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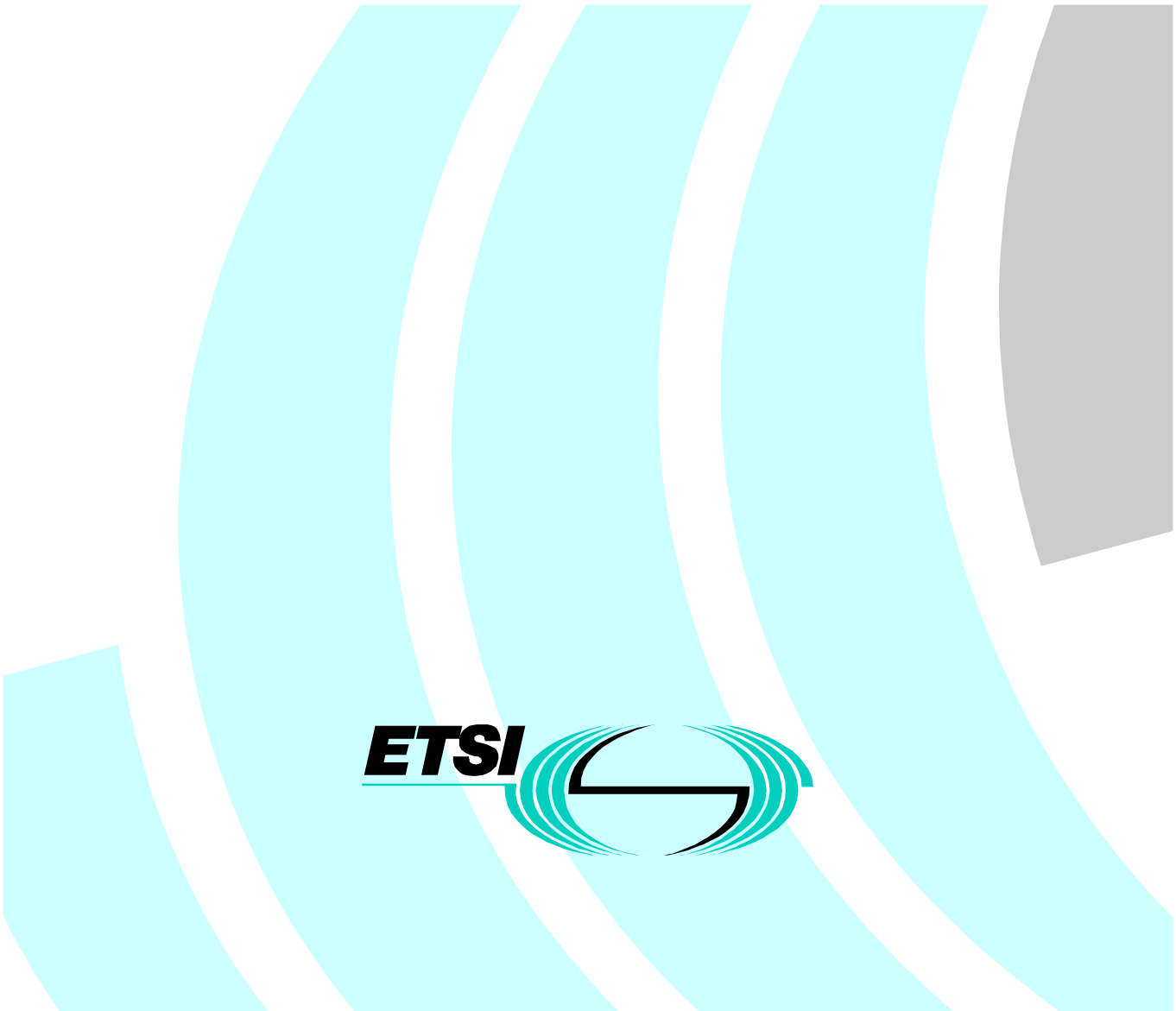
European Standard (Telecommunications series)

Public Switched Telephone Network (PSTN); Subscriber line protocol over the local loop for display (and related) services; Part 2: Off-hook data transmission



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Foreword

This European Standard (Telecommunications series) has been produced by ETSI Project Analogue Terminals and Access (ATA), and is now submitted for the ETSI standards One-step Approval Procedure.

