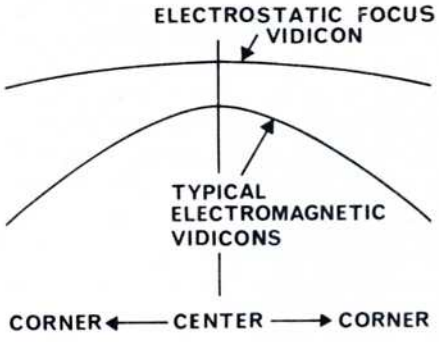
catalog B.3012

RCA Color Film Camera, Type TK-27

- FET-equipped preamps in all four channels
- Shorter setup time
- Automatic control of black level, white level, and sensitivity
- Contour accessory for picture enhancement

3UB

TK-27
RESOLUTION CAPABILITY



Simplified Interconnection

Horizontal and vertical drive signals for the TK-27 now originate in the film camera itself instead of in the master sync generator as with other color film cameras. This simplifies cabling and reduces the number of distribution amplifiers required by the system.

Advanced Camera and Optics

The design of the camera and optical assemblies assure long term life and freedom from secondary reflections. Assemblies are mounted on a ½-inch-thick, aluminum base plate. This is rigidly fastened to the structurally reinforced cabinet which is in turn bolted to the floor. Unprecedented accuracy is achieved in superimposing optically the four images on the vidicons. Prisms are employed to separate and direct the light image to each of the four cameras. Dichroic surfaces are sealed within the optical block to eliminate any multiple reflections and to prevent contamination from dust or handling. Prisms, therefore, are maintenance-free, assuring optimum performance at all times. Plug-in design permits quick and easy removal of vidicon assemblies to facilitate tube changing or trouble shooting.

Minimum Space Requirement

Plug-in transistorized modules associated with the camera circuits are located along the top of the camera unit above the vidicon setup control panel. The plug-in modules comprising the Auxiliary Assembly which combines pulse regeneration, blanking and colorplexing functions are housed in two module frames each only 5¼ inches high.

Ease of Setup and Test

TK-27 camera circuits are designed so that one man can set up and adjust the camera using simple pulse techniques which speed up camera adjustments. Built in and operable by a switch, test pulses determine that pickup tubes and amplifiers are operating at proper levels. A switch on the control panel inserts pulses for checking system stability at any time. Initial adjustment of the TK-27 is made quickly and further touch-up is rarely required. A built-in color bar generator provides full raster R, G and B signals at 75 or 100 percent level to facilitate setup of the colorplexing function using only an oscilloscope.

Operating Features

Design of the TK-27 makes it possible to include all the remote controls for the system in three control panels that are mounted side-by-side in a console housing or in a standard rack, occupying only 7 inches of height. Operators will find it easy to maintain consistently high picture quality with minimum attention. There are several unique points about the controls. For example, white and black balance controls, used to individually control levels in each chrominance channel to compensate for deficiencies in color film, are completely non-interacting. Chroma level may also be adjusted from the control panel.

