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Terrestrial Trunked Radio (TETRA) - Voice plus Data (V+D) - Part 12: Supplementary services stage 3 - Sub-part 14: Late Entry (LE)

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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 - NAF 742 C
Association à but non lucratif enregistrée à la
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Foreword

This European Standard (EN) has been produced by ETSI Technical Committee Terrestrial Trunked Radio (TETRA).

The present document is part 12, sub-part 14 of a multi-part deliverable covering Voice plus Data (V+D), as identified below:

EN 300 392-1: "General network design";

EN 300 392-2: "Air Interface (AI)";

EN 300 392-3: "Interworking at the Inter-System Interface (ISI)";

ETS 300 392-4: "Gateways basic operation";

EN 300 392-5: "Peripheral Equipment Interface (PEI)";

EN 300 392-7: "Security";

EN 300 392-9: "General requirements for supplementary services";

EN 300 392-10: "Supplementary services stage 1";

EN 300 392-11: "Supplementary services stage 2";

EN 300 392-12: "Supplementary services stage 3";

EN 300 392-12-1: "Call Identification (CI)";

ETS 300 392-12-2: "Call Report (CR)";

EN 300 392-12-3: "Talking Party Identification (TPI)";

EN 300 392-12-4: "Call Forwarding (CF)";

ETS 300 392-12-5: "List Search Call (LSC)";

EN 300 392-12-6: "Call Authorized by Dispatcher (CAD)";

ETS 300 392-12-7: "Short Number Addressing (SNA)";

EN 300 392-12-8: "Area Selection (AS)";

ETS 300 392-12-9: "Access Priority (AP)";

EN 300 392-12-10: "Priority Call (PC)";

ETS 300 392-12-11: "Call Waiting (CW)";

EN 300 392-12-12: "Call Hold (HOLD)";

EN 300 392-12-13: "Call Completion to Busy Subscriber (CCBS)";

EN 300 392-12-14: "Late Entry (LE)";

EN 300 392-12-16: "Pre-emptive Priority Call (PPC)";

EN 300 392-12-17: "Include Call (IC)";

EN 300 392-12-18: "Barring of Outgoing Calls (BOC)";

EN 300 392-12-19: "Barring of Incoming Calls (BIC)";

EN 300 392-12-20: "Discreet Listening (DL)";

EN 300 392-12-21: "Ambience Listening (AL)";

EN 300 392-12-22: "Dynamic Group Number Assignment (DGNA)";

EN 300 392-12-23: "Call Completion on No Reply (CCNR)";

ETS 300 392-12-24: "Call Retention (CRT)";

ETS 300 392-13: "SDL model of the Air Interface (AI)";

ETS 300 392-14: "Protocol Implementation Conformance Statement (PICS) proforma specification";

TS 100 392-15: "TETRA frequency bands, duplex spacings and channel numbering";

TS 100 392-16: "Network Performance Metrics";

TR 100 392-17: "TETRA V+D and DMO specifications";

TS 100 392-18: "Air interface optimized applications";

NOTE: Part 3, sub-parts 6 and 7 (Speech format implementation), part 4, sub-part 3 (Data networks gateway), part 10, sub-part 15 (Transfer of control), part 13 (SDL) and part 14 (PICS) of this multi-part deliverable are in status "historical" and are not maintained.

National transposition dates

Date of adoption of this EN:	13 March 2012
Date of latest announcement of this EN (doa):	30 June 2012
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 December 2012
Date of withdrawal of any conflicting National Standard (dow):	31 December 2012

1 Scope

The present document defines the stage 3 specifications of the Supplementary Service Late Entry (SS-LE) for the Terrestrial Trunked Radio (TETRA).

SS-LE allows radio users to be informed of and, if they are concerned, to join an already existing point-to-multipoint speech or data call.

Man-Machine Interface (MMI) and charging principles are outside the scope of the present document.

