

TSG RAN Meeting #22
Maui, USA, 9 - 12 December 2003

RP-030691

Title CRs (Rel-5 only) to TS 25.423 and TS 25.433 on Range Extension for GPS Almanac Reporting
Source TSG RAN WG3
Agenda Item 7.4.6

RAN3 Tdoc	Spec	curr. Vers.	new Vers.	REL	CR	Rev	Cat	Title	Work item
R3-031775	25.423	5.7.0	5.8.0	REL-5	877	1	F	Range Extension for GPS Almanac Reporting	TEI5
R3-031776	25.433	5.6.0	5.7.0	REL-5	921	1	F	Range Extension for GPS Almanac Reporting	TEI5

CHANGE REQUEST

25.423 CR 877 # rev 1 # Current version: 5.7.0

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:	# Range Extension for GPS Almanac Reporting	
Source:	# RAN3	
Work item code:	# TE15	Date: # 17/11/2003
Category:	# F Use <u>one</u> 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 .	Release: # Rel-5 Use <u>one</u> of the following releases: 2 (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)

Reason for change:	# Currently, it is only possible for an RNC ₂ to report GPS Almanac assistance data for 'maxSat'=16 satellite ids within an Information Report message. As a result, a complete set of Almanac assistance (for entire constellation of 24-32 satellites) cannot be provided to an RNC ₁ upon request.
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Summary of change:	# R0: A constant, 'maxNoOfSatAlmanac'=32, is defined so that the IE 'GPS Almanac' may contain information for up to 32 satellite ids. The <i>Satellite Almanac Information</i> IE is extended so that the IE 'GPS Almanac' may contain information for up to 32 satellite ids. The range of 'satellite information' in clause 9.2.1.30G (tabular) and its corresponding ASN.1 description are modified to allow information to be reported for up to 32 satellite ids. R1: ASN.1 corrections
	<u>Impact Analysis:</u> Impact assessment towards the previous version of the specification (same release): This CR has isolated impact with the previous version of the specification (same release). This CR has isolated impact under protocol point of view. The impact can be considered isolated because the change affects only the Information Reporting function.
Consequences if not approved:	# The RNC ₂ will remain unable to provide a complete set of GPS Almanac assistance (for entire constellation of 24-32 satellites) to an RNC ₁ upon request.

Clauses affected: ⌘ 9.2.1.30G, 9.3.4, 9.3.6

Other specs affected:	⌘	Y	N	Other core specifications Test specifications O&M Specifications	⌘ 25.433 CR921 Rel-5
		X	X		

Other comments: ⌘

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.

9.2.1.30G GPS Almanac

This IE provides the information regarding the GPS Almanac. For further details on the meaning of parameters, see [30].

IE/Group name	Presence	Range	IE Type and Reference	Semantics Description
WN _a	M		BIT STRING(8)	
Satellite Almanac Information	M	<i>1,,<maxNo OfSatAlma nac></i>		See Note 1.
>DataID	M		INTEGER (0..3)	
>SatID	M		SAT ID 9.2.1.50A	Satellite ID
>e	M		BIT STRING(16)	
>t _{oa}	M		BIT STRING(8)	
>δl	M		BIT STRING(16)	
>OMEGADOT	M		BIT STRING(16)	
>SV Health	M		BIT STRING(8)	
>A ^{1/2}	M		BIT STRING(24)	
>OMEGA ₀	M		BIT STRING(24)	
>M ₀	M		BIT STRING(24)	
>ω	M		BIT STRING(24)	
>af ₀	M		BIT STRING(11)	
>af ₁	M		BIT STRING(11)	
SV Global Health	O		BIT STRING(364)	

Range Bound	Explanation
<i>maxNoOfSatAlmanac</i>	Maximum number of satellite almanacs for which information can be provided

[Note 1: This information element is a simplified representation of the ASN.1 description. Repetitions 1 through maxNoSat and repetitions maxNoSat+1 through maxNoOfSatAlmanac are represented by separate ASN.1 structures with different criticality.](#)

