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Foreword

This Interim European Telecommunication Standard (I-ETS) has been produced by the Terminal Equipment (TE) Technical Committee of the European Telecommunications Standards Institute (ETSI).

An ETSI standard may be given I-ETS status either because it is regarded as a provisional solution ahead of a more advanced standard, or because it is immature and requires a "trial period". The life of an I-ETS is limited to three years after which it can be converted into an ETS, have its life extended for a further two years, be replaced by a new version, or be withdrawn.

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1 Scope

This I-ETS specifies the technical characteristics (electrical, functional, visual and acoustic) for videotelephony terminals to be used at the basic access of the coincident S and T interface of the Integrated Services Digital Network (ISDN). The characteristics of this I-ETS are meant to specify characteristics that are outside the scope of attachment standards or specifications, and outside the scope of standards specifying the end-to-end characteristics for videotelephony terminals. However, this I-ETS is not intended to be used for type approval purposes or other mandatory requirements.

This I-ETS is applicable to videotelephony terminals as well as to the videotelephony functions of multimedia or multiservice terminals.

This I-ETS is applicable to terminal equipment supporting the videotelephony teleservice in the ISDN as defined in ETS 300 264 [1].

The characteristics specified in this I-ETS will cover a number of functions or facilities that can be combined to form a particular terminal.

For multimedia or multiservice terminals, other requirements or standards may apply in addition to this I-ETS.

The requirements of this I-ETS do not apply to videoconference terminals. Requirements to videoconference terminals are specified in other standards.

2 Normative references

This I-ETS incorporates by dated and 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 I-ETS only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

- [1] ETS 300 264 (1994): "Integrated Services Digital Network (ISDN); Videotelephony teleservice, Service description".
- [2] CCITT Recommendation G.701 (1988): "Vocabulary of digital transmission and multiplexing, and pulse code modulation (PCM) terms".
- [3] CCITT Recommendation I.112 (1988): "Vocabulary of terms for ISDNs".
- [4] CCITT Recommendation I.230 (1988): "Definition of bearer service categories".
- [5] CCITT Recommendation I.240 (1988): "Definition of teleservices".
- [6] CCITT Recommendation P.10 (1988): "Vocabulary of terms on telephone transmission quality and telephone sets".
- [7] ETS 300 111 (1992): "Integrated Services Digital Network (ISDN); Telephony 3,1 kHz teleservice, Service description".
- [8] ETS 300 263 (1994): "Integrated Services Digital Network (ISDN); Telephony 7 kHz teleservice, Service description".
- [9] ETS 300 012 (1992): "Integrated Services Digital Network (ISDN); Basic user-network interface, Layer 1 specification and test principles".
- [10] ETS 300 145 (1994): "Integrated Services Digital Network (ISDN); Audiovisual services, Videotelephone systems and terminal equipment operating on one or two 64 kbit/s channels".
- [11] ETS 300 102-1 (1990): "Integrated Services Digital Network (ISDN); User-network interface layer 3, Specification for basic call control".

- [12] ETS 300 267-1 (1994): "Integrated Services Digital Network (ISDN); Telephony 7 kHz and videotelephony teleservices, Digital Subscriber Signalling System No. one (DSS1) protocol, Part 1: Protocol specification".
- [13] I-ETS 300 245-1: "Integrated Services Digital Network (ISDN); Technical characteristics of telephony terminals, Part 1: General".
- [14] CCITT Recommendation G.722 (1988): "7 kHz audio coding within 64 kbit/s".
- [15] I-ETS 300 322 (1995): "Integrated Services Digital Network (ISDN); Digital Subscriber Signalling System No. 1 (DSS 1); Abstract Test Suite (ATS) specification for signalling network layer protocol for circuit-mode basic call control (user)".
- [16] CCITT Recommendation G.711 (1988): "Pulse code modulation (PCM) of voice frequencies".
- [17] ETS 300 182-1 (1993): "Integrated Services Digital Network (ISDN); Advice of Charge (AOC) supplementary service, Digital Subscriber Signalling System No. one (DSS1) protocol, Part 1: Protocol specification".
- [18] I-ETS 300 245-7 (1995): "Integrated Services Digital Network (ISDN); Technical characteristics of telephony terminals; Part 7: Locally generated information tones".
- [19] ETS 300 144 (1994): "Integrated Services Digital Network (ISDN); Audiovisual services, Frame structure for a 64 kbit/s to 1 920 kbit/s channel and associated syntax for inband signalling".
- [20] ETS 300 143 (1994): "Integrated Services Digital Network (ISDN); Audiovisual services, Inband signalling procedures for audiovisual terminals using digital channels up to 2 048 kbit/s".
- [21] I-ETS 300 302-1 (1994): "Integrated Services Digital Network (ISDN); Videotelephony teleservice; Part 1: Electroacoustic characteristics for handset telephony function when using Pulse Code Modulation (PCM) encoding".
- [22] CCITT Recommendation G.728 (1992): "Coding of speech at 16 kbit/s using low-delay code excited linear prediction".
- [23] ITU-T Recommendation H.261 (1993): "Video codec for audiovisual services at p x 64 kbit/s".
- [24] ITU-T Recommendation T.122 (1993): "Multipoint communication service for audiographics and audiovisual conferencing service definition".
- [25] ITU-T Recommendation T.123 (1994): "Protocol stacks for audiographic and audiovisual teleconference applications".
- [26] ITU-T Recommendation T.125 (1994): "Multipoint communication service protocol specification".
- [27] IEC Publication 651: "Sound level meters".
- [28] IEC Publication 225: "Octave, half-octave and third-octave band filters intended for the analysis of sound and vibrations".
- [29] ETS 300 085 (1990): "Integrated Services Digital Network (ISDN); 3,1 Hz telephony teleservice, Attachment requirements for handset terminals (Candidate NET 33)".

