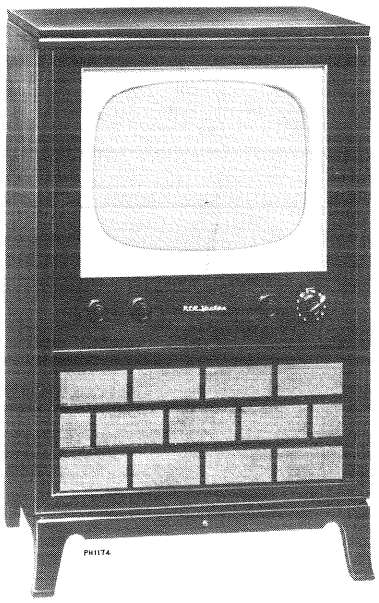


Model 7T111B
"Haywood"
Walnut, Mahogany or Oak

RCA VICTOR

TELEVISION RECEIVER
MODEL 7T111B

Chassis No. KCS47GF-2

— Mfr. No. 274 —

SERVICE DATA

— 1951 No. T10 —

PREPARED BY RCA SERVICE CO., INC.
FOR
RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.

GENERAL DESCRIPTION

Model 7T111B receivers employ nineteen tubes plus three rectifiers and a 17GP4 kinescope.

Features of the television unit are: full twelve channel coverage; Intercarrier FM sound system; improved picture brilliance; picture A-G-C; A-F-C horizontal hold; stabilized vertical hold; two stages of video amplification; noise saturation circuits; improved sync separator and clipper; four mc. band width for picture channel and reduced hazard high voltage supply. An auxiliary audio input jack is provided to permit the use of an external record playing attachment.

ELECTRICAL AND MECHANICAL SPECIFICATIONS

PICTURE SIZE.....146 square inches on a 17GP4 kinescope

R-F FREQUENCY RANGES

Channel Number	Channel Freq. Mc.	Picture Carrier Freq. Mc.	Sound Carrier Freq. Mc.	Receiver R-F Osc. Freq. Mc.
2	54-60	55.25	59.75	80.750
3	60-66	61.25	65.75	86.750
4	66-72	67.25	71.75	92.750
5	76-82	77.25	81.75	102.750
6	82-88	83.25	87.75	108.750
7	174-180	175.25	179.75	200.750
8	180-186	181.25	185.75	206.750
9	186-192	187.25	191.75	212.750
10	192-198	193.25	197.75	218.750
11	198-204	199.25	203.75	224.750
12	204-210	205.25	209.75	230.750
13	210-216	211.25	215.75	236.750

VIDEO RESPONSE.....To 4 mc.

SWEEP DEFLECTION.....Magnetic

FOCUS.....Electrostatic

POWER SUPPLY RATING.....115 volts, 60 cycles, 205 watts

AUDIO POWER OUTPUT RATING.....3.5 watts max.

LOUDSPEAKER (92580-4W).....8" PM Dynamic, 3.2 ohms

DIMENSIONS (inches)	Width	Height	Depth
Cabinet (outside).....	22⅞	36 1/16	19

WEIGHT Model	Chassis with Tubes in Cabinet	Shipping Weight
7T111B.....	92 lbs.....	111 lbs.

RECEIVER ANTENNA INPUT IMPEDANCE

Choice: 300 ohms balanced or 72 ohms unbalanced.

RCA TUBE COMPLEMENT

Tube Used	Function
(1) RCA 6CB6	R-F Amplifier
(2) RCA 6J6	R-F Oscillator and Mixer
(3) RCA 6AU6	1st Sound I-F Amplifier
(4) RCA 6AU6	2nd Sound I-F Amplifier
(5) RCA 6AL5	Sound Discriminator
(6) RCA 6AV6	1st Audio Amplifier
(7) RCA 6K6GT	Audio Output
(8) RCA 6AU6	1st Picture I-F Amplifier
(9) RCA 6CB6	2nd Picture I-F Amplifier
(10) RCA 6AU6	3rd Picture I-F Amplifier
(11) RCA 6CB6	4th Picture I-F Amplifier
(12) RCA 6AL5	Picture 2nd Detector and AGC Detector
(13) RCA 12AU7	1st and 2nd Video Amplifier
(14) RCA 12AU7	DC Restorer and Sync Separator
(15) RCA 6SN7GT	Sync Separator and Vertical Sweep Osc.
(16) RCA 6K6GT	Vertical Sweep Output
(17) RCA 6SN7GT	Horizontal Sweep Oscillator and Control
(18) RCA 6BG6G	Horizontal Sweep Output
(19) RCA 6W4GT	Damper
(20) RCA 1B3-GT/8016	High Voltage Rectifier
(21) RCA 17GP4	Kinescope
(22) RCA 5U4G	Rectifier
(23) RCA 1V2	Focus Rectifier

First Edition—First Printing. 8-31-51 Printed in U. S. A.

ELECTRICAL AND MECHANICAL SPECIFICATIONS
(Continued)

PICTURE INTERMEDIATE FREQUENCIES

Picture Carrier Frequency	25.50 mc.
Adjacent Channel Sound Trap	27.00 mc.
Accompanying Sound Traps	21.00 mc.
Adjacent Channel Picture Carrier Trap	19.50 mc.

SOUND INTERMEDIATE FREQUENCIES

Sound Carrier Frequency	4.5 mc.
Sound Discriminator Band Width between peaks	400 kc

VIDEO RESPONSE	To 4 mc.
FOCUS	Electrostatic
SWEEP DEFLECTION	Magnetic
SCANNING	Interlaced, 525 line
HORIZONTAL SWEEP FREQUENCY	15,750 cps
VERTICAL SWEEP FREQUENCY	60 cps
FRAME FREQUENCY (Picture Repetition Rate)	30 cps

OPERATING CONTROLS (Front Panel)

Channel Selector, Fine Tuning	Dual Control Knobs
Picture Brightness	Dual Control Knobs
Picture Horizontal Hold, Picture Vertical Hold	Dual Control Knobs
Sound Volume and On-Off Switch, Tone Control	Dual Control Knobs

NON-OPERATING CONTROLS (not including r-f and i-f adjustments)

Picture Centering	top chassis adjustment
Width	rear chassis adjustment
Height	rear chassis adjustment
Horizontal Linearity	rear chassis screwdriver adjustment
Vertical Linearity	rear chassis adjustment
Horizontal Drive	rear chassis screwdriver adjustment
Horizontal Oscillator Frequency	top chassis adjustment
Horizontal Oscillator Waveform	bottom chassis adjustment
Horizontal Locking Range	rear chassis adjustment
Focus	top chassis adjustment
Ion Trap Magnet	top chassis adjustment
Deflection Coil	top chassis wing nut adjustment
AGC Control Switch	rear chassis adjustment

HIGH VOLTAGE WARNING

OPERATION OF THIS RECEIVER OUTSIDE THE CABINET OR WITH THE COVERS REMOVED, INVOLVES A SHOCK HAZARD FROM THE RECEIVER POWER SUPPLIES. WORK ON THE RECEIVER SHOULD NOT BE ATTEMPTED BY ANYONE WHO IS NOT THOROUGHLY FAMILIAR WITH THE PRECAUTIONS NECESSARY WHEN WORKING ON HIGH VOLTAGE EQUIPMENT. DO NOT OPERATE THE RECEIVER WITH THE HIGH VOLTAGE COMPARTMENT SHIELD REMOVED.

KINESCOPE HANDLING PRECAUTIONS

DO NOT REMOVE THE RECEIVER CHASSIS, INSTALL, REMOVE OR HANDLE THE KINESCOPE IN ANY MANNER UNLESS SHATTERPROOF GOGGLES, AND HEAVY GLOVES ARE WORN. PEOPLE NOT SO EQUIPPED SHOULD BE KEPT AWAY WHILE HANDLING KINESCOPES. KEEP THE KINESCOPE AWAY FROM THE BODY WHILE HANDLING.

The kinescope bulb encloses a high vacuum and, due to its large surface area, is subjected to considerable air pressure. For this reason, the kinescope must be handled with more care than ordinary receiving tubes.

The large end of the kinescope bulb — particularly that part at the rim of the viewing surface — must not be struck, scratched or subjected to more than moderate pressure at any time. During service if the tube sticks or fails to slip smoothly into its socket, or deflecting yoke, investigate and remove the cause of the trouble. Do not force the tube. Refer to the Receiver Installation section for detailed instructions on kinescope installation. All RCA replacement kinescopes are shipped in special cartons and should be left in the cartons until ready for installation in the receiver.

The following adjustments are necessary when turning the receiver on for the first time.

1. Turn the TV-PH switch on the front panel to the "TV" position.

2. Turn the receiver "ON" and advance the SOUND VOLUME control to approximately mid-position.

3. Set the STATION SELECTOR to the desired channel.

4. Adjust the FINE TUNING control for best sound fidelity and the SOUND VOLUME control for suitable volume.

5. Turn the BRIGHTNESS control fully counter-clockwise, then clockwise until a light pattern appears on the screen.

6. Adjust the VERTICAL hold control until the pattern stops vertical movement.

7. Adjust the HORIZONTAL hold control until a picture is obtained and centered.

8. Adjust the PICTURE and BRIGHTNESS controls for suitable picture contrast and brightness.

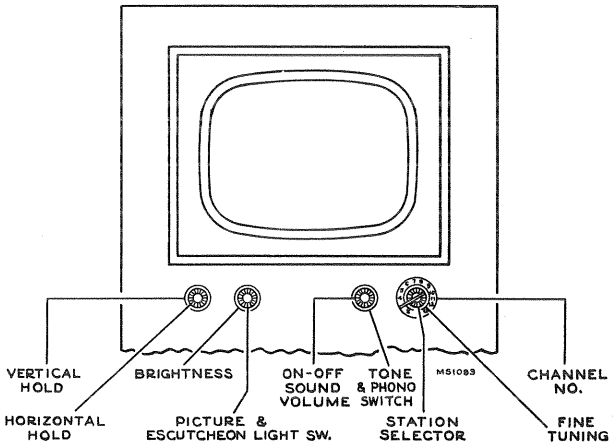


Figure 1—Receiver Operating Controls

9. After the receiver has been on for some time, it may be necessary to readjust the FINE TUNING control slightly for improved sound fidelity.

10. In switching from one channel to another, it may be necessary to repeat steps 4 and 8.

11. When the set is turned on again after an idle period it should not be necessary to repeat the adjustments if the positions of the controls have not been changed. If any adjustment is necessary, step number 4 is generally sufficient.

12. If the positions of the controls have been changed, it may be necessary to repeat steps 2 through 8.

13. To use a record player, plug the record-player output cable into the PHONO jack on the rear apron, and set the TV-PH switch to "PH."

14. To turn on station escutcheon light, pull out on picture control knob, and push in to turn off.

INSTALLATION INSTRUCTIONS

UNPACKING. — These receivers are shipped complete in cardboard cartons. The kinescope is shipped in place in the receiver.

Take the receiver out of the carton and remove all packing material.

Install the control knobs on the proper control shafts.

Make sure that all tubes are in place and are firmly seated in their sockets.

Check to see that the kinescope high voltage lead clip is in place.

Connect the antenna transmission line to the receiver antenna terminals. Plug a power cord into the 115 volt a-c power source and into the receiver interlock receptacle. Turn the receiver power switch to the "on" position, the brightness control fully clockwise, and the picture control counter-clockwise.

ION TRAP MAGNET ADJUSTMENT. — Set the ion trap magnet approximately in the position shown in Figure 2. Starting from this position immediately adjust the magnet by moving it forward or backward at the same time rotating it slightly around the neck of the kinescope for the brightest raster on the screen. Reduce the brightness control setting until the raster is slightly above average brilliance. Turn the focus control (shown in Figure 2) until the line structure of the raster is clearly visible. Readjust the ion trap magnet for maximum raster brilliance. The final touches of this adjustment should be made with the brightness control at the maximum clockwise position with which good line focus can be maintained.

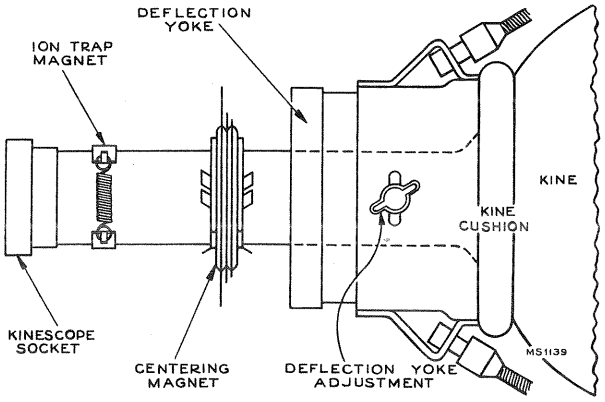


Figure 2—Yoke and Focus Magnet Adjustments

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.

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

If the Horizontal Oscillator and AGC System are operating properly, it should be possible to sync the picture at this point. However, if the AGC control is misadjusted, and the receiver is overloading, it may be impossible to sync the picture.

If the receiver is overloading, turn S106 on the rear apron (see Figure 3) counter-clockwise until the set operates normally and the picture can be synced.

CHECK OF HORIZONTAL OSCILLATOR ALIGNMENT. — Turn the horizontal hold control to the extreme counter-clockwise position. The picture should remain in horizontal sync. Momentarily remove the signal by switching off channel then back. Normally the picture will be out of sync. Turn the control clockwise slowly. The number of diagonal black bars will be gradually reduced and when only 2 bars sloping downward to the left are obtained, the picture will pull into sync upon slight additional clockwise rotation of the control. Pull-in should occur when the control is approximately 90 degrees from the extreme counter-clockwise position. The picture should remain in sync for approximately 90 degrees of additional clockwise rotation of the control. At the extreme clockwise position, the picture should be out of sync and should show 1 vertical or diagonal black bar in the raster.

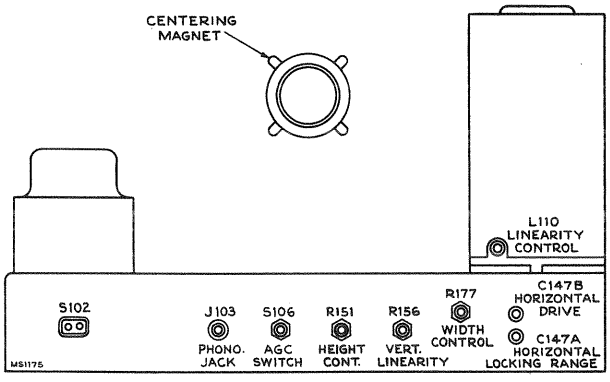


Figure 3—Rear Chassis Adjustments

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 "Focus Magnet Adjustment."

ALIGNMENT OF HORIZONTAL OSCILLATOR. — If in the above check the receiver failed to hold sync with the hold control at the extreme counter-clockwise position or failed to hold sync over 90 degrees of clockwise rotation of the control from the pull-in point, it will be necessary to make the following adjustments.

Horizontal Frequency Adjustment. — Turn the horizontal hold control to the extreme clockwise position. Tune in a television station and adjust the T108 horizontal frequency adjustment on top of the chassis until the picture is just out of sync and the horizontal blanking appears as a vertical or diagonal black bar in the raster.

Horizontal Locking Range Adjustment. — Set the horizontal hold control to the full counter-clockwise position. Momentarily remove the signal by switching off channel then back. The picture may remain in sync. If so turn the T108 top core slightly and momentarily switch off channel. Repeat until the picture falls out of sync with the diagonal lines sloping down to the left. Slowly turn the horizontal hold control clockwise and note the least number of diagonal bars obtained just before the picture pulls into sync.

If more than 2 bars are present just before the picture pulls into sync, adjust the horizontal locking range trimmer C147A slightly clockwise. If less than 2 bars are present, adjust C147A slightly counter-clockwise. Turn the horizontal hold control counterclockwise, momentarily remove the signal and recheck the number of bars present at the pull-in point. Repeat this procedure until 2 bars are present.

Repeat the adjustments under "Horizontal Frequency Adjustment" and "Horizontal Locking Range Adjustment" until the conditions specified under each are fulfilled. When the horizontal hold operates as outlined under "Check of Horizontal Oscillator Alignment" the oscillator is properly adjusted.

If it is impossible to sync the picture at this point and the AGC system is in proper adjustment it will be necessary to adjust the Horizontal Oscillator by the method outlined in the alignment procedure on page 11. For field purposes paragraph "A" under Horizontal Oscillator Waveform Adjustment may be omitted.

CENTERING ADJUSTMENT. — These receivers employ electrostatic kinescopes and are provided with special centering magnets. These magnets are in the form of two wire rings mounted on a non-magnetic tube which is placed around the neck of the kinescope at a distance of about three-fourths of an inch in back of the deflection yoke. When the magnets are rotated on the tube so that the gaps in the rings are together, maximum centering effect is produced. To shift the picture, rotate one of the magnets with respect to the other. To shift the picture in the desired direction rotate the entire centering magnet assembly on the neck of the kinescope. By alternately rotating one magnet with respect to the other, then rotating the entire assembly around the neck of the tube, proper centering of the picture can be obtained.

It is important that the centering magnets not be operated too close to the yoke as the a-c field from the yoke may cause the centering magnets to become demagnetized.

WIDTH, DRIVE AND HORIZONTAL LINEARITY ADJUSTMENTS. — Adjustment of the horizontal drive control affects the high voltage applied to the kinescope. In order to obtain the highest possible voltage hence the brightest and best focused picture, adjust horizontal drive counter-clockwise as far as possible without stretching the left side of the picture. As a first adjustment, set the horizontal drive trimmer C147B one-half turn out from maximum capacity.

Turn the horizontal linearity coil out until appreciable loss in width occurs, then in until nearly maximum width and the best linearity is obtained.

Adjust the width control R177 to obtain correct picture width.

A slight readjustment of these three controls may be necessary to obtain the best linearity.

HEIGHT AND VERTICAL LINEARITY ADJUSTMENTS. —Adjust the height control (R151 on chassis rear apron) until the picture fills the mask vertically. Adjust vertical linearity (R156 on rear apron), until the test pattern is symmetrical from top to bottom. Adjustment of either control will require a readjustment of the other. Adjust centering to align the picture with the mask.

FOCUS. — Set the brightness control for average brightness. Set the focus control slightly counter-clockwise from the position of best focus. Adjust the ion trap magnet for maximum brightness. Within the range of maximum brightness, a region of best focus will occur. Set the ion trap magnet within this region of best focus. This adjustment is critical if optimum focus is to be obtained. Do not use the ion trap magnet as a centering adjustment. Center the picture with the centering magnet. Repeat the above procedure until no improvement is obtained.

With the picture at average brightness, focus the receiver on the vertical wedge of a test pattern. The horizontal lines of the raster should be in focus or nearly so. If it is necessary to compromise between wedge focus and raster line focus, favor the wedge focus as long as the raster lines are visible. Normally at low brightness the center of the picture is in sharpest focus. At maximum useable brightness, best focus will be obtained near the edges of the picture. This condition gives best average focus with changes in brightness.

