CHANGE NOTICE

Affected Document: IS-GPS-800 Rev G	**IRN/SCN Number** XXX-XXXX-XXX	**Date:** DD-MMM-YYYY
Authority: RFC-00413	**Proposed Change Notice** PCN-IS-800G-RFC413	**Date:** 09-JUN-2020

CLASSIFIED BY: N/A
DECLASSIFY ON: N/A

Document Title: NAVSTAR GPS Space Segment/ User Segment L1C Interface

RFC Title: Integrity Support Messages

Reason For Change (Driver):

1. Navigation integrity for Global Navigation Satellite Systems (GNSS) including GPS has, to date, been codified in performance standard(s) documentation. The implication is that receiver manufacturers must extract information manually and encode it into GNSS receivers. This has two negative effects: 1) operational receivers cannot be modified without a maintenance cycle when updated standards are released; 2) for other-than-GPS systems, receiver manufacturer reliance on documentation produced by foreign entities.
2. Affected documents: IS-GPS-200, IS-GPS-705, and IS-GPS-800.

Description of Change:
Define an Integrity Support Message (ISM) that contains pertinent integrity information about GNSS constellations including, and that are compatible with, GPS and broadcast the ISM via CNAV (L2C & L5) and CNAV-2 (L1C). These messages enable the end user to perform Advanced Receiver Autonomous Integrity Monitoring (ARAIM).

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AUTHORIZED SIGNATURES	REPRESENTING	DATE
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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

IS800-140 :

Section Number :
3.5.1.0-3

WAS :
Subframe 3 provides other navigation data which is commutated over multiple pages. Each page of subframe 3 provides different data as shown in Figures 3.5-2 through 3.5-8. Additional subframe 3 pages may be defined in the future. It shall be noted that the broadcast sequence of subframe 3 pages is variable and, as such, users must not expect a fixed pattern of page sequence. Subframe 3 provides an 8-bit PRN number of the transmitting SV with a range of 0 (00000000) to 255 (11111111).

Redlines :
Subframe 3 provides other navigation data which is commutated over multiple pages. Each page of subframe 3 provides different data as shown in Figures 3.5-2 through 3.5-~~8~~8a. Additional subframe 3 pages may be defined in the future. It shall be noted that the broadcast sequence of subframe 3 pages is variable and, as such, users must not expect a fixed pattern of page sequence. Subframe 3 provides an 8-bit PRN number of the transmitting SV with a range of 0 (00000000) to 255 (11111111).

IS :
Subframe 3 provides other navigation data which is commutated over multiple pages. Each page of subframe 3 provides different data as shown in Figures 3.5-2 through 3.5-8a. Additional subframe 3 pages may be defined in the future. It shall be noted that the broadcast sequence of subframe 3 pages is variable and, as such, users must not expect a fixed pattern of page sequence. Subframe 3 provides an 8-bit PRN number of the transmitting SV with a range of 0 (00000000) to 255 (11111111).

Rationale :
The new figure for the ISM will be Figure 3.5-8a to maintain numbering scheme. Making a global change to incorporate the new figure

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IS800-1030 :
Insertion after object IS800-371 (placed after text)

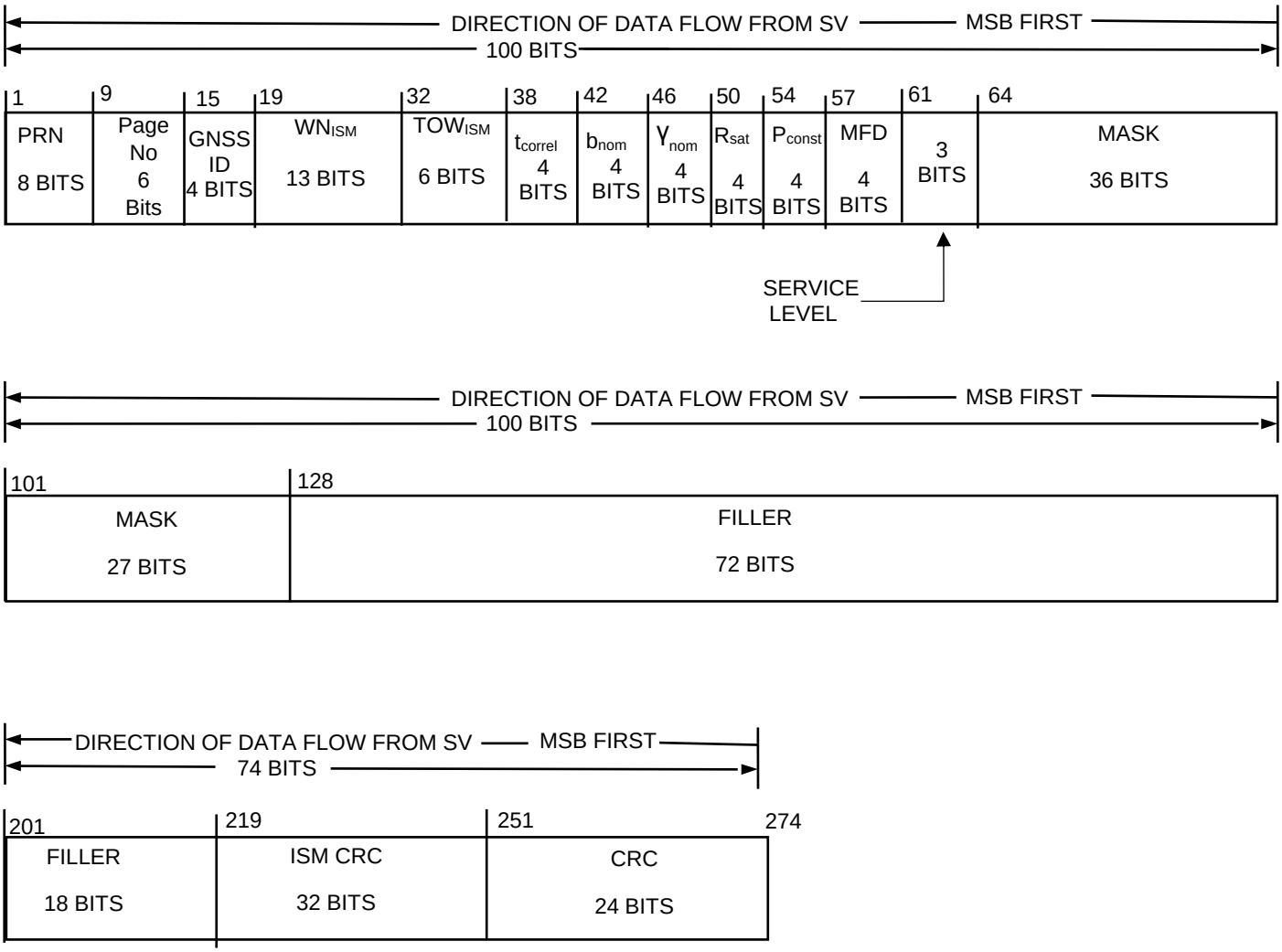
Figure 3.5-8. Subframe 3, Page 7 - SV Configuration

