

► This RA has been substantially re-written; for clarity no change marks are presented - please read RA in entirety ◀

## RA 2120 - Pilots' Instrument Rating Scheme

### Rationale

*Pilots are sometimes required to fly Aircraft with insufficient visual references, or in shared airspace where Visual Flight Rules may be inappropriate or disallowed. Failure to safely fly their Aircraft to permitted limits solely by reference to instruments, or failure to comply with Instrument Flight Rules (IFR) for coordinating with other Aircraft and Controllers in shared airspace, increases the Risk to Life posed to Aircraft occupants and third parties on the ground. The pilots' Instrument Rating (IR) Scheme requires Aviation Duty Holders (ADH) and Accountable Managers (Military Flying) (AM(MF)) to adopt suitable measures to ensure pilots have appropriate qualifications, recent experience, knowledge, and skill to operate safely in these circumstances. Categorizations of Instrument Ratings provide a graduated scale based on experience as an indicator of demonstrated competence in Instrument Flying (IF)<sup>1</sup>.*

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### Regulation

**2120(1)**

#### Instrument Rating Requirements

2120(1) All pilots who fly UK Military Aircraft in Instrument Meteorological Conditions (IMC); or with insufficient visual references; or under IFR - **shall** hold a valid IR for their Aircraft type(s).

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#### Instrument Rating Requirements

1. **Crewed Aircraft.** Pilots of crewed Aircraft flying in IMC, or with insufficient visual references, or under IFR, **should** hold a valid IR.
2. **Remotely Piloted Aircraft (RPA).** Pilots of RPA in the Certified and Specific S2 Categories flying Beyond Visual Line of Sight (BVLOS), without a sensor certified for flight by visual references alone, **should** hold a valid IR.
3. **IR Training Design.** ADH / AM(MF) **should** define in orders the criteria for award of an IR for their Aircraft type(s). An IR **should** assure pilot competency in relation to:
  - a. Safe Aircraft handling when IF (such as in IMC or when BVLOS), and;
  - b. Knowledge, skills, and experience for safe flight under IFR<sup>2</sup> in classes of airspace in accordance with (iaw) the Air System Safety Case (ASSC)<sup>3</sup>, Military Permit To Fly (MPTF) and / or Release To Service (RTS).
4. **Training Prior to IR Award.** In derogation to this Regulation (to cater for training), ADH / AM(MF) **should** define in orders any circumstances under which a pilot with appropriate IF supervision may fly in IMC without a valid IR, including minimum competence requirements. The following circumstances **should** be considered:
  - a. IF towards award of an IR or revalidation of a lapsed IR, when crewed with another pilot who holds a valid IR.
  - b. Provision for an IF competence check to demonstrate competence in IF where the requirements for initial award or revalidation of an IR are not met. An IF competence check **should not** confer the same privileges as an IR and **should not** be used for continuous IMC operations or flight under IFR. IF competence checks **should** be documented in pilots' flying training records.

<sup>1</sup> Refer to MAA 02 – MAA Master Glossary.

<sup>2</sup> Refer to RA 2307 – Rules of the Air.

<sup>3</sup> Refer to RA 1205 – Air System Safety Cases.

