BROADCAST AND TELEVISION EQUIPMENT

RCA

Instructions

RADIO CORPORATION OF AMERICA, Industrial Electronic Products

TK-1C

Monoscope Camera

MI-26030-B

IB-36075-2

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RADIO CORPORATION OF AMERICA

BROADCAST AND COMMUNICATIONS PRODUCTS, CAMDEN, N. J.

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FIRST AID

WARNING

OPERATION OF ELECTRONIC EQUIPMENT INVOLVES THE USE OF HIGH VOLTAGES WHICH ARE DANGEROUS TO LIFE. OPERATING PERSONNEL MUST AT ALL TIMES OBSERVE ALL SAFETY REGULATIONS. DO NOT CHANGE TUBES OR MAKE ADJUSTMENTS INSIDE THE EQUIPMENT WITH VOLTAGE SUPPLY ON. UNDER CERTAIN CONDITIONS DANGEROUS POTENTIALS MAY EXIST IN CIRCUITS WITH POWER CONTROLS IN THE OFF POSITION DUE TO CHARGES RETAINED BY CAPACITORS, ETC. TO AVOID CASUALTIES, ALWAYS DISCHARGE AND GROUND CIRCUITS PRIOR TO TOUCHING THEM.

Personnel engaged in the installation, operation and maintenance of this equipment or similar equipment are urged to become familiar with the following rules both in theory and in the practical application thereof. It is the duty of every radioman to be prepared to give adequate First Aid and thereby prevent avoidable loss of life.

ARTIFICIAL RESPIRATION

(Courtesy of the American Red Cross)

If victim is not breathing, begin some form of artificial respiration at once. Wipe out quickly any foreign matter visible in the mouth, using your fingers or a cloth wrapped around your fingers.

MOUTH-TO-MOUTH (MOUTH-TO-NOSE) METHOD

Fig. 1

Tilt victim's head back. (Fig. 1). Pull or push the jaw into a jutting-out position. (Fig. 2).

Fig. 2

If victim is a small child, place your mouth tightly over his mouth and nose and blow gently into his lungs about 20 times a minute. If victim is an adult (see Fig. 3), cover the mouth with your mouth, pinch his nostrils shut, and blow vigorously about 12 times a minute.

Fig. 3

If unable to get air into lungs of victim, and if head and jaw positions are correct, suspect foreign matter in throat. To remove it, place victim in position shown in Fig. 4, and slap sharply between shoulder blades.

Fig. 4

Rescuers who cannot, or will not, use mouth-to-mouth or mouth-to-nose technique should use a manual method.

THE BACK PRESSURE-ARM LIFT (HOLGER-NIELSEN) METHOD

Place victim face-down, bend his elbows and place his hands one upon the other, turn his head slightly to one side and extend it as far as possible, making sure that the chin is jutting out. Kneel at the head of the victim. Place your hands on the flat of the victim's back so that the palms lie just below an imaginary line running between the armpits (Fig. 5).

Fig. 5

Rock forward until the arms are approximately vertical and allow the weight of the upper part of your body to exert steady, even pressure downward upon the hands (Fig. 6).

Fig. 6

Immediately draw his arms upward and toward you, applying enough lift to feel resistance and tension at his shoulders (Fig. 7). Then lower the arms to the ground. Repeat this cycle about 12 times per minute, checking the mouth frequently for obstruction.

Fig. 7

If a second rescuer is available, have him hold the victim's head so that the jaw continues to jut out (Fig. 8). The helper should be alert to detect any stomach contents in the mouth and keep the mouth as clean as possible at all times.

Fig. 8

RELATED INFORMATION FOR BOTH METHODS

If vomiting occurs, quickly turn the victim on his side, wipe out his mouth, and then reposition him.

When a victim is revived, keep him as quiet as possible until he is breathing regularly. Keep him from becoming chilled and otherwise treat him for shock. Continue artificial respiration until the victim begins to breathe for himself or a physician pronounces him dead or he appears to be dead beyond any doubt.

Because respiratory and other disturbances may develop as an aftermath, a doctor's care is necessary during the recovery period.

BURNS

FIRST DEGREE BURN

SKIN REDDENED. Temporary treatment—Apply baking soda or Unguentine.

SECOND DEGREE BURN

SKIN BLISTERED. Temporary treatment — Apply baking soda, wet compress, white petroleum jelly, foille jelly, olive oil, or tea.

THIRD DEGREE BURN

FLESH CHARRED. Temporary treatment — Apply baking soda, wet compress, white petroleum jelly, or foille spray. Treat for severe shock.

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ELECTRICAL CHARACTERISTICS

Input Requirements:

Horizontal Drive	-3.5 to -5 volts, 10% hor. cycle
Vertical Drive	-3.5 to -5 volts, 4% vert. cycle
Blanking Pulses	-3.5 to -5 volts, RMA std.
Synchronizing Signal (Optional)	-3.5 to -5 volts, RMA std.
Auxiliary Signal*	1.5 volts, max.
Impedance	75 ohms
Output Signal (2 identical outputs)	1.5 volts video plug 0.5-volt sync., or 2 volts composite, white in positive direction. Impedance 75 ohms.

Power:

D.C. Requirement, Regulated	-3 volts (centering) and 300 ma at 280 volts
A.C. Requirement	110/120 volts, 50/60 cycles, 100 watts

*Auxiliary signal is not amplified, only modified by optional addition of blanking and synchronizing pulses.

TUBE COMPLEMENT

6 RCA Type 6AC7	3 RCA Type 6SN7GT	1 RCA Type 1B3GT/8016
3 RCA Type 6AG7	1 RCA Type 6V6GT	1 RCA Type 2F21
3 RCA Type 6SL7GT	1 RCA Type 6Y6GT	1 RCA Type 991
		1 RCA Type 6AL5

For tube functions, refer to Figure 9.

MECHANICAL SPECIFICATIONS

Height	17-1/2 inches
Width	19 inches
Depth	11 inches
Weight	55 pounds

EQUIPMENT

The TK-1C Monoscope Camera is supplied as MI-26030-B and includes all tubes in place except the Monoscope tube. This tube, type 2F21, is shipped separately and carries the RCA reference number MI-26657. A spare set of tubes may be ordered as MI-26679-A.

For necessary interconnections one 10-prong Jones plug, five coaxial connectors, and six 75-ohm coaxial terminations are supplied with the equipment. Cable required but not supplied is as follows:

1 Five-wire cable from the d-c power supply -- 2 wires for a-c connection, 2 wires for d-c voltage, and 1 wire for centering voltage.

1 Interconnecting cable for remote focus and gain controls (if used).

- Required number and length of 75-ohm cables for installation.

A d-c power source such as from the RCA Type 580-D Regulated Power Supply, MI-21523-C, is required for the Monoscope Camera. Synchronizing pulses may be obtained from the RCA Type TG-1A generator, MI-26915.

DESCRIPTION

GENERAL

The Type TK-1C Monoscope Camera has been designed to produce a video signal of high and dependable quality for use with or without synchronizing pulses. The fixed pattern provided is suitable for checking resolution capabilities, low-frequency phase shift, contrast, and deflection linearity of other television studio equipment, as well as providing a modulating signal for transmitters. When the camera output is employed to modulate an r-f signal generator, the resultant signal may be used to check receiver performance. The Monoscope Camera utilizes a recessed type chassis designed for mounting in a standard 19-inch rack or cabinet.

Four paralleled connectors make it possible to feed theinput signals through to other equipment without disturbing the camera circuits. Three other coaxial connectors provide for the camera output, and seven pin jacks on the chassis enable a rapid check to be made on all input and output signals.

A narrow panel near the lower part of the unit contains the eight most important operating controls while the chassis mounts five screwdriver adjustments. An interlock circuit removes all high voltage when the front panel is removed. A shorting plug clipped to the panel enables the interlock to be bypassed when required during servicing or test.

Low-plate voltage for the Monoscope Camera requires a source of 280 volts d-c at 300 ma; the high-voltage circuit in the camera requires 110/120 volts a-c, 50/60 cycles. A 10-prong Jones plug on the chassis provides for connecting these two circuits.

CIRCUITS

Monoscope Tube

The basic operation of the Monoscope Camera is illustrated on the block diagram, Figure 1. Source of the picture signal is the Monoscope tube which contains a fixed pattern of carbon deposited on an aluminum plate. Advantage is taken of the different secondary emission characteristics of the aluminum and carbon pattern.

When the fixed pattern is scanned, electrons emitted are collected on an electrode which is in the form of a conductive coating on the tube. Although this coating is a-c coupled to ground, it is at a positive potential with respect to the pattern. The picture signal, therefore, appears between the pattern plate and ground.

The high-voltage circuit in the unit supplies the accelerating and focusing potentials for the scanning beam. Deflection of the beam is achieved magnetically by horizontal and vertical deflection yokes which fit over the neck of the tube. Sawtooth scanning currents are supplied to the yokes by horizontal and vertical deflection circuits in the unit. Driving pulses for the deflection circuits must be furnished by an external synchronizing generator.

Vertical Deflection Circuit

As shown on the overall schematic diagram, Figure 10, vertical driving pulses from the synchronizing generator are inserted at either of the two paralleled connectors, J7 or J8. Amplification of the driving pulses is obtained in one triode section of V14, while the second section is utilized as a sawtooth generator. "Height" is controlled by potentiometer R96 in the plate circuit of V14.

