



Public Interface Control Working Group (ICWG) –Day #1

Major Thomas Nix
GPER

Tony Marquez
GPS SE&I
24 Sep 2013

Telecon- (800) 366-7242 Conference code: 1528652

DCO Connect Website: <https://connect.dco.dod.mil/r8436owtv6o>



Methods of Attendance

Method	Link	Dial In
Defense Connect Online- Day #1- Primary	https://connect.dco.dod.mil/r8436owtv6o	<p>(800) 366-7242</p> <p>Conference code: 1528652</p>
Defense Connect Online- Day #1- Backup	https://connectcol.dco.dod.mil/r527a3pz3u7	
GoToMeeting- Day #1, Session 1	https://global.gotomeeting.com/join/757206197	
GoToMeeting- Day #1, Session 2	https://global.gotomeeting.com/join/537854069	



GPS Requirements & Interfaces (R&I) Team

Organization	Title	Name
GPS Directorate	SMC/GPE Engineering Requirements Branch Chief (SMC/GPER)	Major Thomas Nix
Aerospace	GPS Subject Matter Expert (SME)	Karl Kovach
GPS SE&I	GPS Civil SiS Interfaces (IS-GPS-200, 705, and 800) Lead	Tony Marquez
	GPS Requirements & Interfaces (R&I) DOORS Lead	Jay Jair
	GPS ICD-GPS-870 Responsible Engineer	Stephan Hillman



Roll Call

No Proprietary, Competition Sensitive, or Classified Information



UNCLASSIFIED





Rules of Engagement

- **Please place your phones on mute when not speaking to minimize background noise**
- **Due to time constraints, the following apply:**
 - Comments against the topics listed on the official agenda will get priority during discussion
 - Topics that warrant additional discussion may be side-barred
 - Out-of-scope issues will be discussed at the open forum on the last day of the Public ICWG (24-25 Sep 2013)
- **Updated PIRNs will be generated and distributed as a product of this meeting**



Meeting Purpose

- **Purpose of the meeting is to:**
 - Establish the **Directorate position** on the proposed language generated for the enterprise RFCs pertaining to the Public Signals in Space (SiS) documents:
 - IS-GPS-200
 - IS-GPS-705
 - IS-GPS-800
 - *ICD-GPS-870



Agenda

- **Roll Call**
- **Meeting Logistics**
 - **Rules of Engagement**
 - **Meeting Purpose**
- ➔ **Public Document (IS-GPS-200, 705, 800, and ICD-GPD-870) Request For Change (RFC) Proposal Items**
- **Open Forum Comments**
- **Action Item Review**
- **Closing Comments**

Agenda for Public Documents Change Proposals- Day #1



24 Sep 2013 (0800-1100) Session #1

Title	Change Originator
L1C Data Predict Week Number (WN _{OP})	Karl Kovach/Tony Marquez
Public Signals in Space Disconnects	Tony Marquez
CNAV Reference Times	Brent Renfro/Tony Marquez

Lunch 1100-1200

24 Sep 2013 (1200-1700) Session #2

PRN 211-1023 Mission Assignments	Karl Kovach
Clarification of CNAV Broadcast Intervals	Karl Kovach
Document Baseline for User Community & Zero AOD User Interfaces	Stephan Hillman



Agenda for Open Forum Topics- Day #2

25 Sep 2013 (0900-1100) Session #1

Title	Change Originator
Open Forum Comments	All
Removal of Technical Performance Requirements in the Public Signals in Space (SiS) Interface Specifications	John Nielson
PRN Code Assignments	Dinesh Mandahar/Hideyuki Torimoto
Adjacent Band Compatibility Working Group	Karl Kovach/Karen VanDyke

Lunch 1100-1200

25 Sep 2013 (1100-1700) Session #2

Adjacent Band Compatibility Working Group	Karl Kovach/Karen VanDyke
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L1C Data Predict Week Number (WN_{OP})

PROBLEM STATEMENT:

A CNAV-2 ephemeral parameter, the Data Predict Week Number (WN_{OP}), is located in the incorrect subframe. The WN_{OP} parameter should be paired with the Time of Predict (t_{OP}) parameter in the same subframe (or message type) in order for receivers to calculate a viable PNT solution. However, for L1C, WN_{OP} and t_{OP} are located in different subframes; Subframe 3 contains WN_{OP} and Subframe 2 contains t_{OP} . Therefore, L1C receivers cannot calculate a viable PNT solution.

In addition, the requirements should reflect the corresponding bit assignments, bit lengths, and bit definitions to reinforce the utility of the WN_{OP} parameter for receiver manufacturers planning to process the L1C signal

SOLUTION (Proposed):

Pair the L1C WN_{OP} parameter with the Time of Predict (t_{OP}) parameter in the same subframe.

IMPACTED DOCUMENTS:

IS-GPS-200G, IS-GPS-705C, IS-GPS-800C

RESPONSIBLE ENGINEER(S):

Karl Kovach, Tony Marquez



Schedule Impacts

CHANGE MANAGEMENT ACTUAL SCHEDULE: (Select one)										
PRIORITY: Routine: <input checked="" type="checkbox"/>			Urgent:				Emergency:			
CM CYCLE:										
LL ERB Date	JCRB Date	Combined Stakeholder/ Directorate Review Date	Comments Due Date	Resolve Comments	ICWG/ SWG Date	GPS ERB Date	Impact Assessment Period	LL CCB Date	GPS CCB Date	Need Date
6 Mar 2013	14 Mar 2013	3 Jun 2013	7 Aug 2013	7-13 Aug 2013	24-25 Aug 2013	16 Oct 2013	17 Oct- 17 Nov 2013	N/A	16 Dec 2013	7 May 2013
LL ERB Date Identify Need for Change	JCRB Date	Submit for Combined Review	Review Comments Due	Adjudicate and Disposition Comments - Obtain Concurrence	ICWG/SWG Date Today	GPS ERB	All Affected Programs Request Impact Assessments, as Directed by PCO	LL CCB Determine Funding Availability	GPS CCB	Driver Date



L1C Data Predict Week Number (WN_{OP}) CRM Status

CRM – COMBINED STAKEHOLDER/DIRECTORATE REVIEW STATUS

Disposition/Type	Critical	Substantial	Administrative	Totals	Concurrence	Notes
Accept	4	3	4	11		
Accept with Change	0	0	0	0		
Reject	0	0	1	1		One rejected Admin comment was addressed in previous Accepted change against IS-GPS-800
Grand Totals:	4	3	5	12		



Critical Comments

Comment Originator(s)	Karl Kovach (Aerospace)
Resolution	Accept
Impacted Docs	IS-GPS-800C, Figure 3-5.3

Comment	WAS	IS	GPS Directorate Response
The current Data Predict Week Number (WN_{OP}) quantity is located in the incorrect subframe for L1C which will impact receivers ability to correctly determine a valid PNT solution.	WN_{OP} bit layout of Subframe 3, Page 2 (bits 221-228)	WN_{OP} bit layout of Subframe 2 (bits 567-574)	<p>Accept. Regarding WN_{OP} receivers utilizing the L1C signal will not be able to correctly process Integrity Assured User Range Accuracy (IAURA), thus opening up the possibility for receivers to ignore a valid L1C signal.</p> <p>A PCOL has been sent from the Directorate to LM on 1 May 2013 directing them to implement this change.</p>



Critical Comments

Comment Originator(s)	Brent Renfro (UT:ARL)
Resolution	Accept
Impacted Docs	IS-GPS-200G, Section 30.3.3.3.1.3 (New Section)

Comment	WAS	IS	GPS Directorate Response
The bitmaps define the WN_{OP} term, but it is never provided a text definition that specifies the scale factor and application of the quantity.	None	<u>30.3.3.3.1.3 Data Predict Week Number.</u> Bits 257-264 of Message Type 30 shall indicate the Data Predict Week Number (WN_{op}) to which the Data Predict Time of Week (top) is referenced (see 30.3.3.1.1.3 and 30.3.3.2.1.2). The WN_{op} term consists of eight bits which shall be a modulo 256 binary representation of the GPS week number to which the top is referenced.	<i>Accept. IS-GPS-200 and IS-GPS-705 are now included in this scope of this RFC due to JCRB decision (Sep 2013)..</i>



Critical Comments

Comment Originator(s)	Brent Renfro (UT:ARL)
Resolution	Accept
Impacted Docs	IS-GPS-705C, Section 20.3.3.3.1.3 (New Section)

Comment	WAS	IS	GPS Directorate Response
The bitmaps define the WN_{OP} term, but it is never provided a text definition that specifies the scale factor and application of the quantity.	None	<p><u>20.3.3.3.1.5 Data Predict Week Number.</u> Bits 257-264 of Message Type 30 shall indicate the Data Predict Week Number (WN_{OP}) to which the Data Predict Time of Week (top) is referenced (see 20.3.3.1.1.3 and 20.3.3.2.1.2). The WN_{OP} term consists of eight bits which shall be a modulo 256 binary representation of the GPS week number to which the top is referenced.</p>	<p><i>Accept. IS-GPS-200 and IS-GPS-705 are now included in this scope of this RFC due to JCRB decision (Sep 2013)..</i></p>



