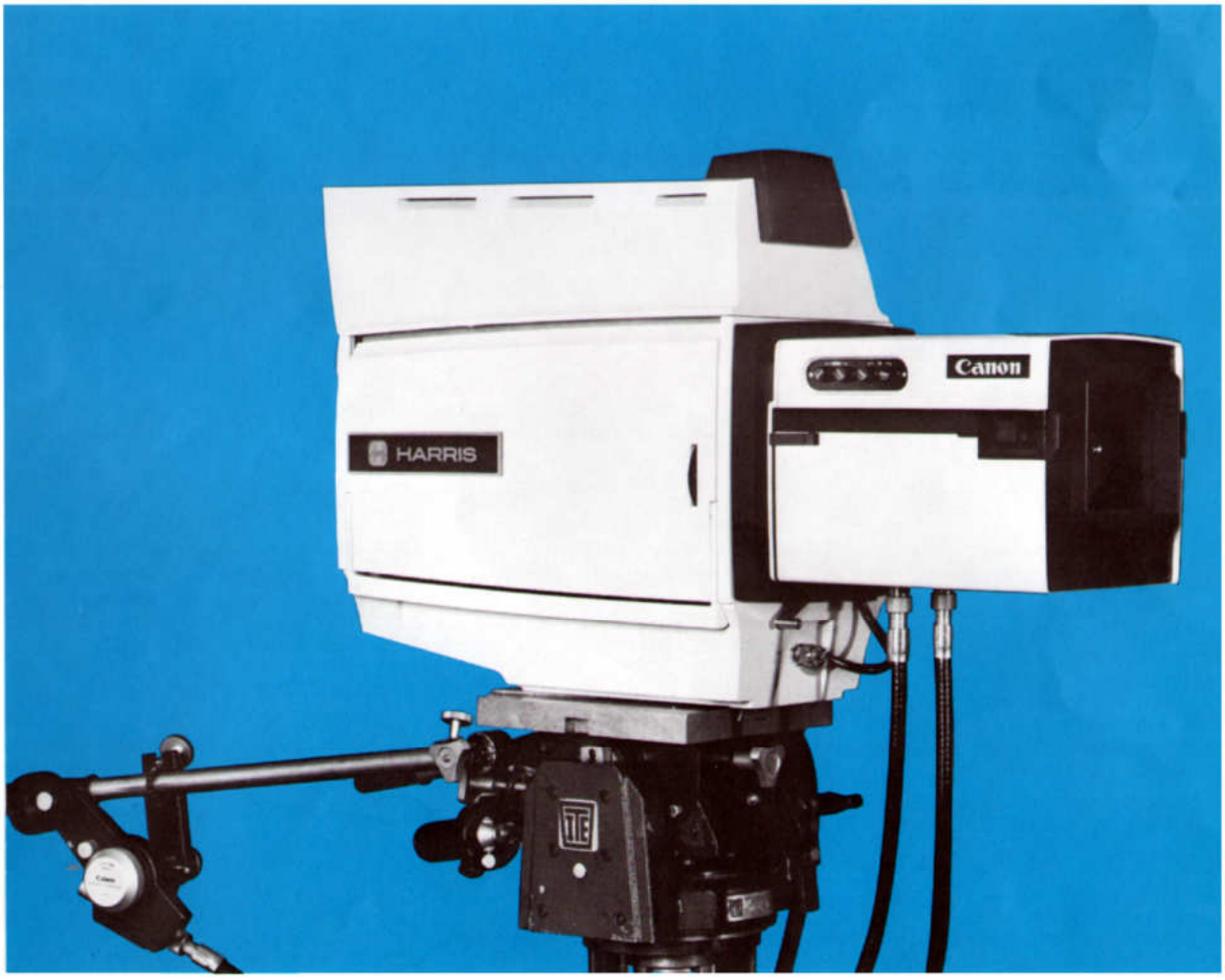
HARRIS
COMMUNICATION AND INFORMATION PROCESSING