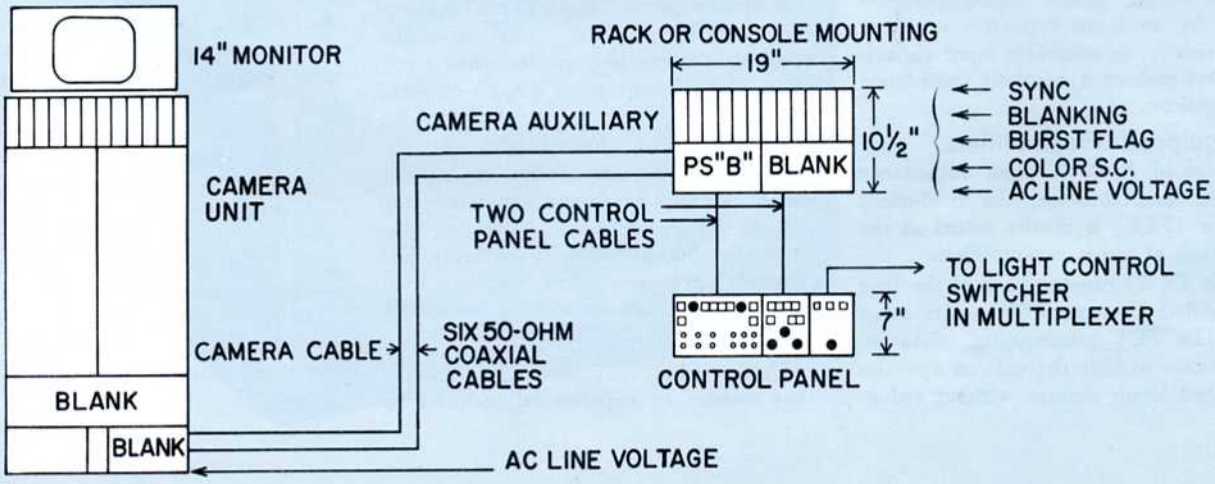
NTSC or PAL Color Standards

The TK-27 is available for operation on either NTSC or PAL color standards. The versatile power supply of the TK-27 operates on either 115 or 230 volts at any frequency between 47 and 63 Hz.

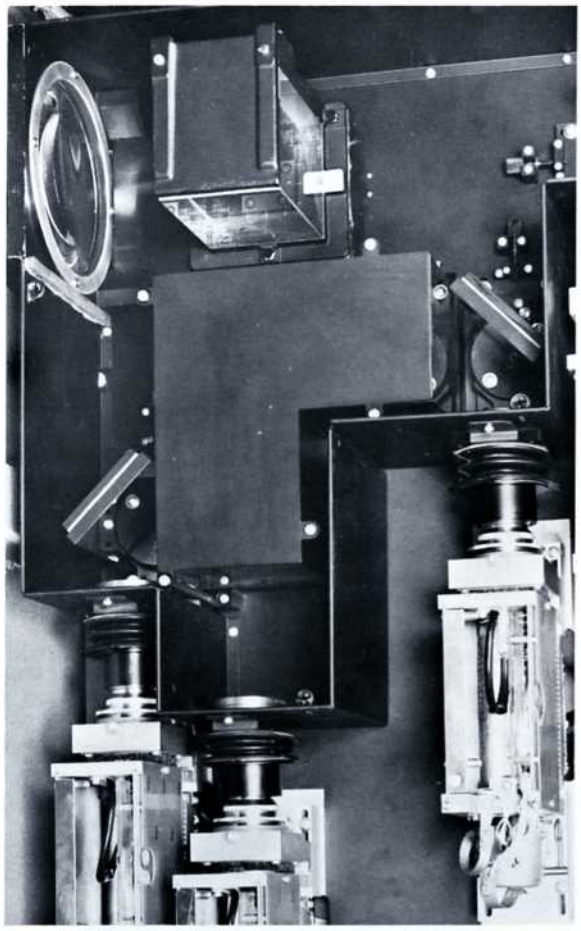
Control Versatility

Three control panels mounted side-by-side contain all the controls and illuminated pushbutton indicator switches for operation of the TK-27 color film camera system from a control console or other location. The left-hand and right-hand panels are used for color operation, while the remote control panel in the center contains the main operating controls. Provision is made for "monochrome only" operation of the TK-27. With this mode, operation is similar to that of the RCA TK-22 monochrome camera. Only those circuits required for processing the signal from luminance vidicon are used. For extended periods of monochrome operation, chrominance vidicons may be turned off.

