

AMENDMENT LIST NUMBER 8 TO
TECHNICAL SPECIFICATION
FOR IGC-APPROVED GNSS FLIGHT RECORDERS

EFFECTIVE 10 DECEMBER 2005
ISSUED BY FAI
ON BEHALF OF THE INTERNATIONAL GLIDING COMMISSION

Pilot Event marking (PEV code). As well as a PEV code attached to a fix in the IGC file, a sequence of fast-fixes must be arranged to follow (para 2.4.4.1). However, wording elsewhere about PEV is not as clear and needs to be consistent with 2.4.4.1. The following clarifications are made:

Glossary: Pilot Event (PEV Code) - last sentence to start: "Also used to start ...".

2.6.7.3 Pilot event marker. End of first sentence, add: "(See 2.4.4.1)". Third sentence to start: "A series of fixes at a shorter interval than usual (fast fix function) must follow a PEV event, ..". Add at the end: "A positive indication to the pilot that the PEV function has been activated must be provided to the pilot; this can be by an indication on a screen or by an audio tone when the PEV function is activated."

Appendix 1 para 5, Pilot Event (PEV code) - Add at the end: "A sequence of fast fixes follows (para 2.6.7.3)."

Appendix 1 para 7, Three Letter Codes, PEV code: Add: "A sequence of fast fixes follows (para 2.6.7.3)."

2.6.3 Memory used for flight data. The end of this para to read: "... must be detected in such a way that IGC flight data files from the recorder will fail the Validate test. When the memory is full, flight data shall continue to be recorded, for instance by over-writing the earliest data previously recorded, rather than stopping the recording of current flight data. (AL8)"

2.6.7.5.1 Fix sampling time for MoP record. Add: "In the case of ENL systems, a fix must be recorded immediately the ENL value exceeds 500 (out of the maximum of 999) for the first time after a sequence of fixes with lower ENL, subsequent fixes being at the selected fix interval."

2.7.2.2.6.2 USB connectors. Delete this para, superseded by 2.7.2.2.7.3.

2.7.2.2.7 Connectors on the FR case. Second sentence about the RJ45 being preferred, change to: Either the RJ45 or the USB type is recommended because standard wiring to these types includes both power and data transfer facilities. The IGC standard connections for the RJ45 are given below and the USB connections are to the international standard.

2.8.4. Change title to Unauthorised changes - operation of the Security Mechanism.

New para 2.8.4.1 (re-number existing 2.8.4.1 as 2.8.4.2):

2.8.4.1 Protection of the Security Mechanism. The security mechanism inside the FR must be protected from any interference from outside, such as an attempt to prevent the mechanism from operating while the FR case is opened. There is the possibility that a probe or tool could be inserted through ventilation holes (if any), through a partially-removed connector on the case, or through a gap in a slightly-opened case. This can generally be prevented by fitting a

guard or shield over the microswitch or other mechanism. This will be closely looked at during GFAC testing. (AL8)

2.9.1 Format of transferred data from the FR. It should be made clear that the file to be checked is the IGC format and not any intermediate binary file. Last sentence, change to read: In all cases, the IGC-format file shall be checked

2.9.3.2.3 Execution of program. The criterion for the 1 minute download time from recorder to PC should be related to glider flight time and not just the byte size of the IGC file. A high byte size can be due to a rapid fix rate rather than a long flight time. Change last sentence to: It must be possible to download to an IGC data file containing 3600 fixes (B-record lines) in 1 minute or less, using a Pentium 500MHz PC running the Windows XP operating system and the standard IGC-shell program for downloading with the DLL supplied by the manufacturer. 3600 fixes are equivalent to recording a 5 hour flight at a 5 second fix interval or a 10 hour flight using a 10 second fix interval. Full security encoding must be included in this downloaded IGC file so that the IGC VALI check can be made on it later. The 60 second time is from when the download process is initiated to when the complete IGC file becomes available for analysis on the PC concerned, and includes any time required for security calculations before flight data is transferred from the recorder to the PC. The time to execute the VALI program (para 2.9) later is considered to be less critical because the VALI check can be made after initial downloading of the IGC file to the PC. (AL8)

Appendix 1 - IGC Data File Format

Para 2.4, Units: Under Time, correct the sss line to read: "sss - number of decimal seconds are those available in the Record concerned, less fields already used for HHMMSS."

Para 2.5.2 Long File Names, add to the first sentence: ", the field order being the same as in the short file name."

Para 2.5.6, add new sub para: 2.5.6.1 Name of Intermediate Format file. If a manufacturer chooses a system where data is download from the recorder in an intermediate format such as binary, the file name for the intermediate format shall be as for the IGC file but with the Manufacturer's three letter code used instead of the "IGC" after the dot. It shall then be possible to convert the intermediate format to the IGC ASCII format through the Conversion utility that is part of the manufacturer's IGC-XXX.DLL file or, for earlier systems, through the CONV-XXX.EXE program. (AL8)

Para 2.5.6, table, add N, NTE, New Technologies s.r.l.