3 Definitions

For the purposes of this I-ETS, the relevant definitions in CCITT Recommendations G.701 [2], I.112 [3], I.230 [4], I.240 [5] and P.10 [6] apply along with the following:

handsfree terminal: A terminal using a loudspeaker associated with an amplifier as a telephony receiver and which can be used without a handset. Defined in CCITT Recommendation P.10 [6].

loudspeaking terminal: A handset terminal using a loudspeaker associated with an amplifier as a telephony receiver. Defined in CCITT Recommendation P.10 [6].

multimedia terminal: A terminal that simultaneously supports two or more media.

multiservice terminal: A terminal that supports two or more teleservices.

restricted power condition: See ETS 300 012 [9]. The condition is indicated by the reversed polarity of the phantom voltage at the S or coincident S and T reference point.

NOTE 1: For some networks the restricted power condition may be the normal operating mode.

telephony 3,1 kHz teleservice: A description of the telephony 3,1 kHz teleservice is given in ETS 300 111 [7], clause 5.

telephony 7 kHz teleservice: A description of the telephony 7 kHz teleservice is given in ETS 300 263 [8], clause 5.

videoconference terminal: A terminal that supports the videoconference teleservice.

NOTE 2: The videoconference teleservice is described in draft prETS 300 678 ("Integrated Services Digital Network (ISDN); Videoconference teleservice, Service description").

videotelephony teleservice: A description of the videotelephony teleservice is given in ETS 300 264 [1], clause 5.

4 Abbreviations

For the purposes of this I-ETS, the following abbreviations apply:

AOC-D	Advice of Charge; charging information During the call
AOC-E	Advice of Charge; charging information at the End of the call
AOC-S	Advice of Charge; charging information at call Set-up time
CD	Call Deflection
CFB	Call Forwarding Busy
CFNR	Call Forwarding No Reply
CFU	Call Forwarding Unconditional
CH	Call Hold
CONF	Conference
CTR	Common Technical Regulation
DTMF	Dual Tone Multi Frequency
ECT	Explicit Call Transfer
ISDN	Integrated Services Digital Network
MLP	Multi Layer Protocol
MMC	Meet Me Conference
MSN	Multiple Subscriber Number
SUB	Subaddressing
TP	Terminal Portability
3PTY	Three Party
UDI-TA	Unrestricted Digital Information with Tones and Announcement

5 Attachment requirements

Attachment requirements are outside the scope of this I-ETS.

NOTE: Information about type approval requirements can be found in annex B to this I-ETS.

6 System description

A system description of a videotelephone terminal is given in ETS 300 145 [10]. All terminals shall be capable of supporting the videotelephony teleservice as specified in ETS 300 264 [1] and the telephony 3,1 kHz teleservice as specified in ETS 300 111 [7].

Terminal types Xb2/3 and Xb5, as defined in ETS 300 145 [10], shall also be capable of supporting the telephony 7 kHz teleservice as specified in ETS 300 263 [8].

Conformance shall be checked by verifying that the requirements of the relevant clauses in this I-ETS, or the requirements of standards referred to, be met.

7 Terminal-network characteristics

7.1 Call control functions for the videotelephony teleservice

The call control functions at the user-network interface shall meet the relevant requirements of ETS 300 102-1 [11] and ETS 300 267-1 [12].

Conformance shall be checked by using the tests specified in these ETSs.

