TSG RAN Meeting #27 **RP-050055**
Tokyo, Japan, 09 - 11 March 2005

Title **CRs (Rel-5 and Rel-6 category A) to TS 25.453**
Source **TSG RAN WG3**
Agenda Item **8.4.5**

RAN3 Tdoc	Spec	CR	Rev	Cat	curr. Vers.	new Vers.	Rel	Work item	Title
R3-050261	25.453	77	1	F	5.9.0	5.10.0	Rel-5	TEI5	Corrections to descriptions of GPS Almanac and Ephemeris fields
R3-050262	25.453	78	1	A	6.7.0	6.8.0	Rel-6	TEI5	Corrections to descriptions of GPS Almanac and Ephemeris fields

3GPP TSG-RAN WG3 #46 **Tdoc ⌘R3-050261**
Scottsdale, USA, 14 – 18 Feburary 2005

CR-Form-v7.1

CHANGE REQUEST

⌘ **25.453** **CR** **77** ⌘**rev** **1** ⌘ Current version: **5.9.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Corrections to descriptions of GPS Almanac and Ephemeris fields
Source:	⌘	RAN3
Work item code:	⌘	TEI5
Date:	⌘	07/02/2005
Category:	⌘	**F**
Release:	⌘	Rel-5

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
Ph2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
Rel-4 (Release 4)
Rel-5 (Release 5)
Rel-6 (Release 6)
Rel-7 (Release 7)

Reason for change:	⌘	Semantic descriptions of some GPS Almanac and Ephemeris fields incorrect or missing. SatID semantic description incorrect or missing in all cases. SatID Type incorrect in DGPS. Other editorial errors.

Summary of change:	⌘	- DGPS Corrections:
		  ■ SatID IE Type corrected to "Integer" to align with ASN.1
		- GPS Almanac and Satellite Health:
		  ■ Semantics description for di added
		  ■ Semantics description for OMEGADOT corrected
		  ■ Reference added to SV Health
		- GPS Clock and Ephemeris Parameters:
		  ■ Semantics description for e added
		  ■ Semantics description for OMEGADOT corrected
		- Various:
		  ■ Semantics description for SatID corrected to align with ASN.1
		- Editorial errors corrected

Consequences if not approved:	⌘	Errors persist
Clauses affected:	⌘	9.2.2.5, 9.2.2.8, 9.2.2.9, 9.2.2.10, 9.2.2.13, 9.2.2.14, 9.2.2.15, 9.2.2.22

Y | N

Other specs affected:	⌘	X		Other core specifications	⌘ TS 25.331
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘	CR also raised to correct similar errors in TS 25.331			

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

9.2.2.5 DGPS Corrections

This IE contains DGPS corrections, which may be employed to compensate for ranging errors due to atmospheric delay, orbital modelling, and satellite clock drift.

Table 27

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
GPS TOW sec	M		INTEGER (0..604799)	In seconds GPS time-of-week when the DGPS corrections were calculated
Status/Health	M		ENUMERATED (UDRE scale 1.0, UDRE scale 0.75, UDRE scale 0.5, UDRE scale 0.3, UDRE scale 0.2, UDRE scale 0.1, no data, invalid data)	
DPGS information	C-Status/Health	*1..<maxSat>*		
>SatID	M		~~Enumerated~~ INTEGER (0..63)	Identifies the satellite and is equal to (SV ID No - 1) where SV ID No is defined in [10].
>IODE	M		Integer(0..255)	
>UDRE	M		Enumerated(UDRE ≤ 1.0 m, 1.0m < UDRE ≤ 4.0m, 4.0m < UDRE ≤ 8.0m, 8.0m < UDRE)	The value in this field shall be multiplied by the UDRE Scale Factor in the IE Status/Health to determine the final UDRE estimate for the particular satellite.
>PRC	M		Integer (-2047..2047)	Scaling factor 0.32 Meters
>Range Rate Correction	M		Integer (-127..127)	Scaling factor 0.032 meters/sec

NEXT CHANGED SECTION

9.2.2.8 GPS Acquisition Assistance

This IE contains parameters that enable fast acquisition of the GPS signals in UE-assisted GPS positioning.

