

Private branch exchanges for connection to public switched telephone networks run by certain public telecommunication operators

Part 1. Specification for general requirements

Centraux privés à être raccordés aux réseaux téléphoniques publics commutés de certaines entreprises de télécommunications publiques
Partie 1. Spécifications générales

Anschluß von Nebenstellen an das öffentlichen Fernsprechnetz, die von einigen Betreibern des öffentlichen Fernmeldenetzes bedient werden
Teil 1. Allgemeine Anforderungen

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Telecommunications Standards Policy Committee (TCT/-) to Technical Committee TCT/8, upon which the following bodies were represented:

- Association of British Telephone Attachment Suppliers Ltd.
- Association of Manufacturers Allied to the Electrical and Electronic Industry (BEAMA)
- British Approvals Board for Telecommunications
- British Radio and Electronic Equipment Manufacturers' Association
- British Security Industry Association
- British Telecommunications
- Business Equipment Trade Association
- Cable and Wireless Limited
- City of Kingston upon Hull Telephone Department
- Committee of London Clearing Bankers on behalf of the Committee of Scottish Clearing Bankers, Co-operative Bank, Trustee Savings Banks and Yorkshire Bank
- Communications Marketing and Servicing Association
- Computing Services Association
- Department of Trade and Industry
- Electronic Engineering Association
- Engineering Equipment and Materials Users' Association
- Independent Broadcasting Authority
- Independent Telecommunications Suppliers' Association
- Mobile Radio Users' Association
- OFTEL (Office of Telecommunications)
- Post Office Engineering Union
- Society of Telecom Executives
- Telecommunications Managers' Association
- Telecommunications Users' Association (TUA)
- UK Offshore Operators' Association Ltd.

The following bodies were also represented in the drafting of the standard, through subcommittees and panels:

- British Gas Corporation
- Central Computer and Telecommunications Agency
- Electricity Supply Industry in England and Wales
- Royal National Institute for the Blind

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Foreword

BS 6450 has been prepared under the direction of the Telecommunications Standards Policy Committee. It forms one of a series of British Standards that is being produced following the commencement of liberalization in October 1981 of the supply of certain telecommunications apparatus within the United Kingdom.

Compliance with the requirements of the appropriate Parts of BS 6450 does not of itself provide the right to connect to the PSTN, and public telecommunication operators (PTOs) may reserve the right to carry out such acceptance testing as they may deem to be necessary prior to the connection of a private branch exchange (PBX) to the PSTN¹⁾.

BS 6450 will be published in Parts; those already published, or in preparation, are as follows.

Part 1	Specification for general requirements
Part 2	Specification for private branch exchanges with terminating stations treated as an entirety
Part 3	Direct dialling in on private branch exchanges
Section 3.1	Specification for direct dialling in on private branch exchanges with terminating stations treated as an entirety
²⁾ Section 3.2	Specification for direct dialling in on private branch exchanges with ports
Part 4	Specification for ports
Part 5	Facilities on private branch exchanges
Section 5.1	Specification for facilities on private branch exchanges with terminating stations treated as an entirety
²⁾ Section 5.2	Specification for facilities on private branch exchanges with ports
Part 6	Simple call-routing mode (SCRM)
Section 6.1	Specification for the simple call-routing mode of PBX operation, with terminating stations treated as an entirety
Part 7	Specification for the procedure of in-service observation for PBXs undergoing type approval

NOTE. Full requirements for multi-frequency (MF) signalling from the PBX to the PSTN are not specified in Part 1 but are specified in the appropriate Part.

Some information on the necessity for requirements for PBXs in addition to or other than those contained in BS 6305 : 1992 and BS 6317 : 1992 is given in annex A.

Annex B gives some general information relevant to PBXs on the electrical characteristics of the PSTN. Information on tones additional to those given in BS 6305 : 1992 is given in annex C.

