – minimal time routes, definition	x					
071 01 03 02	Transoceanic and polar flight (ICAO Doc. 7030 – Regional Supplementary Procedures) – choice of the emergency means for the determination of course and INS cross-checks – cross-checks – determination of tracks and course – polar tracks – terrestrial magnetism characteristic in polar zones – specific problems of polar navigation	x					
071 01 03 03	MNPS Airspace (ICAO Doc. 7030 – Regional Supplementary Procedures, NAT Doc. 001, T 13 5N/5 – Guidance and Information material concerning air navigation in the NAT Region, North Atlantic MNPS Airspace Operations Manual, and RVSM) – definition – geographical limits – regulations and procedures – notices	x					
071 02 00 00	**SPECIAL OPERATIONAL PROCEDURES AND HAZARDS (GENERAL ASPECTS)**	**x**	**x**	**x**	**x**	**x**	**x**
071 02 01 00	Minimum equipment list – AFM	x	x		x	x	
071 02 02 00	Ground de-icing – icing conditions – definition and recognition, on ground/in flight – de-icing, anti-icing, types of de-icing fluids – performance deterioration, on ground/in flight	x	x		x	x	
071 02 03 00	Bird strike risk and avoidance	x	x		x	x	
071 02 04 00	Noise abatement – influence of the flight procedure (departure, cruise, approach) – influence by the pilot (power setting, low drag, low power) – influence by the pilot (power setting, track of helicopter)	x •	x •		x •	x •	

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
071 02 05 00	Fire/smoke – carburettor fire – engine fire – fire in the cabin, cockpit, freight compartment (choice of appropriate fire extinguishing agents according to fire classification and use of the extinguishers) – actions in case of overheated brakes after aborted take-off and landing – smoke in the cockpit and cabin (effects and actions taken)	x	x		x •	x •	
071 02 06 00	Decompression of pressurised cabin – slow decompression – rapid or explosive decompression – dangers and action taken	x	x				
071 02 07 00	Windshear, microburst – definition and description – effects and recognition during departure and approach – actions to avoid and actions taken during encounter	x	x		x	x	
071 02 08 00	Wake turbulence – cause – influence of speed and mass, wind – actions taken when crossing traffic, during take-off and landing	x	x	x	x	x	x
071 02 09 00	Security – unlawful events	x	x		x	x	
071 02 10 00	Emergency and precautionary landings Operations in various terrain – water (i.e. slopes, mountains, jungle, offshore) – definition – cause – factors to be considered (wind, terrain, preparation, flight tactics, landing in various terrain and water) – passenger information – evacuation – action after landing	x •	x •		x	x	
071 02 11 00	Fuel jettisoning – safety aspects – legal aspects	x	x		x	x	
071 02 12 00	Transport of dangerous goods – Annex 18 – practical aspects	x	x		x	x	
071 02 13 00	Contaminated runways – kinds of contamination – braking action, brake coefficient – performance corrections and calculations	x	x		x •	x •	
071 02 14 00	Rotor downwash				x	x	

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
071 02 15 00	Operation influence by meteorological conditions i.e. : – icing – white out – strong winds – windshear, microburst				x	x	
071 03 00 00	**EMERGENCY PROCEDURES** influence by technical problems i.e. – engine failure – fire in cabin cockpit engine – tail/rotor/directional control failure – ground/resonance – blade/stall – settling with power (vortex ring) – overpitch – overspeed – sudden stoppage – dynamic rollover/mast bumping				**x**	**x**	

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
080 00 00 00	**PRINCIPLES OF FLIGHT**	**x**	**x**		**x**	**x**	
081 00 00 00	**PRINCIPLES OF FLIGHT – AEROPLANE**	**x**	**x**				
081 01 00 00	**SUBSONIC AERODYNAMICS**	**x**	**x**				
081 01 01 00	Basics, laws and definitions	x	x				
081 01 01 01	Laws and definitions – units – laws of Newton – ideal gas equation – equation of impulse – equation of continuity – Bernoulli's theorem – static pressure – dynamic pressure – viscosity – density – IAS, CAS, EAS, TAS	x	x				
081 01 01 02	Basics about airflow – stationary airflow – not stationary airflow – streamline – streamtube – two-dimensional airflow – three-dimensional airflow	x	x				
081 01 01 03	Aerodynamic forces on surfaces – resulting airforce – lift – drag – angle of attack – forces and equilibrium of forces during climb, level, descent and turn	x	x				
081 01 01 04	Shape of an aerofoil – thickness to chord ratio – chordline – camberline – nose radius – camber – angle of attack – angle of incidence	x	x				
081 01 01 05	The wing shape – aspect ratio – root chord – tip chord – tapered wings – shape of wing surface – mean aerodynamic chord (MAC)	x	x				
081 01 02 00	The two-dimensional airflow about an aerofoil	x	x				
081 01 02 01	Streamline pattern	x	x				
081 01 02 02	Stagnation point	x	x				

