

Zodiac GPS Receiver Version 2.30

New Serial I/O Messages

The Zodiac software baseline has been upgraded to version 2.30. The standard release for the Jupiter receiver contains serial I/O messages that were added to the messages in version 1.80. The additional output messages are:

- Message 1040, Raw Almanac Output.
- Message 1041, Raw Ephemeris Output.
- Message 1042, Raw Ionospheric and UTC Corrections Output.
- Message 1101, Global Output Control Parameters.
- Message 1110, Frequency Standard Parameters In Use.
- Message 1150, Raw RTCM SC-104.
- Message 1190, Error/Status.

The additional input messages are:

- Message 1240, Raw Almanac Input.
- Message 1241, Raw Ephemeris Input.
- Message 1242, Raw Ionospheric and UTC Corrections Input.

This Application Note describes the new output and input messages in version 2.30.

Raw Almanac Output (Message 1040). This message outputs almanac data. All data is represented as raw subframe page data (excluding parity bits), according to the GPS SPS Signal Specification. Almanac data is found in subframe 5, pages 1 to 25, and in subframe 4, pages 2 to 5, 7 to 10, and 25. This message is intended to download the almanac from the receiver and to store it in a file. When queried, the receiver will output Message

1040 containing the almanac for SV ID 1 to 32. When using Labmon to download the almanac (Message 1040) to a file, Labmon will create Message 1240 in the default file "Almanac.gps". This file is ready to be uploaded to the receiver using Labmon by pressing <Shift><F12>. The contents of the Raw Almanac Output Message are described in the Table below.

Message 1040: Raw Almanac Output Message

Message ID:		1040						
Rate:		Query						
Message Length:		424 words						
Word No.:	Name:	Type:	Units:	Range:	Resolution:			
1-4	Message Header							
5	Header Checksum							
6-7	Set Time (Note 1)	UDI	10 msec ticks	0 to 4294967295				
8	Sequence Number (Note 2)	I		0 to 32767				
9+(13*j)	Week Number (Note 3)	I	weeks	0 to 32767				
10+(13*j)	Raw Almanac Data (Note 3)	UI						
•								
•								
•								
21+(13*j)								
425	Data Checksum							
Note 1:								
Set time is an internal 10 millisecond (T10) count since power-on initialization enabled the processor interrupts. It is not used to derive GPS time, but only serves to provide a sequence of events knowledge. The set time or T10 count references the receiver's internal time at which the message was created for output. The T10 range is approximately 71 weeks.								
Note 2:								
The sequence number is a count that indicates whether the data in a particular binary message has been updated or changed since the last message output.								
Note 3:								
j = 0 to 31 for SV IDs from 1 to 32 of Week Number and Raw Almanac Data.								
Example for SV ID = 1:								
The Raw Almanac data words 10 to 15:								
	Data[10]	Data[11]	Data[12]	Data[13]	Data[14]	Data[15]		
	61	84	91	114	121	141	151	174
Correspond to bits in subframe 4 and 5:								
And the Raw Almanac data words 16 to 21:								
	Data[16]	Data[17]	Data[18]	Data[19]	Data[20]	Data[21]		
	181	204	211	234	241	264	271	294
Correspond to bits in subframe 4 and 5:								

Raw Ephemeris Output (Message 1041). This message outputs ephemeris data for one satellite in the constellation. All data is represented as raw subframe page data (excluding parity bits), according to the Global Positioning System Standard Positioning Service Signal

Specification. Ephemeris data is found in subframes 1 through 3, words 3 to 10. The contents of the Raw Ephemeris Output Message are described in the Table below.