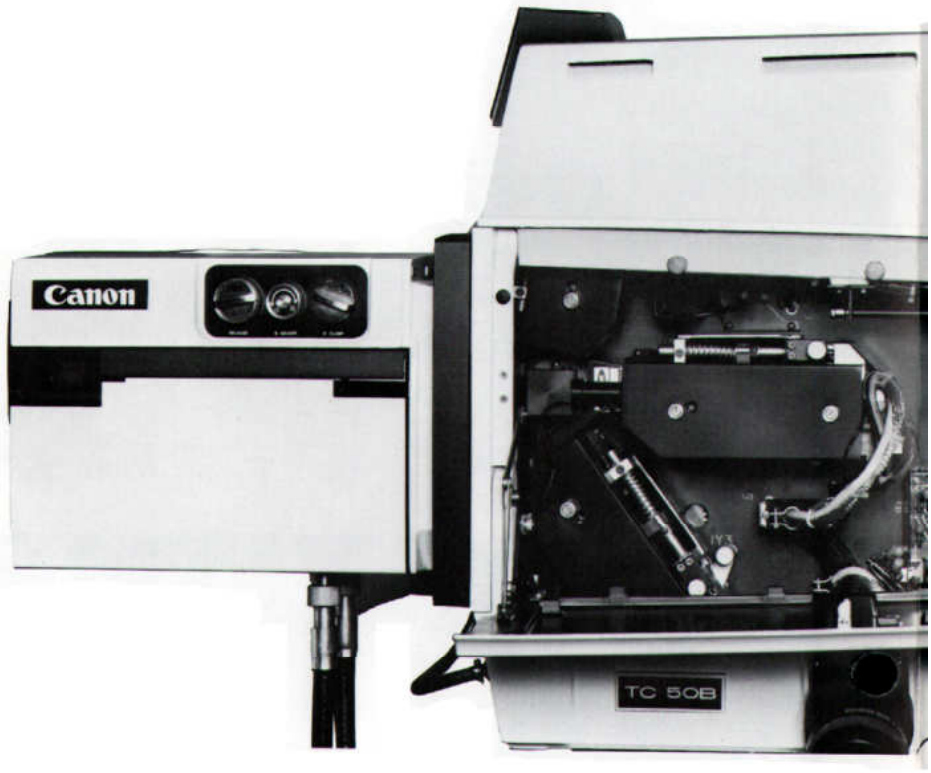
TC-50B

Live Color Television Camera

- Best cost/performance ratio in the industry
- Excellent stability and reliability
- Outstanding capability under low-light-level conditions
- Quick, easy setup
- Rugged cast aluminum frame for precision alignment
- Accepts even the longest, heaviest lenses



TC-50B...Top-of-the-line broadcast



In the TC-50B, Harris has applied its extensive experience in broadcast equipment to offer you a camera with excellent color fidelity, superb picture quality, and great flexibility—all at a much lower price than you would expect for top grade broadcast performance.

The TC-50B is a prism camera using three 1-inch Plumbicon® tubes. The prism, which includes all color separation surfaces, is built and installed as a sealed package unit in the camera. This assures uniformity from camera to camera, and optimum colorimetry.

For operating convenience, a remote control philosophy has guided the design of the TC-50B. The camera is set up and operated from the Camera Control Unit, and controls at the camera head are minimized.

STABILITY AND RELIABILITY

Outstanding stability and reliability of operation have been achieved through rugged, imaginative design. For example, all optical components are mounted on a rigid cast-aluminum plate and case, and are completely adjustment-free, to assure long-term stability.

The cast-aluminum mounting plate and case comprise a solid, precision-machined, stress-relieved integral unit. Rigidity of construction permits the camera to accommodate all standard lenses, ranging from the basic 10/1 zoom, up through the longest, heaviest lenses with extended zoom ranges.

*Reg. trademark of N.V. Philips of Holland

PRECISION YOKE ASSEMBLIES. Each of the Plumbicon® tubes is mounted in a computer-matched yoke. Each yoke assembly is precisely located on the rigid optical bed by a self-aligning quick release mechanism.

TRIPLE REGULATION. All critical voltages are regulated—not once but three times—to assure excellent stability of operation.

INTERFERENCE PROTECTION. Shielding is incorporated throughout the camera to minimize effects of radio frequency interference.

OTHER "BIG CAMERA" FEATURES

LINEAR COLOR MATRIX. Superb colorimetry is achieved through the use of a linear color matrix.

