

Memo

To: Deputy Surveyor General (Geodetic), Snr. Superintendent (SS&QCB)

From: S.D.P.J. Dampegama, Additional Surveyor General,

CC: Institutions and Agencies using GPS

The Second GPS Week number Rollover is Expected on 6/7 April 2019

Dear All,

The second GPS week number roll over is expected on 6/7 April 2019.

The GPS roll over problem is expected and known system error caused by the allocated space to handle GPS week number in the system. In the GPS data message 10 bit field is used to encode the week number. This is very important component to compute GPS epoch. The corresponding maximum decimal number which can be stored in 10-bit long week data field is 1024 weeks approximately equal to 19.7 years. At the end of 1024 epoch the receiver resets week number to zero. The first GPS satellite was commissioned on 6th January 1980 which was the starting epoch of week number. After elapse of 1024 weeks GPS receivers reset the week number on 21st August 1999. As a result most of the GPS receivers around the world went dead or showed very abnormal behavior. Many manufacturers developed patches or updated the firmware to correct the problem. But to my memories almost all Sri Lankan GPS users were clue less about what happened to their receivers on 21st August 1999.

It appears that same situation may repeat in 6/7 April 2019 for the receivers which are not programmed to cope up with the issue. Some GPS manufacturers are handling this situation by implementing firmware to count the 1024 weeks from the date of compilation of the firmware. Such receivers will face the role-over problem after elapse of 1024 weeks from the compilation date of the firmware.

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I recommend you to be aware of the situation and following guideline may be helpful for you to overcome the problem.

- ❖ Update your receiver's firmware to the latest version recommended by the manufacturer.
- ❖ Better to collect data using your receiver on a point with known coordinates on 6/7 April to check the effect of the roll-over problem on your receiver.

The permanent solution or rather long term solution suggested under the GPS modernization programme is to allocate 13- bit field to represent GPS week number. Which will allow GPS users to live without roll-over problem for a period of 157 years.

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