Message 1041: Raw Ephemeris Output Message

Message ID: 1041																																																													
Rate: Variable																																																													
Message Length: 48 words																																																													
Word No.:	Name:	Type:	Units:	Range:	Resolution:																																																								
1-4	Message Header																																																												
5	Header Checksum																																																												
6-7	Set Time (Note 1)	UDI	10 msec ticks	0 to 4294967295																																																									
8	Sequence Number (Note 2)	I		0 to 32767																																																									
Ephemeris Identification (9-47)																																																													
9	Satellite PRN	I		1 to 32																																																									
10	Momentum, Alert Flag (Note 3)	I		0 to 1																																																									
11	Synchronization, Anti-Spoof Flag (Note 4)	I		0 to 1																																																									
12-47	Ephemeris Data	UI																																																											
48	Data Checksum																																																												
<p>Note 1: Set time is an internal 10 millisecond (T10) count since power-on initialization enabled the processor interrupts. It is not used to derive GPS time, but only serves to provide a sequence of events knowledge. The set time or T10 count references the receiver's internal time at which the message was created for output. The T10 range is approximately 71 weeks.</p> <p>Note 2: The sequence number is a count that indicates whether the data in a particular binary message has been updated or changed since the last message output.</p> <p>Note 3: If SV configuration code = 0, this is the Momentum Flag. If SV configuration code = 1, this is the Alert Flag. Momentum Flag is = 1 when a thruster type momentum dump has occurred since the last ephemeris upload. Alert Flag = 1 indicates that the SV URA may be worse than indicated for satellite PRN.</p> <p>Note 4: If SV configuration code = 0, this is the Synchronization Flag. If SV configuration code = 1, this is the Anti-Spoof Flag. Synchronization Flag is = 0 when the leading edge of the TLM word is coincident with the X1 epoch. Anti-Spoof Flag = 1 when the anti-spoof mode is ON in the satellite PRN.</p> <p>Note 5:</p> <table border="1" style="margin-left: 20px;"> <tr> <td>The raw ephemeris data words 12 to 17:</td> <td>Data[12]</td> <td>Data[13]</td> <td>Data[14]</td> <td>Data[15]</td> <td>Data[16]</td> <td>Data[17]</td> </tr> <tr> <td>Corresponding to bits in subframe 1:</td> <td>61</td> <td>84</td> <td>91</td> <td>114</td> <td>121</td> <td>141</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>151</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>174</td> </tr> </table> <table border="1" style="margin-left: 20px;"> <tr> <td>The raw ephemeris data words 18 to 23:</td> <td>Data[18]</td> <td>Data[19]</td> <td>Data[20]</td> <td>Data[21]</td> <td>Data[22]</td> <td>Data[23]</td> </tr> <tr> <td>Corresponding to bits in subframe 1:</td> <td>181</td> <td>204</td> <td>211</td> <td>234</td> <td>241</td> <td>264</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>271</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>294</td> </tr> </table> <p>Raw ephemeris data words 24 to 35 correspond to the bits 61 to 294 in subframe 2. Raw ephemeris data words 36 to 47 correspond to the bits 61 to 294 in subframe 3.</p>						The raw ephemeris data words 12 to 17:	Data[12]	Data[13]	Data[14]	Data[15]	Data[16]	Data[17]	Corresponding to bits in subframe 1:	61	84	91	114	121	141							151							174	The raw ephemeris data words 18 to 23:	Data[18]	Data[19]	Data[20]	Data[21]	Data[22]	Data[23]	Corresponding to bits in subframe 1:	181	204	211	234	241	264							271							294
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						271																																																							
						294																																																							

Raw Ionospheric and UTC Corrections Output (Message 1042). This message outputs the parameters associated with correcting for the affects of the Earth's ionosphere on GPS signal propagation and the parameters associated with UTC timekeeping. All data is represented as raw subframe page data (excluding parity bits), according to the Global Positioning System Standard Positioning Service Signal Specification. Ionospheric data is found in subframe 4, page 18, bits 9 through 24 of word 3 plus the 24 MSBs of words 4 and 5. UTC data is found in subframe 4, page 18, words 6 to 9 and the 8 MSBs of word 10.

This message is intended to download raw UTC from the receiver and store it in a file. When queried, the receiver will output Message 1042 containing the almanac for SV ID 1 to 32. When using Labmon to download UTC (Message 1042) to a file, Labmon will create Message 1242 in the default file "UTC.gps". This file is ready to be uploaded to the receiver using Labmon by pressing <Shift><F12>. The contents of the Raw Ionospheric and UTC Corrections Output Message are described in the Table below.