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- c. Aircraft Commanders flying without sufficient visual references as part of a recognized flying training course who hold an appropriate IF competence check.
5. **IR Award.** The appropriate ADH / AM(MF) or Flight Operations Post Holder (FOPH) **should** only award an IR to a pilot after either a satisfactory recommendation from an Aircrew Instructor<sup>1</sup> (AI) or Aircrew Examiner<sup>4</sup> (AE) following an Instrument Rating Test (IRT), or by recognition of a current and valid civil IR<sup>5</sup>. If stipulated in ADH / AM(MF) orders, decisions on the award of an IR may be delegated to either:
- Type-specific Qualified Aircrew Instructors (Qualified AI), with a Green or Master Green IR; or,
  - Instrument Rating Instructors (IRI) or Examiners (IRE).
6. **IR Award Category.** An IR **should** be categorized Amber, White, Green or Master Green, commensurate with flying experience, together with knowledge and accuracy demonstrated during the IRT as specified in ADH / AM(MF) orders.
7. **IR 'Frozen' Category.** If a pilot flies an IRT to the White, Green or Master Green standard, but has fewer than the minimum hours specified by the ADH / AM(MF) for the award of that category, they **should** be granted a 'Frozen' IR. The pilot is awarded a lower IR, which is upgraded automatically if the minimum hours requirement is achieved within 3 months of the test. The timescale in which the hours **should** be achieved could be restricted further by the ADH or AM(MF).
8. **IR 'Regression' Category.** A Green or Master Green IR **should** automatically regress to a White IR and a White IR to Unrated status if the minimum currency and practice requirements are not completed, provided the minimum currency and practice requirements are sufficient for the lower IR category. In either instance, the pilot **should** complete the currency backlog to regain their previous IR. An Unrated pilot **should** do so under appropriate IF supervision.
9. **Recording the IR Award.** On award of an IR, or a change to / from a Frozen or Regression Category, full details **should** be recorded in the pilot's Flying Logbook and their flying training record, including as a minimum:
- IR category;
  - Any restrictions (such as types of approach or classes of airspace)<sup>6</sup>;
  - Expiry date;
  - Aircraft type and mark;
  - Any Performance Based Navigation (PBN) endorsement.
10. **IR Applicability in Multi-Pilot Air Systems.** ADH / AM(MF) **should** define in orders which category limitations apply for crews with more than one pilot (if they hold different IR categorizations).
11. **IR Recognition Across Aircraft Types or Marks.** ADH / AM(MF) **should** define in orders if award of an IR on an Aircraft type or mark is valid for another Aircraft type or mark. This **should** only be permitted for pilots who routinely remain qualified and current on multiple types or marks.
12. **IF Currency.** ADH / AM(MF) **should** define in orders IF currency minima required to maintain validity of an IR. This **should** include a minimum number of IF hours and instrument approaches for that Aircraft type in a specified period. Where necessary, IF currency minima **should** also include applicability of IF training (including recordable hours) conducted across multiple types, or in a multi-crew environment. ADH / AM(MF) **should** also determine the number of IF simulator hours and / or approaches that may be accredited to IF currency, or an IRT<sup>7</sup>.

<sup>4</sup> An 'Aircrew Examiner' is authorized to certify (but not instruct) other Aircrew to operate Air Systems within the Defence Air Environment.

<sup>5</sup> Subject to ADH / AM(MF) considering the civil licence demonstrates the necessary knowledge, skills and experience for their Aircraft type and role.

<sup>6</sup> An ADH / AM(MF) may remove restrictions later, subject to re-assessment of any IRT requirements that were omitted.

<sup>7</sup> Refer to RA 2375 – Qualification and Approval of Flight Simulator Training Devices.

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13. **IF Practice and Simulated IF.** ADH / AM(MF) **should** ensure that all pilots who are required to maintain an IR are given opportunities for adequate practice evenly distributed throughout the period of their appointment. IF practice and simulated IF, where during a live flight external visual references are artificially limited, **should** normally be carried out in Air Systems fitted with dual controls and supervised by a Safety pilot iaw RA 2307<sup>2</sup>. Live flying exercises involving unusual attitudes **should** be conducted in Visual Meteorological Conditions (VMC).

14. **IR Expiry.** Subject to maintaining IF currency minima, an IR **should** expire 13 months from the date of the first flight of the IRT. ADH / AM(MF) **should** only grant extensions to the 13 month expiry for essential operational reasons or exceptional circumstances. Where this is the case, any extension **should** be approved personally and in writing by the appropriate ADH or AM(MF).