The tests for compliance with the requirements of BS 6450 are written, in general, without specifying, for example:

- a) the state of other PSTN lines not referred to in the test, e.g. on-line state, idle state, signalling state; or
- b) the state of other terminating stations not referred to in the test, e.g. on-hook, off-hook; or
- c) which, or how many, switching paths are to be in use; or
- d) which installation-dependent parameters (e.g. PSTN line lengths) as defined by the supplier are selected; or

¹⁾ For further information see British Telecommunications, *Preconnection inspection for call-routing apparatus to be connected to the British Telecommunications network*.

²⁾ In preparation.

- e) which combinations of PBX facilities are in use; or
- f) which combinations of terminating stations, switching paths and connection to PSTN lines are selected; or
- g) whether the PBX is in power or equipment failure mode.

It is recognized that knowledge of individual PBX system architecture would be necessary in order to decide which combinations are significant when making each test for compliance.

It is also recognized that knowledge of individual PBX system architecture would be necessary in order to decide to what extent the requirements of BS 6450 are applicable when the PBX is operating in the overload condition.

Manufacturers should be aware that, by tradition, the operation of PBX consoles has been an important source of employment for blind and partially-sighted people. It is desirable that the social benefits of this tradition should continue, and although it is not a requirement of BS 6450, designers might consider ways by which they can adapt standard PBX equipment to incorporate facilities to enable the blind and partially-sighted to operate the equipment. The Royal National Institute for the Blind is able and willing to give advice as to which features are most acceptable to blind operators. Such adaptation is likely to add to the cost of standard equipment but some users are prepared to pay a small premium in order to meet their obligations to the disabled. The Manpower Services Commission is also generally able to assist in meeting costs of aids that are essential to the employment of disabled people. It is desirable that the basic design of apparatus should facilitate adaptation for visually handicapped operators at reasonable cost. It should be stressed that while the provision of facilities for the blind is not a requirement of BS 6450, any equipment so produced, whether by additions to, or adaptation of standard equipment, or by a complete re-design, has to comply with BS 6450 if approval is to be gained for connection to the PSTN.

Recommendations for the installation of PBXs, including wiring, are given in BS 6701 : Parts 1 and 2.

This Part of BS 6450 has been presented for designation under Section 22(6) of the Telecommunications Act 1984.

This edition of BS 6450 : Part 1 replaces BS 6450 : Part 1 : 1983 which is superseded and withdrawn. This edition introduces technical changes but it does not reflect a full review or revision of the standard, which will be undertaken in due course.

The more important changes are as follows.

- a) Clause 22 has been deleted and the specification for compliance has been included in BS 6450 : Part 7.
- b) Annex K has been substantially amended.
- c) Annex O has been added.

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

BS 6450 specifies requirements for private branch exchanges that are necessary for their connection to public networks run by certain public telecommunication operators.

This Part of BS 6450 specifies the following:

- a) general requirements for private branch exchanges;
- b) requirements specific to private branch exchanges intended to have connections to the analogue interfaces of a public switched telecommunications network (PSTN).

This Part of BS 6450 does not of itself specify the complete requirements for a particular PBX installation and needs to be read in conjunction with the appropriate Part or Parts of BS 6450.

BS 6450 does not apply to private branch exchanges for connection to shared service lines or 1 + 1 carrier systems.

BS 6450 does not apply to PBXs for connection in parallel with any other apparatus whose ringer equivalence number (REN) (see 4.2.1 of BS 6305 : 1992) exceeds 0.3.

BS 6450 applies to dealer boards and automatic call distributors.

NOTE 1. The titles of the publications referred to in this Part of BS 6450 are listed on page 36.

NOTE 2. For the purposes of BS 6450, reference to male persons also includes females.

NOTE 3. Where reference is made in this Part of BS 6450 to a particular clause in another publication, the requirements are applicable irrespective of the scope of that publication. Any clauses of another publication not specifically invoked do not apply.

NOTE 4. Unless otherwise stated, all clause references refer to this Part of BS 6450.

NOTE 5. Compliance with this Part will not necessarily ensure that the apparatus is satisfactory for the user's purposes.

