

BGA APPROVAL PROCEDURE FOR IGC FLIGHT RECORDER CALIBRATION OFFICERS

Reference: IGC Flight Recorder Specification (<https://tinyurl.com/IGCFRSpec>)

Flight Recorder calibrations for use in assessing FAI Badge and Record flights and for checking for airspace infringements in competitions must be carried out by persons approved by the BGA, using equipment which is also approved by the BGA. A list of such people is available from the BGA office and is published when the OOs handbook is updated. In addition calibrations carried out by any laboratory approved by the Civil Aviation Authority or the Ministry of Defence for calibration of altimeters are also acceptable.

It should be possible using the equipment to hold the pressure in the vacuum chamber steady within 0.01 hPa for periods of about one minute and the overall accuracy of the pressure measuring equipment should be within 0.2 hPa after taking appropriate corrections into account. For digital absolute pressure instruments this is normally only the correction for its calibration. Correction procedures for mercury barometers and manometers were published in "BS 2520 Barometer conventions and tables, their application and use", but this was withdrawn in 2013. An Excel spreadsheet giving temperature and local gravity corrections is available from the BGA Sporting Code Officer. Notes on the use of each type of pressure measurement are below in Appendix 1.

Application for Approval

Application for approval should be made to the BGA and should include the following:

1. A description and diagram of the equipment to be used.
2. A copy of the applicant's procedure for carrying out calibrations
3. An example of the chart proposed for an Flight Recorder.

The submission should demonstrate an understanding of the requirements for accurate use of the equipment.

Calibration Law

Calibrations are to be made to the International Civil Aviation Organisation (ICAO) Standard Atmosphere, (ISA) Appendix 2 below.

Preparation of Flight Recorder

The FR should be set to a recording interval of 2 seconds or less.

Procedure

The flight recorder should be placed in a vacuum chamber. Calibration must cover a range from standard Zero Pressure Altitude ISA (1013.25hPa) to 30,000ft or 9,000m ISA. All calibration points including sea level should be approached from a lower pressure altitude (i e by decreasing the pressure). Altitude steps of 1000 ft are required for at least the first 1000ft with 2000ft thereafter. Alternatively, steps of 500m for the first 2000m and 1000m thereafter may be used. A steady pressure for at least 10 successive records on the FR IGC file should be held at each pressure

level. After recording the point at maximum Pressure Altitude, the pressure should be returned slowly to 1013.25 hPa and held long enough to give a clear zero altitude ISA record.

After removing the FR from the pressure chamber, download the IGC file from the Flight Recorder. The altitude at each level must be taken directly from the Pressure Altitude records in the IGC file, not from any analysis software, since some programs may introduce an offset.

The chart must include the following information (See the IGC FR Specification Chapter 4):

Height of each altitude step.

Flight Recorder type and Serial number (S/ID)

Place of calibration.

Date of calibration.

Name, signature and Approval Number of the calibrating officer.

Appendix 1 – Pressure Reference Instruments.

1. Electronic Pressure Gauges. An electronic Pressure Gauge reading in the range 0 to 1200 hPa is recommended, with an output precision of 0.01 hPa or better. The output may read in hPa or ISA pressure altitude. For use in Calibrating Flight Recorders, the instrument must have a valid Certificate of Calibration from a UKAS Accredited Laboratory.

2. Mercury Micromanometers.

2.1 These instruments are not recommended on Health and Safety grounds. If used care must be taken in setting the instrument to a true zero mercury column height at a pressure of 1013.25 hPa.

2.2 The instrument must be checked for verticality of the instrument (a 1 degree error introduces a 0.02% pressure error). The instrument should be cleaned annually in accordance with its maintenance manual, and the mercury checked for purity.

2.3 The column height at each pressure altitude should be corrected for local gravity and ambient temperature (an Excel spreadsheet is available from the BGA Calibration officer to make these calculations).

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