

**Draft standard to match to and work with
ETS 300 001/NET4**

Specification for

**Simple telephones for
connection to public switched
telephone networks run by
certain public
telecommunications operators**

Committees responsible for this Published Document

The preparation of this Published Document was entrusted by the Telecommunications Standards Policy Committee (TCT/-) to Technical Committee TCT/2, upon which the following bodies were represented:

- British Approvals Board for Telecommunications
- British Facsimile Industry Consultative Committee
- British Radio and Electronic Equipment Manufacturers' Association
- British Telecommunications plc
- Cable and Wireless plc
- Communications Marketing and Servicing Association
- Computing Services Association
- Department of Trade and Industry (Telecommunications and Posts Division)
- EEA (the Electronics and Business Equipment Association)
- Electrical Installation Equipment Manufacturers' Association (BEAMA Ltd.)
- Engineering Equipment and Materials Users' Association
- Independent Broadcasting Authority
- Independent Telecommunications Suppliers' Association
- Institution of Electrical Engineers
- Kingston Communications (Hull) plc
- Mercury Communications Limited
- Mobile Radio Users' Association
- National Communications Union
- OFTEL (Office of Telecommunications)
- Telecommunication Engineering and Manufacturing Association
- Telecommunications Industry Association
- Telecommunications Managers' Association
- Telecommunications Users' Association (TUA)
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Preface

This Published Document, PD 6568, has been prepared during the run-up to the anticipated designation of NET4 in November 1992.

It has been prepared under the direction of the Telecommunications Standards Policy Committee.

The draft standard set out herein has been considered and approved by the TCT/2 Technical Committee.

This draft standard is intended to match to and work with ETS 300 001/NET4 and is derived from BS 6317 : 1992.

However, because of the shortness of available time, it has not been possible to pursue the normal BSI procedure of public comment, reconsideration and adjustment by the Technical Committee followed by correction and examination by the BSI's editorial department.

Consequently this Published Document may contain errors and lack the quality of presentation of the usual BSI Published Documents.

The readers and users of this Published Document are requested to be indulgent and to notify us of any errors, technical, editorial or otherwise, that might be encountered, or provide comments.

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**DRAFT STANDARD TO MATCH TO AND WORK WITH ETS 300 001/NET 4
SPECIFICATION FOR SIMPLE TELEPHONES FOR CONNECTION TO PUBLIC SWITCHED
TELEPHONE NETWORKS RUN BY CERTAIN PUBLIC TELECOMMUNICATIONS OPERATORS**

Foreword

This draft Standard has been prepared under the direction of the Telecommunications Standards Policy Committee. It forms one of a series of draft Standards that are being produced following the commencement of liberalization in October 1981 of the supply of certain telecommunications apparatus within the United Kingdom and the anticipated designation of NET 4 in November 1992.

The series of draft standards includes product and facility specifications giving particular requirements for individual items of apparatus and facilities, together with standards covering general requirements for the connection of apparatus to the various public telecommunication systems (i.e. any telecommunication system designated as a public telecommunication system by an order made under Section 9 of the Telecommunications Act 1984). At the present time, these systems include the public switched telephone networks, the telex networks, the packet switching services, and leased private circuits run by British Telecommunications plc, Kingston Communications (Hull) plc and Mercury Communications Limited.

The requirements specified in the draft standards are intended to ensure that apparatus complying with them, when connected to public telecommunication systems, will neither adversely affect any public system nor interfere with the service available to other users of public telecommunication systems. The standards include safety requirements only for the protection of personnel operating the public telecommunication system and for the protection of users from hazards that may arise from the connection of the apparatus to that system.

This standard does not specify particular requirements for telephones for use by the hard of hearing. However, manufacturers of telephones should be aware that communication by means of a telephone can be of great importance to the hard of hearing. This is not restricted to the individual user's ability to make use of his own telephone but extends to the use which would otherwise be made of telephones at work, in hotels, restaurants, hospitals and other public places or in the home of friends and relatives. Many hearing aids incorporate the facility to couple inductively to telephones that generate sufficient stray magnetic field from speech circuits in the receiver. Bearing in mind that to equip telephones with this capability will in many cases be relatively simple and inexpensive (for example by the incorporation of an inductive coupling device), it is desirable that telephone instruments are designed in such a way that a person using a hearing-aid with an inductive coupling facility is able to carry on conversation. Whilst the provision of facilities for the hard of hearing is not a requirement of this standard, any apparatus with such a provision should comply with the requirements of this specification.

