CHANGE NOTICE

Affected Document: IS-GPS-705 Rev J	**IRN/SCN Number** IRN-IS-705J-003	**Date:** 27-SEP-2023
Authority: RFC-00502	**Proposed Change Notice** PCN- IS-705J_RFC502	**Date:** 31-MAY-2023

Document Title: NAVSTAR GPS Space Segment/Navigation User Segment L5 Interfaces

RFC Title: 2023 Proposed Changes to the Public Documents

Reason For Change (Driver):

1. Finalize the CNAV Schedules Technical Baseline changes
2. Resolve the Data ID Issue (a commercial vendor did not want Data IDs other than 2)
3. Add the maximum power for GPS III/IIIF SVs to IS-GPS-200
4. Accommodate all administrative fixes possible from Boeing's list of fixes

Description of Change:

Make updates to public documents IS-GPS-200, IS-GPS-705 and IS-GPS-800 as appropriate

1. Update the CNAV message schedule information
2. Publish the resolution for the Data ID Issue to IS-GPS-200
3. Add the maximum power for GPS III/IIIF SVs to IS-GPS-200
4. Fix the three figures that have the most readability problems

Authored By: RE: Tony Anthony **Checked By:** RE: Emily Hendrickson

AUTHORIZED SIGNATURES	REPRESENTING	DATE
DUNN.MICHAEL.J.1171235045 Digitally signed by DUNN.MICHAEL.J.1171235045 Date: 2024.01.19 11:22:56 -08'00'	PNT Technical Director, MilComm & PNT Directorate, Space Systems Command (SSC)	19-JAN-2024

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	CODE IDENT 66RP1

IS705-1524:

Section Number:
6.2.8.1.0-1

WAS:
A Core CEI Data Set are the CEI parameters necessary for a satellite to be used for a position solution (non-almanac); broadcast to users with the shortest broadcast interval -- see Table 20-XII. The t_{op} term provides the epoch time of week of the state data utilized for CEI data, except for parameters marked with a Note1 in Table 6-I-1.

Redlines:
A Core CEI Data Set are the CEI parameters necessary for a satellite to be used for a position solution (non-almanac); broadcast to users with the shortest broadcast interval -- see ~~Table~~ 20~~-XII~~.3.4.1. The top term provides the epoch time of week of the state data utilized for CEI data, except for parameters marked with a Note1 in Table 6-I-1.

IS:
A Core CEI Data Set are the CEI parameters necessary for a satellite to be used for a position solution (non-almanac); broadcast to users with the shortest broadcast interval -- see 20.3.4.1. The t_{op} term provides the epoch time of week of the state data utilized for CEI data, except for parameters marked with a Note1 in Table 6-I-1.

IS705-1521:

Section Number:
6.2.8.1-2

WAS:

Symbol	Parameter Name	Message
$\dot{A}$	Change Rate in Semi-major Axis	10
ΔA	Semi-major Axis Difference at Reference Time	10
Δn_0	Mean Motion Difference from Computed Value at Reference Time	10
$\Delta \dot{n}_0$	Rate of Mean Motion Difference from Computed Value	10
ω	Argument of Perigee	10
e	Eccentricity	10
ISF	Integrity Status Flag [NOTE1]	10
(L1/L2/L5)	Signal Health (3 bits)	10
M_0	Mean Anomaly at Reference Time	10
URA_{ED}	Elevation Dependent User Range Accuracy	10
WN	Week Number	10
t_{oe}	Time of Ephemeris	10, 11
t_{op}	CEI Data Sequence Propagation Time of Week	10, 30-37
$\Delta \dot{\Omega}$	Rate of Right Ascension Difference	11
Ω_0	Longitude of Ascending Node of Orbit Plane at Weekly Epoch	11
C_{ic}	Amplitude of the Cosine Harmonic Correction Term to the Angle of Inclination	11
C_{is}	Amplitude of the Sine Harmonic Correction Term to the Angle of Inclination	11
C_{rc}	Amplitude of the Cosine Harmonic Correction Term to the Orbit Radius	11
C_{rs}	Amplitude of the Sine Correction Term to the Orbit Radius	11
C_{uc}	Amplitude of Cosine Harmonic Correction Term to the Argument of Latitude	11
C_{us}	Amplitude of Sine Harmonic Correction Term to the Argument of Latitude	11
i_0	Inclination Angle at Reference Time	11
IDOT	Rate of Inclination Angle	11
$ISC_{L1C/A}$	Inter-signal Correction	30
ISC_{L2C}	Inter-signal Correction	30
ISC_{L5I5}	Inter-signal Correction	30
ISC_{L5Q5}	Inter-signal Correction	30
T_{GD}	Group Delay Differential	30

Symbol	Parameter Name	Message
a_{f0}	SV Clock Bias Correction Coefficient	30-37
a_{f1}	SV Clock Drift Correction Coefficient	30-37
a_{f2}	Drift Rate Correction Coefficient Index	30-37
t_{oc}	Time of Clock	30-37
URA_{NED0}	NED Accuracy Index	30-37
URA_{NED1}	NED Accuracy Change Index	30-37
URA_{NED2}	NED Accuracy Change Rate Index	30-37
Alert	Alert Flag[NOTE1]	All

NOTE1: Parameters so indicated are for CEI Refinement – not limited to curve fit. Parameters not indicated are needed for/limited to curve fit.

