

**3**  
EDITION



B R O A D C A S T  
**C A M E R A**

E Q U I P M E N T

*for*

MONOCHROME AND  
COLOR TELEVISION

**TV CAMERAS**

**CAMERA ACCESSORIES**

**LIGHTING EQUIPMENT**

**CAMERA LENSES**

**CAMERA MOUNTS**

**MOBILE UNITS**

Stephen M Comer

# BROADCAST CAMERA EQUIPMENT CATALOG

(Third Edition)

PRICE \$1.00



**RADIO CORPORATION OF AMERICA**

Broadcast and Television Equipment

Camden, N. J.

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## **ABOUT THIS CATALOG**

This Catalog is devoted solely to information on RCA camera equipment designed especially for television station and closed circuit use. Other RCA Broadcast Equipment Catalogs contain similar information on film, terminal, audio, and test and measuring equipments, AM, FM and TV transmitters, antennas, transmission line equipment and accessories.

The information contained in this catalog is intended to serve as a buying guide for the users of this type equipment. In the belief that broadcast engineers want facts, rather than generalities, the content has purposely been kept brief and factual. Readers who desire more information or individual bulletins on particular equipment items are invited to write to the RCA Broadcast Representative in the RCA Regional Office nearest them (see opposite page).

## **OTHER RCA TECHNICAL PRODUCTS**

The RCA television equipment described in this catalog is specifically designed for broadcast station and closed circuit use. RCA also manufactures many other electronic products including: two-way radio and microwave radio communication equipment; optical and magnetic film recording equipment; sound systems of all types; 16mm projectors and magnetic recorders; industrial inspection and automation equipment; scientific instruments, such as the electron microscope; industrial television systems; intercoms; and many types of custom-built equipment for industry, the military, educational and medical services. Information describing these products may be obtained from RCA Regional Offices.

## HOW TO ORDER

The RCA Broadcast Camera Equipment shown in this catalog is sold directly through RCA Broadcast Representatives, who are familiar with broadcast equipment and related problems. One or more of these RCA Representatives are

located in each of the RCA Regional Offices listed below. Orders for equipment shown in this catalog, or requests for additional information, should be directed to the nearest one of these offices.

## PRICES

The prices of the various equipment units shown in this catalog are given in a separate price list. Prices are listed in the order in which they are shown in the catalog. To determine the price of any equipment first note the page

on which it is shown in the catalog, then consult the price list in accordance with this page number. Equipments are identified by type and MI (Master Item) numbers which are used to identify apparatus on invoices and packing slips.

YOU CAN LOCATE YOUR NEAREST RCA REPRESENTATIVE FROM THIS LIST

### REGIONAL OFFICES

Front and Cooper Streets  
CAMDEN 2, NEW JERSEY  
Woodlawn 3-8000



36 West 49th Street  
NEW YORK 20, NEW YORK  
Judson 6-3800



7901 Empire Freeway  
DALLAS 35, TEXAS  
Fleetwood 2-3911



1600 Keith Building  
CLEVELAND 15, OHIO  
Cherry 1-3450

200 Berkeley Street  
BOSTON 16, MASSACHUSETTS  
Hubbard 2-1700



1121 Rhodes-Haverty Building  
134 Peachtree Street, N.W.  
ATLANTA 3, GEORGIA  
Jackson 4-7703



1006 Grand Avenue  
KANSAS CITY 6, MISSOURI  
Harrison 1-6480



1560 North Vine Street  
HOLLYWOOD 28, CALIFORNIA  
Hollywood 9-2154

420 Taylor Street  
SAN FRANCISCO 2, CALIFORNIA  
Ordway 3-8027



1186 Merchandise Mart Plaza  
CHICAGO 54, ILLINOIS  
Delaware 7-0700



1625 K Street, N.W.  
WASHINGTON 6, D. C.  
District 7-1260



2250 1st Avenue, South  
SEATTLE 4, WASHINGTON  
Main 8350



# LIVE COLOR CAMERA CHAIN

TYPE TK-41



## FEATURES

- All-purpose live color TV camera providing low noise, high resolution picture in full, natural color
- All controls conveniently located—only two master controls needed for on-air operation of camera chain
- Optional console mounting or rack mounting available for camera control equipment
- Utilizes same processing amplifier control equipment as 3-V color film cameras
- Improved, high quality color monitor
- Built-in camera cable equalization
- Optical orbiter extends life of IO tubes
- All electronic viewfinder with improved 7-inch aluminized kinescope
- Performance independent of line voltage variation over wide range
- Simplicity of mechanical design provides easy access to all circuits and controls
- Forced-air ventilation of pick-up tubes
- Stable, fixed, plug-in gamma corrector units
- Standard TV lenses including zoom-types

## USES

The RCA TK-41 Live Color Camera Chain provides the television broadcast station with the ideal means of originating beautiful, full-color programs. Live color programming permits maximum realization of the benefits of color—adding a brilliant new dimension to programming techniques and presenting commercial products in thrilling reality. Local color originations of studio programs and commercials, sporting events, community parades and festivals can build station prestige and stimulate sponsor interest. Live color commercial inserts and station breaks between color network and color film features hold and strengthen viewer interest by maintaining color program continuity. Color mobile units, designed to handle up to

five color cameras, are available to extend the use of color cameras to a broad variety of field programming applications.

Designed with the objective of providing an easily operated, space-conserving and economical color television pick-up system, the TK-41 has earned wide acceptance throughout the broadcast industry. Its performance and reliability have been thoroughly proven by extensive use under daily operating conditions. The camera is easily handled and is designed for operation by a single cameraman. A cradle type camera mounting head, which accurately maintains the camera in balance about its own

center of gravity, results in maneuverability and convenience of operation comparable to that of monochrome studio camera equipment.

The TK-41 camera employs the same complement of standard lenses as monochrome camera equipment. The camera control equipment includes a processing amplifier which is identical with that used with the RCA Type TK-26A 3-Vidicon Color Film Chain. Centralized controls provide minimum setup time. During "on-air" operation, the camera control operator can control signal processing for best picture quality by the use of only two knobs. Control operations can be centered at a console or rack position as desired.

### DESCRIPTION

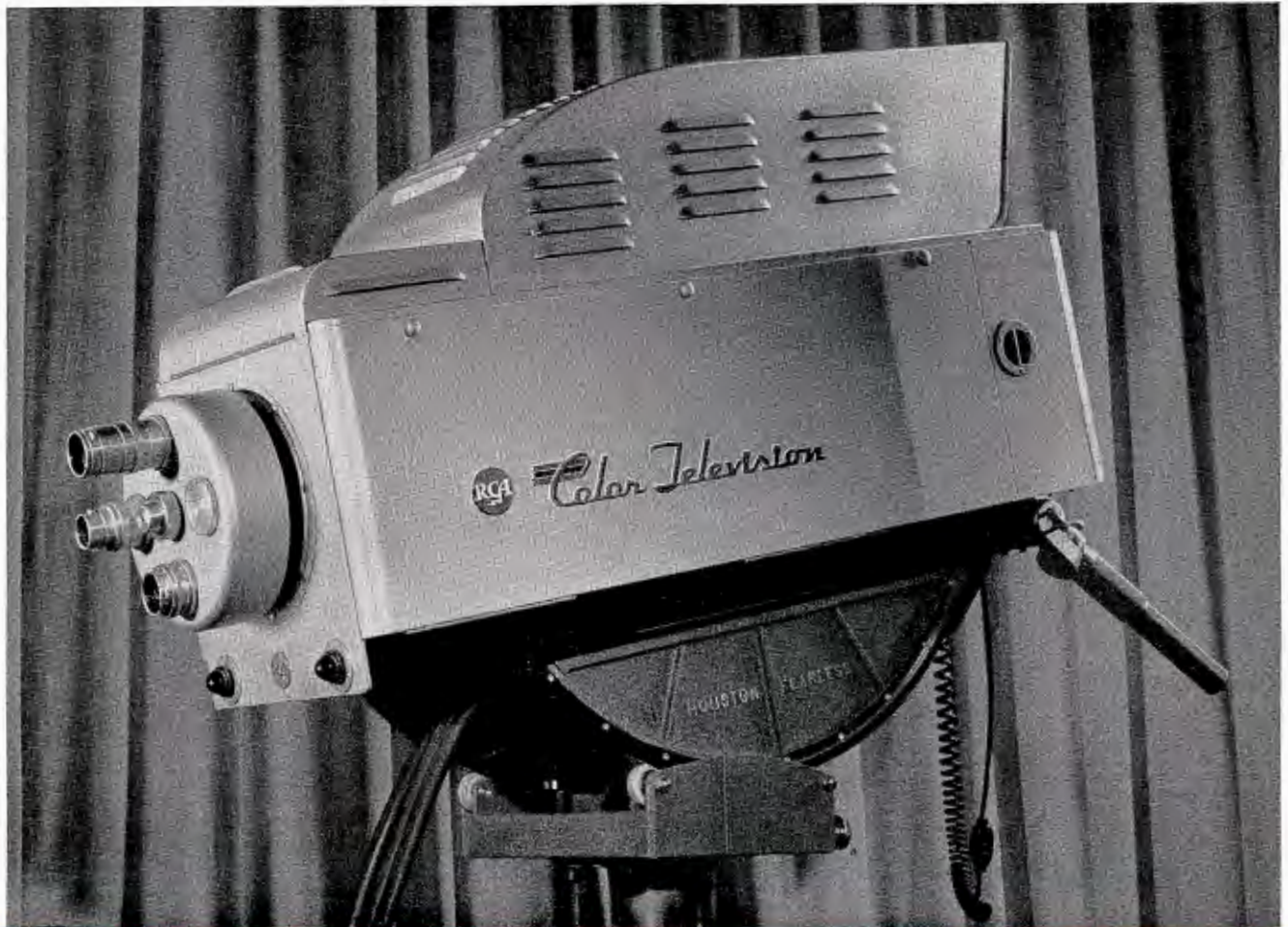
The TK-41 Color Camera Chain is similar in many respects to monochrome camera chains now in use in that it contains a live pickup camera as well as signal processing and control units. The major equipment units include the color camera, viewfinder, camera control panel, processing amplifier, TM-21A color monitor, TX-1C Colorplexer

with aperture compensator and automatic carrier balance, TM-6C master monitor, and power supplies.

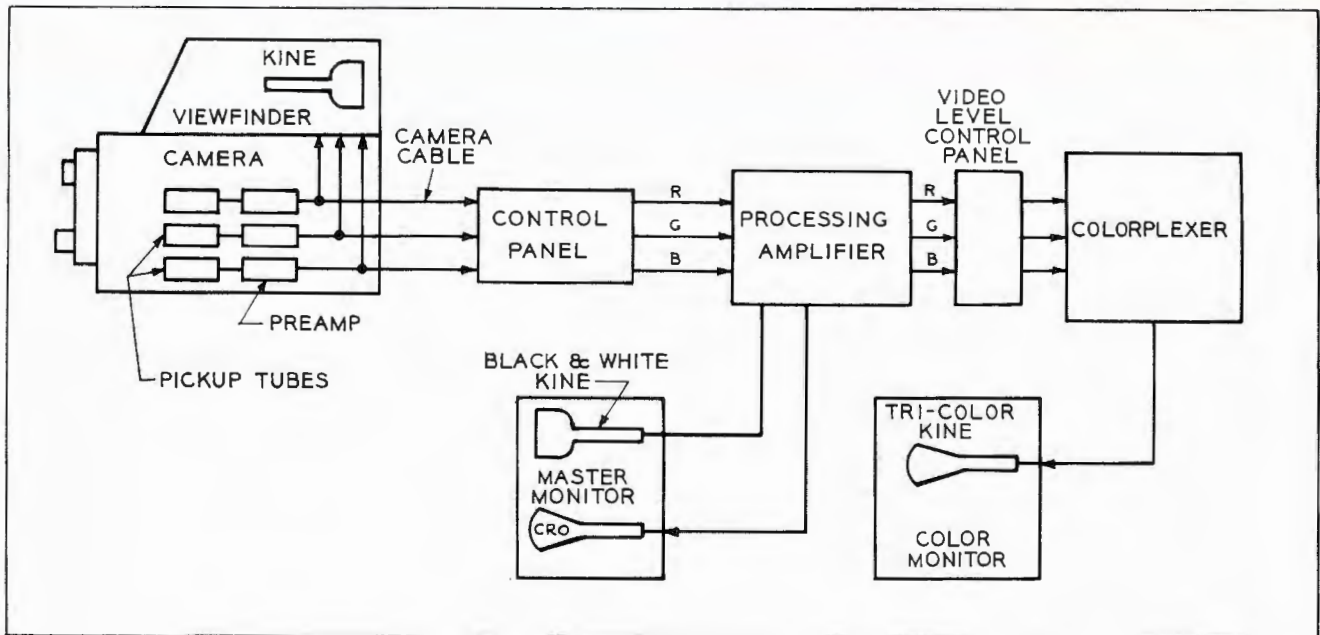
The color camera proper contains a light splitting optical system, three image orthicon tubes to provide red, blue and green signals, horizontal and vertical deflection circuits for the image orthicons, a target blanking circuit, regulated high voltage and negative voltage circuit, image orthicon protection circuit, and three plug-in video pre-amplifiers, one for each of the three color channels. The electronic viewfinder includes a 7TP4 kinescope with necessary deflection and video circuits to provide a picture for the camera operator.

The three video signals from the color camera are fed directly to the camera control panel on which both operating and selected set-up controls are located. These signals are in turn fed to the processing amplifier which performs the functions of cable compensation, video amplification, blanking and shading insertion, feedback clamping, linear clipping, gamma correction and output amplification as well as providing auxiliary switching for the master monitor kinescope and CRO.

Graceful styling, maneuverability, and simplicity of operation are featured in TK-41.







Simplified diagram showing major components of the TK-41 Color Camera Chain. The lineup features considerable space and cost saving advantages over previous color chains.

The processing amplifier feeds a monochrome master monitor, which provides both kinescope and CRO displays of signals at various vital points in the system, selected by push-button. A colorplexer combines the processed video signals into a single FCC standard color signal. The colorplexer feeds a tri-color monitor and the camera switching system. This unit accepts the red, green and blue signals from the image orthicons and transforms them to M, I, and Q signals. These are adjusted with respect to bandwidth and delay and then multiplexed to produce one composite signal from the three input signals. An aperture compensator connects in series with the luminance channel of the colorplexer. A TM-21A Color Monitor is also included in the chain and is utilized at the camera control position to provide a check on the quality of the final color picture.

### TK-41 Color Camera (MI-40500-A1)

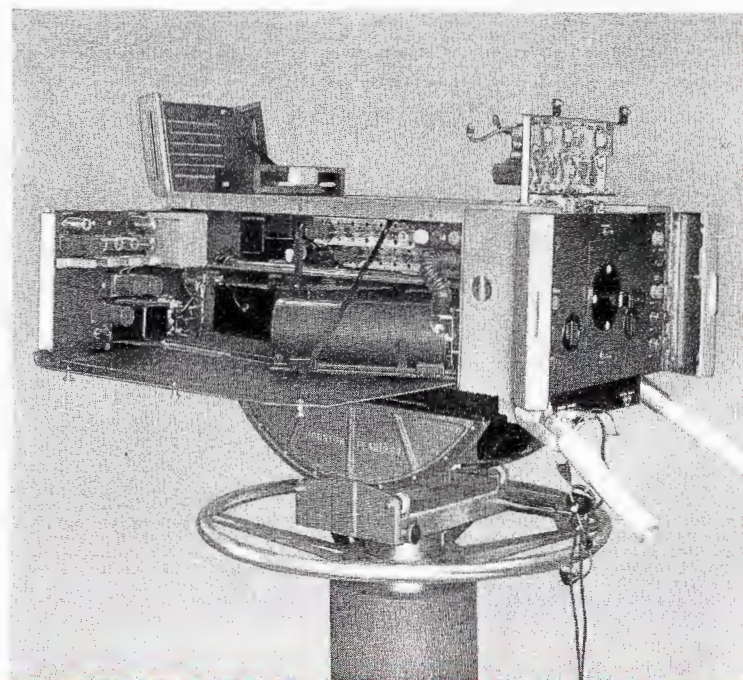
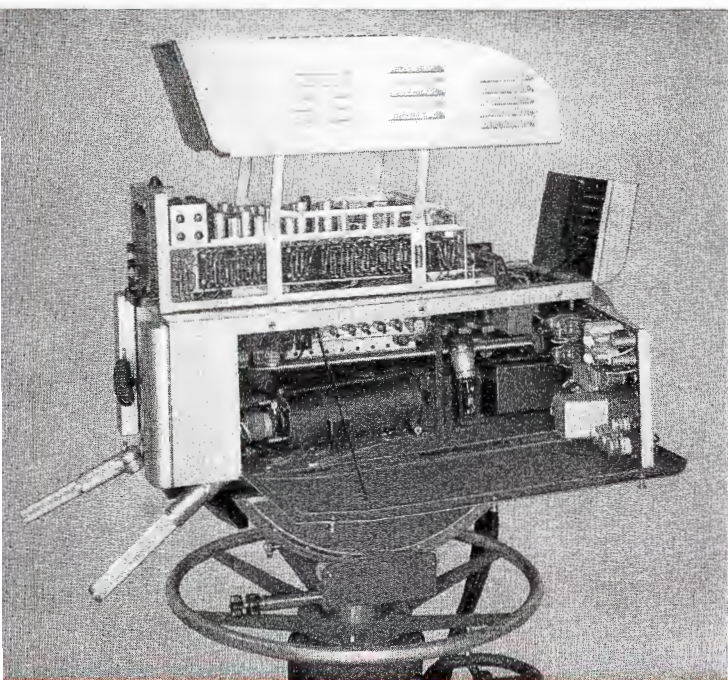
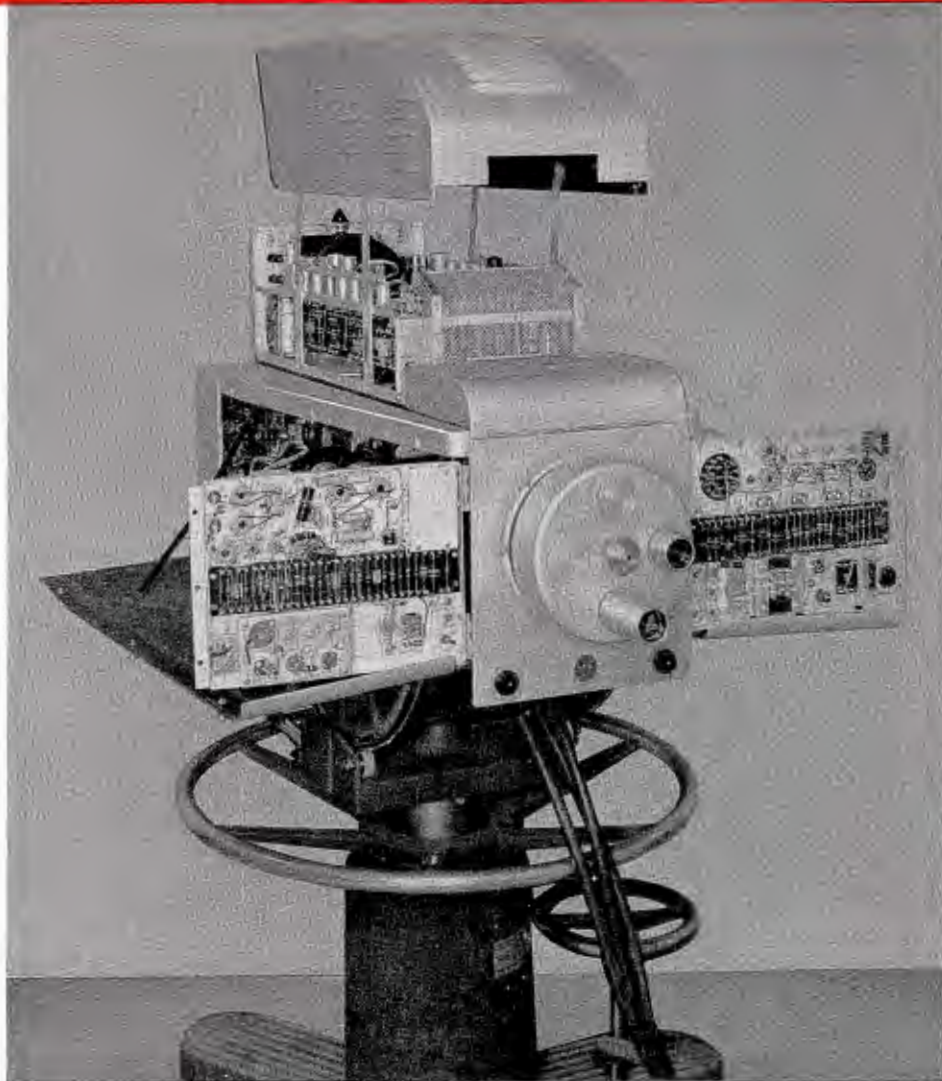
The RCA Color Camera contains the three image orthicon pick-up tubes with their focus, deflection and beam-alignment coils, complete horizontal and vertical deflection circuits, the video preamplifiers, blowers, light-splitting optical system, turret with four lens positions, and means for adjusting optical focus and remote iris opening.

The camera is entirely self-contained with the exception of the d-c power supplies, video processing amplifier and certain electrical controls which are located for operating convenience at the camera control panel. All electrical connections to the camera are made through three standard twenty-eight conductor camera cables attached by connectors in such manner as to permit the cables to be

brought toward the front of the camera, drawn through a special cable clamping bracket, and then draped in a gradual curve to the floor out of way of the cameraman. Physically the TK-41 Color Camera is 15 inches high, 44 inches long, and the width tapers from 16 inches at the front to a maximum of 21 inches at the rear edges of the side door covers. On the front end of the camera is the lens turret, and on the rear are the local electrical set-up controls and the control handle for rotating the turret. The optical focus handle is located on the right. This focus control and the turret handle are normally the only two controls which require the attention of the cameraman during a television program.

Two sets of communication and program sound jacks are mounted on a strip installed below the back operating panel at the rear of the camera. They provide voice communications between the camera operator, the camera control operator, and the program director or other studio personnel. Electrical registration controls are also located on the rear plate of the camera behind hinged covers. They include the following independent controls: red and blue skew, with polarity reversing switch, height, width, and vertical and horizontal Q adjustment. An off-on switch operates the blower motors. An overscan switch is also provided. The G-5 controls are located just inside the left side cover near the rear of the camera. Dynode gain controls are similarly located on the right side.

The side door panels of the camera housing swing outward making all components readily accessible for servicing. From the cameraman's position, the right side door



COMPLETE ACCESSIBILITY to all circuits and controls makes maintenance and servicing of RCA color camera a pleasure for both operators and service technicians.



EASE OF MANIPULATION will delight the studio cameraman and aids in maintaining smooth program performance. Set-up controls shown above are all conveniently located behind hinged doors. Only two handle controls are needed for on-air operation of camera.

exposes the hinged horizontal deflection chassis, which may be swung 180 degrees from its normal position, permitting replacement of tubes and access to the remote iris synchro motor driving mechanism and other parts of the optical system. The yoke assembly of the red channel and the tube side of the red channel video preamplifier are also exposed. When the left side panel is dropped, the hinged vertical deflection chassis can also be swung outward 180 degrees. It permits further access to elements of the optical plate assembly, and the blue and green channel yoke assemblies. The Type 6474/1854 image orthicon tubes can be replaced by removing a single holding screw of each yoke assembly and swinging the yoke assembly out the sides of the camera.

Raising the ventilation hood at the front of the camera gives access to the connections of two heater transformers in this area as well as the relay lens and vertical compensator elements of the optical system. The elapsed time indicator is visible when the hood is raised. Viewfinder component and circuit tests together with tube replacements may be made with the viewfinder cover in the raised position.

The viewfinder may be removed from the camera to provide access to wiring of the hinged shelf type chassis at the rear of the camera. This shelf is used for tie points for the image orthicon sockets, and for filtering components of the deflection circuits. Included here are the three video preamplifier input coupling and filter circuits.

The image orthicon protection circuit with its associated tube and relay is also mounted here. Loss of either the vertical or horizontal deflection to the yokes of any of the image orthicons in the camera causes the circuit to bias off the image orthicons. This prevents the beam from being concentrated in a single line or spot which might cause permanent damage.

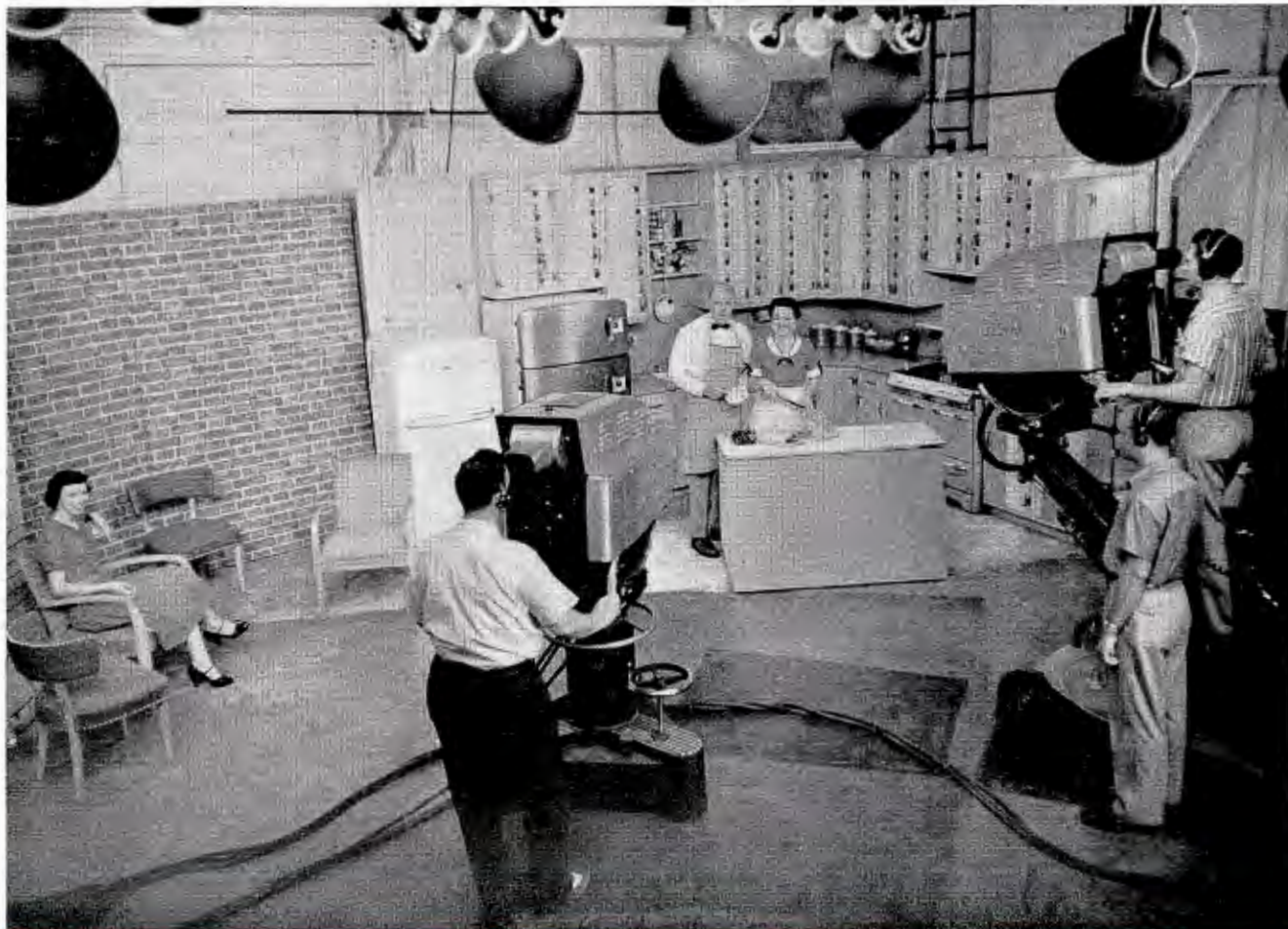
Removing the viewfinder also gives access to the plug-in preamplifiers located just ahead of the top shelf. These supply the red, blue and green signals to the camera cables and the camera viewfinder. Each of the preamplifiers includes six stages. The first four are simple shunt-peaked stages. The second stage has a screwdriver adjusted cathode peaking circuit for adjusting tilt in the low-frequency end of the response curve of the amplifiers. In the cathode of the third stage there is a similar circuit with a knob type control which may be adjusted to give minimum streaking for the associated image orthicon. The last two stages are a feed-back pair, providing cathode output to the 51-ohm camera cables and to the viewfinder. There is an adjustable trimmer in this stage which affects the response curve tilt at the high-frequency end. Each of

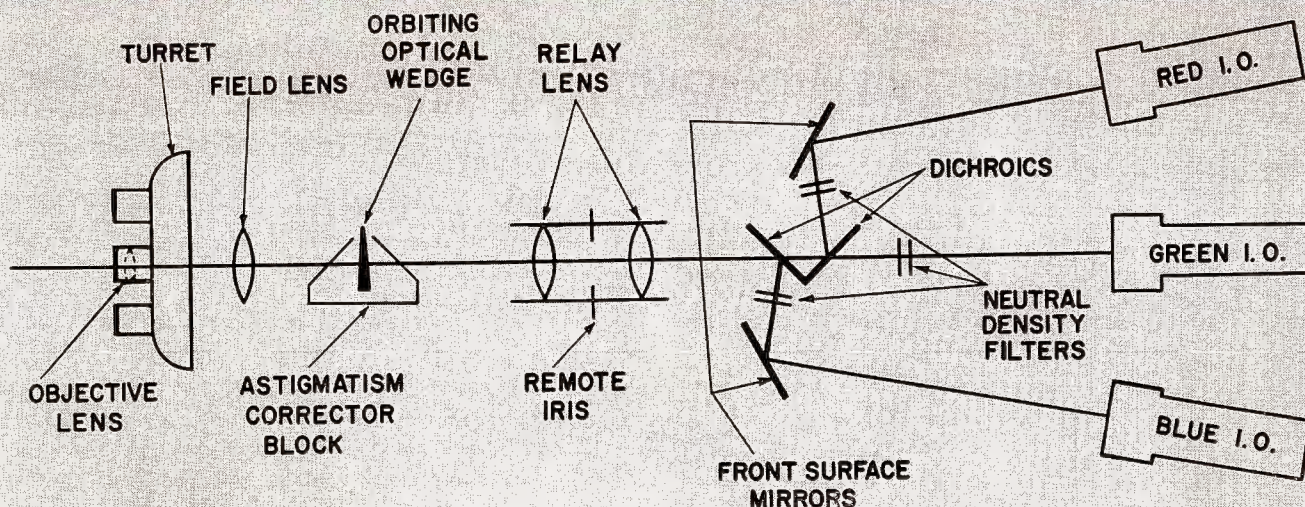
the preamplifiers is shock mounted and bonded to the cross members of the upper camera framing.

Two tally lights are mounted on the front face of the camera. They serve to indicate to the actors when the camera is in actual use. In addition, there is one on top of the viewfinder for directors and one on the kinescope bezel plate for the operator. The latter are operative, however, only when used in conjunction with a camera switching unit. The lights are normally off until a tally relay is actuated by a control voltage (24 volts d-c).

The individual image orthicon tubes and the area within the camera housing are forced-air cooled. Separate blowers are used to cool the individual image orthicon tubes. Cooling air is brought into the socket end of each yoke assembly by means of flexible hose leading from its associated blower. All external areas of the camera and viewfinder have an aluminum finish to further aid in maintaining optimum temperature conditions within the camera. Two utility outlets and a fuse are mounted on the under side at the back end of the camera. They provide facilities for an independent source of a-c that may be used for test equipment.

WBAP-TV studio scene showing a typical color telecast.





### Optical System

The rotatable lens turret accommodates four objective lenses. A set of camera lenses having focal lengths of 50, 90, and 135 mm is supplied. Telephoto lenses may also be mounted on the turret. The optical axis of the taking lens is at the bottom section of the turret. The turret is attached to a shaft that protrudes through a stationary drum. The drum serves as a light trap as well as a support for the lens turret shaft. Each objective lens has a matching field lens mounted on a "spider" support housed within the drum. The objective lenses and the associated field lenses remain properly matched at each selected position of the lens turret. This lens selection is achieved by means of a handle type manual control on the back panel of the camera.

Optical focus is accomplished by moving the lens turret longitudinally along the optical axis. This is done by rotating the focus handle located at the right rear of the camera. Focusing the secondary image on each of the red, blue and green image orthicons is achieved by sliding the individual image orthicon yoke assemblies backward or forward along their respective optical axis during initial set-up.

A complete relay optical system is mounted behind the field lenses. It consists of a vertical astigmatism corrector, relay lenses, remote control iris, dichroic mirrors, light filters, front surface reflective mirrors and horizontal astigmatism corrector. The purpose of this system is to separate the light image into three primary color images and direct each to the photo-sensitive cathode of an individual image orthicon tube. The individual components in this system are mounted on a supporting base plate. The complete unit can be taken from the camera by removing four screws that secure the base plate to the camera frame and then disconnecting the cable attached to the iris control selsyn. Color trimming filters are used in conjunction with the

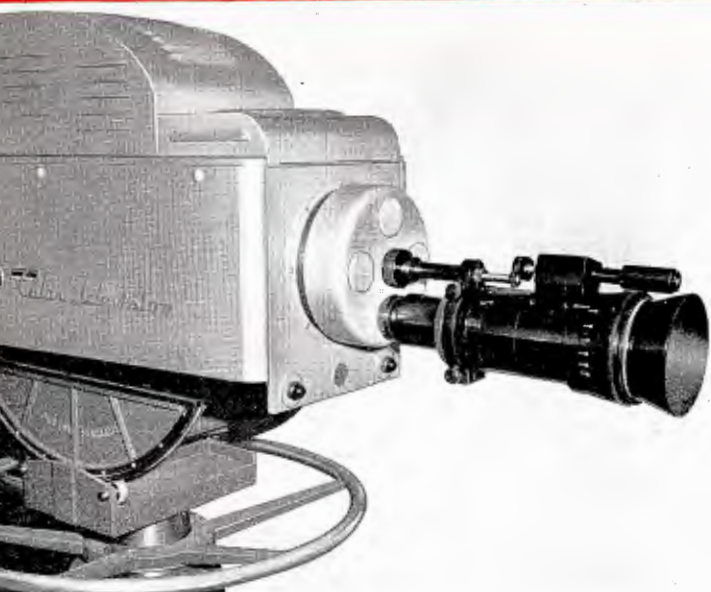
dichroic mirrors to adjust the overall spectral sensitivity curves as desired for the color camera. All filters are inserted in recessed grooves in frames that are secured to the dichroic block with spring clips. A filter in the common optical path eliminates spurious effects of undesirable infra-red and ultra violet wavelengths, and also aids in trimming the red channel. The three image orthicon tubes are mounted within focus and scanning coil assemblies, located at the rear of the optical assembly.

Located in a vertical plane between the vertical astigmatism corrector plates is a rotating circular glass plate with a slight taper that gives a circular movement to the image on the photocathodes of the image orthicon tubes. The unit is motor driven at the rate of approximately one orbiting cycle per minute. The movement of the picture is so slight and so slow that it is not apparent to the viewer; however, it is sufficient to prevent image burn-in on the image orthicon tubes. This extends the life of the image orthicons and reduces operating costs.

A cradle type tilt head, designed especially for use with the color camera, provides ease of maneuverability in both tilting and panning of the camera and viewfinder, comparable to that of the RCA monochrome camera. The TK-41 is provided with a TD-9C Motor Driven Pedestal for general studio use. Alternate mountings such as the Panoram Camera Dolly (MI-40823) and the Type TD-30B Studio Crane (MI-26037-1), are available for special program applications.

### Camera Viewfinder (MI-40501)

The viewfinder is used by the operator of the color camera to frame the scene, to aid in focusing the camera, and to facilitate in setting up the camera registration. The viewfinder consists of a monochrome kinescope provided with deflection, blanking and video circuits required to provide a picture for the camera operator. A six push-button selector switch at the right of the viewing screen enables



Telephoto or zoom-type lenses can be accommodated on the TK-41 rotatable lens turret when desired.

the operator to view any channel separately, to view the red or the blue superimposed on the green, or to view all three images superimposed. The focus, brightness, and contrast controls are mounted to the left of the viewing screen.

The single channel positions are used when making adjustments on individual channels; the red on green and blue on green are useful for registration adjustments. The switching is accomplished by altering the bias on the input amplifier tubes; each of these tubes is kept at cutoff except when it is desired to view the particular signal connected to its input. Blanking pulses of adjustable duration are produced by two multivibrators (triggered by horizontal and vertical drive) and added to the video signal before application to the viewfinder kinescope.

The viewfinder is designed to slide in guides and lock in position directly above the camera. All signal and operating voltages are fed to the unit through a self-aligning socket connection that automatically engages when the unit slides into place. A pull handle to facilitate the installation and removal of the viewfinder is located on its operating panel just below the viewing screen. To the left of this handle is a thumb latch to release the unit from a locked position. The viewfinder is covered by a multi-louvered hood which can be raised to facilitate ease in servicing the unit. A detachable viewing hood (MI-40502) is attached to the viewfinder control panel for shielding the viewing screen from extraneous light.

### Control Console

The TK-41 camera control units may be conveniently mounted in the Control Console. This control position in-

cludes: (1) a TM-6C Master Monitor mounted in its Console Housing, and (2) a Master Console Housing in which the Camera Control Panel and the Processing Amplifier may be mounted. This Master Console Housing is designed to mount the 19-inch Camera Control Panel in the indented section of the console desk and the Processing Amplifier in the top sloping portion of the console. The camera control equipment also includes a TM-21A Color Monitor. This may be suspended from the wall or ceiling or set upon a stand.

If preferred, all of the TK-41 Control equipment may be rack mounted with the exception of the color monitor. In this case a Rack Mounted Control Desk and Accessory Kit, MI-40415, is available to provide desk space at the rack location.

### Camera Control Panel (MI-40523)

The camera control panel, on which the remote control adjustments of the color camera are mounted, is located in the sloping portion of the desk section of the 19-inch console which houses the processing amplifier. It lies below and in front of the processing amplifier front panel, and has a cover plate through which the two program operating controls protrude. These are the Pedestal and Iris

Master Monitor and Processing Amplifier mounted in new console housings. The consoles are also designed to house Camera Control Panel, Color Monitor, and other camera chain equipment.



Control knobs. The latter operates the remote iris selsyn motor in the optical system, and is conveniently operated by the right hand. Mounted directly above this control, in the processing amplifier panel, is the iris f stop indicator meter. In normal operation, the remote iris control performs the function of overall gain control for the complete color camera chain. The left hand operates a master pedestal control which provides simultaneous adjustment of the pedestal voltage in the three channels. Set-up controls for each of the three image orthicons may be reached by lifting the cover plate.

Colored knobs identify the three video channels. The individual channel controls include horizontal and vertical centering, alignment, orthicon focus, multiplier focus, image focus, image accelerator voltage, target voltage, and beam current. Also provided is a target test knob to aid in setting target voltage accurately and rapidly, as well as a selector switch which permits the metering of: target, orth focus, image focus and multiplier focus voltage settings in each color channel.

### Video Level Control Panel (MI-40871)

The Video Level Control Panel is mounted in an MI-40872 Table Assembly, adjacent to the MI-40523 Camera Control Panel. The Video Level Control Panel consists of three attenuator pads located in the video line between the Processing Amplifier and the Colorplexer to allow precise settings of the white balance, thereby completely eliminating pedestal-riding during programming. The control may also be used to introduce color shifts of precisely controlled amplitude into the picture to compensate for minor color differences between cameras. The pads are thus used as trimmer adjustments to achieve true color picture uniformity between cameras.

### Processing Amplifier

The processing amplifier, MI-40520-A, has been designed to perform a great number of functions in a single versatile unit. Integration of these electrical functions in a single unit results in a simple, space-conserving system. Use of this design allows set-up time to be substantially reduced and requires fewer video operators and control room engineers for programming. Hence considerable savings in operating costs can be realized. A large reduction in power required as well as increased tube life due to extremely conservative operation of tubes further reduce costs, at the same time improving performance and overall quality.

The basic circuit elements in the processing amplifier are three plug-in video amplifiers which perform accurately and with extreme stability the following functions: cable compensation, video amplification, blanking insertion, shading insertion, feedback clamping, linear clipping,



Optional rack mounting for the TK-41 control equipment may be specified. A convenient desk with top panel removed to reveal set-up controls is shown above.

gamma correction, and output amplification. Pulse circuitry needed for the camera and shading generators, is obtained from stabilized multi-vibrators. These multi-vibrators provide pulses of constant amplitude and width independent of the incoming pulse. These circuits require no tube selection and are completely stable. Shading signals are provided for insertion of either horizontal or vertical shading. A fourth plug-in unit serves as the video section of an electronic switcher which is an integral part of the main chassis. The switcher, used with Master Monitor, TM-6C, provides an individual or combined presentation of red, blue and green video.

The entire chassis of the processing amplifier is drawer-slide mounted for easy pull-out for servicing. The front panel is hinged, thus permitting it to be opened to facilitate removal of tubes and servicing of other components behind the panel.

An edge-lighted translucent plastic escutcheon is mounted on the outside surface of the panel to provide illumination of the nomenclature for the various controls when the unit is operated in semi-darkness. All controls are conveniently mounted on the panel. Thirteen lucite pushbuttons at the top of the panel control the switching arrangement which permits separate Master Monitor Kinescope or CRO observation of important test points, including individual channels, various channels superimposed, and colorplexer output. A staircase signal for the CRO circuit is provided for a sequential display of red, blue, and green channels.

**Master and Color Control Monitors**

The Type TM-6C Master Monitor provides in a compact form a complete monitoring unit for the observation of the camera chain's video signals. It is used for both picture (kinescope) and waveform (oscilloscope) monitoring of signals at any stage of transmission from the camera to the output of the colorplexer. Careful scrutinization of a number of details of the video signal may be performed which will aid in maintaining proper level and color balance, as well as obtaining registration during set-up.

The unit employs a special ten-inch aluminized, straight gun, electro-statically focused kinescope for direct picture monitoring and a five-inch, flat faced, cathode ray tube for waveform presentation. When used with the processing amplifier of the color camera, the wide band CRO display consists of three adjacent waveforms corresponding to the red, blue, and green video signals.

The Color Control Monitor, Type TM-21A, provides an accurate, stabilized color picture display at high brightness level and is extremely useful in pinpointing parts of the color chain requiring adjustment. The equipment affords the control operator precision checks on camera registration, color balance, shading, deflection and transmission system transients, and effects of pedestal adjustments, as well as camera deflection linearity, chroma level and phase of hue adjustments. It greatly simplifies camera



Type TM-21A Color Control Monitor, MI-40226-A.

matching and provides a standard against which color performance can be evaluated. Long term stability of the monitor is assured by liberal use of feedback. Time devoted to monitor adjustments is negligible.

**Rack Mounted Equipment**

All the units normally housed in the consoles—Master Monitor, Control Panel and Processing Amplifier may be rack mounted. To complete the camera chain, a Colorplexer, aperture compensator, automatic carrier balance, focus current regulator and centering current supply, and a set of two WP-15 power supplies also mount in standard 84-inch cabinet racks.

**Television Color Camera Chain  
Power, Space, Tube and Weight Information**

Equipment	MI	Tubes	D-C ma	A-C Watts	Total Heat	Rack Space	Weight
Color Camera—Defl. ....	40500-A	37	225 + (210 at 360 v.)	132	277	—	250
—Preamp. ....			330				
Viewfinder .....	40501	20	125 + (65 at 360 v.)	58	117	—	45
Processing Amplifier .....	40520	55	360	180	200	10 1/2"	50 1/2
Focus Current Regulator .....	49524	4	12	85	90	5 1/4"	22
Centering Current Regulator .....	40839	—	—	40	40	5 1/4"	22
Colorplexer .....	40209-A	36	300	95	180	21"	34
Automatic Carrier Balance .....	40416	5	20	—	—	3 1/2"	10
Aperture Compensator .....	40414	2	33	10	15	1 3/4"	3
TM-6C Master Monitor .....	26136-B	31	450	90	220	18"	55
TM-21A Color Monitor .....	40226-A	63	—	900	900	—	213
Regulator—WP-15B Power Supply (2 Units) .....	26088-B	3 ea.	—	—	—	3 1/2" ea.	12 ea.
Rectifier—WP-15B Power Supply (2 Units) .....	26087-B	—	—	415 ea.	—	7" ea.	59 ea.



## SPECIFICATIONS

## Camera Electrical Specifications

Input:	
Horizontal Drive from Processing Amp-51 Ohm.....	Min. 2 volts, (neg.) peak-to-peak
Vertical Drive from Processing Amp-51 Ohm.....	Min. 2 volts, (neg.) peak-to-peak
D-C Power (from power supplies):	
Regulated	
Camera.....	280 volts, 245 ma
Preamplifiers.....	280 volts, (3x110) ma
Unregulated	
Camera and Deflection.....	360 volts, 210 ma
Focus Coil Current.....	75 ma
Tally Lights (Relay Controls).....	24 volts d-c
A-C Power:	
Heaters, Blowers.....	117 v., 50/60 cycle, 1 phase, 132 watts
Output:	
Video Response.....	Essentially flat to 8 mc
Video Signals (black negative) 51 Ohm.....	0.3 volt, peak-to-peak
Video Signals to Viewfinder.....	0.6 volt, peak-to-peak

## Viewfinder Electrical Specifications

Input:	
Video Signals (negative).....	0.6 volt, peak-to-peak
Horizontal Drive (negative—Hi-impedance).....	2 volts, peak-to-peak
Vertical Drive (negative—Hi-impedance).....	2 volts, peak-to-peak
D-C Power (from power supply):	
Regulated.....	280 volts, 125 ma
Unregulated.....	360 volts, 65 ma
Tally Lights (Relay Controls).....	24 volts, d-c
A-C Power.....	50/60 cycles, single phase, 117 volts, 58 watts

## Processing Amplifier Electrical Specifications

Input:	
Video (red, blue, green and test).....	0.3 volt peak-to-peak
Impedance (red, blue, green and test).....	75 ohm $\pm 5\%$
Horizontal Drive (high impedance).....	1.5 to 5 volts peak-to-peak
Vertical Drive (high impedance).....	1.5 to 5 volts peak-to-peak
Blanking Pulse (high impedance).....	1.5 to 5 volts peak-to-peak
Calibration Pulse (high impedance).....	1.5 kc sq. wave 0.7 volt peak-to-peak
Output:	
Video to Colorplexer (red, blue and green).....	0.7 volt peak-to-peak
Impedance.....	75 ohms
Video to Monitor CRO.....	0.7 volt peak-to-peak
Impedance.....(Sending end 75 ohms, receiving end unterminated)	
Video to Monitor Kinescope.....	0.7 volt peak-to-peak
Impedance.....	75 ohms
Horizontal Drive:	
Width.....	8.5 microseconds $\pm 5\%$
Amplitude.....	3.5 volts peak-to-peak
Impedance.....	75 ohms
Vertical Drive:	
Width.....	800 microseconds $\pm 20\%$
Amplitude.....	3.5 volts peak-to-peak
Impedance.....	75 ohms
Blanking Pulse:	
Width.....	Equal to input pulse width $\pm 1\%$
Amplitude.....	2 volts peak-to-peak
Impedance.....	75 ohms
Calibration Pulse:	
Width.....	Equal to input pulse width
Amplitude.....	0.7 volt peak-to-peak $\pm 1\%$
Impedance.....	Low
Twenty Cycle Staircase Voltage to Master Monitor:	
Amplitude (maximum).....	20 volts peak-to-peak
Impedance.....	High
Regulated D-C Supply Voltage.....	280 volts
D-C Current.....	360 ma
Filament Voltage.....	6.3 volts a-c
Filament Current.....	25.0 amps
Regulated D-C Voltage.....	130 volts
Dimensions.....	10 15/32" high x 17 5/8" wide x 20 3/8" long
Weight.....	50 1/2 lbs.

## Tube Complement

CAMERA:	
3—RCA 6474/1854 Image Orthicon	5—12AT7
1—6AL5	2—12AU7
3—6CB5	12—6AH6
2—6V6-GT	3—5687
2—1B3-GT	1—12AX7
4—6U8	1—6AU5
VIEWFINDER:	
2—6AB4	1—6CB6
1—6AG7	1—6BQ6-GT
1—6AH6	2—1X2A
1—6AL5	3—12AT7
1—6AQ5	5—12AY7
1—6AS7-G	1—7TP4
PROCESSING AMPLIFIER:	
9—12AT7	3—6U8
3—12AU7	1—6CL6
1—12BH7	1—6BX7
1—12AX7	4—6BQ7A
VIDEO AMPLIFIERS:	
12—6BQ7A	8—6CL6
8—12AX7	4—6AL5
FOCUS CURRENT REGULATOR:	
1—5R4GY	1—12AX7
2—6BX7	
COLORPLEXER:	
11—6AU6	5—6AS6 (Stock #204603)
2—6AH6	1—OA2
2—12AU7	6—6AL5
4—6U8	1—OB2
2—6BQ7	2—5687
APERTURE COMPENSATOR:	
1—6BQ7A	1—6AU8
COLOR CONTROL MONITOR	
4—6AU8	1—6CG7
5—6BQ7A	2—6CD6-G
5—6197	1—3B2
9—12AX7	2—6BD4A
4—6A15	2—6AU4GTA
1—6AN8	1—1X2B
8—6AW8	1—21CYP22
8—12AT7	1—6X4
1—OA2	4—6080
1—6BC7	1—5651
1—6W6	
MASTER MONITOR:	
1—12BH7	1—10SP4 kinescope (not supplied)
3—6485	1—6BQ7A
7—12AT7	4—1X2A
1—6AL5	1—6L6
2—6BQ6-GT	2—6CB6
1—12AU7	4—6197
2—12AX7	
1—5ABP1 CRO (not supplied)	
REGULATED POWER SUPPLIES:	
6—6336	2—12AX7
2—12AT7	2—5651

## Mechanical Specifications—Overall

	Camera	Viewfinder	Camera Control Panel
Length .....	44"	34 1/8"	18"
Width .....	21"	13 3/8"	13 1/8"
Height .....	14 1/2"	11 1/8"	8"
Weight .....	250 lbs.*	45 lbs.	10 lbs.

