RFC 467: Proposed Changes to the Public Documents

Reflects the resultant decisions from the Public-ICWG September 29, 2021

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Problem Statement:
1. Reserved/spare bits in the CNAV 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.
Impacted Documents:
IS-GPS-200, IS-GPS-705, IS-GPS-800

Stakeholder Review (CRM) Status

16) CRM – COMBINED STAKEHOLDER/DIRECTORATE REVIEW STATUS:					
Disposition/Type	**Critical**	**Substantial**	**Administrative**	**Totals**	
Accept	**1**	**36**	**40**	**77**	
Accept with Comment	**3**	**12**	**5**	**20**	
Defer	**1**	**18**	**0**	**19**	
Reject	**0**	**2**	**0**	**2**	
Grand Totals:	**5**	**68**	**45**	**118**	

16) CRM – COMBINED STAKEHOLDER/DIRECTORATE REVIEW STATUS:					
Disposition/Type	**Critical**	**Substantial**	**Administrative**	**Totals**	
Accept	**1**	**36**	**40**	**77**	Rejects
Accept with Comment	**3**	**12**	**5**	**20**	
Defer	**1**	**18**	**0**	**19**	
Reject	**0**	**2**	**0**	**2**	
Grand Totals:	**5**	**68**	**45**	**118**	

CRM-241

DOORS ID	IS705-1736		
Paragraph	20.3.4.4	**Comment Number**	241
Comment Type	Substantive	**Disposition**	~~Accept~~Reject
Comment Originator(s)	Jeff Stevens (MITRE)		
Comment	Recommend changing the constraint on curve fit start times to be a 15-minute boundary, which is consistent with the CS and SV implementation, and may provide more helpful information to users that wish to identify the start and end times of the currently active curve fit interval. In the first sentence, recommend using wording consistent with IS200-2121. (13) RATIONALE FOR CHANGE: Consistency with CS/SV implementation		
Government Response	Decided at the Public ICWG that propagation time granularity should be 300 seconds across the board. (See next slide for proposed changes)		

CRM-241

Paragraph	IS705-1736, 20.3.4.4
Redlines	The start time of the curve fit interval of the first CEI data set of a new CEI data sequence propagation may ~~have a~~ be later than the start time ~~than~~ 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.

Original suggestion of 900 seconds has been removed

CRM-243

DOORS ID	IS800-1172		
Paragraph	3.5.5.2	**Comment Number**	243
Comment Type	Substantive	**Disposition**	~~Accept~~Reject
Comment Originator(s)	Jeff Stevens (MITRE)		
Comment	Recommend changing the constraint on curve fit start times to be a 15-minute boundary, which is consistent with the CS and SV implementation, and may provide more helpful information to users that wish to identify the start and end times of the currently active curve fit interval. (13) RATIONALE FOR CHANGE: Consistency with CS/SV implementation		
Government Response	At Public ICWG, decided that the curve fit interval time granularity should remain 300 seconds (AKA 5 minutes) (See next slide for proposed changes)		

CRM-243

Paragraph	IS800-1172, 3.5.5.2
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 data set of a new CEI data sequence propagation will be a multiple of ~~300~~ 900 seconds (~~5~~ 15 minutes) relative to the start of week

Reject

16) CRM – COMBINED STAKEHOLDER/DIRECTORATE REVIEW STATUS:					
Disposition/Type	**Critical**	**Substantial**	**Administrative**	**Totals**	
Accept	**1**	**36**	**40**	**77**	Defers
Accept with Comment	**3**	**12**	**5**	**20**	
Defer	**1**	**18**	**0**	**19**	
Reject	**0**	**2**	**0**	**2**	
Grand Totals:	**5**	**68**	**45**	**118**	

CRM-267

DOORS ID	IS200-196, 6.3.1		
Paragraph	6.3.1 Received Signals	**Comment Number**	267
Comment Type	Substantive	**Disposition**	Defer
Comment Originator(s)	Rhonda Slattery (Aerospace)		
Comment	We should add a maximum power for GPS III/IIIF even if we don't have a separate figure example. This was discussed in an earlier RFC for 705 and 800, but seems to have been missed in 200.		
Government Response	More coordination work is needed with stakeholders Should be resolvable within the next year		

CRM-267

Paragraph	6.3.1 Received Signals
Paragraph of Interest	**6.3.1 Received Signals** 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.

CRM-257/276/309

DOORS ID	IS800-1175		
Paragraph	New Table General – About Maximum Broadcast Interval	**Comment Number**	257 276 309
Comment Type	Substantive	**Disposition**	Defer
Comment Originator(s)	Bert Hayden (SE&I) Rhonda Slattery (Aerospace) Jeff Crum (LMCO)		
Comment	257: The table as construed is misleading. Revise table … (13) RATIONALE FOR CHANGE: Improve the clarity of the table. 276: We should add additional information about the conditions for the various messages, and add caveats where appropriate 309: Unless I've done my math incorrectly, I believe the consequence of this table is that you cannot broadcast CNAV-2 SF3PG5. Is that the planned CONOPS for CNAV-2 message broadcast? I believe that the required number of slots within the one-hour, 200-slot CNAV-2 BPE is as follows: PG1 entries required = 25 (1 msg every 144 sec) PG2 entries required = 25 (1 msg every 144 sec) PG3 entries required = 36 (6 msgs every 600 sec, assuming 32 SV constellation) PG4 entries required = 32 (32 msgs every 3600 sec, assuming 32 SV constellation) PG5 entries required = 128 (32 msgs every 900 sec, assuming 32 SV constellation) PG6 entries required = (optional)		
Government Response	Needs more consultation with stakeholders (See **CNAV/CNAV2 Message Schedule and Broadcast Interval Working Group** Discussion)		

CRM-255/256/304

DOORS ID	IS200-670		
Paragraph	IS200-670 Table 30-XII IS705-371 Table 20-XII	**Comment Number**	255 256 304
Comment Type	Substantive	**Disposition**	Defer
Comment Originator(s)	Bert Hayden (SE&I) Jeff Crum (LMCO)		
Comment	255/256 The table as construed is misleading. Revise table …. Improve the clarity of the table. 304 Update table to IS200-670, specifically the asterisk annotation on the maximum broadcast interval for the Midi Almanac MT37. The 60 minutes should have both the 2-asterisk and 4-asterisk annotation, just like the Reduced Almanac in the row above.		
Government Response	Will be worked with the other similar issues		

CRM-283

DOORS ID	IS705-1632, IS200-1788		
Paragraph	IS-GPS-705, 20.3.3.10.1.8 Constellation Fault Probability	**Comment Number**	283
Comment Type	Substantive	**Disposition**	Defer
Comment Originator(s)	Denis Bouvet (Thales)		
Comment	The fault probability and the fault rate are linked through the Mean Fault Duration. It could be more convenient to replace the constellation fault probability by a constellation fault rate, as an update of the MFD will cause an update of the Pconst if the Rconst is not modified. Current Rconst derived from SPS PS commitments would be 10-8/hr. If the Rconst remains constant in the future, but MFD is reduced, the resulting Pconst = Rconst * MFD to be broadcast in the ISM may not be encodable with the given format. For instance: if new MFD equals 0.5 hour, the Pconst should be equal to 5*10-9, and this value is not encodable in the ISM. There is no issue if the ISM broadcast Rsat, Rconst and MFD instead of Rsat, Pconst and MFD. If the analysis is confirmed, consider updating the ISM content, and replace the Pconst by Rconst, and change the units of the defined values (per hour).		
Government Response	More coordination work is needed with stakeholders (See **CNAV/CNAV-2 ISM Parameter** Discussion)		

CRM-283

Paragraph	IS200-1788 20.3.3.10.1.8 and IS705-1632 20.3.3.10.1.8
Paragraphs of Interest	IS-GPS-200 **30.3.3.10.1.8 Constellation Fault Probability** Bits 78 through 81 of Message Type 40 shall provide the assumed Constellation Fault Probability (P_{const}) value for ARAIM at the current time for the associated GNSS constellation. IS-GPS-705 **20.3.3.10.1.8 Constellation Fault Probability** Bits 78 through 81 of Message Type 40 shall provide the assumed Constellation Fault Probability (P_{const}) value for ARAIM at the current time for the associated GNSS constellation.