Updates to parameters in table shall prompt changes in t_{oe}/t_{oc}. Any parameter marked with NOTE1 may be changed with or without a change in t_{oe}/t_{oc}.

Redlines:

Symbol	Parameter Name	Message
$\dot{A}$	Change Rate in Semi-major Axis	10
ΔA	Semi-major Axis Difference at Reference Time	10
Δn_0	Mean Motion Difference from Computed Value at Reference Time	10
$\Delta \dot{n_0}$	Rate of Mean Motion Difference from Computed Value	10
ω	Argument of Perigee	10
e	Eccentricity	10
ISF	Integrity Status Flag NOTE1	10
(L1/L2/L5)	Signal Health (3 bits)	10
M_0	Mean Anomaly at Reference Time	10
URA_{ED}	Elevation Dependent User Range Accuracy	10
WN	Week Number	10
t_{oe}	Time of Ephemeris	10, 11
t_{op}	CEI Data Sequence Propagation Time of Week	10, 30-37
$\Delta \dot{\Omega}$	Rate of Right Ascension Difference	11
Ω_0	Longitude of Ascending Node of Orbit Plane at Weekly Epoch	11
C_{ic}	Amplitude of the Cosine Harmonic Correction Term to the Angle of Inclination	11
C_{is}	Amplitude of the Sine Harmonic Correction Term to the Angle of Inclination	11
C_{rc}	Amplitude of the Cosine Harmonic Correction Term to the Orbit Radius	11
C_{rs}	Amplitude of the Sine Correction Term to the Orbit Radius	11
C_{uc}	Amplitude of Cosine Harmonic Correction Term to the Argument of Latitude	11
C_{us}	Amplitude of Sine Harmonic Correction Term to the Argument of Latitude	11
i_0	Inclination Angle at Reference Time	11
IDOT	Rate of Inclination Angle	11
$ISC_{L1C/A}$	Inter-signal Correction	30
ISC_{L2C}	Inter-signal Correction	30
ISC_{L5I5}	Inter-signal Correction	30
ISC_{L5Q5}	Inter-signal Correction	30
T_{GD}	Group Delay Differential	30
WN_{OP}	CEI Data Sequence Propagation Week Number	30
a_{f0}	SV Clock Bias Correction Coefficient	30-37
a_{f1}	SV Clock Drift Correction Coefficient	30-37

Symbol	Parameter Name	Message
a_{f2}	Drift Rate Correction Coefficient ~~Index~~	30-37
t_{oc}	Time of Clock	30-37
URA_{NED0}	NED Accuracy Index	30-37
URA_{NED1}	NED Accuracy Change Index	30-37
URA_{NED2}	NED Accuracy Change Rate Index	30-37
Alert	Alert Flag[NOTE1]	All
NOTE1: Parameters so indicated are for CEI Refinement – not limited to curve fit. Parameters not indicated are needed for/limited to curve fit. Updates to parameters in table shall prompt changes in t_{oe}/t_{oc}. Any parameter marked with NOTE1 may be changed with or without a change in t_{oe}/t_{oc}.		

IS:

Symbol	Parameter Name	Message
$\dot{A}$	Change Rate in Semi-major Axis	10
ΔA	Semi-major Axis Difference at Reference Time	10
Δn_0	Mean Motion Difference from Computed Value at Reference Time	10
$\Delta \dot{n_0}$	Rate of Mean Motion Difference from Computed Value	10
ω	Argument of Perigee	10
e	Eccentricity	10
ISF	Integrity Status Flag [NOTE1]	10
(L1/L2/L5)	Signal Health (3 bits)	10
M_0	Mean Anomaly at Reference Time	10
URA_{ED}	Elevation Dependent User Range Accuracy	10
WN	Week Number	10
t_{oe}	Time of Ephemeris	10, 11
t_{op}	CEI Data Sequence Propagation Time of Week	10, 30-37
$\Delta\dot{\Omega}$	Rate of Right Ascension Difference	11
Ω_0	Longitude of Ascending Node of Orbit Plane at Weekly Epoch	11
C_{ic}	Amplitude of the Cosine Harmonic Correction Term to the Angle of Inclination	11
C_{is}	Amplitude of the Sine Harmonic Correction Term to the Angle of Inclination	11
C_{rc}	Amplitude of the Cosine Harmonic Correction Term to the Orbit Radius	11
C_{rs}	Amplitude of the Sine Correction Term to the Orbit Radius	11
C_{uc}	Amplitude of Cosine Harmonic Correction Term to the Argument of Latitude	11
C_{us}	Amplitude of Sine Harmonic Correction Term to the Argument of Latitude	11
i_0	Inclination Angle at Reference Time	11
IDOT	Rate of Inclination Angle	11
$ISC_{L1C/A}$	Inter-signal Correction	30
ISC_{L2C}	Inter-signal Correction	30
ISC_{L5I5}	Inter-signal Correction	30
ISC_{L5Q5}	Inter-signal Correction	30
T_{GD}	Group Delay Differential	30
WN_{OP}	CEI Data Sequence Propagation Week Number	30
a_{f0}	SV Clock Bias Correction Coefficient	30-37
a_{f1}	SV Clock Drift Correction Coefficient	30-37

