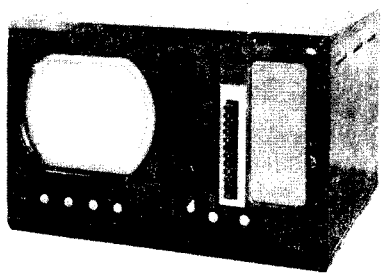
GENERAL DESCRIPTION

The 101.854 is a 30 tube, direct-viewing table model Television Receiver. Features of the receiver include full 12 channel push button coverage, automatic gain control, stablized horizontal hold, four stages of Video I.F. Amplification, a 10" direct view picture tube, a preselector circuit and a noise limiting circuit.



Power Supply:

All models 117 Volts AC 60 Cycle operated unless otherwise specified. Power consumption 290 Watts.

Frequency Range:

Channels 2 through 13. For channel frequencies, see table

Antenna Equipment

The antenna input is designed to operate with maximum efficiency on a dual channel dipole antenna using 72 Ohm concentric coaxial lead-in. Silvertone Television Kit, Catalog No. 6720 or equivalent is recommended. Instructions for proper erection and installation of the antenna are included with the antenna kit. A separate installation manual is available covering the technical procedure and problems in antenna installation. The shield of the lead-in should be connected to terminal screw or clamp "G" The center conductor of the lead-in should be connected to terminal screw "A"

Intermediate Frequencies

Sound I.F. Carrier - 21.9 MC.
Video I.F. Carrier - 26.4 MC.

Horizontal Scanning Frequency

15,750 Cycles per second

Vertical Scanning Frequency

60 Cycles per second

Scanning

525 lines per second, interlaced

Picture Tube

A 10" direct view with 6" x 8" viewing area

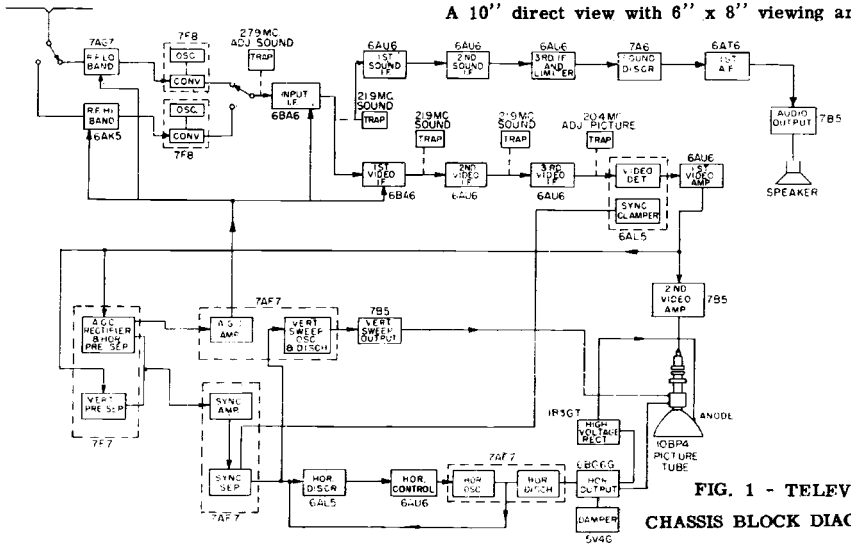


FIG. 1 - TELEVISION CHASSIS BLOCK DIAGRAM

CIRCUIT DESCRIPTION

The 101.854 Television Receiver Chassis contains 26 tubes plus two low voltage rectifiers, one high voltage rectifier and one 10BP4 picture tube. The operating controls are (1) Station Selector (2) Fine tuning (3) Audio Volume (4) Contrast (5) Brightness (6) Horizontal Hold (7) Vertical Hold.

The Special features of this Receiver are as follows:

1. Push Button Tuning

   For maximum convenience in customer operation, individual push buttons are provided for each of the television channels, from 2-13, inclusive. These push buttons are pre-set at the factory. Fine tuning control is provided for best adjustment of sound and picture.

2. Shielded Co-Axial Antenna Lead-in

   The receiver is designed to operate from a shielded co-axial antenna lead-in. This simplifies the antenna installation and prevents noise pick-up on the antenna lead-in.

3. Tuned Input Circuit

   A double-tuned circuit, tuned to the desired signal channel, is provided ahead of the RF Amplifier. This tuned circuit is very effective in eliminating unwanted signals and spurious responses.

4. Permeability Tuning

   Five RF circuits, including the HF Oscillator, are tuned by means of iron-dust cores which move in unison when actuated by the push button mechanism. This system of tuning insures freedom from switch trouble.

5. Automatic Gain Control

   Simplified customer operation is provided by a very flat AGC System which has a high degree of noise immunity. Very little, if any, readjustment of controls is required in going from one station to another.

6. Direct Coupled Video System

   A direct coupled Video System eliminates all video coupling capacitors and also eliminates the need for a DC Restorer. This reduces the visible effects of noise.

7. New Contrast Control

   A new method of controlling contrast practically eliminates the necessity for readjustment of the brightness control when making adjustments of the contrast control.

8. Horizontal Automatic Frequency Control

   A sine-wave type of Horizontal AFC is employed which provides excellent picture stability, even in the presence of noise and weak signals.

A Block Diagram of the Television Chassis is shown in Figure 1. The shielded Antenna lead-in is connected to the input of the RF Tuner Unit. This Tuner Unit functions to select the desired television signal channel by means of individual push buttons. The Tuner Unit consists of two separate amplifier channels; one for channels 2-6, inclusive and the other for channels 7-13, inclusive. Each Amplifier channel comprises an RF Amplifier, a Frequency Converter and a High-Frequency Oscillator. The output of the Tuner Unit is at intermediate frequency and the band-width up to this point is wide enough to pass both the picture carrier and the sound carrier of the desired signal channel.

The output of the Tuner Unit is then applied to the Input IF Amplifier which also passes both the picture and sound carriers. At this point, a "trap" circuit is inserted which is tuned to reject the sound carrier of the adjacent channel signal. The output of the Input IF Amplifier is split; the picture carrier and the sound carrier being amplified by individual signal channels.

CIRCUIT DESCRIPTION

The sound carrier with its accompanying side-bands is passed through three additional stages of amplification and "detected" by a discriminator to produce audio output.

The video carrier, together with its side-bands, is passed through three additional amplifier stages and detected to produce a video signal. Suitable traps are provided in the video amplifier channel to reject the sound carrier, since this sound carrier must not be permitted to reach the Video Detector.

The video signal out of the Video Detector is passed through two amplifier stages and the output of the 2nd Video Amplifier is impressed upon the grid of the Picture Tube.

Automatic Gain Control voltage is obtained from the output of the 1st Video Amplifier by means of the AGC Rectifier. The output of the AGC Rectifier is amplified by the AGC Amplifier and the negative DC voltage developed by the AGC Amplifier is applied to the RF Amplifier and two IF Amplifiers to control their gain.

The AGC Rectifier performs a dual function; that is, it also separates horizontal synchronizing information. A separate tube is used to separate the vertical synchronizing information. After separation, the horizontal and vertical synchronizing information is combined and passed through a sync amplifier. Final separation of the combined horizontal and vertical synchronizing information is accomplished in the sync separator. The output of the sync separator is split; that is, the horizontal synchronizing information passes to the horizontal sweep circuits and the vertical synchronizing information passes to the vertical sweep circuits.

Vertical synchronizing pulses from the sync separator are applied to the Vertical Sweep Oscillator and holds this oscillator in synchronism with the incoming sync pulses. The Vertical Sweep Oscillator produces a saw-tooth voltage which is applied to the vertical sweep output stages and this in turn energizes the vertical Deflection Coils of the Picture Tube.

Horizontal synchronizing information from the sync separator is supplied to the Horizontal Discriminator. A signal from the Horizontal Oscillator is also supplied to the Horizontal Discriminator. The output of the Horizontal Discriminator is applied to the horizontal Control Tube which then functions to hold the Horizontal Oscillator in synchronism with the incoming horizontal sync pulses.

The output of the Horizontal Oscillator actuates the Horizontal Discharge Tube which produces a saw-tooth of voltage suitable for application to the Horizontal Output stage and the output of the Horizontal Output stage energizes the horizontal deflection coils on the Picture Tube. Associated with the Horizontal Output stage is the Damper Tube which is necessary to obtain horizontal deflection.