Both sections of sawtooth amplifier V13 are connected in cascade to increase the voltage to the proper vertical driving level for the output tube V12A. Transformer T2 couples V12A to deflection coil L8.

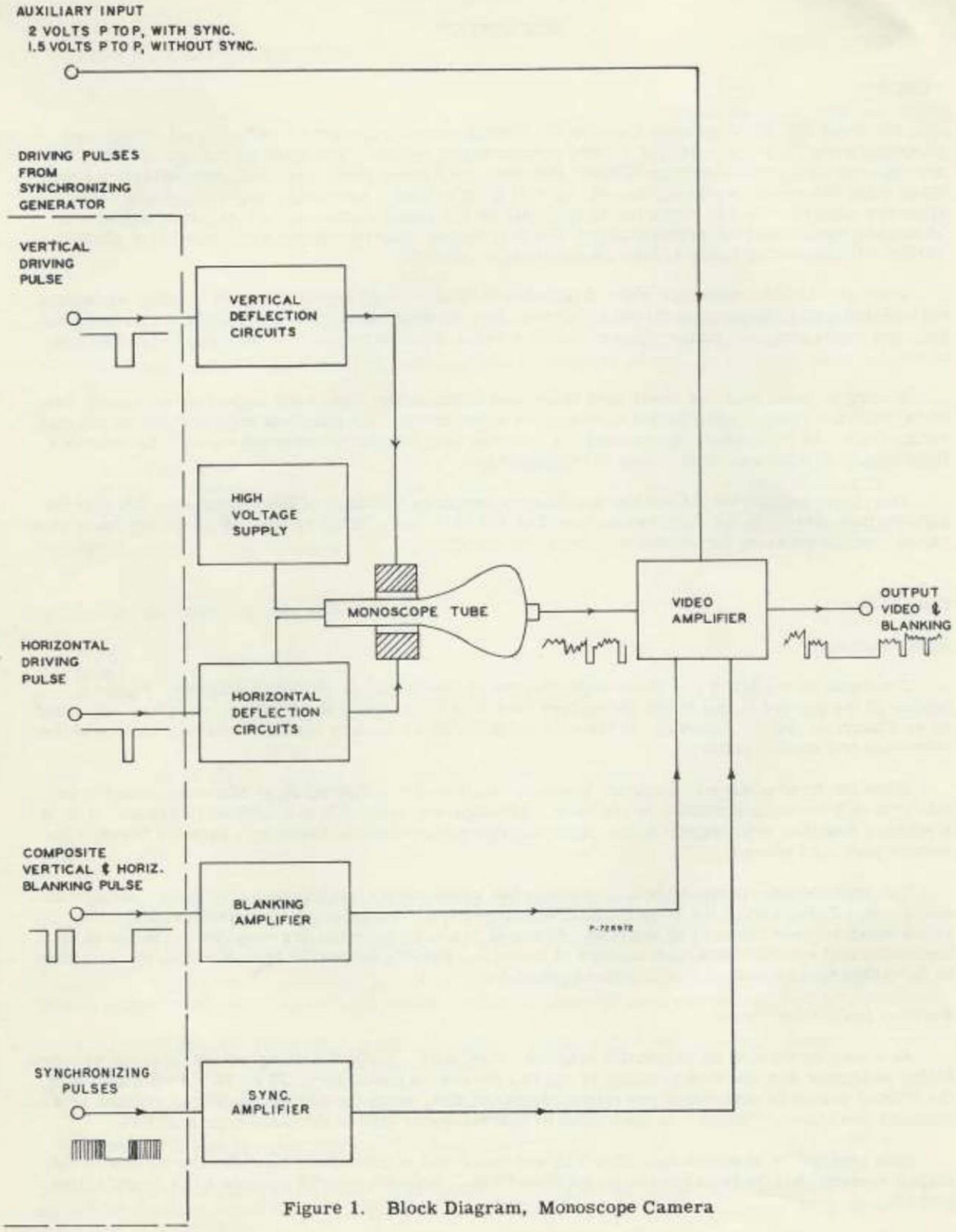

Figure 1. Block Diagram, Monoscope Camera

The grid and cathode of vertical feed back amplifier V11A are connected across R109 which is in series with the vertical deflection coil L8. Resistor R109 also connects to the center tap on VERT. CENT. potentiometer R131. Control R131 is part of the grid leak circuit of V11A and has effect over the entire raster.

Horizontal Deflection Circuit

Horizontal driving pulses are fed into either J9 or J10. These connectors are coupled to one section of V18 which is utilized as a horizontal driving pulse amplifier. The other section of V18 is used as a sawtooth generator, "width" being controlled by R116.

Output from V18 is fed through V17, and through T3 to the horizontal deflection coils L7 and damper tube V16. Tube V16 provides control of horizontal deflection linearity and maximum utilization of available power. Figure 2 illustrates the fundamental damper circuit while Figure 3 is an extraction from the overall schematic diagram. Potentiometers R127 and R126 are the HOR LIN A and HOR LIN B controls, respectively.

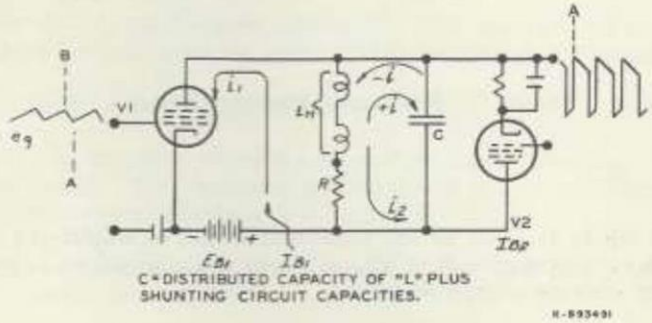

Figure 2. Fundamental Damper Circuit

Blanking Amplifier

Blanking pulses through J5 or J6 are amplified by V9B and V7. By connecting the plate of V7 directly to the plate circuit of V2, the amplified blanking pulses are coupled to the video amplifier stages.

Video Amplifier

The seven-stage video amplifier, V1 to V8, is of the series-shunt peaked type. To compensate for the distributed capacity at the Monoscope output, a high-peaking circuit is added between V5 and V6. Frequency response of the other stages is essentially flat to 8 mc. The two output stages, V8 and V10, are identical.

GAIN control, R36, is connected into the screen grid circuit of V2 while R83 BRIGHTNESS control, functions to control black level in a linear clipper circuit. The "Transient Suppressor," R44, is set at about 1.5 volts above the screen voltage on V3.

The auxiliary signal input, J1 or J2, permits the optional mixing of special test signals with blanking and synchronizing pulses. Thus signals such as from a sweep generator or grating generator may be passed through a unity gain amplifier, V2 and V3. Blanking is added in the common plate load of V2 and V7, while optional synchronizing pulses are added at the screen grid of V3. After mixing, the test signal then contains the necessary requisites for transmitter modulation. The AUX IN toggle switch, S1, on the chassis provides control of this circuit.

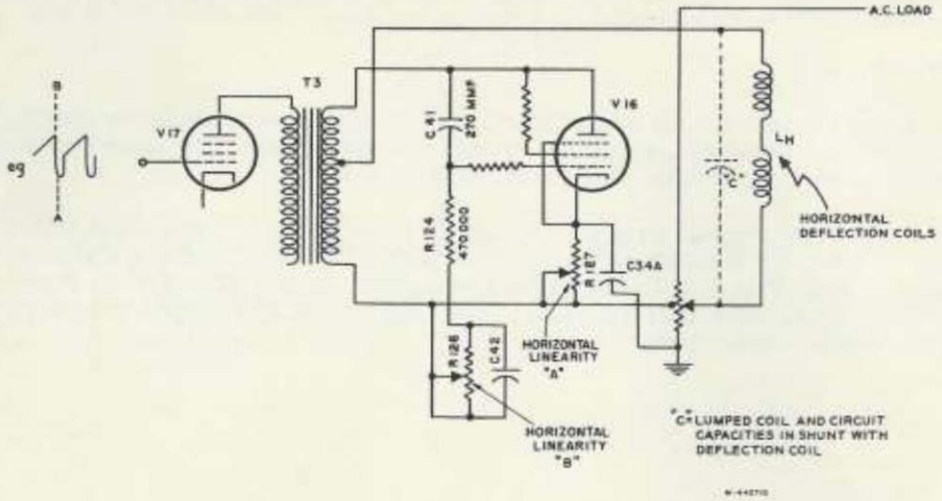

Figure 3. Horizontal Damper Circuit

Synchronizing Amplifier

Synchronizing pulse inputs at J3 or J4 are passed through two amplifying stages, V9A and V12B, before insertion in the screen grid circuit of V3. Control of these pulses is provided by SYNC GAIN potentiometer R66, in the cathode circuit of V9A.

H. V. Power Supply

High voltage for the Monoscope tube, V20, is obtained from a power supply in the unit. Transformer T1 supplies heater voltages for all tubes as well as the high voltage for V20. A 1B3GT/8016 tube, V15, serves as the high-voltage, half-wave rectifier.

The positive side of the high voltage is grounded so the signal plate of the Monoscope will be at ground potential. FOCUS control R80 and BRIGHTNESS control R83 are part of the output bleeder which supplies the required Monoscope voltages.

