

Specification for

Telex terminal apparatus for connection to public telecommunications operators' telex networks

Committees responsible for this British Standard

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British Gas plc
British Telecommunications plc
Business Equipment Trade Association
Cable and Wireless plc
Department of Trade and Industry
Electronic Engineering Association
Engineering Equipment and Materials Users' Association
Independent Telecommunications Suppliers' Association
National Communications Union
Mercury Communications Ltd.
Office of Telecommunications
Telecommunications Engineering and Manufacturing Association (TEMA)
Telecommunications Managers' Association
Telecommunications Users' Association (TUA)

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Contents

	Page
Committees responsible	Inside front cover
Foreword	iii
1 Scope	1
2 Abbreviations and definitions	1
3 TTA categories	3
4 General	5
5 Line interface	6
6 Signalling	12
7 Outgoing calls	14
8 BSP signals during message transmission	19
9 Automatic repeat attempts	20
10 Incoming call	21
11 Call clearing	23
12 Intermediate telex terminal apparatus (I-TTA)	23
13 Marking	25
14 Instructions for use	25
Appendix A Information to be provided by the supplier for test purposes	26
Appendix B General conditions for test	26
Appendix C Standard test procedures	27
Appendix D General tests	28
Appendix E Modem tests	40
Figure 1 — Power and voltage limit curves	7
Figure 2 — Measurement of longitudinal output	11
Figure 3 — Exchange simulator transmission: PTS discrimination and commencement of selection	29
Figure 4 — Exchange simulator transmission: call collision and response to WRV signal	29
Figure 5 — Exchange simulator transmission: commencement of SPC selection	29
Figure 6 — Measurement of transmit distortion	35
Figure 7 — Deviation of d.c. wetting current	36
Figure 8 — SCVF I-TTA automatic changeover	37
Figure 9 — Test circuit for measuring transmit frequency and output signal power	41
Figure 10 — Measurement of receiver margin	42
Figure 11 — Measurement of received signal level	43
Figure 12 — Receive signal level attenuation	44
Figure 13 — Measurement of return loss and transverse power level limits	45
Figure 14 — Measurement of longitudinal conversion loss	46
Figure 15 — Transverse conversion loss	47
Figure 16 — Measurement of DC resistance	48
Table 1 — Requirements and features specific to TO-TTA, RO-TTA, RT-TTA and FE-TTA	5
Table 2 — Message storage and security features specific to RT-TTA and RO-TTA	5

	Page
Table 3 — Power and voltage levels	10
Table 4 — Telegraph characters	13
Table 5 — Tolerances	27
Table 6 — Exchange simulator transmission	29
Table 7 — Exchange simulator transmission	31
Publications referred to	Inside back cover

Foreword

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

The series of standards includes product specifications giving particular requirements for individual items of apparatus together with standards covering general requirements for the connection of apparatus to the various systems of network operators.

The requirements specified in the standards are intended to ensure that apparatus complying with them, when connected to a Public Telecommunication Operator's network, will neither adversely affect any part of the network nor interfere with the service available to other users. The standards include safety requirements for the protection of personnel operating the network and for the protection of users from hazards that may arise from the connection of the apparatus to the network.

This standard is presented for designation, or other ratification for approval purposes, under the Telecommunications Act 1984. Ratification for approval purposes other than by means of a designation is under consideration.

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 conforms to 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, or other ratification for approval purposes, will be included when available with all copies of this standard. Any further information on, or details of, the designation or other ratification may be obtained from the Office of Telecommunications (OFTEL), Export House, 50 Ludgate Hill, London EC4M 7JJ.

This standard specifies particular requirements for telex terminal apparatus (TTA) and should be used in conjunction with BS 6301.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 48, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This British Standard specifies requirements for Telex Terminal Apparatus (TTA) for direct connection or via one or more pieces of apparatus to the British Telecommunications plc (BT) telex network, the Kingston Communications plc (Hull) telex network, and the Mercury Ltd. (MCL) telex network.

The requirements are intended to minimize the risk of interference with other users and to ensure compatibility with the UK Public Telecommunications Operators' (PTO's) and other terminals connected to the PTO networks.

This TTA standard applies to apparatus having the following basic characteristics:

- a) single channel voice frequency (SCVF) or low voltage signalling;
- b) a signalling rate of 50 baud;
- c) the use of characters coded in the international telegraph alphabet No. 2 (ITA2).

This standard applies to five categories of TTA:

- 1) RO-TTA receive only telex terminal apparatus capable of receiving messages only;
- 2) TO-TTA transmit only telex terminal apparatus capable of sending messages only;
- 3) RT-TTA receive and transmit telex terminal apparatus capable of receiving and sending messages;
- 4) FE-TTA front end telex terminal apparatus with minimum functionality;
- 5) I-TTA intermediate telex terminal apparatus, being a switching or patching device connected between the telex network and other categories of SCVF TTA.

Within each category of TTA, the standard specifies various optional facilities.

The obligatory and optional features for each category of TTA are summarized in clause 3.

The tests described in this standard are type tests.

NOTE 1 A list of information to be provided by the supplier for test purposes is given in Appendix A.

NOTE 2 The general conditions for test are given in Appendix B.

NOTE 3 Standard test procedures are described in Appendix C. The specific test procedures are described in Appendix D and Appendix E.

NOTE 4 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 British Standard the following abbreviations and definitions apply.

