

PROJECTION ROOM

579

TX-1B

Colorplexer



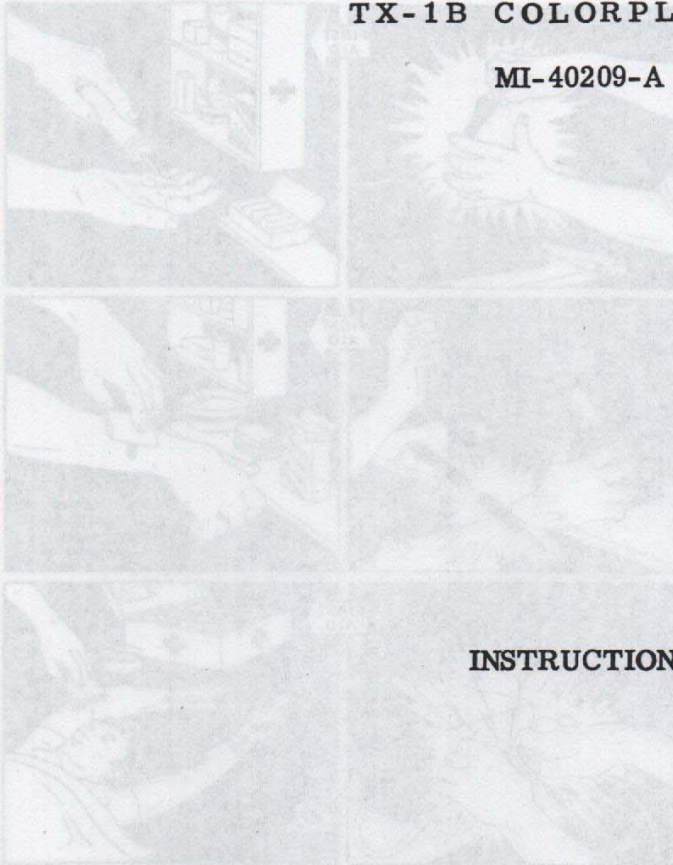
RADIO CORPORATION OF AMERICA
ENGINEERING PRODUCTS DEPARTMENT CAMDEN, N. J.

IB-36224

FIRST AID

TX-1B COLORPLEXER

MI-40209-A



INSTRUCTIONS

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 connected in the off position due to charges retained by capacitors, etc. To avoid casualties always discharge and ground circuits prior to touching them.

ABOUT FIRST AID

Personnel engaged in the installation, operation and maintenance of this equipment or similar equipment are urged to become familiar with the following rules which are essential to the proper application of first aid in the event of an accident. It is the duty of every individual to be prepared to give assistance first aid and first aid by prompt avoidance of it.

RESCUATION

1. PROTECT YOURSELF with dry insulating material.
2. BREAK THE CIRCUIT by opening the power switch or by pulling the victim away from the conductor.
3. DON'T TOUCH VICTIM WITH YOUR BARE HANDS UNTIL THE CIRCUIT IS BROKEN.



4. REMOVE EARPLUGS, TOBACCO OR GUM FROM MOUTH.
5. PLACE TONGUE OF VICTIM WITH THE POINT OF THE TONGUE FOR FIRST AID.
6. LAY PATIENT ON STOMACH, face down, with the head and feet at right angles to each other and feet at elbow. Turn face toward nearest hand or forearm.
7. WITH ARMS STRAIGHT SWING THE VICTIM'S HEAD AND NECK TO THE LEFT, TOBACCO OR GUM FROM MOUTH.
8. AFTER TWO-THREE SWINGS FORWARD AGAIN. Repeat action to other side for minute.
9. DURING REVERSE SWINGS IMMEDIATELY to relieve the pressure.

Manufactured by
RADIO CORPORATION OF AMERICA
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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.

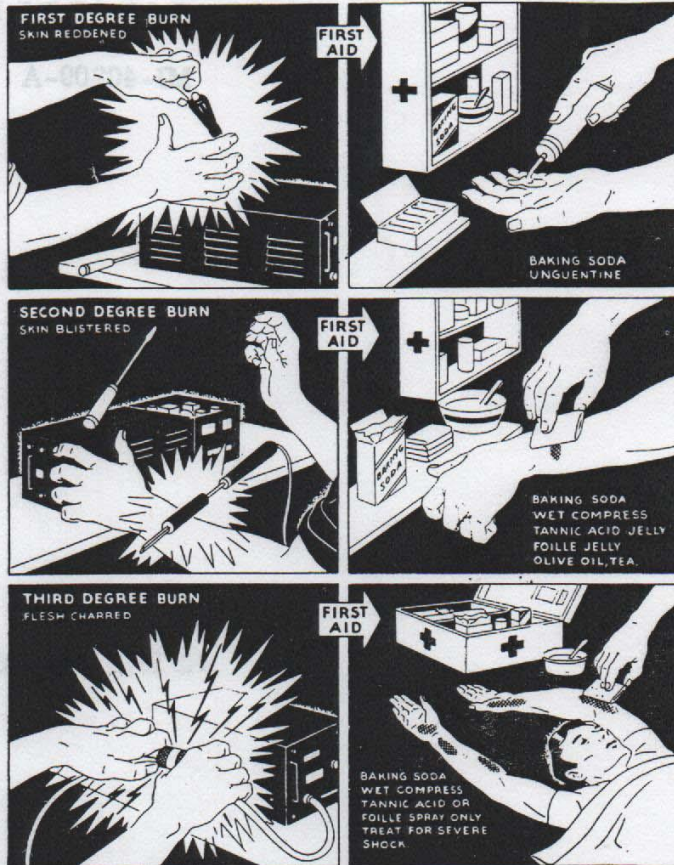
ABOUT FIRST AID

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.

PRONE-PRESSURE METHOD OF RESUSCITATION

1. PROTECT YOURSELF with dry insulating material.
2. BREAK THE CIRCUIT by opening the power switch or by pulling the victim free of the live conductor.

DON'T TOUCH VICTIM WITH YOUR BARE HANDS UNTIL THE CIRCUIT IS BROKEN.



(A)



(B)



(C)

3. LAY PATIENT ON STOMACH, one arm extended, the other arm bent at elbow. Turn face outward resting on hand or forearm.
4. REMOVE FALSE TEETH, TOBACCO OR GUM from patient's mouth.
5. KNEEL STRADDLING PATIENTS THIGHS. See (A).
6. PLACE PALMS OF YOUR HANDS ON PATIENT'S BACK with little fingers just touching the lowest ribs.
7. WITH ARMS STRAIGHT, SWING FORWARD gradually bringing the weight of your body to bear upon the patient. See (B).
8. SWING BACKWARD IMMEDIATELY to relieve the pressure. See (C).
9. AFTER TWO SECONDS, SWING FORWARD AGAIN. Repeat twelve to fifteen times per minute.
10. WHILE ARTIFICIAL RESPIRATION IS CONTINUED, HAVE SOMEONE ELSE:
 - (a) Loosen patient's clothing.
 - (b) Send for doctor.
 - (c) Keep patient warm.
11. IF PATIENT STOPS BREATHING, CONTINUE ARTIFICIAL RESPIRATION. Four hours or more may be required.
12. DO NOT GIVE LIQUIDS UNTIL PATIENT IS CONSCIOUS.

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EQUIPMENT LIST

TUBE COMPLEMENT

The following items comprise the RCA Colorplexer, Model 1225-A:

COLORPLEXER CHASSIS

Symbol	RCA Type	Function
V1	6AU6	M and Sync. Amplifier
V2	6AH6	I Amplifier
V3	6AH6	Q Amplifier
V4	6AU6	I Amplifier
V5	6AU6	Q Amplifier
V6	12AU7	I Phase Splitter; Q Phase Splitter
V7	*	I Modulator
V8	*	I Modulator
V9	*	Q Modulator
V10	*	Q Modulator
V11	6AU6	M Adder
V12	6AU6	Chroma Adder
V13	6AL5	Retrace Clamp
V14	6AL5	I Modulator Clamp
V15	6AL5	I Modulator Clamp
V16	6AL5	Q Modulator Clamp
V17	6AL5	Q Modulator Clamp
V18	6AU6	0° Subcarrier Amplifier
V19	6AU6	90° Subcarrier Amplifier
V20	12AU7	Horizontal Delay Amplifier
V21	0B2	Regulator
V22	6U8	Video Amplifier
V23	6BQ7A	Video Amplifier
V24	6U8	Video Amplifier
V25	6BQ7A	Series Amplifier
V26	5687	Video Output Amplifier
V27	5687	Video Output Amplifier
V28	0A2	Regulator
V29	6U8	Retrace Blank, MV. and Clamp Osc.
V30	6U8	Retrace Clamp Driver and Clamp Driver
V31	6AL5	Output Clamp
V32	6AU6	Burst Flag Inverter
V33	*	Burst Keyer
V34	6AU6	Burst Adder

* RCA Stock No. 204603

PHASE SHIFTER CHASSIS

V1	6AU6	Subcarrier Amplifier
V2	6AU6	Subcarrier Driver

EQUIPMENT LIST

The following items comprise the RCA Colorplexer, MI-40209-A:

Colorplexer chassis, including all tubes
 Delay Line, approx. 32 feet long
 Delay Line, approx. 26 feet long
 Instruction Book IB-36224

RECOMMENDED TEST EQUIPMENT

The following test equipment is recommended to facilitate adjustment and maintenance of the RCA Colorplexer:

VoltOhmyst, RCA Type WV-97A
 Oscilloscope, RCA Type TO-524D
 Color Bar Generator, RCA MI-34001-C
 Color Signal Analyzer, RCA MI-34016-A
 Cross-Over Filter, RCA MI-34021 (part of RCA Linearity Checker, MI-34017-A)

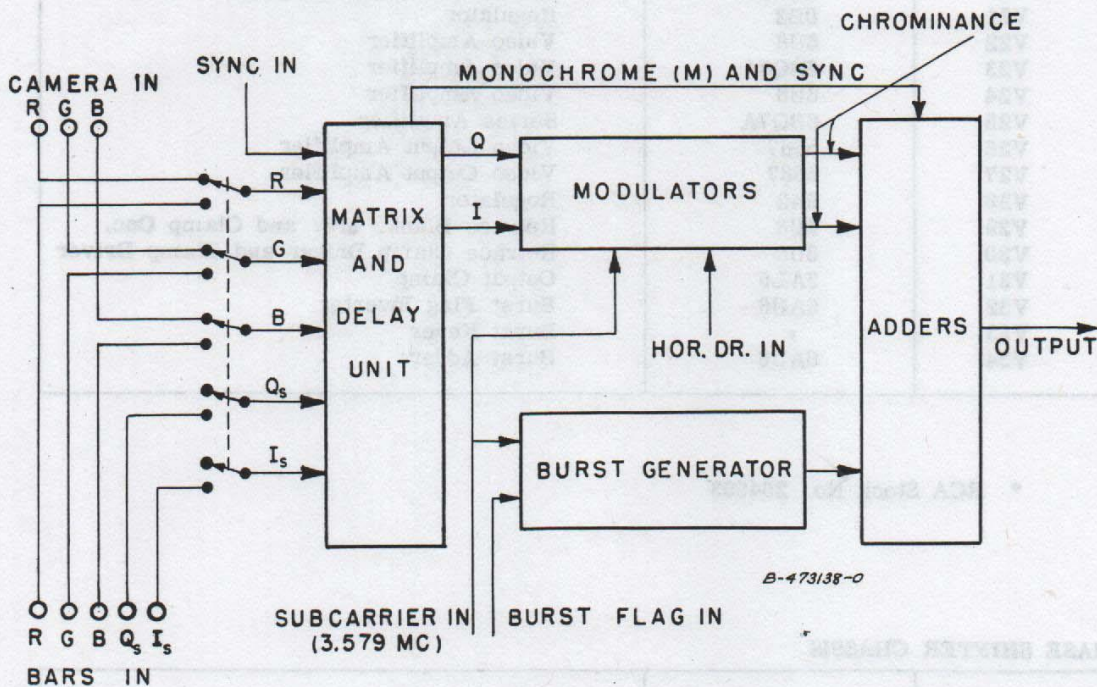


Figure 1 - Block Diagram, TX-1B Colorplexer

DESCRIPTION

The RCA Colorplexer, MI-40209-A, is a rack-mounted unit which combines, on one chassis, the circuits required to produce a composite color television signal from the various individual signals originating in a color television signal-generating system. Its functions as shown in the Block Diagram, Figure 1, are as follows:

1. Cross-mixing, or matrixing, red, blue, and green video signals from a color television camera chain, from a color-slide scanner, or from a color-bar generator, in proper proportion to produce a luminance signal (which is equivalent to a monochrome video signal) and to produce two color-difference or chrominance signals.
2. Suppressed-carrier modulation of the subcarrier by each of the two chrominance signals in phase quadrature, so that the color information conveyed by each may be transmitted within the same frequency limits.
3. Adding standard sync signals to the video and color information.
4. Inserting burst flag signals of suitable amplitude and duration into the composite color television signal.
5. Filtering the chrominance signals to maintain their required bandwidth.
6. Compensation for delays in the signals introduced by filtering of the chrominance signals.
7. To provide suppression of spurious signals during horizontal blanking or retrace time before addition of standard sync and burst signals.
8. Shifting phase of incoming 3.579545 megacycle subcarrier through 360° to allow matching of several Colorplexer outputs with respect to subcarrier phase.