Supplementary Service stage 3 specification is preceded by the stage 1 and the stage 2 specifications of the service. Stage 1 describes the functional capabilities from the user's point of view. Stage 2 defines the functional behaviour in terms of functional entities and information flows. Stage 3 gives a precise description of the Supplementary Service from the implementation point of view. It defines the protocols for the service and the encoding rules for the information flows. It defines the processes for the functional entities and their behaviour. The described protocols and behaviour apply for the Switching and Management Infrastructure (SwMI) and for the Mobile Station (MS) and can be applied over the Inter-System Interface (ISI) between TETRA systems.

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the reference document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at <http://docbox.etsi.org/Reference>.

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2.1 Normative references

The following referenced documents are necessary for the application of the present document.

- [1] ETSI EN 300 392-10-14: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 10: Supplementary services stage 1; Sub-part 14: Late Entry (LE)".
- [2] ETSI EN 300 392-11-14: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 11: Supplementary services stage 2; Sub-part 14: Late Entry (LE)".
- [3] ETSI EN 300 392-1: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 1: General network design".
- [4] ETSI EN 300 392-9: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 9: General requirements for supplementary services".
- [5] ETSI ETS 300 392-12-7: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 12: Supplementary services stage 3; Sub-part 7: Short Number Addressing (SNA)".
- [6] ETSI EN 300 392-2: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 2: Air Interface (AI)".
- [7] ETSI EN 300 392-3-3: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 3: Interworking at the Inter-System Interface (ISI); Sub-part 3: Additional Network Feature Group Call (ANF-ISIGC)".
- [8] ETSI EN 300 392-3-1: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 3: Interworking at the Inter-System Interface (ISI); Sub-part 1: General design".

- [9] ETSI EN 300 392-3-5: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 3: Interworking at the Inter-System Interface (ISI); Sub-part 5: Additional Network Feature for Mobility Management (ANF-ISIMM)".

2.2 Informative references

The following referenced documents are not necessary for the application of the present document but they assist the user with regard to a particular subject area.

- [i.1] ITU-T Recommendation Z.100 (1993): "Specification and description language (SDL)".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

acknowledge LE: indication sent in LE messages by a SwMI to inform a member who would like to join the call that he has to inform the SwMI of his entering the call

authorized user: identified user who is able to define and interrogate the SS-LE parameters

broadcast LE: indication sent by a SwMI to inform members of a multipoint call which are currently not already involved in this call that they can join directly an existing communication (a channel is already allocated in this cell)

home SwMI: TETRA system in which SS-LE can be defined and invoked

NOTE: Home SwMI is the TETRA system which has same Mobile Network Identity (MNI) as the TETRA group identity to which SS-LE is defined.

paging LE: indication sent by a SwMI to inform members of a multipoint call which are currently not already involved in this call that they need to ask for a communication channel for that call if they wish to participate the call (a channel is not yet allocated in this cell)

server user: party that receives the SS-LE indications about an ongoing call and joins the call

NOTE: Also known as user B.

user B: in a group call a party that receives the SS-LE indications about an ongoing call

visited SwMI: TETRA system to which SS-LE can be extended and invoked

NOTE: Visited SwMI is a TETRA system which has a different MNI as the TETRA group identity to which SS-LE is defined.

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

ACK	Acknowledgement
CC	Call Control
CMCE	Circuit Mode Control Entity
FE	Functional Entity
GTSI	Group TETRA Subscriber Identity
ISI	Inter-System Interface
LE	Late Entry
LS	Line Station
MS	Mobile Station
PDU	Protocol Data Unit
SAP	Service Access Point

SS Supplementary Service

NOTE 1: The abbreviation SS is only used when referring to a specific supplementary service.