Negative bias for the clipping action in V3 is also supplied by V15, while V11B serves as a voltage regulator. Fuse F1 and interlock S2 are connected in the primary circuit of T1.

Remote Operating Circuits

For remote focusing of the Monoscope tube, a 2.5-megohm potentiometer may be connected to pin 6 of J15 as shown on Figure 10. This control may be utilized if the picture monitor is located at a distance from the Monoscope Camera.

Similarly, a 100,000-ohm potentiometer connected between pin 5 of J15 and ground may be utilized as a remote gain control.

If the bus wire connected across C12 (located on R36) is removed and the local GAIN control is operated to its maximum counterclockwise position, full control of gain will be available at the remote position.

Miscellaneous

Pins 10 and 12 of J15 are utilized for connecting the external d-c 280-volt supply required for low plate and screen voltages. The -3 volts centering potential is connected to pin 11, while pins 7 and 8 of J15 require 110/120, 50/60 cycle a-c power connections.

INSTALLATION

After unpacking, check the unit for damage incurred during shipment. Then remove the front panel and inspect all tubes to insure that they are firmly seated in their sockets.

Next, mount the unit in the rack or cabinet. Mounting screws are not supplied.

INSTALLING MONOSCOPE TUBE

To install the Monoscope tube, swing the hinged metal tube shield away from the chassis. Remove the top shield cover.

Insert the tube in the shield, rotating the tube so that the collector pin is accessible through the hole in the shield. Tighten the clamp on the lower end of the shield, to hold the tube in position.

Connect the red lead to the collector pin on the side of the tube.

Connect the black lead to the plate pin on the face of the tube. Position the wire so that it fits in the slot on the rim of the shield. Disconnecting the other end of this lead temporarily may facilitate making the connection. Be sure to reconnect it if removed.

Next replace the tube shield cover and swing the assembly back into place until locked by the pin and plug arrangement on the shield and chassis.

Attach the socket to the tube base, completing installation of this tube. Figure 7, the top chassis view, illustrates correct positioning of the leads to the tube.

CONNECTING CABLES

Two input taps are provided on the primary of transformer T1. If the measured line voltage ranges from 115 to 125 volts, the primary connection need not be changed since this is the as-shipped condition. If the line voltage falls within the 105- to 115-volt limits, the black wire with red tracer should be disconnected from the fuse receptacle and the black lead with yellow tracer connected in its place. Tape the end of the lead removed.

Connect a suitable cable to the Jones plug in socket J15. The connections to be made are as follows:

JACK J15	CIRCUIT
Pin 7, 8	110/120-volt, 50/60 cycle a-c
Pin 10	280 volts d-c, 300 ma, regulated
Pin 11	-3 volts d-c
Pin 12	Ground
Pin 5	Remote gain (if required)
Pin 6	Remote focus (if required)

Since no a-c switch is contained in the Monoscope Camera, it is advisable to parallel the camera supply with the a-c source to the low-voltage power supply which may be an RCA Type 580-D unit. In this

manner the power supply switch will control the a-c to the camera, insuring that the deflection circuits will be operating while high voltage is on the Monoscope tube. This arrangement aids in preventing possible damage to the Monoscope tube.

Connect the driving, blanking, synchronizing pulse, and output cables as indicated adjacent to the seven coaxial jacks. Since an unterminated line causes reflections which may alter the shape of an incoming signal, use should be made of the 75-ohm line terminations supplied. These terminations plug into the auxiliary input connectors and should be used when a cable is not terminated or not "looped" through to other equipment.

When used, connect a monitor to the MONITOR OUTPUT jack. Insertion or removal of the monitor plug will not affect the camera's signal output.

INITIAL ADJUSTMENTS

Several initial adjustments must be made on the Monoscope Camera before routine operation. Since some of the controls are located on the chassis, the front panel must be removed during the following procedure, and the interlock short-circuited.

First, remove the interlock shorting plug from the front panel clips and place it in the interlock receptacle.

Set both remote controls, if used, at the mid-position.

Set the Monoscope GAIN control at mid-range.

Turn BEAM control counterclockwise to minimum.

Energize the low-voltage power supply and allow one minute for the equipment to warm up.

Make certain both vertical and horizontal driving pulses are present at the camera input jacks.

DANGER

AT ALL TIMES KEEP HANDS AWAY FROM THE PLATE LEAD OF THE HIGH-VOLTAGE RECTIFIER TUBE, V15. THIS LEAD IS AT A POTENTIAL OF 1250 VOLTS WITH RESPECT TO GROUND.

Using the monitor oscilloscope as an indicator, set the blanking voltage to the desired amplitude by means of the BRIGHTNESS control. Adjust the raster in the monitor kinescope for the standard 4-to-3 aspect ratio.

Turn up the BEAM control until a picture appears on the monitor kinescope.

If the picture is rotated with respect to the raster, it may be aligned by loosening the two thumbscrews which hold the yoke against the Monoscope tube shield, and rotating the yoke.

Using an insulated screwdriver, adjust the HI PKR control (near V7) for minimum streaking and smearing.

Adjust for best focus with FOCUS control.

Adjust WIDTH, HEIGHT, VERT. CENT., and HOR. CENT. controls so that the picture in the monitor kinescope completely fills the raster.

Controls R126 and R127 are horizontal deflection linearity adjustments. H. LIN. A control, R127, should be set in the vicinity of from one-half to three-quarters maximum clockwise rotation. H. LIN. B control, R126, adjusts the scanning distribution on the right hand side of the picture. By careful adjustment of these controls a high degree of horizontal linearity can be achieved. Variable resistance R108, V. LIN., controls the vertical scanning linearity. These three screwdriver controls are mounted on the chassis and are indicated on Figure 7.

Synchronizing pulse height is controlled by SYNC. GAIN control R66, while R83, BRIGHTNESS control, enables the black level to be adjusted. These two screwdriver controls are also pointed out on Figure 7. If necessary to adjust the TRANSIENT SUPP. potentiometer, measure the voltage from the control arm to ground and set it for a potential approximately 1.5 volts above the screen voltage on V3.

Deflection linearity may be checked by measuring the spacing between the horizontal and vertical cross lines in the Monoscope pattern, Figure 6. The dashed lines in each wedge also serve as the center lines in this cross line pattern.

Linearity may be established independently of the viewing monitor by use of a grating generator such as the RCA Type WA-3A unit. The grating generator signal is simply connected to the AUX IN jack on the camera. Then, to mix the generator signal with the Monoscope pattern, temporarily disconnect the lead from the contact on S1 to ground and connect it to pin 3 or 5 of the socket for V2. Switch S1 should remain in the OFF position for this operation. After the linearity adjustment the lead should be reconnected to ground.

Using the monitor oscilloscope as an indicator, the blackest part of the picture signal should now be brought down to the blanking level. It is well to keep the beam intensity as high as possible in order to achieve the maximum signal-to-noise ratio in the video amplifier. Care should be taken however not to use too high a beam intensity since this causes enlargement of the beam with consequent loss in resolution.

After making all necessary adjustments, the auxiliary interlock plug should be removed from the receptacle and replaced in its holder on the front panel. Secure the front panel to the chassis.

OPERATION

To operate the Monoscope Camera throw the power switch on the low voltage rectifier unit to the "ON" position. After the required warm-up period it may be necessary to make some slight readjustments of the gain, focus, and scanning controls. These panel controls will have to be readjusted from time to time as the tubes age.

INTERPRETATION OF TEST PATTERN

In Figure 6, the test pattern of the RCA type 2F21 Monoscope tube is illustrated. The outside diameter of the large circle is three-fourths the pattern width. Therefore, when the deflection is adjusted so as to give a true, or undistorted form to this circle, the standard aspect ratio of 4-3 is established.

The five sets of vertical and horizontal resolution wedges are calibrated in number of lines resolution, i.e. the numbers indicate the total number of alternate black and white lines of equal width which can be contained in the height of the picture. Resolution lines are of equal width in both horizontal and vertical directions. Hence, the total number of lines which can be contained in the width of the picture is greater than the number contained in the height by a factor equal to the aspect ratio (1.33).

The dashed center line of each wedge indicates the calibration point of the value adjacent to it. The calibrations 20, 30, etc., multiplied by 10 indicate the number of lines resolution. The point on the vertical wedges where distinction between individual lines just disappears, indicates the horizontal resolution of the system or equipment under test.

In the case of the horizontal wedges, vertical resolution is indicated by the calibration of the point where separation between lines just becomes indistinguishable. The principal set of wedges in the central part of the pattern, as well as those in each of the four corners, provides an indication of the quality focus. This applies especially to the corner wedges where defocusing is most likely to prevail.

The diagonal wedges simulate a density range extending from black towards white. With the brightness adjusted so that the innermost portion is black, or 100 percent, the remaining three sections of each wedge are respectively 75, 50, and 25 percent of black.

Thin line grids extending over the pattern provide an additional check on the horizontal and vertical deflection linearity. The diagonal bars indicate the boundaries of a section which is one-half the overall pattern width. The horizontal bars beneath the small circle vary logarithmically in length. The amount of streaking following the end of the bar in the change from black to white, indicates the quality of the low-frequency response of the circuits under test.