TELEVISION CHANNELS & FREQUENCIES

CHANNEL NO.	FREQ. MC.	PICTURE CARRIER MC	SOUND CARRIER MC	HETERODYNE OSC. FREQ. MC
2	54 - 60	55.25	59.75	81.65
3	60 - 66	61.25	65.75	87.65
4	66 - 72	67.25	71.75	93.65
5	76 - 82	77.25	81.75	103.65
6	82 - 88	83.25	87.75	109.65
7	174 - 180	175.25	179.75	201.65
8	180 - 186	181.25	185.75	207.65
9	186 - 192	187.25	191.75	213.65
10	192 - 198	193.25	197.75	219.65
11	198 - 204	199.25	203.75	225.65
12	204 - 210	205.25	209.75	231.65
13	210 - 216	211.25	215.75	237.65

TELEVISION ALIGNMENT PROCEDURE

Preliminary

This alignment is an exacting procedure and should be undertaken only when necessary. Before finally deciding that alignment is necessary and before removing the television chassis from the customers home.

1. Be sure of your antenna installation.
2. Check all operating controls and adjustments including the oscillator.
3. Check reception on all channels possible.
4. Check tubes by substitution of known good tubes.

In the repair shop,

5. Measure all important voltages including the AFC.
6. Substitute a known good picture tube.
7. If picture definition is still inadequate, observe the overall I. F. response curve of the receiver.

If none of the above checks indicate other trouble, proceed as follows.

Test Equipment

To service this receiver according to the alignment procedure below, the following test equipment is necessary.

1. RF Sweep Generator with frequency range from 10-220 Mc. with 1 Mc. and 10 Mc. sweep width having adjustable output of at least 0.1 volt.
2. Signal Generator with frequency range from 20-220 Mc. with adjustable output of at least 0.1 volt. If available, the use of two signal generators as markers will facilitate the alignment
3. Cathode Ray Oscilloscope with a vertical amplifier and phasing control.
4. Vacuum Tube Volt meter (V. T. V. M.).

ATTENTION:

For reasons of safety, this television chassis should not be serviced before first removing the picture tube. If, however, it becomes necessary to view the image during servicing, the picture tube may be replaced in its mounting only after the chassis has been set in such a position so as to make all adjustments conveniently available. It is recommended that the chassis be placed on end with the Tuner Assembly toward the bench. It is necessary to use a wooden block to adequately support the chassis on its end.

To remove the picture tube from the Chassis:

1. Remove two wing head screws which hold the strap around the picture tube to the chassis.
2. Remove the picture tube socket, the second anode contact and the ion trap and withdraw the tube.

CAUTION: The second anode lead to the picture tube has a potential of approximately 10,000 volts. Disconnect the ungrounded filament lead to the 7AF7 Hor. Osc. & Disch. tube. This eliminates the 10,000 volt hazard and removes the modulation pattern from the oscilloscope. Be sure the shell of the picture tube is grounded at all times when the second anode lead is connected.

Video I. F. And Trap Alignment

1. Connect the negative lead of a 3 volt battery to pin 6 of the 7AF7 AGC Amp. tube and the positive lead to ground.
2. Connect the V. T. V. M. across 3900 Ohm Resistor R71, using shielded leads.
   CAUTION: These terminals are approximately - 125 volts below ground.
3. Connect the Signal generator to pin 1 of 6BA6 imput I. F. tube.
4. Set signal generator at 20.4 Mc. and align trimmer C79 on transformer T9 for minimum output; increasing the output of the generator as required to get a satisfactory indication on the meter.
5. Set signal generator at 21.9 Mc. and align trimmer C66 on transformer T8 for minimum output; increasing the output of the generator as required to obtain a satisfactory meter indication.
6. Set signal generator at 21.9 Mc. and align trimmer C54 on transformer T6 for minimum output; increasing generator output as before.
7. Set signal generator at 21.9 Mc. and align trimmer C47 on transformer T4 for minimum output; increasing the output of the generator as required to obtain a satisfactory meter indication.
8. Set signal generator at 23.9 Mc. and adjust tuning slug of transformer T9 for maximum output; adjusting the signal generator output as required to keep the meter reading less than

3 volts. Two peaks may be obtained when making this adjustment and steps 9, 10 and 11. Select the peak that occurs when the slugs are out.

9. Set signal generator at 26.1 Mc. and adjust tuning slug of transformer T8 for maximum output; adjusting the generator output as before to keep the meter reading less than 3 volts.
10. Set signal generator at 23.4 Mc. and adjust the tuning slug of transformer T6 for maximum output; adjusting the signal generator as before.
11. Set signal generator at 25.0 Mc. and adjust tuning slug of transformer T4 for maximum output; adjusting the signal generator as before.
12. Repeat procedures 4, 5, 6, 7, 8, 9, 10 and 11 until adjustments do not change.
13. Disconnect the voltmeter from across 3900 Ohm Resistor R71 and connect oscilloscope to the same points using shielded leads; keeping the high side of the oscilloscope on the high side of Resistor R71. At these points also connect a .01 mfd. capacitor in parallel with this oscilloscope.
14. Disconnect the signal generator and connect the sweep generator to the same point; loosely coupling the signal generator set at 26.4 Mc. for use as a marker.
15. Tune sweep generator to 24 Mc. and 10 Mc. sweep and view response curve of the video I. F. transformers. See Figure 2 for desired over-all response curve. Note that the video carrier (26.4 Mc. marker) is 50% down on the curve. If necessary, readjust slug on T6 slightly to obtain this result. Note also that the curve should be symmetrical and that the band width should be approximately 3.3 Mc. The band width may be checked by varing the frequency of the marker signal until it indicates 70% response on the opposite side of the curve. The difference between this frequency and 26.4 should be approximately 3.3 Mc. If necessary, make slight re-adjustment of slug on T4, T8 and T9 to obtain the required curve result.

SOUND DISCRIMINATOR AND I. F. ALIGNMENT

1. Connect the signal generator to pin 1 of 6BA6 input I. F. tube.
2. Connect the V. T. V. M. across 3900 Ohm Resistor R71 and tune signal generator for dip in response at 21.9 Mc.
3. Connect the V. T. V. M. across 47,000 Ohm Resistor R126. Adjust trimmers C120, C119, C116 and C115 of transformers T14 and T13 respectively for maximum negative indication on the meter; adjusting the signal generator to produce a meter reading of approximately 10 volts.
4. Connect the V. T. V. M. across 100,000 Ohm Resistor R129.
5. Tune the primary trimmer C123 of discriminator transformer T15 for maximum output on the meter.
6. Connect the V. T. V. M. between pin 2 of the 7A6 sound detector and ground.
7. With the voltmeter on the extreme low scale, adjust the secondary of discriminator transformer T15 for "zero output" on the meter. Note that a positive or negative reading is possible when making this adjustment. This is why the discriminator must be adjusted for "zero output".
8. Repeat 4, 5, 6 and 7.
9. Connect the sweep generator to pin 1 of 6BA6, input I. F. tube and loosely couple the signal generator, set at 21.9 Mc. for use as a marker.
10. Connect the oscilloscope to pin 2 of 7A6 sound detector tube with an .01 mfd. capacitor in parallel.
11. Tune the sweep generator to 21.9 Mc. with a 1 Mc. sweep and view the pattern on the oscilloscope. The pattern should be similar to that shown in Figure 3 .

R. F. UNIT ALIGNMENT

1. Connect a detector probe as shown in Figure 4 to plate (pin 5) of 6BA6 input I.F. Amplifier.
2. Remove the 6BA6 1st. video I.F. tube from its socket.

