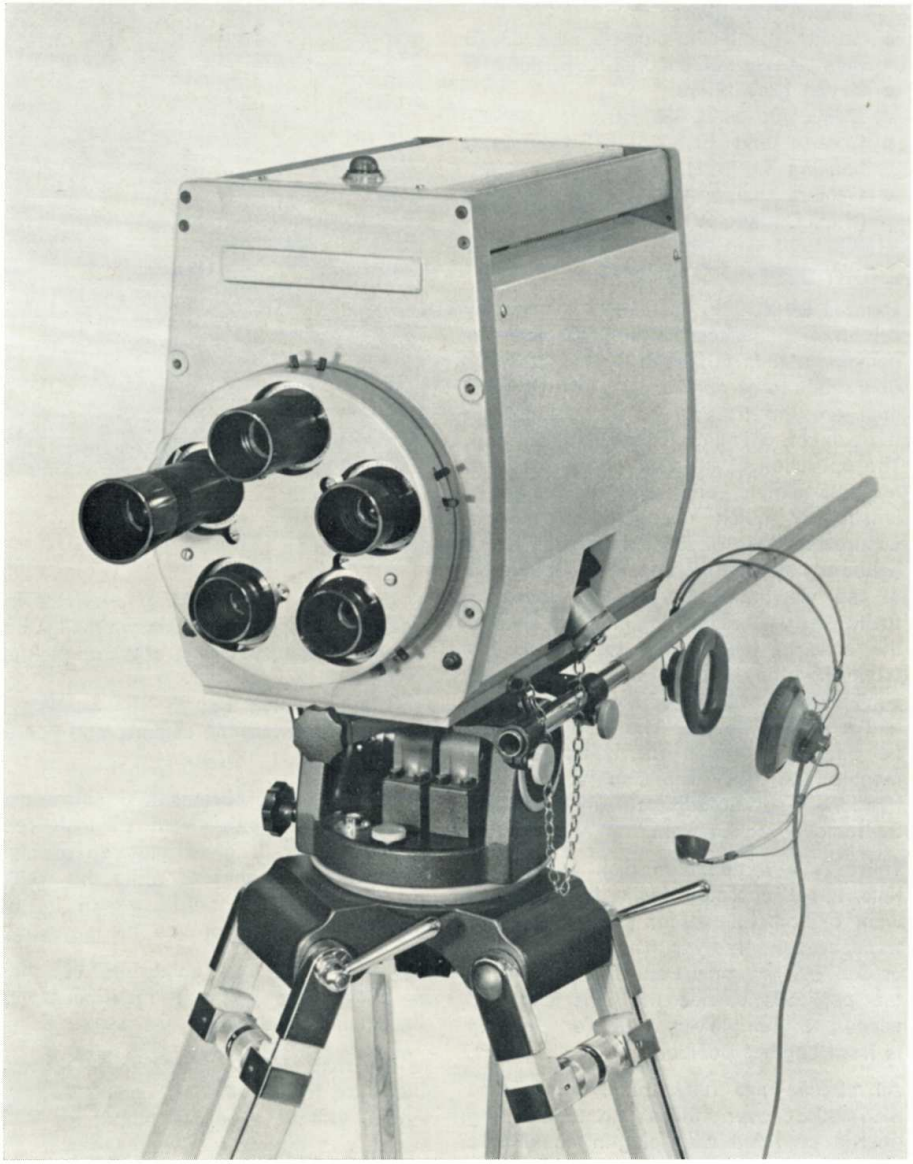
PLUMBICON STUDIO CAMERA CHAIN, TYPE EL 8020 – EL 8025



With this fully transistorised camera chain full use has been made for the first time of the outstanding properties of the Plumbicon pick-up tube in studio use, viz.:

- High light sensitivity
- Excellent signal-to-noise ratio
- No inertia phenomena
- No burning-in of the image
- No spurious signals
- No dark current
- Operation over a wide temperature range
- Long life
- Very simple adjustment and operation.