Table 33

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
GPS TOW msec	M		INTEGER (0..6.048*10^8 -1)	GPS Time of Week in milliseconds (rounded down to the nearest millisecond unit).
Satellite information		*1..<maxSat>*		
>SatID	M		INTEGER(0..63)	Identifies the satellite and is equal to (SV ID No - 1) where SV ID No is defined in [10].
>Doppler (0^{th} order term)	M		INTEGER (-2048..2047)	Scaling factor 2.5Hz
>**Extra Doppler**		*0..1*		
>>Doppler (1^{st} order term)	M		INTEGER (-42..21)	Scaling factor 1/42
>>Doppler Uncertainty	M		ENUMERATED (12.5,25,50, 100,200,…)	In Hz
>Code Phase	M		INTEGER (0..1022)	In Chips, specifies the centre of the search window
>Integer Code Phase	M		INTEGER (0..19)	Number of 1023 chip segments
>GPS Bit number	M		INTEGER (0..3)	Specifies GPS bit number (20 1023 chip segments)
>Code Phase Search Window	M		ENUMERATED (1023,1,2,3, 4,6,8,12,16,24,32,48,64,96,128,192)	Specifies the width of the search window.
>**Azimuth and Elevation**		*0..1*		
>>Azimuth	M		INTEGER (0..31)	Scaling factor 11.25 Degrees
>>Elevation	M		INTEGER (0..7)	Scaling factor 11.25 Degrees

Table 34

Range bound	Explanation
MaxSat	Maximum number of satellites for which data is included in this IE.

9.2.2.9 GPS Almanac and Satellite Health

This IE contains a reduced-precision subset of the clock and ephemeris parameters.

Table 35

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
WN_a	M		BIT STRING (8)	
Satellite information		*1..<maxSat Almanac>*		
>DataID	M		BIT STRING (2)	See [10]
>SatID	M		INTEGER (0..63)	Identifies the satellite and is equal to (SV ID No - 1) where SV ID No is defined in [10].~~Satellite ID~~
>e	M		BIT STRING (16)	Eccentricity [10]
>t_{oa}	M		BIT STRING (8)	Reference Time Ephemeris [10]
>δ~~I~~i	M		BIT STRING (16)	Correction to Inclination (semi-circles) [10]
>OMEGADOT	M		BIT STRING (16)	~~Longitude of Ascending Node of Orbit Plane at Weekly Epoch~~Rate of Right Ascension (semi-circles/sec) [10]
>SV Health	M		BIT STRING (8)	[10]
>$A^{1/2}$	M		BIT STRING (24)	Semi-Major Axis (meters)$^{1/2}$ [10]
>$OMEGA_0$	M		BIT STRING (24)	Longitude of Ascending Node of Orbit Plane at Weekly Epoch (semi-circles) [10]
>M_0	M		BIT STRING (24)	Mean Anomaly at Reference Time (semi-circles) [10]
>ω	M		BIT STRING (24)	Argument of Perigee (semi-circles) [10]
>af_0	M		BIT STRING (11)	apparent clock correction [10]
>af_1	M		BIT STRING (11)	apparent clock correction [10]
SV Global Health	O		BIT STRING (364)	This enables GPS time recovery and possibly extended GPS correlation intervals

Table 36

Range bound	Explanation
MaxSatAlmanac	Maximum number of satellites for which data is included in this IE.

9.2.2.10 GPS Clock and Ephemeris Parameters

The IE contains the GPS clock information and GPS Ephemeris.