This Standard is presented for designation under the Telecommunications Act 1984.

It is stipulated in the Telecommunications Act 1984 that apparatus within the scope of a designated standard may only be approved for connection to a telecommunication system if it complies with that standard. Exceptions may be determined by or under the designation, which may stipulate variations of, or additions to, the requirements of the standard and may also set conditions that have to be complied with as regards the apparatus, or its connection, or its use.

A copy of any designation will be included when available with all copies of this standard. Any further information on, or details of, the designation may be obtained from the Office of Telecommunications (OFTEL), Export House, 50 Ludgate Hill, London EC4M 7JJ.

Some apparatus may incorporate facilities for which a mandatory standard is necessary, but for which no standard has yet been designated for approval purposes under the Telecommunications Act 1984. Other apparatus may incorporate innovative features not foreseen when the relevant standard was written and designated and for which that standard is not fully appropriate. The British Approvals Board for Telecommunications (BABT) can sometimes deal with these cases by writing a 'Special investigation test schedule' (SITS), which has the effect of stating requirements where there is no designated standard or of supplementing or varying the requirements in the application of the designated standard. Information on any relevant SITS may be obtained from the Director, BABT, Claremont House, 34 Molesey Road, Hersham, Walton-on-Thames, Surrey KT12 4RQ.

Compliance with a British Standard does not of itself confer immunity from legal obligations. In particular, attention is drawn to the Telecommunications Act 1984.

Section 1. General

1 Scope

This draft standard specifies electrical and mechanical requirements and tests for simple telephones for connection to a single exchange line of the public switched telephone network run by certain licensed public telecommunication operators or systems connected thereto.

This draft standard does not apply to apparatus for connection to shared service lines. This standard does not specify requirements for apparatus for connection as extensions on any form of PBX.

This standard does not apply to apparatus with control of or switching of other voice circuits.

This draft standard does not apply to apparatus specially designed or adapted for the disabled (see foreword). This standard applies to apparatus for household, office and similar general indoor use.

The tests described in this draft standard are type tests as defined in BS 4778 : 1979. The general conditions for the tests, both in the main text and in annex B, are described in annex A.

NOTE. The titles of the publications referred to in this standard are listed on the inside back cover.

2 Abbreviations and definitions

For the purposes of this draft Standard the abbreviations and definitions given in ETS 300 001/NET4 and BS 6301 apply, together with the following abbreviations and definitions.

2.1 Abbreviations

2.1.1 *LTS*

Local telephone system (see figure 13).

2.1.2 *RLR*

Receiving loudness rating.

2.1.3 *SLR*

Sending loudness rating.

2.1.4 *SPL*

Sound pressure level.

2.1.5 *STMR*

Masked sidetone loudness rating.

2.1.6 *BT*

British Telecommunications plc.

2.1.7 *PSTN*

Public switched telephone network.

2.1.8 *PTO*

Public telecommunications operator.

2.1.9 *REN*

Ringer equivalence number.

2.1.10 *MF*

Multi-frequency.

2.2 Definitions

2.2.1 artificial ear

A device at the entry of which the acoustic impedance is the same as the acoustic impedance of the average human ear and comprising an acoustic network and a measurement microphone which permit calibration of earphones used in audiometry and telephonometry.

2.2.2 artificial mouth

An electric-acoustic transducer used for the testing of microphones at close speaking distances.

2.2.3 free field

A sound field in a homogeneous and isotropic medium whose boundaries exert a negligible effect upon acoustic measurements.

NOTE. Satisfactory free field conditions may be considered to exist where errors owing to the departure from ideal conditions do not exceed ± 1 dB.

2.2.4 handset

A rigid combination of telephone microphone and receiver in a form convenient for holding simultaneously to mouth and ear.

2.2.5 mouth reference point (MRP)

A point located at a distance of 25 mm in front of the equivalent lip position on the horizontal axis through the centre of the opening of the artificial mouth.

2.2.6 real ear loss

A correction factor intended to represent the acoustic loss attributed to the leakage occurring between an earpiece and a real ear.

2.2.7 sidetone

The reproduction in a telephone receiver of sounds picked up by the associated telephone microphone.

2.2.8 simple telephone

Apparatus for non-loudspeaking voice communication over the PSTN for which initiation and termination of the call is under manual control and is effected by mechanical lifting and replacement of a part or the whole of the apparatus. Where call signalling is provided it is made either by loop-disconnect signalling or multi-frequency signalling, with the signalling of each call being controlled by a rotary dial or a key pad, or by manual initiation of stored numbers.

