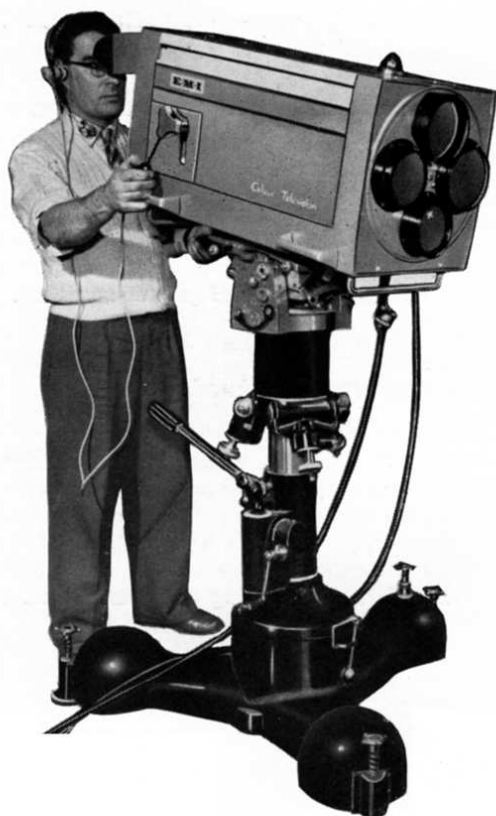




EMI ELECTRONICS LTD

Serving Science and Industry

BROADCAST & RECORDING EQUIPMENT DIVISION



Colour Television Camera Type 204

- ★ ***Compact and simple to operate***
- ★ ***Sensitive optical system***
- ★ ***Operates under poor lighting conditions***

Remote control panel operates camera up to 1000 feet

Suitable for broadcasting and closed circuit applications

THE Colour Camera Channel Type 204 produces high-quality colour television pictures suitable both for broadcasting and for closed circuit applications. The basic channel, consisting of camera, control unit, channel amplifier, power supply and waveform monitor, is inexpensive and can be used for 405, 525 and 625 lines systems. Special attention has been paid during design stages of the equipment to ensuring that maximum reliability and stability of colour balance and registration are maintained so that it can, if necessary, be operated over long periods of time by unskilled staff. Amongst the ancillary units available are the N.T.S.C. Colour Encoder 865, Sub-carrier Generator and Divider 868, Sub-carrier Phase Measuring Unit 870, Colour Bar

and Burst Pulse Generator 872, and various colour picture monitors.

The EMI colour television camera channel has already been extensively used in hospitals, at sales conventions and sports meetings, for entertainments and in industry. Experience has emphasised that whilst monochrome television is quite adequate for many applications, there are occasions when only colour can convey the information required. This is especially true not only of medical television, described in the EMI brochure "Medical Television", but also of fashion shows and sales demonstrations of such commodities as cosmetics and packaged foods. For educational applications and entertainments the advantages conferred by colour are manifest.

The Colour Camera



The Camera

The EMI camera uses three vidicon tubes, and a novel optical system which is capable of producing high quality pictures even under difficult lighting conditions. Each vidicon tube has its own focusing system, scanning yoke, and head amplifier. The camera will operate on 405, 525 or 625 line standards, and is capable of working in any fully compatible system. It has a four-lens turret giving horizontal taking angles of 6, 9, 18, and 27 degrees. The maximum aperture is $f\ 1.4$.

From the outset, EMI concentrated on producing a camera that would be far ahead of existing systems in colour rendering, efficiency and simplicity. The optical system evolved gives an outstanding increase in efficiency and light sensitivity.