Section Number :
3.5.2.0-19

WAS :
<INSERTED OBJECT>

Redlines :
<INSERTED OBJECT>

IS :



Note: Broadcast sequence of subframe 3 pages is a variable and, as such, users must not expect a fixed pattern of page sequence

Rationale :
Adding the Figure that depicts the Structure of the ISM in CNAV-2.

IS800-1031 :
Insertion after object IS800-1030

Section Number :
3.5.2.0-20

WAS :
<INSERTED OBJECT>

Redlines :
Figure 3.5-8a Subframe 3, Page 8, Integrity Support Message

IS :
Figure 3.5-8a Subframe 3, Page 8, Integrity Support Message

Rationale :
Adding appropriate Figure Caption

IS800-1032 :
Insertion after object IS800-283 (placed after Sec 3.5.4.6)

3.5.4.6 **Subframe 3, Page 7 - SV Configuration**

Section Number :
3.5.4.7

WAS :
<INSERTED OBJECT>

Redlines :
Object Heading : Subframe 3, Page 8- Integrity Support Message (ISM)

IS :
Object Heading : **Subframe 3, Page 8- Integrity Support Message (ISM)**

Rationale :
New section for ARAIM users that has details on the ISM

IS800-1034 :
Insertion below object IS800-1032

Section Number :
3.5.4.7.0-1

WAS :
<INSERTED OBJECT>

Redlines :
Figure 3.5-8a contains the structure of the Subframe 3, Page 8 message. The contents are defined below, followed by material pertinent to the use of the Integrity Support Message (ISM) data. Users who implement Advanced Receiver Autonomous Integrity Monitoring (ARAIM) may use these parameters for the ARAIM algorithm as referenced in future TSO and MSO.

IS :
Figure 3.5-8a contains the structure of the Subframe 3, Page 8 message. The contents are defined below, followed by material pertinent to the use of the Integrity Support Message (ISM) data. Users who implement Advanced Receiver Autonomous Integrity Monitoring (ARAIM) may use these parameters for the ARAIM algorithm as referenced in future TSO and MSO.

Rationale :
Main ARAIM algorithms are found in the referenced documents. They are currently in work and when finalized the references need to be updated. Also spelling out ARAIM since it is the first mention of it.

IS800-1033 :
Insertion after object IS800-1034

Section Number :
3.5.4.7.1

WAS :
<INSERTED OBJECT>

Redlines :
Object Heading : ISM Parameter Content

IS :
Object Heading : **ISM Parameter Content**

Rationale :
Parameter section

IS800-1035 :
Insertion below object IS800-1033

Section Number :
3.5.4.7.1.0-1

WAS :
<INSERTED OBJECT>

Redlines :
Subframe 3, Page 8 shall contain the parameters related to GNSS constellation and satellite integrity parameters used for ARAIM algorithms.

IS :
Subframe 3, Page 8 shall contain the parameters related to GNSS constellation and satellite integrity parameters used for ARAIM algorithms.

Rationale :
the message has only ISM parameters.

IS800-1036 :
Insertion after object IS800-1035

Section Number :
3.5.4.7.1.0-2

WAS :
<INSERTED OBJECT>

Redlines :
The bit lengths, scale factors, ranges, and units of these parameters are given in Table 3.5-9.

IS :
The bit lengths, scale factors, ranges, and units of these parameters are given in Table 3.5-9.

Rationale :
Statement directing the user to the parameter table.

IS800-1037 :
Insertion after object IS800-1036

Section Number :
3.5.4.7.1.0-3

WAS :
<INSERTED OBJECT>

Redlines :
The CS shall upload the current ISM parameters, when necessary, to the SVs.

IS :
The CS shall upload the current ISM parameters, when necessary, to the SVs.

Rationale :
Add requirement that makes it explicit that CS will upload this new message.

IS800-1116 :
Insertion after object IS800-1037

Section Number :
3.5.4.7.1.0-4

WAS :
<INSERTED OBJECT>

Redlines :
Users should use the ISM parameters with the most recent WN_{ISM} and TOW_{ISM} time stamp. All time stamps should be in the past.

IS :
Users should use the ISM parameters with the most recent WN_{ISM} and TOW_{ISM} time stamp. All time stamps should be in the past.

Rationale :
Adding user requirement to make them aware to use the latest and valid ISM.

