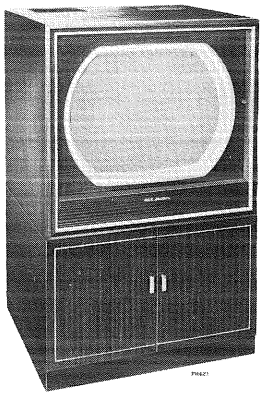


Model 9T105
"York"
Mahogany, Walnut or Oak

RCA VICTOR

TELEVISION RECEIVERS
MODELS 9T105, 9T126, 9T128

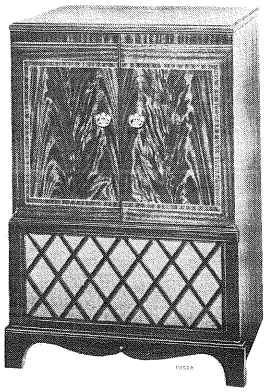
Chassis Nos. KCS49B, or KCS49C,

—Mfr. No. 274—

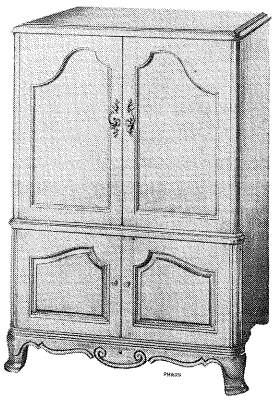
SERVICE DATA

—1951 No. T5—

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



Model 9T126
"Hillsdale"
Walnut, Mahogany or Oak



Model 9T128
"Provincial"
Walnut, Mahogany or Maple

GENERAL DESCRIPTION

Model 9T105, 9T126 and 9T128 receivers are deluxe "19 inch" television receivers. The receivers are identical except for cabinets, jewel lights and speakers.

Features of the television unit are: full twelve channel coverage; 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 .....204 square inches on a 19AP4A Kinescope

TELEVISION R-F FREQUENCY RANGE

All 12 television channels, 54 mc. to 88 mc., 174 mc. to 216 mc.
Fine Tuning Range..±250 kc. on chan. 2, ± 650 kc. on chan. 13
Picture Carrier Frequency .....25.50 mc.
Sound Carrier Frequency .....21.00 mc.

VIDEO RESPONSE .....To 4 mc.

SWEEP DEFLECTION .....Magnetic

FOCUS .....Magnetic

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

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

CHASSIS DESIGNATIONS

KCS49B ..... In Model 9T105
KCS49C ..... In Models 9T126 and 9T128

LOUDSPEAKERS

KCS49B .....(92580-4) 8" PM Dynamic, 3.2 ohms
KCS49C .....(92569-11) 12" PM Dynamic, 3.2 ohms

DIMENSIONS (inches)	Width	Height	Depth
Cabinet (outside), 9T105	24¼	23¼	26⅝
Cabinet (outside), 9T126	29	40¼	27⅞
Cabinet (outside), 9T128	29¼	40¼	26¾

WEIGHT Model	Chassis with Tubes in Cabinet	Shipping Weight
9T105	103	122
9T126	135	159
9T128	133	165

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 Oscillator
(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 19AP4A	Kinescope
(22)	RCA 5U4G	Rectifier

First Edition—First Printing. 6-29-51

Printed in U.S.A.

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	21.00 Mc.
Sound Discriminator Band Width between peaks	400 kc
VIDEO RESPONSE	To 4 Mc.
FOCUS	Magnetic
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 & 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 Osc. Freq.	top chassis adjustment
Horizontal Osc. 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. See that the TV-PH switch on the rear apron is in 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.

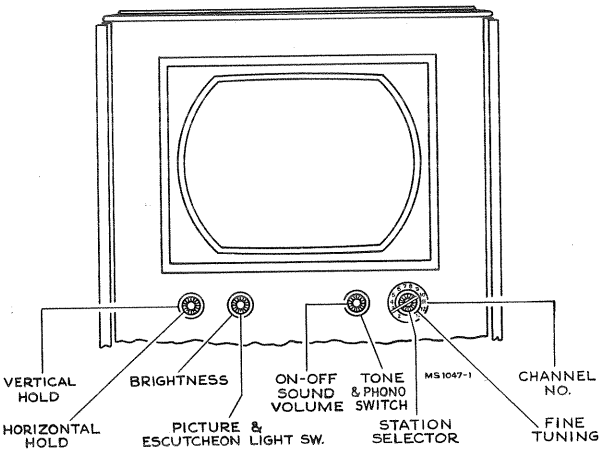


Figure 1—Receiver Operating Control

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. On console type receivers, to turn on station escutcheon light, pull out on picture control knob, and push in to turn off.

INSTALLATION INSTRUCTIONS

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.

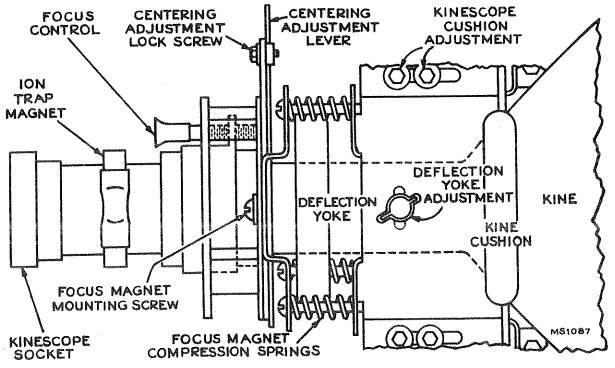


Figure 2—Yoke and Focus Magnet Adjustments

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.

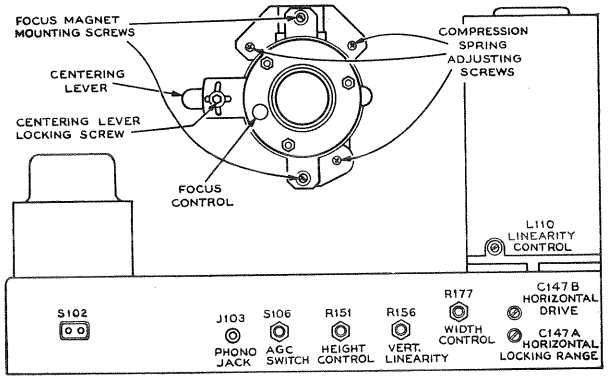


Figure 3—Rear Chassis Adjustments

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 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.

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.

FOCUS MAGNET ADJUSTMENT.—The focus coil should be adjusted so that there is approximately three-eighths inch of space between the rear cardboard shell of the yoke and the front of the front face of the focus magnet. This spacing gives best average focus over the face of the tube.

The axis of the hole through the magnet should be parallel with the axis of the kinescope neck with the kinescope neck through the middle.

CENTERING ADJUSTMENT.—No electrical centering controls are provided. Centering is accomplished by means of a separate plate on the focus magnet. Some centering plates include a locking screw which must be loosened before centering, and others are held in adjustment by friction. Up and down adjustment of the plate moves the picture side to side and sidewise adjustment moves the picture up and down.

If a corner of the raster is shadowed, check the position of the ion trap magnet. Reposition the magnet within the range of maximum raster brightness to eliminate the shadow and center the picture by adjustment of the focus magnet plate. In no case should the magnet be adjusted to cause any loss of brightness since such operation may cause immediate or eventual damage to the tube. In some cases it may be necessary to shift the position of the focus magnet in order to eliminate a corner shadow.

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 of 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.—Adjust the focus magnet for maximum definition in the test pattern vertical "wedge" and best focus in the white areas of the pattern.

On focus magnets using two shunts, the one with the cable is the "fine adjustment" and the other is the "focus range" adjustment. In general, the two shunts should be adjusted to approximately equal positions.

Recheck the position of the ion trap magnet to make sure that maximum brightness is obtained.

Check to see that the cushion and yoke thumbscrews and the focus coil mounting screws are tight.

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.

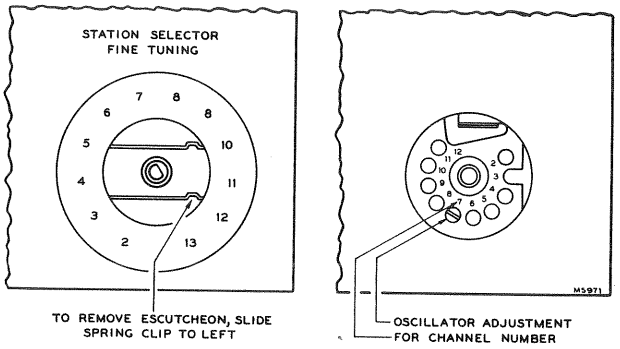


Figure 4—R-F Oscillator Adjustments

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 these two channels.

Replace the cabinet back and reconnect the receiver antenna leads to the cabinet back. Tighten the back retaining screws securely otherwise the back may rattle when the receiver is operated at high volume.

CABINET ANTENNA.—A cabinet antenna is provided in these receivers 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.

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 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 on console models, the yoke and high voltage cable. Remove the yoke frame grounding strap on the console models. Take out the six 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, take out the four screws and one wing screw which hold the yoke frame to the cabinet. Remove the kinescope, the yoke frame with yoke and focus 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 and focus magnet. 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 four screws and wing screw and tighten.

Slip the kinescope as far forward as possible. Slide the kinescope cushion firmly up against the flare of the tube and tighten the adjustment wing screws. 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 magnets because of shadows on the corner of the raster.

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

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

Connect the kinescope socket to the tube base and connect the high voltage lead clip from the rim of 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.

RCA Television Antenna, type No. 225A1 is designed for reception of all twelve television channels. The antenna uses the 300-ohm RCA "Bright Picture" television transmission line. The antenna, a dipole with reflector, is unidirectional on channels two through six. When used on these channels, the maximum signal is obtained when the antenna rods are broadside toward the transmitting antenna, with the antenna element between the reflector and the transmitting antenna.

If two or more stations are available between channels two and six 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.

When operated on channels seven through thirteen (174 to 216 Mc), the antenna has side lobes. On these channels, the maximum signal will be obtained when the antenna is rotated approximately 35 degrees in either direction from its broadside position toward the transmitting antenna. In many instances this effect may not cause any difficulties and it may be possible to make a compromise orientation which will permit satisfactory reception on all high and low channels. In some instances, however, this will not be the case due to reflections or to insufficient signal strength from one or more stations.

RCA antenna type 204A1 is available for use in locations in which it is desirable to eliminate side lobes and to have the antennas 7-13 directivity the same as 2-6 directivity.

For use in cases where it is desirable to have adjustable 7-13 directivity different from 2-6, RCA antenna type 206A1 is provided.

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

In weak signal areas it is possible to "stack" the type 204A1 antenna to obtain increased signal strength by employing one type 204A1 antenna and one type 208A1 stacking kit.

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, it may be possible to eliminate the reflections by rotating the antenna or by moving it to a new location. In extreme cases, it may be impossible to eliminate the reflection.

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.