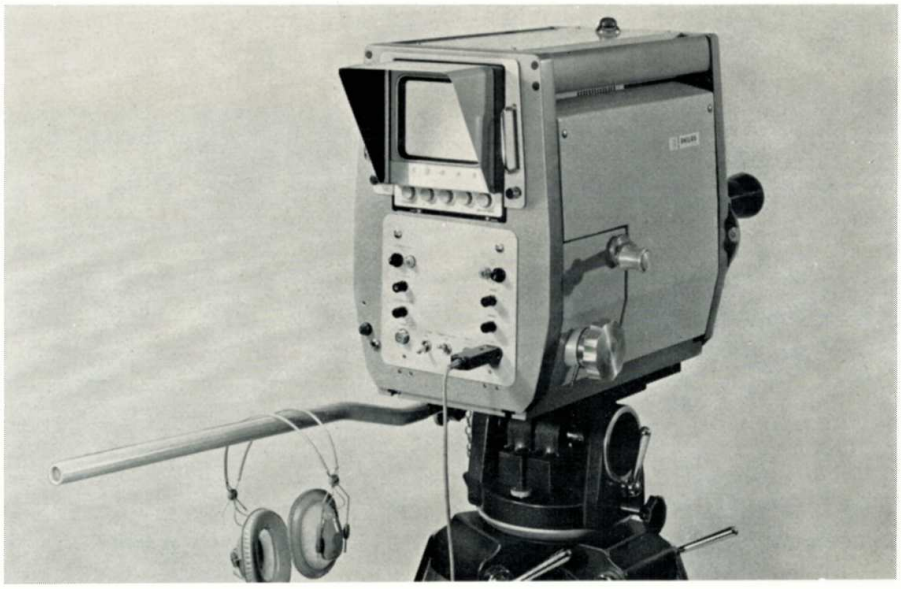
Because of these excellent qualities of the Plumbicon, the studio camera chain EL 8020 - EL 8025 complies with stringent demands in respect of picture quality and reliability.

Maintenance and supervision are greatly facilitated because the Plumbicon requires only little expenditure for the circuitry and use is made of plug-in, hinged circuit boards.

The camera with its five-lens turret meets all the normal requirements of studio work and outdoor broadcasting. Provision has been made for replacement of the lens turret by a fixing plate for a zoom lens.

The complete camera chain comprises:

- Plumbicon Studio Camera EL 8020, including electronic viewfinder and lens turret, but excluding pick-up tube, lenses and grey filters
- Studio Plumbicon pick-up tube 55875
- Five lenses EL 8960/02 . . . EL 8960/06
- Seven grey filters EL 8961/00 . . . EL 8961/06
- Control unit EL 8025 (if desired in housing EL 8971)
- Camera cable with plugs, EL 8980 (B.I.C.C., Mk IV)



SHORT DESCRIPTION

Camera EL 8020

All important electrical controls are accommodated in the control unit; the only operations to be performed by the cameraman are the training of the camera on the subject, changing lenses and focusing. The operation of the five-lens turret by a lever is simple, and rapid exchange of lenses by quick change lens mounts ensures no loss of time. Luminous fields (with adjustable brightness) in the hood of the viewfinder indicate the lens actually in use. Focusing is by shifting the slide of the pick-up tube back and forward. This is done by a large convenient knob with adjustable friction grip and a locking device. The tube slide can be hinged outwards for quick replacement of the tube. The diaphragms of all five lenses can be adjusted simultaneously by remote control from the control unit.

There is a ten-position disk behind the lens turret operated by a knurled disk witht eight positions for grey filters with transparencies ranging from 1.5 to 100 %, or for colour correction filters. One of the positions carries the lens cap and access to the pick-up tube for cleaning is from another position.

All circuits are fully transistorised and distributed over three printed wiring boards provided with plug-in connectors as follows:

- a pre-amplifier board inserted into the slide of the pick-up tube and connected directly to the signal electrode of the tube. In this way optimum signal-to-noise ratio and minimum interference from extraneous fields is ensured. The input stage in the cascode has two nuvistors.
- a board with circuits for vertical deflection, diaphragm control, and camera cueing.
- a board with circuits for horizontal deflection and blanking, a circuit for the test saw-tooth generator together with a safety circuit for the pick-up tube.

  The two latter boards can be hinged outwards while the camera is in operation.

The camera incorporates a transistorised electronic viewfinder with 6½-inch rectangular tube. It gives pictures of high contrast and brightness while the treble boost device with on/off switch in the amplifier greatly improves the definition.

The viewfinder can easily be removed as a complete unit and reconnected to the camera by a cable.

At the rear of the camera there are adjustments for viewfinder, cueing and intercom system, a coaxial output for VBS signal, and outlets for two headsets.

Five cue lamps are fitted, two at the front (with on/off switch), one at the top and two at the rear (one within the viewfinder hood).

Inside the camera there is an operating hours counter for the tube.

The camera cable is connected to the camera on the left hand side by a socket running at an angle of 45 degrees and situated near the camera pivot. This socket can be hinged to a horizontal position if the camera is used on a table surface. Below the camera is a mains socket with 2-A fuse, connected to a separate mains socket on the control unit.

Control unit EL 8025

The camera control unit is suitable for insertion into 19-inch or DIN racks. It is mounted on roller rails and can be drawn out over its whole length during operation. It can also be supplied in a cabinet EL 8971.

