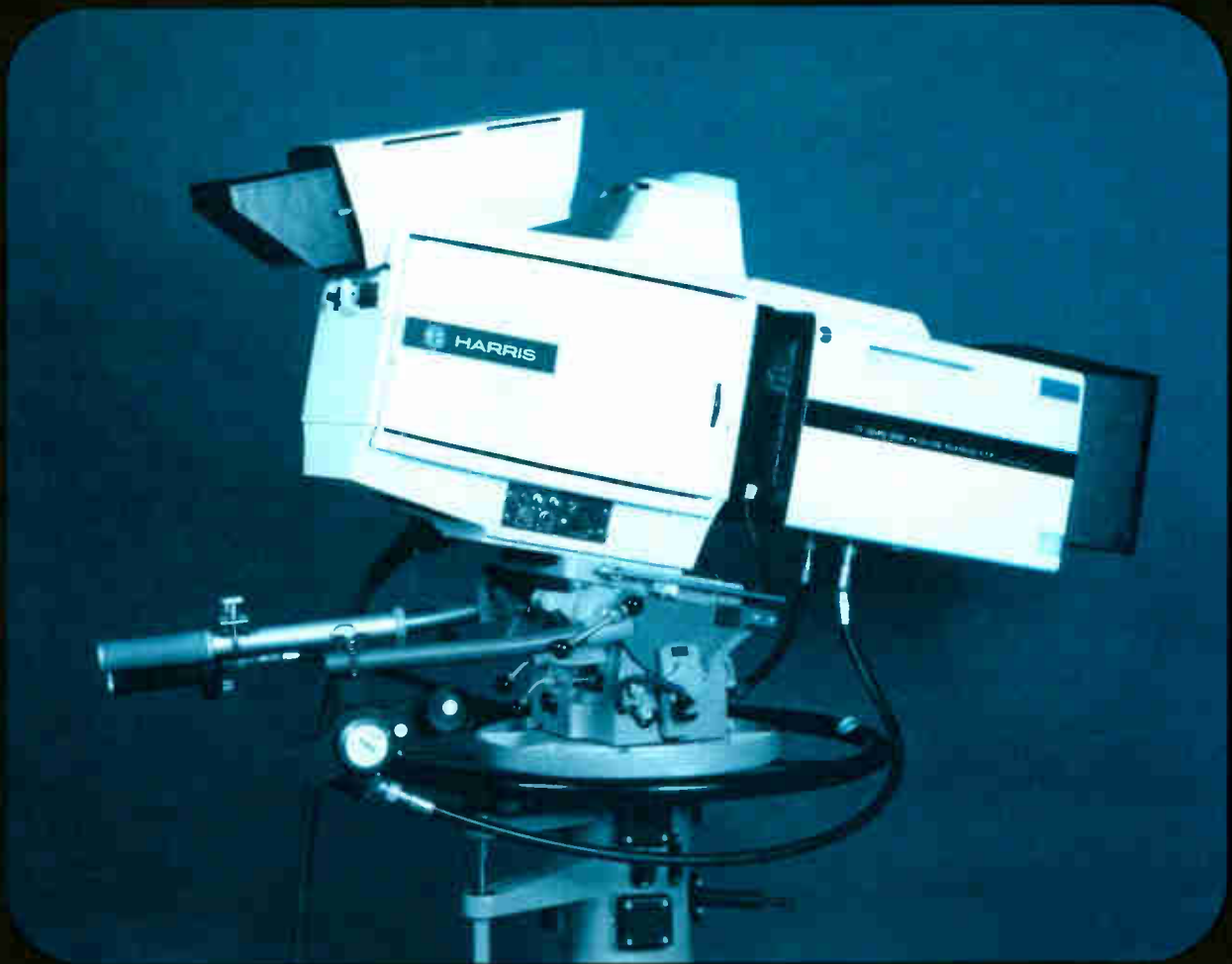


The Harris

# TC-85

Computer Setup

Color Television Camera



**HARRIS**

# HARRIS TC-85—the first studio camera

- An individual computer in each camera means high system reliability
- Computerized setup is fast and reliable...saves time, assures peak operating performance
- Stability of camera system provides controlled, repeatable performance
- Versatile add-on modular Triax cable system
- Excellent sensitivity allows noise-free pictures at very low light levels...ideal for remotes
- Highlight Handling system reduces comet-tailing 10:1
- Geometry corrector for outstanding geometry and registration

