VIDEO EQUIPMENT

Everything for TV

WPIX in nighttime action at the Roosevelt Raceway, Westbury, N. Y. RCA TV Field Equipment is used throughout.

Television Studio-on-Wheels. This special RCA TV field truck is handling the track sound-and-picture pick-up between Roosevelt Raceway grandstand and WPIX in New York City. All RCA-equipped, it is designed to carry everything needed to operate up to 3 cameras in the field.

. . . complete field equipment,

for instance —

● That exciting finish you see is being covered by television field equipment, all-RCA from camera to microwave relay antenna.

Thoroughly practical for quick, on-the-spot pick-ups, this highly compact and portable equipment is designed to handle outdoor telecasting under all sorts of conditions. Complete pick-up and relay equipment includes: two image orthicon cameras (with telephoto lens); camera tripods; camera control units; on-the-air master monitor; camera switching system; synchronizing generator; microwave relay equipment; associated power supplies; reels of cable—all carried in one special truck.

Why this preference for RCA field equipment among the majority of TV stations now in operation?

Because RCA TV Field Equipment has been worked out by television experts who know the business. All gear, for example, is completely portable and subdivided into small units for easy handling. All field cameras are equipped with 4-position turret lens and electronic view finders. There are complete switching facilities that help the operators deliver faster-moving shows. And there is a special truck that carries the equipment to location . . . with all the facilities required to run most of the equipment *right from the vehicle itself.* No wires needed to get the picture signals back to the station. High-efficiency microwave radio relay does it—airline!

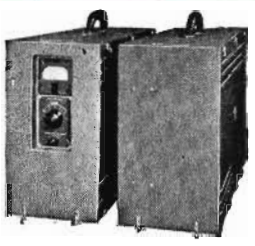
. . .

Overlook none of the technical and economical advantages of correct initial station planning. Your RCA Television Specialist can help. Call him. Or write Dept. **190-D** RCA Engineering Products, Camden, New Jersey.

RA Microwave Relay Transmitter IR-1A. Transmits the picture sig-ls from field to studio (or from dio to transmitter). It includes a rabolic antenna with hook-shaped ve guide, built-in transmitter, and mote control unit. Matching re-iver unit at the station picks up the icrowave relay signal.

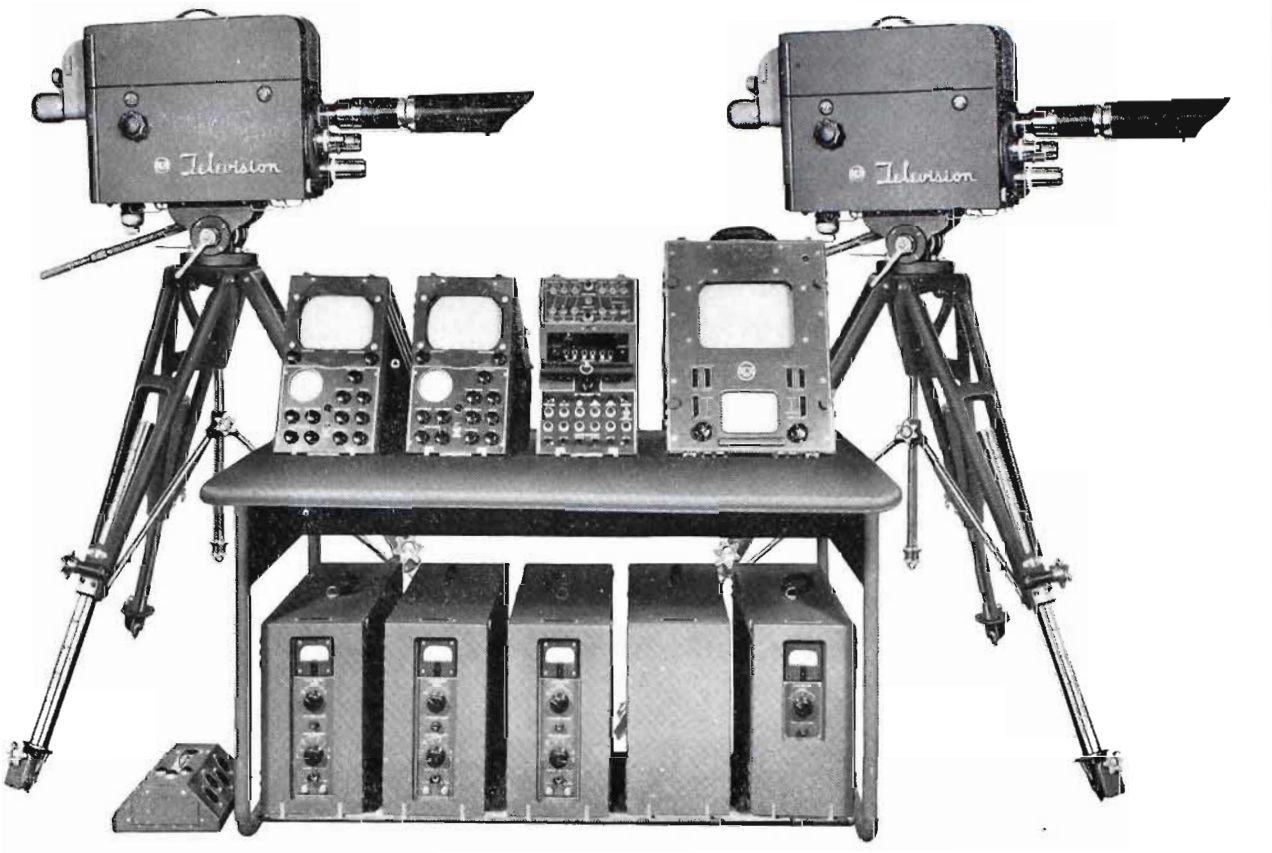
RCA Field Camera Control TK-30A. For monitoring the picture and controlling its quality. Unit No. 1 includes one 7" picture monitor tube and one 3" oscilloscope (to observe video signal waveform). Unit No. 2 is the power supply.

RCA Field-Switching System TS-30A. Nerve center of TV field pick-up operations. Switches intercom circuits and picture signals between cameras and monitor. Unit No. 1 provides for video switching, sync signal insertion, and master monitor switching. Unit No. 2 is the power supply.



RCA Field Synchronizing Generator TG-10A. Produces timing pulses for TV field equipment. Unit No. 1 includes pulse-forming circuits, frequency-control circuits, and power supply. Unit No. 2 includes the pulse-shaping and output circuits.

RCA Television Field Pick-up Equipment



The RCA Television Field Pickup Equipment is designed for portable or field use in picking up television programs such as sporting events, parades, outdoor or indoor shows, and other special events in places where permanent television installations are not available. The design of the equipment is centered around the RCA Image Orthicon camera tube which is so sensitive that it may be used with incident illumination on the scene as low as approximately one foot candle, and which is entirely free of any blocking or "charging-up" effect from flashes of excess light which paralyze other types of pick-up tubes.

The Field Equipment includes such important features as a four-position lens turret on each camera, an electronic view finder in each camera, a complete telephone intercommunication system, accessibility of tubes, components, and circuits for easy servicing, and many other features.

To facilitate portability, the equipment has been divided into relatively small units with emphasis placed on keeping the number of major pieces to a minimum, and at the same time maintaining high standards of reliability and flexibility in operation. Wherever possible the major units have the shape and approximate size of a medium sized suitcase. The camera and view finder, master monitor, and power distribution box are the only exceptions. Each unit is provided with one or more carrying handles, and covers and shock mounts to protect fragile parts during transportation. All interconnections are made with cables and plugs which may be connected or disconnected in a few minutes.

A general practice of making all electrical connections through receptacles mounted on the rear panels of the suitcase units has been followed. An exception exists in the case of intercommunication head-sets which are plugged into jacks on the front of the Field Switching System. Whenever possible, multiple conductor cables are used so that the number of cable connections is kept to a minimum consistent with flexibility of the equipment. With few exceptions, the connectors used have single-turn locking rings which prevent accidental disconnecting of the cables.

Careful consideration has been given to conservative design in the selection of high quality components and in allowing ample reserve in ratings. Also attention has been given to providing rugged construction and secure mountings so that the equipment will stand the wear and tear of daily use over long periods of time.

The Field Equipment is so designed that it may be set up for temporary operation on a table or desk. In such a case, the desk and control units comprise a simple operating console. The equipment may also be used in conjunction with a mobile television unit in which the suitcases may be installed to form a mobile television studio.

The units included with the standard Two-Camera Chain, Field Pick-Up Equipment are as follows:

2—Type TK-30A Field Camera Equipments
1—Type TG-10A Field Synchronizing Generator
1—Type TS 30A Field Switching Equipment
(All equipments are supplied with tubes)

The Type TK-30A Field Camera Equipment includes:

1—High Sensitivity Image Orthicon Camera with newsreel-type tripod, plug-in electronic view finder employing a 5" Kinescope and three turret-mounted lenses (50 mm and 90 mm and 135 mm focal lengths).

1—Field Camera Control Unit. This unit provides the required control and operating voltages for the Field Camera and provides picture (on a 7" Kinescope) and wave form (on a 3" Cathode Ray Oscilloscope tube) monitoring of the camera signal.

1—Field type Power Supply. This unit contains the heater and plate supply transformer, rectifiers and plate-voltage regulating circuits.

1—Set of Camera-Camera Control Unit Cables; one 50' length, one 100' length and one 200' length.

The Type TG-10A Field Synchronizing Generator includes:

1—Field Pulse Former
1—Field Pulse Shaper
1—Power Distribution Box. This unit provides for power supply connections to a-c power systems of three types: 3 phase—4 wire; Single phase—3 wire; Single phase—2 wire. 9 Twist Lock power outlets and 2 convenience outlets are provided.

The Type TS-30A Field Switching Equipment includes:

1—Switching System. This unit provides all the video program, monitor and intercommunication switching required for field pick-up equipment using up to four cameras, plus two auxiliary video program lines. Camera, view finder, camera control and switching equipment tally lights indicate to performers, cameraman, control operators and program director which camera is supplying program.

The Field Type Master Monitor (listed below) can be switched to:

a. The outgoing video signal.

b. Relay equipment monitoring signal.

c. Either of the two auxiliary video program lines.

d. A separate Monitor input.

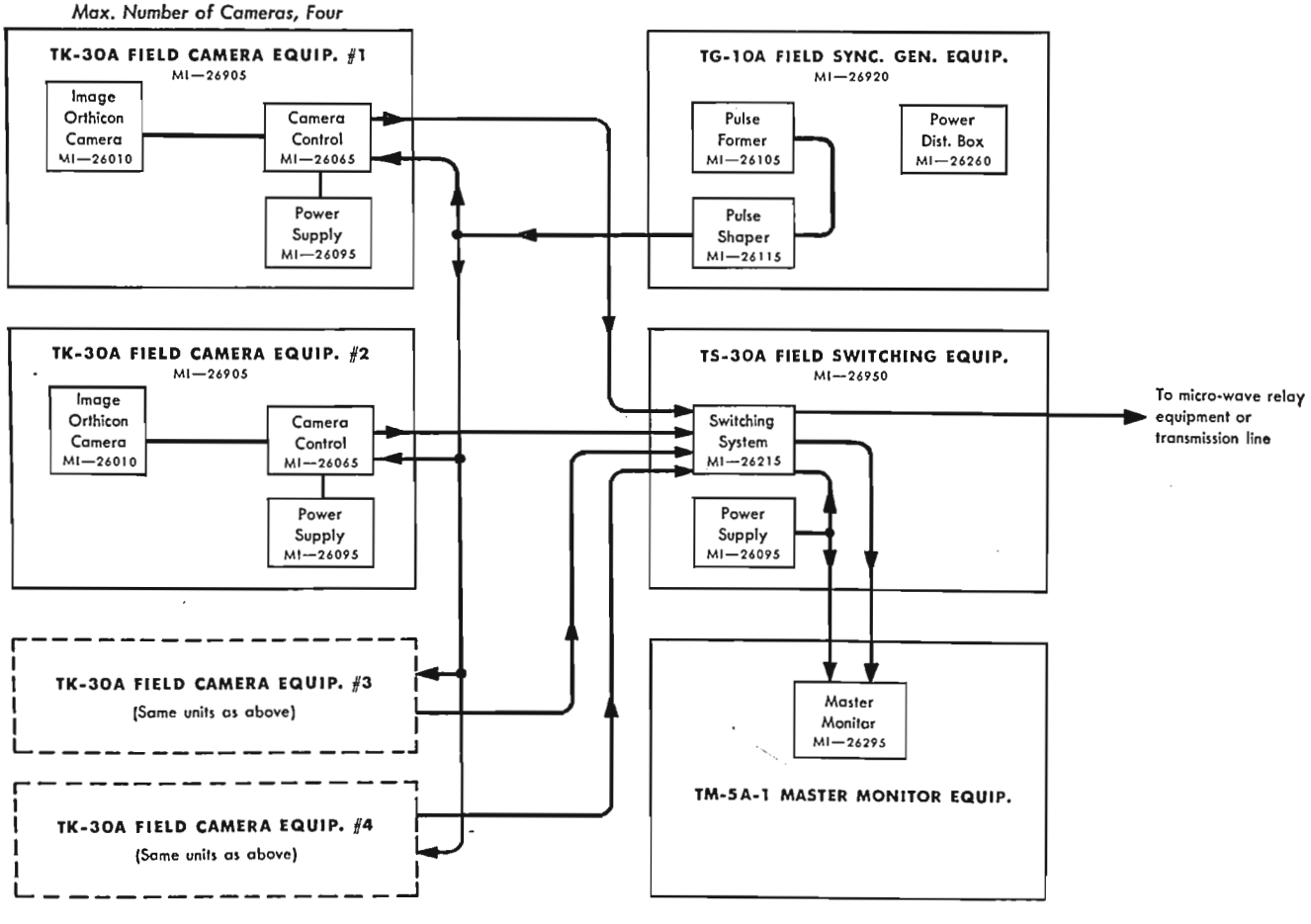
The audio intercommunication facilities provide a flexible set-up so that the program director can talk to any or all of the operating personnel and the home station, or various special and separate intercommunication circuits may be set up. All operating personnel normally hear program sound on one headphone, and intercommunication sound on the other.

1—Field Type Power Supply. This furnishes power to the switching system and Master Monitor.

OPTIONAL

1—Field Type Master Monitor. This unit provides for picture (on a 10" Kinescope) and wave form (on a 5" CRO Tube) monitoring of the Signal selected by the field switching system.

RCA TELEVISION FIELD PICKUP EQUIPMENT



Field Television Camera Equipment, Type TK-30A

Features

- Highly sensitive at extremely low light levels.
- Able to handle enormous light ranges.
- No loss of picture after intense flashes of light.
- Simplified interconnections providing quick assembly on location.
- Electronic view finder.
- Rugged mechanical construction.
- A four position lens turret controlled from rear.
- Provision for two intercom telephone sets.
- Suitable for studio use.
- Easy access to all parts.

Uses

The TK-30A television camera is intended to be used in field television pick-ups of all kinds. It 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. While designed especially for field use, it is also satisfactory for most types of studio programs; and for many applications the TK-30A has special advantages.

Description

The TK-30A is a portable, field television camera equipment consisting of camera, tripod, camera control, field power supply, and miscellaneous accessory items; such as: cables, etc. The camera makes use of the RCA-developed Image Orthicon. The remarkable sensitivity of the Image Orthicon is so great that operation is possible with light levels as low as one foot-candle with an f 3.5 lens. The Image Orthicon is able to adapt itself automatically to enormous changes in scene brilliance without serious loss of contrast anywhere in the range. This characteristic makes it possible to shift instantly from a dark scene in heavy shadows to another in bright sunlight with only very slight readjustment. The Image Orthicon is able to withstand extreme peaks of intense illumination, such as photo flash lamps aimed directly at the lens, without any after effects requiring the resetting of controls.

The Field Camera Control is contained in a small easily-carried case. On the front, there are located two cathode ray tubes which serve as indicators of the picture quality. A seven inch kinescope is used as a picture monitor, and a three inch oscilloscope is used as a wave form monitor.

The picture signal amplifier performs the following several important functions:

1. It provides a gain control for the picture signal.
2. It mixes the picture blanking signal with the signal from the Camera.
3. It establishes black level at the beginning of each scanning line by means of a "clamp" circuit.
4. It provides for the addition of the Synchronizing signal whenever only a single camera chain is used.
5. Its output stage is a line amplifier capable of delivering two volts peak to peak composite picture and synchronizing signal to a 75 ohm coaxial transmission line (or 1.5 volts of picture only).
6. It includes a stage for introducing a fixed amount of gamma correction.
7. It includes high level driver stages for feeding the two monitor tubes.

The Field Power Supply is a portable unit designed to provide all the d-c required by the circuits in the Field Camera, Field View Finder, and Field Camera Control in one camera chain. It may, of course, be used for any other application where its voltage and current ratings meet the requirements. The output voltage of this power supply is electronically regulated within very close limits. It is capable of delivering 1 ampere at a maximum of 285 volts. The internal impedance of the power supply is less than 0.25 ohm. This low impedance

makes it an excellent power supply for amplifiers having variable current requirements and critical low frequency response such as television amplifiers.

The complete camera may be disassembled into several parts for easy carrying. The camera is built into an exceedingly compact case which mounts on top of the tripod. All controls are conveniently located on the back. The camera assembly includes a picture signal preamplifier and the deflection and camera blanking circuits. A feature of this camera is the provision of a lens turret in which four lenses of different focal lengths may be mounted. On the rear of the case is located a large handle which rotates the lens turret. A trigger switch incorporated in the handle cuts off the picture during the interval while the handle is turning. Changing from one lens to another requires only one and a half seconds.

The operator focuses the picture by observing the image in the electronic view finder, constituting the upper section of the camera assembly, and adjusting a knob on the right side of the cabinet. This knob slides the Orthicon back and forth inside the case. This saves having to adjust the lenses themselves for focusing. The use of the electronic view finder with this camera is a necessity; since at low light levels an optical view finder would not be satisfactory. It also has the advantage of eliminating the need for additional lenses which would be required for an optical system. The view finder employs a five inch kinescope with sufficient brilliance to produce a satisfactory picture under normal outdoor light conditions. Since the operator sees on the face of this kinescope the picture which is being transmitted, he is able to focus the picture, and also to monitor the quality and general operation. Two different viewing hoods are provided: one straight-on type, and the other a periscope type, which may be mounted in either of two positions. This gives the operator a choice of three different viewing heights. For ease in transporting and maintenance, the view finder and camera are separate units, each of which is an integral unit in itself. A streamlined cover with a carrying handle is placed on the camera unit when the view finder is removed. It is also possible to operate

Field Camera Control Unit and Field Power Supply

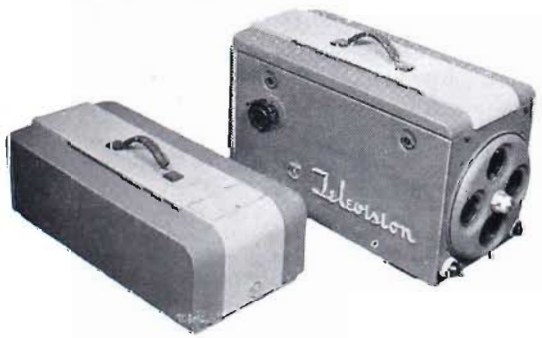
the camera without the view finder: as for instance where the camera is set up in a fixed position and operates unattended.

Specifications

FIELD CAMERA AND POWER SUPPLY

Number of Scanning Lines—525
Interlacing—2 to 1
Field Repetition Rate—60 per sec.
Frame Repetition Rate—30 per sec.
Line Repetition Rate—15750 per sec.
Picture Signal Level—2.0 volts, peak-to-peak, max. of which 75% is picture and blank, and 25% is sinc. (See RMA Standards).
Picture Signal Polarity at Output—Black negative
Type of Transmission Line for Picture Signal—Coaxial
Impedance of Transmission Line—75 ohms
Maximum Length of Camera Cable—1000 ft.
Total Included Angle of Lenses (in horizontal plane):
a. 50 mm f1.9 Ektar—34°
b. 90 mm f3.5 Ektar—20°
c. 135 mm f3.8 Ektar—13°
***d. 8.5 in., f3.9—8°
***e. 13 in., f5.0—5.3°
***f. 15 in., f5.0—4.5°
***g. 17 in., f5.0—4°
***h. 25 in., f5.0—2.75°
Incident Illumination on Scene:
(a) Minimum (approx.)—0.5 ft. candle
(b) Required for First Grade Results—10 to 20 ft. candles
(c) Maximum—Bright sunlight
Note: Figure for (a) above is based on the use of an f3.5 lens or faster.
Primary Volts—98-129 volts, a-c, 50-60 cycles
Primary Voltage Taps:

	Nominal	*Range*
Tap No. 1	125 v.	121-129 v.
Tap No. 2	117 v.	113-121 v.
Tap No. 3	109 v.	105-113 v.
Tap No. 4	102 v.	98-106 v.



TK-30A Electronic View Finder and Camera disassembled for easy carrying

A-c Power Input for All Units—Approx. 1200 watts
Power Output of Supply:
Regulated d-c Supply 270-285 volts—1 amp.
Constant Current Supply intended to operate into 2000 ohm load (focusing coil)—50-80 ma.

Dimensions (in inches):

	CASE ONLY			OVERALL			
	L.	*W.*	*Ht.*	*L.*	*W.*	*Ht.*	*Weight*
Field Camera	28⅛	10⅜	11 3/16	26	11¾	13⅝**	65 lbs.
View Finder	21¾	10⅜	7	21¾‡	11¾	13⅝**	34 lbs.
Field Camera Control	24½	8⅛	15⅛	27¼	8½	18½	65 lbs.
Field Power Supply	24½	8⅛	15⅛	24½	8½	18½	58 lbs.
Turret with 3 Ektar Lenses							4¾ lbs.
Camera Cable (200 ft. with plugs)							80 lbs.

Camera Cable Dimensions:
Diameter—0.810 in.
Standard Lengths—50 ft., 100 ft., 200 ft.
Finish—Two tone umber gray wrinkle with chrome trim

Tube Complement

1 RCA Image Orthicon (Field Type), 3 RCA 6AK5, 1 RCA 6AG5, 1 RCA 6J6, 3 RCA 6SN7GT, 2 RCA 6SL7GT, 1 RCA 6BG6G, 1 RCA 6AS7G, 1 RCA 1B3GT/8016, 1 RCA 6V6GT, 1 RCA 6L7

Field Camera View Finder—2 RCA 6AG7, 1 RCA 6J6, 1 RCA 6V6GT, 1 RCA 6H6, 2 RCA 6SN7GT, 1 RCA 6SL7GT, 1 RCA 6BG6G, 1 RCA 1B3GT/8016, 1 RCA 6AS7G, 1 RCA 5FP4A

Field Camera Control—1 RCA 6SK7, 4 RCA 6AC7, 2 RCA 6H6, 10 RCA 6SN7GT, 1 RCA 6AL5, 4 RCA 6AG7, 1 RCA 884, 1 RCA 6SL7GT, 1 RCA 6BG6G, 1 RCA 6AS7G, 1 RCA 2X2, 1 RCA 991, 1 RCA 3KP1, 1 RCA 7CP4

Field Power Supply—5 RCA 6AS7G, 6 RCA 5R4GY, 1 RCA 6Y6G, 1 RCA 6AC7, 1 RCA 6SL7GT, 2 RCA VR150

Stock Identification—MI-26905

Equipment Supplied

(Includes equipment below plus miscellaneous cables, fittings, hardware and miscellaneous)

1 Camera—MI-26010-A
1 Camera Viewfinder—MI-26015
1 Metal Camera Tripod—MI-26046
1 Camera Control Unit—MI-26065
1 Power Supply—MI-26095
1 Set Interconnecting Cables—MI-26730
1 50 ft. Camera Cable—MI-26725-1
1 100 ft. Camera Cable—MI-26725-2
1 200 ft. Camera Cable—MI-26725-3
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-26510-1
1 Shock Mount—MI-26510-3
1 Set of Tubes including (1) 3KP1, (1) 5FP4, (1) 7CP4, (1) Image Orthicon
1 Ring Sight—MI-26576
1 Friction Head—MI-26205-A

Accessories

Camera Cable (length to be specified by customer) MI-94-C
Video Coax Cable RG-11/u—MI-83
Video Coax Cable RG-59/u—MI-75
Camera Lens 8.5 in., f3.9—MI-26550-4
Camera Lens 13 in., f5—MI-26550-5
Camera Lens 15 in., f5—MI-26550-6
Camera Lens 17 in., f5—MI-26550-7
Camera Lens 25 in., f5—MI-26550-8
Plate Current Meter—MI-21200-C1

‡ Less viewing hood.
* Less lenses.
** Including cover.
*** Not standard equipment. Available as accessory items.

Field Synchronizing Generator, Type TG-10A

Features

- Delivers standard RMA synchronizing and blanking.
- Also delivers separate horizontal and vertical driving signals.
- Complete in two suitcases, Pulse Former and Pulse Shaper.
- Frequency controlled either by 60 cycle power line or by quartz crystal.
- Built-in cathode ray tube indicator for counter circuits.
- Built-in regulated power supply.
- Single cable connection between the two suitcases.
- All output signals, except synchronizing, on single cable.
- Synchronizing on separate cable to provide for single or multiple camera operation.
- Operation over wide range of line voltage.
- Built-in line voltage meter and tap switch.
- Convenience outlet with fuse.

Uses

The TG-10A synchronizing generator is the heart of the field television pickup equipment. Its function is to provide all the timing information, in the form of electrical pulse signals, required for controlling and synchronizing the scanning processes in both the field pickup equipment and the receiver.

Description

In order to keep the weight and size of the TG-10A within reasonable limits, the equipment has been divided into two parts, the Field Pulse Former and the Field Pulse Shaper, each contained in a separate case. Also included with the TG-10A is a Power Distribution Box which is intended to be used for connecting the 117 volt power source to the various units of the RCA Field Television Equipment.

The equipment generates four separate signals which are required for a 525 line interlaced system as recommended by the RMA. The signals are designated as follows:

1. Synchronizing
2. Blanking
3. Vertical driving (at field frequency, 60 cycles)
4. Horizontal driving (at line frequency, 15,750 cycles)

The first two of these signals, Synchronizing and Blanking, are used directly in composing the final picture signal fed to the output of the system. In other words, they appear as parts of the composite picture signal. The last two signals, Horizontal and Vertical Driving, are used in the pickup equipment only. Their principal function is to trigger deflection generators in cameras and monitors. They are also used for keying signals in "clamp" circuits and for blanking signals in the camera.

FIELD PULSE FORMER

The Field Pulse Former contains the timing circuits required in the system. Specifically, they include the master oscillator which operates at twice line frequency (31,500 cycles), a series of counters for stepping this master frequency down to line frequency (15,750 cycles) and to field frequency (60 cycles), and an automatic frequency control circuit for locking the synchronizing generator to the power supply frequency. A crystal oscillator operating at 94.5 kc. is provided as an alternative means of controlling the frequency of the generator where the power supply system is not stable enough to serve as a reference.

Controls for the counter circuits, AFC circuit, and crystal oscillator are made accessible by removing the side cover on the tube side of the unit. A cathode ray tube indicator (RCA 2BP1) for the counter circuits is mounted within the case and is visible when the cover is removed to make adjustments of the controls.

A single cable containing 4 coaxial lines and several other conductors carries signals and power between the Field Pulse Former and the Field Pulse Shaper. The a-c power enters the Pulse Former through a special connector. A convenience outlet, separately fused for 10 amperes, is provided on the rear panel. No other connections are required.

The Field Pulse Former also includes a regulated power supply which provides all the plate current required by both the Former and the Shaper. The Transformer primary is tapped at several points to accommodate a wide range of line voltage (98 to 129 volts). A selector switch for these taps is mounted on the front panel directly under a line voltmeter which indicates when the proper tap has been selected.

FIELD PULSE SHAPER

The Field Pulse Shaper contains all circuits necessary for shaping, mixing, and pulse width control to produce the four output signals. Pulse widths are adjustable by means of screwdriver-type controls which may be locked in position.

Power Distribution Box

The outputs are fed to 75 ohm coaxial lines from the plate circuits of the final amplifier tubes (RCA 6AG7). These outputs are coupled through blocking capacitors to prevent d-c from flowing in the transmission lines. The normal signal level on these lines is 4 volts, peak to peak. All four signals are negative in polarity.

Two separate cables carry the signals to the equipment in the system. One multiple cable, consisting of four coaxials, carries the Picture Blanking and the Horizontal and Vertical Driving signals to the Field Camera Controls. The second cable is a single coaxial line which carries the Synchronizing signal.

Two filament transformers are mounted in the Pulse Shaper to supply the tube heaters. Plate current for the tubes is provided by the regulated power supply in the Field Pulse Former.

POWER DISTRIBUTION BOX

This distribution box has nine 2-prong twistlock receptacles which fit the power cables supplied with the equipment. This number of outlets is more than sufficient for a four camera setup, and thus allows extra outlets for operation of associated audio equipment. Two standard convenience outlets are also provided for soldering irons, trouble lights, etc.

The power-feed line to the box is a four-conductor water proof cable (each conductor #10 gauge, stranded) connected through 4-prong twistlock connectors. A total of 200 feet of this cable is supplied with each equipment.

Provision is made for connecting this box to any one of three types of power distribution lines which are normally encountered in the United States. These are:

1. Single phase, 2 wire (117 volts).
2. Single phase, 3 wire (117 volts from each outer line to neutral).
3. Three phase, 4 wire (117 volts from each outer line to neutral).

A link board under a trap door at one end of the box provides easy means for rearranging the circuits to fit any of these three systems. Outlets are color-coded to indicate phasing on the three phase system, and correspondingly colored pilot lamps indicate which phases are "hot" in case a main fuse burns out.

Provision is thus made to utilize all elements of any available power distribution system so as to minimize voltage drop.

Specifications

Field Repetition Rate ——— 60 per sec.

Frame Repetition Rate ——— 30 per sec.

Line Repetition Rate ——— 15,750 per sec.

Synchronizing Generator Master Oscillator Frequency 31,500 cycles/sec.

Synchronizing Generator Counter Ratios:
- First ——— 7 : 1
- Second ——— 5 : 1
- Third ——— 5 : 1
- Fourth ——— 3 : 1

Frequency Stability of Horizontal Sync. (when stabilized by power supply) ——— ±0.15%/sec. max.

Frequency of Quartz Crystal ——— 94,500 cycles/sec. ±50 cycles

Synchronizing Generator Output Signals:

(a) Signal Level (all signals) 4.0 (—0.5, +1.0 volts, peak-to-peak)

(b) Signal Polarity (all signals) ——— Negative

(c) Waveform-Sync ——— Defined by "Recomended Sync. Generator Waveforms", a drawing submimtted January 22, 1946 (Revised October 9, 1946) by the RMA Sub-committee on Studio Facilities.

(d) Waveform-Picture Blanking ——— Defined by "Recommended Sync. Generator Waveforms", a drawing submitted January 22, 1946 (Revised October 9, 1946) by the RMA Sub-committee on Studio Facilities.

(e) Waveform-Horizontal Driving ——— Rectangular pulse, 15,750/sec. Width 6.3 microsec. (approx.)

(f) Waveform-Vertical Driving ——— Rectangular pulse, 60/sec. Width 4% or .00067 sec.

A-c Power Input, Sync Gen. ——— 325 watts

Dimensions (in inches):

	CASE ONLY			OVERALL			
	L.	*Wt.*	*Ht.*	*L.*	*W.*	*Ht.*	*Wt.*
Field Pulse Form'r	24½	8⅛	15⅛	25¾	8½	18½	67½ lbs.
Field Pulse Shaper	24½	8⅛	15⅛	25¾	8½	18½	52 lbs.
Power Dist. Box	11⅛	8⅞	3¾	11⅜	8⅞	5	10 lbs.

Finish ——— Deep umber gray wrinkle with chrome trim

Tube Complement:

Pulse Former MI-26105	Pulse Shaper MI-26115
1 RCA 2BP1	6 RCA 6AC7
2 RCA 5V4G	4 RCA 6AG7
4 RCA 6AC7	4 RCA 6L7
1 RCA 6AS7G	12 RCA 6SL7GT
7 RCA 6H6	2 RCA 6SN7GT
3 RCA 6SL7GT	2 RCA 5691
7 RCA 6SN7GT	
2 RCA OD3/VR150	
1 RCA VC5K1	

Stock Identification ——— MI-26920

Equipment Supplied:
- 1 Pulse Former ——— MI-26105
- 1 Pulse Shaper ——— MI-26115
- 1 Power Distribution Box ——— MI-26260
- 1 Plate Current Meter ——— MI-21200-C1
- 2 Shock Mounts ——— MI-26510-1
- 1 Set of Cables ——— MI-26735

Accessories

1 Crystal Unit ——— MI-26545

Master Monitor, Type TM-5A

Features

- Operates with composite picture signal input (synchronized operation) or with separate picture signal and pulse signal input voltages (driven operation).
- Special 10 inch diameter, kinescope with aluminum backing makes possible a very brilliant picture.
- Special low capacity input connection.
- Compact design permits location in operating consoles with minimum space requirements. Operator can easily look over the top of the console and can observe at least three adjacent monitors without difficulty.
- Synchronization of the oscilloscope sweep with the kinescope sweep at half-line or half-field frequency is completely automatic.
- Operating controls are extremely simple.
- Pulse high-voltage supply reduces shock hazard considerably.
- Tubes and circuits are readily accessible.
- Adapter is available for rack mounting and a suitcase type enclosure available for portable or field use.
- Calibration circuit permits quick reference to a fixed voltage level.
- Grid circuit of oscilloscope is available for pulse measuring techniques.

Uses

The Type TM-5A Master Monitor provides in a compact chassis a complete monitoring unit adaptable to the supervision of composite picture signals at any stage of transmission, from camera pickup to radio transmitter input. It may be used for both picture and waveform monitoring of signals from the relay receiver, the output signal at the master control room, or any other picture signals it may be desirable to monitor at the radio transmitter location.

Description

The Master Monitor is furnished in chassis form. It may, therefore, be placed in a housing and grouped with other master monitors or camera controls to form an operating console. A case for table top mounting is available so it can be used conveniently with field equipment for monitoring purposes, and in conjunction with the adaptor, MI-26526, it can be used as a rack mounted monitor.

The unit employs a 10 inch kinescope for direct picture monitoring and a 5 inch oscilloscope for signal component analysis. Input circuits are arranged to permit the same or different picture signals to appear on the kinescope and oscilloscope screens at the same time.

A calibration circuit is included to establish a definite voltage level on the oscilloscope screen for measuring purposes. The horizontal scanning frequency of the oscilloscope tube is automatically half that of the kinescope and results in two cycles of either horizontal or vertical pulses, as may be selected by the operator, appearing on the oscilloscope screen.

TM-5A Master Monitor shown mounted in Field Carrying Case, MI-26521

The vertical front panel of the monitor, finished in dark umber gray is arranged with an opening at the top center, fitted with a rectangular mask, for the 10 inch kinescope to present the picture screen. The screen of the 5 inch oscilloscope is arranged immediately below the kinescope screen in a 5 inch circular opening. The lower section of the panel carries the switches and controls, conveniently grouped.

With the ends of the kinescope and oscilloscope presented to the panel, the other components of the circuits are mounted on vertical chassis on both sides of the cathode-ray tubes with tube sockets and circuit components arranged on narrow shelf members so that all parts are readily accessible for servicing.

A twelve contact plug at the rear of the assembly provides for the connection of necessary input power and external synchronizing pulse wiring. A safety feature is included in the form of an interlock which is attached to the monitor, so that withdrawal of the chassis from the case opens the high voltage circuits in the unit to prevent accidental contact with dangerous potentials.

The Master Monitor may be operated as either a "synchronized" or as a "driven" monitor. In the synchronized case, the scanning circuits are operated by blocking oscillators which in turn are triggered by the sync. pulses contained in the incoming composite picture signal. In the driven case, the incoming signal will normally come from a camera chain without sync. pulses. The scanning circuits are therefore "driven" directly by separate signals from the synchronizing generator. Connections to the sync. generator are made through the multi-contact plug. The switching arrangement employed for selecting the type of operation cuts off the blocking oscillators by opening the cathode circuits when the unit is operated as a driven monitor. The unit includes three step down transformers to furnish current for the tube heaters and filaments but d-c currents for the tube plate circuits and centering circuits must be obtained from an external regulated power supply.

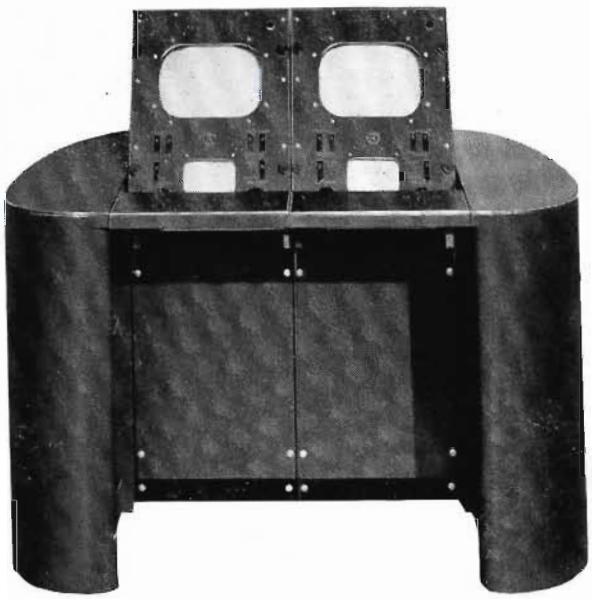
Specifications

INPUT POWER WHEN USED AS LINE OR RELAY RECEIVER MONITOR

From Line for Tube Heaters:
- Line Voltage — 105-125 volts
- Line Frequency — 50-60 cycles, single phase

From Power Supply:
- Plate Voltage — 285 volts d-c
- Plate Current — 510 ma.
- Centering Voltage — —7 volts d-c

Tube Complement — 3—6AC7, 6—6AG7, 2—6AL5, 1—6AS7-G, 2—6BG6-G, 11—6SN7-GT, 2—IB3-GT/8016, 1—5CP1A, 1—1816P4



The TM-5A Master Monitor may be mounted in Video Console unit as shown above

Photo above shows how TM-5A may be mounted in a special housing for portable uses

INPUT FROM CAMERA CHAIN WHEN USED AS CAMERA OR PROGRAM MONITOR

	Peak to Peak Voltage	*Frequency in Cycles*	*Pulse Width*
Vertical Drive	2 min.	60	4%
Horizontal Drive	2 min.	15,750	10%
*Oscillator Drive	8	Mixed 30 and 7875	
** Bias	—18	d-c	
*** Tally Light	6.3 v.		

Frequency Response:
- Kinescope Amplifier — Flat ±1 db to 8 mc.
- Oscilloscope Amplifier (Vertical Deflection) — Flat ±1.5 db to 4 mc.

Input Impedance:
- CRO Input — High
- Kinescope Input — High
- CRO Drive Signal — High

Signal Input Range:
- CRO Input — 0.5 to 3 volts
- Kinescope Input — 0.5 to 3 volts

Chassis Dimensions — 17¾" high; 13" wide; 20¼" deep

Weight — 68 lbs.

Stock Identification (chassis only) — MI-26135-A

Accessory Field Carrying Case — MI-26521

Shock Mount — MI-26510-2

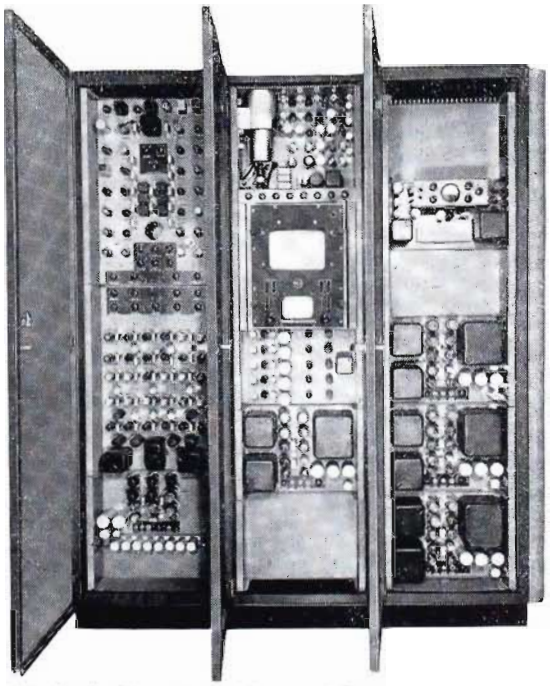
Rack Mounting Adaptor — MI-26526

Blower Kit (needed if TM-5A is used in Console Housing) — MI-26579

* Use of this signal is optional.

** Used only with camera chain, under which condition following output voltages are available from monitor:
- Pedestal Control — 0 to —18 volts d-c
- Video Gain Control — 0 to —18 volts d-c

*** Connected to switching or monitor heater circuit.



With Rack Mounting Adaptor, MI-26526, the TM-5A may be mounted as shown above

Field Switching System, Type TS-30A

Features

- Surgeless camera switching (clamp circuit) for four cameras and two auxiliary signals.
- Switching between cameras without interrupting sync, thus eliminating frame slipping at receivers.
- Individual level control on each auxiliary picture input.
- Switching of Master Monitor for checking the outgoing picture line, auxiliary lines, relay transmitter, etc.
- Push button switches for picture signals.
- Tally system to indicate "on-the-air" to the camera control operator, camera man, and performers.
- Clamp circuit holds black level constant.
- Sync. level adjustable over wide range.
- Incoming signal may be with or without sync.
- Operation in conjunction with a Master Monitor from a single external power supply.
- Built-in power supply with separate control switch for the intercom. system.
- Complete miniature "central office" for an inter-communication system between all operators in a four camera setup and the program director, technical director, and main studio.

Uses

The Field Switching System, when used in combination with the Field Master Monitor, is the equivalent, in the Field Equipment, of the director's console in a studio. It provides two major services in a setup involving more than one camera. The first is, of course, a means of switching between cameras and of monitoring the outgoing signal. The second is the provision of an intercommunication center for the telephone system which enables all operating personnel to talk with each other.

Description

The complete equipment consists of the Field Switching unit, contained in a compact, easily carried case; and the associated Field Power Supply, likewise contained in a portable case.

The picture signal circuits provide for switching between four cameras and two incoming auxiliary lines, or in unusual cases, between six cameras. Communication circuits are limited to a maximum of four cameras.

Two sets of push button switches are provided for picture switching. One set, located at the bottom of the front panel, and marked "CAMERA SWITCHING," switches signal from any of four cameras or two auxilliary inputs to the outgoing line. The second set marked "MONITOR SWITCHING" provides for switching the Field Master Monitor to any of the following five positions:

1. Outgoing picture line.
2. Monitor output of relay transmitter.
3. Incoming auxiliary line 5.
4. Incoming auxiliary line 6.
5. Spare input to monitor.

Each push button has an associated tally. Camera switching tallies operate in conjunction with tallies in the Cameras and Camera Controls.

The picture amplifier includes a "clamp" circuit to eliminate switching transients and other low frequency disturbances which may have been added to the signal earlier in the system, and thus provides that smooth switching which adds much to program technique.

The three 75-ohm coaxial outputs from the outgoing line amplifier are as follows:

1. Picture Output (for feeding a relay transmitter or studio line).
2. Master Monitor Output.
3. Auxiliary Monitor Output.

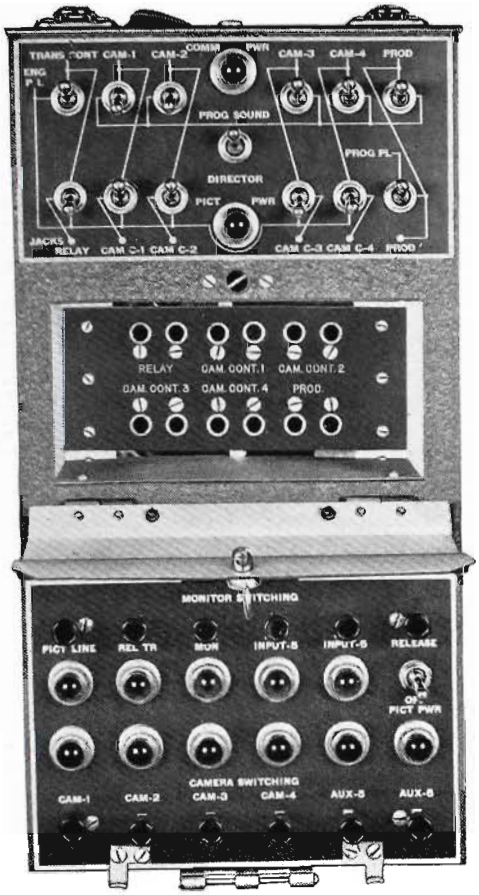
At output 1 appears the signal from the particular camera selected by the CAMERA SWITCHING push button. The second output is effectively in parallel with the first output when the monitor switch is in the picture line position.

The third output is provided to supply signal to any auxiliary equipment which it may be desired to operate such as an additional monitor, a standby link transmitter, or the switching system of an additional set of field equipment.

All three of these outputs deliver the same signal level and polarity, i.e., 2 volts, peak to peak, of picture and sync. with sync. negative. It is assumed that this level is based on the standard ratio of 75% picture and 25% sync. However, for signals from local Cameras, where sync. is mixed with the camera signal in the Field Switching System, the amount of synchronizing voltage may be increased above the 25% value by adjusting the Synchronizing Gain Control.

Pulse signals for operation of the clamp circuit are derived from the synchronizing signal. The clamp operates at black level so that the output stage always operates over the same portion of its characteristic.

Filament power for all tubes in the field switcher is supplied by a transformer in the Field Switching System. D-c



Front view of Switching Unit showing panel detail

for plate supply is obtained from an MI-26095 Field Power Supply which is also capable of providing plate current to a Field Master Monitor at the same time. The power control switch for the Field Power Supply with an associated tally, is located on the front panel of the Field Switching System. The intercommunication system provides talking circuits between the camera men, the camera control operator, the technical director, the program director, and any assistant production personnel who may be stationed near the cameras. It provides also a circuit for distribution of the program sound to all the operators of the system. Each operator may be provided with a telephone set consisting of a double ear phone head band and a microphone. One ear phone in each set reproduces the program sound, and the other reproduces the operators' conversation.

Recessed under the front panel of the Field Switching System is a jack board with accommodations for six telephone sets; one for each camera, one for the program director and one without program sound for the relay transmitter operator.

A group of toggle switches on the upper part of the front panel provides means for making several circuit combinations in the intercommunication system. The following combinations are available:

1. Separate circuit to each camera and the relay transmitter.
2. A common circuit to all cameras or any grouping of them.
3. Optional tie-in between operators and program director.
4. Optional tie-in between operators and the engineering PL. (Private Line).
5. Optional tie-in between engineering PL and production PL.
6. Optional circuit for the program director over the program line.

The circuit used for the intercommunication system is the common battery type. The power supply operates fom the a-c line and is contained in the Field Switching System. A separate power switch, fuse, and tally are provided so that the intercommunication system may be operated while the rest of the equipment is turned off.

Four separate cables carry the intercommunication and tally circuits between the Field Switching System and the four Field Camera Controls. A jack provides means for a 2 wire circuit to the relay transmitter. Receptacles are provided for connecting the program sound, and the engineering and program phone lines, or PL's, from the main studio or transmitter.

Controls normally used during show time are located on the front panel. Others, used rather infrequently, are located under a small trap door on top of the suitcase. Controls normally preset are located on the chassis and are made accessible by removing the cover on the tube side of the unit.

Individual coaxial connectors are provided for all incoming and outgoing picture and synchronizing lines. All other connections are made with multiple conductor cables to keep the number of connections to a minimum.