\* Camera weight less objective lens, panning and focus handles.

**SPECIFICATIONS (Continued)**  
**Equipment Supplied**

CONSOLE-MOUNTED CONTROL			RACK-MOUNTED CONTROL		
Qty.	MI Number	Description	Qty.	MI Number	
1	40500-A1	Color Camera (less Image Orthicons).....	1	40500-A1	
1	40501	Viewfinder (including Kinescope).....	1	40501	
1	40502	Hood.....	1	40502	
1	40520-A	Processing Amplifier (less Gamma Correctors).....	1	40520-A	
3	40833-1	Gamma Corrector (0.7).....	3	40833-1	
1	40833-2	Gamma Corrector (1.0).....	1	40833-2	
1	40523	Camera Control Panel.....	1	40523	
1	40524	Focus Current Regulator.....	1	40524	
1	40839	Centering Current Supply.....	1	40839	
1	40829	Neutral Density Filters, Set of.....	1	40829	
1	26550-1	Lens, 50mm Objective.....	1	26550-1	
1	26550-2	Lens, 90mm Objective.....	1	26550-2	
1	26550-3	Lens, 135mm Objective.....	1	26550-3	
1	40802-1	Field Lens (for 50mm Objective Lens).....	1	40802-1	
2	40802-2	Field Lens (for 90mm and 135mm Objective Lens).....	2	40802-2	
1	40951	TX-1C Colorplexer comprising the following:.....	1	40951	
		1 MI-40209-B Colorplexer.....			
		1 MI-40414 Aperture Compensator.....			
		1 MI-40416 Automatic Carrier Balance Control.....			
1	26136-C	TM-6C Master Monitor.....	1	26136-C	
1	26544	Sync Interlock Relay (for TM-6C).....	1	26544	
1	40416	Automatic Carrier Balance Control (for TX-1C).....	1	40416	
1	40226-A	TM-21A Color Monitor.....	1	40226-A	
1	26786	Console Housing (for TM-6C).....	—	—	
1	26787	Console Housing (for MI-40520-A and 40523).....	—	—	
1	26579-B	Blower (for TM-6C).....	—	—	
—	—	Rack Mounting Desk for Control Panel.....	1	40415	
—	—	Rack Mount Adaptor for TM-6C.....	1	26526	
—	—	Rack Extension Kit.....	2	40408	
1	26655	Kinescope Tube, Type 10SP4 (for TM-6C).....	1	26655	
1	26667	CRO Tube, Type 5ABP1 (for TM-6C).....	1	26667	
3	40825	Image Orthicon Tube, Type 6474/1854.....	3	40825	
2	26087-B	WP-15B Power Supply (Rectifier).....	2	26087-B	
2	26088-B	WP-15B Power Supply (Regulator).....	2	26088-B	
3	26725-B5	Camera Cable, 50-ft. (with Connectors).....	3	26725-B5	
1	40834	Cable Harness and Barrier Strips.....	1	40834	
1	26759-41	Power Cable.....	1	26759-41	
1	26759-42	Power Cable.....	1	26759-6	
1	26646	Adjustable Transformer.....	1	26646	
1	26647	Transformer Mounting Plate (for MI-26646).....	1	26647	
1	40824	Cradle Head.....	1	40824	
1	40861	TD-9C Motor Driven Pedestal..... (Complete with operating tubes including those listed)	1	40861	
1	40871	Video Level Control Panel.....	1	40871	
1	40872	Table Assembly for MI-40871.....	1	40872	

NOTE: The following bulk cable is required and should be ordered separately

to meet individual installation requirements:

83	RG-11/U 75 Ohm Coaxial Cable.....	83
75	RG-59/U 75 Ohm Coaxial Cable.....	75
94E	28-Conductor Shielded Cable.....	94E
80	12-Conductor Shielded Cable.....	80
82	8-Conductor Shielded Cable.....	82

**Accessory Equipment**

Neutral Density Slide Mechanism for TK-41.....	MI-40528	RETMA Registration Test Chart.....	MI-26822-3
Left End Panel for Console Housing.....	MI-26788-1	RETMA Linear Gray Scale.....	MI-26822-4
Right End Panel for Console Housing.....	MI-26788-2	RETMA Logarithmic Gray Scale Chart.....	MI-26822-5
Left Side Cover for Console Housing.....	MI-26789-1	Plastic Cover for TK-41.....	MI-26862-2
Right Side Cover for Console Housing.....	MI-26789-2	Type BR-84D Cabinet Rack.....	MI-30951-D84
Single Headset.....	MI-11743	*WA-9A Calibration Pulse Generator.....	MI-26070
Double Headset.....	MI-11744	*WA-1D Color Bar Generator.....	MI-34001
Interphone Connection Unit.....	MI-11734	WA-7B Linearity Checker.....	MI-34017-A
Interphone Retardation Coil.....	MI-11737	WA-21B Video Sweep Generator.....	MI-30021-B
Mounting Plate for Interphone Connection Unit.....	MI-11735	TO-524D Oscilloscope.....	MI-26500
Mounting Panel for Retardation Coil.....	MI-11736/-A	WA-3B Grating Generator.....	MI-30003-B
TK-41 Optical Alignment Tool Kit.....	MI-40836		
Magnetic Shielding Kit for TK-41.....	MI-40854		
RETMA Linearity Test Chart.....	MI-26822-1		
RETMA Resolution Test Chart.....	MI-26822-2		

\* If not already available, one each of the above starred equipments is necessary for operation of the TK-41 Color Studio Camera Chain.

# STUDIO CAMERA EQUIPMENT

TYPE TK-11B



## FEATURES

- All-purpose monochrome TV camera
- New electronic viewfinder with improved 7-inch aluminized kinescope
- Improved mechanical design providing easy access to circuits and controls
- Thermostatically controlled forced ventilation of coil and tube
- Protection circuit for deflection failure
- "Overscan" switch for warm-up and rehearsal
- Four lens positions on a rotatable turret
- Short "set-up" time; fast, accurate focusing
- Electromagnetic orbiter protects against burn-in and prolongs image orthicon life
- Focus modulation for improved edge and corner focus
- Image Orthicon carriage features precision ball bearing slide mechanism and variable speed drive
- Auxiliary orthicon focus control in camera permits "one-man" set-up
- Stability and flexibility in performance
- Single WP-15 Power Supply provides current requirements for entire camera chain

## USES

The TK-11B Camera is designed to pick up scenes produced in television studios and provide composite video signals that can be feed to a television transmitter. The equipment introduces a new Image Orthicon Camera, MI-26011-C, and a new Viewfinder, MI-20616-B. The camera uses an Image Orthicon Pickup Tube from which under normal lighting conditions (25-150 foot-candles) an excellent pictures is obtained.

The viewfinder features a 7-inch aluminized Kinescope Tube which enables the cameraman to view the scene. The camera and viewfinder provide an all-purpose camera which is used either for field or studio applications. They form the core of both the RCA TK-11B Studio Camera Equipment and the RCA TK-31B Field Camera chain. Short "set-up" time, and fast accurate focusing may be achieved with either chain.

## DESCRIPTION

The TK-11B Studio Camera Equipment consists of the camera, which can be mounted on a crane type dolly or studio pedestal, a viewfinder, a camera control which can be mounted in a desk-type console section, and power supplies designed for rack mounting. The size and general appearance of the console section is identical to that of

the Film Camera Equipment and the Studio Switching System. Any number of these console sections (one for each equipment) can be bolted together to form a convenient desk-type console. This TK-11B design is centered around a single all-purpose camera which may be used for either field or studio applications.



Two complete RCA Studio Camera Chains are shown installed in the studios of WSUN-TV, St. Petersburg, Florida.



Closeup of the camera from the cameraman's operating position.

### Studio Camera, RCA MI-26011-C

The camera comprises a mounting for the image orthicon pickup tube together with its focus, deflection and beam-alignment coils, complete horizontal and vertical deflection circuits, a video pre-amplifier, target heater, blower duct, yoke assembly, and an optical system consisting of a turret with four lens positions and means for adjusting optical focus and iris openings. It is entirely self-contained except for a B power supply and certain electrical controls which are located, for operating convenience, at the camera control. All electrical connections are made through a single cable and plug which carry input power and sync generator signals to the camera, and video output and control circuits from it.

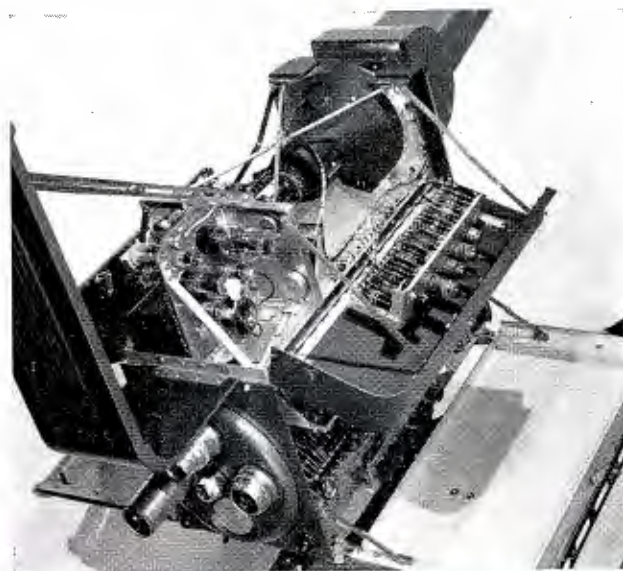
Physically the camera is divided into three main compartments. In the center compartment is located the pickup tube with its deflection, focus and alignment coils. The two side compartments, accessible by opening the side

doors, contain the video and deflection amplifiers respectively. On the front end of the camera is the lens turret, and on the rear are some of the electrical controls and the control handle for rotating the turret. The optical focus control is located on the right hand side of the camera (from the rear or operating position). This focus control and the turret handle are normally the only two controls which require the attention of the cameraman during a television program.

A bracket containing seven controls and switches is attached to the camera frame at the base of the deflection chassis. The blower-motor assembly is located at the bottom front portion of the camera under the yoke assembly. A 24-pin connector and two sets of communication and program sound jacks are within easy reach on the bottom of the camera housing. Two tally lights at the front and one at the rear of the camera are used as "on-the-air" indicators. The camera is designed to mount the viewfinder, an essential adjunct of the unit, and viewing hood above it.

Optical focusing is obtained by moving the tube itself, along with its coils. The complete yoke assembly is supported on a ball bearing slide mechanism which is an integral part of the assembly.

Hinged doors, fitted with knuckle-type stays, permit easy access to camera and viewfinder.





Side view of camera with viewfinder removed.  
Note convenient carrying handles.

Although rigidly fastened to the frame when in position, the entire assembly is removable in a few moments for servicing because it forms a plug-in unit. This suspension is smoothly driven through its entire travel for optical focusing by  $2\frac{1}{4}$  turns of a focus knob. The knob remains in place when the side door is opened. This simple yet rugged drive mechanism imparts a non-linear motion so that relatively great image orthicon motion per degree of knob rotation is obtained for close ups. Conversely, vernier motion is provided near infinity focus, where rapid motion would make accurate focusing difficult.

The improved yoke provides better shading, less geometric distortion and improved shielding of deflection fields from the image section. A simple wrap-around mu-metal shield extends from the image end past the alignment coils for complete shielding against external magnetic fields.

### Simplified Alignment

The alignment coil assembly incorporated in the camera comprises two pairs of coils in space quadrature so that independent control of currents in the two pairs of coils will produce a correcting cross field in any direction required. In this system, no mechanical adjustment of the coil is required; it is rigidly mounted. The alignment procedure involves the simultaneous adjustment of two potentiometer controls which determine the currents in the two sets of coils. In order to simplify the alignment pro-

cedure, an auxiliary orthicon focus control has been included in the camera.

### Thermostatically Controlled Cooling

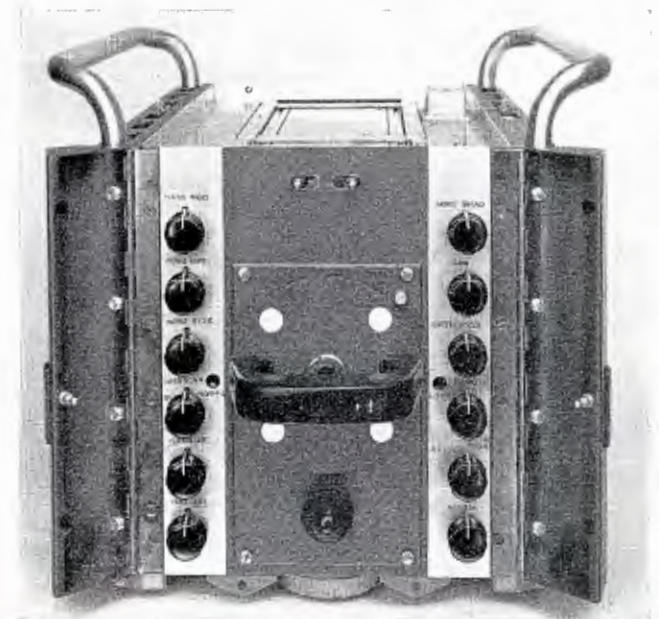
Thermal control of the operating temperature for the image orthicon tube has been incorporated in the TK-11B. The "plug-in" blower which is easily removed from the camera is cycled by a thermostat imbedded in the mask on the face of the pickup tube. The output of the blower couples to a gas mask type hose which directs cooling air through the air passages along the surface of the tube and between the coils. This assures proper operating temperature for stable performance and longer tube life. Provisions are also made for continuous operation of the blower and the target heater to meet extreme conditions.

### Image Orthicon Tube Protection

Protection for the image orthicon tube is assured through the use of a protection circuit which cuts off the tube when there is a loss of driving signals, deflection circuit failure, or failure of the activating relay.

Vertical deflection incorporates feedback and phase correction for excellent linearity and stability without need for linearity adjustments. Target blanking insertion is at low impedance to eliminate crosstalk problems. Horizontal deflection has excellent linearity, single knob linearity control, for ease of adjustment, better stability, and freedom from transients by an improved push-pull type circuit and a novel ferrite core output transformer.

View (from cameraman's position) of lens changing handle and camera "setup" controls.



A seven microsecond return time insures good operation even with the extreme delay conditions associated with 1000-foot camera cable operation. Adequate and symmetrical centering controls are available. Both deflection circuits can be switched from normal scan to 15 percent overscan to guarantee against burned target areas during warm-up, rehearsals, and stand-by while maintaining linearity and aspect ratio.

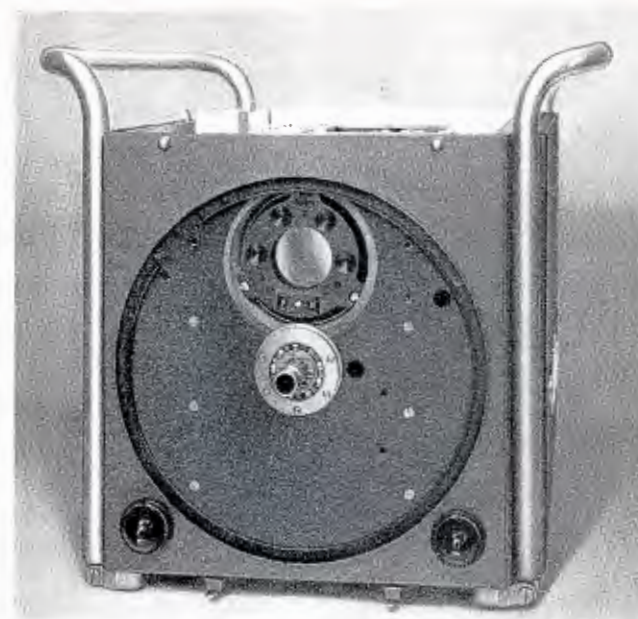
### Electromagnetic Orbiter

The yoke assembly is provided with a toroidal coil which is connected to an orbiting generator located at the control position. The current through this coil creates a slight displacement of the focus coil and magnetic field at the image end. The direction of displacement rotates to keep the electron image at the target in a constant orbiting motion to avoid burn-in of the image orthicon. The rate of orbiting is sufficiently slow and slight to be virtually unnoticeable. This feature prolongs the useful life of image orthicons to reduce operating costs.

### Extra Features

For maximum picture sharpness and improved corner resolution, a focus modulation circuit is an important feature of the TK-11B camera. This circuit provides low-impedance feed of horizontal and vertical parabolic wave-shapes in a 4/3 aspect ratio to the orthicon wall to provide continuous beam focus over the usable target area. Blemishes inherent on the surface of the signal multiplier of the tube are defocused and are made to disappear without sacrifice of resolution.

The decelerator control is continuously variable from 0-120 volts for accurate "port hole" control. Image accelerator control provides "S-distortion" correction. Vertical deflection reversal is provided by a switch for special effects applications. Switch is made at the same time to a preset centering potentiometer to insure operation with the same



Front of camera with lens turret removed showing turret indexing and blower thermostat mounted in mask.

target area. Horizontal deflection reversal is possible in that two coaxial leads feed the yoke so that a simple change of the yoke connections at the yoke plug will permit, for example, multiplexer operation.

A multiplier video gain control allows correction in case of dynode overload. A line voltage tap switch compensates for line voltage drop associated with different cable lengths. An elapsed time indicator records hours of tube operation conveniently.

The video amplifier is a plug-in unit with all power connections made through a single plug. Three small coaxial connectors are provided for the video input, main output, and viewfinder output signal connections. The amplifier is mounted on rubber to minimize the effects of vibration and shock.

The mask assembly on the left fits over the face of the kinescope thus forming the viewing end of the viewfinder. The detachable viewing head on the right may be rigidly mounted to the mask assembly.



A pulse type high-voltage supply provides stable picture tube operating potentials and, incidental to this, a resistive configuration maintains constant loading on the —500 volt supply as image focus is varied to speed the narrowing-down process when operation is being optimized during setup.

Amplitude response extends to 8 megacycles and performance at low frequencies is free of streaking. Two stages of cathode high peaking eliminate over-shoot and smear by very accurately compensating for the amplifier input loss of high frequencies while reducing microphonics associated with conventional high peaking. A separate output of this amplifier provides signal for the viewfinder. Ample gain insures a bright viewfinder picture with even a low-limit camera tube. Shading signals are introduced in the camera amplifier thus allowing shading in the viewfinder picture—a feedback pair in the output stage adds viewfinder isolation, sending-end cable termination, and provides linearity and stability.

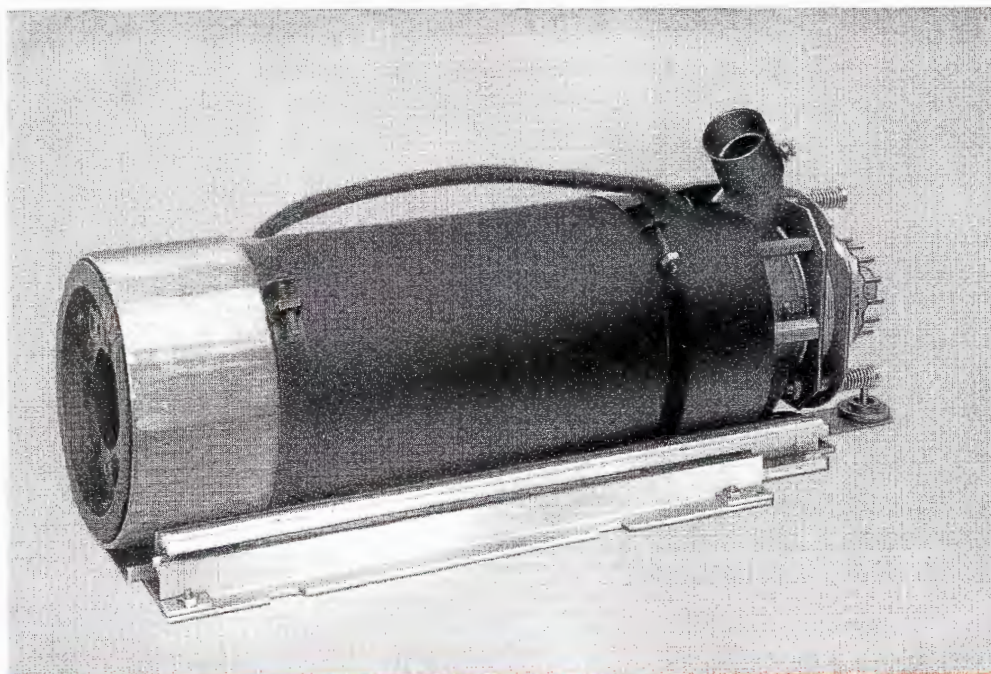
#### Electronic Viewfinder, RCA MI-26016-B

The Electronic Viewfinder is a picture monitor using a seven-inch aluminized kinescope tube (RCA-7TP4) which enables the cameraman to view the scene. The design of this unit permits ease of access to the circuits and components, without interrupting operation. The kinescope is enclosed in a magnetic shield which minimizes stray fields

and also serves as a light shield around the tube. The video amplifier includes adjustable blanking width controls to match blanking used in the camera control, thus eliminating confusion in determining the actual edges of the transmitted picture. The Viewfinder unit literally plugs into the top of the camera thus forming a complete operating unit. The front is easily detached for kinescope removal. A detachable viewing hood may be rigidly mounted to the mask assembly to prevent stray light from striking the face of the kinescope. The number of exposed operating controls has been reduced to three (contrast, brightness, and focus) with rim-type control knobs protruding through the rounded corners of the kinescope mask assembly. Other controls are normally preset and are located on the amplifier chassis. No interaction exists between the viewfinder and the camera.

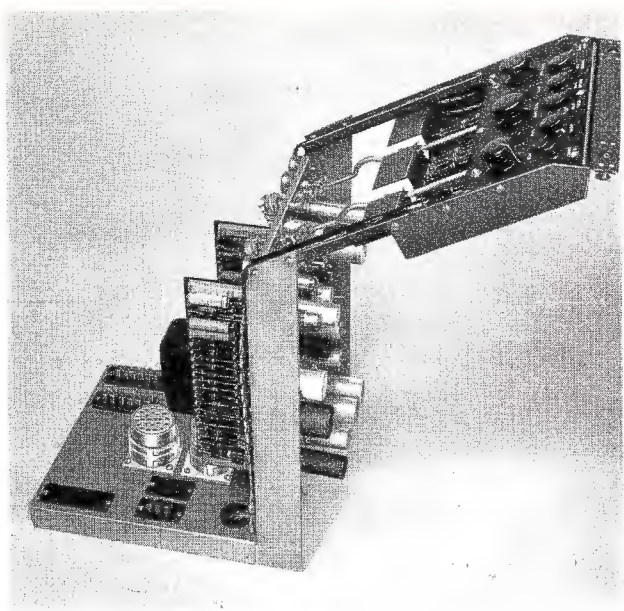
Variable-width blanking permits the cameraman to see the "on-the-air" picture for accurate framing. Horizontal deflection is highly efficient; vertical deflection is a duplicate of the camera circuit; the video amplifier is wide band; and a driven clamp provides accurate d-c restoration. The viewfinder is attached to the camera by a two-finger, one-hand type release mechanism.

The TK-11B camera and viewfinder design features two utility handles for styling, protection and easy carrying. Station call letters in any color requested are also included among the many styling features.



Yoke assembly removed from the camera showing orbiter coil over image end.





Studio Camera Control showing chassis and control panel.

### Studio Camera Control, RCA MI-26056-B

The Studio Camera Control enables the video operator to monitor and control the quality of the picture signal produced by the studio camera. It is a desk-type console section with a TM-6C Camera Monitor mounted in the upper part, and the control chassis mounted in the compartment below. The camera monitor has a ten-inch picture tube for displaying the picture and a five-inch oscillograph tube which reproduces the picture signal waveform. Controls for gain and black level setting are brought out on the monitor front panel.

The major operating controls have been reduced to three: Beam, Orthicon Focus, and Image Focus. These are equipped with standard, medium sized knobs which match those used on the associated Master Monitor. Less frequently used controls are grouped under a hinged cover over the control panel. The lucite panel is coated with dull black paint and utilizes edge lighting which illuminates designations but does not produce any stray light.

The control chassis contains the necessary circuits for amplifying the video signal, establishing black level, mixing in a sawtooth correcting signal, adding picture blanking to the picture signal, adding the synchronizing signal and providing three separate outputs. In order to provide more comprehensive control of the picture quality an arrangement has been included for controlling the non-linearity of the video-amplifier.

Ability to "stretch" the whites or grays is sometimes helpful in improving inferior pictures or producing special effects in contrast. A feedback type of video output amplifier provides 3 identical outputs and monitoring is directly from the main video line—all output video lines being terminated at both ends.

Circuitry is provided to allow use of the existing interconnecting lines in the camera cable to feed the driving currents to the electromagnetic orbiter coil located in the camera when the orbiting generator is plugged into the camera control. This does not affect normal operation of the intercommunication circuits. A switch on the camera control is provided to stop the orbiting motion when a perfectly stationary image is required as in the case of super-impositions. A tally provides warning indication when the orbiter is turned off.

### Power Supplies

The WP-15B Regulated Power Supply is an economical, light-weight, well-regulated source of d-c voltage designed to meet television broadcasting needs. One WP-15B equipment is capable of supplying the current requirements of the entire monochrome camera chain.

The WP-15B features two-chassis construction based on separation of rectifier and regulator functions. This makes it possible for those favoring the centralized approach to power supply facilities to place all of the rectifier chassis in one rack. The regulator section of the power supply can then be placed in locations adjacent to the equipment loads. When mounted together the rectifier and regulator chassis occupy only 10½ inches of rack space.

The output current of 1500 milliamperes (250 ma per rack unit, 21.1 ma per pound weight) is available at the regulated voltage output over a range of 270 to 290 volts; or, an unregulated current at a nominal voltage of 410 volts; or in combination of regulated or unregulated output adding up to 1500 ma. The WP-15B Power Supply regulates over an output current range of 200-1500 ma. If for any reason the load is removed or the regulator is disconnected from the rectifier, operation under such no-load conditions will not damage the power supply. Transformer and chokes feature open-core construction of high temperature silicon steel with silicon varnish impregnated windings for long life. The power transformer line voltage taps can be changed without unsoldering any leads since spade connectors with screw fastenings are used. The regulator chassis has its own filament transformer.

An MI-26090-A Current Regulator is provided to supply constant current to the camera focus coil. It is designed for mounting in a standard rack in the studio control room.

**SPECIFICATIONS**

**Performance Specifications**

Type of Reproduction.....	Monochrome
Number of Scanning Lines.....	525
Frame Repetition Rate.....	30 per sec.
Field Repetition Rate.....	60 per sec.
Line Repetition Rate.....	15,750 per sec.
Picture Signal Level.....	1.4 volts, peak to peak (1.0 volt is picture and blanking and 0.4 volt is sync.)
Picture Polarity at Output.....	Black negative
Impedance of Coaxial Transmission Line.....	75 ohms
Maximum Length of Camera Cable.....	1000 ft.

**Electrical Specifications for Camera**

Input:

Horizontal Driving (negative).....	2 volts, peak-to-peak
Vertical Driving (negative).....	2 volts, peak-to-peak
DC Power (from power supplies)	
Regulated.....	285 volts, 300 milliamperes
Unregulated (for viewfinder).....	380 volts, 80 milliamperes
Focus Coil Current.....	75 milliamperes
AC Power (Heaters, blower, tally lights)	
.....	117 volts, 50/60 cycles, single phase, 90 watts

Output:

Picture Response.....	Extends to 8 megacycles
Picture Signals (black negative).....	0.4 volt, peak-to-peak
Picture Signals to Viewfinder.....	0.7 volt, peak-to-peak

**Electrical Specifications for Viewfinder**

Input (from camera).....	0.7 volt, peak-to-peak
Horizontal Driving (negative).....	2 volts, peak-to-peak
Vertical Driving (negative).....	2 volts, peak-to-peak
DC Power (from Power Supply):	
Regulated.....	285 volts, 200 milliamperes
Unregulated.....	380 volts, 80 milliamperes
AC Power.....	117 volts, 50/60 cycles, single phase, 60 watts

**Mechanical Specifications**

Camera:	
Length.....	27 1/2"
Width.....	16"
Height.....	14 1/2"
Viewfinder:	
Length.....	23 1/2"
Width.....	10 1/2"
Height.....	8 1/2"
Studio Camera Control:	
Length.....	26"
Width.....	11 3/8"
Height.....	23 3/8"
Weights:	
Camera (less lenses, including viewfinder).....	109 lbs.
Studio Camera Control.....	27 lbs.
Finish.....	The camera and viewfinder are finished in deep umber gray with chrome trim. Call letters are furnished in any color requested.

**Total Horizontal Field Angle of Lenses:\***

a. 35mm, f3.3.....	48.5°
b. 50mm, f1.9.....	35.°
c. 90mm, f3.5.....	20.°
d. 135mm, f3.8.....	13.3°
e. 8 1/2 in., f3.9.....	8.4°
f. 13 in., f3.5.....	5.5°
g. 13 in., f5.0.....	5.5°
h. 15 in., f5.1.....	4.75°
i. 17 in., f5.0.....	4.17°
j. 25 in., f5.0.....	2.83°

\* Calculated for nominal raster dimensions of .96" x 1.24".

Illumination on Scene:

(a) Incident Illumination (min.).....	0.5 foot-candle
(b) Incident Illumination for Best Results	
.....	25 to 75 foot-candles (RCA 5820)

Note: Fig. for (a) above is based on use of f3.5 lens or faster.

**NOTE:** This equipment also available for operation from 625 line 50 field standards from 220 volts, 50 cycle, single phase AC power.

**Tube Complement**

Camera:			
1—5820	3—12AT7	3—12AU7	1—6BQ6-GT
1—6S4	1—6AQ5	1—1V2	1—6AS6
1—6X4	4—6AH6	1—5687	1—6U8
1—6CU6			
Viewfinder:			
1—6CL6	2—5763	2—12AU7	1—7TP4
4—12AT7	1—6S4	1—6BQ6-GT	3—6AL5
2—1X2A	1—6AS7-G	1—OA2	
Studio Camera Control:			
6—6AH6	4—6AL5	1—OA2	1—6AU5-GT
8—12AT7	1—6BQ7A	2—12AU7	1—6AG7
WP-15B Power Supply:			
3—6336	1—12AX7	1—12AT7	1—5651
Current Regulator:			
1—OD3	1—6SL7-GT	1—6Y6-G	

**Equipment Supplied**

TK-11B Studio Camera Equipment  
Equipment below plus miscellaneous cables, fittings, hardware and instruction books are supplied:

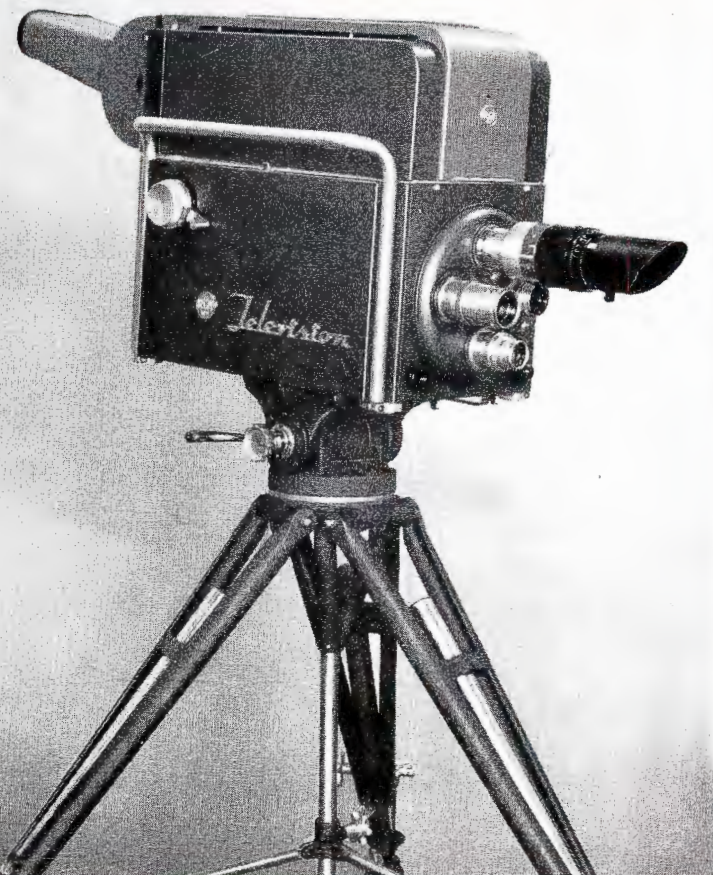
1 Image Orthicon Camera.....	MI-26011-C
1 Camera Viewfinder.....	MI-26016-B
1 Camera Control Chassis.....	MI-26056-B
1 Master Monitor, Type TM-6C.....	MI-26136-B
1 Power Rectifier (WP-15B).....	MI-26087-B
1 Power Regulator (WP-15B).....	MI-26088-B
1 Current Regulator.....	MI-26090-A
1 Console Housing.....	MI-26786*
1 Blower for Master Monitor Housing.....	MI-26579-B
1 Set of Tubes:	
1 Cathode Ray, RCA 5ABP1.....	MI-26667
1 Kinescope, RCA 10SP4.....	MI-26655
1 Image Orthicon, RCA 5820.....	MI-26656
1 Set of Interconnecting Cables for Studio Camera Control.....	MI-26746
1 Lens, 50mm f1.9.....	MI-26550-1
1 Lens, 90mm f3.9.....	MI-26550-2
1 Lens, 135mm f3.8.....	MI-26550-3
1 Camera Cable, 50 ft. in length.....	MI-26725-C9
1 Orbiting Generator.....	MI-26853
1 Set of Call Letter Panels.....	MI-26546

**Accessories**

Lens, 8 1/2", f3.9.....	MI-26550-4
Lens, 35mm, f3.3.....	MI-26550-9
Left Panel Assembly and Side Cover.....	MI-26788-1
Right Panel Assembly and Side Cover.....	MI-26788-2
Upper Left Side Cover Only.....	MI-26789-1
Upper Right Side Cover Only.....	MI-26789-2
Studio Dolly, Type TD-5A, less Friction Head.....	MI-26040
Television Pedestal, Type TD-7A.....	MI-26044
Television Pedestal, Type TD-10.....	MI-26053
Television Pedestal, Type TD-3A.....	MI-26036
Camera Cradle Head.....	MI-26203-A
Camera Friction Head.....	MI-26205-B
Metal Tripod, Type TD-11A.....	MI-26046-A
Tripod Dolly.....	MI-26042-A
Orbiter Interconnecting Cable.....	MI-13333
Plastic Cover.....	MI-26862-1,-2
Neutral Density Filter Holder.....	MI-26847

# Field Television Camera Equipment

TYPE TK-31B



## FEATURES

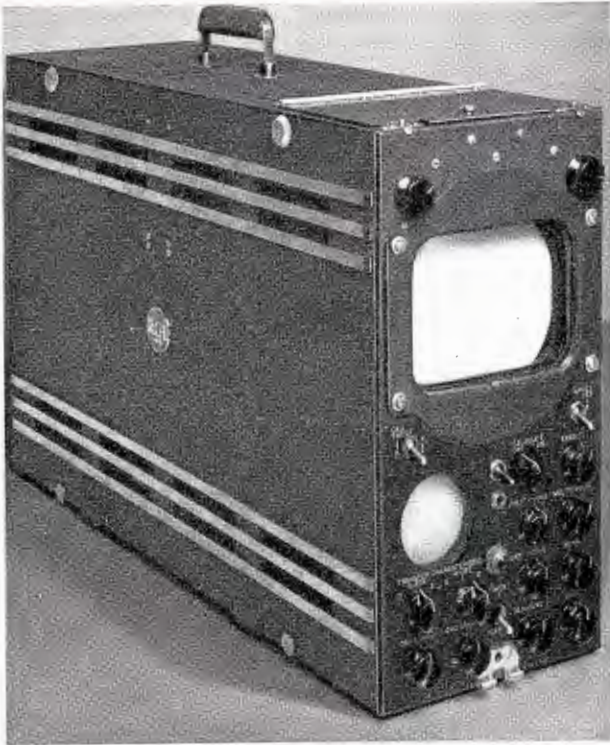
- Short "set-up" time, fast, accurate focusing
- 7-inch aluminized Kinescope Viewfinder included as standard equipment
- Four lens positions on a rotatable turret
- Easy access to controls through wide opening hinged doors with knuckle stays
- Thermostatically controlled forced ventilation of coil and tubes
- Protection circuit for deflection failure
- "Overscan" switch for warm-up and rehearsal
- Plug-in blower, pre-amp, and yoke assemblies
- Focus Modulation for improved electrical focus
- Electro-magnetic orbiter to eliminate burn-in and prolong image orthicon life

## USES

The TK-31B Field Camera Equipment is intended to be used in field television pick-ups of all kinds. The RCA 5820 image orthicon tube is especially suitable for use where the lighting conditions are poor, as is frequently the case at sporting events, in night clubs, and at other remote pick-up points. The minimum required incident illumination on the scene is .5 foot-candle. First grade results are obtained between 25 and 75 foot-candles illumination.

## DESCRIPTION

The TK-31B Field Television Camera Equipment consists of the camera and viewfinder, which can be mounted on a lightweight tripod, crane type dolly or studio pedestal; and the field camera control and field power supply units—each contained in portable, easy to carry cases—which can be mounted on a horizontal table surface with all operating controls conveniently available for field use. The TK-31B design is centered around a single all-purpose camera which may be used for either field or studio applications.



Field Camera Control Unit in carrying case.

**Field Camera Control, RCA MI-26066-A**

The Field Camera Control for use in remote pick-ups is contained in a suitcase unit for easy carrying, and enables the video operator to monitor and control the quality of the picture signal produced by the field camera. On the front panel are located two cathode ray tubes which serve as picture quality indicators. A seven-inch aluminized kinescope is used as a picture monitor, and a three-inch CRO tube is used as a waveform monitor.

An improved feature of the Field Camera Control is the sub-assembly, plug-in, r-f type high voltage supply. It is a completely separate unit which receives only its B+ and filament voltages from the camera control, and in turn supplies the +1500 volt focus potential and 10 kv ultror voltage for the kinescope as well as the -1500 volt cathode potential for the CRO tube. This extremely compact, efficient, and well-shielded unit provides stable ultror and focus voltages and ensures constant focus and deflection on the kinescope screen.

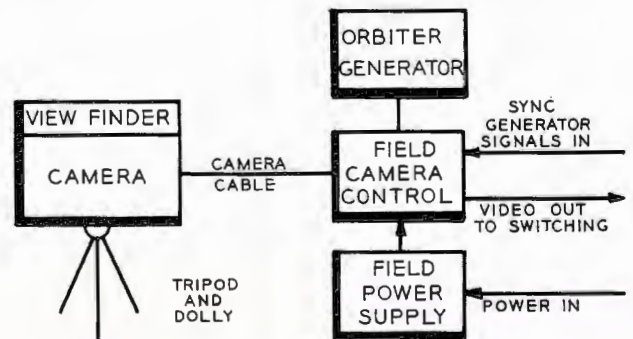
A seven-inch kinescope provides the cameraman an excellent monitor to evaluate his operation. Appropriate circuits

to obtain the maximum performance from this tube have been included. Its high contrast and brightness provide a picture which is easily observed under outdoor daylight conditions.

Improved circuitry assures a video-frequency response that in no way limits the system. New sine-wave clamping employed at three places effectively establishes black level and guarantees gray scale rendition without introducing high-frequency unbalance to damage the blanking waveform. A regenerative type blanking circuit stabilizes blanking insertion. Fixed blanking set-up adds a controlled amount of "blacker-than-black" blanking. Ability to "stretch" the whites or grays is sometimes helpful in improving inferior pictures or producing special effects in contrast. Two "black-white" stretch circuit switches permit selection of four different conditions of gray scale alteration while keeping overall video amplitude constant.

From the output stage of the video amplifier are available two identical isolated video outputs which operate at the standard level of one volt of picture signal. Monitoring is direct from the outgoing line. Sync can be mixed in the camera control and thus makes available a composite signal at each output.

The waveform monitor, or CRO, features a highly stable sweep circuit which operates at either one-half of horizontal scanning frequency or one-half of vertical scanning frequency at the operator's choice. Indirect edge lighting is used with a calibrated lucite scale over the face of the CRO tube for easy and accurate measurements. When sync is mixed in the field camera control, a complete presentation of the CRO is available which enables the operator to set the proper levels.



Field camera chain block diagram.



Field Power Supply, MI-26091.

The mechanical construction of the Field Camera Control has been designed to realize the benefits of sub-assembly construction as far as possible. A small blower provides forced cooling to the unit. Accessibility is excellent, thereby making servicing easy.

A "target-set" button is provided to automatically reduce the target potential by two volts as a means for rapidly setting the target two volts above cut-off. Both vertical and horizontal sawtooth shading signals of either polarity are available. Video response is compensated by a "3-position" switch for various cable lengths in common use.

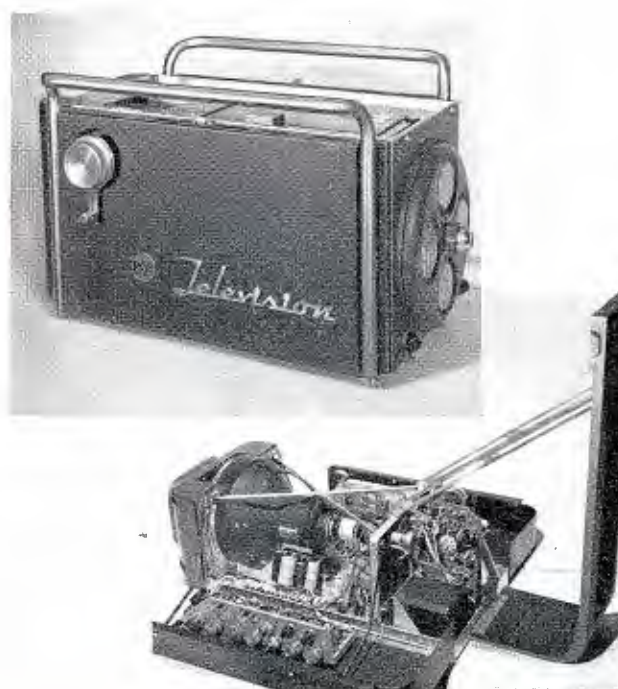
Circuitry is provided to allow use of the existing intercommunication lines in the camera cable to feed the driving currents to the electro-magnetic orbiter coil located in the camera, when the orbiting generator is plugged into the camera control. This does not affect nominal operation of the intercommunication circuits. A switch on the camera control is provided to stop the orbiting motion when a

perfectly stationary image is required, as in the case of superimpositions. A tally light provides a warning indication when the orbiter is turned off.

### Field Power Supply, RCA MI-26091

The Field Power Supply, Type TY-31A, is a portable unit designed to supply all the d-c current required by the TK-31B Field Camera, Viewfinder, and Field Camera Control in one camera chain. A blower cooling system directs an air stream directly over the tubes. An important feature is the broad range of output current values at which regulated voltage may be obtained. The addition of a relay to withdraw a series regulator under light load provides a regulating range from 1.25a at 285 volts down to about 400 ma. The low end of the output range is especially useful when servicing only one unit of the camera chain, in which case the current drain is low.

TK-31B Field Camera, with viewfinder removed for easy transportation. Hinged doors allow easy servicing and maintenance.



Viewfinder Unit, which plugs into the top of the camera, features easy access to components through use of hinged doors fitted with knuckle-type stays.

**SPECIFICATIONS**

**Performance Specifications**

Type of Reproduction.....	Monochrome
Number of Scanning Lines.....	525
Odd Line Interlacing.....	2 to 1
Frame Repetition Rate.....	.30 per sec.
Field Repetition Rate.....	.60 per sec.
Line Repetition Rate.....	15,750 per sec.
Picture Signal Level.....	1.4 volts, peak to peak (1.0 volt is picture and blanking 0.4 volts is sync)
Picture Polarity at Output.....	Black negative
Impedance of Coaxial Transmission Line.....	75 ohms
Maximum Length of Camera Cable.....	1000 ft.
Illumination on Scene:	
(a) Incident Illumination (min.).....	0.5 foot-candle
(b) Incident Illumination for Best Results	
25 to 75 foot-candles (RCA 5820)	

Note: Fig. for (a) above is based on use of f3.5 lens or faster.

**Electrical Specifications**

Power Requirements (one MI-26091):  
 Field Power Supply is provided and has ratings as follows:  
 Primary.....98-129 volts, rms. 50/60 cycle, single phase, 1350 watts,  
 full load 14 watts, 117 volts

Output:  
 Regulated.....285 volts d-c, 1250 ma  
 Non-regulated.....400 volts d-c, 90 ma  
 Focus Coil Current.....60-90 ma

**Mechanical Specifications**

Camera (case only).....	20 1/4" long, 12 3/8" wide, 12 1/8" high
Camera (overall).....	27 1/2" long, 16" wide, 14 1/2" high
Viewfinder (case only).....	22" long, 10 3/8" wide, 8 1/4" high
Viewfinder (overall).....	23 1/2" long, 10 1/2" wide, 8 1/2" high
Field Camera Control (overall).....	27 1/2" long, 8 1/2" wide, 17 1/2" high
Field Power Supply (overall).....	26" long, 8 1/2" wide, 18 1/2" high

Weights:  
 Camera (less lenses, including Viewfinder).....109 lbs.  
 Field Camera Control.....67 lbs.  
 Field Power Supply.....58 lbs.  
 Turret with 3 Lenses.....4 3/4 lbs.  
 Camera Cable .....0.4 lbs. per ft.

Total Included Angle of Lenses:*	
a. 35mm, f3.3 .....	48.5°
b. 50mm, f1.9 .....	35.0°
c. 90mm, f3.5 .....	20.0°
d. 135mm, f3.8 .....	13.3°
e. 8 1/2", f3.9 .....	8.4°
f. 13", f3.5 .....	5.5°
g. 13", f5.0 .....	5.5°
h. 15", f5.1 .....	4.75°
i. 17", f5.0 .....	4.17°
j. 25", f5.0 .....	2.83°

\* Calculated for nominal raster dimensions of .96" x 1.24".

Finish.....All units are finished in two-tone umber gray wrinkle with chrome trim. Call letters are furnished in any color requested.

**Tube Complement**

TK-31B Camera:			
1-5820	3-12A7	3-12AU7	1-6BQ6-GT
1-6S4	1-6AQ5	1-1V2	1-6AS6
1-6X4	4-6AH6	1-6U8	1-5687
1-6CU6			
Viewfinder:			
1-6CL6	2-5763	2-12AU7	1-7TP4
4-12A7	1-6S4	1-6BQ6-GT	3-6AL5
2-1X2A	1-6AS7-G	1-OA2	
Field Camera Control:			
8-6AH6	5-6AL5	1-6CL6	10-12A7
6-12AU7	1-6AUS-GT	1-6S4	3-5763
2-6BQ6	1-7TP4	1-3KP1	2-991
1-6L6	4-1X2A	1-6BQ7A	

Field Power Supply:

6-5R4GY	5-6AS7-G	1-6SL7-GT	2-OD3
1-6Y6-G	1-6AC7		

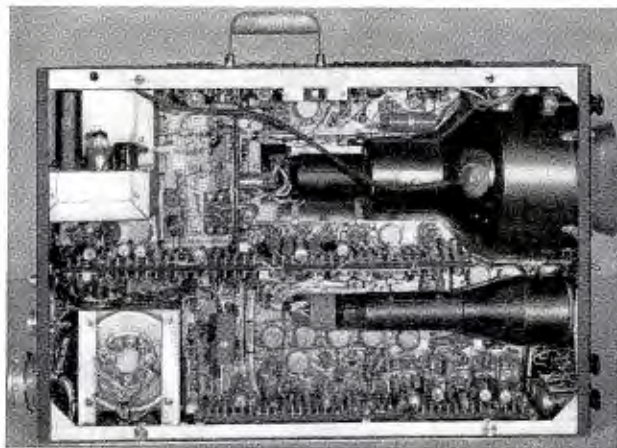
**Equipment Supplied**

TK-31B Field Television Camera Equipment including Equipment below plus miscellaneous fittings and instructions are supplied:

1 Camera .....	MI-26011-C
1 Camera Viewfinder .....	MI-26016-B
1 Metal Camera Tripod .....	MI-26046
1 Camera Control Unit.....	MI-26066-A
1 Power Supply .....	MI-26091
1 TV Friction Head.....	MI-26205-B
1 Set Interconnecting Cables.....	MI-26730
1 50 ft. Camera Cable.....	MI-26725-C5
1 100 ft. Camera Cable.....	MI-26725-C6
1 200 ft. Camera Cable.....	MI-26725-C7
1 Camera Lens f1.9, 50mm.....	MI-26550-1
1 Camera Lens f3.5, 90mm.....	MI-26550-2
1 Camera Lens f3.8, 135mm.....	MI-26550-3
2 Shock Mounts .....	MI-26511-A1
1 Shock Mount .....	MI-26511-3
1 3KP1 Cathode Ray.....	MI-26650
1 5820 Image Orthicon.....	MI-26656
1 7TP4 Kinescope .....	MI-26666
1 Set Call Letter Panels.....	MI-26546
1 Orbiting Generator .....	MI-26853

**Accessories**

Camera Lens 8.5", f3.9.....	MI-26550-4
Camera Lens 13", f5.....	MI-26590-8
Camera Lens 15", f5.....	MI-26590-9
Camera Lens 17", f5.....	MI-26590-12
Camera Lens 25", f5.....	MI-26550-8
Plate Current Meter.....	MI-21200-C1
Tripod Dolly .....	MI-26042-A
Cradle Type Pan and Tilt Head.....	MI-26203-A
Friction Type Pan and Tilt Head.....	MI-26205-B
Neutral Density Filter Holder.....	MI-26847
Protective Camera Cover.....	MI-26862-2
Orbiter Interconnecting Cable.....	MI-13333
Plastic Cover .....	MI-26862-1, -2



Field Camera Control Unit with side panel removed showing kinescope and CRO mounting, and circuit wiring.