2.2.9 supplier's declaration

A written declaration made by a supplier that an apparatus complies with stated requirements. A Supplier's Declaration should be based on evidence, held by the supplier, that the requirements are met. Such evidence should consist of actual test information or other substantiating material relating to the design of the apparatus.

2.2.10 exclusive line

An extension of the PSTN for application to apparatus that makes use of only one exchange connection, excluding shared service.

2.2.11 basic network loop

The two wires, designated 'A' and 'B', that form the electrical extension from a public switched telephone network exchange equipment to the subscriber termination.

2.2.12 on-line

The state of the apparatus where the subscriber termination has an electrical configuration that enables the current in the basic network loop to be at its maximum steady state value.

2.2.13 off-line

The state of the apparatus where the subscriber termination has an electrical configuration that enables the current in the basic network loop to be at its minimum steady state value.

2.2.14 idle state

A condition of the apparatus when it is off-line, that is, not in use, but excluding the ringing state.

2.3 Notation

The following notations apply:

- dBm** Absolute power level with respect to 1 mW, expressed in decibels.
- dBmp** Absolute psophometric power level (weighted for telephony) with respect to 1 mW, expressed in decibels.
- dBV** Absolute voltage level with respect to 1 V, expressed in decibels.

3 General operating conditions

The apparatus shall comply with ETS 300 001/NET4.

NOTE. Some of the requirements of this standard may be access requirements that might be proper to ETS 300 001/NET4. They will be reviewed at the earliest opportunity.

3.1 External power

NOTE. Internal batteries are not classed as an external power source.

3.1.1 *General*

Where the apparatus utilizes an external power source to provide the simple telephone functions (see 5.1.7), the requirements of this standard shall be met with the external power source connected and operative.

3.1.2 *Off-line requirements*

The apparatus shall continue to comply with clause 8 after the external power source is made inoperative.

For apparatus where the supplier states that the ringing detector is affected when the external power source is inoperative (see 5.1.8 and 5.2.4), sub-clause 8.1 b) shall not apply. Voltage V measured in the Ringer Equivalence Number (REN) test of ETS 300 001/NET4 shall not fall below 20 V r.m.s.

Compliance with 3.1.2 is determined by inspection of the supplier's statements and by the test of B.17.

Where the supplier states (see 5.1.8) that the requirements of clause 12 are not met when the external power source is inoperative, no tests shall be made in respect of that clause.

3.1.3 *Provision of emergency service*

Where the apparatus is capable of being used to make 999 calls to the emergency services, the apparatus shall continue to meet the requirements of clauses 13 and 14 for at least 1 h during the 7 h period after the external power source is made inoperative.

Compliance is determined by inspection of the supplier's statement specified in 5.1.9, the declaration specified in 5.1.10 and by the test of B.17.

3.1.4 *Assignment of REN*

For apparatus where the supplier states that the ringing detector is affected when the external power source is made inoperative (see 5.1.8), then for the purposes of clause 8, a ringing detector shall have failed to function only when the voltage *V* measured in the Ringer Equivalence Number (REN) test of ETS 300 001 falls below 20 V r.m.s.

3.2 Connection to PSTN

The apparatus shall be fitted with a plug that complies with BS 6312 : 1985.

The allocation of plug pins shall be as given in table 1. Pins 1 and 6 shall not be used. Compliance is determined by inspection.

3.3 Independence of line polarity

The requirements of section 2 of this standard shall be met independently of line polarity.

Compliance is determined by reversal of the dc voltage appearing between the A and B terminals of the apparatus under test between individual tests as appropriate.

3.4 User-controlled receiving volume control

For apparatus fitted with a user-controlled receiving volume control, the requirements of clause 13 shall be met for all positions of the control, except where otherwise stated in 13.3.2, 13.4, 13.5.2, 13.5.3, 13.8.1 and 13.8.2.

3.5 Suppression of transmission while PSTN connection is maintained

NOTE 1. Suppression of transmission in the sending direction is, in effect, reduction of the sending sensitivity, but in customer literature it may be given different names, such as 'mute' or 'microphone off', and it may be used for privacy or in noisy environments. To allow tests to be simplified without risking harm to the PSTN, this standard refers to 30 dB of suppression but, in reality, this would not be sufficient for a user seeking privacy and an attenuation of the order of 70 dB is more appropriate as a design target. It is also recommended that the receiver should not act as a microphone while sending is suppressed.

