

Specification for

Television receivers and monitors for use in education and training

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Electronic Equipment Standards Policy Committee (EEL/-) to Technical Committee EEL/25, upon which the following bodies were represented:

- British Broadcasting Corporation
- British Radio and Electronic Equipment Manufacturers' Association
- British Telecommunications plc
- Independent Broadcasting Authority
- Institution of Electrical Engineers
- Radio, Electrical and Television Retailers' Association
- Radiocommunications Agency

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

- Association for Consumer Research (ACRe)
- British Educational Equipment Association
- Consumer Policy Committee of BSI
- Department of Education and Science
- Greater London Council
- Inner London Education Authority, Centre for Learning Resources
- International Consumer Electronics Association (ICEA)
- National Council for Educational Technology (NCET)
- National Television Rental Association
- Training & Educational Systems Testing Bureau (TEST Bureau)

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Foreword

This British Standard has been prepared under the direction of the Electronic Equipment Standards Policy Committee. It specifies essential technical and operational requirements for television receivers and monitors for educational and training use which may differ from the requirements for equipment used in household installations (BS 415). It applies to equipment supplied with or without a stand.

This British Standard supersedes BS 4958:1973, Supplement No. 1 (1976) to BS 4958:1973 and BS 5488:1977, which are withdrawn.

The specification for educational equipment should not, for economic reasons, deviate unnecessarily from that for household equipment of the same type; however, there are certain special needs, such as for build strength and for tighter safety and security measures, for suiting equipment more closely to use in educational and training establishments. This specification therefore does not cover every aspect of receiver or monitor design, but it includes a number of clauses, compliance with which is conditional only upon a particular feature being present in a specific product. Where these additional facilities are required, they should have been agreed between the purchaser and the supplier.

Attention is drawn to the possible dangers associated with incautious moving of a large television receiver or monitor mounted on a stand, and reference should be made to 4.2, 4.3 and the appendices.

Product certification. Users of this British Standard are advised to consider the desirability of third party certification of product conformity with this British Standard based on testing and continuing surveillance, which may be coupled with assessment of a supplier's quality systems against the appropriate Part of BS 5750.

Enquiries as to the availability of third party certification schemes will be forwarded by BSI to the Association of Certification Bodies. If a third party certification scheme does not already exist, users should consider approaching an appropriate body from the list of Association members.

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.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 20, 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 features and facilities, and special requirements for safety, performance, security and maintenance relating to education and training use, of television receivers and of picture monitors which do not include facilities for reception. The latter include composite-video and RGB-video monitors both with and without sound channels.

In general the performance of equipment marketed for the present purpose is sufficiently high, requiring only a few characteristics of performance to be specified in detail in this standard.

The standard applies to equipment supplied with or without a stand and can also be used to test whether a combination of equipment with any particular stand is satisfactory. However, it would not be correct to claim that a stand by itself complies with this standard, irrespective of the equipment fitted or intended to be fitted to it.

Visual display equipment compatible with only one particular computer or type of computer is not within the scope of this standard.

NOTE 1 Regarding installation, attention is drawn to BS 6330 for guidance on installation of equipment with facilities for the reception of broadcast programmes, and to BS 6259 for guidance on installation of sound system equipment.

NOTE 2 The titles of the publications referred to in this standard are listed on the inside back cover.

2 Definitions and symbols

For the purposes of this British Standard the definitions given in BS 4727-3:Group 04, and the definitions and the symbols for decibel suffixes given in BS 3549 apply, together with the following.

2.1

equipment

a television or picture monitor, a combined receiver/monitor, or a receiver and/or monitor combined with a video recorder or player

2.2

combination of equipment and stand

a complete assembly of equipment and stand or trolley, considered as a unitary item of equipment (even though it may be delivered in component parts and assembled on site)

2.3

authorized person

a person designated by management to carry out duties and tasks on their behalf on the understanding that the correct and appropriate procedures will be followed and standing instructions obeyed

2.4

build strength

quality, condition, or degree of being strong, by virtue of the form or make of the component parts and the way in which the equipment is constructed from them

3 General

3.1 Build strength

The equipment shall have been designed such that it will be able to withstand the educational and training environment.

NOTE 1 Manufacturers should bear in mind that the education and training environment is more severe than that in a normal household. Because the details of build strength are so much dependent on the design of individual products it is not practicable to specify test methods in this standard. Some of the specifications and methods in BS 2011-2.1, BS 4875, BS 5873 and BS 6250 may be applicable.