A removable front cover is provided to protect the switches and other controls from damage during transportation. Removable side covers are also provided. The wiring side is interlocked and an auxiliary link is supplied to restore power for servicing.

Specifications

Dimensions:

Field Switching Unit

Case Only	24½" long, 8⅛" wide, 15⅛" high
Overall	26½" long, 8½" wide, 18½" high

Field Power Supply

Case Only	24½" long, 8⅛" wide, 15⅛" high
Overall	24½" long, 8½" wide, 15⅛" high

A-c Power Input (approx.):

Switcher and Power Unit	800 watts
Switcher, Power Unit and Master Monitor	1150 watts

Weight:

Field Switching Unit	71.5 lbs.
Field Power Unit	58 lbs.
Stock Identification	MI-26950

Tube Complement

3 RCA 6AC7	1 RCA 6H6
5 RCA 6AG7	3 RCA 6SN7GT

Equipment Supplied

1 Switching System	MI-26215
3 Headsets	MI-26570-6
2 Shock Mounts	MI-26510-1
1 Set of Cables	MI-26740
Power Supply	MI-26095
Plate Current Meter	MI-21200-C1

Accessories

Auxiliary Field Switcher (Fader)	MI-26238

Auxiliary Field Switching Control, MI-26238

Features

- Provides means for a dissolve, fade, superimposed picture, or instantaneous switching.
- Switches up to six local signals.
- Tally light switching for four camera chains.
- Provides local tally light system to indicate camera or cameras "on-the-air".
- Separate adjustments of signal levels for superimposed picture.
- Use in conjunction with TS-30A Camera Control permits handling of various combinations of eleven signals.

Uses

The Auxiliary Field Switching Control is designed for use with the TS-30A Field Switching System. It permits a varied number of switching and fading conditions depending on individual requirements. For example, actual operation allows the following to be accomplished with the output of the auxiliary switcher fed to "AUX" 5 input on the TS-30A:

Combination	Switching		Fading
	Local	Remote	Local
A	11	0	6
B	8	3	4
C	4	7	0

(Other combinations are also possible)

For example, in combination "B" above, actual operation permits the following: (1) Four local signals may be fed to Auxiliary Switcher which can be faded or switched instantaneously. (2) Four other local signals may be fed to TS-30A for instantaneous switching. (3) Two remote signals may be fed to Auxiliary Switcher on "Aux 5" and "Aux 6" and a third remote to "Aux 6" of TS-30A.

As used above in normal operation with the output of the Auxiliary Switcher fed to "Aux 5" input of TS-30A, the TS-30A "Sync" switch is used at "INT" position when switching remotes and at "EXT" for switching or fading local signals.

Rear view of Field Switching Control showing coax connectors and Jones plug supplied

Description

The Auxiliary Field Switching Control includes the necessary push-button switches, fader control, resistor networks, tally lights and coaxial connectors for accommodating six camera control circuits (or four cameras and two auxiliary). Fader lever arms provided are normally operated together but may be operated separately as the operator chooses. When fading from black, it is not necessary to punch a "release" button on the "off" channel. If no button is depressed in the "off" channel, operation is automatically set for black. The auxiliary unit is housed in an all-metal case finished in umber gray wrinkle. All switching circuit controls are clearly and legibly identified on the front panel. Coax terminals are brought out at the rear with suitable coax connectors provided for making the necessary connections. Output of the auxiliary control is fed into the TS-30A Field Switching Equipment on any input with its termination lifted. A Jones plug and connector are also provided at the rear to supply d-c to the camera tally light relays.

Specifications

ELECTRICAL

(1) Input Impedance ——— 75 ohms

(2) Input Signal ——— 1.5 volts, peak to peak, black negative

(3) Frequency Response ——— Flat to 7 mc ±10% (fader arms locked and at one extreme position), sloping off to −20% at 7 mc with arms locked and at mid-position

(4) Tally Lights ——— 12 volt miniature bayonet #1815 or equivalent

MECHANICAL

Maximum Dimensions ——— Width 8¼", height 3½", depth 6"

Approximate Weight ——— 6 lbs.

Finish—Body—Umber gray wrinkle; Pushbuttons—One row of six white, one row of six black; Lever Handles—One white, one black.

Stock Identification ——— MI-26238

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.
- Provides mountings for relay receiver and transmitter and field or studio cameras (MI-26010-A and MI-26000-A respectively.
- May be readily used with Tripod Dolly TD-15A.
- 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 accommodate tilt head MI-26206 which may be used in conjunction with microwave relay transmitter (TTR-1B) and microwave receiver unit (TRR-1B). The type TD-11A tripod may also be used in supporting RCA television studio and field cameras (with friction head MI-26205). 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.

TD-11A Tripod above with RCA Studio Camera. At right TD-11A is collapsed for carrying.

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).

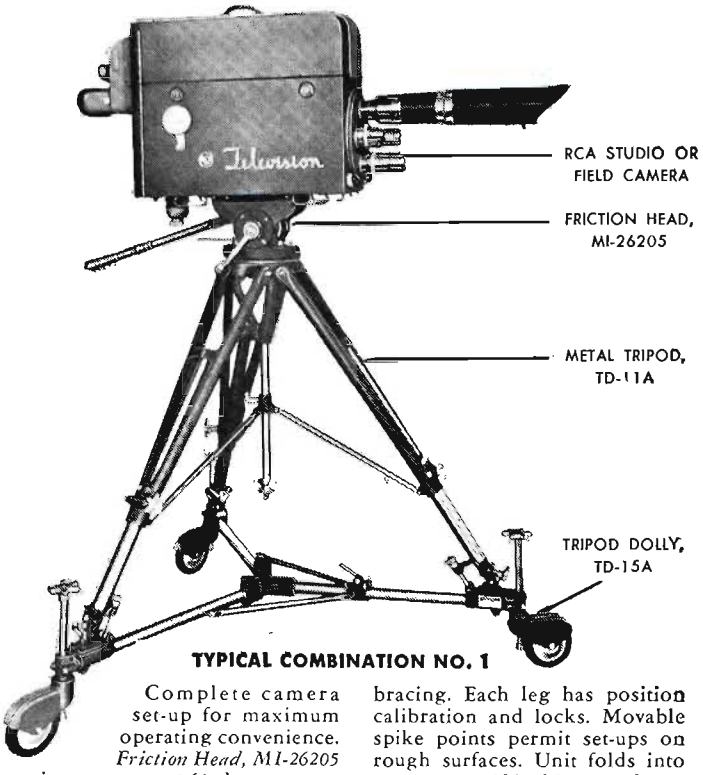
The lower tubular portion of each leg is easily adjusted and slides within a long-length bearing which is held to close tolerances. Thus, minimum play and maximum rigidity are assured throughout the working range. When tripod legs are adjusted for desired height, they may be locked in position by means of hand-operated, clamp screws. 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	25⅝"
Maximum	42½"
Maximum Diameter at Feet (legs extended)	70"
Dimensions (folded for transport):	
Overall Height (legs collapsed)	31⅝"
Overall Diameter	10"
Weight	25 lbs.
Stock Identification	MI-26046

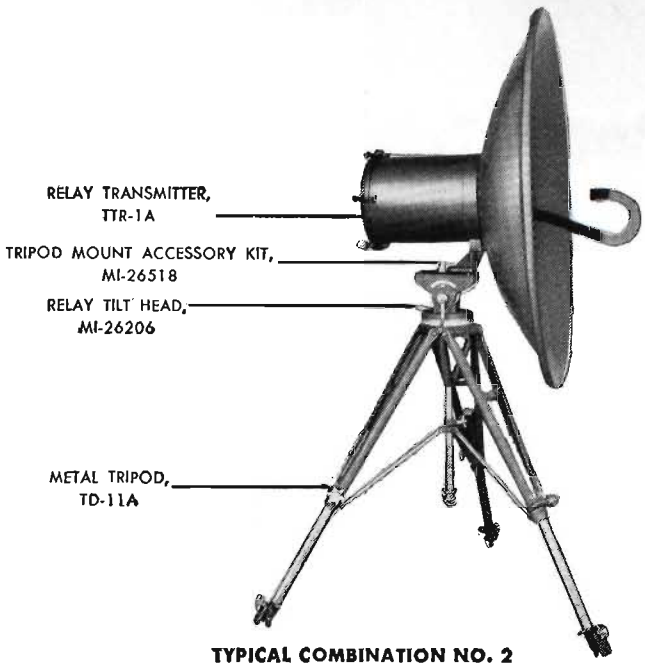
Accessories

Camera Friction Head	MI-26205
Tilt Head for Microwave Relay Transmitter and/or Receiver	MI-26206
Tripod Dolly, Type TD-15A	MI-26042



TYPICAL COMBINATION NO. 1

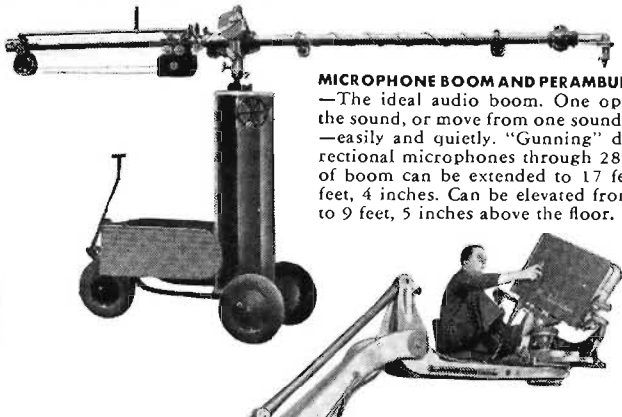
Complete camera set-up for maximum operating convenience. *Friction Head, MI-26205* gives camera 360-degree panning and full tilting action. Has "degree-indicator" scales and locking handles. *All-Metal Tripod, TD-11A* uses individual tie rods and center post for sturdy bracing. Each leg has position calibration and locks. Movable spike points permit set-ups on rough surfaces. Unit folds into compact, self-locking package. *Tripod Dolly, TD-15A* takes up a circular area only 57" diameter. Wheel stops for fixed positions. Folds and carries in a compact package.



TYPICAL COMBINATION NO. 2

A complete vhf relay transmitter for difficult terrain and long distances, where radio relay is more practical than coaxial cable. *Tripod Mount Accessory Kit, MI-26518* provides means for mounting relay equipment to tripod. Includes mounting plate, saddle, and bolts. *Relay Tilt Head MI-26206* provides wide adjustment angles for vertical tilt and horizontal rotation. Sealed bearings for all-weather service. Accurately calibrated. Individual locking handles. *Metal Tripod TD-11A* same as Combination No. 1.

Dollies, booms, stands,

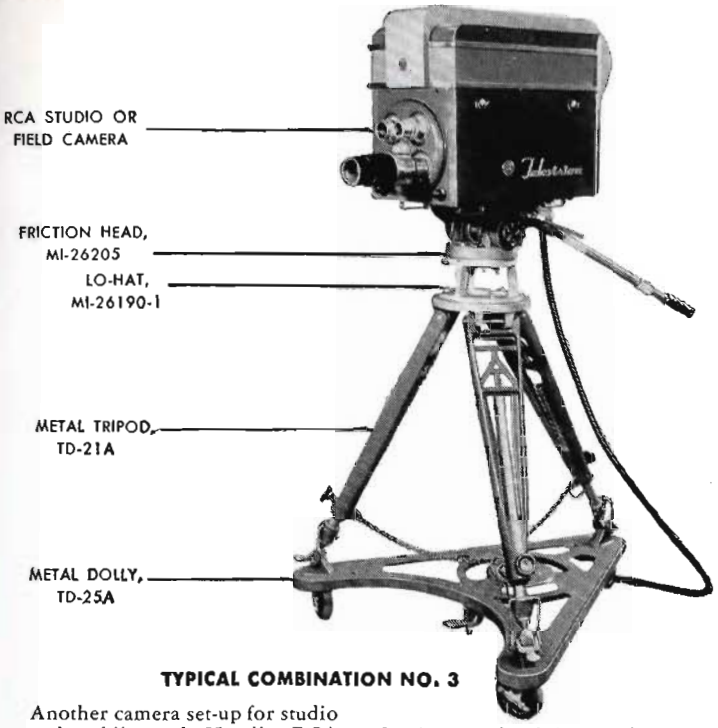


MICROPHONE BOOM AND PERAMBULATOR, MI-26574—The ideal audio boom. One operator can follow the sound, or move from one sound source to another—easily and quietly. "Gunning" device revolves directional microphones through 280 degrees. Radius of boom can be extended to 17 feet; retracted to 7 feet, 4 inches. Can be elevated from 6 feet, 5 inches to 9 feet, 5 inches above the floor.

DE LUXE TV STUDIO CRANE—Specifically for large studios. Enables you to get dramatic viewing angles, smooth panning of big scenes, approaches, retreats. Lens height; from 2 to 10 feet above the floor. Full 360 degrees panning around the crane base. 180-degree panning of the turret table. 100-degree up-and-down lift. Turns in a 6-foot radius.

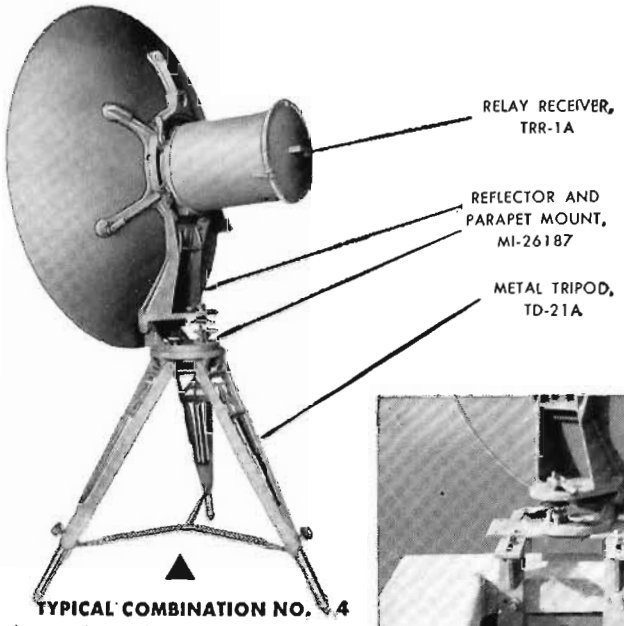
"MAGIC LOCK" BOOM STAND, KS-4A—The handiest microphone boom ever designed for TV studios. Convenient locking devices enable operator to control it with one hand. No set screws. No release mechanisms. No slipping. Each adjustment locks into position. Moves in a 180-degree arc and a base radius of 26 inches. Silent in operation.

STUDIO CAMERA DOLLY, TD-5A—Similar to the dollies used in film studios—but both front and rear wheels turn to the side. Entire unit can be moved sidewise. Stops lock the dolly in a fixed position. Camera crane boom can be elevated from 23 inches to 74 inches above the floor. -



TYPICAL COMBINATION NO. 3

Another camera set-up for studio and mobile work. Handles RCA Studio Camera or Field Camera. *Friction Head, MI-26205* same as used in Combination No. 1. *Lo-Hat, MI-26190-1* provides greater freedom and height for camera action. *Metal Tripod TD-21A* for fixed or portable set-ups. Cast aluminum and stainless steel construction. Legs adjustable up to 21 inches. Dual feet; pointed for field work and flanged for fixed service. *Metal Dolly TD-25A.* Non-swiveling. Foot-controls for parallel wheel alignment. Individual wheel and tripod locks.

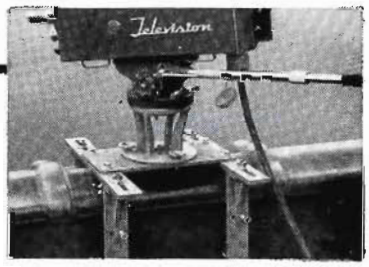


TYPICAL COMBINATION NO. 4

A complete relay pick-up receiving system. Relay receiver and parabola fasten to tripod through Reflector and Parapet Mount, MI-26187. *Metal Tripod, TD-21A* is set up for rough surfaces.

Field Camera and Friction Head, MI-26205, can be mounted on *High Hat MI-26190-2* for wall or parapet use. Complete assembly is attached to *Parapet Clamp Support MI-26189.*

▲ Here, Reflector and Parapet Mount MI-26187 fasten to Clamp Support, MI-26189—which mounts on top of wall. Relay reflector may also be permanently mounted in wall openings by means of "Gimbal" *Antenna Ring Mount, MI-26207* (not illustrated).



mounts, accessories...

STUDIO CAMERA PEDESTAL, TD-1A—Television's favorite pedestal for studio and other indoor operations. Moves freely, quietly. Crank handle raises and lowers camera to any height between 40 inches and five feet above the floor. Moves in any direction—or about a point. Panning and tilting provided by Friction Head MI-26205.

for every TV set-up

PICTURED on these pages are typical units and combinations from the most complete line of television accessories in the industry—application-engineered to meet every pick-up situation called for in your TV operations.

This line of mechanical accessories enables you to select just the right combination for your station operation. It includes every device needed for providing universal camera action in the studio and the field. It provides additional flexibility for maneuvering and covering shots from any angle.

RCA TV accessories are stoutly built to withstand the tough wear and tear encountered in field and studio operations. Yet each unit is a model of mechanical simplicity—easy to transport, easy to set up, easy to adjust, and easy to handle.

RCA TV accessories like these are used today in nearly every television station in the country. For complete information on the entire line, call your RCA Broadcast Sales Engineer. Or write Dept. 19JD, RCA Engineering Products, Camden, New Jersey.

Camera Friction Head, MI-26205A

Features

- Designed for use with RCA Field and Studio Cameras, MI-26010A and MI-26000A.
- Single screw mounting for cameras—detachable telescopic handle furnished.
- Separate positive locking handle for tilt and panning positions.
- Separate friction shoe permits adjustment of tilting friction to suit individual operator.
- Ball bearings in races on both ends of tilt shaft as well as large ball thrust bearing in races for panning assure smooth tilting and panning action.
- Ball thrust bearing and friction control adjustment assure smooth panning and tilting action.
- Carefully selected materials and weather sealed bearings.
- All exterior parts are of stainless steel or are hard chrome plated to completely eliminate possibility of corrosion.
- Counter-balancing springs are completely enclosed.

Uses

The MI-26205A Friction Head was designed especially for use with the RCA Field and Studio Cameras, MI-26010A and MI-26000A, and may be mounted on any of the following units:

RCA Type TD-11A Tripod, MI-26046
RCA Type TD-1A Studio Pedestal, MI-26035
RCA Type TD-5A Panoram Dolly, MI-26040
RCA Series of High and Low Hat Adapters, MI-26190

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-26205A Friction Head is of rugged all-metal construction, in which all materials have been carefully selected for both field and studio use.

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 balanced 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) ——— 18 lbs. approx.

Finish ——— Dark umber gray wrinkle

Angle of Rotation ——— 360°

Stock Identification ——— MI-26205-A

Tripod Dolly, Type TD-15A

Features

- Provides mobility for tripod camera mounting.
- Folds into compact lightweight self-locking package for carrying.
- Large diameter 5" wheels permit easy movement.
- Wheel stops provide for locking tripod in position.
- Tripod firmly locked to dolly.
- Attractively finished in hard chrome.

Use

The Tripod Dolly is designed for use on tripods 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.

Dolly Fitted to Camera Tripod, TD-11A

Description

The Tripod 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 x 14 x 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.

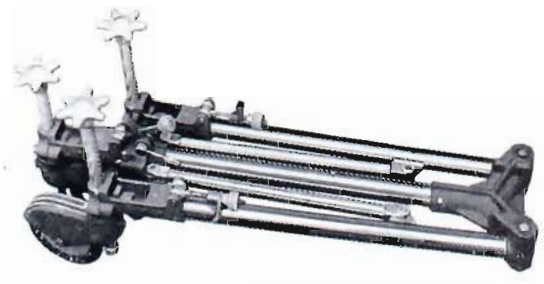
Specifications

Dimensions (unfolded and extended):

Height	6 in.
Diameter	57 in.

Folded for transport:

Height	8 in.
Width	14 in.
Length	29 in.
Weight	25¼ lbs.
Stock Identification	MI-26042



Dolly Folded for Transportation

Television Relay Transmitter, Type TTR-1B

TTR-1B Relay Transmitter at right, and Transmitter Control Unit (MI-26305) below

Features

- Used with TRR-1B Receiver provides complete Television Relay System.
- Microwave frequency operation permits simplified circuits and small size.
- Tripod mountings and accessories provide portability for field use.
- Effective automatic frequency control.
- Sturdily constructed to withstand continued outdoor use.
- Parapet mount and gimbal mount available for fixed installations.
- Wide band circuits provide excellent system response satisfactory for a 500 line picture without noticeable degradation.

Uses

The Type TTR-1B Relay Transmitter, when used with a Type TRR-1B Relay Receiver, constitutes a highly directional wide-band relay link—capable of transmitting video signals without visible decrease in picture quality. Such a system has three important applications which are:

(a) FOR STUDIO-TO-TRANSMITTER CIRCUITS where conditions of terrain, distance, or right-of-way permit economical and reliable operation. For such use the transmitter and parabolic antenna units will be permanently mounted on the roof or other high location near the studio and the transmitter control unit will be mounted, ordinarily, on the equipment racks in the studio control room. The receiving equipment will be permanently located at the transmitter site.

(b) FOR FIELD PICKUPS as a means of transmitting video signal from field pickup cameras or similar sources to a television control room for broadcasting. In this case, the rotatable tripod mounting illustrated will ordinarily be used. The antenna will be located on some high point, such as the top of a stadium where a line-of-sight path with sufficient clearance is available. The transmitter control unit will be located with the camera control equipment as, for instance, in the radio booth or in the field truck or mobile unit.

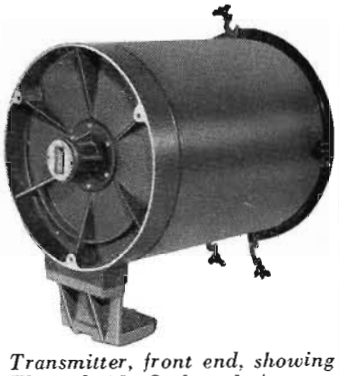
(c) AS A REPEATER STATION, when distances or intervening obstacles necessitate an additional link to reach the picture signal destination. Picture degradation through two links is negligible. The intermediate transmitter and receiver will be situated on a building or other suitable support, (antenna locations and frequency assignments being made so that local transmitter signal does not interfere with local receiver reception). The RCA relay equipment utilizes microwave frequencies in the 6500 to 7050 megacycle band. Radiation is confined to a relatively narrow beam by the paraboloid reflectors. Either 4-foot or 6-foot diameter paraboloids are available. A maximum range of 25 miles with good signal-to-noise ratio can be expected using a 4-foot diameter paraboloid. The 6-foot parabola permits longer range, but it has a narrower radiating pattern and of course is heavier.

Description

The TTR-1B Relay Transmitter is a complete, transportable transmitting system consisting of (1) a transmitter, (2) a narrow-beam antenna, (3) an antenna mounting capable of wide adjustment in the horizontal and vertical plane, and (4) a transmitter control unit.

The transmitter is contained in a cylindrical weatherproof housing attached to the rear of a parabolic reflector. It utilizes a klystron oscillator which is frequency-modulated by variations of the negative voltage on the repeller plate. It has a power output of approximately 100 milliwatts, operating at any selected frequency between 6500 and 7050 megacycles. The normal frequency deviation is 12 mc. with polarity such that a video signal in the white direction produces an increase in frequency. The output is fed to the parabolic reflector by means of a wave guide. Coupled into this wave guide system are an absorption type wavemeter, and a crystal detector monitor. The wavemeter is factory-set to any assigned frequency. The d-c from the crystal detector may be measured either at the transmitter or at the transmitter control unit as a rough indication of relative power output. The a-c component of the crystal detector output is amplified and fed over a coaxial line to the transmitter control unit where it serves during preliminary adjustment to indicate the correct frequency, and during operation, to indicate proper centering of the signal around the resonant frequency of the klystron cavity. Filament power for the tubes in the transmitter is supplied from a small filament transformer on the same chassis. All other voltage supplies are received on the transmitter chassis which are accessible by removing the protective cover over the cable input connection. By plugging in a suitable meter in the proper jack, it is possible to measure the current through modulator tube, and the oscillator tube. Another jack is provided so that a telephone handset can be plugged into the unit for communication with the transmitter control unit location.

The parabolic antenna provides a very high gain in the direction of transmission. The four foot size (illustrated) has a gain of approximately 5000, thereby giving an equivalent power output of 500 watts. The parabola is also available in the six foot size, with more than twice the gain, for use in communicating over greater distances. Transmission is limited to a line-of-sight path, and under normal conditions, a range of 10 to 25 miles may be expected with a satisfactory signal to noise ratio.



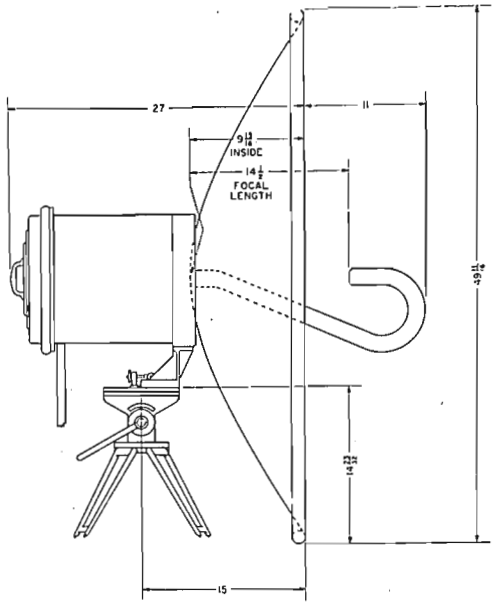
Transmitter, front end, showing Wave Guide Stub and Antenna Mounting Studs

The transmitter control unit is housed in a small, easily-carried, portable cabinet with a convenient handle on the top. Tho controls are accessibly located on a control panel on the side of the cabinet. This control unit may be located up to 200 feet from transmitter for camera cable and for greater lengths RG/8U coax to carry video from transmitter control to transmitter. It contains all the necessary operating and monitoring controls, and after initial adjustments of the transmitter and antenna have been made, all operations may be carried on from this unit. It also contains a regulated B+ supply for operation of the transmitter tubes, and a regulated negative supply for the klystron repeller plate. For greater operating convenience, provision is made for extending the operation of the controls necessary for routine adjustments of the transmitter to a monitoring console.

A tripod mounting and four foot parabolic reflector usually serve best *for mobile service*. A six foot reflector with corresponding antenna waveguide can be tripod mounted but is not recommended because of size and weight.

For fixed service two types of mount are available. The parapet mount is designed for installation on building parapets and similar structures. (Mount has a four foot dish attached.) The transmitter housing and antenna waveguide are easily installed or removed as an assembly at rear of the antenna support, thus permitting a permanent support and reflector installation without unnecessary encumbrance of a transmitter.

The additional fixed service mount is a gimbal ring which serves as a "wall" mount for four, and six-foot reflectors. It is particularly suitable for fixed installations using six-foot reflectors.



Simplified sketch showing tripod mounting of TTR-1B Transmitter

Specifications

Frequency Range — 6500-7050 mc.
Power Output, Nominal — 100 milliwatts
Antenna Gain, approximate:
- 4 ft. Reflector — 5,000
- 6 ft. Reflector — 11,500

Frequency Deviation, normal, each side of center — 5 to 6 mc.
Video Input (at Transmitter Control)
- Complete Modulation — 2 volts, peak-to-peak

Video Input Impedance — 75 ohms
Video Frequency Range — 60 cycles to 7.5 mc.
Power Supply Requirements (Transmitter and Control) 117 volt, 60 cycles a-c — 170 watts
Tube Complement:
- Transmitter Unit — RCA 6AG7 video amplifier and modulator; RCA 6SL7GT voltage regulator; RCA 6H6 d-c setter; RCA 6SL7GT monitor amplifier; and RCA 2K26 oscillator.
- Transmitter Control Unit — RCA 6AG7 video amplifier; 2 RCA 6X5-GT rectifiers; 3 RCA VR150 voltage regulator; RCA VR105 voltage regulator; RCA 5V4G rectifier; RCA 6AS7G regulator; RCA 6SL7GT amplifier.

Mechanical Specifications

Transmitter Control (in carrying case) — 13" high, 20" wide, 9½" deep
Weight — 38 lbs.
Transmitter (in housing) — 14½" high, 17" wide, 14" deep
Weight — 40 lbs
Parabolic Reflector with Parapet:
Base Mounting — 48½" high, 48" wide, 14½" deep
Weight — 47 lbs.
Parabolic Reflectors — Dia. 4ft., 14½" deep, weight 30 lbs.
Dia. 6 ft., 15½" deep, weight 75 lbs.
Finish — Two-tone umber gray
Stock Identification — MI-26935-A

Equipment Supplied

Field television relay transmitter equipment is packed as Master Item 26935-A from the following units and components.

1 TTR-1B Relay Transmitter including set of tubes in place — MI-26166-A
1 Field Relay Transmitter Control including set of tubes in place — MI-26305
1 Wavemeter (with crystal in place) — MI-26565*

* Dash No. of MI-26565 as specified by Sales Order to correspond with frequency assigned to customer.

1 Antenna (select from list below)
- a. Antenna, including 4 ft. Paraboloid and Feed System — MI-26185-A
- b. Antenna, including 6 ft. Paraboloid and Feed System — MI-26185-B
- *c. Mounting and 4 ft. Reflector (for parapet antenna) — MI-26187

MI-26186 Antenna Feed System (for 4 ft. Parabola) required in addition.

1 Mounting Support for Transmitter and Antenna (select from list below)
- *a. Mounting and 4 ft. Reflector (for parapet antenna) — MI-26187
- b. Television Tripod, TD-11A — MI-26046
- c. Antenna Tilt Head — MI-26206
- d. Tripod Accessories Kit — MI-26518

Required with (b), (c) combination and with (d).
- e. Relay Antenna Ring Mount (Gimbal Ring) — MI-26207

* Do not duplicate.

2 Headset (single earphone) — MI-26570-3
1 Set of Interconnecting Cables — MI-26755
1 Cable, Camera, 20 ft. length with connectors — MI-26725-4
1 Camera, Cable, with connector (for installation between transmitter control and transmitter) 20/50/100/200 ft. lengths — MI-26725-4,1,2,3
1 Intercom, Cable, with connectors for use between transmitter control and picture control position 7/25/100 ft. lengths — MI-26756-1,2,3
1 Instruction Book — IB-36051-1

Accessories

1 Coaxial Cable with connectors for Video Input
1 Plug-in Meter MI-21200-C1 for making adjustments
1 Cable and components for remote monitoring; plug is supplied
1 16-22 volt, d-c source and retardation coil for telephone talking voltage when not available on public or private lines being used
1 Oscilloscope for frequency tuning and monitoring
1 Picture Monitor for checking video input to transmitter Pins for scope and ground pin jacks

Spare Components

Crystal Detector — MI-26660

Television Relay Receiver, Type TRR-1B

Relay Receiver TRR-1B (at right), and TY-25A Regulated Power Supply and Receiver Control Unit (MI-26310-A) below

Features

- Used with TTR-1B Transmitter, provides complete receiving system.
- Suitable for permanent installation.
- Completely portable for field use.
- Lightweight.
- Effective automatic frequency control.
- Use of identical items (antennas, mounts and enclosures) increases flexibility and interchangeability.

Uses

The Type TRR-1B Relay Receiver, when used with a Type TTR-1B Relay Transmitter, constitutes a highly-directional wide-band radio link especially suited to the transmission and reception of television video signals. Such a link circuit has three important applications which are:

(a) FOR STUDIO-TO-TRANSMITTER CIRCUITS where conditions of terrain, distance, or right-of-way make such a system more convenient or economical than a coaxial line. For such use the antenna of the TRR-1B is located on a tower or other high point near the transmitter building in a fixed position directed toward the TTR-1B Transmitter located at the studio. The receiver control unit and power supply unit are ordinarily mounted on equipment racks in the transmitter control room.

(b) FOR FIELD PICKUPS where a TTR-1B Transmitter, arranged for portable use, is employed to send the video signal back to the studio (instead of wire or coaxial lines). In this case a rotatable mounting such as that illustrated will ordinarily be used (since there will be pickups from various directions). For temporary use, the tripod mounting may be used. When the equipment is used frequently, a more permanent mounting is desirable. In any event it must be high enough to provide a line-of-sight path to the transmitting antenna location.

(c) AS A REPEATER STATION, when distances or intervening obstacles necessitate an additional link to reach the picture signal destination. Picture degradation through two links is negligible. The intermediate transmitter and receiver will be situated on a building or other suitable support, (antenna locations and frequency assignments being made so that local transmitter signal does not interfere with local receiver reception). The RCA relay equipment utilizes microwave frequencies in the 6500 to 7050 megacycle band. Radiation is confined to a relatively narrow beam by the paraboloid reflectors. Either 4-foot or 6-foot diameter paraboloids are available. A maximum range of 25 miles with good signal-to-noise ratio can be expected using a 4-foot diameter paraboloid. The 6-foot parabola permits longer range, but it has a narrower radiating pattern and of course is heavier.

Description

The TRR-1B Relay Receiver is a complete (transportable, if desired) FM receiving system covering the frequency range of 6500-7050 megacycles. It consists of (1) a receiver, (2) a highly directional antenna, (3) an antenna mounting unit which may be either fixed or rotatable, (4) a receiver control unit, and (5) a regulated power supply unit. These units are easily set up and connected by means of convenient plug-in cables.

The signal is picked up on the highly directional, high gain (5000) parabolic (4-foot) antenna and fed into the receiver. The receiver is contained in a cylindrical, weatherproof housing attached to the back of the parabolic reflector. This housing contains a klystron tube heterodyne oscillator, a crystal mixer circuit, and five stages of the receiver i-f amplifier. This provides an output signal of about 50 millivolts at an i-f center frequency of 129 mc. This signal is fed to a coaxial line leading to the receiver control unit. The receiver has a built-in transformer which supplies filament power to all tubes. All other voltages are obtained from the power supply by way of the receiver control unit. The equipment is provided with an intercommunication system so that handsets may be plugged in and operators may communicate between the receiver and the receiver control unit.

The receiver control unit contains seven additional i-f stages, the limiter and discriminator stages, and the AFC system. There are two separate discriminator channels fed from the output of the i-f amplifier. One supplies signal to the main transmitter and monitoring circuits. The other is used to generate a control voltage for the AFC amplifier. The receiver control unit is connected to the receiver by means of a single cable with plug connectors at each end. In operation this cable may be as long as 200 feet. Longer lengths may be used where RG/8U coax is employed for the I-F signal. In addition, a cable connector at the rear of the receiver control unit permits the connection of an extension cable so that routine adjustments may be conducted from a nearby monitoring console. Both this unit and the power supply may be mounted in a standard equipment rack. The receiver control panel is located on the front. A convenient power supply carrying case for portable operation is available. This control unit has its own filament transformer, but the other voltages are received from the power supply. All tubes are accessible from the front of the unit, and all cable connections are made at the rear.

Specifications

Frequency Range	6500-7050
Reciver I-F Centered About	129 mc
Receiver I-F and Discriminator Bandwidth, approx.	16 mc
Antenna Gain, Approx. 4-foot Reflector	5000
6-foot Reflector	11,500
Video Output of Receiver	2 volts, peak-to-peak
Power Supply Requirements (Receiver and Receiver Control) 117 volt, 60 cycles	250 watts

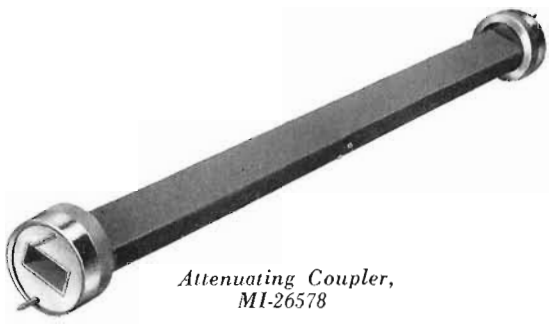
Mechanical Specifications

Receiver Control (in carrying case)	13" high, 20" wide, 9½" deep
Weight	26 lbs.
Receiver (in housing)	14¼" high, 17¼" wide, 14" deep
Weight	38 lbs.
Parabolic Reflector with Parapet Base Mounting	48½" high, 48" wide, 14½" deep
Weight	47 lbs.
Parabolic Reflectors	Dia. 4 ft., 14½" deep, weight 30 lbs.
	Dia. 6 ft., 15½" deep, weight 75 lbs.

TUBE COMPLEMENT

Receiver Unit—RCA 6J6 IF amplifier; 4 64Kt IF amplifiers; RCA 2K26 heterodyne oscillator

Receiver Control Unit—7 RCA 6AK5 IF amplifiers; 2 RCA 6J6 limiters; 4 RCA 6AK5 balancing amplifiers; 2 RCA 6AL5 discriminators; RCA 6SL7-GT AFC oscillator; RCA 6SL7-GT balanced amplifier; RCA 6SN7-GT amplifier and rectifier; RCA 6AC7-1649 video amplifier; 2 RCA 6AG7 video amplifiers



Attenuating Coupler, MI-26578

Equipment Supplied

Field television relay receiving equipment is packed as Master Item 26940-A from the following units and components:

1	TRR-1B Relay Receiver including set of tubes in place	MI-26181-A
1	Relay Receiver Control including set of tubes in place	MI-26310-A
1	Regulated Power Supply Type 580-C (for rack mounting)	MI-21523-B1
	Type TY-25A (rack mounting)	MI-26086
	Field case to adapt Type TY-25A for portable service	MI-26527
1	Antenna (select from list below)	
	a. Antenna, including 4 ft. Paraboloid and Feed System	MI-26185-A
	b. Antenna, including 6 ft. Paraboloid and Feed System	MI-26185-B
	*c. Mounting and 4 ft. Reflector (for parapet antenna)	MI-26187
	MI-26186 Antenna Feed System (for 4 ft. Parabola) required in addition.	
1	Mounting Support for Transmitter and Antenna (select from list below)	
	*a. Mounting and 4 ft. Reflector (for parapet antenna)	MI-26187
	b. Television Tripod, TD-11A	MI-26046
	c. Antenna Tilt Head	MI-26206
	d. Tripod Accessories Kit	MI-26518
	Required with (b), (c) combination and with (d).	
	e. Relay Antenna Ring Mount (Gimbal Ring)	MI-26207
2	Headset (single earphone)	MI-26570-3
1	Attenuating Coupler (equivalent to approx. 10 miles of transmission)	MI-26578
1	Cable, Camera, 20 ft. length with connectors	MI-26725-4
1	Cable, Camera with connectors for installation between Receiver Control and Receiver 20/50/100/200 ft. lengths	MI-26725-4, 1, 2, 3
1	Instruction Book	IB-36051-1

Accessories

1 Coaxial Cable with connectors for video output

1 Plug-in Meter MI-21200-C1 for making adjustments

1 Cable and components for remote monitoring; plug is supplied

1 16-22 volt d-c source and retardation coil for telephone talking voltage when not available on public or private lines being used

1 Oscilloscope for receiver frequency adjustments, tuning and balancing of discriminators

1 Picture Monitor for checking video output of receiver

Spare Components

Crystal Detector	MI-26660

* Do not duplicate.

Metal Tripod, Type TD-21A

Features

- Designed for Microwave Relay use.
- Legs adjustable up to 21 inches.
- Feet pointed for field use—flanged for permanent use.
- Cast aluminum and stainless steel construction.

Uses

The type TD-21A metal tripod is designed primarily for use with Microwave Relay field equipment. The tripod may be used directly with the back loading parapet mount, MI-26187. It may also be used for supporting RCA Field or Studio Cameras.

Description

The type TD-21A tripod is made of cast aluminum and stainless steel to provide a rigid, yet lightweight, portable unit. The tripod legs are adjustable up to 21 inches and the unit may be employed in either permanent or temporary installations by means of two types of feet—pointed for field work, flanged for more permanent use. While intended primarily for relay transmitter and receiver applications, some stations may also employ the tripod for camera use. Friction heads, plus Hi and/or Lo-Hat adaptors are required for such applications.

In addition to Microwave Relay uses, the TD-21A may be employed to support Television Cameras, as shown at left with Lo-Hat and TD-25A Dolly.

Specifications

Finish	Gray crackle
Weight	42 lbs.
Stock Identification	MI-26047

Accessories

TD-15A Dolly	MI-26042
TD-25A Dolly	MI-26043
Lo-hat	MI-26190-1
Hi-hat	MI-26190-2
Studio Friction Head	MI-26205
Tilt Head	MI-26206

Camera Tripod Dolly, Type TD-25A

The type TD-25A dolly is designed for use in studio or portable TV applications. It is of all-metal design and incorporates a foot-actuated wheel alignment and release pedestal which fixes all wheels in a parallel plane. Thus, swivelling is prevented and straight line dollying is permitted. Individual wheel locks and positive tripod locks, without springs, are provided. The type TD-25A dolly may be used in conjunction with available tripods for a TV studio combination.

Specifications

Construction	Cast aluminum
Finish	Gray crackle
Weight	30 lbs.
Stock Identification	MI-26043

Relay Tilt Head, MI-26206

Features

- Simplified construction, with improved weather-sealed bearings.
- Interchangeable mounting with regular friction head of the panning handle type.
- Degree scales are provided for tilt and 360° rotation.
- Separate, positive lock handles are provided for tilt and azimuth rotation.
- All exterior parts are of stainless steel or are hard chrome plated to eliminate possibility of corrosion.
- Mounting design permits interchangeability on all mounts where regular friction head is used.

Uses

The MI-26206 Tilt Head has been designed especially for use with the RCA Microwave Relay Equipment. It is easily transported and provides an ease of set-up adjustment. It is less expensive than the friction head of the panning handle type. It is suitable for mounting directly on the TD-11A all-metal tripod for field use.

Description

The Tilt Head is of a sturdy, all-metal design in which materials have been carefully selected for outdoor or field use. Lightweight aluminum castings are employed and all surfaces are attractively finished in an umber gray wrinkle. The standard TTR-1A Microwave transmitter or TRR-1B Microwave receiver mounts on the MI-26206 head in conjunction with Tripod Mount Accessory Kit. A total rotational angle of 360 degrees and an ample tilt angle together with suitable "degree-indicator" scales are provided. Individual positive locking handles maintain proper settings of tilt and rotation.

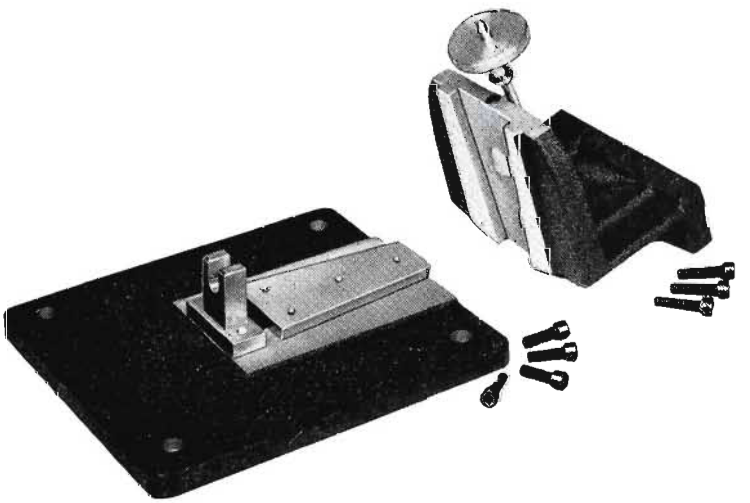
Specifications

Height	8"
Length	8"
Width	7"
Width (Over Handle)	10½"
Angle of Rotation	360°
Stock Identification	MI-26206
Companion Tripod (TD-11A)	MI-26046

Tripod Mount Accessory Kit

Description

The Tripod Mount Accessory Kit is required and provides a convenient means for the Tripod Mounting of Relay Antenna Transmitters and Receivers for mobile service. The Accessory Kit consists of tripod mounting plate and saddle plus necessary mounting bolts. The front casting of the relay transmitter or receiver has a suitable rectangular surface for attaching the tripod accessory kit mounting. The tripod mounting plate fastens directly to Relay Tilt Head, MI-26206, which mounts on the TD-11A all-metal tripod. The tripod mounting saddle and plate form a dovetailed mounting assembly and easily slide together by means of a "V" cut groove and raised shoulder. A threaded rod equipped with a clamping wing screw securely locks the assembly in place to provide a rigid mounting. This same device enables the assembly to be easily and readily disassembled.



Specifications

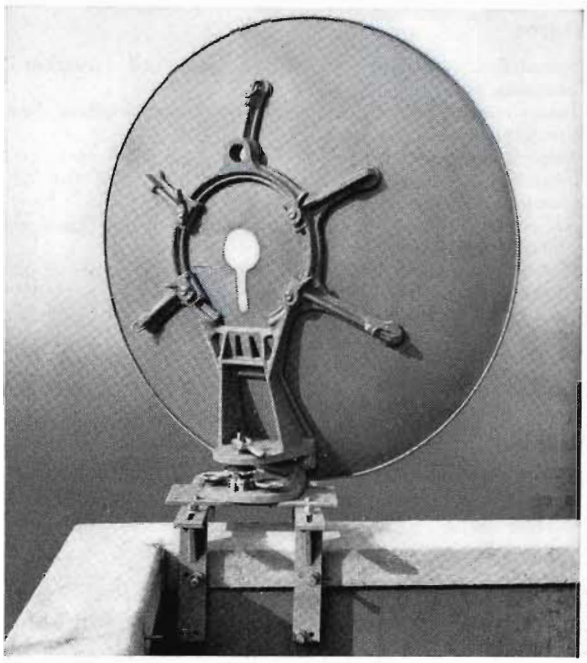
Finish	Black crackle
Weight (approx.)	2 lbs.
Stock Identification	MI-26518

Reflector and Parapet Mount, MI-26187

Description

Reflector and Parapet Mountings are available for use with RCA Portable Microwave Relay Equipment. The back-loading feature of the equipment permits quick installation of relay links by means of four fasteners. (Four equally spaced lugs on the rim of relay transmitter housing are utilized to clamp the unit in place for parapet mounting.) Telecasters may install reflectors on a permanent or semi-permanent basis at strategic locations by simply bolting directly to a flat surface. The reflector and mount is also suited for installing in conjunction with Parapet Clamp, MI-26189 as a fixed-service mounting. The Reflector and Parapet Mount unit may be used with Tripod MI-26047 for day-to-day, Relay use on a mobile unit, when desired.

Reflector and Parapet Mount as used with TD-21A Tripod to support Relay Transmitter



Reflector and Parapet Mount shown as used with Parapet Clamp for wall type mounting

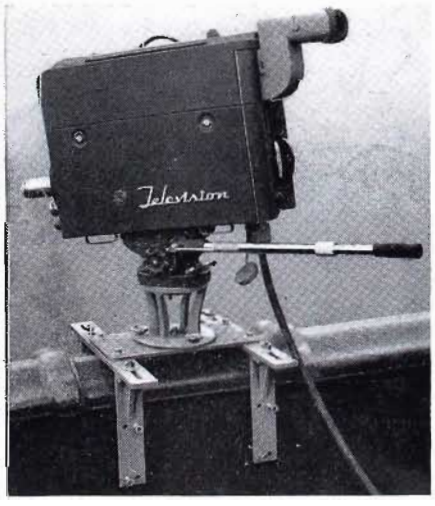
Specifications

Finish	Gray crackle
Weight	45 lbs.
Stock Identification (Reflector and Parapet Mount)	MI-26187
Accessory Parapet Clamp	MI-26189
Accessory Tripod	MI-26047

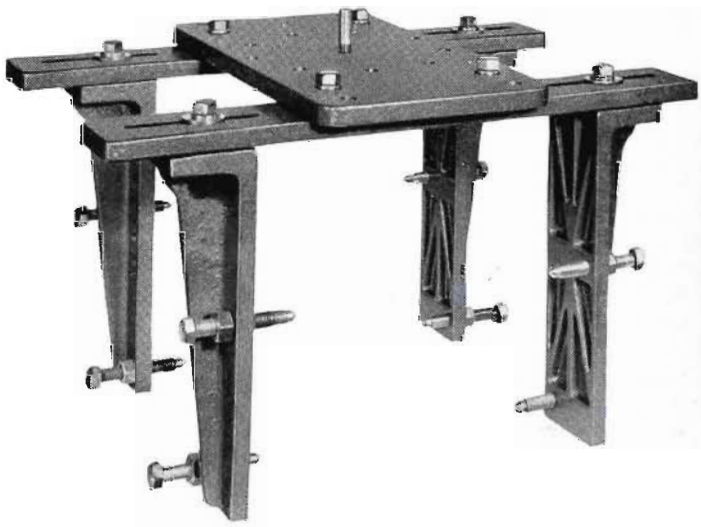
Parapet Clamp Support Mount, MI-26189

Description

The Parapet Clamp is designed to mount on building parapets or walls for accommodating Microwave Relay Equipment—and in some cases television cameras. The clamp is made of rugged cold rolled steel and serves as an adjustable platform for either temporary or permanent installation, as desired.



