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Attachments to the Public Switched Telephone Network (PSTN); Category II attachment requirements for 300 bits per second duplex modems standardized for use on the PSTN (Candidate NET 21)

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Category II attachment requirements for 300 bits per second
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**(The text of this ETS may be utilized, wholly or in part,
for the establishment of NET 21)**

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Foreword

This European Telecommunication Standard (ETS) has been produced by the Terminal Equipment (TE) Technical Committee of the European Telecommunications Standards Institute (ETSI). The text of this ETS may be utilized, wholly or in part, for the establishment of NET 21.

This ETS contains the technical requirements for approval to Category II of 300 bits per second duplex modems standardised for use on the Public Switched Telephone Network (PSTN). These requirements are based upon, and do not conflict with, CCITT Recommendation V.21 [4] except in the cases of subclause 5.3.1 where the frequency tolerances specified are tighter than those given; subclause 5.5.1 (Response times of the received line signal detector) and subclause 5.5.2 (Response times of the ready for sending indicator) where a restricted range of values have been inserted to assist inter-operability.

Additionally, requirements are included which relate to end-to-end inter-operability over PSTN connections. These requirements are in excess of the CCITT Recommendations. A modem which complies with CCITT Recommendation V.21 [4] should always meet the requirements of this ETS which relate to parameters specified in that CCITT Recommendation except in the case of some of the intentional deviations identified above.

Clause 4 of this ETS references the requirements which are common to both Category I and Category II modems, which are contained in ETS 300 114 [2], Clause 4.

Clause 5 of this ETS contains Category II requirements specific to 300 bits per second duplex modems. In the case of certain functions common to a number of different types of modem (e.g. Auto-answering sequence) reference is made to Clause 5 of ETS 300 114 [2] which contains the relevant requirements, etc.

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1 Scope

This ETS specifies the technical characteristics to be offered by modems seeking Category II approval for duplex operation over the PSTN at 300 bits per second. The modulation scheme specified is that described in CCITT Recommendation V.21 [4].

The term "modem" in the context of this ETS includes all physical implementation practices for voice band modems which are galvanically connected to the PSTN.

This ETS specifies two modes of operation: answer mode and call mode.

NOTE: Modems can provide either simply one of the above modes or provide both modes together with facilities for selecting either of the two modes.

This ETS also contains descriptions of the tests to be performed in order to confirm compliance with the functional requirements contained herein. A general description of the test conditions and test requirements is given in Annex A (Normative).

2 Normative References

This ETS incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

- [1] Draft prETS 300 001: "Attachments to Public Switched Telephone Network (PSTN); General technical requirements for equipment connected to an analogue subscriber interface in the PSTN"
- [2] ETS 300 114 (1990): "Attachments to the Public Switched Telephone Network (PSTN); Basic attachment requirements for modems standardized for use on the PSTN"
- [3] CCITT Recommendation S.33 (1984): "Standardization of an international text for the measurement of the margin of start-stop machines using International Alphabet No 5"
- [4] CCITT Recommendation V.21 (1984): "300 bits per second duplex modem standardized for use on the General Switched Telephone Network"
- [5] CCITT Recommendation V.24 (1984): "List of definitions for interchange circuits between Data Terminal Equipment and Data Circuit-Terminating Equipment"
- [6] CCITT Recommendation V.25 (1984): "Automatic answering equipment and/or parallel automatic calling equipment on the general switched telephone network including procedures for disabling of echo control devices for both manually and automatically established calls"
- [7] CCITT Recommendation V.54 (1984): "Loop Test devices for modems"

3 Definitions and abbreviations

The definitions and abbreviations of ETS 300 114 apply, together with the following.

3.1 Definitions

Answer mode: When calls are established with automatic facilities, a standard answer mode shall be used by the modem at the answering station. This mode consists of conventional characteristics (e.g. use

of high channel carrier frequency or particular scrambler generating polynomial) complementary to those used in the standard call mode by the modem at the calling station, in order to ensure proper connection and inter-working.

If calls are established on the PSTN by operators, or for leased line operation, bilateral agreement on the use of call mode and answer mode shall be necessary.