NOTE: ETS 300 267-1 [12] specifies the layer 3 requirements for the videotelephony teleservice as described in ETS 300 263 [8]. Additional characteristics as well as short term solutions will be described in prl-ETS 300 654 ("Integrated Services Digital Network (ISDN); Videotelephony terminals, Interim D-channel signalling aspects").

7.2 Call control functions for the telephony 3,1 kHz teleservice

The call control functions at the user-network interface shall meet the relevant requirements of I-ETS 300 245-1 [13] and ETS 300 102-1 [11].

Conformance shall be checked by using the tests specified in this ETS and I-ETS.

7.3 Call control functions for the telephony 7 kHz teleservice

Where the speech coding option according to CCITT Recommendation G.722 [14] is implemented, the call control functions at the user-network interface shall meet the relevant requirements of ETS 300 102-1 [11], ETS 300 267-1 [12] and I-ETS 300 245-1 [13].

Conformance shall be checked by using the tests specified in these ETSs and I-ETS.

7.4 Support of supplementary services in the ISDN

7.4.1 General

If two B-channels are required the ISDN supplementary services shall be invoked for each call. There are other restrictions related to the videotelephony teleservice due to coding algorithms and the inband signalling system.

7.4.2 Supplementary services, Multiple Subscriber Number/Subaddressing

7.4.2.1 Address checking

A terminal connected to an ISDN basic access can be selected by using the Multiple Subscriber Number (MSN) and/or Subaddressing (SUB) supplementary services, if present.

Only one ISDN number or subaddress shall be allocated to the videotelephony function of a terminal. Where two B-channels are required, the same ISDN number or subaddress shall be used for both connections (however, see note).

If the terminal, as an option, supports the MSN and/or SUB supplementary services and information for selection is stored, a terminal connected to an ISDN basic access shall perform address checks on the ISDN subscriber number and/or subaddress, if present in the incoming SETUP message. These checks are additional to the compatibility checks referred to in subclauses 7.1 to 7.3.

Conformance shall be checked by using the relevant tests specified in I-ETS 300 322 [15].

NOTE: Regions outside Europe may allocate separate numbers to the two B-channels used. For interworking with those regions and with non-ISDN video equipment on non-ISDN networks, it may be necessary to use different destination numbers.

7.4.2.2 No selection information stored

When no information for selection is stored, the terminal shall respond to every incoming SETUP message if the compatibility checks specified in subclauses 7.1 to 7.3 are successful.

Conformance shall be checked by using the relevant tests specified in I-ETS 300 322 [15].

7.4.2.3 Programming

Off-line programming and erasing of information for selection (MSN and/or SUB) shall be available to the human user.

Conformance shall be checked by inspection.

7.4.3 Support of conference supplementary services

The conference supplementary services offered by the ISDN (Meet-Me Conference (MMC), Conference call, Add-on (CONF) or Three party (3 PTY)) may be invoked only when the terminal is operating in mode 0U and uses A-law speech coding according to CCITT Recommendation G.711 [16].

Before one of these supplementary services is invoked, the terminal shall switch to mode a0U.

Conformance shall be checked by verifying that the relevant supplementary services only can be invoked when the terminal is working in mode a0U.

NOTE 1: The remote videotelephone terminal cannot be forced to transmit unframed, only to receive unframed. Unless that terminal is switched to mode a0U by user action, the speech quality will be reduced.

NOTE 2: If the remote terminal has indicated that it supports CCITT Recommendation G.711 [16] μ -law only, the invocation of these supplementary services should be prevented.

7.4.4 Call manipulating supplementary services

When invoking the call manipulating supplementary services (Call Hold (CH), Explicit Call Transfer (ECT) or Terminal Portability (TP)), an interaction between inband signalling and D-channel signalling is needed. The principles specified in ETS 300 145 [10] shall be used.

Before the invocation of these supplementary services, a mode a0U communication shall be established.

7.4.5 Call diversion supplementary services

Terminals that support these supplementary services (Call Forwarding Unconditional (CFU), Call Forwarding Busy (CFB), Call Forwarding No Reply (CFNR), and Call Deflection (CD)) shall have the capability of compatibility checking of both octet 4 and octet 4a of the HLC information element as described in ETS 300 267-1 [12].

For an incoming SETUP message where an initial channel is indicated, in octet 4a of the HLC information element, or where there is no indication of the status of the channel, the normal procedures for these supplementary services shall apply.

Where the incoming SETUP message is indicating an additional channel in octet 4a, and the terminal has not established an initial channel, the terminal shall reject the call.

If it is not known that the call request is for an additional channel, the call shall be accepted.

Conformance shall be checked by inspection.

NOTE: The refinement of the D-channel and inband procedures is for further study.

