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Public Switched Telephone Network (PSTN); Protocol over the local loop for display services; Server Display and Script Services (SDSS); Part 1: Phase 0

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Contents

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Foreword

This European Standard, telecommunications series (EN) has been produced by ETSI Project Analogue Terminals and Access (ATA), and is now submitted for the Public Enquiry phase of the ETSI standards Two-step Approval Procedure (TAP).

The present document is part 1 of a multi-part EN covering Server Display and Script Services protocol (SDSS), as identified below:

Part 1: Phase 0, based on Bellcore ADSI specifications SR-INS-0002461 and TR-NWT-001273 but modified and extended to include European network signalling events and physical access requirements.

Part 2: Phase 1, definition of the requirements necessary to support enhanced Server Display and Script Services as extensions to the requirements specified in Part 1.

Proposed national transposition dates	
Date of latest announcement of this EN (doa):	3 months after ETSI publication
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	6 months after doa
Date of withdrawal of any conflicting National Standard (dow):	6 months after doa

Introduction

The Server Display and Script Services protocol (SDSS) is the European equivalent of the Analogue Display Services Interface (ADSI) protocol. The SDSS protocol provides bi-directional data communication in an analogue environment between a TE and a Server. The Server may be external to the network or integral with the network. The protocol uses Frequency Shift Keying (FSK) signalling for downstream transmission of data and uses DTMF signalling for upstream transmission of data. There are many potential physical implementations of the TE and its user interfaces and it is not the intention of this EN to restrict the physical implementation in any way. However, in order that any SDSS TE may interwork correctly with an SDSS Server, it is essential that all SDSS TE have some common features. This is provided by means of the concept of an abstract TE which is the functionality the Server assumes the TE to have in order to interwork correctly and comprises a set of logical components that all physical SDSS TE shall provide.

The abstract TE supports two applications:

a) Server Display Control applications (interactive ADSI session with remote Server).

b) Feature Download applications (advanced call management service ADSI script originating from the network - no Server interaction during session).

1 Scope

The present document specifies the requirements necessary to support Server Display and Script Services (SSDS) screenphone services. The requirements are intended to ensure correct interworking between a TE and a SDSS Server using the core protocol defined in Bellcore ADSI specifications SR-INS-0002461 [5], TR-NWT-001273 [6] and associated Technical Reference Bulletins [8] and [9], but modified and extended to include European network signalling events and physical access requirements.

The present document is not written for regulatory purposes.

2 Normative references

References may be made to:

a) specific versions of publications (identified by date of publication, edition number, version number, etc.), in which case, subsequent revisions to the referenced document do not apply; or

b) all versions up to and including the identified version (identified by "up to and including" before the version identity); or

c) all versions subsequent to and including the identified version (identified by "onwards" following the version identity); or

d) publications without mention of a specific version, in which case the latest version applies.

A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1] prETS 300 659-1: "Public Switched Telephone Network (PSTN); Subscriber line protocol over the local loop. For display (and related) Services. Part 1: On hook data transmission".

[2] prETS 300 778-1: "Public Switched Telephone Network (PSTN); Protocol Over The local loop for display and related services; Terminal Equipment Requirements; Part 1: Off-line Data Transmission".

[3] prETS 300 659-2: "Public Switched Telephone Network (PSTN); Subscriber line protocol over the local loop for display (and related) Services; Part 2: Off-hook data transmission".

[4] prETS 300 778-2: "Public Switched Telephone Network (PSTN); Protocol Over The local loop for display and related services; Terminal Equipment (TE) Requirements. Part 2: On-line Data Transmission".

[5] Bellcore SR-INS-0002461: "Customer Premises Equipment Compatibility Considerations for ADSI, Issue 1".

[6] Bellcore TR-NWT-001273: "Generic requirements for a SPCS to Customer Premises Equipment Data Interface, Issue 1".

[7] Bellcore SR-TSV-002476: "TE Compatibility Considerations for the Voiceband Data Transmission, Issue 1".

[8] Bellcore TECHNICAL REFERENCE BULLETIN Nos. 1,2 and 3 for SR-INS-0002461: "Customer Premises Equipment Compatibility Considerations for ADSI".

[9] Bellcore TECHNICAL REFERENCE BULLETIN Nos. 1,2 and 3 for TR-NWT-001273: "Generic requirements for a SPCS to Customer Premises Equipment Data Interface".

[10] prTBR 21 (July 1996) "Terminal Equipment (TE); Attachment requirements for pan-European approval for connection to the analogue Public Switched telephone Networks (PSTNs) of TE (excluding TE supporting the voice telephony service) in which network addressing, if provided, is by means of Dual Tone Multi frequency (DTMF) signalling".

[11] ETS 300 001 (March 1996): "Attachments to Public Switched Telephone Network (PSTN); General technical requirements for equipment connected to an analogue subscriber interface in the PSTN".

[12] TR 101 041-1: "Human Factors (HF); European harmonization of network generated tones; Part 1: A review and recommendations".

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3 Definitions, and abbreviations

3.1 Definitions

For the purposes of the present document, the definitions of ETS 300 778-1 [2] apply, in addition to the following:

SDSS: European equivalent of the ADSI protocol.

3.2 Abbreviations

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

ADSI	Analogue Display Services Interface
CPE	Customer Premises Equipment
DT-AS	Dual Tone Alerting Signal
DTMF	Dual Tone Multi Frequency
FDM	Feature Download Management
FKM	Feature Key Management
FSK	Frequency Shift Keying
MDMF	Multiple Data Message Format
MM	Modem Management
N/R	Not Reported
RP-AS	Ringing Pulse Alerting Signal
SDC	Server Display Control
SPCS	Stored Program Controlled Switching system
TAS	TE Alerting Signal
TCM	Terminal Control Management

4 Requirements

4.1 Access requirements

There are no access requirements in this EN. Terminal equipment will normally be subject to the regulatory requirements identified in the appropriate ETSI or national standards.

4.2 SDSS requirements

The requirements necessary to support Server Display and Script services (SDSS) screenphone applications are contained in annexes A and B. These annexes are based upon the Bellcore ADSI specifications and associated Technical Reference Bulletins, but with modifications to some [physical layer] requirements to enable operation on European networks.

Annexes A and B are structured to have clause by clause correspondence with the associated Bellcore specifications. Where the European requirements differ from those in the Bellcore standards, the additional or replacement requirements are explicitly stated. Where the European requirements are identical to the corresponding Bellcore requirements, the relevant clauses are identified "no change".

Annex A contains compatibility requirements for Terminal Equipment (TE) to operate with the SDSS protocol.

Annex B contains generic requirements for an SDSS server and associated communications protocol.

Annex C contains a summary of the network supervisory tones and ringing signals used by those network operators currently providing or intending to provide SDSS services.

The TE shall conform to the Service applicable requirements of annex A and B.

5 EMC requirements

There are no EMC requirements under this EN.

NOTE: General EMC requirements are imposed under the EMC Directive (89/336/EEC).

6 Safety requirements

There are no safety requirements under this EN.

NOTE: General safety requirements are imposed under the Low Voltage Directive (73/23/EEC) and Articles 4(a) and 4(b) of Directive 91/263/EEC.

Annex A (normative): SR-INS-0002461

Compatibility requirements for Terminal Equipment (TE) to operate with the SDSS protocol.

