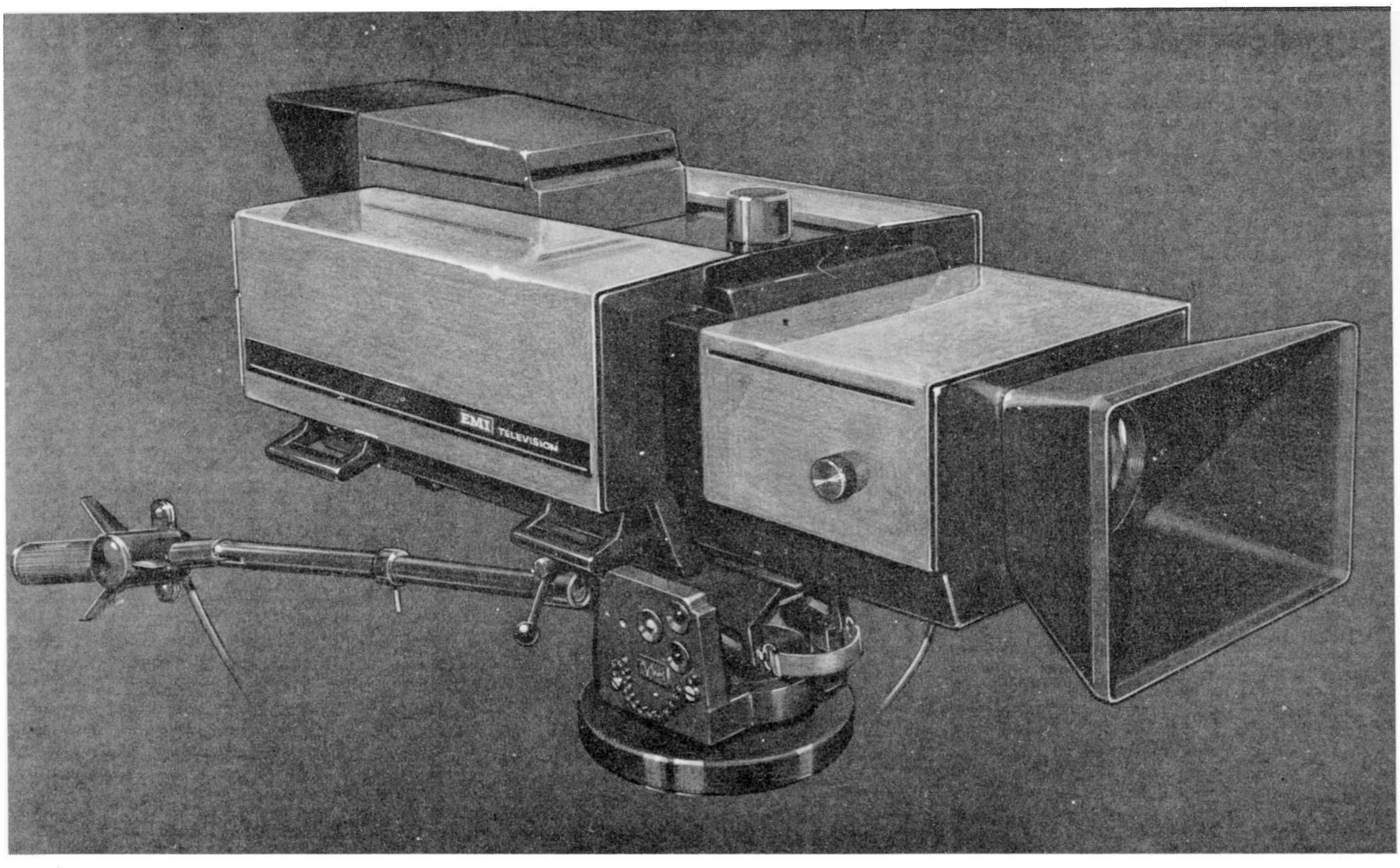


New EMI colour camera

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THE Colour Camera Type 2005 is the latest in the line of broadcast television cameras developed by the Television Equipment Division of E.M.I. Electronics Ltd. This new colour camera gives excellent quality pictures and is a logical development from the widely used E.M.I. Colour Camera Type 2001.

Whilst a radically new camera head has been engineered many electronic and mechanical features have been borrowed from the earlier 2001 design. This has resulted in many components and circuits being common to both cameras — a useful feature to the television station who now owns 2001 cameras and would like to obtain a number of the new 2005 cameras.

The 2005 camera employs three 30mm lead oxide vidicon pickup tubes. A range of manual or servo controlled zoom lenses is available, the required lens being mounted on the front of the camera. The camera viewfinder display includes an electronically generated marker showing the field of view of the lens in use.

