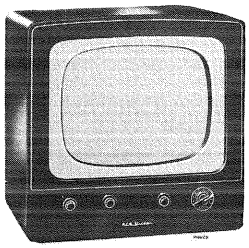


Model 17T153 "Bristol"
Mahogany Finish Metal

Model 17T154 "Whitfield"
Mahogany Grained Metal
Blonde Grained Metal

RCA VICTOR

TELEVISION RECEIVERS

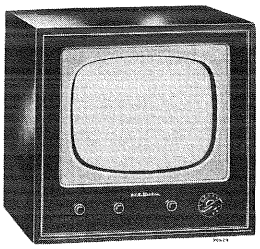
MODELS 17T153, 17T154, 17T155, 17T160, 17T162, 17T172, 17T172K, 17T173, 17T173K, 17T174, 17T174K

Chassis Nos. KCS66 or KCS66A or KCS66D
—Mfr. No. 274—

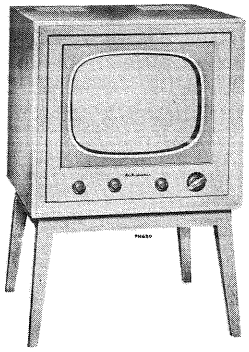
SERVICE DATA

—1951 No. T7—

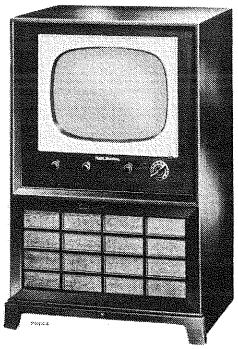
PREPARED BY RCA SERVICE CO., INC.
FOR
RADIO CORPORATION OF AMERICA
RCA VICTOR DIVISION
CAMDEN, N. J., U. S. A.



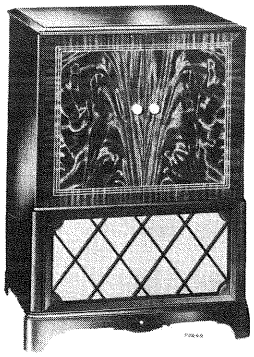
Model 17T155 "Preston"
Walnut, Mahogany, Limed Oak



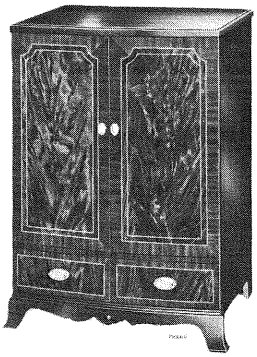
Model 17T160 "Hampton"
Walnut, Mahogany, Limed Oak



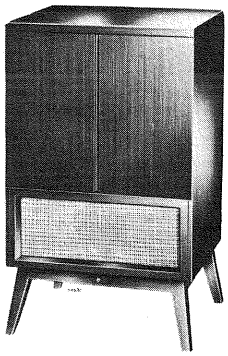
Model 17T162 "Caldwell"
Walnut, Mahogany, Limed Oak



Model 17T172 "Covington"
Walnut, Mahogany, Limed Oak



Model 17T173 "Calhoun"
Walnut, Mahogany



Model 17T174 "Kendall"
Walnut, Mahogany, Limed Oak

ELECTRICAL AND MECHANICAL SPECIFICATIONS

PICTURE SIZE. .146 sq. in. on a 17CP4 or 17GP4 Kinescope

TELEVISION R-F FREQUENCY RANGE

All 12 television channels, 54 mc. to 88 mc., 174 mc. to 216 mc.

Picture I-F Carrier Frequency.....45.75 mc.
Sound I-F Carrier Frequency.....41.25 mc. and 4.5 mc.

POWER SUPPLY RATING. .115 volts, 60 cycles, 190 watts

AUDIO POWER OUTPUT RATING.....5.0 watts max.

CHASSIS DESIGNATIONS

KCS66.....In Models 17T153, 17T154, 17T155 & 17T160
KCS66A.....In Models 17T162, 17T172, 17T173 & 17T174
KCS66D.....In Models 17T172K, 17T173K & 17T174K

LOUDSPEAKERS

92569—14W, 12" PM Dynamic in Models 17T172, 17T172K, 17T173 & 17T173K

971494—1W, 12" PM Dynamic in Models 17T172 & 17T172K
971490—2W, 8" PM Dynamic in all other model receivers.

WEIGHT Model	Chassis with Tubes in cabinet	Shipping Weight
17T153	82 lbs.	94 lbs.
17T154	82 lbs.	94 lbs.
17T155	74 lbs.	94 lbs.
17T160	80 lbs.	103 lbs.
17T162	94 lbs.	116 lbs.
17T172	102 lbs.	129 lbs.
17T173	106 lbs.	130 lbs.
17T174	96 lbs.	121 lbs.

RECEIVER ANTENNA INPUT IMPEDANCE

Choice: 300 ohms balanced or 72 ohms unbalanced.

RCA TUBE COMPLEMENT

	Tube Used	Function
(1)	RCA 6BQ7	R-F Amplifier
(2)	RCA 6X8	R-F Oscillator and Mixer
(3)	RCA 6AU6	1st Picture I-F Amplifier
(4)	RCA 6CB6	2nd Picture I-F Amplifier
(5)	RCA 6CB6	3rd Picture I-F Amplifier
(6)	RCA 6CB6	4th Picture I-F Amplifier
(7)	RCA 6AG7	Video Amplifier
(8)	RCA 6AU6	1st Sound I-F Amplifier
(9)	RCA 6AU6	2nd Sound I-F Amplifier
(10)	RCA 6AL5	Ratio Detector
(11)	RCA 6AV6	1st Audio Amplifier
(12)	RCA 6AQ5	Audio Output
(13)	RCA 6CB6	AGC Amplifier
(14)	RCA 6SN7GT	Sync Separator
(15)	RCA 6SN7GT	Vert Sync Amplifier and Vert Sweep Osc.
(16)	RCA 6AQ5	Vertical Sweep Output
(17)	RCA 6SN7GT	Horizontal Sync Amplifier
(18)	RCA 6SN7GT	Horizontal Sweep Oscillator and Control
(19)	RCA 6BQ6GT	Horizontal Sweep Output
(20)	RCA 6W4GT	Damper
(21)	RCA 1B3-GT/8016	High Voltage Rectifier
(22)	RCA 1V2 (in KCS66 & KCS66A)	Focus Rectifier
(23)	RCA 17GP4 (in KCS66 & KCS66A) or RCA 17CP4 (in KCS66D)	Kinescope Kinescope

Fourth Edition—First Printing 5-15-52

Printed in U.S.A.

ELECTRICAL AND MECHANICAL SPECIFICATIONS

(Continued)

PICTURE INTERMEDIATE FREQUENCIES

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

SOUND INTERMEDIATE FREQUENCIES

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

VIDEO RESPONSE	To 4 Mc.
FOCUS	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.

OPERATING INSTRUCTIONS

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

1. See that the TV-PH switch 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 picture 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.

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

10. 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.

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

12. 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".

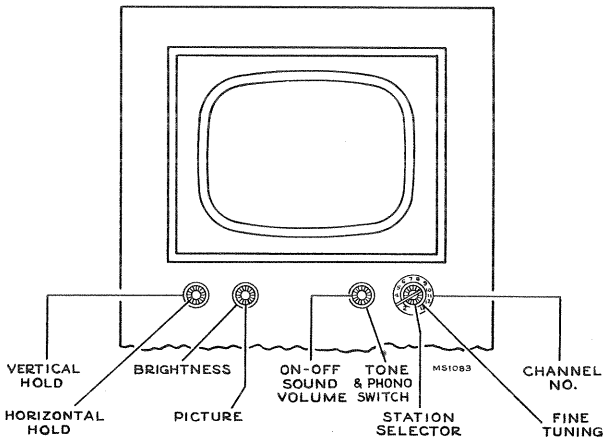


Figure 1—Receiver Operating Control

INSTALLATION INSTRUCTIONS

Early production of these RCA Victor 17-inch television receivers employed an electrostatic focus kinescope type 17GP4. Late production receivers employ a magnetic focus kinescope type 17CP4. To identify receivers, those employing magnetic focus kinescopes have a letter "K" following the mode number. The chassis in the "K" series of receivers is different from early production units only to the extent of the changes necessary to operate the other kinescope.

There are minor differences in the installation adjustments. Instructions for both series of chassis are given in the following procedure:

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

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

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 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.

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. Connect the antenna transmission line to the receiver.

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 R175 on the rear apron (see Figure 3) counter-clockwise until the set operates normally and the picture can be synced.

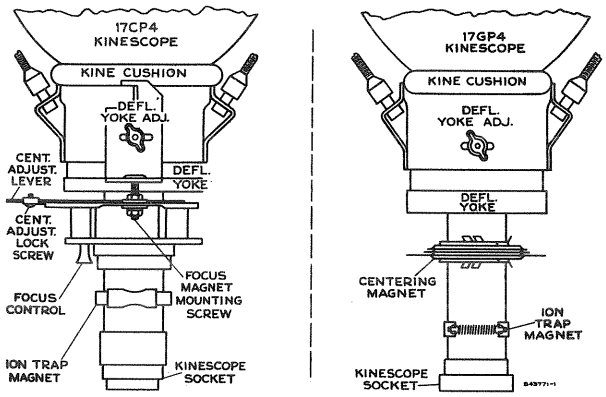


Figure 2—Ion Trap Magnet and Centering Adjustments

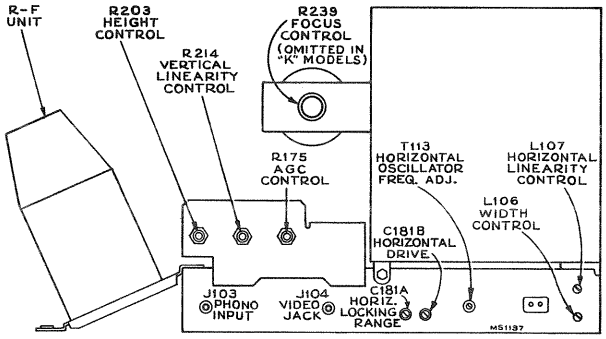


Figure 3—Rear Chassis Adjustments

INSTALLATION INSTRUCTIONS

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 or 3 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 before the control has been turned 120 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 remain in sync and should not show a black bar in the picture.

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 "Centering 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 T113 horizontal frequency adjustment at the rear 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. Then turn the T113 core until the bar moves out of the picture leaving it in sync.

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 T113 rear 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 3 bars are present just before the picture pulls into sync, adjust the horizontal locking range trimmer C181A slightly clockwise. If less than 2 bars are present, adjust C181A 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 or 3 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 "B" under Horizontal Oscillator Waveform Adjustment may be omitted.

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

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

FOCUS MAGNET ADJUSTMENTS (Disregard for electrostatic Models).—The focus magnet should be adjusted so that there is approximately three-eighths inch of space between the rear cardboard shell of the yoke and the flat 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 (Disregard for electrostatic Models).—Centering is accomplished by means of a separate plate on the focus magnet. The centering plate includes a locking screw which must be loosened before centering. 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 recenter 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 trimmer C181B counter-clockwise until the picture begins to "wrinkle" in the middle then clockwise until the "wrinkle" disappears.

Turn the horizontal linearity control L107 clockwise until the picture begins to "wrinkle" on the right and then counter-clockwise until the "wrinkle" disappears and best linearity is obtained.

Adjust the width control L106 to obtain correct picture width.

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

Adjustments of the horizontal drive control affect horizontal oscillator hold and locking range. If the drive control was adjusted, recheck the oscillator alignment.

HEIGHT AND VERTICAL LINEARITY ADJUSTMENTS.—Adjust the height control (R203 on chassis rear apron) until the picture fills the mask vertically. Adjust vertical linearity (R214 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 ADJUSTMENTS (Disregard for "K" Models).—Set the brightness control for average raster brightness. Set the focus control R239 (see Figure 3) slightly counter-clockwise from the best focus position. Adjust the ion trap magnet for maximum brightness. Within the range of maximum brightness, a region of best focus will occur. Set the ion trap magnet within this region of best focus. Do not use the ion trap magnet as a centering adjustment.

If the picture is not properly centered on the screen, readjust the centering magnet.

Adjust the focus control for best vertical wedge resolution consistent with good line focus. As a final check, turn the brightness control for low picture brightness. Best focus should occur in the center of the picture. Turn the brightness control for maximum useable brightness. Best focus should occur near the edge of the picture. This condition of adjustment gives the best average focus.

FOCUS (Disregard for electrostatic Models).—Adjust the focus magnet for maximum definition in the test pattern vertical "wedge" and best focus in the white areas of the pattern.

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 7. 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 for channel 13 is on top of the chassis.

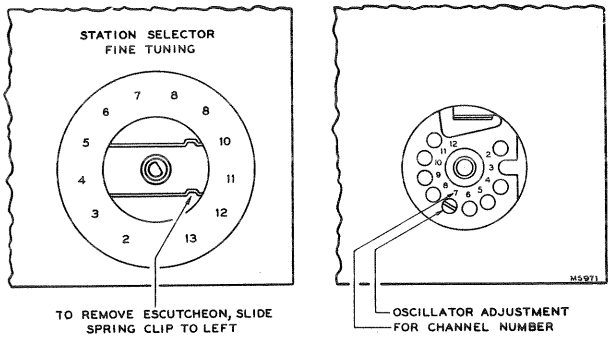


Figure 4—R-F Oscillator Adjustments

AGC THRESHOLD CONTROL.—The AGC threshold control R175 is adjusted at the factory and normally should not require readjustment in the field.

To check the adjustment of the AGC Threshold Control, tune in a strong signal and sync the picture. Momentarily remove the signal by switching off channel and then back. If the picture reappears immediately, the receiver is not overloading due to improper setting of R175. If the picture requires an appreciable portion of a second to reappear, or bends excessively, R175 should be readjusted.