Sometimes a PSTN connection could be maintained but, temporarily, conversation over it not desired at all. In such cases, both sending and receiving sensitivities could effectively be suppressed simultaneously. Such a condition could, in user literature, also be referred to as 'mute', or sometimes as 'hold'.

NOTE 2. Compliance with 3.5.1, 3.5.2 and 3.5.3 is determined by the supplier in accordance with 5.1.4.

3.5.1 *General*

Where suppression of the transmission in either the sending or receiving direction is effected by a latching operation, when that suppression has been invoked and when that action which would normally establish the off-line condition is executed (e.g. the handset is replaced):

- a) the off-line conditions shall be restored within 30 s of that action; and
- b) normal transmission shall be available when the apparatus is next placed in the on-line state.

Compliance is determined by an appropriate functional test.

NOTE. This requirement is intended to guard a naive user against difficulty in making emergency calls.

3.5.2 *Suppression of sending*

3.5.2.1 There shall be a mode of operation in which sending is not suppressed.

Compliance is determined by inspection.

3.5.2.2 For apparatus where the user can invoke a mode of operation that suppresses transmission in the sending direction while a PSTN connection is maintained (see 5.1.4), when that suppression is invoked, the following requirements shall apply.

- a) The sending sensitivity, as determined in accordance with B.1, at any frequency in the range 200 Hz to 8 kHz shall be not greater than the value measured in accordance with B.1 when the suppression is not invoked.
- b) Where the SLR, as determined in accordance with B.1, is reduced by more than 30 dB compared to the value measured in accordance with B.1 when the suppression is not invoked, the requirements of 13.1, 13.3.1, 13.4, 13.5.1, 13.5.3 and 13.6.1 shall not apply.

Compliance is determined by the tests specified in clause 13 (with the exceptions listed in 3.5.5.2 b) above).

3.5.3 *Suppression of sending and receiving*

3.5.3.1 There shall be a mode of operation in which neither sending nor receiving is suppressed.

Compliance is determined by inspection.

3.5.3.2 For apparatus where the user can invoke a mode of operation that suppresses transmission in both sending direction and receiving directions while a PSTN connection is maintained (see 5.1.4), when that suppression is invoked, the following requirements shall apply:

a) where the SLR and RLR, as determined in accordance with B.1 and B.2 respectively, are reduced by more than 30 dB compared to the values measured in accordance with B.1 and B.2 when the suppression is not invoked, the requirements of clause 9 are modified by b) and c) of this clause, and 13.1, 13.2, 13.3, 13.4, 13.5, 13.6, 13.7 shall not apply.

Compliance is determined by the tests specified in clauses 9 and 13 (with the exceptions listed in 3.5.3.2 a) above).

b) The requirement in 9.1 for the dc characteristics to lie above the lower limit shall apply except that steady state voltages not less than those which would appear across a 240 ohm resistor shall be permitted.

NOTE. This requirement is intended to relax the lower limit between approximately 15 mA and 26 mA.

Table 1. Allocation of plug pins	
Pin number	Allocation
1	Not used
2	A wire
3	Earth (when provided)
4	SHUNT wire (when provided)
5	B wire
6	Not used
NOTE. Plug pin 6 is adjacent to the latch.	

4 Marking

4.1 The apparatus shall be marked with the supplier's or manufacturer's name or identification mark.

4.2 The apparatus shall be marked with the supplier's or manufacturer's model number or type reference.

4.3 The apparatus shall be marked with its ringer equivalence number (REN).

4.4 The marking specified in 4.1, 4.2, and 4.3 shall be indelible, legible and easily discernible on the apparatus.

Compliance shall be checked by inspection and by rubbing the marking lightly, first for 15 s with a piece of cloth soaked with water, and then for 15 s with a piece of cloth soaked with petroleum spirit.

After the test, the marking shall still be legible. Adhesive labels, where used, shall not have worked loose or become curled at the edges.

4.5 Where 999 cannot be dialled on the apparatus for the purpose of making outgoing calls to the BT emergency (999) service (see 5.2.5), a warning stating this inability shall either:

- a) be displayed or marked on the apparatus in a position visible when the apparatus is in its intended normal operating position; or
- b) be displayed on a label attached to (but which may be detachable from) the apparatus.