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
081 01 02 03	Pressure distribution	x	x				
081 01 02 04	Centre of pressure/Cma.c.	x	x				
081 01 02 05	Lift and downwash	x	x				
081 01 02 06	Drag and wake (loss of impulse)	x	x				
081 01 02 07	Influence of angle of attack	x	x				
081 01 02 08	Flow separation at high angles of attack	x	x				
081 01 02 09	The Lift – α graph	x	x				
081 01 03 00	The coefficients	x	x				
081 01 03 01	The lift coefficient C_l – the lift formula – C_l – α graph – C_{lmax} and α – Normal Values of C_{lmax}, α_{crit}, α_{stall}, and the slope of the C_l/A.o.A curve	x	x				
081 01 03 02	The drag coefficient C_d – the drag formula: – zero lift drag – lift induced drag – C_d – α graph – C_l– C_d graph, profile polar – C_l – C_d ratio – normal values of the C_l – C_d ratio	x	x				
081 01 04 00	The three-dimensional airflow about an aeroplane	x	x				
081 01 04 01	Streamline pattern – span-wise flow and causes – tip vortices and local α – tip vortices and angle of attack – up-wash and down-wash die to tip vortices – span-wise lift distribution – wake turbulence behind an aircraft (causes, distribution, duration of the phenomenon)	x	x				

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
081 01 04 02	Induced drag – influence of tip vortices on the angle of attack – the induced local α – influence of induced angle of attack on the direction of the lift vector – induced drag and angle of attack – induced drag and speed – induced drag and wing aspect ratio – induced drag and wing planform – induced drag coefficient – induced drag coefficient and angle of attack – influence of the induced drag on the C_L -α graph	x	x				
	– influence of the induced drag on the C_L – C_D graph, airplane polar, lift drag ratio – parabolic airplane polar in a graph and as a formula – influence of plan of section – winglets – tip-tanks – wing span loading – influence of wing twist – influence of change of camber						
081 01 05 00	The total drag	x	x				
081 01 05 01	The parasite drag – profile drag – interference drag – friction drag	x	x				
081 01 05 02	The profile drag and speed	x	x				
081 01 05 03	The induced drag and speed	x	x				
081 01 05 04	The total drag	x	x				
081 01 05 05	The total drag and speed	x	x				
081 01 05 06	Minimum drag	x	x				
081 01 05 07	The drag – speed graph	x	x				
081 01 06 00	The ground effect	x	x				
081 01 06 01	Effect on C_{Di}	x	x				
081 01 06 02	Effect on α_{crit}	x	x				
081 01 06 03	Effect on C_L	x	x				
081 01 06 04	Effect on take-off and landing characteristics of an aircraft	x	x				
081 01 07 00	The relation between the lift coefficient and the speed for constant lift	x	x				
081 01 07 01	As a formula	x	x				
081 01 07 02	In a graph	x	x				
081 01 08 00	The stall	x	x				

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
081 01 08 01	Flow separation at increasing angles of attack – the boundary layer: – laminar layer – turbulent layer – transition – separation point – influence of angle of attack – influence on: – pressure distribution – location of centre of pressure – C_L – C_D – pitch moments – down-wash at horizontal stabiliser	x	x				
	– buffet – use of controls						
081 01 08 02	The stall speed – in the lift formula – 1g stall speed – FAA stall speed – influence of: – the centre of gravity – power setting – altitude (IAS) – wing loading, W/S – load factor n: – definition – turns – forces	x	x				
081 01 08 03	The initial stall in span-wise direction – influence of plan form – aerodynamic twist (wash out) – geometric twist – use of ailerons – influence of fences, vortilons, saw teeth and vortex generators	x	x				
081 01 08 04	Stall warning – importance of stall warning – speed margin – buffet – stall strip – flapper switch – AOA vane – AOA probe – stick shaker – recovery from stall	x	x				

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
081 01 08 05	Special phenomena of stall – the power-on stall – climbing and descending turns – swept back wings – super- or deep-stall, stick pusher – canards – T-tailed aircraft – avoidance of spins: – spin development – spin recognition – spin recovery – ice (in stagnation point and on surface): – absence of stall warning – abnormal behaviour of the stall – stabiliser stall	x	x				
081 01 09 00	C_{Lmax} augmentation	x	x				
081 01 09 01	Trailing edge flaps and the reasons for use in take-off and landing – different types of flaps: – split flap – plain flap – slotted flap – fowler flap – their influence on the $C_L – \alpha$ graph – their influence on the $C_L – C_D$ graph – flap asymmetry – influence on pitch movement	x	x				
081 01 09 02	Leading edge devices and the reasons for use in take-off and landing – different types: – krueger flaps – variable camber flaps – slats – their influence on the $C_L – \alpha$ graph – their influence on the $C_L – C_D$ graph – slat asymmetry – normal/automatic operation	x	x				
081 01 09 03	Vortex generators – aerodynamic principles – advantages – disadvantages	x	x				
081 01 10 00	Means to decrease the $C_L – C_D$ ratio, increasing drag	x	x				
081 01 10 01	Spoilers and the reasons for use in the different phases of flight – different functions: – flight spoilers (speedbrakes) – ground spoilers (lift dumpers) – roll spoilers – spoiler-mixer – their influence on the $C_L – \alpha$ graph – their influence on the $C_L – C_D$ graph and ratio	x	x				