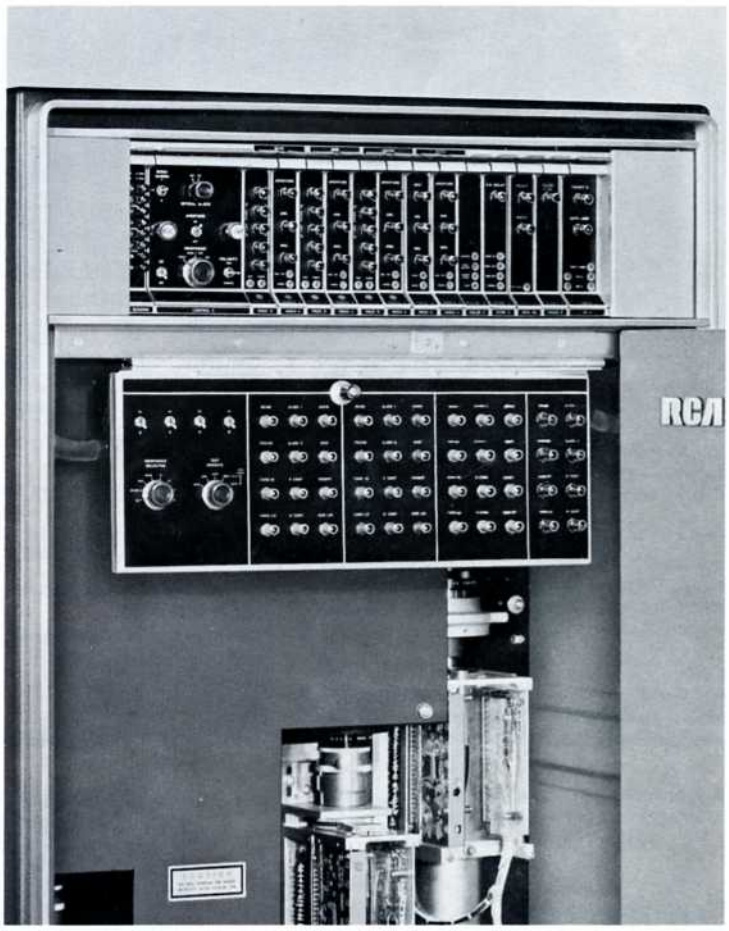
TK-27 COLOR FILM CAMERA SYSTEM



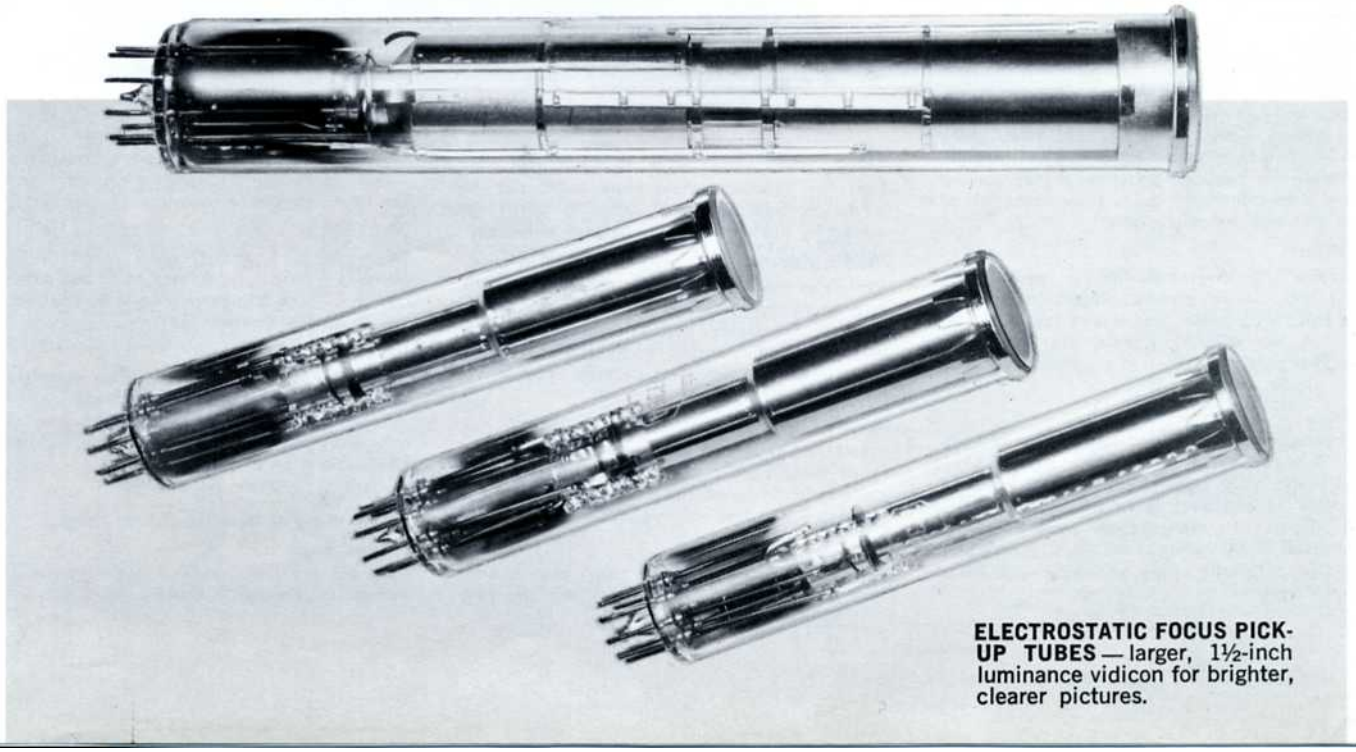
New Design Advances for Ultimate Picture Quality



SEALED PRISM DICHROICS eliminate secondary reflections — are maintenance-free.



