

# TECHNICAL SPECIFICATION FOR IGC-APPROVED GNSS FLIGHT RECORDERS

## AMENDMENT LIST NUMBER 7

Date of Effect - 31 January 2022

General: Replace Mb with mb or mbar (12 places in the document)

Page xiii: under WGS84, remove references to the following which no longer exist:

[https://earth-info.nga.mil/GandG/publications/tr8350.2/tr8350\\_2.html](https://earth-info.nga.mil/GandG/publications/tr8350.2/tr8350_2.html)

<https://gis.icao.int/egap/webpdf/REF08-Doc9674.pdf>

Replace: "The large page-counts of these two documents show the complexity of defining such a system"  
with: "The complexity of defining such a system"

1.1.3.3, Validation of data in IGC files - IGC Shell Program, add: This is to ensure that when an IGC file is used to Validate a flight performance, the FR from which the file originated has not been altered in an unauthorised way or incurred damage that could cause errors in flight data, and data in the IGC file used for Validation of a flight is identical to the data initially downloaded from a serviceable and secure FR. In the event of damage or alteration, causing a breach of security, the FR should continue to produce an IGC file but this and future files must fail the IGC Validation process, and the HFFRS record in the IGC file must be changed to read 'SECURITY SUSPECT' (or other relevant data such as SECURITY MICROSITCH OPERATED, etc). See A3.2.4 and A3.2.5 for required data in IGC files and Appendix C for the IGC Shell program. (AL7)

1.1.10.1, add at the end: , and more detail is in Appendix C.

1.1.10.1.2 Validation - Fail. Add: This indicates that the IGC file can not be used for validation of flights to IGC standards of security, and the FR should be returned to the manufacturer or his designated agent for investigation and a security re-set.

2.2.5, first sentence, replace "must be available" by "is required".

3.6, add: delete "The Sporting Code for Gliding (SC3) requires a fix interval of not more than 60 seconds for establishing flight continuity." - this is no longer in SC3. Add: "as well as near Waypoints and Pilot Events (PEV)",

3.6, first sentence, add: 1-second fixing near Waypoints and Pilot Events (PEV). Also, replace: "The choice of fix intervals for normal flight should include a 20 second interval to allow for very long flights (some record flights have been over 14 hours) and 5 and 10 seconds." by "The choice of fix intervals for normal flight must include a 5 second (or longer) interval to allow for very long flights (some record flights have been over 14 hours)".

5.1 to start: The Environmental Noise Level (ENL) system operates completely within the recorder case, and is mandatory for all IGC FRs. It is fundamental for gliders with engines and is sometimes vital in gliders without engines in accident and incident situations.

5.3 to start: For all IGC-approved FRs, a working ENL system is mandatory.

last sentence to read: Where an ENL sensor is fitted it must not be possible to be disabled and must always give significant positive readings when noise is detected.

A2.4 Date line, correct B record to H

Time line, add: HHMMSS (hours, minutes, seconds)

Page 22 under Lat/Long, add: if additional digits are used, for the fractional minutes define the position through LAD and LOF in the I record.

P22 Altitude, line 3 delete: above the WGS84 ellipsoid. (Reason, refers to pressure altitude as well as GPS)

line 3 add: and if necessary with leading minus sign. (Reason, too allow for low lying land)

P22 add: Temperature - TTTttt. TTT with leading zeros (and leading minutes if required). TTT fixed to 3 characters. ttt - number of temperature decimals. The number of fields recorded are those available for temperature in the Record concerned, less 3 already used for TTT. (AL7)

A2.5. title, add: (FILE ID)

A2.5.1, Long file name to be 6 characters XXXXXX.

The note to read: The XXXXXX field has 6-characters, with hyphens at the start and end, with leading zeros if necessary to make up the 6 characters. It can also be used by a manufacturer to differentiate between different FR types, such as using the first characters to indicate each FR type.

A2.5.6 , page 24 : Table of FR Manufacturers, add Avionix,, AVX, and RC Electronics , RCE

A3.1 Title, add: (ID)

table, in Unique FR ID line: Element box to read: XXX or XXXXXX

and add to remarks column : New types of FR must use the IGC long File Name/ID format, see A2.5 for long and short IGC file names. If data follows the FR ID, a hyphen should be used to separate the file name from data that follows, see under Additional Data below.

A3.3, change "Also, Environmental Noise Level (ENL) is mandatory if an engine of any sort is fitted. FXA must be followed by SIU, ENL and MOP, if these are recorded in the FR. Note that although the SIU number is optional in the B record" to "Also, Environmental Noise Level (ENL) is mandatory, and FXA must be followed by SIU, ENL and MOP (if MOP is recorded in the FR)."

3.6, change to: **IGC file - Fix Data.**

3.6.1 Fix Intervals. The choice of fix intervals for normal flight must include 1 second (required for world championships). A 5 second or longer interval should also be provided to allow for very long flights (some record flights have been over 14 hours). 1 second fix intervals should be automatic when near to declared Start, Turn and Finish points. *(Previous wording on PEV follows)*

3.6.2 Other Data. Re-number the old 3.6.1 as 3.6.2

A4.1, change: "followed by optional fields such as SIU and then ENL for Motor Gliders" to "followed by SIU and ENL"

Also change "ENL either 39-41 or 41-43 depending whether SIU is used" to "ENL 41-43"

A4.1.2 table under GNSS Alt, last column add: and negative sign "-". Negative values to have negative sign instead of leading zero.

A7 table - under ANX/ANY/ABZ, add: in degrees per second

under Date, add: UTC

A9.2 , add to IGC file example:

HF FRS SECURITY OK or SECURITY SUSPECT / SECURITY MS OPERATED (as relevant) : TEXTSTRING CRLF

C1.2, delete obsolete reference: <http://www.fai.org/gliding/gnss/freeware.asp>

C4, delete obsolete reference: [www.fai.org/gliding/gnss/freeware.asp](http://www.fai.org/gliding/gnss/freeware.asp).

E1.2, delete "www" before "rec.aviation.soaring".

G4 second sentence to end: , or equivalent system approved by GFAC.

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