MAINTENANCE

WARNING

HIGH VOLTAGES INJURIOUS TO LIFE ARE PRESENT IN THE UNIT. USE GREAT CARE IN MEASURING TUBE VOLTAGES. HEAVY, WELL-INSULATED TEST PROBES SHOULD BE USED IN CONJUNCTION WITH A METER CAPABLE OF MEASURING AT LEAST 1500 VOLTS.

Little attention is required to keep the Monoscope Camera in good working condition. Periodic inspections should be started dating from the time the unit is placed in operation. These inspection periods should be no longer than thirty days apart. During these inspections the unit should be cleaned and dusted thoroughly. All tubes should be checked. Any tube showing weak or sluggish emission should be replaced with a tube known to be good.

In the event faulty operation does occur, a typical voltage and waveform chart is supplied on Figure 9. When measuring tube voltages any measurement plus or minus twenty percent of the typical voltage readings is an indication of a fault in the circuit being measured.

The high-voltage supply has a 1.5 ampere fuse, F1, in series with one side of the power source. Under no circumstance replace this fuse with one having a higher current rating. In the event a replaced fuse burns out, ascertain and clear the fault in the unit before inserting another.

Seven chassis pin jacks, labeled BLANK, AUX, PIX, V. DRIVE, SYNC, H. DRIVE, and MON., enable these circuits to be tested rapidly from the front of the unit. In addition these test jacks make it unnecessary for any external cables to be removed. Symbol numbers of the jacks are J2, 12, 14, 16, 17, 18, and 20.

VIDEO ALIGNMENT

General

Alignment of the video stages is usually not necessary unless the components that determine the video response have been replaced. If poor response is evident, check the value of the plate-load resistors, the damping resistors across the peaking coils, and the peaking coils. The tube or tubes involved should also be checked by replacing a suspected tube with one that is known to be good.

Test Equipment Required

To align the video circuits, the following test equipment is required:

1. Video sweep generator RCA Type WA-21A or WA-21B.

2. Peak-to-peak crystal detector as shown schematically on Figure 4.

In constructing this detector, it is important that all leads, except the external leads to the oscilloscope, be kept as short as possible. Distributed capacity must be kept to a minimum.

3. Oscilloscope with good 60-cycle response.

Video Amplifier Alignment Procedure

The video amplifiers in the Monoscope Camera can usually be aligned with the camera mounted in its rack. However, for complete realignment it is better to perform the alignment on a bench or table. When this is done, an RCA Type 580-D regulated power supply or its equivalent is required. Another requirement is blanking, driving, and sync signals. When work is performed with the camera on a bench, the remote-gain jumper MUST be in place.

Although the complete alignment procedure is given, it is usually only necessary to align the circuit in which a component has been replaced.

To completely realign the Monoscope Camera, proceed as follows:

1. Disconnect the SYNC, BLANKING, VERT DRIVE, HOR DRIVE, and PICT OUT cables from the Monoscope Camera. Bear in mind that this may upset the sync generator terminations, depending on the overall equipment layout. Connect a 75-ohm termination to the PICT OUT jack, J11.

2. Place the POWER switch (on the camera power-supply) in the OFF position, remove the camera front-cover, then remove the socket from the monoscope tube, V20.

3. Turn the GAIN and BRIGHTNESS controls to their maximum clockwise position, then with a screwdriver turn the TRANS SUP control maximum clockwise. Place the AUX IN switch in the OFF position. If a remote GAIN control is in the circuit, turn it to the maximum clockwise position.

4. Disconnect cathode capacitors C48, C50, and C44 from pin 5 of V2, V4, and V5 respectively. These capacitors will be reconnected later on in the procedure.

5. Place the camera power-supply switch in the ON position, then insert the shorting plug in the interlock switch. Connect the OSCILLOSCOPE OUTPUT of the detector to the vertical input on the oscilloscope. Use the "Oscilloscope Sync" from the sweep generator as an external horizontal-sweep voltage for the oscilloscope.

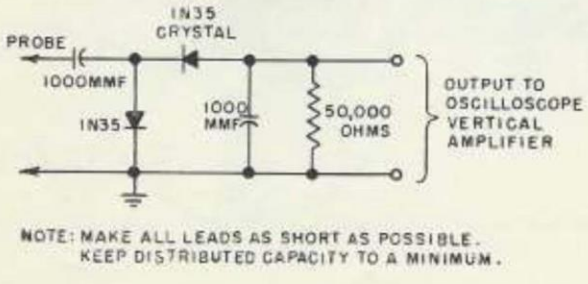

Figure 4. Schematic Diagram, Video Detector

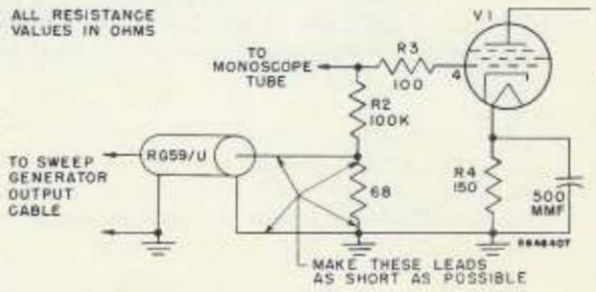

Figure 5. Input Circuit, Video Alignment

6. Observing high voltage precautions, connect and align the camera in accordance with the table which follows:

Step	Connect sweep output to	Connect PROBE side of detector to	Set sweep attenuator to obtain a peak-to-peak voltage of (on oscilloscope)	Align top and bottom core of (for flattest response to 8 mc)
A	V3-4	PICT OUT jack, J11 or J13	1.2	L5
B	V2-4	PICT OUT	1.2	L4
C	V6-4	PICT OUT	1.2	L3
D	V4-4	V5-5	1.2	L2
E	V1-4	V5-5	1.2	L1

7. Disconnect the sweep and the diode detector from the Monoscope Camera. Place the camera in normal operation by connecting the monoscope tube-socket and the blanking, driving and sync cables. Connect the picture output, properly terminated, to a suitable monitor which is known to have good frequency response.

8. Adjust the HI PKR (high peaker) capacitor for minimum streaking as observed on the monitor picture.

At this step of the procedure, the high-frequency output will be low and the wedge in the picture (pattern) should be visible to approximately the 400-line point.

9. Shut the power (to the camera) off, remove the tube-socket from the monoscope, then repeat steps 1 and 3.

10. Reconnect the detector to the PICT OUT jack (terminated with 75 ohms).

11. Connect the sweep output to the camera input circuit through a short length of RG-59/U cable and a 68-ohm carbon resistor as shown on Figure 5.

12. Restore power to the camera, then observe that the response curve, indicated on the oscilloscope screen, begins to drop down at approximately the 2-megacycle point.

Reconnect C46, C48, and C50 to their original positions (see step 4). The two to eight megacycle portion of the final response curve should have a gradual rising characteristic. The response at eight megacycles should be approximately 10 to 15% greater than the response at two megacycles.

13. Shut the power off, disconnect the test equipment, restore the camera input circuit to its original condition, then place the Monoscope Camera in operation. Restore all the controls that were changed for alignment purpose to their original setting.