LOW BAND ALIGNMENT

A. Connect sweep generator tuned to 24 Mc. with a 10 Mc. sweep to pin 8 of 7F8 Low Band converter by removing the tube from the socket, wrapping a short lead around the pin of the tube, then inserting the tube back into the socket. Loosely couple the signal generator to this point for use as a marker and tune signal generator to 27.9 Mc.
B. Connect oscilloscope to output of detector probe as shown in Figure 4 and short the trap (21.9 Mc.) on T4 by soldering a wire across trimmer C47.
C. Press button for channel 2 selection. Tune slug on output transformer T1 and input I. F. transformer T3 to obtain an approximate symmetrical curve.
D. Tune trimmer C44 on transformer T3 (trap) to the 27.9 Mc. marker signal.
E. Readjust slug on output transformer T1 and input I. F. transformer T3 to obtain curve shown in Figure 5.
F. Repeat D, E and D in order indicated.
G. Connect signal generator to antenna terminals, and tune to 87.75 Mc.
H. Connect voltmeter across 47,000 ohm Resistor R126 and remove the short across trimmer C47.
I. Turn the channel 6 adjustment screw counterclockwise until 1" of the threaded shank protrudes from the rear of the metal plate at the back of the tuner unit. Turn channel 2 adjustment screw counterclockwise until 5/8" of the threaded shank protrudes from the rear of the metal plate. Depress channel 6 firmly and turn the oscillator vernier control to its center position.
J. Adjust oscillator trimmer C31 for maximum output on the voltmeter; reducing the generator output to keep the meter reading below 10 volts.
K. Remove the signal generator from the antenna terminals and connect sweep generator to control grid of 7AG7. This is done by removing the tube from its socket, wrapping a short lead around pin 6 and inserting the tube back into the socket. Tune sweep generator to 85 Mc. center frequency with 10 Mc. sweep.
L. Depress channel 6 firmly and adjust trimmers C16 and C21 for a symmetrical over-coupled response curve.
M. Tune sweep generator to 57 Mc. center frequency with a 10 Mc. sweep. Depress channel 2 and adjust L11 for a symmetrical over-coupled response curve.
N. Tune sweep generator to 85 Mc. center frequency with a 10 Mc. sweep and adjust oscillator trimmer C31 for a symmetrical over-coupled response curve.
O. Connect sweep generator to antenna terminals. In most cases, it will be necessary to "pad" the generator leads so as to match the impedance at the antenna terminals. This is directly dependent on the sweep generator used. The antenna has 75 ohm input impedance.
P. Adjust trimmers C2 and C5 for a symmetrical over-coupled response curve.
Q. Loosely couple a signal generator to the antenna terminals for use as a marker. Depress channel 6 and tune for response on oscilloscope as shown in Figure 6 (E) by turning channel 6 adjustment screw which mechanically determines the position of the cores.
R. Repeat the above step for aligning channels 5, 4, 3, and 2. See Figure 6 for center sweep frequencies and desired response curves.

HIGH BAND ALIGNMENT

A. Depress channel 7 and connect sweep generator to pin 1 of 7F8 High Band converter by removing the tube from the socket, wrapping a short lead around the pin of the tube, then inserting the tube back into its socket. Loosely couple the signal generator to this point for use as a marker.
B. Connect the oscilloscope to the output of the crystal diode and set the oscillator vernier (located on the front of the chassis) in its approximate center position.
C. Set sweep generator to 24 Mc. center frequency with a 10 Mc. sweep and tune High Band output transformer T2 to obtain a curve as shown in Figure 5 which is symmetrical. Tune input I. F. Transformer T3 only if it has been replaced.
D. Connect signal generator to the antenna terminals.
E. Connect voltmeter across the 47,000 Ohm Resistor R126.
F. Release all channel buttons, tune signal generator to 217 Mc. and adjust trimmer C34 for maximum output on the voltmeter; reducing the generator output to keep the meter reading below 10 volts.
G. Connect sweep generator to pin 1 of 6AK5 by removing the tube from the socket, wrapping a short lead around the pin of the tube, then inserting the tube back into the socket. Tune to approximately 213 Mc. center frequency with a 10 Mc. sweep and adjust trimmers C25 and C26 for a symmetrical over-coupled response curve.
H. Connect sweep generator to antenna terminals with a proper "pad". See procedure "O" under Low Band Alignment.
I. Adjust trimmers C3 and C9 for a symmetrical over-coupled response curve.
J. Set sweep generator at 213 Mc. with a 10 Mc. sweep width.
K. Depress channel 13 and tune for response on the oscilloscope as shown in Figure 6 (L) by turning channel 13 adjustment screw (located at the rear of the Tuner Unit) which mechanically determines the position of the cores.
L. Proceed as in the previous step for aligning channels 12, 11, 10, 9, 8 and 7. See Figure 6 for center sweep frequencies and response curves to obtain on the oscilloscope.
M. Replace the 6BA6 1st. video I.F. tube in its socket.

N. With the chassis completely adjusted and connected for operation, tune in a test pattern from a television station.
O. Turn the contrast control to its full on position and the brightness control to a low level (so that contrast is still noticeable).
P. Detune the fine tuning control so that sound bars just become visible. A 4.5 Mc. beat is now readily visible on the screen.
Q. Rotate (counterclockwise) the 4.5 Mc. trap (L30) adjustment screw to its full out position (about 1" of screw showing).
R. Turn the adjustment screw in (clockwise) until the 4.5 Mc. beat on the screen just disappears. Do not go beyond this point.

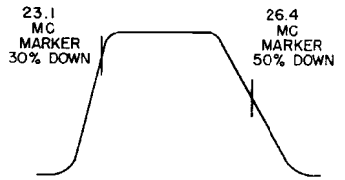


FIG. 2 - OVERALL I. F. RESPONSE CURVE

FIG. 3 - SOUND DISCRIMINATOR RESPONSE CURVE

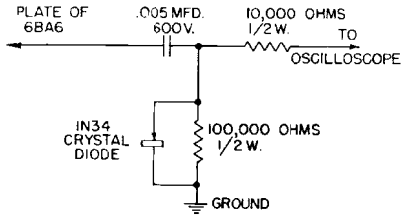


FIG. 4 - DETECTOR PROBE

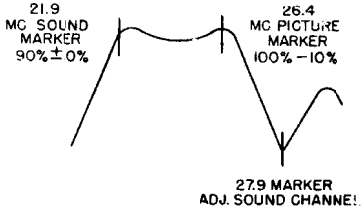
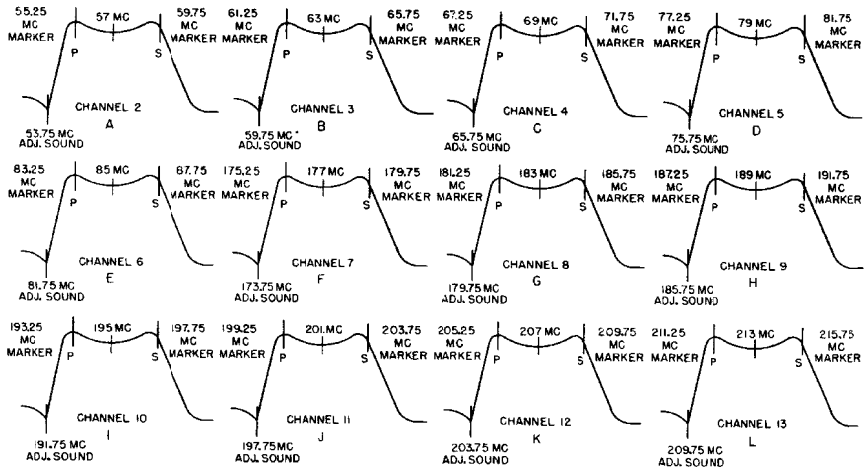


FIG. 5 - OVERALL INPUT I. F. RESPONSE CURVE

FIG. 6 - R. F. RESPONSE CURVE



P- PICTURE CARRIER MARKER 100% RESPONSE, MINUS 20% TOLERANCE
S-SOUND CARRIER MARKER 90% RESPONSE, PLUS 10% MINUS 20% TOLERANCE

