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**Universal Mobile Telecommunications System (UMTS);  
LTE;  
5G;  
User Equipment (UE)  
conformance specification for UE positioning;  
Part 4: Test suites  
(3GPP TS 37.571-4 version 16.4.0 Release 16)**



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**ETSI**

650 Route des Lucioles  
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - APE 7112B  
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# Introduction

The present document is part 4 of a multi-part conformance test specification. The specification contains a TTCN design frame work and the detailed test specifications in TTCN for the UE:

- A-GPS at the UTRA Uu interface in TTCN-2;
- A-GNSS at the UTRA Uu interface in TTCN-3;
- LTE positioning at the LTE-Uu interface in TTCN-3.
- NR positioning at the NR-Uu interface in TTCN-3.

The present document is part 4 of a multi-parts TS:

- 3GPP TS 37.571-1: User Equipment (UE) conformance specification for UE positioning; Part 1: Terminal conformance.
- 3GPP TS 37.571-2: User Equipment (UE) conformance specification for UE positioning; Part 2: Protocol conformance.
- 3GPP TS 37.571-3: User Equipment (UE) conformance specification for UE positioning; Part 3: Implementation Conformance Statement (ICS).
- **3GPP TS 37.571-4: User Equipment (UE) conformance specification for UE positioning; Part 4: Test suites.**
- 3GPP TS 37.571-5: User Equipment (UE) conformance specification for UE positioning; Part 5: Test scenarios and assistance data.

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# 1 Scope

The present document specifies the protocol and signalling conformance testing in TTCN for the UE:

- A-GPS at the UTRA Uu interface;
- LTE positioning at the LTE-Uu interface;
- A-GNSS at the UTRA Uu interface.
- NR positioning at the NR-Uu interface.

The following TTCN test specification and design considerations can be found in the present document:

- Test system architecture;
- Test models and ASP definitions;
- Test methods and usage of communication ports definitions;
- Test configurations;
- Design principles and assumptions;
- TTCN styles and conventions;
- Partial PIXIT proforma;
- Test suites in TTCN-2 and TTCN-3;
- The Test Suites designed and implemented in the present document are based on the test specifications in prose in 3GPP TS 37.571-2 [3];
- The applicability of the individual test cases is specified in the test ICS proforma specification in 3GPP TS 37.571-3 [4].

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# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
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- [1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".
- [2] 3GPP TS 37.571-1: " User Equipment (UE) conformance specification for UE positioning; Part 1: Conformance test specification".
- [3] 3GPP TS 37.571-2: " User Equipment (UE) conformance specification for UE positioning; Part 2: Protocol conformance".
- [4] 3GPP TS 37.571-3: " User Equipment (UE) conformance specification for UE positioning; Part 3: Implementation Conformance Statement (ICS)".

- [5] 3GPP TS 37.571-5: " User Equipment (UE) conformance specification for UE positioning; Part 5: Test scenarios and assistance data".
- [6] 3GPP TS 36.523-3: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Packet Core (EPC); User Equipment (UE) conformance specification; Part 3: Test suites".
- [7] 3GPP TS 36.508: "Evolved Universal Terrestrial Radio Access (E-UTRA) and Evolved Packet Core (EPC); Common test environments for User Equipment (UE) conformance testing".
- [8] 3GPP TS 34.123-3: "User Equipment (UE) conformance specification; Part 3: Abstract test suite (ATS)".
- [9] 3GPP TS 34.108: "Common test environments for User Equipment (UE); Conformance testing".
- [10] 3GPP TS 37.355: " LTE Positioning Protocol (LPP)".
- [11] 3GPP TS 24.301: "Non-Access-Stratum (NAS) protocol for Evolved Packet System (EPS); Stage 3".
- [12] 3GPP TS 25.331: "Radio Resource Control (RRC); Protocol specification".
- [13] 3GPP TS 24.080: "Mobile radio interface layer 3 supplementary services specification; Formats and coding".
- [14] 3GPP TS 29.002: "Mobile Application Part (MAP) specification".
- [15] ITU-T Recommendation X.880: "Information technology - Remote Operations: Concepts, model and notation".
- [16] ITU-T Recommendation Q.773: "Transaction capabilities formats and encoding".
- [17] ETSI ES 201 873-1: "Methods for Testing and Specification (MTS); The Testing and Test Control Notation version 3; Part 1: TTCN-3 Core Language".
- [18] 3GPP TS 34.109: "Terminal logical test interface; Special conformance testing functions".
- [19] 3GPP TS 23.038: "Alphabets and language-specific information".
- [20] ETSI TR 101 666 (V1.0.0): "Information technology; Open Systems Interconnection Conformance testing methodology and framework; The Tree and Tabular Combined Notation (TTCN) (Ed. 2++)".
- [21] 3GPP TS 24.008: "Mobile radio interface Layer 3 specification; Core network protocols; Stage 3".
- [22] 3GPP TS 23.032: "Universal Geographical Area Description (GAD)".
- [23] 3GPP TS 36.211: "Evolved Universal Terrestrial Radio Access (E-UTRA); Physical channels and modulation".
- [24] 3GPP TS 38.523-3: "5GS; User Equipment (UE) conformance specification; Part 3: Protocol Test Suites".
- [25] 3GPP TS 24.501: "Non-Access-Stratum (NAS) protocol for 5G System (5GS); Stage 3".
- [26] 3GPP TS 36.331: "Evolved Universal Terrestrial Radio Access (E-UTRA); Radio Resource Control (RRC); Protocol specification".
- [27] 3GPP TS 38.331: "NR; Radio Resource Control (RRC) protocol specification".
- [28] 3GPP TS 38.508-1: "5GS; User Equipment (UE) conformance specification; Part 1: Common test environment".
- [29] 3GPP TS 38.211: "NR; Physical channels and modulation".



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## 3 Definitions, symbols and abbreviations

### 3.1 Definitions

For the purposes of the present document, the terms and definitions given in 3GPP TR 21.905 [1] apply.

### 3.2 Symbols

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] apply.

### 3.3 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply:

ASP	Abstract Service Primitive
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## 4 A-GPS system architecture and test model

A-GPS signalling conformance tests are specified in TTCN-2. The system architecture and the test model are based on 3GPP TS 34.123-3 [8].

### 4.1 ATS and module structure

Refer to 3GPP TS 34.123-3 [8], clause 5.

### 4.2 Upper tester

Refer to 3GPP TS 34.123-3 [8], clause 7.3.5.1.

### 4.3 SV PCO

Refer to 3GPP TS 34.123-3 [8], clause 7.3.5.2.

### 4.4 A-GPS Primitives

Refer to 3GPP TS 34.123-3[8], clause 7.3.5.3.

### 4.5 Specific test suite operation for A-GPS testing

Refer to 3GPP TS 34.123-3 [8], clause 8.7.7.

## 5 A-GNSS and LTE positioning system architecture and test models

### 5.1 Test system architecture

#### 5.1.1 General system architecture

Refer to 3GPP TS 36.523-3 [6], clause 4.1.1.

#### 5.1.2 Component architecture

Each access technology (RAT) is hosted by a separate TTCN-3 parallel component (PTC):

- E-UTRA PTC;
- UTRA PTC.

The PTCs are controlled by the TTCN-3 positioning master test component (POS MTC) which:

- Is an extension of the MTC as defined in 3GPP TS 36.523-3 [6], clause 4.1.2.
- Controls the SS Positioning Simulator.

Figure 5.1.2-1 shows this component architecture for an E-UTRA and UTRA scenario.

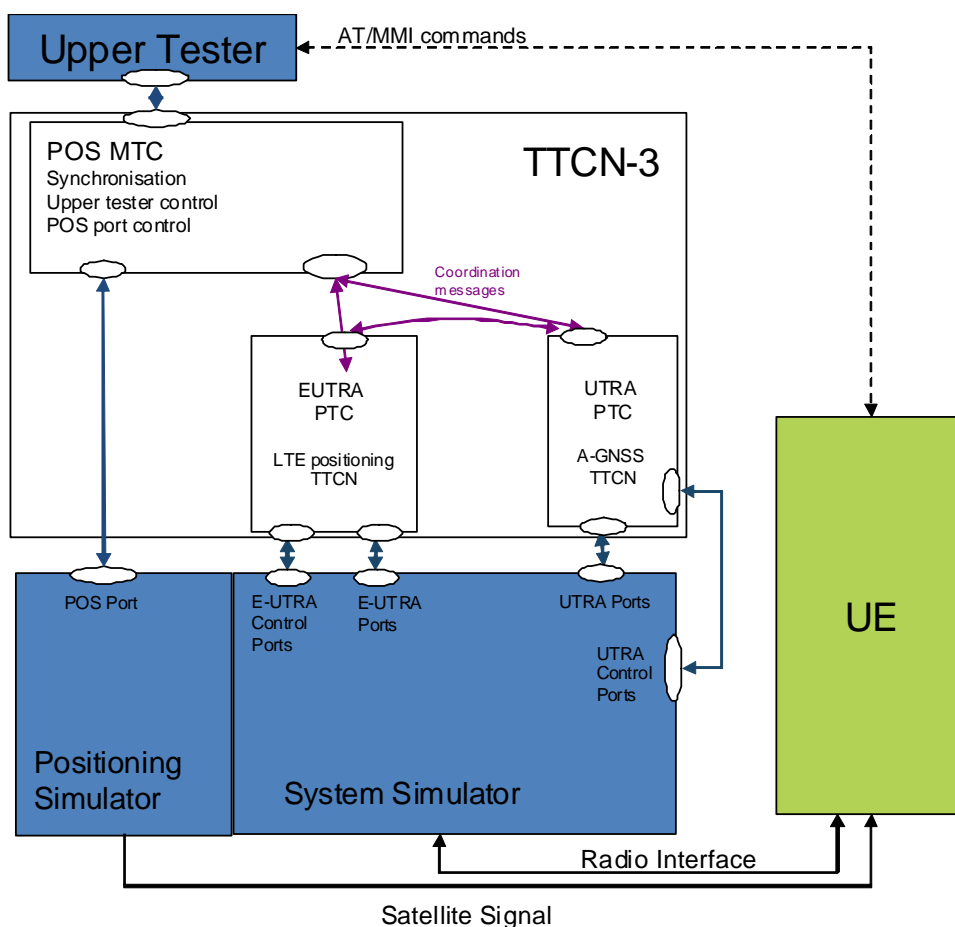


Figure 5.1.2-1: Component architecture for an E-UTRA and UTRA scenario

The PTCs are allocated according to the following principles:

- For LTE positioning tests cases, the E-UTRA PTC is created.
- For LTE positioning CS fallback test cases, E-UTRA and UTRA PTCs are created.
- For UTRA A-GNSS test cases, the UTRA PTC is created.

### 5.1.2.1 Interfaces

A number of interfaces are taken into consideration.

#### **POS MTC - PTC:**

Common synchronisation of PTCs.

Positioning simulator command/data coordination messages.

Upper tester primitives.

#### **POS MTC - System Interface:**

Upper tester primitives.

#### **POS MTC- Positioning Simulator:**

Positioning simulator command and data primitives.

#### **PTC - PTC:**

Primitives containing information for IRAT handover.

#### **PTC - System Interface:**

Primitives containing peer-to-peer message.

Configuration primitives.

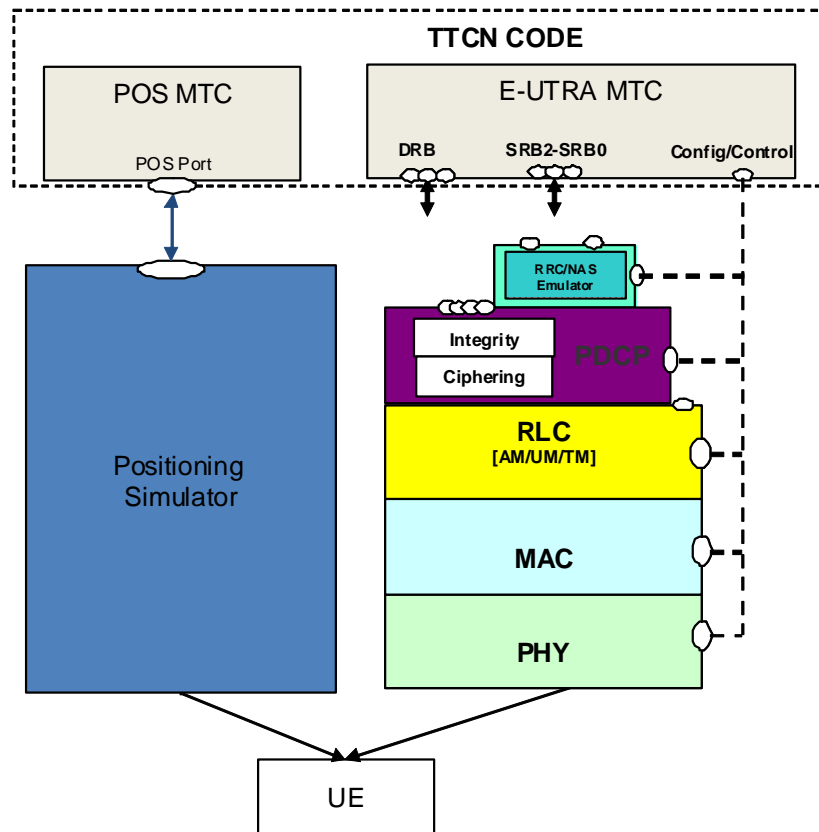
## 5.2 Test model

In order to perform the LTE positioning and A-GNSS tests, the Positioning Simulator shall have two basic functional unites:

- Satellite simulator generating and broadcasting satellite signals.
- Assistance data source storing the data associated with the pre-defined GPS and GNSS test scenarios (see 3GPP TS 37.571-5 [5]).