The present document is part 2 of a multi-part standard covering the PSTN subscriber line protocol over the local loop for display (and related) services, as described below:

Part 1: "On-hook data transmission";

Part 2: "Off-hook data transmission";

Part 3: "Data link message and parameter codings".

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

1 Scope

The present document specifies the subscriber line protocol for the support of PSTN display services at Local Exchange in "off-hook" state by using asynchronous voice-band FSK signalling. The present document is a complement of part 1 that deals with "on-hook data transmission associated or not associated with ringing". The present document contains only the differences and extensions to EN 300 659-1 [1].

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.
- For a non-specific reference, 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] EN 300 659-1 (V1.2): "Public Switched Telephone Network (PSTN); Subscriber line protocol over the local loop for display (and related) services; Part 1: On-hook data transmission".

[2] EN 300 659-3 (V1.2): "Public Switched Telephone Network (PSTN); Subscriber line protocol over the local loop for display (and related) services; Part 3: Data link message and parameter codings".

[3] ES 201 235: "Specification of Dual Tones Multi-Frequency (DTMF) Transmitters and Receivers; Part 1 to Part 4".

NOTE: Not yet publicly available.

[4] TR 101 182: "Analogue Terminals and Access (ATA); Definitions, abbreviations and symbols".

3 Definitions and abbreviations

3.1 Definitions

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

loop state: state where the TE draws sufficient DC current to activate the exchange. The loop state is also known as the on-line state or the **off-hook** state, see TR 101 182 [4]

quiescent state: state where the TE draws insufficient DC current to activate the exchange. The Quiescent state is also known as the idle state, off-line state or the **on-hook** state, see TR 101 182 [4]

3.2 Abbreviations

The following abbreviation applies in addition to the definitions and abbreviations described in EN 300 659-1 [1]:

SAS Subscriber Alerting Signal

4 Data Encoding

Data encoding shall be as described in EN 300 659-3 [2].

5 Protocol Requirements

5.1 Presentation Layer

Presentation layer requirements shall be as described in EN 300 659-1 [1].

5.2 Data-link Layer

Data-link layer requirements shall be as described in EN 300 659-1 [1] with the following differences:

a) **Channel Seizure Signal:** it shall not be transmitted.

b) **Mark Signal:** consists of a block of 80 ± 25 mark bits.

5.3 Physical Layer

Physical layer requirements shall be as described in EN 300 659-1 [1].

6 Data transmission requirements: signalling, timing and tolerance

In addition to on-hook data transmission as described in EN 300 659-1 [1] the following shall apply:

Interface Z shall support data transmission to the TE also in off-hook state.

6.1 Off-hook data transmission

Data transmission requirements refer to the network end of the local loop (interface point Z, see annex C of EN 300 659-1 [1]).

A TE Alerting Signal (TAS) will be used to signal to the TE that data transmission is to be expected. The TAS is a Dual Tone-Alerting Signal (off-hook).

A Subscriber Alerting Signal (SAS) could be sent (e.g. Call Waiting Tone) from the LE to the subscriber before protocol signalling process: presence/absence of the SAS, SAS transmission procedure and SAS physical characteristics are outside the scope of the present document.

Sequence of the events at the network end:

Event 1: The LE shall block the speech path to and from the far-end party in order to minimize interference with any alerting signal and the data transmission. This also prevents the far-end party from receiving these signals.

Event 2: The LE transmits the TAS.

Event 3: The LE waits for the TE-Acknowledgement Signal (TE-ACK).

Event 4, case a: If the LE does not recognize a valid TE-ACK within a time-out, the LE shall not send any data transmission and shall restore the speech path.

Event 4, case b: If the LE recognize a valid TE-ACK within the time-out, FSK modulation transmission shall follow.

Event 5: After FSK modulation transmission the speech transmission shall be restored.

If the TE goes in quiescent state the signalling process should be aborted.

Figure 1 presents time diagram at the network end of the local loop in case of successful attempt.