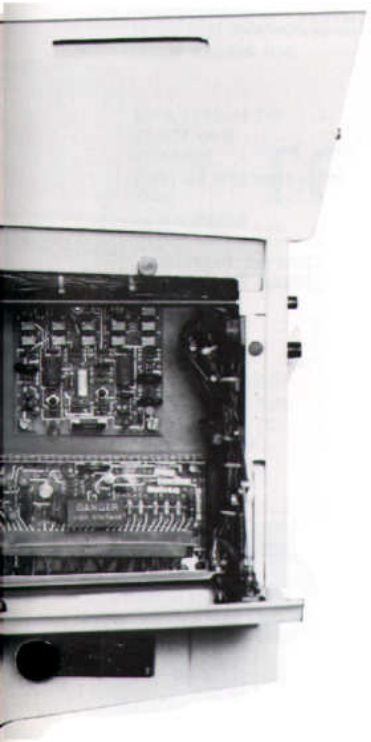
APERTURE CORRECTION. An integral horizontal and vertical aperture corrector produces sharp, clear pictures. For added crispness an integral contours-from-green image enhancer with comb filter is used.

LOW-LIGHT CAPABILITY. The TC-50B is designed for outstanding capability under low-light-level conditions. Through the use of a single master gain control, correct color balance is maintained with optimum signal to noise.

INTEGRAL BIAS LIGHT. The optical system includes an integral bias light which reduces lag when operating at low-light levels. This improves picture quality and avoids "smear".

ANTI-POLARIZATION. The TC-50B optical system incorporates a retardation plate, which eliminates color shift or distortion resulting from polarized light produced by sources such as polished floors or hair spray.

quality at a middle-of-the-line price



COLOR CORRECTION. A 5-position color correction filter wheel is incorporated in the optical system to allow for varying light conditions. To simplify use, the wheel is accessible without opening camera head doors. Optical filters are removable so that special effects filters may be used.

FLARE COMPENSATION. Controls are provided for flare compensation in all three color channels. This circuitry maintains blacks even under extremes of contrast.

INTEGRAL ENCODER. The camera system includes an NTSC encoder in the CCU control drawer. A built-in color bar generator facilitates encoder alignment.

CHROMA KEY OUTPUTS. Red, blue and green outputs are provided for use with Chroma Keyers or other special effects generators.

DESIGNED FOR CONVENIENT SETUP AND CONTROL

The TC-50B Camera Control Unit has three components: operate panel, set-up panel/control drawer, and power supply. These can be conveniently rack mounted in one location, or the operate panel can be remoted to another location.

MOUNTING. Control units can be mounted in a standard 19-inch rack occupying only 8 rack units (14 inches) or in a compact field case.

PICTURE ROTATION. A unique design feature provides an adjustment at the CCU for electronic rotation of the red and blue pictures. This eliminates the need for mechanical yoke rotation.

MASTER GAIN CONTROL. Under insufficient light conditions, the master gain control provides for boosting video gains while maintaining correct color balance. The master gain control is continuously variable, providing smooth transition and optimum signal-to-noise ratio.

PUSHBUTTON BEAM SET. The beam can be adjusted easily by using a pushbutton circuit which momentarily reduces sensitivity in each channel by 50%. This −6 dB gain feature facilitates following the recommended beam setting procedure.

MASTER BLANKING. The video operator can readily adjust the black level of the picture over a wide range with the master blanking control. The normal operating point is located readily by an electronic null at the center position of the control.

TC-50B operate panel and setup panel/control drawer.

VIDEO METER. A small video meter on the front panel of the control drawer provides quick, simple setup of white balance and black balance and can substitute for a waveform monitor.

LENS CAP. The lens cap is remotely operable for ease of setup, and for standby periods.

CLIP CONTROL. To simplify setup, the camera is equipped with a master white clip control.

OPTIONS. Two plug-in module accessories are available for the TC-50B CCU: an integral cable compensator module for cable lengths up to 1500 feet; and an integral NTSC sync generator module.

CAMERAMAN CONVENIENCE

The TC-50B's operation is enhanced by its weight and size, which assure smooth panning and tilting. With controls centralized at the CCU, a technical man is not required at the camera head.

For the cameraman's convenience, the following controls are provided at the camera head:

- High peaking control, activated by pushbutton, to aid in focusing.
- Selectable viewfinder display.
- Viewfinder brightness and contrast.
- Intercom volume—one for each headset.
- Main tally "on-off" switch.
- Call button.

VERSATILE VIEWFINDER DISPLAY. The integral viewfinder is designed for versatility, with a three-position selection of display.

The encoded output position displays properly framed output of the camera. The CCU monitor switch output position presents individual red, blue, green or difference pictures. The external video position displays special effects such as split screen.

Separate viewing hoods for indoor and outdoor service are included.

