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GLOBAL POSITIONING SYSTEM DIRECTORATE
SYSTEMS ENGINEERING & INTEGRATION
INTERFACE SPECIFICATION
IS-GPS-200

Navstar GPS Space Segment/Navigation User Segment Interfaces

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Section	WAS	IS
6.3.7.2.1	The generation of 37 mutually exclusive P-code PRN sequences are described in Section 3.3.2.2. An additional set of 147 P-code PRN sequences are generated by circularly shifting each of the original 37 sequences (over one week) by an amount corresponding to 1, 2, 3, 4, or 5 days. The additional sequences are therefore time shifted (i.e. offset) versions of the original 37 sequences. These offset P-code PRN sequences, Pi(t), are described as follows: Pi(t) = Pi-37x(t + xT), where i is an integer from 64 to 210, x is an integer portion of (i-1)/37, and T is defined to equal 24 hours. As an example, P-code sequence for PRN 91 would be the same sequence as PRN 17 shifted 48 hours into a week (i.e. 1st chip of PRN 91 at beginning of week is the same chip for PRN 17 at 48 hours after beginning of week). The complete list of the additional P-code PRN assignments is shown in Table 6-I. Any assignment of a P-code PRN number and its code sequence for any additional SV and/or other L1/L2 signal applications will be selected from the sequences of Table 6-I.	The generation of 37 mutually exclusive P-code PRN sequences are described in Section 3.3.2.2. An additional set of 147 P-code PRN sequences are generated by circularly shifting each of the original 37 sequences (over one week) by an amount corresponding to 1, 2, 3, 4, or 5 days. The additional sequences are therefore time shifted (i.e. offset) versions of the original 37 sequences. These offset P-code PRN sequences, $P_i(t)$, are described as follows: $P_i(t) = P_{i-37x}(t + xT)$, where i is an integer from 64 to 210, x is an integer portion of (i-1)/37, and T is defined to equal 24 hours. As an example, P-code sequence for PRN 91 would be the same sequence as PRN 17 shifted 48 hours into a week (i.e. 1^{st} chip of PRN 91 at beginning of week is the same chip for PRN 17 at 48 hours after beginning of week). The complete list of the additional P-code PRN assignments is shown in Table 6-I. Any assignment of a P-code PRN number and its code sequence for any additional SV and/or other L1/L2 signal applications will be selected from the sequences of Table 6-I.

Section	WAS	IS
20.3.3.5.1.3	See WAS table below	See IS table below

WAS

Table 20-VIII. Codes for Health of SV Signal Components

MSB LSB	Definition
00000	All Signals OK
00001	All Signals Weak*
00010	All Signals Dead
00011	All Signals Have No Data Modulation
00100	L1 P Signal Weak
00101	L1 P Signal Dead
00110	L1 P Signal Has No Data Modulation
00111	L2 P Signal Weak
01000	L2 P Signal Dead
01001	L2 P Signal Has No Data Modulation
01010	L1 C Signal Weak
01011	L1 C Signal Dead
01100	L1 C Signal Has No Data Modulation
01101	L2 C Signal Weak
01110	L2 C Signal Dead
01111	L2 C Signal Has No Data Modulation
10000	L1 & L2 P Signal Weak
10001	L1 & L2 P Signal Dead
10010	L1 & L2 P Signal Has No Data Modulation
10011	L1 & L2 C Signal Weak
10100	L1 & L2 C Signal Dead
10101	L1 & L2 C Signal Has No Data Modulation
10110	L1 Signal Weak*
10111	L1 Signal Dead
11000	L1 Signal Has No Data Modulation
11001	L2 Signal Weak*
11010	L2 Signal Dead
11011	L2 Signal Has No Data Modulation
11100	SV Is Temporarily Out (Do not use this SV during current pass)**
11101	SV Will Be Temporarily Out (Use with caution)**
11110	One Or More Signals Are Deformed, However The Relevant URA Parameters Are Valid
11111	More Than One Combination Would Be Required To Describe Anomalies (Not including those marked with "**")

* 3 to 6 dB below specified power level due to reduced power output, excess phase noise, SV attitude, etc.
** See definition above for Health Code 11111.
*** Note: Deformed means one or more signals do not meet the requirements in Section 3.

IS

Table 20-VIII. Codes for Health of SV Signal Components

MSB LSB	Definition
00000	All Signals OK
00001	All Signals Weak*
00010	All Signals Dead
00011	All Signals Have No Data Modulation
00100	L1 P Signal Weak
00101	L1 P Signal Dead
00110	L1 P Signal Has No Data Modulation
00111	L2 P Signal Weak
01000	L2 P Signal Dead
01001	L2 P Signal Has No Data Modulation
01010	L1 C Signal Weak
01011	L1 C Signal Dead
01100	L1 C Signal Has No Data Modulation
01101	L2 C Signal Weak
01110	L2 C Signal Dead
01111	L2 C Signal Has No Data Modulation
10000	L1 & L2 P Signal Weak
10001	L1 & L2 P Signal Dead
10010	L1 & L2 P Signal Has No Data Modulation
10011	L1 & L2 C Signal Weak
10100	L1 & L2 C Signal Dead
10101	L1 & L2 C Signal Has No Data Modulation
10110	L1 Signal Weak*
10111	L1 Signal Dead
11000	L1 Signal Has No Data Modulation
11001	L2 Signal Weak*
11010	L2 Signal Dead
11011	L2 Signal Has No Data Modulation
11100	SV Is Temporarily Out (Do not use this SV during current pass)**
11101	SV Will Be Temporarily Out (Use with caution)**
11110	***One Or More Signals Are Deformed, However The Relevant URA Parameters Are Valid
11111	More Than One Combination Would Be Required To Describe Anomalies (Not including those marked with "**")

* 3 to 6 dB below specified power level due to reduced power output, excess phase noise, SV attitude, etc.
** See definition above for Health Code 11111.
*** Note: Deformed means one or more signals do not meet the requirements in Section 3.

