CHANGE NOTICE

Affected Document:	IRN/SCN Number	Date:
IS-GPS-200 Rev M	IRN-IS-200M-001	13-JAN-2022
Authority:	**Proposed Change Notice**	**Date:**
RFC-00467	PCN-IS-200L_RFC467	10-DEC-2021

Document Title: NAVSTAR GPS Space Segment / Navigation User Interfaces

RFC Title: 2021 Proposed Changes to the Public Documents

Reason For Change (Driver):

1. Reserved/spare bits in the CNAV/CNAV-2 in IS-GPS-200 are assumed to be a static bit pattern. With the current proposed implementation to fill those bits with a pseudorandom bit pattern, users are at risk of incorrectly using those bits for integrity checks.
2. The GPS IIIF SV Configuration Code '101' confirms that the "alert" in HOW is still applicable. As such, one of the public stakeholder was requesting clarification to confirm if the "alert" in the HOW will also be applicable in the future undefined configuration codes. This is not sufficient for safety-of-life equipment that would need to have the confirmation because the alert is part of the "marginal" conditions leading to the selection/deselection of a satellite in a RAIM or ARAIM integrity context.
3. Current Issue of Data and Clock (IODC) requirement in IS-GPS-200 states that the IODC will be different from any value transmitted by the SV during the preceding 7-days. In certain occasions, current operations have shown not to follow that requirement.
4. The descriptions of how the navigation message changes with time (for example, transitions between data sets, or behavior under extended navigation) do not capture all the implementation differences between earlier SVs and GPS III/IIIF.
5. Documents need clarification and clean-up, as identified in past Public ICWGs and as newly-identified changes of administrative nature.

Description of Change:

1. Clarify language in IS-GPS-200, IS-GPS-705 and IS-GPS-800 to tell users to not utilize the spare/reserved bits.
2. Add clarification to the SV Configuration Code section for the undefined SV codes.
3. Modify or delete the IODC requirement.
4. Update the timing-related information to reflect the current implementation, including aspects specific to GPS III/IIIF. Also added deferred (from RFC-444 RSAM) a Timing Relationships section to ICD-GPS-700 following the Timing Relationships section outline in IS-GPS-200 to ensure the entire subject is covered for MNAV/M-Code.
5. Provide clarity and clean up identified administrative changes in all affected documents.

Authored By: RE: Tony Anthony **Checked By: RE:** Meaghan Leonhardt

AUTHORIZED SIGNATURES	REPRESENTING	DATE
DUNN.MICHAEL.J.1171235045 Digitally signed by DUNN.MICHAEL.J.1171235045 Date: 2022.04.19 06:51:55 -07'00'	PNT Capability Area Integrator, Space Systems Architect, Space Systems Command – LAAFB	19 April 2022

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CODE IDENT 66RP1

IS200-1402:

Section Number:
3.2.1.1.1
WAS:
Object Heading: Expanded P-Code (GPS III)
Redlines:
Object Heading: Expanded P-Code (GPS III and GPS IIIF)
IS:
Object Heading: Expanded P-Code (GPS III and GPS IIIF)

IS200-1315:

Section Number:
3.2.1.3.1
WAS:
Object Heading: Expanded C/A Code (GPS III)
Redlines:
Object Heading: Expanded C/A Code -(GPS III and GPS IIIF)
IS:
Object Heading: Expanded C/A Code (GPS III and GPS IIIF)

IS200-46:

Section Number:
3.2.3.0-1
WAS:
The L1 consists of two carrier components which are in phase quadrature with each other. Each carrier component is bi-phase shift key (BPSK) modulated by a separate bit train. One bit train is the modulo-2 sum of the P(Y)-code and LNAV data, D(t), while the other is the modulo-2 sum of the C/A-code and the LNAV data, D(t). For Block II/IIA and IIR, the L2 is BPSK modulated by only one of those two bit trains; the bit train to be used for L2 modulation is selected by ground command. A third modulation mode is also selectable on the L2 channel by ground command: it utilizes the P(Y)-code without the LNAV data as the modulating signal. For a particular SV, all transmitted signal elements (carriers, codes and data) are coherently derived from the same on-board frequency source.
Redlines:
The L1 consists of two carrier components which are in phase quadrature with each other. Each carrier component is bi-phase shift key (BPSK) modulated by a separate bit train. One bit train is the modulo-2 sum of the P(Y)-code and LNAV data, D(t), while the other is the modulo-2 sum of the C/A-code and the LNAV data, D(t). For Block ~~II/IIA and~~ IIR, the L2 is BPSK modulated by only one of those two bit trains; the bit train to be used for L2 modulation is selected by ground command. A third modulation mode is also selectable on the L2 channel by ground command: it utilizes the P(Y)-code without the LNAV data as the modulating signal. For a particular SV, all transmitted signal elements (carriers, codes and data) are coherently derived from the same on-board frequency source.
IS:
The L1 consists of two carrier components which are in phase quadrature with each other. Each carrier component is bi-phase shift key (BPSK) modulated by a separate bit train. One bit train is the modulo-2 sum of the P(Y)-code and LNAV data, D(t), while the other is the modulo-2 sum of the C/A-code and the LNAV data, D(t). For Block IIR, the L2 is BPSK modulated by only one of those two bit trains; the bit train to be used for L2 modulation is selected by ground command. A third modulation mode is also selectable on the L2 channel by ground command: it utilizes the P(Y)-code without the LNAV data as the modulating signal. For a particular SV, all transmitted signal elements (carriers, codes and data) are coherently derived from the same on-board frequency source.

IS200-50:

Section Number:
3.2.3.0-5
WAS:

SV Blocks	L1		L2**	
	In-Phase*	Quadrature-Phase*	In-Phase*	Quadrature-Phase*
Block II/IIA/IIR	P(Y) ⊕ D(t)	C/A ⊕ D(t)	P(Y) ⊕ D(t) or P(Y) or C/A ⊕ D(t)	Not Applicable
Block IIR-M/IIF/ and GPS III/ IIIF	P(Y) ⊕ D(t)	C/A ⊕ D(t)	P(Y) ⊕ D(t) or P(Y)	L2 CM ⊕ D_C(t) with L2 CL or C/A ⊕ D(t) or C/A

Notes: 1) The configuration identified in this table reflects only the content of Section 3.2.3 and does not show all available codes/signals on L1/L2.

⊕ = "exclusive-or" (modulo-2 addition)
D(t) = LNAV data at 50 bps
D_C(t) = CNAV data at 25 bps with FEC encoding resulting in 50 sps

* Terminology of "in-phase" and "quadrature-phase" is used only to identify the relative phase quadrature relationship of the carrier components (i.e. 90 degrees offset of each other).

** The two carrier components on L2 may not have the phase quadrature relationship. They may be broadcast on same phase (ref. Section 3.3.1.5).

Redlines:

SV Blocks	L1		L2**	
	In-Phase*	Quadrature-Phase*	In-Phase*	Quadrature-Phase*
Block ~~II/IIA/~~IIR	P(Y) ⊕ D(t)	C/A ⊕ D(t)	P(Y) ⊕ D(t) or P(Y) or C/A ⊕ D(t)	Not Applicable
Block IIR-M/IIF/ and GPS III/ IIIF	P(Y) ⊕ D(t)	C/A ⊕ D(t)	P(Y) ⊕ D(t) or P(Y)	L2 CM ⊕ D_C(t) with L2 CL or C/A ⊕ D(t) or C/A

Notes: 1) The configuration identified in this table reflects only the content of Section 3.2.3 and does not show all available codes/signals on L1/L2.

⊕ = "exclusive-or" (modulo-2 addition)
D(t) = LNAV data at 50 bps
D_C(t) = CNAV data at 25 bps with FEC encoding resulting in 50 sps

* Terminology of "in-phase" and "quadrature-phase" is used only to identify the relative phase quadrature relationship of the carrier components (i.e. 90 degrees offset of each other).

** The two carrier components on L2 may not have the phase quadrature relationship. They may be broadcast on same phase (ref. Section 3.3.1.5).

IS:

SV Blocks	L1		L2**	
	In-Phase*	Quadrature-Phase*	In-Phase*	Quadrature-Phase*
Block IIR	P(Y) ⊕ D(t)	C/A ⊕ D(t)	P(Y) ⊕ D(t) or P(Y) or C/A ⊕ D(t)	Not Applicable
Block IIR-M/IIF/ and GPS III/ IIIF	P(Y) ⊕ D(t)	C/A ⊕ D(t)	P(Y) ⊕ D(t) or P(Y)	L2 CM ⊕ $D_C(t)$ with L2 CL or C/A ⊕ D(t) or C/A

Notes: 1) The configuration identified in this table reflects only the content of Section 3.2.3 and does not show all available codes/signals on L1/L2.

⊕ = "exclusive-or" (modulo-2 addition)
D(t) = LNAV data at 50 bps
$D_C(t)$ = CNAV data at 25 bps with FEC encoding resulting in 50 sps

* Terminology of "in-phase" and "quadrature-phase" is used only to identify the relative phase quadrature relationship of the carrier components (i.e. 90 degrees offset of each other).

** The two carrier components on L2 may not have the phase quadrature relationship. They may be broadcast on same phase (ref. Section 3.3.1.5).

IS200-56:

Section Number:
3.3.1.1.0-1
WAS:
For Block IIA, IIR, IIR-M, and IIF satellites, the requirements specified in this IS shall pertain to the signal contained within two 20.46 MHz bands; one centered about the L1 nominal frequency and the other centered about the L2 nominal frequency (see Table 3-Vb). For GPS III, GPS IIIF, and subsequent satellites, the requirements specified in this IS shall pertain to the signal contained within two 30.69 MHz bands; one centered about the L1 nominal frequency and the other centered about the L2 nominal frequency (see Table 3-Vc).
Redlines:
For Block ~~IIA,~~ IIR, IIR-M, and IIF satellites, the requirements specified in this IS shall pertain to the signal contained within two 20.46 MHz bands; one centered about the L1 nominal frequency and the other centered about the L2 nominal frequency (see Table 3-Vb). For GPS III, GPS IIIF, and subsequent satellites, the requirements specified in this IS shall pertain to the signal contained within two 30.69 MHz bands; one centered about the L1 nominal frequency and the other centered about the L2 nominal frequency (see Table 3-Vc).
IS:
For Block IIR, IIR-M, and IIF satellites, the requirements specified in this IS shall pertain to the signal contained within two 20.46 MHz bands; one centered about the L1 nominal frequency and the other centered about the L2 nominal frequency (see Table 3-Vb). For GPS III, GPS IIIF, and subsequent satellites, the requirements specified in this IS shall pertain to the signal contained within two 30.69 MHz bands; one centered about the L1 nominal frequency and the other centered about the L2 nominal frequency (see Table 3-Vc).

IS200-1523:

Section Number:
3.3.1.6.0-11
WAS:
Table 3-IV. Composite L1 Transmitted Signal Phase ** (Block II/IIA and IIR SVs Only)
Redlines:
Table 3-IV. Composite L1 Transmitted Signal Phase ** ~~(~~Block ~~II/IIA and~~ IIR SVs Only)
IS:
Table 3-IV. Composite L1 Transmitted Signal Phase ** (Block IIR SVs Only)

IS200-1524:

Section Number:
3.3.1.6.0-13
WAS:
Table 3-Va. Received Minimum RF Signal Strength for Block IIA, IIR, IIR-M, IIF, GPS III, and GPS IIIF Satellites
(20.46 MHz Bandwidth)
Redlines:
Table 3-Va. Received Minimum RF Signal Strength for Block ~~IIA,~~ IIR, IIR-M, IIF, GPS III, and GPS IIIF Satellites

(20.46 MHz Bandwidth)
IS:
Table 3-Va. Received Minimum RF Signal Strength for Block IIR, IIR-M, IIF, GPS III, and GPS IIIF Satellites

(20.46 MHz Bandwidth)

IS200-77:

Section Number:
3.3.1.6.0-14
WAS:

SV Blocks	Channel	Signal	
		P(Y)	C/A or L2C
IIA/IIR	L1	-161.5 dBW	-158.5 dBW
	L2	-164.5 dBW	-164.5 dBW
IIR-M/IIF	L1	-161.5 dBW	-158.5 dBW
	L2	-161.5 dBW	-160.0 dBW
GPS III/ IIIF	L1	-161.5 dBW	-158.5 dBW
	L2	-161.5 dBW	-158.5 dBW

Redlines:

SV Blocks	Channel	Signal	
		P(Y)	C/A or L2C
~~IIA/~~IIR	L1	-161.5 dBW	-158.5 dBW
	L2	-164.5 dBW	-164.5 dBW
IIR-M/IIF	L1	-161.5 dBW	-158.5 dBW
	L2	-161.5 dBW	-160.0 dBW
GPS III/ IIIF	L1	-161.5 dBW	-158.5 dBW
	L2	-161.5 dBW	-158.5 dBW

IS:

SV Blocks	Channel	Signal	
		P(Y)	C/A or L2C
IIR	L1	-161.5 dBW	-158.5 dBW
	L2	-164.5 dBW	-164.5 dBW
IIR-M/IIF	L1	-161.5 dBW	-158.5 dBW
	L2	-161.5 dBW	-160.0 dBW
GPS III/ IIIF	L1	-161.5 dBW	-158.5 dBW
	L2	-161.5 dBW	-158.5 dBW

IS200-2046:

Section Number:
3.3.1.9.0-2
WAS:
For the angular range of ±13.8 degrees from nadir, L1 ellipticity shall be no worse than 1.2 dB for Block IIA
Redlines:
~~For the angular range of ±13.8 degrees from nadir, L1 ellipticity shall be no worse than 1.2 dB for Block IIA~~
IS:
<DELETED OBJECT>

IS200-2047:

Section Number:
3.3.1.9.0-3
WAS:
and shall be no worse than 1.8 dB for Block IIR/IIR-M/IIF/III/IIIF SVs.
Redlines:
~~and~~For the angular range of ±13.8 degrees from nadir, L1 ellipticity shall be no worse than 1.8 dB for Block IIR/IIR-M/IIF/III/IIIF SVs.
IS:
For the angular range of ±13.8 degrees from nadir, L1 ellipticity shall be no worse than 1.8 dB for Block IIR/IIR-M/IIF/III/IIIF SVs.

IS200-2048:

Section Number:
3.3.1.9.0-4
WAS:
L2 ellipticity shall be no worse than 3.2 dB for Block II/IIA SVs
Redlines:
~~L2 ellipticity shall be no worse than 3.2 dB for Block II/IIA SVs~~
IS:
<DELETED OBJECT>

IS200-2049:

Section Number:
3.3.1.9.0-5
WAS:
and shall be no worse than 2.2 dB for Block IIR/IIR-M/IIF and GPS III/IIIF SVs over the angular range of ±13.8 degrees from nadir.
Redlines:
~~and~~For the angular range of ±13.8 degrees from nadir, L2 ellipticity shall be no worse than 2.2 dB for Block IIR/IIR-M/IIF~~ and GPS~~ /III/IIIF SVs~~ over the angular range of ±13~~.8 degrees from ~~nadir.~~
IS:
For the angular range of ±13.8 degrees from nadir, L2 ellipticity shall be no worse than 2.2 dB for Block IIR/IIR-M/IIF/III/IIIF SVs.

IS200-157:

Section Number:
6.2.1.0-1
WAS:
User Range Accuracy (URA) is a statistical indicator of the GPS ranging accuracy obtainable with a specific signal and SV. URA provides a conservative RMS estimate of the user range error (URE) in the associated navigation data for the transmitting SV. It includes all errors for which the Space and Control Segments are responsible. Whether the integrity status flag is 'off' or 'on', 4.42 times URA bounds the instantaneous URE with 1-(1e-5) per hour probability ('legacy' level of integrity assurance). When the integrity status flag is 'on', 5.73 times URA bounds the instantaneous URE with 1-(1e-8) per hour probability ('enhanced' level of integrity assurance). Integrity properties of the URA are specified with respect to the scaled (multiplied by either 4.42 or 5.73 as appropriate) upper bound values of the URA index or to the scaled composite of the upper bound values of all component URA indexes.
Redlines:
User Range Accuracy (URA) is a statistical indicator of the GPS ranging accuracy obtainable with a specific signal and SV. URA provides a conservative RMS estimate of the user range error (URE) in the associated navigation data for the transmitting SV. It includes all errors for which the Space and Control Segments are responsible. Whether the integrity status flag is ~~'off'~~"0" or ~~'on'~~"1", 4.42 times URA bounds the instantaneous URE with 1-(1e-5) per hour probability ('legacy' level of integrity assurance). When the integrity status flag is ~~'on'~~set to "1", 5.73 times URA bounds the instantaneous URE with 1-(1e-8) per hour probability ('enhanced' level of integrity assurance). Integrity properties of the URA are specified with respect to the scaled (multiplied by either 4.42 or 5.73 as appropriate) upper bound values of the URA index or to the scaled composite of the upper bound values of all component URA indexes.
IS:
User Range Accuracy (URA) is a statistical indicator of the GPS ranging accuracy obtainable with a specific signal and SV. URA provides a conservative RMS estimate of the user range error (URE) in the associated navigation data for the transmitting SV. It includes all errors for which the Space and Control Segments are responsible. Whether the integrity status flag is "0" or "1", 4.42 times URA bounds the instantaneous URE with 1-(1e-5) per hour probability ('legacy' level of integrity assurance). When the integrity status flag is set to "1", 5.73 times URA bounds the instantaneous URE with 1-(1e-8) per hour probability ('enhanced' level of integrity assurance). Integrity properties of the URA are specified with respect to the scaled (multiplied by either 4.42 or 5.73 as appropriate) upper bound values of the URA index or to the scaled composite of the upper bound values of all component URA indexes.

IS200-1292:

Section Number:
6.2.1.0-4
WAS:
Note #3: The URA is not required to bound the instantaneous URE when: (a) an alert is issued to the users before the instantaneous URE exceeds either of the scaled URA bounds; or (b) if the integrity status flag is 'off' an alert is issued to the users no more than 8.0 seconds after the instantaneous URE exceeds the 4.42 times URA bound; or (c) if the integrity status flag is 'on' an alert is issued to the users no more than 8.0 seconds after the instantaneous URE exceeds the 4.42 times URA bound; or (d) if the integrity status flag is 'on' an alert is issued to users no more than 5.2 seconds after the instantaneous URE exceeds the 5.73 times URA bound. In this context, an "alert" is defined as any indication or characteristic of the conveying signal, as specified elsewhere in this document, which signifies to users that the conveying signal may be invalid or should not be used, such as the health bits not indicating operational-healthy, broadcasting non-standard code, parity error, etc.
Redlines:
Note #3: The URA is not required to bound the instantaneous URE when: (a) an alert is issued to the users before the instantaneous URE exceeds either of the scaled URA bounds; or (b) if the integrity status flag is ~~'off'~~"0", an alert is issued to the users no more than 8.0 seconds after the instantaneous URE exceeds the 4.42 times URA bound; or (c) if the integrity status flag is ~~'on'~~"1", an alert is issued to the users no more than 8.0 seconds after the instantaneous URE exceeds the 4.42 times URA bound; or (d) if the integrity status flag is ~~'on'~~"1", an alert is issued to users no more than 5.2 seconds after the instantaneous URE exceeds the 5.73 times URA bound. In this context, an "alert" is defined as any indication or characteristic of the conveying signal, as specified elsewhere in this document, which signifies to users that the conveying signal may be invalid or should not be used, such as the health bits not indicating operational-healthy, broadcasting non-standard code, parity error, etc.
IS:
Note #3: The URA is not required to bound the instantaneous URE when: (a) an alert is issued to the users before the instantaneous URE exceeds either of the scaled URA bounds; or (b) if the integrity status flag is "0", an alert is issued to the users no more than 8.0 seconds after the instantaneous URE exceeds the 4.42 times URA bound; or (c) if the integrity status flag is "1", an alert is issued to the users no more than 8.0 seconds after the instantaneous URE exceeds the 4.42 times URA bound; or (d) if the integrity status flag is "1", an alert is issued to users no more than 5.2 seconds after the instantaneous URE exceeds the 5.73 times URA bound. In this context, an "alert" is defined as any indication or characteristic of the conveying signal, as specified elsewhere in this document, which signifies to users that the conveying signal may be invalid or should not be used, such as the health bits not indicating operational-healthy, broadcasting non-standard code, parity error, etc.

IS200-167:

Section Number:
6.2.2.1.0-1
WAS:
The original concept validation satellites developed by Rockwell International and designated as satellite vehicle numbers (SVNs) 1-11 are termed "Block I" SVs. These SVs were designed to provide 3-4 days of positioning service without contact from the CS. These SVs transmitted a configuration code of 000 (reference paragraph 20.3.3.5.1.4). There are no longer any active Block I SVs in the GPS constellation. The last Block I SV was decommissioned in 1995.
Redlines:
The original concept validation satellites ~~developed by Rockwell International and~~ designated as satellite vehicle numbers (SVNs) 1-11 are termed "Block I" SVs. These SVs were designed to provide 3-4 days of positioning service without contact from the CS. These SVs transmitted a configuration code of 000 (reference paragraph 20.3.3.5.1.4). There are no longer any active Block I SVs in the GPS constellation. The last Block I SV was decommissioned in 1995.
IS:
The original concept validation satellites designated as satellite vehicle numbers (SVNs) 1-11 are termed "Block I" SVs. These SVs were designed to provide 3-4 days of positioning service without contact from the CS. These SVs transmitted a configuration code of 000 (reference paragraph 20.3.3.5.1.4). There are no longer any active Block I SVs in the GPS constellation. The last Block I SV was decommissioned in 1995.

IS200-169:

Section Number:
6.2.2.2.0-1
WAS:
The operational satellites are designated Block II, Block IIA, Block IIR, Block IIR-M, Block IIF, GPS III, and GPS IIIF SVs. Characteristics of these SVs are provided below. Modes of operation for these SVs and accuracy of positioning services provided are described in paragraphs 6.3.2 through 6.3.4. These SVs transmit configuration codes as specified in paragraph 20.3.3.5.1.4. The navigation signal provides no direct indication of the type of the transmitting SV.
Redlines:
The operational satellites are designated Block ~~II, Block IIA, Block~~ IIR, Block IIR-M, Block IIF, GPS III, and GPS IIIF SVs. Characteristics of these SVs are provided below. Modes of operation for these SVs and accuracy of positioning services provided are described in paragraphs 6.3.2 through 6.3.4. These SVs transmit configuration codes as specified in paragraph 20.3.3.5.1.4. The navigation signal provides no direct indication of the type of the transmitting SV.
IS:
The operational satellites are designated Block IIR, Block IIR-M, Block IIF, GPS III, and GPS IIIF SVs. Characteristics of these SVs are provided below. Modes of operation for these SVs and accuracy of positioning services provided are described in paragraphs 6.3.2 through 6.3.4. These SVs transmit configuration codes as specified in paragraph 20.3.3.5.1.4. The navigation signal provides no direct indication of the type of the transmitting SV.

IS200-170:

Section Number:
6.2.2.2.1
WAS:
Object Heading: Block II SVs
Redlines:
Object Heading: Block II SVs (Decommissioned)
IS:
Object Heading: Block II SVs (Decommissioned)

IS200-171:

Section Number:
6.2.2.2.1.0-1
WAS:
The first block of full scale operational SVs developed by Rockwell International are designated as SVNs 13-21 and are termed "Block II" SVs. These SVs were designed to provide 14 days of positioning service without contact from the CS.
Redlines:
The first block of full scale operational SVs ~~developed by Rockwell International~~ are designated as SVNs 13-21 and are termed "Block II" SVs.~~-~~ These SVs were designed to provide 14 days of positioning service without contact from the CS. These SVs transmitted a configuration code of 001 (reference paragraph 20.3.3.5.1.4). There are no longer any active Block II SVs in the GPS constellation.