Turn R175 fully counter-clockwise. The raster may be bent slightly. This should be disregarded. Turn R175 clockwise until there is a very, very slight bend or change of bend in the picture. Then turn R175 counter-clockwise just sufficiently to remove this bend or change of bend.

If the signal is weak, the above method may not work as it may be impossible to get the picture to bend. In this case, turn R175 clockwise until the snow in the picture becomes more pronounced, then counter-clockwise until the best signal to noise ratio is obtained.

The AGC control adjustment should be made on a strong signal if possible. If the control is set too far clockwise on a weak signal, then the receiver may overload when a strong signal is received.

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 L58 core on top of the antenna matching transformer for minimum interference in the picture.

CAUTION.—In some receivers, the FM trap L58 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 L58 to make sure that it does not affect sensitivity on these two channels.

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

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

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

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

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

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

Turn the tube so that the key on the base of the tube will be down and insert the neck of the kinescope through the deflection coil 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 wing screw and tighten. Engage the two side rods into the yoke frame and tighten the two nuts. Slide the deflection yoke as far forward as possible. If this is not done, difficulty will be encountered in adjusting the ion trap and focus magnet because of shadows on the corner of the raster.

Slide the chassis into the cabinet, then insert and tighten the 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. Perform the entire set-up procedure beginning with Ion Trap Magnet Adjustment.

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

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

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

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 1/4 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

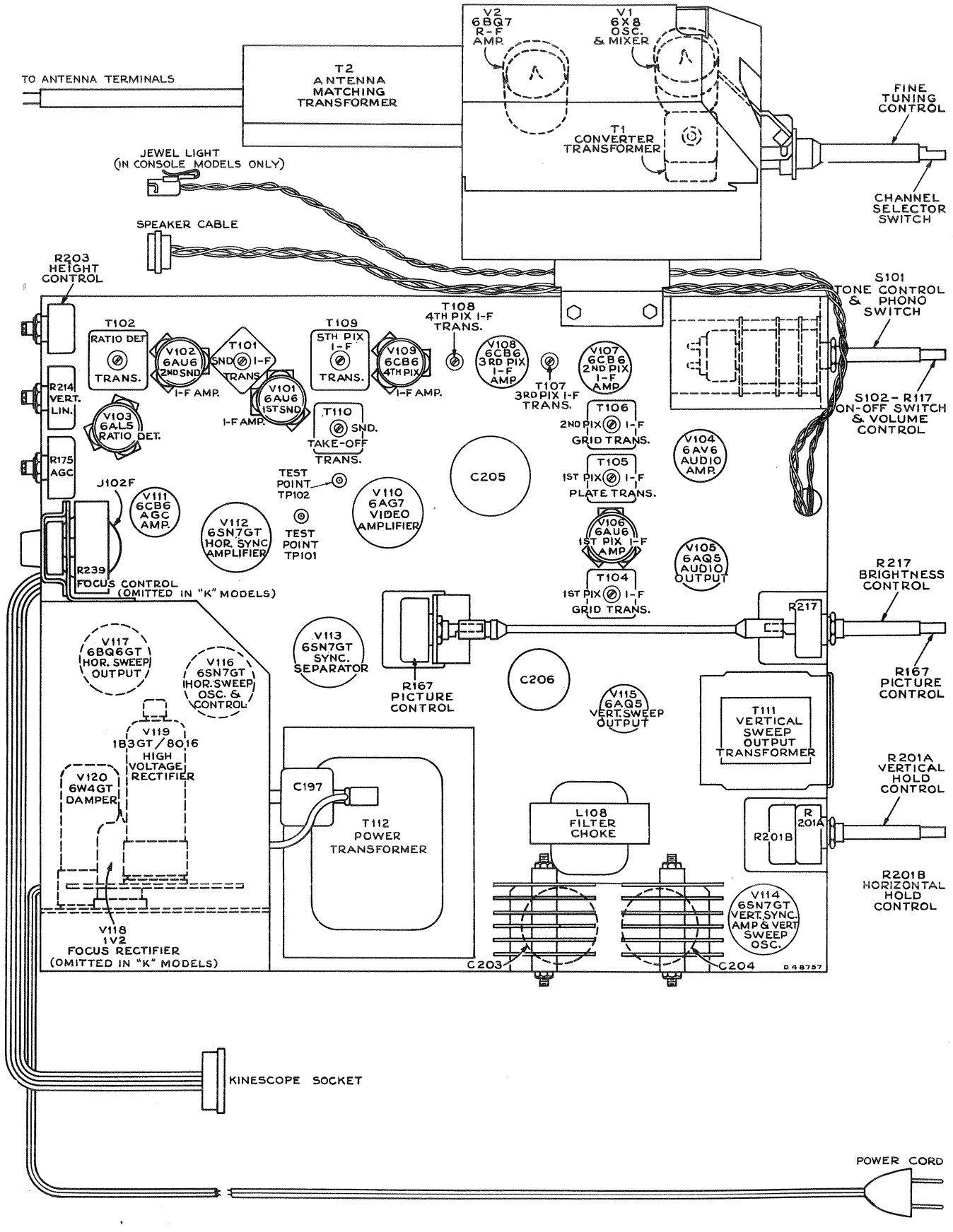


Figure 5—Chassis Top View

CHASSIS BOTTOM VIEW

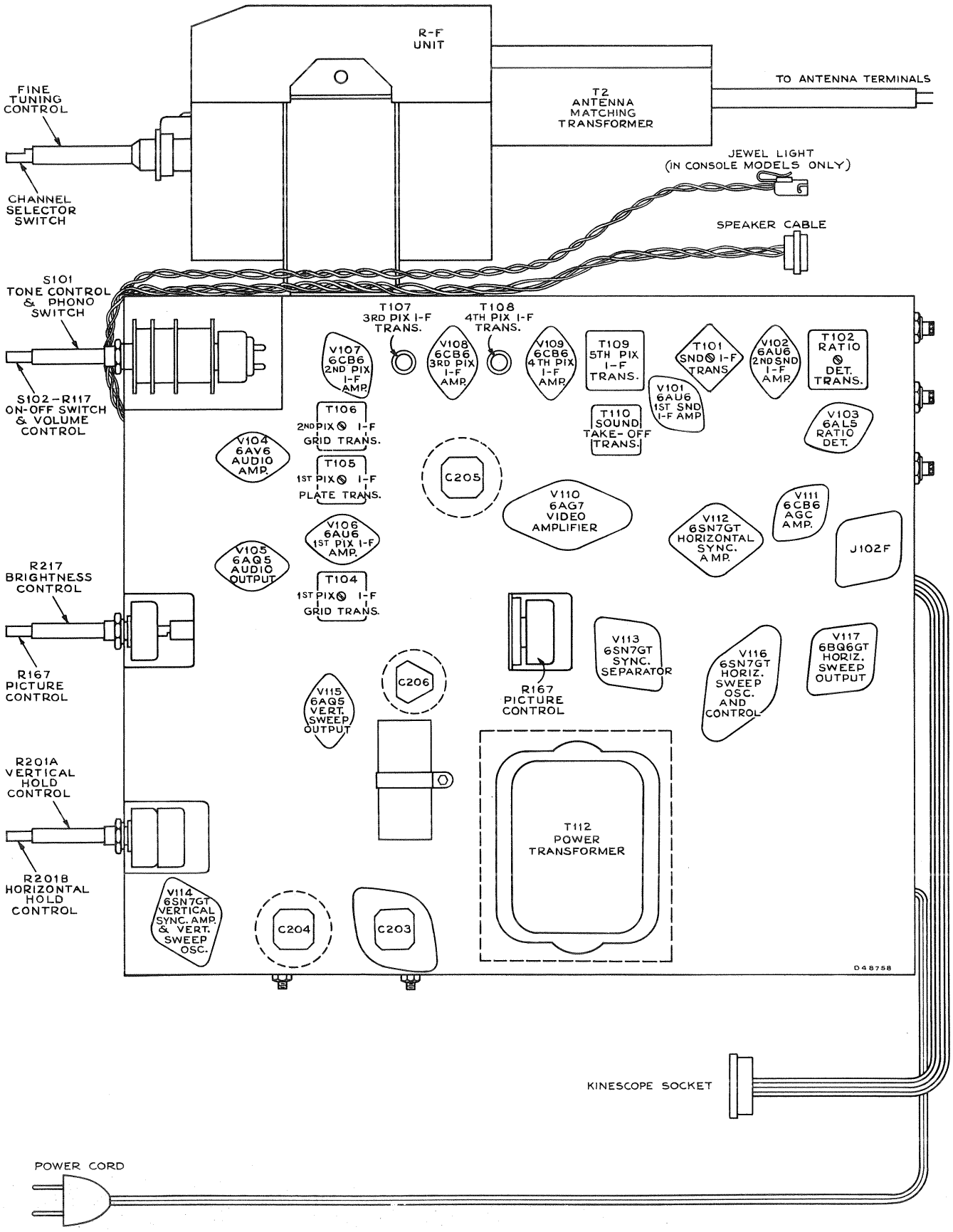


Figure 6—Chassis Bottom View

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
35 to 90 mc., 1 mc. to 12 mc. sweep width
170 to 225 mc., 12 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.

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.

Signal Generator to provide the following frequencies with crystal accuracy.

(a) Intermediate frequencies
4.5 mc. sound i-f transformer
39.25 mc. adjacent channel picture trap
41.25 mc. sound trap
45.75 mc. picture carrier
47.25 mc. adjacent channel sound trap

(b) Radio frequencies

Channel Number	Picture Carrier Freq. Mc.	Sound Carrier Freq. Mc.	Receiver R-F Osc. Freq. Mc.
2	55.25	59.75	101
3	61.25	65.75	107
4	67.25	71.75	113
5	77.25	81.75	123
6	83.25	87.75	129
7	175.25	179.75	221
8	181.25	185.75	227
9	187.25	191.75	233
10	193.25	197.75	239
11	199.25	203.75	245
12	205.25	209.75	251
13	211.25	215.75	257

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

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

Electronic Voltmeter of Junior or Senior "VoltOhmyst" type and a high voltage multiplier probe for use with this meter to permit measurements up to 20 kv.

CAUTION: Do not short the kinescope second anode lead. Its short circuit current presents a considerable overload on the high voltage rectifier V119.

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

(1) Ant. Matching Unit
(2) R-F Unit
(3) Ratio Detector
(4) Sound I-F Trans.
(5) Sound Take-Off Trans.
(6) Picture I-F Traps
(7) Picture I-F Trans.
(8) Sweep Alignment of I-F
(9) Horizontal Oscillator
(10) Sensitivity Check

ANTENNA MATCHING UNIT ALIGNMENT.—The antenna matching unit is accurately aligned at the factory. Adjustment of this unit should not be attempted in the customer's home since even slight misalignment may cause serious attenuation of the signal especially on channel 2. The r-f unit is aligned with a particular antenna matching transformer in place. If for any reason, a new antenna matching transformer is installed, the r-f unit should be realigned.

The F-M Trap which is mounted in the antenna matching unit may be adjusted without adversely affecting the alignment of the unit.

To align the antenna matching unit disconnect the lead from the FM trap L58 to the channel selector switch S5.

With a short jumper, connect the output of the matching unit through a 1000 mmf. capacitor to the grid of the second pix i-f amplifier, pin 1 of V107.

Replace the cover on the matching unit while making all adjustments.

Remove the first pix i-f amplifier tube V106.

Connect the positive terminal of a bias box to the chassis and the potentiometer arm to the junction of R143 and R144. Set the potentiometer to produce approximately −6.0 volts of bias at the test point TP101.

Connect an oscilloscope to the video test point TP102 and set the oscilloscope gain to maximum.

Connect a signal generator to the antenna input terminals. Modulate the signal generator 30% with an audio signal.

Tune the signal generator to 45.75 mc. and adjust the generator output to give an indication on the oscilloscope. Adjust L59 in the antenna matching unit for minimum audio indication on the oscilloscope.

Tune the signal generator to 41.25 mc. and adjust L60 for minimum audio indication on the oscilloscope.

Remove the jumper from the output of the matching unit.

Connect a 300 ohm ½ watt composition resistor from L58 to ground, keeping the leads as short as possible.

Connect an oscilloscope low capacity crystal probe from L58 to ground. The sensitivity of the oscilloscope should be approximately 0.03 volts per inch. Set the oscilloscope gain to maximum.

Connect the r-f sweep generator to the matching unit antenna input terminals. In order to prevent coupling reactance from the sweep generator into the matching unit, it is advisable to employ a resistance pad at the matching unit terminals. Figure 11 shows three different resistance pads for use with sweep generators with 50 ohm co-ax output, 72 ohm co-ax output or 300 ohm balanced output. Choose the pad to match the output impedance of the particular sweep employed.

Connect the signal generator loosely to the matching unit antenna terminals.

Set the sweep generator to sweep from 45 mc. to 54 mc. With RCA type WR59A sweep generators, this may be accomplished by retuning channel number 1 to cover this range. With WR59B sweep generators this may be accomplished by retuning channel number 2 to cover the range. In making these adjustments on the generator, be sure not to turn the core too far clockwise so that it becomes lost beyond the core retaining spring.

Adjust L61 and L62 to obtain the response shown in figure 12. L61 is most effective in locating the position of the shoulder of the curve at 52 mc. and L62 should be adjusted to give maximum amplitude at 53 mc. and above consistent with the specified shape of the response curve. The adjustments in the matching unit interact to some extent. Repeat the above procedure until no further adjustments are necessary.

Remove the 300 ohm resistor and crystal probe connections. Restore the connection between L58 and S5. Replace V106.