Message 1042: Raw Ionospheric and UTC Corrections Output Message

Message ID:		1042																											
Rate:		Query																											
Message Length:		22 words																											
Word No.:	Name:	Type:	Units:	Range:	Resolution:																								
1-4	Message Header																												
5	Header Checksum																												
6-7	Set Time (Note 1)	UDI	10 msec ticks	0 to 4294967295																									
8	Sequence Number (Note 2)	I		0 to 32767																									
9	Week Number (Note 3)	I	weeks	0 to 32767																									
10-21	Raw Ionospheric and UTC Correction Ephemeris Data From Page 18 of Subframe 4 (Note 4)	UI																											
22	Data Checksum																												
<p>Note 1: Set time is an internal 10 millisecond (T10) count since power-on initialization enabled the processor interrupts. It is not used to derive GPS time, but only serves to provide a sequence of events knowledge. The set time or T10 count references the receiver's internal time at which the message was created for output. The T10 range is approximately 71 weeks.</p> <p>Note 2: The sequence number is a count that indicates whether the data in a particular binary message has been updated or changed since the last message output.</p> <p>Note 3: A full week number is required because of the truncated format of the value in the telemetry data stream.</p> <p>Note 4: Example for SV ID = 1: The raw iono and UTC data words 10 to 15: Correspond to bits in page 18 of subframe 4: And the iono and UTC data words 16 to 21: Correspond to bits in page 18 of subframe 4:</p> <table border="1" style="margin-left: 20px;"> <tr> <td>Data[10]</td> <td>Data[11]</td> <td>Data[12]</td> <td>Data[13]</td> <td>Data[14]</td> <td>Data[15]</td> </tr> <tr> <td>61</td> <td>84</td> <td>91</td> <td>114</td> <td>121</td> <td>141 151 174</td> </tr> <tr> <td>Data[16]</td> <td>Data[17]</td> <td>Data[18]</td> <td>Data[19]</td> <td>Data[20]</td> <td>Data[21]</td> </tr> <tr> <td>181</td> <td>204</td> <td>211</td> <td>234</td> <td>241</td> <td>264 271 294</td> </tr> </table>						Data[10]	Data[11]	Data[12]	Data[13]	Data[14]	Data[15]	61	84	91	114	121	141 151 174	Data[16]	Data[17]	Data[18]	Data[19]	Data[20]	Data[21]	181	204	211	234	241	264 271 294
Data[10]	Data[11]	Data[12]	Data[13]	Data[14]	Data[15]																								
61	84	91	114	121	141 151 174																								
Data[16]	Data[17]	Data[18]	Data[19]	Data[20]	Data[21]																								
181	204	211	234	241	264 271 294																								

Global Output Control Parameters (Message 1101).
This message provides the current status of the Measurement Engine mode. The contents of the Global

Output Control Parameters Message are described in the Table below.

Message 1101: Global Output Control Parameters Message

Message ID: 1101					
Rate: Variable					
Message Length: 12 words					
Word No.:	Name:	Type:	Units:	Range:	Resolution:
1-4	Message Header				
5	Header Checksum				
6-7	Set Time (Note 1)	UDI	10 msec ticks	0 to 4294967295	
8	Sequence Number (Note 2)	I		0 to 32767	
9	Current Measurement Engine Mode (Note 3)	UI	enumeration	0 = Autonomous acquisition 1 = Sequential acquisition 2 = Commanded channel 3 = Parallel acquisition 4 = Reset	
10	Reserved				
11	Reserved				
12	Data Checksum				
<p>Note 1: Set time is an internal 10 millisecond (T10) count since power-on initialization enabled the processor interrupts. It is not used to derive GPS time, but only serves to provide a sequence of events knowledge. The set time or T10 count references the receiver's internal time at which the message was created for output. The T10 range is approximately 71 weeks.</p> <p>Note 2: The sequence number is a count that indicates whether the data in a particular binary message has been updated or changed since the last message output.</p> <p>Note 3: This mode cannot be commanded. The mode word is set to "initializing" by the Measurement Engine immediately after power-up. When initialization is complete, the mode is changed to another value, typically autonomous cold start. The Initialized mode will never be seen by a Navigation Engine on the AAMP 2-8 because the mode will be changed before the Navigation Engine starts. It is intended for applications with the Navigation Engine on a remote processor.</p>					

Frequency Standard Parameters In Use (Message 1110). This message outputs the parameters used to support the receiver's uncompensated crystal oscillator. The contents of the Frequency Standard Parameters In Use Message are described in the Table below.

NOTE: Message 1110 is primarily used to output key parameters to GPS systems without non-volatile storage. This is why the format of input message 1310 is exactly the same -- the output message is used to capture data, while the input message is used to restore data.