IS:
The first block of full scale operational SVs are designated as SVNs 13-21 and are termed "Block II" SVs. These SVs were designed to provide 14 days of positioning service without contact from the CS. These SVs transmitted a configuration code of 001 (reference paragraph 20.3.3.5.1.4). There are no longer any active Block II SVs in the GPS constellation.

IS200-172:

Section Number:
6.2.2.2.2
WAS:
Object Heading: Block IIA SVs
Redlines:
Object Heading: Block IIA SVs (Decommissioned)
IS:
Object Heading: Block IIA SVs (Decommissioned)

IS200-173:

Section Number:
6.2.2.2.2.0-1
WAS:
The second block of full scale operational SVs developed by Rockwell International are designated as SVNs

22-40 and are termed "Block IIA" SVs. These SVs are capable of providing 60 days of positioning service without contact from the CS.

Redlines:

The second block of full scale operational SVs ~~developed by Rockwell International~~ are designated as SVNs 22-40 and are termed "Block IIA" SVs.~~-~~ These SVs ~~are~~were capable of providing 60 days of positioning service without contact from the CS. These SVs transmitted a configuration code of 001 (reference paragraph 20.3.3.5.1.4). There are no longer any active Block IIA SVs in the GPS constellation.

IS:

The second block of full scale operational SVs are designated as SVNs 22-40 and are termed "Block IIA" SVs. These SVs were capable of providing 60 days of positioning service without contact from the CS. These SVs transmitted a configuration code of 001 (reference paragraph 20.3.3.5.1.4). There are no longer any active Block IIA SVs in the GPS constellation.

IS200-175:

Section Number:

6.2.2.2.3.0-1

WAS:

The block of operational replenishment SVs developed by Lockheed Martin are designated as SVNs 41-61 and are termed "Block IIR" SVs. These SVs have the capability of storing at least 60 days of navigation data with current memory margins, while operating in a IIA mode, to provide positioning service without contact from the CS for that period. (Contractual requirements for these SVs specify transmission of correct data for only 14 days to support short-term extended operations while in IIA mode.)

Redlines:

The block of operational replenishment SVs ~~developed by Lockheed Martin~~ are designated as SVNs 41-61 and are termed "Block IIR" SVs. These SVs have the capability of storing at least 60 days of navigation data with current memory margins~~, while operating in a IIA mode,~~ to provide positioning service without contact from the CS for that period.~~ (Contractual requirements for these SVs specify transmission of correct data for only 14 days to support short-term extended operations while in IIA mode.)~~

IS:

The block of operational replenishment SVs are designated as SVNs 41-61 and are termed "Block IIR" SVs. These SVs have the capability of storing at least 60 days of navigation data with current memory margins to provide positioning service without contact from the CS for that period.

IS200-177:

Section Number:
6.2.2.2.4.0-1
WAS:
The subset of operational replenishment SVs developed by Lockheed Martin which are “Modernized” configuration of “Block IIR” SVs are termed “Block IIR-M”.
Redlines:
The subset of operational replenishment SVs ~~developed by Lockheed Martin~~ which are “Modernized” configuration of “Block IIR” SVs are termed “Block IIR-M”.

IS:
The subset of operational replenishment SVs which are “Modernized” configuration of “Block IIR” SVs are termed “Block IIR-M”.

IS200-179:

Section Number:
6.2.2.2.5.0-1
WAS:
The block of operational replenishment SVs developed by Boeing are designated as SVNs 62-73 and are termed “Block IIF” SVs. This is the first block of operational SVs that transmit the L5 Civil signal. These SVs will provide at least 60 days of positioning service without contact from the CS.
Redlines:
The block of operational replenishment SVs ~~developed by Boeing~~ are designated as SVNs 62-73 and are termed “Block IIF” SVs. This is the first block of operational SVs that transmit the L5 Civil signal. These SVs will provide at least 60 days of positioning service without contact from the CS.
IS:
The block of operational replenishment SVs are designated as SVNs 62-73 and are termed “Block IIF” SVs. This is the first block of operational SVs that transmit the L5 Civil signal. These SVs will provide at least 60 days of positioning service without contact from the CS.

IS200-1405:

Section Number:
6.2.2.2.6.0-1
WAS:
The block of operational replenishment SVs are designated as SVNs 74-105. This is the first block of operational SVs that transmit the L1C signal. These SVs will provide at least 60 days of positioning service without contact from the CS.

Redlines:
The block of operational replenishment SVs are designated as SVNs 74-~~105~~83. This is the first block of operational SVs that transmit the L1C signal.- These SVs will provide at least 60 days of positioning service without contact from the CS.

IS:
The block of operational replenishment SVs are designated as SVNs 74-83. This is the first block of operational SVs that transmit the L1C signal. These SVs will provide at least 60 days of positioning service without contact from the CS.

IS200-2124:
Insertion after object IS200-1404
Section Number:
6.2.2.2.7
WAS:
<INSERTED OBJECT>
Redlines:
Object Heading: GPS IIIF SVs
Object Type: Header
IS:
Object Heading: GPS IIIF SVs
Object Type: Header

IS200-2125:
Insertion below object IS200-2124
Section Number:
6.2.2.2.7.0-1
WAS:
<INSERTED OBJECT>
Redlines:
The block of operational replenishment SVs are designated as SVNs 84-105. This is the follow-on to the GPS III SVs and is termed "GPS IIIF". These SVs will provide at least 60 days of positioning service without contact from the CS.
Object Type: Info-Only
IS:
The block of operational replenishment SVs are designated as SVNs 84-105. This is the follow-on to the GPS III SVs and is termed "GPS IIIF". These SVs will provide at least 60 days of positioning service without contact from the CS.
Object Type: Info-Only

IS200-183:

Section Number:
6.2.3.0-1
WAS:
The following three operational intervals have been defined. These labels will be used to refer to differences in the interface definition as time progresses from SV acceptance of the last navigation data upload.
Redlines:
The following three operational intervals have been defined. -These labels will be used to refer to differences in the LNAV interface definition as time progresses from SV acceptance of the last navigation data upload. For CNAV data, the interface definition does not change with time from upload and only the "normal operations" label is applicable, irrespective of the SV's current LNAV operational interval.
IS:
The following three operational intervals have been defined. These labels will be used to refer to differences in the LNAV interface definition as time progresses from SV acceptance of the last navigation data upload. For CNAV data, the interface definition does not change with time from upload and only the "normal operations" label is applicable, irrespective of the SV's current LNAV operational interval.

IS200-192:

Section Number:
6.2.5
WAS:
Object Heading: L5 Civil Signal
Redlines:
Object Heading: L5 and L1C Civil ~~Signal~~Signals
IS:
Object Heading: L5 and L1C Civil Signals

IS200-2123:
Insertion after object IS200-193
Section Number:
6.2.5.0-2
WAS:
<INSERTED OBJECT>
Redlines:
An additional signal on the L1 carrier denoted L1 Civil (L1C) is only available on GPS III and subsequent blocks of SVs and the signal is specified/described in interface specification IS-GPS-800.
Object Type: Info-Only
IS:
An additional signal on the L1 carrier denoted L1 Civil (L1C) is only available on GPS III and subsequent blocks of SVs and the signal is specified/described in interface specification IS-GPS-800.
Object Type: Info-Only

IS200-1506:

Section Number:
6.2.6.0-1
WAS:
Reserved bits (or a single reserved value within a defined bit) are intended for future or other use and their values may change throughout the life of the system. In order to preserve future use of a reserved value within a defined bit, the User Segment should handle those values as described for each applicable field.
Redlines:
Reserved bits (or a single reserved value within a defined bit) are intended for future or other use and their values may change throughout the life of the system. The reserved fields within the navigation messages that are not defined should be treated as "don't care" bits by the user equipment. "Don't care" bits in the system are bits in a bit field that may or may not have an assigned meaning. User equipment is not required to do anything with these bits. In order to preserve future use of a reserved value within a defined bit, the User Segment should handle those values as described for each applicable field.
IS:
Reserved bits (or a single reserved value within a defined bit) are intended for future or other use and their values may change throughout the life of the system. The reserved fields within the navigation messages that are not defined should be treated as "don't care" bits by the user equipment. "Don't care" bits in the system are bits in a bit field that may or may not have an assigned meaning. User equipment is not required to do anything with these bits. In order to preserve future use of a reserved value within a defined bit, the User Segment should handle those values as described for each applicable field.

IS200-1639:

Section Number:
6.2.9.1-2
WAS:

Symbol	Parameter Name	Subframe	Message
SV Health	SV Health (6 bits)	1	N/A
IODC	Issue of Data, Clock	1	N/A
URA	URA Index	1	N/A
WN	Data Sequence Propagation Week Number	1	10
T_{GD}	Group Delay Differential	1	30
a_{f0}	SV Clock Bias Correction Coefficient	1	30-37
a_{f1}	SV Clock Drift Correction Coefficient	1	30-37
a_{f2}	Drift Rate Correction Coefficient	1	30-37
t_{oc}	Time of Clock	1	30-37
$\sqrt{A}$	Square Root of the Semi-Major Axis	2	N/A
Δn	Mean Motion Difference from Computed Value	2	N/A
Fit Interval Flag	Fit Interval Flag	2	N/A
e	Eccentricity	2	10
M_0	Mean Anomaly at Reference Time	2	10
t_{oe}	Time of Ephemeris	2	10, 11
C_{rs}	Amplitude of the Sine Correction Term to the Orbit Radius	2	11
C_{uc}	Amplitude of Cosine Harmonic Correction Term to the Argument of Latitude	2	11
C_{us}	Amplitude of Sine Harmonic Correction Term to the Argument of Latitude	2	11
IODE	Issue of Data, Ephemeris	2, 3	N/A
ISF	Integrity Status Flag [NOTE1]	All	10
ω	Argument of Perigee	3	10
$\dot{\Omega}$	Rate of Right Ascension	3	11
Ω_0	Longitude of Ascending Node of Orbit Plane at Weekly Epoch	3	11
i_0	Inclination Angle at Reference Time	3	11
IDOT, $i_{0\text{-}n}$-DOT	Rate of Inclination Angle	3	11
C_{ic}	Amplitude of the Cosine Harmonic Correction Term to the Angle of Inclination	3	11
C_{is}	Amplitude of the Sine Harmonic Correction Term to the Angle of Inclination	3	11
C_{rc}	Amplitude of the Cosine Harmonic Correction Term to the Orbit Radius	3	11

Symbol	Parameter Name	Subframe	Message
ΔA	Semi-major Axis Difference at Reference Time	N/A	10
$\dot{A}$	Change Rate in Semi-major Axis	N/A	10
Δn_0	Mean Motion Difference from Computed Value at Reference Time	N/A	10
$\Delta \dot{n}_0$	Rate of Mean Motion Difference from Computed Value	N/A	10
(L1/L2/L5)	Signal Health (3 bits)	N/A	10
URA_{ED}	Elevation Dependent User Range Accuracy	N/A	10
$ISC_{L1C/A}$	Inter-signal Correction	N/A	30
ISC_{L2C}	Inter-signal Correction	N/A	30
ISC_{L5I5}	Inter-signal Correction	N/A	30
ISC_{L5Q5}	Inter-signal Correction	N/A	30
t_{op}	CEI Data Sequence Propagation Time of Week	N/A	10, 30-37
URA_{NED0}	NED Accuracy Index	N/A	30-37
URA_{NED1}	NED Accuracy Change Index	N/A	30-37
URA_{NED2}	NED Accuracy Change Rate Index	N/A	30-37
Alert	Alert Flag [NOTE1]	All	All

NOTE1: Parameters so indicated are for CEI Refinement – not limited to curve fit. Parameters not indicated are needed for/limited to curve fit.
Updates to parameters in table shall prompt changes in t_{oe}/t_{oc} for CNAV and t_{oe}/t_{oc}/IODC/IODE for LNAV. Any parameter marked with NOTE1 may be changed with or without a change in t_{oe}/t_{oc}/IODC/IODE.

Redlines:

Symbol	Parameter Name	Subframe	Message
SV Health	SV Health (6 bits)	1	N/A
IODC	Issue of Data, Clock	1	N/A
URA	URA Index	1	N/A
WN	Data Sequence Propagation Week Number	1	10
T_{GD}	Group Delay Differential	1	30
a_{f0}	SV Clock Bias Correction Coefficient	1	30-37
a_{f1}	SV Clock Drift Correction Coefficient	1	30-37
a_{f2}	Drift Rate Correction Coefficient	1	30-37
t_{oc}	Time of Clock	1	30-37
$\sqrt{A}$	Square Root of the Semi-Major Axis	2	N/A
Δn	Mean Motion Difference from Computed Value	2	N/A
Fit Interval Flag	Fit Interval Flag	2	N/A
e	Eccentricity	2	10
M_0	Mean Anomaly at Reference Time	2	10
t_{oe}	Time of Ephemeris	2	10, 11
C_{rs}	Amplitude of the Sine Correction Term to the Orbit Radius	2	11
C_{uc}	Amplitude of Cosine Harmonic Correction Term to the Argument of Latitude	2	11
C_{us}	Amplitude of Sine Harmonic Correction Term to the Argument of Latitude	2	11
IODE	Issue of Data, Ephemeris	2, 3	N/A
ISF	Integrity Status Flag NOTE1	All	10
ω	Argument of Perigee	3	10
$\dot{\Omega}$	Rate of Right Ascension	3	~~11~~N/A
$\Delta\dot{\Omega}$	Rate of Right Ascension Difference	N/A	11
Ω_0	Longitude of Ascending Node of Orbit Plane at Weekly Epoch	3	11
i_0	Inclination Angle at Reference Time	3	11
IDOT~~, i_{0_n} DOT~~	Rate of Inclination Angle	3	11
C_{ic}	Amplitude of the Cosine Harmonic Correction Term to the Angle of Inclination	3	11
C_{is}	Amplitude of the Sine Harmonic Correction Term to the Angle of Inclination	3	11
C_{rc}	Amplitude of the Cosine Harmonic Correction Term to the Orbit Radius	3	11
ΔA	Semi-major Axis Difference at Reference Time	N/A	10
$\dot{A}$	Change Rate in Semi-major Axis	N/A	10

Symbol	Parameter Name	Subframe	Message
Δn_0	Mean Motion Difference from Computed Value at Reference Time	N/A	10
$\Delta \dot{n}_0$	Rate of Mean Motion Difference from Computed Value	N/A	10
(L1/L2/L5)	Signal Health (3 bits)	N/A	10
URA_{ED}	Elevation Dependent User Range Accuracy	N/A	10
$ISC_{L1C/A}$	Inter-signal Correction	N/A	30
ISC_{L2C}	Inter-signal Correction	N/A	30
ISC_{L5I5}	Inter-signal Correction	N/A	30
ISC_{L5Q5}	Inter-signal Correction	N/A	30
t_{op}	CEI Data Sequence Propagation Time of Week	N/A	10, 30-37
URA_{NED0}	NED Accuracy Index	N/A	30-37
URA_{NED1}	NED Accuracy Change Index	N/A	30-37
URA_{NED2}	NED Accuracy Change Rate Index	N/A	30-37
Alert	Alert Flag NOTE1	All	All

NOTE1: Parameters so indicated are for CEI Refinement – not limited to curve fit. Parameters not indicated are needed for/limited to curve fit.

Updates to parameters in table shall prompt changes in t_{oe}/t_{oc} for CNAV and t_{oe}/t_{oc}/IODC/IODE for LNAV. Any parameter marked with NOTE1 may be changed with or without a change in t_{oe}/t_{oc}/IODC/IODE.

IS:

Symbol	Parameter Name	Subframe	Message
SV Health	SV Health (6 bits)	1	N/A
IODC	Issue of Data, Clock	1	N/A
URA	URA Index	1	N/A
WN	Data Sequence Propagation Week Number	1	10
T_{GD}	Group Delay Differential	1	30
a_{f0}	SV Clock Bias Correction Coefficient	1	30-37
a_{f1}	SV Clock Drift Correction Coefficient	1	30-37
a_{f2}	Drift Rate Correction Coefficient	1	30-37
t_{oc}	Time of Clock	1	30-37
$\sqrt{A}$	Square Root of the Semi-Major Axis	2	N/A
Δn	Mean Motion Difference from Computed Value	2	N/A
Fit Interval Flag	Fit Interval Flag	2	N/A
e	Eccentricity	2	10
M_0	Mean Anomaly at Reference Time	2	10
t_{oe}	Time of Ephemeris	2	10, 11
C_{rs}	Amplitude of the Sine Correction Term to the Orbit Radius	2	11
C_{uc}	Amplitude of Cosine Harmonic Correction Term to the Argument of Latitude	2	11
C_{us}	Amplitude of Sine Harmonic Correction Term to the Argument of Latitude	2	11
IODE	Issue of Data, Ephemeris	2, 3	N/A
ISF	Integrity Status Flag [NOTE1]	All	10
ω	Argument of Perigee	3	10
$\dot{\Omega}$	Rate of Right Ascension	3	N/A
$\Delta\dot{\Omega}$	Rate of Right Ascension Difference	N/A	11
Ω_0	Longitude of Ascending Node of Orbit Plane at Weekly Epoch	3	11
i_0	Inclination Angle at Reference Time	3	11
IDOT	Rate of Inclination Angle	3	11
C_{ic}	Amplitude of the Cosine Harmonic Correction Term to the Angle of Inclination	3	11
C_{is}	Amplitude of the Sine Harmonic Correction Term to the Angle of Inclination	3	11
C_{rc}	Amplitude of the Cosine Harmonic Correction Term to the Orbit Radius	3	11
ΔA	Semi-major Axis Difference at Reference Time	N/A	10
$\dot{A}$	Change Rate in Semi-major Axis	N/A	10

Symbol	Parameter Name	Subframe	Message
Δn_0	Mean Motion Difference from Computed Value at Reference Time	N/A	10
$\Delta \dot{n}_0$	Rate of Mean Motion Difference from Computed Value	N/A	10
(L1/L2/L5)	Signal Health (3 bits)	N/A	10
URA_{ED}	Elevation Dependent User Range Accuracy	N/A	10
$ISC_{L1C/A}$	Inter-signal Correction	N/A	30
ISC_{L2C}	Inter-signal Correction	N/A	30
ISC_{L5I5}	Inter-signal Correction	N/A	30
ISC_{L5Q5}	Inter-signal Correction	N/A	30
t_{op}	CEI Data Sequence Propagation Time of Week	N/A	10, 30-37
URA_{NED0}	NED Accuracy Index	N/A	30-37
URA_{NED1}	NED Accuracy Change Index	N/A	30-37
URA_{NED2}	NED Accuracy Change Rate Index	N/A	30-37
Alert	Alert Flag [NOTE1]	All	All

NOTE1: Parameters so indicated are for CEI Refinement – not limited to curve fit. Parameters not indicated are needed for/limited to curve fit.

Updates to parameters in table shall prompt changes in t_{oe}/t_{oc} for CNAV and t_{oe}/t_{oc}/IODC/IODE for LNAV. Any parameter marked with NOTE1 may be changed with or without a change in t_{oe}/t_{oc}/IODC/IODE.

IS200-196:

Section Number:
6.3.1.0-1
WAS:
The guaranteed minimum user-received signal levels are defined in paragraph 3.3.1.6. As additional supporting material, Figure 6-1 illustrates an example variation in the minimum received power of the near-ground user-received L1 and L2 signals from Block II/IIA/IIR SVs as a function of SV elevation angle.
Redlines:
The guaranteed minimum user-received signal levels are defined in paragraph 3.3.1.6. As additional supporting material, Figure 6-1 illustrates an example variation in the minimum received power of the near-ground user-received L1 and L2 signals from Block ~~II/IIA/~~IIR SVs as a function of SV elevation angle.
IS:
The guaranteed minimum user-received signal levels are defined in paragraph 3.3.1.6. As additional supporting material, Figure 6-1 illustrates an example variation in the minimum received power of the near-ground user-received L1 and L2 signals from Block IIR SVs as a function of SV elevation angle.

IS200-2052:

Section Number:
6.3.1.0-3
WAS:
For Block II/IIA and IIR SVs, the maximum received signal levels as a result of these factors is not expected to exceed -155.5 dBW and -153.0 dBW, respectively, for the P(Y) and C/A components of the L1 channel, nor -158.0 dBW for either signal on the L2 channel.
Redlines:
For Block ~~II/IIA and~~ IIR SVs, the maximum received signal levels as a result of these factors is not expected to exceed -155.5 dBW and -153.0 dBW, respectively, for the P(Y) and C/A components of the L1 channel, nor -158.0 dBW for either signal on the L2 channel.
IS:
For Block IIR SVs, the maximum received signal levels as a result of these factors is not expected to exceed -155.5 dBW and -153.0 dBW, respectively, for the P(Y) and C/A components of the L1 channel, nor -158.0 dBW for either signal on the L2 channel.

IS200-1545:

Section Number:
6.3.1.0-6
WAS:
Figure 6-1. User Received Minimum Signal Level Variations (Example, Block II/IIA/IIR)
Redlines:
Figure 6-1. User Received Minimum Signal Level Variations (Example, Block ~~II/IIA/~~IIR)
IS:
Figure 6-1. User Received Minimum Signal Level Variations (Example, Block IIR)

IS200-199:

Section Number:
6.3.2
WAS:
Object Heading: Extended Navigation Mode (Block II/IIA)
Redlines:
Object Heading: Extended Navigation Mode ~~(Block II/IIA)~~
IS:
Object Heading: Extended Navigation Mode

IS200-200:

Section Number:
6.3.2.0-1
WAS:
The Block II and IIA SVs are capable of being uploaded by the CS with a minimum of 60 days of navigation data to support a 60 day positioning service. Due to memory retention limitations, the Block II SVs may not transmit correct data for the entire 60 days but are guaranteed to transmit correct data for at least 14 days to support short-term extended operations. Under normal conditions the CS will provide daily uploads to each SV, which will allow the SV to maintain normal operations as defined in paragraph 6.2.3.1 and described within this IS. During normal operations, the SVs will have a user range error that is at or below a level required to support a positioning accuracy of 16 meters spherical error probable (SEP). In addition, the almanac data, UTC parameters and ionospheric data will be maintained current to meet the accuracy specified in this IS.
Redlines:
~~The Block II and IIA SVs are capable of being uploaded by the CS with a minimum of 60 days of navigation data to support a 60 day positioning service. Due to memory retention limitations, the Block II SVs may not transmit correct data for the entire 60 days but are guaranteed to transmit correct data for at least 14 days to support short-term extended operations.~~ Under normal conditions the CS will provide daily uploads to each SV, which will allow the SV to maintain normal operations as defined in paragraph 6.2.3.1 and described within this IS~~. During normal operations, the SVs will have a user range error that is at or below a level required to support a positioning accuracy of 16 meters spherical error probable (SEP)~~. In addition, the almanac data, UTC parameters and ionospheric data will be maintained current to meet the accuracy specified in this IS.
IS:
Under normal conditions the CS will provide daily uploads to each SV, which will allow the SV to maintain normal operations as defined in paragraph 6.2.3.1 and described within this IS. In addition, the almanac data, UTC parameters and ionospheric data will be maintained current to meet the accuracy specified in this IS.