Para 3.7, Differential GPS (D-record). Take out para 3.7 from section 3 (single instance records) and put it in section 4 (multiple instance records) as para 4.6. Reason, the Differential Station used could change as position changes during a flight , so the D-record is a multiple instance record. Also, change the first sentence to: "This indicates that differential GPS is being used and can be a multiple-instance record if, during the flight, more than one differential beacon is used."

Para 4.2 E RECORD - EVENTS. To start: "The E-record is used to record specific events on the IGC file that occur at irregular intervals. Such events include a pilot-initiated event (PEV code). The E Record is placed before the individual fix (B) Record for the same time ... "

Para 7, Three-Letter Code (TLC) list, modifications followed by deletions and then new TLCs:

ATS, third column to start "Altimeter pressure setting in hectoPascals with 4 numbers and one decimal point (for instance, 1013.2, 0995.7)."

DOB - add, ". Obsolete code, now use DB1"

FXA, first entry for B and other records, third column, delete "unless specified differently".

GSP, third column to read: "Groundspeed, three numbers in kilometres per hour (AL8)"

HDM and HDT, add to third column: ", three numbers based on degrees clockwise from 000 for north. (AL8)"

IAS - third column to read: "Airspeed, three numbers in kilometres per hour (AL8)"

PLT - third column to read: "Pilot-in-charge (aircraft commander), family name first then given name(s) as required (AL8)"

SCM - Add: ". Obsolete code, now use CM2 (AL8)"

TRM and TRT, add to third column: ". Three numbers based on degrees clockwise from 000 for north (AL8)"

WDI - Third column to read: "Wind Direction (the direction the wind is coming from). Three numbers based on degrees clockwise from 000 for north (AL8)"

WVE - Change to WSP and third column to read: "Wind speed, three numbers in kilometres per hour (AL8)". (This is a factual correction, the word "velocity" includes direction, "speed" does not).

Remove the following TLC:

SUP (Supplementary fix) and TPL (turn point list). These have not been used in many years.

Add the following TLC:

CCO - J, K - Compass course (from the aircraft compass sensor). Three numbers based on degrees clockwise from 000 for north. (AL8)

CM2 - H - Second Crew Member's Name, family name first then given name(s) as required (same format as PLT for pilot-in-charge). For aircraft with more than two crew, use CM3 and so forth if required. (AL8)

DB1 - H - Date of Birth of the pilot-in-charge (aircraft commander) in the previous line of the H record (DDMMYY) (AL8)

DB2 - H - Date of Birth of second crew member in format DDMMYY. For aircraft with more than two crew, use DB3 and so forth if required. (AL8)

FLP - E - Flap position, three characters such as FLP060 for 60 degrees of positive flap. If negative, use a negative sign before the numbers, such as FLP-20 for minus 20 degrees flap. (AL8)

LAD - I, B - The last places of decimal minutes of latitude, where latitude is recorded to a greater precision than the three decimal minutes that are in the main body of the B-record. The fourth and any

further decimal places of minutes are recorded as an extension to the B-record, their position in each B-record line being specified in the I-record. (AL8)

LOD - I, B - The last places of decimal minutes of longitude, where longitude is recorded to a greater precision than the three decimal minutes that are in the main body of the B-record. The fourth and any further decimal places of minutes are recorded as an extension to the B-record, their position in each B-record line being specified in the I-record. (AL8)

MAC - E - MacCready setting for rate of climb/speed-to-fly (m/sec) (AL8)

OAT - J, K - Outside air temperature (Celsius). If negative, use negative sign before the numbers.

TDS - I,B,J,K - Decimal seconds of UTC time, for use with systems recording time to this accuracy. Time in seconds is recorded in the main body of the B-record and decimal seconds are recorded as an extension to the B-record, their position in each B-record line being specified in the I-record. Similarly with the K and J-records. (AL8)

UND - E - Undercarriage (landing gear), recorded as UP or DN, in the format UNDUP or UNDDN. (AL8)

VAR - J, K - uncompensated variometer (non-total energy) vertical speed in metres and decimal metres. If negative, use negative sign before the numbers. (AL8)

VAT - J, K - compensated variometer (total energy/netto) vertical speed in metres and decimal metres. If negative, use negative sign before the numbers. (AL8)

XN* - as appropriate - A manufacturer-selected code where N is the manufacturer's single-character IGC name (Appendix 1 para 3.5.6) and * can be any character. The manufacturer must specify its meaning and usage in the documentation for the recorder and its use must be approved by GFAC before IGC-approval of the recorder. The X prefix is intended to allow a trial with a provisional new code before deciding whether it is worthwhile adding to the full list. (AL8)