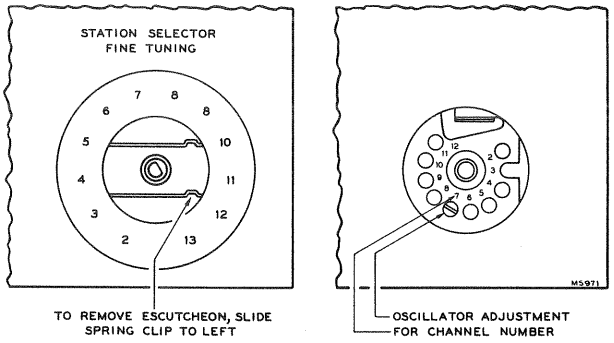


Figure 4—R-F Oscillator Adjustments

CHECK OF R-F OSCILLATOR ADJUSTMENTS. — Tune in all available stations to see if the receiver r-f oscillator is adjusted to the proper frequency on all channels. If adjustments are required, these should be made by the method outlined in the alignment procedure on page 10. The adjustments for channels 2 through 12 are available from the front of the cabinet by removing the station selector escutcheon as shown in Figure 4. Adjustment of channel 13 is on top of the chassis.

AGC CONTROL. — The AGC control switch is provided as an installation adjustment. The normal position for strong signal areas is with the switch in the number 1 or counter-clockwise position. If impulse type of interference is experienced, turn the switch to the number 2 or center position. In very weak signal areas in which impulse type interference is experienced, turn the switch to position number 3 or fully clockwise. In this position, all AGC is removed and the receiver will overload if the input signal exceeds 200 microvolts. However, for signals under 200 microvolts, this position of the AGC control switch gives best noise immunity of sync.

FM TRAP ADJUSTMENT. — In some instances interference may be encountered from a strong FM station signal. A trap is provided to eliminate this type of interference. To adjust the trap tune in the station on which the interference is observed and adjust the L203 core on top of the r-f unit for minimum interference in the picture.

CAUTION. — In some receivers, the FM trap L203 will tune down into channel 6 or even into channel 5. Needless to say, such an adjustment will cause greatly reduced sensitivity on these channels. If channels 5 or 6 are to be received, check L203 to make sure that it does not affect sensitivity at these two channels.

Replace the cabinet back and reconnect the antenna leads to the cabinet back.

CABINET ANTENNA. — A cabinet antenna is provided and the leads are brought out near the antenna terminal board. The cabinet antenna may be employed in place of the outdoor antenna in areas where the signals are strong and no reflections are experienced.

CHASSIS REMOVAL. — To remove the chassis from the cabinet for repair or installation of a new kinescope, remove the control knobs, the cabinet back, unplug the speaker cable, the kinescope socket, the antenna cable, the pilot light cable, the yoke cable, the high voltage cable and the yoke frame grounding strap. Take out the four chassis bolts under the cabinet. Withdraw the chassis from the back of the cabinet.

KINESCOPE HANDLING PRECAUTION. — Do not install, remove, or handle the kinescope in any manner, unless shatterproof goggles and heavy gloves are worn. People not so equipped should be kept away while handling the kinescope. Keep the kinescope away from the body while handling.

To remove the kinescope from the cabinet, loosen the two nuts and disengage the rods alongside the kinescope. Remove the wing screw which holds the yoke frame to the cabinet. Remove the kinescope, the yoke frame with yoke and centering magnet as an assembly.

INSTALLATION OF KINESCOPE. — Handle this tube by the metal rim at the edge of the screen. Do not cover the glass bell of the tube with fingermarks as it will produce leakage paths which may interfere with reception. If this portion of the tube has inadvertently been handled, wipe it clean with a soft cloth moistened with "dry" carbon tetrachloride.

Wipe the kinescope screen surface and front panel safety glass clean of all dust and fingermarks with a soft cloth moistened with "Windex" or similar cleaning agent.

Turn the tube so that the key on the base of the tube will be down and insert the neck of the kinescope through the deflection coil. If the tube sticks, or fails to slip into place smoothly, investigate and remove the cause of the trouble. Do not force the tube.

Replace the kinescope and yoke frame assembly in the cabinet. Insert the wing screw and tighten. Engage the two side rods into the yoke frame and tighten the two nuts. Slide the deflection yoke as far forward as possible. If this is not done, difficulty will be encountered in adjusting the ion trap and focus magnet because of shadows on the corner of the raster.

Slide the chassis into the cabinet, then insert and tighten the four chassis bolts.

Slip the centering magnet and ion trap magnet over the neck of the kinescope.

Connect the kinescope socket to the tube base and connect the high voltage lead from the rim of the kinescope into the high voltage bushing on the high voltage compartment.

Reconnect all other cables. Do not forget to replace the yoke frame grounding strap. Perform the entire set-up procedure beginning with Ion Trap Magnet Adjustment.

ANTENNAS. — The finest television receiver built may be said to be only as good as the antenna design and installation. It is therefore important to select the proper antenna to suit the particular local conditions, to install it properly and orient it correctly.

If two or more stations are available and the two stations are in different directions, it may be possible to make a compromise orientation which will provide a satisfactory signal on all such channels.

If it is impossible to obtain satisfactory results on one or more channels, it may become necessary either to provide means for turning the antenna when switching channels or to install a separate antenna for one or more channels and to switch antennas when switching channels.

In some cases, the antenna should not be installed permanently until the quality of the picture reception has been observed on a television receiver. A temporary transmission line can be run between receiver and the antenna, allowing sufficient slack to permit moving the antenna. Then, with a telephone system connecting an observer at the receiver and an assistant at the antenna, the antenna can be positioned to give the most satisfactory results on the received signal. A shift of direction or a few feet in antenna position may effect a tremendous difference in picture reception.

REFLECTIONS.—Multiple images sometimes known as echoes or ghosts, are caused by the signal arriving at the antenna by two or more routes. The second or subsequent image occurs when a signal arrives at the antenna after being reflected off a building, a hill or other object. In severe cases of reflections, even the sound may be distorted. In less severe cases, reflections may occur that are not noticeable as reflections but that will instead cause a loss of definition in the picture.

Depending upon the circumstances and the type of antenna employed, it may be possible to eliminate the reflections by rotating the antenna or by moving it to a new location. In some cases it may be desirable to employ an antenna with a sharp beam pattern and a high front to back ratio such as a Yagi cut to channel. In extreme cases, it may be impossible to eliminate the reflection.

Under certain extremely unusual conditions, it may be possible to rotate or position the antenna so that it receives the cleanest picture over a reflected path. If such is the case, the antenna should be so positioned. However, such a position may give variable results as the nature of reflecting surfaces may vary with weather conditions. Wet surfaces have been known to have different reflecting characteristics than dry surfaces.

INTERFERENCE. — Auto ignition, street cars, electrical machinery and diathermy apparatus may cause interference which spoils the picture. Whenever possible, the antenna location should be removed as far as possible from highways, hospitals, doctors' offices and similar sources of interference. In mounting the antenna, care must be taken to keep the antenna rods at least ¼ wave length (at least 6 feet) away from other antennas, metal roofs, gutters or other metal objects.

Short-wave radio transmitting and receiving equipment may cause interference in the picture in the form of moving ripples. In some instances it may be possible to eliminate the interference by the use of a trap in the antenna transmission line. However, if the interfering signal is on the same frequency as the television station, a trap will provide no improvement.

WEAK PICTURE. — When the installation is near the limit of the area served by the transmitting station, the picture may be speckled, having a "snow" effect, and may not hold steady on the screen. This condition is due to lack of signal strength from the transmitter.

In such weak signal areas, it may be desirable to employ an antenna cut for the particular station which it is desired to receive. The received signal can often be improved by "stacking" two such antennas.

RECEIVER LOCATION. — The owner should be advised of the importance of placing the receiver in the proper location in the room.

The location should be chosen—

—Away from bright windows and so that no bright light will fall directly on the screen. (Some illumination in the room is desirable, however.)

—To give easy access for operation and comfortable viewing.

—To permit convenient connection to the antenna.

—Convenient to an electrical outlet.

—To allow adequate ventilation.

VENTILATION CAUTION. — The receiver is provided with adequate ventilation holes in the bottom and back of the cabinet. Care should be taken not to allow these holes to be covered or ventilation to be impeded in any way.

If the receiver is to be operated with the back of the cabinet near a wall, at least a two-inch clearance should be maintained between cabinet and wall.

CHASSIS TOP VIEW

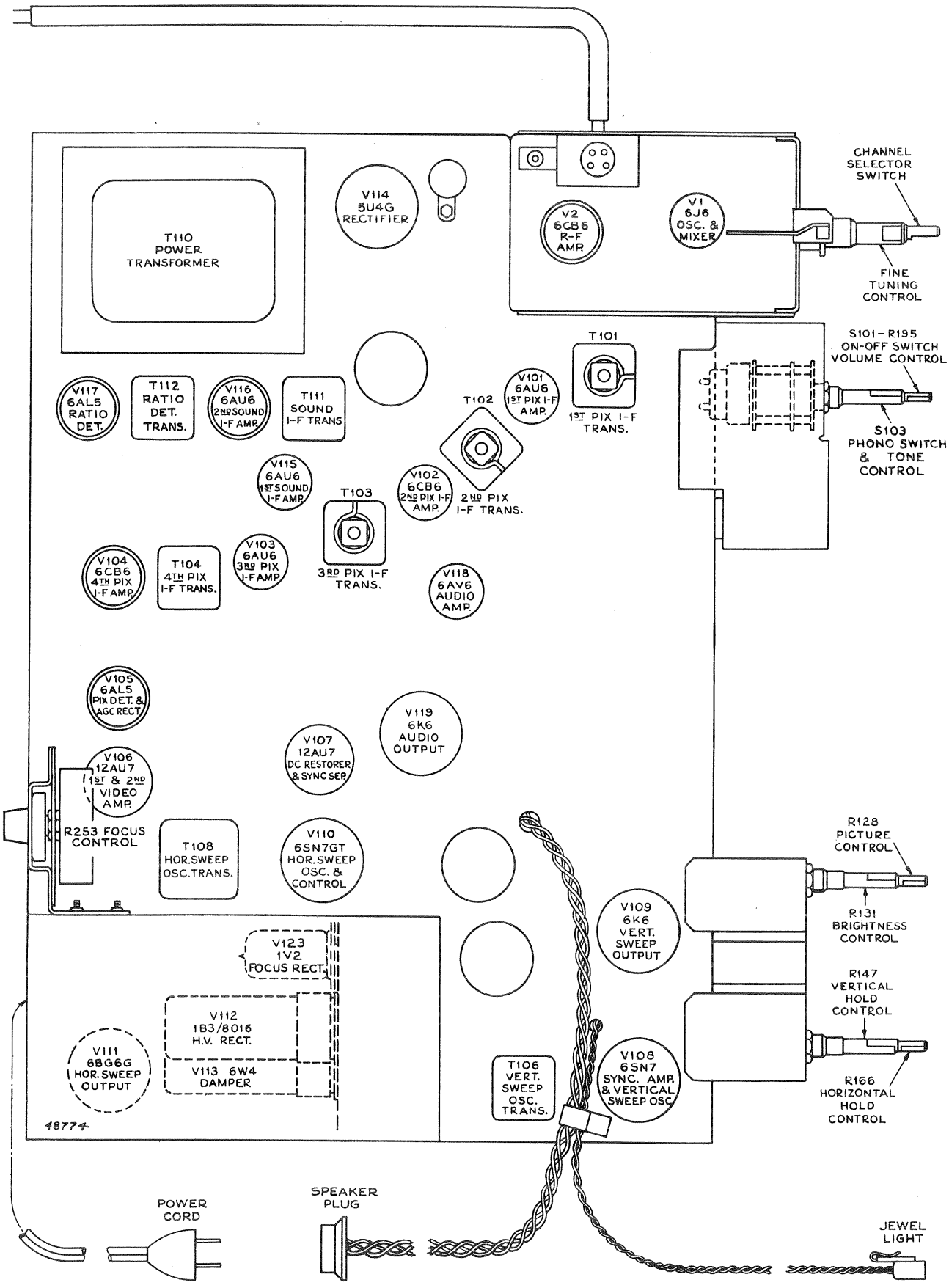


Figure 5—Chassis Top View

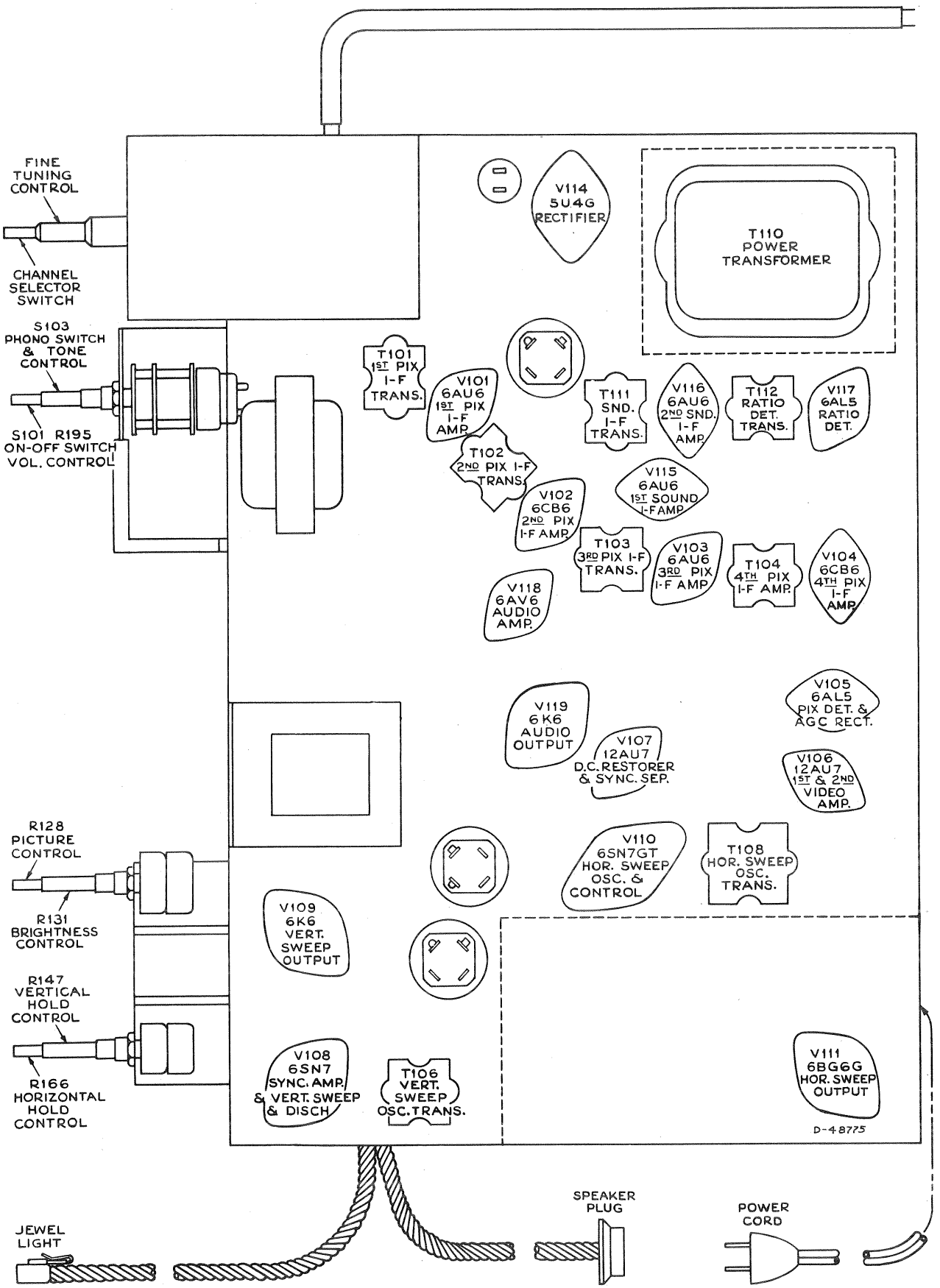


Figure 6—Chassis Bottom View

ALIGNMENT PROCEDURE

TEST EQUIPMENT. — To properly service the television chassis of this receiver, it is recommended that the following test equipment be available:

R-F Sweep Generator meeting the following requirements:

(a) Frequency Ranges

20 to 30 mc., 1 mc. and 10 mc. sweep width
50 to 90 mc., sweep width
170 to 225 mc., 10 mc. sweep width

(b) Output adjustable with at least .1 volt maximum.

(c) Output constant on all ranges.

(d) "Flat" output on all attenuator positions.

Cathode-Ray Oscilloscope. — For alignment purposes, the oscilloscope employed must have excellent low frequency and phase response, and should be capable of passing a 60-cycle square wave without appreciable distortion. While this requirement is not met by many commercial instruments, RCA Oscilloscopes, types WO-55A, WO-57A, WO-58A, WO-79A, WO-79B and WO-60C fill the requirement and any of these may be employed.

For video and sync waveform observations, the oscilloscope must have excellent frequency and phase response from 10 cycles to at least two megacycles in all positions of the gain control. The RCA types WO-58A, WO-79A and WO-79B are ideally suited for this purpose.

Signal Generator to provide the following frequencies with crystal accuracy.

(a) Intermediate frequencies

19.50 mc. adjacent channel picture trap
21.00 mc. sound i-f and sound traps
22.2 and 25.4 mc. conv. and first pix i-f trans.
22.53 mc. second picture i-f transformer
25.35 mc. fourth picture i-f transformer
21.95 mc. third picture i-f transformer
23.7 mc. fifth picture i-f coil
25.50 mc. picture carrier
27.00 mc. adjacent channel sound trap

(b) Radio frequencies

Channel Number	Picture Carrier Freq. Mc.	Sound Carrier Freq. Mc.
2	55.25	59.75
3	61.25	65.75
4	67.25	71.75
5	77.25	81.75
6	83.25	87.75
7	175.25	179.75
8	181.25	185.75
9	187.25	191.75
10	193.25	197.75
11	199.25	203.75
12	205.25	209.75
13	211.25	215.75

(c) Output of these ranges should be adjustable and at least .1 volt maximum.

Heterodyne Frequency Meter with crystal calibrator if the signal generator is not crystal controlled.

Electronic Voltmeter of Junior or Senior "VoltOhmyst" type and a high voltage multiplier probe for use with this meter to permit measurements up to 15 kv.

Service Precautions. — If possible, the chassis should be serviced without the kinescope. However, if it is necessary to view the raster during servicing, it would be a great convenience to have a set of yoke, focus coil, kinescope socket, high voltage and speaker extension cables.

CAUTION. — Do not short the kinescope second anode lead. Its short circuit current presents a considerable overload on the high voltage rectifier V112.

Adjustments Required. — Normally, only the r-f oscillator and mixer lines will require the attention of the service technician. All other circuits are either broad or very stable and hence will seldom require readjustment.

ORDER OF ALIGNMENT. — When a complete receiver alignment is necessary, it can be most conveniently performed in the following order:

(1) Ratio detector
(2) Sound i-f transformers
(3) Sound Take-off transformer
(4) Picture i-f traps
(5) Picture i-f transformers
(6) R-F unit
(7) Overall picture i-f
(8) Horizontal oscillator

RATIO DETECTOR ALIGNMENT. — Set the signal generator at 4.5 mc. and connect it to the second sound i-f grid, pin 1 of V116. Set the generator for 30% 400 cycle modulation.

As an alternate source of signal, the RCA WR39B or WR39C calibrator may be employed. In such a case, connect the calibrator to the grid of the fourth pix i-f amplifier, pin 1 of V104.