Critical Comments

Comment Originator(s)	Brent Renfro (UT:ARL)
Resolution	Accept
Impacted Docs	IS-GPS-800C, Section 3.5.4.2.4 (New Section)

Comment	WAS	IS	GPS Directorate Response
The bitmaps define the WN_{OP} term, but it is never provided a text definition that specifies the scale factor and application of the quantity.	None	<u>3.5.4.2.4 Data Predict Week Number.</u> Bits 567-574 of Subframe 3, Page 2 shall indicate the Data Predict Week Number (WN_{OP}) to which the Data Predict Time of Week (top) is referenced (see 3.5.3.3). The WN_{OP} term consists of eight bits which shall be a modulo 256 binary representation of the GPS week number to which the top is referenced.	<i>Accept</i>

Substantive Comments



Comment Originator(s)	Brent Renfro (UT:ARL)
Resolution	Accept
Impacted Docs	IS-GPS-200G, 30.3.3.2.4

Comment	WAS	IS	GPS Directorate Response
Once full definition of WN_{OP} is added (see earlier comment), remove existing incomplete definition and provide reference to where definition is now located.	WN_{OP} Data Predict Week Number, identifying the GPS week to which the top term refers. See Sections 30.3.3.1.1.3 and 30.3.3.2.1.2 (Data Predict Time of Week).	<DELETE>	<i>Accept. IS-GPS-200 and IS-GPS-705 are now included in this scope of this RFC due to JCRB decision (Sep 2013).</i>

Substantive Comments



Comment Originator(s)	Brent Renfro (UT:ARL)
Resolution	Accept
Impacted Docs	IS-GPS-705C, 20.3.3.2.4

Comment	WAS	IS	GPS Directorate Response
Once full definition of WN_{OP} is added (see earlier comment), remove existing incomplete definition and provide reference to where definition is now located.	WN_{OP} -- Data Predict Week Number, identifying the GPS week to which the top term refers. See Section 20.3.3.1.1.3 and 20.3.3.2.1.2 (Data Predict Time of Week).	<DELETE>	<i>Accept. IS-GPS-200 and IS-GPS-705 are now included in this scope of this RFC due to JCRB decision (Sep 2013)..</i>

Substantive Comments



Comment Originator(s)	Brent Renfro (UT:ARL)
Resolution	Accept
Impacted Docs	IS-GPS-800C, Section 3.5.3.8

Comment	WAS	IS	GPS Directorate Response
Once full definition of WN_{OP} is added (see earlier comment), remove existing incomplete definition and provide reference to where definition is now located.	WN_{OP} -- Data Predict Week Number, identifying the GPS week to which the top term refers. See Section 3.5.3.3 (Data Predict Time of Week).	<DELETE>	<i>Accept.</i>

Administrative Comments



Comment Originator(s)	Brent Renfro (UT:ARL)
Resolution	Accept
Impacted Docs	IS-GPS-800C, Figure 3.5-1

Comment	WAS	IS	GPS Directorate Response
<p>Remove outline around Integrity Status Flag parameter. Add number of bits. Consistent use of capitalization.</p> <p>Outline was originally placed when ISF was new and highlighted in yellow. Now that the change is accomplished, it's simply vestigial clutter. Consistency with how L1C Health is handled at top of figure. All other fields are labeled with BOTH start bit and number of bits. (See also IS-GPS-705C, Fig. 20-1 for example I like.) This is a VERY GOOD cross-check and should be maintained.</p>	Integrity Status Flag	ISF- 1 BIT	Accept.

Administrative Comments



Comment Originator(s)	Brent Renfro (UT:ARL)
Resolution	Accept with comment.
Impacted Docs	IS-GPS-800C, Figure 3.5-1

Comment	WAS	IS	GPS Directorate Response
<p>Remove outline around "Reserved", add bit count. Consistent use of capitalization.</p> <p>Consistency with how L1C Health is handled at top of figure. All other fields are labeled with BOTH start bit and number of bits. This is a VERY GOOD cross-check and should be maintained.</p>	"Reserved"	"RESERVED - 1 BIT"	<i>Accept with comment. Should be 2 bits (575-576) in subframe 2, not one bit.</i>

Administrative Comments



Comment Originator(s)	Justin Rodriguez/Kevin Lewis (RTN)
Resolution	Reject
Impacted Docs	IS-GPS-800C, 3.5.3.8

Comment	WAS	IS	GPS Directorate Response
<p>Changes to the broadcast structure of the L1C signal will only impact GPSIII vehicles.</p> <p>The development for incorporation of L1C has not started therefore changes to the location of parameters within the subframe is of no impact to design.</p> <p>The timeline for this activity would be prior to IT 2.1 Seg/EI Systems Engineering kickoff.</p> <p>No Raytheon SE concerns with this RFC</p>	<p>The public signals in space documents contain incongruent information regarding curve fit intervals between the LNAV & CNAV signals. These documents also utilize the Week Number of Operation (WNop) variable without specifically defining its intended use. Without the correct parameters defined, receiver manufactures may incorrectly design receivers using faulty parameters.</p>	<p>Update wording to "shall" statements in IS-800</p>	<p><i>Reject. Based on previous comment provided by Brent Renfro (UT:ARL) this comment is addressed in the new proposed section of IS-GPS-800, Section 3.5.4.2.4.</i></p>



CNAV Reference Times

PROBLEM STATEMENT:

The current CNAV signals (L2C, L5, and L1C) reference time parameters are stated to be 100% common to the LNAV reference time parameters. However, there are additional time parameters that apply to the CNAV signals (reference time parameters, epoch times, and algorithms detecting cutovers specific to CNAV).

Not applying the additional time parameters to receivers processing the CNAV signal may prevent receivers from correctly processing the modernized GPS signal.

SOLUTION (Proposed):

State the complete list of timing parameters that pertain to the CNAV signal.

IMPACTED DOCUMENTS:

IS-GPS-200G, IS-GPS-705C, IS-GPS-800C

RESPONSIBLE ENGINEER(S):

Brent Renfro, Tony Marquez



Schedule Impacts

CHANGE MANAGEMENT ACTUAL SCHEDULE: (Select one)										
PRIORITY: Routine: <input checked="" type="checkbox"/>			Urgent:				Emergency:			
CM CYCLE:										
LL ERB Date	JCRB Date	Combined Stakeholder/ Directorate Review Date	Comments Due Date	Resolve Comments	ICWG/ SWG Date	GPS ERB Date	Impact Assessment Period	LL CCB Date	GPS CCB Date	Need Date
12 Sep 2012	23 Apr 2013	3 Jun 2013	7 Aug 2013	7-13 Aug 2013	24-25 Aug 2013	16 Oct 2013	17 Oct- 17 Nov 2013	N/A	16 Dec 2013	Jan 2014
LL ERB Date Identify Need for Change	JCRB Date	Submit for Combined Review	Review Comments Due	Adjudicate and Disposition Comments - Obtain Concurrence	ICWG/SWG Date Today	GPS ERB	All Affected Programs Request Impact Assessments, as Directed by PCO	LL CCB Determine Funding Availability	GPS CCB	Driver Date



RFC-00193-Directorate/Stakeholder Review Status

16) REVIEW STATUS:

Office	Response Required	Comment (C)	No Comment (NC)	No Impact (NI)	No Response (NR)	Prime Contractors /External Stakeholders	Contract(s) Affected (Response Required)	Comment (C)	No Comment (NC)	No Impact (NI)	No Response (NR)
GPA	RR		X			IIR/IIR-M	FA8823-10-C-0002 (Sustainment)	RR			X
GPC	RR				X	IIF	F04701-96-C-0025	RR	X	X	
GPD	RR	X				OCS	F04701-96-C-0025	RR			X
GPE	RR				X	GPSIII	FA8807-08-C-0010	RR			X
GPG	RR				X	OCX	FA8807-10-C-0001	RR	X		
GPGN	RR				X	ADAP	FA8807-04-C-0004	RR			X
GPL	RR	X				DAGR	FA8807-09-C-0002	RR			X
GPN	RR				X	MAGR2K	FA8807-05-D-0001	RR			X
GPU	RR		X			GB-GRAM	W15P7T-07-D-P214	RR			X
GPV	RR				X	MUE	FA8807-06-C-0001/3/4	RR			X
AEROSPACE	RR		X			MGUE	FA8807-12-C-0011/12/13	RR			X
AFSPC/50 th SW	RR		X			NSA					
AFSPC/A5M	RR		X								
SE&I	RR				X						



CNAV Reference Times CRM Status

CRM – COMBINED STAKEHOLDER/DIRECTORATE REVIEW STATUS

Disposition/Type	Critical	Substantial	Administrative	Totals	Concurrence	Notes
Accept	3	1	2	6		
Accept with Change	0	0	0	0		
Reject	0	0	0	0		
Grand Totals:	3	1	2	6		

Critical Comments



Comment Originator(s)	Brent Renfro (UT:ARL)
Resolution	Accept
Impacted Docs	IS-GPS-200, Section 30.3.4.5

Comment	WAS	IS	GPS Directorate Response
Replace reference to misleading text with correct descriptive text	20.3.4.5 also applies to the CNAV reference times.	See MS-Word file: "Proposed Reference Time Section 30_3_4_5"	Accept.