NOTE 2 For recommended conditions of use in education and training establishments, see Appendix A.

3.2 Electromagnetic compatibility (generation of, and immunity from, interference)

Equipment for the reception of broadcast programmes shall comply with the recommended limits for radiated interference and immunity from interference for off-air receivers given in BS 905. Monitors shall comply with the relevant clauses of BS 905, pending the publication of a British Standard on the electromagnetic compatibility of monitors.

3.3 Constructional features

3.3.1 Doors and hoods

NOTE Doors and hoods can be useful in making the picture more visible and avoiding screen reflections. However a cost is involved in their provision.

If fitted, the following requirements shall apply to equipment and to a combination of equipment and stand.

- a) Doors shall remain in position when placed in the fully open and closed positions.

Compliance shall be checked by inspection.

- b) Adequate provision shall be made for gripping the doors for opening them.

Compliance shall be checked by inspection.

- c) Doors shall open so that the included angle is greater than 90°.

Compliance shall be checked by inspection.

- d) The inside surfaces of doors and hoods shall be of a dark neutral colour and a matt finish.

Compliance shall be checked by inspection.

- e) Hoods shall be non-detachable and shall retract or fold away so that they are protected and retained when the doors are closed.

Compliance shall be checked by inspection.

f) An illuminated, or audible, warning shall be visible, or audible, when the equipment is connected to the mains supply, and switched on and the doors are closed.

Compliance shall be checked by inspection.

3.3.2 Small screen equipment

NOTE 1 Cabinet styles usually change from portable type to fixed set type at a screen size of approximately V40, but a clear distinction is difficult because the larger portable equipment is quite heavy and bulky.

NOTE 2 In the V system of designating picture size, the number refers to the length in centimetres of the diagonal of the visible picture.

Small screen equipment shall have:

- a) means for permanent attachment to a bench top or study carrel for security purposes;
- b) a headphone socket, if audio facilities are provided in the equipment;
- and, unless specifically designed for fixed use,
- c) means for gripping the cabinet to carry it;
- d) a mass not exceeding 12 kg.

3.4 Reliability

3.4.1 The operation of the equipment without an input signal, and with any accessible control at any position, shall not damage the equipment in any way.

3.4.2 On equipment with video and audio output sockets the circuit design shall be such that electrical mis-termination of any socket will not cause damage to the equipment circuits.

3.5 Information for the user

Information for the user shall comprise the following.

- a) The user instruction book, containing details of installation procedure, setting-up, operation of all user controls and features, simple fault diagnosis with the user controls, and the functions and contact designations of all connectors.

NOTE It is very important that this document should be easily available to all users of the equipment.

- b) Abridged instructions, clearly marked on the equipment itself if there is a suitable area to display them.

(See also 7.1.4 and 7.2.2.4.)

4 Safety

NOTE Advice on product safety for schools undertaking purchasing on their own behalf is given in Appendix B.

4.1 Electrical

4.1.1 For electrical safety, the equipment shall comply with BS 415.

NOTE Attention is drawn to the statement on product certification in the foreword.

4.1.2 In addition to the requirements of BS 415, no aperture in the equipment shall permit the test pin IV specified in BS 3042, when applied with a force of 10 N, to penetrate the structure so as to touch any live parts.

NOTE A greater degree of protection against wilful damage may be achieved if no aperture will admit the test pin at all. Attention is, however, drawn to the third paragraph of the foreword.

4.1.3 The mains lead shall be fitted with a 13 A plug, complying with BS 1363, fitted with the appropriate (usually a 5 A) fuse.

4.2 Mechanical

4.2.1 Since the mechanical safety of a combination of equipment and stand depends in a complex way on the mechanical properties of the component parts, such combinations shall not be disassembled for use with other equipment or stands unless the safety of such a new combination has been confirmed by an authorized person.

NOTE In multi-storey buildings it might be necessary to transfer the equipment from floor to floor. Where there is no lift which is capable of taking the equipment it is preferable for a sufficient quantity of equipment to be provided so that transfers from floor to floor are unnecessary in normal circumstances. In any case, whenever a combination of equipment and stand has to be taken up or down stairs, it should be dis-assembled and the component parts should be carried separately. This, and the subsequent re-assembly, should be done only by authorized persons.

4.2.2 After re-assembly a combination shall be checked by an authorized person to ensure that the equipment has been correctly and firmly fitted to the stand.

NOTE This information should be included in the "User instructions".

4.2.3 If a stand is provided, the equipment shall be securely fixed to it in such a manner that full compliance is maintained with 4.2.5.