15. **Cancellation of an Award or Appointment.** A pilot's IR **should** be cancelled by their ADH / AM(MF) or delegated authority, if there is evidence that the pilot is no longer competent to hold the IR. Similarly, an appointment as an IRI or IRE **should** be cancelled on the recommendation of the ADH / AM(MF) if there is evidence that the IRI or IRE is no longer competent. If an award or appointment is cancelled the word 'CANCELLED' **should** be written or stamped in red over the appropriate entry in the pilot's Flying Logbook and recorded in their flying training record.

16. **Appointment as an IRE or IRI.** An IRE / IRI is an AE or AI who is qualified to deliver assessment or training for an IR. Pilots **should** only be appointed as an IRE / IRI after an examination approved by an ADH / AM(MF). Authority to appoint IRE / IRI **should not** be delegated below OF4 level or the FOPH. Experienced IRE and IRI may be appointed as Command IRE (CIRE) or Command IRI (CIRI). IRE / IRI **should** hold at least a Green category IR valid for all types of approach and classes of airspace relevant to the Aircraft type(s) for which they instruct, or examine.

**Performance Based Navigation (PBN)**

17. **PBN Training and Currency.** ADH / AM(MF) **should** define in orders suitable training and currency requirements for PBN endorsements appropriate to their Aircraft type(s).

18. **PBN Endorsements.** Pilots **should** be granted PBN privileges as part of their IR, appropriate to their Air System's certified navigation specification and iaw the ADH / AM(MF) approval, when they have successfully completed an IRT containing type-specific PBN assessments and either:

- a. A course of PBN theoretical knowledge and practical flying training equivalent to the requirements of Annex I of the European Union Aviation Safety Agency (EASA) Part-Flight Crew Licencing (Part-FCL)<sup>8</sup>, including PBN elements appropriate to the Air System(s) to be operated, or;
- b. An assessment of previous PBN training and experience which satisfies the ADH / AM(MF) that competence acquired is equivalent to that gained through the specified course for the Aircraft type.

19. **Required Navigation Performance (RNP) Approach (APCH) Restrictions.** For Aircraft approved for RNP APCH, if the IRT does not include an RNP APCH exercise, the PBN endorsement for the pilot is restricted and the Flying Logbook entry **should** state 'No RNP APCH' (eg Voyager White / PBN / No RNP APCH).

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20. **Practical Training Environment.** Practical flying training for an IR may be conducted during a live sortie in IMC or under simulated IF conditions, or using an appropriately qualified and approved Flight Simulator Training Device<sup>7</sup> (FSTD).

21. **IR Recognition Across Aircraft Types or Marks.** In determining applicability of an IR from one type or mark of Aircraft to one or more other types, ADH / AM(MF) will need to consider such factors as types of approach, approved classes of airspace,

<sup>8</sup> Refer to Annex I of the EASA Part-FCL.

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asymmetric characteristics, instrument / cockpit layouts, performance, handling, and Air System complexity.

22. **Classes of Airspace.** Notwithstanding general privileges conferred by a pilot's category of IR, limitations will apply in those classes of airspace for which the Air System is not equipped - unless the appropriate Air Traffic Control (ATC) authority has given clearance and it is permitted by the Air System RTS or MPTF.

23. **Command IRE / IRI.** Command IRE / IRI are appointed by ADH / AM(MF) to signify higher levels of experience and competence. They provide support to less experienced IRE / IRI, guidance and assurance to the ADH / AM(MF) in design and management of the IR scheme - and may support several Aircraft types.

**IR Categories**

24. **Unrated.** All pilots who don't hold a valid IR for that Aircraft type are Unrated, whether or not they have completed an IF competence check. An Unrated pilot who inadvertently enters IMC will minimize time spent in IMC to that necessary to regain VMC.

25. **Amber IR.** The Amber IR will normally be awarded to pilots who have passed the appropriate flying and ground tests but lack the experience or currency criteria laid down for the award of a White or Green IR.

a. **Privileges.** The Amber IR qualifies a pilot to carry out the following tasks.