CRM-272

DOORS ID	IS800-1040, IS705-1618, IS800-1040		
Paragraph	IS200-1770 30.3.3.10.1 ISM Parameter Content IS705-1618 20.3.3.10.1 ISM Parameter Content IS800-1040 3.5.4.7.1 ISM Parameter Content	**Comment Number**	272
Comment Type	Substantive	**Disposition**	Defer
Comment Originator(s)	Rhonda Slattery (Aerospace)		
Comment	We should change Pconst to Rconst and add MFDconst for more detailed information		
Government Response	More coordination work is needed with stakeholders Should be resolvable within the next year		

CRM-281/313

DOORS ID			
Paragraph	IS-GPS-200M, 20.3.3.5.1.1	**Comment Number**	281 313
Comment Type	Substantive/Critical	**Disposition**	Defer
Comment Originator(s)	Denis Bouvet (Thales) Yi Ding (CMC Electronics)		
Comment	281 Following the PICWG 2015 meeting, and regarding a comment raised on Data ID interpretation, the minutes mention the following resolution: "The Government team will investigate the possibly of adding additional clarifications to IS-GPS-200 to address this [Backward compatibility] concern. While the Government still maintains the right to employ a Data ID different that “01”, the group confirmed that users of the data structure corresponding to currently defined Data ID values will still be fully functional/compatible.“ 313 We do not agree with the last sentence. Some certified and fielded receivers do check the Data ID coding to process the GPS LNAV data. Employing a Data ID different from "01" will create backward compatibility issue.		
Government Response	The government will propose amendments to 20.3.3.5.1.1 and 40.3.3.5.1.1 to be reviewed at the 2022 Public ICWG that will specify the future use of the other Data IDs in LNAV transmissions. This proposal will preserve backward compatibility with all legacy receivers, whether or not they check the Data ID value. (See next slide for sections of note)		

Paragraph	IS-GPS-200, 20.3.3.5.1.1 and 40.3.3.5.1.1
Paragraph of Interest	**20.3.3.5.1.1 Data ID and SV ID** The two MSBs of word three in each page shall contain data ID. Data ID number two (denoted by binary code 01) denotes the LNAV data structure of D(t) which is described in this Appendix and is the only valid value. … **40.3.3.5.1.1 Data ID and SV ID** The two MSBs of word three in each page shall contain the data ID. Data ID number two (denoted by binary code 01) denotes the LNAV data structure of D(t) which is described in this Appendix and is the only valid value.

CRM-204/266

DOORS ID	IS200-1639		
Paragraph	Table 6-I-1. CEI Data Set Parameters	**Comment Number**	204 266
Comment Type	Substantive	**Disposition**	~~Accept~~Defer
Comment Originator(s)	Jeff Stevens (MITRE) Rhonda Slattery (Aerospace)		
Comment	JS: The inter-signal correction parameters do not meet the definition of “core CEI” because they are not needed for an initial position solution, and they are not broadcast to users with the shortest broadcast interval. They should have a "NOTE1" to indicate that they are not considered "core CEI". RS: This is only showing part of the table. Shouldn't we be adding NOTE 1 to the ISCs also?		
Government Response	Deferred at Public ICWG to study what is “core CEI” more thoroughly This deferral applies to CRM #204, 238, 244, 266 and 303 (See next slide for proposed changes)		

Paragraph

Redlines

Table 6-I-1. CEI Data Set Parameters

Symbol	Parameter Name	Sub[illegible]me	Message
SV Health	SV Health (6 bits)	1	N/A
. . .	. . .		. . .
$\dot{\Omega}$	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 C[illegible] Plan[illegible] Weekly Epoch	3	11
. . .		. . .	. . .
URA_{ED}	Elevation Depend[illegible] Use[illegible]ge [illegible]ccuracy	N/A	10
$ISC_{L1C/A}$	Inter-signal Corre[illegible] NOTE1	N/A	30
ISC_{L2C}	Inter-signal [illegible]on-[illegible] NOTE1	N/A	30
ISC_{L5I5}	[illegible]rna[illegible]rre[illegible]on NOTE1	N/A	30
ISC_{L5Q5}	[illegible]nter-[illegible]l Correction NOTE1	N/A	30
. . .	. . .	. . .	. . .
Alert	A[illegible] 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.

Deferred

CRM-238/303

DOORS ID	IS705		
Paragraph	Table 6-I-1. CEI Data Set Parameters	**Comment Number**	238 303
Comment Type	Substantive	**Disposition**	~~Accept~~Defer
Comment Originator(s)	Jeff Stevens (MITRE) Jeff Crum (LMCO)		
Comment	238 The inter-signal correction parameters do not meet the definition of “core CEI” because they are not needed for an initial position solution, and they are not broadcast to users with the shortest broadcast interval. They should have a "NOTE1" to indicate that they are not considered "core CEI". 303 Object is missing from PCN but needs to be included. Update table to match the same RFC-467 change applied to IS200-1639		
Government Response	Deferred at Public ICWG to study what is “core CEI” more thoroughly (See next slide for proposed changes)		

CRM-238/303

Paragraph	Table 6-I-1 CEI Data Set Parameters
Redlines	

Symbol	Parameter Name	Message
	. . .	
$\Delta\dot{\Omega}$	Delta Rate of Right Ascension	11
	. . .	
$i_{0\text{-}n}$-DOT	Rate of Inclination Angle	11
$ISC_{L1C/A}$	Inter-signal Correction NOTE1	30
ISC_{L2C}	Inter-signal Correction NOTE1	30
ISC_{L5I5}	Inter-signal Correction NOTE1	30
ISC_{L5Q5}	Inter-signal Correction NOTE1	30
	. . .	

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}. Any parameter marked with NOTE1 may be changed with or without a change in t_{oe}/t_{oc}.

Deferred

CRM-244

DOORS ID	IS800-917		
Paragraph	Table 6.2-18	**Comment Number**	244
Comment Type	Substantive	**Disposition**	~~Accept~~Defer
Comment Originator(s)	Jeff Stevens (MITRE)		
Comment	The inter-signal correction parameters do not meet the definition of “core CEI” because they are not needed for an initial position solution, and they are not all broadcast to users with the shortest broadcast interval. They should have a "NOTE1" to indicate that they are not considered "core CEI". *See Table 6.2-18.* *Add a superscripted “NOTE1” in the second column after the names of the following parameters: ISC_{L1CP}, ISC_{L1CD}, ISC_{L1CA}, ISC_{L2C}, ISC_{L5I5}, ISC_{L5Q5}* (13) RATIONALE FOR CHANGE: Consistency with "core CEI" definition		
Government Response	Deferred at Public ICWG to study what is “core CEI” more thoroughly (See next slide for proposed changes)		

CRM-244

Paragraph	IS800-917, Table 6.2-18
Redlines	

Symbol	Parameter Name	me
…		
i_0	Inclination Angle at Reference Time	2
$i_{0\text{-}n}$-DOT	Rate of Inclination Angle	2
ISC_{L1CP}	Inter-signal Correction NOTE1	2
ISC_{L1CD}	Inter-signal Correction NOTE1	2
ISC_{L1CA}	Inter-signal Correction NOTE1	3
ISC_{L2C}	Inter-signal Correcti	3
ISC_{L5I5}	Inter-signa rrect NOTE1	3
ISC_{L5Q5}	Inter-signa ecti	3
ISF	Integri Statu NOTE1	2
…		

N ara s so dicated are for CEI Refinement – not limited to curve fit.
rame ot i ed are needed for/limited to curve fit.
lates t rameters in table shall prompt changes in t_{oe}. Any parameter marked
v may be changed with or without a change in t_{oe}.