This specification supports the following GNSS: GPS, Galileo, GLONASS and BDS.

## 5.2.1 LTE GNSS test model



**Figure 5.2.1-1: E-UTRA Test model for LTE positioning GNSS testing**

The LTE positioning test model consists of an SS E-UTRAN protocol stack and a positioning simulator. The SS E-UTRA emulation part is the same as the model defined in 3GPP TS 36.523-3 [6].

The UE is configured in normal mode. On UE side Ciphering/Integrity (PDCP and NAS) is enabled. The tests are performed on C-Plane.

The ASPs at POS Port are used to:

- Load a pre-defined test scenario into the positioning simulator.
- Start or stop generating and broadcasting satellite signals from the positioning simulator.
- Retrieve the GNSS assistance data from assistance data source.

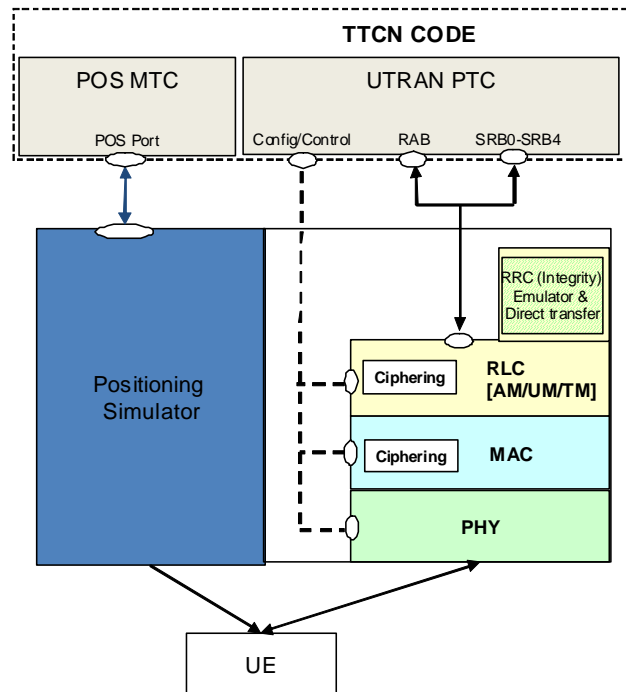
Under the ASP commands, the upper tester loads or re-loads pre-defined GNSS test scenario to the positioning simulator. The generated satellite signals shall simulate the GNSS environment as specified in 3GPP TS 37.571-2 [3], clause 5.

The SS also sends the GNSS assistance data to the UE through LPP signalling (see 3GPP TS 37.355 [10]) to facilitate the UE acquiring and tracking satellites. Such assistance data shall be consistent to within  $\pm 2$  seconds with the satellite signals generated (see 3GPP TS 37.571-2 [3], clause 5.2.1).

The assistance data source shall provide the assistance data consistent to  $\pm 1/0$  second with the GNSS test scenario currently running in the satellite simulator (i.e. the data shall be up to 1 second in advance of the scenario); this allows for a further 2 seconds of latency in the SS. In case multiple satellite systems are configured in a test, the assistance data are requested or retrieved in a single ASP command for all satellite systems.

The UE positioning services are encoded in a TCAP [16] ROSE component [15] of the facility information element [14] in the Supplement Service [13] conveyed in the NAS messages. The facility information element is encoded in BER in TTCN referred to 3GPP TS 24.080 [13], clause 3.6.1 and 3GPP TS 29.002 [14], clause 17.1.1.

## 5.2.2 UTRA A-GNSS test model



**Figure 5.2.2-1: UTRA Test model for A-GNSS testing**

The A-GNSS test model consists of an SS UTRAN protocol stack and a positioning simulator. The SS UTRA emulation part is the same as the model defined in 3GPP TS 36.523-3 [6], clause 4.4.1.

The UE is configured in normal mode. Ciphering and Integrity (RRC) are enabled. The tests are performed on C-Plane.

The ASPs at POS Port are used to:

- Load a pre-defined test scenario into the positioning simulator.
- Start or stop generating and broadcasting satellite signals from the positioning simulator.
- Retrieve the GPS and GNSS assistance data from assistance data source.

Under the ASP commands, the upper tester loads or re-loads pre-defined GPS or GNSS test scenario to the positioning simulator. The generated satellite signals shall simulate the A-GPS and A-GNSS environment as specified in 3GPP TS 37.571-2 [3], clause 4.2.

The SS also sends the GPS or GNSS assistance data to the UE through RRC signalling to facilitate the UE acquiring and tracking satellites. Such assistance data shall be consistent to within  $\pm 2$  seconds with the satellite signals generated (see 3GPP TS 37.571-2 [3], clause 4.2).

The assistance data source shall provide the assistance data consistent to  $\pm 1/0$  second with the GPS or GNSS test scenario currently running in the satellite simulator (i.e. the data shall be up to 1 second in advance of the scenario); this allows for a further 2 seconds of latency in the SS. In case multiple satellite systems are configured in a test, the assistance data are requested or retrieved in a single ASP command for all satellite systems.

The UE positioning services are encoded in a TCAP [16] ROSE component [15] of the facility information element [14] in the Supplement Service [13] conveyed in the NAS messages. The facility information element is encoded in BER in TTCN referred to 3GPP TS 24.080 [13], clause 3.6.1 and 3GPP TS 29.002 [14], clause 17.1.1.

## 5.3 ASP specifications

The E-UTRAN and UTRAN ASP definitions are specified according to 3GPP TS 36.523-3 [6], clause 6.

The positioning simulator ASP definitions are documented in annex C.

## 5.4 LTE OTDOA test model

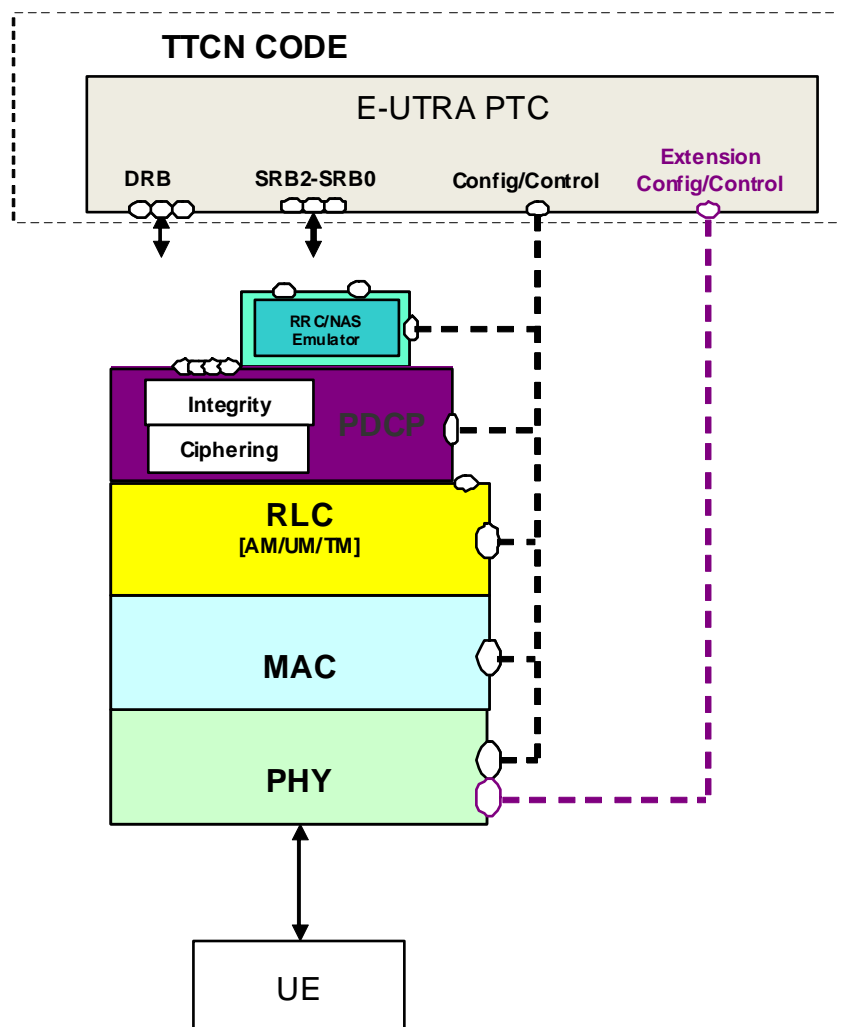


Figure 5.4-1: E-UTRA OTDOA test model

The LTE OTDOA test model consists of an SS E-UTRAN protocol stack. The SS E-UTRA emulation part is the same as the model defined in 3GPP TS 36.523-3 [6] with an additional port to configure the antenna port 6 and the Positioning Reference Signal (PRS) in the LTE cells. The extension of LTE ASPs is defined in annex C.

The simulated OTDOA environment is specified in 3GPP TS 37.571-2 [3], clause 5.2.2), cells are synchronous and configured with the timing offset set to 0. The PRS is transmitted according to 3GPP TS 36.211 [23], clause 6.10.4.

The UE is configured in normal mode. On UE side Ciphering/Integrity (PDCP and NAS) is enabled. The tests are performed on C-Plane.

The PRS signals are transmitted by the SS E-UTRAN, the assistance data are written in TTCN.

## 5.5 LTE ECID test model

The test model is referred to the LTE positioning test model defined in clause 5.2.1; except that no satellite signals are required.

# 6 LTE indoor positioning system architecture and test models

## 6.1 Test system architecture

### 6.1.1 General system architecture

Refer to 3GPP TS 36.523-3 [6], clause 4.1.1.

### 6.1.2 Component architecture

The same architecture as in 5.1.2 applies, excluding the UTRA PTC.