7.4.6 Advice of Charge supplementary services (AOC-S, AOC-D, AOC-E)

7.4.6.1 Protocols and procedures

The protocols and procedures for the Advice of Charge supplementary services are specified in ETS 300 182-1 [17].

Conformance shall be checked by using the tests specified for the relevant supplementary services.

7.4.6.2 Additional channel

The Advice of Charge supplementary services provide charging information on a per call basis. Where these supplementary services are invoked, and an additional channel is established, the terminal shall also invoke the supplementary service for this call.

Conformance shall be checked by inspection.

7.4.7 Other supplementary services

If supplementary services not identified in the subclauses above are applied, they shall be invoked for each of the two calls where appropriate.

Conformance shall be checked by using the tests specified for the relevant supplementary services.

7.5 Overlap and en-bloc sending

Any terminal that supports manual input of the destination number at the time of the call attempt, shall support the complete procedures for overlap sending as specified in ETS 300 102-1 [11]. The support of the procedures for en-bloc sending is optional.

Conformance shall be checked by using the tests specified in I-ETS 300 322 [15].

NOTE: The en-bloc procedure is recognised as the most appropriate for the ISDN, but the overlap procedure is required to guarantee having the dialling procedure as for the analogue telephone (as far as the human interface is concerned).

For the additional call the en-bloc sending procedure is recommended.

7.6 Information tones

7.6.1 Transmission of tones and announcement from the network

The terminal shall be capable of transmitting, to the human user, audio information (tones and verbal announcements) transmitted on the initial B-channel allocated to the call.

If octet 3 of the Bearer Capability information element in the SETUP message indicate "Speech" or "UDI TA", most networks will provide information tones encoded to A-law according to CCITT Recommendation G.711 [16] and transmitted on the B-channel allocated to the call.

The decoding in the terminal shall be based upon the same coding law.

NOTE 1: Where BC "Speech" is used, the A-law to μ -law or μ -law to A-law conversions take place at the interface between the A-law region and the μ -law-region. For videotelephony the A-law to μ -law decoding is selected and performed by the terminals. The conditions related to this selection are not covered by this I-ETS yet.

The acoustic receiver may be connected to the B-channel after the receipt of a SETUP ACKNOWLEDGE message (overlap sending) or a CALL PROCEEDING message (en-bloc sending).

NOTE 2: This allows transmission of any tone or announcement generated by or transmitted through the network, and applied to the B-channel without previous notification (i.e. without Progress indicator, which is optional and will not be provided by all networks).

The receiver shall be connected to the B-channel after the receipt of a call control message containing progress description #1 (call is not end-to-end ISDN: further progress information may be available inband) or # 8 (inband information or appropriate pattern now available).

To reduce the reception of noise caused by random codes possibly present on the B-channel before connection through the network, the acoustic receiver may be temporarily switched off in the overlap sending state.

To be able to receive tones and announcements from the network the receiver may be connected or re-connected to the B-channel after the receipt of a DISCONNECT message with progress description # 8 (inband information or appropriate pattern now available).

The receiver shall be disconnected from the B-channel after the receipt of any of the messages DISCONNECT without progress description # 8 (inband information or appropriate pattern now available), RELEASE or RELEASE COMPLETE.

Conformance shall be checked by verifying that the B-channel information is audible when the conditions described above are met.

7.6.2 Generation of tones by the terminal

The ability of the terminal to generate tones and verbal announcements for presentation to the human user, on the basis of local information and/or messages received on the D-channel, is a permitted option.

Such tones or announcements may be used to replace signals from the network and/or to give the human user audible information in cases when no B-channel is available or allocated, or when no tones or announcements are provided by the network.

If the option is implemented, at least one of the following two modes shall be possible:

- normal mode:

 - locally generated tones or announcements are used to replace signals from the network;

- mixed mode:

locally generated tones or announcements are used in cases when no B-channel is available or the equivalent tones and announcements are not provided by the network. Otherwise information transmitted on the B-channel are used.

NOTE: If local generation of tones or messages is included in a terminal, it is recommended to include a European harmonized set of tones. A standard for such tones can be found in I-ETS 300 245-7 [18].

Conformance shall be checked by using the tests specified in I-ETS 300 245-7 [18].

8 End-to-end characteristics

8.1 General

The end-to-end characteristics include both end-to-end transmission of the media supported (i.e. audio and moving image), and end-to-end signalling that may be inband or out-band (D-channel).

8.2 Inband signalling

The inband signalling system is specified in ETS 300 144 [19], and the procedures specified in ETS 300 143 [20] shall be used.