Set the frequency of the calibrator to 25.50 mc. (pix carrier) and modulate with 4.5 mc. crystal. The 4.5 mc. signal will be picked off at T114 and amplified through the sound i-f amplifier.

Connect the "VoltOhmyst" to the junction of R279 and R281.

Connect the oscilloscope across the speaker voice coil and turn the volume control for maximum output.

Set the trimmer C287 (on the bottom of the V117 socket) for minimum capacity.

Tune the ratio detector primary, T112 top core for maximum d-c output on the "VoltOhmyst." Adjust the signal level from the signal generator for 5 volts on the "VoltOhmyst" when finally peaked. This is approximately the operating level of the ratio detector for average signals.

Tune the ratio detector secondary T112 bottom core for minimum AM output on the oscilloscope.

Repeat adjustments of T112 top for maximum d-c and T112 bottom for minimum output on the oscilloscope making final adjustments with the 4.5 mc. input level adjusted to produce 5 volts d-c on the "VoltOhmyst."

Connect the "VoltOhmyst" to the junction of R192 and S103 and note the amount of d-c present. If this voltage exceeds ± 1.5 volts, adjust C287 by turning the core in until zero d-c is obtained. Readjust the T112 bottom core for minimum output on the oscilloscope. Repeat the adjustments of C287 and T112 bottom core until the voltage at R192 and S103 is less than ± 1.5 volts when T112 bottom core is set for minimum indication on the oscilloscope.

Connect the "VoltOhmyst" to the junction of R279 and R281 and repeak the T112 top core for maximum d-c on the meter and again reset the generator so that the meter reads minus 5 volts.

Repeat the adjustments in the above two paragraphs until the voltage at R192 and S103 is less than ± 1.5 volts when the T112 top core is set for maximum d-c at the junction of R279 and R281 and the T112 bottom core is set for minimum indication on the oscilloscope.

SOUND I-F ALIGNMENT. — Connect the sweep generator to the first sound i-f amplifier grid, pin 1 of V115. Adjust the generator for a sweep width of 1 mc. at a center frequency of 4.5 mc.

Insert a 4.5 mc. marker signal from the signal generator into the first sound i-f grid.

Connect the oscilloscope in series with a 10,000-ohm resistor to terminal A of T111.

Adjust T111 top and bottom cores for maximum gain and symmetry about the 4.5 mc. marker on the i-f response. The pattern obtained should be similar to that shown in Figure 13.

The output level from the sweep should be set to produce approximately 1.0 volt peak-to-peak at terminal A of T111 when the final touches on the above adjustment are made. It is necessary that the sweep output voltage should not exceed the specified values otherwise the response curve will be broadened, permitting slight misadjustment to pass unnoticed and possibly causing distortion on weak signals.

Connect the oscilloscope to the junction of R192 and S103 and check the linearity of the response. The pattern obtained should be similar to that shown in Figure 12.

SOUND TAKE-OFF ALIGNMENT. — Connect the 4.5 mc. generator in series with a 1,000-ohm resistor to terminal "D" of T114. The input signal should be approximately 0.5 volts.

Short the fourth pix i-f grid to ground, pin 1 V104, to prevent noise from masking the output indication.

As an alternate source of signal the RCA WR39B or WR39C calibrator may be used. In such a case, disregard the above two paragraphs.

Connect calibrator across link circuit, T101 C, D, and modulate 25.50 carrier with 4.5 mc. crystal.

Connect the crystal diode probe of a "VoltOhmyst" to the plate of the video amplifier, pin 6 of V106.

Adjust the core of T114 for minimum output on the meter.

Remove the short from pin 1 V104 to ground if used.

PICTURE I-F TRAP ADJUSTMENT. — Connect the "VoltOhmyst" to the junction of R102 and R201.

Obtain a 7.5 volt battery capable of withstanding appreciable current drain and connect the ends of a 1,000 ohm potentiometer across it. Connect the battery positive terminal to chassis and the potentiometer arm to the junction of R102 and R201. Adjust the potentiometer for −3.0 volts indication on the "VoltOhmyst."

Set the channel switch to the blank position between channels number 2 and 13.

Connect the "VoltOhmyst" to pin 2 of V106 and to ground.

Connect the output of the signal generator to terminal D of T101.

Set the generator to each of the following frequencies and with a thin fiber screwdriver tune the specified adjustment for minimum indication on the "VoltOhmyst." In each instance the generator should be checked against a crystal calibrator to insure that the generator is exactly on frequency.

(1) 21.00 mc.—T103 (top)
(2) 27.00 mc.—T102 (top)
(3) 27.00 mc.—T104 (top)
(4) 19.50 mc.—T101 (top)

In the above transformers using threaded cores, it is possible to run the cores completely through the coils and secure two peaks or nulls. The correct position is with the cores in the outside ends of the coils. If the cores are not in the correct position, the coupling will be incorrect and it will be impossible to secure the correct response.

PICTURE I-F TRANSFORMER ADJUSTMENTS. — Set the signal generator to each of the following frequencies and peak the specified adjustment for maximum indication on the "VoltOhmyst." During alignment, reduce the input signal if necessary to prevent overloading.

23.7 mc.—L103
25.35 mc.—T104 (bottom)
21.95 mc.—T103 (bottom)
22.53 mc.—T102 (bottom)

R-F UNIT ALIGNMENT. — Disconnect the co-ax link from terminal 2 of the r-f unit terminal board and connect a 39 ohm composition resistor between lugs 1 and 2.

Detune T1 by backing the core all the way out of the coil.

In early production units in which L44 is adjustable, back the L44 core all the way out. Back L203 core all the way out.

In order to align the r-f tuner, it will first be necessary to set the channel-13 oscillator to frequency. The shield over the bottom of the r-f unit must be in place when making any adjustments.

The oscillator may be aligned by adjusting it to beat with a crystal-calibrated heterodyne frequency meter, or by feeding a signal into the receiver at the r-f sound carrier frequency and adjusting the oscillator for zero output from the sound discriminator. In this latter case the sound discriminator must first have been aligned to exact frequency. Either method of adjustment will produce the same results. The method used will depend upon the type of test equipment available. Regardless of which method of oscillator alignment is used, the frequency standard must be crystal controlled or calibrated.

If the receiver oscillator is to be adjusted by the heterodyne frequency meter method, couple the meter probe loosely to the receiver oscillator.

If the receiver oscillator is adjusted by feeding in the r-f sound carrier signal, connect the signal generator to the receiver antenna terminals. Connect the "VoltOhmyst" to the sound discriminator output (junction of R192 and S103). Also couple the link loosely to lug 2 of the r-f unit terminal board so as to permit measurement of sound discriminator.

Set the channel selector switch to 13.

Adjust the frequency standard to the correct frequency (236.75 mc. for heterodyne frequency meter or 215.75 mc. for the signal generator).

Set the fine tuning control to the middle of its range.

Adjust C1 for an audible beat on the heterodyne frequency meter or zero voltage from sound discriminator.

Now that the channel-13 oscillator is set to frequency, we may proceed with the r-f alignment.

Turn the AGC control to the counter-clockwise position.

Connect the bias box to terminal 3 of the r-f unit terminal board and adjust the bias box potentiometer for −3.5 volts.

Connect the oscilloscope to the test connection at R5 on top of the r-f unit.

Connect the r-f sweep oscillator to the receiver antenna terminals. The method of connection depends upon the output impedance of the sweep. The P300 connections for 300-ohm balanced or 72-ohm single-ended input are shown in the circuit schematic diagram. If the sweep oscillator has a 50-ohm single-ended output, 300-ohm balanced output can be obtained by connecting as shown in Figure 7.

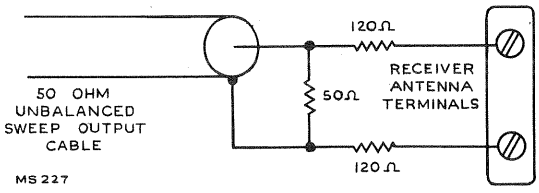


Figure 7—Unbalanced Sweep Cable Termination

Connect the signal generator loosely to the receiver antenna terminals.

Set the receiver channel switch to channel 8.

Set the sweep oscillator to cover channel 8.

Insert markers of channel 8 picture carrier and sound carrier, 181.25 mc. and 185.75 mc.

Adjust C9, C11, C16 and C22 for approximately correct curve shape, frequency, and band width as shown in Figure 16.

The correct adjustment of C22 is indicated by maximum amplitude of the curve midway between the markers. C16 tunes the r-f amplifier plate circuit and affects the frequency of the curve most noticeably. C9 tunes the converter grid circuit and affects the tilt of the curve most noticeably (assuming that C22 has been properly adjusted). C11 is the coupling adjustment and hence primarily affects the response band width.

Set the receiver channel switch to channel 6.

Adjust the frequency standard to the correct frequency (108.75 mc. for heterodyne frequency meter or 87.75 mc. for the signal generator).

Set the fine tuning control to the middle of its range.

Adjust L5 for an audible beat on the heterodyne frequency meter or zero voltage from sound discriminator.

Set the sweep generator to channel 6.

From the signal generator, insert channel 6 sound and picture carrier markers, 83.25 mc. and 87.75 mc.

Adjust L42, L45 and L49 for proper response as shown in Figure 16.

L42 is adjusted to give maximum amplitude of the curve between the markers. L45 primarily affects the tilt of the curve. L49 primarily affects the frequency of response.

Connect the "VoltOhmyst" to the r-f unit test point at R5.

Adjust C7 for −3.0 volts at the test point.

Retouch L42, L45 and L49 for proper response if necessary. If necessary, retouch C11 for proper band width on channel 6. Continue these retouching adjustments until proper response is obtained and −3.0 volts of oscillator injection are present at the test point.

Set the receiver channel selector switch to channel 8 and readjust C1 for proper oscillator frequency.

Set the sweep oscillator and signal generator to channel 8.

Readjust C9, C16 and C22 for correct curve shape, frequency and band width. Readjust C11 only if necessary.

Switch the receiver, the sweep oscillator and signal generator to channel 13.

Adjust L52 for maximum amplitude of the curve midway between markers and then overshoot the adjustment by turning the slug in the same direction from the initial setting a little more than the amount of turning required to reach maximum amplitude of response.

Adjust C22 for maximum amplitude of response.

Turn off the sweep generator. Adjust the L43 core for correct channel 13 oscillator frequency, then overshoot the adjustment by turning the slug a little more in the same direction from the initial setting. Reset the oscillator to proper frequency by adjustment of C1.

Turn the sweep oscillator back on.

Check the response of channels 7 through 13 by switching the receiver channel switch, sweep oscillator and marker oscillator to each of these channels and observing the response and oscillator injection obtained. See Figure 16 for typical response curves. It should be found that all these channels have the proper shaped response with the markers above 80% response.

If the markers do not fall within this requirement, switch to channel 8 and readjust C9, C11, C16 and C22 as necessary. If C22 required adjustment, the adjustment should be overshot a small amount and corrected by adjustment of L52 to give maximum amplitude of response between the sound and picture carrier markers. The antenna circuit (L52, C22) is broad so that tracking is not particularly critical.

If the valley in the top of the selectivity curves for the high channels is deeper than normal, the curve can be flattened somewhat by decreasing the inductance of L44 by turning the core stud in. Be sure to check for undesirable resonant suckouts on channels 7 and 8 if this is done. In later production units, L44 may be fixed and not require adjustment.

Turn the sweep oscillator off and check the receiver channel 8 r-f oscillator frequency. If the oscillator is off frequency overshoot the adjustment of C1 and correct by adjusting L43.

Turn the receiver channel selector switch to channel 6. Adjust L5 for correct oscillator frequency.

Turn the sweep oscillator on and to channel 6 and observe the response curve. If necessary readjust L42, L45 and L49. It should not be necessary to touch C11.

Check the oscillator injection voltage at the test point. If necessary adjust C7 to give −3 volts injection. If C7 is adjusted, switch to channel 8, and readjust C9 for proper curve shape, then recheck channel 6.

Switch the receiver through channel 6 down through channel 2 and check for normal response curve shapes and oscillator injection voltage.

Likewise check channels 7 through 13, stopping on 13 for the next step.

With the receiver on channel 13, check the receiver oscillator frequency. Correct by adjustment of C1 if necessary.

Adjust the oscillator to frequency on all channels by switching the receiver and the frequency standard to each channel and adjusting the appropriate oscillator trimmer for the specified indication. It should be possible to adjust the oscillator to the correct frequency on all channels with the fine tuning control in the middle third of its range.

Channel Number	Picture Carrier Freq. Mc.	Sound Carrier Freq. Mc.	Receiver R-F Osc. Freq. Mc.	Channel Oscillator Adjustment
2	55.25	59.75	80.750	L1
3	61.25	65.75	86.750	L2
4	67.25	71.75	92.750	L3
5	77.25	81.75	102.750	L4
6	83.25	87.75	108.750	L5
7	175.25	179.75	200.750	L6
8	181.25	185.75	206.750	L7
9	187.25	191.75	212.750	L8
10	193.25	197.75	218.750	L9
11	199.25	203.75	224.750	L10
12	205.25	209.75	230.750	L11
13	211.25	215.75	236.750	C1

Switch to channel 8 and observe the response.

Adjust T1 clockwise while watching the change in response. When T1 is properly adjusted, the selectivity curve will be slightly wider with a slightly deeper valley in its top.

Switch through all channels and observe response, oscillator injection and r-f oscillator frequency. Minor touch-ups of adjustments may be made at this time. However, if C7 or C9 are changed appreciably, then a recheck of the oscillator frequency on all channels should be made.

Reconnect the link from T101 to terminal 2 of the r-f unit terminal board.

Since T1 was adjusted during the r-f unit alignment it will be necessary to sweep the overall i-f response.

R-F UNIT TUBE CHANGES. — Since most of the circuits are low capacitance circuits the r-f unit may require readjustments when the tubes are changed.

If the 6CB6 r-f amplifier tube is changed, it may be necessary to readjust C16 and C22.

If the 6J6 oscillator and mixer tube is changed, then more extensive adjustments are required.

For good conversion efficiency, the oscillator injection to a triode mixer must be held reasonably close to the optimum value. Although there is some latitude in this level, it is nearly expended in the normal variation in injection from channel to channel. Consequently, the adjustment of C7 is limited primarily to establishing the conditions for good conversion. Since changes in oscillator in ection affect conversion gain, it also affects the input capacity of the mixer, thus also affecting tracking of the mixer grid circuit. These tube variations with their consequent effect on circuit alignment thereby require readjustment of the r-f unit if maximum conversion efficiency is to be retained after the 6J6 tube is changed. It may be possible, however, to try several 6J6 tubes and select one which gives satisfactory performance without realignment.

SWEEP ALIGNMENT OF PIX I-F. — Set the r-f unit bias to −3.5 volts.

Connect a 47 ohm resistor across the link circuit at T101 terminals C and D.

Remove the second picture i-f tube.

With the oscilloscope connected to the r-f unit test connection and the sweep oscillator connected to the antenna terminals, set the sweep output to give 0.1 volt peak-to-peak on the oscilloscope.

Switch through the channels and select one that is essentially flat and with the two carriers at 90% response or higher. Channel 6 is usually the most desirable for this test.

Remove the 47 ohm resistor and replace V102.

Connect the oscilloscope to terminal 2 of V106 socket.

Clip 330 ohm resistors across R106, R108, R113 and R119.

Connect the bias box to the junction of R102 and R201. Adjust the box for −1 volt.

Adjust the sweep oscillator output to give 0.5 volt peak-to-peak on the oscilloscope.

Connect the signal generator loosely to the i-f amplifier.

Adjust T1 and T101 bottom core to obtain the response curve shown in Figure 14.

Remove the 330 ohm resistors across R106, R108, R113 and R119.

Set the i-f bias to −4.5 volts.

Adjust the sweep output to give 3 volts peak-to-peak on the oscilloscope.

Retouch T1, T101 bottom, T102 bottom, T103 bottom, T104 bottom and L103 to obtain the response curve shown in Figure 15.

HORIZONTAL OSCILLATOR ADJUSTMENT. — Normally the adjustment of the horizontal oscillator is not considered to be a part of the alignment procedure, but since the oscillator waveform adjustment requires the use of an oscilloscope, it can not be done conveniently in the field. The waveform adjustment is made at the factory and normally should not require readjustment in the field. However, the waveform adjustment should be checked whenever the receiver is aligned or whenever the horizontal oscillator operation is improper.

Horizontal Frequency Adjustment. — With a clip lead, short circuit the coil between terminals C and D of the horizontal oscillator transformer T108. Tune in a television station and sync the picture if possible.

A. — Turn the horizontal hold control R166 to the extreme clockwise position. Adjust the T108 Frequency Adjustment (atop the chassis) so that the picture is just out of sync and the horizontal blanking appears in the picture as a vertical bar. The position of the bar is unimportant.

B. — Turn the hold control approximately one-quarter of a turn from the extreme clockwise position and examine the width and linearity of the picture. If picture width or linearity is incorrect, adjust the horizontal drive control C147B, the width control R177 and the linearity control L110 until the picture is correct. If C147B, R177 or L110 were adjusted, repeat step A above.

Horizontal Locking Range Adjustment. — Turn the horizontal hold control fully counter-clockwise. The picture may remain in sync. If so, turn the T108 top core slightly and momentarily switch off channel. Repeat until the picture falls out of sync with the diagonal lines sloping down to the left. Momentarily remove the signal by switching off channel then back. Slowly turn the horizontal hold control clockwise and note the least number of diagonal bars obtained just before the picture pulls into sync.

If more than 9 bars are present just before the picture pulls into sync, adjust the horizontal locking range trimmer C147A slightly clockwise. If less than 7 bars are present, adjust C147A slightly counter-clockwise. Turn the horizontal hold control counter-clockwise, momentarily remove the signal and recheck the number of bars present at the pull-in point. Repeat this procedure until 7 to 9 bars are present.

Horizontal Oscillator Waveform Adjustment. — Remove the shorting clip from terminals C and D of T108. Turn the horizontal hold control to the extreme clockwise position. With a thin fibre screwdriver, adjust the Oscillator Waveform Adjustment Core of T108 (under the chassis) until the horizontal blanking bar appears in the center.

A. — Connect the low capacity probe of an oscilloscope to terminal C of T108. Turn the horizontal hold control one-quarter turn from the clockwise position so that the picture is in sync. The pattern on the oscilloscope should be as shown in Figure 17. Adjust the Oscillator Waveform Adjustment Core of T108 until the two peaks are at the same height. During this adjustment, the picture must be kept in sync by readjusting the hold control if necessary.

This adjustment is very important for correct operation of the circuit. If the broad peak of the wave on the oscilloscope is lower than the sharp peak, the noise immunity becomes poorer, the stabilizing effect of the tuned circuit is reduced and drift of the oscillator becomes more serious. On the other hand, if the broad peak is higher than the sharp peak, the oscillator is overstabilized, the pull-in range becomes inadequate and the broad peak can cause double triggering of the oscillator when the hold control approaches the clockwise position.

Remove the oscilloscope upon completion of this adjustment.