Message 1110: Frequency Standard Parameters In Use Message (1 of 2)

Message ID: 1110					
Rate: Variable					
Message Length: 22 words					
Word No.:	Name:	Type:	Units:	Range:	Resolution:
1-4	Message Header				
5	Header Checksum				
6-7	Set Time (Note 1)	UDI	10 msec ticks	0 to 4294967295	
8	Sequence Number (Note 2)	I		0 to 32767	
9	Frequency Standard Issue Number (Note 3)	UI		0 to 65535	
TEMPERATURE CHARACTERISTIC:					
10	C_0 (Aging and Calibration Offset) (Note 4)	I	sec/sec	0 to $\pm 2^{-14}$	2^{-29}
11	C_1 (Linear Term) (Note 4)	I	sec/sec/°C	0 to $\pm 2^{-20}$	2^{-35}
12	C_2 (Second Order Term) (Note 4)	I	sec/sec/(°C) ²	0 to $\pm 2^{-26}$	2^{-41}
13	C_3 (Third Order Term) (Note 4)	I	sec/sec/(°C) ³	0 to $\pm 2^{-32}$	2^{-47}
14	T_{INF} (Inflection Point) (Note 4)	I	°C	0 to ± 100	0.01
TEMPERATURE DYNAMICS:					
15	D_0 (Note 5)	I			
16	D_1 (Note 5)	I			
TEMPERATURE SENSOR CALIBRATION:					
17	T_{REF} (Calibration Reference Temperature) (Note 6)	I	°C	0 to ± 100	0.01
18	T_0 (Temperature Sensor Reading at T_{REF}) (Note 6)	UI	counts	0 to 65535	1
19	S_0 (Temperature Sensor Scale Factor) (Note 6)	I	°C/count	0 to $\pm 2^{-3}$	2^{-18}

Message 1110: Frequency Standard Input Parameters In Use Message (2 of 2)

Word No.:	Name:	Type:	Units:	Range:	Resolution:
UNCERTAINTY COEFFICIENTS:					
20	U ₀ (Note 7)	I	sec/sec	0 to $\pm 2^{-14}$	2 ⁻²⁹
21	U ₁ (Note 7)	I	sec/sec/°C	0 to $\pm 2^{-20}$	2 ⁻³⁵
22	Data Checksum				
<p>Note 1: Set time is an internal 10 millisecond (T10) count since power-on initialization enabled the processor interrupts. It is not used to derive GPS time, but only serves to provide a sequence of events knowledge. The set time or T10 count references the receiver's internal time at which the message was created for output. The T10 range is approximately 71 weeks.</p> <p>Note 2: The sequence number is a count that indicates whether the data in a particular binary message has been updated or changed since the last message output.</p> <p>Note 3: Unique identification of each update. This allows a different set of data to be in use while newer data are only stored to EEPROM. The issue number is preserved from run to run if non-volatile storage is available.</p> <p>Note 4: Defines a cubic in (T – TINF). Over a range of TINF±65 degrees C, each term can produce from 0.002 to 60 ppm, approximately.</p> <p>Note 5: Unused.</p> <p>Note 6: These parameters define the temperature sensor scaling according to the equation: $T = TREF + (TFILT - T0)S0$</p> <p>Note 7: Defines a linear equation in (T – TINF). Over a range of TINF ±65°C, each term can produce from 0.002 to 60 ppm, approximately.</p>					

Raw RTCM SC-104 (Message 1150). This message contains the raw (unformatted) data from the last valid received RTCM message. The parity bits have been removed from the incoming raw RTCM message. The

contents of the Raw RTCM SC-104 Message are described in the Table below. Refer to the RTCM SC-104 Standard for more detailed information.

Message 1150: Raw RTCM SC-104 Message

Message ID: 1150					
Rate: Variable					
Message Length: 77 words					
Word No.:	Name:	Type:	Units:	Range:	Resolution:
1-4	Message Header				
5	Header Checksum				
6-7	Set Time (Note 1)	UDI	10 msec ticks	0 to 4294967295	
8	Sequence Number (Note 2)	I		0 to 32767	
9-10	RTCM Header (LSDW)	UDI			
11-12	RTCM Header (MSDW)	UDI			
13-14	RTCM Data #1 (LSDW)	UDI			
•					
•					
•					
75-76	RTCM Data #32 (MSDW)	UDI			
77	Data Checksum				
<p>Note 1: Set time is an internal 10 millisecond (T10) count since power-on initialization enabled the processor interrupts. It is not used to derive GPS time, but only serves to provide a sequence of events knowledge. The set time or T10 count references the receiver's internal time at which the message was created for output. The T10 range is approximately 71 weeks.</p> <p>Note 2: The sequence number is a count that indicates whether the data in a particular binary message has been updated or changed since the last message output.</p>					

Error/Status Message (Message 1190). This message provides diagnostic information if the receiver encounters an error during execution of its firmware.

The contents of the Error/Status Message are described in the Table below.