Deferred

CRM-242

DOORS ID	IS800-140, IS800-1174		
Paragraph	Multiple	**Comment Number**	242
Comment Type	Substantive	**Disposition**	~~Accept~~Defer
Comment Originator(s)	Jeff Stevens (MITRE)		
Comment	Table 3.5-9 is already in use in IS-GPS-800; see IRN-IS-800G-002 from RFC-413. Assign a new table number to Table 3.5-9 Maximum Repetition Rates and Maximum Broadcast Periods. (13) RATIONALE FOR CHANGE: Consistency		
Government Response	~~Will convert to Table 3.5-2a~~ Per the Public ICWG, determined this is part of the same issue as **CNAV/CNAV2 Message Schedule and Broadcast Interval** and needs to be deferred • IS800-140 is adjusted to remove the reference to Table 3.5-2a • IS800-1174 and IS100-1175 are rejected to not add the table (See next slide for proposed changes)		

CRM-242

Paragraph	IS800-140, IS800-1174, Multiple paragraphs
Redlines	Subframe 3 provides other navigation data which is commutated over multiple pages. Each page of subframe 3 provides different data as shown in Figures 3.5-2 through 3.5-~~8a~~8a.~~-~~ Additional subframe 3 pa[illegible] may be defined in the future.~~-~~ It shall be noted that the broadcast sequence of subframe 3 pages is variable~~ and,~~. ~~as~~The ~~su[illegible]~~ ~~mum users~~repetition ~~must~~rates ~~not~~and ~~expect~~broadcast ~~a~~periods ~~fixed~~are ~~pattern~~given ~~of~~in page~~Table sequenc~~ ~~in~~ paragraph 3.5.4.~~-~~ Subframe 3 provides an 8-bit PRN number of the transmitting SV with a range of 0 (00000000) t[illegible] (11111111).

Green Indicates Recent Change

Table 3.5-~~9~~2a Maximum Repetition Rates a[illegible] M[illegible]mum Broadcast Intervals ~~Periods~~.

Page Data	Page N[illegible]er	Maximum Broadcast Intervals †
UTC, IONO and ISC	1	144 sec
GGTO and EOP	2	144 sec ***
Reduced Almanac	3	10 min *,***
Midi Almanac	4	60 min *
Differential Correcti[illegible]	5	15 min **,***
Tex[illegible]age	6	As Needed
S[illegible]n	7	12.5 min
Integ[illegible]uppor[illegible]ssage	8	144 sec

* Complete se[illegible] in the constellation.
** When Differential Corrections are available.
*** Optional (interval applies if/when broadcast).
† The intervals specified are maximum. As such, the broadcast intervals may be shorter than the specified value.

Deferred

CRM-275

DOORS ID	IS800-1174, IS800-1175		
Paragraph		**Comment Number**	275
Comment Type	Substantive	**Disposition**	~~Accept~~Defer
Comment Originator(s)	Rhonda Slattery (Aerospace)		
Comment	I think this is in 3.5.5. To be parallel to 200 and 705, it should be after 3.5.5.1 and referenced in there.		
Government Response	Per the Public ICWG, determined this is part of the same issue as **CNAV/CNAV2 Message Schedule and Broadcast Interval** and needs to be deferred • IS800-1174 and IS100-1175 are rejected to not add the table Will keep a note that when this table is eventually implemented it should go into the document ~~Moved to location~~ after IS800-288. (See next slide for proposed changes)		

CRM-275

Paragraph	IS800-287, ID800-288, IS800-1174, IS800-1175
Redlines	

3.5.5.1 Paging and Cutovers

Broadcast sequence of subframe 3 pages is completely arbitrary and, as such, users must not expect a fixed pattern of page sequence.

Deferred

Table 3.5-2a. Maximum Repetition and Maximum Broadcast Intervals

Page Data	Page Number	Repetition Interval †	Maximum Broadcast Interval
UTC, IONO and ISC	1	144 sec	Not Applicable
GGTO and EOP	2	144 sec ***	Not Applicable
Reduced Almanac	3	Not Applicable	10 min ***
Midi Almanac	4	Not Applicable	60 min ***
Differential Corrections	5	Not Applicable	15 min **,***
Text Message	6	As Needed	Variable
Reserved	7	12 min	Not Applicable
Integrity Support Message	8	144 sec	Variable

* Complete set of SVs in the constellation
** When Differential Corrections are available
*** Optional (interval applies if/when broadcast)
† The intervals specified are maximum. As such, the broadcast intervals may be shorter than the specified value.

CRM-308

DOORS ID	IS800-1174		
Paragraph	IS800 Section 3.5.4.0-3	**Comment Number**	308
Comment Type	Substantive	**Disposition**	~~Accept~~Defer
Comment Originator(s)	Jeff Crum		
Comment	Modify Table Caption/Title to be consistent with similar tables from IS200 and IS705.		
Government Response	Per the Public ICWG, determined the table for this caption will be resolved as part of the same issue as **CNAV/CNAV2 Message Schedule and Broadcast Interval** and needs to be deferred • Once the main issue is solved, this Table Caption issue can be resolved • For now, IS800-1174 and IS100-1175 are rejected to not add the table (See next slide for proposed changes)		

Paragraph	IS800 Section 3.5.4.0-3
Redlines	Table 3.5-2a. Maximum Repetition Rates and Maximum Broadcast Inter *Object Type*: Table Caption

Deferred

16) CRM – COMBINED STAKEHOLDER/DIRECTORATE REVIEW STATUS:					
Disposition/Type	**Critical**	**Substantial**	**Administrative**	**Totals**	
Accept	**1**	**36**	**40**	**77**	Critical Accept and Accept with Comments
Accept with Comment	**3**	**12**	**5**	**20**	
Defer	**1**	**18**	**0**	**19**	
Reject	**0**	**2**	**0**	**2**	
Grand Totals:	**5**	**68**	**45**	**118**	

CRM-278, 279, 312

DOORS ID	IS200-1760, IS200-281		
Paragraph	IS-GPS-200, 6.4.6.2.2 Specific Alarm Indications	**Comment Number**	278 279 312
Comment Type	Critical	**Disposition**	Accept with Comments
Comment Originator(s)	John Foley (Garmin) Denis Bouvet (Thales) Yi Ding (CMC Electronics)		
Comment	278… This proposed change is not backwards-compatible with some equipment designed in accordance with earlier versions of IS-GPS-200. … 279 … The proposed change on the alarm condition related to the 5 parity checks will have an impact on airborne receivers that currently consider the satellite as 'GPS UNHEALTHY' as soon as 5 parity failures are detected, regardless of the processed LNAV subframe. Consider removing the proposed update 312 The intent of the proposed change is for the airborne receiver to NOT consider default navigation data in subframe 4 or 5 as a failure condition. However, the actual wording in item (a) does not distinguish the parity errors due to Default Navigation Data (DND) or due to random erroneous bits. …		

CRM-278, 279, 312 (cont)

Government Response	Original change is removed, but clarification for (a) is now in a new Note 5 which should satisfy the commenter's objections (see next two slides for proposed changes)

CRM -278, 279, 312 Proposed Change

Paragraph	IS-GPS-200, 6.4.6.2.2

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 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 (toe) is not current (i.e. not within the current curve-fit) or does not match the broadcast time of clock (toc) (excluding normal data set cutovers, see paragraphs 30.3.3.1.1 and 30.3.4.4).
(c) The broadcast top 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~~300~~.*

CRM -278, 279, 312 Proposed Change (cont)

Paragraph	IS-GPS-200, IS200-281 , 20.3.2 Message Structure
Redlines	(9th Paragraph) ~~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~~All 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 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 ~~word 10~~ 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~~, (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.