Check of Horizontal Oscillator Adjustments. — Set the horizontal hold control to the full counter-clockwise position. Momentarily remove the signal by switching off channel then back. Slowly turn the horizontal hold control clockwise and note the least number of diagonal bars obtained just before the picture pulls into sync.

If more than 2 bars are present just before the picture pulls into sync, adjust the horizontal locking range trimmer C147A slightly clockwise. If less than 2 bars are present, adjust C147A slightly counter-clockwise. Turn the horizontal hold control counter-clockwise, momentarily remove the signal and recheck the number of bars present at the pull-in point. Repeat this procedure until 2 bars are present.

Turn the horizontal hold control to the maximum clockwise position. The picture should be just out of sync to the extent that the horizontal blanking bar appears as a single vertical or diagonal bar in the picture. Adjust the T108 Frequency Adjustment until this condition is fulfilled.

SENSITIVITY CHECK. — A comparative sensitivity check can be made by operating the receiver on a weak signal from a television station and comparing the picture and sound obtained to that obtained on other receivers under the same conditions.

This weak signal can be obtained by connecting the shop antenna to the receiver through a ladder type attenuator pad. The number of stages in the pad depends upon the signal strength available at the antenna. A sufficient number of stages should be inserted so that a somewhat less than normal contrast picture is obtained when the picture control is at the maximum clockwise position. Only carbon type resistors should be used to construct the pad.

RESPONSE CURVES. — The response curves shown on page 14 and referred to throughout the alignment procedure were taken from a production set. Although these curves are typical, some variations can be expected.

The response curves are shown in the classical manner of presentation, that is with "response up" and low frequency to the left. The manner in which they will be seen in a given test set-up will depend upon the characteristics of the oscilloscope and the sweep generator. The curves may be seen inverted and/or switched from left to right depending on the deflection polarity of the oscilloscope and the phasing of the sweep generator.

NOTES ON R-F UNIT ALIGNMENT. — Because of the frequency spectrum involved and the nature of the device, many of the r-f unit leads and components are critical in some respects. Even the power supply leads form loops which couple to the tuned circuits, and if resonant at any of the frequencies involved in the performance of the tuner, may cause serious departures from the desired characteristics. In the design of the receiver these undesirable resonant loops have been shifted far enough away in frequency to allow reasonable latitude in their components and physical arrangement without being troublesome. When the r-f unit is aligned in the receiver, no trouble from resonant loops should be experienced. However, if the unit is aligned in a jig separate from the receiver, attention should be paid to insure that unwanted resonances do not exist which might present a faulty representation of r-f unit alignment.

A resonant circuit exists between the r-f tuner chassis and the outer shield box, which couples into the antenna and r-f plate circuits. The frequency of this resonance depends on the physical structure of the shield box, and the capacitance between the tuner chassis and the front plate. In the KRK8 units, this resonance should fall between 120 and 135 mc. and is controlled in the design by using insulating washers of different thicknesses (in the front plate to tuner chassis mounting) to compensate for differences in the shield boxes of different models of receivers. The performance of the tuner, particularly on channels 7 and 8 will be impaired if the proper washers for the particular shield box involved are not used. Obviously then, if the r-f unit is removed for service, the washers should be replaced in the correct order when the unit is replaced.

ALIGNMENT TABLE

THE DETAILED ALIGNMENT PROCEDURE BEGINNING ON PAGE 8 SHOULD BE READ BEFORE ALIGNMENT BY USE OF THE TABLE IS ATTEMPTED

STEP No.	CONNECT SIGNAL GENERATOR TO	SIGNAL GEN. FREQ. MC.	CONNECT SWEEP GENERATOR TO	SWEEP GEN. FREQ. MC.	CONNECT OSCILLOSCOPE TO	CONNECT "VOLTOHMYST" TO	MISCELLANEOUS CONNECTIONS AND INSTRUCTIONS	ADJUST	REFER TO
	RATIO DETECTOR, SOUND I-F AND SOUND TAKE-OFF ALIGNMENT								
1	2nd sound i-f grid (pin 1, V116) OR WR39B or C connect to grid of 4th pix i-f amp. Pin 1, V104	4.5 mc. 400 cy. mod OR 25.5 mc. mod. by 4.5 mc.	Not used	—	Across speaker voice coil, volume control at max.	Junction of R279 and R281	Set C287 at min. capacity Adjust signal input level to produce 5 volts on meter	Adjust T112 (top) for max. dc on meter Adjust T112 (bot.) for min. output on scope. Repeat until no improvements are obtained	Fig. 8 Fig. 9
2	"	"	"	—	"	Junction of R192 & S103	If the meter reads more than ±1.5 volts, adjust C287 for zero on the meter and readjust T112 (bot.) for min. output on scope. Repeat steps 1 and 2 until all conditions are satisfied.		
3	Sig. Gen. to 1st snd. i-f grid or WR39 as above	"	1st sound i-f grid (pin 1, V115)	4.5 mc. 1 mc. wide	In series with 10,000 ohms to T111-A	Not used	Sweep output reduced to provide 1 volt p-to-p on scope	T111 (top and bot.) for max. gain and symmetry at 4.5 mc.	Fig. 8 Fig. 9 Fig. 13
4	"	"	"	"	Junction of R192 and S103	"	Check for symmetrical response waveform (positive & negative).		Fig. 8 Fig. 12
5	Sig. Gen. in series with 1000 ohms to T114-D OR WR39 connected across T101 C & D	4.5 mc. OR 25.50 mc. 4.5 mc. mod.	Not used	—	—	Connect through crystal probe to pin 6 of V106	If signal generator is used, instead of WR39, short pin 1 of V109 to ground	Adjust T114 for minimum output on "VoltOhmyst"	Fig. 8
	PICTURE I-F AND TRAP ADJUSTMENT								
6	Not used		Not used	—	Not used	Junction of R102 & R201	Connect bias box to junction of R102 & R201 and to ground	Adjust potentiometer for −3.0 volts on meter	Fig. 10
7	Terminal D of T101	21.00	"	—	"	Pin 2 of V106 and to ground	Meter on 3v scale. Rec. between 2 & 13	T103 (top) for min. on meter	Fig. 10 Fig. 8
8	"	27.00	"	—	"	"	"	T102 (top) for min.	"
9	"	27.00	"	—	"	"	"	T104 (top) for min.	"
10	"	19.50	"	—	"	"	"	T101 (top) for min.	"
11	"	23.7	"	—	"	"	"	L103 (top) for max.	"
12	"	25.35	"	—	"	"	"	T104 (bot.) for max.	Fig. 9
13	"	21.95	"	—	"	"	"	T103 (bot.) for max.	"
14	"	22.5	"	—	"	"	"	T102 (bot.) for max.	"

R-F UNIT ALIGNMENT

STEP No.	CONNECT SIGNAL GENERATOR TO	SIGNAL GEN. FREQ. MC.	CONNECT SWEEP GENERATOR TO	SWEEP GEN. FREQ. MC.	CONNECT HETERODYNE FREQ. METER TO	HET. METER FREQ. MC.	CONNECT "VOLTOHMYST" TO	MISCELLANEOUS CONNECTIONS AND INSTRUCTIONS	ADJUST	REFER TO
15	Disconnect the co-ax link from terminal 2 of the r-f unit terminal board and connect a 39 ohm composition resistor between lugs 1 and 2. If the receiver oscillator is adjusted by feeding in the r-f sound carrier signal, couple the link loosely to lug 2 of the r-f unit terminal board so as to permit measurement at sound discriminator. In early production units in which L44 is adjustable, back the L44 core all the way out. Detune T1 by backing the core all the way out of the coil. In order to align the r-f tuner, it will first be necessary to set the channel 13 oscillator to frequency. The shield over the bottom of the r-f unit must be in place when making any adjustments.									
16	Antenna terminals	215.75 mc.	Not used		Loosely coupled to r-f oscillator	236.75 mc.	Junction of R192 & S103 for signal gen. method only	Fine tuning centered. Receiver on channel 13. Het. freq. meter coupled to osc. if used.	C1 for zero on meter or beat on het. freq. meter	Fig. 10 Fig. 8
17			"				Connect "Volt-Ohmyst" to terminal 3 of the r-f unit terminal board	Turn AGC control counter - clockwise. Connect bias box to terminal 3 of r-f unit term. board.	Adjust the bias box potentiometer for −3.5 volts.	Fig. 10
18	Antenna terminal (loosely)	181.25 185.75	Antenna terminals (see text for precaution)	Sweeping channel 8	Not used	—	Not used	Rec. on chan. 8. Connect oscilloscope to test connection at R5 on top the r-f unit. Adjust C9, C11, C16 and C22. Correct curve shape, frequency, and band width. C22 is adjusted to give max. amplitude between markers. C9 primarily affects tilt and C16 primarily affects the frequency of response. C11 affects the response band width.		Fig. 16 (8)
19	"	87.75	"	Not used	Loosely coupled to r-f oscillator	108.75	Junction of R192 & S103 for signal gen. method only	Rec. on channel 6	L5 for zero on meter or beat on het. freq. meter	Fig. 8 Fig. 10 Fig. 11
20	"	83.25 87.75	"	Channel 6	Not used	—		Rec. on chan. 6. Adjust L42, L45 and L49 for proper response. L42 is adjusted to give max. amplitude between markers. L45 primarily affects tilt and L49 primarily affects freq. of response. If necessary, retouch C11 for proper width.		Fig. 16 (6)
21	Not used	—	Not used	—	Not used	—	Connect "Volt-Ohmyst" to r-f unit test point R5	Rec. on channel 6	Adjust C7 for −3.0 volts at the test point	Fig. 8 Fig. 9
22	Repeat steps 19, 20 and 21 until the specified conditions are obtained.									

ALIGNMENT TABLE

STEP No.	CONNECT SIGNAL GENERATOR TO	SIGNAL GEN. FREQ. MC.	CONNECT SWEEP GENERATOR TO	SWEEP GEN. FREQ. MC.	CONNECT HETERODYNE FREQ. METER TO	HET. METER FREQ. MC.	CONNECT "VOLTOHMYST" TO	MISCELLANEOUS CONNECTIONS AND INSTRUCTIONS	ADJUST	REFER TO
23	Antenna terminal (loosely)	185.75		—	Loosely coupled to r-f oscillator	206.75	Junction of R192 & S103 for sig. gen. method only	Rec. on channel 8	C1 for zero on meter or beat on het. freq. meter	Fig. 8 Fig. 10
24	Antenna terminal (loosely)	181.25 185.75	Antenna terminals (see text for precaution)	Sweeping channel 8	Not used	—	Not used	Rec. on chan. 8. Readjust C9, C16 and C22 for correct curve shape, frequency and band width. Readjust C11 only if necessary.		Fig. 8 Fig. 9 Fig. 16 (8)
25	"	211.25 215.75	"	Sweeping channel 13	Not used	—	Not used	Rec. on chan. 13. Adjust L52 for max. amplitude between markers and then overshoot a little more than the amount of turning required to reach max. response. Adjust C22 to regain max. amplitude of response.		Fig. 9 Fig. 16 (13)
26	"	215.75	Not used	—	Loosely coupled to r-f oscillator	236.75	Junction of R192 & S103 for signal gen. method only	Fine tuning centered. Receiver on chan. 13. Adjust L43 for correct channel 13 osc. freq. then overshoot. Reset the osc. to proper freq. by adjustment of C1.		Fig. 8 Fig. 11
27	"	205.25 209.75	Antenna terminals (see text for precaution)	channel 12	Not used	—	Connect "Volt-Ohmyst" to r-f unit test point at R5	Rec. on channel 12	Check to see that response is correct and −3.0 volts of osc. injection is present	Fig. 10 Fig. 16
28	"	199.25 203.75		channel 11	"	—	"	Rec. on channel 11	"	Fig. 16 (11)
29	"	193.25 197.75	"	channel 10	"	—	"	Rec. on channel 10	"	Fig. 16 (10)
30	"	187.25 191.75	"	channel 9	"	—	"	Rec. on channel 9	"	Fig. 16 (9)
31	"	181.25 185.75	"	channel 8	"	—	"	Rec. on channel 8	"	Fig. 16 (8)
32	"	175.25 179.75	"	channel 7	"	—	"	Rec. on channel 7	"	Fig. 16 (7)
33	If the response of any channel (steps 27 through 32) is below 80% at either marker, repeat step 24 and adjust C9, C11, C16 and C22 as necessary to pull response up on the low channel yet maintain correct response on channel 8. If C22 required adjustment, the adjustment should be overshot a small amount and corrected by adjustment of L52 to give maximum amplitude of response between the sound and picture carrier markers.									
34	Repeat step 23. If the oscillator is off frequency overshoot the adjustment of C1 and correct by adjusting L43.									
35	Repeat steps 27 through 34 until all adjustments are obtained.									
36	Antenna terminals (loosely)	87.75	Not used	—	Loosely coupled to r-f oscillator	108.75	Junction of R192 & S103 for sig. gen. metnod only	Rec. on channel 6	L5 for zero on meter or beat on het. freq. meter	Fig. 10 Fig. 11
37	"	83.25 87.75	Ant. terminals (see text for precaution)	Sweeping channel 6	Not used	—	Not used	Observe response. If necessary readjust L42, L45 and L49. It should not be necessary to touch C11.		Fig. 8 Fig. 9 Fig. 16
38	Not used	—	Not used	—	Not used	—	Connect "Volt-Ohmyst" to the r-f unit test point at R5	Check osc. injection. If necessary adjust C7 to give −3 volts. If C7 is adjusted, switch to channel 8, and readjust C9 for proper response then repeat step 37.		Fig. 9 Fig. 10
39	Antenna terminals (loosely)	77.25 81.75	Ant. terminals (see text for precaution)	channel 5	"	—	"	Rec. on channel 5	Check to see that response is correct and −3.0 volts of osc. injection is present	Fig. 16 (5)
40	"	67.25 71.75	"	channel 4	"	—	"	Rec. on channel 4		Fig. 16 (9)
41	"	61.25 65.75	"	channel 3	"	—	"	Rec. on channel 3	"	Fig. 16 (3)
42	"	55.25 59.75	"	channel 2	"	—	"	Rec. on channel 2	"	Fig. 16 (2)
43	Likewise check channels 7 through 13, as outlined in steps 32 back through 27, stopping on channel 13 for next step.									
44	Antenna terminals	215.75	Not used	—	Loosely coupled to r-f oscillator	236.75	Junction of R192 & S103 for sig. gen. method only	Fine tuning centered. Receiver on channel 13	C1 for zero on meter or beat on het. freq. meter	Fig. 8 Fig. 10
45	"	209.75	"	—	"	230.75	"	Rec. on channel 12	L11 as above	Fig. 11
46	"	203.75	"	—	"	224.75	"	Rec. on channel 11	L10 as above	Fig. 11
47	"	197.75	"	—	"	218.75	"	Rec. on channel 10	L9 as above	Fig. 11
48	"	191.75	"	—	"	212.75	"	Rec. on channel 9	L8 as above	Fig. 11
49	"	185.75	"	—	"	206.75	"	Rec. on channel 8	L7 as above	Fig. 11
50	"	179.75	"	—	"	200.75	"	Rec. on channel 7	L6 as above	Fig. 11
51	"	87.75	"	—	"	108.75	"	Rec. on channel 6	L5 as above	Fig. 11
52	"	81.75	"	—	"	102.75	"	Rec. on channel 5	L4 as above	Fig. 11
53	"	71.75	"	—	"	92.75	"	Rec. on channel 4	L3 as above	Fig. 11
54	"	65.75	"	—	"	86.75	"	Rec. on channel 3	L2 as above	Fig. 11
55	"	59.75	"	—	"	80.75	"	Rec. on channel 2	L1 as above	Fig. 11
56	Repeat steps 44 through 55 as a check.									
57	Antenna terminals	181.25 185.75	Antenna terminals	Sweeping channel 8	Not used	—		Rec. on chan. 8. Oscilloscope at R5 test point. Adjust T1 clockwise. When properly adjusted, curve will be slightly wider with a slightly deeper valley in top.		Fig. 16 (8)
58	Switch through all channels and observe response, oscillator injection and r-f oscillator frequency. Minor touch-ups of adjustments may be made at this time. However, if C7 or C9 are changed appreciably, then a recheck of the oscillator frequency on all channels should be made.									
59	Remove 39 ohm resistor and reconnect link from T101 to terminal 2 of r-f unit terminal board. Proceed with sweep alignment of Pix I-F.									

STEP No.	CONNECT SIGNAL GENERATOR TO	SIGNAL GEN. FREQ. MC.	CONNECT SWEEP GENERATOR TO	SWEEP GEN. FREQ. MC.	CONNECT OSCILLOSCOPE TO	CONNECT "VOLTOHMYST" TO	MISCELLANEOUS CONNECTIONS AND INSTRUCTIONS	ADJUST	REFER TO
SWEEP ALIGNMENT OF PICTURE I-F AMPLIFIER									
60	Loosely coupled to i-f amplifier	22.2 25.4	Antenna terminals	Sweeping selected channel	Terminal 2 of V106 socket	Junction of R102 & R201	Select channel known to have good r-f response. Clip 330 ohm resistors across R106, R108, R113, R119. Connect bias box to junction R102, R201.	Adjust bias box for −1.0 v. Set sweep to give 0.5 v. p-p on oscilloscope. Adjust T1 and T101 for correct response.	Fig. 8 Fig. 9 Fig. 10 Fig. 14
61	"	21.85 24.75 25.50 26.25	"	"	"	"	Remove 330 ohm resistors. Set bias box for −4.5 v.	Set sweep to give 3.0 v. p-p on oscilloscope. Adjust T1, T101 bot., T102 bot., T103 bot., T104 bot. and L103 for desired response.	Fig. 15