- (1) IMC: Airways crossing. Flight in Class F and G airspace.
- (2) Special VFR: Flight in Class D airspace.
- (3) IFR: Flight in Class D and E airspace while under the control of the authority controlling that airspace.
- (4) Operational Air Traffic (OAT): All classes of airspace in the UK.

b. **IR Allowance.** A pilot holding an Amber IR will add the allowance of 300 ft to procedure minima when calculating Decision Height / Altitude (DH / DA) and Minimum Decent Height / Altitude (MDH / MDA).

26. **White IR.** The White IR will normally be awarded to pilots who have passed the appropriate flying and ground tests but lack the experience or currency criteria for the award of a Green IR.

a. **Privileges.** The unrestricted White IR qualifies a pilot to operate as General Air Traffic (GAT) or OAT in all classes of airspace.

b. **Restrictions.** ADH / AM(MF) may specify restrictions that apply to the issue of the White IR according to the experience of the pilot or the limitations of the Air System type.

c. **IR Allowance.** A pilot holding a White IR will add the allowance of 200 ft to procedure minima when calculating DH / DA and MDH / MDA.

27. **Green IR.** The Green IR will normally be awarded to pilots who have passed the appropriate flying and ground tests and who meet the minimum experience and currency criteria for the award of a Green IR:

a. **Privileges.** The unrestricted Green IR qualifies a pilot to operate as GAT or OAT in all classes of airspace.

b. **Restrictions.** ADH / AM(MF) may specify restrictions that apply to the issue of the Green rating according to the experience of the pilot or the limitations of the Air System type.

c. **IR Allowance.** The allowance for a Green IR is zero – procedures may be flown to the published minima.

28. **Master Green IR.** The Master Green IR will normally only be awarded to pilots who have displayed superior airmanship. It recognizes a higher level of experience and accomplishment in IF:

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- a. **Privileges.** The unrestricted Master Green IR qualifies the pilot to the same level as a Green IR and confers the same privileges.
- b. **Restrictions.** ADH / AM(MF) may specify restrictions that apply to the issue of a Master Green IR.
- c. **IR Allowance.** The allowance for a Master Green IR is zero – procedures may be flown to the published minima.

29. **Civilian IR Equivalency.** ADH / AM(MF) may allow a civilian IR to be used to confer a military IR; however, in doing so they must ensure that all the criteria contained within this Regulation are met.

30. Civilian and Service FSTD Instructors who conduct IRTs will be nominated as IRE / IRI and fly their qualifying IRT in the FSTD to Green standard. Those nominated will only be approved by CIRE / CIRI after being observed briefing, conducting, and debriefing a simulator IRT. FSTD IRE / IRI will be valid for 13 months from the date of the test.

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**Instrument Rating Test**

2120(2) All pilots **shall** demonstrate their ability to fly a UK Military registered Aircraft accurately and safely by reference to instruments alone and iaw airspace requirements before being issued an IR.

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**Instrument Rating Test**

31. If conferring a military IR based on recognising equivalence of a civil IR, an ADH / AM(MF) **should** conduct to a gap analysis and supplemental training to mitigate any differences between applicable military IR training design for the Aircraft type, and the civil IR syllabus<sup>9</sup>.

32. The IRT **should** be a live flight or IFSTD<sup>7</sup> test in addition to a ground examination as promulgated by ADH / AM(MF), relevant to Air System type. Flight tests and ground examinations for IR **should** only be conducted by a type-specific Qualified AI with a suitable IR, or an appointed CIRE / CIRI / IRE / IRI.

33. During the IRT, which may be taken under simulated or actual instrument flight conditions, a pilot **should** demonstrate their ability to fly accurately and safely by reference to Air System instruments alone and to the limits of the aids available. When fitted and not otherwise restricted, the head-up display **should** be used as the primary attitude reference during the IRT. The exercises included in the IRT **should** be promulgated in ADH / AM(MF) orders: all tests **should** comply with the provisions below.