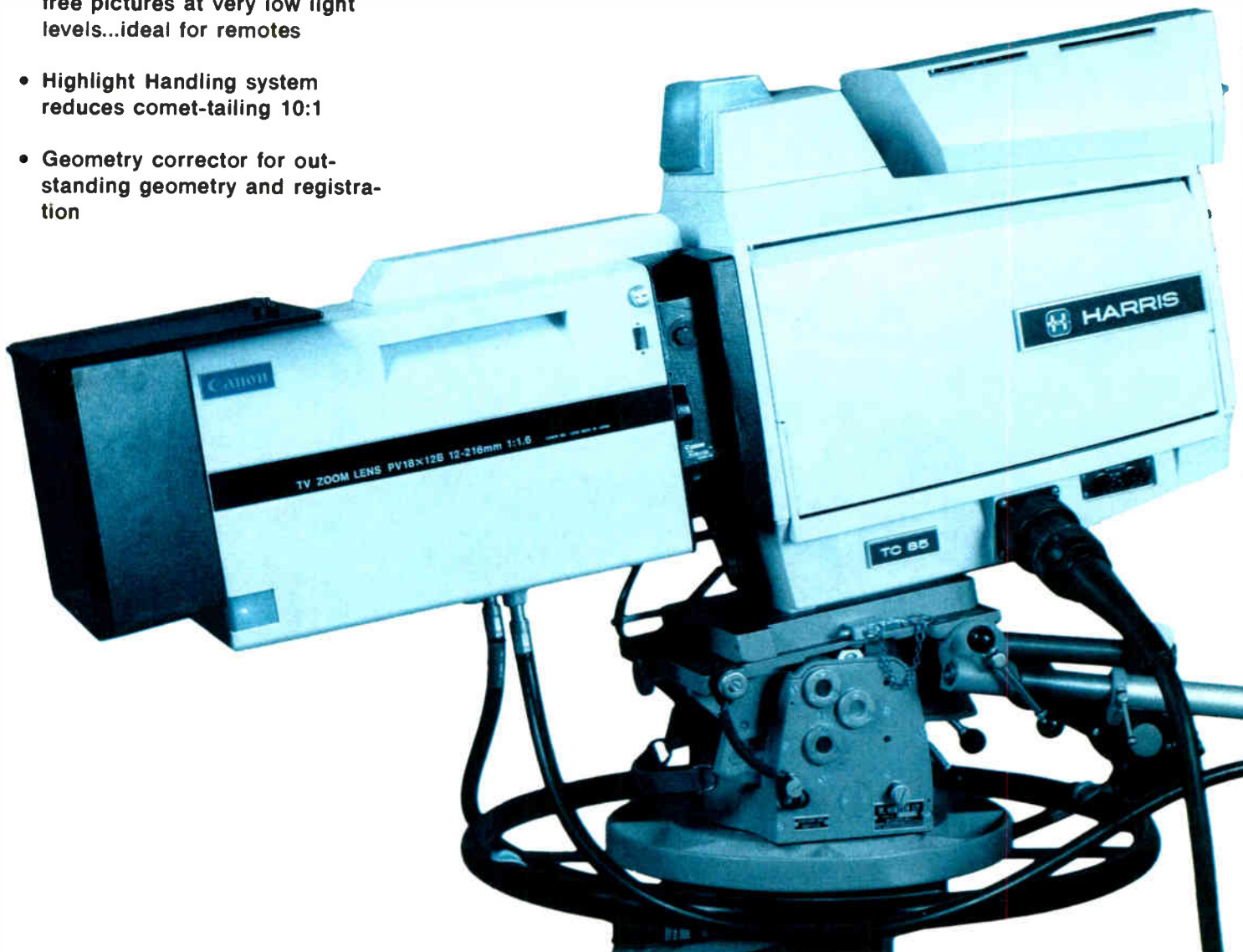
The TC-85 is a computer setup camera, with all operator functions controlled by the computer, and adjusted according to preset parameters. Each camera has a built-in independent computer to eliminate camera interdependence in multi-camera installations. This allows *simultaneous* camera setup to save you time, and means optimum, fail-safe performance by your TC-85s.