Symbol	Parameter Name	Message
a_{f2}	Drift Rate Correction Coefficient	30-37
t_{oc}	Time of Clock	30-37
URA_{NED0}	NED Accuracy Index	30-37
URA_{NED1}	NED Accuracy Change Index	30-37
URA_{NED2}	NED Accuracy Change Rate Index	30-37
Alert	Alert Flag[NOTE1]	All
NOTE1: Parameters so indicated are for CEI Refinement – not limited to curve fit. Parameters not indicated are needed for/limited to curve fit. Updates to parameters in table shall prompt changes in t_{oe}/t_{oc}. Any parameter marked with NOTE1 may be changed with or without a change in t_{oe}/t_{oc}.		

IS705-1603:

Section Number:
6.4.5.1.2.0-1

WAS:
The following alarm indications are specific to the code signals listed below.

I5-Code Signal

(a) The failure of the CRC on 5 successive CNAV messages (30 seconds) (see paragraph 20.3.5).

(b) The broadcast t_{oe} is not current (i.e. not within the current curve-fit) or does not match the broadcast t_{oc} (excluding normal data set cutovers, see paragraphs 20.3.3.1.1 and 20.3.4.4).

(c) The broadcast t_{op} is not consistent across the Message Types 10, 11 and Type 30's messages which comprise the current (i.e. not within the current curve-fit) CEI data set (excluding normal data set cutovers, see paragraph 20.3.4.4).

(d) The transmitted bits (bits 39-276) in Message Types 10, 11 and Type 30's are all set to 0's or all set to 1's.

(e) The 8-bit preamble does not equal 10001011_2, decimal 139, or hexadecimal 8B (see paragraph 20.3.3).

Notes:

1. *A SIS alarm indication exists when the satellite is not trackable because it is not transmitting the standard PRN code modulation on the L-band carrier signal. These SIS alarm indications are specifically called out above because of their relatively high probability of occurrence.*
2. *The SIS alarm indications related to the CNAV message data are considered "weak" indications since receivers do not necessarily continuously read each satellite's CNAV message data either by design or by circumstance (e.g., radio-frequency interference [RFI] can prevent reading CNAV message data). These weak SIS alarm indications are assumed to have a five-minute lag time before receivers take notice of them for alerting purposes.*
3. *The SIS alarm indications related to the CNAV message data are indicative of a problem onboard the satellite. GPS receivers may perceive similar indications caused by local effects that are unrelated to the broadcast SIS.*
4. *In addition to SIS alarm indications, other conditions may also cause GPS signals to become temporarily untrackable, such as ionospheric signal fades, local signal masking, or local interference.*

Redlines:
The following alarm indications are specific to the code signals listed below.

I5-Code Signal

(a) The failure of the CRC on 5 successive CNAV messages (30 seconds) (see paragraph 20.3.5).

(b) The broadcast toe is not current (i.e. not within the current curve-fit) or does not match the broadcast toc (excluding normal data set cutovers, see paragraphs 20.3.3.1.1 and 20.3.4.4).

(c) The broadcast top is not consistent across the Message Types 10, 11 and Type 30's messages which comprise the current (i.e. not within the current curve-fit) CEI data set (excluding normal data set cutovers, see paragraph 20.3.4.4).

(d) The transmitted bits (bits 39~~-~~ through 276) in one or more of Message Types 10, 11~~ and Type~~or 30~~'s~~ through 37 are all set to 0's or all set to 1's.

(e) The 8-bit preamble does not equal 100010112, decimal 139, or hexadecimal 8B (see paragraph 20.3.3).

Notes:

A SIS alarm indication exists when the satellite is not trackable because it is not transmitting the standard PRN code modulation on the L-band carrier signal. These SIS alarm indications are specifically called out above because of their relatively high probability of occurrence.