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
081 01 10 02	Speedbrakes as a means of increasing drag and the reasons for use in the different phases of flight – the influence on the C_L – C_D graph and ratio	x	x				
081 01 11 00	The boundary layer	x	x				
081 01 11 01	Different types – laminar – turbulent	x	x				
081 01 11 02	Their advantages and disadvantages on pressure drag and friction drag	x	x				
081 01 12 00	Special circumstances	x	x				
081 01 12 01	Ice and other contamination – ice in stagnation point – ice on the surface (frost, snow, clear ice)	x	x				
	– rain – contamination of the leading edge – effects on stall – effects on loss of controllability – effects on control surface moment – influence on high lift devices during take-off, landing and low speeds – affect on lift/drag ratio						
081 01 12 02	Deformation and modification of airframe, ageing aircraft	x	x				
081 02 00 00	**TRANSONIC AERODYNAMICS**	**x**					
081 02 01 00	The Mach number definition	x					
081 02 01 01	Speed of sound	x					
081 02 01 02	Influence of temperature and altitude	x					
081 02 01 03	Compressibility	x					
081 02 02 00	Normal shockwaves	x					
081 02 02 01	M_{crit} and exceeding M_{crit}	x					
081 02 02 02	Influence of : – Mach number – control deflection – angle of attack – aerofoil thickness – angle of sweep – area ruling	x					
081 02 02 03	Influence on : – C_L – α graph – C_{Lmax} – C_D – C_L – C_D	x					
081 02 02 04	Aerodynamic heating	x					
081 02 02 05	Shock stall/Mach buffet	x					

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
081 02 02 06	Influence on : – drag – pitch (Mach trim): – contribution of: – movement of the centre of pressure – angle of sweep – down-wash	x					
081 02 02 07	Buffet margin, aerodynamic ceiling	x					
081 02 03 00	Means to avoid the effects of exceeding M_{crit}	x					
081 02 03 01	Vortex generators	x					
081 02 03 02	Supercritical profile – shape – influence of aerofoil shape on shockwaves – advantages and disadvantages of supercritical aerofoil	x					
081 03 00 00	**SUPERSONIC AERODYNAMICS**	**x**					
081 03 01 00	Oblique shockwaves	x					
081 03 01 01	Mach cone	x					
081 03 01 02	Influence of aircraft weight	x					
081 03 01 03	Expansion waves	x					
081 03 01 04	Centre of pressure	x					
081 03 01 05	Wave drag – control surface hinge moment – control surface efficiency	x					
081 04 00 00	**STABILITY**	**x**	**x**				
081 04 01 00	Condition of equilibrium in stable horizontal flight	x	x				
081 04 01 01	Precondition for static stability	x	x				
081 04 01 02	Sum of moments – lift and weight – drag and thrust	x	x				
081 04 01 03	Sum of forces – in horizontal plane – in vertical plane	x	x				
081 04 02 00	Methods of achieving balance	x	x				
081 04 02 01	Wing and empennage (tail and canard)	x	x				
081 04 02 02	Control surfaces	x	x				
081 04 02 03	Ballast or weight trim	x	x				
081 04 03 00	Longitudinal stability	x	x				
081 04 03 01	Basics and definitions – static stability, positive, neutral and negative – precondition for dynamic stability – dynamic stability, positive, neutral and negative – damping: – phugoid – short period – effect of high altitude on dynamic stability	x	x				

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
081 04 03 02	Static stability	x	x				
081 04 03 03	Neutral point/location of neutral point – definition	x	x				
081 04 03 04	Contribution of : – aircraft geometry – down-wash: – a.c. of the wing	x	x				
081 04 03 05	Location of centre of gravity – aft limit, minimum stability margin – forward position – effects on static and dynamic stability	x	x				
081 04 03 06	The C_M – α graph	x	x				
081 04 03 07	Contribution of : – location of centre of gravity – control deflection – major aircraft parts (wings, fuselage, tail) – configuration: – flap deflection – gear extension	x	x				
081 04 03 08	The elevator position – speed graph (IAS)	x	x				
081 04 03 09	Contribution of : – location of centre of gravity – trim (trim tab) – trim (stabiliser trim)	x	x				
081 04 03 10	The stick force speed graph (IAS)	x	x				
081 04 03 11	Contribution of : – location of centre of gravity – trim (trim tab) – trim (stabiliser trim) – Mach number/Mach trim – friction in the system – downspring – Bob Weight	x	x • 				
081 04 03 12	The manoeuvring/stick force per g	x	x				
081 04 03 14	Contribution of : – location of centre of gravity – trim – spring – Bob Weight	x	x				
081 04 03 15	Stick force per g and the limit load factor – category of certification	x	x				
081 04 03 16	Special circumstances – ice: – effects of flap extension – effects of stabiliser ice – rain – deformation of airframe	x	x				
081 04 04 00	Static directional stability	x	x				
081 04 04 01	Slip angle ß	x	x				