R-F UNIT ALIGNMENT.—An r-f unit which is operative and requires only touch up adjustments, requires no presetting of adjustments. For such units, skip the remainder of this paragraph. For units which are completely out of adjustment, preset all adjustments to the approximate center of their range with the following exceptions: Set C18 so that the screw head is approximately three-eighths of an inch above chassis. Set the T1 core for maximum inductance (core turned counter-clockwise). Set C11 near maximum capacity (one-quarter turn from tight). Do not change any of the adjustments in the antenna matching unit.

Disconnect the link from terminals "A" and "B" of T104 and terminate the link with a 39 ohm composition resistor.

The r-f unit is aligned with zero AGC bias. To insure that the bias will remain constant, take a clip lead and short circuit the r-f unit power terminal board terminal 3 to ground.

Connect the oscilloscope to the test point TP1 on top of the r-f unit. Set the oscilloscope gain to maximum.

Turn the receiver channel selector switch to channel 2.

Connect the output of the signal generator to the grid of the r-f amplifier, V2. To do this, remove the tube from the socket and fashion a clip by twisting one end of a small piece of wire around pin number 7. Replace the tube in the socket leaving the end of the wire protruding from under the tube. Connect the signal generator to this wire through a 1,500 mmf capacitor.

Tune the signal generator to 43.5 mc. and modulate it 30% with a 400 cycle sine wave. Adjust the signal generator for maximum output.

Adjust L65 on top of the r-f unit for minimum 400 cycle indication on the oscilloscope. If necessary, this adjustment can be retouched in the field to provide additional rejection to one specific frequency in the i-f band pass. However, in such cases, care should be taken not to adjust it so as to reduce sensitivity on channel 2.

Remove the wire clip from pin 7 of V2 and replace the tube and tube shield.

Set the channel selector switch to channel 8.

Turn the fine tuning control 30 degrees clockwise from the center of its mechanical range now and at all times when adjusting the oscillator frequency.

Adjust C1 for proper oscillator frequency, 227 mc. This may be done in several ways. The easiest way and the way which will be recommended in this procedure will be to use the signal generator as a heterodyne frequency meter and beat the oscillator against the signal generator. To do this, tune the signal generator to 227 mc. with crystal accuracy. Insert one end of a piece of insulated wire into the r-f unit through the hole provided for the adjustment for C11. Be careful that the wire does not touch any of the tuned circuits as it may cause the frequency of the r-f unit oscillator to shift. Connect the other end of the wire to the "r-f in" terminal of the signal generator. Adjust C1 to obtain an audio beat with the signal generator.

Connect the sweep generator through a suitable attenuator as shown in Figure 11 to the input terminals of the antenna matching unit.

Connect the signal generator loosely to the antenna terminals.

Set the sweep oscillator to cover channel 8.

Set the oscilloscope to maximum gain and use the minimum input signal which will produce a useable pattern on the oscilloscope. Excessive input can change oscillator injection during alignment and produce consequent misalignment even though the response as seen on the oscilloscope may look normal.

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

Adjust C9, C11, C15 and C18 for approximately correct curve shape, frequency, and band width as shown in Figure 13.

The correct adjustment of C18 is indicated by maximum amplitude of the curve midway between the markers. C15 tunes the r-f amplifier plate circuit and affects the frequency of the pass band most noticeably. C9 tunes the mixer grid circuit and affects the tilt of the curve most noticeably (assuming that C18 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 signal generator to the channel 6 oscillator frequency 129 mc.

Turn the fine tuning control 30 degrees clockwise from the center of its mechanical range.

Adjust L5 for an audible beat with the signal generator as before.

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 L48, L50 and L53 for proper response as shown in Figure 13.

L50 tunes the r-f amplifier plate circuit and primarily affects the frequency of the pass band. L53 tunes the r-f amplifier grid and is adjusted to give maximum amplitude of the curve between the markers. L48 affects the tilt of the curve but not quite the same as C9 adjustment. When the circuits are correctly adjusted and L48 is rocked on either side of its proper setting, the high frequency (sound carrier) end of the curve appears to remain nearly fixed in amplitude while the picture carrier end tilts above or below this point.

Turn off the sweep and signal generators.

Connect the "VoltOhmyst" to the r-f unit test point TP1.

Adjust the oscillator injection trimmer C8 for –3.5 volts or at maximum if –3.5 volts cannot be reached. This voltage should fall between –2.5 and –5.5 volts on all channels when the alignment of all circuits is completed.

Turn the sweep oscillator and signal generator back on and recheck channel 6 response. Readjust L48, L50 and L53 if necessary.

Set the receiver channel selector switch to channel 8 and readjust C1 for proper oscillator frequency, 227 mc.

Set the sweep oscillator and signal generator to channel 8.

Readjust C9, C11, C15 and C18 for correct curve shape, frequency and band width.

Turn off the sweep and signal generators, switch back to channel 6 and check the oscillator injection voltage at TP1 if C9 was adjusted in the recheck of channel 8 response.

If the initial setting of oscillator injection trimmer C8 was far off, it may be necessary to adjust the oscillator frequency and response on channel 8, adjust the oscillator injection on channel 6 and repeat the procedure several times before the proper setting is obtained.

Turn off the sweep generator and switch the receiver to channel 13.

Adjust the signal generator to the channel 13 oscillator frequency 257 mc.

Set the fine tuning control 30 degrees clockwise from the center of its mechanical range.

Adjust L46 to obtain an audible beat. Slightly overshoot the adjustment of L46 by turning the slug a little more in the same direction from the original setting, then reset the oscillator to proper frequency by adjusting C1 to again obtain the beat.

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 13 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, C15 and C18 as necessary.

Turn off the sweep generator and check the channel 8 oscillator frequency. If C1 has to be readjusted for channel 8, the principle of overshooting the adjustment and then correcting by adjusting L46 should be followed in order to establish the L/C ratio for the desired oscillator tracking.

Turn the receiver channel selector switch to channel 6. Adjust L5 for correct oscillator frequency, 129 mc.

Turn the sweep oscillator on and to channel 6 and observe the response curve. If necessary readjust L48, L50 and L53.

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

If excessive tilt in the same direction occurs on channels 2, 3 and 4, adjust C18 on channel 2 to overshoot the correction of this tilt, then switch to channel 6 and adjust L53 for maximum amplitude of curve between markers. This adjustment should produce "flat" response on the low channels if the other adjustments especially L48 are correct.

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 heterodyne freq. meter to each channel and adjusting the appropriate oscillator trimmer to obtain the audible beat. 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. When employing WR39 calibrators to adjust the receiver oscillator, tune the calibrator to one half the receiver oscillator frequency on channels 4, 5 and 6 and to one fourth the receiver oscillator frequency on channels 11, 12 and 13.

ALIGNMENT PROCEDURE

Channel Number	Picture Carrier Freq. Mc.	Sound Carrier Freq. Mc.	Receiver R-F Osc. Freq. Mc.	Channel Oscillator Adjustment
2	55.25	59.75	101	L1
3	61.25	65.75	107	L2
4	67.25	71.75	113	L3
5	77.25	81.75	123	L4
6	83.25	87.75	129	L5
7	175.25	179.75	221	L6
8	181.25	185.75	227	L7
9	187.25	191.75	233	L8
10	193.25	197.75	239	L9
11	199.25	203.75	245	L10
12	205.25	209.75	251	L11
13	211.25	215.75	257	C1

Remove the 39 ohm resistor from the link and reconnect the link to terminals "A" and "B" of T104.

RATIO DETECTOR ALIGNMENT.—In order to obtain good ratio detector alignment an AM modulated signal generator that is exceptionally free from FM modulation must be employed. Set the signal generator at 4.5 mc. and connect it to the second sound i-f grid, pin 1 of V102. Set the generator for 30% 400 cycle modulation.

As an alternate source of signal, the RCA WR39B or WR39C calibrator may be employed. If used, connect its output cable to the grid of the 4th pix i-f amplifier, pin 1 of V109. Set the frequency of the calibrator to 45.75 (pix carrier) and modulate with 4.5 mc. crystal. Also turn on the internal AM audio modulation. The 4.5 mc. signal will be picked off at T110A and amplified through the sound i-f amplifier.

Connect the "VoltOhmyst" to the junction of R110 and R114.

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

Set the trimmer C226 (on the bottom of the V103 socket) for minimum capacity.

Tune the ratio detector primary, T102 top core for maximum DC output on the "VoltOhmyst." Adjust the signal level from the signal generator for 10 volts on the "VoltOhmyst" when finally peaked. This is approximately the operating level of the ratio detector for average signals.

Connect the "VoltOhmyst" to the junction of R112 and C113.

Adjust the T102 bottom core for zero d-c on the meter. Then, turn the core to the nearest minimum AM output on the oscilloscope.

Repeat adjustments of T102 top for maximum DC and T102 bottom for minimum output on the oscilloscope making final adjustment with the 4.5 mc. input level adjusted to produce 10 volts d-c on the "VoltOhmyst" at the junction of R110 and R114.

Connect the "VoltOhmyst" to the junction of R112 and C113 and note the amount of d-c present. If this voltage exceeds ±1.5 volts, adjust C226 by turning the core in until zero d-c is obtained. Readjust the T102 bottom core for minimum output on the oscilloscope. Repeat the adjustments of C226 and T102 bottom core until the voltage at R112 and C113 is less than ±1.5 volts when T102 bottom core is set for minimum indication on the oscilloscope.

Connect the "VoltOhmyst" to the junction of R110 and R114 and repeat the T102 top core for maximum d-c on the meter and again reset the generator output so that the meter reads minus 10 volts.

Repeat the adjustments in the above two paragraphs until the voltage at R112 and C113 is less than ±1.5 volts when the T102 top core is set for maximum d-c at the junction of R110 and R114 and the T102 bottom core is set for minimum indication on the oscilloscope.

SOUND I-F ALIGNMENT. — Connect the sweep generator to the first sound i-f amplifier grid, pin 1 of V101. Adjust the generator for a sweep width of 1 mc. at a center frequency of 4.5 mc.

Insert a 4.5 mc. marker signal from the signal generator into the first sound i-f grid. With the WR39B or WR39C calibrators the 4.5 mc. crystal signal may be obtained at the R-F out terminal by turning the variable osc. switch off, the calibrate switch to 4.5 mc. and the volume control with mod. off.

Connect the oscilloscope in series with a 10,000 ohm resistor to terminal A of T101.

Adjust T101 top and bottom cores for maximum gain and symmetry about the 4.5 mc. marker on the i-f response. The pattern obtained should be similar to that shown in Figure 14.

The output level from the sweep should be set to produce approximately 2.0 volt peak-to-peak at terminal A of T101 when the final touches on the above adjustment are made. It is necessary that the sweep output voltage should not exceed the specified values otherwise the response curve will be broadened, permitting slight misadjustment to pass unnoticed and possibly causing distortion on weak signals.

Connect the oscilloscope to the junction of R112 and C113 and check the linearity of the response. The pattern obtained should be similar to that shown in Figure 15.

SOUND TAKE-OFF ALIGNMENT.—Connect the 4.5 mc. generator in series with a 1000 ohm resistor to terminal "C" of T110. The input signal should be approximately 0.5 volts.

Short the fourth pix i-f grid to ground, pin 1 V109, to prevent noise from masking the output indication.

As an alternate source of signal the RCA WR39B or WR39C calibrator may be used. In such a case, disregard the above two paragraphs. Connect calibrator across link circuit, T104 A, B, and modulate 45.75 carrier with 4.5 mc. crystal.

Connect the crystal diode probe of a "VoltOhmyst" to the plate of the video amplifier, pin 8 of V110.

Adjust the core of T110 for minimum output on the meter.

Remove the short from pin 1 V109 to ground, if used.

PICTURE I-F TRAP ADJUSTMENT.—Connect the i-f signal generator across the link circuit on terminals A and B of T104.

Connect the "VoltOhmyst" to test point TP101.

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 R143 and R144.

Set the bias pot to produce approximately –1.0 volt of bias at test point TP101.

Connect the "VoltOhmyst" to test point TP102 at the picture detector.

Set the signal generator to each of the following frequencies and adjust the corresponding circuit for minimum d-c output at TP102. Use sufficient signal input to produce 1.0 volt of d-c on the meter when the final adjustment is made.

39.25 mc.	T104 top core
41.25 mc.	T105 bottom core
47.25 mc.	T106 bottom core

PICTURE I-F TRANSFORMER ADJUSTMENTS.—Set the signal generator to each of the following frequencies and peak the specified adjustment for maximum indication on the "VoltOhmyst." During alignment, reduce the input signal if necessary in order to produce 1.0 volt of d-c at test point TP102 with –1.0 volt of i-f bias at test point TP101.

43.7 mc.	T109
45.5 mc.	T108
41.8 mc.	T107

To align T105 and T106, connect the sweep generator to the first picture i-f grid, pin 1 of V106 through a 1000 mmf. ceramic capacitor. Shunt R141, R149 and terminals "A" and "F" of T109 with 330 ohm composition resistors. Set the i-f bias to –1.0 volt at test terminal TP101. Connect the oscilloscope to test point TP102.

Adjust T105 and T106 top cores for maximum gain and curve shape as shown in Figure 16. For final adjustments set the output of the sweep generator to produce 0.5 volts peak-to-peak at the oscilloscope terminals.

To align T1 and T104, connect the sweep generator to the mixer grid test point TP2. Use the shortest leads possible, with not more than one inch of unshielded lead at the end of the sweep cable.

Set the channel selector switch to channel 4.

Connect a 180 ohm composition resistor from terminal B of T105 to the junction of R135 and C132. Connect the oscilloscope diode probe to terminal B of T105 and to ground.

Couple the signal generator loosely to the diode probe in order to obtain markers.

In some receivers, C221 is variable and is provided as a bandwidth adjustment. Preset C221 to minimum capacity.

Adjust T1 (top) and T104 (bottom) for maximum gain at 43.5 mc. and with 45.75 mc. at 70% of maximum response.