Table 37

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
C/A or P on L2	M		BIT STRING (2)	Code(s) on L2 Channel [10]
URA Index	M		BIT STRING (4)	User Range Accuracy [10]
SV Health	M		BIT STRING (6)	[10]
IODC	M		BIT STRING (10)	Issue of Data, Clock [10]
L2 P Data Flag	M		BIT STRING (1)	[10]
SF 1 Reserved	M		BIT STRING (87)	[10]
T_{GD}	M		BIT STRING (8)	Estimated group delay differential [10]
t_{oc}	M		BIT STRING (16)	apparent clock correction [10]
af_2	M		BIT STRING (8)	apparent clock correction [10]
af_1	M		BIT STRING (16)	apparent clock correction [10]
af_0	M		BIT STRING (22)	apparent clock correction [10]
C_{rs}	M		BIT STRING(16)	Amplitude of the Sine Harmonic Correction Term to the Orbit Radius (meters) [10]
Δn	M		BIT STRING (16)	Mean Motion Difference From Computed Value (semi-circles/sec) [10]
M_0	M		BIT STRING (32)	Mean Anomaly at Reference Time (semi-circles) [10]
C_{uc}	M		BIT STRING (16)	Amplitude of the Cosine Harmonic Correction Term To The Argument Of Latitude (radians) [10]
~~E~~e	M		BIT STRING (32)	~~C~~Eccentricity [10]
C_{us}	M		BIT STRING (16)	Amplitude of the Sine Harmonic Correction Term To The Argument Of Latitude (radians) [10]
$(A)^{1/2}$	M		BIT STRING (32)	Semi-Major Axis (meters)$^{1/2}$ [10]
t_{oe}	M		BIT STRING (16)	Reference Time Ephemeris [10]
Fit Interval Flag	M		BIT STRING (1)	[10]
AODO	M		BIT STRING (5)	Age Of Data Offset [10]
C_{ic}	M		BIT STRING (16)	Amplitude of the Cosine Harmonic Correction Term To The Angle Of Inclination (radians) [10]
$OMEGA_0$	M		BIT STRING (32)	Longitude of Ascending Node of Orbit Plane at Weekly Epoch (semi-circles) [10]
C_{is}	M		BIT STRING (16)	Amplitude of the Sine Harmonic Correction Term To The Angle Of Inclination (radians) [10]
i_0	M		BIT STRING (32)	Inclination Angle at Reference Time (semi-circles) [10]
C_{rc}	M		BIT STRING (16)	Amplitude of the Cosine Harmonic Correction Term to the Orbit Radius (meters) [10]

ω	M		BIT STRING (32)	Argument of Perigee (semi-circles) [10]
OMEGAdot	M		BIT STRING (24)	Rate of Right Ascension ~~Longitude of Ascending Node of Orbit Plane at Weekly Epoch~~ (semi-circles/sec) [10]
Idot	M		BIT STRING (14)	Rate of Inclination Angle (semi-circles/sec) [10]

NEXT CHANGED SECTION

9.2.2.13 GPS Navigation Model

This IE contain information required to manage the transfer of precise navigation data to the GPS-capable UE.

Table 43

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
Satellite information		*1..<maxSat>*		
>SatID	M		INTEGER (0..63)	Identifies the satellite and is equal to (SV ID No - 1) where SV ID No is defined in [10].~~Satellite ID~~
>Satellite Status	M		ENUMERATED (NS_NN, ES_SN, ES_NN, REVD)	See note
>GPS Clock and Ephemeris parameters	C-*Satellite status*		9.2.2.10	

NEXT CHANGED SECTION

9.2.2.14 GPS Real Time Integrity

Table 47

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
CHOICE *Bad Satellites Presence*				
>Bad Satellites				
>>**Satellite information**		*1..<maxNoSat>*		
>>>BadSatID	M		INTEGER (0..63)	Identifies the satellite and is equal to (SV ID No - 1) where SV ID No is defined in [10].~~Satellite ID~~
>No Bad Satellites			NULL	

Table 48

Range bound	Explanation
MaxNoSat	Maximum number of satellites for which data is included in this IE.