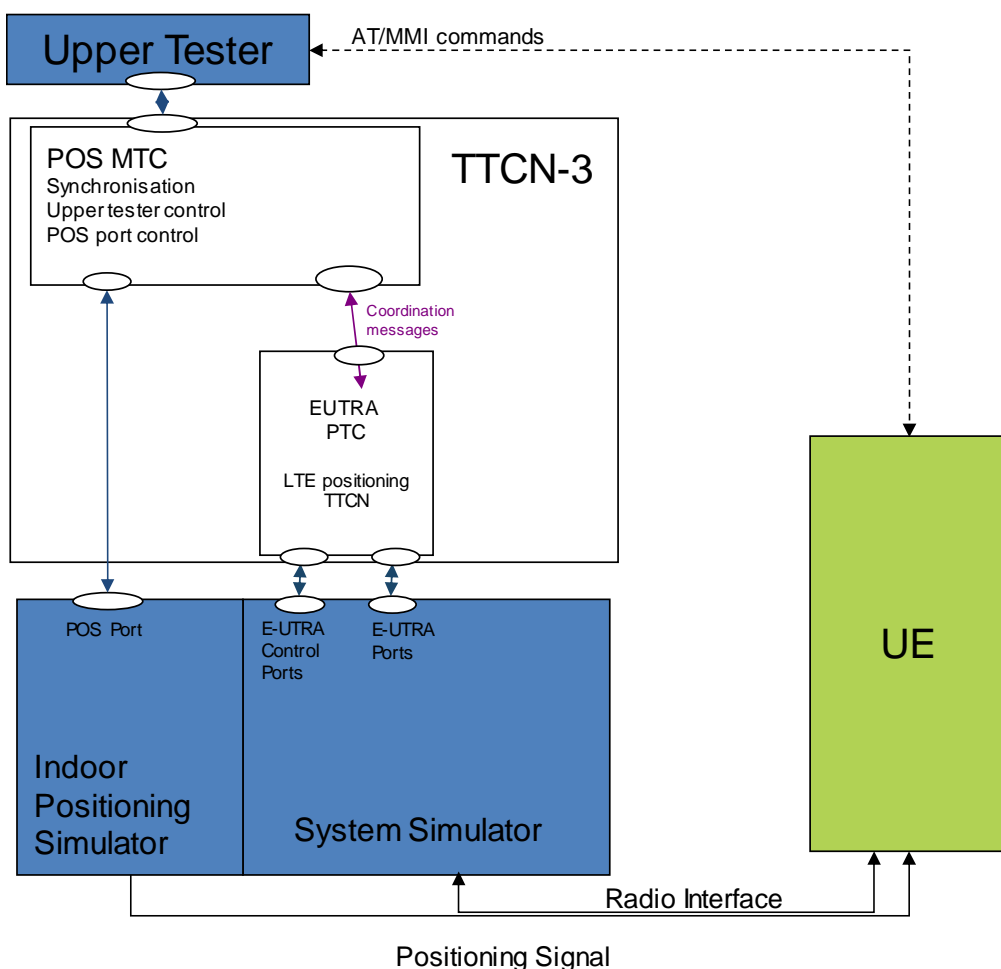


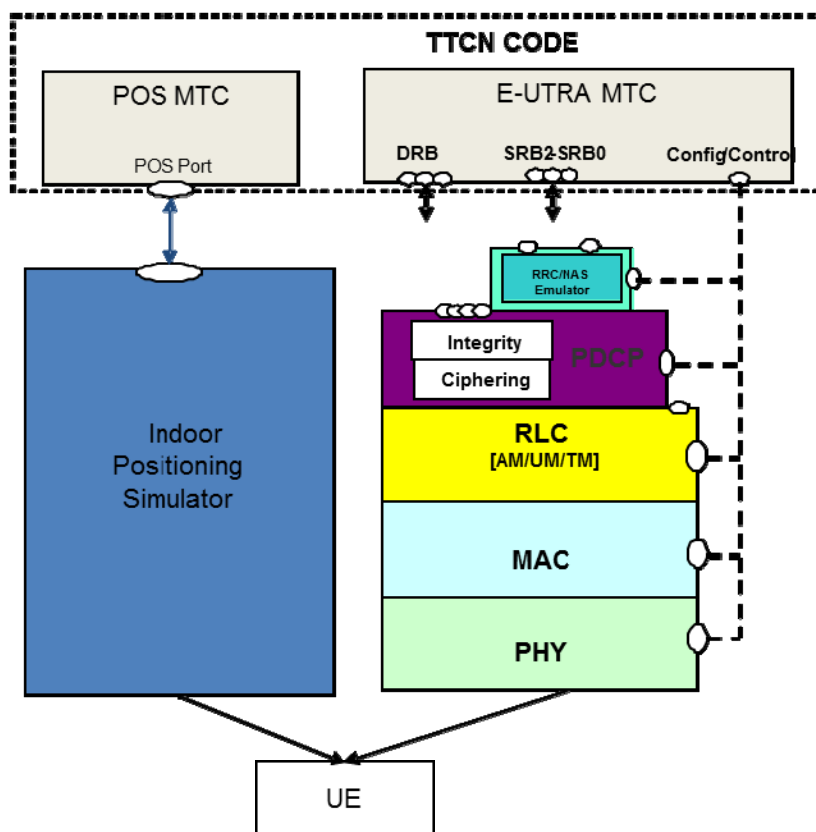
Figure 6.1.2-1: Component architecture for an E-UTRA scenario

### 6.1.2.1 Interfaces

Refer to 5.1.2.1.

## 6.2 Test model

### 6.2.1 LTE indoor positioning test model



**Figure 6.2.1-1: E-UTRA Test model for LTE indoor positioning testing**

The LTE Indoor Positioning test model consists of an SS E-UTRAN protocol stack and an Indoor Positioning simulator. Depending on the Indoor Positioning Technology to be tested, the Indoor Positioning simulator will generate:

- MBS beacon signals, for MBS test cases;
- WLAN signals, for WLAN test cases;
- Bluetooth signals, for Bluetooth test cases.
- The Indoor Positioning simulator will be switched off for Sensor test cases.

The SS E-UTRA emulation part is the same as the model defined in 3GPP TS 36.523-3 [6].

The UE is configured in normal mode. On UE side Ciphering/Integrity (PDCP and NAS) is enabled. The tests are performed on C-Plane.

The ASPs at POS Port are used to:

- Load a pre-defined test scenario into the Indoor Positioning simulator.
- Start or stop generating and broadcasting signals from the Indoor Positioning simulator.



- Retrieve the appropriate (MBS, WLAN, Sensor) assistance data from the assistance data source.

Under the ASP commands, the upper tester loads or re-loads pre-defined test scenario to the Indoor Positioning simulator. The generated signals shall simulate the corresponding Indoor Positioning environment as specified in 3GPP TS 37.571-2 [3], clause 5.

The SS also sends the appropriate assistance data to the UE through LPP signalling (see 3GPP TS 37.355 [10]) to facilitate the UE acquisition of MBS Beacons or WLAN APs. For UE-based tests, the SS also sends the appropriate assistance data to enable the UE to calculate its position for MBS or WLAN tests, or calculate altitude based on barometric pressure sensor measurements.

The UE positioning services are encoded in a TCAP [16] ROSE component [15] of the facility information element [14] in the Supplement Service [13] conveyed in the NAS messages. The facility information element is encoded in BER in TTCN referred to 3GPP TS 24.080 [13], clause 3.6.1 and 3GPP TS 29.002 [14], clause 17.1.1.

---

## 6A LTE test models requiring GNSS support

Several LTE test models specified in TS 36.523-3 [6] require the presence of a GNSS emulation. Those are:

- V2X services: refer to TS 36.523-3 [6] clause 4.2.11
- Aerial UE: refer to TS 36.523-3 [6] clause 4.2.12

The positioning simulator shall be capable of generating and broadcasting the following GNSS: GPS, Galileo, GLONASS and BDS.

The ASPs at POS Port for the both test models are used to:

- Load a pre-defined test scenario into the positioning simulator.
- Start or stop generating and broadcasting satellite signals from the positioning simulator.

The ASPs at POS Port for V2X services are additionally used to:

- Trigger the positioning simulator to move in the test scenario to the next geographical area or zone.
- Trigger the positioning simulator to switch on/off the transmitter without stopping the UTC time sequence.

The ASPs at POS Port for aerial UE communication are additionally used to:

- Set an initial altitude above the sea level. Geographical latitude and longitude are defined in the test scenario and remain constant during the test execution.
- Trigger the positioning simulator to simulate a vertical movement in the test scenario towards a specified altitude level.

---

## 6B NG-RAN NR positioning system architecture and test models

### 6B.1 Test system architecture

#### 6B.1.1 General system architecture

Refer to 3GPP TS 36.523-3 [6], clause 4.1.1.

#### 6B.1.2 Component architecture

The NR PTC is controlled by the TTCN-3 positioning master test component (POS MTC) which:

- Is an extension of the MTC as defined in 3GPP TS 38.523-3 [24], clause 4.2.
- Controls the SS Positioning Simulator.

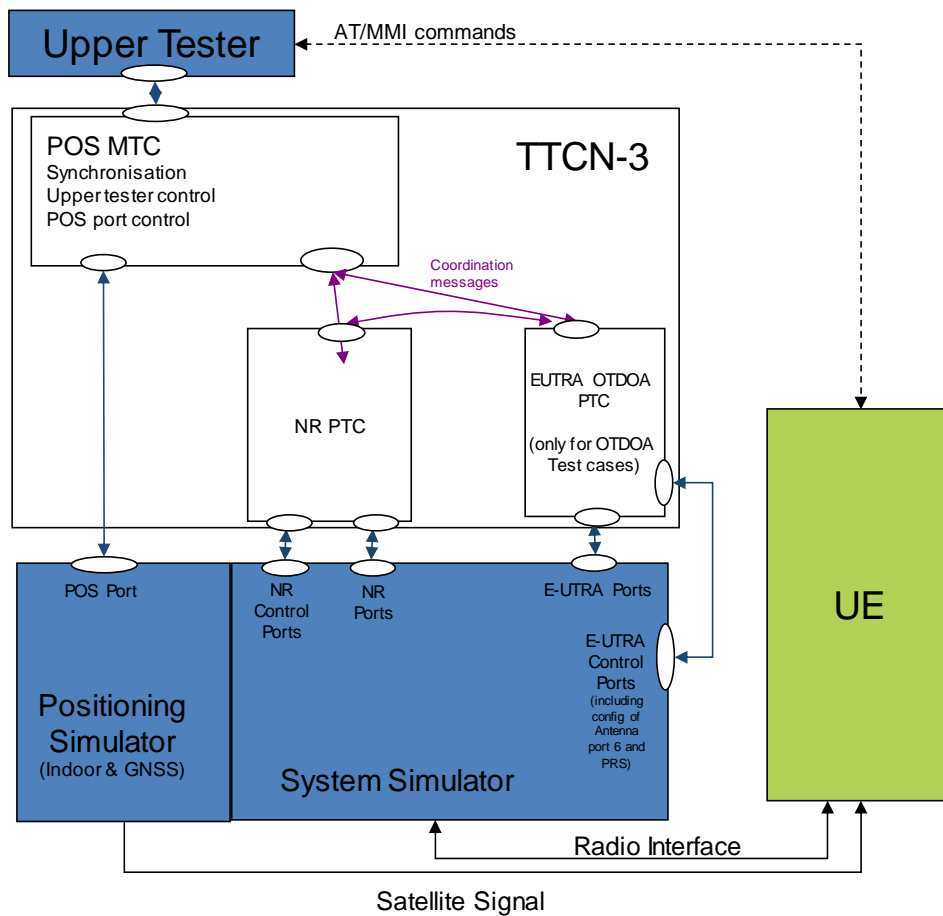


Figure 6B.1.2-1: Component architecture for a NR scenario

As specified in TS 37.571-2 [2], subclause 8.2.8:

- The connection between the Position Simulator and the UE (Satellite signal) shall be conducted.
- The connection between the System Simulator and the UE (Radio Interface) shall be conducted for NR FR1 and radiated (OTA) for NR FR2.

## 6B.2 Test models

### 6B.2.1 NR GNSS positioning test model

The NR positioning test model consists of an SS NR protocol stack and a positioning simulator. The SS NR/5GC emulation part is the same as the model defined in 3GPP TS 38.523-3 [24]. The positioning simulator is the same as for LTE positioning test model defined in clause 5.2.1.

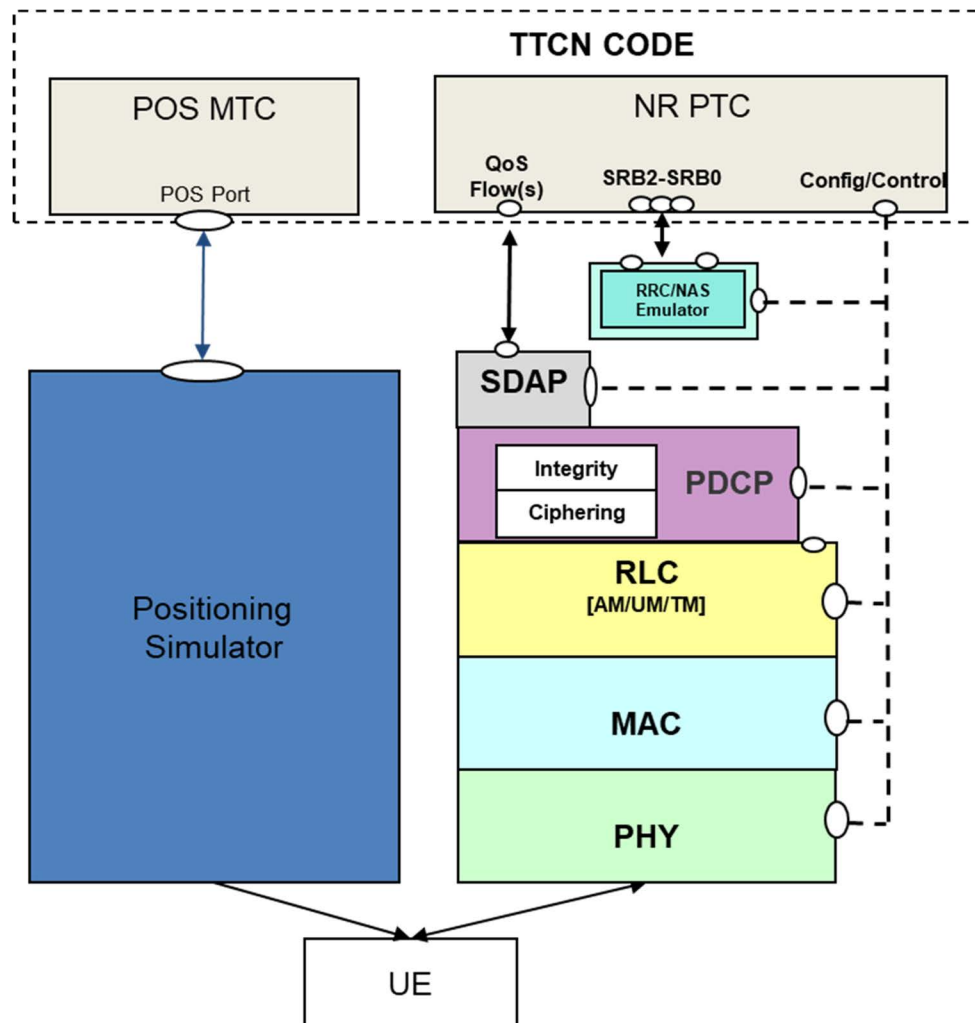


Figure 6B.2.1-1: Test model for NR GNSS positioning testing

## 6B.2.2 NR indoor positioning test model

The NR indoor positioning test model is the same as the NR positioning test model in clause 6B.2.1 but replacing the Positioning simulator with an Indoor Positioning simulator. The same principles as in clause 6.2.1 apply but replacing LTE with NR.

## 6B.2.3 NR OTDOA (LTE) positioning test model

OTDOA measurements are not supported on NR cells in Rel-15. The OTDOA measurements are provided by LTE cells instead. The UE will be attached to an NR cell and the LPP session will be established over NR/5GC NAS. The UE will report OTDOA RSTD measurements from LTE neighbour cells.

The NR OTDOA (LTE) positioning model consists of an SS NR/5GC protocol stack and a SS E-UTRAN protocol stack. The SS NR/5GC emulation part is the same as the model defined in 3GPP TS 38.523-3 [34]. The SS E-UTRAN emulation part is the same as the model defined in clause 5.4 (i.e. including an additional port to configure the antenna port 6 and the Positioning Reference Signal (PRS) in the LTE cells). The E-UTRA PTC will not be connected to NASEMU or IMS/IP PTCs.

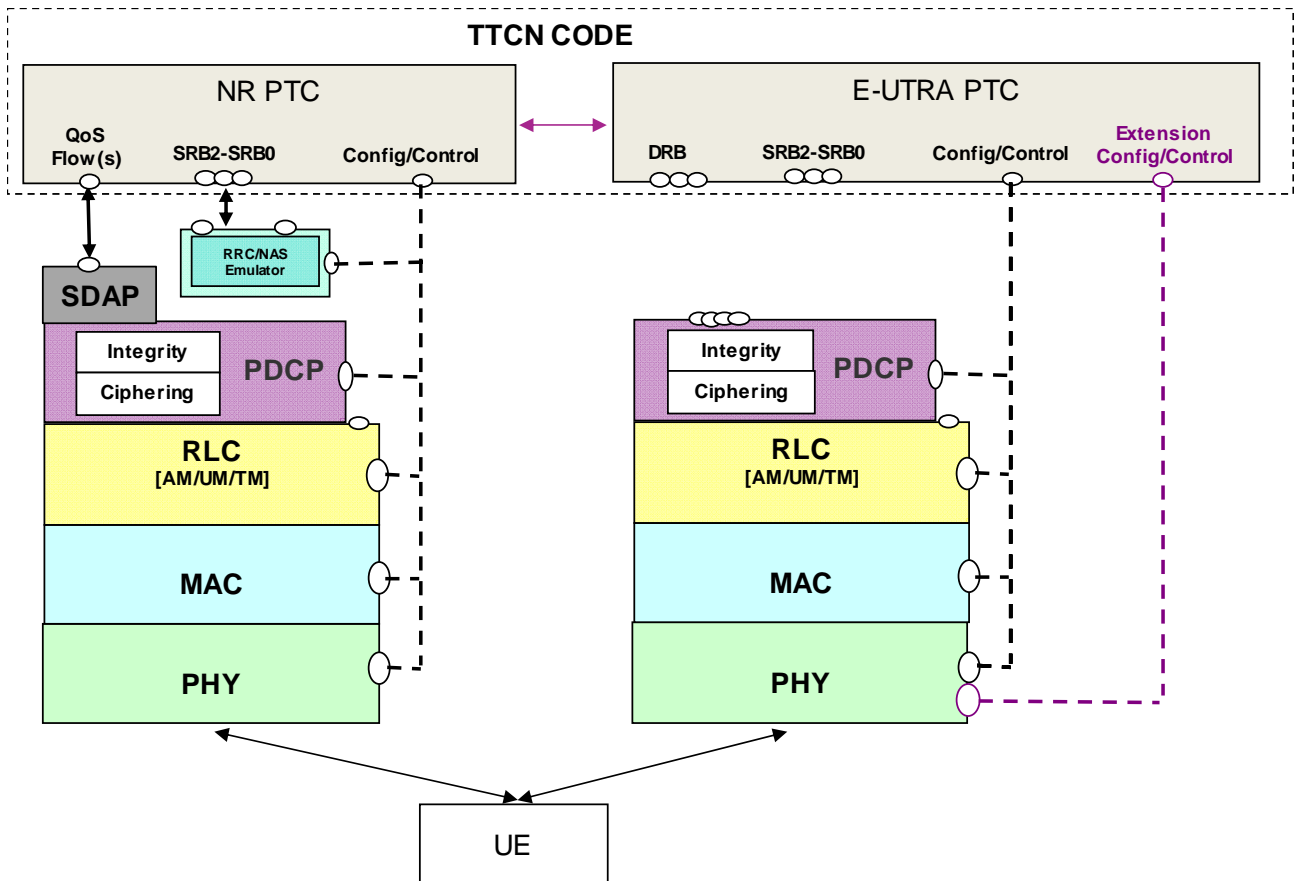


Figure 6B.2.3-1: Test model for NR OTDOA (LTE) positioning testing

## 6B.2.4 NR Multi-RTT, DL-AoD and DL-TDOA positioning test model

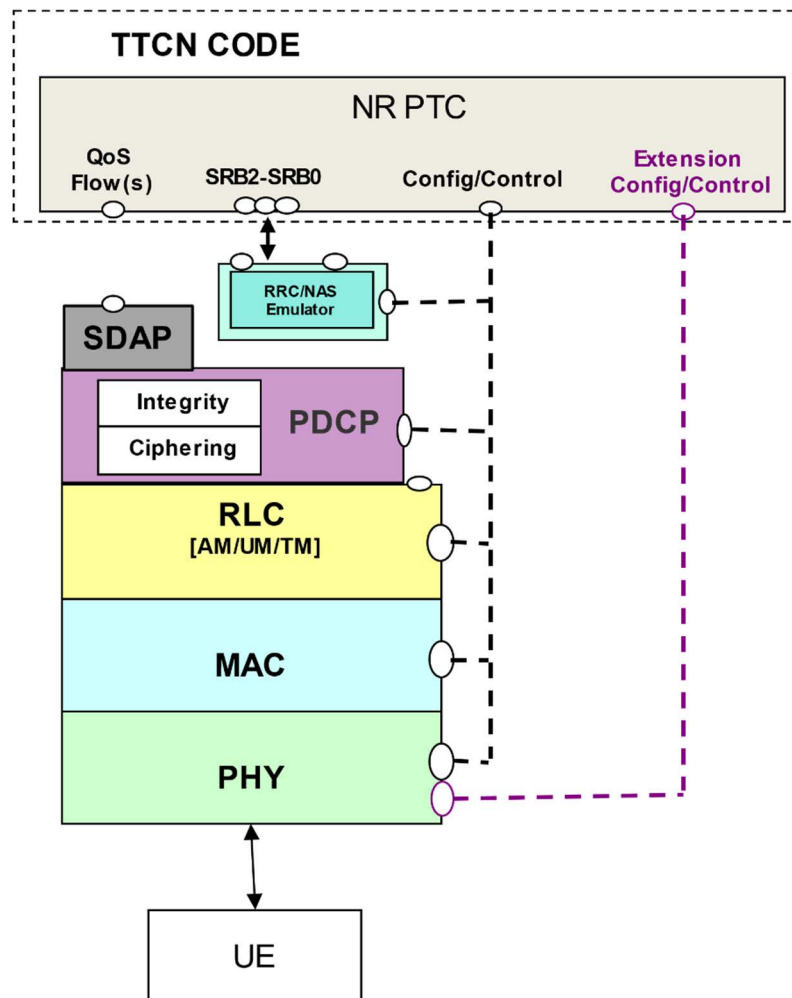


Figure 6B.2.4-1: NR Multi-RTT, DL-AoD and DL-TDOA test model

The NR Multi-RTT, DL-AoD and DL-TDOA test model is the same as the NR/5GC Layer 3 test model (TS 38.523-3 [24], clause 5.2.1.1) with an additional port to configure the DL Positioning Reference Signal (DL-PRS) in the NR cells. The extension of NR ASPs is defined in annex X [TBD].

The simulated NR Multi-RTT, DL-AoD and DL-TDOA environments are specified in TS 37.571-2 [3], clauses 8.2.9, 8.2.10 and 8.2.11, respectively. The DL-PRS is transmitted according to TS 38.211 [29], clause 7.4.1.7.

The UE is configured in normal mode. On UE side Ciphering/Integrity (PDCP and NAS) is enabled. The tests are performed on C-Plane.

The DL-PRS is transmitted by the physical layer of the NR cell(s) in the SS. The assistance data to provide the UE with the configuration of the DL-PRS is sent from the SS to the UE via LPP signalling.

For Multi-RTT, the SS will be also configured through the NR\_SYS port to receive UL-SRS from the UE.

## 6B.2.5 NR E-CID test model

The test model is the same as the NR/5GC Layer 3 test model (TS 38.523-3 [24], clause 5.2.1.1).

---

## 7 Upper Tester Interface

### 7.1 MMI for A-GPS

Refer to 3GPP TS 34.123-3 [8], clause B.1.12.

### 7.2 MMI for A-GNSS, LTE and NR positioning

Refer to 3GPP TS 36.523-3 [6], clause 5.

The following MMI commands are defined for A-GNSS, LTE and NR positioning.

**Table 7.2-1: MMI commands**

Command	Parameters	
	Name	Value
"CHECK_LCS_CLIENT"		none
"LOCATION_INFO"		none

**Table 7.2-2: MMI commands imported from 3GPP TS 36.523-3 [6], clause 5**

Command
"SWITCH_ON"
"SWITCH_OFF"
"POWER_ON"
"POWER_OFF"
"CHECK_DTCH_THROUGHCONNECTED"
"CLEAR_STORED_ASSISTANCE_DATA"

The following AT commands are applied in TTCN.

**Table 7.2-3: AT Commands**

Command	Reference
AT+CMOLR	TS 27.007 [32]
AT+CMTLR	TS 27.007 [32]
AT+CMLRA	TS 27.007 [32]

---

## 8 IXIT Proforma

### 8.1 A-GPS test suite parameters declarations

Refer to 3GPP TS 34.123-3 [8], clause B.1.13.

### 8.2 A-GNSS, LTE and NR positioning test suite parameters declarations

Same PIXIT parameters are referred to clause 8.1.

Additionally, the following PIXIT parameter shall be used:

**Table 8.2-1: A-GNSS, LTE and NR positioning PIXIT**

<b>Parameter Name</b>	<b>Description</b>	<b>Type</b>	<b>Default Value</b>	<b>Supported Value</b>
px_GnssScenario2012	Usage of GNSS scenarios with date in 2012 from 3GPP TS 37.571-5 [5]	BOOLEAN	FALSE	

---

## 9 Other SS Requirements with TTCN-3 impact

### 9.1 Codec Requirements

Refer to 3GPP TS 36.523-3 [6] clause 8.1 and TS 38.523-3 [24] clause 8.1.

## Annex A (normative): Test Suites

This annex contains the approved TTCN Test Suites.

### A.1 UTRA A-GPS test suite

This annex includes the reference to those approved A-GPS ATS which are contained in 3GPP TS 34.123-3 [8], clause A.11.

The ATSS have been produced using the Tree and Tabular Combined Notation (TTCN2) according to TR 101 666 [20].

#### A.1.1 Baseline of specifications

Table A.1.1-1 shows the baseline of the relevant core specifications and the test specifications which the delivered ATSS are referred to.

**Table A.1.1-1: Versions of the test and Core specifications**

<b>Core specifications</b>	3GPP TS 25.331 [12]
<b>Test specifications</b>	3GPP TS 37.571-2 [3]
	3GPP TS 37.571-3 [4]
	3GPP TS 37.571-5 [6]
	3GPP TS 34.123-3 [8]
	3GPP TS 34.108 [9]
	3GPP TS 34.109 [18]

#### A.1.2 AGPS ATS

The approved AGPS test cases are listed. An "X" in columns FDD or LCR TDD indicates the test case approved for the relevant ATS.

**Table A.1.2-1: AGPS TTCN test cases**

Test case reference		Description	FDD	TDD
TS 37.571-2 [3]	TS 34.123-3 [8]			
6.1.1.1	17.2.2.1	LCS Network Induced location request/UE-Based GPS/Emergency Call/with USIM	X	
6.1.1.2	17.2.2.2	LCS Network Induced location request/UE-Based GPS/Emergency Call/without USIM	X	
6.1.1.3	17.2.2.3	LCS Network induced location request/UE-Assisted GPS/Emergency call/With USIM	X	
6.1.1.4	17.2.2.4	LCS Network induced location request/UE-Assisted GPS/Emergency call/Without USIM	X	
6.1.2.1	17.2.3.2	LCS Mobile originated location request/UE-Based GPS/Position estimate request/Success	X	
6.1.2.7	17.2.3.9	LCS Mobile originated location request/UE-Assisted GPS/Position Estimate/Success	X	
6.1.3.1	17.2.4.1	LCS Mobile terminated location request/UE-Based GPS	X	
6.1.3.2	17.2.4.2	LCS Mobile-terminated location request/UE-Based GPS/Request for additional assistance data/Success	X	
6.1.3.3	17.2.4.3	LCS Mobile-terminated location request/UE-Based GPS/Failure - Not Enough Satellites	X	
6.1.3.4	17.2.4.4	LCS Mobile terminated location request/UE-Assisted GPS/Success	X	
6.1.3.5	17.2.4.5	LCS Mobile terminated location request/UE-Assisted GPS/Request for additional assistance data/Success	X	
6.1.3.7	17.2.4.7	LCS Mobile terminated location request/UE-Based GPS/Privacy Verification/Location Not Allowed if No Response	X	



### A.1.3 The TTCN Machine Processable form (TTCN.MP)

The TTCN.MP representation corresponding to the corresponding FDD ATS is referred to 3GPP TS 34.123-3 [8], clause A.11.

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## A.2 UTRA A-GNSS, LTE and NR/5GC positioning test suite

The test suites have been produced using the Testing and Test Control Notation version 3 (TTCN-3) according to ES 201 873-1 [17].

### A.2.1 Baseline of specifications

Table A.2.1-1 shows the baseline of the relevant core specifications and the test specifications which the delivered TTCN test suites are referred to.

**Table A.2.1-1: References of the test and Core specifications**

<b>Core specifications baseline</b>	3GPP TS 37.355 [10]
	3GPP TS 24.301 [11]
	3GPP TS 25.331 [12]
	3GPP TS 24.501 [25]
	3GPP TS 36.331 [26]
	3GPP TS 38.331 [27]
<b>Test specifications</b>	3GPP TS 37.571-2 [3]
	3GPP TS 37.571-3 [4]
	3GPP TS 37.571-5 [5]
	3GPP TS 36.508 [7]
	3GPP TS 38.508-1 [28]

The Test Suite in TTCN3 is contained in multiple ASCII files which accompany the present document.

### A.2.2 E-UTRA LTE positioning Test Cases

Table A.2.2-1 lists all approved test cases.

**Table A.2.2-1: E-UTRA LTE positioning TTCN test cases**

Test case	Description
7.1.1	UE Network Capability
7.2.1.1	Location Notification
7.2.1.2	Privacy Verification – Location Allowed if no Response
7.2.1.3	Privacy Verification – Location not Allowed if No Response
7.3.1.1	Position Capability Transfer
7.3.2.1	LPP Duplicated Message
7.3.2.2	LPP Acknowledgment
7.3.2.3	LPP Retransmission
7.3.3.1	LPP Requested Method not Supported – UE-Assisted sub-test 1
7.3.4.2.5s	E-SMLC Initiated Assistance Data Delivery followed by Location Information Transfer: UE-Assisted sub-test 5
7.3.4.2.6s	E-SMLC Initiated Assistance Data Delivery followed by Location Information Transfer: UE-Assisted sub-test 6
7.3.4.2.7s	E-SMLC Initiated Assistance Data Delivery followed by Location Information Transfer: UE-Assisted sub-test 7
7.3.4.4.5s	E-SMLC Initiated Position Measurement without assistance data: UE-Assisted sub-test 5
7.3.4.4.7s	E-SMLC Initiated Position Measurement without assistance data: UE-Assisted sub-test 7
7.3.5.1.5s	E-SMLC initiated Abort sub-test 5

## A.2.3 UTRA A-GNSS Test Cases

Table A.2.3-1 lists all approved test cases.

**Table A.2.3-1: UTRA A-GNSS TTCN test cases**

Test case	Description
6.2.1.1.4s	NI-LR Emergency Call: UE-Based A-GNSS sub-test 4
6.2.2.1.4s	MO-LR Position Estimate: UE-Based A-GNSS sub-test 4
6.2.2.3.4s	MO-LR Position Estimate: UE-Based A-GNSS – Failure Not Enough Satellites sub-test 4
6.2.3.2.4s	MT-LR Position Estimate: UE-Based A-GNSS – Failure Not Enough Satellites sub-test 4
6.2.3.3	Location Notification
6.2.3.4	Privacy Verification - Location Allowed if No Response
6.2.3.5	Privacy Verification - Location Not Allowed if No Response

## A.2.4 NR/5GC Test Cases

Table A.2.4-1 lists all approved test cases.

**Table A.2.4-1: NR/5GC TTCN test cases**

Test case	Description
9.3.1.1.NR5GC	Position Capability Transfer
9.3.1.2.5s.NR5GC	LPP Abort: Subtest 5
9.3.1.2.15s.NR5GC	LPP Abort: Subtest 15
9.3.2.1.NR5GC	LPP Duplicated Message
9.3.2.2.NR5GC	LPP Acknowledgement
9.3.2.3.NR5GC	LPP Retransmission
9.3.4.1.15s.NR5GC	E-SMLC Initiated Assistance Data Delivery followed by Location Information Transfer: UE-Based: Subtest 15
9.3.4.2.15s.NR5GC	E-SMLC Initiated Assistance Data Delivery followed by Location Information Transfer: UE-Assisted: Subtest 15
9.3.4.3.15s.NR5GC	E-SMLC Initiated Position Measurement without Assistance Data: UE-Based: Subtest 15
9.3.4.4.15s.NR5GC	E-SMLC Initiated Position Measurement without Assistance Data: UE-Assisted: Subtest 15

---

## Annex B (informative): ASN.1 modules

### B.1 A-GPS ASN.1 module

Refer to 3GPP TS 34.123-3 [8], annex H.1.

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### B.2 A-GNSS ASN.1 modules

Refer to 3GPP TS 34.123-3 [8], annex H.2.

---

### B.3 LPP ASN.1

The LPP asn.1 modules are extracted from 3GPP TS 37.355 [10] without any change.

# Annex C (informative): E-UTRA System Simulator Extension ASP Definitions in TTCN-3

## C.1 EUTRA\_POS\_ASP\_TypeDefs

Type definitions for configuration of Positioning Reference Signal in the system simulator; Common design principles: refer to 3GPP TS 36.523-3 [6], annex D.

### C.1.1 System\_Configuration\_PosExt

Formal ASP Definitions for EUTRA PRS system configuration.

#### SystemRequest\_PosExt\_Type

TTCN-3 Union Type		
<b>Name</b>	<b>SystemRequest_PosExt_Type</b>	
<b>Comment</b>	NOTE: Same structure as SystemRequest_Type in 3GPP TS 36.523-3 [6], annex D.	
Cell	<a href="#">CellConfigRequest_PosExt_Type</a>	configure PRS in an LTE cell; the cell shall be configured as usual beforehand and SS shall raise an error when the cell does not exist yet; there is no explicit release of the PRS but the whole cell needs to be released

#### SystemConfirm\_PosExt\_Type

TTCN-3 Union Type		
<b>Name</b>	<b>SystemConfirm_PosExt_Type</b>	
<b>Comment</b>	confirmations for system configuration; in general to be sent after the configuration has been done	
Cell	Null_Type	(no further parameters from SS)

### C.1.2 Cell\_Configuration\_PosExt

Specific Info for PRS Cell Configuration Primitive.

#### C.1.2.1 Cell\_Configuration\_Common\_PosExt

##### CellConfigRequest\_PosExt\_Type

TTCN-3 Union Type		
<b>Name</b>	<b>CellConfigRequest_PosExt_Type</b>	
<b>Comment</b>	NOTE: Same structure as SystemRequest_Type in 3GPP TS 36.523-3 [6], annex D.	
AddOrReconfigure	<a href="#">CellConfigInfo_PosExt_Type</a>	for PRS configuration of given cell: CellId : identifier of the cell to be configured RoutingInfo : None TimingInfo : Now (for initial configuration and for reconfiguration in general) ControlInfo : CnfFlag:=true; FollowOnFlag:=false (in general)

**CellConfigInfo\_PosExt\_Type**

TTCN-3 Record Type			
<b>Name</b>	<b>CellConfigInfo_PosExt_Type</b>		
<b>Comment</b>	NOTE: Same structure as SystemRequest_Type in 3GPP TS 36.523-3 [6], annex D; common information for initial cell configuration or reconfiguration; in case of reconfiguration OMIT means 'keep configuration as it is'.		
Basic	<a href="#">BasicCellConfig_PosExt_Type</a>	opt	Extended PRS information for a cell

**BasicCellConfig\_PosExt\_Type**

TTCN-3 Record Type			
<b>Name</b>	<b>BasicCellConfig_PosExt_Type</b>		
<b>Comment</b>	NOTE: Same structure as SystemRequest_Type in 3GPP TS 36.523-3 [6], annex D. Physical layer:		
PhysicalLayerConfigDL	<a href="#">PhysicalLayerConfigDL_PosExt_Type</a>	opt	Default settings regarding physical control PRS signal

**C.1.2.2 Downlink\_Physical\_Layer\_Configuration\_PosExt**

Downlink physical layer configuration:

- DL antenna configuration for port 6.
- PRS configuration.

**AntennaPort6\_Config\_Type**

TTCN-3 Record Type			
<b>Name</b>	<b>AntennaPort6_Config_Type</b>		
<b>Comment</b>	to configure antenna port 6 for positioning; all fields are declared as optional to allow single reconfigurations; in this case omit means "keep as it is"		
Port	AntennaPort_Type	opt	
PRS	PRS_Info	opt	

**PhysicalLayerConfigDL\_PosExt\_Type**

TTCN-3 Record Type			
<b>Name</b>	<b>PhysicalLayerConfigDL_PosExt_Type</b>		
<b>Comment</b>	all fields are declared as optional to allow single reconfigurations; in this case omit means "keep as it is"		
AntennaPort6	<a href="#">AntennaPort6_Config_Type</a>	opt	

**C.1.3 System\_Interface\_PosExt****SYSTEM\_CTRL\_POSEXT\_REQ**

TTCN-3 Record Type			
<b>Name</b>	<b>SYSTEM_CTRL_POSEXT_REQ</b>		
<b>Comment</b>			
Common	ReqAspCommonPart_Type		For configuration of antenna port 6 TimingInfo is now
Request	<a href="#">SystemRequest_PosExt_Type</a>		configure a PRS in a cell

**SYSTEM\_CTRL\_POSEXT\_CNF**

TTCN-3 Record Type		
<b>Name</b>	<b>SYSTEM_CTRL_POSEXT_CNF</b>	
<b>Comment</b>		
Common	CnfAspCommonPart_Type	TimingInfo is ignored by TTCN => SS may set TimingInfo to "None"
Confirm	<a href="#">SystemConfirm_PosExt_Type</a>	

**EUTRA\_SYSTEM\_POSEXT\_PORT**

TTCN-3 Port Type		
<b>Name</b>	<b>EUTRA_SYSTEM_POSEXT_PORT</b>	
<b>Comment</b>	EUTRA PTC: Ext Port for system configuration of antenna port 6	
out	<a href="#">SYSTEM_CTRL_POSEXT_REQ</a>	
in	<a href="#">SYSTEM_CTRL_POSEXT_CNF</a>	

---

## C.2 References to TTCN-3

References to TTCN-3		
EUTRA_POS_ASP_TypeDefs	Positioning/EUTRA_POS_ASP_TypeDefs.ttcn	Rev 6449

# Annex D (informative)

## Positioning System Simulator ASP Definitions in TTCN-3

### D.1 PosSystem\_ASP\_TypeDefs

#### PosSystem\_ASP\_TypeDefs: Constant Definitions

TTCN-3 Basic Types			
<b>tsc_MaxPosSystems</b>	integer	12	

#### PositioningSystemType

TTCN-3 Enumerated Type	
Name	PositioningSystemType
Comment	
gps	
modernizedGPS	
glonass	
galileo	
qzss	
otdoa	
ecid	
bds	
mbs	
wlan	
bluetooth	
sensor	

#### PositioningSystemList\_Type

TTCN-3 Record of Type	
Name	PositioningSystemList_Type
Comment	
record length (1.. <a href="#">tsc_MaxPosSystems</a> ) of <a href="#">PositioningSystemType</a>	

#### Altitude\_Type

TTCN-3 Record Type			
Name	Altitude_Type		
Comment			
Height	integer		Height above a sea level in meters

### D.1.1 PosSystem\_Load\_Scenario

Load scenarios follow 3GPP TS 37.571-5 [5]

#### PosSystem\_Load\_Scenario: Basic Type Definitions

TTCN-3 Basic Types	
<b>ScenarioNumber_Type</b>	integer

## PositioningScenario\_Type

TTCN-3 Union Type		
Name	PositioningScenario_Type	
Comment		
LTE_Positioning	<a href="#">ScenarioNumber_Type</a>	Reference to 3GPP TS 37.571-5 [5]
AGNSS	<a href="#">ScenarioNumber_Type</a>	Reference to 3GPP TS 37.571-5 [5]
V2X	<a href="#">ScenarioNumber_Type</a>	V2X Reference to 3GPP TS 36.508 [7]
NR_Positioning	<a href="#">ScenarioNumber_Type</a>	Reference to 3GPP TS 37.571-5 [5]
Aerial	<a href="#">ScenarioNumber_Type</a>	Reference to 3GPP TS 36.508 [7] clause 4.12

## D.1.2 PosSystem\_Retrieve\_Data

## D.1.2.1 SatSystem\_Retrieve\_UTRAN\_Data

## UTRAN\_GPS\_AssistanceDataRequest\_Type

TTCN-3 Record Type			
Name	UTRAN_GPS_AssistanceDataRequest_Type		
Comment			
AssistanceDataReqGPS	bitstring		bitstring containing 3GPP TS 25.331 [12] type UE-Positioning-GPS-AdditionalAssistanceDataRequest

## UTRAN\_GANSS\_AssistanceDataRequest\_Type

TTCN-3 Record Type			
Name	UTRAN_GANSS_AssistanceDataRequest_Type		
Comment			
AssistanceDataReqGANSS	bitstring	opt	bitstring containing 3GPP TS 25.331 [12] type UE-Positioning-GANSS-AdditionalAssistanceDataRequest
AssistanceDataReqGANSSv860ext	bitstring	opt	bitstring containing 3GPP TS 25.331 [12] type UE-Positioning-GANSS-AdditionalAssistanceDataRequest-v860ext
AssistanceDataReqGANSSvc50ext	bitstring	opt	bitstring containing 3GPP TS 25.331 [12] type UE-Positioning-GANSS-AdditionalAssistanceDataRequest-vc50ext