2 Abbreviations, definitions and notation

2.1 Abbreviations

For the purposes of this Part of BS 6450, the following abbreviations, together with those given in BS 6301 : 1989, BS 6305 : 1992 and BS 6317 : 1992, apply.

2.1.1 CEPT

Conference of European Posts and Telecommunications Administrations.

2.1.2 CSA

Called subscriber answer.

2.1.3 PABX

Private automatic branch exchange.

2.1.4 PBX

Private branch exchange.

2.1.5 PMBX

Private manual branch exchange.

2.1.6 TJF

Test jack frame.

2.1.7 PTO

Public telecommunication operator.

2.1.8 PSTN

Public switched telephone network.

2.2 Definitions

For the purposes of this Part of BS 6450, the following definitions, together with those given in BS 4727 (see note 1), BS 6301 : 1989, BS 6305 : 1992, BS 6317 : 1992 and BS 6328 : Part 1 : 1985, apply.

NOTE 1. The relevant BS 4727 publications concerned are:

Part 1 : Group 01 : 1983;

Part 3 : Group 01 : 1971;

Part 3 : Group 02 : 1971.

NOTE 2. One of the definitions differs from that given in BS 4727; it is marked with an asterisk.

2.2.1 Equipment

2.2.1.1 private branch exchange (PBX)*

Apparatus that includes the capability of switching and interconnecting, on a call by call basis, calls between any combination of the following that are intended to carry voice traffic routed via the PSTN:

- exchange lines;
- terminating stations;
- private circuits;
- private links.

NOTE. Switching and interconnecting arrangements may be automatic or manual.

2.2.1.2 earth calling PBX

PBX that calls the PSTN by means of the earth calling signalling method.

2.2.1.3 loop calling, disconnect clearing PBX

PBX that calls the PSTN by means of the loop calling, disconnect clearing signalling method.

2.2.1.4 terminating station

Extension telephone instrument, operator's console or other equivalent device not directly connected to the PSTN except via the PBX. A terminating station may originate or receive calls to and from the PSTN and originate or receive calls to and from other terminating stations associated with the PBX.

2.2.1.5 *Text deleted.*

2.2.1.6 test jack frame (TJF)

Circuit disconnection and test access facility.

2.2.1.7 loop calling, guarded clearing PBX

PBX that calls the PSTN by means of the loop calling, guarded clearing signalling method.

2.2.1.8 private circuit

Permanently assigned connection that is provided by a public telecommunication system between two ports on separate items of private telecommunication apparatus.

2.2.1.9 private link

Connection that does not form part of a public telecommunication system, between two ports on private telecommunication apparatus.

2.2.2 Indications**2.2.2.1 call arrival indication**

Indication from the PSTN to a called party that a call, incoming to him, awaits an answer.

2.2.2.2 proceed indication

Indication (e.g. dial tone) to a caller, subsequent to his having initiated a seize signal, that appropriate PSTN equipment is ready to receive routing information.

NOTE. See C.2 of BS 6305 : 1992.

2.2.3 Signals and signalling methods**2.2.3.1 answer signal**

Signal to indicate that a call has been answered.

2.2.3.2 called subscriber answer signal (CSA signal)

Signal, initiated by a called party, to indicate to the PSTN that he has answered a call incoming to him.

2.2.3.3 PSTN answer signal

Signal, initiated by the PSTN, to indicate to the caller's PBX that the outgoing call that has been made has now been answered.

2.2.3.4 clear signal

Signal, initiated by a calling or called party, to indicate that he is in the process of reverting to, or has reverted to, the idle state.

2.2.3.5 PSTN disconnect clear signal

Signal, initiated by the PSTN towards a PBX, on a PSTN line provided with the loop calling, disconnect clearing signalling method, to indicate that the PSTN regards the call as irrevocably having come to an end.

2.2.3.6 PSTN clear back signal

Signal, initiated by the PSTN towards a caller or his PBX following a PSTN answer signal, to indicate that the called party has cleared.

