

# ETSI EN 300 659-2 V1.3.1 (2001-01)

---

*European Standard (Telecommunications series)*

**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**

---



---

**Reference**

REN/AT-030006-2

---

**Keywords**

data, PSTN, protocol, service

**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  
Sous-Préfecture de Grasse (06) N° 7803/88

---

**Important notice**

---

Individual copies of the present document can be downloaded from:

<http://www.etsi.org>

The present document may be made available in more than one electronic version or in print. In any case of existing or perceived difference in contents between such versions, the reference version is the Portable Document Format (PDF). In case of dispute, the reference shall be the printing on ETSI printers of the PDF version kept on a specific network drive within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at <http://www.etsi.org/tb/status/>

If you find errors in the present document, send your comment to:  
editor@etsi.fr

---

**Copyright Notification**

---

No part may be reproduced except as authorized by written permission.  
The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 2001.  
All rights reserved.

---

# Contents

Intellectual Property Rights .....	4
Foreword.....	4
1 Scope.....	5
2 References.....	5
3 Definitions and abbreviations.....	5
3.1 Definitions .....	5
3.2 Abbreviations.....	5
4 Data Encoding.....	6
5 Protocol Requirements.....	6
5.1 Presentation Layer.....	6
5.2 Data-link Layer .....	6
5.3 Physical Layer.....	6
6 Data transmission requirements: signalling, timing and tolerance .....	6
6.1 Off-hook data transmission.....	6
6.1.1 TAS physical characteristics.....	8
6.1.2 Timing.....	8
6.1.3 TE-Acknowledgement Signal.....	8
History .....	9

---

## Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: "*Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards*", which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (<http://www.etsi.org/ipr>).

The attention of ETSI has been drawn to UK Patent Number GB 2 258 119 B which is, or may be, or may become, Essential to certain aspects of the present document. The owner of this patent has undertaken to grant irrevocable licenses on fair, reasonable and non-discriminating terms and conditions under the patent pursuant to the ETSI IPR Policy. The licensing undertaking has been made subject to the condition that those who seek licenses agree to reciprocate. Further details pertaining to the patent can be obtained directly from the patent owner.

The present IPR information has been submitted to ETSI and pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

IPR Owner: Northern Telecom Limited,  
Patent Licensing and Strategy  
3 Robert Speck Parkway  
Mississauga ON L4Z 3CB  
Canada

Contact: Mr Stuart Wilkinson  
Assistant Vice-President  
Patent and Licensing Strategy

---

## Foreword

This European Standard (Telecommunications series) has been produced by ETSI Technical Committee Access and Terminals (AT).

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>National transposition dates</b>	
Date of adoption of this EN:	12 January 2001
Date of latest announcement of this EN (doa):	30 April 2001
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 October 2001
Date of withdrawal of any conflicting National Standard (dow):	31 October 2001