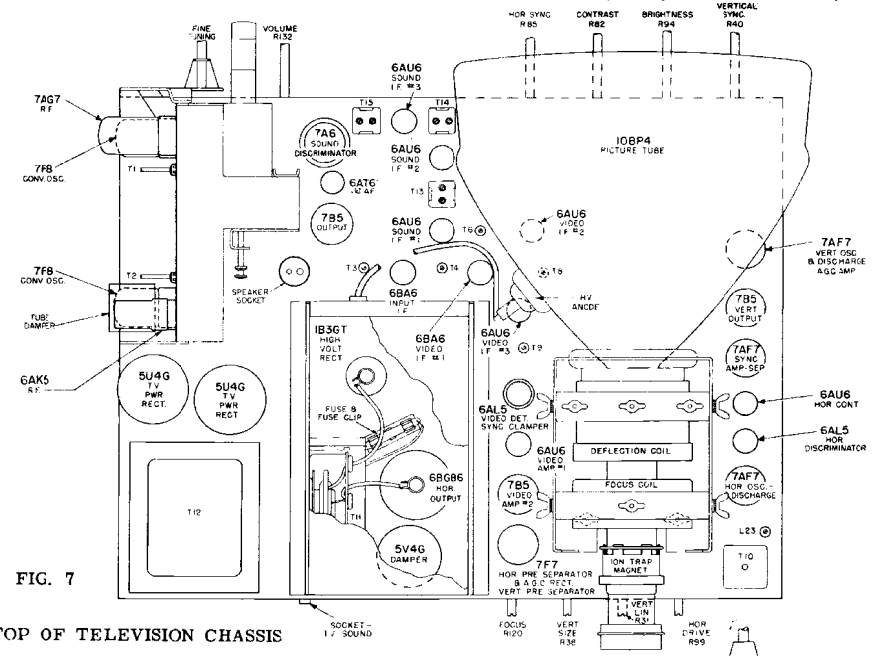


FIG. 7

TOP OF TELEVISION CHASSIS

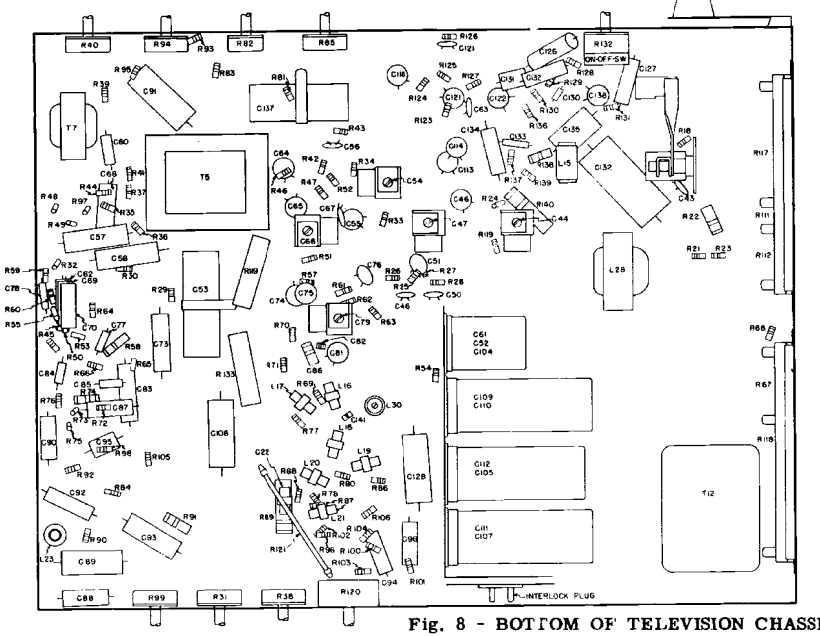


Fig. 8 - BOTTOM OF TELEVISION CHASSIS

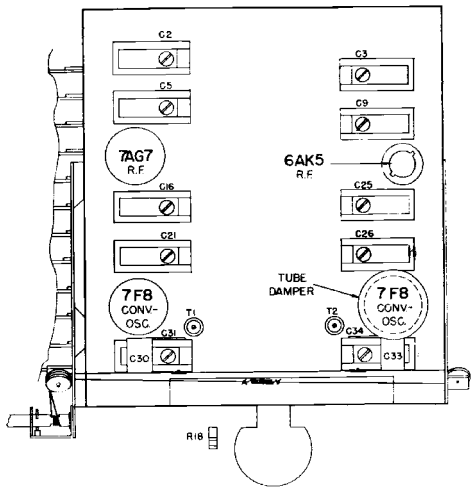


FIG. 9 - TOP OF TUNER UNIT

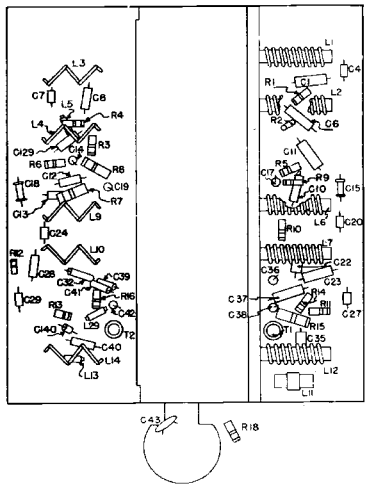


FIG. 10 - BOTTOM OF TUNER UNIT

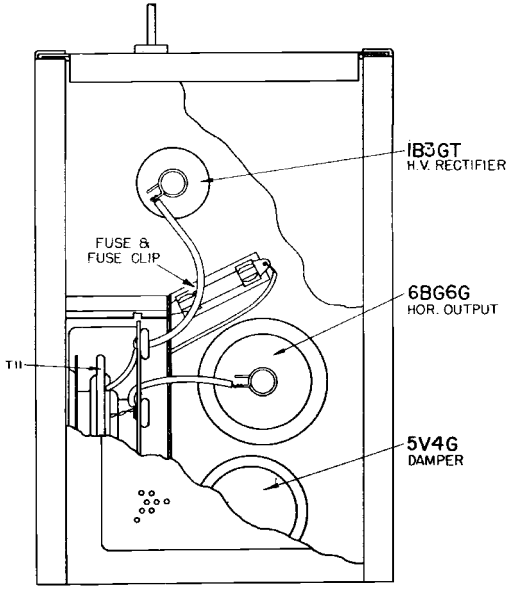


FIG. 11 - TOP OF H. V. SCANNING CASE

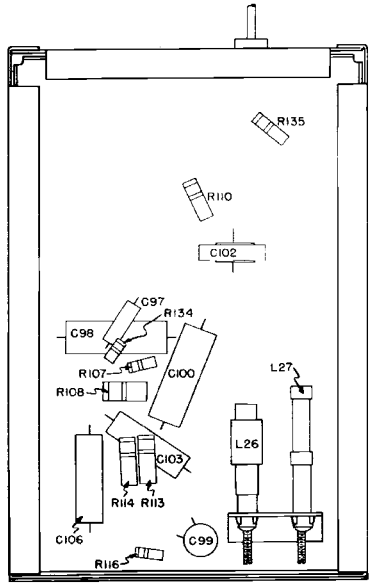
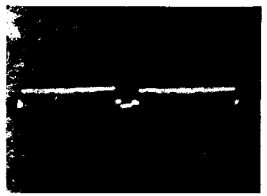
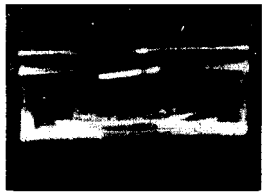


FIG. 12 - BOTTOM OF H. V. SCANNING CASE

WAVE FORM MEASUREMENTS

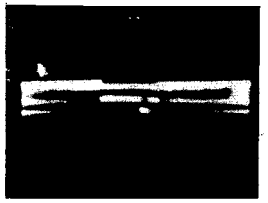


6AU6 1st Video Amplifier.
Control Grid (Test Point 1)
3 Volts P to P (Horizontal)

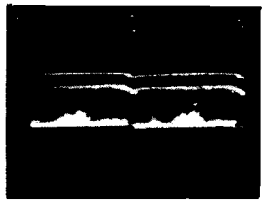


6AU6 1st Video Amplifier.
Plate (Test Point 2) 20 Volts
P to P. (60 Cycle Sine Wave
Sweep)

7B5 2nd Video Amplifier.
Plate (Test Point 3)
65 Volts P to P. (Horizontal)
Contrast Control Maximum
Brightness Control Minimum.

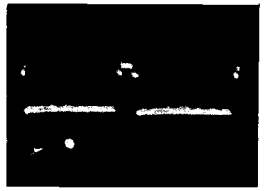


6AU6 1st Video Amplifier.
Control Grid (Test Point 1)
3 Volts P to P.
(60 Cycle Sine Wave Sweep)



6AU6 1st Video Amplifier.
Plate (Test Point 2)
20 Volts P to P. (Vertical)

7B5 2nd Video Amplifier.
Plate (Test Point 3)
65 Volts P to P.
(60 Cycle Sine Wave Sweep)
Contrast Control Maximum
Brightness Control Minimum



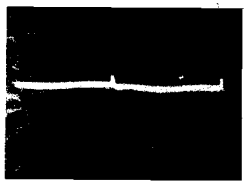
6AU6 1st Video Amplifier.
Plate (Test Point 2)
20 Volts P to P. (Horizontal)

7B5 2nd Video Amplifier.
Plate (Test Point 3)
65 Volts P to P. (Vertical)
Contrast Control Maximum
Brightness Control Minimum.

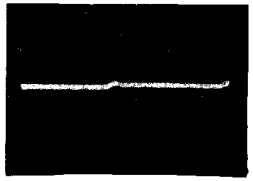
NOTE 1: The Peak to Peak (P to P) voltages of the above Wave Forms are dependent on the depth of modulation of the transmitter signal; voltages shown above are obtained when modulation is approximately 90 per cent.

NOTE 2: The bend in the vertical sync. and blanking period is due to the operation of the AGC system and has no effect on the received picture.

