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**GLOBAL POSITIONING SYSTEMS DIRECTORATE
SYSTEMS ENGINEERING & INTEGRATION
INTERFACE SPECIFICATION
IS-GPS-705**

NAVSTAR GPS Space Segment/User Segment L5 Interfaces



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Date

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IS705-144 : (Section 6.3.4)

WAS :

Among all unique L5-code sequences that could be generated using different initial states as described in Section 3.2.1.1, 126 sequences (63 I5 and 63 Q5) are selected and assigned in Table 3-Ia and Table 3-Ib. An additional 294 sequences (147 I5 and 147 Q5) are selected and assigned with PRN numbers in the below Table 6-II. Any assignment of an L5 PRN number and its code sequence for any additional SV and/or other L5 signal applications, such as Satellite Based Augmentation System (SBAS) satellite signals, will be selected from the sequences of Table 6-II. PRN sequences numbered 211-1023 are reserved for internal system use and are therefore not provided in this section.

IS :

[The additional PRN sequences provided in this section are for information only.](#) Among all unique L5-code sequences that could be generated using different initial states as described in Section 3.2.1.1, 126 sequences (63 I5 and 63 Q5) are selected and assigned in Table 3-Ia and Table 3-Ib. An additional 294 sequences (147 I5 and 147 Q5) are selected and assigned with PRN numbers in the below Table 6-II. Any assignment of an L5 PRN number and its code sequence for any additional SV and/or other L5 signal applications, such as Satellite Based Augmentation System (SBAS) satellite signals, will be selected from the sequences of Table 6-II. PRN sequences numbered 211-1023 are reserved for internal system use and are therefore not provided in this section.

IS705-1518 :

Insertion after object IS705-143 (Section 6.3.4)

WAS :

N/A

IS :

[Pre-Operational Use:](#)

IS705-1519 :

Insertion below object IS705-1518 (Section 6.3.4)

WAS :

N/A

IS :

Before any new signal or group of signals (e.g., L2C, L5, M, L1C, etcetera) is declared operational, the availability of and/or the configuration of the broadcast signal or group of signals may not comply with all requirements of the relevant IS or ICD. For example, the pre-operational broadcast of L2C signals from the IIR-M satellites did not include any NAV or CNAV data as required by IS-GPS-200. Pre-operational use of any new signal or group of signals is at the users own risk.

IS705-302 : (Section 20.3.3.4.5)

WAS :

Table 20-V. Midi Almanac Parameters				
Parameter	No. of Bits**	Scale Factor (LSB)	Valid Range***	Units
t_{oa}	8	2^{12}	0 to 602,112	seconds
e	11	2^{-16}	0.0 to 0.03	dimensionless
δ_i^{****}	11*	2^{-14}		semi-circles
$\dot{\Omega}$	11*	2^{-33}	-6.33E-07 to 0	semi-circles/sec
\sqrt{A}	17	2^{-4}	2530 to 8192	$\sqrt{\text{meters}}$
Ω_0	16*	2^{-15}		semi-circles
ω	16*	2^{-15}		semi-circles
M_0	16*	2^{-15}		semi-circles
a_{f0}	11*	2^{-20}		seconds
a_{f1}	10*	2^{-37}		sec/sec

* Parameters so indicated shall be two's complement with the sign bit (+ or -) occupying the MSB;

** See Figure 20-10 for complete bit allocation in message type 37;

*** Unless otherwise indicated in this column, valid range is the maximum range attainable with indicated bit allocation and scale factor;

**** Relative to $i_0 = 0.30$ semi-circles.

IS :

Table 20-V. Midi Almanac Parameters				
Parameter	No. of Bits**	Scale Factor (LSB)	Valid Range***	Units
t_{oa}	8	2^{12}	0 to 602,112	seconds
e	11	2^{-16}	0.0 to 0.03	dimensionless
δ_i^{****}	11*	2^{-14}		semi-circles
$\dot{\Omega}$	11*	2^{-33}	-1.19E-07 to 0	semi-circles/sec
\sqrt{A}	17	2^{-4}	2530 to 8192	$\sqrt{\text{meters}}$
Ω_0	16*	2^{-15}		semi-circles
ω	16*	2^{-15}		semi-circles
M_0	16*	2^{-15}		semi-circles
a_{f0}	11*	2^{-20}		seconds
a_{f1}	10*	2^{-37}		sec/sec

* Parameters so indicated shall be two's complement with the sign bit (+ or -) occupying the MSB;

** See Figure 20-10 for complete bit allocation in message type 37;

*** Unless otherwise indicated in this column, valid range is the maximum range attainable with indicated bit allocation and scale factor;

**** Relative to $i_0 = 0.30$ semi-circles.

IS705-1497 : (Section 20.3.3.4.6.1)

WAS :

A 6-bit value of “000000” in the PRN_a field shall indicate that no further Status Words are contained in the remainder of the data block. In this event, all subsequent bits in the data block field shall be filler bits, i.e., alternating ones and zeros beginning with one.