---

# 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] 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".

---

# 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

---

## 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:** 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].

---

## 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:

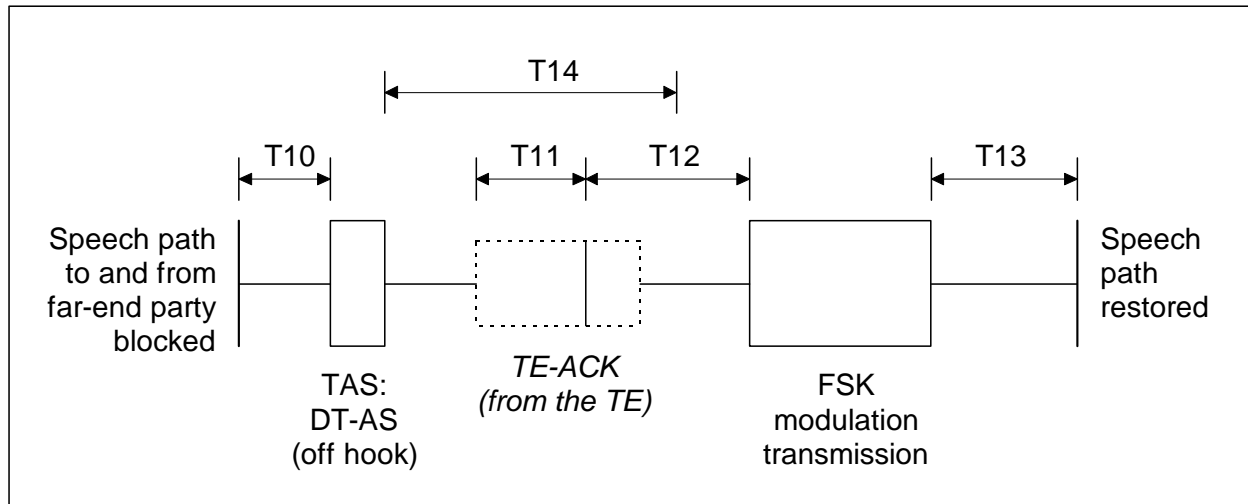
- Event 1:** The LE shall block the speech path to and from the far-end party in order to minimize interference with any alerting signal and the data transmission. This also prevents the far-end party from receiving these signals.
- Event 2:** The LE shall transmit the TAS.
- Event 3:** The LE shall 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.

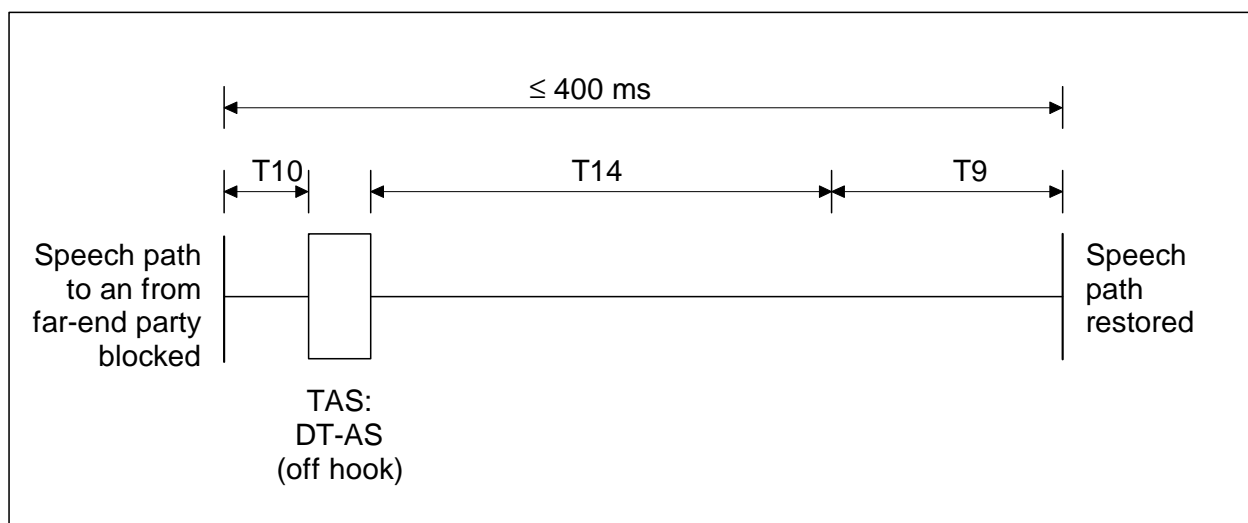
If the TE goes in quiescent state the signalling process should be aborted.

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 $\pm$ 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 $\pm$ 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: <ol style="list-style-type: none"> <li>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>it is not restored between the SAS and the TAS, then T10 shall commence at the end of the SAS.</li> </ol>	

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.



---

## 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
V1.3.1	September 2000	One-step Approval Procedure
		OAP 200017: 1999-12-29 to 2000-04-28
		OAP 20010112: 2000-09-13 to 2001-01-12
V1.3.1	January 2001	Publication