Australian Government

Civil Aviation Safety Authority

Civil Aviation Order 40.2.1 (as amended)

made under regulations 5.14, 5.16, 5.18 and 303 of the *Civil Aviation Regulations 1988.*

This compilation was prepared on 2 February 2009 taking into account amendments up to *Civil Aviation Order 40.2.1 Amendment Order (No. 1) 2008.*

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Contents

Section 40.2.1 (Instrument ratings)

Section 40.2.1

Instrument ratings

1 Application

1.1 For the purposes of subregulation 5.14 (1):

(a) the flight tests that must be passed; and

(b) other requirements that must be satisfied;

for the issue of each grade of instrument rating are set out in subsections 7, 8 and 10.

1.2 For the purposes of subregulation 5.14 (1):

(a) the flight tests that must be passed; and

(b) other requirements that must be satisfied;

for the renewal of each grade of instrument rating are set out in subsection 12.

1.3 For the purposes of regulation 5.18:

(a) the authority given by each grade of instrument rating; and

(b) the limitations on that authority;

are set out in subsections 11, 13 and 14.

Note This section is to be read in conjunction with sections 40.1.0 and 40.3.0 of this Part. Where applicable, this section should also be read in conjunction with subsection 11 of CAO 20.7.4 (Aeroplane Weight and Performance Limitations), CAO 20.18 (Aircraft Equipment — Basic Operational Requirements) and CAO 45.0 (Flight Crew Standards — Synthetic Flight Trainers — General).

2 Interpretation

2.1 In this section:

aeronautical experience means experience gained during flight time as a pilot member of the operating crew of an aircraft and experience gained during simulated flight as a pilot member of the operating crew of an approved synthetic flight trainer.

aeroplane instrument rating means an instrument rating of 1 of the following grades:

(a) command (multi-engine aeroplane);

(b) command (single engine aeroplane);

(c) co-pilot (aeroplane).

approved training and checking organisation means an organisation that is:

(a) provided by the operator of an aircraft; and

(b) approved by the Authority.

category of aircraft means either aeroplane or helicopter as applicable.

centre-line thrust aeroplane means an aeroplane that has the following characteristics:

(a) the aeroplane has 2 or more engines; and

(b) the failure of 1 or more of the engines does not produce asymmetric handling qualities in the aeroplane.

circling approach means an extension of an instrument approach procedure which provides for visual circling of the aerodrome or landing site prior to landing.

command instrument rating means an instrument rating of 1 of the following grades:

(a) command (multi-engine aeroplane);

(b) command (single engine aeroplane);

(c) command (multi-engine helicopter);

(d) command (single engine helicopter).

co-pilot means a person serving in any piloting capacity on an aircraft other than:

(a) a person who is pilot in command of the aircraft; or

(b) a person who is acting in command of the aircraft under supervision; or

(c) a person who is on board the aircraft for the sole purpose of receiving flying training.

co-pilot instrument rating means an instrument rating of 1 of the following grades:

(a) co-pilot (aeroplane);

(b) co-pilot (helicopter).

coupled approach means an ILS approach whereby the aircraft is manoeuvred by the autopilot in response to signals received from the ILS ground installation.

cross-country means flight for the purpose of either visual or radio navigation. This may constitute either a single leg to a destination other than the point of departure or a number of sectors terminating at either the point of departure or another destination.

dual controls means an arrangement of ground, flight and engine controls such that either pilot can operate the aircraft in a normal or conventional manner during ground and flight operations. Notwithstanding the foregoing, nose wheel steering is excepted where an aircraft is designed to have nose wheel steering operated only from the left seat.

flight management system, in relation to an aircraft, means a system which automatically integrates the aircraft's engine and performance parameters with vertical and horizontal navigational information to provide command guidance to the pilot and the aircraft's automatic flight control system.

GNSS means the Global Navigation Satellite System, a satellite navigation system used by a pilot on board to determine position from satellite data.

GPS means the Global Positioning System.

grade of instrument rating means 1 of the grades of instrument rating set out in regulation 5.13.

helicopter instrument rating means an instrument rating of 1 of the following grades:

(a) command (multi-engine helicopter);

(b) command (single engine helicopter);

(c) co-pilot (helicopter).

instrument rated flying school means a flying school that provides instrument training under an Air Operator's Certificate.

instrument rating examination means the aeronautical knowledge test described in section 2 of Appendix III.

instrument rating test means the flight and theory test described in Appendix I.

instrument time means instrument flight time and instrument ground time.

non-precision instrument approach means any instrument approach during which azimuth guidance is provided but glide path guidance is not provided.

piloting means controlling an aircraft during flight time as a pilot member of the flight crew.

RNAV(GNSS) approach means an instrument approach using only lateral navigation information from the GNSS.

type of navigation aid means GNSS, ILS, LLZ, VOR, NDB or DME, as the case may be.

2.3 For the purposes of this section, a person is an approved person to conduct an instrument rating test, a flight proficiency test, an instrument rating examination or instrument flying training if CASA gives written approval for the person to conduct the test, examination or training.

2.4 A reference in this section to a regulation or subregulation identified by a numerical code (for example 5.16 or 5.14 (1)) is a reference to the regulation or subregulation in the *Civil Aviation Regulations 1988* identified by that code.

5 Duration

5.1 For the purposes of subregulation 5.17 (3), an instrument rating remains in force for the period of 1 year from the last day of the month in which the rating was issued or renewed.

6 Endorsements

6.2 If CASA issues, or renews, a particular grade of instrument rating by entering it in a person's personal log book, the form the entry must take is the letters 'IR' (the endorsement of the instrument rating) followed by whichever of the following is applicable to the grade of instrument rating:

(a) in the case of a command (multi-engine aeroplane) or a command (multi-engine helicopter) grade rating — the letters and symbol 'C-ME'; or

(b) in the case of a command (single-engine aeroplane) or a command (single engine helicopter) grade rating — the letters and symbol 'C-SE'; or

(c) in the case of a co-pilot (aeroplane) or a co-pilot (helicopter) grade rating — the letters 'CP'.

6.4 If CASA issues, or renews, a particular grade of instrument rating by entering the grade of instrument rating in a person's personal log book, the navigation aid NDB, or the navigation aid VOR, must also be entered in the log book.

6.5 If a person:

(a) satisfies the requirements of paragraph 10.1 in relation to a particular grade of instrument rating; and

(b) satisfies the requirements of the instrument rating test for any of the following navigation aids or procedures:

(i) RNAV/(GNSS);

(ii) ILS;

(iii) LLZ;

(iv) VOR;

(v) DME or GPS arrival procedure;

(vi) NDB;

that navigation aid or procedure must also be entered in the person's personal log book.

Note The instrument rating test requirements are set out in subsection 10 and Appendix I.

6.6 An endorsement entered in a person's log book for a navigation aid or procedure:

(a) has no time limit; and

(b) may be used with any grade of instrument rating held by the person; and

(c) may only be used subject to compliance with the relevant recent experience, and proficiency testing, requirements mentioned in subsection 11.

7 Aeronautical knowledge

7.1 A person seeking an instrument rating must:

(a) have passed the instrument rating examination; or

(b) have passed an examination conducted by CASA, or its predecessors, in each of the following subjects:

(i) meteorology;

(ii) radio navigation aids;

(iii) airways operating procedures.

7.5 The instrument rating examination shall be conducted by CASA or by an approved person.

8 Aeronautical experience

8.1 Aeronautical experience gained in an approved synthetic flight trainer may be used to satisfy the aeronautical experience requirements for an instrument rating only to the extent specified in this section.

8.2 Subject to subsections 10A and 10B, a person seeking an aeroplane instrument rating must hold:

(a) a private pilot (aeroplane) licence that is not subject to any condition that restricts the holder to flying within a specified distance from an aerodrome; or

(b) a commercial pilot (aeroplane) licence; or

(c) an air transport pilot (aeroplane) licence; or

(d) a certificate of validation that has effect as if it were one of those licences.

8.2.1 A person seeking a helicopter instrument rating must hold:

(a) a private pilot (helicopter) licence that is not subject to any condition that restricts the holder to flying within a specified distance from an aerodrome; or

(b) a commercial pilot (helicopter) licence; or

(c) an air transport pilot (helicopter) licence; or

(d) a certificate of validation that has effect as if it were one of those licences.