4.6 Where the apparatus is capable of indicating incoming calls and utilizes an external power source, and is not capable of indicating incoming calls if the external power source is inoperative (see 5.2.4), a warning stating this inability shall either:

- a) be displayed or marked on the apparatus in a position visible when the apparatus is in its intended normal operating position; or
- b) be displayed on a label attached to (but which may be detachable from) the apparatus.

5 Information to be provided by the supplier

5.1 Information required for testing purposes

5.1.1 The supplier shall determine the classification of the impedance of the apparatus for MF tone signalling as given in ETS 300 001/NET4.

5.1.2 Where the apparatus is provided with a ringing detector, the supplier shall state whether it is an audible or non-audible detector (see clause 8). Where a non-audible ringing detector is provided, the supplier shall state precise criteria for the correct functioning of the ringing detector.

5.1.3 For the purposes of the compliance tests for 9.3, 9.4 and 16.3, the supplier shall state whether or not the apparatus has one or more earth connections and, if it has, identify the position of the earth point.

5.1.4 The supplier shall state whether the apparatus offers suppression of transmission while a PSTN connection is maintained.

5.1.5 Where the apparatus is provided with a receiving volume control, the supplier shall state if this is intended to be user-controlled (see clause 13).

5.1.6 The supplier shall state whether the apparatus is capable of indicating incoming calls from the PSTN.

5.1.7 Where the apparatus utilizes an external power source to provide the simple telephone functions, the supplier shall provide such information or means as is necessary to enable the apparatus to be tested in conjunction with an appropriate external power source.

5.1.8 For the purposes of testing compliance to 3.1.2, the supplier shall state whether the ringing detector or the special signalling conditions are affected when the external power source is made inoperative.

5.1.9 For the purposes of testing compliance to 3.1.2 and/or 4.3, in cases where the apparatus uses an external power source to provide the simple telephone functions, the supplier shall state whether or not the apparatus is capable of being used to make 999 calls to the emergency services.

5.1.10 Where the apparatus uses an external power source to provide the simple telephone functions and is capable of being used to make calls to the emergency services, a Supplier's Declaration shall be provided that the apparatus continues to meet the requirements of clauses 13 and 14 for at least one hour during the 7 hour period after the external power source is made inoperative.

5.1.11 Where the supplier has made a declaration in accordance with 5.1.8, the supplier shall provide the information or means necessary to ensure that any internal power sources are fully charged for the test to B.17.

5.1.12 For the purposes of the test B.17, the supplier shall nominate a sequence of digits to be dialled.

5.1.13 The supplier shall state whether the apparatus has a means of disabling the ringing detector.

5.1.14 If, for an apparatus with a means of disabling the ringing detector (see 5.1.13), the fully operational position of the ringing detector specified in 8.1 a) 1) is not at the maximum volume position, the supplier shall state the position of the volume control at which compliance with 8.1 b) 1) is to be checked.

5.1.15 The supplier shall state whether the apparatus has the ability to make outgoing calls to the PSTN.

5.1.16 The supplier shall state whether or not the apparatus uses a carbon microphone.

5.2 Instructions for use

5.2.1 Instructions for use shall be supplied with the apparatus. The information shall be written in English.

The instructions for use shall include the following information.

- a) A statement of the PSTN circuits to which the apparatus is suitable for connection (see clause 1).

- b) An explanation of the basic concept of ringer equivalent numbers and their relationship to the maximum ringer capacity of the line and a warning that operation cannot be guaranteed in installations with mixed types of apparatus. If a REN of 4 is marked on the apparatus, the instructions for use shall include a statement that no apparatus marked with a REN number other than 0 shall be permitted to be connected simultaneously to the line.
- c) A repetition of the marking as specified in clause 4.
- d) A description of the functions provided by the apparatus.
- e) A statement that the apparatus should be used only on PSTN lines on which specific PSTN services or facilities are provided.

NOTE. Examples of PSTN facilities are loop-disconnect and multi-frequency dialling.

5.2.2 Where either the ringing detector or the special signalling conditions are affected by the loss of external power, the instructions for use shall contain a warning.

5.2.3 Where an external power source is utilized to provide the simple telephone functions, the instructions for use shall contain sufficient information to allow the connection of a compatible external power source.

5.2.4 Where the apparatus is capable of indicating incoming calls and utilizes an external power source to provide the simple telephone functions, the instructions for use shall state whether the apparatus is capable of indicating incoming calls when the external power source is made inoperative.

5.2.5 The instructions for use shall state whether 999 can be dialled on the apparatus for the purposes of making outgoing calls to the emergency (999) service.

