Approval document for an IGC Position Recorder (IGC PR) for validation of IGC Silver and Gold Badge Flights

Issuing Authority: Aero Club of India (ACI)
Safdarjung Airport, Aurobindo Marg, New Delhi-110003

Date of effect: 04-05-2018

References: Use the latest version of the documents from the IGC or GFAC web pages and search for "Position Recorder". At the time of issue of this document, the para references are listed below, but may change with future IGC updates.

A. FAI Sporting Code Section 3 (Gliders and Motor Gliders) (SC3) paras 1.1.6, 2.2.6, 2.6.
B. Annex B to the Code (SC3B), pages iv, vi, and paras 1.7, 2.1.1.2, 2.2.2.
C. Annex C to the Code (SC3C), paras 1.2c, 6.1, 6.2, 10 on Data Analysis, Appendix 3, Appendix 4, Appendix 5, particularly paras 1.5b and 1.6
D. Technical Specification for IGC-approved Flight Recorders, para 1.7

1.1. General. This document authorises the use of the GPS recording device described later in para 2 for use as an IGC Position Recorder (PR) for flights under the jurisdiction of the above NAC under the rules and procedures for PRs in the FAI Sporting Code Section 3 (Gliding) and other IGC documents, in particular under References A-D above.

1.2 Flights to be Validated. The FAI Sporting Code for gliders (Reference A above) allows IGC Position Recorders to be used for flights for Silver and Gold IGC Badges only. For other badge, diploma and record flights, an IGC-approved Flight Recorder (FR) must be used, and an FR can also be used for Silver and Gold badge flights.

1.3. Scope. This document covers only the PR recording function and the data in the IGC-format file that is downloaded from it (Reference D and 3.3 below). Other functions in the PR and other modules that can be connected, are not the responsibility of the NAC or IGC.

Type of IGC Position Recorder

2.1. Name of IGC Position Recorder: flyWithCE Flight Recorder FR300

Manufacturer:
Name: flyWithCE Uroš Podlogar s.p.
Address: Ulica Lojzeta Hrovata 9
4000 Kranj
Slovenia
Email: uros.podlogar@flywithce.com
Web: www.flywithce.com

Contact name(s): Uroš Podlogar

2.3. Details of the PR.

Size: 77 x 28 x 18 mm
Weight: 15g
Connections: USB 1.1/2.0

3. **Compliance with the IGC Sporting Code**
This type of IGC Position Recorder complies with IGC requirements for Position Recorders (References A-D above) as follows.

3.1. The WGS84 ellipsoid Earth Model is used for all fixes in the IGC file (SC3 requirement).
The flyWithCE Flight Recorder uses GPS with the WGS84 Earth Model.

3.2. All fixes in IGC files downloaded from this Recorder are all obtained from real-time GPS data, and no predicted fixes are recorded (SC3 requirement).

The GPS chip outputs the position type. Any predicted fixes are marked by GPS status and are not written.

3.3. The downloaded IGC file can be electronically validated at any time to ensure that the file is identical to when it was initially downloaded (SC3 requirement).

3.3.1 The Download program/method is:

The flyWithCE Logbook application is used for downloading IGC files from the flyWithCE Flight Recorder. During download, the personal computer used has to be connected to the Internet, because the flyWithCE web server is used to sign the downloaded flight. If Internet connection is not available than G record is not generated in the IGC file, but the flight can be reloaded later when an Internet connection is available and the G record will be generated.

The Flight declaration has to be entered before the flight. The user can change flight declarations at a later time, but the G record will be deleted (or will no longer be valid if user changes the declaration using a text editor).

The program flyWithCE Logbook is available with flyWithCE Flight Recorder or on web site:
http://www.flywithce.com/#download

3.3.2 The file validation program to be used with such downloaded IGC files is:

The IGC file can be validated with the program vali-fwc.exe, which is available on web site:
http://www.flywithce.com/#download

3.4. Recording of Altitude. References: Annex B & C to SC3 (SC3B & SC3C), IGC FR Technical Specification.

3.4.1 Altitude data from this IGC PR - for accurate measurement is from figures in the IGC file for:

GPS altitude above the WGS84 Ellipsoid, applying the margin over Pressure Altitude requirements as specified in the Sporting Code (Reference A), currently 100 metres.

