PROPOSED INTERFACE REVISION NOTICE (PIRN)						
Note: This Cover Page is not intended for signature. It is to be used during the document update (pre-ICWG) process.						
Affected ICD/IS: IS-GPS-800 Rev D	PIRN Number: PIRN-IS-800D-003A					
Authority: RFC-00312	PIRN Date: 06-DEC-2016					
CLASSIFIED BY: N/A DECLASSIFY ON: N/A						
Document Title: Navstar GPS Space Segment / User Segment L1C Interfaces						
Reason For Change (Driver):						
To remove ambiguity in contractor interpretation, the definition of the parameter Time of Predict (T_op) and other timing parameters must be clarified in the GPS technical baseline documentation.						
Description of Change:						
Process RFC via the proposed changes with the correct stakeholders and update the appropriate documentation for accurate implementation.						
Prepared By: Amit Patel Checked By: Christy Carter						
	STATEMENT A: Approved For Public Release; Dis	stribution Is Unlimited  Interface Control Contractor:				
THIS DOCUMENT SPECIFIES TECH NOTHING HEREIN CONTAINED SH. TERMS OF ANY CONTRACT OR PU PARTIES AFFECTED.	ALL BE DEEMED TO ALTER THE	An Engility Company  200 N. Sepulveda Suite 1800 El Segundo, CA 90245				

#### IS800-157:

#### WAS:

Any change in the subframe 2 ephemeris and clock data shall be accomplished with a simultaneous change in the  $t_{oe}$  value. The SV shall assure that the  $t_{oe}$  value, for at least the first data set transmitted by an SV after an upload, is different from that transmitted prior to the cutover. The eight LSBs of  $t_{oe}$  for each data set shall be different from the eight LSBs of  $t_{oe}$  transmitted during the previous six hours by the SV.

### IS:

Any change in the subframe 2 ephemeris and clock data shall be accomplished with a simultaneous change in the toe value. The SV shall assure that the toe value, for at least the first CEI data set transmitted by an SV after from an auploadnew CEI data sequence propagation, is different from that transmitted from the prior to CEI the data cutover sequence propagation. The eight LSBs of toe- for each CEI data set shall be different from the eight LSBs of toe- transmitted during the previous six hours by the SV.

### IS800-158:

#### WAS:

The general format of clock data in subframe 2 consists of data fields for SV clock correction coefficients. The clock parameters of subframe 2 describe the SV time scale during the period of validity. The parameters are applicable during the time in which they are transmitted. Beyond that time, they are still applicable, however, the most recent data set should be used since the accuracy degrades over time.

#### IS:

The general format of clock data in subframe 2 consists of data fields for SV clock correction coefficients. The clock parameters of subframe 2 describe the SV time scale during the period of validity. The parameters are applicable during the time in which they are transmitted. Beyond that time, they are still applicable, however, the most recent <u>CEI</u> data set should be used since the accuracy degrades over time.

## IS800-159:

## WAS:

Table 3.5-1. Subframe 2 Parameters (1 of 3)					
Parameter		No. of Bits**	Scale Factor (LSB)	Effective Range***	Units
WN	Week No.	13	1		weeks
ITOW	Interval time of week	8		83	(see text)
t <sub>op</sub>	Data predict time of week	11	300	604,500	seconds
L1C health		1			(see text)
URA <sub>ED</sub> Index	ED accuracy index	5*			(see text)
t <sub>oe</sub>	Ephemeris/clock data reference time of week	11	300	604,500	seconds
ΔΑ ****	Semi-major axis difference at reference time	26*	2-9		meters
Å	Change rate in semi-major axis	25*	2 <sup>-21</sup>		meters/sec
$\Delta n_0$	Mean Motion difference from computed value at reference time	17*	2 <sup>-44</sup>		semi-circles/sec
$\Delta  ilde{\mathbf{n}}_0$	Rate of mean motion difference from computed value	23*	2 <sup>-57</sup>		semi-circles/sec <sup>2</sup>
M <sub>0-n</sub>	Mean anomaly at reference time	33*	2-32		semi-circles
e <sub>n</sub>	Eccentricity	33	2 <sup>-34</sup>		dimensionless
$\omega_{ m n}$	Argument of perigee	33*	2 <sup>-32</sup>		semi-circles