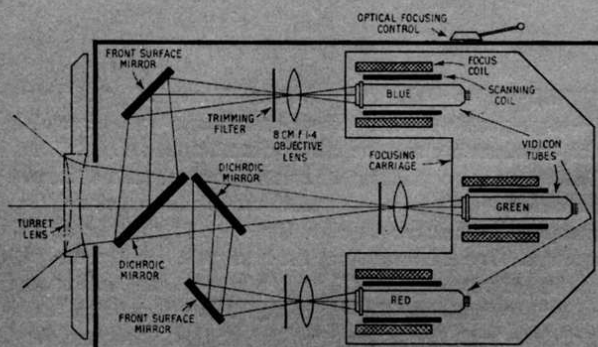
A great deal of attention has also been paid to the other factors that influence picture quality. The Camera Type 204 has an excellent signal-to-noise ratio, wide contrast range, stability of colour registration, high level clamping, and stabilized gain of amplifiers.

Camera Controls

A single control on the side of the camera operates the focusing adjustment and selects the position of the lens turret. An angular movement of the control arm is used for focusing, and a complete turn of the arm for moving the turret to the next lens position. This arrangement has the obvious advantages of simplicity and ease of operation. No "setting up" controls are contained in the camera.

Optical System

The new optical system is so designed that it allows the maximum amount of light to fall on the photoconductive surfaces of the vidicon tubes, and avoids many of the disadvantages of relay lenses. In the EMI system, light entering the camera through the turret lens is split up into its primary colours by two dichroic mirrors, which subtract first the blue and then red components from the incident beam, and pass the green component. The three beams are then focused on the photoconductive surfaces of the vidicon tubes by small objective lenses. These lenses are designed to have a small field of view so as to avoid colour errors introduced when dichroic mirrors are used at widely different angles of incidence.



Optical layout of camera

Basic Camera Channel Equipment

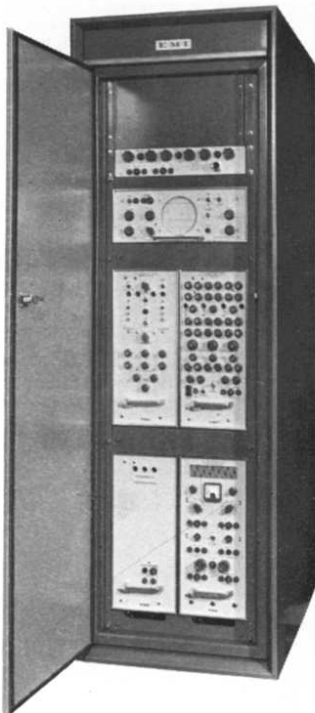
Channel Amplifier Type 247

The signals from the head amplifiers are applied to three separate amplifier channels, and amplified to a suitable value for high-level line-by-line clamping, and then applied to a field-by-field clamp. These signals are then further amplified before being distributed into the output which consists of two RGBY outputs at 0.7 volt peak-to-peak and two 4-volts negative mixed syncs. One RGBY output is relay controlled. The channel amplifier contains the following controls for operating the camera :

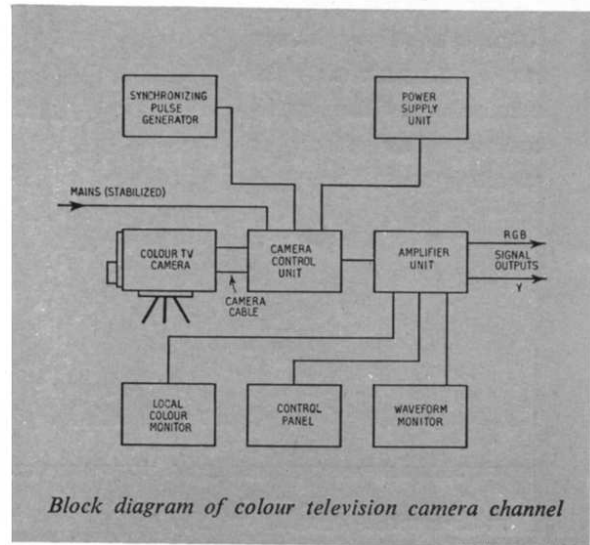
- Individual and master black level*
- Individual and master video gain*
- Remote iris*
- Local/remote switch*
- Manual/automatic gain switch*
- Test waveform switch*

Power Supply Type 229

The power supply unit for the camera channel operates from single-phase mains supply of 90 volts to 140 volts or 205 to 255 volts, 50 to 60 cycles per second. It supplies d.c. outputs of 300 volts positive and 150 volts negative for operating thermionic valves, and 27 volts positive, 24 volts positive, and 22 volts for operating microphone circuits, relays, shift coils, and other components of the equipment. It provides for complete control and monitoring of all the supplies. Consumption is 2 KVA on full load.