Operating controls for the various functions are mounted on the front of the chassis, as are the test jacks which are connected to key points in the circuitry for observation of waveforms.

Provision is made at the Colorplexer's input for selecting either camera signals or color bar test signals for transmission through the unit. When the selector switch is in the BARS position, two additional inputs are included, which are for special test pulses supplied by the RCA Color Bar Generator.

Figures 3 and 4 are the Schematic Diagrams of the Colorplexer and the Phase Shifter sections respectively.

INSTALLATION

The RCA Colorplexer, MI-40209-A, is designed for mounting in a standard 19-inch equipment rack. All connections, except those for power input, are made at the rear of the unit with 75-ohm coaxial cable and connectors. All power is applied through the six-terminal Jones connector, J14, located at the upper rear of the chassis. A mating female power connector, P14, is supplied with the equipment, as are sufficient 75-ohm coaxial connectors. Where two identically-labeled input jacks are furnished, the extra one in every case is for bridging to another piece of equipment or for termination in 75 ohms, using a 75-ohm non-inductive resistor and coaxial connector.

LINE VOLTAGE SETTING

Using an accurate voltmeter, measure the a-c line voltage to which the Colorplexer will be connected. Adjust the input taps on the power transformers, T4 and T5, by connecting each tap lead to the proper primary terminal, either 2, 3, or 4 for line voltages of 109, 117, or 125 respectively.

POWER CONNECTIONS

Connect the a-c line to terminals 7 and 8 of P14. Connect the positive side of a well-regulated source of 280 volts dc, such as the RCA Type WP-33B, to terminal 10 of P14. Connect the negative side to terminal 12. The power supply must be capable of supplying 300 ma.

DELAY LINE CONNECTIONS

Two lengths of coaxial cable, with connectors mounted at each end, are supplied as part of the equipment. These are delay lines, tagged "MONO" and "I". They are to be connected between the appropriately labeled coaxial jacks at the rear of the chassis. Connect the ends of the "MONO" cable to the MONO DELAY jacks, J39 and J40; connect the "I" cable similarly to the I DELAY jacks, J37 and J38. The excess cable may be coiled for convenience and hung at the top of the rack or left lying at the bottom.

SIGNAL INPUT CONNECTIONS

Connect horizontal driving signals from the station's pulse distribution system to one of the HORIZ DRIVE jacks, J9 or J24.

Connect the subcarrier output from the RCA Color Frequency Standard to the SUBCARRIER INPUT jack, J101 or J102.

Connect the KEYING PULSE OUTPUT from the RCA Burst Flag Generator to one of the BURST FLAG INPUT jacks, J44 or J45.

Connect RETMA sync signal from the station's pulse distribution system to the SYNC IN test jack, J21.

Terminate unused jacks in 75 ohms.

Facing the chassis from the rear, there is a panel at the right, on which are mounted 8 jacks in two vertical rows. Connect the left row of 5 jacks to the proper output jacks of the RCA Color Bar Generator. From top to bottom respectively they are BLUE, SPECIAL I, RED, SPECIAL Q, and GREEN. The right hand row of three jacks is for (from top to bottom respectively) blue, red, and green video signals from the color camera chain and slide scanner, if used. Where these jacks are to be connected will depend on the manner in which the individual station's equipment is arranged and the type of video switching used.

SIGNAL OUTPUT CONNECTIONS

Flexibility in output connection may be had by the provision of three output jacks, J11, J12, and J13, where the complete composite color television signal appears. Individual requirements will dictate how the jacks are to be used, such as for video line, monitoring, distribution to viewing rooms, and the like. Terminate unused output jacks in 75 ohms.

ADJUSTMENT PROCEDURES

INITIAL ADJUSTMENTS

Check the electrical connections and set all control switches to OFF. Turn on the external power supply. Operate switch S6, HTR-150, to ON. Allow at least one minute for the tube heaters to warm up, then turn switch S7, +280, to ON. While waiting for the unit to reach normal operating temperature, check for the correct amplitude of all input signals as follows:

1. Rotate the CAM BARS switch, S8, to BARS. Set the PATTERN SWITCH on the Color Bar Generator to Position 3. Using the oscilloscope listed under "Recommended Test Equipment", measure each of the five inputs from the Color Bar Generator at the five test jacks provided for this purpose. They are on the front of the Colorplexer, mounted in a vertical row near the left edge, labeled from top to bottom, B IN, I_S IN, R IN, Q_S IN, G IN. The amplitude of the signal at each test jack should be one volt.
2. Check for a -4 volt peak signal at the HORIZ DRIVE IN test jack, J25.
3. Check for a -4 volt peak signal at the BURST FLAG IN test jack, J46, at the extreme lower right of the chassis.
4. Check for a subcarrier amplitude of two volts peak-to-peak, \pm no more than 10%, at test jack J103 which is the input test jack on the 360° phase shifter.
5. Check for a -4 volt sync signal at the SYNC IN test jack, J21, slightly to the upper left of the center of the chassis.

PHASE SHIFTER

Perform the operations described in this section on the 360° Phase Shifter chassis which is attached to the bottom of the Colorplexer chassis.

1. Connect the vertical input of the oscilloscope through a low-capacity probe between pin 1 of V2 and ground. Set the oscilloscope's horizontal deflection for an internally triggered sawtooth sweep.
2. Set the ROUGH PHASE ADJ, S1, to the 0° position. Adjust C1 for maximum amplitude of the signal on the oscilloscope.
3. Connect the oscilloscope through the low-capacity probe to terminal C of transformer T2. Adjust the core of T2 for maximum amplitude of the subcarrier signal being displayed by the oscilloscope.
4. Adjust the core of L3 so that the rotation of R7, FINE PHASE ADJ, throughout its range results in a decrease of no more than 5% in the amplitude of the signal on the oscilloscope. The subcarrier amplitude should remain constant when each position of S1, ROUGH PHASE ADJ, is checked.

5. Readjust the core of T2 to set the amplitude of the subcarrier signal at 2.0 volts $\pm 10\%$, peak-to-peak.

This completes adjustment of the 360° Phase Shifter. For the steps which follow, trigger the oscilloscope's horizontal deflection with horizontal driving signals. These signals may be conveniently obtained by connecting a wire between the oscilloscope's trigger input and J25, which is the HORIZ DRIVE IN test jack on the front of the Colorplexer near the right edge.

COLORPLEXER

Two methods of adjustment are described in the following text. The first does not make use of the special I and Q test pulses generated by the RCA Color Bar Generator. The second method does.

Method I

Connect the oscilloscope's vertical input jack to one of the Colorplexer's OUTPUT test jacks through an RCA Cross-Over Filter, MI-34021. These jacks are located at the extreme upper right of the chassis. Set the filter's switch to D, and the PATTERN SWITCH on the RCA Color Bar Generator to Position 1.

1. Set the three toggle switches on the front of the Colorplexer near the vertical center line to OFF. These are S5, MONO ON-OFF; S3, I ON-OFF; and S4, Q ON-OFF.
2. While observing the oscilloscope pattern, adjust I CARRIER BALANCE, R171; and Q CARRIER BALANCE, R176, which are mounted close to the horizontal center line of the chassis. Use these controls to cancel out any signals appearing on the base line of the oscilloscope. A smooth, clean base line indicates carrier balance.
3. Turn switch S5, MONO ON-OFF to ON which will cause the M and sync signals to appear on the oscilloscope. Adjust the OUTPUT GAIN control, R104, to set the amplitude of the white (first) bar in the signal to 1.0 volt. This control, R104, is at the extreme top of the chassis slightly to the right of center.
4. Adjust the SYNC GAIN control, R265, until the peak amplitude of the sync signal is equal to 0.4 volt.
5. The retrace blanking and clamping circuits should now be adjusted as follows:

Feed a horizontal blanking signal into the BLUE CAMERA signal input jack, J1.

NOTE

If a camera signal is already connected to the input of the Colorplexer, this signal may be substituted for the horizontal blanking signal for retrace blanking adjustment. The same adjustment procedure will apply.

Set the CAMERA-BARS switch, S8, to CAMERA. This switch is at the extreme left of the chassis, near the bottom. Adjust the HORIZONTAL DRIVE DELAY control, C30, until the leading edge of the retrace blanking signal coincides with the leading edge of the horizontal blanking signal at the output of the Colorplexer. C30 is at the right edge, above center of the Colorplexer, and is accessible from the front of the unit.

It may be helpful to slightly unbalance either the I or the Q CARRIER BALANCE controls. This unbalance corresponds to a spurious signal which will be diminished to nearly zero by the retrace blanking signal. The leading edge of the retrace blanking signal occurs where the video signal changes sharply in amplitude just before horizontal sync.

6. Adjust the **BLANKING WIDTH** control, C25, which is located on the back of the chassis near C30, until the trailing edge of the retrace blanking signal coincides with the trailing edge of the horizontal blanking signal. These edges may be identified in a manner similar to that for the leading edges except that they follow the sync signal.

CAUTION

BE SURE TO ADJUST THE HORIZONTAL DRIVE DELAY CONTROL, C30, BEFORE ADJUSTING THE BLANKING WIDTH CONTROL, C25, SINCE C30 WILL AFFECT BOTH THE LEADING AND THE TRAILING EDGES OF THE RETRACE BLANKING SIGNAL.

Rebalance the I and Q **CARRIER BALANCE CONTROLS**, then set the **CAMERA-BARS** switch, S8, to the **BARS** position. Disconnect the horizontal blanking signal from the **BLUE CAMERA** signal input jack, J1.

7. Turn the **MONO ON-OFF** switch, S5, to **OFF**.

8. Turn switch S3, **I ON-OFF** to **ON**. Turn **I GAIN**, R253, to about two-thirds of its clockwise position. R253 is to the lower left of the center point of the chassis.

9. Adjust **I PHASE**, C134, for maximum amplitude of the oscilloscope pattern. This is a screwdriver adjustment located at the rear of the chassis on transformer T1

10. Adjust **I WHITE BALANCE**, R25, until the white (first) bar in the oscilloscope pattern is cancelled out. This control is the red knob at the left center of the chassis.

11. Set the **Cross-Over Filter** switch to **L**. Carefully adjust **I VID BAL 1**, R52, and **I VID BAL 2**, R248, for complete cancellation, in the oscilloscope pattern, of the video signal. R52 is a screwdriver adjustment close to the center point of the front of the chassis; R248 is a similar control mounted at the rear of the chassis near R52.

12. Set the **Cross-Over Filter** switch to **D**. Check the setting of **I CARRIER BALANCE**, R171, for complete cancellation of the carrier signal in the oscilloscope pattern.

Repeat steps 11 and 12 alternately until cancellation of both video and carrier signals is complete.