2.1 Abbreviations

NOTE At the time of going to press, PTOs offering a telex service in the UK were: British Telecommunications plc; Mercury Communications Ltd. and Kingston Communications plc.

BSP	backward signalling path
BT	British Telecommunications plc
CCITT	International Telegraph and Telephone Consultative Committee
CR	carriage return
CSCS	commence selection character sequence
FE-TTA	front-end TTA
FS	figure-shift
FSP	forward signalling path
Hull	Kingston Communications plc
I-TTA	intermediate TTA
ITA2	international telegraph alphabet number 2 (CCITT)
LF	line feed
LS	letter-shift
MCL	Mercury Communications Ltd.
NTP	network termination point
PTO	public telecommunications operator
PTS	proceed to select
RDI	redirection of call
RO-TTA	receive only TTA
RT-TTA	receive and transmit TTA
SCVF	single channel voice frequency
SP	space
SPC	stored programme control
STP	standard test procedure
TO-TTA	transmit only TTA
TRM	test reference modem
TTA	telex terminal apparatus
WRU	who are you?

2.2 Definitions

2.2.1

I-TTA resistance

the maximum dc loop resistance under any mode of operation for an I-TTA

2.2.2

forward signalling path

the path conveying signals transmitted by the TTA

2.2.3**backward signalling path**

the path conveying signals for reception by the TTA

2.2.4**out of service condition**

the condition at the TTA whereby calls are unable to be either initiated or accepted

2.2.5**free line condition**

a condition in which a TTA is not in the out of service condition and which is not processing on line an incoming or outgoing call or call attempt

2.2.6**call request signal**

the signal transmitted by a TTA to indicate that it wishes to initiate a call attempt

2.2.7**proceed to select signal**

the signal transmitted on the backward signalling path when the telex exchange is ready to receive selection signals

2.2.8**commence selection character sequence**

a sequence of characters transmitted by an SPC exchange as a prompt that selection may commence

2.2.9**incoming call signal**

the signal transmitted by the network to indicate to a TTA the presence of an incoming call

2.2.10**call accepted signal**

the signal transmitted by the TTA in response to a received incoming call signal to indicate acceptance of the incoming call

2.2.11**clearing signal**

the signal sent by the TTA or the network to initiate clearing of a call or call attempt

2.2.12**clear confirmation signal**

the signal sent by the TTA or the network as a response to a received clearing signal

2.2.13**who-are-you? (WRU) signal**

a signal comprising the ITA2 combination 4 in figure case

2.2.14**answerback**

a sequence of characters which a telex terminal automatically transmits in response to a received WRU signal in order to indicate its identity

2.2.15**“here is” signal**

a sequence of identification characters which a telex terminal may transmit

NOTE Normally, the “here is” signal is the same as the answerback.

2.2.16**call collision**

incoming call while TTA is attempting to make an outgoing call

2.2.17**return loss**

a quantity, expressed in decibels, associated with the degree of match between two impedances calculated from the following expression

$$20 \log_{10} \frac{Z_b + Z_t}{Z_b - Z_t}$$

where

Z_t is the measured complex impedance; and

Z_b is the reference complex impedance.

2.2.18**fox message**

a message for test purposes comprising “THE QUICK BROWN FOX JUMPS OVER THE LAZY DOG” (CCITT Recommendation R. 52)

2.2.19**exchange simulator**

an arrangement of apparatus that can simulate the functions and signalling timings of PTO telex networks and, where appropriate, terminating apparatus

2.2.20**presentation**

any secure means by which a message may be recognized or inspected, e.g. by printing, punching to paper tape, or displaying on a visual display unit in a manner which requires a manual acknowledgement before the screen display is changed

2.2.21**storage**

methods of recording an incoming message within the TTA in a manner which could not be readily decoded by the user, e.g. on computer magnetic discs

2.2.22**message**

a group of characters comprising a telex transmission

2.2.23**test reference modem (TRM)**

a modem of known, repeatable, and reliable performance

NOTE An example is the TRM 1A to BT specification TG 2808.

2.2.24**automatic**

a feature controlled by the TTA

2.2.25**manual**

a feature controlled by the user

2.2.26**audit path**

an event log linking different parts of an incoming message which has been split into sections due to formatting or user intervention

2.2.27**user**

the person or organization responsible to the PTO for connection of the TTA to the PTO network

2.2.28**volatile storage**

storage that requires a power supply (mains or battery)

2.2.29**non-volatile storage**

storage that does not depend on a power supply

2.2.30**selection**

the process whereby the TTA informs the network of the required destination

2.2.31**unit**

the signal element in an equal-length multi-unit telegraph code from the arrangements of which the alphabet is formed

2.2.32**unit element**

an alphabetic signal element having a duration equal to the unit interval. (CCITT Recommendation R.140)

2.3 Categories of channel signal states

The two channel states are A-condition and Z-condition.

NOTE The following are synonymous terms:—

A-condition	Z-condition
START	STOP
SPACE	MARK
BINARY 0	BINARY 1
POSITIVE	NEGATIVE
ON	OFF

3 TTA categories**3.1 Receive only TTA (RO-TTA)**

A RO-TTA shall not be capable of initiating outgoing calls.

Compliance is checked by inspection.

See 3.6.2.1, 3.6.2.2 and 3.6.2.4.

3.2 Transmit-only TTA (TO-TTA)

A TO-TTA shall either:

- a) not respond to an incoming call; or
- b) clear an incoming call as described by 10.1.1; 10.1.2, and 10.1.3.