8.3 The aeronautical experience of an applicant for the issue of a command instrument rating shall include:

(a) 50 hours cross-country flight time as pilot in command; and

(b) 40 hours instrument time, of which not less than 20 hours shall be instrument flight time on the category of aircraft for which the rating is sought; and

(c) 20 hours cross-country instrument time; and

(d) 10 hours dual instrument flight instruction time; and

(e) except for those persons whose licence is restricted to day only operations, 10 hours night flight of which not less than 5 hours shall be as pilot in command on the category of aircraft for which the rating is sought.

8.5 An applicant for the issue of a co-pilot instrument rating requires only the aeronautical experience requirements of the pilot licence held.

9 Synthetic flight trainers

9.1 The operational standards for synthetic flight trainers are mentioned in Manual of Standards (***MOS***) — Part 60 Synthetic Training Devices and the document entitled *Operational Standards and Requirements — Approved Synthetic Trainers (FSD2)*.

9.2 A synthetic flight trainer may be approved for the purpose for accruing instrument time as required by paragraph 8.3 of this section, and to meet specified flight test and recent experience requirements. Instrument rating credits applicable to approved synthetic flight trainers are specified in Appendix II to this section.

10 Instrument rating test requirements

10.1 Subject to paragraph 10.5, a person seeking a particular grade of instrument rating must in all cases satisfy the requirements of the instrument rating test:

(a) for the use of the navigation aid NDB or the navigation aid VOR; and

(b) for that grade of rating.

10.2 An instrument rating must not be issued to a person unless the person satisfies the requirements of paragraph 10.1.

10.3 A person who meets the requirements of paragraph 10.1 may attempt the requirements for any of the following navigation aids or procedures:

(a) RNAV/(GNSS);

(b) ILS;

(c) LLZ;

(d) VOR;

(e) DME or GPS arrival procedure;

(f) NDB.

10.4.2 The instrument rating test must be conducted:

(a) by CASA, an approved testing officer or an approved person; and

(b) in an aircraft, or approved synthetic flight trainer, that is appropriate to the grade of instrument rating sought.

10.4.3 A person may attempt the instrument rating test for initial issue of a grade of instrument rating only if the person meets the requirements of:

(a) subsection 7; and

(b) subsection 8 for aeronautical experience relevant to the rating; and

(c) the *Civil Aviation Regulations 1988* that apply for issue of the pilot licence mentioned in subsection 8 for the rating; and

(d) paragraph 10.4.3A.

10.4.3A For subparagraph 10.4.3 (d), the person must meet at least 1 of the following requirements:

(a) the person:

(i) has completed a course of instrument flying training:

(A) that is appropriate to the grade of instrument rating sought; and

(B) that was conducted by an instrument rated flying school or an approved training and checking organisation; and

(ii) has been recommended for the test by the supervisor of that course of training;

(b) CASA is satisfied that:

(i) the person:

(A) has held an instrument rating issued by CASA; or

(B) holds, or has held, an instrument rating issued by the appropriate authority of a Contracting State or by a defence force of Australia or of another country; and

(ii) the training undertaken by the person to get that rating is adequate to allow the person to attempt the instrument rating test for the grade of rating sought;

(c) the person:

(i) holds a particular grade of command instrument rating; and

(ii) is seeking another grade of instrument rating;

(d) the person:

(i) is seeking a command (single-engine aeroplane) or a command (multi-engine aeroplane) grade of instrument rating; and

(ii) holds a co-pilot (aeroplane) grade of instrument rating; and

(iii) has accrued at least 50 hours of instrument flight time as a co-pilot of an aeroplane;

(e) the person:

(i) is seeking a command (single engine helicopter) or a command (multi-engine helicopter) grade of instrument rating; and

(ii) holds a co-pilot (helicopter) grade of instrument rating; and

(iii) has accrued at least 50 hours of instrument flight time as a co-pilot of a helicopter.

10.5 For paragraph 10.11, if a person attempts, as a series of tests, the instrument rating flight test for both aeroplane and helicopter categories of aircraft, a demonstration of proficiency using a navigation aid in 1 of the aircraft categories is taken to be a demonstration of proficiency for the other aircraft category if proficiency in at least 1 instrument approach is demonstrated in each category.

10.6 An applicant for the initial issue or renewal of an instrument rating shall provide an aircraft or an approved synthetic flight trainer, as applicable, for the purpose of demonstrating aeronautical skill in the manoeuvres and

procedures specified in Appendix I. The aircraft shall be equipped with dual controls and certificated and approved for flight under the I.F.R. Provision shall also be made for the person conducting the test to transmit and receive communications on the radio equipment being used. The applicant shall provide a suitable means of simulating instrument meteorological conditions which allows the person conducting the test to maintain adequate vision forward and to each side of the aircraft.

10.7 The instrument rating test shall be conducted with the minimum flight crew complement specified in the aircraft flight manual and any additional crew required by an approved training and checking organisation.

10.8 If the instrument rating test is conducted in an aircraft certificated for single pilot operation, the person conducting the test must not, during the test, perform any duty essential to the operation of the aircraft.

10.9 If:

(a) the instrument rating test is conducted in an aircraft certificated for multi-pilot operation; and

(b) the person conducting the test occupies a control seat;

he or she must, during the test, perform all co-pilot duties.

10.10 An instrument rating test may be conducted as 1 test, or as a series of tests.

10.11 If an instrument rating test is conducted as a series of tests, the person attempting the test is taken not to have passed it unless he or she passes all the tests in the series within a period of 28 days.

10A Multi-crew pilot (aeroplane) — co-pilot grade of instrument rating

10A.1 A person is taken to satisfy subparagraphs 10.4.3 (b), (c) and (d) for attempting the co-pilot aeroplane instrument rating test if the test is incorporated into the multi-crew pilot (aeroplane) flight test undertaken following successful completion of a course of training mentioned in regulations 5.215 and 5.216 of the *Civil Aviation Regulations 1988*.

10A.2 A person is taken to satisfy subparagraphs 10.4.3 (b) and (c) for attempting the co-pilot aeroplane instrument rating test if the person:

(a) holds, or has held, an overseas pilot licence that is at least equivalent to the multi-crew pilot (aeroplane) licence; and

(b) holds a student pilot licence; and

(c) the test is incorporated into the multi-crew pilot (aeroplane) flight test.

Note Under subregulation 5.207 (4) of CAR 1988, an overseas pilot licence is equivalent to a multi-crew pilot (aeroplane) licence if it authorises the holder of the licence to fly an aeroplane as co-pilot in air transport operations, and it was issued in accordance with the standards and recommended practices mentioned in Annex 1 to the Chicago Convention.

10B Command (multi-engine aeroplane) grade of instrument rating

A person is taken to satisfy subparagraphs 10.4.3 (b) and (c) for attempting the command (multi-engine aeroplane) instrument rating test if the person:

(a) holds, or has held, an overseas pilot licence that is at least equivalent to an air transport pilot (aeroplane) licence; and

(b) has the aeronautical experience mentioned in paragraph 8.3; and

(c) holds a student pilot licence.

10C Incorporation of instrument rating test into multi-crew pilot (aeroplane) flight test

For subsection 10A, the co-pilot grade of instrument rating test may be incorporated into the multi-crew pilot (aeroplane) flight test provided the requirements of both tests are satisfied in the flight test.

11 Recent experience requirements

11.1 The holder of a command instrument rating shall not act as pilot in command of an aircraft on an I.F.R. flight unless the recent experience requirements of this subsection are satisfied. Recent experience requirements for flights using Night V.F.R. procedures are detailed in subsection 14.

11.2 The holder of a command instrument rating shall not act as pilot in command of an aircraft on I.F.R. flights unless within the preceding 90 days, that person has:

(a) completed 3 hours instrument time with a minimum of either 1 hour instrument flight time on that category of aircraft or 1 hour instrument time on an approved flight simulator; or

(b) completed either 1 hour of dual instrument flight instruction time on that category of aircraft or 1 hour instrument instruction time on an approved flight simulator; or

(c) completed 1 hour instrument flight time whilst acting in command under supervision or 1 hour instrument time whilst acting in command under supervision on an approved flight simulator; or

(d) passed the instrument rating test on either that category of aircraft or an approved flight simulator.

