



## **IGC 2019 Plenary Meeting**

### **Agenda Item 6.2.5**



## **GNSS Flight Recorder Approval Committee (GFAC)**

Ian Strachan, Chairman

## **Report to the IGC Plenary 2019**

8 January 2019

# GFAC Committee Report to the IGC Plenary 2019

**1 GNSS Flight Recorders.** A total of 63 main types of GNSS Flight Recorders (FRs) from 20 different manufacturers are currently IGC-approved, 72 when different models within types are included.

References: [www.ukiws.demon.co.uk/GFAC/igc\\_approved\\_frs.pdf](http://www.ukiws.demon.co.uk/GFAC/igc_approved_frs.pdf) or through [www.fai.org/igc-documents](http://www.fai.org/igc-documents)

1.1 Approval Updates. 2018 was a busy year and Approval activity was as follows:

14 February	LXNAV	addition of PowerMouse-IGC with Flarm firmware
15 April	LX Navigation	addition of Eos 80 and Era 57 and Era 80
31 August	LX Navigation	addition of Colibri X
6 November	LX Navigation	Red Box Flarm - update to references to IGC file header record
10 November	LX Navigation	addition of LX 10000, a variant of the LXN Era 80
15 November	LX Navigation	addition of Flarm Eagle and Flarm Eagle Mobile

**2 Update requests to Flight Recorder Manufacturers.** A major programme is currently underway where each manufacturer of an IGC-approved Flight Recorder is being asked (in alphabetical order of manufacturer name) to look at all of their current FR data on the IGC and GFAC web pages, and check that it is up-to-date. As stated above, there are 20 different FR manufacturers and 72 different models of IGC-approved FRs, so this is the largest such exercise ever carried out by GFAC since it was created by IGC in 1995.

2.1 The Update Process. The first IGC-approval documents were published in 1996 and have been updated by GFAC many times over the years. However, today there is an IGC-approval document on the web that dates back to 2003 (Scheffel Themi), followed by one dated 2005 (New Technologies NTE Easy Matchbox), three dated 2007 (Cambridge CAI 302, New Technologies NTE Easy, and the Zander/SDI GP941), 5 dated 2006, and so forth. However, the IT and security environment has changed radically since these years, which is why this large-scale update exercise has been undertaken. It is hoped that by the date of the IGC Plenary, the request-and-reply process will be complete, although this depends on the willingness of many manufacturers and their advisors to reply in the detail that has been requested. In addition, some of the early IGC FR manufacturers have either been taken over by other organisations, may have left the FR business without informing IGC, or simply be out of business. At the time of this report, update requests have been sent to about half of listed FR manufacturers, but the current rate of reply is low and future requests and follow-up questions will be necessary.

2.2 The Way Ahead. The intention is that GFAC, the ANDS Committee and the IGC Bureau will use the above data to recommend a way ahead to the Plenary on subjects such as the balance between current standards of security and ease of use in-the-field, compared to the security and operator situation when older IGC-approvals were first published.

2.3 IGC-approval Levels. There are three IGC-approval levels - Level 1, All Flights; Level 2, All Badges and Distance Diplomas; Level 3, Badge flights up to and including Diamonds. The Approval levels of all current IGC-approved FRs will be re-assessed and a revised list will be prepared by the ANDS and GFA Committees for the information of the IGC Bureau and Plenary together with action dates for future changes, with the intention of reflecting the current security situation rather than conditions of the past.

**3. GPS Lat/Long Accuracy.** Recent tests have shown average errors between 4 to 7 metres at accurately surveyed ground positions at about 51N 001W near Lasham Gliding Centre, UK.

**4 IGC File Analysis.** Many IGC files have been analysed during 2018. These include those from FRs being tested, and files sent to GFAC for analysis and advice. Advice has been given to NACs, competition organisers, pilots, OOs and FR manufacturers.

## 5 Amendments

5.1 SC3 Annex B. Amendment 11 dated April 1918 added provisions for High Altitude Flight Recorders (HAFRs) to allow for flights over 15km by Perlan and other high altitude gliders. Amendment 12 dated October 2018 updated the paragraphs on pilot and glider owner responsibilities for engine recording. A re-draft of Appendix A to SC3B on procedures for changing IGC-approval levels is after the main body of this document and is intended to make it easier to change the levels of old recorder designs which now have major differences compared to the current FR Specification.

5.2 FR Specification. The last amendment to the FR Specification was in April 2016. The next amendment to the FR Specification is under discussion and a report will be made to the Plenary. Some subjects include:

5.2.1 Increase in Private Key length for future types of FR at "All Flights" level. It has been proposed that the length of Private Keys for new designs of FRs for "All Flights" should be doubled from 1536 to 3072 bits for RSA and DSA encryption, 256 bits for ECC encryption and the equivalent for other asymmetric encryption methods.

5.2.2 Recorder Type in the IGC file header. This should be unique, and correspond to labelling on the recorder case and other documents such as Instruction Manuals.

5.2.3 Front-Engine Electric Systems (FES). Originally these were "sustainers" for use in flight. Wording is being updated because many are now powerful enough to allow self-launching.

5.2.4 New Glider Types. For IGC files, it must always be possible to make manual inputs of Glider Type in addition to the list of types provided by some FR manufacturers. This is because it is not possible for such lists to cover all glider types, particularly new ones. This was a point raised by the Sporting Code Committee after a claim had been refused due to an inaccurate glider type in the IGC file.

5.2.5 Starting the IGC file. Recording should always begin when the FR is switched on and movement is detected. An IGC file should not be lost due to special switching requirements before flight.

5.2.6 Engine Recording. A few FRs have both ENL and MOP systems inside the FR, with different frequency sensitivities. This needs to be covered as well as MOP systems connected by cable.

