CHANGE NOTICE

Affected Document:	IRN/SCN Number	Date:
IS-GPS-800 Rev F	XXX-XXXX-XXX	DD-MMM-YYYY
Authority:	**Proposed Change Notice**	**Date:**
RFC-00403	PCN-IS-800F_RFC403	18-OCT-2019

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

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

RFC Title: Health Bit Clarification

Reason For Change (Driver):
The CNAV & CNAV-2 health summary bits for L1, L2, and L5 are not clearly defined and can be interpreted in multiple ways.
Documents affected: IS-GPS-200, IS-GPS-705, IS-GPS-800, and ICD-GPS-870

(Pre-RFC 788)

Description of Change:
Clarify the definition of the health summary bits. In addition, establish precedence for health indicators that eliminates ambiguity. May require a fix to message types.

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AUTHORIZED SIGNATURES	REPRESENTING	DATE
	GPS Directorate Space & Missile Systems Center (SMC) – LAAFB	

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CODE IDENT 66RP1

IS800-1034 :
Insertion after object IS800-944

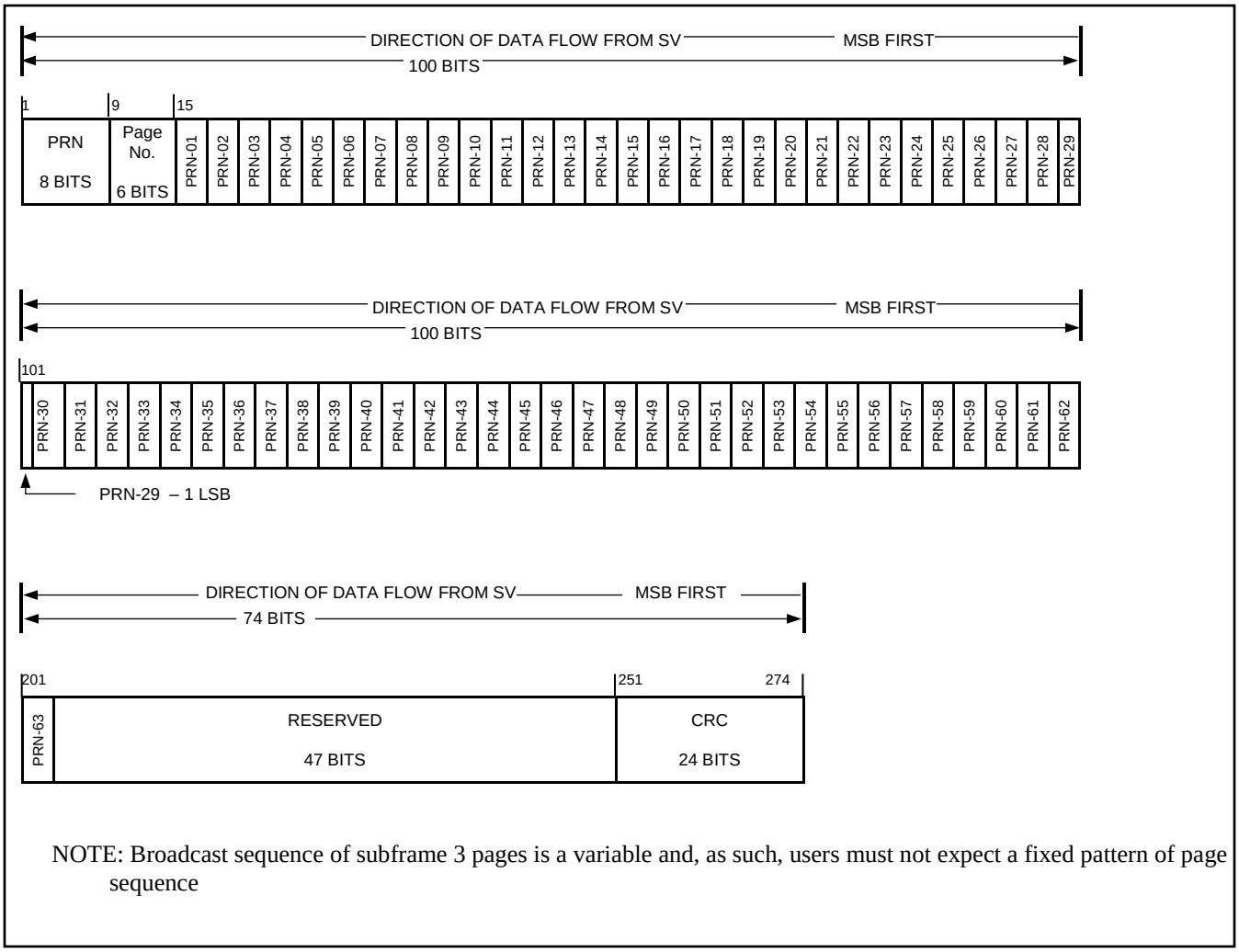
Figure 3.5-7. Subframe 3, Page 6 - Text

Section Number :
3.5.2.0-17

WAS :
N/A

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 :
Add figure for SV Configuration on CNAV-2

IS800-371 :

Section Number :
3.5.2.0-18

WAS :
Figure 3.5-8. Subframe 3, Page 7 - (Reserved)

Redlines :
Figure 3.5-8 Subframe3, Page 7 – ~~(Reserved)~~SV Configuration

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

Rationale :
Using existing reserved section for new section for SV Configuration on CNAV-2

IS800-251 :

Section Number :
3.5.4.3.4.0-1

WAS :
The three, one-bit, health indication in bits 44, 45 and 46 of subframe 3, page 4 and bits 31, 32 and 33 of each packet of reduced almanac refers to the L1, L2, and L5 signals of the SV whose PRN number is specified in the message or in the packet. For each health indicator, a "0" signifies that all signals on the associated frequency are okay and "1" signifies that some or all signals on the associated frequency are bad. The predicted health data will be updated at the time of upload when a new midi almanac or reduced almanac has been built by the CS. The transmitted health data may not correspond to the actual health of the transmitting SV or other SVs in the constellation.