Critical Comments

Comment Originator(s)	Brent Renfro (UT:ARL)
Resolution	Accept
Impacted Docs	IS-GPS-705, Section 20.3.4.5

Comment	WAS	IS	GPS Directorate Response
Update reference	The LNAV reference time information in paragraph 20.3.4.5 in IS-GPS-200 also applies to the CNAV reference times.	The reference time information in paragraph 30.3.4.5 of IS-GPS-200 applies.	<i>Accept.</i>



Critical Comments

Comment Originator(s)	Brent Renfro (UT:ARL)
Resolution	Accept
Impacted Docs	IS-GPS-800, Section 3.5.5.3

Comment	WAS	IS	GPS Directorate Response
Update reference	The LNAV reference time information in paragraph 20.3.4.5 in IS-GPS-200 also applies to the CNAV reference times.	The CNAV reference time information in paragraph 30.3.4.5 of IS-GPS-200 also applies to the CNAV-2 reference times.	<i>Accept.</i>

Substantive Comments



Comment Originator(s)	Kuniharu Endo (Lighthouse Technology and Consulting Co.,Ltd.)
Resolution	Discuss
Impacted Docs	IS-GPS-200G, (Section 30.3.4.5)

Comment	WAS	IS	GPS Directorate Response
<p>Although the fit interval of LNAV was 4 hours, I would like to know the reason why it was changed to 3 hours.</p> <p>Is there a benefit to the users?</p>	N/A	N/A	<i>Discuss</i>



Administrative Comments

Comment Originator(s)	Jaime Van Horn (SMC/GPLN)
Resolution	Reject
Impacted Docs	IS-GPS-200G, Section 30.3.4.5, Pg 4 of PIRN

Comment	WAS	IS	GPS Directorate Response
<p>Why is it listed as "... CS (Block IIR-M/IIF)...?"</p> <p>IIR-M and IIF are space vehicles, OCX or AEP/LADO would be the CS.</p> <p>Please clarify.</p>	<p>The LNAV reference time information in paragraph 20.3.4.5 in IS-GPS-200 also applies to the CNAV reference times.</p>	<p>The CNAV reference time information in paragraph 30.3.4.5 of IS-GPS-200 also applies to the CNAV-2 reference times.</p>	<p><i>Reject. This is outside the scope of this RFC. Furthermore, the information (CS (Block IIR-M/IIF) is merely educational/informational for the reader and has no bearing on the technical baseline/user design WRT GPS.</i></p>



Administrative Comments

Comment Originator(s)	Steven Brown (LM)
Resolution	Reject
Impacted Docs	IS-GPS-200G, Section 30.3.4.5 (Table 30-XIII)

Comment	WAS	IS	GPS Directorate Response																																																																				
<p>In Table 30-XIII, there are many empty cells. If the time parameter is not applicable, suggest entering "N/A" or "0" in the table cell.</p>	<table border="1"> <thead> <tr> <th colspan="6">Table 30-XIII. Reference Times</th> </tr> <tr> <th rowspan="2">Fit Interval (hours)</th> <th rowspan="2">Transmission Interval (hours)</th> <th colspan="4">Hours After First Valid Transmission Time</th> </tr> <tr> <th>t_{oc} (clock)</th> <th>t_{oe} (ephemeris)</th> <th>t_{oa} (almanac)</th> <th>t_{ot} (UTC)</th> </tr> </thead> <tbody> <tr> <td>3*</td> <td>2*</td> <td>1.5</td> <td>1.5</td> <td></td> <td></td> </tr> <tr> <td>144</td> <td>144</td> <td></td> <td></td> <td>70</td> <td>70</td> </tr> <tr> <td>≥144</td> <td>≥144</td> <td></td> <td></td> <td>70</td> <td>70</td> </tr> </tbody> </table> <p>* Defined in Section 30.3.3.1.1</p>	Table 30-XIII. Reference Times						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	144			70	70	≥144	≥144			70	70	<table border="1"> <thead> <tr> <th colspan="6">Table 30-XIII. Reference Times</th> </tr> <tr> <th rowspan="2">Fit Interval (hours)</th> <th rowspan="2">Transmission Interval (hours)</th> <th colspan="4">Hours After First Valid Transmission Time</th> </tr> <tr> <th>t_{oc} (clock)</th> <th>t_{oe} (ephemeris)</th> <th>t_{oa} (almanac)</th> <th>t_{ot} (UTC)</th> </tr> </thead> <tbody> <tr> <td>3*</td> <td>2*</td> <td>1.5</td> <td>1.5</td> <td></td> <td></td> </tr> <tr> <td>144</td> <td>144</td> <td>0</td> <td>0</td> <td>70</td> <td>70</td> </tr> <tr> <td>≥144</td> <td>≥144</td> <td>0</td> <td>0</td> <td>70</td> <td>70</td> </tr> </tbody> </table> <p>* Defined in Section 30.3.3.1.1</p>	Table 30-XIII. Reference Times						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	144	0	0	70	70	≥144	≥144	0	0	70	70	<p>Reject. Table 20-XIII is the same in that it does not contain "nulls" or zeros and will not be changed.</p>
Table 30-XIII. Reference Times																																																																							
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PRN 211-1023 Mission Assignments

PROBLEM STATEMENT:

Currently, PRNs 211-1023 are not assigned to PNT missions. The impact of not explicitly assigning this PRN range to PNT missions is:

Other GNSS systems might assume the USAF will not utilize PRNs 211-1023 for GPS missions since the IS-GPS-200 only lists the sequence of PRNs up to 210 and does not mention or assign PRNs 211-1023 to PNT missions. Therefore, other GNSS systems may request to utilize these PRNs for their missions.

SOLUTION (Proposed):

Reserve PRNs 211-1023 for USAF GPS missions.

IMPACTED DOCUMENTS:

IS-GPS-200G, IS-GPS-705C, IS-GPS-800C

RESPONSIBLE ENGINEER(S):

Karl Kovach



Schedule Impacts

CHANGE MANAGEMENT ACTUAL SCHEDULE: (Select one)										
PRIORITY: Routine: <input checked="" type="checkbox"/>			Urgent:				Emergency:			
CM CYCLE:										
LL ERB Date	JCRB Date	Combined Stakeholder/ Directorate Review Date	Comments Due Date	Resolve Comments	ICWG/ SWG Date	GPS ERB Date	Impact Assessment Period	LL CCB Date	GPS CCB Date	Need Date
12 Sep 2012	23 Apr 2013	3 Jun 2013	7 Aug 2013	7-13 Aug 2013	24-25 Aug 2013	16 Oct 2013	17 Oct- 17 Nov 2013	N/A	16 Dec 2013	On Going Fear
LL ERB Date Identify Need for Change	JCRB Date	Submit for Combined Review	Review Comments Due	Adjudicate and Disposition Comments - Obtain Concurrence	ICWG/SWG Date Today	GPS ERB	All Affected Programs Request Impact Assessments, as Directed by PCO	LL CCB Determine Funding Availability	GPS CCB	Driver Date



PRN 211-1023 Mission Assignments CRM Status

CRM – COMBINED STAKEHOLDER/DIRECTORATE REVIEW STATUS

Disposition/Type	Critical	Substantial	Administrative	Totals	Concurrence	Notes
Accept	1	1	0	2		
Accept with Change	0	0	0	0		
Reject	0	0	0	0		
Grand Totals:	1	1	0	2		



Critical Comments

Comment Originator(s)	Chris Sedgewick (2SOPS)		
Resolution	<i>Chair will speak with commenter on questions.</i>		
Impacted Docs	IS-GPS-200G, Section 3.3.2.1		
Comment	WAS	IS	GPS Directorate Response
<p>In Section 3.3.2.1, the current "G" version the text states "where I is an integer from 64-210...". Was this section and others where the current PRN limitation is defined as "210" assessed for updates to 1023?</p> <p>Numerous PRN 210 references are listed in IS-GPS-200G and other ICDs and Spec's. Did all references where the PRN limit is 210 assessed for updates to reflect the PRN increase to 1023?</p>	N/A	N/A	<i>Chair will speak with commenter on questions.</i>



Substantive Comments

Comment Originator(s)	Kuniharu Endo (Lighthouse Technology and Consulting Co.,Ltd.)
Resolution	Reject
Impacted Docs	IS-GPS-200G, Section 30.3.4.1

Comment	WAS	IS	GPS Directorate Response
Concerning "Midi Almanac" and "Reduced Almanac", please tell me the purpose and how to use each of them. What is the merit if a user uses each of them properly?	N/A	N/A	There will be an ION paper that will discuss this.