CHASSIS TOP VIEW

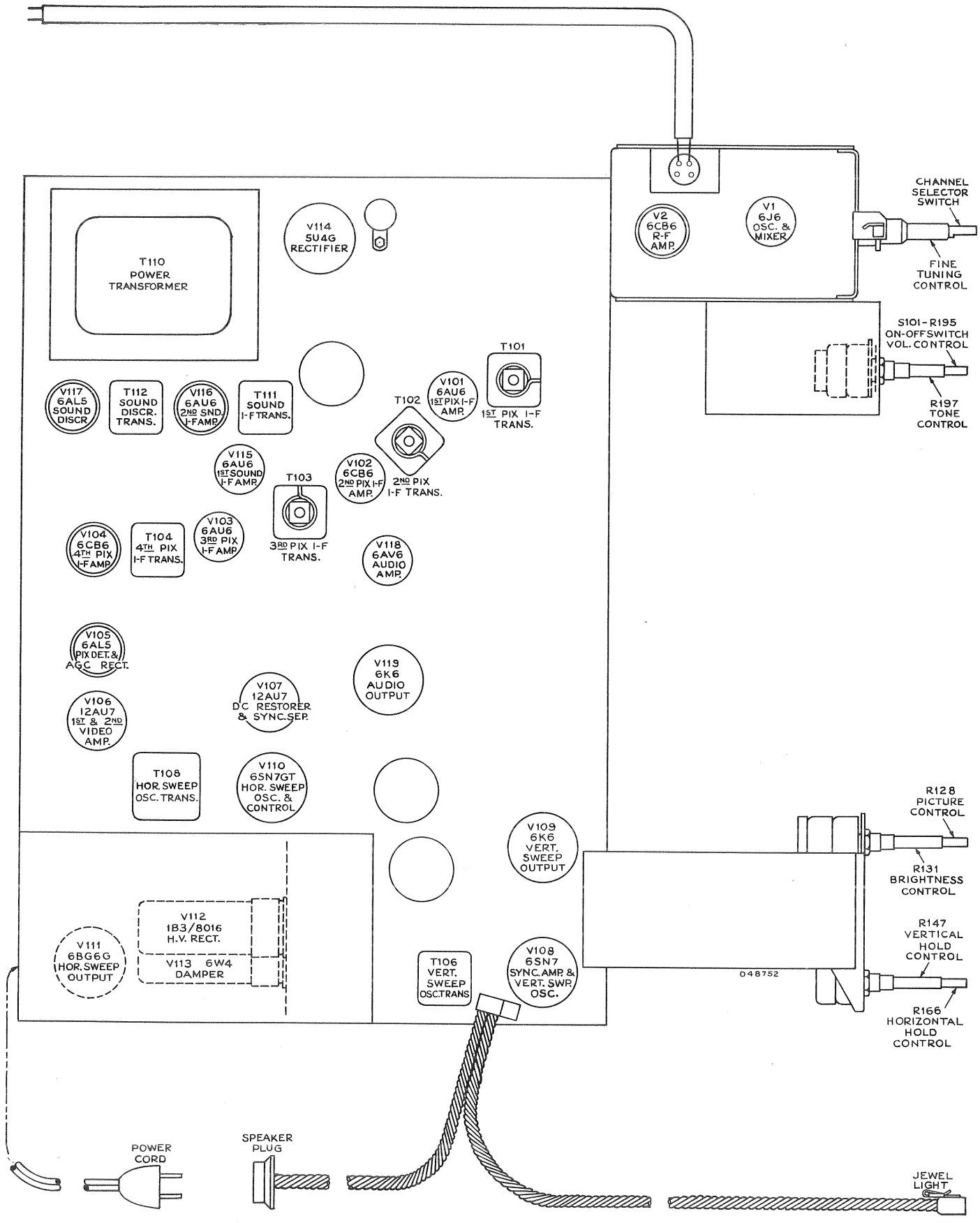


Figure 5—Chassis Top View

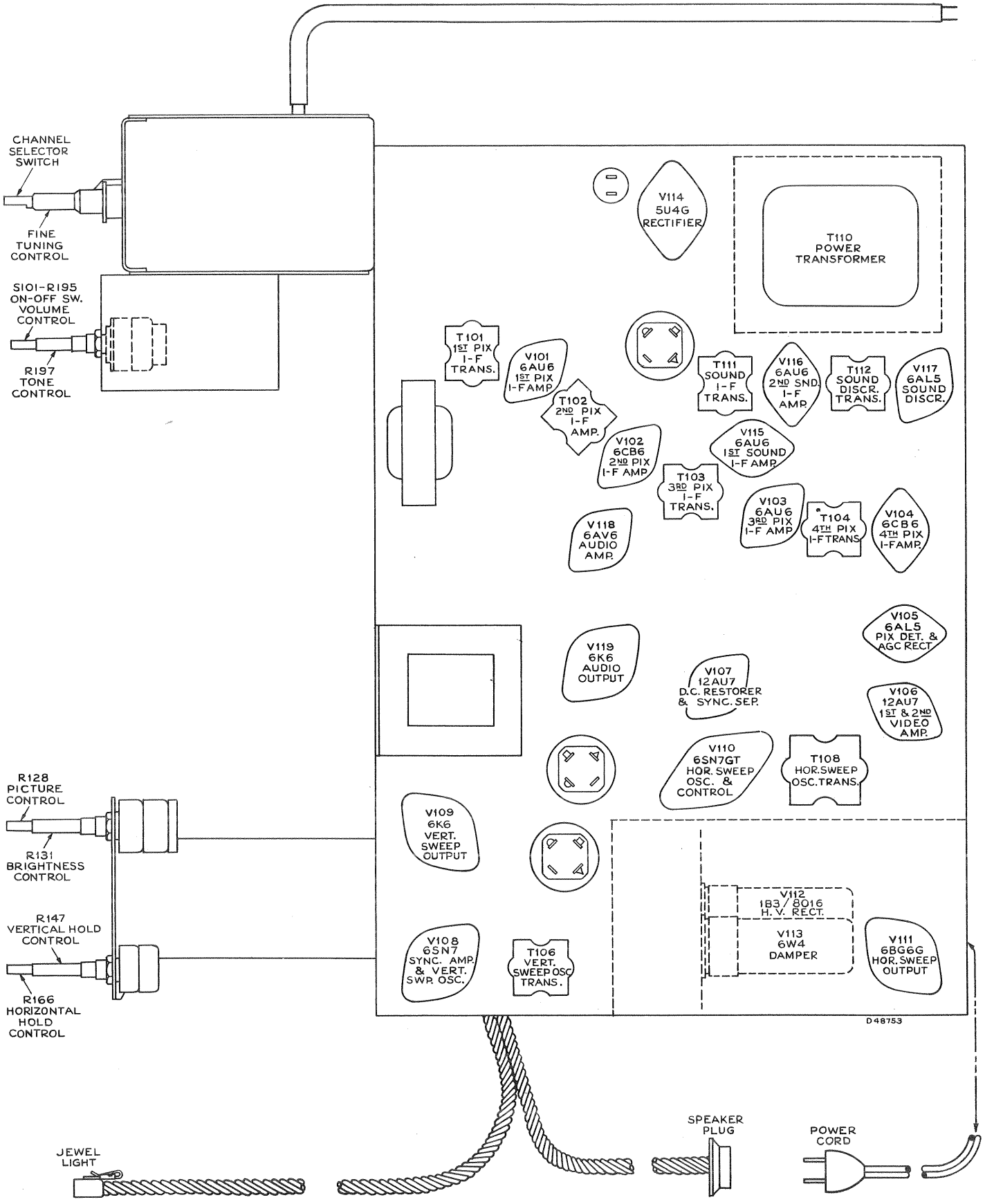


Figure 6—Chassis Bottom View

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
22.3 and 25.4 mc. conv. and first pix i-f trans.
25.3 mc. second picture i-f transformer
24.35 mc. fourth picture i-f transformer
21.75 mc. third picture i-f transformer
22.5 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 multipli probe for use with this meter to permit measurements up 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) Sound discriminator
(2) Sound i-f transformers
(3) Picture i-f traps
(4) Picture i-f transformers
(5) R-F unit
(6) Overall picture i-f
(7) Horizontal oscillator
(8) Sensitivity check

SOUND DISCRIMINATOR ALIGNMENT.—Set the signal generator for approximately .1 volt output at 21.00 mc. and connect it to the second sound i-f grid, pin 1 of V116.

Detune T112 secondary (bottom) to the extreme counterclockwise position.

Set the "VoltOhmyst" on the 3-volt scale.

Connect the meter, in series with a one-megohm resistor, to pin 7 of V117.

Adjust the primary of T112 (top) for maximum output on the meter.

Connect the "VoltOhmyst" to the junction of R192 and S103. Adjust T112 secondary (bottom). It will be found that it is possible to produce a positive or negative voltage on the meter dependent upon this adjustment. Obviously to pass from a positive to a negative voltage, the voltage must go through zero. T112 (bottom) should be adjusted so that the meter indicates zero output as the voltage swings from positive to negative. This point will be called discriminator zero output.

Connect the sweep oscillator to the grid of the second sound i-f amplifier, pin 1 to V116.

Adjust the sweep band width to approximately 1 mc. with the center frequency at approximately 21.00 mc. and with an output of approximately .1 volt.

Connect the oscilloscope to the junction of R192 and S103. The pattern obtained should be similar to that shown in Figure 12. If it is not, adjust T112 (top) until the wave form is symmetrical.

The peak-to-peak band width of the discriminator should be approximately 400 kc. and the trace should be linear from 20.925 mc. to 21.075 mc.

Note.—The bottom core and stud in the discriminator transformer are at plus B potential.

SOUND I-F ALIGNMENT.—Connect the sweep oscillator to the first sound i-f amplifier grid, pin 1 of V115.

Insert at 21.00 mc. marker signal from the signal generator into the first sound i-f grid.

Connect the oscilloscope to the second sound i-f grid return (terminal A of T111) in series with a 33,000-ohm isolating resistor.

Adjust T111 (top and bottom) for maximum gain and symmetry about the 21.00 mc. marker. The pattern obtained should be similar to that shown in Figure 13.

The output level from the sweep should be set to produce approximately .3 volt peak-to-peak at the second sound i-f grid return 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.

The band width at 70% response from the first sound i-f grid to the second i-f grid should be approximately 200 kc.

PICTURE I-F TRAP ADJUSTMENT.—Connect the "Volt-Ohmyst" 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) 21.00 mc.—T105 (top)
(3) 27.00 mc.—T102 (top)
(4) 27.00 mc.—T104 (top)
(5) 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 "Volt-Ohmyst." During alignment, reduce the input signal if necessary to prevent overloading.

24.35 mc.—L103
22.5 mc.—T104 (bottom)
21.75 mc.—T103 (bottom)
25.3 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 at 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.

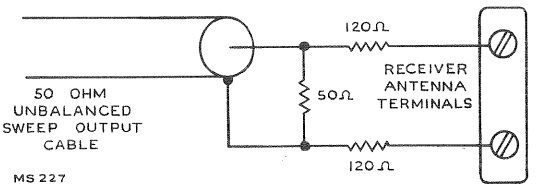


Figure 7—Unbalanced Sweep Cable Termination

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 tuning 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 requires 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 injection 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 or 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

	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
DISCRIMINATOR AND SOUND I-F ALIGNMENT									
	2nd sound i-f grid (pin 1, V116)	21.00 .1 volt output	Not used		Not used.	In series with 1 meg. to pin 7 of V117	Meter on 3 volt scale	Detune T112 (bot.) Adjust T112 (top) for max. on meter	Fig. 12 Fig. 9 Fig. 8
	"	"	"		"	Junction of R192 & S103	Meter on 3 volt scale	T112 (bottom) for zero on meter	Fig. 12 Fig. 9
	"	"	2nd sound i-f grid (pin 1, V116)	21.00 center .1 v. out	Junction of R192 & S103	Not used	Check for symmetrical response waveform (positive & negative). If not equal adjust T112 (top) until they are equal		Fig. 12 Fig. 9
	1st sound i-f grid (pin 1, V115)	21.00 reduced output	1st sound i-f grid (pin 1, V115)	21.00 reduced output	Terminal "A" of T111 in series with 33K.	"	Sweep output reduced to provide 0.3 volt p-to-p on scope	T111 top & bottom for max. gain and symmetry at 21.00 mc.	Fig. 13 Fig. 10 Fig. 9 Fig. 8
PICTURE I-F AND TRAP ADJUSTMENT									
	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
	Terminal D of T101	21.00	"	—	"	Pin 2 of V106 and to ground	Meter on 3 v. scale. Rec. between 2 & 13	T103 (top) for min. on meter	Fig. 10 Fig. 8
	"	21.00	"	—	"	"	"	T105 (top) for min.	Fig. 8
	"	27.00	"	—	"	"	"	T102 (top) for min.	"
	"	27.00	"	—	"	"	"	T104 (top) for min.	"
	"	19.50	"	—	"	"	"	T101 (top) for min.	"
	"	24.35	"	—	"	"	"	L103 (top) for max.	"
	"	22.5	"	—	"	"	"	T104 (bot) for max.	Fig. 9
	"	21.75	"	—	"	"	"	T103 (bot) for max.	"
	"	25.3	"	—	"	"	"	T102 (bot.) for max.	"

R-F UNIT ALIGNMENT

	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
	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.									
	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
			"				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
	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)
	"	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
	"	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)
	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
	Repeat steps 19, 20 and 21 until the specified conditions are obtained.									
	Antenna terminal (loosely)	185.75	Not used	—	Loosely coupled to r-f oscillator	206.75	Junction of R192 & S103 for sig. gen. method only	Rec. on chan. 8	C1 for zero on meter or beat on het. freq. meter	Fig. 8 Fig. 10

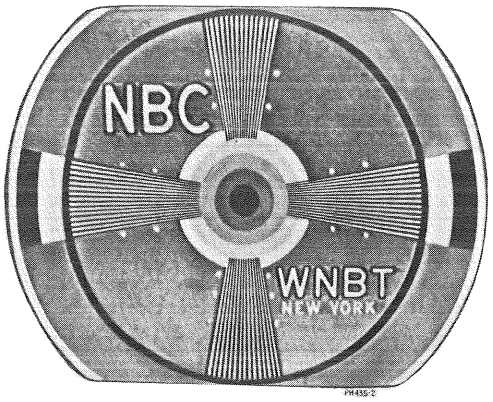


Figure 18—Normal Picture

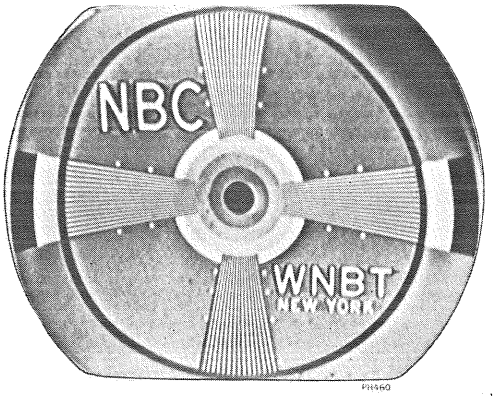


Figure 19—Focus Magnet and Ion Trap Magnet Misadjusted

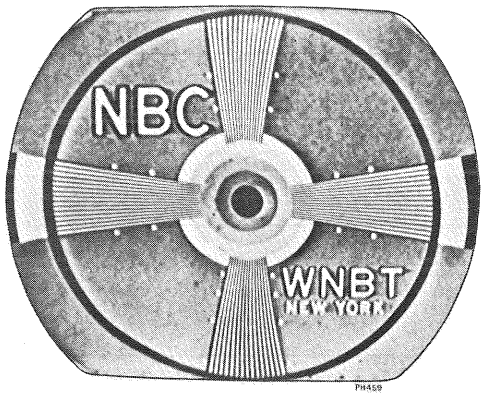


Figure 20—Horizontal Linearity Control Misadjusted (Picture Cramped in Middle)