Parapet Clamp Support, MI-26189, as used with Hi-Hat to support RCA Field Camera



Specifications

Finish	Gray crackle
Weight	53 lbs.
Stock Identification	MI-26189

Camera Hi-Hat and Lo-Hat

Description

The camera Hi- and Lo-hats are made available as camera mounts for use in restricted quarters where a tripod may not prove convenient. Installation of the hi-hat may save time on fixed locations from which frequent pickups are made. Either the hi-hat or lo-hat will accept friction head MI-26205A or tilt head MI-26206, for studio or field use, respectively. Both camera hat units may be used in combination with parapet clamp, MI-26189 and/or tripod, MI-26047.

Lo-Hat, MI-26190-1

Hi-Hat, MI-26190-2

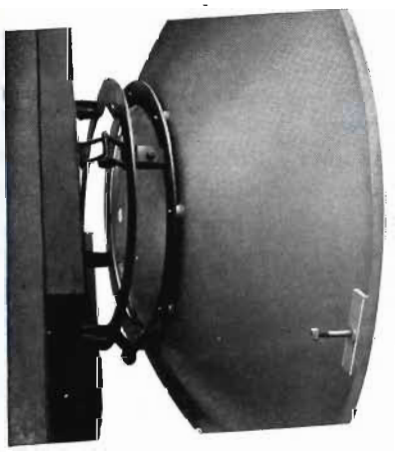
Specifications

Construction	Cast aluminum, blue hammeroid finish
Height:	
Lo-hat	4″
Hi-hat	6″
Weight:	
Lo-hat	14 lbs.
Hi-hat	17 lbs.
Stock Identification:	
Lo-hat	MI-26190-1
Hi-hat	MI-26190-2

Relay Antenna Ring Mount

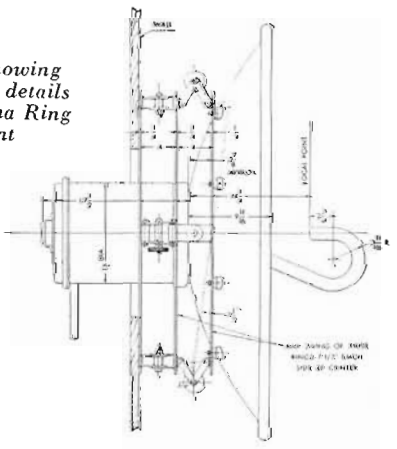
Description

The RCA Relay Antenna Ring Mount consists of a gimbal ring assembly which serves as a convenient "wall-type" or fixed-service mount for four- and six-foot reflectors. It is particularly recommended for the six-foot reflector as a fixed-location assembly. The antenna ring fastens directly to antenna reflector bosses provided. (The transmitter or receiver housing with its wave guide receives support from the reflector.) With the rear ring of the assembly rigidly bolted to its support, the middle and front rings, which carry the relay equipment and reflector, may be adjusted in both horizontal and vertical planes by means of hinged links and locking bolts. Adjustments provided on the gimbal ring permit a ±7½ degree horizontal and vertical movement.



Antenna Ring Mount as used to mount Relay Reflector

Sketch showing mounting details for Antenna Ring Mount



Specifications

Dimensions:	
Ring Diameter (outside)	34″
Ring Adjustment, Vertical and Horizontal	±7½ degrees
Finish	Umber gray crackle
Weight (approx.)	80 lbs.
Stock Identification	MI-26207

Attenuating Coupler, MI-26578

(For Testing Microwave Relay Equipment)

Features

- Convenient attenuation of transmitter signal for making receiver adjustments.
- Equipped for rapid attachment to both transmitter and receiver.
- Provides attenuation of approximately 52 db, equivalent to about 10 miles of free space transmission.

Use

When used in conjunction with the TTR-1A/1B Transmitter and TRR-1A/1B Receiver, the Attenuating Coupler facilitates checking of the micro-wave receiver assembly for proper sensitivity, alignment, signal-to-noise ratio, tuning, and other similar adjustments. The attenuator may also be used to dissipate power when aligning the transmitter. Accurate results may be obtained because adjustments are made under conditions comparable to actual operation.

Description

The Attenuating Coupler is a section of waveguide, Type RG50/U, modified to provide a small, easily handled piece of equipment for making receiver tests. The attenuating material used is laminated phenolic sheet, inserted in the waveguide with a tight fit. Two set screws hold the attenuator in position. Coupling nuts furnished for attaching to transmitter and receiver housings are the same as those supplied with standard antenna waveguides.

Receiver adjustments and sensitivity tests are made under simulated operating conditions. Dependable results are possible at a distance normally providing less than one db of free space attenuation.

With the attenuator as the path between the transmitter and the receiver under test, the strength of signal received is equivalent to the signal strength ten miles from a transmitter under normal operating conditions. No blocking of receiver stages due to excessive signal is present, because the transmitted signal undergoes 52 db of attenuation before being fed to the receiver.

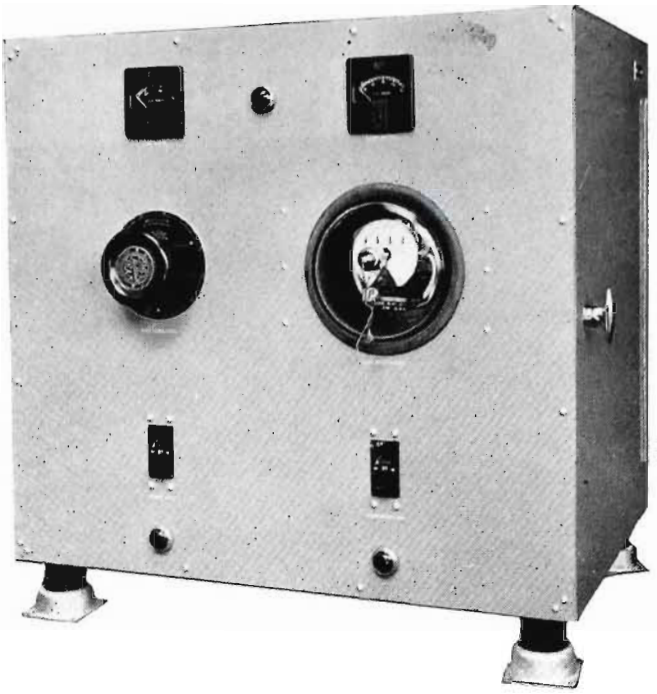
Specifications

Overall Length, excluding Pins	24"
Overall Length, with Pins	25½"
Waveguide	RG50/U ¾" x 1½" O.D.
Coupling Nuts	Same as supplied with standard antenna waveguide
Attenuation	Approximately 52 db, equivalent to about 10 miles of free space transmission
Weight	4½ lbs.

Mobile Power Control Unit, MI-26293

Features

- Provides line voltage control near operator's position.
- Voltmeter to check supply voltage before it is applied to Control Unit.
- Voltmeter to check voltage applied to equipment.
- Separate circuit breakers for equipment and utility loads.
- Watthour-demand meter to measure power consumption.
- Permits a-c operation of television mobile unit lighting system.
- Mounts conveniently on stand near wall of mobile unit.

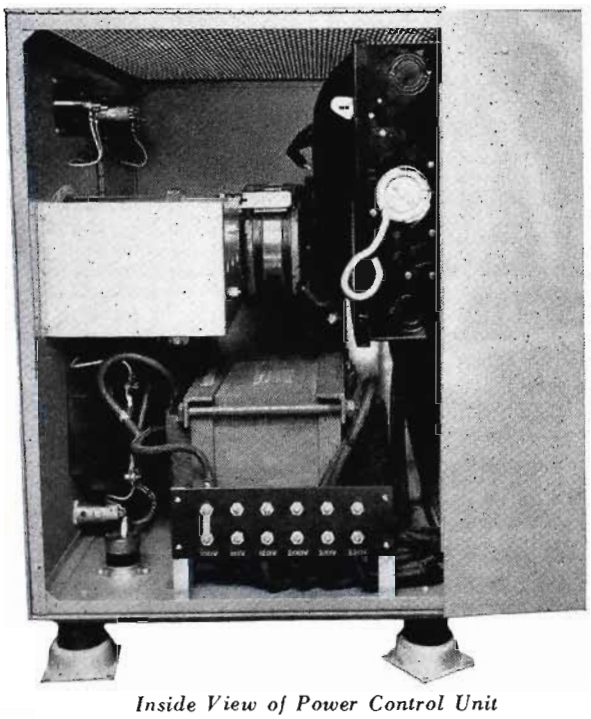


Use

The Power Control Unit is designed to provide a means for controlling, from a central point, the line voltage input to the equipment used in the television mobile unit. In addition, it is designed to record the power consumption of the equipment. The control is capable of operating from any two-wire system providing input voltages between 100 and 120 volts or between 200 and 220 volts, 60 cycles, at 5 KVA, which is sufficient to supply power to two camera chains, a master monitor, switching, audio and relay transmitter equipment.

Description

The Power Control Unit consists of transformers, circuit breakers and other control apparatus for manually regulating the output voltage. The equipment is housed in a cabinet 18" x 24½" x 27", which is designed for mounting on the stand located near the wall of the mobile unit directly behind one of the operators' seats. Heavy shock mounts are provided with the cabinet.



Inside View of Power Control Unit

Three meters are provided: a line input voltmeter, and output voltmeter and a half-hour demand watthour meter. A master line switch inside the cabinet is accessible through a side door. There are two circuit breakers on the front panel. One, rated at 40 amperes, is in the line to the television equipment. The other, a 10-ampere circuit breaker, is in the circuit to the utility outlets. The utility outlet is intended to supply the lighting system of the Television Mobile Unit when it is stationary during programs. Three pilot lights are located on the front panel. One is used as an indicator for the master switch. The other two are associated with the two circuit breakers. All connections to the power control unit are made through connectors mounted at the bottom.

Specifications

Line Input Voltage	100-220, or 200-220 volts, 60 cycles, single phase
Power Handling Capability (to television equipment)	4 KVA
Power Handling Capability (to utility outlets)	1 KVA
Output Voltages	117 volts
Dimensions of Cabinet:	
Height	27"
Width	24½"
Depth	18"
Weight	250 lbs. approx.
Stock Identification	MI-26293

Television Mobile Unit, Type TJ-50A

Features

- Provision made for mounting voltage control unit.
- Economical and convenient to maintain—standard chassis.
- Modern styling conforms with that of RCA Television Equipment.
- Six feet of head room in interior.
- Large windows in driving compartment.
- All glass is shatterproof.
- Complete and convenient stowage facilities.
- Provision made for six cable reels.
- Inside ladder and hatch provides access to roof.
- Roof covered with special non-skid tread material.
- Adequate heating facilities.
- Complete control room in rear of truck.

Uses

The RCA Television Mobile Unit is a custom-built vehicle designed to carry the television equipment needed to pick up outdoor scenes and relay the pictures to a studio or transmitter room for broadcasting.

The interior arrangement provides adequate storage space for three cameras, their tripods and the relay transmitting parabola—units which must be set up outside the vehicle for telecasting. Equipment which need not be removed from the vehicle, such as the relay transmitter control unit, audio amplifier and mixer, monitors and the camera control unit, are shock-mounted on a metal frame. An attractively finished, linoleum covered operating table is provided adjacent to equipment.

Use of the Mobile Unit greatly simplifies the work of transporting the television equipment required for field pickups. It also saves considerable wear and tear on the television units as well as time in setting them up for operation.

Description

The body of the vehicle, built on a standard 1½-ton chassis, is custom-built to provide an attractive, practical and compact unit. The standard finish is in two-tone umber gray which is both attractive and durable. (Optional colors can be furnished.) The roof is reinforced to support the weight of the field cameras as well as the relay antenna and the operators. Access to the roof is made easy through use of an inside ladder and a 24" x 36" rain-tight hatch.

A short wheelbase gets the vehicle around sharp turns in narrow streets; large, full-view shatterproof windows facilitate safe driving in heavy traffic; and a 90-horsepower engine provides speed on open roads as well as pulling power on the hills.

The four cable reels supplied are mounted on swinging arms housed in a rear compartment accessible through two doors in the back of the unit. When the rear doors are opened, the reels can be swung out into the clear to facilitate unreeling the cable. Each reel can accommodate 200 feet of camera cable. If additional cable is required, there is space in the compartment for the addition of two cable reels.

Shock mounts are available for use under the operator's table in mounting power supplies and portable sync generator. Also provided is a mounting plate for accommodating the microwave relay transmitter head end. Truck overhead lights and two 110 volt utility outlets in either wall at the side of the operating table are provided. A convenient shelf is incorporated for relay transmitter control and monitor equipment. Curtains are supplied for closing off control section to provide a darkened operating area.

Inside, the vehicle has adequate heating facilities for cold weather. A transformer provided under the hood allows the switching at the dashboard panel of truck lights to regular a-c outlets whenever available. The linoleum covered operating table at the rear runs the full width of the Mobile Unit, and provides convenient operating space for three operators seated side by side. Swivel chairs for the operators are permanently mounted to the floor. The storage lockers for the cameras, tripods and accessories are built along the inside walls of the vehicle.

Interior view, looking aft, showing ladder to roof, and operators' positions

Specifications

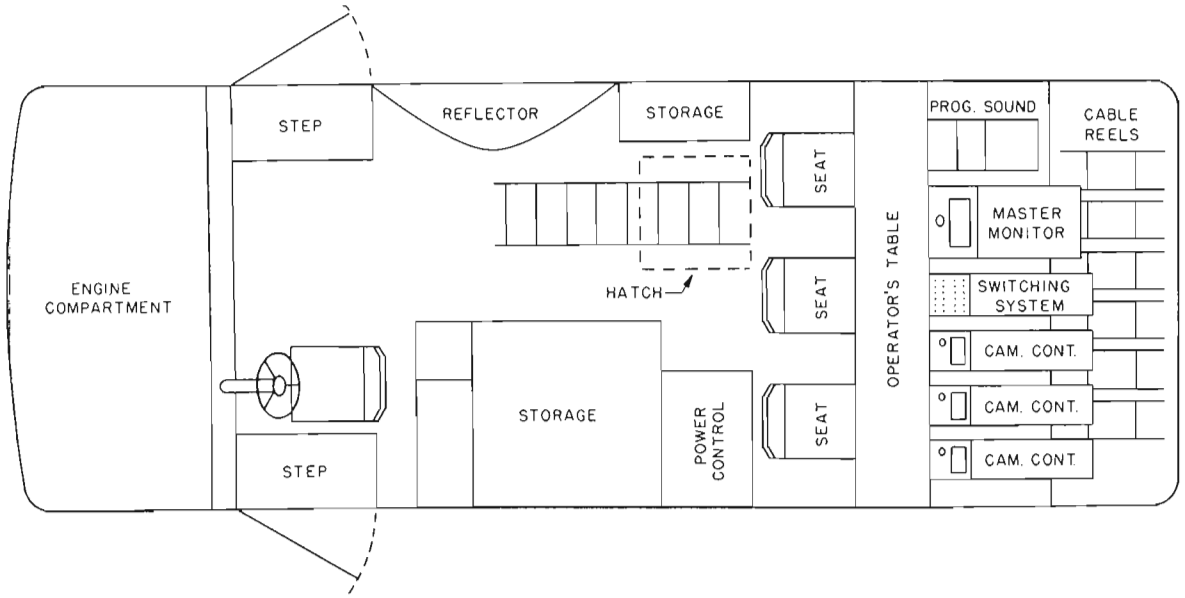
Outside Dimensions (overall):	
Length (bumper to bumper)	269″
Width	89″
Height	110″
Inside Dimensions:	
Width	84″
Height	72″
Height (at operators' table)	67″
Gross Weight	13,500 lbs.
Tire Size	7.50 x 20
Chassis	Standard 1½-ton 160″ wheelbase
Finish	Two-tone umber gray (light umber gray inside)

Equipment Supplied

Stock Identification	MI-26981
1 TJ504 Field Truck	MI-26290
4 Cable Reels	MI-26573
1 Set of Shock Mounts (transmitter control)	MI-26758
1 Audio Amplifier Rack	MI-26569
1 Tripod Plate and Accessories	MI-26518-99

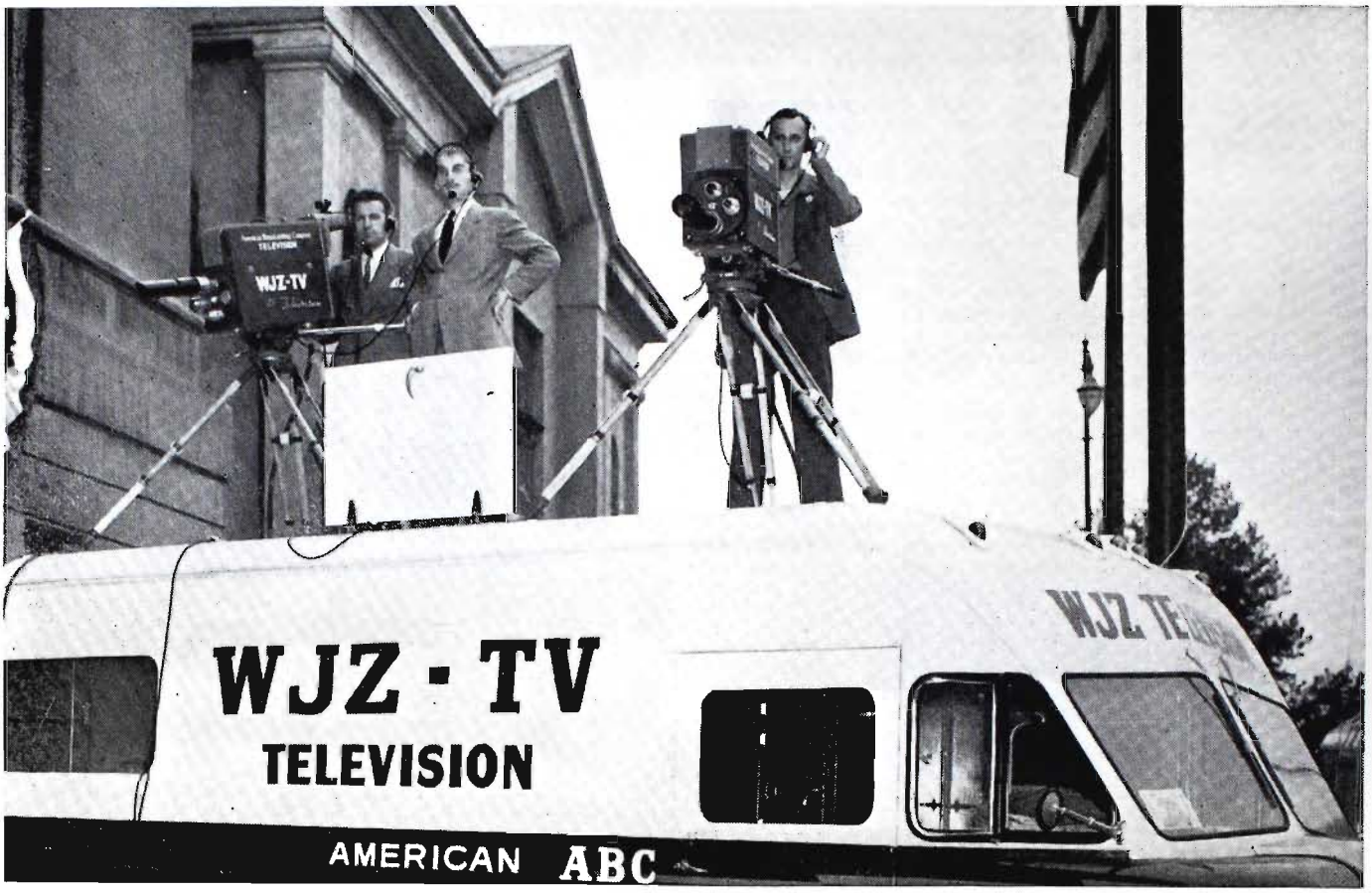
Accessories

Mobile Power Control Unit	MI-26293

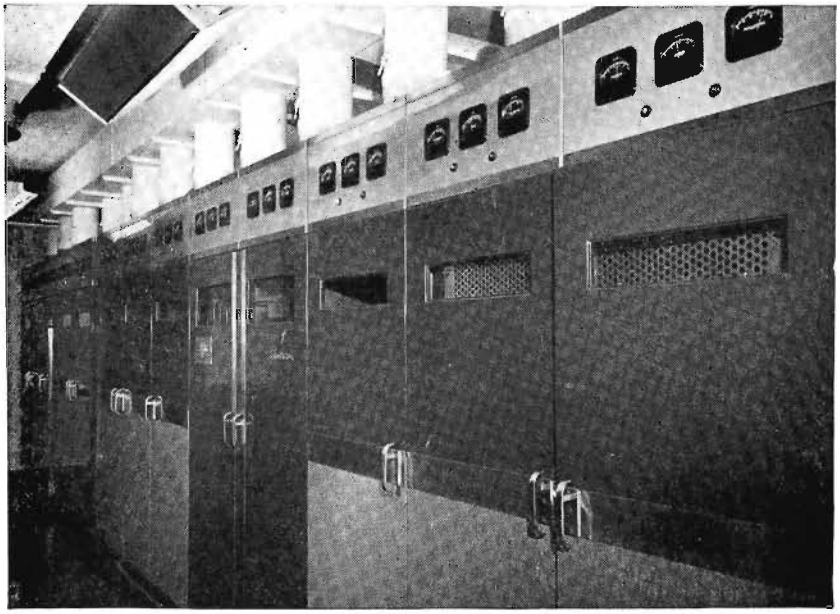


Interior layout plan of TJ-50A

RCA Equipment

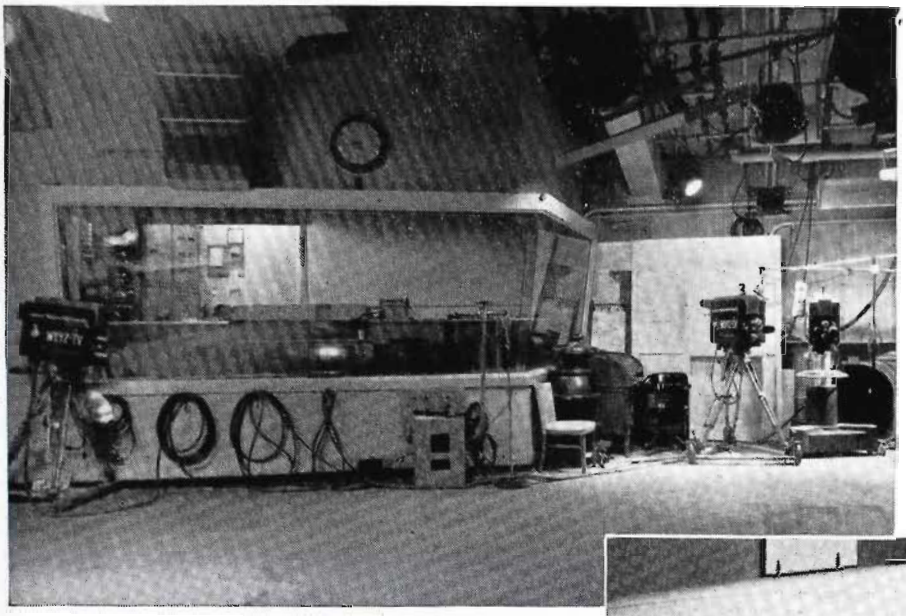


WJZ-TV. RCA field equipment in action atop a WJZ-TV field truck. WJZ-TV also uses RCA television camera controls, microwave relay equipment, sync generators, studio cameras, video and audio control-room console, complete film facilities, turntables, microphones, Superturnstile antenna, and the 5-kw transmitter Type TT-5A.



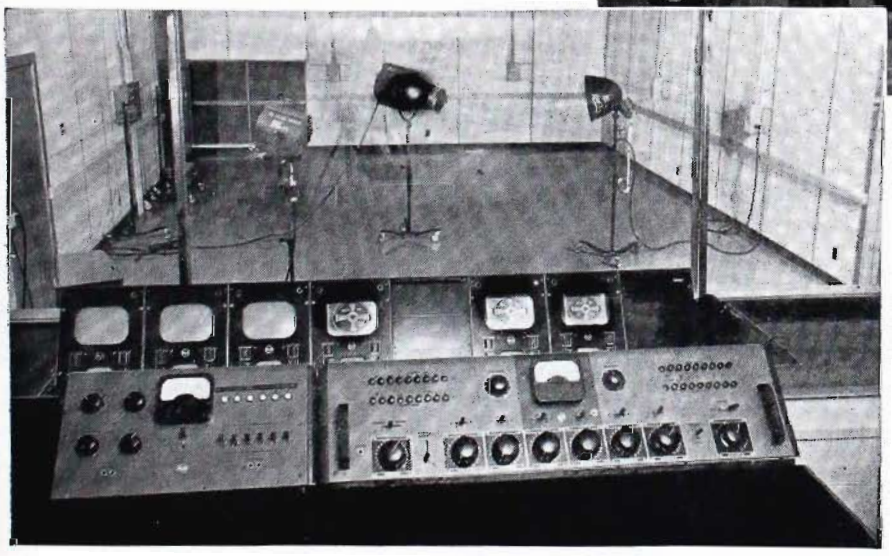
WENR-TV. The RCA 5-kw television transmitter Type TT-5A and RCA 10-kw FM transmitter Type BTF-10B at WENR-TV. This station also includes an RCA Superturnstile antenna, field truck and field camera equipment, studio cameras, video and audio control-room equipment, film projectors, film cameras, turntables, and microphones.

..The Choice of Television Stations



WXYZ-TV. One of the WXYZ-TV studios showing RCA studio cameras and the RCA-equipped control room. WXYZ-TV also uses RCA television field trucks, sync generator, microwave relay equipment, film projectors, slide projectors, film cameras, turntables, microphones, transmitter equipment—including the RCA TT-5A 5-kw transmitter and an RCA Superturnstile antenna.

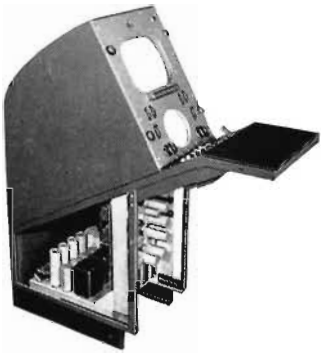
KECA-TV. KECA-TV's television field truck—like many other TV stations—is an RCA "studio on wheels." It is complete with RCA image orthicon cameras, camera tripods, camera control units, on-the-air master monitor, camera switching system, sync generator, microwave relay equipment, power supplies. KECA-TV also uses RCA studio cameras, film equipment, turntables, microphones, and an RCA Superturnstile antenna.



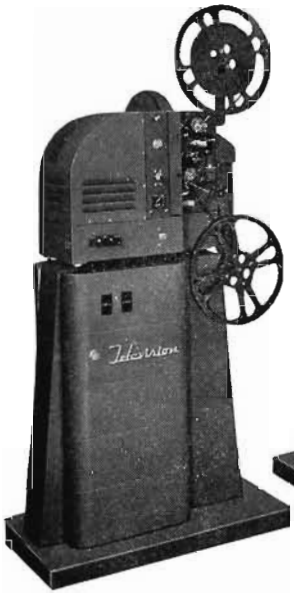
KGO-TV. Video control-room equipment at KGO-TV is completely RCA. KGO-TV also uses RCA field cameras, microwave relay equipment, field truck, sync generator, studio cameras, film projectors, slide projectors, film cameras, turntables, microphones and an RCA Superturnstile antenna.

RCA Television Camera and Studio Control Room Equipment

TK-10A Studio Camera



TS-10A Switching Section



TP-16A Television Projector

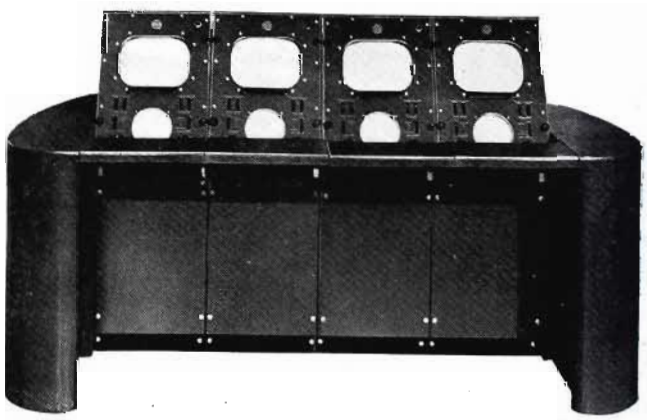
TK-20A Film Camera

RCA Television Studio Cameras and associated control equipments are designed for all television installations, large or small. It is economical for stations starting out in a small way, because a minimum number of equipment units will handle their early requirements. As these stations grow, and new sources of program material become available, additional equipment units can be added without discarding previously installed equipment. In this way the small broadcaster can expect to have eventually a station which duplicates in appearance and facilities those stations which start on a larger scale.

RCA add-a-unit designs are also economical for larger television stations; first, because they eliminate costly duplication of apparatus, and second, because their manufacture in relatively larger quantities makes it possible to offer better quality at lower prices.

For all television broadcasters who plan to provide studio and film telecasts, there are five basic types of equipment required. These are, namely: (1) Pickup equipment, i.e., studio cameras, film and slide projectors; (2) a switching system for the cameras (or for the studios); (3) sync generating equipment; (4) program monitoring equipment; and (5) camera dollies and pedestals, line amplifiers, power supplies, etc. These items can be obtained separately, so that in each case, the broadcaster can buy to suit his particular needs. All units have matching appearance and umber-gray finish. Moreover, they are electrically and mechanically designed to operate together. Additional units can be added at any time without fear of filling studios and control rooms with a number of dissimilar components.

A typical electrical arrangement of what we consider to be the basic camera equipment required for even the smallest station with studio control facilities is shown in the block diagram.

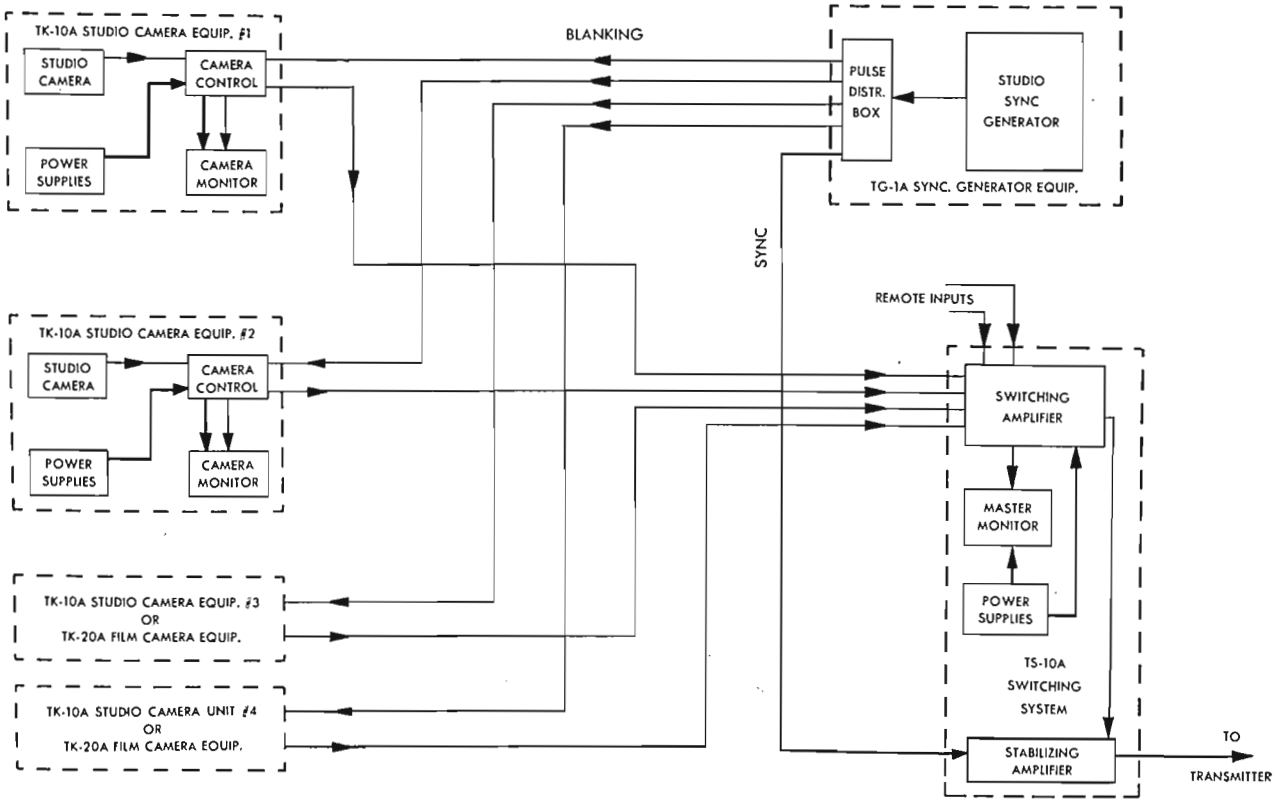


4-Section Video Console

Use is made of two Type TK-10A Studio Camera equipments, two TK-20A Film Camera equipments, a TG-1A Studio Sync Generator, and a TS-10A Switching System. The switching system can handle six input lines. As shown in the diagram, two of these six inputs are used for remote lines such as network or field pickups, and the other four are divided between two studio cameras and two film cameras. Sync is fed from the Sync Generator through a pulse distribution box to the TA-5B Stabilizing Amplifier which combines the sync with the camera video signals. Ordinarily, video signals fed to the remote inputs already contain sync which is supplied by the field equipment, or, in the case of the network input, is supplied at the station of origin. However, the Stabilizing Amplifier can also add sync automatically to remote input signals when necessary.

Program monitoring equipment required depends upon the number of studios employed by the broadcaster. For the smaller stations with perhaps one studio plus a projection room, the video console formed by the camera control units and one switching unit will in most cases be adequate for satisfactory supervision and direction of programming. This video console is made up by bolting side by side one camera control section from each camera equipment plus a switching section. The addition of trim end-sections then forms an attractive desk-type console. Any number of these units can be fastened together.

Stations employing several studios and facilities for network programs will require a program director's console. This console is styled similarly to the video console, but the viewing monitors are built inside the housing and viewed through an opening in the top of the console. Thus, light cannot strike the screens. The director's console is provided with three monitors, two for preview and one for the program line. A switching panel allows the director to fade, lap-dissolve and switch the video signals.



Block Diagram showing Schematic Arrangement of Studio Camera, Pickup, and Control Room Equipment

Studio Camera Equipment, Type TK-10A

Features

- Electronic Viewfinder included as standard equipment.
- Four lens positions provided on a rotatable turret.
- Optical focusing easily accomplished by a knob on the side of the camera.
- Studio Camera is supplied as single, complete, compact package.
- Hinged doors and covers permit easy access to camera circuits and controls.
- Four tally lights, two on the front of the camera, one on rear of camera and one beside the viewfinder kinescope, indicate to the cameraman and performers when the camera is on-the-air.
- A combination microphone and headset for each operator produces program sound in one earphone and order wire conversation in the microphone and other earphone.
- Two phone jacks on camera—one for cameraman, one for production man.
- Camera mounting designed for a standard tripod, a crane type dolly or studio pedestal.

Uses

The TK-10A Studio Camera Equipment is designed to pick up scenes produced in television studios, and provide composite video signals that can be fed to a television transmitter.

The camera uses an Image Orthicon pickup tube which requires much less light than former studio cameras. Under normal lighting conditions (75-150 foot-candles) an excellent picture is obtained.

Description

The TK-10A Studio Camera Equipment consists of the Camera itself, which can be mounted on a crane type dolly or studio pedestal, a Camera Control 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. Therefore, the studio camera control unit can be used in conjunction with other studio and film units. Any number of these console sections (one for each camera) can be bolted together to form a convenient desk-type console.

STUDIO CAMERA

The general arrangement of the controls and components of the Studio Camera resembles that of the RCA Field Camera. Like the field camera, the studio camera employs image orthicon deflection circuits, a picture preamplifier, and an electronic viewfinder which is mounted directly on the camera. The viewfinder, which enables the camera man to view the scene he is picking up, uses a 5 inch picture tube (RCA-5FP4A) which operates with an image brightness satisfactory for viewing scenes even in brightly lighted studios. Sufficient gain is available to insure a sharp viewfinder image, even when handling dark scenes. Camera circuits are arranged on either side of the tube and coil assembly. On one side, the video preamplifier tubes are mounted on a shelf with the circuit components easily accessible on a terminal board below the shelf. The deflection and high voltage pulse supply circuits are mounted in a similar manner on the other side of the camera. Hinged doors on either side of the camera swing down to provide easy access to the camera circuits.

Studio Camera mounted on TD-1A Pedestal Dolly

Four EKTAR type lenses are mounted on a lens turret which can be rotated by a handle at the rear of the camera. These lenses are relatively small due to the small size of the photocathode in the pickup tube. They are available in sizes from 35 mm f3.3 to 135 mm f3.8. Optical focusing is accomplished by adjustment of a knob on the side of the camera. This knob moves the pickup tube and its focus and deflection coil assembly with respect to the lens.

Controls for the studio camera circuits are located on the rear of the camera in two rows behind hinged covers. All these controls are normally preset and do not require adjustment during a program. Communication and tally light circuits are provided in the camera cable.

Studio Camera Control Unit consisting of TM-5A Monitor and Camera Control Chassis (MI-26055) mounted in console housing (MI-26266B)

STUDIO CAMERA CONTROL

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-5A camera monitor mounted in the upper part, and the control chassis mounted in the compartment below. The camera monitor has a 10-inch picture tube for displaying the picture, and a 5-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 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 3 separate outputs. It is a vertically mounted chassis with a bracket projecting from the top part of the chassis supporting the operating controls. Four commonly used controls project through the desk top surface. These are:

1. Orthicon Focus
2. Beam Current
3. Target
4. Image Focus

Three less frequently used controls are recessed under a small panel in the top surface.

The control unit complete with its controls can be removed easily from the console by removing the lower front panel and sliding the unit out. All electrical connections are made with plug-in connectors.

POWER SUPPLIES

Four power supplies are required for each camera chain. These are as follows:

1. Type WP-33B to supply B+ to master monitor.
2. Type WP-33B to supply B+ to camera and viewfinder.
3. Type 580-C to supply B+ to camera control and to current regulator.
4. Current regulator to supply constant current to camera focus coil.

These four power supplies are designed for mounting in a standard rack in the studio control room.

Specifications

Number of Lines	525
Odd Line Interlacing	2 to 1
Frame Rate	30 per sec.
Field Rate	60 per sec.
Picture Signal Level	1.5 volts, peak-to-peak max. (conforms to RMA standards)
Picture Polarity at Output	Black negative
Impedance of Coaxial Transmission Line	75 ohms
Maximum Length Camera Cable	1000 ft.
Total Included Angle of Lenses:	
(a) 35 mm f3.3 Ektar	50°
(b) 50 mm f1.9 Ektar (3 lenses furnished)	34°
(c) 90 mm f3.5 Ektar (3 lenses furnished)	20°
(d) 135 mm f4.5 (3 lenses furnished)	13°
(e) 8.5 in., f3.9 Ilex	8°
(f) 13 in., f3.5 Ilex	5°

Incident Illumination (min.)	25 foot-candles
Incident Illumination for Best Results	100 to 200 foot-candles
Power Source	117 volts, 60 cycles
Power Consumption:	
(a) Heater Supply Camera Control	375 watts
(b) Two WP-33B Power Supplies	800 watts
(c) One 580-C Power Supply	370 watts
(d) Current Regulator	15 watts
Total for One Camera Chain	1560 watts

MECHANICAL SPECIFICATIONS

Camera (including Viewfinder)	
Length	35"
Width	13"
Height	20"
Camera Control Console:	
Depth	36"
Width	13¼"
Height (overall)	41"
Weights:	
Camera (without lenses including Viewfinder)	105 lbs.
Camera Control Console Assembly (including Master Monitor)	140 lbs.
Camera Cable	0.4 lbs. per foot

Tube Complements

TK-10A Studio Camera—1 RCA Image Orthicon (Studio type), 1 RCA 6AG5, 3 RCA 6AK5, 1 RCA 6J6, 3 RCA 6SN7GT, 2 RCA 6SL7GT, 1 RCA 6BG6G, 1 RCA 6AS7G, 1 RCA 1B3GT/8016, 1 RCA 6V6GT, 1 RCA 6L7.

Studio View Finder—2 RCA 6AG7, 1 RCA 6J6, 1 RCA 6V6GT, 1 RCA 6H6, 2 RCA 6SN7GT, 1 RCA 6SL7GT, 1 RCA 6BG6G, 1 RCA 1B3GT/8016, 1 RCA 6AS7G, 1 RCA 5FP4A.

Studio Camera Control—6 RCA 6SN7GT, 1 RCA 6SH7, 2 RCA 6AG7, 2 RCA 6AL5, 1 RCA 6Y6G, 4 RCA 6AC7.

Tube Complement for Power Supply 580-C, WP-33A, and Current Regulator are listed elsewhere in this catalog.

Equipment Furnished

Stock Identification	MI-26900

(Equipment below plus miscellaneous cables, fittings and hardware is supplied)

1	Studio Camera	MI-26000-A
1	Camera Viewfinder	MI-26005
1	Camera Control Chassis	MI-26055
1	Master Monitor TM-5A	MI-26135-A
1	Regulated Power Supply	MI-21523-B2
2	Regulated Power Supplies	MI-26985-B
1	Current Regulator	MI-26090
1	Console Housing	MI-26266-B
1	Blower	MI-26579-A
1	Lens 50mm f1.9	MI-26550-1
1	Lens 90mm f3.9	MI-26550-2
1	Lens 35mm f3.8	MI-26550-3
1	Set of Tubes for MI-26900 consisting of (1) 5CP1A, (1) 5FP4A, (1) 186P4 and (1) Image Orthicon	

Accessories

8.5 in. f3.9 Lens	MI-26550-4
35mm f3.3 Lens	MI-26550-9
13 in. f3.5 Lens	MI-26550-10
17 in. f5.0 Lens	MI-26550-7
Camera Cable (length to be specified by customer)	MI-94-C
Video Coax Cable RG 11/u	MI-83
Video Coax Cable RG 59/u	MI-75
Power Cable 12-cond., Shielded	MI-80
Inter Communication Cable 8-cond., Shielded	MI-82
Pulse Distribution Box	MI-26757
Studio Camera Dolly	MI-26040
Studio Camera Pedestal	MI-26035
Camera Friction Head	MI-26205-A
Metal Tripod TD-11A	MI-26046

Studio Camera Pedestal, Type TD-1A

Features

- Pedestal moves smoothly and silently.
- Ruggedly constructed for durability.
- Mechanically balanced for ease of operation.
- Easily maneuvered in small areas.
- Attractively finished in wrinkle enamel and stainless steel.

Uses

The Studio Camera Pedestal, MI-26035 provides a convenient and useful mounting pedestal for the television camera. It is designed for use in the studio and in other indoor places where telecasts might be made. Mounted on the pedestal, the camera can be moved freely and quietly about the telecasting site. A crank handle on the pedestal raises or lowers the camera to any height between approximately 40 inches and five feet above the floor. Panning and tilting of the camera is provided by a Friction Head, which although shown in the photograph, is supplied separately, as MI-26205. The Friction Head, which can be used to mount either field or studio type RCA cameras to the pedestal, is described in detail on a separate sheet.

Description

The illustrations show the Studio Camera Pedestal with and without camera mounted. As previously mentioned, the wheel with the crank handle is used for raising and lowering the camera. Because of fine mechanical balance in the gear mechanism, very little effort is required either to raise or lower the camera.

Studio type camera mounted on the pedestal.

Fully extended, the overall height of pedestal is 54". Friction head for mounting camera is supplied separately as MI-26205.

The large wheel steers the three rubber-tired wheels on which the pedestal rides. In steering, these three wheels turn in any direction simultaneously because of a chain which links them together. The small pedal shown lowers a caster which effectively raises a wheel and makes the pedestal maneuverable about a point. The pedestal is finished in umber gray and is styled to match other RCA television equipment.

Specifications

Overall Dimensions (not including Friction Head):	
Height (Maximum)	54 inches
Height (Minimum)	32 inches
Width and Depth (maximum at base)	39 inches
Weight	450 lbs.
Stock Identification	MI-26035

Accessory

Friction Head	MI-26205-A

Studio Camera Dolly, Type TD-5A

View showing rear wheels turned at right angles. Friction head for mounting camera is supplied separately as MI-26205.

Features

- Rubber-tired wheels insure smooth, quiet movement.
- Provision for turning rear wheels 90°.
- 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 Studio 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 dolly is usually manned by two operators, one who maneuvers the dolly and the other who trains and focuses the camera.

Description

The Studio Camera Dolly is similar to the dolly 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 caster. The caster 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 inches
Length (Including Boom)	81 inches
Length (Chassis)	65 inches
Width (Chassis)	35 inches
Weight	745 lbs.
Stock Identification	MI-26010

Accessory

Friction Head	MI-26205-A

Everything for TV—

entire studios, for instance...

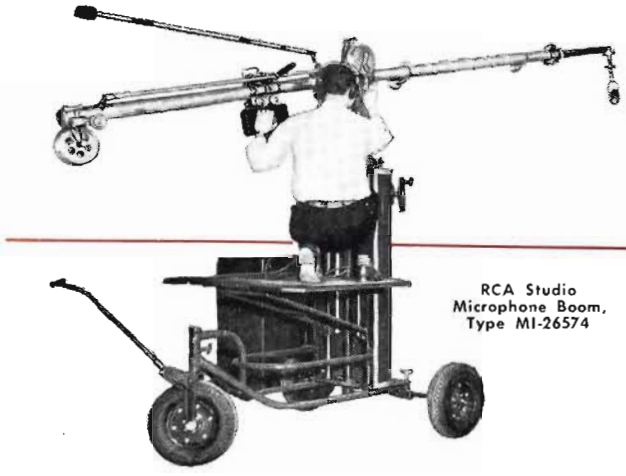
● Action in this TV studio is being covered by picture-and-sound pick-up units—all RCA. Just one combination, this, among dozens of different studio equipment arrangements now being delivered to more than 50 of the nation's leading television stations.

As workable and versatile, we believe, as the pick-up equipment in any motion-picture studio, this set-up has the electrical and mechanical facilities required to handle any show in the station—and with the same professional results. It includes two studio cameras using the new studio-type RCA image orthicon pick-up tube—with one camera mounted on a new crane-type dolly, and one camera mounted on a pedestal-type dolly. It includes a high-fidelity microphone, and a special-type microphone boom to follow the action swiftly.