11.3 Subject to paragraph 11.8, the holder of a command instrument rating must not, as pilot in command of an aircraft, carry out a RNAV/(GNSS) approach or an instrument approach using DME or GPS arrival procedures, NDB or VOR in I.M.C. unless, in the immediately preceding 90 days, the holder has performed an approach using the same type of navigation aid or procedure in flight or in an approved synthetic flight trainer.

11.3A Despite paragraph 11.3:

(a) if a holder of a command instrument rating has, in the immediately preceding 90 days, flown DME arrival procedures, paragraph 11.3 does not apply to the holder in relation to GPS arrival procedures; and

(b) if a holder of a command instrument rating has, in the immediately preceding 90 days, flown GPS arrival procedures, paragraph 11.3 does not apply to the holder in relation to DME arrival procedures; and

(c) if a holder of a command instrument rating has, in the immediately preceding 90 days, flown an ILS approach or a LLZ approach, paragraph 11.3 does not apply to the holder in relation to a VOR approach.

11.3B Despite paragraph 11.3, the holder of a command instrument rating must not carry out a RNAV/(GNSS) approach as pilot in command of an aircraft unless, in the immediately preceding 6 months, the holder has carried out a RNAV/(GNSS) approach:

(a) in flight or in an approved synthetic flight trainer; and

(b) using a GNSS receiver:

(i) which is the same as that fitted in the aircraft; or

(ii) which CASA has determined in writing is to be taken as being the same as that fitted in the aircraft.

11.4 The holder of a command instrument rating shall not carry out an ILS or LLZ approach in IMC as pilot in command of an aircraft unless, within the preceding 35 days, that person has performed in flight, or in a synthetic flight trainer approved for the purpose, either one of those approaches.

11.5 The holder of a command instrument rating shall not act as pilot in command on single pilot I.F.R. flights unless within the preceding 90 days:

(a) that person has completed as a single pilot operation either in an aircraft certificated for single pilot operations or an approved synthetic trainer, 1 hour instrument time including 1 instrument approach, as pilot in command or acting in command under supervision; or

(b) that person has passed the instrument rating test conducted as a single pilot operation.

11.6 Subject to paragraph 11.8, the holder of a command instrument rating shall not carry out an instrument approach in I.M.C. as pilot in command of an aircraft unless, during the preceding 15 months, proficiency on the navigation aid being used has been demonstrated to CASA, an approved testing officer or approved person during an instrument rating test or a flight proficiency test conducted in accordance with an approved training and checking programme. This requirement may be satisfied in accordance with the provisions of Appendix I, subparagraph 4.1 (b).

11.7 Credits for recent experience which can be achieved in approved synthetic flight trainers are specified in Appendix II.

11.8 Paragraphs 11.3 and 11.6 do not apply to the holder of a command instrument rating if he or she:

(a) is employed by, or working under an arrangement with, an operator who has a cyclic training and proficiency program that:

(i) meets the requirements of Appendix V; and

(ii) is approved under regulation 217; and

(b) is a participant in the program; and

(c) met the standards required by the program in the last session of the program that he or she attended.

12 Renewal

12.1 A grade of instrument rating must be renewed for a period of 12 months from the date of its expiry if:

(a) its holder passes the instrument rating test applicable to the renewal of the grade of rating within the last 90 days before the grade of rating is due to expire; or

(b) its holder:

(i) is employed by, or working under an arrangement with, an operator who has a cyclic training and proficiency program that:

(A) meets the requirements of Appendix V; and

(B) is approved under regulation 217; and

(ii) is a participant in the program; and

(iii) met the standards required by the program in the last session of the program that he or she attended.

12.2 Where an instrument rating has expired for a period of less than 12 months, an applicant may qualify for issue of a rating by passing the instrument rating test applicable to the renewal of a rating.

12.3 Where an instrument rating has expired for a period in excess of 12 months, an applicant may qualify for issue of a rating by passing the instrument rating test applicable to the initial issue of an instrument rating.

12.4 The holder is taken to meet the requirements of subparagraph 12.1 (a) if he or she complies with subsection 12A within the 90 days before the grade of rating is due to expire.

12.5 For paragraph 12.2, the applicant is taken to meet the requirements of subparagraph 12.1 (a) if he or she complies with subsection 12A within the period mentioned in paragraph 12.2.

12.6 For paragraph 12.3, subsection 12A does not apply.

12.7 To avoid doubt, for a person who is subject to competency checks by a training and checking organisation under subregulation 217 (2) of the *Civil Aviation Regulations 1988* (***CAR 1988***), renewal of a grade of instrument rating using an instrument proficiency check on a flight simulator under subsection 12A may be conducted as part of the flight crew competency checking mentioned in subclause 3.4A of Appendix 2 of *Civil Aviation Order 82.1*.

Note For subsection 12.7 to apply, the respective requirements of subsection 12A and of subclause 3.4A of Appendix 2 of *Civil Aviation Order 82.1* must all be met.

12A Renewal using an overseas flight simulator training provider

12A.1 For the renewal of a grade of instrument rating, the holder may undertake:

(a) an instrument proficiency check on a flight simulator with a flight simulator training provider in a Contracting State whose flight simulator qualification certificates are recognised by CASA (a ***recognised certificate State*** or ***RCS***); and

(b) an oral aeronautical knowledge test (the ***oral test***) based on the matters mentioned in subclause 1.1 of Appendix 1 and relevant to the instrument rating to be renewed.

Note 1 Advisory Circular AC 60-2 (1) (May 2007) states that CASA currently recognises the flight simulator qualification certificates issued by Canada, Hong Kong (Special Administrative Region of China), New Zealand, the United States of America, Belgium, the Czech Republic, Denmark, Finland, France, Germany, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Note 2 CAAP 5.14-1 contains guidance and forms for an applicant undertaking the instrument proficiency checks on a flight simulator in a Contracting State.

12A.2 At least 10 working days before undertaking the instrument proficiency check mentioned in subparagraph 12A.1 (a), the holder must give CASA details of the proposed check.

Note CASA EX68/07 exempts a holder who gives CASA these details from the requirement under regulation 60.055 of the *Civil Aviation Safety Regulations 1998* to obtain CASA

approval to be the user of the flight simulator for renewing the holder's grade of instrument rating under subsection 12A.

12A.3 For paragraph 12A.1:

(a) the flight simulator training provider and the person conducting the checks (the ***checker***) must be approved by the national airworthiness authority of the RCS (the ***RCS NAA***) to undertake operating crew training and checking of which the instrument proficiency checks in the simulator are an approved part; and

(b) the checker must:

(i) hold a current delegation or authorisation from the RCS NAA:

(A) for certifying the instrument procedures proficiency of flight crew in the RCS; and

(B) that confers a status equivalent to that of an approved testing officer; and

(ii) be an employee of the training provider for undertaking instrument proficiency checks; and

(c) the flight simulator must be one for which there is a current qualification certificate for instrument proficiency checks issued by the RCS NAA; and

(d) the training provider must have written procedures and a document management system for the reliable certification of a person's successful completion of the instrument proficiency checks undertaken; and

(e) subject to paragraph 12A.4, the instrument proficiency checks undertaken by the holder must:

(i) conform in all respects to Australian instrument procedures; and

(ii) comply with the Australian instrument rating renewal requirements in Appendix 1 of this Order (except paragraphs 4.1 (a), (b) and (c)):

(A) as if those requirements were applicable to an instrument rating renewal flight test on the flight simulator; and

(B) if proficiency is demonstrated on the flight simulator in using ILS or LLZ, and another non-precision instrument approach — as if that proficiency met the proficiency testing requirement for VOR.

Note The Australian instrument rating renewal requirements in Appendix 1 of this Order include, for example, a requirement for the holder to satisfactorily demonstrate a circling approach. This, and other requirements contained in the Appendix, may differ from the requirements of the relevant recognised certificate State.

12A.4 For this subsection, a checker is taken to be an approved person for subclause 1.1 of Appendix 1 of this Order (deciding on an acceptable route).