(See also 4.1.1.) No part of the stand shall obstruct ventilation to a greater degree than it is obstructed when the equipment is standing in its normal position on a flat surface. Fasteners for attaching the equipment to the stand or used in the structure of the stand shall be provided with anti-loosening means. [See, for example, BS 4464 (for helical spring washers) and BS 2470 (for cup point set screws).] Fasteners shall be provided with positive anti-loosening devices.

4.2.4 Because different stands of similar appearance can have markedly different stability properties, each version of a stand shall be clearly marked with an identification that is unique to the model and version of stand. If the stand is made up of interchangeable parts, each part shall be clearly marked with a unique identification code unless it can easily be identified otherwise, e.g. by measurement of main dimensions.

4.2.5 It shall not be possible, with the stand provided or with any other stand recommended by the equipment manufacturer or distributor, to fix the equipment to the stand in any way which would result in the completed assembly failing to comply with any clause of this standard when using tools of the general type which are recommended by the manufacturer or distributor or which are suitable for use with the fixing devices supplied.

4.2.6 A mobile type of stand shall be mounted on castors which cannot be locked.

NOTE Considerations in the selection of the wheel size are detailed in Appendix C.

4.2.7 An assembly of equipment and a mobile stand shall be able to be manoeuvred through a doorway 750 mm wide.

4.2.8 A mobile assembly shall be clearly marked with an arrow, in white characters on a rectangular green background in accordance with BS 5378-1, and, on one end, with the word "PUSH" indicating the preferred direction in which the assembly should be moved.

4.3 Stability test

4.3.1 A combination of equipment and stand which includes a detachable or portable item such as a video recorder shall comply with **4.3.2** and **4.3.3** whether the detachable item is present or not.

4.3.2 An assembly of equipment on a stand without wheels shall not topple over when tilted to an angle of 15° from the vertical in any direction.

4.3.3 An assembly of equipment on a mobile stand, either steerable as described in **A.7 b)** or capable of travel in any direction, shall satisfy the static balance test given in Appendix D when applied in the preferred normal direction as marked on the assembly (see **4.2.8**) and in the reverse direction.

In the directions at right angles to the normal direction, the assembly shall not topple when tilted to an angle of 15° from the vertical.

5 Controls

5.1 The controls shall be sufficiently robust to withstand the normal hazards of education and training use, easy to use and permanently labelled. Compliance with the last shall be checked by inspection.

5.2 The following user controls shall be provided on equipment:

- a) on/off;
- b) picture brightness.

NOTE For colour receivers and monitors it is recommended that user controls for contrast and colour saturation are also provided.

5.3 A user sound volume control shall be provided on equipment which has facilities for sound reproduction.

5.4 Channel selection controls shall be provided on equipment which has facilities for the reception of broadcast programmes off-air or by cable. A minimum of six channels shall be selectable. At least one channel shall be suitable for the reproduction of r.f. signals from a household-type helical scan video cassette recorder and the channel selector or display shall be marked "AV", "VCR" or "video".

NOTE The controls in **5.2** to **5.4** may be duplicated on a remote control unit and other control functions may be provided either by remote control, or on the equipment, or both.

5.5 Equipment with remote control shall have sufficient local controls integral with the equipment to ensure that it may be used even if the remote control transmitter is missing or is otherwise out of action.

NOTE The operation of any teletext functions is not included in this requirement.

5.6 Equipment which has facilities for the reception of broadcast programmes off-air or by cable shall have at least the controls specified in **5.2** and **5.3** accessible at the front of the equipment.

6 UHF off-air receiving equipment

NOTE The following requirements apply only where the mentioned feature is provided.

6.1 The receiver shall be tunable to UHF, 625 line channels 21-68 and shall be suitable for the reception of programmes transmitted using the CCIR system PAL-I.

6.2 The maximum input before overloading occurs shall exceed 10 mV vision carrier e.m.f.

6.3 The rated input impedance of the receiver shall be 75 Ω unbalanced and the actual standing wave ratio shall not exceed 4 : 1 when the receiver is fed from a 75 Ω source.

7 Visual reproduction

7.1 Equipment with input facilities for video signals

NOTE 1 The requirements of **7.1.1** apply only where the mentioned feature is provided.

NOTE 2 Most of the requirements are consistent with those in BS 6552.

7.1.1 Composite video input

NOTE The requirements of 7.1.1.1 and 7.1.1.2 are based on a signal whose video-to-sync ratio is 2.33 ± 0.75 .

