ONCORE TECHNICAL APPLICATION NOTE

Upcoming Incorrect Application of Leap Second

Motorola Oncore GPS receivers have the capability of reporting time and date referenced to GPS system time or UTC (Universal Time Coordinated). The difference between the two time systems (currently 13 seconds) is broadcast in the GPS satellite navigation message as a set of UTC correction parameters. These parameters define the current difference between GPS and UTC time, and information on the next scheduled leap second event. These parameters are used by the Oncore firmware to convert GPS time to UTC time and to account for the leap second at the proper time.

The output format for the time of insertion or deletion of the future leap second is GPS week number and day number within the GPS week. The GPS week number parameter in the UTC correction parameter set is 8 bits long, which allows for 256 weeks of unambiguous time calculation. The current GPS satellite navigation message broadcast of UTC data still contains the week number corresponding to that last leap second event. Currently, there is no leap second event scheduled prior to the end of the 256-week cycle on November 27, 2003. This unanticipated long duration between leap second events will cause a brief one-second anomaly in the time reported from Motorola Oncore receivers with software versions listed below on midnight of November 28, 2003. The time/date output at that time will follow this pattern:

Correct UTC Time/Date	UTC Time/Date reported by the Oncore Receiver	note
11/27/2003 23:59:58	11/27/2003 23:59:58	
11/27/2003 23:59:59	11/27/2003 23:59:59	
11/28/2003 00:00:00	**11/29/2003** 00:00:00	Wrong date reported for one second, time is correct
11/28/2003 00:00:01	11/28/2003 00:00:01	Date is corrected the next second, time is still correct
11/28/2003 00:00:02	11/28/2003 00:00:02	

This one-second anomaly will not affect any other operation of the receiver including the accuracy of the 1PPS pulse, satellite tracking performance, or position accuracy.

Affected products lines are:
- ➢ **VP Oncore**
- ➢ **UT Oncore**
- ➢ **GT Oncore**
- ➢ **M12 Oncore**

This anomaly will not occur on any version of the M12+ Oncore Timing receivers.

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