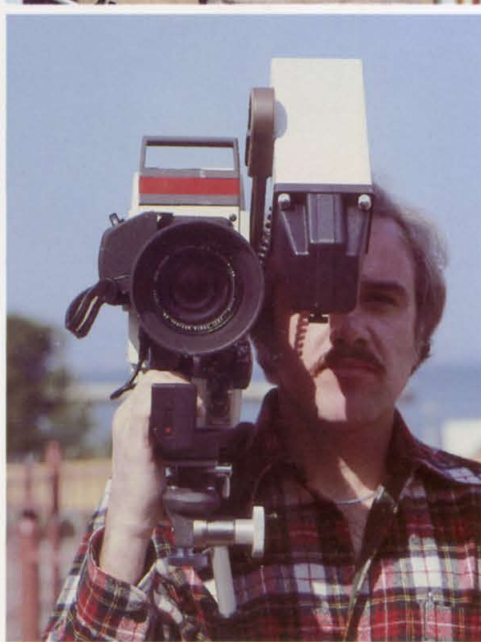




THE CEI 310 MODULAR BROADCAST COLOR TELEVISION CAMERA SYSTEM



The CEI 310. The most complete field production system you can buy.

The 310 is a totally modular, American made, broadcast quality color television camera system. The 310's components are so well designed and separated that its configuration can be instantly changed to meet the need of the moment: an extremely portable EFP camera, a studio systems camera, a studio self-contained camera.

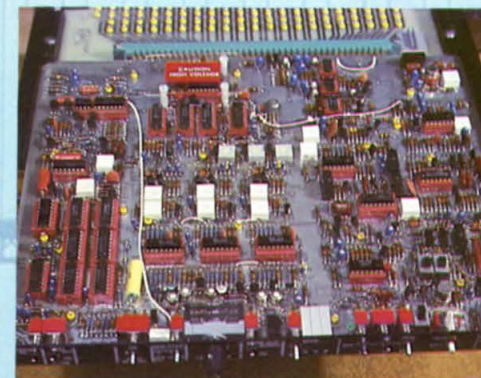
The 310 is the result of

brand new design concepts founded on the latest state of the technology. The camera head (a mere 8 lbs.) contains a highly efficient prism optical assembly with bias light and four-position filter wheel. High-gain, low-noise pre-amplifiers help deliver an S/N ratio of -52dB or better. The camera head can be operated up to 600 feet from its electronics unit. A remote



control system extends operation an additional 2000 feet.

The 310 gives you full systems capability and it can be quickly color matched to any other camera. Yet with all this versatility, the 310 costs less than any comparable system. It produces a picture comparable in quality to that of the most expensive broadcast camera you can buy. And better than most.



The 310 automatically operates on a wide variety of AC or DC power sources. With available adapters, the 310 can be used in a film chain unit and for medical applications including microsurgery, pathology, endoscopy, and gross surgery.

CEI

The 310 electronics unit. It's everything you want and then some.

More than a CCU, the 310 Electronics Unit contains virtually all of the camera electronics. This design results in the minimum size and weight at the camera head while providing COMPLETE control at the EU. Functional Modularity provides high flexibility in service, manufacturing, and updating to assure the maximum in anti-obsolescence.

The 310 construction philosophy consists of a small number of circuit boards which mount the

controls as an integral unit minimizing wiring, connectors, size and weight. The rugged EU is designed to be equally at home occupying only 5" in your studio rack mount or bouncing on the floor of a helicopter. A unique automatic switching and locking AC power adapter corrects for voltage fluctuations, from 95 to 250 volts and 48 to 63 Hz, so you can use the 310 anywhere in the world. A separate DC adapter automatically corrects for land, sea, and airborne systems, from 10 to 32 volts DC.

Board 1: The complete sweep generation and registration system is on this board. Because the 310 offers more registration set up controls, it provides the best registered picture in the industry. Examples of the thorough capability of the system are: horizontal correction wave-

forms into vertical sweeps, electronic rotation, and multiplicative corrections for keystone and pincushion in red and blue. Perfect registration, even after a tube or single yoke change, is possible with the 310 system.

Board 2: This board contains the video processing system. There are controls for white shading, black shading, flare, black level and cable compensation for all three channels. Complete masking control is provided for perfect matching to other cameras. Automatic gain stabilization is provided via a test pulse during the blanking interval. A tint control allows flesh tone adjustment without affecting black or white balance.

Board 3: A high quality two line enhancer is completely contained on this board. Premium grade glass delay lines are used. Horizontal and vertical detail and coring controls allow precise adjustment to user preference. A threshold control is provided for noise reduction in blacks. CCD or other enhancer systems, as developed, can be "plug-in" retrofitted.

Board 4: This board provides the many interfaces between the camera system and the outside world such as audio, lens, tally, and intercom controls. Automatic systems for iris and digital white balance are included. A three position gamma switch allows immediate selection of unity, .45 or any third variable gamma law you choose to preset. Monitor and viewfinder control circuits allow selection of

encoded output, external viewfinder feed, or independent super imposition of red or blue with green. A clipper warning circuit indicates by flashing in areas of the picture which exceed the 100% level. Beams on and off controls as well as black stretch circuits are provided.

Board 5: The highly stable sync generator and encoder are contained on this board. Changing the 310 for operation at a different standard, e.g. NTSC to PAL-I, can be accomplished in less than one minute. Standard IC chips are used to allow easy procurement of spares as well as to provide selection of horizontal and vertical blanking widths. The 310 system can operate stand-alone on its own stable internal reference or be solidly gen locked despite widely varying APL in a reference signal.