Compliance with a) is checked by test 42 of Appendix D.

Compliance with b) is checked by the tests specified in 10.1.1, 10.1.2, and 10.1.3.

See 3.6.2.1, 3.6.2.2 and 3.6.2.3.

NOTE It is recommended that equipment in the TO-TTA category should be connected to outgoing-only telex lines. [See clause 14 i).]

3.3 Receive and transmit TTA (RT-TTA)

A RT-TTA shall be capable of initiating outgoing calls and receiving incoming calls.

See 3.6.2.1, 3.6.2.2, 3.6.2.3, and 3.6.2.4.

NOTE RO-TTA and TO-TTA are sub-sets of the RT-TTA specification.

3.4 Front-end TTA (FE-TTA)

An FE-TTA shall comprise of apparatus with at least a functionality that, with the addition of other apparatus, might be constructed to operate as an RO-TTA, TO-TTA or RT-TTA.

See 3.6.2.1, 3.6.2.2 and 3.6.2.3.

3.5 Intermediate telex terminal apparatus (I-TTA)

An I-TTA is a switching or patching device that is incorporated in the serial path between the NTP and any of the following on SCVF lines: RO-TTA; TO-TTA; RT-TTA and FE-TTA.

See 3.6.2.1 and 3.6.2.5.

3.6 Tables relating to TTA categories

3.6.1 General. Subclauses 3.6.2.1, 3.6.2.2, 3.6.2.3, 3.6.2.4 and 3.6.2.5 summarize the obligatory (A) and optional (B) features applicable to each category of TTA.

All optional clauses shall be complied with, unless the TTA supplier indicates that the option is not supported (see Appendix A).

3.6.2 Specific requirements and features

3.6.2.1 All categories of TTA. The following shall apply to all categories of TTA:

- clause 4.2 Safety

clause 13 Marking

clause 14 Instructions for use.

3.6.2.2 *TO-TTA, RO-TTA, RT-TTA, and FE-TTA.*

The requirements of the clauses indicated by A in Table 1 shall apply. The requirements of the clauses indicated by B in Table 1 shall apply if the relevant option is supported.

3.6.2.3 *Selection protocols (TO-TTA, RT-TTA and FE-TTA).* The TTA shall provide the SPC selection protocol (7.2) and, optionally, the Strowger selection protocol (7.1).

The Strowger and SPC selection protocols include a number of functions which can be provided as either manual or automatic in operation. These are described below as paired options. The TTA shall support at least one of the paired options.

All options are applicable unless the TTA supplier indicates that specific options are not supported (see Appendix A). Requirements that may require deletion from the test schedule are summarised as follows:

NOTE 1 See clause 14.

NOTE 2 Until the BT telex network is converted to all SPC working, it is anticipated that telex terminal apparatus will support the Strowger selection protocol.

a) Strowger selection protocol

NOTE 3 This requirement does not apply if Strowger selection is not supported.

Manual/automatic paired options: [omit options not supported]

7.1.6.1 or 7.1.6.2

7.1.7.4.1 or (7.1.7.4.2 and 7.1.7.4.3)

7.1.8.1.1.1 or 7.1.8.1.1.2

7.1.8.1.2.1 or 7.1.8.1.2.2

7.1.8.2.2 or 7.1.8.2.3

7.1.9.1 or (7.1.9.2 and 7.1.9.3)

Test as manual and/or automatic: [omit options not supported]

7.1.2 manual/automatic

7.1.3.1 manual/automatic

7.1.8.1.2.3 manual/automatic

7.1.8.2.1 manual/automatic

Optional: [omit options not supported]

7.1.4.1, 7.1.4.2, 7.1.7.2 and 7.1.10

b) SPC selection protocol

NOTE 4 Paired options in brackets indicate CSCS or non-CSCS option.

Manual/automatic paired options: [omit options not supported]

7.2.3.1 or (7.2.4.1 or 7.2.4.2)

7.2.7.1.1 or 7.2.7.1.2

7.2.7.2.2 or 7.2.7.2.3

Test as manual and/or automatic: [omit options not supported]

(7.2.5.1.1 or 7.2.5.2.1) manual/automatic
or

(7.2.5.1.2 or 7.2.5.2.2) manual/automatic

7.2.7.2.1 manual/automatic

Optional: [omit options not supported]

(7.2.3.2.1 or 7.2.3.2.2), 7.2.4.3, 7.2.6.2 and 7.2.8

3.6.2.4 *Message storage and security features specific to RT-TTA and RO-TTA.* The clauses indicated by A in Table 2 shall apply to RT-TTA and RO-TTA. The clauses indicated by B in Table 2 shall apply to RT-TTA and RO-TTA if the relevant option is supported.

Table 1 — Requirements and features specific to TO-TTA, RO-TTA, RT-TTA and FE-TTA

Clause	Category of TTA			
	RT-TTA	RO-TTA	TO-TTA	EF-TTA
	Obligatory (A) or optional (B) feature			
3.1		A		
3.2			A	
3.3	A			
3.4				A
4.1 and 5.1	see note 1	see note 1	see note 1	see note 1
4.2 and 5.2	see note 1	see note 1	see note 1	see note 1
6.1	A	A	A	A
6.2	A	A	A	A
6.3.1	A	A	A	A
6.3.2	B	B	B	B
6.3.3	A	A (note 2)	A	A
6.4	A	A	A	A
6.5	A	A	A	A
6.6				A
6.7	A	A	A	A
8	A		A	A
9	B		B	B
10.1.1	A	A	B	A
10.1.2	A		B } (note 3)	A
10.1.3	B	B	B	B
11.1	A		A	A
11.2	A	A	A	A
11.3	A		A	A

NOTE 1 Either 4.1 and 5.1, or 4.2 and 5.2 are obligatory for all categories of TTA (SCVF or low voltage interface, respectively).