The computer, combined with the camera's inherent stability, allows camera operation by non-technical personnel, freeing your engineers for

other station duties. The computer eliminates even minor readjustments. At just the push of a button, consistent quality setups are achieved—camera matching is no longer a problem.

You'll find the TC-85 ideal for every facet of your operation, from production, to news, to remotes.

**PRODUCTION STUDIO.** How many times have you seen talent and highly trained technicians waiting around for the cameras to be optimized for productions in multiple-set studios?



# with a built-in setup computer

Now, with the TC-85, you can preset all of your cameras prior to production, according to the lighting on each set, in just a few minutes. This allows you to move the cameras freely from set to set, with virtually instantaneous setup of all cameras at once from their stored memories. Instead of the 30 minutes you would probably spend setting up 3 cameras each time you move, you spend only a few seconds with TC-85s!

**NEWS.** In many stations, production cameras also do double duty in the newsroom, and are regularly moved

from the production studio to the news area two or three times a day. Now, with the TC-85, you can continue your production work almost up until the time the news is ready to start. Then you can quickly wheel the cameras to your news center, push a button to recall the newsroom setup from the computers, and once again all of your cameras are ready to go in seconds. Think of the scheduling flexibility this will allow. And, if you currently use separate cameras for news and for production, you can conveniently cut down on the number of cameras required in your operation.

These are just a few typical situations in which the computer setup TC-85 camera helps you increase operational efficiency, with absolutely no compromise in picture quality.

**A Detailed Look at the Computer Setup.** As mentioned previously, each TC-85 incorporates a computer setup unit. This independent computer concept works to your advantage in multi-camera installations, where simultaneous camera setup saves you a lot of valuable time. It also provides added operational safety, for if one

As each TC-85 has an independent computer, camera interdependence is eliminated. This independent computer concept allows simultaneous multi-camera setup, and provides optimum reliability in multi-camera installations.



**REMOTES.** If you want to move outside the studio for a remote, the TC-85 does this very nicely, with its add-on Triax Cable system. And here again the computer setup makes things easier for you. Let's take a look at what advantages the camera offers you at, say, a football game.

First, the Triax system allows you to operate each camera up to one mile from the controls—on top of the stadium, for instance—without worrying about bulky Multicore cable, and without losing any of the cameras' superb picture quality or fine automatics.

Once in place, all cameras can be set up simultaneously by computer in a very few minutes, even if they are unattended. A quick color balance is accomplished automatically, in seconds, when the cameramen arrive at their posts—which need only be a couple of minutes before on-air time—and the TC-85s are ready to cover the action.

With cameras preset for direct sunlight and shadow conditions, as the play progresses up and down the field, the video operator merely selects the appropriate preset for optimum picture quality.

computer should fault, only one camera is affected, not all cameras.

Each adjustment performed by the computer is carried out to an extremely fine tolerance for the most consistent setup possible. The operator is not required to preset any controls prior to activation of the automatic setup.

Upon activation of the auto setup, a special test slide is automatically positioned in the optical path by a diascope (pattern projecting) lens. With a conventional zoom lens, an external chart may be used.

Complete setup for any number of cameras is accomplished in just a few minutes, depending on the required adjustments. In each camera, the computer starts its sequence by performing beam, focus and alignment adjustments. As the program continues, a coarse and then a fine registration, including size, centering, linearity, width, height and rotation are performed. The auto setup function also adjusts shading; pedestal and black balance; white balance; gamma and flare. Once the setup sequence is completed, the settings are stored in the computer



memory, and may be recalled as required.

A pre-production setup of all your cameras is completed in *less than 45 seconds*—including checking and adjustment of fine registration, black balance, white balance, gamma and flare. This is the first studio camera to offer a multi-camera quick check program that can be accomplished in less time than a standard commercial break!

Harris has also added a convenient feature to the setup unit which allows modification of computer settings to incorporate human judgment for that "artistic touch". Once the modifications have been made, they may automatically be reapplied in future setups.

The auto setup unit has a special store/recall memory for retention of four balance settings that may be required by different color temperatures or for artistic effects.