CENTRALIZED TK-27 CONTROLS speed camera setup and test adjustments.



ELECTROSTATIC FOCUS PICK-UP TUBES — larger, 1½-inch luminance vidicon for brighter, clearer pictures.

Camera Unit Modules

TK-27 Camera Modules.

Shading
Provides ± SAW and PARAB signals for each of the vidicon channels.

Control
Controls monitor feed selection, gamma, monochrome polarity reversal, 3-V/4-V operation and indicates when camera is in mono only mode.

Proc
Processor clamps video and inserts gamma correction. Contains controls for manual and automatic black and automatic sensitivity. One used for each of four vidicon channels.

Video
Amplifies video from preamplifier and provides aperture compensation. One used for each of four vidicon channels.

Pulse
Generates white test pulse, black level pulse,. horizontal drive stop pulse, gating pulses and test pulses for use in setup, testing and automatic circuits.

Sync
Generates and distributes vertical gating, vertical drive, timing pulse and horizontal drive. Contains circuitry for automatic time delay compensation. Clips and amplifies sync for use in other modules.

Defl
Deflection provides horizontal and vertical deflection. Provides vidicon protection in case of scan-failure.

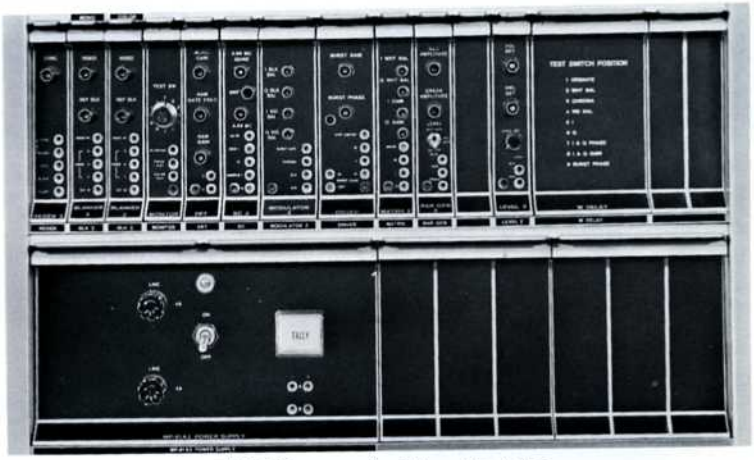
Trans
Transitional—using signals from the DEFL and HV modules. Provides horizontal and vertical deflection for chrominance channel vidicons.

HV
High Voltage—Generates high voltage, DC filament voltage for the luminance channel vidicon and reference voltage to operate transistor decouplers. Vidicon blanking and target voltage ranges are set in this module.

Power B (not shown)
Develops regulated positive and negative low voltage DC for use in camera. Supplies low voltage AC to FIL module.

Fil (not shown)
Filament Power—Converts AC low voltage to regulated DC filament voltage for the R, B and G vidicons. Contains switch to turn off this voltage for long term monochrome only operations.

Camera Auxiliary Modules



TK-27 Camera Auxiliary Modules.

Regen
Regenerates sync and blanking and generates clamp pulses. Contains part of circuitry for horizontal drive advance to compensate for cable and encoder delays.

Blanker
Adds final blanking to video. Contains multiple video output line driver with sending-end termination and has switchable sync addition to output video. Contains single line driver with sending-end termination which can be remotely switched to line, an external signal coming from a loop-through input or combination of line and external test signal.

Monitor
Contains line driver amplifier for feeds to the CRO and picture monitor. Regenerates blanking and clamp pulses and inserts system blanking on the RGB&M signals. Test switch is included to allow set-up of encoder using only CRO signal.