NOTE 2 Requirements applicable to the enabling of outgoing calls do not apply.

NOTE 3 TO-TTAs comply with all of the requirements of 10.1.1, 10.1.2, and 10.1.3, or none at all (see 3.2).

Table 2 — Message storage and security features specific to RT-TTA and RO-TTA

Clause	Obligatory feature (A) or optional feature (B)
10.2.1	A
10.2.2	B
10.2.3	A
10.2.4.1	A unless 10.2.5.1 applies
10.2.4.2	A unless 10.2.5.1 applies
10.2.5.1	} see note 1
10.2.5.2	
10.2.5.3	
10.2.6	A
10.2.7	see note 2

NOTE 1 At least one of these storage techniques is to be supported.

NOTE 2 If the TTA is capable of being switched between different storage techniques as described in 10.2.7, each of the modes supported is to be tested.

3.6.2.5 Features specific to I-TTA. I-TTA shall comply with 12.1, 12.2, 12.4.3, 12.4.4 and 12.5.

Paired options: [omit options not supported]

12.3.1 or 12.3.2

12.4.1.1 or 12.4.1.2.

Optional: [omit if option not supported]

12.4.2

4 General

4.1 Connection to PTO telex network

4.1.1 SCVF interface. The method of connection shall be by means of a flexible lead and plug complying with BS 6312, or by means which allow connection to a PTO supplied connection strip.

NOTE 1 The recommended method of connection for small installations consisting of one or a few telex lines is via a plug complying with BS 6312. Larger installations may use plugs complying with BS 6312, or connection to a connection strip supplied by the PTO.

NOTE 2 A typical connection strip is Strips, Connection 237A in accordance with BT Specification S 1514.

If a plug complying with BS 6312 is used, the plug pins shall be allocated as follows:

Pin number	Allocation
1	A or B leg
2	not used
3	not used
4	not used
5	not used
6	A or B leg

If connection is to a PTO connection strip, the instructions to users shall describe the means of enabling connection within the requirement of 5.1.3.

Compliance is checked by inspection.

4.1.2 Low voltage interface. The method of connection shall be by means of a flexible lead and 25-way D-type male connector complying with BS 6623-1, or to a PTO supplied connection strip.

Compliance is checked by inspection.

If a 25-way D-type male connector is used, the connector pins shall be allocated as follows:

Pin number	Allocation	Direction Line TTA
7	Common return	<----->
2	Transmit data	<-----
3	Receive data	----->

NOTE 1 The use of the remaining pins on the 25-way D-type male connector is not specified in this standard.

Compliance is checked by inspection.

NOTE 2 The recommended method of connection for small installations consisting of one or a few telex lines is via a 25-way D-type male connector. For larger installations a PTO supplied connection strip is recommended.

NOTE 3 A typical connection strip is Strips, Connection 237A in accordance with BT Specification S 1514.

4.2 Safety

The TTA shall comply with BS 6301.

NOTE BS 6301 is expected to be superseded by EN 41003 during 1991.

5 Line interface

5.1 SCVF

5.1.1 Transmitter

5.1.1.1 Transmission frequencies. The TTA shall transmit SCVF signals to the exchange via the FSP. The output spectrum due to the modulation shall be equivalent to that produced by continuous phase, frequency shift keying with a bandwidth limitation on the output (see 5.1.1.3).

The steady state FSP frequencies shall be as follows:

Z-condition = 1 650 ± 3 Hz

A-condition = 1 850 ± 3 Hz

Compliance is checked by test 1 of Appendix E.

5.1.1.2 Output signal power. The output power of each signal state (A-condition and Z-condition), when the TTA is connected to a 600 Ω non-reactive load, shall be in the range - 14 ± 1 dBm. The difference in output power between each signal state (A-condition and Z-condition) shall not exceed 1 dB.

Compliance is checked by test 1 of Appendix E.

NOTE The recommended design tolerance is - 13 +0 -1 dBm.

5.1.1.3 Power level limits

5.1.1.3.1 General. The power level limits shall be as given in Table 3 and measured with a selective measuring set or its equivalent, calibrated to measure the r.m.s. voltage of any signal within its measurement bandwidth.