Control Cubicle



Block diagram of colour television camera channel

Camera Control Unit Type 218

The camera control unit contains all the electrical controls for the operation of the camera, they are :

- Beam current, beam focus, alignment, and target potentials*
- Scan height and width*
- Horizontal and vertical shift*
- Registration of the output signals.*
- Dynamic shading correction*

The alignment procedure has been simplified : during alignment, a switch allows the introduction of a change in electrostatic focus potential every third field. The alignment controls are then set for a minimum motion of the resultant picture. This method is quick and positive.

Waveform Monitor Type 302/1

The waveform monitor enables television waveforms to be displayed for examination on a five-inch cathode ray tube, and it operates on 405, 525, and 625 line systems. Composite and non-composite signals with an external synchronising pulse input can be displayed. The large, bright, and well-focused display makes accurate measurements simple and rapid, and the illuminated graticule shows peak white, blanking, and sync tip levels for accurate setting of the waveform amplitude. The graticule is calibrated for European and American systems.

Colour Camera Type 204 fitted with mirror, boom and lighting assembly for medical television applications. The mirror is remotely controlled.



Ancillary Equipment

Remote-control Panel Type 217

With this panel the camera can be operated remotely over distances of up to 1000 feet. It contains the programme controls necessary for operating the channel—master gain, master black level, iris control, and censor/transmit switch. The remote control panel contains no valves, and is extremely reliable and robust.

Monochrome Picture Monitor Type 301

The picture monitor provides a monochrome display of high resolution on a 14-inch cathode ray tube for monitoring the picture of vision transmissions on 405, 525, and 625 line systems. Its outstanding features include a stable picture size with varying picture content, bridging or terminating input for composite or non-composite signals, and separate sync input for use with non-composite signal.

Synchronising Generator Type 294

The synchronising generator generates all the waveforms necessary to operate standard television equipment. It generates four separate pulse outputs; line drive, field drive, mixed synchronising, and mixed blanking, each of which is of negative polarity. It takes less than one hour to convert the unit for use on 405, 525, or 625 line systems, and it has its own built-in waveform monitor.

Colour Picture Monitors Types 308 and 309

The colour picture monitors provide a colour display of high resolution on a 21-inch (534 mm) shadow-mask tube for high-quality monitoring and picture evaluation of vision transmissions on 525 or 625 line systems.

N.T.S.C. Colour Encoder Type 865

The colour encoder produces an N.T.S.C. type of signal and contains all the circuits required to generate composite video colour signals from red, green and blue video inputs. The only additional inputs required, except those from power supplies and standard pulses, are from the burst pulse and sub-carrier generators. An outstanding feature is its stability.

Sub-carrier Generator and Divider Type 868

The sub-carrier generator and divider generates sub-carrier for the encoder and divides down to twice line frequency for locking the synchronizing generator.

Colour Bar and Burst Pulse Generator Type 872

The colour bar and burst pulse generator generates saturated colour bar signals for the adjustment and testing of the encoder, for which it also provides the burst pulse input.

Sub-carrier Phase Measuring Unit Type 870

The sub-carrier phase measuring unit measures the relative sub-carrier phases obtained on colour bars generated by the Colour Bar and Burst Pulse Generator Type 872 and enables performance of the encoder to be checked. It can also be used to obtain precise quadrature adjustment of the encoder.

The Company reserves the right to modify these designs and specifications without notice



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