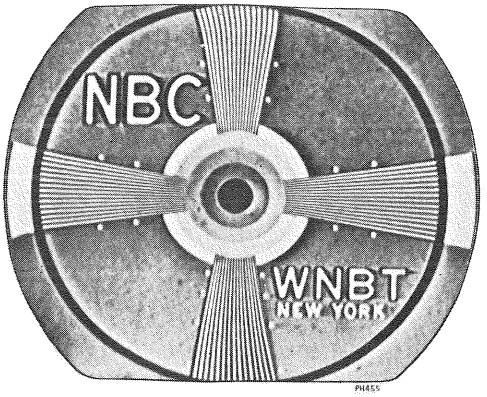


Figure 21—Width Control Misadjusted

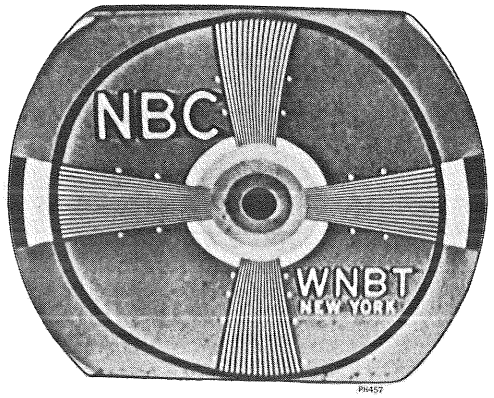


Figure 22—Horizontal Drive Control Misadjusted

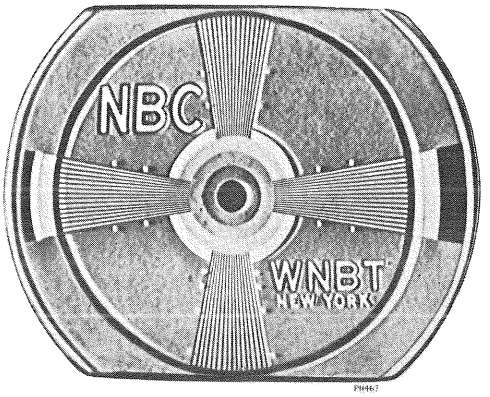


Figure 23—Transients

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

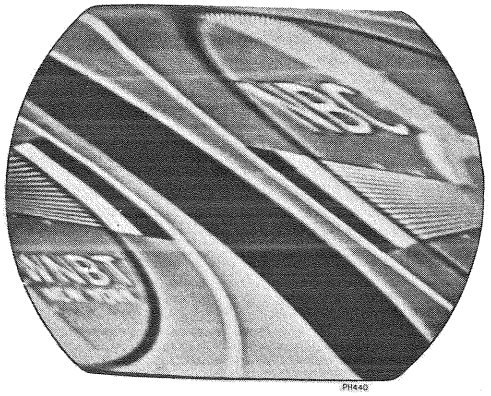


Figure 25—Test Pattern Showing Out of Sync Condition When Horizontal Hold Control Is at the Maximum Clockwise Position

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
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 chan. 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 chan. 11	"	Fig. 16 (11)
29	"	193.25 197.75	"	channel 10	"	—	"	Rec. on chan. 10	"	Fig. 16 (10)
30	"	187.25 191.75	"	channel 9	"	—	"	Rec. on chan. 9	"	Fig. 16 (9)
31	"	181.25 185.75	"	channel 8	"	—	"	Rec. on chan. 8	"	Fig. 16 (8)
32	"	175.25 179.75	"	channel 7	"	—	"	Rec. on chan. 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 requires 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. method only	Rec. on chan. 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 chan. 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 chan. 4		Fig. 16 (9)
41	"	61.25 65.75	"	channel 3	"	—	"	Rec. on chan. 3	"	Fig. 16 (3)
42	"	55.25 59.75	"	channel 2	"	—	"	Rec. on chan. 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 chan. 12	L11 as above	Fig. 11
46	"	203.75	"	—	"	224.75	"	Rec. on chan. 11	L10 as above	Fig. 11
47	"	197.75	"	—	"	218.75	"	Rec. on chan. 10	L9 as above	Fig. 11
48	"	191.75	"	—	"	212.75	"	Rec. on chan. 9	L8 as above	Fig. 11
49	"	185.75	"	—	"	206.75	"	Rec. on chan. 8	L7 as above	Fig. 11
50	"	179.75	"	—	"	200.75	"	Rec. on chan. 7	L6 as above	Fig. 11
51	"	87.75	"	—	"	108.75	"	Rec. on chan. 6	L5 as above	Fig. 11
52	"	81.75	"	—	"	102.75	"	Rec. on chan. 5	L4 as above	Fig. 11
53	"	71.75	"	—	"	92.75	"	Rec. on chan. 4	L3 as above	Fig. 11
54	"	65.75	"	—	"	86.75	"	Rec. on chan. 3	L2 as above	Fig. 11
55	"	59.75	"	—	"	80.75	"	Rec. on chan. 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	22.3 25.4	Antenna terminals	Sweeping selected channel	Terminal 2 of V106 socket	Junction of R102 and 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. 1

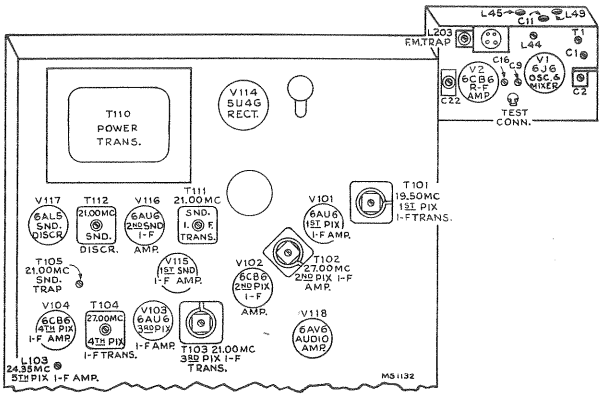


Figure 8—Top Chassis Adjustments

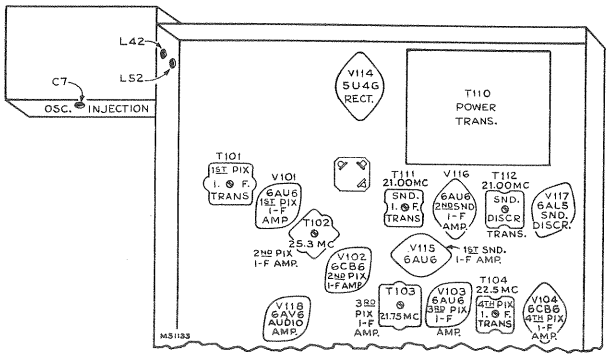


Figure 9—Bottom Chassis Adjustments

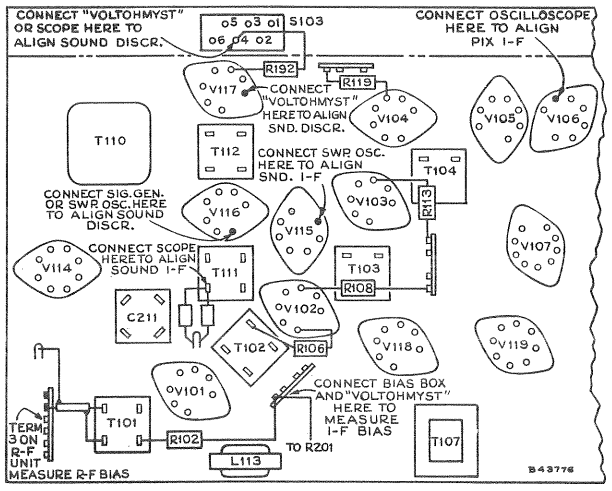


Figure 10—Test Connection Points

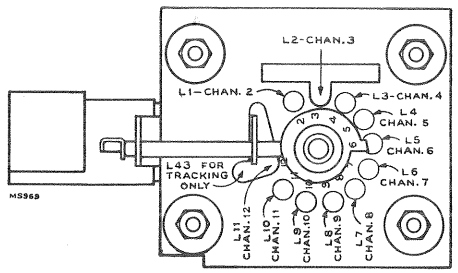


Figure 11—R-F Oscillator Adjustments

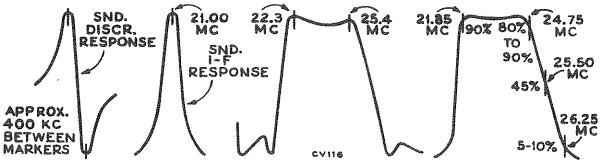


Figure 12 Discriminator Response

Figure 13 Sound I-F Response

Figure 14 T1 and T101 Response

Figure 15 Overall I-F R-F Response

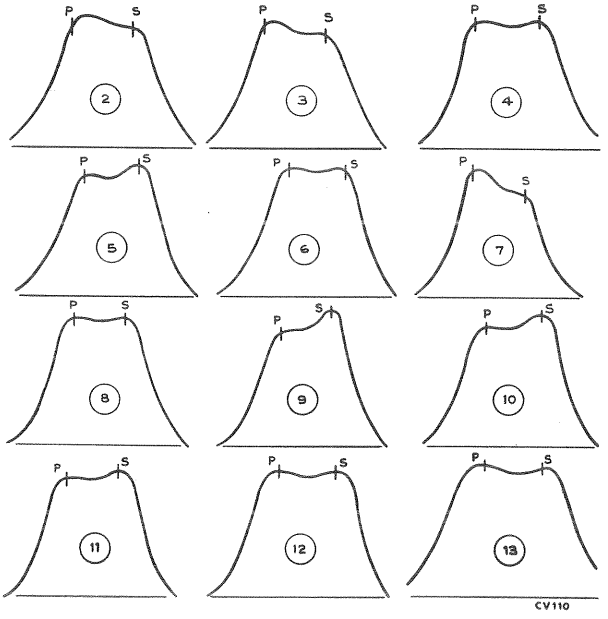


Figure 16—R-F Response

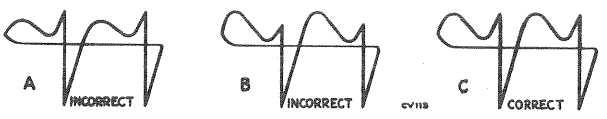


Figure 17—Horizontal Oscillator Waveforms

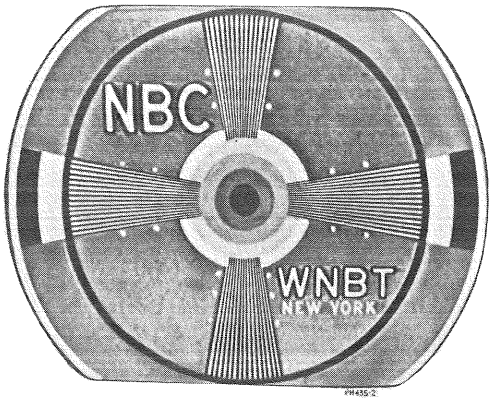


Figure 18—Normal Picture

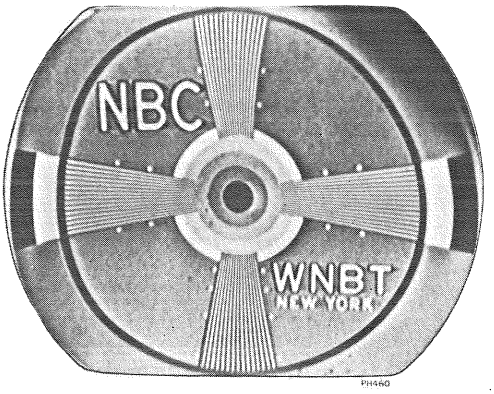


Figure 19—Focus Magnet and Ion Trap Magnet Misadjusted

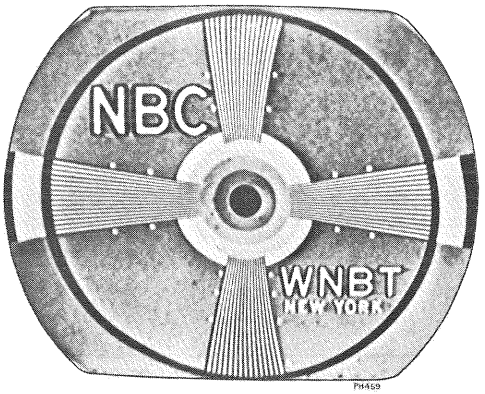


Figure 20—Horizontal Linearity Control Misadjusted (Picture Cramped in Middle)

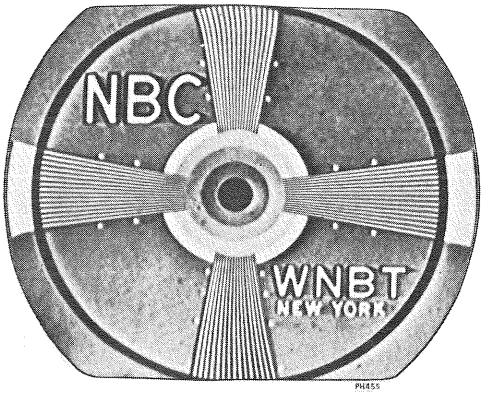


Figure 21—Width Control Misadjusted

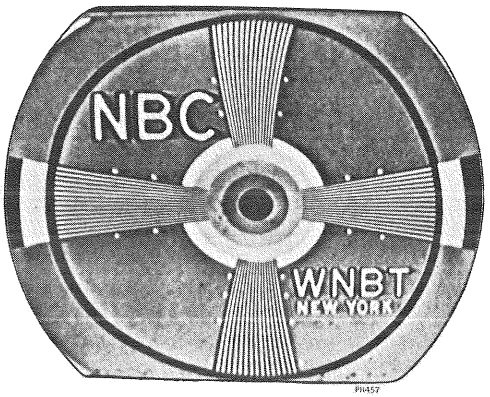


Figure 22—Horizontal Drive Control Misadjusted

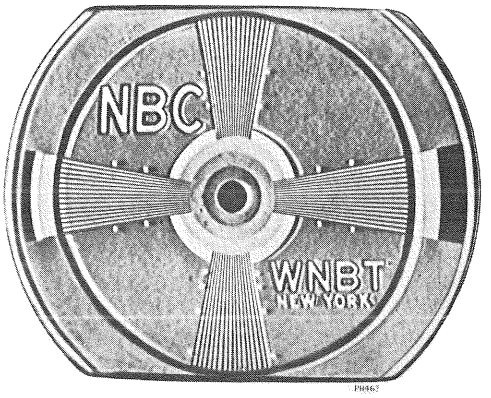


Figure 23—Transients

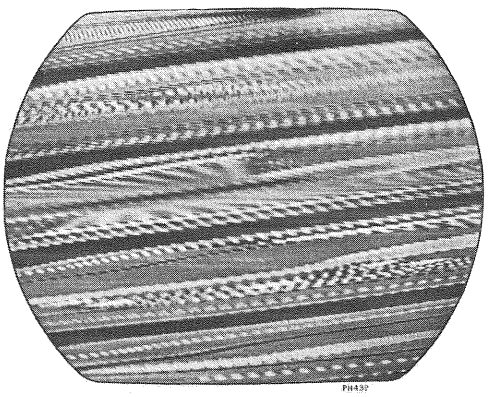


Figure 24—Test Pattern Showing Out of Sync Condition When Horizontal Hold Control Is in a Counter-clockwise Position—Just Before Pulling Into Sync

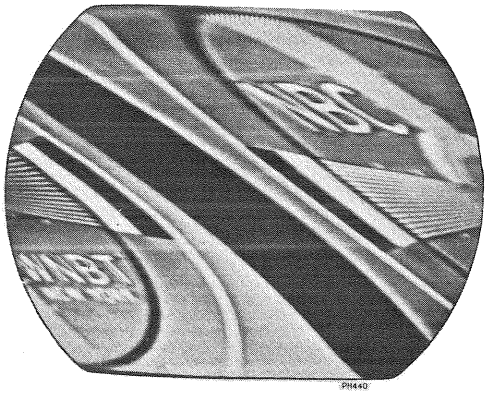


Figure 25—Test Pattern Showing Out of Sync Condition When Horizontal Hold Control Is at the Maximum Clockwise Position

Following is a list of symptoms of possible failures and an indication of some of the possible faults:

NO RASTER ON KINESCOPE:

(1) Incorrect adjustment of ion trap magnet. Magnet reversed either front to back or top to bottom.

