



PRELIMINARY SHEET
EXPERIMENTAL MODEL

Plumbicon* Colour Television Camera Chain, Type LDK 13



The design of this portable colour television camera was made possible by the development of a new, $\frac{5}{8}$ -in Plumbicon tube, a miniature type roughly half the size of the standard Plumbicon. The equipment consists of a very small, light-weight camera, an intermediate unit and a camera control unit, the latter being the standard CCU of the Plumbicon Studio Colour Camera Chain, Type LDK 3. Small size and low weight—camera including lens 4.5 kg, $3\frac{1}{2}$ -in viewfinder 2 kg, interconnection cable (1½ mtr) complete with plug and socket 1½ kg, intermediate unit 6.8 kg and carrying belt 3 kg—make this camera equipment particularly suitable for use in outside broad-

casting for on-the-spot covering of various events.

It is equally suitable for application in the medical field, not only for televising surgical operations but also for use in conjunction with optical instruments in microscopy and endoscopy.

The interconnection cable between camera and intermediate unit may have a length of several metres, so that in outside broadcast work the intermediate unit can be carried as back-pack by an assistant of the cameraman, or when it is carried by the cameraman himself, he may lay it down and move about with the camera proper within

a certain area. Two types of electronic viewfinder have been designed for this camera, the above-mentioned $3\frac{1}{2}$ -in reflex type and a 1-in direct viewing type, which weighs 1 kg.

The intermediate unit on its turn is connected to the CCU, which will normally be located in an outside broadcast van, by means of a single camera cable with a maximum length of 1000 metres.

The CCU provides PAL or NTSC-coded colour signals with and without sync pulses, as well as a gamma-corrected RGB signal triplet for external use.

The Camera

The camera is built into an aluminium alloy casted housing having deep-drawn aluminium covers with snap-locking. The housing is fitted with a facility for tripod mounting. The camera only contains the pick-up section comprising the colour-splitting prism, the three camera tubes with associated deflection units, and the first video pre-amplifier of each colour channel. The remaining circuitry normally housed in a camera, is accommodated in the intermediate unit.

The whole pick-up section is incorporated in a dust-free, aluminium casted block fixed to the front of the camera housing, to which the lens is also mounted by means of a quick-locking bayonet device. This mechanical design results in an outstanding optical precision and a lasting stability.

The camera is equipped with a specially designed Schneider zoom lens, type Vario-gon, f/1.6, 13 to 65 mm, with servo-controlled iris and manually controlled focus and zoom. The new, more efficient colour-splitting prism employed, is preceded by a $\lambda/4$ -filter to reduce objectionable effects due to incident, polarised light. A four-position filter wheel is arranged between lens and prismatic colour-splitter. A cap filter is not required, because the lens iris can be completely closed.

* Registered Trade Mark for television camera tubes.

The miniature, $\frac{5}{8}$ -in Plumbicon tubes are electrostatically focussed. Apart from the overall picture sharpness achieved, this method of focussing has the additional, important advantage of obviating the need of focussing coils in the deflection coil assemblies, so that these coil assemblies could be considerably reduced in size and weight. The deflection units have vernier controls for optical focussing and picture rotation.

All electrical units of the camera are of the plug-in type. The video pre-amplifiers, which employ thin film techniques, apply the primary colour signals with an amplitude of 200 mV to the intermediate unit.

The Intermediate Unit

The circuitry of this unit is mounted on plug-in printed boards. It includes: pulse generation, horizontal scanning, scan failure protection, focussing, video amplification, cable length correction, test signal generation, intercommunication and signalling. The video amplifiers have an output signal level of 0.7 V. The test signal generator provides a line sequential sawtooth signal that can be fed to the camera pre-amplifiers via a signal current source in the camera. The unit has a spare location lodging a module extender, to facilitate service measurements. It is further fitted with a blower for forced-air cooling. This unit, which can be combined with a carrying belt for use in outside broadcast work, is connected to the CCU by means of a single camera cable.

The Camera Control Unit

As mentioned before, the camera chain uses the standard, modular CCU of the LDK 3 Plumbicon Studio Colour Camera Chain. This unit consists of three major subassemblies: Local Control Unit, Electronics Unit and Power Supply Unit. These subassemblies, which are connected by cables at the rear, can be accommodated either in a 19-in rack or in three separate cabinets.

The Local Control Unit includes a pull-out drawer with operational controls at the front panel and setting-up and colour registration controls at the top panel, and the Colour Waveform Monitor, Type LDK 4910.

The Electronics Unit comprises two rows of modules containing the circuitry for: video processing including contour enhancement, encoding, pulse generation and timing, vertical scanning, focussing and beam alignment, picture switching, test signal generation, communication, signalling and remote control.

The Power Supply Unit consists of one row of modules containing the regulated power supply circuitry for the camera chain. Voltage supplies for video and scanning circuits have been separated to minimize interference. All power supplies for the camera are automatically adapted to the various lengths of camera cable used.