Clarification of CNAV Broadcast Intervals

PROBLEM STATEMENT:

The current CNAV/CNAV-2 broadcast intervals tables in IS-GPS-200, IS-GPS-705, and IS-GPS-800 do not clearly convey the separate, distinct characteristics between each type of almanac message data (Reduced Almanac, Midi Almanac) and associated message type numbers (Message Type 31 and 37, respectively); nor do the tables note the operational flexibility retained by AFSPC.

A literal reading of the existing CNAV/CNAV-2 broadcast intervals tables has -- and will likely continue to -- cause the Control Segment to waste valuable CNAV/CNAV-2 throughput broadcasting unnecessary CNAV/CNAV-2 messages.

SOLUTION (Proposed):

Clarify the differences/separation/options for each CNAV message type/data, message type number, and associated broadcast intervals.

IMPACTED DOCUMENTS:

IS-GPS-200G, IS-GPS-705C, IS-GPS-800C

RESPONSIBLE ENGINEER(S):

Karl Kovach



Schedule Impacts

CHANGE MANAGEMENT ACTUAL SCHEDULE: (Select one)										
PRIORITY: Routine: <input checked="" type="checkbox"/>			Urgent:				Emergency:			
CM CYCLE:										
LL ERB Date	JCRB Date	Combined Stakeholder/ Directorate Review Date	Comments Due Date	Resolve Comments	ICWG/ SWG Date	GPS ERB Date	Impact Assessment Period	LL CCB Date	GPS CCB Date	Need Date
		3 Jun 2013	7 Aug 2013	7-13 Aug 2013	24-25 Aug 2013	16 Oct 2013	17 Oct- 17 Nov 2013	N/A	16 Dec 2013	
▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
LL ERB Date Identify Need for Change	JCRB Date	Submit for Combined Review	Review Comments Due	Adjudicate and Disposition Comments - Obtain Concurrence	ICWG/SWG Date Today	GPS ERB	All Affected Programs Request Impact Assessments, as Directed by PCO	LL CCB Determine Funding Availability	GPS CCB	Driver Date



RFC-00199: Clarification of CNAV Broadcast Intervals CRM Status

CRM – COMBINED STAKEHOLDER/DIRECTORATE REVIEW STATUS

Disposition/Type	Critical	Substantial	Administrative	Totals	Concurrence	Notes
Accept	0	1	2	3		
Accept with Change	0	0	0	0		
Reject	0	0	0	0		
Grand Totals:	0	1	2	3		



Substantive Comments

Comment Originator(s)	Justin Rodriguez/Kevin Lewis (RTN)
Resolution	Reject
Impacted Docs	IS-GPS-200G & IS-GPS-705C

Comment	WAS	IS	GPS Directorate Response
<p>The clarification provided to IS-200 and IS-705 suggests that the Midi almanac and reduced almanac can be broadcast as desired without specifying an explicit need for either. In this case, without further guidance, it would be in the best interest of the Control Segment to only broadcast the reduced almanac as it minimizes the needed onboard memory and permits the CS to broadcast the entire almanac in the 300 slot CNAV broadcast pattern with room to spare for WAGE/EOP/Text/ etc. Barring explicit guidance to the contrary, it is conceivable that the operational system, by default, will only broadcast the reduced almanac unless an operator chooses otherwise.</p> <p>The following assumptions were applied: Midi and Reduced almanacs will be scheduled at the operators' discretion, Validation checks will verify that the selected almanac types (Midi, Reduced, or both) are repeated at the rates specified in IS-200, Any desired automated process to intelligently schedule Midi almanacs or Reduced almanacs on a constellation-wide basis will be addressed through a separate RFC, Any desired optimization or analysis tools that an operator may use to guide almanac selection will be addressed through separate RFCs, No performance displays will be created within MSA to indicate almanac 'performance'.</p> <p>The timeline this activity will need to align with is prior to IT 1.7 Seg/EI Systems Engineering kickoff</p>	<p>The current CNAV/CNAV-2 broadcast intervals tables in IS-GPS-200, IS-GPS-705, & IS-GPS-800 do not clearly convey the separate, distinct characteristic between each type of almanac message data (Reduced Almanac, Midi Almanac) & associated message type numbers (Message Type 31 & 37, respectively);nor do the tables note the operational flexibility retained by AFSPC.</p> <p>A literal reading of the existing CNAV/CNAV-2 broadcast intervals tables has (& will likely continue to) cause the Control Segment to waste valuable CNAV/CNAV-2 throughput broadcasting unnecessary CNAV/CNAV-2 messages.</p>	<p>Add a new requirement to reflect MDS changes as well as updating a "shall" statement in both the IS-200 & IS-705.</p>	<p>Reject</p>

Substantive Comments



Comment Originator(s)	Blake Karkroska (RTN)
Resolution	Discuss
Impacted Docs	IS-GPS-200G (30.3.3.4) IS-GPS-705 (20.3.3.4)

Comment	WAS	IS	GPS Directorate Response
<p>The current language in both IS-GPS-200 and IS-GPS-705 do not align with the way forward currently being put forward for RFC-00199 which calls for the non-simultaneous transmission of Reduced and Midi Almanacs. Recommend further modification of the language in both documents to reflect the non simultaneous transmission.</p>	<p><u>30.3.3.4 Message Types 31, 12, and 37 Almanac Parameters.</u> The almanac parameters are provided in any one of message types 31, 37, and 12. Message type 37 provides Midi almanac parameters and the reduced almanac parameters are provided in either message type 31 or type12. The SV shall broadcast both message types 31 (and/or 12) and 37. However, the reduced almanac parameters (i.e. message types 31 and/or 12) for the complete set of SVs in the constellation will be broadcast by a SV using shorter duration of time compared to the broadcast of the complete set of Midi almanac parameters (i.e. message type 37). The parameters are defined below, followed by material pertinent to the use of the data.</p>		<p><i>Discuss</i></p>



Administrative Comments

Comment Originator(s)	Brent Renfro (UT:ARL)
Resolution	Accept
Impacted Docs	IS-GPS-200, Table 30-XII

Comment	WAS	IS	GPS Directorate Response
Message Type 37 includes SV clock correction parameters. Therefore, it should have an asterisk.	Table 30-XII, row 7, column 2: "37"	"37*"	Accept.



Administrative Comments

Comment Originator(s)	Brent Renfro (UT:ARL)		
Resolution	Accept		
Impacted Docs	IS-GPS-705C, Table 20-XII, Page 184		
Comment	WAS	IS	GPS Directorate Response
Message Type 37 includes SV clock correction parameters. Therefore, it should have an asterisk.	Table 20-XII, row 7, column 2: "37"	"37*"	<i>Accept</i>



Public Signals in Space Disconnects

PROBLEM STATEMENT:

The current public signals in space documents contain obsolete information (UTC OE, Extended NAV, and URE), incorrect information (L2C message duration, GNSS ID bit assignments), and missing information (L5 ellipticity values). If these disconnects are not resolved, receiver manufacturers will have issues designing to incorrect requirements and the Directorate will be misrepresenting the current and future GPS system performance in a public document.

SOLUTION (Proposed):

Resolve obsolete (UTC OE, Extended Nav, and URE), incorrect (L2C message duration, GNSS ID bit assignments), and missing (L5 ellipticity values) requirements in the public signals in space documents

IMPACTED DOCUMENTS:

IS-GPS-200G, IS-GPS-705C, IS-GPS-800C

RESPONSIBLE ENGINEER(S):

Tony Marquez, Karl Kovach



Schedule Impacts

CHANGE MANAGEMENT ACTUAL SCHEDULE: (Select one)										
PRIORITY: Routine: <input checked="" type="checkbox"/>			Urgent:				Emergency:			
CM CYCLE:										
LL ERB Date	JCRB Date	Combined Stakeholder/ Directorate Review Date	Comments Due Date	Resolve Comments	ICWG/ SWG Date	GPS ERB Date	Impact Assessment Period	LL CCB Date	GPS CCB Date	Need Date
11 Sep 2013	12 Sep 2013	3 Jun 2013	7 Aug 2013	7-13 Aug 2013	24-25 Aug 2013	16 Oct 2013	17 Oct- 17 Nov 2013	N/A	16 Dec 2013	Nov 2013
LL ERB Date Identify Need for Change	JCRB Date	Submit for Combined Review	Review Comments Due	Adjudicate and Disposition Comments - Obtain Concurrence	ICWG/SWG Date Today	GPS ERB	All Affected Programs Request Impact Assessments, as Directed by PCO	LL CCB Determine Funding Availability	GPS CCB	Driver Date



Public Signals in Space Disconnects CRM Status

CRM – COMBINED STAKEHOLDER/DIRECTORATE REVIEW STATUS						
Disposition/Type	Critical	Substantial	Administrative	Totals	Concurrence	Notes
Accept	7	7	4	18		
Accept with Change	0	0	0	0		
Reject	4	0	2	6		Rejected comments center around misunderstanding of RFC looking to delete text, not modify obsolete text.
Grand Totals:	11	7	6	24		

Critical Comments



Comment Originator(s)	Karl Kovach (Aerospace)
Resolution	Discuss
Impacted Docs	IS-GPS-200G, Section 3.3.4

