



SERIES 110 COLOUR CAMERAS

LINK

ELECTRONICS

110 STUDIO/O.B. CAMERA

LINK SERIES 110

TYPE 110 STUDIO/O.B. CAMERA

The leader in the family of cameras from Link Electronics, the Series 110, offers all the features expected from the latest generation of Broadcast Colour Cameras. Engineered to a demanding specification and designed around the cameraman – not the electronics – the camera includes these main features

- Lightweight yet robust for studio or outside broadcast use
- Anti-comet tail operation with light bias and extended red tubes
- High sensitivity – normal operation with 75ft cdl. at f2.8
- Computer matched optics with pluggable studio or O.B. matrix
- Integral zoom – choice of lens and drive systems
- Removeable tilting viewfinder with lens angle indication
- Exceptional accessibility for maintenance
- Lightweight cable with automatic length compensation
- Comprehensive monitoring and communications facilities
- Compact control unit only six rack units high



With the Series 110 the Link Electronics design team have taken full advantage of the latest developments in solid-state technology. Setting themselves a very high specification they have been able to build a camera which is designed to fulfil the requirements of the most demanding user at a reasonable cost.

Series 110 embraces a range of colour cameras, this version being based on a sturdy, attractively designed frame. The heart of the camera is a new splitter block with high efficiency, low colour shading and tightly controlled characteristics. The integral zoom lens, coupled with the compact electronics, makes a sensibly sized camera which is highly stable both mechanically and electronically.

TECHNICAL SPECIFICATION

System:

625 lines, 50 field or 525 line 60 field. P.A.L., N.T.S.C. or Secam coders available.

Pick-up Tubes:

Three 25mm Lead Oxide Vidicon tubes, incorporating Anti-Comet Tail guns and light bias. Philips type XQ1080 series or equivalent.

Power Input:

115V \pm 10% or 230V \pm 10% at approximately 300VA.

Channel Outputs:

2 sets R.G. & B. 0.7V into 75 Ω from 75 Ω source. 1 set limited to system bandwidth. One colour separation overlay signal output of 0.7V into 75 Ω B-Y, G-Y or R-Y, depending on setting of pluggable link.

Monitoring Outputs:

2 x monitor outputs of 1V composite into 75 Ω for picture and waveform.

1 x colour step waveform for parade display on waveform monitor of -5, 0, +5V from 1K Ω source.

Channel Inputs:

Syncs and blanking 0.5V to 6V negative going. Ext. test signal, 1V composite. Ext. viewfinder signal, 1V composite. Bridging connectors provided with all inputs.

Sensitivity:

With scene illumination of 750 lux and peak white scene reflectance of 60%, lens aperture is f/2.8.

Signal/Noise:

48dB unweighted w.r.t. a peak signal current of 300 nA per channel, with unity gamma, and linear matrix, no contour correction.

Geometry:

Inside a circle having diameter 0.8 picture height, better than 0.5% of picture height. Outside this circle better than 1%.

Registration:

Inside a circle of diameter 0.9 picture height, deviations less than 40nS. Outside this circle deviations less than 100nS.

Frequency Response:

\pm 0.5dB to 5MHz.

Resolution:

Adjustable with contour corrector to 100% depth of modulation at 5MHz; without overcorrection at lower frequencies. The contour correction includes circuitry to prevent excessive black edging if overcorrection is used.

Gamma Laws:

Switchable. 0.4, 0.5, 0.6 and unity.

Master Gain:

Switchable at CCU from 0 to +12dB in 3dB steps.

Colour Balance:

\pm 8dB, allowing \pm 6dB for colour temperature variations and \pm 2dB for tube variations.

Master Lift:

Before gamma correction, range +10% to -30%.

Individual Lifts:

Range \pm 5%.

Linear Matrix:

Reversible plug-in module provides two alternative coefficients for daylight or studio conditions.

Taking Characteristics:

Prism optical crossovers are matched to within \pm 5nm.

Contour Correction:

Both horizontal and vertical. Level dependent circuits with noise coring. Separate controls for horizontal/vertical mix and gain.