IS200-201:

Section Number:
6.3.2.0-2
WAS:
If the CS is unable to upload the SVs (the CS is unavailable or the SV is unable to accept and process the upload), each SV will individually transition to short-term extended operations and eventually to long-term extended operations (based on time from each SV's last upload) as defined in paragraphs 6.2.3.2 and 6.2.3.3, and as further described throughout this IS. As time from upload continues through these three operational intervals, the user range error of the SV will increase, causing a positioning service accuracy degradation. The rate of accuracy degradation is slow over the short-term extended operations interval, such that at the end of this interval (approximately 14 days after upload) the US will be able to achieve a positioning accuracy of 425 meters SEP. The rate of accuracy degradation increases in the long-term extended interval, such that by the 180th day after the last upload, the positioning errors will have grown to 10 kilometers SEP. During these intervals the URA will continue to provide the proper estimate of the user range errors.
Redlines:
~~If the CS is unable to upload the SVs (the CS is unavailable or the SV is unable to accept and process the upload), each SV will individually transition to short-term extended operations and eventually to long-term extended operations (based on time from each SV's last upload) as defined in paragraphs 6.2.3.2 and 6.2.3.3, and as further described throughout this IS. As time from upload continues through these three operational intervals, the user range error of the SV will increase, causing a positioning service accuracy degradation. The rate of accuracy degradation is slow over the short-term extended operations interval, such that at the end of this interval (approximately 14 days after upload) the US will be able to achieve a positioning accuracy of 425 meters SEP. The rate of accuracy degradation increases in the long-term extended interval, such that by the 180th day after the last upload, the positioning errors will have grown to 10 kilometers SEP. During these intervals the URA will continue to provide the proper estimate of the user range errors.~~
IS:
<DELETED OBJECT>

IS200-202:

Section Number:
6.3.2.0-3
WAS:
During short-term and long-term extended operations (approximately day 2 through day 62 after an upload), the almanac data, UTC parameters and ionospheric data will not be maintained current and will degrade in accuracy from the time of last upload.
Redlines:
~~During~~If ~~short-term~~the ~~and~~CS ~~long-term~~is ~~extended~~unable ~~operations~~to upload the SVs (~~approximately~~the ~~day~~CS ~~2~~is ~~through~~unavailable ~~day~~or ~~62~~the ~~after~~SV ~~an~~is unable to accept and process the upload), the almanac data, UTC parameters and ionospheric data will not be maintained current and will degrade in accuracy from the time of last upload.
IS:
If the CS is unable to upload the SVs (the CS is unavailable or the SV is unable to accept and process the upload), the almanac data, UTC parameters and ionospheric data will not be maintained current and will degrade in accuracy from the time of last upload.

IS200-1490:

Section Number:
6.3.3
WAS:
Object Heading: Block IIA Mode (Block IIR/IIR-M) and Extended Navigation Mode (Block II-F)
Redlines:
Object Heading: ~~Block~~Extended ~~IIA~~Navigation Mode (Block IIR/IIR-M~~) and Extended Navigation Mode (Block II-F~~/IIF)
IS:
Object Heading: Extended Navigation Mode (Block IIR/IIR-M/IIF)

IS200-206:

Section Number:
6.3.3.1
WAS:
Object Heading: Block IIA Mode (Block IIR/IIR-M)
Redlines:
Object Heading: ~~Block~~Extended ~~IIA~~Navigation Mode (Block IIR/IIR-M)
IS:
Object Heading: Extended Navigation Mode (Block IIR/IIR-M)

IS200-207:

Section Number:
6.3.3.1.0-1
WAS:
The Block IIR/IIR-M SVs, when operating in the Block IIA mode, will perform similarly to the Block IIA SVs and have the capability of storing at least 60 days of navigation data, with current memory margins, to provide positioning service without contact from the CS for that period (through short-term and long-term extended operations). (Contractual requirements for these SVs specify transmission of correct data for only 14 days to support short-term extended operations while in IIA mode.) Under normal conditions, the CS will provide daily uploads to each SV, which will allow the SV to maintain normal operations as defined in paragraph 6.2.3.1 and described within this IS.
Redlines:
The Block IIR/IIR-M SVs~~, when operating in the Block IIA mode, will perform similarly to the Block IIA SVs and~~ have the capability of storing at least 60 days of navigation data, with current memory margins, to provide positioning service without contact from the CS for that period (through short-term and long-term extended operations)~~. (Contractual requirements for these SVs specify transmission of correct data for only 14 days to support short-term extended operations while in IIA mode.)~~ Under normal conditions, the CS will provide daily uploads to each SV, which will allow the SV to maintain normal operations as defined in paragraph 6.2.3.1 and described within this IS.
IS:
The Block IIR/IIR-M SVs have the capability of storing at least 60 days of navigation data, with current memory margins, to provide positioning service without contact from the CS for that period (through short-term and long-term extended operations). Under normal conditions, the CS will provide daily uploads to each SV, which will allow the SV to maintain normal operations as defined in paragraph 6.2.3.1 and described within this IS.

IS200-203:

Section Number:
6.3.4
WAS:
Object Heading: Extended Navigation Mode (GPS III)
Redlines:
Object Heading: Extended Navigation Mode (GPS III and GPS IIIF)
IS:
Object Heading: Extended Navigation Mode (GPS III and GPS IIIF)

IS200-205:

Section Number:
6.3.4.0-2
WAS:
If the CS is unable to upload the SVs (the CS is unavailable or the SV is unable to accept and process the upload), each SV shall individually transition to short-term extended operations and eventually to long-term extended operations (based on time from each SV's last upload) as defined in paragraph 6.2.3.2 and 6.2.3.3, and as further described throughout this IS. As time from upload continues through these three operational intervals, the user range error (URE) of the SV will increase, causing a positioning service accuracy degradation.
Redlines:
If the CS is unable to upload the SVs (the CS is unavailable or the SV is unable to accept and process the upload), ~~each~~the user range error (URE) of the SV will increase as time from upload continues, causing a positioning service accuracy degradation. Each SV shall continue to maintain normal operations during a period that will nominally extend to at least 60 days from upload but may be shorter. Any SV that enters extended navigation following this normal operations period shall individually transition to short-term extended operations and ~~eventually~~subsequently to long-term extended operations (based on time from ~~each~~the SV's last upload) as defined in paragraph 6.2.3.2 and 6.2.3.3, and as further described throughout this IS~~. As time from upload continues through these three operational intervals, the user range error (URE) of the SV will increase, causing a positioning service accuracy degradation~~.
IS:
If the CS is unable to upload the SVs (the CS is unavailable or the SV is unable to accept and process the upload), the user range error (URE) of the SV will increase as time from upload continues, causing a positioning service accuracy degradation. Each SV shall continue to maintain normal operations during a period that will nominally extend to at least 60 days from upload but may be shorter. Any SV that enters extended navigation following this normal operations period shall individually transition to short-term extended operations and subsequently to long-term extended operations (based on time from the SV's last upload) as defined in paragraph 6.2.3.2 and 6.2.3.3, and as further described throughout this IS.

IS200-1760:

Section Number:
6.4.6.2.2.0-1
WAS:
The following alarm indications are specific to the code signals listed below.
C/A-Code or P(Y)-Code Signal
(a) The failure of parity on 5 successive words of LNAV data (3 seconds) (see paragraphs 20.3.5 and 40.3.5).
(b) The broadcast IODE does not match the 8 LSBs of the broadcast IODC (excluding normal data set cutovers, see paragraph 20.3.3.4.1).
(c) The transmitted bits in words 3-10 in subframe 1, 2, or 3 are all set to 0's or all set to 1's.
(d) Default LNAV data is being transmitted in subframes 1, 2, or 3 (see paragraph 20.3.2).
(e) The 8-bit preamble does not equal 10001011_2, decimal 139, or hexadecimal 8B (see paragraph 20.3.3).

CM-Code Signal
(a) The failure of the cyclic redundancy check (CRC) on 5 successive CNAV messages (60 seconds) (see paragraph 30.3.5).
(b) The broadcast time of ephemeris (t_{oe}) is not current (i.e. not within the current curve-fit) or does not match the broadcast time of clock (t_{oc}) (excluding normal data set cutovers, see paragraphs 30.3.3.1.1 and 30.3.4.4).
(c) The broadcast t_{op} is not consistent across the Message Types 10, 11 and Type 30's messages which comprise the current (i.e. not within the current curve-fit) CEI data set (excluding normal data set cutovers, see paragraph 30.3.4.4).
(d) The transmitted bits (bits 39-276) in Message Types 10, 11 and Type 30's are all set to 0's or all set to 1's.
(e) The 8-bit preamble does not equal 10001011_2, decimal 139, or hexadecimal 8B (see paragraph 30.3.3).

Notes:
1. *A SIS alarm indication exists when the satellite is not trackable because it is not transmitting the standard PRN code modulation on the L-band carrier signal. These SIS alarm indications are specifically called out above because of their relatively high probability of occurrence.*
2. *The SIS alarm indications related to the LNAV and CNAV message data are considered "weak" indications since receivers do not necessarily continuously read each satellite's LNAV or CNAV message data either by design or by circumstance (e.g., radio-frequency interference [RFI] can prevent reading LNAV or CNAV message data). These weak SIS alarm indications are assumed to have a five-minute lag time before receivers take notice of them for alerting purposes.*
3. *The SIS alarm indications related to the LNAV or CNAV message data are indicative of a problem onboard the satellite. GPS receivers may perceive similar indications caused by local effects that are unrelated to the broadcast SIS.*
4. *In addition to SIS alarm indications, other conditions may also cause GPS signals to become temporarily untrackable, such as ionospheric signal fades, local signal masking, or local interference.*

Redlines:
The following alarm indications are specific to the code signals listed below.

C/A-Code or P(Y)-Code Signal
(a) The failure of parity on 5 successive words of LNAV data (3 seconds) (see paragraphs 20.3.5 and 40.3.5). (See Note 5)
(b) The broadcast IODE does not match the 8 LSBs of the broadcast IODC (excluding normal data set cutovers, see paragraph 20.3.3.4.1).
(c) The transmitted bits in words 3-10 in subframe 1, 2, or 3 are all set to 0's or all set to 1's.
(d) Default LNAV data is being transmitted in subframes 1, 2, or 3 (see paragraph 20.3.2).
(e) The 8-bit preamble does not equal 100010112, decimal 139, or hexadecimal 8B (see paragraph 20.3.3).

CM-Code Signal
(a) The failure of the cyclic redundancy check (CRC) on 5 successive CNAV messages (60 seconds) (see paragraph 30.3.5).
(b) The broadcast time of ephemeris (t_{oe}) is not current (i.e. not within the current curve-fit) or does not match the broadcast time of clock (t_{oc}) (excluding normal data set cutovers, see paragraphs 30.3.3.1.1 and 30.3.4.4).
(c) The broadcast t_{op} is not consistent across the Message Types 10, 11 and Type 30's messages which comprise the current (i.e. not within the current curve-fit)- CEI data set (excluding normal data set cutovers, see paragraph 30.3.4.4).
(d) The transmitted bits (bits 39-276) in Message Types 10, 11 and Type 30's are all set to 0's or all set to 1's.
(e) The 8-bit preamble does not equal 100010112, decimal 139, or hexadecimal 8B (see paragraph 30.3.3).

Notes:
1. *A SIS alarm indication exists when the satellite is not trackable because it is not transmitting the standard PRN code modulation on the L-band carrier signal. These SIS alarm indications are specifically called out above because of their relatively high probability of occurrence.*
2. *The SIS alarm indications related to the LNAV and CNAV message data are considered "weak" indications since receivers do not necessarily continuously read each satellite's LNAV or CNAV message data either by design or by circumstance (e.g., radio-frequency interference [RFI] can prevent reading LNAV or CNAV message data). These weak SIS alarm indications are assumed to have a five-minute lag time before receivers take notice of them for alerting purposes.*
3. *The SIS alarm indications related to the LNAV or CNAV message data are indicative of a problem onboard the satellite. GPS receivers may perceive similar indications caused by local effects that are unrelated to the broadcast SIS.*
4. *In addition to SIS alarm indications, other conditions may also cause GPS signals to become temporarily untrackable, such as ionospheric signal fades, local signal masking, or local interference.*
5. *Alarm indication (see C/A-Code or P(Y)-Code Signal (a)) does not apply to the default navigation data described in paragraph 20.3.2, when in subframes 4 or 5. Application of the user parity algorithm at paragraph 20.3.5.2 will result in failed parity checks for words 3-10 because the default LNAV data pattern is applied to bits 61-298.*

IS:
The following alarm indications are specific to the code signals listed below.

C/A-Code or P(Y)-Code Signal

(a) The failure of parity on 5 successive words of LNAV data (3 seconds) (see paragraphs 20.3.5 and 40.3.5). *(See Note 5)*

(b) The broadcast IODE does not match the 8 LSBs of the broadcast IODC (excluding normal data set cutovers, see paragraph 20.3.3.4.1).

(c) The transmitted bits in words 3-10 in subframe 1, 2, or 3 are all set to 0's or all set to 1's.

(d) Default LNAV data is being transmitted in subframes 1, 2, or 3 (see paragraph 20.3.2).

(e) The 8-bit preamble does not equal 10001011_2, decimal 139, or hexadecimal 8B (see paragraph 20.3.3).

CM-Code Signal

(a) The failure of the cyclic redundancy check (CRC) on 5 successive CNAV messages (60 seconds) (see paragraph 30.3.5).

(b) The broadcast time of ephemeris (t_{oe}) is not current (i.e. not within the current curve-fit) or does not match the broadcast time of clock (t_{oc}) (excluding normal data set cutovers, see paragraphs 30.3.3.1.1 and 30.3.4.4).

(c) The broadcast t_{op} is not consistent across the Message Types 10, 11 and Type 30's messages which comprise the current (i.e. not within the current curve-fit) CEI data set (excluding normal data set cutovers, see paragraph 30.3.4.4).

(d) The transmitted bits (bits 39-276) in Message Types 10, 11 and Type 30's are all set to 0's or all set to 1's.

(e) The 8-bit preamble does not equal 10001011_2, decimal 139, or hexadecimal 8B (see paragraph 30.3.3).

Notes:

1. *A SIS alarm indication exists when the satellite is not trackable because it is not transmitting the standard PRN code modulation on the L-band carrier signal. These SIS alarm indications are specifically called out above because of their relatively high probability of occurrence.*
2. *The SIS alarm indications related to the LNAV and CNAV message data are considered "weak" indications since receivers do not necessarily continuously read each satellite's LNAV or CNAV message data either by design or by circumstance (e.g., radio-frequency interference [RFI] can prevent reading LNAV or CNAV message data). These weak SIS alarm indications are assumed to have a five-minute lag time before receivers take notice of them for alerting purposes.*
3. *The SIS alarm indications related to the LNAV or CNAV message data are indicative of a problem onboard the satellite. GPS receivers may perceive similar indications caused by local effects that are unrelated to the broadcast SIS.*
4. *In addition to SIS alarm indications, other conditions may also cause GPS signals to become temporarily untrackable, such as ionospheric signal fades, local signal masking, or local interference.*
5. *Alarm indication (see C/A-Code or P(Y)-Code Signal (a)) does not apply to the default navigation data described in paragraph 20.3.2, when in subframes 4 or 5. Application of the user parity algorithm at paragraph 20.3.5.2 will result in failed parity checks for words 3-10 because the default LNAV data pattern is applied to bits 61-298.*

IS200-281:

Section Number:
20.3.2.0-9
WAS:
Block II and IIA SVs are designed with sufficient memory capacity for storing at least 60 days of uploaded LNAV data. However, the memory retention of these SVs will determine the duration of data transmission. The memory retentivity is guaranteed for at least 60 days for SVs subsequent to Block IIA. GPS III and GPS IIIF SVs have the capability to support operation for at least 60 days without contact from the CS. Alternating ones and zeros will be transmitted in words 3 through 10 in place of the normal LNAV data whenever the SV cannot locate the requisite valid control or data element in its on-board computer memory. The following specifics apply to this default action: (a) the parity of the affected words will be invalid, (b) the two trailing bits of word 10 will be zeros (to allow the parity of subsequent subframes to be valid -- reference paragraph 20.3.5), (c) if the problem is the lack of a data element, only the directly related subframe(s) will be treated in this manner, (d) if a control element cannot be located, this default action will be applied to all subframes and all subframes will indicate ID = 1 (Block II/IIA only) (i.e., an ID-code of 001) in the HOW (reference paragraph 20.3.3.2) (Block IIR/IIR-M, IIF, and GPS III/IIIF SVs indicate the proper subframe ID for all subframes). Certain failures of control elements which may occur in the SV memory or during an upload will cause the SV to transmit in non-standard codes (NSC and NSY) which would preclude normal use by the US. Normal LNAV data transmission will be resumed by the SV whenever a valid set of elements becomes available.
Redlines:
~~Block II and IIA~~All SVs ~~are~~have ~~designed~~the ~~with~~capability ~~sufficient~~to ~~memory~~support ~~capacity~~operation for ~~storing~~ at least 60 days~~ of uploaded LNAV data.~~without contact ~~However,~~from the~~ memory retention of these SVs~~CS. ~~will determine~~Whenever the~~ duration of data transmission. ~~The~~SV ~~memory~~cannot ~~retentivity~~locate ~~is~~the ~~guaranteed~~requisite ~~for~~valid ~~at~~control ~~least~~or ~~60~~data ~~days~~element ~~for~~in ~~SVs~~its ~~subsequent~~on-board ~~to~~computer ~~Block~~memory, ~~IIA.~~the ~~GPS~~SV ~~III~~will ~~and~~transmit ~~GPS~~default ~~IIIF~~LNAV ~~SVs~~data ~~have~~in the ~~capability to support operation for at~~affected ~~least~~subframes. ~~60 days~~Default ~~without~~LNAV ~~contact~~data ~~from~~is ~~the~~a ~~CS.~~sequence of ~~Alternating~~alternating ones and zeros~~ will be transmitted~~ in ~~words~~bits ~~3~~61 through~~ 10 in place of the normal LNAV data whenever the SV cannot locate the requisite valid control or data element in~~298, ~~its~~beginning ~~on-board~~with ~~computer~~a ~~memory~~one.~~ The following specifics apply to this default action: (a) the apparent parity of the affected words will be invalid, (b) the two trailing bits of ~~word~~the ~~10~~subframe (bits 299 and 300) will be zeros (to allow the parity of subsequent subframes to be valid ~~--~~ reference paragraph 20.3.5), (c) if the problem is the lack of a data element, only the directly related subframe(s) will be treated in this manner~~, (d) if a control element cannot be located, this default action will be applied to all subframes and all subframes will indicate ID = 1 (Block II/IIA only) (i.e., an ID-code of 001) in the HOW (reference paragraph 20.3.3.2) (Block IIR/IIR-M, IIF, and GPS III/IIIF SVs indicate the proper subframe ID for all subframes)~~. Certain failures of control elements which may occur in the SV memory or during an upload will cause the SV to transmit in non-standard codes (NSC and NSY) which would preclude normal use by the US. Normal LNAV data transmission will be resumed by the SV whenever a valid set of elements becomes available.

IS:
All SVs have the capability to support operation for at least 60 days without contact from the CS. Whenever the SV cannot locate the requisite valid control or data element in its on-board computer memory, the SV will transmit default LNAV data in the affected subframes. Default LNAV data is a sequence of alternating ones and zeros in bits 61 through 298, beginning with a one. The following specifics apply to this default action: (a) the apparent parity of the affected words will be invalid, (b) the two trailing bits of the subframe (bits 299 and 300) will be zeros (to allow the parity of subsequent subframes to be valid - reference paragraph 20.3.5), (c) if the problem is the lack of a data element, only the directly related subframe(s) will be treated in this manner. Certain failures of control elements which may occur in the SV memory or during an upload will cause the SV to transmit in non-standard codes (NSC and NSY) which would preclude normal use by the US. Normal LNAV data transmission will be resumed by the SV whenever a valid set of elements becomes available.

IS200-282:

Section Number:
20.3.2.0-10
WAS:
Block II/IIA SVs are uploaded with a minimum of 60 days of LNAV data. However, the EAROM retentivity for Block II SVs is designed and guaranteed for only 14 days. Therefore, Block II SV memory is most likely to fail sometime during long-term extended operations after repeated write operations. In the case of memory failure, the SV will transmit alternating ones and zeros in word 3-10 as specified in the above paragraph. The EAROM retentivity for Block IIA SVs is designed and guaranteed for at least 60 days.
Redlines:
~~Block II/IIA SVs are uploaded with a minimum of 60 days of LNAV data. However, the EAROM retentivity for Block II SVs is designed and guaranteed for only 14 days. Therefore, Block II SV memory is most likely to fail sometime during long-term extended operations after repeated write operations. In the case of memory failure, the SV will transmit alternating ones and zeros in word 3-10 as specified in the above paragraph. The EAROM retentivity for Block IIA SVs is designed and guaranteed for at least 60 days.~~
IS:
<DELETED OBJECT>

IS200-2024:

Section Number:
20.3.3.3.1.1.0-3
WAS:
For Block II SVs in long-term extended operations, beginning approximately 28 days after upload, the transmission week number may not correspond to the actual GPS week number due to curve fit intervals that cross week boundaries.
Redlines:
~~For Block II SVs in long-term extended operations, beginning approximately 28 days after upload, the transmission week number may not correspond to the actual GPS week number due to curve fit intervals that cross week boundaries.~~
IS:
<DELETED OBJECT>

IS200-355:

Section Number:
20.3.3.4.1.0-7
WAS:
Any change in the subframe 2 and 3 core CEI data will be accomplished with a simultaneous change in both IODE words. The CS (Block II/Block IIA/IIR/IIR-M/IIF) and SS (GPS III/IIIF) shall assure that the toe value, for at least the first CEI data set transmitted by an SV from a new CEI data sequence propagation, is different from that transmitted for the prior CEI data sequence propagation (reference paragraph 20.3.4.5).
Redlines:
Any change in the subframe 2 and 3 core CEI data will be accomplished with a simultaneous change in both IODE words. The CS (Block ~~II/Block IIA/~~IIR/IIR-M/IIF) and SS (GPS III/IIIF) shall assure that the t_{oe} value, for at least the first CEI data set transmitted by an SV from a new CEI data sequence propagation, is different from that transmitted for the prior CEI data sequence propagation (reference paragraph 20.3.4.5).
IS:
Any change in the subframe 2 and 3 core CEI data will be accomplished with a simultaneous change in both IODE words. The CS (Block IIR/IIR-M/IIF) and SS (GPS III/IIIF) shall assure that the t_{oe} value, for at least the first CEI data set transmitted by an SV from a new CEI data sequence propagation, is different from that transmitted for the prior CEI data sequence propagation (reference paragraph 20.3.4.5).

IS200-363:

Section Number:
20.3.3.4.3.0-1
WAS:
The user shall compute the ECEF coordinates of position for the phase center of the SVs' antennas utilizing a variation of the equations shown in Table 20-IV. Subframes 2 and 3 parameters are Keplerian in appearance; the values of these parameters, however, are produced by the CS (Block II/Block IIA/IIR/IIR-M/IIF) and SS (GPS III/IIIF) via a least squares curve fit of the propagated ephemeris of the phase center of the SVs' antennas (time-position quadruples; t, x, y, z expressed in ECEF coordinates). Particulars concerning the periods of the curve fit, the resultant accuracy, and the applicable coordinate system are given in the following subparagraphs.
Redlines:
The user shall compute the ECEF coordinates of position for the phase center of the SVs' antennas utilizing a variation of the equations shown in Table 20-IV. Subframes 2 and 3 parameters are Keplerian in appearance; the values of these parameters, however, are produced by the CS (Block ~~II/Block IIA/~~IIR/IIR-M/IIF) and SS (GPS III/IIIF) via a least squares curve fit of the propagated ephemeris of the phase center of the SVs' antennas (time-position quadruples; t, x, y, z expressed in ECEF coordinates). Particulars concerning the periods of the curve fit, the resultant accuracy, and the applicable coordinate system are given in the following subparagraphs.
IS:
The user shall compute the ECEF coordinates of position for the phase center of the SVs' antennas utilizing a variation of the equations shown in Table 20-IV. Subframes 2 and 3 parameters are Keplerian in appearance; the values of these parameters, however, are produced by the CS (Block IIR/IIR-M/IIF) and SS (GPS III/IIIF) via a least squares curve fit of the propagated ephemeris of the phase center of the SVs' antennas (time-position quadruples; t, x, y, z expressed in ECEF coordinates). Particulars concerning the periods of the curve fit, the resultant accuracy, and the applicable coordinate system are given in the following subparagraphs.

