

To: Owners and Operators of IGC-approved GPS Flight Recorders
From: Chairman IGC GNSS Flight Recorder Approval Committee (GFAC)
Date: 29 November 2014
Subject: **Date Errors in IGC files from Flight Recorders**

Summary: Owners and operators of GPS Flight Recorders (FRs), particularly of older designs, are advised to switch on the FR at regular intervals during periods when it is not in use for flights, in order to keep the FR and GPS receiver batteries from running down. This will minimise the possibility that when the FR is used again, the date recorded in the IGC file being several years in error.

Background.

Posts on Newsgroup Rec.Aviation.Soaring (r.a.s.) have shown that in some early models of IGC-approved Flight Recorders, the date recorded in the IGC file has suddenly started to be in error by several years. This has been noticed with older models of Cambridge and Garrecht Volkslogger FRs, and modifications are offered to correct it.

The error is because the small internal battery inside the GPS receiver has run down, and the FR has been switched off for some time so that its own battery has also run down. When the FR is used again, this can cause the wrong date to be placed in the IGC file, for reasons given below. Some types of IGC-approved FRs have firmware that is able to identify this condition and continue to output the correct date, and others have types of GPS receiver that are not subject to this potential date error.

The IGC GNSS Flight Recorder Approval Committee (GFAC) is investigating. It is contacting FR manufacturers so that they are aware of the anomaly, can inform GFAC whether their FRs could also be affected, and have the opportunity to take remedial action such as through servicing or changing the GPS receiver, or developing a Firmware update that corrects the date.

Technical Detail.

GPS dates are expressed as a week number and a day-of-week number after the date when the GPS system first came fully on line (6 January 1980). There was no problem up to 1024 weeks after 6 January 1980, and the 1024 week period is called a "GPS Epoch". 1024 weeks is 19.6923 years, or 19 years 8 months and about 10 days, and the so-called "first GPS epoch" lasted until August 1999.

We are now in the second GPS date Epoch, which will become the Third Epoch in May 2019. Today, in order to output the correct date, the GPS receiver needs to recognise that we are in the Second Epoch.

However, if the GPS receiver does not recognise the current Epoch, the date output may revert to one in the first Epoch and so be incorrect in the IGC file by several years. Unless a correction is made inside the FR, the date in the IGC file will probably be 1024 weeks before the correct date, although other dates have also been seen. The rest of the flight data should be unaffected, although there have been cases where other anomalies have also been present.

This major date error can occur if affected Frs are switched off for a long time and the small sustaining battery in the GPS receiver has run down.

In principle, a correction can be made through FR Firmware which can make appropriate adjustments to the date from the GPS receiver (by adding 1024 weeks). It is understood that some FRs have such firmware, other FRs use GPS receivers that are not subject to this error, but other FRs do not and are potentially subject to recording false dates in the IGC file.