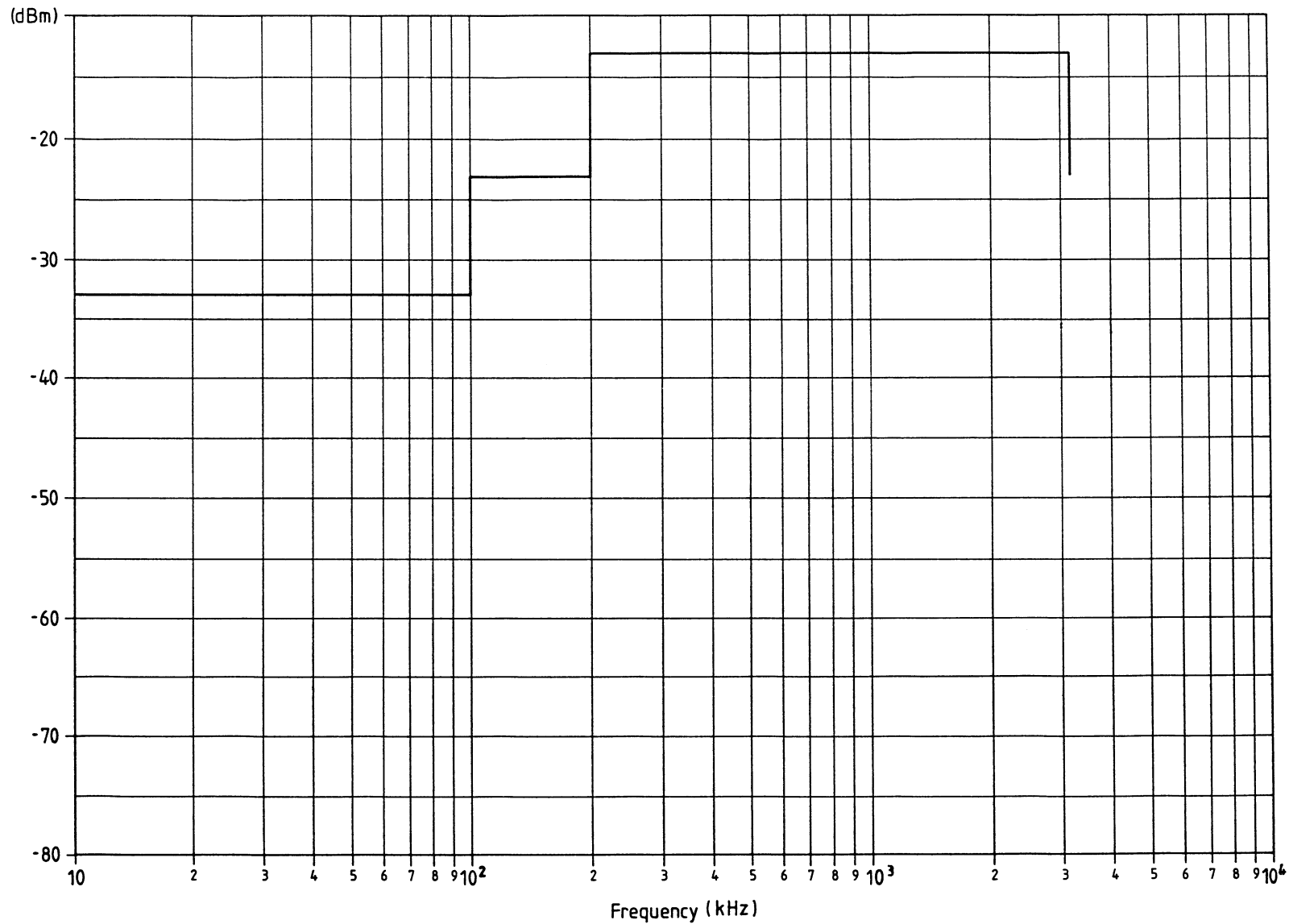
NOTE 1 The limit curves shown in Figure 1 are straight lines joining the successive co-ordinates that are given in Table 3, with the power/voltage levels in decibels plotted on a linear scale against frequency on a logarithmic scale.

NOTE 2 It is recommended that the power/voltage levels for frequencies above 8 MHz be kept at or below the power/voltage levels quoted for 8 MHz.

5.1.1.3.2 Transverse power levels. The total transverse power level contained in any 10 Hz band up to 3.4 kHz shall not be greater than the upper limit in Table 3(a) [shown in Figure 1(a)], for the centre of that band, when the TTA is connected to a 600 Ω balanced resistive load and ITA2 combination 15 is transmitted continuously at 50 baud.

