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GPS Errors in SBMAX64

By Ivan Izaak

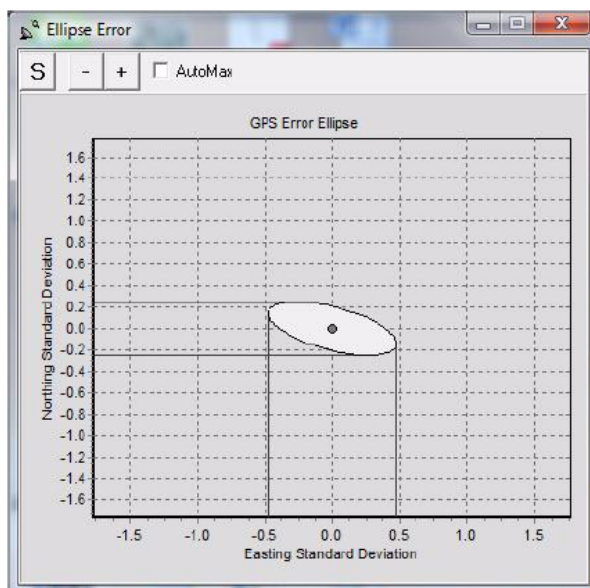
To know what errors were reported by the GPS, you may want to log the NMEA \$GPGST string from your GPS which can output standard NMEA0183 data.

GST strings contain GPS Pseudorange Noise Statistics.

1. **Set your GPS unit to output a GST string.**
2. **In the HYPACK® HARDWARE program, check the Record Device Specific Messages function for the GPS device driver.**

When the Record Device Specific Message function is checked for the GPS.dll, the HYPACK® SURVEY program can display the Ellipse Error window (select the WINDOW-NEW-GPS-ELLIPSE ERROR).

Fig. 1 Ellipse Error Window in HYPACK® SURVEY.



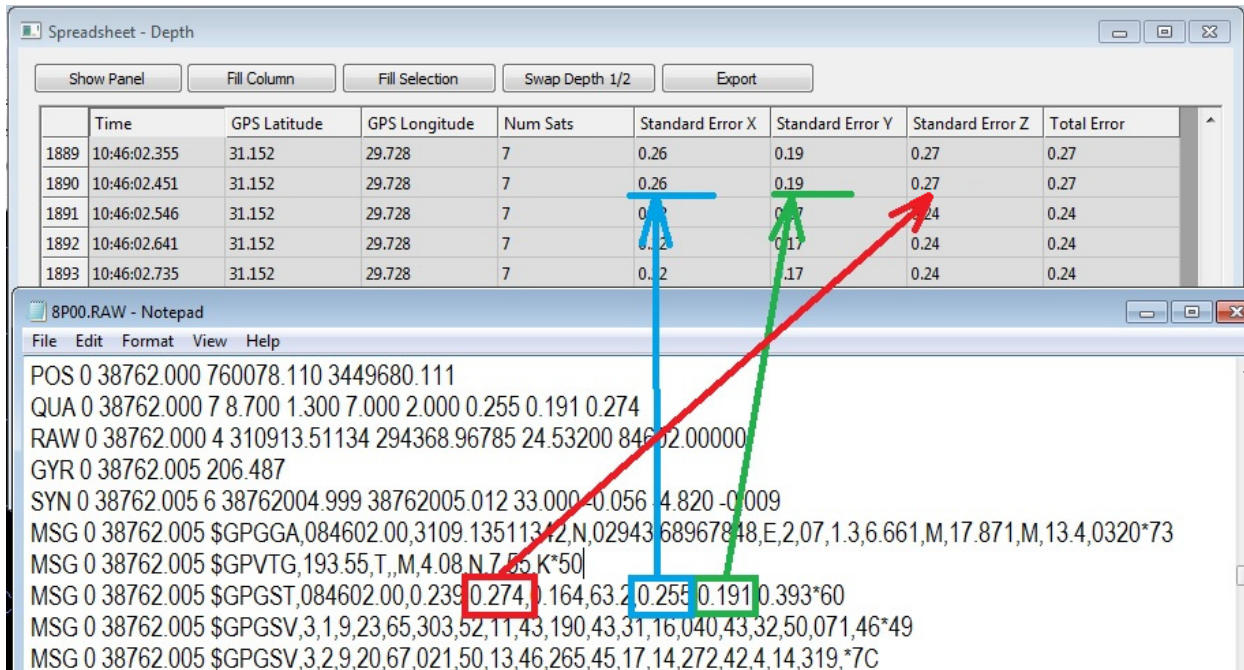
The program also records all messages coming from your GPS into the MSG strings as follows:

```
MSG 0 38579.004
$GPGGA,084259.00,3109.22835143,N,02943.87735445,E,2,08,1.2,6.684,M,1
7.872,M,20.0,0320*78
MSG 0 38579.004 $GPVTG,211.76,T,,M,4.79,N,8.88,K*51
MSG 0 38579.004
$GPGST,084259.00,0.703,0.363,0.200,64.1,0.338,0.240,0.482*66
MSG 0 38579.004
$GPGSV,2,1,8,23,64,300,50,11,44,190,48,31,17,040,42,32,51,069,49*42
MSG 0 38579.004 $GPZDA,084259.005,03,05,2010,00,00*54
```

```
MSG 0 38579.004 $GPHDT,223.833,T*3E
MSG 0 38579.004 $GPGSA,A,3,23,11,31,32,20,13,17,4,,,,,1.9,1.2,1.5*0D
```

So, we have logged the GST messages; now how can we check them? Well, it all happens in SBMAX64 (the 64-bit SINGLE BEAM EDITOR). This is how the spreadsheet looks if we logged the GST messages:

Figure 2 Standard Errors in SBMAX64 Spreadsheet (above) and Corresponding GST String (below)



MSG Format

MSG stands for the device specific message, 0 is the device ID (device sequence in the HARDWARE program), 38762.005 0 time in seconds past midnight, then the GPS data string. Those MSG records with the GST output hold the pseudorange noise data.

To see the MSG data in the Spreadsheet, enable the Standard Error X, Y, Z and Total Error items. Total Error will be the biggest error there.

IMPORTANT: In some cases, your GPS may output binary messages. This makes your RAW file 'bad' for the SBMAX editors.

To avoid such issue, you can do either of the following:

- Uncheck Record Device Specific Messages function, but then you won't have the error data.
- Make sure that your GPS receiver outputs only standard NMEA messages.