<sup>\*</sup> Parameters so indicated are in two's complement notation;

<sup>\*\*</sup> See Figure 3.5-1 for complete bit allocation in Subframe 2;

<sup>\*\*\*</sup> Unless otherwise indicated in this column, effective range is the maximum range attainable with indicated bit allocation and scale factor.

<sup>\*\*\*\*</sup> Relative to  $A_{REF} = 26,559,710$  meters.

## IS:

Table 3.5-1. Subframe 2 Parameters (1 of 3)					
Parameter		No. of Bits**	Scale Factor (LSB)	Effective Range***	Units
WN	Week No.	13	1		weeks
ITOW	Interval time of week	8		0 to 83	(see text)
t <sub>op</sub>	CEI Data sequence propagation time of week	11	300	0 to 604,500	seconds
L1C health	propagation time of week	1			(see text)
URA <sub>ED</sub> Index	ED accuracy index	5*			(see text)
t <sub>oe</sub>	Ephemeris/clock data reference time of week	11	300	0 to 604,500	seconds
ΔA ****	Semi-major axis difference at reference time	26*	2-9		meters
Å	Change rate in semi-major axis	25*	2-21		meters/sec
$\Delta n_0$	Mean Motion difference from computed value at reference time	17*	2 <sup>-44</sup>		semi-circles/sec
$\Delta n_0^{ullet}$	Rate of mean motion difference from computed value	23*	2 <sup>-57</sup>		semi-circles/sec <sup>2</sup>
$M_{0-n}$	Mean anomaly at reference time	33*	2-32		semi-circles
$e_n$	Eccentricity	33	2 <sup>-34</sup>	0.0 to 0.03	dimensionless
$\omega_{ m n}$	Argument of perigee	33*	2-32		semi-circles

<sup>\*</sup> Parameters so indicated are in two's complement notation;

<sup>\*\*</sup> See Figure 3.5-1 for complete bit allocation in Subframe 2;

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

<sup>\*\*\*\*</sup> Relative to  $A_{REF} = 26,559,710$  meters.

## **IS800-161**:

## WAS:

Table 3.5-1. Subframe 2 Parameters (3 of 3)					
Parameter		No. of Bits**	Scale Factor (LSB)	Effective Range***	Units
URA <sub>NED0</sub> Index	NED Accuracy Index	5*			(see text)
URA <sub>NED1</sub> Index	NED Accuracy Change Index	3			(see text)
URA <sub>NED2</sub> Index	NED Accuracy Change Rate Index				(see text)
$a_{f2-n}$	SV Clock Drift Rate Correction Coefficient		2 <sup>-60</sup>		sec/sec <sup>2</sup>
$a_{ m fl-n}$	SV Clock Drift Correction Coefficient	20*	2 <sup>-48</sup>		sec/sec
$a_{ m f0-n}$	SV Clock Bias Correction Coefficient	26*	2-35		seconds
T <sub>GD</sub> ****	Inter-Signal Correction for L1 or L2 P(Y)	13*	2 <sup>-35</sup>		seconds
ISC <sub>LICP</sub> ****	Inter-Signal Correction for L1C <sub>P</sub>	13*	2 <sup>-35</sup>		seconds
ISC <sub>L1CD</sub> ****	Inter-Signal Correction for L1C <sub>D</sub>	13*	2-35		seconds
WN <sub>OP</sub>	Data Predict Week Number	8	1		weeks

<sup>\*</sup> Parameters so indicated are in two's complement notation;

<sup>\*\*</sup> See Figure 3.5-1 for complete bit allocation in Subframe 2;

<sup>\*\*\*</sup> Unless otherwise indicated in this column, effective range is the maximum range attainable with indicated bit allocation and scale factor.