# VIDICON STUDIO CAMERA

TYPE TK-15



## FEATURES

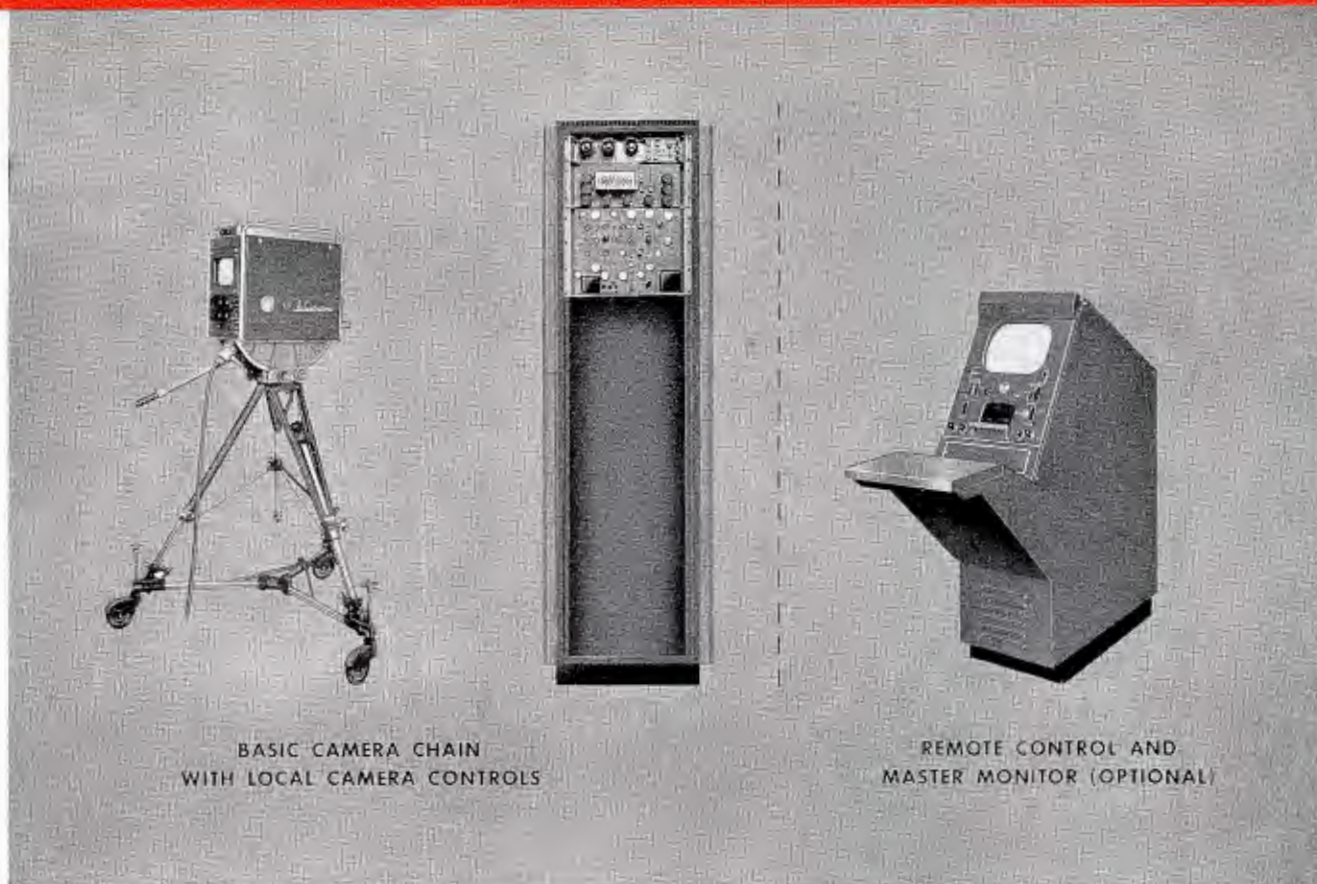
- For television broadcast and closed-circuit applications
- Excellent picture quality for flip card commercials, live news programs, and other scenes on which adequate light can be concentrated
- Brings economical operation of vidicon tubes to live studio use
- Full 7-inch viewfinder and self-contained camera controls permit video control from the camera
- Accessory remote control panel mounts in console with master monitor for standard video operation
- Non-linear focus mechanism provides quick and precise optical focus
- Feedback-stabilized circuitry simplifies setup and operation
- Variable gamma compensation produces faithful grayscale reproduction over wide range

## USES

The TK-15 Vidicon Studio Camera has many applications in both television stations and closed-circuit installations. As a source of live programming in television stations, this new vidicon camera is extremely useful for picking up scenes on which adequate lighting levels (approximately 200 foot-candles) can be maintained. For example, a single TK-15 camera can be utilized for live newscasts, simple product demonstrations and flip-chart commercials. Under adequate lighting conditions, excellent picture quality is available from the vidicon tube. Usable pictures can be obtained with lighting levels of 50 foot-candles or less, depending upon the picture quality requirements of the application. The economy of operation inherent in the vid-

icon makes the TK-15 an excellent investment for the uses described.

Design of the TK-15 meets professional requirements in every way. Mechanically, the camera is designed for rugged use and utmost accessibility to components. Electrically, advanced circuit techniques, a reduced tube complement and simplified operating controls have been introduced without compromise to performance. Signal-to-noise ratio, gray scale rendition and detail resolution are excellent—more than suitable for originating high quality video signals for either broadcast or closed-circuit applications.



BASIC CAMERA CHAIN  
WITH LOCAL CAMERA CONTROLS

REMOTE CONTROL AND  
MASTER MONITOR (OPTIONAL)

The camera and rack mounted equipments at the left comprise basic camera chain. Optional remote control facilities and master monitor are mounted in standard broadcast control console at the right.



## DESCRIPTION

The TK-15 camera and seven-inch electronic viewfinder constitute a single, self-contained chassis equipped with a four-lens turret and all operating controls (gain, pedestal, beam and electrical focus). A standard camera cable connects the camera with the output amplifier which may be mounted in either a standard cabinet rack or a portable fieldcase housing. These units, plus a WP-15B power supply, comprise the basic camera chain.

Remote control of all electrical adjustments is available by means of an optional camera control panel. This panel may be mounted, along with a master monitor, in a standard television console housing or cabinet rack. For field application, it can be mounted in the fieldcase housing of the output amplifier.

Rugged, vertical plane chassis construction has been featured in the TK-15 camera design. Hinged doors on either side of the camera open downward to expose the camera

◀ All operating controls (gain, pedestal, beam and electrical focus) are located at the rear of the camera, where they are immediately available to the cameraman.



interior for inspection and maintenance. The video amplifying circuits are mounted on a hinged subchassis which swings outward from the camera, providing easy access to every component. The video preamplifier circuits are contained on a separately shock-mounted subchassis.

Special attention has been given to the precise mechanical requirements of the optical system for the vidicon. Due to the small size of the picture on the surface of the vidicon photocathode, extremely close tolerances must be maintained on optical focus travel to avoid focus backlash. This is achieved by an ingenious, cam-operated mechanism which precisely translates the focus knob rotation into an exact, non-linear characteristic motion of the vidicon and yoke assembly. Complete absence of focus backlash is thus assured, even under the severe tolerance requirements of short focal length lenses. Also, due to the special non-linear focus motion characteristic, the amount of focus knob rotation required to adjust optical focus is essentially independent of distance.

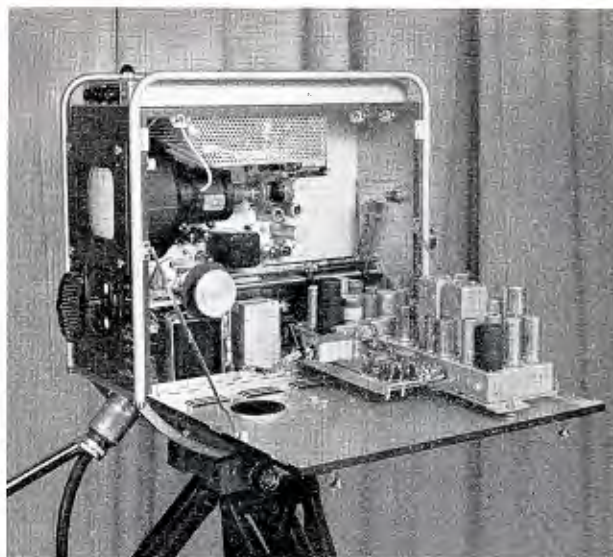
Any high quality, 16mm Type "C" mount lenses may be used with the TK-15 camera. Up to four lenses may be mounted in the turret at any one time.

Electrical interference in the camera is eliminated by means of individual camera cable conductor barrier filters at the cable connector and thorough shielding of the low level video circuits. These facilities are vital to the quality of pictures and operational reliability.

The output amplifier performs the functions of video amplification, blanking insertion, feedback clamping, linear clipping, camera pulse amplification, gamma compensation and sync mixing. A variable gamma compensation circuit is provided in the output amplifier chassis to provide "stretching" of black information in the picture, thereby compensating for the black "compression" inherent in kinescope picture reproduction. Three separate feedback isolated video output circuits are provided with a minimum of 40 db of isolation between circuits.

A substantial saving has been achieved in the total number of tubes used in the camera chain. In addition, the number and complexity of setup and operating controls have been minimized, resulting in savings to the user through reduced demands on the skill of technical personnel. At the same time, stability and reliability of the camera have actually been improved. For example:

- (1) All video amplifier stages are gain stabilized.
- (2) Pedestal levels are stabilized by feedback clamp circuits.
- (3) Deflection linearity and amplitude are feedback stabilized.
- (4) Vidicon split anode focus yields maximum flatness of focus; minimum picture rotation during adjustment.



Vertical plane construction with hinged subchassis provides complete accessibility.

- (5) Calibration signal permits accurate setting of channel gain; simplified vidicon setup adjustments.
- (6) Cascode video preamplifier provides high signal-to-noise ratio.
- (7) Detail resolution is sharpened by variable aperture compensation.

The TK-15 camera is available with several combinations of accessory equipment to fit a variety of applications. For broadcast television studio use and other applications requiring a very high quality picture monitor and waveform monitor, a studio camera chain is available including a TM-6C master monitor and console housing. An alternate equipment group for field applications includes the master monitor, camera output amplifier and power supply mounted in fieldcases.

For applications which do not require the use of a waveform monitor, a system is available which includes a TM-7C continuity monitor in place of the master monitor. For occasional test observation of the waveform, either a separate waveform monitor or a suitable general purpose oscilloscope may be used.

Cam operated focus mechanism provides non-linear travel for easy focus at any object distance.





Remote control panel mounts below master monitor for control room operations with waveform and picture display.

**SPECIFICATIONS**

**General**

Type of Reproduction.....Monochrome  
 Viewfinder Kinescope.....Seven-inch diameter, P4 phosphor  
 Number of Scanning Lines.....525, 2 to 1 interlaced  
 Frame Repetition Rate.....30 per second  
 Field Repetition Rate.....60 per second  
 Line Repetition Rate.....15,750 per second  
 Incident Illumination for Best Results.....200 foot-candles  
 Picture Polarity at Output.....Black negative  
 Maximum Length of Camera Cable.....500 feet  
 Lens Type.....16mm C-mount  
 Intercom Facility.....Separate circuits, program and interphone

**Electrical**

Power Requirements:  
 Line Rating.....105-125 volts, 50/60 cycles, single phase  
 Power (including TM-6C monitor).....450 watts  
 Current.....5 amperes

Input Signals:  
 Horizontal Drive.....4 volts peak-to-peak negative  
 Blanking.....4 volts peak-to-peak negative  
 Sync.....4 volts peak-to-peak negative

Output Signals:  
 Picture #1.....Picture with optional sync 1.4 volts  
 Picture #2.....Picture with optional sync 1.4 volts  
 Picture #3.....Picture only, 1.0 volt

Bandwidth.....Essentially flat to 6 megacycles, 3 db down at 8 megacycles

Aperture Compensation Peak Boost Frequency.....4.5 megacycles

Aperture Compensation Amplitude.....Continuously variable from 0 to 10 db

Gamma Correction Factors.....0.5, 0.7 and unity  
 Isolation between Output Lines.....40 db minimum  
 Output Impedance.....75 ohm coaxial, doubly terminated

**Mechanical**

Dimensions:  
 Camera Case.....11" x 19" x 2 1/4"  
 Output Amplifier (rack mounting).....14" x 19"  
 Camera Control Panel (console mounting).....11" x 3 1/2" x 2 3/4"

Weight:  
 Camera.....72 lbs.  
 Output Amplifier.....20 lbs.  
 Camera Control Panel.....2 1/2 lbs.

**Equipment Supplied**

- TK-15 Studio Vidicon Camera Chain complete with TM-6C Master Monitor
- 1 TK-15 Vidicon Camera.....MI-26023-A
  - 1 Output Amplifier.....MI-26063
  - 1 Camera Control Panel.....MI-26213
  - 1 Vidicon Tube Type 7038.....MI-26861
  - 1 WP-15B Power Supply Rectifier.....MI-26087-B
  - 1 WP-15B Power Supply Regulator.....MI-26088-B
  - 1 TM-6C Master Monitor.....MI-26957-A
  - 1 Console Housing, 13-inch.....MI-26786
  - 1 Console Adaptor for Camera Control Panel.....MI-26212
  - 1 Camera Cable, 50-foot.....MI-26725-A5
  - 1 Lens, 35mm.....MI-26841-4
  - 1 Lens, 25mm.....MI-26841-1
  - 1 Lens, 50mm.....MI-36061-2
  - 1 Viewfinder Shade.....MI-26842

- TK-15 Field Camera Chain complete with TM-6C Field Master Monitor
- 1 TK-15 Vidicon Camera.....MI-26023-A
  - 1 Output Amplifier.....MI-26063
  - 1 Camera Control Panel.....MI-26213
  - 1 Fieldcase for Output Amplifier and Control Panel.....MI-26863
  - 1 Vidicon Tube Type 7038.....MI-26861
  - 1 TY-31A Field Power Supply.....MI-26091
  - 1 TM-6C Field Master Monitor System.....MI-26955-B
  - 1 Camera Cable, 50-foot.....MI-26725-A5
  - 1 Lens, 35mm.....MI-26841-4
  - 1 Lens, 25mm.....MI-26841-1
  - 1 Lens, 50mm.....MI-36061-2
  - 1 Viewfinder Shade.....MI-26842

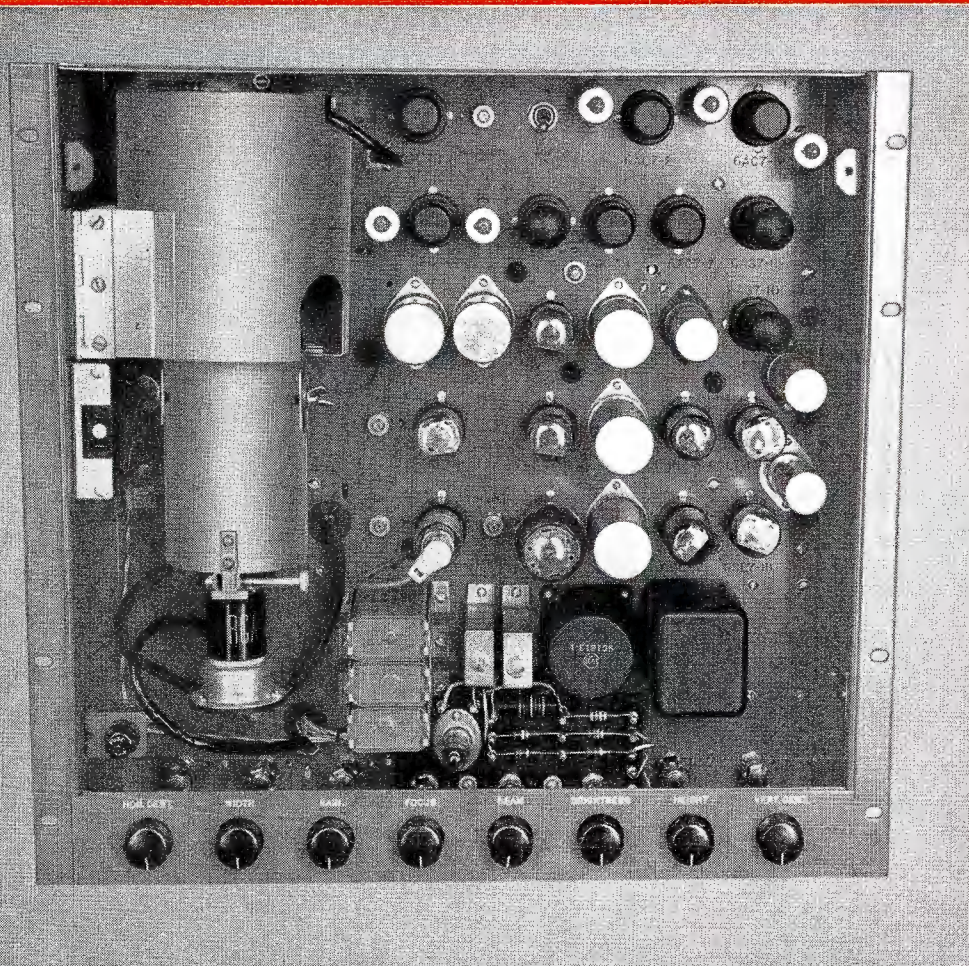
- TK-15 Studio Camera System including TM-7C Continuity Monitor
- 1 TK-15 Vidicon Camera.....MI-26023-A
  - 1 Output Amplifier.....MI-26063
  - 1 Vidicon Tube Type 7038.....MI-26861
  - 1 WP-33B Power Supply.....MI-26085-B
  - 1 Continuity Monitor, 17-inch.....ES-26995-A
  - 1 Camera Cable, 50-foot.....MI-26725-A5
  - 1 Lens, 35mm.....MI-26841-4
  - 1 Lens, 25mm.....MI-26841-1
  - 1 Lens, 50mm.....MI-36061-2
  - 1 Viewfinder Shade.....MI-26842

**Accessories**

- Camera Cradle Head.....MI-26203-A
- TD-7A Lightweight Camera Pedestal.....MI-26044
- TD-10 Lightweight Pedestal.....MI-26053
- TD-11A Metal Tripod.....MI-26046
- TD-15A Tripod Dolly, Folding Type.....MI-26042-A
- TG-2A Studio Sync Generator.....MI-26102-A
- TG-12A Field Sync Generator System.....MI-26112-A
- Lens, 25mm f/1.5.....MI-26841-1
- Lens, 50mm f/1.5.....MI-36061-2
- Lens, 35mm f/1.5.....MI-26841-4
- Lens, 102mm f/2.7.....MI-36061-4
- TO-1 Television Oscilloscope.....ES-40903
- WO-91A Oscilloscope, General Purpose
- TA-21A Video AGC Amplifier.....MI-26296-A

# MONOSCOPE CAMERA

## TYPE TK-1C



### FEATURES

- Useful to television transmitting station, laboratory, factory, or service bench
- Centralized operating controls
- Compact construction; "bath tub" chassis for standard rack mounting
- Built-in high voltage power supply
- Auxiliary input for alignment purposes
- Provision for remote control of gain and focus
- Pattern shows scanning symmetry, vertical and horizontal resolution, shading, reproduction of isolated details, contrast and brightness
- Accessible arrangement

### USES

The Type TK-1C Monoscope Camera is a completely self-contained television camera which produces a video signal by scanning a picture pattern built into the monoscope pickup tube. The camera may be used as a convenient means of generating a television picture signal for video testing of television transmitting equipment, or for "test pattern" transmission during warm-up and stand-by periods. In the latter case, the station call letters may be made a part of the pattern, thereby providing station identification. It may, likewise, be used in the television transmitting station as a readily available source of video signal, of high quality, to be used in place of the studio camera when making tests or adjustments on other units of the system. In the laboratory, factory, or service bench, the equipment may be used as a source of video signal to test or adjust television receivers, video amplifiers, and picture tubes.

### DESCRIPTION

The TK-1C Monoscope Camera comprises the monoscope tube, the scanning generators, the video output amplifiers, and the high voltage power supply for the monoscope tube. This equipment is built on the familiar recessed "bath tub" type of chassis which fits into a standard 19-inch rack. All tubes and large components are located on the front of the chassis, while the wiring and smaller components are on the rear. The controls are grouped on a narrow control panel along the bottom of the chassis. When installed and in operation, the front is covered by a large cover plate which conceals everything but the control panel. This cover plate is interlocked to protect operating personnel from the high voltages present in the equipment.

The monoscope tube in the TK-1C is mounted in a vertical position at the left of the chassis. The upper part of the tube is enclosed in a Mumetal shield. The magnetic deflecting coils are mounted within the shield, and are attached to it. By disconnecting the tube socket, anode, and

signal leads, the whole assembly—tube, coils, and shield—may be swung outward. This arrangement allows the tube to be changed very easily, and at the same time, conserves rack space.

The monoscope tube ordinarily used in the TK-1C is an RCA 2F21. This tube provides a standard test pattern which shows the following details of the quality of reproduction in a given television system: scanning symmetry, resolution in both vertical and horizontal directions, shading and reproduction of isolated details. In addition it provides a pattern to facilitate proper adjustment of contrast and brightness. Monoscope tubes may also be obtained with special pattern showing station call letter, monogram, or other subject matter of the customer's choice. These tubes are available on a custom basis and are designated Type 1699.

The Vertical Deflection Generator consists of four tubes and associated circuits. The first of these tubes amplifies the driving signal received from the synchronizing generator and generates a saw-tooth voltage wave which is amplified in the second, third, and fourth tubes. The output is applied to the magnetic deflecting coils of the monoscope tube. Negative feedback is employed to improve scanning linearity.

The Horizontal Deflection Generator includes three tubes and associated circuits. The first tube is the driving signal input amplifier and saw-tooth voltage generator; the second and third tubes amplify the output wave and feed it to the horizontal deflecting coils of the monoscope tube.

The Blanking Amplifier is used to provide the proper level and polarity of the blanking pulses received from the synchronizing generator before these pulses are fed into the Video Amplifier for mixing with the video signal.

The Sync Amplifier is used to provide proper level and polarity of synchronizing pulses from the synchronizing generator. These pulses are fed into the video amplifier for mixing with the video signal.

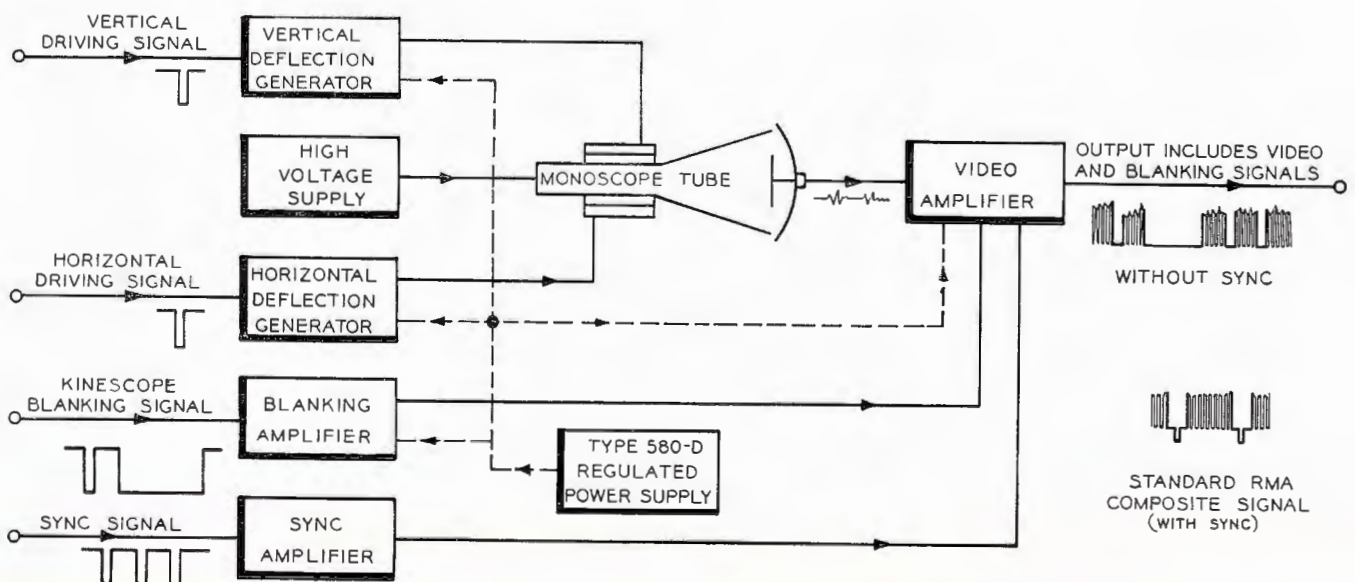
The Video Amplifier includes six stages of video amplification—together with a clipper stage which is inserted between the fifth and sixth stages. The monoscope output signal is fed directly into the first stage of this amplifier, and the blanking signal is introduced in the output of the fifth stage. The output of the fifth stage (which contains both video and blanking signals) is fed to a clipper stage which adjusts the height of the blanking "pedestals". The clipper feeds an output stage which consists of two tubes having their grids tied in parallel, but with the plate circuits separate. This provides two separate outputs—one for picture output and one for monitoring purposes.

**SPECIFICATIONS**

Output Voltage.....	1.5 volts peak-to-peak
Output Impedance.....	75 ohms
Power Supply Required:	
Blanking, Horizontal Drive and Vertical Drive	
Pulse Inputs (neg. polarity).....	3.5 to 5 volts
Resolution Capability.....	At least 450 lines
Power Consumption:	
110-220 volts a-c 60 cycles.....	100 watts
280 volts d-c (from Type 580-D Power Supply).....	200 ma.
Dimensions.....	17½" high, 19" wide, 11" deep
Weight .....	55 lbs.
Tube Complement:	
6—6AC7	1—6Y6-G
3—6AG7	1—1B3-GT
3—6SL7-GT	1—99T
1—6V6-GT	1—2F21
	3—6SN7-GT
Stock Identification:	
Monoscope Camera complete with tubes.....	ES-26960-B
Monoscope Camera (less tube).....	MI-26030-B

**Accessories**

Spare Monoscope Tube 2F21.....	MI-26657
Special Monoscope Tube.....	Type 1699
Spare Set of Tubes for Camera.....	MI-26679-A



# TELEVISION CAMERA LENSES

MI-26550-8  
25 inch



MI-26590-10  
17 inch



MI-26590-9  
15 inch



MI-26590-8  
13 inch



MI-26550-4  
8½ inch



MI-26550-3  
135 mm.



MI-26550-2  
90 mm.



MI-26550-1  
50 mm.



MI-26550-9  
35 mm.

## FEATURES

- Varied lens speeds and focal lengths provide necessary flexibility for TV programming
- Precision design and lightweight construction permit smooth convenient turret manipulation
- Special long lenses ideal for sports pickups with dramatic closeups
- Bayonet-type mountings permit quick and easy interchange of long lenses without unscrewing mounting rings
- Studio lenses, especially selected for TV, provide high optical quality, precision interchangeability, barrel preset focusing and engraved depth of field scales

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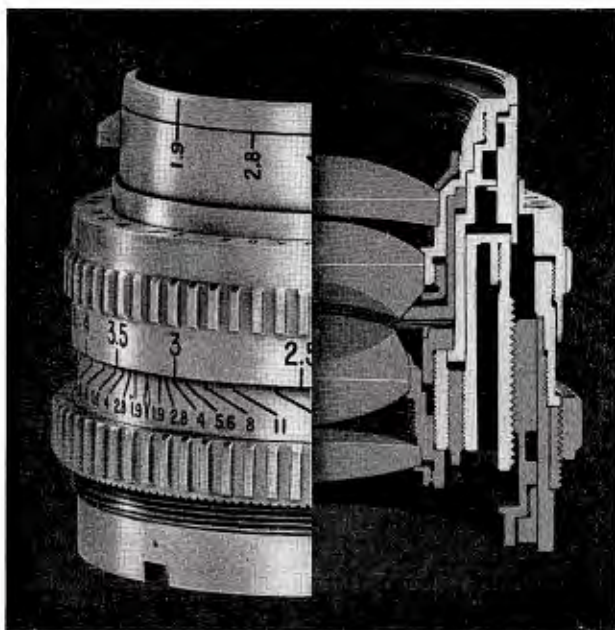
## USES

The RCA group of lenses is made available to meet normal, wide angle, telephoto and ultra speed requirements for television camera use. All lenses mount directly in the four-position turrets of both studio and field type RCA TV cameras. The lens group provides a wide choice of sizes, speeds and focal lengths permitting utmost versatility in television studio scenes, sporting events, dramatic closeups and fast action scenes . . . and makes possible the detailed pickup of objects varying in size, from a coin less than 3 inches from the lens, to a ball player located over 400 feet away. Larger objects such as an airplane may be clearly seen several thousand feet distant.

The increasing use of theatre stages with camera locations 20 to 50 feet from footlights is bringing the telephoto lenses indoors. The improved sensitivity of recent image orthicons has made it possible to stop down field lenses to f/8 and f/11 without resorting to additional illumination.

## DESCRIPTION

The RCA television camera lenses range in focal lengths from 1½ inches to 25 inches (35mm to 610mm). For purposes of description, the group of lenses will be divided into two classes—(1) Special Long Lenses for Television Field Use and (2) Standard Lenses for Television Studio and Field Use.



Cutaway view of smaller or "studio" type lens showing details of mechanical design.

## Special Long Lenses for Field Use

The group of special lenses, frequently called telephoto lenses, include the 25-inch, 17-inch, 15-inch and 13-inch lens sizes. All incorporate simplicity of design and lightweight construction. They are ideally suited for television field uses, sports pickup, etc. Focal lengths from 13 to 25 inches enable interesting closeup, particularly when the action is over 50 feet away. The design requirement of lightweight construction is met by use of a thin, lightweight barrel which is provided with a light baffle to prevent internal reflections of the lens tube. The 13-inch, 15-inch and 17-inch focal lengths employ Cooke three-element type lens design with all optical elements coated to improve shadow details and brilliancy in the image for both black-and-white and color television work. Each lens has an adjustable graduated iris diaphragm to permit stopping the lens to f/32. A locking clamp prevents accidental movement of settings. A rotatable lens hood is provided which can be easily removed, if desired. All lenses incorporate a quick-change, precision-machined bayonet mount which permits rapid interchange or removal of long lenses from the camera turret as desired. The 25-inch lens is supplied with a complete set of fixed iris diaphragms.

## Standard Lenses (Studio and Field Use)

This group of lenses includes the 8½-inch, 135mm, 90mm, 50mm and 35mm sizes, the four latter are lenses of short focal length which have a greater depth of field and require little adjustment for closeup scenes. They are corrected for lateral and longitudinal chromatic aberration. The 8½-inch lens is similar in design to the long lenses described above—it features the same lightweight barrel, built-in iris and turret mounting bayonet adaptor. Focusing barrel adjustments, suited to RCA camera turret designs, permit the pre-setting of a given lens for closeups while other lenses remain at infinity focus. This avoids time-consuming re-adjustment of the focus knob for extreme closeups. All lenses are threaded to receive standard filters and sunshades are available but not supplied.

The studio lenses employ an adjustable built-in iris and double threaded mountings of stainless steel for long wear and safety. Lenses are specially treated by a coating process which increases efficiency of light transmission, thus improving the clarity, brilliance and black and white contrast of pictures obtained. Lens elements are accurately assembled and positioned in mounts. Inside the mounts are light baffles which give added contrast by reducing flare. All lens barrels carry diaphragm scales and depth of field scales.

**Depth of Field: MI-26550-9 f/3.3, 35mm**

Circle of Confusion, .002 in.

Distance* Focused On	f/3.3		f/5.6		f/8		f/11		f/16		f/22	
	ft. in.	to ft. in.	ft. in.	to ft. in.	ft. in.	to ft. in.	ft. in.	to ft. in.	ft. in.	to ft. in.	ft. in.	to ft. in.
INF.	24 —	inf.	14 6	inf.	10 —	inf.	7 6	inf.	5 3	inf.	3 9	inf.
35 feet	14 6	inf.	10 3	inf.	8 —	inf.	6 3	inf.	4 6	inf.	3 6	inf.
15 feet	9 4	40 —	7 6	inf.	6 3	inf.	5 —	inf.	4 —	inf.	3 3	inf.
10 feet	7 3	17 9	6 —	32 —	5 3	inf.	4 4	inf.	3 6	inf.	2 9	inf.
8 feet	6 —	11 9	5 3	17 6	4 6	36 —	4 —	inf.	3 3	inf.	2 8	inf.
6 feet	4 9	7 9	4 4	10 —	3 9	14 —	3 6	29 —	3 —	inf.	2 6	inf.
5 feet	4 3	6 3	3 9	7 6	3 6	9 6	3 —	14 6	2 9	130 —	2 3	inf.
4 feet	3 6	4 8	3 3	5 4	3 —	6 4	2 9	8 —	2 4	16 —	2 —	inf.
3 feet	2 9	3 4	2 7	3 8	2 5	4 1	2 3	4 9	2 —	6 6	1 10	12 —
2 feet	1 10½	2 1¾	1 9¾	2 3	1 8¾	2 4	1 8	2 7	1 6½	3 —	1 5	3 8

**Depth of Field: MI-26550-1 f/1.9, 50mm**

Circle of Confusion, .002 in.

Distance* Focused On	f/1.9		f/2.8		f/4		f/5.6		f/11		f/22	
	ft. in.	to ft. in.	ft. in.	to ft. in.	ft. in.	to ft. in.	ft. in.	to ft. in.	ft. in.	to ft. in.	ft. in.	to ft. in.
INF.	85 —	inf.	59 —	inf.	41 —	inf.	29 —	inf.	15 —	inf.	7 6	inf.
50 feet	32 —	120 —	27 —	inf.	23 —	inf.	19 —	inf.	11 9	inf.	6 9	inf.
25 feet	19 6	37 —	17 6	43 —	15 8	63 —	13 9	162 —	9 6	inf.	6 —	inf.
15 feet	12 9	17 9	12 —	20 —	11 —	23 —	10 —	32 —	7 9	inf.	5 3	inf.
10 feet	9 —	11 3	8 8	12 —	8 2	13 —	7 6	15 —	6 3	28 —	4 6	inf.
8 feet	7 4	8 9	7 1	9 2	6 10	9 10	6 5	10 9	5 4	16 4	4 —	inf.
6 feet	5 8	6 6	5 6	6 7	5 3	6 11	5 1	7 1	4 5	9 6	3 6	25 —
5 feet	4 9	5 3	4 8	5 4	4 6	5 7	4 4	5 10	3 11	6 6	3 2	13 —
4 feet	3 10¼	4 1¾	3 9¼	4 3	3 8¾	4 4½	3 7	4 6½	3 3	5 3	2 9	7 9
3 feet	2 11⅞	3 1	2 10⅝	3 1½	2 10	3 2⅞	2 9	3 3	2 7	3 7	2 3	4 6
2 feet	1 11⅝	2 ¾	1 11⅜	2 ⅝	1 11	2 1	1 10¾	2 1¼	1 9⅞	2 2½	1 8¼	2 5¾

\* Distances are measured from the subject to the image plane of the camera.

**Depth of Field: MI-26550-2 f/3.5, 90mm**

Circle of Confusion, .002 in.

Distance* Focused On	f/3.5		f/5.6		f/8		f/11		f/16		f/22	
	ft. in.	to ft. in.	ft. in.	to ft. in.	ft. in.	to ft. in.	ft. in.	to ft. in.	ft. in.	to ft. in.	ft. in.	to ft. in.
INF.	150 —	inf.	94 —	inf.	66 —	inf.	48 —	inf.	33 —	inf.	24 —	inf.
200 feet	88 —	inf.	66 —	inf.	50 —	inf.	39 —	inf.	29 —	inf.	21 —	inf.
100 feet	62 —	350 —	50 —	inf.	41 —	inf.	33 —	inf.	25 —	inf.	20 —	inf.
50 feet	38 —	75 —	33 —	106 —	29 —	210 —	25 —	inf.	20 —	inf.	17 —	inf.
25 feet	22 —	29 —	19 6	33 —	18 4	39 —	16 8	50 —	14 6	96 —	12 8	inf.
15 feet	13 9	16 8	13 —	17 6	12 4	19 —	11 8	21 —	10 6	26 —	9 6	37 —
10 feet	9 6	10 8	9 —	11 —	8 9	11 8	8 6	12 4	7 10	13 9	7 4	16 3
8 feet	7 8	8 4	7 5⅝	8 8	7 3	9 —	7 —	9 4	6 8	10 3	6 3	11 4
6 feet	5 10	6 2½	5 8½	6 4	5 7	6 6	5 5	6 8	5 3	7 —	5 —	7 8
5 feet	4 10½	5 1½	4 9⅝	5 2½	4 8⅝	5 4	4 7½	5 5⅝	4 6	5 8	4 4	6 —
4 feet	3 11	4 1	3 10½	4 1½	3 9⅞	4 2⅞	3 9¼	4 3	3 8	4 4⅝	3 6¾	4 6¾

The above tables do not give the depth for f/4. For this opening it can be estimated by comparison.

**Depth of Field: MI-26550-3 f/3.8, 135mm**

Circle of Confusion, .002 in.

Distance* Focused On	f/3.8		f/5.6		f/8		f/11		f/16		f/22	
	ft. in.	to ft. in.	ft. in.	to ft. in.	ft. in.	to ft. in.	ft. in.	to ft. in.	ft. in.	to ft. in.	ft. in.	to ft. in.
INF.	310 —	inf.	250 —	inf.	150 —	inf.	130 —	inf.	74 —	inf.	54 —	inf.
200 feet	119 —	inf.	103 —	inf.	85 —	inf.	72 —	inf.	54 —	inf.	42 —	inf.
100 feet	75 —	148 —	69 —	176 —	59 —	inf.	52 —	inf.	42 —	inf.	35 —	inf.
50 feet	42 —	59 —	40 —	65 —	37 —	75 —	34 —	90 —	30 —	148 —	26 —	inf.
25 feet	23 —	27 —	22 6	28 —	22 —	29 —	21 —	32 —	19 —	36 —	17 6	44 —
15 feet	14 5	15 9	14 3	16 —	13 10	16 6	13 5	17 —	12 9	18 4	12 —	20 —
10 feet	9 9	10 4	9 8	10 5	9 6	10 7	9 4	10 10	9 —	11 3	8 9	11 9
8 feet	7 10	8 2	7 9	8 3	7 8	8 4	7 6	8 6	7 4	8 9	7 2	9 —
6 feet	5 10⅞	6 1⅞	5 10½	6 1½	5 9⅞	6 2⅞	5 9	6 3	5 8	6 4	5 6	6 6
5 feet	4 11⅝	5 ⅝	4 11	5 1	4 10¾	5 1¼	4 10¼	5 1¾	4 9½	5 2⅝	4 9	5 5
4 feet	3 11⅝	4 ¾	3 11⅜	4 ⅝	3 11⅞	4 ⅞	3 10⅞	4 1⅞	3 10½	4 1½	3 10⅞	4 2

**Depth of Field: MI-26550-4 f/3.9, 8½" Objective**

Circle of Confusion, .003 in.

Distance Focused On (Feet)	f/3.9		f/5.6		f/8.0		f/11		f/16		f/22		f/32	
	ft.	to ft.	ft.	to ft.	ft.	to ft.	ft.	to ft.	ft.	to ft.	ft.	to ft.	ft.	to ft.
INF.	309	inf.	215	inf.	150	inf.	110	inf.	75	inf.	55	inf.	38	inf.
1000	236	inf.	177	inf.	131	inf.	99	inf.	70	inf.	52	inf.	36	inf.
500	191	inf.	150	inf.	116	inf.	90	inf.	65	inf.	49	inf.	35	inf.
200	121	568	104	2861	86	inf.	71	inf.	55	inf.	43	inf.	32	inf.
100	76	148	68	187	60	298	52	1156	43	inf.	35	inf.	27	inf.
50	43	60	41	65	38	75	34	92	30	149	26	578	22	inf.
	ft. in. to ft. in.		ft. in. to ft. in.		ft. in. to ft. in.		ft. in. to ft. in.		ft. in. to ft. in.		ft. in. to ft. in.		ft. in. to ft. in.	
25	23	27	22	28	21	30	20	32	18	37	17	46	15	74
15	14	15	14	16	13	16	13	17	12	18	11	20	10	24

**Depth of Field: MI-26590-8 f/5.0, 13" Objective**

Circle of Confusion, .003 in.

Distance Focused On (Feet)	f/5.0		f/6.3		f/8.0		f/11		f/16		f/22		f/32	
	ft.	to ft.	ft.	to ft.	ft.	to ft.	ft.	to ft.	ft.	to ft.	ft.	to ft.	ft.	to ft.
INF.	470	inf.	373	inf.	293	inf.	213	inf.	147	inf.	107	inf.	73	inf.
1000	484	inf.	427	inf.	370	inf.	299	inf.	227	inf.	176	inf.	128	inf.
500	326	1070	299	1520	270	3380	230	inf.	185	inf.	150	inf.	113	inf.
200	165	254	158	273	149	303	136	376	119	628	103	3185	85	inf.
100	91	112	88	116	85	121	81	131	75	152	68	188	60	314
50	48	53	47	54	46	55	45	57	43	60	41	65	37	76
	ft. in. to ft. in.		ft. in. to ft. in.		ft. in. to ft. in.		ft. in. to ft. in.		ft. in. to ft. in.		ft. in. to ft. in.		ft. in. to ft. in.	
25	24	25	24	25	24	26	23	26	23	27	22	28	31	30
15	14	15	14	15	14	15	14	15	14	15	14	16	13	16

**Depth of Field: MI-26590-9 f/5.0, 15" Objective**

Circle of Confusion, .003 in.

Distance Focused On (Feet)	f/5.0		f/6.3		f/8.0		f/11		f/16		f/22		f/32	
	ft.	to ft.	ft.	to ft.	ft.	to ft.	ft.	to ft.	ft.	to ft.	ft.	to ft.	ft.	to ft.
INF.	625	inf.	496	inf.	391	inf.	284	inf.	195	inf.	142	inf.	98	inf.
1000	556	5000	498	inf.	439	inf.	362	inf.	281	inf.	221	inf.	163	inf.
500	357	833	333	1008	305	1389	266	4166	219	inf.	181	inf.	140	inf.
200	172	238	166	251	159	269	148	307	132	410	117	676	99	inf.
100	93	109	91	111	89	115	85	121	80	134	74	154	66	205
50	48	52	48	53	47	53	46	55	44	57	42	60	40	67
	ft. in. to ft. in.		ft. in. to ft. in.		ft. in. to ft. in.		ft. in. to ft. in.		ft. in. to ft. in.		ft. in. to ft. in.		ft. in. to ft. in.	
25	24	25	24	25	24	26	24	26	23	26	23	27	22	28
15	14	15	14	15	14	15	14	15	14	15	14	15	13	16

**Depth of Field: MI-26590-10—f/5.7, 17" Objective**

Circle of Confusion, .003 in.

Distance Focused On (Feet)	f/5.6		f/6.3		f/8.0		f/11		f/16		f/22		f/32	
	ft.	to ft.	ft.	to ft.	ft.	to ft.	ft.	to ft.	ft.	to ft.	ft.	to ft.	ft.	to ft.
INF.	717	inf.	637	inf.	502	inf.	365	inf.	251	inf.	183	inf.	126	inf.
1000	589	3307	560	4646	501	inf.	422	inf.	334	inf.	267	inf.	201	inf.
500	371	768	359	823	334	996	297	1588	250	inf.	211	inf.	167	inf.
200	176	232	173	237	166	250	157	276	143	333	129	443	111	986
100	94	108	93	109	91	111	88	116	83	125	79	138	72	166
	ft. in. to ft. in.		ft. in. to ft. in.		ft. in. to ft. in.		ft. in. to ft. in.		ft. in. to ft. in.		ft. in. to ft. in.		ft. in. to ft. in.	
50	48	51	48	52	47	52	46	53	45	55	44	57	41	62
25	24	25	24	25	24	25	24	25	23	26	23	26	22	27



## Depth of Field: MI-26550-8 f/5.6, 25" Objective

Circle of Confusion, .003 in.

Distance Focused On (Feet)	f/5.6		f/6.3		f/8.0		f/11		f/16		f/22		f/32	
	ft.	to ft.	ft.	to ft.	ft.	to ft.	ft.	to ft.	ft.	to ft.	ft.	to ft.	ft.	to ft.
INF.	1669	inf.	1378	inf.	1085	inf.	789	inf.	542	inf.	394	inf.	271	inf.
1000	770	1428	734	1570	685	1855	612	2729	520	inf.	441	inf.	352	inf.
500	435	588	423	611	406	650	380	732	342	927	306	1365	260	6382
200	189	213	187	216	183	220	178	229	169	245	160	268	146	317
100	97	103	96	104	95	105	94	107	92	110	89	115	84	123
	ft. in.	to ft. in.	ft. in.	to ft. in.	ft. in.	to ft. in.	ft. in.	to ft. in.	ft. in.	to ft. in.	ft. in.	to ft. in.	ft. in.	to ft. in.
50	49 3	50 10	49 1	50 11	48 11	51 2	48 6	51 7	47 10	52 5	47	53 5	45 10	55 1
25	24 10	25 2	24 10	25 2	24 9	25 3	24 7	25 5	24 5	25 7	24 3	25 10	23 11	26 2

## SPECIFICATIONS

Stock Identification	Description	f No.	Full Vertical Field Angle	Total Horizontal Field Angle*
MI-26550-9	Studio Camera Lens, 35mm.....	f/3.3	38°	48.5°
MI-26550-1	Studio Camera Lens, 50mm.....	f/1.9	27°	35°
MI-26550-2	Studio Camera Lens, 90mm.....	f/3.5	15°	20°
MI-26550-3	Studio Camera Lens, 135mm.....	f/3.8	10°	13.3°
MI-26550-4	Studio and Field Camera, Lens 8 1/2".....	f/3.9	6.47°	8.4°
MI-26590-8	Field Camera Lens, 13".....	f/5.0	4.23°	5.5°
MI-26590-9	Field Camera Lens, 15".....	f/5.0	3.67°	4.75°
MI-26590-10	Field Camera Lens, 17".....	f/7.0	3.23°	4.17°
MI-26550-8	Field Camera Lens, 25".....	f/5.0	2.20°	2.83°

\* Field angle applies for use with Monochrome Cameras only; to calculate angle for Color Camera divide by 1.1.

## FIELD LENSES, MI-40802

## USES

The MI-40802 Series of Field Lenses function to redirect all of the light reaching the image plane from the objective lens so that it will enter the relay lens system of the color television camera and thus insure uniform illumination of the relayed image. The size of the primary image is not changed by the field lens. In general, the field lenses must have a different power characteristic for each objective lens used. In some cases it has been found that the same field lens can be used satisfactorily with different objective lenses. The field lenses designed for each of the objective lenses used are mounted on a spider located directly behind the lens turret support drum. This spider rotates with the lens turret as lens positions are changed. All the field lenses are designed with identical thickness and location to avoid changes in the position of the primary image as lenses are interchanged.

## DESCRIPTION

The MI-40802 Field Lenses are designed to complement the television camera objective lenses and range in diopter power from 20 to 4.5 and are ground on a radius of 1.969

to 9.065 inches. The lens is made of spectacle crown glass of finest quality, precision centered and edged. Each is 1.812 inches in diameter with 1/2mm beveled edge and is 1/2 inch thick at the central point. Both surfaces have a baked magnesium fluoride coating for minimum green reflection at normal incidence.

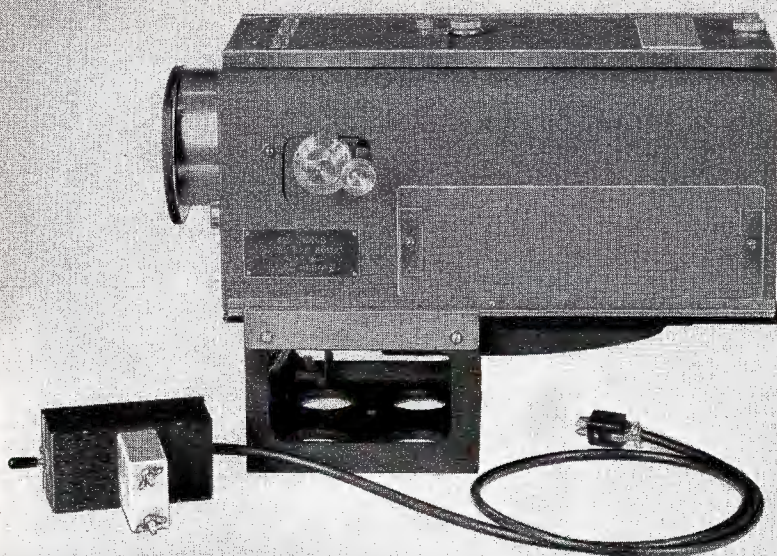
Each field lens is set in a brass lens assembly consisting of a lens holder approximately 3 inches in diameter before knurling, with lens cap and a mask. Each of the lens elements are accurately assembled and positioned. All lens holders carry stencilled diopter power markings.