Message 1190: Error/Status Message

Message ID:		1190			
Rate:		Variable			
Message Length:		13 words			
Word No.:	Name:	Type:	Units:	Range:	Resolution:
1-4	Message Header				
5	Header Checksum				
6-7	Set Time (Note 1)	UDI	10 msec ticks	0 to 4294967295	
8	Sequence Number (Note 2)	I		0 to 32767	
9	Class (Note 3)	UI		0 to 5	
10	Number	I			
11	Code Environment (CENV)	UI			
12	Program Counter (PC)	UI			
13	Data Checksum				
<p>Note 1:</p> <p>Set time is an internal 10 millisecond (T10) count since power-on initialization enabled the processor interrupts. It is not used to derive GPS time, but only serves to provide a sequence of events knowledge. The set time or T10 count references the receiver's internal time at which the message was created for output. The T10 range is approximately 71 weeks.</p> <p>Note 2:</p> <p>The sequence number is a count that indicates whether the data in a particular binary message has been updated or changed since the last message output.</p> <p>Note 3:</p> <p>0 = User mode exception 1 = Exec mode exception 2 = Trap 3 = Executive error 4 = Executive Service Routine error 5 = User error</p>					

Raw Almanac Input (Message 1240). This message allows the user to enter the almanac data. All data is represented as raw subframe page data (excluding parity bits), according to the Global Positioning System Standard Positioning Service Signal Specification.

Almanac data is found in subframe 5, pages 1 through 25 and in subframe 4, pages 2 through 5, 7 through 10, and 25. The contents of the Raw Almanac Input Message are described in the Table below.

Message 1240: Raw Almanac Input Message

Message ID: 1240																													
Rate: As required - maximum rate 1 Hz (Note 1)																													
Message Length: 422 words																													
Word No.:	Name:	Type:	Units:	Range:	Resolution:																								
1-4	Message Header																												
5	Header Checksum																												
6	Sequence Number (Note 2)	I		0 to 32767																									
7+(13*j)	Week Number (Note 3)	I	Weeks	0 to 32767																									
8+(13*j)	Raw Almanac Data (Note 3)	UI																											
•																													
•																													
•																													
19+(13*j)																													
422	Data Checksum																												
<p>Note 1: This message is intended to upload raw almanac data to the receiver.</p> <p>Note 2: The sequence number is a count that indicates whether the data in a particular binary message has been updated or changed since the last message input.</p> <p>Note 3: $j = 0 + 31$ for SV IDs from 1 to 32 of Week Number and Raw Almanac Data.</p> <p>Example for SV ID = 1: The Raw Almanac data words 8 to 13: Correspond to bits in subframe 4 to 5: And the Raw Almanac data words 14 to 19: Correspond to bits in subframe 4 to 5:</p> <table border="1" style="margin-left: 40px;"> <tr> <td>Data[8]</td> <td>Data[9]</td> <td>Data[10]</td> <td>Data[11]</td> <td>Data[12]</td> <td>Data[13]</td> </tr> <tr> <td>61</td> <td>84</td> <td>91</td> <td>114</td> <td>121</td> <td>141 151 174</td> </tr> <tr> <td>Data[14]</td> <td>Data[15]</td> <td>Data[16]</td> <td>Data[17]</td> <td>Data[18]</td> <td>Data[19]</td> </tr> <tr> <td>181</td> <td>204</td> <td>211</td> <td>234</td> <td>241</td> <td>264 271 294</td> </tr> </table>						Data[8]	Data[9]	Data[10]	Data[11]	Data[12]	Data[13]	61	84	91	114	121	141 151 174	Data[14]	Data[15]	Data[16]	Data[17]	Data[18]	Data[19]	181	204	211	234	241	264 271 294
Data[8]	Data[9]	Data[10]	Data[11]	Data[12]	Data[13]																								
61	84	91	114	121	141 151 174																								
Data[14]	Data[15]	Data[16]	Data[17]	Data[18]	Data[19]																								
181	204	211	234	241	264 271 294																								

Raw Ephemeris Input (Message 1241). This message allows the user to enter ephemeris data for one satellite in the constellation. All data is represented as raw subframe data (excluding parity bits), according to the Global Positioning System Standard Positioning Service

Signal Specification. Ephemeris data is found in subframes 1 through 3, words 3 to 10. The contents of the Raw Ephemeris Input Message are described in the Table below.