The 2005 camera will work with up to 600 metres of TV-81N camera cable or up to 300 metres of miniature cable.

It has an 18cm diagonal viewfinder which is a development of that used on the 2001 camera. The viewfinder, as well as displaying the camera picture, can also be driven by an external video signal which can be viewed instead of, or mixed with, the channel signal — thus aiding camera alignment. As a further aid to camera set up an integral diascope system can be included.

One problem inherent in the use of lead oxide vidicon tubes is lag - especially at low light levels. In the 2005 camera lag has been minimised by the incorporation of fixed bias lighting. Bias lighting applied to the face of the tubes results in higher signal currents and, therefore, lower lag. When the bias lighting is switched on preset black level compensation is automatically applied to restore black to the correct level. Circuitry is included in the camera head to correct the shading caused by the use of bias lighting.

Another feature, benefiting those broadcasters who hire their pickup tubes from the tube manufacturers, is the inclusion of a standby facility in the 2005 camera. In this "standby" mode the camera is warmed up and ready for use at about a minute's notice. However the camera pickup tubes are being operated in

such a way that the tube hours are not accountable for hire payment purposes. When the extended period in which a camera can be powered up but not in use is considered it will be seen that the 2005 standby facility can result in an appreciable cost saving and will greatly extend pickup tube life. The standby switch, located at the C.C.U., reduces the pickup tube heater supply to four volts, switches off the tube beams and inserts a mechanical capping device in the optical path to the tubes. On switching to normal operation the heater voltage is instantly restored to the normal working value, but the beam currents are held off for approximately one minute, the removal of the mechanical cap also being delayed.

The 2005 camera head employs precision scanning and focussing yokes in conjunction with highly stabilised scanning and pickup tube heater supplies resulting in good long term stability and accurate registration. The geometrical deviation between green and any other picture is less than 0.05% of the picture height within a circle equal to 0.8 times the picture height and less than 0.2% outside this area. Registration stability is further aided by the inclusion of a unit that automatically maintains the relative centering of the red, green and blue pictures.

The E.M.I. Auto Centering Unit Type 2117 (A.C.U.) was first announced at the N.A.B. convention, held in Chicago earlier this year. Red, green and blue signals from the camera are fed to the A.C.U. which inspects the red and blue signals for centering errors relative to the green signal, in both horizontal and vertical directions. If an error is detected a correction signal is generated and applied to the appropriate camera centering circuit. This results in a centering accuracy of approximately $\pm$0,1 picture elements.

The signals from the three pickup tubes are amplified in low noise head amplifiers with F.E.T. front ends. They then pass through low pass band filters to minimise noise and cross-talk. Individual red and blue gain controls for equality balance and an accurately tracking master gain control with an 18dB range are included, these controls being operated from the C.C.U. The signals then pass through clamping and limiting circuits to the camera cable output amplifiers.

In the Camera Control Unit Type 2116 the three signals pass through processing stages for camera cable loss correction, amplification and black level clamping. The black levels are then automatically adjusted by flare correction circuits to compensate for scattered light effects. Following this, horizontal aperture correction can be applied to all three signals. The signals are then routed through an integral contour corrector to provide an improvement in resolution. The three signals are then processed in a 3 x 3 matrix that provides colorimetry correction, pass to gamma correction circuits that can provide a gamma range of ;- linear — 0.72 — 0.55 or 0.45 and then to blanking and limiting circuits. Three independent non composite outputs of each of the three signals are then provided at 0.7 volts standard picture level into 75 ohms.

The 2005 camera includes test facilities switched from the C.C.U. so that test signals can be routed through the entire video processing chain. Monitor points permit signal inspection at various processing stages. A comprehensive switching arrangement allows a variety of signals to be fed to a picture monitor, a waveform monitor and the camera viewfinder. A sequential output of red, green and blue is available for monitoring purposes.

The 2005 camera uses the same programme control panels as the 2001 camera. The Operational Control Panel Type 2105 includes those controls necessary for normal programme operation. Iris and master black controls are combined in a joystick. Rotation of the joystick controls master black and operation in the quadrant mode gives fine iris control. This panel also includes coarse iris control and calibration and preview monitor switching controls.

The other programme panel is the Colour Balance Panel Type 2102. This contains two joystick controls. One enables the gain to be altered in the red, green or blue channels without affecting the overall gain. The other allows for alteration of the black level in the red, green or blue channels.

The 2005 camera is available for use in 625 line 50 field and 525 line 60 field systems. It requires 500 VA of power from a supply of 100-125 or 200-250 volts 50-60Hz.

Input pulse requirements are horizontal and vertical drives, blanking and mixed synce.

The 2005 camera includes a comprehensive communications system that will satisfy all production and engineering requirements. ■