\*\*\*\* The bit string of "1000000000000" will indicate that the group delay value is not available.

## **IS**:

	Table 3.5-1. Subframe 2 F	arameters	(3 of 3)		
Parameter		No. of Bits**	Scale Factor (LSB)	Effective Range***	Units
URA <sub>NED0</sub> Index	NED Accuracy Index	5*			(see text)
URA <sub>NED1</sub> Index	NED Accuracy Change Index	3			(see text)
URA <sub>NED2</sub> Index	NED Accuracy Change Rate Index	3			(see text)
$a_{f2-n}$	SV Clock Drift Rate Correction Coefficient	10*	2 <sup>-60</sup>		sec/sec <sup>2</sup>
a <sub>f1-n</sub>	SV Clock Drift Correction Coefficient	20*	2 <sup>-48</sup>		sec/sec
a <sub>f0-n</sub>	SV Clock Bias Correction Coefficient	26*	2 <sup>-35</sup>		seconds
T <sub>GD</sub> ****	Inter-Signal Correction for L1 or L2 P(Y)	13*	2 <sup>-35</sup>		seconds
ISC <sub>L1CP</sub> ****	Inter-Signal Correction for L1C <sub>P</sub>	13*	2 <sup>-35</sup>		seconds
ISC <sub>L1CD</sub> ****	Inter-Signal Correction for L1C <sub>D</sub>	13*	2 <sup>-35</sup>		seconds
$ m WN_{op}$	CEI Data Propagation Sequence Week Number	8	1		weeks

<sup>\*</sup> Parameters so indicated are in two's complement notation;

<sup>\*\*</sup> See Figure 3.5-1 for complete bit allocation in Subframe 2;

<sup>\*\*\*</sup> Unless otherwise indicated in this column, effective range is the maximum range attainable with indicated bit allocation and scale factor.

**** The bit string of "1000000000000" will indicate that the group delay value is not available.
IS800-163:
WAS: Bits 1 through 13 of subframe 2 shall contain 13 bits that are a modulo-8192 binary representation of the current GPS week number at the start of the data set transmission interval (see paragraph 6.2.2).
<b>IS</b> : Bits 1 through 13 of subframe 2 shall contain 13 bits that are a modulo-8192 binary representation of the current GPS week number at the start of the <u>CEI</u> data set transmission interval (see paragraph 6.2.2).
IS800-166:
15000-100
WAS : Data Predict Time of Week
IS: <u>CEI</u> Data <u>PredictSequence Propagation</u> Time of Week
IS800-167:

#### WAS:

Bits 22 through 32 of subframe 2 shall contain the data predict time of week ( $t_{op}$ ). The  $t_{op}$  term provides the epoch time of week of the state estimate utilized for the prediction of satellite quasi-Keplerian ephemeris parameters.

#### IS:

Bits 22 through 32 of subframe 2 shall contain the <u>CEI</u> data <u>predictsequence propagation</u> time of week (top). The top term provides the epoch time of week of the state <u>estimatedata</u> utilized for <u>thesatellite</u> <u>predictionCEI</u> data. Users are cautioned to avoid using this parameter to compute age of <u>satellitedata</u> quasi-Keplerianfor <u>ephemerisany</u> <u>parametersSV</u>.

#### IS800-172:

#### WAS:

The predicted health data will be updated at the time of upload when a new data set has been built by the CS. The transmitted health data may not correspond to the actual health of the transmitting SV. In real time, if the L1C signal becomes unhealthy, the status change will normally be indicated by the broadcast of non-standard code or be indicated by the health bits as described in subframe 2.

### IS:

The predicted health data will be updated at the time of upload when a new <u>CEI</u> data set has been built by the CS. The transmitted health data may not correspond to the actual health of the transmitting SV. In real time, if the L1C signal becomes unhealthy, the status change will normally be indicated by the broadcast of non-standard code or be indicated by the health bits as described in subframe 2.