As a diagnostic tool, during the auto setup sequence, lighted indicators inform the operator of the setup status. If a function is not completed, a steady indication advises the location of the difficulty.

Should manual operation of the camera system be desired, simply push a button to disable the computer, and the manual setup panel can be used to perform all adjustable functions. In the manual mode, all setup controls are available simultaneously.

For multiple-camera installations, several convenient front panel mounting configurations are available, and external inputs are provided for initiating complete or pre-production setups for all cameras simultaneously.

**TC-85 Performance and Versatility.** Color fidelity and picture integrity are of the highest quality in the TC-85—and the camera's versatility is unmatched.

With the TC-85 you get the widest selection of operating modes and options of any studio camera in the industry: Triax or Multicore cable; accommodation of all types of pickup tubes, including Diode Gun Plumbicons® and Saticons®\*; and accommodation of all lenses designed for the 25mm format, from the largest 42:1 zoom to 10:1 zoom, or special effects lenses. Tube type changes can be accomplished easily, and Triax added at any time, in the field.

This advanced camera provides high resolution, with low lag; high sensitivity; a master gamma contrast control; and Highlight Handling that virtually eliminates comet-tailing, to give you clean, sharp video even under the most severe lighting conditions.

The TC-85 camera head has a variety of features to simplify the job of the camera operator, including a tilting, detachable viewfinder; four tally lights; two-way signaling; and a script clip. The intercom system has two independent channels with a separate third channel for program audio.

With its computer setup, triax option, ease of operation, outstanding picture quality, low-light-level capability and unique flexibility, the TC-85 offers you a positive way to improve picture quality while holding the line on operating costs.

Some of the more important specific features of the TC-85 include:

**Automatic Iris Control.** Special weighting and frequency discriminating digital circuitry prevents specular reflections or momentary errors from upsetting an otherwise properly exposed picture. For example, overhead lighting in a wide studio shot will not affect picture quality.

**Low-Noise Pre-Amplifiers.** Low-light-level performance is enhanced by low-noise pre-amplifiers in conjunction with bias light, efficient prism optics and a master gain control. Master gain is switched from the computer operate panel in steps of +6, +12 and -6 dB, and has 6 dB of continuous vernier adjustment for up to +18 dB of gain. Pictures are quiet at ten foot-candles.

**Master Gamma.** The unique master gamma control on the computer operate panel allows you to increase or decrease contrast for better shots in difficult lighting conditions. Black level is unaffected by this control.

**Electronic Color Temperature Correction.** The camera computer selects lighting temperature equalization from four preset increments, without reduction of pickup tube face plate illumination.



An optional remote control panel connects to the computer unit of each camera, giving joystick control of MASTER BLACK and IRIS. Additional controls include paint pots, gain, balances (white or black), scenes and other necessary control functions. Four panels can be mounted side by side in a 10½" x 19" rack mount tray.

