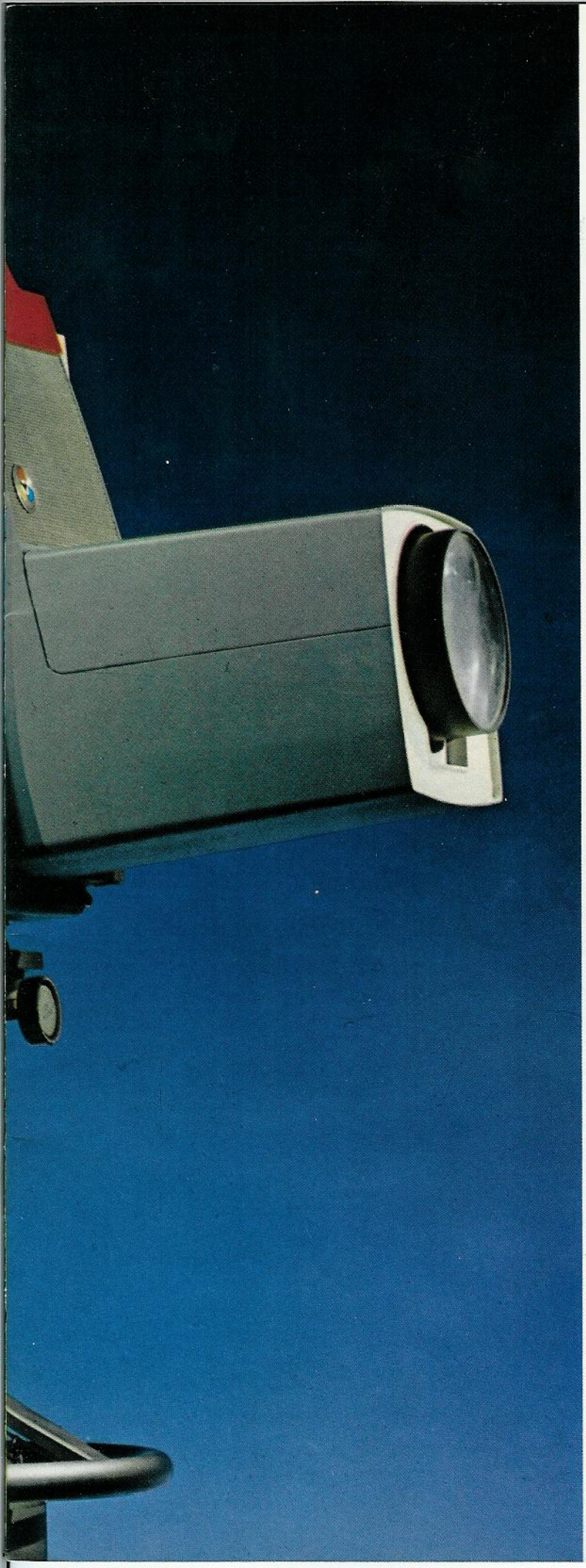



# Television's finest live-color camera —the General Electric PE-250.

GENERAL ELECTRIC


COLOR
CAMERA
GENERAL ELECTRIC



# Unmatched live-color performance—made possible by more than 20 years of color research and development.

The new General Electric PE-250 gives you the finest live-color television reproduction you can get.

We've been working more than 20 years to be able to make this statement.

Working with advanced design engineers at our headquarters in Syracuse.

Working with a broad range of color television processes at our Research Center in Schenectady and our Electronics Laboratory in Syracuse.

Working to develop, produce, test and refine the 4-V PE-24, now television's most widely accepted color film camera.

The first production 4-V on the air in 1963 gave you proof of the superior fidelity of the 4-tube design.

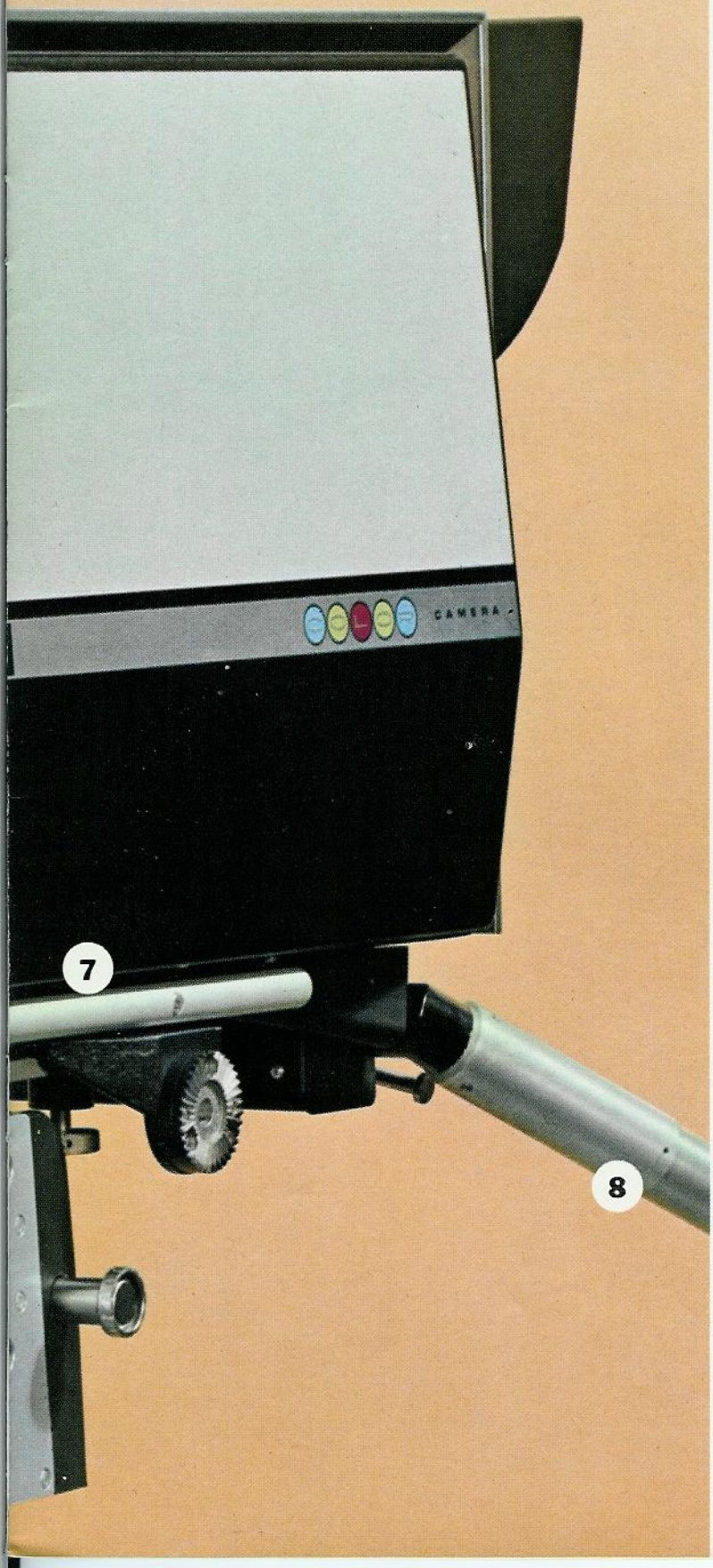
General Electric solid-state circuitry gave you reliability unmatched in the broadcasting industry.

And now the new PE-250 live-color camera gives you a new high standard of electronic color reproduction.

All in a camera easy to operate and maintain.

- It's compact and light—less than 160 lbs. complete.
- It's versatile—designed for studio and remote use.
- It's completely transistorized—reliable and easy to test and service.
- It's fully equipped—with the features you want.
- And it's easy to control—the entire camera chain is designed for utmost operator convenience.


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ANGÉNIEUX - ZOOM
GENERAL ELECTRIC
HOUSTON FEARLESS




# Continuous 10 to 1 zoom lens— usable down to three feet.

The General Electric PE-250 has a built-in continuous 10 to 1 zoom lens. Its basic range is from 18mm to 180mm, f/2.2, usable to within 36 inches from your subject. And with an accessory close-up lens, it is usable down to 23 inches. Two- and three-times extenders, which are simply and quickly threaded into the lens assembly, make the zoom equivalent to a 1.4-inch to 43-inch lens on an I.O. camera.

The zoom lens is bolted directly to the same precision-aligned optical bench that supports the entire PE-250 optical system.

**1.** The tally light system is completely transistorized.

**2.** Prompter units, spots and other accessories may be attached directly to the top of the camera.

**3.** Whisper fan removes air from inside of camera into lens shroud. The viewfinder power supply is located behind the fan assembly.