Board 6: This entire board, an additional 20% of the camera electronic space, has been set aside for you and the future. It allows for customization of your camera and an additional insurance policy against obsolescence. CEI continues to announce new features available on a plug-in basis for the 310. Among the options you can order at any time are: RGB outputs (before or after gamma), sync and sub-carrier outputs, automatic pedestal, iris window shade, and an SMPTE time code generator. There are more to come. Many 310 cameras are delivered with no options since all the features discussed in boards 1 through 5 are standard and provide the most complete 2/3" EFP camera in the industry.



The Remote Control Panel (below) remotes production controls up to 2000 feet from the EU. Controls include paint (red and blue trim), joystick iris and black level, IC volume, IC isolate, black stretch on-off, black stretch control, tally/call, and horizontal and vertical centering. Illuminated indicators include power, operate, sync lock, tally/call, black stretch, and IC isolate.



SPECIFICATIONS

Sensitivity/signal-to-noise

A -52dB S/N ratio in encoded luminance channel, gamma at unity, no aperture correction, and a 4.2MHz bandwidth will be achieved at an aperture of f/1.7, 80 foot candles, 3200°K illumination incident on a 60% reflective white.

Maximum sensitivity

Minimum incident light for full output with lens at f/1.4 and +12dB gain inserted is 6 foot candles.

Resolution/modulation depth

Correctable to 100% response at 500 TVL. Limiting resolution 600 TVL.

Registration accuracy

Zone 1: Circle equal to 0.8 picture height, 0.1%.

Zone 2: Circle equal to picture width, 0.2%.

Zone 3: Elsewhere, 0.3%

Geometry

Distortion less than ±1% excluding lens distortions.

Aperture correction

H and V enhancement: detail signal from green channel output. Coring with adjustable threshold and V and H coring depth. V and H contour amplitude individually adjustable.

Gamma correction

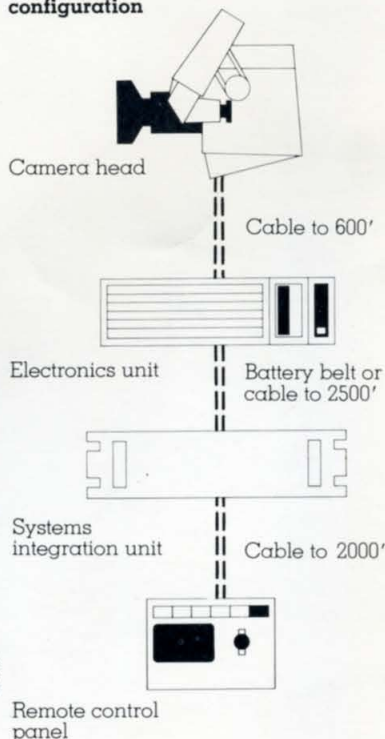
Switchable: Unity, .45, and preset position variable from .35 to unity.

Shading provisions

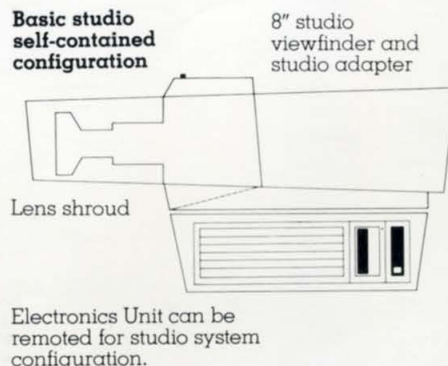
Multiplicative H and V sawtooth and parabola white level shading.

Individual R, G, and B flare correction, plus bias light shading.

Extended operation for any configuration



Basic studio self-contained configuration



The CEI 310 is the most complete broadcast quality field production camera system in the world today. It produces as fine a picture as you'll ever see from any color television camera, no matter how well known the name or how high the price. The 310 is built in America using American components. It's rugged, reliable, and designed to fend off obsolescence. And our 24-hour parts service will never let you down.

Our engineers are easily reached by telephone before and after you've bought your 310. They're eager to help. They speak your language. Call us today.

CEI

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Color standards

NTSC, PAL-I/B, PAL-M, SECAM.

Scans

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

System power

AC: 95/250V, 48 to 63 Hz, 90VA (with 3" VF)

DC: 12V at 7.2A (with 3" VF) (With 8" VF add 18W)

Inputs

IV p-p black burst or composite color video for gen lock.

Outputs

Two composite encoded video.

One monitor output, switchable. Composite encoded, R, G, B, and -G. R, G, and B video, buffered sync, and subcarrier (with options board installed).

Pickup tubes

Three 3/4" Saticon* or Plumbicon** tubes

Cable length

Camera head to Electronics Unit: to 600'

Electronics Unit to System Integration Unit: to 2500'

Electronics Unit to Remote Control Panel: to 2000'

Optical system

Bias lighted, high index glass prism with R, G, and B split. I. R stop, and output trim filters. Built-in filter wheel with cap, 85, 85B/.6ND and clear glass elements.

Intercom

Comprehensive intercom system with AGC on microphones, provision for program sound for camera man and at electronics unit. Interface to 2 or 4 wire systems.

Viewfinders

3" high brightness, flat face tube with sun shade, optional ocular adapter. 8" high brightness, flat face tube with studio adapter.

Audio

One microphone level input at camera head.

One microphone level input at Electronics Unit.

Two microphone outputs at Electronics Unit.

Environmental

Ambient temperature range: -15°C to +45°C.

Storage: -30°C to +50°C.

Altitude: to 10,000 feet.

Relative humidity: to 90%, non-condensing.

Physical

Camera head: 4 5/8" x 6 3/4" x 9 1/2", 8 lbs.

Electronics Unit: 5" x 13" x 14.5", 19.5 lbs.

* TM Hitachi

**TM N. V. Philips