The SIS alarm indications related to the CNAV message data are considered "weak" indications since receivers do not necessarily continuously read each satellite's CNAV message data either by design or by circumstance (e.g., radio-frequency interference [RFI] can prevent reading CNAV message data). These weak SIS alarm indications are assumed to have a five-minute lag time before receivers take notice of them for alerting purposes.

The SIS alarm indications related to the CNAV message data are indicative of a problem onboard the satellite. GPS receivers may perceive similar indications caused by local effects that are unrelated to the broadcast SIS.

In addition to SIS alarm indications, other conditions may also cause GPS signals to become temporarily untrackable, such as ionospheric signal fades, local signal masking, or local interference.

IS:
The following alarm indications are specific to the code signals listed below.

I5-Code Signal

(a) The failure of the CRC on 5 successive CNAV messages (30 seconds) (see paragraph 20.3.5).

(b) The broadcast t_{oe} is not current (i.e. not within the current curve-fit) or does not match the broadcast t_{oc} (excluding normal data set cutovers, see paragraphs 20.3.3.1.1 and 20.3.4.4).

(c) The broadcast t_{op} is not consistent across the Message Types 10, 11 and Type 30's messages which comprise the current (i.e. not within the current curve-fit) CEI data set (excluding normal data set cutovers, see paragraph 20.3.4.4).

(d) The transmitted bits (bits 39 through 276) in one or more of Message Types 10, 11 or 30 through 37 are all set to 0's or all set to 1's.

(e) The 8-bit preamble does not equal 10001011_2, decimal 139, or hexadecimal 8B (see paragraph 20.3.3).

Notes:

1. *A SIS alarm indication exists when the satellite is not trackable because it is not transmitting the standard PRN code modulation on the L-band carrier signal. These SIS alarm indications are specifically called out above because of their relatively high probability of occurrence.*
2. *The SIS alarm indications related to the CNAV message data are considered "weak" indications since receivers do not necessarily continuously read each satellite's CNAV message data either by design or by circumstance (e.g., radio-frequency interference [RFI] can prevent reading CNAV message data). These weak SIS alarm indications are assumed to have a five-minute lag time before receivers take notice of them for alerting purposes.*
3. *The SIS alarm indications related to the CNAV message data are indicative of a problem onboard the satellite. GPS receivers may perceive similar indications caused by local effects that are unrelated to the broadcast SIS.*
4. *In addition to SIS alarm indications, other conditions may also cause GPS signals to become temporarily untrackable, such as ionospheric signal fades, local signal masking, or local interference.*

IS705-1605:

Section Number:
6.4.5.2.0-1

WAS:
The health of the I5-code and Q5-code signals is marginal when the signals would otherwise have been defined as healthy except that one or more of the following three warning conditions is or are present:

1. Default CNAV data (i.e., Message Type 0) is being transmitted on the I5-code signal in lieu of Message Types 10, 11 and/or Type 30's (e.g., a current and consistent CEI data set is not available within the maximum broadcast interval defined in paragraph 20.3.4.1). See paragraph 20.3.3.
2. The URA alert flag is raised (i.e., bit 38 of each CNAV message is set to 1) and therefore the I5-code signal URA components do not apply to the I5-code and Q5-code signals. This means the I5-code and Q5-code signal URA may be worse than indicated by the URA index components transmitted in Message Type 10 and Type 30's. See paragraph 20.3.3.
3. Either or both the URA_{ED} index in Message Type 10 and the URA_{NED0} index in Message Type 30's transmitted in the I5-code signal are equal to 15 or -16 ("N"=15 or "N"=-16). See paragraphs 20.3.3.1.1.4 and 20.3.3.2.4.

A more restrictive 'marginal indications' (e.g., the transmitted URA index in Subframe 1 greater than or equal to 8) may apply in the context of specified minimum performance standards such as are given in the GPS Standard Positioning Service Performance Standard (SPS PS).

Redlines:
The health of the I5-code and Q5-code signals is marginal when the signals would otherwise have been defined as healthy except that one or more of the following three warning conditions is or are present:

The satellite does not broadcast a current and consistent CEI data set within three times the maximum broadcast interval defined in paragraph 20.3.4.1.

Note 1: Default CNAV data (i.e.~~,~~ Message Type 0) ~~is~~may ~~being~~be transmitted ~~on~~in ~~the~~lieu ~~I5-code~~of ~~signal~~any ~~in~~message ~~lieu~~type ~~of~~when ~~Message~~the ~~Types~~correct ~~10,~~data ~~11~~for ~~and/or~~the ~~Type~~message ~~30's~~type ~~(e.g.,~~is ~~a~~unavailable ~~current~~or ~~and~~ ~~consistent~~when ~~CEI~~no ~~data~~other ~~set~~message is ~~not~~scheduled. ~~available~~ ~~within~~

Note 2: UE might be unable to confirm the ~~maximum~~satellite broadcast ~~interval~~of ~~defined~~a ~~in~~consistent ~~paragraph~~data ~~20.3.4.1).~~set when ~~See~~local ~~paragraph~~conditions ~~20.3.3~~prevent correctly receiving and decoding a continuous set of messages.