## UTRAN\_AssistanceDataRequest\_Type

TTCN-3 Union Type		
Name	UTRAN_AssistanceDataRequest_Type	
Comment		
GPS	<a href="#">UTRAN_GPS_AssistanceDataRequest_Type</a>	
GANSS	<a href="#">UTRAN_GANSS_AssistanceDataRequest_Type</a>	

## UTRAN\_AssistanceDataRequestList\_Type

TTCN-3 Record of Type	
Name	UTRAN_AssistanceDataRequestList_Type
Comment	
record length(1..tsc_MaxPosSystems) of <a href="#">UTRAN_AssistanceDataRequest_Type</a>	



**UTRAN\_GPS\_AssistanceData\_Type**

TTCN-3 Record Type			
<b>Name</b>	<b>UTRAN_GPS_AssistanceData_Type</b>		
<b>Comment</b>	The returned Almanac information is split into two fields: Almanac for satellites 1 to 16 in AssistanceDataGPSr7 together with other information; Almanac for satellites 17 to 31: in 'almanacSat17To31'		
AssistanceDataGPSr7	bitstring	opt	bitstring containing 3GPP TS 25.331 [12] type UE-Positioning-GPS-AssistanceData-r7
AssistanceDataGPSr12	bitstring	opt	bitstring containing 3GPP TS 25.331 [12] type UE-Positioning-GPS-AssistanceData-r12
AlmanacSatInfoList17To31	bitstring	opt	bitstring containing 3GPP TS 25.331 [12] type AlmanacSatInfoList

**UTRAN\_GANSS\_AssistanceData\_Type**

TTCN-3 Record Type			
<b>Name</b>	<b>UTRAN_GANSS_AssistanceData_Type</b>		
<b>Comment</b>			
AssistanceDataGANSS_r8	bitstring	opt	bitstring containing 3GPP TS 25.331 [12] type UE-Positioning-GANSS-AssistanceData-r8
AssistanceDataGANSS_r12	bitstring	opt	bitstring containing 3GPP TS 25.331 [12] type UE-Positioning-GANSS-AssistanceData-r12

**UTRAN\_AssistanceData\_Type**

TTCN-3 Union Type		
<b>Name</b>	<b>UTRAN_AssistanceData_Type</b>	
<b>Comment</b>		
GPS	<a href="#">UTRAN_GPS_AssistanceData_Type</a>	
GANSS	<a href="#">UTRAN_GANSS_AssistanceData_Type</a>	

**UTRAN\_AssistanceDataList\_Type**

TTCN-3 Record of Type	
<b>Name</b>	<b>UTRAN_AssistanceDataList_Type</b>
<b>Comment</b>	record length(1.. <a href="#">tsc_MaxPosSystems</a> ) of <a href="#">UTRAN_AssistanceData_Type</a>

**D.1.2.2 PosSystem\_Retrieve\_LPP\_Data**

When data is to be requested for more than one positioning system, they will be included into one single template. This template will include a list with one element for each positioning system.  
See template "cs\_RequestAssistData\_UEB\_GpsAndGlonass" as an example.

**LPP\_AssistanceDataRequest\_Type**

TTCN-3 Union Type		
<b>Name</b>	<b>LPP_AssistanceDataRequest_Type</b>	
<b>Comment</b>		
LPP_AssistanceData	bitstring	bitstring containing 3GPP TS 37.355 [10] type RequestAssistanceData-r9-IEs

**LPP\_AssistanceDataProvide\_Type**

TTCN-3 Union Type		
Name	<b>LPP_AssistanceDataProvide_Type</b>	
Comment		
LPP_AssistanceData	bitstring	bitstring containing 3GPP TS 37.355 [10] type ProvideAssistanceData-r9-IEs

**LPP\_AssistanceDataRequestList\_Type**

TTCN-3 Record of Type	
Name	<b>LPP_AssistanceDataRequestList_Type</b>
Comment	
record length(1.. <a href="#">tsc_MaxPosSystems</a> ) of <a href="#">LPP_AssistanceDataRequest_Type</a>	

**LPP\_AssistanceDataList\_Type**

TTCN-3 Record of Type	
Name	<b>LPP_AssistanceDataList_Type</b>
Comment	
record length(1.. <a href="#">tsc_MaxPosSystems</a> ) of <a href="#">LPP_AssistanceDataProvide_Type</a>	

**D.1.2.3 PosSystem\_Retrieve\_Data\_Common**

**AssistanceDataRetrieveRequest\_Type**

TTCN-3 Union Type		
Name	<b>AssistanceDataRetrieveRequest_Type</b>	
Comment		
LPP	<a href="#">LPP_AssistanceDataRequestList_Type</a>	LTE/NR positioning
UTRA_GNSS	<a href="#">UTRAN_AssistanceDataRequestList_Type</a>	Retrieve A-GNSS data list in the order of positioning system provided in PositioningSystemList

**AssistanceDataRetrieveResponse\_Type**

TTCN-3 Union Type		
Name	<b>AssistanceDataRetrieveResponse_Type</b>	
Comment		
LPP	<a href="#">LPP_AssistanceDataList_Type</a>	LTE/NR positioning
UTRA_AGNSS	<a href="#">UTRAN_AssistanceDataList_Type</a>	Retrieve A-GNSS data list in the order of positioning system provided in PositioningSystemList

**D.1.3 PosSystem\_PowerControl**

**PowerControl\_Type**

TTCN-3 Union Type		
Name	<b>PowerControl_Type</b>	
Comment	V2X. The GNSS simulator is switched on/off without stopping the UTC time sequence	
PowerOn	<a href="#">Null_Type</a>	By default the power is on in the GNSS simulator
PowerOff	<a href="#">Null_Type</a>	

## D.1.4 System\_Interface

Common ASP definitions

### PosSystemCtrlRequest\_Type

TTCN-3 Union Type		
Name	PosSystemCtrlRequest_Type	
Comment		
Start	<a href="#">Null_Type</a>	
Stop	<a href="#">Null_Type</a>	
LoadScenario	<a href="#">PositioningScenario_Type</a>	
RetrieveData	<a href="#">AssistanceDataRetrieveRequest_Type</a>	
TriggerMove	<a href="#">Null_Type</a>	V2X. Start moving to the next area/zone in the scenario
TriggerPowerOnOff	<a href="#">PowerControl_Type</a>	V2X. Switch on/off the transmitter without stopping UTC time sequence
SetAltitude	<a href="#">Altitude_Type</a>	Aerial Set the height above the sea level to the provided value
TriggerAerialMove	<a href="#">Altitude_Type</a>	Aerial Start moving towards target height

### PosSystemCtrlConfirm\_Type

TTCN-3 Union Type		
Name	PosSystemCtrlConfirm_Type	
Comment	In general, to be sent after the configuration has been done	
Start	<a href="#">Null_Type</a>	
Stop	<a href="#">Null_Type</a>	
LoadScenario	<a href="#">Null_Type</a>	
RetrieveData	<a href="#">AssistanceDataRetrieveResponse_Type</a>	
TriggerMove	<a href="#">Null_Type</a>	V2X
TriggerPowerOnOff	<a href="#">Null_Type</a>	V2X
SetAltitude	<a href="#">Null_Type</a>	Aerial
TriggerAerialMove	<a href="#">Null_Type</a>	Aerial

### POS\_SYSTEM\_CTRL\_REQ

TTCN-3 Record Type			
Name	POS_SYSTEM_CTRL_REQ		
Comment			
PositioningSystemList	<a href="#">PositioningSystemList_Type</a>		The list of positioning systems to be configured; there is only one system of one type in the list e.g. gps, galileo etc.
CnfFlag	boolean		true => SS shall send CNF
Request	<a href="#">PosSystemCtrlRequest_Type</a>		

### POS\_SYSTEM\_CTRL\_CNF

TTCN-3 Record Type			
Name	POS_SYSTEM_CTRL_CNF		
Comment			
PositioningSystemList	<a href="#">PositioningSystemList_Type</a>		
Confirm	<a href="#">PosSystemCtrlConfirm_Type</a>		

**POS\_MTC\_SYSTEM\_PORT**

TTCN-3 Port Type	
<b>Name</b>	<b>POS_MTC_SYSTEM_PORT</b>
<b>Comment</b>	Positioning: port at the MTC to be mapped to the system
out	<a href="#">POS_SYSTEM_CTRL_REQ</a>
in	<a href="#">POS_SYSTEM_CTRL_CNF</a>

**POS\_MTC\_PTC\_PORT**

TTCN-3 Port Type	
<b>Name</b>	<b>POS_MTC_PTC_PORT</b>
<b>Comment</b>	Positioning: port at the MTC to hand over information from the positioning system to the PTC(s)
out	<a href="#">POS_SYSTEM_CTRL_CNF</a>
in	<a href="#">POS_SYSTEM_CTRL_REQ</a>

**POS\_PTC\_MTC\_PORT**

TTCN-3 Port Type	
<b>Name</b>	<b>POS_PTC_MTC_PORT</b>
<b>Comment</b>	Positioning: port at the PTC(s) to send commands to the positioning system via the MTC
out	<a href="#">POS_SYSTEM_CTRL_REQ</a>
in	<a href="#">POS_SYSTEM_CTRL_CNF</a>

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## D.2 CommonDefs

**CommonDefs: Basic Type Definitions**

TTCN-3 Basic Types		
<b>Null_Type</b>	boolean (true)	dummy type for 'typeless' fields in unions

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## D.3 References to TTCN-3

References to TTCN-3		
<b>PosSystem_ASP_TypeDefs</b>	POS/PosSystem_ASP_TypeDefs.ttcn	Rev 30522
<b>CommonDefs</b>	Common/CommonDefs.ttcn	Rev 30597

## Annex E (informative)

# NR5GC System Simulator Extension ASP Definitions in TTCN-3

## E.1 NR5GC\_POS\_ASP\_TypeDefs

Type definitions for configuration of DL Positioning Reference Signal in the system simulator;  
Common design principles: refer to 3GPP TS 38.523-3 [24] annex D.

### E.1.1 NR\_System\_Configuration\_PosExt

Formal ASP Definitions for NR5GC DL-PRS system configuration

#### NR\_SystemRequest\_PosExt\_Type

TTCN-3 Union Type		
<b>Name</b>	<b>NR_SystemRequest_PosExt_Type</b>	
<b>Comment</b>	NOTE: Same structure as NR_SystemRequest_Type in 3GPP TS 38.523-3 [24] annex D	
Cell	<a href="#">NR_CellConfigRequest_PosExt_Type</a>	configure DL-PRS in an NR cell; the cell shall be configured as usual beforehand and SS shall raise an error when the cell does not exist yet; there is no explicit release of the PRS but the whole cell needs to be released

#### NR\_SystemConfirm\_PosExt\_Type

TTCN-3 Union Type		
<b>Name</b>	<b>NR_SystemConfirm_PosExt_Type</b>	
<b>Comment</b>	confirmations for system configuration; in general to be sent after the configuration has been done	
Cell	Null_Type	(no further parameters from SS)

### E.1.2 NR\_Cell\_Configuration\_PosExt

Specific Info for DL-PRS Cell Configuration Primitive

#### E.1.2.1 NR\_Cell\_Configuration\_Common\_PosExt

##### NR\_CellConfigRequest\_PosExt\_Type

TTCN-3 Union Type		
<b>Name</b>	<b>NR_CellConfigRequest_PosExt_Type</b>	
<b>Comment</b>	NOTE: Same structure as NR_SystemRequest_Type in 3GPP TS 38.523-3 [24] annex D	
AddOrReconfigure	<a href="#">NR_CellConfigInfo_PosExt_Type</a>	for PRS configuration of given cell: CellId : identifier of the cell to be configured RoutingInfo : None RlcBearerRouting : 'None' MacBearerRouting : 'omit' TimingInfo : Now (for initial configuration and for reconfiguration in general) ControllInfo : CnfFlag:=true; FollowOnFlag:=false (in general)

### NR\_CellConfigInfo\_PosExt\_Type

TTCN-3 Record Type			
<b>Name</b>	<b>NR_CellConfigInfo_PosExt_Type</b>		
<b>Comment</b>	NOTE: Same structure as NR_SystemRequest_Type in 3GPP TS 38.523-3 [24] annex D common information for initial cell configuration or reconfiguration; in case of reconfiguration OMIT means 'keep configuration as it is'		
PhysicalLayer	<a href="#">NR_CellConfigPhysicalLayer_PosExt_Type</a>	opt	Extended DL-PRS information for a cell

### NR\_CellConfigPhysicalLayer\_PosExt\_Type

TTCN-3 Record Type			
<b>Name</b>	<b>NR_CellConfigPhysicalLayer_PosExt_Type</b>		
<b>Comment</b>	NOTE: Same structure as NR_SystemRequest_Type in 3GPP TS 38.523-3 [24] annex D Physical layer:		
Downlink	<a href="#">NR_CellConfigPhysicalLayerDownlink_PosExt_Type</a>	opt	Default settings regarding physical control DL-PRS signal

## E.1.2.2 Downlink\_Physical\_Layer\_Configuration\_PosExt

Downlink physical layer configuration:

- DL-PRS Frequency Layer configuration.
- DL-PRS TRP configuration.