A.1 Introduction

The following is based on SR-INS-0002461 [5] and associated Technical Reference Bulletins [8] with changes made to the Bellcore text, where appropriate, to meet specific European requirements.

A.1.1 Purpose

No changes.

A.1.2 Definitions

No changes.

A.1.3 Background

The ADSI protocol provides bi-directional data communication in an analogue environment between a TE and a Server. The Server may be external to the network or integral with the network. The protocol uses FSK signalling for downstream transmission of data and uses DTMF signalling for upstream transmission of data. The ADSI protocol in Europe shall conform to the ETSI Caller Display Services requirements listed below.

A.1.4 Related documents

TR-NWT-001273 [6] and associated Technical Reference Bulletins [9].

The ETSI Caller Display Services requirements are to be found in:

ETS 300 659-1 [1];

ETS 300 778-1 [2];

ETS 300 659-2 [3];

ETS 300 778-2 [4].

Figure 1 in Bellcore SR-INS-0002461 [5] is not applicable.

A.1.5 Scope

This annex specifies the requirements necessary to support the initial phase of the Server Display and Script Services (SDSS) screenphone services. The requirements are intended to ensure correct interworking by a TE when connected to SDSS screenphone services provided either by the local exchange or a remote server. This annex contains only variations with respect to Bellcore SR-INS-002461 [5] as necessary to comply with European requirements.

A.2 Abstract CPE (TE)

No change.

A.2.1 Virtual Display management

No change.

A.2.1.1 Information Display page

No change.

A.2.1.2 Communication Display page

No change.

A.2.1.3 Formatting Virtual Display pages

No change.

A.2.1.4 Soft Key Tuple Information

No change.

A.2.1.5 Display Character Attributes

No change.

A.2.1.6 Global prompt

No change.

A.2.2 Feature Key Management (FKM)

No change.

A.2.2.1 Soft Keys

No change.

A.2.2.1.1 Soft Key Definers

No change.

A.2.2.1.2 Soft Key Definer Number

No change.

A.2.2.1.3 Soft Key Label String

No change.

A.2.2.1.4 Soft Key Return String

Requirement: All DTMF tone timings, frequencies, levels and twists shall comply with TBR 21[10] for on-line signalling.

Changes to the return strings shall consist of:

For x(82) minimum off-line period shall be 500 ms.

For x(83) the Time Break Recall period shall meet the requirements of subclause 9.1.1 of ETS 300 001 [11]. For x(84) the time-out for reception of dial tone shall be 3 seconds.

Test: Compliance shall be by suppliers declaration.

A.2.2.2 Page/Line Up and Down Keys

No change.

A.2.2.3 Line soft Key Tuples

No change.

A.2.3 Terminal Control Management

No change.

A.2.3.1 Display

No change.

A.2.3.2 Call Reference Buffers

No change except that the Call Reference Buffers shall be cleared on detection of TAS signal instead of Power Ringing.

A.2.3.3 Current Line Number Buffer

No change.

A.2.3.4 Active Line

No change.

A.2.3.5 Input Format Table

No change.

A.2.3.6 Input Buffer

No change.

A.2.3.7 CPE (TE) ID and CPE (TE) Configuration

No change.

A.2.4 Modem Management (MM)

No change.

A.2.5 Feature Download Management (FDM)

No change.

A.2.5.1 FDM Security

No change.

A.2.5.2 Feature Download Management (FDM) Page

No change.

A.2.5.2.1 FDM Maintenance

No change.

A.2.5.2.2 FDM Display

No change.

A.2.5.2.3 Default Service

No change.

A.2.5.3 Downloadable Data

No change.

A.2.5.3.1 Service Script

Requirement: Changes to the detection and generation of event codes shall consist of:

Event 1: The abstract TE shall generate this event when it receives a CLIP message in compliance with ETS 300 778-1 [2] when in the off-line state.

Event 2: The abstract TE shall generate this event when it receives a Message Waiting Indicator message when in the off-line state. See ETS 300 778-1 [2] subclause 6.2.

Event 3: The abstract TE shall generate this event when the TE goes on-line during a call arrival ringing cycle. The duration of each ringing cycle is given in Table Y.2, TR 101 041-1 [12].

Event 4: The abstract TE shall generate this event on detection of an outgoing call answered by a called party e.g. (cessation of ringing tone). Timer durations as for SR-INS- 0002461 [5] subclause A.2.5.3.1.

The recommendations given in Technical Reference Bulletin No. 3 for SR-INS-0002461 [8] should be followed if the method of detection is as specified in Bellcore SR-INS-0002461 [5].

Event 5: The abstract TE shall generate this event when it detects cessation of ringing and it does not go on-line during ringing.

Event 6: No change.

Event 7: No change.

Event 8: The abstract TE shall generate this event on detection of a DT-AS followed by a CLIP Call Setup message when in the on-line state.

Event 9: The abstract TE shall generate this event on detection of busy tone (Number engaged indication).

Event 10: The abstract TE shall generate this event on detection of outgoing ringing state.

Event 11: The abstract TE shall generate this event on detection of dial tone which is not the result of a recall key depression.

Event 12: The abstract TE shall generate this event when it registers a recall key depression and subsequent detection of dial tone. If detection of dial tone is as a result of a soft key return string control code the event shall not be generated.

Event 13: The abstract TE shall generate this event when it detects Message Waiting Indicator tone. If detection of dial tone is as a result of a soft key return string control code the event shall not be generated.

Event 14: The abstract TE shall generate this event on detection of congestion tone (Path engaged indication).

Event 15: The abstract TE shall generate this event on detection of distinctive ringing as indicated in table C.12 of annex C.

Event 16: The abstract TE shall generate this event on detection of normal call arrival indication. Any call arrival pattern not covered by other events listed shall also generate this event.

Event 17: The abstract TE shall generate this event on detection of reminder ringing. This event is not currently used in Europe.

Event 18: The abstract TE shall generate this event on detection of special ringing as described in table C.13 of annex C.

Event 19: The abstract TE shall generate this event on detection of coded ringing as specified in table C.14 of annex C.

Event 20: No change

Event 21: No change

Event 22: No change

Event 23: No change

Event 24: No change

New Events applicable in Europe:

Event 51:The abstract TE shall generate this event on detection of special dial tone as described in table C.5 of annex C.

Event 52: The abstract TE shall generate this event on detection of number unobtainable tone as specified in table C.6 of annex C.

Event 53: The abstract TE shall generate this event on detection of call waiting tone as specified in table C.10 of annex C.

Event 54: The abstract TE shall generate this event on detection of special information tone as specified in table C.7 of annex C.

A.2.5.3.2 Tables

No changes.

A.2.5.4 Service-Script Interpreter

No change.

A.2.5.5 Starting and Ending a Service Script

No change.

NOTE: Event 17 is not required to start a service script (for further study).

A.2.5.6 Service Script Example

No change.

A.2.6 Hanging Up (Call release)

No changes.

A.2.7 Idle State Settings

No change.

NOTE: See subclause A.2.2.1.4 for idle state timing.

A.2.8 Off-hook CPE Modes (On-line TE modes)

No change.

A.2.9 Summary of Abstract CPE (TE)

No change.

A.3 Minimum requirements for physical CPE (TE)

A.3.1 Signalling Capabilities

No change.

A.3.1.1 Signal Detection and Generation - Physical Layer

The ETSI standards referred to in subclause A.1.4 of this annex shall apply.