8.3 Audio characteristics

8.3.1 Handset function

8.3.1.1 PCM coding

To communicate with telephony terminals, and to establish a common audio mode when establishing a videotelephony communication, all videotelephony terminals shall have implemented PCM coding according to CCITT Recommendation G.711 [16]. Both A-law and μ -law encoding shall be implemented.

The requirements and corresponding test methods for the PCM encoding characteristics of the handset function are specified in I-ETS 300 302-1 [21]. Conformance shall be checked by verifying that the requirements of this I-ETS are met.

NOTE: When the terminal is working in a framed mode the least significant bit is used for in-band signalling.

8.3.1.2 3,1 kHz bandwidth coding at 16 kbit/s

As an option, speech encoding according to CCITT Recommendation G.728 [22] may be implemented.

Conformance of the encoding and decoding algorithms shall be checked using the tests specified in CCITT Recommendation G.728 [22].

NOTE: The speech coding algorithm specified in CCITT Recommendation G.728 [22] is based on a digital bitstream encoded according to CCITT Recommendation G.711 [16]. The terminal applications of CCITT Recommendation G.728 [22] algorithm are based on the framing structure specified in ETS 300 144 [19]. These terminals will be able to work in mode a0, i.e. using CCITT Recommendation G.711 [16] encoding. The characteristics to be specified in this I-ETS can, therefore, be verified by testing the terminal in mode a0 and verifying conformance to CCITT Recommendation G.728 [22]. I-ETS 300 302-1 [21] provides further information.

8.3.1.3 7 kHz bandwidth SB-ADPCM coding

As an option, speech coding according to CCITT Recommendation G.722 [14] may be implemented.

Conformance of the encoding and decoding algorithms shall be checked using the tests specified in CCITT Recommendation G.722 [14].

NOTE 1: I-ETS 300 302-3 will specify the 7 kHz handset function characteristics of videotelephony terminals.

NOTE 2: The end-to-end characteristics for terminals supporting the telephony 7 kHz teleservice are specified in I-ETS 300 245-5.

8.3.2 Loudspeaking and handsfree functions

8.3.2.1 PCM coding

The requirements and corresponding test methods for an optional loudspeaking and/or handsfree function using PCM coding according to CCITT Recommendation G.711 [16] can be found in I-ETS 300 302-2.

8.3.2.2 3,1 kHz bandwidth coding at 16 kbit/s

The requirements and corresponding test methods for an optional loudspeaking and/or handsfree function using LD-CELP coding according to CCITT Recommendation G.728 [22] is for further study

NOTE: These characteristics will be specified in I-ETS 300 302-4.

8.3.2.3 7 kHz bandwidth SB-ADPCM coding

The requirements and corresponding test methods for an optional loudspeaking and/or handsfree function using SB-ADPCM coding according to CCITT Recommendation G.722 [14] is for further study.

NOTE: These characteristics will be specified in I-ETS 300 302-4.

8.4 Video characteristics

The video encoding characteristics shall meet the requirements of ITU-T Recommendation H.261 [23].

8.5 Dual Tone Multi Frequency (DTMF) signalling

8.5.1 General

As an option the terminal may be equipped to send DTMF signals in the connected B-channel. If this option is implemented, the requirements of this subclause apply.

If the option is implemented, encoding shall be according to CCITT Recommendation G.711 [16], A-law.

Conformance shall be checked using the tests specified in annex A, clause A.3 of this I-ETS.

8.5.2 Connection to the B-channel

When the acoustic receiver is connected to the B-channel, as described in the subclause 7.6.1, it shall be possible to connect the DTMF transmitter to the B-channel.

It shall not be possible to connect the DTMF transmitter to the B-channel until one of the messages specified for connection of the acoustic receiver in subclause 7.6.1 is received. This shall also apply in the case when B-channel information is replaced by locally generated information, see subclause 7.6.2.

Conformance shall be checked by inspection.

8.5.3 Signalling frequencies

Each signal consists of two simultaneous frequencies, one from a high and one from a low frequency group. Each frequency group consists of four frequencies.

The signalling frequencies and corresponding codes shall be according to table 1.

Table 1: Signalling scheme for DTMF signals

	Hz	High frequency group			
		1 209	1 336	1 477	1 633
Low frequency group	697	1	2	3	A
	770	4	5	6	B
	852	7	8	9	C
	941	*	0	#	D

If DTMF signalling is implemented, at least the codes for the digits 0 - 9, "*" and "#" shall be included. The implementation of codes for "A", "B", "C" and "D" is optional.

Conformance shall be checked by using the test specified in annex A, subclause A.3.1 of this I-ETS.

NOTE 1: A reference document for this signalling system is CCITT Recommendation Q.23.