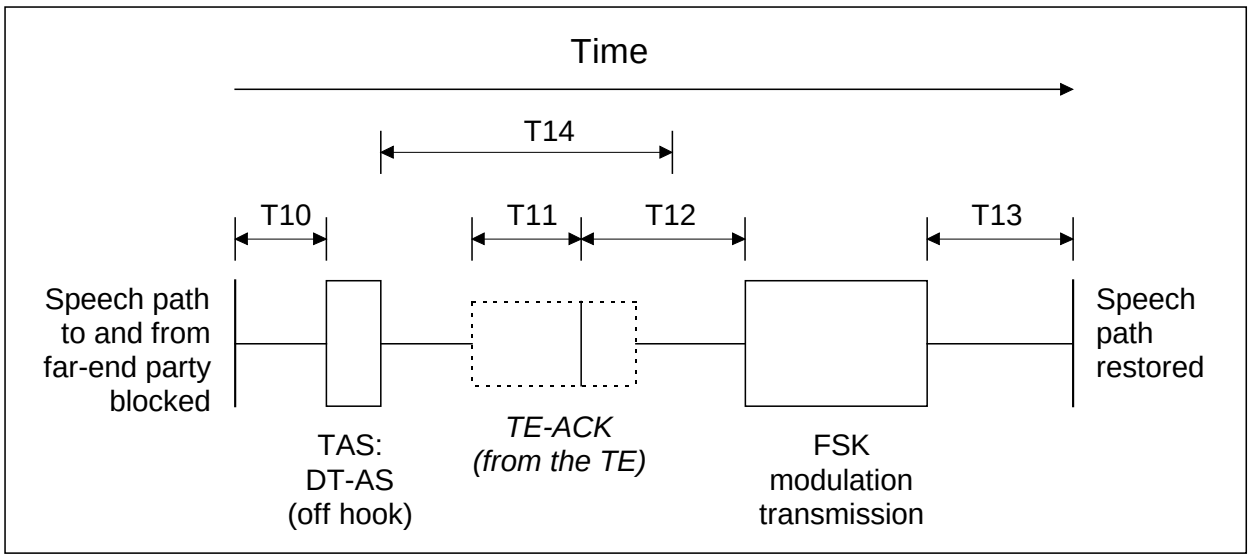

Figure 1: Time diagram at the network end of the local loop: successful attempt

Figure 2 presents time diagram at the network end of the local loop in case of unsuccessful attempt.

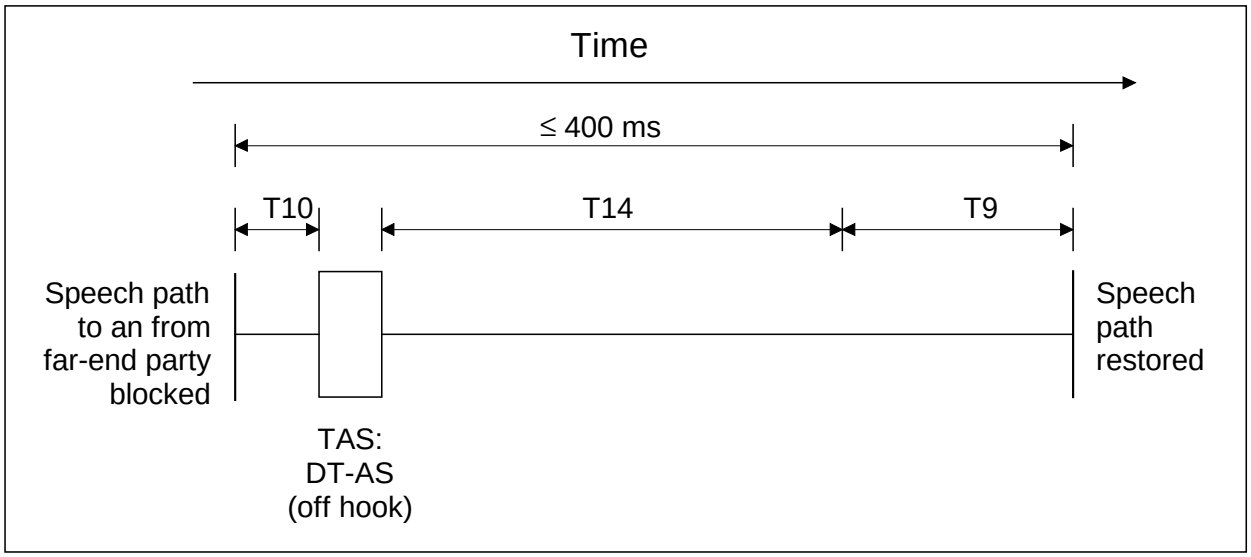

Figure 2: Time diagram at the network end of the local loop: unsuccessful attempt