A.3.1.1.1 FSK Data Transmission Interface

Signalling format requirements described in subclause 4.4 of prETS 300 778-1 [2] shall apply, with the following differences:

A.3.1.1.1.1 Signalling levels

Requirement: The requirements of ETS 300 778-1 [2] and ETS 300 778-2 [4] shall apply.

Test: Compliance shall be by suppliers declaration.

NOTE: For interworking with a remote server see subclause B.3.1.

A.3.1.1.2 Server-CPE (TE) Handshaking Signals

Requirement: Changes to the Server-CPE (TE) Handshaking Signals and timings shall consist of:

A.3.1.1.2.1 Network to TE operating sequence

The network starts the sequence by sending a TE Alerting Signal (TAS).

After detection of the TE Alerting signal the TE mutes voice paths, disables any manual signalling facility, and returns a TE-Acknowledgement signal (TE-ACK) to the network. DTMF "A" is a valid TE-ACK signal.

If the network recognizes a valid TE-ACK from the TE within a time-out, FSK data is transmitted to the TE.

If the FSK data is an ADSI message or a number of ADSI messages (max. 5) the TE returns a "message acknowledge" (M-ACK) to the network. DTMF D0 to D5 is a valid M-ACK signal.

After FSK data transmission or M-ACK signal the TE restores voice paths and enables any manual signalling facility.

If the network does not recognize a valid TE-ACK within a time-out, FSK data is not transmitted, TE restores voice paths and enables any manual signalling facility.

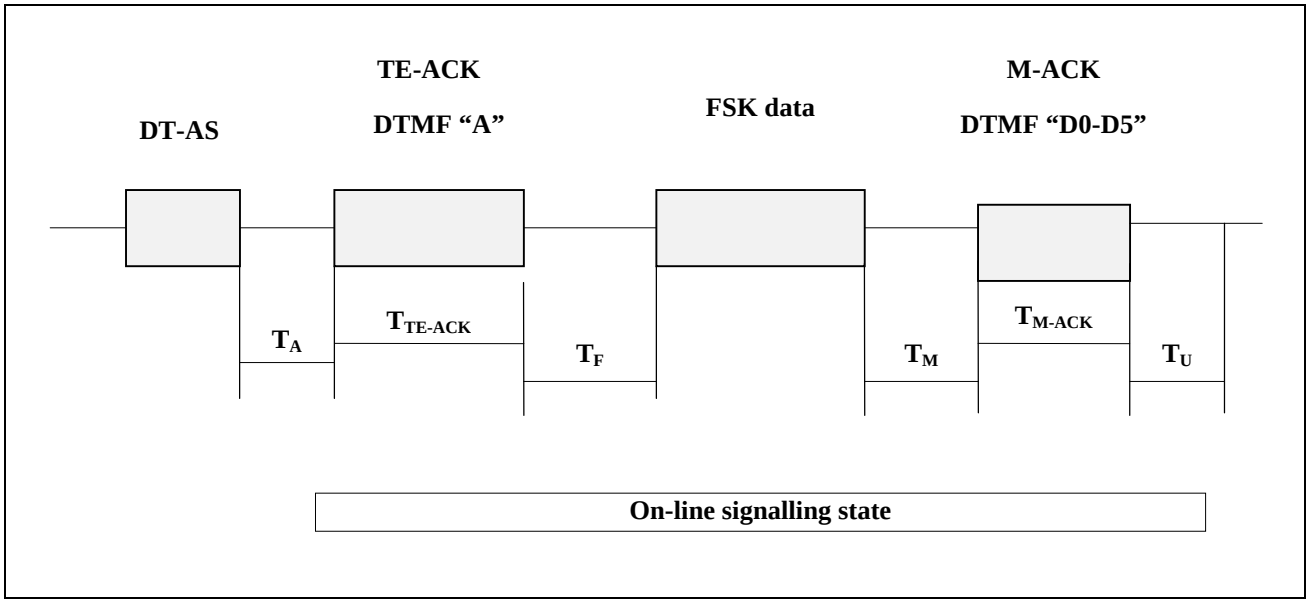

Figure A.1: Timing requirements

A.3.1.1.2.2 Timing requirements

Table A.1: On-line timing definitions and values

Time interval	Value ETSI	Value Bellcore	Definition
T_A	As specified in Table 2 of prETS 300 778-2 [4]		The time between end of DT-AS signal and start of TE-ACK signal. See subclause A.3.1.1.2.5.
T_{TE-ACK}	As specified in Table 2 of prETS 300 778-2 [4]		Duration of DTMF "TE-ACK signal" subclause A.3.1.1.2.5.
T_F	As specified in Table 2 of prETS 300 778-2 [4]		The time the TE waits for FSK data. Measured from the start of the TE-ACK signal. See subclause A.3.1.1.2.8.
T_M	100 ms - 600 ms	100 - 600 ms	Time between end of ADSI message and start of M-ACK signal.
T_{M-ACK}	195 ms - 270 ms	110 - 130 ms	Duration of DTMF "M-ACK" signal- only if data is ADSI message.
T_u	$0 < T_u < 120$ ms	0 - 50 ms	Restoration time. See subclauses A.3.1.1.2.7, and A.3.1.1.2.8.

NOTE 1: A two way transmission delay of max. 15 ms between the TE and the LE has been assumed for T_A and T_F.

NOTE 2: Server detection period reduced to 55 ms to allow interworking with US based ADSI TE.

A.3.1.1.2.3 Voice path muting

Requirement: The TE shall mute the voice paths and disable the manual signalling facility before the start of the TE-ACK signal. See figure A.1

Test: Compliance shall be by suppliers declaration.

A.3.1.1.2.4 TE - Acknowledgement signal (TE-ACK)

Requirement: The TE shall start sending to the network a TE - Acknowledgement signal, DTMF "A", within T_A ms from the end of a TE Alerting Signal. The TE-ACK signal shall be of duration T_{TE-ACK} ms. See table A.1.

Test: Compliance shall be by suppliers declaration

NOTE: It is recommended that sending of the TE-ACK signal is delayed so there is no possibility of overlap with the received DT-AS signal. However, it is also recommended that the delay is not made too great, as this would unnecessarily extend the signalling period.

A.3.1.1.2.5 TE - ADSI Message Acknowledgement signal

Requirement: The TE shall start sending to the network a TE-ADSI Message Acknowledgement signal, DTMF "D0 to D5". (Digit "D" followed by digit "0 - 5"), within T_{M-} ms from detection of the end of the last message in an ADSI message data burst.

The M-ACK signal shall be of duration T_{M-ACK} ms. See table A.1.

A.3.1.1.2.6 Start time

Requirement: The requirements of ETS 300 778-2 [4], subclause 4.3.3 shall apply.

Test: Compliance shall be by suppliers declaration.

A.3.1.1.2.7 End time

Requirement: The TE shall, restore voice paths and enable any manual signalling facility, within T_u ms from when the M-ACK signal has been completely signalled. See table A.1.

Test: Compliance shall be by suppliers declaration.

A.3.1.1.2.8 Timeout - FSK data transmission not received

Requirement: If FSK data is not received within T_F ms from the start of the TE-ACK signal the TE shall restore voice paths and enable any manual signalling facility within T_u ms see Table C.2.

Test: Compliance shall be by suppliers declaration.