34. **IRT Report.** On completion of flight and ground tests, an IRT Report **should** be completed and filed in the pilot's flying training record.

35. **IRT Accuracy Parameters.** The parameters for the level of accuracy that pilots **should** be assessed against for the mandatory sections of the test are in Tables 1, 2 and 3 (see AMC Paragraph 36– Assessment Parameters). For Aircraft capable of operating between fixed wing and rotary wing modes (such as tilt-rotor Aircraft) ADH / AM(MF) **should** specify IRT accuracy parameters within those of either Table 2 or Table 3, based on the ASSC.

<sup>9</sup> For CAA / EASA, refer EASA-Part Flight Crew Licencing FCL.600-IR.

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Table 1. Tracking Parameters, Instrument Approach (all Aircraft, all ratings).

Type of Approach <sup>10</sup>	Parameters of Permitted Deviation
Lateral and vertical Angular deviations (eg ILS, Localiser Performance with Vertical Guidance (LPV) Approaches)	±½ full scale deflection of azimuth or glide path indication during the final approach.
Linear lateral deviations (eg 2D <sup>11</sup> Lateral Navigation (LNAV), 3D <sup>12</sup> LNAV / Vertical Navigation (VNAV) Approaches)	±½ the RNP value associated with the procedure. Brief deviations from this standard up to a maximum of the full RNP value are allowable.
Linear vertical deviations (eg 3D LNAV / VNAV Approach using Baro VNAV)	Not more than – 75 feet below the vertical profile at any time, and not more than + 75 feet above the vertical profile at or below 1000 feet above Aerodrome level.
Precision Approach Radar (PAR), Surveillance Radar Approach (SRA)	The correct and timely application of Controller instructions.
Radio Aid Approaches (eg TACAN / VOR / NDB Approaches)	±5 degrees of published tracks.
Non-Standard Aircraft-Specific Approaches (eg GPS Automatic Take-Off or Landing System).	As published in ADS, with pilots to identify and respond appropriately to out-of-limit conditions (defined by ADH / AM(MF)).

Table 2. Fixed Wing Aircraft.

IR Category	Parameters of Permitted Deviation
Amber and White Ratings	±10 degrees of heading ±10 knots / 0.03 M ±100 feet (but ±200 feet above FL 250 and +100 feet to -0 feet at MDH / MDA)
Green and Master Green Rating	±5 degrees of heading ±5 knots / 0.02 M ±100 feet (but ±200 feet above FL 250 and +100 feet to -0 feet at MDH / MDA)

Table 3. Rotary Wing Aircraft.

IR Category	Parameters of Permitted Deviation
Amber, White, Green Ratings	±10 degrees of heading ±10 knots ±100 feet (but +100 feet to -0 feet at MDH / MDA)
Master Green Rating	±5 degrees of heading ±5 knots ±100 feet (but +100 feet to -0 feet at MDH / MDA)

36. **Assessment Parameters.** Except for approach minima, which are mandatory, the IRT parameters **should** be a guide to assessment only and apply to conditions of nil or light turbulence. In more difficult conditions the testing officer **should** grant a degree of latitude to the pilot under test. Greater importance **should** be attached to smooth flying using the recommended techniques, with associated captaincy, cockpit management and airmanship appropriate to the type and role of Air System on which tested, and the IR awarded. Candidates for the IRE / IRI test **should** plan, brief, fly, debrief and assess their own test in the presence of a CIRE / CIRI.

37. **Accuracy in Atypical Situations.** The limits of accuracy expected during simulated emergencies, flight on standby instruments or for operational exercises will depend on Air System instrumentation and operational requirements. The limits for these sections of tests **should** be laid down in ADH / AM(MF) orders.

<sup>10</sup> Refer to Military Manual of Air Traffic Management; Air Publication 3456 – RAF Manual of Flying; and Air System Document Sets (ADS) for information on relevant approach types.