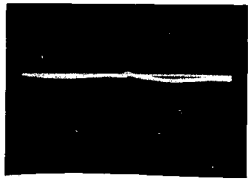
WAVE FORM MEASUREMENTS



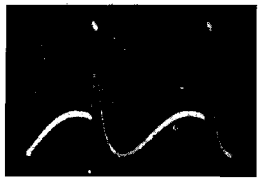
7F7 Hor. Preseparator, AGC Rect. & Vert. Preseparator. Cathode of AGC Rect. & Hor. Presep. (Test Point 4) 1.5 Volts P to P. (Vertical)



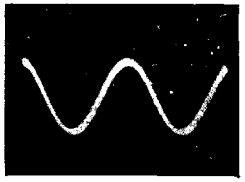
7F7 Hor. Preseparator, AGC Rect. & Vert. Preseparator. Cathode of AGC Rect. & Hor. Presep. (Test Point 4) 0.5 Volts P to P. (Horizontal)



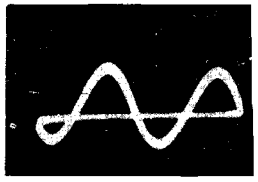
7F7 Hor. Preseparator, AGC Rect. & Vert. Preseparator. Cathode of Vert. Separator (Test Point 5) 0.5 Volts P to P. (Vertical)



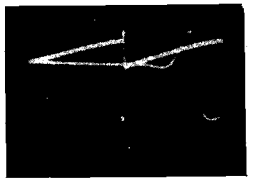
6AL5 AFC Disc. Diode Plate (Test Point 10) 30 Volts total P to P 10 Volts Sine Wave P to P. (Horizontal)



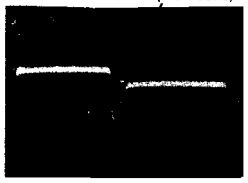
6AL5 AFC Disc. Diode Plate to Diode Plate (Test Point 10 to Test Point 11). Ground Lead of Oscilloscope to Pin 7 8 Volts P to P. (Horizontal)



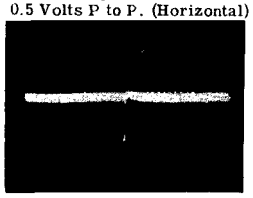
6AU6 Hor. Control. Plate (Test Point 12) 60 Volts P to P. (Horizontal)



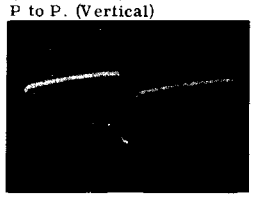
7AF7 Vert. Osc. & AGC Amplifier Plate of Vert. Osc. Section (Test Point 20) 160 Volts P to P. (Vertical)



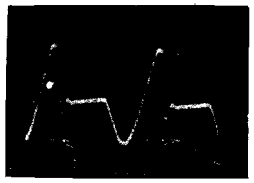
7F7 Hor. Preseparator, AGC Rect. & Vert. Preseparator. Plate of Vert. Preseparator (Test Point 6) 45 Volts P to P. (Horizontal)



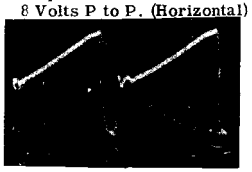
7F7 Hor. Preseparator, AGC Rect. & Vert. Preseparator (Test Point 6) 70 Volts P to P. (Vertical)



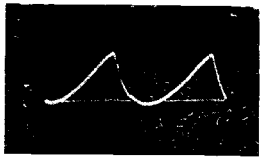
7F7 Hor. Preseparator, AGC Rect. & Vert. Preseparator. Plate of AGC Rect. & Hor. Preseparator (combined output from both sections of 7F7) Test Point 7, 25 Volts P to P. (Horizontal)



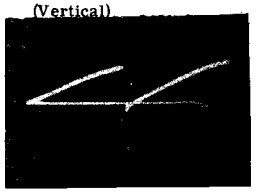
7AF7 Hor. Osc. & Disch. Plate of Osc. Section (Test Point 13) 120 Volts P to P. (Horizontal)



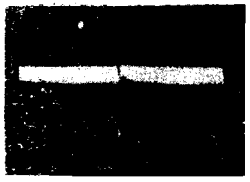
7AF7 Hor. Osc. & Disch. Plate of Disch. Section. (Test Point 14) 110 Volts P to P. (Horizontal)



6BG6G Hor. Output. Cathode (Test Point 15) 15 Volts P to P. (Horizontal)

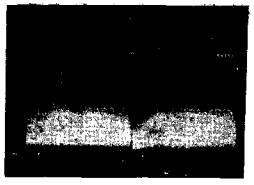


7B5 Vert. Output. Control Grid (Test Point 21) 125 Volts P to P. (Vertical)

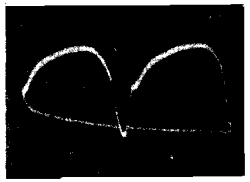


7F7 Hor. Preseparator, AGC Rect. & Vert. Preseparator. Plate of AGC Rect. & Hor. Preseparator (combined output from both sections of 7F7) Test Point 7, 30 Volts P to P. (Vertical)

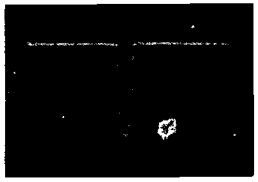
7AF7 Sync. Amplifier & Sync. Separator. Plate of Sync Amplifier (Test Point 8) 160 Volts P to P. (Horizontal)



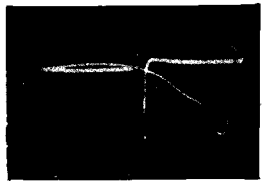
7AF7 Sync. Amplifier & Sync. Separator. Plate of Sync. Amplifier (Test Point 8) 160 Volts P to P. (Vertical)



5V4G Hor. Damper. Cathode (Test Point 16) 35 Volts P to P. (Horizontal)

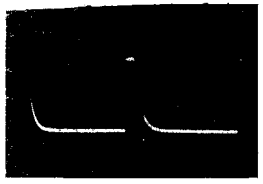


Input to Hor. Deflection Coils. (Test Point 17) 1100 Volts P to P. (Horizontal)

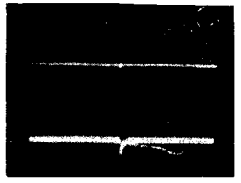


Vert. Sync. Integrating Network. (Test Point 18) 65 Volts P to P. (Vertical)

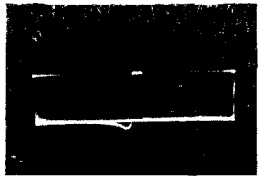
7B5 Vert. Output. Plate (Test Point 22) 700 Volts P to P. (Vertical)



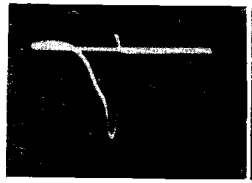
7AF7 Sync. Amplifier & Sync. Separator. Cathode of Sync. Separator (Test Point 9) 35 Volts P to P. (Horizontal)



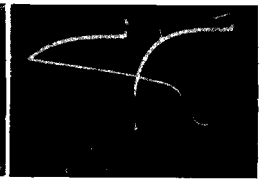
7AF7 Sync. Amplifier & Sync. Separator. Cathode of Sync. Separator (Test Point 9) 45 Volts P to P. (Vertical)



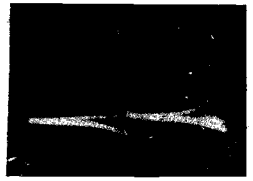
7AF7 Sync. Amplifier & Sync. Separator. Cathode of Sync. Separator (Test Point 9). 45 Volts P to P. (60 Cycle Sine Wave Sweep)



Vert. Sync. Integrating Network. (Test Point 18) 65 Volts P to P. (60 Cycle Sine Wave Sweep)



7AF7 Vert. Osc. & AGC Amplifier. Control Grid of Vert. Osc. (Test Point 19) 350 Volts P to P. (Vertical)



Input to Vert. Deflection Coils (Test Point 23). 70 Volts P to P. (Vertical)

Note 3: The term "60 Cycle Sine Wave" refers to the type of oscilloscope horizontal sweep employed.

Note 4: The above waveforms are taken with the oscilloscope horizontal sweep direction from left to right and with upward deflection corresponding to positive polarity.

Note 5: In some instances the waveforms obtained will not be identical with those shown, due to the electrical characteristics of the oscilloscope used.

TELEVISION SERVICE ADJUSTMENTS

ION TRAP MAGNET ADJUSTMENT

Rotate the front magnet or ring so that the gap is firmly positioned in line with the red mark on the ion trap magnet.

Slip the ion trap magnet on the neck of the picture tube with the ring magnet facing the front so that the arrow points toward the high voltage contact on the picture tube. See illustration

The ion trap rear magnet poles should be approximately over the ion trap flags in the picture tube. The ion trap flags are small, rectangular plates in the neck of the picture tube about 1 inch from the black base of the tube. Starting from this position, adjust the magnet by moving it forward or backward until the raster is observed. Rotate it slightly around the neck of the picture tube for the brightest raster on the screen, and at the same time reduce the brightness control setting until the raster is slightly above average brilliance. Adjust the focus control (on the rear apron) until the line structure of the raster is clearly visible. Readjust the ion trap magnet for maximum raster brilliance. The final touches on this adjustment should be made with the brightness control at the maximum position with which good line focus can be maintained.