A.3.1.1.3 Timers

No change from Bellcore specification.

A.3.1.1.4 Signal Detection and Generation

No change from Bellcore specification.

A.3.1.1.4.1 Signal Detection

The events described in subclause A.2.5.3.1 shall apply.

A.3.1.1.4.1.1 TE Alerting Signal (TAS)

Requirement: The requirements of prETS 300 778-2 [4] shall apply.

NOTE: It is recommended that TE should detect TAS in the presence of speech. Guidelines may be found in SR-TSV-002476 [7]

A.3.1.1.4.1.2 Call Progress Tones (Network tones)

Requirements: The TE shall be able to detect those Network tones specified as applicable by the events listed in Section A.2.5.3.1. See annex C.

Test: Compliance shall be by suppliers declaration.

Tables 8, 9 and the ANSI references are not applicable. Bellcore SR-INS-0002461 [5]

A.3.1.1.4.1.3 Power Ringing

Requirement: The TE shall distinguish between different alerting (ring) cadences within 3 seconds of their arrival at the TE. The European alerting cadences are listed in annex C.

Test: Compliance shall be checked by suppliers declaration.

NOTE: Table 10 in Bellcore SR-INS-0002461 [5] is not applicable

A.3.1.1.4.1.4 On-Hook/Off-Hook

No change.

A.3.1.1.4.1.5 Extension in Use

No change.

A.3.1.1.4.2 Signal generation

No change.

A.3.1.1.4.2.1 Dual-Tone Multifrequency (DTMF)

Requirement: The TE shall be able to generate DTMF tone signals as specified in TBR 21 [10], subclause 4.8.2.

A.3.1.1.4.2.2 Dial pulse One

Not applicable.

A.3.1.1.4.2.3 Disconnect and Switch-hook Flash

Requirement: The TE shall meet the requirements of subclause 9.1.1 of ETS 300 001 [11].

NOTE 1: To ensure a disconnect signal the CPE (TE) should remain in the off-line state for at least 500 ms.

NOTE 2: Switch-hook Flash is not applicable in the EU.

A.3.1.2 Signalling Layer - Link protocol

No change.

The Server - TE handshaking sequence requirements of subclause A.3.1.1.2 shall apply.

A.3.1.3 Message Layer

No change.

The requirements of ETS 300 778-1 [2] and ETS 300 778-2 [4] shall apply in addition to the ADSI protocol specified in Bellcore TR-NWT-001273 [6].

A.3.1.3.1 Non-ADSI Message

The requirements of ETS 300 778-1 [2] and ETS 300 778-2 [4] shall apply.

A.3.1.3.1.1 Existing non-ADSI Messages

The requirements of ETS 300 778-1 [2] and ETS 300 778-2 [4] shall apply.

A.3.1.3.1.2 Future TR-NWT-000030 MDMF Parameter

No change to Bellcore CPE (TE) ID parameter.

Requirement: If the Bellcore CPE (TE) ID parameter is implemented the TE shall comply with the timings in table A.2.

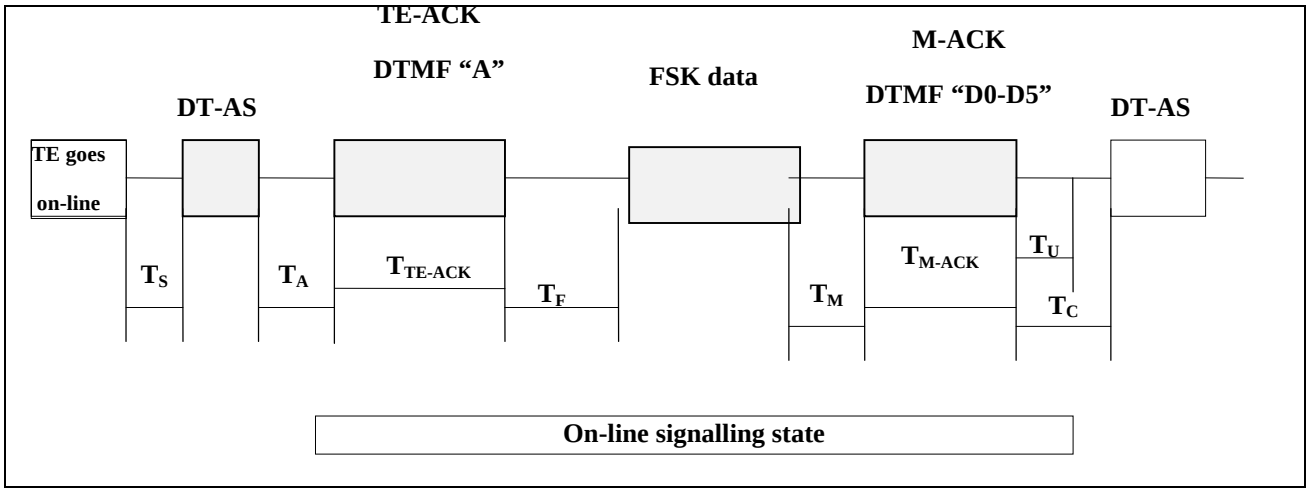

Figure A.2 Future CPE (TE) ID parameter timings

Table A.2: CPE (TE) ID parameter - timing definitions and values

Time interval	Value ETSI	Value Bellcore	Definition
T_S	0 < T_S < 500ms	0 - 500 ms	Server initiated Script updates: Time between TE going on-line and reception of DT-AS.
T_A	As specified in Table 2 of prETS 300 778-2 [4]		The time between end of DT-AS signal and start of TE-ACK signal.
T_{TE-ACK}	As specified in Table 2 of prETS 300 778-2 [4]		Duration of DTMF "TE-ACK signal".
T_F	As specified in Table 2 of prETS 300 778-2 [4]		The time the TE waits for FSK data measured from the start of the TE-ACK signal.
T_M	100 - 600 ms	100 - 600 ms	Time between end of ADSI message and start of M-ACK signal.
T_{M-ACK}	195 - 270 ms	110 - 130 ms	Duration of DTMF "M-ACK" signal- only if data is ADSI message.
T_u	0 <T_u < 120 ms	0 - 50 ms	Restoration time.
T_C	0 - 2 s	0 - 2 s	Delay time before next DT-AS.

NOTE: A two way transmission delay of max. 15 ms between the TE and the LE has been assumed for T_{TE-ACK} and T_F.

A.3.1.3.2 ADSI Messages

No change.

A.3.2 Display

No change.

A.3.2.1 Display Size

No change.

A.3.2.2 Displaying Virtual Pages

No change.

A.3.2.2.1 Wrapping Indicator

No change.

A.3.2.3 Display Character Attributes

No change.

A.3.2.4 Cursor

No change.

A.3.2.5 Active Line

No change.

A.3.2.6 Display Alphanumeric Mode

No change.

A.3.2.7 Interaction between Server Display Control and Feature Download Applications

No change.

A.3.3 Soft Keys

No change.

A.3.4 Size of FDM page

No change.

A.3.5 Local Scrolling

A.3.5.1 Active Logical Section Buffer

No change.

A.3.5.2 Active Soft Key Definer

No change.

A.3.5.3 Local Global Prompt Copy

No change.

A.3.5.4 Scrolling or Page Up/Down

No change.

A.3.6 Information Automatic Select (INAS)

No change.

A.3.7 Assigning CPE (TE) ID

No change.