The URA alert flag is raised (i.e., bit 38 of each CNAV message is set to 1) and therefore the I5-code signal URA components do not apply to the I5-code and Q5-code signals. This means the I5-code and Q5-code signal URA may be worse than indicated by the URA index components transmitted in Message Type 10 and Type 30's. See paragraph 20.3.3.

Either or both the URAED index in Message Type 10 and the URANED0 index in Message Type 30's transmitted in the I5-code signal are equal to 15 or -16 ("N"=15 or "N"=-16). See paragraphs 20.3.3.1.1.4 and 20.3.3.2.4.

A more restrictive 'marginal indications' (e.g., the transmitted URA index in Subframe 1 greater than or equal to 8) may apply in the context of specified minimum performance standards such as are given in the GPS Standard Positioning Service Performance Standard (SPS PS).

IS:
The health of the I5-code and Q5-code signals is marginal when the signals would otherwise have been defined as healthy except that one or more of the following three warning conditions is or are present:

1. The satellite does not broadcast a current and consistent CEI data set within three times the maximum broadcast interval defined in paragraph 20.3.4.1.

   Note 1: Default CNAV data (i.e. Message Type 0) may be transmitted in lieu of any message type when the correct data for the message type is unavailable or when no other message is scheduled.

   Note 2: UE might be unable to confirm the satellite broadcast of a consistent data set when local conditions prevent correctly receiving and decoding a continuous set of messages.

2. The URA alert flag is raised (i.e., bit 38 of each CNAV message is set to 1) and therefore the I5-code signal URA components do not apply to the I5-code and Q5-code signals. This means the I5-code and Q5-code signal URA may be worse than indicated by the URA index components transmitted in Message Type 10 and Type 30's. See paragraph 20.3.3.

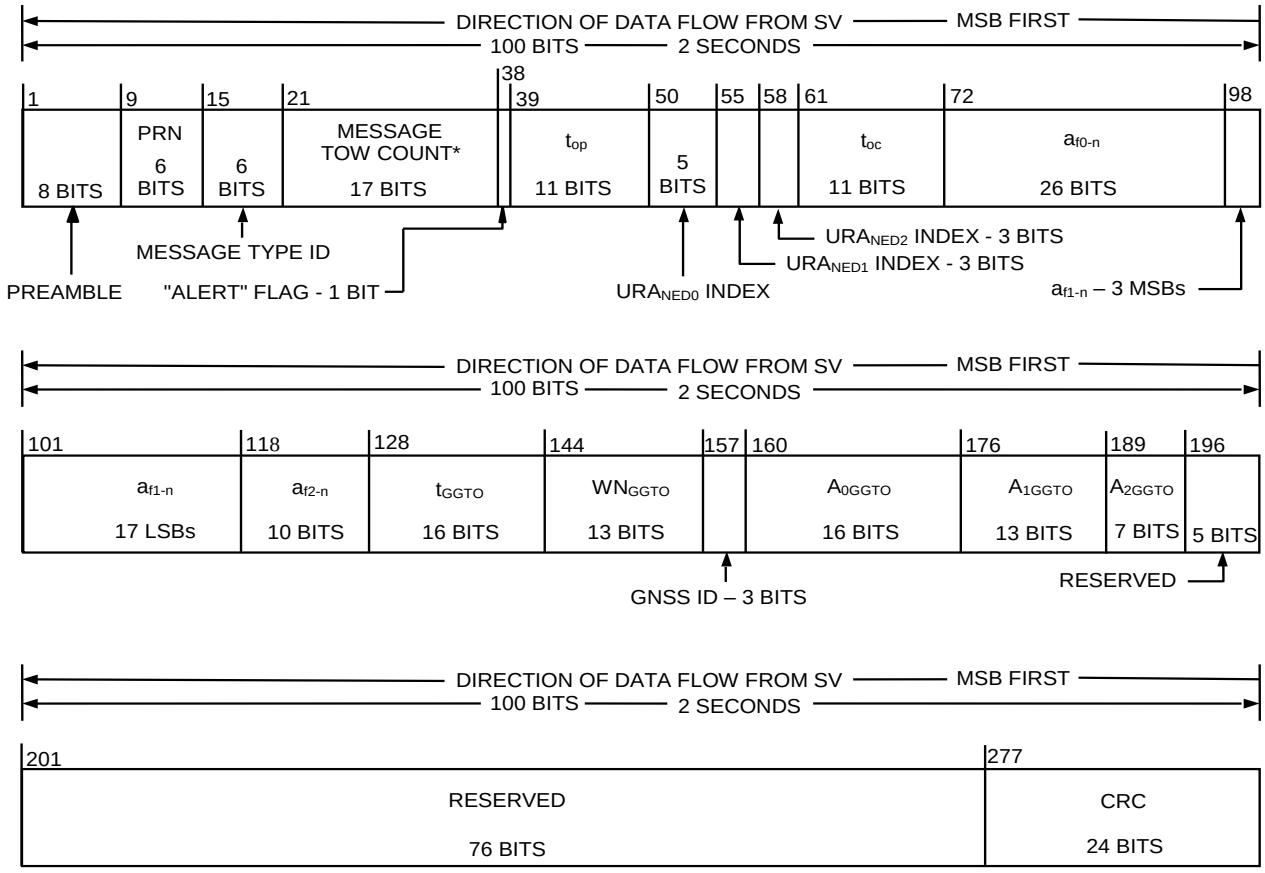
3. Either or both the URA_{ED} index in Message Type 10 and the URA_{NED0} index in Message Type 30's transmitted in the I5-code signal are equal to 15 or -16 ("N"=15 or "N"=-16). See paragraphs 20.3.3.1.1.4 and 20.3.3.2.4.