Redlines :
The three, one-bit, health indication in bits 44, 45 and 46 of subframe 3, page 4 and bits 31, 32 and 33 of each packet of reduced almanac refers to the L1, L2, and L5 ~~signals~~carrier of the SV whose PRN number is specified in the message or in the packet. ~~For~~ These health indication bits only apply to codes and data as defined in IS-GPS-200, IS-GPS-705, and IS-GPS-800.

The health of each ~~health~~carrier ~~indicator,~~is ~~a~~indicated ~~"~~by:

0~~"~~ ~~signifies=~~ ~~that~~Some or all ~~signals~~codes ~~on~~and ~~the~~data ~~associated~~on ~~frequency~~this carrier are ~~okay~~OK,

1 = All codes and ~~"1"~~data ~~signifies~~on ~~that~~this ~~some~~carrier are bad or ~~all~~unavailable.

The ~~signals~~health ~~on~~bit indication shall be given relative to the ~~associated~~capabilities ~~frequency~~of ~~are~~each ~~bad~~SV as designated by the configuration code in the LNAV message (see paragraph 20.3.3.5.1.4 of IS-GPS-200) or the CNAV-2 message (see paragraph 3.5.4.7). Accordingly, the health bit for any SV which does not have a certain capability will be indicated as "healthy" if the lack of this capability is inherent in its design or if it has been configured into a mode which is normal from a user standpoint and does not require that capability; however, the Operating Command may choose to set the health bit "unhealthy" for an SV without a certain capability. Users who have not received or choose not to use configuration code should assume that every signal is available on every SV. The predicted health data will be updated at the time of upload when a new ~~midi almanac or~~CEI ~~reduced~~data ~~almanac~~set has been built by the CS. Therefore, ~~The~~the transmitted health data may not correspond to the actual health of the transmitting SV. ~~or~~For ~~other~~more ~~SVs~~information ~~in~~about ~~the~~user ~~constellation~~protocol for interpreting health indications see paragraph 6.4.5.

IS :
The three, one-bit, health indication in bits 44, 45 and 46 of subframe 3, page 4 and bits 31, 32 and 33 of each packet of reduced almanac refers to the L1, L2, and L5 carrier of the SV whose PRN number is specified in the message or in the packet. These health indication bits only apply to codes and data as defined in IS-GPS-200, IS-GPS-705, and IS-GPS-800.