Adjust C221 until 41.25 mc. is at 80% response with respect to the low frequency shoulder at approximately 41.9 mc. as shown in Figure 16.

In receivers in which C221 is fixed, adjust T1 (top) and T104 (bottom) for maximum gain and the response shown in Figure 17.

Disconnect the diode probe, the 180 ohm and three 330 ohm resistors.

SWEEP ALIGNMENT OF PIX I-F.—Connect the oscilloscope to the test point TP102.

Adjust the bias potentiometer to obtain –6.0 volts of bias as measured by a "VoltOhmyst" at test point TP101.

Leave the sweep generator connected to the mixer grid test point TP2 with the shortest leads possible and with not more than one inch of unshielded lead at the end of the sweep cable. If these precautions are not observed, the receiver may be unstable and the response curves obtained may be unreliable.

Adjust the output of the sweep generator to obtain 3.0 volts peak-to-peak on the oscilloscope.

Couple the signal generator loosely to the grid of the first pix i-f amplifier. Adjust the output of the signal generator to produce small markers on the response curve.

Retouch T108 and T109 to obtain the response shown in Figure 18. Do not adjust T107 unless absolutely necessary. If T107 is adjusted too low in frequency it will raise the level of the 41.25 mc. sound i-f carrier and may create interference in the picture. It will also cause poor adjacent channel picture rejection. If T107 is tuned too high in frequency, the level of the 41.25 mc. sound i-f carrier will be too low and may produce noisy sound in weak signal areas.

Remove the oscilloscope, sweep and signal generator connections.

Remove the bias box employed to provide bias for alignment.

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 may require 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.—Tune in a station and sync the picture. If the picture cannot be synchronized with the horizontal hold control R201B, then adjust the T113 frequency core on the rear apron until the picture will synchronize. If the picture still will not sync, turn the T113 waveform adjustment core (under the chassis) out of the coil several turns from its original position and readjust the T113 frequency core until the picture is synchronized.

Examine the width and linearity of the picture. If picture width or linearity is incorrect, adjust the horizontal drive control C181B, the width control L106 and the linearity control L107 until the picture is correct.

Horizontal Oscillator Waveform Adjustment. — The horizontal oscillator waveform may be adjusted by either of two methods. The method outlined in paragraph A below may be employed in the field when an oscilloscope is not available. The service shop method outlined in paragraph B below requires the use of an oscilloscope.

A.—Turn the horizontal hold control completely clockwise. Place adjustment tools on both cores of T113 and be prepared to make simultaneous adjustments while watching the picture on the screen. First, turn the T113 frequency core (on the rear apron) until the picture falls out of sync and one diagonal black bar sloping down to the right appears on the screen. Then, turn the waveform adjustment core (under the chassis) into the coil while at the same time adjusting the frequency core so as to maintain one diagonal black bar on the screen. Continue this procedure until the oscillator begins to motorboat, then turn the wavefrom adjustment core out until the motorboating just stops. As a check, turn the T113 frequency core until the picture is synchronized then reverse the direction of rotation of the core until the picture begins to fall out of sync with the diagonal bar sloping down to the right. Continue to turn the frequency core in the same direction. Additional bars should not appear on the screen. Instead, the horizontal oscillator should begin to motorboat. Retouch the adjustment of the T113 waveform adjustment core if necessary until this condition is obtained.

B.—Connect the low capacity probe of an oscilloscope to terminal C of T113. 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 19. Adjust the waveform adjustment core of T113 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.

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 T113 frequency 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 3 bars are present just before the picture pulls into sync, adjust the horizontal locking range trimmer C181A slightly clockwise. If less than 2 bars are present, adjust C181A 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 or 3 bars are present.

Turn the horizontal hold control to the maximum clockwise position. Adjust the T113 frequency core so that the diagonal bar sloping down to the right appears on the screen and then reverse the direction of adjustment so that bar just moves off the screen leaving the picture in synchronization.

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.

RESPONSE CURVES.—The response curves shown on page 14 are typical though 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 sweep generator.

NOTES ON R-F UNIT ALIGNMENT.—Because of the frequency spectrum involved many of the r-f unit leads 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 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 attention should be paid to insure that unwanted resonances do not exist which might present a faulty representation of 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 structure of the shield box. This resonance is controlled by using insulating washers of proper thickness in the front plate to tuner chassis mounting. Obviously, if the r-f unit is removed for service, the washers should be replaced in the correct order.

ALIGNMENT TABLE

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

Step No.	CONNECT SIGNAL GENERATOR TO	SIGNAL GEN. FREQ. MC.	CONNECT SWEEP GENERATOR TO	SWEEP GEN. FREQ. MC.	CONNECT HETERODYNE FREQ. METER TO	HET. METER FREQ. MC.	CONNECT OSCILLOSCOPE TO	MISCELLANEOUS CONNECTIONS AND INSTRUCTIONS	ADJUST	REFER TO
	ANTENNA MATCHING UNIT ALIGNMENT									
1	Do not adjust this unit unless fairly certain that it requires adjustment. Disconnect lead from L58 to S5. Connect the output of the matching unit through 1000 mmf. to pin 1 of V107. Replace cover on the matching unit. Remove V106 from its socket. Connect a bias box to the junction of R143 and R144 and set it to produce -6 volts at TP 101.									
2	Antenna terminals	45.75 mc. 30% mod.	Not used	—	Not used	—	TP102. Scope gain to max.	—	L59 for min. audio on scope	Fig. 7
3	"	41.25 mc. 30% mod.	"	—	"	—	"	—	L60 for min. audio on scope	Fig. 7
4	Antenna terminals loosely		Antenna terminals through pad	45 to 54 mc.	"	—	Scope xtal probe to L58	Remove 1000 mmf. Connect 300 ohms from L58 to gnd.	L61 and L62 to obtain response of Fig. 12	Fig. 7 Fig. 11 Fig. 12
	R-F UNIT ALIGNMENT									
5	If unit is completely out of adjustment, preset all adjustments to center of range with following exceptions. Set C18 so that head is 3/8" above chassis. Set T1 max. counterclockwise. Set C11 1/4 turn from max. clockwise. Disconnect link from T104 and terminate with 39 ohms. Short r-f unit power terminal 3 to ground. Set fine tuning 30 degrees clockwise from mechanical center of its range for all oscillator adjustments.									
6	Grid, pin 7 of V2 through 1500 mmf.	43.5 mc. 30% mod. 400 cy.	Not used	—	Not used	—	TP1. Gain to maximum	Set r-f unit on channel 2	L65 for min. indication on scope	Fig. 7 Fig. 10
7	Not used	—	Not used	—	Loosely to r-f unit oscillator	227 mc.	Not used	R-F unit on channel 8	C1 for beat on het. freq. meter	Fig. 7
8	Antenna terminals loosely	181.25 and 185.75	Antenna terminals through pad	Channel 8	Not used	—	TP1. Gain to maximum	Use min. signal which will give useable pattern	C9, C11, C15 and C18 for response shown in Fig. 13	Fig. 7 Fig. 13
9	Not used	—	Not used	—	Loosely to r-f unit oscillator	129 mc.	Not used	R-F unit on channel 6	L5 for beat on het. freq. meter	Fig. 8
10	Antenna terminals loosely	83.25 and 87.75	Antenna terminals through pad	Channel 6	Not used	—	TP1. Gain to maximum	"	L48, L50 and L53 for response shown in Fig. 13	Fig. 7 Fig. 13
11	Not used	—	Not used	—	Not used	—	Not used	Rec. on channel 6. Connect "Volt-Ohmyst" to TP1	C8 for -3.5 volts on meter	Fig. 7
12	Antenna terminals loosely	83.25 and 87.75	Antenna terminals through pad	Channel 6	Not used	—	TP1. Gain to maximum	R-F unit on channel 6	Check response readjust L48, L50 and L53 if necessary	Fig. 7 Fig. 13
13	Not used	—	Not used	—	Loosely to r-f unit oscillator	227 mc.	Not used	R-F unit on channel 8	C1 for beat on het. freq. meter	Fig. 7
14	Antenna terminals loosely	181.25 and 185.75	Antenna terminals through pad	Channel 8	Not used	—	TP1. Gain to maximum	"	Check response adjust C9, C11, C15 and C18 if necessary	Fig. 7
15	If C9 was readjusted in step 14, repeat step 11, step 13 and step 14 until the conditions specified in each step are fulfilled without additional adjustments.									
16	Not used	—	Not used	—	Loosely to r-f unit oscillator	257 mc.	Not used	Rec. on channel 13	L46 for beat on het. freq. meter. Overshoot L46 slightly and adjust C1 for beat	Fig. 7
17	Antenna terminals loosely	211.25 215.75	Antenna terminals through pad	Channel 13	Not used	—	TP1. Gain to maximum	Rec. on channel 13 "VoltOhmyst" on TP1	Check to see that response is correct and -3.0 volts of osc. injection is present	Fig. 13
18	"	205.25 209.75	"	Channel 12	Not used	—	"	Rec. on channel 12	"	Fig. 13
19	"	199.25 203.75	"	Channel 11	"	—	"	Rec. on channel 11	"	Fig. 13
20	"	193.25 197.75	"	Channel 10	"	—	"	Rec. on channel 10	"	Fig. 13
21	"	187.25 191.75	"	Channel 9	"	—	"	Rec. on channel 9	"	Fig. 13
22	"	181.25 185.75	"	Channel 8	"	—	"	Rec. on channel 8	"	Fig. 13
23	"	175.25 179.75	"	Channel 7	"	—	"	Rec. on channel 7	"	Fig. 13
24	If the response of any channel (steps 17 through 23) is below 80% at either marker, adjust C9, C11, C15 and C18 as necessary to pull response up on the low channel yet maintain correct response on channel 8.									
25	Repeat step 13. If the oscillator is off frequency overshoot the adjustment of C1 and correct by adjusting L46.									
26	Repeat steps 16 through 25 until all adjustments are obtained.									
27	Not used	—	Not used	—	Loosely to r-f unit oscillator	129 mc.	Not used	Rec. on channel 6	L5 for beat on het. freq. meter	Fig. 7
28	Antenna terminals loosely	83.25 87.75	Antenna terminals through pad	Channel 6	Not used	—	TP1. Gain to maximum	Rec. on channel 6 "VoltOhmyst" on TP1	Check to see that response is correct and -3.0 volts of osc. injection is present	Fig. 7 Fig. 13
29	"	77.25 81.75	"	Channel 5	"	—	"	Rec. on channel 5	"	Fig. 13
30	"	67.25 71.75	"	Channel 4	"	—	"	Rec. on channel 4	"	Fig. 13
31	"	61.25 65.75	"	Channel 3	"	—	"	Rec. on channel 3	"	Fig. 13

