

## CHANGE NOTICE

<b>Affected Document:</b> IS-GPS-200 Rev N	<b>IRN/SCN Number</b> XXX-XXXX-XXX	<b>Date:</b> DD-MMM-YYYY
---	---------------------------------------	-----------------------------

<b>Authority:</b> RFC-00495	<b>Proposed Change Notice</b> PCN-IS-200N_RFC495	<b>Date:</b> 11-MAY-2022
--------------------------------	---	-----------------------------

**Document Title:** NAVSTAR GPS Space Segment/Navigation User Interfaces

**RFC Title:** 2022 Proposed Changes to the Public Documents

**Reason For Change (Driver):**

1. Change Pconst to Rconst and MFDconst in the CNAV and CNAV2 Integrity Support Message. The rate of unalerted constellation failures (Rconst) and the mean duration of these failures (MFDconst) characterize such failures better than the probability of an unalerted constellation failure at any given time. (Pre- RFC-1200)
2. Implement Administrative Fixes needed on any document otherwise affected by the solutions to the above problem.

**Description of Change:**

1. Rework Pconst to Rconst and MFDconst in all affected documents
2. Provide clarity and clean up identified administrative changes in all affected documents IS-GPS-200, IS-GPS-705 and IS-GPS-800.

**Authored By: RE: Tony Anthony** **Checked By: RE: Christopher J. Adams**

AUTHORIZED SIGNATURES	REPRESENTING	DATE
	PNT Technical Director, MilComm & PNT Directorate, Space Systems Command (SSC)	

DISTRIBUTION STATEMENT A: Approved for Public Release; Distribution Is Unlimited

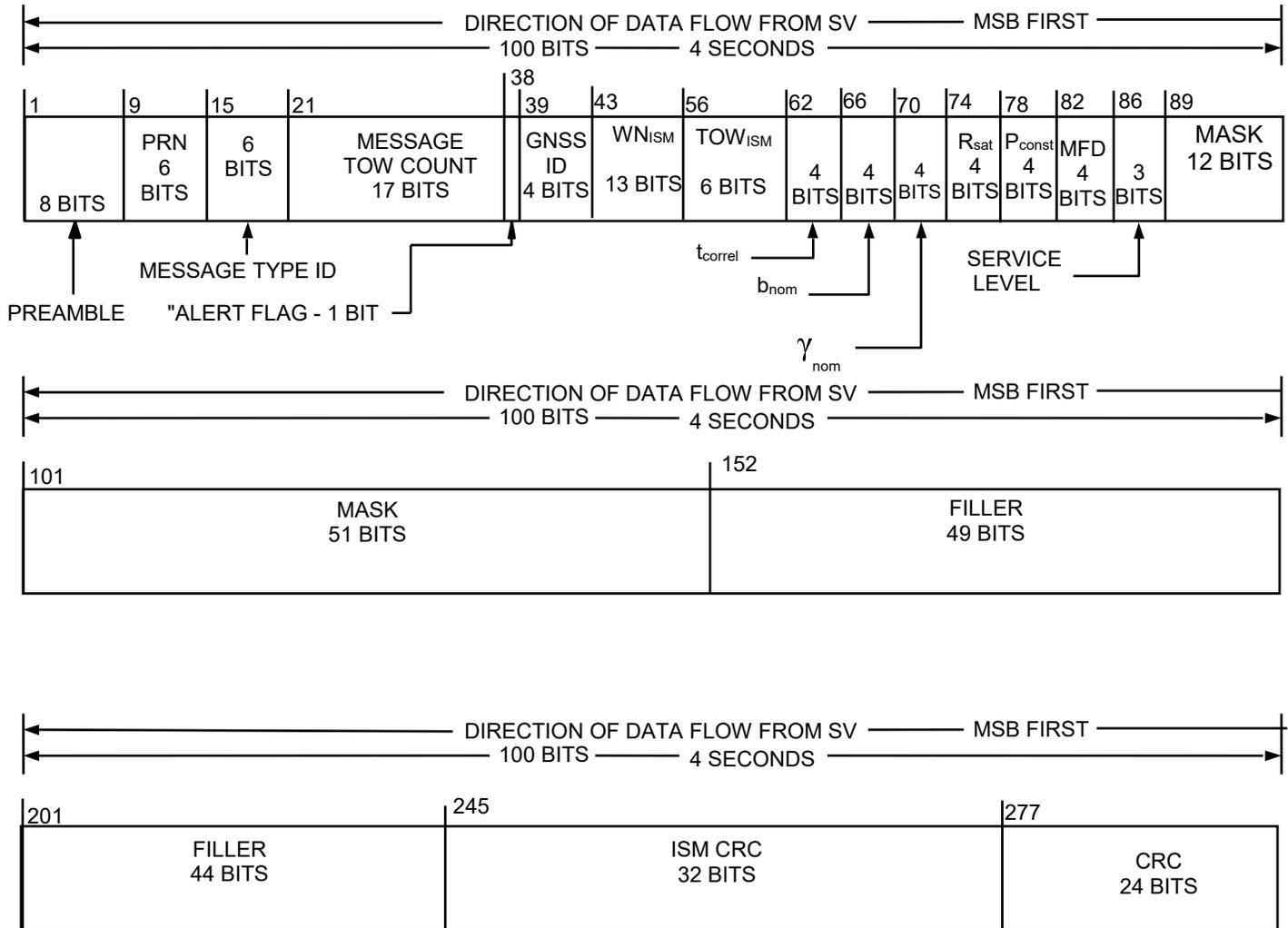
THIS DOCUMENT SPECIFIES TECHNICAL REQUIREMENTS AND NOTHING HEREIN CONTAINED SHALL BE DEEMED TO ALTER THE TERMS OF ANY CONTRACT OR PURCHASE ORDER BETWEEN ALL PARTIES AFFECTED.	Interface Control Contractor: SAIC (GPS SE&I) 200 N. Pacific Coast Highway, Suite 1800 El Segundo, CA 90245 CODE IDENT 66RP1
--	--