6.1.1 Timing

Table 1 presents time interval and values related to the described events:

Table 1: Off-hook timing definitions and values

Time interval	Value	Definition
T10	0 ms – 150 ms	The time between speech path blocking and beginning of TAS sending. (note)
T11	40 ms – 55 ms	The time for the LE to recognize the TE-ACK.
T12	55 ms – 200 ms	The time between TE-ACK recognition and the start of FSK modulation transmission.
T13	40 ms – 120 ms	The time to restore the speech path after the end of FSK modulation transmission.
T14	160 ± 5 ms	The maximum time allowed within which a valid TE-ACK shall be correctly detected. The time interval, for which T14 is the maximum, shall begin at the end of TAS transmission.
T9	0 ms – 150 ms	The time to restore the speech path after the end of T14.
NOTE: If, according to a service description, a SAS is sent and the speech path has been blocked before the SAS and: a) it is restored between the SAS and the TAS, then T10 is the time between the final speech path blocking and the beginning of TAS sending; b) it is not restored between the SAS and the TAS, then T10 shall commence at the end of the SAS.		

Values indicated in table 1 should respect the constraints at the network end as specified in tables 2 and 3.

Table 2: Network End constraints

Constraint (ms)
T10 + 85 [DT-AS_{max}] + 165 [$T14_{max}$] + **T9** ≤ 400
NOTE 1: Text in square brackets on the right of a value is used to indicate the parameter related to that value. NOTE 2: T10 and T9 are implementation dependent.

Table 3: Network End constraint reasons

Reason	Simplified constraint (ms)
400 ms is the maximum carrier blocking time allowed by some videotex terminals (see figure 2: unsuccessful attempt).	**T10 + T9** ≤ 150

6.1.2 TAS physical characteristics

The TAS is a Dual Tone-Alerting Signal (off-hook). Physical characteristic of the DT-AS (off-hook) are described in table 4.

Table 4: TAS: Dual Tone Alert Signal (Off-hook)

Nominal Frequencies	same as specified for DT-AS in EN 300 659-1 [1])
Signal Level	same as specified for DT-AS in EN 300 659-1 [1])
Maximum difference in the power between tones	same as specified for DT-AS in EN 300 659-1 [1])
Signal Purity	same as specified for DT-AS in EN 300 659-1 [1])
Duration	80 ms ± 5 ms

6.1.3 TE-Acknowledgement Signal

The LE shall accept the DTMF "D" as described in ES 201 235 [3] as a valid TE-ACK.

As a network option, the DTMF "A", "B" and "C" may be considered as a valid alternative TE-Acknowledgement Signal from other types of Terminal Equipment.

Annex A (informative): Constraints on the timing at the TE - LE interface

This annex records reasons for constraints that have been considered to ensure correct interworking between LE and TE.

Table A.1: Constraint reasons

n	Reason
1	The TE-ACK sending should be ensured by the TE before the LE time-out expiring (transmission delays should be taken into account).
2	A minimum DTMF length should be ensured by the TE to allow recognition at LE.
3	Overlapping between DT-AS receiving and DTMF sending at TE shall be avoided by the TE.
4	A maximum DTMF length should be ensured by the TE to avoid overlapping between DTMF receiving and FSK transmission at the LE .
5	The TE should ensure a minimum expiration time for FSK recognition expiring (transmission delays should be taken into account).

A.1 Transmission delay

For calculation purposes a 15 ms transmission return delay between LE-TE has been used. Longer transmission delays may exist.

History

Document history		
Edition 1	September 1997	Publication as ETS 300 659-2
V1.2.1	December 1999	One-step Approval Procedure OAP 200017: 1999-12-29 to 2000-04-28