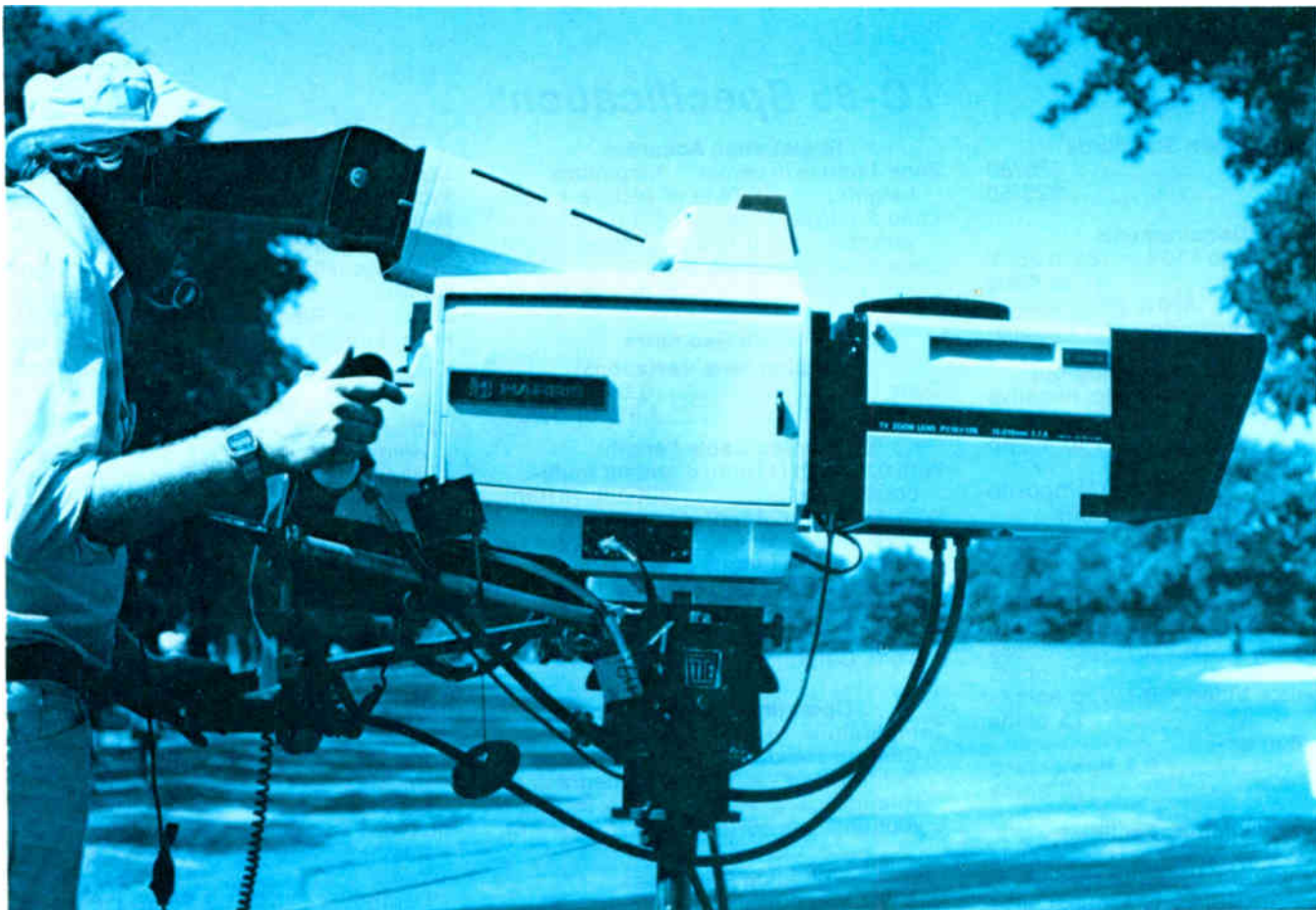
**Aperture Correction.** A two-line horizontal and vertical aperture corrector, employing comb filter, horizontal level-dependent-set, and noise coring techniques, provides a new dimension in picture quality. Some unique features of this system include fully gamma corrected detail enhancement to maintain resolution even in the low-light areas; and adjustable horizontal boost frequency and single control horizontal/vertical ratio adjustment. This means you can tailor the picture crispness to scene material.

**Level Dependent Contours.** A "Horizontal Level Dependent Contour" adjustment is employed which allows a pre-determined threshold above which horizontal contours are to be generated.

**Black Level.** A master black control with a unique electronic null provides the video operator with easy return to normal setup level.

**Encoder Flexibility.** The TC-85's integral encoder emphasizes more versatility for the video engineer. Output options include: individually selectable composite/non-composite signals; and front panel choice of color, mono or mono with burst.

The inserted sync is an AGC'd replica of the incoming signal from the station sync generator, so that the timing and controlled rise and fall times of the incoming sync signal are maintained. Burst flag is internally generated with controlled rise and fall times, and is timed from the leading edge of sync.



The TC-85, with Triax, is ideal for remotes such as sporting events, where studio-quality pictures are required.

The color bars are inserted before encoding for accurate verification of system performance, and are activated from the computer operate panel. Color bar options include: 75% bars or 75% bars with 100% white; full field or split field format. Color bars are produced by synchronous switching, with shaping controlled by active filters, to generate an exceptionally clean signal. CCIR standards are available.

**Chroma Key.** The TC-85 provides red, blue and green linear chroma key outputs for crisp, clean chroma keys even with Triax.