The health of each carrier is indicated by:

0 = Some or all codes and data on this carrier are OK,

1 = All codes and data on this carrier are bad or unavailable.

The health bit indication shall be given relative to the capabilities of each SV as designated by the configuration code in the LNAV message (see paragraph 20.3.3.5.1.4 of IS-GPS-200) or the CNAV-2 message (see paragraph 3.5.4.7). Accordingly, the health bit for any SV which does not have a certain capability will be indicated as "healthy" if the lack of this capability is inherent in its design or if it has been configured into a mode which is normal from a user standpoint and does not require that capability; however, the Operating Command may choose to set the health bit "unhealthy" for

an SV without a certain capability. Users who have not received or choose not to use configuration code should assume that every signal is available on every SV. The predicted health data will be updated at the time of upload when a new CEI data set has been built by the CS. Therefore, the transmitted health data may not correspond to the actual health of the transmitting SV. For more information about user protocol for interpreting health indications see paragraph 6.4.5.

Rationale :
Clarify definition of health bits in this section to specify carriers. Also clarify that health bit will be set relative to the capability of each SV as assigned by the SV configuration code. Additionally as established with LNAV health data, the SV will be set as "healthy" if lack of a capability is inherent relative to the SV configuration code. Add reference to the new user protocol section for further clarification of health indications.

IS800-283 :

Section Number :
3.5.4.6

WAS :
Subframe 3, Page 7 - (Reserved)

Redlines :
Subframe 3, Page 7 - ~~(Reserved)~~SV Configuration

IS :
Subframe 3, Page 7 - SV Configuration

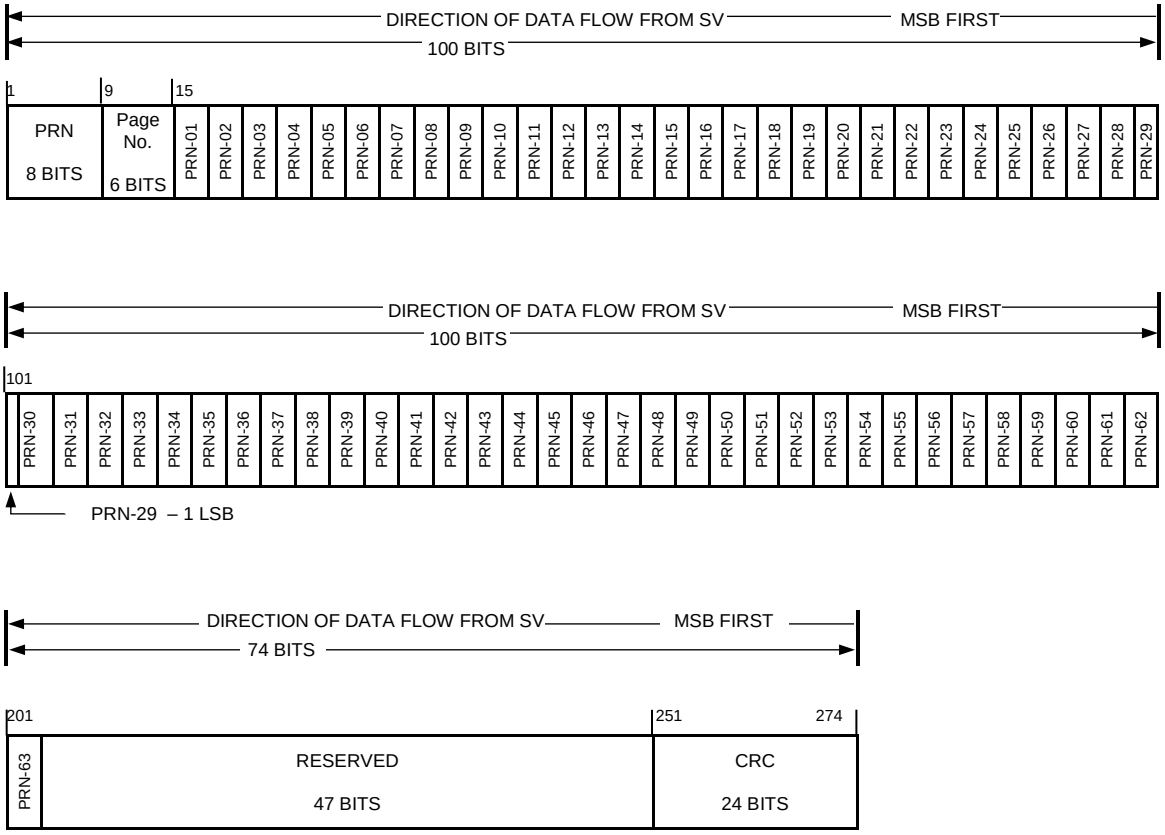
Rationale :
Using existing reserved section for new section for SV Configuration on CNAV-2

