

**Access and Terminals (AT);
Analogue access to the
Public Switched Telephone Network (PSTN);
Protocol over the local loop for display and related services;
Terminal Equipment requirements;
Part 2: Off-hook data transmission**



Reference

DES/AT-030016

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Foreword

This ETSI Standard (ES) has been produced by ETSI Technical Committee Access and Terminals (AT), and is now submitted for the ETSI standards Membership Approval Procedure.

The present document is part 2 of a multi-part deliverable covering the Protocol over the local loop for display and related services; Terminal Equipment requirements, as identified below:

- Part 1: "On-hook data transmission";
- Part 2: "Off-hook data transmission";**
- Part 3: "Protocol Implementation Conformance Statement (PICS) proforma specification On-Hook and Off-Hook";
- Part 4: "Test Suite Structure and Test Purposes (TSS&TP); On-Hook and Off-Hook";
- Part 5: "Abstract Test Suite (ATS) and partial Protocol Implementation eXtra Information for Testing (PIXIT) proforma specification for the user; On-Hook and Off-Hook".

The present document replaces EN 300 778-2 which is being withdrawn. There are no technical differences between the present document and the former EN 300 778-2.

1 Scope

The present document specifies the electrical characteristics and the functional characteristics for Terminal Equipment (TE) for connection to the network termination point (NTP) of a Public Switched Telephone Network (PSTN) interface providing a Protocol Over The local Loop For Display Services, based on the protocols defined in EN 300 659-2 [3] and EN 300 659-3 [4]. The present document contains only additional requirements with respect to the requirements in ES 300 778-1 [1]. The present document does not specify any method to cater for distinction between several TE-ACK, if sent, when more than one TE is off-hook on the same line.

The present document applies to off-hook data transmission only. A TE intended for off-hook data transmission shall also be able to receive a on-hook data transmission.

The present document is not written for regulatory purposes.

The requirements are intended to ensure correct reception and detection of the received data. The method of displaying the received data is not defined.

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 and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

- [1] ETSI ES 300 778-1: "Access and Terminals (AT); Analogue access to the Public Switched Telephone Network (PSTN); Protocol over the local loop for display and related services; Terminal Equipment requirements; Part 1: On-hook data transmission".
- [2] ETSI EN 300 659-1: "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 1: On-hook data transmission".
- [3] ETSI EN 300 659-2: "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".
- [4] ETSI EN 300 659-3: "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 3: Data link message and parameter codings".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in EN 300 659-1 [2], EN 300 659-2 [3], ES 300 778-1 [1] and the following apply:

off-hook signalling state: state of the TE when in the loop state, the TE is capable of receiving Frequency-Shift Keying (FSK) data transmission, and the normal transmission functions are suspended

3.2 Abbreviations

For the purposes of the present document, the abbreviations defined in EN 300 659-1 [2], EN 300 659-2 [3], ES 300 778-1 [1] and the following apply:

TE-ACK TE Acknowledgement Signal

4 Physical layer requirements

4.1 Loop state

There are no loop state access requirements under the present document.

Loop state requirements are given in relevant access standards.

4.2 Data transmission

4.2.1 Network and TE interoperation

- 1) The LE starts the handshaking sequence by sending a TE Alerting Signal (TAS) and muting of the voice paths at the LE.
- 2) After detection of the TAS the TE mutes voice paths and disables any manual signalling facility.
- 3) The TE returns a TE-Acknowledgement signal (TE-ACK) to the LE.
- 4) The TE enters the off-hook signalling state.
- 5) The LE recognizes a valid TE-ACK, and starts data transmission to the TE.
- 6) After data transmission is completed, the TE and LE restores any voice paths and the TE enables any manual signalling facility.

If the LE does not receive a valid TE-ACK, the data is not transmitted and after a time-out period the TE restores any voice paths and enables any manual signalling facility.

If for any other reason the TE does not receive data transmission, the TE, after a time-out period, restores any voice paths and enables any manual signalling facility.

See also figure 1.

4.2.2 TE Alerting Signal (TAS)

Requirement: The TE shall detect a TAS, DT-AS, as specified in table 1.

Table 1: DT-AS signal characteristics

Nominal frequencies	2 130 Hz and 2 750 Hz with the accuracy $\pm 0,5 \%$
Signal level	-12 dBV/tone to -35 dBV/tone across line terminals
Twist	6 dB max
Duration	80 ms ± 5 ms

Test: Compliance shall be by supplier's declaration.

NOTE: The detector must not detect normal speech or similar signals generated on the line by the users, as a TAS. It is equally important that the detector can recognize the TAS in the presence of normal speech or similar signals from the own user, as the TE is normally not muted when receiving the TAS.

4.3 Timer requirements

Table 2: Off-hook timers

Timer	Value	Description
T_A	85 ms	The maximum time between end of the DT-AS and start of the TE-ACK signal
T_{TE-ACK}	65 ms to 90 ms	Duration of the TE-ACK, a DTMF "D"
T_F	295 ms	The maximum time the TE waits for the start of data transmission. Measured from the start of the TE-ACK
T_U	120 ms	Maximum restoration time to loop state

NOTE: A two-way transmission delay of maximum 15 ms between the TE and the Local Exchange (LE) has been assumed for T_A and T_F .