NOTE. This signal is distinguished from the PSTN disconnect clear signal in that, at this stage, the PSTN does not regard the call as irrevocably having come to an end.

2.2.3.7 PSTN end-of-call clear signal

Signal, initiated by the PSTN towards a PBX, on a PSTN line provided with the earth calling signalling method, to indicate that the PSTN regards the call as irrevocably having come to an end.

NOTE. The signal arises from the reversion to the idle state of this type of PSTN termination, and has the same function as the PSTN disconnect clear signal.

2.2.3.8 dialling

The sending of information needed by the PSTN to set up a required connection or invoke a desired service.

NOTE. This term includes the use of a keypad as well as a dial, and loop-disconnect signalling, MF tone signalling, or other signalling.

2.2.3.9 earth calling signalling method

Method that calls the PSTN on an outgoing call by means of an earth condition applied to the B-wire. When the PSTN has been seized, a loop is applied between the A- and B-wires and the earth condition is removed. On an incoming call from the PSTN, a CSA signal is returned by means of a loop between the A- and B-wires. At the end of each call a PSTN end-of-call clear signal is received from the PSTN.

The A-wire potential is disconnected to the PSTN during the idle state.

2.2.3.10 loop calling, disconnect clearing signalling method

Method that calls the PSTN on an outgoing call or returns a CSA signal to the PSTN on an incoming call, by means of a loop between the A- and B-wires. At the end of each call a PSTN disconnect clear signal is received from the PSTN.

NOTE. In the loop calling, disconnect clearing signalling method, the protocol is identical to that of a simple telephone connected to the PSTN with the addition of the PSTN disconnect clear signal.

2.2.3.11 hold signal

Condition needed to maintain a connection either partly or completely set up.

2.2.3.12 Text deleted.**2.2.3.13 PSTN equipment seized signal**

Signal, initiated by the PSTN towards a PBX, on a PSTN line provided with the earth calling signalling method, to indicate that the PSTN equipment has recognized, and is acting upon, a PSTN seize signal.

2.2.3.14 seize (seizure) signal

Signal initiated by a caller to indicate that he intends to set up a new call.

2.2.3.15 PBX seize (seizure) signal

Seize signal from a PBX terminating station to the PBX.

2.2.3.16 PSTN seize (seizure) signal

Seize signal from a PBX to the PSTN.

2.2.3.17 register recall signal

Signal initiated during a call, by a party to that call, for the purpose of obtaining connection or reconnection to a register so that further instructions may be given.

2.2.3.18 PBX register recall signal

Register recall signal from a terminating station user to his PBX, to secure reconnection to the PBX register.

2.2.3.19 PSTN register recall signal

Register recall signal either from a party to the call directly connected to the PSTN, or forwarded from a PBX to the PSTN, with the object of securing reconnection to the PSTN register.

2.2.3.20 PSTN guarded release signal

Signal, generated by the PSTN when the loop calling, guarded clearing signalling method is used, to indicate that the call has come to an irrecoverable end and that the PSTN is releasing the connection.

The signal will occur at one of the following three points of a call:

- a) just prior to the park state, indicating that the PSTN is about to park the line if a PBX clear signal is not received;
- b) at the end of a normal call clearing sequence prior to the PSTN restoring to the idle state;
- c) prior to the PSTN restoring to the idle state from the park state.

NOTE. The signal at the public exchange is a reduction in the feed current to less than 1 mA for a period of 400 ms to 510 ms. Owing to PSTN line characteristics, the reduction in the feed current to less than 1 mA will not necessarily be immediately detectable at the connection point. The period at the connection point below 1 mA will be not less than 220 ms.

2.2.4 States and services

2.2.4.1 loop

D.C. path between the A- and B-wires that permits the seizure and holding of a PSTN line.

2.2.4.2 calling state

Portion of a call during which a PSTN seize signal is applied.

2.2.4.3 regulated service

Service in which specified facilities are available to subscribers provided that they obey certain specific rules (set out by the regulating authority) when interfacing with that service.