(2) V111 or V112 inoperative. Check waveforms on grids and plates.

(3) No high voltage—if horizontal deflection is operating as evidenced by the correct waveform on terminal 1 of high voltage transformer, the trouble can be isolated to the 1B3GT circuit. Either the T109 high voltage winding is open, the 1B3GT tube is defective, its filament circuit is open, or C161 is shorted.

(4) V110 circuit inoperative—Refer to schematic and waveform chart.

(5) Damper tube (V113) inoperative.

(6) Defective kinescope.

(7) R131 open.

(8) No receiver plate voltage—filter capacitor shorted—or filter choke open.

NO VERTICAL DEFLECTION:

(1) V108 or V109 inoperative. Check voltage and waveforms on grids and plates.

(2) T106 or T107 open.

(3) Vertical deflection coils open.

SMALL RASTER:

(1) Low Plus B or low line voltage.

(2) V111 defective.

POOR VERTICAL LINEARITY:

(1) If adjustments cannot correct, change V109.

(2) Vertical output transformer T107 defective.

(3) V108 defective—check voltage and waveforms on grid and plate.

(4) C143, R152, C213A or C213D defective.

(5) Low plate voltage—check rectifiers and capacitors in supply circuits.

(6) If height is insufficient, try changing V108.

POOR HORIZONTAL LINEARITY:

(1) If adjustments do not correct, change V111 or V113.

(2) T109 or L110 defective.

(3) C159 or C160 defective.

WRINKLES ON LEFT SIDE OF RASTER:

(1) C165 defective.

(2) Defective yoke.

PICTURE OUT OF SYNC HORIZONTALLY:

(1) T108 incorrectly tuned.

(2) R165, R166 or R168 defective.

TRAPEZOIDAL OR NON SYMMETRICAL RASTER:

(1) Improper adjustment of focus magnet or ion trap magnet.

(2) Defective yoke.

RASTER AND SIGNAL ON KINESCOPE BUT NO SOUND:

(1) R-F oscillator off frequency.

(2) Sound i-f, discriminator or audio amplifier inoperative—check V115, V116, V117, V118, V119 and their socket voltages.

(3) T113 or C183 defective.

(4) Speaker defective.

SIGNAL AT KINESCOPE GRID BUT NO SYNC:

(1) AGC control switch S106 misadjusted.

(2) V107B, inoperative. Check voltage and waveforms at its grid and plate.

SIGNAL ON KINESCOPE GRID BUT NO VERTICAL SYNC:

(1) Check V108 and associated circuit—C140, R214, etc.

(2) Integrating network inoperative—Check.

(3) R147, R148, R149, R150, R151, R152, R154, R157, C141, or C143 defective.

(4) Gas current, grid emission or grid cathode leakage in V108. Replace.

SIGNAL ON KINESCOPE GRID BUT NO HORIZONTAL SYNC:

(1) T108 misadjusted—readjust as instructed on page 11.

(2) V110 inoperative—check socket voltages and waveforms.

(3) T108 defective.

(4) C146, C148, C147A, C149, C150, C151, C152, or C153 defective.

(5) If horizontal speed is completely off and cannot be adjusted check R165, R166, R168, R169, R170, R172 and R177.

SOUND AND RASTER BUT NO PICTURE OR SYNC:

(1) Picture i-f, detector or video amplifier inoperative—check V103, V104, V105 and V106—check socket voltages.

(2) Bad contact to kinescope grid.

PICTURE STABLE BUT POOR RESOLUTION:

(1) V105 or V106 defective.

(2) Peaking coils defective—check for specified resistance.

(3) Make sure that the focus control operates on both sides of proper focus.

(4) R-F and I-F circuits misaligned.

PICTURE SMEAR:

(1) R-F or I-F circuits misaligned.

(2) Open peaking coil.

(3) This trouble can originate at the transmitter—check on another station.

PICTURE JITTER:

(1) AGC control switch S106 misadjusted.

(2) If regular sections at the left picture are displaced change V111.

(3) Vertical instability may be due to loose connections or noise.

(4) Horizontal instability may be due to unstable transmitted sync.

RASTER BUT NO SOUND, PICTURE OR SYNC:

(1) Defective antenna or transmission line.

(2) R-F oscillator off frequency.

(3) R-F unit inoperative—check V1, V2.

DARK VERTICAL LINE ON LEFT OF PICTURE:

(1) Reduce horizontal drive and readjust width and horizontal linearity.

(2) Replace V111.

LIGHT VERTICAL LINE ON LEFT OF PICTURE:

(1) C166 defective.

(2) V113 defective.

PICTURE I-F RESPONSE.—At times it may be desirable to observe the individual i-f stage response. This can be achieved by the following method:

Shunt all i-f transformers and coils with a 330 ohm carbon resistor except the one whose response is to be observed.

Connect a wide band sweep generator to the converter grid and adjust it to sweep from 18 mc. to 30 mc.

Connect the oscilloscope across the picture detector load resistor and observe the overall response. The response obtained will be essentially that of the unshunted stage. The effects of the various traps are also visible on the stage response.

Figures 26 through 30 show the response of the various stages obtained in the above manner. The curves shown are typical although some variation between receivers can be expected. Relative stage gain is not shown.

RESPONSE PHOTOGRAPHS

Taken from RCA WO58A Oscilloscope

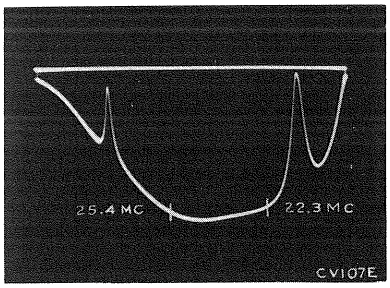


Figure 26—Response of Converter and First Pix I-F Transformer

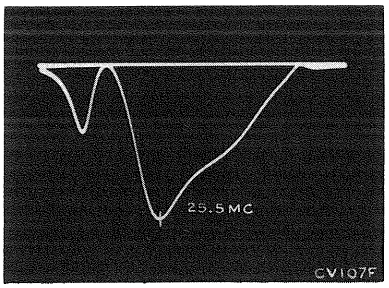


Figure 27—Response of Second Pix I-F Transformer

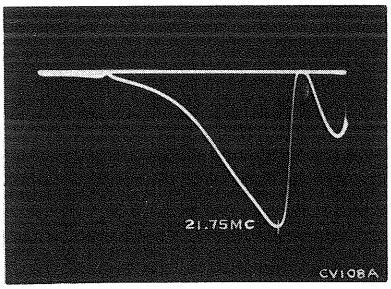


Figure 28—Response of Third Pix I-F Transformer

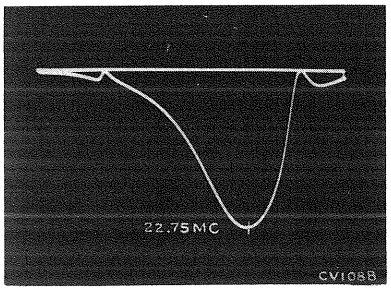


Figure 29—Response of Fourth Pix I-F Transformer

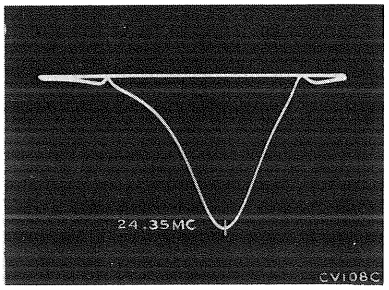


Figure 30—Response of Fifth Pix I-F Coil

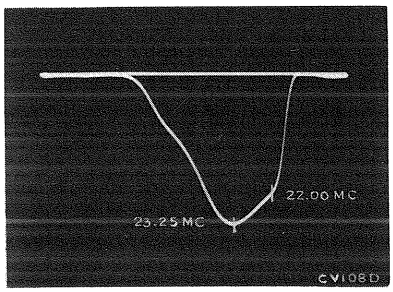


Figure 31—Response from First Pix I-F Grid to Pix Det.

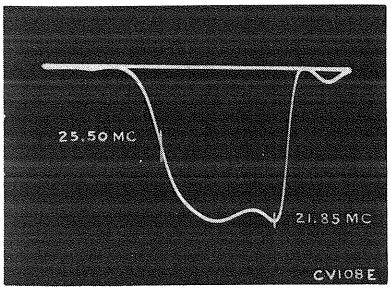


Figure 32—Overall Pix I-F Response

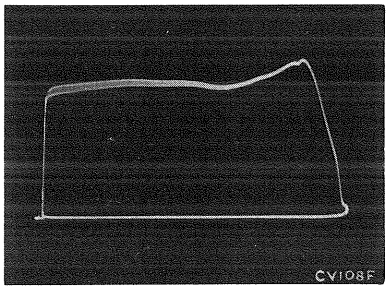


Figure 33—Video Response at Average Contrast

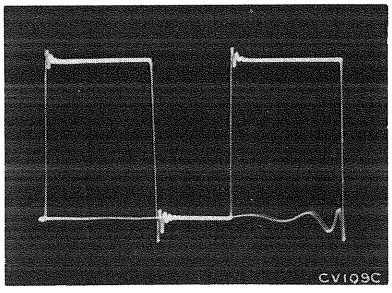


Figure 34—Video Response (100 KC Square Wave)

WAVEFORM PHOTOGRAPHS

Taken from RCA WO58A Oscilloscope

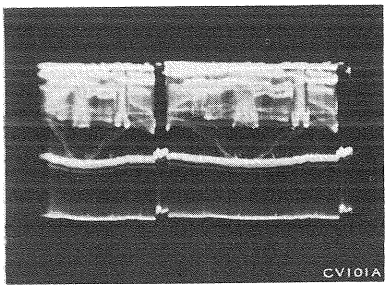
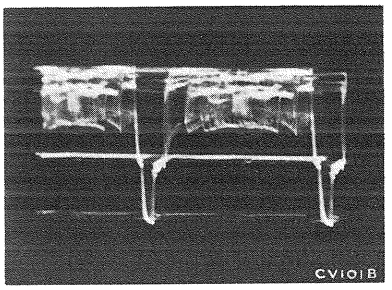
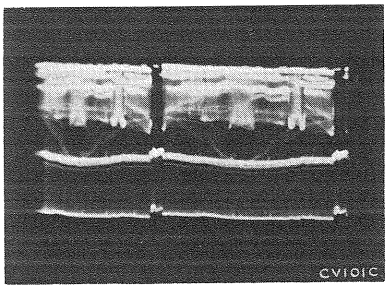


Plate of Picture Detector
(Pin 7 of V105) (6AL5)

Figure 35—Vertical (Oscilloscope Synced to ½ of Vertical Sweep Rate) (5.5 Volts PP)

Figure 36—Horizontal (Oscilloscope Synced to ½ of Horizontal Sweep Rate) (5.5 Volts PP)

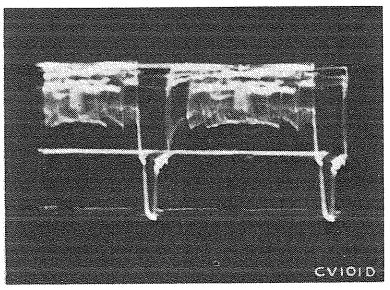




Grid of 1st Video Amplifier
(Pin 2 of V106) (12AU7)

Figure 37—Vertical (5.3 Volts PP)

Figure 38—Horizontal (5.3 Volts PP)



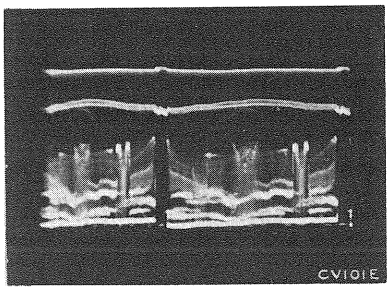
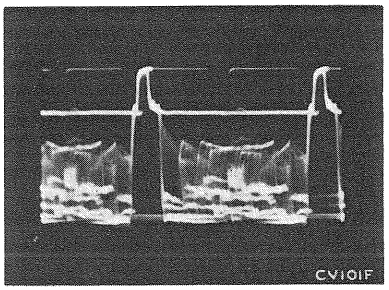
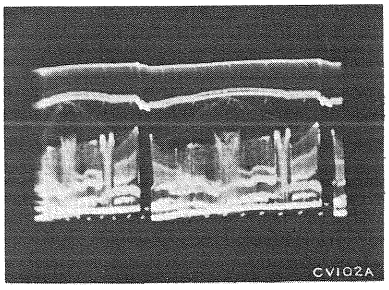