13. Turn switch S3, **I ON-OFF**, to **OFF**. Set the **Cross-Over Filter Switch** to **D**.

14. Turn switch S4, **Q ON-OFF**, to **ON**. Set **Q GAIN** control, R255, to about two thirds of its clockwise rotation. R255 is near the lower edge of the chassis, somewhat to the left of center.

15. Adjust **Q PHASE**, C135, for maximum amplitude of the oscilloscope pattern. This is a screwdriver adjustment located toward the lower right corner.

16. Adjust **Q WHITE BAL**, R38, until the white (first) bar in the oscilloscope pattern is cancelled out. This control is the blue knob to the left of **Q GAIN**

17. Set the **Cross-Over Filter Switch** to **L**. Carefully adjust **Q VID BAL 1**, R61, and **Q VID BAL 2**, R249, for complete cancellation, in the oscilloscope pattern, of the video signal. The **Q VID BAL** controls will be found on the same horizontal line as the **I VID BAL** controls, and in the same relative positions.

18. Set the Cross-Over Filter Switch to D. Check the setting of Q CARRIER BALANCE, R176, for complete cancellation of the carrier signal in the oscilloscope pattern.

Repeat steps 17 and 18 alternately until cancellation of both video and carrier signals is complete.

19. The Q signal is now being presented by the oscilloscope. Adjust Q GAIN control, R255, so that the peak-to-peak voltage of the two highest-amplitude bars (green and purple) is 1.044 volts. Turn switch S4, Q OFF-ON to OFF.

20. Turn switch S3, I ON-OFF, to ON, putting the I signal on the oscilloscope. Adjust I GAIN control, R253, so that the peak-to-peak voltage of the two highest-amplitude bars (red and cyan) is 1.19 volts.

21. Adjust BURST GAIN control, R273, for a 0.4 volt peak-to-peak burst signal.

22. Remove the oscilloscope's vertical input from the Colorplexer and connect it to the output of the RCA Color Signal Analyzer. Connect the output of the Colorplexer to the input of the Color Signal Analyzer.

23. Add 90 degrees, in steps of 57 degrees and 33 degrees, from the calibrated phase standard. Adjust the uncalibrated phase-shifter for base line cancellation of all signals on the oscilloscope except the burst signal.

24. Remove 57 degrees of calibrated delay. Adjust BURST PHASE, C152, for cancellation of only the burst signal on the base line.

25. Remove 33 degrees of calibrated delay. Turn switch S3, I ON-OFF, to OFF. Turn switch S4, Q ON-OFF to ON. Adjust Q PHASE, C135, for cancellation of all signals on the base line except the burst signal.

26. Remove the Color Signal Analyzer from the output of the Colorplexer and replace it with the vertical input of the oscilloscope. Recheck the settings of the video output and gain controls per steps 3, 11, and 12. Be sure that only one switch is on at a time; MONO ON for the OUTPUT GAIN control, I ON for I GAIN, and Q ON for Q GAIN.

27. Turn all three switches (S3, S4, and S5) to ON; a composite color signal will appear on the oscilloscope. Turn the CAM-BARS switch to CAM; the Colorplexer is ready for use.

Method II

Set the PATTERN SWITCH on the RCA Color Bar Generator to Position 3. Check all input signals as described under "Initial Adjustments". Apply horizontal drive signals to the trigger input of the RCA Oscilloscope Type TO-524D and connect the vertical input to one of the OUTPUT test jacks of the Colorplexer, through an RCA Cross-Over Filter, MI-34021. Set the filter switch to D.

1. Turn the three toggle switches, MONO ON-OFF, I ON-OFF, and Q ON-OFF to OFF.

2. While observing the oscilloscope pattern, adjust I CARRIER BALANCE, R171, and Q CARRIER BALANCE, R176, to cancel out any signals appearing on the base line of the oscilloscope. A smooth, clean base line indicates balance.

3. Turn switch S5, MONO ON-OFF to ON which will cause the M and sync signals to appear on the oscilloscope. Adjust the OUTPUT GAIN control, R104, to set the amplitude of the white (first) bar in the signal to 1.0 volt. This control, R104, is at the extreme top of the chassis slightly to the right of center.

4. Adjust the SYNC GAIN control, R265, until the peak amplitude of the sync signal is equal to 0.4 volt.

5. The retrace blanking and clamping circuits should now be adjusted as follows:

Feed a horizontal blanking signal into the BLUE CAMERA signal input jack, J1.

NOTE

If a camera signal is already connected to the input of the Colorplexer, this signal may be substituted for the horizontal blanking signal for retrace blanking adjustment. The same blanking adjustment. The same adjustment procedure will apply.

Set the CAMERA-BARS switch, S8, to CAMERA. This switch is at the extreme left of the chassis, near the bottom. Adjust the HORIZONTAL DRIVE DELAY control, C30, until the leading edge of the retrace blanking signal coincides with the leading edge of the horizontal blanking signal at the output of the Colorplexer.

It may be helpful to slightly unbalance either the I or the Q CARRIER BALANCE controls. This unbalance corresponds to a spurious signal which will be diminished to nearly zero by the retrace blanking signal. The leading edge of the retrace blanking signal occurs where this spurious signal is suddenly diminished. The leading edge of blanking occurs where the video signal changes sharply in amplitude just before horizontal sync.

6. Adjust the BLANKING WIDTH control, C25, until the trailing edge of the retrace blanking signal coincides with the trailing edge of the horizontal blanking signal. These edges may be identified in a manner similar to that for the leading edges except that they follow the sync signal.

CAUTION

BE SURE TO ADJUST THE HORIZONTAL DRIVE DELAY CONTROL, C30, BEFORE ADJUSTING THE BLANKING WIDTH CONTROL, C25, SINCE C30 WILL AFFECT BOTH THE LEADING AND THE TRAILING EDGES OF THE RETRACE BLANKING SIGNAL.

Rebalance the I and Q CARRIER BALANCE controls, then set the CAMERA-BARS switch, S8, to the BARS position. Disconnect the horizontal blanking signal from the BLUE CAMERA signal input jack, J1.

7. Turn the MONO ON-OFF switch, S5, to OFF.

8. Turn switch S3, I ON-OFF to ON. Turn I GAIN, R253, to about two-thirds of its clockwise position. R253 is to the lower left of the center point of the chassis.

9. Adjust I PHASE, C134, for maximum amplitude of the oscilloscope pattern. This is a screwdriver adjustment located at the rear of the chassis on transformer T1.

10. Adjust I WHITE BALANCE, R25, until the white (first) bar in the oscilloscope pattern is cancelled out. This control is the red knob at the left center of the chassis.

11. Set the Cross-Over Filter switch to L. Carefully adjust I VID BAL 1, R52, and I VID BAL 2, R248, for complete cancellation, in the oscilloscope pattern, of the video signal. R52 is a screwdriver adjustment close to the center point of the front of the chassis; R248 is a similar control mounted at the rear of the chassis near R52.

12. Set the Cross-Over Filter switch to D. Check the setting of I CARRIER BALANCE, R171, for complete cancellation of the carrier signal in the oscilloscope pattern.

Repeat steps 11 and 12 alternately until cancellation of both video and carrier signals is complete.

13. Turn switch S3, I ON-OFF, to OFF. Set the Cross-Over Filter Switch to D.

14. Turn switch S4, Q ON-OFF, to ON. Set Q GAIN control, R255, to about two thirds of its clockwise rotation. R255 is near the lower edge of the chassis, somewhat to the left of center.

15. Adjust Q PHASE, C135, for maximum amplitude of the oscilloscope pattern. This is a screwdriver adjustment located toward the lower right corner.

16. Adjust Q WHITE BAL, R38, until the white (first) bar in the oscilloscope pattern is cancelled out. This control is the blue knob to the left of Q GAIN.

17. Set the Cross-Over Filter Switch to L. Carefully adjust Q VID BAL 1, R61, and Q VID BAL 2, R249, for complete cancellation, in the oscilloscope pattern, of the video signal. The Q VID BAL controls will be found on the same horizontal line as the I VID BAL controls, and in the same relative positions.

18. Set the Cross-Over Filter Switch to D. Check the setting of Q CARRIER BALANCE, R176, for complete cancellation of the carrier signal in the oscilloscope pattern.

Repeat steps 17 and 18 alternately until cancellation of both video and carrier signals is complete.

19. The Q signal is now being presented by the oscilloscope. Adjust Q GAIN control, R255, so that the peak-to-peak voltage of the two highest-amplitude bars (green and purple) is 1.044 volts. Turn switch S4, Q OFF-ON to OFF.

20. Turn switch S3, I ON-OFF to ON, putting the I signal on the oscilloscope. Adjust I GAIN control, R253, so that the peak-to-peak voltage of the two highest-amplitude bars (red and cyan) is 1.19 volts.

21. Adjust BURST GAIN control, R273, for a 0.4 volt peak-to-peak burst signal.

22. Turn switch S4, Q ON-OFF, to ON.

23. Move the vertical input of the oscilloscope from the output of the Colorplexer to the output of the RCA Color Signal Analyzer. Connect the input of the Color Signal Analyzer to the output of the Colorplexer.

24. Add 90 degrees of calibrated delay in steps of 57 degrees and 33 degrees.

25. Adjust the uncalibrated phase shifter for cancellation, on the base line, of the I_s portion of the demodulated signal.

26. Remove the 57-degree step of calibrated delay. Adjust BURST PHASE capacitor, C152, for cancellation of only the burst signal on the oscilloscope's base line.

27. Remove the 33-degree step of calibrated delay. Adjust Q PHASE capacitor, C135, for cancellation, on the base line, of the Q_s portion of the demodulated signal.

28. Reconnect the oscilloscope's vertical input to the output of the Colorplexer, removing the input to the Color Signal Analyzer. Recheck the settings of the individual gain controls, OUTPUT GAIN, Q GAIN, and I GAIN, as described in steps 3, 19, and 20. This should be done with only the appropriate switch ON for each control.

29. Turn ON all three switches (S3, S4, and S5); a composite color signal will be presented by the oscilloscope.

30. Turn the CAM-BARS switch to CAM. The Colorplexer is now ready for operation.

OPERATION AND MAINTENANCE

It is recommended that, at the beginning of each operating day, the settings of the various controls of the RCA Colorplexer be checked. Once operating personnel have become familiar with the equipment, such checking is a relatively simple matter. Using the methods of oscilloscope observation outlined under INITIAL ADJUSTMENTS, turning the toggle switches ON, one at a time will disclose immediately whether the various GAIN and BALANCE controls require adjustment.

Figure 2 shows a photograph of the complete signal from the Color Bar Generator after colorplexing, together with a chart of the amplitudes of the various portions of the signal.

During operation, should I or Q carrier unbalance occur, the station's master monitor will indicate the condition by an increase in the thickness of the base line of the oscilloscope pattern. Return the carriers to balance by carefully adjusting I CARRIER BALANCE and Q CARRIER BALANCE.

Because of aging of tubes, a time may come when balance of the carriers will not be possible by adjustment of the balancing controls. Should this occur, try interchanging one of the I modulator tubes with one of the Q modulator tubes; if this is not successful, return the tubes to their original sockets and interchange the other two tubes. (V7 and V8 are the I modulator tubes; V9 and V10 are the Q modulator tubes.) Proper balance requires two tubes in each stage whose mutual conductances are as nearly alike as possible. It may be necessary to try other tubes until this condition is fulfilled.

Operating adjustments to the 360° Phase Shifter are required only when two or more Colorplexers are to be phased together. Select one Colorplexer as a standard; adjust the phasing of the other(s) to match it in the following manner:

Connect the RCA Color Signal Analyzer to a point where a common line is carrying signals from all Colorplexers; at the master control position, for example. Connect the oscilloscope, triggered by horizontal driving pulses, to the Color Signal Analyzer.

On the Colorplexer selected as a standard, rotate S1, ROUGH PHASE ADJ to a 0° position; rotate R7, FINE PHASE ADJ fully counterclockwise. Make no further adjustments to these controls on this Colorplexer.