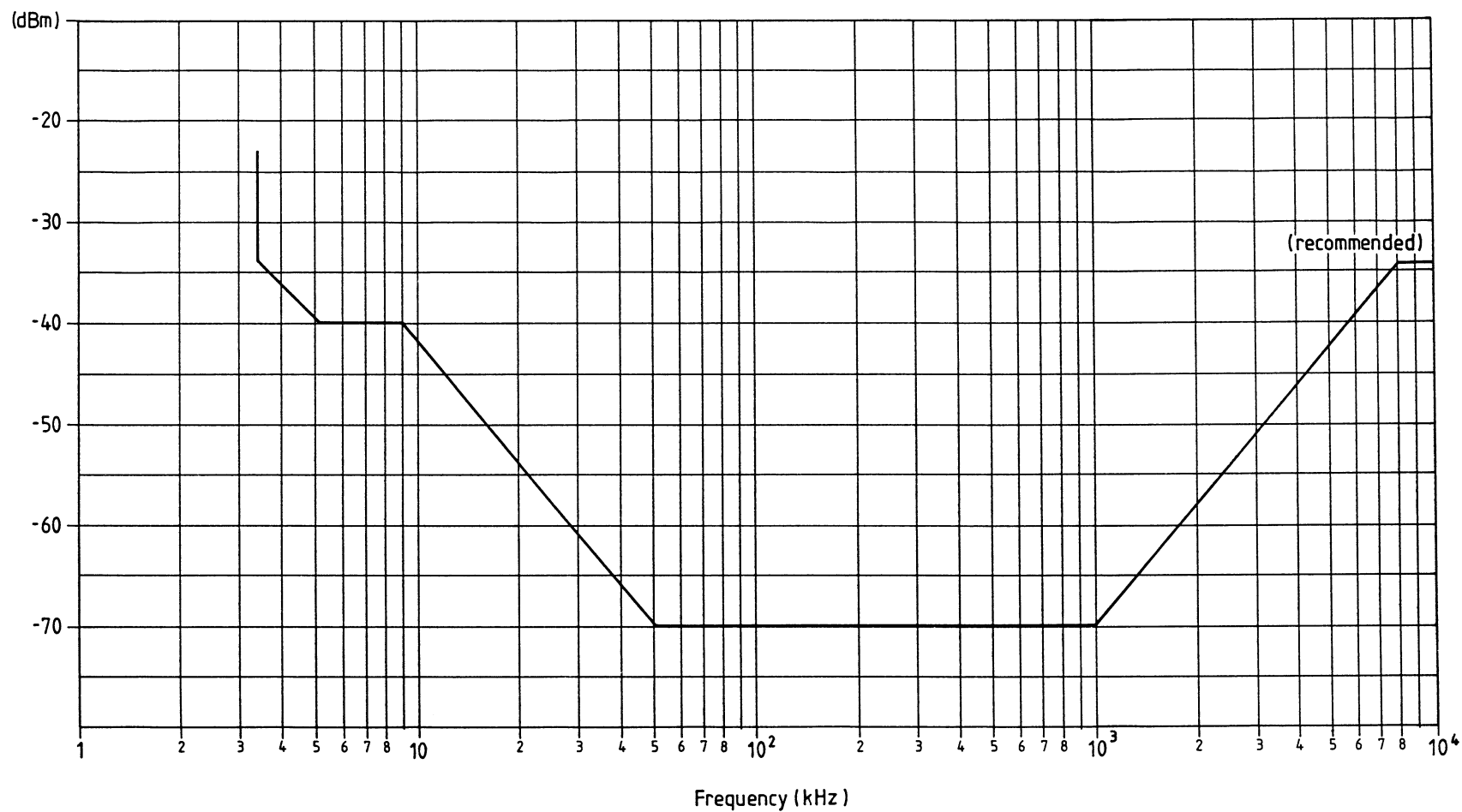
The total transverse power level contained in any 3 kHz band above 3.4 kHz shall not be greater than the limit in Table 3(b) [shown in Figure 1(b)], for the centre of that band, when the TTA is connected to a 600 Ω balanced resistive load and ITA2 combination 15 is transmitted continuously at 50 baud.

Compliance is checked by test 6 of Appendix E.



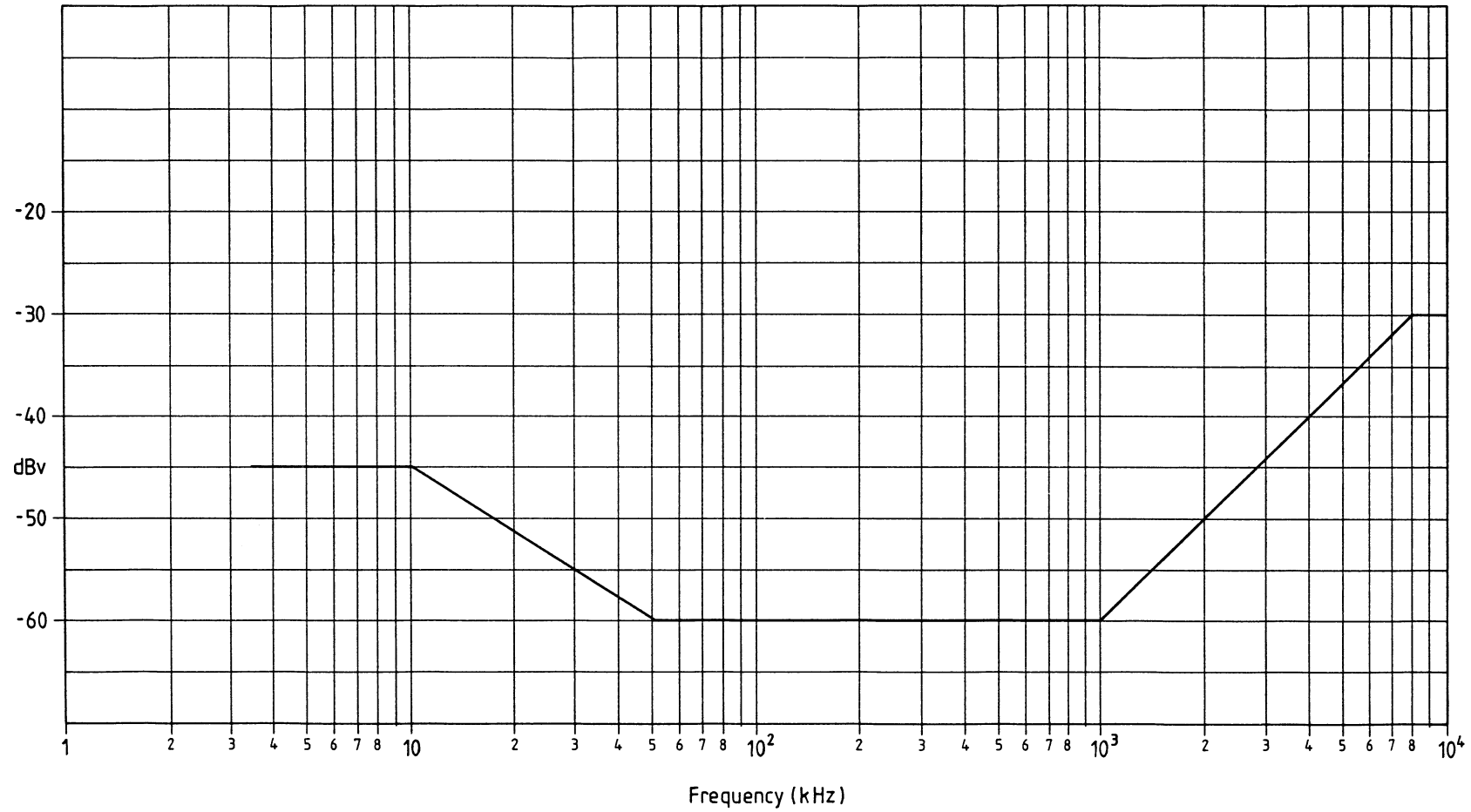
(a) Transverse power limit curve, (measured in any 10 Hz bandwidth) up to 3.4 kHz