Green text reflects recent changes

CRM-284, 286

DOORS ID	IS200-462		
Paragraph	IS-GPS_200, 20.3.4.4.0-1	**Comment Number**	284 286
Comment Type	284 Substantive 286 Critical	**Disposition**	284 Accept 286 Accept ~~with Comments~~
Comment Originator(s)	Jed Dennis (FAA) Mikael Mabilleau (Europa)		
Comment	284 Dual-Frequency SBAS will use IODC. Can there be a constraint on IODC similar to IODE, since IODC inherently includes IODE? … Statement about IODC based on inherent behavior of IODE 286 … 1) Consider to modify the 7 days requirement for the IODC uniqueness by another time window requirement… 2) Bring a paper presenting the change of the IODC uniqueness requirement to the ICAO NSP		
Government Response	• This change is not required since the IODE is a modulo representation of the IODC; however, it is correct and the added parenthetical phrase may help some readers • The presentation to ICAO NSP will be handled by a mechanism outside the Public ICWG and RFC processes		

CRM-284

Paragraph	IS200-462, 20.3.4.4.0-1
Redlines	The transmitted IODE (and therefore also the transmitted IODC) will be different from any value transmitted by the SV during the preceding six hours.

16) CRM – COMBINED STAKEHOLDER/DIRECTORATE REVIEW STATUS:					
Disposition/Type	**Critical**	**Substantial**	**Administrative**	**Totals**	
Accept	**1**	**36**	**40**	**77**	
Accept with Comment	**3**	**12**	**5**	**20**	
Defer	**1**	**18**	**0**	**19**	
Reject	**0**	**2**	**0**	**2**	
Grand Totals:	**5**	**68**	**45**	**118**	

Substantial Accept with Comments

CRM-200, 249, 263, 291

DOORS ID	IS200-173		
Paragraph	6.2.2.2.2 Block IIA SVs.	**Comment Number**	200 249 263 291
Comment Type	Substantive/Administrative	**Disposition**	Accept
Comment Originator(s)	Jeff Stevens (MITRE) Anne Kastenholz (Boeing) Rhonda Slattery (Aerospace) Jeff Crum (LMCO)		
Comment	• For consistency within section 6.2.2, remove the developer name for the Block IIA SVs. • Similar to the edit in IS200-171, remove the string "developed by Rockwell International". • Delete Rockwell here too (Or undelete it in 171) • If you are removing the developing contractor from other related objects, you should remove Rockwell International from this object, too.		
Government Response	All Block II and IIA SVs have been decommissioned, so requirements about them have been removed from this document or rewritten to indicate they are decommissioned. (see next slide for proposed change)		

Paragraph	IS200-170, IS200-171, IS200-172, IS200-173
Redlines	**6.2.2.2.1 Block II SVs (Decommissioned)** 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. **6.2.2.2.2 Block IIA SVs (Decommissioned)** 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.

CRM-237/274/301/302

DOORS ID	IS705-1494, IS705-1495		
Paragraph	6.2.2.2.2 Block IIA SVs	**Comment Number**	237 274 301 302
Comment Type	Substantive	**Disposition**	Accept with Comments
Comment Originator(s)	Jeff Stevens (MITRE) Rhonda Slattery (Aerospace) Jeff Crum (LMCO)		
Comment	237 For consistency with the deletion of Block II, the section for Block IIA SVs needs to be deleted. 274 Since these were left in 200, why not continue to reference to them? If you delete them here, you should delete them there too. 301 Object is missing from PCN but needs to be included. (Would change to) 6.2.2.2.2 RESERVED 302 Object is missing from PCN but needs to be included. (Would delete text under 6.2.2.2.2)		
Government Response	Keeping the paragraphs describing the SV blocks as decommissioned and refer to IS-GPS-200 to maintain consistency. (see next slide for proposed change)		

Paragraph	IS705-1494, IS705-1495, IS705-120, IS705-121
Redlines	**6.2.2.2.1 Block II SVs (Decommissioned)** See paragraph 6.2.2.2.1 of IS-GPS-200. These satellites do not broadcast the L5 signal. **6.2.2.2.2 Block IIA SVs (Decommissioned)** See paragraph 6.2.2.2.2 of IS-GPS-200. These satellites do not broadcast the L5 signal.

CRM-213/285

DOORS ID	IS200-468		
Paragraph	Table 20-XII. IODC Values and Data Set Lengths (Block IIR/IIR-M/IIF & GPS III/ IIIF)	**Comment Number**	213 285
Comment Type	Substantive	**Disposition**	213 Accept 285 Accept with Comments
Comment Originator(s)	Jeff Stevens (MITRE) Jed Dennis (FAA)		
Comment	213 The proposed wording change is missing the cutover time constraint for transition between succeeding 24-hour CEI data sets. The final sentence should be deleted, consistent with the statement in the Rationale that there are no longer any CEI data sets transmitted for greater than 24 hours. 285 What is the User Segment supposed to do with the information about the reserved IODC in Note 6? Should User Segment not use this satellite if these values are broadcast? Maybe better to delete if there is no action for the User Segment.		
Government Response	(See next slide for proposed change)		

Paragraph

Redlines

Table 20-XII. IODC Values and Data Set Lengths (Block IIR/IIR-M/IIF & GPS III/ IIIF)

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 0-139, 256-495, 512-751 or 768-1007 ~~0 to 1023 excluding those values of IODC (240-255, 496-511, 752-767 and 1008-1023)~~ that correspond to IODE values in the range 0-239~~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.

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

Green text reflects changes as a result of Public ICWG

CRM-219

DOORS ID	IS200-540		
Paragraph	30.3.3.1.1.2 Signal Health (L1/L2/L5).	**Comment Number**	219
Comment Type	Substantive	**Disposition**	Accept with Comments
Comment Originator(s)	Jeff Stevens (MITRE)		
Comment	The health bits in MT10 only convey information for the transmitting SV, so the addition of the phrase "or other SVs in the constellation" does not appear to be relevant here. Should this change have been applied instead to the MT37 / reduced almanac signal health description in section 30.3.3.4.4?		
Government Response	(See next slide for proposed change)		

Paragraph	IS200-598 30.3.3.4.4 Signal Health (L1/L2/L5).
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.

Paragraph	IS200-540 30.3.3.1.1.2 Signal Health (L1/L2/L5).
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.