Plate of 1st Video Amplifier
(Pin 1 of V106) (12AU7)
Voltage depends on setting of picture control

Figure 39—Vertical (3-18 Volts PP)

Figure 40—Horizontal (3-18 Volts PP)

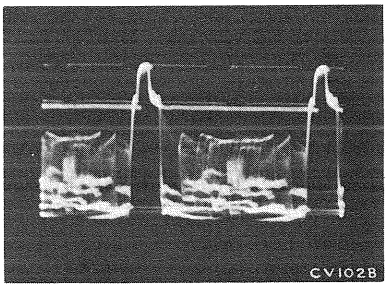




Grid of 2nd Video Amplifier
(Pin 7 of V106) (12AU7)
Voltage depends on setting of picture control

Figure 41—Vertical (3-18 Volts PP)

Figure 42—Horizontal (3-18 Volts PP)



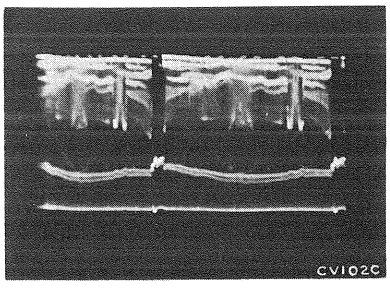
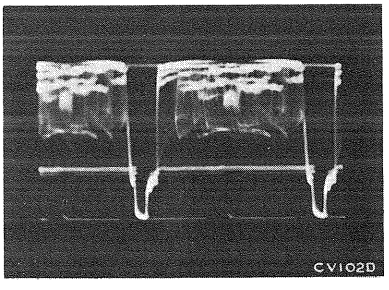
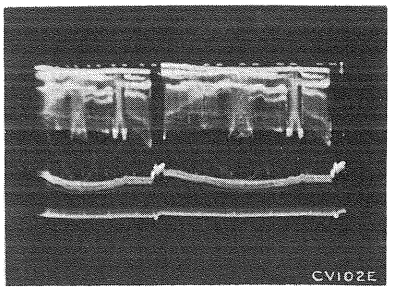


Plate of 2nd Video Amplifier
(Picture Max.)
(Pin 6 of V106) (12AU7)
Voltage depends on setting of picture control

Figure 43—Vertical (25-90 Volts PP)

Figure 44—Horizontal (25-90 Volts PP)

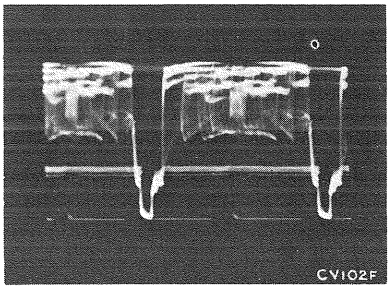


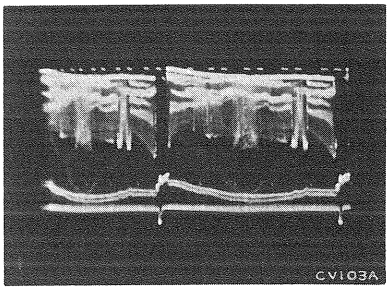


Input to Kinescope (Junction of L109 and R135) (Picture Max.)
Voltage depends on setting of picture control

Figure 45—Vertical (25-90 Volts PP)

Figure 46—Horizontal (25-90 Volts PP)

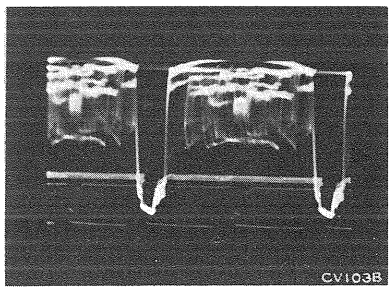


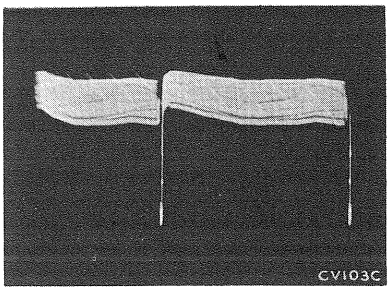


Cathode of D-C Restorer (Pin 3 of V107) (12AU7)
Voltage depends on setting of picture control

Figure 47—Vertical (20-80 Volts PP)

Figure 48—Horizontal (20-80 Volts PP)

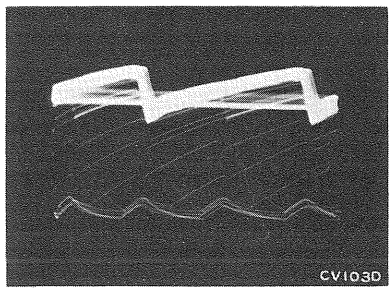


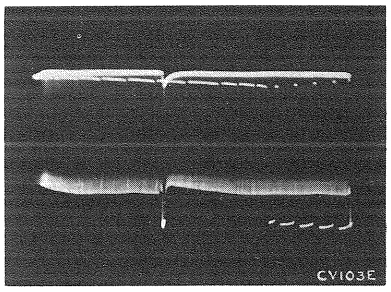


Grid of D-C Restorer (Pin 2 of V107) (12AU7)
Voltage depends on setting of picture control

Figure 49—Vertical (3-10 Volts PP)

Figure 50—Horizontal (3-10 Volts PP)

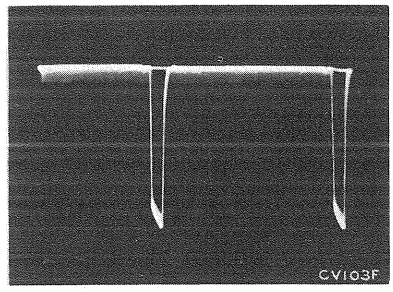




Grid of Sync Separator (Pin 4 of V108A)
Voltage depends on setting of picture control

Figure 51—Vertical (6-8 Volts PP)

Figure 52—Horizontal (6-8 Volts PP)



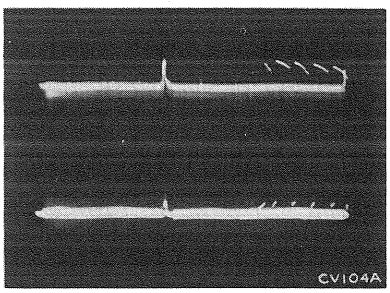
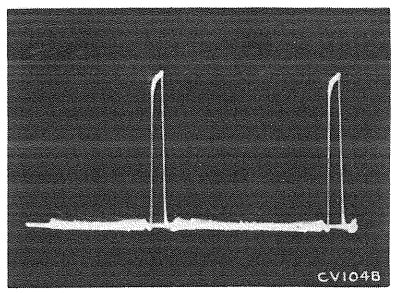


Plate of Sync Separator (Pin 5 of V108)
Voltage depends on setting of picture control

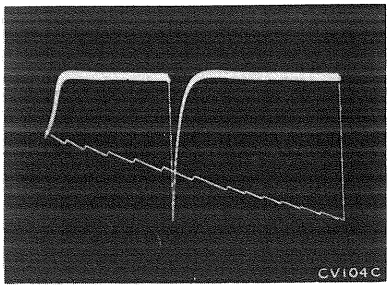
Figure 53—Vertical (14-16 Volts PP)

Figure 54—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 55—Vertical (.8-1.0 Volts PP)

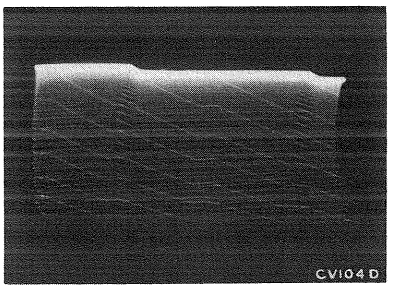


Figure 56—Horizontal (.8-1.0 Volts PP)

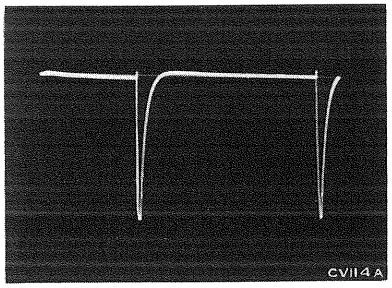


Figure 57—Output of Integrating Network (Junction of C139, C140 and R146) (45 Volts PP)

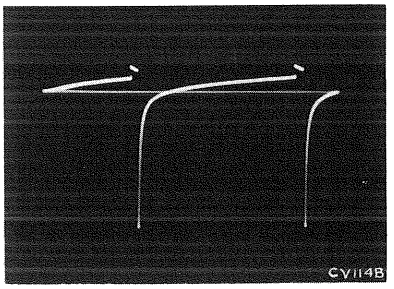


Figure 58—Grid of Vertical Oscillator (Pin 1 of V108B) (180 Volts PP)

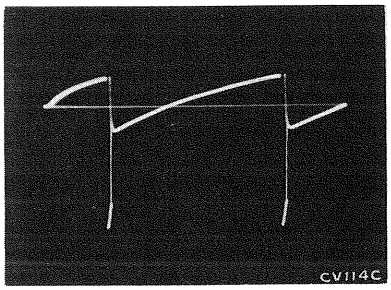


Figure 59—Plate of Vertical Oscillator (Pin 2 of V108B) (120 Volts PP)

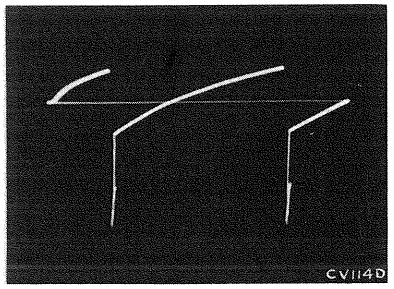


Figure 60—Grid of Vertical Output (190 Volts PP) (Pin 5 of 109) (6K6GT)

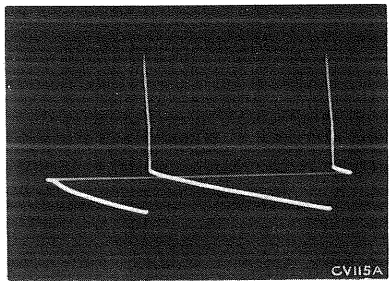


Figure 61—Plate of Vertical Output (1300 Volts PP) (Pin 3 of V109) (6K6GT)

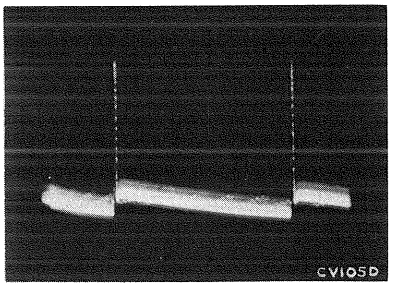


Figure 62—Input of Vertical Deflection Coils (15 Volts PP) (Voltage across pins 1 & 2 of J101F)

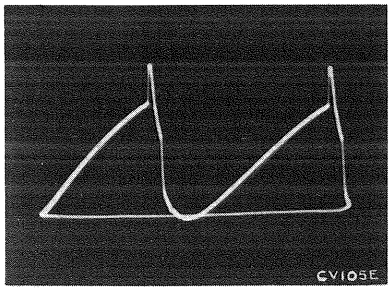


Figure 63—Grid of Horizontal Oscillator Control (22 Volts PP) (Pin 1 of V110) (6SN7GT)

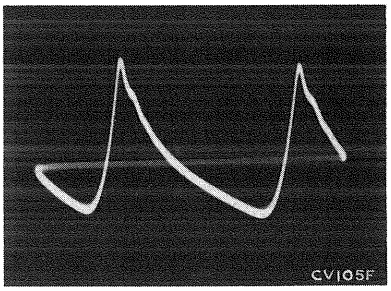


Figure 64—Cathode of Horizontal Oscillator Control (1.0 Volts PP) (Pin 3 of V110) (6SN7GT)

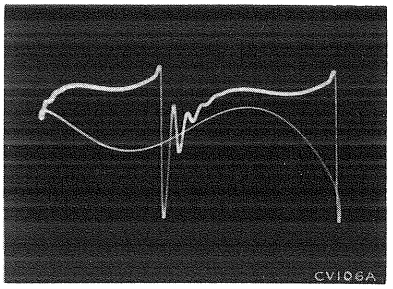
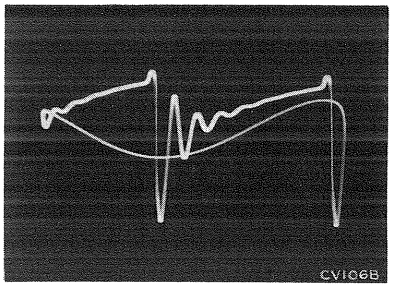


Figure 65—Junction of R162, R164 and R170 (52 Volts PP)

Figure 66—Grid of Horizontal Oscillator (340 Volts PP) (Pin 4 of V110) (6SN7GT)



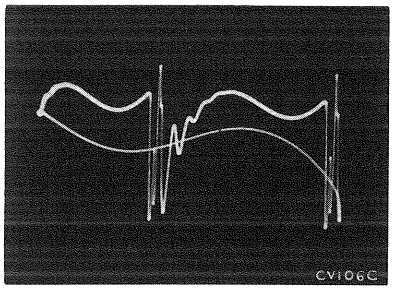
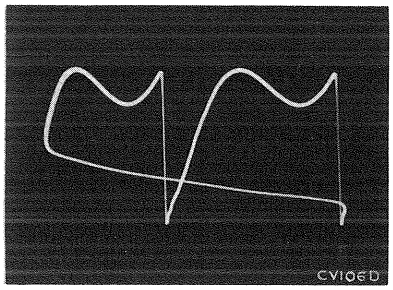


Figure 67—Plate of Horizontal Oscillator (190 Volts PP) (Pin 5 of V110) (6SN7GT)

