



# IS-GPS-705 ICWG MEETING MINUTES



**Minutes Date:** 08-Oct-2009

**Minutes By:** Gopal/Kogus/Buckley

**Meeting Date:** 01-Oct-2009

**Meeting Time:** 0800 - 1200

**Location:** Los Angeles Airport Doubletree Hotel

**Chairs:** Capt Neal Roach, USAF  
Vimal Gopal, SE&I

## Discussions:

At this ICWG, the ICC went page-by-page through the last CCB'ed version of the document and went over all changes in the document that were made after the last ICWG. The following is a list of the sections that were reviewed as well as any discussions that took place and any changes that were made to the document.

- Section 3.3.1.2 Correlation Loss
  - The consensus from the stakeholder community was to change the section to match the verbiage from the IS-GPS-800 document. The exact verbiage was included and the correlation loss value of 0.2 dB was changed to 0.6 dB for the L5 signal.
  - A discussion then ensued to determine the true ramifications of the correlation loss requirement with respect to the Receiver filter called out in the link budget. Bud Bakeman stated that the narrower the receiver filter, the less correlation loss that filter will cause. AJ Van Dierendonck says that the wider the receiver filter, the less correlation loss will ensue. Chris Hegarty agreed with AJ. Bud Bakeman then again stated that there is less impact by the filter, i.e. less correlation loss the narrower filter you have.
  - An action item was created to look at the table in section 3.3.1.2 and review whether the numbers should be switched between the 30.69 B/W and the 20.46 B/W. This was discussed later in the meeting, thus the AI was closed.
  - After continued discussion (which included a telecom with Jack Holmes), the stakeholders then agreed to change the table in section 3.3.1.2 of the IS-GPS-200 document as well. The stakeholders wanted to get rid of the right column that calls out the Correlation loss #'s associated with the 20.46 MHz B/W. LM advocates that the correlation loss for the L5 should be 0.6 dB.
  - LM took an action to review the correlation loss verbiage for all Public SIS documents. (200, 705, 800).
- Section 3.2.1.2
  - The word “receiving” was changed to “tracking” in the first sentence of this section. This was done to improve the clarity of the sentence and as a result from a comment by Brent Renfro.
- Section 3.3.1.3 Carrier Phase Noise
  - This section was also changed to reflect the decision made at the IS-GPS-200 review regarding LM's proposal for the “-80 dBc/Hz at 1 kHz” change.
  - Chris Hegarty presented a study that analyses the integrated values of the radians over the three options discussed at the ICWG.



- Section 3.3.1.4 Spurious Transmission
  - Updated document to change the proposed change in the first sentence from “at least 40 dB below the unmodulated L5 carrier over the band...” to “at or below -40dBc over the band...” for clarification to the reader.
- Section 3.3.1.6 Signal Power Levels.
  - No change from original proposal.
- Table 3-III
  - No change from original proposed language.
- Section 3.3.1.6.1 SSV received power levels
  - No change. It was also decided that the note at the bottom of the Tables associated with SSV Power levels in the 200 and 800 IS’s are not required in this document. LM can meet the specified power levels as stated.
- Section 3.3.1.7.1 Group Delay Uncertainty
  - Changed the bounds of probability from 2 Sigma to 95% probability per ICWG consensus and to remain consistent with other public interfaces.
- Section 3.3.1.7.2 Group Delay Differential
  - Changed the bounds of probability from 2 Sigma to 95% probability per ICWG consensus and to maintain consistency with other public interfaces.
- Section 3.3.1.7.3 SSV Group Delay Uncertainty
  - No change.
- Section 3.3.1.8 Signal Coherence
  - Changed the bounds of probability from 2 Sigma to 95% probability per ICWG consensus.
  - Also included an additional sentence (recommended by Karl Kovach) to reflect how the corrections are provided to the user and refers to section 20.3.3.3.1.2. This was provided from the IS-200 ICWG consensus.
- Section 3.3.1.8 Signal Polarization
  - No change to original proposal.
- Section 6.2.1 User Range Accuracy
  - Updated document to change “paragraph” to “section” for correctness.
- Section 20.3.3.1.1 Message type 10 and 11 ephemeris...
  - Updated section that refers to the Integrity status flag and included a section that is also in the 200 and 800 IS’s. Included this text...”The CNAV message will contain information that allows users to operate when integrity is assured. This is accomplished...”
- Section 20.3.3.2.1 Message Types 30 through 37 SV Clock...
  - Clarified this section to match with 200 and 800 verbiage. Included the text... “The parameters are applicable during the time in which they are transmitted. Beyond that time...”
- Section 20.3.3.2.4 SV Clock Accuracy Estimates.
  - Included the text...” Clock-related URA (URAc) accounts for signal-in-space contributions...” to address Comment #175 from the 705 CRM. This addition is also identified in the 200 and 800 ISs.
  - A note was also included at the bottom of the table to help identify which URA value to use for integrity purposed. This note identified utilizing the “upper bound” of the URA range. This is also evident in the 200 and 800 ISs.
- Section 20.3.3.5.1.1 User Algorithm for Application of the EOP
  - New verbiage has been included to address the ECEF to ECI coordinate transformation equations which are based on Technical Note 21. This, however, will be replaced with a new set of equations to be included at a later date.