/* partly omitted */

9.3.4 Information Element Definitions

```

/* partly omitted */
    maxNoSat,
    maxNrOfSNAs,
    maxNrOfHARQProc,
    maxNrOfHSSCCHCodes,
    maxNrOfMACdFlows,
    maxNrOfMACdFlows-1,
    maxNrOfPDUIndexes,
    maxNrOfPDUIndexes-1,
    maxNrOfPrioQueues,
    maxNrOfPrioQueues-1,
    maxNrOfSatAlmanac-maxNoSat,

/* partly omitted */

    id-TypeOfError,
    id-Angle-Of-Arrival-Value-LCR,
    id-IPDL-TDD-ParametersLCR,
    id-DSCH-InitialWindowSize,
    id-Maximum-DL-Power-TimeslotLCR-InformationItem,
    id-Minimum-DL-Power-TimeslotLCR-InformationItem,
    id-HS-SICH-Reception-Quality,
    id-HS-SICH-Reception-Quality-Measurement-Value,
    id-ExtendedGSMCellIndividualOffset,
    id-Unidirectional-DCH-Indicator,
    id-Satellite-Almanac-Information-ExtItem

/* partly omitted */

-- G

/* partly omitted */

GeographicalCoordinate-ExtIEs RNSAP-PROTOCOL-EXTENSION ::= {
    ...
}

GERAN-Cell-Capability ::= BIT STRING (SIZE (16))
-- First bit: A/Gb mode --
-- Second bit: Iu mode --
-- Note: undefined bits are considered as a spare bit and spare bits shall be set to 0 by the transmitter and shall be ignored by the receiver. --
GERAN-Classmark ::= OCTET STRING
-- GERAN Classmark as defined in (38) --

GPS-Almanac ::= SEQUENCE {
    wna-alm          BIT STRING (SIZE (8)),
    satellite-Almanac-Information   SEQUENCE (SIZE (1..maxNoSat)) OF
}

```

```

SEQUENCE {
    DATA-ID,
    SAT-ID,
    gps-e-alm
    BIT STRING (SIZE (16)),
    gps-toa-alm
    BIT STRING (SIZE (8)),
    gps-delta-I-alm
    BIT STRING (SIZE (16)),
    omegadot-alm
    BIT STRING (SIZE (16)),
    svhealth-alm
    BIT STRING (SIZE (8)),
    gps-a-sqrt-alm
    BIT STRING (SIZE (24)),
    omegazero-alm
    BIT STRING (SIZE (24)),
    m-zero-alm
    BIT STRING (SIZE (24)),
    gps-omega-alm
    BIT STRING (SIZE (24)),
    gps-af-zero-alm
    BIT STRING (SIZE (11)),
    gps-af-one-alm
    BIT STRING (SIZE (11)),
    iE-Extensions
    ProtocolExtensionContainer { { Satellite-Almanac-Information-ExtIEs} }      OPTIONAL,
    ...
},
-- This GPS-Almanac-Information is for the 1st 16 satellites
sVGlobalHealth-alm      BIT STRING (SIZE (364))      OPTIONAL,
iE-Extensions           ProtocolExtensionContainer { { GPS-Almanac-ExtIEs} }      OPTIONAL,
...
}

Satellite-Almanac-Information-ExtIEs RNSAP-PROTOCOL-EXTENSION ::= {
    ...
}

GPS-Almanac-ExtIEs RNSAP-PROTOCOL-EXTENSION ::= {
    { ID id-Satellite-Almanac-Information-ExtItem CRITICALITY ignore      EXTENSION      Satellite-Almanac-Information-ExtItem      PRESENCE
    optional },
    ...
}

Satellite-Almanac-Information-ExtItem SEQUENCE (SIZE (1..maxNrOfSatAlmanac-maxNoSat)) OF
SEQUENCE {
    DATA-ID,
    SAT-ID,
    gps-e-alm
    BIT STRING (SIZE (16)),
    gps-toa-alm
    BIT STRING (SIZE (8)),
    gps-delta-I-alm
    BIT STRING (SIZE (16)),
    omegadot-alm
    BIT STRING (SIZE (16)),
    svhealth-alm
    BIT STRING (SIZE (8)),
    gps-a-sqrt-alm
    BIT STRING (SIZE (24)),
    omegazero-alm
    BIT STRING (SIZE (24)),
    m-zero-alm
    BIT STRING (SIZE (24)),
    gps-omega-alm
    BIT STRING (SIZE (24)),
    gps-af-zero-alm
    BIT STRING (SIZE (11)),
    gps-af-one-alm
    BIT STRING (SIZE (11)),
    iE-Extensions
    ProtocolExtensionContainer { { Satellite-Almanac-Information-ExtItemIEs} }      OPTIONAL,
    ...
}
-- Includes the GPS-Almanac-Information for the 17th through 32nd satellites.