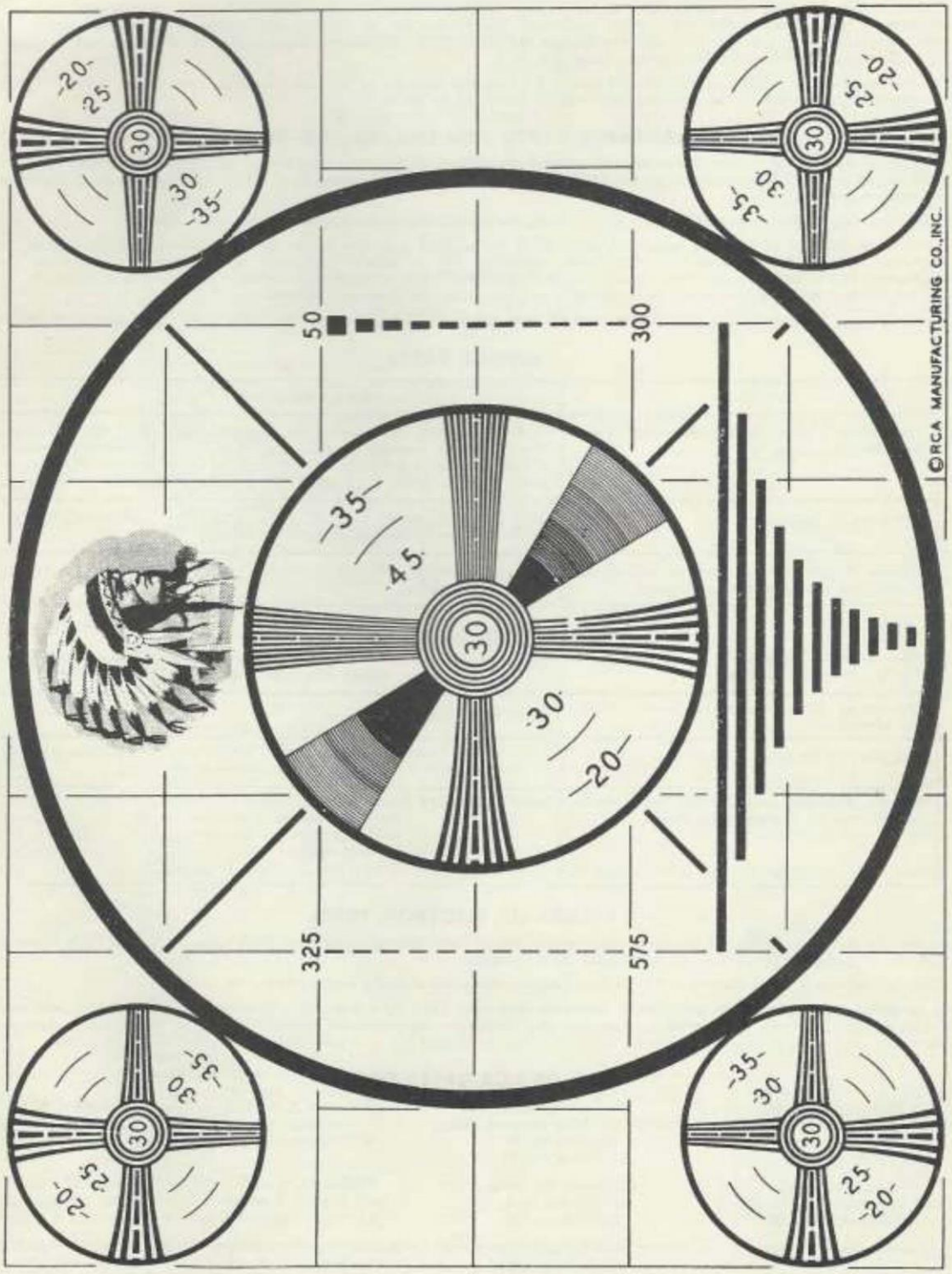

Figure 6 - Picture Pattern, Monoscope Camera

EQUIPMENT LOST OR DAMAGED IN TRANSIT

When delivering the equipment to you, the truck driver or carrier's agent will present a receipt for your signature. Do not sign it until you have (a) inspected the containers for visible signs of damage and (b) counted the containers and compared with the amount shown on the shipping papers. If a shortage or if evidence of damage is noted, insist that notation to that effect be made on the shipping papers before you sign them.

Further, after receiving the equipment, unpack it and inspect thoroughly for concealed damage. If concealed damage is discovered, immediately notify the carrier, confirming the notification in writing, and secure an inspection report. This item should be unpacked and inspected for damage WITHIN 15 DAYS after receipt. Report all shortages and damages to RCA, Broadcast and Television Department, Camden 2, N. J.

Radio Corporation of America will file all claims for loss and damage on this equipment so long as the inspection report is obtained. Disposition of the damaged item will be furnished by RCA.

REPLACEMENT PARTS AND ENGINEERING SERVICE

RCA field engineering service is available at current rates. Requests for field engineering service may be addressed to your RCA Broadcast Field Representative or the RCA Service Company, Inc., Broadcast Service Division, Camden, N. J. Telephone: WOodlawn 3-8000.

When ordering replacement parts, please give symbol, description, and stock number of each item ordered.

The part which will be supplied against an order for a replacement item may not be an exact duplicate of the original part. However, it will be a satisfactory replacement differing only in minor mechanical or electrical characteristics. Such differences will in no way impair the operation of the equipment. Parts with no stock numbers are standard components. They are not stocked by RCA and should be obtained from your local electronic parts distributor.

The following tabulations list service parts and electron tube ordering instructions according to your geographical location.

SERVICE PARTS

LOCATION	ORDER SERVICE PARTS FROM:
Continental United States, including Alaska and Hawaii	RCA Parts and Accessories Department, P.O. Box 654, Camden, New Jersey or through your nearest RCA Regional Office. Emergency orders may be telephoned, telegraphed, or teletyped to RCA Emergency Service, Bldg. 60, Camden, N. J. (Telephone: WO 3-8000).
Dominion of Canada	RCA Victor Company Limited, 1001 Lenoir Street, Montreal, Quebec or through your local Sales Representative or his office.
Outside of Continental United States, Alaska, Hawaii and the Dominion of Canada	RCA International Division, Clark, N. J., U.S.A. or through your local Sales Representative.

ELECTRON TUBES

LOCATION	ORDER ELECTRON TUBES FROM:
Continental United States, including Alaska and Hawaii	Local RCA Tube Distributor.
Dominion of Canada	RCA Victor Company Limited, 1001 Lenoir Street, Montreal, Quebec or through your local Sales Representative or his office.
Outside of Continental United States, Alaska, Hawaii and the Dominion of Canada	Local RCA Tube Distributor or from: Tube Department RCA International Division 30 Rockefeller Plaza New York 20, New York, U.S.A.

RETURN OF ELECTRON TUBES

If for any reason, it is desired to return tubes, please return them through your local RCA tube distributor, RCA Victor Co. Ltd., or RCA International Div., depending on your location.

Please do not return tubes directly to RCA without authorization and shipping instructions.

It is important that complete information regarding each tube (including type, serial number, hours of service and reason for its return) be given. When tubes are returned, they should be shipped to the address specified on the Return Authorization form. A copy of the Return Authorization and also a Service Report for each tube should be packed with the tubes.

LIST OF RCA SALES OFFICES

Atlanta 3, Georgia
1121 Rhodes-Haverty Bldg.
134 Peachtree St. N.W.
JAckson 4-7703

Boston 16, Mass.
Room 2301, John Hancock Bldg.
200 Berkley St.
HUbbard 2-5765

Camden 2, N. J.
Building 15
WOodlawn 3-8000

Charlotte 4, N. C.
504 Charlottetown Mall
333-3996

Chicago 54, Ill.
1186 Merchandise Mart Plaza
DElaware 7-0700

Cleveland 15, Ohio
1600 Keith Bldg.
CHerry 1-3450

Dallas 35, Texas
7901 Empire Freeway
FLeetwood 2-3911

Detroit 39, Mich.
12605 Arnold St.
KEnwood 4-5100

Hollywood 28, Calif.
RCA Bldg., 1560 N. Vine St.
HOllywood 9-2154

Indianapolis, Ind.
501 N. LaSalle St.
MElrose 6-5321

Kansas City 15, Missouri
7711 State Line Road
EMerson 1-6770

New York 20, New York
36 W. 49th St.
JUdson 6-3800

Paterson, N. J.
495 E. 30th St.
MUlberry 4-0972

Portland 5, Oregon
1208 S.W. 14th St.
CApitol 6-6828

San Francisco 2, Calif.
420 Taylor St.
ORdway 3-8027

Seattle, Washington
2250 First Ave., S.
MAin 2-8350

Washington 6, D. C.
1725 K St., N.W.
FEderal 7-8500

PARTS LIST

For ordering information see page 16

MONOSCOPE CAMERA

SYMBOL NO.	DESCRIPTION	DRAWING NO.	STOCK NO.
C1	Capacitor, 0.25 mf, 600 volts	K-8887706-12	59751
C2	Capacitor, fixed, dual section, includes C2A/C2B	B-442900-59	94280
C2A	Capacitor, 50 mf, 450 volts, part of C2		
C2B	Capacitor, 40 mf, 450 volts, part of C2		
C3	Capacitor, fixed, dual section, includes C3A/C3B	M-442900-33	96215
C3A	Capacitor, 80 mf, 400 volts, part of C3		
C3B	Capacitor, 10 mf, 400 volts, part of C3		
C4	Capacitor, 0.22 mf, 400 volts	C-735715-129	73794
C5	Not Used		
C6	Capacitor, same as C4		
C7	Capacitor, fixed, four section, includes C7A/C7B/C7C/C7D	B-442900-30	59759
C7A	Capacitor, 20 mf, 450 volts, part of C7		
C7B/C/D	Capacitor, 10 mf, 450 volts, part of C7		
C8	Capacitor, same as C4		
C9	Capacitor, variable, 7-45 mmf	K-868903-3	54221
C10	Capacitor, same as C3		
C10A/B	Capacitor, same as C3A/C3B		
C11	Capacitor, same as C4		
C12, C13	Capacitor, 330 mmf, 500 volts	P-727851-135	76473
C14	Capacitor, 0.47 mf, 400 volts	C-737818-96	59512
C15	Capacitor, 5600 mmf, 500 volts	727866-165	39670
C16	Capacitor, fixed, dual section, 20 mf per section, 450 volts	M-95695-39	34889
C16A/B	Capacitor, part of C16		
C17	Capacitor, same as C14		
C18	Capacitor, same as C16		
C19, C20	Capacitor, 1 mf, 600 volts	K-8887706-14	45807
C21	Capacitor, 0.22 mf, 400 volts	C-735718-179	74957
C22	Capacitor, same as C3		
C22A/B	Capacitor, part of C22		
C23	Capacitor, same as C21		
C24	Capacitor, same as C16		
C25	Not Used		
C26	Capacitor, 1 mf, 1500 volts	K-984629-123	58481
C27	Capacitor, 2 mf, 1000 volts	K-984629-113	59760
C28	Capacitor, same as C26		
C29, C30, C31	Capacitor, 0.1 mf, 600 volts	C-735715-275	73557
C32, C33	Capacitor, same as C21		
C34	Capacitor, fixed, dual section, 0.5 mf per section, 400 volts	K-984680-417	94558
C34A/B	Capacitor, part of C34		
C35	Capacitor, same as C29		
C36, C37	Capacitor, 0.01 mf, 600 volts	C-735715-263	73565
C38	Capacitor, 270 mmf, 500 volts	P-727851-133	59483
C39	Capacitor, same as C36		
C40	Capacitor, same as C34		
C40A/B	Capacitor, part of C40		
C41	Capacitor, same as C38		
C42	Capacitor, same as C36		
C43	Capacitor, same as C29		
C44	Capacitor, same as C12		
C45	Capacitor, 500 mf, 6 volts	B-449633-46	94337
C46	Capacitor, 100 mmf, 500 volts	727851-123	39628
C47	Capacitor, same as C45		
C48	Capacitor, same as C46		
C49	Capacitor, 15 mf, 350 volts	M-442901-68	37877
C50	Capacitor, 120 mmf, 500 volts	727851-125	39630
C51	Capacitor, same as C4		
F1	Fuse, 1.5 amperes	K-55544-2	2725