9.2.2.15 GPS Reference Time

Table 49

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
GPS Week	M		INTEGER (0..1023)	
GPS TOW msec	M		INTEGER (0..6.048*10^8 -1)	GPS Time of Week in milliseconds (rounded down to the nearest millisecond unit).
GPS TOW Assist		*0.. <maxSat >*		
>SatID	M		INTEGER (0..63)	Identifies the satellite and is equal to (SV ID No - 1) where SV ID No is defined in [10].
>TLM Message	M		BIT STRING (14)	
>Anti-Spoof	M		BOOLEAN	
>Alert	M		BOOLEAN	
>TLM Reserved	M		BIT STRING (2)	

NEXT CHANGED SECTION

9.2.2.22 Information Type

The Information Type indicates which kind of information the SAS shall provide.

Table 58

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
CHOICE *Information Type*				
>*Implicit*				
>>Method Type	M		9.2.2.25	
>*Explicit*				
>>**Explicit Information**		*1..<maxnoofExpInfo>*		
>>>CHOICE *Explicit Information Item*	M			
>>>>*Almanac and Satellite Health*			NULL	
>>>>*UTC Model*				
>>>>>Transmission TOW Indicator	M		9.2.2.29	
>>>>*Ionospheric Model*				
>>>>>Transmission TOW Indicator	M		9.2.2.29	
>>>>*Navigation Model*				
>>>>>Transmission TOW Indicator	M		9.2.2.29	
>>>>>**Nav. Model Additional Data**		*0..1*		
>>>>>>GPS Week	M		INTEGER(0..1023)	
>>>>>>GPS_Toe	M		INTEGER(0..167)	GPS time of ephemeris in hours of the latest ephemeris set
>>>>>>T-Toe limit	M		INTEGER (0..10)	ephemeris age tolerance in hours
>>>>>>**Satellite related data**		*0..<maxSat>*		
>>>>>>>SatID	M		INTEGER (0..63)	Identifies the satellite and is equal to (SV ID No - 1) where SV ID No is defined in [10].
>>>>>>>IODE	M		INTEGER (0..255)	Issue of Data Ephemeris for SatID
>>>>*DGPS Corrections*			NULL	
>>>>*Reference Time*			NULL	
>>>>*Acquisition Assistance*			NULL	
>>>>*Real Time Integrity*			NULL	
>>>>*Almanac and Satellite Health SIB*				
>>>>>Transmission TOW Indicator	M		9.2.2.29	

3GPP TSG-RAN WG3 #46 **Tdoc ⌘R3-050262**
Scottsdale, USA, 14 – 18 Feburary 2005

CR-Form-v7.1

CHANGE REQUEST

⌘ **25.453** **CR** **78** ⌘**rev** **1** ⌘ Current version: **6.7.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ ☐ ME ☐ Radio Access Network ☒ Core Network ☐

Title:	⌘	Corrections to descriptions of GPS Almanac and Ephemeris fields
Source:	⌘	RAN3
Work item code:	⌘	TEI5
Date:	⌘	07/02/2005
Category:	⌘	**A**
Release:	⌘	Rel-6

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
Ph2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
Rel-4 (Release 4)
Rel-5 (Release 5)
Rel-6 (Release 6)
Rel-7 (Release 7)

Reason for change: ⌘ Semantic descriptions of some GPS Almanac and Ephemeris fields incorrect or missing.
SatID semantic description incorrect or missing in all cases.
SatID Type incorrect in DGPS.
Other editorial errors.

Summary of change: ⌘
- DGPS Corrections:
  - SatID IE Type corrected to “Integer” to align with ASN.1
- GPS Almanac and Satellite Health:
  - Semantics description for di added
  - Semantics description for OMEGADOT corrected
  - Reference added to SV Health
- GPS Clock and Ephemeris Parameters:
  - Semantics description for e added
  - Semantics description for OMEGADOT corrected
- Various:
  - Semantics description for SatID corrected to align with ASN.1
- Editorial errors corrected

Consequences if not approved: ⌘ Errors persist

Clauses affected: ⌘ 9.2.2.5, 9.2.2.8, 9.2.2.9, 9.2.2.10, 9.2.2.13, 9.2.2.14, 9.2.2.15, 9.2.2.22

Y | N

Other specs affected:	⌘	X		Other core specifications	⌘ TS 25.331
			X	Test specifications	
			X	O&M Specifications	
Other comments:	⌘	CR also raised to correct similar errors in TS 25.331			

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at http://www.3gpp.org/specs/CR.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

9.2.2.5 DGPS Corrections

This IE contains DGPS corrections, which may be employed to compensate for ranging errors due to atmospheric delay, orbital modelling, and satellite clock drift.