```

```

Satellite-Almanac-Information-ExtItemIEs_RNSAP-PROTOCOL-EXTENSION ::= {
    ...
}

GPSInformation ::= SEQUENCE (SIZE (1..maxNoGPSTypes)) OF
SEQUENCE {
    gPSInformationItem      ENUMERATED {
        GPS-NavigationModel-and-TimeRecovery,
        GPS-Ionospheric-Model,
        GPS-UTC-Model,
        GPS-Almanac,
        GPS-RealTime-Integrity,
        ...
    },
    iE-Extensions          ProtocolExtensionContainer { { GPSInformation-ExtIEs} }      OPTIONAL,
    ...
}
-- This IE shall be present if the Information Type IE indicates 'GPS Information'

GPSInformation-ExtIEs_RNSAP-PROTOCOL-EXTENSION ::= {
    ...
}

```

9.3.6 Constant Definitions

/* partly omitted */

maxNrOfHSSCCHCodes	INTEGER ::= 4
maxNrOfHSSICHs	INTEGER ::= 4
maxNrOfMACdFlows	INTEGER ::= 8
maxNrOfMACdFlows-1	INTEGER ::= 7 -- maxNrOfMACdFlows - 1
maxNrOfPDUIndexes	INTEGER ::= 8
maxNrOfPDUIndexes-1	INTEGER ::= 7 -- maxNrOfPDUIndexes - 1
maxNrOfPrioQueues	INTEGER ::= 8
maxNrOfPrioQueues-1	INTEGER ::= 7 -- maxNrOfPrioQueues - 1
maxNrOfSNAs	INTEGER ::= 65535
<u>maxNrOfSatAlmanac-maxNoSat</u>	<u>INTEGER ::= 16</u>

/* partly omitted */

id-ExtendedGSMCellIndividualOffset	ProtocolIE-ID ::= 514
id-RL-ParameterUpdateIndicationFDD-RL-InformationList	ProtocolIE-ID ::= 518
id-Primary-CPICH-Usage-For-Channel-Estimation	ProtocolIE-ID ::= 519
id-Secondary-CPICH-Information-Change	ProtocolIE-ID ::= 521
id-UE-Support-Of-Dedicated-Pilots-For-Channel-Estimation	ProtocolIE-ID ::= 522
id-UE-Support-Of-Dedicated-Pilots-For-Channel-Estimation-Of-HS-DSCH	ProtocolIE-ID ::= 523
id-RL-ParameterUpdateIndicationFDD-RL-Information-Item	ProtocolIE-ID ::= 524
id-Phase-Reference-Update-Indicator	ProtocolIE-ID ::= 525
id-Unidirectional-DCH-Indicator	ProtocolIE-ID ::= 526

| [id-Satellite-Almanac-Information-ExtItem](#)

ProtocolIE-ID ::= 530

CHANGE REQUEST

25.433 CR 921 # rev 1 # Current version: 5.6.0

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:	# Range Extension for GPS Almanac Reporting	
Source:	# RAN3	
Work item code:	# TE15	Date: # 17/11/2003
Category:	# F Use <u>one</u> 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 .	Release: # Rel-5 Use <u>one</u> of the following releases: 2 (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)

Reason for change:	# Currently, it is only possible for the NodeB to report GPS Almanac assistance data for 'maxSat'=16 satellite ids within an Information Report message. As a result, a complete set of Almanac assistance (for entire constellation of 24-32 satellites) cannot be provided to the CRNC upon request.
Summary of change:	R0: A constant, 'maxNoOfSatAlmanac'=32, is defined so that the IE 'GPS Almanac' may contain information for up to 32 satellite ids. The SAT-Info-Almanac-Item IE is extended so that the SAT-Info-Almanac IE may contain information for up to 32 satellite ids. The range of 'satellite information' in clause 9.2.1.31F (tabular) and its corresponding ASN.1 description are modified to allow information to be reported for up to 32 satellite ids. R1: ASN.1 corrections <u>Impact Analysis:</u> Impact assessment towards the previous version of the specification (same release): This CR has isolated impact with the previous version of the specification (same release). This CR has isolated impact under protocol point of view. The impact can be considered isolated because the change affects only the Information Reporting function.
Consequences if not approved:	# The Node B will remain unable to provide a complete set of GPS Almanac assistance (for entire constellation of 24-32 satellites) to an CRNC upon request.