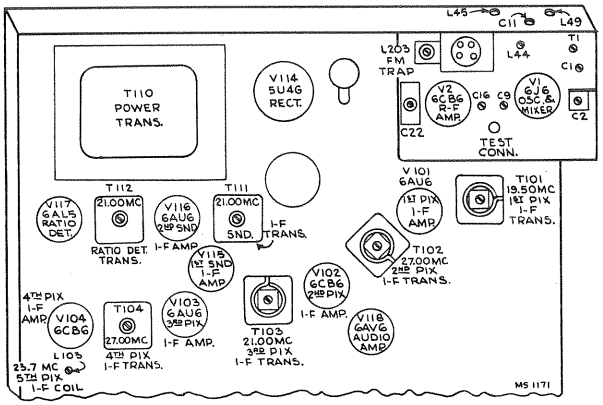


Figure 8—Top Chassis Adjustments

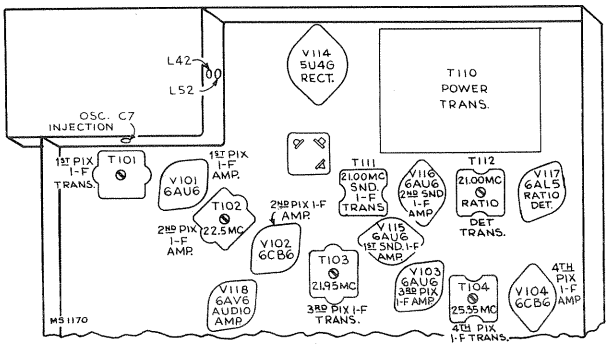


Figure 9—Bottom Chassis Adjustments

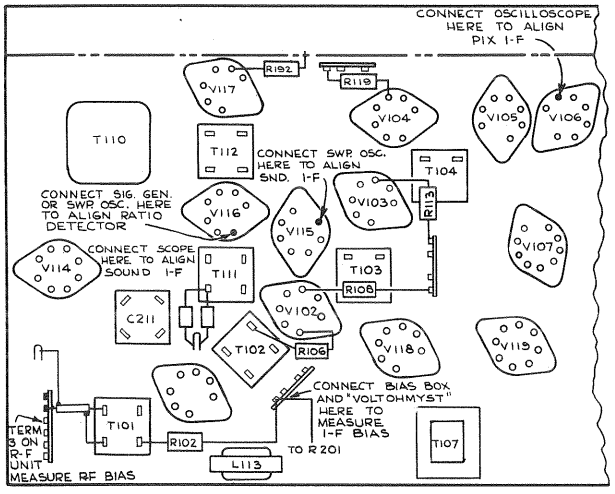


Figure 10—Test Connection Points

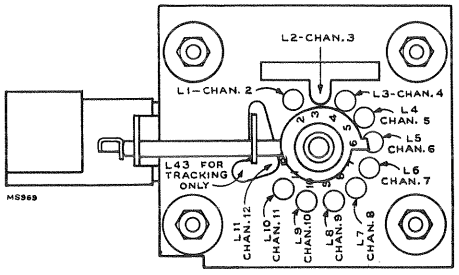


Figure 11—R-F Oscillator Adjustments

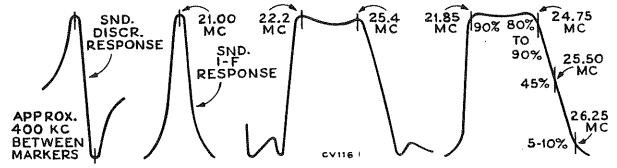


Figure 12 Ratio Det. Response | *Figure 13 Sound I-F Response* | *Figure 14 T1 and T101 Response* | *Figure 15 Overall I-F R-F Response*

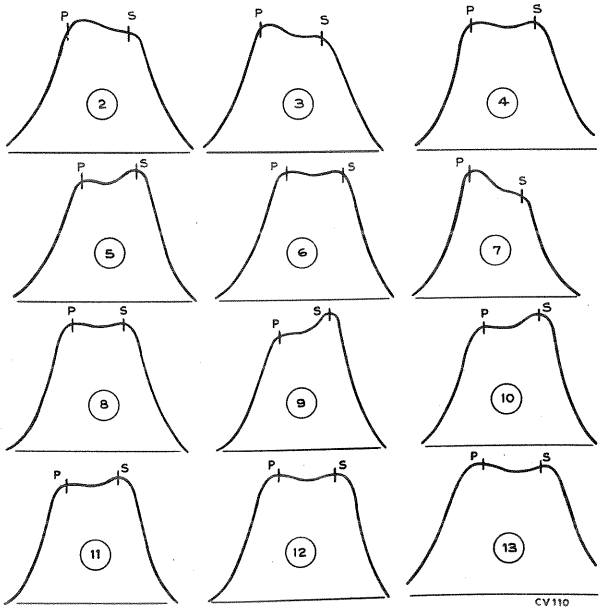


Figure 16—R-F Response

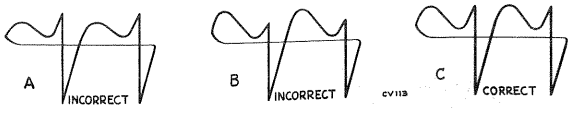


Figure 17—Horizontal Oscillator Waveforms

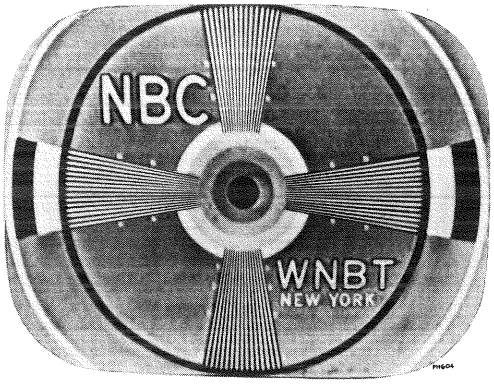


Figure 18—Normal Picture

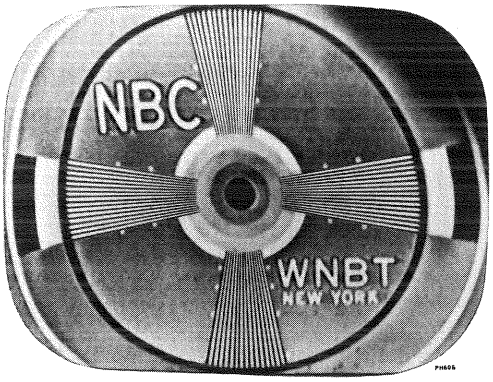


Figure 19—Centering Magnet and Ion Trap Magnet Misadjusted

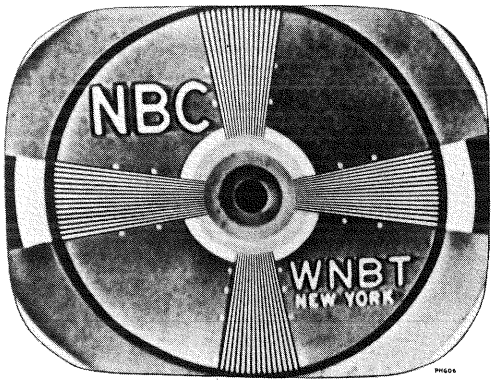


Figure 20—Horizontal Linearity Control Misadjusted (Picture Cramped in Middle)

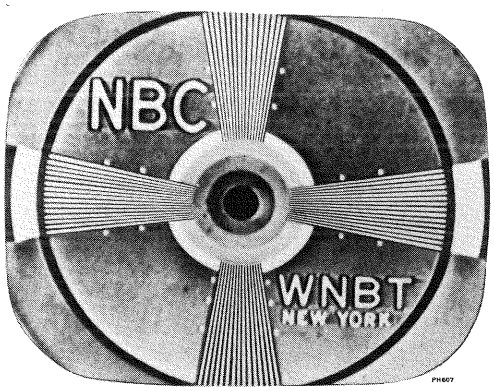


Figure 21—Width Control Misadjusted

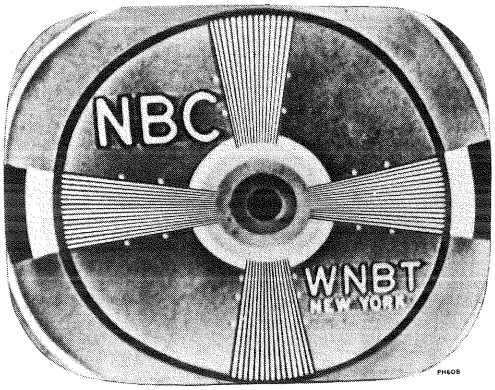


Figure 22—Horizontal Drive Control Misadjusted

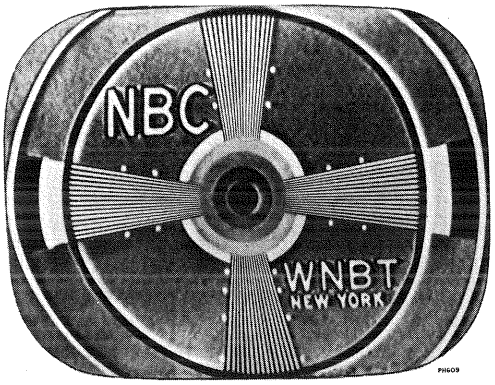


Figure 23—Transients

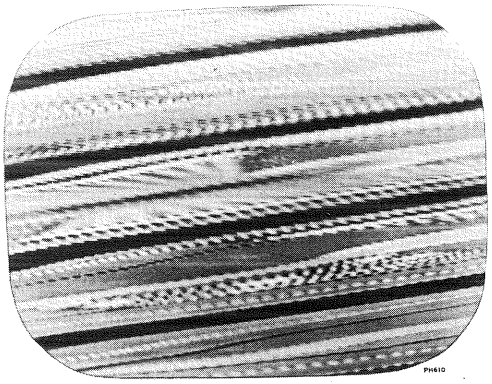


Figure 24—Test Pattern Showing Out of Sync Condition When Horizontal Hold Control Is in a Counter-clockwise Position—Just Before Pulling Into Sync

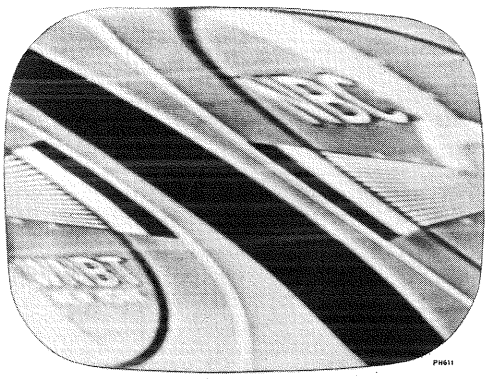


Figure 25—Test Pattern Showing Out of Sync Condition When Horizontal Hold Control Is at the Maximum Clockwise Position

WAVEFORM PHOTOGRAPHS

Taken from RCA WO58A Oscilloscope

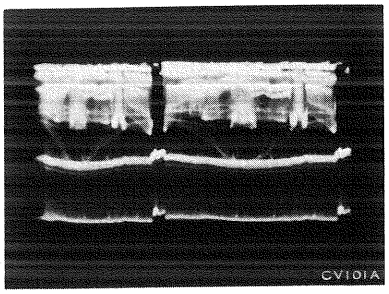
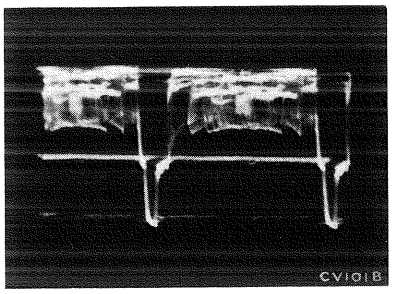
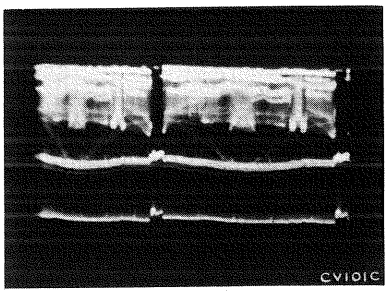


Plate of Picture Detector
(Pin 7 of V105) (6AL5)

Figure 26—Vertical (Oscilloscope Synced to ½ of Vertical Sweep Rate) (5.5 Volts PP)

Figure 27—Horizontal (Oscilloscope Synced to ½ of Horizontal Sweep Rate) (5.5 Volts PP)

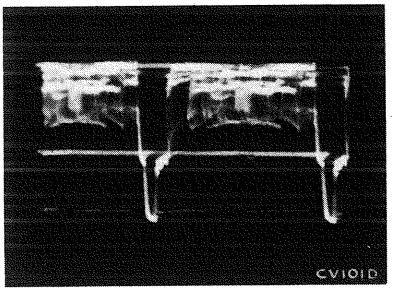




Grid of 1st Video Amplifier
(Pin 2 of V106) (12AU7)

Figure 28—Vertical (5.3 Volts PP)

Figure 29—Horizontal (5.3 Volts PP)



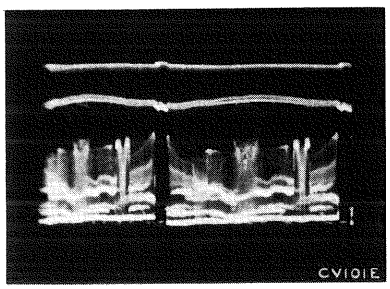
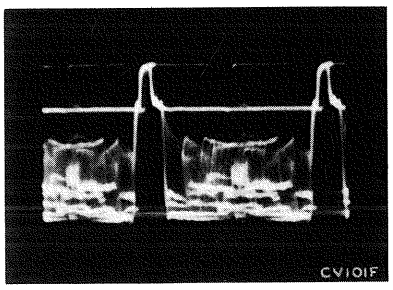
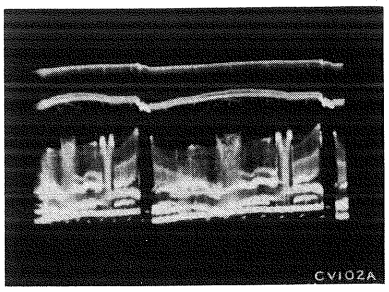


Plate of 1st Video Amplifier
(Pin 1 of V106) (12AU7)
Voltage depends on setting of picture control

Figure 30—Vertical (3-18 Volts PP)

Figure 31—Horizontal (3-18 Volts PP)

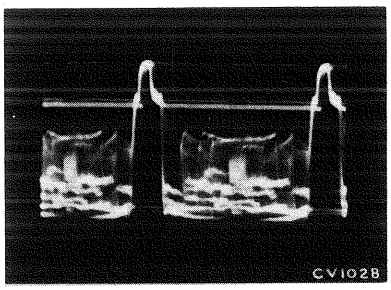




Grid of 2nd Video Amplifier
(Pin 7 of V106) (12AU7)
Voltage depends on setting of picture control

Figure 32—Vertical (3-18 Volts PP)

Figure 33—Horizontal (3-18 Volts PP)



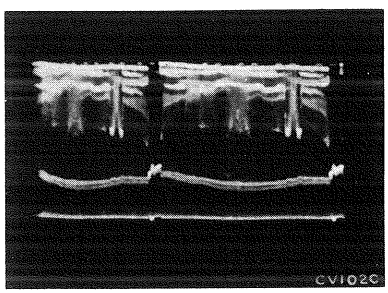
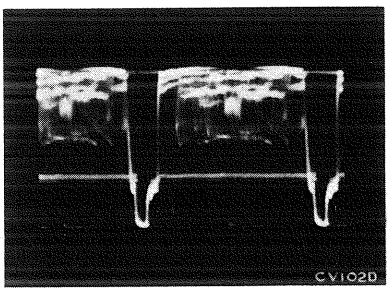
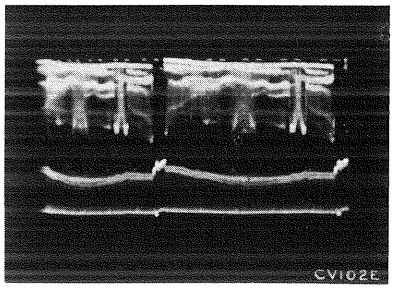


Plate of 2nd Video Amplifier
(Picture Max.)
(Pin 6 of V106) (12AU7)
Voltage depends on setting of picture control

Figure 34—Vertical (25-90 Volts PP)

Figure 35—Horizontal (25-90 Volts PP)

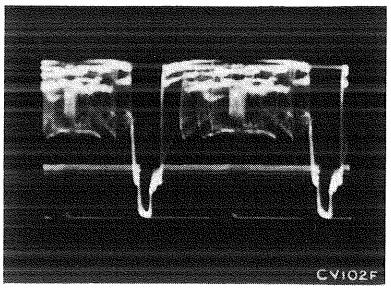


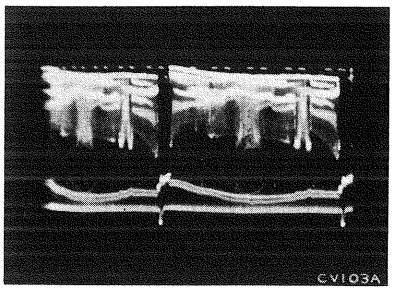


Input to Kinescope (Junction of L109 and R135) (Picture Max.) Voltage depends on setting of picture control

Figure 36—Vertical (25-90 Volts PP)

Figure 37—Horizontal (25-90 Volts PP)

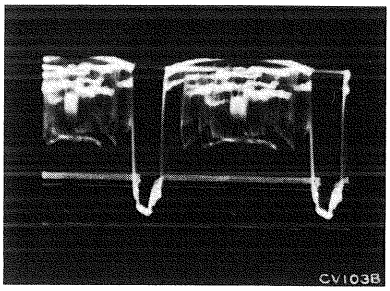


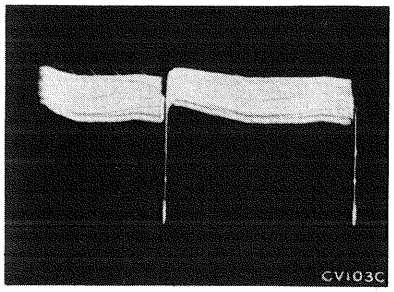


Cathode of D-C Restorer (Pin 3 of V107) (12AU7) Voltage depends on setting of picture control

Figure 38—Vertical (20-80 Volts PP)

Figure 39—Horizontal (20-80 Volts PP)

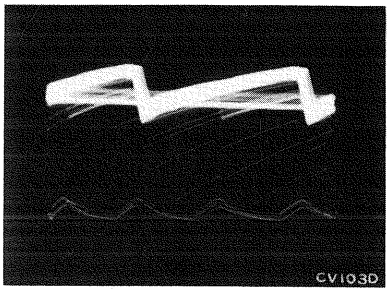


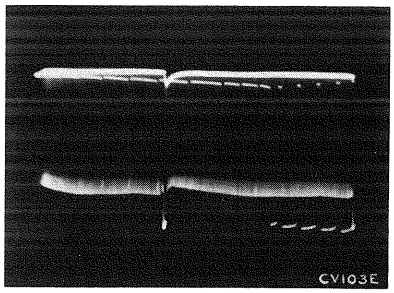


Grid of D-C Restorer (Pin 2 of V107) (12AU7) Voltage depends on setting of picture control

Figure 40—Vertical (3-10 Volts PP)

Figure 41—Horizontal (3-10 Volts PP)

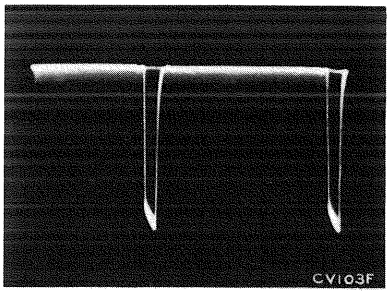




Grid of Sync Separator (Pin 4 of V108A) Voltage depends on setting of picture control

Figure 42—Vertical (6-8 Volts PP)

Figure 43—Horizontal (6-8 Volts PP)



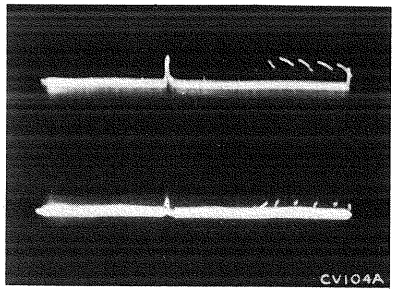
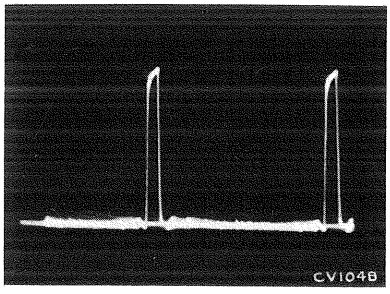


Plate of Sync Separator (Pin 5 of V108A) Voltage depends on setting of picture control