CRM-222/280/306

DOORS ID	IS-464, IS200-1972, IS705-1675,IS800-1159		
Paragraph	IS200-1972, 30.3.4.4 Data Sets IS705-1675, 20.3.4.4 Data Sets	**Comment Number**	222 280 306
Comment Type	Substantive	**Disposition**	Accept/Accept with Comments
Comment Originator(s)	Jeff Stevens (MITRE) Denis Bouvet (Thales) Jeff Crum (LMCO)		
Comment	222 Recommend changing the constraint on curve fit start times to be a 15-minute boundary, which is consistent with the CS and SV implementation, and may provide more helpful information to users that wish to identify the start and end times of the currently active curve fit interval. In the previous sentence, recommend using wording consistent with IS200-2121 280 Is the following statement correct for all the CEI data set? In particular for the first CEI data set of a new CEI data sequence? "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." If the answer is no, consider changing the sentence as follows: Except for the first CEI data set of a new CEI data sequence propagation, the start of the transmission interval for a CEI data set corresponds to the beginning of the curve fit interval for this CEI data set. 306 This text is inconsistent with the equivalent text at the beginning of IS200-1972. Recommend making them consistent.		
Government Response	(See next slides for proposed changes across three documents)		

CRM-280

Paragraph	IS200-464, 20.3.4.4 Data Sets
Redlines	Green Indicates Recent Change due to CRM #280 (4th Paragraph) 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.

CRM-280

Paragraph	IS200-1972, 30.3.4.4 Data Sets
Redlines	Green Indicates Recent Change due to CRM #280 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. 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 900 seconds (15 minutes) relative to the start of week.

CRM-280

Paragraph	IS705-1675, 20.3.4.4 Data Sets
Redlines	Green Indicates Recent Change due to CRM #280 (5th Paragraph) 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.

CRM-280

Paragraph	IS800-1159, 3.5.5.2 Data Sets
Redlines	Green Indicates Recent Change due to CRM #280 (3rd Paragraph) 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.

CRM-228/297

DOORS ID	IS200-1438		
Paragraph	Figure 40-1 (sheet 10 of 11)	**Comment Number**	228 297
Comment Type	Substantive	**Disposition**	228 Accept 297 Accept with Comments
Comment Originator(s)	Jeff Stevens (MITRE) Jeff Crum (LMCO)		
Comment	228 The proposed change appears to be replacing the format diagram for SF4:P13 with a duplicate of the format diagram for SF4:P14/15/17. This is incorrect; please see the next two CRM entries for the correct changes to Figure 40-1. 297 Unclear what the PCN change is doing. Please explain. Improve PCN description of what is actually changing. The WAS, REDLINES, and IS don't seem to clearly depict what is changing.		
Government Response	The change is an error and is being rescinded		

CRM-265

DOORS ID	IS200-1405		
Paragraph		**Comment Number**	265
Comment Type	Substantive	**Disposition**	Accept with Comments
Comment Originator(s)	Rhonda Slattery (Aerospace)		
Comment	Should we split the SV IDs into III and IIIF, like II and IIA in 171/173. Or maybe split IIIF into it's own paragraph or combine 171 and 173 for consistency.		
Government Response	Agree to split the description of GPS III and GPS IIIF SVs. (See next page for details)		

CRM-265

Paragraph	IS200-1405
Redlines IS200-1405	**6.2.2.2.6 GPS III SVs** 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. ~~The subset of operational replenishment SVs which are the "Follow-On" configuration of "GPS III" SVs are termed "GPS IIIF".~~
IS200-2124 IS200-2125	**6.2.2.2.7 Block IIIF SVs** 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.

CRM-300/234

DOORS ID	IS200-2120 and IS200-2108		
Paragraph	IS200 Section 40.3.3.5.1.2.0-5 and 40.3.3.5.1.2.0-6 40.3.3.5.1.2 Almanac Data	**Comment Number**	300 234
Comment Type	Substantive	**Disposition**	300: Accept with Comments 234: Accept
Comment Originator(s)	300: Jeff Crum (LMCO) 234: Jeff Stevens (MITRE)		
Comment	300: With the addition of IS200-2120 (that has more details), does it make sense to have IS200-2108 remain in the document? Should IS200-2120 refer to IIR-M and IIF SVs in addition to the GPS III and IIIF SVs? 234: The final paragraph that refers to Block IIR/IIR-M/IIF and GPS III/IIIF should be deleted. Correct information for GPS III/IIIF is now in the newly added paragraph IS200-2120, and LNAV-U does not apply to Block IIR/IIR-M/IIF.		
Government Response	While IS200-2120 should be kept as is, other adjustments have been made. (See next slide for current proposal)		

CRM-300/234

Paragraph	IS200 Section 40.3.3.5.1.2.0-5 and 40.3.3.5.1.2.0-6
As Of May 21 IS200-2107 IS200-2120 IS200-2108	~~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.~~ 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. 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 IS200-2107 ~~IS200-2120~~ ~~IS200-2108~~	~~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.~~ 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. ~~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.~~

Green Indicates Recent Change

CRM-264

DOORS ID	IS200-175, IS200-207		
Paragraph	6.2.2.2.3 Block IIR SVs 6.3.3.1 Extended Navigation Mode (Block IIR/IIR-M)	**Comment Number**	264
Comment Type	Substantive	**Disposition**	Accept with Comment
Comment Originator(s)	Rhonda Slattery (Aerospace)		
Comment	After 14 days they will broadcast incorrect data? I think this is not true. The accuracy will degrade, but the data is required to be "correct". Can we come up with a better phrase or just delete this sentence?		
Government Response	Removed the statements about “Contractual requirements…”. An Interface Specification should generally restrict itself to engineering intent. At Public ICWG determined the phrase about “IIA mode” should be deleted because Block IIA has been decommissioned and other SVs should no longer use terms like IIA mode. (See next slide for proposed changes)		

CRM-264

Paragraph	IS200-175, IS200-207
Redlines	**6.2.2.2.3 Block IIR SV** 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.)~~ **6.3.3.1 Extended Navigation Mode (Block IIR/IIR-M)** 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.

Green Indicates Recent Public ICWG Change

16) CRM – COMBINED STAKEHOLDER/DIRECTORATE REVIEW STATUS:					
Disposition/Type	**Critical**	**Substantial**	**Administrative**	**Totals**	
Accept	**1**	**36**	**40**	**77**	Substantial Accepts
Accept with Comment	**3**	**12**	**5**	**20**	
Defer	**1**	**18**	**0**	**19**	
Reject	**0**	**2**	**0**	**2**	
Grand Totals:	**5**	**68**	**45**	**118**	

CRM-196/261/288/289

DOORS ID	IS200-2046:IS200-2049		
Paragraph	3.3.1.9 Signal Polarization.	**Comment Number**	196 261 288 289
Comment Type	Substantive	**Disposition**	Accept
Comment Originator(s)	Jeff Stevens (MITRE) Rhonda Slattery (Aerospace) Jeff Crum (LMCO) Jeff Crum (LMCO)		
Comment	196 The changes to the Signal Polarization section 3.3.1.9 appear to be introducing duplicated wording, for example "The transmitted signal shall be right-hand circularly polarized (RHCP)" is shown as being added in IS200-2047 and IS200-2049 when it already exists as the first paragraph in this section. 261 The first sentence added in 2047 already existed in 3.3.1.9 and wasn't deleted in 2046. It appears it's now in the paragraph twice? In 200L this is all one paragraph, so it's unclear how you are changing it in four objects. If it was broken up somewhere, that should show in the PCN 288/289 Object unnecessarily combines IS200-93 and IS200-2049 with IS200-2047. …		
Government Response	Agree. The three requirements in -2047 will be distributed across -93, -2047 and -2049 with wording for L2 matching the wording for L1. (See next slide for proposed redlines)		

CRM-196

Paragraph	3.3.1.9 Signal Polarization
Redlines	IS200-93 The transmitted signal shall be right-hand circularly polarized (RHCP). IS200-2047 ~~and~~For the angular range of ±13.8 degrees from nadir, L1 ellipticity shall be no worse than 1.8 dB for Block IS200-2049 ~~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.~~

CRM-197

DOORS ID			
Paragraph	6.2.2.1 Developmental SVs.	**Comment Number**	197
Comment Type	Substantive	**Disposition**	Accept
Comment Originator(s)	Jeff Stevens (MITRE)		
Comment	For consistency within section 6.2.2, remove the developer name for the Developmental SVs.		
Government Response	(See next slide for proposed change)		

Paragraph	6.2.2.1 Developmental SVs.
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.