### IS800-179:

#### WAS:

The user shall compute the ECEF coordinates of position for the SV's antenna phase center (APC) utilizing a variation of the equations shown in Table 3.5-2. The ephemeris parameters are Keplerian in appearance; however, the values of these parameters are produced by the SV via a least squares curve fit of the predicted ephemeris of the SV APC (time-position quadruples: t, x,

y, z expressed in ECEF coordinates). Particulars concerning the applicable coordinate system are given in Sections 20.3.3.4.3.3 and 20.3.3.4.3.4 of IS-GPS-200.

#### IS:

The user shall compute the ECEF coordinates of position for the SV's antenna phase center (APC) utilizing a variation of the equations shown in Table 3.5-2. The ephemeris parameters are Keplerian in appearance; however, the values of these parameters are produced by the SV via a least squares curve fit of the <u>predicted propagated</u> ephemeris of the SV APC (time-position quadruples: t, x, y, z expressed in ECEF coordinates). Particulars concerning the applicable coordinate system are given in Sections 20.3.3.4.3.3 and 20.3.3.4.3.4 of IS-GPS-200.

IS800	1_QN4	
1,700	ケノソマ	

WAS:

Data Predict Week Number.

IS:

CEI Data PredictSequence Propagation Week Number.

### IS800-905:

#### WAS:

Bits 567-574 of Subframe 2 shall indicate the Data Predict Week Number (WN $_{OP}$ ) to which the Data Predict Time of Week (top) is referenced (see 3.5.3.3). The WN $_{OP}$  term consists of eight bits which shall be a modulo 256 binary representation of the GPS week number to which the top is referenced.

### IS:

Bits 567-574 of Subframe 2 shall indicate the CEI Data PredictSequence Propagation Week Number (WNOPWNop) to which the CEI Data PredictSequence Propagation Time of Week (top) is referenced (see 3.5.3.3). The WNOPWNop term consists of eight bits which shall be a modulo 256 binary representation of the GPS week number to which the top is referenced. The combination of the epoch time of state data (top, WNop) for a valid CEI data sequence propagation will be in the past relative to the time of broadcast.

IS800-289:
<b>WAS</b> : Cutovers of subframe 2 data to new data sets will nominally occur on hour boundaries except for the first data set of a new upload. The first data set of newly uploaded data will cutover on 15 minute boundaries.
<b>IS</b> :  Cutovers of subframe 2 data to new <u>CEI</u> data sets will nominally occur on hour boundaries except for the first <u>CEI</u> data set of a new <u>upload CEI data sequence propagation</u> . The first <u>CEI</u> data set of newly uploaded data will cutover on 15 minute boundaries.
IS800-869 :
WAS: Data Sets
IS: CEI Data Sets
IS800-871:
$\textbf{WAS}$ : The $t_{oe}$ shall be equal to the $t_{oc}$ of the same CNAV data set. The following rules govern the

transmission of  $t_{oe}$  and  $t_{oc}$  values in different data sets: (1) The transmitted  $t_{oc}$  will be different from any value transmitted by the SV during the preceding seven days; (2) The transmitted  $t_{oe}$ 

will be different from any value transmitted by the SV during the preceding six hours.

Cutovers to new data sets will occur only on hour boundaries except for the first data set of a new upload. The first data set may be cut-in (reference paragraph 3.5.5.1) at any time during the hour and therefore may be transmitted by the SV for less than one hour.

The start of the transmission interval for each data set corresponds to the beginning of the curve fit interval for the data set. Each data set remains valid for the duration of its transmission interval, and nominally also remains valid for the duration of its curve fit interval. A data set is rendered invalid before the end of its curve fit interval when it is superseded by the SV cutting over to the first data set of a new upload.

Normal Operations. The subframe 2 data sets are transmitted by the SV for periods of two hours. The corresponding curve fit interval is three hours.