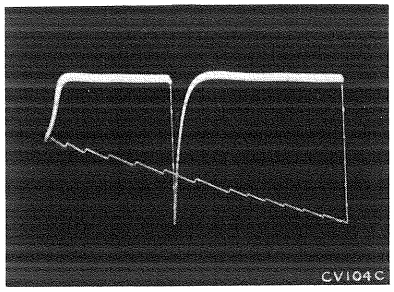
Figure 44—Vertical (14-16 Volts PP)

Figure 45—Horizontal (14-16 Volts PP)



WAVEFORM PHOTOGRAPHS

Taken from RCA WO58A Oscilloscope



Cathode of Sync Separator (Pin 6 of V108A) Voltage depends on setting of picture control

Figure 46—Vertical (.8-1.0 Volt PP)

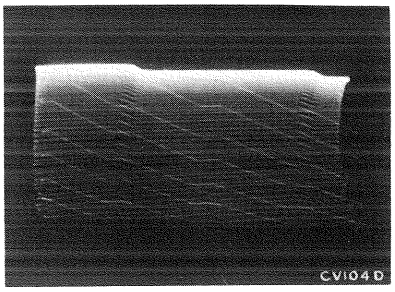


Figure 47—Horizontal (.8-1.0 Volt PP)

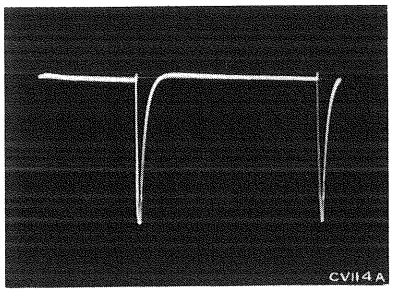


Figure 48—Output of Integrating Network (Junction of C139, C140 and R146) (45 Volts PP)

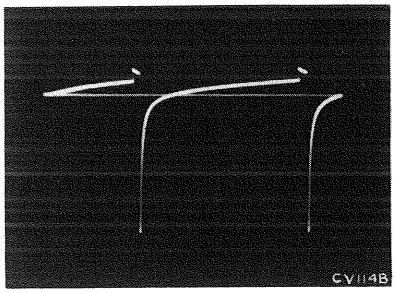


Figure 49—Grid of Vertical Oscillator (Pin 1 of V108B) (180 Volts PP)

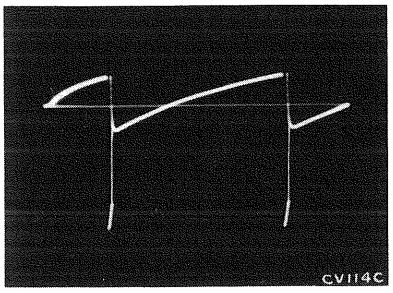


Figure 50—Plate of Vertical Oscillator (Pin 2 of V108B) (120 Volts PP)

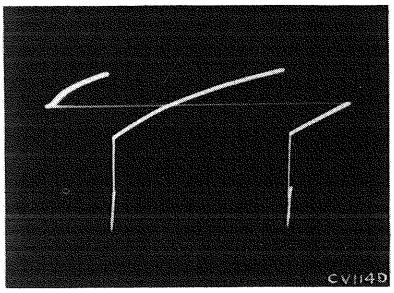


Figure 51—Grid of Vertical Output (190 Volts PP) (Pin 5 of V109) (6K6GT)

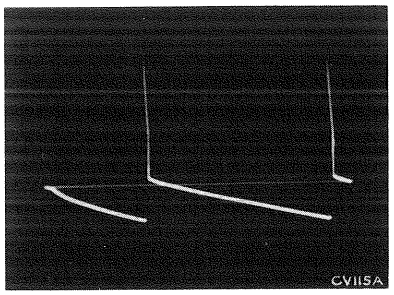


Figure 52—Plate of Vertical Output (1300 Volts PP) (Pin 3 of V109) (6K6GT)

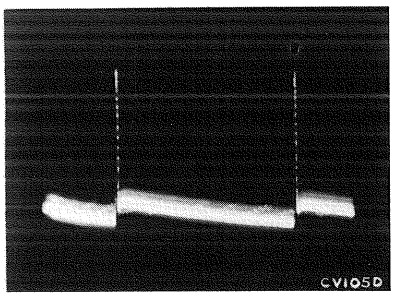


Figure 53—Input of Vertical Deflection Coils (15 Volts PP) (Voltage Across Pins 1 and 2 of J101F)

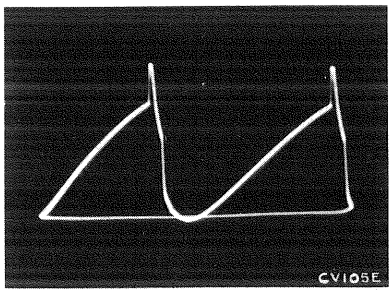


Figure 54—Grid of Horizontal Oscillator Control (22 Volts PP) (Pin 1 of V110) (6SN7GT)

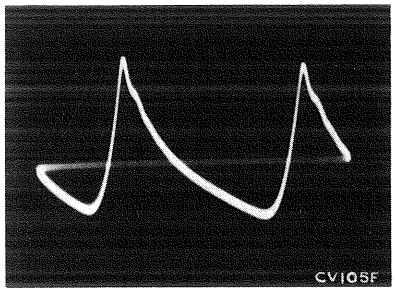


Figure 55—Cathode of Horizontal Oscillator Control (1.0 Volt PP) (Pin 3 of V110) (6SN7GT)

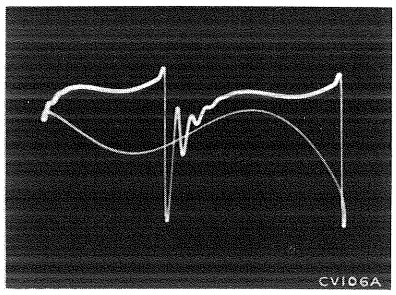


Figure 56—Junction of R126, R163 and R170 (52 Volts PP)

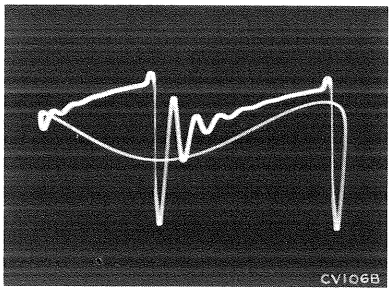


Figure 57—Grid of Horizontal Oscillator (340 Volts PP) (Pin 4 of V110) (6SN7GT)

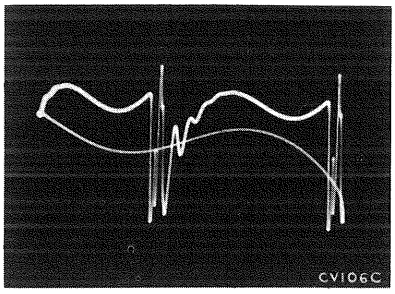


Figure 58—Plate of Horizontal Oscillator (190 Volts PP) (Pin 5 of V110) (6SN7GT)

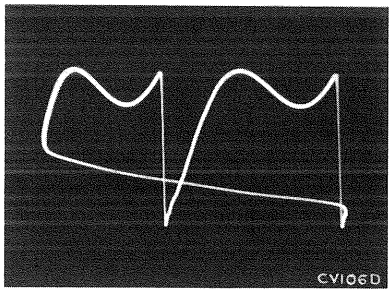


Figure 59—Terminal "C" of T108 (120 Volts PP)

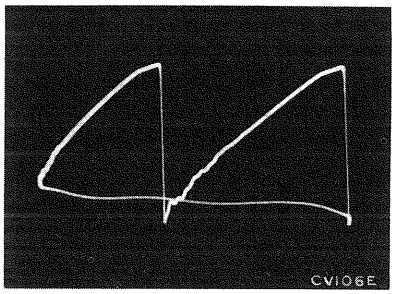


Figure 60—Input to Horizontal Output Tube (80-110 Volts PP) (Junction of C155 and C147B)

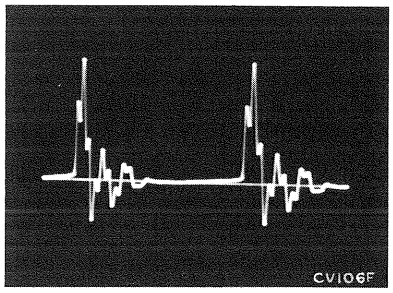


Figure 61—Plate of Horizontal Output (Approx. 6,000 Volts PP) (Measured Through a Capacity Voltage Divider Connected from Top Cap of V111 to Ground)

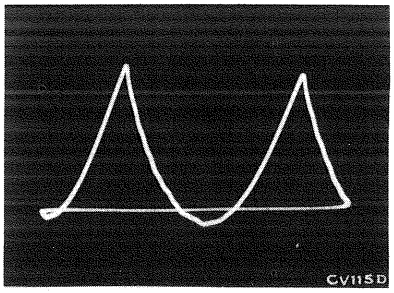


Figure 62—Cathode of Horizontal Output Tube (9-12 Volts PP) (Pin 3 of V111) (6BG6G)

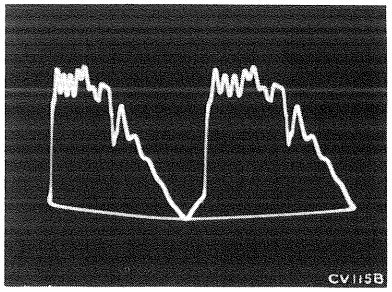


Figure 63—Screen of Horizontal Output Tube (5-120 Volts PP) (Pin 8 of V111) (6BG6G)

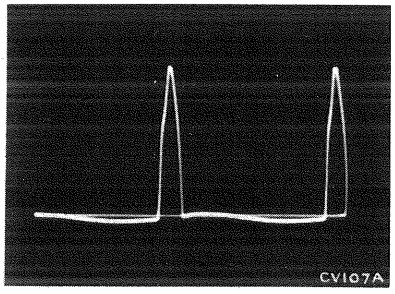


Figure 64—Cathode of Damper (3000 Volts PP) (Pin 3 of V113) (6W4GT)

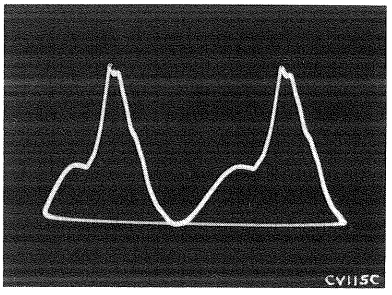


Figure 65—Plate of Damper (140 Volts PP) (Pin 5 of V113) (6W4GT)

VOLTAGE CHART

The following measurements represent two sets of conditions. In the first condition, a 2500 microvolt test pattern signal was fed into the receiver, the picture synced and the AGC control properly adjusted. The second condition was obtained by removing the antenna leads and short circuiting the receiver antenna terminals. Voltages shown are read with a WV97A Senior "VoltOhmyst" between the indicated terminal and chassis ground and with the receiver operating on 117 volts, 60 cycles, a-c. The symbol < means less than.

Tube No.	Tube Type	Function	Operating Condition	E. Plate		E. Screen		E. Cathode		E. Grid		I Plate (ma.)	I Screen (ma.)	Notes on Measurements
				Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts			
V1	6J6	Mixer	2500 Mu. V. Signal	2	144	—	—	7	0	5	−2.3	6.6	—	
			No Signal	2	135	—	—	7	0	5	−2.1	5.6	—	
V1	6J6	R-F Oscillator	2500 Mu. V. Signal	1	100	—	—	7	0	6	−3.0	4.0	—	*Depending upon channel
			No Signal	1	96	—	—	7	0	6	−2.7	3.9	—	
V2	6AG5	R-F Amplifier	2500 Mu. V. Signal	5	250	6	130	2	0.1	1	−3.4	3.0	0.6	
			No Signal	5	166	6	84	2	0.4	1	−0.2	10.3	2.3	
V101	6AU6	1st Pix. I-F Amplifier	2500 Mu. V. Signal	5	195	6	222	7	0.3	1	−5.0	1.7	0.8	
			No Signal	5	121	6	135	7	0.8	1	−0.8	5.2	2.2	
V102	6CB6	2nd Pix. I-F Amplifier	2500 Mu. V. Signal	5	222	6	203	2	0.3	1	−5.0	2.0	0.7	
			No Signal	5	124	6	112	2	0.8	1	−0.8	5.5	1.6	
V103	6AU6	3rd Pix. I-F Amplifier	2500 Mu. V. Signal	5	185	6	225	7	0.2	1	−5.0	1.7	0.7	
			No Signal	5	94	6	132	7	0.5	1	−0.75	4.9	2.0	
V104	6CB6	4th Pix. I-F Amplifier	2500 Mu. V. Signal	5	165	6	142	2	2.25	1	0	9.6	3.1	
			No Signal	5	118	6	132	2	2.1	1	0	9.0	3.1	
V105	6AL5	Picture 2nd Det.	2500 Mu. V. Signal	7	−2.0	—	—	1	0	—	—	0.3	—	
			No Signal	7	−0.5	—	—	1	0	—	—	<0.1	—	
V105	6AL5	AGC Rectifier	2500 Mu. V. Signal	2	−9.5	—	—	5	5.5	—	—	<0.1	—	
			No Signal	2	−2.0	—	—	5	5.5	—	—	<0.1	—	
V106	12AU7	1st Video Amplifier	2500 Mu. V. Signal	1	100	—	—	3	1.2	2	−2.3	3.6	—	At maximum contrast
			No Signal	1	54	—	—	3	0.9	2	−0.5	2.6	—	
			2500 Mu. V. Signal	1	190	—	—	3	9.0	7	−2.6	0.9	—	At minimum contrast
			No Signal	1	122	—	—	3	6.9	7	−0.5	0.6	—	
V106	12AU7	2nd Video Amplifier	2500 Mu. V. Signal	6	330	—	—	8	125	2	118	9.3	—	At maximum contrast
			No Signal	6	295	—	—	8	121	2	110	13.6	—	
			2500 Mu. V. Signal	6	300	—	—	8	131	7	120	12.9	—	At minimum contrast
			No Signal	6	295	—	—	8	121	7	110	13.6	—	
V107	12AU7	DC Rest. & Sync. Sep.	2500 Mu. V. Signal	1	10	—	—	3	45	2	−4.5	—	—	At maximum contrast
			No Signal	1	8	—	—	3	1.7	2	−0.4	—	—	
			2500 Mu. V. Signal	6	7.2	—	—	8	54	7	0	—	—	
			No Signal	6	7.0	—	—	8	—	7	0	—	—	

VOLTAGE CHART

Tube No.	Tube Type	Function	Operating Condition	E. Plate		E. Screen		E. Cathode		E. Grid		I Plate (ma.)	I Screen (ma.)	Notes on Measurements
				Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts			
V108A	6SN7GT	Sync. Amplifier	2500 Mu. V. Signal	5	50	—	—	6	7.8	4	7.4	—	—	
			No Signal	5	46	—	—	6	7.0	4	7.0	—	—	
V108	6SN7GT	Vertical Oscillator	2500 Mu. V. Signal	2	*345	—	—	3	0	1	*–58	0.4	—	*Depends on setting of height control
			No Signal	2	*395	—	—	3	0	1	*–58	0.4	—	
V109	6K6GT	Vertical Output	2500 Mu. V. Signal	3	370	4	370	8	51	5	0	11.5	1.9	
			No Signal	3	365	4	365	8	51	5	0	11.4	1.9	
V110	6SN7GT	Horizontal Osc. Control	2500 Mu. V. Signal	2	*160	—	—	3	*–4.6	1	*–14.6	0.32	—	*Depends on setting of hold control
			No Signal	2	*152	—	—	3	*–4.4	1	*–3.5	0.28	—	
V110	6SN7GT	Horizontal Oscillator	2500 Mu. V. Signal	5	230	—	—	6	0	4	–82	1.8	—	
			No Signal	5	225	—	—	6	0	4	–85	1.8	—	
V111	6BG6G	Horizontal Output	2500 Mu. V. Signal	5	*630	8	335	3	7.2	5	–33	67	5.0	*6000 volt pulse present
			No Signal	5	*630	8	329	3	7.2	5	–33	67.1	4.9	
V112	1B3GT /8016	H. V. Rectifier	Brightness Min.	Cap	*	—	—	2 & 7	*11,000	—	—	0	—	*12,000 volt pulse present
			Brightness Maximum	Cap	*	—	—	2 & 7	*12,200	—	—	0.1	—	
V113	6W4GT	Damper	2500 Mu. V. Signal	5	387	—	—	3	*391	—	—	69	—	*3000 volt pulse present
			No Signal	5	380	—	—	3	*387	—	—	70	—	
V114	5U4G	Rectifier	2500 Mu. V. Signal	4 & 6	*368	—	—	2 & 8	391	—	—	185	—	*AC measured with AC voltmeter
			No Signal	4 & 6	*367	—	—	2 & 8	387	—	—	199	—	
V115	6AU6	1st Sound I-F Amp.	2500 Mu. V. Signal	5	120	6	120	7	0.8	1	–0.2	6.8	2.9	
			No Signal	5	108	6	108	7	0.8	1	–0.1	6.2	2.8	
V116	6AU6	2nd Sound I-F Amp.	2500 Mu. V. Signal	5	118	6	87	7	0	1	–1.3	4.9	2.8	
			No Signal	5	110	6	76	7	0	1	–0.5	6.9	3.1	
V117	6AL5	Sound Discrim.	2500 Mu. V. Signal	2	–7.2	—	—	5	0	—	—	<0.1	—	
			No Signal	2	–10.0	—	—	5	0	—	—	<0.1	—	
V118	6AV6	1st Audio Amplifier	2500 Mu. V. Signal	7	95	—	—	2	0	1	–0.5	0.5	—	
			No Signal	7	84	—	—	2	0	1	–0.4	0.4	—	
V119	6K6GT	Audio Output	2500 Mu. V. Signal	3	352	4	368	8	131	5	112	28.7	4.3	
			No Signal	3	348	4	360	8	134	5	108	28.8	4.2	
V120	17GP4	Kinescope	2500 Mu. V. Signal	Cone	11,000	10	384	11	100	2	46	<0.1	<0.1	
			No Signal	Cone	12,200	10	375	11	74	2	8.3	<0.1	<0.1	