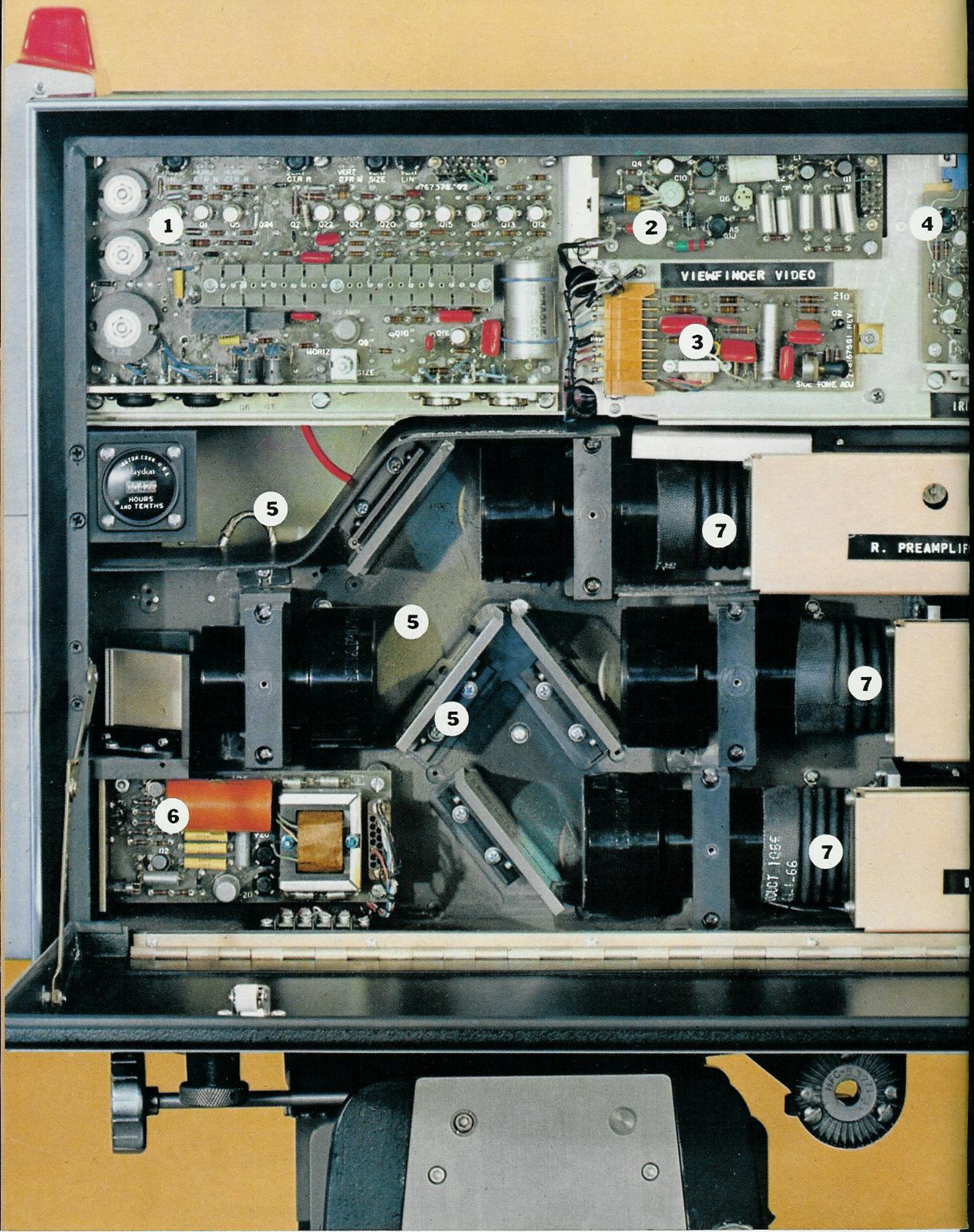
**4.** The PE-250 lens zooms from 18mm to 180mm in less than a second.

**5.** The two- and three-times lens extenders increase focal length from basic 18-180mm (f/2.2) to 36-360mm (f/4.4) and 54-540mm (f/6.6). The extenders are easy to install and remove. The zoom lens need never be removed.

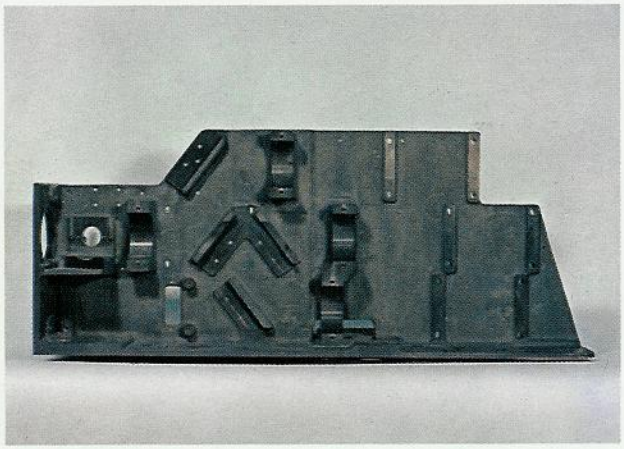
**6.** Precision-machined stainless-steel rods keep the zoom lens in perfect alignment at all positions.

**7.** The lock-in two-position handles make the PE-250 easy to carry and mount. They can be positioned for raising the camera to the cam head height. And they can be pivoted upward, closer to the center of gravity, for easier carrying. When not in use, they are retracted under the camera out of the way.

**8.** The zoom lens focus control, built into the pan and tilt handle, makes subject tracking simple, easy.


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VIEWFINDER VIDEO
HOURS AND TENTHS
R. PREAMPLIF

# PE-250
## color optics—held in precision alignment by a pre-cast optical bench.



The PE-250 optical system is mounted on a pre-aligned, machined magnesium alloy casting. The camera's precision alignment is protected from stresses from any direction. And an optical enclosure, shown with the cover removed, protects the dichroics from dust and stray light.

**1.** Viewfinder sweep

**2.** Viewfinder video amplifier

**3.** Intercom amplifier

**4.** Iris servo amplifier

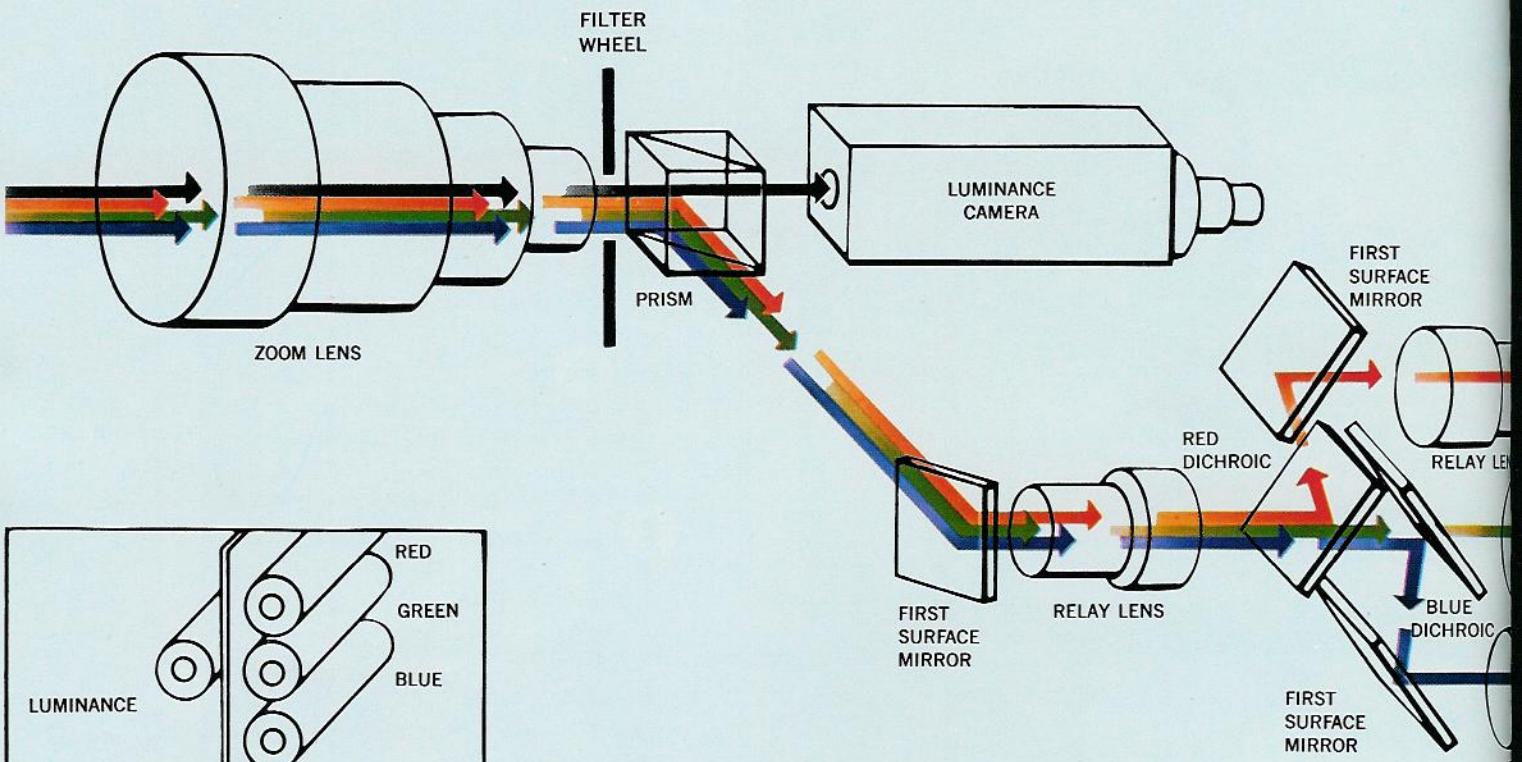
**5.** Color reproduction optics and yoke assemblies are mounted on a precision factory-aligned optical bench. The camera can take rugged abuse without misaligning the optical system. And because you don't have to remove the yoke assembly or any optical components to replace Plumbicon* tubes, you never have to worry about realignment.