CRM-205

DOORS ID	6.3.2		
Paragraph	6.3.2 Extended Navigation Mode	**Comment Number**	205
Comment Type	Substantive	**Disposition**	Accept
Comment Originator(s)	Jeff Stevens (MITRE)		
Comment	Since this section is being changed to be a generic description of extended operations, the final paragraph (following IS200-201) needs to be updated to remove the direct linkage with short-term and long-term extended operations since those behaviors are SV block and code specific		
Government Response	(See next slide for proposed changes)		

Paragraph	6.3.2 Extended Navigation Mode
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), ~~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.

CRM-206/207

DOORS ID	6.3.4		
Paragraph	6.3.4 Extended Navigation Mode (GPS III).	**Comment Number**	206 207
Comment Type	Substantive	**Disposition**	Accept
Comment Originator(s)	206: Jeff Stevens (MITRE) 207: Jeff Stevens (MITRE)		
Comment	206: Section title needs updating to add GPS IIIF. 207: The GPS III/IIIF extended navigation description needs updating to reflect the fact that these SVs will nominally maintain 4-hour curve fits with 2-hour cutovers if contact with the CS has been lost.		
Government Response	(See next slide for proposed changes)		

Paragraph	6.3.4 Extended Navigation Mode (GPS III).
Redlines	**6.3.4 Extended Navigation Mode (GPS III and GPS IIIF).** (2nd Paragraph) 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~~.

CRM-208/209/269

DOORS ID	IS200-2073		
Paragraph	20.3.3.5.1.4 Anti-Spoof (A-S) Flags and SV Configurations.	**Comment Number**	208 209 269
Comment Type	Substantive/Administrative	**Disposition**	Accept
Comment Originator(s)	Jeff Stevens (MITRE) Rhonda Slattery (Aerospace)		
Comment	208 Recommend removing the language about "system backward compatibility requirements" to simplify the final paragraph. To be consistent with the details that are being removed from the individual SV configuration code descriptions, the information in the HOW should be described as "flags". 209 The "IS" wording contains unnecessary underlining. 269 The II/IIA stuff was deleted from 20.3.2, so this is no longer accurate for 001 - maybe just delete II/IIA here too?		
Government Response	(See next slide for proposed changes)		

Paragraph	IS200-2073 20.3.3.5.1.4 Anti-Spoof (A-S) Flags and SV Configurations
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; memory~~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. ~~To comply with system backward compatibility requirements, all present and future satellites that transmit the C/A and P(Y) ranging codes will have A-S capability, and A-S and "alert" in HOW.~~ All present and future satellites that transmit the C/A and P(Y) ranging codes will have A-S capability, and flags for A-S and "alert" in HOW.

Green Indicates Recent Change

CRM-210/211/212

DOORS ID	IS200-463/2091/2121		
Paragraph	20.3.4.4 Data Sets.	**Comment Number**	210/211/212
Comment Type	Substantive	**Disposition**	Accept
Comment Originator(s)	Jeff Stevens (MITRE)		
Comment	210: The proposed wording change has inadvertently modified one occurrence of the phrase "CEI data sets" to the less specific "sets“ (IS200-463). 211: The proposed wording change is missing the cutover time constraint for transition between succeeding 24-hour CEI data sets. The final sentence should be deleted, consistent with the statement in the Rationale that there are no longer any CEI data sets transmitted for greater than 24 hours (IS200-2091). 212: Recommend changing the constraint on curve fit start times to be a 15-minute boundary, which is consistent with the CS and SV implementation, and may provide more helpful information to users that wish to identify the start and end times of the currently active curve fit interval (IS200-2121).		
Government Response	(See next slide for proposed changes)		

Paragraph	20.3.4.4 Data Sets.
Redlines	IS200-463 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 ~~hour~~two hours and therefore may be transmitted by the SV for less than ~~one~~two ~~hour~~hours. Upon ~~During~~transition to short-term operations, cutover ~~to~~from 4these 2-hour ~~sets and~~CEI ~~subsequent~~data ~~cutovers~~sets to ~~succeeding~~ 4-hour CEI data sets ~~will always occur modulo~~ 4and ~~hours~~subsequent ~~relative~~cutovers to ~~end/start of week. Cutover from~~succeeding 4 ~~hour CEI data sets to 6~~-hour CEI data sets shall occur modulo ~~12~~24 hours relative to end/start of week. IS200-2091 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 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.~~ Green Indicates Recent Change)0-464 : 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. IS200-2121 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~~900 seconds (~~5~~15 minutes) relative to the start of week.

CRM-215

DOORS ID	IS200-472		
Paragraph	20.3.4.5 Reference Times.	**Comment Number**	215
Comment Type	Substantive	**Disposition**	Accept
Comment Originator(s)	Jeff Stevens (MITRE)		
Comment	The "Rationale" wording includes inappropriate references.		
Government Response	(See next slide for proposed Rationale)		

Paragraph	20.3.4.5 Reference Times.
Redlines	(5th Paragraph) 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. . . . . . . Rationale (now reads) The week number should be listed in addition to the reference time epoch for each of the time-dependent parameters.

CRM-226/298

DOORS ID	IS200-1498		
Paragraph	30.3.3.5 Message Type 32 Earth Orientation Parameters (EOP).	**Comment Number**	226 298
Comment Type	Substantive	**Disposition**	Accept
Comment Originator(s)	Jeff Stevens (MITRE) Jeff Crum (LMCO)		
Comment	226 Table and paragraph references in the final paragraph are incorrect for IS-GPS-200. 298 The table and section cross-references don't appear to be accurate. • (Table 20-XV) -> (Table 30-XIII) • §20.3.4.7.1 and §20.3.4.6.1 -> §30.3.3.1.3 and §20.3.3.3.3.1.		
Government Response	(See next slide for proposed changes)		