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 OSCILLOSCOPE TO	MISCELLANEOUS CONNECTIONS AND INSTRUCTIONS	ADJUST	REFER TO
32	"	55.25 59.75	"	Channel 2	"	—	"	Rec. on channel 2	"	Fig. 13
33	If excessive tilt in the same direction occurs on channels 2, 3 and 4, adjust C18 on channel 2 to overshoot the correction of this tilt then switch to channel 6 and adjust L53 for max. amplitude of response between carrier markers.									
34	Check r-f response and oscillator injection on channels 7 through 13 steps 23 back up through step 17 stopping on channel 13 for the next step.									
35	Not used	—	Not used	—	Loosely coupled to r-f oscillator	257 mc.	TP1. Gain to maximum	Rec. on channel 13	C1 for beat on het. freq. meter	Fig. 7
36	"	—	"	—	"	251 mc.	"	Rec. on channel 12	L11 as above	Fig. 7
37	"	—	"	—	"	245 mc.	"	Rec. on channel 11	L10 as above	Fig. 7
38	"	—	"	—	"	239 mc.	"	Rec. on channel 10	L9 as above	Fig. 7
39	"	—	"	—	"	233 mc.	"	Rec. on channel 9	L8 as above	Fig. 7
40	"	—	"	—	"	227 mc.	"	Rec. on channel 8	L7 as above	Fig. 7
41	"	—	"	—	"	221 mc.	"	Rec. on channel 7	L6 as above	Fig. 7
42	"	—	"	—	"	129 mc.	"	Rec. on channel 6	L5 as above	Fig. 7
43	"	—	"	—	"	123 mc.	"	Rec. on channel 5	L4 as above	Fig. 7
44	"	—	"	—	"	113 mc.	"	Rec. on channel 4	L3 as above	Fig. 7
45	"	—	"	—	"	107 mc.	"	Rec. on channel 3	L2 as above	Fig. 7
46	"	—	"	—	"	101 mc.	"	Rec. on channel 2	L1 as above	Fig. 7
47	Repeat steps 35 through 46 as a check. On completion, remove 39 ohm resistor and reconnect link to terminals A and B of T104.									
	RATIO DETECTOR, SOUND I-F AND SOUND TAKE-OFF ALIGNMENT									
48	Grid 2nd Snd. I-F (pin 1, V102) or WR39B or C connect to grid 4th pix I-F (pin 1, V109)	4.5 mc. 400 cy. mod. or 45.75 mc. mod. by 4.5 mc. and 400 cy.	Not used	—	Not used	—	Across speaker voice coil. Volume control set for max. volume.	"VoltOhmyst" to junction of R110 and R114. Set C226 for min. capacity. Set signal gen. to give −10 V on meter.	T102 top core for max. d-c on meter. Connect "VoltOhmyst" to junction R112 and C113. Adjust T102 bottom core for zero d-c on meter then to nearest audio min. on the oscilloscope.	Fig. 9 Fig. 10
49	"	"	"	—	"	—	"	"VoltOhmyst" to junction R112 and C113. If the meter reads more than ±1.5 volts, adjust C226 for zero on the meter and readjust T102 (bot.) for min. output on scope. Repeat steps 48 and 49 until all conditions are satisfied.		Fig. 9 Fig. 10
50	Sig. Gen. to 1st Snd. I-F	4.5 mc.	1st Sound I-F grid (pin 1, V101)	4.5 mc.	"	—	In series with 10,000 ohms to terminal A, of T101.	Sweep output reduced to provide 2 v p-p on scope.	T101 top and bot. cores for max. gain and symmetry at 4.5 mc.	Fig. 9 Fig. 10 Fig. 14
51	"	"	"	"	"	—	Junction of R112 and C113	Check for symmetrical response waveform (positive and negative).		Fig. 15
52	Sig. Gen. in series with 1000 ohms to T110-C or WR39 across T104 A and B	"	Not used	—	"	—		"VoltOhmyst" xtal probe to pin 8, V110. If sig. gen. is used short pin 1, V109 to ground.	Adjust T110 for minimum reading on "VoltOhmyst"	Fig. 9
	PICTURE I-F AND TRAP ADJUSTMENT									
53	Not used	—	Not used	—	Not used	—	Not used	Connect bias box to junction of R143 and R144 and to gnd. Adjust to give −1.0 v on "VoltOhmyst" at TP101.		
54	Sig. Gen. across T104 A and B	39.25 mc.	"	—	"	—	"	"VoltOhmyst" to TP102. Gen. output to give −1.0 volt d-c.	T104 top core to give min. d-c on meter.	Fig. 9
55	"	41.25 mc.	"	—	"	—	"	"	T105 bot. for min.	Fig. 10
56	"	47.25 mc.	"	—	"	—	"	"	T106 bot. for min.	Fig. 10
57	"	43.7 mc.	"	—	"	—	"	Sig. Gen. output to give −1.0 V d-c at TP102.	T109 for max.	Fig. 7
58	"	45.5 mc.	"	—	"	—	"	"	T108 for max.	Fig. 9
59	"	41.8 mc.	"	—	"	—	"	"	T107 for max.	Fig. 9
60	First pix i-f grid (pin 1, V106) loosely	Various See Fig. 16	First pix i-f grid pin 1, V106 through 1000 mmf.	40 to 48 mc.	"	—	To test point TP102	Shunt R141, R149 and terminals A and F of T109 with 330 ohms, 0.5 v p-p on scope.	Adjust T105 and T106 top cores for max. gain and response shown in Fig. 16.	Fig. 9 Fig. 16
61	Connected loosely to diode probe	Various See Fig. 17	Mixer grid test point TP2 with short lead	40 to 48 mc.	"	—	Scope diode probe to T105-B and to gnd.	Rec. on chan. 4. Connect 180 ohms from T105-B to junction R135 and C132. Upon completion disconnect scope and shunting resistors.	Set C221 to min. Adjust T1 top and T104 bot. for max. gain at 43.5 mc. and 45.75 mc. at 70%. Adjust C221 until 41.25 mc. is at 80%.	Fig. 9 Fig. 17
62	Connected loosely to grid of 1st pix i-f	Various See Fig. 18	"	"	"	—	Connect scope to TP102	"VoltOhmyst" to TP101. Set bias box for −6.0 volts at TP101. Set sweep output to produce 3.0 volts p-p on scope.	Retouch T108 and T109 to obtain response shown in Fig. 18. Do not adjust T107 unless absolutely necessary.	Fig. 18

ALIGNMENT DATA

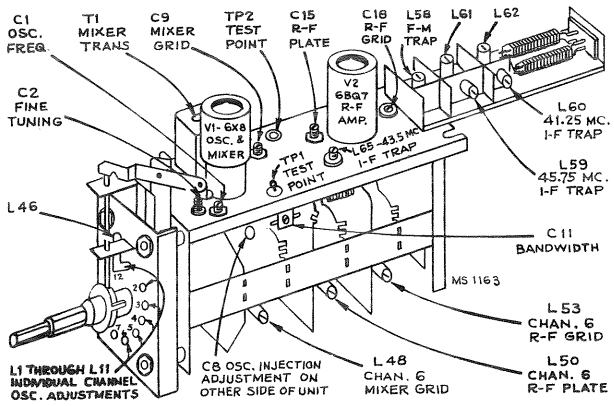


Figure 7—R-F Unit Adjustments

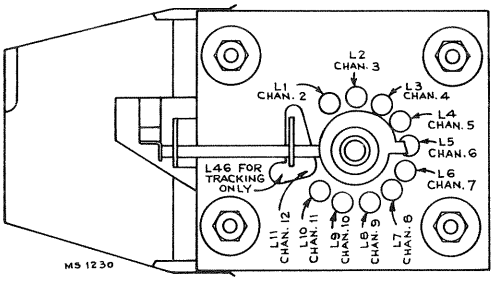


Figure 8—R-F Oscillator Adjustments

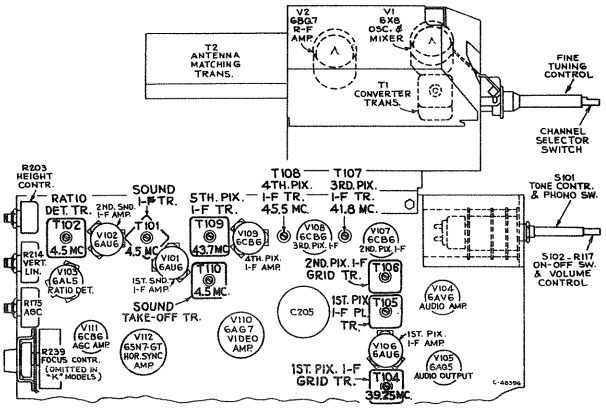


Figure 9—Top Chassis Adjustments

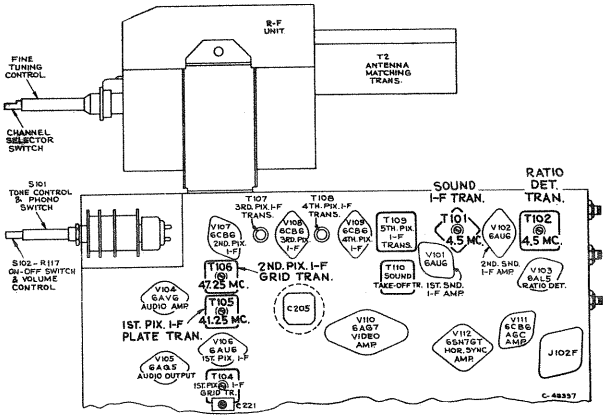


Figure 10—Bottom Chassis Adjustments

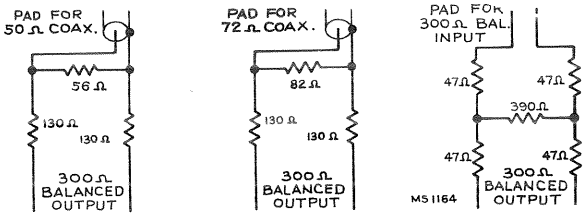


Figure 11—Sweep Attenuator Pads

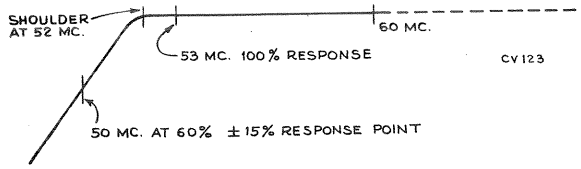


Figure 12—Antenna Matching Unit Response

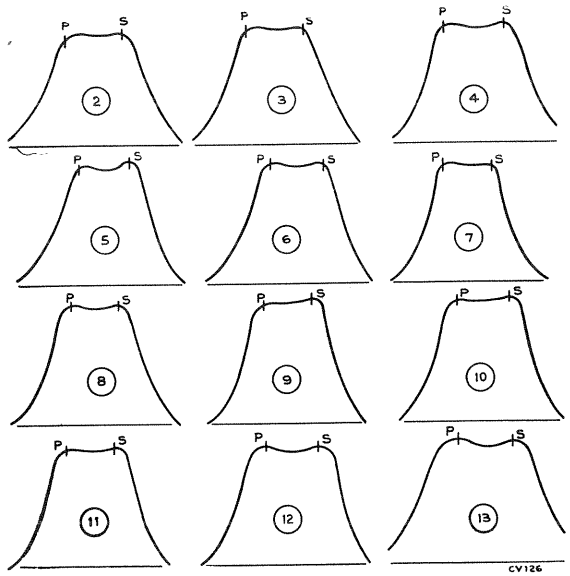


Figure 13—R-F Response

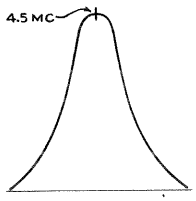


Figure 14 Sound I-F Response

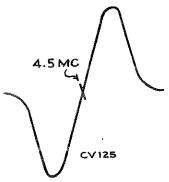


Figure 15 Ratio Det. Response

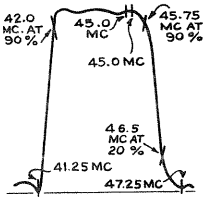


Figure 16 T105 and T106 Response

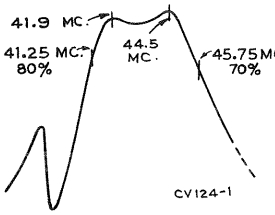


Figure 17 T1 and T104 Response

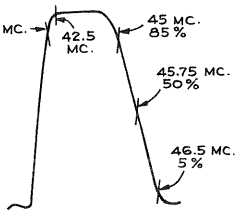


Figure 18 Over-all I-F Response

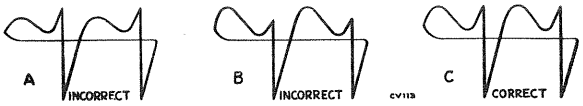


Figure 19—Horizontal Oscillator Wave Forms

TEST PATTERN PHOTOGRAPHS

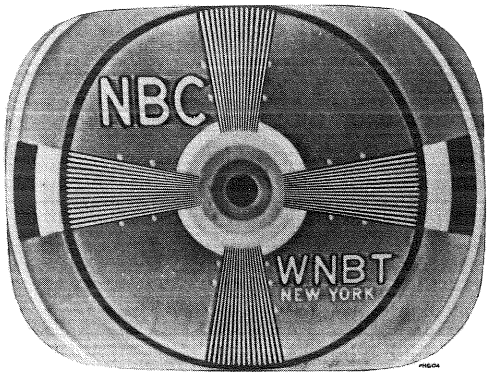


Figure 20—Normal Picture

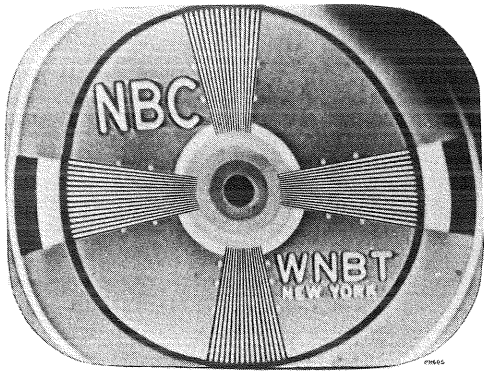


Figure 21—Focus Magnet and Ion Trap Magnet Misadjusted

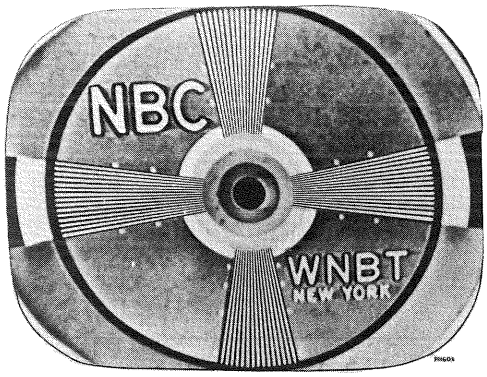


Figure 22—Horizontal Linearity Control Misadjusted (Picture Cramped in Middle)

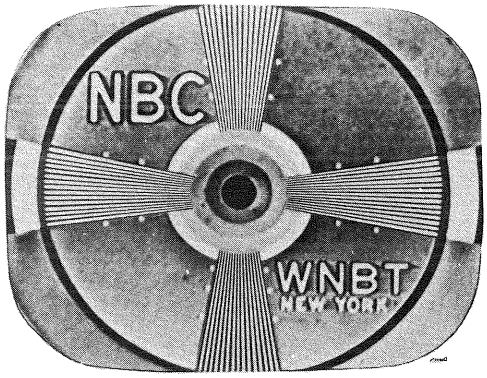


Figure 23—Width Control Misadjusted

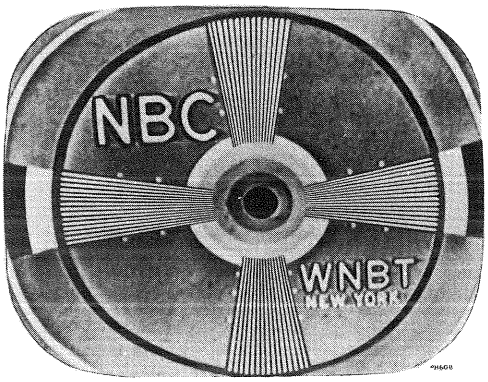


Figure 24—Horizontal Drive Control Misadjusted

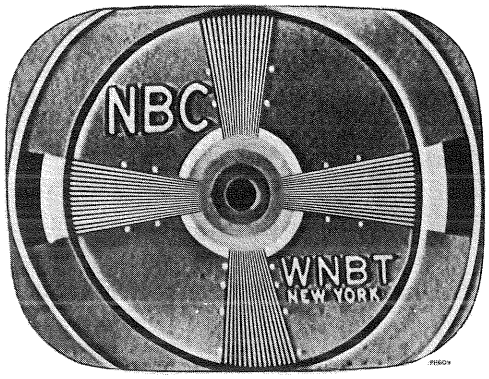


Figure 25—Transients

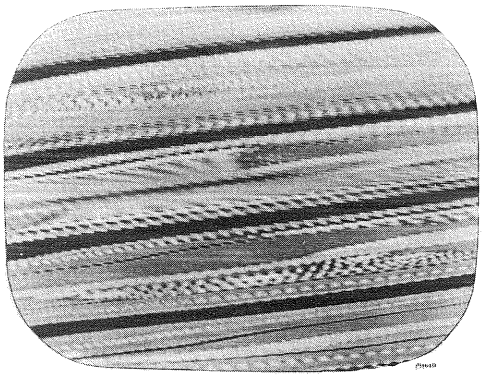


Figure 26—Test Pattern Showing Out of Sync Condition When Horizontal Hold Control is in a Counter-clockwise Position—Just Before Pulling Into Sync

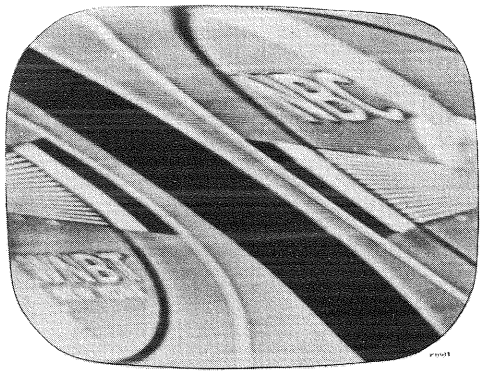


Figure 27—Test Pattern Showing Out of Sync Condition When Horizontal Hold Control Is at the Maximum Clockwise Position

SERVICE SUGGESTIONS

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) V116 or V117 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 T114 high voltage winding is open, the 1B3GT tube is defective, its filament circuit is open or C197 is shorted.