12A.5 The holder must successfully complete:

(a) the instrument proficiency checks that met the requirements in subparagraph 12A.3 (e) for the grade of instrument rating to be renewed; and

(b) the oral test.

12A.6 If the holder is subject to competency checks by a training and checking organisation under subregulation 217 (2) of CAR 1988, the oral test must be conducted:

(a) by a pilot who is:

(i) the chief pilot or approved check pilot of the training and checking organisation; and

(ii) approved by CASA to conduct flight tests for the grade of instrument rating applied for; or

(b) as if paragraph 12A.7 applied.

12A.7 If the holder is not subject to competency checks by a training and checking organisation under subregulation 217 (2) of CAR 1988, the oral test must be conducted by a CASA flying operations inspector (***FOI***), or an approved testing officer (***ATO***), approved to conduct flight tests for the grade of instrument rating applied for.

12A.8 When applying for the renewal of a particular grade of instrument rating, the holder must give a CASA officer, or the relevant chief pilot, approved check pilot, or ATO, as the case requires, the following documents, or copies of them, with persuasive evidence that each document or copy is what it purports to be:

(a) the training provider's current NAA approval to undertake operating crew training and checking for instrument proficiency checks;

(b) the current NAA approval and delegation of the checker for the instrument proficiency checks;

(c) the checker's signed statement of the instrument proficiency checks that were successfully undertaken by the holder and that met the requirements in subparagraph 12A.3 (e).

12A.9 The chief pilot or the approved check pilot may issue the renewal of the grade of instrument rating applied for by the holder only if:

(a) he or she is a CASA delegate for that purpose under subregulation 5.14 (2) of CAR 1988; and

(b) he or she has received the documents mentioned in paragraph 12A.8; and

(c) the training and checking organisation's operations manual sets out the procedures for the oral test and the instrument rating renewal required under this subsection; and

(d) the holder has successfully completed the oral test.

12A.10 For a holder to whom paragraph 12A.7 applies, the renewal of the grade of instrument rating applied for may be issued by:

(a) a CASA officer following receipt of:

(i) the documents mentioned in paragraph 12A.8; and

(ii) written confirmation from the FOI or ATO that the holder has successfully completed the oral test; or

(b) the ATO who:

(i) observed the instrument flight check; and

(ii) received the documents mentioned in paragraph 12A.8; and

(iii) either:

(A) conducted the successful oral test; or

(B) received from another FOI or ATO who conducted the successful oral test, written confirmation of having done so.

13 Privileges and limitations

13.1 A command (multi-engine aeroplane) grade of instrument rating authorises the holder of the rating to fly an aeroplane as pilot in command, or co-pilot, while the aeroplane is flying under the I.F.R.

13.2 A command (single engine aeroplane) grade of instrument rating authorises the holder of the rating:

(a) to fly a single engine or a centre-line thrust aeroplane as pilot in command while the aeroplane is flying under the I.F.R.; and

(b) to fly an aeroplane as co-pilot while the aeroplane is flying under the I.F.R.

13.3 A co-pilot (aeroplane) grade of instrument rating authorises the holder of the rating to fly an aeroplane as co-pilot while the aeroplane is flying under the I.F.R.

13.3.1 A command (multi-engine helicopter) grade of instrument rating authorises the holder of the rating to fly a helicopter as pilot in command or co-pilot, while the helicopter is flying under the I.F.R.

13.3.2 A command (single engine helicopter) grade of instrument rating authorises the holder of the rating:

(a) to fly a single engine helicopter as pilot in command while the helicopter is flying under the I.F.R.; and

(b) to fly a helicopter as co-pilot while the helicopter is flying under the I.F.R.

13.3.3 A co-pilot (helicopter) grade of instrument rating authorises the holder of the rating to fly a helicopter as co-pilot of a helicopter for which the licence is valid while the helicopter is flying under the I.F.R.

13.3.4 For regulation 5.16, it is a condition of each instrument rating that the holder may act as pilot in command or co-pilot of an aircraft being flown under the I.F.R. only if each navigation aid or procedure that is used to navigate the aircraft during the flight has been endorsed in his or her personal log book.

13.3.5 Subject to paragraph 13.3.6, if the holder of a particular grade of instrument rating:

(a) for the purpose of renewing the rating attempts the instrument rating test; and

(b) fails to satisfy the requirements of the instrument rating test that relate to that grade of rating;

the holder must not exercise the authority given by the rating until he or she satisfies those requirements.

13.3.6 In spite of paragraph 13.3.5, if the holder of a particular grade of instrument rating has failed to satisfy the requirements referred to in paragraph 13.3.5, the holder may exercise the authority given by the rating for the purpose of increasing his or her instrument flying skills if:

(a) the holder is accompanied in the aircraft by an approved person, or by a person who:

(i) holds a valid flight instructor rating; and

(ii) is authorised by that rating to conduct instrument flying training in aircraft of the category and type concerned; and

(b) the aircraft is not being used to carry passengers for hire or reward.

13.4 In spite of paragraph 13.3.4, the holder of an instrument rating may use the DME:

(a) for navigation; or

(b) in conjunction with other types of navigation aid, to conduct instrument approaches other than DME arrival procedures.

13.4A For regulation 5.16, a person who has a RNAV(GNSS) endorsement must not conduct a RNAV(GNSS) approach in I.M.C. as pilot in command of an aircraft unless he or she has carried out at least 3 RNAV(GNSS) approaches in flight, or in a synthetic flight trainer, using a GNSS receiver:

(a) which is the same as that fitted in the aircraft; or

(b) which CASA has determined in writing is to be taken as being the same as that fitted in the aircraft.

13.5 Privileges and limitations concerned with flight by night in V.F.R. are detailed in subsection 14.

13.6 In spite of paragraph 13.3.4, the holder of an instrument rating may use the GNSS when exercising the authority given by the rating:

(a) as a primary means of navigation; or

(b) to obtain position fixes;

if the requirements of paragraph 13.7 or 13.8 are met in relation to the holder.

13.7 For the purposes of paragraph 13.6, the requirements of this paragraph are met in relation to the holder of an instrument rating if:

(a) he or she has satisfactorily completed a course of training in accordance with the syllabus set out in Appendix IV conducted by:

(i) CASA; or

(ii) a training and checking organisation approved under regulation 217; or

(iii) an instrument school; and

(b) 1 of the following sub-subparagraphs applies:

(i) if the training was conducted by CASA — CASA is satisfied that the holder is competent to use GNSS when exercising the authority given by the holder's instrument rating and has made an entry in the holder's personal log book to that effect;

(ii) if the training was conducted by a training and checking organisation a check pilot in that organisation is satisfied that the holder is competent to use GNSS when exercising the authority given by the

holder's instrument rating and has made an entry in the holder's personal log book to that effect;

(iii) if the training was conducted by an instrument school — a nominated person within the meaning of paragraph 13.9 who is employed by, or working under an arrangement with, the school is satisfied that the holder is competent to use GNSS when exercising the authority given by the holder's instrument rating and has made an entry in the holder's personal log book to that effect.

13.8 For the purposes of paragraph 13.6, the requirements of this paragraph are met in relation to the holder of an instrument rating if CASA:

(a) is satisfied that the holder has received training in the subjects set out in the syllabus in Appendix IV; and

(b) is satisfied that the holder is competent to use GNSS when exercising the authority given by the holder's instrument rating and has made an entry to that effect in the holder's personal log book.

13.9 For the purposes of paragraph 13.7:

check pilot means a person approved by CASA for the purposes of Part 82 of the Orders.

instrument school means a flying school that is authorised by its AOC to conduct training for the issue or renewal of an instrument rating.

nominated person means a person who:

(a) holds a flight instructor (aeroplane) rating grade 1, or a flight instructor (helicopter) rating grade 1; and

(b) holds a command instrument rating.

13A Endorsements not required in some cases

13A.1 A member of a flight crew of an aircraft that is conducting one of the following procedures may conduct the procedure without holding an endorsement under this section:

(a) a GNSS approach and landing procedure;

(b) a RNAV-based approach using the aircraft's flight management system;

(c) a precision approach and landing procedure using MLS.