## SPECIFICATIONS

Lens Assembly for 50mm objective lens (diopter power).....MI-40802-A1	
Lens Assembly for 90mm and 135mm objective lens (diopter power 13.5).....MI-40802-A2	
Lens Assembly for Electra Zoom and also 8 1/2 objective lens (diopter power 7).....MI-40802-A3	
Lens Assembly for 13", 15", 17" and Berthiot Zoom objective lenses (diopter power 5.75).....MI-40802-A4	
Lens Assembly for 25" objective lens (diopter power 4.5).....MI-40802-A5	
Lens Assembly for 75mm objective lens (diopter power 6.5).....MI-40802-A6	
Lens Assembly for 35mm objective lens (diopter power 24.7).....MI-40802-A7	

**FEATURES**

- Electrical or manual "Zoom" control
- Greater flexibility for studio use
- High speed dual range lens with excellent definition . . . valuable for remotes, night or day
- Simplicity and ease of control frees operator for panning, tilting and dollying
- Good for Color with accessory mounting equipment

**USES**

The Electra-Zoom Lens is designed primarily for use with RCA television cameras to provide greater flexibility in staging studio programs. It may also be used for sports and special events.

The focal length of this lens can be varied either mechanically or electrically. The ability to change the focal length or "zoom" permits the field of view to be continuously adjusted to fit varying and unexpected conditions of live action programming.

**DESCRIPTION**

The Electra-Zoom Lens has a rectangular appearance and mounts on all RCA Image Orthicon TV Cameras by means of a single screw on a plate which in turn is fastened to the base of the camera. Existing screw holes in the camera are used to secure the plate. With the standard lens turret removed, a light-tight seal to the front of the camera is accomplished by means of a special turret.

The lens has a focus control, an iris control and a "zoom" which can be operated either manually or electrically. A calibrated focusing knob on the side is used to make adjustments for various object distances. The lens will then automatically keep objects in focus at the distance set on the focusing knob at all points of the zooming action.

The camera is provided with a dual range lens of 2 $\frac{5}{8}$  to 7 inches and 3 $\frac{1}{2}$  to 10 inches. An accessory extension lens provides a third range of 4 to 12 inches.

When dollying the camera, or at distances closer than 8 feet it may be necessary to also use the regular focus control on the camera. In the studio the lens is usually set on 12 or 15 feet, while baseball or sports programs call for settings of 75 to 100 feet.

The iris is controlled by a knob inside the top cover, and a remote electrical iris control can be supplied where desired.

Manual operation of the "zoom" is accomplished by means of a push rod through the turret shaft. The change from manual to electrical operation of the zoom can be done easily, but not while the camera is in operation. When operated electrically, the "zoom" is controlled by a switch which can be secured to the panning handle. The speed of the "zoom" is constant with total travel requiring approximately 9 seconds. The motion is smooth and quiet with focus being maintained throughout.

Light efficiency is excellent as is the uniformity of focus over the raster. These compare very closely with standard 50, 90 and 135mm single purpose lenses. When used on a TK-40A/41 Color TV Camera, Field lens, MI-40802-A3 must be provided. An optional accessory is the MI-40530 Mounting Platform.

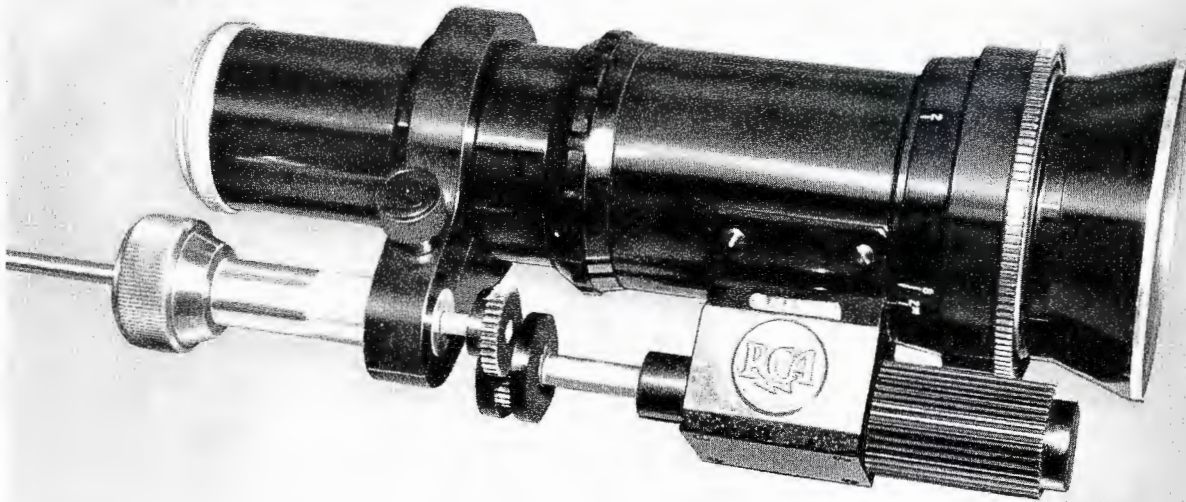
**SPECIFICATIONS**

Focal Length of Basic Dual Range Lens.....	2 $\frac{5}{8}$ " to 7" and 3 $\frac{1}{2}$ " to 10"
Speed .....	f2.8
Power Requirements.....	110 volts a-c (125 ma.)
Noise Level.....	No electrical interference No appreciable mechanical noise
Speed of Zoom.....	9 sec. (for full travel)
Size.....	Length 14", Width 7", Height 6 $\frac{1}{2}$ "
Weight (net).....	12 lbs. total (plate, 2 $\frac{1}{2}$ lbs.)
Stock Identification .....	MI-26549-4

**Accessories**

Extension Lens 4" to 12".....	MI-26549-6
Mounting Platform for Live Color Camera.....	MI-40530
Field Lens for TK-40A/41.....	MI-40802-A3

Note: In ordering for use on TK-11A/31A Camera, specify whether cradle or friction head will be used.



**FEATURES**

- **Maintains constant maximum aperture throughout entire zoom range—even at maximum lens opening**
- **4 to 1 zoom range and focal range 60mm to 240mm (2<sup>3</sup>/<sub>8</sub> to 9<sup>7</sup>/<sub>16</sub> inches)**
- **Fully color corrected**
- **High resolution and contrast at all lens settings**
- **Simple turret mounting for rigidity and ease of installation**
- **Attractive black anodized finish**

**USES**

The Berthiot B-4 and C-4 Type Lenses, MI-26633-1 and MI-26633-3, are high quality manually operated zoom lenses for use on RCA monochrome and color image orthicon cameras in the studio or on remotes. The Berthiot B-4, MI-26633-1, with an optical speed of f/5.9 is the economical choice for almost all monochrome studio productions and outdoor events. For color cameras and special applications of monochrome cameras where a faster lens is required, the Berthiot C-4 lens with a speed of f/3.8 is recommended. Both Berthiot lenses produce an image comparable to that of high quality fixed focal length lenses and therefore may be used in place of other lenses between the focal lengths of 60 to 240mm or 2<sup>3</sup>/<sub>8</sub> to 9<sup>7</sup>/<sub>16</sub> inches.

The two type lenses each have a zoom range of 4 to 1, which is greater than that of many other zoom type lenses available for studio use. The lenses are fully corrected for color for excellent detail rendition in either color or monochrome cameras. These lenses may be easily and rapidly interchanged between all RCA image orthicon cameras.

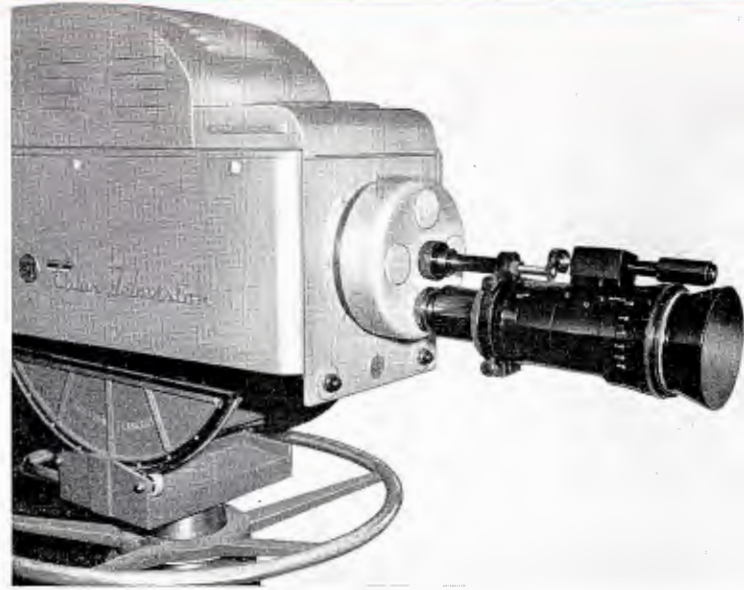
**DESCRIPTION**

The Berthiot B-4 and C-4 exhibit excellent resolution and contrast throughout the zoom range even at maximum aperture and maintain focus exceptionally well. Optical bench tests with the National Bureau of Standards optical test chart shows these lenses to be capable of resolving completely the finest line group on the chart. This represents a resolving power well in excess of any television system.

Each lens is equipped with a continuously variable iris diaphragm calibrated in "f" stops. The B-4 lens is adjustable between f/5.9 and f/44.0. The Type C-4 lens is adjustable between f/3.8 and f/22.0. The optical speed of the Berthiot lenses remains constant at the value indicated by the aperture adjustment throughout the entire zoom range. This is true even at the maximum aperture, which does not decrease as the lens is zoomed toward the long focal length position.

Each lens includes a lens shade holder for front lens or filter, and a carrying case. The black anodized finish on the lenses and mounting adapters presents an attractive appearance. The MI-26633-1 lens is supplied with mounting adapters for the RCA TK-11/31 and TK-10/30 series monochrome TV cameras. Mounting adapters for use of the MI-26633-1 lens with the TK-40A/41 color cameras are available on separate order. Mounting adapters for all three type cameras are supplied with the MI-26633-3 Type C-4 Lens.

The MI-26633-1 lens is 12½ inches long and weighs 7 pounds. The weight of the lens is taken up by the center turret shaft rather than at the turret lens flange, in order to maintain accurate optical and mechanical alignment. The maximum diameter is 4½ inches. Two and one half turns of the control rod are required to cover the entire



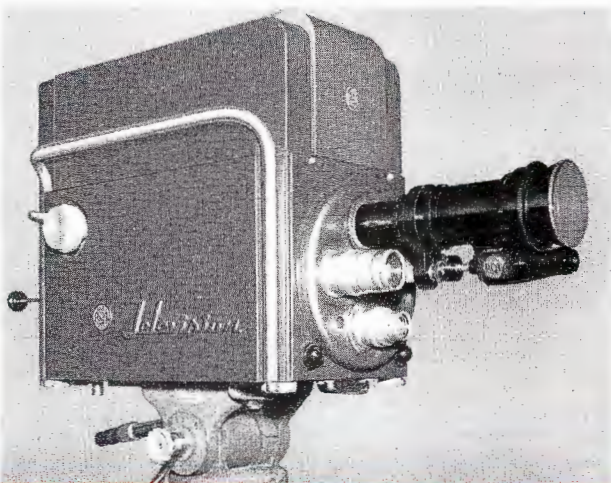
Berthiot C-4 Zoom Lens shown mounted on TK-41 Television Camera.

focus range of 7 feet to infinity, while 1¼ inch of longitudinal movement of the control rod covers a zoom range of 4 to 1 with a focal length range of 60 to 240mm.

The MI-26633-3 Type C-4 lens is similar in appearance and operation to the Type B-4, but has a maximum diameter of 6¼ inches in order to provide a faster optical speed of f/3.8. The length is 16 inches and the weight is 17½ pounds.

Standard RCA camera pan-and-tilt heads may be readily balanced to handle the added weight. The travel distance of the control rod for a complete zoom from 60 to 240mm is two inches. Three and one-quarter turns of the control rod are required to cover the entire focus range of 15 feet to infinity.

Berthiot B-4 Zoom Lens shown mounted on TK-11B Television Camera.



**SPECIFICATIONS**

	Berthiot B-4	Berthiot C-4
Zoom Range .....	60-240mm or 2¾"-9¾"	60-240mm or 2¾"-9¾"
Speed .....	f/5.9 to f/44.0	f/3.8 to f/22.0
Focus Range .....	7 ft. to infinity	15 ft. to infinity
Maximum Length (less shade) .....	12½"	16"
Lens Shade Length....	1½"	1½"
Maximum Diameter..	4½"	6¼"
Weight (including mounting) .....	7 lbs.	17½ lbs.
Stock Identification..	MI-26633-1	MI-26633-3

**Accessory Equipment**

- Control rod and support for mounting the MI-26633-1 Type B-4 lens on the TK-40 or TK-41 Color Camera.....MI-26633-2
- Field Lens required for TK-40 or TK-41 Color Camera when using either the type B-4 or C-4 Berthiot zoom lens.....MI-40802-A4

# STUDIO CAMERA PEDESTAL

TYPE TD-3A

## FEATURES

- Easily operated by one man
- Dual rubber-tired wheels for extra stability
- Counterbalanced camera is easily raised or lowered
- Storage compartments in base for extra weights, tools, etc.
- Arrows on steering wheel show direction of wheels
- Adjustable guards prevent wheels from running into cables
- Drag clutch to suit individual requirements



## USES

The Studio Camera Pedestal, TD-3A, offers complete mobility to cameras for normal studio requirements and needs only the cameraman to operate. The Pedestal provides for smooth, running dolly shots, raising and lowering of the camera while on the air, and smooth horizontal and vertical panning when used with the Friction Head, MI-26205-B, or Cradle Head, MI-26203-A. It gives a firm, stable mount to television cameras, resulting in more versatile operation and steadier pictures. The TD-3A has been especially designed for use in the studio and in other indoor places where telecasts might be made. It provides especial safety features for both operators, and programming equipment, cables and studio props.

## DESCRIPTION

The TD-3A Pedestal is illustrated above. An MI-26205-B Friction Head (not supplied) is shown mounted on the Pedestal. The Pedestal is quickly and easily moved in any direction by the cameraman. A steering wheel, which is directly below the camera at all heights, guides the three sets of dual wheels. Two types of steering are available:

- (1) Synchronous steering in which all wheels are locked parallel and turn simultaneously. This is best for tracking in a straight line.
- (2) Tricycle steering in which only the forward wheel turns with the steering wheel; the back wheels are locked parallel. This enables the Pedestal to be turned sharply in any direction.

The Pedestal may be changed instantly from one type of steering to the other without displacement of the camera. Six hard-rubber-tired wheels are mounted in pairs and equipped with ball bearings for smooth and silent rolling. Wheel cable guards can be raised or lowered as desired.

Since the camera is carefully counterbalanced with adjustable weights, it may be raised or lowered simply by lifting or pushing on the steering wheel or camera. Additional camera weight such as large lenses, lights, etc., is easily compensated for by the use of additional weights to counterbalance. A drag clutch is provided to suit individual requirements. A brake locks the column at any desired height. Raising, lowering, locking or drag adjustment can be made by the cameraman anywhere in the 360 degree position of the Pedestal without his having to stoop or bend. This makes it possible to raise or lower the camera while the Pedestal is in motion.

The Pedestal base is made of arc-welded steel; the center column of seamless steel tubing. It is finished in gray hammertone; the trim and steering wheel of satin chrome.



Arrows on steering wheel show direction of wheels. Lower ring locks column and controls drag.

**SPECIFICATIONS**

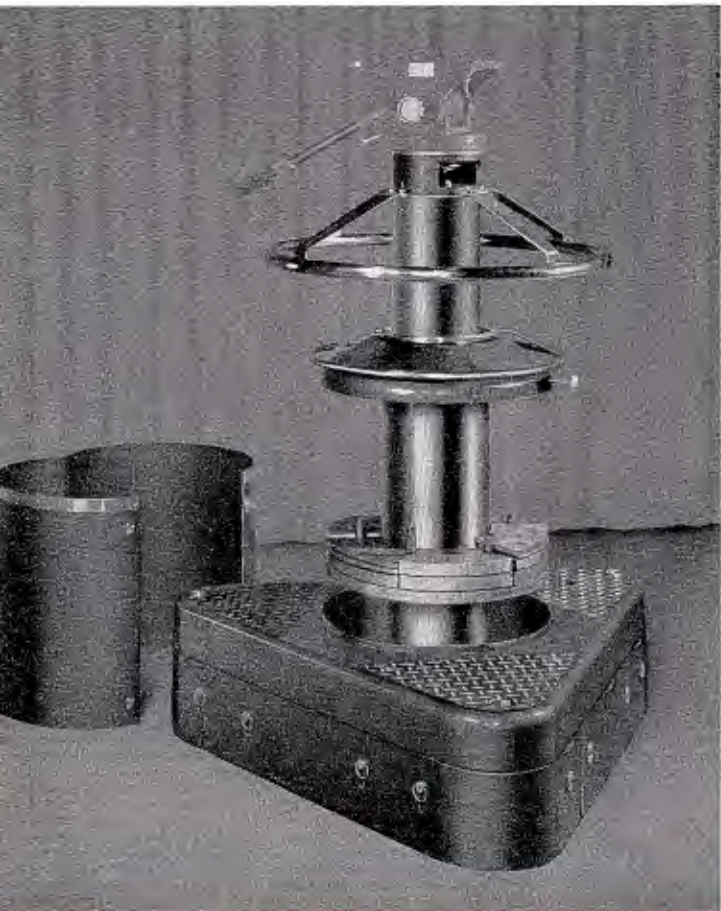
Overall Dimensions (not including Friction Head):

Height (maximum) .....	57"
Height (minimum) .....	36"
Width and Depth (maximum at base).....	38 1/4"
Width and Depth (minimum at base).....	34 1/2"
Net Weight .....	596 lbs.
Shipping Weight .....	750 lbs.
Stock Identification .....	MI-26036

TD-3A Pedestal, completely assembled, with lead counterweights stowed in base storage compartments.

**Accessories**

Friction Head .....	MI-26205-B
Cradle Head .....	MI-26203-A



◀ Pedestal with housing removed, showing placement of lead weights for counterbalancing camera.



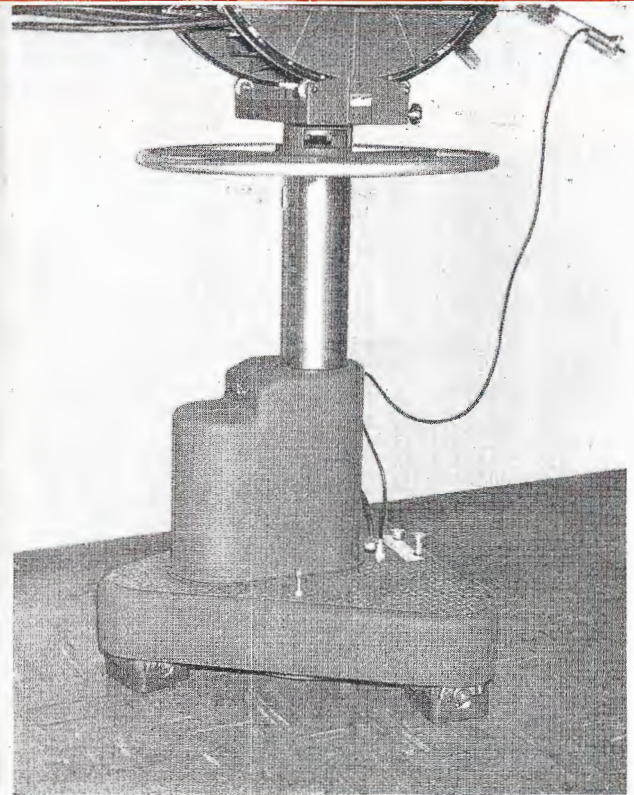
▶ Storage compartments in base provide convenient space for extra lead weights, tools, etc.

# MOTOR DRIVEN CAMERA PEDESTALS

Types TD-9C & TD-9M

## FEATURES

- Motor driven lift mechanism provides new ease and smoothness of operation—allows cameraman to raise or lower camera effortlessly without taking hands off camera control
- Adjustable height from 34 to 54 inches
- Lightweight — yet sturdily constructed to carry all types of studio cameras
- Seven-second cycling from maximum low to maximum high
- 1/3 h.p. drive mechanism shock mounted in sound proof casing
- Synchronous and tricycle steering offers complete mobility in small areas



## USES

The new Motor Driven Camera Pedestals, Type TD-9C and TD-9M, provide a convenient and useful mounting for the television camera. They are designed to provide maximum maneuverability and ease of operation for a single operator in the studio or other indoor telecasting site. Two models are provided by RCA: the TD-9C, MI-40861 with large 34" steering wheel, is designed to mount color television cameras, and the TD-9M, with 25" diameter steering wheel, is specified for monochrome and smaller type cameras. The TD-9C and TD-9M Pedestals are identical except for size of the steering wheel. The steering wheels are interchangeable so that one pedestal can be used for either color or monochrome cameras.

## DESCRIPTION

The TD-9C Motor Driven Camera Pedestal without camera mounted is illustrated above. The pedestal is quickly and easily moved in any direction by the cameraman by means of a steering wheel, which is directly below the camera at all heights, and guides the three sets of wheels. Two types of steering are available: synchronous in which all wheels are locked parallel and turn simultaneously, or tricycle in which only the forward wheel turns with the steering

wheel and the back wheels are locked parallel. The former is best for tracking in a straight line, the tricycle steering enables the pedestal to be turned sharply in any direction. The pedestal may be changed instantly from one type of steering to the other without displacement of the camera by means of a foot operated press-button control.

Pedestal height is controlled by a 1/3 h.p. motor which operates through a reduction gear and lifting cable. The entire drive mechanism is shock mounted and encased in a sound proof casing. The casing has three suit-case type catches which open for easy access to motor, relays, and associated control mechanism. The drive mechanism is operated by a single two-way (nominally off) control switch. The camera can be raised from lowest to highest position in 7 seconds. The direction is instantly reversible.

The pedestal has a ruggedly constructed re-inforced metal base with non-skid diamond pattern base plate, the column is of seamless tubing, and a special column head casting permits accessibility to the tilt or cradle head mounting nut. The base contains the a-c power socket and control cable connector. It rolls quietly on rubber-tired wheels. Adjustable cable guards are provided on each wheel to protect cables and other studio equipment. The pedestal is finished in umber gray and styled to match other RCA Studio television equipment.

**SPECIFICATIONS**

Power Requirements.....115 volts a-c, 60 cycle, 6 amps.

Overall Dimensions (not including friction or cradle head):

Height (maximum) .....53<sup>3</sup>/<sub>4</sub>"

Height (minimum) .....34<sup>1</sup>/<sub>2</sub>"

Width and Depth (maximum at base).....38<sup>1</sup>/<sub>4</sub>"

Width and Depth (minimum at base).....35"

Net Weight .....365 lbs.

Shipping Weight .....490 lbs.

**Stock Identification:**

TD-9C Pedestal (for Color TV Cameras).....MI-40861

TD-9M Pedestal (for Monochrome TV Cameras).....MI-26038

**Accessories**

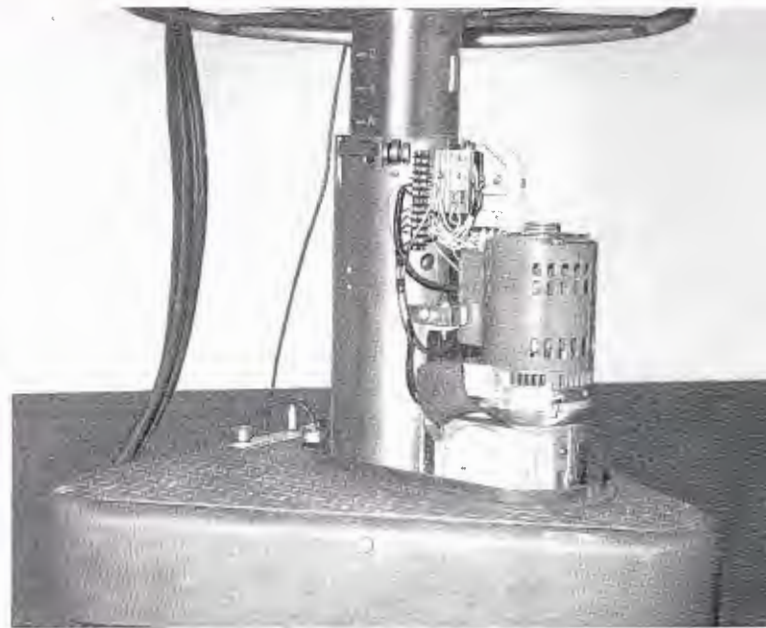
34" Diameter Steering Wheel.....MI-40862

25" Diameter Steering Wheel.....MI-26039

Color Cradle Head .....MI-40824

Camera Cradle Head.....MI-26203-A

Camera Friction Head.....MI-26205-B



TD-9C Pedestal with cover removed showing motor drive mechanism, relays and shock mounting



Versatile camera mountings for color and monochrome television cameras are essential for good programming in the modern television studio. RCA offers a wide choice of camera mounts for any type operation.



# LIGHTWEIGHT CAMERA PEDESTAL

## TYPE TD-7

### FEATURES

- Extremely light and maneuverable—ideal for the small studio
- Choice of parallel or tricycle steering
- Easy dollying
- Adjustable guards prevent wheels from rolling over cables
- Hand wheel easily adjusts height from 34 to 55 inches
- Low cost
- Sturdy construction for years of service

### USES

The TD-7 Lightweight Camera Pedestal provides a firm, stable mount for television cameras. The new pedestal is lightweight and maneuverable and designed with the small type TV studio in mind. It accommodates friction, cradle or any other standard type heads for smooth horizontal panning and vertical tilting. The pedestal is easily positioned in the studio or rolled for running dolly shots, and it has provisions for raising and lowering the camera quickly and easily. Better showmanship, more versatile camera effects and smoother television production can be achieved by the cameraman as a result of the new operating ease and better control afforded by the TD-7.

### DESCRIPTION

The TD-7 Lightweight Camera Pedestal is precision built of the finest metals—steel, aluminum, bronze—each tested and selected for its specific purpose and engineered to give years of dependable service. Weighing only 140 pounds, it is easily positioned in the studio or rolled to any studio point by the cameraman alone. It rolls smoothly and quietly on rubber-tired, ballbearing wheels. Adjustable cable guards are provided on each wheel to protect cables and other studio equipment.

The TD-7 features two types of steering: parallel steering, in which the three wheels are locked parallel and turn together; and tricycle steering, in which all steering is done with the rear wheel, while the front wheels are locked in parallel. The former type is used for straight-line tracking in running dolly shots, while tricycle steering enables the pedestal to turn sharply in any direction or to rotate around its own axis. Changing from one type of steering



to the other is accomplished by simply lifting the steering wheel. By rotating the wheel 180 degrees, it can be used either as a tee handle or a semi-circular steering wheel. The camera pedestal is quickly and easily raised or lowered by turning a hand wheel conveniently located on the side of the column. The center column and steering shaft are readily removed from the base for transporting the pedestal to field locations.

### SPECIFICATIONS

Overall Dimensions (not including Head):

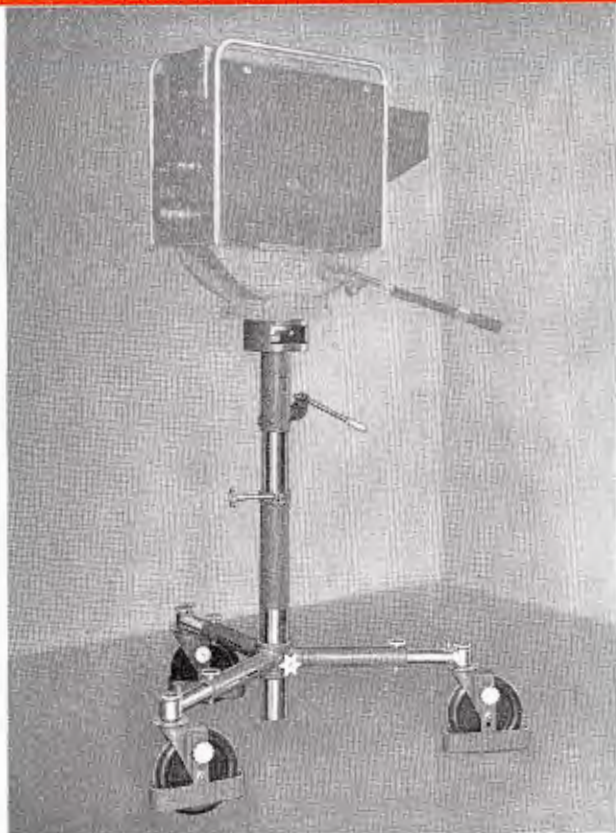
Height.....	55" max., 34" min.
Width.....	34" max., 30" min.
Net Weight.....	140 lbs.
Shipping Weight.....	200 lbs. (approx.)
Stock Identification .....	MI-26044

### Accessories

Friction Head .....	MI-26205-B
Cradle Head .....	MI-26203-A

# LIGHTWEIGHT HYDRAULIC PEDESTAL

## TYPE TD-10



### FEATURES

- Camera easily and rapidly raised with hydraulic lift
- Base legs adjustable to expand wheel spread
- Fully adjustable cable guards
- Large 8-inch diameter wheels for smooth dollying
- Swivel locks on wheels
- Low cost

### USES

The TD-10 Lightweight Hydraulic Camera Pedestal, MI-26053, is an attractive chrome-trimmed mount designed for use with RCA TK-11, TK-15, and other monochrome television cameras. This sturdy pedestal is an economical choice for many studio and field applications.

The TD-10 offers greater convenience and utility than a combination tripod and dolly at a comparable price. Set up time is held to a minimum. Between camera shots the hydraulic lift allows height adjustments to be made easily and rapidly for operator preference; an important feature not easily accomplished with the tripod and dolly. Simple adjustments to the legs may be made to expand the wheel base. The large wheels provide smooth dolly shots. The TD-10 pedestal meets the requirement for a camera mount that is easier to adjust in base width and height than the tripod-dolly combination, yet is more economical than pedestals which have the facility for providing smooth "on air" height adjustments.

### DESCRIPTION

The Type TD-10 Camera Pedestal features a hydraulic lift built into the lightweight center column to allow camera operator to easily raise the top of the pedestal to any desired operating height between 35 to 60 inches from the floor. The camera is lowered by simply releasing the hydraulic valve. A three-position positive lock is provided at the pedestal base for a coarse adjustment of pedestal height.

The pedestal comes complete with sturdy metallic three-legged base which eliminates the need of a mounting dolly. A three position positive lock is provided on each leg to extend the base to achieve maximum stability and maneuverability. The base dimensions may be expanded from 32 to 43 inches. Large eight-inch diameter wheels employ full caster ball bearings for smooth dollying action. They are provided with individually adjustable cable guards. A swivel lock is included on each wheel so that a fixed position may be maintained when desired.

The TD-10 Pedestal makes possible an attractive highly versatile mounting for monochrome cameras at a remarkably low price. Provisions are made for easy access to the head mounting nut. Any standard RCA cradle or friction head may be used. The pedestal is easily disassembled into a small package for transporting to remote locations.

### SPECIFICATIONS

Overall Dimensions (not including friction or cradle head):

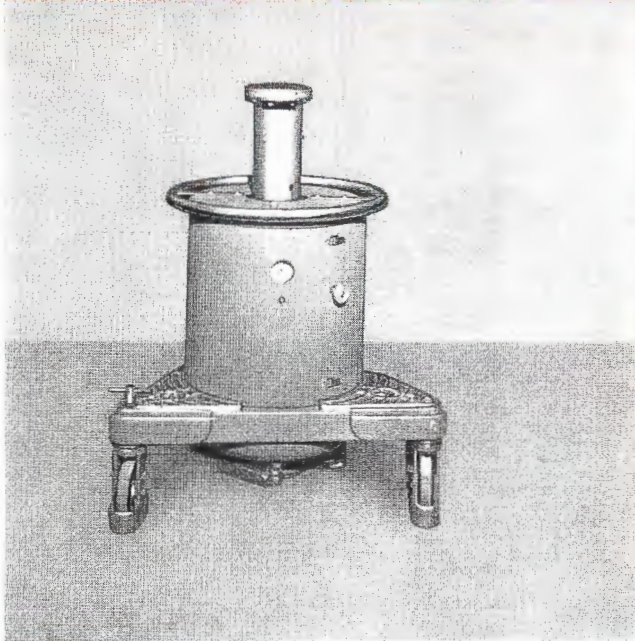
Height (maximum) .....	60"
Height (minimum) .....	35"
Base, not extended (minimum dimension).....	32"
Base, extended (minimum dimension).....	43"
Weight .....	76 lbs.
Stock Identification .....	MI-26053

### Accessories

Friction Head .....	MI-26205-B
Cradle Head .....	MI-26203-A

# PNEUMATIC-BALANCE CAMERA DOLLIES

Type PN6 Series



## FEATURES

- Lightweight unit with counter-balanced action easily does two-man dolly shots with single operator
- Versatility makes one-camera shows feasible
- Smooth effortless camera positioning in both vertical and horizontal planes
- Rotatable base—readily relocated anywhere in 360 degrees
- Light enough to be dollyed sideways, either direction, while “booming” up or down
- Welded steel construction—light but strong
- Simple, easy maintenance

## USES

The PN6 Series of Pneumatic-Balance Camera Dollies fill the need for a camera dolly that provides smooth, jerkless motion in both the vertical and horizontal planes, and consequently allows the most flexible camera performance.

Three models of Pneumatic-Balance Cameras are available: (1) the Model PN6-29 standard Pneumatic-Balance Camera Dolly; (2) the Model PN6-29B Pneumatic Dolly with Brake; and (3) Model PN6-33B Pneumatic Color Dolly with Brake. All camera pedestals may be used with either monochrome or color camera equipment, but the heavier type PN6-33B has been especially designed for the heavier type color cameras.

## DESCRIPTION

The Pneumatic-Balance Camera Dolly incorporates a closed air system reservoir. The camera mount is on a piston which rides in a cylinder on a cushion of compressed air. An encircling reservoir provides the storage space for excess air when the camera is at the lower heights. The spring-like effect of the compressed air on the piston results in a practically weightless camera load. Addition of air may be made through the use of an ordinary tire pump, a transfer bottle, or a compressor.

The Pneumatic-Balance Camera Dolly is a flexible lightweight unit. In addition to the counter-balanced action on the elevation adjustment, the dolly is easily moved about the studio by a single camera operator. It is equipped with ball-bearing, rubber-tired wheels providing silent, smooth and effortless movement. Cable guards act as pushers on any cables that may be in the line of travel.

Due to the fact that there is practically no loss in the closed air system, replenishment of the air supply in the dolly is seldom needed. In case of a change of camera load, the pressure in the system is readily compensated.

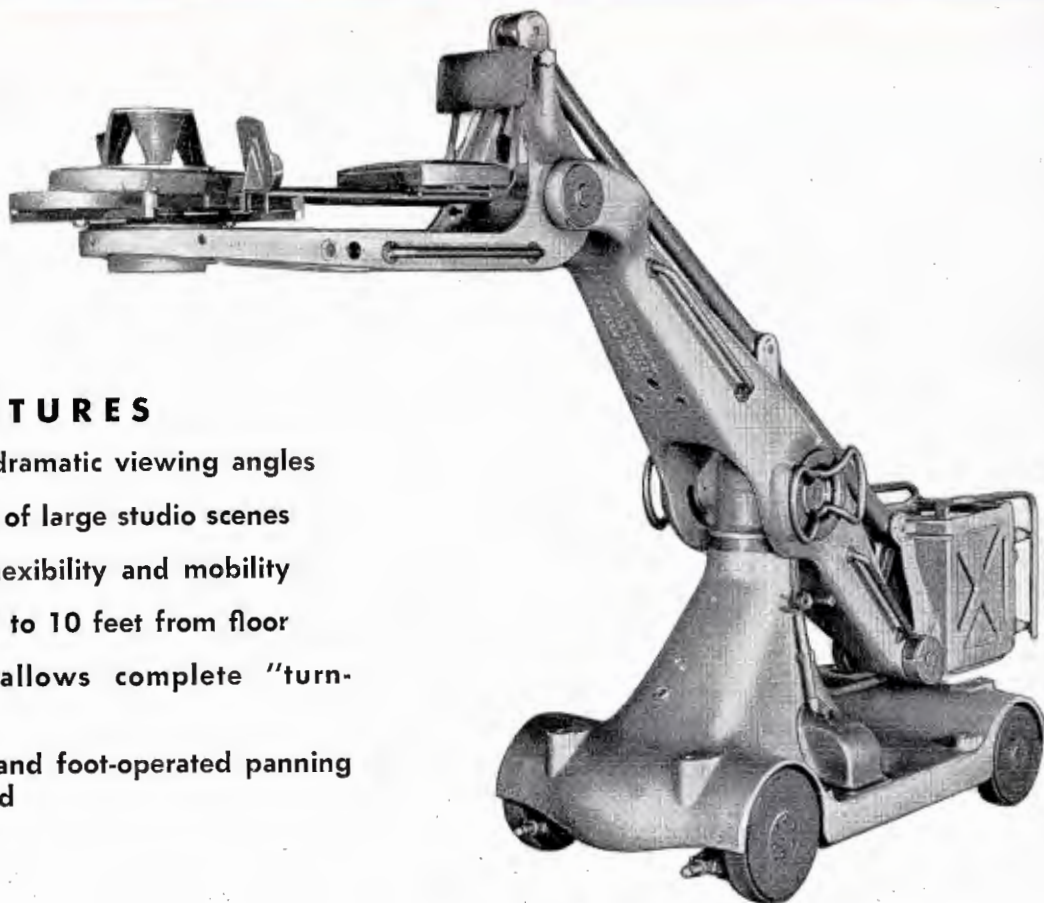
A special brake control mechanism is available on the Models PN6-29B and PN6-33B. This consists of a three-position switch which provides desired height adjustment and locking as well as free-wheeling on the dolly column. A larger wheel base and larger diameter steering wheel make the PN6-33B Model especially suitable for color television cameras.

## SPECIFICATIONS

Air Requirements.....	1/3 weight of camera load. Test at 400 P.S.I.
Cable Guards.....	Adjustable from 1/8" to 1" above floor, welded steel for durability
Base Positioning.....	Can be re-positioned anywhere in 360° circle by lifting "T" handle on one corner
Weight .....	315 lbs.
Height.....	31" to 51" over panhead mount
Wheel-Base.....	29" center to center or 33" for larger (color) cameras
Wheels.....	6" rubber-tired, ball-bearing with Alemite grease fittings
Electric Column Brake.....	Provided on PN6-29B and PN6-33B models, and available as a field change kit for PN6-29 at an additional charge

# TELEVISION STUDIO CRANES

TYPES TD-30B



## FEATURES

- Makes possible dramatic viewing angles
- Smooth panning of large studio scenes
- Provides great flexibility and mobility
- Lens height of 2 to 10 feet from floor
- Steering unit allows complete "turn-around"
- Operator's seat and foot-operated panning controls provided

## USES

The Houston Television Cranes enable the operator to obtain dramatic viewing angles, smooth panning of large scenes, approaches and retreats that add life and interest to television programs. The equipment is designed to mount either Monochrome or Color Image Orthicon TV Cameras.

## DESCRIPTION

The Model TD-30B DeLux Television Crane provides a lens height of from 2 to 10 feet from the floor, full 360-degree panning around the crane base, 180-degree panning of the turret table, and 100-degrees up and down lift. The

crane will pass through a doorway 36 inches wide by 6 feet high, and weighs approximately 1200 pounds. The crane consists of the base, platform, boom arm, and parallel arm made of cast aluminum alloy, the weight box, the center post with panning and tilt brake, the steering unit and the turret table. The optional equipment that determines the type of crane consists of the drive unit, jacks and hydraulic pump.

The turret table is an integral part of the crane and is permanently mounted on the platform. It is capable of 180-degree rotation, and contains the operator's seat, foot pedals for rotating the turret table and an adjustable friction type turret lock within the operator's reach.

The center post is a telescoping tube. It permits the boom to be panned a full 360 degrees and lifted up 55 degrees and down 45 degrees from the horizontal position. A hydraulic cylinder with 15-inch extension is mounted in the telescoping tube. It is manually operated by a hydraulic pump with the handle on the side of the base. A flow restrictor, located in the cylinder base, limits the down stroke speed in case of accidental damage to the hydraulic lines. The panning brake is hand-operated by moving the small lever on the base. It can be adjusted to any degree of friction desired. An automatic locking pin prevents the use of the hydraulic pump when the panning brake is out of its neutral position. The tilt brake is operated by handles on both sides of the boom casting and can be set to any degree of friction.

The steering unit is of a special design that permits the crane to be completely turned around within a 6-foot radius and it allows it to be placed squarely against a wall with very little maneuvering. It incorporates a "lock-preventing arm" which allows a sharp turn without running the risk of jamming the steering mechanism.

The motor drive unit consists of a specially designed 2-hp 110 volt d-c series-wound motor, supported on rubber mounts. It is coupled to a 10:1 differential drive by a Morse-Morflex Coupling to provide smooth silent opera-

tion. A control unit that contains the motor control, reversing switch and brake control permits various degrees of acceleration and deceleration. The control unit (not shown) can be operated at the crane, or remotely, if desired. The brake is a solenoid-operated friction, air-cooled disk type, controlled by a carbon pile that gives the operator a braking power proportional to the pressure applied to the brake handle.

## SPECIFICATIONS

Main Boom Panning Angle.....	360°
Turret Table Panning Angle.....	180° or 90° each side of center
Overall Length (maximum).....	13 ft. approx.
Overall Height (maximum).....	8½ ft. approx.
Overall Width .....	3 ft. approx.

### Type TD-30B Deluxe Television Crane

Complete with Power Drive, Remote Control Unit, Hydraulic Lift, Jack Assembly, Electrical Circuitry, Model TCT Turret Table, and MI-26190-3 Hi-Hat.

Shipping Weight (crated).....	3250 lbs. approx.
Stock Identification .....	MI-26037-1

### Accessories

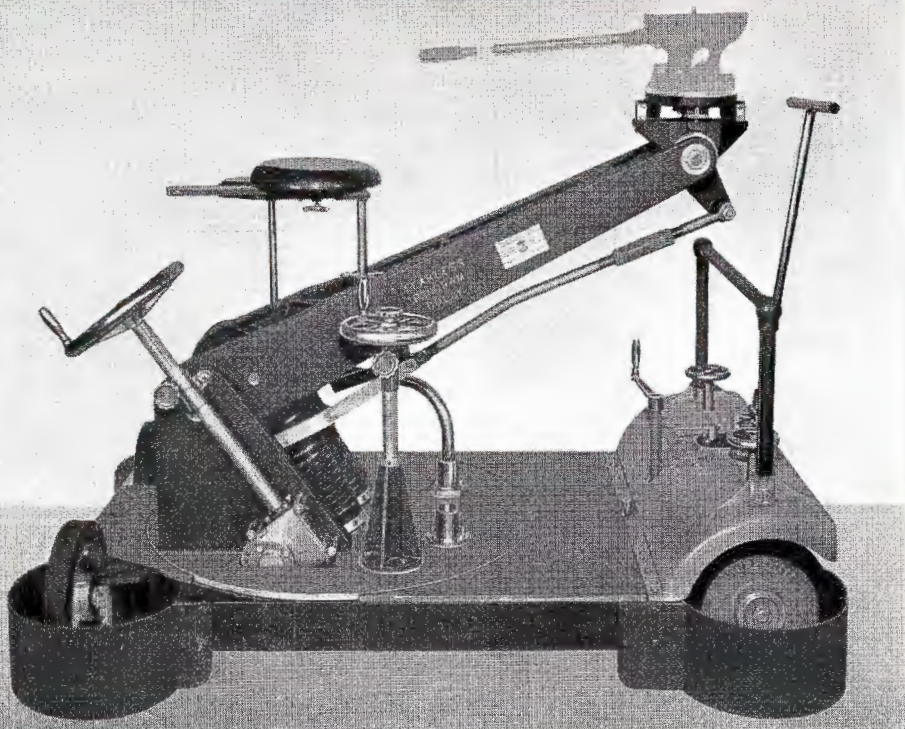
Friction Head .....	MI-26205-B
Cradle Head .....	MI-26203-A
Color Cradle Head .....	MI-40824



The Television Studio Crane shown at left is equipped with Studio Camera. Lens heights up to 10 feet from floor make dramatic viewing angles possible.

# STUDIO CAMERA DOLLY

TYPE TD-5AM and TD-5AC



## FEATURES

- Rubber-tired wheels insure smooth, quiet movement
- Provision for turning rear wheels 90 degrees
- System of counterbalanced weight makes controls easy to operate
- Stops provided for holding dolly in fixed position
- Finished in umber gray wrinkle and stainless steel

## USES

The TD-5A Camera Dolly is designed for use in television studios. One of the most important uses of the dolly is to dolly the camera in and out of scenes. The boom upon which the camera is mounted can be raised or lowered, or swung completely around. Shots can be made from unusual angles, and movement of the camera can be slow and steady. Thus, it provides the television station with facilities to produce more effective, more interesting programs. The TD-5A is usually manned by two operators, one who maneuvers the dolly and the other who trains and focuses the camera. Two models are available—the MI-26040 unit for use with Monochrome TV cameras and the MI-40823 for use with Color TV cameras.

## DESCRIPTION

TD-5A Studio Camera Dollies are similar to those used in film productions. An important difference is that the rear wheels of the television dolly can be turned at right angles as shown in the photo. This allows the rear end of the dolly to be swung around, while the front end of the chassis pivots on a castor. The castor is lowered simultaneously with the turning of the rear wheels. The control for this

operation is the "trolley-switch" handle near the front of the chassis. This feature of turning the wheels and lowering a fifth wheel permits the dolly to be moved sidewise, which is of course advantageous in small studios. The crane boom on which the camera is mounted can be raised to a height of 74 inches (above the floor) or lowered to a height of 23 inches. This boom is raised and lowered by the inclined control wheel at the rear. The control wheel in front of this turns the boom turret on the chassis. Mechanical design is such that very little effort is required to turn the control wheels.

## SPECIFICATIONS

Overall Dimensions (without Friction Head):	
Height (Maximum) .....	68"
Length (Including Boom).....	81"
Length (Chassis) .....	65"
Width (Chassis) .....	35"
Weight .....	745 lbs.
Stock Identification:	
TD-5AM Studio Camera Dolly (for Monochrome Cameras).....	MI-26040
TD-5AC Studio Camera Dolly (for Color TV Cameras).....	MI-40823

## Accessories

Friction Head .....	MI-26205-B
Cradle Head (Monochrome Cameras).....	MI-26203-A
Cradle Head (Color Cameras).....	MI-40824

# PORTA TRIPOD AND DOLLY

TYPES PT6-A and PB6-A



## FEATURES

- Maximum versatility in a camera mount—ideal for use in studio or field
- Replaces requirement for tripod, baby tripod, hi-hat, triangle, and parapet mounts
- Rugged, sturdy, simple construction—no light castings to break
- Portable—easily collapsed into compact, lightweight units quickly readied for transport
- Rugged dolly base available for varying requirements

## USES

The Porta Tripod, Type PT6-A, offers a full range of easy and convenient height adjustments from a full 56-inch elevation for awkward, hard-to-get, high-angle shots down to a low-level 8-inch Hi-Hat mounting for "dug-out" shots. The equipment is at home both in the studio or in the field, and is excellent for narrow-aisle dolly shots or remotes. A collapsible and versatile Dolly, Type PB6-A is available for mounting.

A dolly with telescoping legs is available and can be quickly mounted to the tripod with three bolts. The dolly's full-castering, rubber-tired wheels insure smooth, instant mobility in any direction. Wheels are equipped with permanently lubricated ball bearing throughout. Telescoping legs comprised of tubular members of square cross-section provide strength and rigidity. A simple clamping device locks the tripod firmly in place on the dolly legs. Adjustable, wrap-around cable guards prevent interference with camera movements.

## DESCRIPTION

The Porta Tripod and Dolly folds compactly to a light-weight portable package, and opens with a trilateral extension permitting a low-to-high range of 8 to 56 inches. A sliding camera shaft allows height adjustment over a 21-inch range without re-leveling legs. The extension elements are equipped with simple-hand-turned locking mechanisms for easy and rapid individual release and lock. Self-leveling, rubber-faced contact pads provide automatic adjustment to ground. Spur tips are instantly available where conditions make them preferable.

## SPECIFICATIONS

Tripod Weight.....	30 lbs.
Dolly Weight.....	40 lbs.
Combined Weight.....	70 lbs.
Height Range of Tripod Adjustability.....	8" to 56"
Dolly Wheel Diameter.....	.6"
Cable Guard Height.....	Adjustable from $\frac{1}{16}$ " to 1" above floor
Stock Identification:	
Porta Tripod.....	Type PT6-A
Porta Dolly.....	Type PB6-A

# METAL TRIPOD

## TYPE TD-11A



### FEATURES

- Three-point leg bracing with individual tie rods and sturdy center post insure rigidity and stability
- Extremely light in weight—yet rugged in design
- Folds into small, compact, self-locking package for carrying
- Individual leg calibrations aid in accurate positioning and adjusting
- Attractively finished in deep umber gray wrinkle and hard chrome

### USES

The type TD-11A tripod is designed to support all types of RCA television studio and field cameras (with friction head MI-26205-B, or cradle heads MI-26203-A and MI-40824). When used with television tripod dolly type TD-15A, it provides a maximum of convenience and mobility for dollying operations.