DEFLECTION YOKE ADJUSTMENT

If the lines of the raster are not horizontal or squared with the picture mask, rotate the deflection yoke until this condition is obtained. Tighten the yoke adjustment wing screw.

Note: Be sure the deflection yoke as well as the picture tube mounting are positioned forward as far as possible against the flare of the picture tube.

PICTURE ADJUSTMENTS

It will now be necessary to obtain a test pattern picture in order to obtain further adjustments.

FOCUS COIL ADJUSTMENTS

If the corner of the raster is shadowed, it indicates that the electron beam is striking the neck of the tube. Loosen the focus coil adjustment wing nuts and slide the coil up or down, backward or forward until the entire raster is visible, properly centered and with no shadowed corners. Tighten the focus coil adjustment wing nuts with the coil in this position. The focus coil should be positioned as close to the deflection yoke as will permit the above adjustments to be made. This clearance should be 3/6 to 1/4 inch. See illustration on page 26.

CHECK OF HORIZONTAL OSCILLATOR ALIGNMENT

Turn the horizontal hold control (on the front panel) to the extreme counterclockwise position. The picture should remain in horizontal sync. Momentarily remove the signal by releasing the channel push button and then depressing it again. Normally the picture will pull into sync.

Turn the horizontal hold control to the extreme clockwise position. The picture should remain in sync. Momentarily remove the signal as noted above. Again the picture should normally pull into sync.

If the receiver passes the above checks and the picture is normal and stable, the horizontal oscillator is properly aligned. Skip "Alignment of Horizontal Oscillator" and proceed with "Height and Vertical Linearity Adjustments."

ALIGNMENT OF HORIZONTAL OSCILLATOR

If in the above check the receiver failed to hold sync with the hold control at either extreme or failed to pull into sync after momentary removals of the signal, make the adjustments under "Slight Retouching Adjustments," as noted below. If, after making these retouching adjustments, the receiver fails to pass the above checks or if the horizontal oscillator is completely out of adjustment, then make the adjustments under "Complete Realignment."

SLIGHT RETOUCHING ADJUSTMENTS

Tune in a television station and adjust the fine tuning control for best sound quality. Sync the picture and adjust the contrast control for normal contrast. Turn the horizontal hold control to the extreme position in which the oscillator fails to hold or to pull in. Turn the frequency adjustment on the top of horizontal discriminator transformer T10 until the oscillator pulls into sync. Check hold and pull-in for the both extreme positions of the hold control.

COMPLETE REALIGNMENT

Tune in a television station and adjust the fine tuning control for best sound quality.

Turn the frequency adjustment (transformer T10), until the picture is synchronized. (If the picture is not synchronized vertically, adjust the vertical hold). Adjust the picture controls for normal picture.

Turn the phase adjustment screw (bottom of Transformer T10) until the blanking bar, which may appear in the picture, moves to the right and off the raster. The range of this adjustment is such that it is possible to hit an unstable condition (ripples in the raster). The screw must be turned clockwise from the unstable position.

Turn the horizontal hold control on the front panel to the extreme counterclockwise position. Turn frequency adjustment screw clockwise until the picture falls out of sync. Then turn it slowly counterclockwise to the point where the picture falls in sync again.

Readjust phase adjustment so that the left side of the picture is close to the left side of the raster, but does not begin to fold over.

Turn horizontal hold to extreme clockwise position. The right side of the picture should be close to the right side of the raster, but should not begin to fold over. If it does, readjust the phase.

Momentarily remove the signal as noted above. When the signal is restored, the picture should fall in sync. If it doesn't, turn the frequency adjustment counterclockwise until the picture falls in sync.

Turn horizontal hold to extreme counterclockwise position. Remove the signal momentarily as noted above. When the signal is restored, the picture should fall in sync.

NOTE: If the picture does not pull in sync after momentary removals of signal in both extreme positions of horizontal hold, the pull-in range may be inadequate, though not necessarily. A pull-in through 3/4 of the hold control range may still be satisfactory.

There is a difference between the pull-in range and hold-in range of frequencies. Once in sync, the circuit will hold 50% to 100% more variation in frequency that it can pull in. The range of the horizontal hold control is only approximately equal to the pull-in range. Considerable variation may be found due to variations in the cut-off characteristic of the horizontal oscillator control tubes.

Now that a picture has been obtained we may proceed with the picture adjustments.

Adjust the electrical focusing adjustment for maximum definition in the vertical wedge of the test pattern.

HEIGHT AND VERTICAL LINEARITY ADJUSTMENTS

Adjust the height control (on rear apron) until the picture fills the screen vertically. Adjust vertical linearity (on rear apron) until the test pattern is symmetrical from top to bottom. Adjustment of either control will require a readjustment of the other. If necessary adjust vertical centering by means of the focus coil to align the picture with the mask.

WIDTH AND HORIZONTAL LINEARITY ADJUSTMENTS

Turn the horizontal drive (on rear apron) clockwise as far as possible without causing crowding of the right of the picture. This position provides maximum high voltage to the picture tube second anode. Adjust the horizontal linearity control until the test pattern is symmetrical left to right. A slight readjustment of the horizontal drive control may be necessary when the linearity control is used. Adjust the width control until the picture just fills the screen horizontally. If necessary adjust horizontal centering by means of the focus coil to align the picture with the mask.

FOCUS

Adjust the focus control for maximum definition in the test pattern vertical "wedge".

Check to see that all adjustment wing nuts of the deflection yoke and focus coil are tight.