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

(5) Damper tube (V120) inoperative.

(6) Defective kinescope.

(7) R218 open.

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

NO VERTICAL DEFLECTION:

(1) V114B or V115 inoperative. Check voltage and waveforms on grids and plates.

(2) T111 open.

(3) Vertical deflection coils open.

SMALL RASTER:

(1) Low Plus B or low line voltage.

(2) V117 defective.

POOR VERTICAL LINEARITY:

(1) If adjustments cannot correct, change V115.

(2) Vertical output transformer T111 defective.

(3) V114B defective—check voltage and waveforms on grid and plate.

(4) C168, C170, C171, C172, C173 or C174 defective.

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

(6) If height is insufficient, try changing V114.

POOR HORIZONTAL LINEARITY:

(1) If adjustments do not correct, change V117, or V120.

(2) T114 or L107 defective.

(3) C195 or C196 defective.

WRINKLES ON SIDE OF RASTER:

(1) C199 defective.

(2) Defective yoke.

PICTURE OUT OF SYNC HORIZONTALLY:

(1) T113 incorrectly tuned.

(2) R226, R227 or R201B defective.

TRAPEZOIDAL OR NON SYMMETRICAL RASTER:

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

(2) Defective yoke.

RASTER AND SIGNAL ON KINESCOPE BUT NO SOUND:

(1) T110 defective.

(2) Sound i-f, ratio detector or audio amplifier inoperative—check V101, V102, V103 and their socket voltages.

(3) Audio system defective.

(4) Speaker defective.

SIGNAL AT KINESCOPE GRID BUT NO SYNC:

(1) AGC control R175 misadjusted.

(2) V111, inoperative. Check voltage and waveforms at its grid and plate.

SIGNAL ON KINESCOPE GRID BUT NO VERTICAL SYNC:

(1) Check V114B and associated circuit.

(2) Integrating network inoperative—Check.

(3) V113 or V114A defective or associated circuit defective.

(4) Gas current grid emission or grid cathode leakage in V114. Replace.

SIGNAL ON KINESCOPE GRID BUT NO HORIZONTAL SYNC:

(1) T113 misadjusted—readjust as instructed on page 11.

(2) V112 or V113 inoperative—check socket voltages and waveforms.

(3) T113 defective.

(4) C157, C181A, C182, C183, C184, C185, C186, C187 or C188 defective.

(5) If horizontal speed is completely off and cannot be adjusted check R226, R227, R201B, R229, R230 and R231.

SOUND AND RASTER BUT NO PICTURE OR SNYC:

(1) Picture, detector or video amplifier defective—check CR101 and V110—check socket voltages.

(2) Bad contact to kinescope cathode.

PICTURE STABLE BUT POOR RESOLUTION:

(1) CR101 or V110 defective.

(2) Peaking coils defective—check 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 R175 misadjusted.

(2) If regular sections at the left picture are displaced change V117.

SERVICE SUGGESTIONS

(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 V117.

LIGHT VERTICAL LINE ON LEFT OF PICTURE:

(1) C193 defective.

(2) V120 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:

For T107, T108 or T109, shunt all i-f transformers with a 330 ohm carbon resistor except the one whose response is to be observed.

Connect a wide band sweep generator to the second pix i-f grid and adjust it to sweep from 38 mc. to 48 mc.

Connect the oscilloscope to test point TP102 and observe the overall response. The response obtained will be essentially that of the unshunted stage.

To see the response of transformers T1, T104 and T105, T106, follow the instructions given on page 10.

Figures 28 through 36 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

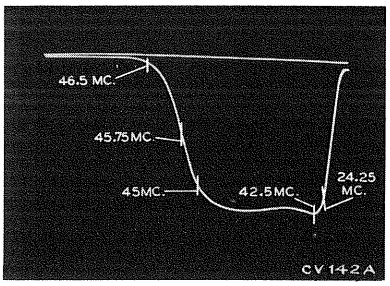


Figure 28—Overall Pix I-F Response

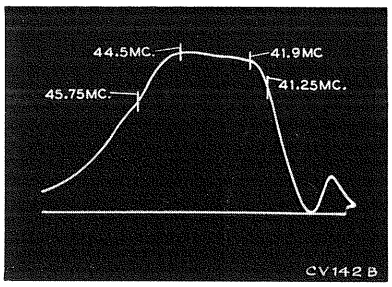


Figure 29—Response of T1-T104 Pix I-F Transformers

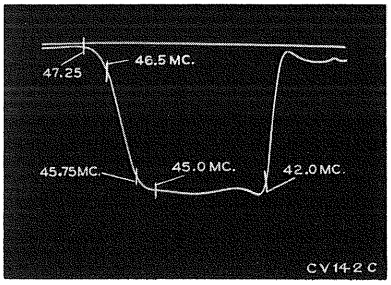


Figure 30—Response of T105-T106 Pix I-F Transformer

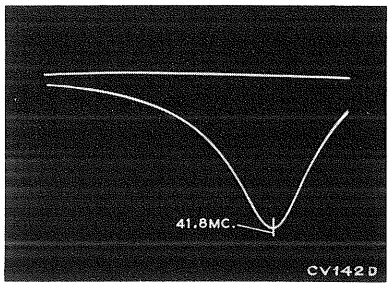


Figure 31—Response of T107 Pix I-F Transformer

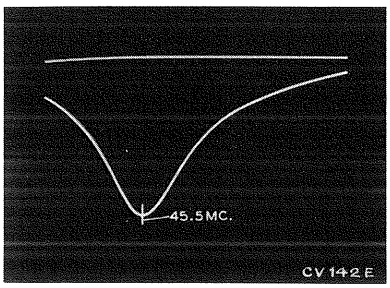


Figure 32—Response of T108 Pix I-F Coil

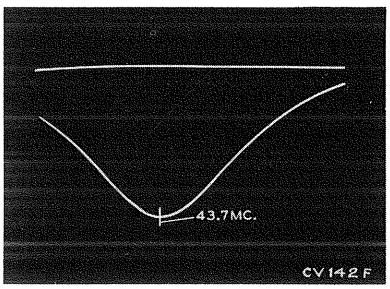


Figure 33—Response of T109 Pix I-F Coil

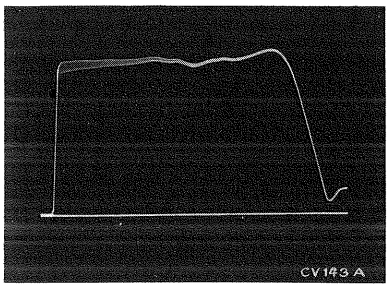


Figure 34—Video Response at Average Contrast

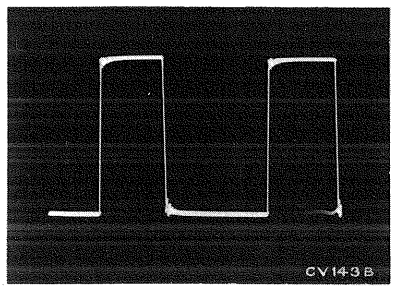


Figure 35—Video Response (100 KC Square Wave)

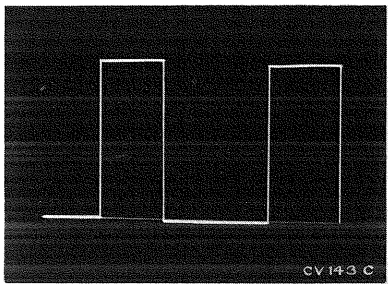


Figure 36—Video Response (60 Cycle Square Wave)

SERVICE SUGGESTIONS

(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 V117.

LIGHT VERTICAL LINE ON LEFT OF PICTURE:

(1) C193 defective.

(2) V120 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:

For T107, T108 or T109, shunt all i-f transformers with a 330 ohm carbon resistor except the one whose response is to be observed.

Connect a wide band sweep generator to the second pix i-f grid and adjust it to sweep from 38 mc. to 48 mc.

Connect the oscilloscope to test point TP102 and observe the overall response. The response obtained will be essentially that of the unshunted stage.

To see the response of transformers T1, T104 and T105, T106, follow the instructions given on page 10.

Figures 28 through 36 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

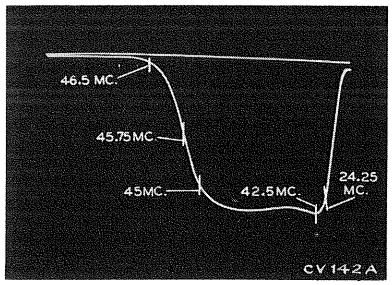


Figure 28—Overall Pix I-F Response

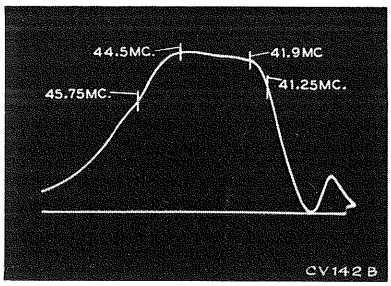


Figure 29—Response of T1-T104 Pix I-F Transformers

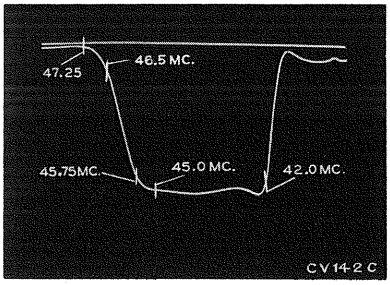


Figure 30—Response of T105-T106 Pix I-F Transformer

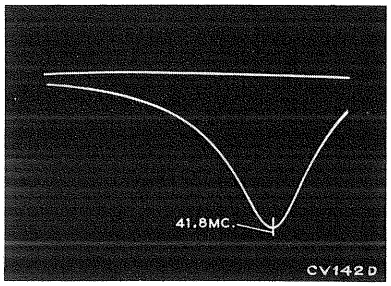


Figure 31—Response of T107 Pix I-F Transformer

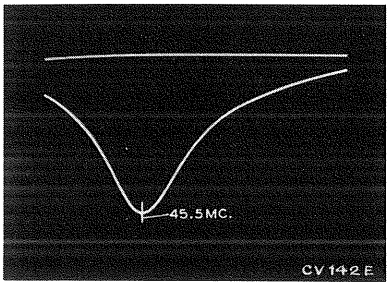


Figure 32—Response of T108 Pix I-F Coil

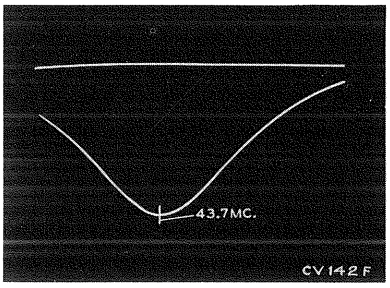


Figure 33—Response of T109 Pix I-F Coil

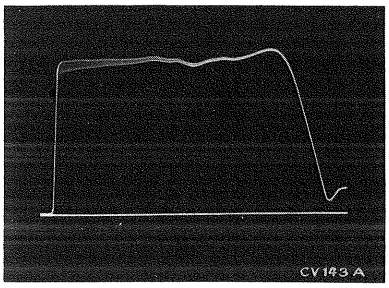


Figure 34—Video Response at Average Contrast

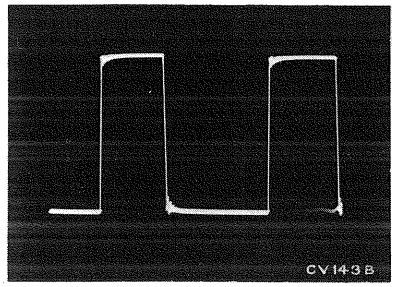


Figure 35—Video Response (100 KC Square Wave)

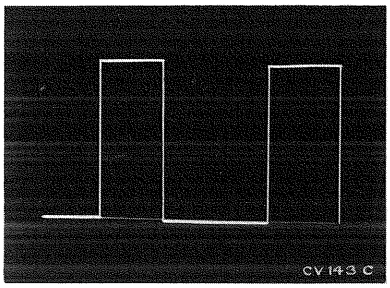
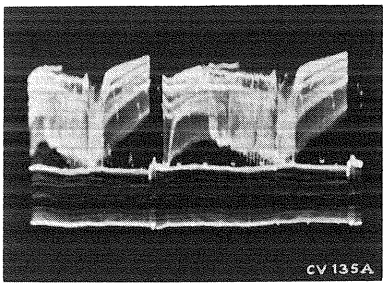