### DESCRIPTION

The type TD-11A consists of an all-metal tripod structure of aluminum castings and tubular steel construction which provides a compact, lightweight, yet rugged design. It folds into a small-size unit which is easily portable. When collapsed for carrying, legs are latched to the center stabilizing post, thus preventing leg spread during transport.

In operation the TD-11A provides a "working-height" range of approximately 25 to 42 inches. Outstanding in design are individual tie rods which connect to and brace all tripod legs (these same three tie rods also couple to the center stabilizing post and provide a stable, rigid support).

The lower tubular portion of each leg is easily adjusted and slides within a long-length bearing which is held to close tolerances. Thus, minimum play and maximum rigidity are assured throughout the working range. When tripod

legs are adjusted for desired height, they may be locked in position by means of hand-operated clamp screws. Calibration numbers are engraved on the lower legs to simplify leveling. The lower end of each leg is provided with a self-aligning, universally-mounted casting, which in one plane has a flat surface for use on level flooring—and in another plane has a steel spike for use on rough surfaces. The flat-surface also provides a suitable mounting for use with Tripod Dolly, TD-15A.

### SPECIFICATIONS

Recommended Operating Heights:	
Minimum .....	25 $\frac{5}{8}$ "
Maximum .....	42 $\frac{1}{2}$ "
Maximum Diameter at Feet (legs extended).....	70"
Dimensions (folded for transport):	
Overall Height (legs collapsed).....	31 $\frac{5}{8}$ "
Overall Diameter .....	10"
Net Weight .....	25 lbs.
Stock Identification .....	MI-26046

### Accessories

Color Camera Cradle Head.....	MI-40824
Camera Cradle Head.....	MI-26203-A
Camera Friction Head.....	MI-26205-B
Tripod Dolly, Type TD-15A.....	MI-26042-A



# TRIPOD DOLLY

TYPE TD-15A



## USES

The TD-15A Tripod Dolly is designed for use with the TD-11A Tripod fitted with television cameras. When tripods are used indoors, which is very often the case, use of the dolly precludes any possibility of marring the floor, and provides greater mobility for the tripod. Used in the field with reasonably flat terrain, the dolly makes it convenient and easy to change the position of the tripod.

## DESCRIPTION

The TD-15A Dolly consists of a lightweight triangular-shaped steel structure supported on three swivel wheels, five inches in diameter. The finish is hard chrome. For convenience in transporting, the dolly folds into a package 8 by 14 by 29 inches. When extended and fastened to the tripod, it occupies a circular area 57 inches in diameter. The dolly is fastened firmly to the tripod by a clamp at each leg. Spring-loaded stop feet at each wheel serve to hold the tripod in a fixed position. Wheels may be removed readily if such should be required.

As each wheel is on a swivel, the course can be easily changed by merely pushing in the proper direction. Caster locking devices at each wheel make it possible to lock two

## FEATURES

- Provides mobility for tripod camera mounting
- Folds into compact lightweight self-locking portable package
- Large diameter 5-inch wheels permit easy movement
- Wheel stops provide for locking tripod in position
- Tripod firmly locked to dolly

or all three wheels in a parallel position, enabling the dolly to track in a straight line for rolling dolly shots, closely simulating results obtained with more expensive equipment.

## SPECIFICATIONS

Dimensions (unfolded and extended):

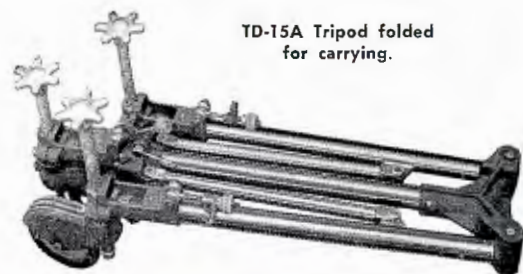
Height .....6"  
Diameter .....57"

Folded for Transport:

Height .....8"  
Width .....14"  
Length .....29"

Net Weight .....25½ lbs.

Stock Identification .....MI-26042-A



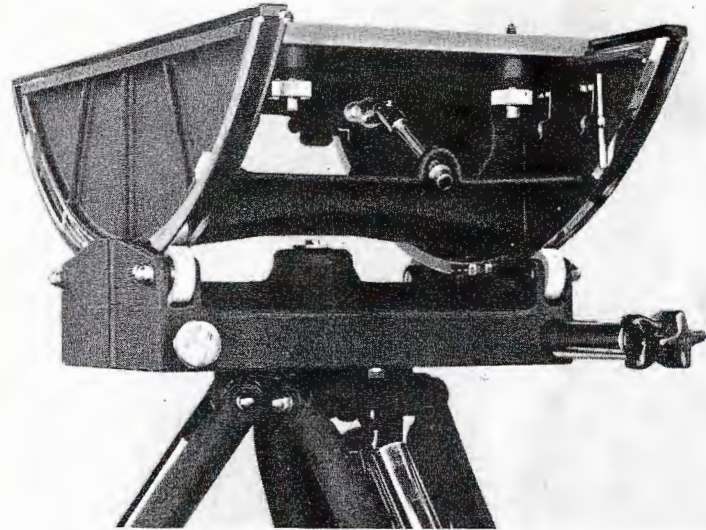
TD-15A Tripod folded  
for carrying.

# TELEVISION CAMERA CRADLE HEADS

MI-40824 and MI-26203-A

## FEATURES

- New ease of camera operation
- Perfect balance
- Rugged construction
- Adapted to fit all standard tripods, pedestals, dollies, cranes or hi-hats
- No counterbalancing springs to get out of adjustment or to produce noise



Color Camera Cradle Head, MI-40824

## USES

The MI-40824 Cradle Head is designed especially for use with the RCA Color Image Orthicon Cameras, while the MI-26203-A Cradle Head is specified for the Monochrome Image Orthicon Cameras. The Color Cradle Head fits all standard heavy duty pedestals, dollies, cranes, tripods or hi-hats, and the Monochrome Cradle Head may be used with the same units as well as the TD-7A Lightweight Camera Pedestal, and lightweight Mounting Adaptors.

The cradles provide a new balance and ease of camera operation. When the camera is tilted up or down, the cradle rotates around a constant center of gravity, maintaining absolute balance at all times. There are no counterbalancing springs to get out of adjustment or to produce noise. Panning action is accomplished with the same ease as the tilt action due to precision ball bearing construction. The heads have special flexibility for both studio or outdoor camera operation.

## DESCRIPTION

Sturdy rigid aluminum castings are used for all major parts of the new Monochrome and Color TV Camera Cradle Heads to provide and maintain accurate alignment. Separate cradle tracks allow for replacement in case of damage. The new mountings feature perfect balance around a constant center of gravity when tilting or panning.

The camera with all accessories attached, can be balanced perfectly when mounted on the head without loosening the camera hold-down screws. This is accomplished by moving the top camera plate on the head forward or back with a lead screw.

◀ Monochrome Camera Cradle Head, MI-26203-A



Tilting is controlled by an adjustable handle, which comes mounted with the Monochrome Model. The Color Cradle Head is controlled by the camera handle itself. Four phenolic-covered ball bearing rollers mounted in the base of the head support the cradle. The cradle tracks ride on these bearings, providing smooth, quiet operation. The head tilts down 38 degrees and up 30 degrees. Stop blocks prevent the cradle from riding off the bearings at the extreme limits of travel. The amount of drag on the tilt is controlled by a convenient knob, provided with a vernier differential screw for fine adjustment.

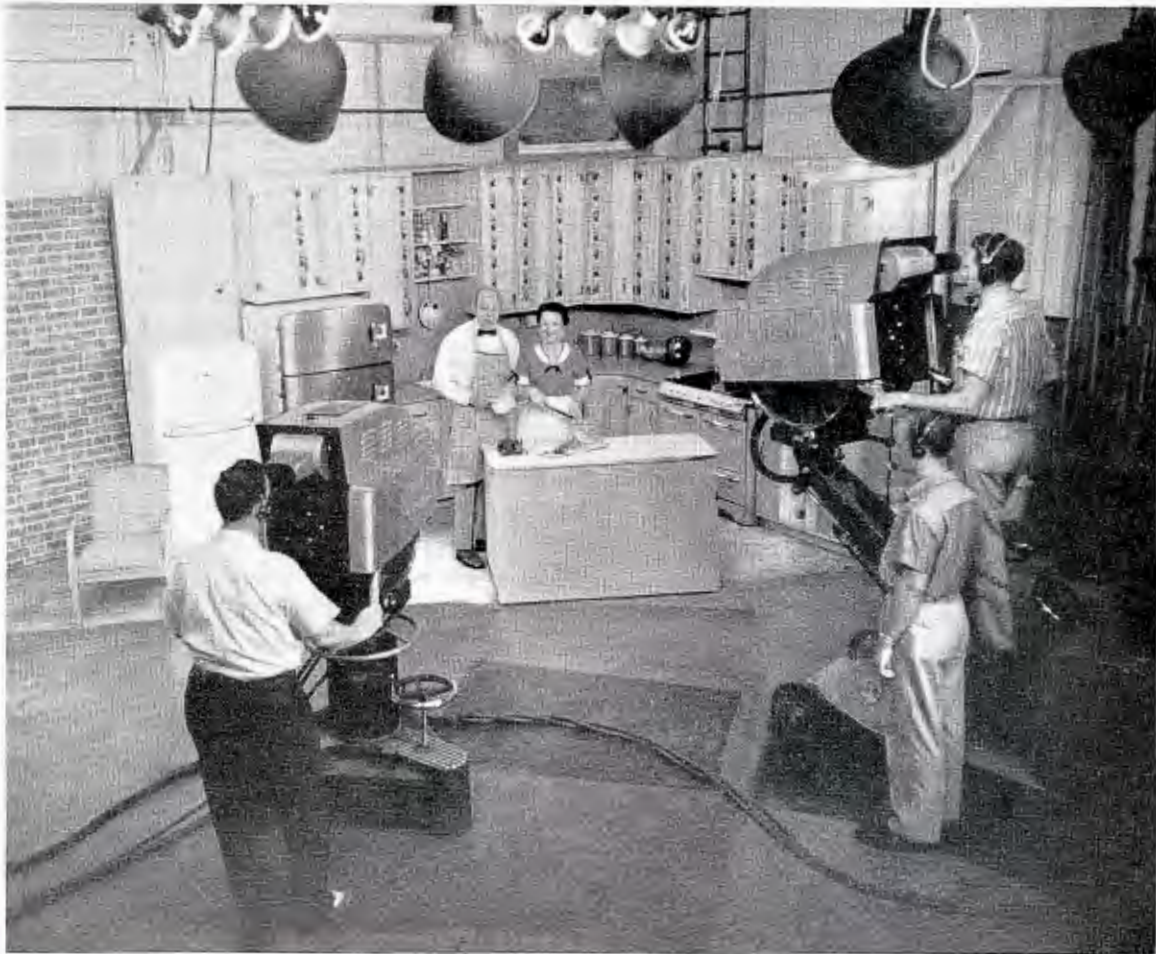
Panning action is accomplished by two precision ball bearings in the base of the head which carry the vertical load. All ball bearings are of the sealed type and require no

service lubrication for the life of the unit. Drag adjustment is provided on the tilt. Brakes on the pan and tilt quickly lock the camera in a fixed position.

### SPECIFICATIONS

	Monochrome Cradle Head	Color Cradle Head
Angle of Rotation.....	360°	360°
Top Plate .....	67/8" wide x 5" long	12" wide x 14" long
Height .....	71/4"	101/2"
Weight .....	26 lbs.	55 lbs.
Shipping Weight .....	45 lbs.	90 lbs.
Control Handle .....	Supplied	Not supplied
Finish .....	Umber gray	Umber gray
Stock Identification .....	MI-26203-A	MI-40824

Cradle heads provide flexibility for both studio or outdoor operation, and they fit all standard pedestals, dollies, cranes, tripods or hi-hats.



# REMOTE CONTROL CRADLE HEAD

Type MCH-5, for Monochrome Cameras

## FEATURES

- Permits remote controlled pan and tilt of one or more cameras from a central control location
- Allows camera placement in locations inaccessible for manual operation
- Silent operation for studio use
- "Joy-stick" type of control
- Can be used on any RCA tripod, pedestal or crane
- Can be disengaged for manual operation of camera

## USES

The Type MCH-5 Remote Control Cradle Head is an ideal mount for all RCA monochrome TV studio cameras or the Type TK-45 Vidicon Color Camera permitting one or more cameras to be operated from a remote location. A remote controlled zoom lens may be used in conjunction with the MCH-5 to add remote focus, remote iris, and remote zoom to complete the flexibility of remote camera operation. The MCH-5 permits unattended camera operation and the positioning of cameras at points inaccessible for manual operation.

## DESCRIPTION

The Type MCH-5 Remote Control Cradle Head includes features of the standard RCA monochrome cradle head that has proven itself over years of satisfactory operation. Sturdy aluminum castings are used for all major parts to provide and maintain accurate alignment. Cradle type construction features perfect balance around a constant center of gravity when tilting or panning.

Two series-type motors drive the cradle head during panning and tilting. Direction and speed of movement are controlled by rheostats operated by a "joy-stick". The azimuth motor rotates the head through a 370 degree angle by means of a worm drive within the cradle base. Elevation is controlled by a friction drive through the

cradle guide rollers. The entire mechanism is designed to mount on any of the various RCA tripod, crane or pedestal mounts. The motors are mechanically isolated from the base by means of rubber shock mounts and are enclosed within sound proof housings. Adjustable limit switches are provided for both azimuth and elevation.

The camera with all accessories attached can be balanced perfectly when mounted on the MCH-5 without loosening the camera hold-down screws. This is accomplished by moving the top camera plate on the head forward or back with a lead screw. A pan and tilt handle is provided with the head in case manual operation is desired. Four phenolic-covered ball bearing rollers mounted in the base of the head support the cradle. The cradle tracks ride on these bearings, providing smooth, quiet operation. The head tilts down 38 degrees and up 30 degrees from horizontal. The amount of drag on the tilt is controlled by a convenient vernier differential screw for fine adjustment.

The remote control panel can be console or rack mounted. At the center of the panel is located the lever or "joy-stick" for control of pan and tilt. The camera moves in the direction the lever is moved. Both pan and tilt may occur simultaneously if desired. The speed of the movement is also controlled by the lever. The further it is moved from the normal vertical position, the greater the speed. On and off switches also are located on the panel as well as a power-on indicator lamp. More than one control location can be accommodated with delegate switches to select the direct control point.

## SPECIFICATIONS

Angle of Rotation.....	370°
Elevation.....	38° down and 30° up
Control Handle .....	Supplied
Motor Controls.....	Two 1/30 h.p. series-type motors
Power Requirements.....	115 volts, a-c, 50/60 cycle, single phase
Top Plate Dimensions.....	.67 <sup>5</sup> / <sub>8</sub> " wide x 5" long
Height of Mounting Head.....	9"
Weight.....	Approx. 40 lbs.
Shipping Weight.....	Approx. 60 lbs.
Finish .....	Umber Gray
Stock Identification.....	Type MCH-5

# HI-HAT MOUNTING ADAPTOR

MI-26190-3



Hi-Hat, MI-26190-3.

## FEATURES

- Convenient mount for television cameras in studio or field
- Easy to install
- Cast aluminum construction

## USES

The Hi-Hat Adaptor, MI-26190-3 is designed to serve as a television camera mount for use in restricted quarters where a tripod may not prove convenient. Installation of the adaptor may save time on fixed location from which frequent pick-ups are made. The adaptor is also used to mount RCA microwave relay equipment.

## DESCRIPTION

The MI-26190-3 Hi-Hat is a lightweight aluminum adaptor designed to accommodate either a camera friction head, MI-26205-B, camera cradle heads, MI-26203-A, or MI-40824, or relay antenna tilt head, MI-26204. All are machined to a top diameter of 7 inches and a base mounting diameter of 10¼ inches. The Hi-Hat adaptor is 6 inches high, and has a deep umber gray wrinkle finish. The adaptor may be used in combination with parapet clamp, MI-26189.

## SPECIFICATIONS

Construction.....	Cast aluminum, deep umber gray finish
Height .....	6"
Net Weight.....	2½ lbs.
Stock Identification .....	MI-26190-3

## CAMERA FRICTION HEAD, MI-26205-B

### USES

The MI-26205-B, Friction Head, is designed especially for use with the RCA Monochrome Image Orthicon Cameras and may be mounted on any of the RCA type pedestals, tripods or hi- or lo-hat adaptors. The Friction Head is mounted on these units by means of a single hand-operated wing nut, which is furnished with the Friction Head.

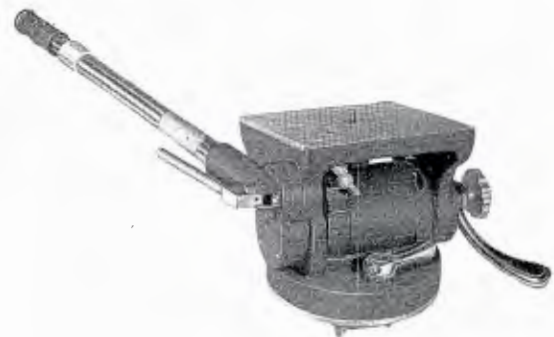
### DESCRIPTION

The MI-26205-B, Friction Head, is of rugged all-metal construction, in which all materials have been carefully selected for both field and studio use. An outstanding feature is the unique balance spring adjustment provided to compensate for camera unbalance.

Since all castings used are aluminum, the friction head is light, yet sturdy, and lends itself to extreme portability. All visible surfaces of the castings are attractively finished in deep umber gray wrinkle and present a very neat appearance.

Rotation through 360 degrees in azimuth and ample tilt, up and down, are provided for operation with the RCA cameras. Extremely smooth in operation, RCA Field and Studio Cameras when mounted on this unit are well bal-

anced in any position of tilt, by means of specially designed counterbalance springs. Thus, a minimum of effort is required by the camera operator.



## SPECIFICATIONS

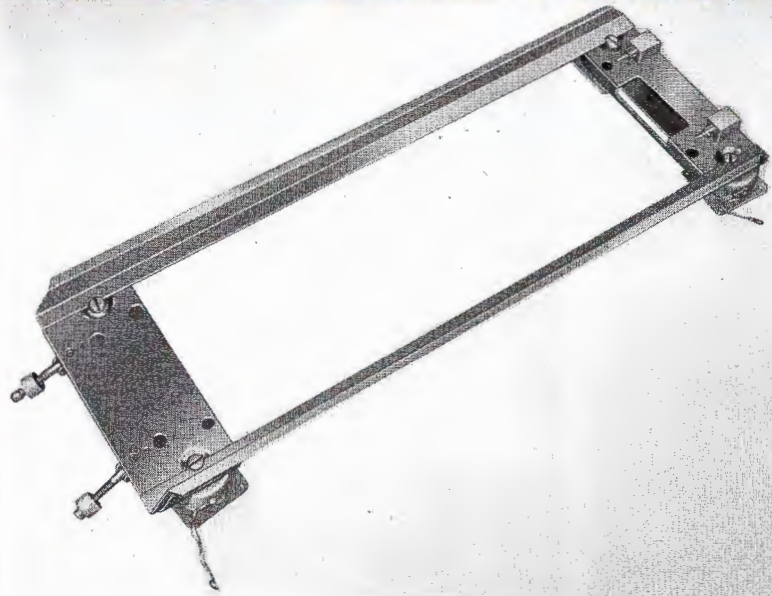
Dimensions:	
Overall Height .....	8¼"
Overall Length .....	8½"
Overall Width .....	13"
Weight (including panning handle).....	28 lbs. (approx.)
Finish.....	Dark umber gray wrinkle
Angle of Rotation.....	360°
Stock Identification .....	MI-26205-B

# SHOCK MOUNTS

## MI-26511 SERIES

### FEATURES

- Afford added life and protection to field television equipment
- Barry type mounts absorb harmful shock and vibration
- Sturdily constructed of stainless steel
- Protective cadmium plated finish
- Equipment slides into place with added ease



### USES

Shock mounts are available for use with all RCA Field TV Camera Equipment. These mounts are designed to protect the camera chain from harmful shock and vibration during transportation and normal field usage. The MI-26511-A1 mounting base is designed for use with the Field Camera Control, Switcher, Power Supply and Sync Generator Units; MI-26511-2 is used with the Field Master Monitor, and MI-26511-3 is specified for the Field Camera and View Finder.

### DESCRIPTION

A variety of slide-type mounting racks with Barry-type rubber shock mounts able to withstand loads up to 50 pounds each are carried in different base sizes to accommodate all Field Television Camera Equipment units. The chassis shock mountings are made of .063" stainless steel with Barry-type rubber mounts grounded to the frame by flexible strap or similar means. All steel fasteners and parts other than stainless steel are protectively plated with cadmium. Two spring-loaded index pins grip the equipment through holes in the rear of the chassis, while lock down clamps bolt the equipment into place from the front so that the equipment is securely lashed down at all times. Each mount is  $2\frac{3}{8}$  inches square by  $1\frac{17}{32}$  inches high and has four .234-inch diameter mounting holes spaced  $1\frac{13}{16}$  inches apart. The shock mounts accommodate the  $\frac{1}{4}$ -inch diameter clamping thumbscrews. Each mount is capable of withstanding loads up to 12 pounds.

### SPECIFICATIONS

#### Shock Mounting for Field Camera Control, Switcher, Power Supply and Sync Generator Units:

Dimensions:	
Overall Length .....	$28\frac{5}{16}$ "
Inside Width .....	$8\frac{3}{16}$ "
Free Height .....	$1\frac{13}{16}$ "
Mountings.....	Four rubber mounts to support 13 to 31 lbs. each, spaced $22\frac{33}{64}$ " x $7\frac{1}{6}$ " apart
Stock Identification .....	MI-26511-A1

#### Shock Mounting for Field Master Monitor Unit:

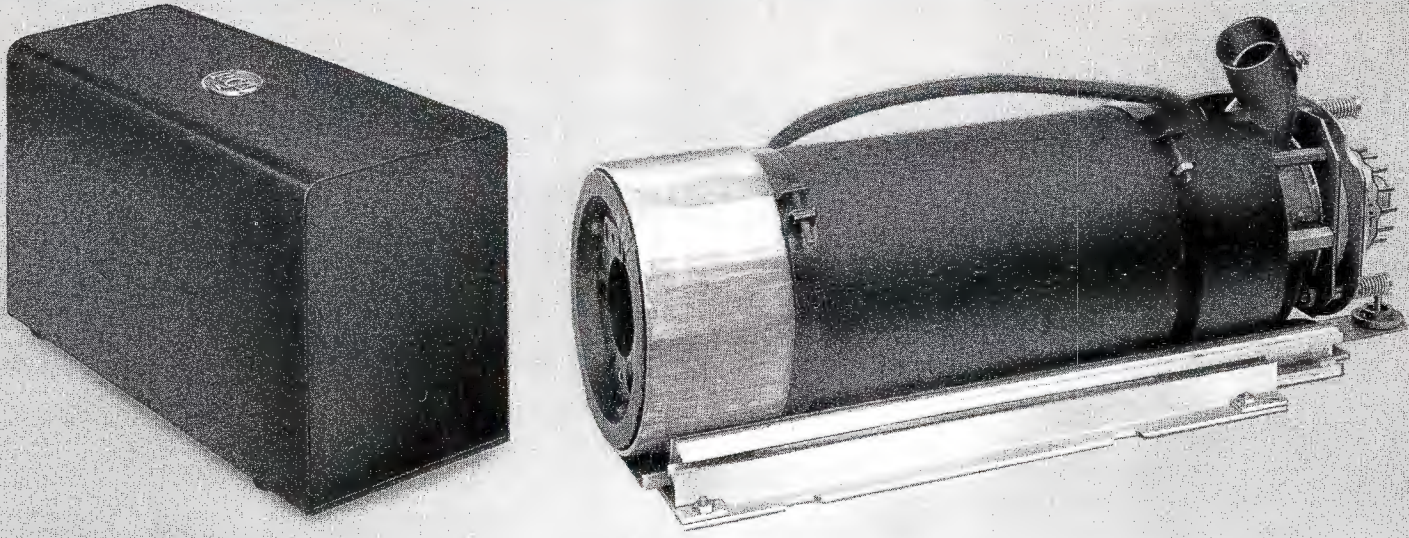
Dimensions:	
Overall Length .....	$23\frac{3}{8}$ "
Inside Width .....	$13\frac{11}{16}$ "
Free Height .....	$1\frac{13}{32}$ "
Mountings.....	Four rubber mounts to support 13 to 31 lbs. each, spaced 18" x 12" apart
Stock Identification .....	MI-26511-2

#### Shock Mounting for Field Camera and View Finder:

Dimensions:	
Overall Length .....	$23\frac{1}{16}$ "
Inside Width .....	$8\frac{3}{16}$ "
Free Height .....	$1\frac{13}{16}$ "
Mountings.....	Four rubber mounts to support 20 to 48 lbs. each, spaced $18\frac{3}{8}$ " x $7\frac{1}{6}$ " apart
Stock Identification .....	MI-26511-3

# ELECTRO-MAGNETIC ORBITERS

For Monochrome Image Orthicon Cameras



## FEATURES

- Adds new life to image orthicon tubes by minimizing "burn-in"
- Equipment mounts inside camera without affecting normal operation or appearance
- Separate remote control requires no additional wires to camera
- Orbiting movement so steady it is undetectable by viewer
- Greatly cuts tube cost—orbiter soon pays for itself
- Orbiting Cycle one minute

## USES

RCA's series of Electro-Magnetic Orbiters are designed to prevent "burn-in" and increase the life of image orthicon tubes used in standard monochrome type television cameras. The equipment, which mounts inside the cameras without affecting normal operation or appearance, causes a slow continuous elliptical movement of the image approximately five percent of picture height on the photo-sensitive surface of the tube. Operating at about one revolution per minute such motion is not apparent to the viewer yet is sufficient to prevent sticking or "burn-in." The control unit for the monochrome orbiter permits remote operation from the control position, utilizing wires already available in the camera cable.

Image orthicon tubes are often retired from operation because of "burn-in" damage even though the other

characteristics which affect picture quality have not deteriorated. The installation of an RCA Electro-Magnetic Orbiter will allow many of these tubes to be returned to service.

There are several types of monochrome yoke assemblies in present-day studio TV cameras, so it is important when ordering the Electro-Magnetic Orbiter to state the type of camera in which the equipment is to be used. The following equipment is specified for RCA type cameras:

MI-26850/26853/26857 for TK-11/31 Series Monochrome Cameras

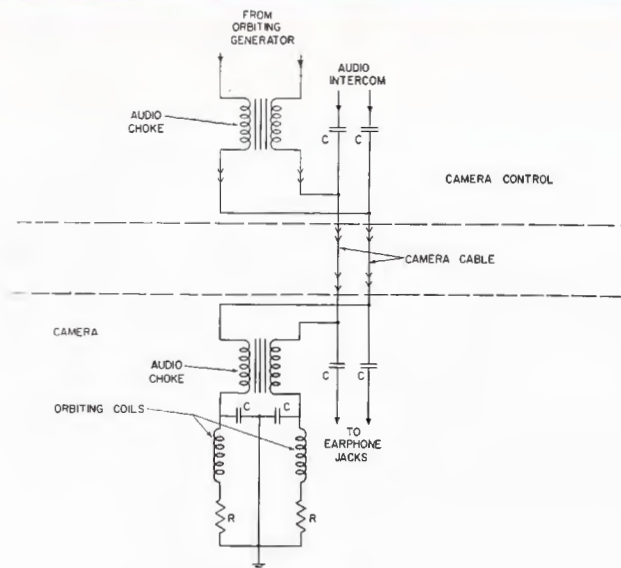
MI-26851/26853/26857 for TK-10/30 Series Monochrome Cameras

MI-26852/26853/26857 for TK-10/30 Monochrome Cameras modified by RCA Service Co.

**DESCRIPTION**

The RCA Electro-Magnetic Orbiters for monochrome television cameras employ a suitable deflection yoke placed over the image section of the image orthicon tube and is excited by appropriate currents to make possible a non-mechanical method of orbiting the target charge image in its translation from the photocathode to the target. The equipment consists of two parts, the deflection yoke for the image section and a generator chassis for producing the required yoke exciting currents. The generator is supplied on a rack-mounting adaptor, but it may be removed for mounting elsewhere.

The yoke assembly is of toroidal construction to make it as thin as possible. The core is a thin section of either mu-metal laminations or iron wire wrap depending on type camera on which it is to be used. The mu-metal core in the case of the external yoke for TK-11/31 and TK-10/30 Series camera preserves the continuity of the mu-metal shielding over the focus coil. The iron wire core for the internal yoke for TK-10/30 Series Cameras modified by RCA Service Co., presents a high-reluctance path for the focus field and hence does not disturb the normal magnetic focus fields within the image section of the tube. Two toroidal coils are placed in quadrature about the image section of the yoke assembly. The coils are driven from a small generating assembly, located at the control position, which contains a geared down motor driving a selsyn generator. The output of the selsyn consists of two 60 cps currents, one modulated with a 1 cycle-per-minute sine wave and the other with a 1 cycle-per-minute cosine wave. These waveforms are demodulated to produce two 1 cycle-per-minute currents 90 degrees out of phase.



Cable circuit schematic.

The toroidal coils are fed through the intercommunication circuits in the camera cable. A phantom circuit is employed to avoid interference with the intercommunication function. The resultant magnetic field produced by the current through these coils slowly rotates and slightly deflects the electron image from its normal travel between the photocathode and the target. Since all of the "burn-in" takes place at the target, this prevents "sticking" as well as orbiting the optical image on the photo-cathode. The small amount of orbiting and the slow rate used make the effect unnoticeable by the viewer. TV stations wishing absolutely motionless pictures may secure as an accessory an Immobilizer Coil Kit to suit their installation. Interconnecting cable, MI-13333, is required for connecting the generator unit and camera control. A modification kit, MI-26857 is required at the camera control.

**SPECIFICATIONS**

- Power Requirements.....117 volts, 60 cycles, single phase 8 watts
- Orbiting Cycle.....1 minute
- Orbiting Deflection......5% picture height (approx.)

**Orbiter Generator**

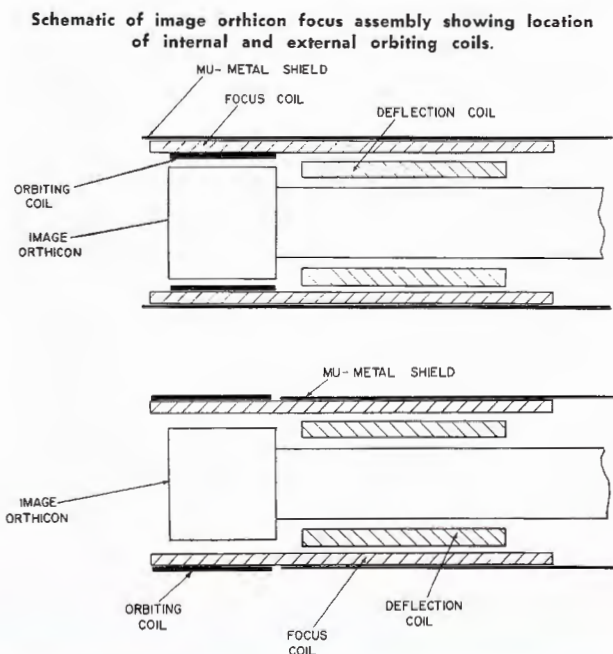
- Generator Dimensions (excluding rack mounting adapter):
- Length ..... 8"
- Width ..... 3 1/4"
- Height ..... 5"
- Weight..... Approx. 5 lbs.
- Rack Mounting Adapter Height..... 5 1/4"

**Stock Identification**

- Electro Magnetic Orbiter Coil for TK-11/31 Series Monochrome Cameras ..... MI-26850-A
- Electro Magnetic Orbiter Coil for TK-10/30 Series Monochrome Cameras ..... MI-26851-A
- Electro Magnetic Orbiter Coil for TK-10/30 Monochrome Cameras Modified by RCA Service Co..... MI-26852
- Electro-Magnetic Orbiter Generator..... MI-26853
- Modification Kit for Camera Controls..... MI-26857

**Accessories**

- Interconnecting Cable (required accessory, supplied in bulk, specify length when ordering)..... MI-13333
- Immobilizer Coil Kit (for use with MI-26850/26853)..... MI-26854
- Immobilizer Coil Kit (for use with MI-26851/26853)..... MI-26855



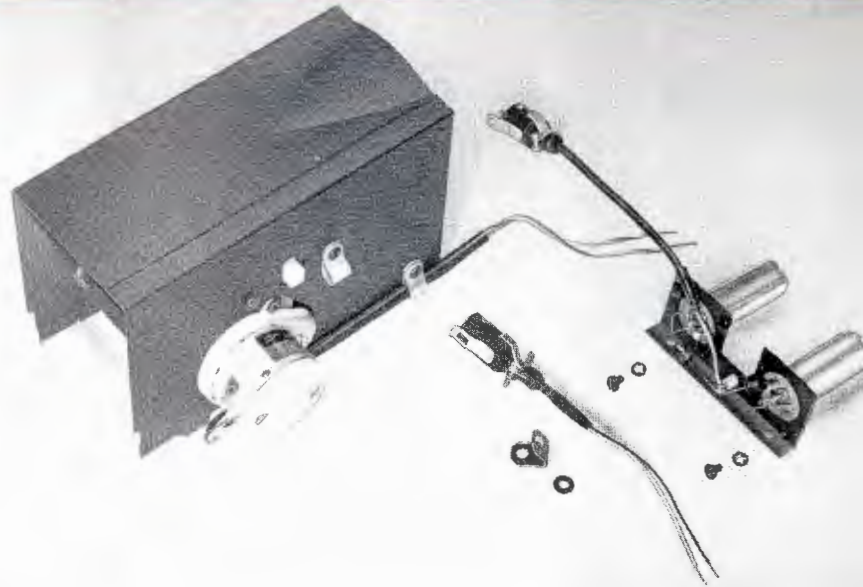


# ORBITING WEDGE ASSEMBLY

MI-40832, for RCA Color Cameras TK-40A/41

## FEATURES

- Adds new life to image orthicon tubes by minimizing "burn-in"
- Equipment kit easily mounts in existing equipment
- Does not alter the appearance or size of Color TV Camera



- Small optical taper required for orbiting produces no adverse effect in optical image quality
- Orbiting movement so steady it is undetectable by viewer
- Greatly cuts tube cost—equipment soon pays for itself

## USES

Orbiting Wedge Assembly, MI-40832, is designed to prevent "burn-in" and increase the life of image orthicon tubes used in Type 40A and Type TK-41 Color TV Cameras. The equipment is easily installed in a portion of the optical system common to all color channels so that the optical images on the photocathodes of the three image orthicons will move in a circular orbit. Thus, since the individual images on the red, green and blue tubes move together, there is no effect on camera registration. Operating at

about one revolution per minute the orbital motion is not apparent to the viewer but is sufficient to prevent sticking or "burn-in."

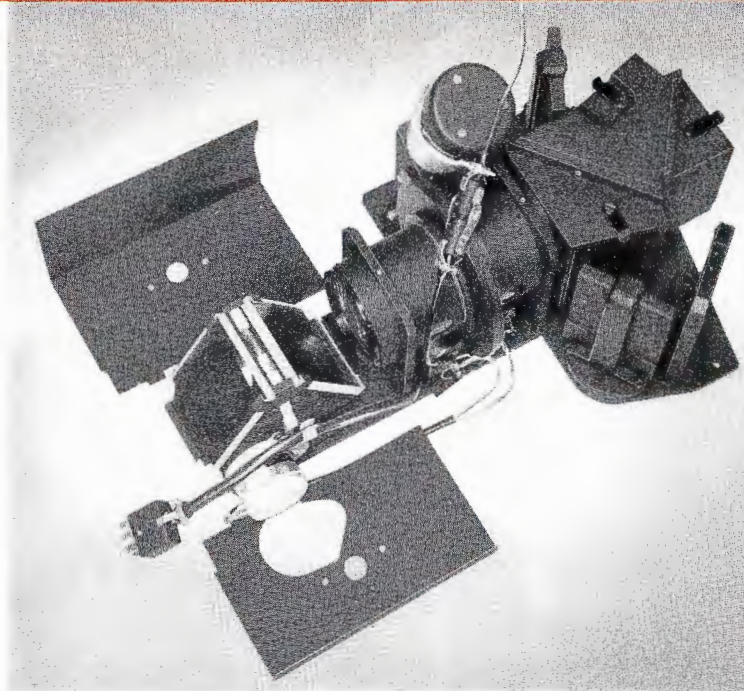
Image orthicon tubes are often retired from operation because of "burn-in" even though the other characteristics which affect picture quality have not deteriorated. The installation of the Orbiting Wedge Assembly will allow many of these tubes to be returned to service.

RCA Orbiting Wedge Assembly Kit, shown on front page un-assembled and assembled in TK-41 Color TV Camera is here exposed to show installation details. With covers removed, the orbiting wedge in ring gear is seen between sloping lenses of the astigmatism corrector block. Motor assembly driving the wedge is seen in foreground, and small rectifier assembly and connecting cable assembly neatly mount under iris and relay lens.

**DESCRIPTION**

The RCA Orbiting Wedge Assembly, MI-40832 is a kit designed to fit neatly into the existing optical system of the TK-40 or TK-41 Color TV Camera. A rotating optical wedge with a taper of 22 minutes is inserted in the astigmatism corrector block where it gives a circular movement to the image on the photocathode. The deviation causes the image to move in a circular orbit whose diameter is approximately 3 percent of picture height. The period of one orbiting cycle is approximately one minute.

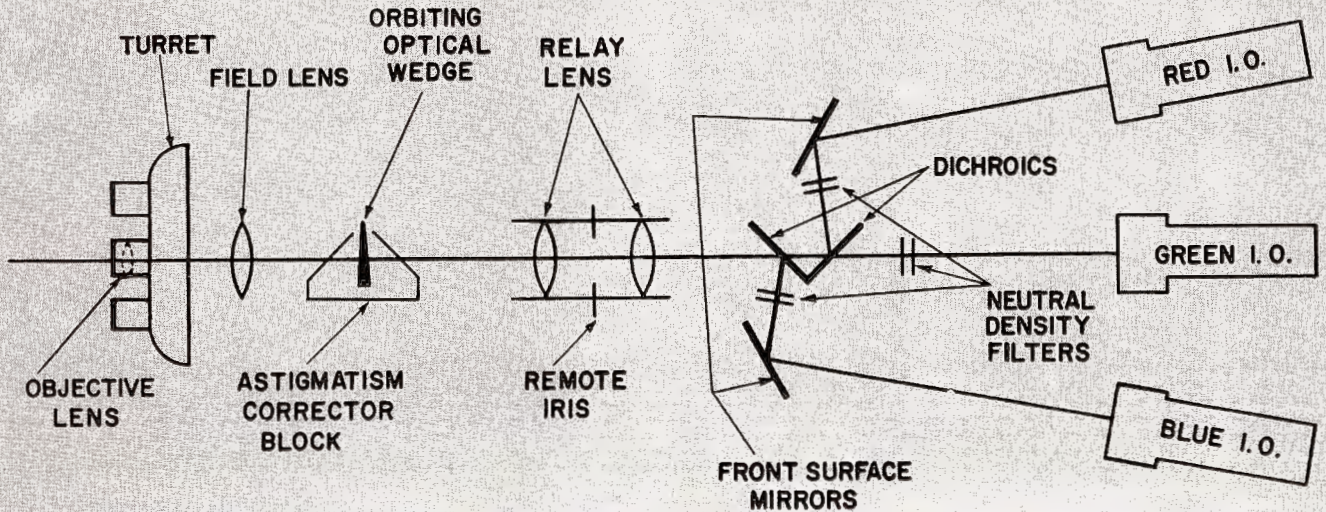
The MI-40832 equipment kit consists essentially of an optical wedge assembly contained in a vertical astigmatism correction which comes preassembled and may be exchanged for the vertical astigmatism corrector in the present TK-40 or TK-41 Color TV Cameras. A small d-c motor, acting through a suitable gear train, rotates the optical wedge which is mounted in a ring gear. The small optical taper required for orbiting produces no adverse effects on optical image quality. The entire assembly, with cover, is 6 7/8 inches long, 4 3/4 inches wide over the motor and 4 1/2 inches high and is easily mounted entirely within the present camera. A small rectifier assembly, connecting cable assembly, and assembly hardware complete the kit. This equipment is mounted directly under the iris and relay lenses and is connected into the Color Wedge Orbiter assembly.



**SPECIFICATIONS**

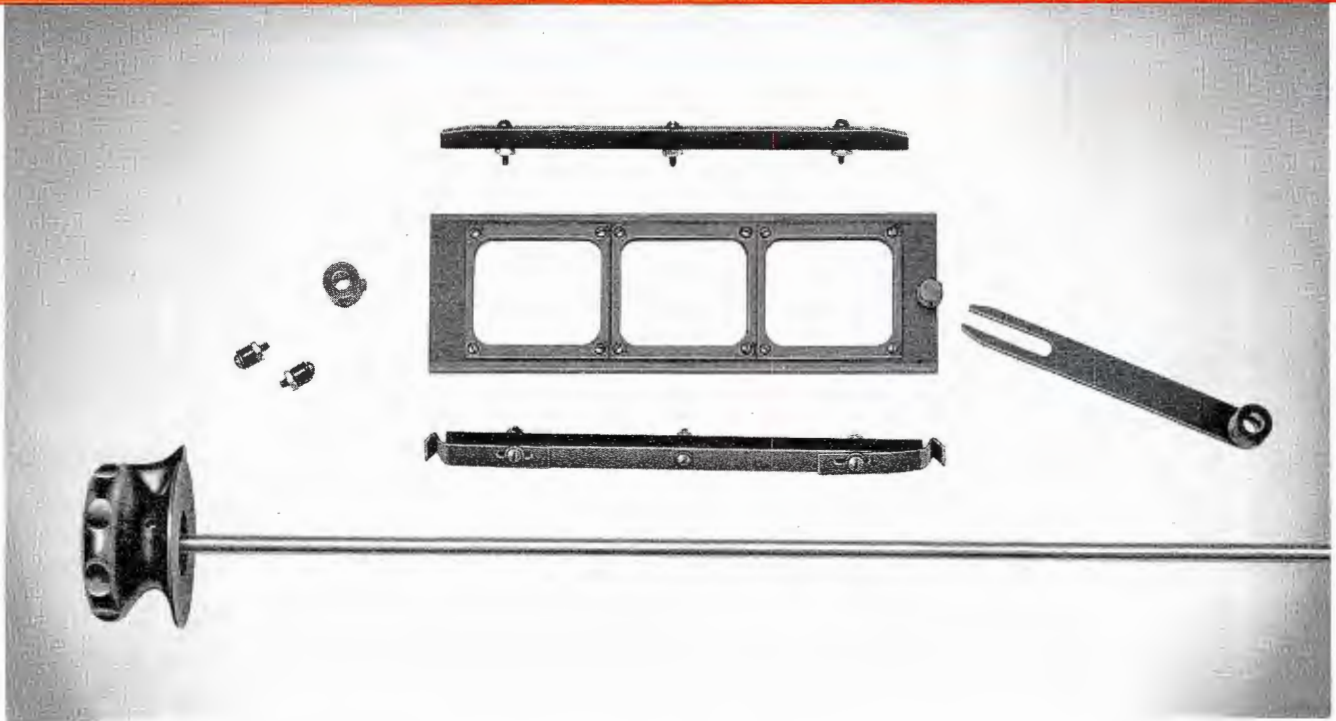
Orbiting Wedge Angle.....	0° 22'
Wedge Rotation.....	1 rpm approx.
Orbiting deflection.....	3% of picture height (approx.)
Power Supply: (Part of Kit).....	12 volt d-c
Timing Motor (operated at 12 volts d-c).....	6 volts d-c
Overall Dimensions (color wedge orbiter assembly):	
Height .....	4 1/2"
Width (over motor).....	6 7/8"
Length .....	6 7/8"
Weight.....	4 lbs. approx.
Stock Identification .....	MI-40832

Color camera optical system schematic drawing showing location of orbiting optical wedge.



# NEUTRAL DENSITY FILTER SLIDE MECHANISM

FOR TYPE TK-40A and TK-41 COLOR CAMERAS



## FEATURES

- Neutral density filters compensate for large variations of light level
- Permits operation of image orthicons at optimum signal to noise ratio
- Filters accommodated by convenient and easy to operate slide mechanism
- Instantaneous change from rear camera control
- Compensation does not affect color

## USES

The Neutral Density Filter Slide Mechanism, MI-40528, provides a useful means of controlling large variations of light levels for RCA TK-40A and TK-41 Color TV Cameras. The remote iris control in the camera lens can handle variations of light levels up to 30 to 1 without difficulty; however, during the televising of outdoor events in color where daylight is the light source, the variation of incident illumination levels can be expected to vary as much as

100 to 1. By selecting neutral density filters (values of 1.0 to 2.0 supplied), all light ranges normally encountered can be handled. The MI-40528 slide mechanism kit is easily installed in RCA color TV cameras.

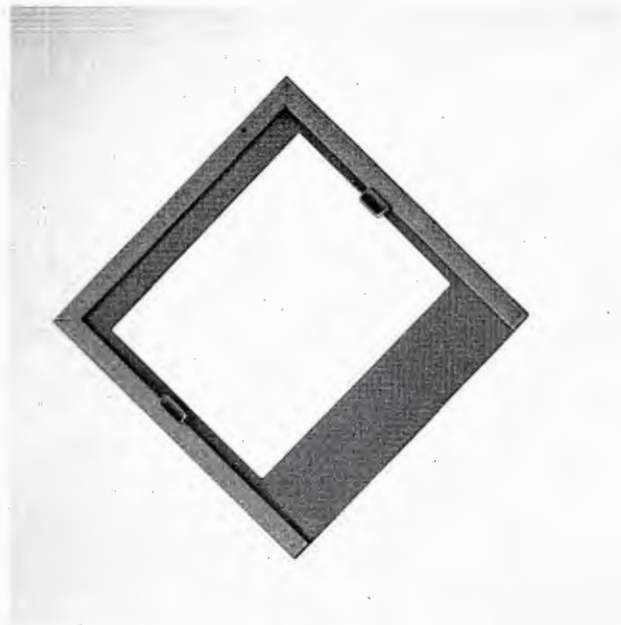
## DESCRIPTION

The MI-40528 Neutral Density Filter Slide Mechanism is provided as a kit of parts consisting of a brass slide assembly, three hard-brass filter holders, two rails of sturdy brass bar, two beryllium copper springs, steel control shaft, a black plastic control knob, lever assembly, three vertical compensation shields and mounting hardware. The kit may be easily installed in the optical path common to the three color image orthicon tubes. Complete instructions are furnished with the equipment.

Two neutral density filters, with values of 1.0 and 2.0 density respectively, are provided with the slide mechanism. They may be inserted into two of the three filter holders. When installed the slide mechanism is easily operated from the rear of the camera by turning the control knob to any of three positions. The central position may be used to provide normal illumination, while a turn to the left or the right instantly provides the required amount of compensation from the two filters.

Stock Identification .....MI-40528

## NEUTRAL DENSITY FILTER HOLDERS FOR TK-11/31 SERIES CAMERAS



### USES

The Neutral Density Filter Holder for TK-11/31 Series Cameras, MI-26847, provides a useful means for holding a neutral density filter in front of the image orthicon face plate to reduce the light level reaching the image orthicon. One filter attenuates the light equally for all lenses on the turret. This is especially useful outdoors where there is no control of lighting and the iris on the lenses cannot be stopped down sufficiently.

### DESCRIPTION

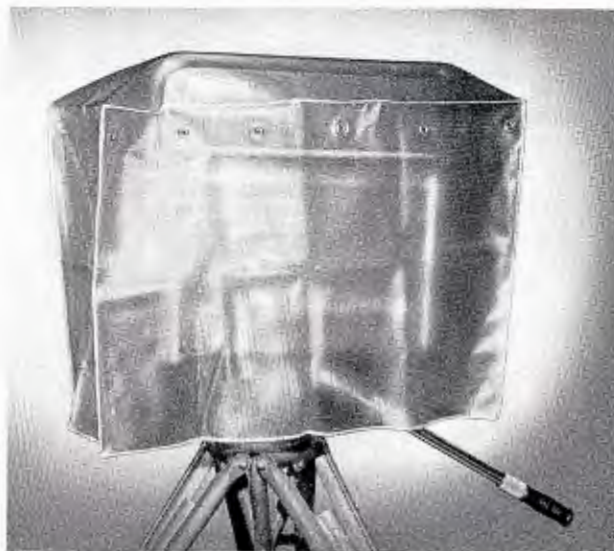
MI-26857 consists of a single phosphor-bronze filter holder with two tines for snapping the filter into position on the bakelite mask immediately in front of the face of the image orthicon tube. Two filters are provided with neutral density values of 1.0 and 2.0 respectively.

Stock Identification .....MI-26847

## TELEVISION CAMERA COVERS

### DESCRIPTION

Three plastic covers designed to protect RCA studio or field television cameras from dust, grime, and the elements are available. They are especially recommended for cameras in field use, and as a protective covering during transportation or storage. The translucent covers are made of reinforced material for durability and attractiveness. The MI-26862-1 is long enough to slip directly over a camera with either a viewfinder hood or telephoto lenses. The MI-26862-2 has a zippered end to allow accommodation of camera accessories that may increase its length. Color TV cameras require the large size cover, MI-26862-3.



