

## Preventing and fixing date errors in ProMark3 rover files

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## A. Introduction

When recording GPS data, the ProMark3 receiver logs a GPS ephemeris file, a timetagged file containing daily satellite orbit and status information. Some ProMark3 rover receivers, however, occasionally record the wrong GPS week number in their ephemeris files. Sometimes the cause is user error, but there is also evidence of a firmware defect causing this problem. Until the release of new ProMark3 firmware, there are ways to both prevent and correct misdated ephemeris files.

## **B.** Preventive Action

The most important preventative action to take is to always allow the ProMark3 receiver to calculate a position <u>before</u> you open a job and begin logging data.

- 1. If you have just purchased the ProMark3, take the receiver outside where it has a clear view of the sky and turn it on. Then do the following:
  - a. Double-tap the Utilities icon
  - b. Double-tap the GpsInit icon
  - c. Double-tap the name of your present location and initialize the receiver.
  - d. Double-tap the **GPSStatus** icon, tap the **Sig/Nav** tab and give the receiver 13 minutes to download a current GPS almanac before logging data
- 2. Before you start logging data on a subsequent day, take the receiver outside to a location where it has an open view of the sky, run **GPSStatus** (the **Sig/Nav** tab) and wait until the receiver calculates a GPS position.

Then, after opening a job, check the job name as it is displayed on the ProMark3 logging screen. Jobs are automatically named according to the "RJOB1A06.088" naming convention, where:

- o "R" indicates this is a Raw data file
- o "JOB1" is the user-defined, four-character job name
- "A" means this is the first job of the day, "B" means it is the second job, etc.
- o "06" stands for year 2006, etc.
- $\circ$  "088" is the Julian day number (the 88<sup>th</sup> day of the year)

If you know the Julian day number is wrong, the ephemeris file you are recording will be unusable and you can replace it by performing a **Cold Reset**:

- a. Close the job and exit the Surveying application
- b. Double-tap the Utilities icon on the ProMark3 Desktop
- c. Double-tap the GpsReset icon and tap Cold Reset
- d. Tap **OK** on the message window saying "Reset successful"
- e. Take the receiver outside to a location where it has an open view of the sky, run **GPSStatus** and wait until the receiver calculates a GPS position.
- f. Close GPS Status and exit the Utilities folder
- g. From the **Desktop**, tap the **Settings** icon and press the **Enter** button
- h. Run **Date/Time** and make sure the displayed date and time are correct.

If you are ever unsure if the receiver will use the wrong GPS week, you may perform a **Cold Reset** before opening a job.



## C. Corrective Action

To post-process a ProMark3 dataset that includes a bad ephemeris file, you need only to copy the ephemeris file recorded the same day by any other GPS receiver into the folder containing the rover data and then rename the file according to the ProMark3 naming convention. This overwrites the bad file with a good one.

ProMark3 rover receivers record R-files, compressed files containing three separate files:

- o B-file: containing position and raw GPS measurement data.
- D-file: time-tagged description file containing attributes, error messages, etc.
- o E-file: satellites ephemeris, including the GPS week number

When you download an R-file to your PC using GNSS Solutions, the Download utility extracts the B-, D- and E-files and writes them to the target folder.

On any one day, all GPS satellites broadcast the same ephemeris file. In addition, all ephemeris files recorded by any GPS receivers, regardless of brand or model are identical for the same GPS day (which ends at midnight, UTC time). This means E-files recorded by Magellan receivers the same day are identical. So if the E-file recorded by a ProMark3 rover receiver includes the wrong GPS week number, you may copy the base receiver's E-file into the folder containing the rover data and rename it "EJOB1A06.088" (for an E-file recorded during the first session of "JOB1" on the 88<sup>th</sup> day of 2006). If JOB1 comprised more than one session, you should make multiple copies of the base receiver's E-file and name them EJOB1<u>A</u>06.088, EJOB1<u>B</u>06.088, EJOB1<u>C</u>06.088, etc.

You can also download an ephemeris file from any public CORS site and rename it according to the ProMark3 naming convention described above. Please note that if you recorded two sessions for one job - one before and one after midnight, UTC time - you will need the ephemeris file from both days.

It is extremely rare, but if a ProMark3 <u>base</u> receiver's E-file contains an incorrect GPS week number, you can similarly copy any GPS receiver's ephemeris file – *recorded the same day* – into the folder containing the base files and rename it "E0001A06.088" where "0001" is the base receiver's four-character site ID and "A06.088" indicates this was the first base file recorded by the receiver on the 88<sup>th</sup> day of 2006.