Figure 68—Terminal "C" of T108 (120 Volts PP)



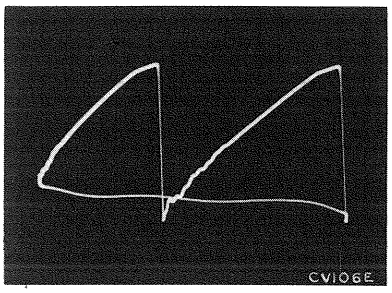
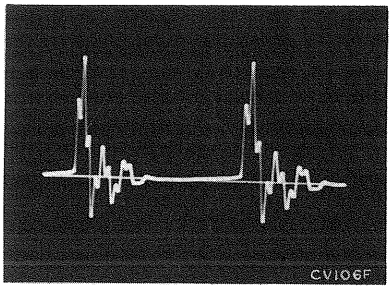


Figure 69—Input to Horizontal Output Tube (80-110 Volts PP) (Junction of C155 and C147B)

Figure 70—Plate of Horizontal Output (Approx. 6000 Volts PP) (Measured Through a Capacity Voltage Divider Connected from Top Cap of V111 to Ground)



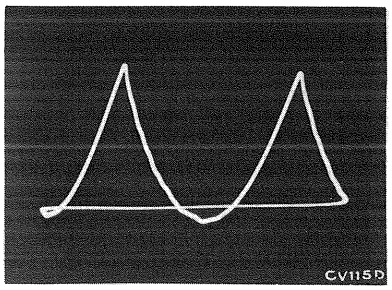
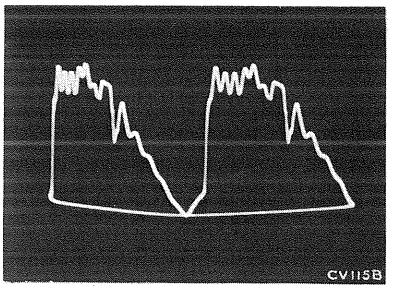


Figure 71—Cathode of Horizontal Output Tube (9-12 Volts PP) (Pin 3 of V111) (6BG6G)

Figure 72—Screen of Horizontal Output Tube (5-120 Volts PP) (Pin 8 of V111) (6BG6G)



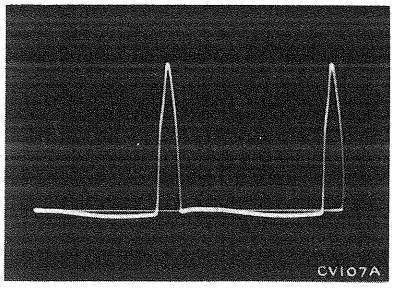
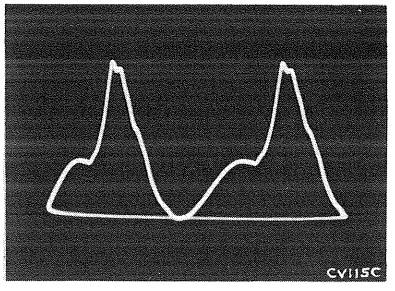


Figure 73—Cathode of Damper (3000 Volts PP) (Pin 3 of V113) (6W4GT)

Figure 74—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 type WV79A 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	3d 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 2d 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	2	−2.6	0.9	—	At minimum contrast
			No Signal	1	122	—	—	3	6.9	2	−0.5	0.6	—	
V106	12AU7	2d Video Amplifier	2500 Mu. V. Signal	6	330	—	—	8	125	7	118	9.3	—	At maximum contrast
			No Signal	6	295	—	—	8	121	7	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	—	—	

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	6SN7	Vertical Oscillator	2500 Mu. V. Signal	2	*395	—	—	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	6SN7 GT	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	*14500	—	—	0	—	*14500 volt pulse present
			Brightness Maximum	Cap	*	—	—	2 & 7	*12700	—	—	0.1	—	
V113	6W4 GT	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	2d 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	19AP4	Kinescope	2500 Mu. V. Signal	Cone	14,000	10	384	11	100	2	46	<0.1	<0.1	
			No Signal	Cone	13,500	10	375	11	74	2	8.3	<0.1	<0.1	

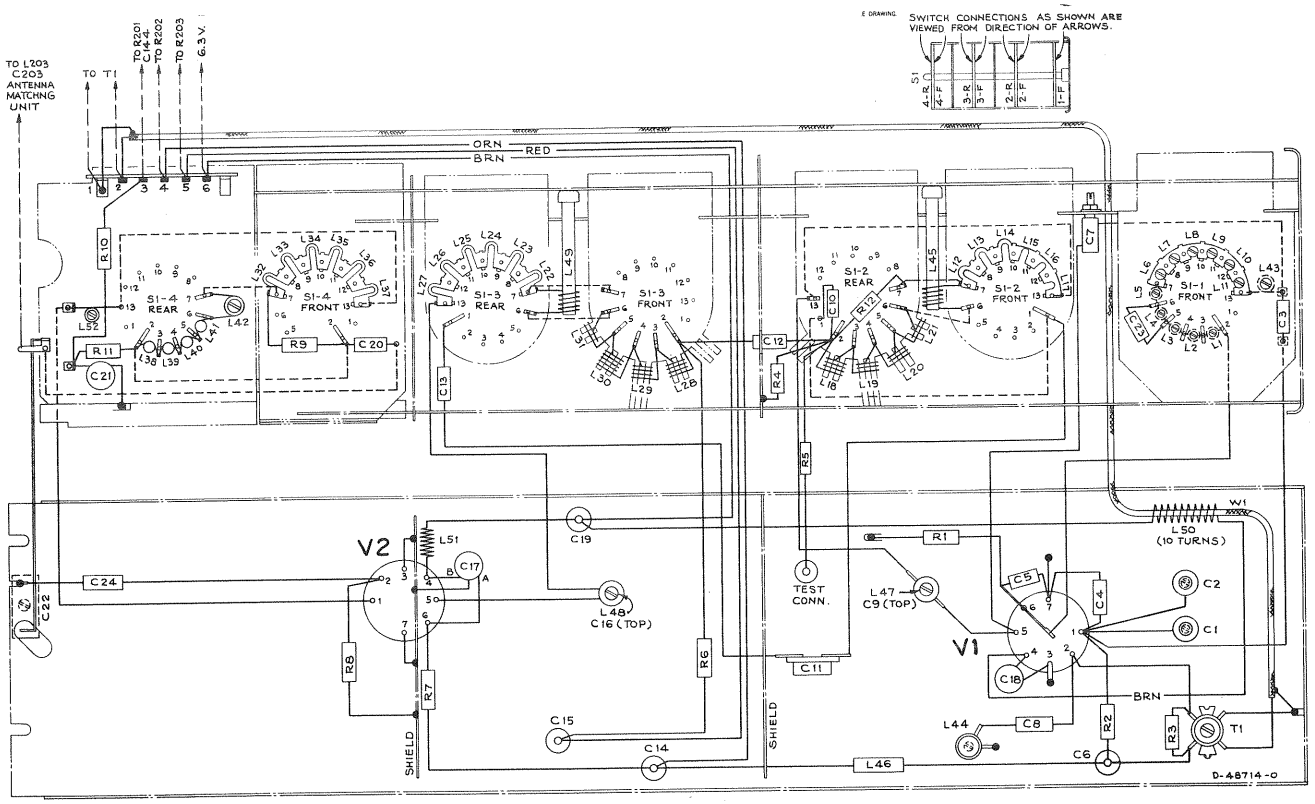
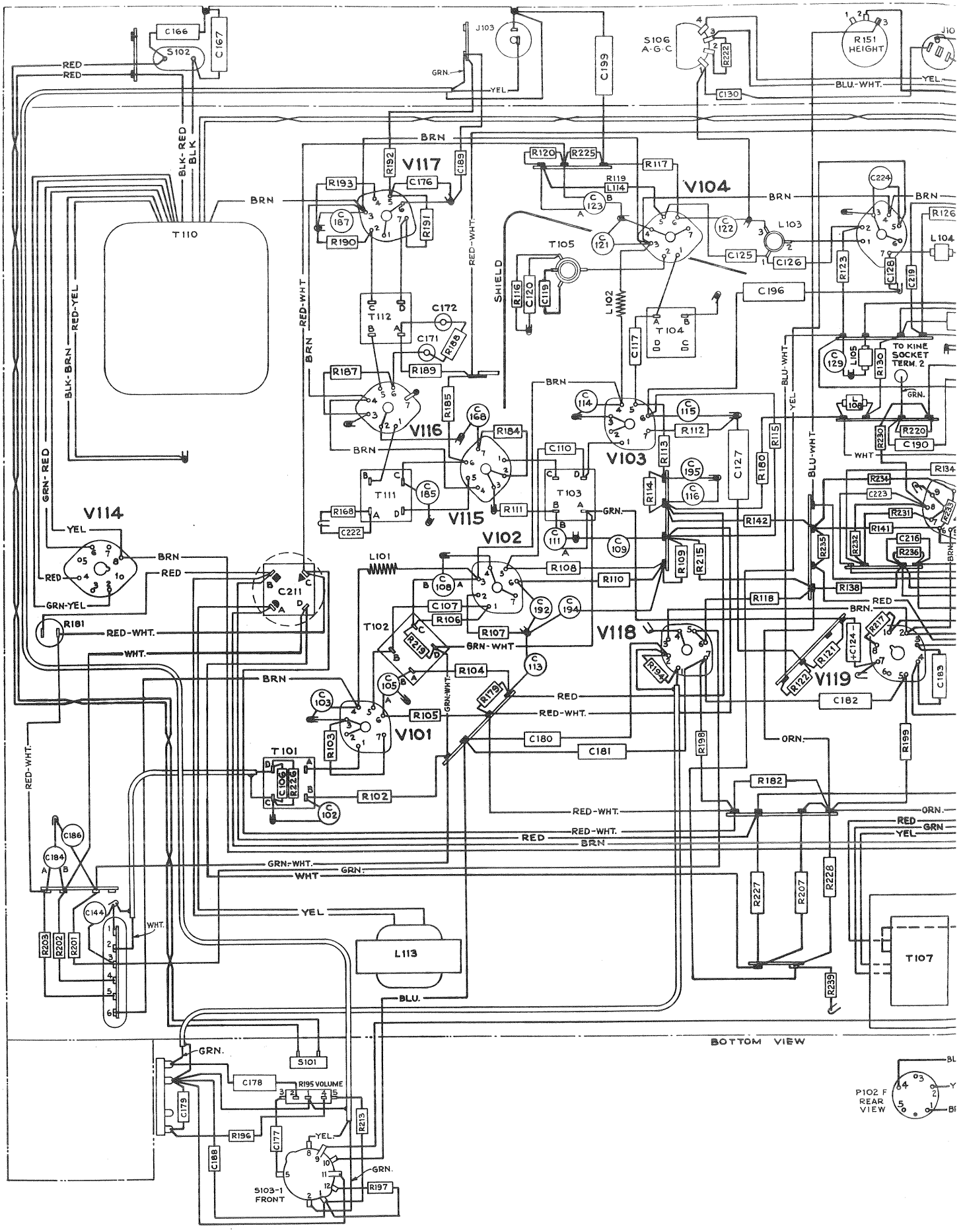
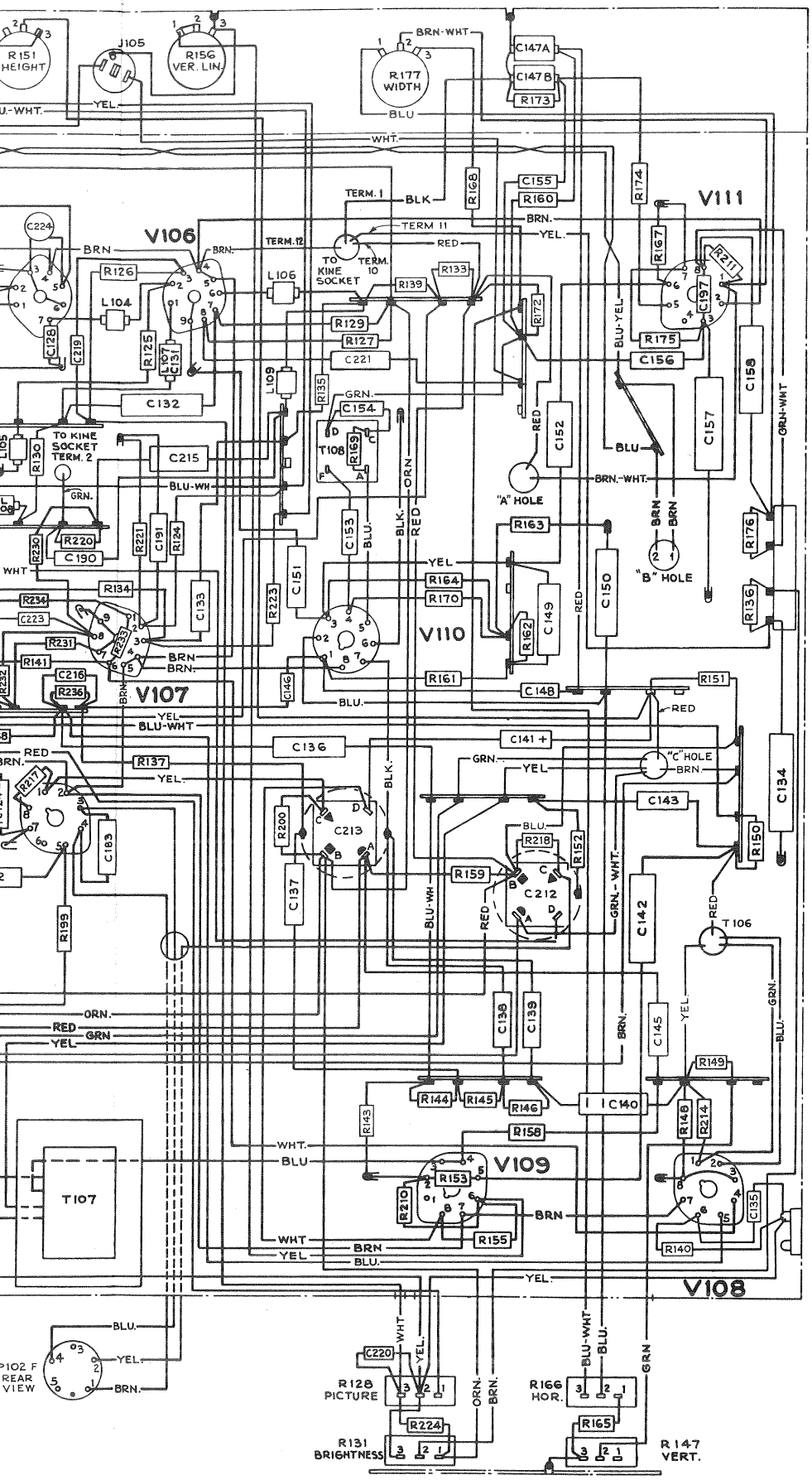


Figure 75—R-F Unit Wiring Diagram

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 1500 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 V106 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 kine 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.