2.2.4.4 park state

Condition into which the PSTN may place a PSTN line that is seized but not active on a call.

NOTE. See C.1.1 of BS 6305 : 1992.

2.2.4.5 power down state

Condition into which certain public exchanges place idle PSTN lines in order to conserve energy, and where the normal feeding arrangements are replaced by a high resistance feed.

NOTE. The PSTN is able to recognize a seize signal during the power down state (see C.1.1 of BS 6305 : 1992).

2.2.4.6 night service

PBX facility provided to allow adequate service to be given during periods when the operators' positions are unstaffed, typically at night.

NOTE. In night service, incoming PSTN calls may be directed to specific terminating station(s), or indicated generally, so that any terminating station user can answer the call by dialling a suitable code.

The facilities afforded to various terminating station users may be modified as deemed desirable by the customer.

2.2.4.7 major failure

State where at least 60 % of the PSTN lines of a PBX undergo simultaneous loss of service due to a failure within the PBX.

NOTE. An example of major failure would be a system 'crash' caused by the failure of the central processor in a single processor system or the simultaneous failure of all processors on a replicated system.

2.2.4.8 loss of service

State where any established call is lost or where incorrect response to incoming calls or outgoing call attempts persists for more than 16 s.

2.2.4.9 overload

State where the rate of actions required to operate the PBX at 100 % of its configured capacity is exceeded.

2.2.4.10 Text deleted.

2.2.5 Tests

2.2.5.1 type test

Test or series of tests directed towards approval of a design, conducted to determine whether an item is capable of meeting the requirements of the product specification.

2.3 Notation

2.3.1 dBm

Absolute power level with respect to 1 mW, expressed in decibels.

2.3.2 dBmp

Absolute psophometric power level (weighted for telephony) with respect to 1 mW, expressed in decibels.

2.3.3 dBPa

Absolute sound pressure level with respect to 1 Pa, expressed in decibels.

2.3.4 dBV

Absolute voltage level with respect to 1 V, expressed in decibels.

NOTE TO 2.3. Further information on all expressions for power levels used in this standard is given in CCITT Recommendation B.12.

3 Compliance principles

3.1 Requirements

3.1.1 Unless otherwise stated in this Part of BS 6450, the requirements of this Part of BS 6450 shall apply to a PBX in all operating states (but not overload conditions) under all combinations of terminating stations, switching paths and connections to PSTN lines and with all the possible combinations of PBX facilities in use, under the full range of installation-dependent parameters as defined by the supplier (see clause 24).

3.1.2 Unless specific PSTN line polarities are stated in this Part of BS 6450, the requirements shall be met for both polarities of PSTN line connection.

NOTE. PSTN line polarity reversals, other than as part of the operation of a signalling system, will normally occur only when the PBX is in the idle state.

3.2 Tests

3.2.1 Unless otherwise stated in this Part of BS 6450, the tests of this Part of BS 6450 shall be applied to a PBX in all operating states (but not overload conditions) under all combinations of terminating stations, switching paths and connections to PSTN lines and with all the possible combinations of PBX facilities in use, under the full range of installation-dependent parameters as defined by the supplier (see clause 24).

NOTE 1. Tests may be performed in any order.

NOTE 2. Each annex that describes tests for compliance covers, in general, tests for more than one requirement. The tests within each annex are ordered in the logical sequence in which they can be performed in the test laboratory. This order is different from that of the presentation of the requirements, which follow a conceptual order.

3.2.2 The tests described in this Part of BS 6450 shall be type tests (see 2.2.5.1).

3.2.3 Unless otherwise stated in a particular test, the tests shall be performed under the normal operating conditions described in A.1.1 of BS 6305 : 1992.

3.2.4 For apparatus with protection barriers, the protection barrier shall be connected in its normal operating position for the tests.

3.2.5 Unless otherwise stated the tests in this Part of BS 6450 shall be performed with three non-reactive 50 k Ω resistors, one between the relevant A- and B-wires and one between each wire and earth.

NOTE. These resistances simulate the worst conditions present on the PSTN (see B.2).