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
081 04 04 02	Yaw moment coefficient C_N	x	x				
081 04 04 03	C_N – ß graph	x	x				
081 04 04 04	Contribution of – location of centre of gravity – angle of sweep of the wing – fuselage at high angles of attack – strakes	x	x				
	– dorsal fin and angle of sweep of fin – major aircraft parts						
081 04 05 00	Static lateral stability	x	x				
081 04 05 01	Bank angle ø	x	x				
081 04 05 02	The roll moment coefficient C_l	x	x				
081 04 05 03	Contribution of angle of slip ß	x	x				
081 04 05 04	The C_l – ß graph	x	x				
081 04 05 05	Contribution of – angle of sweep of wing – ventral fin – location of the wing – dihedral/anhedral	x	x				
081 04 05 06	Effective lateral stability	x	x				
081 04 06 00	Dynamic lateral stability	x	x				
081 04 06 01	Effects of asymmetric propeller slipstream	x	x				
081 04 06 02.	Tendency to spiral dive	x	x				
081 04 06 03	Dutch roll – causes – Mach – yaw damper	x	x • 				
081 04 06 04	Effects of altitude on dynamic stability	x	x				
081 05 00 00	**CONTROL**	**x**	**x**				
081 05 01 00	General	x	x				
081 05 01 01	Basics, the Three Planes and Three Axis	x	x				
081 05 01 02	Camber change	x	x				
081 05 01 03	Angle of attack change	x	x				
081 05 02 00	Pitch control	x	x				
081 05 02 01	Elevator	x	x				
081 05 02 02	Down-wash effects	x	x				
081 05 02 03	Ice on tail	x	x				
081 05 02 04	Location of centre of gravity	x	x				
081 05 03 00	Yaw control	x	x				
081 05 03 01	Pedal/Rudder ratio changer	x	x				
081 05 03 02	Moments due to engine thrust – direct	x	x				

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
	– induced						
081 05 03 03	Engine failure (n – 1) – rudder limitations at asymmetric thrust – meaning of V_{MCA}, V_{MCG}	x	x				
081 05 04 00	Roll control	x	x				
081 05 04 01	Ailerons – inboard ailerons – outboard ailerons – function in different phases of flight	x	x				
081 05 04 03	Spoilers	x	x				
081 05 04 04	Adverse yaw	x	x				
081 05 04 05	Means to avoid adverse yaw – frise ailerons – differential aileron deflection – coupling ailerons to rudder by spring – roll spoilers – effects of asymmetric propeller slip stream	x	x				
081 05 05 00	Interaction in different planes (yaw/roll)	x	x				
081 05 05 01	Limitations of asymmetric power	x	x				
081 05 06 00	Means to reduce control forces	x	x				
081 05 06 01	Aerodynamic balance – nose balance – hornbalances – internal balances – balance tab, antibalance tab – servo tab – spring tab	x	x				
081 05 06 02	Artificial – power assisted controls – fully powered controls – artificial feel: – inputs: – dynamic pressure q – stabiliser setting	x	x				
081 05 07 00	Mass balance	x	x				
081 05 07 01	Reasons to balance – means	x	x				
081 05 08 00	Trimming	x	x				
081 05 08 01	Reasons to trim	x	x				
081 05 08 02	Trim tabs	x	x				
081 05 08 03	Stabiliser trim/Trim rate versus IAS – position of Centre of Gravity influence on trim/stabiliser setting for take-off	x	x				
081 06 00 00	**LIMITATIONS**	**x**	**x**				
081 06 01 00	Operating limitations – flutter – aileron reversal	x	x • •				

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
	– gear/flap operating		•				
081 06 01 01	V_{MO}, V_{NO}, V_{NE}	x	x				
081 06 01 02	M_{MO}	x					
081 06 02 00	Manoeuvring envelope	x	x				
081 06 02 01	Manoeuvring load diagram – load factor – accelerated stall speed – V_A, V_C, V_D. – manoeuvring limit load factor/certification category	x	x				
081 06 02 02	Contribution of : – mass – altitude – Mach number	x	x •				
081 06 03 00	Gust envelope	x	x				
081 06 03 01	Gust load diagram – vertical gust speeds – accelerated stall speed – V_B, V_C, V_D – gust limit load factor – V_{RA}	x	x				
081 06 03 02	Contribution of : – mass – altitude – Mach number	x	x •				
081 07 00 00	**PROPELLERS**	**x**	**x**				
081 07 01 00	Conversion of engine torque to thrust	x	x				
081 07 01 01	Meaning of pitch	x	x				
081 07 01 02	Blade twist	x	x				
081 07 01 03	Fixed pitch and variable pitch/constant speed	x	x				
081 07 01 04	Propeller efficiency versus speed	x	x				
081 07 01 05	Effects of ice on propeller	x	x				
081 07 02 00	Engine failure or engine stop	x	x				
081 07 02 01	Windmilling drag – influence on yaw moment when asymmetric power	x	x				
081 07 02 02	Feathering – influence on glide performance – influence on yaw moment when asymmetric power	x	x				
081 07 03 00	Design feature for power absorption	x	x				
081 07 03 01	Aspect ratio of blade	x	x				
081 07 03 02	Diameter of propeller	x	x				
081 07 03 03	Number of blades	x	x				
081 07 03 04	Propeller noise	x	x				
081 07 04 00	Moments and couples due to propeller operation	x	x				
081 07 04 01	Torque reaction	x	x				