V117
V116
V115
V114
V104
V103
V102
V101
V118
V119
T110
T112
T111
T105
T104
T103
T102
T101
L101
L102
L103
L104
L105
L113
S102
S106 A-G-C
R151 HEIGHT
S101
S103-1 FRONT
R195 VOLUME
C196
SHIELD
TO KINE SOCKET TERM. 2
BOTTOM VIEW
P102 F REAR VIEW
RED
RED-WHT.
BLK-RED
BLK
BRN
BLK-BRN
RED-YEL
GRN-RED
GRN-YEL
YEL
GRN.
BLU.
BLU-WHT.
WHT.
GRN-WHT.
ORN.



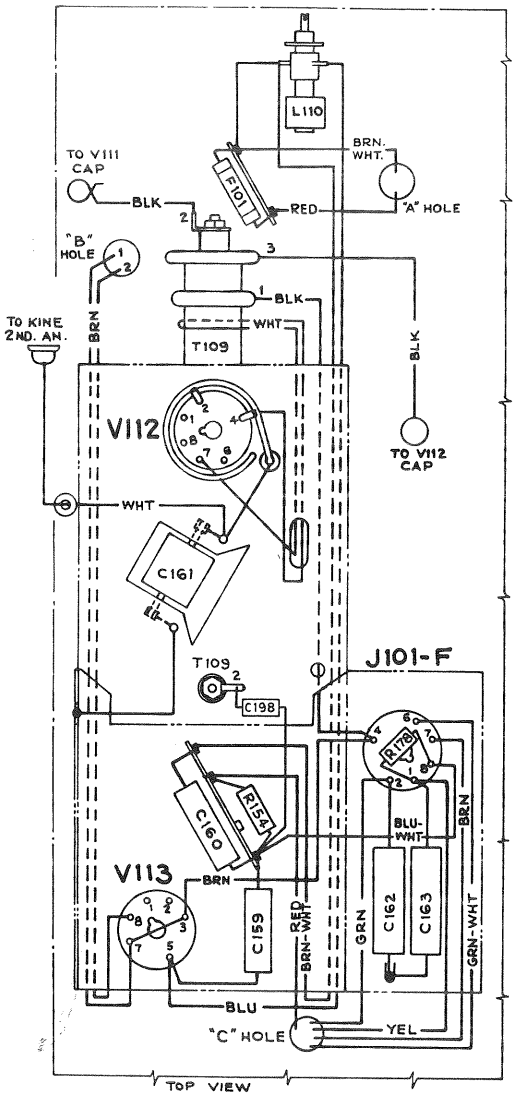


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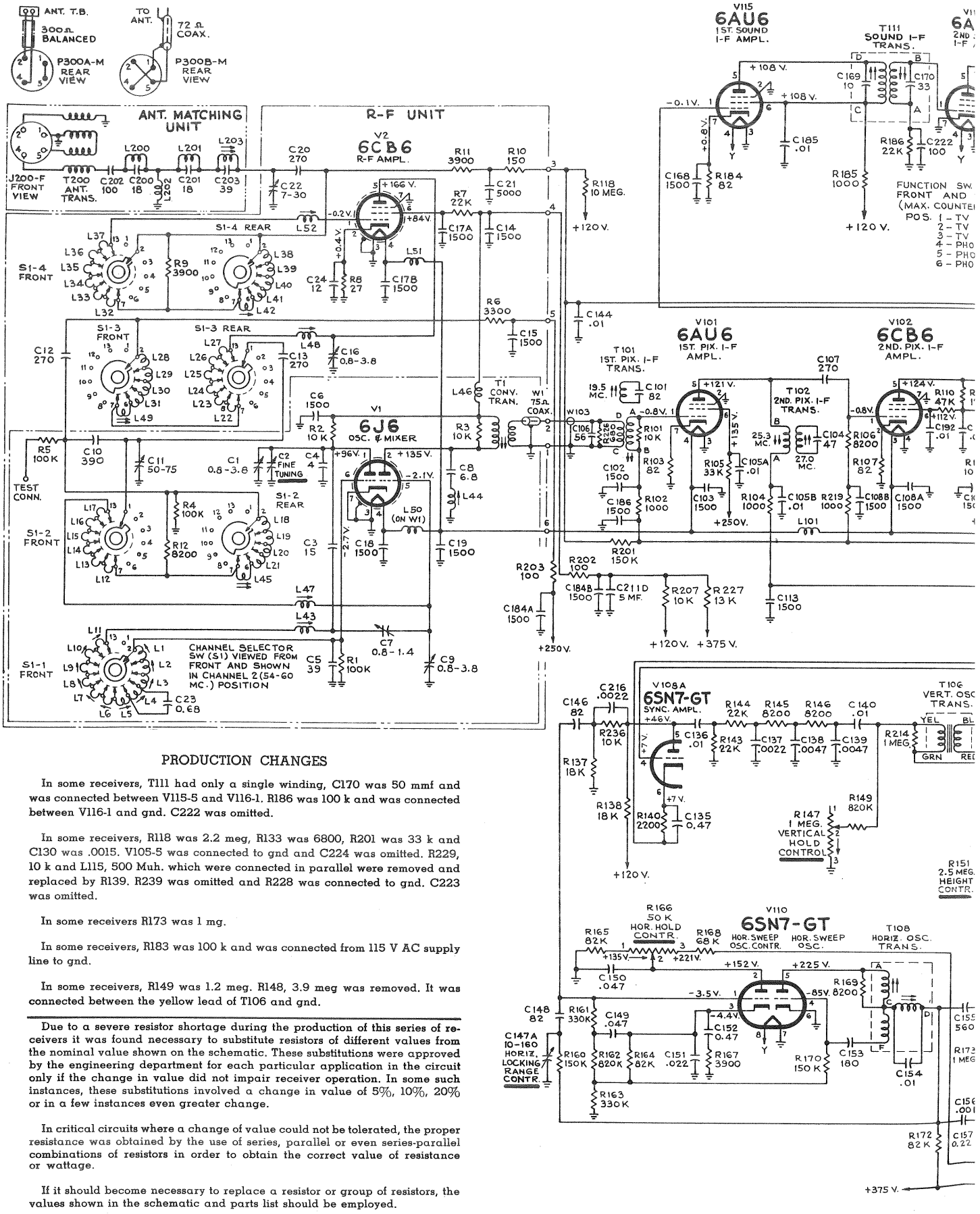
Figure 76
Chassis Wiring Diagram



PRODUCTION CHANGES

In some receivers, T111 had only a single winding, C170 was 50 mmf and was connected between V115-5 and V116-1. R186 was 100 k and was connected between V116-1 and gnd. C222 was omitted.

In some receivers, R118 was 2.2 meg, R133 was 6800, R201 was 33 k and C130 was .0015. V105-5 was connected to gnd and C224 was omitted. R229, 10 k and L115, 500 Muh. which were connected in parallel were removed and replaced by R139. R239 was omitted and R228 was connected to gnd. C223 was omitted.

In some receivers R173 was 1 mg.

In some receivers, R183 was 100 k and was connected from 115 V AC supply line to gnd.

In some receivers, R149 was 1.2 meg. R148, 3.9 meg was removed. It was connected between the yellow lead of T106 and gnd.

Due to a severe resistor shortage during the production of this series of receivers it was found necessary to substitute resistors of different values from the nominal value shown on the schematic. These substitutions were approved by the engineering department for each particular application in the circuit only if the change in value did not impair receiver operation. In some such instances, these substitutions involved a change in value of 5%, 10%, 20% or in a few instances even greater change.

In critical circuits where a change of value could not be tolerated, the proper resistance was obtained by the use of series, parallel or even series-parallel combinations of resistors in order to obtain the correct value of resistance or wattage.

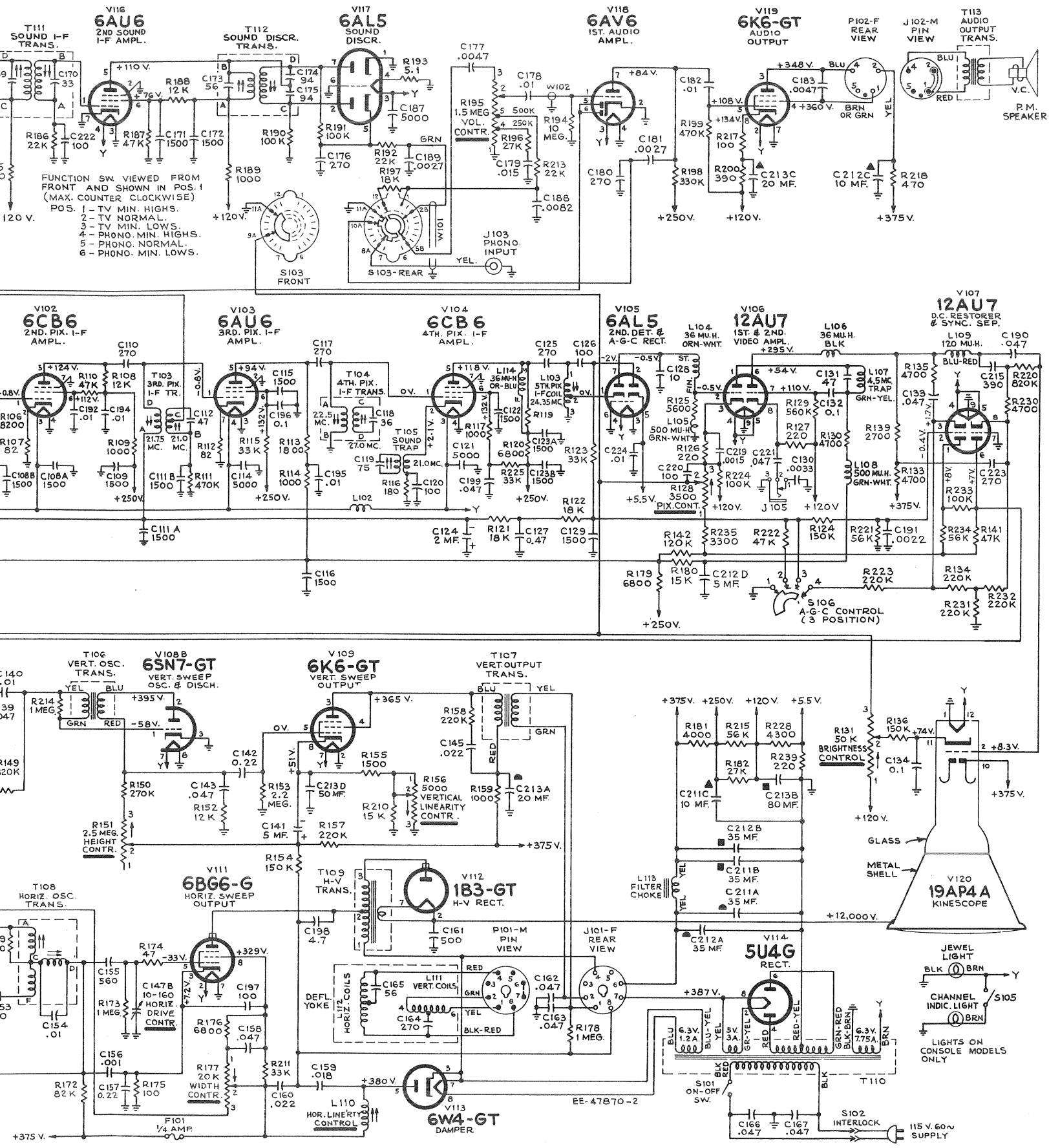
If it should become necessary to replace a resistor or group of resistors, the values shown in the schematic and parts list should be employed.

If the value of the resistor to be replaced is different from the value shown in the schematic, and the schematic value is not available, then it is permissible to replace it with the value found in the receiver or some value between that and the value shown in the schematic. Some of the commercially available, low resistance value, molded body types are of wire wound construction. Such resistors should not be employed in the r-f unit, i-f or video sections as the inductive effect of these resistors may impair circuit operation.

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 valu
ohm are not shown.
Direction of arrows
cates clockwise rotatic



oil resistance values less than 1 n are not shown.

irection of arrows at controls indi- es 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.