#### IS:

The toe shall be equal to the toe of the same CNAV data set. The following rules rule governgoverns the transmission of toe and toe values in different CEI data sets: (1) The transmitted toetoe will be different from any value transmitted by the SV during the preceding seven days; (2) The transmitted toe will be different from any value transmittedsix byhours. thetop SV does during not the have preceding to six match hours toe.

Cutovers to new <u>CEI</u> data sets will occur only on hour boundaries except for the first <u>CEI</u> data set of a new <u>uploadCEI data sequence propagation</u>. The first <u>CEI</u> data set may be cut-in (reference paragraph 3.5.5.1) at any time during the hour and therefore may be transmitted by the SV for less than one hour.

The start of the transmission interval for each <u>CEI</u> data set corresponds to the beginning of the curve fit interval for the <u>CEI</u> data set. Each <u>CEI</u> data set remains valid for the duration of its transmission interval, and nominally also remains valid for the duration of its curve fit interval. A <u>CEI</u> data set is rendered invalid before the end of its curve fit interval when it is superseded by the SV cutting over to the first <u>CEI</u> data set of a new <u>upload</u> <u>CEI</u> data sequence propagation.

Normal Operations. The subframe 2<u>CEI</u> data sets are transmitted by the SV for periods of two hours. The corresponding curve fit interval is three hours.

### **IS800-918**:

Insertion after object IS800-871

WAS:

N/A

**IS**:

<u>Changes in parameters marked with NOTE1 shown in Table 6.2-18 do not prompt a change in toe/toc.</u> Updates to parameters without NOTE1 prompt changes in toe/toc.

IS800-893:

WAS:

APC	-	antenna phase center
ASCII	-	American Standard Code for Information Interchange
ВСН	-	Bose, Chaudhuri, and Hocquenghem
BOC	-	Binary Offset Carrier
BPSK	-	Bi-Phase Shift Key
ССВ	-	Configuration Control Board
CDC	-	clock differential correction
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

SS	Global Navigation Satellite System  Global Positioning System  GPS Wing  Interface Control Contractor  Interface Control Working Group  Interface Revision Notice	
	GPS Wing  Interface Control Contractor  Interface Control Working Group	
	Interface Control Contractor  Interface Control Working Group	
/G -	Interface Control Working Group	
-	Interface Revision Notice	
-	Interface Specification	
-	Inter-Signal Correction	
W -	Interval Time of Week	
PC -	Low Density Parity Check	
R -	Linear Feedback Shift Register	
-	Least Significant Bit	
-	Leap Seconds Future	
-	Common L1 Signal	
S -	Master Control Station	
z -	Megahertz	
3 -	Most Significant Bit	
V -	Legacy Navigation Message, D(t)	
CD -	non-standard L1C <sub>D</sub>	
CP -	non-standard L1C <sub>P</sub>	
N -	Proposed Interface Revision Notice	
1 -	Pseudo-Random Noise	
-	Radio Frequency	
CP -	Right-Hand Circularly Polarized	
S -	Root Mean Square	
AS -	Satellite Based Augmentation System	

-	symbols per second
-	Space Segment
-	Space Service Volume
-	Space Vehicle
-	To Be Determined
-	To Be Resolved
-	To Be Supplied
-	Time-Multiplexed BOC
-	Time of Interval
-	Time of Week
-	User Differential Range Accuracy
-	User Equipment
-	User Range Accuracy
-	User Segment
-	U.S. Naval Observatory
-	Coordinated Universal Time
-	World Geodetic System 1984

# **IS**:

APC	-	antenna phase center
ASCII	-	American Standard Code for Information Interchange
ВСН	-	Bose, Chaudhuri, and Hocquenghem
BOC	-	Binary Offset Carrier
BPSK	-	Bi-Phase Shift Key
ССВ	-	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

