

RECOMMENDATION CCTF 24-4 (2025)

On the preparations for the possible discontinuation of GPS signals semi-codeless tracking

The Consultative Committee for Time and Frequency (CCTF), at its 24th session (2025).

Considering that

- Current GPS links used for UTC are based on semi-codeless tracking of the L1 P(Y) and L2 P(Y) signals, referred to as P1 and P2 in the CGGTTS format.
- The 2019, 2021 and 2025 U.S. Federal Radionavigation Plans state a commitment to maintaining the existing GPS L1 C/A, L1 P(Y), L2C, and L2 P(Y) signal characteristics that enable codeless and semi-codeless access until at least two years after 24 operational satellites are broadcasting the L5 signal with fully functional navigation messages, without any guarantee beyond that point.

Noting that

- A discontinuation of the ability to track P1 and P2 would have a significant impact on the computation of UTC.
- Already to date 19 GPS satellites are transmitting L5, 24 are transmitting L2C, and 8 are transmitting L1C signals, and that the availability of 24 satellites broadcasting the L5 signal is estimated to occur in 2029.
- Most laboratories participating in UTC already operate receivers capable of tracking The L5 signals, as well as modernized L1C and L2C signals.
- Calibration campaigns of Group 1 laboratories are carried out only every 3 years, and currently do not cover these signals,

Recommends that

National Metrology Institutes, Designated Institutes, and the BIPM:

- begin systematic collection and archiving of data from GPS L1C, L2C, and L5 signals, both during routine operation and calibration campaigns.
- evaluate the performance of these signals for time transfer, including the analysis of various ionosphere-free combinations.
- consider adapting time transfer formats (e.g., CGGTTS) and associated software to support processing based on GPS L1C, L2C, and L5 signals.

The BIPM:

- includes GNSS other than GPS in Circular T PPP solution.
- considers establishing the reference calibration values for these signals in collaboration with UTC labs.
- Monitors the GPS codes used in IGS products