Comment	WAS	IS	GPS Directorate Response
The 90ns UTCOE quantity in IS-GPS-200 may present problems to certain receivers. During test, certain receivers (if they ever received 90ns for UTCOE) may cause failures.	The NAV data contains the requisite data for relating GPS time to UTC. The accuracy of this data during the transmission interval shall be such that it relates GPS time (maintained by the MCS of the CS) to UTC (USNO) within 90 nanoseconds (one sigma).	The NAV data contains the requisite data for relating GPS time to UTC. The accuracy of this data during the transmission interval shall be such that it relates GPS time (maintained by the MCS of the CS) to UTC (USNO) within 20 nanoseconds (one sigma).	<i>Discuss</i>

Critical Comments



Comment Originator(s)	Karl Kovach (Aerospace)
Resolution	Discuss
Impacted Docs	IS-GPS-200G, Section 3.3.4

Comment	WAS	IS	GPS Directorate Response
<p>Delete 20 nsec and 97 nsec numbers and associated text from this PIRN to IS-GPS-200G.</p> <p>See K. Kovach briefing entitled "Irreconcilable Differences on UTCOE Accuracy Performance Specifications in SIS Iss & ICDs and DoD Guided Solution for the CCB"</p>	<p>PIRN for Removing Obsolete Info from ICD-GPS-200G: The NAV data contains the requisite data for relating GPS time to UTC. The accuracy of this data during the transmission interval shall be such that it relates GPS time (maintained by the MCS of the CS) to UTC (USNO) within 90 nanoseconds (one sigma). This data is generated by the CS; therefore, the accuracy of this relationship may degrade if for some reason the CS is unable to upload data to a SV. At this point, it is assumed that alternate sources of UTC are no longer available, and the relative accuracy of the GPS/UTC relationship will be sufficient for users. Range error components (e.g. SV clock and position) contribute to the GPS time transfer error, and under normal operating circumstances (two frequency time transfers from SV(s) whose navigation message indicates a URA of eight meters or less), this corresponds to a 97 nanosecond (one sigma) apparent uncertainty at the SV. Propagation delay errors and receiver equipment biases unique to the user add to this time transfer uncertainty.</p>	<p>PIRN for Removing Obsolete Info from ICD-GPS-200G: The NAV data contains the requisite data for relating GPS time to UTC. This data is generated by the CS; therefore, the accuracy of this relationship may degrade if for some reason the CS is unable to upload data to a SV.</p>	<p><i>Discuss</i></p>

Critical Comments



Comment Originator(s)	Karl Kovach (Aerospace)
Resolution	Discuss
Impacted Docs	IS-GPS-200G, Section 3.3.4

Comment	WAS	IS	GPS Directorate Response
<p>Delete 90 nsec and 97 nsec numbers and associated text from paragraph 3.3.4 of IS-GPS-200G.</p> <p>See K. Kovach briefing entitled "Irreconcilable Differences on UTCOE Accuracy Performance Specifications in SIS Iss & ICDs and DoD Guided Solution for the CCB"</p>	<p>ICD-GPS-200G: The NAV data contains the requisite data for relating GPS time to UTC. The accuracy of this data during the transmission interval shall be such that it relates GPS time (maintained by the MCS of the CS) to UTC (USNO) within 90 nanoseconds (one sigma). This data is generated by the CS; therefore, the accuracy of this relationship may degrade if for some reason the CS is unable to upload data to a SV. At this point, it is assumed that alternate sources of UTC are no longer available, and the relative accuracy of the GPS/UTC relationship will be sufficient for users. Range error components (e.g. SV clock and position) contribute to the GPS time transfer error, and under normal operating circumstances (two frequency time transfers from SV(s) whose navigation message indicates a URA of eight meters or less), this corresponds to a 97 nanosecond (one sigma) apparent uncertainty at the SV. Propagation delay errors and receiver equipment biases unique to the user add to this time transfer uncertainty.</p>	<p>ICD-GPS-200G: The NAV data contains the requisite data for relating GPS time to UTC. This data is generated by the CS; therefore, the accuracy of this relationship may degrade if for some reason the CS is unable to upload data to a SV.</p>	<p><i>Discuss</i></p>

Critical Comments



Comment Originator(s)	Steven T. Hutsell (2SOPS)
Resolution	Discuss
Impacted Docs	IS-GPS-200G, Section 3.3.4

Comment	WAS	IS	GPS Directorate Response
<p>This paragraph apparently proposes changing a figure of 90 ns to 20 ns. Such a change a) appears to be lacking any presentation of justification/reference, and b) poses mathematical conflict with a figure of 97 ns later in the paragraph.</p> <p>Given the nature of the distribution of this document, publication of an incorrect performance specification is unacceptable.</p>	[Inadequately justified change]	[Provide adequate justification of change]	<i>Discuss</i>

Critical Comments



Comment Originator(s)	Steven T. Hutsell (2SOPS)
Resolution	Reject
Impacted Docs	IS-GPS-200G, Table 30-IX

Comment	WAS	IS	GPS Directorate Response
<p>This PIRN proposes removing a table (30-IX) that otherwise appears critical to the Time Transfer mission of GPS. Furthermore, the proposed removal does not appear to propose an accompanying removal of IS-GPS-200 text that explicitly references this table. The office that is proposing this change appears to be either a) missing something obvious, or b) substantially failing to provide adequate justification/rationale.</p> <p>Numerous AFSPC Requirements and SMC Specifications associated with the Time Transfer mission (too many to list).</p>	[Inappropriate deletion of this table]	[Cancellation of inappropriate deletion of this table]	Reject. The text is not being deleted.

Critical Comments



Comment Originator(s)	Steven T. Hutsell (2SOPS)
Resolution	Reject
Impacted Docs	IS-GPS-200G, Figure 3.5-2

Comment	WAS	IS	GPS Directorate Response
<p>This PIRN proposes removing a figure (3.5-2) that otherwise appears critical to the Time Transfer mission of GPS. Furthermore, the proposed removal does not appear to propose an accompanying removal of IS-GPS-800 text that explicitly references this figure. The office that is proposing this change appears to be either a) missing something obvious, or b) substantially failing to provide adequate justification/rationale.</p> <p>Numerous AFSPC Requirements and SMC Specifications associated with the Time Transfer mission (too many to list).</p>	[Inappropriate deletion of this figure]	[Cancellation of inappropriate deletion of this figure]	<i>Reject. The text is not being deleted.</i>

Critical Comments



Comment Originator(s)	Steven Brown (LM)
Resolution	Accept
Impacted Docs	IS-GPS-705C, Section 20.3.3.8.1

Comment	WAS	IS	GPS Directorate Response
<p>Like IS-GPS-200 the text in section 20.3.3.8.1 should be changed from "Bits 155 through 157 of message type 35 shall identify the other GPS like navigation system to which the offset data applies." To "Bits 157 through 159 of message type 35 shall identify the other GPS like navigation system to which the offset data applies."</p> <p>Text should match the bit allocation map in Figure 20-8.</p>	<p>Bits 155 through 157 of message type 35 shall identify the other GPS like navigation system to which the offset data applies."</p>	<p>Bits 157 through 159 of message type 35 shall identify the other GPS like navigation system to which the offset data applies."</p>	<p>Accept. A PCOL letter has been sent from the Directorate to LM instructing LM to design to this change.</p>

Critical Comments



Comment Originator(s)	Steven Brown (LM)
Resolution	Accept
Impacted Docs	IS-GPS-705C, Section 20.3.3.8.1

Comment	WAS	IS	GPS Directorate Response
It shows that GNSS ID starts at bit 157 and is 3 bits long. The figure should show the end of GNSS ID and the start of A _{0GGTO} to be 160.	GNSS ID ends at 158 and A _{0GGTO} starts at 159.	GNSS ID ends at 159 and A _{0GGTO} starts at 160.	<i>Accept. A PCOL letter has been sent from the Directorate to LM instructing LM to design to this change.</i>

Critical Comments



Comment Originator(s)	Ron Dixon (Boeing)
Resolution	Accept
Impacted Docs	All

Comment	WAS	IS	GPS Directorate Response
Reason For Change (Driver) description does not match all of the WAS/IS information in the PRN-IS-200G-004 document. The UTCOE information in 3.3.4 matches the Reason For Change, but 3.3.2.4 and 30.3.3.6.2 concern L2C and aren't applicable to II/IIA and don't match the II/IIA URE and extended navigation mode Reasons For Change.	GNSS ID ends at 158 and A _{0GGTO} starts at 159.	GNSS ID ends at 159 and A _{0GGTO} starts at 160.	<i>Accept. A PCOL letter has been sent from the Directorate to LM instructing LM to design to this change.</i>

Substantive Comments



Comment Originator(s)	Jeff Crum (LM)
Resolution	Accept
Impacted Docs	IS-GPS-200G, Section 30.3.3.8.1