Table 27

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
GPS TOW sec	M		INTEGER (0..604799)	In seconds GPS time-of-week when the DGPS corrections were calculated
Status/Health	M		ENUMERATED (UDRE scale 1.0, UDRE scale 0.75, UDRE scale 0.5, UDRE scale 0.3, UDRE scale 0.2, UDRE scale 0.1, no data, invalid data)	
DPGS information	C-Status/Health	*1..<maxSat>*		
>SatID	M		~~ENUMERATED~~ INTEGER (0..63)	Identifies the satellite and is equal to (SV ID No - 1) where SV ID No is defined in [10].
>IODE	M		INTEGER (0..255)	
>UDRE	M		ENUMERATED (UDRE ≤ 1.0 m, 1.0m < UDRE ≤ 4.0m, 4.0m < UDRE ≤ 8.0m, 8.0m < UDRE, ...)	The value in this field shall be multiplied by the UDRE Scale Factor in the IE Status/Health to determine the final UDRE estimate for the particular satellite.
>PRC	M		INTEGER (-2047..2047.)	Scaling factor 0.32 Meters
>Range Rate Correction	M		INTEGER (-127..127)	Scaling factor 0.032 meters/sec

NEXT CHANGED SECTION

9.2.2.8 GPS Acquisition Assistance

This IE contains parameters that enable fast acquisition of the GPS signals in UE-assisted GPS positioning.

Table 33

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
GPS TOW msec	M		INTEGER (0..6.048*10^8 -1)	GPS Time of Week in milliseconds (rounded down to the nearest millisecond unit).
Satellite information		*1..<maxSat>*		
>SatID	M		INTEGER (0..63)	Identifies the satellite and is equal to (SV ID No - 1) where SV ID No is defined in [10].
>Doppler (0^{th} order term)	M		INTEGER (-2048..2047)	Scaling factor 2.5Hz
>**Extra Doppler**		*0..1*		
>>Doppler (1^{st} order term)	M		INTEGER (-42..21)	Scaling factor 1/42
>>Doppler Uncertainty	M		ENUMERATED (12.5,25,50, 100,200,…)	In Hz
>Code Phase	M		INTEGER (0..1022)	In Chips, specifies the centre of the search window
>Integer Code Phase	M		INTEGER (0..19)	Number of 1023 chip segments
>GPS Bit number	M		INTEGER (0..3)	Specifies GPS bit number (20 1023 chip segments)
>Code Phase Search Window	M		ENUMRATED (1023,1,2,3, 4,6,8,12,16,24,32,48,64,96,128,192)	Specifies the width of the search window.
>**Azimuth and Elevation**		*0..1*		
>>Azimuth	M		INTEGER (0..31)	Scaling factor 11.25 Degrees
>>Elevation	M		INTEGER (0..7)	Scaling factor 11.25 Degrees

Table 34

Range bound	Explanation
MaxSat	Maximum number of satellites for which data is included in this IE.

9.2.2.9 GPS Almanac and Satellite Health

This IE contains a reduced-precision subset of the clock and ephemeris parameters.

