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# GPS / Galileo Time Offset ICD Development

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# Galileo and GPS Time Products

- **GPS and Galileo System Time**
  - Internal navigation time scales.
  - GPS Time is specified to be kept to within 1  $\mu$ s modulo 1 second of UTC (USNO) and in practice has not exceeded 50 ns for the past eight years.
  - Galileo System Time is specified to be kept to within 50 ns of TAI.
  - typically the internal navigation system time is only used as part of the navigation solution and is not considered a standard time product.
- **UTC** is obtained from GPS or Galileo by adding the integral number of leap seconds and fine UTC/TAI correction information contained in the navigation data.
- **TAI** can be obtained from Galileo by adding the fine Galileo TAI corrections obtained from the Galileo data message. TAI may be obtained from GPS by subtracting 19 seconds from GPS time and adding the fine UTC correction contained in the GPS data message.

## Interoperability GPS-Galileo

- Galileo System Time (GST) is steered to a prediction taken from a number of UTC(k) laboratory clocks via an external timing service.
- GPS-Time is steered to prediction of UTC(USNO)-(leap seconds), i. e.  $\sim$ TAI
- Both GST and GPS-Time are real-time versions of the various UTC(k) laboratories they reflect
- If the offset between GST and GPS Time is made available to user, interoperability is ensured