Figure 36—Video Response (60 Cycle Square Wave)

WAVEFORM PHOTOGRAPHS

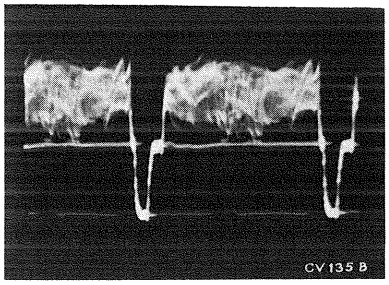
Taken from RCA WO58A Oscilloscope



Grid of 1st Video Amplifier
(Pin 4 of V110) (6AG7)
Voltage Depends on Picture

Figure 37—Vertical (Oscilloscope Synced to ½ of Vertical Sweep Rate) (6.0 Volts PP)

Figure 38—Horizontal (Oscilloscope Synced to ½ of Horizontal Sweep Rate) (6.0 Volts PP)



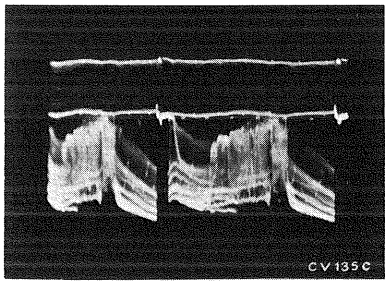
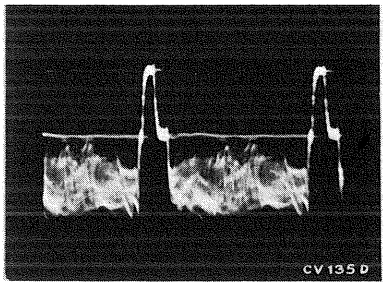
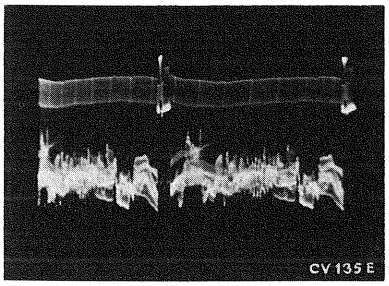


Plate of 1st Video Amplifier
(Pin 8 of V110) (6AG7)
Voltage depends on picture

Figure 39—Vertical (105 Volts PP)

Figure 40—Horizontal (105 Volts PP)

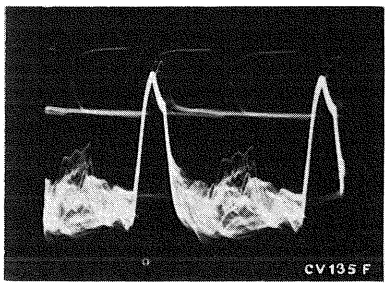




Grid of Sync Separator
(Pin 4 of V113) (6SN7)
Voltage depends on picture

Figure 41—Vertical (30 Volts PP)

Figure 42—Horizontal (30 Volts PP)



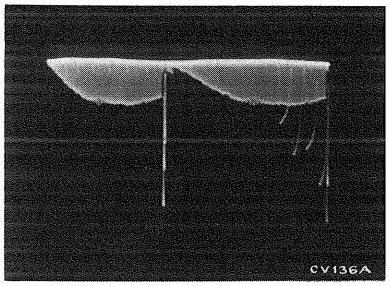
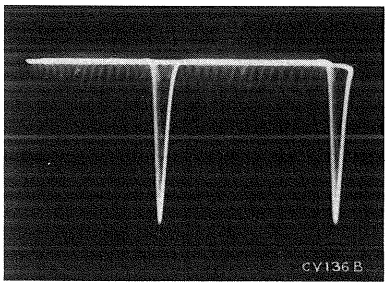
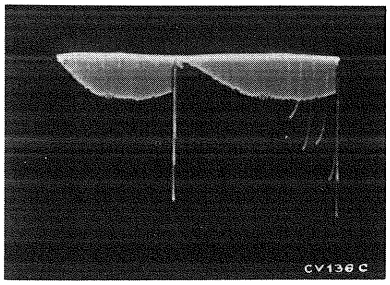


Plate of Sync Separator
(Pin 5 of V113) (6SN7)
(.25 mfd in series with probe)

Figure 43—Vertical (33 Volts PP)

Figure 44—Horizontal (8 Volts PP)

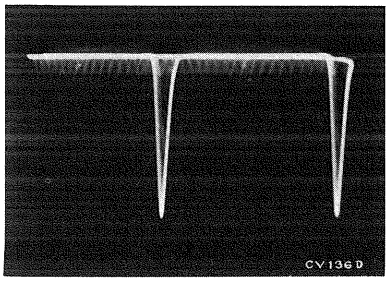




Grid of Vertical Sync Amp
(Pin 4 of V114A) (6SN7)

Figure 45—Vertical (12 Volts PP)

Figure 46—Horizontal (5 Volts PP)



WAVEFORM PHOTOGRAPHS

Taken from RCA WO58A Oscilloscope

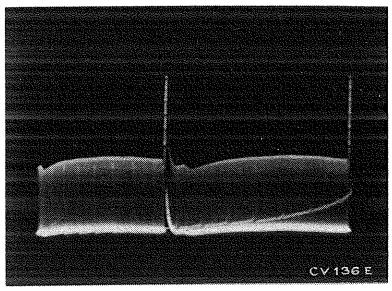
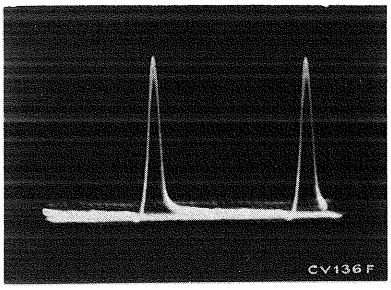


Plate of Vertical Sync Amp
(Pin 5 of V114A) (6SN7)

Figure 47—Vertical (27 Volts PP)

Figure 48—Horizontal (16 Volts PP)



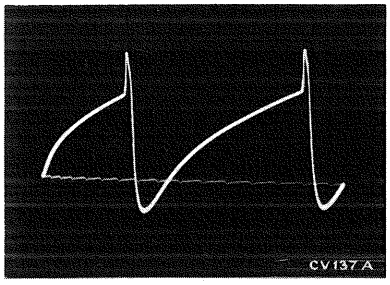
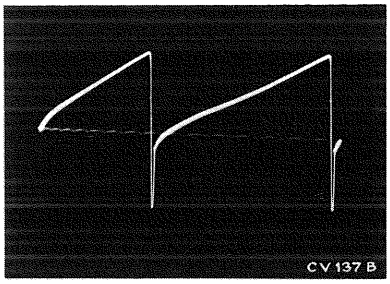


Figure 49—Grid of Vertical Sweep Osc. (Pin 1 of V114B) (6SN7) (25 Volts PP)

Figure 50—Plate of Vertical Sweep Osc. (Pin 2 of V114B) (30 Volts PP)



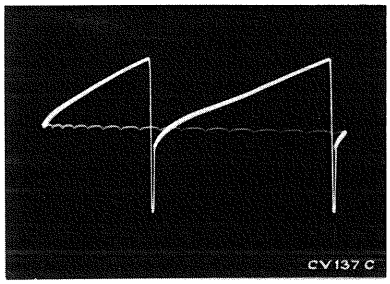
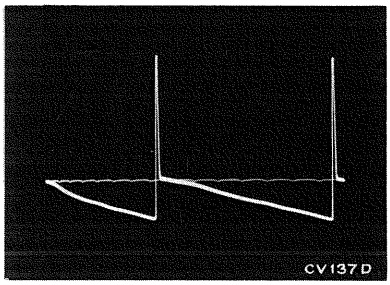
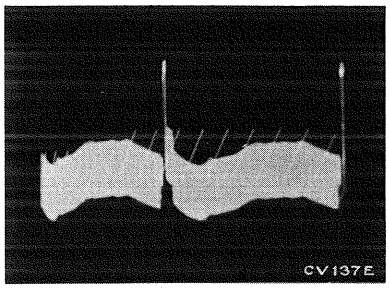


Figure 51—Grid of Vertical Sweep Output (Pin 1 of V115) (6AQ5) (35 Volts PP)

Figure 52—Plate of Vertical Sweep Output (Pin 5 of V115) (6AQ5) (800 Volts PP)

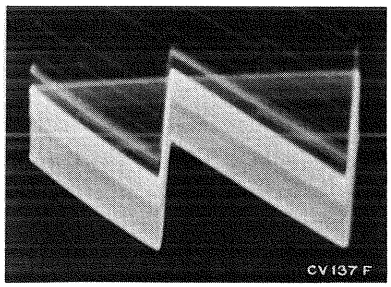


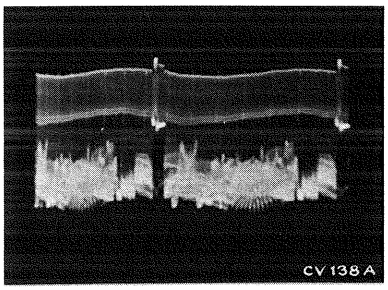


Cathode of Sync Separator
(Pin 3 of V113) (6SN7)

Figure 53—Vertical (11 Volts PP)

Figure 54—Horizontal (6 Volts PP)

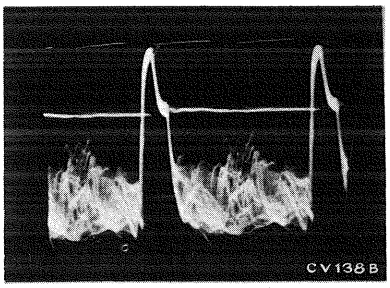




Grid of Sync Separator
(Pin 1 of V113) (6SN7)

Figure 55—Vertical (40 Volts PP)

Figure 56—Horizontal (40 Volts PP)



WAVEFORM PHOTOGRAPHS

Taken from RCA WO58A Oscilloscope

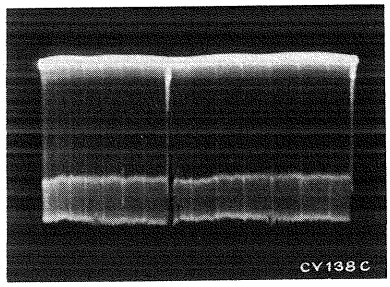
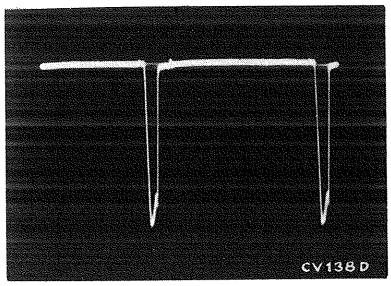
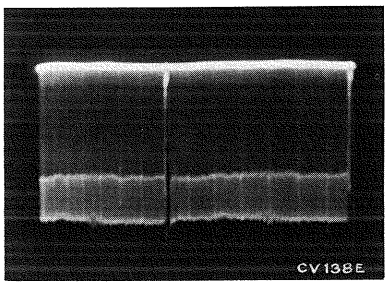


Plate of Sync Separator
(Pin 2 of V113) (6SN7)

Figure 57—Vertical (15 Volts PP)

Figure 58—Horizontal (15 Volts PP)

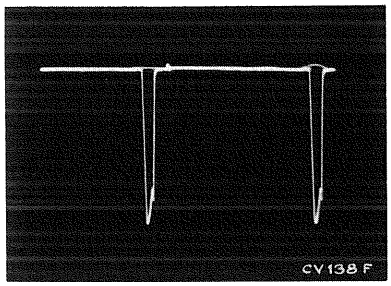




Grid of Hor. Sync Amp.
(Pin 4 of V112) (6SN7)

Figure 59—Vertical (15 Volts PP)

Figure 60—Horizontal (15 Volts PP)



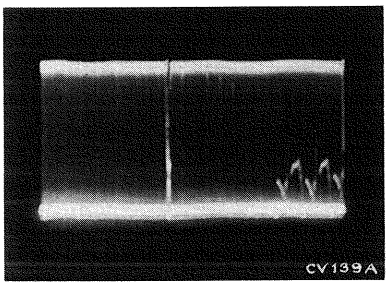
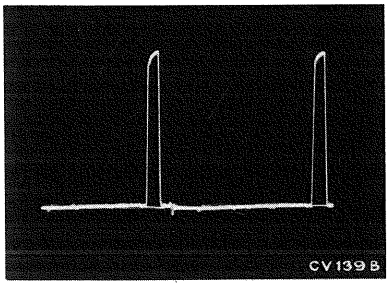
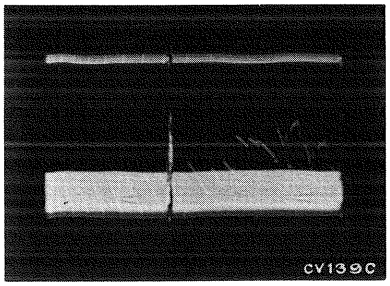


Plate of Hor. Sync Amp.
(Pin 5 of V112) (6SN7)

Figure 61—Vertical (70 Volts PP)

Figure 62—Horizontal (70 Volts PP)

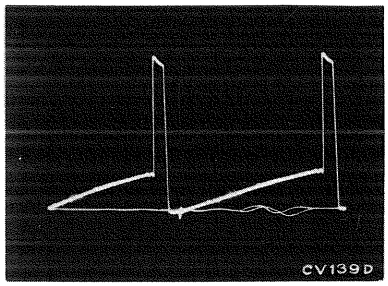


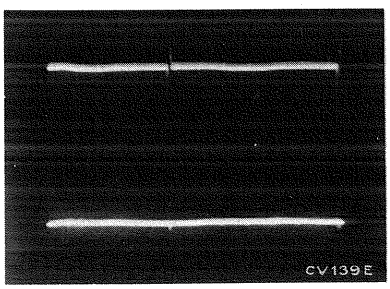


Grid of Hor. Sync Amp.
(Pin 1 of V112) (6SN7)