**6.** Power supply for iris servo amplifier

**7.** Bellows couplings between the exit relay lenses and the camera tube deflection assemblies prevent dirt and stray light from reaching the tube faces.

**8.** Color channel pre-amplifier

*Registered Trademark of N.V. Philips' Gloeilampenfabrieken of The Netherlands.

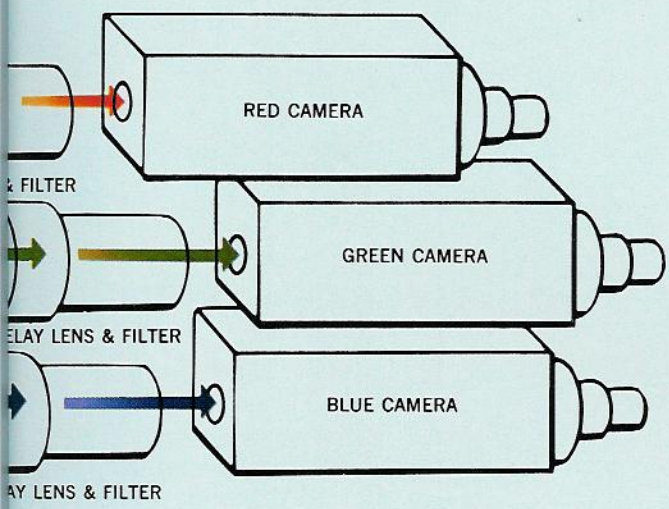






**RELATIVE POSITION OF PICK-UP TUBES**

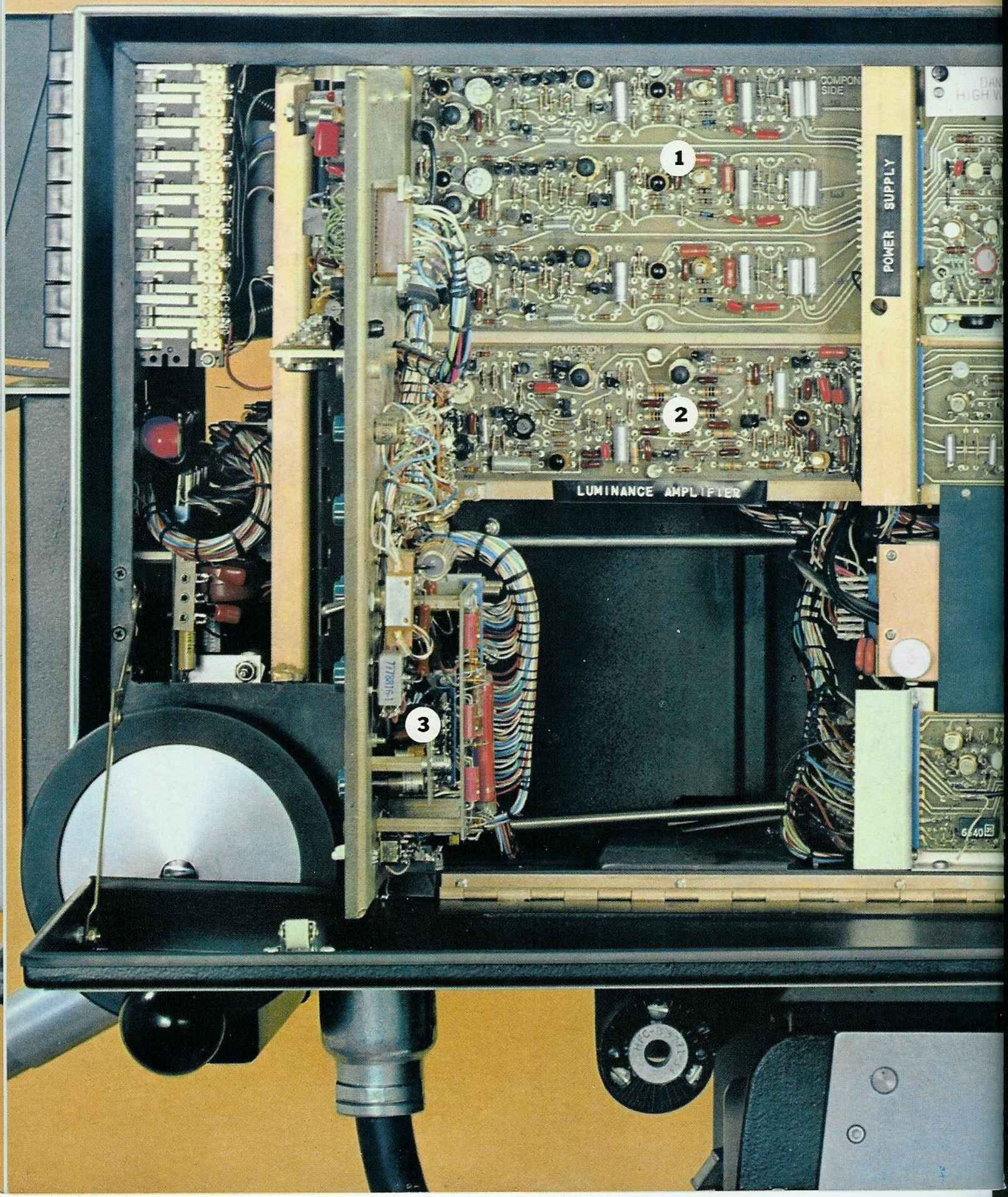
# Four-Plumbicon optical system—gives brilliant, true color.

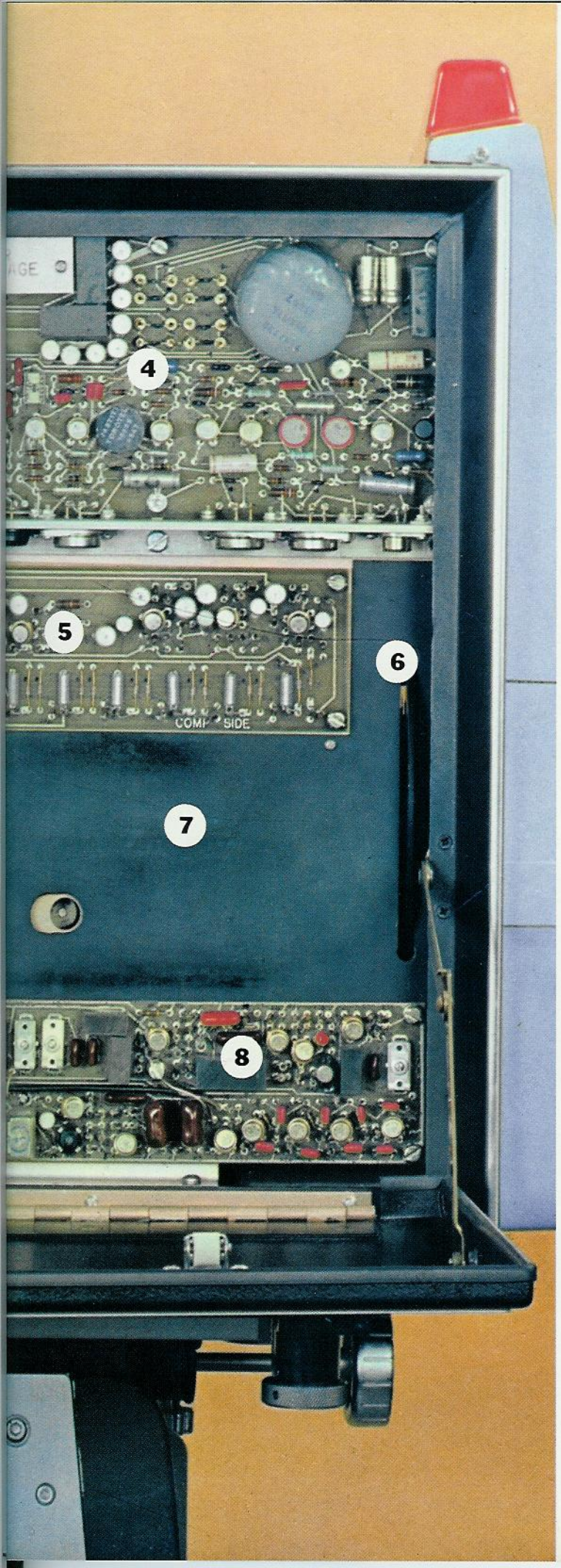



The PE-250 makes beautiful, precise, true color pictures. The system uses four Plumbicon tubes—red, green, blue and luminance—to produce crisp, sharp images with color quality that's unmatched in television.