Good reason why RCA studio equipment is tops with so many TV station men.

RCA TV studio equipment is integrated to work together like the mechanism in a watch. RCA TV studio equipment is uniquely versatile. It can be used in any combination by any station, large or small. It can be supplemented by additional units—without doing away with the initial equipment. RCA TV studio equipment produces sharper picture contrast with great depth of focus—and with less expensive lighting. RCA TV studio equipment is designed and built by a company well-known in the industry for its *continued* interest in the performance of the equipment—after it's in your station.

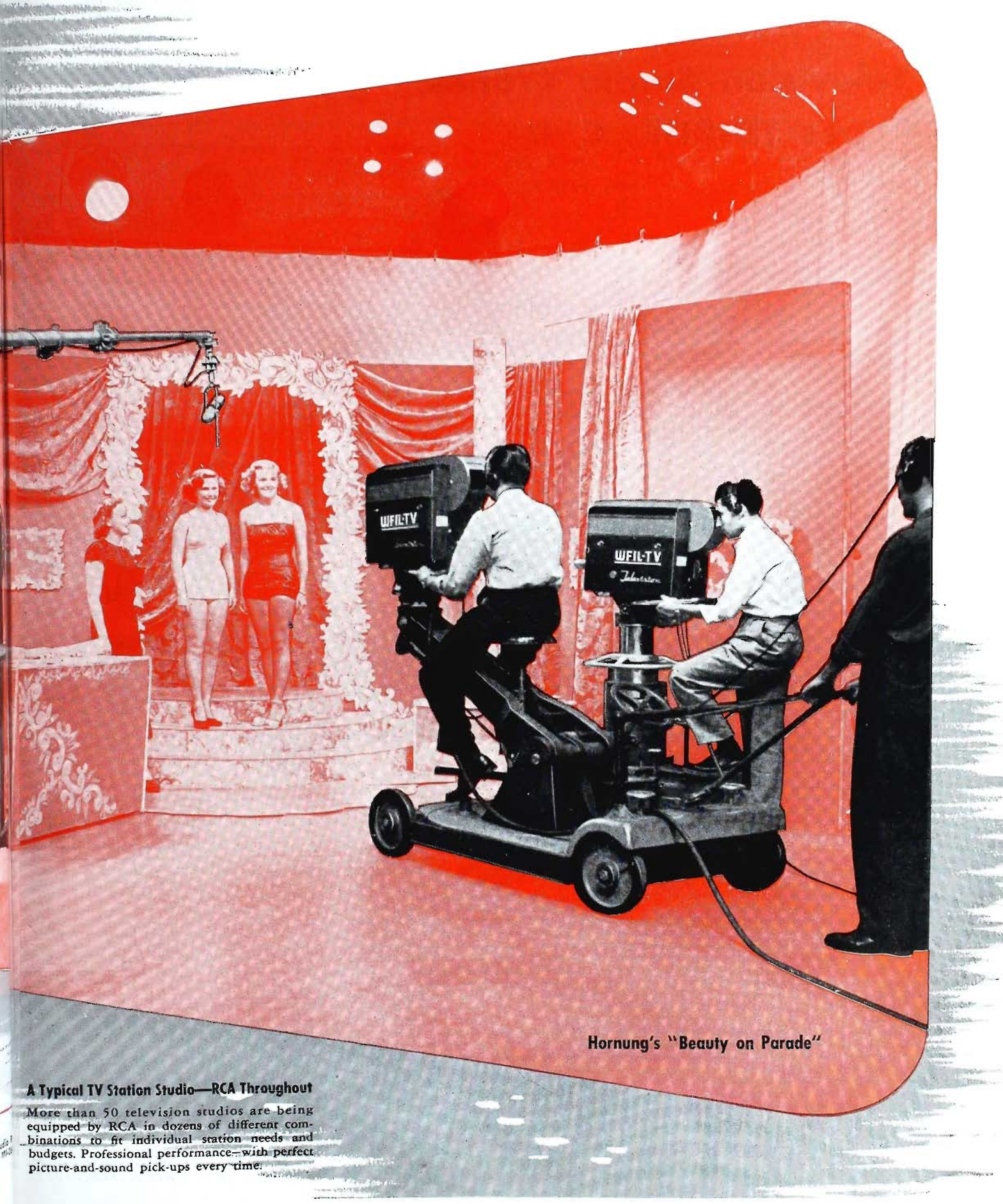
Why not let an RCA Television Specialist help you plan your TV station? Call him in. Or write Dept. 19KC, RCA Engineering Products, Camden, New Jersey. No charge. No obligation.



RCA Studio Microphone Boom, Type MI-26574

RCA Studio Dolly, Type MI-26040

RCA Studio Pe... Type MI-260...

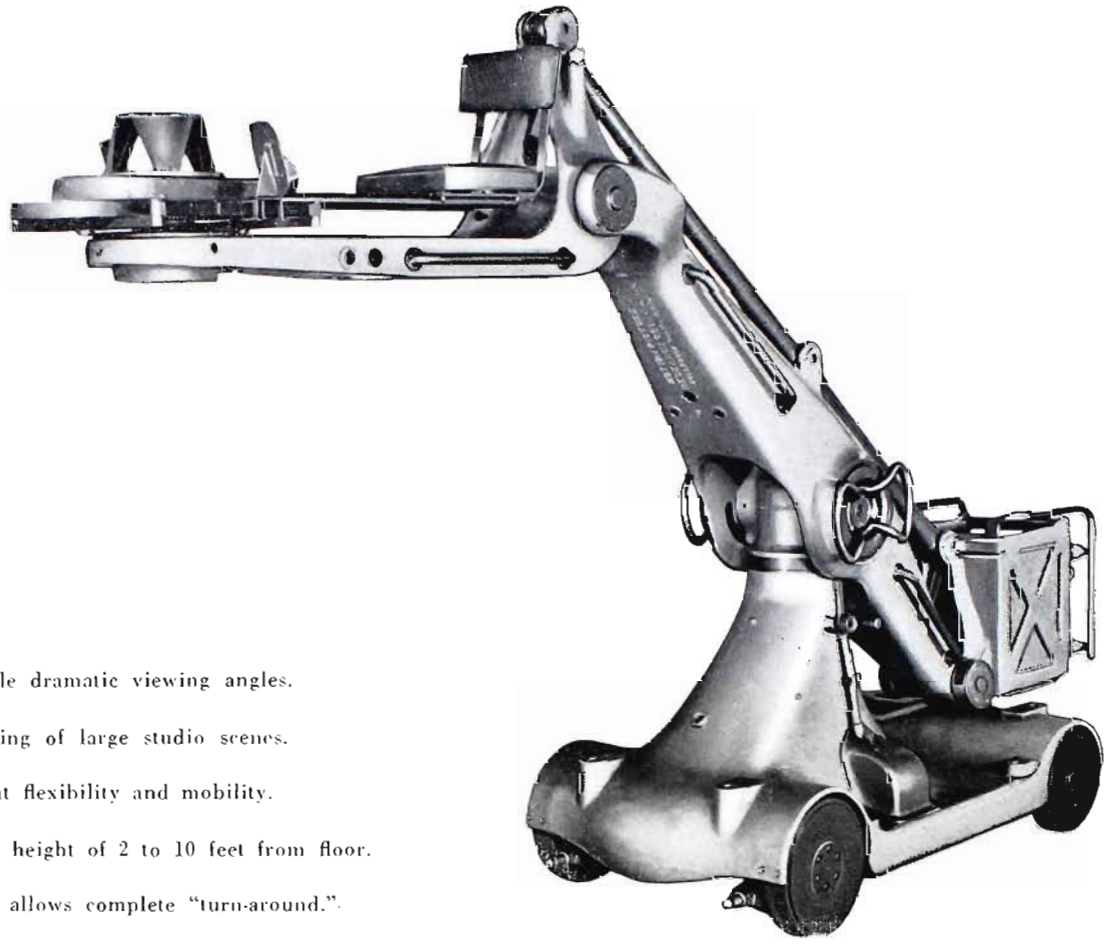


Hornung's "Beauty on Parade"

A Typical TV Station Studio—RCA Throughout

More than 50 television studios are being equipped by RCA in dozens of different combinations to fit individual station needs and budgets. Professional performance—with perfect picture-and-sound pick-ups every time.

Television Studio Cranes, Types TD-30B, C, D



Features

- Makes possible dramatic viewing angles.
- Smooth panning of large studio scenes.
- Provides great flexibility and mobility.
- Provides 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 are designed for use in large television studios and enable the operator to obtain dramatic viewing angles, smooth panning of large scenes, approaches and retreats that add life and interest to television programs.

Description

The Model TD-30B DeLuxe 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 1,200 pounds. The Models TD-30C and TD-30D Cranes differ from the Model TD-30B only in the accessories included. 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 dam-

age 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 operation. 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 and Model TCT Turret Table.

Shipping Weight (crated) ..... 3,250 lbs. approx.

Stock Identification MI-26037-1

TYPE TD-30C TELEVISION CRANE

Complete with Hydraulic Lift, Hand Brake and TCT Turret Table. (Power Drive, Remote Control Unit, Jack Assembly and Electrical Circuitry not included.)

Shipping Weight (crated) ..... 3,080 lbs. approx.

Stock Identification MI-26037-2

TYPE TD-30D TELEVISION CRANE

Basic Crane Unit complete with TCT Turret Table and Hand Brake. (Does not include accessories listed with other models.)

Shipping Weight (crated) ..... 3,000 lbs. approx.

Stock Identification MI-26037-3

Accessory

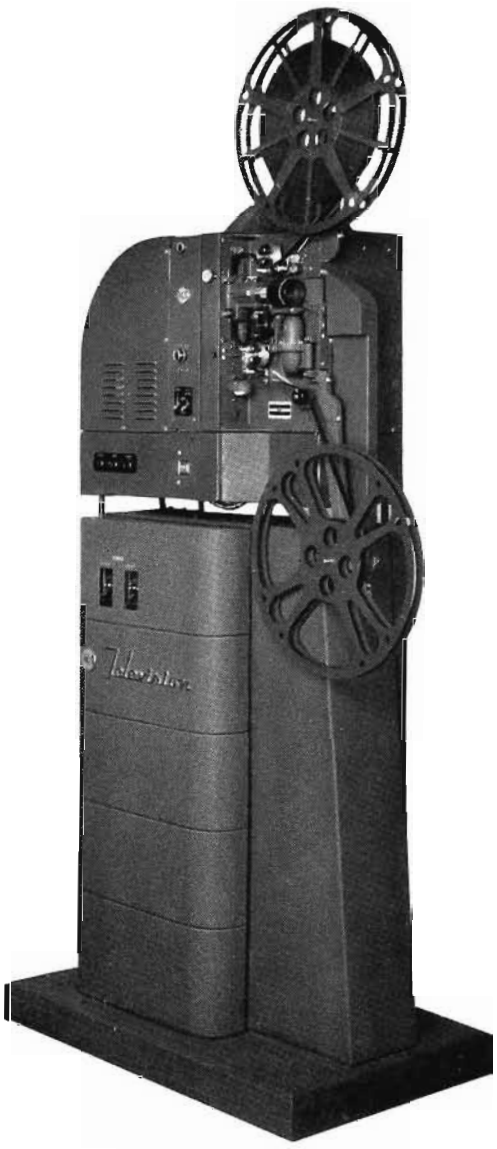
Friction Head MI-26205-A

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

Film Projector, Type TP-16B

Features

- Simple, straightforward film path provides for quick and easy threading.
- Removable film gate makes aperture cleaning easy.
- Constant light source provides utmost simplicity in design.
- Film lengths up to 2000 feet can be used without replacing reels.
- Coated lenses minimize reflections and improve contrast.
- Resolving power of lens is 60 lines per millimeter at any point in the field.
- Projector can be operated on a current supply of 50 cycles as well as 60 cycles.



Uses

The TP-16B Film Projector is used in television studios to provide regular program material using standard 16mm sound motion-picture film. To obtain the video signal, the projector is used in conjunction with the TK-20A Film Camera, and the two units are mounted in such a position that the TP-16B projects a picture directly onto the mosaic of the picture tube in the film camera.

The TK-20A Film Camera is similar to a studio camera except that it is not provided with any optical focusing system. Instead, the optical system of the projector is used to size and focus the picture which is projected on the pickup tube mosaic.

It is not necessary to have a separate camera for each projector. If the film projectors are arranged in pairs, a multiplexing arrangement may be employed to make one camera serve both projectors, and a slide projector in addition. Since projectors are ordinarily used in pairs (for showing alternate reels) this is a very practical arrangement.

Description

The TP-16B Projector is entirely self-contained and, with the exception of the film feed arrangement, is entirely enclosed. The projector housing is provided with an attractive umber-gray crackle finish matching that of other RCA television equipment. The projector proper is mounted on a heavy cast base frame. This frame in turn is mounted by means of leveling screws on a pedestal of matching design and finish. This pedestal greatly improves the appearance and provides a convenient place for mounting the controls and field-supply for the special three-phase motor which is a feature of the TP-16B.

The optical projection system consists of a 1000-watt air-blast-cooled incandescent lamp, a silver-coated pyrex glass reflector, a large two-element aspheric condenser lens, and a 3.5 inch, F.2 "coated" projection lens. This system provides plenty of illumination on the mosaic of the camera iconoscope and is, of course, much simpler than systems using switched or pulsed light sources.

The film feed arrangement of the TP-16B is identical to that of the standard projector with the exception that the pull-down claw works at a greater speed. Film is fed from the upper reel under a large sixteen-tooth feed sprocket and through the precision made film gate. Light, controlled by a rotating shutter, is projected through the film at this point. The film is pulled down through the gate, a single frame at a time, by the pull-down claw just below the gate.

Since television standards (and proper synchronization) require transmission of 60 fields (30 frame, interlaced) per second, and motion picture film is made for projection at 24 frames per second, some means must be provided for conversion from the one rate to the other. In the TP-16B this is done by "scanning" the first frame twice, the second frame three times, the third twice, the fourth three times, and so on.

The average rate, then is 2½ scannings per frame—which, multiplied by the 24 frames per second, provides 60 scanned fields per second.

If the "pull-down" could be accomplished during the vertical blanking interval—1/750th of a second, every 1/60th of a second—no further modifications of the standard projector would be necessary. Unfortunately this is not mechanically possible. Therefore, a further stratagem is employed. This consists in the use of short light flashes so timed that the film picture is projected on the pickup tube mosaic for only 1/1200th of a second, every 1/60th of a second. These flashes occur during the vertical retrace time and are provided by a rotary shutter which consists of an 18-inch metal disc with a slot cut in its periphery. This disc is driven at a speed of exactly 3600 rpm by a special 3-phase synchronous motor. This arrangement is possible because the mosaic of the pickup tube "stores" the picture during the interval between flashes of illumination.

Synchronization of the TP-16B Projector with the television system is assured by virtue of the fact that both the television synchronizing generator (which drives the beam in the camera pickup tube) and the motor which drives the projector shutter have a common source of power. To insure that the shutter will be in step at all times a large-size motor with a separately excited d-c field is used. The d-c field, being polarized, makes the motor always "lock" in proper phase relationship with the sync generator. The power supply for the motor field is mounted in the pedestal.

Sound System

A number of unusual features are incorporated in this sound unit. One is the use of radio-frequency voltage (28 kc) on the exciter lamp filament. This prevents hum and noise from being introduced by the lamp itself. Another feature is the fact that the exciter lamp mounting and sound carriage are die-cast in one piece, thereby insuring permanent accurate alignment. Still another is the use of the famous RCA-developed rotary stabilizer on the sound drive.

An audio preamplifier is built into the base of the projector. This amplifier, which is of conventional design, employs an RCA-1620 as a photo-cell amplifier, an RCA-6J7 as a voltage amplifier and RCA 6V6FT/G as an output tube. A tapped output transformer provides output impedances of 250 or 500 ohms. Output level is +4VU at 1000 cycles with less than 1% total r-m-s harmonic distortion.

The audio amplifier is assembled on a small chassis which can be easily removed from the base housing. Also mounted on this panel is the 28 kc oscillator which supplies voltage for the filament of the exciter lamp and a power supply using a 5Y3-GT/E which supplies plate voltage for the amplifier and oscillator.

A sound equalizer panel is available as an accessory for the projector sound channel and is identified as MI-26313. The unit is constructed to be mounted convenient to the audio control position so that the film sound may be easily adjusted for proper response. The compensation in frequency response is necessary because of the wide variation in recording of and printing of 16mm films. A single control is used in a tilt circuit with a straight through center position; with three high boost and three low boost positions of 2.5 db steps each.

Provision for Remote Control

Controls mounted on the projector include "Standby," "Emergency Run," "Start," "Stop" and "Remote." When the remote switch is operated, "Start" and "Stop" controls at a remote location may be used to control operation. These circuits operate through relays and a master contactor mounted on the pedestal.

Maintenance Features

Easy and quick maintenance is one of the features of the TP-16B projector. The field power supply, control circuits and all external connectors in the pedestal are easily reached by removing the pedestal side covers. The preamplifier and exciter filament supply unit are available when the cover plate, held by two thumbscrews, is removed. The projector lamp is reached through a hinged door. The film gate assembly is easily removed for cleaning. All parts of the film feed system are in the open where they may be constantly observed.

Specifications

Film Type	Standard 16mm
Film Capacity	400′ to 2000′
Film Speed	24 frames per second
Shutter Speed	60 frames per second
Projector Lens Line	48″ above floor
Audio Output Power	+4 VU at 1000 cycles
Output Impedance	250/500 ohms
Frequency Response	±2 db from 80 to 3000 cycles ±3 db from 80 to 4000 cycles
Hum and Noise Level	40 db below output level
Dimensions	Height 68″; Length 32″; Width 16¾″
Weight	Projector 90 lbs.; Pedestal 135 lbs.; Total 225 lbs.
Tubes Required	1 RCA-927, 1 RCA-1620, 1 RCA-6J7, 2 RCA-6V6GT/G, 3 RCA-5U4G, 1 RCA-5Y3GT/G, Projector Lamp T-12
Power Required	
209-220 volts, three-phase	250 watts
105-125 volts, single-phase	1200 watts
Stock Identification	MI-26930-A

Equipment Furnished

Projector Head	MI-26125-A
Pedestal	MI-26132
Projector Motor Field Power Supply	MI-26314

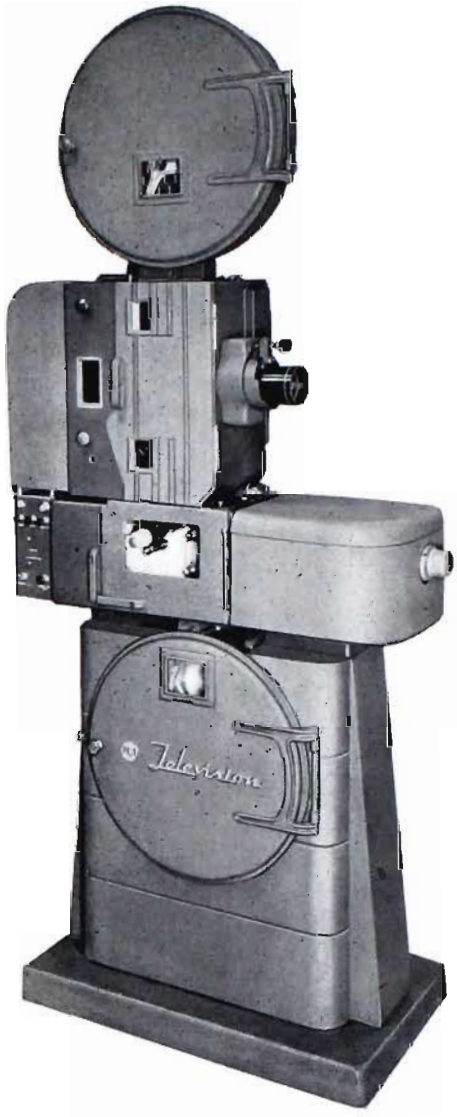
Accessories

16mm Film Projector Equalizer	MI-26313
Panel and Shelf (supports 2 MI-26313)	MI-26581
Rack Mounting Control Panel	MI-26321
TP-9A Multiplexer	MI-26318-A
TP-1A Slide Projector	MI-26130

Television Film Projector, Type TP-35B

Features

- Highly efficient pulsed light source, no shutter mechanism required.
- Quiet operation.
- Excellent picture definition.
- Completely enclosed unit—even to film magazines.
- Very little heat on film—stills of any frame of the film can be projected.
- RCA sound head used—response flat out to 6 kc.
- Light output of projector favorable for proper operation of film camera.



Use

The TP-35B 35mm Television Projector is designed for use in television stations as a means for utilizing standard 35mm sound motion picture films as program material. The TP-35B can be used as the single source of program material for the television station, or it may be alternated with "live" programs and network shows to add variety to the station's program schedule.

The TP-35B Projector is designed for use with the TK-20A Film Camera. In the simplest arrangement, the projector is mounted in such a position that it projects motion pictures directly on the pickup tube in the TK-20A Film Camera. The video signal produced by the camera is then fed to the studio control room. A single TK-20A Film Camera can serve two motion picture projectors and a slide projector by using a Multiplexer. This device employs a slide projector and two mirrors mounted at the required angle to direct the pictures from either projector onto the pickup tube of the film camera.

Description

The TP-35B Projector is entirely enclosed. The housing is finished in an attractive umber-gray crackle finish, matching that of other RCA equipment. Shatterproof glass windows permit viewing the operation of the mechanism without removing any door or cover.

Film is fed from the upper film magazine down through the film feed sprocket and through the film gate in the picture head. At this point, light produced by a pulsed-light lamp is projected through the film. The pulsed-light system eliminates the need for a shutter mechanism. It consists of an electrically operated gas-filled lamp which produces short pulses of light at the required rate of speed. The film then passes over the sound drum to the lower film magazine in the pedestal of the projector.

Also contained in the pedestal is a power supply which furnishes d-c voltage for the field of the driving motor, and a terminal board on which is mounted the relay for the pulsed-light lamp. Power for this lamp is furnished by a power supply which is mounted in the projection room control rack which contains the monitoring equipment and remote control panel. A control box on the rear of the projector contains the necessary switches for starting and stopping. For the use of two projectors, a changeover panel is provided. This panel, which is rack-mounted directly below the video monitor in the projection room, contains switches for starting and stopping either projector, and for changing over from one projector to the other. The changeover switches control relays which switch the optical systems (douse and undouse) as well as the sound circuits.

For the purpose of using standard motion picture film, which runs at an average speed of 24 frames per second, on a television system which has a basic rate of 30 frames per second, a new type intermittent has been designed. This intermittent is a 3-sided geneva movement driven at an average speed of 24 cycles per second. Pull down time is 120° (as compared to

90° on a standard theatre projector). Showing time is alternately 168° and 312° (as compared to 270° on a standard theatre projector). This arrangement permits a 5% 60-cycle light pulse to be phased so that three pulses occur during the 312° showing interval, and 2 pulses occur during the 168° showing interval. This results in 60 pictures or 30 television frames per second, while the average speed of the film remains at 24 frames per second.

The TP-35B designed for television by RCA, employs the most advanced features known to the field of film projection and its application to the production of television programs. One of the basic units of the equipment is the Brenkert BT90 Projector Head employing the special geneva movement and other features needed to meet the standards set up for the television system.

The sound head is the standard RCA high quality unit used in all Brenkert theatre projectors. For the TP-35B, it includes a special salient-pole synchronous motor. The projection lens combines the favorable features associated with high quality projection lenses, such as: flatness of field, freedom from color fringes, excellent contrast, and definition. Durable anti-reflection coatings increase light transmission and improve image contrast through elimination of internal reflections. The lens mount is hermetically sealed to prevent the entrance of dust or moisture.

Auxiliary equipment, not a part of the basic projector assembly, is normally housed in a standard cabinet rack located in the projection room. This rack-mounted equipment includes the pulsed light power supply, exciter lamp supply, remote control panels, and a 10-inch picture monitor. Controls are arranged so that either of two projectors can be started and stopped and change-over relays operated either at the projector or from the control room.

View of Projection Room Control Rack, MI-26927-A, which contains monitoring and control equipment

Most moving parts of the projector are automatically and continuously lubricated. A pump inside the housing delivers a continuous flow of oil from the reservoir at the base of the main frame to the rotary lubricator which throws the oil over the gears and to every bearing. An oil sight gauge provides an indication of the amount of oil in the reservoir.

Specifications

Film Type	Standard 35mm
Film Capacity	2000'
Film Speed	24 frames per second
Light Pulse	5% duration—60 times per second (synchronized with flyback time of camera pickup tube)
Projector Lens Line	48" above floor
Projection Distance	(6½" focal length lens)—37"
Audio Output Impedance	500 ohms balanced
Dimensions (overall):	
Height	6' 3"
Width	16½"
Depth	34"
Weight	400 lbs. (approx.)
Power Requirements (Projector):	
Projector Motor	200 watts, 208 volts, three phase
Projector Motor Field Supply	100 watts, 115 volts, single phase
Pulsed Light Supply	450 watts, 208 volts, three phase 200 watts, 115 volts, single phase
Exciter Lamp Supply	45 watts, 115 volts, single phase
Tube Complement (for Projector only):	3—RCA 5U4G 1—Exciter Lamp, 10 v., 5 a. 1—Type 868 Photo Cell (for Sound Head)
Stock Identification	MI-26925

Equipment Furnished

Projector Head	MI-26120
Projector Motor Field Supply	MI-26314
Projector Pedestal	MI-26304-A
Projector Control Box	MI-26210-A
Sound Head	MI-26300-A
Lamp House and Optical System	MI-26762
Upper Film Magazine	MI-26301
Lens	MI-26317
Set of Interconnecting Cables	MI-26731-A
Tubes and Spares (Sound Head)	MI-9625-B
One Complete Cabinet Rack of Equipment (Consisting of the followings items):	MI-26927-A
Exciter Lamp Supply	MI-9607
Tubes and Spares (Lamp Supply)	MI-9636
Receiver Monitor and Panel	MI-26323
Projector Control Panel	MI-26321
Pulsed Light Unit	MI-26303-A
Fuse Panel	MI-4395-B
BA-1A Preamplifier	MI-11218-A
Preamplifier Power Supply	MI-26320
BR-2A Panel (Preamp. and Power Supply)	MI-11598
Shelf (Preamplifier and Power Supply)	MI-11599
Set of Tubes (Preamplifier)	MI-11288
Tube (Preamplifier and Power Supply)	MI-11262

Film Camera Equipment, Type TK-20A

Features

- Either positive or negative film can be used.
- Tubes and parts are easily accessible.
- Operation is simple—few controls are used.
- Camera can be operated 50 feet from control console.
- Oscilloscope in monitor can be used for measuring pulses.
- 10-inch aluminized tube for picture monitoring provides very bright picture.
- Clamp circuit eliminates low-frequency microphonics from video signal.

Uses

The RCA Film Camera Equipment consists of a Film Camera, a Camera Control Unit, and associated power supplies and cables. This camera chain when properly set up with a motion picture film projector or a slide projector, and supplied with synchronizing signals, will produce standard video signals which can be fed to the television transmitter. By use of an RCA Multiplexer, which is a small, compact device having two mirrors mounted at the required angle, a single film camera can be arranged to serve two film projectors and a slide projector. The TK-20A can be used with either 16MM or 35MM projectors.

Description

The Film Camera Equipment is designed to meet the requirements of any size television station. Ordinarily, the film camera is permanently mounted to the floor in the projection room, although it also can be mounted on a wall track so that it can be moved easily to any one of several film projectors installed in the room.

The Camera Control Unit consists of a chassis type unit containing circuits for control of the signal generated in the film camera, and a Type TM-5A Camera Monitor for analysis of the video signal and observation of its picture quality. These two units are mounted in a desk-type console section which is located in the transmitter room or studio control room. This console section can be grouped with other console housings (with end sections for trim) to form a neat convenient operating desk. The monitor unit contains a 10-inch picture tube and a 5-inch oscilloscope. D-c voltages for the TK-20A camera equipment are supplied by two Type WP-33B heavy duty regulated power supplies. These power supplies are rack-mounted in the control room or transmitter room. The TK-20A equipment is finished in umber gray to match other RCA television equipment.

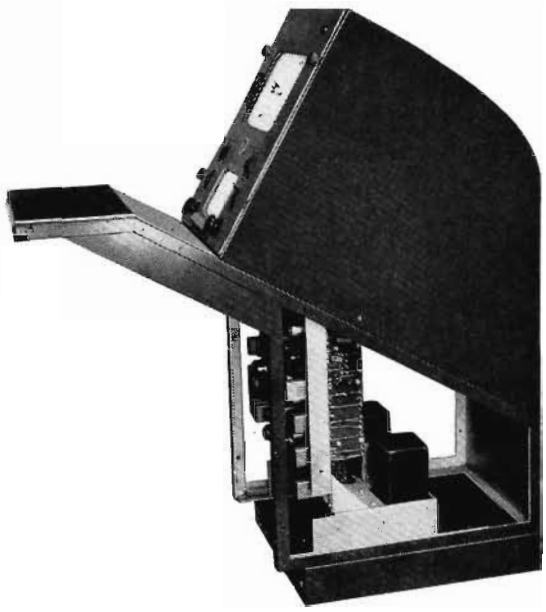
FILM CAMERA

In the illustration, the film camera is shown mounted on a pedestal, which provides for permanent mounting to the floor. If the camera is to be mounted on a wall track, the pedestal of course is not required. Contained in the film camera case are the RCA 1850A Iconoscope pickup tube, blanking and deflection amplifiers and a 6-stage video preamplifier. Since the picture from the projector is focused directly on the mosaic of the Iconoscope, no focusing lenses are required for the film camera.

CAMERA CONTROL

The Camera Control consists of the control unit proper and the Type TM-5A Camera Monitor. The control unit contains a picture signal amplifier fed by the preamplifier in the camera, pulse line amplifiers to feed driving signals from the studio sync generator to the camera, and several controls directly associated with the operation of circuits in the camera. All components of the control unit are mounted on a chassis installed in the console desk directly below the camera monitor, the controls projecting through a sloping panel on the top of the console.

Electrically, the Camera Monitor is identical to the TM-5A Master Monitor used with the field camera equipment. It contains a 10-inch aluminum-backed Kinescope for observation



Camera Control Unit showing interior arrangement. This unit is normally housed in the master control console.

of the composite video signal fed to the transmitter, and a 5-inch oscilloscope for viewing the signal waveform and for quickly and accurately measuring signal levels. A calibration circuit in the monitor permits quick reference to a fixed voltage level. Circuits in the camera monitor include separate low-capacity inputs, video amplifiers and scanning generators for both the Kinescope and oscilloscope tubes. Transformers within the TM-5A provide filament voltages for all tubes in the monitor. Plate voltages are supplied by one of the WP-33-B power supplies.

POWER SUPPLIES

The Type WP-33B Heavy Duty power supplies each furnish extremely well-regulated d-c voltages at loads from 200 to 600 milliamperes. Output voltages are adjustable between 260 and 295 volts. The components are assembled on recessed type chassis for mounting in standard cabinets or open racks.

Specifications

POWER REQUIREMENTS

Line Rating	105-125 volts, 60 cycle, single phase
Power	1000 watts
Current	10.1 amps.
Power Factor	0.94

INPUT SIGNALS

Horiz. Drive	4 volts, 15,750 cps, 10% pulse width
Vert. Drive	4 volts, 60 cps, 4% pulse width
CRO Drive (optional)	8 volts, mixed 30 cps and 7,875 cps
Mixed Sync (optional)	4 volts, RMA signal
Mixed Blanking	4 volts, RMA signal

OUTPUT SIGNALS

Picture Output	1.5 v. peak-to-peak (picture signal)
Remote Monitor Output	1.5 v. peak-to-peak (picture signal)
Frequency Response	Flat within 1 db to 6 megacycles
Input Impedance for Pulses	High

Tube Complement

FILM CAMERA	FILM CAMERA CONTROL
1 RCA 1850-A	3 RCA 6AC7
3 RCA 6SL7GT	2 RCA 6AL5
5 RCA 6SN7GT	8 RCA 6SN7-GT
1 RCA 6AC7	3 RCA 6AG7
1 RCA 6BG6G	1 RCA 6Y6-G
1 RCA 6Y6-G	2 RCA 6SH7
1 RCA 6V6-GT	
3 RCA 6AK5	
2 RCA 6AG5	
1 RCA 6J6	

(Tube complement for WP-33B Power Supply is listed on page B.4361)

Stock Identification ——— MI-26910

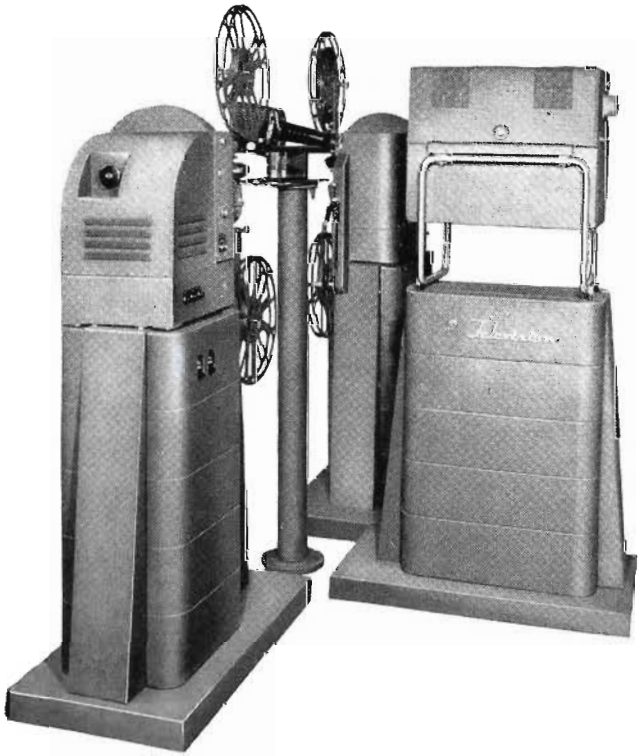
Equipment Supplied

(Equipment below plus Miscellaneous Cables, Fittings, Hardware, etc., is supplied)

1 Film Camera	MI-26020-A
Film Camera Pedestal	MI-26050
1 Camera Control Chassis	MI-26075
1 Master Monitor Chassis	MI-26135-A
2 Regulated Power Supplies	MI-26085-B
1 Console Housing	MI-26266-B
1 Set of Tubes for MI-26910 consisting of (1) 5CP1A, (1) 1816P4, (1) 1850-A	
1 Blower	MI-26579-A

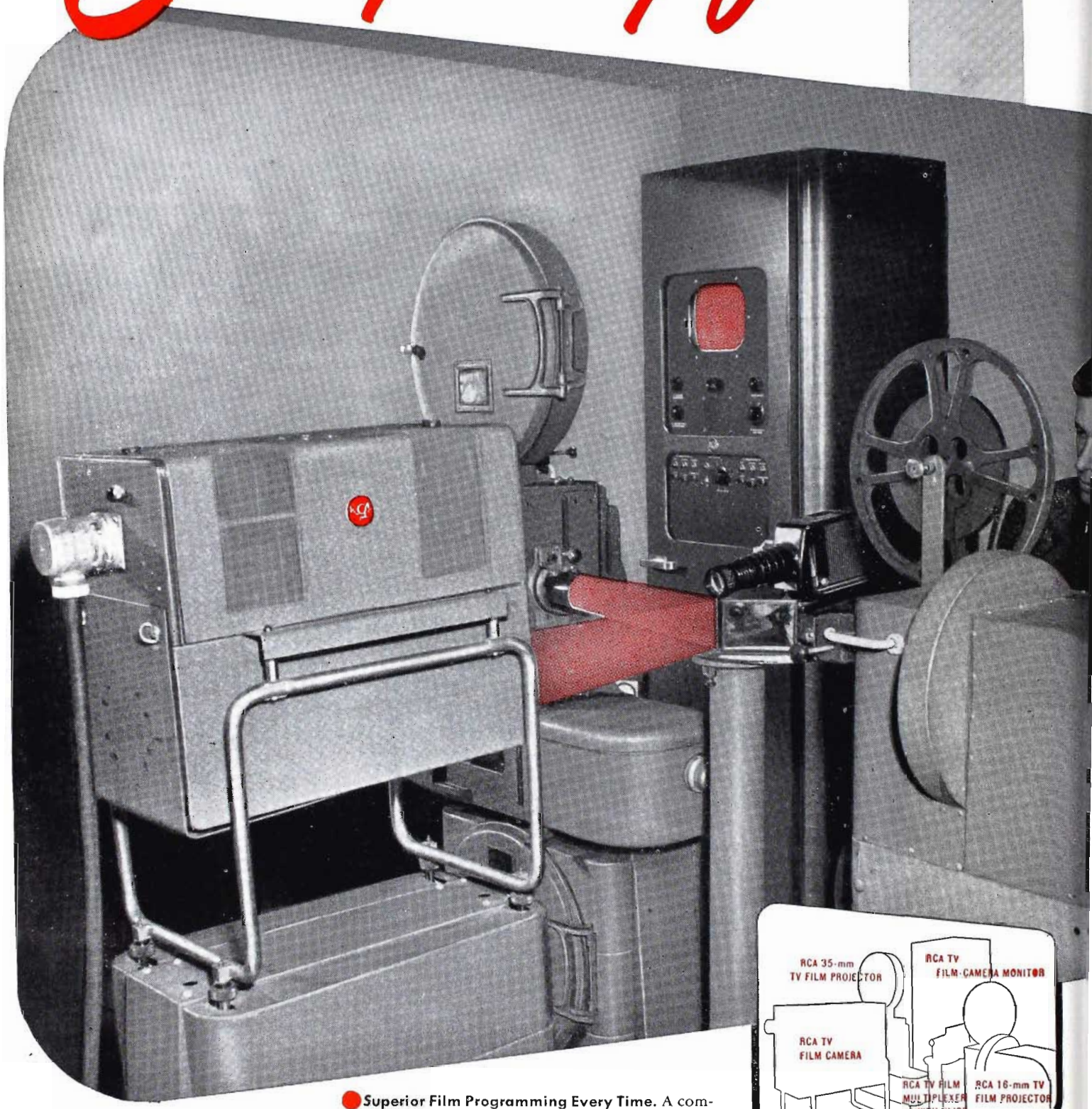
Accessories

Intercom Cable 8 Cond. Shielded	MI-82
Video Coax Cables RG 11/u	MI-83
Video Coax Cables RG 59/u	MI-75
Pulse Distribution Box	MI-26757



Typical arrangement of TK-20A Film Camera, TP-16A Film Projector and TP-9B Film Multiplexer

Everything for TV...



Superior Film Programming Every Time. A completely equipped TV film-projection room by RCA —one of nearly 10 different combinations now being delivered to more than 50 television stations throughout the country.

entire film-projection rooms,

for instance —

YOU are looking at a complete film projection room for a typical small television station—one of nearly ten different "all-RCA" combinations now being delivered to more than fifty stations throughout the country.

As reliable and practicable as the projection room of a modern theatre, this simple, integrated equipment is designed to handle film program material of every description—station identification slides, newsreels, commercial announcements, shorts, feature films, cue-ins for live-talent shows, etc. *And one operator can run it!*

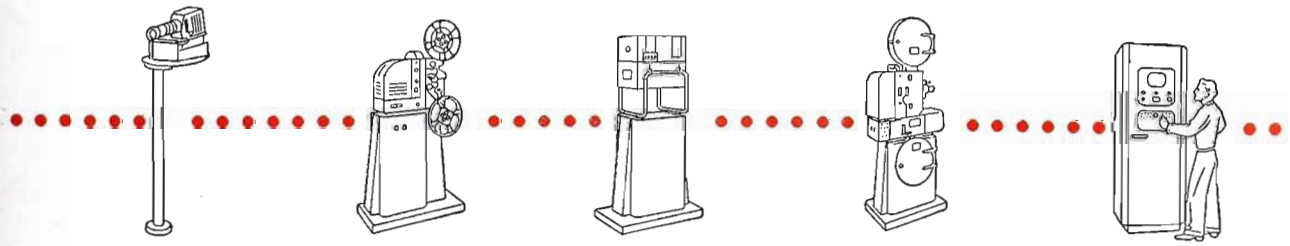
All-RCA from floor to ceiling, the installation includes everything needed to produce bright, flickerless, dependable television pictures: A TV film camera; A new 35-mm film projector; A 16-mm film projector; A multiplexer for using two projectors with *one* film camera; and rack-mounting power supplies, amplifiers, and monitor. Projector switching for the entire room is under finger-tip control from the room itself—or from the studio control room.

Why the extraordinary acceptance of RCA film projection equipment by more than 50 television stations?

Because all RCA projection units are unified and designed to work together in any combination . . . enabling each station to select just the proper units for its special needs and budget. Because RCA makes it practical for a station to start small and add projection units as it grows—without discarding any of the original equipment. Because RCA makes everything required in a television film-projection room—and accepts complete responsibility for the over-all performance of the equipment. Because each station layout is planned *correctly from the start,* by television experts who understand the business thoroughly.

• • •

No need for expensive experiments with your own film-projection room . . . if you let an RCA Television Specialist help you with the planning. Call him. Or write Dept. 19 JA, RCA Engineering Products, Camden, New Jersey.



RCA Multiplexer, Type TP-9B. Produces uninterruoted projection of multi-reel films with only **one** film camera. Complets, with slide projector for station breaks, commercials, etc.

RCA 16-mm Film Projector, Type 16B. Popular low-cost projector. Self-contained. Simple. Low cost. Enables **any** station to use the film programming now available. Produces brilliant pictures and high-quality sound.

RCA Film Camera, Type TK-20A. A high-contrast film camera having unusual stability. It is used with either 16-mm or 35-mm film projectors, and slide projectors.

RCA 35-mm Film Projector, Type TP-35B. Projects sharp, flickerless pictures —and high-fidelity sound. Brilliant light output with negligible heating of film and film gate. Can project single frames as stills.

RCA Film Camera Monitor Rack. This is the control center of the projection room. It houses the amplifiers, all necessary rack-mounted power supplies, and the kinescope for viewing the film pictures.

Film Multiplexer, Type TP-9B

Features

- Permits use of a single film camera for two film projectors.
- Accommodates slide projector MI-26130 available extra.
- Employs long life front-surface optical type mirrors.
- Aids program continuity.
- Introduces negligible optical distortion.
- Designed for use with 16mm and 35mm projectors.
- Employs no moving parts.

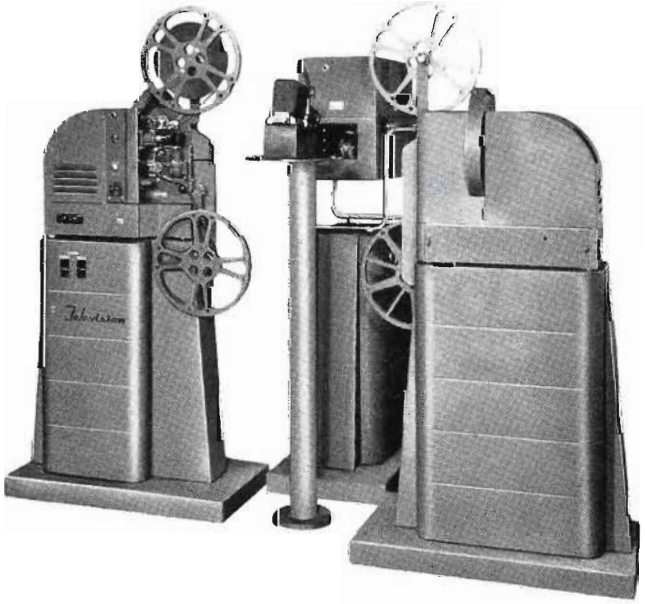
Uses

The Film Multiplexer is a device for use in the television projection room. It enables television station personnel to permanently arrange a single film camera and two film projectors so that either projector can be used with the film camera, without need for moving the units about the room.

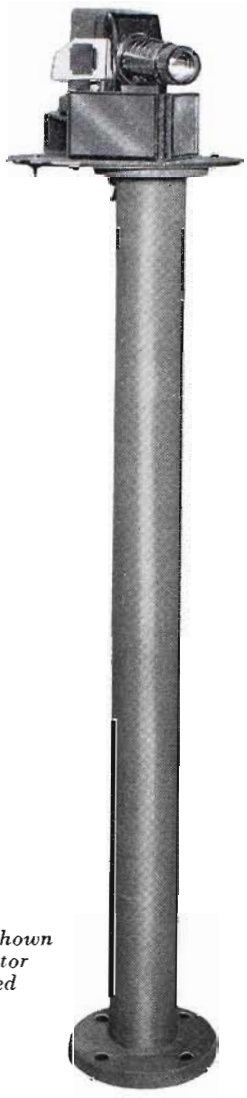
The Multiplexer employs two mirrors mounted at the required angle to reflect the image from either projector onto the pickup tube in the film camera. In addition, a small slide projector mounted just above the two mirrors provides a means for station identification. The image from the slide projector is focused directly on the tube in the film camera.

Description

The Film Multiplexer consists of a pedestal which is made up of pipe and suitable mounting flanges. Two front-surface mirrors are mounted and provision for incorporating a slide projector. The pedestal is fitted with a flange at the bottom for bolting to the floor. The recommended slide projector is an Eastman Type A-2 Kodaslide Projector with a 100-watt projection lamp. The Multiplexer (MI-26318) is finished in umber gray to match other RCA television equipment.



Typical projection installation showing Multiplexer with two Film Projectors and Film Camera



Film Multiplexer shown with Slide Projector MI-26130 mounted atop

Specifications

Power Requirement (for projector lamp)
110 volts a-c, 50/60 cycles

Dimensions (overall):

Height	54"
Width	13"
Weight	40 lbs.
Stock Identification	MI-26318

Accessory

Slide Projector (TP-1A)	MI-26130

Projector Changeover Panel, MI-26321

Features

- Mounts in standard 35mm equipment rack.
- Control panel provides start, stop and changeover of light and sound.
- Will control two projectors (16mm and 35mm in any combination).

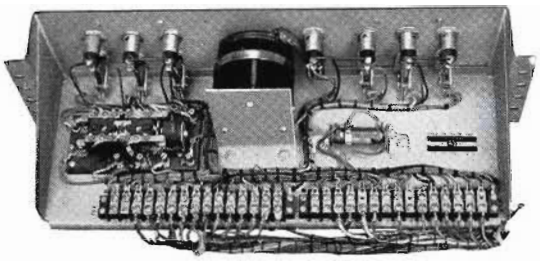
Uses

The Television Projector Changeover Panel is employed in TV projection rooms for the start, stop or simultaneous changeover of light and sound in 16mm and 35mm film programming.

Description

The projector panel is a standard 19″ rack equipment type and consists of two banks of switches, each having 3 momentary-contact push buttons (START, STOP and CHANGEOVER). Associated tally lights, slide projector on-off switch, slide projector fader control for controlling lamp brightness and tally light are also provided. All circuits and push-button contacts terminate in terminal strips mounted at the rear of the changeover panel.

Changeover push-button control provides for switching companion circuit relays associated with either 16mm or 35mm TV projectors. These circuits and relays are remote from the changeover panel and are located within the projectors and in TV equipment racks. The MI-26321 panel is provided as standard equipment with TV Projector Equipment Rack. Used in this manner or as a separately mounted panel, it provides extreme flexibility in the control and switching of two projectors (any combination of 16mm and/or 35mm) and one slide projector.



Rear view showing switches, relays and terminal strip.