IS200-365:

Section Number:
20.3.3.4.3.1.0-1
WAS:
Bit 17 in word 10 of subframe 2 is a "fit interval" flag which indicates the curve-fit interval used by the CS (Block II/Block IIA/IIR/IIR-M/IIF) and SS (GPS III and GPS IIIF) in determining the ephemeris parameters, as follows:

0 = 4 hours,
1 = greater than 4 hours.

Redlines:
Bit 17 in word 10 of subframe 2 is a "fit interval" flag which indicates the curve-fit interval used by the CS (Block ~~II/Block IIA/~~IIR/IIR-M/IIF) and SS (GPS III and GPS IIIF) in determining the ephemeris parameters, as follows:

0 = 4 hours,
1 = greater than 4 hours.

IS:
Bit 17 in word 10 of subframe 2 is a "fit interval" flag which indicates the curve-fit interval used by the CS (Block IIR/IIR-M/IIF) and SS (GPS III and GPS IIIF) in determining the ephemeris parameters, as follows:

0 = 4 hours,
1 = greater than 4 hours.

IS200-380:

Section Number:
20.3.3.4.4.0-6
WAS:
It should be noted that the NMCT information shall be supported by the Block IIR SV.
Redlines:
~~It should be noted that the NMCT information shall be supported by the Block IIR SV.~~
IS:
<DELETED OBJECT>

IS200-391:

Section Number:
20.3.3.5.1.1.0-6
WAS:

Page	Subframe 4		Subframe 5	
	Data ID	SV ID*	Data ID	SV ID*
1	Note(2)	57	Note(1)	1
2	Note(1)	25	Note(1)	2
3	Note(1)	26	Note(1)	3
4	Note(1)	27	Note(1)	4
5	Note(1)	28	Note(1)	5
6	Note(2)	57	Note(1)	6
7	Note(1)	29	Note(1)	7
8	Note(1)	30	Note(1)	8
9	Note(1)	31	Note(1)	9
10	Note(1)	32	Note(1)	10
11	Note(2)	57	Note(1)	11
12	Note(2)	62	Note(1)	12
13	Note(2)	52	Note(1)	13
14	Note(2)	53	Note(1)	14
15	Note(2)	54	Note(1)	15
16	Note(2)	57	Note(1)	16
17	Note(2)	55	Note(1)	17
18	Note(2)	56	Note(1)	18
19	Note(2)	58 Note(3)	Note(1)	19
20	Note(2)	59 Note(3)	Note(1)	20
21	Note(2)	57	Note(1)	21
22	Note(2)	60 Note(3)	Note(1)	22
23	Note(2)	61 Note(3)	Note(1)	23
24	Note(2)	62	Note(1)	24
25	Note(2)	63	Note(2)	51

* Use "0" to indicate "dummy" SV. When using "0" to indicate dummy SV, use the data ID of the transmitting SV.

Note 1: Data ID of that SV whose SV ID appears in that page.
Note 2: Data ID of transmitting SV.
Note 3: SV ID may vary (except for IIR/IIR-M/IIF/GPS III/ GPS IIIF SVs).

Redlines:

Page	Subframe 4		Subframe 5	
	Data ID	SV ID*	Data ID	SV ID*
1	Note(2)	57	Note(1)	1
2	Note(1)	25	Note(1)	2
3	Note(1)	26	Note(1)	3
4	Note(1)	27	Note(1)	4
5	Note(1)	28	Note(1)	5
6	Note(2)	57	Note(1)	6
7	Note(1)	29	Note(1)	7
8	Note(1)	30	Note(1)	8
9	Note(1)	31	Note(1)	9
10	Note(1)	32	Note(1)	10
11	Note(2)	57	Note(1)	11
12	Note(2)	62	Note(1)	12
13	Note(2)	52	Note(1)	13
14	Note(2)	53	Note(1)	14
15	Note(2)	54	Note(1)	15
16	Note(2)	57	Note(1)	16
17	Note(2)	55	Note(1)	17
18	Note(2)	56	Note(1)	18
19	Note(2)	58 ~~Note(3)~~	Note(1)	19
20	Note(2)	59 ~~Note(3)~~	Note(1)	20
21	Note(2)	57	Note(1)	21
22	Note(2)	60 ~~Note(3)~~	Note(1)	22
23	Note(2)	61 ~~Note(3)~~	Note(1)	23
24	Note(2)	62	Note(1)	24
25	Note(2)	63	Note(2)	51

* Use "0" to indicate "dummy" SV. When using "0" to indicate dummy SV, use the data ID of the transmitting SV.

Note 1: Data ID of that SV whose SV ID appears in that page.
Note 2: Data ID of transmitting SV.
~~Note 3: SV ID may vary (except for IIR/IIR-M/IIF/GPS III/ GPS IIIF SVs).~~

IS:

Page	Subframe 4		Subframe 5	
	Data ID	SV ID*	Data ID	SV ID*
1	Note(2)	57	Note(1)	1
2	Note(1)	25	Note(1)	2
3	Note(1)	26	Note(1)	3
4	Note(1)	27	Note(1)	4
5	Note(1)	28	Note(1)	5
6	Note(2)	57	Note(1)	6
7	Note(1)	29	Note(1)	7
8	Note(1)	30	Note(1)	8
9	Note(1)	31	Note(1)	9
10	Note(1)	32	Note(1)	10
11	Note(2)	57	Note(1)	11
12	Note(2)	62	Note(1)	12
13	Note(2)	52	Note(1)	13
14	Note(2)	53	Note(1)	14
15	Note(2)	54	Note(1)	15
16	Note(2)	57	Note(1)	16
17	Note(2)	55	Note(1)	17
18	Note(2)	56	Note(1)	18
19	Note(2)	58	Note(1)	19
20	Note(2)	59	Note(1)	20
21	Note(2)	57	Note(1)	21
22	Note(2)	60	Note(1)	22
23	Note(2)	61	Note(1)	23
24	Note(2)	62	Note(1)	24
25	Note(2)	63	Note(2)	51

* Use "0" to indicate "dummy" SV. When using "0" to indicate dummy SV, use the data ID of the transmitting SV.

Note 1: Data ID of that SV whose SV ID appears in that page.
Note 2: Data ID of transmitting SV.

IS200-394:

Section Number:
20.3.3.5.1.2.0-2
WAS:
The almanac message for any dummy SVs shall contain alternating ones and zeros with valid parity.
Redlines:
The almanac message (174 almanac data bits and 8 SV health bits) for any dummy SVs shall contain alternating ones and zeros with valid parity.
IS:
The almanac message (174 almanac data bits and 8 SV health bits) for any dummy SVs shall contain alternating ones and zeros with valid parity.

IS200-396:

Section Number:
20.3.3.5.1.2.0-5
WAS:
For Block II and IIA SVs, three sets of almanac shall be used to span at least 60 days. The first and second sets will be transmitted for up to six days each; the third set is intended to be transmitted for the remainder of the 60 days minimum, but the actual duration of transmission will depend on the individual SV's capability to retain data in memory. All three sets are based on six-day curve fits that correspond to the first six days of the transmission interval.
Redlines:
~~For Block II and IIA SVs, three sets of almanac shall be used to span at least 60 days. The first and second sets will be transmitted for up to six days each; the third set is intended to be transmitted for the remainder of the 60 days minimum, but the actual duration of transmission will depend on the individual SV's capability to retain data in memory. All three sets are based on six-day curve fits that correspond to the first six days of the transmission interval.~~
IS:
<DELETED OBJECT>

IS200-1418:

Section Number:
20.3.3.5.1.2.0-6
WAS:
For Block IIR/IIR-M, IIF, GPS III, and GPS IIIF SVs, five sets of almanac shall be used to span at least 60 days. The first, second, and third sets will be transmitted for up to six days each; the fourth and fifth sets will be transmitted for up to 32 days; the fifth set is intended to be transmitted for the remainder of the 60 days minimum, but the actual duration of transmission will depend on the individual SV's capability to retain data in memory.
The first, second, and third sets are based on six day curve fits. The fourth and fifth sets are based on 32 day curve fits.
Redlines:
For Block IIR/IIR-M, IIF, GPS III, and GPS IIIF SVs, a minimum of five sets of almanac shall be used to span at least 60 days. The first, second, and third sets will be transmitted for up to six days each; the fourth and ~~fifth~~subsequent sets will be transmitted for up to 32 days each; with the ~~fifth~~final set ~~is intended to be~~ transmitted for the remainder of the 60 days minimum~~, but the actual duration of transmission will~~. ~~depend on~~ During the ~~individual SV's capability to retain data in memory.~~ first
~~The~~18 ~~first,~~days ~~second,~~after ~~and~~upload ~~third~~the sets are based on six day curve fits. ~~The fourth and fifth~~Subsequent sets are based on 32 day curve fits.
IS:
For Block IIR/IIR-M, IIF, GPS III, and GPS IIIF SVs, a minimum of five sets of almanac shall be used to span at least 60 days. The first, second, and third sets will be transmitted for up to six days each; the fourth and subsequent sets will be transmitted for up to 32 days each; with the final set transmitted for the remainder of the 60 days minimum.
During the first 18 days after upload the sets are based on six day curve fits. Subsequent sets are based on 32 day curve fits.

IS200-2073:

Section Number:
20.3.3.5.1.4.0-3
WAS:
Code SV Configuration

000 No Information is available
001 A-S capability, plus flags for A-S and "alert" in HOW; memory capacity as described in paragraph 20.3.2 (e.g. Block II/Block IIA/IIR SV).
010 A-S capability, plus flags for A-S and "alert" in HOW; memory capacity as described in paragraph 20.3.2, M-code signal capability, L2C signal capability (e.g., Block IIR-M SV).
011 A-S capability, plus flags for A-S and "alert" in HOW; memory capacity as described in paragraph 20.3.2, M-code capability, L2C signal capability, L5 signal capability (e.g., Block IIF SV).
100 A-S capability, plus flags for A-S and "alert" in HOW; memory capacity as described in paragraph 20.3.2, M-code capability, L1C signal capability, L2C signal capability, L5 signal capability, no SA capability (e.g., GPS III SVs).
101 A-S capability, plus flags for A-S and “alert” in HOW; memory capacity as described in paragraph 20.3.2, M-code capability, Regional Military Protection capability, L1C signal capability, L2C signal capability, L5 signal capability, no SA capability (e.g., GPS IIIF SVs).
110, 111 Reserved in order to preserve future use of these values in a future revision of this IS. Until such a revision, the User Segment developing to this version of this IS should interpret these values as indicating that no information in this data field is presently usable as a means to identify the actual SV configuration.

Redlines:
Code— SV Configuration

000—— No Information is available
001—— A-S capability, plus flags for A-S and "alert" in HOW; memory Memory capacity as described in paragraph 20.3.2 (e.g. Block II/Block IIA/IIR SV).
010—— A-S capability, plus flags for A-S and "alert" in HOW; memory Memory capacity as described in paragraph 20.3.2, M-code signal capability, L2C signal capability (e.g., Block IIR-M SV).
011—— A-S capability, plus flags for A-S and "alert" in HOW; memory Memory capacity as described in paragraph 20.3.2, M-code capability, L2C signal capability, L5 signal capability (e.g., Block IIF SV).
100—— A-S capability, plus flags for A-S and "alert" in HOW; memory Memory capacity as described in paragraph 20.3.2, M-code capability, L1C signal capability, L2C signal capability, L5 signal capability, no SA capability (e.g., GPS III SVs).
101 A-S capability, plus flags for A-S and "alert" in HOW; memoryMemory capacity as described in paragraph 20.3.2, M-code capability, Regional Military Protection capability, L1C signal capability, L2C signal capability, L5 signal capability, no SA capability (e.g., GPS IIIF SVs).
110, 111 – Reserved in order to preserve future use of these values in a future revision of this IS. Until such a revision, the User Segment developing to this version of this IS should interpret these values as indicating that no information in this data field is presently usable as a means to identify the actual SV configuration.

All present and future satellites that transmit the C/A and P(Y) ranging codes will have A-S capability, plus flags for A-S and "alert" in HOW.

IS:
Code SV Configuration

000 No Information is available
001 Memory capacity as described in paragraph 20.3.2 (e.g. Block IIR SV).
010 Memory capacity as described in paragraph 20.3.2, M-code signal capability, L2C signal capability (e.g., Block IIR-M SV).
011 Memory capacity as described in paragraph 20.3.2, M-code capability, L2C signal capability, L5 signal capability (e.g., Block IIF SV).
100 Memory capacity as described in paragraph 20.3.2, M-code capability, L1C signal capability, L2C signal capability, L5 signal capability, no SA capability (e.g., GPS III SVs).
101 Memory capacity as described in paragraph 20.3.2, M-code capability, Regional Military Protection capability, L1C signal capability, L2C signal capability, L5 signal capability, no SA capability (e.g., GPS IIIF SVs).
110, 111 Reserved in order to preserve future use of these values in a future revision of this IS. Until such a revision, the User Segment developing to this version of this IS should interpret these values as indicating that no information in this data field is presently usable as a means to identify the actual SV configuration.

All present and future satellites that transmit the C/A and P(Y) ranging codes will have A-S capability, plus flags for A-S and "alert" in HOW.

IS200-433:

Section Number:
20.3.3.5.2.2.0-2
WAS:
In addition, the Block IIR/IIR-M SVs will also ensure that, based on a valid CS upload, all t_{oa} values in subframes 4 and 5 will be the same for a given almanac data set and will differ for successive data sets which contain changes in almanac parameters.
Redlines:
In addition, the Block IIR/IIR-M and GPS III/IIIF SVs will also ensure that, based on a valid CS upload, all t_{oa} values in subframes 4 and 5 will be the same for a given almanac data set and will differ for successive data sets which contain changes in almanac parameters.
IS:
In addition, the Block IIR/IIR-M and GPS III/IIIF SVs will also ensure that, based on a valid CS upload, all t_{oa} values in subframes 4 and 5 will be the same for a given almanac data set and will differ for successive data sets which contain changes in almanac parameters.

IS200-439:

Section Number:
20.3.3.5.2.3.0-4
WAS:
During extended operations (short-term and long-term) the almanac time parameter may not provide the specified time accuracy or URE component.
Redlines:
During extended operations (short-term and long-term), or if the CS is otherwise unable to upload the SVs, the almanac time parameter may not provide the specified time accuracy or URE component.

IS:
During extended operations (short-term and long-term), or if the CS is otherwise unable to upload the SVs, the almanac time parameter may not provide the specified time accuracy or URE component.

IS200-443:

Section Number:
20.3.3.5.2.4.0-5
WAS:
The estimated GPS time (t_E) shall be in seconds relative to end/start of week. During the normal and short-term extended operations, the reference time for UTC data, t_{ot}, is some multiple of 2^{12} seconds occurring approximately 70 hours after the first valid transmission time for this UTC data set (reference 20.3.4.5).
Redlines:
The estimated GPS time (t_E) shall be in seconds relative to end/start of week. ~~During the normal and short-term extended operations, the~~The reference time for UTC data, t_{ot}, is some multiple of 212 seconds occurring approximately 70 hours after the first valid transmission time for this UTC data set (reference 20.3.4.5).
IS:
The estimated GPS time (t_E) shall be in seconds relative to end/start of week. The reference time for UTC data, t_{ot}, is some multiple of 2^{12} seconds occurring approximately 70 hours after the first valid transmission time for this UTC data set (reference 20.3.4.5).

IS200-447:

Section Number:
20.3.3.5.2.5.0-1
WAS:
The "dual-frequency" (L1 and L2) user shall correct the time received from the SV for ionospheric effect by utilizing the time delay differential between L1 and L2 (reference paragraph 20.3.3.3.3.3). The "single-frequency" user, however, may use the model given in Figure 20-4 to make this correction. It is estimated that the use of this model will provide at least a 50 percent reduction in the single - frequency user's RMS error due to ionospheric propagation effects. During extended operations, the use of this model will yield unpredictable results.
Redlines:
The "dual-frequency" (L1 and L2) user shall correct the time received from the SV for ionospheric effect by utilizing the time delay differential between L1 and L2 (reference paragraph 20.3.3.3.3.3).- The "single-frequency" user, however, may use the model given in Figure 20-4 to make this correction.- It is estimated that the use of this model will provide at least a 50 percent reduction in the single - frequency user's RMS error due to ionospheric propagation effects.- During extended operations, or if the CS is otherwise unable to upload the SVs, the use of this model will yield unpredictable results.
IS:
The "dual-frequency" (L1 and L2) user shall correct the time received from the SV for ionospheric effect by utilizing the time delay differential between L1 and L2 (reference paragraph 20.3.3.3.3.3). The "single-frequency" user, however, may use the model given in Figure 20-4 to make this correction. It is estimated that the use of this model will provide at least a 50 percent reduction in the single - frequency user's RMS error due to ionospheric propagation effects. During extended operations, or if the CS is otherwise unable to upload the SVs, the use of this model will yield unpredictable results.

IS200-462:

Section Number:
20.3.4.4.0-1
WAS:
The IODE is an 8 bit number equal to the 8 LSBs of the 10 bit IODC of the same CEI data set. The following rules govern the transmission of IODC and IODE values in different CEI data sets: (1) The transmitted IODC will be different from any value transmitted by the SV during the preceding seven days; (2) The transmitted IODE will be different from any value transmitted by the SV during the preceding six hours. The range of IODC will be as given in Table 20-XI for Block II/IIA SVs and Table 20-XII for Block IIR/IIR-M/IIF and GPS III/IIIF SVs.
Redlines:
The IODE is an 8 bit number equal to the 8 LSBs of the 10 bit IODC of the same CEI data set. ~~-~~The following ~~rules~~rule ~~govern~~governs the transmission of IODC and IODE values in different CEI data sets:~~-~~ (1) The ~~transmitted IODC will be different from any value~~ transmitted ~~by~~ ~~the~~IODE ~~SV~~(and ~~during~~therefore, the ~~preceding seven days; (2) The~~ transmitted ~~IODE~~IODC) will be different from any value transmitted by the SV during the preceding six hours.~~-~~ The range of IODC will be as given in ~~Table 20-XI for Block II/IIA SVs and~~ Table 20-XII for Block IIR/IIR-M/IIF and GPS III/IIIF SVs.
IS:
The IODE is an 8 bit number equal to the 8 LSBs of the 10 bit IODC of the same CEI data set. The following rule governs the transmission of IODC and IODE values in different CEI data sets: (1) The transmitted IODE (and therefore, the transmitted IODC) will be different from any value transmitted by the SV during the preceding six hours. The range of IODC will be as given in Table 20-XII for Block IIR/IIR-M/IIF and GPS III/IIIF SVs.

IS200-463:

Section Number:
20.3.4.4.0-2
WAS:
Cutovers to new CEI data sets will occur only on hour boundaries except for the first CEI data set of a new CEI data sequence propagation. The first CEI data set may be cut-in (reference paragraph 20.3.4.1) at any time during the hour and therefore may be transmitted by the SV for less than one hour. During short-term operations, cutover to 4-hour sets and subsequent cutovers to succeeding 4-hour CEI data sets will always occur modulo 4 hours relative to end/start of week. Cutover from 4-hour CEI data sets to 6-hour CEI data sets shall occur modulo 12 hours relative to end/start of week.
Redlines:
Cutovers to new CEI data sets will occur only on two-hour boundaries except for the first CEI data set of a new CEI data sequence propagation. The first CEI data set may be cut-in (reference paragraph 20.3.4.1) at any time during the hourtwo hours and therefore may be transmitted by the SV for less than onetwo hourhours. Upon Duringtransition to short-term operations, cutover tofrom 4these 2-hour sets andCEI subsequentdata cutoverssets to succeeding 4-hour CEI data sets will always occur modulo 4and hourssubsequent relativecutovers to end/start of week. Cutover fromsucceeding 4 hour CEI data sets to 6-hour CEI data sets shall occur modulo 124 hours relative to end/start of week.

IS:
Cutovers to new CEI data sets will occur only on two-hour boundaries except for the first CEI data set of a new CEI data sequence propagation. The first CEI data set may be cut-in (reference paragraph 20.3.4.1) at any time during the two hours and therefore may be transmitted by the SV for less than two hours. Upon transition to short-term operations, cutover from these 2-hour CEI data sets to 4-hour CEI data sets and subsequent cutovers to succeeding 4-hour CEI data sets shall occur modulo 4 hours relative to end/start of week.

IS200-2091:

Section Number:
20.3.4.4.0-3
WAS:
Cutover from 12-hour CEI data sets to 24-hour CEI data sets shall occur modulo 24 hours relative to end/start of week. Cutover from a CEI data set transmitted 24 hours or more occurs on a modulo 24-hour boundary relative to end/start of week.
Redlines:
Upon transition to long-term operations, cutover from 4-hour CEI data sets to 6-hour CEI data sets shall occur modulo 12 hours relative to end/start of week. Subsequent cutovers to succeeding 6-hour CEI data sets shall occur modulo 6 hours relative to end/start of week. Cutover from 6-hour CEI data sets to 12-hour CEI data sets and subsequent cutovers to ~~24~~succeeding 12-hour CEI data sets shall occur modulo ~~24~~12 hours relative to end/start of week. Cutover from ~~a~~12-hour CEI data ~~set~~sets ~~transmitted~~to 24-hour ~~hours~~CEI ~~or~~data ~~more~~sets ~~occurs~~and ~~on~~subsequent ~~a~~cutovers ~~modulo~~to succeeding 24-hour ~~boundary~~CEI data sets shall occur modulo 24 hours relative to end/start of week.
IS:
Upon transition to long-term operations, cutover from 4-hour CEI data sets to 6-hour CEI data sets shall occur modulo 12 hours relative to end/start of week. Subsequent cutovers to succeeding 6-hour CEI data sets shall occur modulo 6 hours relative to end/start of week. Cutover from 6-hour CEI data sets to 12-hour CEI data sets and subsequent cutovers to succeeding 12-hour CEI data sets shall occur modulo 12 hours relative to end/start of week. Cutover from 12-hour CEI data sets to 24-hour CEI data sets and subsequent cutovers to succeeding 24-hour CEI data sets shall occur modulo 24 hours relative to end/start of week.

IS200-464:

Section Number:
20.3.4.4.0-4
WAS:
The start of the transmission interval for each CEI data set corresponds to the beginning of the curve fit interval for the CEI data set. Each CEI data set nominally remains valid for the duration of its curve fit interval. A CEI data set may be rendered obsolete before the end of its curve fit interval when it is superseded by the SV cutting over to new data.

Redlines:
~~The~~Except for the first CEI data set of a new CEI data sequence propagation, the start of the transmission interval for each CEI data set corresponds to the beginning of the curve fit interval for the CEI data set. Each CEI data set remains valid for the duration of its transmission interval, and nominally also remains valid for the duration of its curve fit interval.~~-~~ A CEI data set ~~may be~~is rendered obsolete before the end of its curve fit interval when it is superseded by the SV cutting over to the first CEI data set of a new CEI data sequence propagation.
IS:
Except for the first CEI data set of a new CEI data sequence propagation, the start of the transmission interval for each CEI data set corresponds to the beginning of the curve fit interval for the CEI data set. Each CEI data set remains valid for the duration of its transmission interval, and nominally also remains valid for the duration of its curve fit interval. A CEI data set is rendered obsolete before the end of its curve fit interval when it is superseded by the SV cutting over to the first CEI data set of a new CEI data sequence propagation.

IS200-2121:
Insertion after object IS200-464
Section Number:
20.3.4.4.0-5
WAS:
<INSERTED OBJECT>
Redlines:
The start time of the curve fit interval of the first CEI data set of a new CEI data sequence propagation may be later than the start time of the curve fit interval of the preceding CEI data set that was transmitted prior to the cutover. The beginning of the curve fit interval of the first CEI data set of a new CEI data sequence propagation will be a multiple of 300 seconds (5 minutes) relative to the start of week.