**IS200-1808:**

**Section Number:**

30.3.3.0-30

**WAS:**



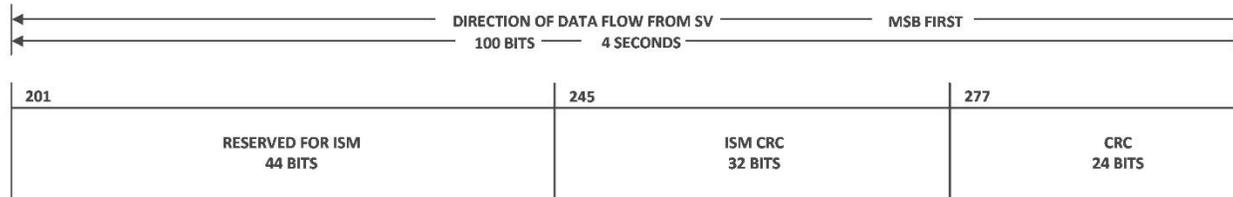
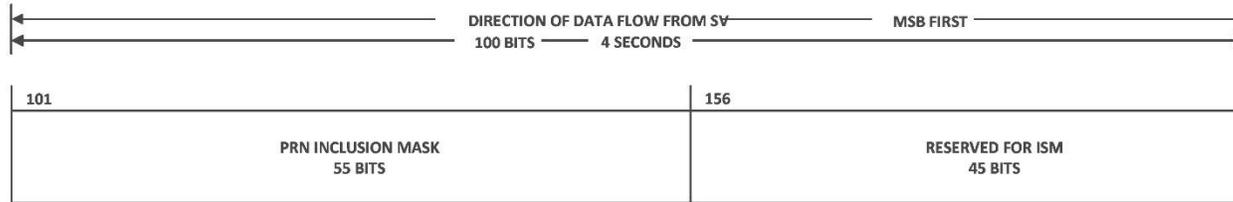
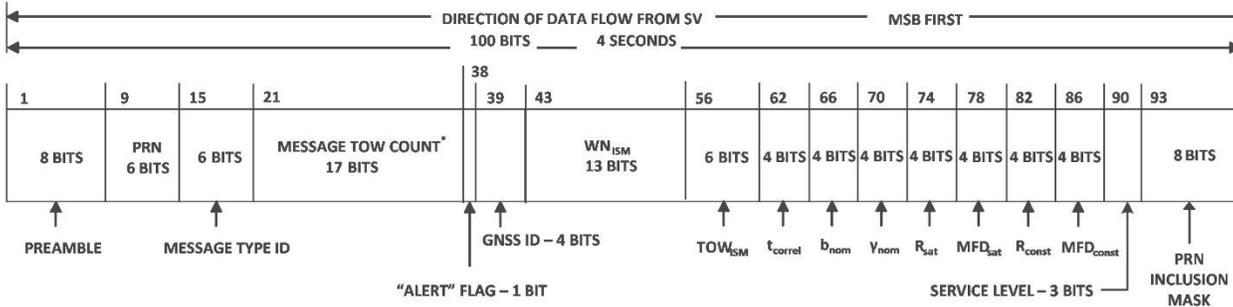
\* MESSAGE TOW COUNT = 17 MSBs OF ACTUAL TOW COUNT AT START OF NEXT 12-SECOND MESSAGE

**Redlines:**

<not available for graphics>

- MFD<sub>sat</sub> has been added, pushing the other fields to the “right” 4 bits.
- P<sub>const</sub> has been replaced with R<sub>const</sub>, which is a rate instead of a probability.
- MFD has been renamed MFD<sub>const</sub> to differentiate it from the mean fault duration for the satellite.
- FILLER at 93 bits has been renamed RESERVED FOR ISM at 89 bits.

**IS:**



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

**Rationale:**

As part of the Pconst to Rconst Conversion, the figure needs adjustment of “Pxxx” to “Rxxx” and “MFDxxx” (T. Anthony)

IS200-1770:

Section Number:

30.3.3.10.1.0-6

WAS:

Parameter	No. of Bits**	Scale Factor (LSB)	Valid Range***	Units
GNSS ID	4			
WN <sub>ISM</sub>	13	1		weeks
TOW <sub>ISM</sub>	6	4	0 to 164	hours
t <sub>correl</sub>	4		0 to 12	hours
b <sub>nom</sub>	4		0 to 2	meters
γ <sub>nom</sub>	4		0 to 2	
R <sub>sat</sub>	4		1x10 <sup>-3</sup> to 3.16x10 <sup>-10</sup>	/hours
P <sub>const</sub>	4		1x10 <sup>-3</sup> to 3.16 x10 <sup>-10</sup>	
MFD	4		0.25 to 24	hours
Service Level*	3			
Mask****	63			

\* See Table 30-XIb for Service Level Descriptions  
\*\* See Figure 30-14a for complete bit allocation in Message Type 40  
\*\*\* Unless otherwise indicated in this column, valid range is the maximum range attainable with indicated bit allocation and scale factor  
\*\*\*\* See Table 30-XIb for Mask bit mapping

Redlines:

Parameter	No. of Bits**	Scale Factor (LSB)	Valid Range***	Units
GNSS ID	4		<a href="#">See text</a>	
$WN_{ISM}$	13	1	<a href="#">0 to 8191</a>	weeks
$TOW_{ISM}$	6	4	0 to 164	hours
$t_{correl}$	4		<del>0 to 12</del> <a href="#">See text</a>	<del>hours</del>
$b_{nom}$	4		<del>0 to 2</del> <a href="#">See text</a>	<del>meters</del>
$\gamma_{nom}$	4		<del>0 to 2</del> <a href="#">See text</a>	
$R_{sat}$	4		<del><math>1 \times 10^{-3}</math> to <math>3.16 \times 10^{-10}</math></del> <a href="#">See text</a>	<del>/hours</del>
$MFD_{sat}$	<u>4</u>		<a href="#">See text</a>	
$PR_{const}$	<u>4</u>		<a href="#">See text</a>	
$MFD_{const}$	4		<del>0.25 to 24</del> <a href="#">See text</a>	<del>hours</del>
Service Level***	3		<a href="#">See text</a>	
<a href="#">PRN Inclusion</a> Mask ****	63		<a href="#">See text</a>	
<p>* See Figure 30-14a for complete bit allocation in Message Type 40</p> <p>** Unless otherwise indicated in this column, valid range is the maximum range attainable with indicated bit allocation and scale factor</p> <p>*** See Table 30-XIb for Service Level Descriptions</p> <p>**** See Table 30-XI<b>bc</b> for <a href="#">PRN Inclusion</a> Mask bit mapping</p>				

IS:

Parameter	No. of Bits*	Scale Factor (LSB)	Valid Range**	Units
GNSS ID	4		See text	
$WN_{ISM}$	13	1	0 to 8191	weeks
$TOW_{ISM}$	6	4	0 to 164	hours
$t_{correl}$	4		See text	
$b_{nom}$	4		See text	
$\gamma_{nom}$	4		See text	
$R_{sat}$	4		See text	
$MFD_{sat}$	4		See text	
$R_{const}$	4		See text	
$MFD_{const}$	4		See text	
Service Level***	3		See text	
PRN Inclusion Mask ****	63		See text	
<p>* See Figure 30-14a for complete bit allocation in Message Type 40</p> <p>** Unless otherwise indicated in this column, valid range is the maximum range attainable with indicated bit allocation and scale factor</p> <p>*** See Table 30-XIb for Service Level Descriptions</p> <p>**** See Table 30-XIc for PRN Inclusion Mask bit mapping</p>				