Section	WAS	IS
20.3.3.5.2.4	Depending upon the relationship of the effectivity date to the user's current GPS time, the following three different UTC/GPS-time relationships exist: a. Whenever the effectivity time indicated by the WN_{LSF} and the DN values is not in the past (relative to the user's present time), and the user's present time does not fall in the time span which starts at six hours prior to the effectivity time and ends at six hours after the effectivity time, the UTC/GPS-time relationship is given by t_{UTC} = $(t_E - \Delta t_{UTC})$ [modulo 86400 seconds] where t_{UTC} is in seconds and Δt_{UTC} = $\Delta t_{LS} + A_0 + A_1 (t_E - t_{ot} + 604800 (WN - WN_t))$, seconds; t_E = GPS time as estimated by the user after correcting t_{SV} for factors described in paragraph 20.3.3.3.3 as well as for selective availability (SA) (dither) effects; Δt_{LS} = delta time due to leap seconds; A_0 and A_1 = constant and first order terms	Depending upon the relationship of the effectivity date to the user's current GPS time, the following three different UTC/GPS-time relationships exist: a. Whenever the effectivity time indicated by the WN_{LSF} and the DN values is not in the past (relative to the user's present time), and the user's present time does not fall in the time span which starts at six hours prior to the effectivity time and ends at six hours after the effectivity time, the UTC/GPS-time relationship is given by t_{UTC} = $(t_E - \Delta t_{UTC})$ [modulo 86400 seconds] where t_{UTC} is in seconds and Δt_{UTC} = $\Delta t_{LS} + A_0 + A_1 (t_E - t_{ot} + 604800 (WN - WN_t))$, seconds; t_E = GPS time as estimated by the user after correcting t_{SV} for factors described in paragraph 20.3.3.3.3 as well as for selective availability (SA) (dither) effects; Δt_{LS} = delta time due to leap seconds; A_0 and A_1 = constant and first order terms of polynomial; t_{ot} = reference time for UTC data (reference 20.3.4.5);

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	of polynomial;	WN = current week number (derived from subframe 1); WN_t = UTC reference week number.
20.3.3.5.2.4	b. Whenever the user's current time falls within the time span of six hours prior to the effectivity time to six hours after the effectivity time, proper accommodation of the leap second event with a possible week number transition is provided by the following expression for UTC: $t_{UTC} = W[\text{modulo } (86400 + \Delta t_{LSF} - \Delta t_{LS})]$, seconds; where $W = (t_E - \Delta t_{UTC} - 43200)$ [modulo 86400] + 43200, seconds; and the definition of Δt_{UTC} (as given in 20.3.3.5.2.4a above) applies throughout the transition period. Note that when a leap second is added, unconventional time values of the form 23:59:60.xxx are encountered. Some user equipment may be designed to approximate UTC by decrementing the running count of time within several seconds after the event, thereby promptly returning to a proper time indication. Whenever a leap second event is encountered,	b. Whenever the user's current time falls within the time span of six hours prior to the effectivity time to six hours after the effectivity time, proper accommodation of the leap second event with a possible week number transition is provided by the following expression for UTC: $t_{UTC} = W[\text{modulo } (86400 + \Delta t_{LSF} - \Delta t_{LS})]$, seconds; where $W = (t_E - \Delta t_{UTC} - 43200)$ [modulo 86400] + 43200, seconds; and the definition of Δt_{UTC} (as given in 20.3.3.5.2.4a above) applies throughout the transition period. Note that when a leap second is added, unconventional time values of the form 23:59:60.xxx are encountered. Some user equipment may be designed to approximate UTC by decrementing the running count of time within several seconds after the event, thereby promptly returning to a proper time indication. Whenever a leap second event is encountered, the user equipment must consistently implement carries or borrows into any year/week/day counts.
30.3.3.1.1	Any change in the message type 10 and 11 ephemeris data will be accomplished with a simultaneous change in the t_{oe} value. The CS will assure the toe value for Block IIR-M/IIF and SS will assure the toe value for Block III, for at least the first data set transmitted by an SV after an upload, is different from that transmitted prior to the cutover. See Section 30.3.4.5 for additional information regarding t_{oe}.	Any change in the message type 10 and 11 ephemeris data will be accomplished with a simultaneous change in the t_{oe} value. The CS will assure the t_{oe} value for Block IIR-M/IIF and SS will assure the t_{oe} value for GPS III, for at least the first data set transmitted by an SV after an upload, is different from that transmitted prior to the cutover. See Section 30.3.4.5 for additional information regarding t_{oe}.