Object Type: Info-Only
IS:
The start time of the curve fit interval of the first CEI data set of a new CEI data sequence propagation may be later than the start time of the curve fit interval of the preceding CEI data set that was transmitted prior to the cutover. The beginning of the curve fit interval of the first CEI data set of a new CEI data sequence propagation will be a multiple of 300 seconds (5 minutes) relative to the start of week.

Object Type: Info-Only

IS200-687:

Section Number:
20.3.4.4.0-11
WAS:
The transmission intervals and curve fit intervals with the applicable IODC ranges are given in Tables 20-XI and 20-XII.
Redlines:
The transmission intervals and curve fit intervals with the applicable IODC ranges are given in ~~Tables 20-XI and~~Table 20-XII.
IS:
The transmission intervals and curve fit intervals with the applicable IODC ranges are given in Table 20-XII.

IS200-1588:

Section Number:
20.3.4.4.0-12
WAS:
Table 20-XI. IODC Values and Data Set Lengths (Block II/IIA)
Redlines:
Table 20-XI. ~~IODC Values and Data Set Lengths (Block~~RESERVED ~~II/IIA)~~
IS:
Table 20-XI. RESERVED

IS200-467:

Section Number:
20.3.4.4.0-13
WAS:

Days Spanned	Transmission Interval (hours) (Note 4)	Curve Fit Interval (hours)	IODC Range (Note 1)
1	2	4	(Note 2)
2-14	4	6	(Note 2)
15-16	6	8	240-247
17-20	12	14	248-255, 496 (Note 3)
21-27	24	26	497-503
28-41	48	50	504-510
42-59	72	74	511, 752-756
60-63	96	98	757

Note 1: For transmission intervals of 6 hours or greater, the IODC values shown will be transmitted in increasing order.

Note 2: IODC values for blocks with 2- or 4-hour transmission intervals (at least the first 14 days after a new CEI data sequence propagation) shall be any number in the range 0 to 1023 excluding those values of IODC that correspond to IODE values in the range 240-255, subject to the constraints on re-transmission given in paragraph 20.3.4.4.

Note 3: The ninth 12-hour data set may not be transmitted.

Note 4: The first CEI data set of a new CEI data sequence propagation may be cut-in at any time and therefore the transmission interval may be less than the specified value.

Redlines:
<DELETED OBJECT>

IS:
<DELETED OBJECT>

IS200-468:

Section Number:
20.3.4.4.0-15
WAS:

Days Spanned	Transmission Interval (hours) (Note 5)	Curve Fit Interval (hours)	IODC Range
1	2	4	(Note 2)
2-14	4	6	(Note 2)
15-16	6	8	240-247 (Note 1)
17-20	12	14	248-255, 496 (Note 1) (Note 3)
21-62	24	26	497-503, 1021-1023

Note 1: For transmission intervals of 6 and 12 hours, the IODC values shown will be transmitted in increasing order.

Note 2: IODC values for blocks with 1-, 2- or 4-hour transmission intervals (at least the first 14 days after a new CEI data sequence propagation) shall be any number in the range 0 to 1023 excluding those values of IODC that correspond to IODE values in the range 240-255, subject to the constraints on re-transmission given in paragraph 20.3.4.4. The CS can define the GPS III and GPS IIIF SV time of transition from the 4 hour curve fits into extended navigation (beyond 4 hour curve fits). Following the transition time, the SV will follow the timeframes defined in the table, including appropriately setting IODC values.

Note 3: The ninth 12-hour data set may not be transmitted.

Note 4: Reserved

Note 5: The first CEI data set of a new CEI data sequence propagation may be cut-in at any time and therefore the transmission interval may be less than the specified value.

Redlines:

Days Spanned	Transmission Interval (hours) (Note 5)	Curve Fit Interval (hours)	Fit Interval Flag	IODC Range (Note 6)
1	2	4	0	(Note 2)
2-14	4	6	1	(Note 2)
15-16	6	8	1	240-247 (Note 1)
17-20	12	14	1	248-255, 496 (Note 1) (Note 3)
21-62	24	26	1	497-503, 1021-1023

Note 1: For transmission intervals of 6 and 12 hours, the IODC values shown will be transmitted in increasing order.

Note 2: IODC values for blocks with 1-, 2- or 4-hour transmission intervals (at least the first 14 days after a new CEI data sequence propagation) shall be any number in the range ~~0 to 1023 excluding those values of IODC~~ 0-239, 256-495, 512-751 or 768-1007 that correspond to IODE values in the range ~~240 255~~ 0-239, subject to the constraints on re-transmission given in paragraph 20.3.4.4. The CS can define the GPS III and GPS IIIF SV time of transition from the 4 hour curve fits into extended navigation (beyond 4 hour curve fits). Following the transition time, the SV will follow the timeframes defined in the table, including appropriately setting IODC values.

Note 3: The ninth 12-hour data set may not be transmitted.

Note 4: Reserved

Note 5: The first CEI data set of a new CEI data sequence propagation may be cut-in at any time and therefore the transmission interval may be less than the specified value.

Note 6: IODC values in the ranges 504-511, 752-767 and 1008-1020 are reserved

IS:

Days Spanned	Transmission Interval (hours) (Note 5)	Curve Fit Interval (hours)	Fit Interval Flag	IODC Range (Note 6)
1	2	4	0	(Note 2)
2-14	4	6	1	(Note 2)
15-16	6	8	1	240-247 (Note 1)
17-20	12	14	1	248-255, 496 (Note 1) (Note 3)
21-62	24	26	1	497-503, 1021-1023

Note 1: For transmission intervals of 6 and 12 hours, the IODC values shown will be transmitted in increasing order.

Note 2: IODC values for blocks with 2- or 4-hour transmission intervals (at least the first 14 days after a new CEI data sequence propagation) shall be any number in the range 0-239, 256-495, 512-751 or 768-1007 that correspond to IODE values in the range 0-239, subject to the constraints on re-transmission given in paragraph 20.3.4.4. The CS can define the GPS III and GPS IIIF SV time of transition from the 4 hour curve fits into extended navigation (beyond 4 hour curve fits). Following the transition time, the SV will follow the timeframes defined in the table, including appropriately setting IODC values.

Note 3: The ninth 12-hour data set may not be transmitted.

Note 4: Reserved

Note 5: The first CEI data set of a new CEI data sequence propagation may be cut-in at any time and therefore the transmission interval may be less than the specified value.

Note 6: IODC values in the ranges 504-511, 752-767 and 1008-1020 are reserved

IS200-2092:

Section Number:
20.3.4.5.0-4
WAS:
Epoch Application Algorithm Reference

t_{oc} 20.3.3.3.3.1

t_{oe} 20.3.3.4.3

t_{oa} 20.3.3.5.2.2 and 20.3.3.5.2.3

t_{ot} 20.3.3.5.2.4

Redlines:
Epoch Week Application Algorithm Reference

t_{oc} 20.3.3.3.3.1

t_{oe} 20.3.3.4.3

t_{oa} WN_a 20.3.3.5.2.2 and 20.3.3.5.2.3

t_{ot} WN_t 20.3.3.5.2.4

IS:

Epoch	Week	Application Algorithm Reference
t_{oc}		20.3.3.3.3.1
t_{oe}		20.3.3.4.3
t_{oa}	WN_a	20.3.3.5.2.2 and 20.3.3.5.2.3
t_{ot}	WN_t	20.3.3.5.2.4

IS200-472:

Section Number:
20.3.4.5.0-5
WAS:
Table 20-XIII describes the nominal selection which will be expressed modulo 604,800 seconds in the Navigation Message.
Redlines:
For each parameter, Table 20-XIII ~~describes~~specifies the fit interval, the nominal transmission interval, and the nominal selection of the fit point (which will be expressed as an epoch time modulo 604,800 seconds in the Navigation Message). Where applicable, the week number associated with the epoch time is also provided in the Navigation Message.
IS:
For each parameter, Table 20-XIII specifies the fit interval, the nominal transmission interval, and the nominal selection of the fit point (which will be expressed as an epoch time modulo 604,800 seconds in the Navigation Message). Where applicable, the week number associated with the epoch time is also provided in the Navigation Message.

IS200-2122:
Insertion after object IS200-472
Section Number:
20.3.4.5.0-6
WAS:
<INSERTED OBJECT>
Redlines:
The nominal transmission interval in Table 20-XIII represents the maximum time period during which a particular data set will be valid for broadcast in the Navigation Message. The actual broadcast duration may be shorter than the specified transmission interval if the SV cuts over to a new data set.

Object Type: Info-Only
IS:
The nominal transmission interval in Table 20-XIII represents the maximum time period during which a particular data set will be valid for broadcast in the Navigation Message. The actual broadcast duration may be shorter than the specified transmission interval if the SV cuts over to a new data set.

Object Type: Info-Only

IS200-474:

Section Number:
20.3.4.5.0-8
WAS:
The CS (Block II/IIA/IIR/IIR M/IIF) and SS (GPS III and GPS IIIF) shall assure that the t_{oe} value, for at least the first CEI data set transmitted by an SV from a new CEI data sequence propagation, is different from that transmitted from the prior CEI data sequence propagation (see paragraph 20.3.4.4).
Redlines:
The CS (Block ~~II/IIA/~~IIR/IIR-~~-~~M/IIF) and SS (GPS III and GPS IIIF) shall assure that the t_{oe} value, for at least the first CEI data set transmitted by an SV from a new CEI data sequence propagation, is different from that transmitted from the prior CEI data~~-~~ sequence propagation (see paragraph 20.3.4.4).
IS:
The CS (Block IIR/IIR-M/IIF) and SS (GPS III and GPS IIIF) shall assure that the t_{oe} value, for at least the first CEI data set transmitted by an SV from a new CEI data sequence propagation, is different from that transmitted from the prior CEI data sequence propagation (see paragraph 20.3.4.4).

IS200-2093:

Section Number:
20.3.4.5.0-9
WAS:
As such, when a new CEI data sequence propagation is cutover for transmission, the CS (Block IIA/IIR/IIR-M/IIF) and SS (GPS III and GPS IIIF) shall introduce a small deviation in the t_{oe} resulting in the t_{oe} value that is offset from the hour boundaries (see Table 20 XIII). This offset t_{oe} will be transmitted by an SV in the first CEI data set of the new CEI data sequence propagation and the second CEI data set, following the first CEI data set, may also continue to reflect the same offset in the t_{oe}.
Redlines:
As such, when a new CEI data sequence propagation is cutover for transmission, the CS (Block ~~IIA/~~IIR/IIR-M/IIF) and SS (GPS III and GPS IIIF) shall introduce a small negative deviation in the t_{oe} relative to the midpoint of the curve fit interval, resulting in ~~the~~a t_{oe} value that is offset from the nominal location on an hour ~~boundaries~~boundary (see Table 20-~~-~~XIII).~~-~~ This offset t_{oe} will be transmitted by an SV in the first CEI data set of the new CEI data sequence propagation. ~~and the~~The second CEI data set, following the first CEI data set, may also continue to reflect ~~the same~~an offset in the t_{oe} relative to the nominal location on an hour boundary.
IS:
As such, when a new CEI data sequence propagation is cutover for transmission, the CS (Block IIR/IIR-M/IIF) and SS (GPS III and GPS IIIF) shall introduce a small negative deviation in the t_{oe} relative to the midpoint of the curve fit interval, resulting in a t_{oe} value that is offset from the nominal location on an hour boundary (see Table 20-XIII). This offset t_{oe} will be transmitted by an SV in the first CEI data set of the new CEI data sequence propagation. The second CEI data set, following the first CEI data set, may also continue to reflect an offset in the t_{oe} relative to the nominal location on an hour boundary.

IS200-475:

Section Number:
20.3.4.5.0-10
WAS:
When the t_{oe}, immediately prior to a new CEI data sequence propagation cutover, already reflects a small deviation (i.e. a new CEI data sequence propagation cutover has occurred in the recent past), then the CS (Block II/IIA/IIR/IIR-M/IIF) and SS (GPS III and GPS IIIF) shall introduce an additional deviation to the t_{oe} when a new CEI data sequence propagation is cutover for transmission.
Redlines:
When the t_{oe}, immediately prior to a new CEI data sequence propagation cutover, already reflects a small deviation (i.e. a new CEI data sequence propagation cutover has occurred in the recent past), then the CS (Block ~~II/IIA/~~IIR/IIR-M/IIF) and SS (GPS III and GPS IIIF) shall introduce an additional deviation to the t_{oe} when a new CEI data sequence propagation is cutover for transmission.
IS:
When the t_{oe}, immediately prior to a new CEI data sequence propagation cutover, already reflects a small deviation (i.e. a new CEI data sequence propagation cutover has occurred in the recent past), then the CS (Block IIR/IIR-M/IIF) and SS (GPS III and GPS IIIF) shall introduce an additional deviation to the t_{oe} when a new CEI data sequence propagation is cutover for transmission.

IS200-476:

Section Number:
20.3.4.5.0-11
WAS:
A change from the broadcast reference time immediately prior to cutover is used to indicate a change of values in the CEI data set. The user may use the following example algorithm to detect the occurrence of a new CEI data sequence propagation cutover:

DEV = t_{oe} [modulo 3600]

If DEV ≠ 0, then a new CEI data sequence propagation cutover has occurred within past 4 hours.

Redlines:
A change from the broadcast reference time immediately prior to cutover is used to indicate a change of values in the CEI data set.- The user may use the following example algorithm to detect the occurrence of a new CEI data sequence propagation cutover:

DEV = t_{oe} [modulo 3600]

If DEV ≠ 0, then a new CEI data sequence propagation cutover has occurred within the past 4 hours.

When DEV = 0, the broadcast t_{oe} and t_{oc} correspond to the midpoint of the curve fit interval for that CEI data set (Table 20-XIII). When DEV ≠ 0, the broadcast t_{oe} and t_{oc} are offset values representing a time that is a minimum of 16 seconds prior to the midpoint of the curve fit interval for that CEI data set. These offsets are accounted for in the generation of the time-dependent coefficients in the CEI data set, such that the user may directly apply the broadcast t_{oe} and t_{oc} in the algorithms of paragraphs 20.3.3.4.3 and 20.3.3.3.3.1.

IS:
A change from the broadcast reference time immediately prior to cutover is used to indicate a change of values in the CEI data set. The user may use the following example algorithm to detect the occurrence of a new CEI data sequence propagation cutover:

DEV = t_{oe} [modulo 3600]
If DEV ≠ 0, then a new CEI data sequence propagation cutover has occurred within the past 4 hours.

When DEV = 0, the broadcast t_{oe} and t_{oc} correspond to the midpoint of the curve fit interval for that CEI data set (Table 20-XIII). When DEV ≠ 0, the broadcast t_{oe} and t_{oc} are offset values representing a time that is a minimum of 16 seconds prior to the midpoint of the curve fit interval for that CEI data set. These offsets are accounted for in the generation of the time-dependent coefficients in the CEI data set, such that the user may directly apply the broadcast t_{oe} and t_{oc} in the algorithms of paragraphs 20.3.3.4.3 and 20.3.3.3.3.1.

IS200-477:

Section Number:
20.3.4.5.0-13
WAS:

Fit Interval (hours)	Transmission Interval (hours)	Hours After First Valid Transmission Time			
		t_{oc} (clock)	t_{oe} (ephemeris)	t_{oa} (almanac)	t_{ot} (UTC)
4	2*	2	2		
6	4	3	3		
8	6	4	4		
14	12	7	7		
26	24	13	13		
50	48	25	25		
74	72	37	37		
98	96	49	49		
122	120	61	61		
146	144	73	73		
144 (6 days)	144			70	70
$\geq$ 144 (6 days)	> 144			70	70
* Some SVs will have transmission intervals of 1 hour per paragraph 20.3.4.4.					

Redlines:

Fit Interval (hours)	Transmission Interval (hours)	Hours After First Valid Transmission Time			
		t_{oc} (clock)	t_{oe} (ephemeris)	t_{oa} (almanac)	t_{ot} (UTC)
4	2	2	2		
6	4	3	3		
8	6	4	4		
14	12	7	7		
26	24	13	13		
~~50~~	~~48~~	~~25~~	~~25~~		
~~74~~	~~72~~	~~37~~	~~37~~		
~~98~~	~~96~~	~~49~~	~~49~~		
~~122~~	~~120~~	~~61~~	~~61~~		
~~146~~	~~144~~	~~73~~	~~73~~		
144 (6 days)	144 (6 days)			70	~~70~~
768 (32 days) *	768 (32 days) *			70	
~~≥ 144 (6 days)~~N/A	144 (6 days) **			~~70~~	70

* Applies after 18 days if the CS is unable to upload the SV

** If the CS is unable to upload the SV this interval may extend to at least 1,584 hours (66 days)

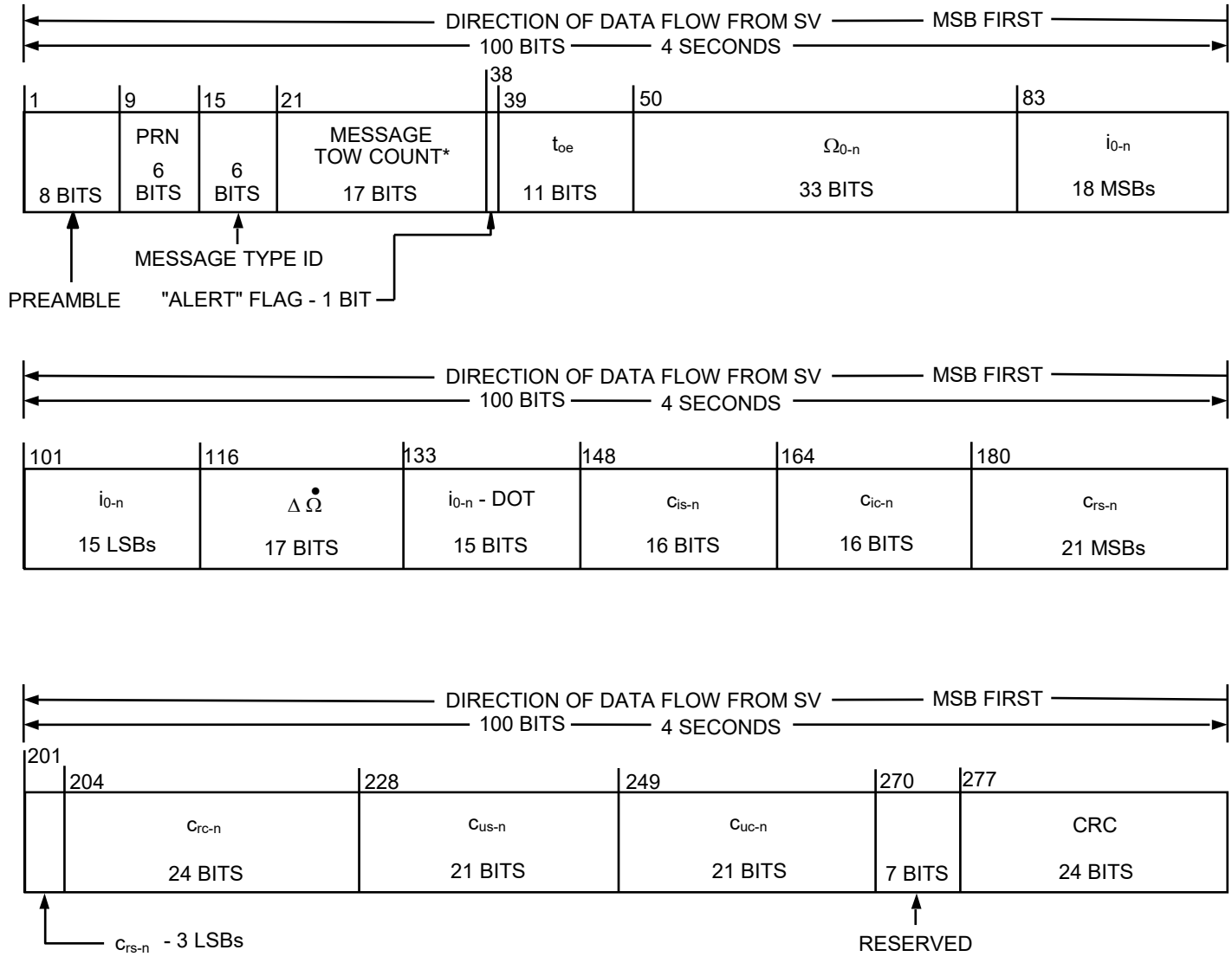
IS:

Fit Interval (hours)	Transmission Interval (hours)	Hours After First Valid Transmission Time			
		t_{oc} (clock)	t_{oe} (ephemeris)	t_{oa} (almanac)	t_{ot} (UTC)
4	2	2	2		
6	4	3	3		
8	6	4	4		
14	12	7	7		
26	24	13	13		
144 (6 days)	144 (6 days)			70	
768 (32 days) *	768 (32 days) *			70	
N/A	144 (6 days) **				70

* Applies after 18 days if the CS is unable to upload the SV
** If the CS is unable to upload the SV this interval may extend to at least 1,584 hours (66 days)

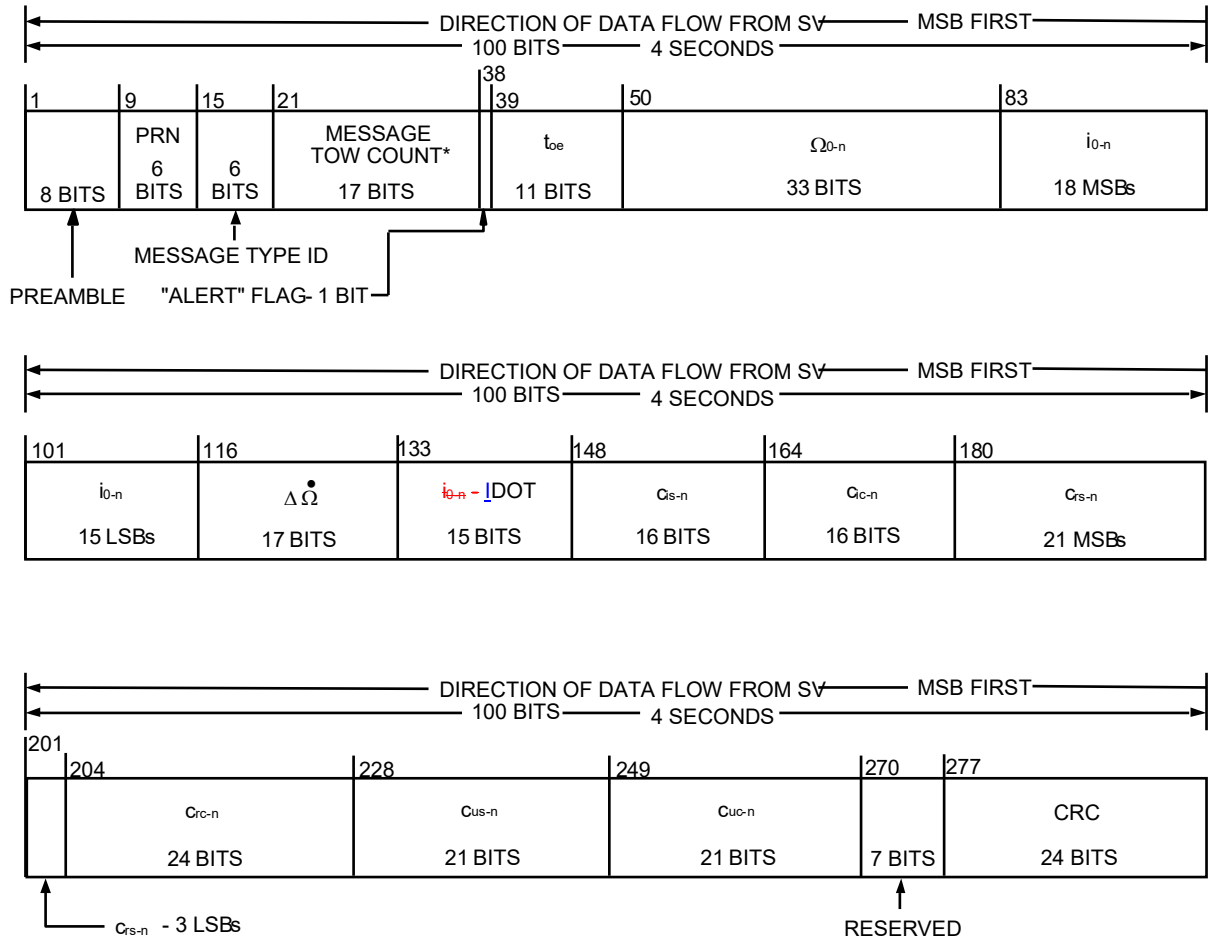
IS200-1401:

Section Number:
30.3.3.0-4
WAS:



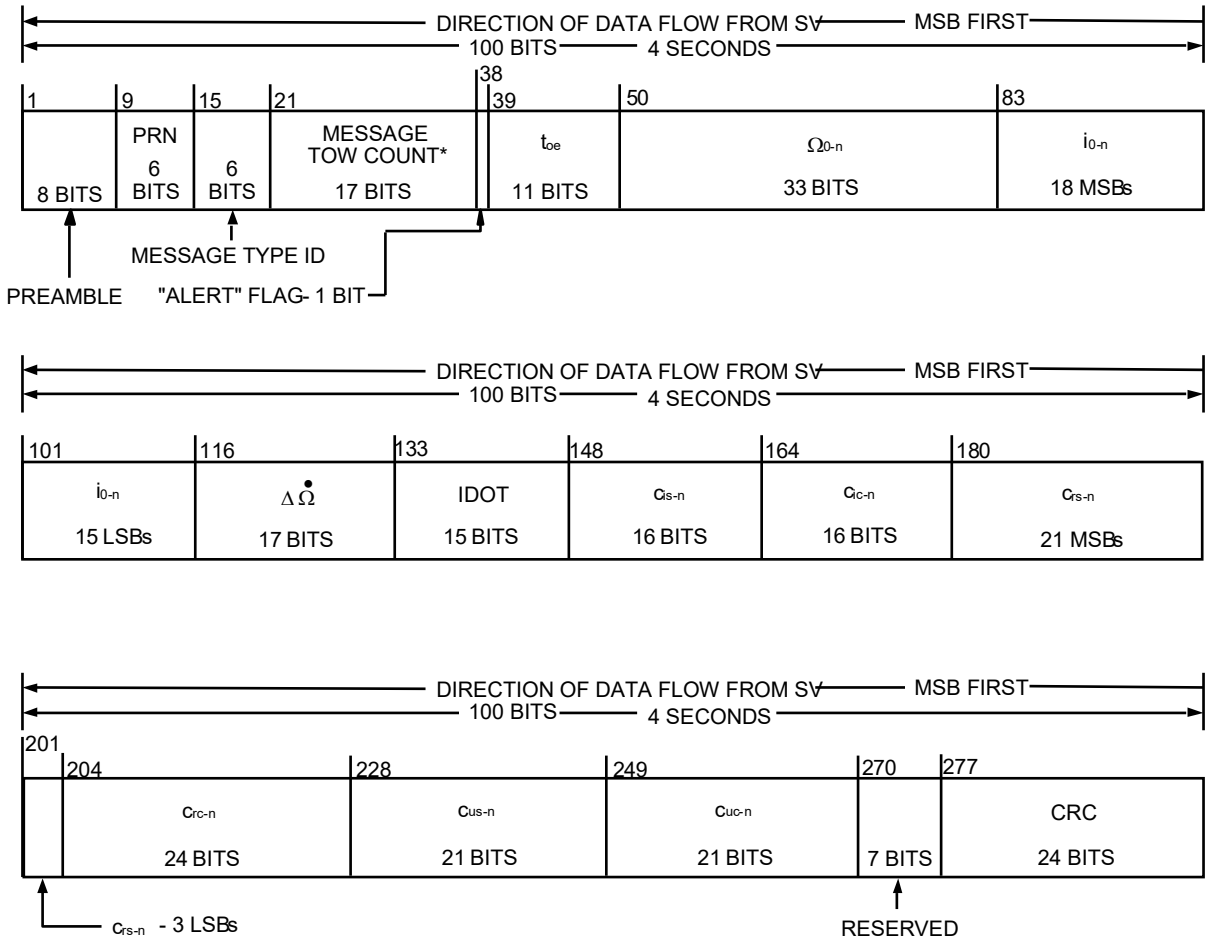
* MESSAGE TOW COUNT = 17 MSB OF ACTUAL TOW COUNT AT START OF NEXT 12-SECOND MESSAGE

Redlines:



* MESSAGE TOW COUNT = 17 MSB OF ACTUAL TOW COUNT AT START OF NEXT SUBSECOND MESSAGE

IS:



* MESSAGE TOW COUNT = 17 MSB OF ACTUAL TOW COUNT AT START OF NEXT SUBFRAME 12 SECOND MESSAGE

IS200-540:

Section Number:
30.3.3.1.1.2.0-2
WAS:
The health bit indication shall be given relative to the capabilities of each SV as designated by the configuration code in the LNAV message (see paragraph 20.3.3.5.1.4). Accordingly, the health bit for any SV which does not have a certain capability will be indicated as "healthy" if the lack of this capability is inherent in its design or if it has been configured into a mode which is normal from a user standpoint and does not require that capability; however, the Operating Command may choose to set the health bit "unhealthy" for an SV without a certain capability. Single-frequency L2C users or users who have not recieved or choose not to use configuration code should assume that every signal is available on every SV. The predicted health data will be updated at the time of upload when a new CEI data set has been built by the CS. Therefore, the transmitted health data may not correspond to the actual health of the transmitting SV. For more information about user protocol for interpreting health indications see paragraph 6.4.6.
Redlines:
The health bit indication shall be given relative to the capabilities of each SV as designated by the configuration code in the LNAV message (see paragraph 20.3.3.5.1.4). Accordingly, the health bit for any SV which does not have a certain capability will be indicated as "healthy" if the lack of this capability is inherent in its design or if it has been configured into a mode which is normal from a user standpoint and does not require that capability; however, the Operating Command may choose to set the health bit "unhealthy" for an SV without a certain capability. Single-frequency L2C users or users who have not ~~recieved~~received or choose not to use configuration code should assume that every signal is available on every SV. The predicted health data will be updated at the time of upload when a new CEI data set has been built by the CS. Therefore, the transmitted health data may not correspond to the actual health of the transmitting SV. For more information about user protocol for interpreting health indications see paragraph 6.4.6.
IS:
The health bit indication shall be given relative to the capabilities of each SV as designated by the configuration code in the LNAV message (see paragraph 20.3.3.5.1.4). Accordingly, the health bit for any SV which does not have a certain capability will be indicated as "healthy" if the lack of this capability is inherent in its design or if it has been configured into a mode which is normal from a user standpoint and does not require that capability; however, the Operating Command may choose to set the health bit "unhealthy" for an SV without a certain capability. Single-frequency L2C users or users who have not received or choose not to use configuration code should assume that every signal is available on every SV. The predicted health data will be updated at the time of upload when a new CEI data set has been built by the CS. Therefore, the transmitted health data may not correspond to the actual health of the transmitting SV. For more information about user protocol for interpreting health indications see paragraph 6.4.6.

IS200-553:

Section Number:
30.3.3.1.3.0-7
WAS:

Parameter		No. of Bits**	Scale Factor (LSB)	Valid Range***	Units
t_{oe}	Ephemeris data reference time of week	11	300	0 to 604,500	seconds
$\Omega_{0\text{-}n}$	Longitude of Ascending Node of Orbit Plane at Weekly Epoch	33*	2^{-32}		semi-circles
$\dot{\Omega}$****	Rate of right ascension difference	17*	2^{-44}		semi-circles/sec
$i_{0\text{-}n}$	Inclination angle at reference time	33*	2^{-32}		semi-circles
$i_{0\text{-}n}$ –DOT	Rate of inclination angle	15*	2^{-44}		semi-circles/sec
$C_{is\text{-}n}$	Amplitude of the sine harmonic correction term to the angle of inclination	16*	2^{-30}		radians
$C_{ic\text{-}n}$	Amplitude of the cosine harmonic correction term to the angle of inclination	16*	2^{-30}		radians
$C_{rs\text{-}n}$	Amplitude of the sine correction term to the orbit radius	24*	2^{-8}		meters
$C_{rc\text{-}n}$	Amplitude of the cosine correction term to the orbit radius	24*	2^{-8}		meters
$C_{us\text{-}n}$	Amplitude of the sine harmonic correction term to the argument of latitude	21*	2^{-30}		radians
$C_{uc\text{-}n}$	Amplitude of the cosine harmonic correction term to the argument of latitude	21*	2^{-30}		radians

* Parameters so indicated are two's complement, with the sign bit (+ or -) occupying the MSB;
** See Figure 30-1 and Figure 30-2 for complete bit allocation in Message Types 10 and 11;
*** Unless otherwise indicated in this column, valid range is the maximum range attainable with indicated bit allocation and scale factor.
**** Relative to $\dot{\Omega}_{REF} = -2.6 \times 10^{-9}$ semi-circles/second.

Redlines:

Parameter		No. of Bits**	Scale Factor (LSB)	Valid Range***	Units
t_{oe}	Ephemeris data reference time of week	11	300	0 to 604,500	seconds
$\Omega_{0\text{-}n}$	Longitude of Ascending Node of Orbit Plane at Weekly Epoch	33*	2^{-32}		semi-circles
$\dot{\Omega}$****	Rate of right ascension difference	17*	2^{-44}		semi-circles/sec
$i_{0\text{-}n}$	Inclination angle at reference time	33*	2^{-32}		semi-circles
~~$i_{0\text{-}n}$~~ IDOT	Rate of inclination angle	15*	2^{-44}		semi-circles/sec
$C_{is\text{-}n}$	Amplitude of the sine harmonic correction term to the angle of inclination	16*	2^{-30}		radians
$C_{ic\text{-}n}$	Amplitude of the cosine harmonic correction term to the angle of inclination	16*	2^{-30}		radians
$C_{rs\text{-}n}$	Amplitude of the sine correction term to the orbit radius	24*	2^{-8}		meters
$C_{rc\text{-}n}$	Amplitude of the cosine correction term to the orbit radius	24*	2^{-8}		meters
$C_{us\text{-}n}$	Amplitude of the sine harmonic correction term to the argument of latitude	21*	2^{-30}		radians
$C_{uc\text{-}n}$	Amplitude of the cosine harmonic correction term to the argument of latitude	21*	2^{-30}		radians

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

** See Figure 30-1 and Figure 30-2 for complete bit allocation in Message Types 10 and 11;

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

**** Relative to $\dot{\Omega}_{REF} = -2.6 \times 10^{-9}$ semi-circles/second.

IS:

Parameter		No. of Bits**	Scale Factor (LSB)	Valid Range***	Units
t_{oe}	Ephemeris data reference time of week	11	300	0 to 604,500	seconds
$\Omega_{0\text{-}n}$	Longitude of Ascending Node of Orbit Plane at Weekly Epoch	33*	2^{-32}		semi-circles
$\dot{\Delta\Omega}$****	Rate of right ascension difference	17*	2^{-44}		semi-circles/sec
$i_{0\text{-}n}$	Inclination angle at reference time	33*	2^{-32}		semi-circles
IDOT	Rate of inclination angle	15*	2^{-44}		semi-circles/sec
$C_{is\text{-}n}$	Amplitude of the sine harmonic correction term to the angle of inclination	16*	2^{-30}		radians
$C_{ic\text{-}n}$	Amplitude of the cosine harmonic correction term to the angle of inclination	16*	2^{-30}		radians
$C_{rs\text{-}n}$	Amplitude of the sine correction term to the orbit radius	24*	2^{-8}		meters
$C_{rc\text{-}n}$	Amplitude of the cosine correction term to the orbit radius	24*	2^{-8}		meters
$C_{us\text{-}n}$	Amplitude of the sine harmonic correction term to the argument of latitude	21*	2^{-30}		radians
$C_{uc\text{-}n}$	Amplitude of the cosine harmonic correction term to the argument of latitude	21*	2^{-30}		radians

* Parameters so indicated are two's complement, with the sign bit (+ or -) occupying the MSB;
** See Figure 30-1 and Figure 30-2 for complete bit allocation in Message Types 10 and 11;
*** Unless otherwise indicated in this column, valid range is the maximum range attainable with indicated bit allocation and scale factor.
**** Relative to $\dot{\Omega}_{REF} = -2.6 \times 10^{-9}$ semi-circles/second.

IS200-555:

Section Number:
30.3.3.1.3.0-11
WAS:

Element/Equation *	Description
$\Phi_k = \nu_k + \omega_n$	Argument of Latitude
$\delta u_k = C_{us\text{-}n}\sin 2\Phi_k + C_{uc\text{-}n}\cos 2\Phi_k$	Argument of Latitude Correction } Second Harmonic Perturbations
$\delta r_k = C_{rs\text{-}n}\sin 2\Phi_k + C_{rc\text{-}n}\cos 2\Phi_k$	Radial Correction
$\delta i_k = C_{is\text{-}n}\sin 2\Phi_k + C_{ic\text{-}n}\cos 2\Phi_k$	Inclination Correction
$u_k = \Phi_k + \delta u_k$	Corrected Argument of Latitude
$r_k = A_k(1 - e_n \cos E_k) + \delta r_k$	Corrected Radius
$i_k = i_{o\text{-}n} + (i_{o\text{-}n}\text{-DOT})t_k + \delta i_k$	Corrected Inclination
$x_k' = r_k \cos u_k$ $y_k' = r_k \sin u_k$	Positions in orbital plane
$\dot{\Omega} = \dot{\Omega}_{REF} + \Delta\dot{\Omega}$ ***	Rate of Right Ascension
$\Omega_k = \Omega_{0\text{-}n} + (\dot{\Omega} - \dot{\Omega}_e)\, t_k - \dot{\Omega}_e\, t_{oe}$	Corrected Longitude of Ascending Node
$x_k = x_k' \cos\Omega_k - y_k' \cos i_k \sin\Omega_k$ $y_k = x_k' \sin\Omega_k + y_k' \cos i_k \cos\Omega_k$ $z_k = y_k' \sin i_k$	Earth-fixed coordinates of SV antenna phase center

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

Redlines:

Element/Equation *	Description
$\Phi_k = \nu_k + \omega_n$	Argument of Latitude
$\delta u_k = C_{us\text{-}n}\sin 2\Phi_k + C_{uc\text{-}n}\cos 2\Phi_k$	Argument of Latitude Correction (Second Harmonic Perturbations)
$\delta r_k = C_{rs\text{-}n}\sin 2\Phi_k + C_{rc\text{-}n}\cos 2\Phi_k$	Radial Correction (Second Harmonic Perturbations)
$\delta i_k = C_{is\text{-}n}\sin 2\Phi_k + C_{ic\text{-}n}\cos 2\Phi_k$	Inclination Correction (Second Harmonic Perturbations)
$u_k = \Phi_k + \delta u_k$	Corrected Argument of Latitude
$r_k = A_k(1 - e_n \cos E_k) + \delta r_k$	Corrected Radius
$i_k = i_{o\text{-}n} + (\dot{i}_{o\text{-}n}\text{-}\text{IDOT})t_k + \delta i_k$	Corrected Inclination
$x_k' = r_k \cos u_k$ $y_k' = r_k \sin u_k$	Positions in orbital plane
$\dot{\Omega} = \dot{\Omega}_{REF} + \Delta\dot{\Omega}$ ***	Rate of Right Ascension
$\Omega_k = \Omega_{0\text{-}n} + (\dot{\Omega} - \dot{\Omega}_e)\, t_k - \dot{\Omega}_e\, t_{oe}$	Corrected Longitude of Ascending Node
$x_k = x_k' \cos\Omega_k - y_k' \cos i_k \sin\Omega_k$ $y_k = x_k' \sin\Omega_k + y_k' \cos i_k \cos\Omega_k$ $z_k = y_k' \sin i_k$	Earth-fixed coordinates of SV antenna phase center

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

IS:

Element/Equation *	Description
$\Phi_k = \nu_k + \omega_n$	Argument of Latitude
$\delta u_k = C_{us\text{-}n}\sin 2\Phi_k + C_{uc\text{-}n}\cos 2\Phi_k$	Argument of Latitude Correction } Second Harmonic Perturbations
$\delta r_k = C_{rs\text{-}n}\sin 2\Phi_k + C_{rc\text{-}n}\cos 2\Phi_k$	Radial Correction } Second Harmonic Perturbations
$\delta i_k = C_{is\text{-}n}\sin 2\Phi_k + C_{ic\text{-}n}\cos 2\Phi_k$	Inclination Correction } Second Harmonic Perturbations
$u_k = \Phi_k + \delta u_k$	Corrected Argument of Latitude
$r_k = A_k(1 - e_n \cos E_k) + \delta r_k$	Corrected Radius
$i_k = i_{o\text{-}n} + (IDOT)t_k + \delta i_k$	Corrected Inclination
$x_k' = r_k \cos u_k$ $y_k' = r_k \sin u_k$ }	Positions in orbital plane
$\dot{\Omega} = \dot{\Omega}_{REF} + \Delta\dot{\Omega}$ ***	Rate of Right Ascension
$\Omega_k = \Omega_{0\text{-}n} + (\dot{\Omega} - \dot{\Omega}_e)\, t_k - \dot{\Omega}_e\, t_{oe}$	Corrected Longitude of Ascending Node
$x_k = x_k' \cos \Omega_k - y_k' \cos i_k \sin \Omega_k$ $y_k = x_k' \sin \Omega_k + y_k' \cos i_k \cos \Omega_k$ $z_k = y_k' \sin i_k$ }	Earth-fixed coordinates of SV antenna phase center
*** $\dot{\Omega}_{REF} = -2.6 \times 10^{-9}$ semi-circles/second.	

IS200-1614:

Section Number:
30.3.3.3.1.1.0-2
WAS:
Table 30-IV. Group Delay Differential Parameters ****
Object Type: <blank>
Redlines:
Table 30-IV. Group Delay Differential Parameters~~****~~
Object Type: ~~<blank>~~Table Caption
IS:
Table 30-IV. Group Delay Differential Parameters
Object Type: Table Caption

IS200-582:

Section Number:
30.3.3.3.1.1.0-3
WAS:

Parameter	No. of Bits**	Scale Factor (LSB)	Valid Range***	Units
T_{GD}	13*	2^{-35}		seconds
$ISC_{L1C/A}$	13*	2^{-35}		seconds
ISC_{L2C}	13*	2^{-35}		seconds
ISC_{L5I5}	13*	2^{-35}		seconds
ISC_{L5Q5}	13*	2^{-35}		seconds

* Parameters so indicated are two's complement with the sign bit (+ or -) occupying the MSB;
** See Figure 30-3 for complete bit allocation in Message Type 30;
*** Valid range is the maximum range attainable with indicated bit allocation and scale factor;
**** The bit string of "1000000000000" will indicate that the group delay value is not available.

Redlines:

Parameter	No. of Bits**	Scale Factor (LSB)	Valid Range***	Units
T_{GD}	13*	2^{-35}		seconds
$ISC_{L1C/A}$	13*	2^{-35}		seconds
ISC_{L2C}	13*	2^{-35}		seconds
ISC_{L5I5}	13*	2^{-35}		seconds
ISC_{L5Q5}	13*	2^{-35}		seconds

* Parameters so indicated are two's complement with the sign bit (+ or -) occupying the MSB;
** See Figure 30-3 for complete bit allocation in Message Type 30;
*** Valid range is the maximum range attainable with indicated bit allocation and scale factor
~~**** The bit string of "1000000000000" will indicate that the group delay value is not available.~~

IS:

Parameter	No. of Bits**	Scale Factor (LSB)	Valid Range***	Units
T_{GD}	13*	2^{-35}		seconds
$ISC_{L1C/A}$	13*	2^{-35}		seconds
ISC_{L2C}	13*	2^{-35}		seconds
ISC_{L5I5}	13*	2^{-35}		seconds
ISC_{L5Q5}	13*	2^{-35}		seconds

* Parameters so indicated are two's complement with the sign bit (+ or -) occupying the MSB;
** See Figure 30-3 for complete bit allocation in Message Type 30;
*** Valid range is the maximum range attainable with indicated bit allocation and scale factor

IS200-598:

Section Number:
30.3.3.4.4.0-1
WAS:
The three, one-bit, health indication in bits 155, 156, and 157 of Message Type 37 and bits 29, 30 and 31 of each packet of reduced almanac refers to the L1, L2, and L5 carrier of the SV whose PRN number is specified in the message or in the packet. These health indication bits only apply to codes and data as defined in IS-GPS-200, IS-GPS-705, and IS-GPS-800.
The health of each carrier is indicated by:

0 = Some or all codes and data on this carrier are OK,

1 = All codes and data on this carrier are bad or unavailable.

The health bit indication shall be given relative to the capabilities of each SV as designated by the configuration code in the LNAV message (see paragraph 20.3.3.5.1.4). Accordingly, the health bit for any SV which does not have a certain capability will be indicated as "healthy" if the lack of this capability is inherent in its design or if it has been configured into a mode which is normal from a user standpoint and does not require that capability; however, the Operating Command may choose to set the health bit "unhealthy" for an SV without a certain capability. Single-frequency L2C users or users who have not received or choose not to use configuration code should assume that every signal is available on every SV. The predicted health data will be updated at the time of upload when a new CEI data set has been built by the CS. Therefore, the transmitted health data may not correspond to the actual health of the transmitting SV. For more information about user protocol for interpreting health indications see paragraph 6.4.6.
Redlines:
The three, one-bit, health indication in bits 155, 156, and 157 of Message Type 37 and bits 29, 30 and 31 of each packet of reduced almanac refers to the L1, L2, and L5 carrier of the SV whose PRN number is specified in the message or in the packet. These health indication bits only apply to codes and data as defined in IS-GPS-200, IS-GPS-705, and IS-GPS-800.
The health of each carrier is indicated by:

0 = Some or all codes and data on this carrier are OK,

1 = All codes and data on this carrier are bad or unavailable.

The health bit indication shall be given relative to the capabilities of each SV as designated by the configuration code in the LNAV message (see paragraph 20.3.3.5.1.4). Accordingly, the health bit for any SV which does not have a certain capability will be indicated as "healthy" if the lack of this capability is inherent in its design or if it has been configured into a mode which is normal from a user standpoint and does not require that capability; however, the Operating Command may choose to set the health bit "unhealthy" for an SV without a certain capability. Single-frequency L2C users or users who have not received or choose not to use configuration code should assume that every signal is available on every SV. The predicted health data will be updated at the time of upload when a new CEI data set has been built by the CS. Therefore, the transmitted health data may not correspond to the actual health of the ~~transmitting~~relevant SV. For more information about user protocol for interpreting health indications see paragraph 6.4.6.

IS:
The three, one-bit, health indication in bits 155, 156, and 157 of Message Type 37 and bits 29, 30 and 31 of each packet of reduced almanac refers to the L1, L2, and L5 carrier of the SV whose PRN number is specified in the message or in the packet. These health indication bits only apply to codes and data as defined in IS-GPS-200, IS-GPS-705, and IS-GPS-800.
The health of each carrier is indicated by:

0 = Some or all codes and data on this carrier are OK,

1 = All codes and data on this carrier are bad or unavailable.

