

GPSOC LINKS REPORTS of GPS UE ERRORS to FLAWED UE PROCESSING of ALMANAC FROM PRN 30

A thorough examination of the GPS service delivery has confirmed that no violations of the interface specifications are contributing to the errors reported. While IS-GPS-200 compliant, the signals and data broadcast from GPS satellites during this period include extended **non-operational and unhealthy broadcasts from PRN 6 and PRN 30** respectively. The inappropriate utilization of these non-operational/unhealthy signals/data could result in UE mal-performance or malfunction.

PRNs 6 and 30 are both clearly and comprehensively represented as unhealthy. PRN 6 does not even appear in the almanac broadcast from any PRN. A **specific UE fault mode in utilization of the PRN 30 broadcast data is described below**, because it corresponds to the types of intermittent errors that some users are reporting.

An IS-GPS-200 **compliant extended navigation mode** (no navigation message uploads for an extended period of time) **functional checkout**, is in progress using SVN 64 **until approximately mid-May**. In this mode PRN 30 is broadcasting almanac datasets that do not reflect constellation changes that occurred since it was last uploaded with navigation message data. These almanac datasets are of 32 day duration, and therefore have TOAs which age to multiple weeks in the past.

The utilization of these almanacs in a manner that regards the time of week, but **neglects or mishandles the week number** (effectively executing as if the current week number is the week number associated with these almanac parameters), will **result in an increasing error in visibility determination and other almanac based estimations** (elevation/azimuth, Doppler shift, SV clock offset from GPS time, etc) as the dataset's actual week offset from the current week increases.

As this **week offset cycle occurs, with each 32 day dataset introduction**, the erroneous treatment described **results in decreasing numbers of satellites "available" and increasing DOP** when adequate satellites are acquired. The PRN 30 sourced datasets would be selected as the most up-to-date broadcast (presuming neglect/mishandling of the week number) on many days of each week. This week's rollover of the truncated (max value of 255) almanac week number could increase the errors experienced dramatically, as the offset could grow exponentially in that transition.