NOTE 2: DTMF tones sent before the receipt of the CONNECT message are, in some cases, valid for terminals to interwork with supplementary and other services (not end-to-end).

8.5.4 Frequency deviation

Each signal frequency shall not differ more than 1,5 % from the nominal frequencies given in table 1.

Conformance shall be checked by using the test specified in annex A, subclause A.3.1 of this I-ETS.

8.5.5 Level

The level of each frequency, measured selectively, shall be - 15 dBm0 with a tolerance of ± 2 dB.

Conformance shall be checked by using the test specified in annex A, subclause A.3.2 of this I-ETS.

8.5.6 Timing

For manual operation, the signal shall be sent as long as the corresponding push button is depressed. If the time of the signals and/or pauses are automatically controlled by the terminal equipment, each signal and each pause shall not be less than 65 ms.

Conformance shall be checked by using the test specified in annex A, subclause A.3.3 of this I-ETS.

9 Power feeding

9.1 General conditions

The power consumption by a videotelephony terminal from Power Source 1 shall be according to the requirements stated in ETS 300 012 [9].

9.2 Restricted Power Condition

The permitted option of being a designated terminal for use under Restricted Power Condition, may be implemented in any terminal capable of supporting 3,1 kHz telephony, if it meets the requirements for a designated terminal given in this I-ETS and in ETS 300 085 [29].

When working under Restricted Power Condition as a designated terminal, at least the telephony 3,1 kHz teleservice shall be supported.

It shall be possible to disable this option.

9.2.1 Leakage current

Under the Restricted Power Condition, a non-designated terminal shall comply with the leakage current requirements of ETS 300 012 [9].

9.2.2 Operation of the designated terminal under Restricted Power Conditions

Under Restricted Power Conditions a designated terminal shall fulfil the requirements for a designated terminal as specified in ETS 300 085 [29].

A multiservice or multimedia terminal (e.g. videotelephony terminal) may be the designated terminal if it responds, on a default basis, to incoming calls with Bearer Capability (BC) "speech" or "3,1 kHz audio" combined with a Progress indicator when it has no other power available than the Restricted power. The response shall be independent of any other operation programmed for Normal Power Condition.

10 Physical modules

10.1 Handset

There is no requirement for handset shape.

NOTE: Telephony performance is dependent on good handset characteristics. CCITT Recommendation P.35 contains some specifications for handset dimensions which are known to give good handset characteristics.

10.2 Audible alerting module

10.2.1 Sound pressure level

Where a terminal has an audible alerting module only, the requirements of this subclause shall be met.

In Normal Power Conditions the average sound pressure level shall not be more than 120 dBA (26 dBPa(A)).

The average sound pressure level shall not be less than 50 dBA (- 44 dBPa(A)).

If an adjustment control for loudness is provided, this requirement shall apply when it is in that position which produces the maximum sound pressure.

Conformance shall be checked by the test described in annex A, subclause A.2.1.

10.2.2 Alerting module control

10.2.2.1 Starting

The alerting module shall start within 500 ms after the SETUP message with compatible information elements (see clause 7) has been sent to the terminal.

The start of the audible alerting module is defined by the time when the sound pressure has reached 40 dB(A).

If an adjustment for control for loudness is provided, this requirement shall apply when it is in that position which produces the maximum sound pressure.

Conformance shall be verified by a supplier's declaration of conformance.

10.2.2.2 Stopping

The alerting module shall stop within 1 500 ms after:

- a CONNECT message has been sent from the terminal;
- DISCONNECT, RELEASE or RELEASE COMPLETE messages have been sent to the terminal;
- the network has deactivated the basic access user-network interface at layer 1.

Stopping of the audible alerting module is defined by the time when the sound pressure has fallen below the value defined in subclause 10.2.2.1.

If an adjustment for control for loudness is provided, this requirement shall apply when it is in the position that produces the maximum sound pressure.

Conformance shall be verified by a supplier's declaration of conformance.

10.2.3 Adjustment of sound characteristics

Adjustment of the sound characteristics of the audible alerting module (pitch, timbre and cadence) may be provided as an option. At least one setting shall meet the sound pressure level requirement of this I-ETS.

10.2.4 Frequency spectrum

The sound pressure level in each of the frequency bands 179 Hz - 1 120 Hz and 1 120 Hz - 11 200 Hz shall not be more than 18 dB below the total unweighted sound pressure level.

At least one setting of the alerting module shall exist where these requirements are fulfilled.

NOTE 1: 179 Hz, 1 120 Hz and 11 200 Hz are edges of the third-octave bands centred at 200 Hz, 1 000 Hz and 10 000 Hz.

To ensure good audibility it is desirable to have an output with both low and high frequency content and a distinctive cadence.