Clauses affected: ⌘ 9.2.1.31F, 9.3.4, 9.3.6

Other specs affected:	⌘	Y	N	Other core specifications Test specifications O&M Specifications	⌘ 25.423 CR877 Rel-5
		X	X		

Other comments: ⌘

How to create CRs using this form:

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- 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.

9.2.1.31F GPS Almanac

This IE provides the information regarding the GPS Almanac. For further details on the meaning of parameters, see [27].

IE/Group name	Presence	Range	IE Type and Reference	Semantics Description
WN _a	M		BIT STRING(8)	
Satellite Almanac Information	M	<i>1,,<maxNo OfSatAlma nac></i>		See Note 1.
>DataID	M		INTEGER (0..3)	
>SatID	M		SAT ID 9.2.1.50A	Satellite ID
>e	M		BIT STRING(16)	
>t _{oa}	M		BIT STRING(8)	
>δl	M		BIT STRING(16)	
>OMEGADOT	M		BIT STRING(16)	
>SV Health	M		BIT STRING(8)	
>A ^{1/2}	M		BIT STRING(24)	
>OMEGA ₀	M		BIT STRING(24)	
>M ₀	M		BIT STRING(24)	
>ω	M		BIT STRING(24)	
>af ₀	M		BIT STRING(11)	
>af ₁	M		BIT STRING(11)	
SV Global Health	O		BIT STRING(364)	

Range Bound	Explanation
<i>maxNoOfSatAlmanac</i>	Maximum number of satellite almanacs for which information can be provided

[Note 1: This information element is a simplified representation of the ASN.1 description. Repetitions 1 through maxNoSat and repetitions maxNoSat+1 through maxNoOfSatAlmanac are represented by separate ASN.1 structures with different criticality.](#)

/* partly omitted */

9.3.4 Information Element Definitions

```

maxNrOfMACdPDUIndexes,
maxNrOfMACdPDUIndexes-1,
maxNrOfPriorityQueues,
maxNrOfPriorityQueues-1,
maxNrOfHARQProcesses,
maxNrOfSyncDLCodesLCR,
maxNrOfSyncFramesLCR,
maxNrOfContextsOnUeList,
maxNrOfSatAlmanac-maxNoSat,

/* partly omitted */

id-HS-DSCHRequiredPower,
id-HS-DSCHProvidedBitRate,
id-HS-DSCHRequiredPowerValue,
id-HS-DSCHProvidedBitRateValue,
id-Best-Cell-Portions-Value,
id-Unidirectional-DCH-Indicator,
id-SAT-Info-Almanac-ExtItem

/* partly omitted */

-- =====
-- G
-- =====

GapLength          ::= INTEGER (1..14)
-- Unit slot

GapDuration        ::= INTEGER (1..144,...)
-- Unit frame

GPS-Almanac ::= SEQUENCE {
    wna-alm      BIT STRING (SIZE (8)),
    sat-info-almanac   SAT-Info-Almanac,
    sVGlobalHealth-alm BIT STRING (SIZE (364)) OPTIONAL,
    ie-Extensions   ProtocolExtensionContainer { { GPS-Almanac-ExtIEs} }      OPTIONAL,
    ...
}

GPS-Almanac-ExtIEs NBAP-PROTOCOL-EXTENSION ::= {
    { ID id-SAT-Info-Almanac-ExtItem CRITICALITY ignore      EXTENSION      SAT-Info-Almanac-ExtList      PRESENCE optional },
    ...
}

