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Specification for

**School [REDACTED]
television receivers
and stands**



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The Schools Television Receivers Committee, under whose supervision this British Standard was prepared, consists of representatives of the following Government departments and scientific, industrial and other organizations:

Association of Education Committees
British Broadcasting Corporation
British Radio Equipment Manufacturers' Association
Department of Education and Science
Department of Trade and Industry
Educational Foundation for Visual Aids
Electronic Engineering Association
Electronic Rentals Association
Greater London Council
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Foreword

This British Standard has been prepared at the request of the Association of Education Committees, to take the place once occupied by the booklet 'School Television Broadcasting' published for three Associations (County Councils Association, Association of Municipal Corporations and Association of Education Committees) and the (then) London County Council by the AEC in 1956, and long out of print.

School television is likely to increase in scope considerably in the future. The rate of growth is inevitably bound up with the cost of equipment involved and this cost is likely to be less the nearer this equipment is in specification to that used in domestic installations. The specification of a school television receiver should not deviate from that of a domestic television receiver except where absolutely necessary. This specification therefore does not cover every aspect of receiver design, but specifies those technical requirements essential for school use which may differ from the requirements for equipment used in domestic installations.

The main points of deviation are likely to be due to:

- (1) the surroundings in which the receiver is used, necessitating a special cabinet, the largest picture tube in volume production, together with adequate sound;
- (2) the sources of signal, which may, in addition to broadcast sources, include video tape recordings and live camera pictures;
- (3) the possible need for mobility of the receiver.

Education authorities are encouraged to use equipment based on a common type that can be made in reasonable production quantities, and should ensure that any specific requirements are kept to a minimum to reduce the need for custom built receivers.

The purpose of this British Standard is to provide a specification for:

- (1) a basic school receiver;
- (2) a receiver with additional facilities which allow it to be used directly for recording and playback at video and audio frequencies.

Either type may be required for direct reception from an aerial or for reception by means of a school or area wired distribution system. No attempt has been made to cover any more sophisticated equipment.

Attention is drawn to the possible dangers associated with incautious moving of a large television receiver mounted on a stand, and reference should be made to 6.2, A.6 and Appendix D. The committee responsible for preparing this specification has given a great deal of time and attention to considering the introduction of recommendations which should provide reasonable assurance for the safety of school staff and pupils, bearing in mind that if a stand with a set on it has to be moved in a school the dimensions of the stand must be such that it will pass through a school classroom doorway.

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British Standard Specification for

School television receivers
and stands**1. General****1.1 Scope**

This British Standard specifies requirements for construction and performance for television receivers for use in schools, together with stands on which they can be mounted.

The specification is arranged in six sections, dealing with:

- electrical signal input;
- electrical output requirements;
- controls;
- electrical and mechanical construction;
- safety requirements;
- reliability requirements.

This specification does not cover every aspect of design, but it is limited to the essential technical and operational requirements which are particular to television receivers for use in schools.

This standard covers monochrome single standard 625 line receivers. Much of the specification also applies to colour receivers, but techniques are not sufficiently developed to enable a complete standard to be issued for these at present.

This specification is not intended to cover small screen portable receivers.

Appendix A gives details of recommended school viewing and listening conditions which lead to certain design requirements and gives recommendations about servicing. Appendix B and Figures 1-4 explain why a particular arrangement of video and audio input panel, with a three position selector switch, has been specified for receivers with additional facilities. Appendix D provides guidance about the stability of receivers and stand assemblies.

NOTE. The titles of the British Standards and Codes of Practice referred to in this standard are listed on the inside back cover.

Supplement No.1 to this standard is an interim document covering additional requirements applicable to colour receivers for use in schools.

1.2 Definitions and symbols

For the purposes of this British Standard the definitions and the symbols for decibel suffixes given in BS 3549 apply. Reference should also be made when necessary to BS 2065, BS 204 and relevant sections of BS 4727 which will eventually supersede BS 204.

Except where otherwise stated, any reference to an aerial socket includes HF system input sockets as well as UHF/VHF input sockets.

1.3 Installation

Attention is drawn to CP 1020, which is a revision of CP 327.201:1960, and CP 327:Part 3, for guidance about installation etc., which shall be followed wherever they are applicable.

1.4 Testing

Except where otherwise stated, testing shall be carried out in accordance with BS 3549:1963 for vision and BS 4054 for sound.

1.5 Interference

Recommended limits for radiated interference and immunity from interference for off-air receivers are given in BS 905. Additional requirements for receivers to be used in conjunction with relay systems are the responsibility of the appropriate system authority.

1.6 Marking

The receiver shall be permanently marked with the following particulars.

- (1) The number of this British Standard (BS 4958).
- (2) The necessary details required by Clause 5 of BS 415:1967.
- (3) The manufacturer's name, model and serial number.

NOTE 1. The mark BS 4958 on or in relation to the product is a claim by the manufacturer that it complies with the requirements of this standard.

NOTE 2. Attention is drawn to certification facilities offered by BSI; see the inside back cover of this standard.

2. Electrical signal input

2.1 General

The basic receiver shall comply with the requirements specified in 2.1.1, 2.1.2 or 2.1.3, and shall be capable of handling signals from one of the following sources.

- (1) UHF and, when necessary, VHF 625 lines direct off-air reception (see 2.1.1);
- (2) VHF or UHF 625 line reception, via wired network (see 2.1.2), using
 - a. standard channels, or
 - b. P.O. specified channels (as in P.O. Specification RC 5372);
- (3) 625 line reception, via HF wired network (see 2.1.3).

A receiver with additional facilities shall also be equipped to handle:

- (4) 625 line reception from a video source such as a camera or video tape recorder, together with accompanying sound (see 2.1.4).