And because the all-important luminance channel has its own Plumbicon tube, you get better monochrome picture reproduction, too.

- There are no relay lenses or imaging optics in the luminance channel.
- General Electric's technically advanced open faced dichroics give you superior color and ghost-free reproduction.
- Pick-up tubes are mounted parallel and encased in mu-metal jackets. This minimizes the effects of external magnetic influences on camera performance.
- Trim filters are integrated with the exit relay lenses.
- The PE-250 features a special filter wheel—located between zoom lens and prism for simple selection of color-correcting and neutral density filters.


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POWER SUPPLY
LUMINANCE AMPLIFIER




# Solid-state, plug-in circuitry—sets up, checks out and services easily.

All PE-250 camera components are built around General Electric's proven transistorized circuitry. Modular construction simplifies service and adjustments. Component and transistor identification is printed right on the plug-in modules.

1. Opening the swing-out local control board provides access to the intermediate amplifiers. A white clipper for each is included, and a peak to peak detector indicates video level. Each amplifier has separate outputs to feed the viewfinder and the camera cable.

**2.** The luminance camera intermediate amplifier also has an amplitude dependent aperture corrector. The amount of correction applied is adjustable, as is the white clipper used. This amplifier has separate outputs to feed the viewfinder and the camera cable.

**3.** The skew generator module generates voltages to correct for skews in the yokes.

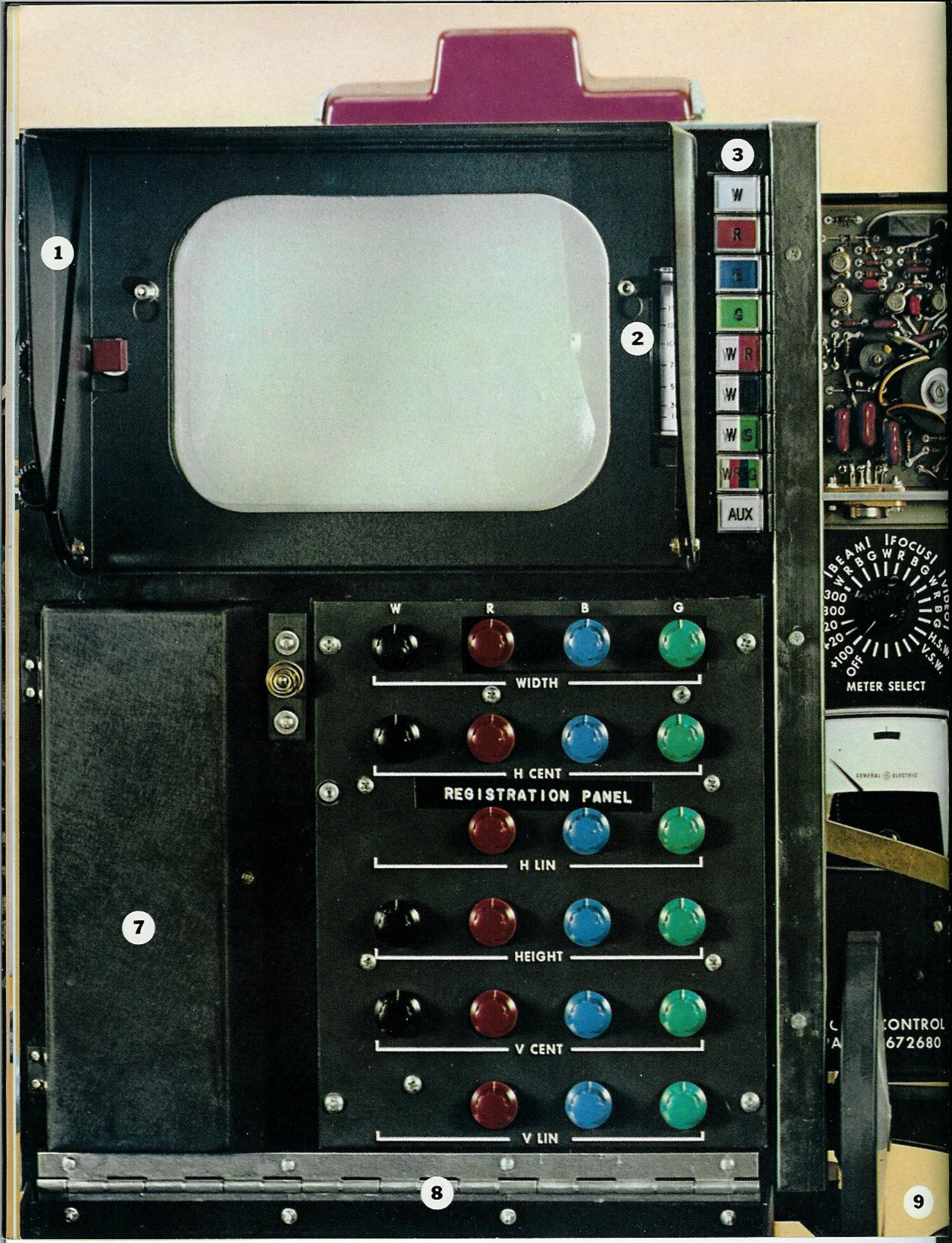
**4.** The camera's regulated power supply module provides regulated d-c power for the camera circuits, and contains the circuits for the 30-cycle alignment signal. The power supply has both overload and overvoltage protection.

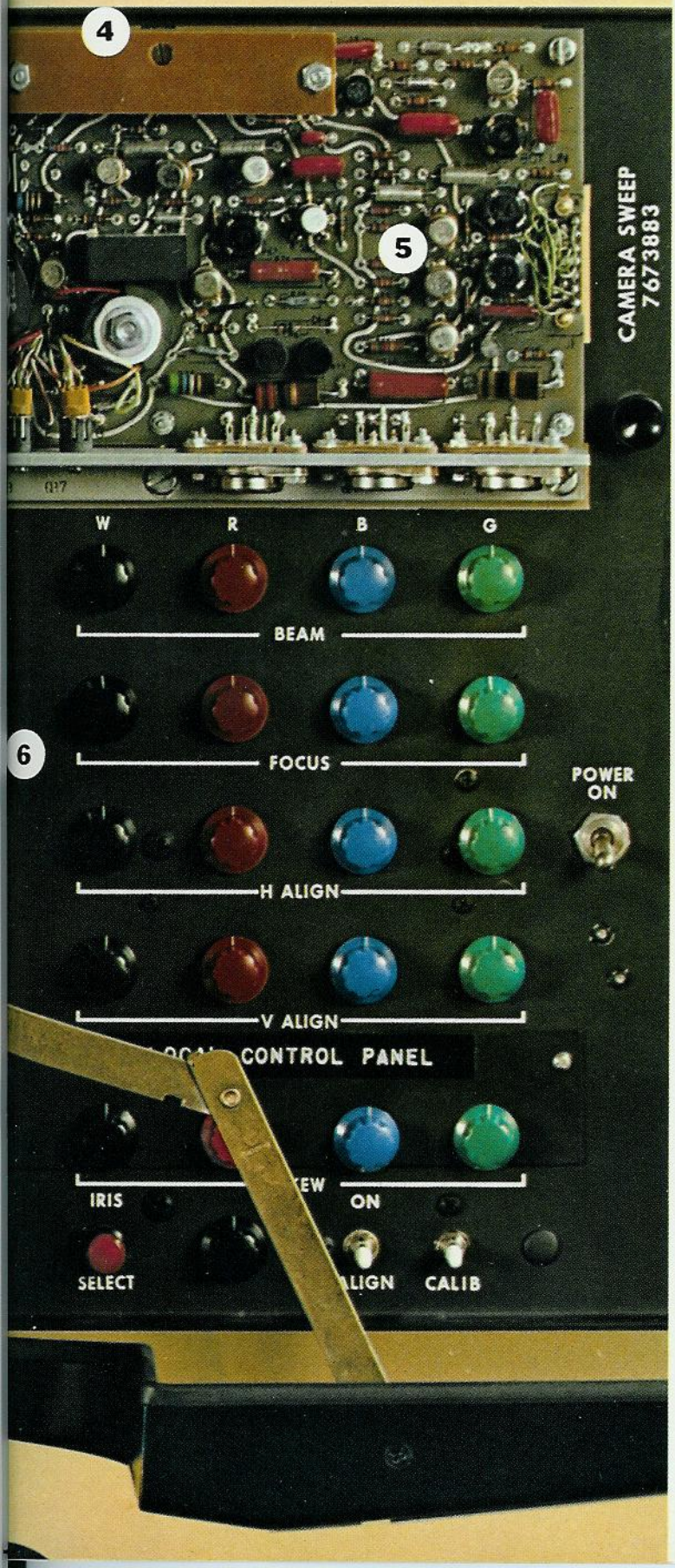
**5.** The viewfinder switcher module is used to select the appropriate signal to be presented on the viewfinder picture tube. Its diode video switchers are d-c controlled by push buttons alongside the viewfinder picture tube.

