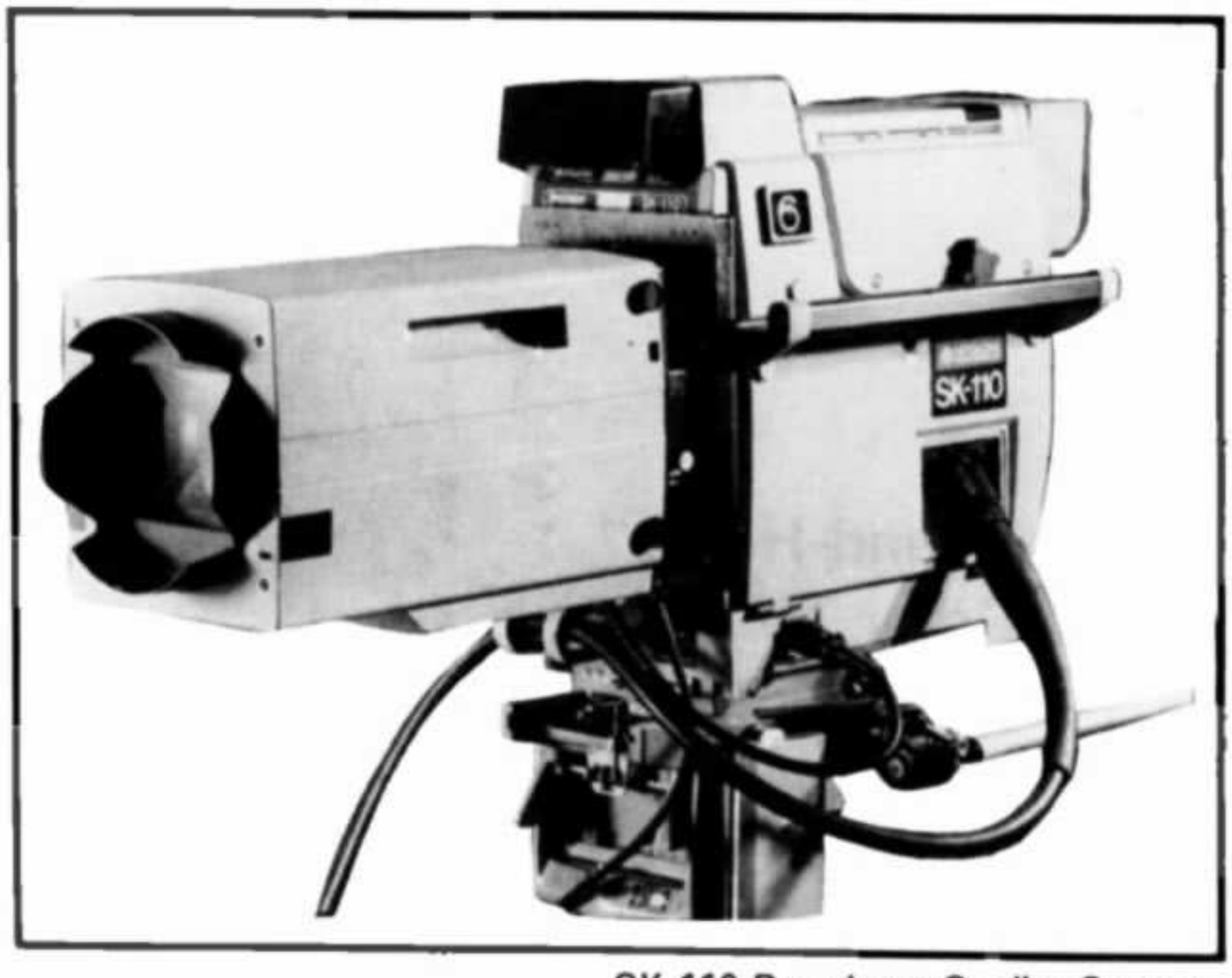
HITACHI
Hitachi Denshi, Ltd.

COLOR TV CAMERA



SK-110 Broadcast Quality Camera

CAMERA HEAD

- **Highly efficient prism optics:** A newly developed f1.8 prism optics are used in conjunction with 1-1/4" Plumbicon* tubes to provide a high signal-to-noise ratio of 54 dB at 2000 lux and f5.6. The optical filters have been dust-proofed to virtually eliminate dust problems.
- **Six-position ND and color filter discs:** Two filter discs, one for ND filters and the other for color filters have been provided, with independent filter selection possible from both the RCU and the SCU. The discs are servomotor driven and may be rotated in either direction.
- **Improved registration and optical axis accuracy:** By using an independent four-corner adjustable dynamic registration compensation unit, compensation to within 0.05% over the entire picture area is possible. This can be achieved by means of either the auto-setup or the remote control from the SCU. The compensation data is stored in RAM memory with a back-up battery. The optics, coil assemblies and zoom lens are mounted as a unit to ensure that mechanical distortion does not affect the optical system or coil assemblies and to eliminate the effects of external mechanical stresses on registration and optical axis accuracy.
- **Comet tails eliminated by ABO (Automatic Beam Optimizer):** The Hitachi developed ABO circuit allows the beam current to be increased up to 16 times versus only 4 times the normal setting for conventional systems, a limitation imposed by considerations of picture quality. This means that comet tails can be eliminated without the usual accompanying misregistration, loss of resolution, and increase in dark current.
- **High-performance viewfinder:** A bright, high-resolution CRT has been used in the viewfinder to provide an easy-to-view image even for outdoor shooting. The viewfinder can be tilted from +25° to -45° and rotated +/-90° to set it at any arbitrary angle.
- **Easy-to-use video select button:** R, G, B, minus G, and two return video signals (AUX-1 and AUX-2) can be switch-selected as the viewfinder video signal.
- **Convenient monitor output on the camera head:** A separate video output has been provided on the camera head to be used for floor monitors, etc.
- **Red and green tallies:** The viewfinder is provided with both red and green tallies, the red one for live shooting and the green one used for VTR recording.
- **Built-in microphone amplifier:** The camera head is provided with a built-in microphone amplifier with limiter. The audio output is balanced to prevent the pickup of noise from the camera cable.
- **Test signals provided to simplify setup:** Test signals are used for easy calibration of the output of each amplifier stage. The signals are applied in sequence, starting from the process amplifier and walking back until the preamplifier is calibrated. The test signals may be applied to the input of the preamplifier first stage, process amplifier-1 and process amplifier-2, and consist of a 100% and 200% level sawtooth waveform which can be used for level calibration as well as verification of gamma, knee point, slope and clipping point.
- **Designed for easy servicing:** The camera head and CCU PC boards are simple to remove and marked on both sides, making parts easy-to-find for quick servicing or inspection. Another serviceability feature is a coil assembly that can be removed while the camera is mounted to the dolly.