Low frequency content is particularly important for those with impaired hearing.

It is advantageous to be able to change the characteristics of the audible alerting the signal to make it possible to distinguish between terminals.

NOTE 2: To ensure good audibility it is desirable to have an output with both low and high frequency content and a distinctive cadence. Low frequency content is particularly important for those with impaired hearing.

Conformance shall be checked by using the test described in annex A, subclause A.2.1.3 of this I-ETS.

10.3 Indication of requested teleservice

10.3.1 Audible indication

As an option, the possibility to select different alerting signals to indicate the requested teleservice may be provided.

If the option is provided, the two alternative signals shall have different cadence and/or different frequency spectrum.

Conformance shall be checked by the test described in annex A, subclause A.2.1 of this I-ETS.

10.3.2 Visual indication

As an option, a visual indication of an incoming call request may be implemented.

The indication shall be activated when an incoming SETUP message with compatible information elements (see clause 7) has been sent to the terminal.

This visual indication shall be discontinued when one of the following conditions are met:

- a CONNECT message has been sent from the terminal;
- DISCONNECT, RELEASE or RELEASE COMPLETE messages have been sent to the terminal;
- the network has deactivated the basic access user-network interface at layer 1.

Conformance shall be checked by activating the terminal as described in subclause A.2.2 of this I-ETS and observing the result.

11 Multipoint aspects

11.1 Minimum configuration for multipoint application

The minimum requirements for multipoint applications are specified in ETS 300 145 [10].

Where a data communication facility, as described in clause 12, is not implemented, the terminal may, as an option, be able to establish a "dummy" data channel to be able to transmit and receive video signals to/from the other terminals. If the option is implemented, the "dummy data" shall consist of all ones, whenever this is necessary to comply with the received multipoint command [MCC] as defined in ETS 300 144 [19]. At the same time, the terminal shall be able to digest the incoming multiplexed signal containing data at the given rate(s), correctly processing the reduced video rate but discarding the data.

Such a terminal shall include in its capability set the value {Nil_Data}, together with a list of the data capabilities that can be accepted, including as a minimum the value {MLP-6.4k}. The data bits of the incoming signal are discarded and the video correctly decoded at the lower rate.

11.2 Optional functions

Various additional functions may be supported as options. These functions can be provided using specific Control and Indication BAS codes specified in ETS 300 144 [19] or preferably through the relevant procedures referred to in clause 12.

NOTE: It is pointed out that some of these features are strongly advised by human factors experts.

12 Data communication

As an option, a low speed point-to-point data communication facility may be implemented.

NOTE 1: A suitable data system is to be specified. Work is currently being carried out under ETSI work item number DI/TE-04114 ("Videophone reference terminal; Data communication using in-band signalling principles").

As an option, the terminal may provide data communication functions identified as T.120 Protocol in ETS 300 144 [19]. These functions shall be in conformance with the characteristics described in ITU-T Recommendations T.122 [24], T.123 [25] and T.125 [26].

As a minimum, the terminal shall support the ISDN basic profile principles described in subclause 5.1.1 of ITU-T Recommendation T.123 [25].

NOTE 2: The references to ITU-T Recommendations in ITU-T Recommendation T.123 [25] will, where available, be replaced by references to corresponding ETSI Standards.

NOTE 3: Conformance testing of the T.120 protocol stack is for further study.

Annex A (normative): Test specification

A.1 General conditions for testing

A.1.1 Environment for tests

The environmental conditions for the testing laboratory can be found in I-ETS 300 322 [15].

A.1.2 Power supply limitations

The power supply limitation can be found in ETS 300 012 [9].

A.1.3 Test equipment interface

The interface on the test equipment connected to the terminal under test shall be capable of providing the signalling and supervision necessary for the terminal to be working in all test modes. The connection of the test equipment to the terminal under test at the S and T reference point shall be according to ETS 300 012 [9].

A.1.4 Alternative test methods

The requirements of this I-ETS were written on the basis of the standard test methods described in this annex. For some parameters, alternative test methods may exist. It shall be the responsibility of the test house to ensure that any alternative method used is equivalent to that described in this annex.

A.1.5 Accuracy of test equipment

Unless otherwise specified, the accuracy on all test equipment used in the tests shall be better than:

Item	Accuracy
Electrical Signal Power	$\pm 0,2$ dB for levels $> - 50$ dBm
Electrical Signal Power	$\pm 0,4$ dB for levels $< - 50$ dBm
Sound pressure	$\pm 0,7$ dB
Time	± 5 %
Frequency	± 2 % (see note)

NOTE: When measuring sampled systems, it is advisable to avoid measuring at sub-multiples of the sampling frequency. There is a tolerance of ± 2 % on the frequencies, which may be used to avoid this problem, except for half the sampling frequency where only the $- 2$ % tolerance may be used.