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
081 07 04 02	Gyroscopic precession	x	x				
081 07 04 03	Asymmetric slipstream effect	x	x				
081 07 04 04	Asymmetric blade effect	x	x				
081 08 00 00	**FLIGHT MECHANICS**	**x**	**x**				
081 08 01 00	Forces acting on an airplane	x	x				
081 08 01 01	Straight horizontal steady flight	x	x				
081 08 01 02	Straight steady climb	x	x				
081 08 01 03	Straight steady descent	x	x				
081 08 01 04.	Straight steady glide	x	x				
081 08 01 05	Steady coordinated turn – bank angle – load factor – turn radius – angular velocity – rate one turn	x	x				
081 08 02 00	Asymmetric thrust	x	x				
081 08 02 01	Moments about the vertical axis	x	x				
081 08 02 02	Forces on vertical fin	x	x				
081 08 02 03	Influence of bank angle – overbanking – finstall	x	x				
081 08 02 04	Influence of aircraft weight	x	x				
081 08 02 05	Influence of use of ailerons	x	x				
081 08 02 06	Influence of special propeller effects on roll moments – propeller torque – propeller wash on flaps	x	x				
081 08 02 07	Influence of slipangle on roll moments	x	x				
081 08 02 08	V_{MCA}	x	x				
081 08 02 09	V_{MCL}	x	x				
081 08 02 10	V_{MCG}	x	x				
081 08 02 11	Influence of altitude	x	x				]
081 08 03 00	Emergency descent	x	x				
081 08 03 01	Influence of configuration	x	x				
081 08 03 02	Influence of chosen mach number and IAS	x	x				
081 08 03 03	Typical points on polar curve	x	x				
081 08 04 00	Windshear	x	x				]

Appendix 1 to JAR-FCL 1.470 (continued)

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
082 00 00 00	**PRINCIPLES OF FLIGHT – HELICOPTER**				**x**	**x**	
082 01 00 00	**SUBSONIC AERODYNAMICS**				**x**	**x**	
082 01 01 00	Basics laws and definitions				x	x	
082 01 01 01	Components of aircraft				x	x	
082 01 01 02	Aircraft configuration				x	x	
082 01 01 03	Units of measurement of – length – area – volume – velocity – mass – pressure – temperature – density – force – power – energy				x	x	
082 01 01 04	Terms used to describe aerodynamic phenomena				x	x	
082 01 01 05	Reference speeds				x	x	
082 01 01 06	Abbreviations				x	x	
082 01 02 00	Derivation of lift				x	x	
082 01 02 01	Equation of continuity				x	x	
082 01 02 02	Bernoulli's theorem				x	x	
082 01 02 03	Streamline flow				x	x	
082 01 02 04	Angle of attack				x	x	
082 01 02 05	Pressure distribution about a wing (transverse and longitudinal)				x	x	
082 01 02 06	Centre of pressure				x	x	
082 01 02 07	Aerofoil shape (plan and section) and its effect on lift				x	x	
082 01 02 08	Lift formula				x	x	
082 01 02 09	Lift/drag ratio				x	x	
082 01 03 00	Drag				x	x	
082 01 03 01	Profile drag – causes – variation with speed – methods of minimising it				x	x	
082 01 03 02	Induced drag – causes – vortices – variation with speed – design factors affecting it				x	x	
082 01 03 03	Total effect of the combination of profile and induced drag				x	x	