SYMBOL NO.	DESCRIPTION	DRAWING NO.	STOCK NO.
J1	Connector, jack	P-255223-1	51800
J2	Jack, tip	K-845648-1	18348
J3 to J11	Connector, same as J1		
J12	Jack, same as J2		
J13	Connector, same as J1		
J14	Jack, same as J2		
J15	Connector	P-727969-11	51928
J16, J17, J18	Jack, same as J2		
J19	Connector, receptacle	M-445813-4	54890
J20	Jack, same as J2		
L1	Coil	P-739772-505	51906
L1A/B	Coil, part of L1		
L2	Coil, same as L1		
L2A/B	Coil, part of L2		
L3	Coil	P-739772-506	51907
L3A/B	Coil, part of L3		
L4	Coil, same as L3		
L4A/B	Coil, part of L4		
L5	Coil, same as L3		
L5A/B	Coil, part of L5		
L6	Coil, reactor	M-901919-1	51909
L7	Coil, assembly	K-8883411-501	54604
L8	Coil, deflecting yoke	P-727966-501	51913
P1	Connector, plug	K-252868-1	66344
P2	Not Used		
P3	Connector, same as P1		
P4	Not Used		
P5	Connector, same as P1		
P6	Not Used		
P7	Connector, same as P1		
P8	Not Used		
P9	Connector, same as P1		
P10 to P14	Not Used		
P15	Connector, plug	P-727969-12	51929
P16 to P18	Not Used		
P19	Connector, UG-260/U	M-427992-501	56153
R1	Resistor, 100,000 ohms, 1 watt	K-90496-86	512410
R2	Resistor, 100,000 ohms, 1/2 watt	K-82283-86	502410
R3	Resistor, 100 ohms, 1/2 watt	K-82283-50	502110
R4	Resistor, 150 ohms, 1/2 watt	K-82283-52	502115
R5	Resistor, 56,000 ohms, 1 watt	K-90496-83	512356
R6	Resistor, same as R3		
R7	Resistor, 5600 ohms ±5%, 1/2 watt	K-82283-177	502256
R8	Resistor, 1300 ohms ±5%, 1/2 watt	K-82283-162	33572
R9	Resistor, 10,000 ohms, 1 watt	K-90496-74	315310
R10	Resistor, 470,000 ohms, 1/2 watt	K-82283-94	502447
R11	Resistor, same as R3		
R12	Resistor, same as R4		
R13	Resistor, same as R5		
R14	Resistor, 8200 ohms, 1/2 watt	K-82283-181	502282
R15	Resistor, same as R8		
R16	Resistor, 220 ohms, 1 watt	K-90496-54	512122
R17	Resistor, same as R10		
R18	Resistor, same as R3		
R19	Resistor, 82 ohms, 1/2 watt	K-82283-49	502082
R20	Resistor, 18,000 ohms, 1 watt	K-90496-77	512318
R21	Resistor, 560 ohms, 1 watt	K-90496-59	38884
R22	Resistor, 120,000 ohms, 1 watt	K-90496-87	512412
R23	Resistor, 680 ohms, 1/2 watt	K-82283-60	502168
R24	Resistor, same as R4		
R25	Resistor, same as R5		
R26	Resistor, 8200 ohms ±5%, 1/2 watt	K-82283-181	502282
R27	Resistor, 1200 ohms, 1/2 watt	K-82283-63	502212
R28	Resistor, 5600 ohms, 1 watt	K-90496-71	512256
R29	Resistor, same as R10		
R30	Resistor, same as R3		
R31	Resistor, 47 ohms, 1 watt	K-90496-46	512047
R32	Resistor, 33 ohms, 1/2 watt	K-82283-44	30789
R33	Resistor, 220 ohms, 1/2 watt	K-82283-54	502122
R34	Resistor, same as R5		
R35	Not Used		

SYMBOL NO.	DESCRIPTION	DRAWING NO.	STOCK NO.
R36	Resistor, variable, 100,000 ohms	M-433196-4	95243
R37	Resistor, 3300 ohms ±5%, 1/2 watt	K-82283-171	30733
R38	Resistor, 910 ohms ±5%, 1 watt	K-90496-158	59761
R39	Resistor, 470,000 ohms, 1 watt	K-90496-94	512447
R40	Resistor, same as R3		
R41	Resistor, same as R4		
R42	Resistor, 33,000 ohms, 1 watt	K-90496-80	38895
R43	Resistor, 10,000 ohms, 2 watts	K-99126-74	522310
R44	Resistor, variable, 5000 ohms	M-433196-18	52009
R45	Resistor, 15,000 ohms, 2 watts	K-99126-76	522315
R46	Resistor, 6800 ohms, 1/2 watt	K-82283-179	502268
R47	Resistor, 560 ohms, 1/2 watt	K-82283-59	5164
R48	Resistor, 27,000 ohms, 2 watts	K-99126-79	522327
R49	Resistor, 560,000 ohms, 1/2 watt	K-82283-95	502456
R50	Resistor, same as R3		
R51	Resistor, same as R19		
R52	Resistor, same as R3		
R53	Resistor, 18,000 ohms, 2 watts	K-99126-77	39158
R54	Resistor, non-inductive, 3000 ohms, 5 watts	M-443853-22	51629
R55	Resistor, same as R2		
R56	Resistor, same as R49		
R57	Resistor, 10 ohms, 1/2 watt	K-82283-38	502010
R58	Resistor, 1000 ohms, 1 watt	K-90496-62	512210
R59	Resistor, same as R42		
R60	Resistor, 560,000 ohms, 1 watt	K-90496-95	512456
R61	Resistor, 47 ohms, 1/2 watt	K-82283-46	502047
R62	Resistor, 47,000 ohms, 1 watt	K-90496-82	512347
R63	Resistor, same as R1		
R64	Resistor, same as R49		
R65	Resistor, 820 ohms, 1/2 watt	K-82283-61	502182
R66	Resistor, same as R127		
R67	Resistor, 470 ohms, 1 watt	K-90496-58	512147
R68	Resistor, 1 megohm, 1/2 watt	K-82283-98	502510
R69	Resistor, 820,000 ohms, 1/2 watt	K-82283-97	502482
R70	Resistor, same as R3		
R71	Resistor, same as R19		
R72	Resistor, same as R53		
R73	Resistor, same as R54		
R74	Resistor, same as R2		
R75	Resistor, 330,000 ohms, 1 watt	K-90496-92	512433
R76	Resistor, variable, 50,000 ohms	M-433196-5	51944
R77	Resistor, 1.2 megohms, 1 watt	K-90496-99	512512
R78	Resistor, 1 megohm, 1 watt	K-90496-98	512510
R79	Resistor, same as R22		
R80	Resistor, same as R36		
R81	Resistor, 150,000 ohms, 1 watt	K-90496-88	512415
R82	Resistor, 180,000 ohms, 1 watt	K-90496-89	512418
R83	Resistor, variable, 10,000 ohms	M-433196-6	68833
R84	Resistor, 8200 ohms, 1 watt	K-90496-73	512282
R85	Resistor, 1200 ohms, 1 watt	K-90496-63	512212
R86	Resistor, 330,000 ohms, 1/2 watt	K-82283-92	502433
R87	Resistor, same as R1		
R88, R89	Resistor, 15 ohms, 1/2 watt	K-82283-40	502015
R90	Resistor, same as R68		
R91	Resistor, 470 ohms, 1/2 watt	K-82283-58	30499
R92	Resistor, same as R57		
R93	Resistor, same as R68		
R94	Resistor, 22,000 ohms, 1 watt	K-90496-78	71989
R95	Resistor, 2.2 megohms, 1/2 watt	K-82283-102	30649
R96	Resistor, same as R76		
R97	Resistor, same as R1		
R98, R99	Resistor, 820 ohms, 1/2 watt	K-82283-61	502182
R100	Resistor, same as R68		
R101	Resistor, same as R43		
R102	Resistor, same as R9		
R103	Resistor, 470,000 ohms, 1/2 watt	K-82283-94	502447
R104	Resistor, same as R58		
R105	Not Used		
R106	Resistor, same as R16		
R107	Resistor, same as R1		
R108	Resistor, variable, 500,000 ohms	M-433196-30	52444