TALLYS. The main camera head tally light is large, bright, and located on top of the unit for 360-degree visibility. Another tally is located on the viewfinder for convenience of the cameraman.

A two-way signaling system is provided between the camera and the CCU. A pushbutton at the camera head

Planned for Serviceability

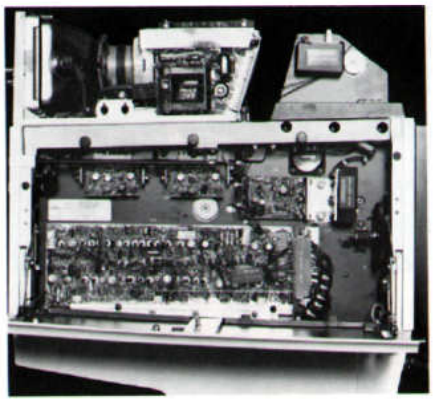
energizes an audible signal and the tally light at the CCU. A pushbutton at the operate panel lights the camera tallys.

INTERCOM. An intercom system links the camera and the CCU. Facilities are provided at the camera head for two headsets.

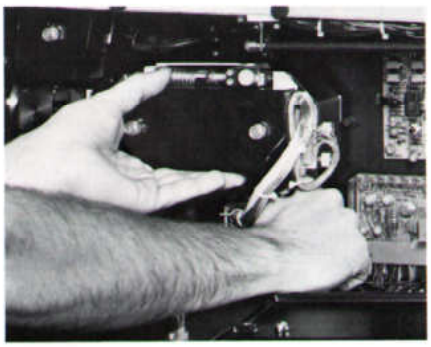
A bridging input is provided so that program audio can be inserted in the intercom system. A volume control for this input is located at the CCU.

SCRIPT CLIP. As an added convenience feature for the cameraman, a script clip is provided at the rear of the camera.

The TC-50B has a rugged mechanical design, and numerous features to provide exceptional reliability. When service is required, however, the system is designed for ready accessibility and simplified service.



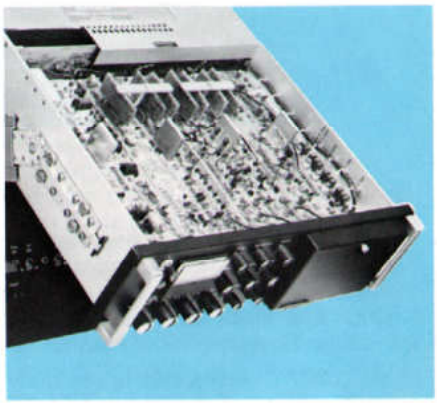
CAMERA HEAD. The camera head can be serviced without the use of extenders and circuit boards can be checked without being removed.



PICKUP TUBES. Tube replacement is quickly accomplished and does not require removal of other camera head components. Each computer-matched yoke assembly is attached with a self-aligning quick-release mechanism. A single connector provides connections for the pre-amp, the tube and the yoke.

INTERCHANGEABLE PRE-AMPS. Because of differences in sensitivity in the three channels, selectable pre-amp gain is provided to assure matched pre-amp outputs. Pre-amps are interchangeable, simplifying maintenance and stocking of parts.

REMOVABLE VIEWFINDER. The viewfinder is detachable. A long extension cable is provided to facilitate servicing.



CCU CONTROL DRAWER. This drawer can be extended and tilted for easy access and servicing.

STATUS LIGHTS. Seven indicator lights inside the camera show availability of necessary voltages from the CCU to assist in fault isolation. Test points are provided at all critical locations to simplify maintenance.

HOUR METER. The camera head includes an elapsed time meter as a validation should a tube warranty claim arise.

USER CONNECTIONS. Tally light and intercom connections are readily accessible.

TC-50B SPECIFICATIONS

ELECTRICAL SCAN STANDARDS
EIA 525/60
CCIR 625/50

POWER REQUIREMENTS
Voltage ..... 90 to 130V or 180 to 260V, 60 Hz (50 Hz on request)
Power Load ..... 260 VA (exclusive of monitoring)

INPUTS (Loop-Through, Bridging)
Sync ..... 2 to 8Vpp, negative
H Drive ..... 2 to 8Vpp, negative
V Drive ..... 2 to 8Vpp, negative
Sub Carrier ..... 1.5 to 4Vpp
VF External Video ..... 1.0Vpp composite