IS :

A 6-bit value of “000000” in the PRN_a field shall indicate that ~~no further Status Words are no contained data~~ in the ~~remainder of the reduced data almanac block packet~~. In this event, all subsequent bits through the last bit of the last packet in the ~~data message block~~ (bit field 272 for MT 31, bit 276 for MT 12) shall be filler bits, i.e., alternating ones and zeros beginning with one.

IS705-313 : (Section 20.3.3.4.6.2.1)

WAS :

Table 20-VI. Reduced Almanac Parameters				
Parameter*****	No. of Bits	Scale Factor (LSB)	Valid Range **	Units
δ_A ***	8 *	2^{+9}	**	meters
Ω_0	7 *	2^{-6}	**	semi-circles
Φ_0 *****	7 *	2^{-6}	**	semi-circles

* Parameters so indicated shall be two's complement with the sign bit (+ or -) occupying the MSB;
 ** Valid range is the maximum range attainable with indicated bit allocation and scale factor;
 *** Relative to $A_{ref} = 26,559,710$ meters;
 **** $\Phi_0 =$ Argument of Latitude at Reference Time = $M_0 + \omega$;
 ***** Relative to following reference values:
 $e = 0$
 $\delta_i = +0.0056$ semi-circles ($i = 55$ degrees)
 $\dot{\delta}_i = -2.6 \times 10^{-9}$ semi-circles/second

IS :

Table 20-VI. Reduced Almanac Parameters*****				
Parameter	No. of Bits	Scale Factor (LSB)	Valid Range **	Units
δ_A ***	8 *	2^{+9}	**	meters
Ω_0	7 *	2^{-6}	**	semi-circles
Φ_0 *****	7 *	2^{-6}	**	semi-circles

* Parameters so indicated shall be two's complement with the sign bit (+ or -) occupying the MSB;

** Valid range is the maximum range attainable with indicated bit allocation and scale factor;

*** Relative to $A_{ref} = 26,559,710$ meters;

***** $\Phi_0 = \text{Argument of Latitude at Reference Time} = M_0 + \omega$;

***** Relative to following reference values:

$e = 0$

$\delta_i = +0.0056$ semi-circles ($i = 55$ degrees)

$\dot{\Omega} = -2.6 \times 10^{-9}$ semi-circles/second

IS705-332 : (Section 20.3.3.6.2)

WAS :

Table 20-IX. UTC Parameters					
Parameter Symbol	Parameter Description	No. of Bits**	Scale Factor (LSB)	Valid Range***	Units
A _{0-n}	Bias coefficient of GPS time scale relative to UTC time scale	16*	2 ⁻³⁵		Seconds
A _{1-n}	Drift coefficient of GPS time scale relative to UTC time scale	13*	2 ⁻⁵¹		sec/sec
A _{2-n}	Drift rate correction coefficient of GPS time scale relative of UTC time scale	7*	2 ⁻⁶⁸		sec/sec ²
Δ _{tLS}	Current or past leap second count	8*	1		seconds
t _{ot}	Time data reference Time of Week	16	2 ⁴	0 to 604,784	seconds
WN _{ot}	Time data reference Week Number	13	1		weeks
WN _{LSF}	Leap second reference Week Number	8	1		weeks
DN	Leap second reference Day Number	4	1	1 to 7	days
Δ _{tLSF}	Current or future leap second count	8*	1		seconds
<p>* Parameters so indicated shall be two's complement with the sign bit (+ or -) occupying the MSB; ** See Figure 20-6 for complete bit allocation *** Unless otherwise indicated in this column, valid range is the maximum range attainable with indicated bit allocation and scale factor.</p>					

IS :

Table 20-IX. UTC Parameters					
Parameter Symbol	Parameter Description	No. of Bits**	Scale Factor (LSB)	Valid Range***	Units
A _{0-n}	Bias coefficient of GPS time scale relative to UTC time scale	16*	2 ⁻³⁵		Seconds
A _{1-n}	Drift coefficient of GPS time scale relative to UTC time scale	13*	2 ⁻⁵¹		sec/sec
A _{2-n}	Drift rate correction coefficient of GPS time scale relative of UTC time scale	7*	2 ⁻⁶⁸		sec/sec ²
Δt _{LS}	Current or past leap second count	8*	1		seconds
t _{ot}	Time data reference Time of Week	16	2 ⁴	0 to 604,784	seconds
WN _{ot}	Time data reference Week Number	13	1		weeks
WN _{LSF}	Leap second reference Week Number	13	1		weeks
DN	Leap second reference Day Number	4	1	1 to 7	days
Δt _{LSF}	Current or future leap second count	8*	1		seconds
<p>* Parameters so indicated shall be two's complement with the sign bit (+ or -) occupying the MSB; ** See Figure 20-6 for complete bit allocation *** Unless otherwise indicated in this column, valid range is the maximum range attainable with indicated bit allocation and scale factor;</p>					