**Rationale:**

As part of the Pconst to Rconst Conversion, the table needs adjustment of “Pxxx” to “Rxxx” and “MFDxxx” (T. Anthony)  
 CRM #1 4/26/2022 Included "PRN Inclusion" into the \*\*\*\* comment so normalize terminology across the table. (T. Anthony)

5/18/2022 CRM #2 Restored the 2nd note to "Unless otherwise indicated in this column, valid range is the maximum range attainable with indicated bit allocation and scale factor" because th replacement note alluded to the existence of RSAM, which we decided to not document in public documents during RFC-444 (T. Anthony)

**IS200-1797:****Section Number:**

30.3.3.10.1.7.0-1

**WAS:**

Bits 74 through 77 of Message Type 40 shall provide the assumed Satellite Fault Rate ( $R_{sat}$ ) value for ARAIM at the current time for the associated GNSS constellation.

**Redlines:**

Bits 74 through 77 of Message Type 40 shall provide the assumed ~~Satellite~~ ~~satellite~~ ~~Fault~~ ~~fault~~ ~~Rate~~ ~~rate~~ ( $R_{sat}$ ) value for ARAIM at the current time for the associated GNSS constellation.

**IS:**

Bits 74 through 77 of Message Type 40 shall provide the assumed satellite fault rate ( $R_{sat}$ ) value for ARAIM at the current time for the associated GNSS constellation.

**Rationale:**

CRM #3 4/26/2022 uncapitalize "satellite fault rate" (T. Anthony)

---

**IS200-2126:**

Insertion after object IS200-1796

**Section Number:**

30.3.3.10.1.8

**WAS:**

&lt;INSERTED OBJECT&gt;

**Redlines:**

*Object Heading* 30.3.3.10.1.8 ~~Mean Duration of a Satellite Fault~~

*Object Type:* ~~Header~~

**IS:**

*Object Heading* 30.3.3.10.1.8 Mean Duration of a Satellite Fault

*Object Type:* Header

**Rationale:**

As part of the Pconst to Rconst Conversion, the message format has added MFD<sub>sat</sub>. (T. Anthony)

CRM #31 4/26/2022 The precedent was set in RFC-450 to expand MFD to mean duration of a xxx fault. (T. Anthony)

---

**IS200-2127:**

Insertion below object IS200-2126

**Section Number:**

30.3.3.10.1.8.0-1

**WAS:**

&lt;INSERTED OBJECT&gt;

**Redlines:**

~~Bits 78 through 81 of Message Type 40 shall provide the assumed mean duration of a satellite fault (MFD<sub>sat</sub>) value for ARAIM at the current time for the associated GNSS constellation.~~

*Object Type:* ~~Requirement~~

**IS:**

Bits 78 through 81 of Message Type 40 shall provide the assumed mean duration of a satellite fault (MFD<sub>sat</sub>) value for ARAIM at the current time for the associated GNSS constellation.

*Object Type:* Requirement

**Rationale:**

As part of the Pconst to Rconst Conversion, the message format MFD<sub>sat</sub> has been added. (T. Anthony)

CRM #31 4/26/2022 The precedent was set in RFC-450 to expand MFD to mean duration of a xxx fault. (T. Anthony)

---

**IS200-2128:**

Insertion after object IS200-2127

**Section Number:**

30.3.3.10.1.8.0-2

**WAS:**

<INSERTED OBJECT>

**Redlines:**

The four bits are defined as follows:

0000 = 0.25 hours

0001 = 0.33 hours

0010 = 0.50 hours

0011 = 0.67 hours

0100 = 0.83 hours

0101 = 1 hour

0110 = 1.25 hours

0111 = 1.50 hours

1000 = 1.75 hours

1001 = 2 hours

1010 = 3 hours

1011 = 4 hours

1100 = 7 hours

1101 = 10 hours

1110 = 17 hours

1111 = 24 hours

*Object Type:* Info-Only

**IS:**

The four bits are defined as follows:

0000 = 0.25 hours

0001 = 0.33 hours

0010 = 0.50 hours

0011 = 0.67 hours

0100 = 0.83 hours

0101 = 1 hour

0110 = 1.25 hours

0111 = 1.50 hours

1000 = 1.75 hours

1001 = 2 hours

1010 = 3 hours

1011 = 4 hours

1100 = 7 hours

1101 = 10 hours

1110 = 17 hours

1111 = 24 hours

*Object Type:* Info-Only

**Rationale:**

As part of the Pconst to Rconst Conversion, the message format has been modified to accomodate MFDsat. (T. Anthony)

---

**IS200-1787:****Section Number:**

30.3.3.10.1.9

**WAS:***Object Heading* 30.3.3.10.1.9 Constellation Fault Probability**Redlines:***Object Heading* 30.3.3.10.1.9 Constellation Fault ~~Probability~~[Rate](#)**IS:***Object Heading* 30.3.3.10.1.9 Constellation Fault Rate**Rationale:**

As part of the Pconst to Rconst Conversion, the message probabilities have changed to rates. (T. Anthony)

---

**IS200-1788:****Section Number:**

30.3.3.10.1.9.0-1

**WAS:**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.*Object Type:* <blank>**Redlines:**Bits ~~78~~82 through ~~81~~85 of Message Type 40 shall provide the assumed ~~Constellation~~[constellation](#) ~~Fault~~[fault](#) ~~Probability~~[rate](#) (~~Pconst~~[Rconst](#)) value for ARAIM at the current time for the associated GNSS constellation.*Object Type:* ~~<blank>~~[Requirement](#)**IS:**Bits 82 through 85 of Message Type 40 shall provide the assumed constellation fault rate ( $R_{const}$ ) value for ARAIM at the current time for the associated GNSS constellation.*Object Type:* Requirement**Rationale:**

As part of Pconst to Rconst Conversion, the message format has changed and probabilities have changed to rates. (T. Anthony)

**IS200-1789:**

**Section Number:**

30.3.3.10.1.9.0-2

**WAS:**

The four bits are defined as follows:

0000 =  $3.16 \times 10^{-3}$   
0001 =  $1 \times 10^{-3}$   
0010 =  $3.16 \times 10^{-4}$   
0011 =  $1 \times 10^{-4}$   
0100 =  $3.16 \times 10^{-5}$   
0101 =  $1 \times 10^{-5}$   
0110 =  $3.16 \times 10^{-6}$   
0111 =  $1 \times 10^{-6}$   
1000 =  $3.16 \times 10^{-7}$   
1001 =  $1 \times 10^{-7}$   
1010 =  $3.16 \times 10^{-8}$   
1011 =  $1 \times 10^{-8}$   
1100 =  $3.16 \times 10^{-9}$   
1101 =  $1 \times 10^{-9}$   
1110 =  $3.16 \times 10^{-10}$   
1111 = RESERVED