OUTPUTS
Program
Video ..... Two Composite, 1Vpp across 75 ohm
Chroma Key
(R,B,G) non-composite ..... 0.7Vpp across 75 ohm
Monitor Video
non-composite ..... 0.7Vpp across 75 ohm

MONITOR SWITCHING FACILITIES
Picture and
Waveform ..... R,B, & G separately or combined with —G or —B; color output (program)
Viewfinder ..... output of picture & waveform monitor switch; Y video; external video

SENSITIVITY (Typical tubes)
Minimum incident light on 60% reflectance chip for full output
with f2.0 lens 12fc
with f1.6 lens 8fc
Incident Light for
rated Signal/Noise ..... 100fc at f2.8
Signal/Noise
Ratio ..... better than 50 dB (300 na green signal current; 1.0 Gamma; bandwidth 10 kHz to 4.2 MHz; masking, aperture and chroma—off)
Center Resolution: typically 40% @ 5MHz at program output—correctable to 100%

OPTICAL SYSTEM
Color Separation ..... single unit prism with Integral Bias Light
Correction Filters ..... 5 position filter wheel
Depolarization ..... retardation plate at prism input

PICK-UP TUBES
Red ..... Amperex XQ1073 extended red
Blue ..... Amperex XQ1070B
Green ..... Amperex XQ1070G

REGISTRATION ACCURACY
Zone 1 (Circle = .8V) 0.05%
Zone 2 (Circle = 1.0V) 0.1%
Zone 3 (Circle = 1.0H) 0.2%
Zone 4 (All Other) 0.4%

PICTURE GEOMETRY
Zone 2 ..... 0.5%
Zone 4 ..... 1.0%

CAMERA CABLE LENGTH
Without Optional
Module ..... to 300 ft. (91m)
With Optional
Module ..... to 1500 ft. (457m)

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)

STABILITY
After a 30 minute warm-up the camera will perform within specifications for 8 hours, provided the temperature change does not exceed ±10 degrees C or the specified limits.

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.

GAMMA CORRECTION
Continuously variable from linear to 0.35, each channel.

INTERCOM
Party Line ..... 600 ohm balanced to ground
Camera Head ..... accommodates two headsets; separate amps & controls
Operate Panel ..... one headset, amp & controls
Program Audio ..... bridging input (unbalanced with level control)

SIGNALING SYSTEM
CCU to Camera ..... pushbutton operates camera tally lights
Camera to CCU ..... pushbutton operates tally lights and audible signal

VIEWFINDER
Screen Diagonal ..... 6.1 in. (155 mm)
Picture Brightness ..... 0 to 150 ft. lamberts
Resolution ..... better than 600 TV lines
Picture Timing ..... AFC
Video Equalization ..... Automatic to maximum cable length
Controls ..... Contrast, Brightness, Video Peaking and Input Select

MECHANICAL
Camera Head (Less lens)
Height ..... 19.5 in. (495 mm)
Width ..... 10.5 in. (267 mm)
Depth ..... 21 in. (533 mm)
Weight ..... Approximately 75 lbs. (34 kg)
Control Drawer
Height ..... 5.25 in. (133 mm)
Width ..... 19 in. (483 mm)
Depth ..... 22 in. (559 mm)
Weight ..... 20 lbs. (9 kg)
Operate Panel
Height ..... 1.75 in. (45 mm)
Width ..... 19 in. (483 mm)
Depth ..... 7.25 in (184 mm)
Weight ..... 2 lbs. (.9 kg)
Main Power Supply
Height ..... 7 in. (178 mm)
Width ..... 19 in. (483 mm)
Depth ..... 18 in. (457 mm)
Weight ..... 38 lbs. (17 kg)

ACCESSORIES
NTSC Sync Generator Module
Cable Compensation Module
All one-inch format lenses from Angenieux, Canon, Fujinon and Schneider
Camera Cable, std. lengths 50 ft., 100 ft., 150 ft., 200 ft., 250 ft., 300 ft., 400 ft., 500 ft.
Operate Panel Extension Cable, std. lengths 25 ft., 50 ft., 100 ft., 200 ft.
Headset, single and dual
Conrac SNA9, 9-inch Picture Monitor
Tektronix 528 Waveform Monitor
ITE Cam Head, H2 or H3; ITE P4 or P5 Studio Pedestal
ITE-WA Wedge Adapter; ITE-WP Wedge Plate
Quick-Set (Houston-Fearless) and Vinten Cam Heads, Pedestals, etc.
Vinyl Rain Cover

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