Linear Feedback Shift Register	LDPC	-	Low Density Parity Check
Leap Seconds Future	LFSR	-	Linear Feedback Shift Register
Common L1 Signal	LSB	-	Least Significant Bit
MCS - Master Control Station  MHz - Megahertz  MSB - Most Significant Bit  NAV - Legacy Navigation Message, D(t)  NSCD - non-standard L1C <sub>p</sub> NSCP - non-standard L1C <sub>p</sub> 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  TMBOC - Time-Multiplexed BOC  TOI - Time of Interval	LSF	-	Leap Seconds Future
MHz         -         Megahertz           MSB         -         Most Significant Bit           NAV         -         Legacy Navigation Message, D(t)           NSCD         -         non-standard L1Cp           NSCP         -         non-standard L1Cp           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 Segment           SV         -         Space Vehicle           TBD         -         To Be Determined           TBR         -         To Be Supplied           TMBOC         -         Time-Multiplexed BOC           TOI         -         Time of Interval	L1C	-	Common L1 Signal
MSB - Most Significant Bit  NAV - Legacy Navigation Message, D(t)  NSCD - non-standard L1Cp  NSCP - non-standard L1Cp  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	MCS	-	Master Control Station
NAV - Legacy Navigation Message, D(t)  NSCD - non-standard L1C <sub>D</sub> NSCP - non-standard L1C <sub>P</sub> 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  TMBOC - Time-Multiplexed BOC  TOI - Time of Interval	MHz	-	Megahertz
NSCD - non-standard L1C <sub>D</sub> NSCP - non-standard L1C <sub>P</sub> 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  TMBOC - Time-Multiplexed BOC  TOI - Time of Interval	MSB	-	Most Significant Bit
NSCP - non-standard L1C <sub>P</sub> 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	NAV	-	Legacy Navigation Message, D(t)
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	NSCD	-	non-standard L1C <sub>D</sub>
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	NSCP	-	non-standard L1C <sub>P</sub>
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	PIRN	-	Proposed Interface Revision Notice
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	PRN	-	Pseudo-Random Noise
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	RF	-	Radio Frequency
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	RHCP	-	Right-Hand Circularly Polarized
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	RMS	-	Root Mean Square
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	SBAS	-	Satellite Based Augmentation System
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	sps	-	symbols per second
SV - Space Vehicle  TBD - To Be Determined  TBR - To Be Resolved  TBS - To Be Supplied  TMBOC - Time-Multiplexed BOC  TOI - Time of Interval	SS	-	Space Segment
TBD - To Be Determined  TBR - To Be Resolved  TBS - To Be Supplied  TMBOC - Time-Multiplexed BOC  TOI - Time of Interval	SSV	-	Space Service Volume
TBR - To Be Resolved  TBS - To Be Supplied  TMBOC - Time-Multiplexed BOC  TOI - Time of Interval	SV	-	Space Vehicle
TBS - To Be Supplied  TMBOC - Time-Multiplexed BOC  TOI - Time of Interval	TBD	-	To Be Determined
TMBOC - Time-Multiplexed BOC  TOI - Time of Interval	TBR	-	To Be Resolved
TOI - Time of Interval	TBS	-	To Be Supplied
	TMBOC	-	Time-Multiplexed BOC
TOW - Time of Week	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

### IS800-911:

Insertion after object IS800-910

**WAS**: N/A

IS:

Clock, Ephemeris, Integrity (CEI) Data Set.

#### IS800-912:

Insertion below object IS800-911

WAS:

N/A

IS:

The Clock, Ephemeris, Integrity (CEI) data set is the collection of SV-specific clock correction polynomial parameters, ephemeris parameters, and related parameters (health flags, URA parameters, time tags, etc.) needed to use the SV's broadcast signal(s) in the positioning service. The parameters in the CEI data set are explicitly listed in Table 6.2-18. The entire CEI data set is needed for maximum accuracy. However, the core CEI data set (parameters without

epoch time of week of the state data utilized for the core CEI data set.
IS800-919: Insertion after object IS800-912
WAS: N/A
IS: Core CEI Data Set.
IS800-920 :
Insertion below object IS800-919  WAS: N/A
IS: Set of CEI parameters necessary for a satellite to be used for a position solution (non-almanac) broadcast to users with the shortest broadcast interval. 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 6.2-18.
IS800-916 :
Insertion after object IS800-919
WAS: N/A
IS: Table 6.2-18. CEI Data Set Parameters