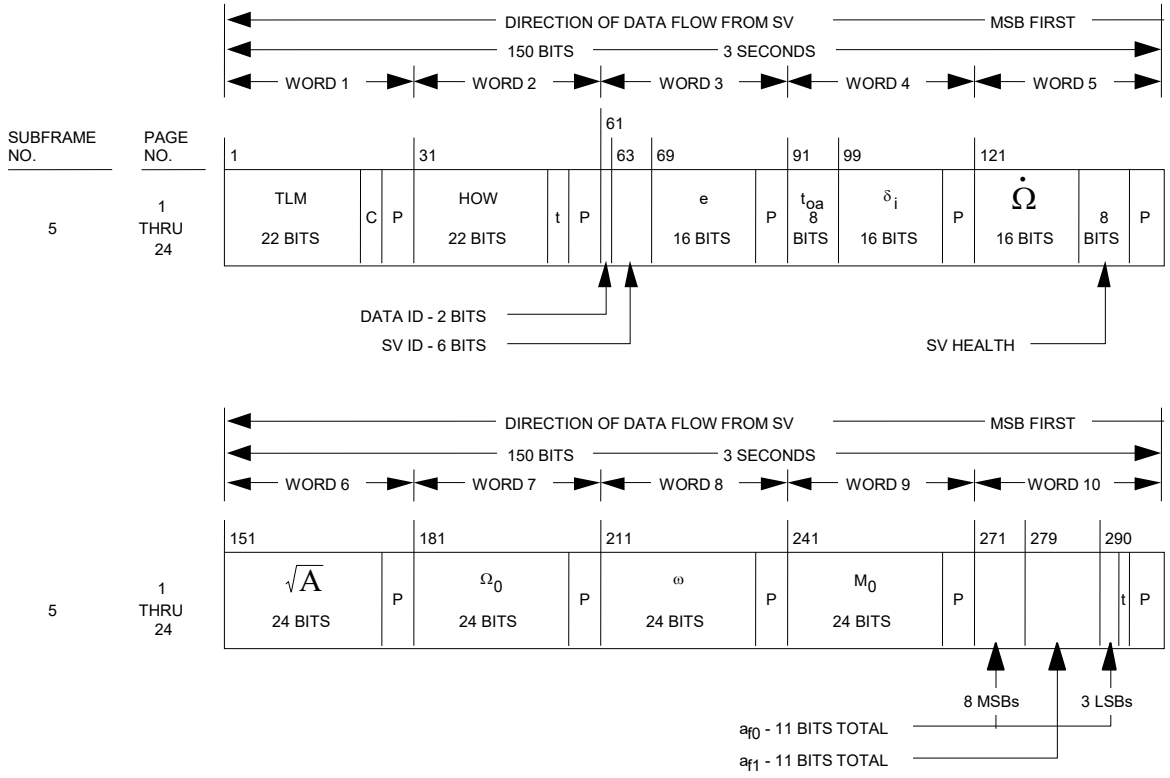
Paragraph	30.3.4.5 Reference Times
Redlines	(10th Paragraph) A change from the broadcast reference time immediately prior to cutover is used to indicate a change of values in the CEI data set. For CNAV data, the user may use the following example algorithm to detect the occurrence of a new CEI data sequence 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-~~VI~~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 ~~20.3.4.7.1~~30.3.3.1.3 and ~~20.3.4.6.1~~20.3.3.3.3.1.

Green Indicates Recent Change

CRM-229

DOORS ID	Figure 40-1 (sheet 4 of 11)		
Paragraph	Figure 40-1 (sheet 4 of 11)	**Comment Number**	229
Comment Type	Substantive	**Disposition**	Accept
Comment Originator(s)	Jeff Stevens (MITRE)		
Comment	Because SF4:P10 is not used for almanac in the LNAV-U data structure, it should be removed from sheet 4 that depicts the format of the almanac pages.		
Government Response	(See next slide for proposed changes)		

Paragraph	Figure 40-1 (sheet 4 of 11)
Redlines	In the NOTE below the figure, change "… PAGES 2, 3, 4, 5, 7, 8, 9 & 10 OF SUBFRAME 4 …" to "… PAGES 2, 3, 4, 5, 7, 8 & 9 OF SUBFRAME 4 …"

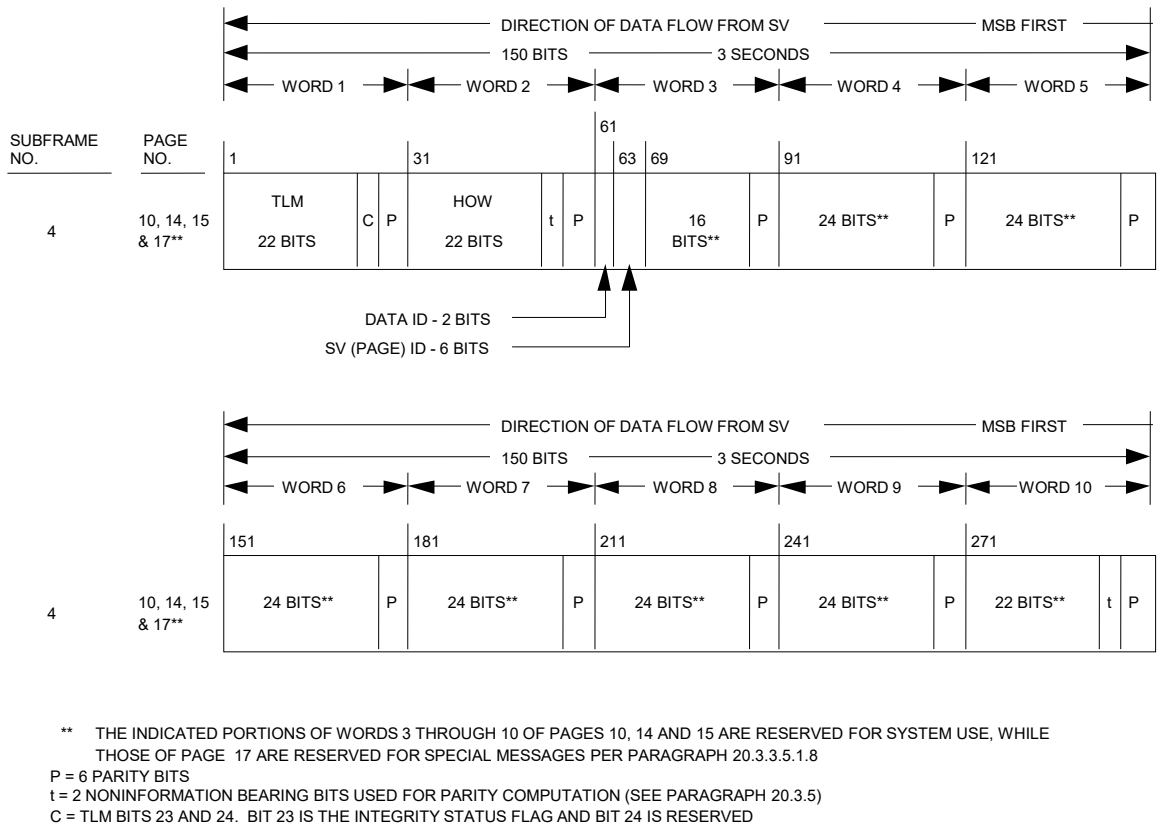


P = 6 PARITY BITS
t = 2 NONINFORMATION BEARING BITS USED FOR PARITY COMPUTATION (SEE PARAGRAPH 20.3.5)
C = TLM BITS 23 AND 24. BIT 23 IS THE INTEGRITY STATUS FLAG AND BIT 24 IS RESERVED
NOTE: PAGES 2, 3, 4, 5, 7, 8, & 9 OF SUBFRAME 4 HAVE THE SAME FORMAT AS PAGES 1 THROUGH 24 OF SUBFRAME 5

CRM-230

DOORS ID			
Paragraph	Figure 40-1 (sheet 11 of 11)	**Comment Number**	230
Comment Type	Substantive	**Disposition**	Accept
Comment Originator(s)	Jeff Stevens (MITRE)		
Comment	Because SF4:P10 is not used for almanac in the LNAV-U data structure, it should be added to sheet 11 that depicts the format of the "reserved and special messages" SF4 pages.		
Government Response	(See next slide for proposed changes)		

Paragraph	Figure 40-1 (sheet 11 of 11)
Redlines	Under "PAGE NO" , change both occurrences of "14, 15 & 17**" to "10, 14, 15 & 17**". In the double asterisk footnote below the figure, change "… OF PAGES 14 AND 15 ARE RESERVED FOR SYSTEM USE …" to "… OF PAGES 10, 14 AND 15 ARE RESERVED FOR SYSTEM USE …".