A.3.8 Manual Operation

No change except that Switch-hook Flash is replaced by Time Break Recall.

A.3.9 Memory Requirements

No change.

A.3.9.1 Virtual Display Pages

No change.

A.3.9.2 Soft Key Definer Table

No change.

A.3.9.3 Call Reference Buffers

No change.

A.3.9.4 Input Buffers

No change.

A.3.9.5 Input Format Buffer

No change.

A.3.9.6 Default Soft Key Tuple

No change.

A.3.9.7 Current Line Number Buffer

No change.

A.3.9.8 Service Script and associated Tables

No change.

A.3.9.8.1 Flags

No change.

A.3.9.8.2 CPE (TE) Script Soft Key Table

No change.

A.3.9.8.3 Predefined Display Table

No change.

A.3.9.8.4 Service Script

No change.

A.3.9.9 Summary of Memory Requirement

No change.

A.3.10 Data Preservation

No change.

A.3.11 Extension Phones

No change.

A.4 Error treatment

No change.

A.4.1 User Input

No change.

A.4.2 Data Structures

No change.

A.4.3 Undefined lines in Virtual Displays

No change.

A.4.4 Data Transmission

No change.

A.4.5 Message Sequence

No change.

A.4.6 Network-CPE (TE) Signal Detection

No change.

A.4.7 Network-CPE (TE) Signal Generation

No change.

A.5 Other CPE (TE) considerations

A.5.1 CPE (TE)-based Functions

No change.

A.5.2 CPE (TE) Functionality and Impact on Services

No change.

A.5.2.1 Downloading the initial Service Script

No change.

A.5.2.2 On-hook CPE (TE) display

No change.

A.5.3 Interaction between a Server Display Session and a Call Waiting/CIDCW

No change.

A.5.4 Industry Standards and FCC Regulations

Not applicable.

Appendix 1 - Components of the abstract CPE (TE)

No change.

Appendix 2 - Samples of Service Scripts

No change.

Annex B (normative): TR-NWT-001273

Generic requirements for an SDSS Server protocol.

B.1 Introduction

The following is based on TR-NWT-001273 [6] and associated Technical Reference Bulletins [9] with changes made to the Bellcore text, where appropriate, to meet specific European requirements.

B.1.1 Definition

References shall be replaced by the references in subclause A.1.4.

B.1.2 Background

References shall be replaced by the references in subclause A.1.4.

B.1.2.1 Scope

No change.

B.1.3 Customer Perspective

No change.

B.1.4 ADSI Compatible CPE (TE)

No change.

B.1.5 Requirements Technology

No change.

B.2 Interface operations

No change.

B.2.1 Introduction to categories of message

References shall be replaced by the references in subclause A.1.4.

B.2.1.1 Server Display Control Messages

No change.

B.2.1.2 Feature Download Messages

No change.

B.2.2 Session Interruption Treatment

Network Operator specific requirements apply.

B.2.3 Errors and Retransmission

Not applicable.

B.3 ADSI protocol

No changes.

B.3.1 First Layer (Physical Layer)

Physical layer requirements specified in prETS 300 659-1 [1] and prETS 300 659-2 [3] shall apply.

NOTE 1: For interworking with a remote server it is recommended that the send level of the remote server be increased by up to 6 dB.

NOTE 2: For interworking with a remote server it is recommended that the sensitivity level of the remote server be increased by up to 6 dB.

NOTE 3: Server interworking with US based ADSI TE is ensured by reducing server detection period for $T_{TE\text{-}ACK}$ to 55 ms.

B.3.2 Second Layer (Datalink Layer)

References shall be replaced by the references in subclause A.1.4.

NOTE: Message Number word is additional for ADSI protocol datalink layer.

B.3.2.1 Message Format for Datalink Layer.

No changes except references shall be replaced by the references in subclause A.1.4

B.3.2.2 Standard ADSI Protocol - Functions to support the Datalink Layer

No change. ETSI standards as listed in annex A shall apply.

B.3.3 Third (Message) Layer

No change except references shall be replaced by the references in subclause A.1.4.

B.4 Standard ADSI data message parameters

No change.

B.4.1 ADSI Server Display Control messages

No change. Bellcore TR-NWT-000508, LSSGR: Automatic Message Accounting, section 8.1, referred to in TR-NWT-001273 [6], is not applicable.

B.4.2 Feature Download Message Parameters

No change.

B.5 Call processing control and transmissions

No change. except references shall be replaced by the references in subclause A.1.4.

B.5.1 Connections

No change.

B.5.2 Class of Service

No change.

B.5.3 Charge treatment

For further study on applicability to the present document.

B.5.4 Common Channel Signalling

For further study on applicability to this EN.

B.5.5 Transmission

No change.

B.6 Administration (not applicable)

B.6.1 Services Changes to the BCC

There are no requirements under this EN.

B.6.2 Service Changes to the Customer

There are no requirements under this EN.

B.6.3 Installation and Support

There are no requirements under this EN.

B.6.4 Craftsperson/SPCS Interface

There are no requirements under this EN.

B.7 Performance and reliability

There are no requirements under this EN.

B.8 Maintenance

There are no requirements under this EN.

B.9 Limitations and restrictions

No change. except references shall be replaced by the references in subclause A.1.4.

B.10 Timing and tolerances

No change. except references shall be replaced by the references in subclause A.1.4

Appendix A: DTMF Tones

The requirements of TBR 21 [10] shall apply.

Appendix B: Encoding of 8-bit characters in DTMF signals

No change.

Appendix C: Acknowledge/Negative Acknowledge signals

No change.

Appendix D: Soft Key Return String Format

No change.

Appendix E: Additional Guidelines for Host Computer Servers

No change, except references shall be replaced by the references in subclause A.1.4

Appendix F: Message Flow Scenarios of a typical ASDI SDC Session

No change. except references shall be replaced by the references in subclause A.1.4

Annex C (informative): Network Tones and Ringing signals

NOTE: The information in the following tables are advisory and have been compiled from information obtained in a questionnaire to the Network Operators. It is recommended that specific network tones and ringer characteristics should be confirmed with the Network Operators.

Table C.1: Ringing tone

Tone Description		A tone advising the caller that a connection has been made and that a calling signal is being applied to a telephone number or service point.	
Bellcore ADSI event code		**10**	
Event code description		Audible ringing tone detected	
Freq. f ±Δf [Hz]	**Level l ±Δl [dBm]**	**Cadence t ±Δt [ms]**	**Network Operator**
400 up to 490	-6,5 to -43 *	1 000 ± 200 on 5 000 ± 1 000 off	Austria Telecom
400 + 450	0 to -37 *	350 on 220 off then start at any point in: 400 on 200 off 400 on 2 000 off. Cadence does not necessarily coincide with ringing current cadence.	British Telecom
425 ± 5	-4,5 [dBmO] ± 0,5	1 000 ± 100 on 3 000 ± 100 off	Belgium
425 ± 20	-5 +2/-3 [dBm0]	1 000 ± 100 on 4 000 ± 400 off	Czech Republic
440 ± 2	-8 ± 0,5	1 500 ± 150 on 3 500 ± 350 off repeating	France Telecom
425 or 450 425	0 to -47 * [dB (950mV)]	250 on 4 000 off then 1 000 on 4 000 off repeating 500 on 4 000 off then 1 000 on 4 000 off repeating	Deutsche Telekom
425	-10	1 250 on 3 750 off	MATAV (Hungary)
425	-10	1 250 0n 3 750 off	PANNON (Hungary)
425 ± 15	-13 ± 2	1 000 ± 100 on 4 000 ± 400 off repeating	Telecom Italia
425 ±15	-12 ± 3	1 500 ± 150 on 3 000 ± 300 off rept	Telefonica
425 ± 15	-10 [dBmO]	1 000 ± 100 on 5 000 ± 500 off repeating	Telia
425	-15	1 000 on 4 000 off repeated	Tele Finland
425 ± 15	n/r	1 000 on 5 000 off	Telecel (Portugal)
425	n/r	1 000 on 5 000 off	Portugal Telecom
425 ± 15	- 13	1 000 ± 100 on 4 000 ± 400 off	Telenor
450	250 mV	2 000 on 4 000 off	Turk Telecom
* : Applies to sensitivity levels at TE interface Other levels apply to Local Exchange (LE) interface. NOTE: **N/R =** Not Reported			