Switch in the Colorplexer chosen as a standard; its output will be displayed on the oscilloscope. Adjust the Color Signal Analyzer's uncalibrated phase shifter until the color burst signal is cancelled on the base line of the oscilloscope.

and FIVE PHASE
 color burst signal.
 phase, it is possible
 in the standard
 for to uncancel
 tion required.

for a slight
 the noting the direction
 tion is the same
 as that used in canceling the standard Colorplexer's burst, the two are in phase; if it is
 opposite, the second is 180° out of phase. For the latter condition, perform the phasing
 procedure again, setting KUNIM FIBER A/D on the second Colorplexer to a point 180° from
 its former position, recheck THE KUNIM A/D, if necessary, for complete cancellation of
 the color burst signal.

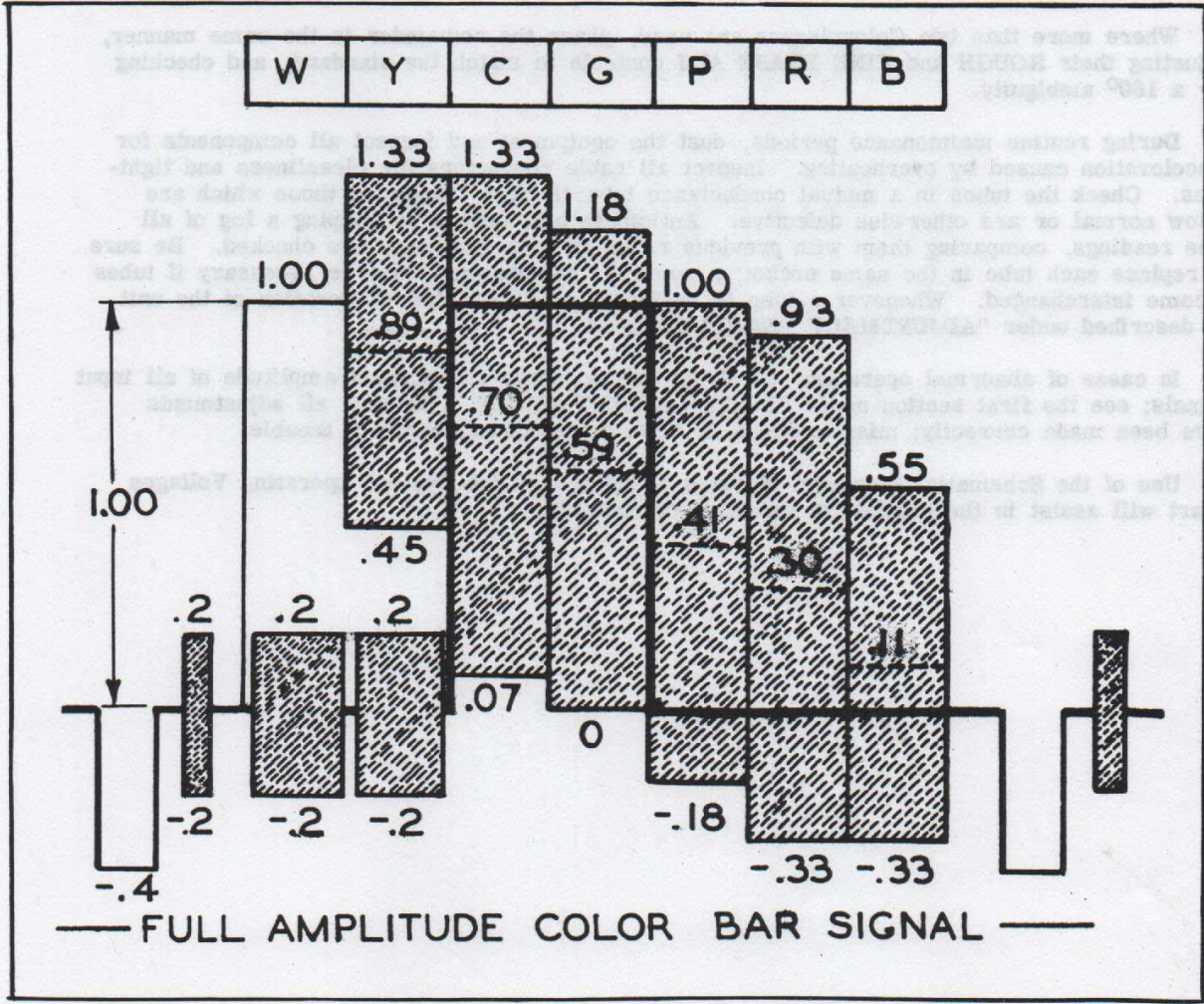
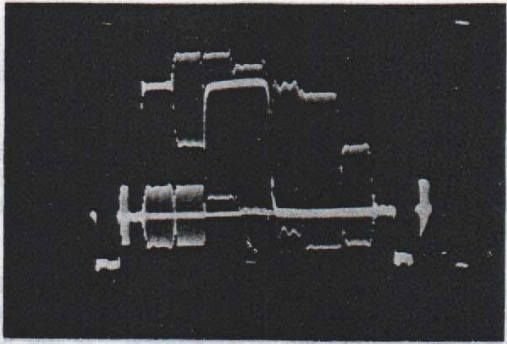


Figure 2 - Waveform of Colorplexed Color Bar Video Signal

Switch to the output of the second Colorplexer. Adjust its ROUGH and FINE PHASE ADJ controls for cancellation, on the base line of the oscilloscope, of the color burst signal.

Although the outputs of the two Colorplexers are now apparently in phase, it is possible that a 180° phase difference exists. To check for this condition, switch in the standard Colorplexer. Rotate the Color Signal Analyzer's uncalibrated phase shifter to uncancel slightly the burst signal previously cancelled, noting the direction of rotation required. Cancel the burst signal again with the uncalibrated phase shifter.

Switch in the second Colorplexer; rotate the uncalibrated phase shifter for a slight uncancellation of the burst signal now appearing on the oscilloscope, again noting the direction of rotation required to obtain the same direction of unbalance. If the direction is the same as that used in uncancelling the standard Colorplexers' burst, the two are in phase; if it is opposite, the second is 180° out of phase. For the latter condition, perform the phasing procedure again, setting ROUGH PHASE ADJ on the second Colorplexer to a point 180° from its former position; readjust FINE PHASE ADJ, if necessary, for complete cancellation of the color burst signal.

Where more than two Colorplexers are used, phase the remainder in the same manner, adjusting their ROUGH and FINE PHASE ADJ controls to match the standard, and checking for a 180° ambiguity.

During routine maintenance periods, dust the equipment and inspect all components for discoloration caused by overheating. Inspect all cable connectors for cleanliness and tightness. Check the tubes in a mutual conductance tube checker, replacing those which are below normal or are otherwise defective. Anticipate tube failure by keeping a log of all tube readings, comparing them with previous readings each time they are checked. Be sure to replace each tube in the same socket; a complete readjustment may be necessary if tubes become interchanged. Whenever a tube is replaced, check the entire operation of the unit as described under "ADJUSTMENT PROCEDURES".

In cases of abnormal operation, check for the presence and correct amplitude of all input signals; see the first section under "INITIAL ADJUSTMENTS". Be sure all adjustments have been made correctly; misadjustment is the most frequent source of trouble.

Use of the Schematic Diagrams, Figures 3 and 4, and the Typical Operating Voltages Chart will assist in the location of defective components.

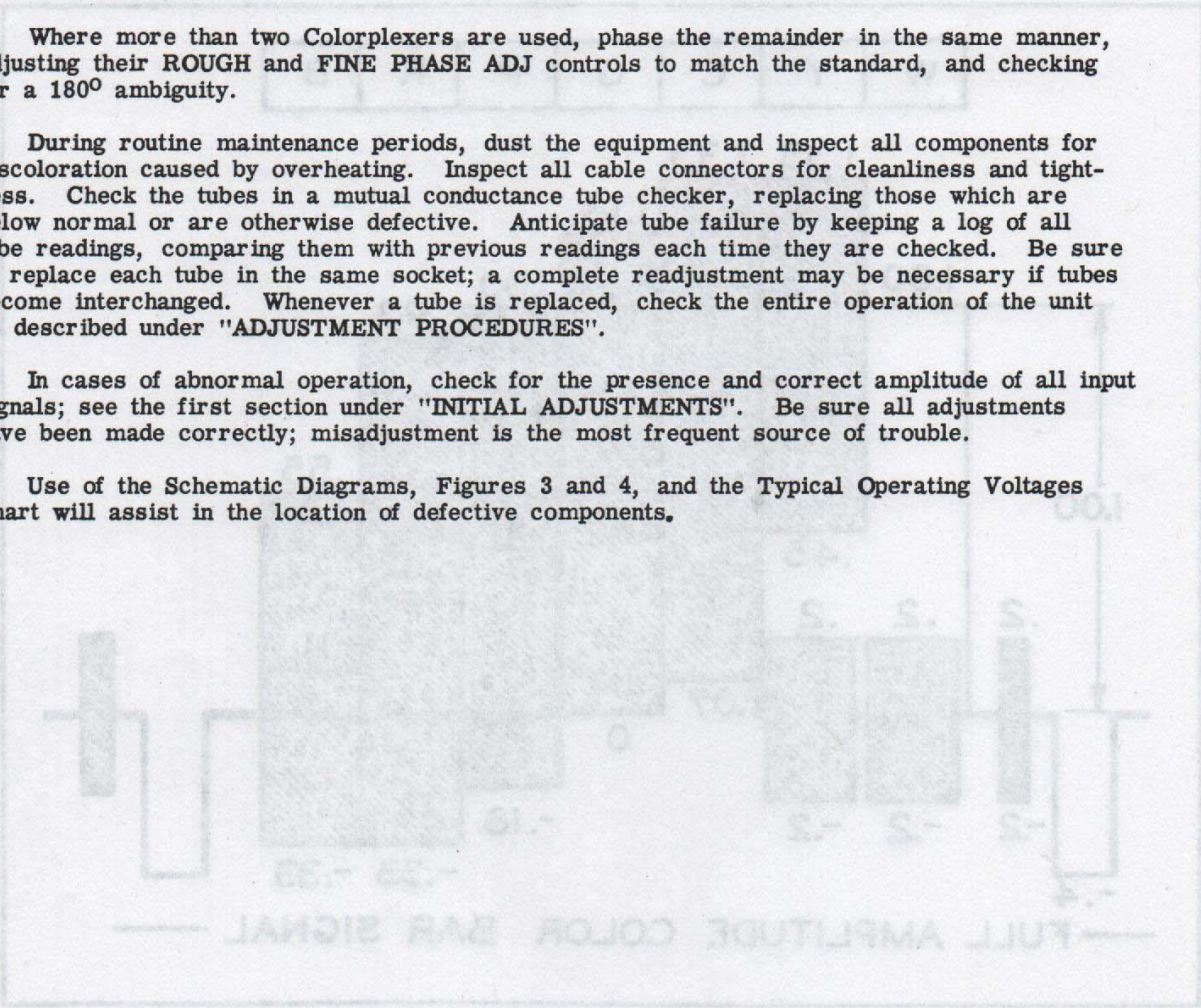


Figure 1 - Waveform of Colorburst Color Bar Video Signal

TX-1B TYPICAL D-C OPERATING VOLTAGES

(Measured With VoltOhmyst)