**6.** A seven-position disc for color compensating and neutral density control is located between the rear of the zoom lens and prism. One position is "lens cap" and one is "clear." The remaining positions are for user's choice of color correcting filters.

**7.** Luminance channel pre-amplifier and deflection assembly. Note easy access for tube changes.

**8.** The timing/calibration module generates a calibration waveform that is attenuated in the proper ratio to simulate the desired signal input current to each pre-amplifier unit, simplifying gain calibration. It also provides all of the proper timing pulses for camera clamps and sweep circuitry.


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H LIN
HEIGHT
V CENT
V LIN
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BEAM
FOCUS
VIDEO
300
300
20
+20
+100
OFF
H.S.W.
V.S.W.
METER SELECT
CONTROL
672680




# All controls within view and reach— true one-man set-up.

The General Electric PE-250 live color camera is designed for operator convenience. Every control and indicator (for both viewfinder and camera) your cameraman wants is within view and reach. And the viewfinder is ideal for outdoor remote work. Eight inches big, and over 150 foot lamberts of highlight brightness.

General Electric's "subractive" registration technique gives you simple, fast and accurate color registration. Reversed polarity chroma pictures compared to luminance reveal even the most minute differences.

**1.** Viewfinder brightness, contrast and focus controls are conveniently grouped.

**2.** Zoom lens focal length meter.

**3.** The viewfinder selector switch has nine positions, eight to assist in registration and one to select optional external video source.

**4.** The local control panel swings out for extra convenience during check-out and set-up operations.

**5.** The camera sweep module produces the horizontal and vertical sweeps for the camera tube yokes, and provides camera blanking and sweep failure protection.

**6.** The built-in, switchable "go/no-go" meter simplifies camera circuit checks. Its twenty positions permit an immediate, simple electrical check on the entire camera.

**7.** Access door to three color camera tubes.

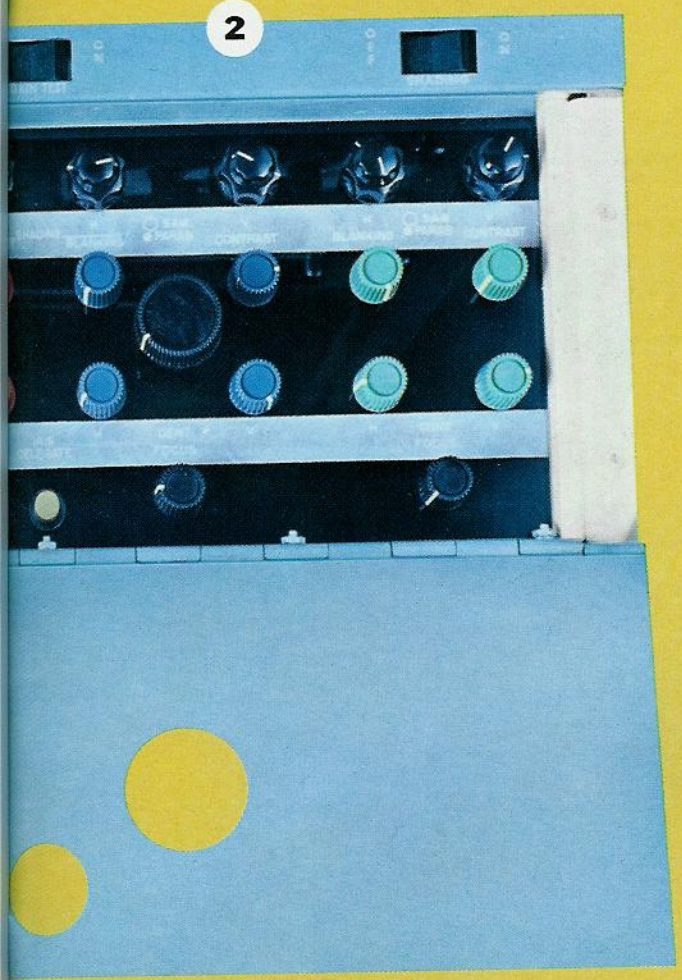
**8.** The intercom gain control, dual intercom jacks and convenience outlet are located below the lower door.

**9.** The zoom control is a heavy flywheel, smooth and quick in operation. Zoom position is translated electrically to a focal length meter (2.) for operator convenience.


GENERAL ELECTRIC
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# Compact rack and console—provides additional convenience for multi-channel operation.

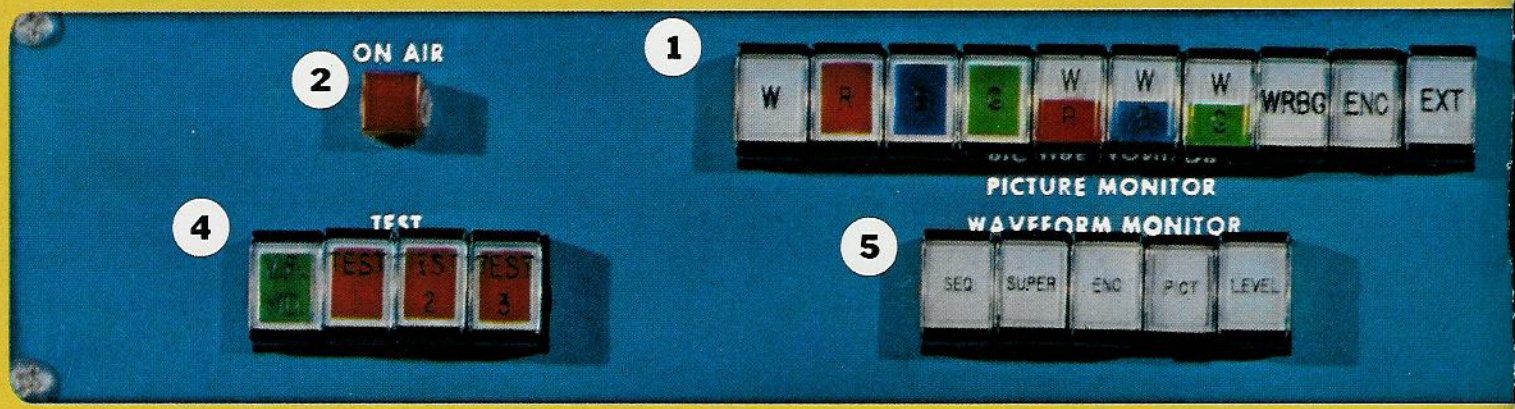


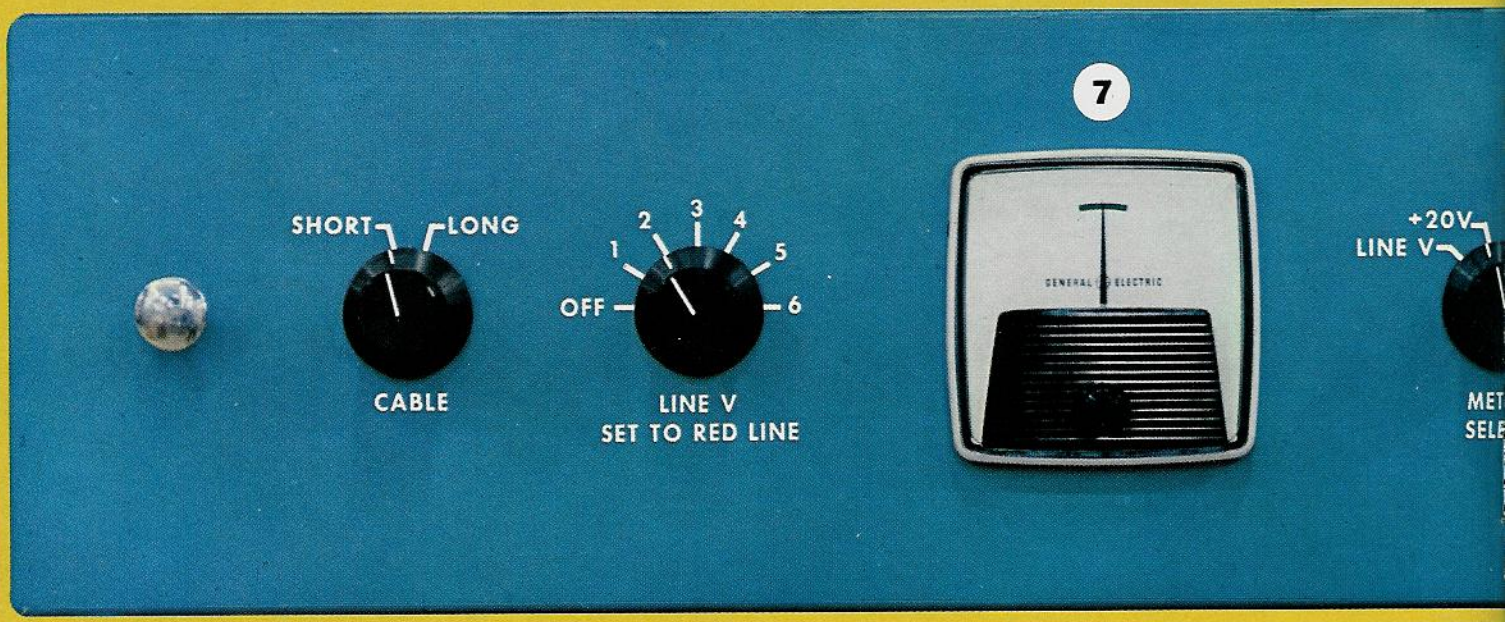

The compact PR-42-A remote control rack and desk console are assembled in a 55-inch unit. All the operational, monitoring and test signal facilities are immediately available within the reach of one operator.