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
082 01 04 00	Distribution of forces – balance of couples				x	x	
082 01 04 01	Lift/weight and thrust/drag couples				x	x	
082 01 04 02	Necessity to achieve balance				x	x	
082 01 04 03	Methods of achieving balance				x	x	
082 01 05 00	Stability				x	x	
082 01 05 01	Aircraft axes and planes of rotation				x	x	
082 01 05 02	Static stability				x	x	
082 01 05 03	Dynamic stability				x	x	
082 01 05 04	Effects of design features on stability				x	x	
082 01 05 05	Inter-action between stability in different planes				x	x	
082 01 05 06	Effect of altitude/speed on stability				x	x	
082 01 05 07	Roll and yaw dampers				x	x	
082 01 06 00	Blade-stall				x	x	
082 01 06 01	Angle of Attack				x	x	
082 01 06 02	Boundary layer and reasons for stalling				x	x	
082 01 06 03	Variation of lift and drag in the stall				x	x	
082 01 06 04	Movement of the centre of pressure				x	x	
082 01 07 00	Transonic effects on blades				x	x	
082 01 07 01	Shock waves – the reasons for their formation at subsonic speed – their effect on the handling and operation of the helicopter				x	x	
082 01 08 00	Limitations				x	x	
082 01 08 01	Manoeuvring and gust envelope				x	x	
082 01 09 00	Performance degradation				x	x	
082 01 09 01	Adverse on performance due to profile contamination – icing – rain – modification to and condition of the airframe				x	x	
082 02 00 00	**HELICOPTER AERODYNAMICS**				**x**	**x**	
082 02 01 00	The helicopter and associated terminology				x	x	
082 02 01 01	Comparison with fixed wing and autogyro				x	x	
082 02 01 02	Plane of rotation				x	x	
082 02 01 03	Axes of rotation				x	x	
082 02 01 04	Rotor shaft axis				x	x	
082 02 01 05	Tip path plane				x	x	
082 02 01 06	Rotor disc				x	x	
082 02 01 07	Disc loading				x	x	
082 02 01 08	Blade loading				x	x	

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
082 02 02 00	The forces diagram and associated terminology				x	x	
082 02 02 01	Pitch angle				x	x	
082 02 02 02	Rotational airflow				x	x	
082 02 02 03	Induced airflow				x	x	
082 02 02 04	Relative airflow to the blade				x	x	
082 02 02 05	Angle of attack				x	x	
082 02 02 06	Lift-blade				x	x	
082 02 02 07	Drag-blade				x	x	
082 02 02 08	Total reaction – blade				x	x	
082 02 02 09	Rotor thrust				x	x	
082 02 02 10	Rotor drag				x	x	
082 02 02 11	Torque				x	x	
082 02 02 12	Weight				x	x	
082 02 03 00	Uniformity of rotor thrust along blade span				x	x	
082 02 03 01	Blade twist				x	x	
082 02 03 02	Taper				x	x	
082 02 03 03	Coning angle				x	x	
082 02 03 04	Centrifugal force				x	x	
082 02 03 05	Limits of rotor RPM				x	x	
082 02 03 06	Centrifugal turning moments				x	x	
082 02 04 00	Helicopter Controls				x	x	
082 02 04 01	Collective lever – collective pitch changes – relationship with rotor thrust and rotor drag				x	x	
082 02 04 02	Cyclic stick – cyclic pitch changes – rotor disc attitude – rotor thrust tilt				x	x	
082 02 04 03	Yaw pedals – fuselage torque – tail rotor drift – tail rotor roll – fenestron tail – tandem rotors – co axial rotors – notar				x	x	
082 02 05 00	Rotor blade freedom of movement				x	x	
082 02 05 01	Feathering – the feathering hinge – pitch angle				x	x	
082 02 05 02	Flapping – the flapping hinge – alleviation of bending stresses – flapping to equality				x	x	

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
082 02 05 03	Dragging – the drag hinge – drag dampers – leading/lagging – periodic drag changes – blade cg (conservation of angular momentum) – hookes joint effect				x	x	
082 02 06 00	Phase lag and advance angle				x	x	
082 02 06 01	The control orbit				x	x	
082 02 06 02	Pitch operating arm movement				x	x	
082 02 06 03	Rate of pitch change				x	x	
082 02 06 04	Rate of blade flapping				x	x	
082 02 06 05	Resulting disc attitude				x	x	
082 02 06 06	Phase lag definition				x	x	
082 02 06 07	Advantage angle – definition				x	x	
082 02 07 00	Vertical flight				x	x	
082 02 07 01	Take off				x	x	
082 02 07 02	Vertical climb				x	x	
082 02 07 03	Vertical descent				x	x	
082 02 07 04	Hover outside ground effect				x	x	
082 02 07 05	Ground effect				x	x	
082 02 07 06	Factors affecting ground cushion				x	x	
082 02 07 08	Dynamic roll-over avoidance of				x	x	
082 02 08 00	Forces in balance				x	x	
082 02 08 01	At the hover				x	x	
082 02 08 02	In forward flight				x	x	
082 02 08 03	Influence of cg				x	x	
082 02 08 04	Influence of rotor shaft tilt				x	x	
082 02 09 00	Translational lift				x	x	
082 02 09 01	Effect of horizontal airflow on induced flow				x	x	
082 02 09 02	Variation of total flow through the disc with forward flight				x	x	
082 02 09 03	The relationship between pitch angle and angle of attack				x	x	
082 02 10 00	Power Requirements				x	x	
082 02 10 01	Rotor profile power				x	x	
082 02 10 02	Power absorption – tail rotor and ancillary equipment				x	x	
082 02 10 03	Rotor profile power variation with forward speed				x	x	
082 02 10 04	Induced drag				x	x	
082 02 10 05	Parasite drag				x	x	
082 02 10 06	Total power required				x	x	
082 02 10 07	Power available				x	x	

