

## Re: GPS M12+ Motorola: Time accuracy

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Thanks for your answers.

> *If you want to get the best precision out of your receiver, you will have  
> to use the PPS signal.*

We want to use the PPS signal to synchronize our system to the GPS time with a high accuracy. The problem that we have is that we are not sure how we get the time stamp for this PPS signal. We start the GPS receiver and send the @@Hb command setting the Output rate to 1 time each second. We wait until the GPS tracks minimum 4 satellites, after this we start to get data position and time, but which time?

The time included in the @@Hb answer has the format hmsffff: hours, minutes, seconds, fractional second(ns). Is this the exact GPS time? in this case, is the GPS time of the last PPS signal or of the next PPS signal? What means the fractional second? Why with only one track satellite we got sometimes inside 1 second two time stamps for example 12:40:15 99926 and 12:40:15 99999987? Why the answer includes sometimes more track satellites than visible ones?

Trying a new way to get the time with precision we follow the instruction of M

12+ User's Guide created by Motorola:

1.- @@Gd: we start sending the @@Gd command in mode 3 (enable autosite survey) to get the position by the average of 10000 position fixes.

> *GPS receiver startup always takes some time. Doing a skysearch can take  
> 15 minutes. If the receiver is configured to do a site survey (before going  
> into 0D-mode), that can take an additional 20 minutes.*

When we send this message we get the answer with the control type value (3) but How we know that the position has been set in a right way?

2.- @@Aw: to set the time in GPS.

3.- @@Gf: to set the T-RAIM function limit in 300 ns.

4.- @@Ge: to set ON the T-RAIM function

5.- @@ Hn: with this command it is requested a T-RAIM status message.  
The data received from this command include:

Pulse Status: 01 (ON)

Pulse Synced to: 01 (GPS)

T-RAIM Solution Status: 00 (OK)

T-RAIM Status: 00 (detection and isolation possible)

Accuracy estimate: 0000

Error next PPS:-8

> *If you want to get the best precision out of your receiver, you will have  
> to use the PPS signal. You will also have to apply a timing correction  
> factor that you can get from the @@En status message (negative sawtooth...);  
> in effect, the receiver is telling you that the next PPS tick is going to be  
> <n> nanoseconds late (or early).*

This "Error next PPS" value is the time correction (the same that I could get with the @@En status message) that I have to apply to the time set by the PPS signal?

What means the Accuracy estimate value? We get always 0000.

Thanks to read this long message : )

Mayte