13A.2 However, a member of a flight crew may only conduct a procedure mentioned in paragraph 13A.1:

(a) in an aircraft that is operated by an AOC holder who:

(i) has been issued with an approval by CASA to conduct the procedure; and

(ii) has a training and checking organisation approved under regulation 217; and

(b) if the pilot of the aircraft:

(i) has received training, and has been certified by the operator as competent, to conduct the procedure for the aircraft type and the aircraft's FMS in accordance with the AOC holder's approved training syllabus for the procedure; and

(ii) for a precision approach procedure — holds an ILS endorsement; and

(iii) is employed by the AOC holder.

13A.3 Despite paragraph 13.3.4, the co-pilot of an aircraft may use a navigation aid or procedure that is not endorsed in his or her personal log book if the co-pilot:

(a) is a crew member of aircraft operated by an AOC holder who has a cyclic training and proficiency program approved under regulation 217 (the ***program***); and

(b) while participating in the program — received training and demonstrated competency in the use of the navigation aid or procedure to a standard equivalent to that required for it to be endorsed in his or her personal log book; and

(c) continues to participate successfully in the program.

14 Flight by night under night V.F.R. procedures

14.1 A particular grade of command instrument rating authorises the holder of the rating to fly an aircraft of the category concerned within Australia as pilot in command, or co-pilot, using the navigation aids endorsed in the holder's personal log book in the following circumstances:

(a) Private and aerial work flights under night V.F.R. procedures provided the pilot meets the aeronautical and recent experience requirements applicable to a night V.F.R. endorsement.

(b) Charter flights under night V.F.R. procedures, provided the following aeronautical and recent experience requirements are satisfied:

(i) **Aeronautical Experience**. The pilot's aeronautical experience shall include 10 hours cross-country flight time using night V.F.R. procedures including a minimum of 2 navigation exercises (of at least 300 nautical miles or 3 hours duration), as either pilot in command or in command under supervision. Each exercise shall exceed a distance of 100 nautical miles from the point of departure and shall provide at least 1 landing at an aerodrome other than that of departure, located in an area remote from extensive ground lighting.

(ii) **Recent Experience**. The pilot's recent experience shall include 3 take-offs and landings by night within the preceding 90 days, and either a night cross-country flight (of at least 100 nautical miles or 1 hour duration) within the preceding 6 months or a flight check by night with an approved person also within the preceding 6 months.

14.2 The holder of a co-pilot instrument rating may act as co-pilot on flights by night under V.F.R. procedures, and exercise the privileges of a night V.F.R. endorsement, provided the aeronautical and recent experience requirements applicable to the type of operation and class of rating are satisfied.

Appendix I

Instrument rating test

1 Introduction

1.1 An applicant for an instrument rating shall undergo a flight test on a route acceptable to CASA or approved testing officer or approved person, and shall demonstrate proficiency in:

(a) knowledge of relevant orders and publications; and

(b) flight planning; and

(c) preparation for flight; and

(d) altimetry, air traffic control, departure, en-route, arrival procedures; and

(e) the manoeuvres and procedures associated with the operation of the category and type of aircraft and navigation aid procedures, as specified in subsection 2 of this Appendix; and

(f) identification of navigation aids by recognition of their morse code identifiers.

The flight test need not be conducted in controlled airspace.

1.2 Simulated instrument meteorological conditions and simulated engine failures are acceptable for the purpose of the instrument rating test. Pilots who are subject to an approved training and checking system may conduct all or part of the instrument rating test as part of their flight proficiency test.

1.3 The manoeuvres and procedures specified in this section may be demonstrated in flight or, where authorised in this section, in an approved synthetic flight trainer. Applicants seeking a co-pilot instrument rating are required to demonstrate proficiency while operating under the direction of the pilot in command.

2 Flight manoeuvres

2.1 Normal flight:

(a) The flight manoeuvres specified for normal flight are applicable to all instrument rating tests.

(b) Proficiency in the manoeuvres and procedures required for normal flight may be demonstrated under the conditions of asymmetric flight or flight under reduced thrust required by paragraph 2.2.

(c) The applicant shall demonstrate the ability to perform solely by reference to instruments the flight manoeuvres as specified, and the procedures applicable to the type of navigation aid for which an endorsement is sought. An applicant shall demonstrate proficiency using the instruments available following failure of the primary attitude instrument. The person conducting the instrument rating test must not simulate the failure of an aircraft's primary attitude instrument while the aircraft is flying in I.M.C., or at night, unless he or she has, in view, a serviceable attitude indicator or artificial horizon, and an appropriately qualified person occupies a control seat and has in view a serviceable attitude indicator or artificial horizon. If the aircraft is fitted with a standby attitude instrument that is

powered from a source other than the source from which the primary attitude instrument is powered, the person conducting the test must not require the person attempting the test to use a turn needle, or turn co-ordinator, to determine the attitude of the aircraft during simulated failure of the primary attitude instrument. An autopilot or a coupled approach may be used in the demonstration of proficiency in instrument approach procedures. However, the applicant shall also be required to demonstrate proficiency in instrument approach procedures without the use of the flight director and without the autopilot engaged in aircraft where this is permitted.

(ca) For the purposes of subparagraph 2.1 (c), ***standby attitude instrument*** includes:

(i) a co-pilot's attitude indicator or artificial horizon; and

(ii) an electronic flight instrument system with reversionary modes which cater for attitude reference and cathode ray tube failures.

(d) An applicant for the endorsement of a particular navigation aid shall demonstrate proficiency in the orientation, interception, homing, holding and descent procedures to the standards specified in this section and in accordance with a published approach procedure. Satisfactory performance requires correct tuning, identification and use of the aid. For initial endorsement of RNAV/(GNSS), ILS, LLZ, VOR and NDB on each category of aircraft, proficiency shall be demonstrated either in flight, or in a flight simulator approved for the purpose. For initial endorsement of GPS or DME arrival procedure, proficiency may be demonstrated in an approved synthetic flight trainer. Initial endorsement for ILS includes endorsement for LLZ.

(e) **Missed Approach**. The applicant shall demonstrate proficiency in the execution of a missed approach.

(f) **Circling Approach**. The applicant shall demonstrate proficiency in conducting a circling approach. Should an operator's policy be that circling approaches will not be conducted in a particular aeroplane type, then this requirement to demonstrate a circling approach for the issue or renewal of an instrument rating while flying that particular aeroplane type can be deleted. However, should an instrument rating holder wish to exercise the privileges of an instrument rating on an aeroplane in which circling approaches can be flown, the holder must demonstrate proficiency in conducting a circling approach in an aeroplane, or in a synthetic flight trainer approved for the purpose.

(g) The applicant shall demonstrate satisfactory knowledge of turbulence penetration and unusual attitude recovery techniques, and may be required to demonstrate proficiency in these techniques in flight or in a synthetic flight trainer approved for the purpose.

2.2 Asymmetric flight and flight with reduced thrust:

(a) **Requirements**. An applicant for an instrument rating with multi-engine privileges shall demonstrate proficiency on multi-engine aircraft, not being center-line thrust aeroplanes, in the procedures of paragraphs 2.2 (b) to 2.2 (f) inclusive, as applicable. Correct handling of ancillary

controls and adherence to the limitations as applicable is a requirement for satisfactory performance of these manoeuvres.

(b) **Co-pilot instrument rating**. The requirement to demonstrate proficiency in asymmetric flight (aeroplanes) or reduced power performance (multi-engine helicopters) for the co-pilot instrument rating shall be limited to be performed in the cruise.

(c) **Take-off**. For multi-engine aeroplanes, the applicant shall attain optimum aeroplane performance following failure of an engine. The speed at which that failure may be simulated shall be as follows:

(i) Aeroplanes for which the take-off performance is predicated on the establishment of a V_1. Failure of the engine shall be simulated at a speed greater than V_1.

(ii) Aeroplanes other than those described in subparagraph (i). Failure of the engine shall be simulated at a speed greater than either the 1 engine inoperative best rate of climb speed or the take-off safety speed plus 10 knots, whichever is the higher.

(d) **Reduced power performance (multi-engine helicopters)**. The applicant shall demonstrate proficiency in executing all manoeuvres within the specified limitations of the helicopter at a given weight and with 1 engine disengaged.