### SPECIFICATIONS

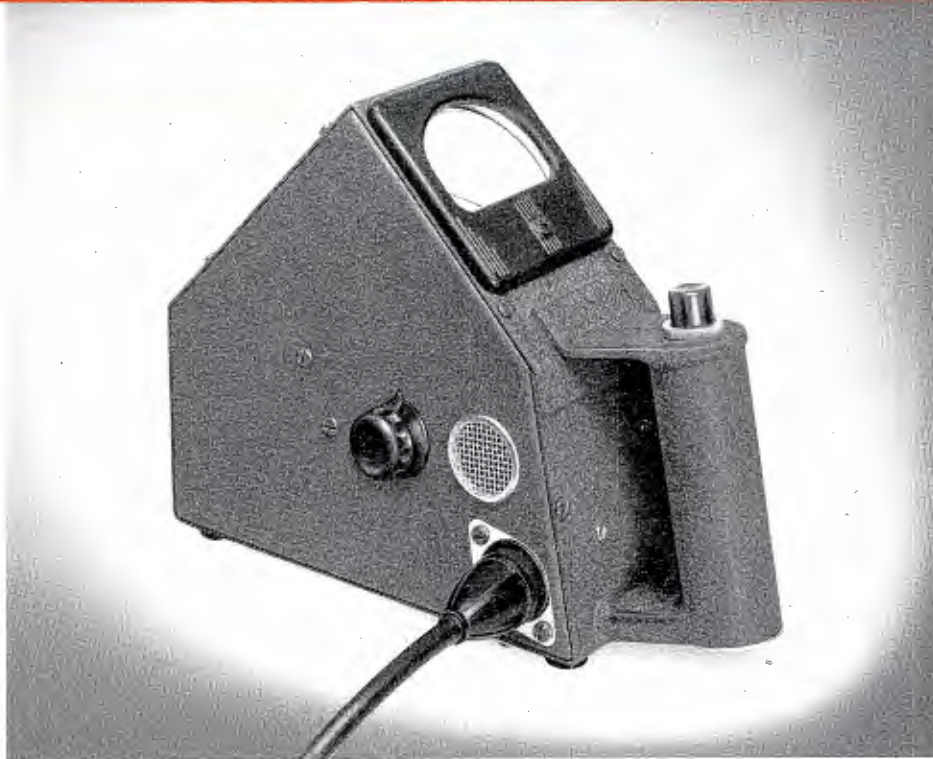
	MI-26862-1	MI-26862-2	MI-26862-3
Dimensions (overall):			
Length .....	35"	30"	54"
Width .....	15"	17"	22"
Height (at rear) .....	21"	22"	25"
Weight (approx.) .....	3 lbs.	2½ lbs.	4 lbs.

Stock Identification:

Plastic Cover for image orthicon camera and viewfinder with hood .....	MI-26862-1
Plastic Cover for image orthicon camera and viewfinder, zippered end .....	MI-26862-2
Plastic Cover for TK-40A/41 cameras.....	MI-26862-3

# LUMINOMETER

MI-40869



## FEATURES

- Aids in improving monochrome transmission of color TV programs
- Saves rehearsal time by eliminating camera check-out of scenery
- Self-contained 115 volt a-c light source
- Direct reading meter measures gray scale values as reproduced by live color cameras

## USES

The Luminometer, MI-40869, can be used to foretell how various colors will reproduce on a monochrome receiver when picked up with a live color camera. A scene designer can measure directly the gray scale values of colored objects or background scenery to allow him to select colors which will show separation on monochrome receivers. Without a Luminometer this must be checked on camera, often when it is too late to make a change. With the self-contained Luminometer, this can now be checked in the paint shop or costume room. Two different hues that look well side by side on a color receiver may have the same gray scale value and blend together on a monochrome receiver.

## DESCRIPTION

The MI-40869 Luminometer contains an incandescent light source and a photo-electric cell which activates a scaled direct-reading meter. The face of the photo-electric cell is covered with a red, a blue, and a green colored filter, each showing an area proportional to that color's contribution to the luminance signal. The spectral response of the filters in conjunction with the photo-electric cell is equal to that of the TK-41 color camera.

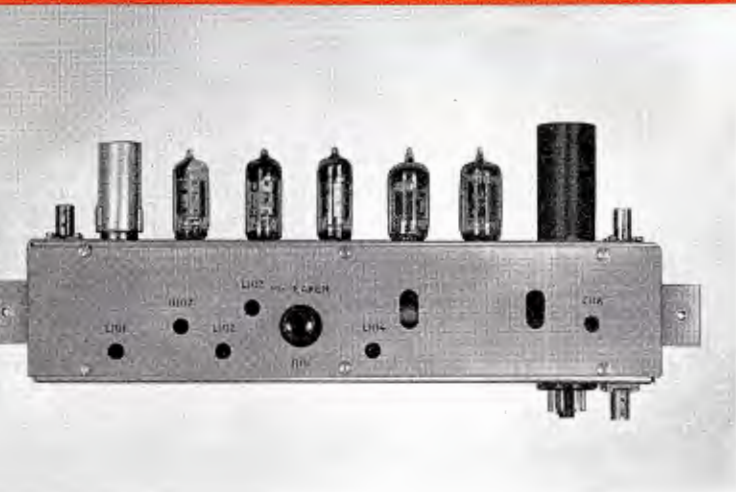
The Luminometer is held against the material to be tested and an internal light source is triggered on. The light reflected from the material is filtered in passing to the photo-electric cell. The current produced is measured by the meter which is calibrated in percent response.

## SPECIFICATIONS

Range Scale .....	0-100%
Dimensions (Overall).....	10" long, 7¼" high, 4½" deep
Weight .....	3½ lbs.
Finish.....	Umber gray crackle
Cable.....	10 ft. utility cord
Power Requirements.....	115 volts, a-c, 50/60 cycles, 75 watts
Stock Identification .....	MI-40869

# VIDEO PRE-AMPLIFIERS

## MI-26153 and MI-40800



MI-40800

### USES

The Video Pre-Amplifier, MI-26153, is supplied as part of every RCA TK-11B Studio Camera and RCA TK-31B Field Camera. The Color Video Pre-Amplifier, MI-40800 is the corresponding plug-in sub-chassis supplied as part of all TK-41 Color Television Cameras. Either unit may be ordered as a spare sub-assembly. Since the units are easily interchangeable through "plug-in" connection features, pre-amplifier units can be removed from in-use cameras in a matter of seconds, and a replacement quickly installed. This allows bench-testing of a defective pre-amplifier unit and repair by station operators without interruption of the use of the camera.

### DESCRIPTION

This video pre-amplifier is a plug-in unit with all power connections made through an octal plug in the bottom and with three small co-axial connectors for input, main output and viewfinder output connections. When in place it is shock mounted to minimize the effect of vibration.

Ample gain is available to provide a normal signal to the viewfinder and camera control with a low limit camera tube. Two stages of cathode high peaking eliminate overshoot and smear by accurately compensating for the capacitive loading of the image orthicon, while reducing microphonics associated with other types of high peaking. Excellent low frequency response insures against streaking. A video frequency response extending to 8 mc faithfully transmits the video information produced by the image orthicon. The feed-back output stage provides a separate

### FEATURES

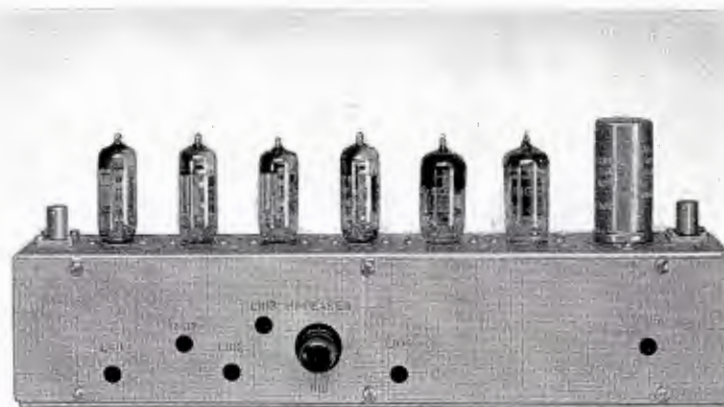
- Plug-in type construction
- Frequency response extends to 8.0 mc
- Very good low frequency response
- Shock mounted
- Frequency compensated through the usable band
- Separate video output for viewfinder
- Low impedance output. Output line sending end terminated

viewfinder output, sending end termination for the output video line, and excellent linearity and stability. Ferrite beads are used in all grid circuits to prevent the possibility of oscillations. Special decoupling circuits required for color camera operation are included in the MI-40800 Color Video Pre-Amplifier.

### SPECIFICATIONS

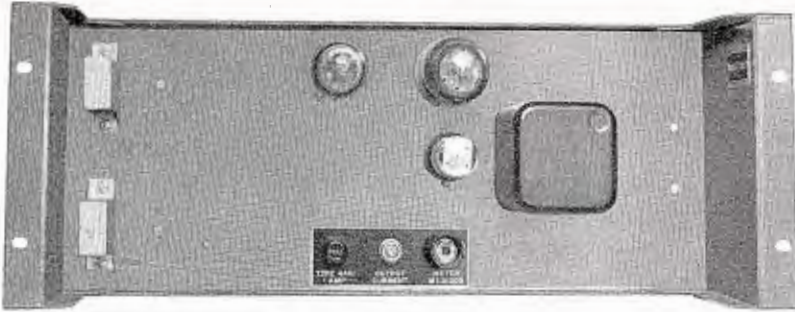
Tube Complement.....4-6AH6, 1-6U8, 1-5687  
 Dimensions, Overall.....Approximately 12¼" wide, 6" high, 2¾" deep  
 Stock Identification:  
 Monochrome Video Pre-Amplifier Assembly,  
 including tubes in place.....MI-26153  
 Color Video Pre-Amplifier Assembly, including tubes in place....MI-40800

Monochrome Video Pre-Amplifier, MI-26153.



# CURRENT REGULATOR

MI-26090-A



## FEATURES

- Counteracts current variations in camera focus coil circuit
- Current can be manually adjusted over a range from 65 to 85 milliamperes
- Uses common tube types
- Tubes easily replaced from front of Regulator

## USE

The Current Regulator is an electronic device which maintains constant current in the focus coil of the TK-11B Studio Camera. Variations in the magnitude of current flowing through the coil are produced by changes in the applied voltage or by changes in the resistance of the coil as a result of changes in the operating temperatures, which would impair the focus of the camera. The Current Regulator counteracts these variations and also provides a means for adjusting the focus coil current to the proper value.

## DESCRIPTION

All components of the Current Regulator are mounted on a recessed chassis designed for rack mounting. The unit employs an RCA 6SL7-GT twin triode as a d-c amplifier, and an RCA 6Y6-G current regulator tube. The cathodes of the d-c amplifier are kept at fixed levels by voltage regulator tubes.

The 6Y6-G current regulator tube is effectively in series with the camera focus coil and its 400-volt source of unregulated d-c so that the internal resistance of the 6Y6-G, which is controlled by the d-c amplifier, determines the magnitude of current flowing in the coil circuit. The input of the d-c amplifier is connected across a small resistor also connected in series with the focus coil. Thus variations in the voltage developed across the small resistor (as a result of current changes in the focus coil circuit) are fed to the d-c amplifier which in turn raises or lowers the

conductance of the 6Y6-G to counteract the current change taking place. Regulation is, of course, instantaneous and the result is a constant flow of current through the focus coil of the camera. The Current Regulator will maintain constant current at a preset value over wide ranges of resistance change in the load and over wide ranges of input voltage.

## SPECIFICATIONS

### Power Requirements

#### Input:

Filament Supply.....	117 volts, 60 cycles, single phase, 15 watts
Focus Coil Supply.....	360-400 volts, dc unregulated and 280 volts dc regulated

#### Output:

Regulated.....	65 to 85 milliamperes
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#### Chassis Dimensions:

Depth .....	5 1/2"
Width .....	19"
Height .....	7"
Weight .....	9 lbs.

### Tube Complement

- 1—RCA OD3 Voltage Regulator
- 1—RCA 6SL7-GT D-C Amplifier
- 1—RCA 6Y6-G Current Regulator

### Equipment Supplied

Current Regulator complete with Tubes.....	MI-26090-A
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### Accessories

Plate Current Meter.....	MI-21200-C1
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# HIGH VOLTAGE POWER SUPPLY

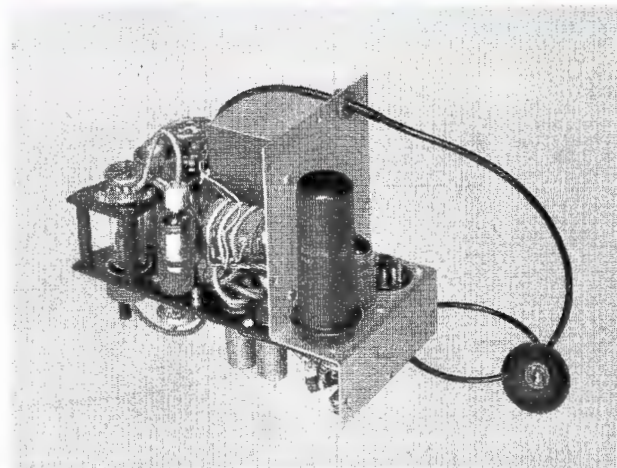
MI-26838

## FEATURES

- Compact, efficient r-f type high voltage supply on plug-in, sub-assembly type chassis
- Provides highly stable ultor and focus voltages to maintain constant focus and deflection on kinescope screen
- High voltage regulation prevents blooming and size changes in monitors
- Can be used interchangeably in RCA Master Monitor or Field Camera Control (less case in field camera control)

## DESCRIPTION

The MI-26838 R-F High Voltage Power Supply is a plug-in type sub-assembly enclosed in a shielded case. It contains four rectifier tubes. The output of the r-f oscillator is coupled through the high voltage transformer to two of the rectifiers. Their associated components form a voltage doubler circuit which supplies final accelerating voltage for the kinescope. The other two rectifiers are conventional half-wave rectifiers which supply  $-1600$  volts CRO cathode potential and  $+1800$  volts kinescope focusing potential respectively. The regulator circuit and its associated components stabilizes the output voltage and minimizes voltage change with variation in load current.



Regulation is accomplished by automatically varying the screen voltage on the r-f oscillator tube in proportion to variations in load current. The values of output voltages of the power supply are established at the factory by presetting a control resistor in the cathode circuit of the regulator tube.

## SPECIFICATIONS

Tube Complement.....	1-6L6, 1-6BQ7, 4-1X2A
Dimensions (overall).....	7 $\frac{3}{4}$ " long, 4 $\frac{1}{6}$ " wide, 5 $\frac{7}{8}$ " high
Weight .....	.5 lbs. (approximately)
Stock Identification:	
High Voltage Power Supply.....	MI-26838

## PLATE CURRENT METER, MI-21200-C1



## DESCRIPTION

Plate current Meter, MI-21200-C1, is a two scale meter for checking the plate currents drawn by the regulator tubes in RCA Power Supplies Types WP-15, WP-33, 580-D and TY-31. It also is used for measuring the output voltage and total output current of these power supplies, and for measuring the focus coil current in RCA Image Orthicon Camera Equipment. The 0-150 ma scale is used for these metering functions. By pressing the button on the meter panel, the 0-15 ma scale can be used to measure the signal level calibration voltage in the TM-6C Master Monitor. The proper external shunts are included in each of the equipments with which the meter is used.

## SPECIFICATIONS

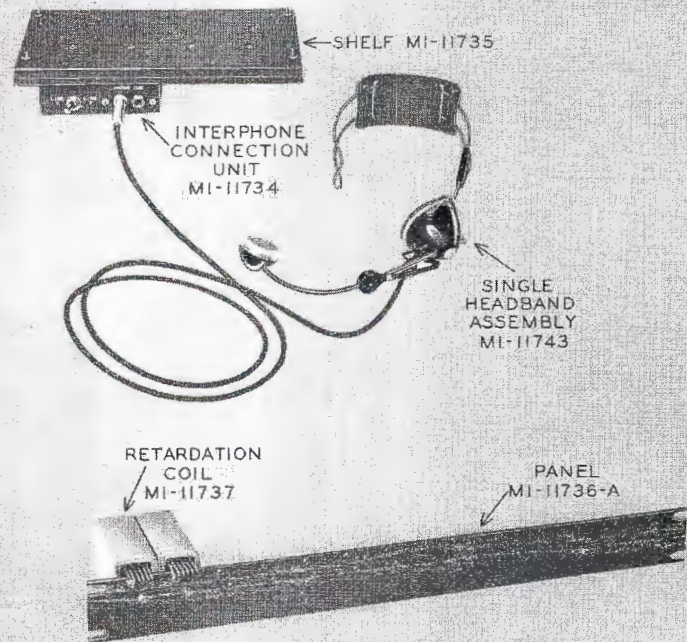
Range Scales.....	0-150 ma., 0-15 ma.
Approximate Size.....	3 $\frac{5}{8}$ " x 5 $\frac{7}{8}$ " x 2 $\frac{3}{8}$ "
Net Weight .....	.3 lbs.
Finish .....	Bakelite case
Cable.....	5' 9" cord with plug-in jack
Stock Identification .....	MI-21200-C1



# INTERPHONE EQUIPMENT

## FEATURES

- Convenient intercom with studio personnel or remote line as desired
- Can mount to console, desk, or wall
- Designed to be compatible with RCA TV equipment
- Simple circuit with anti-side tone feature
- Regulated power supply



## USES

RCA Interphone Equipment is designed to provide convenient switching and headset connection facilities for an internal communication system. Such a system is particularly useful for the radio or television broadcast studio since it allows talking and listening with selected personnel

and with a conference bus or remote private line as desired. Any number of interphone connections may be used. The 24-volt d-c regulated power supply provides interphone power for a system using up to 30 headsets simultaneously.

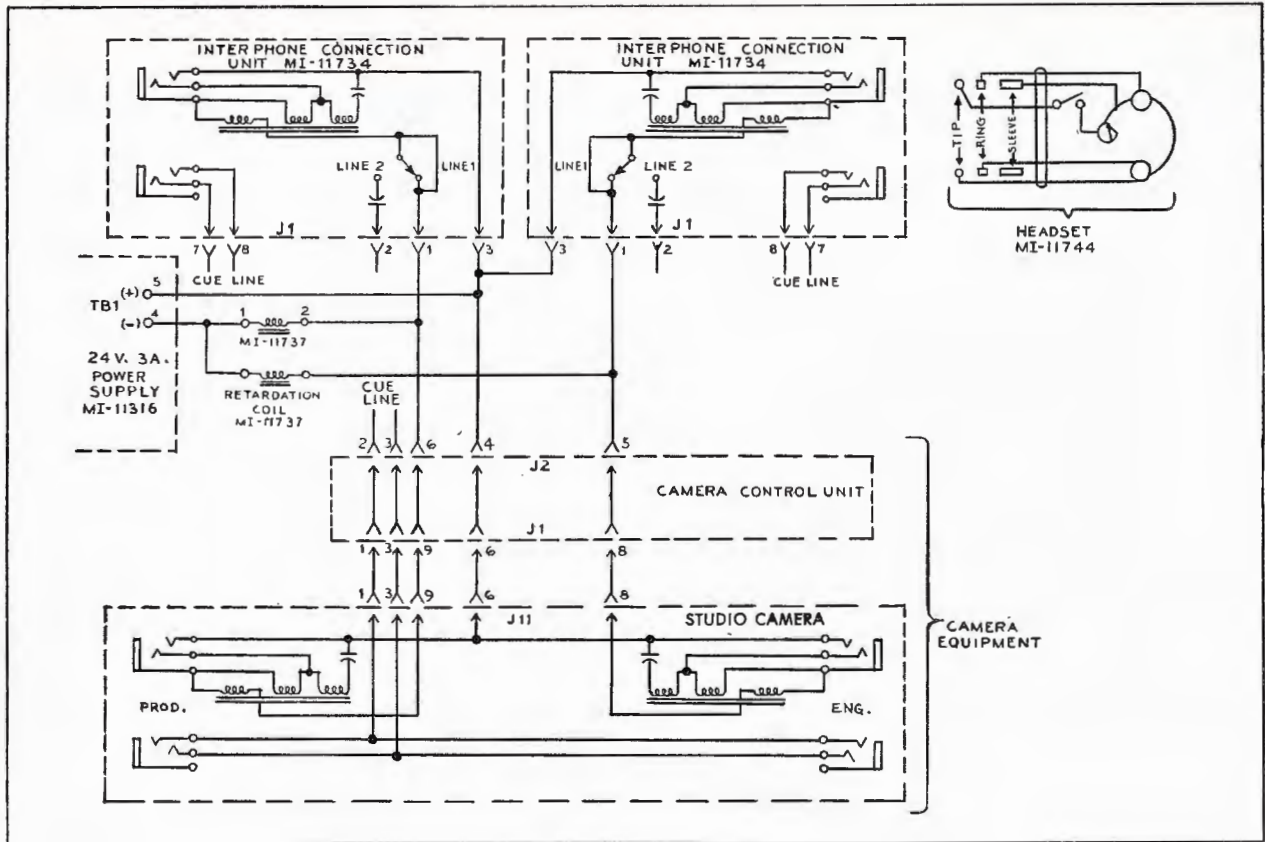
## DESCRIPTION

Heart of the Studio Interphone System is the Interphone Connection Unit, MI-11734, which consists of a compact jack box designed for plate mounting. The unit consists of a simple circuit having an induction coil and capacitor to provide an anti-side tone feature. This results in local sounds being partially cancelled in the local earpiece. The circuit is housed in a small metal box having two phone jacks for use either with a single or a double headset as required, and a two-position toggle switch for selecting a local circuit or a remote line. A cable plug is mounted in the rear.

A Retardation Coil, MI-11737, permits simultaneous use of four carbon microphones such as one interphone connec-

tion unit and three camera headsets on a common battery or power supply. The coil permits a d-c power voltage to be imposed upon the two-wire telephone talking line. This audio frequency choke minimizes the effect of the power supply from lowering the two-wire telephone impedance at voice frequencies, and also allows adequate flow of direct current.

Mounting Panel, MI-11736-A, will permit mounting up to 14 retardation coils in the rack. Either a Single Headband Assembly, MI-11743, or a Double Headband Assembly, MI-11744, can be used for listening and talking with the Studio Interphone System.



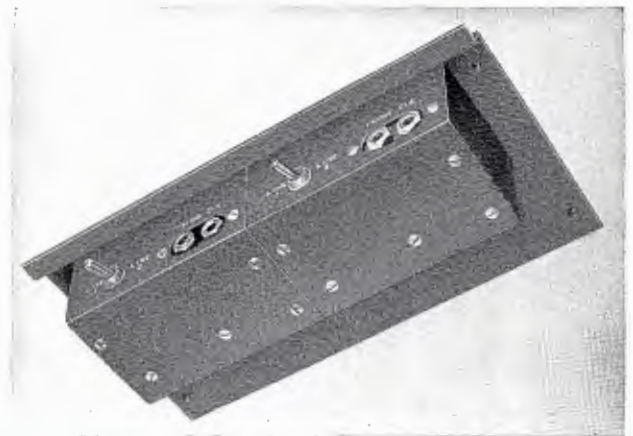
Schematic diagram of typical Interphone System.

**SPECIFICATIONS**

- D-C Resistance (Headset):  
 Microphone Switch On.....70 ohms approximately  
 Microphone Switch Off .....Infinite
- Inductance at 1000 Cycles (Headset):  
 Microphone Switch On.....70 millihenries approximately  
 Microphone Switch Off .....245 millihenries
- D-C Resistance (Retardation Coil).....165 ohms  
 Inductance (Retardation Coil).....3.4 henries  
 Maximum Recommended Load Current.....125 ma d-c  
 Power Supply.....Regulated 24 volts, 3 amps, d-c
- Dimensions:  
 Interphone Connection Unit.....4<sup>5</sup>/<sub>8</sub>" x 4<sup>1</sup>/<sub>4</sub>" x 2<sup>3</sup>/<sub>16</sub>"  
 Retardation Coil.....4<sup>5</sup>/<sub>8</sub>" x 1 45/64" x 1<sup>3</sup>/<sub>16</sub>"  
 Mounting Plate.....11" x 6<sup>3</sup>/<sub>8</sub>"  
 Retardation Coil Panel, MI-11736.....19" x 13<sup>4</sup>/<sub>4</sub>" x 3<sup>1</sup>/<sub>16</sub>"  
 Retardation Coil Panel, MI-11736-A.....19" x 13<sup>4</sup>/<sub>4</sub>" x 3<sup>1</sup>/<sub>16</sub>"  
 Regulated Power Supply.....9" x 7<sup>3</sup>/<sub>4</sub>" x 5<sup>3</sup>/<sub>4</sub>"
- Weight:  
 Interphone Connection Unit.....1 lb., 11 ozs.  
 Retardation Coil .....15 ozs.  
 Retardation Coil Panel, MI-11736.....19 ozs.  
 Retardation Coil Panel, MI-11736-A.....18 ozs.  
 Single Headband Assembly.....6 ozs. (less cord)  
 Double Headband Assembly.....9 ozs. (less cord)  
 Regulated Power Supply.....25 lbs. (net)

Stock Identification of Interphone Components:

- Interphone Connection Unit.....MI-11734  
 Retardation Coil .....MI-11737  
 Shelf for Mounting MI-11734.....MI-11735  
 Panel (Accommodating 14 Retardation Coils).....MI-11736-A  
 Single Headband Assembly.....MI-11743  
 Double Headband Assembly.....MI-11744  
 Regulated Power Supply.....MI-11316



Console Shelf, MI-11735, has mounting accommodations for two Interphone Connection Units.

# TV CABLES, PLUGS, CONNECTORS

## FEATURES

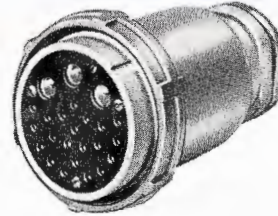
- Wide variety of cables and connectors
- Specially designed for television applications
- Facilitates TV installations—avoids delays
- High-quality insulations with conservative voltage ratings and special shields
- Various cable lengths and special cables available as kits



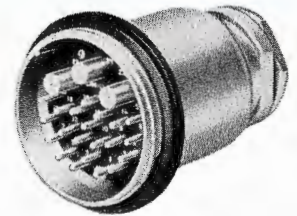
8-Conductor Intercom Cable, MI-26759-11



Pulse Cable MI-26759-9



MI-26759 -22



MI-26759 -21



MI-26759 -23



MI-26759 -24

## USES

RCA television cables, plugs and connectors are made available for inter-connecting the various components of TV broadcast equipment—studio, control room and remote. Camera, power, pulse, intercom, coax transmission line and inter-connecting cables with companion connectors are available as individual items or in groups for use with various equipment systems. Refer to the individual equipment catalog sheets to determine which cables are required with specific items of video equipment.

### Camera Cables

The MI-26725 series multi-conductor, flexible camera cables listed here are supplied in convenient lengths complete with necessary male and female connectors. These cables facilitate making required inter-connections between cameras and camera controls. Conductors are stranded and covered with "color-coded" silk and cotton braid insulation. An inner shield of tinned copper braid is provided. A choice of durable rubber or vinyl outer covering is offered. Overall cable diameter is 0.83 inches. Dustcaps are provided on cables normally used for field applications.

Stock Identification	Description	Length
MI-26725-A5	Rubber covered with 24-pin straight male and female connectors. With dustcaps.	50 feet
MI-26725-C5	Vinyl covered, with 24-pin straight male and female connectors. With dustcaps.	50 feet
MI-26725-A6	Rubber covered with 24-pin straight male and female connectors. With dustcaps.	100 feet
MI-26725-C6	Vinyl covered, with 24-pin straight male and female connectors. With dustcaps.	100 feet
MI-26725-A7	Rubber covered with 24-pin straight male and female connectors. With dustcaps.	200 feet
MI-26725-C7	Vinyl covered, with 24-pin straight male and female connectors. With dustcaps.	200 feet
MI-26725-A9	Rubber covered with 24-pin 90 degree male and a straight female connector. Protective rubber grommet.	50 feet
MI-26725-C9	Vinyl covered, with 24-pin 90-degree male and female connectors. Protective rubber grommet.	50 feet
MI-26725-A10	Rubber covered with 24-pin 90 degree female and a 90 degree male connector. With dustcaps.	50 feet
MI-26725-C10	Vinyl covered, with 24-pin, 90 degree male and female connectors. Protective rubber grommet.	50 feet

(Continued next page)

Camera Cables and Plugs (Cont. from page 1)

Stock Identification	Description	Length
MI-40831-1	Control Cable; 33-conductor, flexible rubber-covered, shielded and individually color coded with Jones type male and female connectors.	50 feet
MI-40831-2	Shading Generator Cable; 18-conductor, rubber-covered, flexible, with Jones type male and female connectors.	4 feet
MI-40835	Set of Interconnecting Cables (Camera to Camera Auxiliary):	
	(a) Camera Cable; 20-conductor, flexible, rubber-covered, shielded, and individually color coded with rectangular Cannon type male and female connectors.	3 feet
	(b) Coaxial Cable; Type RG-59/U, flexible, rubber-covered.	3 feet



12-Conductor, Power Cable MI-26759-6 supplied with Jones type connectors.

Camera Cable Connectors

The connectors described below include both the 90 degree and straight type for use in making up camera cables in any desired length, using bulk camera cable.

Stock Identification	Type	Description
MI-26759-A21	Straight Male Camera Cable Connector.	24-contact for use as a cable termination.
MI-26759-A22	Straight Female Camera Cable Connector.	24-contact for use as cable termination.
MI-26759-23	90° Female Camera Cable Connector.	24-contact for use as cable termination. Designed so that cable enters connector at 90° to axis of contact pins.
MI-26759-24	90° Male Camera Cable Connector.	24-contact for use as cable termination. Designed so that cable enters connector at 90° to axis of contact pins.
MI-26759-A41	Dustcap for male cable connector.	2 1/16" dia. x 1 3/32" deep, internal thread, with #10 chain and fastener.
MI-26759-A42	Dustcap for female cable connector.	2 1/16" dia. 1 1/16" deep, internal thread, with #10 chain and fastener.
MI-26759-45	Coaxial Termination. 75 ohm 1%.	Includes single contact coaxial connector plug, terminal assembly with a 1/2 watt, 75-ohm resistor.
MI-26759-48	Straight Female Connector with waterproof jacket.	24-contact for use as micro-wave cable termination.
MI-26759-49	Gasket for MI-26759-48.	Buna "N" rubber 1/4" square with knitted monel mesh bonded to rubber.
MI-40856	Straight Jones Type Connector with plug button.	Dummy plug, 18-contact, for use as jumper unit to make axis shading of processing amplifier operable when shading amplifier is not used in system.

Power and Control Cables and Plugs

The cables and connectors described below are available for use as spare units or replacements for those supplied with RCA television studio equipment.

Stock Identification	Power Cable Description	Length
MI-26759-2	2-conductor, rubber covered, flexible with male connector and female connector with dustcap.	10 feet
MI-26759-3	4-conductor, rubber covered, flexible with male and female connectors.	50 feet
MI-26759-6	12-conductor, rubber covered, flexible with male and female Jones type connectors.	34 inches
MI-26759-7	12-conductor, rubber covered, flexible with male and female Cannon type connectors and dustcaps.	6 feet
MI-26759-8	12-conductor, rubber covered, flexible with male and female Jones type connectors.	6 feet
MI-26759-41	18-conductor, rubber covered, flexible with male and female Jones type connectors.	4 feet
MI-26759-42	12-conductor, rubber covered, flexible with male and female Jones type connectors.	5 1/2 feet
MI-26759-45	12-conductor, rubber covered, flexible with male and female connectors. With dustcaps.	10 feet
MI-26759-54	3-conductor, rubber covered, flexible with female connector with dustcap and male plug, cable clamp and adapter.	10 feet

## Coax Cable Assemblies

The coaxial transmission line cable assemblies are made available in several different convenient lengths as shown in the accompanying chart. All are durable, rubber-covered, flexible cables with inner conductor and outer shielded conductor.

Stock Identification	Description	Length
MI-26759-12	Coax Cable Assembly with 2 male plugs and dustcaps. Impedance, 75 ohms.	7 feet
MI-26759-13	Same as MI-26759-12.	25 feet
MI-26759-14	Same as MI-26759-12 less dustcaps.	64 inches
MI-26759-15	Coax Cable Assembly with 2 male plugs and dustcaps. Impedance, 75 ohms.	100 feet

## Pulse and Intercom Cables

The pulse cable assemblies described here are supplied complete with suitable multi-contact connectors and protective dustcaps. The cables for TV intercom use are flexible and complete with phone-type jack plugs at each end. Cables are available in varying lengths as shown.

Stock Identification	Description	Length
MI-26759-9	Pulse Cable—7-conductor, rubber covered, flexible with straight male and female connectors and dustcaps.	7 feet
MI-26759-11	Intercom Cable—9-conductor, rubber covered, flexible, with male and female connectors and dustcaps.	7 feet

## Sets of Interconnection Cables

The cables listed below are supplied in groups in accordance with the requirements of the indicated video equipment systems.

### MI-26730, INTERCONNECTING CABLES FOR TK-31B FIELD CAMERA EQUIPMENT

Includes:

- 1—10 ft., 2-cond., Power Cable with Plugs and Dust-caps, MI-26759-2
- 1—6 ft., 12-cond., Power Cable with Plugs and Dust-caps, MI-26759-7
- 1—7 ft., 7-cond., Pulse Cable with Plugs and Dust-caps, MI-26759-9
- 1—7 ft., 9-cond., Intercom Cable with Plugs and Dust-caps, MI-26759-11
- 1—7 ft., Coaxial Transmission Cable with Plugs and Dust-caps, MI-26759-12

### MI-26736- INTERCONNECTING CABLES FOR FIELD SYNC GENERATOR

Includes:

- 1—10 ft., 2-cond., Power Cable with Plugs and Dust-cap, MI-26759-2
- 1—100 ft., 4-cond., Power Cable with Plugs, MI-26759-4
- 1—2 ft., 4-cond., Power Cable with Female Plug, MI-26759-5
- 1—7 ft., Transmission Line Cable with Plugs and Dust-cap, MI-26759-12
- 1—Pulse Termination Plug, MI-26759-17

### MI-26740-A, INTERCONNECTING CABLES AND FITTINGS FOR FIELD SWITCHING EQUIPMENT

Includes:

- 1—10 ft., 2-cond., Power Cable with Plugs and Dust-caps, MI-26759-2
- 1—6 ft., 12-cond., Power Cable with Plugs and Dust-caps, MI-26759-7
- 1—25 ft., Coaxial Transmission Cable, MI-26759-13
- 1—100 ft., Coaxial Transmission Cable, MI-26759-15
- 1—Set of Coaxial Fittings, MI-26759-18

### MI-26746, INTERCONNECTING CABLES FOR TK-11B STUDIO CAMERA CONTROL

Includes:

- 1—34 inch, 8-cond., Power Cable with Plugs, MI-26759-6
- 1—64 inch, Coaxial Transmission Line Cable with Plugs, MI-26759-14

## Microwave Cable

The Microwave Cables described below are used with the TVM-1A equipment to connect r-f heads and control units for both transmitter and receiver. Cable assemblies are made available in several different convenient lengths as shown in the accompanying chart.

Stock Identification	Type	Description
MI-26725-C11	Microwave Cable with straight male connector and straight female connector with waterproof jacket and gasket.	28-conductor, rubber-covered, flexible color coded, shielded cable 3 coax conductors, impedance 51 ohms $\pm 5\%$ , 21 conductors of #22 A.W.G. with insulation for 1000 v. d-c. 20 feet long.
MI-26725-C12	Same as MI-26725-C11	50 feet.
MI-26725-C13	Same as MI-26725-C11	100 feet.
MI-26725-C14	Same as MI-26725-C11	150 feet.
MI-26725-C15	Same as MI-26725-C11	200 feet.
MI-40885	TVT-1A Microwave Transmitter Video Cable Kit to permit use of separate 75-ohm cable for extended transmission of video signals from transmitter control to the transmitter head.	Consisting of 31-inch Type RG-59/U flexible cable end and 28-inch Type RG-59/U flexible cable for control end, with Type "N" connectors to mate with 75-ohm Type RG-11/U cable; support bracket assembly; 6½ foot flexible coaxial cable with Type UG-260/U connector one end, resistors, and hardware.
MI-40886	TVR-1A Microwave Receiver IF Cable Kit to permit separate 50-ohm Type RG-8/U cable for transmission of i-f signal from receiver head to receiver control.	Consisting of 30-inch cable assembly for head end and 19-inch cable assembly for control end equipped with Type UG-88/U, UG-556/U and UG-210/U connectors to mate with RG-8/U 50-ohm cable.

## Bulk Cable and Accessories

The various cables described in the accompanying table are available to the broadcaster in bulk quantities for making TV interconnections in special or nonstandard lengths as desired.

Stock Identification	Type Cable	Approx. Diam.	Characteristics
MI-43C	MICROPHONE CABLE—3-conductor, rubber covered, with outer neoprene covering, flexible.	0.300"	3 conductors of #20 A.W.G. tinned cadmium bronze, stranded for low impedance circuits.
MI-48	PULSE CABLE—8-conductor, rubber covered, flexible with individual color coding.	0.75"	4 coax conductors of 72 ohms impedance and 4 conductors of #16 A.W.G. with insulation for 600 v d-c.
MI-51	POWER CABLE—4-conductor, rubber covered, flexible, shielded, and individual color coding.	0.490"	4 conductors of #14 A.W.G. with insulation for 2500 v, RMS, 60 cycles.
MI-75	COAXIAL CABLE—Type RG-59/U, flexible, rubber-covered. Single inner conductor and outer shield conductor.	0.242"	Impedance, 73 $\pm$ 3 ohms. Normal capacitance 21 MMF/ft., max. operating voltage 2300 RMS.
MI-74A	COAXIAL CABLE—Type RG-8/U, flexible, rubber covered. Single inner conductor and outer shield conductor.	0.405"	Impedance 52 $\pm$ 2 ohms. Normal capacitance 29.5 MMF/ft.; max. operating voltage 4000 RMS.
MI-80	POWER CABLE—12-conductor, rubber-covered, flexible, shielded and individually color coded.	0.590"	12 conductors of #18 A.W.G. with insulation for 2500 v, RMS, 60 cycles.
MI-82	INTERCOM CABLE—8-conductor, rubber-covered, flexible, shielded with individual color coding.	0.490"	7 conductors #18 A.W.G. 1 conductor #14 A.W.G. with insulation for 2500 v, RMS, 60 cycles.
MI-83	COAXIAL CABLE—Type RG-11/U, flexible, rubber-covered. Single inner conductor and outer shield conductor.	0.405"	Impedance, 75 $\pm$ 3 ohms. Normal capacitance 20.5 MMF/ft., max. operating voltage 4000 RMS.
MI-90	COAXIAL CABLE—Type RG-62/U, flexible, rubber covered. Single inner conductor and outer shielded conductor.	0.242"	Impedance 93 ohms. Normal capacitance 14.5 MMF/ft.; max. operating voltage 750 RMS.
MI-94D	CAMERA CABLE—28-conductor, rubber covered, flexible, color coded, shielded cable consisting of: (A) 3 coaxial conductors, (B) 3 groups of (7 each) stranded, tinned copper conductors, (C) 4 groups of single conductors tinned copper stranded wire.	0.83"	Coax conductor impedance 51 ohms $\pm$ 5%, 21 conductors of #22 A.W.G. and 4 conductors of #18 A.W.G. with insulation for 1000 v, d-c.

Stock Identification	Type Cable	Approx. Diam.	Characteristics
MI-94E	CAMERA CABLE—25-conductor, vinyl-covered, flexible, color coded, shielded cable consisting of: (A) 3 coaxial conductors, (B) 3 groups of (6 each) stranded, tinned copper conductors, and (C) 1 group of 4 tinned copper conductors.	0.83"	Coax conductor impedance, 51 ohms $\pm$ 5%, 18 conductors of #22 A.W.G. and 4 of #14 A.W.G. with insulation for 1000 v, d-c.
MI-13307	MICROPHONE CABLE—2-conductor, flexible, shielded, color coded.	0.285"	2 conductors each consisting of 41 strand tinned copper wire .0063" dia. to meet RMS specifications.
MI-13318	COAXIAL CABLE—Type RG-58/U, flexible, rubber-covered.	0.20"	Impedance 50 ohms.
MI-13319	POWER CABLE—18-conductor, rubber-covered, flexible, shielded and individually color coded.	0.590"	16 conductors of #22 A.W.G., 2 conductors of #16 A.W.G. with insulation for 2500 v, RMS, 60 cycles.
MI-13320	CONTROL CABLE, 33-conductor, flexible, rubber-covered, shielded and individually color coded.	0.75"	27 conductors #22 A.W.G. wire jacketed 0.059" dia.; 4 conductors #22 A.W.G. wire jacketed 0.106" dia.; and 2 wires same shielded with .005 tinned copper wire.
MI-13321	DELAY CABLE—Type RG-65/U, flexible, shielded.	0.75"	Impedance 1000 ohms.
MI-13324	COAXIAL CABLE—Type Tel-73, vinyl covered, flexible, single inner conductor and outer shield conductor.	0.171"	Impedance 70 ohms; normal capacitance 21 MMF/ft.; max. operating voltage 7000 RMS; attenuation at 400 mc of 12 db/100 ft.
MI-13325	COAXIAL CABLE, Type CE113, flexible double shielded, rubber cover.	0.305"	Impedance 74.99 ohms at 4 mc, normal capacitance 20 MMF/ft., max operating voltage 4000 RMS.
MI-40422	Crimping Tool (for use with CE113 Cable and MI-40423 fittings).		
MI-40423	Fittings for adapting CE113 Cable to PL-259 Connector.		Consisting of 25 pieces of inner sleeving and 25 pieces of outer sleeving.
MI-13333	ORBITER CABLE—7-conductor, flexible, rubber covered, shielded and individually color coded.	0.360"	7 conductors of #20 A.W.G. tinned copper wire stranded 24 x 36.

# TELEVISION LIGHTING EQUIPMENT



## FEATURES

- Experienced lighting engineers help plan studio requirements
- A wide variety of equipment available
- Efficient, economical studio lighting plans for any type of TV studio
- RCA lighting equipment plans are selected with maximum "flexibility" in mind
- Recommendations based on many successful stations in operation
- Complete equipment plans from lamps to lugs — for monochrome and color TV
- A custom recommendation to fit your programming and architectural requirements



Closeup of lighting used in a typical TV set.

## DESCRIPTION

RCA's complete line of Television Lighting Equipment offers maximum flexibility, efficiency and economy in meeting the programming needs of modern, up-to-date TV studios.

Based on their wide experience with the great number of today's television stations, RCA engineers have carefully selected a representative line of equipment of leading lighting manufacturers such as Kliegl Bros. and Century Lighting Inc. Such equipment includes all the fixtures, accessories and wiring and control devices needed for a workable and versatile studio lighting system.

During the planning of the television camera and control equipment for your TV studio, RCA engineers are also available to help plan your lighting system—whether it be for a "workshop-type" of studio, TV theatre studio, or a "repetitive programming" studio. RCA will plan your lighting in accordance with your studio's architectural properties, degree of flexibility desired, and as general program material dictates.

## "Present-Day" TV Lighting

Although TV Lighting Equipment is similar to theatre lighting, it is quite different on several counts. For example, (in contrast to theatre and early TV techniques) complete camera versatility is considered so important that 95 percent of all lighting fixtures are suspended from above, to clear the floor area of stands and cables.

With the introduction by RCA of the new Image Orthicon Tubes, 5820 and 1854, the quantity of light required has been drastically reduced and in turn the philosophy of lighting has changed.

The greater sensitivity of our present cameras means that emphasis is placed on lighting systems which are more efficient and flexible. Fixtures have become a multiplicity of different low wattage lighting sources and accessories to provide all the various lighting functions demanded in television. To adjust those fixtures in a vertical plane, pantograph hangers are available. When mounted on electrified "Mobilrail" the units can also be moved horizontally.



In the studio, lighting fixtures are mounted from a fixed cross hatched gridwork, or if the ceiling height permits, on counterbalanced pipe battens or rope, chain, and wire cable suspended battens. Together with the pantographs, complete versatility is obtained with a minimum of labor and delay in rehearsal time. Any size of scenery may, therefore, be accommodated, and the front fill lights may be adjusted easily to approximately the recommended camera level.

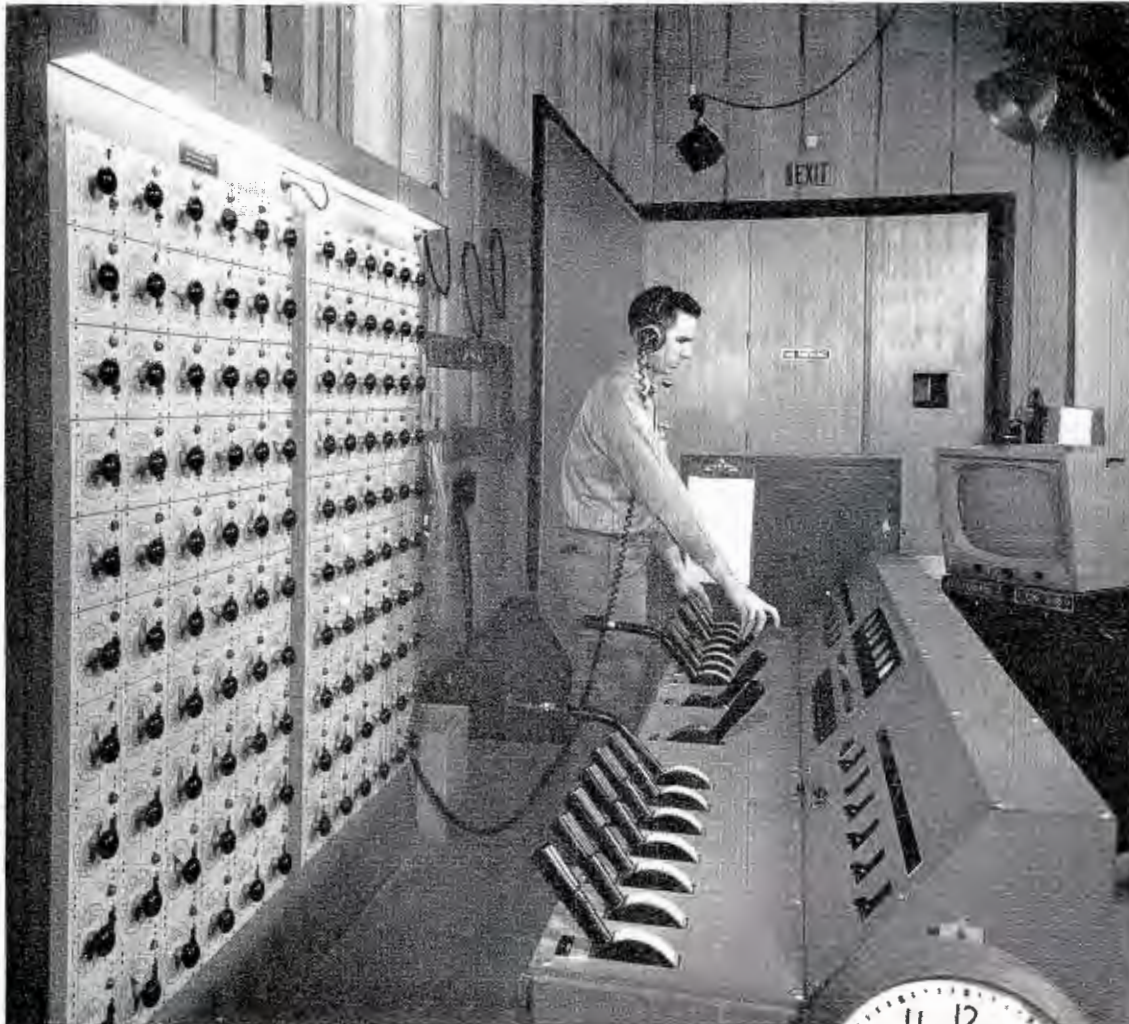
More complex switching and dimming will require control boards. Outlet load selection by means of patch plugs or rotary selector switchers greatly improve the safety and efficiency of lighting control. Electronic dimming has now taken its place in the lighting field to simplify the control functions. Because they control large studio currents with small control voltages, the electronic console may be located in the studio control room near the video operator. More recently, electronic remote control devices have been introduced. Studio installations of up to 100 units, indi-

vidually controlled in rotation, tilt, height, intensity and focus, from a small remoteboard in the control room, have been made.

### Check List

In planning a TV lighting system, a great many factors must be kept in mind by the TV station engineer and the TV systems engineer as well. Listed here as a convenient check list are some of the objectives of the TV studio owner.

1. To provide a safe and rapid means of energizing the lighting fixtures:
  - a. By minimum lengths and number of time consuming portable cables.
  - b. By initially installing ample carrying capacity of wiring, control devices, and feeders additional costly electrical construction in an operating studio can be eliminated.



View of an electronic dimmer control console and load selector panels which combine to provide efficient and precise control of lighting for a large studio.

2. To specify equipment that is reliable and can be easily installed.
  - a. To assure dependable operation.
  - b. To keep maintenance and time consuming improvisations to a minimum.
  - c. To obtain the most favorable casualty, compensation, and fire insurance rates.
3. Fixtures should be specified that are:
  - a. Light weight for easy handling, yet durable to withstand the handling.
  - b. Easily adjusted, repositioned, and focused.
  - c. Safely constructed and wired.
  - d. The number and type of fixtures should be adequate to prevent the use of lamps of higher wattage than the units are designed for.
  - e. Equipment should include a variety of accessories specifically made for the fixtures. These are barn doors, diffuser frames, etc. This is to prevent the use of improvised 'wired on' gadgets that may drop off or cause damage by fire.
  - f. Provide maximum light output per dollar invested.