A.2 Audible alerting module

A.2.1 Sound pressure level measurement

A.2.1.1 Measurement conditions

The measurements shall be carried out under anechoic conditions.

A.2.1.2 Measurement method

The telephony terminal shall be placed centrally on a non-resonant, hardwood table surface having minimum dimensions of: 1 m x 1 m x 20 mm.

The microphone shall be positioned at a point 0,5 m horizontally along from the centre of the terminal, and 0,3 m vertically above the table surface.

Measurements of the A-weighted sound pressure level shall be taken at six equispaced points round the telephony terminal under test, i.e. at 60° intervals.

The average A-weighted sound pressure level shall be calculated according to the following formula:

$$L_p = 10 \log_{10} \frac{1}{6} \sum_{i=1}^6 10^{\frac{L_{pi}}{10}} \text{ dB SPL (A-weighted)}$$

Where L_{pi} = A-weighted sound pressure level measured at point i , and "dB SPL" is dB relative to 20 μ Pa.

The time constant shall be 125 ms (IEC Publication 651 [27], "fast"). The maximum reading shall be used.

A minimum thickness of 20 mm ensures that the table shall be non-resonant.

A.2.1.3 Frequency spectrum measurement

The measurement shall be performed as described in subclause A.2.1.2.

The spectrum shall be measured by using one-third octave band filters according to IEC Publication 225 [28]. The total levels of the bands with centre frequencies from 200 Hz to 1 000 Hz, and frequencies from 1 250 Hz to 10 000 Hz shall be calculated and compared with total unweighted sound pressure level.

A.3 DTMF measurements

A.3.1 Frequency

A frequency measuring instrument with accuracy better than 0,2 % shall be used.

The frequencies shall be measured at the digital interface when each push button is pressed, or if appropriate, when a pre-programmed sequence is sent.

A.3.2 Signal level

The signal levels shall be measured selectively at the digital interface when each push button is pressed or if appropriate, when stored sequences of equal symbols are sent.

A.3.3 Signal timing

The signal time sequence shall be measured at the digital interface when a stored sequence of DTMF symbols is sent.

The time when the signal is present is defined to be when the total level is less than 10 % below the maximum level.

The pause is defined to be when the total level is less than 10 % of the maximum level.

The maximum level shall be taken as the maximum peak voltage which corresponds to the maximum value of the final signal level attained during excitation of the sending terminal.

NOTE: A more precise definition for signal timing and levels is given in ETS 300 001, subclause 5.4.6.

Annex B (informative): Bibliography

For the purposes of this I-ETS, the following documents have been informatively referenced:

- I-ETS 300 302-2: "Integrated Services Digital Network (ISDN); Videotelephony teleservice, Part 2: Electroacoustic characteristics for 3,1 kHz bandwidth loudspeaking and handsfree terminals".
- I-ETS 300 302-3: "Integrated Services Digital Network (ISDN); Videotelephony teleservice, Part 3: Wideband handset".
- I-ETS 300 302-4: "Integrated Services Digital Network (ISDN); Videotelephony teleservice, Part 4: Wideband coding and loudspeaking handsfree function".

NOTE 1: Parts 3 and 4 of the above I-ETS are still under study within ETSI TC-TE.

- Draft prETS 300 678: "Integrated Services Digital Network (ISDN); Videoconference teleservice, Service description".
- Draft prI-ETS 300 654: "Integrated Services Digital Network (ISDN) Videotelephony Terminals Interim D-channel signalling aspects".
- CCITT Recommendation Q.23 (1988): "Technical features of push-button telephone sets".
- CCITT Recommendation P.35 (1988): "Handset telephones".
- DI/TE-04114: "Videophone reference terminal; Data communication using inband signalling principles".
- ETS 300 001: "Attachments to the Public Switched Telephone Network (PSTN); General technical requirements for equipment connected to an analogue subscriber interface in the PSTN (NET 4)".
- I-ETS 300 245-5: "Integrated Services Digital Network (ISDN); Technical characteristics of telephony terminals, Part 5: Wideband (7 KHz) handset telephony".
- TBR 3: "Integrated Services Digital Network (ISDN); Attachment requirements for terminal equipment to connect to an ISDN using ISDN basic access".
- TBR 8: "Integrated Services Digital Network (ISDN); Telephony 3,1 KHz teleservice; Attachment requirements for handset terminals".

NOTE 2: Both TBR 3 and TBR 8 form the technical content of the yet to be announced Common Technical Regulations (CTRs 3 and 8).

History

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