SSI	Short Subscriber Identity
SwMI	Switching and Management Infrastructure
TNCC	TETRA Network layer Call Control
TNSS	TETRA Network layer Supplementary Service

Supplementary service abbreviations

For the purposes of the present document, the following abbreviations also apply:

SS-AL	Ambience Listening
SS-AP	Access Priority
SS-AS	Area Selection
SS-BIC	Barring of Incoming Calls
SS-BOC	Barring of Outgoing Calls
SS-CAD	Call Authorized by Dispatcher
SS-CCBS	Call Completion to Busy Subscriber
SS-CCNR	Call Completion on No Reply
SS-CF	Call Forwarding
SS-CFB	Call Forwarding on Busy
SS-CFNR	Call Forwarding on No Reply (generic for both CFNRy and CFNRc)
SS-CFNRC	Call Forwarding on Mobile Subscriber Not Reachable
SS-CFNRY	Call Forwarding on No Reply
SS-CFU	Call Forwarding Unconditional
SS-CI	Call Identification
SS-CLIP	Calling Line Identification Presentation
SS-CLIR	Calling Line Identification Restriction
SS-COLP	COnnected Line identification Presentation
SS-COLR	COnnected Line identification Restriction
SS-CR	Call Report SIST EN 300 392-12-14:2012
SS-CRT	Call Retention standards.iteh.ai/catalog/standards/sist/06d4d039-641d-43fc-92c3-1d90d8760542/sist-en-300-392-12-14-2012
SS-CW	Call Waiting 1d90d8760542/sist-en-300-392-12-14-2012
SS-DGNA	Dynamic Group Number Assignment
SS-DL	Discreet Listening
SS-HOLD	call HOLD
SS-IC	Include Call
SS-LE	Late Entry
SS-LSC	List Search Call
SS-PC	Priority Call
SS-PPC	Pre-emptive Priority Call
SS-SNA	Short Number Addressing
SS-TPI	Talking Party Identification

NOTE 2: Supplementary service abbreviations are also used without "SS-" preamble e.g. "SS-AL" and "AL" are used as appropriate.

NOTE 3: The supplementary services list contains also abbreviations that are not used in the present document.

4 SS-LE service description

4.1 General

SS-LE supplementary service enables users to join the group call after the original call setup. SS-LE specifies the definition, interrogation and operation of the supplementary service. The Switching and Management Infrastructure (SwMI) applies the SS-LE definitions when a call is active for the group. The SS-LE actions are defined for the SwMI and for the Mobile Station (MS). The SS-LE information flows may be delivered over the Inter-System Interface (ISI).

This supplementary service is applicable to circuit mode speech and data group call services defined in EN 300 392-2 [6].

The Functional Entities used in the present document are defined in EN 300 392-11-14 [2].

4.2 SS-LE services offered over the TNSS-SAP and TNCC-SAP

SS-LE is an optional supplementary service for TETRA voice plus data layer 3. If SS-LE is supported, this clause shall specify the services and their availability.

The following SS-LE services shall be provided:

- late entry indications for a basic service (call control service).

The following SS-LE services may be provided:

- definition: a request to define SS-LE into the SwMI;
- definition information: the reception of SS-LE definition for information;
- interrogation: interrogation of SS-LE definition.

The SS-LE service access point may be used in conformance testing as a normative (but potentially not accessible) boundary in MSs and LSs.

NOTE 1: As the present document only deals with the SS-LE all the service primitives have been shown without a TNSS-LE-prefix e.g. the TNSS-LE DEFINE request is shorten into the DEFINE request.

NOTE 2: As man-machine interface and MS/LS applications are outside the scope of the present document service primitives are used to define information exchange to and from the standardized part of the MS/LS. Those primitives may be only indirectly accessible.

NOTE 3: The layer 3 services and service boundary for the SwMI are outside the scope of the present document.

The SS-LE services described in this clause shall complement the call control service specified in EN 300 392-2 [6], clause 11.

4.3 SS-LE service primitives

4.3.1 List of SS-LE service primitives

The SS-LE services as defined in EN 300 392-10-14 [1] are accessed in the SS-LE protocol description via service primitives. The SS-LE service primitives at the authorized user MS/LS (FE3) shall be:

- DEFINE request;
- DEFINE indication;
- INTERROGATE request; and
- INTERROGATE indication.

The SS-LE service primitives at the served user MS/LS (FE1) may be:

- BROADCAST LE indication;
- ACKNOWLEDGE LE indication;
- ACKNOWLEDGE LE response;
- PAGING LE indication; and