## Requirements of Studio Lighting Techniques

Every television lighting system should be capable of providing the following functions. RCA has selected and makes available its line of Lighting Equipment to satisfy the various requirements set forth here:

1. Base or General Lighting.
2. Modeling Lighting.
3. Back Lighting.
4. Effects Lighting.

*Base lighting* is that uniform, wide angle illumination which covers the whole scene to be televised and which should establish the mood, i.e., daylight, evening, interior, exterior, etc. The minimum level is limited to a value which will produce an acceptable signal-to-noise ratio with the studio camera used. The actual value of incident light required is also determined by the depth of field and normally ranges from 6 to 120 foot-candles for average lens stops for monochrome and 100 to 400 foot-candles for color. Productions may require even greater variations than this, and for our plans, we will specify 80 foot-



In this studio scene overhead spots and floods are manipulated to provide desired lighting effect.

candles for an average interior for monochrome and 240 foot-candles for color. This base or general light can be provided by incandescent floods (scoops), or long range scoops (for long distance throws). *Base lighting* can also be obtained by using the Fresnel spot lights at flood position.

*Modeling light* is directional light at an angle to the camera axis which develops forms in the scene. Such light can also project through a window, open door, or fireplace to the subject or main acting area. Shadows are then produced, and give an illusion of depth to the subject. This can be obtained by unbalanced base light without destroying the illusion of the space effect. More generally, however, Fresnel lens spotlights provided with diffusers and barn doors can effectively create the form and enhance the appearance of the scene. The intensity of this lighting should be 20 to 30 percent greater than the base light in the scene.

*Back lighting.* The purpose of back lighting is to separate the actors from the background. This is obtained by using spotlights at the rear of the set, directed from above. The level of this backlight should approach an intensity 50% greater than that of the base light, and should be applied with caution since light should never enter the television camera lens.

*Effects lighting* is specialized lighting which injects reality to the televised scene. Such effects as clouds, snow, rain, lightning, firelight, and window light can be obtained by rear projection or by simple silhouettes in front of a light source. Many types of lighting equipment are available for other special beam patterns. The background projector has been used more recently. It can project a simulated background which may be stationary as produced from a slide or moving objects from motion picture film. For proper picture quality, the highlights thus projected should be equal to or at least half of those of the live scene highlights.

The proper combination of these various functions of light can give the illusion of three dimensions to the television picture and impart the desired artistic results. Complete flexibility in all phases of the lighting system is necessary to satisfy the techniques of present day television.

### Lighting Application Tools

Unobstructed flexibility of camera and mike boom is required on the studio floor; therefore, the lighting is done from overhead. The means of supporting the lighting fixtures is facilitated by the application tools—viz., grid-work and pantographs.



View of studio at Station WFGA-TV, Jacksonville, Fla., with electronic dimmer lighting control and patchboard in extreme right corner.

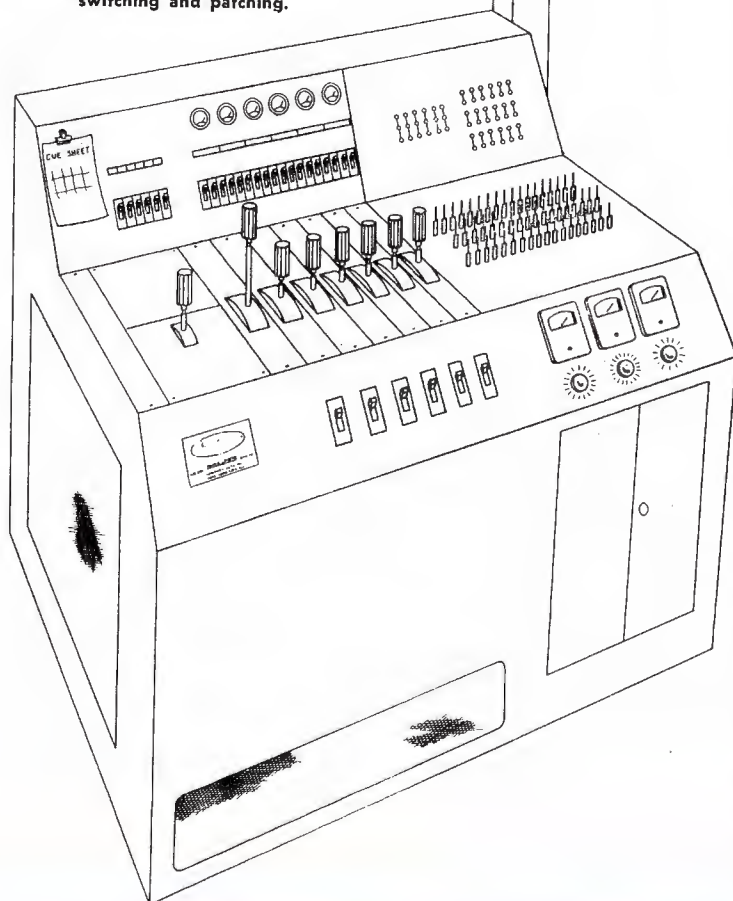
The ceiling height of 14 to 18 feet prompts the use of a primary-secondary type of grid structure using a 1¼-inch black iron pipe. The primary grid is installed as close to the ceiling as possible—allowing clearance for raceways, ducts, and sprinklers. From this permanent group of parallel pipes is suspended a secondary grid. The secondary pipes are suspended by means of double "C" clamps or chain from the primary pipes and are perpendicular to them. The criss-cross network formed should be on 6- to 8-foot centers to insure adequate facilities for suspension of fixtures. The secondary pipes allow flexibility, as they can be repositioned to any point on the scene required. Normally, the resulting grid is spaced 12 to 14 feet from the studio floor. From this grid the fixtures can be hung directly, or through pantograph hangers.

Pantographs permit raising and lowering of lighting fixtures and when used with crossarms can support a number of fixtures. Current pantographs can support weights up to 60 pounds and allow for a vertical travel from 8½ to 12½ feet at maximum extensions. A number of pantographs supported from the grid have a great advantage for rapid vertical adjustment. Their most important use in the studio is the support of base lights which, for best pictures, should be approximately 8 feet from the floor.

For studios of ceiling heights above 16 feet a counter-weighted type of grid-work is recommended. This type of grid is described in Plan #3.

THE SKETCH INCLUDED HERE DEPICTS THE USES OF SOME OF THE VARIOUS LIGHTING UNITS WHICH MIGHT BE EMPLOYED IN A TYPICAL TV INSTALLATION.

Switchboard Unitized for dimming, switching and patching.



### Wiring and Control Devices

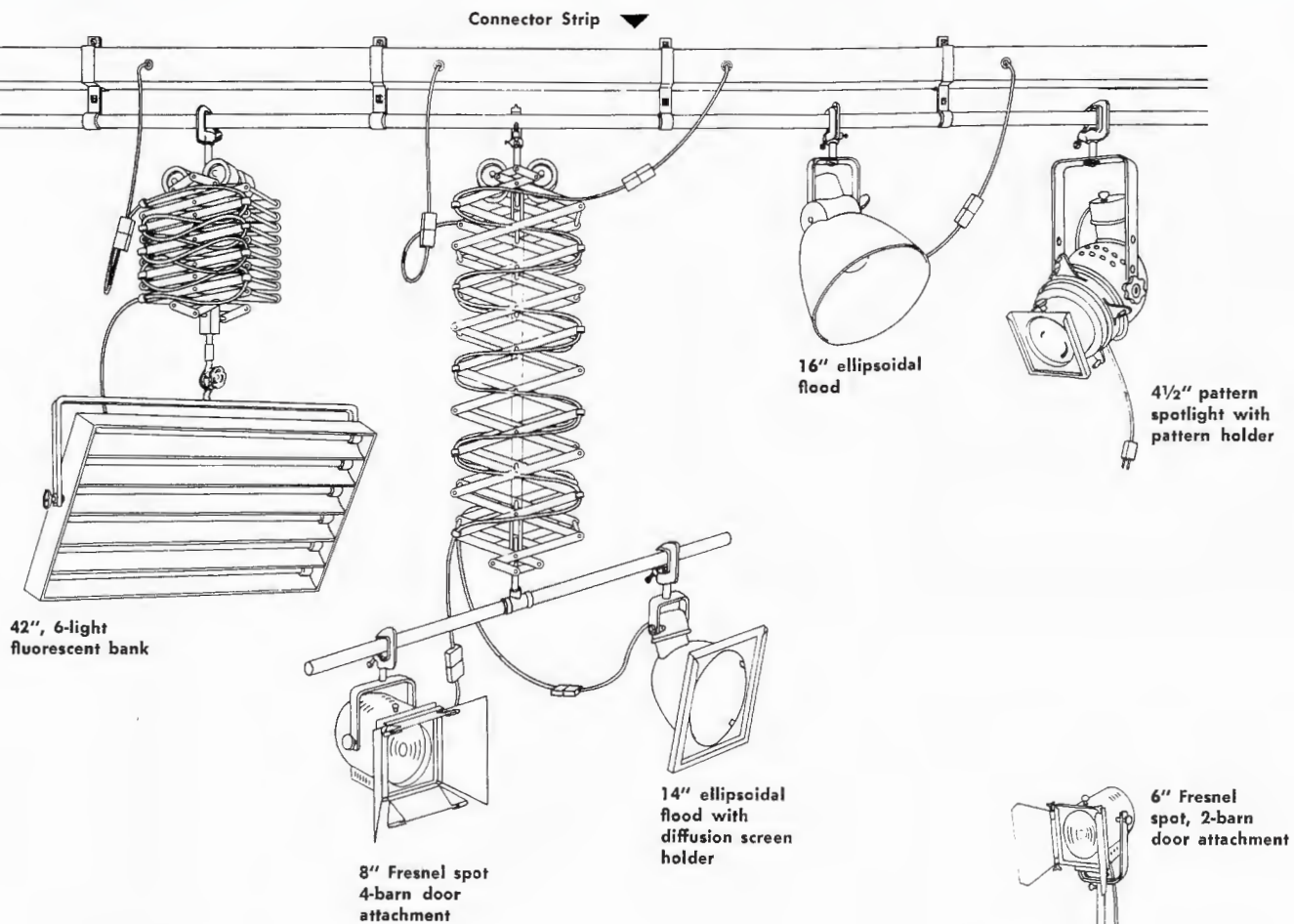
Mounted to the secondary pipes are the connector strips, each with 5 outlets. These outlets are pigtails of 3- or 4-foot cables with female stage connectors attached. A total of one ceiling outlet for every 20 square feet of working studio space should be provided in the studio.

From each connector strip, a 12-conductor cable brings the branch circuits directly, or through 4 by 4-inch duct to the studio lighting control. The control board is located on the studio floor so that the operator can view the scene or the control room for cues, and has sufficient switches and dimmers for the accurate and noiseless control of each outlet.

The switchboard should contain a master switch to make possible blackouts and control of everything but work lights. The power is fed to individually fused and switchable outgoing 20 amp. circuits—one for each ceiling outlet. With the addition of a dimmer board, even greater flexibility is obtained. Dimming makes possible special effects, transitions, and control of overall light level.

Practical considerations have limited the studio lighting system to a-c operation. The total a-c power service recommended for the switchboard input is 30 to 40 watts per square foot of working studio space from a 3-phase, 4-wire, 60-cycle system. In addition to this, a special floor outlet box is recommended. This outlet in the middle of the scenic studio area should have a 60-amp. female outlet and 3-pole switch to provide power for special high current equipment such as an electric range in the kitchen set.

The wiring system of this studio should have, in addition, outlets and connectors of suitable uniformity to make possible complete interchangeability of cable, outlets, or instrument. An equipment ground, carried throughout the system, insures the safety of all personnel.

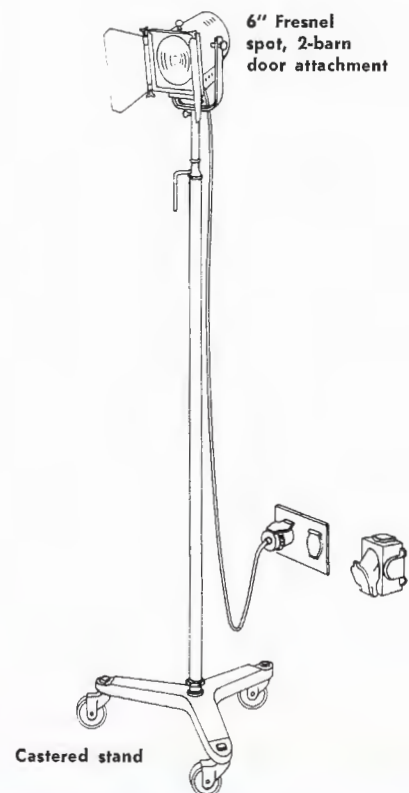


### Lighting Sources

The scoop is a practical source to be considered for use in the TV studio. Several of these units on each scene can provide easily the desired wide angle base light. This light level will vary with the mood of the scene to be televised. When mounted on the pantograph hanger, they can be adjusted with the result that their beam strikes the scene at an angle no greater than 20 degrees and, with diffuser frames, give the proper breakup of the harsh light.

A number of Fresnel spotlights can provide the key and modeling light for the scenes. These units, together with suitable barn doors, can provide the proper, narrow-angled light to supply form for the scene. Their level should contribute a 20 to 30 percent increase in intensity above the average base lighting.

These spotlights can provide backlight of 50 percent greater intensity than the base light. The purpose of backlight is to separate the main actors from the background scenery.



### Three Practical Equipment Plans

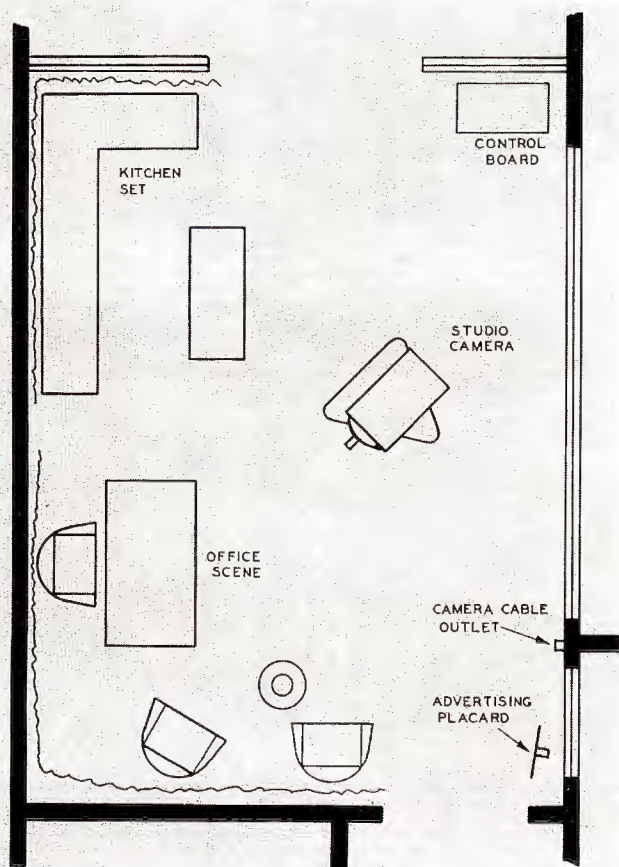
Obviously, each TV studio must be considered on the basis of its own size and the programming to be accomplished. However, included here are floor plans and equipment lists for three station plans. These plans will perhaps cover a majority of the applications met in actual practice.

#### Equipment Plan #1 (Small Studio, Single Live Camera)

In this plan, the studio will undoubtedly be used for repetitive type of programming. Local, unrehearsed shows such as panel discussions, interviews, local spots, kitchen shows or demonstrations will be predominant. Although the studio is a small 18 by 25-foot unit, it can accommodate a permanent kitchen set and an office scene. Space is also available for displaying the sponsor's products and advertising placards.

The lighting system for such a studio has previously been described from the standpoint of application tools, wiring and control devices, and sources. The equipment required for TV Studio Plan #1 is listed below.

Sketch showing studio scenic arrangement for Plan #1.



### Plan #1 Equipment List

Portable Lighting Equipment Complement for a Semi-Permanent Studio (18' x 25', Two Scene)

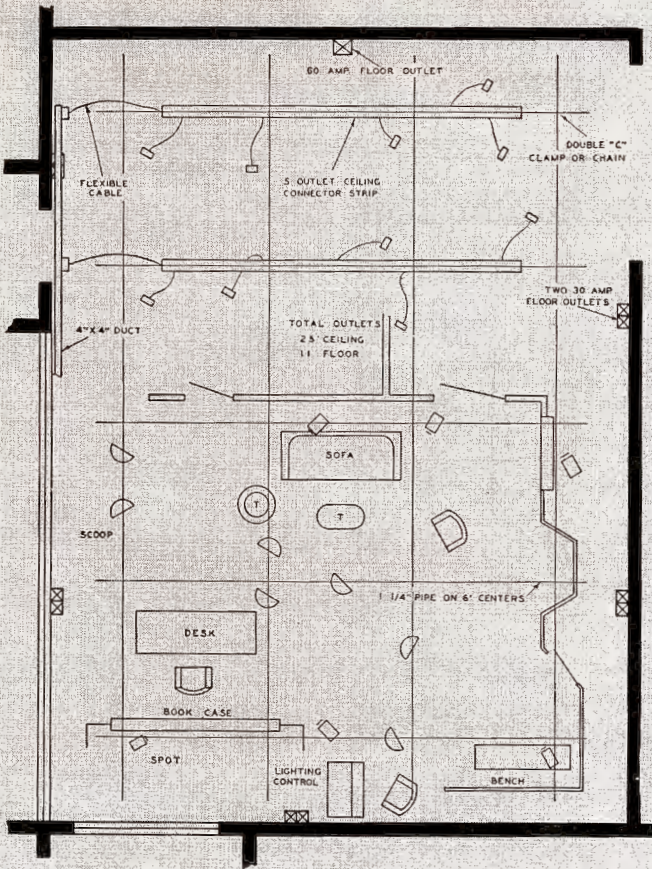
Qty.	Description	Stock Reference	
		Century	Kliegl
	FIXTURES (each with 3-wire, 3-pole connectors)		
4	Baby Scoop, 300-500 w.	1312G	TV1122G
4	Scoop, 750-2000 w.	1315G	TV1122G
2	3-Inch Fresnel Spotlight, 75-150 w.	523G	44N3TVG
4	6-Inch Fresnel Spotlight, 250-750 w.	520G	44N6TVG
4	8-Inch Fresnel Spotlight, 1000-1500 w.	526G	44N8TVG
1	Follow Spotlight with Iris, 250-750 w.	998G	1365G/1
1	Pattern Projector, 250-750 w.	1581G	1365PG
	ACCESSORIES		
4	Diffuser Frame, Baby Scoop	3225	1078C
4	Diffuser Frame, Scoop	3226	1078
1	Roll of Spun Glass Diffuser	SGD	SG-1
1	4-Way Barn Door for 3-Inch Fresnel	2579	10803A
2	2-Way Barn Door for 6-Inch Fresnel	2570	1080
1	4-Way Barn Door for 6-Inch Fresnel	2580	1080A
2	2-Way Barn Door for 8-Inch Fresnel	2571	1081
1	Set of Patterns for Pattern Projector	2085/2071	1097
3	Roller Caster Floor Stands	3570	1422CR
5	Lightweight Pantograph Hangers	3289	TV111
5	Short Extension Cables	18RCCG	10EG
3	Medium Extension Cables	25RCCG	25EG
	WIRING AND CONTROL DEVICES (3-Wire System)		
2	Portable Connector Strip, with 25 ft. Cable and 5 outlets	6315-5/20	2440G/25
2	Portable Connector Strip, with 35 ft. Cable and 5 outlets	2824	2440G/35
1	Portable Switch, Dimmer, and Distribution Panel with a minimum of 18-20 amp outlets	2-2803/ 1-2882	TV2415G

### Studio Lighting Equipment Plan #2

The studio of Plan #2 might be classified as a general utility or "workshop" type of studio. Unlike the Plan #1 studio, it is capable of handling somewhat more complex programming involving more frequent setup changes. Dramatic, planned, or restricted sequence programs will originate from this (22 by 34 by 14 to 18-foot) studio.

To fulfill the requirements of present and future programming, the lighting arrangement for this studio must be as flexible as possible. A criss-cross pipe grid on 6-foot centers and spaced 12 to 14 feet from the floor is used. With such a network and spacing, it is always easy to relocate a fixture on a desired point in a scene. Besides the fixtures themselves, the grid also supports the connector strips and pantograph hangers. Since the latter brings the fixtures within arm's reach, they facilitate the adjustment of fixtures with a minimum amount of time and effort on the part of electricians or other production personnel.

NOTE: LAYOUT IS SYMMETRICAL, UPPER HALF PLAN BEING CEILING ARRANGEMENT AND LOWER HALF SCENIC.



Sketch showing the studio lighting arrangement for Plan #2.

Safety and flexibility in the studio wiring system is assured by the use of six connector strips. Each has five pigtail female outlets and is fed from a terminal box on a 4-inch duct through rubber cable. Spaced uniformly on the secondary pipes, they provide 30 ceiling outlets or approximately one outlet for every 30 square feet of studio space. Five other double outlet circuits are provided 1 to 2 feet from the floor on the walls. The adequate branch circuits available at the switchboard make it possible to always find a convenient outlet in the studio. A uniform type of connector throughout the lighting system is suggested to permit interchangeability.

All ceiling and floor outlets are wired to the switchboard where they are switchable or dimmable either collectively or individually, by a patchboard where each outlet is provided with a counterbalanced, retractable cord and male plug. They are patched into the desired bank of grouped female jacks, and, in turn, can be energized by breaker switches. The patching feature makes it possible to group all the fixtures associated with a particular scene to one

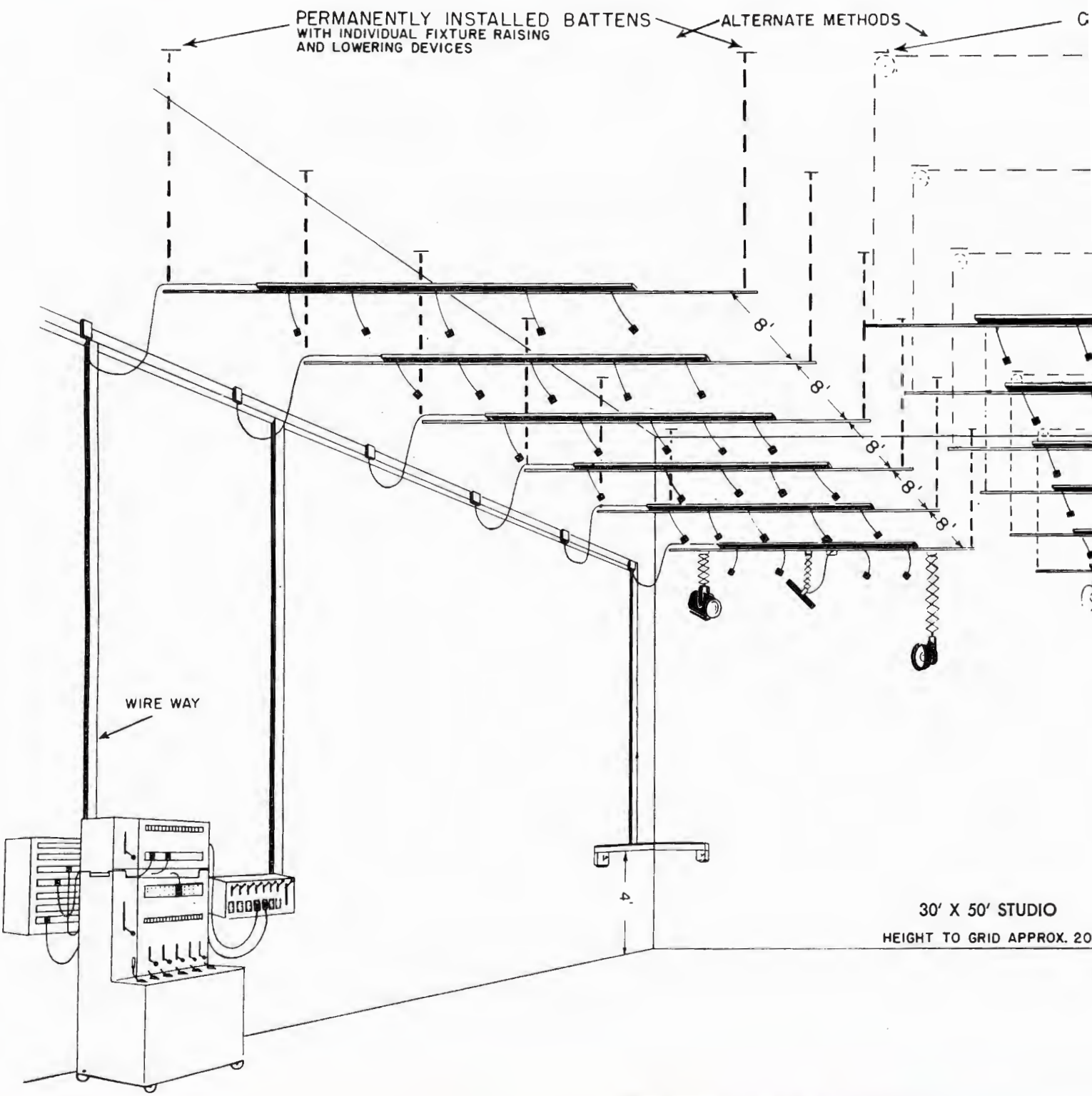
master and dimmer. Lastly, the studio light control must be capable of supplying 25 KW of fused power or almost 30 watts per square foot of studio floor space.

From an engineering standpoint, the lighting sources must provide the proper quality and quantity of light needed to produce a good TV picture. Practically, it has been found that incandescents or a combination of fluorescents and incandescents can provide the quality of light to insure proper tonal rendition for monochrome cameras. Fluorescents cannot be mixed with incandescents for color cameras because of their wide difference in effective color temperature. The quantity of light reflected from the TV scene must be sufficient to allow the camera to produce a picture of acceptable signal-to-noise ratio. The average lighting level is 100 foot-candles, for monochrome but it is recommended that sufficient sources be available to produce about 400 foot-candles of incident light in order that there be proper flexibility in control and lens stops for future color productions.

**Plan #2 Equipment List**

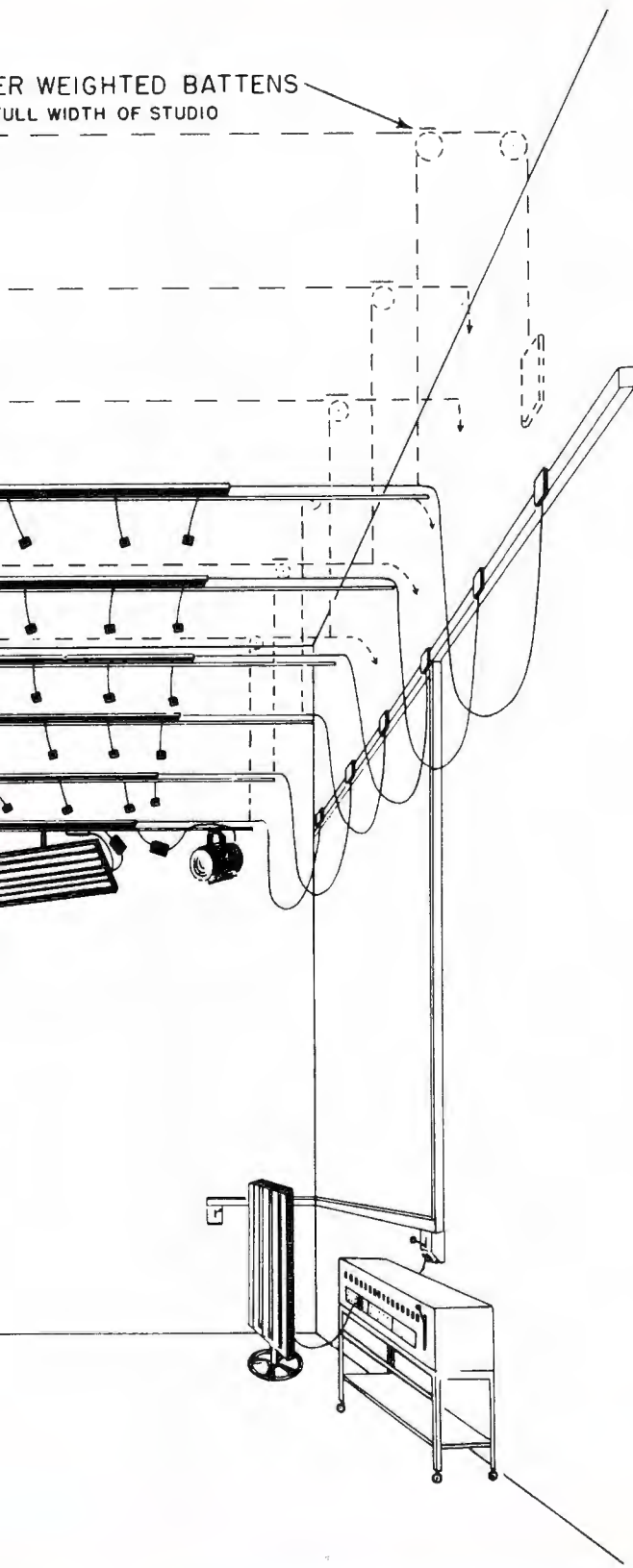
TV Lighting Equipment Complement for a Permanent Studio (approx. 22' x 34' x 14' Ceiling)

Qty.	Description	Stock Reference	
		Century	Kliegl
FIXTURES (each with 3-wire, 3-pole connectors)			
6	Baby Scoop, 300-500 w.	1312G	TV1122G
6	Scoop, 750-2000 w.	1315G	TV1122G
3	3-Inch Fresnel Spotlight, 75-150 w.	523G	44N3TVG
12	6-Inch Fresnel Spotlight, 250-750 w.	520G	44N6TVG
5	8-Inch Fresnel Spotlight, 1000-1500 w.	526G	44N8TVG
2	Follow Spotlight with Iris, 250-750 w.	998G	1366G/1
2	Pattern Projector, 250-750 w.	1581G	1365PG
ACCESSORIES			
6	Diffuser Frame, Baby Scoop	3225	1078C
6	Diffuser Frame, Scoop	3226	1078
1	Roll of Spun Glass Diffuser	SGD	SG-1
1	4-Way Barn Door for 3-Inch Fresnel	2579	10803A
4	2-Way Barn Door for 6-Inch Fresnel	2570	1080
2	4-Way Barn Door for 6-Inch Fresnel	2580	1080A
2	2-Way Barn Door for 8-Inch Fresnel	2571	1081
2	Set of Patterns for Pattern Projector	2085/2071	1097
5	Roller Caster Floor Stands	3570	1422CR
8	Lightweight Pantagraph Hangers	3289	TV111
2	Heavyweight Pantagraph Hangers	3534	TV112
10	Short Extension Cables	18RCCG	10EG
6	Medium Extension Cables	25RCCG	25EG
WIRING CONTROL DEVICES (3-Wire System)			
6	Connector Strips, with 5 outlets and 20 ft. cables	6307-5/20	3432G/20
2	Wall Outlet, 2 Way, 20 amp.	3047	2433G/2
1	Wall Outlet, 1-way, 60 amp.	3049	TV2405G
1	Switch, Dimmer, and Load Selection Control Board with a minimum of 30-20 amp. outlets	2836/2880	TV2409G/TV2414G



Sketch showing the arrangement of lights, supports, fixtures and outlets in a TV studio such as that of #2 Alternate.





## Lighting Equipment Plan #2 (Alternate)

The television studio of "Plan #2 Alternate" is similar to Plan #2, except that this plan can accommodate two more scenes. In using a higher ceiling in a larger studio, a counterweighted batten is employed as shown in the sketch at left. Plan "#2 Alternate" studio is 30 by 50 feet and can also be classified as a workshop type of studio. Lighting equipment is listed below.

### Lighting Equipment Plan #2 (Alternate) TV Lighting Equipment Complement for a Permanent Studio (approx. 30' x 50' x 27' Ceiling)

Qty.	Description	Stock Reference	
		Century	Kliegl
	<b>FIXTURE (each with 3-wire, 3-pole connectors)</b>		
10	Baby Scoop, 300-500 w.	1312G	TV1122G
10	Scoop, 750-2000 w.	1315G	TV1122G
4	3-Inch Fresnel Spotlight, 75-150 w.	523G	44N3TVG
16	6-Inch Fresnel Spotlight, 250-750 w.	520G	44N6TVG
8	8-Inch Fresnel Spotlight, 1000-1500 w.	526G	44N8TVG
2	Fresnel Senior Spotlight, 2000 w.	572G	44N12TVG
2	Striplight	431G	TV602G
3	Follow Spotlight with Iris, 250-750 w.	1582G	1365G/1
3	Pattern Projector, 250-750 w.	1581G	1365PG
1	Follow Spotlight with Iris, 1000 w.	998G	1366G/1
	<b>ACCESSORIES</b>		
10	Diffuser Frame, Baby Scoop	3225	1078C
10	Diffuser Frame, Scoop	3226	1078
1	Roll of Spun Glass Diffuser	SGD	SG-1
2	4-Way Barn Door for 3-Inch Fresnel	2579	10803A
6	2-Way Barn Door for 6-Inch Fresnel	2570	1080
2	4-Way Barn Door for 6-Inch Fresnel	2580	1080A
4	2-Way Barn Door for 8-Inch Fresnel	2571	1081
1	2-Way Barn Door for Senior Fresnel	2573	1082
2	Set of Patterns for Pattern Projector	2085/2071	1097
6	Roller Caster Floor Stands	3570	1422CR
8	Lightweight Pantograph Hanger	3289	TV111
4	Heavyweight Pantograph Hanger	3534	TV112
16	Short Extension Cable	18RCCG	10EG
6	Medium Extension Cable	25RCCG	25EG
	<b>WIRING AND CONTROL DEVICES</b>		
14	7-ft. Connector strip with 5 outlets	6307-5/20	3432G/20
4	Wall Outlet, 2-way, 20 amp.	3047	2433G/2
1	Wall Outlet, 1-way, 60 amp.	3049	TV2405G
1	Switch, Dimmer, and Load Selection Control Board with a minimum of 70-20 amp. outlets	2872/2880	PA32TVP

**Lighting Equipment Plan #3**

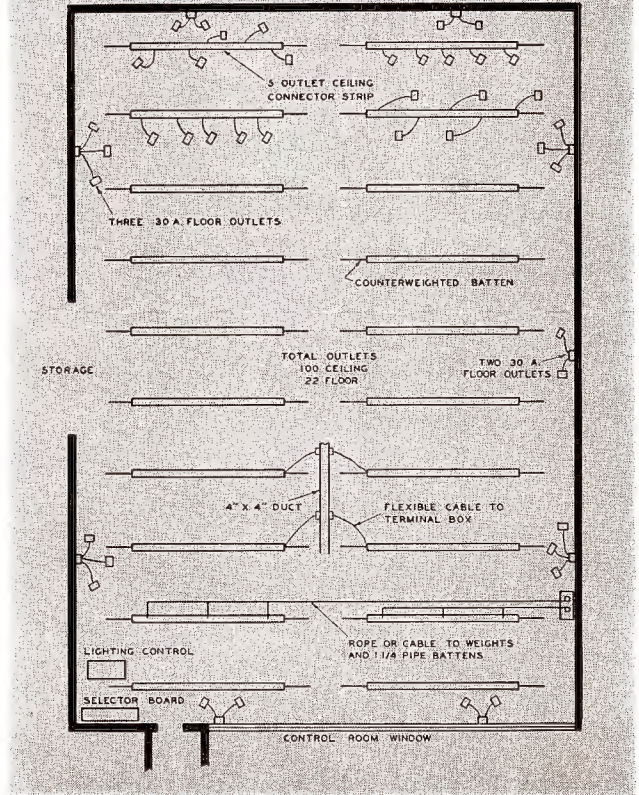
The studio of Plan #3 offers greater versatility than that of the previous plans described. It will originate a variety of dramatic shows and commercial sequences. Having a 40 by 60 foot working space, it requires approximately 100 branch circuits. Branch circuits may be grouped as scenery requires by means of a patch or rotary selector board. They, in turn, are switched and dimmed at the control board.

**Plan #3 Equipment List**

TV Lighting Equipment Complement for a Permanent Studio (approx. 40' x 60' x 27' Ceiling)

Qty.	Description	Stock Reference	
		Century	Kliegl
<b>FIXTURES (each with 3-way, 3-pole connectors)</b>			
15	Baby Scoop, 300-500 w.	1312G	TV1122G
15	Scoop, 750-2000 w.	1315G	TV1122G
4	3-Inch Fresnel Spotlight, 75-150 w.	523G	44N3TVG
20	6-Inch Fresnel Spotlight, 250-750 w.	520G	44N6TVG
15	8-Inch Fresnel Spotlight, 1000-1500 w.	526G	44N8TVG
3	Fresnel Senior Spotlight, 200 w.	572G	44N12TVG
4	Striplight	431G	TV602G
3	Follow Spotlight with Iris, 250-750 w.	1582G	1365G/1
4	Pattern Projector, 250-750 w.	1581G	1365PG
2	Follow Spotlight with Iris, 1000 w.	998G	1366G/1
<b>ACCESSORIES</b>			
15	Diffuser Frame, Baby Scoop	3225	1078C
15	Diffuser Frame, Scoop	3226	1078
2	Roll of Spun Gloss Diffuser	SGD	SG-1
2	4-Way Barn Door for 3-Inch Fresnel	2579	10803A
8	2-Way Barn Door for 6-Inch Fresnel	2570	1080
3	4-Way Barn Door for 6-Inch Fresnel	2580	1080A
8	2-Way Barn Door for 8-Inch Fresnel	2571	1081
1	2-Way Barn Door for Senior Fresnel	2573	1082
2	Set of Patterns for Pattern Projector	2085/2071	1097
8	Roller Caster Floor Stands	3570	1422CR
12	Lightweight Pantograph Hanger	3289	TV111
6	Heavyweight Pantograph Hanger	3534	TV112
20	Short Extension Cable	18RCCG	10EG
10	Medium Extension Cable	25RCCG	25EG
<b>WIRING AND CONTROL DEVICES</b>			
20	15 ft. Connector Strip with 5 outlets	6315-5/20	619G-5/15
5	Wall Outlet, 2-way	3047	2433G/2
2	Wall Outlet, 1-way, 50 amp.	3049	TV2405G
1	Switch, Dimmer, and Load Selection Control Board with a minimum of 100-20 amp. Circuits	2872/2836/2881	PA33TVP

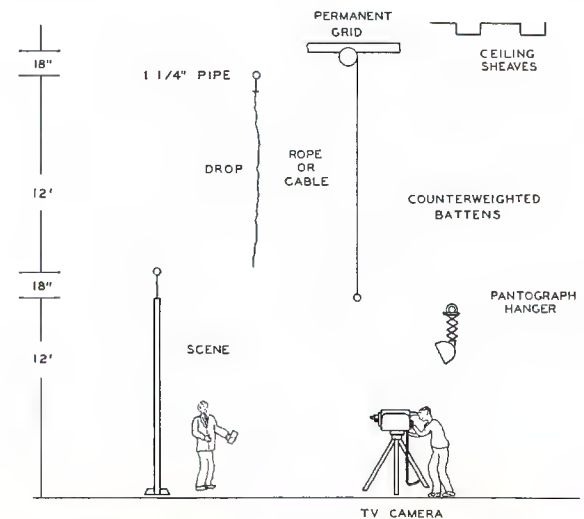
Sketch of Plan #3 studio (40 x 60) showing lighting arrangement.



**Summary of Lighting Plans**

Type	Size		Area (sq. ft.)	Outlets		Scenes
	Diam.	Ht.		Ceiling	Floor	
1 Camera Temporary	18x25	14	450	20	0	2
1 Camera Permanent	22x34	14	750	30	5	4
2 Camera Permanent	30x50	27	1500	60	9	6
3 Camera Permanent	40x60	27	2400	100	12	8

MINIMUM 27' CEILING



Studio arrangement for proper ceiling height to permit varying scenery set heights.

**KLIEGL BROTHERS LIGHTING EQUIPMENT**

DESCRIPTION	TYPE
<b>Scoops (Less Lamps)</b>	
300-500 W. 15" Baby Scoop.....	TV1122G
750-2500 W. 18" Scoop.....	TV1155G
750-1000 W. Long Range Scoop.....	TV1158G
Standard Scoop on Adj. Roller Floor Stand.....	TV1157CRG
<b>Slimline Fixtures (Less Lamps and Ballasts)</b>	
For 6-64" Tubes.....	TV664G
For 4-64" Tubes.....	TV464G
For 6-42" Tubes.....	TV642G
For 4-42" Tubes.....	TV442G
Portable 4-64" Tube on Adj. Roller Stand.....	TV464CRG
<b>Ballast Boxes for Slimline:</b>	
For 6-64" Fixture.....	TV664BG
For 4-64" Fixture.....	TV464BG
For 6-42" Fixture.....	TV642BG
For 4-42" Fixture.....	TV442BG
Three Circuit Feeder for Type TV664G which Allows 1/2, 2/3 and Full Intensity Operation.....	TV664BG5
<b>Slimline Fixtures—"All-in-One"</b>	
For 6-64" Tubes: 1-Cir.....	TV6WB4G
For 6-64" Tubes: 3-Cir.....	TV6WB64G5
For 4-64" Tubes: 1-Cir.....	TV4WB64G
For 6-42" Tubes: 1-Cir.....	TV6WB42G
For 4-42" Tubes: 1-Cir.....	TV4WB42G
<b>Fluorescent Fixtures (Less Lamps and Ballasts)</b>	
For 6-48" Tubes.....	TV6S4BG
For 4-48" Tubes.....	TV4S4BG
<b>Ballast Boxes for Fluorescents:</b>	
For 6-48" Tubes.....	TV6S4BG
For 4-48" Tubes.....	TV4S4BG
<b>Fluorescent Fixtures—"All-in-One"</b>	
For 6-48" Tubes.....	TV6WBS4BG
For 4-48" Tubes.....	TV4WBS4BG
<b>Fresnel-Lens Spotlights (Less Lamps)</b>	
100/150 W. 3" Lens.....	44N3TVG
500/750 W. 6" Lens.....	44N6TVG
500/750 W. Pole—OP, 6" Lens.....	44NP6TVG
1000/2000 W. 8" Lens.....	44N8TVG
1000/2000 W. Pole—OP, 8" Lens.....	44NP8TVG
1000/2000 W. Oval Beam, 8" Lens.....	44NO8TVG
1000/2000 W. 12" Lens.....	44N12TVG
3000/5000 W. 16" Lens.....	44N16TVG
<b>Klieglights (Less Lamps)</b>	
500/750 W. 6" Lens.....	1365G
500/750 W. 6" Lens with Iris Shutter.....	1365G/Iris
Pattern Projector, 500/750 W.....	1365PG
1000/2000 W. 6" Lens.....	1366G
1000/2000 W. 6" Lens, Pattern Projector.....	1366PG
1000/2000 W. 6" Lens with Iris Shutter.....	1366G/Iris
1000/2000 W. 8" Lens.....	1368G
1000/2000 W. 8" Lens with Iris Shutter.....	1368G/Iris
1000/2000 W., Pattern Projector, 8" Lens.....	1368PG
3 KW Klieglight.....	1374G
3 KW Pattern Projector.....	1374PG
3 KW 8" Lens, with Iris Shutter.....	1375G
3 KW 8" Lens, Pattern Projector and Holder.....	1375PG
Set of Patterns for Projectors.....	1097
<b>Follow Spotlights (Less Lamps)</b>	
2000 W. 12" Lens.....	1174G
2000 W. 8" Lens.....	1174WG
3000 W. 12" Lens.....	1178G
3000 W. 8" Lens.....	1178WG
<b>Special-Purpose Units (Less Lamps)</b>	
1000/2000 W. Kliegsun.....	TV1143G
Striplight, 4 Ft., 6 Lamps.....	TV600G
Striplight, 4 Ft., 6 Lamps, with Reflectors.....	TV602G
Striplight with Reflectors on Roller Stand.....	TV602CRG

DESCRIPTION	TYPE
<b>Background Projection</b>	
2100 W. 60 V. Background Effects Projector (Slide Changer, Scenic and Electro-Mechanical Effects may be purchased at additional cost).....	1674G
<b>Hanging Devices</b>	
Double "C" Pipe Clamp.....	TV119
Adjustable Pendant Clamp, Unit Support.....	TV120
Adjustable Batten Support to 6 Ft.....	TV121
Batten Support, 4 Ft., Non-Adj.....	TV122
Counterbalanced "Lazy Boy" Hanger for All Scoops, 6" Lens Fresnel and Kliegsun.....	TV111
Counterbalanced "Lazy Boy" Hanger for 8" Fresnel Spot.....	TV112
Counterbalanced "Lazy Boy" Hanger for 12" Fresnel Spot and Slimline Units.....	TV113
<b>Roller-Caster Floor Stands</b>	
19" Caster Base.....	1420CR
25" Caster Base.....	1421CR
25", 3 Section Pedestal.....	1421/3CR
30" Caster Base.....	1422CR
30", 3 Section Pedestal.....	1422/3CR
30", 3 Sectional Pedestal, 16 Ft. Extension.....	1422/3CR/18
<b>Switch Sets for Floor Stands</b>	
With No. 955G Pigtail Connector.....	30AMP/G
With No. 957G Pigtail Connector.....	60AMP/G
<b>Barn Doors</b>	
2 Way for 6" Fresnel Spot.....	1080
2 Way for 8" Fresnel Spot.....	1081
2 Way for 12" Fresnel Spot.....	1082
2 Way for 16" Fresnel Spot.....	1083
2 Way for 1122 Scoop and 1143 Kliegsun.....	1084
2 Way for 1155 Scoop.....	1091
2 Way for 1158 Scoop.....	1092
4 Way for 3" Fresnel Spot.....	10803A
4 Way for 6" Fresnel Spot.....	1080A
4 Way for 8" Fresnel Spot.....	1081A
4 Way for 12" Fresnel Spot.....	1082A
4 Way for 16" Fresnel Spot.....	1083A
4 Way for 1122 Scoop and 1143 Kliegsun.....	1084A
4 Way for 1155 Scoop.....	1091A
4 Way for 1158 Scoop.....	1092A
<b>Diffuser Frames and Mediums</b>	
For 3" Fresnel Spot.....	1032
For 6" Spotlights: 1365 Kliegs.....	1036
For 8" Spotlights: 1366 Kliegs.....	570F
For 12" Fresnel Spot.....	578
For 16" Fresnel Spot.....	585
For 1174 and 1178 Follow Spots.....	1039
For 1122 Scoop: 1143 Kliegsun.....	1078C
For 1155 Scoop.....	1078
For 1158 Scoop.....	1078B
Spun Glass Diffuser Roll (3' x 12').....	SG-1
One Yard of Fibre Glass	
One Sheet Gelatine	
<b>Wiring Devices</b>	
Wall Box with Two Pigtail Outlets.....	2433G/2
Wall Box with Three Pigtail Outlets.....	2433G/3
Wall Box with Four Pigtail Outlets.....	2433G/4
<b>Connector Strips:</b>	
7 1/2 Ft. with 5 #955G Pigtails—Without Feed Cable.....	2432G
With 10 Ft. Feed Cable.....	2432G/10
With 15 Ft. Feed Cable.....	2432G/15
With 20 Ft. Feed Cable.....	2432G/20
With 25 Ft. Feed Cable.....	2432G/25
Strip Any Length, with Any Number of Pigtail Connectors.....	619G
Terminal Box for Connector Strips.....	2406G
<b>Portable Patch Sets:</b>	
7 1/2 Ft. Strip, 5 #955G Outlets, 20 Ft. Cable.....	2440G/20
With 25 Ft. Cable.....	2440G/25
With 35 Ft. Cable.....	2440G/35

**KLIEGL BROTHERS LIGHTING EQUIPMENT (Continued)**

DESCRIPTION	TYPE	DESCRIPTION	TYPE
<b>Control Equipment—Patch-Plug/Autrastat System</b>			
Location Feeder Box, Knife Switch, 1 Outlet.....	TV2405G	Two-Unit Combination Including: Rotorelector Panel (12 No-Dim Feeder, 30 Circuits and Control Switches).....	PA43TV1B
Location Feeder Box, Circuit Breakers, 2 Outlets.....	TV2405G/2	Dimmer Console (6 Dimmers Without Control Switches).....	PA45TV2
Wall Distribution Box—4 Outlets.....	TV2403G	<b>Rotorelector/Electronic Switchboards</b>	
Wall Distribution Box—7 Outlets.....	TV2401G	Three Unit Combination Including: .....	Bull-56
Patch Board, Wall Type, 100 Connectors.....	TV2407G	Rotorelector Panel (70 Circuits)	
<b>Switchboards:</b>			
Portable Type, Non Dim, 15 Circuits.....	TV2409G	Dimmer Console (6 Dim, 6 No-Dim Feeder Circuits)	
5 Dimmers, 15 Circuits.....	TV2414G	Thyratron Bank (6 Circuits Assembly)	
6 Dimmers, 18 Circuits.....	TV2415G	Note: Rotorelectors available in 12, 24 and 36 Positions.	
6 Dim, 6 No-Dim, 70-Patch Circuits.....	PA32TVP	<b>Equipment Extension Cables</b>	
10 Dim, 2 No-Dim, 125-Patch Circuits.....	PA33TVP	10 Ft. Rubber Cable, #12-2G, 955-G Connections (Male and Female) on Opposite Ends.....	10EG
Stand for TV24096.....	TV2418	Same with 25 Ft. Cable.....	25EG
<b>Mobile Wiring Equipment</b>			
Breaker Type, with 3-Ft. #8-4G Cable, 3ph4W Plus G, 4957G Male Connector, 6-955G Outlets.....	456G4	<b>Connectors</b>	
Breaker Type, with 3-Ft. #63G Cable, 1-ph4W Plus G, 3957G Male Connector, 6-955G Outlets.....	456G3	20 A., 2 Wire, Plus Ground.....	955G
<b>Rotorelector/Autrastat Switchboards</b>			
Single Unit Combination with 10 Dim, 2 No-Dim, 125 Rotorelector Circuits.....	PA33TVR	30 A., 2 Wire, Plus Ground.....	956G
Two-Unit Combination Including Rotorelector Panel (70 Circuits) and Dimmer Console (6 Dim, 6 No-Dim).....	PA32TVR	60 A., 2 Wire, Plus Ground.....	957G
		60 A., 3 Wire, Plus Ground.....	3957G
		60 A., 4 Wire, Plus Ground.....	4957G
		100 A., 3 Wire, Plus Ground.....	3958G
		12 Conductors of #12 Wire.....	12/12
		6 Conductors of #12 Wire.....	12/6
		5 Conductors of #6 Wire.....	6/5

General view of a studio showing flexible lighting arrangement which provides "third-dimensional" effect, head-on, or general illumination as required for various sets.