Flare Correction:

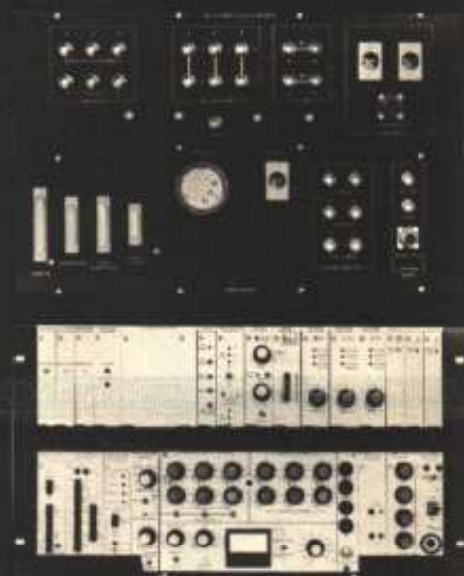
Switchable in-out.

Shading Correction:

Additive and multiplicative compensation with sawtooth and parabolic waveforms introduced before the action of the variable gain circuits.

Monitoring Facilities:

Push-button selection of the following signals at CCU input or output: Luminance; Red; Green; Blue; R minus G; B minus G; R/G or B/G CLUE or at $\frac{1}{4}$ field, R.G.B. line parade, ext. test minus green, local sawtooth injected at CCU input or head amp input. Bridging out of green facilities provided.



CCU

Linear Looped Outputs:

0.7V, 75 Ω noncomposite, clamped R, G and B signals looped through at rear of CCU.

Camera Cable:

Diameter 13mm. F & G 753-5, or BICC 5677 or equivalent. Max. length usable is 800 m. F & G 753-6 (7mm) max. length 100 m. Auto length correction. No volts above 12 on cable with head disconnected.

Remote Controls:

2 multiway outputs for master lift and iris and colour balance.

Standby Facilities:

Switch at CCU reduces tube heaters to 4V., caps up and cuts off beams and hours counter. When released normal operation achieved after 30 second delay on beam currents. Lamp at head indicates standby condition.

TECHNICAL SPECIFICATION

Automatic Capping:

Camera automatic mechanical capping when power is switched off.

Communications:

4 circuits provided to the head and one to CCU. Cameraman has individual level control of producer, secretary, engineering and programme sound. Cameraman's and spare headset outlets provided at the head, together with two headphone sockets, with level controls for programme sound and talkback. Full communications facilities, with individual level controls available on multiway socket for tracker etc. Communications interface with the channel at zero level, balanced.

Separate Call Producer and Call Engineering keys at the camera which may be operated from the Pan Bar, and Call Camera key at the CCU which flashes the On-Air Cue lights.

Programme Microphones:

Two Programme Microphone circuits provided between camera and CCU, with individual gain control facilities. Input - 60dB, balanced, low impedance. Output - zero level, balanced.

Camera Rig Facility:

Switch on camera head allows only comms. to the CCU and utility mains socket to be powered.

Filter Wheel:

Takes up to six filters, controlled from CCU. Visual indication of filter position at camera.

Centre of Gravity:

Thumbwheel adjustment provided at camera rear.

Viewfinder:

7" tube, with integral implosion guard. Tilttable $\pm 60^\circ$, rotatable 90° for camera line-up. Highlight brightness 2000 lm/m^2 . Detachable and can be operated up to 3 metres from the camera. Normal/mix/ext. switch provided. Can be remotely operated from Pan Bar. Electronic zoom angle indicator. On-air and zoom-available lights visible inside viewing hood.

On-Air Lamps:

Dual recessed at camera front, inside viewfinder hood on rear panel, CCU, OCP, colour balance and auxilliary tracker output.

Auxilliary Video:

An output of viewfinder video provided at camera head. A second video link is provided from CCU to camera head for commentators monitor, Autocue, etc.

Environmental:

Camera will operate between -10°C and $+40^\circ\text{C}$, up to 95% RH.

Negligible drift will occur for variations of $\pm 10^\circ\text{C}$ within this temperature range.

Lenses:

A full range of lenses will operate with the camera including Rank Taylor Hobson, Angenieux, Schneider, and Cannon. In most cases both manual and servo versions can be accommodated.