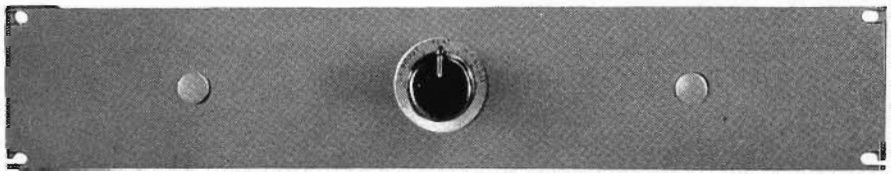
Specifications

Projector Panel Width	19″
Projector Panel Height	4⅞″
Stock Identification	MI-26321

Sound Equalizer and Panel

Features

- Panel and shelf accommodates up to 3 equalizers.
- Equalizer provides frequency compensation for 16mm sound.
- Panel flush mounts in standard relay rack and may be located in TV studio control room.



Uses

Equalizer, MI-26313, is used in conjunction with 16mm sound for providing proper frequency compensation. Panel and shelf, MI-26581, is used as a convenient mounting and may be rack panel mounted.

Description

Equalizer, MI-26313, consists of a compensator network which tilts frequencies about the 1000 cycle point in 2 dh steps (see curve below). There is an insertion loss of 7.2 db in the "flat" position. Three, 2-db steps on either side of the "flat" position are provided: one is for high-frequency boost, the other for low-frequency boost. Input and output impedances are 250 ohms. Panel and Shelf, MI-26581, as described above is available separately for mounting up to three equalizer units.

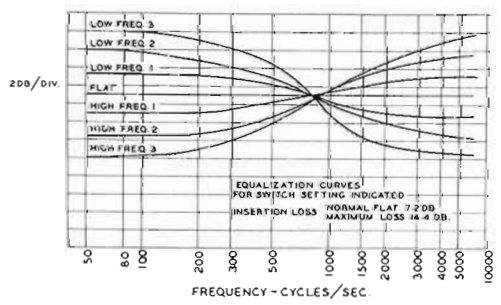
Rear view of Panel and Shelf with equalizer mounted

Specifications

For Equalizer	(See curve)
Equalizer Dimension	8 1/16″ long, 3⅜″ wide, 2 9/32″ high
Panel Width	19″
Panel Height	3½″
Stock Identification:	
Equalizer	MI-26313
Panel and Shelf	MI-26581

Accessories

Line Transformer	MI-4000-B
H-Pad	MI-4171-30



Kinephoto Equipment, Type TMP-20B

Features

- Provides permanent film record of television studio shows, field pickups, excerpts from special broadcasts.
- Utilizes standard 16mm motion picture film.
- Records positive or negative images.
- Accommodates 1200 feet of film.

Uses

RCA Kinephoto Equipment, Type TMP-20B when used with a suitable camera,* provides a method to record television images on motion picture film for subsequent use as television program material. Video signals fed to the TMP-20B appear on a kinescope, and in turn are recorded on film by the camera.

There are many uses for the TMP-20B: (1) Outdoor pickup or network programs can be recorded for later broadcasting. An example of this might be the broadcast, to a large evening audience, of political or sports events picked up and recorded in the afternoon; (2) the TMP-20B permits the recording of scenes which might be used in conjunction with studio scenes for plays, or for clients' advertising commercials; (3) the TMP-20B provides a means for syndication of television shows to other television stations; and (4) it allows program material to be checked and edited to suit the station, or perhaps the advertisers' needs.

Description

The TMP-20B Kinephoto Equipment consists basically of a projection type kinescope with its associated control panel, video amplifier, deflection circuits and power supplies. As illustrated, the kinescope and camera* are mounted on top a double cabinet rack which houses the rack-mounted sections.

The camera available for use with the TMP-20B is designed with a precision timing shutter which exposes exactly 525 picture lines per frame. The camera permits exposure of a complete television frame, after which the film is transported for exposure of the next film frame. The time for moving the film equals half of the television field, so that one field in every five provides the time for moving the film.

The built-in oscilloscope provides a monitoring waveform for maintaining the necessary adjustments on the kinescope circuits.

The TMP-20B has been designed to provide the best results in kinescope photography and the kinescope images have proper brightness and other qualities for optimum photographic results.

Specifications

(Exclusive of Camera)

Power Source ——— 110-120 volts, 60 cycles, 750 watts

Video Input ——— Standard RMA 2 volt peak to peak combined video synchronizing and blanking signal

Input Impedance ——— 72 ohms

Overall Dimensions:

Length ——— 50″
Width ——— 26″
Height ——— 56″

Weight (not including camera) ——— 500 lbs. (approx.)

* RCA 16mm Television Motion Picture Camera, Type TVK-75B.

TMP-20B Kinephoto Equipment with Type TVK-75B 16mm Motion Picture Camera

Tube Complement:

3 RCA OD3/VR-150	4 RCA 6AS7-G
5 RCA 1B3-GT	2 RCA 6BG6-G
2 RCA 5V4-G	1 RCA 6SL7-GT
4 RCA 5R4-GY	1 RCA 6V6
2 RCA 6AG5	3 RCA 6Y6-G
3 RCA 6AH6	16 RCA 12AU7
3 RCA 6AL5	1 RCA 3KP1
4 RCA 6AQ5	1 RCA 5WP11

Stock Identification ——— MI-15005-B

Equipment Supplied

(Includes Projection Kinescope, Video Amplifier, 30 kv Supply, Scope Power Supply, Deflection and Blanking Panel, Scope and Control Panel, Bias Supply, Blank Chassis, WP-33A Power Supply, Frames, Doors, Side Panels and Bases.)

Accessories

16mm Television Motion Picture Camera, TVK-75B (including two film magazines and lens) ——— MI-15006-B

Sound Recording Equipment ——— On application

Houston Developer ——— MI-26602

Automatic Film Developers, Types TVF-2A and 4A

Features

- Completely self contained.
- Easy to operate.
- Provides reversal processing of black and white 16mm films (Type TVF-2A).
- Provides for developing of negative or positive 16mm films of all types (Type TVF-4A).
- Combines with RCA Kinephoto equipment to facilitate TV programming possibilities.
- Three film magazines with 1200-foot capacity.

Uses

Houston automatic film developers are available for use by TV stations in providing film processing facilities. They are suitable for use in conjunction with RCA Kinephoto equipment in expanding 16mm TV programming. The Type TVF-2A is designed for the reversal processing of black and white 16mm films, and the Type TVF-4A for developing negative or positive films of all types.

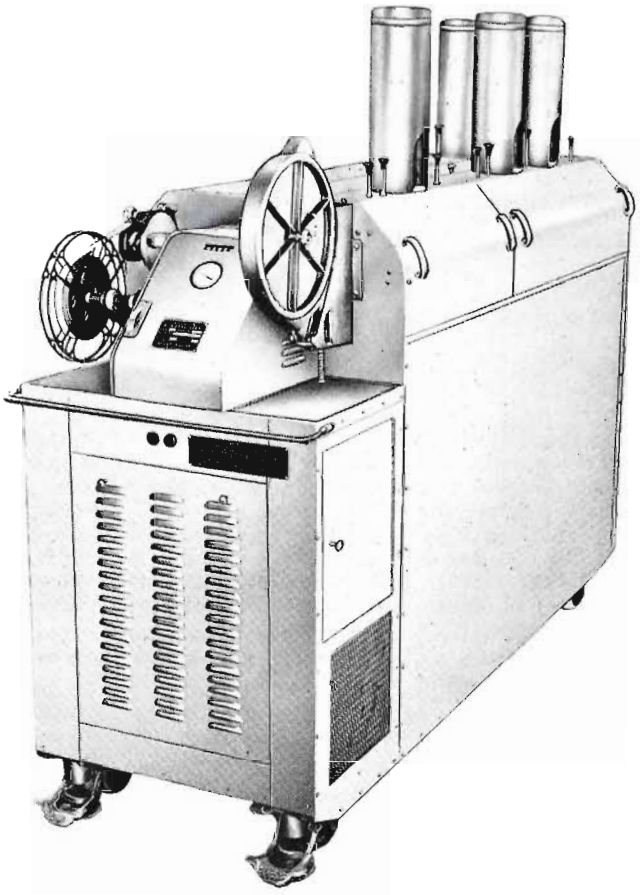
Description

Both units are semi-portable, in that they are mounted on casters for ease in moving to suitable locations and are equipped with locks to hold them stationary during operation of the equipment. The machines are constructed almost entirely of stainless steel with the exception of castings, motors, film rollers and other detail parts. The solution and wash tanks, drying cabinet, two solution circulating pumps, a refrigeration system, a solution heater, thermometer, footage counter, three electric motors, and advanced design film transport mechanism with variable speed transmission, comprise the basic parts. Heat lamps for heating and a filter for cleaning the circulating air for the dry-box are also provided. Three film magazines of 1200-foot capacity are provided for loading the exposed film in a dark room and to allow operation of the machine in white light. Air squeegee outlets are provided after the first rinse and before the dry-box to be fed from an air pressure line. Where no such source of air is available, a supplementary auxiliary silenced and filtered air blower for remote mounting is available as MI-26606.

TYPE TVF-2A FOR REVERSAL PROCESSING

Replenishers for the first and second developers, the bleach and the hypo are also furnished. The replenisher bottles are fitted with glass petcocks and the rate of replenishment is gauged by calibrations on the replenisher brackets. The fresh replenisher solution is added at the bottom of the tanks and solution level maintained in the various tanks by overflow drains at the top. This overflow is piped to a single drain line at the rear of the machine. Processing speeds for reversal film are dependent upon the manufacturer's specifications and type used. Speeds of 18 to 35 feet per minute are possible, dependent on the film type.

View of Auxiliary Photographic Air Unit, MI-26606



TYPE TVF-4A FOR NEGATIVE OR POSITIVE PROCESSING

The Houston Type TVF-4A, Negative or Positive, automatic film developer, is almost identical to the Type TVF-2A. It is designed for developing of positive or negative films. In size, it is the same. Replenishers in the Type TVF-4A are for both the developer solution and the hypo. Processing speeds for negative are 18 to 35 feet per minute, and for positive, 25 to 45 feet per minute, dependent on the film type.

Specifications

Power Supply (Type TVF-2A and 4A)	220 volts a-c, 60 cycle, single phase, 32.06 amperes, 7 k.v.a.
Water Requirements	7½ gal. per min.
Length Overall	76"
Width	26¼"
Height	66"
Net Weight	1400 lbs.
Crated Gross Weight	2200 lbs.
Total Shipping Space	112 cu. ft.
Equipment Furnished	(See description)
Type TVF-2A 16mm Automatic Film Developer (for reversal processing)	MI-26602
Type TVF-4A 16mm Automatic Film Developer (for negative or positive processing)	MI-26604
Type TVF-6A Air Unit for Film Developer	MI-26606

16mm Double-head Contact Printers, Type TVF-8A

Features

- Provides television stations with quick-printing method for 16mm picture and sound films.
- Continuous contact printer.
- Flexible in operation.
- Easy to use controlled by one operator.
- Speeds of 60 or 120 ft/min. provided.
- Adjustable printing heads and enclosed drive mechanism.

Uses

The Houston Continuous Contact Printer may be used by television stations to provide a quick method of printing 16mm sound and picture films. It is designed for continuous commercial use and four printing procedures are possible: (1) Composite Print—One roll of positive stock with picture negative threaded over one head and sound negative on the other; (2) Double Print—Two rolls of positive stock and one negative with apertures adjusted for picture or sound: (3) Single Print—Using either head independently, with other side of machine empty:; and (4) Double Print—Using both heads independently with two rolls of negatives.

Description

The double-head design, with selective apertures that may be individually adjusted, permits flexibility of operation. The printer is designed primarily for composite printing, although easily threaded for any of the four practical printing procedures mentioned above. For composite printing, the picture negative and the unexposed positive film pass through one gate and the sound negative and the positive through the second gate. This results in a synchronized positive print produced by a single operator. The printer operates in either direction, thus eliminating either extra handling, or rewinding of the film negative, additional prints being made simply by threading a new roll of positive stock.

The light intensities of two printing heads are independently adjustable and offer 22 logarithmically graduated exposure adjustments. These adjustments can be made while the film is running. The operator may set the light adjustment for the following scene while one scene is running. The light will remain at the proper exposure for the scene being printed and will not change until the scene change notch reaches the proper position. When this occurs, the light adjustment will change automatically to the value set for the new scene. Provision is made for a filter holder assembly for emulsion correction, if desired.

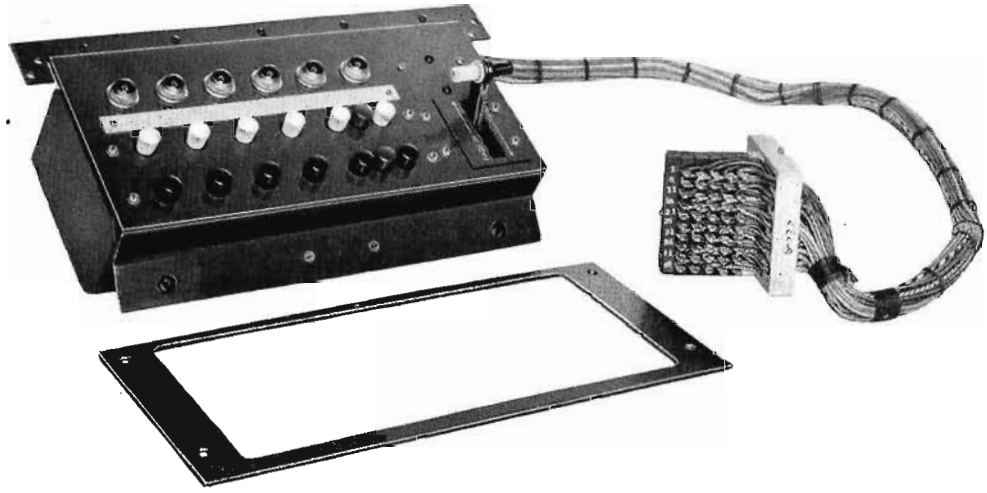
The printer is provided with selective speeds of either 60 or 120 feet per minute. The slower speed is usually employed for cut negatives and the faster speed for duplicate negatives.

The drive mechanism, lamp houses and electrical installation are enclosed in the upper cabinet and are easily accessible through a large rear door for inspection and maintenance. The reel clutches have been specially designed to provide a light hold-back tension on the film in the takeoff and a tight drive tension on the takeup. The change of tensions is automatic as the printer is reversed, and no manual adjustment is necessary.

Specifications

A-c Power Requirements	110 volt, 8 amps., 60 cycle, single phase
D-c Power Requirements	115 volt, 4 amps. (200 watt lamps)
Film	16mm, single or double perforated
Apertures	(3) picture, full, sound
Printing Heads	2
Printing Lamps	200 watt, 110 volt d-c
Lamp Rheostats	10 ohm, 50 watt
Printing Direction	Heads or tails
Reel Capacity	2000 ft.
Motor	⅓ H.P., 110 volt, 60 cycles, a-c capacitor start
Fuses	15 amp. a-c, 10 amp. d-c
Dimensions	Height 79⅜", Width 55¾", Depth 22"
Weight, Uncrated	635 lbs.
Weight, Crated	1025 lbs.
Stock Identification (Type TVF-8A 16mm Double-Head Contact Printer)	MI-26608

Program Control Panel, MI-26221



Features

- Designed for use in TS-20A Relay Switching System.
- 6 input channels.
- 2 output channels.
- Manual fading control.
- Tally lamps to indicate channels in use.
- Mounts in standard console section, MI-26266.

Uses

The push button circuits are arranged for use with the Relay Switching Units in the TS-20A system. Remote switching may then be accomplished between 6 inputs and 2 outputs. In addition, a fader lever assembly consisting of two levers which may be operated independently or locked together is provided. Potentiometers geared to these levers are the proper value for use with the TA-10A Mixing Amplifier. Thus, both instantaneous switching and manually controlled fading and lap-dissolving effects may be obtained by use of this panel and its associated equipment. Interlock contacts operated by the levers are provided for tally lamp control.

Description

The MI-26221 Program Control Panel is especially designed for mounting in an MI-26266 Console Section in which is also mounted a TM-5A Master Monitor. The panel hinges downward to permit removal of the Master Monitor. A cover is provided on the back of the Program Control panel for protection of the switch assemblies. The push buttons are arranged in two rows of six with one additional release button in each row. Above these are six tally lamps for use as active channel indicators. Lamps are removable from the front of the panel. Connections are made to a telephone type terminal block which may be located in the lower portion of the console.

Specifications

Lamp Voltage ..... 12 volts

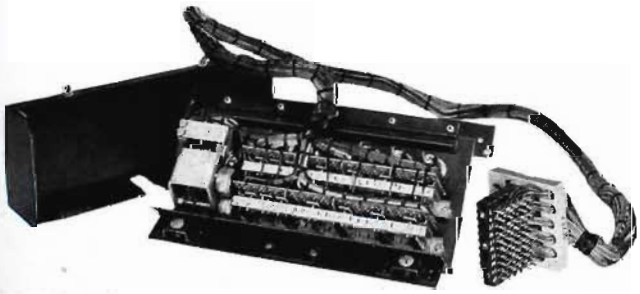
Circuit ..... Three make contacts for each push button, wired to terminals on telephone block.
One side of lamps common wired to terminal block.
Fader potentiometer and interlock contacts wired to terminal block.

Dimensions ..... 13″ wide, 5⅝″ high, 3½″ high

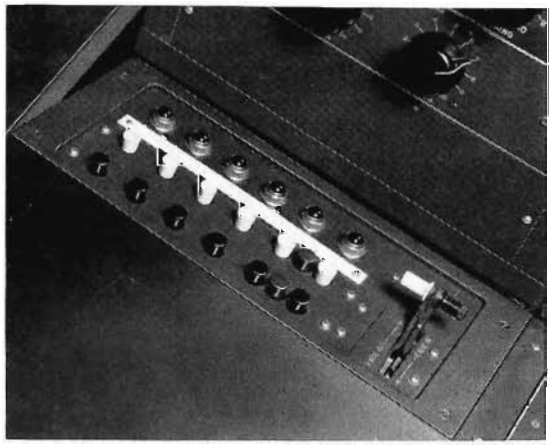
Length of Cable ..... 45″

Weight ..... Approximately 16 lbs.

Stock Identification MI-26221

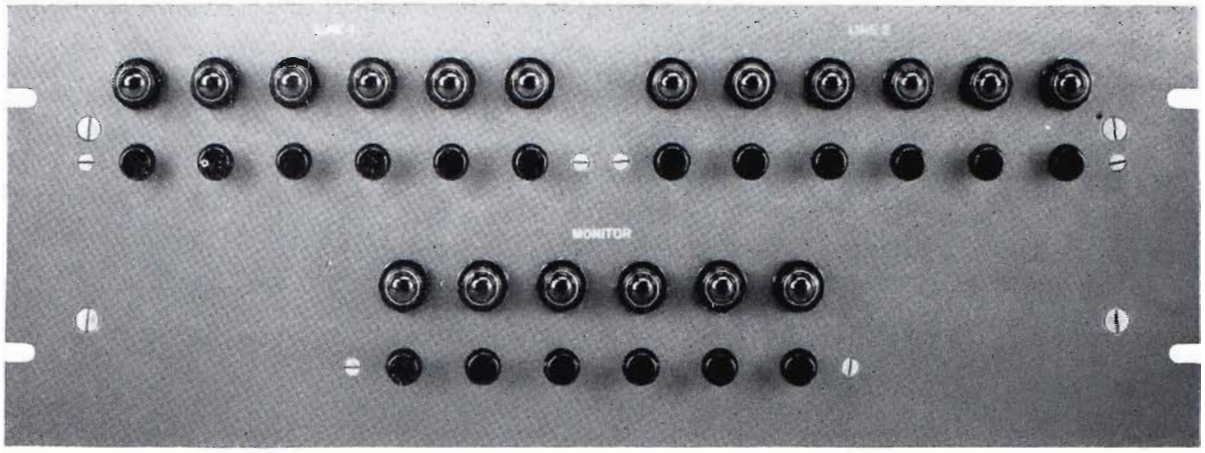


Rear view of MI-26221 Control Panel showing protective back cover, panel wiring, switches and terminal block.



The Program Control Panel may be mounted in Console Master Monitor Section. Adapter mounting panel is supplied.

Television Switching Panel, Type TS-1A



Features

- Accommodates six input lines—provides outputs for local monitor and 2 remote lines.
- Interlocked push button switches prevent accidental overlap.
- Indicator lights for each push button.
- Compensating networks in the input.
- Coaxial connectors, input and output.
- Standard rack-mounting assembly.

Use

The TS-1A Switching Panel provides an easy and convenient means for switching any one of six different input video signals to the television transmitter or to local and remote monitors. It is an inexpensive method which can be employed when the fading or lap-dissolving features of the more elaborate TS-10A Switching System are not required.

Description

As can be seen in the above photo, the Switching Panel employs three banks of six switches marked "Line 1," "Line 2," and "Monitor." Each bank handles six input signals and provides instant selection without disturbing the frequency characteristics of the incoming lines. The tally lights for the three banks are independent. Energized by the switches, they identify which input signals are being fed to the respective output lines.

The Switching Panel is designed to provide a constant matching termination to all the input lines, independent of the output load. Each incoming line passes through a 75 ohm constant resistance network, and is terminated in a 75-ohm resistor. The monitor push buttons switch a high impedance, low-capacity, line to the center point of any one of these networks. In this way, a local monitor connection with a capacity up to 200 mmf can be used. In cases where the monitor capacity is less, fixed padding condensors can be paralleled with the output to bring the total up to 200 mmf. This is done to prevent disturbing the response of the monitoring network.

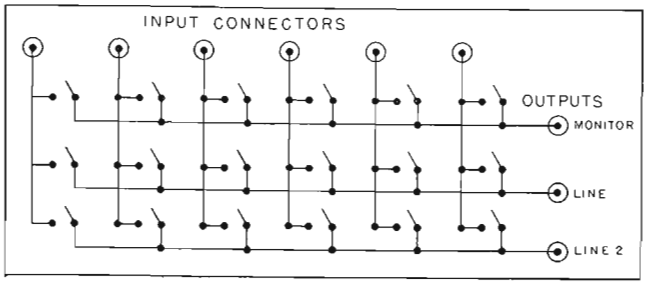
As can be seen in the circuit diagram, the "Line 1" and "Line 2" outputs are bridging the monitor line. Therefore, short, low-capacity output cables should be used. The usual method is to connect the output lines to a rack-mounted TA-1A Distribution Amplifier, which in turn feeds the transmitter and monitor lines.

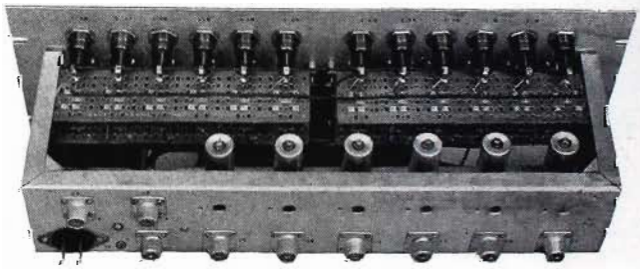
A rear view of the TS-1A Switching Panel is shown below. The six coaxial jacks grouped on the right side are the input for the six video lines. The three at the left are the output connectors. A transformer mounted on the chassis supplies the tally light voltage. A-c power for this is brought in on a standard connector on the lower left corner.

Specifications

Overall Dimensions:

Height	7″
Width	19″
Depth	8″
Input Circuits	6
Output Circuits	3
Impedances:	
Input	75 ohms (RG/59U or RG/11U)
Output	93 ohms (RG/62U)
Weight	13 lbs.
Power Requirements (for lamps)	117 volts, 50-60 cycles, 0.2 amps.
Finish	Umber gray enamel (to match other RCA Television units)
Stock Identification	MI-26237





Studio Camera Switching Equipment, Type TS-10A

Features

- System will accommodate six signal inputs.
- Manual fading control allows choice of any fading speed.
- Remote signals can be previewed before being switched on-the-air.
- Full complement of tally lights.
- Tally lights at on-the-air cameras are activated by the switching system.
- Local sync automatically added when remote sync fails.
- Private or conference communication can be maintained between all stations.
- Intercommunication can be operated with other equipment off.
- All personnel have access to program sound.
- Stabilizing amplifier automatically corrects picture-sync ratio for transmitter.

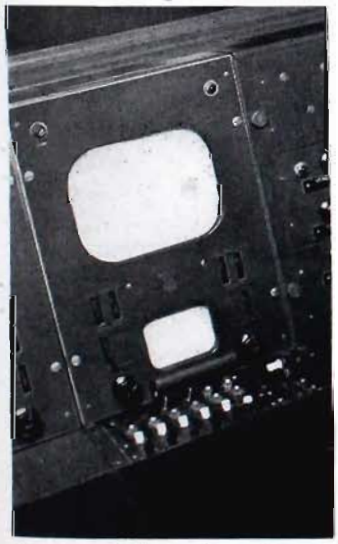
Uses

The TS-10A Studio Camera Switching System is designed for use by television stations obtaining video signals from more than one line. Briefly, the TS-10A will allow a single video operator to do these things: (1) Select any signal from six input lines; (2) switch the desired signal into the on-the-air line; (3) fade or dissolve two local signals simultaneously at any speed; (4) fade in or fade out any one signal; (5) switch instantaneously from one signal to another; and (6) superimpose two local signals with any desired degree of magnitude for each signal.

Intercommunication circuits in the TS-10A allow program personnel two-way conversation. In addition, volume-controlled program sound is supplied to all personnel through one earpiece of their headset.

Description

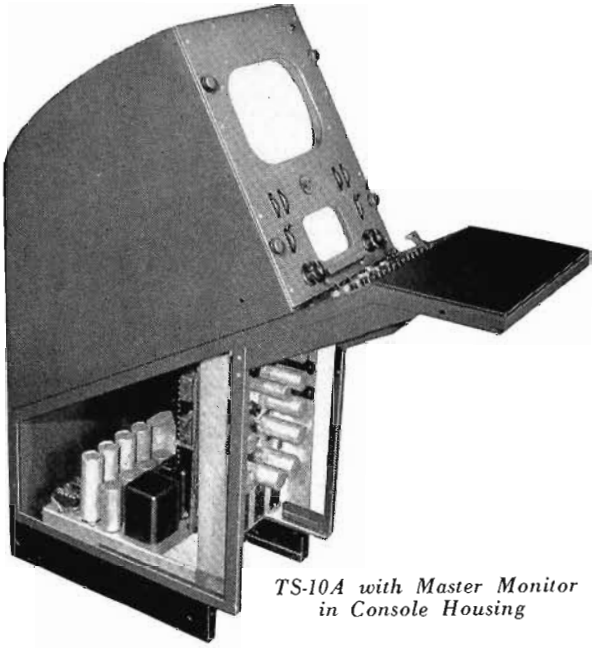
The TS-10A Studio Camera Switching Equipment consists of the switching amplifier chassis-type unit, a TM-5A Master Monitor, two WP-33B Power Supplies and a TA-5B Stabilizing Amplifier. The switching amplifier is mounted in the lower compartment of an RCA desk-type console section, and the TM-5A Master Monitor is mounted above it. The TA-5B Stabilizing Amplifier and WP-33B Power Supplies are also chassis-type units designed for mounting in a standard equipment rack. Equipment also included are intercom control box, 6 headsets, 1 blower kit.



Closeup of TS-10A Control Panel

The controls for the switching amplifier project through the inclined top panel of the desk. These controls consist of two banks of push buttons from which the on-the-air signal is selected, two toggle switches for controlling local and remote sync, gain controls for two remote input lines, a three-position switch for selecting either the on-the-air signal or one of the two remote signals for preview display on the monitor, fading and dissolving controls, and tally lights showing which inputs are being used.

The switching amplifier consists of 3 two-stage picture amplifiers and 2 two-stage sync relay interlock amplifiers. Two of the picture amplifiers have their inputs



TS-10A with Master Monitor in Console Housing

connected to separate banks of camera selector switches. They have common outputs, however, so that they can serve one camera singly or two cameras together in a lap-dissolve or superimposition. The third picture amplifier feeds the monitor input. The two sync amplifiers automatically add local sync to the video signal when remote sync fails or when local sync is otherwise required.

Specifications

Power Line Requirements
100-120 volts, 50/60 cycles, 1060 (max.) watts
(includes power required by the two WP-33A Power Supplies)

Input Signal:
Local Input
(video from camera control) ——— 1.5 v. peak-to-peak
Auxiliary Input (as remote) ——— 1.5 v. min. peak-to-peak video, 18-33% sync

Input Impedance:
Local Input ——— 75 ohms
Auxiliary Input
(as remote) ——— 75 ohms, variable line termination

Output Impedance ——— Approx. 2000 ohms

Load Impedance ——— 75 ohms

Mechanical Specifications (Console Section):
Dimensions (overall) ——— 41" High, 13" Wide, 6" Deep
Weight ——— 46 lbs.
Finish ——— Dark umber gray

Tube Complement:

4 RCA 6AG7	1 RCA 6SN7/GT
2 RCA 6AC7	1 RCA 6SL7/GT

Stock Identification ——— MI-26965

Equipment Supplied:
(Equipment below plus miscellaneous cables, fittings, hardware, etc., are supplied)

1 Studio Camera Switching Control Chassis	MI-26235
1 TA-5B Stabilizing Amplifier	MI-26160-A
1 Master Monitor Chassis	MI-26135-A
1 Console Housing	MI-26266-B
1 Blower	MI-26579-A
2 Regulated Power Supplies	MI-26085-B
6 Headsets	MI-26570-6
1 Set of Tubes Including (1) 5CP1A, (1) 1816P1	
1 Studio Intercom Control Box	MI-26568

Now...

This RCA Switching System consists of a master "on-the-air" monitor and oscilloscope, a waist-high control panel (enlarged view, above) and mixing amplifier, below. This equipment becomes one of the standard-size sections of RCA's unit-built video console (top of page). Any combination of camera-controls and monitors is possible to fit your particular station.

split-second selection

of all television program material

New RCA Camera Switching Unit provides convenient, push-button control at your video console

HERE, in one compact unit, is a control center for your television programs. Into it can be brought as many as six video inputs—from studio cameras, film cameras, relays, and network. *One* operator can handle the lot!

Twelve different types of switching are your assurance of a smooth, dramatic presentation, whatever the program. Look at the possibilities:

Your operator can *instantly* switch: (1) between two local camera signals; (2) between two remote signals; (3) from local to remote; (4) from remote to local; (5) from local to black screen (no signal); (6) from remote to black (screen); (7) from black to remote. With the special manual fader control he can, *at any desired speed:* (9) fade out local to black; (10) fade in local from black; (11) lap-dissolve between any two locals; (12) superimpose two locals and adjust the level of each. All sorts of trick effects are possible by moving the two levers that make up the fader control.

Tally lights provide an instant check on which input is being used and whether a remote signal is being received. If remote sync fails for any reason, local sync automatically takes over.

The monitor in the top of the console section allows the operator to either view the on-the-air signal or preview one of the two remote signals.

An unusually flexible intercom switching system (not shown) is included to permit private, special-group, or conference communication between practically all personnel. All have access to program sound through one earpiece of their headsets.

Here, we believe, is a switching system that represents the most advanced engineering in television station techniques. It will help you simplify television station routine—bring new possibilities to television programming. Be sure to get the complete story. Write Dept. 30-L, Radio Corporation of America, Engineering Products Department, Camden, N. J.

FADING CONTROL

MONITOR SWITCH
3-position: program line, either of two remotes

GAIN FOR REMOTE INPUT (#6)

REMOTE INPUTS

RELEASE BUTTONS

TALLY LIGHTS
and switches for remote sync

CAMERA SWITCHES
(2 rows) handle 4 inputs from studio and film cameras and 2 remotes to permit fading, instantaneous switching, special effects.

TALLY LIGHTS
for six inputs

GAIN FOR REMOTE INPUT (#5)

PROGRAM SOURCES

RCA Studio Camera (Switching Unit handles up to four)

RCA's Mobile Studio (Switching Unit can handle two remotes)

RCA Film Camera (Switching Unit handles two with 2 studio cameras)

Studio Remote Control Equipment, Type TC-65A

Features

- Provides remote control of various rack-mounted television units.
- Adapted to mounting in a desk section of control consoles, or in a standard rack.
- Provides central control position for units mounted in separate rooms.
- Often reduces cost in running video lines.
- Offers better efficiency in control room operations.

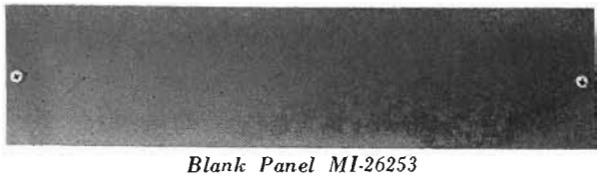
MI-26249

MI-26250

MI-26247

MI-26248

MI-26251



Blank Panel MI-26253

Remote Control Equipment
Mounted in Console Housing Section, MI-26266-B

Uses

The RCA Studio Remote Control Equipment, MI-26985 consists of five separate control panels, a console housing section which matches RCA video console housings, and a mounting adapter which permits the panels to be mounted in the console housing. Other adapters are also available which permit the panels to be individually rack-mounted.

The five different control panels, which can be obtained separately, provide for remote control of rack-mounted television units such as the monoscope camera, power relay panel, relay receiver, sync generator (phasing control), and stabilizing amplifier. Up to six such panels can be installed in the upper compartment of the housing. The power control panel will control up to five power supplies, and the sync generator panel will control the phasing of the two sync signals. If less than six control panels are used, blank panels can be obtained to fill empty space in the housing. The complement of control panels and blank panels mounted in the housing provides a very attractive desk section, and permits future expansion of remote control facilities.

Panel Adapter MI-26254

Description

The five different remote control panels, as well as the various adapters, and blank panels are described in the following paragraphs:

MONOSCOPE CAMERA (MI-26248)

The Monoscope Camera Remote Control Panel consists of two potentiometers wired to a terminal board in the rear. These potentiometers provide remote control of video gain and focus of the monoscope camera. Engraved panel markings permit instant check for proper setting of controls.

POWER CONTROL (MI-26251)

The Power Remote Control Panel consists of five on-off toggle switches, five tally lights, and five small card holders for switch identifications. The five switches can operate as many as five different power supplies, by operating 120-volt relays in the power supply lines. Relays for this purpose are mounted in a relay power control panel which is available as MI-26271.

RELAY RECEIVER (MI-26247)

The Relay Receiver Remote Control Panel consists of two potentiometers, an AFC on-off switch, a tally light and a telephone jack for checking incoming sound on a wire line. The two potentiometers control video gain and receiver tuning; the tally light indicates when the receiver is turned on.

SYNC GENERATOR PHASING (MI-26249)

The Sync Generator Phasing Remote Control Panel consists of two potentiometers, two tally lights and a phasing indicator on-off switch. This panel will provide for phasing one of two local sync generators with a remote sync generator. The tally lights indicate which local generator is in use.

STABILIZING AMPLIFIER (MI-26250)

The Stabilizing Amplifier Remote Control Panel consists of three potentiometers for controlling picture gain, the picture clipper and sync level in the circuits of a stabilizing amplifier.

BASIC PANEL (MI-26252)

The Basic Panel provides for mounting up to six remote control panels (or blank panels) in the upper compartment of the console housing. The basic panel is provided with four fasteners which hold it securely to the flanges of the housing.

PANEL ADAPTER (MI-26254)

The Panel Adapter when used with any one of the remote control panels adapts them to mounting in any standard rack.

Specifications

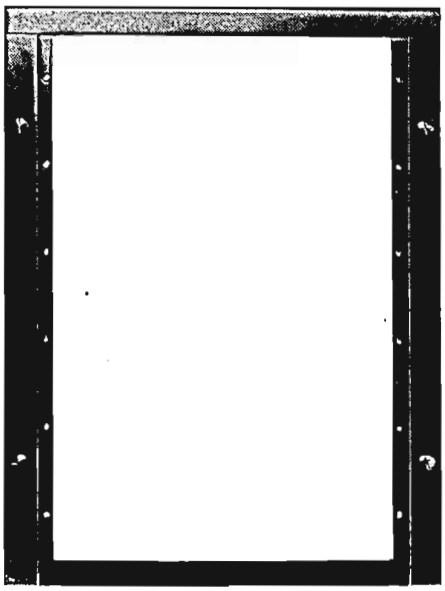
Power Requirements	120 volts, 60 cycles, 10 watts for tally lights and relays
Panel Dimensions	11″ length, 2⅝″ width
Rack Panel Adapter	19″ length, 3½″ width
Stock Identification	MI-26985

Equipment Supplied:

1 Monoscope Camera Control Panel	MI-26248
1 Power Control Panel	MI-26251
1 Relay Receiver Panel	MI-26247
1 Sync Generator Phasing Panel	MI-26249
1 Stabilizing Amplifier Panel	MI-26250
1 Basic Mounting Panel	MI-26252
1 Console Housing Section	MI-26266-B
1 Blank Panel	MI-26253

Accessories

Cabinet Rack Mounting Adapter	MI-26254
Television Cabinet Rack	MI-30951 series
Power Relay Panel	MI-26761



Basic Panel MI-26252

Remote Control Switching System, Type TS-20A

Features

- Employs relays for local and remote video switching.
- Can be used for studio or master control switching.
- Permits use of all programming techniques such as fading and lap-dissolving between local signals.
- Centralizes coaxial cable connections.
- Coaxial cable connections not required at operating positions.
- Provides circuits for tally light operation.
- Provides control circuits for sync interlocks.
- Design permits expansion of facilities without obsolescence of original equipment.

Use

The RCA Type TS-20A Remote Control Switching System is designed for use in television studio control and master control rooms. It consists of different types and quantities of equipment depending upon the size and type of switching operation desired. The equipment may be used for switching a minimum of six inputs to two outputs or a maximum of twelve inputs to six outputs (five outputs if tally light relay panel is used).

For the studio control room the system can be set up to provide complete facilities for program monitoring, production talk back and video switching between television studio cameras, film cameras, remote pick-ups or network programs. Controls can be provided for fading and lap-dissolving between local studio video signals. The system can provide for program previewing and other monitoring functions since up to five program monitors can be furnished.

For the master control room the system can be set up to provide complete video switching and monitoring facilities within the limits noted above.

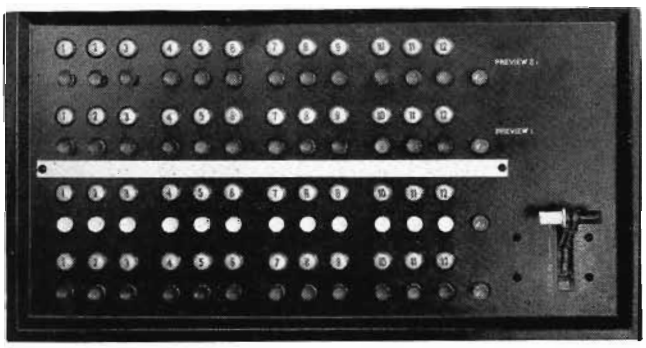
The push-button control panels designed for the system can be housed in consoles in convenient position for monitoring the video facilities. Actual switching is accomplished remotely by d-c relays which are housed in racks at any desired location in the control room. By installing a panel of jacks and video patch cords in adjacent rack equipment, switching of all sources of signals to this position and to the master control console, or directly to the transmitter, can be accomplished quickly and efficiently. Special high-speed transfer relays almost completely eliminate picture disturbance caused by switching.

The use of d-c relays in the TS-20A system adds to the overall flexibility of television stations layouts and simplifies the addition of studio facilities when expanded operating schedules require the use of more than one control room. The RCA Remote Control Switching System permits the broadcaster to eleminate the costly expense of installing intricate video lines to interconnect the television studios and control rooms.

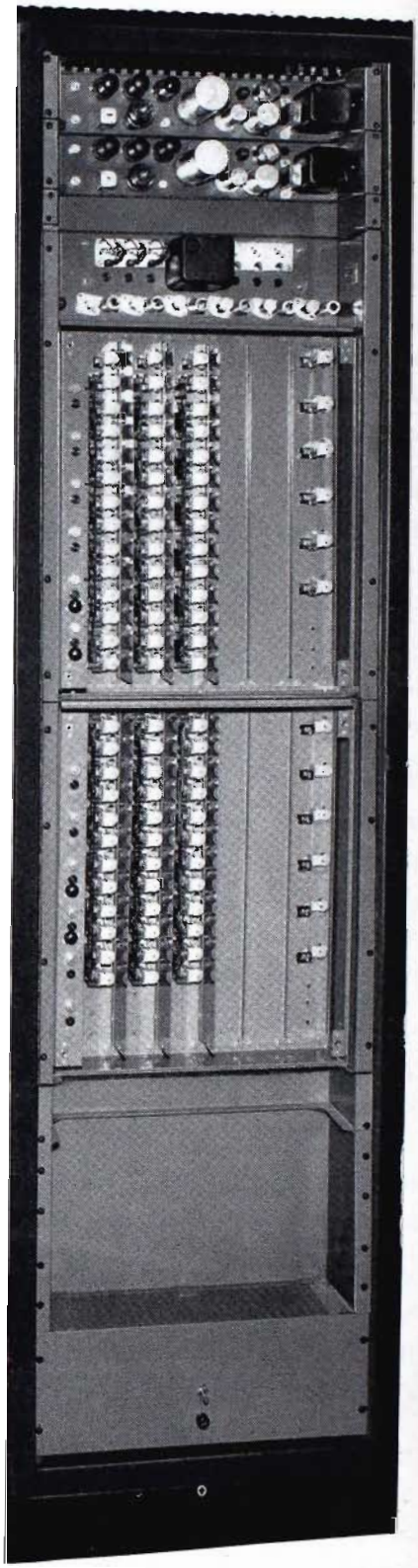
Description

The complete TS-20A Remote Control Switching System consists of several types of individual units which fall in the following categories. (For break-down see equipment listing under "Specifications".)

A. The video relay switching chassis and panels used to extend functions of basic units.
B. The push-button panels (for operating the video relays) which are available for several switching schemes and mounting arrangements.
C. The program or master monitors, for use in conjunction with push-button panels.
D. The various consoles for mounting the push-button panels and monitors.
E. Standard components.



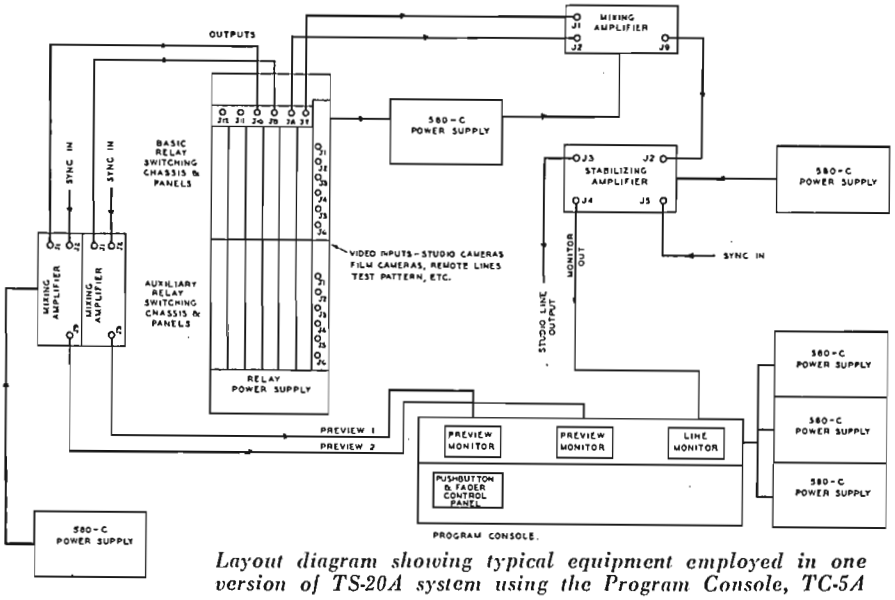
Push Button Panel MI-26220-1. This is one of five different panels available for mounting in the TC-5A Program Director's Console.



Standard rack containing relay chassis, amplifiers and power supplies.

RELAY SWITCHING

The basic relay switching chassis supplied with the TS-20A System provides for switching six video input channels to two output lines. All six inputs can be used for local signals. However, two channels may be used for remote signals since they are equipped with automatic circuits which remove the local sync addition. Following are the units included: (A) Basic Relay Chassis (MI-26231); (B) Two Basic Relay Panels (MI-26233). The number of outputs may be increased to a maximum of six (five if tally light relay panel is used) by the addition of Basic Relay Panels (MI-26233)—one panel for each output. The Basic Relay Chassis contains a cathode coupled output tube for each channel to isolate the source signal from any output line. The Auxiliary Relay Chassis (MI-26230) which is designed for installation directly below the Basic Relay Chassis, provides six additional inputs for two output channels. Here the number of outputs can be increased to six by mounting four Auxiliary Relay Panels (MI-26232) in the Auxiliary Chassis. The Tally Relay Panel (MI-26234) can be mounted in the Basic or in the Auxiliary Relay Chassis. This panel is designed for mounting where the sixth relay panel would be located. If Tally Relay Panels are used, the number of outputs is limited to a maximum of five.



Layout diagram showing typical equipment employed in one version of TS-20A system using the Program Console, TC-5A

PUSH-BUTTON PANELS

RCA has designed five different push-button video control panels to handle all or only a few of the switching and fading functions. Three of the units include switching and fading and two of the units include only switching. MI-26220-1 handles twelve inputs and four outputs with fader; MI-26220-2, twelve inputs and three outputs with fader; MI-26221, six inputs and two outputs with fader; and MI-26222, and MI-26223, each handle six inputs and two outputs only. MI-26220-1 and 2 were designed primarily for program director's console type TC-5A installation. The MI-26221, 26222 and 26223 switch panels have been designed for use in console sections for master switching. All the buttons are of the push type and a tally light is associated with each one. A release button is located in each row of channel buttons.

MONITORS

The TC-5A Program Director's Console with its Program Monitors (MI-26140) may form a part of the TS-20A system. The push-button switch panel (MI-26220-1 or 2) is mounted as a part of this console. The MI-26221 and MI-26222 switch panels are designed for mounting in a single console section (sloped portion) which is at right angles to the panel on which remote control panels are located (see data sheet on Studio Remote Control Equipment, MI-26985). The MI-26223 switch panel mounts in the upper section and space required is equal to that of two small remote control panels. With the MI-26221 and MI-26222 panels, a Master Monitor, TM-5A, may be mounted in the same console. With the MI-26223, other remote panels may be mounted in the same console and a master monitor in an adjacent console housing.

AMPLIFIERS AND POWER SUPPLIES

The amplifiers associated with the system include Types TA-1A Distribution Amplifiers, TA-5B or 5C Stabilizing Amplifiers and Type TA-10A Mixing Amplifiers. The number required, of course, depends on the size of the installation. The Distribution Amplifier makes possible multiple distribution of video signals, while the Stabilizing Amplifier, which in addition to inserting local sync, also corrects relative sync and picture levels. These units are described in RCA sales literature (Form 1J-1268 and Form 1J-2917, respectively). The Mixing Amplifier has two input channels and a common output channel. This is the unit which provides for lap-dissolving and fading of two input signals. Two levers mounted on the switching panel operate gain controls in the amplifier—one gain control for each channel. Thus, two signals fed into the amplifier can be superimposed with any relative degree of amplitude for each.

The TS-20A Switching System uses regulated power supplies and 24-volt supplies for the d-c relays. The equipment has been designed so that it is possible to employ the units in a great number of different combinations to meet the requirements of the individual stations. Station plans can be obtained from RCA upon request.

Specifications

Power Requirements:
- Relays — 24 volts d-c
- Amplifiers — 280 volts d-c
- Filaments — 115 volts a-c

Video Input Channels — 6 min., 12 max.
Video Output Channels — 2 min., 6 max.*
Input Impedance — 75 ohms**
Output Impedance — High***
Video Transfer Relay Adjustments for — Overlap switching, Gap switching

Dimensions:
- Basic Relay Chassis — 26¼" high, 19" wide, 9½" deep
- Auxiliary Relay Chassis — 21" high, 19" wide, 8¾" deep

Tube Complement:
- Basic Relay Chassis — 6 RCA 6J6 output tubes
- Tube Complement — (For complement tube listings refer to catalog pages on individual equipments)

Stock Identification — Schedule 26990

Equipment Supplied—The TS-20A System includes the following equipment which may be used in many different combinations determined by individual station requirements.