Comment	WAS	IS	GPS Directorate Response
<p>There is a discrepancy in IS-GPS-200 between Figure 30-8 and Section 30.3.3.8.1.</p> <p>We believe that the figure 30-8 is correct. It shows that GNSS ID starts at bit 157 and is 3 bits long.</p>	<p><u>30.3.3.8.1 GPS/GNSS Time Offset Parameter Content.</u> Message Type 35 provides SV clock correction parameters (ref. Section 30.3.3.2) and also, shall contain the parameters related to correlating GPS time with other GNSS time. Bits 155 through 157 of message type 35 shall identify the other GPS like navigation system to which the offset data applies. The three bits are defined as follows;</p> <p>000 = no data available, 001 = Galileo, 010 = GLONASS, 011 through 111 = reserved for other systems.</p>	<p><u>30.3.3.8.1 GPS/GNSS Time Offset Parameter Content.</u> Message Type 35 provides SV clock correction parameters (ref. Section 30.3.3.2) and also, shall contain the parameters related to correlating GPS time with other GNSS time. Bits 157 through 159 of message type 35 shall identify the other GPS like navigation system to which the offset data applies. The three bits are defined as follows;</p> <p>000 = no data available, 001 = Galileo, 010 = GLONASS, 011 through 111 = reserved for other systems.</p>	<p><i>Accept. A PCOL letter has been sent from the Directorate to LM instructing LM to design to this change.</i></p>

Substantive Comments



Comment Originator(s)	Tony Marquez (SE&I)
Resolution	Accept
Impacted Docs	IS-GPS-800C, Table 3.5-1

Comment	WAS	IS	GPS Directorate Response
Table 3.5-1 does not state an effective range for eccentricity, which for L5 and L2C are both 0.03. Recommend placing an effective range on the L1C signal.	Table 3.5-1 does not list effective range of eccentricity	Table 3.5-1 lists effective range of eccentricity @ 0.03 to be consistent with L2C and L5.	<i>Accept</i>

Substantive Comments



Comment Originator(s)	Steven Brown (LM)
Resolution	Accept
Impacted Docs	IS-GPS-705, Section 6.3.3

Comment	WAS	IS	GPS Directorate Response																		
Update from TBD to the following figure	TBD	<table border="1"> <tr> <td>Angle (deg)</td> <td>±0</td> <td>±2</td> <td>±4</td> <td>±6</td> <td>±8</td> <td>±10</td> <td>±12</td> <td>±14.3</td> </tr> <tr> <td>Ellipticity (dB)</td> <td>0.8</td> <td>0.8</td> <td>0.8</td> <td>1.1</td> <td>1.3</td> <td>1.4</td> <td>1.4</td> <td>1.3</td> </tr> </table>	Angle (deg)	±0	±2	±4	±6	±8	±10	±12	±14.3	Ellipticity (dB)	0.8	0.8	0.8	1.1	1.3	1.4	1.4	1.3	<p><i>Accept. This TBD was brought up two years ago as part of RFC-0077 but was unable to be resolved in 2011. This data resolves the TBD from RFC-0077.</i></p>
Angle (deg)	±0	±2	±4	±6	±8	±10	±12	±14.3													
Ellipticity (dB)	0.8	0.8	0.8	1.1	1.3	1.4	1.4	1.3													

Substantive Comments



Comment Originator(s)	John Nielson (Rockwell Collins)
Resolution	Discuss
Impacted Docs	IS-GPS-200, Section 3.3.4

Comment	WAS	IS	GPS Directorate Response
<p>Change from 90 ns to 20 ns for the offset from UTC is good; however, the 97 ns value for the space and control segments at the end of the paragraph needs to also be updated to reflect a reasonable requirement. based on the 20 ns offset from UTC. This change is needed so receivers can meet their 100 ns time error requirement.</p> <p>This change is needed so receivers can meet their 100 ns time error requirement which cannot be met if 97 ns is allocated to the space and control segments.</p>	<p>The NAV data contains the requisite data for relating GPS time to UTC. The accuracy of this data during the transmission interval shall be such that it relates GPS time (maintained by the MCS of the CS) to UTC (USNO) within 20 nanoseconds (one sigma). This data is generated by the CS; therefore, the accuracy of this relationship may degrade if for some reason the CS is unable to upload data to a SV. At this point, it is assumed that alternate sources of UTC are no longer available, and the relative accuracy of the GPS/UTC relationship will be sufficient for users. Range error components (e.g. SV clock and position) contribute to the GPS time transfer error, and under normal operating circumstances (two frequency time transfers from SV(s) whose navigation message indicates a URA of eight meters or less), this corresponds to a 97 nanosecond (one sigma) apparent uncertainty at the SV. Propagation delay errors and receiver equipment biases unique to the user add to this time transfer uncertainty.</p>	<p>The NAV data contains the requisite data for relating GPS time to UTC. The accuracy of this data during the transmission interval shall be such that it relates GPS time (maintained by the MCS of the CS) to UTC (USNO) within 20 nanoseconds (one sigma). This data is generated by the CS; therefore, the accuracy of this relationship may degrade if for some reason the CS is unable to upload data to a SV. At this point, it is assumed that alternate sources of UTC are no longer available, and the relative accuracy of the GPS/UTC relationship will be sufficient for users. Range error components (e.g. SV clock and position) contribute to the GPS time transfer error, and under normal operating circumstances (two frequency time transfers from SV(s) whose navigation message indicates a URA of eight meters or less), this corresponds to a TBD nanosecond (one sigma) apparent uncertainty at the SV. Propagation delay errors and receiver equipment biases unique to the user add to this time transfer uncertainty.</p>	<p>Discuss</p>

Substantive Comments



Comment Originator(s)	Chris Sedgewick (2SOPS)
Resolution	Speak with commenter on proposed path forward (return to ICWG)
Impacted Docs	IS-GPS-200, Section 3.3.4

Comment	WAS	IS	GPS Directorate Response
Page 3 of RFC-188A_PIRN-IS-200G-004.pdf section titled "IS-GPS-200 RevG (5 Sep 2012) Navstar GPS Space Segment/Navigation User Interfaces" states "...within 90 nanoseconds..." and the section titled "Proposed Removal of Obsolete Information from the Public Signals in Space Documents" states "...within 20 nanoseconds...". Please explain the difference.	See Comment block	See Comment block	Speak with commenter on proposed path forward (return to ICWG)

Substantive Comments



Comment Originator(s)	Brent Renfro (UT:ARL)
Resolution	Accept
Impacted Docs	IS-GPS-200, Section 30.3.3.1.1

Comment	WAS	IS	GPS Directorate Response
<p>The MT10 & 11 section of IS-GPS-200 does not define Bit 273 as IS-705 does in the corresponding section. Recommend placing the definition of Bit 273 in IS-200 in the obvious location.</p> <p>The MT10 & 11 section of IS-GPS-200 does not define Bit 273 as IS-705 does in the corresponding section.</p> <p>Recommend placing the definition of Bit 273 in IS-200 in the obvious location.</p>	None	Bit 273 of Message Type 10 indicates the phase relationship between L2C and P(Y) as specified in section 3.3.1.5.1.	<i>Accept</i>

Substantive Comments



Comment Originator(s)	Brent Renfro (UT:ARL)
Resolution	Accept
Impacted Docs	IS-GPS-200, Section 30.3.3

Comment	WAS	IS	GPS Directorate Response
L2C is a 12 second message, not a 6 second message. L5 is a 6 second message.	Each message starts with an 8-bit preamble - 10001011, followed by a 6-bit PRN number of the transmitting SV, a 6-bit message type ID with a range of 0 (000000) to 63 (111111), and the 17-bit message time of week (TOW) count. When the value of the message TOW count is multiplied by 6, it represents SV time in seconds at the start of the next 6-second message. An "alert" flag, when raised (bit 38 = "1"), indicates to the user that the signal URA components may be worse than indicated in the associated message types and that he shall use at his own risk. For each default message (Message Type 0), bits 39 through 276 shall be alternating ones and zeros and the message shall contain a proper CRC parity block.	Each message starts with an 8-bit preamble - 10001011, followed by a 6-bit PRN number of the transmitting SV, a 6-bit message type ID with a range of 0 (000000) to 63 (111111), and the 17-bit message time of week (TOW) count. When the value of the message TOW count is multiplied by 6, it represents SV time in seconds at the start of the next 12-second message. An "alert" flag, when raised (bit 38 = "1"), indicates to the user that the signal URA components may be worse than indicated in the associated message types and that he shall use at his own risk. For each default message (Message Type 0), bits 39 through 276 shall be alternating ones and zeros and the message shall contain a proper CRC parity block.	Accept

Administrative Comments



Comment Originator(s)	Steven Brown (LM)
Resolution	Accept
Impacted Docs	IS-GPS-200, Figure 3-12

Comment	WAS	IS	GPS Directorate Response
"End/Start of week" is covered by a line	Figure 3-12 has a line covering the "End/Start of week" text.	Figure 3-12 does not have a line covering the "End/Start of week" text.	<i>Accept.</i>



Administrative Comments

Comment Originator(s)	Steven Brown (LM)
Resolution	Reject
Impacted Docs	IS-GPS-200, Figure 20-1 (Sheet 1) to Figure 20-1 (Sheet 7)