```

```

/* partly omitted */

-- =====
-- S
-- =====

AdjustmentPeriod      ::= INTEGER(1..256)
-- Unit Frame

SAT-ID ::= INTEGER (0..63)

SAT-Info-Almanac ::= SEQUENCE (SIZE (1..maxNoSat)) OF SAT-Info-Almanac-Item

SAT-Info-Almanac-Item ::= SEQUENCE {
    data-id          DATA-ID,
    sat-id           SAT-ID,
    gps-e-alm        BIT STRING (SIZE (16)),
    gps-toa-alm      BIT STRING (SIZE (8)),
    gps-delta-I-alm  BIT STRING (SIZE (16)),
    omegadot-alm     BIT STRING (SIZE (16)),
    svhealth-alm     BIT STRING (SIZE (8)),
    gps-a-sqrt-alm   BIT STRING (SIZE (24)),
    omegazero-alm    BIT STRING (SIZE (24)),
    m-zero-alm       BIT STRING (SIZE (24)),
    gps-omega-alm    BIT STRING (SIZE (24)),
    gps-af-zero-alm   BIT STRING (SIZE (11)),
    gps-af-one-alm   BIT STRING (SIZE (11)),
    ie-Extensions     ProtocolExtensionContainer { { SAT-Info-Almanac-Item-ExtIEs} }      OPTIONAL,
    ...
}

-- This GPS-Almanac-Information is for the 1st 16 satellites

SAT-Info-Almanac-Item-ExtIEs NBAP-PROTOCOL-EXTENSION ::= {

    ...
}

SAT-Info-Almanac-ExtList      ::= SEQUENCE (SIZE (1..maxNrOfSatAlmanac-maxNoSat)) OF SAT-Info-Almanac-ExtItem

SAT-Info-Almanac-ExtItem      ::= SEQUENCE {
    data-id          DATA-ID,
    sat-id           SAT-ID,
    gps-e-alm        BIT STRING (SIZE (16)),
    gps-toa-alm      BIT STRING (SIZE (8)),
    gps-delta-I-alm  BIT STRING (SIZE (16)),
    omegadot-alm     BIT STRING (SIZE (16)),
    svhealth-alm     BIT STRING (SIZE (8)),
    gps-a-sqrt-alm   BIT STRING (SIZE (24)),
    omegazero-alm    BIT STRING (SIZE (24)),
    m-zero-alm       BIT STRING (SIZE (24)),
    gps-omega-alm    BIT STRING (SIZE (24)),
    gps-af-zero-alm   BIT STRING (SIZE (11)),
    gps-af-one-alm   BIT STRING (SIZE (11)),
}

```

```

ie-Extensions      ProtocolExtensionContainer { { SAT-Info-Almanac-ExtItemIEs } }      OPTIONAL,
...
}
-- Includes the GPS-Almanac-Information for 17th through 32nd satellites.

SAT-Info-Almanac-ExtItemIEs NBAP-PROTOCOL-EXTENSION ::= {
...
}

SAT-Info-DGPSCorrections ::= SEQUENCE (SIZE (1..maxNoSat)) OF SAT-Info-DGPSCorrections-Item

```

/* partly omitted */

9.3.6 Constant Definitions

/* partly omitted */

```

maxNrOfMACdPDUIndexes-1      INTEGER ::= 7      -- maxNrOfMACdPDUIndexes - 1
maxNrOfPriorityQueues        INTEGER ::= 8
maxNrOfPriorityQueues-1      INTEGER ::= 7      -- maxNrOfPriorityQueues - 1
maxNrOfHARQProcesses         INTEGER ::= 8
maxNrOfContextsOnUeList       INTEGER ::= 16
maxNrOfCellPortionsPerCell   INTEGER ::= 64
maxNrOfCellPortionsPerCell-1  INTEGER ::= 63
maxNrOfSatAlmanac-maxNoSat   INTEGER ::= 16      -- maxNrOfSatAlmanac - maxNoSat

```

/* partly omitted */

id-HSSICH-Info-DM-Rsp	ProtocolIE-ID ::= 592
id-Best-Cell-Portions-Value	ProtocolIE-ID ::= 593
id-Primary-CPICH-Usage-for-Channel-Estimation	ProtocolIE-ID ::= 594
id-Secondary-CPICH-Information-Change	ProtocolIE-ID ::= 595
id-NumberOfReportedCellPortion	ProtocolIE-ID ::= 596
id-TimeslotISCP-LCR-InfoList-RL-ReconfPrepTDD	ProtocolIE-ID ::= 599
id-Unidirectional-DCH-Indicator	ProtocolIE-ID ::= 602
<u>id-SAT-Info-Almanac-ExtItem</u>	<u>ProtocolIE-ID ::= 609</u>