A. Relay Switching Units:

Basic Relay Chassis	MI-26231
Basic Relay Panel	MI-26233
Auxiliary Relay Chassis	MI-26230
Auxiliary Relay Panel	MI-26232
Tally Light Relay Panel	MI-26234

B. Push-Button Panels:

Program Control Panel (with fader)	MI-26221
Master Control Panel	MI-26222
Master Control Panel	MI-26223
Program Control Panel (part of 26975)	MI-26220-1 or 2

C. Monitors:

Master Monitor	MI-26135-A
Program Monitor (part of 26975)	MI-26140

D. Console Units:

Program Director's Console	MI-26975-1 thru 8
Console Housing	MI-26266
Blower for Master Monitor	MI-26579

E. Standard Components:

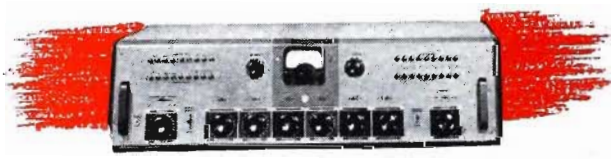
Relay Power Supply	MI-11309
Cabinet Rack	MI-30951-C84
Type 580C Power Supply	MI-21523-B1
WP-33A Power Supply	MI-26085-A
Stabilizing Amplifier, TA-5B	MI-26160-A
Regulated Power Supply, Type TY-25A	MI-26086
Distribution Amplifier	MI-26155
Mixing Amplifier TA-10A	MI-26281

* 5 max. when tally relay panel is used.
** Adjustable between 60-87 ohms.
*** For capacity coupled inputs.

Everything for TV...

RCA De Luxe Video Console. Everything you need to monitor, control, and switch camera pictures. "Add-a-unit" design enables you to expand these facilities as your station grows.

RCA Camera Control Type TK-10A. Makes it practical to watch and control the picture quality of station camera. Same size and appearance as RCA's switching units, film camera control, and preview- and line-monitoring units. These units can be grouped in any combination to form a video console (shown above).



RCA Studio Consolette Type 76-C4. This flexible and easy-to-operate control unit performs all the audio amplifying, monitoring, and control functions of a TV station—large or small. Can be used for single- or two-studio operation, and for two transcription turntables.

THAT PICTURE you see over there is a studio control room for a medium-size television station—complete by RCA, from sight to sound.

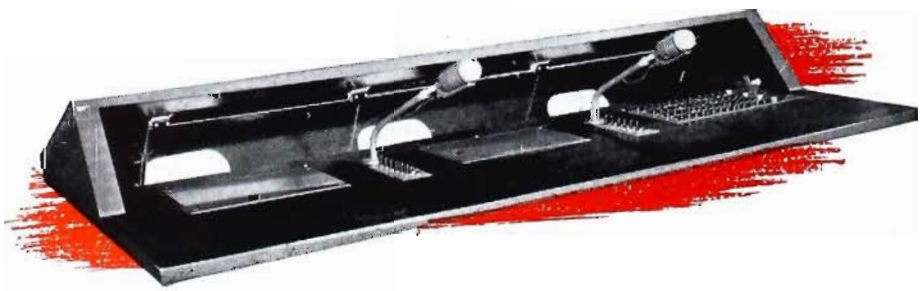
This room virtually puts entire programming under "push-button" supervision. From here you control and monitor studio programs . . . sound and picture . . . switch between *al* cameras, switch to network or remote programs, control and monitor recorded sound, monitor the programs on the air.

In this room are large picture monitors for previewing signals from remotes or networks and from the studio cameras. In this room also is an audio consolette that controls all program sound lines—from the studio microphones network audio line, studio and announce microphones, and from the turntables shown in the foreground. A program console . . . with its picture monitor for viewing the studio line and the on-the-air picture . . . co-ordinates the programming. Nothing included in this room that should not be there. Nothing omitted that should be included.

Why do most TV stations go RCA all the way on studio control-room equipment?

Because RCA control-room equipment has design flexibility to meet every station's need and budget. Because RCA control-room equipment is *unit-built* . . . permits easy and economical addition of extra units without a worry about discarding the original equipment. Because a single company makes the entire line . . . *and backs it up!*

For professional assistance in planning your television station, call in an RCA Specialist. Or write Dept. 19 F RCA Engineering Products, Camden, N. J.



RCA Program Directors Console Type TC-5A. Television's most up-to-date directors' control. Includes large-size picture monitors for the studio outgoing line, for previewing, and for "on-the-air" monitoring. All switching under finger-tip control. Low height for full studio visibility. Recessed monitors for maximum image brightness in a fully-lighted control room.

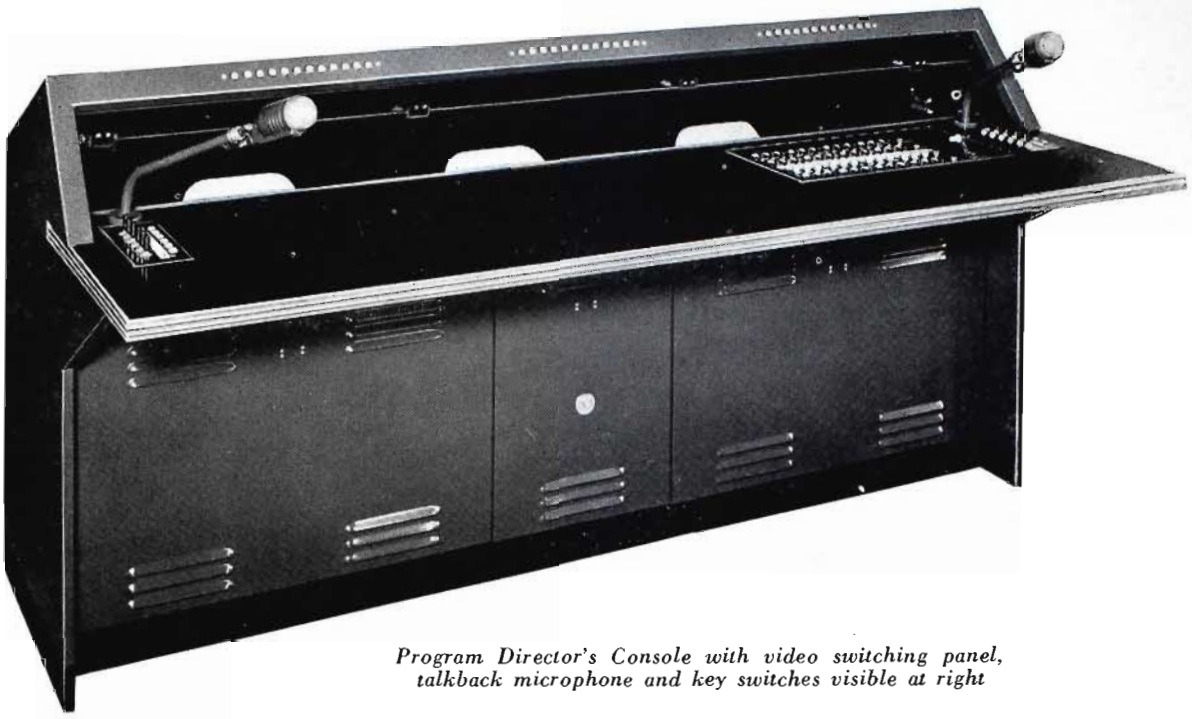
entire studio control rooms,

for instance—

Typical RCA Control Room for a TV Station
—one of more than 20 possible layouts to meet any station requirement, large or small.

1. Audio Consolette—for separate channel
2. Audio Consolette
3. Program Directors' Console
4. Video Console
5. Transcription Turntables
6. Audio Operator Position
7. Program Director Position
8. Technical Director Position
9. Video Operator Position

Program Director's Console, Type TC-5A



Program Director's Console with video switching panel, talkback microphone and key switches visible at right

Features

- Provides complete program and technical directors' facilities for supervision of television programming.
- Picture monitors totally enclosed in console—shielded from stray light—permits better viewing.
- Up to five 10-inch monitors may be mounted in console.
- Low console construction provides unobstructed view into studio—minimum depth of console places directors close to control room window.
- Optimum viewing distance—wide angle viewing of monitor screens.
- Controls provided for switching, fading or previewing any of twelve input signals—tally lights for each push button.
- Two microphones for one-way communication to 6 different points for each microphone—equipped with tally lights.

Use

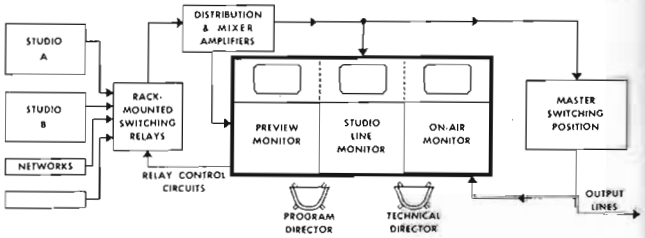
The Type TC-5A, Program Director's Console is a compactly built supervisory console designed to provide complete control of television studio produced programs; however, it has facilities for switching in other sources of programs as desired. It is intended for use by the program and technical directors, and is constructed to permit a maximum unobstructed view of the studio. The monitors (MI-26140) are mounted in a vertical position in the bottom of the console, and are viewed on a mirror, resulting in minimum height and depth for the console, as well as an optimum viewing distance. The console is designed to be a part of the TS-20A Switching System.

The use of three or five monitors is a matter of preference. Uses for three monitors are: (1) a studio line monitor showing the picture going to the master control room; (2) a preview monitor showing the next picture to be used; and (3) an "on air" monitor showing the picture actually going to the transmitter. Connections can be provided in the TC-5A so that this third monitor may be employed as a second preview monitor and can be controlled by push buttons with associated tally lights. To permit flexibility, the video inputs to all monitors can be brought out on a rack mounted patch panel so that any composite signal may be patched into them for different requirements.

The technical and program directors sit side by side, serving to coordinate large programs with a maximum of smoothness. The technical director has at his fingertips controls to switch, fade, lap-dissolve or preview any signal upon orders from the program director.

Description

The technical director's control panel handles up to twelve input signals, of which up to four can be from remote lines and the remainder from local lines. The switching relays and mixing amplifier (used for fading) are rack-mounted, but the push-button controls for switching are located on the console. Two rows of push buttons are associated with the mixing amplifier, one row for each amplifier input channel. A third row of push buttons selects the desired input signal for the preview monitor in the console. A fourth row of push buttons may be added to accommodate the option of a second preview monitor. Electrical interlocking prevents putting more than one signal on the air at one time. Associated with each



Block diagram showing typical use of the Program Director's Console

TC-5A front cover removed to show mounting of monitors

push button on the control panel is a tally light which shows when the circuit is in use. The glass jewels contain numbers from one to twelve, corresponding to the twelve inputs. In addition, three sets of tally lights are provided at the top front of the console cover, each set consisting of twelve lights with jewels numbered from one to twelve. The contrast, brightness, focus, vertical and horizontal hold controls for each program monitor mount at the back edge of the console desk directly in front of the respective monitor. The console is designed so that switching and fading controls may be installed at either end of the program console desk, leaving the seating arrangement up to individual customer requirements.

Ten different signal switching and fading operations are possible with the technical director's control panel when used in conjunction with the TS-20A System.

1. Black screen to any signal instantaneously
2. Any signal to black screen instantaneously
3. Fading from local signal to black screen
4. Fading from black screen to local signal
5. Local signal to remote signal instantaneously
6. Remote signal to local signal instantaneously
7. Fade out local signal to black screen and instantaneously switch in remote signal
8. Switch out remote signal instantaneously to black screen and fade in local signal
9. Lap dissolve between two local signals at any speed
10. Super-imposition of two local signals

Intercommunication facilities, consisting of two microphones with a bank of six selector keys for each, are provided on the console for one-way communication to a maximum of twelve different points. The selector keys are the lever type, non-locking on one side, and locking on the other. Tally lights indicate which circuit is in use, preventing interruption while orders are being given. The designation strips on the intercom and technical director's panel are designed for making penciled notations which can be rubbed off, a feature to accommodate changes in designations with each program.

The television Program Director's Console, TC-5A, can be called a custom-built standard unit since there are eight different standard assemblies than can be furnished on order. (See 26975—1 through 8.)

Specifications

POWER REQUIREMENTS

Line to Tube Heaters:

3 Monitors — 105-125 volts, 50/60 cycles, 225 watts
5 Monitors — 105-125 volts, 50/60 cycles, 375 watts

Line to Type 580-C Regulated Power Supplies (to supply monitor plate voltage)

3 Monitors — 105-125 volts, 50/60 cycles, 1110 watts
5 Monitors — 105-125 volts, 50/60 cycles, 1850 watts

MECHANICAL SPECIFICATIONS

Overall Dimensions — 36″ High, 72″ Wide, 36″ Deep

Desk Top — 21″ Deep

Weight:

With 3 Monitors — 383 lbs.
With 5 Monitors — 507 lbs.

Finish — Dark umber gray

TUBE COMPLEMENT

For One Program Monitor—1st Picture Amplifier, RCA 6AG7; 2nd Picture Amplifier, RCA 6AG7; D. C. Restorer, RCA 6SN7GT; Sync. Separator, RCA 6AC7; Sync. Output, RCA 6SN7GT; Vert. S.T. Generator, RCA 6SN7GT; Vert. S.T. Output, RCA 6SN7GT; Vert. Distortion Amplifier, RCA 6AC7; Focus Coil Current Reg., RCA 6AG7; Hor. S.T. Generator, RCA 6SN7GT; Hor. Driver, RCA 6SN7GT; 2-Hor. Output, 2-RCA 6BG6G; Hor. Damper, RCA 6AS7G; 2-H.V. Rectifier, 2-RCA 1B3-GT/8016; Kinescope, RCA 1816-P4.

Stock Identification: Note from the chart below that a choice of eight different TC-5A combinations is available to meet broadcasters' individual requirements. Combinations offer a selection of three or five monitors, 38 or 48 button switching panels, and a left or right hand location for switching panels. ORDER TC-5A BY SCHEDULE NOS. (i.e., MI-26975-1, MI-26975-2, or MI-26975-3, etc.) . . . except when ordering individual items for replacement or as spare equipment.

TC-5A Program Console Equipment Supplied	MI-26975-1	MI-26975-2	MI-26975-3	MI-26975-4	MI-26975-5	MI-26975-6	MI-26975-7	MI-26975-8
Basic Console	(1) MI-26562	(1) MI-26562	(1) MI-26562	(1) MI-26562	(1) MI-26562	(1) MI-26562	(1) MI-26562	(1) MI-26562
Desk Top	(1) MI-26563	(1) MI-26563	(1) MI-26563	(1) MI-26563	(1) MI-26563	(1) MI-26563	(1) MI-26563	(1) MI-26563
(4x12) 48 Button Panel	(1) MI-26220-1	(1) MI-26220-1	——	——	(1) MI-26220-1	(1) MI-26220-1	——	——
(3x12) 36 Button Panel	——	——	(1) MI-26220-2	(1) MI-26220-2	——	——	(1) MI-26220-2	(1) MI-26220-2
Intercom Panels	(1) MI-26224	(1) MI-26224	(1) MI-26224	(1) MI-26224	(1) MI-26224	(1) MI-26224	(1) MI-26224	(1) MI-26224
Console Assembly Kit	(1) MI-26553	(1) MI-26553	(1) MI-26553	(1) MI-26553	(1) MI-26553	(1) MI-26553	(1) MI-26553	(1) MI-26553
Tally Light Assembly	(1) MI-26554	(1) MI-26554	(1) MI-26554	(1) MI-26554	(1) MI-26554	(1) MI-26554	(1) MI-26554	(1) MI-26554
Console Cable (3 Mon.)	(1) MI-26555-1	——	(1) MI-26555-1	——	(1) MI-26555-1	——	(1) MI-26555-1	——
Console Cable (5 Mon.)	——	(1) MI-26555-2	——	(1) MI-26555-2	——	(1) MI-26555-2	——	(1) MI-26555-2
Items Above Are Shipped Assembled	MI-26324-1	MI-26324-2	MI-26324-3	MI-26324-4	MI-26324-5	MI-26324-6	MI-26324-7	MI-26324-8
Monitor	(3) MI-26140	(5) MI-26140	(3) MI-26140	(5) MI-26140	(3) MI-26140	(5) MI-26140	(3) MI-26140	(5) MI-26140
Mirror	(1) MI-26551	(1) MI-26551	(1) MI-26551	(1) MI-26551	(1) MI-26551	(1) MI-26551	(1) MI-26551	(1) MI-26551
Glass	(1) MI-26552	(1) MI-26552	(1) MI-26552	(1) MI-26552	(1) MI-26552	(1) MI-26552	(1) MI-26552	(1) MI-26552
Mask-Control Strip (3 Mon.)	(1) MI-26564-1	——	(1) MI-26564-1	——	(1) MI-26564-1	——	(1) MI-26564-1	——
Mask-Control Strip (5 Mon.)	——	(1) MI-26564-2	——	(1) MI-26564-2	——	(1) MI-26564-2	——	(1) MI-26564-2
Microphone	(2) MI-6206-E	(2) MI-6206-E	(2) MI-6206-E	(2) MI-6206-E	(2) MI-6206-E	(2) MI-6206-E	(2) MI-6206-E	(2) MI-6206-E
Monitor Mtg. Kit	(3) MI-26523	(5) MI-26523	(3) MI-26523	(5) MI-26523	(3) MI-26523	(5) MI-26523	(3) MI-26523	(5) MI-26523
Instruction Book	IB-36043-1	IB-36043-1	IB-36043-1	IB-36043-1	IB-36043-1	IB-36043-1	IB-36043-1	IB-36043-1
Items Above Are Shipped Separately								

Accessories (Order separately)

Type 580-C Power Supply — MI-21523-B1
(One needed for each MI-26140 Program Monitor)
Mixer Amplifier (3 normally required) — MI-26281
Stabilizing Amplifier (additional 580-C power supply desirable) — MI-26160-B
TS-20A Relay Switching Equipment — Schedule 26990
(available to suit individual requirements)


This director's console put
1
2
3
4
5
1 Preview of studio cameras
2 Control room outgoing line
3 Preview of network and remote
4 Inter-com microphone
5 Inter-com switching
6 Camera and remote signal switc

the television pictures ...right before your eyes!

At last program directors can watch monitoring pictures and studio operations—simultaneously

NOW it is possible to sit before your studio window—*and see everything that's going on.* No high-built equipment to obstruct your view of the studio. No need to play peek-a-boo with the video operators up front. You see large, bright pictures of what the cameras see . . . right before your eyes.

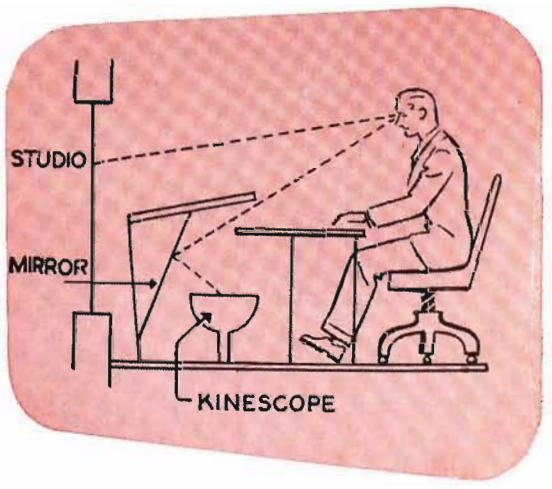
In this new director's console—only 37 inches high and 72 inches wide—the program monitors are mounted *below* the desk . . . and viewed indirectly from light-shielded mirrors. The advantages: A console of low height that enables the program director to see the entire studio from the director's position; daylight-bright monitor pictures that can be seen in a fully-lighted control room.

Using anywhere from two to five monitors—with a 10-inch kinescope of high brilliance in each—this console displays (1) preview pictures of the local cameras, (2) network or other remote signals, (3) the picture going to the transmitter room. All fading, dissolving, and video signal switching is under "push-button" control through a switching panel right in the console. Tally lights indicate the camera that is on the air and the camera that has been selected for preview. Order-wire microphones and order-wire switching provide maximum operating efficiency.

Here, we believe, is a director's console that is years ahead in programming facilities and operating conveniences. It is styled to match all other RCA television and audio equipment and requires a minimum of room. Plenty of desk space, too, for scripts, schedules, and other programming material.

For more information on this new console . . . now in regular production . . . call your RCA Television Specialist. Or write Dept. 19KD, RCA Engineering Products Division, Camden, N. J.

This modern and practical Director's Console brings all electronic aspects of programming under finger-tip control.



Cross-section Side View—The 10" kinescopes are mounted below the desk and viewed indirectly from front-surface type mirrors. This unique design shields the tube screens from direct outside light and provides a complete view of the studio. Normally, two directors handle the console: one for the programming; one for the technical aspects of programming.

Master Control Panels, MI-26222 & 26223

Features

- Designed for use in TS-20A Relay Switching System.
- 6 input channels.
- 2 output channels.
- Tally lamps to indicate channels in use.
- Mounts in standard console section, MI-26266.

Master Control Panel MI-26222 is supplied with back protective cover and adapter mounting plate, as shown.

Uses

The push button circuits of Master Control Panels MI-26222 and MI-26223 are arranged for use with the Relay Switching Units in the TS-20A Switching System. Remote switching may then be accomplished between 6 inputs and 2 outputs.

Description

Both panels include two rows of 6 push buttons plus release buttons in each row. Also associated with each row of push buttons, is a row of lamps to indicate which circuits are in use. All connections are brought out to a telephone type terminal block which may be located in the lower part of the console section. The MI-26222 panel mounts in the sloping section of the desk area and is hinged to permit removal of a Master Monitor if one is mounted in the same console section. A removable back cover provides protection for the switch assemblies. The MI-26223 Panel, although similar in layout, is designed to mount in the MI-26252 Remote Control Basic Frame, which, in turn, mounts in the monitor face of the console section.

Specifications

Lamp Voltage ..... 12 volts

Circuit:

Three make contacts for each push button, wired to terminals on telephone block.

One side of lamps common.

Dimensions:

MI-26222 ..... 13" wide, 5⅝" high, 3½" deep

MI-26223 ..... 11 1/16" wide, 5 11/32" high, 5" deep

Weight:

MI-26222 ..... Approximately 15 lbs.

MI-26223 ..... Approximately 12 lbs.

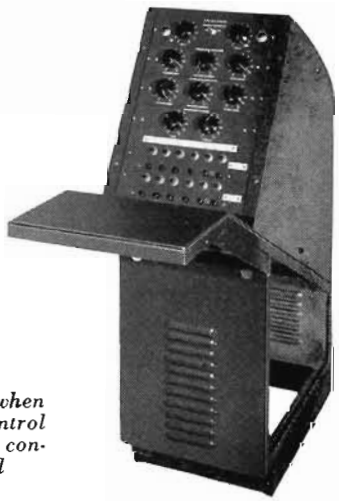
Stock Identification:

Push button Switch Panel

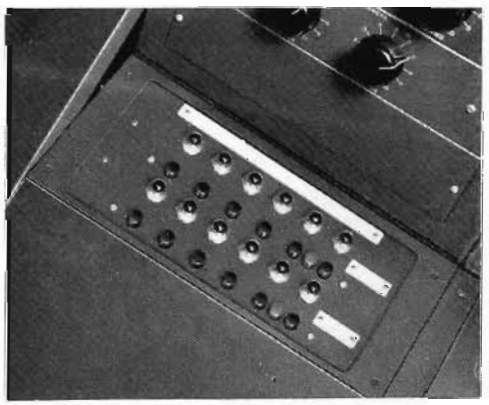
(For Master Control, Desk Top Mtg.) MI-26222

(For Remote Control or Turret Top Mtg.) MI-26223

MI-26223 Panel as supplied for Remote Control Console mounting.

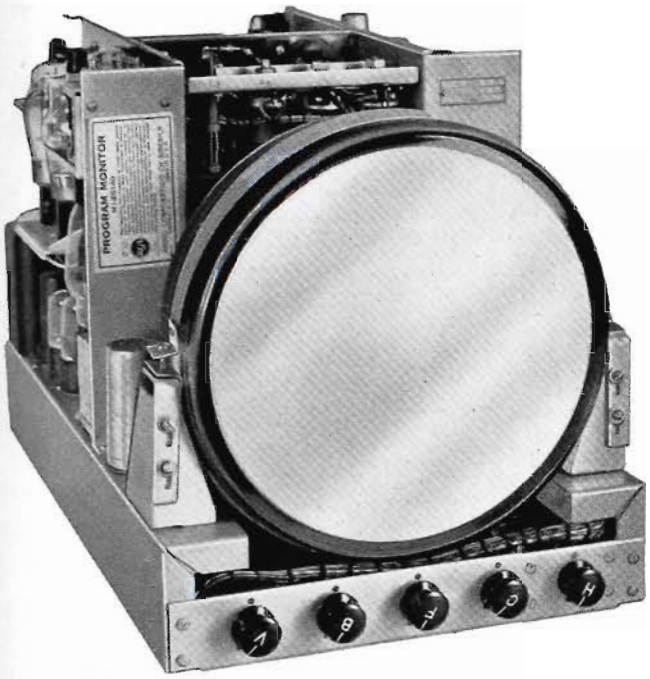


The MI-26223 Panel, when mounted in Remote Control Console MI-26252, provides convenient Master Control facilities.



MI-26222 Master Control Panel shown mounted in sloping desk portion of TV console section.

Program Monitor, Type TM-1A



Features

- A high quality television picture monitor.
- Lends itself to application as program or announce monitor.
- Easily adapted to portable use.
- Minimum size construction with bright picture on 10-inch aluminum backed screen.
- Operates from either composite or separate synchronizing and picture signals—switch controlled.
- Contrast, brightness, focus and horizontal and vertical hold controls mounted on panel which can be removed for remote control.
- Adapter MI-26524 available for rack mounting of program monitor.

Uses

The Type TM-1A Program Monitor is a high quality picture monitor designed for use in announcer's booths, offices, clients' viewing rooms and control rooms of television stations. It can be furnished in an attractive carrying case, or adapted for rack mounting. Supplied with front panel and carrying case, the monitor can be made portable for field applications. Basically, the Program Monitor is identical to the monitors supplied in the RCA Program Director's Console, Type TC-5A.

Description

TM-1A Program Monitor shown mounted in Field Carrying Case, MI-26522

Features of the electrical circuits and components include a picture amplifier with a bandwidth of 6 mc, vertical deflection circuit with automatic linearity control, combined horizontal deflection and high voltage circuit, synchronizing pulse separating circuit, and shielded filament transformers. The monitor will operate from either a composite signal or from separate sync and picture signals. A switch provides rapid changeover for either type of operation. The 10 kv second anode voltage produces a sharp, bright picture.

The input stage of the picture signal amplifier has adjustable gain by means of d-c bias control. When installed in the Program Console, this contrast control along with brightness, focus, and horizontal and vertical hold controls, are wired to a receptacle which permits remote control. The operating controls can thus be made accessible at the operators' positions at the console. In portable operation, these five controls are wired on a removable panel, plug connected to the chassis, permitting use of an extension cable. All other controls, such as size and centering, are part of the internal chassis structure and are accessible for initial adjustment. Means are also provided for reversing both deflection circuits, simplifying the changes necessary to accommodate either direct or reflected view positions of operation.

D-c plate and a-c filament primary power, externally supplied, are introduced through a single 7-pin plug. The picture signal is fed through a standard coaxial fitting, with an additional fitting for connecting a termination plug or another monitor in parallel. The separate sync circuit is provided with the same type of coupling arrangement.

Specifications

INPUT POWER

From Line for Tube Heaters:

Line Voltage	105-125 volts
Line Frequency	60 cycles
Line Power	75 watts

From Regulated Power Supply:

Plate Voltage	280 volts d-c
Plate Current	300 ma.
Centering Bias Supply	4 volts, min.

Electrical Characteristics:

Frequency Response	±1 db to 6 mc.
Signal Input Range	0.75 to 4.0 volts peak to peak
Limiting Resolution (horizontal)	500 lines, minimum
Second Anode Voltage	10 kv. (approx.)

Controls:

Remote	Contrast, brightness, focus, horizontal and vertical hold
Internal	Width, height, horizontal and vertical centering, horizontal and vertical linearity

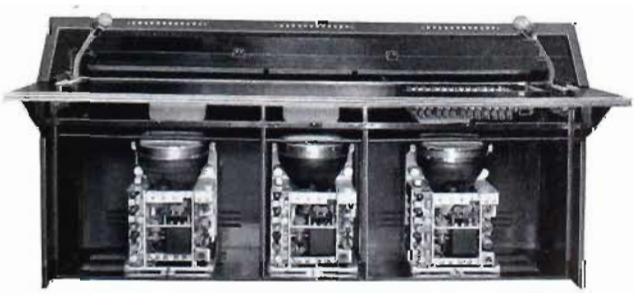
Tube Complement—2—1B3-GT/8016, 2—6AC7, 3—6AG7, 1—6AS7G, 2—6BG6-G, 6—6SN7-GT, 1—1816P4

Mechanical Specifications: (with carrying case)

Length 19½"; Width 12½"; Height	13¼"
Weight	45 lbs. (approx.)
Finish	Dark umber gray wrinkle
Stock Identification	MI-26140
Stock Identification Announce Monitor (with carrying case)	MI-26297

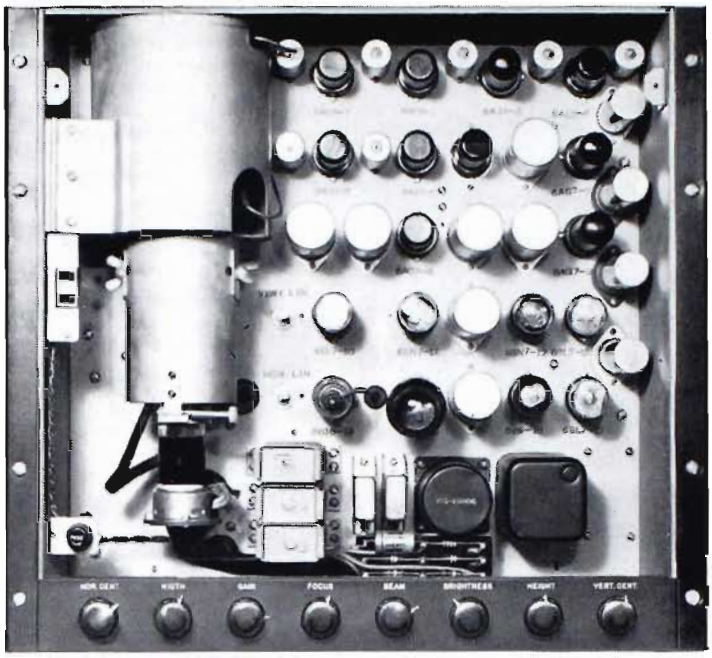
Accessories

Carrying Case	MI-26522
Rack Mounting Adapter	MI-26524
580-C Power Supply	MI-21523-B1



Program Monitors, TM-1A, shown installed in Program Director's Console

Monoscope Camera, Type TK-1A



Features

- Useful to television transmitting station, laboratory, factory, or service bench.
- Centralized operating controls.
- Compact construction; "bath tub" chassis for standard rack mounting.
- Auxiliary input for alignment purposes.
- Built-in high voltage power supply.
- 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.
- RMA signal output.

Uses

The Type TK-1A Monoscope Camera may be used as a convenient means of obtaining an image for video testing of television transmitting equipment, or a "test pattern" to be transmitted 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 known 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. With the addition of a source of blanking and driving signals, an IF sweep generator and an RF signal generator, it produces a complete television picture signal simulating that received off the air, and thus provides a means of testing receivers under conditions equivalent to actual use.

Description

The TK-1A 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 nineteen-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-1A is mounted in a vertical position at the left of the chassis. The upper part of the tube is enclosed in a mu-metal 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, is very economical of rack space.

The monoscope tube ordinarily used in the TK-1A is an RCA-2F21. This tube provides a pattern which combines the

features of several previously used tubes. It 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 isloated details. In addition it provides a pattern to facilitate proper adjustment of contrast and brightness.

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 sawtooth 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 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 fourth 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

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:
110-120 volts a-c 60 cycles ——— 100 watts
280 volts d-c (from Type 580-C Power Supply) ——— 200 ma.

Dimensions ——— 17½" high, 19" wide, 11" deep

Weight ——— 55 lbs.

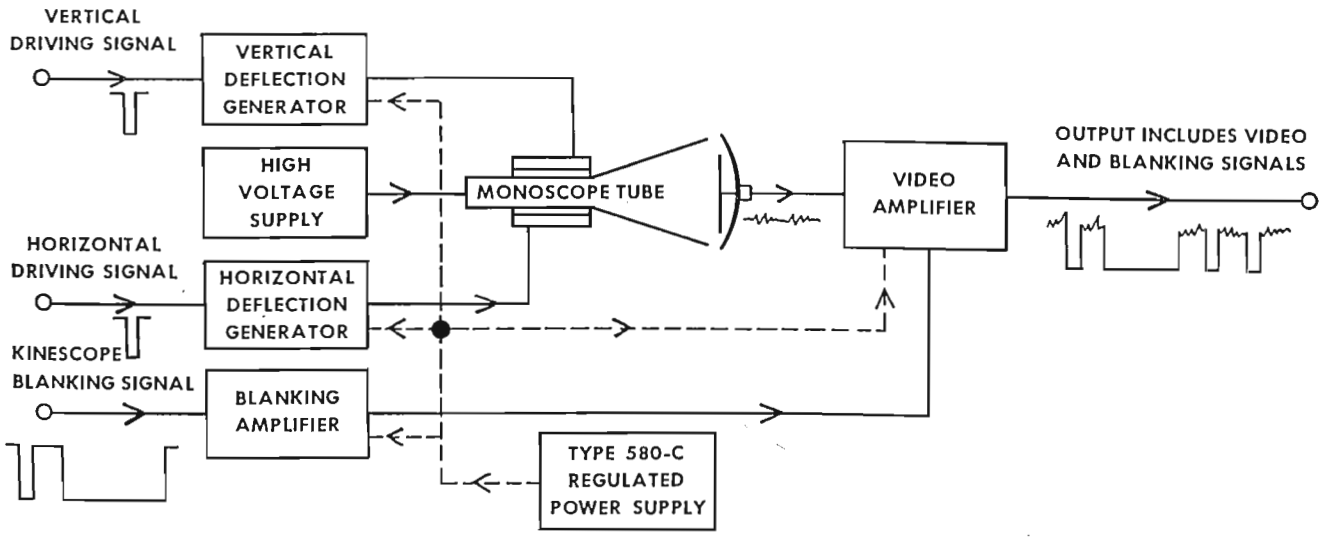
Tube Complement:

6 RCA 6AC7	1 RCA 8016
1 RCA 6H6	1 RCA 6Y6
3 RCA 6AG7	1 RCA 6V6-GT
3 RCA 6SL7-GT	1 RCA 2F21
2 RCA 6SN7-GT	1 RCA 991

Stock Identification ——— MI-26960
(includes monoscope tube RCA 2F21)

Accessories

Monoscope Camera Remote Control Panel ——— MI-26248

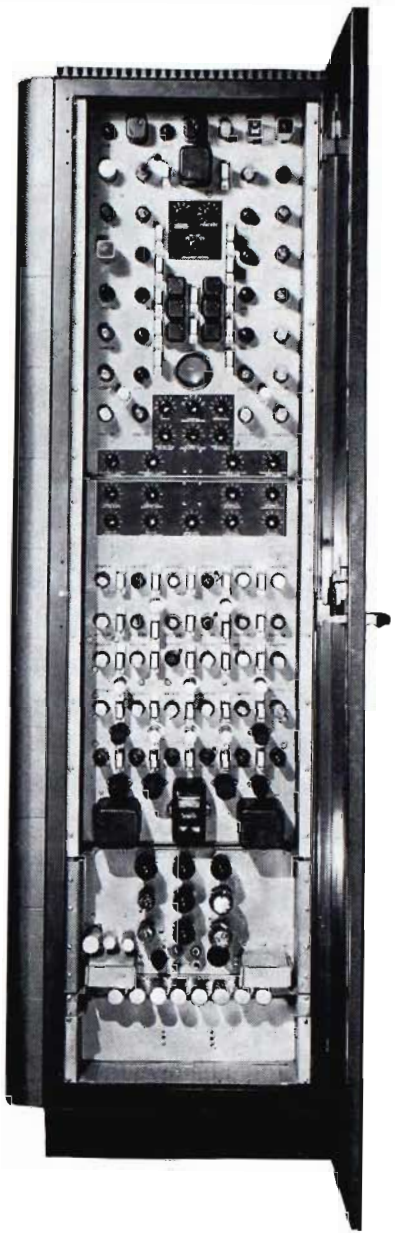


BLOCK DIAGRAM OF THE TYPE TK-1A MONOSCOPE CAMERA

Synchronizing Generator, Type TG-1A

Features

- Special circuits which maintain the timing of the leading edges of the equalizing pulses, the horizontal synchronizing pulses and the vertical synchronizing pulses, with extreme accuracy.
- An improved locking circuit for synchronizing the generator with the 60-cycle power supply—or with a remotely generated synchronizing wave form.
- A built-in crystal oscillator for frequency control.
- Use of circuits which are relatively insensitive to large changes in tube characteristics, so that ageing of tubes will not affect operation of the equipment.
- Operation of all tubes in extremely conservative manner, so that a very long, useful life may be expected.
- Wiring which has been greatly simplified by carefully grouping components so that all leads are very short.
- A built-in oscilloscope which, by means of a selector switch, can be used to check the step-down ratio of any of the frequency-dividing counter circuits.
- A regulated plate voltage power supply unit which, with the other panels, is mounted in place and wired at the factory. The unit is ready for operation immediately on installation.



Uses

The TG-1A Synchronizing Generator is designed for use in television transmitting stations as a source of synchronizing pulses for the studio and film cameras, the monoscope camera, the monitoring oscilloscopes, and the mixing amplifier (which adds the synchronizing pulses to the transmitted video signal). In laboratories and factories it is used in conjunction with a monoscope camera to furnish a complete RMA standard video signal voltage which can be used in the development and production testing of television receivers.

Description

The Type TG-1A Synchronizing Generator is an integral unit complete with power supply. It is assembled in a standard cabinet-type rack which is 84 inches high, 22 inches wide and 18 inches deep. The rack has front and rear doors which open the full length and width of the unit. This type of rack has been standardized for all RCA television, broadcast, and communications terminal equipment. Moreover, all RCA Television and FM transmitters are made up of racks which are similar in appearance, construction and height (although of greater width). Therefore, the TG-1A Generator, and other units mounted in similar racks, may be installed as needed, with assurance that they will match in appearance, other terminal and transmitting units which may be added later.

The 60 tubes and other components which make up the circuits of the TG-1A Generator are mounted on "bath-tub" type chassis which are placed in the cabinet vertically, as shown in the illustration. The 29¾ inch chassis at the top of the cabinet contains the pulse former. Immediately below is a similar chassis containing the "pulse shaping" circuits. The 10½ inch chassis near the bottom is a standard Type 580-C Power Supply Unit, and just below is a 1¾ inch chassis containing electrolytic filter capacitors.

All of the controls, tubes and major components are mounted on the front of the vertical chassis. Thus, all ordinary adjustments, as well as routine checks, can be made by opening the front door. Since no high voltages are exposed on the front of the chassis, this door is not interlocked. Wiring and minor components, such as small capacitors and resistors, are on the back of the panels, and are accessible through the rear door. All terminals are in the clear, and components are identified so that circuit testing, when required, is relatively easy.

Electrically, as well as mechanically, the TG-1A Generator is divided into two main sections. The first section is the pulse former while the second section is the pulse shaper. The pulse former generates all of the different timing frequencies which are required by the system. It also provides a means whereby these frequencies (which are all derived from a single master oscillator) may be "locked in", either with the local 60-cycle power line frequency, with a crystal oscillator, or with some other external source, such as a remotely generated synchronizing wave form. The pulse shaper forms the pulses into the proper wave shapes and combines them as required to provide

the five different signals listed below. These signals are fed to ten output connectors located on a subpanel at the base of the pulse shaper.

It is intended that RG-11U or RG-59U concentric lines be used between these points and the studio cameras, mixing amplifiers, etc. Two coaxial output connections are provided for each signal so that output of either negative or positive polarity is available. When more than one equipment is fed from the generator, a distribution amplifier, such as the Type TA-1A, should be employed in order to isolate the circuits.

Regulated plate voltages for the pulse former and pulse shaper are furnished by the Type 580-C Power Supply. Filament voltages are provided by transformers mounted on the pulse shaper. All a-c power input to the cabinet is controlled by the circuit-breaker switch at the bottom of the pulse shaper.

The Type TG-1A Synchronizing Generator furnishes all of the timing pulses required in a complete television system. These pulses are accurately timed with relation to each other, and are carefully controlled as to wave form in accordance with the standards adopted by the RMA. The five different output signals which are generated will provide all of the timing and synchronizing requirements of a standard 525-line, 30-frame, interlaced television system. These five output signals are:

(1) HORIZONTAL DRIVING SIGNAL

This consists of short-duration, square-wave pulses at horizontal scanning frequency (15,750 cycles). These pulses are used to "trigger" the saw-tooth wave generator (in the camera) which supplies the horizontal scanning voltage for the pickup tube. The width of these pulses is sufficient to blank out the horizontal return trace of the camera tube.

(2) VERTICAL DRIVING SIGNAL

This consists of square-wave pulses of somewhat longer duration which occur at vertical scanning frequency (60 cycles). These pulses are used to "trigger" the saw-tooth wave generator (in the camera) which supplies the vertical scanning voltage for the pickup tube. The width of these pulses is sufficient to blank out the vertical return trace of the camera tube.

(3) SYNCHRONIZING SIGNAL

This is the signal which must be added to the camera picture signal before it is transmitted in order to synchronize the scanning action in the receiver. It is a composite signal consisting of (a) short-duration, horizontal synchronizing pulses at 15,750 cycles, (b) longer duration, vertical synchronizing pulses of the "serrated" type at 60 cycles, and (c) a series of six short-duration, equalizing pulses just preceding each vertical pulse interval and six more following it. All of these have the timing and wave shape prescribed by the RMA Standards.

(4) BLANKING SIGNAL

This signal is added to the transmitted video signal in order to blank out the return trace in the receiver picture tube (kinescope). It consists of square-wave pulses at horizontal scanning frequency (15,750 cycles) and vertical scanning frequency (60 cycles). These pulses are of longer duration than the synchronizing pulses and are transmitted at approximately "black" level. They form the "pedestals" on which the synchronizing signals are placed.

(5) OSCILLOSCOPE SYNCHRONIZING SIGNAL

This signal consists of pulses at half horizontal (7,875 cycles) and half vertical (30 cycles) frequencies. They are used to "trigger" the saw-tooth generator in the monitoring oscilloscope, thus providing (for "wave form" monitoring) oscilloscope patterns which are two lines or two fields in length.

Specifications

Output Voltages

Synchronizing Signals	4 volts, peak-to-peak across 75 ohms
Kinescope Blanking Signal	4 volts, peak-to-peak across 75 ohms
Horizontal Driving Signal	4 volts, peak-to-peak across 75 ohms
Vertical Driving Signal	4 volts, peak-to-peak across 75 ohms
Oscilloscope Synchronizing Signal	8 volts, peak-to-peak across 75 ohms

Power Supply Required

From 109-125 volt, 60 cycle, single phase line — 450 watts

Dimensions

Mounted in Cabinet	84" High, 22" Wide, 18" Deep
Unmounted Rack Units	77" High, 19" Wide, 12½" Deep
Weight (in cabinet)	375 lbs.
(unmounted)	160 lbs.

Tube Complement

1 RCA 1B3GT/8016	18 RCA 6SL7GT
10 RCA 6AC7	11 RCA 6SN7GT
5 RCA 6AG7	2 RCA 5691
8 RCA 6H6	1 RCA 3KP1
4 RCA 6L7	

Power Supply

2 RCA 5U4G	5 RCA 6Y6G
1 RCA 6SL7GT	2 RCA OD3/VR150
1 RCA Stock No. 16864 Neon Lamp	

Stock Identification — MI-26915

Equipment Supplied

Includes below plus hardware, fittings, misc. material

1 Synchronizing Generator Rack	MI-26815
1 Rear Door	MI-30536-G84
1 3KP1 Cathode Ray Tube	MI-26650
1 Instruction Book	1B-36008-1

Accessories

Front Door	MI-30536-G84
Side Panel (single)	MI-30541-G84
Monogram	MI-30596
Synchronizing Generator Phasing Remote Control	MI-26249
Synchronizing Generator Switching Panel	MI-26285
Pulse Distribution Box	MI-26757

Sync Generator Switching Panel, MI-26285

Features

- Used to switch outputs of either of two sync generators to television studio equipment in use.
- Permits quick changeover without loss of airtime in event of breakdown.
- Provides terminations for signals coming from standby sync generator.
- Contacts arranged so that proper termination is provided for both generators at all times.
- Supplied complete with cable connectors.

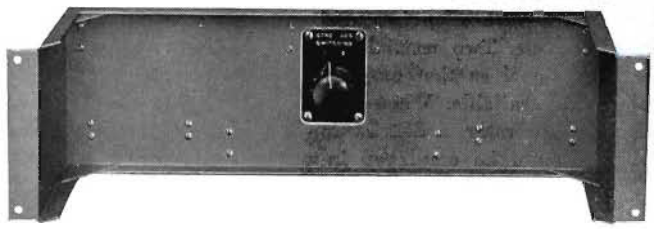
Uses

The Synchronizing Generator Switching Panel MI-26285 may be used to switch all five signals (horizontal driving, vertical driving, blanking, synchronizing and CRO synchronizing) from a single front panel control knob.

The Sync Generator switching chassis can be conveniently mounted in standard 19″ television equipment racks.

Description

The Synchronizing Generator Switching Panel MI-26285 consists of necessary connectors, switches and terminating resistors. Contacts are arranged so that the proper termination is provided for both sync generators at all times. It is supplied in a



recessed type chassis for standard 19″ rack panel mounting and is of proper size to fit in place of tbe blank panels included in studio sync generator equipment rack MI-26815.

Specifications

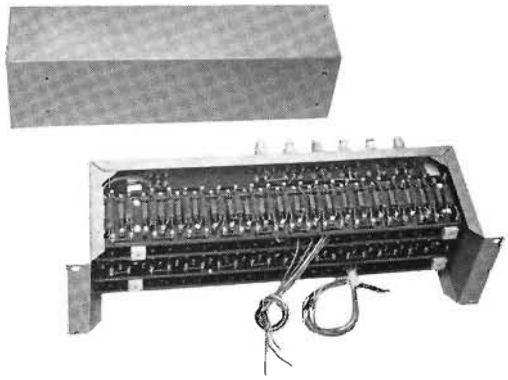
Power Requirement	None
Generator Switch	12 pole, 2 position rotary
Input Signals Accommodated	10
Output Signals Accommodated	5
Dimensions:	
Panel Height	5¼″
Panel Length	19″
Panel Depth	8¾″
Weight (approx.)	14 lbs.