3.2.6 Unless otherwise stated in this Part of BS 6450, measurements shall be made at the PSTN line connection point of the PBX.

3.2.7 Unless otherwise stated in this Part of BS 6450, the tolerances associated with values of components and physical quantities referred to in the tests and figures shall be as given in table 7 of BS 6305 : 1992, except that the tolerances given for the item 'current' shall be replaced by the single entry ' $\pm 1\%$ '.

3.2.8 Where figures show an earth, this earth shall be connected to the PBX earth reference point.

NOTE. Where figures do not show an earth, and where for signalling purposes the line potential(s) need to be referenced to earth, the PBX may need to be artificially set in the appropriate signalling state for the test.

4 Safety

4.1 The PBX shall comply with BS 6301.

4.2 If protection devices are required on the A- and B-wires in order to comply with BS 6301, they shall be connected on the PBX side of the connection point (see 7.1).

Compliance shall be checked by inspection.

5 Text deleted.

6 Night service

The process of placing the PBX into or out of night service shall not interrupt any calls in progress.

Compliance shall be checked by appropriate functional tests.

7 Connection point

7.1 Location

The connection point for each circuit shall be located on the line side of the test jack frame.

Compliance shall be checked by inspection.

7.2 Test jack frame

The test jack frame shall be either:

- part of the PBX; or
- connected to the PBX by a cable or cables whose length shall not exceed 30 m (but see item 19 of table 1).

Compliance shall be checked by inspection and/or measurement, as appropriate.

7.3 Cable termination

In order to allow standardized tools to be used for both PTO cable termination and testing activities, either:

- the terminations used at the connection point shall be strips connection No. 237A, in accordance with BT Specification S1541; or
- where alternative equipment is used, the PBX supplier shall provide the necessary tools and instructions for PTO staff (see item 21 of table 1).

Compliance shall be checked by inspection and, if appropriate, by making sufficient connections with the tools following the instructions to ascertain that satisfactory cable terminations can be achieved.

NOTE 1. Terminations in accordance with a) are preferred.

NOTE 2. Further details and recommendations for cable terminations are given in BS 6701 : Parts 1 and 2.

7.4 Presentation of circuits

All interfaces of the PBX that are to be connected to the cable that carries PTO services shall be brought out to a segregated area of the TJF and the associated connection strips suitably annotated (see 7.5).

Compliance shall be checked by inspection.

NOTE 1. In many cases the TJF will have telecommunications circuits of several types terminated on it, only some of which require connection to PTO networks. This requirement ensures that the cable that carries PTO services may be terminated in a logical manner.

NOTE 2. The order of presentation of PSTN circuits will be agreed between the installer and PTO. The order will depend, in part, on the order in which the PBX and the PSTN select bothway lines (see 17.3 and item 12 of table 1).

NOTE 3. See item 16 of table 1.

7.5 Identification of connections

All circuits requiring to be connected to PTO networks shall be readily identifiable at the connection point for ease of connection, disconnection, testing and reconnection.

Compliance shall be checked by inspection.

NOTE. Where BT strips connection 237A are used, the provision of strips designation 51 ..., 53 ... or 54 ... as appropriate (see BT Specification S1541) will normally permit adequate identification, but reference to clearly presented records would also meet this requirement.

7.6 Transmission circuit, MF signalling and loop-disconnect signalling

The requirements of 6.3 of BS 6317 : 1992 shall apply at the connection point.

8 Control layouts

Control layouts shall comply with clause 15 of BS 6317 : 1992.

NOTE 1. It is recommended that the design of the user interface of terminating stations, including, where applicable, operator positions, should follow sound ergonomic principles; this is to minimize call failure or misrouting with consequent annoyance to PSTN users due to unnecessary operator error.

Section 2. Electrical characteristics

9 Supervisory tones

Prior to answering incoming PSTN calls, only supervisory tones having the same frequency, cadence and meaning as standard supervisory tones, i.e. those described in C.2 of BS 6305 : 1992 and table 2 of this Part of BS 6450, shall be injected into the PSTN.