(e) **Engine out performance or emergency descent (helicopters)**. The applicant shall demonstrate proficiency in entering autorotation solely by reference to instruments after engine failure (single engine helicopters) or after initiating an emergency descent (multi-engine helicopters). Recovery from this manoeuvre shall be made visually.

(f) **Missed Approach**. Failure of an engine is to be simulated prior to or during an instrument approach, and an asymmetric missed approach shall be carried out from an appropriate altitude either in accordance with the published missed approach procedure or as otherwise directed.

3 Flight tolerances

3.1 Flight within the tolerances specified is necessary for the applicant to be judged proficient in the required flying manoeuvres. There shall be no sustained errors in excess of the specified tolerances.

3.2 Normal flight tolerances:

(a) heading ± 5° of nominated heading; and

(b) indicated ± 10 knots (or ± > M.02) of nominated speed, not below minimum approach speed for the configuration; and

(c) height ± 100 feet, at minimum altitudes + 100 feet - 0 feet.

3.3 Asymmetric flight tolerances (aeroplanes):

(a) heading (from datum heading) ± 20° initially, then ± 5°; and

(b) indicated airspeed:

(i) initial climb — nominated 1 engine inoperative climb speeds + 5, - 0 knots;

(ii) subsequent operations ± 10 knots (± M.02); not below minimum approach speed for the configuration; and

(c) height ± 100 feet; at minimum altitudes + 100 feet and - 0 feet.

3.4 One engine disengaged flight tolerances (helicopters):

(a) all manoeuvres as contained in subparagraph 2.2 (d):

(i) heading ± 5° of nominated heading; and

(ii) indicated airspeed ± 10 knots of nominated speed, not below minimum approach speed for the configuration; and

(iii) height ± 100 feet, at minimum altitudes + 100 feet and - 0 feet; and

(b) autorotation:

(i) heading able to turn into the last known wind direction and maintain ± 10°; and

(ii) airspeed — ± 10 knots from recommended minimum rate of descent airspeed.

3.5 Navigation aid and procedure tolerances:

(a)	NDB	± 5 degrees of nominated track; for NDB procedure, descent shall not be commenced unless established within this tolerance; and
(b)	VOR	± 5 degrees of nominated track; for VOR procedure, descent shall not be commenced unless established within this tolerance; and
(c)	ILS and LLZ	± ½ scale deflection (and equivalent on expanded scale); able to land from minimum altitude without undue manoeuvring; and
(d)	DME or GPS arrival	(i) Tracking — within ± 5º for NDB or within ± 5 degrees for VOR when tracking on the defined track or, if a specific track is not defined by the procedure, within the specified sector at all times; and (ii) Descent below LSALT or limiting altitude for a step — not before the distance specified in the arrival procedure for commencement of descent to the next step; and
(e)	RNAV/(GNSS)	± ½ scale deflection at each waypoint passage and on final approach, descent must not be started unless established within this tolerance; GNSS approach mode must be activated during final approach; and
(f)	DME or GNSS arc	± 2 nautical miles.

4 Renewal

4.1. An applicant for renewal of a particular grade of instrument rating shall pass the instrument rating test applicable to the initial issue of that grade of instrument rating except that:

(a) proficiency in using 1 or more of RNAV(GNSS), ILS, LLZ, VOR, DME or NDB may be demonstrated in a synthetic flight trainer approved for the purpose — if proficiency in at least 1 other navigation aid is also demonstrated in flight or in an approved flight simulator; and

(b) a demonstration of proficiency in using ILS or LLZ in accordance with subparagraph (a) may be used to meet the proficiency testing requirements for VOR — if proficiency in at least 1 other non-precision instrument approach is demonstrated as part of the test; and

(c) a demonstration of proficiency in using LLZ may be used to meet the proficiency testing requirements for ILS — if proficiency using ILS was demonstrated at the previous renewal.

4.2 When a grade of instrument rating is being renewed, a person who has a DME or GPS arrival procedure endorsement entered in his or her log book is taken to have demonstrated proficiency for the procedure for paragraph 11.6.

Appendix II

Instrument rating credits for approved synthetic flight trainers

1 Approved flight simulators

Classification	Credits
Level A	All credits applicable to an approved synthetic trainer in accordance with section 2 of this Appendix. Endorsement training in all sequences, excluding landings and the endorsement simulator flight proficiency test. The flight engineer flight proficiency test in accordance with CAO 43.1 Appendix I. The aeronautical experience simulator credits granted in CAO 43.1 Appendix I. The recent experience simulator credits granted in CAO 43.1 Appendix I.
Level B	All credits available for Level A.
Level C	All credits available for Levels A and B.
Level D	All credits available for Levels A, B, and C. All endorsement training including the endorsement flight proficiency test in accordance with CAO 40.1.0 Appendices III and V, but excluding the post-endorsement route training and flight proficiency test on an air route. *Note* Levels of simulators are mentioned in Manual of Standards (MOS) — Part 60 Synthetic Training Devices.

2 Approved synthetic trainers

Classification		Credits
Category A	Procedure Trainer	**Initial Issue** • 20 hours instrument time • DME or GPS Arrival
Category B	Operational Flight Trainer	**Initial Issue** • 20 hours instrument time • 15 hours instrument cross-country time • DME or GPS Arrival **Recency** • 2 hours (of the 3) instrument time requirements in 90 days • NDB, VOR, ILS, LLZ, DME or GPS Arrival, RNAV/(GNSS) • 1 hour instrument time in 90 days for single pilot recent experience requirements **Renewal** • NDB, VOR, ILS, LLZ, RNAV/(GNSS) *Note* 1 approach to be demonstrated in flight
Category C	Aircraft Type Trainer	As for Category B

Note For credits to be applicable, the trainer must be approved to the appropriate classification by CASA, the applicable navigation aids must be approved and operative, and the training must be completed in accordance with the approved Trainer Operations Manual.

Appendix III

Syllabus of training for the instrument rating — aircraft

1 Introduction

1.1 This syllabus provides details of the flying training and aeronautical knowledge requirements for the issue of an instrument rating.

1.2 This syllabus of training is to be read in conjunction with Parts 20, 40 and 48 of the Civil Aviation Orders. Knowledge of these Orders may not be tested in the written examination. However, operational aspects will be checked at the time of the flight test (see paragraph 1.3).

1.3 Prior to the issue of an instrument rating, the applicant shall demonstrate that the standards of flying proficiency and the training objectives specified in this syllabus have been achieved. This requirement shall be satisfied by obtaining pass assessments in a written examination, followed by a combined oral and practical test undertaken with CASA, an approved testing officer or an approved person.

1.4 The written examination will be based on the aeronautical knowledge syllabus detailed in subsections of this Appendix.

1.5 The oral examination will contain relevant questions appropriate to the level and category of licence held.

1.6 Candidates may refer to AIP (complete — including Aerodrome Directory) and Parts 20 to 99 of the Civil Aviation Orders during the written examination. However, the candidate should be aware that time constraints in the written examination may be such that automatic recall of many items will be required to complete the examination in the time allowed. The items recommended for recall are annotated with an asterisk.

1.7 A knowledge of Australian climatology as enumerated in the Bureau of Meteorology publication, *Manual of Meteorology*, *Parts 1 and 2*, is assumed. The seasonal variations in the location and frequency of the following phenomena are emphasised:

(a) frontal weather;

(b) tropical cyclones;

(c) dust devils;

(d) thunderstorms;

(e) jetstreams;

(f) fog.

2 Aeronautical knowledge

2.1 Determine the action necessary to obtain the meteorological documentation required by AIP for a flight to any aerodrome in Australia.

2.2 Use any meteorological document specified in AIP MET to determine the feasibility of an I.F.R. flight in accordance with the requirements of AIP RAC/OPS-1 OPERATIONAL REQUIREMENTS. All requirements are to be considered either singly or in combination at candidate’s initiative.

* 2.3 Given air temperature in clear air or in cloud, determine approximate height of freezing level, using a temperature lapse rate of 3°C per 1 000 feet in clear air and 1.5°C in cloud.