IS800-1039 :
Insertion after object IS800-1116

Section Number :
3.5.4.7.1.0-6

WAS :
<INSERTED OBJECT>

Redlines :
Table 3.5-9 ISM Parameters

IS :
Table 3.5-9 ISM Parameters

Rationale :
Parameter Table Caption

IS800-1040 :
Insertion after object IS800-1039

Section Number :
3.5.4.7.1.0-7

WAS :
<INSERTED OBJECT>

Redlines :

Object Type : Table

IS :

Parameter	No. of Bits**	Scale Factor (LSB)	Valid Range***	Units
GNSS ID	4			
WN_{ISM}	13	1		weeks
TOW_{ISM}	6	4	0 to 164	hours
t_{correl}	4		0 to 12	hours
b_{nom}	4		0 to 2	meters
γ_{nom}	4		0 to 2	
R_{sat}	4		$1x10^{-3}$ to $3.16x10^{-10}$	/hours
P_{const}	4		$1x10^{-3}$ to $3.16x10^{-10}$	
MFD	4		0.25 to 24	hours
Service Level*	3			
Mask ****	63			

* See Table 3.5-10 for Service Level Descriptions

** See Figure 3.5-8a for complete bit allocation in Subframe 3, Page 8

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

**** See Table 3.5-11 for Mask bit mapping

Object Type : Table

Rationale :
Adding Parameter table for the ISMs

IS800-1041 :
Insertion after object IS800-1040

Section Number :
3.5.4.7.1.1

WAS :
<INSERTED OBJECT>

Redlines :
Object Heading : GNSS Constellation ID

IS :
Object Heading : **GNSS Constellation ID**

Rationale :
First ISM parameter in the Message Structure. Sections will go in order of the message structure

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IS800-1042 :
Insertion below object IS800-1041

Section Number :
3.5.4.7.1.1.0-1

WAS :
<INSERTED OBJECT>

Redlines :
Bits 15 through 18 of Subframe 3, Page 8 shall identify the GNSS service to which the associated ISM parameters apply.

IS :
Bits 15 through 18 of Subframe 3, Page 8 shall identify the GNSS service to which the associated ISM parameters apply.

Rationale :
Users who use the ISM will need to know which GNSS system is to apply these parameters for. Therefore, the first parameter is a four bit ID that defines each system.

IS800-1043 :
Insertion after object IS800-1042

Section Number :
3.5.4.7.1.1.0-2

WAS :
<INSERTED OBJECT>

Redlines :
The four bits are defined as follows:

0000 = No Data Available

0001 = Galileo

0010 = GLONASS

0011 = BeiDou

0100 = GPS

0101 = SBAS

0110 = QZSS

0111 = IRNSS

1000 through 1111 = Reserved for other systems

IS :
The four bits are defined as follows:

0000 = No Data Available

0001 = Galileo

0010 = GLONASS

0011 = BeiDou

0100 = GPS

0101 = SBAS

0110 = QZSS

0111 = IRNSS

1000 through 1111 = Reserved for other systems

Rationale :
Bit Definition for the Constellation ID

IS800-1074 :
Insertion after object IS800-1043

Section Number :
3.5.4.7.1.1.0-3

WAS :
<INSERTED OBJECT>

Redlines :
If users see four bits of '0000', users will ignore the entire ISM.

IS :
If users see four bits of '0000', users will ignore the entire ISM.

Rationale :
Statement that gives guidance to the users to ignore the ISM if they get a "0000".

IS800-1044 :
Insertion after object IS800-1041

Section Number :
3.5.4.7.1.2

WAS :
<INSERTED OBJECT>

Redlines :
Object Heading : ISM Effectivity Time Stamp Week Number

IS :
Object Heading : **ISM Effectivity Time Stamp Week Number**

Rationale :
ISM Time Stamp Header

IS800-1045 :
Insertion below object IS800-1044

Section Number :
3.5.4.7.1.2.0-1

WAS :
<INSERTED OBJECT>

Redlines :
Bits 19 through 31 of Subframe 3, Page 8 shall provide the ISM Week Number (WN_{ISM}) applicable to the start of the time of validity for a given ISM data issue.

IS :
Bits 19 through 31 of Subframe 3, Page 8 shall provide the ISM Week Number (WN_{ISM}) applicable to the start of the time of validity for a given ISM data issue.

Rationale :
Users who use the ISM will need to know the time the parameters are created. This parameter in terms of weeks does so.

IS800-1075 :
Insertion after object IS800-1045

Section Number :
3.5.4.7.1.2.0-2

WAS :
<INSERTED OBJECT>

Redlines :
This parameter describes the time stamp, in terms of weeks, for the ISM parameters.

IS :
This parameter describes the time stamp, in terms of weeks, for the ISM parameters.

Rationale :
Users who use the ISM will need to know the time the parameters are created. This parameter in terms of weeks does so.

IS800-1046 :
Insertion after object IS800-1044

Section Number :
3.5.4.7.1.3

WAS :
<INSERTED OBJECT>

Redlines :
Object Heading : ISM Effectivity Time Stamp Time of Week

IS :
Object Heading : **ISM Effectivity Time Stamp Time of Week**

Rationale :
ISM Time Stamp Header

IS800-1047 :
Insertion below object IS800-1046

Section Number :
3.5.4.7.1.3.0-1

WAS :
<INSERTED OBJECT>

Redlines :
Bits 32 through 37 of Subframe 3, Page 8 shall provide the ISM time of week (TOW_{ISM}) applicable to the start of the time of validity for a given ISM data issue.

IS :
Bits 32 through 37 of Subframe 3, Page 8 shall provide the ISM time of week (TOW_{ISM}) applicable to the start of the time of validity for a given ISM data issue.

Rationale :
Users who use the ISM will need to know the time the parameters are created. This parameter in terms of hours does so.

IS800-1076 :
Insertion after object IS800-1047

WAS :
<INSERTED OBJECT>

Redlines :
This parameter describes the time stamp, in terms of hours, for the ISM parameters.

IS :
This parameter describes the time stamp, in terms of hours, for the ISM parameters.

Rationale :
Users who use the ISM will need to know the time the parameters are created. This parameter in terms of hours does so.

IS800-1048 :
Insertion after object IS800-1046

Section Number :
3.5.4.7.1.4

WAS :
<INSERTED OBJECT>

Redlines :
Object Heading : Correlation Time Constant

IS :
Object Heading : **Correlation Time Constant**

Rationale :
tcorrel header

IS800-1049 :
Insertion below object IS800-1048

Section Number :
3.5.4.7.1.4.0-1

WAS :
<INSERTED OBJECT>

Redlines :
Bits 38 through 41 of Subframe 3, Page 8 shall provide the assumed Correlation Time Constant (t_{correl}) value for the ARAIM at the current time for the associated GNSS constellation.

