Change Topic: Public Signals in Space Requirements Disconnects

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:

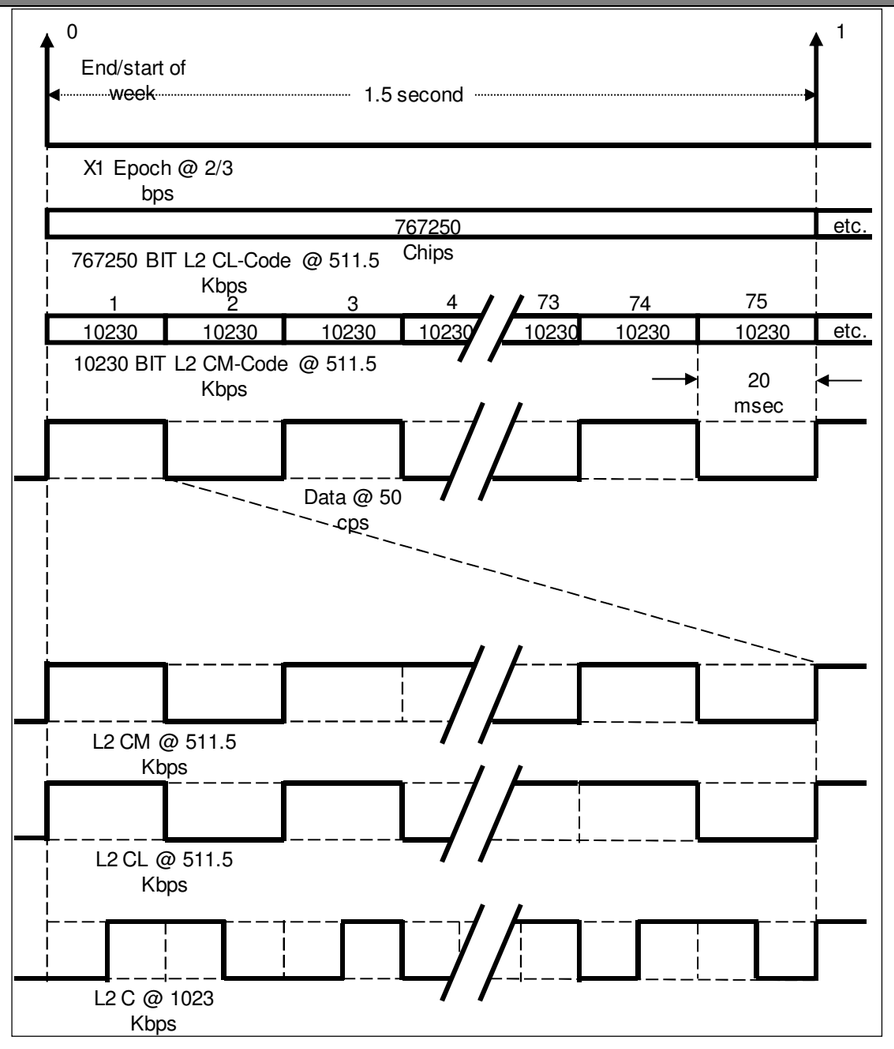
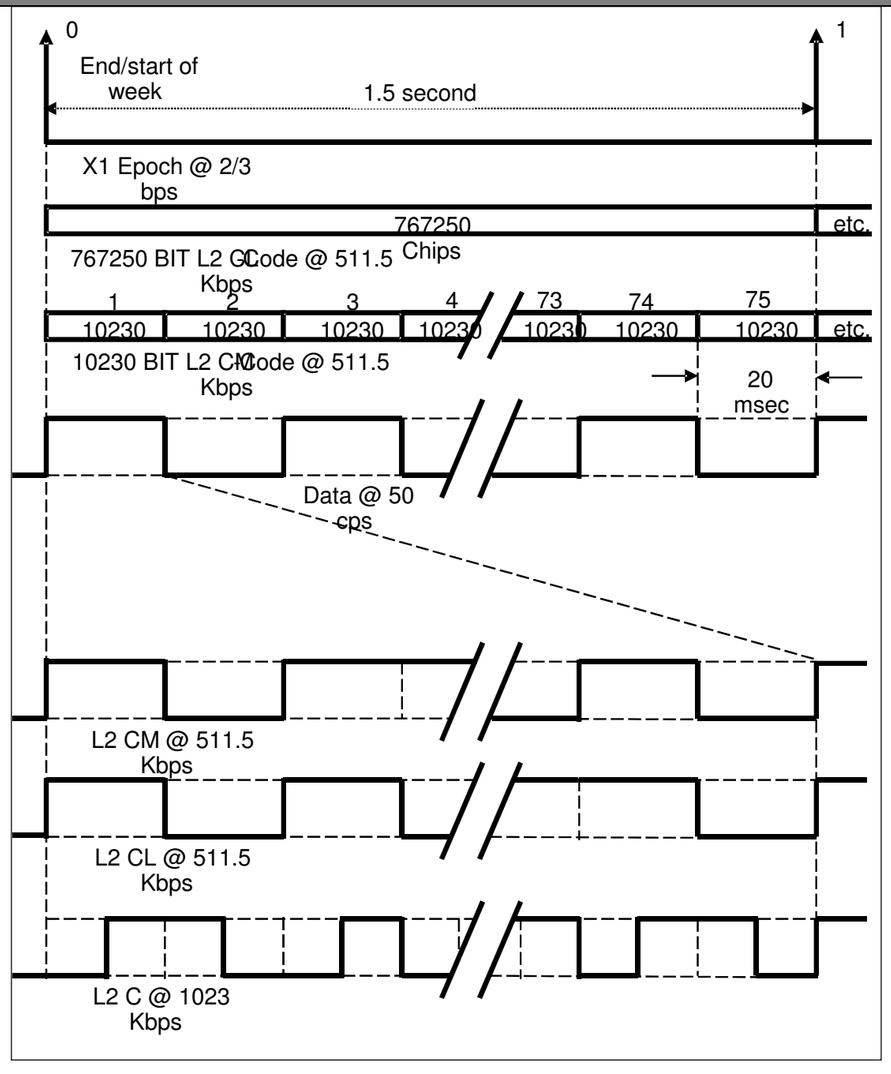
Section Number: This number indicates the location of the text change within the document.