**Redlines:**

The four bits are defined as follows:

0000 =  $3.16 \times 10^{-34}$  /hour  
0001 =  $1 \times 10^{-34}$  /hour  
0010 =  $3.16 \times 10^{-45}$  /hour  
0011 =  $1 \times 10^{-45}$  /hour  
0100 =  $3.16 \times 10^{-56}$  /hour  
0101 =  $1 \times 10^{-56}$  /hour  
0110 =  $3.16 \times 10^{-67}$  /hour  
0111 =  $1 \times 10^{-67}$  /hour  
1000 =  $3.16 \times 10^{-78}$  /hour  
1001 =  $1 \times 10^{-78}$  /hour  
1010 =  $3.16 \times 10^{-89}$  /hour  
1011 =  $1 \times 10^{-89}$  /hour  
1100 =  $3.16 \times 10^{-910}$  /hour  
1101 =  $1 \times 10^{-910}$  /hour  
1110 =  $3.16 \times 10^{-1011}$  /hour  
1111 = RESERVED

**IS:**

The four bits are defined as follows:

0000 =  $3.16 \times 10^{-4}$  /hour

0001 =  $1 \times 10^{-4}$  /hour

0010 =  $3.16 \times 10^{-5}$  /hour

0011 =  $1 \times 10^{-5}$  /hour

0100 =  $3.16 \times 10^{-6}$  /hour

0101 =  $1 \times 10^{-6}$  /hour

0110 =  $3.16 \times 10^{-7}$  /hour

0111 =  $1 \times 10^{-7}$  /hour

1000 =  $3.16 \times 10^{-8}$  /hour

1001 =  $1 \times 10^{-8}$  /hour

1010 =  $3.16 \times 10^{-9}$  /hour

1011 =  $1 \times 10^{-9}$  /hour

1100 =  $3.16 \times 10^{-10}$  /hour

1101 =  $1 \times 10^{-10}$  /hour

1110 =  $3.16 \times 10^{-11}$  /hour

1111 = RESERVED

**Rationale:**

As part of the Pconst to Rconst Conversion, the lexicon has changed from a probability to a rate. (T. Anthony)

---

**IS200-1799:****Section Number:**

30.3.3.10.1.10

**WAS:***Object Heading 30.3.3.10.1.10 Mean Fault Duration***Redlines:***Object Heading 30.3.3.10.1.10 Mean ~~Fault~~ Duration [of a Constellation Fault](#)***IS:***Object Heading 30.3.3.10.1.10 Mean Duration of a Constellation Fault***Rationale:**

As part of the Pconst to Rconst Conversion, the message format now has an MFD designated for the constellation. (T. Anthony)

CRM #32 4/26/2022 The precedent was set in RFC-450 to expand MFD to mean duration of a xxx fault. (T. Anthony)

---

**IS200-1800:****Section Number:**

30.3.3.10.1.10.0-1

**WAS:**

Bits 82 through 85 of Message Type 40 shall provide the assumed Mean Fault Duration (MFD) value for ARAIM at the current time for the associated GNSS constellation.

**Redlines:**

Bits ~~8286~~ through ~~8589~~ of Message Type 40 shall provide the assumed ~~Meanmean Faultduration~~ [Duration of a constellation fault](#) (~~MFD~~[MFDconst](#)) value for ARAIM at the current time for the associated GNSS constellation.

**IS:**

Bits 86 through 89 of Message Type 40 shall provide the assumed mean duration of a constellation fault (MFD<sub>const</sub>) value for ARAIM at the current time for the associated GNSS constellation.

**Rationale:**

As part of the Pconst to Rconst Conversion, the message format has changed. (T. Anthony)

CRM #32 4/26/2022 The precedent was set in RFC-450 to expand MFD to mean duration of a xxx fault. (T. Anthony)

---

**IS200-1801:**

**Section Number:**

30.3.3.10.1.10.0-2

**WAS:**

The four bits are defined as follows:

0000 = 0.25 hours

0001 = 0.33 hours

0010 = 0.50 hours

0011 = 0.67 hours

0100 = 0.83 hours

0101 = 1 hour

0110 = 1.25 hours

0111 = 1.50 hours

1000 = 1.75 hours

1001 = 2 hours

1010 = 3 hours

1011 = 4 hours

1100 = 7 hours

1101 = 10 hours

1110 = 17 hours

1111 = 24 hours

**Redlines:**

The four bits are defined as follows:

0000 = 0.25 hours

0001 = ~~0.33~~5 hours

0010 = ~~0.50~~1 ~~hours~~hour

0011 = ~~0.67~~2 hours

0100 = ~~0.83~~4 hours

0101 = ~~1~~6 ~~hour~~hours

0110 = ~~1.25~~8 hours

0111 = ~~1.50~~10 hours

1000 = ~~1.75~~12 hours

1001 = ~~2~~16 hours

1010 = ~~3~~20 hours

1011 = ~~4~~24 hours

1100 = ~~7~~30 hours

1101 = ~~10~~36 hours

1110 = ~~17~~42 hours

1111 = ~~24~~48 hours

**IS:**

The four bits are defined as follows:

0000 = 0.25 hours

0001 = 0.5 hours

0010 = 1 hour

0011 = 2 hours

0100 = 4 hours

0101 = 6 hours

0110 = 8 hours

0111 = 10 hours

1000 = 12 hours

1001 = 16 hours

1010 = 20 hours

1011 = 24 hours

1100 = 30 hours

1101 = 36 hours

1110 = 42 hours

1111 = 48 hours

**Rationale:**

As part of the Pconst to Rconst Conversion, the this MFD lexicon has changed. (T. Anthony)

---

**IS200-1785:****Section Number:**

30.3.3.10.1.11.0-1

**WAS:**

Bits 86 through 88 of Message Type 40 shall provide the Service Level, as described in Table 30-XIb, applicable to a given page of the ISM data issue.

**Redlines:**

Bits ~~86~~90 through ~~88~~92 of Message Type 40 shall provide the Service Level, as described in Table 30-XIb, applicable to a given page of the ISM data issue.

**IS:**

Bits 90 through 92 of Message Type 40 shall provide the Service Level, as described in Table 30-XIb, applicable to a given page of the ISM data issue.