5.2.7 Three-Letter Codes (TLCs). These are being reviewed to include those relevant to the latest FR designs.

6. **GFAC composition**. The GFAC committee consists of the following, in alphabetical order of family name:

Dr Angel Casado PhD  
Dickie Feakes (Technical Advisor)  
Miguel Madinabeitia MSc (Technical Advisor)  
Tim Newport-Peace (Technical Advisor)  
Pete Purdie BSc  
Tim Shirley (retiring when a replacement can be found)  
Ian Strachan FRAeS (GFAC Chairman)  
Dr Hans Trautenberg PhD  
During the year, GFAC member Marc Ramsey resigned from the Committee

\*\* IGC members are invited to put forward other people with some knowledge of IGC Flight Recorder matters to join the Committee \*\*

6 **IGC Plenary**. An update will be given to the Bureau and the Plenary.

Ian W Strachan

Chairman IGC GFA Committee

[ian@ukiws.demon.co.uk](mailto:ian@ukiws.demon.co.uk)

Next page: re-draft of Appendix A to SC3B (referred to in para 5.1 above)

## SC3B APPENDIX A

### CHANGES OF IGC-APPROVAL LEVEL

A1 Lowering of approval level. If GFAC proposes to lower the approval level of a type of IGC-approved recorder, or to remove the approval, this will be discussed with the FR manufacturer, and the IGC ANDS Committee will be informed. The manufacturer will be given the opportunity of offering an upgrade that will retain the existing approval level for modified recorders. The IGC Bureau may also be informed if considered appropriate at this stage.

A1.1 After these discussions, if GFAC still recommends a lowering of the approval level, it will discuss with the ANDS Committee and then inform the IGC Bureau of its detailed proposal.

A1.2 If the proposal is to lower or remove the approval level together with the date on which it is to take effect, after the IGC Bureau has had time to comment or modify the proposal, the decision will be announced to the IGC discussion group ([igcdiscuss@fai.org](mailto:igcdiscuss@fai.org)) and the international soaring newsgroup ([www.rec.aviation.soaring](http://www.rec.aviation.soaring)) avoiding confidential or proprietary information. The next IGC Plenary meeting will be informed as part of the normal procedure for confirmation of Bureau, ANDS and GFAC activities between Plenaries.

A2 Factors in Lowering Approval Levels. These include the following

A2.1 False or Incorrect Flight Data in IGC Files. Evidence that flight data in IGC files from a particular type of IGC-approved recorder has been, or can relatively easily be, manipulated, altered, or is incorrect. For instance, if it can be shown that data can be changed and the file continues to pass the IGC electronic Validation check.

A2.2 FR Security. Evidence that the security of the FR itself has been compromised, or could relatively easily be compromised. This includes where it has been found that security devices in the FR could be bypassed or where the length of security keys or other features in old recorder designs is considered by ANDS and GFAC to make them vulnerable to interference or hacking, after which IGC files might continue to pass the Validation check. This includes cases where security keys are significantly below the current figures for new types of recorders as given in the IGC FR Specification document (for instance para G2.1.2). For existing recorders with security keys or other features that are not considered a current major threat to interference or hacking, the "Grandfather Rights" principle continues to apply where approval levels for these recorders are not changed even though the key length or other features for completely new recorder designs has been increased.

A2.3 Dates of Change. The lowering or removal of IGC-approval level will take effect at a date agreed between GFAC, ANDS, and the IGC Bureau. Where there is a risk that compromised data could be submitted for flight claims from other recorders of the same type, this could be a date soon after the public announcement.

A2.4 Other factors. If the approval level is to be lowered or removed for reasons other than those above, the date of implementation will be decided by GFAC and ANDS and confirmed the Bureau. This will normally be between 6 and 12 months after the date of the public announcement.

A3 Appeal against a lowering or removal of IGC-approval level. The manufacturer of the recorder or any entity with a direct interest (which must be shown in the appeal papers) in that type of recorder (the "appellant") may appeal to have the decision reviewed. Pending the result of the appeal, the decision and its implementation timescale will stand.

A3.1 Making an Appeal. Within one calendar month of the public announcement, the appellant must notify the IGC President, and pay an appeal fee of 1000 Euros to the IGC account at FAI. The fee is refundable if the appeal is upheld. The full case for the appeal must be received by the IGC President or his nominee within a further calendar month with copies to the Chairmen of the IGC ANDS and GFA Committees. Communication by email should include attachments, pictures and diagrams as appropriate.

A3.2 Appellant's Agreement. In submitting the appeal, the appellant agrees to accept the result, which is at the sole discretion of FAI as the legal entity, its agent IGC, its agents the IGC Bureau, ANDS and GFAC committee members and advisors. In making the appeal, the appellant also agrees not to institute proceedings against the FAI or its agents including any person who was involved on behalf of FAI or IGC.

A3.3 Appeal Evidence. The appeal must include evidence in support so that the ANDS, GFAC and the IGC Bureau, can assess it and consider whether the decision should be changed. Where technical evidence is submitted, this will be assessed by the ANDS and GFA Committees, their advisors and other experts who may be nominated.

A3.4 Decision on the Appeal. The IGC Bureau will confirm or modify the decision that was recommended by the ANDS and GFAC Committees (A3.3 above). This will normally be within one calendar month of receiving evidence from the appellant, but if technical detail has to be assessed the timescale may be longer. The decision will be communicated to the appellant before any public announcement is made.

-----



Fédération Aéronautique Internationale  
Avenue de Rhodanie 54  
CH-1007 Lausanne  
Switzerland  
Tel: +41 21 345 10 70  
Fax: +41 21 345 10 77  
[www.fai.org](http://www.fai.org)