

UNCLASSIFIED
Change Topic: L1C Phase Noise

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This change package accommodates the text changes to support the proposed solution (see table below) within the public Signals-in-Space (SiS) documents. All comments must be submitted in Comments Resolution Matrix (CRM) form.

The columns in the WAS/IS table following this page are defined below:

Section Number: This number indicates the location of the text change within the document.

(WAS) <Document Title>: Contains the baseline text of the impacted document.

Proposed Heading: Contains proposed changes to existing section titles and/or the titles to new sections

Proposed Object Text: Contains proposed changes to baseline text.

Proposed Rationale: Contains the supporting information to explain the reason for the proposed changes.

PROBLEM STATEMENT:
GPS III L1C phase noise specification does not have any identifiable user-base that requires the level of phase noise specified in IS-GPS-800. EDU testing showed that the Mission Data Unit MDU is unlikely to meet this L1C phase noise spec. An MDU design change that improves this performance has been approved for the GPS III-1 SV, but unit-to-unit variations still make the spec difficult to meet.
SOLUTION: (Proposed)
GPS III L1C phase noise specification does not have any identifiable user-base that requires the level of phase noise specified in IS-GPS-800. An MDU design change that improves this performance has been approved for the GPS III-1 SV. The MDU design is being modified to provide better phase noise performance and the phase noise requirement in IS-GPS-800 is proposed to change also. 1) Holding LM to the 0.01 radians rms does not provide the yet-to-be formed L1C user community.

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Start of WAS/IS for IS-GPS-800B, IRN-001 Changes

Section Number	L1C Phase Noise Proposed Heading	IS-GPS-800 RevB IRN001 (17 Apr 2012) Navstar GPS Space Segment/User Segment L1C Interface	Proposed L1C Phase Noise Object Text	Proposed Rationale
3.2.1.3	Carrier Phase Noise. (TBR).	The phase noise spectral density of the unmodulated carrier shall not exceed the magnitude of a straight line (on a log-log plot) between -30 dBc/Hz at 1 Hz and -70 dBc/Hz at 1 x 10 ⁴ Hz, and the one-sided integrated phase noise spectrum between 1 Hz and 10 kHz shall not exceed 0.01 radians rms.	The phase noise spectral density of the unmodulated carrier shall not exceed the magnitude of a straight line (on a log-log plot) between -30 dBc/Hz at 1 Hz and -70 dBc/Hz at 1 x 10⁴Hz, and the one-sided integrated phase noise spectrum between 1 Hz and 10 kHz shall not exceed 0.01 radians rms. <DELETE>	This requirement has been deleted since this is not the method that the contractor has elected to implement this requirement. Deleting this requirement is consistent with the carrier phase noise requirement for IS-GPS-200 and IS-GPS-705.
3.2.1.3		Or, The phase noise spectral density of the unmodulated carrier shall be such that an approximation to the third order Jaffe-Rechtin phase lock loop, which has a 10 Hz one-sided loop noise bandwidth, shall be able to track the carrier to an accuracy of 0.01 radians rms.	Or, The phase noise spectral density of the unmodulated carrier shall be such that an approximation to the third order Jaffe-Rechtin phase lock loop, which has a 10 Hz one-sided loop noise bandwidth, shall be able to track the carrier to an accuracy of 0.01035 radians rms.	GPS III L1C phase noise specification does not have any identifiable user-base that requires the level of phase noise specified in IS-GPS-800. An MDU design change that improves this performance has been approved for the GPS III-1 SV. The MDU design is being modified to provide better phase noise performance and the phase noise requirement in IS-GPS-800 is proposed to change also. 1) Holding LM to the 0.01 radians rms does not provide the yet-to-be formed L1C user community.

End of WAS/IS for IS-GPS-800B, IRN-001 Changes