IS :
Bits 38 through 41 of Subframe 3, Page 8 shall provide the assumed Correlation Time Constant (t_{correl}) value for the ARAIM at the current time for the associated GNSS constellation.

Rationale :
This parameter is used for the ARAIM algorithm to find an integrity solution

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IS800-1050 :
Insertion after object IS800-1049

Section Number :
3.5.4.7.1.4.0-2

WAS :
<INSERTED OBJECT>

Redlines :
The three 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 = 1.00 hours

0110 = 1.17 hours

0111 = 1.33 hours

1000 = 1.50 hours

1001 = 2.10 hours

1010 = 3.00 hours

1011 = 4.20 hours

1100 = 6.00 hours

1101 = 8.50 hours

1110 = 12.00 hours

1111 = RESERVED

IS :
The three 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 = 1.00 hours

0110 = 1.17 hours

0111 = 1.33 hours

1000 = 1.50 hours

1001 = 2.10 hours

1010 = 3.00 hours

1011 = 4.20 hours

1100 = 6.00 hours

1101 = 8.50 hours

1110 = 12.00 hours

1111 = RESERVED

Rationale :
Bit definitions that map to the different time constants

IS800-1051 :
Insertion after object IS800-1048

Section Number :
3.5.4.7.1.5

WAS :
<INSERTED OBJECT>

Redlines :
Object Heading : Additive Term for Nominal Pseudorange Error Bias

IS :
Object Heading : **Additive Term for Nominal Pseudorange Error Bias**

Rationale :
Additive Term Header

IS800-1052 :
Insertion below object IS800-1051

Section Number :
3.5.4.7.1.5.0-1

WAS :
<INSERTED OBJECT>

Redlines :
Bits 42 through 45 of Subframe 3, Page 8 shall provide the assumed Additive Term (b_{nom}) for ARAIM at the current time for the associated GNSS constellation.

IS :
Bits 42 through 45 of Subframe 3, Page 8 shall provide the assumed Additive Term (b_{nom}) for ARAIM at the current time for the associated GNSS constellation.

Rationale :
This parameter is used for the ARAIM algorithm to find an integrity solution

---

IS800-1053 :
Insertion after object IS800-1052

Section Number :
3.5.4.7.1.5.0-2

WAS :
<INSERTED OBJECT>

Redlines :
The three bits are defined as follows:

0000 = 0.00 meters

0001 = 0.13 meters

0010 = 0.25 meters

0011 = 0.38 meters

0100 = 0.50 meters

0101 = 0.63 meters

0110 = 0.75 meters

0111 = 0.88 meters

1000 = 1.00 meters

1001 = 1.13 meters

1010 = 1.25 meters

1011 = 1.38 meters

1100 = 1.50 meters

1101 = 1.63 meters

1110 = 1.75 meters

1111 = 2.00 meters

IS :
The three bits are defined as follows:

0000 = 0.00 meters

0001 = 0.13 meters

0010 = 0.25 meters

0011 = 0.38 meters

0100 = 0.50 meters

0101 = 0.63 meters

0110 = 0.75 meters

0111 = 0.88 meters

1000 = 1.00 meters

1001 = 1.13 meters

1010 = 1.25 meters

1011 = 1.38 meters

1100 = 1.50 meters

1101 = 1.63 meters

1110 = 1.75 meters

1111 = 2.00 meters

Rationale :
Bit definitions that map to the different terms

IS800-1054 :
Insertion after object IS800-1051

Section Number :
3.5.4.7.1.6

WAS :
<INSERTED OBJECT>

Redlines :
Object Heading : Scalar Term for Nominal Pseudorange Error Bias

IS :
Object Heading : **Scalar Term for Nominal Pseudorange Error Bias**

Rationale :
Scalar Term header

IS800-1055 :
Insertion below object IS800-1054

Section Number :
3.5.4.7.1.6.0-1

WAS :
<INSERTED OBJECT>

Redlines :
Bits 46 through 49 of Subframe 3, Page 8 shall provide the assumed Scalar Term (γ_{nom}) value for ARAIM at the current time for the associated GNSS constellation.

IS :
Bits 46 through 49 of Subframe 3, Page 8 shall provide the assumed Scalar Term (γ_{nom}) value for ARAIM at the current time for the associated GNSS constellation.

Rationale :
This parameter is used for the ARAIM algorithm to find an integrity solution

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IS800-1056 :
Insertion after object IS800-1055

Section Number :
3.5.4.7.1.6.0-2

WAS :
<INSERTED OBJECT>

Redlines :
The three bits are defined as follows:

0000 = 0.00

0001 = 0.13

0010 = 0.25

0011 = 0.38

0100 = 0.50

0101 = 0.63

0110 = 0.75

0111 = 0.88

1000 = 1.00

1001 = 1.13

1010 = 1.25

1011 = 1.38

1100 = 1.50

1101 = 1.63

1110 = 1.75

1111 = 2.00

IS :
The three bits are defined as follows:

0000 = 0.00

0001 = 0.13

0010 = 0.25

0011 = 0.38

0100 = 0.50

0101 = 0.63

0110 = 0.75

0111 = 0.88

1000 = 1.00

1001 = 1.13

1010 = 1.25

1011 = 1.38

1100 = 1.50

1101 = 1.63

1110 = 1.75

1111 = 2.00

Rationale :
Bit definitions that map to the different terms

IS800-1057 :
Insertion after object IS800-1054

Section Number :
3.5.4.7.1.7

WAS :
<INSERTED OBJECT>

Redlines :
Object Heading : Satellite Fault Probability

IS :
Object Heading : **Satellite Fault Probability**

Rationale :
Rsat Header

IS800-1058 :
Insertion below object IS800-1057

Section Number :
3.5.4.7.1.7.0-1

WAS :
<INSERTED OBJECT>

Redlines :
Bits 50 through 53 of Subframe 3, Page 8 shall provide the assumed Satellite Fault Probability (R_{sat}) value for ARAIM at the current time for the associated GNSS constellation.