3.4.2 The IGC file – Field for Pressure Altitude. In IGC files from this type of Position Recorder, the field for Pressure Altitude is recorded as

Logbook version 4.30 or newer - Zero, in accordance with SC3C and Reference D,

Logbook version 4.20 or older - GPS Altitude is repeated in the field for Pressure Altitude. When analysing such IGC files, this must not be used as if it was real Pressure Altitude.

4. **Engine Recording**

This PR is not able to detect the operation of a Means of Propulsion (MoP).

For gliders with a MoP, either a separate FR must be carried that records MoP use, or the MoP must be sealed or disabled. *(See Guidance Note 3 at the end).*

5. **Mounting in the Glider**.

5.1 This Position Recorder may be mounted anywhere in the glider.

5.2 The Official Observer must be able to show that it was in the glider for the flight concerned, and that the IGC file used to assess the flight came from it.

6. **Authority**. This approval document is issued by: Aero Club of India
Safdarjung Airport, Aurobindo Marg, New Delhi-110003

Signature: Anisha Suresh, Secretary General, Aero Club of India

Any queries or comments about this document should be sent to the above, with a copy to the Chairman of the IGC GFA Committee (currently: ian@ukiws.demon.co.uk).

(GFAC is responsible for giving advice to NACs on technical aspects of PRs and their downloaded IGC files, also for checking that PRs and their Approval documents comply with the IGC Sporting Code. PR Approval documents that comply with the Code will be published on the IGC GNSS web site in the same way as documents for IGC-approved Flight Recorders).

Guidance Notes

Note 1: Ref: Para 1: The IGC Sporting Code allows Position Recorders to be used only for validation of flights for IGC Silver and Gold badges.

Note 2: Ref: Para 3.4: Where Pressure Altitude is not recorded in the IGC file from a Position Recorder, GPS altitude may be used for measurement purposes if it can be shown that the graph of GPS altitude with time is reasonably smooth and without major short term variations such as "noise" or "spikes" in the trace.

The Sporting Code defines a margin of GPS altitude over the traditional Pressure Altitude figures and at the time of publication of this document, the margin is 100m. The margin is set for the following reasons:

2.1. GPS altitude does not use the altitude/pressure scale of the ICAO International Standard Atmosphere (ICAO ISA) which is the IGC and international datum for aircraft pressure altimeters. In contrast, GPS altitude figures are vertical distances above the WGS84 Ellipsoid.

2.2. GPS altitude data in IGC files from some low-cost GPS receivers has been seen to have short-term variations (electronic "noise" or "spikes") compared to the smoother graph of Pressure Altitude. For approval as an IGC PR, any such variations shown in its IGC files must be shown to be within the 100m margin that is applied by IGC to the use of GPS altitude for measurement compared to Pressure Altitude.

Note 3: Where GPS altitude is to be used for accurate measurement, before a PR Approval document is issued, IGC files from the PR are to be provided to GFAC together with IGC files from an IGC-approved Flight Recorder for the same flight, so that the accuracy and reliability of altitude figures can be compared.

Note 4: Ref: Para 5. If ENL is not recorded, for gliders with a Means of Propulsion (MoP), the following must be carried out:

4.1. Carry a separate FR that records MoP use such as by adding three Environmental Noise Level (ENL) figures to each fix in the IGC file, and is acceptable to the NAC, or:
4.2. Seal the MoP is such a way that the Official Observer can detect if it has been operated, or:
4.3. Disable the MoP prior to flight to the satisfaction of the Official Observer and NAC.

Note 5: An IGC-approved Flight Recorder (FR) may also be used for Silver and Gold flights, and for IGC-approval documents of FRs, see the GFAC and IGC web pages:
www.ukiws.demon.co.uk/GFAC or www.fai.org/igc-our-sport/gnss-recording-devices

---