A more restrictive 'marginal indications' (e.g., the transmitted URA index in Subframe 1 greater than or equal to 8) may apply in the context of specified minimum performance standards such as are given in the GPS Standard Positioning Service Performance Standard (SPS PS).

IS705-205:

Section Number:
20.3.3.0-16

WAS:

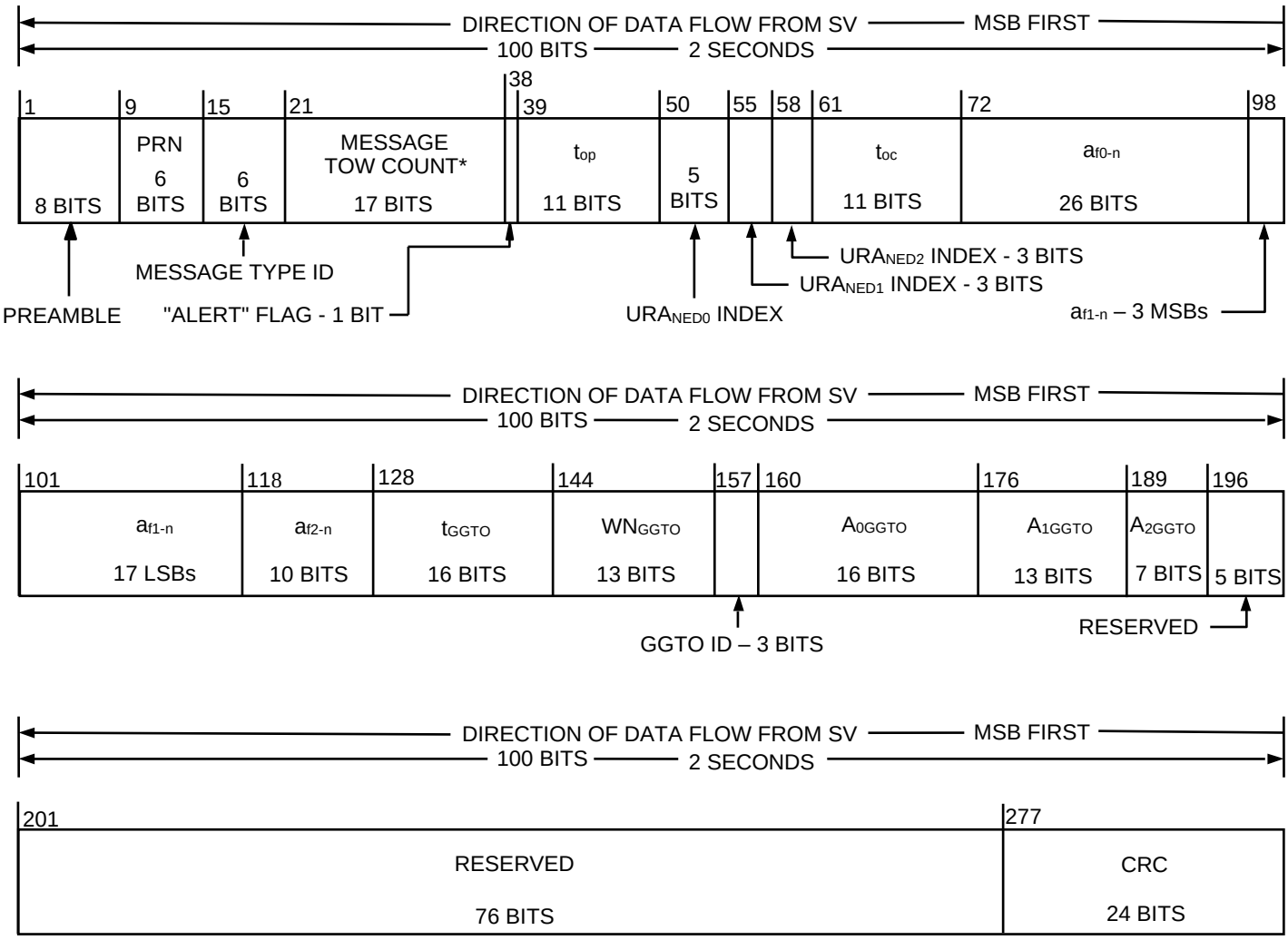


* MESSAGE TOW COUNT = 17 MSB OF ACTUAL TOW COUNT AT START OF NEXT 6-SECOND MESSAGE

Redlines: <not available graphically>

- The GNSS ID field was renamed GGTO ID near the middle of the figure.

IS:



* MESSAGE TOW COUNT = 17 MSB OF ACTUAL TOW COUNT AT START OF NEXT 6-SECOND MESSAGE

IS705-1723:

Section Number:
20.3.3.8.1.0-2

WAS:
Bits 157 through 159 of message type 35 shall identify the other GPS-like navigation system to which the offset data applies. The three bits are defined as follows;

000 = no data available,
001 = Galileo,
010 = GLONASS,
011 through 111 = Reserved in order to preserve use of these values in a future revision of this IS. Until such a revision, the user segment developing to this version of this IS should interpret these values as indicating that the GPS/GNSS Time Offset Parameter data, to which the GNSS Type ID applies, is presently unusable.

Redlines:
Bits 157 through 159 of message type 35 shall identify the other GPS-like navigation system to which the offset data applies. The three bits are defined as follows~~;~~:

000 = no data available,

001 = Galileo,

010 = GLONASS,

011 through 111 = Reserved in order to preserve use of these values in a future revision of this IS. Until such a revision, the user segment developing to this version of this IS should interpret these values as indicating that the GPS/GNSS Time Offset Parameter data, to which the ~~GNSS Type~~GGTO ID applies, is presently unusable.

IS:
Bits 157 through 159 of message type 35 shall identify the other GPS-like navigation system to which the offset data applies. The three bits are defined as follows:

000 = no data available,
001 = Galileo,
010 = GLONASS,
011 through 111 = Reserved in order to preserve use of these values in a future revision of this IS. Until such a revision, the user segment developing to this version of this IS should interpret these values as indicating that the GPS/GNSS Time Offset Parameter data, to which the GGTO ID applies, is presently unusable.

IS705-364:

Section Number:
20.3.3.8.2.0-3

WAS:

Parameter Symbol	Parameter Description	No. of Bits**	Scale Factor (LSB)	Valid Range***	Units
A_{0GGTO}	Bias coefficient of GPS time scale relative to GNSS time scale	16*	2^{-35}		seconds
A_{1GGTO}	Drift coefficient of GPS time scale relative to GNSS time scale	13*	2^{-51}		sec/sec
A_{2GGTO}	Drift rate correction coefficient of GPS time scale relative to GNSS time scale	7*	2^{-68}		sec/sec^2
t_{GGTO}	Time data reference Time of Week	16	2^4	0 to 604,784	seconds
WN_{GGTO}	Time data reference Week Number	13	2^0		weeks
GNSS ID	GNSS Type ID	3			see text

* Parameters so indicated shall be two's complement with the sign bit (+ or -) occupying the MSB;

** See Figure 20-8 for complete bit allocation;

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

Redlines:

Parameter		No. of Bits**	Scale Factor (LSB)	Valid Range***	Units
A_{0GGTO}	Bias coefficient of GPS time scale relative to GNSS time scale	16*	2^{-35}		seconds
A_{1GGTO}	Drift coefficient of GPS time scale relative to GNSS time scale	13*	2^{-51}		sec/sec
A_{2GGTO}	Drift rate correction coefficient of GPS time scale relative to GNSS time scale	7*	2^{-68}		sec/sec^2
t_{GGTO}	Time data reference Time of Week	16	2^{4}	0 to 604,784	seconds
WN_{GGTO}	Time data reference Week Number	13	2^{0}		weeks
GGTO ~~GNSS~~ ID	GGTO ~~GNSS~~ Type ID	3			see text

* Parameters so indicated shall be two's complement with the sign bit (+ or -) occupying the MSB

** See Figure 20-8 for complete bit allocation

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

IS:

Parameter		No. of Bits**	Scale Factor (LSB)	Valid Range***	Units
A_{0GGTO}	Bias coefficient of GPS time scale relative to GNSS time scale	16*	2^{-35}		seconds
A_{1GGTO}	Drift coefficient of GPS time scale relative to GNSS time scale	13*	2^{-51}		sec/sec
A_{2GGTO}	Drift rate correction coefficient of GPS time scale relative to GNSS time scale	7*	2^{-68}		sec/sec^2
t_{GGTO}	Time data reference Time of Week	16	2^{4}	0 to 604,784	seconds
WN_{GGTO}	Time data reference Week Number	13	2^{0}		weeks
GGTO ID	GGTO Type ID	3			see text

* Parameters so indicated shall be two's complement with the sign bit (+ or -) occupying the MSB

** See Figure 20-8 for complete bit allocation

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

IS705-370:

Section Number:
20.3.4.1.0-1

WAS:
Broadcast system of messages is completely arbitrary, but sequenced to provide optimum user performance. Message types 10 and 11 shall be broadcast at least once every 24 seconds.