**Rationale:**

As part of the Pconst to Rconst Conversion, this field has been moved. (T. Anthony)

---

**IS200-1793:****Section Number:**

30.3.3.10.1.12

**WAS:**

*Object Heading 30.3.3.10.1.12 Satellite Mask*

**Redlines:**

*Object Heading 30.3.3.10.1.12 ~~Satellite~~PRN Inclusion Mask*

**IS:**

*Object Heading 30.3.3.10.1.12 PRN Inclusion Mask*

**Rationale:**

As part of the Pconst to Rconst Conversion, this field has a more descriptive name. (T. Anthony)

---

**IS200-1794:****Section Number:**

30.3.3.10.1.12.0-1

**WAS:**

Bits 89 through 151 of Message Type 40 shall provide the PRN inclusion mask. Refer to Table 30-XIc for complete GNSS PRN mapping.

**Redlines:**

Bits ~~89~~93 through ~~151~~155 of Message Type 40 shall provide the PRN inclusion mask. Refer to Table 30-XIc for complete GNSS PRN mapping.

**IS:**

Bits 93 through 155 of Message Type 40 shall provide the PRN inclusion mask. Refer to Table 30-XIc for complete GNSS PRN mapping.

**Rationale:**

CRM #5, 4/26/2022 As part of the Conversion from Pconst to Rconst, the PRN Inclusion Mask field is shifted right 4 bits. (T. Anthony)

---

**IS200-1815:**

**Section Number:**

30.3.3.10.1.12.0-3

**WAS:**

Table 30-XIc PRN Mapping

**Redlines:**

Table 30-XIc PRN [Inclusion Mask](#) Mapping

**IS:**

Table 30-XIc PRN Inclusion Mask Mapping

**Rationale:**

CRM #1 4/26/2022 Reworded the Table Caption to match the reference wording in Table 30-XIa – ISM Parameters at Note \*\*\*\* (T. Anthony)

---

**IS200-1816:****Section Number:**

30.3.3.10.1.12.0-4

**WAS:**

Bits	Galileo	GLONASS	BeiDou	GPS	SBAS	QZSS	IRNSS
89	SVID 1	Freq. 1	RCN 1	PRN 1	PRN 120	PRN 183	PRN ID-1
90	SVID 2	Freq. 2	RCN 2	PRN 2	PRN 121	PRN 184	PRN ID-2
91	SVID 3	Freq. 3	RCN 3	PRN 3	PRN 122	PRN 185	PRN ID-3
92	SVID 4	Freq. 4	RCN 4	PRN 4	PRN 123	PRN 186	PRN ID-4
93	SVID 5	Freq. 5	RCN 5	PRN 5	PRN 124	PRN 187	PRN ID-5
94	SVID 6	Freq. 6	RCN 6	PRN 6	PRN 125	PRN 188	PRN ID-6
95	SVID 7	Freq. 7	RCN 7	PRN 7	PRN 126	PRN 189	PRN ID-7
96	SVID 8	Freq. 8	RCN 8	PRN 8	PRN 127	PRN 190	Reserved
97	SVID 9	Freq. 9	RCN 9	PRN 9	PRN 128	PRN 191	Reserved
98	SVID 10	Freq. 10	RCN 10	PRN 10	PRN 129	PRN 192	Reserved
99	SVID 11	Freq. 11	RCN 11	PRN 11	PRN 130	PRN 193	Reserved
100	SVID 12	Freq. 12	RCN 12	PRN 12	PRN 131	PRN 194	Reserved
101	SVID 13	Freq. 13	RCN 13	PRN 13	PRN 132	PRN 195	Reserved
102	SVID 14	Freq. 14	RCN 14	PRN 14	PRN 133	PRN 196	Reserved
103	SVID 15	Freq. 15	RCN 15	PRN 15	PRN 134	PRN 197	Reserved
104	SVID 16	Freq. 16	RCN 16	PRN 16	PRN 135	PRN 198	Reserved
105	SVID 17	Freq. 17	RCN 17	PRN 17	PRN 136	PRN 199	Reserved
106	SVID 18	Freq. 18	RCN 18	PRN 18	PRN 137	PRN 200	Reserved
107	SVID 19	Freq. 19	RCN 19	PRN 19	PRN 138	PRN 201	Reserved
108	SVID 20	Freq. 20	RCN 20	PRN 20	PRN 139	PRN 202	Reserved
109	SVID 21	Freq. 21	RCN 21	PRN 21	PRN 140	Reserved	Reserved
110	SVID 22	Freq. 22	RCN 22	PRN 22	PRN 141	Reserved	Reserved
111	SVID 23	Freq. 23	RCN 23	PRN 23	PRN 142	Reserved	Reserved
112	SVID 24	Freq. 24	RCN 24	PRN 24	PRN 143	Reserved	Reserved
113	SVID 25	Freq. 25	RCN 25	PRN 25	PRN 144	Reserved	Reserved
114	SVID 26	Freq. 26	RCN 26	PRN 26	PRN 145	Reserved	Reserved
115	SVID 27	Freq. 27	RCN 27	PRN 27	PRN 146	Reserved	Reserved
116	SVID 28	Freq. 28	RCN 28	PRN 28	PRN 147	Reserved	Reserved
117	SVID 29	Freq. 29	RCN 29	PRN 29	PRN 148	Reserved	Reserved
118	SVID 30	Freq. 30	RCN 30	PRN 30	PRN 149	Reserved	Reserved
119	SVID 31	Freq. 31	RCN 31	PRN 31	PRN 150	Reserved	Reserved
120	SVID 32	Freq. 32	RCN 32	PRN 32	PRN 151	Reserved	Reserved
121	SVID 33	Reserved	RCN 33	PRN 33	PRN 152	Reserved	Reserved
122	SVID 34	Reserved	RCN 34	PRN 34	PRN 153	Reserved	Reserved
123	SVID 35	Reserved	RCN 35	PRN 35	PRN 154	Reserved	Reserved
124	SVID 36	Reserved	RCN 36	PRN 36	PRN 155	Reserved	Reserved
125	Reserved	Reserved	RCN 37	PRN 37	PRN 156	Reserved	Reserved
126	Reserved	Reserved	Reserved	PRN 38	PRN 157	Reserved	Reserved
127	Reserved	Reserved	Reserved	PRN 39	PRN 158	Reserved	Reserved
128	Reserved	Reserved	Reserved	PRN 40	Reserved	Reserved	Reserved
129	Reserved	Reserved	Reserved	PRN 41	Reserved	Reserved	Reserved
130	Reserved	Reserved	Reserved	PRN 42	Reserved	Reserved	Reserved
131	Reserved	Reserved	Reserved	PRN 43	Reserved	Reserved	Reserved
132	Reserved	Reserved	Reserved	PRN 44	Reserved	Reserved	Reserved
133	Reserved	Reserved	Reserved	PRN 45	Reserved	Reserved	Reserved
134	Reserved	Reserved	Reserved	PRN 46	Reserved	Reserved	Reserved
135	Reserved	Reserved	Reserved	PRN 47	Reserved	Reserved	Reserved