**Special Effects.** Various optical accessories such as fog-effect, diffusion, color and neutral density filters are available for use in the filter wheel to create special visual effects.

**Sync Generator.** The optional NTSC sync generator plugs into the processor frame of the CCU, and single cable synchronization of camera chains is simply and inexpensively accomplished. Sync, blanking and subcarrier outputs are available at the rear of the CCU

for driving other cameras or other video equipment.

**Waveform and Picture Monitoring.** The TC-85 provides the following waveform outputs: sequential R, B, G; superimposed R, B, G; R-G; B-G; and encoded output. These signals are routed to the waveform monitor by pushbutton control. Video signals to the picture monitor, also selected by pushbutton, are: R, B, G, -G; and encoded output.

**High-Efficiency Switching Power Supply.** The TC-85 owes much of its inherent stability to a power supply that uses high-efficiency switching regulators for both camera head and processor frame power. Switching frequency has been optimized to reduce weight while increasing efficiency to insure reliable, cool operation without need for forced air cooling. Size, weight and heat reductions for the switching supply, and a wide power requirement spec of 90-130/180-260 VAC, 47-63 Hz, make this supply ideal for operation in remote vans or under "brown-out" conditions.

**Mechanical Integrity.** The cast-aluminum TC-85 camera case and the ½-inch-thick aluminum optical mounting plate are combined in a solid, precision-machined and stress-relieved unit. This provides stable operation even under the most demanding field conditions. Computer-matched yokes, manufactured to Harris' specifications, and high-efficiency 4-element prism optics are precision-mounted in this integral unit to give the TC-85 a truly adjustment-free optical system.

**Easy Servicing.** With its designed-in reliability, the TC-85 will provide long-term, trouble-free operation with minimal servicing. When service is required, however, many useful features such as easy tube change, interchangeable pre-amps, readily accessible components and extensive use of test points and computer status lights have been included to cut maintenance time and costs.

For complete information on the TC-85 camera, contact your Harris TV District Manager or the Harris TV Sales Department in Quincy, Illinois (phone: 217/222-8200).

# TC-85 Specifications

## Electrical Scan Standards

EIA ..... 525/60  
CCIR ..... 625/50

## Power Requirements

Voltage ..... 90 to 130V or 180 to 260V  
Frequency ..... 47 to 63Hz  
Power Load ..... .620W (exclusive of monitoring and options)

## Inputs (Loop-Through, Bridging)

Sync ..... 2 to 8 Vpp, negative  
Blanking ..... 2 to 8 Vpp, negative  
Sub Carrier ..... 1 to 4 Vpp  
VF External  
Video ..... 1.0 Vpp Composite  
External video or black burst with optional sync generator ..... 1.0 Vpp

## Outputs

Program Video .. 3 separately selectable for composite or non-composite  
Chroma Key (R, B, G) ..0.7 Vpp across 75 ohms  
Picture Monitor Video ..0.7 Vpp across 75 ohms  
Waveform Monitor  
Video .....0.7 Vpp across 75 ohms

## Monitor Switching Facilities

Picture ..... R, B, & G or —G separately or combined; color output (program)  
Waveform ..... R, B, G sequential or superimposed; R-G; B-G; color output (program)  
Viewfinder ..... R, B or G; Y video; external video

## Sensitivity (Typical tubes)

Minimum Incident Light for full output with f1.6 lens ..... .6 fc  
Incident Light for rated Signal/Noise at f2.8 ..... 80 fc  
Signal/Noise Ratio

NTSC ..... 52 dB  
PAL ..... 49 dB  
(300 na green signal current; 1.0 gamma; bandwidth NTSC - 10 kHz to 4.2 MHz, PAL - 10 kHz to 5.5 MHz; masking, aperture & chroma - off)

Resolution (no aperture correction) ..... 600 TV lines

## Optical System

Color Separation ..Single unit prism with Integral Bias Light  
Correction  
Filters .....5 position filter wheel

## Pick-Up Tubes

Red .....XQ2073R or XQ1073R  
Blue .....XQ2070B or XQ1070B  
Green .....XQ2070G or XQ1070G  
ACT and Saticon tubes also available.