IS :
Bits 50 through 53 of Subframe 3, Page 8 shall provide the assumed Satellite Fault Probability (R_{sat}) value for ARAIM at the current time for the associated GNSS constellation.

Rationale :
This parameter is used for the ARAIM algorithm to find an integrity solution

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IS800-1059 :
Insertion after object IS800-1058

Section Number :
3.5.4.7.1.7.0-2

WAS :
<INSERTED OBJECT>

Redlines :
The three bits are defined as follows:

0000 = 3.16×10^{-3} /hours

0001 = 1×10^{-3} /hours

0010 = 3.16×10^{-4} /hours

0011 = 1×10^{-4} /hours

0100 = 3.16×10^{-5} /hours

0101 = 1×10^{-5} /hours

0110 = 3.16×10^{-6} /hours

0111 = 1×10^{-6} /hours

1000 = 3.16 x 10^{-7} /hours

1001 = 1 x 10^{-7} /hours

1010 = 3.16 x 10^{-8} /hours

1011 = 1 x 10^{-8} /hours

1100 = 3.16 x 10^{-9} /hours

1101 = 1 x 10^{-9} /hours

1110 = 3.16 x 10^{-10} /hours

1111 = RESERVED

IS :
The three bits are defined as follows:

0000 = 3.16 x 10^{-3} /hours

0001 = 1 x 10^{-3} /hours

0010 = 3.16 x 10^{-4} /hours

0011 = 1 x 10^{-4} /hours

0100 = 3.16 x 10^{-5} /hours

0101 = 1 x 10^{-5} /hours

0110 = 3.16 x 10^{-6} /hours

0111 = 1 x 10^{-6} /hours

1000 = 3.16 x 10^{-7} /hours

1001 = 1 x 10^{-7} /hours

1010 = 3.16 x 10^{-8} /hours

1011 = 1 x 10^{-8} /hours

1100 = 3.16 x 10^{-9} /hours

1101 = 1 x 10^{-9} /hours

1110 = 3.16 x 10^{-10} /hours

1111 = RESERVED

Rationale :
Bit definitions that map to the different terms

IS800-1063 :
Insertion after object IS800-1057

Section Number :
3.5.4.7.1.8

WAS :
<INSERTED OBJECT>

Redlines :
Object Heading : Constellation Fault Probability

IS :
Object Heading : **Constellation Fault Probability**

Rationale :
Pconst Header

IS800-1064 :
Insertion below object IS800-1063

Section Number :
3.5.4.7.1.8.0-1

WAS :
<INSERTED OBJECT>

Redlines :
Bits 54 through 57 of Subframe 3, Page 8 shall provide the assumed Constellation Fault Probability (P_{const}) value for the ARAIM at the current time for the associated GNSS constellation.

IS :
Bits 54 through 57 of Subframe 3, Page 8 shall provide the assumed Constellation Fault Probability (P_{const}) value for the ARAIM at the current time for the associated GNSS constellation.

Rationale :
This parameter is used for the ARAIM algorithm to find an integrity solution

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IS800-1065 :
Insertion after object IS800-1064

Section Number :
3.5.4.7.1.8.0-2

WAS :
<INSERTED OBJECT>

Redlines :
The three bits are defined as follows:

0000 = 3.16×10^{-3}

0001 = 1×10^{-3}

0010 = 3.16×10^{-4}

0011 = 1×10^{-4}

0100 = 3.16×10^{-5}

0101 = 1×10^{-5}

0110 = 3.16×10^{-6}

0111 = 1×10^{-6}

1000 = 3.16×10^{-7}

1001 = 1×10^{-7}

1010 = 3.16×10^{-8}

1011 = 1×10^{-8}

1100 = 3.16×10^{-9}

1101 = 1×10^{-9}

1110 = 3.16×10^{-10}

1111 = RESERVED

IS :
The three bits are defined as follows:

0000 = 3.16×10^{-3}

0001 = 1×10^{-3}

0010 = 3.16×10^{-4}

0011 = 1×10^{-4}

0100 = 3.16×10^{-5}

0101 = 1×10^{-5}

0110 = 3.16×10^{-6}

0111 = 1×10^{-6}

1000 = 3.16×10^{-7}

1001 = 1×10^{-7}

1010 = 3.16×10^{-8}

1011 = 1×10^{-8}

1100 = 3.16×10^{-9}

1101 = 1×10^{-9}

1110 = 3.16×10^{-10}

1111 = RESERVED

Rationale :
Bit definitions that map to the different terms

IS800-1060 :
Insertion after object IS800-1063

Section Number :
3.5.4.7.1.9

WAS :
<INSERTED OBJECT>

Redlines :
Object Heading : Mean Fault Duration

IS :
Object Heading : **Mean Fault Duration**

Rationale :
MFD Header

IS800-1061 :
Insertion below object IS800-1060

Section Number :
3.5.4.7.1.9.0-1

WAS :
<INSERTED OBJECT>

Redlines :
Bits 58 through 61 of Subframe 3, Page 8 shall provide the assumed Mean Fault Duration (MFD) value for the ARAIM at the current time for the associated GNSS constellation.

IS :
Bits 58 through 61 of Subframe 3, Page 8 shall provide the assumed Mean Fault Duration (MFD) value for the ARAIM at the current time for the associated GNSS constellation.

Rationale :
This parameter is used for the ARAIM algorithm to find an integrity solution

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IS800-1062 :
Insertion after object IS800-1061

Section Number :
3.5.4.7.1.9.0-2

WAS :
<INSERTED OBJECT>

Redlines :
The three 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 hours

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

IS :
The three 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 hours

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

Rationale :
Bit definitions that map to the different terms

IS800-1066 :
Insertion after object IS800-1060

Section Number :
3.5.4.7.1.10

WAS :
<INSERTED OBJECT>

Redlines :
Object Heading : Service Level

Rationale :
Service Level Header

IS800-1067 :
Insertion below object IS800-1066

Section Number :
3.5.4.7.1.10.0-1

WAS :
<INSERTED OBJECT>

Redlines :
Bits 62 through 65 of Subframe 3, Page 8 shall provide the Service Level, as described in Table 3.5-10, applicable to a given page of the ISM data issue.