Det
Converts monochrome and color difference signals into receiver Rr, Br, and Gr signals. Non-additively mixes signals and switches between NAM white and black to form single NAM signal. (Similar to monochrome camera signal.) Individual NAM white and black signals are used in automatic white and automatic black control systems.

SC
Subcarrier—Supplies quadrature subcarrier to modulator and generates sampling bursts required by automatic carrier balance detectors.

Modulator
Modulates the I and Q color difference signals to produce chroma signal with automatic carrier balance. Generates gating signal to ungate blanker module during burst time. Provides color difference signals to Detector module.

Driver
Band limits I and Q signals, inserts burst flag into I and Q signals for burst generation and feeds these signals to modulator. Amplifies M signal and drives M Delay module. Inserts delay into I signal to match Q filter delay.

Matrix
Matrixes R, B and G signals into I and Q. Contains relays and amplifiers used in monitoring individual M, R, B and G signals and has provisions for tying chrominance signals together for white balance adjustment of encoder.

Bar Gen
Generates R, B and G pulses used to form standard non-split modulated color bar patterns of either 75 or 100 percent level as selected by switch on front panel.

Level
Detects NAM white and NAM black signals and forms DC voltages used in feedback loops for automatic white and automatic black level control. Provides gating required for automatic black operation of camera.

M Delay
Delays M signal to match Q filter delay.

Power B
Develops regulated positive and negative low voltage DC for use in Camera Auxiliary.

Controls and Functions

COLOR CONTROL PANEL

Bars
Connects color bars to colorplexer and color output.

Monitor
Selects monitor display: color output, mono output, NAM, BRGM.

B, R, G, M
Selects outputs seen on monitor or CRO in BRGM position of monitor and CRO switches.

CRO
Selects display for CRO (same choice as on monitor switch).

Chroma
Varies white level in all color channels simultaneously, but not monochrome white level.

Mono
Disables color channels, provides mono signal without burst on all video outputs.

Chroma
Switch turns chroma, but not burst, off.

H Cent
Vernier horizontal centering.

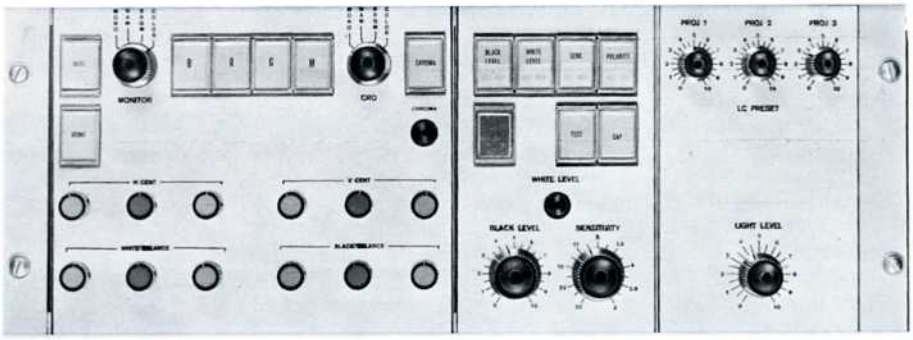
V Cent
Vernier vertical centering.

White Balance
Varies white level of color channels individually.

Black Balance
Varies black level of color channels individually.

REMOTE CONTROL PANEL

Black Level
Selects manual or automatic black level control.



TK-27 Remote Control Facility showing Color Control, Remote Control and Light Control Panels.

White Level
Selects manual or automatic white level control.

Sensitivity
Selects manual or automatic sensitivity control.

Polarity
Selects operation for positive or negative film.

Monitor
Used with studio switcher to connect camera chain output to console monitor.

Test
Energizes test pulses.

Cap
Electronically caps vidicon pickup tubes.

White Level
Controls white level reference pulse when switch is in manual, or sets level to which peak white is held when switch is in automatic.