COLORPLEXER

TUBE		PLATE		GRID NO. 1		CATHODE		GRID NO. 2		GRID NO. 3	
SYMBOL	TYPE	PIN	VOLTS	PIN	VOLTS	PIN	VOLTS	PIN	VOLTS	PIN	VOLTS
V1	6AU6	5	210	1	2.8	7	4.1	6	125	2	4.1
V2	6AH6	5	150	1	4.8	7	6.1	6	115	2	0
V3	6AH6	5	170	1	4.8	7	5.9	6	115	2	0
V4	6AU6	5	260	1	2.5	7	3.9	6	140	2	3.9
V5	6AU6	5	260	1	2.5	7	4.0	6	140	2	4.0
V6a	1/2 12AU7	6	265	7	0	8	9.6	-	-	-	-
V6b	1/2 12AU7	1	265	2	0	3	9.4	-	-	-	-
V7	6AS6	5	185	1	2.4	2	4.9	6	120	7	0
V8	6AS6	5	185	1	2.0	2	4.8	6	120	7	0
V9	6AS6	5	185	1	2.0	2	4.8	6	120	7	0
V10	6AS6	5	185	1	2.3	2	4.8	6	120	7	0
V11	6AU6	5	265	1	1.0	7	2.1	6	140	2	2.1
V12	6AU6	5	265	1	0	7	0.9	6	130	2	0.9
V13a	1/2 6AL5	7	0.65	-	-	1	2.2	-	-	-	-
V13b	1/2 6AL5	2	2.2	-	-	5	3.7	-	-	-	-
V14a	1/2 6AL5	7	0 to -1.5	-	-	1	2.0	-	-	-	-
V14b	1/2 6AL5	2	2.0	-	-	5	5.0	-	-	-	-
V15a	1/2 6AL5	7	0 to -1.5	-	-	1	2.0	-	-	-	-
V15b	1/2 6AL5	2	2.0	-	-	5	5.0	-	-	-	-
V16a	1/2 6AL5	7	0 to -1.5	-	-	1	2.0	-	-	-	-
V16b	1/2 6AL5	2	2.0	-	-	5	5.0	-	-	-	-
V17a	1/2 6AL5	7	0 to -1.5	-	-	1	2.0	-	-	-	-
V17b	1/2 6AL5	2	2.0	-	-	5	5.0	-	-	-	-
V18	6AU6	5	280	1	2.1	7	3.1	6	130	2	3.1
V19	6AU6	5	280	1	2.1	7	3.1	6	130	2	3.1
V20a	1/2 12AU7	1	175	2	3.1	3	84	-	-	-	-
V20b	1/2 12AU7	6	31	7	0	8	0	-	-	-	-
V21	0B2	5	107	-	-	2	0	-	-	-	-
V22a	1/2 6U8	6	150	2	0.4	7	2.0	3	110	-	-
V22b	1/2 6U8	1	140	9	0	8	2.0	-	-	-	-
V23a	1/2 6BQ7A	1	275	2	140	3	140	-	-	-	-
V23b	1/2 6BQ7A	6	140	7	-2.0	8	0	-	-	-	-
V24a	1/2 6U8	6	140	2	0	7	1.1	3	110	-	-
V24b	1/2 6U8	1	0	9	0	8	0	-	-	-	-
V25a	1/2 6BQ7A	1	145	2	0	3	2.1	-	-	-	-
V25b	1/2 6BQ7A	6	280	7	145	8	150	-	-	-	-
V26a	1/2 5687	1	150	2	-5.4	3	0	-	-	-	-
V26b	1/2 5687	9	270	7	145	6	150	-	-	-	-
V27a	1/2 5687	1	150	2	-5.4	3	0	-	-	-	-
V27b	1/2 5687	9	270	7	145	6	150	-	-	-	-
V28	0A2	5	0	-	-	2	-150	-	-	-	-
V29a	1/2 6U8	1	260	9	73	8	86	-	-	-	-
V29b	1/2 6U8	6	73	2	-3.7	7	0	3	94	-	-
V30a	1/2 6U8	1	215	9	-4.2	8	0.65	-	-	-	-
V30b	1/2 6U8	6	270	2	-0.7	7	3.2	3	270	-	-
V31a	1/2 6AL5	7	-1.2	-	-	1	0.4	-	-	-	-
V31b	1/2 6AL5	2	0.4	-	-	5	1.2	-	-	-	-
V32	6AU6	5	86	1	-0.5	7	0	6	86	2	86
V33	6AS6	5	275	1	14.5	2	16.5	6	120	7	0
V34	6AU6	5	265	1	0	7	1.5	6	140	2	1.5

PHASE SHIFTER

V1	6AU6	5	280	1	-0.2	7	1.1	6	130	2	1.1
V2	6AU6	5	270	1	-0.1	7	1.3	6	110	2	1.3

REPLACEMENT PARTS AND ENGINEERING SERVICE

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.

The following tabulations list service parts, electron tube, and field engineering service ordering instructions according to the geographical location of the station.

SERVICE PARTS

STATION LOCATION	OBTAIN SERVICE PARTS FROM
Continental United States or Alaska	Local Broadcast Equipment Sales Representative, his office, or directly from the Service Parts Order Service, Bldg. 60, 19th and Federal Streets, Camden 5, N. J. Emergency orders may be telephoned, telegraphed, or teletyped to RCA Emergency Service, Bldg. 60, Camden, N.J. (Telephone: Woodlawn 3-8000).
Dominion of Canada	Local Broadcast Equipment Sales Representative, his office, or directly from RCA Victor Company Limited, 1001 Lenoir Street, Montreal, Quebec.
Outside of Continental United States, Alaska, and the Dominion of Canada	Local Broadcast Equipment Sales Representative, or Service Parts Order Service, RCA International Division, Gloucester, New Jersey. U.S.A.

ELECTRON TUBES

STATION LOCATION	OBTAIN ELECTRON TUBES FROM
Continental United States or Alaska	Local Distributor or nearest of the following warehouses: 34 Exchange Place Jersey City 2, New Jersey 589 E. Illinois Street Chicago 11, Illinois 420 S. San Pedro Street Los Angeles 13, California
Dominion of Canada	Local Broadcast Equipment Sales Representative, his office, or directly from RCA Victor Company Limited, 1001 Lenoir Street, Montreal, Quebec.
Outside of Continental United States, Alaska, and the Dominion of Canada	Local Distributor or from: Tube Department RCA International Division 30 Rockefeller Plaza New York 20, New York. U.S.A.

If for any reason, it is desired to return tubes, please return them to the place of purchase. If this is not convenient, please notify your RCA serving warehouse so that Return Authorization may be forwarded to you.

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.

FIELD ENGINEERING SERVICE*

STATION LOCATION	REQUEST FIELD ENGINEERING SERVICE FROM
Continental United States or Alaska	Local Broadcast Equipment Sales Representative or the RCA Service Company, Inc., Broadcast Communications Service Division, Camden, N.J. Telephone: Woodlawn 3-8000.
Dominion of Canada	Local Broadcast Equipment Sales Representative, his office, or directly from RCA Victor Company Limited, 1001 Lenoir Street, Montreal, Quebec.
Outside of Continental United States, Alaska, and the Dominion of Canada	Chief Engineer RCA International Division 30 Rockefeller Plaza New York 20, New York, U.S.A.

*Charges for field engineering service will be made at current rates.

PARTS LIST

For ordering information see page 19

COLORPLEXER, MI-40209A

SYMBOL NO.	DESCRIPTION	DRAWING NO.	STOCK NO.
C1, C2	Capacitor: dry electrolytic, 1000 mf +40%, -10%, 15 v	458557-6	204403
C3 to C5	Capacitor: fixed, paper, 0.22 mf ±10%, 200 v	737818-55	97444
C6A/B/C	Capacitor: dry electrolytic, 10/10/10 mf -10% +50%, 450 v	459614-1	99134
C7	Capacitor: fixed, mica, 88 mmf ±5%, 500 v	727853-219	98947
C8, C9	Capacitor: fixed, paper, 0.22 mf ±10%, 400 v	737818-95	94904
C10A/B/C	Capacitor: fixed, dry electrolytic, 10/10/10 mf +50% -10%, 450 v. Same as C6	459614-1	99134
C11, C12	Capacitor: dry electrolytic, 10 mf -10% +50%, 450 v	86028-9	95907
C13	Capacitor: fixed, mica, 150 mmf ±5%, 500 v	727856-227	39632
C14	Capacitor: fixed, mica, 47 mmf ±5%, 500 v	727856-215	39620
C15	Capacitor: fixed, ceramic, 8.2 mmf ±5%, 500 v	8817564-304	98231
C16	Capacitor: fixed, paper, 0.1 mf ±10%, 400 v	735715-175	73551
C17	Capacitor: fixed, mica, 150 mmf ±5%, 500 v. Same as C13 ..	727856-227	39632
C18	Capacitor: fixed, paper, 0.047 mf ±20%, 200 v	735715-21	73558
C19	Capacitor: fixed, mica, 220 mmf ±5%, 500 v	727853-231	96518
C20 to C23	Capacitor: fixed, mica, 1800 mmf ±5%, 1000 v	727876-253	99138
C24	Capacitor: fixed, ceramic, 3.3 mmf ±0.5 mmf, 500 v	8817564-401	205186
C25	Capacitor: variable, 7/45 mmf	984003-5	54221
C26	Capacitor: fixed, paper, 0.47 mf ±10%, 200 v	737818-56	95824
C27	Capacitor: fixed, mica, 100 mmf ±10%, 500 v	727856-123	39628
C28	Capacitor: fixed, paper, 0.01 mf ±10%, 400 v	735715-163	73561
C29	Capacitor: fixed, mica, 33 mf ±5%, 500 v	727851-11	98146
C30	Capacitor: variable, 7/45 mmf. Same as C25	984003-5	54221
C31, C32	Capacitor: fixed, paper, 0.01 mf ±10%, 400 v. Same as C28 ..	735715-163	73561
C33, C34	Capacitor: fixed, paper, 0.1 mf ±10%, 200 v	737818-53	205184
C35	Capacitor: fixed, paper, 0.22 mf ±10%, 400 v. Same as C8 ...	737818-95	94904
C36A/B/C/D	Capacitor: dry electrolytic, 10/10/10/10 mf -10% +50%, 450 v	458558-10	98986
C37	Capacitor: fixed, mica, 1800 mmf ±5%, 1000 v. Same as C20 ..	727876-253	99138
C38	Capacitor: fixed, ceramic, 6.8 mmf ±0.25 mmf, 500 v	90575-412	205183
C39, C40	Not used		
C41	Capacitor: fixed, ceramic, 2 mmf ±0.25 mmf, 500 v	90575-405	99132
C42 to C44	Not used		
C45	Capacitor: fixed, paper, 0.01 mf ±20%, 400 v	735715-113	73561
C46 to C49	Not used		
C50A/B/C	Capacitor: dry electrolytic, 10/10/10 mf -10% +50%, 450 v. Same as C6	459614-1	99134
C51	Not used		
C52, C53	Capacitor: fixed, paper, 0.22 mf ±20%, 400 v	735715-129	73794
C54	Capacitor: fixed, paper, 0.22 mf ±10%, 400 v. Same as C8 ...	737818-95	94904
C55 to C57	Not used		
C58	Capacitor: dry electrolytic, 10 mf -10% +50%, 450 v	459613-1	99133
C59	Capacitor: fixed, mica, 330 mmf ±5%, 500 v	727856-235	39640
C60	Capacitor: fixed, paper, 1.0 mf ±10%, 400 v	737818-97	99125
C61	Capacitor: fixed, mica, 560 mmf ±5%, 500 v	727856-241	99135
C62	Capacitor: variable, 7/35 mmf	8824243-1	45415
C63	Not used		
C64	Capacitor: fixed, paper, 0.22 mf ±10%, 400 v. Same as C8 ...	737818-95	94904
C65A/B/C	Capacitor: dry electrolytic, 200 mf -10% +100%, 300 v; 60 mf -10% +50%, 250 v; 20 mf -10% +50%, 250 v	458558-11	98987
C66	Capacitor: fixed, ceramic, 10 mmf ±0.5 mmf, 500 v	90575-209	53511
C67	Capacitor: variable, 7/35 mmf. Same as C62	8824243-1	45415
C68	Capacitor: fixed, paper, 0.22 mf ±10%, 400 v. Same as C8 ...	737818-95	94904
C69 to C71	Not used		
C72	Capacitor: variable, 7/35 mmf. Same as C62	8824243-1	45415
C73	Capacitor: fixed, paper, 1.0 mf ±10%, 400 v. Same as C60 ...	737818-97	99125
C74	Capacitor: fixed, mica, 560 mmf ±5%, 500 v	727861-241	99136
C75, C76	Not used		
C77	Capacitor: dry electrolytic, 125 mf -10% +50%, 350 v	458558-1	95914
C78	Capacitor: fixed, paper, 0.22 mf ±10%, 400 v. Same as C8 ...	737818-95	94904
C79A/B/C	Capacitor: dry electrolytic, 200 mf -10% +100%, 300 v; 60 mf -10% +50%, 250 v; 20 mf -10% +50%, 250 v. Same as C65	458558-11	98987
C80, C81	Not used		
C82	Capacitor: fixed, paper, 0.01 mf ±10%, 400 v. Same as C28 ..	735715-163	73561
C83, C84	Not used		
C85A/B/C	Capacitor: dry electrolytic, 10/10/10 mf -10% +50%, 450 v. Same as C6	459614-1	99134