IS :
Bits 62 through 65 of Subframe 3, Page 8 shall provide the Service Level, as described in Table 3.5-10, applicable to a given page of the ISM data issue.

Rationale :
Parameter will help the user determine what type of ARAIM these parameters can be used for (eg H-ARAIM or V-ARAIM).

IS800-1068 :
Insertion after object IS800-1067

Section Number :
3.5.4.7.1.10.0-2

WAS :
<INSERTED OBJECT>

Redlines :
Three bits are allocated to the four identified service levels as follows:

000 = Level 1

001 = Level 2

010 = Level 3

011 = Level 4

100 to 111 = Reserved for future use

IS :
Three bits are allocated to the four identified service levels as follows:

000 = Level 1

001 = Level 2

010 = Level 3

011 = Level 4

100 to 111 = Reserved for future use

Rationale :
Bit definitions that map to the specific Service Levels. There are Reserved Bits for a future type of level.

IS800-1069 :
Insertion after object IS800-1068

Section Number :
3.5.4.7.1.10.0-3

WAS :
<INSERTED OBJECT>

Redlines :
Table 3.5-10 Service Level

IS :
Table 3.5-10 Service Level

Rationale :
Table Caption

IS800-1070 :
Insertion after object IS800-1069

Section Number :
3.5.4.7.1.10.0-4

WAS :
<INSERTED OBJECT>

Redlines :

Object Type : Table

IS :

Service Level	Severity	Description
Level 1	No Data Available	Service Level indicates that users may resort to the Performance Values for integrity solutions instead of the ISM. Users should not use ISM
Level 2	Non-Safety of Life Use	Uncertified ARAIM
Level 3	Safety of Life Use (Horizontal)	Service Level indicates that the user should only use these parameters for the applications requiring integrity less than or equivalent to H-ARAIM solutions.
Level 4	Safety of Life Use (Vertical)	Service Level indicates that the user should only use these parameters for the applications requiring integrity less than or equivalent to V-ARAIM solutions.

Object Type : Table

Rationale :
Table gets more specific on each level. The last column is intended to give more guidance to the user on what to do for each level

IS800-1071 :
Insertion after object IS800-1066

Section Number :
3.5.4.7.1.11

WAS :
<INSERTED OBJECT>

Redlines :
Object Heading : Satellite Mask

IS :
Object Heading : **Satellite Mask**

Rationale :
Mask Header

IS800-1072 :
Insertion below object IS800-1071

Section Number :
3.5.4.7.1.11.0-1

WAS :
<INSERTED OBJECT>

Redlines :
Bits 66 through 127 of Subframe 3, Page 8 shall provide the PRN inclusion mask. Refer to Table 3.5-11 for complete GNSS PRN mapping.

IS :
Bits 66 through 127 of Subframe 3, Page 8 shall provide the PRN inclusion mask. Refer to Table 3.5-11 for complete GNSS PRN mapping.

Rationale :
Each bit of the Mask pertains to a single GNSS PRN. The table gets more specific.

IS800-1073 :
Insertion after object IS800-1072

Section Number :
3.5.4.7.1.11.0-2

WAS :
<INSERTED OBJECT>

Redlines :
The applicability of each PRN is indicated by:

0 = Information in the current ISM does not apply to this PRN

1 = Information in the current ISM does apply to this PRN

IS :
The applicability of each PRN is indicated by:

0 = Information in the current ISM does not apply to this PRN

1 = Information in the current ISM does apply to this PRN

Rationale :
Defining the difference between '0' and '1'.

IS800-1077 :
Insertion after object IS800-1073

Section Number :
3.5.4.7.1.11.0-3

WAS :
<INSERTED OBJECT>

Redlines :
Table 3.5-11 PRN Mapping

IS :
Table 3.5-11 PRN Mapping

Rationale :
Table Caption

IS800-1078 :
Insertion after object IS800-1077

Section Number :
3.5.4.7.1.11.0-4

WAS :
<INSERTED OBJECT>

Redlines :

Object Type : Table

IS :