Figure 1 — Power and voltage limit curves



(b) Transverse power limit curve, (measured in any 3kHz bandwidth) up to 8 MHz

Figure 1 — Power and voltage limit curves (continued)



(c) Longitudinal voltage limit curve, (measured in any 3 kHz bandwidth)

Figure 1 — Power and voltage limit curves (concluded)

Table 3 — Power and voltage levels

(a) Transverse power levels up to 3.4 kHz		
Frequency	Power level	
kHz	dBm	
< 0.1	− 33	
0.1	− 23	
0.2	− 23	
0.2	− 13	
3.2	− 13	
3.2	− 23	
3.4	− 23	
(b) Transverse power levels above 3.4 kHz		
Frequency	Power level	
kHz	dBm	
3.4	− 33	
5.1	− 40	
8.9	− 40	
50.0	− 70	
1 000.0	− 70	
8 000.0	− 34	
(c) Longitudinal voltage levels		
Frequency	Limit	R1, R2, R3
kHz	dBv	Ω
3.4	− 45	300
10.0	− 45	300
10.0	− 45	70
50.0	− 60	70
1 000.0	− 60	70
8 000.0	− 30	70
NOTE Figure 2 depicts the test network to which R1, R2, and R3 relate.		

5.1.1.3.3 Longitudinal voltage levels. The total longitudinal voltage level contained in any 3 kHz band above 3.4 kHz, shall not be greater than the limit in Table 3(c) [shown in Figure 1(c)], for the centre of the band, when the TTA is connected to the circuit shown in Figure 2. Up to 8.9 kHz, compliance shall be determined by testing the TTA with ITA2 combination 15 (letter O) being transmitted continuously at 50 baud.

Compliance is checked by test 6 of Appendix E.

5.1.2 Reception. The nominal BSP frequencies sent by the network shall be as follows:

Z-condition = 980 Hz

A-condition = 1 180 Hz

5.1.3 Termination

5.1.3.1 D.C. resistance. The D.C. resistance of the termination shall not be greater than 60 Ω .

Compliance is checked by test 8 of Appendix E.

5.1.3.2 Return loss. The return loss shall be not less than 14 dB with respect to a 600 Ω non-reactive load at all frequencies between 300 Hz and 3 400 Hz, and for wetting currents up to 15 mA.

Compliance is checked by test 4 of Appendix E.

5.1.3.3 Apparatus balance about earth. The line interface of the TTA shall have an impedance balance about earth of not less than 46 dB at all frequencies between 300 Hz and 3 400 Hz, and for wetting currents up to 15 mA.

Compliance is checked by measurement of longitudinal and transverse conversion losses by test 5 of Appendix E.

5.1.4 Transmitter and receiver performance

5.1.4.1 Transmitter distortion. When connected to a worst case line having an impedance presenting a return loss, against a non-reactive 600 Ω termination, of 4 dB the degree of gross start/stop distortion of transmitted signals measured at the output of the test reference modem shall not exceed 10 %.

Compliance is checked by test 7 of Appendix E.

5.1.4.2 Receiver margin. When connected to a worst case line having an impedance presenting a return loss, against a non-reactive 600 Ω termination, of 4 dB, the TTA shall be capable of interpreting signals with start element distortion of 35 % long and short as measured before modulation at nominal BSP frequencies (see 5.1.2), and shall be capable of correctly interpreting signals with start element distortion of 33 % long and short at BSP frequencies deviating from nominal by ± 6 Hz.

The TTA is deemed to be receiving correctly when the error rate of the received characters is not more than 1 in 1 000.

Compliance is checked by test 2 of Appendix E.

NOTE Telex networks operating in conformity with CCITT Recommendations may provide continuous signals of character length equal to 7.25 units with occasional characters of 7.00 units, i.e. 1-unit stop element, occurring at a maximum rate of 1 per second.