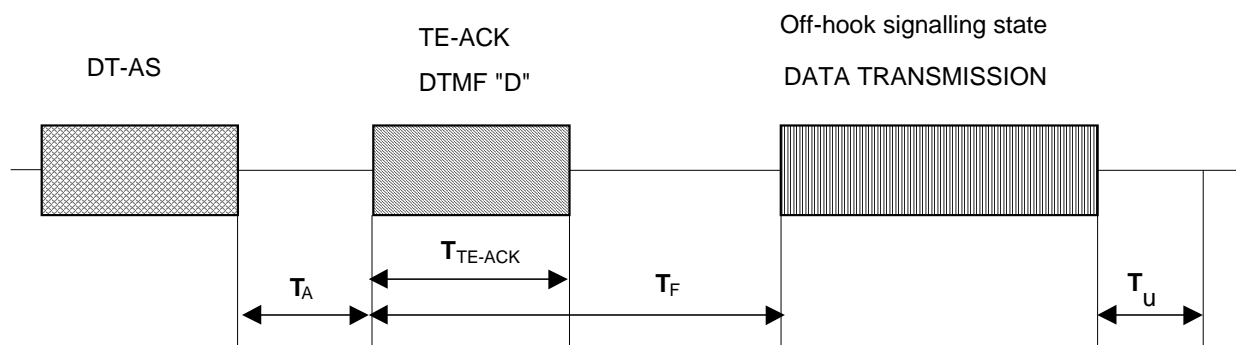


Figure 1: Handshaking sequence and timing requirements

4.3.1 Voice path muting and end time

Requirement: The TE shall mute the voice paths and disable any manual signalling facility before the start of the TE-ACK signal. The voice paths and any manual signalling facility shall remain muted until the end of the data transmission and be restored within T_U . If there is no data transmission they shall remain muted until after the Time-out, T_F , and restoration shall be within T_U (see table 2).

Test: Compliance shall be by supplier's declaration.

4.3.2 TE - Acknowledgement signal

Requirement: The TE shall start sending a TE-ACK to the LE, within T_A from the end of a TAS. The TE-ACK signal shall be of duration and description as in table 2.

Test: Compliance shall be by supplier's declaration.

NOTE: It is recommended that the sending of the TE-ACK signal avoids overlap with the received DT-AS signal.

4.3.3 Start time

Requirement: The TE shall correctly detect a data transmission starting within 95 ms to T_F from the start of the TE-ACK signal (see table 2).

Test: Compliance shall be by supplier's declaration.

4.4 Data signals

Data signals requirements described in ES 300 778-1 [1] shall apply, but with the levels as defined in the following clause.

4.4.1 Levels

Requirement: The TE shall be capable of correctly receiving FSK signalling tones with levels within the range -11 dBV to -33 dBV measured between the line terminals and with a twist between the mark and space tones not exceeding 6 dB.

Test: Compliance is under study.

5 Datalink layer

The structure of the datalink packet is shown in annex D of EN 300 659-1 [2].

5.1 Channel seizure

NOTE: There is no channel seizure signal transmitted from the LE in the off-hook state.

5.2 Mark signal

Requirement: The TE shall correctly receive datalink packets with the following Mark signal field length:

- 80 mark bits \pm 25 mark bits.

Test: Compliance is under study.

5.3 Message type

5.3.1 Valid message type

Requirement: The TE shall meet the appropriate message type requirements defined in ES 300 778-1 [1].

Test: Compliance to different message types is under study.

5.3.2 Unknown message type

Requirement: If the TE receives an unknown message type, the TE shall restore voice paths and enable any manual signalling facilities within T_U from the end of the FSK data and either ignore the message or indicate an error.

Test: Compliance shall be checked by supplier's declaration.

5.4 Message length

Requirement: The TE shall meet the message length requirements defined in ES 300 778-1 [1].

Test: Compliance is under study.

5.5 Checksum

Requirement: The TE shall meet the checksum requirements defined in ES 300 778-1 [1].

Test: Compliance is under study.

5.6 Incorrect checksum

Requirement: If an incorrect checksum is detected the TE shall restore voice paths and enable any manual signalling facility within T_U from the end of the FSK data and shall either ignore the message or indicate an error.

Test: Compliance shall be by supplier's declaration.

6 Presentation layer - message interpretation

Requirement: Presentation layer message interpretation requirements described in ES 300 778-1 [1] shall apply.

Test: Compliance is under study.

7 Safety

Safety requirements are outside the scope of the present document. Safety requirements are published by CENELEC.

8 ElectroMagnetic Compatibility (EMC)

EMC requirements are outside the scope of the present document.

History

Document history		
Edition 1	January 1998	Publication as ETS 300 778-2
V1.2.1	May 2001	Publication as EN 300 778-2
V1.1.1	July 2002	Membership Approval Procedure MV 20020906: 2002-07-09 to 2002-09-06