5.2.6 The instructions for use shall advise the user to attach a label or other indication in keeping with the provisions made on the apparatus, displaying the PSTN, or other, number of the telephone and, if the apparatus is capable of making outgoing calls to the emergency (999) service, the number that needs to be dialled to access that service.

NOTE. 5.2.6 has not been presented for designation under Section 22 (6) of the Telecommunications Act 1984.

5.2.7 If, for an apparatus with a means of disabling the ringing detector, the fully operational position of the ringing detector specified in 8.1 a) 1) is not at the maximum volume position, the instructions for use shall state that the position of the volume control may have an effect on the REN of the apparatus.

5.3 Not assigned.

6 Electrical network connection methods

Where a means of disabling the ringing detector is provided (see note 2 and 5.1.13) it shall be either:

- a) a series disconnection of the ringing circuit; or
- b) other means where the apparatus continues to meet the requirements of ETS 300 001/NET4 and of clause 13 of this standard.

In the case of the adoption of alternative a), compliance is determined by inspection. Where alternative b) is adopted, compliance is determined by measurement of the relevant characteristics affecting bell tinkle, loop-disconnect signalling and speech transmission by the methods specified in the referenced requirements.

NOTE 1. An example of a method of disabling the ringing detector is a bell on/off switch.

NOTE 2. It is not a requirement of this standard that a means of disabling the ringing detector is a necessary feature of a simple telephone.

Section 2. Electrical characteristics of apparatus

NOTE 1. Except where stated, the characteristics specified refer to a single telephone connected to the PSTN.

NOTE 2. For guidance on the electrical characteristics of the PSTN, see appendix C of BS 6305 : 1992.

NOTE 3. See also 3.3 of this standard.

7 Not assigned.

8 Apparatus off-line (ringing state)

8.1 Ringer equivalence number

The ringer equivalence number shall comply with the requirements of ETS 300 001/NET4 with any associated external power source connected and operative.

The test procedure specified shall be carried out with the additional requirements that if the fully operational position of the volume control is not at the maximum volume position, the volume control shall be set at the position stated by the supplier (see 5.1.14).

8.2 Not assigned.

8.3 Not assigned.

9 Apparatus on-line (non-signalling state)

NOTE. Attention is drawn to the requirements of 3.4 which relate to this clause, for apparatus fitted with a user-controlled receiving volume control.

9.1 DC characteristics

The following shall apply in addition to the requirements given in ETS 300 001/NET4.

The steady state voltage measured at the terminals of the apparatus, when plotted against corresponding values of current, shall be not greater than the upper limit and not less than the lower limit as given in table 3 and as shown in figure 2.

Compliance is determined by measurements taken when the apparatus is connected to a source capable of providing currents up to the value obtained when the apparatus is connected to a voltage source of 50 V dc in series with a 400 Ω resistor.

The limit curves are determined by straight lines joining successive coordinates given in table 3.

NOTE 1. The duration of an undesignated interruption or random break in the dc path caused by the apparatus should not exceed 10 ms.

NOTE 2. A telephone should not normally require a current of more than 25 mA for satisfactory operation, although higher currents may be available on some lines. Attention is drawn to the current-limiting characteristics of modern exchanges as described in C.1 of BS 6305 : 1992, and to the fact that line and feeding resistances can restrict current to about 25 mA on conventional exchanges. Operation at currents below 25 mA is therefore an appropriate design objective. It is desirable that telephones do not normally draw more than 60 mA from a 50 V, 400 Ω supply.

NOTE 3. Successful transmission from one of two telephones both of which are on-line depends upon the characteristics of both telephones being well within the limits set out in 9.1 and the extent to which the telephones continue to be operational in the area B of figure 2. In figure 2, area A is determined by currents greater than 25 mA, and area B is determined by currents less than 25 mA.

Table 3. Co-ordinates of voltage limit curves for dc characteristics		
Limit curve	Current	Voltage
Lower limit	12.5	0
	12.5	2.3
	20	6
	100	10

9.2 Not assigned.

9.3 Earth impedance balance

NOTE 1. For the test of earth impedance balance given in ETS 300 001/NET4 the handset is clamped as for the speech transmission tests (see B.1), and without any additional elements to simulate hand capacitance.

NOTE 2. See 5.1.3

9.4 Signal balance about earth

NOTE 1. For the test of signal balance about earth given in ETS 300 001/NET4 the handset is clamped as for the speech transmission tests (see B.1) and without any additional elements to simulate hand capacitance.

NOTE 2. See 5.1.3