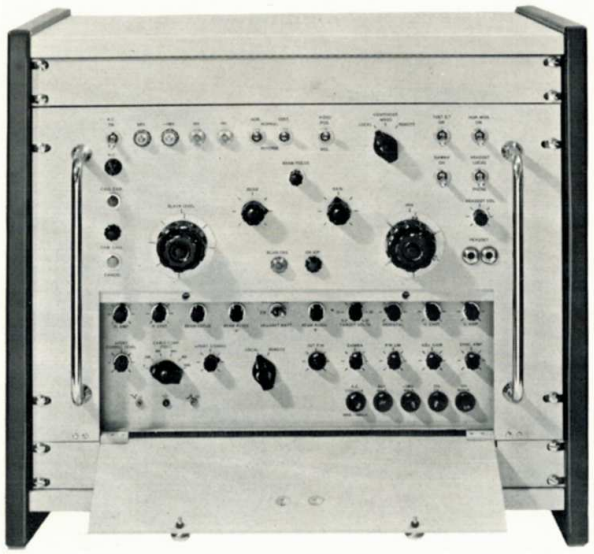
On the control panel are:

- all the operating controls for the adjustment of the camera including diaphragm control, for cueing, and the intercom system
- all the important preset controls (protected by a lid) for the amplifier and deflection circuits.

The operating controls and certain preadjustment controls can be duplicated on a subsidiary control unit.

All circuits are fully transistorised and distributed over four printed wiring boards as follows:

- board with video amplifier and output circuits
- board with circuits for pulse shaping (drive, blanking, and clamping pulses), focusing current, beam alignment and test wobbulator



- board with circuits for cueing and intercom system and for fading in of an external video signal into the viewfinder image
- board with rectifier and stabiliser circuits.

The checking and measurement of the circuit boards is simplified because each can be pulled out and connected again via an extension plate included in the unit so that the whole print protrudes without the operation being affected. All connections are at the rear of the unit including the one for the camera cable.

TECHNICAL DATA

Scanning system:
CCIR 625 lines or EIA 525 lines

Power supply: 100 to 125 V in 5-V steps; 200 to 250 V in 10-V steps; 50 to 60 c/s (fluctuations of ± 10 % do not affect specified performance)

Rated power consumption: 100 VA

Input signals (bridged):
horizontal drive pulse (H)
vertical drive pulse (V)
blanking signal (B)
sync. signal (S)
— 1 to — 5 V_{pp} across 75 Ω

external video signal (VBS): + 1.4 V_{pp} or + 1 V_{pp} across 75 Ω *
(for fading into the viewfinder image)

Output signals:
3 x video signal, separately commutable to: either VB
+ 1 V_{pp} or + 0.7 V_{pp} across 75 Ω*
or VBS
+ 1.4 V_{pp} or + 1 V_{pp} across 75 Ω*

1 x video signal (VBS) on the camera:
+ 1.4 V_{pp} across 75 Ω.

	middle	edge of picture
Resolution (modulation depth at 5 Mc/s):		
without aperture correction	35 %	20 %
with aperture correction	100 %	60 %

Signal-to-noise ratio (peak value of the signal amplitude with respect to r.m.s. value of the noise amplitude at a bandwidth of 5 Mc/s) at a signal current of 0.3 μA:
without gamma and aperture correction: 45 dB
with full gamma and aperture correction and weighted noise: 43 dB

Illumination (reflection factor of the scene 0.5; camera lens f/2, with an average Plumbicon) for a signal current of 0.3 μA: 100 lux

*) Depending on the system adopted in the studio for the VBS amplitudes either 1.4 V_{pp} or 1 V_{pp}; by means of a common switch the three output signals are matched to one of these values.

for a video signal with acceptable signal-to-noise ratio: 15 lux

Picture linearity
within a circle having a diameter equal to the picture height: better than ± 1 % of picture height
beyond this circle: better than ± 2 %

Trapezoid or rhomboid distortion:
less than 2°

Barrel or cushion distortion:
less than 1 % of picture height

Gamma correction (continuous pre-adjustment; with on/off switch): 0.4 . . . 1

Aperture correction (adjustable delay, resulting in improved signal-to-noise ratio): boost of 10 dB at 5 Mc/s; max. at 7 Mc/s

Black-level control (shifting of the black level supplied by the camera, without effect on the overall amplitude):
+ 30 to — 30 % of rated white level

White-level clipping adjustable from:
95 to 110 %

Diaphragm adjustment: by means of a calibrated knob on the control unit; electrical precision: 1/10 of a diaphragm stop; time required for full range: 1.5 second