### Downlink\_Physical\_Layer\_Configuration\_PosExt: Basic Type Definitions

TTCN-3 Basic Types		
DIPrs_CombSizeN_Type	NR_DL_PRS_PositioningFrequencyLayer_r16.dl_PRS_CombSizeN_r16	

### DIPrs\_FreqLayerConfig\_Type

TTCN-3 Record Type			
<b>Name</b>	<b>DIPrs_FreqLayerConfig_Type</b>		
<b>Comment</b>			
DIPrs_ResourceBW	integer	opt	
DIPrs_CombSizeN	<a href="#">DIPrs_CombSizeN_Type</a>	opt	

### DIPrs\_TRPConfig\_Type

TTCN-3 Record Type			
<b>Name</b>	<b>DIPrs_TRPConfig_Type</b>		
<b>Comment</b>			
NrDIPrsSfnOffset	NR_DL_PRS_SFNO_Offset_r16	opt	
NrDIPrsExpectedRstd	integer	opt	
NrDIPrsExpectedRstdUncertainty	integer	opt	
NrDIPrsInfo	NR_DL_PRS_Info_r16	opt	

## DL\_PRSConfig\_Type

TTCN-3 Record Type			
<b>Name</b>	<b>DL_PRSConfig_Type</b>		
<b>Comment</b>	to configure DL-PRS for positioning; all fields are declared as optional to allow single reconfigurations; in this case omit means "keep as it is"		
DIPrs_FreqLayerConfig	<a href="#">DIPrs_FreqLayerConfig_Type</a>	opt	
DIPrs_TRPConfig	<a href="#">DIPrs_TRPConfig_Type</a>	opt	

## NR\_CellConfigPhysicalLayerDownlink\_PosExt\_Type

TTCN-3 Record Type			
<b>ame</b>	<b>NR_CellConfigPhysicalLayerDownlink_PosExt_Type</b>		
<b>Comment</b>	all fields are declared as optional to allow single reconfigurations; in this case omit means "keep as it is"		
DL_PRSConfig	<a href="#">DL_PRSConfig_Type</a>	opt	

## E.1.3 NR\_System\_Interface\_PosExt

## NR\_SYSTEM\_CTRL\_POSEXT\_REQ

TTCN-3 Record Type			
<b>Name</b>	<b>NR_SYSTEM_CTRL_POSEXT_REQ</b>		
<b>Comment</b>			
Common	NR_ReqAspCommonPart_Type		For configuration of DL-PRS TimingInfo is now
Request	<a href="#">NR_SystemRequest_PosExt_Type</a>		configure a DL-PRS in a cell

## NR\_SYSTEM\_CTRL\_POSEXT\_CNF

TTCN-3 Record Type			
<b>Name</b>	<b>NR_SYSTEM_CTRL_POSEXT_CNF</b>		
<b>Comment</b>			
Common	NR_CnfAspCommonPart_Type		TimingInfo is ignored by TTCN => SS may set TimingInfo to "None"
Confirm	<a href="#">NR_SystemConfirm_PosExt_Type</a>		

## NR\_SYSTEM\_POSEXT\_PORT

TTCN-3 Port Type			
<b>Name</b>	<b>NR_SYSTEM_POSEXT_PORT</b>		
<b>Comment</b>	NR PTC: Ext Port for system configuration of DL-PRS		
out	<a href="#">NR_SYSTEM_CTRL_POSEXT_REQ</a>		
in	<a href="#">NR_SYSTEM_CTRL_POSEXT_CNF</a>		

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## E.2 References to TTCN-3

References to TTCN-3		
NR5GC_POS_ASP_ TypeDefs	NR5GC/NR5GC_POS_ASP_TypeDefs.ttcn	Rev 20699



## Annex F (informative): Change history

Change history							
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
2011-06	RAN#51	R5-112203	-	-	Initial proposal for A-GNSS		0.0.1
2011-09	RAN#52	R5-113037	-	-	Introduced positioning test model	0.0.1	0.1.0
2011-11	RAN#53	R5-115106	-	-	Imported A-GPS test model from 3GPP TS 34.123-3	0.1.0	1.0.0
2011-12	RAN#54	RP-111627	-	-	Presentation of V1.0.0	0.1.0	1.0.0
2012-05	RAN#55	R5-121083	-	-	Presentation of V1.1.0	1.0.0	1.1.0
2012-06	RAN#56	RP-120614	-	-	Presentation of V2.0.0	1.0.0	2.0.0
2012-06	RAN#56	-	-	-	Editorial corrections and formatings.	2.0.0	9.0.0
2012-06	RAN#56	-	-	-	Raised to v10.0.0 with no change.	9.0.0	10.0.0
2012-09	RAN#57	R5-123690	0001	-	37571-4: Routine maintenance and updates	10.0.0	10.1.0
2013-06	RAN#60	R5-131136	0003	-	37571-4: Routine maintenance and updates	10.1.0	10.2.0
2013-06	RAN#60	R5s130125	0004	-	Addition of EUTRA UE Positioning test case 7.1.1	10.1.0	10.2.0
2013-06	RAN#60	R5s130145	0005	-	Addition of EUTRA UE Positioning test case 7.3.1.1	10.1.0	10.2.0
2013-06	RAN#60	R5s130147	0006	-	Addition of EUTRA UE Positioning test case 7.3.2.1	10.1.0	10.2.0
2013-06	RAN#60	R5s130149	0007	-	Addition of EUTRA UE Positioning test case 7.3.2.2	10.1.0	10.2.0
2013-06	RAN#60	R5s130151	0008	-	Addition of EUTRA UE Positioning test case 7.3.2.3	10.1.0	10.2.0
2013-06	RAN#60	R5s130153	0009	-	Addition of EUTRA UE Positioning test case 7.3.5.1_6s	10.1.0	10.2.0
2013-06	RAN#60	R5s130155	0010	-	Addition of EUTRA UE Positioning test case 7.3.5.1_5s	10.1.0	10.2.0
2013-06	RAN#60	R5s130157	0011	-	Addition of EUTRA UE Positioning test case 7.3.4.2_5s	10.1.0	10.2.0
2013-06	RAN#60	R5s130159	0012	-	Addition of EUTRA UE Positioning test case 7.3.4.2_6s	10.1.0	10.2.0
2013-06	RAN#60	R5s130288	0013	-	Addition of EUTRA UE Positioning test case 7.3.4.4_5s	10.1.0	10.2.0
2013-06	RAN#60	R5s130290	0014	-	Addition of EUTRA UE Positioning test case 7.3.5.1_1s	10.1.0	10.2.0
2013-06	RAN#60	RP-130616	0015	-	CR to 37.571-4: Add new verified and e-mail agreed TTCN test cases in the TC lists in 37.571-4 (prose), Annex A	10.1.0	10.2.0
2013-09	RAN#61	R5s130421	0016	-	Correction to EUTRA UE Positioning test cases 7.3.4.2.5s and 7.3.4.4.5s	10.2.0	10.3.0
2013-09	RAN#61	R5s130457	0017	-	Correction to EUTRA UE Positioning test case 7.3.5.1.1s	10.2.0	10.3.0
2013-09	RAN#61	R5s130468	0018	-	Correction to EUTRA UE Positioning test cases 7.3.1.1	10.2.0	10.3.0
2013-09	RAN#61	RP-131167	0019	-	CR to 37.571-4: Add new verified and e-mail agreed TTCN test cases in the TC lists in 37.571-4 (prose), Annex A	10.2.0	10.3.0
2013-12	RAN#62	R5s130618	0020	-	Addition of EUTRA UE Positioning test case 7.3.4.1_1s	10.3.0	10.4.0
2013-12	RAN#62	R5s130627	0021	-	Addition of EUTRA UE Positioning test case 7.3.4.3_1s	10.3.0	10.4.0
2013-12	RAN#62	RP-131871	0022	-	CR to 37.571-4: Add new verified and e-mail agreed TTCN test cases in the TC lists in 37.571-4 (prose), Annex A	10.3.0	10.4.0
2014-03	RAN#63	R5-140326	0023	-	A-GNSS ASN.1 reference	10.4.0	10.5.0
2014-03	RAN#63	R5s130913	0024	-	Correction to function fl_TC_7_3_5_1_GNSS_TestBody	10.4.0	10.5.0
2014-03	RAN#63	R5s130914	0025	-	Correction to svID values in AcquisitionAssist and AuxiliaryInformation	10.4.0	10.5.0
2014-03	RAN#63	R5s131009	0026	-	Addition of EUTRA UE Positioning test case 7.3.5.1_2s	10.4.0	10.5.0
2014-03	RAN#63	R5s131011	0027	-	Addition of EUTRA UE Positioning test case 7.3.5.1_4s	10.4.0	10.5.0
2014-03	RAN#63	RP-140316	0028	-	CR to 37.571-4: Add new verified and e-mail agreed TTCN test cases in the TC lists in 37.571-4 (prose), Annex A	10.4.0	10.5.0
2014-06	RAN#64	R5s140086	0029	-	Addition of EUTRA UE Positioning test case 7.2.1.1	10.5.0	10.6.0
2014-06	RAN#64	R5s140088	0030	-	Addition of EUTRA UE Positioning test case 7.2.1.2	10.5.0	10.6.0
2014-06	RAN#64	R5s140090	0031	-	Addition of EUTRA UE Positioning test case 7.2.1.3	10.5.0	10.6.0

Change history							
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
2014-06	RAN#64	R5s140242	0032	-	Correction to LTE UE Positioning test case 7.3.5.1	10.5.0	10.6.0
2014-06	RAN#64	R5s140253	0033	-	Addition of EUTRA UE Positioning test case 7.3.4.4.1s	10.5.0	10.6.0
2014-06	RAN#64	R5s140255	0034	-	Addition of EUTRA UE Positioning test case 7.3.4.2.1s	10.5.0	10.6.0
2014-06	RAN#64	R5s140257	0035	-	Correction to LTE UE Positioning test case 7.3.4.3.1s	10.5.0	10.6.0
2014-06	RAN#64	R5s140316	0036	-	Addition of UTRAN UE Positioning test case 6.2.3.3	10.5.0	10.6.0
2014-06	RAN#64	R5s140318	0037	-	Addition of UTRAN UE Positioning test case 6.2.3.4	10.5.0	10.6.0
2014-06	RAN#64	R5s140320	0038	-	Addition of UTRAN UE Positioning test case 6.2.3.5	10.5.0	10.6.0
2014-06	RAN#64	R5s140433	0039	-	Addition of GCF WI-166 EUTRA UE Positioning test case 7.3.4.3.4s	10.5.0	10.6.0
2014-06	RAN#64	R5s140435	0040	-	Addition of GCF WI-166 EUTRA UE Positioning test case 7.3.4.4.4s	10.5.0	10.6.0
2014-06	RAN#64	RP-140825	0041	-	CR to 37.571-4: Add new verified and e-mail agreed TTCN test cases in the TC lists in 37.571-4 (prose), Annex A	10.5.0	10.6.0
2014-06	RAN#64	R5s140086	0029	-	Addition of EUTRA UE Positioning test case 7.2.1.1	10.5.0	10.6.0
2014-06	RAN#64	R5s140088	0030	-	Addition of EUTRA UE Positioning test case 7.2.1.2	10.5.0	10.6.0
2014-06	RAN#64	R5s140090	0031	-	Addition of EUTRA UE Positioning test case 7.2.1.3	10.5.0	10.6.0
2014-09	RAN#65	R5-144256	0042	-	Routine maintenance and updates	10.6.0	10.7.0
2014-12	RAN#66	R5s140739	0043	-	Addition of GCF WI-166 EUTRA UE Positioning test case 7.3.4.2.4s	10.7.0	10.8.0
2014-12	RAN#66	R5s140777	0044	-	Usage of <MULTIPLE_CNF> in UpperTesterFunctions	10.7.0	10.8.0
2014-12	RAN#66	RP-142067	0045	-	CR to 37.571-4: Add new verified and e-mail agreed TTCN test cases in the TC lists in 37.571-4 (prose), Annex A	10.7.0	10.8.0
2015-03	RAN#67	R5s141359	0047	-	Correction of errors in implementation of positioning CRs	10.8.0	10.9.0
2015-03	RAN#67	R5s150027	0048	-	Addition of GCF WI-166 EUTRA UE Positioning test case 7.3.4.1.4s	10.8.0	10.9.0
2015-03	RAN#67	RP-150336	0049	-	CR to 37.571-4: Add new verified and e-mail agreed TTCN test cases in the TC lists in 37.571-4 (prose), Annex A	10.8.0	10.9.0
2015-03	RAN#67	-	-	-	upgraded to Rel-11 with no change	10.9.0	11.0.0
2015-03	RAN#67	R5-150735	0046	-	Addition of BeiDou Test Model	11.0.0	12.0.0
2015-06	RAN#68	RP-150897	0050	-	CR to 37.571-4: Add new verified and e-mail agreed TTCN test cases in the TC lists in 37.571-4 (prose), Annex A	12.0.0	12.1.0
2015-06	RAN#68	R5s150013	0051	-	Addition of UTRAN UE Positioning test case 6.2.3.2.4s	12.0.0	12.1.0
2015-06	RAN#68	R5s150222	0052	-	Correction to POS ATS in TTCN-3 delivery 15wk10	12.0.0	12.1.0
2015-06	RAN#68	R5s150331	0053	-	Rel-12 baseline upgrade for POS Test Suite	12.0.0	12.1.0
2015-06	RAN#68	R5s150343	0054	-	Corrections to UTRAN UE Positioning functions	12.0.0	12.1.0
2015-06	RAN#68	R5s150344	0055	-	Correction to LTE UE Positioning test cases 7.3.5.1.5s and 7.5.1	12.0.0	12.1.0
2015-06	RAN#68	R5s150345	0056	-	Correction to GLONASS LPP test cases	12.0.0	12.1.0
2015-06	RAN#68	R5s150353	0057	-	Improvement of function f_POS_CheckGnssSupportList	12.0.0	12.1.0
2015-06	RAN#68	R5s150404	0058	-	Addition of GCF WI-166 EUTRA UE Positioning test case 7.3.3.1	12.0.0	12.1.0
2015-06	RAN#68	R5s150439	0059	-	Correction to selection of Assistance Data for sub-test 4	12.0.0	12.1.0

