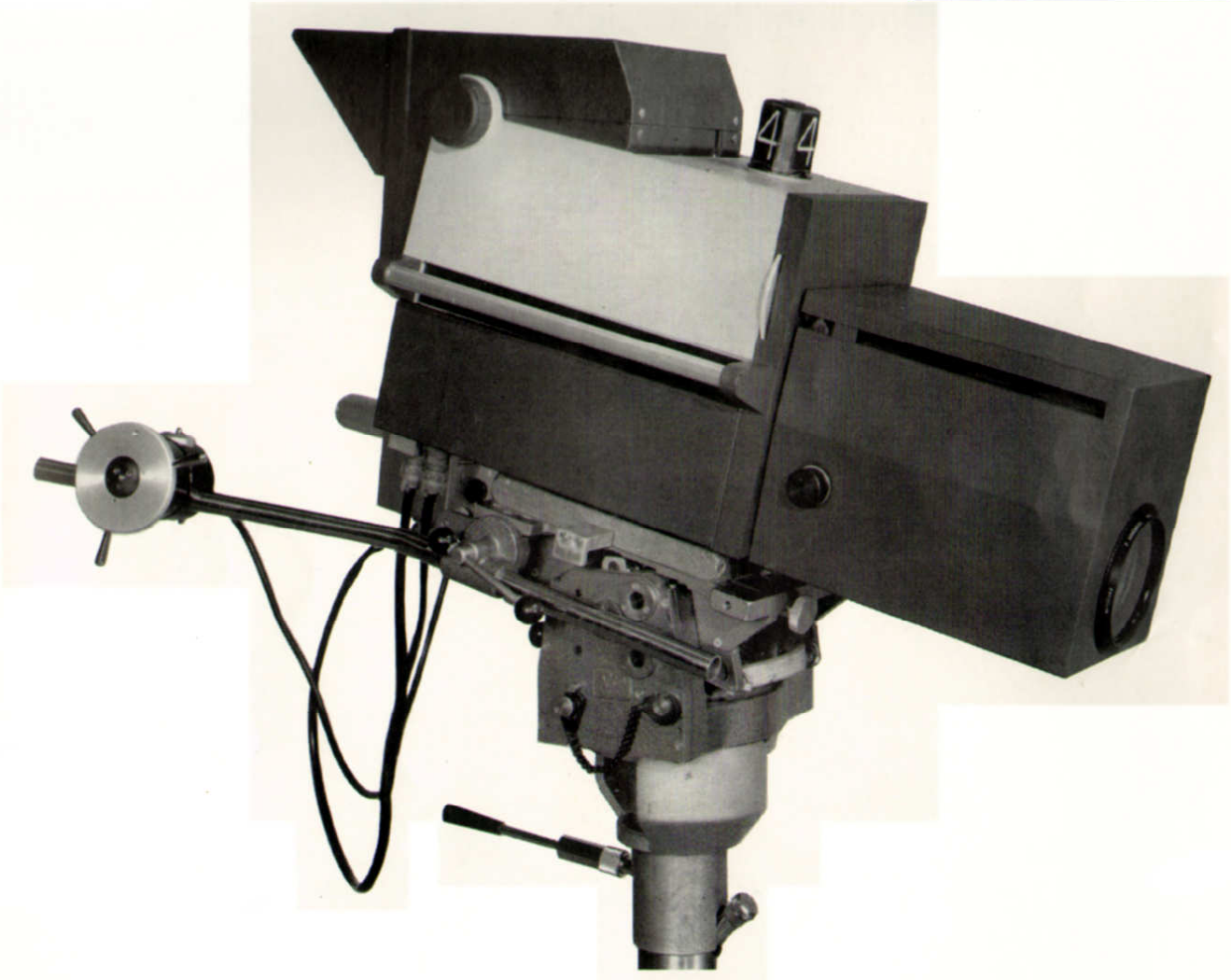
Mark VI Photoconductive Camera Channel

B 3124



MARCONI BROADCASTING

FEATURES

Small and lightweight

Adaptable for live or telecine applications

High sensitivity

Solid state, except for Nuvistor first stage Head Amplifier

New remote gain control circuits

Marconi – patented gamma correction circuits

Modular construction

Tilting, removable viewfinder

Outstanding stability for 'hands off' operation

Thin film circuits used where advantageous

Facilities

The camera may be used as follows:

With Plumbicon* or Vidicon Tubes for—

High quality studio work

Outside broadcasts, on up to 600m (2,000 ft) of camera cable

Manual or fully remote controlled news and continuity broadcasts

With Vidicon Tubes for—

Telecine applications

The camera is readily adaptable for 625, 525 or 405 line standards

* Registered trade mark Philips Gloelampenfabrieken

The Mk VI brings a new concept of versatility to the lightweight, high quality, camera channel. Designed to use either of the two types of photo-conductive pick-up tube widely used today, the Mk VI in its various forms can provide the ideal camera for every purpose in both large and small stations. Its low weight and small size will make it indispensable in many situations. Whatever the special needs of the operator, the Mk VI will provide a unique combination of high performance and operational convenience.

The Mk VI as a Studio Camera

In this application the camera is normally supplied with Plumbicon pick-up tube and lightweight Angenieux 10×18T2 zoom lens. The lens may be fully servoed, i.e. with servo controls for zoom, focus and iris. The amplifiers and associated circuits are housed around the lens and a styled cover matching the camera completes the zoom lens package. Alternatively the lens can be supplied with servoed iris, but manually controlled zoom and focus.

The camera is fitted with a tilting and detachable viewfinder, the same as on the Mk V and Mk VII Cameras. The tilting action is particularly useful on 'low' and 'high-angle' shots, and allows the cameraman to operate in awkward positions without becoming fatigued.

The facility of being able to detach the viewfinder completely and operate it up to 9·1 m (30 feet) from the camera is provided. This enables the camera to be used for operation on camera cranes when the cameraman is located at the base of the crane.

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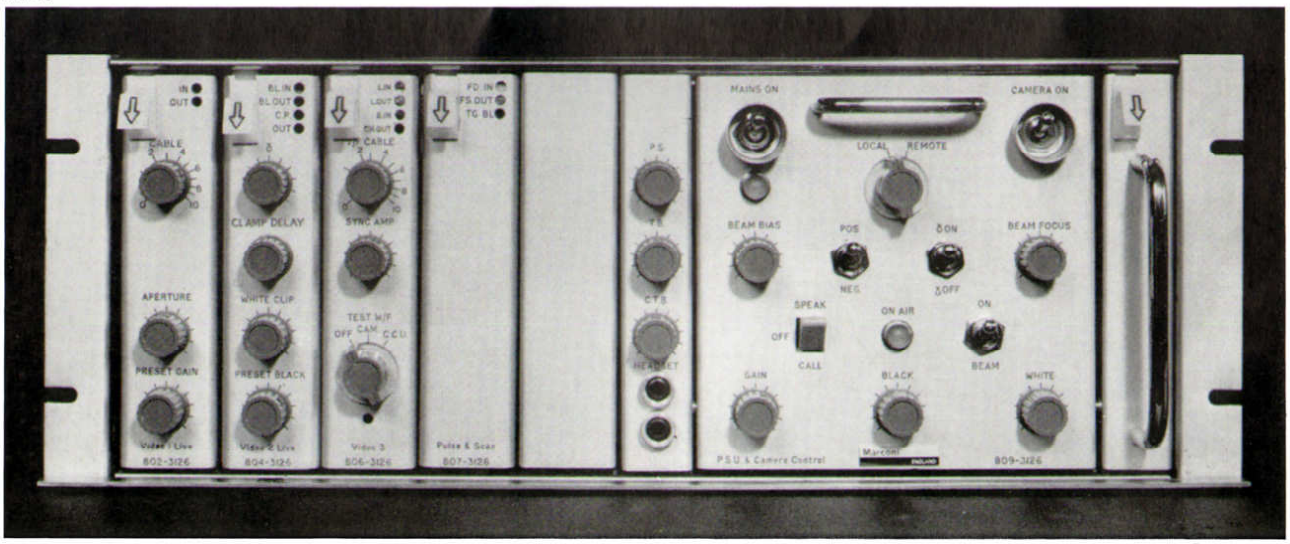

Mark VI Live camera control unit

The Mk VI for Outside Broadcasts

The camera's small size and light weight, only 21·8 kg (48 lb) (30·4 kg, 67 lb, with viewfinder), make it ideal for outside broadcast use.

Where maximum sensitivity is of major importance lenses with larger relative apertures may be used, such as the Angenieux 10×18H (max. aperture f/2·2). These lenses are generally heavier, and when used the camera is fitted with a special 'shoe'. This device enables the camera/lens combination to be correctly balanced on its mounting, and a wide range of adjustment is provided.

For outside broadcasts where a long focal length is required, image orthicon format zoom lenses may be fitted with the aid of the 'shoe'. Thus where Mk VI and Mk V or Mk VII cameras are used, lens sharing can further increase the flexibility of the Mk VI. This mode of operation retains the normal 'speed' of the image orthicon lens.

The Mk VI for Telecine

The camera supplied is very similar to the live version, but has no viewfinder or zoom lens. Instead a single lens plate is fitted. Normally telecine channels are fitted with vidicon pick-up tubes. The camera can be mounted vertically in an optical multiplexer (see Marconi Publication TD 3400).

The camera can also be arranged to mount horizontally; as, for example, in the Full Facilities Telecine (see Marconi Publication TD B3402) or other telecine applications where the film is projected directly onto the pick-up tube photocathode.

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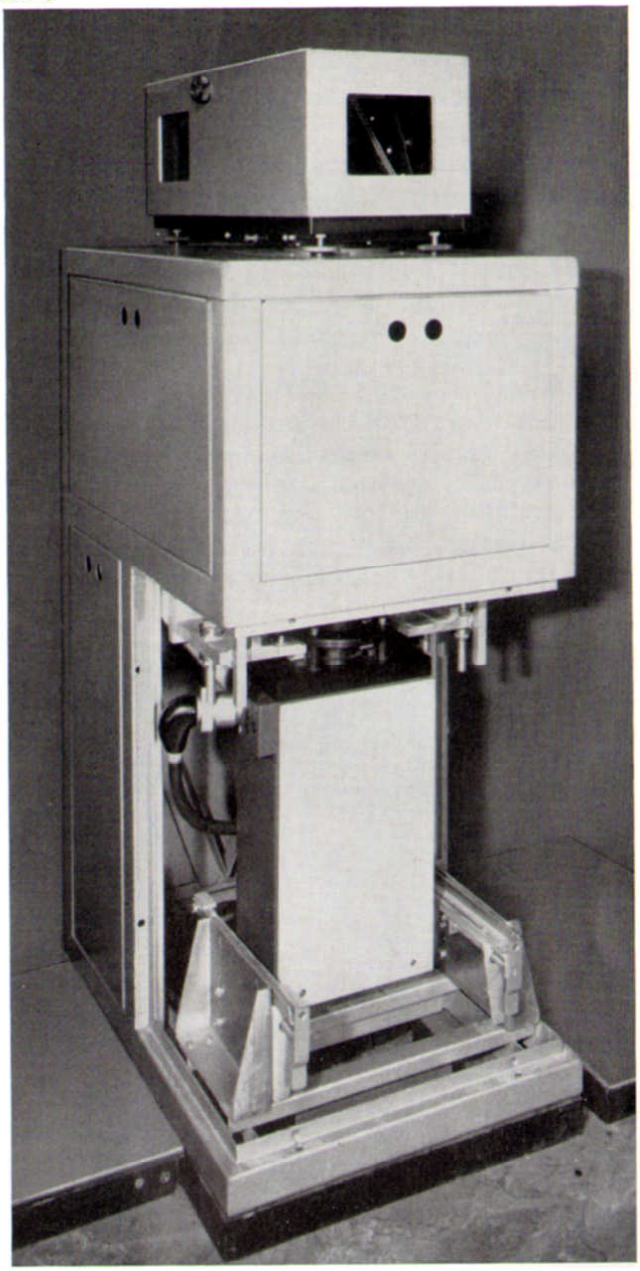
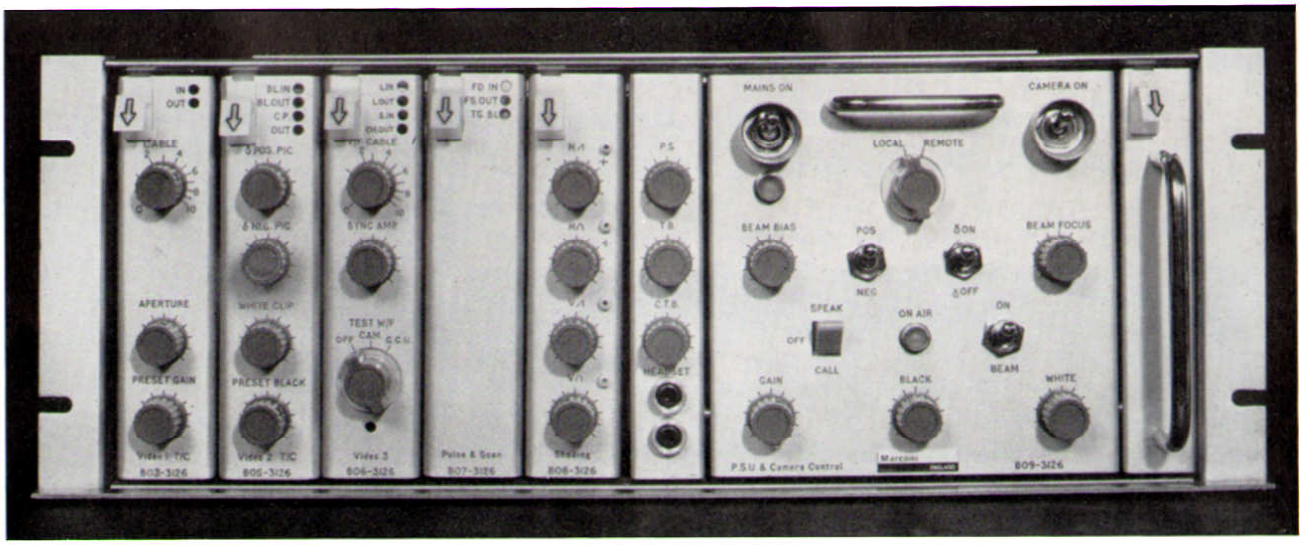


Multiplexer Type B3412. Showing camera in position



Mark VI Telecina camera control unit

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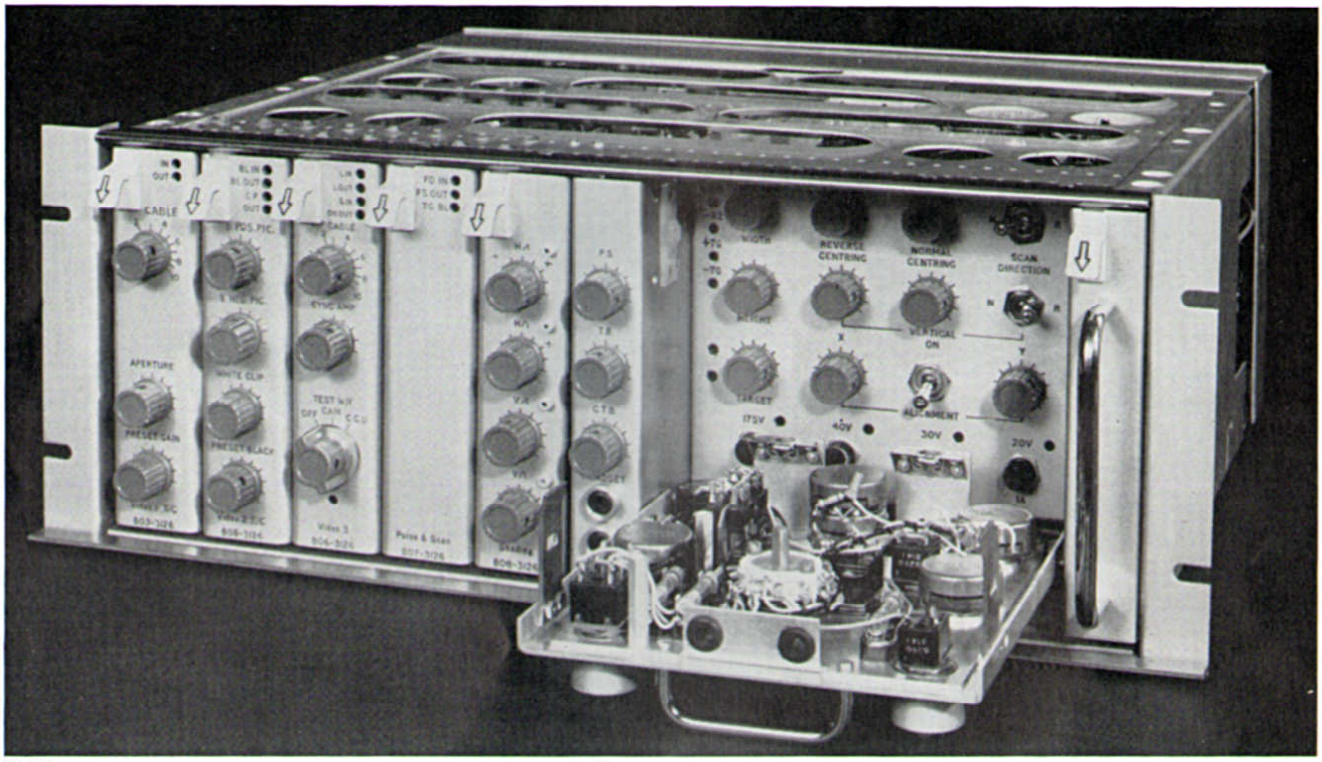
Construction

Mechanical

The camera is styled similarly to the Mk V and Mk VII. The majority of the circuits are housed in the combined camera control and power supply unit. This unit is of modular construction, and the circuit modules plug into a standard Marconi Type B4306 modular equipment rack mounting frame. A back-mounting connector kit, bolted to the rear of the frame, accepts the modules and provides interconnections. It also carries input and output connectors and the camera cable socket. Extension boards are available which permit servicing of the modules to be carried out with power applied to the channel.

The illustration below shows the local control panel hinged down for access to setting-up controls.



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Mark VI Telecine camera control unit, showing local operational control panel hinged down

Electrical

Component types and locations have been carefully chosen to ensure reliable, stable, operation and retain the advantages of photoconductive tube cameras. Thin film circuits are used where they provide worth-while advantages, and transistors have been used throughout, with the exception of the head amplifier which employs a Nuvistor low noise stage. Silicon transistors are used almost exclusively.

The camera head contains a minimum number of circuits and these are carried on printed wiring boards. The basic camera has four small boards: Vision Amplifier, Line Scan, Tube Control and D.C Power Supply; live cameras also have a Talk-back Amplifier fitted.

The viewfinder, where fitted, is the same as that used for Mk V and Mk VII cameras. Connections to the camera are made via a single multiway cable and plug. This cable may be extended to 9·1m (30 ft).

Remote Gain Control

In the C.C.U. the video signal is fed into a unique gain control stage which has advantages of reliability and simplicity, and is insensitive to changes of ambient temperature and supply voltage.

Long Camera Cable

The standard channel will perform on camera cables up to 300 m (1000 ft). A small (optional) printed board allows cables up to 600 m (2000 ft) to be used.

Gamma Correction

The Mk VI camera features Marconi-patented gamma correction circuits.

Correction may be continually and precisely adjusted and it is possible to provide a range of switchable pre-set gamma levels. It is possible to set up the channel amplifiers to any gamma value between 0·4 and 1·0 thus accommodating both types of pick-up tube. In the case of the telecine version of the camera, additional circuits correct for negative film materials. This corrector is a special type designed to produce the correction characteristics required.

Control Panels

The camera control and power supply unit contain all the engineering and operational controls required for satisfactory operation of the channel. A local/remote switch is provided which enables the operational controls to be switched to a remote position for 'hands off' operation.

The live camera Operational Control Panel, Type B3208, is designed so that four can be mounted in the desk well of the standard Marconi console Type B4311. The panel contains the following:

Controls for
- Iris,
- Black Level,
- Gain,
- Channel on/off,
- Beam on/off,
- On-air cue lamp.

A separate control panel is supplied for the telecine camera, Operational Control Panel Type B3127. This is a conventional type of panel containing the following:

Controls for
- White Level,
- Black Level,
- Picture Polarity Change,
- Channel on/off,
- Beam on/off,
- On-air cue lamp.

As an optional extra it is possible to provide the following additional controls in a remote position.

Horizontal scan reverse switch, vertical scan reverse switch, camera talk-back level, talk-back level and programme sound level.

Provision is also made to remote the necessary headset sockets for use with the talkback controls set out above.

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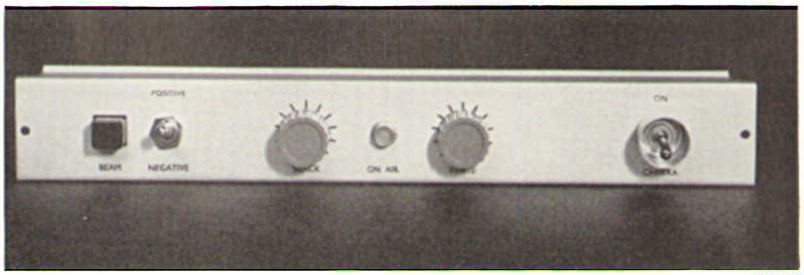
Live camera operational control panel Type B3208

Telecine camera operational control panel Type B3127



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Communications

Two communications amplifiers are supplied as part of each Mk VI live camera channel. One is located in the camera control and power supply unit, and the other in the camera head. Two headset sockets and one headphone socket are provided at the camera, and one headset socket is provided at the camera control and power supply unit.

Additional facilities can be supplied by the Marconi Communications Unit, Type B3654.

Ordering Information

When ordering or enquiring about this equipment, the following details will assist us to deal promptly with your requirements. Please state:

1 Type of camera required, live or telecine.
2 Mains voltage and frequency available.
3 Television line standard.
4 Length of camera cable/s required.
5 Type of zoom lens required, servo or manually controlled.
6 If extension cable for viewfinder required (9·1 m, 30 ft length).
7 Camera cue light designations required, i.e. Cam 1, Cam 2, Cam 3, etc.
8 Whether camera mountings are required (Tripods, friction heads etc.).
9 If additional handbook required (one normally supplied).
10 If spares are required.
11 How many headsets and headphones are required.
12 If 600 m (2000 ft) camera cable working is required.

Data Summary

The B3124 Photoconductive Camera Channel is fully transistorized and thin film circuits are used where advantageous.

Operation on 625, 525 and 405 line standards in both studio/O.B. and telecine versions is achieved by changing internal links.

LIVE CAMERA CHANNEL, FOR STUDIO/O.B. USE.

INPUTS

Mains

Transformer with split primary, tapped for 100–125 V and 200–250 V, in 5% steps, 50–60 Hz.
Live 380 VA, Telecine 195 VA.

Pulses

Bridging input for line drive, field drive, mixed blanking and mixed syncs, between the limits of 1·5 and 8 V, peak to peak.

Video

Inputs for test waveforms and external viewfinder feed.

Communications

Programme Sound, Producer and Control Room Talkback, 'on-air' cue.

CONTROLS

Setting up and operational controls mounted on front panel.

Remote Control

Socket at rear provided for operational control panel which may be used up to 152 m (500 feet) from the C.C.U. A switch on the C.C.U. transfers control to the remote panel.

OUTPUTS

C.C.U. Vision

Three isolated standard level signals which may be individually set to composite or non composite as required.

Communications

Camera talkback, via an on/off switch.

Mains Utility

Connector is provided on the camera to give a mains supply output of 1 ampere.

Vision Utility

An isolated feed of composite vision signal.

Viewfinder

A multiway socket provides power and a further isolated composite vision feed for the viewfinder which can be removed up to 9·1 m (30 feet) away from the camera.

CAMERA PERFORMANCE

Scan Linearity and Geometry

The maximum error with respect to a high quality test grating will not exceed 1 % of height or width.

Signal to Noise Ratio

At least 46 dB for 5·5 MHz bandwidth at 0·3 μA signal current.

Gamma Correction

Single control provides continuous variation of law. Normal range of gamma 0·4 to 1·0 with linear input signal having a 30:1 contrast ratio.

Aperture Correction

Continuously variable control, providing up to 12 dB boost at the following peak frequencies:

625/525 lines 8·5 MHz
405 lines 4·8 MHz

General Stability

Rehearsal quality pictures available one minute from switch-on. After 30 minutes warm-up time output remains substantially stable with constant light input. This performance is maintained for an eight-hour period during which ambient temperature may change $\pm$10°C and mains voltage $\pm 7\frac{1}{2}$ %. The channel will meet this performance at temperatures in the range –10°C to +40°C.

VIEWFINDER

Picture Size

12·4 × 9·4 cm (4·9 × 3·7 inches).

Brightness

Maximum high-light brightness approx. 200 foot lamberts.

H.F. Response

Within $\pm$1·0 dB to 10 MHz.

Resolution

The viewfinder will resolve 600 lines on a Marconi Resolution Chart No. 1.

Linearity and Geometry

The maximum error with respect to a high quality grating generator will not exceed 2 % of height or width.

FINISH

The camera, viewfinder and zoom lens package are finished in contrasting shades of grey Organosol paint which has excellent hard-wearing qualities. The modules are finished with silver paint with black legends.

TELECINE CAMERA CHANNEL

The following items are as specified earlier for the live studio/O.B. version of the channel:

Mains and Pulses inputs to C.C.U.
Vision Outputs from C.C.U.
Remote Controls
Scan Linearity and Geometry
Signal to Noise Ratio
General Stability

Gamma Correction and Picture Polarity Reversal:

A picture polarity reversal switch provides a full-performance negative picture facility, used when scanning negative film material.

Two gamma correction controls provide continuous variation of law. One is used for normal and one for negative gamma correction.

The appropriate control is brought into operation by the picture polarity switch. Normal range of gamma 0·4 to 1·0 for normal polarity and −0·4 to −1·0 for negative polarity with linear input signal having 30:1 contrast ratio.

Aperture and Film Correction:

Continuously variable control providing up to 12 dB boost at peaking frequencies as follows:

625/525 lines	35 mm film	8·5 MHz
	16 mm film	4·8 MHz
405 lines	35 mm film	4·8 MHz
	16 mm film	3·2 MHz

DIMENSIONS

	HEIGHT	LENGTH	WIDTH	WEIGHT
Studio/O.B. Camera head with V/Finder, less lens	39·1 cm (15⅜ in.)	46·1 cm (18⅛ in.)	22·9 cm (9 in.) (excluding handles)	30·4kg (67 lb)
Telecine Camera head	12·7 cm (5 in.)	39·4 cm (15·5 in.)	22·9 cm (9 in.)	10·9kg (24 lb)
Camera Control Unit	17·8 cm (7 in.)	44·5 cm (17·5 in.)	48·3 cm (19 in.)	20 kg (44 lb)
Operational Control Panel Type BB00-3208-02 (live camera)	20·5 cm (8 1/16 in.)	9·5 cm (3¾ in.) beneath mounting surface.	8·25 cm (3¼ in.)	0·91 kg (2 lb)
Operational Control Panel Type BB00-3127-01 (telecine camera)	5·1 cm (2 in.)		35·6 cm (14 in.)	

NOTE: The information given herein is typical of the performance that may be expected, but is subject to confirmation at the time of ordering.

TD-1-B3124

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AN 'ENGLISH ELECTRIC' COMPANY

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