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Terrestrial Trunked Radio (TETRA) - Voice plus Data (V+D) - Part 12: Supplementary services stage 3 - Sub-part 20: Discreet Listening (DL)

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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 - 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 20 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:	21 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

This European Telecommunication Standard (EN) specifies the stage 3 description of the Supplementary Service Discreet Listening (SS-DL) for the Terrestrial Trunked Radio (TETRA).

The DL supplementary service enables an authorized user to listen to one or more communications between TETRA subscribers Mobile Station (MS) without any indication to any user that the communication is being monitored.

As options, the authorized user is able to intrude into the existing call and is able to forcefully clear the monitored call without call owner consent (in the case of a group call).

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

The supplementary service stage 3 description is preceded by the stage 1 and the stage 2 description of the service, according to the method described in ITU-T Recommendation I.130 [i.2]. The stage 1 description specifies the service from the user's point of view. The stage 2 description identifies the functional capabilities of SS-DL and the information flows needed to support the supplementary service as specified in its stage 1 description. And the present stage 3 description specifies the protocols at the air interface and at the various Inter-System Interfaces (ISI) to support SS-DL.

NOTE: According to ITU-T Recommendation I.130 [i.2], the stage 3 description of any telecommunication service addresses the network implementation aspects. Consequently it comprises two steps: the specifications of all protocols at the various reference points involved in any of the service procedures (notably the service operation) are the first step of the stage 3 description, and the specifications of the functions of the corresponding network entities are its second step.

The latter have not been provided since they can be derived from the specification of the functional entity actions in the stage 2 description.

The present document is applicable to Voice plus Data individual call or group call; more specifically to the following entities:

- the MS of the monitoring user during an individual call or a group call;
- the monitoring user Switching and Management Infrastructure (SwMI) in an individual call or a group call;
- the group controlling SwMI and the participating SwMI for a group call;
- the monitored user present SwMI for an individual call;
- and, optionally, the home SwMI of the monitoring/authorized MS, for managing the supplementary service DL.

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 referenced 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.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

2.1 Normative references

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

[1] ETSI EN 300 392-2: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 2: Air Interface (AI)".

[2] 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".

[3] ETSI EN 300 392-3-2: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 3: Interworking at the Inter-System Interface (ISI); Sub-part 2: Additional Network Feature Individual Call (ANF-ISIIC)".

[4] 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)".

[5] 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)".

[6] ETSI EN 300 392-9: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 9: General requirements for supplementary services".

[7] ETSI EN 300 392-1: "Terrestrial Trunked Radio (TETRA); Voice plus Data (V+D); Part 1: General network design".

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 I.112: "Vocabulary of terms for ISDNs".

[i.2] ITU-T Recommendation I.130 (1988): "Method for the characterization of telecommunication services supported by an ISDN and network capabilities of an ISDN".

[i.3] ITU-T Recommendation I.210 (1993): "Principles of telecommunication services supported by an ISDN and the means to describe them".

[i.4] ITU-T Recommendation Q.9: "Vocabulary of switching and signalling terms".

[i.5] ITU-T Recommendation Z.100: "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:

authorized user: identified user who is allowed to activate, deactivate and/or interrogate the SS-DL parameters

basic (…) service: any stand alone bearer service or teleservice

NOTE: Derived from ITU-T Recommendation I.210 [i.3].

bearer service: type of telecommunication service that provides the capability for the transmission of signals between user-network interfaces

NOTE: Defined in ITU-T Recommendation I.112 [i.1].

Mobile Station (MS): physical grouping that contains all of the mobile equipment that is used to obtain TETRA services

NOTE: By definition, a mobile station contains at least one Mobile Radio Stack (MRS).

monitored user: user who is discretely listened to

monitoring user: authorized user who may be discretely listening to a call

served user: authorised user

supplementary service: any service provided by a network in addition to its basic service or services

NOTE 1: Defined in ITU-T Recommendation Q.9 [i.4], a supplementary service modifies or supplements a bearer service or a basic telecommunication service.

NOTE 2: Consequently, it cannot be offered to a customer as a stand alone service. It is be offered together with or in combination with a bearer service or a basic telecommunication service (excerpt from ITU-T Recommendation I.210 [i.3]).

Switching and Management Infrastructure (SwMI): all of the TETRA equipment for a Voice plus Data (V+D) network except for subscriber terminals

NOTE: The SwMI enables subscriber terminals to communicate with each other via the SwMI.

teleservice: type of telecommunications service that provides the complete capability, including terminal equipment functions, for communication between users according to agreed protocols

NOTE: Defined in ITU-T Recommendation I.112 [i.1] except for a minor change at the end.