SYMBOL NO.	DESCRIPTION	DRAWING NO.	STOCK NO.
R109	Resistor, 10 ohms, 1 watt	K-90496-38	512010
R110	Resistor, same as R68		
R111, R112	Resistor, same as R57		
R113	Resistor, same as R2		
R114	Resistor, same as R94		
R115	Resistor, same as R5		
R116	Resistor, same as R76		
R117	Resistor, 47,000 ohms, 1/2 watt	K-82283-82	13677
R118	Resistor, 270,000 ohms, 1 watt	K-90496-91	19232
R119	Resistor, same as R103		
R120	Resistor, 390 ohms, 2 watts	K-99126-57	523139
R121	Resistor, 100 ohms, 1 watt	K-90496-50	512110
R122, R123	Not Used		
R124	Resistor, same as R103		
R125	Resistor, same as R3		
R126	Resistor, variable, 2.5 megohms	M-427471-33	54159
R127	Resistor, variable, 2000 ohms	M-433196-17	52011
R128	Resistor, same as R3		
R129	Resistor, 2200 ohms, 1 watt	K-90496-66	512222
R130, R131	Resistor, variable, 20 ohms	M-433196-37	54416
R132	Resistor, 1000 ohms, 2 watts	K-99126-62	522210
R133	Resistor, 47,000 ohms, 2 watts	K-99126-82	44211
R134	Resistor, 82,000 ohms, 1 watt	K-90496-85	512382
R135	Resistor, same as R94		
R136	Resistor, same as R3		
S1	Switch, DPDT	M-95559-5	93263
S2A	Switch, interlock	K-99119-1	54591
S2B	Plug, interlock switch	K-99119-2	54592
T1	Transformer, power	M-901918-2	59763
T2	Transformer, vertical output	K-895383-1	51910
T3	Transformer, horizontal output	M-901813-1	51911
X1 to X18	Socket	K-99390-1	54414
X19	Socket	K-837884-2	43163
X20	Socket	K-856956-9	54160
X21	Socket	737867-14	94925
XF1	Socket, fuse	K-99088-1	58933
	MISCELLANEOUS		
	Insulator	426765-17	56393
	Knob, for R36, R76, R80, R83, R96, R116, R130, R131	P-712336-507	30075
	Mounting plate, steel, for capacitor C16	K-85559-2	
	Mounting plate, steel, for capacitors C2, C3, C7, C10, C22	K-85559-3	
	Mounting plate, phenolic, for capacitors C18, C24	K-85558-2	28452
	Shield Assembly, monoscope	T-618751-501	51989
	Termination, coaxial	K-895438-501	54256