CENTURY LIGHTING EQUIPMENT

Fixtures Less Lamps (Grounded and with "C" Clamp and Pin Connectors)		
DESCRIPTION		TYPE
3" 75-100-125-150 W. Fresnelite Camera Light.....	523G	
2 Way Barn Door for #523.....	2569	
4 Way Barn Door for #523.....	2579	
Diffuser Frame for #523.....	3220	
6" 250-500-750 W. Fresnelite.....	520G	
2 Way Barn Door for #520.....	2570	
4 Way Barn Door for #520.....	2580	
Diffuser Frame for #520.....	3221	
8" 1000-1500 W. Fresnelite.....	526G	
2 Way Barn Door for #526.....	2571	
4 Way Barn Door for #526.....	2581	
Diffuser Frame for #526.....	3222	
8" 1000-2000 W. Fresnelite, Pole Op, Rear Access, Rapid Screw Feed.....	571G	
2 Way Barn Door for #571G.....	2567	
4 Way Barn Door for #571G.....	2585	
Diffuser Frame for #571G.....	3241	
12" 1000-2000 W. Fresnelite, Pole Op, Rear Access, Rapid Screw Feed.....	572G	
2 Way Barn Door for #572.....	2573	
4 Way Barn Door for #572.....	2587	
Diffuser Frame for #572.....	3242	
14" 3000-5000 W. Fresnelite.....	534G	
2 Way Barn Door for #534.....	2574	
4 Way Barn Door for #534.....	2584	
Diffuser Frame for #534.....	3228	
16" 3000-5000 W. Fresnelite, Pole Op. Rear Access, Rapid Screw Feed.....	576G	
2 Way Barn Door for #576.....	2559	
4 Way Barn Door for #576.....	2586	
Diffuser Frame for #576.....	3246	
14" 300-5000 W. Featherlite.....	554G	
2 Way Barn Door for #554.....	2594	
4 Way Barn Door for #554.....	2694	
Diffuser Frame for #554.....	3244	
20" 10 KW. Featherlite.....	560G	
2 Way Barn Door for #560.....	2595	
4 Way Barn Door for #560.....	2695	
10" 250-400 W. Scoop.....	1327G	
Diffuser Frame for #1327.....	3224	
14" 300-500 W. Baby Scoop.....	1312G	
Diffuser Frame for #1312.....	3225	
16" 750-1000-1500-2000 W. Scoop.....	1315G	
Diffuser and Frame for #1315.....	3226	
18" 750-1000-1500-2000 W. Scoop.....	1318G	
Diffuser Frame for #1318.....	3236	
16" Punch Scoop 750-1000 W.....	1320G	
Diffuser Frame for 1320.....	3238	
4 1/2" 250-500-750 W. Shutter Lekolite.....	1581G	
4 1/2" 250-500-750 W. Lekolite W/Iris.....	1582G	
4 1/2" 250-500-750 W. Pattern Projector W/Shutters and Gobo Slot.....	1581TVG	
Gobo Holders for Above.....	2071	
Goba Slides for Above—Six/Set.....	2085	
6" 250-500-750 W. Pattern Projector W/Shutters and Gobo Slot.....	1591TVG	
Gobo Holder for Above.....	2071	
Gobo Slide for Above—Six/Set.....	2085	
8" 1000-1500-2000 W. Pattern Projector W/Shutters and Gobo Slot.....	1557TVG	
Gobo Holder for Above.....	2055	
Gobo Slide for Above—Six/Set.....	2065	
6" 1500 W. Follow Spot.....	998G	
6" 2100 W. 60 Volt Follow Spot.....	999G	
12" 3000 W. Follow Spot.....	1542G	
12" 5000 W. Follow Spot.....	1545G	
Front Operated Color Boomerang for #1542G and 1545G.....	2012	
Rear Operated Boomerang (Factory Installed Only) for #1542G and 1545G.....	2014	
10" 250-500-750 W. Beam Light.....	1514G	
Diffuser Frame for 1514.....	3237	
6' Slimline Broad.....	1160	

DESCRIPTION		TYPE
<b>Lite-lifts</b>		
7' Extension Lite-Lift Support 12-15 lbs.....		3280
12' Extension Lite-Lift Support 12-15 lbs.....		3286
7' Extension Lite-Lift Support 18-22 lbs.....		3281
12' Extension Lite-Lift Support 18-22 lbs.....		3287
7' Extension Lite-Lift Support 26-30 lbs.....		3283
12' Extension Lite-Lift Support 26-30 lbs.....		3289
12' Extension Lite-Lift Support 0-24 lbs.....		3532
12' Extension Lite-Lift Support 0-60 lbs.....		3534
Single Slider, Wired.....		3520
<b>Stands</b>		
Telescoping Stand with Folding Legs.....		3570
24" 3 Legged Caster Stand with Switch.....		3218
16" 3 Legged Caster Stand 4' to 7' Extension.....		3217
24" 3 Legged Caster Stand 5' to 8' Extension.....		3216
<b>Hangers</b>		
Single 3 Ft. Cross Arm for Use with 3532 and 3534.....		3541
Double 4 Ft. Cross Arms.....		3542
Double 6 Ft. Cross Arms.....		3543
3 Ft. Cross Bars.....		3531
<b>Connector Strips</b>		
Connector Strip, 2 Wire, 18', Four 20 Amp and One 50 Amp. 3' Pigtails.....	6218-4/20-1/50	
Connector Strip, 3 Wire, 18', Four 20 Amp. and One 50 Amp. 3' Pigtails.....	6318-4/20-1/50	
Connector Strip, 2 Wire, 24', Eight 20 Amp. 3' Pigtails.....	6224-8/20	
Connector Strip, 3 Wire, 24', Eight 20 Amp. 3' Pigtails.....	6324-8/20	
Connector Strip, 2 Wire, 24' Seven 20 Amp. and One 50 Amp. 3' Pigtails.....	6224-7/20-1/50	
Connector Strip, 3 Wire, 24', Seven 20 Amp. and One 50 Amp. 3' Pigtails.....	6324-7/20-1/50	
Connector Strip, 2 Wire, 7', Five 20 Amp. 3' Pigtails.....	6207-5/20	
Connector Strip, 3 Wire, 7', Five 20 Amp. 3' Pigtails.....	6307-5/20	
Connector Strip, 2 Wire, 10', Five 20 Amp. 3' Pigtails.....	6210-4/20	
Connector Strip, 3 Wire, 10', Four 20 Amp. 3' Pigtails.....	6310-4/20	
Connector Strip, 2 Wire, 15', Five 20 Amp. 3' Pigtails.....	6215-5/20	
Connector Strip, 3 Wire, 15', Five 20 Amp. 3' Pigtails.....	6315-5/20	
Connector Strip, 2 Wire, 15', Six 20 Amp. 3' Pigtails.....	6215-6/20	
Connector Strip, 3 Wire, 15', Six 20 Amp. 3' Pigtails.....	6315-6/20	
Connector Strip, 2 Wire, 15', Five 20 Amp. and One 50 Amp. 3' Pigtails.....	6215-5/20-1/50	
Connector Strip, 3 Wire, 15', Five 20 Amp. and One 50 Amp. 3' Pigtails.....	6315-5/20-1/50	
Connector Strip, 2 Wire, 18', Five 20 Amp. 3' Pigtails.....	6218-5/20	
Connector Strip, 3 Wire, 18', Five 20 Amp. 3' Pigtails.....	6318-5/20	
Connector Strip, 2 Wire, 20', Six 20 Amp. 3' Pigtails.....	6220-6/20	
Connector Strip, 3 Wire, 20', Six 20 Amp. 3' Pigtails.....	6320-6/20	
Connector Strip, 2 Wire, 20', Seven 20 Amp. 3' Pigtails.....	6220-7/20	
Connector Strip, 3 Wire, 20', Seven 20 Amp. 3' Pigtails.....	6320-7/20	
Connector Strip, 2 Wire, 20', Six 20 Amp. and One 50 Amp. 3' Pigtails.....	6220-6/20-1/50	
Connector Strip, 3 Wire, 20', Six 20 Amp. and One 50 Amp. 3' Pigtails.....	6320-6/20-1/50	
<b>Multi-Conductor Feed Cable</b>		
4 Conductors of #6 Wire.....		6/4
5 Conductors of #6 Wire.....		6/5
8 Conductors of #12 Wire.....		12/8
10 Conductors of #12 Wire.....		12/10
12 Conductors of #12 Wire.....		12/12
14 Conductors of #12 Wire.....		12/14
16 Conductors of #12 Wire.....		12/16
<b>Pin Connectors</b>		
Pin Connectors, 20 Amp. 3 Pole Male and Female.....		3141
Pin Connectors, 20 Amp. 2 Pole Male and Female.....		3154
Pin Connectors, 30 Amp. 2 Pole Male and Female.....		3156
Pin Connectors, 30 Amp. 3 Pole Male and Female.....		3142
Pin Connectors, 60 Amp. 2 Pole Male and Female.....		3161
Pin Connectors, 60 Amp. 3 Pole Male and Female.....		3143
Pin Connectors, 100 Amp. 2 Pole Male and Female.....		3163
Pin Connectors, 100 Amp. 3 Pole Male and Female.....		3163G

**CENTURY LIGHTING EQUIPMENT (Continued)**

DESCRIPTION	TYPE	DESCRIPTION	TYPE
<b>Rubber Covered Jumpers</b>			
Jumper, 18', 12/3 Cable, 20 Amp., Male and Female Connectors.....	28RCCG	Pipe Hanger Clamp for Suspending #5075 from 1¼" to 2" Pipe (Used with #5090 and 5085).....	5083
Jumper, 18', 12/2 Cable, 20 Amp., Male and Female Connectors.....	18RCC	Hanger Clamp for Attaching #5075 to #5090.....	5085
Jumper, 25', 12/3 Cable, 20 Amp., Male and Female Connectors.....	25RCCG	Flush Hanger Clamp for Attaching #5075 Directly to Ceiling Structure.....	5086
Jumper, 25', 12/2 Cable, 20 Amp., Male and Female Connectors.....	25RCC	Light Beam Clamp for Attaching #5090 to "I"-Beams (1000 lb. Test).....	5088
Jumper, 50', 12/3 Cable, 20 Amp., Male and Female Connectors.....	50RCCG	Heavy Beam Clamp (1500 lb. Test).....	5089
<b>Wall Receptacle-Pin Connector</b>			
Double 20 Amp. 2 Pole.....	3046	Double Carrier (Transverse to Fixed Rail Coupling—2 per Transverse Rail).....	5076
Double 20 Amp. 3 Pole.....	3047	Single Carrier (Light or Lite-Lift to Transverse Rail Coupling).....	5077
Single 50 Amp. 2 Pole.....	3048	3-Way Junction Box, Equipped with Three, 5—Circuit Female Receptacles to Receive Looking Plugs on Cable from 3 Distribution Boxes (Wall Mtg.—Specify 2 or 3-Wire).....	5080
Single 50 Amp. 3 Pole.....	3049	<b>Distribution Box (Maunt to top of Transverse Rail) Complete with Mounting Clamps, Fixed 2-Pole Twist-Lock (or Pin Connector if Requested) Female Receptacles and 30' of #12/10 Multiconductor Cable Terminating in a 5 Ckt. Male Locking Plug for Connecting to 5080.....</b>	
<b>Switch Boards</b>			
Complete with 6—6 KW Dimmers, 6—50 Amp. Non Dim Circuits, and Patch Panel with 54 Load Plugs and 54 Jacks.....	2806	Same as #5081 except 3 Wire and 12/12 Cable.....	5092
Complete with 12—6 KW Dimmers, 12—50 Amp. Non Dim Circuits, and 108 Load Plugs and 108 Jacks.....	2812	Triple Cable Rail (3 Rails Tied Together—Length Req'd Equal to #5075).....	5105/3
Complete with 36 + 20 Amp. Load Cords, 21—20 Amp. Control Jacks, 3 Group Master Preset Switches, 1—50 Amp. Floor Pocket Breaker Switch.....	2836	NOTE: Set of Suspension Straps and Clamps Required for suspending cable rails from ceiling running in between and parallel to main rail. If 2 Rails Specify 5105/2 if single Rail #5105/1	
Complete with 144—20 Amp. Load Cords, 78—20 Amp. Control Jacks 12 Group Master Preset Switches, 2—20 Amp. Floor Pocket Breaker Switch.....	2844	Cable Carrier Rides on #5105 Cable Rails for Harnessing of Slack Distribution Cable to Junction Box.....	5140
Complete with 72—20 Amp. Load Cords, 39—20 Amp. Control Jacks, 6 Group Master Preset Switches, 1—50 Amp. Floor Pocket Breaker Switch.....	2872	Hooked Cable Carrier (Alternate, for Harnessing of Slack Distribution to Junction Box Cable—Rides on #5075 Main Rail).....	5079
Complete with 83—20 Amp. Load Plugs, 72 Control Jacks, 6—3 Position Preset Selector Switches each with 3—20 Amp. Breaker Switches, 3 Submaster Relay Switches, 18 Pilots.....	2873	Leg Carrier (Attached to main rail for carrying screen or section of Scenery, etc.).....	5082
Complete with 153 + 20 Amp. Load Plugs, 144 Control Jacks, 12—3 Position Preset Selector Switches each with 3—5 Amp. Breaker Switches, 3 Submaster Relay Switches, 36 Pilots.....	2874	<b>Cyclorama Rail</b>	
Complete with 42—20 Amp. Load Plugs, 72 Jacks, 6—3 Position Preset Selector Switches, 3 Submaster Switches, 18 Pilots.....	2876	Curtain Rail (Standard Lengths 10', 15', 20', 30'.....	5105
Complete with 55—20 Amp. Load Plugs, 72 Control Jacks, 6—3 Position Preset Selector Switches Each with 3—50 Amp. Breaker Switches, 3 Submaster Relay Switches, 18 Pilots.....	2877	Joint Strap (One Pair Required at each #5105 Joint).....	5106
Same as #2882.....	2880-6	1½" Suspension Strap—(Spacing 6' O.C.).....	5108
Two #2883 Dimmer Banks.....	2881	90° Suspension Strap Adaptor for #5108 (Use When Curtain Rail is Parallel to Principal Support).....	5109
Dimmer Bank Complete with 6—6 KW Transformer Interlocking Dimmer, 1 Master Interlocking Handle, 6—50 Amp. Primary Breaker Switch.....	2882	Hanger Clamp for Attaching #5105 to #5108.....	5107
Same as #2882 but with 12 Dimmers.....	2882-2	Flush Hanger Clamp for Attaching #5105 Directly to Ceiling Structure.....	5110
Same as #2882 but with 3 Dimmers.....	2883	Track Dividing Clamp (Used only with Rope Operation of Curtain—Spaces Rail for Overlapping Curtain—2 Req'd per Curtain Section).....	5111
<b>Portable Distribution and Switching Panels</b>			
Complete with 12 Breakers, 2 Pole Pin Connector Receptacle, 50' Cable.....	2802	Curtain Carrier—Nylon (Spacing 12" O.C.).....	5112
Complete with 12 Breakers, 2 Pole Pin Connector Receptacle, 50' Cable.....	2803	Curtain Carrier—Steel (Spacing 12" O.C.).....	5113
Complete with 3 Breakers, 3 Pole Pin Connector Receptacle, 25' Cable.....	2823	Curtain Carrier—3 Wheel, for Rope Operation (for going around corners).....	5114
Complete with 6 Breakers, 3 Pole Pin Connector Receptacle, 25' Cable.....	2824	Master Carrier for Rope Operation (2 Req'd per Curtain—Rope System—Rope Secured to this Carrier).....	5115
Complete with 9 Breakers, 3 Pole Pin Connector Receptacle, 25' Cable.....	2825	Live End Pulley for Rope Operation (1 Req'd per Curtain Section).....	5116
Complete with 12 Breakers, 3 Pole Pin Connector Receptacle, 25' Cable.....	2826	Dead End Pulley for Rope Operation (1 Req'd per Curtain Section).....	5117
<b>Mobilrail</b>			
Mobilrail (Fixed or Transverse Standard 8', 10', 12', 20' 24' Lengths).....	5075	Adjustable Floor Pulley.....	5118
Stop Pins (one Req'd at each Rail Termination).....	5084	Eye Bolt (2 per Rope System).....	5119
Joint Strap (One Pr. Req'd at each #5075 Joint).....	5087	Corner Rope Idler (for Curved Track—1 Req'd per Corner).....	5120
2" Suspension Strap—(Spacing 6' O.C.).....	5090	Backlite Carrier 3—Wheel (for attaching lites to #5105).....	5130
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		6' Portable Striplites, 12 outlets, 3 circuits, in and out.....	392
		6' Portable Striplites, 12 outlets, 3 circuits, in and out.....	391
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# TELEVISION MOBILE UNIT

TYPE TJ-56



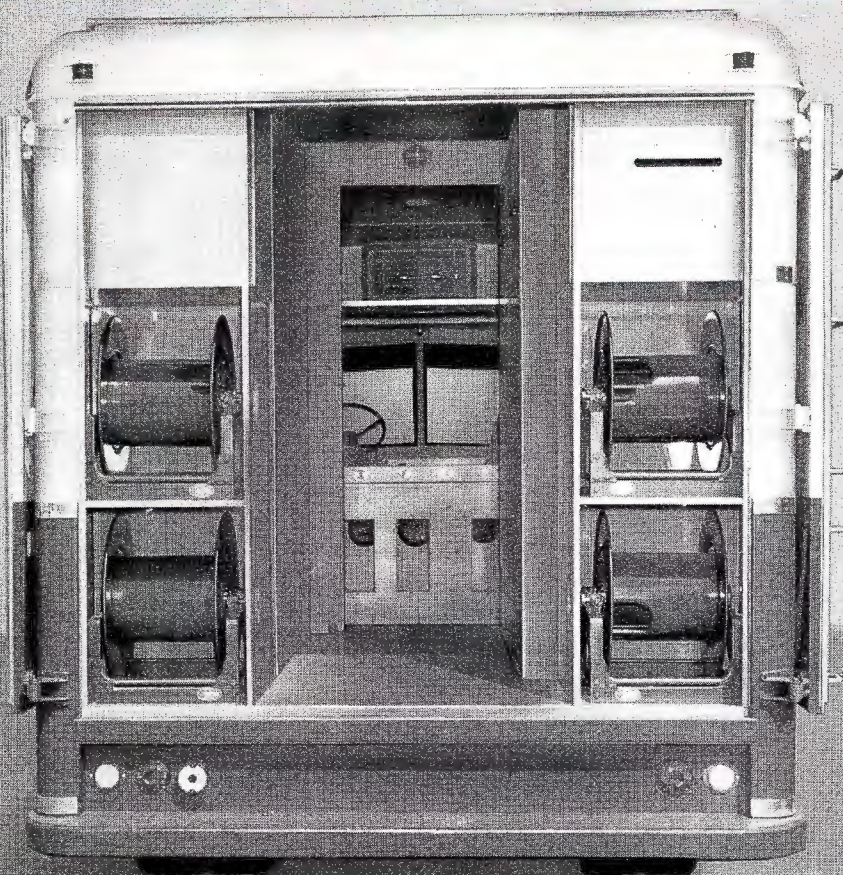
## FEATURES

- Designed to carry four monochrome field camera chains and accessories
- Complete air conditioning of control room
- Standard cab over engine
- Separate control room
- Seating facilities for director and four operating personnel
- Sliding door access to rear of control room
- Cable reels at rear of truck
- Five foot storage compartment in skirt line
- "Air-exhaust" enclosure for power supplies
- Cable entrances from either side
- Access steps to roof
- Outside loading doors for cameras

## USES

The RCA Monochrome Television Mobile Unit is a custom built vehicle designed to carry the television equipment needed to pick up local and remote programs which may originate at locations other than the main studio, and relay this information to the studio or transmitter for re-broadcasting. The TJ-56 Mobile Unit provides the space necessary for a complete complement of audio and video

equipment for remote programming. Use of the Mobile Unit simplifies the work of transporting equipment required for such "remotes" and saves setup time, as well as wear and tear on studio equipment. When not in use for "remotes" it is a simple matter to employ the same equipment for studio programs.



Rear view of the RCA TJ-56 Mobile Unit showing easy access to cable reels and compartment storage areas. A complete line of TV field equipment for use with the TJ-56 Mobile Unit is available from RCA. Note convenient steps leading to roof area.

## DESCRIPTION

The RCA Monochrome Mobile Unit consists essentially of a standard 1½-ton Ford chassis on which is constructed a custom body, attractively styled and well engineered for practical application of remote television pickups. This Mobile Unit serves as a studio always ready to move when needed and ready for operation in a minimum of time. Space is provided for all the essential equipment needed for the pickup of a remote television program. Such equipment includes cameras, synchronizing generator, switching facilities, power supplies, and a means for relaying the picture and sound information back to the station.

Those items normally operated from the control room of the unit, such as the camera controls, are transported in their operating position. Other items such as cameras, tripods, dollies, cable reels, and microwave transmitter have storage space allotted inside the vehicle for transportation.

The inside of the Mobile Unit is divided into two separate and distinct compartments: i.e., an operating compartment and a storage compartment. The entire front section is the operating or control room and is separated from the stor-

age section in the rear by a partition fitted with a sliding door. Entrance to the control room is through the front side doors. The door windows and windshield may be covered by a curtain secured with snap fasteners to exclude outside light. Forward in this compartment are two cushioned chairs, one located in the driver's position and the other on the curb-side. The curb-side chair is rotatable and may be used to provide a seat for the program director. Next, toward the rear, are three cushioned chairs directly in front of an operating control desk. This operating section of the control room has three levels for operating equipment. This layout provides space at floor level for five field power supplies and the field synchronizing generator. These suitcase-styled units normally do not require adjustments during operation and are, therefore, placed under the operating table.

The power supplies ride on slides, and are slid into position through doors in the front. These doors have small windows through which the meters on the power supplies may be read. At the left side of the power supply compartment, an exhaust fan is installed. This fan draws outside air into the compartment through a large filter. The air flow adequately cools equipment mounted within the compartment. The heat from the power supplies may also



be diverted into the operating section if it is so desired for heating purposes in cold weather.

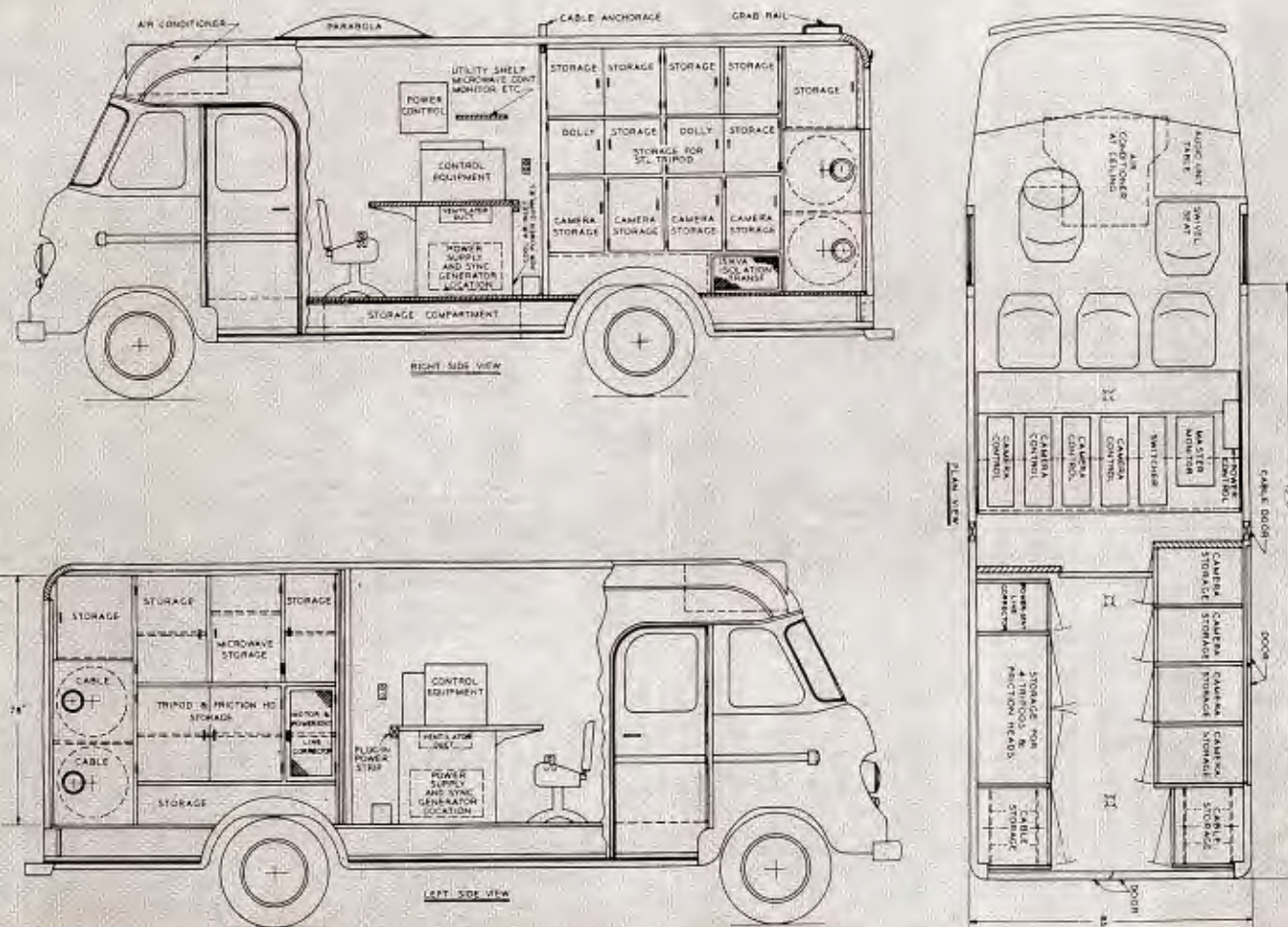
The second level for equipment is the actual table operating position. The front or operating portion of the table has a Formica surface, while the rear is of wood and suitable for fastening shock mountings to accommodate the operating equipment. The rear area of the table has space for as many as four field camera controls, a field master monitor and a field switcher. These items are located directly over the field power supplies and sync generator. All of these equipments are within easy reach of the operators seated at the control desk.

The third level consists of a power control panel and a reinforced shelf which is mounted directly over the camera controls. The shelf provides space to mount microwave control equipment, monitors, and rack equipment. Vertical supports which can be installed between the shelf and roof will provide approximately 21 inches of rack space.

The power control panel is the distribution and control center for a-c power within the mobile unit.

The panel distributes and provides overload protection for ac power to utility, video, air conditioner, and blower motor outlets through pre-wired conduits. Recommended accessories are a 15 KVA isolation transformer and a 15 KVA powerstat line corrector. These accessories are mounted in locations provided in the rear section of the truck. The accessories used in conjunction with the power control panel will distribute unregulated 220 volts to the air conditioner, unregulated 110 volts to the utility and blower outlets, and regulated 110 volts to the video outlets. The accessories and TJ-56 wiring will provide isolation and regulation of four field cameras and associated video and audio equipment.

There is ample room between the rear of the control table and the partition with the sliding door so that the various equipments may be interconnected with the standard cables provided with all units. A 1½-ton air-conditioning



Cutaway view of the TJ-56A Mobile Unit showing provisions made for accommodating complete TV "Remote" Programming Equipment.

system is provided for comfort and efficiency of operating personnel.

The rear section beyond the sliding doors is partitioned into various sizes of cabinets. The heavier equipment stored in the curb side compartments may be reached from the inside of the rear section through the cabinet doors, and through doors which permit direct side loading.

Access to the rear compartment is through two full length doors which comprise the rear panel of the Mobile Unit's body. The rear bumper is fabricated to form a step to this compartment. At the extreme rear, four large cable reels are installed, two on either side of the center aisle and one above the other. These reels are crank-operated and can be reached from the street level.

All vehicle lights may be switched from battery to external a-c power by means of a switch on the dashboard when external power is available. All entrance and outside storage doors have handles with key locks of the recessed type, minimizing damage to the handles. There are side openings for cable entrances to the operating area. Permanent steps are mounted on the inside of the curb-side rear door, permitting ready access to the roof.

The roof is reinforced to support the weight of personnel and operating equipment such as cameras and tripods. It is insulated as are the side walls of the operating or control section of the Mobile Unit. The roof surface is made of steel Diamondette floor plate. Anchor loops are welded in the roof along the edges for lashing down the operating equipment. A parabolic reflector for a microwave system may be clamped to the roof for transporting. A metal pipe

receptacle welded to the roof plate on the curb side will permit insertion of a 1½-inch pipe to provide a cable anchorage to clear the sidewalk by at least 10 feet. A small handrail on the roof at the rear provides easy access to the roof when using the built in type steps on the rear door.

**SPECIFICATIONS**

Length (bumper to bumper).....	265"
Width .....	93"
Height .....	120"
Inside Dimensions:	
Width .....	85"
Height .....	78"
Height (at operator's table).....	29"
Tire Size.....	7.50-20 8 ply
Chassis.....	Standard 1½ ton 154" wheelbase
Finish: Outside.....	Two-tone umber gray or to customer specifications

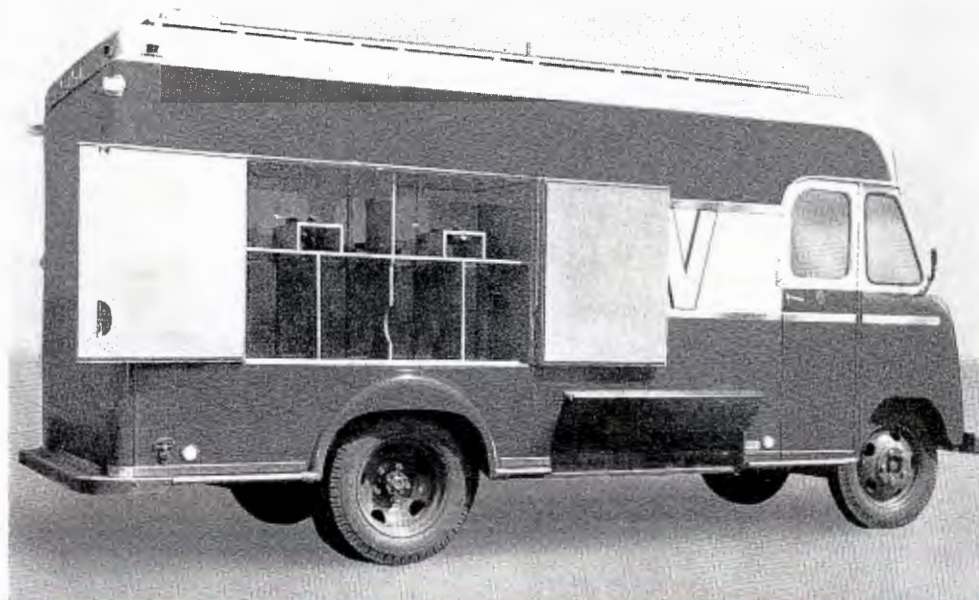
**Equipment Supplied**

- 1 TJ-56 Mobile TV Unit.....MI-26292  
which includes:
- 1 Power Control Panel
- 1 Installed conduit with cabling for Power Control Panel
- 1 RCA Air Conditioner.....1½ ton capacity
- 4 Cable Reels
- 1 Operator's Table
- 1 Blower and forced air cooling system for power supplies
- 6 Slide assemblies for servicing Power Supplies and Sync Generator
- 3 Operator's Chairs
- 1 Lighting Transformer (110V-12V)
- 1 Cab Heater
- 1 Fire Extinguisher
- 1 Gray Twill Curtain

**Accessories**

- Power Transformer, single phase 15 KVA.....MI-26262
- Power-Stat/Line Corrector, single phase 15KVA.....MI-26263

Side view of the RCA Mobile Unit with outside access doors opened to illustrate storage area for TV camera and dollies. Special clamps are provided on the steel plate roof for storing a microwave reflector during transit.



# COLOR TELEVISION MOBILE UNITS



## FEATURES

- Compact, versatile mobile unit offers new avenues of programming—as a remote color pickup facility—as an auxiliary studio control—custom designed and equipped to station requirements
- Mobile control for up to five color cameras
- Efficient space utilization—comfortably seats up to nine operating personnel
- Equipment room designed for ease of maintenance
- Centralized automatic power control
- Roof reinforced for use as camera operating platform
- Air conditioned control room—fully insulated body
- Power steering—air brakes—rugged 501 cubic inch engine
- Custom power and audio-video connection panels

USES

RCA Color Television Mobile Units are custom built vehicles designed to meet specific customer requirements. These units embody complete facilities for originating live color programs and are designed to simplify and expedite the set-up of remote, local and closed circuit shows. RCA Color Mobile Units may also be used in conjunction with studio facilities thereby permitting color origination of live shows from existing facilities. In this manner the mobile unit serves a dual purpose since it becomes a "mobile control room" that can be readily transported to any desired location. The units can be designed to accommodate one to five color cameras or many other variations of equipments which could include color film facilities and low power transmitting facilities.

RCA Color Television Mobile Units have been widely used for broadcast television remote pickup of sporting events, parades and other special events of a broad variety. Closed circuit educational applications include surgical and dental demonstrations and observation of military field maneuvers. Commercial closed circuit uses include the tele-

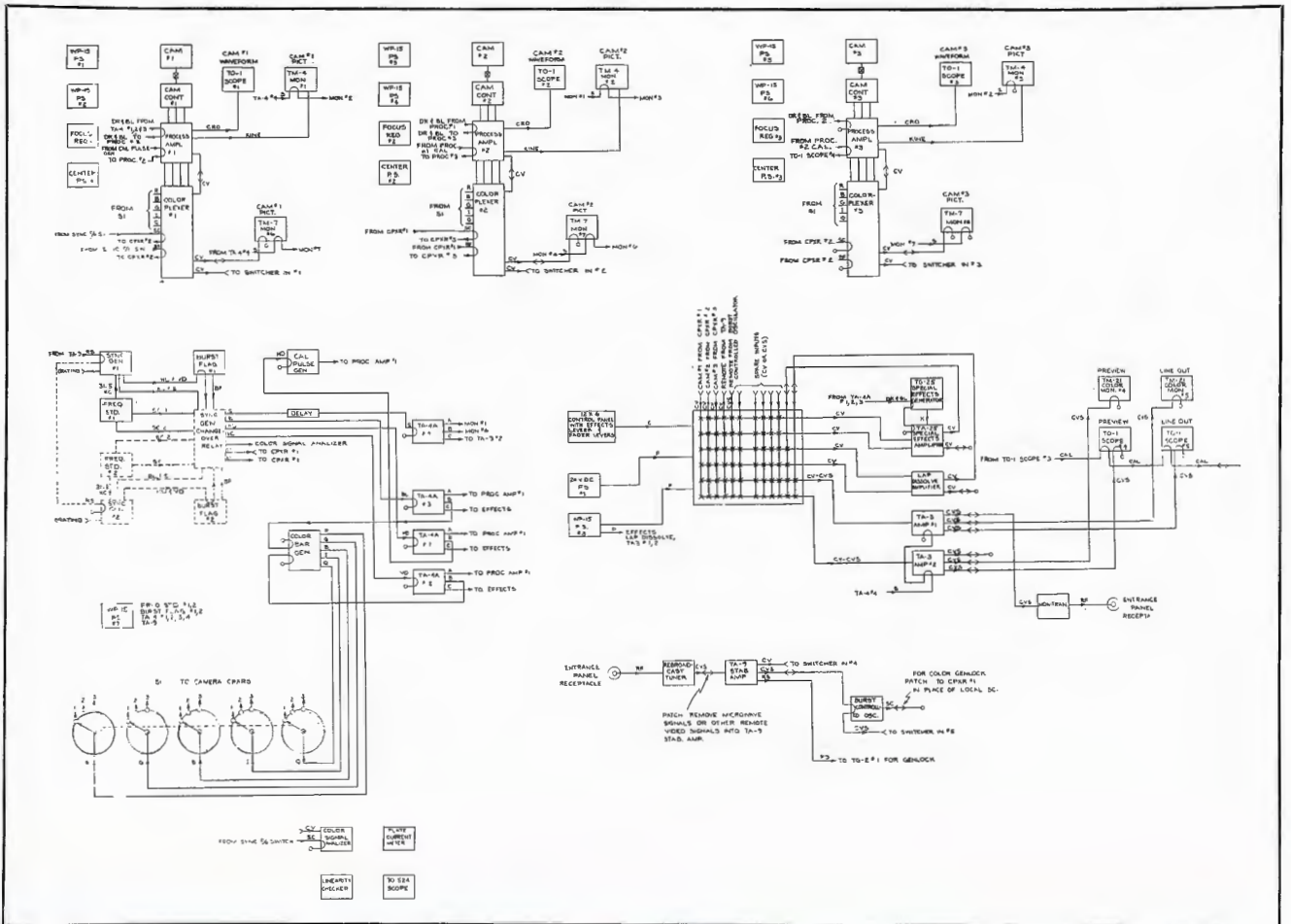
vising of style shows by department stores and live color television demonstrations for television set sales promotion. In effect, RCA Color Television Mobile Units make available complete television production facilities for virtually any programming application at any location which is physically accessible for setup and operation.

DESCRIPTION

Years of experience in the design and construction of color and monochrome television mobile equipment are reflected in RCA Color Mobile Television Units. Patterned after a control room layout, the unit has been designed to handle up to five color camera chains with complete production control facilities. When equipped with three cameras, sufficient space has been provided for transportation of the cameras including mounting equipment and cables. When equipped to handle four or five color camera chains, a second carrier is required to provide transportation for the cameras and mounting equipment.

The RCA Color Mobile Unit comprises a 35-foot truck divided into two sections and accommodating color camera

Typical Functional Diagram of a 3-camera Color Television Mobile Unit.



chains, terminal equipment and operating personnel. The operating area located in the front section of the truck provides room to comfortably accommodate up to nine operating personnel. A three-ton air conditioner maintains a comfortable temperature in the operating area at all times. The storage and rack area located in the rear section is separated from the operating area by a sliding door. The rear section is adequately ventilated by two, heavy-duty, two-speed exhaust fans, which draw filtered air through the equipment area from the outside.

A typical three-camera mobile unit with a full complement of equipment includes three TK-41 Live Color Cameras, a TS-11A Switcher, BC-5A Audio Console, TVM-1A Portable Microwave System, color sync and test equipment, power supplies, audio, video, camera and power cables.

### Power

The video equipment obtains 60-cycle, a-c power from a 25-kva isolation transformer and an automatically controlled line voltage corrector located beneath the floor

of the rear section. A power control panel is conveniently located in the operating section of the truck. Power distribution equipment is mounted on blank panels located in the rack area.

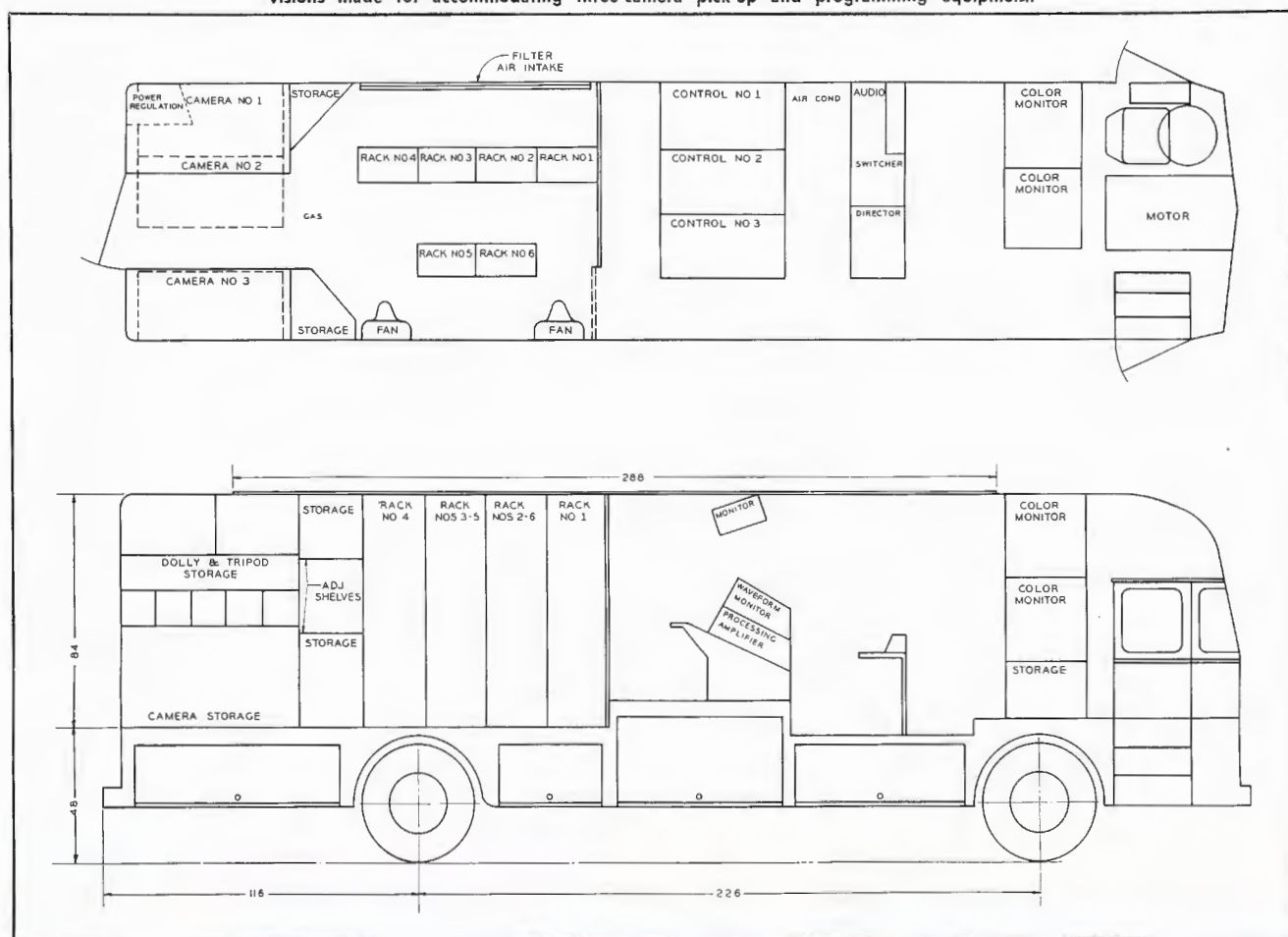
### Test Equipment

Racks located in the rear portion of the truck house the colorplexers, color sync equipment, test equipment, and power supplies. The test equipment includes a bar generator for alignment of colorplexers and color monitors, calibration pulse generator permitting calibration of all signal displaying devices against a common source, linearity checker, color signal analyzer, oscilloscope, and multimeter.

### Wiring and Terminations

Interconnection of all equipment located throughout the truck is accomplished by wiring through ducts installed underneath the floor. All incoming and outgoing lines terminate at an audio-video panel and a power entrance panel located on the right side of the truck. The audio-

Outline drawings of a typical custom-built Color Television Mobile Unit showing provisions made for accommodating three-camera pick-up and programming equipment.



video panel provides connection for the camera inputs, microphones, remote audio inputs, video inputs, microwave control output, video and audio outputs. The power entrance panel contains the a-c output receptacles and the main input power connection. The external source of power required to operate the color mobile unit is single-phase or three-phase, 220 volts.

### Provision for Microwave

To facilitate the setup and use of microwave link equipment, an area of the roof has been reinforced with aluminum plating. Provision has also been made for storage of parabolic reflectors. Installed on the right side of the truck is a 3-inch vertical pipe which extends from the floor to approximately 3-inches above the roof. A smaller telescoping pipe can be extended to a maximum of five feet above the roof. This pipe may be used as an anchorage in locations where it is necessary to run cables overhead or as a gin pole for lifting equipment to the roof of the truck.

### Truck Specifications

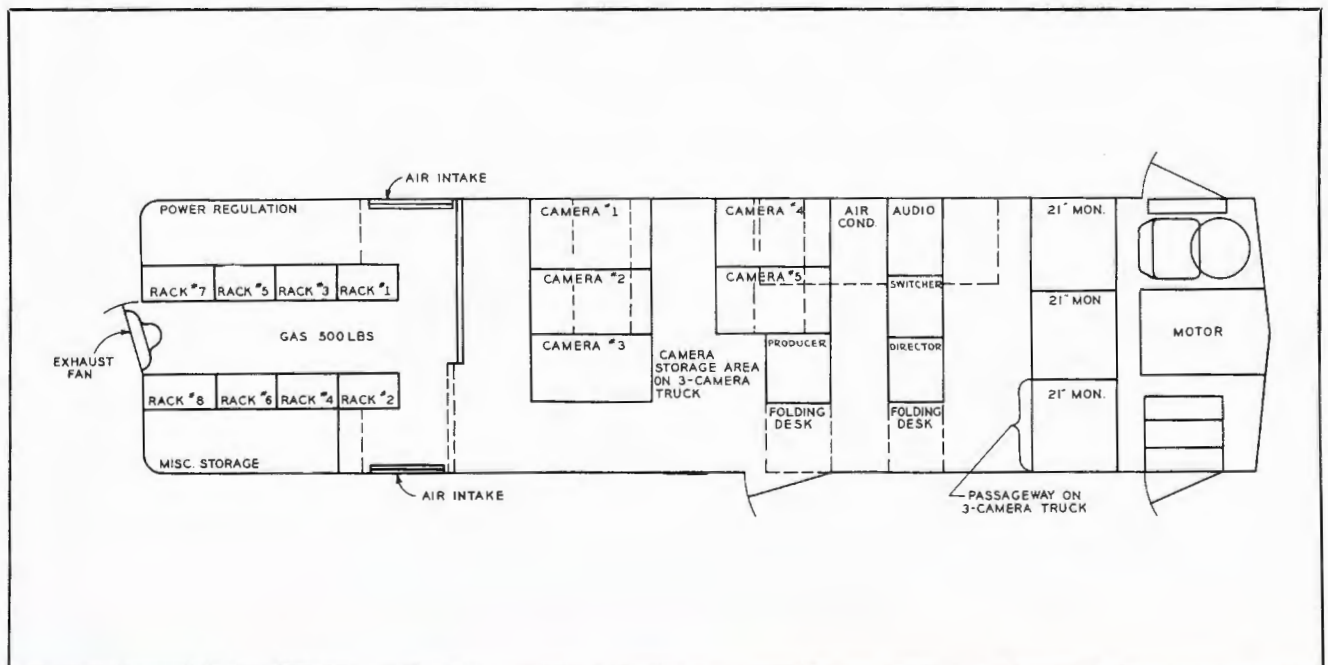
The custom-built body is 35 feet over-all in length and 96 inches wide. Thirty feet of interior length and 89 inches of interior width has been allotted to electronic equipment. The gross vehicle rating is 32,000 pounds, including a liberal safety factor. The weight distribution of all equipment installed and stored in the truck is carefully arranged to assure proper axle loading and riding com-

fort. Special emphasis has been placed on the design of the chassis to provide adequate shock mounting for the equipment facilities. Storage compartments for camera cables, power cables, tripods, dollies and cradle heads are located in the skirt line of the truck. The air conditioner and power regulating equipment are also located in this area of the truck.

The heavy duty custom-built chassis handles the maximum gross vehicle weight with safety. A 220-horsepower truck type gasoline engine provides adequate power to propel the fully loaded unit at nominal highway speeds. Convenient access to the engine for maintenance and repairs has been facilitated by a removable motor hood. A five-speed synchromesh transmission and dual plate friction clutch permit ease of handling by the driver. Design safety measures which serve to simplify the operation of the truck and reduce driver fatigue are air brakes, power steering and tinted glass. Twelve volt d-c power is supplied to the truck electrical system by a heavy duty battery and 50 ampere generator. The air conditioner is mounted below the floor level and is readily accessible for ease of maintenance and servicing.

Fold-out steps built into the outside of the rear door provide access to the roof. An aluminum ladder is also provided for access to the roof and for use as a loading ramp for the color cameras. Aluminum walk-up steps, which are used for entry to the rear and side of the truck, are attached to the inside surface of the doors when not in use.

Outline drawing of Color Mobile Unit showing plans for accommodating five color camera chains.



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