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

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

Proposed Object Text: Contains proposed changes to baseline text.

PROBLEM STATEMENT:
The current public signals in space documents contain incorrect information (L2C message duration, GNSS ID bit assignments), and missing information (L5 ellipticity values). If these disconnects are not resolved, receiver manufacturers will have issues designing to incorrect requirements and the Directorate will be misrepresenting the current and future GPS system performance in a public document.
SOLUTION: *(Proposed)*
Resolve the incorrect (L2C message duration, GNSS ID bit assignments), and missing (L5 ellipticity values) requirements in the public signals in space documents

Section	IS-GPS-200 RevG (5 Sep 2012) Navstar GPS Space Segment/Navigation User Interfaces	Proposed Changes	Rationale
3.3.2.4	 Figure 3-12. L2 CM-/L2 CL-Code Timing Relationships	 Figure 3-12. L2 CM-/L2 CL-Code Timing Relationships	For clarity to the users, the line covering the word "week" is no longer hidden by the line.
30.3.3	Each message starts with an 8-bit preamble - 10001011, followed by a 6-bit PRN number of	Each message starts with an 8-bit preamble - 10001011, followed by a 6-bit PRN number of	L2C is a 12 second

<table>
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<tr><td></td><td>the transmitting SV, a 6-bit message type ID with a range of 0 (000000) to 63 (111111), and the 17-bit message time of week (TOW) count. When the value of the message TOW count is multiplied by 6, it represents SV time in seconds at the start of the next 6-second message. An “alert” flag, when raised (bit 38 = “1”), indicates to the user that the signal URA components may be worse than indicated in the associated message types and that he shall use at his own risk. For each default message (Message Type 0), bits 39 through 276 shall be alternating ones and zeros and the message shall contain a proper CRC parity block.</td><td>the transmitting SV, a 6-bit message type ID with a range of 0 (000000) to 63 (111111), and the 17-bit message time of week (TOW) count. When the value of the message TOW count is multiplied by 6, it represents SV time in seconds at the start of the next 12-second message. An “alert” flag, when raised (bit 38 = “1”), indicates to the user that the signal URA components may be worse than indicated in the associated message types and that he shall use at his own risk. For each default message (Message Type 0), bits 39 through 276 shall be alternating ones and zeros and the message shall contain a proper CRC parity block.</td><td>message, not a 6 second message. L5 is a 6 second message.</td></tr>
<tr><td>30.3.3.1.1</td><td></td><td>Bit 273 of Message Type 10 indicates the phase relationship between L2C and P(Y) as specified in section 3.3.1.5.1 of IS-GPS-200.</td><td>Maintain definition consistency across the Public SIS documents.</td></tr>
<tr><td>30.3.3.6.2</td><td>
Table 30-IX. UTC Parameters
<table>
<tr><th colspan="2">Parameter</th><th>No. of Bits**</th><th>Scale Factor (LSB)</th><th>Effective Range***</th><th>Units</th></tr>
<tr><td>A_{0-n}</td><td>Bias coefficient of GPS time scale relative to UTC time scale</td><td>16*</td><td>2^{-35}</td><td></td><td>Seconds</td></tr>