## Registration Accuracy

Zone 1 (circle in center = 1.0 picture height) .....0.05% of picture height  
Zone 2 (circle in center = 1.0 picture width) .....0.10% of picture height  
Zone 3 (area outside Zone 2) ... 0.20% of picture height

## Picture Geometry

### (including lens deviations)

Zone 1 ..... 0.5% or better  
Zones 2 and 3 ..... 1.0% or better

## Camera Cable Length

With 0.65 inch (17mm) diameter multi-core cable .....2000 ft. (610m)  
With 1.1 inch (28mm) diameter multi-core cable .....3000 ft. (914m)  
With 0.5 inch (13mm) diameter Triaxial Cable and optional Triax System ..... 5000 ft. (1524m)  
Over 5000 feet with larger diameter Triax Cable.

## Operating Environment

Temperature  
Camera Head -20 to +50 degrees C  
Control Unit .... 0 to +50 degrees C  
Humidity ..... 0 to 95% RH  
Altitude ..... 0 to 10,000 ft. (3048m)

## Shading Provisions

H & V sawtooth and parabola modulation. H & V sawtooth and parabola additive, for Bias Light.

## Aperture Correction

Combined horizontal and vertical aperture correction derived from green with comb filtering and noise coring. Primary horizontal boost frequency 6 MHz, with adjustable 2.5 MHz secondary boost.

## Gamma Correction

Master Gamma ... Continuously variable from linear to 0.35 independent of channel controls  
R/B Gamma ..... Vernier for tracking with Green

## Intercom (RTS\* compatible)

Camera Head & CCU ..... Two headsets; Production, Engineering & Cue circuits  
Party Line ... Accepts up to three party lines; selectable impedance matching  
Program Audio ..... Unbalanced bridging for cue audio

## Signaling System

CCU to Camera ..... Pushbutton flashes camera tally lights  
Camera to CCU ... Pushbutton operates audible signal

## Viewfinder

Screen Diagonal .....6.1 in. (155mm)  
Picture Brightness 0 to 150 ft. lamberts  
Resolution ..... better than 600 TV lines  
Picture Timing ..... AFC  
Video Equalization ... Full Cable length  
Controls .... Contrast, Brightness, Input Select and Response (flat, peak, notch)  
Focal Length Indicator ... White bar top of picture

## Mechanical

Camera Head (Less lens)  
Height .....19.5 in. (495 mm)  
Width .....10.5 in. (267 mm)  
Depth .....21 in. (533 mm)  
Weight ..... 85 lbs. (38 kg)

## Processor Frame

Height .....8.75 in. (222 mm)  
Width .....19 in. (483 mm)  
Depth .....15.5 in. (393 mm)  
Weight ..... 30 lbs.(14 kg)

## Auto Setup Unit

Height ..... 7.0 in. (178 mm)  
Width .....19 in. (483 mm)  
Depth .....16 in. (406 mm)  
Weight ..... 24 lbs. (10.9 kg)

## Intercom Panel

Height ..... 1.75 in. (44 mm)  
Width .....19 in. (483 mm)  
Depth .....7.25 in. (184 mm)  
Weight .....3 lbs. (1.4 kg)

## Main Power Supply

Height .....5.25 in. (133 mm)  
Width .....19 in. (483 mm)  
Depth .....20 in. (508 mm)  
Weight ..... 56 lbs. (25 kg)

## Interconnect Panel

Height ..... 7 in. (178 mm)  
Width .....19 in. (483 mm)  
Depth .....6 in. (142 mm)  
Weight .....8 lbs. (3.6 kg)

## Options

Triax  
Remote Control Panel with joystick control  
NTSC Sync Generator Module  
Vinyl Rain Cover

## Accessories

All one-inch format zoom lenses from Angenieux, Canon, Fujinon, Rank and Schneider. Diascope models available.  
Camera Cable, std. length 50 ft., 75 ft., 100 ft., 150 ft., 200 ft., 250 ft., 300 ft., 400 ft., 500 ft.  
Triax Cable, std. length 100 ft., 250 ft., 500 ft., 1000 ft.  
Headset, single or dual, carbon or dynamic mic  
Cam Heads and Pedestals from Vinten, ITE, Quick-Set and TVP.

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