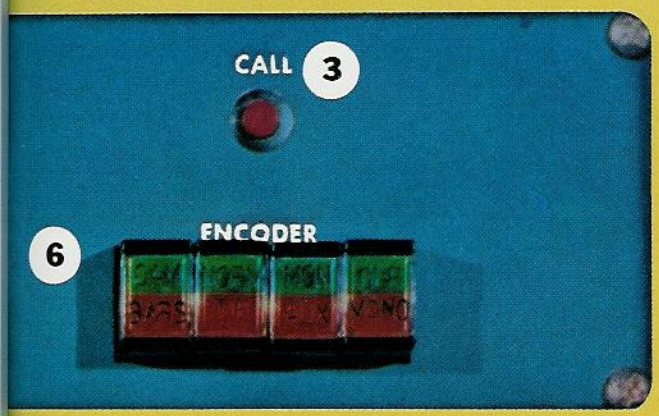
**1.** The PR-42-A remote control console rack contains the following units:
FA-56-A blank panel
TC-68-A monitor select panel
TM-22-A calibration and picture monitors
TM-113-A processing amplifier (2 drawers)
FA-56-B blank panel or TC-74-A color balance control panel
7674065G1 desk unit containing the TC-69-A remote camera panel and intercom control panel
FA-56-D blank panel
TP-38-A power supply
FA-56-B blank panel
The TV-112-A Encoder may be mounted in this rack if desired.

**2.** Located in the desk unit, the TC-69-A panel provides the controls for shading, black level, gain, focus and centering. It contains the plug in modules for the drive converter, the differential amplifiers and the shading generator.

**3.** The intercom facilities are located in the front vertical surface of this unit.


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ON AIR
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WRBG
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PICTURE MONITOR
WAVEFORM MONITOR
SEQ
SUPER
ENC
PICT
LEVEL


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SHORT
LONG
CABLE
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OFF
LINE V
SET TO RED LINE
GENERAL ELECTRIC
+20V
LINE V







# Remote monitor switcher—gives versatile, precision control.

**1.** Picture monitor buttons*
(W) luminance channel output, (R) red output, (B) blue output, (G) green output.
(W/-R) luminance normal and red inverted, (W/-B) luminance normal and blue inverted, (W/-G) luminance normal and green inverted, (WRGB) all camera outputs added, (ENC) encoder output and (EXT) optional input to monitor.

**2.** On-air red tally light
Test buttons are interlocked with the tally light circuit to prevent test signals from going on the air.

**3.** Call button
This button is provided to summon camera operator by a tone signal to camera intercom when he is off the system. It is interlocked with camera tally light to prevent operation when camera is ON-AIR.

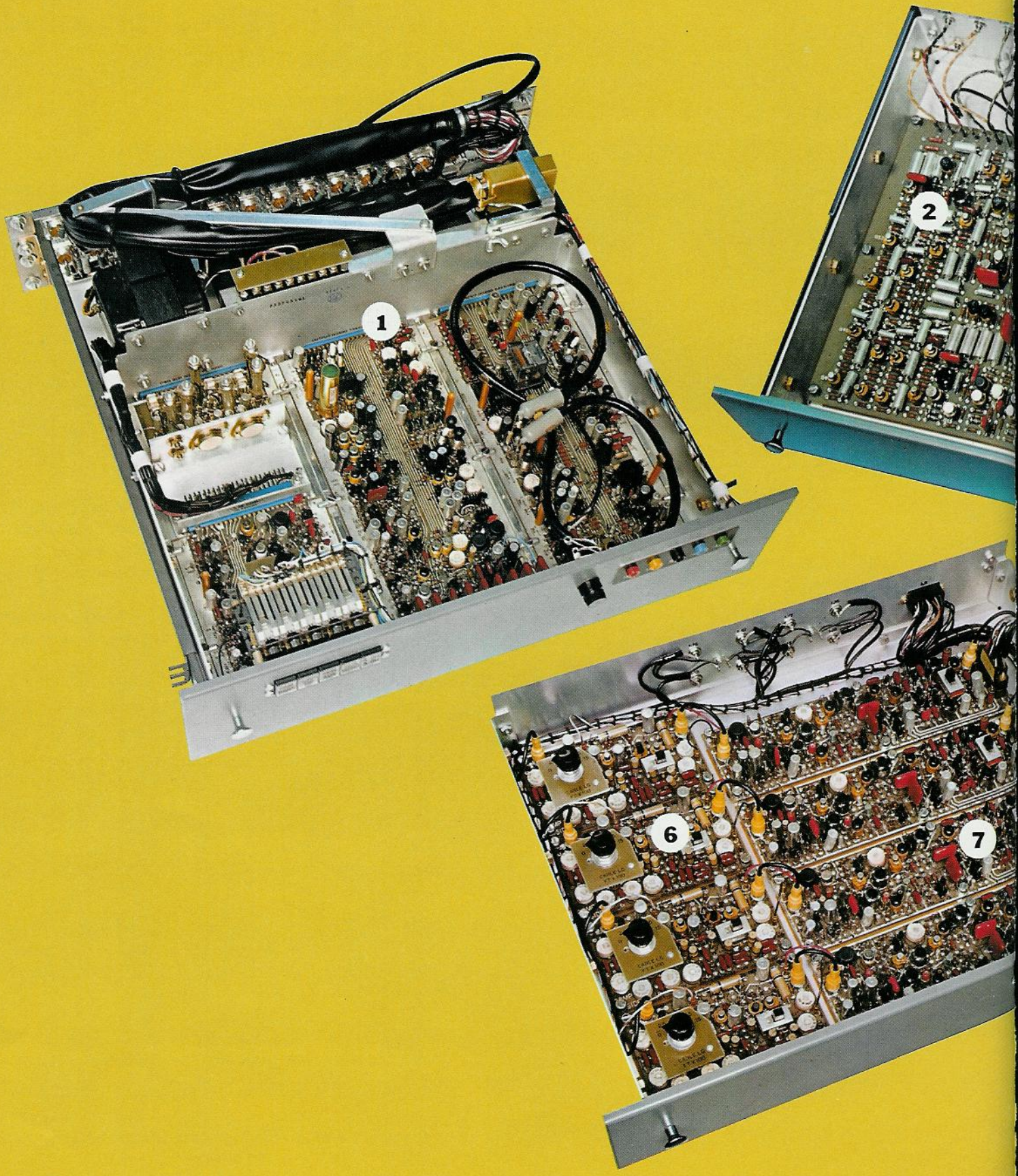
**4.** Test buttons*
(VF-VID) optional input to camera viewfinder, (AUX) button at camera viewfinder is depressed when used.
(TEST 1) mixes an externally supplied grating test signal into camera preamp with picture signal from Plumbicon tube.
(TEST 2) and (TEST 3) feed two optional external test signals into camera preamp, without picture signal from Plumbicon tube.
Note: All three test positions are automatically preempted when studio switcher takes camera.

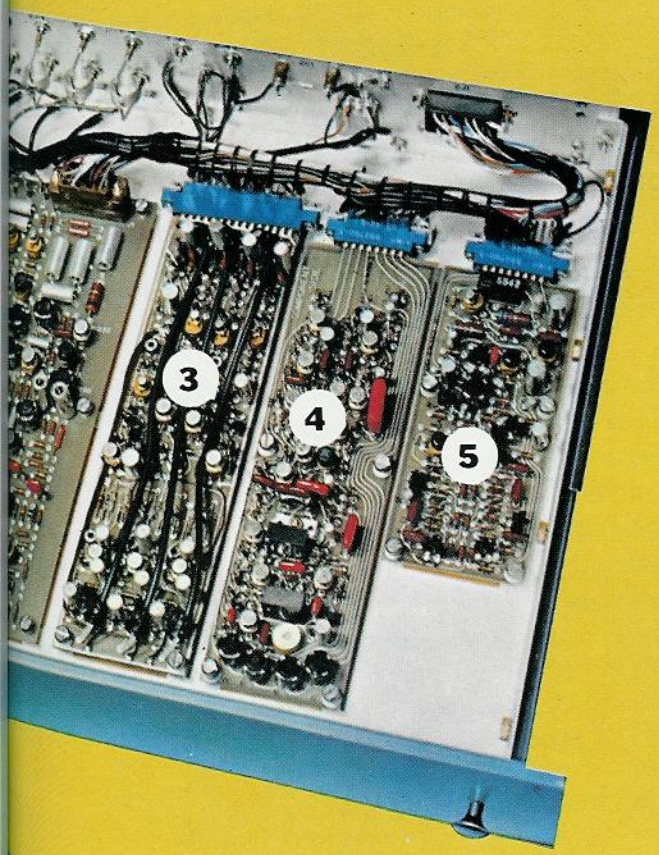
**5.** Waveform monitor buttons*
(SEQ) sequential display of WRGB signals, (SUPER) sequential display of WRGB signals with all four signals physically superimposed, (ENC) encoder output, (PICT) follows selected picture monitor and (LEVEL) logic mixer circuit output, which provides automatic level reference.