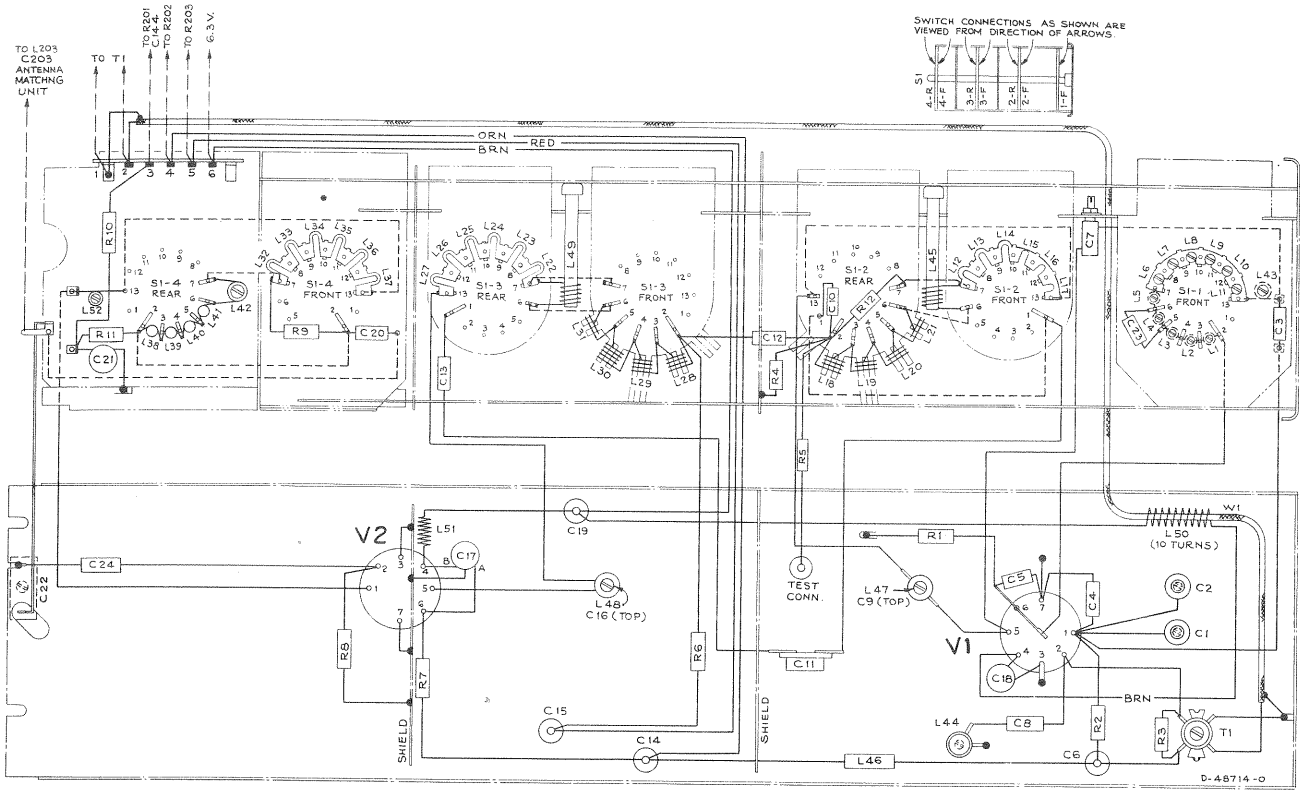
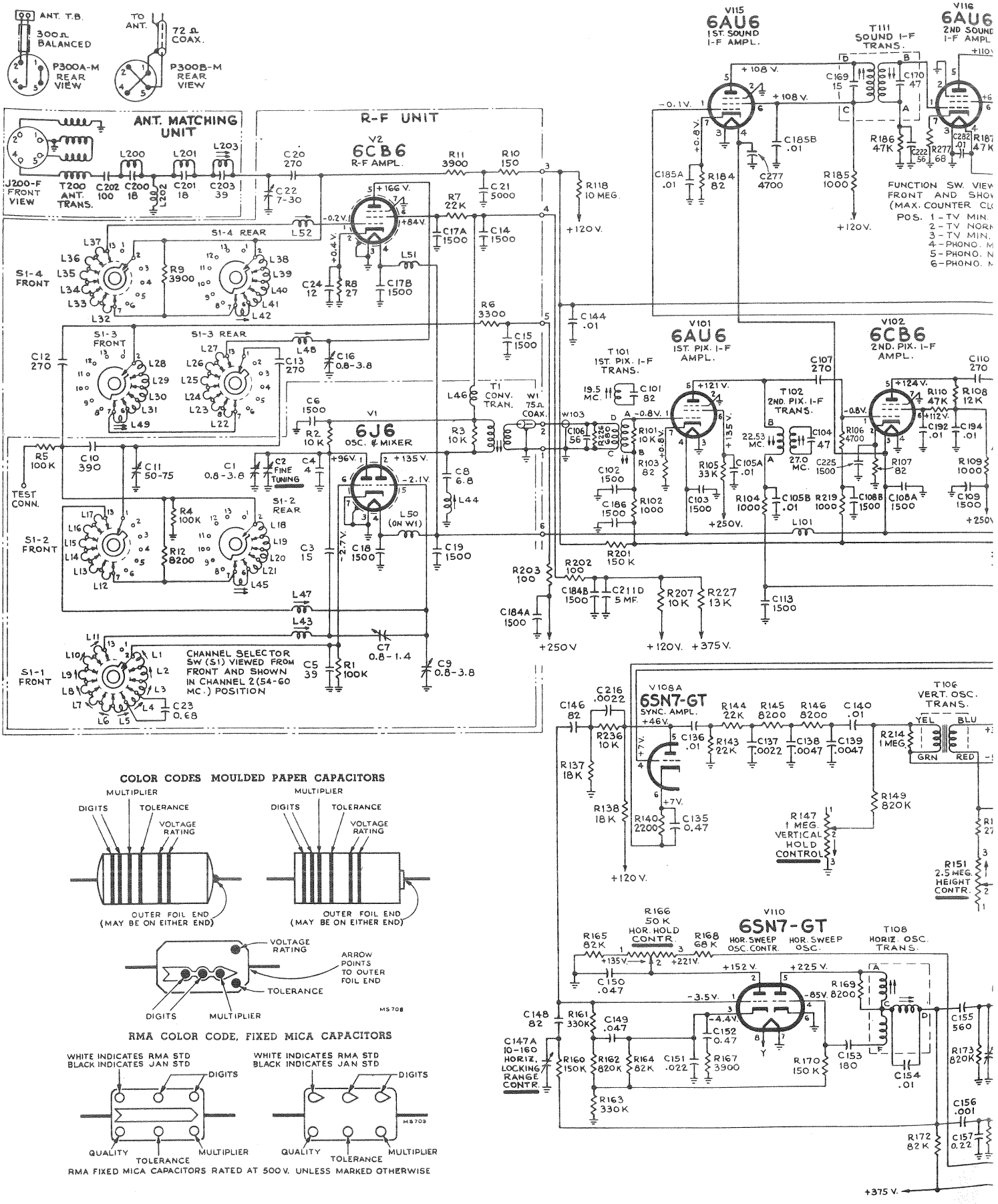


Figure 66—R-F Unit Wiring Diagram

CRITICAL LEAD DRESS:

1. All leads in the picture and sound i-f circuits must be dressed as short and direct as possible with the exception of C106, C107, C110 and C117, which are to be dressed with enough slack so as not to have to move the body of the capacitor to align that particular stage.
2. Dress all 1,500 mmf, .005 mfd and .01 mfd capacitors in the i-f section with leads as short as possible.
3. Dress all wires between T101 and the r-f unit in clamp.
4. Dress C185 to act as shield for lead between pin 5 of V115 socket to T111D and picture i-f circuits.
5. Dress the bodies of resistors R106, R108, R113, R119, R191, R192 and capacitor C176 as close to tube pin as possible.
6. Dress L114 with coded end as close to pin 2 of U105 socket as possible.
7. The length of the bus wire from pin 2 of V116 to ground should not be shortened or rerouted.
8. Dress R194 as close to chassis with leads as short as possible.
9. Dress C199 with leads as short as possible and away from S106.
10. Keep the leads on C126 as short and direct as possible.
11. Dress all components connected to V106 socket up and away from the chassis except L104.
12. Keep the body and coded end of L104 as close to pin 2 of V105 socket as possible.
13. Dress the 4.5 mc. trap L107 up and away from the chassis base.
14. Dress C132 up in the air and towards V105 socket.
15. Dress R125 with body as close as possible to pin 2 of U106 socket.
16. Keep body of R123 as close as possible to pin 2 of V105 socket.
17. Dress C133 and C190 away from C132, C151 and C153.
18. Dress the white wire from picture control R128-3 away from the chassis.
19. Dress all slack on kinescope socket leads under chassis. Dress brown wire away from any components associated with V105 or V106.
20. The green lead from the kinescope socket should be dressed away from all other leads and components and away from V106.
21. Dress R133 towards chassis rear apron.
22. Dress all leads in clamps on rear apron away from V117, V104, V105, V106 sockets and S103.
23. Dress green wire from C147A up and away from chassis.
24. Dress blue wire of T107 toward front apron of chassis.
25. Dress C153 down next to the chassis base.
26. Dress blue/white wire from height control R151-3 under R180.
27. Dress R161, R162, R163, R164 and R170 up and away from the chassis and with a half-inch clearance from the soldering point.
28. Dress the yellow wire from pin 3 of V110 socket over C153.
29. Dress both leads of C198 away from the body of the capacitor.
30. Dress fuse in high voltage compartment so as not to short circuit to ground.
31. Dress blue and blue/yellow wire from power transformer in 3 clamps on chassis base and away from S103 and video section.
32. Dress both wires on S106 away from blue/yellow damper leads of T110.
33. Dress the brown wire from pin 8 of V114 socket away from V118 socket.
34. Dress all 2 watt resistors away from each other and away from all wires and other components.

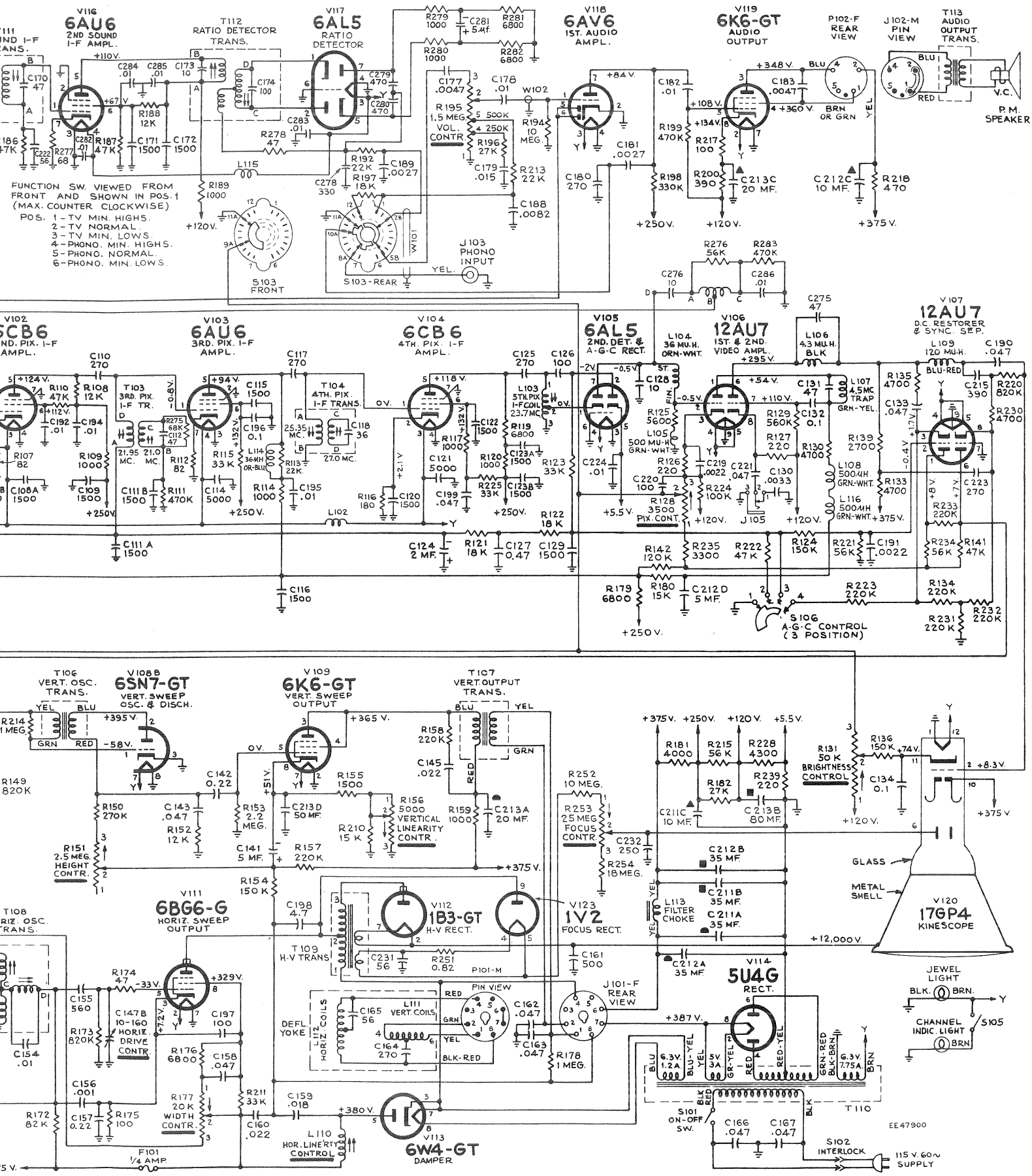


All resistance values in ohms. K = 1000.

All capacitance values less than 1 in MF and above 1 in MMF unless otherwise noted.

Coil resistance ohm are not show

Direction of arr cates clockwise ro



Coil resistance values less than 1 ohm are not shown.

Direction of arrows at controls indicates clockwise rotation.

In some receivers, substitutions have caused changes in component lead color codes, in electrolytic capacitor values and their lug identification markings.

All voltages measured with "Volt-Ohmyst" and with no signal input. Voltages should hold within ±20% with 117 v. a-c supply.

Figure 67—Schematic Diagram

STOCK No.	DESCRIPTION
	R-F UNIT ASSEMBLY KRK8B
75188	Board—Terminal board, 5 contact and ground
75067	Bracket—Vertical bracket for holding oscillator tube shield
75201	Cable—75 ohms, coax. cable (7¼") complete with coil (W1, L50)
75186	Capacitor—Ceramic, variable for fine tuning — plunger type (C2)
75289	Capacitor—Ceramic, 4 mmf., ±0.5 mmf. (C4)
75189	Capacitor—Adjustable, 7-30 mmf. (C22)
75200	Capacitor—Ceramic, 12 mmf. (C24)
45465	Capacitor—Ceramic, 15 mmf. (C3)
75196	Capacitor—Ceramic, 39 mmf. (C5)
75174	Capacitor—Ceramic, trimmer, 50-75 mmf. (C11)
75199	Capacitor—Ceramic, 270 mmf. (C12, C13, C20)
75641	Capacitor—Ceramic, 390 mmf. (C10)
75166	Capacitor—Ceramic, 1500 mmf. (C6, C14, C15, C19)
75089	Capacitor—Ceramic, dual, 1500 mmf. (C17A, C17B)
73748	Capacitor—Ceramic, 1500 mmf. (C18)
73473	Capacitor—Ceramic, 5000 mmf. (C21)
75172	Capacitor—Tubular, steatite, adjustable, 0.65-1.2 mmf. (C7)
71504	Capacitor—Ceramic, 0.68 mmf. (C23)
75184	Capacitor—Ceramic, adjustable, 0.75-4 mmf., complete with adjusting stud (C1)
75197	Capacitor—Ceramic, 6.8 mmf. (C8)
75167	Clip—Tubular clip for mounting stand-off capacitors—RCA 75166
75182	Coil—Trimmer coil (1½ turns) with adjustable inductance core and capacitor stud (screw adjustment) for converter section (C9, L47)
75183	Coil—Trimmer coil (3 turns) with adjustable inductance core and capacitor stud (screw adjustment) for r-f section (L48, C16)
75185	Coil—Converter plate loading coil (L44)
75202	Coil—Choke coil, .56 muh (L46)
73477	Coil—Choke coil (L51)
75187	Core—Adjustable core for fine tuning capacitor C2
75162	Detent—Detent mechanism and fibre shaft
73453	Form—Coil form for L45 and L49
75165	Link—Link assembly for fine tuning
76135	Plate—Front plate and shaft bearing
14343	Retainer—Fine tuning shaft retaining ring
	Resistor—Fixed, composition:—
503027	27 ohms, ±10%, ½ watt (R8)
504115	150 ohms, ±20%, ½ watt (R10)
503233	3300 ohms, ±10%, ½ watt (R6)
503239	3900 ohms, ±10%, ½ watt (R9, R11)
503282	8200 ohms, ±10%, ½ watt (R12)
3078	10,000 ohms, ±5%, ½ watt (R3)
504310	10,000 ohms, ±20%, ½ watt (R2)
503322	22,000 ohms, ±10%, ½ watt (R7)
504410	100,000 ohms, ±20%, ½ watt (R1, R4, R5)
75164	Rod—Actuating plunger rod (fibre) for fine tuning link
71476	Screw—No. 4-40 x ¼" binder head machine screw for adjusting L6, L7, L8, L9, L10, L11
75176	Screw—No. 4-40 x ⅜" fillister head screw for adjusting L5
75177	Screw—No. 4-40 x 5/16" fillister head screw for adjusting L1, L2, L3, L4, L43
74575	Screw—No. 4-40 x .359" adjusting screw for L42
73640	Screw—No. 4-40 x 7/16" adjusting screw for L52
75159	Shaft—Channel selector shaft and plate
75160	Shaft—Fine tuning shaft and cam
75168	Shield—Oscillator and converter sections shield for r-f unit—snap-on type
75193	Shield—Tube shield for V1
75192	Shield—Tube shield for V2
75088	Socket—Tube socket, 7 contact, miniature, ceramic, saddle mounted
75191	Spacer—Insulating spacer for front plate (4 required)
75163	Spring—Friction spring (formed) for fine tuning cam
75068	Spring—Retaining spring for oscillator tube shield
74578	Spring—Retaining spring for adjusting screws
73457	Spring—Return spring for fine tuning control
30340	Spring—Hair pin spring for fine tuning link
75175	Stator—Oscillator section stator complete with rotor, segment, coils, adjusting screws and capacitors C3 and C23 (S1-1, C3, C23, L1, L2, L3, L4, L5, L6, L7, L8, L9, L10, L11, L43)
75178	Stator—Converter stator complete with rotor, coils, capacitors (C10 and C12) and resistors (R4 and R5) (S1-2, C10, C12, L12, L13, L14, L15, L16, L17, L18, L19, L20, L21, L45, R4, R5, R12)
75179	Stator—R-F amplifier stator complete with rotor, coils, capacitor (C13) and resistor (R6) (S1-3, C13, L22, L23, L24, L25, L26, L27, L28, L29, L30, L31, L49, R6)
75180	Stator—Antenna stator complete with rotor, coils, capacitors (C20 and C21) and resistors (R9, R10, R11) (S1-4, C20, C21, L32, L33, L34, L35, L36, L37, L38, L39, L40, L41, L42, L52, R9, R10, R11)
75169	Strip—Coil segment mounting strip—RH center
75170	Strip—Coil segment mounting strip—LH lower
75171	Strip—Coil segment mounting strip—LH upper—less trimmer C7
75173	Stud—No. 6-32 x 13/16" adjusting stud for C7 trimmer
75446	Stud—Capacitor stud—brass—No. 4-40 x 13/16" with 3/64" screw driver slot for trimmer coils L47, L48 and capacitor C1 uncoded and coded "ER"
75447	Stud—Capacitor stud—brass—No. 4-40 x 13/16" with 3/64" screw driver slot for trimmer coils L47, L48 and capacitor C1 coded numerically and "Hi Q"
75181	Transformer—Converter transformer (T1)
75190	Washer—Insulating washer (neoprene) for capacitor C7
75607	Washer—Insulating washer (hex)
	CHASSIS ASSEMBLIES
75515	Bracket—Channel indicator lamp bracket
75646	Capacitor—Ceramic, 4.7 mmf. (C198)
53511	Capacitor—Ceramic, 10 mmf. (C128)
75217	Capacitor—Mica trimmer, dual 10-160 mmf. (C147A, C147B)
75450	Capacitor—Ceramic, 39 mmf. (C203)
71924	Capacitor—Ceramic, 56 mmf. (C222)
71924	Capacitor—Ceramic, 56 mmf. (C106)
76384	Capacitor—Ceramic, 56 mmf. (C231, C232)
73090	Capacitor—Mica, 82 mmf. (C146, C148)
75437	Capacitor—Ceramic, 100 mmf. (C202)
45233	Capacitor—Ceramic, 100 mmf. (C126, C197, C220)