Table 35

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
WN_a	M		BIT STRING (8)	
Satellite information		*1..<maxSat Almanac>*		
>DataID	M		BIT STRING (2)	See [10]
>SatID	M		INTEGER (0..63, ...)	Identifies the satellite and is equal to (SV ID No - 1) where SV ID No is defined in [10]. ~~Satellite ID~~
>e	M		BIT STRING (16)	Eccentricity [10]
$>t_{oa}$	M		BIT STRING (8)	Reference Time Ephemeris [10]
>δ~~I~~i	M		BIT STRING (16)	Correction to Inclination (semi-circles) [10]
>OMEGADOT	M		BIT STRING (16)	Rate of Right Ascension ~~Longitude of Ascending Node of Orbit Plane at Weekly Epoch~~ (semi-circles/sec) [10]
>SV Health	M		BIT STRING (8)	[10]
$>A^{1/2}$	M		BIT STRING (24)	Semi-Major Axis (meters)$^{1/2}$ [10]
$>OMEGA_0$	M		BIT STRING (24)	Longitude of Ascending Node of Orbit Plane at Weekly Epoch (semi-circles) [10]
$>M_0$	M		BIT STRING (24)	Mean Anomaly at Reference Time (semi-circles) [10]
>ω	M		BIT STRING (24)	Argument of Perigee (semi-circles) [10]
$>af_0$	M		BIT STRING (11)	apparent clock correction [10]
$>af_1$	M		BIT STRING (11)	apparent clock correction [10]
SV Global Health	O		BIT STRING (364)	This enables GPS time recovery and possibly extended GPS correlation intervals

Table 36

Range bound	Explanation
MaxSatAlmanac	Maximum number of satellites for which data is included in this IE.

9.2.2.10 GPS Clock and Ephemeris Parameters

The IE contains the GPS clock information and GPS Ephemeris.

Table 37

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
C/A or P on L2	M		BIT STRING (2)	Code(s) on L2 Channel [10]
URA Index	M		BIT STRING (4)	User Range Accuracy [10]
SV Health	M		BIT STRING (6)	[10]
IODC	M		BIT STRING (10)	Issue of Data, Clock [10]
L2 P Data Flag	M		BIT STRING (1)	[10]
SF 1 Reserved	M		BIT STRING (87)	[10]
T_{GD}	M		BIT STRING (8)	Estimated group delay differential [10]
t_{oc}	M		BIT STRING (16)	apparent clock correction [10]
af_2	M		BIT STRING (8)	apparent clock correction [10]
af_1	M		BIT STRING (16)	apparent clock correction [10]
af_0	M		BIT STRING (22)	apparent clock correction [10]
C_{rs}	M		BIT STRING (16)	Amplitude of the Sine Harmonic Correction Term to the Orbit Radius (meters) [10]
Δn	M		BIT STRING (16)	Mean Motion Difference From Computed Value (semi-circles/sec) [10]
M_0	M		BIT STRING (32)	Mean Anomaly at Reference Time (semi-circles) [10]
C_{uc}	M		BIT STRING (16)	Amplitude of the Cosine Harmonic Correction Term To The Argument Of Latitude (radians) [10]
~~E~~e	M		BIT STRING (32)	Eccentricity [10]~~C~~
C_{us}	M		BIT STRING (16)	Amplitude of the Sine Harmonic Correction Term To The Argument Of Latitude (radians) [10]
$(A)^{1/2}$	M		BIT STRING (32)	Semi-Major Axis (meters)$^{1/2}$ [10]
t_{oe}	M		BIT STRING (16)	Reference Time Ephemeris [10]
Fit Interval Flag	M		BIT STRING (1)	[10]
AODO	M		BIT STRING (5)	Age Of Data Offset [10]
C_{ic}	M		BIT STRING (16)	Amplitude of the Cosine Harmonic Correction Term To The Angle Of Inclination (radians) [10]
$OMEGA_0$	M		BIT STRING (32)	Longitude of Ascending Node of Orbit Plane at Weekly Epoch (semi-circles) [10]
C_{is}	M		BIT STRING (16)	Amplitude of the Sine Harmonic Correction Term To The Angle Of Inclination (radians) [10]
i_0	M		BIT STRING (32)	Inclination Angle at Reference Time (semi-circles) [10]
C_{rc}	M		BIT STRING (16)	Amplitude of the Cosine Harmonic Correction Term to the Orbit Radius (meters) [10]

ω	M		BIT STRING (32)	Argument of Perigee (semi-circles) [10]
OMEGAdot	M		BIT STRING (24)	Rate of Right Ascension ~~Longitude of Ascending Node of Orbit Plane at Weekly Epoch~~ (semi-circles/sec) [10]
Idot	M		BIT STRING (14)	Rate of Inclination Angle (semi-circles/sec) [10]

NEXT CHANGED SECTION

9.2.2.13 GPS Navigation Model

This IE contain information required to manage the transfer of precise navigation data to the GPS-capable UE.