REPAIR PARTS LIST

SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION
	R65472	Anode Connector & Lead Assy.
	R65737	Antenna Board Assy.
	R62150	Base - Tube Shield - for 6AK5 R.F. Amplifier
	R67090	Base - Tube Shield - for 6AL5 Video Det. & Sync Clamper
	R70003	Button Assy. - Push - #2
	R70004	Button Assy. - Push - #3
	R70005	Button Assy. - Push - #4
	R70006	Button Assy. - Push - #5
	R70007	Button Assy. - Push - #6
	R70008	Button Assy. - Push - #7
	R70009	Button Assy. - Push - #8
	R70010	Button Assy. - Push - #9
	R70011	Button Assy. - Push - #10
	R70012	Button Assy. - Push - #11
	R70013	Button Assy. - Push - #12
	R70014	Button Assy. - Push - #13
	R65464	Cable & Socket Assy. - Cathode Ray Tube
	R67197	Cable - Coaxial (32")
	R67198	Cable - Coaxial (6-3/4")
	R67195	Cable Assy. - Coaxial (13-1/2")
	R67196	Cable Assy. - Coaxial (12-1/2")
C62,C69,C88,C132,C136		Capacitor - .005 Mfd. - 600 V.
C87,C90		Capacitor - .004 Mfd. - 600 V.
C70		Capacitor - .002 Mfd. - 600 V.
C98		Capacitor - .001 Mfd. - 600 V.
C73,C83,C93,C106,C126		Capacitor - .05 Mfd. - 600 V.
C103		Capacitor - .03 Mfd. - 600 V.
C92,C94,C127,C134		Capacitor - .01 Mfd. - 600 V.
C91,C108,C128		Capacitor - 0.2 Mfd. - 600 V.
C57,C58,C98,C100		Capacitor - 0.1 Mfd. - 600 V.
C20,C140		Capacitor - 1.0 Mmfd. - Ceramic
C7,C24,C124		Capacitor - 1.5 Mmfd. - Ceramic
C4,C27,C29		Capacitor - 2.2 Mmfd. - Ceramic
C82		Capacitor - 3.3 Mmfd. - Ceramic
C131	R63844	Capacitor - 4.7 Mmfd. - Ceramic
C1		Capacitor - 6.0 Mmfd. - Ceramic
C105,C111	R65482	Capacitor - Electrolytic 40 Mfd. - 500 V. 40 Mfd. - 400 V.
C52,C61,C104	R65483	Capacitor - Electrolytic 50 Mfd. - 100 V. 10 Mfd. - 450 V. 10 Mfd. - 450 V.
C109,C110	R65484	Capacitor - Electrolytic 60 Mfd. - 450 V. 80 Mfd. - 150 V.
C53	R65485	Capacitor - Electrolytic 100 Mfd. - 100 V.
C135	R59648	Capacitor - Electrolytic 25 Mfd. - 25 V.
C137	R67328	Capacitor - Electrolytic 40 Mfd. - 450 V.
C139	R70018	Capacitor - Electrolytic 10 Mfd. - 450 V.
L28	R67133	Choke - Filter
	R70065	Clip - Fuse
L25	R65454	Coil - Focus
L15	R65734	Coil - Heater Choke
L23,L26	R65453	Coil - Linearity Control
L10,L14	R63938	Coil - Oscillator
L12	R63833	Coil - Oscillator (Low Band)
L11	R63885	Coil - Oscillator Padder
L8	R63946	Coil - Padder
L5,L13,L29	R63947	Coil - Padder
L3,L4,L9	R63831	Coil - RF (High Band)
L1,L2,L6,L7	R63832	Coil - RF (Low Band)
L16,L21	R65474	Coil - Video Peaking #1
L17	R65497	Coil - Video Peaking #2
L22	R67122	Coil - Video Peaking #4
C37,C41,C86		Capacitor - 10 Mmfd. - Ceramic
C28,C35,C40		Capacitor - 25 Mmfd. - Ceramic
C15,C18,C130		Capacitor - 50 Mmfd. - Ceramic
C77,C84,C85		Capacitor - 100 Mmfd. - Ceramic
C8,C9,C10,C11,C12,C13, C22,C23,C32,C39,C102, C129		Capacitor - 500 Mmfd. - Ceramic
C97		Capacitor -1,000 Mmfd. - Ceramic
C43,C45,C46,C48,C50, C51,C55,C56,C63,C64, C65,C67,C74,C75,C76, C81,C99,C113,C114,C117.		Capacitor -5,000 Mmfd. - Ceramic
C118,C121,C122,C138		
C89	R67119	Capacitor - .015 Mfd. - 400 V. Polystrene
C78		Capacitor - 390 Mmfd. - Mica
C95,C131,C133		Capacitor - 680 Mmfd. - Mica
C60		Capacitor - 5,000 Mmfd. - Mica
C14,C17,C19,C36,C38,C42		Capacitor - 500 Mmfd. - Standoff
C68	R67093	Capacitor - Electrolytic 10 Mfd. - 25 V.
C107,C112	R65461	Capacitor - Electrolytic 40 Mfd. - 500 V. 40 Mfd. - 500 V.
L18,L19	R67123	Coil - Video Peaking #5
L20	R67143	Coil - Video Peaking #6
L24	R65461	Coil - Yoke - Deflection
L27	R65452	Coil - Width Control
L30	R70077	Coil - Trap - 4.5 Mc.
R85,R94	R65449	Control - Brightness & Horizontal Synchronization
R82	R65445	Control - Contrast
R120	R65450	Control - Focusing
R99	R65448	Control - Horizontal Drive
R132	R67307	Control - On-Off & Volume
R31	R67085	Control - Vertical Linearity
R38	R63869	Control - Vertical Size
R40	R65447	Control - Vertical Synchronization
	R41472	Cord - Drive String
	R63819	Core- Iron
	R65421	Cushion - Rubber
	R65420	Cushion - Strap
	R67335	Damper - Coil - Large
	R67336	Damper - Coil - Small
	R70090	Damper - Tube
	R63937	Escutcheon - Channel Buttons
	R70068	Fuse
	R65488	Glass - Picture Bezel
	R65150	Grommet - Rubber
	R67313	Interlock Cover & Cord Assy.
	R70057	Insulator - Capacitor
	R63427	Insulator - Coil Mtg.
	R61830	Insulator - Electrolytic Capacitor Mtg.
	R65424	Insulator - Tube Mtg.
	R70085	Knob - Brightness
	R70084	Knob - Contrast
	R70082	Knob - Fine Tuning
	R70083	Knob - Horizontal
	R70081	Knob - On-Off & Volume
	R70086	Knob - Vertical
	R66920	Leaflet - Customer Instruction
	R66921	Leaflet - Customer Technical
	R65489	Magnet - Ion Trap (Beam Bender)
	R70061	Mask - Tube
	R63940	Plate Assy. - Coil Mtg.
	R63492	Plug - 6 Prong
	R65476	Plug - 2 Prong
	R63825	Plunger Unit Assy.
	R61807	Pulley - Metal
R135	R67236	Resistor - 3.6 Ohm - 1/2 W.
R74	R67223	Resistor - 4.3 Ohm - 1/2 W.
R70		Resistor - 10 Ohm - 1/2 W.
R77		Resistor - 27 Ohm - 1/2 W.
R24,R33		Resistor - 82 Ohm - 1/2 W.
R26,R43,R48,R68, R83,R134		Resistor - 100 Ohm - 1/2 W.
R46,R57,R86,R122,R124		Resistor - 120 Ohm - 1/2 W.
R56		Resistor - 330 Ohm - 1/2 W.
R18		Resistor - 470 Ohm - 1/2 W.
R14		Resistor - 680 Ohm - 1/2 W.
R2,R3,R20,R25,R29,R34,R28 R52,R63,R66,R123,R125, R127		Resistor - 1,000 Ohm - 1/2 W.
R16,R30		Resistor - 1,200 Ohm - 1/2 W.
R19,R27,R60		Resistor - 2,200 Ohm - 1/2 W.
R1,R4,R9		Resistor - 2,700 Ohm - 1/2 W.
R36,R81		Resistor - 3,300 Ohm - 1/2 W.
R71		Resistor - 3,900 Ohm - 1/2 W.
R59,R80		Resistor - 4,700 Ohm - 1/2 W.
R45,R50,R62		Resistor - 8,200 Ohm - 1/2 W.
R5,R13,R49,R65,R78,R105		Resistor - 10,000 Ohm - 1/2 W.
R42,R87		Resistor - 15,000 Ohm - 1/2 W.
R11,R35,R51,R55, R69,R88,R90		Resistor - 22,000 Ohm - 1/2 W.
R47,R61,R84,R104,R106		Resistor - 27,000 Ohm - 1/2 W.
R93,R95		Resistor - 33,000 Ohm - 1/2 W.
R6,R96,R102,R126,R131		Resistor - 47,000 Ohm - 1/2 W.
R100		Resistor - 56,000 Ohm - 1/2 W.
R10,R12,R21,R44,R54, R116,R128,R129,R130		Resistor -100,000 Ohm - 1/2 W.
	R67186	Switch - Band Changing
T15	R65479	Transformer - Discriminator
T10	R57083	Transformer - Horizontal Discriminator
T11	R65441	Transformer - Horizontal Scanning
T1	R63932	Transformer - Output - (Low Band)
T2	R63933	Transformer - Output - (High Band)
T12	R57304	Transformer - Power - 60 C.
T13,T14	R65480	Transformer - Sound I.F.
T7	R65428	Transformer - Vertical Oscillator
T5	R65451	Transformer - Vertical Scanning
T3	R65427	Transformer - Input I.F.
T4,T6,T8,T9	R65426	Transformer - Video I.F. #1,#2,#3,#4
C30	R63431	Vane - Vernier Trimmer (L.H.)
C33	R63432	Vane - Vernier Trimmer (R.H.)

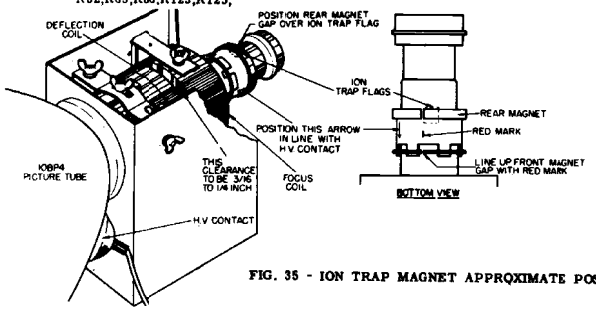


FIG. 35 - ION TRAP MAGNET APPROXIMATE POSITION

Except for run of the first 50 Television Receiver Chassis 101.854, the Sound Discriminator Transformer T15 is constructed so that capacitors C123 and C125 are fixed. Tuning of the primary and secondary coils is now accomplished by iron core slugs; the primary coil being accessible from the bottom of the chassis, the secondary coil from the top of Transformer T15.

The "Sound Discriminator and I.F. Alignment" and the "Caution" note under Test Equipment of the Television Alignment Procedure appearing below are revised and supersede those found in 57 RL 502.