Table C.2: Busy tone

Tone Description		A tone advising the caller that the telephone is busy.	
Bellcore ADSI event code		**9**	
Event code description		Busy tone detected	
Freq. f ±Δf [Hz]	**Level l ±Δl [dBm]**	**Cadence t ±Δt [ms]**	**Network Operator**
400 up to 490	-6,5 to -43 *	300 ± 60 on 300 ± 60 off 0r 400 ± 80 on 400 ± 80 off	Austria Telecom
400	0 to -37dBm *	375 on 375 off repeating	British Telecom
425 ± 5	- 4,5 [dBmO] ± 0,5	500 ± 50 on 500 ± 50 off	Belgium
425 ± 20	-5 +2/-3 [dBm0]	330 ± 30 on 330 ±30 off	Czech Republic
440 ± 2	-3,5 ± 0,5	500 ± 50 on 500 ± 50 off repeating	France Telecom
425 425 or 450	0 to -47 * [dB(950mV)]	480 on 480 off repeating 150 on 475 off repeating	Deutsche Telekom
425	-10	300 on 300 off	MATAV (Hungary)
425	-10	300 on 300 off	PANNON (Hungary)
425 ± 15	-13 ± 2	500 ± 50 on 500 ± 50 off repeating	Telecom Italia
425 ± 15	-12 ± 3	200 ± 20 on 200 ± 20 off repeating	Telefonica
425 ± 15	-10 [dBmO]	250 ± 25 on 250 ± 25 off repeating	Telia
442	-15	300 on 300 off repeated	Tele Finland
425 ± 15	n/r	500 on 500 off	Telecel (Portugal)
425	n/r	500 on 500 off	Portugal Telecom
425 ± 15	-13 ± 2	500 ± 50 500 ± 50 off	Telenor
450	250 mV	500 on 500 off	Turk Telecom
* : Applies to sensitivity levels at TE interface. Other levels apply to Local Exchange (LE) interface.			

Table C.3: Congestion tone

Tone Description		A tone advising the caller that the groups of lines or switching equipment necessary for the setting-up of the required call for the use of a specific service are temporarily engaged.	
Bellcore ADSI event code		**14**	
Event code description		Congestion tone	
Freq. f ± Δf [Hz]	**Level l ±Δl [dBm]**	**Cadence t ± Δt [ms]**	**Network Operator**
425 ± 25	-16 to -43 *	200 ± 40 on 200 ± 40 off	Austria Telecom
400	-6 to -43 * 0 to -37 *	400 on 350 off 225 on 525 off The shorter tone is 6 dBm higher than the longer one	British Telecom
425 ± 5	- 4,5 [dBmO] ± 0,5	167 ± 12 on 167 ± 12 off repeated	Belgium
425 ± 20	-5 +2 /-3 [dBm0]	165 ± 16 on 165 ± 16 off	Czech Republic
		same as for Busy tone	France Telecom
425 425 or 450 - 530	0 - 47 * [dB(950mV)]	240 on 240 off repeated 150 on 475 off repeated	Deutsche Telekom
425	-10	300 on 300 off	MATAV (Hungary)
425	-10	300 on 300 off	PANNON (Hungary)
425 ± 15	-13 ± 2	200 ± 10 on 200 ±10 off repeated	Telecom Italia
425 ± 15	-12 ± 3	3 x (200 ± 20) on 2 x (200 ± 20) off 600 off repeating	Telefonica
425 ± 15	-10 [dBm0]	250 ± 25 on 750 ± 75 off repeated	Telia
425	-15	200 on 200 off repeated	Tele Finland
425 ± 15	N/R	200 on 200 off	Telecel (Portugal)
425	N/R	200 on 200 off	Portugal Telecom
425 ± 15	-13 ± 2	200 ± 20 on 200 ± 20 off	Telenor
450	250 mV	3 x (200 on 200 off) 600 on 200 off	Turk Telecom
* : Applies to sensitivity levels at TE interface. Other levels apply to Local Exchange (LE) interface.			

Table C.4: Dial tone

Tone Description		A tone advising that the exchange is ready to receive call information and inviting the user to start sending call information.	
Bellcore ADSI event code		**11**	
Event code description		Steady Dial tone detected	
Freq. $f \pm \Delta f$ [Hz]	**Level $l \pm \Delta l$ [dBm]**	**Cadence $t \pm \Delta t$ [ms]**	**Network Operator**
400 up to 490	-16 to -26 *	continuous	Austria Telecom
350 + 440	0 to -27 * individual tones 3 dB lower	continuous	British Telecom
425 ± 5	-11 ± 1	continuous	Belgium
425 ± 20	-5 +2/-3 [dBm0]	330 ± 30 on 330 ± 30 off 660 ± 60 on 660 ± 60 off	Czech Republic
440 ± 2	-3,5 ± 0,5	continuous	France Telecom
425	0 - 47 * [dB (950 mV)]	continuous	Deutsche Telekom
425	-10	continuous	MATAV (Hungary)
425	-10	continuous	PANNON (Hungary)
425 ± 15	-13 ± 2	200 ± 20 on 200 ± 20 off 600 ± 60 on 1 000 ± 100 off repeated	Telecom Italia
425 ± 15	-12 ± 3	continuous	Telefonica
425 ± 15	-5 [dBm0]	continuous	Telia
425	-15	continuous	Tele Finland
425 ± 15	N/R	continuous	Telecel (Portugal)
425	N/R	continuous	Portugal Telecom
425 ± 15	-8 ± 2	continuous	Telenor
450	250 mV	continuous	Turk Telecom
* : Applies to sensitivity levels at TE interface. Other levels apply to Local Exchange (LE) interface.			