Comment	WAS	IS	GPS Directorate Response
Sheet 1 of 11 has text in words 7, 8, 9, and 10 cut off or overlapping.			<i>Reject. Current Revision of IS-GPS-200G does not contain these errors.</i>



Administrative Comments

Comment Originator(s)	Ron Dixon (Boeing)
Resolution	Accept
Impacted Docs	IS-GPS-200, Section 30.3.3.6.2

Comment	WAS	IS	GPS Directorate Response
The IS text for the DN entry in the No. of Bits column should be "4****", not "4***" (missing one asterisk).	4***	4****	<i>Accept</i>



Administrative Comments

Comment Originator(s)	Steven Brown (LM)
Resolution	Discuss
Impacted Docs	RFC-00188A PIRNs (and all PIRNs for Public RFCs this cycle)

Comment	WAS	IS	GPS Directorate Response
Proposed changes in Figures are not easily found. Is there a corresponding redlined artifact to help the reviewer?			<i>Rationale detailing the change can be included in the next release of the PIRN for the Public ICWG (24-25 Sep 2013)</i>



Administrative Comments

Comment Originator(s)	Steven Brown (LM)
Resolution	Reject
Impacted Docs	

Comment	WAS	IS	GPS Directorate Response
The Description of Change is incorrect in RFC-188A_PIRN-IS-800C-005.	Remove the obsolete information from IS-GPS-200.	Remove the obsolete information from IS-GPS-200 and IS-GPS-800.	<i>Reject. PIRN that went out for public review on 13 May 2013 only specifies language in the public Signals in Space documents, not specifically IS-200, 705, or 800 individually.</i>

Administrative Comments



Comment Originator(s)	Steven Brown (LM)
Resolution	Accept
Impacted Docs	IS-GPS-200 (30.3.3.8.1) & IS-GPS-705 (20.3.3.8.1)

Comment	WAS	IS	GPS Directorate Response
GNSS bits in CNAV message have errors. We think you have already included this error, but want to make sure it is not lost			<i>Accept. A PCOL directing LM to implement these bits has already been generated and sent from the Directorate. Please see updated IRNs for IS-200 and IS-705</i>

Document Baseline for User Community & Zero AOD User Interfaces



PROBLEM STATEMENT:

Raytheon's baseline CDR design for distribution of data across the User Community and Zero AOD User interfaces has not yet been defined. The current OCX ICD was written to capture the data types provided by this interface, but left the data distribution section based largely on the AEP-equivalent for the User Community interface, ICD-GPS-240. ICD-GPS-240 was written to reflect the in situ implementation for distribution of User Community products and is not appropriate to the broader set of OCX requirements. An Operational Security issue also exists in ICD-GPS-870 due to the presence of SIPRnet distribution information in a Public Release document. .

SOLUTION (Proposed):

Document the Raytheon baseline CDR design for the User Community and Zero AOD User interfaces. This RFC will complete the process by documenting the OCX implementation for transfer of data products from the Control Segment to the Internet and SIPRnet domains as well as the methodology for users to access the data from the OCX distribution points on those networks. To complete integration of the User Community and Zero AOD User interfaces, SS-CS800 must be updated to reflect the correct ICD numbers for these interfaces. To address the OPSEC concern, a new ICD will be established to facilitate separation of Public Release and Sensitive information.

IMPACTED DOCUMENTS:

ICD-GPS-870A, SS-CS-800F, ICD-GPS-875, DT1270102C

RESPONSIBLE ENGINEER(S):

Stephan Hillman



Schedule Impacts

CHANGE MANAGEMENT ACTUAL SCHEDULE: (Select one)										
PRIORITY: Routine: <input checked="" type="checkbox"/>			Urgent:				Emergency:			
CM CYCLE:										
LL ERB Date	JCRB Date	Combined Stakeholder/ Directorate Review Date	Comments Due Date	Resolve Comments	ICWG/ SWG Date	GPS ERB Date	Impact Assessment Period	LL CCB Date	GPS CCB Date	Need Date
27 Mar 2013	11 Apr 2013	3 Jun 2013	18 Jul 2013	7-13 Aug 2013	24-25 Aug 2013	16 Oct 2013	04 Oct- 4 Nov 2013	6 Nov 2013	14 Nov 2013	2 Oct 2013
▲	▲	▲	▲	▲	▲	▲	▲	▲	▲	▲
LL ERB Date Identify Need for Change	JCRB Date	Submit for Combined Review	Review Comments Due	Adjudicate and Disposition Comments - Obtain Concurrence	ICWG/SWG Date Today	GPS ERB	All Affected Programs Request Impact Assessments, as Directed by PCO	LL CCB Determine Funding Availability	GPS CCB	Driver Date



RFC-00177- Document Baseline for User Community & Zero AOD User Interfaces

CRM – COMBINED STAKEHOLDER/DIRECTORATE REVIEW STATUS

Disposition/Type	Critical	Substantial	Administrative	Totals	Concurrence	Notes
Accept	02	16	86	104	104	5 Comments OBE Due to Removal of AF Public Portal
Accept with Change	08	16	06	30	30	10 Comments OBE Due to Removal of AF Public Portal
Reject	06	15	02	23	23	15 Comments OBE Due to Removal of AF Public Portal
Grand Totals:	16	47	94	157	157	*Original Disposition of All OBE Comments Saved for Reference



Action Item Review



Public Interface Control Working Group (ICWG)- Day #2

Major Thomas Nix
GPER

Tony Marquez
GPS SE&I
25 Sep 2013

Telecon- (800) 366-7242 Conference code: 1528652

DCO Connect Website: <https://connect.dco.dod.mil/r8436owtv6o>



Roll Call



GPS Requirements & Interfaces (R&I) Team

Organization	Title	Name
GPS Directorate	SMC/GPE Engineering Requirements Branch Chief (SMC/GPER)	Major Thomas Nix
Aerospace	GPS Subject Matter Expert (SME)	Karl Kovach
GPS SE&I	GPS Civil SiS Interfaces (IS-GPS-200, 705, and 800) Lead	Tony Marquez
	GPS Requirements & Interfaces (R&I) DOORS Lead	Jay Jair
	GPS ICD-GPS-870 Responsible Engineer	Stephan Hillman

No Proprietary, Competition Sensitive, or Classified Information



UNCLASSIFIED





Rules of Engagement

- **Please place your phones on mute when not speaking to minimize background noise**
- **Due to time constraints, the following apply:**
 - Comments against the topics listed on the official agenda will get priority during discussion
 - Topics that warrant additional discussion may be side-barred



Methods of Attendance

Method	Link	Dial In
Defense Connect Online- Day #2- Primary	https://connect.dco.dod.mil/r8436owtv6o	<p>(800) 366-7242</p> <p>Conference code: 1528652</p>
Defense Connect Online- Day #2- Backup	https://connectcol.dco.dod.mil/r527a3pz3u7	
GoToMeeting- Day #2, Session 1	https://global.gotomeeting.com/join/202500133	
GoToMeeting- Day #2, Session 2	https://global.gotomeeting.com/join/192783813	



Agenda for Open Forum Topics- Day #2

25 Sep 2013 (0900-1100) Session #1

Title	Change Originator
Open Forum Comments	All
Removal of Technical Performance Requirements in the Public Signals in Space (SiS) Interface Specifications	John Nielson
PRN Code Assignments	Dinesh Mandahar/Hideyuki Torimoto
Adjacent Band Compatibility Working Group	Karl Kovach/Karen VanDyke

Lunch 1100-1200

25 Sep 2013 (1100-1700) Session #2

Adjacent Band Compatibility Working Group	Karl Kovach/Karen VanDyke
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Open Forum Comments

Comment Originator(s)	Karl Kovach (Aerospace)
Resolution	Discuss
Impacted Docs	All SIS ICDs/Iss; all paragraphs

Comment	WAS	IS	GPS Directorate Response
<p>Delete SIS performance information (e.g., requirements, operating standards, U.S. Government commitments) that could potentially conflict with current or future editions of the SPS PS and PPS PS.</p> <p>DoD/ASD has declared that the official SIS performance information (e.g., requirements, operating standards, U.S. Government commitments) is defined in the SPS PS and PPS PS. Per MIL-STD-962, there is no need to duplicate that SIS performance information in the SIS ICDs/ISSs.</p>	TBS	TBS	<i>Discuss</i>

Open Forum Comments



Comment Originator(s)	Karl Kovach (Aerospace) / Oliver Montebruck (DLR, Germany)
Resolution	Discuss
Impacted Docs	IS-GPS-200G and IS-GPS-705; multiple pages

Comment	WAS	IS	GPS Directorate Response
<p>Clarify that there is only one t_{OP} value per upload, and that that value shows up in multiple MTs.</p> <p>Manufacturers and users want to know.</p>	TBS	TBS.	<i>Discuss</i>

Open Forum Comments



Comment Originator(s)	Karl Kovach (Aerospace)
Resolution	Future Reject
Impacted Docs	IS-GPS-200G, IS-GPS-705, and IS-GPS-800; multiple pages