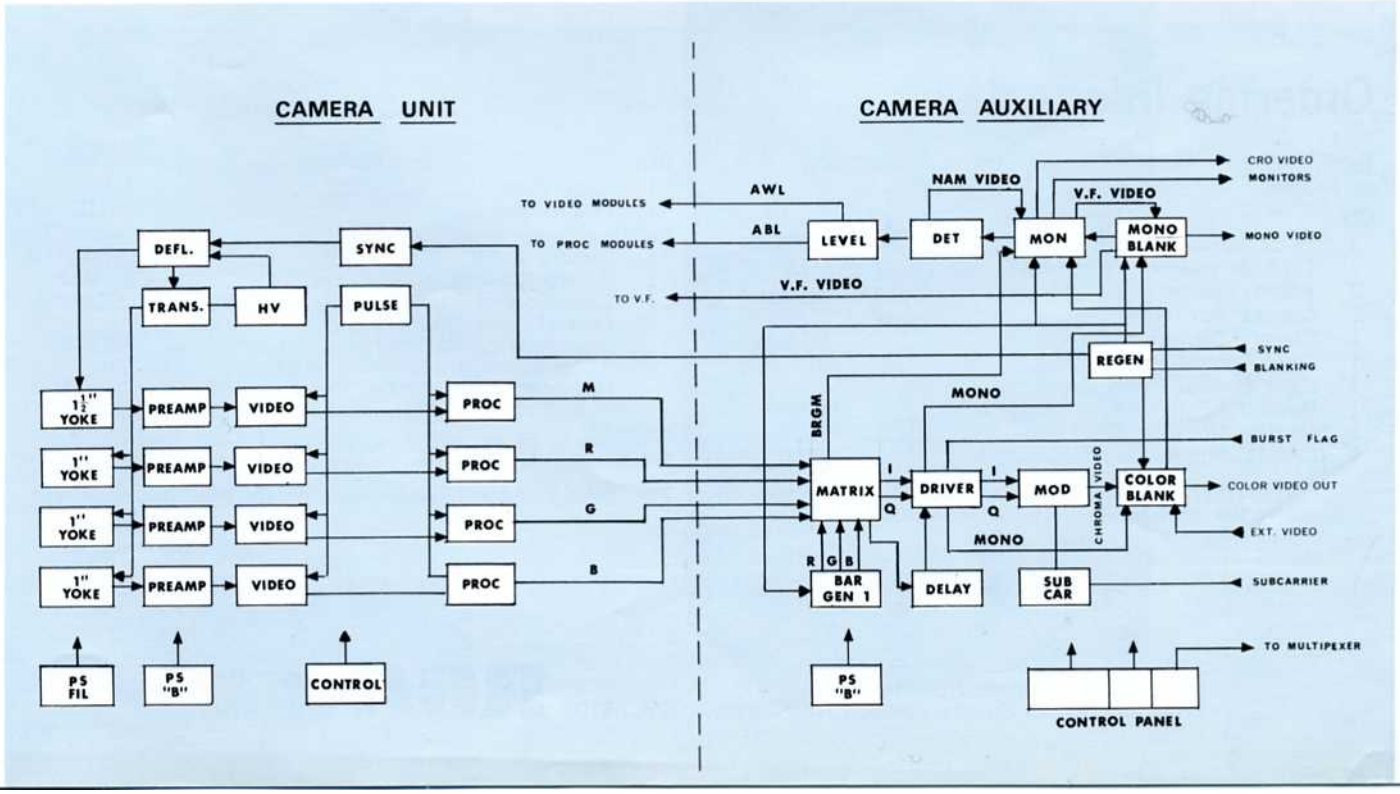
Black Level
Controls black level reference pulse when switch is in manual, or sets level to which peak black is held when switch is in automatic.

Sensitivity
Controls vidicon sensitivity when switch is in manual, or sets level to which peak sensitivity is held when switch is in automatic.

LIGHT CONTROL PANEL

Light Level
Manually controls neutral density disc for color operation.

Functional Diagram



Specifications

General

Type of Reproduction ..... Color and Monochrome
Number of Scanning Lines ..... 525 or 625
Field Repetition Rate ..... 60 or 50 Hz
Line Repetition Rate ..... 15,750 or 15,625 Hz

Picture Quality

Limiting Horizontal Resolution
Luminance Signal ..... **700 lines min. at center 600 lines min. in corners**
Signal-to-Noise Ratio, Luminance Signal ..... Nominal 46 dB peak-to-peak signal/rms noise for bandwidth of 4.5 MHz
Square Wave Tilt ..... Max. 2%, 60 Hz square wave
Video Bandwidth ..... Down not more than 3 dB at 8 MHz
Total Raster Distortion ..... **Within 2% of picture height**