Table C.5: Special dial tone

Tone Description		A tone advising that the exchange is ready to receive call information and inviting the user to start sending call information, at the same time reminding the user that special conditions apply to the termination from which the call was being made	
ETSI SDSS event code		**51**	
Event code description		Special dial tone detected	
Freq. f + Δf [Hz]	**Level l + Δl [dBm]**	**Cadence t + Δt [ms]**	**Network Operator**
340 < f1< 425 400 < f2< 450	-16 to -26 *	continuous	Austria Telecom
350 440	0 to -27 individual * tones 3 dB lower	continuous (440); 750 on 750 off (350) or both tones 750 on 750 off	British Telecom
425 ± 5	-11 ± 1	1 000 ± 50 on 250 ± 50 off repeated	Belgium
425 ± 20	-5 +2/-3 [dBm0]	3 x (165 ± 16 on 165 ± 16 off) 660 ± 60 on 660+60 off	Czech Republic
330 ± 2 + 440 ± 2	-5 ± 0,5 -8,5 ± 0,5	continuous continuous	France Telecom
425 + 400		continuous	Deutsche Telekom
350 + 375 + 400	-15	continuous	MATAV (Hungary)
350 + 375 + 400	-15	continuous	PANNON (Hungary)
425 + 25	-13 + 2	continuous	Telecom Italia
425 ± 15	-12 ± 3	1 000 ± 100 on 100 ± 10 off repeated	Telefonica
425 ± 15	-5	320 ± 32 on 25 ± 15 off repeated	Telia
425	-15	650 on 250 off repeated	Tele Finland
425 ± 15	N/R	1 000 on 200 off	Telecel (Portugal)
425	N/R	1 000 on 200 off	Portugal Telecom
425 + 470	-13 ± 2 max. 3 dB between tones	400 ± 40 on 400 ± 40 on alternating tones	Telenor
450	250 mV	1 000 on 250 off	Turk Telecom
* : Applies to sensitivity levels at TE interface. Other levels apply to Local Exchange (LE) interface. NOTE: **N/R** Not Reported			

Table C.6: Number unobtainable

Tone Description		A tone indicating that the number dialled has not been recognized by the network as valid	
ETSI SDSS event code		**52**	
Event code description		Number Unobtainable detected	
Freq. f + Δf [Hz]	**Level l + Δl [dBm]**	**Cadence t + Δt [ms]**	**Network Operator**
950 ± 50 1 400 ± 50 1 800 ± 50	-9,5 to -43 *	3 x (330 ± 70 on) 1 000 ± 200 of repeated	Austria Telecom
400	0 to -37 *	continuous	British Telecom
		Announcement	Belgium
		Announcement	Czech Republic
		Announcement	France Telecom
N/R			Deutsche Telekom
950 / 1 400 / 1 800	-10	3 * 300 on 1 000 off	MATAV (Hungary)
950 / 1 400 / 1 800	-10	3 * 300 on 1 000 off	PANNON (Hungary)
N/R		Announcement	Telecom Italia
425 ± 15	-12 ± 3	200 ± 20 on 200±20 off 200 ± 20 on 600 off repeated	Telefonica
950 ± 50 1 400 ± 50 1 800 ± 50	-25 [dBm0]	3x (330 ± 70 on 30 off) + announcement repeated	Telia
N/R			Tele Finland
N/R			Telecel (Portugal)
425	N/R	200 on 200 off	Portugal Telecom
		Voice announcement	Telenor
450	250 mV	200 on 200 off	Turk Telecom
* : Applies to sensitivity levels at TE interface. Other levels apply to Local Exchange (LE) interface. NOTE: **N/R** Not Reported			

Table C.7: Special information tone

Tone Description		A tone advising the caller that the called number cannot be reached for reasons other than 'subscriber busy' or 'congestion'. Normally used in association with a recorded announcement	
ETSI SDSS event code		**54**	
Event code description		Special information tone detected	
Freq. **f ± Δf** **[Hz]**	**Level** **l ± Δl** **[dBm]**	**Cadence** **t ± Δt** **[ms]**	**Network Operator**
950 ± 50 / 1 400 ± 50 / 1 800 ±50	-9,5 to -43 *	3x (330 ± 70 on) 1 000± 200 off repeated	Austria Telecom
950 ± 50 / 1 400 ± 50 / 1 800 ±50	no info	3x (330 ± 70 on 30 off) repeated	British Telecom
950 ±25 / 1 400 ± 15 / 1 800±50	-4,5 [dBm0] ± 0,5	3x (330 ± 70 on) 1 000 ± 250 off repeated	Belgium
950 ± 50 / 1 400 ± 50 / 1 800 ±50	-5 +2/-3 [dBm0}	3x (330 ± 70 on 30 off) 1 000 ± 250 off repeated	Czech Republic
950 / 1 400 / 1 800	no info	3 * 300 on 1 000 off	France Telecom
950 / 1 400 / 1 800	- 6 to -53 *	3 * 300 on 1 000 off	Deutsche Telekom
950 / 1 400 / 1 800	-10	3 * 300 on 1 000 off	MATAV (Hungary)
950 /1 400 /1 800	-10	3 * 300 on 1 000 off	PANNON (Hungary)
N/R			Telecom Italia
950 ±25 / 1 400 ± 50 / 1 800±50	-12 ±3	330 ± 10 on 1 000 off repeating	Telefonica
950 ±50 / 1 400 ± 50 /1 800 ±50	-25 [dBm0] *	3x (330 ± 70 on 30 off) + announcement repeated	Telia
950 / 1 400 / 1 800	-22 *	3x (330 on 30 off) 1 000 off repeated	Tele Finland
950 ±50 / 1 400 ± 50 /1 800 ±50	N/R	3x (330 on 30 off) 1 400 off	Telecel (Portugal)
950 / 1 400 / 1 800	N/R	3x (330 on 30 off) 1 000 off	Portugal Telecom
950 ±50 / 1 400 ± 50 /1 800 ±50	-13 ± 2 max. 3dB between tones	3x (330 on) 1 000 off	Telenor
N/R			Turk Telecom
* : Applies to sensitivity levels at TE interface. Other levels apply to Local Exchange (LE) interface. NOTE: **N/R** Not Reported			

Table C.8: Message waiting

Tone Description		A tone to replace the standard dial tone to indicate when a new message has been received	
Bellcore ADSI event code		**13**	
Event code description		Message waiting indicator tone detected.	
Freq. f ± Δf [Hz]	**Level l ± Δl [dBm]**	**Cadence t ± Δt [ms]**	**Network Operator**
N/R			Austria Telecom
N/R			British Telecom
425 ±5	-4,5 ±0,5dBm0	40 ±5 on 40 ±5 off (Special Confirmation Tone, SCT)	Belgium
N/R			Czech Republic
330 ± 2 +440 ± 2	-5 ±0,5 dBm0 -8,5±±0,5dBm0	50 on 150 off 50 on 300 off repeating continuous	France Telecom
N/R			Deutsche Telekom
N/R			MATAV (Hungary)
N/R			PANNON (Hungary)
425 ± 15	-13 ± 2	100 ± 10 on 100 ± 10 off 100 ± 10 on 100 ± 10 off 100 ± 10 on 500 ± 50 off repeating	Telecom Italia
425 ± 15	-12 ± 3		Telefonica
N/R			Telia
N/R			Tele Finland
N/R			Telecel (Portugal)
N/R			Portugal Telecom
N/R			Telenor
N/R			Turk Telecom
NOTE: **N/R** Not Reported			