SOUND DISCRIMINATOR AND I.F. ALIGNMENT

1. Connect the signal generator to pin 1 of 6BA6 input I.F. tube.
2. Connect the V. T. V. M. across 3900 Ohm Resistor R71 and tune signal generator for dip in response at 21.9 Mc.
3. Connect the V. T. V. M. across 47,000 Ohm Resistor R126. Adjust trimmers C120, C119, C116, and C115 of transformers T14 and T13 respectively for maximum negative indication on the meter; adjusting the signal generator to produce a meter reading of approximately 10 volts.
4. Connect the V. T. V. M. across 100,000 Ohm Resistor R129.
5. Tune the primary slug (under chassis) of discriminator transformer T15 for maximum output on the meter.
6. Connect the V. T. V. M. between pin 2 of the 7A6 sound detector and ground.
7. With the voltmeter on the extreme low scale, adjust the secondary slug (top of T15) of discriminator transformer T15 for "zero output" on the meter. Note that a positive or negative reading is possible when making this adjustment. This is why the discriminator must be adjusted for "zero output".
8. Repeat 4, 5, 6 and 7.
9. Connect the sweep generator to pin 1 of 6BA6, input I.F. tube and loosely couple the signal generator, set at 21.9 Mc. for use as a marker.
10. Connect the oscilloscope to pin 2 of 7A6 sound detector tube with a .01 mfd. capacitor in parallel.
11. Tune the sweep generator to 21.9 Mc. with a 1 Mc. sweep and view the pattern on the oscilloscope. The pattern should be similar to that shown in Figure 3 on page 6 of 57 RL 502.

CAUTION: The second anode lead to the picture tube has a potential of approximately 10,000 volts. To eliminate this high voltage hazard, remove the filament voltage to the 6BG6G Horizontal Output tube. Although the 6BG6G tube is in the H.V. Scanning Box, the filament supply can be removed by unsoldering the brown filament wire coming out of the H.V. Scanning Box, at the connecting point on the filament terminal board. In all cases, be sure the shell of the picture tube is grounded when the second anode lead is connected. Note. The 7AF7 Horizontal Oscillator and Discharge Tube must be pulled from its socket to remove the modulation on the Oscillograph.

The previous method specified for removal of this hazard was to disconnect the ungrounded filament lead to the 7AF7 Hor. Osc. and Disc. tube. Due to a recent change in circuit design, this method is no longer satisfactory. The removal of this filament lead eliminates all bias from the 6BG6G Hor. Output tube causing tube failure.

The following deletions have been made to the 101.854 chassis. The Television Repair Parts List appearing in 57 RL 502 should be revised accordingly.

SCHEMATIC LOCATION	PART NUMBER	DESCRIPTION
	R67090	Base - Tube Shield
C102		Capacitor - 500 Mmfd. - Ceramic
C99		Capacitor - 5000 Mmfd. - Ceramic
C53	R65485	Capacitor - Electrolytic 100 Mfd. - 100 V.
R138		Resistor - 560 Ohm - 1/2 W.
R30		Resistor - 1200 Ohm - 1/2 W.
R36		Resistor - 3300 Ohm - 1/2 W.
R107		Resistor - 470,000 Ohm - 1/2 W.
R136		Resistor - 4.7 Megohm - 1/2 W.
R91		Resistor - 3300 Ohm - 1 W.

Add the following to the same list:

	R70132	Base - Tube Shield
C53	R70091	Capacitor - Electrolytic 100 Mfd. - 60 V.
R99		Capacitor - .005 Mfd. - 600 V.
C102	R70154	Capacitor - 500 Mmfd. - 10,000 V.
R136		Resistor - 330 Ohm - 1/2 W.
R30		Resistor - 2200 Ohm - 1/2 W.
R36		Resistor - 3900 Ohm - 1/2 W.
R98		Resistor - 47,000 Ohm - 1/2 W.
R107		Resistor - 330,000 Ohm - 1/2 W.
R136		Resistor - 15 Megohm - 1/2 W.
R91		Resistor - 2200 Ohm - 1 W.

The revised and more positive complete alignment of this Horizontal Oscillator appearing below supersedes that in 57 RL 502 under Television Service Adjustments.

COMPLETE REALIGNMENT

A. Check that there is 11/16" of threaded rod visible on the horizontal "ringing" coil L23 (the rod is located on top the chassis immediately behind the horizontal discriminator transformer T10).

B. Tune in a television station and adjust the fine tuning control for best sound quality.

C. If necessary, turn the frequency adjustment screw (top of transformer T10) until the picture is synchronized horizontally. (If the picture is not synchronized vertically, adjust the vertical hold on the front panel of receiver).

D. Set the horizontal sync control (on front panel of receiver) approximately one-third of the rotation back from the fully clockwise position and remove the horizontal discriminator tube--type 6AL5 (located between tube 7AF7 and tube 6AU6).

E. Carefully turn the frequency adjustment screw (top of transformer T10) until the picture moves back and forth across the screen of the picture tube with the blanking bar vertical.

F. Insert the 6AL5 tube. The picture should "lock" in position horizontally. With the horizontal sync control still set approximately 1/3 of the rotation back from the fully clockwise position, check that there is approximately 1/4" of "blanking" visible on the right hand edge of the picture. In order to see the "blanking," it will be necessary to turn the contrast control almost to minimum and to readjust the brightness control.

G. If the check described in F does not give correct result, it will be necessary to turn the phase adjustment screw (underside of discriminator transformer T10) until the picture is correctly "phased" and the "blanking" width on the right-hand edge of the picture is as described in F.

H. If a phase adjustment has to be made, the procedure described in D and E should be repeated and then a final check of the "phasing," as described in F, must be made. It is important that both the "free-running" (D and E) and "phasing" (F) are correct.

I. The "pull-in" range of the circuit should now be checked. Turn the frequency adjustment screw (top of transformer T10) in a counterclockwise direction until the picture falls out of synchronization in the horizontal direction. Now slowly turn the frequency adjustment screw (top of transformer T10) in a clockwise direction until approximately four diagonal "blanking bars"

J. After checking the "pull-in" range, it is necessary to repeat the procedure described in D and E. This is important.

K. Set the horizontal sync control to the fully clockwise position and then select a "free" channel; i.e., a channel in which no signal is received. Now return to the channel already tuned in and used for the previous checks. The picture should immediately appear, correctly synchronized.

L. Turn the horizontal sync control to the fully counterclockwise position and repeat the check described in K.

M. Set the horizontal sync control approximately one-third of the rotation back from the fully clockwise position.

MODELS 8132, Ch. 101.854;
9122, Ch. 101.864

SCHEMATIC DIAGRAM FOR 101.854 TELEVISION CHASSIS

◊ - PART OF T4 ◈ - PART OF T6 ◊ - PART OF T8 ‡ - PART OF T9 + - PART OF L24
□ - CONTRAST CONTROL MINIMUM ⊛ - CONTRAST CONTROL MAXIMUM

TUBE SOCKETS ARE VIEWED FROM UNDER SOE OF CHASSIS.
VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL, WITH RECEIVER TUNED ON ONE OF CHANNELS 2-6, AND WITH LINE VOLTAGE AT 117 VOLTS. VOLTAGES ON HIGH BAND R.F. TUBES 6AH5 AND 7F8 ARE TAKEN WITH RECEIVER TUNED ON ONE OF CHANNELS 7-13. ALL VOLTAGE READINGS ARE TAKEN WITH A 20,000 OHM PER VOLT METER.

ALL CIRCLED NUMBERS 1 THROUGH 23 INDICATE TEST POINTS FOR THE WAVEFORM PHOTOGRAPHS FOUND IN 57 RL 502 PAGES 15,16,17 AND 18.

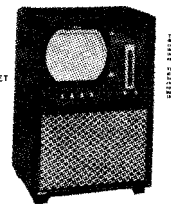
TUBE SOCKETS ARE VIEWED FROM UNDER SOE OF CHASSIS.
VOLTAGE READINGS SHOWN AT SOCKET PRONGS ARE TO CHASSIS, AND ARE TAKEN WITH NO SIGNAL, WITH RECEIVER TUNED ON ONE OF CHANNELS 2-6, AND WITH LINE VOLTAGE AT 117 VOLTS. VOLTAGES ON HIGH BAND R.F. TUBES 6AH5 AND 7F8 ARE TAKEN WITH RECEIVER TUNED ON ONE OF CHANNELS 7-13. ALL VOLTAGE READINGS ARE TAKEN WITH A 20,000 OHM PER VOLT METER.

ALL CIRCLED NUMBERS 1 THROUGH 23 INDICATE TEST POINTS FOR THE WAVEFORM PHOTOGRAPHS FOUND IN 57 RL 502 PAGES 15,16,17 AND 18.

SCHEMATIC DIAGRAM FOR 101.854 & 101.864 TELEVISION CHASSIS

NOTE.
1. 101.854 USES 10BP4
101.864 USES 12LP4

◊ - PART OF T4 ◈ - PART OF T6 ◊ - PART OF T8 ‡ - PART OF T9 + - PART OF L24
□ - CONTRAST CONTROL MINIMUM ⊛ - CONTRAST CONTROL MAXIMUM
△ PART OF T15



SPECIFICATIONS