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
082 02 11 00	Further aerodynamics of forward flight				x	x	
082 02 11 01	Transition from and to the hover				x	x	
082 02 11 02	Symmetry and asymmetry of rotor thrust				x	x	
082 02 11 03	Main rotor flapback				x	x	
082 02 11 04	Tail rotor flapback and methods of removal				x	x	
082 02 11 05	Factors affecting maximum forward speed – design limits of cyclic stick – airflow reversal – retreating blade stall – symptoms and recovery actions – compressibility – flow separation – shock stall – ‘G’ stall				x	x	
082 02 11 06	Inflow roll				x	x	
082 02 12 00	Factors affecting cyclic stick limits				x	x	
082 02 12 01	All up mass (AUM)				x	x	
082 02 12 02	Density altitude				x	x	
082 02 12 03	Cg position				x	x	
082 02 13 00	The flare – power flight				x	x	
082 02 13 01	Thrust reversal				x	x	
082 02 13 02	Effect on aircraft attitude				x	x	
082 02 13 03	Increase in rotor thrust				x	x	
082 02 13 04	Decrease in rotor drag				x	x	
082 02 13 05	Increase in rotor RPM				x	x	
082 02 13 06	Effect of deceleration				x	x	
082 02 14 00	Settling with power (vortex ring)				x	x	
082 02 14 01	Tip vortices				x	x	
082 02 14 02	Comparison induced flow and external flow				x	x	
082 02 14 03	Development				x	x	
082 02 14 04	Change in relative airflow along blade span – root stall and turbulence				x	x	
082 02 15 00	Blade sailing				x	x	
082 02 15 01	Rotor RPM and blade rigidity				x	x	
082 02 15 02	Effect of adverse wind				x	x	
082 02 15 03	Minimising the danger				x	x	
082 02 16 00	Autorotation – vertical				x	x	
082 02 16 01	Rate of decent airflow				x	x	
082 02 16 02	Effective airflow				x	x	
082 02 16 03	Relative airflow				x	x	
082 02 16 04	Inflow and Inflow angle				x	x	

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
082 02 16 05	Autorotative force				x	x	
082 02 16 06	Rotor drag				x	x	
082 02 16 07	Effect of mass and altitude				x	x	
082 02 16 08	Control of rotor RPM with lever				x	x	
082 02 16 09	Rotor RPM stability				x	x	
082 02 17 00	Autorotation – forward flight				x	x	
082 02 17 01	Factors affecting inflow angle				x	x	
082 02 17 02	Effect of forward speed on rate of descent				x	x	
082 02 17 03	Asymmetry of autorotative disc area in forward flight				x	x	
082 02 17 04	Turning				x	x	
082 02 17 05	The flare – rotor RPM increase from movment of autorotative section – increase in rotor thrust – reduction in rate of descent				x	x	
082 02 17 06	Range and endurance				x	x	
082 02 17 07	Autorotative landing				x	x	
082 02 17 08	Height/velocity avoidance graph				x	x	
082 02 18 00	Stability				x	x	
082 02 18 01	Hover				x	x	
082 02 18 02	Forward Flight				x	x	
082 02 18 03	Rearward Flight				x	x	
082 02 18 04	Stability aids – stabilisers and effects of centre of gravity – gyro controlled stabiliser system – stabiliser bars – delta hinge effect				x	x	
082 02 18 05	Effect of lever application on attitude in translational flight				x	x	
082 02 19 00	Control power				x	x	
082 02 19 01	The teetering head				x	x	
082 02 19 02	Fully articulated head				x	x	
082 02 19 03	The rigid rotor				x	x	
082 02 19 04	Effect on stability				x	x	
082 02 19 05	Effect on dynamic/static rollover				x	x	
082 02 20 00	Power requirements – graphs				x	x	
082 02 20 01	Power required/power available graph				x	x	
082 02 20 02	Maximum rate of climb speed				x	x	
082 02 20 03	Operating with limited power				x	x	
082 02 20 04	Best angle of climb speed				x	x	
082 02 20 05	Maximum speed				x	x	
082 02 20 06	Range and endurance				x	x	

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
082 02 20 07	Overpitch				x	x	
082 02 20 08	Overtorque				x	x	
082 02 20 09	Turning				x	x	
082 02 20 10	Comparison of piston and turbine engined helicopters – range and endurance – effect of density altitude – effect of aircraft weight				x	x	