Change history							
Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
2015-09	RAN#69	RP-151421	0060	-	CR to 37.571-4: Add new verified and e-mail agreed TTCN test cases in the TC lists in 37.571-4 (prose), Annex A	12.1.0	12.2.0
2015-09	RAN#69	R5s150011	0061	-	Addition of UTRAN UE Positioning test case 6.2.1.1.4s	12.1.0	12.2.0
2015-09	RAN#69	R5s150589	0062	-	Correction to EUTRA Positioning functions	12.1.0	12.2.0
2015-09	RAN#69	R5s150590	0063	-	Correction to Upper Tester modules	12.1.0	12.2.0
2015-09	RAN#69	R5s150706	0064	-	Addition of UTRAN UE Positioning test case 6.2.2.1.4s	12.1.0	12.2.0
2015-09	RAN#69	R5s150708	0065	-	Addition of UTRAN UE Positioning test case 6.2.2.3.4s	12.1.0	12.2.0
2015-09	RAN#69	-	-	-	update of the "non-specific references" in section 2 according to the approved R5-153582 and an action point on ETSI MCC	12.1.0	12.2.0
2015-12	RAN#70	R5s150710	0068	-	Addition of GCF WI-166 EUTRA UE Positioning test case 7.3.4.2.7s	12.2.0	12.3.0
2015-12	RAN#70	R5s150712	0069	-	Addition of GCF WI-166 EUTRA UE Positioning test case 7.3.4.4.7s	12.2.0	12.3.0
2015-12	RAN#70	R5s150805	0070	-	Correction to POS capability check procedure	12.2.0	12.3.0
2015-12	RAN#70	R5s150911	0071	-	Code improvements in Positioning test cases	12.2.0	12.3.0
2015-12	RAN#70	RP-151697	0072	-	CR to 37.571-4: Add new verified and e-mail agreed TTCN test cases in the TC lists in 37.571-4 (prose), Annex A	12.2.0	12.3.0
2016-03	RAN#71	R5s151010	0073	-	Correction to POS type definition in ATS_15wk38	12.3.0	12.4.0
2016-06	RAN#72	<a href="#">R5s160479</a>	0074	1	Correction to LTE Positioning test cases	12.4.0	12.5.0
2016-06	RAN#72	<a href="#">R5s160480</a>	0075	1	Correction to UTRA Positioning test cases	12.4.0	12.5.0
2016-09	RAN#73	R5s160713	0076	-	Rel-13 baseline upgrade for POS Test Suite	12.5.0	13.0.0
2016-12	RAN#74	-	-	-	updated to deliver latest TTCN	13.0.0	13.1.0
2017-03	RAN#75	R5-171531	0082	-	Indoor Positioning: Introduction of Test Model	13.1.0	13.2.0
2017-03	RAN#75	<a href="#">R5s170127</a>	0078	1	Correction to GCF WI-166 EUTRA UE Positioning test case 7.3.4.4.7s	13.1.0	13.2.0
2017-03	RAN#75	<a href="#">R5s170128</a>	0079	1	Correction to function f_POS_CheckCapabilities() for OTDOA	13.1.0	13.2.0
2017-03	RAN#75	<a href="#">R5s170186</a> /RP-170104	0084	-	Update ASP changes due to inclusion of iPOS in 37.571-4 (prose), Annex D	13.1.0	13.2.0
2017-06	RAN#76	<a href="#">R5s170311</a>	0085	-	Addition of LTE UE Positioning test case 7.3.4.1.10s	13.2.0	13.3.0
2017-06	RAN#76	<a href="#">R5s170313</a>	0086	-	Addition of LTE UE Positioning test case 7.3.4.3.10s	13.2.0	13.3.0
2017-06	RAN#76	<a href="#">R5s170363</a>	0087	-	Aligning name of PICS used in TTCN to the TS 37.571-3 definition	13.2.0	13.3.0
2017-06	RAN#76	<a href="#">R5s170383</a>	0083	1	Corrections to UE Positioning test cases	13.2.0	13.3.0
2017-06	RAN#76	<a href="#">R5s170416</a>	0088	-	Update of TC list in 37.571-4 (prose), Annex A, due to merging of GNSS subtest	13.2.0	13.3.0
2017-09	RAN#77	<a href="#">R5s170630</a>	0089	1	Correction to function 'f_POS_CheckGnssSupportList'	13.3.0	13.4.0
2017-09	RAN#77	<a href="#">R5s170599</a>	0090	-	Rel-14 baseline upgrade for POS Test Suite	13.4.0	14.0.0
2017-09	RAN#77	R5-173663	0091	-	Indoor Positioning Enhancements: Introduction of Test Model	13.4.0	14.0.0
2017-12	RAN#78	R5-176982	0093	1	GNSS Test Model updates for V2X	14.0.0	14.1.0
2017-12	RAN#78	<a href="#">R5s170860</a>	0092	1	Correction to UE Positioning test case 7.3.1.1	14.0.0	14.1.0
2018-03	RAN#79	R5-180677	0099	-	Routine maintenance for TS 37.571-4	14.1.0	14.2.0

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Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
2018-03	RAN#79	<a href="#">R5s180081</a>	0094	1	Correction to EUTRA release information for UE Positioning TCs	14.1.0	14.2.0
2018-03	RAN#79	<a href="#">R5s180113</a>	0095	1	Addition of LTE UE Positioning test case 7.3.4.2.15s (BDS)	14.1.0	14.2.0
2018-03	RAN#79	<a href="#">R5s180114</a>	0096	1	Addition of LTE UE Positioning test case 7.3.4.4.15s (BDS)	14.1.0	14.2.0
2018-03	RAN#79	<a href="#">R5s180115</a>	0097	1	Addition of LTE UE Positioning test case 7.3.5.1.15s (BDS)	14.1.0	14.2.0
2018-06	RAN#80	R5-182292	0102	-	V2X: Test Model updates	14.2.0	14.3.0
2018-06	RAN#80	<a href="#">R5s180327</a>	0101	1	Correction / improvement to UE Positioning TCs 7.2.2.1 + 7.2.2.2	14.2.0	14.3.0
2018-12	RAN#82	<a href="#">R5s180569</a>	0105	-	Correction to number of almanac elements for Galileo	14.3.0	14.4.0
2018-12	RAN#82	<a href="#">R5s180554</a>	0103	-	Rel-15 Sep'18 baseline upgrade for POS Test Suite	14.4.0	15.0.0
2019-03	RAN#83	R5s190056	0106	-	Correction to checking LPP ePDU capabilities	15.0.0	15.1.0
2019-09	RAN#85	R5-197174	0111	1	UE Positioning over NR: Initial Test Model	15.1.0	15.2.0
2019-09	RAN#85	<a href="#">R5s190462</a>	0109	-	Correction to f_POS_CheckCapabilities_Agnss	15.1.0	15.2.0
2019-09	RAN#85	<a href="#">R5s190463</a>	0110	-	Correction to f_POS_CheckGnssSupportList	15.1.0	15.2.0
2019-09	RAN#85	<a href="#">R5s190759</a>	0112	-	Rel-15 Jun'19 partial baseline upgrade for POS TTCN-3 Test Suite	15.1.0	15.2.0
2019-12	RAN#86	R5-198140	0113	-	Aerial Vehicles: Test Model addition	15.2.0	15.3.0
2019-12	RAN#86	R5-198142	0114	-	UE Positioning over NR: Test Model updates	15.2.0	15.3.0
2019-12	RAN#86	R5-198156	0115	-	Routine maintenance for TS 37.571-4	15.2.0	15.3.0
2019-12	RAN#86	<a href="#">R5s191048</a>	0116	-	Correction to the initialisation function for LTE Positioning test cases	15.2.0	15.3.0
2020-03	RAN#87	R5-200261	0118	-	Routine maintenance for TS 37.571-4	15.3.0	15.4.0
2020-03	RAN#87	R5-200262	0119	-	Editorial changes to TS 37.571-X titles to remove references to individual RATs	15.3.0	15.4.0
2020-06	RAN#88	<a href="#">R5s200581</a>	0120	-	Correction to f_POS_CheckGnssSupportList	15.4.0	15.5.0
2020-12	RAN#90	<a href="#">R5s201391</a>	0122	-	Addition of 5G UE Positioning test case 9.3.1.1	15.5.0	15.6.0
2020-12	RAN#90	<a href="#">R5s201393</a>	0123	-	Addition of 5G UE Positioning test case 9.3.1.2.15s	15.5.0	15.6.0
2020-12	RAN#90	<a href="#">R5s201395</a>	0124	-	Addition of 5G UE Positioning test case 9.3.2.1	15.5.0	15.6.0
2020-12	RAN#90	<a href="#">R5s201397</a>	0125	-	Addition of 5G UE Positioning test case 9.3.2.2	15.5.0	15.6.0
2020-12	RAN#90	<a href="#">R5s201399</a>	0126	-	Addition of 5G UE Positioning test case 9.3.2.3	15.5.0	15.6.0
2020-12	RAN#90	<a href="#">R5s201401</a>	0127	-	Addition of 5G UE Positioning test case 9.3.4.1.15s	15.5.0	15.6.0
2020-12	RAN#90	<a href="#">R5s201403</a>	0128	-	Addition of 5G UE Positioning test case 9.3.4.2.15s	15.5.0	15.6.0
2020-12	RAN#90	<a href="#">R5s201405</a>	0129	-	Addition of 5G UE Positioning test case 9.3.4.3.15s	15.5.0	15.6.0
2020-12	RAN#90	<a href="#">R5s201407</a>	0130	-	Addition of 5G UE Positioning test case 9.3.4.4.15s	15.5.0	15.6.0
2020-12	RAN#90	<a href="#">R5s201460</a>	0131	-	Correction to several NR5GC UE Positioning Test related functions	15.5.0	15.6.0
2020-12	RAN#90	<a href="#">R5s201529</a>	0132	-	Correction to function f_POS_NR_SendLppAck()	15.5.0	15.6.0
2020-12	RAN#90	<a href="#">R5s201649</a>	0134	-	Add new verified and e-mail agreed TTCN test cases in the TC lists in 37.571-4 (prose), Annex A	15.5.0	15.6.0
2020-12	RAN#90	<a href="#">R5s201388</a>	0121	-	Rel-16 Sep'20 baseline upgrade for POS Test Suite	15.6.0	16.0.0
2021-03	RAN#91	<a href="#">R5s210208</a>	0133	1	Correction to function f_POS_NR_CheckAgnssMultiFreq	16.0.0	16.1.0
2021-03	RAN#91	<a href="#">R5s210262</a>	0135	1	Correction to a NR5GC UE Positioning related function	16.0.0	16.1.0

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Date	TSG #	TSG Doc.	CR	Rev	Subject/Comment	Old	New
2021-06	RAN#92	R5-212285	0138	-	Routine maintenance for TS 37.571-4	16.1.0	16.2.0
2021-06	RAN#92	<a href="#">R5s210416</a>	0136	-	Correction for common POS function f_POS_SelectTemplateReq_IonosphModel()	16.1.0	16.2.0
2021-09	RAN#93	R5-214729	0143	-	Routine maintenance for TS 37.571-4	16.2.0	16.3.0
2021-09	RAN#93	<a href="#">R5s210887</a>	0144	-	Correction to NR5GC Positioning Functions	16.2.0	16.3.0
2021-09	RAN#93	<a href="#">R5s210922</a>	0141	1	Correction for multi frequency GNSS support checking	16.2.0	16.3.0
2021-09	RAN#93	<a href="#">R5s210926</a>	0142	1	Addition of NR5GC Positioning test case 9.3.1.2.5s	16.2.0	16.3.0
2021-09	RAN#93	<a href="#">R5s211177</a>	0145	-	Add new verified and e-mail agreed TTCN test cases in the TC lists in 37.571-4 (prose), Annex A	16.2.0	16.3.0
2021-12	RAN#94	R5-216658	0149	-	NR Positioning: Test Model addition	16.3.0	16.4.0
2021-12	RAN#94	R5-217256	0151	-	Include new pixit for the 2012 GNSS scenarios	16.3.0	16.4.0
2021-12	RAN#94	<a href="#">R5s211307</a>	0147	-	Correction to POS_Parameters	16.3.0	16.4.0
2021-12	RAN#94	<a href="#">R5s211515</a>	0148	-	Correction to f_POS_OTDOA_CheckEutraBand	16.3.0	16.4.0
2021-12	RAN#94	<a href="#">R5s211696</a>	0153	-	Add new ASP definitions for NR test model extension in Rel-16	16.3.0	16.4.0

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# History

<b>Document history</b>		
V16.0.0	January 2021	Publication
V16.1.0	May 2021	Publication
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