Redlines:
~~Broadcast~~The ~~system~~broadcast schedule of ~~messages~~CNAV message types is completely arbitrary~~,~~ but sequenced to provide optimum user performance.~~ -~~ Message types 10, 11, and ~~11~~a clock message shall be broadcast at least once every 30 seconds (with a nominal rate of 24 seconds) to provide system users the clock, ephemeris and integrity (CEI) data needed to access GPS. Among the broadcast clock messages, an MT 30 message will be broadcast at least once every 150 seconds. Other message types may not be broadcast, but when they are scheduled for broadcast, they will be broadcast in between these CEI messages. If a message type is scheduled for broadcast on L5I from a satellite, that satellite will broadcast that message type on L5I at least every 10 minutes, unless a message generation failure results in its replacement with a Message Type 0. Message types with constellation data (like almanac and differential corrections) will cycle through any allotted broadcast slots in these 10-minute intervals, and therefore, will take longer than 10 minutes to complete the broadcast of the entire data set. CNAV message broadcast schedules may differ between satellites, and between L2C and L5I on the same satellite.

IS:
The broadcast schedule of CNAV message types is completely arbitrary but sequenced to provide optimum user performance. Message types 10, 11, and a clock message shall be broadcast at least once every 30 seconds (with a nominal rate of 24 seconds) to provide system users the clock, ephemeris and integrity (CEI) data needed to access GPS. Among the broadcast clock messages, an MT 30 message will be broadcast at least once every 150 seconds. Other message types may not be broadcast, but when they are scheduled for broadcast, they will be broadcast in between these CEI messages. If a message type is scheduled for broadcast on L5I from a satellite, that satellite will broadcast that message type on L5I at least every 10 minutes, unless a message generation failure results in its replacement with a Message Type 0. Message types with constellation data (like almanac and differential corrections) will cycle through any allotted broadcast slots in these 10-minute intervals, and therefore, will take longer than 10 minutes to complete the broadcast of the entire data set. CNAV message broadcast schedules may differ between satellites, and between L2C and L5I on the same satellite.

IS705-1731:

Section Number:
20.3.4.1.0-2

WAS:
All other messages shall be broadcast in-between, not exceeding the maximum broadcast interval in Table 20-XII. Message type 15 will be broadcast as needed, but will not reduce the maximum broadcast interval of the other messages. Type 15 messages that are longer than one page will not necessarily be broadcast consecutively.

Redlines:
~~All other messages shall be broadcast in-between, not exceeding the maximum broadcast interval in Table 20-XII.~~ Message ~~type~~Type 15~~ will be broadcast as needed, but will not reduce the maximum broadcast interval of the other messages.~~ ~~Type~~and ~~15~~36 messages that are longer than one text page will not necessarily be broadcast consecutively.

IS:
Message Type 15 and 36 messages that are longer than one text page will not necessarily be broadcast consecutively.

IS705-1551:

Section Number:
20.3.4.1.0-3

WAS:
Table 20-XII. Message Broadcast Intervals

Redlines:
Table 20-XII. ~~Message Broadcast Intervals~~RESERVED

IS:
Table 20-XII. RESERVED

IS705-371:

Section Number:
20.3.4.1.0-4

WAS:

Message Data	Message Type Number	Maximum Broadcast Intervals †
Ephemeris	10 & 11	24 sec
Clock	Type 30's	24 sec
ISC, IONO	30*	144 sec
Reduced Almanac	31* or 12	10 min**,****
Midi Almanac	37*	60 min**
EOP	32*	15 min****
UTC	33*	144 sec
Diff Correction	34* or 13 & 14	15 min***,****
GGTO	35*	144 sec****
Text	36* or 15	As needed****
Integrity Support Message +	40	144 sec****

* Also contains SV clock correction parameters.
** Complete set of SVs in the constellation.
*** When Differential Corrections are available.
**** Optional (interval applies if/when broadcast).
\+ One ISM per maximum broadcast interval; However, users are not required but can accept multiple ISMs from any SVs. Users can refer to the future TSO and MSO for further details.
† The intervals specified are maximum. As such, the broadcast intervals may be shorter than the specified value.

Redlines:
<DELETED OBJECT>

IS:
<DELETED OBJECT>