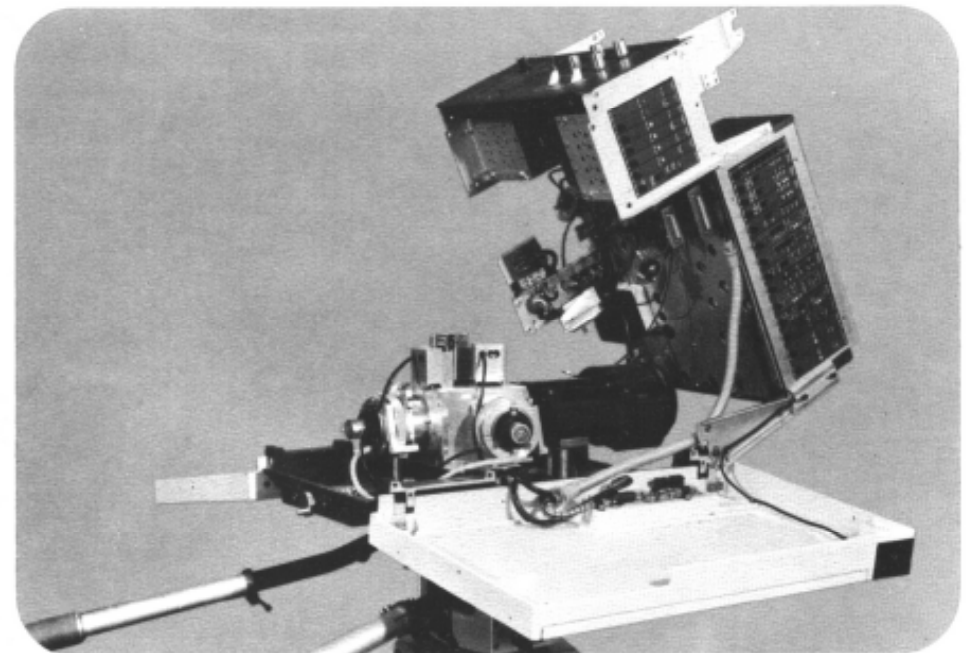
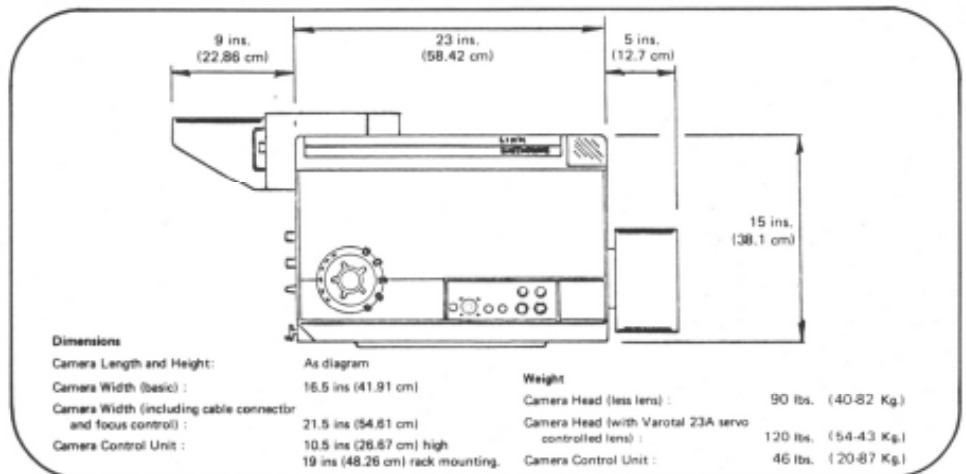
Connectors:

XLR-LNE power.

BNC coaxial.

Cannon 'D' and Varicon multiways.

XLR-aux. audio.



Ease of maintenance

OPERATIONAL FEATURES

The Series 110 broadcast colour cameras use the very latest tubes with anti-comet tail guns, light bias and extended red response. The use of camera tubes with these facilities enhances the ability of the camera to operate in difficult lighting conditions and improves colour rendering.

Although the design has eliminated much of the need for complex automatic correction circuitry it provides for auto-centring and has comprehensive monitoring facilities for fast and accurate line-up. The camera can be rapidly colour balanced under changing light conditions and uses a plug-in matrix to optimise colorimetry for studio or natural lighting.

Designed to accommodate most professional

lenses, the Link Series 110 can be offered with full servo or manual drives. The integral lens package positions the optical and mechanical centres together giving natural perspective in panning shots and minimising the overall front-to-back dimension.

The tilting, removeable viewfinder, with plus or minus 60° range is positioned over the lens axis minimising parallax errors.

Comprehensive communications facilities are included with the camera giving outputs for camera men, floor manager, tracker, etc. Additionally, programme microphone channels and a spare vision circuit are provided along the camera cable for effects microphones, news interviews and other purposes.





Nature provides the Colour
we provide the Camera

LINK
ELECTRONICS

LINK ELECTRONICS LTD.
Walworth Industrial Estate,
Andover, Hampshire, England

Telephone: Andover (0264) 61345
Telex: 47132 (LINKELEC ANDOVR)
Cables: LINKELEC ANDOVERHANTS

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