Table 43

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
Satellite information		*1..<maxSat>*		
>SatID	M		INTEGER (0..63)	Identifies the satellite and is equal to (SV ID No - 1) where SV ID No is defined in [10].~~Satellite ID~~
>Satellite Status	M		ENUMERATED (NS_NN, ES_SN, ES_NN, REVD)	See note
>GPS Clock and Ephemeris parameters	C-*Satellite status*		9.2.2.10	

NEXT CHANGED SECTION

9.2.2.14 GPS Real Time Integrity

Table 47

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
CHOICE *Bad Satellites Presence*				
>Bad Satellites				
>>**Satellite information**		*1..<maxNoSat>*		
>>>BadSatID	M		INTEGER (0..63)	Identifies the satellite and is equal to (SV ID No - 1) where SV ID No is defined in [10].~~Satellite ID~~
>No Bad Satellites			NULL	

Table 48

Range bound	Explanation
MaxNoSat	Maximum number of satellites for which data is included in this IE.

9.2.2.15 GPS Reference Time

Table 49

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
GPS Week	M		INTEGER (0..1023)	
GPS TOW msec	M		ITEGER (0..6.048*10^8 -1)	GPS Time of Week in milliseconds (rounded down to the nearest millisecond unit).
GPS TOW Assist		*0.. <maxSat >*		
>SatID	M		INTEGER (0..63)	Identifies the satellite and is equal to (SV ID No - 1) where SV ID No is defined in [10].
>TLM Message	M		BIT STRING (14)	
>Anti-Spoof	M		BOOLEAN	
>Alert	M		BOOLEAN	
>TLM Reserved	M		BIT STRING (2)	

NEXT CHANGED SECTION

9.2.2.22 Information Type

The Information Type indicates which kind of information the SAS shall provide.

Table 58

IE/Group Name	Presence	Range	IE Type and Reference	Semantics Description
CHOICE *Information Type*				
>Implicit				
>>Method Type	M		9.2.2.25	
>Explicit				
>>**Explicit Information**		*1..<maxnoofExpInfo>*		
>>>CHOICE *Explicit Information Item*	M			
>>>>Almanac and Satellite Health			NULL	
>>>>UTC Model				
>>>>>Transmission TOW Indicator	M		9.2.2.29	
>>>>Ionospheric Model				
>>>>>Transmission TOW Indicator	M		9.2.2.29	
>>>>Navigation Model				
>>>>>Transmission TOW Indicator	M		9.2.2.29	
>>>>>**Nav. Model Additional Data**		*0..1*		
>>>>>>GPS Week	M		INTEGER (0..1023)	
>>>>>>GPS_Toe	M		INTEGER (0..167)	GPS time of ephemeris in hours of the latest ephemeris set
>>>>>>T-Toe limit	M		Integer (0..10)	ephemeris age tolerance in hours
>>>>>>**Satellite related data**		*0..<maxSat>*		
>>>>>>>SatID	M		INTEGER (0..63)	Identifies the satellite and is equal to (SV ID No - 1) where SV ID No is defined in [10].
>>>>>>>IODE	M		INTEGER (0..255)	Issue of Data Ephemeris for SatID
>>>>DGPS Corrections			NULL	
>>>>Reference Time			NULL	
>>>>Acquisition Assistance			NULL	
>>>>Real Time Integrity			NULL	
>>>>Almanac and Satellite Health SIB				
>>>>>Transmission TOW Indicator	M		9.2.2.29	