STOCK No.	DESCRIPTION
73102	Capacitor—Mica, 180 mmf. (C153)
75250	Capacitor—Tubular, moulded paper, oil impregnated, 250 mmf., 12,500 volts (C232)
76303	Capacitor—Ceramic, 270 mmf. (C223)
76303	Capacitor—Ceramic, 270 mmf. (C223)
73091	Capacitor—Mica, 270 mmf. (C107, C110, C117, C125)
39638	Capacitor—Mica, 270 mmf. (C130)
76473	Capacitor—Mica, 330 mmf. (C278)
73094	Capacitor—Mica, 390 mmf. (C215)
39644	Capacitor—Mica, 470 mmf. (C279, C280)
74947	Capacitor—Ceramic, 500 mmf., 20,000 volts (C161)
74250	Capacitor—Mica, 560 mmf. (C155)
75166	Capacitor—Ceramic, 1500 mmf. (stand-off) (C171, C172)
73748	Capacitor—Ceramic, 1500 mmf. (C102, C103, C109, C113, C115, C116, C120, C122, C129, C186, C225)
75089	Capacitor—Ceramic, dual 1500 mmf. (C108A, C108B, C111A, C111B, C123A, C123B, C184, C184B)
73473	Capacitor—Ceramic, 5000 mmf. (C114, C121, C277)
75877	Capacitor—Ceramic, dual, 10,000 mmf. (C105A, C105B, C185A, C185B)
73960	Capacitor—Ceramic, 10,000 mmf. (C144, C192, C194, C195, C224, C282, C283, C284, C285, C286)
73747	Capacitor—Electrolytic, 2 mfd, 50 volts (C124)
28417	Capacitor—Electrolytic, 5 mfd, 450 volts (C141)
74521	Capacitor—Electrolytic, 5 mfd, 50 volts (C281)
75511	Capacitor—Electrolytic comprising 1 section of 20 mfd, 450 volts, 1 section of 80 mfd, 200 volts, 1 section of 20 mfd, 200 volts and 1 section of 50 mfd, 50 volts (C213A, C213B, C213C, C213D)
75510	Capacitor—Electrolytic comprising 2 sections of 35 mfd, 450 volts, 1 section of 10 mfd, 450 volts and 1 section of 5 mfd, 450 volts (C211A, C211B, C211C, C211D, C212A, C212B, C212C, C212D)
75643	Capacitor—Tubular, moulded paper, oil impregnated, .001 mfd, 1000 volts (C156)
73802	Capacitor—Tubular, paper, oil impregnated, .0015 mfd, 1000 volts (C219)
73595	Capacitor—Tubular, paper, oil impregnated, .0022 mfd, 600 volts (C137, C191, C216, C219)
73599	Capacitor—Tubular, paper, oil impregnated, .0027 mfd, 600 volts (C181, C189)
73795	Capacitor—Tubular, paper, oil impregnated, .0033 mfd, 600 volts (C130)
73920	Capacitor—Tubular, paper, oil impregnated, .0047 mfd, 600 volts (C138, C139, C177, C183)
73808	Capacitor—Tubular, paper, oil impregnated, .0082 mfd, 1000 volts (C188)
73561	Capacitor—Tubular, paper, oil impregnated, .01 mfd, 400 volts (C136, C178, C182)
73594	Capacitor—Tubular, moulded paper, oil impregnated, .01 mfd, 600 volts (C140, C154)
73797	Capacitor—Tubular, paper, oil impregnated, .015 mfd, 600 volts (C179)
74727	Capacitor—Tubular, paper, oil impregnated, .018 mfd, 1000 volts (C159)
73562	Capacitor—Tubular, paper, oil impregnated, .022 mfd, 400 volts (C145, C151)
73810	Capacitor—Tubular, paper, oil impregnated, .022 mfd, 1000 volts (C160)
73553	Capacitor—Tubular, paper, oil impregnated, .047 mfd, 400 volts (C149, C199, C221)
75071	Capacitor—Tubular, moulded paper, .047 mfd, 400 volts (C166, C167)

STOCK No.	DESCRIPTION
73592	Capacitor—Tubular, paper, oil impregnated, .047 mfd, 600 volts (C133, C150, C190)
73597	Capacitor—Tubular, paper, oil impregnated, .047 mfd, 1000 volts (C143, C158, C162, C163)
73551	Capacitor—Tubular, paper, oil impregnated, 0.1 mfd, 400 volts (C132, C196)
73557	Capacitor—Tubular, paper, oil impregnated, 0.1 mfd, 600 volts (C134)
73794	Capacitor—Tubular, paper, oil impregnated, 0.22 mfd, 400 volts (C157)
74957	Capacitor—Tubular, paper, oil impregnated, 0.22 mfd, 600 volts (C142)
73787	Capacitor—Tubular, paper, oil impregnated, 0.47 mfd, 200 volts (C127, C135, C152)
76284	Choke—Filter choke (L113)
76143	Clip—Tubular clip for mounting stand-off capacitor No. 75166
75210	Coil—Fifth pix, i-f coil complete with adjustable core (L103)
71449	Coil—Horizontal linearity coil (L110)
73591	Coil—Antenna matching coil (2 required) (Part of T200)
75241	Coil—Antenna shunt coil (L202)
73477	Coil—Choke coil (L101, L102, L115)
75299	Coil—Peaking coil (36 muh) (L104)
71793	Coil—Peaking coil (36 muh) (L106)
76285	Coil—Peaking coil (36 muh) (L114, R113)
75253	Coil—Peaking coil (120 muh) (L109)
75252	Coil—Peaking coil (500 muh) (L105, L108, L116)
74594	Connector—2 contact male connector for power cord
35787	Connector—Phono input connector (J103)
35383	Connector—8 contact male connector—part of deflection yoke (P101)
68592	Connector—8 contact female connector for deflection yoke leads (J101)
38853	Connector—4 contact female connector for antenna transformer (J200)
5040	Connector—4 contact female connector for speaker cable (P102)
75517	Contact—Anode connector contact only
75215	Control—Horizontal and vertical hold control (R147, R166)
71441	Control—Vertical linearity control (R156)
71440	Control—Height control (R151)
75516	Control—Width control (R177)
75514	Control—Picture control, brightness control and channel light switch (R128, R131, S105)
76171	Control—Volume control and power switch (R195, S101)
76503	Control—Focus control (R253)
71498	Core—Adjustable core and stud for F-M trap No. 75449
74956	Cushion, Rubber cushion for deflection yoke hood
74839	Fastener—Push fastener to mount ceramic tube socket (2 required)
73600	Fuse—.25 amp., 250 volts (F101)
16058	Grommet—Rubber grommet for 2nd anode lead exit
37396	Grommet—Rubber grommet for mounting ceramic tube socket (2 required)
76376	Hood—Deflection yoke hood less rubber cushions
75644	Insulator—2nd anode insulator assembly
76377	Insulator—Focus control insulator

REPLACEMENT PARTS (Continued)

STOCK No.	DESCRIPTION
75482	Jack—Video jack (J105)
74969	Knob—Focus control knob
76375	Magnet—Centering magnet
76317	Magnet—Ion trap magnet (P.M.)
76380	Plate—Hi-voltage plate—bakelite—less transformer, capacitor and tube socket
76382	Resistor—Wire wound, 0.82 ohms, 1/3 watt (R251)
76304	Resistor—Wire wound, 220 ohms, ½ watt (R239)
75512	Resistor—Wire wound, 4000 ohms, 10 watts (R181)
76066	Resistor—Wire wound, 4300 ohms, 5 watts (R228)
76065	Resistor—Wire wound, 13,000 ohms, 5 watts (R227)
	Resistor—Fixed, composition:—
504047	47 ohms, ±20%, ½ watt (R174)
503047	47 ohms, ±10%, ½ watt (R278)
34763	68 ohms, ±5%, ½ watt (R277)
503082	82 ohms, ±10%, ½ watt (R103, R107, R112, R184)
503110	100 ohms, ±10%, ½ watt (R217)
504110	100 ohms, ±20%, ½ watt (R202, R203)
523110	100 ohms, ±10%, 2 watts (R175)
503118	180 ohms, ±10%, ½ watt (R116)
503122	220 ohms, ±10%, ½ watt (R126, R127)
513139	390 ohms, ±10%, 1 watt (R200)
513147	470 ohms, ±10%, 1 watt (R218)
503168	680 ohms, ±10%, ½ watt (R226)
504210	1000 ohms, ±20%, ½ watt (R102, R104, R109, R114, R117, R120, R159, R185, R189, R219)
502210	1000 ohms, ±5%, ½ watt (R280)
502212	1200 ohms, ±5%, ½ watt (R279)
513215	1500 ohms, ±10%, 1 watt (R155)
504222	2200 ohms, ±20%, ½ watt (R140)
503227	2700 ohms, ±10%, ½ watt (R139)
503233	3300 ohms, ±10%, ½ watt (R235)
503239	3900 ohms, ±10%, ½ watt (R167)
30494	4700 ohms, ±5%, ½ watt (R130)
503247	4700 ohms, ±10%, ½ watt (R106, R135, R230)
513247	4700 ohms, ±10%, 1 watt (R133)
30734	5600 ohms, ±5%, ½ watt (R125)
14659	6800 ohms, ±5%, ½ watt (R281, R282)
513268	6800 ohms, ±10%, 1 watt (R119, R176)
523268	6800 ohms, ±10%, 2 watts (R179)
502282	8200 ohms, ±5%, ½ watt (R169)
503282	8200 ohms, ±10%, ½ watt (R145, R146)
503310	10,000 ohms, ±10%, ½ watt (R236)
523310	10,000 ohms, ±10%, 2 watts (R207)
30436	12,000 ohms, ±5%, ½ watt (R152)
503312	12,000 ohms, ±10%, ½ watt (R183)
512312	12,000 ohms, ±5%, 1 watt (R108)
503315	15,000 ohms, ±10%, ½ watt (R210)
513315	15,000 ohms, ±10%, 1 watt (R180)
503318	18,000 ohms, ±10%, ½ watt (R121, R122, R137, R197)
513318	18,000 ohms, ±10%, 1 watt (R138)
503322	22,000 ohms, ±10%, ½ watt (R143, R144, R213)
504322	22,000 ohms, ±20%, ½ watt (R192)

STOCK No.	DESCRIPTION
503327	27,000 ohms, ±10%, ½ watt (R196)
523327	27,000 ohms, ±10%, 2 watts (R182)
503333	33,000 ohms, ±10%, ½ watt (R105, R115, R211, R225)
504333	33,000 ohms, ±20%, ½ watt (R123)
503347	47,000 ohms, ±10%, ½ watt (R141, R186, R187, R222)
504347	47,000 ohms, ±20%, ½ watt (R110)
503356	56,000 ohms, ±10%, ½ watt (R221, R234)
513356	56,000 ohms, ±10%, 1 watt (R215)
502368	68,000 ohms, ±5%, ½ watt (R275)
513368	68,000 ohms, ±10%, 1 watt (R168)
512382	82,000 ohms, ±5%, 1 watt (R172)
513382	82,000 ohms, ±10%, 1 watt (R164, R165)
3252	100,000 ohms, ±5%, ½ watt (R190, R191)
503410	100,000 ohms, ±10%, ½ watt (R224, R233)
503412	120,000 ohms, ±10%, ½ watt (R142)
503415	150,000 ohms, ±10%, ½ watt (R136, R154, R160, R201)
504415	150,000 ohms, ±20%, ½ watt (R124)
31895	150,000 ohms, ±5%, 1 watt (R170)
503422	220,000 ohms, ±10%, ½ watt (R134, R157, R158, R223, R231, R232)
503427	270,000 ohms, ±10%, ½ watt (R150)
503433	330,000 ohms, ±10%, ½ watt (R161, R198)
512433	330,000 ohms, ±5%, 1 watt (R163)
503447	470,000 ohms, ±10%, ½ watt (R111, R283)
504447	470,000 ohms, ±20%, ½ watt (R199)
503456	560,000 ohms, ±10%, ½ watt (R129)
503482	820,000 ohms, ±10%, ½ watt (R149, R162, R173, R220)
504510	1 megohm, ±20%, ½ watt (R178, R214)
503522	2.2 megohm, ±10%, ½ watt (R153)
503610	10 megohm, ±10%, ½ watt (R118)
504610	10 megohm, ±20%, ½ watt (R194)
523610	10 megohm, ±10%, 2 watts (R252)
523618	18 megohm, ±10%, 2 watts (R254)
71456	Screw—No. 8-32 x 3/8" wing screw to mount deflection yoke
73584	Shield—Tube shield
31251	Socket—Tube socket, octal, wafer
73117	Socket—Tube socket, 7 pin, miniature
75223	Socket—Tube socket, 9 pin, miniature
73249	Socket—Tube socket, octal, ceramic, plate mounted
31319	Socket—Tube socket, octal, moulded
68592	Socket—Tube socket, 6 contact, moulded
76379	Socket—Tube socket, 6 contact, miniature, plate mounted
71508	Socket—Tube socket, 6 contact, moulded for 1B3/8016
74834	Socket—Kinescope socket
31364	Socket—Pilot lamp socket
75718	Socket—Channel indicator lamp socket
14270	Spring—Retaining spring for focus control knob
75506	Support—Bakelite support only—part of high voltage shield
76010	Switch—AGC switch
76170	Switch—Tone control and phono switch less volume control and power switch (S103)
76463	Terminal—Screw-type grounding terminal

STOCK No.	DESCRIPTION
75508	Transformer—Power transformer, 117 volt, 60 cycle (T110)
74950	Transformer—Vertical output transformer (T107)
74144	Transformer—Vertical oscillator transformer (T106)
74589	Transformer—First pix, i-f transformer (T101, C101, R101)
74590	Transformer—Second pix, i-f transformer (T102, C104)
76264	Transformer—Third pix, i-f transformer (T103, C112)
73574	Transformer—Fourth pix, i-f transformer (T104, C118)
76703	Transformer—Sound take-off transformer (T114, C276, R276)
76438	Transformer—Sound i-f transformer (T111, C169, C170)
76702	Transformer—Ratio detector transformer (T112, C173, C174)
75213	Transformer—Horizontal oscillator transformer (T108)
75509	Transformer—Antenna matching transformer complete with antenna connector, i-f and F-M traps and antenna shunt coil (T200, C200, C201, C202, C203, J200, L200, L201, L202, L203)
76381	Transformer—Hi-voltage transformer (T109)
76704	Trap—4.3 mc trap (L106, C275)
75242	Trap—I-F trap (L200, L201, C200, C201)
75449	Trap—F-M trap complete with adjustable core and stud (L203, C203)
75251	Trap—4.5 mc trap (L107, C131)
74952	Yoke—Deflection yoke (L111, L112, C164, C165)
	SPEAKER ASSEMBLIES 92580-4W RL-105C10 RMA-274
75023	Cap—Dust cap
75024	Cone—Cone complete with voice coil (3.2 ohms)
5039	Connector—4 contact male connector (J102)
75022	Speaker—8" P.M. speaker complete with cone and voice coil less transformer and plug
75520	Transformer—Output transformer (T113)
	NOTE: If stamping on speaker in instrument does not agree with above speaker numbers, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
	MISCELLANEOUS
76506	Back—Cabinet back complete with terminal board and power cord
76184	Board—"Ant" terminal board—2 contact—part of back
76178	Bracket—Suspension bracket for deflection yoke hood assembly
71599	Bracket—Pilot lamp bracket
13103	Cap—Pilot lamp cap
X3199	Cloth—Grille cloth for mahogany or walnut instruments
X3089	Cloth—Grille cloth for oak instruments
39153	Connector—4 contact male connector for antenna cable
75474	Connector—Single contact male connector for antenna cable (2 required)
71457	Cord—Power cord and plug
75608	Cushion—Kinescope masking panel dust seal (rubber)

STOCK No.	DESCRIPTION
76127	Decal—Control panel function decal for mahogany or walnut instruments
76128	Decal—Control panel function decal for oak instruments
74809	Emblem—"RCA Victor" emblem
75455	Escutcheon—Channel marker escutcheon—dark—for mahogany or walnut instruments
75456	Escutcheon—Channel marker escutcheon—light—for oak instruments
74606	Glass—Safety glass
74959	Knob—Fine tuning knob—maroon—for mahogany or walnut instruments (outer)
75461	Knob—Fine tuning knob—beige—for oak instruments (outer)
74960	Knob—Channel selector knob—maroon—for mahogany or walnut instruments (inner)
75462	Knob—Channel selector knob—beige—for oak instruments (inner)
74962	Knob—Brightness control or vertical hold control—maroon—for mahogany or walnut instruments (outer)
75463	Knob—Brightness control or vertical hold control knob—beige—for oak instruments (outer)
76174	Knob—Tone control and phono switch knob—maroon—for mahogany or walnut instruments (outer)
76175	Knob—Tone control and phono switch knob—beige—for oak instruments (outer)
74963	Knob—Picture control, horizontal hold control or volume control and power switch knob—maroon—for mahogany or walnut instruments (inner)
75464	Knob—Picture control, horizontal hold control or volume control and power switch knob—beige—for oak instruments (inner)
11765	Lamp—Pilot or channel marker lamp—Mazda 51
75459	Mask—Channel marker escutcheon light mask—burgundy—for mahogany or walnut instruments
75460	Mask—Channel marker escutcheon light mask—gold—for oak instruments
76126	Mask—Polystyrene masking panel
76177	Nut—No. 10-32 special nut for deflection yoke hood support rods (2 required)
73634	Nut—Speed nut for speaker mounting screws (4 required)
74788	Nut—Speed nut to secure deflection yoke support rods
76176	Rod—"L" shape threaded rod to support deflection yoke hood assembly (2 required)
71456	Screw—No. 8-32 x 3/8" wing screw to fasten suspension bracket to deflection yoke hood
73643	Spring—Spring clip for channel marker escutcheon
72845	Spring—Retaining spring for knobs Nos. 73995, 74959, 75461
14270	Spring—Retaining spring for knobs Nos. 73999, 74960, 74961, 74962, 75462, 75463
30330	Spring—Retaining spring for knobs Nos. 74001, 74963 and 75464
76180	Spring—Formed spring for kinescope masking panel (6 required)
75457	Washer—Felt washer—dark brown—between knob and channel marker escutcheon for mahogany or walnut instruments
75458	Washer—Felt washer—beige—between knob and channel marker escutcheon for oak instruments
75500	Washer—Felt washer for cabinet back screws

The system of employing an asterisk before the stock number of new items has been discontinued.

APPLY TO YOUR RCA DISTRIBUTOR FOR PRICES OF REPLACEMENT PARTS.