



BR 1831

SEPTEMBER 1984

ISSUE 6 DRAFT

**SPECIFICATION FOR CLOSED CIRCUIT TELEVISION FOR
DRIVER ONLY OPERATION**



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AMENDMENTS

Amd. No.	Date	Text Affected

British Railways Board

CONTENTS

- 1 INTRODUCTION
- 2 GENERAL SYSTEM REQUIREMENTS
- 3 TV CAMERAS
- 4 TV CAMERA HOUSING
- 5 CCTV MONITORS
- 6 CCTV MONITORS HOUSING
- 7 RELIABILITY
- 8 MAINTENANCE
- 9 SUPPLY, INSTALLATION, TESTING AND COMMISSIONING

52931/20

PART 1INTRODUCTION**1.1 FORWARD**

This specification is issued by the Stores Controller (Railways), Board Headquarters, Railway Technical Centre, Churnet House, Carrington Street, Derby DE1 3RY; from whom further copies may be obtained.

Technical queries concerning the specification should be referred to :-

The Director of Signal & Telecommunications Engineering
 Melbury House
 Melbury Terrace
 LONDON
 NW1 6JU
 Telephone:- PO (STD) 01-262-3232 Ext 5744 or 6117
 BR (ETD) 015-5744 or 6117

1.2 REFERENCES

- | | |
|------------------|--|
| British Standard | 415 - Safety requirements for mains operated electronic and related apparatus for household and similar general use. |
| | 4200 - Guide on the reliability of electronic equipment and parts used therein. |
| | 5378 - Safety signs and colours Parts 1 and 2. |
| | 5603 - Cable distribution systems primarily for sound and television signals. |
| | 9000 - General requirements for electronic components of tested quality. |
| BR Specification | 819 - Earthing and bonding of telecommunications cable sheaths, separate screening conductors and associated lineside equipment in ac electrified areas. |
| | 857 - Earthing of telecommunications equipment rooms, buildings and relay rooms. |
| | 967 - Railway signalling apparatus: environmental conditions. |
| | 1820 - Earthing and bonding of separate screening conductors and associated lineside telecommunications equipment in dc electrified and non-electrified areas. |

This specification is to be read in conjunction with :-

BR 11 Special Conditions of Contract for Plant, Including Erection

BR 12 General Conditions of Contract for Purchase Materials

Where this specification requires references to British Standards and BR specifications the latest issue shall apply unless specially stated.

1.3 SCOPE

This specification covers the requirements of the Director of Signals and Telecommunications Engineering for the supply, installation and commissioning of monochrome closed circuit television systems to be installed on specified station platforms in connection with Driver Only Operation. It is a requirement that the driver shall have a clear view on the platform along the side of the train from his driving control position. For this to be achieved the use of artificial aids, including CCTV, becomes necessary on certain stations when platform curvature, offside working or length of train prevents the driver having a suitable view.

It is recognised that if the monitors are mounted on the platform then the performance of the TV system will at times be degraded due to high ambient light. Notwithstanding this limitation, the specification is intended to define a high quality CCTV system for the application described above incorporating such features as will enable optimum system performance to be achieved in a railway environment.

The 'Engineer' referred to throughout this specification is defined in the Schedule of Works.

1.4 SPECIFIC REQUIREMENTS

The details of the specific station requirements and any variations from this specification are covered in the "Schedule of Works" accompanying this specification.

1.5 COMPLIANCE WITH SPECIFICATION

The Tenderer shall indicate in detail his compliance or otherwise with this specification.

Reasons for deviation or non-compliance with any item must be given in full indicating alternative options.

52931/22

PART 2GENERAL SYSTEM REQUIREMENTS

- 2.1 The CCTV equipment shall be required to operate in ac electrified, dc electrified and non-electrified areas. The earthing and bonding arrangements for lineside equipment shall be provided by BR and shall conform with BR specification Nos 819 and 1820. Where CCTV equipment is located in telecommunications equipment rooms, buildings and relay rooms the earthing and bonding arrangements shall be provided by BR and shall conform with BR specification No 857.

Where the line is not electrified all equipment shall be to the same requirements as if the line were ac electrified in preparation for any future electrification.

- 2.2 All equipment covers and chassis shall be permanently labelled to warn that high voltages are exposed when the cover is removed and shall comply with 'Safety Signs and Colours Regulation 1980' and BS 5378.
- 2.3 The CCTV equipment shall comply with the appropriate CCIR and CCITT recommendations.
- 2.4 The monitor shall be compatible with the camera and shall use a scanning system of 625 lines and 50 fields utilising 2:1 interlacing.
- 2.5 The aspect ratio of the resultant picture shall be 4:3.
- 2.6 Any inter equipment coaxial cabling shall conform with the requirements of BS5603.
- 2.7 All equipment supplied to this specification shall comply with the environmental conditions specified in BR967 Category E. (Note Temperature range.)
- 2.8 All cables supplied with equipment for use at stations situated in tunnels (see Schedule of Works) shall possess the following properties:-
- (a) flame retardant.
 - (b) low generation of smoke and toxic gases when the cable burns.
 - (c) low generation of corrosive products when cable burns.

The Tenderer shall submit full details of this cable for approval by the Engineer.

52931/23

PART 3TV CAMERAS3.1 GENERAL3.1.1 Size and Quantity

The exact requirement for camera tube size (2/3" or 1") and quantity is given in the Schedule of Works.