# IS800-917:

Insertion after object IS800-916

 ${f WAS}: N/A$ 

**IS** :

Symbol	Parameter Name	Subframe
À	Change Rate in Semi-major Axis	2
ΔΑ	Semi-major axis difference at reference time	2
$\Delta n_0$	Mean Motion Difference from Computed Value at Reference Time	2
$\Delta n_0$	Rate of Mean Motion Difference from Computed Value	2
$\Omega_0$	Longitude of Ascending Node of Orbit Plane at Weekly Epoch	2
ΔΩ	Rate of Right Ascension Difference	
ω	Argument of Perigee	2
a <sub>f0</sub>	SV Clock Bias Correction Coefficient	
a <sub>f1</sub>	SV Clock Drift Correction Coefficient	
a <sub>f2</sub>	Drift Rate Correction Coefficient Index	2
C <sub>ic</sub>	Amplitude of the Cosine Harmonic Correction Term to the Angle of Inclination	2
C <sub>is</sub>	Amplitude of the Sine Harmonic Correction Term to the Angle of Inclination	2
C <sub>rc</sub>	Amplitude of the Cosine Harmonic Correction Term to the Orbit Radius	2
C <sub>rs</sub>	Amplitude of the Sine Correction Term to the Orbit Radius	2
C <sub>uc</sub>	Amplitude of Cosine Harmonic Correction Term to the Argument of Latitude	2
C <sub>us</sub>	Amplitude of Sine Harmonic Correction Term to the Argument of Latitude	
е	Eccentricity	2
i <sub>0</sub>	Inclination Angle at Reference Time	2
i <sub>0-n</sub> -DOT	Rate of Inclination Angle	2
ISC <sub>L1CP</sub>	Inter-signal Correction NOTE1	2

Symbol	Parameter Name	Subframe
ISC <sub>L1CD</sub>	Inter-signal Correction NOTE1	2
ISF	Integrity Status Flag NOTE1	2
ITOW	Interval Time of Week	2
L1C	Signal Health (1 bits)	2
$M_0$	Mean Anomaly at Reference Time	2
T <sub>GD</sub>	Group Delay Differential NOTE1	2
t <sub>oe</sub>	Time of Ephemeris	2
t <sub>op</sub>	CEI Data Sequence Propagation Time of Week	2
URA <sub>ED</sub> Index	Elevation Dependent User Range Accuracy, URA <sub>ED</sub> Index	2
URA <sub>NEDO</sub> Index	NED Accuracy Index	2
URA <sub>NED1</sub> Index	NED Accuracy Change Index	2
URA <sub>NED2</sub> Index	NED Accuracy Change Rate Index	2
WN	Week Number	2

NOTE1: Parameters so indicated are for CEI Refinement – not limited to curve fit. Parameters not indicated are needed for/limited to curve fit. Changes in parameters marked with NOTE1 do not prompt a change in  $t_{\text{oe}}/t_{\text{oc}}$ . Updates to parameters without NOTE1 prompt changes in  $t_{\text{oe}}/t_{\text{oc}}$ .

## IS800-913:

Insertion after object IS800-911

WAS:

IS:

CEI Data Sequence Propagation.

<b>IS800-914</b> : Insertion below object IS800-913
WAS: N/A
A related time-ordered sequence of CEI data sets in which each successive CEI data set is a time propagation of the preceding CEI data set. Special provisions apply to alert users to discontinuities separating one CEI data sequence propagation from another CEI data sequence propagation (e.g., after an upload occurs). An upload may include multiple segments of temporally continuous CEI Data sequence propagations.