<tr><td>A_{1-n}</td><td>Drift coefficient of GPS time scale relative to UTC time scale</td><td>13*</td><td>2^{-51}</td><td></td><td>sec/sec</td></tr>
<tr><td>A_{2-n}</td><td>Drift rate correction coefficient of GPS time scale relative to UTC time scale</td><td>7*</td><td>2^{-68}</td><td></td><td>sec/sec^2</td></tr>
<tr><td>Δt_{LS}</td><td>Current or past leap second count</td><td>8*</td><td>1</td><td></td><td>seconds</td></tr>
<tr><td>t_{ot}</td><td>Time data reference Time of Week</td><td>16</td><td>2^4</td><td>604,784</td><td>seconds</td></tr>
<tr><td>WN_{ot}</td><td>Time data reference Week Number</td><td>13</td><td>1</td><td></td><td>weeks</td></tr>
<tr><td>WN_{LSF}</td><td>Leap second reference Week Number</td><td>8</td><td>1</td><td></td><td>weeks</td></tr>
<tr><td>DN</td><td>Leap second reference Day Number</td><td>4***</td><td>1</td><td></td><td>days</td></tr>
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</td><td>The number of bits assigned to the WNLSF parameter is incorrect. In order to be consistent with Figure 30-6, as well as the bit lengths for WNLSF in IS-GPS-705 and IS-GPS-800, the bit length has been</td></tr>
</table>

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	Current or future leap second count * Parameters so indicated shall be two's complement with the sign bit (+ or -) occupying the MSB; ** See Figure 30-6 for complete bit allocation; *** Unless otherwise indicated in this column, effective range is the maximum range attainable with indicated bit allocation and scale factor; **** Right justified.	Current or future leap second count * Parameters so indicated shall be two's complement with the sign bit (+ or -) occupying the MSB; ** See Figure 30-6 for complete bit allocation; *** Unless otherwise indicated in this column, effective range is the maximum range attainable with indicated bit allocation and scale factor; **** Right justified.	updated to be 13 bits, not 8 bits. Also, the DN entry in the No. of Bits column should be "4****", not "4***" (missing one asterisk).
30.3.3.8.1	Message Type 35 provides SV clock correction parameters (ref. Section 30.3.3.2) and also, shall contain the parameters related to correlating GPS time with other GNSS time. Bits 155 through 157 of message type 35 shall identify the other GPS like navigation system to which the offset data applies. The three bits are defined as follows; 000 = no data available, 001 = Galileo, 010 = GLONASS, 011 through 111 = reserved for other systems.	Message Type 35 provides SV clock correction parameters (ref. Section 30.3.3.2) and also, shall contain the parameters related to correlating GPS time with other GNSS time. Bits 157 through 159 of message type 35 shall identify the other GPS like navigation system to which the offset data applies. The three bits are defined as follows; 000 = no data available, 001 = Galileo, 010 = GLONASS, 011 through 111 = reserved for other systems.	There is a discrepancy in IS-GPS-200 between Figure 30-8 and Section 30.3.3.8.1. We believe that the IS-200, Figure 30-8 is correct. It shows that GNSS ID starts at bit 157 and is 3 bits long. The text in Section 30.3.3.8.1 should match the bits layout in the

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			figure.