* 2.4 Given pilot observations, either in clear air or in cloud, of any 1 or more of the following phenomena — turbulence, precipitation, temperature, cloud type predict the probability and likely duration of:

(a) airframe icing; and

(b) hail; and

(c) micro bursts and wind shear; and

(d) turbulence (including CAT).

2.5 Use GPWT wind velocity data to:

(a) predict the probability of CAT; and

(b) identify forecast jetstream.

* 2.6 Recall the flying conditions likely to be associated with any phenomenon listed in meteorological documents enumerated in AIP MET. Flying conditions are defined as the descriptions given in *Manual of Meteorology, Part 2.*

2.7 List the information provided by the Volmet service as detailed in AIP.

2.8 For a radio navigation aid referred to in subparagraph 6.5 (b):

(a) understand the principles of operation, indications and limitations of the navigation aid; and

(b) extract from AIP:

(i) the rated coverage of the radio navigation aids considering aircraft location, altitude and time of day; and

(ii) pilot navigation tolerances.

* 2.9 For NDB bearings:

(a) predict the sense of the error caused by coastal refraction; and

(b) recall the fact that thunderstorms may cause unreliable bearings; and

(c) recall indications of station passage.

* 2.10 For VOR bearings:

(a) recall the cockpit indications of scalloping; and

(b) recall indications of station passage.

2.11 Given heading and relative NDB bearings:

(a) calculate track to and from the NDB; and

(b) fix position given relative bearings of 2 stations; and

(c) calculate drift relative to planned track; and

(d) calculate the relative bearing which will indicate the aircraft is abeam a station; and

(e) calculate the relative bearing which will indicate that a desired track to or from an NDB has been intercepted, given the intercept heading; and

(f) calculate the heading to steer to intercept desired inbound track before reaching the NDB.

2.12 State the VOR radial the aircraft is on given appropriate cockpit instrument indications including course needle indications of up to 4 dots from central.

2.13 State VOR OBS settings required to provide command indications when flying on given tracks both to and from the VOR.

2.14 Fix position, given cockpit instrument indications utilising VOR and NDB stations.

2.15 State the instrument indications showing that the aircraft is abeam the VOR on a given track.

2.16 Calculate the heading to steer to intercept track to or from a VOR, given original heading and progressive instrument indications showing that the aircraft is drifting away from the desired track.

2.17 Fix position, given instrument indications utilising a DME and either NDB or VOR.

2.18 Recall the prohibition on the operation of aircraft radar equipment within 37 m or 60 m of refuelling equipment, persons or cargo, other aircraft and hangars, as specified in Civil Aviation Orders.

2.19 Plan I.F.R. flights between any aerodromes in Australia.

(a) The following factors are to be considered:

(i) pilot qualifications:

– fitness: CAO section 48.0, paragraph 1.4; and recent experience: CAO section 40.2.1, subsections 11 and 14;

(ii) aircraft certification:

– limitations on I.F.R. flight as specified in the flight manual;

(iii) airways operational requirements as specified in:

– AIP; and

– CAOs.

(b) The following concepts are emphasised:

(i) whether or not the flight may proceed is to be determined by the pilot on his or her own initiative;

(ii) route selection limitations:

– as specified in AIP, RAC/OPS and ERS; and

– LSALT and freezing level; and

– LSALT and engine out aircraft performance;

(iii) determination of LSALT for routes not shown in AIP map;

(iv) table of cruising levels;

(v) alternate aerodrome requirements:

– weather; and

– navigation aids; and

– lighting (including personnel in attendance requirements); and

– availability of weather reports; and

– divert time;

(vi) holding requirements:
- weather; and
- traffic;

(vii) NGT V.F.R. planned on last route segment:
- pilot night recency requirements; and
- alternate requirements;

(viii) airways clearance requirements;

(ix) determination of take-off criteria including departures from aerodromes without navigation aids and MET minima in the event of an engine failure after take-off.

(c) Candidates will be permitted access to:

(i) AIP; and

(ii) CAOs; and

(iii) MET documentation; and

(iv) NOTAMS Class I and II; and

(v) operational requirements specified by ATC, i.e., holding and alternates requirements; and

(vi) aircraft speeds; and

(vii) aircraft endurance; and

(viii) aircraft limitations on I.F.R .flight as specified in the flight manual.

2.20 Conduct an I.F.R. flight anywhere in Australia in accordance with airways operations procedures as detailed in AIP RAC/OPS-1, DAP and ERS. Particular emphasis is given to:

(a) ATC clearances;

(b) operation of aircraft transponders;

(c) departure procedures:

(i) SID;

(ii) OCTA, CTR and GAAP;

(iii) establishing outbound track, including LSALT, traffic and reporting considerations;

(iv) validity of flight plan; and

(v) procedures in the event of loss of radio communication;

(d) climb and cruise procedures:

(i) changes of level including altimetry; and

(ii) amended estimates;

(e) approach and landing procedures:

(i) OCTA, CTR and GAAP;

(ii) visual approach procedures;

(iii) procedures in the event of loss of radio communications;

(iv) cancellation of SAR;

(v) landing manoeuvres OCTA;

(vi) V.M.C. separation procedures for I.F.R. flight under GAAP; and

(vii) operation of VHF aerodrome lighting (PAL).

* 2.21 Recall the privileges and limitations conferred by instrument ratings detailed in subsection 13 of this section.

* 2.22 Identify the documents required to be carried on an I.F.R. flight.

* 2.23 Recall the minimum obstacle clearance criteria for a missed approach as specified in IAL.

* 2.24 Recall the conditions under which an aircraft may descend below minimum safe altitude as detailed in IAL.

* 2.25 Recall the circumstances in which a missed approach must be executed.

* 2.26 Recall the obstacle clearance provided by the minimum circling altitude for I.F.R. aircraft as defined in IAL, both day and night.

3 In flight

3.1 While acting as pilot of the aircraft demonstrate the ability to perform solely by reference to instruments (except where otherwise specified by these Orders) the undermentioned manoeuvres, procedures and actions; within the tolerances laid down in Appendix I of this section and IAL:

(a) all appropriate checks;

(b) plan a satisfactory flight path to cater for the failure of an engine at any stage of the flight;

(c) take-off with the control of the aircraft being fully transferred to reference of flight instruments not later than the take-off minima for the aircraft concerned;

(d) efficient cockpit management;

(e) climb;

(f) maintain aircraft within tracking tolerances using correct order of precision of radio navigation track guidance;

(g) climbing turns;

(h) transition to cruise;

(i) cruise;

(j) turbulence penetration;

(k) steep turns;

(l) descending turns;

(m) descent;

(n) holding;

(o) missed approach (normal);

(p) applicants for command instrument rating only missed approach (1 engine out, multi-engine aircraft);

(q) circling approach and landing from minimum circling altitude;

(r) instrument approach utilising the aid/aids for which an instrument endorsement is required;

(s) applicants for a command instrument rating only maintain control of a multi-engine aircraft during a simulated engine failure;

(t) recover to straight and level flight from unusual attitudes to include:

(i) nose high, speed reducing spiral climb; and

(ii) nose low, speed increasing spiral dive; and

(iii) approximately level flight at speeds not less than 1.2 V_S for the aircraft configuration and weight.

3.2 Aeroplanes — Conduct the following manoeuvres, within the stated limits and without either primary attitude indicator and/or the primary heading source:

(a) straight and level flight;

(b) straight climb and descent;

(c) climbing and descending turns at rate 1;

(d) maintain heading ± 15°;

(e) maintain height ± 200 feet;

(f) recover to straight and level flight from unusual attitudes to include the manoeuvres described in 3.1 (t).

3.3 Helicopters — (all instruments) recover to straight and level flight from unusual attitudes to include:

(a) nose high, speed reducing spiral climb; and

(b) nose low, speed increasing spiral dive; and

(c) approximately level flight at speeds not less than V_{min} IMC.

3.4 Helicopters — (all instruments) enter autorotation after a simulated engine failure (single engine helicopters) or after initiating an emergency descent (multi-engine helicopters).

Appendix IV

Syllabus of training for the use of GNSS under the I.F.R.