Table C.9: Recall dial tone

Tone Description		A modified dial tone indicating that an operating feature is activated that requires presentation of a second dial tone. Also known as stutter dial tone and transfer dial tone.	
Bellcore ADSI event code		**12**	
Event code description		Recall dial tone detected	
Freq. f ± Δf [Hz]	**Level l ± Δl [dBm]**	**Cadence t ± Δt [ms]**	**Network Operator**
N/R			Austria Telecom
N/R			British Telecom
N/R			Belgium
N/R			Czech Republic
440 ± 2	-3,5 ±0,5	continuous	France Telecom
N/R			Deutsche Telekom
N/R			MATAV (Hungary)
N/R			PANNON (Hungary)
425 ±15	-13 ±2	Same as Dial tone	Telecom Italia
425 ± 15	-12 ±3	Same as Dial tone	Telefonica
N/R			Telia
N/R			Tele Finland
N/R			Telecel (Portugal)
N/R			Portugal Telecom
N/R			Telenor
N/R			Turk Telecom
NOTE: **N/R** Not Reported			

Table C.10: Call waiting tone

Tone Description		A tone advising the user of the call waiting supplementary service who is engaged on a call that someone is attempting to call his number.	
ETSI SDSS event code		**53**	
Event code description		Call waiting tone detected	
Freq. f ± Δf [Hz]	**Level l ± Δl [dBm]**	**Cadence t ± Δt [ms]**	**Network Operator**
400 < f1<450	-10 to -36	40 ± 10 on 1 950 ± 390 off	Austria Telecom
400		100 on 2 000 - 5 000 off	British Telecom
1 400±50	-15 ±2 dBm0	2 x (175 ±75on 175 ±75 off)	Belgium
425 ± 20	-11 +2/-3 [dBm0]	330 ± 30 on 9 000 ± 500 off	Czech Republic
440		300 ±50 on repeated once after 10 s and then again after 45 s	France Telecom
425	-6 to -53 [dB (950mV)]	200 on 200 off 200 on 5 000 off	Deutsche Telekom
425	-10	40 on 1 960 off	MATAV (Hungary)
N/R			PANNON (Hungary)
425 ± 15	-13 ± 2	400 ± 40 on 100 ± 10 off 250 ± 25 on 100 ±10 off 150 ±15 on	Telecom Italia
425 ± 15	-12 ± 3	175 ± 10 on 175 ± 10 off 175 ± 10 on 3500 ± 100 off repeated	Telefonica
425 ± 15	-5 [dBm0]	200 on 500 off 200 on one cycle only	Telia
425	-22	150 on 150 off 150 on 8000 off	Tele Finland
425 ± 15	N/R	200 on 30 off 200 on 5 000 off	Telecel (Portugal)
425	N/R	200 on 200 off 200 on 1 000 off	Portugal Telecom
425 ± 15	-27 ± 2	200 on 600 off 200 on 1 0000 on ± 10 % two cycles only	Telenor
N/R			Turk Telecom
NOTE: **N/R** Not Reported			

Table C.11: Normal ringing

Ringing description	Signal sent over a line for the purpose of alerting a party of an incoming call	
Bellcore ADSI event code	**16**	
Event code description	Normal ringing detected	
Freq. f ± Δf [Hz]	**Cadence t ± Δt [ms]**	**Network Operator**
40 up to 55	1 000 ± 200 on 5 000 ± 1 000 off	Austria Telecom
25 + 1,25 to 25 - 3,25 25 + 1 to 25 - 5	400 on 200 off 400 on 2 000 off or 350 0n 220 off then start at any point in: 400 on 200 off 400 on 2 000 off	British Telecom
25 ±1,25	1 000 ±100 on 3 000 ±100 off	Belgium
25 ± 2 50 ± 2	1 000 ± 100 on 4 000 ± 400 off	Czech Republic
50 ± 2	1 500 ± 150 on 3 500 ± 350 off repeating	France Telecom
25	500 on 5 000 off 1 000 on 5 000 off 1 000 on 5 000 off repeating	Deutsche Telekom
25	1 250 on 3 750 off	MATAV (Hungary)
25	1 250 on 3 750 off	PANNON (Hungary)
25 ± 2.5	1 000 ± 100 on 4 000 ± 100 off rep	Telecom Italia
25 ± 1.25	1 500 ± 150 on 3 000 ± 300 off rep	Telefonica
25 ± 1	1 000 ± 100 on 5 000 ± 500 off rep	Telia
25	1 000 on 4 000 off repeated	Tele Finland
N/R		Telecel (Portugal)
25	1 000 on 5 000 off	Portugal Telecom
25 ± 25	1 000 ± 100 on 4 000 ± 400 off	Telenor
25 + 1	2 000 on 4 000 off	Turk Telecom
NOTE: **N/R** Not Reported		

Table C.12: Distinctive ringing

Ringing description	Signal sent to a subscriber indicating that the called party number is the Distinctive ringing service.	
Bellcore ADSI event code	**15**	
Event code description	Distinctive ringing detected	
Freq. $f \pm \Delta f$ [Hz]	**Cadence $t \pm \Delta t$ [ms]**	**Network Operator**
N/R		Austria Telecom
25 + 1 to 25 - 5	1 000 on 2 000	British Telecom
25 ±1.25	1 000 ±100 on 1 000 ±100 off (second special ringing)	Belgium
N/R		Czech Republic
50 ± 2	750 on 1 500 off repeated	France Telecom
N/R		Deutsche Telekom
N/R		MATAV (Hungary)
N/R		PANNON (Hungary)
N/R		Telecom Italia
N/R		Telefonica
N/R		Telia
25	300 on 4 000 off	Tele Finland [1]
25	300 on 300 off 300 on 4 000 off	Tele Finland [2]
25	2 x (300 on 300 off) 300 on 4 000 off	Tele Finland [3]
N/R		Telecel (Portugal)
N/R		Portugal Telecom
N/R		Telenor
N/R		Turk Telecom
NOTE: **N/R** Not Reported		

Table C.13: Special ringing

Ringing description	Signal sent to the initiator of a Ring Back When Free service, when the called party becomes free	
Bellcore ADSI event code	**18**	
Event code description	Special ringing detected	
Freq. f ± Δf [Hz]	**Cadence t ± Δt [ms]**	**Network Operator**
N/R		Austria Telecom
25 +1 - 5	2 x (250 on 250 off) 250 on 1 750 off	British Telecom
N/R		Belgium
N/R		Czech Republic
50 ± 2	2 000 on 1 000 off	France Telecom
N/R		Deutsche Telekom
N/R		MATAV (Hungary)
N/R		PANNON (Hungary)
25 ± 2.5	400 ± 50 on 200 ± 50 off 400 ± 50 on 200 ± 50 off 800 ± 100 on 4 000 ± 100 off rept	Telecom Italia
N/R		Telefonica
25 ± 1	300 ± 30 on 400 ± 40 off repeated during 30 s.	Telia
N/R		Telecel (Portugal)
N/R		Portugal Telecom
N/R		Telenor
N/R		Turk Telecom
NOTE: **N/R** Not Reported		

Table C.14: coded ringing

Ringing description		
Bellcore ADSI event code	**19**	
Event code description	Coded ringing detected	
Freq. f ± Δf [Hz]	**Cadence t ± Δt [ms]**	**Network Operator**
N/R		Austria Telecom
25	400 on 800 off	British Telecom
N/R		Belgium
N/R		Czech Republic
N/R		France Telecom
N/R		Deutsche Telekom
25	500 on 200 off 500 on 3 800 off	MATAV (Hungary)
N/R		PANNON (Hungary)
N/R		Telecom Italia
N/R		Telefonica
N/R		Telia
N/R		Telecel (Portugal)
N/R		Portugal Telecom
N/R		Telenor
N/R		Turk Telecom
NOTE: **N/R =** Not Reported		

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