IS800-284 :

Section Number :
3.5.4.6.0-1

WAS :
(Reserved)

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 :
Add new figure for SV Configuration on CNAV-2

IS800-1021 :
Insertion after object IS800-284

Section Number :
3.5.4.6.0-2

WAS :
N/A

Redlines :
<INSERTED OBJECT>

IS :
Figure 3.5-11. Subframe 3, Page 7 - SV Configuration

Rationale :
Add information for SV Configuration on CNAV-2

IS800-1022 :
Insertion after object IS800-1021

Section Number :
3.5.4.6.0-3

WAS :
N/A

Redlines :
<INSERTED OBJECT>

IS :
Subframe 3, page 7, as depicted in Figure 3.5-11, contains a three-bit long term for each of up to 63 SVs to indicate the configuration code of each SV.

Rationale :
Add information for SV Configuration on CNAV-2

IS800-1023 :
Insertion after object IS800-1022

Section Number :
3.5.4.6.0-4

WAS :
N/A

Redlines :
<INSERTED OBJECT>

IS :
The 63 three-bit-long terms shall indicate the configuration of each SV using the codes as defined in paragraph 20.3.3.5.1.4 of IS-GPS-200.

Rationale :
Add new requirement for SV Configuration on CNAV-2

IS800-1016 :
Insertion after object IS800-867:

6.4.4 PRNs 33 through 63

Section Number :
6.4.5

WAS :
N/A

Redlines :
<INSERTED OBJECT>

IS :
User Protocol for Signal Availability and Health Information

Rationale :
Operational protocols section to address health bit ambiguity and provide users with interpretation for conflicting health information

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IS800-1019 :
Insertion below object IS800-1016

Section Number :
6.4.5.0-1

WAS :
N/A

Redlines :
<INSERTED OBJECT>

IS :
See paragraph 6.4.6 of IS-GPS-200.

Rationale :
Operational protocols section to address health bit ambiguity and provide users with interpretation for conflicting health information

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IS800-1024 :
Insertion after object IS800-1019

Section Number :
6.4.5.1

WAS :
N/A

Redlines :
<INSERTED OBJECT>

IS :
Alarm Indications

Rationale :
Operational protocols section to address health bit ambiguity and provide users with interpretation for conflicting health information

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IS800-1025 :
Insertion below object IS800-1024

Section Number :
6.4.5.1.1

WAS :
N/A

Redlines :
<INSERTED OBJECT>

IS :
Specific Alarm Indications

Rationale :
Operational protocols section to address health bit ambiguity and provide users with interpretation for conflicting health information

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IS800-1026 :
Insertion below object IS800-1025

Section Number :
6.4.5.1.1.0-1

WAS :
N/A

Redlines :
<INSERTED OBJECT>

IS :
(Reserved)

Rationale :
Operational protocols section to address health bit ambiguity and provide users with interpretation for conflicting health information

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IS800-1027 :
Insertion after object IS800-1024

Section Number :
6.4.5.2

WAS :
N/A

Redlines :
<INSERTED OBJECT>

IS :
“Marginal” Indications.

Rationale :
Operational protocols section to address health bit ambiguity and provide users with interpretation for conflicting health information

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IS200-1028 :
Insertion below object IS200-1027

Section Number :
6.4.5.2.0-1

WAS :
N/A

Redlines :
<INSERTED OBJECT>

IS:
(Reserved)

Rationale :
Operational protocols section to address health bit ambiguity and provide users with interpretation for conflicting health information

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