**Supporting Materials:**

<input type="checkbox"/> IS-GPS-705_CRM_Post_01OctICWG.xls	<input type="checkbox"/>
<input type="checkbox"/> IS-GPS-705_Post_01OctICWG.doc	<input type="checkbox"/>
<input type="checkbox"/> IS-GPS-705_WAS-IS_Post_01OctICWG.xls	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

**Attendees:**

<b>Name</b>	<b>Company / Organization</b>
Abayon, Annabelle	GPSW/SE&I
Bakeman, Bud	Aerospace
Brown, Steven	LM GPS III
Ciganer, Ann	Trimble/USGIC
Dobyne, John	Arinc/GPC
Frey, Chuck	LM Space
Getto, Luke	ITT SSD
Grundman, Ron	GPS III SE&I
Hegarty, Chris	MITRE
Hietzke, Wolf	SAIC/SE&I
Jeffris, Mike	MITRE
Jelmeland, Tom	Boeing
Kascak, Matt	GPS SE&I
Kovach, Karl	Aerospace
Liegeois, Rick	L-3 Interstate Electronic Corp.
Mullikin, Tom	Raytheon/OCX
Naick, Purvis	GPSW, GPC
Notley, William	GPSW, GPC
O'Laughlin, Daniel	MITRE
Phillips, Sarah	LM (NG OCX)
Ranney, Scott	LM Space
Reigh, Dan	LM Space
Renfro, Brent	ARL: Univ of Texas
Tucker, Jack	GPSW/GPV (SAIC)
Van Dierendonck, AJ	AJ Systems/FAA/NASA
Yucis, Mike	ITT SSD



**Action Items from this ICWG (Sep 09):**

No	Due Date	Actionee	Item	Resolution
1	08-Oct-09	Bud Bakeman	Look at the table in section 3.3.1.2. Review whether the numbers should be switched between the 30.69MHz and the 20.46MHz	Closed. This AI was resolved during the 1-oct-09 ICWG review
2	07-Oct-09	Steve Brown	LM has taken action to review all Correlation Loss changes for all three documents.	Closed. It may be a non-issue for the respective bands, however, LM needs to review their assumptions and come back on Wednesday. ICC has provided LM the verbiage to the Corr. Loss section of all three SIS doc's (200, 800, 705). LM has responded to those sections under review on 6-oct-09. They have provided their assumptions to meet the Corr Loss spec's in each document.
3	08-Oct-09	John Buckley	Update the section 20.3.3.2.4(SV clock accuracy estimates) of IS-705 and insert the IS-GPS-800 language from its respective section.	Closed. ICC has updated document to reflect the correct sections in the document.
6	08-Oct-09	John Buckley	Apply the def. of L5CNAV shown in 3.2.1 for consistency in the entire document.	Open. Since there is a large number of NAV references in the document, this action will be deferred until the next revision. A new comment will be placed into the CRM. See comment #178 of the 705 CRM.
7	02-Oct-09	John Buckley	send the new language of the correlation loss sections for all three documents to LM.	Closed. This action was completed and LM has provided their response. Their assumptions are under review,
8	08-Oct-09	John Buckley	update the definitions of GPS Blks in section 6.2.2.	Open. Since these changes will need to be ICWG approved, this action will be deferred until the next revision. A comment in the 200 CRM (see comment #165) is tracking this as well.

**Action Items from last ICWG (Nov 08):**

No	Due Date	Actionee	Item	Resolution
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1	Next ICWG	Rich/AJ	1) Set up a working group to evaluate 10 ns to 1ns change in signal coherence, evaluate the symmetry requirements	Closed. Decided that it would not be changed per the 14 Nov 08 TIM. 5-Oct-09: this AI was resolved and can be closed under the Correlation Loss Tiger Team resolution. Additional to their proposal, the proposed verbiage was under review at the last 1-oct-09 ICWG and the final verbiage was aged upon by the stakeholders.
2	01-Jul-08	Munoz	2) Confirm the formulas that need to be changed, reference CRM from GPSW/GPC comment #20	Closed. Reassigned to Chris Hegarty for discussion at 19 Nov 09 ICWG. Updates to be provided at the next ICWG. 5-oct-09: The comment associated with this AI has been withdrawn (from 1-oct-09 ICWG), thus this AI is closed.
3	01-Jul-08	Munoz	3) Comment # 21 and 23, need to verify formulas that need to be changed, parenthesis,	Closed. Reassigned to Chris Hegarty for discussion at 19 Nov 09 ICWG. Updates to be provided at the next ICWG. 5-oct-09: ICC has confirmed both comments 21 and 23 have been accepted and implemented into documentation, thus this AI is closed.
4	Next ICWG	Kovach/AJ	4) Resolve issues with IODE and IODC	Open. Completed for CNAV-2. Need to make the same changes for CNAV. 5-oct-09: This AI is also evident in the IS-200 document. Comment #88 from the 200 CRM will resolve this concern. This comment 88, however, has been deferred until the next revision. AI remains open.
5	31-Jan-09	GPC	Provide more rationale for the removal of the Boeing letter of exception	Open. 5-oct-09: This is currently under review with PC/PK folks. ICC just needs to get clarification from PK regarding the path forward. This, however, may be an issue with the fact that Block IIF SVs are undergoing FCA/PCA. This comment will remain open.

**Next Scheduled Meeting:**

The next ICWG is scheduled for November 10<sup>th</sup>, 2009 from 0800 to 1600. We will ONLY be discussing the Preliminary PIRN (PPIRN) on constellation expansion. Please click the link below for this PPIRN:



2009-07-02 PPIRN  
for 200 for PRN 38-6:

This ICWG will be a telecon. Dial-in information is as follows:

**Phone:** 1-800-FON-SAIC



**Code:** 4511074

There are limited number of lines that will be available on a first-come-first-serve basis. Participants are encouraged to share lines if possible. Please send any comments or further questions to:

Vimal Gopal  
*vimal.gopal.ctr@losangeles.af.mil*  
1-310-416-8476

or

Captain Neal Roach  
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