**6.** Encoder remote control buttons**
(CAM/BARS) camera or color bar, test signal check
(NORM/TIE) normal or tied inputs, for balance check
(MON/AUX) encoder or auxiliary test signal monitor output
(CLR/MONO) color or monochrome line outputs
Note: See TV-112-A Encoder brochure (GEA-8054) for a detailed description of these selector buttons.

**7.** Slide-out drawer power supply (TP-38-A) with tapped transformer, rectifiers and filter to produce 115 volts d-c. A regulator board for ± 20, unregulated + 24 and + 115 volts d-c is read.

*These buttons are lighted when pushed.
**These buttons are green in normal position, red in depressed position.


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# Modular, drawer-mounted video processors and encoder—slide out for easy maintenance and service.

Drawer mounted modules can be serviced instantly under active circuit operating conditions.

**1.** The encoder is described in G-E brochure GEA-8054.

**2.** The monitor switcher module also provides the wave form monitor sequential drive and stair case signal.

**3.** The video logic module contains the circuits that gate the three channels so that only the whitest one appears at one output and the blackest at another.

**4.** The video logic mixer takes the two outputs of the video logic board and, by keying two amplifiers so that each is on for two lines, displays an output on a waveform monitor.

**5.** The blanking and clamp unit generates the blanking to be mixed in the processor. It also generates two clamp pulses. One drives the clamps in the switcher board and the other is used for the processor clamps.

**6.** These four units compensate for video attenuation in long cable lengths. The selector switches provide correction for cable lengths up to 2000 feet. Greater lengths may be used at slightly reduced performance.

**7.** These four modules are the video processors where blanking, shading, white clip and gamma correction are added.

# PE-250 technical data

## System Make-Up

**Components of standard PE-250-A/B/C channels include:**

| | |
|---|---|
| (One) 4PC19A1 | Color camera head including: (one) 7355042G1—f2.2, 18-180mm zoom lens with 2x (f4.4) and 3x (f6.6) extenders and sunshield. (One) 55875 luminance pickup tube. (Three) AX326 color pickup tube. |
| (One) 7355362P1 | Cam head, cams, tripod riser head, plate and control handle. |
| (One) 4PD5A2 | Pedestal |
| (One) 4TC69A1 | Camera control panel including intercom amplifier and control panel |
| (One) 4TV113A1 | Processing amplifier (2 drawers) |
| (One) 4TC68A1 | Monitor select panel |
| (One) 4TP38A1 | Power supply (28V DC) |
| (One) 7674034G1 | Rack interconnection harness |
| (One) 7499753G1 | Blower and panel (for TV-113-A) |
| (One) 4TM22A1 | Monitors including: (one) 7781956-1 9" picture monitor and (one) 7781957-1 waveform monitor |
| (One) 4TV112A1 | Encoder (normally mounted in separate rack) |
| (Two) 7141069P3 | Headset, (single) |
| (One) PV-26-A | Camera cable 50 ft. (factory assembled), camera to control panel |
| (One) 7499680G1 | Encoder cable 50 ft. (factory assembled), encoder to remote monitor select panel |

**Cabinetry supplied with PE-250-A**

| | |
|---|---|
| (One) 4PR1A4 | 83" cabinet rack including rear door and sides. |
| (One) 7674065G2 | Control desk |
| (Two) 4FA56A2 | Blank panel (1RU) |
| (Two) 4FA56B2 | Blank panel (2RU) |
| (One) 4FA56F2 | Blank panel (6RU) |
| (Two) 4FA56G2 | Blank panel (7RU) |

**Cabinetry supplied with PE-250-B**

| | |
|---|---|
| (One) 4PR42A1 | 55" cabinet console (short rack) includes rear door and sides. |
| (One) 7674065G2 | Control desk |
| (One) 4FA56A2 | Blank panel (1RU) |
| (Two) 4FA56B2 | Blank panel (2RU) |
| (One) 4FA56D2 | Blank panel (4RU) |

**Cabinetry supplied with PE-250-C (deep rack)**

| | |
|---|---|
| (One) 4PR41A1 | 86" cabinet rack (includes rear door) for use when accessory 17" color monitor(12RU) is to be mounted in rack. Side trim accessory not included. |
| (One) 4PR40B1 | Control desk |
| (Two) 4FA56A2 | Blank panel (1RU) |
| (Two) 4FA56B2 | Blank panel (2RU) |
| (One) 4FA56F2 | Blank panel (6RU) |
| (Two) 4FA56G2 | Blank panel (7RU) |

## Accessories

**Lenses**

7172877P1 closeup attachment, focus distance 22½" to 57", snap in.

**Headsets**

7141069-3 single headset (double plug)

7774361-2 dual headset (double plug; party line and program/cue.)

**Camera mounts**

7355362P1 cam head (Houston Fearless) includes:(one) set cams (HF-27155-3), (one) tripod riser head, (one) standard mounting plate and (one) control handle

4PD5A2 H. F. pedestal, steerable (counter balanced up to 225#)

7665767-2 H. F. all-metal tripod, amt.—¾, 42½" max. height

RTB H. F. collapsible tripod dolly.

7496998G-1 wedge kit including wedge to fit Mitchell-Vinton head.

**Camera cables (Camera to control panel)**

PV-26-A 50 ft. (factory assembled)

PV-26-B 100 ft. (factory assembled)

7781894G3 special length (factory assembled)

7172605P1 bulk cable (without connectors)

7781907-1 cable connector (male, to control panel)

7781907-2 cable connector (female, to camera)

7781907-3 bulkhead connector (male in camera)

7781907-4 bulkhead connector (female, in control panel)

MS-3191-1 crimping tool

CET-C6B<br>CET-20-8<br>CET-12-4 } extraction tool (Cannon)

M10-K7 Burndy connector and extraction tool

RK-20-2 tool kit

**Encoder cables (Encoder to remote monitor select panel)**

7499680G1 50 ft. (factory assembled)

7499680G2 100 ft. (factory assembled)

7499680G3 special length (factory assembled)

7138457P2 bulk cable (without connectors)

7176277P1 cable connector (female to remote monitor select panel)

7176277P2 cable connector (male to encoder)

(Two) 7176278P1 Hood for encoder cable connector

**Added control position**

4TC69A1 camera control panel

4TV113A1 processing amplifier

4TC68A1 monitor select panel

4TP38A1 power supply (28V)

7674034G1 interconnection harness

7499753G1 blower kit

4TM22A1 monitor including: (one) 7781956-1 9" picture monitor with tally and (one) 7781957 1 waveform monitor

4TV112A1 encoder

**Monitors**

4TM22A1 monitor including: (one) 7781956-1 9" picture monitor with tally and (one) 7781957-1 waveform monitor

4TM23A1 monitor including: (one) 7164456P9 14" picture monitor with tally, rack slides and (one) 7164456P6 waveform monitor with slides.

7499706-1 17" color monitor, rack mount/slides and tally light (G-E blue)

7499706-2 17" color monitor, rack mount/slides and tally light (gray)

7499707-1 21" color monitor, cabinet mount with mounting studs and tally light (G-E blue)

7499707-2 21" color monitor, cabinet mount with mounting studs and tally light (gray)

7499707-3 21" color monitor, cabinet mount with carry handles and tally light (G-E blue)

7499707-4 21" color monitor, cabinet mount with carry handles and tally light (gray)

M8 pedestal mount for 7499707-1 or -2

M9 ceiling mount for 7499707-1 or -2

**Ancillary**

TC-74-A color balance control panel (single camera system)

552-1,-2 color bar generator (Riker) non-encoded, add rack frame #802 and power supply #903

1501-S test signal package (Riker), including multiburst, linearity sine², generators and pulse regenerator.

6601 "New Line" video test set (Riker), including internal power supply, multiburst, linearity, sine² window, and internal drives.

7175744-1 RETMA resolution chart (without gray scales, 200-800 lines)

7175744-2 gray scale overlay strips for resolution chart (set of 4 strips)

7175744-3 linearity (ball) chart

7175744-4 color registration chart

7175744-5 linear reflectance (2 gray scales 4" x 18" each)

7175744-6 logarithmic reflectance (2 gray scales 4" x 18" each)

## Specifications

**Mechanical;** size—PC-19-A camera head, L36"—W15"—H18" weight—with zoom lens, less than 160 lbs.

**Optical;** lens—10 to 1 zoom (.8" diagonal format) 18mm—180mm f/2.2; 36mm—360mm f/4.4 (2X extender); 54mm—540mm f/6.6 (3X extender)

**Electrical;** power input

| | |
|---|---|
| Channel (less below) | 260 watts |
| TM-22-A monitor | 165 watts |
| TV-112-A encoder | 75 watts |
| Total | 500 watts |

90 to 135 or 180 to 270 volts AC, 50/60 cycles.