Electronic viewfinder:
6½-inch rectangular tube
max. brightness: approx. 340 Nit
resolution: 600 lines
frequency boost (with on/off switch): 6 dB at 3 Mc/s;
on the control unit: switch for fading-in of an external video signal or for change-over to this signal

Permissible ambient temperature:
— 10 to + 45° C

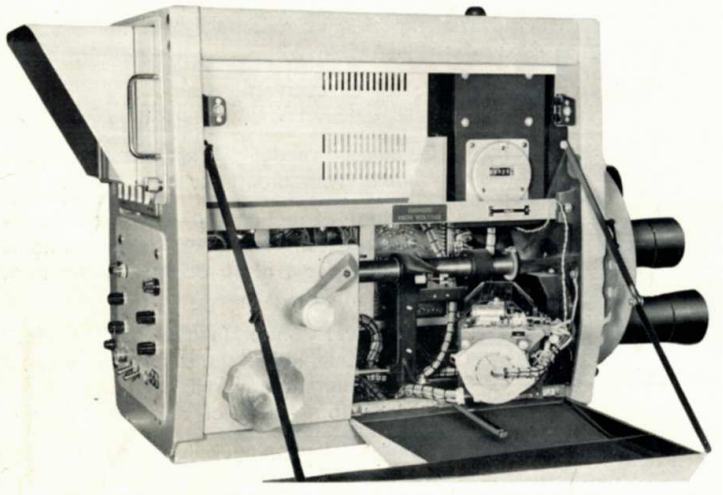
SPECIAL FEATURES

Safety circuit: suppression of the beam current, and lighting up of a pilot lamp, in the event of failure of the deflection currents.

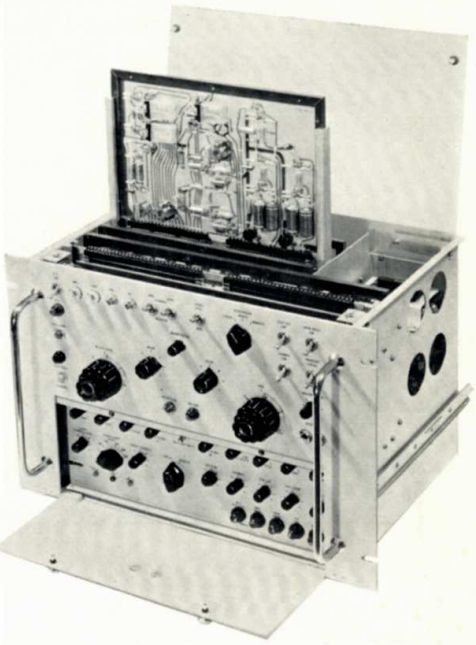
Picture reversal: horizontal and vertical by two change-over switches on the control unit.

Polarity reversal: positive or negative modulation of output signals by switch on control unit.

Initial setting up: by application of the signal supplied by the built-in saw-tooth generator to the input of the pre-amplifier.



Camera with open right-hand cover and camera tube unit swung out for easy replacement of the Plumbicon.



Each circuit board can be pulled out and re-connected through an extension board. This greatly simplifies checking and measuring.

Beam alignment: facilitated by wobbling of the focusing current in the rhythm of half the frame frequency.

Line modulator: modulation of the line amplitude for achieving a "water-mirror" effect.

Cable-length compensation: selector switch with steps of 60 m (200 ft) - maximum 300 m (1000 ft) - for compensating resp. the amplitude, the phase and the transient characteristics.

Cueing: built-in multivibrator for flashing signals from camera to control unit and vice versa.

Intercom between camera and control unit: also possible with camera chain switched off (built-in self charging storage battery).

Subsidiary control unit: connected in parallel to the normal control unit; contains all the operating controls, the principal pre-set controls and the cueing controls for the camera.

Lenses: Schneider TV Xenon; f/2.0.

Focal length (in mm)	28	35	50	75	100
Type EL 8960/. .	/02	/03	/04	/05	/06

Grey filters

Transparency (in %)	100	50	25	12,5	6,3	3,1	1,5
Type EL 8961/. .	/00	/01	/02	/03	/04	/05	/06

Camera cable (B.I.C.C. Mk IV with plugs)

Length (in m)	5	15	25	50	100
Type EL 8980/. .	/00	/01	/02	/03	/04

Dimensions (height x width x depth):
Camera: 470 x 390 x 550 mm (18.5 x 15.4 x 21.7 in)

Control Unit: 310 x 480 x 310 mm (12.2 x 19.0 x 12.2 in).

Weight
Camera: 50 kg (110 lb)
Control Unit: 23 kg (50.6 lb).