

**Access and Terminals (AT);  
Analogue access to the  
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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**Reference**

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## Foreword

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

Version 1.2.1 of the present document had been submitted to One-step Approval Procedure 200017 but was withdrawn due to the receipt of substantial technical comments.

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".

<b>Proposed national transposition dates</b>	
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

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# 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].

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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.
- 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] ETSI EN 300 659-1 (V1.3.1): "Public Switched Telephone Network (PSTN); Subscriber line protocol over the local loop for display (and related) services; Part 1: On-hook data transmission".
- [2] ETSI EN 300 659-3 (V1.3.1): "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] ETSI ES 201 235: "Specification of Dual Tones Multi-Frequency (DTMF) Transmitters and Receivers", Part 1 to Part 4.
- [4] ETSI TR 101 182: "Analogue Terminals and Access (ATA); Definitions, abbreviations and symbols".

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# 3 Definitions and abbreviations

## 3.1 Definitions

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

**loop state:** see TR 101 182 [4]

**quiescent 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]:

DT-AS (off-hook) Dual Tone-Alerting Signal used in off-hook data transmission

SAS Subscriber Alerting Signal

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## 4 Data Encoding

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

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## 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:** shall not be transmitted.
- b) **Mark Signal:** shall consist of a block of  $80 \pm 25$  mark bits.

### 5.3 Physical Layer

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

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## 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) shall be used to signal to the TE that data transmission is to be expected. The TAS shall be a DT-AS (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:

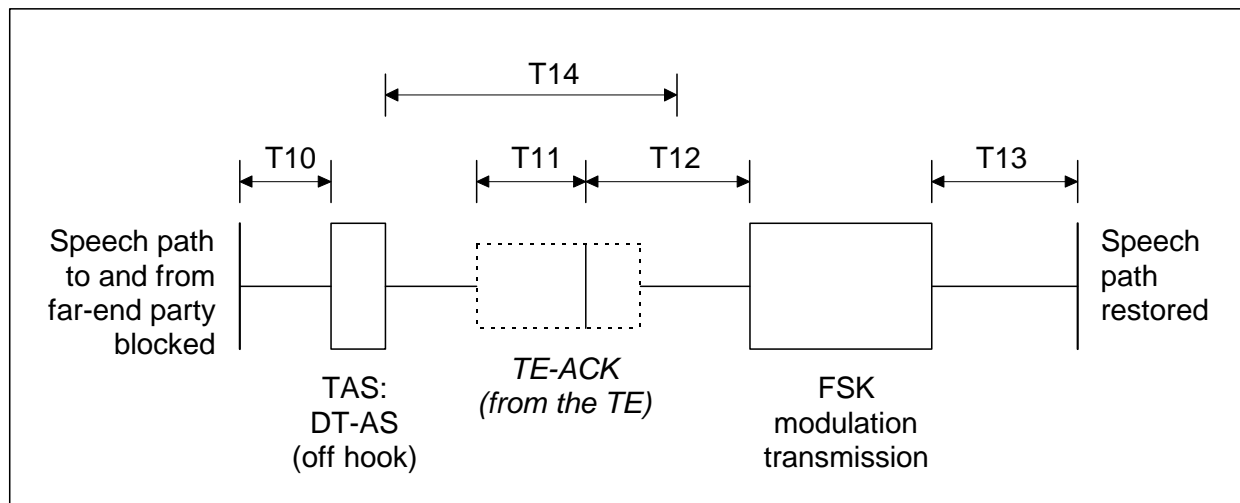
- Event 1:** The LE shall block the speech path to and from the far-end party in order to minimize interference with any alerting signal and the data transmission. This also prevents the far-end party from receiving these signals.
- Event 2:** The LE shall transmit the TAS.
- Event 3:** The LE shall wait for the TE-Acknowledgement Signal (TE-ACK).
- Event 4, case a:** If the LE recognize a valid TE-ACK within the time-out, FSK modulation transmission shall follow.

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

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

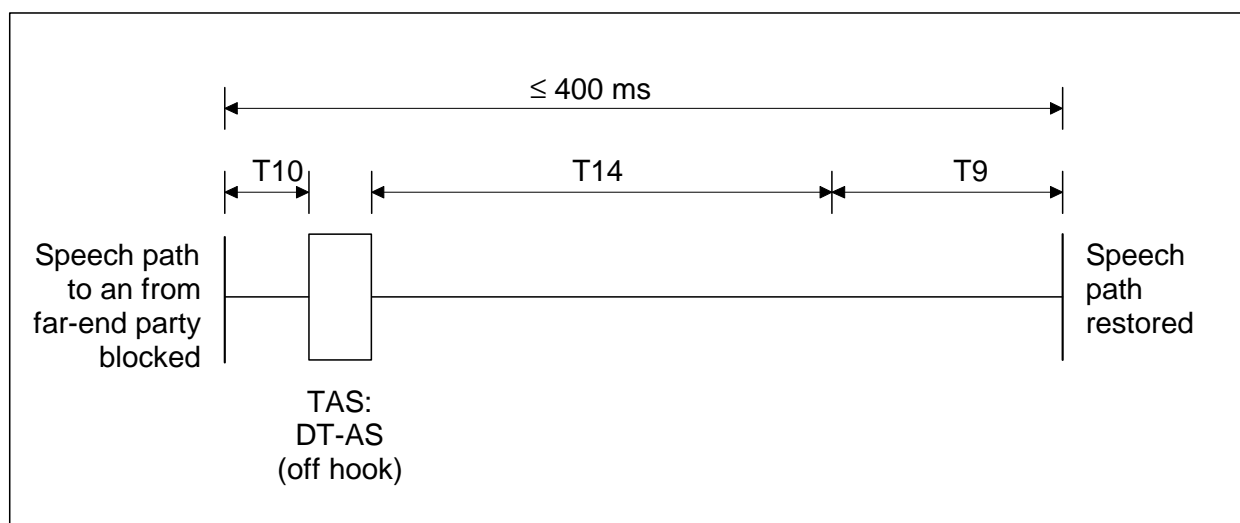
If the TE goes in quiescent state the signalling process should be aborted.

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 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 1.

**Table 1: 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

## 6.1.2 Timing

Table 2 presents time interval and values related to the described events:

**Table 2: 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: <ul style="list-style-type: none"> <li>a) it is restored between the SAS and the TAS, then T10 is the time between the latter speech path blocking and the beginning of TAS sending;</li> <li>b) it is not restored between the SAS and the TAS, then T10 shall commence at the end of the SAS.</li> </ul>	

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

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

**Table 3: Network End constraints**

Constraint (ms)
$T10 + \text{Duration of DT-AS (off-hook)} + T14 + T9 \leq 400$
NOTE: 400 ms is the maximum carrier blocking time allowed by some videotex terminals (see figure 2: unsuccessful attempt).

## 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.



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## History

<b>Document history</b>			
Edition 1	September 1997	Publication as ETS 300 659-2	
V1.2.1	December 1999 April 2000	One-step Approval Procedure Withdrawn from OAP	OAP 200017: 1999-12-29 to 2000-04-28
V1.3.1	September 2000	One-step Approval Procedure	OAP 20010112: 2000-09-13 to 2001-01-12