Fig. 77—Circuit Schematic Diagram

STOCK No.	DESCRIPTION
	R-F UNIT ASSEMBLIES
	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—#4-40 x ¼" binder head machine screw for adjusting L6, L7, L8, L9, L10, L11
75176	Screw—#4-40 x ⅜" fillister head screw for adjusting L5
75177	Screw—#4-40 x 5/16" fillister head screw for adjusting L1, L2, L3, L4, L43
74575	Screw—#4-40 x .359" adjusting screw for L42
73640	Screw—#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 RF 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 req'd)
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—Hairpin 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—#6-32 x 13/16" adjusting stud for C7 trimmer
75446	Stud—Capacitor stud—brass—#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—#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
	KCS 49B—Table models
	KCS 49C—Console models
75515	Bracket—Channel indicator lamp bracket for KCS49C
75228	Bracket—Focus magnet mounting bracket—upper
75229	Bracket—Focus magnet mounting bracket—lower
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. (C106)
73090	Capacitor—Mica, 82 mmf. (C146, C148)
75437	Capacitor—Ceramic, 100 mmf. (C202)
75469	Capacitor—Ceramic, 100 mmf. (C120)
39396	Capacitor—Ceramic, 100 mmf. (C126, C197, C220, C222)
73102	Capacitor—Mica, 180 mmf. (C153)
75244	Capacitor—Ceramic, 270 mmf. (C176)
39638	Capacitor—Mica, 270 mmf. (C180)
73091	Capacitor—Mica, 270 mmf. (C107, C110, C117, C125)
76303	Capacitor—Ceramic, 270 mmf. (C223)
73094	Capacitor—Mica, 390 mmf. (C215)
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, C122, C129, C168, C186)
75089	Capacitor—Ceramic, dual 1500 mmf. (C108A, C108B, C111A, C111B, C123A, C123B, C184A, C184B)
73473	Capacitor—Ceramic, 5000 mmf. (C114, C121, C187)
75877	Capacitor—Ceramic, dual 10,000 mmf. (C105A, C105B)
73960	Capacitor—Ceramic, 10,000 mmf. (C144, C185, C192, C194, C195, C224)

STOCK No.	DESCRIPTION
75646	Capacitor—Ceramic, 4.7 mmf. (C198)
73747	Capacitor—Electrolytic, 2 mfd, 50 volts (C124)
28417	Capacitor—Electrolytic, 5 mfd, 450 volts (C141)
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)
73598	Capacitor—Tubular, paper, oil impregnated, .0015 mfd, 600 volts (C219)
73595	Capacitor—Tubular, paper, oil ipregnated, .0022 mfd, 600 volts (C137, C191, C216)
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, 400 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)
75071	Capacitor—Tubular, moulded paper, .047 mfd, 400 volts (C166, C167)
73553	Capacitor—Tubular, paper, oil impregnated, .047 mfd, 400 volts (C149, C199, C221)
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 75166
75210	Coil—Fifth pix, i-f coil complete with adjustable coil (L103)
71449	Coil—Horizontal linearity coil (L110)
73591	Coil—Antenna matching coil (2 req'd) (Part of T200)
75241	Coil—Antenna shunt coil (L202)
73477	Coil—Choke coil (L101, L102)
75299	Coil—Peaking coil (36 muh) (L104)
71793	Coil—Peaking coil (36 muh) (L106)
76285	Coil—Peaking coil (36 muh) (L114, R119)
75253	Coil—Peaking coil (120 muh) (L109)
75252	Coil—Peaking coil (500 muh) (L105, L108)
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 contactfemale connector for antennatransformer (J200)
5040	Connector—4 contact female connector for speaker cable (P102)

STOCK No.	DESCRIPTION
75517	Contact—Anode connector contact only
75215	Control—Horizontal and vertical hold control (R147, R166)
75216	Control—Picture and brightness control for KCS49B (R128, R131)
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 for KCS49C (R128, R131, S105)
76171	Control—Volume control and power switch (R195, S101)
71498	Core—Adjustable core and stud for FM trap 75449
74956	Cushion—Rubber cushion for deflection yoke hood (2 req'd)
74839	Fastener—Push fastener to mount ceramic tube socket (2 req'd)
73600	Fuse—.25 amp. 250 volts (F101)
16058	Grommet—Rubber grommet for 2nd. anode lead exit
37396	Grommet—Rubber grommet to mount ceramic tube socket (2 req'd)
75445	Hood—Deflection yoke hood less rubber cushions
75644	Insulator—2nd. anode insulator
75482	Jack—Video Jack (J105)
76168	Magnet—Focus magnet complete with adjustable plate and stud (screw driver adjusting type)
74953	Magnet—Ion trap magnet (PM) for Model 9T105
76322	Magnet—Ion trap magnet (PM) for Models 9T126, 9T128
75518	Plate—Hi-voltage plate—bakelite—less transformer, capacitor and tube socket
72067	Resistor—Wire wound, 5.1 ohms, ½ watt (R193)
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)
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, R159, R185, R189, R219)
513215	1500 ohms, ±10%, 1 watt (R155)
503218	1800 ohms, ±10%, ½ watt (R113)
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 (R135, R230)
513247	4700 ohms, ±10%, 1 watt (R133)
30734	5600 ohms, ±5%, ½ watt (R125)
513268	6800 ohms, ±10%, 1 watt (R120, R176)
523268	6800 ohms, ±10%, 2 watts (R179)
14250	8200 ohms, ±5%, ½ watt (R106, 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 (R188)
30866	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, R186, R213)

STOCK No.	DESCRIPTION
504322	22,000 ohms, ±20%, ½ watt (R192)
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, 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)
513368	68,000 ohms, ±10%, 1 watt (R168)
52609	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)
38892	330,000 ohms, ±5%, 1 watt (R163)
503447	470,000 ohms, ±10%, ½ watt (R111, R199)
503456	560,000 ohms, ±10%, ½ watt (R129)
503482	820,000 ohms, ±10%, ½ watt (R162, R220)
503510	1 megohm, ±10%, ½ watt (R173)
504510	1 megohm, ±20%, ½ watt (R178, R214)
503610	10 megohm, H 10—, W watt (R118)
30162	1.2 megohm, ±5%, ½ watt (R149)
503522	2.2 megohm, ±10%, ½ watt (R153)
70249	3.9 megohm, ±5%, ½ watt (R148)
504610	10 megohm, ±20%, ½ watt (R194)
503610	10 megohm, ±10%, ½ watt (R118)
74602	Screw—#10-32 x 1¾" round head machine screw for focus magnet adjustment (3 req'd)
75236	Screw—#8-32 x ⅜" pan head cross-recessed screw to mount focus magnet (2 req'd)
75083	Screw—#8-32 x ¼" wing screw for mounting 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
71508	Socket—Tube socket, 6 contact, moulded for 1B3/8016
68592	Socket—Tube socket, 6 contact
31364	Socket—Pilot lamp socket for KCS49C
75718	Socket—Channel indicator lamp socket for KCS49C
74834	Socket—Kinescope socket
75233	Spring—Compression spring for focus magnet adjustment (3 req'd)
76636	Stud—Adjusting stud complete with guard for focus magnet
75506	Support—Bakelite support only—part of hi-voltage shield
76010	Switch—AGC switch (S106)
76170	Switch—Tone control and phono switch S103
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)
71424	Transformer—Sound i-f transformer (T111, C169, C170)
75212	Transformer—Sound discriminator transformer (T112, C173, C174, C175)
75213	Transformer—Horizontal oscillator transformer (T108)
75509	Transformer—Antenna matching transformer complete with antenna connector i-f and FM traps and shunt coil (T200, C200, C201, C202, C203, J200, L200, L201, L202, L203)
75585	Transformer—Hi-voltage transformer (T109)
71778	Trap—Sound trap (T105, C119)
75242	Trap—I-F trap (L200, L201, C200, C201)
75449	Trap—FM 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, P101)
	SPEAKER ASSEMBLIES 92580-4W RL 105C8 RMA 274 (For Model 9T105)
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 plug and transformer
75520	Transformer—Output transformer (T113)
	SPEAKER ASSEMBLIES 92580-4F RMA 150 (For Model 9T105)
76120	Cone—Cone complete with voice coil assembly (3.2 ohms)
	SPEAKER ASSEMBLIES 92569-11W RL 111A2 RMA 274 (For Models 9T126, 9T128)
13867	Cap—Dust cap
75082	Cone—Cone complete with voice coil (3.2 ohms)
5039	Connector—4 contact male connector (J102)
74974	Speaker—12" P.M. speaker complete with cone and voice coil less transformer and plug
75520	Transformer—Output transformer (T113)
	SPEAKER ASSEMBLIES 92569-11B (For Models 9T126, 9T128)
75875	Cone—Cone and voice coil assembly (3.2 ohms)
	SPEAKER ASSEMBLIES 92569-11R RMA 285 (For Models 9T126, 9T128)
76121	Cone—Cone and voice coil assembly (3.2 ohms) NOTE:—If stamping on speaker in instrument does not agree with above speaker number, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.

STOCK No.	DESCRIPTION
	MISCELLANEOUS
76192	Back—Cabinet back complete with power cord and terminal board for Model 9T105
76194	Back—Cabinet back complete with power cord and terminal board for Models 9T126 and 9T128
76184	Board—"Antenna" terminal board
75465	Bracket—Suspension bracket for deflection yoke and focus magnet support assembly
71599	Bracket—Pilot lamp bracket for Model 9T126, 9T128
13103	Cap—Pilot lamp cap for Models 9T126, 9T128
71892	Catch—Bullet catch and strike for cabinet doors for Model 9T126
X1917	Cloth—Grille cloth for mahogany or walnut instruments for Model 9T105
X1918	Cloth—Grille cloth for oak instruments for Model 9T105
X3144	Cloth—Grille cloth for mahogany or walnut instruments for Model 9T126
X3093	Cloth—Grille cloth for oak instruments for Model 9T126
X3199	Cloth—Grille cloth for mahogany or walnut instruments for Model 9T128 and for maple instruments for Model 9T128
39153	Connector—4 contact male connector for antenna cable
75474	Connector—Single contact male connector for antenna cable (2 req'd)
71457	Cord—Power cord and plug
75608	Cushion—Dust seal cushion
76195	Decal—Control function decal for Model 9T105
71984	Decal—"RCA Victor" decal
76127	Decal—Control function decal for mahogany or walnut instruments for Models 9T126, 9T128
76128	Decal—Control function decal for oak or maple instruments for Models 9T126, 9T128
74809	Emblem—"RCA Victor" emblem
75499	Escutcheon — Channel marker escutcheon — dark — for mahogany or walnut instruments for Model 9T105
75501	Escutcheon—Channel marker escutcheon—light—for oak instruments for Model 9T105
75455	Escutcheon — Channel marker escutcheon — dark — for mahogany or walnut instruments for Models 9T126, 9T128
75456	Escutcheon—Channel marker escutcheon—light—for oak or maple instruments for Models 9T126, 9T128
72113	Foot—Rubber foot (4 req'd) for Model 9T105
75619	Glass—Safety glass
37396	Grommet—Rubber grommet for speaker mounting (4 req'd)
75621	Hinge—Control panel hinges (1 set) for Model 9T105
74308	Hinge—Cabinet door hinge (1 set) for Model 9T126
74959	Knob—Fine tuning knob—maroon—for mahogany or walnut instruments (outer)
75461	Knob—Fine tuning knob—beige—for oak instruments (outer) for Models 9T105, 9T126
74960	Knob—Channel selector knob—maroon—for mahogany or walnut instruments (inner)
75462	Knob—Channel selector knob—beige—for oak instruments (inner) for Models 9T105, 9T126
74962	Knob—Brightness control or vertical hold control—maroon—for mahogany or walnut instruments (outer)
75463	Knob—Brightness control or vertical hold control—beige—for oak instruments for Models 9T105, 9T126
76190	Knob—Tone control and phono switch knob—maroon—for mahogany or walnut instruments (outer)
76191	Knob—Tone control and phono switch knob—beige—for oak instruments (outer) for Models 9T105, 9T126
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) for Models 9T105, 9T126
73995	Knob—Fine tuning knob—tan—for maple instruments (outer) for Models 9T128
74961	Knob—Channel selector knob—tan—for maple instruments (inner) for Model 9T128
73999	Knob—Brightness control or vertical hold control knob—tan—for maple instruments (outer) for Model 9T128
76193	Knob—Tone control and phono switch knob—tan—for maple instruments (outer) for Model 9T128
74001	Knob—Picture control, horizontal hold control or volume control and power switch knob—tan—for maple instruments (inner) for Model 9T128
11765	Lamp—Pilot or channel marker lamp—Mazda 51—for Models 9T126, 9T128
75459	Mask—Channel marker escutcheon light mask—burgundy—for mahogany or walnut instruments for Models 9T126, 9T128
75460	Mask—Channel marker escutcheon light mask—gold—for oak or maple instruments for Models 9T126, 9T128
75620	Mask—Kinescope masking panel
73634	Nut—Speed nut for speaker mounting screws (4 req'd) for Models 9T126, 9T128
75622	Pull—Door pull for Model 9T126
76196	Pull—Door pull—L.H.—for upper door for Model 9T128
76197	Pull—Door pull—R.H.—for upper door for Model 9T128
76198	Pull—Door pull for lower doors for Model 9T128
71456	Screw—#8-32 x 7/16" wing screw for deflection yoke and focus magnet mounting support
75623	Screw—#8-32 x 5/8" trimit head screw for door pull for Model 9T126
74279	Screw—#8-32 x 7/8" trimit head screw for door pulls for upper doors for Model 9T128
75626	Screw—#8-32 x 1 1/4" trimit head screw for door pulls for lower doors for Model 9T128
75587	Spring—Formed spring for mounting kinescope masking panel
73643	Spring—Spring clip for channel marker escutcheons
72845	Spring—Retaining spring for knobs 74959, 73995 and 75461
14270	Spring—Retaining spring for knobs 73999, 74961, 74960, 74962, 75462, 75463
30330	Spring—Retaining spring for knobs 74001, 74963 and 75464
72936	Stop—Cabinet door stop for Model 9T126
75500	Washer—Felt washer for cabinet back screws
75457	Washer—Felt washer—dark brown—between knob and channel marker escutcheon for mahogany or walnut instruments for Models 9T126 and 9T128
75458	Washer—Felt washer—beige—between knob and channel marker escutcheon for oak instruments for Model 9T126
75523	Washer—Felt washer—tan—between knob and channel marker escutcheon for maple instruments for Model 9T128

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