The health bit indication shall be given relative to the capabilities of each SV as designated by the configuration code in the LNAV message (see paragraph 20.3.3.5.1.4). Accordingly, the health bit for any SV which does not have a certain capability will be indicated as "healthy" if the lack of this capability is inherent in its design or if it has been configured into a mode which is normal from a user standpoint and does not require that capability; however, the Operating Command may choose to set the health bit "unhealthy" for an SV without a certain capability. Single-frequency L2C users or users who have not received or choose not to use configuration code should assume that every signal is available on every SV. The predicted health data will be updated at the time of upload when a new CEI data set has been built by the CS. Therefore, the transmitted health data may not correspond to the actual health of the relevant SV. For more information about user protocol for interpreting health indications see paragraph 6.4.6.

IS200-2119:
Insertion after object IS200-600
Section Number:
30.3.3.4.5.0-2
WAS:
<INSERTED OBJECT>
Redlines:
The Midi almanac parameters shall be updated by the CS at least once every 3 days while the CS is able to upload the SVs. If the CS is unable to upload the SVs, the accuracy of the Midi almanac parameters transmitted by the SVs will degrade over time.
Object Type: Requirement
IS:
The Midi almanac parameters shall be updated by the CS at least once every 3 days while the CS is able to upload the SVs. If the CS is unable to upload the SVs, the accuracy of the Midi almanac parameters transmitted by the SVs will degrade over time.
Object Type: Requirement

IS200-630:

Section Number:
30.3.3.6.2.0-1
WAS:
Message Type 33 includes: (1) the parameters needed to relate GPS Time to UTC (USNO), and (2) notice to the user regarding the scheduled future or recent past (relative to Nav message upload) value of the delta time due to leap seconds (Δt_{LSF}), together with the week number (WN_{LSF}) and the day number (DN) at the end of which the leap second becomes effective. Information required to use these parameters to calculate t_{UTC} is in paragraph 20.3.3.5.2.4 except the following definition of Δt_{UTC} shall be used.
Redlines:
Message Type 33 includes: (1) the parameters needed to relate GPS Time to UTC (USNO), and (2) notice to the user regarding the scheduled future or recent past (relative to Nav message upload) value of the delta time due to leap seconds (~~DtLSF~~ ΔtLSF), together with the GPS week number (WNLSF) and the GPS day number (DN) ~~at~~near the end of which ~~the leap second~~ΔtLSF becomes effective. Information required to use these parameters to calculate (and define) tUTC is in paragraph 20.3.3.5.2.4 except the following definition of ~~DtUTC~~ΔtUTC shall be used.
IS:
Message Type 33 includes: (1) the parameters needed to relate GPS Time to UTC(USNO), and (2) notice to the user regarding the scheduled future or recent past (relative to Nav message upload) value of the delta time due to leap seconds (Δt_{LSF}), together with the GPS week number (WN_{LSF}) and the GPS day number (DN) near the end of which Δt_{LSF} becomes effective. Information required to use these parameters to calculate (and define) t_{UTC} is in paragraph 20.3.3.5.2.4 except the following definition of Δt_{UTC} shall be used.

IS200-1796:

Section Number:
30.3.3.10.1.7
WAS:
Object Heading: Satellite Fault Probability
Redlines:
Object Heading: Satellite Fault ~~Probability~~Rate
IS:
Object Heading: Satellite Fault Rate

IS200-1797:

Section Number:
30.3.3.10.1.7.0-1
WAS:
Bits 74 through 77 of Message Type 40 shall provide the assumed Satellite Fault Probability (R_{sat}) value for ARAIM at the current time for the associated GNSS constellation.
Redlines:
Bits 74 through 77 of Message Type 40 shall provide the assumed Satellite Fault ~~Probability~~Rate (R_{sat}) value for ARAIM at the current time for the associated GNSS constellation.
IS:
Bits 74 through 77 of Message Type 40 shall provide the assumed Satellite Fault Rate (R_{sat}) value for ARAIM at the current time for the associated GNSS constellation.

IS200-1969:

Section Number:
30.3.4.4.0-2
WAS:
t_{op} does not have to match t_{oe}/t_{oc}. As a redundant check, t_{op} in Message Type 10 and 11 will match with the t_{op} term in Message Type 30-37 for a valid CEI data set.
Redlines:
t_{op} does not have to match t_{oe}/t_{oc}~~. As a redundant~~but ~~check,~~the t_{op} in Message Type 10~~ and 11~~ will match~~ with~~ the t_{op}~~ term~~ in Message Type 30-37 ~~for~~from ~~a~~the ~~valid~~same CEI data set.
IS:
t_{op} does not have to match t_{oe}/t_{oc} but the t_{op} in Message Type 10 will match the t_{op} in Message Type 30-37 from the same CEI data set.

IS200-1970:

Section Number:
30.3.4.4.0-3
WAS:
The following rule governs the transmission of t_{oe} and t_{oc} values in different data sets: The transmitted t_{oe}/t_{oc} will be different from any value transmitted by the SV during the preceding six hours.
Redlines:
The following rule governs the transmission of t_{oe} and t_{oc} values in different CEI data sets: The transmitted t_{oe}/t_{oc} will be different from any value transmitted by the SV during the preceding six hours.
IS:
The following rule governs the transmission of t_{oe} and t_{oc} values in different CEI data sets: The transmitted t_{oe}/t_{oc} will be different from any value transmitted by the SV during the preceding six hours.

IS200-1971:

Section Number:
30.3.4.4.0-4
WAS:
Cutovers to new CEI data sets will occur only on hour boundaries except for the first data set of a new CEI data sequence propagation. The first CEI data set may be cut-in (reference paragraph 30.3.4.1) at any time during the hour and therefore may be transmitted by the SV for less than one hour.
Redlines:
Cutovers to new CEI data sets will occur only on two-hour boundaries except for the first CEI data set of a new CEI data sequence propagation. The first CEI data set may be cut-in (reference paragraph 30.3.4.1) at any time during the ~~hour~~two hours and therefore may be transmitted by the SV for less than ~~one~~two ~~hour~~hours.
IS:
Cutovers to new CEI data sets will occur only on two-hour boundaries except for the first CEI data set of a new CEI data sequence propagation. The first CEI data set may be cut-in (reference paragraph 30.3.4.1) at any time during the two hours and therefore may be transmitted by the SV for less than two hours.

IS200-1972:

Section Number:
30.3.4.4.0-5
WAS:
The start of the transmission interval for each CEI data set corresponds to the beginning of the curve fit interval for the CEI data set. Each CEI data set remains valid for the duration of its transmission interval, and nominally also remains valid for the duration of its curve fit interval. A CEI data set is rendered obsolete before the end of its curve fit interval when it is superseded by the SV cutting over to the first CEI data set of a new CEI data sequence propagation.
Redlines:
~~The~~Except for the first CEI data set of a new CEI data sequence propagation, the start of the transmission interval for each CEI data set corresponds to the beginning of the curve fit interval for the CEI data set.~~-~~ Each CEI data set remains valid for the duration of its transmission interval, and nominally also remains valid for the duration of its curve fit interval.~~-~~ A CEI data set is rendered obsolete before the end of its curve fit interval when it is superseded by the SV cutting over to the first CEI data set of a new CEI data sequence propagation.
The start time of the curve fit interval of the first CEI data set of a new CEI data sequence propagation may be later than the start time of the curve fit interval of the preceding CEI data set that was transmitted prior to the cutover. The beginning of the curve fit interval of the first CEI data set of a new CEI data sequence propagation will be a multiple of 300 seconds (5 minutes) relative to the start of week.
IS:
Except for the first CEI data set of a new CEI data sequence propagation, the start of the transmission interval for each CEI data set corresponds to the beginning of the curve fit interval for the CEI data set. Each CEI data set remains valid for the duration of its transmission interval, and nominally also remains valid for the duration of its curve fit interval. A CEI data set is rendered obsolete before the end of its curve fit interval when it is superseded by the SV cutting over to the first CEI data set of a new CEI data sequence propagation.
The start time of the curve fit interval of the first CEI data set of a new CEI data sequence propagation may be later than the start time of the curve fit interval of the preceding CEI data set that was transmitted prior to the cutover. The beginning of the curve fit interval of the first CEI data set of a new CEI data sequence propagation will be a multiple of 300 seconds (5 minutes) relative to the start of week.

IS200-1492:

Section Number:
30.3.4.5.0-3
WAS:
Each of these parameters is formulated as a polynomial in time. The specific time scale of expansion can be arbitrary. Due to the short data field lengths available in the Navigation Message format, the epoch of the polynomial is chosen near the midpoint of the expansion range so that quantization error is small. This results in time epoch values which can be different for each data set. Time epochs contained in the Navigation Message and the different algorithms which utilize them are related as follows:

Redlines:
Each of these parameters is formulated as a polynomial in time. The specific time scale of expansion can be arbitrary. Due to the short data field lengths available in the Navigation Message format, the nominal epoch of the polynomial is chosen near the midpoint of the expansion range so that quantization error is small. This results in time epoch values which can be different for each data set. Time epochs contained in the Navigation Message and the different algorithms which utilize them are related as follows:
IS:
Each of these parameters is formulated as a polynomial in time. The specific time scale of expansion can be arbitrary. Due to the short data field lengths available in the Navigation Message format, the nominal epoch of the polynomial is chosen near the midpoint of the expansion range so that quantization error is small. This results in time epoch values which can be different for each data set. Time epochs contained in the Navigation Message and the different algorithms which utilize them are related as follows:

IS200-1493:

Section Number:
30.3.4.5.0-4
WAS:

Epoch	Application Algorithm Reference
t_{oc}	20.3.3.3.3.1
t_{oe}	20.3.3.4.3
t_{oa}	20.3.3.5.2.2 and 20.3.3.5.2.3
t_{ot}	20.3.3.5.2.4 and 30.3.3.6.2
t_{op}	30.3.3.2.4
t_{EOP}	30.3.3.5.1
t_{OD}	30.3.3.7
t_{GGTO}	30.3.3.8.2

Redlines:

Epoch	Week	Application Algorithm Reference
t_{oc}		20.3.3.3.3.1
t_{oe}	~~20~~	30.3.3.~~4~~1.3
t_{oa}	WN_{a-n}	20.3.3.5.2.2~~ and~~, 20.3.3.5.2.3 and 30.3.3.4.6.2
t_{ot}	WN_{ot}	20.3.3.5.2.4 and 30.3.3.6.2
t_{op}	WN_{op}	30.3.3.2.4
t_{EOP}	WN_{ot}	30.3.3.5.1
t_{OD}		30.3.3.7
t_{GGTO}	WN_{GGTO}	30.3.3.8.2

IS:

Epoch	Week	Application Algorithm Reference
t_{oc}		20.3.3.3.3.1
t_{oe}		30.3.3.1.3
t_{oa}	WN_{a-n}	20.3.3.5.2.2, 20.3.3.5.2.3 and 30.3.3.4.6.2
t_{ot}	WN_{ot}	20.3.3.5.2.4 and 30.3.3.6.2
t_{op}	WN_{op}	30.3.3.2.4
t_{EOP}	WN_{ot}	30.3.3.5.1
t_{OD}		30.3.3.7
t_{GGTO}	WN_{GGTO}	30.3.3.8.2

IS200-1494:

Section Number:
30.3.4.5.0-5
WAS:
For those parameters for which fit interval and transmission interval are relevant, Table 30-XIII specifies the fit interval, the nominal transmission interval, and the nominal selection of the fit point (which will be expressed modulo 604,800 seconds in the Navigation Message).

Redlines:
For those parameters for which fit interval and transmission interval are relevant, Table 30-XIII specifies the fit interval, the nominal transmission interval, and the nominal selection of the fit point (which will be expressed modulo 604,800 seconds in the Navigation Message). The nominal transmission interval in Table 30-XIII represents the maximum time period during which a particular data set will be valid for broadcast in the Navigation Message. The actual broadcast duration may be shorter than the specified transmission interval if the SV cuts over to a new data set.
IS:
For those parameters for which fit interval and transmission interval are relevant, Table 30-XIII specifies the fit interval, the nominal transmission interval, and the nominal selection of the fit point (which will be expressed modulo 604,800 seconds in the Navigation Message). The nominal transmission interval in Table 30-XIII represents the maximum time period during which a particular data set will be valid for broadcast in the Navigation Message. The actual broadcast duration may be shorter than the specified transmission interval if the SV cuts over to a new data set.

IS200-1495:

Section Number:
30.3.4.5.0-6
WAS:
The coefficients of expansion are obviously dependent upon choice of epoch, and thus the epoch time and expansion coefficients must be treated as an inseparable parameter set. Note that a user applying current navigation data will normally be working with negative values of $(t-t_{oc})$ and $(t-t_{oe})$ in evaluating the expansions.

Redlines:
The coefficients of expansion are obviously dependent upon choice of epoch, and thus the epoch time and expansion coefficients must be treated as an inseparable parameter set. Note that a user applying current navigation data during the first 1.5 hours of the transmission interval will normally be working with negative values of $(t-t_{oc})$ and $(t-t_{oe})$ in evaluating the expansions.
IS:
The coefficients of expansion are obviously dependent upon choice of epoch, and thus the epoch time and expansion coefficients must be treated as an inseparable parameter set. Note that a user applying current navigation data during the first 1.5 hours of the transmission interval will normally be working with negative values of $(t-t_{oc})$ and $(t-t_{oe})$ in evaluating the expansions.

IS200-1496:

Section Number:
30.3.4.5.0-7
WAS:
The CS (Block IIR-M/IIF) and SS (GPS III and GPS IIIF) shall assure that the t_{oe} value, for at least the first CEI data set transmitted by an SV after a new CEI data sequence propagation, is different from that transmitted prior to the cutover (see paragraph 30.3.4.4).
Redlines:
The CS (Block IIR-M/IIF) and SS (GPS III and GPS IIIF) shall assure that the t_{oe} value, for at least the first CEI data set transmitted by an SV ~~after~~from a new CEI data sequence propagation, is different from that transmitted from the prior ~~to~~CEI ~~the~~data ~~cutover~~sequence propagation (see paragraph 30.3.4.4).
IS:
The CS (Block IIR-M/IIF) and SS (GPS III and GPS IIIF) shall assure that the t_{oe} value, for at least the first CEI data set transmitted by an SV from a new CEI data sequence propagation, is different from that transmitted from the prior CEI data sequence propagation (see paragraph 30.3.4.4).

IS200-1975:

Section Number:
30.3.4.5.0-8
WAS:
As such, when a new CEI data sequence propagation is cutover for transmission, the CS (Block IIR-M/IIF) and SS (GPS III and GPS IIIF) shall introduce a small deviation in the t_{oe} resulting in the t_{oe} value that is offset from the nominal location of 1.5 hours into the fit interval (see Table 30-XIII). This offset t_{oe} will be transmitted by an SV in the first data set after a new CEI data sequence propagation cutover and the second CEI data set, following the first CEI data set, may also continue to reflect the same offset in the t_{oe}.
Redlines:
As such, when a new CEI data sequence propagation is cutover for transmission, the CS (Block IIR-M/IIF) and SS (GPS III and GPS IIIF) shall introduce a small negative deviation in the t_{oe} relative to the midpoint of the curve fit interval, resulting in ~~the~~a t_{oe} value that is offset from the nominal location of 1.5 hours into the fit interval (see Table 30-XIII).~~-~~ This offset t_{oe} will be transmitted by an SV in the first CEI data set ~~after~~of ~~a~~the new CEI data sequence propagation~~ cutover~~. ~~and~~ ~~the~~The second CEI data set, following the first CEI data set, may also continue to reflect~~ the~~ ~~same~~an offset in the toe relative to the nominal location of 1.5 hours into the fit interval.
IS:
As such, when a new CEI data sequence propagation is cutover for transmission, the CS (Block IIR-M/IIF) and SS (GPS III and GPS IIIF) shall introduce a small negative deviation in the t_{oe} relative to the midpoint of the curve fit interval, resulting in a t_{oe} value that is offset from the nominal location of 1.5 hours into the fit interval (see Table 30-XIII). This offset t_{oe} will be transmitted by an SV in the first CEI data set of the new CEI data sequence propagation. The second CEI data set, following the first CEI data set, may also continue to reflect an offset in the t_{oe} relative to the nominal location of 1.5 hours into the fit interval.

IS200-1498:

Section Number:
30.3.4.5.0-10
WAS:
For CNAV data, the user may use the following example algorithm to detect the occurrence of a new CEI data sequence propagation cutover:

DEV = t_{oe} [modulo 7200]

If DEV ≠ 5400, then a new CEI data sequence propagation cutover has occurred within the past 4 hours.

Redlines:
A change from the broadcast reference time immediately prior to cutover is used to indicate a change of values in the CEI data set. For CNAV data, the user may use the following example algorithm to detect the occurrence of a new CEI data sequence propagation cutover:

DEV = t_{oe} [modulo 7200]

If DEV ≠ 5400, then a new CEI data sequence propagation cutover has occurred within the past 4 hours.

When DEV = 5400, the broadcast t_{oe} and t_{oc} correspond to the midpoint of the curve fit interval for that CEI data set (Table 30-XIII). When DEV ≠ 5400, the broadcast t_{oe} and t_{oc} are offset values representing a time that is a minimum of 300 seconds prior to the midpoint of the curve fit interval for that CEI data set. These offsets are accounted for in the generation of the time-dependent coefficients in the CEI data set, such that the user may directly apply the broadcast t_{oe} and t_{oc} in the algorithms of paragraphs 30.3.3.1.3 and 20.3.3.3.3.1.
IS:
A change from the broadcast reference time immediately prior to cutover is used to indicate a change of values in the CEI data set. For CNAV data, the user may use the following example algorithm to detect the occurrence of a new CEI data sequence propagation cutover:

DEV = t_{oe} [modulo 7200]

If DEV ≠ 5400, then a new CEI data sequence propagation cutover has occurred within the past 4 hours.

When DEV = 5400, the broadcast t_{oe} and t_{oc} correspond to the midpoint of the curve fit interval for that CEI data set (Table 30-XIII). When DEV ≠ 5400, the broadcast t_{oe} and t_{oc} are offset values representing a time that is a minimum of 300 seconds prior to the midpoint of the curve fit interval for that CEI data set. These offsets are accounted for in the generation of the time-dependent coefficients in the CEI data set, such that the user may directly apply the broadcast t_{oe} and t_{oc} in the algorithms of paragraphs 30.3.3.1.3 and 20.3.3.3.3.1.

IS200-1499:

Section Number:
30.3.4.5.0-12
WAS:

Fit Interval (hours)	Transmission Interval (hours)	Hours After First Valid Transmission Time			
		t_{oc} (clock)	t_{oe} (ephemeris)	t_{oa} (almanac)	t_{ot} (UTC)
3*	2*	1.5	1.5		
144 (6 days)	144			70	70
≥144 (6 days)	≥144			70	70
* Defined in Section 30.3.3.1.1					

Redlines:

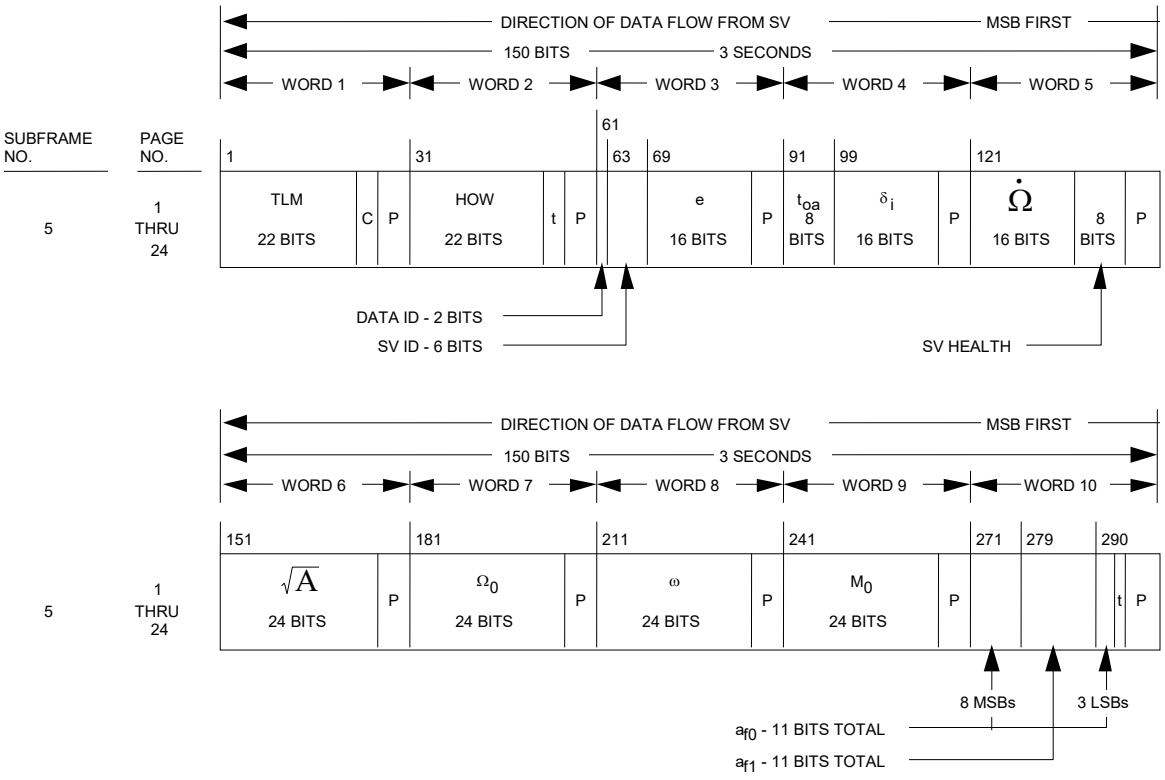
Fit Interval (hours)	Transmission Interval (hours)	Hours After First Valid Transmission Time			
		t_{oc} (clock)	t_{oe} (ephemeris)	t_{oa} (almanac)	t_{ot} (UTC)
3*	2*	1.5	1.5		
144 (6 days)	144 (6 days)			70	~~70~~
~~≥144 (6 days)~~	~~≥144~~			~~70~~	~~70~~
768 (32 days) **	768 (32 days) **			70	
N/A	72 (3 days) ***				70
* Defined in Section 30.3.3.1.1 ** Applies after 18 days if the CS is unable to upload the SV *** If the CS is unable to upload the SV this interval may extend to at least 1,512 hours (63 days)					

IS:

Fit Interval (hours)	Transmission Interval (hours)	Hours After First Valid Transmission Time			
		t_{oc} (clock)	t_{oe} (ephemeris)	t_{oa} (almanac)	t_{ot} (UTC)
3*	2*	1.5	1.5		
144 (6 days)	144 (6 days)			70	
768 (32 days) **	768 (32 days) **			70	
N/A	72 (3 days) ***				70
* Defined in Section 30.3.3.1.1 ** Applies after 18 days if the CS is unable to upload the SV *** If the CS is unable to upload the SV this interval may extend to at least 1,512 hours (63 days)					

IS200-1432:

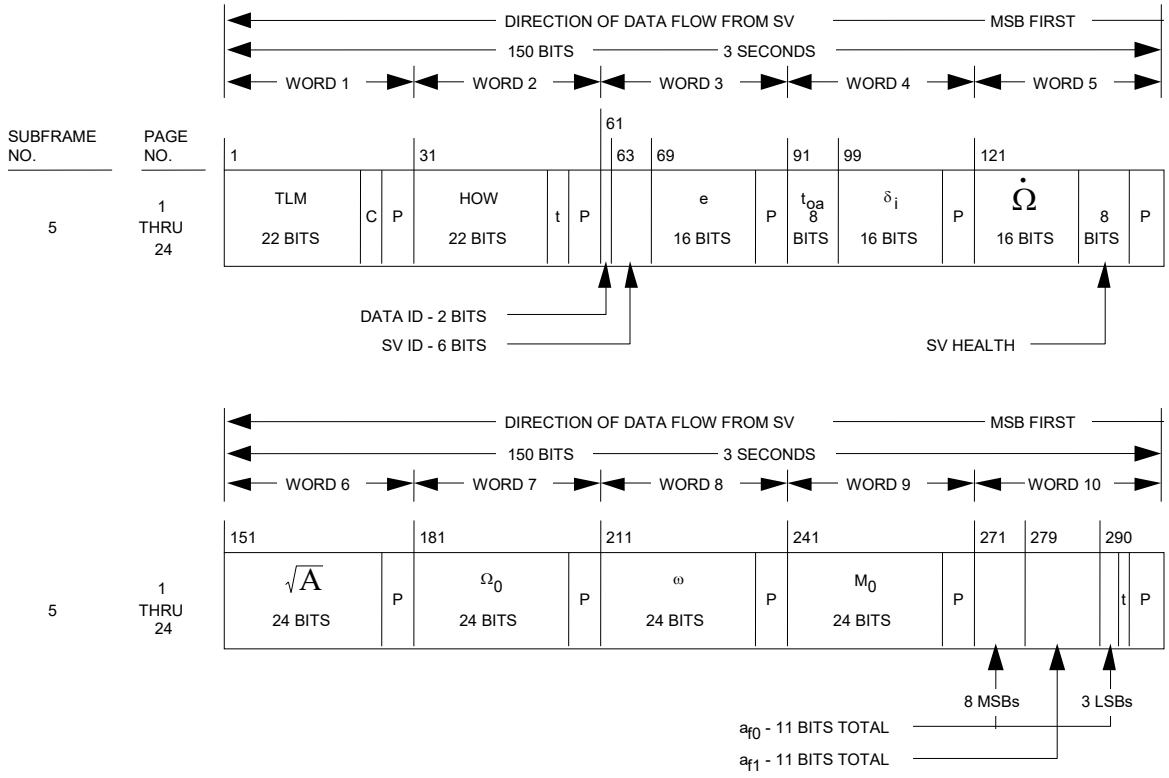
Section Number:
40.3.2.0-8
WAS:



P = 6 PARITY BITS
t = 2 NONINFORMATION BEARING BITS USED FOR PARITY COMPUTATION (SEE PARAGRAPH 20.3.5)
C = TLM BITS 23 AND 24. BIT 23 IS THE INTEGRITY STATUS FLAG AND BIT 24 IS RESERVED
NOTE: PAGES 2, 3, 4, 5, 7, 8, 9 & 10 OF SUBFRAME 4 HAVE THE SAME FORMAT AS PAGES 1 THROUGH 24 OF SUBFRAME 5

Redlines:
Graphic not available. Removed references to Page 10 in the Note

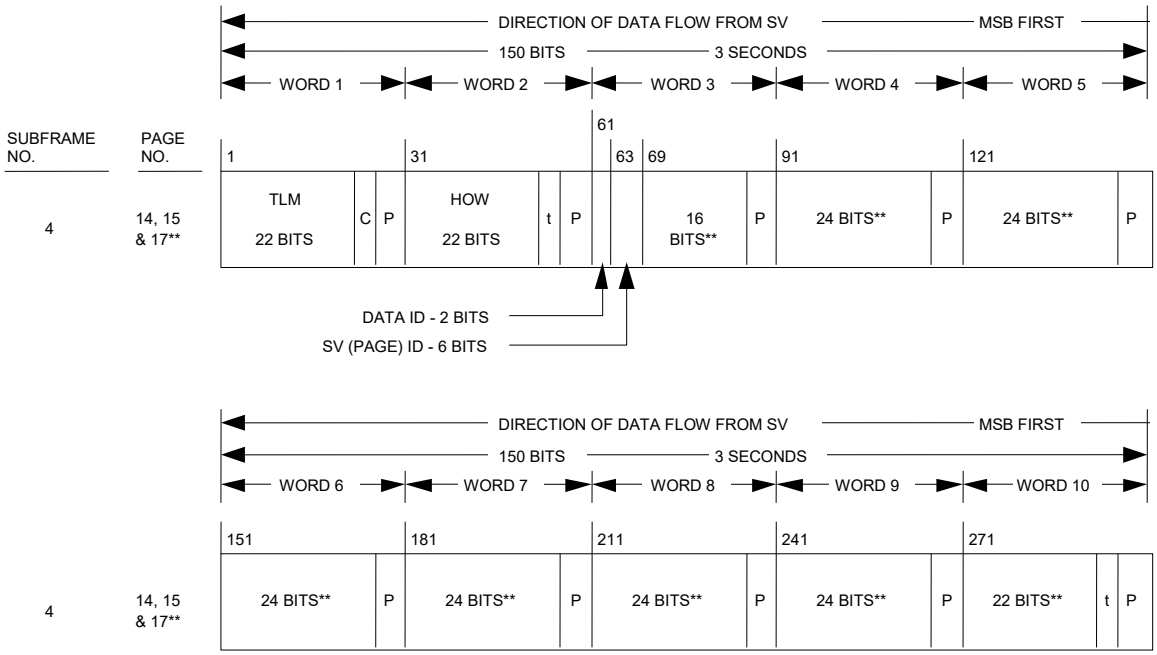
IS:



P = 6 PARITY BITS
t = 2 NONINFORMATION BEARING BITS USED FOR PARITY COMPUTATION (SEE PARAGRAPH 20.3.5)
C = TLM BITS 23 AND 24. BIT 23 IS THE INTEGRITY STATUS FLAG AND BIT 24 IS RESERVED
NOTE: PAGES 2, 3, 4, 5, 7, 8, & 9 OF SUBFRAME 4 HAVE THE SAME FORMAT AS PAGES 1 THROUGH 24 OF SUBFRAME 5

IS200-1439:

Section Number:
40.3.2.0-22
WAS:

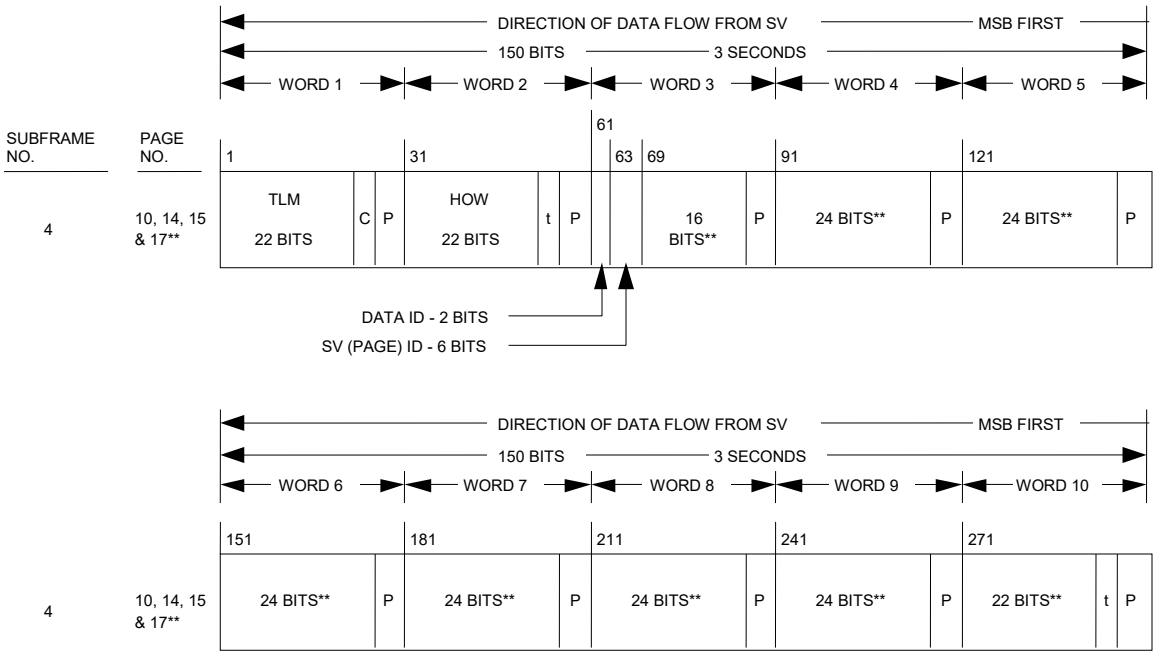


** THE INDICATED PORTIONS OF WORDS 3 THROUGH 10 OF PAGES 14 AND 15 ARE RESERVED FOR SYSTEM USE, WHILE THOSE OF PAGE 17 ARE RESERVED FOR SPECIAL MESSAGES PER PARAGRAPH 20.3.3.5.1.8
P = 6 PARITY BITS
t = 2 NONINFORMATION BEARING BITS USED FOR PARITY COMPUTATION (SEE PARAGRAPH 20.3.5)
C = TLM BITS 23 AND 24. BIT 23 IS THE INTEGRITY STATUS FLAG AND BIT 24 IS RESERVED

Redlines:

Graphic not available. Added references to Page 10 in the Note

IS:



** THE INDICATED PORTIONS OF WORDS 3 THROUGH 10 OF PAGES 10, 14 AND 15 ARE RESERVED FOR SYSTEM USE, WHILE THOSE OF PAGE 17 ARE RESERVED FOR SPECIAL MESSAGES PER PARAGRAPH 20.3.3.5.1.8

P = 6 PARITY BITS

t = 2 NONINFORMATION BEARING BITS USED FOR PARITY COMPUTATION (SEE PARAGRAPH 20.3.5)

C = TLM BITS 23 AND 24. BIT 23 IS THE INTEGRITY STATUS FLAG AND BIT 24 IS RESERVED

IS200-1372:

Section Number:
40.3.3.5.1.1-1
WAS:

Page	Subframe 4		Subframe 5	
	Data ID	SV ID* (Note 4)	Data ID	SV ID* (Note 4)
1	Note(2)	121	Note(1)	65
2	Note(1)	89	Note(1)	66
3	Note(1)	90	Note(1)	67
4	Note(1)	91	Note(1)	68
5	Note(1)	92	Note(1)	69
6	Note(2)	121	Note(1)	70
7	Note(1)	93	Note(1)	71
8	Note(1)	94	Note(1)	72
9	Note(1)	95	Note(1)	73
10	Note(2)	0	Note(1)	74
11	Note(2)	121	Note(1)	75
12	Note(2)	126	Note(1)	76
13	Note(2)	116	Note(1)	77
14	Note(2)	117	Note(1)	78
15	Note(2)	118	Note(1)	79
16	Note(2)	121	Note(1)	80
17	Note(2)	119	Note(1)	81
18	Note(2)	120	Note(1)	82
19	Note(2)	122 Note(3)	Note(1)	83
20	Note(2)	123 Note(3)	Note(1)	84
21	Note(2)	121	Note(1)	85
22	Note(2)	124 Note(3)	Note(1)	86
23	Note(2)	125 Note(3)	Note(1)	87
24	Note(2)	126	Note(1)	88
25	Note(2)	127	Note(2)	115

* Use "0" to indicate "dummy" SV. When using "0" to indicate dummy SV, use the data ID of the transmitting SV.
Note 1: Data ID of that SV whose SV ID appears in that page.
Note 2: Data ID of transmitting SV.
Note 3: SV ID may vary (except for IIR/IIR-M/IIF/GPS III/GPS IIIF SVs).
Note 4: For almanac data pages, the SV ID relationship to PRN ID is defined in Table 3-Ia and Table 3-Ib

Redlines:

Page	Subframe 4		Subframe 5	
	Data ID	SV ID* (Note ~~4~~3)	Data ID	SV ID* (Note ~~4~~3)
1	Note(2)	121	Note(1)	65
2	Note(1)	89	Note(1)	66
3	Note(1)	90	Note(1)	67
4	Note(1)	91	Note(1)	68
5	Note(1)	92	Note(1)	69
6	Note(2)	121	Note(1)	70
7	Note(1)	93	Note(1)	71
8	Note(1)	94	Note(1)	72
9	Note(1)	95	Note(1)	73
10	Note(2)	~~0~~Reserved	Note(1)	74
11	Note(2)	121	Note(1)	75
12	Note(2)	126	Note(1)	76
13	Note(2)	116	Note(1)	77
14	Note(2)	117	Note(1)	78
15	Note(2)	118	Note(1)	79
16	Note(2)	121	Note(1)	80
17	Note(2)	119	Note(1)	81
18	Note(2)	120	Note(1)	82
19	Note(2)	122 ~~Note(3)~~	Note(1)	83
20	Note(2)	123 ~~Note(3)~~	Note(1)	84
21	Note(2)	121	Note(1)	85
22	Note(2)	124 ~~Note(3)~~	Note(1)	86
23	Note(2)	125 ~~Note(3)~~	Note(1)	87
24	Note(2)	126	Note(1)	88
25	Note(2)	127	Note(2)	115

* Use "0" to indicate "dummy" SV. When using "0" to indicate dummy SV, use the data ID of the transmitting SV.

Note 1: Data ID of that SV whose SV ID appears in that page

Note 2: Data ID of transmitting SV

Note 3: ~~SV ID may vary (except for IIR/IIR-M/IIF/GPS III/GPS IIIF SVs).~~

~~Note 4:~~ For almanac data pages, the SV ID relationship to PRN ID is defined in Table 3-Ia and Table 3-Ib

IS:

Page	Subframe 4		Subframe 5	
	Data ID	SV ID* (Note 3)	Data ID	SV ID* (Note 3)
1	Note(2)	121	Note(1)	65
2	Note(1)	89	Note(1)	66
3	Note(1)	90	Note(1)	67
4	Note(1)	91	Note(1)	68
5	Note(1)	92	Note(1)	69
6	Note(2)	121	Note(1)	70
7	Note(1)	93	Note(1)	71
8	Note(1)	94	Note(1)	72
9	Note(1)	95	Note(1)	73
10	Note(2)	Reserved	Note(1)	74
11	Note(2)	121	Note(1)	75
12	Note(2)	126	Note(1)	76
13	Note(2)	116	Note(1)	77
14	Note(2)	117	Note(1)	78
15	Note(2)	118	Note(1)	79
16	Note(2)	121	Note(1)	80
17	Note(2)	119	Note(1)	81
18	Note(2)	120	Note(1)	82
19	Note(2)	122	Note(1)	83
20	Note(2)	123	Note(1)	84
21	Note(2)	121	Note(1)	85
22	Note(2)	124	Note(1)	86
23	Note(2)	125	Note(1)	87
24	Note(2)	126	Note(1)	88
25	Note(2)	127	Note(2)	115

* Use "0" to indicate "dummy" SV. When using "0" to indicate dummy SV, use the data ID of the transmitting SV.

Note 1: Data ID of that SV whose SV ID appears in that page

Note 2: Data ID of transmitting SV

Note 3: For almanac data pages, the SV ID relationship to PRN ID is defined in Table 3-Ia and Table 3-Ib

IS200-2105:

Section Number:
40.3.3.5.1.2.0-2
WAS:
The almanac message for any dummy SVs shall contain alternating ones and zeros with valid parity.
Redlines:
The almanac message (174 almanac data bits and 8 SV health bits) for any dummy SVs shall contain alternating ones and zeros with valid parity. Users are cautioned against attempting to track a dummy SV since the results are unpredictable.
IS:
The almanac message (174 almanac data bits and 8 SV health bits) for any dummy SVs shall contain alternating ones and zeros with valid parity. Users are cautioned against attempting to track a dummy SV since the results are unpredictable.

IS200-2107:

Section Number:
40.3.3.5.1.2.0-4
WAS:
For Block IIA SVs, three sets of almanac shall be used to span at least 60 days. The first and second sets will be transmitted for up to six days each; the third set is intended to be transmitted for the remainder of the 60 days minimum, but the actual duration of transmission will depend on the individual SV's capability to retain data in memory. All three sets are based on six-day curve fits that correspond to the first six days of the transmission interval.
Redlines:
For ~~Block~~GPS ~~IIA~~III and GPS IIIF SVs, ~~three~~a minimum of five sets of almanac shall be used to span at least 60 days.~~-~~ The first, second, and ~~second~~third sets will be transmitted for up to six days each; the ~~third~~fourth ~~set~~and ~~is~~subsequent ~~intended~~sets ~~to~~will be transmitted for~~ the remainder~~ ~~of~~up ~~the~~to ~~60~~32 days ~~minimum,~~each; ~~but~~with the ~~actual~~final ~~duration~~set ~~of~~transmitted ~~transmission~~for ~~will~~the ~~depend~~remainder ~~on~~of the ~~individual~~60 ~~SV's~~days ~~capability~~minimum. ~~to~~During ~~retain~~the ~~data~~first ~~in~~18 ~~memory.~~days after ~~All~~upload ~~three~~the sets are based on six~~-~~ day curve fits~~ that correspond~~. ~~to~~Subsequent ~~the~~sets ~~first~~are ~~six~~based ~~days~~on ~~of~~32 ~~the~~day ~~transmission~~curve ~~interval~~fits.
IS:
For GPS III and GPS IIIF SVs, a minimum of five sets of almanac shall be used to span at least 60 days. The first, second, and third sets will be transmitted for up to six days each; the fourth and subsequent sets will be transmitted for up to 32 days each; with the final set transmitted for the remainder of the 60 days minimum. During the first 18 days after upload the sets are based on six day curve fits. Subsequent sets are based on 32 day curve fits.

IS200-2, IS200-4, IS200-9, IS200-12, IS200-17, IS200-19, IS200-21, IS200-24, IS200-26, IS200-28, IS200-30, IS200-32, IS200-39, IS200-41, IS200-45, IS200-51, IS200-53, IS200-55, IS200-57, IS200-60, IS200-62, IS200-64, IS200-65, IS200-68, IS200-70, IS200-72, IS200-79, IS200-82, IS200-84, IS200-86, IS200-88, IS200-90, IS200-92, IS200-94, IS200-96, IS200-104, IS200-122, IS200-130, IS200-135, IS200-137, IS200-139, IS200-145, IS200-156, IS200-162, IS200-164, IS200-166, IS200-168, IS200-170, IS200-172, IS200-174, IS200-176, IS200-178, IS200-182, IS200-184, IS200-186, IS200-188, IS200-190, IS200-192, IS200-1512, IS200-1648, IS200-1514, IS200-195, IS200-199, IS200-1490, IS200-206, IS200-1456, IS200-203, IS200-209, IS200-214, IS200-217, IS200-219, IS200-230, IS200-236, IS200-242, IS200-244, IS200-246, IS200-266, IS200-268, IS200-269, IS200-272, IS200-276, IS200-278, IS200-296, IS200-298, IS200-302, IS200-308, IS200-310, IS200-313, IS200-315, IS200-317, IS200-321, IS200-325, IS200-328, IS200-330, IS200-332, IS200-334, IS200-336, IS200-339, IS200-342, IS200-345, IS200-347, IS200-349, IS200-351, IS200-359, IS200-362, IS200-364, IS200-369, IS200-371, IS200-372, IS200-374, IS200-376, IS200-378, IS200-381, IS200-383, IS200-386, IS200-392, IS200-398, IS200-406, IS200-409, IS200-411, IS200-414, IS200-419, IS200-421, IS200-427, IS200-429, IS200-432, IS200-437, IS200-440, IS200-446, IS200-448, IS200-453, IS200-455, IS200-457, IS200-459, IS200-461, IS200-469, IS200-478, IS200-480, IS200-482, IS200-496, IS200-498, IS200-499, IS200-504, IS200-508, IS200-509, IS200-512, IS200-514, IS200-531, IS200-532, IS200-536, IS200-538, IS200-542, IS200-547, IS200-549, IS200-557, IS200-558, IS200-561, IS200-563, IS200-565, IS200-567, IS200-570, IS200-577, IS200-578, IS200-580, IS200-583, IS200-585, IS200-587, IS200-1503, IS200-590, IS200-592, IS200-595, IS200-597, IS200-599, IS200-601, IS200-603, IS200-606, IS200-608, IS200-613, IS200-615, IS200-617, IS200-624, IS200-626, IS200-629, IS200-632, IS200-634, IS200-637, IS200-640, IS200-642, IS200-644, IS200-648, IS200-650, IS200-653, IS200-656, IS200-658, IS200-661, IS200-664, IS200-666, IS200-668, IS200-671, IS200-673, IS200-675, IS200-677, IS200-1384:

This change removes the trailing period from all of the above headings.

Section Number:
<many>

WAS:
<many>

Redlines:
<many>~~.~~
IS:
<many>

IS200-2108:

Section Number:
40.3.3.5.1.2.0-6
WAS:
For Block IIR/IIR-M, IIF, GPS III, and GPS IIIF SVs, multiple sets of almanac parameters shall be uploaded to span at least 60 days.
Redlines:
~~For Block IIR/IIR-M, IIF, GPS III, and GPS IIIF SVs, multiple sets of almanac parameters shall be uploaded to span at least 60 days.~~
IS:
<DELETED OBJECT>

 # CP Status = 'In Review': 106
CP Status = 'Applied': 203

of inserted requirements: 1
# of modified requirements: 36
# of deleted requirements: 7
# of TBDs: 0
# of TBRs: 0
of (added/modified) effectivities: 0
of VCRM additions: 0
# of VCRM modifications: 0
# of VCRM deletions: 0
# of descriptive texts: 35
of (added/modified) tables: 12
of (added/modified) figures: 3

Verification Cross Reference Matrix:
Only new requirement objects and objects containing VCRM attributes that are being added, modified or deleted in this IRN/SCN will be shown in the "Was" and "Is" fields in the VCRM.

WAS:

DOORS ID	Object Number	Effectivity	AEP Effectivity	CS Effectivity	SS Effectivity	Highest Verification Level	Segment	System Verification Method
IS200-2046	3.3.1.9.0-2	N/A		N/A	N/A	N/A	SV	N/A
IS200-2048	3.3.1.9.0-4	N/A		N/A	N/A	N/A	SV	N/A
IS200-201	6.3.2.0-2	N/A		N/A	N/A	N/A	SV	N/A
IS200-282	20.3.2.0-10	N/A		N/A	N/A	N/A	SV	N/A
IS200-380	20.3.3.4.4.0-6	N/A		N/A	N/A	N/A	SV	N/A
IS200-396	20.3.3.5.1.2.0-5	N/A		10	N/A	N/A	SV CS	N/A
IS200-2119	<INSERTED>	<INSERTED>	<INSERTED>	<INSERTED>	<INSERTED>	<INSERTED>	<INSERTED>	<INSERTED>
IS200-2108	40.3.3.5.1.2.0-6	N/A		10	N/A	N/A	CS	N/A

IS:

DOORS ID	Object Number	Effectivity	AEP Effectivity	CS Effectivity	SS Effectivity	Highest Verification Level	Segment	System Verification Method
IS200-2046	<DELETED>	<DELETED>	<DELETED>	<DELETED>	<DELETED>	<DELETED>	<DELETED>	<DELETED>
IS200-2048	<DELETED>	<DELETED>	<DELETED>	<DELETED>	<DELETED>	<DELETED>	<DELETED>	<DELETED>
IS200-201	<DELETED>	<DELETED>	<DELETED>	<DELETED>	<DELETED>	<DELETED>	<DELETED>	<DELETED>
IS200-282	<DELETED>	<DELETED>	<DELETED>	<DELETED>	<DELETED>	<DELETED>	<DELETED>	<DELETED>
IS200-380	<DELETED>	<DELETED>	<DELETED>	<DELETED>	<DELETED>	<DELETED>	<DELETED>	<DELETED>
IS200-396	<DELETED>	<DELETED>	<DELETED>	<DELETED>	<DELETED>	<DELETED>	<DELETED>	<DELETED>
IS200-2119	30.3.3.4.5.0-2			N/A	N/A	N/A		N/A
IS200-2108	<DELETED>	<DELETED>	<DELETED>	<DELETED>	<DELETED>	<DELETED>	<DELETED>	<DELETED>