PARTS LIST

For ordering information see page 19

SYMBOL NO.	DESCRIPTION	DRAWING NO.	STOCK NO.
C86, C87	Capacitor: fixed, paper, 0.01 mf $\pm 10\%$, 400 v. Same as C28 ...	735715-163	73561
C88 to C90	Not used		
C91	Capacitor: fixed, paper, 0.22 mf $\pm 20\%$, 400 v. Same as C52 ...	735715-129	73794
C92, C93	Not used		
C94	Capacitor: fixed, paper, 0.22 mf $\pm 20\%$, 400 v. Same as C52 ...	735715-129	73794
C95	Capacitor: fixed, paper, 0.1 mf $\pm 10\%$, 200 v	735715-75	73784
C96 to C103	Not used		
C104	Capacitor: fixed, paper, 0.1 mf $\pm 10\%$, 400 v. Same as C16	735715-175	73551
C105	Capacitor: dry electrolytic, 125 mf -10% $+50\%$, 350 v. Same as C77	458558-1 735715-163	95914 73561
C106	Capacitor: fixed, paper, 0.01 mf $\pm 10\%$, 400 v. Same as C28 ...	735715-163	73561
C107	Capacitor: fixed, ceramic, 8.2 mmf $\pm 5\%$, 500 v. Same as C15	8817564-304	98231
C108	Capacitor: fixed, mica, 47 mmf $\pm 5\%$, 500 v. Same as C14	727856-215	39620
C109	Not used		
C110	Capacitor: fixed, ceramic, 4.7 mmf ± 1.0 mmf, 500 v	90575-301	71086
C111	Capacitor: fixed, ceramic, 12 mmf $\pm 5\%$, 500 v	90575-211	70595
C112	Not used		
C113, C114	Capacitor: dry electrolytic, 16 mf -10% $+50\%$, 450 v	449633-15	99694
C115, C116	Not used		
C117	Capacitor: fixed, ceramic, 18 mmf $\pm 5\%$, 500 v	90575-215	57517
C118	Capacitor: fixed, mica, 820 mmf $\pm 2\%$, 500 v	727863-345	52795
C119, C120	Capacitor: fixed, mica, 150 mmf $\pm 5\%$, 500 v	727853-227	99652
C121	Not used		
C122	Capacitor: fixed, ceramic, 10 mmf ± 0.5 mmf, 500 v. Same as C66	90575-209	53511
C123 to C125	Not used		
C126	Capacitor: fixed, ceramic, 8.2 mmf $\pm 5\%$, 500 v. Same as C15 ..	8817564-304	98231
C127 to C129	Not used		
C130	Capacitor: fixed, mica, 100 mmf $\pm 10\%$, 500 v. Same as C27 ...	727856-123	39628
C131	Not used		
C132	Capacitor: dry electrolytic, 24 mf -10% $+50\%$, 350 v	449633-16	99695
C133	Not used		
C134	Capacitor: variable, 5/20 mmf	8824243-2	55301
C135	Capacitor: variable, 4.5/25 mmf	8817584-1	57602
C136, C137	Capacitor: fixed, ceramic, 33 mmf $\pm 5\%$, 500 v	90575-221	90015
C138A/B	Capacitor: dry electrolytic, 20/20 mf -10% $+50\%$, 450 v	459614-2	99295
C139	Capacitor: fixed, mica, 180 mmf $\pm 5\%$, 500 v	727856-229	51416
C140	Capacitor: fixed, mica, 39 mmf $\pm 5\%$, 500 v	727856-213	39618
C141	Capacitor: fixed, mica, 82 mmf $\pm 5\%$, 500 v	727856-221	39626
C142	Capacitor: fixed, mica, 120 mmf $\pm 5\%$, 500 v	727856-225	39630
C143	Capacitor: fixed, mica, 180 mmf $\pm 5\%$, 500 v. Same as C139	727856-229	51416
C144	Capacitor: fixed, mica, 68 mmf $\pm 5\%$, 500 v	727856-219	39624
C145	Capacitor: fixed, paper, 0.1 mf $\pm 10\%$, 200 v. Same as C95	735715-75	73784
C146A/B/C	Capacitor: dry electrolytic, 10/10/10 mf -10% $+50\%$, 450 v. Same as C6	459614-1	99134
C147	Capacitor: fixed, paper, 0.1 mf $\pm 10\%$, 400 v. Same as C16	735715-175	73551
C148	Capacitor: fixed, ceramic, 12 mmf $\pm 5\%$, 500 v. Same as C111	90575-211	70595
C149	Capacitor: fixed, mica, 100 mmf $\pm 10\%$, 500 v. Same as C27	727856-123	39628
C150	Capacitor: fixed, paper, 0.22 mf $\pm 10\%$, 200 v. Same as C3	737818-55	97444
C151	Capacitor: fixed, mica, 100 mmf $\pm 10\%$, 500 v. Same as C27	727856-123	39628
C152	Capacitor: variable, 7/45 mmf. Same as C25	984003-5	54221
C153	Capacitor: fixed, mica, 100 mmf $\pm 10\%$, 500 v. Same as C27	727856-123	39628
C154 to C160	Not used		
C161	Capacitor: fixed, mica, 270 mmf $\pm 5\%$, 500 v	727853-233	98948
C162	Not used		
C163	Capacitor: fixed, ceramic, 15 mmf $\pm 5\%$, 500 v	90575-213	45465
C164, C165	Capacitor: fixed, mica, 6 mmf $\pm 5\%$, 500 v	748252-306	204767
C166	Capacitor: fixed, mica, 62 mmf $\pm 5\%$, 500 v	727853-218	204766
C167 to C174	Capacitor: fixed, paper, 0.1 mf $\pm 10\%$, 200 v. Same as C33	737818-53	205184
C175A/B	Capacitor: dry electrolytic, 20/20 mf -10% $+50\%$, 450 v. Same as C138	459614-2	99295
CR1	Crystal: rectifier	1N34A	59395
CR2, CR3	Crystal: selenium rectifier	8879997-1	99228
CR4	Crystal: rectifier. Same as CR1	1N34A	59395
DL1	Delay Line: 32 ft. long	470661-501	
DL2	Delay Line: 26 ft. long	470661-502	
F1	Fuse: slo-blo, 1 amp	8851771-3	94877
F2	Fuse: slo-blo, 2 amp	8851771-4	56012

PARTS LIST

For ordering information see page 19

SYMBOL NO.	DESCRIPTION	DRAWING NO.	STOCK NO.
J1 to J6	Connector: coaxial	255223-1	51800
J7, J8	Not used		
J9 to J13	Connector: coaxial. Same as J1	255223-1	51800
J14	Connector: male, 6 pin	727969-3	51604
J15	Jack: tip, red	845648-2	54409
J16, J17	Jack: tip, blue	845648-4	99215
J18	Jack: tip, red. Same as J15	845648-2	54409
J19	Not used		
J20, J21	Jack: tip, black	845648-1	18348
J22	Jack: tip, blue. Same as J16	845648-4	99215
J23	Jack: tip, red. Same as J15	845648-2	54409
J24	Connector: coaxial. Same as J1	255223-1	51800
J25 to J28	Jack: tip, black. Same as J20	845648-1	18348
J29, J30	Jack: tip, ivory	845648-6	99217
J31, J32	Not used		
J33, J34	Connector: coaxial. Same as J1	255223-1	51800
J35	Jack: tip, black. Same as J20	845648-1	18348
J36	Not used		
J37 to J40	Connector: coaxial. Same as J1	255223-1	51800
J41	Jack: tip, red. Same as J15	845648-2	54409
J42	Jack: tip, black. Same as J20	845648-1	18348
J43	Jack: tip, green	845648-3	99214
J44, J45	Connector: coaxial. Same as J1	255223-1	51800
J46, J47	Jack: tip, black. Same as J20	845648-1	18348
L1 to L4	Not used		
L5A/B	Coil: peaking, adjustable iron core, black dot	739772-501	52453
L6	Not used		
L7A/B	Coil: peaking, adjustable iron core, green dot	739772-508	94556
L8	Coil: air core, 15 millihenry	8831776-501	95173
L9	Not used		
L10A/B	Coil: peaking, adjustable core, 162.9 to 100 microhenry	739772-515	99410
L11, L12	Not used		
L13	Coil: "Q" channel filter, 918 microhenry	8866338-1	204768
L14, L15	Coil: "Q" channel filter, 279 microhenry $\pm 5\%$	8817508-1	99300
L16 to L19	Coil: RF choke, 13 microhenry $\pm 5\%$	8816186-1	99299
L20	Coil: peaking, 36 microhenry	940144-5	71793
L21A/B/C/D	Coil: non-metallic core (2 windings: 1.9 microhenry) (2 windings: 3.39 microhenry)	8818809-1	99303
P1 to P6	Connector: male, coaxial	252868-1	66344
P7, P8	Not used		
P9 to P13	Connector: male, coaxial. Same as P1	252868-1	66344
P14	Connector: female, 6 pin	727969-4	51607
P15 to P23	Not used		
P24	Connector: male, coaxial. Same as P1	252868-1	66344
P25 to P32	Not used		
P33, P34	Connector: male, coaxial. Same as P1	252868-1	66344
P35, P36	Not used		
P37 to P40	Connector: male, coaxial. Same as P1	252868-1	66344
P41 to P43	Not used		
P44, P45	Connector: male, coaxial. Same as P1	252868-1	66344
R1	Resistor: fixed, composition, 2960 ohm $\pm 1\%$, 1 w	8898693-298	99081
R2	Resistor: fixed, composition, 5940 ohm $\pm 1\%$, 1 w	8898693-303	99076
R3	Resistor: fixed, composition, 15,900 ohm $\pm 1\%$, 1 w	8898693-304	99075
R4	Resistor: fixed, composition, 10,000 ohm $\pm 5\%$, 1 w	90496-183	512310
R5	Resistor: fixed, composition, 75 ohm $\pm 5\%$, 1 w	90496-132	91942
R6	Resistor: fixed, composition, 56,000 ohm $\pm 5\%$, 2 w	99128-201	28741
R7, R8	Resistor: fixed, composition, 82 ohm $\pm 5\%$, 1/2 w	82283-133	502082
R9	Resistor: fixed, composition, 75 ohm $\pm 5\%$, 1/2 w	82283-132	502075
R10	Resistor: fixed, composition, 82 ohm $\pm 5\%$, 1/2 w. Same as R7	82283-133	502082
R11	Resistor: fixed, composition, 1 meg $\pm 10\%$, 1/2 w	82283-98	502510
R12	Resistor: fixed, composition, 100 ohm $\pm 5\%$, 1 w	90496-135	512110
R13	Resistor: fixed, composition, 75 ohm $\pm 5\%$, 1/2 w. Same as R9	82283-132	502075
R14	Not used		
R15	Resistor: fixed, composition, 82,000 ohm $\pm 5\%$, 1 w	90496-205	512382
R16	Resistor: fixed, composition, 270,000 ohm $\pm 5\%$, 1 w	90496-217	19232
R17	Not used		