NOTE. Since there is no British Standard for this class of video equipment there can still be some incompatibility between such an additional source and the receiver. The purchaser should therefore consult the manufacturers of both the receiver and the video source equipment on this point.

2.1.1 VHF and UHF 625 lines direct off-air reception

2.1.1.1 *Channels.* The receiver shall be tunable to UHF 625 line channels 21-68 CCIR* system I.

NOTE. VHF 625 line may be required off-air after 405 line transmissions cease. Then the proposed channels will be A-J CCIR system I (see CP 1020 which supersedes CP 327.201).

2.1.1.2 *Sensitivities.* The sensitivity for UHF and VHF shall be as follows.

- (1) For vision, better than -68 dB (mW) (equivalent to 220 μ V). For standard output see 3.2.9.
- (2) For sound, better than -75 dB (mW) (equivalent to 100 μ V). For standard output refer to BS 3549.

The signal to noise ratio at these sensitivities shall be better than 28 dB vision and 34 dB sound (see BS 3549, Clause 22 for methods of measurement for vision, and BS 4054 for sound).

It is assumed that in weak signal conditions an external low noise amplifier may be used.

2.1.1.3 *Maximum input.* The maximum input before overloading occurs shall exceed -35 dB(mW) (equivalent to 10 mV) UHF, and -29 dB(mW) (equivalent to 20 mV) VHF, vision.

2.1.1.4 *Aerial input impedance.* The receiver shall have a nominal input impedance of 75 Ω coaxial feed and the voltage standing wave ratio shall not exceed 4:1.

2.1.1.5 *Connectors.* The receiver shall be fitted with a coaxial socket complying with the requirements of BS 3041 (see 5.1.3).

2.1.2 VHF and UHF 625 line reception via wired network

2.1.2.1 *Channels.* The receiver shall be tunable to either of the following.

- (1) Standard channels. VHF and/or UHF 625 lines. VHF channels A-J, or UHF channels 21-68, both to CCIR system I.
- (2) P.O. specified channels. To relevant P.O. Specification RC 5372.

2.1.2.2 *Sensitivities.* Sensitivities in 2.1.2.1 (1) shall be as follows.

- (1) For vision, better than -61 dB(mW) (equivalent to 500 μ V). For standard output see 3.2.9 and
- (2) For sound, better than -68 dB(mW) (equivalent to 220 μ V). For standard output refer to BS 3549, Clause 8a.

* Comité Consultatif International des Radiocommunications (CCIR Report No. 308-2 refers).

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The signal to noise ratio at these sensitivities shall be better than 28 dB for vision and 34 dB for sound.

Sensitivities in 2.1.2.1 (2) shall be as specified in the relevant P.O. Specification RC 5372.

2.1.2.3 Maximum input. The maximum input before overloading occurs shall exceed -41 dB(mW) (equivalent to 5 mV) vision.

2.1.2.4 System input impedance. The receiver shall have a nominal input impedance of 75 Ω coaxial feed and the voltage standing wave ratio shall not exceed 4:1.

2.1.2.5 Connectors. The receiver shall be fitted with a coaxial socket complying with the requirements of BS 3041 (see 5.1.3).

2.1.3 625 line reception with HF wired network

2.1.3.1 Channel frequencies. The required channel frequencies will be dependent on the individual HF system but shall be in the band 3 – 30 MHz.

2.1.3.2 Transmission standards. 625 lines CCIR system I shall apply for vision, sound requirements being dependent on the system.

2.1.3.3 Sensitivities and signal to noise ratios. Requirements are laid down in 'Post Office Technical Conditions and Performance Standards for Broadcast Relay Services'.

2.1.3.4 Maximum input. The receiver shall not show signs of overload at the maximum planned signal input level specified by the HF system contractors.

2.1.3.5 Input connector and feeder. The input connector and feeder shall comply with the system contractor's specification.

2.1.4 625 line reception from a video source and accompanying audio (only required on receivers with additional facilities)

2.1.4.1 Video. The sensitivity shall be better than 0.5 V peak-to-peak composite video for standard output.

The maximum input before overloading occurs shall exceed 2 V peak-to-peak.

The nominal input impedance shall be 75 $\Omega \pm 10\%$ throughout the video frequency band when terminated. Underterminated, the bridging impedance shall be not less than 4700 Ω (see 2.3.3).

The receiver shall be fitted with an input socket complying with 5.1.3.3(a).

2.1.4.2 Audio. The sensitivity shall be better than 0.25 V.

The maximum input before overloading occurs shall exceed 2.5 V.

The nominal input impedance shall be 10 k Ω , unbalanced.

The receiver shall be fitted with an input socket complying with 5.1.3.3(b).

3. Electrical output requirements

3.1 General

The basic receiver shall include video item (1) and audio item (1) below. Video item (2) and/or audio item (2) are required in receivers with additional facilities.

Video

- (1) Picture tube (see 3.2).
- (2) Electrical output to a socket suitable for video recording (see 3.3).

Audio

- (1) Built-in amplifier and loudspeaker (see 3.4).
- (2) Electrical output to socket for use in conjunction with tape recorder or with separate power amplifier and loudspeakers (see 3.5).

3.2 Picture tube display

3.2.1 Picture tube. The picture tube shall be the largest size available in volume production.

3.2.2 Picture outline distortion. When measured in accordance with BS 3549 the picture outline distortion shall not exceed 3%.

3.2.3 Picture timebase linearity. When tested in accordance with BS 3549, Clause 12 the non-linearity of the viewed portion of the picture shall be not worse than 8% in the horizontal and vertical directions.

3.2.4 Interlace. When tested in accordance with BS 3549, Clause 18a (i), the field scan interlace shall be not worse than 40/60 over the major portion of the vertical hold range.