CCU

- **Compact design:** The CCU is designed as a dedicated camera control unit for computer controlled cameras. Both the video processing section and the computer section have been housed in one compact package.
- **Linear matrix masking:** A built-in linear matrix masking circuit is provided and ensures faithful color reproduction and easy tone matching among cameras.
- **High-performance contour corrector:** Compensation signals derived from the R and G channels provide clear, crisp images of even red subjects. The contour correction signals are automatically processed to match the type of subject, maintain optimum compensation and ensure natural images.
- **Standby mode operation:** Three operating modes have been provided to reduce power consumption and extend the life of the pickup tubes and CRT.
  (1) CCU POWER: Main power supply is switched on; the CCU is operating.
  (2) POWER: The camera head is on and the heaters of the pickup tubes and CRT are supplied with 50% of the normal voltage.
  (3) BEAM: The pickup tube beams are switched on and the camera operates.
- **Genlock:** The SK-110 is genlocked to an external sync signal when composite sync and subcarrier signals are applied. Horizontal and subcarrier phases can be adjusted manually. If required, genlocking by means of a black burst signal can also be provided.
- **Built-in SMPTE/VIT color bar generator:** A color bar generator conforming to the latest SMPTE standards has been built-in for convenient adjustment of monitors. Also built-in is a VIT color bar generator, allowing monitoring of the characteristics of the encoder and the transmission line while on the air.
- **High-reliability LSI process amplifier:** Camera picture quality is greatly effected by the stability of the process amplifiers used. LSI process amplifiers have been used in the SK-110 camera to provide stable operation with respect to temperature variations and eliminate variations between channels. They provide both picture quality and high reliability and represent the most advanced step in a camera of this class.
- **Special effects:**
  (1) The horizontal and vertical deflection currents can be independently reversed, a feature useful in picking up mirror images.
  (2) The video polarity of the R, G, and B signals can be independently inverted.
  (3) A circuit has been provided which can be used to provide swinging of horizontal deflection by means of an externally applied low frequency signal.
- **Encoder with variable gamma (contrast):** Gamma control of luminance and chrominance signals is linked and can be adjusted by remote control, making adjustment of the picture contrast very easy, even under such difficult conditions as those encountered outdoors.
- **Iris:** In the Auto Iris mode the lens iris is automatically adjusted according to subject illumination. In manual mode, the center value and adjustment range of the iris are set by the sense and range controls of the SCU or RCU. This feature makes operation in the studio where light variations are small extremely simple. The iris values are visible on the SCU and RCU LED display.

AUTOMATIC SETUP

- **Zero method control:** The zero method of control is capable of controlling the R, G, and B channels, thus eliminating the troublesome manual adjustment of the G channels required in the G channel reference method. The system has been completely automated, and a parallel control system can set up multiple cameras simultaneously in just 2 minutes.
- **Control of multiple cameras:** By using a DSU for every group of six cameras, up to 24 cameras can be controlled with just one SCU. By adding a TSU control capabilities can be expanded up to 42 cameras using two SCUs, providing all the flexibility you will ever need.
- **Automatic setup modes:** Five automatic setup modes have been provided; full, registration, color balance, G-reference, and white balance. These can be selected from to suit the picture conditions at the time. In addition, manual control from either the SCU or RCU is possible, with all normal operational controls accessible manually.
- **Data files:** Five data files are provided except for the AUTO data file. Automatic setup data is automatically stored in the AUTO data file. It is possible to store or erase the manual setup data from the SCU in the five data files by operating the entry or reject switch.
- **Fault diagnosis:** Fault diagnosis of the camera video system, power supply and pulse system is performed automatically to detect failures. Diagnosed results are printed out on the typewriter. This system has greatly simplified camera maintenance by providing quick and accurate information on failures.
- **Quick check:** When the SCU Check switch is depressed, registration (G-reference) and color balance (G-reference) are automatically checked and, if the required accuracy is not being obtained, the readjustment is automatically made.
- **Scroll display and automatic setup status display:** The results of the fault diagnosis and the quick check are displayed on a scrolled picture monitor character display. The scrolling display may be stopped at any desired point for viewing. The status of the automatic setup function (controlled parameters and their status) may also be viewed on the picture monitor character display.
- **Remote control:** The SCU, TSU, DSU, and CCU may be connected with just three twisted-pair cables and be separated from one other by up to 1000m (3000 ft.). The CCU and RCU may be connected using three twisted-pair cables and separated up to 100m (300 ft.). If the power supply is provided externally to the RCU the distance to the CCU can be extended up to 1000m (3000 ft.).