Sync Generator Delay Panel, MI-26286

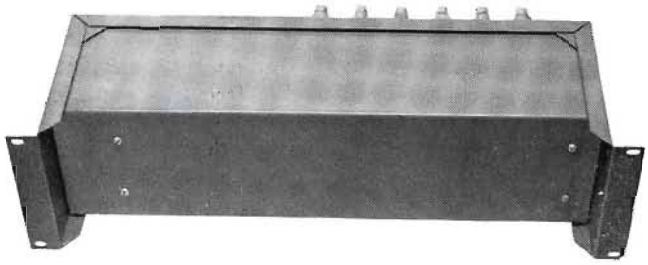
Description

The Sync Generator Delay Panel is used to equalize the time delay in coaxial cables between the sync generator and studios located at different remote distances. The Delay Panel is to be used with a Distribution Amplifier, as follows. Horizontal driving and blanking pulses are fed into the two lines which are terminated internally in 75 ohms. Lines are tapped at points of desired delay, and fed through short lengths of unterminated coaxial line to the Distribution Amplifier, which feeds pulses to the studio.

The Panel consists of 2 delay lines and each line is equivalent (in time delay) to 2000 feet of RG-11/U coax cable. One is for horizontal driving pulses, the other for blanking. Since the total delay involved is to the studio and return, tbe maximum studio distance is 1000 feet. Each line consists of 40 sections, giving a total delay of 3.08 microseconds (equivalent to 2000 feet of RG-11/U coax). Each section has a delay of .077 microsecond (equivalent to 50 feet of RG-11/U). The Sync Generator Delay Panel is supplied in standard recessed "hathtub" chassis for regular 19″ panel mounting.



View of Sync Generator Delay Panel shown with protective cover removed



Specifications

Provision for 6 Taps Per Line	6 studios
Bandwidth	50% response @ 3 mc.
Cutoff at End of Line (suitable for pulses only)	@ 5 mc.
Impedance (Delay of sync must be adjusted on delay line in sync gen.)	75 ohms
Panel Width	19″
Panel Height	5¼″
Approx. Weight	12 lbs.
Stock Identification	MI-26286

The Pulse Distribution Box

Features

- Convenient distribution of synchronizing generator pulses.
- Distributes blanking to as many as eight camera controls.
- Eliminates complicated patching system.
- Four 6-pin output connectors.

Use

The Pulse Distribution Box is a compact junction box designed to provide a convenient distribution of the driving, and blanking pulses received from the Studio Synchronizing Generator and fed to the Camera Controls. It replaces distribution by means of complex patching systems, supplying a common feed point for as many as eight camera controls.

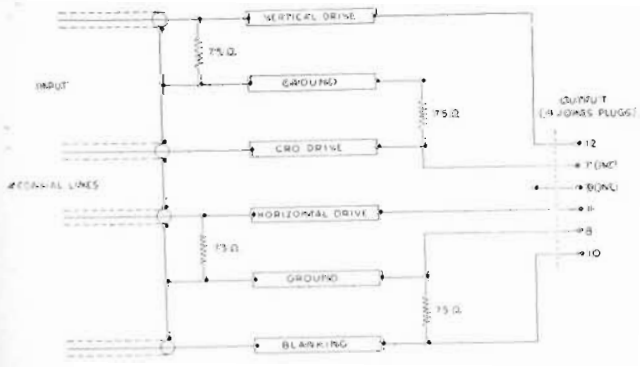
Description

As can be seen on the circuit diagram of the Pulse Distribution Box, coaxial cables from the synchronizing generator bring blanking, and horizontal and vertical driving pulses to the center terminals of tbe box. The coaxial lines are normally terminated in this box, therefore, terminating resistors connected from the lines to ground are built into the box. Because the lines are terminated in the box, the output lines are necessarily high-impedance, low-capacity circuits. From the center terminals, connections are made to four 6-pin connectors, wired in parallel, and placed on the ends of tbe box, as seen in the picture below. Normal operation provides pulsing for four camera controls. By series connecting sets of two cameras, the four connectors can be expanded to handle as many as eight cameras simultaneously. An additional coaxial cable is brought into the box from the generator, carrying the Cathode Ray Oscilloscope driving pulse. This terminal provides an auxiliary method of drive, since the driving pulse is carried by other means in normal television station operation.

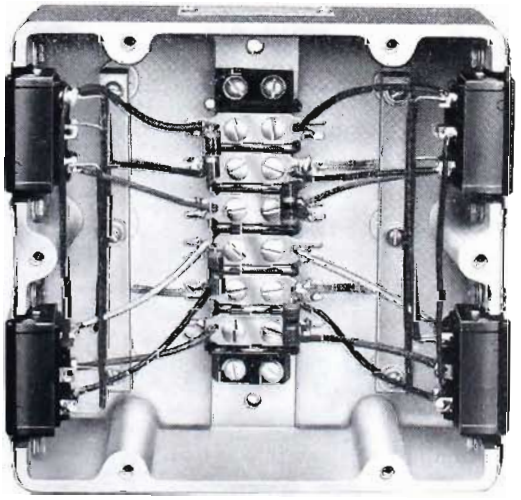
Specifications

Overall Dimensions:

Height	6"
Width	6"
Depth	2¾"
Input	Solder connections for four coaxial lines
Output	Four 6-pin connectors
Approximate Weight	5 lbs.
Stock Identification	MI-26757

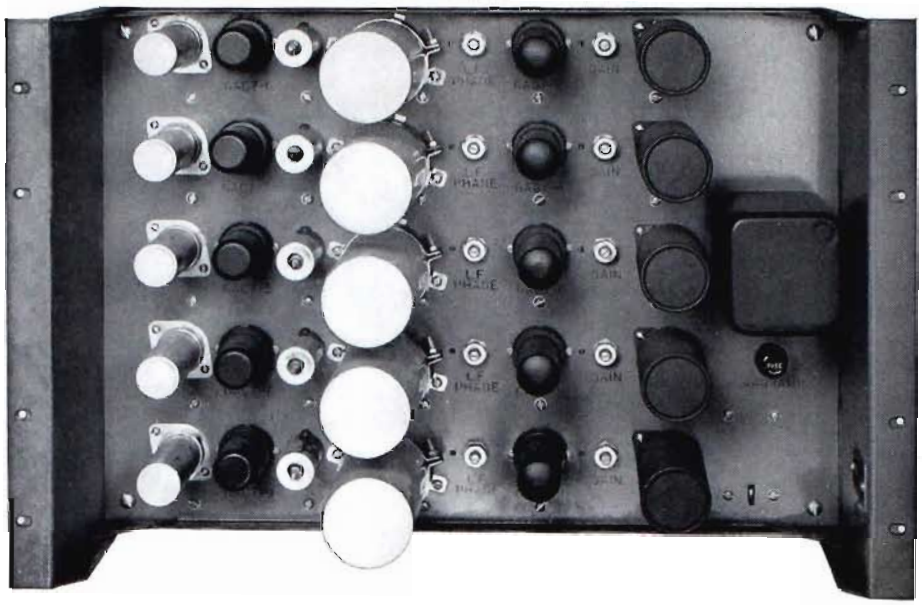


Sketch showing Distribution Box Connection



Pulse Distribution Box with cover removed

Distribution Amplifier, Type TA-1A



Features

- Equally useful as distribution, mixing or isolation amplifier.
- Five amplifiers on one chassis.
- Bridging inputs.
- Excellent isolation between equipments.
- Positive or negative polarity.
- Standard "bath tub" type chassis.
- Accessible mounting arrangement.

Uses

The Type TA-1A Distribution Amplifier may be used in any one of the three following applications: (a) to feed video or pulse signals from a single source to several separate outlets; (b) to mix video and synchronizing signals in order that they may be fed to a single output line; ;(c) as a straight-forward isolation amplifier, by paralleling all five channels. The wide variety of possible uses of this equipment makes it equally adaptable to test bench, laboratory, or television transmitting installations.

Description

The equipment consists of five separate video isolation amplifiers mounted on a single chassis. These amplifiers are of the bridging type, and have relatively high input impedance, permitting a number of them to be paralleled across a video line with a minimum disturbance to the driving source. Each amplifier delivers, to a 75 ohm output line, a signal of the same level and polarity as it receives.

When the amplifiers are used to feed several output lines, the inputs being paralleled, there is a high degree of isolation between lines and between any individual line and the source. Thus, disturbances, short circuits, equipment failures, or the like on one line will not be reflected onto the other lines. This is of considerable value to good overall operation in any television installation.

The components of the TA-1A are assembled on a chassis of the recessed, or "bath tub" type. All tubes and other large components are mounted on the front of the chassis, with the resistors and other small components on the rear. This type of construction provides neat appearance, convenient operation and maximum accessibility. The chassis is standard rack width and is designed to mount in either an enclosed cabinet type rack or a standard open type rack. In the latter case a cover panel may be used, if desired.

Each of the five amplifiers consists of two stages. The two tubes and other components which make up each amplifier are arranged in a row across the chassis. Each amplifier is provided with a gain control so that the gain may be varied from approximately .9 to 1.1. This feature is especially convenient when it is desired to equalize accurately the levels on the several output lines.

The input and output connections on the rear of the amplifier are designed to accommodate standard fittings for either RG 11/U or RG 59/U coaxial lines. Two connectors are provided for each input and each output to facilitate interconnecting the sections. This amplifier may be used at any point in a television system regardless of whether the polarity at that point is positive or negative. An adjustment is provided for reducing the low frequency phase distortion to a negligible value.

A built in filament transformer provides filament voltages for all tubes. Plate voltages are obtained externally, preferably from a well regulated power supply such as the Type 580-C. Power connections are made by means of a standard cable receptacle at the lower left of the chassis.

Specifications

Number of Amplifiers	Five
Voltage Gain, Each Amplifier	Adjustable .9 to 1.1
Frequency Char	±1 db to 10 mc, and adjustable to ideal 60 cycle square-wave response
Input Picture Signal Level (max.)	2 volts, peak-to-peak
Input Pulse Signal Level (max.)	4 volts, peak-to-peak
Output Signal Level (per section)	2 volts, peak-to-peak
Input Impedance	Bridging
Input Capacity (on two cable sockets)	40 mmf
Input Polarity	Positive or negative
Output Impedance	Approximately 2000 ohms
Output Polarity	Positive or negative
Power Supply Required:	
105-125 volts, 50-60 cycles	50 watts
d-c 280 volts (Type 580-C Supply)	260 ma
Tube Complement	5 RCA 6AC7, 5 RCA 6AG7
Dimensions	12¼" high, 19" wide, 8" deep
Weight	35 lbs.
Stock Identification	MI-26155

Accessories

Type 580-C Regulated Power Supply	MI-21523-B1

Stabilizing Amplifier, Type TA-5C

Features

- Reshapes sync portion of degraded composite signals.
- Amplifies sync portion of signal to desired value of from 0-1.5 volts.
- Removes low frequency distortion on signal.
- Has separate "sync output" in phase with incoming signal.
- "Picture Output" provides 2.0 volts across 37.5 ohms.
- Has "Monitor Output" for monitoring purposes.
- Can mix sync with camera signals.
- Cleans up blanking pulse.
- Gain and sync level can be controlled separately and remotely.
- Operates on signals as low as .15 volts peak-to-peak.
- Bathtub chassis for standard rack mounting.

Uses

The TA-5C stabilizing amplifier, which replaces the TA-5B design, is a unit for: correcting many types of faulty television signals, mixing sync with video signals from the cameras, supplying a separate sync pulse for local sync generator "lock-in," and for removing sync from a remote signal so that it may be switched, faded or dissolved with local signals. Here are a few ways in which the TA-5C equipment is employed:

(1) In a microwave relay system.
(2) On the input of a remote or network incoming line.
(3) On the output of a studio line.
(4) With the RCA studio switching equipment in a master control room as individual studios.
(5) On the input of the transmitter.

Some of the common sources of disturbance which the TA-5C will correct are as follows:

1. Hum or surges originating in power supplies and other random disturbances created by high-impedance grounding circuits, long cable sheaths, etc.
2. Circuit saturation, with resultant destruction of the proper sync-picture ratio.
3. Switching surges.
4. Low-frequency distortion introduced by coupling circuits with inadequate time constants.

Description

The TA-5C stabilizing amplifier is a new improved circuit design which replaces its predecessor, the TA-5B. It clips a composite signal at blanking level. The video portion of the signal, with its cleaned up blanking reference, is fed to a mixing amplifier stage where sync (which was previously clipped and reshaped) is once again added.

Separate gain controls are used on both video and sync portions of the signal and permit a sync range setting of 0 to 50%. The recombined composite signal is fed to a two-stage picture amplifier which provides the proper output across 37½ ohms and to a monitor output circuit which feeds 75 ohms.

Sync is separated from the composite video signal and after two stages of clipping provides a standard RMA sync signal to a sync output jack. This signal may be used to phase a local sync generator with the incoming remote signal. Thus, it is possible to add the local sync signal to the remote video signal, making possible "fades and dissolves" between local and remote signals.

A two-position attenuator at the input accommodates a range of input signals from 0.25 volt to 15 volts, peak-to-peak. The output of the amplifier is designed to deliver the standard level of picture and blanking signal (1.5 volts, peak-to-peak) with a maximum sync of 1.5 volts peak-to-peak. The amount of sync can be adjusted independently to any value between 0 and 1.5 volts, peak-to-peak.

Filament power for all tubes is provided by a transformer mounted on the chassis. Plate voltage must be obtained from an external regulated power supply such as the RCA Type 580-C. All external power connections are made through an 8-pin plug and receptacle. One side of the primary line to the filament transformer is fused.

The TA-5C Stabilizing Amplifier is mounted on a recessed chassis for standard rack-mounting. Therefore, it can be mounted in the transmitter room or studio control room with other rack-mounted equipment.

Specifications

Power Requirements:

A-c	109-125 volts, 55 watts, 50/60 cycles
D-c	280 volts, 320 ma.

Input Signal Requirements:

Composite Signal Black Negative	.15 volts peak-to-peak
Sync Amplitude (minimum)	15% of composite signal
Local Sync Signal	3.5-5.0 volts

Output Signal Values:

Picture Component	1.5 volts peak-to-peak
Sync Component of Composite Signal	0-1.5 volts peak-to-peak
Sync Output (negative)	4.0 volts peak-to-peak
Stable Operation Limits	
Composite Signal Level Change	±6 db
(Picture level will change; sync level will remain constant)	

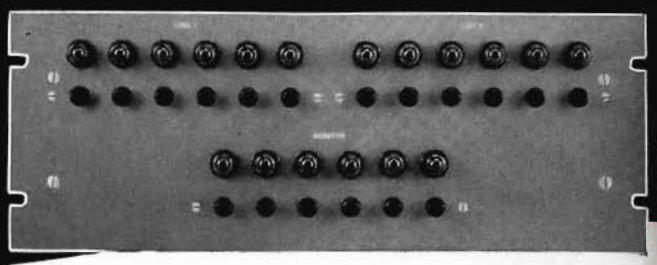
Dimensions:

Height	10½"
Width	19"
Depth	8⅝"
Weight	17 lbs.
Finish (front of chassis)	Light umber gray
Stock Identification	MI-26160-B

Tube Complement:

9 RCA 6AC7	1 RCA 6SL7GT
4 RCA 6AG7	1 RCA 6H6
1 RCA 6SK7	1 RCA OD3/VR-150
2 RCA 6SN7GT	

Regulated Power Supply (Heavy-Duty) WP-33B. Provides well-regulated d-c voltage at loads of 200 to 600 ma. Adjustable output, 260 to 295 volts. Voltage variation, less than 0.2 volt between minimum and maximum load.



Switching Panel, TS-1A. A convenient way to switch any one of 6 different input video signals to TV transmitter, or to local and remote monitors.

Everything in

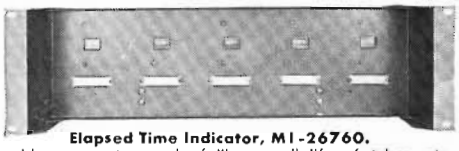
Regulated Power Supply, TY-25A. Provides well-regulated d-c source at loads from 200 to 300 ma. Output is adjustable between 260 and 290 volts. Less than 0.5% variation between minimum and maximum load.

Regulated Power Supply, 580-C. Output adjustable between 260 and 295 volts—at 50 to 400 ma. Less than 0.25-volt variation between min. and max. load. Includes meter selector switch and meter jack.

Current Regulator, MI-26090. Maintains constant current in focus coil of Studio Camera TK-10A. Current can be adjusted over a range of 65 to 85 ma.

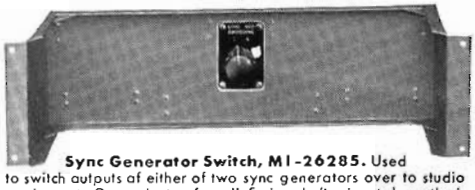
Power Relays MI-26761. Provides remote power switching in conjunction with Power C Panel MI-26251. Includes 5 separate power r

Stabilizing Amplifier Control, MI-26250. Includes three potentiometers. Controls: (1) picture gain; (2) picture clipper; (3) sync level in stabilizing amplifier.

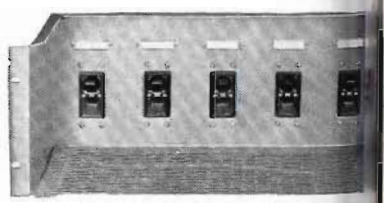


Elapsed Time Indicator, MI-26760. Provides constant record of "hours on" life of tubes, etc. Includes 5 individually-operated counter indicators driven by synchronous motors.

Sync Generator Phasing Control, MI-26249. Provides for phasing one of two local synchronizing generators with one remote synchronizing generator.



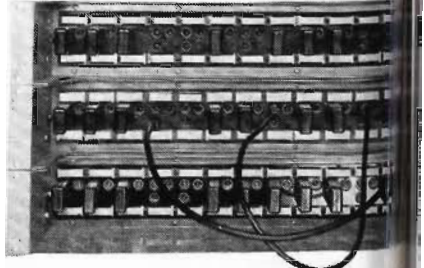
Sync Generator Switch, MI-26285. Used to switch outputs of either of two sync generators over to studio equipment. One selector for all 5 signals (horizontal, vertical, blanking, sync, and CRO sync).



Circuit Breaker, MI-26240. Designed as m switch breaker between power line and TV stu equipment. Accommodates up to 5 breakers (cho of breakers available, extra).

Relay Receiver Control, MI-26247. Controls video gain and receiver tuning. Includes 2 potentiometers, AFC "on-off" switch, tally light, and telephone jack.

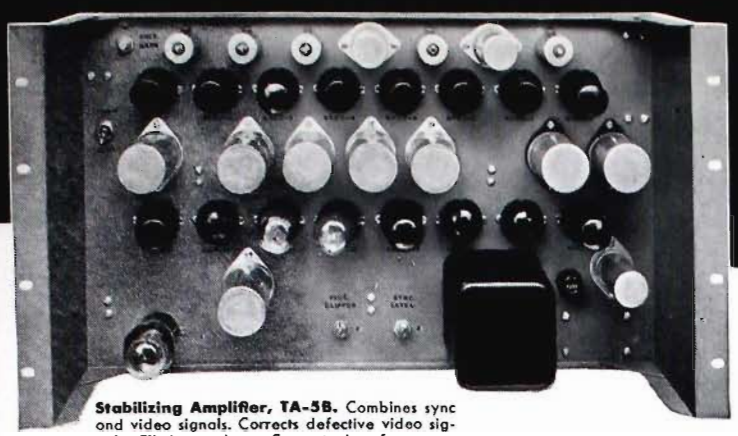
Panel Adapter MI-26254. Enables you to mount control panels (shown in left column and below) in any standard rack.



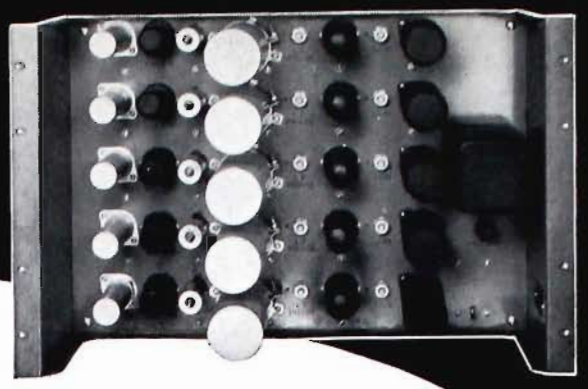
Monoscope Camera Control, MI-26248. Provides remote control of video gain, and focus of monoscope camera. Includes 2 potentiometers wired to terminal board.

Power Remote Control, MI-26251. Operates up to 5 power supplies through 120-volt relays. Has 5 "on-off" toggle switches and 5 tally lights.

Video Jack Panel, MI-26245. For patchin and/or sync signals. Includes 12 groups of coax assemblies (3 per group). Video jack plugs and cord



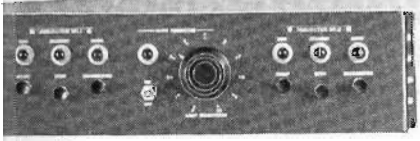
Stabilizing Amplifier, TA-5B. Combines sync and video signals. Corrects defective video signals. Eliminates hum. Corrects low-frequency response. Improves signal-to-noise ratio of sync signals.



Distribution Amplifier, TA-1A. Well-suited for use as: (1) video and sync signal mixer, (2) isolation amplifier, or (3) for feeding video or pulse signals from a single source to separate outlets.

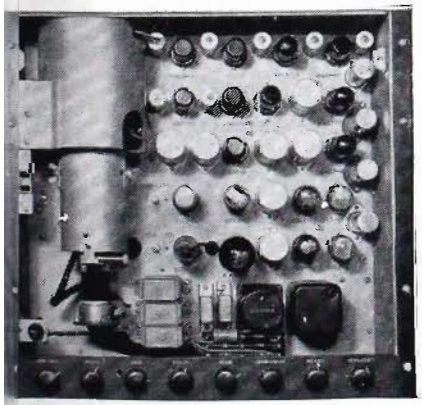
Rack-mounted Units for TV stations

Mixing Amplifier, TA-10A. Useful as mixing, fading, remote control, or isolation amplifier. Two bridging-type inputs; one output. Positive or negative polarity.



ector Change-Over MI-26321. Designed for start-, stopping or simultaneous changeover of light and sound 1 and 35-mm film programming. Handles two projectors any combination (16mm or 35mm).

ord Equalizer, MI-26313. Provides proper frequency ompensation of 16-mm sound reproduction. Compensator etwork tilts frequencies above 1000 cps in 2-db steps. ar and Shelf (MI-26581), available extra.



f-contained Monoscope Camera, TK-1A. Ideal o signal source of known quality for testing: station ams, video amplifiers, picture tubes, TV receivers. Pattern ws scanning symmetry, vertical and horizontal resolution, ding, contrast, and brightness.

. . . control panels, amplifiers, projector changeover, switch panels, relay and indicator panels, power supplies, circuit breakers, jack panels

Here is your answer for ready-to-operate units that can be installed wherever you need them.

All units are identical in design and construction to those used in RCA's regular station-proved TV Broadcast Equipment—and are built with the same high-quality components. Units are built on recessed, or "bathtub" type chassis. Tubes and components are within handy reach. Controls are centralized and clearly marked.

Representing the most comprehensive line of rack-mounted TV equipment in the industry, these carefully engineered units can readily be mounted in enclosed-type racks or in standard open-type racks. Many types can be mounted conveniently in RCA console-type housings.

• • •

RCA rack-mounted units are being used in practically every television station in the country. For information about any one of them . . . or the entire line . . . simply ask your RCA Broadcast Sales Engineer. Or write Department 19KB, RCA Engineering Products, Camden, New Jersey.

Mixing Amplifier, Type TA-10A

Features

- Useful as a mixing, fading, remote control or isolation amplifier.
- Accommodates two inputs—one output.
- Bridging type inputs provided.
- Positive or negative polarity.
- Standard "bath tub" type chassis.
- Accessible mounting arrangement.

Uses

The type TA-10A, Mixing Amplifier may be used in several different television applications. As a mixing amplifier it may be employed for sync addition. For fader service, the TA-10A may be used to fade, lap dissolve, or mix two picture signals. Either in the above applications, or as an isolation amplifier, the TA-10A may be adjusted for fixed gain or may be operated from a remotely located control position.

Description

The TA-10A equipment consists of two input amplifier stages feeding (through a common load network) a single output stage. These inputs are of the bridging type and have relatively high input impedance, thus permitting parallel operation with other units, and operation from a cathode follower source. The output stage is designed to feed a 75 ohm line, delivering a signal of the same level and polarity as that which is fed into either input channel (one channel on—the other off).

The components of the TA-10A are assembled on a chassis of the recessed, or "bath tub" type. All tubes and large components are mounted on the front of the chassis—with circuit wiring, small component terminal boards, video and power connections located at the rear. This type of construction provides neat appearance, convenient operation and maximum accessibility. The chassis is standard 19″ rack width and is designed to mount in either an enclosed cabinet type rack or a standard open type rack. In the latter case, a cover panel may be used, if desired.

Two methods of gain control are provided. The remote control feature provides for remotely located potentiometers which vary the grid bias on the input stages (a bias supply is "built-in" the TA-10A for use with this external circuit if desired). In this way, the gain may be varied from cut-off to full output. Secondly, potentiometers on the chassis provide for adjustment of the full gain value from approximately .9 to 1.1. (This feature is essential in maintaining standard system levels.)

The input and output connections are designed to accommodate standard fittings for RG-11U (MI-83) or RG-59U (MI-75) coaxial cables. Two connectors are provided for each of the two inputs to allow for terminations or "loop-through" circuits.

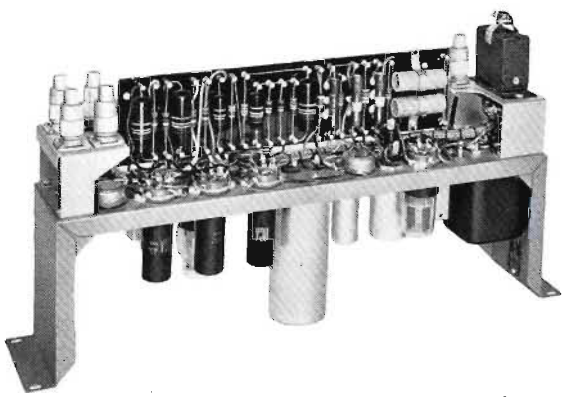
An adjustment is provided for reducing the low frequency phase distortion to a negligible value. The bias supply is also provided with a voltage adjustment.

A built-in, filament transformer supplies filament voltages for all tubes. Plate voltages are obtained externally, preferably from a well-regulated power supply such as the type 580-C. Power connections are made by means of a multi-pin receptacle.

For fader service, a remote fader lever assembly is available as MI-26531-2. This assembly is also included in the MI-26220-1 and MI-26220-2 and MI-26221 push-button panels which are used in the TS-20A Relay Switching System.

Specifications

Inputs	2
Outputs	1
Voltage Gain, Each Amplifier, Maximum	.9 to 1.1 (adjustable)
Voltage Gain, Each Amplifier, Remote Control	Cut-off to maximum
Frequency Response	±1 db to 8 mc, and adjustable to ideal 60 cycle square-wave response
Input Signal Level	2 volts, peak-to-peak
(Channel 2, Composite sync)	4 volts, peak-to-peak
Output Signal Level	2 volts, peak-to-peak
Input Impedance	Bridging
Input Polarity	Positive or negative
Output Load Impedance	75 ohms
Output Polarity	Positive or Negative
Power Supply Required:	
A-c, 105-125 Volts (tap adjustment) 60 Cycles	20 watts
D-c, 280 Volts (type 580-C supply)	120 ma
Tube Complement:	3 RCA 6AG7, 1 RCA OD3NR150, 1 RCA 6SL7GT
Dimensions	3½″ high, 19″ wide, 10″ deep
Weight	12 lbs. approx.
Finish	Dark umber gray
Stock Identification	MI-26281



Small components, video and power connection are at rear of chassis

Regulated Power Supply, Type 580-C

(General Purpose)

Features

- Extremely well-regulated output.
- Unusually low output ripple.
- Low internal d-c resistance.
- Components and connections easily accessible.
- Compact and neat in arrangement.

Uses

The RCA Type 580-C Regulated Power Supply fills the need for a well-regulated source of d-c at loads of 50 to 400 milliamperes. The output is adjustable between 260 and 295 volts, with variations of less than 0.25 volts from minimum to maximum load. Thus it is suitable for laboratory, industrial, and communications applications in which an unusually well-regulated source of d-c is required. As a-c ripple in the output is less than 0.005 per cent, the output voltage may be used for most purposes without additional filtering.

The Type 580-C is especially suited for use with RCA television equipment, which it matches in appearance and construction.

Description

The regulating circuit employed in the 580-C is of the series type. The d-c internal resistance is less than 0.7 ohms.

This Power Supply is assembled on a recessed chassis of the "bath-tub" type. Tubes and filter condensers project from the front of the chassis, while transformers, resistors, and wiring are at the rear. The chassis is standard rack width and may be mounted either in one of the new enclosed-type RCA cabinet racks, or on a standard "open-face" rack. In the latter event a blank panel may be mounted over the Power Supply if desired. Controls are centralized on a small, plainly-marked panel at the bottom of the unit. In addition to the power "on-off" switch there is provision for switching from a load range of 50-80 ma. to 80-400 ma., as well as a potentiometer for adjusting output voltage. A meter selector switch and a meter jack provide for plugging in a meter to read individual tube plate currents, output current, and output voltage. A special meter (MI-21200-C) is available for this purpose.

Specifications

Output Voltage	Adjustable 260 to 295 volts
Output Current	50 to 400 ma.
D-C Regulation	Less than 0.25 volts, minimum to maximum load
A-C Ripple	Less than 0.005 per cent
Power Supply	110-120 volts, 50-60 cycles
Power Input	370 watts (maximum)
Tube Complement:	
2 RCA 0D3/VR150	1 RCA 6SL7GT
2 RCA 5U46	6 RCA 6Y6G
1 NE 32	
Dimensions	10½" high, 19" wide, 12" deep
Weight	58 lbs.
Stock Identification	MI-21523-B2

Accessory

Plate Current Meter	MI-21200-CL

Regulated Power Supply, Type WP-33B

(Heavy Duty)

Features

- Extremely well-regulated output.
- Unusually low output ripple.
- Low internal d-c resistance.
- Components and connections easily accessible.
- Kinescope centering-voltage supply included.
- Compact and neat in arrangement.
- Output voltage during starting does no exceed final regulated value.

Uses

The RCA WP-33B Power Supply is intended for laboratory, industrial and communications applications requiring a well-regulated source of d-c voltage at loads of 200 to 600 milliamperes. The output is adjustable between 260 and 295 volts, and varies less than 0.20 volts from minimum to maximum load. A-C ripple in the output is less than 0.005 per cent, so that the output voltage may be used for most purposes without additional filtering.

The Type WP-33B is especially suited for use with RCA television equipment, which it matches in appearance and construction.

Description

The regulating circuit employed in the WP-33B is of the series type. The d-c internal resistance of this Power Supply is less than 0.5 ohms.

The WP-33B is assembled on a recessed chassis of the "bath tub" type. Tubes, filter condensers, and transformers project from the front of the chassis, while transformer terminals, resistors, and wiring are at the rear. The chassis is standard rack width and may be mounted in one of the new enclosed-type RCA cabinet racks or on a standard "open-face" rack. In the latter event, a blank panel may be mounted over the Power Supply if desired.

Controls are centralized on a small, plainly-marked panel at the bottom of the unit. In addition to the power "on-off" switch, there is a potentiometer for adjusting output voltage. A meter selector switch and a meter jack make provision for plugging in a meter to read individual tube plate currents, output current, and output voltage. A special meter (MI-21200-C) is available for this purpose.

Specifications

Output Voltage	Adjustable 260 to 295 volts
Output Current	200 to 600 ma.
D-C Regulation	Less than 0.20 volts, minimum to maximum load
A-C Ripple	Less than 0.005%
Power Supply	105/125 volts, 50/60 cycles
Power Input	450 watts (maximum)
Tube Complement:	4 RCA 5R4GY, 1 RCA 6SL7GT, 1 NE 32, 3 RCA 6AS7G, 2 RCA 0D3/VR150
Dimensions	14" high, 19" wide, 9" deep
Weight	82 lbs.
Stock Identification	MI-26085-B

Accessory

Plate Current Meter	MI-21200-C1

Regulated Power Supply, Type TY-25A

The Regulated Power Supply, MI-26086, as furnished for mounting in a standard rack

Features

- Extremely well-regulated output.
- Unusually low output ripple, less than .01%.
- Can be rack-mounted, also available in attractive carrying case.
- Input and output plug connection easily accessible.

Use

The RCA Type TY-25A is a special lightweight power supply which provides a well-regulated source of d-c at loads from 200 to 300 milliamperes. The output is adjustable between 260 and 290 volts, with variations of less than 0.5% from minimum to maximum load. Thus, the power supply is suitable for laboratory, broadcast, industrial and communications applications in which an unusually well-regulated, well-filtered source of d-c is required. The TY-25A is especially suited for use with RCA broadcast equipment, which it matches in appearance and construction.

Description

The TY-25A Power Supply is assembled on a recessed type chassis, which is standard rack width and can be mounted in RCA cabinet-type or open racks. Transformer, tubes and filter condensers project from the front of the chassis, while resistors and plug connectors are at the rear. Controls consist of an a-c line voltmeter, a power on-off switch, meter selector switch, output voltage adjustment and a meter jack. The meter selector switch and meter jack provide for plugging in a separate meter to read individual tube plate currents, output current and output voltage. A special meter (MI-21200-C) is available for this purpose.

Specifications

Output Voltage	Adjustable 260-290 volts
Output Current	200-300 ma.
D-c Regulation	0.5% variations, min. to max. load
A-c Ripple	Less than 0.01% (peak-to-peak)
Power Requirements	120 volts, 60 cy., 300 w.
Dimensions	10½" high, 19" wide, 9" deep
Weight	50 lbs.

Stock Identification:

Power Supply for Rack Mounting	MI-26086
Power Supply in Carrying Case	MI-26096
Carrying Case Only	MI-26527

Tube Complement

1 RCA 6SL7-GT	2 RCA 6AS7G
2 RCA OD3/VR150	1 NE-32
2 RCA 5R4GY	

Regulated Power Supply mounted in a carrying case for portable use (MI-26096). The case is available as MI-26527.

Current Regulator, MI-26090

Features

- Counteracts current variations in camera focus coil circuit.
- Current can be manually adjusted over a range from 65 to 85 milliamperes.
- Common tube types are employed.
- All tubes easily replaced from front of unit.
- Designed for standard racks and cabinets.

Use

The Current Regulator is an electronic device which maintains constant current in the focus coil of the TK-10A Studio Camera. Variations in the magnitude of current flowing through the coil are brought about by temperature changes, which would ordinarily 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 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:

A-c	Single phase 117 volts, 60 cycles, 15 watts (for fil. transformer)
D-c	400 volts from Type 580-C Power Supply

Chassis Dimensions:

Depth	5½"
Width	19"
Height	8"
Weight	9 lbs.

Tube Complement:

1—RCA 0D3/VR150 Voltage Regulator
1—RCA 991 Voltage Regulator
1—RCA 6SL7-GT D-C Amplifier
1—RCA 6Y6-G Current Regulator

Stock Identification—MI-26090

Accessories

Plate Current Meter—MI-21200-C1

TV Studio Lighting Equipment

Features

- Efficient, economical lighting equipment for most any type of TV studio
- Complete line of equipment available — incandescents, fluorescents and hi-intensity spots.
- Fully controllable—maximum of rotation and tilt offers flexibility of use.
- Noiseless control through chrome fairleads provided by central control board.
- All types may be ceiling mounted in an inverted pyramid pattern.
- High-voltage wiring is eliminated.

Uses

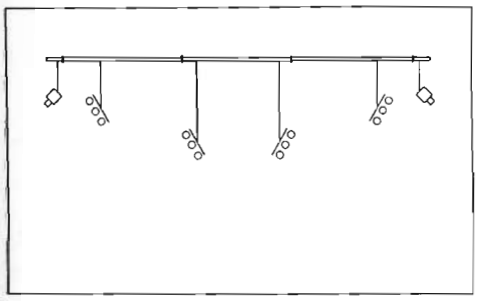
RCA's television studio lighting equipment enables controllable lighting of TV studios. In use, all units may be remotely and noiselessly controlled from a central control board. Lights are usually ceiling mounted in an inverted pyramid (see sketch below) for most efficient use of equipment.

Description

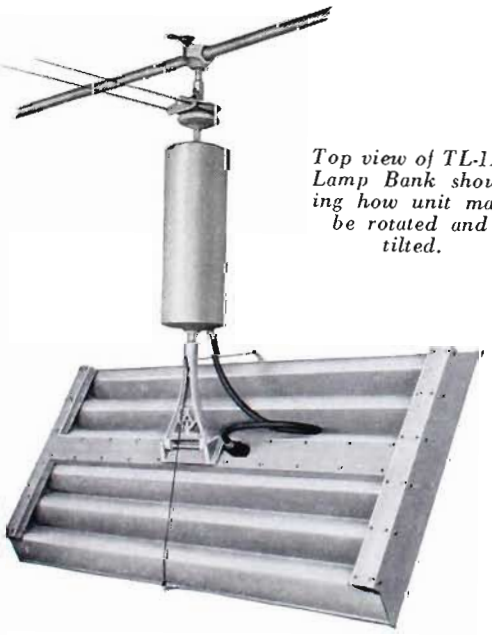
A complete line of studio lighting equipment including hi-intensity controllable fluorescents, incandescent units, Fairlead control guides, spotlight hangers, control board and switching panels are available to the telecaster. All equipment is studio tested and may be supplied as a packaged system to match the lighting response curves of modern studio cameras. Lighting equipment systems for handling any studio setup can be furnished (see sketches for small and average studio). Hi-intensity fluorescents easily provide 200 foot candles of uniformly distributed light. All lights are rotatable, may be tilted, and are designed for inverted pyramid mounting on studio ceilings. Studio lights are conveniently controlled mechanically from a central control board.

Maximum flexibility is provided, since each light may be positioned for basic work, modeling, or back lighting. Each light may be directed to more than one acting area. Dimming by tilting, rotating, or cutting off half banks can be accomplished without disturbing the light distribution. All equipment is mounted "off-the-floor," thus leaving valuable studio space free from congestion. RCA will gladly assist in the planning of studio lighting arrangements to meet particular station requirements.

Typical TV Studio-Proved Floor Plans and Ceiling Arrangement for RCA Lighting Systems

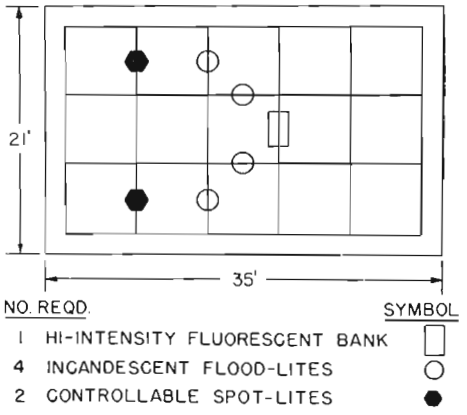


Cross-sectional view of a TV studio, showing RCA's inverted pyramid-type of lighting. This system delivers unobstructed light to every point in the studio.

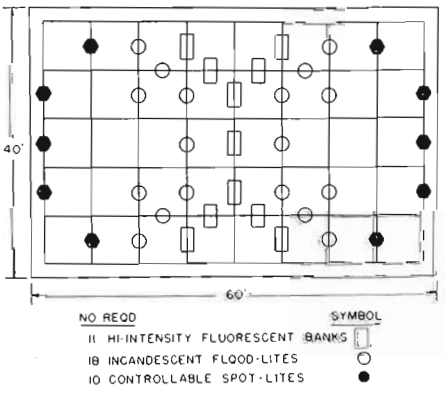


Top view of TL-1A Lamp Bank showing how unit may be rotated and tilted.

For a small interim-type studio, 21 feet by 35 feet. This plan more than meets the minimum lighting requirements of 200 foot candles and a contrast range of 2-to-1.



For the average-size studio, 40 feet by 60 feet. This plan more than meets the minimum lighting requirements of 200 foot candles and a contrast range of 2-to-1.



TV Studio Lighting Equipment (Continued)

High-Intensity Fluorescent Bank, Type TL-1A

HI-INTENSITY FLUORESCENT BANK, TYPE TL-1A

The fluorescent bank is designed for general studio illumination where Image Orthicon cameras are employed. It is fully controllable in rotation and tilt (rotates 360 degrees; tilts 170 degrees). Built-in rubber-cushioned ballast units, heavy duty jumper cord connections, and instant start, hi-voltage striking circuit. Designed for use with 3500-4500 Kelvin slim-line tubes for producing proper color temperature illumination. Only 600 watts connected load. 2000-3000 hour life. Individual parabolic alzac reflectors for each tube pre-focused at 20 feet.

Specifications

Total Wattage	600 watts
Lamps	6, 3500° K slim-line 5 ft. tubes
Suspension	Standard full control unit
Supply Voltage	60 cycles, 115 volt, a-c
Stock Identification	MI-26615

INCANDESCENT LAMP BANK, TYPE TL-5A

The 12-lamp standard light source for normal studio operation. Ideal for slow fades and provides equal light distribution on "douses." Circuits terminate in a recessed male twist lock receptacle with connecting jumpers furnished. Heavy duty asbestos covered interior wiring is used. Maximum load per circuit is 3 kw; per unit is 6 kw. Recommended lamping is 3 kw overall and 1½ kw per circuit. Utilizes heavy duty ball-bearing mounted control spindle, quick release head clamp, fixture clamp and ¾ inch pipe extension. Single cast aluminum grille construction. Rotates 360 degrees. Tilts 170 degrees. Noiseless control.

Specifications

Finish	Dark umber gray wrinkle and chrome
Weight, Control Spindle	7 lbs.
Weight, Unclamped Fixture	28 lbs.
Total Weight	35 lbs.
Stock Identification	MI-26618

Incandescent Lamp Bank, Type TL-5A

Spotlight Hanger, MI-26620

SPOTLIGHT HANGERS, TYPES TL-10A & TL-11A

(2 KW MI-26621, and ¾ KW MI-26620)

Convenient spotlight hangers are available for use with Mole-Richardson or Oleson 2-KW Solar Spot, or 750 watt Baby Spot. Rotation of 360 degrees and a tilt of 170 degrees about the point of support is provided.

Specifications

Finish	Dark umber gray wrinkle and chrome
Weight (Spindle and Adaptor)	10¾ lbs.
Weight, 2-KW Spot	41 lbs.
Weight, ¾-KW Spot	17½ lbs.
Total Weight, 2-KW Assembly	51¾ lbs.
Total Weight, ¾-KW Assembly	28¼ lbs.
Stock Identification:	
¾-KW Hanger	MI-26620
2-KW Hanger	MI-26621

ROTATABLE LAMP MOUNT, TYPE TL-15A

The rotatable lamp mount is furnished with or without extension bars for mounting individual or multiple flood lamps, as desired. Control spindle can rotate 360 degrees—tilt 170 degrees about the point of support.

Specifications

Finish	Dark umber gray wrinkle and chrome
Weight	35 lbs. approx.
Stock Identification (scoops not included)	MI-26622

FAIRLEADS, TYPE TL-32A

The Fairlead provides a practical way of guiding mechanical control lines to the control board without noise. It is fully adjustable and will rotate 360 degrees or tilt 170 degrees about the point of support. It is equipped with a quick-release grid-iron clamp. Nine chrome bushings reduce control line friction.

Specifications

Finish	Dark umber gray wrinkle and chrome
Weight	4¼ lbs.
Stock Identification	MI-26632

HIGH-INTENSITY DOLLY LIGHT, TL-26A

The TL-26A Dolly Light is designed to provide maneuverability in studio lighting at floor levels. It is ideal for front light reinforcement and low-angle side illumination in difficult program situations. It may also be used as a mobile floor unit where restricted heights make the usual ceiling installations difficult. The TL-26A uses six five-foot Slimline lamps mounted in Alzak reflectors. Entire reflector is rigidly supported by cast aluminum construction plus steel backing channels. Dolly wheels incorporate individual foot-operated wheel locks. Light banks may be rotated from horizontal to vertical and tilted through 90 degrees. Built-in rubber cushioned ballast is mounted over center support spindle. The TL-26A may be easily modified for ceiling mounting, when desired.

Specifications

Total Wattage	600 watts
Lamps	6, 3500 K slimline 5-foot tubes
Dolly	Similar to Type TD-25A
Power	60 cycle, a-c
Finish	Umber gray
Stock Identification	MI-26617

TV Studio Lighting Equipment (Continued)

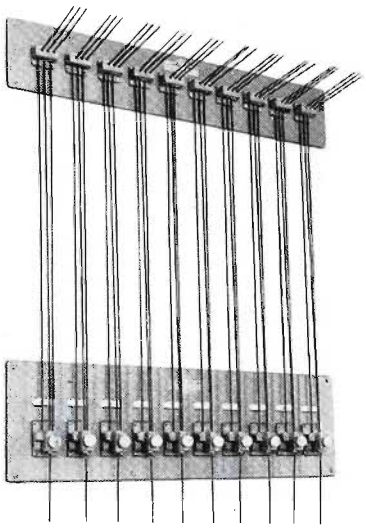
MERCURY SWITCH PANEL, TYPE TL-30A

The mercury switch panel is designed to provide instantaneous and noiseless switching of studio lighting equipment. It handles up to 20 separate circuits in the space normally occupied by one ordinary circuit breaker. The panels are bracket mounted and may be connected in series for multiple assemblies. Panelboard can be used to double as a wire trunk.

Mercury Switch Panel, MI-26624

Specifications

Size	33″ x 14″ x 5½″
Construction	Aluminum with dark umber gray wrinkle
Weight	22 lbs.
Stock Identification	MI-26624



Light Control Panel, MI-26627

LIGHT CONTROL PANEL, TYPE TL-31A

The light control panel is a completely assembled unit which consists of ten headblocks and ten rope locks for controlling ten light banks. The headblock which is equipped with three chromed grommets and a noiseless split roller—and the rope lock assembly which provides an automatic lock for any degree of tilt are available as single units.

Specifications

Finish	Dark umber gray wrinkle and chrome
Weight	14½ lbs.
Stock Identification:	
Ready-to-Operate Panel	MI-26627

Console Housings and Wing Sections

Features

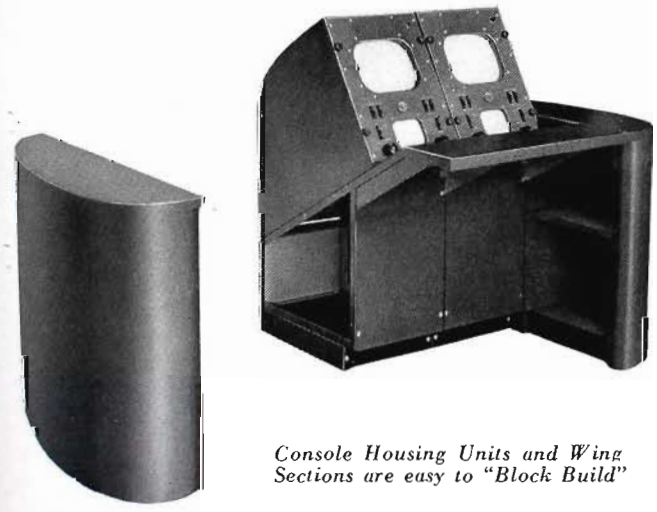
- Convenient mounting for remote control panel equipment or master monitor.
- Sturdy steel frame construction.
- Two-tone umber gray to match companion studio equipment.
- Removable cover plates allow access to components.
- Allows "block-building" to suit individual needs.

Use

RCA standard "add-a-unit" Console Housing and End Sections are available for mounting Master Monitors, or the Television series of Remote Control Panels. The bottom portions of console housings may be used for housing Studio Camera Controls, Film Camera Controls and the TS-10A Switching Control Chassis. Thus, the console housing may be used for TV studio applications and expanded as additional facilities are required. The trim "end" or "wing" sections are used to form an attractive studio console unit which gives a finished appearance.