136	Reserved	Reserved	Reserved	PRN 48	Reserved	Reserved	Reserved
137	Reserved	Reserved	Reserved	PRN 49	Reserved	Reserved	Reserved
138	Reserved	Reserved	Reserved	PRN 50	Reserved	Reserved	Reserved
139	Reserved	Reserved	Reserved	PRN 51	Reserved	Reserved	Reserved
140	Reserved	Reserved	Reserved	PRN 52	Reserved	Reserved	Reserved
141	Reserved	Reserved	Reserved	PRN 53	Reserved	Reserved	Reserved
142	Reserved	Reserved	Reserved	PRN 54	Reserved	Reserved	Reserved
143	Reserved	Reserved	Reserved	PRN 55	Reserved	Reserved	Reserved
144	Reserved	Reserved	Reserved	PRN 56	Reserved	Reserved	Reserved
145	Reserved	Reserved	Reserved	PRN 57	Reserved	Reserved	Reserved
146	Reserved	Reserved	Reserved	PRN 58	Reserved	Reserved	Reserved
147	Reserved	Reserved	Reserved	PRN 59	Reserved	Reserved	Reserved
148	Reserved	Reserved	Reserved	PRN 60	Reserved	Reserved	Reserved
149	Reserved	Reserved	Reserved	PRN 61	Reserved	Reserved	Reserved
150	Reserved	Reserved	Reserved	PRN 62	Reserved	Reserved	Reserved
151	Reserved	Reserved	Reserved	PRN 63	Reserved	Reserved	Reserved
SVID = Space Vehicle ID Freq. = Carrier Frequency Number RCN = Ranging Code Number PRN = Pseudorandom Noise Number							

## Redlines:

Bits	Galileo	GLONASS	BeiDou	GPS	SBAS	QZSS	IRNSS
<del>89</del> 93	SVID 1	Freq. 1	RCN 1	PRN 1	PRN 120	PRN 183	PRN ID-1
<del>90</del> 94	SVID 2	Freq. 2	RCN 2	PRN 2	PRN 121	PRN 184	PRN ID-2
<del>91</del> 95	SVID 3	Freq. 3	RCN 3	PRN 3	PRN 122	PRN 185	PRN ID-3
<del>92</del> 96	SVID 4	Freq. 4	RCN 4	PRN 4	PRN 123	PRN 186	PRN ID-4
<del>93</del> 97	SVID 5	Freq. 5	RCN 5	PRN 5	PRN 124	PRN 187	PRN ID-5
<del>94</del> 98	SVID 6	Freq. 6	RCN 6	PRN 6	PRN 125	PRN 188	PRN ID-6
<del>95</del> 99	SVID 7	Freq. 7	RCN 7	PRN 7	PRN 126	PRN 189	PRN ID-7
<del>96</del> 100	SVID 8	Freq. 8	RCN 8	PRN 8	PRN 127	PRN 190	Reserved
<del>97</del> 101	SVID 9	Freq. 9	RCN 9	PRN 9	PRN 128	PRN 191	Reserved
<del>98</del> 102	SVID 10	Freq. 10	RCN 10	PRN 10	PRN 129	PRN 192	Reserved
<del>99</del> 103	SVID 11	Freq. 11	RCN 11	PRN 11	PRN 130	PRN 193	Reserved
<del>100</del> 104	SVID 12	Freq. 12	RCN 12	PRN 12	PRN 131	PRN 194	Reserved
<del>101</del> 105	SVID 13	Freq. 13	RCN 13	PRN 13	PRN 132	PRN 195	Reserved
<del>102</del> 106	SVID 14	Freq. 14	RCN 14	PRN 14	PRN 133	PRN 196	Reserved
<del>103</del> 107	SVID 15	Freq. 15	RCN 15	PRN 15	PRN 134	PRN 197	Reserved
<del>104</del> 108	SVID 16	Freq. 16	RCN 16	PRN 16	PRN 135	PRN 198	Reserved
<del>105</del> 109	SVID 17	Freq. 17	RCN 17	PRN 17	PRN 136	PRN 199	Reserved
<del>106</del> 110	SVID 18	Freq. 18	RCN 18	PRN 18	PRN 137	PRN 200	Reserved
<del>107</del> 111	SVID 19	Freq. 19	RCN 19	PRN 19	PRN 138	PRN 201	Reserved
<del>108</del> 112	SVID 20	Freq. 20	RCN 20	PRN 20	PRN 139	PRN 202	Reserved
<del>109</del> 113	SVID 21	Freq. 21	RCN 21	PRN 21	PRN 140	Reserved	Reserved
<del>110</del> 114	SVID 22	Freq. 22	RCN 22	PRN 22	PRN 141	Reserved	Reserved
<del>111</del> 115	SVID 23	Freq. 23	RCN 23	PRN 23	PRN 142	Reserved	Reserved
<del>112</del> 116	SVID 24	Freq. 24	RCN 24	PRN 24	PRN 143	Reserved	Reserved
<del>113</del> 117	SVID 25	Freq. 25	RCN 25	PRN 25	PRN 144	Reserved	Reserved
<del>114</del> 118	SVID 26	Freq. 26	RCN 26	PRN 26	PRN 145	Reserved	Reserved
<del>115</del> 119	SVID 27	Freq. 27	RCN 27	PRN 27	PRN 146	Reserved	Reserved
<del>116</del> 120	SVID 28	Freq. 28	RCN 28	PRN 28	PRN 147	Reserved	Reserved
<del>117</del> 121	SVID 29	Freq. 29	RCN 29	PRN 29	PRN 148	Reserved	Reserved
<del>118</del> 122	SVID 30	Freq. 30	RCN 30	PRN 30	PRN 149	Reserved	Reserved
<del>119</del> 123	SVID 31	Freq. 31	RCN 31	PRN 31	PRN 150	Reserved	Reserved
<del>120</del> 124	SVID 32	Freq. 32	RCN 32	PRN 32	PRN 151	Reserved	Reserved
<del>121</del> 125	SVID 33	Reserved	RCN 33	PRN 33	PRN 152	Reserved	Reserved
<del>122</del> 126	SVID 34	Reserved	RCN 34	PRN 34	PRN 153	Reserved	Reserved
<del>123</del> 127	SVID 35	Reserved	RCN 35	PRN 35	PRN 154	Reserved	Reserved
<del>124</del> 128	SVID 36	Reserved	RCN 36	PRN 36	PRN 155	Reserved	Reserved
<del>125</del> 129	Reserved	Reserved	RCN 37	PRN 37	PRN 156	Reserved	Reserved
<del>126</del> 130	Reserved	Reserved	Reserved	PRN 38	PRN 157	Reserved	Reserved
<del>127</del> 131	Reserved	Reserved	Reserved	PRN 39	PRN 158	Reserved	Reserved
<del>128</del> 132	Reserved	Reserved	Reserved	PRN 40	Reserved	Reserved	Reserved
<del>129</del> 133	Reserved	Reserved	Reserved	PRN 41	Reserved	Reserved	Reserved
<del>130</del> 134	Reserved	Reserved	Reserved	PRN 42	Reserved	Reserved	Reserved
<del>131</del> 135	Reserved	Reserved	Reserved	PRN 43	Reserved	Reserved	Reserved
<del>132</del> 136	Reserved	Reserved	Reserved	PRN 44	Reserved	Reserved	Reserved
<del>133</del> 137	Reserved	Reserved	Reserved	PRN 45	Reserved	Reserved	Reserved
<del>134</del> 138	Reserved	Reserved	Reserved	PRN 46	Reserved	Reserved	Reserved
<del>135</del> 139	Reserved	Reserved	Reserved	PRN 47	Reserved	Reserved	Reserved
<del>136</del> 140	Reserved	Reserved	Reserved	PRN 48	Reserved	Reserved	Reserved

