

Re: Determining when GPS data is good

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Anne wrote:

Hi!

I am new to GPS's and I am writing software application for the PocketPC to get the location using I-Blue737 Bluetooth GPS. I can get and parse the NMEA string okay and get the latitude and longitude values, but I'm not sure when the location is within the 2D-RMS spec of less than 3 meters. Can I assume after the cold start time, the data is accurate? What do GPS applications typically do to determine when the data is good? Any help would be appreciated!

Hi,

from the data in the standard NMEA messages, it is not possible to find a definitive answer to that question. As Sam said, only comparison with a known surveyed position will do that.

DOP (Dilution Of Precision, check the GSA sentence), does not give an accuracy, just a dilution. It's a measure of the geometry of the satellites used in the solution. For instance, if all visible satellites are within a small spot of the sky, you will get high DOP values. Any measurement error gets effectively multiplied with the DOP.

Inside the receiver, it is possible to calculate an upper bound of the position/velocity error. Most receivers will not output that information. The ones that do, output it in the GBS (errors), GRS (residuals) and GST (noise stats). This feature is known as RAIM and only works with 6 or more satellites in view.

If your receiver doesn't do RAIM, you have two options.

1) extract the pseudo-ranges and ephemeris data from the receiver and calculate your own solution. The residuals from the overdetermined solution give you an upper bound for the error. This is what a RAIM

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receiver does internally. Unfortunately, the necessary information is not available in NMEA mode – you'll have to switch into the manufacturer's 'binary' mode.

2) Guess. Look at how many satellites are used in the solution (GGA or GSA) and look at their signal strengths (GSV). A large number of satellites, good signal strength (absolute and relative) and a low DOP number means good precision.

You can also compare the positions with integrated velocities. Typically, atmospheric errors affect the position more than they affect the velocity. However, GPS manufacturers know this as well and filter the output accordingly. You may or may not be able to outguess the manufacturer's firmware.

Kind regards,

Iwo

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