PARTS LIST

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SYMBOL NO.	DESCRIPTION	DRAWING NO.	STOCK NO.
R18	Resistor: fixed, composition, 560,000 ohm $\pm 10\%$, 1/2 w	82283-95	502456
R19	Resistor: fixed, composition, 5100 ohm $\pm 5\%$, 1 w	90496-176	19481
R20	Resistor: fixed, wire wound, 750 ohm $\pm 1\%$, 1 w	990187-285	205106
R21	Resistor: fixed, composition, 1000 ohm $\pm 5\%$, 1 w	90496-159	512210
R22	Resistor: fixed, wire wound, 301 ohm $\pm 1\%$, 1 w	990187-247	205105
R23	Resistor: fixed, composition, 1 meg $\pm 10\%$, 1/2 w.		
	Same as R11	82283-98	502510
R24	Resistor: fixed, composition, 100 ohm $\pm 5\%$, 1 w.		
	Same as R12	90496-135	512110
R25	Resistor: variable, 10,000 ohm $\pm 10\%$, 2 w	433196-6	68833
R26	Resistor: fixed, composition, 1 meg $\pm 10\%$, 1/2 w.		
	Same as R11	82283-98	502510
R27	Resistor: fixed, composition, 100 ohm $\pm 5\%$, 1 w.		
	Same as R12	90496-135	512110
R28	Resistor: fixed, composition, 100 ohm $\pm 10\%$, 1/2 w	82283-50	502110
R29	Resistor: fixed, wire wound, 4020 ohm $\pm 1\%$, 1 w	990187-359	205112
R30	Resistor: fixed, wire wound, 3830 ohm $\pm 1\%$, 1 w	990187-357	205111
R31	Resistor: fixed, wire wound, 2610 ohm $\pm 1\%$, 1 w	990187-341	205110
R32	Resistor: fixed, wire wound, 750 ohm $\pm 1\%$, 1 w		
	Same as R20	990187-285	205106
R33	Resistor: fixed, wire wound, 4420 ohm $\pm 1\%$, 1 w	990187-363	205109
R34	Resistor: fixed, wire wound, 2740 ohm $\pm 1\%$, 1 w	990187-343	205108
R35	Resistor: fixed, wire wound, 3160 ohm $\pm 1\%$, 1 w	990187-349	205107
R36	Resistor: fixed, wire wound, 301 ohm $\pm 1\%$, 1 w		
	Same as R22	990187-247	205105
R37	Resistor: fixed, composition, 1000 ohm $\pm 5\%$, 1 w.		
	Same as R21	90496-159	512210
R38	Resistor: variable, 10,000 ohm $\pm 10\%$, 2 w. Same as R25	433196-6	68833
R39	Resistor: fixed, composition, 100 ohm $\pm 10\%$, 1 w	90496-50	512110
R40	Resistor: fixed, composition, 100 ohm $\pm 10\%$, 1/2 w.		
	Same as R28	82283-50	502110
R41	Resistor: fixed, composition, 1 meg $\pm 10\%$, 1/2 w.		
	Same as R11	82283-98	502510
R42	Resistor: fixed, composition, 100 ohm $\pm 10\%$, 1/2 w.		
	Same as R28	82283-50	502110
R43	Resistor: fixed, composition, 1 meg $\pm 10\%$, 1/2 w.		
	Same as R11	82283-98	502510
R44 to R47	Resistor: fixed, composition, 1000 ohm $\pm 5\%$, 2 w	99126-159	37496
R48	Resistor: fixed, composition, 560,000 ohm $\pm 10\%$, 1/2 w.		
	Same as R18	82283-95	502456
R49	Resistor: fixed, composition, 3900 ohm $\pm 5\%$, 1 w	90496-173	512239
R50	Resistor: fixed, wire wound, 604 ohm $\pm 1\%$, 1 w	990187-276	205163
R51	Resistor: fixed, composition, 100 ohm $\pm 10\%$, 1/2 w.		
	Same as R28	82283-50	502110
R52	Resistor: variable, linear curve, 250 ohm $\pm 10\%$, 2 w	433196-49	99084
R53	Resistor: fixed, wire wound, 604 ohm $\pm 1\%$, 1 w.		
	Same as R50	990187-276	205163
R54, R55	Resistor: fixed, composition, 100 ohm $\pm 10\%$, 1/2 w.		
	Same as R28	82283-50	502110
R56	Resistor: fixed, composition, 82,000 ohm $\pm 5\%$, 1 w.		
	Same as R15	90496-205	512382
R57, R58	Resistor: fixed, composition, 100 ohm $\pm 10\%$, 1/2 w.		
	Same as R28	82283-50	502110
R59	Resistor: fixed, wire wound, 1020 ohm $\pm 1\%$, 1 w	990187-302	205164
R60	Resistor: fixed, composition, 100 ohm $\pm 10\%$, 1/2 w.		
	Same as R28	82283-50	502110
R61	Resistor: variable, linear curve, 250 ohm $\pm 10\%$, 2 w.		
	Same as R52	433196-49	99084
R62	Resistor: fixed, wire wound, 1070 ohm $\pm 1\%$, 1 w	990187-304	99082
R63	Resistor: fixed, composition, 270 ohm $\pm 5\%$, 1 w	90496-145	512127
R64	Resistor: fixed, composition, 100 ohm $\pm 10\%$, 1/2 w.		
	Same as R28	82283-50	502110
R65	Resistor: fixed, composition, 270 ohm $\pm 5\%$, 1 w.		
	Same as R63	90496-145	512127
R66, R67	Resistor: fixed, composition, 100 ohm $\pm 10\%$, 1/2 w.		
	Same as R28	82283-50	502110
R68	Resistor: fixed, composition, 1500 ohm $\pm 5\%$, 1 w	90496-163	512215
R69	Resistor: fixed, composition, 47,000 ohm $\pm 5\%$, 2 w	99126-199	44211
R70	Resistor: fixed, composition, 100 ohm $\pm 10\%$, 1/2 w.		
	Same as R28	82283-50	502110

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SYMBOL NO.	DESCRIPTION	DRAWING NO.	STOCK NO.
R71	Resistor: fixed, composition, 1 meg $\pm 10\%$, 1/2 w. Same as R11	82283-98	502510
R72	Resistor: fixed, composition, 100 ohm $\pm 5\%$, 1 w. Same as R12	90496-135	512110
R73	Resistor: fixed, composition, 47,000 ohm $\pm 5\%$, 2 w. Same as R69	99126-199	44211
R74	Resistor: fixed, composition, 1 meg $\pm 10\%$, 1/2 w. Same as R11	82283-98	502510
R75	Resistor: fixed, composition, 100 ohm $\pm 5\%$, 1 w. Same as R12	90496-135	512110
R76	Resistor: fixed, composition, 100 ohm $\pm 10\%$, 1 w. Same as R39	90496-50	512110
R77, R78	Resistor: fixed, composition, 470,000 ohm $\pm 10\%$, 1/2 w	82283-94	502447
R79	Resistor: fixed, composition, 220,000 ohm $\pm 10\%$, 1 w	90496-90	512422
R80, R81	Resistor: fixed, composition, 100 ohm $\pm 10\%$, 1/2 w. Same as R28	82283-50	502110
R82	Resistor: fixed, composition, 56,000 ohm $\pm 10\%$, 2 w	99126-83	28741
R83	Resistor: fixed, composition, 27,000 ohm $\pm 10\%$, 2 w	99126-79	522327
R84	Resistor: fixed, composition, 3300 ohm $\pm 5\%$, 1 w	90496-171	71986
R85	Resistor: fixed, composition, 100,000 ohm $\pm 5\%$, 2 w	99126-207	522410
R86	Resistor: fixed, composition, 100 ohm $\pm 10\%$, 1/2 w. Same as R28	82283-50	502110
R87	Resistor: fixed, composition, 330 ohm $\pm 5\%$, 1 w	90496-147	512133
R88	Resistor: fixed, composition, 18,000 ohm $\pm 5\%$, 2 w	99126-189	522318
R89	Resistor: fixed, composition, 4700 ohm $\pm 5\%$, 1 w	90496-175	512247
R90	Resistor: fixed, composition, 15,000 ohm $\pm 10\%$, 2 w	99126-76	522315
R91	Resistor: fixed, composition, 4.7 meg $\pm 5\%$, 1/2 w	82283-247	502547
R92	Resistor: fixed, composition, 2.2 meg $\pm 5\%$, 1/2 w	82283-239	502522
R93	Resistor: fixed, composition, 220 ohm $\pm 5\%$, 1 w	90496-143	512122
R94	Resistor: fixed, composition, 1.8 meg $\pm 5\%$, 1/2 w	82283-237	11769
R95	Resistor: fixed, composition, 100 ohm $\pm 10\%$, 1 w. Same as R39	90496-50	512110
R96	Resistor: fixed, composition, 560 ohm $\pm 10\%$, 1/2 w	82283-59	502156
R97	Resistor: fixed, composition, 560 ohm $\pm 10\%$, 2 w	99126-59	522156
R98	Resistor: fixed, composition, 1 meg $\pm 10\%$, 1/2 w. Same as R11	82283-98	502510
R99	Resistor: fixed, composition, 2200 ohm $\pm 5\%$, 1 w	90496-187	512222
R100	Resistor: fixed, composition, 150,000 ohm $\pm 5\%$, 1 w	90496-211	512415
R101	Resistor: fixed, composition, 18 ohm $\pm 10\%$, 1/2 w	82283-41	33568
R102	Resistor: fixed, composition, 33,000 ohm $\pm 5\%$, 1 w	90496-195	512333
R103	Resistor: fixed, composition, 430 ohm $\pm 5\%$, 1/2 w	82283-150	19781
R104	Resistor: variable, 200 ohm $\pm 10\%$, 2 w	433196-9	52598
R105	Resistor: fixed, composition, 100 ohm $\pm 10\%$, 1/2 w. Same as R28	82283-50	502110
R106	Resistor: fixed, composition, 220 ohm $\pm 5\%$, 1 w. Same as R93	90496-143	512122
R107	Resistor: fixed, composition, 1000 ohm $\pm 5\%$, 1 w. Same as R21	90496-159	512210
R108	Resistor: fixed, composition, 18,000 ohm $\pm 5\%$, 2 w. Same as R88	99126-189	522318
R109	Resistor: fixed, composition, 4700 ohm $\pm 5\%$, 1 w. Same as R89	90496-175	512247
R110	Resistor: fixed, composition, 3300 ohm $\pm 5\%$, 1 w. Same as R84	90496-171	71986
R111	Resistor: fixed, composition, 39,000 ohm $\pm 5\%$, 1 w	90496-197	71084
R112	Resistor: fixed, composition, 750,000 ohm $\pm 5\%$, 1/2 w	82283-228	44048
R113	Resistor: fixed, composition, 120 ohm $\pm 10\%$, 1/2 w	82283-51	502112
R114	Resistor: fixed, composition, 3300 ohm $\pm 5\%$, 1 w. Same as R84	90496-171	71986
R115	Resistor: fixed, composition, 1000 ohm $\pm 5\%$, 1 w. Same as R21	90496-159	512210
R116	Resistor: fixed, composition, 2200 ohm $\pm 10\%$, 1/2 w	82283-66	502222
R117	Resistor: fixed, composition, 510 ohm $\pm 5\%$, 1/2 w	82283-152	3383
R118	Resistor: fixed, composition, 27,000 ohm $\pm 5\%$, 2 w	99126-193	522327
R119	Resistor: fixed, composition, 2.2 meg $\pm 5\%$, 1/2 w. Same as R92	82283-239	502522
R120	Resistor: fixed, composition, 4.7 meg $\pm 5\%$, 1/2 w. Same as R91	82283-247	502547