Comment	WAS	IS	GPS Directorate Response
<p>Add words to explicitly tell manufacturers that the broadcast WN_{OP} value in the MT-30 messages and in Subframe 2 is the eight LSBs of the full WN_{OP}.</p> <p>The ISs don't explicitly tell manufacturers and users that this is so, and some manufacturers/users have become confused about it.</p>	TBS.	TBS	<i>Future reject.</i>

Open Forum Comments



Comment Originator(s)	Ron Dixon (Boeing)
Resolution	Discuss
Impacted Docs	IS-GPS-200G, Section 30.3.3

Comment	WAS	IS	GPS Directorate Response
<p>Need to be more clear when alternating ones and zeros occur, what does the string begin with? Ones? Zeros?</p>	<p>Each message starts with an 8-bit preamble - 10001011, followed by a 6-bit PRN number of the transmitting SV, a 6-bit message type ID with a range of 0 (000000) to 63 (111111), and the 17-bit message time of week (TOW) count. When the value of the message TOW count is multiplied by 6, it represents SV time in seconds at the start of the next 6-second message. An “alert” flag, when raised (bit 38 = “1”), indicates to the user that the signal URA components may be worse than indicated in the associated message types and that he shall use at his own risk. For each default message (Message Type 0), bits 39 through 276 shall be alternating ones and zeros and the message shall contain a proper CRC parity block.</p>	<p>Each message starts with an 8-bit preamble - 10001011, followed by a 6-bit PRN number of the transmitting SV, a 6-bit message type ID with a range of 0 (000000) to 63 (111111), and the 17-bit message time of week (TOW) count. When the value of the message TOW count is multiplied by 6, it represents SV time in seconds at the start of the next 6-second message. An “alert” flag, when raised (bit 38 = “1”), indicates to the user that the signal URA components may be worse than indicated in the associated message types and that he shall use at his own risk. For each default message (Message Type 0), bits 39 through 276 shall be alternating ones and zeros, beginning with a one, and the message shall contain a proper CRC parity block.</p>	<p><i>Discuss</i></p>

Open Forum Comments



Comment Originator(s)	Ron Dixon (Boeing)
Resolution	Discuss
Impacted Docs	IS-GPS-705C, Section 20.3.3

Comment	WAS	IS	GPS Directorate Response
Need to be more clear when alternating ones and zeros occur, what does the string begin with? Ones? Zeros?	Each message starts with an 8-bit preamble - 10001011, followed by a 6-bit PRN number of the transmitting SV, a 6-bit message type ID with a range of 0 (000000) to 63 (111111), and the 17-bit message time of week (TOW) count. When the value of the message TOW count is multiplied by 6, it represents SV time in seconds at the start of the next 6-second message. An "alert" flag, when raised (bit 38 = "1"), indicates to the user that the signal URA components may be worse than indicated in the associated message types and that he shall use at his own risk. For each default message (Message Type 0), bits 39 through 276 shall be alternating ones and zeros and the message shall contain a proper CRC parity block.	Each message starts with an 8-bit preamble - 10001011, followed by a 6-bit PRN number of the transmitting SV, a 6-bit message type ID with a range of 0 (000000) to 63 (111111), and the 17-bit message time of week (TOW) count. When the value of the message TOW count is multiplied by 6, it represents SV time in seconds at the start of the next 6-second message. An "alert" flag, when raised (bit 38 = "1"), indicates to the user that the signal URA components may be worse than indicated in the associated message types and that he shall use at his own risk. For each default message (Message Type 0), bits 39 through 276 shall be alternating ones and zeros, beginning with a one, and the message shall contain a proper CRC parity block.	

Open Forum Comments



Comment Originator(s)	Ron Dixon (Boeing)
Resolution	Discuss
Impacted Docs	IS-GPS-705C, Section 20.3.3.2.4

Comment	WAS	IS	GPS Directorate Response
The new version of the document (IS-GPS-705C.doc) only got partially updated. "which" instead of "that" is still in IS-GPS-705C.doc.			<i>Discuss</i>

Open Forum Comments



Comment Originator(s)	Matthew Kim (GPS SE&I)
Resolution	Discuss
Impacted Docs	IS-GPS-800C, Table 6.3-1

Comment	WAS	IS	GPS Directorate Response
<p>What is the exact meaning of the following statement in Table 6.3-1. "Codes 183-202 are extra codes that are suited for use with a BOC (1,1) pilot component" Why are these specific PRN codes called out?</p>			<p><i>Its because QZSS is going to look more like our signal. (Accommodate plans for QZSS)</i></p>

Open Forum Comments



Comment Originator(s)	Dr. ShawKang Wu (GPS SE&I)
Resolution	
Impacted Docs	IS-GPS-200G, Section 3.2.1

Comment	WAS	IS	GPS Directorate Response
<p>In ICD801-530, NSCM stands for Non-Standard Civil Medium, but in IS200-23 it stands for Non-Standard Civil moderate. I believe they were meant for the same thing. Anyone know if both terms have been used interchangeably? If that's the case, it may not be worth of a new RFC or piggybacking to an existing RFC to change it? Any thoughts?</p>	<p>For Block IIR-M, IIF, and subsequent blocks of SVs, two additional PRN ranging codes are transmitted. They are the L2 civil-moderate (L2 CM) code and the L2 civil-long (L2 CL) code. The SVs will transmit intentionally "incorrect" versions of the L2 CM and L2 CL codes where needed to protect the users from receiving and utilizing anomalous navigation signals. These "incorrect" codes are termed non-standard L2 CM (NSCM) and non-standard L2 CL (NSCL) codes. The SVs shall also be capable of initiating and terminating the broadcast of NSCM and/or NSCL code(s) independently of each other, in response to CS command.</p>	<p>For Block IIR-M, IIF, and subsequent blocks of SVs, two additional PRN ranging codes are transmitted. They are the L2 civil-medium (L2 CM) code and the L2 civil-long (L2 CL) code. The SVs will transmit intentionally "incorrect" versions of the L2 CM and L2 CL codes where needed to protect the users from receiving and utilizing anomalous navigation signals. These "incorrect" codes are termed non-standard L2 CM (NSCM) and non-standard L2 CL (NSCL) codes. The SVs shall also be capable of initiating and terminating the broadcast of NSCM and/or NSCL code(s) independently of each other, in response to CS command.</p>	<p>L2 CM is Civil Moderate NOT civil Medium. See Section 6.</p>

Open Forum Comments



Comment Originator(s)	Tony Marquez (GPS SE&I)
Resolution	Accept. Moved to RFC-00188A.
Impacted Docs	IS-GPS-705C, Section 3.2.1

Comment	WAS	IS	GPS Directorate Response
<p>Currently, there is a TBD in IS-GPS-705 WRT to the ellipticity of the L5 signal as it applies to GPS III. It was originally thought that the ellipticity values would be provided when testing the signal occurred off the GPS III antenna panel (GPS III FCA/PCA). However, the ellipticity values exist in IS-GPS-800 (L1C). This infers that the L5 ellipticity values are available for L5 for GPS III and should be inserted into IS-GPS-705.</p>			<p><i>Taken care of in RFC-00188A per ellipticity table supplied by LM on 7 Aug 2013.</i></p>

Open Forum Comments



Comment Originator(s)	Steven Brown (LM)
Resolution	Discuss
Impacted Docs	IS-GPS-200, Section 3.3.1.1

Comment	WAS	IS	GPS Directorate Response
Looking to clarification for GPS III BW and Tables 3-Va, 3-Vb and 3-Vc	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 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).	For Block IIA, IIR, IIR-M, IIF and III 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 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).	<i>Discuss</i>

Open Forum Comments



Comment Originator(s)	Steven Brown (LM)
Resolution	Discuss
Impacted Docs	IS-GPS-200, Section 3.3.1.6

Comment	WAS	IS	GPS Directorate Response
Looking to clarification for GPS III BW and Tables 3-Va, 3-Vb and 3-Vc	The SV shall provide L1 and L2 navigation signal strength at end-of-life (EOL), worst-case, in order to meet the minimum levels specified in Table 3-V. Any combining operation done by the SV and associated loss is compensated by an increase in SV transmitted power and thus transparent to the user segment. The minimum received power is measured at the output of a 3 dBi linearly polarized user receiving antenna (located near ground) at worst normal orientation, when the SV is above a 5-degree elevation angle. The received signal levels are observed within the in-band allocation defined in para. 3.3.1.1.	The SV shall provide L1 and L2 navigation signal strength at end-of-life (EOL), worst-case, in order to meet the minimum levels specified in Tables 3-Va, 3-Vb and 3-Vc. Any combining operation done by the SV and associated loss is compensated by an increase in SV transmitted power and thus transparent to the user segment. The minimum received power is measured at the output of a 3 dBi linearly polarized user receiving antenna (located near ground) at worst normal orientation, when the SV is above a 5-degree elevation angle. The received signal levels are observed within the in-band allocation defined in para. 3.3.1.1	<i>Discuss</i>