Bits	Galileo	GLONASS	BeiDou	GPS	SBAS	QZSS	IRNSS
59	SVID 1	Freq. 1	RCN 1	PRN 1	PRN 120	PRN 183	PRN ID-1
60	SVID 2	Freq. 2	RCN 2	PRN 2	PRN 121	PRN 184	PRN ID-2
61	SVID 3	Freq. 3	RCN 3	PRN 3	PRN 122	PRN 185	PRN ID-3
62	SVID 4	Freq. 4	RCN 4	PRN 4	PRN 123	PRN 186	PRN ID-4
63	SVID 5	Freq. 5	RCN 5	PRN 5	PRN 124	PRN 187	PRN ID-5
64	SVID 6	Freq. 6	RCN 6	PRN 6	PRN 125	PRN 188	PRN ID-6
65	SVID 7	Freq. 7	RCN 7	PRN 7	PRN 126	PRN 189	PRN ID-7
66	SVID 8	Freq. 8	RCN 8	PRN 8	PRN 127	PRN 190	Reserved
67	SVID 9	Freq. 9	RCN 9	PRN 9	PRN 128	PRN 191	Reserved
68	SVID 10	Freq. 10	RCN 10	PRN 10	PRN 129	PRN 192	Reserved
69	SVID 11	Freq. 11	RCN 11	PRN 11	PRN 130	PRN 193	Reserved
70	SVID 12	Freq. 12	RCN 12	PRN 12	PRN 131	PRN 194	Reserved
71	SVID 13	Freq. 13	RCN 13	PRN 13	PRN 132	PRN 195	Reserved
72	SVID 14	Freq. 14	RCN 14	PRN 14	PRN 133	PRN 196	Reserved
73	SVID 15	Freq. 15	RCN 15	PRN 15	PRN 134	PRN 197	Reserved
74	SVID 16	Freq. 16	RCN 16	PRN 16	PRN 135	PRN 198	Reserved
75	SVID 17	Freq. 17	RCN 17	PRN 17	PRN 136	PRN 199	Reserved
76	SVID 18	Freq. 18	RCN 18	PRN 18	PRN 137	PRN 200	Reserved
77	SVID 19	Freq. 19	RCN 19	PRN 19	PRN 138	PRN 201	Reserved
78	SVID 20	Freq. 20	RCN 20	PRN 20	PRN 139	PRN 202	Reserved
79	SVID 21	Freq. 21	RCN 21	PRN 21	PRN 140	Reserved	Reserved
80	SVID 22	Freq. 22	RCN 22	PRN 22	PRN 141	Reserved	Reserved
81	SVID 23	Freq. 23	RCN 23	PRN 23	PRN 142	Reserved	Reserved
82	SVID 24	Freq. 24	RCN 24	PRN 24	PRN 143	Reserved	Reserved
83	SVID 25	Freq. 25	RCN 25	PRN 25	PRN 144	Reserved	Reserved
84	SVID 26	Freq. 26	RCN 26	PRN 26	PRN 145	Reserved	Reserved
85	SVID 27	Freq. 27	RCN 27	PRN 27	PRN 146	Reserved	Reserved
86	SVID 28	Freq. 28	RCN 28	PRN 28	PRN 147	Reserved	Reserved
87	SVID 29	Freq. 29	RCN 29	PRN 29	PRN 148	Reserved	Reserved
88	SVID 30	Freq. 30	RCN 30	PRN 30	PRN 149	Reserved	Reserved
89	SVID 31	Freq. 31	RCN 31	PRN 31	PRN 150	Reserved	Reserved
90	SVID 32	Freq. 32	RCN 32	PRN 32	PRN 151	Reserved	Reserved
91	SVID 33	Reserved	RCN 33	PRN 33	PRN 152	Reserved	Reserved
92	SVID 34	Reserved	RCN 34	PRN 34	PRN 153	Reserved	Reserved
93	SVID 35	Reserved	RCN 35	PRN 35	PRN 154	Reserved	Reserved
94	SVID 36	Reserved	RCN 36	PRN 36	PRN 155	Reserved	Reserved
95	Reserved	Reserved	RCN 37	PRN 37	PRN 156	Reserved	Reserved
96	Reserved	Reserved	Reserved	PRN 38	PRN 157	Reserved	Reserved
97	Reserved	Reserved	Reserved	PRN 39	PRN 158	Reserved	Reserved
98	Reserved	Reserved	Reserved	PRN 40	Reserved	Reserved	Reserved

99	Reserved	Reserved	Reserved	PRN 41	Reserved	Reserved	Reserved
100	Reserved	Reserved	Reserved	PRN 42	Reserved	Reserved	Reserved
101	Reserved	Reserved	Reserved	PRN 43	Reserved	Reserved	Reserved
102	Reserved	Reserved	Reserved	PRN 44	Reserved	Reserved	Reserved
103	Reserved	Reserved	Reserved	PRN 45	Reserved	Reserved	Reserved
104	Reserved	Reserved	Reserved	PRN 46	Reserved	Reserved	Reserved
105	Reserved	Reserved	Reserved	PRN 47	Reserved	Reserved	Reserved
106	Reserved	Reserved	Reserved	PRN 48	Reserved	Reserved	Reserved
107	Reserved	Reserved	Reserved	PRN 49	Reserved	Reserved	Reserved
108	Reserved	Reserved	Reserved	PRN 50	Reserved	Reserved	Reserved
109	Reserved	Reserved	Reserved	PRN 51	Reserved	Reserved	Reserved
110	Reserved	Reserved	Reserved	PRN 52	Reserved	Reserved	Reserved
111	Reserved	Reserved	Reserved	PRN 53	Reserved	Reserved	Reserved
112	Reserved	Reserved	Reserved	PRN 54	Reserved	Reserved	Reserved
113	Reserved	Reserved	Reserved	PRN 55	Reserved	Reserved	Reserved
114	Reserved	Reserved	Reserved	PRN 56	Reserved	Reserved	Reserved
115	Reserved	Reserved	Reserved	PRN 57	Reserved	Reserved	Reserved
116	Reserved	Reserved	Reserved	PRN 58	Reserved	Reserved	Reserved
117	Reserved	Reserved	Reserved	PRN 59	Reserved	Reserved	Reserved
118	Reserved	Reserved	Reserved	PRN 60	Reserved	Reserved	Reserved
119	Reserved	Reserved	Reserved	PRN 61	Reserved	Reserved	Reserved
120	Reserved	Reserved	Reserved	PRN 62	Reserved	Reserved	Reserved
121	Reserved	Reserved	Reserved	PRN 63	Reserved	Reserved	Reserved
SVID = Space Vehicle ID Freq. = Carrier Frequency Number RCN = Ranging Code Number PRN = Pseudorandom Noise Number							

Object Type : Table

Rationale :
Added the table that specifically maps the Mask bits to individual SV IDs for different GNSS.

IS800-1079 :
Insertion after object IS800-1078

Section Number :
3.5.4.7.1.11.1

Redlines :
Object Heading : Integrity Support Message Cyclic Redundancy Check

IS :
Object Heading : **Integrity Support Message Cyclic Redundancy Check**

Rationale :
Add Header for ISM CRC

IS800-1080 :
Insertion below object IS800-1079

Section Number :
3.5.4.7.1.11.1.0-1

WAS :
<INSERTED OBJECT>

Redlines :
Bits 219 through 250 of Subframe 3, Page 8 are a 32-bit Cyclic Redundancy Check (CRC) specific to the ISM parameters. The ISM CRC will cover only the ISM parameters in Subframe 3, Page 8, (Bits 15 to 218). Refer to DO-246E-Change 1 document for more details on the ISM CRC.

IS :
Bits 219 through 250 of Subframe 3, Page 8 are a 32-bit Cyclic Redundancy Check (CRC) specific to the ISM parameters. The ISM CRC will cover only the ISM parameters in Subframe 3, Page 8, (Bits 15 to 218). Refer to DO-246E-Change 1 document for more details on the ISM CRC.

Rationale :
The ISM CRC is an added security measure to check the accuracy of the ISM data.