7.1.1.1 The input shall be a.c. coupled and have a sensitivity suitable for all signals in the range 1 V peak-to-peak, ± 3 dB, with positive-going video and negative-going sync.

7.1.1.2 The rated input impedance shall be 75Ω (terminated). If the input is suitable for loop-through operation, the input impedance shall be not less than 1 k Ω .

7.1.2 RGB video input

NOTE The requirements of 7.1.2.1 to 7.1.2.6 assume that a separate synchronizing signal is provided. RGB TTL signals are normally not suitable for distribution over cables much longer than 10 m.

7.1.2.1 RGB video (analogue) inputs shall have sensitivities suitable for all signals in the range 0.7 V peak-to-peak, ± 3 dB, positive-going. The sensitivities of the three component inputs shall not differ by more than 0.5 dB.

7.1.2.2 Inputs for synchronizing signals accompanying RGB video (analogue) signals shall be suitable for all signals in the range 0.3 V peak-to-peak, -3 dB, $+10$ dB, negative-going.

7.1.2.3 The rated input impedance of RGB video (analogue) inputs shall be 75Ω terminated. Underterminated, the input impedance shall be not less than 1 k Ω .

7.1.2.4 RGB video (TTL) inputs shall be suitable for accepting signals of up to 5 V peak-to-peak, positive-going.

With true TTL inputs, input signals of up to 0.8 V shall not result in any illumination of the picture display: illumination shall be switched on with an input signal value of less than 2 V and the screen luminance shall remain constant for input signals up to 5 V. With TTL-level (hybrid) inputs maximum illumination of the picture display shall be obtained with an input of 1.5 V.

NOTE TTL-level (hybrid) inputs behave as linear inputs up to an input voltage of less than or equal to 1.5 V and will accept input voltages of up to 5 V.

7.1.2.5 Inputs for synchronizing signals and accompanying RGB video TTL signals shall be suitable for accepting signals of up to 5 V peak-to-peak, negative-going.

7.1.2.6 The d.c. input impedance of RGB video (TTL) inputs shall be at least 10 k Ω .

7.1.3 RGB intensity (RGBI or IRGB)

The intensity signal shall comply with the same requirements as for the accompanying RGB signals. The intensity signal in all cases shall be a two-state signal.

7.1.4 User instructions

The user instructions shall clearly state the type(s) of RGB video inputs provided on the equipment: RGB video (analogue), RGB video (TTL), RGB video TTL-level (hybrid). Except for the peritelevision connector referred to in 9.2 i) all connectors on the equipment for RGB video inputs shall be marked to indicate the type of RGB video signal for which each connector is intended.

7.2 Equipment providing video signal outputs

NOTE 1 The requirements of 7.2.1 and 7.2.2 apply only where the mentioned feature is provided.

NOTE 2 Most of the requirements are consistent with those in BS 6552.

7.2.1 Composite video output

The output shall be 1 V peak-to-peak, ± 3 dB, with positive-going video, at peak white. The video-to-sync ratio shall be 2.33 ± 0.75 .

7.2.2 RGB video output

7.2.2.1 RGB video (analogue) output signals, when terminated with 75Ω , shall be 0.7 V peak-to-peak, ± 3 dB, positive-going, between the peak value and blanking level. When the component signals are intended in combination to result in a monochrome picture display, the difference in peak level between any two primary colour signals shall not exceed 0.5 dB.

7.2.2.2 Synchronizing output signals, when terminated with 75Ω , shall be 0.3 V peak-to-peak, -3 dB, $+10$ dB, negative-going.

7.2.2.3 RGB video (TTL) output signals, when terminated with 10 k Ω , shall not exceed 5 V peak-to-peak, positive-going.

For true TTL outputs, at blanking level the signal shall not exceed 0.4 V; for peak level the signal shall be not less than 2.4 V. For TTL-level (hybrid) outputs, maximum illumination shall be represented by a signal within the range 1 V to 1.5 V peak-to-peak, although the maximum signal amplitude may be up to 5 V peak-to-peak.

7.2.2.4 The user instructions shall clearly state the type(s) of RGB (or RGBI) video outputs provided on the equipment: RGB video (analogue), RGB video (TTL), RGB video TTL-level (hybrid). Except for the peritelevision connector referred to in 9.2 i) (for which the RGB signals shall comply with BS 6552) all connectors on the equipment for RGB video outputs shall be identified by appropriate marking to indicate the type of RGB video signal available from the connector.