Bits	Galileo	GLONASS	BeiDou	GPS	SBAS	QZSS	IRNSS
<del>137</del> 141	Reserved	Reserved	Reserved	PRN 49	Reserved	Reserved	Reserved
<del>138</del> 142	Reserved	Reserved	Reserved	PRN 50	Reserved	Reserved	Reserved
<del>139</del> 143	Reserved	Reserved	Reserved	PRN 51	Reserved	Reserved	Reserved
<del>140</del> 144	Reserved	Reserved	Reserved	PRN 52	Reserved	Reserved	Reserved
<del>141</del> 145	Reserved	Reserved	Reserved	PRN 53	Reserved	Reserved	Reserved
<del>142</del> 146	Reserved	Reserved	Reserved	PRN 54	Reserved	Reserved	Reserved
<del>143</del> 147	Reserved	Reserved	Reserved	PRN 55	Reserved	Reserved	Reserved
<del>144</del> 148	Reserved	Reserved	Reserved	PRN 56	Reserved	Reserved	Reserved
<del>145</del> 149	Reserved	Reserved	Reserved	PRN 57	Reserved	Reserved	Reserved
<del>146</del> 150	Reserved	Reserved	Reserved	PRN 58	Reserved	Reserved	Reserved
<del>147</del> 151	Reserved	Reserved	Reserved	PRN 59	Reserved	Reserved	Reserved
<del>148</del> 152	Reserved	Reserved	Reserved	PRN 60	Reserved	Reserved	Reserved
<del>149</del> 153	Reserved	Reserved	Reserved	PRN 61	Reserved	Reserved	Reserved
<del>150</del> 154	Reserved	Reserved	Reserved	PRN 62	Reserved	Reserved	Reserved
<del>151</del> 155	Reserved	Reserved	Reserved	PRN 63	Reserved	Reserved	Reserved
SVID = Space Vehicle ID Freq. = Carrier Frequency Number RCN = Ranging Code Number PRN = Pseudorandom Noise Number							

IS:

Bits	Galileo	GLONASS	BeiDou	GPS	SBAS	QZSS	IRNSS
93	SVID 1	Freq. 1	RCN 1	PRN 1	PRN 120	PRN 183	PRN ID-1
94	SVID 2	Freq. 2	RCN 2	PRN 2	PRN 121	PRN 184	PRN ID-2
95	SVID 3	Freq. 3	RCN 3	PRN 3	PRN 122	PRN 185	PRN ID-3
96	SVID 4	Freq. 4	RCN 4	PRN 4	PRN 123	PRN 186	PRN ID-4
97	SVID 5	Freq. 5	RCN 5	PRN 5	PRN 124	PRN 187	PRN ID-5
98	SVID 6	Freq. 6	RCN 6	PRN 6	PRN 125	PRN 188	PRN ID-6
99	SVID 7	Freq. 7	RCN 7	PRN 7	PRN 126	PRN 189	PRN ID-7
100	SVID 8	Freq. 8	RCN 8	PRN 8	PRN 127	PRN 190	Reserved
101	SVID 9	Freq. 9	RCN 9	PRN 9	PRN 128	PRN 191	Reserved
102	SVID 10	Freq. 10	RCN 10	PRN 10	PRN 129	PRN 192	Reserved
103	SVID 11	Freq. 11	RCN 11	PRN 11	PRN 130	PRN 193	Reserved
104	SVID 12	Freq. 12	RCN 12	PRN 12	PRN 131	PRN 194	Reserved
105	SVID 13	Freq. 13	RCN 13	PRN 13	PRN 132	PRN 195	Reserved
106	SVID 14	Freq. 14	RCN 14	PRN 14	PRN 133	PRN 196	Reserved
107	SVID 15	Freq. 15	RCN 15	PRN 15	PRN 134	PRN 197	Reserved
108	SVID 16	Freq. 16	RCN 16	PRN 16	PRN 135	PRN 198	Reserved
109	SVID 17	Freq. 17	RCN 17	PRN 17	PRN 136	PRN 199	Reserved
110	SVID 18	Freq. 18	RCN 18	PRN 18	PRN 137	PRN 200	Reserved
111	SVID 19	Freq. 19	RCN 19	PRN 19	PRN 138	PRN 201	Reserved
112	SVID 20	Freq. 20	RCN 20	PRN 20	PRN 139	PRN 202	Reserved
113	SVID 21	Freq. 21	RCN 21	PRN 21	PRN 140	Reserved	Reserved
114	SVID 22	Freq. 22	RCN 22	PRN 22	PRN 141	Reserved	Reserved
115	SVID 23	Freq. 23	RCN 23	PRN 23	PRN 142	Reserved	Reserved
116	SVID 24	Freq. 24	RCN 24	PRN 24	PRN 143	Reserved	Reserved
117	SVID 25	Freq. 25	RCN 25	PRN 25	PRN 144	Reserved	Reserved
118	SVID 26	Freq. 26	RCN 26	PRN 26	PRN 145	Reserved	Reserved
119	SVID 27	Freq. 27	RCN 27	PRN 27	PRN 146	Reserved	Reserved
120	SVID 28	Freq. 28	RCN 28	PRN 28	PRN 147	Reserved	Reserved
121	SVID 29	Freq. 29	RCN 29	PRN 29	PRN 148	Reserved	Reserved
122	SVID 30	Freq. 30	RCN 30	PRN 30	PRN 149	Reserved	Reserved
123	SVID 31	Freq. 31	RCN 31	PRN 31	PRN 150	Reserved	Reserved
124	SVID 32	Freq. 32	RCN 32	PRN 32	PRN 151	Reserved	Reserved
125	SVID 33	Reserved	RCN 33	PRN 33	PRN 152	Reserved	Reserved
126	SVID 34	Reserved	RCN 34	PRN 34	PRN 153	Reserved	Reserved
127	SVID 35	Reserved	RCN 35	PRN 35	PRN 154	Reserved	Reserved
128	SVID 36	Reserved	RCN 36	PRN 36	PRN 155	Reserved	Reserved
129	Reserved	Reserved	RCN 37	PRN 37	PRN 156	Reserved	Reserved
130	Reserved	Reserved	Reserved	PRN 38	PRN 157	Reserved	Reserved
131	Reserved	Reserved	Reserved	PRN 39	PRN 158	Reserved	Reserved
132	Reserved	Reserved	Reserved	PRN 40	Reserved	Reserved	Reserved
133	Reserved	Reserved	Reserved	PRN 41	Reserved	Reserved	Reserved
134	Reserved	Reserved	Reserved	PRN 42	Reserved	Reserved	Reserved
135	Reserved	Reserved	Reserved	PRN 43	Reserved	Reserved	Reserved
136	Reserved	Reserved	Reserved	PRN 44	Reserved	Reserved	Reserved
137	Reserved	Reserved	Reserved	PRN 45	Reserved	Reserved	Reserved
138	Reserved	Reserved	Reserved	PRN 46	Reserved	Reserved	Reserved
139	Reserved	Reserved	Reserved	PRN 47	Reserved	Reserved	Reserved
140	Reserved	Reserved	Reserved	PRN 48	Reserved	Reserved	Reserved
141	Reserved	Reserved	Reserved	PRN 49	Reserved	Reserved	Reserved
142	Reserved	Reserved	Reserved	PRN 50	Reserved	Reserved	Reserved
143	Reserved	Reserved	Reserved	PRN 51	Reserved	Reserved	Reserved

