



DEPARTMENT OF THE AIR FORCE
50TH SPACE WING (AFSPC)

6 Jun 02

MEMORANDUM FOR RECORD

FROM: 2 SOPS/DO

SUBJECT: Single Frequency Ionospheric Correction Parameters Anomaly

1. From 28 May through 02 June 2002 (Modified Julian Date 52422 – 52427), single frequency GPS receivers (i.e. L1 only) and unkeyed, dual frequency GPS receivers may have experienced larger than normal ranging errors during portions of the day due to an erroneous navigation message parameter. This erroneous parameter had the potential to produce additional ranging errors on the order of ± 16 meters or additional timing errors on the order of ± 50 -55 nanoseconds. While the magnitude of this error was much higher than normal, user performance was still within existing values in the GPS SPS Performance Standard.
2. A combined 2 SOPS and US Naval Observatory team isolated this anomaly to an incorrect ionospheric correction database coefficient in the Master Control Station (MCS). This incorrect coefficient was included in the navigation message of all satellites during the above dates. The error was identified and corrected and the entire constellation was updated with the correct ionospheric value by 2 June, 2200z.
3. To correct the receiver effects of this problem, users must download subframe 4 and 5 data in its entirety after 2 June 2002. This can be accomplished by reading the navigation message for 12.5 consecutive minutes. This will allow affected receivers to automatically download the correct ionospheric correction table.
4. Attached is a graph of the ionospheric delay calculated by a single frequency receiver before, during, and after the affected dates (Note the flattened portion of the ionospheric correction data). This graph was provided by the US Naval Observatory from their Washington DC location.

<signed>

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Attachment:
Ionosphere Delay Obtained via Single Frequency Model

Ionosphere Delay Obtained via Single Frequency Model