<sup>11</sup> 2D Approaches have lateral guidance only (eg VOR, TACAN, NDB, LNAV Approaches).

<sup>12</sup> 3D Approaches have lateral and vertical guidance (eg ILS, LPV, LNAV / VNAV Approaches).

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38. **Management of Automatic Systems.** The IRT **should** assess use of automatic systems to manage crew resource management throughout a sortie. Use of autopilot functions **should** be encouraged, but where pilots may need to fly the Aircraft in a reversionary mode then this **should** also be assessed. Additionally, for Aircraft with an automatic take-off or landing capability, pilots **should** be assessed on their ability to monitor the system for out-of-limit conditions and to safely fly a missed approach procedure in each of the available manual or reversionary methods of control.

39. **Airborne Assessment of Skill.** The IRT schedules for individual Air System types **should** be promulgated in ADH / AM(MF) orders. They **should** be designed to ensure that the pilot has the necessary skills to fly a particular type in all those classes of airspace for which it is equipped, unless restrictions are placed on operations of the Air System by ADH / AM(MF) or the individual by commanders or FOPHs, who may then limit the test accordingly. In these circumstances, the limitations **should** be clearly laid out in the Flying Logbook and the IRT Report.

40. **Conduct of the Test.** Exercises involving reversionary instrumentation, unusual attitudes and simulated emergencies **should** be conducted in a manner that is appropriate to the Air System type and role; unrealistic simulated emergencies **should not** be included. The flight test **should** be conducted on not more than two sorties, but the rating validity **should** expire 13 months after the date of the first sortie.

41. **Crew Co-ordination.** If the Aircraft for the IRT is normally flown with the aid of a crew member, then the candidate **should** be assisted with such information and assistance as would normally be made available to them by the crew. If additional cockpit / Remote Pilot Station crew are specified in the RTS, they should be appropriately qualified<sup>13</sup> to support the pilot during the IRT.

42. **Ground Examination.** Oral or written ground examinations **should** be conducted by an IRE / IRI within 7 days of the flight test on a particular Air System type. IRE / IRI **should** ensure that the candidate's ground knowledge is sufficient for them to fly their Aircraft type safely during instrument flight as pilot or Aircraft Commander. Relevant questions **should** be selected according to the Air System type and role from the following list, and the standard of answers **should** be appropriate to the rating awarded:

- a. **Manual of Military Air Traffic Management.** Many Regulations combine orders for pilots and air traffic controllers; questions **should not** be asked on controller aspects.
- b. **ADH or AM(MF) Orders.**
- c. **Information.** Pilots **should** be able to extract relevant information from appropriate Air Information Publications and Flight Information Publications. Candidates for the IRE / IRI test **should** also be able to extract information on the conduct of IRTs from this Regulatory Article and subordinate documents / publications.
- d. **Flight instruments and Navigation Aids.** Pilots **should** be able to explain the basic principles of operation, list the errors and limitations, and describe the normal and emergency use of the flight instruments and navigation aids that they are required to interpret or operate in flight.
- e. **Meteorology.** Pilots **should** be able to:
  - (1) Discuss the practical properties of the air masses in their likely theatres of operation.
  - (2) Describe the formation, Hazards associated with and avoidance of meteorological phenomena; and decode meteorological documentation.
- f. **Performance.** Pilots **should** be able to make correct use of the Air System Documentation Set and other performance documents normally used on type. Where appropriate, they **should** be able to extract practical performance, holding and diversion information from these documents.

<sup>13</sup> Refer to RA 2101 – Aircrew Qualifications; RA 2102 – Aircrew Competence in Role; and RA 2340 - Supernumerary Crew, Supernumerary Support Crew and Passengers.

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**Instrument Rating Test**

43. The central advisory body regarding IF standards and techniques is Examining Wing of the Central Flying School (CFS). Where authorized, CFS agents may provide advice within their ADH / AM(MF) orders on IF matters.