Section 1 Primary means enroute navigation

GPS system components and principle of operation

Demonstrate an understanding of the GPS system and its principles of operation:

- GPS system components, space, control and user
- Aircraft equipment requirements
- GPS satellite signal and pseudo random code
- Principle of position fixing
- Method of minimising receiver clock error
- Minimum satellites required for navigation functions
- Masking function
- Performance limitations of various equipment types
- GNSS use of WGS84 coordinate system

Navigation system performance requirements

Define the following terms in relation to a navigational system and recall to what extent the GPS system meets the associated requirements:

- Accuracy
- Integrity:
  - » Means of providing GNSS integrity
  - » RAIM, procedural, systems integration
- Availability
- Continuity of service

Authorisation and documentation

- Recall the requirements applicable to pilots and equipment for GPS operations
- Pilot training requirements
- Log book certification
- Aircraft equipment requirements
- GNSS Notams

GPS errors and limitations

Recall the cause and magnitude of typical GPS errors:

- Ephemeris
- Clock
- Receiver
- Atmospheric/ionospheric
- Multipath
- SA
- Typical total error associated with C/A code
- Effect of PDOP/GDOP on position accuracy
- Susceptibility to interference
- Comparison of vertical and horizontal errors
- Tracking accuracy and collision avoidance

Human factors and GNSS

Be aware of the human factors limitations associated with the use of GNSS equipment. Apply GNSS operating procedures which provide safeguards against navigational errors and loss of situational awareness because of the following:

- Mode errors
- Data entry errors
- Data validation and checking including independent cross checking procedures
- Automation induced complacency
- Non-standardisation of the GNSS – pilot interface
- Human information processing and situational awareness

GNSS equipment-specific navigation procedures

Recall and apply knowledge of appropriate GNSS operating procedures to typical navigational tasks using a specific type of aircraft equipment, including:

- Select appropriate operational modes
- Recall categories of information contained in the navigational database
- Predict RAIM availability
- Enter and check user defined waypoints
- Enter/retrieve and check flight plan data
- Interpret typical GNSS navigational displays LAT./Long, distance and bearing to waypoint, CDI
- Intercept and maintain GNSS defined tracks
- Determine TMG, GS, ETA, time and distance to WPT, WV in flight
- Indications of waypoint passage
- Use of direct to function
- Use of nearest airport function
- Use of GNSS in GPS and DME/GPS arrival procedures

GNSS equipment checks

For the specific type of aircraft equipment, carry out the following GNSS operational and serviceability checks at appropriate times:

- TSO status
- Satellites acquired
- RAIM status
- PDOP/GDOP status
- IFR Database currency
- Receiver serviceability
- CDI sensitivity
- Position indication

GNSS warnings and messages

For the specific type of aircraft equipment recognise and take appropriate action for GNSS warnings and messages, including the following:

- Loss of RAIM
- 2D navigation
- In Dead Reckoning mode
- Database out-of-date
- Database missing

- GNSS fail
- Barometric input fail
- Power/battery fail
- Parallel offset on
- Satellite fail

Section 2 GNSS non-precision approaches

RNAV(GNSS) operational modes

Syllabus requirements

Criteria to be met by applicant:

- know the conditions and actions that allow the GNSS receiver to function in the appropriate mode for the successful conduct of a RNAV(GNSS) approach. Know the parameters applicable to tracking tolerances, automatic waypoint sequencing, CDI sensitivity and RAIM availability in each of the following segments:
  - » entry
  - » RAIM availability
  - » initial approach
  - » intermediate approach
  - » final approach
  - » missed approach
- state the indications requiring a missed approach to be initiated

Competence to be shown

Applicant to demonstrate:

- that he or she can correctly state the mode of operation required during each segment of a RNAV(GNSS) approach, the conditions required to transition to and operate in that mode, and the associated CDI sensitivity and RAIM protection provided

Methods of RAIM prediction

Syllabus requirements

Criteria to be satisfied by applicant:

- know the parameters applicable to RAIM warnings in the en route, terminal and approach modes
- know the effect of availability or otherwise of baro-aiding on RAIM availability and prediction
- be able to predict RAIM availability at destination and ETA using:
- aircraft GNSS receiver; and
- if available, an external RAIM prediction service
- know the effect of satellite unserviceability on the reliability of each type of prediction
- know the effect of each type of RAIM prediction on operational requirements

Competence to be shown

Applicant to demonstrate:

- that he or she can accurately predict, within 1 hour before departure, the availability of approach RAIM at the destination or alternate aerodrome within ± 15 minutes of ETA
- that he or she knows any limitations which apply to the prediction

Operational requirements

Syllabus requirements

Criteria to be met by applicant:

- know the operational requirements which apply to planning a flight on the basis of conducting a RNAV(GNSS) procedure at the destination

Competence to be shown

Applicant to demonstrate:

- that he or she can, in a given operational situation, correctly state the alternate or holding requirements that apply at a destination served by a RNAV(GNSS) procedure

Human factors and GNSS operation

Syllabus requirements

Criteria to be met by applicant:

- be able to describe how the following factors may adversely affect the conduct of a RNAV(GNSS) procedure and describe suitable pilot procedures to minimise those effects:
  - » data input
  - » functions selection logic
  - » automation effects
  - » fixation
  - » mode awareness
  - » alert modes
  - » the control loop
  - » situational awareness

Competence to be shown

Applicant to demonstrate:

- that he or she knows operating procedures for GNSS equipment which eliminate, as far as possible, errors due to any of the factors specified

Appendix V

Cyclic training and proficiency programs

For the purposes of paragraphs 11.8 and 12.1, an operator's cyclic training and proficiency program must:

(a) be relevant to a type of aircraft operated by the operator; and

(b) be conducted in an approved flight simulator that provides an accurate representation of the flight deck of a type of aircraft operated by the operator; and

(c) require a participant in the program to demonstrate during each session that he or she can safely conduct a flight under the I.F.R. in the type of aircraft represented by the simulator used for the session; and

(d) require a participant in the program to demonstrate during each session that he or she is proficient in the normal, and emergency, flight manoeuvres and operating procedures for the type of aircraft represented by the simulator used for the session; and

(e) require a participant in the program to demonstrate during each session that he or she is proficient in cockpit resource management techniques.

Notes to Civil Aviation Order 40.2.1

Note 1

The Civil Aviation Order (in force under the *Civil Aviation Regulations 1988*) as shown in this compilation comprises Civil Aviation Order 40.2.1 amended as indicated in the Tables below.

Table of Orders

Year and number	Date of notification in *Gazette*/ registration on FRLI	Date of commencement	Application, saving or transitional provisions
CAO 2004 No. R34	8 December 2004	8 December 2004 (*see* s. 2)	
CAO 40.2.1 2006 No. 1	FRLI 24 March 2006	25 March 2006 (*see* s. 2)	
CAO 40.2.1 2006 No. 2	FRLI 24 May 2006	25 May 2006 (*see* s. 2)	
CAO 40.2.1 2007 No. 1	FRLI 19 December 2007	20 December 2007 (*see* s. 2)	
CAO 40.2.1 2008 No. 1	FRLI 22 December 2008	23 December 2008 (*see* s. 2)	

Table of Amendments

ad. = added or inserted am. = amended rep. = repealed rs. = repealed and substituted

Provision affected	How affected
s. 40.2.1	rs. CAO 2004 No. R34
subs. 6	am. CAO 40.2.1 2006 No. 1
subs. 8	am. CAO 40.2.1 2008 No. 1
subs. 9	am. CAO 40.2.1 2006 No. 2
subs. 10	am. CAO 40.2.1 2006 No. 1
subs. 10A	ad. CAO 40.2.1 2008 No. 1
subs. 10B	ad. CAO 40.2.1 2008 No. 1
subs. 10C	ad. CAO 40.2.1 2008 No. 1
subs. 12	am. CAO 40.2.1 2007 No. 1
subs. 12A	ad. CAO 40.2.1 2007 No. 1
subs. 13	am. CAO 40.2.1 2006 No. 1
subs. 13A	am. CAO 40.2.1 2006 No. 1
Appendix I	am. CAO 40.2.1 2006 No. 1; CAO 40.2.1 2008 No. 1
Appendix II	am. CAO 40.2.1 2006 No. 2