Operational

Gamma Correction Luminance Channel ..... Switchable to three preset values; 0.5, 0.7, 1.0 and 1.2
Gramma Correction, Chroma Channels ..... Continuously variable, 0.5 to 1.0
Aperture Correction ..... Amplitude continuously adjustable from 0 to +12 dB boost at 5.5 MHz

Electrical

Input Signals:
- Sync ..... 2 to 8 volts, peak-to-peak, neg.
- Blanking ..... 2 to 8 volts, peak-to-peak, neg.
- Burst Flag ..... 2 to 8 volts, peak-to-peak
- Color Sub-Carrier ..... 2.0 ±0.5 volts, peak-to-peak 3.579545 MHz, 4.4296875 MHz or 4.3361875 MHz*
- Input Impedance ..... Bridging

Output Signals:
- Program ..... 2 color and 2 monochrome either 1.0 volt peak-to-peak composite or 0.7 volt peak-to-peak non-composite. One color autput required for color monitor.
- Monitor ..... 1 color and 1 monochrome for internal picture and waveform monitor through system monitor selector switches plus 1 composite monochrome signal for optional camera position monitor.

Output Impedance ..... 75 ohms, sending end terminated

* Choice of sub-carrier frequency to be specified by customer.

Power Input

(Camera and Auxiliary, excluding monitors):
Line Voltage ..... 90-130 volts or 180-260 volts
Line Frequency ..... 47 to 63 Hz
Power Consumption ..... 200 watts

Mechanical

Overall Dimensions:	Wide	High	Deep
Camera Unit	24″ 610 mm	58″ 1473 mm	18″ 457 mm
Camera Auxiliary	19″ 483 mm	10½″ 267 mm	16½″ 419 mm
Control Panel Frame (for Remote Control Panel, Color Control panel and Light Control Panel)	19″ 483 mm	7″ 178 mm	— —
Remote Control Panel	4¼″ 133 mm	7″ 178 mm	7″ 178 mm
Color Control Panel	8½″ 266 mm	7″ 178 mm	7″ 178 mm
Light Control Panel	4¼″ 133 mm	7″ 178 mm	2″ 50 mm
Monochrome Monitor and Rotatable Housing	19¼″ 489 mm	12″ 305 mm	18″ 457 mm

Optical Centerline Height ..... 48 inches (1220 mm) above floor level, adjustable

Weight (approximate)

Camera Unit ..... 250 lbs. (113 kg.)
Camera Auxiliary ..... 100 lbs. (45 kg.)
Control Panels, mounted in frame ..... 9 lbs. (4 kg.)
Monochrome Monitor and Rotatable Housing ..... 75 lbs. (34 kg.)

Accessories

Contours Accessory Kit MI-557806
Low Pass Filter, 4.43 MHz MI-557219
Detented Knobs for Control Panels MI-557815
I/Q Module for TK-27 ..... MI-556554

Ordering Information

Type TK-27 Four Tube Color Film Camera Equipment (NTSC) as follows:

Qty.	Description	MI-
1	TK-27 Camera Unit	557208-D1
1	1½-inch Vidicon, Type 8480-V1	557205-A2
3	1-inch Vidicon, Type 8134-V1	557206-A2
1	Camera Auxiliary Unit	557207-A4
1	Remote Control Panel	557203-A1
1	Color Control Panel	557204-A2
1	Light Control Panel	40152
1	Mounting Frame for Control Panels	557306
1	Monitor Housing, Rotatable	557209
1	CRB-14 Picture Monitor, 14-inch	557231-A2
1	Color Film	40846
1	Test Slides	557342
Required Interconnecting Cable:		
1	Camera Cable	557345-*
1	Remote Control Panel Cable	557344-*
1	Color Control Panel Cable	557343-*
**	Coaxial Cable, RG-58/U (Six lengths used between camera and auxiliary units)	13318-A
**	12-conductor Shielded Cable (Used to interconnect Light Control Panel and TP-55 Multiplexer)	13380-12

* Available in 50′, 75′, 100′ and custom lengths. Specify lengths required.
** Bulk Cable. Specify lengths required.

The TK-27 Color Camera is also available for operation on PAL color standards. When ordering for PAL standards, specify the camera auxiliary unit as an MI-557207-B1.

Commercial Electronic Systems Division
Front and Cooper Streets, Camden, New Jersey, U.S.A. 08102

RCA Broadcast Equipment