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SYMBOL NO.	DESCRIPTION	DRAWING NO.	STOCK NO.
R121	Resistor: fixed, composition, 270 ohm $\pm 5\%$, 1 w. Same as R63	90496-145	512127
R122	Resistor: fixed, composition, 1.8 meg $\pm 5\%$, 1/2 w. Same as R94	82283-237	11769
R123	Resistor: fixed, composition, 270 ohm $\pm 5\%$, 1 w. Same as R63	90496-145	512127
R124 to R126	Resistor: fixed, composition, 100 ohm $\pm 10\%$, 1/2 w. Same as R28	82283-50	502110
R127	Resistor: fixed, composition, 470,000 ohm $\pm 10\%$, 1/2 w. Same as R77	82283-94	502447
R128	Resistor: fixed, composition, 18,000 ohm $\pm 5\%$, 1/2 w	82283-189	502318
R129	Resistor: fixed, composition, 220 ohm $\pm 10\%$, 2 w	99126-54	522122
R130	Resistor: fixed, composition, 470,000 ohm $\pm 5\%$, 1/2 w	82283-223	502447
R131	Resistor: fixed, composition, 100 ohm $\pm 10\%$, 1/2 w. Same as R28	82283-50	502110
R132 to R134	Resistor: fixed, composition, 120 ohm $\pm 1\%$, 1 w, 2500 v	984081-137	99061
R135	Resistor: fixed, composition, 39,000 ohm $\pm 5\%$, 1 w. Same as R111	90496-197	71084
R136 to R138	Resistor: fixed, composition, 200 ohm $\pm 1\%$, 1 w, 2500 v	984081-142	99062
R139	Resistor: fixed, composition, 1 meg $\pm 10\%$, 1/2 w. Same as R11	82283-98	502510
R140	Resistor: fixed, composition, 100 ohm $\pm 10\%$, 1/2 w. Same as R28	82283-50	502110
R141	Resistor: fixed, composition, 470 ohm $\pm 10\%$, 1 w	90496-58	512147
R142	Resistor: fixed, composition, 100 ohm $\pm 5\%$, 1 w. Same as R12	90496-135	512110
R143	Resistor: fixed, composition, 1 meg $\pm 10\%$, 1/2 w. Same as R11	82283-98	502510
R144	Resistor: fixed, composition, 75 ohm $\pm 5\%$, 1/2 w. Same as R9	82283-132	502075
R145	Resistor: fixed, composition, 100 ohm $\pm 10\%$, 1/2 w. Same as R28	82283-50	502110
R146	Resistor: fixed, composition, 6800 ohm $\pm 5\%$, 1 w	90496-179	512268
R147	Resistor: fixed, composition, 75 ohm $\pm 5\%$, 1/2 w. Same as R9	82283-132	502075
R148	Resistor: fixed, composition, 100 ohm $\pm 5\%$, 1 w. Same as R12	90496-135	512110
R149	Resistor: fixed, composition, 1 meg $\pm 10\%$, 1/2 w. Same as R11	82283-98	502510
R150	Resistor: fixed, composition 1 meg $\pm 1\%$, 1 w	990187-601	56329
R151, R152	Resistor: fixed, composition, 100 ohm $\pm 10\%$, 1 w. Same as R39	90496-50	512110
R153	Resistor: fixed, composition, 1 meg $\pm 10\%$, 1/2 w. Same as R11	82283-98	502510
R154	Resistor: fixed, composition, 33,000 ohm $\pm 5\%$, 1 w. Same as R102	90496-195	512333
R155 to R157	Not used		
R158	Resistor: fixed, composition, 27,000 ohm $\pm 5\%$, 2 w. Same as R118	99126-193	522327
R159, R160	Not used		
R161	Resistor: fixed, composition, 1000 ohm $\pm 5\%$, 1 w. Same as R21	90496-159	512210
R162 to R169	Resistor: fixed, composition, 1 meg $\pm 1\%$, 1/2 w	8898692-231	55658
R170	Resistor: fixed, composition, 1 meg $\pm 1\%$, 1 w. Same as R150	990187-601	56329
R171	Resistor: variable, 1000 ohm $\pm 10\%$, 2 w	433196-8	68848
R172	Resistor: fixed, composition, 330 ohm $\pm 5\%$, 1 w. Same as R87	90496-147	512133
R173	Resistor: fixed, wire wound, 6000 ohm $\pm 5\%$, 10 w	8817660-19	205185
R174	Resistor: fixed, composition, 510 ohm $\pm 5\%$, 1 w	90496-152	3632
R175	Resistor: fixed, composition, 68 ohm $\pm 5\%$, 1 w	90496-131	512068
R176	Resistor: variable, 1000 ohm $\pm 10\%$, 2 w. Same as R171	433196-8	68848
R177	Resistor: fixed, composition, 510 ohm $\pm 5\%$, 1 w. Same as R174	90496-152	3632
R178, R179	Not used		
R180	Resistor: fixed, wire wound, 7500 ohm, 10 w	443853-9	53651
R181	Resistor: fixed, composition, 100,000 ohm $\pm 10\%$, 2 w	99126-86	522410
R182	Resistor: fixed, composition, 22 ohm $\pm 10\%$, 1 w	90496-42	39930
R183	Resistor: fixed, composition, 120,000 ohm $\pm 10\%$, 1 w	90496-87	512412
R184	Resistor: fixed, composition, 330,000 ohm $\pm 10\%$, 1 w	90496-92	512433

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SYMBOL NO.	DESCRIPTION	DRAWING NO.	STOCK NO.
R9	Resistor: fixed, composition, 1000 ohm $\pm 10\%$, 1 w	90496-62	512210
R10	Resistor: fixed, composition, 180 ohm $\pm 10\%$, 1/2 w	82283-53	502118
R11	Resistor: fixed, composition, 82,000 ohm $\pm 10\%$, 1 w	90496-85	512382
S1	Switch: selector, 3 circuit, 4 position	8865160-1	30155
T1	Transformer: video, input stage	8861357-501	204475
T2	Transformer: output tank coil	743206-506	204474
XV1, XV2	Socket: tube, 7 contact, miniature	737867-18	94879
MISCELLANEOUS			
	Knob: pointer type	712336-507	30075
	Shield: tube	99369-2	54521
	Terminal: stand off	8890637-5	97745

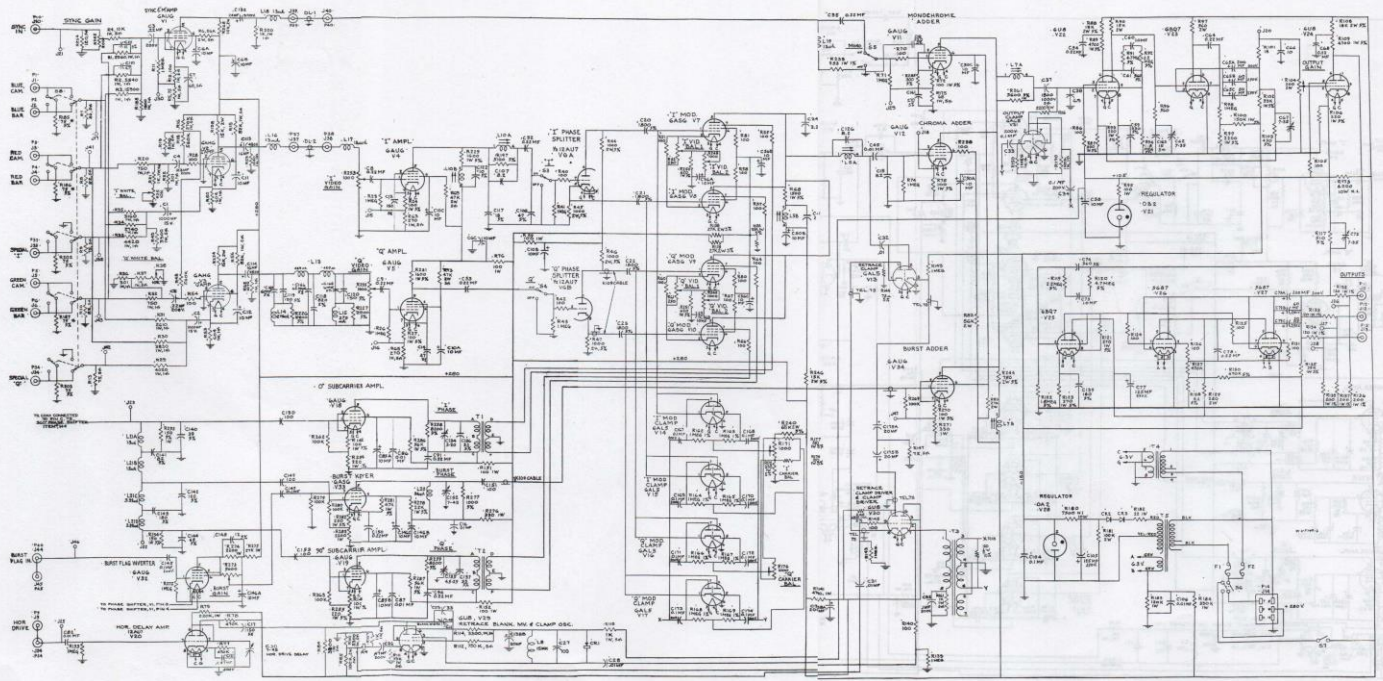


Figure 3 - Schematic Diagram, TX-1B Colorplexer

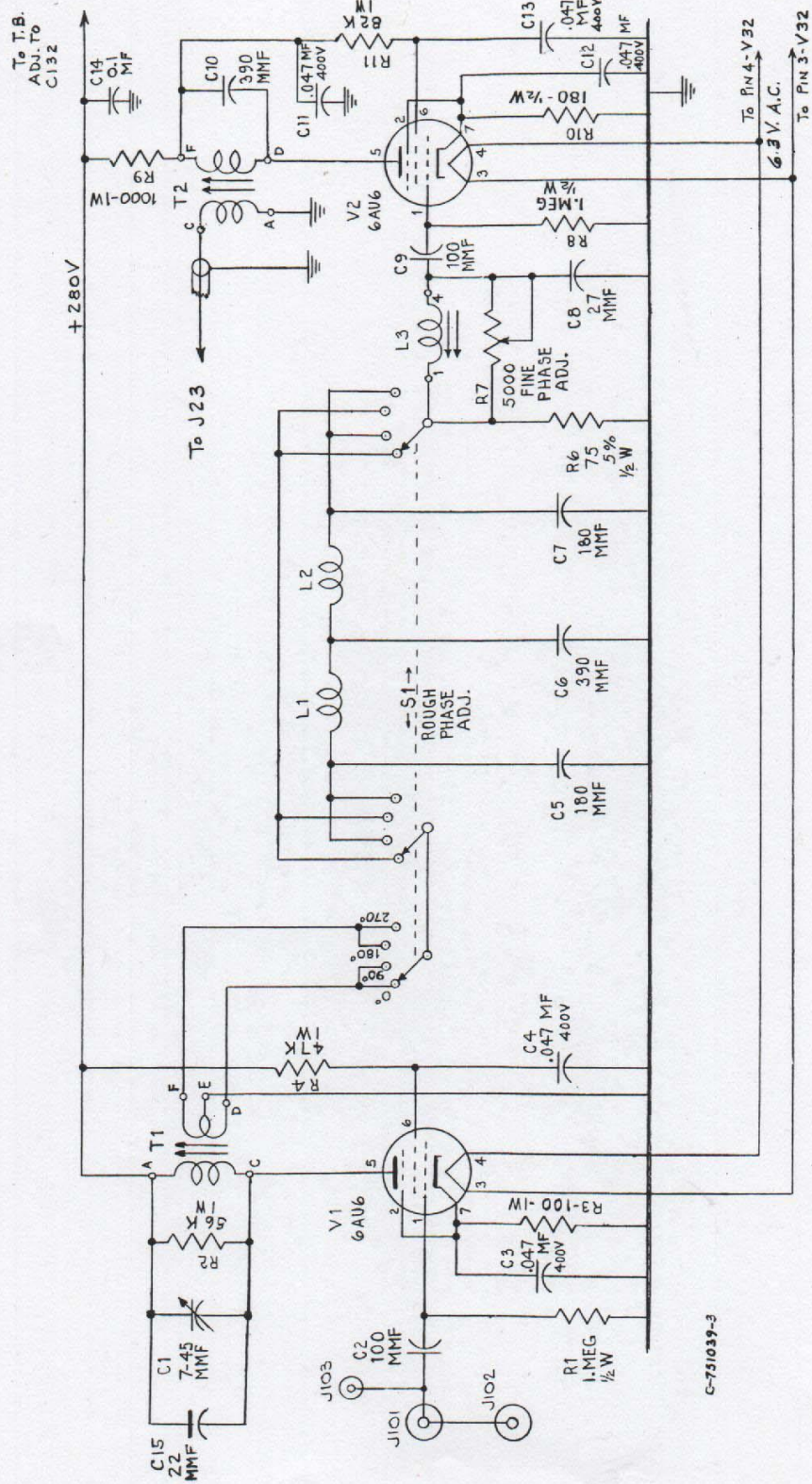


Figure 4 - Schematic Diagram, 360° Phase Shifter