IS800-893 :

Section Number :
6.1.0-1

WAS :

APC	-	antenna phase center
ASCII	-	American Standard Code for Information Interchange
BCH	-	Bose, Chaudhuri, and Hocquenghem
BOC	-	Binary Offset Carrier
BPSK	-	Bi-Phase Shift Key
CCB	-	Configuration Control Board
CDC	-	clock differential correction
CEI	-	Clock/Ephemeris/ Integrity
CNAV-2	-	L1C Navigation Message
CRC	-	Cyclic Redundancy Check
CS	-	Control Segment
dBc	-	Power ratio of a signal to a (unmodulated) carrier signal, expressed in decibels
DC	-	differential correction
DN	-	Day Number
ECEF	-	Earth-Centered, Earth-Fixed
ECI	-	Earth-Centered, Inertial
EDC	-	ephemeris differential correction
EOE	-	Edge-of-Earth
EOL	-	End-of-Life
EOP	-	Earth Orientation Parameters
FEC	-	Forward Error Correction
GBAS	-	Ground Based Augmentation System

GGTO	-	GPS/GNSS Time Offset
GNSS	-	Global Navigation Satellite System
GPS	-	Global Positioning System
GPSW	-	GPS Wing
ICC	-	Interface Control Contractor
ICWG	-	Interface Control Working Group
IRN	-	Interface Revision Notice
IS	-	Interface Specification
ISC	-	Inter-Signal Correction
ITOW	-	Interval Time of Week
LDPC	-	Low Density Parity Check
LFSR	-	Linear Feedback Shift Register
LNAV	-	Legacy Navigation Message, D(t)
LSB	-	Least Significant Bit
LSF	-	Leap Seconds Future
L1C	-	Common L1 Signal
MCS	-	Master Control Station
MHz	-	Megahertz
MSB	-	Most Significant Bit
NAV	-	Navigation
NSCD	-	non-standard $L1C_D$
NSCP	-	non-standard $L1C_P$
PIRN	-	Proposed Interface Revision Notice
PRN	-	Pseudo-Random Noise
RF	-	Radio Frequency
RHCP	-	Right-Hand Circularly Polarized
RMS	-	Root Mean Square

SBAS	-	Satellite Based Augmentation System
sps	-	symbols per second
SS	-	Space Segment
SSV	-	Space Service Volume
SV	-	Space Vehicle
TBD	-	To Be Determined
TBR	-	To Be Resolved
TBS	-	To Be Supplied
TMBOC	-	Time-Multiplexed BOC
TOI	-	Time of Interval
TOW	-	Time of Week
UDRA	-	User Differential Range Accuracy
UE	-	User Equipment
URA	-	User Range Accuracy
US	-	User Segment
USNO	-	U.S. Naval Observatory
UTC	-	Coordinated Universal Time
WGS 84	-	World Geodetic System 1984

Redlines :

APC	-	antenna phase center
ARAIM	-	Advanced Receiver Autonomous Integrity Monitoring
ASCII	-	American Standard Code for Information Interchange
BCH	-	Bose, Chaudhuri, and Hocquenghem
BOC	-	Binary Offset Carrier
BPSK	-	Bi-Phase Shift Key
CCB	-	Configuration Control Board
CDC	-	clock differential correction
CEI	-	Clock/Ephemeris/ Integrity
CNAV-2	-	L1C Navigation Message
CRC	-	Cyclic Redundancy Check
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GNSS	-	Global Navigation Satellite System

GPS	-	Global Positioning System
GPSW	-	GPS Wing
ICC	-	Interface Control Contractor
ICWG	-	Interface Control Working Group
IRN	-	Interface Revision Notice
IS	-	Interface Specification
ISC	-	Inter-Signal Correction
ISM	-	Integrity Support Message
ITOW	-	Interval Time of Week
LDPC	-	Low Density Parity Check
LFSR	-	Linear Feedback Shift Register
LNAV	-	Legacy Navigation Message, D(t)
LSB	-	Least Significant Bit
LSF	-	Leap Seconds Future
L1C	-	Common L1 Signal
MCS	-	Master Control Station
MHz	-	Megahertz
MSB	-	Most Significant Bit
MSO	-	Military Standard Order
NAV	-	Navigation
NSCD	-	non-standard $L1C_D$
NSCP	-	non-standard $L1C_P$
PIRN	-	Proposed Interface Revision Notice
PRN	-	Pseudo-Random Noise
RAIM	-	Receiver Autonomous Integrity Monitoring
RF	-	Radio Frequency
RHCP	-	Right-Hand Circularly Polarized

RMS	-	Root Mean Square
SBAS	-	Satellite Based Augmentation System
sps	-	symbols per second
SS	-	Space Segment
SSV	-	Space Service Volume
SV	-	Space Vehicle
TBD	-	To Be Determined
TBR	-	To Be Resolved
TBS	-	To Be Supplied
TMBOC	-	Time-Multiplexed BOC
TOI	-	Time of Interval
TOW	-	Time of Week
TSO	-	Technical Standard Order
UDRA	-	User Differential Range Accuracy
UE	-	User Equipment
URA	-	User Range Accuracy
US	-	User Segment
USNO	-	U.S. Naval Observatory
UTC	-	Coordinated Universal Time
WGS 84	-	World Geodetic System 1984

IS :

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NSCP	-	non-standard $L1C_P$
PIRN	-	Proposed Interface Revision Notice
PRN	-	Pseudo-Random Noise
RAIM	-	Receiver Autonomous Integrity Monitoring
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RMS	-	Root Mean Square
SBAS	-	Satellite Based Augmentation System
sps	-	symbols per second
SS	-	Space Segment
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TOI	-	Time of Interval
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TSO	-	Technical Standard Order
UDRA	-	User Differential Range Accuracy
UE	-	User Equipment
URA	-	User Range Accuracy
US	-	User Segment
USNO	-	U.S. Naval Observatory
UTC	-	Coordinated Universal Time
WGS 84	-	World Geodetic System 1984

Rationale :
Adding RAIM, ARAIM, and ISM to the abbreviation list.