** 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

CRM-231/232/270/298

DOORS ID	IS200-1372		
Paragraph	Table 40-V. Data IDs and SV IDs in Subframes 4 and 5	**Comment Number**	231 232 270 298
Comment Type	Substantive/Administrative	**Disposition**	Accept
Comment Originator(s)	Jeff Stevens (MITRE) Rhonda Slattery (Aerospace) Jeff Crum (LMCO)		
Comment	231 Because SF4:P10 is not used for almanac in the LNAV-U data structure and does not have an assigned SV ID, it should be indicated as "Reserved" in the table. 232 The "Redlines" incorrectly shows the "(Note 4)" in the headings for the two SV ID columns as deleted, instead of being replaced with "(Note 3)" 270 It appears you didn't correctly apply the notes. Note 4, now note 3, should apply to the entire column, and Note 3 was deleted, but is still referenced in specific cells 298 The REDLINES don't match the IS so it's hard to tell what the real change is. It looks like the "IS" has the correct info so the REDLINES needs to be fixed. Improve PCN depiction of the REDLINES to match the "IS" object which appears to be correct.		
Government Response	(See next slide for proposed changes)		

Paragraph

IS200-1372, Table 40-V. Data IDs and SV IDs in Subframes 4 and 5

Redlines

Page	Subframe 4		Subframe 5	
	Data ID	SV ID* (Note 43)	Data ID	SV ID* (Note 43)
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

CRM-233

DOORS ID	IS200-2105		
Paragraph	40.3.3.5.1.2 Almanac Data	**Comment Number**	233
Comment Type	Substantive	**Disposition**	Accept
Comment Originator(s)	Jeff Stevens (MITRE)		
Comment	For consistency with LNAV-L section 20.3.3.5.1.2, the caution about attempting to track a dummy SV should be added to this section for LNAV-U.		
Government Response	(See next slide for proposed changes)		

Paragraph	40.3.3.5.1.2 Almanac Data
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.

CRM-239

DOORS ID			
Paragraph	20.3.3.3.1.3 Ionospheric Data.	**Comment Number**	239
Comment Type	Substantive	**Disposition**	Accept
Comment Originator(s)	Jeff Stevens (MITRE)		
Comment	Extended operations are not applicable to CNAV and so the wording may be simplified.		
Government Response	(See next slide for proposed changes)		

Paragraph	20.3.3.3.1.3 Ionospheric Data
Redlines	. . . . . . The ionospheric data shall be updated by the CS at least once every six days while the CS is able to upload the SVs. If the CS is unable to upload the SVs, the ionospheric data transmitted by the SVs may not be accurate~~.~~ ~~During extended operations, if the CS is unable to upload the SVs~~, and the use of this model will yield unpredictable results.

CRM-240

DOORS ID	IS705		
Paragraph	20.3.4.4 Data Sets	**Comment Number**	240
Comment Type	Substantive	**Disposition**	Accept
Comment Originator(s)	Jeff Stevens (MITRE)		
Comment	This paragraph is erroneously being replaced with a duplicate copy of the newly added paragraph IS705-1736.		
Government Response	(See next slide for proposed changes)		

Paragraph	20.3.4.4 CEI Data Sets
Redlines	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.

CRM-253/254

DOORS ID	IS-GPS-705, Modifies IS705-1521 and IS705-275		
Paragraph	Table 6-I-1 Table 20-IV Table 30-IV	**Comment Number**	253 254
Comment Type	Substantive	**Disposition**	Accept
Comment Originator(s)	Brent Renfro (ARL UT)		
Comment	Table 20-IV does not remove the note '**** The bit string of "1000000000000" will indicate that the group delay value is not available.' Table 30-IV does not remove the note '**** The bit string of "1000000000000" will indicate that the group delay value is not available.' (13) RATIONALE FOR CHANGE: This note should have been removed in RFC 442.		
Government Response	(See next two slides for proposed changes)		

CRM-253

Paragraph	IS-GPS-705, IS705-275 Table 20-IV, Group Delay Differential Parameters
Redlines	

Table 20-IV. Group Delay Differential Parameters**

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 20-3 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.~~

CRM-254

Paragraph	IS-GPS-200, IS200-1614 and IS200-582, Table 30-IV Group Delay Differential Parameters
Redlines	

Table 30-IV. Group Delay Differential Parameters ****

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~~

CRM-262

DOORS ID	IS200-1292		
Paragraph	6.2.1.1 Note 3	**Comment Number**	262
Comment Type	Substantive	**Disposition**	Accept
Comment Originator(s)	Rhonda Slattery (Aerospace)		
Comment	If you are deleting all references to integrity status flag being off or on, you left out Note 3.		
Government Response	Convert off and on to 0 and 1 (See next slide for proposed changes)		

CRM-262

Paragraph	IS200-1292, 6.2.1.1 Note 3
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.

CRM-268

DOORS ID	IS200-431		
Paragraph		**Comment Number**	268
Comment Type	Substantive	**Disposition**	Accept
Comment Originator(s)	Rhonda Slattery (Aerospace)		
Comment	Why doesn't this apply to GPS III? The data is calculated the same for all the SVs. I would revert to the original language		
Government Response	Reverting to original. Since GPS III/IIIF SVs may not transition to short- or long-term extended operations, but the URE will still increase with time since last upload, the URE estimates for each operational interval in the table in 20.3.3.5.2.1 may not be applicable to GPS III/IIIF. (See next slide for proposed changes)		

CRM-268

Paragraph	IS200-431
IS in May 2021	The user is cautioned that the sensitivity to small perturbations in the parameters is even greater for the almanac than for the ephemeris, with the sensitivity of the angular rate terms over the interval of applicability on the order of 10^{14} meters/(semicircle/second). An indication of the URE provided by a given almanac during each of the operational intervals on Block IIR/IIR-M/IIF SVs is as follows:
WAS at RFC origination and NOW	The user is cautioned that the sensitivity to small perturbations in the parameters is even greater for the almanac than for the ephemeris, with the sensitivity of the angular rate terms over the interval of applicability on the order of 10^{14} meters/(semicircle/second). An indication of the URE provided by a given almanac during each of the operational intervals is as follows:

CRM-307

DOORS ID	IS800-140		
Paragraph	IS800 Section 3.5.1.0-3	**Comment Number**	307
Comment Type	Substantive	**Disposition**	Accept
Comment Originator(s)	Jeff Crum		
Comment	Text is incorrectly modified to remove Figure 3.5-8a. That figure needs to be cited because it was added to IS800 via RFC-413 and is part of the baseline IS-GPS-800H.		
Government Response	Include Figure 3.5-8a because it was added in RFC-413. (See next slide for proposed changes)		

Paragraph	IS800 Section 3.5.1 Message Content
Redlines	(3rd Paragraph) Subframe 3 provides other navigation data which is commutated over multiple pages. -Each page of subframe 3 provides different data as shown in Figures 3.5-2 through 3.5-~~8a~~8~~8~~8a.- Additional subframe 3 pages may be defined in the future.- It shall be noted that the broadcast sequence of subframe 3 pages is variable~~ and,~~. ~~as~~The ~~such,~~maximum ~~users~~repetition ~~must~~rates ~~not~~and ~~expect~~broadcast ~~a~~periods ~~fixed~~are ~~pattern~~given ~~of~~in ~~page~~Table ~~sequence~~3.-5-2a. Subframe 3 provides an 8-bit PRN number of the transmitting SV with a range of 0 (00000000) to 255 (11111111).