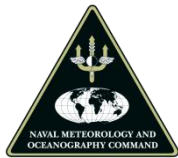# CGSIC
GPS Week Roll Over Issue

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GPS Week Rollover

- **GPS Time as defined in the legacy GPS navigation message (ICD-200), uses 10 bits to count GPS Week Numbers. This representation can only cover a finite period of 1024 weeks (19.7 year epoch).**

- **GPS Time started on Jan 6, 1980**

- **The first GPS Time Epoch ended on Aug 21/22 1999.**

- **GPS Time is presently in its second Epoch which will end on April 6, 2019**

- **It's up to the user receiver to resolve this week number ambiguity**

- **Newer receivers fully compliant with GPS ICD should handle this event OK**

- **In the Future the Modernized GPS Navigation (CNAV and MNAV) message has a 13-bit week number, which for all practical purposes solves this ambiguity**
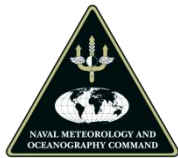
- *UTC timing displayed and/or time tags of receiver data containing PNT information could jump by 19.7 years*

- *Any month/year conversion could also fail*

- *Navigation solution should be OK, but associated time tags could be incorrect thus still corrupting navigation data at the system level*

- *And the failure is not limited to April 6/7 2019*

- *A common fix for week number ambiguity was to hard code new pivot date, which shifts event to unknown date/time in future*
  - *December 2014, older legacy USNO monitor receiver failed*
  - *Feb 14, 2016 Endrun technology receivers using a Trimble GPS engine failed*
  - *Aug 14, 2016 Motorola Oncore UT+ older firmware failed*
  - *July 22, 2017 older Novatel GPS engine failed, notice was posted in Spring 2017 to upgrade firmware, but many did not check*
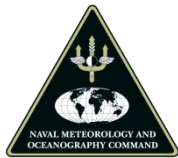
Does your receiver have a problem with GPS Week Roll Over

- *Most newer receivers are likely going to be OK if ICD-200 was followed*

- *Older receiver may be problematic*

- *"Trust but Verify" consult you manufacture*

- *Conduct testing using GPS simulator*