Bits	Galileo	GLONASS	BeiDou	GPS	SBAS	QZSS	IRNSS
144	Reserved	Reserved	Reserved	PRN 52	Reserved	Reserved	Reserved
145	Reserved	Reserved	Reserved	PRN 53	Reserved	Reserved	Reserved
146	Reserved	Reserved	Reserved	PRN 54	Reserved	Reserved	Reserved
147	Reserved	Reserved	Reserved	PRN 55	Reserved	Reserved	Reserved
148	Reserved	Reserved	Reserved	PRN 56	Reserved	Reserved	Reserved
149	Reserved	Reserved	Reserved	PRN 57	Reserved	Reserved	Reserved
150	Reserved	Reserved	Reserved	PRN 58	Reserved	Reserved	Reserved
151	Reserved	Reserved	Reserved	PRN 59	Reserved	Reserved	Reserved
152	Reserved	Reserved	Reserved	PRN 60	Reserved	Reserved	Reserved
153	Reserved	Reserved	Reserved	PRN 61	Reserved	Reserved	Reserved
154	Reserved	Reserved	Reserved	PRN 62	Reserved	Reserved	Reserved
155	Reserved	Reserved	Reserved	PRN 63	Reserved	Reserved	Reserved
SVID = Space Vehicle ID Freq. = Carrier Frequency Number RCN = Ranging Code Number PRN = Pseudorandom Noise Number							

**Rationale:**

CRM #6, #22 4/26/2022 Update the Mask pattern since the message has shifted right 4 bits to bits 89 through 151 becomes 93 through 155 (T. Anthony)

---

**IS200-2129:**

Insertion after object IS200-1793

**Section Number:**

30.3.3.10.1.13

**WAS:**

<INSERTED OBJECT>

**Redlines:**

*Object Heading* 30.3.3.10.1.13 [Reserved for ISM](#)

*Object Type:* [Header](#)

**IS:**

*Object Heading* 30.3.3.10.1.13 Reserved for ISM

*Object Type:* Header

**Rationale:**

As part of the Pconst to Rconst Conversion, the message format has changed to have bits reserved for ISM use. (T. Anthony)

---

**IS200-2130:**

Insertion below object IS200-2129

**Section Number:**

30.3.3.10.1.13.0-1

**WAS:**

<INSERTED OBJECT>

**Redlines:**

[Bits 156 through 244 of Message Type 40 are reserved for future ISM use.](#)

*Object Type:* [Info-Only](#)

**IS:**

Bits 156 through 244 of Message Type 40 are reserved for future ISM use.

*Object Type:* Info-Only

**Rationale:**

As part of the Pconst to Rconst Conversion, the message format has bits reserved for ISM use. (T. Anthony)

CRM #7 4/26/2022 For consistency, changing from MT-40 to Message Type 40 throughout the document (T. Anthony)

---

**IS200-1818:****Section Number:**

30.3.3.10.1.14.0-1

**WAS:**

Bits 245 through 276 of MT-40 are a 32-bit Cyclic Redundancy Check (CRC) specific to the ISM parameters. The ISM CRC will cover only the ISM parameters in Message Type 40, (Bits 39 to 244). Refer to DO-246E-Change 1 document for more details on the ISM CRC.

**Redlines:**

Bits 245 through 276 of ~~MT-~~[Message Type](#) 40 are a 32-bit Cyclic Redundancy Check (CRC) specific to the ISM parameters. The ISM CRC will cover only the ISM parameters in Message Type 40; (~~B~~[bits 39](#) ~~to~~[through](#) 244). Refer to DO-246E-Change 1 document for more details on the ISM CRC.

**IS:**

Bits 245 through 276 of Message Type 40 are a 32-bit Cyclic Redundancy Check (CRC) specific to the ISM parameters. The ISM CRC will cover only the ISM parameters in Message Type 40 (bits 39 through 244). Refer to DO-246E-Change 1 document for more details on the ISM CRC.

**Rationale:**

CRM #7 4/26/2022 For consistency, changing from MT-40 to Message Type 40 throughout the document (T. Anthony)

CRM #27 4/25/2022 Bit range was confusing using "nn to nn" form so converted to "nn through nn" to include the upper bound as always intended (T. Anthony) As of 6/6/2022, removed the comma just before the "(bits nn through nn)" (T. Anthony)

Anthony)

---

**# CP Status = 'In Review': 20**

# of inserted requirements: 1  
# of modified requirements: 1  
# of deleted requirements: 0  
# of TBDs: 0  
# of TBRs: 0  
# of (added/modified) effectivities: 0  
# of VCRM additions: 0  
# of VCRM modifications: 0  
# of VCRM deletions: 0  
# of descriptive texts: 11  
# of (added/modified) tables: 1  
# of (added/modified) figures: 1