NOTES AND SKETCHES

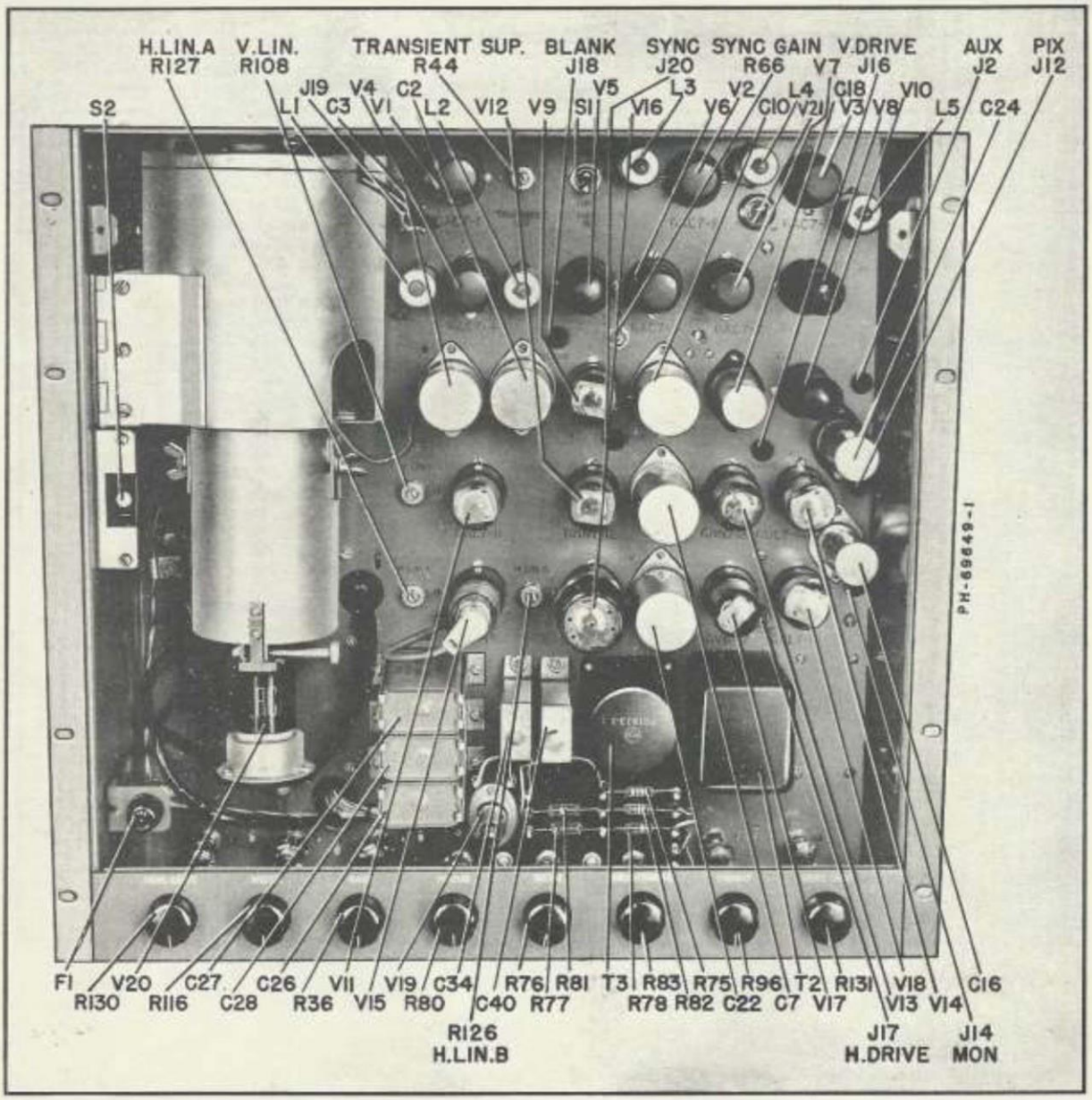

Figure 7 - Monoscope Camera, Front View

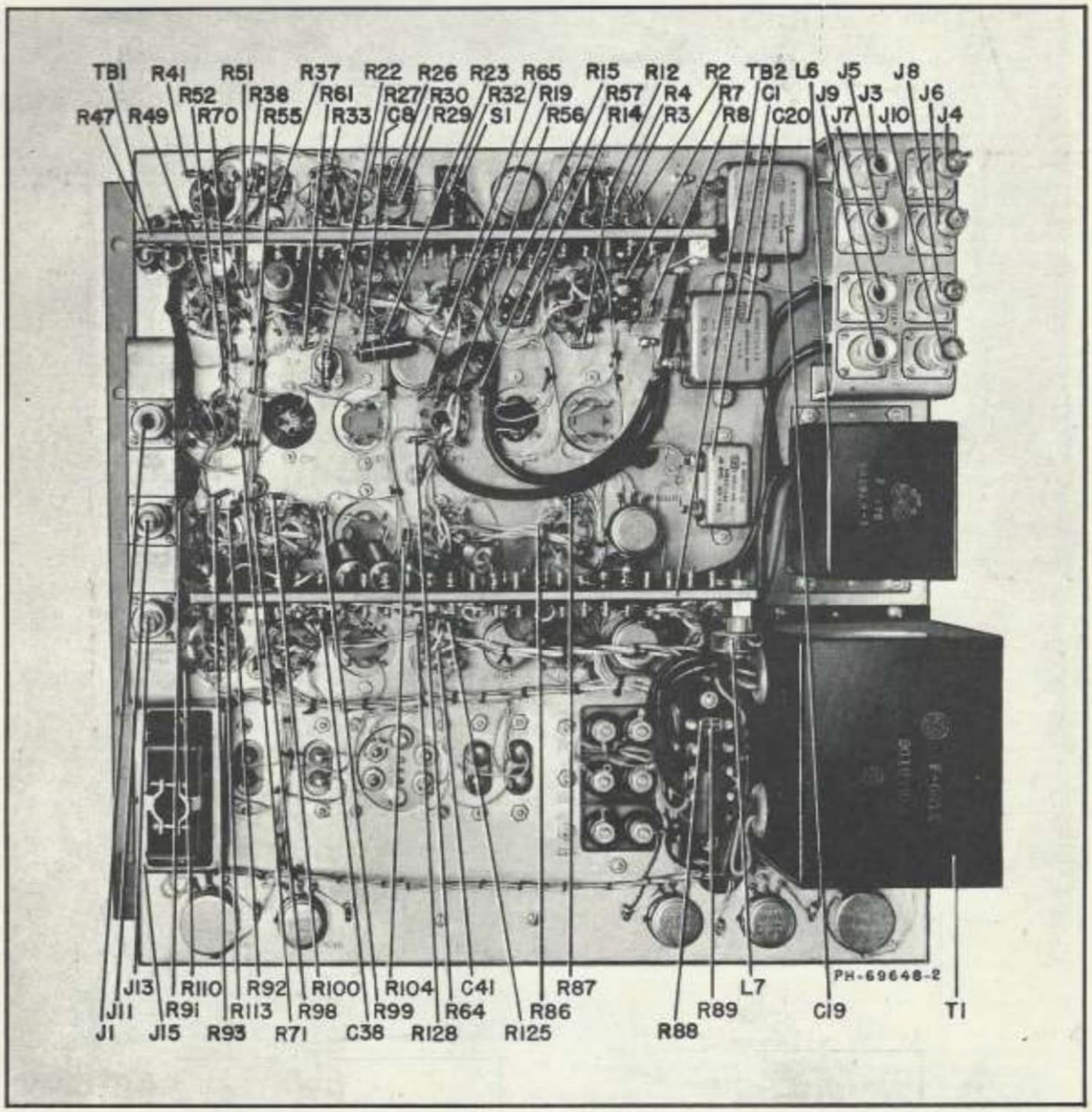

Figure 8 - Monoscope Camera, Rear View

TUBE			GRID				PLATE				CATHODE				SCREEN	
SYMBOL	RCA TYPE	FUNCTION	PIN	VOLTAGE DC	VOLTAGE AC*	WAVEFORM	PIN	VOLTAGE DC	VOLTAGE AC*	WAVEFORM	PIN	VOLTAGE DC	VOLTAGE AC*	WAVEFORM	PIN	VOLTAGE DC
V1	6AC7	VIDEO AMP.	4	0			8	168			5	1.7			6	163
V2	6AC7	VIDEO AMP.	4	0	1.0		8	275	9.6		5	2.2			6	155
V3	6AC7	VIDEO AMP.	4	-2.5	9.6		8	160	6.3		5	1.25	2.0		6	160
V4	6AC7	VIDEO AMP.	4	0			8	268			5	2			6	165
V5	6AG7	VIDEO AMP.	4	0	3.6		8	230	5.0		5	2.9	3.0		6	152
V6	6AC7	VIDEO AMP.	4	0			8	220	1.0	SAME AS GRID V2	5	1.9	0		6	145
V7	6AC7	BLANKING AMP.	4	-2.4	7.0		8	275	9.6		5	0.15	0.7		6	70
V8	6AG7	VIDEO OUTPUT	4	0	5.5		8	200	2.0		5	2.9	3.3		6	160
V9A	1/2 6SN7	SYNC. AMP.	1	0	4.7		2	281	2.3		3	1.1	3.9		-	-
V9B	1/2 6SN7	BLANKING AMP.	4	-1.1	3.5		5	208	7.0		6	0.03	0.08		-	-
V10	6AG7	VIDEO OUTPUT	4	0	5.5	SAME AS V8	8	200	2.0	SAME AS V8	5	2.8	3.2	SAME AS V8	6	160
V11A	1/2 6SL7	VERT. FEEDBACK AMP.	1	-1.4	0.08		2	189	2.9		3	-0.8	0.65		-	-
V11B	1/2 6SL7	REGULATOR, H.V.	4	+0.6	0.1		5	95	8.0		6	0	0		-	-
V12A	1/2 6SN7	VERT. OUTPUT	1	0	18		2	268	85		3	9	10		-	-
V12B	1/2 6SN7	SYNC. AMP.	4	155	2.9		5	285	0		6	165			-	-
V13A	1/2 6SN7	1st VERT. S.T. AMP.	1	0.05	1.4		2	189	2.9		3	5	1.2		-	-
V13B	1/2 6SN7	2nd VERT. S.T. AMP.	4	0	2.9		5	209	17.5		6	5.9	1.3		-	-
V14A	1/2 6SL7	VERT. DRIVE AMP.	1	0	4.8		2	138	50		3	4.2	1.3		-	-
V14B	1/2 6SL7	VERT. DISCHARGE	4	-26	30		5	0.1	1.4		6	0			-	-
V15	1B3GT	H.V. RECTIFIER	-	-			CAP	1250			2,7	95	8.0		-	-
V16	6Y6G	HOR. DAMPER	5	-72	520		3	-3.3	720		8	6	1.2		4	-3.3
V17	6V6GT	HOR. OUTPUT	5	0	18		3	282	880		8	17	0.9		4	285
V18A	1/2 6SL7	HOR. DRIVE AMP.	1	-1	3.8		2	145	30		3	0.05	0.09		-	-
V18B	1/2 6SL7	HOR. DISCHARGE	4	-26	30		5	167	18		6	0.03			-	-
V19	991	REGULATOR	-	-			-	1190			-	1140			-	-
V21	6AL5	CLIPPER & TRANSIENT SUPPRESSOR	-	-	-		2 7	160 0	6.3 5.3	SAME AS V3 SAME AS GRID V8	5 1	162 160	- 6.3	SAME AS PLATE V3	-	-

V20	2F21	MONOSCOPE	PIN NO.	1	2	3	4	5	6	7	8	COLLECTOR CAP	
			DC VOLTAGE	-	0	-600	-900	-800	-800	-	-	280	

Approximate normal output conditions simulated, 75-ohm terminations used.
All dc voltages measured to ground, with RCA VoltOhmyst, Jr.
Voltages used: filament 6.3 v. ac; line 115 v. ac; power supply 280 v. dc and -3 v. dc.

*Peak to peak, 60 cycle sweep.

Figure 9 - Voltage and Waveform Chart

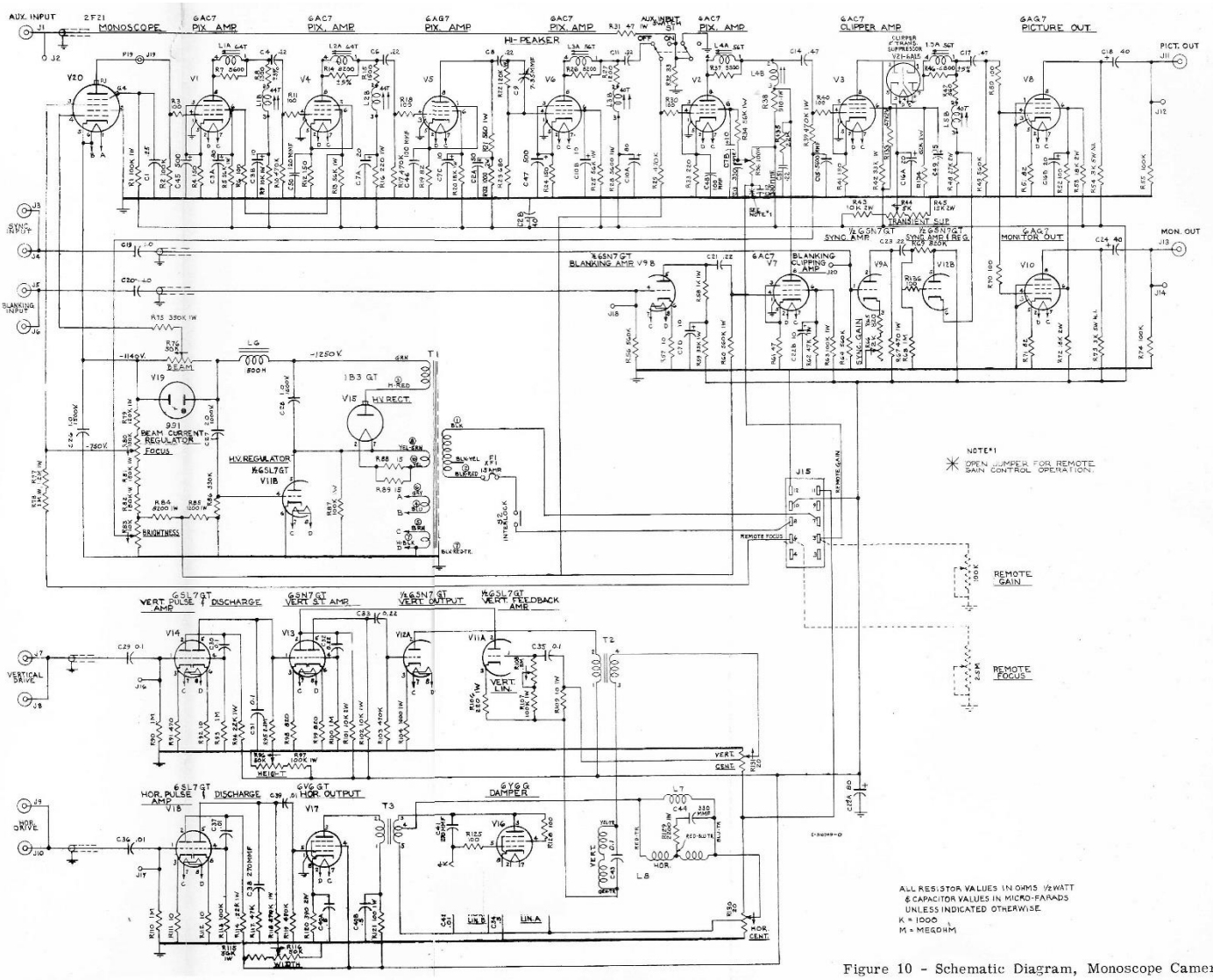

Figure 10 - Schematic Diagram, Monoscope Camera

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