3.2 Abbreviations

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

ACK	Acknowledgement
AI	Air Interface
ANF	Additional Network Feature
ANF-ISIGC	Additional Network Feature - Inter-System Interface Group Call
ANF-ISIIC	Additional Network Feature - Inter-System Interface Individual Call
ANF-ISIMM	Additional Network Feature - Inter-System Interface Mobility Management
ANF-ISISS	Additional Network Feature - Inter-System Interface Supplementary Service
APDU	Application Packet Data Unit
CI	Call Intrusion
CMCE	Cicuit Mode Control Entity
CR	Change Request
DL-PDU	Discreet Listening Protocol Data Unit
DMO	Direct Mode Operation
FE	Functional Entity
GTSI	Group TETRA Subscriber Identity
ISDN	Integrated Services Digital Network
ISI	Inter-System Interface
ISI PDU	Inter-System Interface Protocol Data Unit
ITSI	Individual TETRA Subscriber Identity
MMI	Man Machine Interface
MNI	Mobile Network Identity
MS	Mobile Station
PDU	Protocol Data Unit
PEI	Peripheral Equipment Interface
PICS	Protocol Implementation Conformance Statement
PSTN	Public Services Telephone Network
ROSE	Remote Operation Service Element
SDL	Specification Design Language
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
TAU	Timer unit after Greek letter Tau
TCH	Traffic CHannel

TCH/S	Traffic CHannel Speech
TNSS	TETRA Network layer Supplementary Service (service acces point)
TSI	TETRA Subscriber Identity
XX	generic name of an information element

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 on 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
SS-CRT	Call Retention
SS-CW	Call Waiting
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-DL service description

4.1 General

This clause describes SS-DL specific services offered by the Circuit Mode Control Entity (CMCE) at the Supplementary Services service access point (TNSS-SAP) of the TETRA voice plus data layer 3 service boundary. The SS-DL service access point is used in conformance testing as a normative boundary in TETRA Mobile Stations (MSs).

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

4.2 SS-DL services offered over the TNSS-SAP

The service offered to users of SS-DL are defined as service primitives containing service parameters. The service primitives are defined in clause 4.3 and the service parameter are defined in clause 4.4.

In addition to the defined service primitives a SwMI may response by a service not supported or a process not supported primitives as appropriate, refer EN 300 392-3-1 [2].

NOTE: As man-machine interface or user 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. Those primitives may be only indirectly accessible.

4.2.1 Services to authorized user

The SS-DL service primitives for the authorized user (FE3) at the MS TNSS-SAP shall be:

- ACTIVATE/DESACTIVATE request;
- ACTIVATE/DEACTIVATE ACK indication;
- INTERROGATE request;
- INTERROGATE ACK indication.

Authorized user (FE3) shall be able to make SS-DL activations, deactivations and interrogations. The activation can be on one or more individual or group identity. The interrogation can be made to one or more identity. FE2 shall acknowledge the request. FE2 shall save the SS-DL and activation state in the home SwMI of the monitored user, if the request was accepted. Upon migration of the monitored user, SS-DL profile will be transported to the visited SwMI.

4.2.2 Services to the monitoring user FE7

The SS-DL service primitives for the monitoring user (FE7) at the MS TNSS-SAP shall be:

- CALL INTRUSION request;
- FORCED-REL request;
- INFO-TALKING-ITSI indication;
- INFORM indication;
- INFORM response (INFORM ACK);
- MODIFY indication;
- MONITOR request;
- MONITORED-CALL-CLEARED indication;
- RELEASE request;
- TEMPORARY LEAVE request.

4.2.3 Services to monitored user

There are no SS-DL service primitives for the monitored user (FE1) at the MS TNSS-SAP (monitored user).

4.3 Service Primitives

4.3.1 ACTIVATE request

The ACTIVATE request primitive shall be sent to the MS CMCE by the authorized user application over TNSS-SAP to activate SS-DL.

The activation process shall support one TETRA identity in a request. Optionally it may support a list and/or range of identities. Such identity/identities may be those of either individual users or of groups.

The ACTIVATE request primitive shall contain the SS-DL parameters listed in table 1.

Table 1: Parameters for the primitive ACTIVATE request

Parameter	Request
Basic service information	M
TETRA identity/identities	M (note 1)
Access priority	M
Delay timer	O
Access priority	O
Activation request	M (note 2)
NOTE 1: It is optional to support more than one identity. NOTE 2: There shall be only one activation request per request primitive.	

4.3.2 ACTIVATE ACK indication

The ACTIVATE ACK indication primitive shall be sent to the authorized user application by the MS CMCE over TNSS-SAP to inform it of the result of a previous ACTIVATE request.

If the previous ACTIVATE request has been addressed to a SwMI for more than one identity, that SwMI may send its corresponding response either in one single indication which applies to all those identities or in multiple indications.

The ACTIVATE ACK indication primitive shall contain the SS-DL parameters listed in table 2.

Table 2: Parameters for the primitive ACTIVATE ACK indication

Parameter	Indication
Activation result	M (note 1)
TETRA identity/identities	M (note 2)
Basic service information	M
Access priority	O
Activation state	C (notes 1 and 3)
NOTE 1: There shall be only one activation result and one activation state per request primitive. NOTE 2: It is optional to support more than one identity. NOTE 3: Conditional on the activation result.	