Call mode: When calls are established with automatic facilities, a standard call mode shall be used by the modem at the calling station. This mode consists of conventional characteristics (e.g. use of low channel carrier frequency or particular scrambler generating polynomial) complementary to those used in the standard answer mode by the modem at the answering station, in order to ensure proper connection and inter-working.

If calls are established on the PSTN by operators, or for leased line operation, bilateral agreement on the use of call mode and answer mode shall be necessary.

Data Terminal Equipment (DTE): is used to define the origin and destination of signals present at the digital interface of a modem. This expression does not require that a "commercial data terminal" be present to receive or generate such signals; a tester or any other suitable device may monitor or generate such signals.

Degree of start-stop distortion: in start-stop transmission the ratio of the maximum measured difference, irrespective of sign, between the actual and theoretical intervals separating any significant instant from the significant instant of the start element immediately preceding it, to the unit interval.

The highest absolute value of degrees of individual distortion of the significant instants of a stop-start signal is reached within a specific time interval.

The degree of distortion of start-stop modulation, restitution or signal shall be expressed as a percentage.

The result of measurement shall be completed by an indication of the period of the observation. The start-stop distortion shall be considered positive when the significant instant occurs after the ideal instant and conversely, negative when it occurs before.

Degree of synchronous start-stop distortion: the degree of start-stop distortion determined when the assumed unit interval is that appropriate to the actual modulation rate.

The degree of synchronous start-stop distortion shall be measured by adjusting the scanning rate of the distortion measuring set.

The start-stop distortion shall be considered positive when the significant instant occurs after the ideal instant and conversely, negative when it occurs before.

For the determination of the actual mean modulation rate, account shall only be taken of those significant instants of modulation (or restitution) that correspond to a change on the same sense as that occurring at the beginning of the start element.

Initial carrier mode: a mode in which the Answer Mode Modem (AMM) transmits its carrier signal immediately after the end of the auto answer sequence, and the Call Mode Modem (CMM) remains silent until it receives a carrier signal from the AMM.

Modem: a functional unit that modulates and de-modulates signals in order to enable digital data to be transmitted over analogue transmission facilities.

Modem used for reference: a modem used for some of the tests specified herein or in another modem specific ETS. A modem used for reference may, at the discretion of the applicant, be provided by the testing authority or by himself. It shall be designed:

- to meet the requirements of the same Recommendation(s) of the CCITT as the modem under test, to the extent necessary for performing the tests;

- to provide the functionalities for a modem used for reference that are specified in the relevant testing Clauses; and
- to provide an interface which is accessible and of a type suitable for use in the tests (e.g. CCITT Recommendation V.24 [5]).

Where the applicant has provided the modem used for reference and the test fails, the testing authority may not be in a position to determine the precise reason for failure.

Modes of operation: modes specified in this modem specific ETS, that have an influence upon line signals present at the PSTN interface.

Modes of use: modes specified in this modem specific ETS, that have an influence upon conditions present at a digital interface e.g. a "conventional" CCITT Recommendation V.24 [5] interface or a PC bus interface in the case of an integral modem .

On-line state: an electrical condition into which, when connected to the network, a modem is placed such that it draws enough current to be capable of activating the exchange.

NOTE: Usually, a modem in the on-line state is potentially capable of sending or receiving speech-band information to or from the network.

3.2 Abbreviations

AMM	Answer Mode Modem
CCITT	Comité Consultatif International Télégraphique et Téléphonique
Cct	Circuit
CEPT	Conférence des Administrations Européennes des Postes et des Télécommunications
CMM	Call Mode Modem
DCE	Data Circuit-Terminating Equipment
DTE	Data Terminal Equipment
PSTN	Public Switched Telephone Network
RFS	Ready For Sending

4 General requirements

4.1 References to other ETSs

The modem shall comply with ETS 300 114 [2]: Clause 4.

NOTE: ETS 300 114 [2] in turn refers to Draft prETS 300 001 [1] for the majority, if not all, of its requirements.

4.2 Information to be provided by the applicant

4.2.1 Information required for testing purposes

The applicant shall declare which of the modes of operation/use identified in this ETS approval to Category II is sought.

Compliance shall be considered to have been accomplished by provision of the relevant information.

NOTE: This could be accomplished by completion of a form such as the one provided in Annex B (Informative).

4.2.2 Instructions for use

Instructions for use shall be made available with the apparatus. The instructions for use shall include: