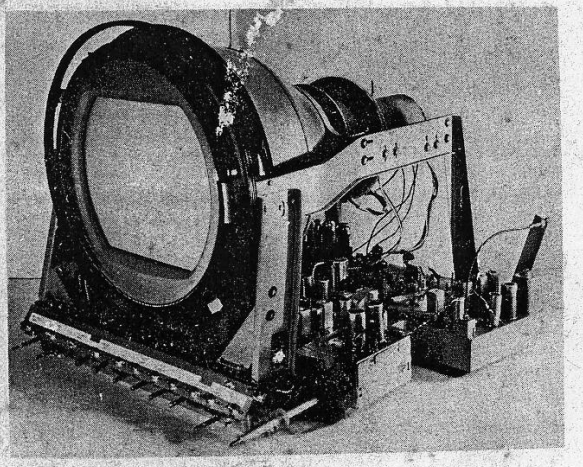
Westinghouse
TELEVISION RADIO

H A Poehler

SERVICE MANUAL



CHASSIS ASSEMBLY

V-2284-15

SPECIFICATIONS

FREQUENCY RANGES:

CHANNEL NUMBER	CHANNEL FREQUENCY (MC.)	VIDEO CARRIER FREQUENCY (MC.)	SOUND CARRIER FREQUENCY (MC.)	RECEIVER H-F OSCILLATOR FREQUENCY (MC.)
2	54 – 60	55.25	59.75	101
3	60 – 66	61.25	65.75	107
4	66 – 72	67.25	71.75	113
5	76 – 82	77.25	81.75	123
6	82 – 88	83.25	87.75	129
7	174 – 180	175.25	179.75	221
8	180 – 186	181.25	185.75	227
9	186 – 192	187.25	191.75	233
10	192 – 198	193.25	197.75	239
11	198 – 204	199.25	203.75	245
12	204 – 210	205.25	209.75	251
13	210 – 216	211.25	215.75	257

FINE TUNING RANGE:

1.5 mc. minimum; 5 mc. maximum

AUDIO POWER OUTPUT:

Undistorted . . . . . 2.5 watts
Maximum . . . . . 3.0 watts

OPERATING VOLTAGE:

105 to 120 volts, 60 cycles A-C

LOUDSPEAKER:

Type . . . . . 10" P.M.
Voice Coil Impedance . . 3.2 ohms at 400 cycles

(Specifications continued on next page)

Westinghouse Electric Corporation TELEVISION-RADIO DIVISION, METUCHEN, N. J.

PRINTED IN U.S.A.

RM 4038

POWER CONSUMPTION ..... 500 watts

RECEIVER ANTENNA INPUT IMPEDANCE:
... 300 ohms balanced or 72 ohms unbalanced

VIDEO CARRIER INTERMEDIATE FREQUENCY:
..... 45.75 mc.

VIDEO RESPONSE: ..... 4.1 mc.

SOUND CARRIER INTERMEDIATE FREQUENCY:
..... 4.5 mc.

FOCUS: ..... Magnetic

SWEEP DEFLECTION: ..... Magnetic

SCANNING ..... Interlaced 525 lines

HORIZONTAL SCANNING FREQUENCY:
..... 15,750 CPS

VERTICAL SCANNING FREQUENCY: ... 60 CPS

FRAME FREQUENCY:
(picture repetition rate): ..... 30 CPS

TUBE COMPLEMENT

1	6BZ7 or 6BQ7A	RF Amplifier
1	6U8	H.F. Oscillator and Mixer
4	6CB6	IF Amplifiers
2	6AU6	Sound IF Amplifiers
1	6BN6	FM Detector
1	6BK5	Audio Output
1	12AT7	Sync Amplifier
1	6AU6	Sync Separator
1	6AL5	Horizontal Afc.
1	12AU7	Horizontal Multivibrator
2	6BG6G	Horizontal Output
2	6AX4GT	Horizontal Dampers
1	6SN7GT	Vertical Multivibrator
1	6AH4GT	Vertical Output
1	6AU6	Keyed AGC
1	12BY7	1st Video Amplifier
1	6BK5	Line Driver
1	6BK7	Red and Blue Video Amplifier
1	6BK7	Red Output
1	6BK7	G-Y and Green Amplifier
1	6AS6 or 6DB6	R-Y Demodulator
1	6AS6 or 6DB6	B-Y Demodulator
1	6BK7	Blue and Green Output
1	6BL7GT	Color Killer and Dyn. Conv. Phasing AMP
1	6BA6	Chroma Amplifier
1	6AH6	Burst Amplifier
1	6AL5	Phase Detector
1	6U8	Reactance & Electron Coupled Osc.
1	6BC7	Red-Green-Blue Clamper
1	6BD4	H.V. Regulator
3	3A3GT	H.V. Rectifier and diode coupler
1	1AX2	Focus Rectifier
3	5U4G	Low Voltage Rectifiers

1 15GP22 ..... TRI-Color Cathode-Ray Tube

HIGH VOLTAGE WARNING

The danger accompanying shock is always present when the receiver is operated outside the cabinet or when the rear cover is removed from the cabinet. Only a person familiar with the precautions to be observed when working with high voltage equipment should service this receiver.

CATHODE RAY TUBE HANDLING PRECAUTIONS

Shatterproof goggles and heavy gloves should be worn at all times when handling a cathode ray tube. The tube should not be handled in the vicinity of any person not so equipped. When handling a tube, always carry it away from the body with one hand on the bell near the neck of the tube, while the other hand is grasping the edge of the front faceplate.

Due to the large surface area of the tube and the high vacuum contained within, more than ordinary care is required to prevent shattering the tube. The large end of the bulb, particularly the rim of the viewing surface, must not be struck, scratched, or subjected to more than moderate pressure. If the tube binds during removal or replacement, determine the cause of the trouble – **DO NOT FORCE THE TUBE.**

An additional precaution is required when handling a cathode ray tube that has an aquadag coating on the outside of the tube. The outside aquadag coating forms one plate of a capacitor, and the inside coating to which the high voltage is applied serves as the other plate. The high voltage charge may be retained in this capacitor for a long time after the high voltage lead is disconnected. Since the charge could produce a shock that would startle the handler into dropping the tube, the charge should be dissipated before any handling of the tube is attempted. To dissipate the charge, place a jumper from the outside aquadag coating to the metal flange on the tube. Due to the relatively high resistance of the aquadag, the jumper should be held in place for some time to insure complete discharge.

6BD4 TUBE CAUTIONS

The 6BD4 High Voltage regulator tube when in operation, may be extremely dangerous. Great care must be taken during the adjustment of this circuit or the replacement of this tube. A potential of 20,000 volts exists between the tube base and the plate cap.

When handling the tube, avoid contact with the glass envelope. Always handle by the tube base or plate cap because fingerprints on the envelope may cause cornia discharge.

In the event of handling the tube envelope, clean with a clean dry cloth.

INSTALLATION INSTRUCTIONS

To Prepare the Receiver for Operation:

Model H-840CK15 is shipped in operating condition. There is no shipping material to be removed. Simply remove the receiver from its carton, and connect the AC plug to a 105 to 120 volt 60 AC outlet.

The antenna terminals are located on the back of the receiver, an external antenna must be connected to these terminals.

To Check the Operation of the Receiver:

1. Turn on the receiver by rotating the off-on-volume control clockwise.

2. Rotate the color control fully counterclockwise.

3. Adjust the receiver to the desired channel. This is accomplished by rotating the channel selector to the position where the desired VHF channel number appears in the channel window.

4. Rotate the picture control to the position that provides best contrast between the light and dark parts of the picture. It may be necessary to adjust the brightness control to obtain proper shading between the light and dark parts of the picture.

5. Adjust the fine tuning control for best picture detail.

6. If the picture moves up or down on the screen, rotate the vertical hold control clockwise or counterclockwise until the picture is stabilized vertically.

7. If the picture is pulled into diagonal bars or if the edge of the picture quivers or tends to fold over, adjust the horizontal hold control for correct synchronization. This control can be adjusted so that it will seldom be necessary to readjust it thereafter. To obtain this adjustment, tune in a TV station, and rotate the control to the middle of its range over which the picture is synchronized. If the middle of the sync range does not correspond approximately to the middle of its mechanical range, make the adjustments described under Horizontal Ringing Coil in the ADJUSTMENT section. Check the adjustment of the horizontal control by switching to another channel and then back again. The picture should be stable when switching from channel to channel.

8. Rotate the focus control to the position that provides best focus.

9. Rotate the convergence control to a position that removes the color edges from the center of the picture. It may not be possible to remove color edges from the entire picture, but a position should be found that reduces color edges to a minimum.

10. Adjust the off-on-volume control for the desired sound volume.

11. Adjust the tone control for the desired tone quality.

NOTE: The above adjustments will produce a black and white picture. The following adjustments cannot be made until a color program comes on.

12. Rotate the color control clockwise to add the right amount of color to the picture. If color is not obtained or if adequate color intensity cannot be obtained, at maximum position of the color control, the fine tuning control should be readjusted. If color diagonal bars or colored streaks appear in the picture, rotate the COLOR HOLD control to a position that provides a clear stable colored picture.

ADJUSTMENTS

Centering

The vertical and horizontal centering controls are located on the back of the receiver. (See Fig. 6) Rotating the vertical centering control clockwise or counterclockwise will move the picture up or down with respect to the mask. Rotating the horizontal centering control clockwise or counterclockwise will move the picture right or left with respect to the mask.

Height and Vertical Linearity

The height adjustment on the back of the chassis controls the overall height of the picture, and the vertical linearity adjustment controls the relationship between the vertical dimensions of the upper and lower sections of the picture. A balance between the two controls is necessary to make the picture symmetrical and fill the mask vertically.

Width and Horizontal Linearity

The width adjustment on the back of the chassis controls the overall width of the picture, and the horizontal linearity adjustment controls the relationship between the horizontal dimensions of the left and the right sections of the picture. A balance between the two controls is necessary to make the picture symmetrical with correct horizontal dimensions. These controls can be adjusted with a ¼" Spintite-type wrench.

Horizontal Ringing Coil

The horizontal ringing coil (L705) should be adjusted as follows:

1. Short out the ringing coil with a short jumper wire.

2. Set the horizontal hold control to the middle of its range, and leave it in this position during the steps that follow.

3. Connect a VTVM to the pin # 2 grid circuit of the horizontal multivibrator, so as to measure the DC voltage between this point and ground.

4. With the receiver tuned to a TV station, adjust C741 (located on the rear of the chassis) for **zero** voltage on the meter. If zero voltage can be approached but not quite reached at one extreme of the C741 adjustment, it may be necessary to set the horizontal hold control slightly to one side of mid-position to obtain zero voltage.

5. Remove the jumper from across the ringing coil.

6. Adjust the ringing coil for **zero** voltage on the meter, and check the adjustment by switching to another channel and then back again. The receiver should pull into horizontal synchronization on all channels.

Quieting Control

The quieting control is located on the back of the receiver and is adjusted by means of a screwdriver inserted through the hole in the back cover. This control, which determines the AM rejection characteristics of the sound system, is normally adjusted during alignment of the sound system as described under ***Sound Alignment Procedure*** and will not ordinarily require further adjustment. In very weak signal areas, however, a reduction in noise or hiss on the sound may be obtained by slightly re-adjusting the control.

AGC Control

Allow the receiver to warm up for at least five minutes before adjusting the AGC control. With the receiver tuned to the strongest signal in the area, rotate the AGC control clockwise until the receiver begins to overload or, if the signal is weak, until snow on the picture becomes more pronounced. Then rotate the control counterclockwise to the position when the best picture with minimum snow and no sign of overload is obtained. Make certain that overload does not occur on any channel. If evidence of overload is noticed, rotate the AGC control counterclockwise until the condition disappears.

It is recommended that the strongest signal in the area be used when adjusting the AGC control. If a weak signal is used during the adjustment, the control may be set too far in a clockwise direction to permit reception of a strong signal without overload.

ANTENNA INSTALLATION FOR COLOR RECEPTION

Normally, a good black and white antenna installation will be sufficient for the reception of color broadcasts. As the frequencies making up the color signal lie at the upper end of the channel being received, several factors have to be taken into consideration for good color reception.

Compromise orientation of the antenna, which was satisfactory for black and white reception, in many instances will not suffice for color as the compromise produces nulls in the antenna response which can cause attenuation at the upper end of the channel and, thereby, cause the loss of the color signal.

Ghosts may be a problem due to the phase of the reflected signal being such that the color information signal may be cancelled out with the consequent loss of color in the picture. Great care must be taken when using narrow beam antennas to eliminate ghosts, that the band response of the antenna being used does not fall off on the high end resulting in the attenuation and loss of the color signal.

As the broad-band response of some master antenna systems is none too good, some trouble may be encountered in these systems where the color information signal will be attenuated to the extent that all color information will be lost.

Due to these factors, when installing a color receiver, the antenna installation should be checked for the possibility of it being the cause of poor color reception.

CRT TUBE REMOVAL AND REPLACEMENT

1. Remove the Field Neutralizing plug (male) from the socket located on the chassis. (See Figure 1)
2. Disconnect the CRT socket assembly from the CRT tube base.
3. Disconnect the high voltage connector assembly from the high voltage supply and the H.V. regulator 6BD4 tube cap.
4. With a ¼" Spintite remove 4 self-tapping screws (2 on each side) which mount CRT strap and bracket assembly to the right and left mounting frame bracket. (See Figure 1)
5. Slowly remove the CRT tube with metal shield from the chassis seeing that the CRT strap and bracket assembly with side brackets and the neck of the CRT tube are free so that the tube can easily be detached from the chassis.
6. With CRT tube seated in an empty tube carton, (used as a base) observe the dismounting of the CRT strap and bracket assembly, field neutralizing coil, insulating ring, metal shield and CRT contact anode attached to the H.V. connector assembly.
7. With the replacement tube seated in the tube carton, clip the contact anode to the metal flange. This contact anode clip must be in line with Pin # 17, blue gun, of the CRT pin base. Facing the CRT faceplate, starting 1" from the contact anode clip, wrap the insulating ring CCW around the CRT tube allowing the insulating ring to extend to the front edge of the faceplate. The H.V. connector assembly lead will protrude from under the insulating ring, at a nine o'clock position as seen in figure 1A. Holding the insulating ring securely with one hand, place the CRT strap and bracket assembly around the insulating ring seeing that the side mounting brackets (CRT strap assy.) are snug against the CRT faceplate as seen in figure 1B. Place the field neutralizing coil and brackets over the tube with the brackets secured under the CRT strap assembly. Four brackets will be found tapped to the field neutralizing coil. One of these brackets must be located 2" to the left of the screw and under the CRT strap assembly, as seen in figure 1B. Now tighten the screw on the CRT assembly securing the field neutralizing coil and insulating ring to the CRT tube. The CRT assembly is now ready for installation on the chassis.
8. Place CRT tube and assembly back on the chassis seeing that the metal shield is secure and now replace the four ¼" self-tapping screws (two on each side) which mount the CRT strap and bracket assembly to the right and left hand mounting frame.
9. Check to see that the bottom side of the rectangular portion of the CRT tube is parallel with the chassis. If not, loosen CRT strap assembly and rotate accordingly.

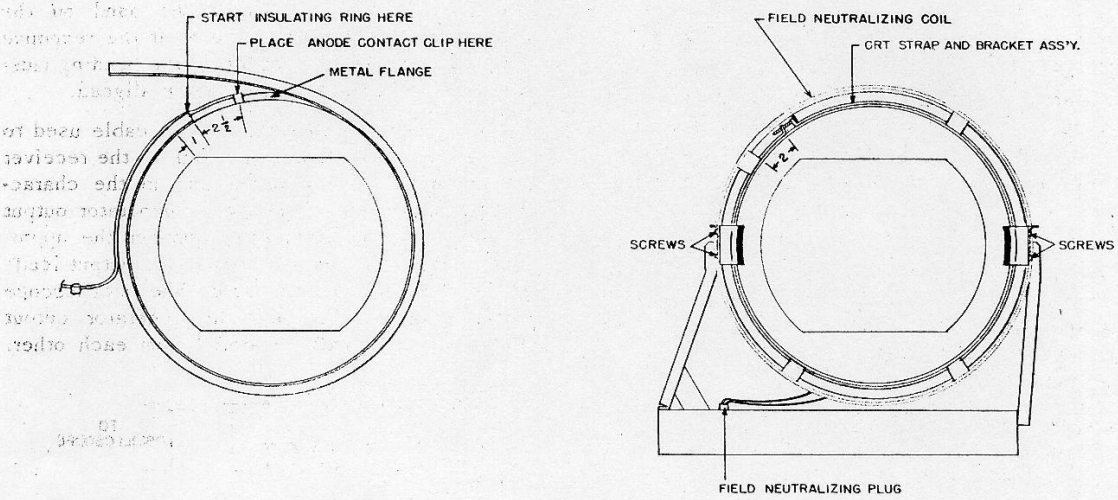


FIGURE 1 CRT INSTALLATION

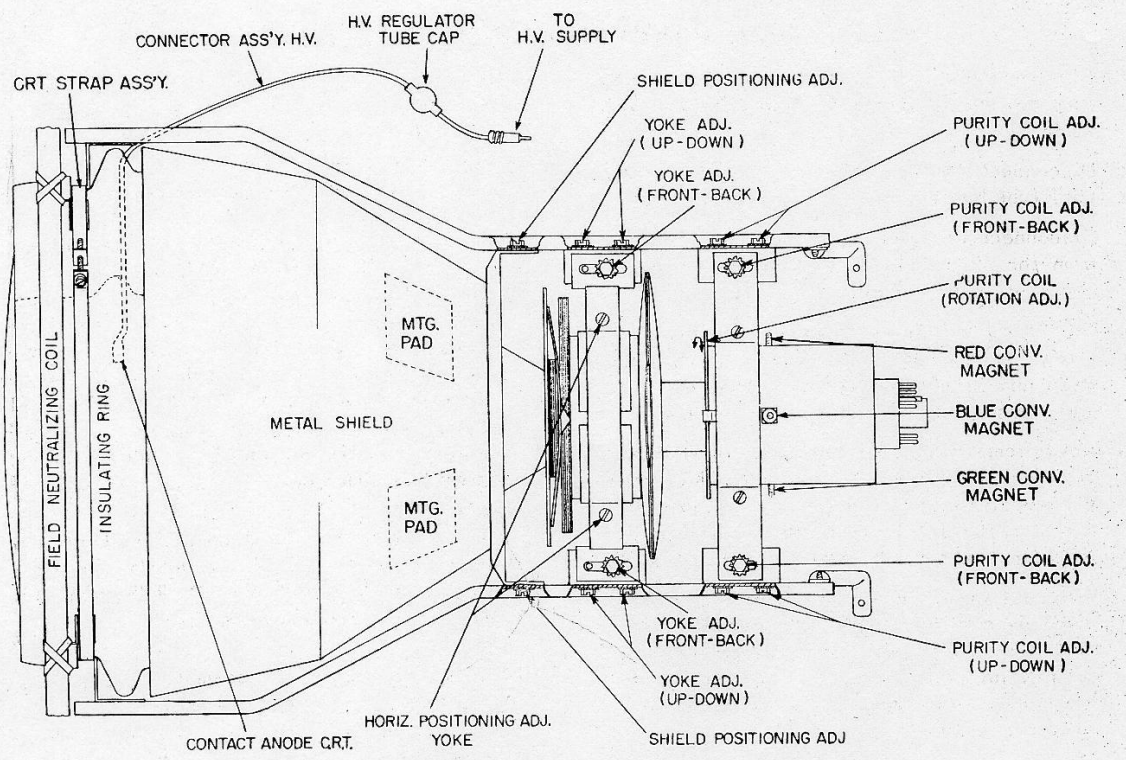


FIGURE 2 CRT ADJUSTMENTS

ALIGNMENT

Test Equipment

To service these chassis, the following test equipment should be available:

(1) R-F sweep generator that is capable of producing a 10 mc. sweep at center frequencies ranging from 10 to 90 mc. and 170 to 216 mc. The output must be adjustable from at least 100,000 microvolts down to a very low minimum, and the output must be flat at all positions of the attenuator.

(2) Video sweep generator that is capable of producing a 0-5 mc. sweep.

(3) Cathode ray oscilloscope preferably one with a wide-band vertical deflection amplifier and a low-capacitance input probe. The oscilloscope should have good low-frequency response characteristics.

(4) Signal generator or generators capable of producing an accurate signal at all intermediate frequencies between 4.5 and 50 mc. and all picture and sound R-F frequencies. The output level must be adjustable from at least 100,000 microvolts down to a very low minimum.

(5) A crystal controlled signal generator capable of producing video marker signals, 100 KC, 2 mc., 3 mc., 3.58 mc., 4 mc., and 4.5 mc.

(6) Vacuum tube voltmeter equipped with a high multiplier probe for measurements up to 30,000 volts and an R-F probe for measuring R-F voltages.

General Information

The chassis and the test equipment should be bonded together by short lengths of heavy braided copper ribbon, and all interconnecting leads should be shielded and should be as short as possible. The effectiveness of the bonding can be checked during alignment by placing the hand on the chassis or test equipment case. If the response curve or meter reading changes, the bonding must be improved before the circuits are aligned.

It is important that the coaxial cable used to couple the sweep generator output to the receiver be terminated at its output end in the characteristic impedance of the sweep generator output circuit. To accomplish this, connect the appropriate value of resistance across the output leads at the open end of the cable. The oscilloscope vertical input cable and the generator output cables must be well separated from each other.

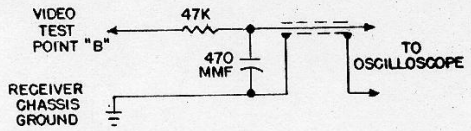


FIGURE 3 DECOUPLING NETWORK

IF ALIGNMENT CHART

Rotate the channel selector to channel 13.

Connect oscilloscope to video test point (See V-2284-15 schematic diagram) through the decoupling network shown in Fig. 3.

Connect 15 volt bias battery to AGC line at junction of R508 1.2M and C501 .005 mfd.

Set AGC control for 4 volts at first IF grid pin 1.

Couple the marker generator output to the sweep generator output. In the steps that follow use marker to check the response curve at the frequencies indicated on Fig. 4.

Step	Alignment Signal	Remarks	Adjust
1.	Remove 6BQ7A or 6BZ7 RF tube from tuner		
2.	44MC sweep 0-10MC to 4th IF grid	Connect detuning clip to plate of 3rd IF Detune L504 and L506 full clockwise	T504 primary for max. response. T504 secondary for max. response. L505 for max. A. (Fig. 4)
3.	41.25 marker		L504 and L506 for min. at 41.25
4.	44MC sweep		Readjust T504 primary and secondary, also L505 for max. response
5.	44MC sweep 0-10MC to 3rd IF grid	Connect detuning clip to plate of 2nd IF Detune L502 min.	T503 primary for max. T503 secondary for max. Alternately trim primary and secondary for response B. (Fig. 4)
6.	41.25 marker		Adjust L502 for min. response.
7.	44MC sweep 0-10MC to 2nd IF	Connect detuning clip to 1st IF plate. Detune L501	T502 primary and secondary for response C. (Fig. 4)
8.	47.25 marker		L501 min. response at 47.25MC
9.	44MC sweep 0-10MC to 1st IF	Detune L500 full clockwise before adjusting T501	T501 primary and secondary for response D. (Fig. 4)
10.	39.75MC marker		L500 min. response 39.75MC
11.	44MC sweep 0-10MC to 6U8 mixer-osc.	Coupling to plate of osc. mixer 6U8 capacitor-shield	T100 on tuner and bottom of T500 for response curve E. (Fig. 4)
12.	41.25 marker. Same as step 11		Top of T500. E (Fig. 4)
13.	41.25 marker. Same as step 11		Recheck L504, L506 and top of T500 for maximum suckout at 41.25MC
14.	41.25 marker. Same as step 11		Sound control set for 38db down on 41.25MC

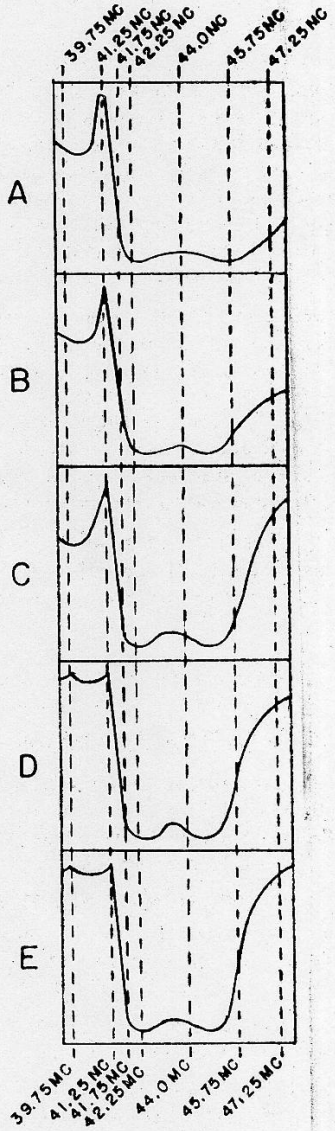


FIGURE 4 RESPONSE CURVES

SOUND ALIGNMENT PROCEDURE

The sound system can be aligned using either locally generated signals or a received TV signal. Since the latter method does not require signal generating equipment, it will be described first and will be followed by the procedure using locally generated signals.

To use an "air" signal for alignment:

1. Tune the receiver to a TV station and connect an attenuator between the receiver and the antenna so that the strength of the signal can be varied from weak to strong.

2. Set the quieting control (R205) located on the back of the chassis approximately to its mid-position.

3. Apply a strong signal to the receiver, and adjust the quadrature coil (L204) for maximum program sound. If peaks occur at two different positions that are widely separated, use the one that occurs when the slug is farthest counterclockwise. If two peaks occur within a narrow range of adjustment, sufficient signal is not being applied to the receiver and/or the quieting control is not set at the proper position.

4. Reduce the signal to its lowest useable level and adjust the 4.5 mc. IF slugs (L202, L201 and L200) and the quadrature coil (L204) again for maximum program sound. If peaks occur at two different settings of the slug, use the peak that occurs when the slug is farthest counterclockwise. Recheck adjustments of L202, L201 and L200 at the lowest useable signal level.

5. Apply a very weak signal that allows noise to be heard and adjust the quieting control (R205) for minimum noise. The position at which the noise is minimized depends on the strength of the signals, therefore, the weakest useable station in the area should be used for this adjustment. This control determines the AM rejection characteristics of the sound system, and its correct setting is normally about mid-position. ***Do not leave the quieting control set at its maximum counterclockwise position.***

To use Locally Generated Signals for Alignments

1. Connect an oscilloscope or an AC voltmeter across the volume control for use as an indicator.

2. Apply a 4.5 mc. FM signal (deviation approximately 7.5 KC.) to pin # 1 of the 4th video IF amplifier (6CB6).

3. Using a strong signal, adjust (L204) for maximum output.

4. Reduce the signal to the lowest level that will produce an indication and adjust in the following order L202, L201, and L200 for maximum output, then readjust L204 for maximum output.

5. Apply a 4.5 mc. AM signal (modulated approximately 30 percent) to pin # 1 of the 4th video IF amplifier (6CB6).

6. Beginning with a very low signal level, increase the generator output, while rotating the quieting control back and forth, until the signal level is such that the AM output across the volume control dips to **zero** with a rise on each side as the quieting control is rotated. Set the quieting control for zero output at this signal level.

PRODUCTION CHANGES

In later production of the V-2284-15 chassis the following changes may be found.

SECTION 3 – CHROMINANCE

1. Change R301 to 2,200 ohms ½W–RC20AE222K
2. Change R337 to 10,000 ohms ½W–RC20AE103K
3. Change R338 to 10,000 ohms ½W–RC20AE103K
4. Change C302 to .005 mfd.

SECTION 6 – VIDEO AMP.

1. In later production a 4.5 mc. trap has been added in the cathode circuit of the first video amplifier (12BY7). (See Figure 5.)

C611	RCM20B331K	Capacitor 330 mmf.
L605	V-14634-1	Coil, slug tuned

2. In later production, a 330 mmf. capacitor, part no. RCM20B331K has been added as a cathode bypass capacitor. This new capacitor will be found across R608. (6BK5 cathode circuit.)

SECTION 7 – SWEEP AND HEATERS

To increase the stability of the vertical multivibrator, resistor R718 has been changed from 100,000 ohms 1W to 270,000 ohms ½W., part number RC20AE274K.

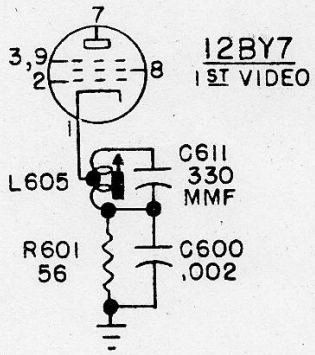


FIGURE 5 12BY7 VIDEO AMP.

SECTION 8 – HI-LOW POWER AND DEFLECTION

In later production the following changes have been made.

1. Change R806 to 3.3 ohms ½W – RRU33R3K
2. Change R807 to 4.7 ohms ½W – RRU34R7K

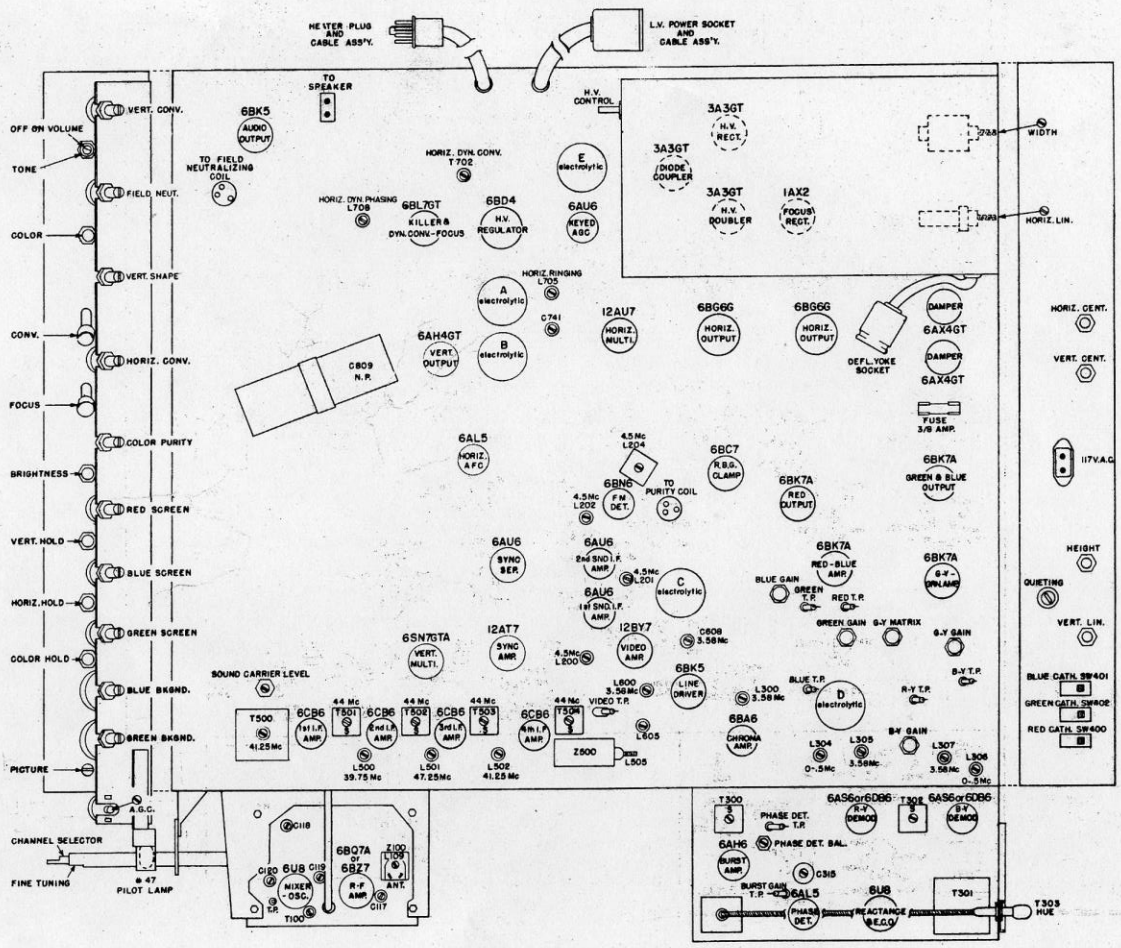


FIGURE 6 TOP VIEW OF V-2284-15 CHASSIS

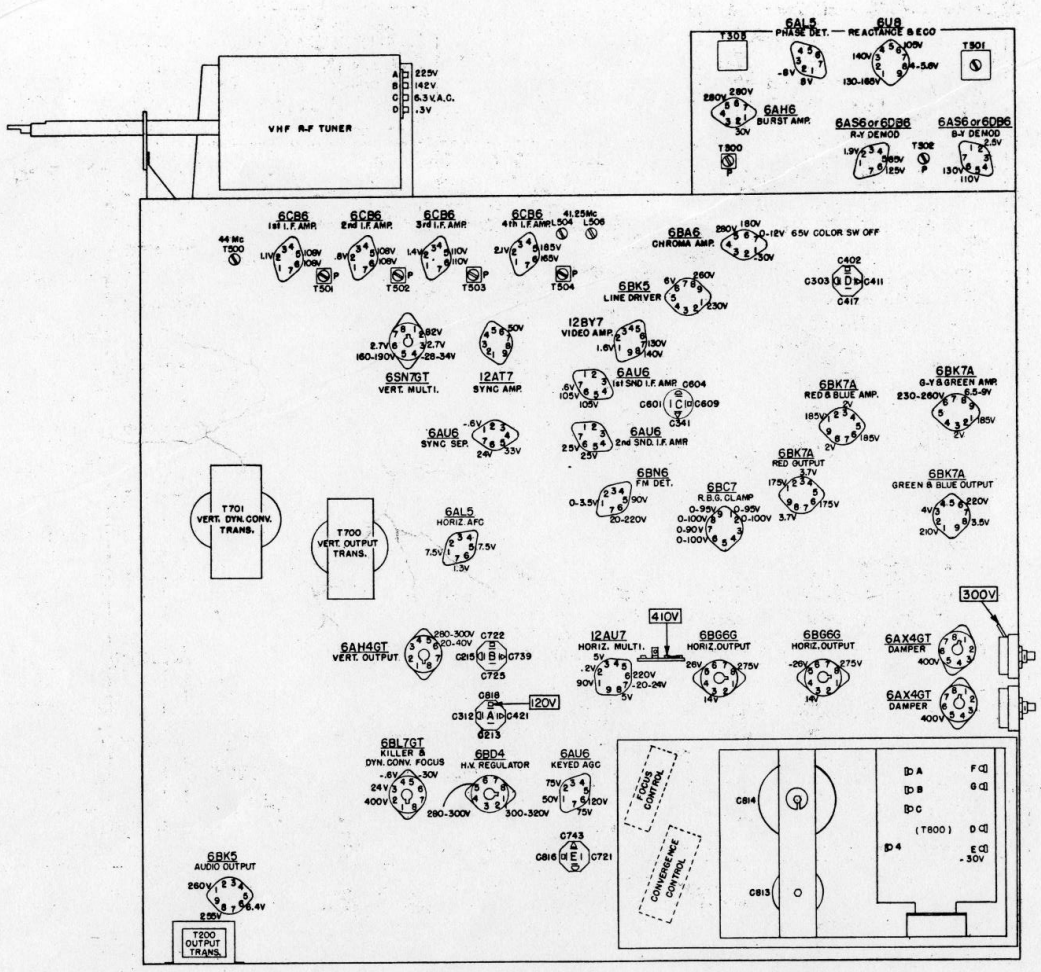


FIGURE 7 BOTTOM VIEW OF V-2284-15 CHASSIS

3. Change R808 to 3.3 ohms ½W – RRU33R3K
4. Change R822 to 200 ohms 40W – V-14335-2
5. Change R824 to 100,000 ohms 1W-RC30AE104K
6. The horizontal output transformer (T800) has been changed from part number V-12977-1 to V-12977-2.
7. Resistor R800 – 1 megohm 1W., has been removed from the circuit.
8. The three 1B3GT rectifiers have been replaced in later production by 3 – 3A3GT rectifiers.

ADJUSTMENT AND ALIGNMENT OF COLOR CIRCUITS

COLOR PURITY ADJUSTMENT

This adjustment must be made following an installation of a color picture tube.
The adjustment is as follows:

1. Set the receiver on a blank channel.
2. With only the red gun on, switch off the Blue (SW401) and Green (SW402) cathode switches located on the rear apron of the chassis.
3. Loosen the yoke adjustment front-back Figure 2, and slide the yoke assembly back (approximately 3").
4. Rotate the purity coil rotation adjustment (Figure 2) in connection with the color-purity control Figure 6 until the most uniform red appears in the center area of the tube. (Disregard the purity condition along the sides and at the top and bottom.
5. Slide deflection yoke forward until best screen purity for the most uniform red is reached, and retighten screws making sure that no neck shadows are present. If some impurity occurs at the edges, a slight adjustment of the Field Neutralizing control may result in better purity on the edges of the raster.
6. Next check the blue purity by switching off the Red switch SW400 and switching on the blue switch SW401.
7. Green purity is checked by switching off the blue switch SW401 and switching on the Green switch SW402.
8. After the final purity check, switch on all cathode switch SW400, SW401, and SW402.

CONVERGENCE ADJUSTMENTS

(a) Apply a dot pattern, video signal to video test point or a R.F. signal dot pattern modulated to antenna terminal of set.

(b) Adjust monochrome channel video gain controls and brightness for an equal output from the three guns.

(c) With vertical and horizontal convergence controls turned off counter-clockwise (Figure 6) and convergence magnets (Figure 2) maximum distance from the neck of the tube, adjust the convergence control (Figure 6) for the best convergence at the center area of the raster.

(d) Each gun will make a set of dots in its own color. When exact convergence is obtained, the three sets of dots will coincide and merge into a single color, if controls are correct the dot will be white.

(e) Adjust individual magnets on neck of (Figure 2) the tube with convergence control set so that the three dots will form a triangle, with green and red on the same plane and blue below and centered between the green and red.

(f) Set convergence control R-811 so that the three dots will super impose one upon another to form one dot, if one of the dots does not coincide, adjust the magnet for convergence at center of raster.

(g) Adjust vertical and horizontal R727 and R754 convergence controls also vertical convergence shape R730 and horizontal convergence phasing L708 for best convergence at edges of raster, this will have an effect on the center of the raster and it will be necessary to readjust DC convergence control R811 for center. Also readjust focus control R-801 for best focus.

(h) Upon completing the convergence adjustments check color purity. It may be necessary to readjust purity control R816.

(i) Adjust Field Neutralizing control R817 with only red gun on and set for a pure red raster with changing of control it will be noted that color contamination can be seen around edges of raster.

BLACK AND WHITE BALANCE

A Black and White Balance adjustment is to produce a white raster with no large area color contamination in a black and white picture. There should be no change in Black and White Balance when the brightness control is advanced or the picture control increased for a normal picture.

For proper adjustment proceed as follows using Figure 6 (Top) Chassis view:

1. Turn color control (R304) to the off position (CCW)
2. Set picture control (R607) to minimum (CCW)
3. Set brightness control (R416) to maximum (CW)
4. Adjust red, (R417) blue (R418) and green (R419) screen controls (CW) for a bright gray raster.

Information

A. Red, blue and green screen controls are located on the front of the chassis. Remove the brass escutcheon strip secured by two screws found under the front control door.

B. If the red, blue and green screen controls are high (CW), the color will dominate the raster. Other indications are as follows: When the red screen is too low (CCW), the raster will be a greenish blue; if the blue screen is too low (CCW), the raster will be a yellowish white; and if the green screen is too low (CCW), the raster will be purple.

5. With the brightness still at maximum (CW), advance the picture control (R607) (CW) until a picture begins to appear.
6. Adjust the green (R441) and blue (R424) gain controls (CW) until white appears on the high-brightness highlights in the picture.

   Blue (R424) and green (R441) gain controls are found on the top rear of the chassis. (See Figure 6) Check for the stamp marking of the control.

7. With the picture control advanced until a picture appears, turn the brightness control (CCW) down to a reduced value. Adjust the green and blue background controls until equal grays are reached on the picture.

Information

A. Blue and green background controls are located on the front of the chassis under the brass escutcheon strip.

B. The green background control will vary the background from a purple to a green, and the blue background varies it from blue to yellow.

8. After the above procedure is completed, check that the brightness control and picture control may be varied over the normal viewing range without affecting the color of white or gray.

HIGH VOLTAGE REGULATOR ADJUSTMENT

1. Using a high voltage probe with a vacuum tube voltmeter, place the probe on Pin # 7 of the 1B3GT output rectifier. (Figure 6) or at the plate of the 6BD4 with the plate connector moved up, but not disconnected.
2. Adjust the HV control R813 for 20KV output.
3. With the meter connected, adjust brightness control from low level brightness, to a high level brightness. There should be very little change in voltage. If the voltage should vary, adjustment of the HV control is necessary. Maximum change should not exceed 500 – 1000 volts or 5%.

SUB CARRIER ALIGNMENT

Hue Control (T303)

1. Place a jumper lead from Pin # 7 cathode of the Electron Coupled Oscillator 6U8 to ground making the oscillator inoperative.
2. Feed one volt of a 3.58 MC crystal controlled signal into the grid pin # 1 of the Burst Amplifier 6AH6.
3. Connect a High Impedance probe from the scope to the Burst Gain Test Point. (Use a 1 mmf. capacitor to prevent detuning.)
4. Remove the 5U4G, 410 volt rectifier tube in the power supply to eliminate horizontal sweep.
5. Place a jumper lead from the junction of R313-270 OHM resistor and R309-270K resistor to ground. (Cathode circuit of the Burst Amplifier 6AH6.)
6. Adjust T303 for maximum.

PHASE DETECTOR BALANCE (R318)

1. Place a jumper lead from Pin # 7 cathode of the Electron Coupled Oscillator 6U8 to ground making the oscillator inoperative.
2. Feed one volt of a 3.58 MC crystal controlled signal into the grid pin # 1 of the Burst Amplifier 6AH6.

3. Connect a VTVM (Set to zero center 10 volt scale) to the Phase Detector test point Figure 6, and ground side to the Chassis.
4. Remove the 5U4G, 410 volt rectifier tube in the power supply to eliminate horizontal sweep.
5. Place a jumper lead from the junction of R313-270 OHM resistor and R309-270K resistor to ground. (Cathode circuit of the Burst Amplifier 6AH6.)
6. Adjust Phase Detector Balance Control R318 Figure 6 for zero reading. (Check – Rotate full clockwise and counter clockwise for positive and negative readings and then set for zero.

LOCAL OSCILLATOR QUADRATURE TRANSFORMER (T302)

1. Place a jumper lead from Pin # 7 cathode of the Electron Coupled Oscillator 6U8 to ground making the oscillator inoperative.
2. Feed one volt of a 3.58 MC crystal controlled signal to the grid Pin # 2 of the E.C.O. Tube 6U8.
3. Connect a High Impedance probe from the scope to the suppressor grid pin # 7 of the R-Y Demodulator Tube 6AS6.
4. Remove the 5U4G, 410 volt rectifier tube in the power supply to eliminate horizontal sweep.
5. Place a jumper lead from the junction of R313-270 OHM resistor and R309-270K resistor to ground. (Cathode circuit of the Burst Amplifier 6AH6.)
6. Peak the primary (bottom) of T302 for maximum.
7. Move High Impedance probe from the scope to suppressor grid Pin # 7 of the B-Y Demodulator Tube 6AS6.
8. Peak the secondary (TOP) of T302 for maximum.
9. After completing alignment to this point. Remove the following:
   a. Jumper lead from Pin # 7 Cathode of the E.C.O. to 6U8 to ground.
   b. The 3.58 MC crystal controlled signal from grid # 2 of the E.C.O. tube 6U8.
   c. High Impedance probe from the suppressor Grid Pin # 7 of the B-Y Demodulator Tube 6AS6.

LOCAL OSCILLATOR TRANSFORMER (T301)

1. Feed one volt of 3.58 MC crystal controlled signal to the grid pin # 1 of the R-Y Demodulator Tube 6AS6.
2. Connect a jumper lead from the plate pin #5 of the R-Y Demodulator Tube 6AS6 through a .01 MFD capacitor to the high side of the volume control R210.
3. Remove the 5U4G, 410 volt rectifier tube in the power supply to eliminate horizontal sweep.
4. Place a jumper lead from the junction of R313-270 OHM resistor and R309-270K resistor to ground. (Cathode circuit of the Burst Amplifier 6AH6.)
5. Remove the chroma amplifier tube 6BA6.
6. Set Color Hold Control (R325) to mid-range.
7. Adjust T301 (Bottom) Oscillator Transformer Figure 6 for zero beat in the speaker. Check – Rotate Color Hold Control R325 Clockwise and counterclockwise for a high frequency beat. Re-set Color Hold Control R325 for zero beat at mid-range.
8. After completing alignment to this point remove the following:
   a. Remove the jumper lead from the plate pin # 5 of the R-Y Demodulator Tube 6AS6 through a .01 MFD capacitor to the high side of the volume control.
   b. Replace the chroma amplifier Tube 6BA6.

PHASE DETECTOR AC BALANCE C315

1. Place a jumper lead from Pin # 7 cathode of the Electron Coupled Oscillator 6U8 to ground making the oscillator inoperative.
2. Feed one volt of a 3.58 MC crystal controlled signal into the grid pin # 1 of the Burst Amplifier 6AH6.
3. Connect a VTVM (Set zero center 10 volt scale) to the Phase Detector Test Point.
4. Remove the 5U4G, 410 volt rectifier tube in the power supply to eliminate horizontal sweep.
5. Place a jumper lead from the junction of R313-270 OHM resistor and R309-270K resistor to ground. (Cathode circuit of the Burst amplifier 6AH6.)
6. Color Hold Control R305 must remain in its mid-range position.
7. Adjust C315 Figure 6 (Top) for zero reading (If zero reading cannot be obtained, set for minimum.)

3.58 MC TRAP (C608)

1. Place a jumper lead from Pin # 7 cathode of the Electron Coupled Oscillator 6U8 to ground making the oscillator inoperative.
2. Feed a video sweep signal (0 to 5MC sweep width) into the video test point and the ground side to the chassis.

3. Connect the diode probe Figure 8 from the scope to the Red Test Point.
4. Remove the 5U4G, 410 volt rectifier tube in the power supply to eliminate horizontal sweep.
5. Place a jumper lead from the junction of R313-270 OHM resistor and R309-270K resistor to ground. (Cathode circuit of the Burst Amplifier 6AH6.)
6. Loosely couple a marker generator output to the vertical amplifier of the scope. Set marker generator at the prescribed frequencies. See Figure 9F with the output attenuated until the marker pips are barely visible on the curve.
7. Adjust variable capacitor C608 for minimum 3.58 MC signal as shown on the curve in Figure 9F.

B-Y GAIN (R340), G-Y GAIN (R351) AND G-Y MATRIX R348 ADJUSTMENTS

1. Set the channel selector to an unused channel.
2. Feed approximately 1 volt of 100 KC signal from the signal generator into the video test point. Figure 6.
3. Remove the Chroma Amplifier Tube 6BA6.
4. Connect scope lead to the Red Test Point. Figure 6.
5. Adjust picture control R607 for 1 volt peak to peak indicated on the scope. ***DO NOT MOVE AFTER SETTING.***
6. Replace the Chroma Amplifier tube 6BA6 and remove the line driver tube 6BK5.
7. Feed approximately one volt of 3.4 MC signal from the signal generator to the Video Test Point.
8. Set Color Control R304 for 1.2 volts peak to peak indicated on the scope. ***DO NOT MOVE AFTER SETTING.***
9. Remove scope lead from the Red Test Point and connect to the Blue Test Point.
10. Adjust B-Y Gain Control R340 for 1.4 volts peak to peak indicated on the scope.
11. Remove the B-Y demodulator tube 6AS6.
12. Remove the scope lead from the Blue Test Point and connect to the Green Test Point.
13. Adjust G-Y Gain Control R351 for .6 volt peak to peak indicated on the scope.
14. Replace the B-Y demodulator tube 6AS6 and remove the R-Y demodulator tube 6AS6.
15. Adjust G-Y matrix control R348 for .4 volts peak to peak indicated on the scope.
16. Replace all tubes.

The above method is not used when a color bar signal is available.

CHROMINANCE ALIGNMENT

Chroma Alignment Data

The procedure for chroma alignment is as follows:

1. Remove the 5U4 410 Volt Rectifier Tube.

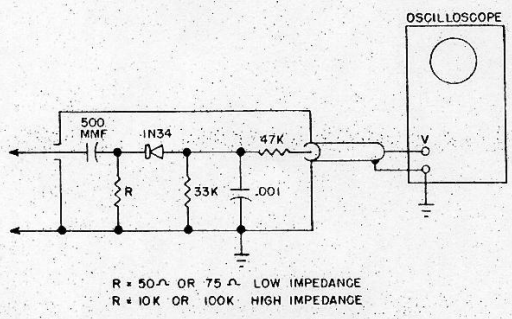


FIGURE 8 DETECTOR PROBE

2. Video and Chroma Amplifiers Alignment.
   - A. Feed video sweep generator to grid of 1st video amplifier.
   - B. Place detector probe on line driver grid. (See Figure 8)
   - C. Set contrast control at maximum. (Step D. used only on late production receivers.)
   - D. Short out sound trap in 1st video amplifier cathode (center tap of coil to R601.)
   - E. Tune L600 for a peak at 4.3 Mc.
   - F. Place detector probe on chroma grid.
   - G. Tune L300 for response shown in Figure 9B.
   - H. Feed video sweep to chroma grid.
   - I. Place detector probe on demodulator grid.
   - J. Tune T300 for response shown in Figure 9C.
   - K. Feed video sweep to 1st video amplifier grid.
   - L. Place detector probe on demodulator grid.
   - M. Response is shown in Figure 9C.

(Steps N, O, P, Q – used only on late production receivers.)

N. Remove short from trap coil.

O. Feed a 4.5 Mc signal to grid of 1st video amplifier.

P. Place a VTVM with crystal probe on grid of line driver amplifier.

Q. Tune L605 for sharp null shown in Figure 9D.

3. Overall Chrominance Alignment.

   A. Use Test equipment set up as shown in Figure 11.

   B. Response curve should be as shown in Figure 9E.

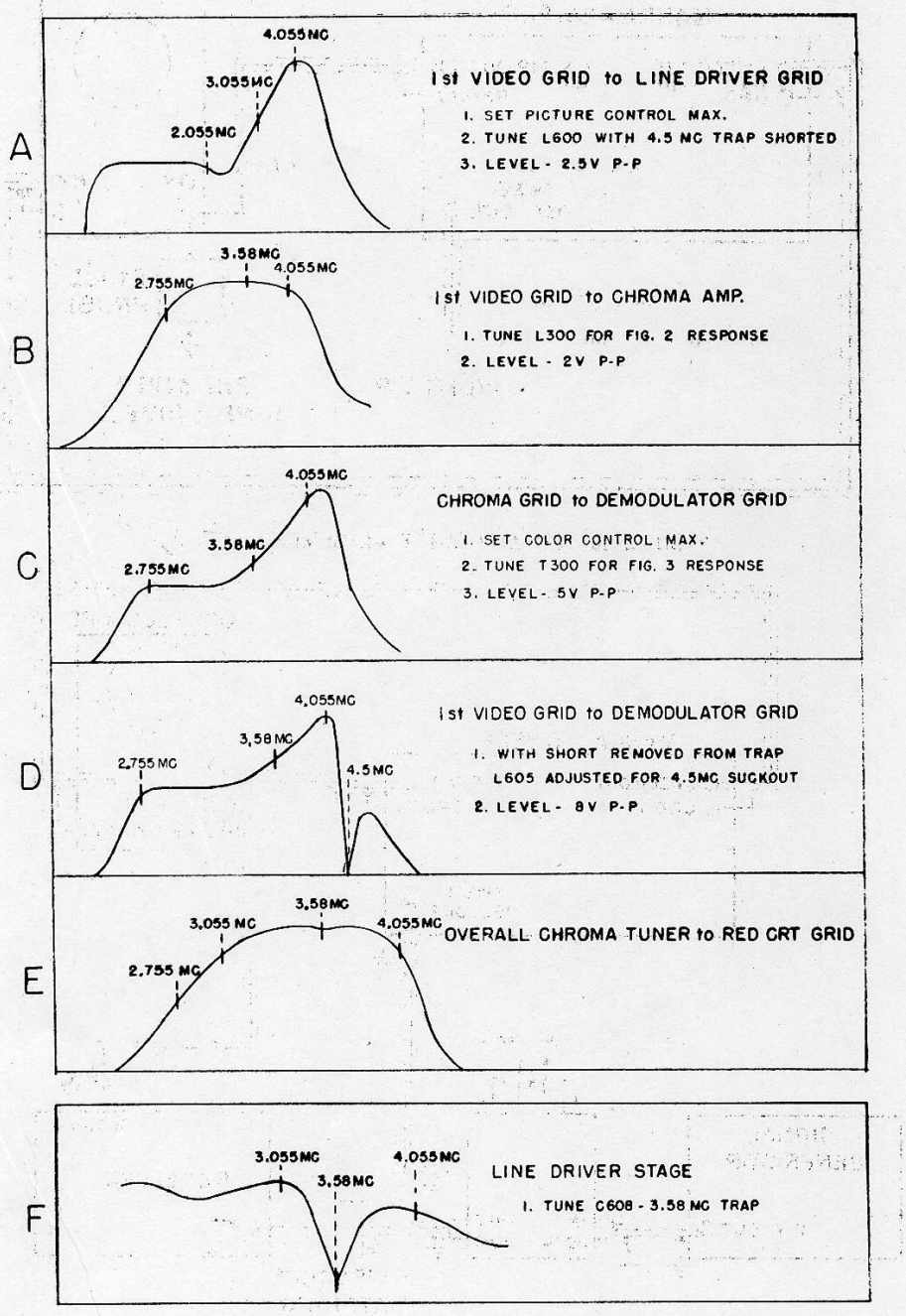


FIGURE 9 CHROMINANCE RESPONSE CURVES

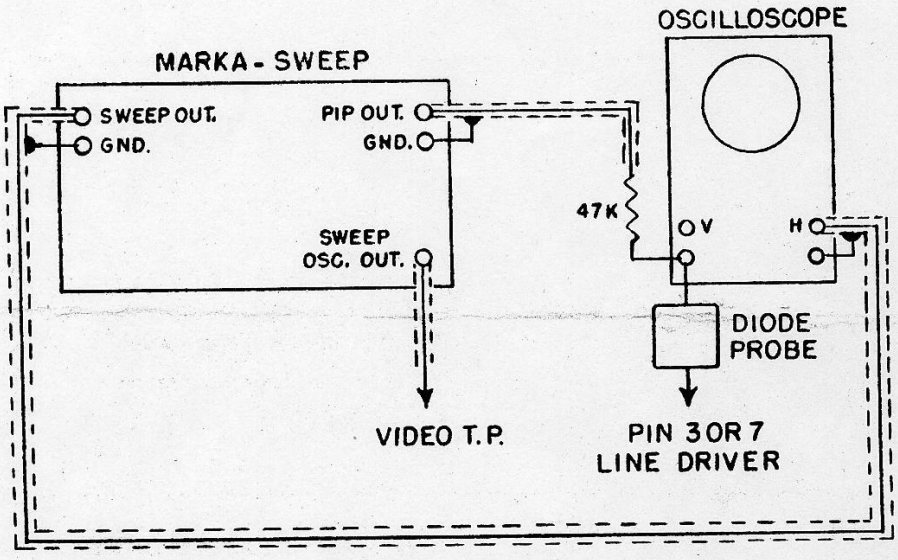


FIGURE 10 CHROMINANCE ALIGNMENT SETUP

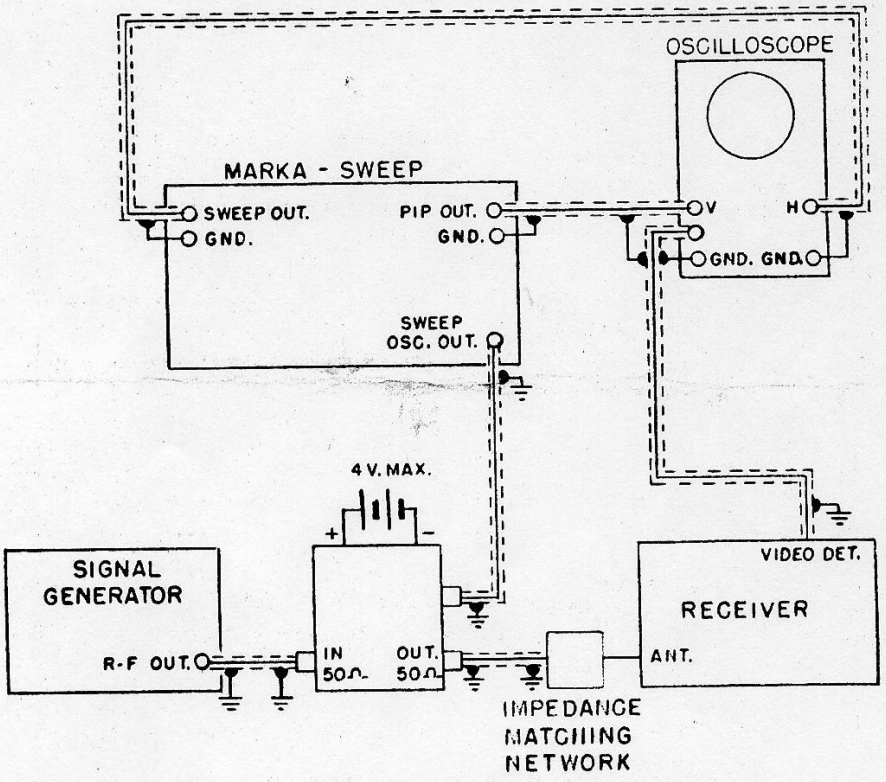


FIGURE 11 OVERALL BANDPASS RESPONSE SETUP

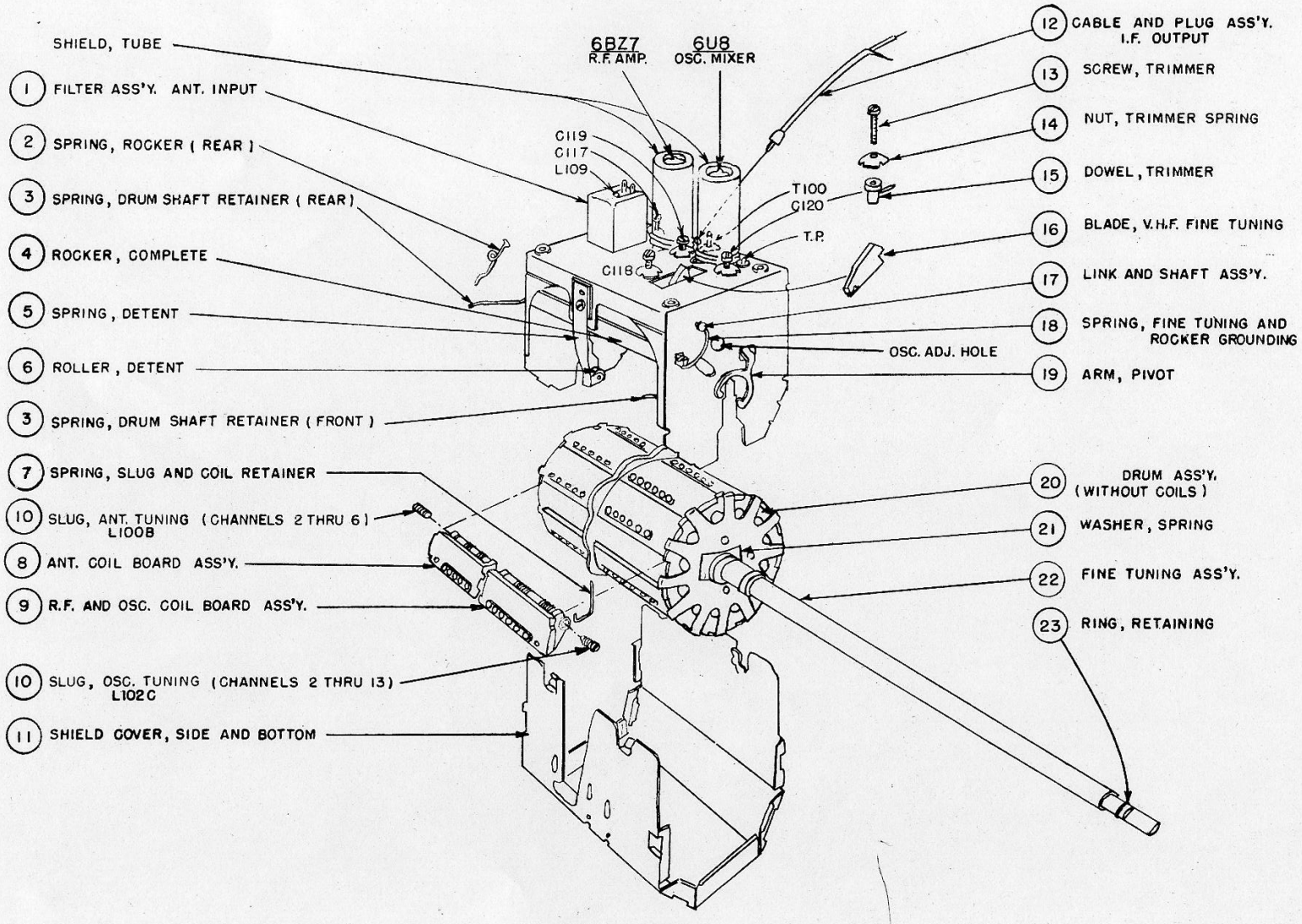
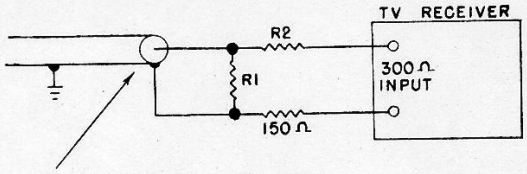


FIGURE 12 V-14190-1 TUNER EXPLODED VIEW

RF TUNER INFORMATION

Replacement of Coil Strips

When replacing tuner strips in the V-2284-15 chassis follow the procedure as covered below.



ZO	R1	R2
50Ω	56Ω	120Ω
72Ω	82Ω	110Ω

FIGURE 13 IMPEDANCE MATCHING

1. Remove the channel selector and fine tuning knobs.
2. Remove the back cover assembly.
3. With a small screw driver lift off the bottom cover shield of the RF tuner.
4. Remove RF tuner tubes and tube shields.
5. With ¼" spintite remove four screws which mount the RF tuner to the mounting plate. See Figure 6 (top view)
6. Rotate the RF tuner (CCW) so that tuner coil strips in the tuner drum are up and in position to be removed. Carefully insert a thin screw driver between the retainer spring on the tuner drum and the appropriate coil strip. Twist blade away from the turret and raise the end of the coil. Do this for the other section of the coil strip.

   DO NOT PLACE ANY PRESSURE ON THE TUNER BECAUSE IT IS TEMPORARILY HANGING IN POSITION.
7. Replace the appropriate coil strips and restore RF tuner assembly to its original status.
8. Replace the removed parts and check operating condition of the replaced coil strips. If best sound and picture detail is not received, proceed with oscillator alignment.

ELECTRICAL PARTS V-14190-1 TUNER ASSY.

Ref. No.	Part No.	Description	List Price Each
C106	V-8659	Capacitor, 3 mmf. NPO	$.30
C107	V-8661	Capacitor, 47 mmf. NPO	.30
C108	V-8755	Capacitor, 47 mmf.	*
C112	V-8746	Capacitor, 10 mmf.	*
†C114	V-8758	Capacitor, 68 mmf. 10%	*
C115	V-8662	Capacitor, 1,000 mmf. GMV	.25
†C117	V-8667	3 to 9 mmf. trimmer	*
C118, C119, C120	Trimmer Capacitors C118, C119 and C120 are not stocked as complete assemblies, but may be obtained by ordering mechanical part items 13, 14, and 15. (See Mechanical Parts List and Fig. 12)		
C123	V-8748	Capacitor, 220 mmf. ± 10%	*
C124	V-8749	Capacitor, 1.5 mmf. NPO	*
C125	V-8756	Capacitor, 5 mmf.	*
C126	V-8662	Capacitor, 1000 mmf. GMV	.25
L101	V-8757	Choke, heater	*
R100	RC20AE223K	Resistor, 22,000 ohms ½W. ± 10%	.06
R102	RC20AE473K	Resistor, 47,000 ohms ½W. ± 10%	.05
R103	RC20AE824K	Resistor, 820,000 ohms ½W. ± 10%	*
R104	RC20AE474K	Resistor, 470,000 ohms ½W. ± 10%	.05
R105	RC30AE152K	Resistor, 1,500 ohms 1 W. ± 10%	.09
R106	RC20AE104K	Resistor, 100,000 ohms ½W. ± 10%	.05
R107	RC20AE104K	Resistor, 100,000 ohms ½W. ± 10%	.05
R108	RC20AE103K	Resistor, 10,000 ohms ½W. ± 10%	.05
R110	RC30AE332K	Resistor, 3,300 ohms 1W. ± 10%	.09
R111	RC20AE822K	Resistor, 8,200 ohms ½W. ± 10%	.05
R112	RC20AE153K	Resistor, 15,000 ohms ½W. ± 10%	.05
R113	RC20AE104K	Resistor, 100,000 ohms ½W. ± 10%	.05
†T100	V-8759	IF coil assy., 44 mc. output	*
Z100	V-8751	Filter Assy., Antenna Input (includes L109)	*

MECHANICAL PARTS FOR V-14190-1 TUNER

Ref. No. On Illus.	Part No.	Description	List Price Each
2	V-8731	Spring, rocker arm (rear)	*
3	V-8732	Spring, drum shaft retaining (front and rear)	*
4	V-8733	Rocker, complete with contacts	*
5	V-8677	Spring, detent	.20
6	V-8678	Roller, detent	.20
7	V-8679	Spring, oscillator slug and coil retainer	.10
† 8	V-14196 (2 through 13)	Antenna – RF Coil strip	*
† 9	V-14197 (2 through 13)	Mixer-osc. coil strip	*
†	V-14195 (14 through 83)	VHF Strip (includes antenna and oscillator section)	9.95
10	V-8680	Slug, oscillator tuning	.10
11	V-8734	Shield Cover, side and bottom	*
12	V-14259-1	Cable and plug assy., IF output	*
13	V-8735	Screw, trimmer	*
14	V-8736	Nut, trimmer spring	*
15	V-8737	Dowel, trimmer	*
16	V-8738	Blade, VHF fine tuning	*
17	V-8739	Link and shaft assy. (associated with the fine tuning blade)	*
18	V-8740	Spring, (fine tuning and rocker arm ground)	*
19	V-8741	Arm, pivot	*
†20	V-8761	Drum Assy., (without coil strips)	*
21	V-8743	Washer, spring	*
†22	V-8762	Fine Tuning Assy.	*
23	V-8745	Ring, shaft retainer	*
	V-8753	Terminal board assy., power (not shown)	
	V-8754	Shield tube, 6U8 and 6BZ7.	

NOTE: *The dash number following the basic part number for coil strips indicate the channel numbers, ie., the part number for channel 2 Antenna – RF Coil Strip would be V-14196-2.*

† *New part number listed for the first time in Westinghouse Television-Radio service information.*

* *Price furnished on request.*

NOTE: *All prices are subject to change without notice.*

REPLACEMENT PART INFORMATION

The following list of items are not carried as replacement parts:

A. Tube socket, 6U8 or 6BZ7
B. Board assembly, contact
C. Shield and feed through capacitor assy. (Located in the center of the tuner.)
D. IF output receptacle.

V-2284-15 CHASSIS PARTS

Miscellaneous

Part No.	Description	List Price Each
†V-12789-1	Bracket assy., convergence control	***
†V-12786-1	Bracket assy., focus control	***
†V-12791-1	Bracket assy., (mounts C813 and C814)	***

MECHANICAL PARTS FOR V-14190-1 TUNER (Continued)

Ref. No.	Part No.	Description	Function	List Price Each
†	V-14626-1	Cable and plug assy., male 9 pin (heaters)		***
†	V-12946-1	Cable and socket assy., female 7 pin (yoke)		3.00
†	V-14255-1	Cable and socket assy., female 7 pin (LV power)		1.50
†	V-14400-1	Cap and lead assy., (1AX2)		.40
†	V-14401-2	Cap and lead assy., (6BQ6, 1B3GT)		.40
	V-14259-2	Cable and plug assy., IF input		***
	V-5426	Clip, IF mounting		.03
†	V-14129-2	Clamp, (mount bottom front plate glass)		.90
†	V-14539-1	Connector assy., HV (includes connector and HV anode contact)		***
	V-11966-1	Holder, fuse		.20
	#47	Lamp, pilot		.11
†	V-12973-2	Lead, HV (mounted on the HV assy.)		.95
†	V-14098-2	Locknut, (used to secure the magnetic screw to the shield assy.)		***
	V-5549	Plug, AC power		.30
†	V-14105-1	Plug, 3 prong (used with the color purity and Field neutralizing coils		***
†	V-14254-1	Plug, shielded 7 pin (yoke)		***
†	V-14054-1	Plug, 7 pin male (power supply chassis V-2282-1)		.30
†	V-12835-1	Ring, insulating (CRT lip ring)		5.75
†	V-14095-1	Screw, magnetic (convergence)		1.10
†	V-12781-1	Shaft, extension, focus control		2.70
†	V-12781-2	Shaft, extension, convergence control		2.75
†	V-12782-2	Shaft, 13" (picture control)		2.75
†	V-14325-1	Shaft assy., flexible, hue control		***
†	V-14250-1	Shaft, extension, picture control		.40
	V-6648	Shield, pilot lamp		.05
	V-10038-1	Shield, miniature, (6CB6, 6AH6, 6AU6, 6AS6, and 6AL5)		.06
	V-10038-2	Shield, miniature, (6U8)		.10
	V-10038-3	Shield, miniature, (6BN6)		.10
†	V-14087-1	Shield and nut assy., (less purity coil, locknuts and magnetic screw)		***
	V-10905-2	Socket, pilot lamp		.35
	V-11697-1	Socket, 3 prong, includes retaining ring (Purity or Field neutralizing coils)		.23
†	V-12957-1	Socket assy., female, 20 pin CRT		11.75
†	V-8729	Socket assy., focus rectifier (Assy. consists of C801, R800 and R803)		***
†	V-14268-1	Socket, miniature molded (1AX2)		.20
	V-11097-2	Socket assy., HV		.60
	V-9888-3	Socket, miniature wafer (6AH6, 6AL5, 6AS6, 6AU6 and 6CB6)		.14
	V-9889-2	Socket, miniature wafer (6U8, 6BC7, 6BK7, 12BY7 and 12AT7)		.12
	V-10958-2	Socket, miniature wafer (12AU7 and 6BK5)		.20
	V-4195-1	Socket, molded octal (6BL7GT, 6AH4GT, 6AX4GT and heater socket LV power)		.14
	V-4514-1	Socket, molded octal (5U4G, 6BD4 and 6BG6)		.17
†	V-14383-2	Spring, grounding (used in metal CRT shell)		***
†	V-12820-2	Strap assy., CRT		***
	V-5406	Switch, DPDT (Red, Blue and Green gun)		.34
	V-11344-1	Terminal board, VHF antenna		.16

SECTION 1 – RF

Part No.	Description	List Price Each
V-14190-1	RF Tuner, assembly	$49.50

SECTION 2 – SOUND

Ref. No.	Part No.	Description	Function	List Price Each
†C200	R1CC22S2L220K	Capacitor, 22 mmf.	Sound take-off	$ .15
C201	RCM20B151K	Capacitor, 150 mmf.	4.5 mc. tank	.20
C202	RCM20B151K	Capacitor, 150 mmf.	4.5 mc. plate tank	.20
C203	V-5596-1	Capacitor, .005 mfd.	Screen bypass	.25
C204	RCM20B470K	Capacitor, 47 mmf.	IF coupling	.22
C205	V-5596-1	Capacitor, .005 mfd.	Cathode bypass	.25
C206	RCM20B 47OK	Capacitor, 47 mmf.	4.5 mc. plate tank	.22
C207	R2CC63Y5Y202M	Capacitor, .002 mfd. 600v.	Screen bypass	.25
C208	RCM20B470K	Capacitor, 47 mmf.	IF coupling	.22
C209	V-9044-1	Capacitor, dual, .005 mfd. – .005 mfd.	Cathode and screen bypass	.39
C210	R2CC62Y5Y152M	Capacitor, 1,500 mmf. 600v.	Plate bypass	.20
C211	RCP10M4203K	Capacitor, .02 mfd. 400v.	Audio coupling	.25
C212	R2CC63Y5Y202M	Capacitor, .002 mfd. 600v.	Tone compensation	.25
†C213A	V-14212-1	Capacitor, elec. 20 mfd. 25v. (assy. consists of C213A, C312A, C421A, and C818A)	Cathode bypass	4.15*
C214	RCP10M6502M	Capacitor, .005 mfd. 600v.	Tone compensation	.20
†C215B	V-14216-1	Capacitor, elec. 30 mfd. 450v. (assy. consists of C215B, C722B, C725B and C739B)	Filter	4.25*
L200	V-9882-5	Reactor, IF	1st sound IF grid	.60
L201	V-9882-5	Reactor, IF	1st sound IF plate	.60
L202	V-9882-2	Reactor, IF	2nd sound IF plate	.70
L203	V-9915-2	Reactor, 350 microhenries	6BN6 grid	.30
L204	V-11396-	Coil, quadrature	FM detector	1.60
R200	RC20AE680K	Resistor, 68 ohms ½w.	Cathode bias	.04
R201	RC30AE122K	Resistor, 1,200 ohms 1w.	Screen dropping	.10
R202	RC20AE273K	Resistor, 27,000 ohms ½w.	Grid return	.06
R203	RC20AE121K	Resistor, 120 ohms ½w.	Cathode bias	.06
R204	RC30AE273K	Resistor, 27,000 ohms 1w.	Screen dropping	.09
R205	V-11345-2	Resistor, 500 ohms adjustable	Quieting control	1.40
R206	RC40AE273K	Resistor, 27,000 ohms 2w.	Screen dropping	.22
R207	RC20AE471K	Resistor, 470 ohms ½w.	Plate linearity	.06
R208	RC20AE224K	Resistor, 220,000 ohms ½w.	Plate load	.05
†R209	V-12954-1	Control, 1 megohm (assy. consists of R209, R210 and SW800)	Tone	2.35*
†R210	V-12954-1	Control, 500,000 ohms (assy. consists of R209, R210, and SW800)	Volume	2.35*
R211	RC20AE151K	Resistor, 150 ohms ½w.	Suppressor	.05
R212	RC20AE181K	Resistor, 180 ohms ½w.	Cathode bias	.10
R213	RC20AE102K	Resistor, 1,000 ohms ½w.	Screen dropping	.05
†R214	V-11328-13	Resistor, 750 ohms 10w.	Decoupling	.95
R215	RC20AE103K	Resistor, 10,000 ohms	Voltage divider	.05
T200	V-9238-1	Transformer	Audio	1.90

SECTION 3 – CHROMINANCE

Ref. No.	Part No.	Description	Function	List Price Each
C300	RCP10M4503K	Capacitor, .05 mfd. 400v.	Blanking bias network	$ .25
C301	RCM20B470K	Capacitor, 47 mmf.	Chroma bandpass	.22
†C302	R1CC22S2L220K	Capacitor, 22 mmf.	Chroma bandpass	.15
†C303D	V-14213-1	Capacitor, elec. 40 mfd. 150v. (assy. consists of C303D, C402D, C411D and C417D)	Cathode bypass	2.80*

Ref. No.	Part No.	Description	Function	List Price Each
C304	V-9863-3	Capacitor, .01 mfd.	Cathode bypass	.22
C305	RCP10M6103M	Capacitor, .01 mfd. 600v.	Chroma blanking coupling	.21
C306	RCP10M4104M	Capacitor, .1 mfd. 400v.	Bypass	.25
C307	RCM20B470K	Capacitor, 47 mmf.	Chroma bandpass	.22
C308	RCM20B470K	Capacitor, 47 mmf.	Chroma bandpass	.22
C309	V-4637	Capacitor, elec. 4 mfd. 50v.	Cathode bypass	.85
C310	V-9044-1	Capacitor, dual, .005 mfd. – .005 mfd.	Cathode and screen bypass	.39
C311	V-5596-1	Capacitor, .005 mfd.	Screen bypass	.25
†C312A	V-14212-1	Capacitor, elec., 30 mfd. 450v. (assy consists of C213A, C312A, C421A and C818A)	Screen bypass	4.15*
†C313	RCM30C332K	Capacitor, 3,300 mmf.	Coupling	1.10
†C314	RCM30C332K	Capacitor, 3,300 mmf.	Coupling	1.10
†C315	V-12961-1	Capacitor, variable, 1-3.5 mmf.	AC balance	1.20
†C316	R1CC33C0G101J	Capacitor, 100 mmf.	Oscillator feedback coupling	.35
C317	V-5596-1	Capacitor, .005 mfd.	Bypass	.25
C318	V-4637	Capacitor, elec. 4 mfd. 50v.	Filter	.85
†C319	R1CC2C0G100F	Capacitor, 10 mmf.	Reactance tube grid	.15
†C320	R1CC22C0H409D	Capacitor, 4 mmf.	Reactance tube plate	.30
C321	V-9863-1	Capacitor, .01 mfd.	Cathode bypass	.20
C322	RCP10W4104M	Capacitor, .1 mfd. 400v.	Cathode bypass	.24
†C323	R1CC31C0G470K	Capacitor, 47 mmf.	Coupling	.15
†C324	R1CC22U2H330J	Capacitor, 33 mmf.	Oscillator tank	***
†C325	R2CC61Z5Z102P	Capacitor, .001 mfd. 600v.	B†bypass	.15
†C326	R1CC35C0G151J	Capacitor, 150 mmf.	3.58 mc. tank	.60
C327	V-9863-3	Capacitor, .01 mfd.	Color killer grid	.22
C328	V-5596-1	Capacitor, .005 mfd.	Screen bypass	.25
†C329	R1CC33C0G101J	Capacitor, 100 mmf.	ECO coupling	.35
†C330	R1CC33C0G101J	Capacitor, 100 mmf.	3.58 mc. tank	.35
†C331	R1CC33C0G101J	Capacitor, 100 mmf.	3.58 mc. tank	.35
C332	V-5596-1	Capacitor, .005 mfd.	Screen bypass	.25
†C333	R1CC22S2L220K	Capacitor, 22 mmf.	3.58 mc. trap	.15
C334	V-10293-1	Capacitor, elec., 10 mfd. 450v.	R-Y coupling	1.25
C335	V-4885	Capacitor, elec., 4 mfd. 450v.	Decoupling	1.05
C336	V-4636	Capacitor, elec. 50 mfd. 25v.	Cathode bypass	.95
C337	V-9863-3	Capacitor, .01 mfd.	Cathode bypass	.22
C338	V-5596-1	Capacitor, .005 mfd.	Screen bypass	.25
†C339	R1CC22S2L220K	Capacitor, 22 mmf.	3.58 mc. trap	.15
C340	V-10293-1	Capacitor, elec., 10 mfd. 450v.	B-Y coupling	1.25
†C341C	V14214-1	Capacitor, elec., 10 mfd. 450v. (assy. consists of C341C, C601C, C604C and C609C)	Decoupling	4.25*
C342	V-4885	Capacitor, elec., 4 mfd.	G-Y coupling	1.05
†L300	V-14056-2	Reactor, 47 microhenries	3.58 mc. bandpass	.80
†L302	V-12962-1	Reactor, 500 microhenries	RF choke	.60
†L303	V-12962-1	Reactor, 500 microhenries	RF choke	.60
†L304	V-14056-4	Reactor, slug tuned, 1.8 to 2.8 microhenries	R-Y bandpass	.90
†L305	V-9883-3	Reactor	3.58 mc. trap	.70
†L306	V-14056-4	Reactor, slug tuned, 1.8 to 2.8 microhenries	B-Y bandpass	.90
L307	V-9883-3	Reactor	3.58 mc. trap	.70
†L308	V-12962-1	Reactor, 500 microhenries	ECO plate	.60

SECTION 3 – CHROMINANCE (Continued)

Ref. No.	Part No.	Description	Function	List Price Each
R300	RC20AE273K	Resistor, 27,000 ohms ½w.	Blanking bias network	.06
R301	RC20AE102K	Resistor, 1,000 ohms ½w.	Grid Load	.05
R302	RC20AE101K	Resistor, 100 ohms ½w.	Cathode bias	.05
R303	RC20AE683K	Resistor, 68,000 ohms ½w.	Cathode bias	.05
†R304	V-12952-1	Control, 10,000 ohms (includes SW300)	Color	1.15*
R305	RC30AE563K	Resistor, 56,000 ohms 1w.	Blanking network	.10
R306	RC30AE333K	Resistor, 33,000 ohms 1w.	Screen dropping	.09
R307	RC20AE332K	Resistor, 3,300 ohms ½w.	Screen decoupling	.05
R308	RC30AE224K	Resistor, 220,000 ohms 1w.	Voltage divider	.10
†R309	RC30AE274K	Resistor, 270,000 ohms 1w.	Voltage divider	.10
R310	RC20AE152K	Resistor, 1,500 ohms ½w.	Damping	.05
R311	RC20AE101K	Resistor, 100 ohms ½w.	Suppressor	.05
R312	RC20AE273K	Resistor, 27,000 ohms ½w.	Grid Load	.06
†R313	RC20AE271K	Resistor, 270 ohms ½w.	Cathode bias	.10
R314	RC20AE103K	Resistor, 10,000 ohms ½w.	Cathode bias	.05
R315	RC20AE682K	Resistor, 6,800 ohms ½w.	Screen dropping	.05
R316	RC20AE222K	Resistor, 2,200 ohms ½w.	Decoupling	.05
R317	RC20AE474K	Resistor, 470,000 ohms ½w.	Phase detector load	.05
†R318	V-12951-7	Control, 200,000 ohms	Phase detector balance	.75
R319	RC20AE474K	Resistor, 470,000 ohms ½w.	Phase detector load	.05
R320	RC20AE104K	Resistor, 1000,000 ohms ½w.	Phase detector balance	.05
R321	RC20AE561K	Resistor, 560 ohms ½w.	Reactance tube grid	.04
R322	RC20AE472K	Resistor, 4,700 ohms ½w.	Phase detector T.P.	.05
†R323	RC20AE271K	Resistor, 270 ohms ½w.	Cathode bias	.10
R324	RC20AE392K	Resistor, 3,900 ohms ½w.	Cathode bias	.04
†R325	V-12953-1	Control, 2,500 ohms	Color hold	.85
R326	RC20AE473K	Resistor, 47,000 ohms ½w.	Grid Return	.05
R327	RC20AE154K	Resistor, 150,000 ohms ½w.	B+ dropping	.07
R328	RC20AE475K	Resistor, 4.7 megohms ½w.	Voltage divider	.05
R329	RC20AE107M	Resistor, 100 megohms ½w.	Voltage divider	.10
R330	RC30AE473K	Resistor, 47,000 ohms 1w.	Screen dropping	.09
R331	RC40AE393K	Resistor, 39,000 ohms 2w.	Plate load	.20
R332	RC20AE151K	Resistor, 150 ohms ½w.	Cathode bias	.05
R333	RC20AE221K	Resistor, 220 ohms ½w.	Screen decoupling	.05
R334	RC20AE103K	Resistor, 10,000 ohms ½w.	Plate load	.05
R335	RC20AE153K	Resistor, 15,000 ohms ½w.	Signal divider	.05
R336	RC20AE333K	Resistor, 33,000 ohms ½w.	Matrix network	.05
R337	RC20AE562K	Resistor, 5,600 ohms ½w.	Signal divider	.06
R338	RC20AE153K	Resistor, 15,000 ohms ½w.	G-Y grid	.05
R339	RC20AE470K	Resistor, 47 ohms ½w.	Cathode bias	.05
†R340	V-12951-6	Control, 500 ohms	B-Y gain	.75
R341	RC20AE221K	Resistor, 220 ohms ½w.	Decoupling	.05
R342	RC20AE103K	Resistor, 10,000 ohms ½w.	Plate load	.05
R343	RC40AE183K	Resistor, 18,000 ohms 2w.	B+ dropping	.18
R344	RC40AE183K	Resistor, 18,000 ohms 2w.	B+ dropping	.18
R345	RC20AE153K	Resistor, 15,000 ohms ½w.	Signal divider	.05
R346	RC20AE153K	Resistor, 15,000 ohms ½w.	Matrix network	.05
R347	RC20AE472K	Resistor, 4,700 ohms ½w.	G-Y grid	.05
†R348	V-12951-8	Control, 10,000 ohms	G-Y matrix	.75
R349	RC20AE472K	Resistor, 4,700 ohms ½w.	G-Y Grid	.05
R350	RC20AE222K	Resistor, 2,200 ohms ½w.	Cathode bias	.05
R351	V-6463	Control, 5,000 ohms	G-Y gain	.76

SECTION 5 – IF (Continued

Ref. No.	Part No.	Description	Function	List Price Each
†C531	R1CC32COG680K	Capacitor, 68 mmf.	Sound trap	.15
†L500	V-14061-3	Coil, slug tuned	Adj. picture trap	.75
†L501	V-14061-3	Coil, slug tuned	Adj. sound trap	.75
†L502	V-14061-4	Coil, slug tuned	41.25 mc. sound trap	.70
L503	V-4886-2	Coil, 1.1 microhenries (included in T504)	RF choke	.38
†L504	V-14061-3	Coil, slug tuned	41.25 mc. sound trap	.75
†L505	V-14061-6	Coil, slug tuned	44 mc. bandpass	.75
†L506	V-14061-3	Coil, slug tuned	41.25 mc. sound trap	.75
L507	V-4886-1	Coil, 14 microhenries	RF choke	.55
L508	V-9915-1	Coil, 100 microhenries	Video peaking	.30
L509	V-4886-1	Coil, 14 microhenries	Sync. decoupler	.55
	V-10916-1	Crystal, (included in T504)	Sound detector	1.20
	V-10916-1	Crystal, (included in Z500)	Video detector	1.20
†R500	V-9927-17	Resistor, 470 ohms ½w.	Bandpass damper	.15
R501	RC40AE682K	Resistor, 6800 ohms 2w.	B† dropping	.18
†R502	V-12951-6	Control, 500 ohms	Sound level	***
R503	RC20AE102K	Resistor, 1,000 ohms ½w.	AGC decoupling	.05
R504	RC20AE274K	Resistor, 270,000 ohms ½w.	AGC divider	.06
R505	RC40AE682K	Resistor, 6,800 ohms 2w.	B† dropping	.18
R506	RC40AE183K	Resistor, 18,000 ohms 2w.	B† dropping	.18
R507	RC20AE186K	Resistor, 18 megohms ½w.	AGC divider	.18
R508	RC20AE125K	Resistor, 1.2 megohms ½w.	AGC divider	.10
R509	V-9813-2	Control, 1 megohms	AGC	.65
R510	RC20AE560K	Resistor, 56 ohms ½w.	Cathode bias	.06
R511	RC20AE471K	Resistor, 470 ohms ½w.	Decoupling	.06
R512	V-9927-5	Resistor, 3,000 ohms ½w.	Damping	.11
R513	RC20AE472K	Resistor, 4,700 ohms ½w.	Decoupling	.05
R514	RC20AE104K	Resistor, 100,000 ohms ½w.	AGC divider	.05
R515	RC20AE560K	Resistor, 56 ohms ½w.	Cathode bias	.06
R516	RC20AE471K	Resistor, 470 ohms ½w.	Decoupling	.06
R517	V-9927-5	Resistor, 3,000 ohms ½w.	Damping	.11
R518	RC20AE151K	Resistor, 150 ohms ½w.	Cathode bias	.05
R519	RC20AE471K	Resistor, 470 ohms ½w.	Decoupling	.06
R520	V-9927-5	Resistor, 3,000 ohms ½w.	Damping	.11
R521	RC20AE181K	Resistor, 180 ohms ½w.	Cathode bias	.10
R522	RC20AE123K	Resistor, 12,000 ohms ½w.	Screen dropping	.05
R523	RC20AE471K	Resistor, 470 ohms ½w.	Decoupling	.06
R524	RC40AE103K	Resistor, 10,000 ohms 2w.	Screen dropping	.18
R525	RC20AE224K	Resistor, 220,000 ohms ½w.	Detector filter	.05
†R526	V-9927-13	Resistor, 4,300 ohms ½w.	Bandpass damper	.15
R527	RC20AE221K	Resistor, 220 ohms ½w.	Isolation	.05
R528	RC20AE103K	Resistor, 10,000 ohms ½w.	Sync take-off	.05
†T500	V-14319-1	Transformer	IF input	4.85
T501	V-9879-1	Transformer	1st IF	1.30
T502	V-9879-1	Transformer	2nd IF	1.30
T503	V-9879-1	Transformer	3rd IF	1.30
†T504	V-14066-1	Transformer assy. (assy. consists of C522, C523, L503, R525 and crystal)	4th IF	4.75
†Z500	V-12846-1	Coil assy. (assy. consists of C524, C525, C526, C527, C528, L504, L505, L506, L507, R526, and crystal.	Video detector	***

SECTION 6 – VIDEO AMP.

Ref. No.	Part No.	Description	Function	List Price Each
C600	R2CC63Y5Y202M	Capacitor, .002 mfd. 600v.	Cathode bypass	$ .25
†C601C	V-14214-1	Capacitor, elec. 10 mfd. 450v. (assy. consists of C341C, C601C, C604C, and C609C)	Screen bypass	4.25*
†C602	R1CC2252L220K	Capacitor, 22 mmf.	Sync burst takeoff	.15
†C603	R2CC61Z5Z102P	Capacitor, .001 mfd. 600v.	Video coupling	.15
†C604C	V-14214-1	Capacitor, elec. 40 mfd. 450v.(assy. consists of C314C, C601C, C604C and C609C)	B† bypass	4.25*
C605	V-6570-1	Capacitor, elec. 30 mfd. 450v.	Video coupling	1.65
†C606	R1CC22S2L680K	Capacitor, 68 mmf.	Chroma takeoff	.15
†C607	RCM20B102K	Capacitor, 1000 mmf.	3.58 mc. trap	.45
†C608	V-11228-3	Capacitor, variable 100-580 mmf.	3.58 mc. trap	.35
†C609C	V-14214-1	Capacitor, elec., 10 mfd. 450v. (assy. consists of C314C, C601C, C604C and C609C)	Screen bypass	4.25*
C610	V-6570-1	Capacitor, elec., 30 mfd. 450v.	Video coupling	1.65
†L600	V-14056-1	Coil, slug tuned	3.58 mc. bandpass	.80
†L601	V-14025-1	Coil	3.58 mc. trap	1.20
L602	V-9915-1	Coil, 100 microhenries	Peaking	.30
†L603	V-15540-1	Delay line assy.	Delay line	***
L604	V-9915-1	Coil, 100 microhenries	Peaking	.30
R600	RC20AE332K	Resistor, 3,300 ohms ½w.	Grid return	.05
R601	RC20AE560K	Resistor, 56 ohms ½w.	Cathode bias	.06
R602	RC30AE333K	Resistor, 33,000 ohms 1w.	Screen dropping	.09
R603	RC40AE103K	Resistor, 10,000 ohms 2w.	Plate load	.18
R604	RC40AE103K	Resistor, 10,000 ohms 2w.	Plate load	.18
R605	RC40AE152K	Resistor, 1,500 ohms 2w.	Plate load	.18
R606	RC30AE102K	Resistor, 1,000 ohms 1w.	Decoupling	.10
†R607	V-14026-1	Control, 500 ohms	Picture	.90
†R608	RC20AE271K	Resistor, 270 ohms ½w.	Cathode bias	.10
R609	RC30AE223K	Resistor, 22,000 ohms 1w.	Screen dropping	.09
R610	RC40AE562K	Resistor, 5,600 ohms 2w.	Plate load	.25
R611	RC40AE562K	Resistor, 5,600 ohms 2w.	Plate load	.25

SECTION 7 – SWEEP AND HEATERS

Ref. No.	Part No.	Description	Function	List Price Each
C700	V-5596-1	Capacitor, .005 mfd.	Heater bypass	$ .25
C701	V-5596-1	Capacitor, .005 mfd.	Heater bypass	.25
C702	V-5596-1	Capacitor, .005 mfd.	Heater bypass	.25
C703	V-5596-1	Capacitor, .005 mfd.	Heater bypass	.25
C704	V-9863-1	Capacitor, 800 mmf.	Heater bypass	.20
C705	V-9863-1	Capacitor, 800 mmf.	Heater bypass	.20
C706	V-9863-1	Capacitor, 800 mmf.	Heater bypass	.20
C707	V-9863-1	Capacitor, 800 mmf.	Heater bypass	.20
C708	RCP10W4504M	Capacitor, .5 mfd..400V.	AGC filter	.55
C709	RCP10W4104M	Capacitor, .1 mfd..400V.	AGC filter	.25
C710	V-5596-1	Capacitor, .005 mfd.	AGC cathode bypass	.25
C711	RCP10M6103M	Capacitor, .01 mfd. 600V.	Sync coupling	.21
C712	RCM20B271K	Capacitor, 270 mmf.	Sync coupling	.20
C713	RCP10W4104M	Capacitor, .1 mfd. 400V.	Screen bypass	.25

SECTION 7 – SWEEP AND HEATERS (Continued)

Ref. No.	Part No.	Description	Function	List Price Each
C714	RCM20B470K	Capacitor, 47 mmf.	Plate bypass	.22
C715	RCP10W4503M	Capacitor, .05 mfd. 400V.	Cathode bypass	.24
C716	RCP10W4104M	Capacitor, .1 mfd. 400V.	Coupling	.25
C717	RCP10M6103M	Capacitor, .01 mfd. 600V.	VMV coupling	.21
†C718	V-12943-1	Capacitor, elec., 10 mfd. 600V.	Decoupling	3.70
C719	RCP10M6104M	Capacitor, .1 mfd. 600V.	Vertical shaping network	.35
C720	RCP10M6104M	Capacitor, .1 mfd. 600V.	Vertical coupling	.35
†C721E	V-14215-1	Capacitor, elec., 4 mfd. 250V. (assy. consists of C721E, C743E, and C816E)	Cathode bypass	4.75*
†C722B	V-14216-1	Capacitor, elec., 30 mfd. 450V. (assy. consists of C215B, C722B, C725B and C739B)	B† filter	4.25*
C723	RCP10M6203M	Capacitor, .02 mfd. 600V.	Capacitive divider	.25
†C724	RCP10M6254M	Capacitor, .25 mfd. 600V.	Coupling	***
†C725B	V-14216-1	Capacitor, elec., 10 mfd. 50V. (assy. consists of C215B, C722B, C725B, and C739B)	Cathode bypass	4.25*
†C726	RCM30C332K	Capacitor, 3,300 mmf.	Convergence shaping	1.10
†C727	V-9571-2	Capacitor, .001 mfd. 2KV.	Convergence coupling	.85
C728	V-9571-1	Capacitor, .001 mfd. 6KV.	Convergence coupling	1.00
†C729	RCP10M6254M	Capacitor, .25 mfd. 600V.	Plate bypass	***
C730	RCM20B151K	Capacitor, 150 mmf.	Horizontal sync coupling	.20
C731	RCM20B101K	Capacitor, 100 mmf.	AFC bias network	.22
C732	RCM20B391K	Capacitor, 390 mmf.	Horizontal sweep feedback	.23
C733	RCM20B681K	Capacitor, 680 mmf.	Correction voltage filter	.25
C734	RCP10M6103M	Capacitor, .01 mfd. 600V.	Correction voltage filter	.21
C735	RCP10M6103M	Capacitor, .01 mfd. 600V.	Correction voltage filter	.21
C736	RCP10M6502M	Capacitor, .005 mfd. 600V.	Correction voltage filter	.20
C737	RCM20B101K	Capacitor, 100 mmf.	Plate bypass	.22
C738	RCM30C392K	Capacitor, 3,900 mmf.	Ringing	1.17
†C739B	V-14216-1	Capacitor, elec., 10 mfd. 450V. (assy. consists of C215B, C772B, C725B and C739B)	B† filter	4.25*
C740	RCM20B101K	Capacitor, 100 mmf.	Horizontal coupling	.22
C741	V-11228-2	Capacitor, variable 5-80 mmf.	Horizontal coupling	.35
C742	RCP10W4104M	Capacitor, .1 mfd. 400V.	Bypass	.25
†C743E	V-14215-1	Capacitor, elec. 10 mfd. 475V. (assy. consists of C721E, C743E and C816E)	B† filter	4.75*
C744	RCM20B391K	Capacitor, 390 mmf.	Pulse shaping	.23
C745	RCP10M6103M	Capacitor, .01 mfd. 600V.	Coupling	.21
C746	RCP10M4504M	Capacitor, .5 mfd. 400V.	Cathode bypass	.20
C747	RCP10M4104M	Capacitor, .1 mfd. 400V.	Screen bypass	.25
†C748	RCM30B472J	Capacitor, 4,700 mmf.	Convergence coupling	.80
†C749	RCM30C332K	Capacitor, 3,300 mmf.	Convergence coupling	1.10
L700	V-4886-2	Coil, 1.1 microhenries	Heater isolation	.38
L701	V-4886-2	Coil, 1.1 microhenries	Heater isolation	.38
L702	V-4886-2	Coil, 1.1 microhenries	Heater isolation	.38
L703	V-4886-2	Coil 1.1 microhenries	Heater isolation	.38
L705	V-6764-1	Coil	Ringing	1.45
L706	V-9099-2	Coil, 3.3 microhenries	Suppressor	.20
L707	V-9099-2	Coil 3.3 microhenries	Suppressor	.20

SECTION 7 – SWEEP AND HEATERS (Continued)

Ref. No.	Part No.	Description	Function	List Price Each
†L708	V-14001-1	Coil, slug tuned	Convergence phase	1.30
R700	RC40AE682K	Resistor, 6,800 ohms 2W.	Voltage divider	.18
R701	RC40AE123K	Resistor, 12,000 ohms 2W.	Voltage divider	.20
R702	RC20AE472K	Resistor, 4,700 ohms ½W.	AGC grid	.05
R703	RC20AE474K	Resistor, 470,000 ohms ½W.	Grid return	.05
R704	RC20AE153K	Resistor, 15,000 ohms ½W.	Voltage dropping	.05
R705	RC20AE474K	Resistor, 470,000 ohms ½W.	Grid return	.05
R706	RC20AE474K	Resistor, 470,000 ohms ½W.	Coupling limiter	.05
R707	RC20AE224K	Resistor, 220,000 ohms ½W.	Voltage divider	.05
R708	RC20AE394K	Resistor, 390,000 ohms ½W.	Screen dropping	.05
R709	RC20AE473K	Resistor, 47,000 ohms ½W.	Plate load	.05
R710	RC20AE273K	Resistor, 27,000 ohms ½W.	DC divider	.06
R711	RC20AE222K	Resistor, 2,200 ohms ½W.	Signal divider	.05
R712	RC20AE473K	Resistor, 47,000 ohms ½W.	HMV grid	.05
R713	RC20AE103K	Resistor, 10,000 ohms ½W.	Signal divider	.05
R714	RC20AE470K	Resistor, 47 ohms ½W.	Signal divider	.05
R715	RC20AE122K	Resistor, 1,200 ohms ½W.	Cathode bias	.05
R716	RC20AE564K	Resistor, 560,000 ohms ½W.	VMV grid	.05
R717	V-11539-2	Control, 750,000 ohms	Vertical hold	.80
R718	RC20AE104K	Resistor, 100,000 ohms 1W.	Plate load	.10
R719	RC20AE474K	Resistor, 470,000 ohms ½W.	Voltage divider	.05
R720	V-9813-2	Control, 1megohm	Height	.65
R721	RC20AE102K	Resistor, 10,000 ohms ½W.	Decoupling	.05
R722	RC20AE225K	Resistor, 2.2 megohms ½W.	Grid leak	.05
R723	RC20AE123K	Resistor, 12,000 ohms ½W.	Vertical shaping	.05
R724	RC20AE102K	Resistor, 1,000 ohms ½W.	Cathode Bias	.05
†R725	V-14528	Control, 10,000 ohms	Vertical linearity	***
R726	RC20AE561K	Resistor, 560 ohms ½W.	Decoupling	.05
†R727	V-12951-8	Control, 10,000 ohms	Vertical conv. and focus	.70
R728	RC20AE104K	Resistor, 100,000 ohms ½W.	Isolation	.05
R729	RC20AE224K	Resistor, 220,000 ohms ½W.	Dynamic conv. grid	.05
†R730	V-12951-9	Control, 5 megohms	Vertical conv. shaping	.70
R731	RC40AE102K	Resistor, 1,000 ohms 2W.	Cathode bias	.15
R732	RC20AE105K	Resistor, 1 megohm ½W.	AFC bleeder	.05
R733	RC20AE105K	Resistor, 1 megohm ½W.	AFC cathode	.05
R734	RC20AE183K	Resistor, 18,000 ohms ½W.	Horizontal feedback	.05
R735	RC20AE224K	Resistor, 220,000 ohms ½W.	Correction voltage filter	.05
R736	RC20AE474K	Resistor, 470,000 ohms ½W.	Correction voltage filter	.05
R737	RC20AE821K	Resistor, 820 ohms ½W.	Cathode bias	.05
R738	RC30AE273K	Resistor, 27,000 ohms 1W.	Plate load	.09
R739	RC20AE223K	Resistor, 22,000 ohms ½W.	Damping	.06
R740	RC30AE273K	Resistor, 27,000 ohms 1W.	Decoupling	.09
R741	RC20AE274K	Resistor, 270,000 ohms ½W.	HMV grid	.06
R742	V-11538-3	Control 60,000 ohms	Horizontal hold	.80
R743	RC20AE223K	Resistor, 22,000 ohms ½W.	Pulse shaping	.06
R744	RC20AE563K	Resistor, 56,000 ohms ½W.	Plate load	.10
R745	RC20AE223K	Resistor, 22,000 ohms ½W.	Decoupling	.06
R746	RC20AE333K	Resistor, 33,000 ohms ½W.	Voltage divider	.05
R747	RC20AE680K	Resistor, 68 ohms ½W.	Suppressor	.04
R748	RC20AE105K	Resistor, 1 megohm ½W.	Grid return	.05
R749	RC20AE680K	Resistor, 68 ohms ½W.	Suppressor	.04
R750	RC20AE680K	Resistor, 68 ohms ½W.	Suppressor	.04
†R751	V-11328-14	Resistor, 75 ohms 5W.	Cathode bias	.50

SECTION 7 – SWEEP AND HEATERS (Continued)

Ref. No.	Part No.	Description	Function	List Price Each
R752	RC20AE680K	Resistor, 68 ohms ½W.	Suppressor	.04
†R753	V-11328-15	Resistor, 7,500 ohms 5W.	Voltage dropping	***
†R754	V-12951-1	Control, 100,000 ohms	Horizontal conv. and focus	.75
R755	RC20AE335K	Resistor, 3.3 megohms ½W.	Grid return	.05
R756	RC20AE823K	Resistor, 82,000 ohms ½W.	AGC filter	.05
†T700	V-6981-7	Transformer	Vertical output	***
†T701	V-14002-1	Transformer	Vertical conv. and focus	13.50
†T702	V-14000-1	Transformer	Horizontal conv. and focus	4.50
Z700	V-11192-1	Filter	Integrating	1.30

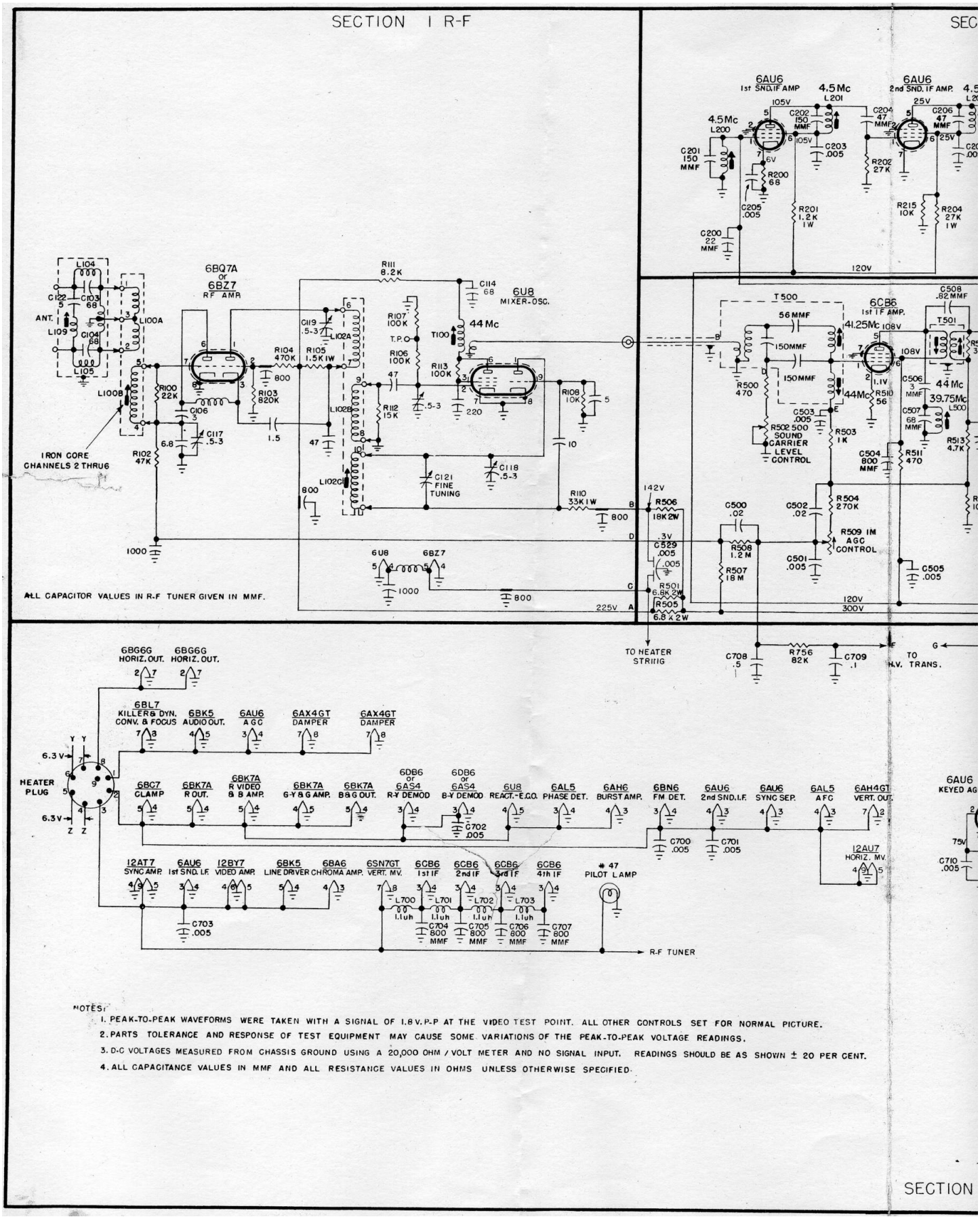
SECTION 8 – HI-LOW POWER AND DEFLECTION

Ref. No.	Part No.	Description	Function	List Price Each
†C800	V-12967-1	Capacitor, .005 mfd. 6KV.	Focus filter	$1.15
†C801	V-9901-4	Capacitor, 1200 mmf. 15KV.	Focus filter	3.75
C802	RCP10M6504M	Capacitor, .5 mfd. 600V.	Deflection coupler	.20
C803	V-3236-1	Capacitor, elec., 20 mfd. 25V.	DC stabilizer	.78
C804	RCP10M6104M	Capacitor, .1 mfd. 600V.	Deflection coupler	.35
C805	RCP10M6203K	Capacitor, .05 mfd. 600V.	Yoke return	.25
C806	V-3236-1	Capacitor elec., 20 mfd. 25V.	DC stabilizer	.78
C807	V-3236-1	Capacitor, elec., 20 mfd. 25V.	DC stabilizer	.78
†C808	RCP10M6683M	Capacitor, .068 mfd. 600V.	Horizontal Lin. network	.35
†C809	V-14029-1	Capacitor, elec., 1,000 mfd. 25V.	Vertical centering	3.40
C810	RCP10M4503M	Capacitor, .05 mfd. 400V.	Bypass	.25
†C811	V-14027-1	Capacitor, 500 mmf. 10KV.	Dynamic conv. coupler	1.50
†C812	V9901-4	Capacitor, 1,200 mmf. 15KV.	HV filter	3.75
†C813	V-9901-4	Capacitor, 1,200 mmf. 15KV.	HV filter	3.75
†C814	V-12969-2	Capacitor, 2,000 mmf. 30KV	HV filter	19.50
C815	RCP10M6203K	Capacitor, .02 mfd. 600V.	Grid by pass	.25
†C816E	V-14215-1	Capacitor, elec., 80 mfd. 450V. (assy. consists of C721E, C743E, and C816E)	B† filter	4.75*
†C817	V-14128-2	Capacitor, 175 mmf. 3,000V.	Transient damping	***
†C818A	V-14212-1	Capacitor, elec., 30 mfd. 450V. (assy. consists of C213A, C312A, C421A and C818A)	B† filter	4.15*
†C819	V-14013	Capacitor, elec., 20 mfd. 600V.	B† filter	4.05
†C820	V-14012-1	Capacitor, elec., 10 mfd. 600V.	B† filter	3.55
†C821F	V-12985-1	Capacitor, elec., 40 mfd. 450V. (assy. consists of C821F, C822F, and C823F)	310V filter	5.10*
†C822F	V-12985-1	Capacitor, elec., 80 mfd. 450V. (Assy. consists of C821F, C822F, and C823F)	310V filter	5.10*
†C823F	V-12985-1	Capacitor, elec., 10 mfd. 450V. (assy. consists of C821F, C822F, and C823F)	Line filter	5.10*
C824	V-5040-15	Capacitor, .01 mfd. 600V.	AC line filter	.35
C825	V-5040-15	Capacitor, .01 mfd. 600V.	AC line filter	.35
†C826	V-12943-1	Capacitor, elec., 10 mfd. 600V.	B† By pass	3.70
F800	V-6171-10	Fuse, 3/8 amp. 250V.	Protection	.25

SECTION 8 – HI-LOW POWER AND DEFLECTION (Continued)

Ref. No.	Part No.	Description	Function	List Price Each
†L800	V-12974-1	Coil	Width	2.35
†L801	V-12975-1	Coil	Horizontal linearity	1.80
†L802	V-12959-1	Coil, (contains male plug)	Color purity	9.75
†L803	V-12979-1	Coil, (contains male plug)	Field neutralizing	***
L804	V-6471-2	Coil	410V line filter	2.35
†L805	V-12988-1	Coil	310V line filter	4.25
L806	V-9099-2	Coil, 3.3 microhenries	RF choke	.20
R800	RC30AE105K	Resistor, 1 megohm 1W.	Focus bleeder	.10
†R801	V-12971-1	Control, 5 megohms	Focus	4.50
†R802	V-12976-1	Resistor, 8 megohms 1.5W.	Focus bleeder	3.50
R803	RRU31R2K	Resistor, 1.2 ohms ½W.	Focus rectifier filament	.17
R804	RC20AE472K	Resistor, 4,700 ohms ½W.	Yoke return	.05
†R805	V-12948-1	Control, 40 ohms 3W.	Horizontal centering	1.50
†R806	RRU32R2K	Resistor, 2.2 ohms ½W.	HV filament	.15
R807	RC30AE100K	Resistor, 10 ohms 1W.	HV filament	.09
†R808	RRU32R2K	Resistor, 2.2 ohms ½W.	HV filament	.15
†R809	V-12976-2	Resistor, 22 megohms 1.5W.	HV bleeder	3.50
†R810	V-12976-3	Resistor, 100 megohms 2W.	HV bleeder	3.50
†R811	V-12972-1	Control, 50 megohms	Convergence	4.75
†R812	V-12976-4	Resistor, 80 megohms 1.5W.	HV bleeder	3.50
†R813	V-12951-5	Control, 2.5 megohm	HV adjustment	.70
R814	RC20AE225K	Resistor, 2.2 megohm ½W.	HV bleeder	.05
R815	RC20AE102K	Resistor, 1,000 ohms ½W.	Filament isolation	.05
†R816	V-14137-1	Control, 20 ohms 2W.	Purity	1.30
†R817	V-12948-3	Control, 20 ohms 3W.	Field neutralizer	1.45
†R818	V-12948-2	Control, 15 ohms 3W.	Vertical centering	1.45
R819	RC20AE102K	Resistor, 1,000 ohms ½W.	Transient damping	.05
R820	RC20AE102K	Resistor, 1,000 ohms ½W.	Transient damping	.05
R821	RC20AE391K	Resistor, 390 ohms ½W.	Transient damping	.08
†R822	V-14335-1	Resistor, 300 ohms 50W.	Current limiting	2.20
R823	V-9375-4	Resistor, 3,000 ohms 20W.	B† dropping	1.35
R824	RC30AE224K	Resistor, 220,000 ohms 1W.	Protection	.10
†SW800	V-12954-1	Switch (includes R209, R210, and SW800)	Off-on	2.35*
†T800	V-12977-1	Transformer	Horizontal output	39.00
†T801	V-12986-1	Transformer	Low voltage power	44.00
†Z800	V-12982-1	Yoke Assy. (Assy. consists of R819, R820, R821, C817, and V-14254-1 male plug)	Deflection	64.50

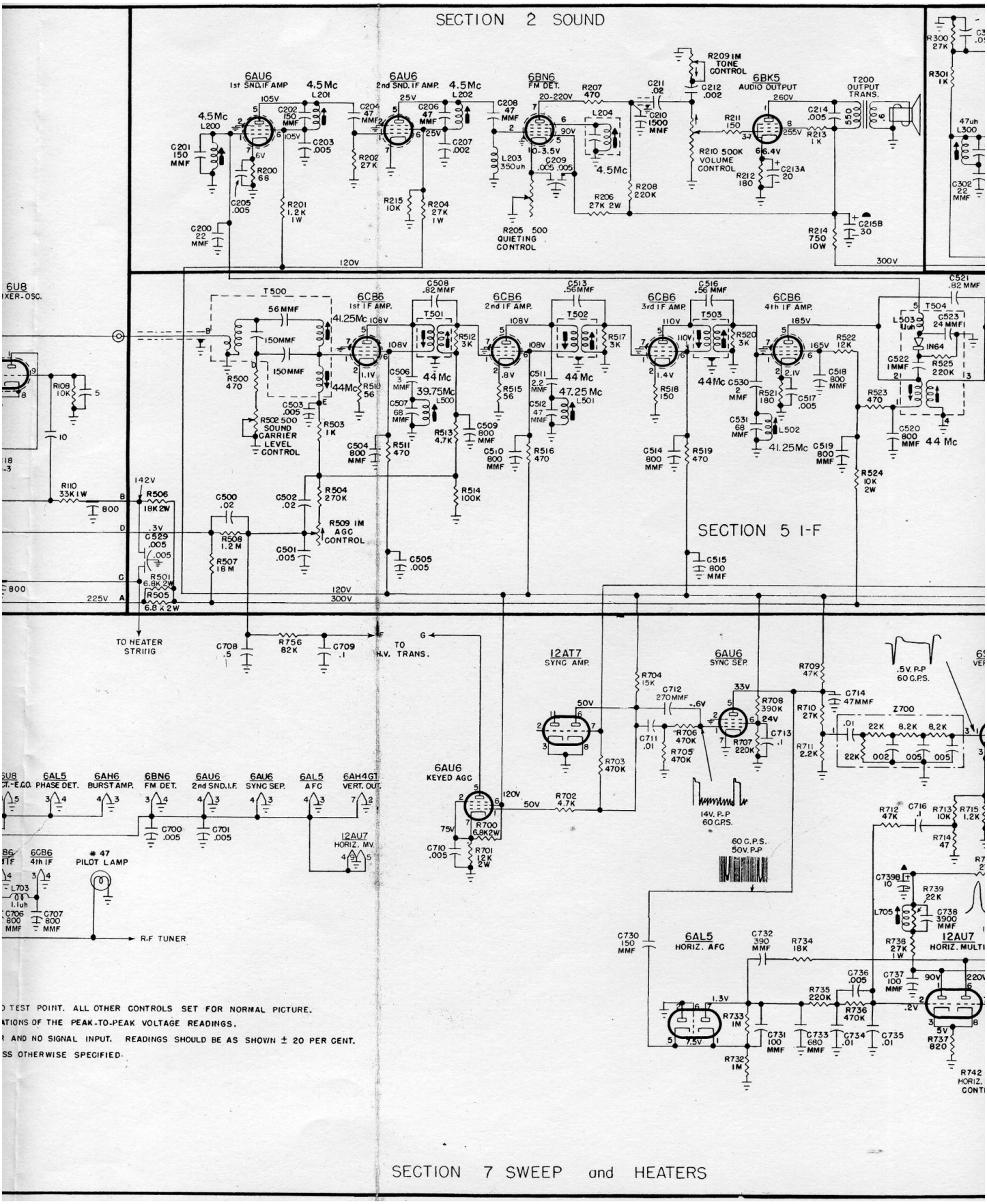
† New part number listed for the first time in Westinghouse radio or television service information.
* Sold only as complete assembly. Price shown covers complete as sembly.
** Price includes Federal Excise Tax.
*** Price furnished on request.
NOTE: All prices are subject to change without notice.

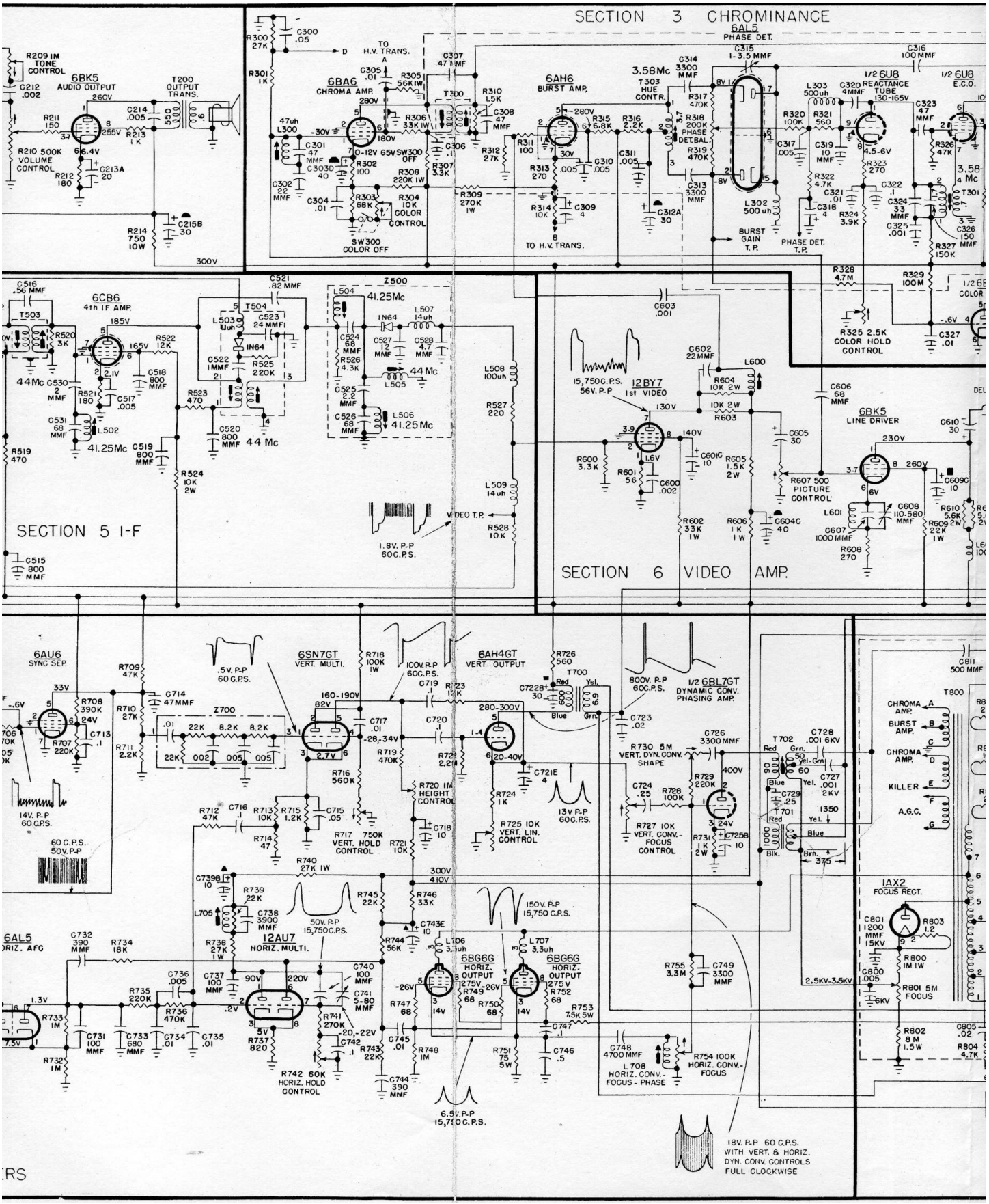


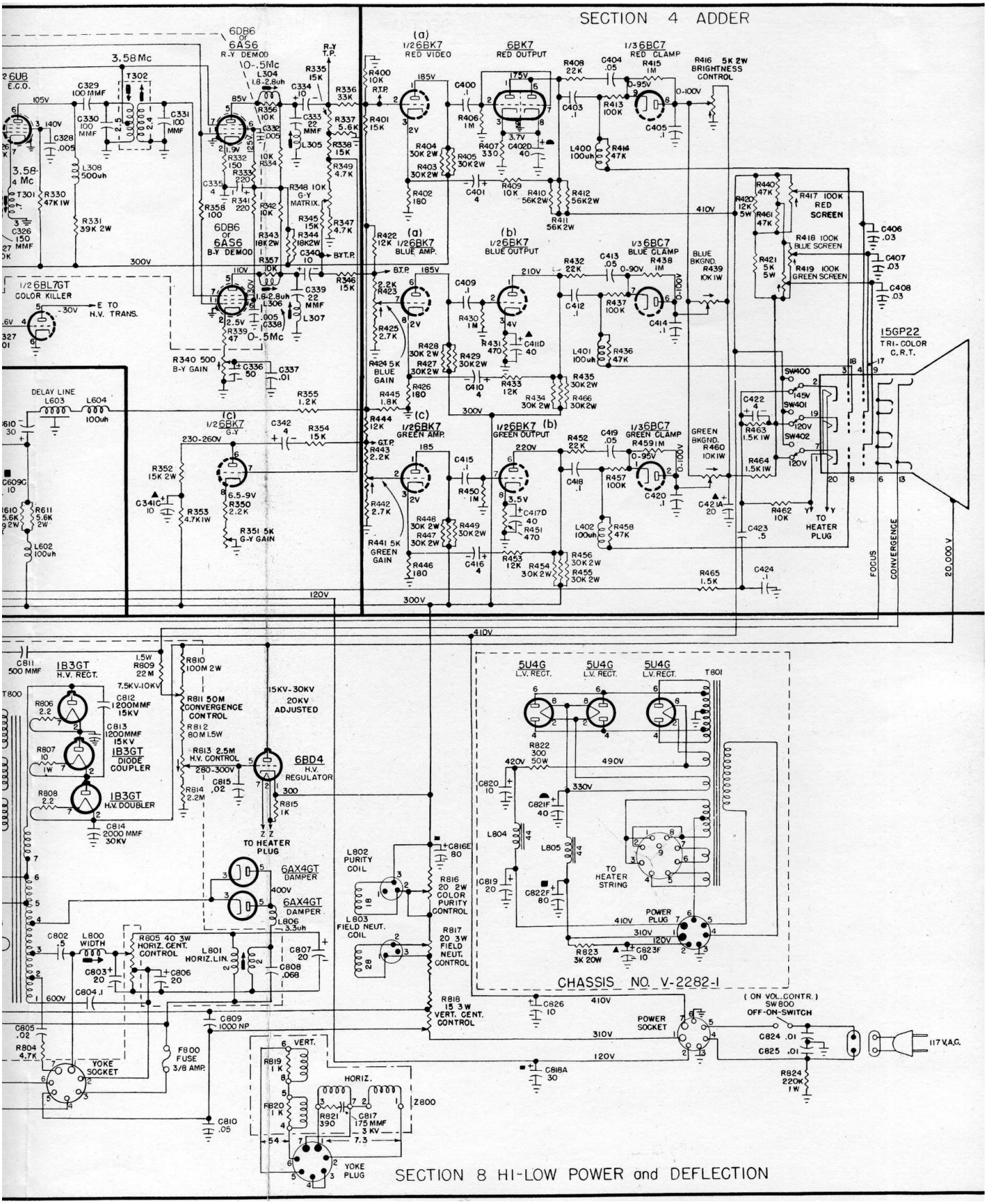
NOTES:

1. PEAK-TO-PEAK WAVEFORMS WERE TAKEN WITH A SIGNAL OF 1.8 V. P-P AT THE VIDEO TEST POINT. ALL OTHER CONTROLS SET FOR NORMAL PICTURE.
2. PARTS TOLERANCE AND RESPONSE OF TEST EQUIPMENT MAY CAUSE SOME VARIATIONS OF THE PEAK-TO-PEAK VOLTAGE READINGS.
3. D-C VOLTAGES MEASURED FROM CHASSIS GROUND USING A 20,000 OHM / VOLT METER AND NO SIGNAL INPUT. READINGS SHOULD BE AS SHOWN ± 20 PER CENT.
4. ALL CAPACITANCE VALUES IN MMF AND ALL RESISTANCE VALUES IN OHMS UNLESS OTHERWISE SPECIFIED.

SECTION


SECTION 2 SOUND
6AU6 1st SND.IF AMP
4.5Mc L201
4.5Mc L200
6AU6 2nd SND. IF AMP.
4.5Mc L202
6BN6 FM DET.
20-220V
6BK5 AUDIO OUTPUT
260V
T200 OUTPUT TRANS.
R209 IM TONE CONTROL
C212 .002
R210 500K VOLUME CONTROL
R211 150
R212 180
C213A 20
C214 .005
R213 1K
C201 150 MMF
C202 150 MMF
C203 .005
C204 47 MMF
C205 .005
C206 47 MMF
C207 .002
C208 47 MMF
C209 .005 .005
C210 1500 MMF
C211 .02
C215B 30
R200 68
R201 1.2K 1W
R202 27K
R204 27K 1W
R205 500 QUIETING CONTROL
R206 27K 2W
R207 470
R208 220K
R214 750 10W
R215 10K
L203 350uh
L204
4.5Mc
105V
25V
90V
10-3.5V
6.4V
255V
120V
300V
R300 27K
R301 1K
47uh L300
C302 22 MMF
6U8 MIXER-OSC.
T500
56MMF
150MMF
150MMF
R500 470
R502 500 SOUND CARRIER LEVEL CONTROL
R503 1K
C503 .005
6CB6 1st I.F AMP.
41.25Mc
44Mc
T501
C508 .82MMF
R512 3K
R510 56
C506 3 MMF
C507 68 MMF
39.75Mc L500
C509 800 MMF
R513 4.7K
C504 800 MMF
R511 470
R514 100K
108V
1.1V
6CB6 2nd I.F AMP.
T502
C513 .56MMF
R517 3K
C511 2.2 MMF
47.25Mc L501
C512 47 MMF
C510 800 MMF
R516 470
R515 56
.8V
6CB6 3rd I.F AMP.
T503
C516 .56 MMF
R520 3K
R518 150
C514 800 MMF
R519 470
C515 800 MMF
110V
1.4V
6CB6 4th I.F AMP.
T504
C521 .82 MMF
L503 1uh
C523 24 MMFI
IN64
R525 220K
C522 1MMF
C530 2 MMF
R521 180
C517 .005
C518 800 MMF
C531 68 MMF
L502
41.25Mc
C519 800 MMF
C520 800 MMF 44 Mc
R522 12K
R523 470
R524 10K 2W
165V
2.1V
SECTION 5 I-F
R108 10K
R110 33K 1W
800
10
18
-3
142V
R506 18K 2W
C500 .02
C502 .02
R504 270K
R509 IM AGC CONTROL
R508 1.2M
R507 18M
C501 .005
C505 .005
.3V
C529 .005 .005
R501 6.8K 2W
R505 6.8 X 2W
225V
TO HEATER STRING
C708 .5
R756 82K
C709 .1
TO H.V. TRANS.
12AT7 SYNC AMP.
6AU6 SYNC SEP.
6AU6 KEYED AGC
R704 15K
C712 270MMF
R706 470K
R705 470K
C711 .01
R703 470K
R702 4.7K
R700 6.8K2W
R701 12K 2W
C710 .005
50V
75V
120V
-.6V
33V
24V
R708 390K
R707 220K
C713 .1
R709 47K
C714 47MMF
R710 27K
R711 2.2K
Z700
.01
22K
8.2K
8.2K
22K
.002
.005
.005
.5V. P-P 60 C.P.S.
14V. P-P 60 C.P.S.
60 C.P.S. 50V. P-P
6U8 CT.-E.G.O.
6AL5 PHASE DET.
6AH6 BURST AMP.
6BN6 FM DET.
6AU6 2nd SND.I.F.
6AU6 SYNC SEP.
6AL5 AFC
6AH4GT VERT. OUT.
C700 .005
C701 .005
12AU7 HORIZ. MV.
6CB6 4th I.F
L703 1.1uh
C706 800 MMF
C707 800 MMF
47 PILOT LAMP
R-F TUNER
6AL5 HORIZ. AFC
C730 150 MMF
C732 390 MMF
R734 18K
R735 220K
R736 470K
R733 IM
R732 IM
C731 100 MMF
C733 680 MMF
C734 .01
C735 .01
C736 .005
C737 100 MMF
R737 820
R738 27K 1W
C739B 10
R739 .22K
L705
C738 3900 MMF
12AU7 HORIZ. MULTI
R712 47K
C716 .1
R713 10K
R715 1.2K
R714 47
1.3V
7.5V
90V
.2V
5V
R742 HORIZ. CONTI
TEST POINT. ALL OTHER CONTROLS SET FOR NORMAL PICTURE.
ATIONS OF THE PEAK-TO-PEAK VOLTAGE READINGS.
AND NO SIGNAL INPUT. READINGS SHOULD BE AS SHOWN ± 20 PER CENT.
SS OTHERWISE SPECIFIED.
SECTION 7 SWEEP and HEATERS


SECTION 3 CHROMINANCE
SECTION 5 I-F
SECTION 6 VIDEO AMP.
6BK5 AUDIO OUTPUT
T200 OUTPUT TRANS.
6BA6 CHROMA AMP.
6AH6 BURST AMP.
6AL5 PHASE DET.
1/2 6U8 REACTANCE TUBE
1/2 6U8 E.C.O.
3.58Mc T303 HUE CONTR.
R209 1M TONE CONTROL
R210 500K VOLUME CONTROL
SW300 COLOR OFF
R304 10K COLOR CONTROL
R325 2.5K COLOR HOLD CONTROL
BURST GAIN T.P.
PHASE DET. T.P.
TO H.V. TRANS.
6CB6 4th I.F. AMP.
Z500 41.25Mc
44Mc
41.25Mc
VIDEO T.P.
1.8V. P-P 60C.P.S.
12BY7 1st VIDEO
15,750C.P.S. 56V. P-P
6BK5 LINE DRIVER
R607 500 PICTURE CONTROL
C608 110.580 MMF
C607 1000 MMF
6AU6 SYNC SEP.
6SN7GT VERT. MULTI.
6AH4GT VERT. OUTPUT
1/2 6BL7GT DYNAMIC CONV. PHASING AMP.
R717 750K VERT. HOLD CONTROL
R720 1M HEIGHT CONTROL
R725 10K VERT. LIN. CONTROL
R727 10K VERT. CONV.-FOCUS CONTROL
R730 5M VERT. DYN. CONV. SHAPE
T700
T701
T702
T800
CHROMA AMP.
BURST AMP.
KILLER
A.G.C.
1AX2 FOCUS RECT.
R801 5M FOCUS
12AU7 HORIZ. MULTI.
6AL5 HORIZ. AFC
6BG6G HORIZ. OUTPUT
R742 60K HORIZ. HOLD CONTROL
R754 100K HORIZ. CONV.-FOCUS
L708 HORIZ. CONV.-FOCUS - PHASE
18V. P-P 60 C.P.S. WITH VERT. & HORIZ. DYN. CONV. CONTROLS FULL CLOCKWISE
6.5V. P-P 15,710 C.P.S.
14V. P-P 60 C.P.S.
60 C.P.S. 50V. P-P
13V P-P 60C.P.S.
800V. P-P 60C.P.S.
150V. P-P 15,750 C.P.S.
50V. P-P 15,750C.P.S.
.5V. P-P 60 C.P.S.
100V. P-P 60C.P.S.



SECTION 8 HI-LOW POWER and DEFLECTION