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
090 00 00 00	**COMMUNICATIONS**	**x**	**x**	**x**	**x**	**x**	**x**
091 00 00 00	**VFR COMMUNICATIONS**	**x**	**x**		**x**	**x**	
091 01 00 00	**DEFINITIONS**	**x**	**x**		**x**	**x**	
091 01 01 00	Meanings and significance of associated terms	x	x		x	x	
091 01 02 00	Air Traffic Services abbreviations	x	x		x	x	
091 01 03 00	Q-code groups commonly used in RTF air-ground communications	x	x		x	x	
091 01 04 00	Categories of messages	x	x		x	x	
091 02 00 00	**GENERAL OPERATING PROCEDURES**	**x**	**x**		**x**	**x**	
091 02 01 00	Transmission of letters	x	x		x	x	
091 02 02 00	Transmission of numbers (including level information)	x	x		x	x	
091 02 03 00	Transmission of time	x	x		x	x	
091 02 04 00	Transmission technique	x	x		x	x	
091 02 05 00	Standard words and phrases (relevant RTF phraseology included)	x	x		x	x	
091 02 06 00	Radiotelephony call signs for aeronautical stations including use of abbreviated call signs	x	x		x	x	
091 02 07 00	Radiotelephony call signs for aircraft including use of abbreviated call signs	x	x		x	x	
091 02 08 00	Transfer of communication	x	x		x	x	
091 02 09 00	Test procedures including readability scale	x	x		x	x	
091 02 10 00	Read back and acknowledgement requirements	x	x		x	x	
091 02 11 00	Radar procedural phraseology	x	x		x	x	
091 03 00 00	**RELEVANT WEATHER INFORMATION TERMS (VFR)**	**x**	**x**		**x**	**x**	
091 03 01 00	Aerodrome weather	x	x		x	x	
091 03 02 00	Weather broadcast	x	x		x	x	
091 04 00 00	**ACTION REQUIRED TO BE TAKEN IN CASE OF COMMUNICATION FAILURE**	**x**	**x**		**x**	**x**	
091 05 00 00	**DISTRESS AND URGENCY PROCEDURES**	**x**	**x**		**x**	**x**	
091 05 01 00	Distress (definition – frequencies – watch of distress frequencies – distress signal – distress message)	x	x		x	x	
091 05 02 00	Urgency (definition – frequencies – urgency signal – urgency message)	x	X		x	x	
091 06 00 00	**GENERAL PRINCIPLES OF VHF PROPAGATION AND ALLOCATION OF FREQUENCIES**	**x**	**X**		**x**	**x**	
092 00 00 00	**IFR COMMUNICATIONS**	**x**		**x**	**x**		**x**
092 01 00 00	**DEFINITIONS**	**x**		**x**	**x**		**x**
092 01 01 00	Meanings and significance of associated terms	x		x	x		x

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Appendix 1 to JAR-FCL 1.470 (continued)

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		Aeroplane			*Helicopter*		
		ATPL	CPL	IR	ATPL	CPL	IR
092 01 02 00	Air Traffic Control abbreviations	x		x	x		x
092 01 03 00	Q-code groups commonly used in RTF air-ground communications	x		x	x		x
092 01 04 00	Categories of messages	x		x	x		x
092 02 00 00	**GENERAL OPERATING PROCEDURES**	**x**		**x**	**x**		**x**
092 02 01 00	Transmission of letters	x		x	x		x
092 02 02 00	Transmission of numbers (including level information)	x		x	x		x
092 02 03 00	Transmission of time	x		x	x		x
092 02 04 00	Transmission technique	x		x	x		x
092 02 05 00	Standard words and phrases (relevant RTF phraseology included)	x		x	x		x
092 02 06 00	Radiotelephony call signs for aeronautical stations including use of abbreviated call signs	x		x	x		x
092 02 07 00	Radiotelephony call signs for aircraft including use of abbreviated call signs	x		x	x		x
092 02 08 00	Transfer of communication	x		x	x		x
092 02 09 00	Test procedures including readability scale; establishment of RTF communication	x		x	x		x
092 02 10 00	Read back and acknowledgement requirements	x		x	x		x
092 02 11 00	Radar procedural phraseology	x		x	x		x
092 02 12 00	Level changes and reports	x		x	x		x
092 03 00 00	**ACTION REQUIRED TO BE TAKEN IN CASE OF COMMUNICATION FAILURE**	**x**		**x**	**x**		**x**
092 04 00 00	**DISTRESS AND URGENCY PROCEDURES**	**x**		**x**	**x**		**x**
092 04 01 00	PAN medical	x		x	x		x
092 04 02 00	Distress (definition – frequencies – watch of distress frequencies – distress signal – distress message)	x		x	x		x
092 04 03 00	Urgency (definition – frequencies – urgency signal – urgency message)	x		x	x		x
092 05 00 00	**RELEVANT WEATHER INFORMATION TERMS (IFR)**	**x**		**x**	**x**		**x**
092 05 01 00	Aerodrome weather	x		x	x		x
092 05 02 00	Weather broadcast	x		x	x		x
092 06 00 00	**GENERAL PRINCIPLES OF VHF PROPAGATION AND ALLOCATION OF FREQUENCIES**	**x**		**x**	**x**		**x**
092 07] 00	**MORSE CODE**	**x**	**x**	**x**	**x**	**x**	**x**

[Amdt. 1, 01.06.00; Amdt. 2, 01.08.02]

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