**Signal outputs;** processor—one (75-ohm) for each channel. Encoder*—six (75-ohm) as follows: (one) monitor, color composite, (one) monitor, monochrome composite, (two) line, composite and (two) line, composite or non-composite.

*For Encoder specifications, see brochure GEZ-4113.

**Signal inputs;** channel—H-drive, V-drive and blanking 4vpp ± 0.5vpp.

Encoder—sync, blanking and sub-carrier 1vpp to 4.5vpp.

**Operating conditions;** min. camera ambient for continuous operation —20°C (—4°F); max. room ambient for continuous operation 45°C (113°F); max. inside cabinet rack or console ambient for continuous operation 55°C (131°F); max. relative humidity 95%; altitude 10,000 ft.

**Geometric distortion;** no point will depart more than 2% from its true position.

**Sensitivity;** acceptable picture down to 50 fc at f/2.2. Recommended studio lighting 250-300 fc at f/4.

**Squarewave response;** less than 2% tilt of a 50-cycle squarewave.

**Resolution;** 100% response at 400 TV lines with aperture correction.

**Bandwidth;** luminance channel 8MHZ ± 1DB. 10MHZ —3DB.

**Camera cable length;** up to 2,000 ft. with adjustable compensation, will operate at greater lengths at slightly reduced performance.

**Gamma;** continuously variable .4 to 1.

**Signal to noise ratio;** 40-DB P.P. to RMS.

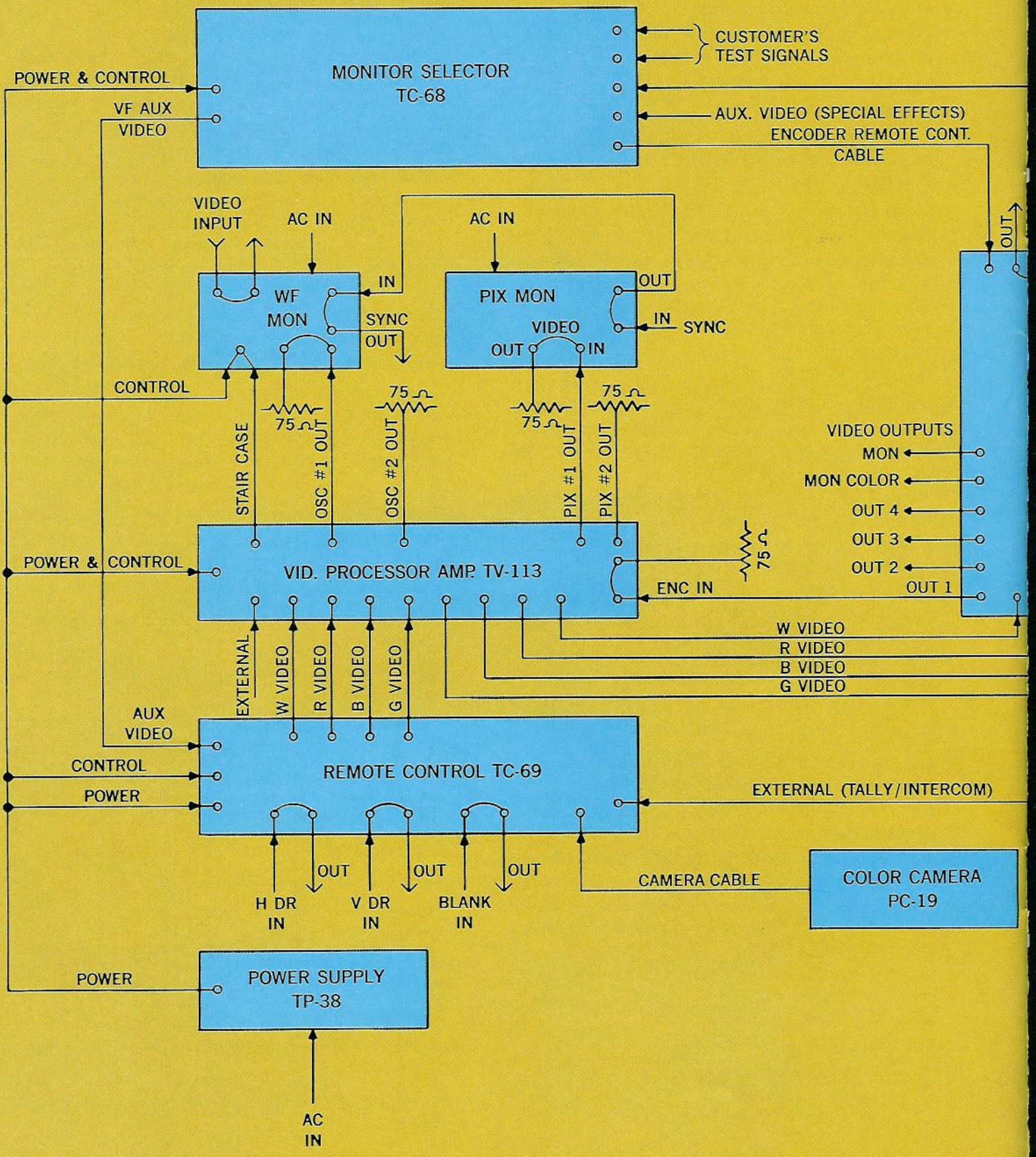
**Pick-up tube complement;** 1-55875 Amperex. 3-AX326 Amperex.

**Viewfinder;** 8", brightness in excess of 150 ft. Lamberts highlight brightness (aperture corrected video).

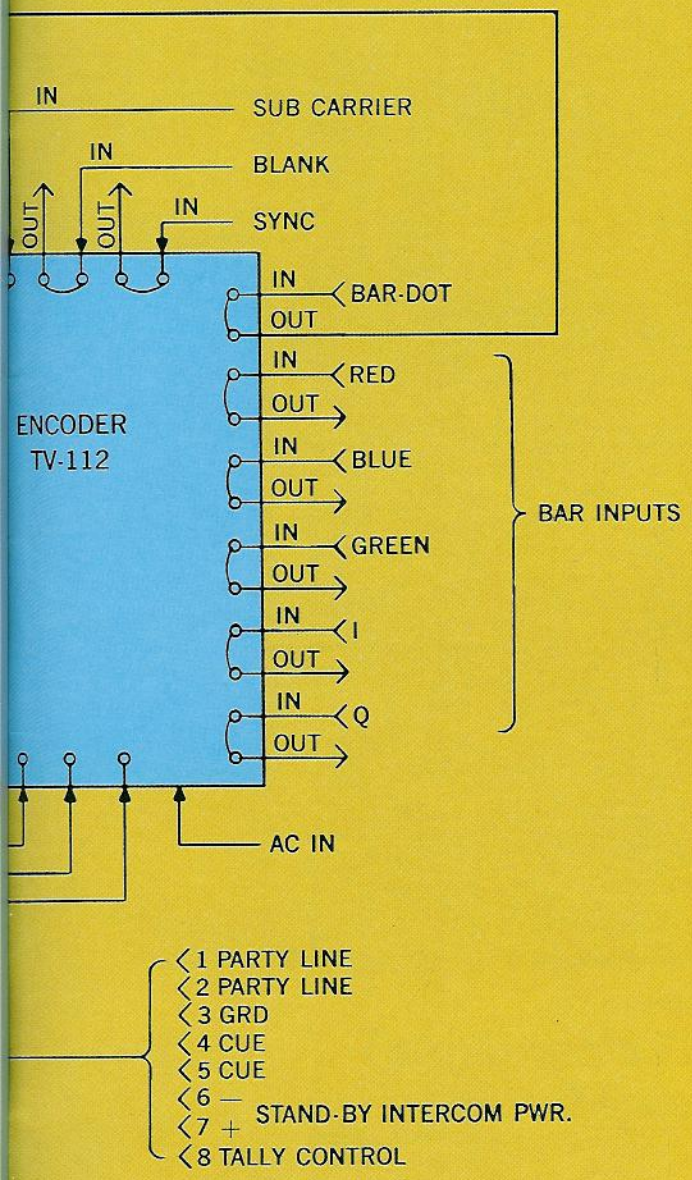
**Registration;** subtractive signal registration.

**Shading;** "Amplitude Modulated Shading" rather than "Additive Shading."

**Scanning standards;** 525 lines—60 fields or 625 lines—50 fields.


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# External connection diagram— and where to get more information.







Contact your General Electric Broadcast Sales Representative, or write directly to General Electric Company, Broadcast Sales, Visual Communication Products Department, Electronics Park, Syracuse, New York 13201.

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