Compliance shall be checked by inspection and, where appropriate, measurement.

NOTE 1. In order to avoid user confusion, supervisory tones used in the PBX to indicate 'ringing', 'engaged (busy)', 'number unobtainable', and 'warning tone' should conform in character and significance to the standard supervisory tones (see C.2 of BS 6305 : 1992 and annex C).

Additional supervisory tones required in connection with optional facilities, e.g. discriminatory ringing, call waiting indication (see annex C), may be used. In deciding the characteristics of such tones, manufacturers should take account of CEPT Recommendation T/SF23. Also, the particular facility and the tone employed should be within the overall parameters applying to tones and signals transmitted to the PSTN line.

NOTE 2. It is recommended that the requirement specified in clause 9 should apply to inter-PBX circuits.

NOTE 3. It is recommended that on calls answered and connected by the PBX operator to terminating stations, only awaiting answer indication (see C.2 of BS 6305 : 1992) should normally be returned to the PSTN.

10 Idle state

NOTE. During tests for compliance with the idle state requirements, the ringing detector is connected.

10.1 Idle state current

The current flowing between the PBX, in the idle state, and the PSTN shall be not greater than 120 μ A in either direction. Where applicable, the special signalling conditions of 4.4.4.2 and 4.4.4.3 of BS 6305 : 1992 shall be disabled.

Compliance shall be checked by measurement of the current flowing when each wire of the PSTN line interface is connected in turn to a 50 V d.c. source (with its positive pole earthed) applied in series with a 200 Ω resistor, the measurement being made with the other wire earthed and, where applicable, the special signalling conditions specified in 4.4.4.2 and 4.4.4.3 of BS 6305 : 1992 disabled.

During the test for compliance, currents greater than 120 μ A shall be ignored if the duration of any current in excess of 120 μ A does not exceed 10 ms in any one 110 ms duration.

NOTE 1. The requirement of 3.2.5 does not apply to this test.

NOTE 2. PTOs described in the scope of this Part of BS 6450 do not guarantee that it will be possible in all present or future circumstances to draw 120 μ A from the PSTN.

NOTE 3. In order to enable PTOs to perform accurate fault prediction testing, it is recommended that the resistance of any intentional earth path is stable to within 3 %.

10.2 Direct potentials applied to the PSTN line

10.2.1 Positive potential

If the PBX applies a steady-state positive potential relative to earth on either the A- or B-wires, the potential shall not exceed 10 V.

Compliance shall be checked by measurement of open-circuit voltage.

10.2.2 Negative potential

The PBX shall not apply any negative potential exceeding 60 V relative to earth on either the A- or B-wires.

Compliance shall be checked by measurement of open-circuit voltage.

10.3 Power level

The power level shall comply with 4.1.4 of BS 6305 : 1992.

10.4 Capacitative termination

When tested in accordance with the method described in annex N, the termination of each PSTN line shall present to the PSTN a capacitance, C , between the A- and B-wires of between 1.62 μ F and 2.64 μ F in series with a resistance, R , of between 1 k Ω and 10 k Ω .

10.5 Text deleted.

11 Ringing state

11.1 Ringing detection (call arrival indication detection)

The relevant ringing indicator shall respond to the ringing signal.

Compliance shall be checked by the method described in annex E.

11.2 Restrictions on signals sent to the PSTN line

The PBX shall comply with 4.2.2 of BS 6305 : 1992, except that in the test for compliance, figure 5 of this Part of BS 6450, with S6 in position 1, S4 in position 2, S14 in position 2, and S15 in position 2, shall be used instead of figure 17 of BS 6305 : 1992.

11.3 Impedance

The wire-to-earth impedance shall not be less than 10 k Ω in the frequency range 16 Hz to 3400 Hz.

Compliance shall be checked with 1 V a.c. r.m.s. applied.

12 On-line state

12.1 Impedance balance about earth

The PBX shall comply with 4.3.3 of BS 6305 : 1992.