5.1.4.3 Received signal level

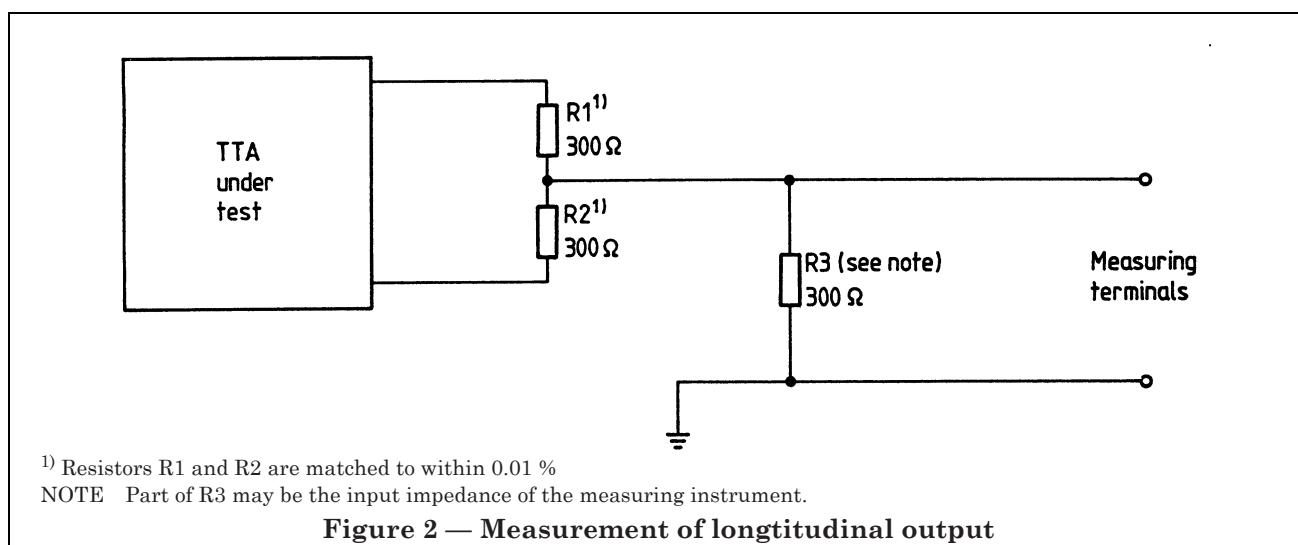
5.1.4.3.1 The TTA shall incorporate a signal level detector which responds to the total power contained within the nominal spectrum of the received line signal.

NOTE A 400 Hz interference signal is included in the test to ensure selective discrimination.

Compliance is checked by test 3 of Appendix E.

5.1.4.3.2 When the received signal level is – 43 dBm or greater, the TTA shall interpret the line condition as either A-condition or Z-condition.

Compliance is checked by test 3 of Appendix E.



5.1.4.3.3 Within 450 ms of the received signal level falling below a threshold of between – 45 dBm and – 48 dBm, the TTA shall commence sending the clearing signal A-condition on the FSP.

The receiver shall interpret correctly or incorrectly up to five characters received after the signal level falls below the threshold. Thereafter, the TTA shall not interpret characters received until the received signal level has returned to at least 2 dB above the threshold.

Compliance is checked by test 3 of Appendix E.

NOTE If after a drop in received signal level below the threshold given in 5.1.4.3.2 but before the start of transmission of the clearing signal the received signal returns to a level greater than 2 dB above the threshold for a period greater than 10 ms, transmission of the clearing signal may be inhibited.

5.1.4.3.4 Once the signal level has fallen below the threshold value the TTA shall ignore any subsequent increases in the signal level which are up to 2 dB above threshold and of any duration.

Compliance is checked by test 3 of Appendix E.

5.1.4.3.5 Once the signal level has fallen below the threshold value the TTA shall ignore any subsequent increases in the signal level which are up to 10 ms duration of any amplitude up to – 42 dBm. This requirement does not apply during the first 20 ms from the fall of signal level.

Compliance is checked by test 3 of Appendix E.

5.1.5 TTA out of service. When the SCVF modem is conditioned to indicate TTA out of service, the transmitted signal power on the FSP shall not exceed – 50 dBm over the frequency range 300 Hz to 3 400 Hz.

Compliance is checked by test 20 of Appendix D.

NOTE 1 The out of service condition may exist following user or system action or as a result of system failure. In either case the out of service condition is characterized by an absence of TTA generated A-condition and Z-condition signals on the FSP.

NOTE 2 The telex exchange will interpret the out of service condition as a subscriber absent condition. Calls destined for the out of service TTA will be cleared after transmission of the service signal ABS or DER.

5.1.6 TTA out of service from free line condition. The TTA shall go out of service only from the free line condition and when at least 1 s has elapsed since the end of a previous call (incoming or outgoing), as measured from the start of transmission or reception of a clear confirmation signal. This requirement shall not apply when the TTA is out of service because of the loss or removal of mains power.

Compliance is checked by test 21 of Appendix D.

5.2 Low voltage

NOTE 1 For SCVF modems see 5.1.

NOTE 2 The low voltage interface (based on CCITT Recommendation V.28) will allow direct connection from the TTA to the PTO network connection point. The low voltage interface is not suitable for external line use and this restricts it to the same building local to the TTA.

NOTE 3 The low voltage interface operates in a double current mode with the receivers isolated.

5.2.1 Receiver

5.2.1.1 Input resistance. The DC resistance shall lie in the range 3 000 Ω 7 000 Ω for voltages in the range 3 V to 15 V.

Compliance is checked by test 9 of Appendix E.

5.2.1.2 Receiver threshold. A signal voltage in the range – 3 V (threshold) to – 15 V (maximum) shall be interpreted as Z-condition. A signal voltage in the range + 3 V (threshold) to + 15 V (maximum) shall be interpreted as A-condition.

Between the threshold voltages, noise immunity shall be provided by ensuring that a hysteresis of at least 0.5 V exists between the switching voltages.

Compliance is checked by test 10 of Appendix E.