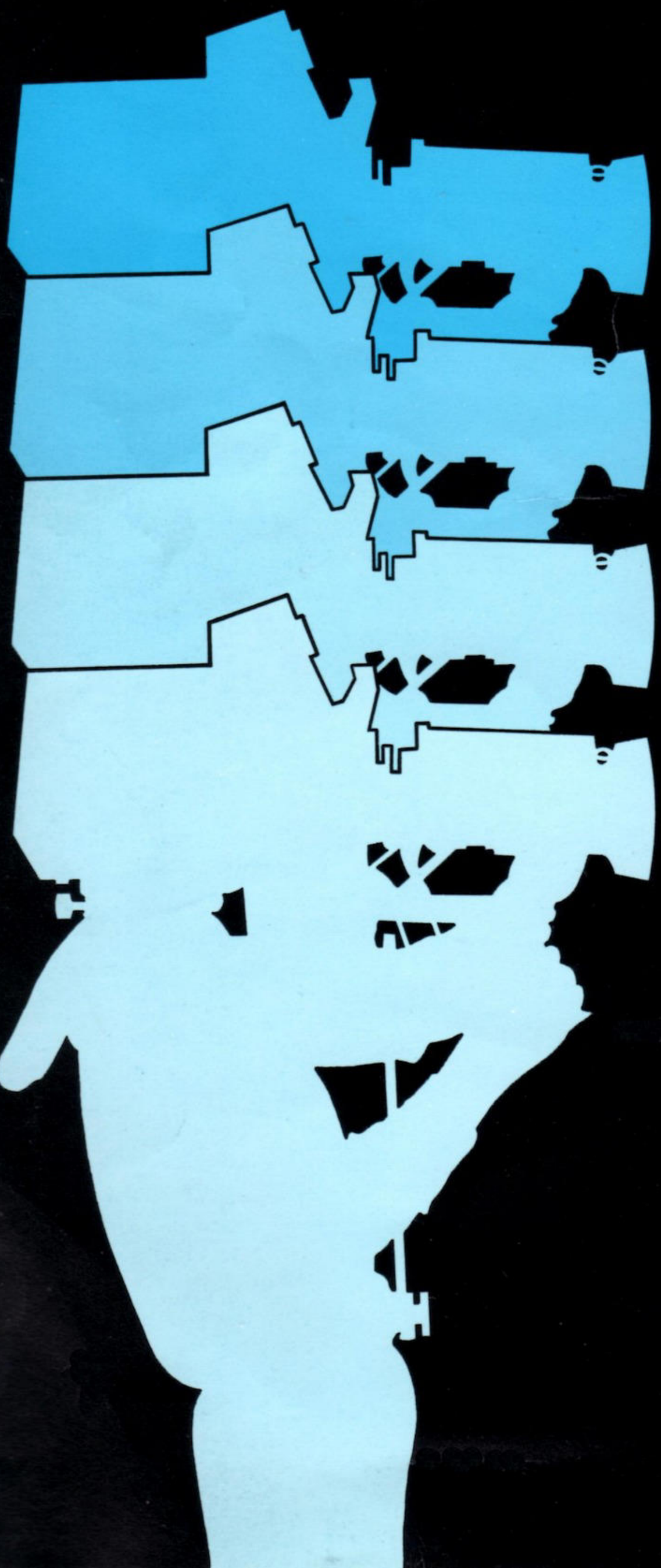
Marconi

Mark IX Portable Colour Camera



Mark IX Portable Colour Camera

Electronic Field Production Camera



- Lightweight and robust
- 1in tubes for high quality
- Prism optics
- 900 m cable to C.C.U.*
- No backpack
- HOP tubes with light bias
- Automatic or manual versions
- C.C.U. common to studio camera
- Battery operation option
- Full talkback facilities
- Large lens adaptor
- Large viewfinder adaptor
- 1in, 3in or 7in viewfinders
- Triax option
- Wide range of lenses
- Programme microphone circuit
- Comprehensive viewfinder mix facilities

Introduction

The Mark IX Portable colour camera is designed as a companion unit to the Mark IX camera, and as a true Electronic Field Production (EFP) camera. It can be used in a wide variety of roles either hand held or tripod mounted in situations where small size and portability are the main criteria. It can be connected to a Mark IX camera control unit via standard Mark VIII camera cable and may be either mains or battery powered.

The camera channel is designed to produce high quality pictures in order that they can be inter-cut with pictures from studio cameras without noticeable degradation of picture quality.

The small size of the C.C.U. (5 rack units) 8·75 in makes it ideal for use with small vehicles such as a mini-mobile, estate car or golf cart.

All the optional features of the Mark IX camera (with the exception of a built-in diascope) are available for the portable version. These options are set out on page 5. For automatic alignment, a separate diascope attachment is available which can be substituted for the lens.

The different roles of camera application are set out on page 8.

Low power consumption makes the camera suitable for battery operation in the field in boats/helicopters, etc.

The addition of a triax package makes it eminently suitable for those types of outside broadcast operation where the use of a multicore cable is expensive and time consuming.



Mk IX P mounted on Vinten Portaped and Fluid Head.

Camera Head

By releasing four clips the top cover may be removed giving access to all the circuitry. Inside the head are the prism optics, the three yokes and the printed wiring boards. Lightweight components are used throughout to keep the camera head weight down. The camera is connected to the C.C.U. by up to 90 m of T1889 (13 mm) Mark VIII cable. For extended cable operation a further 800 m may be used by employing a small in-line adaptor module. A quick release connector is provided at the head to facilitate camera cable changing.

The camera is ergonomically designed and all controls come readily to hand. It may be used on either the right or left shoulder. The camera balances well and it is possible to temporarily remove both hands from the camera should this be necessary.

Viewfinders

The standard viewfinder for portable operation is a lightweight 3 in binocular unit. The viewfinder provides the cameraman with a clear, crisp display. An internal cue light is fitted. Brightness and contrast controls are available to the cameraman and a built-in crispener provides picture enhancement. The viewfinder mix facility enables an external signal to be displayed. A switch in the camera enables any one of 6 different video combinations to be displayed.

For some applications a monocular viewfinder with high definition tube is preferred and this unit offers the same facilities as those available on the 3 in unit.

For studio and OB tripod applications the standard 7 in viewfinder which provides 200 ft. laberts of brightness is available. This viewfinder has the additional features of adjustable crispener, external centring controls and cue dim.

Lenses

The camera can accept a wide range of lenses designed for the 25 mm pick-up tube format. These range from 6:1 to 42:1. All lenses have servo iris, most have servo zoom, but for weight saving purposes manual focus control is preferable. The list of zoom lenses and facilities is set out in the data summary.

Camera Control Unit

This unit which is common to the studio camera is a 19 in rack mounted unit 222 mm (8·75 in) high. It contains all the video circuitry including the camera control panel and the power supply.

All the preset controls on the front of the modules are protected from accidental misadjustment by a cover.

All operational controls are grouped on the camera control panel on the right hand side. The camera power supply is fitted behind the camera control panel.

The basic camera is designed for manual operation but automatic facilities are available as an option.

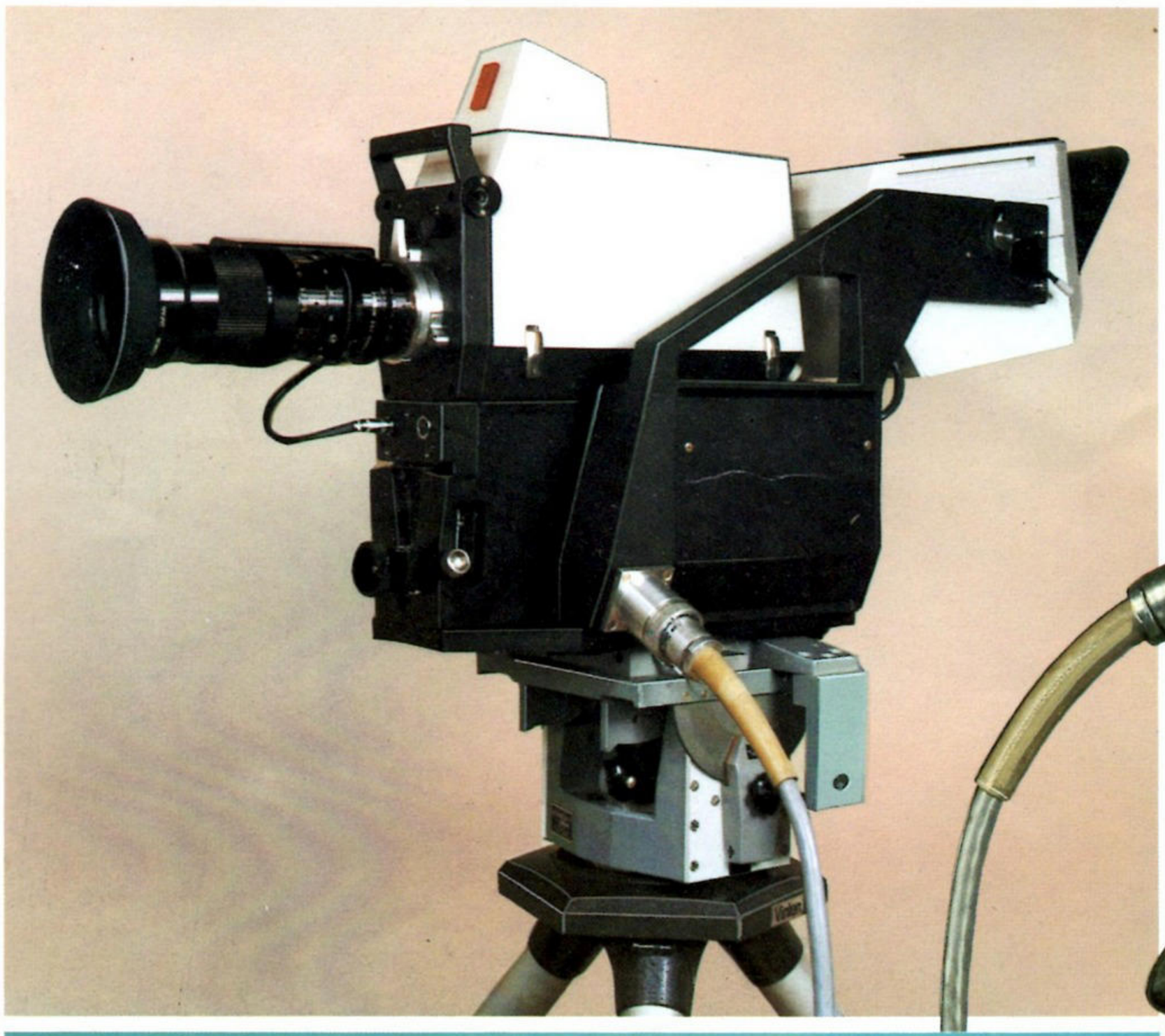
Automatic Facilities

(1) Automatic Dynamic Gain is provided as standard on the coder module.
(2) The following are provided on the optional automatic balance module:
  (a) Automatic white balance (when viewing a suitable white area)
  (b) Automatic black balance (when camera is capped)
  (c) Automatic iris (when selected at CCP or RCP)
  (d) Automatic master black (when selected at CCP or RCP), sets master black to blackest part of G, R or B picture)
(3) When Auto balance module is fitted optional automatic registration module may also be fitted.
(4) If auto registration module is fitted the optional dynamic centring module may also be fitted.

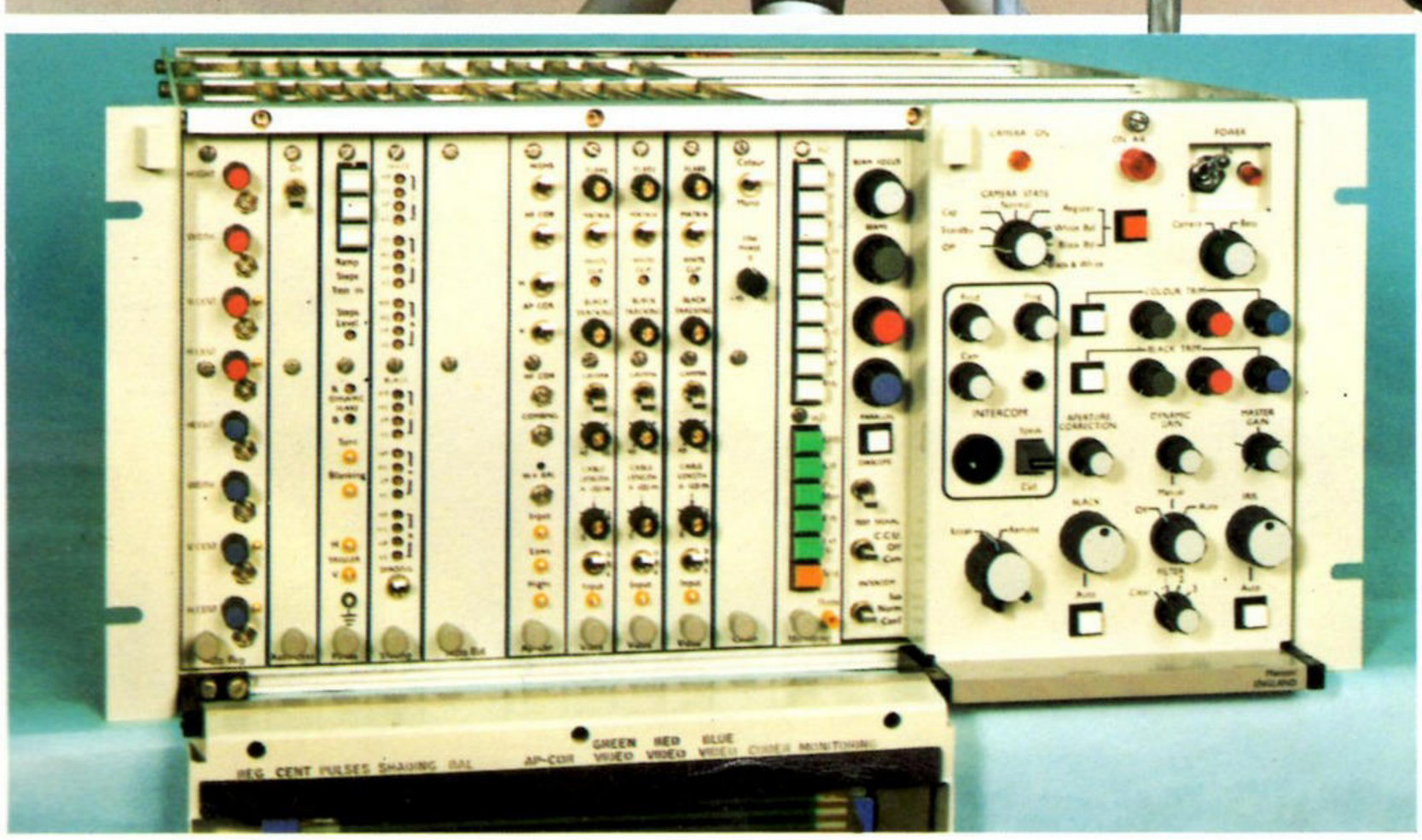
Remote Control Panel

This panel contains all the controls necessary for remote control of the camera for both studio and OB operation. It may be operated up to 150 m (500 ft) from the CCU.

In addition to the operational controls the camera may be registered and colour balanced from the panel. A switch on the joystick may be used to operate a picture matching matrix when required.



Convertible camera.



Camera control unit.

Coder Module

This unit forms one module of the CCU. Either PAL or NTSC versions are available. The unit generates three outputs of standard level encoded video, one for monitoring and two are available on the rear panel. The coder can produce BBC, EBU, FCC or 100% coded bars, either split or full field. I & Q signals are also available with FCC split field bars from the NTSC coder.

Changes of bar configuration are selected by links. Changeover from camera to bars signal may be controlled either from the CCP or RCP. Selection of mono or mono+burst is also available remotely.

If it is desired, the camera control unit can be employed with an external coder fed from the R, G and B video outputs at the rear panels.

Triax

For operation with triax cable a pair of additional units may be used. At the camera head a small triax converter is used to change between triax and multicore cable. This enables a standard head to be used. At the CCU the triax cable is connected to a small base station which is only 3 rack units high and half a rack width. This unit enables a standard CCU to be used.

The triax version can work with up to 1·5 km of 13 mm cable. All the facilities available on the standard camera are also available on the triax version including chroma key.

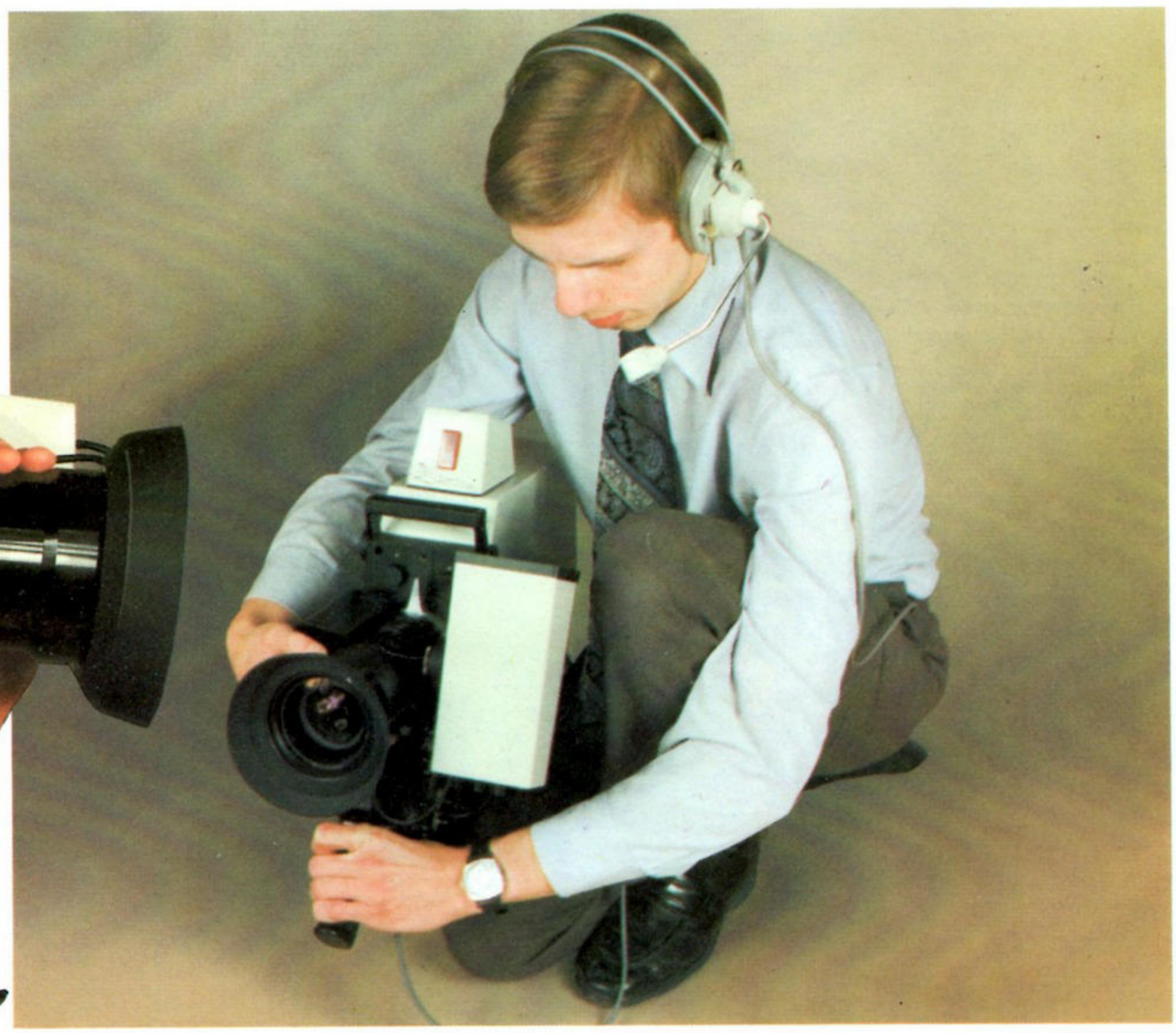
Cues and Communications

The camera is designed to work with the B.3656 Communication Equipment. Each camera channel is equipped with the following facilities:

(1) A cameraman's headset outlet at the front of the camera feeding a single earpiece headset. The cameraman hears a mixture of producer, programme sound and engineering talkback.
(2) Cameraman's speak/call switch.
(3) Cue light at front of camera and in the viewfinder. (The front cue light may be switched off, if required).
(4) Optional high quality programme mic circuit connected to an XLR socket at the rear of the camera. The circuit is provided with a compressor and is designed to accept a standard dynamic microphone. A level control is provided, together with LED indication.

The talkback system is universal and can work with either U.S. or European systems. It is designed to work with high quality moving coil headsets. Carbon microphones can be used, but will give inferior results.

Mark IX Portable is easily used for low angle shots.





Adjustable shoulder mount to fit individual cameramen.

Optional Items	Automatic Portable	Manual Portable
Programming Microphone circuits	★	★
Headsets	★	★
7 in Viewfinder	★	★
7 in Viewfinder mounting	★	★
1 in Viewfinder	★	★
'In line' adaptor module	★	★
Remote control panel	standard	★
Extended red matrix	★	★
Service extender boards kit	★	★
Large lens adaptor	★	★
Triax adaptors	★	★
Battery power supply unit	★	★
Diascope	★	★
Carrying case	standard	★

Data Summary

Systems
CCIR 625 lines, 50 fields/s 2:1 interlaced or EIA 525 lines, 60 fields/s 2:1 interlaced, not switchable.

Power Supply
95-130 V and 190-260 V 48-60 Hz.
At any voltage within the specified range a swing of ±5% will not affect performance data specified. Canon EP4 connector. By using an alternative supply 24 V DC may be employed.

Inputs
Mixed blanking (1·5 V-6 V), bridging input, BNC connector. Return loss 30 dB to 2T pulse and bar.
Mixed sync input, same for mixed blanking.
Colour step sync, input 1·5 V-6 V, BNC connector. Return loss 30 dB to 2T pulse and bar.
Remote video, 1·0 V composite signal, bridging input, BNC connector. Return loss 36 dB to 2T pulse and bar.
Burst gate (PAL) 1·5 V-6 V, BNC connectors bridging input, return loss 30 dB to 2T pulse and bar.
Subcarrier 0·5-3 V, bridging input. BNC connectors. Return loss 30 dB at subcarrier frequency.
Test 0·7 V non composite signal, bridging input. Return loss 36 dB to 2T pulse and bar.

Outputs
Coder video. 2 outputs, each 75 Ω source impedance.
Return loss better than 30 dB to 2T pulse and bar.
G, R, B, video 0·7 V peak-peak from 75 Ω source.
Picture monitoring video 75 Ω source, return loss better than 30 dB to 2T pulse and bar.
Waveform monitoring video as for picture monitoring.
Colour step sync 75 Ω source.
Colour step waveform. 2 V to 15 V adjustable.
Output impedance less than 500 Ω.
Waveform monitor sequence, isolated relay contacts.
Chroma key signal (colour selection by links). 0·7 V peak-peak from 75 Ω source.
Programme Audio. 0 dBm. XRL connector.

Sensitivity and Noise
With 1100 lux (100 ft candles) incident on a white chip of 60% reflectance and lens iris at f2·8 a signal current of 200 nA will be obtained in the green channel using average tubes. This signal current produces 0·7 V GRB video output with master gain controls at 0 dB.
By increasing gain to +12 dB and opening the iris to f1·7, just acceptable pictures will be obtained down to 90 lux (8 ft candles).
The peak signal to RMS noise ratio of the green channel measured in a 5 MHz bandwidth will be better than 46 dB relative to the signal current of 200 nA (measurements taken with gamma off and corrections off).

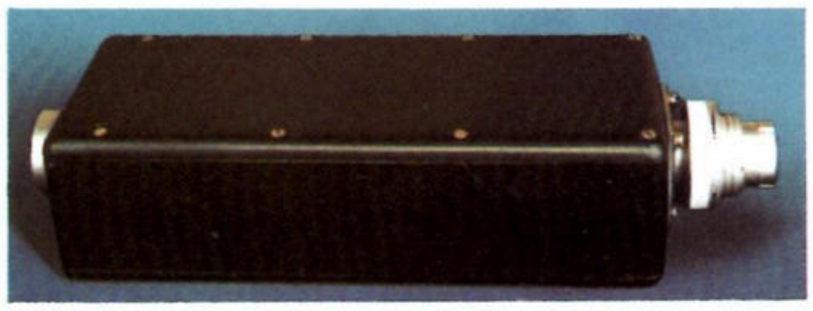
Resolution
With aperture correction, 100% modulation depth can be obtained at 5 MHz in each video channel.

Registration
40 ns accuracy in Zone 1, 80 ns in Zone 2, and 120 ns in Zone 3 (with average tubes). Zone 1 is an ellipse whose major and minor axes are equal to 80% of picture height and width; Zone 2 is outside Zone 1, but within a circle of diameter equal to picture width; Zone 3 is the remainder.

Scanning Geometry (excluding lens)
Overall distortion less than 0·25% of picture width in Zone 1, less than 0·5% in Zone 2 and less than 1·0% in Zone 3.

Gamma Correction
Continuously variable from 0·4-0·55 or 1·0.

Master Gain
Control is provided over the range 0 to 12 dB from either the CCP or RCP.
This range may be changed from −3 dB to +9 dB by changing links.



In-line Adaptor (extends operation by 800 metres).



Camera fitted with 1in high resolution viewfinder. Viewfinders may be fitted in right or left side of camera.

Shading
Shading correction line and field, sawtooth and parabola is provided at black and white.

Warming Up
Rehearsal quality pictures will be obtained in less than 2 minutes after switch on in the ambient temperature range of +10°C to +45°C.

Camera Cable
Multicore up to 90 m of BICC T.1889 to CCU or in line adaptor unit. 800 m from adaptor unit to CCU.
Suitable cable is also manufactured by BIW and Mohawk.
Triax BICC T.1894 (13mm) up to 1·5 km.
BICC T.1892 (9mm) up to 900 m.

Pick-up Tubes
25 mm lead oxide tubes with HOP and light bias, either extended red or standard.

Portable Lenses (all servo iris)

Type	Range mm	Max. aperture	Min. focusing distance	Basic horizontal angle	Weight
1 Canon PV10×12 B2	12–120	f2·0–f3·1	0·45 m	55·4°–6·0°	2·5 kg (5·5 lb)
2 Ang. 15×12·5	12·5–188	f2·5–f3·5	0·6 m	54°–4·0°	2·5 kg (5·5 lb)
3 Ang. 6×130 D2	13–78	f2·2–f3·2	0·6 m	59°–10°	1·2 kg (2·7 lb)

1 Motorized zoom and manual or servo focus.
2 Servo zoom and manual focus by hand and cable. Range extender and close-up adaptor available.
3 Manual zoom and manual focus by hand.
Other lenses will be added in the future. Large lenses may be used with a heavy duty adaptor.

Ambient Temperature

(i) Storage −20° to +60°C.
(ii) Equipment may be switched on without damage over the range −20° to +40°C.
(iii) No change in performance data will occur at ambient temperature variations of ±10°C with respect to the temperature during the line up procedure, within the range of −10° to +40°C.

Dimensions	Length	Width	Height	Weight
Camera*	430 mm (17·0 in)	120 mm (4·73 in)	370 mm (14·5 in)	6·4 kg (14 lb)
1 in Viewfinder	213 mm (8·4 in)	103 mm (4·0 in)	110 mm (4·35 in)	1·1 kg (2·5 lb)
[illegible]iewfinder	81 mm (3·2 in)	92 mm (3·6 in)	184 mm (7·25 in)	1·0 kg (2·2 lb)
7 in Viewfinder	191 mm (7·5 in)	203 mm (8·0 in)	270 mm (10·6 in)	5·5 kg (12 lb)
CCU	222 mm (8·75 in)	483 mm (19 in)	556 mm (21·9 in)	25 kg (54 lb)
RCP	206 mm (8·1 in)	149 mm (5·87 in)	105 mm (4·1 in)	1·9 kg (3 lb)
In-line Adaptor	244 mm (11·5 in)	82 mm (3·22 in)	118 mm (4·65 in)	3·0 kg (6·4 lb)
Triax Converter	270 mm (10·5 in)	162 mm (6·4 in)	270 mm (10·5 in)	7·0 kg (15 lb)

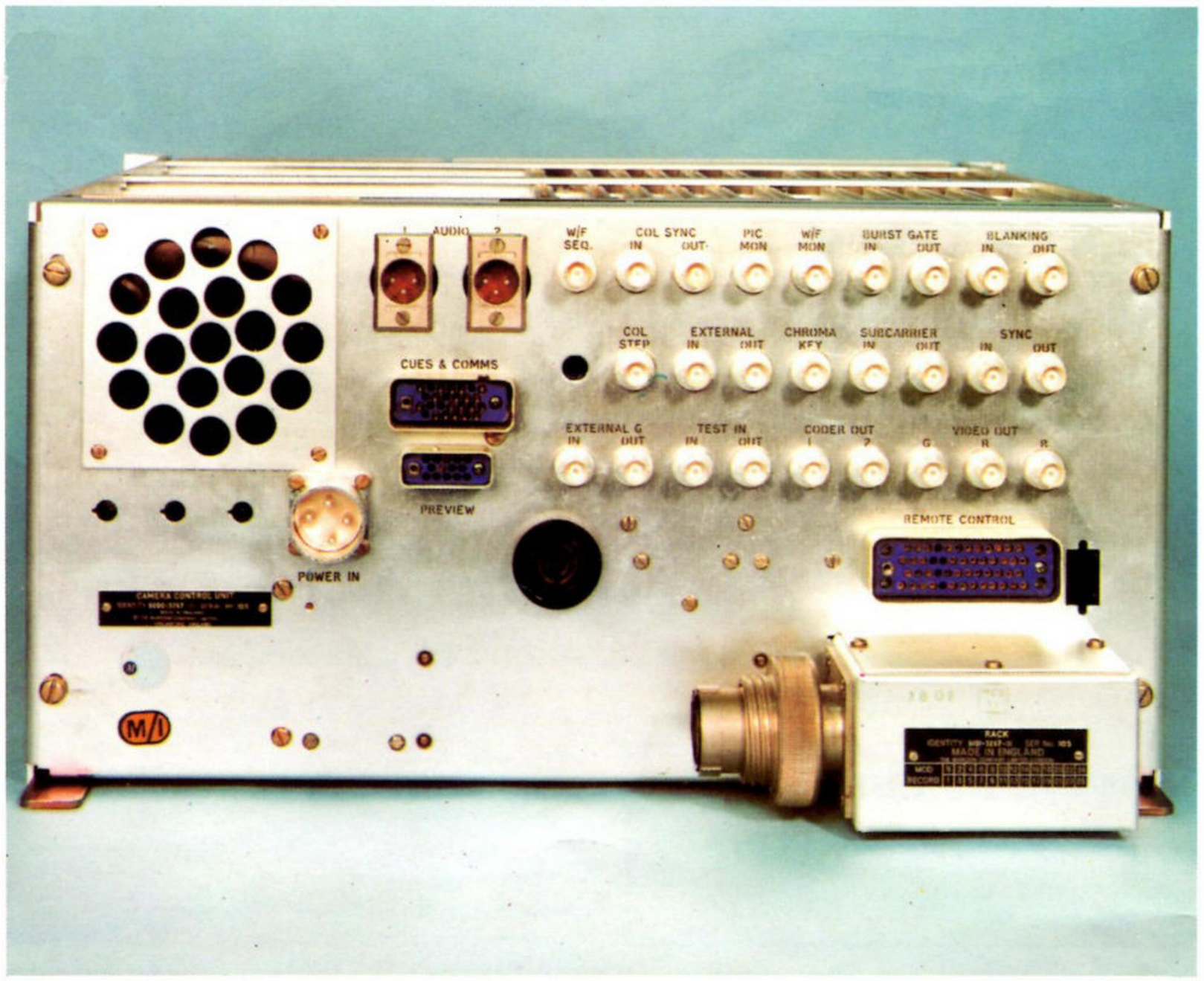
*Excluding zoom lens.

Ordering Information

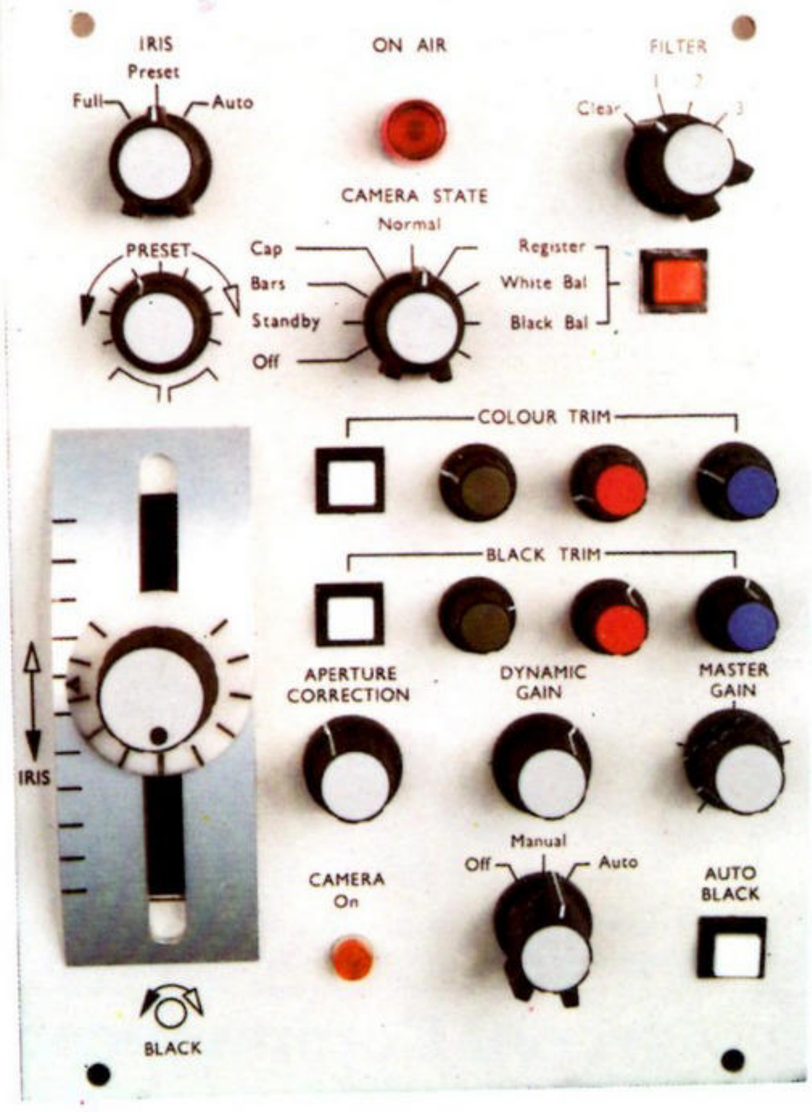
To ensure that your order is quickly processed and that you receive the correct items, please specify:

(1) Television standard and system required
(2) Length of camera cable
(3) AC supply voltage and tolerance
(4) Type of zoom lens and whether servo or manual, range extenders, etc.
(5) CCU mounting arrangements
(6) What options are required
(7) If a friction head and tripod/pedestal are required
(8) If test charts are required
(9) If additional handbooks are required
(10) If headsets/headphones are required
(11) If camera pick-up tubes are required
(12) If a 7 in viewfinder and mounting is required
(13) If training is required
(14) Any further items of equipment needed such as picture and waveform monitors, sync gens., communications, etc.
(15) Distance of remote control panel from CCU
(16) If a diascope is required
(17 If a large lens adaptor is required
(18) If battery operation is required
(19) If 1 in viewfinder is required
(20) Multicore or Triax

Rear view of control unit.

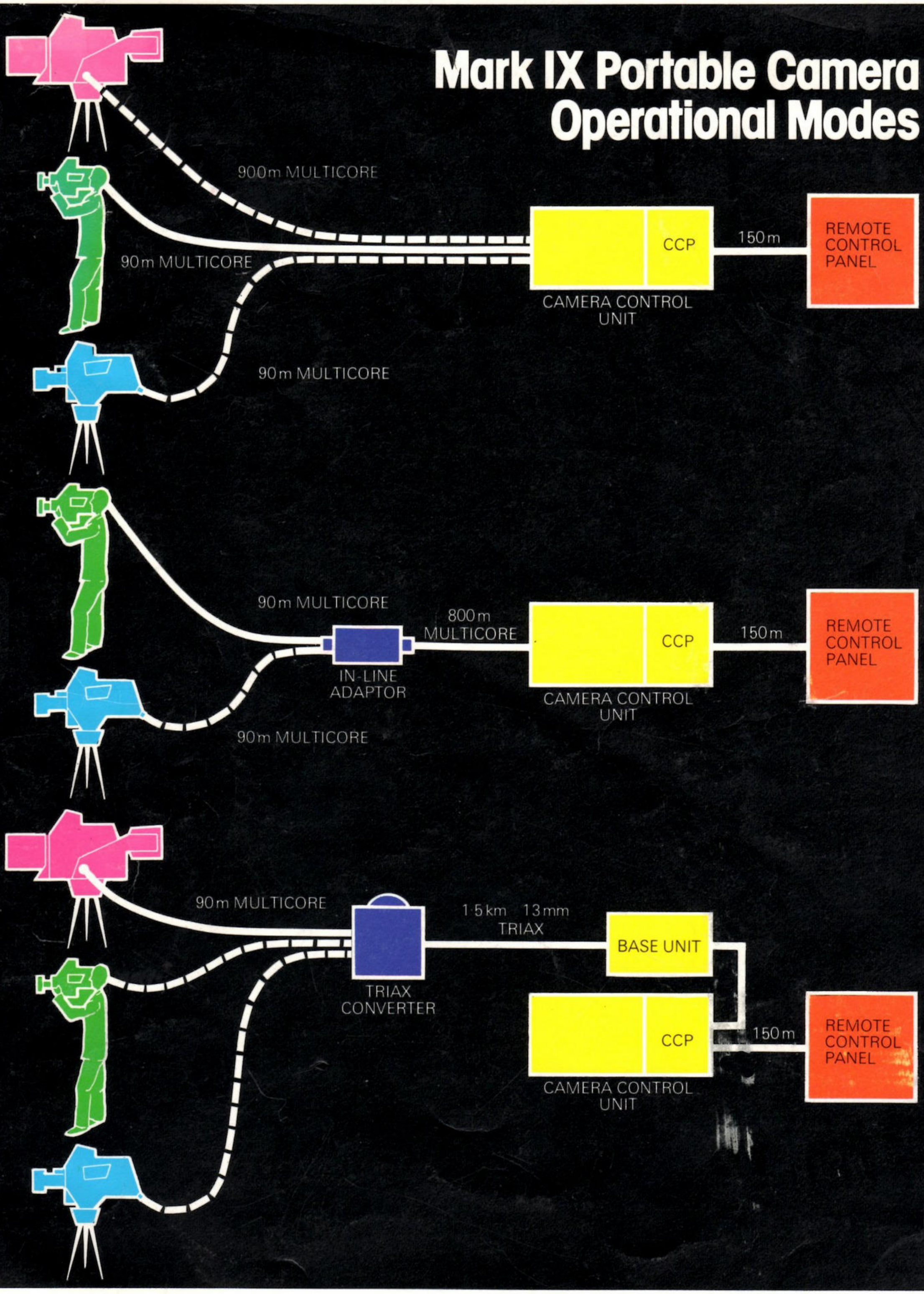


Remote control panel.



www.tvcameramuseum.org

Mark IX Portable Camera Operational Modes



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