Description

The Standard Console Housing Section consists of a steel framework structure which forms a convenient mounting for Studio equipment. It is finished in a dark umber gray to match other units. The operating desk portion is at a 28 inch height and is covered in a durable, burn-proof, black linoleum surface. The desk turret top section has holes provided at the rear for the adjustment of circuits without the removal of chassis units. Removable front cover plates allow easy access to console monitor units and blower assembly which is located below desk surfaces. (When a Master Monitor is used, the suitable blower, MI-26579-A should also be employed.)



Console Housing Units and Wing Sections are easy to "Block Build"

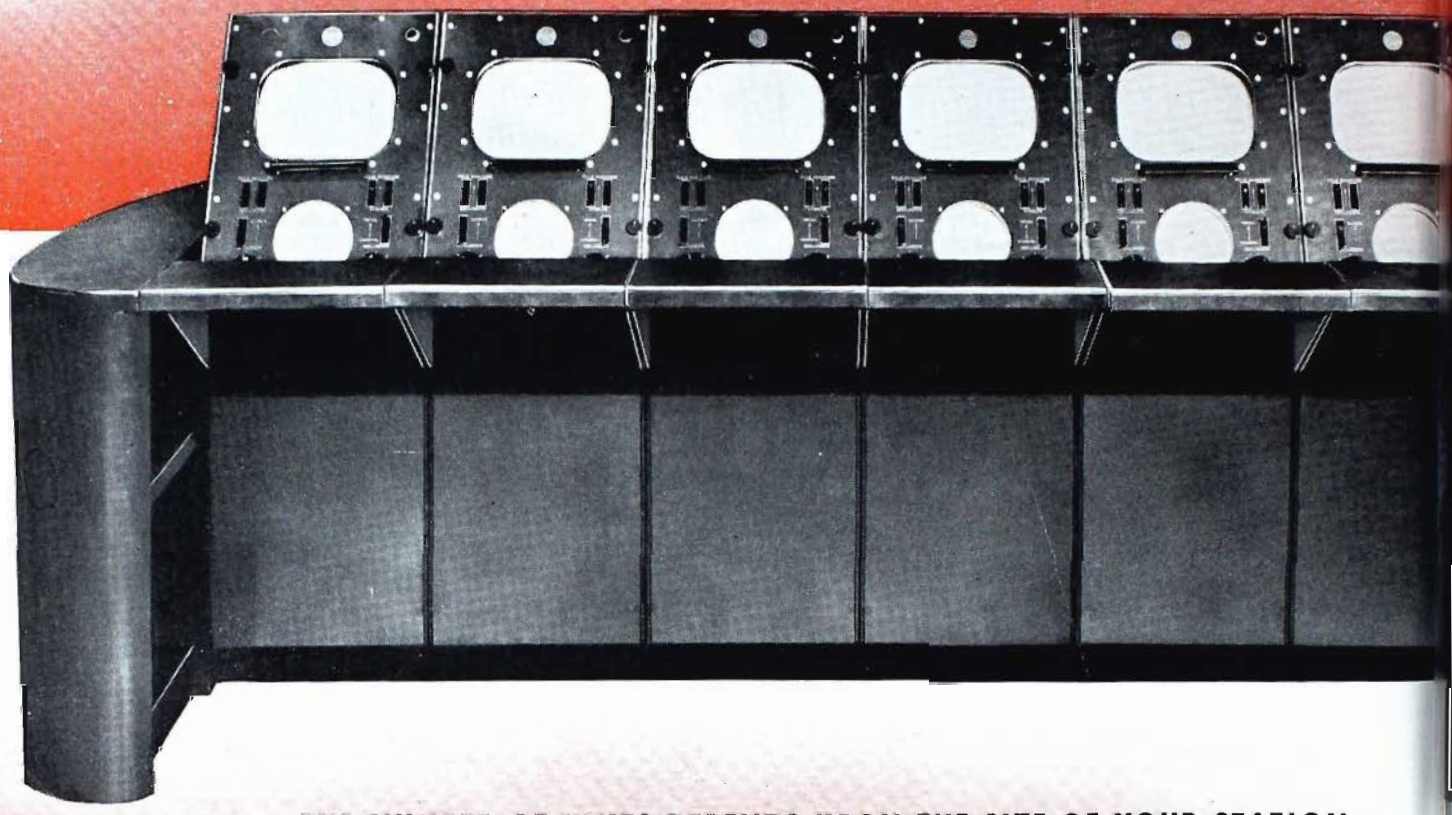
Between the console desk portion and the Master Monitor is a sloping area which is used for operating controls such as: Film Camera Controls, Studio Camera Controls or Studio Switching Chassis.

The trim "end" or "wing" sections are available for completing the console desk setup. They are finished in matching umber gray with block linoleum tops and give an attractive appearance to the installation. End sections are equipped with shelves which may be used for storage of files, station logs, etc.

Specifications

Stock Identification:	
Console Housing	MI-26266-B
Dimensions (Console Housing):	
Height	41″
Width	13¼″
Depth	36″
Weight	50 lbs.
Stock Identification:	
Console End Section (left wing)	MI-26265-1
Console End Section (right wing)	MI-26265-2
Dimensions (End Section):	
Height	28¼″
Width	9″
Depth	36″
Weight	43 lbs.

Now... a deluxe

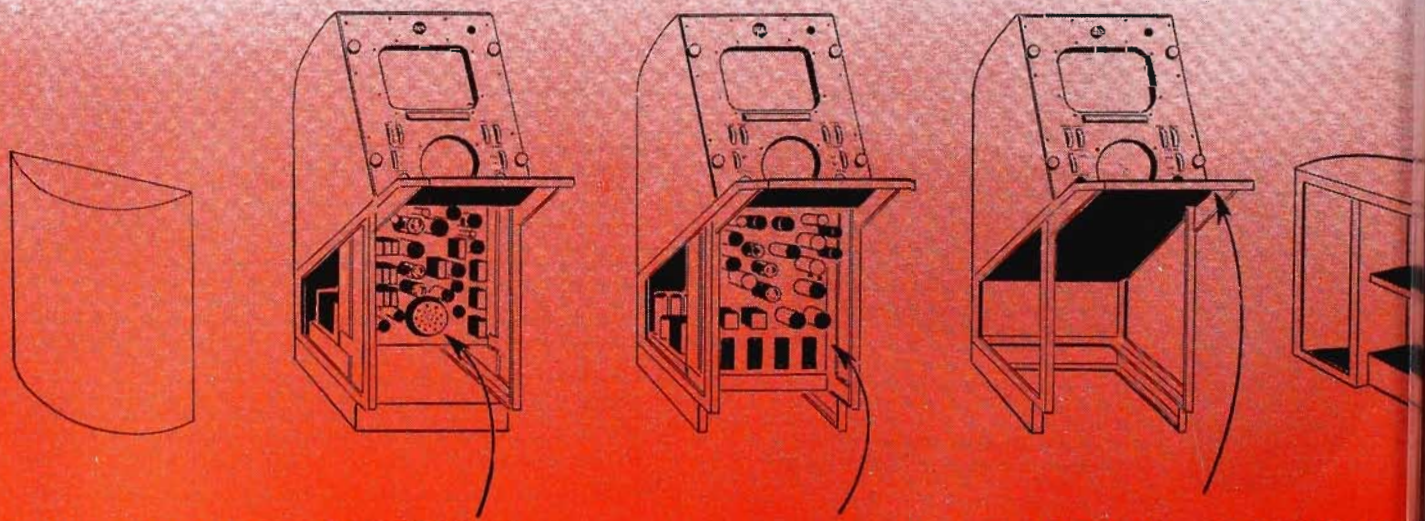


THE NUMBER OF UNITS DEPENDS UPON THE SIZE OF YOUR STATION

CAMERA MONITOR SECTION
(ONE FOR EACH STUDIO AND FILM CAMERA)

PROGRAM MONITOR SECTION

PREVIEW MONITOR SECTION



HOUSING END SECTION
(LEFT END)

CAMERA CONTROL UNIT

CAMERA SWITCHING UNIT

ON-THE-AIR
CAMERA SWITCH

HOUSING END
(RIGHT EN

Studio Console

for smooth video programming

Includes every practical facility and refinement for monitoring, dissolving, fading, and switching.

HERE'S THE CONSOLE that puts all electronic aspects of television programming "under control." It is already in production at RCA.

It contains everything needed to monitor, control, and switch the outputs of several studio cameras, film cameras, and network lines. Ten-inch Kinescopes provide for direct picture monitoring; five-inch oscilloscopes for checking video signal components. It's easy to increase picture brilliance, adjust contrast and focus, and provide proper shading.

Complete switching facilities centralize the selection of all video program material . . . permit push-button control of closeups, long shots, film commercials, station breaks, fadeouts, dissolves, wipes, special effects, and network programs.

Engineered with an eye to the future:

The number of units in the video console depends upon the size of your station. RCA's "add-a-unit" design gives you a compact, unified console, whatever your requirements . . . permits easy and economical addition of extra units as your station expands . . . without discard of any original equipment.

To co-ordinate all programming directions, provision has been made for telephone communication between key studio personnel and console operators.

This console, we believe, is a real contribution to convenient video control . . . another step by RCA to assure smoother studio programming . . . more interesting, more dramatic telecasting. We'll be glad to make specific recommendations for your station. Write Dept.

Normally, two operators handle a 5-monitor console . . . one selects the "on-the-air" signal at the request of the program director; the other has technical control of the individual cameras.

Television Camera Lenses

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.
- Ektar series of lenses (made exclusively for TV) provide high optical quality, precision interchangeability, barrel preset focusing and engraved depth of field scales.

Uses

RCA lenses are especially designed for television camera use (all lenses mount directly in the four-position turrets of RCA TK-10A and TK-30A studio and field cameras). A wide choice of lens sizes, speeds and focal lengths permits 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 four hundred 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 so-called "field" lenses indoors. The improved sensitivity of recent image orthicons has made it possible to stop down field lenses to f8 and f11 without resorting to additional illumination.

Description

The RCA television camera lenses range in focal lengths from 1½ inches to 25 inches (35mm to 610mm). Some of the short focal length Kodak lenses are now called "Ektanon" rather than "Ektar." Optically, the lenses are identical and both types are made exclusively for TV use. 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.

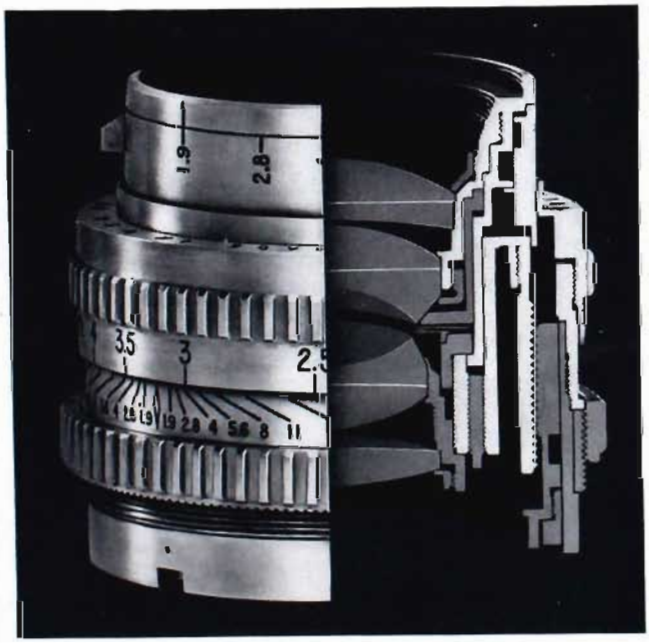
SPECIAL LONG LENSES (FIELD USE)

The group of special long lenses (frequently called telephoto) includes the 25-inch, 17-inch, 15-inch and 13-inch lens sizes. All incorporate simplicity of design, lightweight construction and are ideally suited for television field uses, sports pickup, etc. (focal lengths from 13 to 25 inches enable interesting closeups, particularly when action is over 50 feet away). The design requirement of lightweight construction is met by use of a thin, lightweight barrel which is specially threaded to minimize internal reflections. Instead of the usual glass assembly, brass shell and adjustable iris, the long lenses employ a high quality doublet (or achromat lens) consisting of two kinds of glass cemented together and mounted between two threaded aluminum rings. The achromat, as the name implies, is corrected for color distortion (correction is excellent below f-11 and acceptable at full aperture). Very lightweight, removable "Waterhouse" fixed stops (f-8, f-11, f-16 and f-22) are provided. The maximum aperture is approximately f5.0. Ability of the image orthicon to accept wide fluctuations in light level made the use of fixed stops (instead of built-in iris) possible and facilitated design of a lightweight barrel. All lenses incorporate a quick-change, precision-machined bayonet mount which permits rapid interchange or removal of long lenses from camera turret as desired.

Closeup of special 13" lens. MI-26550-10, suitable for either field or studio use.

STANDARD LENSES (STUDIO AND FIELD USE)

This group of lenses includes the 13-inch, 8½-inch, 135mm, 90mm, 50mm and 35mm sizes. The 13-inch studio lens, although similar to other long lenses in barrel design, is quite different in optical design. It is a high-quality f3.5 Cook type anastigmat lens mounted in a fixed focus, lightweight barrel (interchangeable with other long lens adapters). The 13-inch lens has a built-in iris, adjustable from f3.5 to f42. While primarily intended for studio use, it may also be used for field pickups. Since it is faster than a 13-inch achromat lens, it is useful for night pickup of poorly lighted indoor or outdoor events. The resolution of this lens is better than 55 lines per millimeter over the entire scanned area. The 8½-inch lens is similar in design to the 13-inch lens described above with lightweight barrel, built-in iris, and turret mounting bayonet adapter.



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

The smaller, standard sizes (135mm, 90mm, 50mm and 35mm focal lengths) employ Ektar lenses which offer features of high quality, speed, small size and lightweight construction. 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 Ektar and Ektanon lenses have focusing barrels except the 35mm lens. Fortunately, very short focal length lenses have great depth of field and require little adjustment for closeup scenes. Lenses are threaded to receive standard filters and sunshades available but not supplied.

All the smaller 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. The entire group of lenses is made available to meet normal, wide angle, telephoto and ultra speed requirements for television use.

Specifications

Description	*f Number*	*Total Horizontal Field Angle*	*Stock No.*
Studio Camera Lens, 35mm	f3.3	51.5°	MI-26550-9
Studio Camera Lens, 50mm	f1.9	34°	MI-26550-1
Studio Camera Lens, 90mm	f3.5	19°	MI-26550-2
Studio Camera Lens, 135mm	f3.8	13°	MI-26550-3
Studio and Field Camera Lens, 8½"	f3.9	8°	MI-26550-4
Studio and Field Camera Lens, 13"	f3.5	5°	MI-26550-10
Field Camera Lens, 13"	f5.0	5°	MI-26550-5
Field Camera Lens, 15"	f5.0	4.5°	MI-26550-6
Field Camera Lens, 17"	f5.0	4°	MI-26550-7
Field Camera Lens, 25"	f5.0	2.75°	MI-26550-8

Television Zoomar Lens

Features

- "Zoom" feature permits quick shifting from long shots or wide views to closeups—ideal for sports pickup.
- Continuous variation provided for focal length from 3 to 22 inches.
- A precision lens consisting of specially-coated multi-elements reduces loss of incident light.
- Lever arrangement provides wide-angle, intermediate and "telephoto" positions.

Uses

The Television Zoomar lens is designed for use with the RCA image orthicon tube for TV pickups of sporting events and other outdoor functions such as large political meetings or gatherings. Two "Zoom" ranges provide variable focal lengths: (a) The first range for closer viewing; (b) The second for distant viewing.

With proper lighting, the "Zoomar" may be used as a vari-focal lens or as a single purpose lens set at a focal length desired for proper composition. The Zoomar lens is not designed to yield maximum picture definition under poor light conditions and should not be used with insufficient light when high definition is desired. However, when used with inadequate light the Zoomar will produce special effects or illusions, if desired.

Description

The Television Zoomar consists of 28 lens elements which permit full compensation with linear displacements of optical components. The result is a vari-focal lens with a single barrel movement. The 28 lens elements are made up of two main groups; namely, the stationary lens elements and coupled movable lens elements. A lever attached to the lens barrel enables movement or a change in focal length. Movement of the barrel to any position in the housing yields an image of varying size and maximum sharpness. The front set of lenses in the movable barrel takes care of the change in focal length (the "Zoom") and the rear lenses compensate for focus.

The maximum 'F' speed of the Television Zoomar when used up to 12 inches focal length is f/5.6. Above 12 inches focal length, full aperture should not be used. The highest recommended 'F' speed when using the Zoomar at over 12 inches focal length is f/8. Both variable focal length ranges can be stopped-down to f/22 if desired. Definition when using the Television Zoomar is dependent upon 'F' setting. When stopped down to f/16, maximum definition is obtained on the optical axis. At this point, there is no appreciable difference between the Television Zoomar and a good single purpose lens. At f/11 the definition is equal to about 90% that of a good single purpose lens; at f/8, definition is equal to about 80%. When used wide open at f/5.6, definition of the Zoomar is equivalent to approximately 75% that of a good single purpose lens.

Specifications

Interchangeable Wide Angle Front Lens:
Zoom Range (for close viewing)—Focal lengths, 3″ to 13″
Interchangeable Tele Front-lens:
Zoom Range (for distant viewing)—Focal lengths, 5″ to 22″
Field Coverage (difference in field area)—Up to 15 times
Speed—f/5.6 to f/22
Dimensions, overall—Length 30″, width 3″
Approximate Weight—14 lbs.
Stock Identification—MI-26549-3

Video Analyzer

Features

- Accurate means of checking orthicon tube characteristics.
- Enables quick alignment and adjustment of TV cameras.
- Convenient for matching and balancing two or more camera chains.
- Eliminates laborious methods of pattern comparison tests.

Uses

The Video Analyzer is used as a convenient means for checking image orthicon tube characteristics and camera adjustments. With the Video Analyzer, the following checks can be made quickly, easily and accurately: (1) Lens turret alignment, (2) Mechanical alignment of Image Orthicon Assembly, (3) Old Mosaic (or previously scanned target area), (4) Vertical and horizontal image size, (5) Vertical and horizontal linearity, (6) Vertical and horizontal centering, (7) Vertical and horizontal shading, (8) Resolution (both horizontal and vertical by rotating analyzer), (9) Color response, (10) Sensitivity, (11) Saturation point, (12) Contrast range, (13) Frequency distortion, (14) "S" distortion (image section electrical adjustment), and (15) Scanning tilt.

Description

The Video Analyzer consists of an incandescent low Kelvin rating light source, a precision transparent test pattern, and a calibrated correction lens mounted in a compact, lightweight metal housing having a telescoping barrel that fits directly on the TV camera's 80 mm lens. A "bubble level" on the top of the analyzer's housing makes it easy to adjust the built-in test pattern for perfect horizontal alignment.

The Analyzer can be connected to any 110-volt source, including the utility outlet on the camera. The test pattern is illuminated by pressing a spring-tension hand switch. By checking the tones of the three color strips (red, green and blue) against the six-step, gray scale on the analyzer's target (as they appear on the monitor)—it is a simple matter to evolve a convenient code-number system for identifying color and light sensitivity characteristics of an image orthicon.

Specifications

Length—12″; Weight—1 lb.; Shipping Weight—6 lbs.
Overall Cable Length (plug and switch)—5′
Stock Identification—MI-26548

Television Balowstar Lens

Features

- Extremely fast lens possessing high resolution.
- Produces image of unusual contrast and clarity.
- Ideal for remote pickup where lighting conditions may be unfavorable.
- Designed for use with RCA image orthicons.
- Sharp focus maintained under mixed-light conditions.

Uses

The Balowstar Lens is intended for television remote pickups where lighting conditions and object distances are unfavorable, as in theatres, churches and other public gathering places. Church services, night street scenes, concerts, opera, night club performances and on-the-spot news events in hotel lobbies can be covered. The Balowstar lens is designed for use with the RCA image orthicon. If used with an image orthicon, which has practically no response to infra-red, the lens can be regarded for all practical purposes as an apochromat. The lens will also give good results when some infra-red component is present—since the Balowstar lens has its focal plane for infra-red close to its general focal plane.

Description

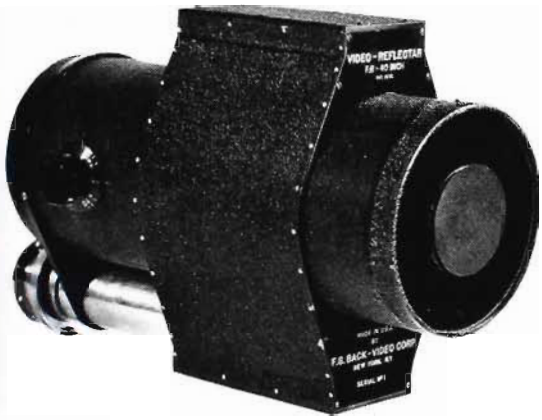
The television Balowstar, designed by Dr. Frank G. Back, is a very fast, low-loss lens possessing a high degree of resolution and contrast, features which contribute to high quality TV images. The Balowstar consists of three groups of special lens elements which are precision ground to very close tolerances.

Rated at f/1.3, with a focal length of 7 inches, the TV Balowstar operates efficiently under all kinds of lighting conditions and is corrected for infra-red illumination (the invisible light given off by unfiltered incandescent lamps) as well as for visible illumination. Under mixed light, some lenses produce one focus for the infra-red light and another for the visible light, resulting in an image which tends to be fuzzy and out of focus. This condition is avoided by special design of the lens elements which brings the two foci practically together to produce a sharp focus even when infra-red light and visible light are combined (as in TV pickups on the spot where the kind and quality of illumination cannot be controlled as it is in the studio). Not only is the Balowstar lens color corrected, but it is free of zonal spherical aberration, which means that its focus does not change when the aperture is closed down.

Specifications

"F" Number	1.3
Focal Length	7"
Type Lens	Low-loss, high resolution, color corrected, and consisting of 3 groups of special lens elements.
Approximate Weight	6 lbs.
Overall Length, Approximate	15"
Stock Identification	MI-26549-2

Television Reflectar Lens



Features

- 40-inch focal length with compact 16-inch unit.
- High resolution and picture quality.
- Light in weight and mounts directly on TV Camera Turret without interfering with other lenses.
- Provides close "closeups" without decrease in picture quality.

Uses

The Television Reflectar Lens is a long-focal length (40-inch) unit which is designed for "pickups" where extreme closeups are desirable—such as: football games, baseball games, boxing matches, horse races and news events.

Description

The Television Reflectar (invented by Dr. Back) is actually a "lenseless" lens, since four special reflectors are utilized to bounce light beams back and forth to obtain desired magnification. The long-focus, (40-inch equivalent focal length) lens consists of a correction plate (a mirror-reflector, shaped like a segment of a large sphere), and three aluminized flat mirrors. Light enters through correction plate, is picked up by the mirror-reflector, and is "zig-zagged" back and forth by the aluminized reflectors to the target of the image orthicon.

Lens control (F stop opening) is obtained by adjustment of a rotatable damper which is placed directly in front of the aspherical reflector. Depending on the damper's position, "F" stops of F/8 to F/22 are provided. Since there is only one refractive element of very low power, the lens is free of chromatic aberrations. It is also fully corrected for spherical aberration. Astigmatism and curvature of field are negligible.

Specifications

Resolution	Approx. 3000 TV lines at center Approx. 1500 TV lines at edges
Focal Length (equivalent)	40"
"F" Speed (dependent on damper position)	F/8 to F/22
Overall Length (approx.)	16"
Weight (approx.)	6 lbs.
Stock Identification	MI-26549-1

Elapsed Time Indicator, MI-26760

Features

- Provides five meters for convenient hour-indication in comparing life of camera tubes, etc., with warranties.
- Card holders provided for circuit identification.
- High-quality, long-life synchronous motors.
- Jones terminal strips provided for ease in making connections.
- Supplied in standard recessed type chassis.

Uses

The Elapsed Time Indicator Panel may be operated directly from any 110 volt a-c line. When used with suitable circuit breakers, it provides a constant record of "hours on", or elapsed time in measuring the life of television tubes such as camera tubes, etc.

Description

The time indicator, MI-26760, consists of a system of five, individually-operated, counter indicators which are driven by synchronous motors. Gearing ratios are selected so that indicators may be read directly in elapsed-hours (up to a maximum of 10,000 hours). A tenths scale is provided for hour readings where greater accuracy is desired. The indicator chassis is operable from any 110 volt, 60 cycle line.

The complete assembly is supplied in a standard recessed or "bathtub" type chassis for 19" television rack panel mounting. It is reasonably compact and occupies only 3½" of vertical panel space. A Jones terminal strip is provided for greater ease in making connections.

Specifications

Line Voltage	110 volts, 60 cycles
Power Input	Negligible
Calibration Markings	Hours, tenths hours
Total Time Reading	10,000 hours max.
Dimensions:	
Panel Vertical Height	3½"
Panel Length	19"
Panel Depth	5¼"
Weight, approx.	6 lbs.
Stock Identification (including 5 time indicators mounted in place)	MI-26760

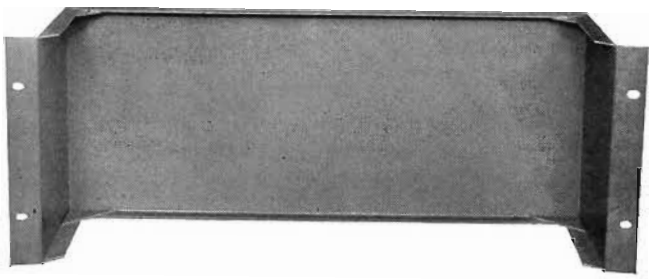
Blank Recessed Chassis

Use

A complete line of standard 19" recessed type chassis is available for filling out blank spaces in television cabinet racks. They are convenient for later use in mounting television components, meters, or special equipment.

Description

A variety of eight chassis (all of the standard recessed or "bath tub" type) are carried in different panel heights of 1 23/32" to 13 31 32". All are supplied in a standard 19" panel length and 5¼" depth. All chassis are made of $\frac{3}{16}$" sheet steel with suitable mounting holes for standard 19" equipment racks. Units are finished in light umber gray to match companion rack equipment.



Chassis Height	*Stock Identification*
1 23/32"	MI-26525-1
3 15/32"	MI-26525-2
5 7/32"	MI-26525-3
6 31/32"	MI-26525-4
8 23/32"	MI-26525-5
10 15/32"	MI-26525-6
12 7/32"	MI-26525-7
13 31/32"	MI-26525-8

Chassis Trim Cover, MI-21457-B

This cover is essentially a flat piece of perforated steel properly framed so that it will fit in over the ends of either blank or equipment chassis if mounted in the rack.

It effectively forms a separator lying in a horizontal plane between equipments in the rack. The Chassis Trim Cover (MI-21457-B) is particularly useful when it becomes necessary to install front mounted units in combination with standard bath-tub chassis in the same rack. In this manner gaping holes in the rack are eliminated, small tools will not be dropped inside of the rack, and neat appearance is coupled with a convenient shelf arrangement.

Circuit Breaker Chassis, MI-26240

Features

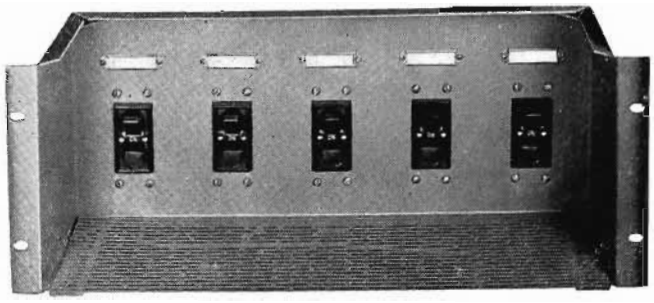
- Supplied as standard recessed chassis with mounting accommodations for any combination of 5 breakers (MI-26764 series).
- Cover plates provided for unused breaker mounting holes.
- Mounts in 19″ cabinet rack.
- Choice of breakers available (3 current ratings, available as MI-26764).

Uses

Circuit Breaker Chassis, MI-26240, is employed as a main switch breaker panel between the power line and the television studio equipment to be controlled.

Description

MI-26240 consists of a standard recessed type chassis suitable for regular 19″ rack panel mounting. It includes individual cutouts for mounting five series MI-26764 circuit breakers. (Available ratings of 10 amps., 20 amps. and 40 amps., all at 115 volts.)



Specifications

Panel Height	7″
Panel Length	19″
Panel Depth	5¼″
Weight (approx.)	10 lbs.
Stock Identification	MI-26240

ACCESSORY CIRCUIT BREAKERS

10 amps., 115 volts	MI-26764-1
20 amps., 115 volts	MI-26764-2
40 amps., 115 volts	MI-26764-3

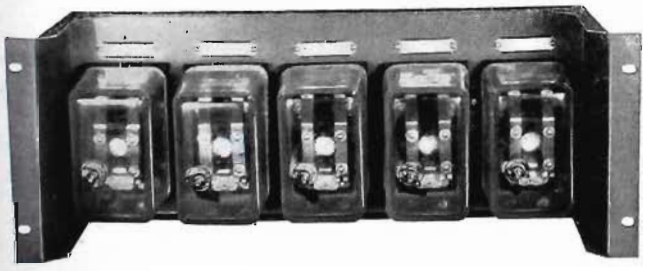
Power Relay Panel, MI-26761

Features

- Five individual relays provided in standard 19″ recessed type chassis.
- Makes possible remote switching of power circuits in conjunction with studio power remote control panel (MI-26251).
- Glass dust covers avoid corrosion of contacts or intermittent operation.
- Convenient, standard 19″ rack mounting.
- Card holders provided for circuit identification.

Uses

Use of the Power Relay Control Chassis, MI-26761, facilitates the remote switching of television studio control circuits directly from a separate Studio Console Remote Control Panel (MI-26251), or from the studio control desk.



The energizing coils of all relays are operated from a regular 110 volt, 60 cycle line thus eliminating need for separate transformers.

Description

The Power Relay Panel consists of five magnetically-operated relays which are supplied in a standard recessed type chassis suitable for 19″ television equipment rack mounting. All relays are equipped with contacts rated at 30 amps., so that relatively high-power circuits may be easily handled. Glass dust covers prevent contact corrosion due to moisture and allow visual inspection of relay operation. Relay equipment is designed to operate from a 110 volt, 60 cycle source and employs low current coils, thus eliminating the use of heavy-duty wiring, switches, etc.

Specifications

Line Voltage	110 volts, 60 cycles
Relay Contact Rating (two circuits)	60 amps.
Relay Contact Rating (single circuit)	30 amps., max.
Dimensions:	
Panel Vertical Height	7″
Panel Length	19″
Panel Depth	7¾″
Weight (approx.)	10 lbs.
Stock Identification (includes 5 relays mounted in place)	MI-26761

Accessory

Studio Console Control Panel	MI-26251

Plate Current Meter, MI-21200-C1

Features

- Two scales provided (0-150 ma., 0-15 ma.).
- Compact, small in size.
- Quick means of checking regulated power supplies.
- Furnished complete with 5′ 9″ cord and plug-in jack.

Uses

Plate Current Meter, MI-21200-C1, is a two scale (0-15 ma. and 0-150 ma.) meter for checking the plate current of the regulator tubes of the 580-C and WP-33B regulated power supplies. It is also suitable for use in checking field power supply MI-26095. In addition it may be used to check total current drain and voltage output of the above-mentioned circuit, as well as alignment coil current of the studio camera supplied by the current regulator MI-26090.

Description

The Plate Current Meter is furnished in a bakelite case of convenient size ($3\frac{5}{8}$″ x $5\frac{7}{16}$″ x $2\frac{3}{8}$″) and has a 5′ 9″ cord complete with plug-in jack for use in checking power supply panels. A momentary-contact meter push-button switch changes the 0-150 ma. scale to 0-15 ma., when desired.

Specifications

Stock Identification	MI-21200-C1
Approximate Size	$3\frac{5}{8}$″ x $5\frac{7}{16}$″ x $2\frac{3}{8}$″
Weight	
Range Scales	0-150 ma., 0-15 ma.

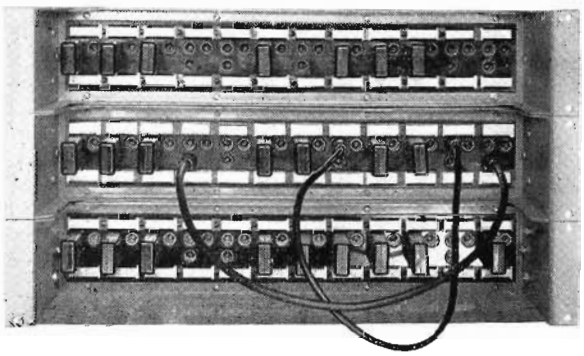
Video Jack Panel, Plugs and Cords

Features

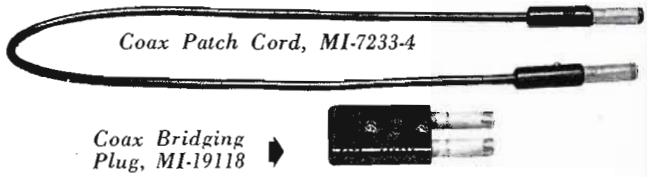
- Provides convenient patching of video and synchronizing circuits.
- Accessory bridging plugs and cords available.
- Supplied in standard 19″ recessed type chassis for rack mounting.
- 12 groups (arranged three per group) of coaxial jack assemblies provided.
- Removable mounting bracket allows recessed or flush mounting as desired.

Uses

Video Jack Panel, MI-26245, and associated plugs and cords provide a convenient means for patching video and/or synchronizing signals as desired. Sufficient jack positions are provided to lend flexibility and enable patching of special lines when desired.



Three Video Jack Panels (MI-26245) are shown above. Each has 12 jack groups (3 jacks per group).



Description

The Video Jack Panel is supplied in a recessed or "bathtub" type chassis for standard 19″ cabinet rack panel mounting. It is finished in umber gray to match other equipment. Twenty-four (two rows of 12 each) coaxial connectors are provided at the rear of the chassis to facilitate making cable connections from desired sources.

Located on the front of the chassis panel are 12 groups of coaxial jack assemblies (arranged three jacks per group). The top two jacks of each group are paralleled and in turn connected to the input coaxial connector at the rear of the chassis. The bottom, or output coaxial jacks, are also connected to coaxial connectors on the rear of the chassis. Circuits may be simply bridged by use of special coaxial plugs (MI-19118) or patched to other lines or circuits by use of coaxial patch cords (MI-7233-4). The third coaxial jack of each group provides a convenient means for monitoring (without disturbing the program line) or paralleling of output circuits. RG-11/U cable is recommended for use in making external connections.

Specifications

Stock Identification (Video Jack Panel)	MI-26245
Dimensions:	
Height	3 15/32″
Length	19″
Depth (overall)	9¼″
Depth (mounting flange to jack board)	5¼″
Stock Identification (Coaxial Bridging Plug)	MI-19118
Stock Identification (Coaxial Patch Cord 78½″ long)	MI-7233-4

Television Cables, Plugs, Connectors

Uses

RCA television cables, plugs and connectors are made available for inter-connecting the various components of TV broadcast setups—studio, control room and remote. Camera, power, pulse, intercom, coax transmission line and inter-connecting cables with companion connectors can be obtained as individual items or in special groups as desired. The use of the specially designed cables and connectors described below will facilitate station installations and avoid expensive delays.

Features

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

Camera Cables and Plugs

The 24-conductor, flexible cables listed here provide five convenient lengths. Cables are supplied complete with necessary male and female connectors and accommodate required inter-connections between cameras, camera control and monitoring positions. Communication and tally light circuits are also handled by the camera cables. Conductors are stranded and covered with "color-coded" silk and cotton braid insulation. An inner shield of tinned copper braid is provided. Outer coverings are of a durable rubber compound. Overall cable diameter is ¾ inches.

Stock Identification	Type—Camera Cable	Length
MI-26759-1	24-conductor with 90 degree female and a straight male connector. Partial special braided outer shield.	50 feet
MI-26725-1	24-conductor, with straight male and female connectors. With dustcaps.	50 feet
MI-26725-2	24-conductor, with straight male and female connectors. With dustcaps.	100 feet
MI-26725-3	24-conductor, with straight male and female connectors. With dustcaps.	200 feet
MI-26725-4	24-conductor, with straight male and female connectors. Protective rubber grommet.	20 feet

Camera Cable MI-26759-1, showing connectors and partial outer shield.

Camera Cable MI-26725-4, shown with special protective grommet. Other Cables, MI-26725-1, -2 and -3 are similar.

Intercom Cables

The cables listed below are available for TV intercom use in the three different lengths shown. All are flexible and are complete with phone-type jack plugs at each end.

Stock Identification	Length
MI-26756-1	7 feet
MI-26756-2	25 feet
MI-26756-3	100 feet

Intercom Cable MI-26756-1, -2 and -3 are identical except for cable lengths.

Power Cables and Plugs

The power cable and plug assemblies described below provide a choice in number of conductors and various cable lengths for convenience in handling TV power circuits.

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-26759-4	Same as MI-26759-3.	100 feet
MI-26759-5	4-conductor, rubber covered, flexible with female connector at one end—and terminals on 4 leads at other end.	24 feet
MI-26759-6	12-conductor, rubber covered, flexible with male and female connectors.	34 inches
MI-26759-7	12-conductor, rubber covered, flexible with male and female connectors with dustcaps.	6 feet
MI-26759-8	12-conductor, rubber covered, flexible with male and female connectors.	6 feet

4-Conductor Power Cable and Plug, MI-26759-5 (at left) is supplied with terminals at one end. 4-Conductor Power Cables MI-26759-3 and -4 are supplied as shown, at right above.

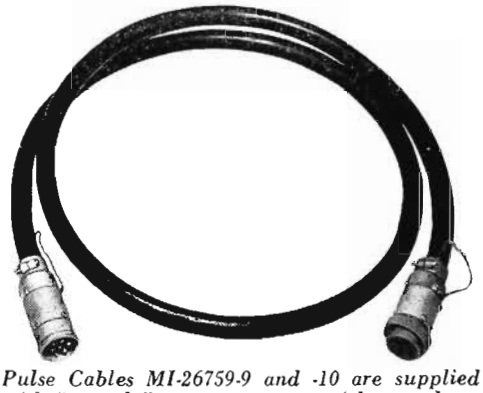
2-Conductor Power Cable, MI-26759-2.

12-Conductor Power Cable, MI-26759-7.

12-Conductor Power Cables, MI-26759-6 and -8 are supplied, as above, with "Jones" type connectors.

Pulse and Intercom Cables

The cable assemblies described here are supplied complete with suitable multi-contact connectors and protective dustcaps.



Pulse Cables MI-26759-9 and -10 are supplied with "straight" type connectors (shown above less dustcaps).

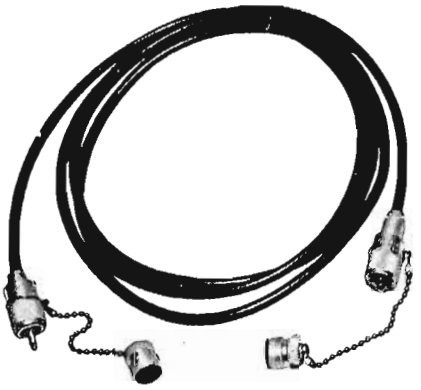
Stock Identification	Description	Length
MI-26759-9	Pulse Cable—7-conductor, rubber covered, flexible with straight male and female connectors and dustcaps.	7 feet
MI-26759-10	Pulse Cable—Same as MI-26759-9.	4 feet
MI-26759-11	Intercom Cable—9-conductor, rubber covered, flexible, with male and female connectors and dustcaps.	7 feet

9-Conductor Intercom Cable, MI-26759-11 is furnished as shown at right.

Coax Cable Assemblies

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

Stock Identification	Description	Length
MI-26759-12	Coax Cable Assembly with male plugs and dustcaps. Impedance, 73 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 male plugs and dustcaps. Impedance, 75 ohms.	100 feet

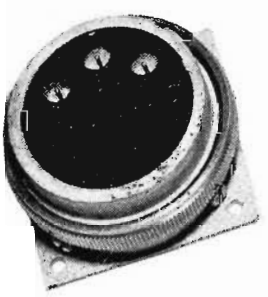


The MI-26759 Coax Cables are similar (differences are noted in table at left).

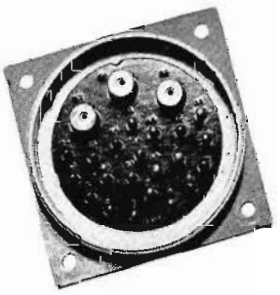
Cable Connectors

The connectors described below include both the 90 degree and straight type for use in making up TV interconnections and terminations, as needed. Connectors are suitable for use with bulk cables listed.

Stock Identification	Type	Description
MI-26759-17	Pulse Termination Plug.	7-pin male connector with 3 pins tied to ground at common pin thru three 75 ohm resistors.
MI-26759-18	Set of Coax Fittings.	Includes 5 junction fittings and 5 termination fittings for joining coax cable assemblies.
MI-26759-19	Male Chassis Camera Cable Connector.	24-contact with flange for mounting on chassis or panel.
MI-26759-20	Female Chassis Camera Cable Connector.	24-contact with flange for mounting on chassis or panel.
MI-26759-21	Straight Male Camera Cable Connector.	24-contact for use as a cable termination.
MI-26759-22	Straight Female Camera Cable Connector.	24-contact for use as cable termination with MI-26759-21.
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-26759-20



MI-26759-19

MI-26759-21

MI-26759-22

Above, Pulse Termination Plug, MI-26759-17.

At right, Coax fittings, MI-26759-18 includes 5 junction fittings and 5 terminations.

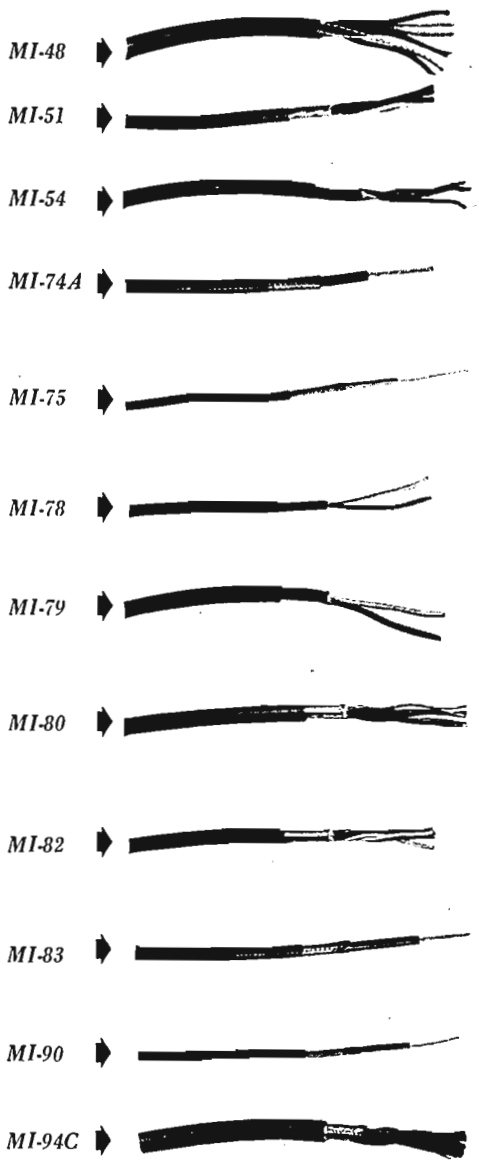
MI-26759-23

MI-26759-24

Bulk Cable

The various cables described in the accompanying table are available to the broadcaster in bulk quantities for making TV interconnections in special or non-standard lengths as desired. Cables listed are suitable for use with individual connectors and plugs available.

Stock Identification	Type Cable	Approx. Diam.	Characteristics
MI-48	PULSE CABLE—8-conductor, rubber covered, flexible with individual color coding.	0.073"	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.	0.050"	4 conductors of #14 A.W.G. with insulation for 2500 v, rms, 60 cycles.
MI-54	POWER CABLE—4-conductor, rubber covered, flexible, shielded with color coding (untinned, 1 white, 1 black).	0.50"	4 conductors of 41 strands of .0063" copper wire.
MI-74A	COAXIAL CABLE—Type RG-8/U, flexible, rubber covered. Single inner conductor and outer shield conductor.	0.405"	Impedance, 52 ±2 ohms.
MI-75	COAXIAL CABLE—Type RG-59/U, flexible, rubber covered. Single inner conductor and outer shield conductor.	0.242"	Impedance, 73 ±3 ohms.
MI-78	POWER CABLE—2-conductor, rubber covered, flexible, shielded (wire untinned, 1 white, 1 black).	0.390"	2 conductors of 65 strands of .0063" wire.
MI-79	POWER CABLE—2-conductor, rubber covered, flexible, shielded (wire untinned, 1 white, 1 black).	0.484"	2 conductors of 65 strands of .010" wire.
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, 73 ±3 ohms.
MI-90	COAXIAL CABLE—Type RG-62/U, flexible, rubber covered. Single inner conductor and outer shield conductor.	0.242"	Impedance, 93 ohms approx.
MI-94C	CAMERA CABLE — 24-conductor, rubber-covered, flexible, color coded, shielded cable consisting of: (A) 3 coaxial conductors, (B) 3 groups of (7 each) stranded, tinned copper conductors.	0.81"	Coax conductor impedance, 51 ohms ±5%, 21 conductors of #22 A.W.G. with insulation for 1000 v, d-c.



Sets of Interconnection Cables

The special cable groups listed below are supplied as special selected sets which prove convenient in making interconnections of various classes of Television equipment.

MI-26730, INTERCONNECTING CABLES FOR FIELD CAMERA EQUIPMENT
Includes: 1—10 ft., 2-cond., Power Cable, MI-26759-2
1— 6 ft., 12-cond., Power Cable, MI-26759-7
1— 7 ft., 7-cond., Pulse Cable, MI-26759-9
1— 7 ft., 9-cond., Intercom Cable, MI-26759-11
1— 7 ft., Coaxial Transmission Cable, MI-26759-12

MI-26735, INTERCONNECTING CABLES AND PLUG FOR FIELD SYNC GENERATOR
Includes: 1—10 ft., 2-cond., Power Cable with Plugs and Dustcap, MI-26759-2
2—50 ft., 4-cond., Power Cable with Plugs, MI-26759-3
1—100 ft., 4-cond., Power Cable with Plugs, MI-26759-4
1—7 ft., Transmission Line Cable with Plugs and Dustcap, MI-26759-12
1—4 ft., 7-cond., Pulse Cable with Plugs and Dust Caps, MI-26759-10
1—2 ft., 4-cond., Power Cable with Female Plug, MI-26759-5
1—Pulse Termination Plug, MI-26759-17

MI-26740, INTERCONNECTING CABLES AND FITTINGS FOR FIELD SWITCHING EQUIPMENT
Includes: 1—10 ft., 2-cond., Power Cable, MI-26759-2
1— 6 ft., 12-cond., Power Cable, MI-26759-7
1— 6 ft., 12-cond., Power Cable, MI-26759-8
1— 7 ft., Coaxial Transmission Cable, MI-26759-12
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 STUDIO CAMERA CONTROL
Includes: 1—34 inch, 8-cond., Power Cable, MI-26759-6
1—64 inch, Transmission Line Cable, MI-26759-14

MI-26745, INTERCONNECTING CABLES FOR FILM CAMERA
Includes: 1—50 ft., Camera Cable, MI-26759-1
1—34 inch, 8-cond., Power Cable, MI-26759-6
1—64 inch, Transmission Line Cable, MI-26759-14

MI-26755, INTERCONNECTING CABLES FOR FIELD RELAY TRANSMITTER
Includes: 1— 10 ft., 2-cond., Power Cable, MI-26759-2
1— 25 ft., Transmission Line Cable, MI-26759-13
1—100 ft., Transmission Line Cable, MI-26759-15