Message 1241: Raw Ephemeris Input Message

Message ID:		1241							
Rate:		As required - maximum rate 1 Hz							
Message Length:		46 words							
Word No.:	Name:	Type:	Units:	Range:	Resolution:				
1-4	Message Header								
5	Header Checksum								
6	Sequence Number (Note 1)	I		0 to 32767					
7	Satellite PRN	I		1 to 32					
8	Momentum Alert Flag (Note 2)	I							
9	Synchronization Anti-Spoof Flag (Note 3)	I							
10-45	Ephemeris Data (Note 4)	UI							
46	Data Checksum								
Note 1:									
The sequence number is a count that indicates whether the data in a particular binary message has been updated or changed since the last message output.									
Note 2:									
If SV configuration code = 0, this is the Momentum Flag. If SV configuration code = 1, this is the Alert Flag. Momentum Flag is = 1 when a thruster type momentum dump has occurred since the last ephemeris upload. Alert Flag = 1 indicates that the SV URA may be worse than indicated for satellite PRN.									
Note 3:									
If SV configuration code = 0, this is the Synchronization Flag. If SV configuration code = 1, this is the Anti-Spoof Flag. Synchronization Flag is = 0 when the leading edge of the TLM word is coincident with the X1 epoch. Anti-Spoof Flag = 1 when the anti-spoof mode is ON in the satellite PRN.									
Note 4:									
The raw ephemeris data words 10 to 15:		Data[10]	Data[11]	Data[12]	Data[13]	Data[14]	Data[15]		
Corresponding to bits in subframe 1:		61	84	91	114	121	141	151	174
The raw ephemeris data words 16 to 21:		Data[16]	Data[17]	Data[18]	Data[19]	Data[20]	Data[21]		
Corresponding to bits in subframe 1:		181	204	211	234	241	264	271	294
Raw ephemeris data words 22 to 33 correspond to the bits 61 to 294 in subframe 2.									
Raw ephemeris data words 34 to 45 correspond to the bits 61 to 294 in subframe 3.									

Raw Ionospheric and UTC Corrections Input (Message 1242). This message allows the user to enter the parameters associated with the correction for the affects of the Earth's ionosphere on GPS signal propagation, and the parameters associated with UTC timekeeping. All data is represented as raw subframe page data (excluding parity bits), according to the Global

Positioning System Standard Positioning Service Signal Specification. Ionospheric data is found in subframe 4, page 18, bits 9 through 24 of word 3 plus the 24 MSBs of words 4 and 5. UTC data is found in subframe 4, page 18, words 6 through 9 and the 8 MSBs of word 10. The contents of the Raw Ionospheric and UTC Corrections Input Message are described in the Table below.

Message 1242: Raw Ionospheric and UTC Corrections Input Message

Message ID: 1242																													
Rate: As required - maximum rate 1 Hz (Note 1)																													
Message Length: 20 words																													
Word No.:	Name:	Type:	Units:	Range:	Resolution:																								
1-4	Message Header																												
5	Header Checksum																												
6	Sequence Number (Note 2)	I		0 to 32767																									
7	Week Number	I	weeks	0 to 32767																									
8-19	Raw Ionospheric and UTC Correction Ephemeris Data in Page 18 of Subframe 4 (Note 3)	UI																											
20	Data Checksum																												
<p>Note 1: This message is intended for uploading raw ionospheric and UTC corrections to the receiver.</p> <p>Note 2: The sequence number is a count that indicates whether the data in a particular binary message has been updated or changed since the last message input.</p> <p>Note 3: Example for SV ID = 1: The raw iono and UTC data words 8 to 13: Correspond to bits in subframe 4, page 18: And the raw iono and UTC data words 14 to 19: Correspond to bits in subframe 4, page 18:</p> <table border="1" style="margin-left: 100px;"> <tr> <td>Data[8]</td> <td>Data[9]</td> <td>Data[10]</td> <td>Data[11]</td> <td>Data[12]</td> <td>Data[13]</td> </tr> <tr> <td>61</td> <td>84</td> <td>91</td> <td>114</td> <td>121</td> <td>141 151 174</td> </tr> <tr> <td>Data[14]</td> <td>Data[15]</td> <td>Data[16]</td> <td>Data[17]</td> <td>Data[18]</td> <td>Data[19]</td> </tr> <tr> <td>181</td> <td>204</td> <td>211</td> <td>234</td> <td>241</td> <td>264 271 294</td> </tr> </table>						Data[8]	Data[9]	Data[10]	Data[11]	Data[12]	Data[13]	61	84	91	114	121	141 151 174	Data[14]	Data[15]	Data[16]	Data[17]	Data[18]	Data[19]	181	204	211	234	241	264 271 294
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