3.1.2 Standards

This camera shall be compatible with the television monitor defined in section 5 of this specification and have a scanning system of 625 lines, 50 fields/sec, fixed 2:1 interlace and a 4:3 aspect ratio.

3.1.3 Power Supplies

The power supplied by the Engineer to the camera is specified in the Schedule of Works and will be one of the following :-

- (a) 110v (+ 6% - 10%) at 50 Hz ($\pm 1\%$)
- (b) 240v (+ 6% - 10%) at 50 Hz ($\pm 1\%$)
- (c) dual voltage, the camera shall have the facility to work on both voltage ranges specified in (a) and (b) above.

The camera shall work within the limits given in this specification. The Tenderer should be aware that substantial levels of harmonics may be present due to the operation of traction equipment.

3.1.4 Earthing

- (a) Connection of the equipment shall not introduce an earth on to either pole of the mains supply.
- (b) When required in the Schedule of Works the camera shall have a means of isolating the signal common from the chassis, when isolated the impedance between signal common and the chassis shall be in excess of 10k ohms at 50 Hz.
- (c) When in its normal position the camera chassis shall be electrically bonded to its housing.
- (d) The camera housing will be earth bonded in accordance with BR819.

3.1.5 Construction

- (a) In general solid state circuitry techniques shall be used throughout, with the exception of the camera tube and certain switching functions which may be relay controlled.
- (b) The main circuit functions must not be split between separate P.C.B.s. The P.C.B.s shall be attached by coded edge connectors and shall be replaceable without the need for soldering of flying leads.

FACSIMILE TRANSMISSION

**BRITISH RAIL
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To: LUCY HUNTER **Fax:** 00 35776 **No. of pages** 33 (INCLUDING COVER)

Message :

Please find as follows the Specification BR 1831

**Title: Specification for closed circuit television for driver only
operation.**

Regards,

Louise Marshall

PART 3 (Cont'd)

3.2 (Cont'd)

3.2.15 Lens Package

- (c) The camera shall be fitted to take standard C mount lens.
- (d) A means of mechanically locking the lens focus ring shall be provided to prevent any movement due to vibration.
- (e) Any camera tube racking assembly shall be mechanically secured against any movement due to vibration.
- (f) The lens package construction and mounting shall be fitted with quick release facilities to simplify change of camera tube.
- (g) The lens package may be required to have a solenoid operated shutter. The shutter in the normal or unpowered position must not obstruct the field of view. (See Schedule of Works.)
- (h) Where an auto iris lens is used the standby (picture off) condition will cause the iris to close.

52931/29

3.2.12 Sensitivity

- (a) The camera must be able to operate between light levels ranging from bright sunlight to night illumination by platform lighting. As a guide the minimum value of platform illumination will be of the order of 20 lux (measured midway between lighting columns at the platform edge).
- (b) There are few locations where the platform is totally underground and a constant light level will be maintained.

Unless otherwise stated in the Schedule it must be assumed that the camera sensitivity shall meet the requirements of (a) above.

3.2.13 Camera Tube

- (a) For normal operation (as defined in 3.2.1) (a) the camera shall be fitted with one of the following types of tube :-

- (a) Chalnicon
- (b) Newvicon
- (c) Ultricon
- (d) Silicon diode

The type of tube offered should be stated together with the reason for its preference over the other tubes listed. The Tenderer may offer an alternative type of tube but must state why it is preferred to those stated above.

- (b) For operation in areas of constant light levels (as defined in 3.2.12 (b)) a standard vidicon tube may be accepted (see Schedule of Works).

3.2.14 Gamma Correction

The Tenderer should quote, as a separate cost, for the inclusion of variable gamma correction circuits as a means of enhancing the grey scale.

3.2.15 Lens Package

- (a) An auto iris lens is to be supplied unless the camera has to work in constant light conditions when a fixed iris lens will be acceptable. (See Schedule of Works)
- (b) The focal length and f No. of the lens will be as quoted in the Schedule of Works.

3.2.8 Short Circuit Protection

The camera design shall be such that a permanent short circuit across the video output connector shall not cause any damage to the camera.

3.2.9 Scan Failure Protection

The camera tube shall be automatically protected, by the camera design, against failure of either the vertical or horizontal scans.

3.2.10 Picture Off Mode

The Engineer will require a picture off mode and this shall be accomplished as follows :-

- (a) The camera shall be fitted with a relay or opto-isolator switch which shall cut off the camera tube electron beam from the target when either the relay coil is energised or the solid state switch is turned on. The control signal shall be provided by the Engineer in the form of a 'clean contact'. The Tenderer shall state the open circuit potential and current that would flow through this contact.
- (b) The composite video signal shall be at blanking level when the camera is in the picture off mode.
- (c) A facility to override this condition for testing purposes must be provided.

Further protection of the camera tube may be required when not in use. See 3.2.15 (g) and (h) and Schedule of Works for requirements.

3.2.11 Resolution

Using the same conditions as in section 3.2.5, the peak black to white amplitude response to a high contrast ratio 400 t.v. line square wave test pattern shall be a minimum of :-

- (a) 50% of the peak black to white amplitude response of a 100 t.v. line square wave test pattern when measured at the centre of the picture. (Defined as a circle of diameter 0.8 times picture height.)
- (b) 10% of the peak black to white amplitude response of a 100 t.v. line square wave test pattern when measured at the corners of the picture (defined as a distance 15% of the diagonal length from each corner).

52931/27