Figure 63—Vertical (65 Volts PP)

Figure 64—Horizontal (65 Volts PP)

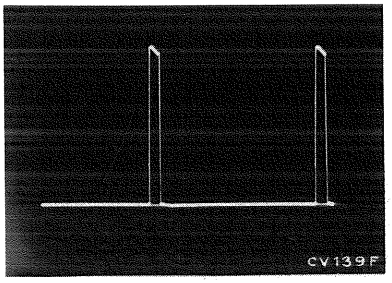




Cathode of Hor. Sync Amp.
(Pin 3 of V112) (6SN7)

Figure 65—Vertical (18 Volts PP)

Figure 66—Horizontal (18 Volts PP)



WAVEFORM PHOTOGRAPHS

Taken from RCA WO58A Oscilloscope

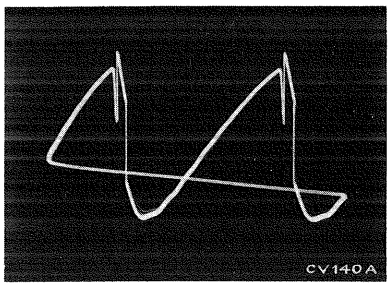
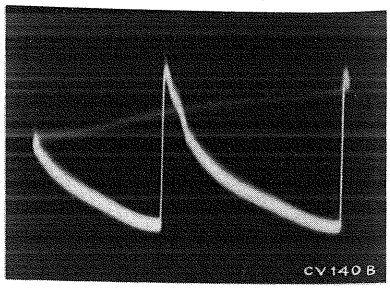


Figure 67—Grid of Horizontal Oscillator Control (Pin 1 of V116) (6SN7GT) (22 Volts PP)

Figure 68—Cathode of Horizontal Oscillator Control (Pin 3 of V116) (6SN7GT) (1.3 Volts PP)



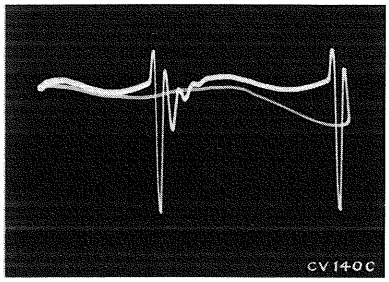
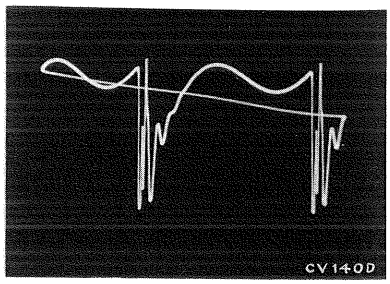


Figure 69—Grid of Horizontal Oscillator (Pin 4 of V116) (6SN7GT) (390 Volts PP)

Figure 70—Plate of Horizontal Oscillator (Pin 5 of V116) (6SN7GT) (140 Volts PP)



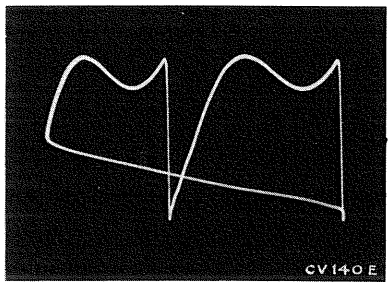
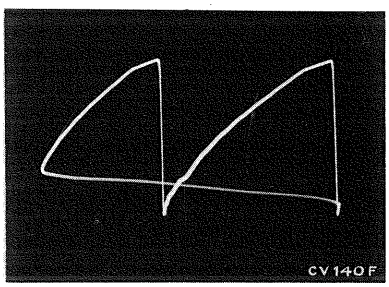


Figure 71—Terminal "C" of T113 (120 Volts PP)

Figure 72—Grid of Horizontal Output Tube (Pin 5 of V117) (6BQ6) (95 Volts PP)



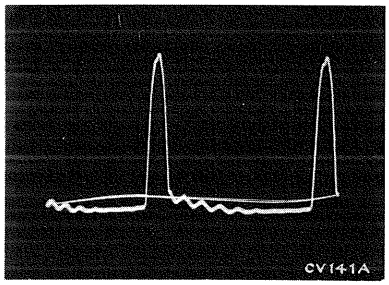
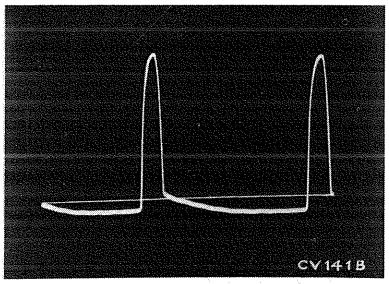


Figure 73—Plate of Horizontal Output (Approx. 4000 Volts PP) (Measured Through a Capacity Voltage Divider Connected from Top Cap of V117 to Ground)

Figure 74— Cathode of Damper (Pin 3 of V120) (6W4GT) (2300 Volts PP)



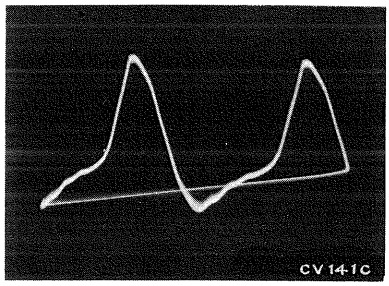
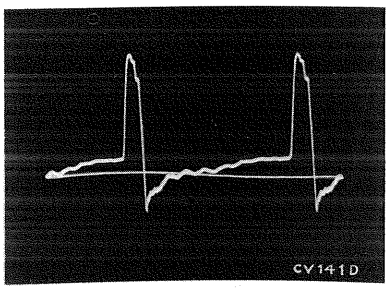


Figure 75—Plate of Damper (Pin 5 of V120) (6W4GT) (180 Volts PP)

Figure 76—Plate of AGC Amplifier (Pin 5 of V111) (6CB6) (600 Volts PP)



17T153, 17T154, 17T155, 17T160, 17T162, 17T172, 17T172K, 17T173, 17T173K, 17T174, 17T174K

VOLTAGE CHART

The following measurements represent two sets of conditions. In the first condition, a 5000 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 WV97A senior "VoltOhmyst" between the indicated terminal and chassis ground and with the receiver operating on 117 volts, 60 cycles, a-c. The symbol < means less than.

Tube No.	Tube Type	Function	Operating Condition	E. Plate		E. Screen		E. Cathode		E. Grid		Notes on Measurements
				Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	
V1	6X8	Mixer	5000 Mu. V. Signal	9	—	8	—	6	0	7	—	
			No Signal	9	145 to 150	8	145 to 150	6	0	7	–2.8 to –3.5	Depending on channel
V1	6X8	R-F Oscillator	5000 Mu. V. Signal	3	—	—	—	6	0	2	—	
			No Signal	3	88 to 108	—	—	6	0	2	–3.0 to –5.1	Depending on channel
V2	6BQ7	R-F Amplifier	5000 Mu. V. Signal	6	—	—	—	8	—	7	—	
			No Signal	6	133 to 138	—	—	8	1.1	7	—	Depending on channel
V2	6BQ7	R-F Amplifier	5000 Mu. V. Signal	1	—	—	—	3	—	2	—	
			No Signal	1	260	—	—	3	133 to 138	2	—	Depending on channel
V101	6AU6	1st Sound I-F Amp.	5000 Mu. V. Signal	5	255	6	185	7	0.8	1	–1.0	
			No Signal	5	245	6	165	7	0.9	1	0	
V102	6AU6	2d Sound I-F Amp.	5000 Mu. V. Signal	5	260	6	52	7	0.17	1	–24	
			No Signal	5	255	6	54.0	7	0.12	1	*–1.5	*Unreliable measuring point. Voltage depends on noise.
V103	6AL5	Ratio Detector	5000 Mu. V. Signal	7	0.54	—	—	1	15.1	—	—	7.5 kc deviation at 400 cycles
			No Signal	7	–0.85	—	—	1	*6.85	—	—	*Unreliable measuring point. Voltage depends on noise.
V104	6AV6	1st Audio Amplifier	5000 Mu. V. Signal	7	102	—	—	2	0	1	–0.3	At min. volume
			No Signal	7	100	—	—	2	0	1	–0.3	At min. volume
V105	6AQ5	Audio Output	5000 Mu. V. Signal	5	245	6	254	2	17	7	0	At min. volume
			No Signal	5	240	6	250	2	17	7	0	At min. volume
V106	6AU6	1st Pix. I-F Amplifier	5000 Mu. V. Signal	5	248	6	255	7	0.2	1	–6.7	
			No Signal	5	150	6	120	7	1.0	1	*0	*Unreliable measuring point. Make measurement at T104-D.
V107	6CB6	2nd Pix. I-F Amplifier	5000 Mu. V. Signal	5	249	6	232	2	0.15	1	–6.7	
			No Signal	5	145	6	108	2	0.8	1	0	
V108	6CB6	3d Pix. I-F Amplifier	5000 Mu. V. Signal	5	145	6	135	2	1.2	1	0	
			No Signal	5	130	6	127	2	1.1	1	0	
V109	6CB6	4th Pix. I-F Amplifier	5000 Mu. V. Signal	5	215	6	150	2	2.1	1	0	
			No Signal	5	210	6	140	2	2.0	1	0	
V110	6AG7	Video Amplifier	5000 Mu. V. Signal	8	135	6	150	5	1.35	4	–3.0	
			No Signal	8	100	6	125	5	1.65	4	*–0.6	*Depends on noise
V111	6CB6	AGC Amplifier	5000 Mu. V. Signal	5	–35.8	6	238	2	120	1	120	AGC control set for normal operation
			No Signal	5	4.0	6	265	2	100	1	80	AGC control set for normal operation

VOLTAGE CHART

Tube No.	Tube Type	Function	Operating Condition	E. Plate		E. Screen		E. Cathode		E. Grid		Notes on Measurements
				Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	
V112	6SN7GT	Hor. Sync Amplifier	5000 Mu. V. Signal	2	150	—	—	3	1.2	1	–38.0	
			No Signal	2	143	—	—	3	0.68	1	*–18	*Unreliable measurement point. Voltage depends on noise.
			5000 Mu. V. Signal	5	77	—	—	6	0	4	–1.3	
			No Signal	5	75	—	—	6	0	4	*–0.8	*Voltage depends on noise.
V113	6SN7GT	Hor. Sync Separator	5000 Mu. V. Signal	2	269	—	—	3	118	1	100	
			No Signal	2	263	—	—	3	*90	1	*80	*Unreliable measurement point. Voltage depends on noise.
V113	6SN7GT	Vert. Sync Separator	5000 Mu. V. Signal	5	450	—	—	6	125	4	100	
			No Signal	5	400	—	—	6	100	4	80	
V114A	6SN7GT	Vert. Sync Amplifier	5000 Mu. V. Signal	5	12.0	—	—	6	0	4	–0.13	
			No Signal	5	11.0	—	—	6	0	4	–0.05	
V114B	6SN7GT	Vertical Oscillator	5000 Mu. V. Signal	2	*53	—	—	3	0	1	*–14.8	*Depends on setting of Vert. hold control.
			No Signal	2	*53	—	—	3	0	1	*–14.1	Voltages shown are synced pix adjustment.
V115	6AQ5	Vertical Output	5000 Mu. V. Signal	5	245	6	259	2	21.5	1	0	
			No Signal	5	240	6	252	2	21.6	1	0	
V116	6SN7GT	Horizontal Osc. Control	5000 Mu. V. Signal	2	182	—	—	3	8.0	1	–12.5	
			No Signal	2	180	—	—	3	–3.0	1	–19.5	
			5000 Mu. V. Signal	2	135	—	—	3	8.8	1	–13.5	Hor. hold counter-clockwise
			5000 Mu. V. Signal	2	225	—	—	3	8.8	1	–12.5	Hor. hold clockwise
V116	6SN7GT	Horizontal Oscillator	5000 Mu. V. Signal	5	185	—	—	6	0	4	–58	
			No Signal	5	180	—	—	6	0	4	–67	
			5000 Mu. V. Signal	5	185	—	—	6	0	4	–58	Hor. hold counter-clockwise
			5000 Mu. V. Signal	5	185	—	—	6	0	4	–58	Hor. hold clockwise
V117	6BQ6GT	Horizontal Output	5000 Mu. V. Signal	Cap	*	4	168	8	18.0	5	–15.0	*High Voltage Pulse Present
			No Signal	Cap	*	4	168	8	18.5	5	–15.0	*High Voltage Pulse Present
V118	1V2	Focus Rectifier	5000 Mu. V. Signal	9	*	—	—	4 & 5	4280	—	—	*High Voltage Pulse Present
Omitted on "K" Models			No Signal	9	*	—	—	4 & 5	4220	—	—	*High Voltage Pulse Present
V119	1B3GT /8016	H. V. Rectifier	5000 Mu. V. Signal	Cap	*	—	—	2 & 7	13,500	—	—	*High Voltage Pulse Present
			No Signal	Cap	*	—	—	2 & 7	13,200	—	—	*High Voltage Pulse Present
V120	6W4GT	Damper	5000 Mu. V. Signal	5	266	—	—	3	*	—	—	*High Voltage Pulse Present
			No Signal	5	261	—	—	3	*	—	—	*High Voltage Pulse Present
V121	17GP4 or 17CP4	Kinescope	5000 Mu. V. Signal	Cone	13,500	10	475	11	140	2	90	At average Brightness
			No Signal	Cone	13,200	10	470	11	135	2	90	At average Brightness

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17T173,
17T174K

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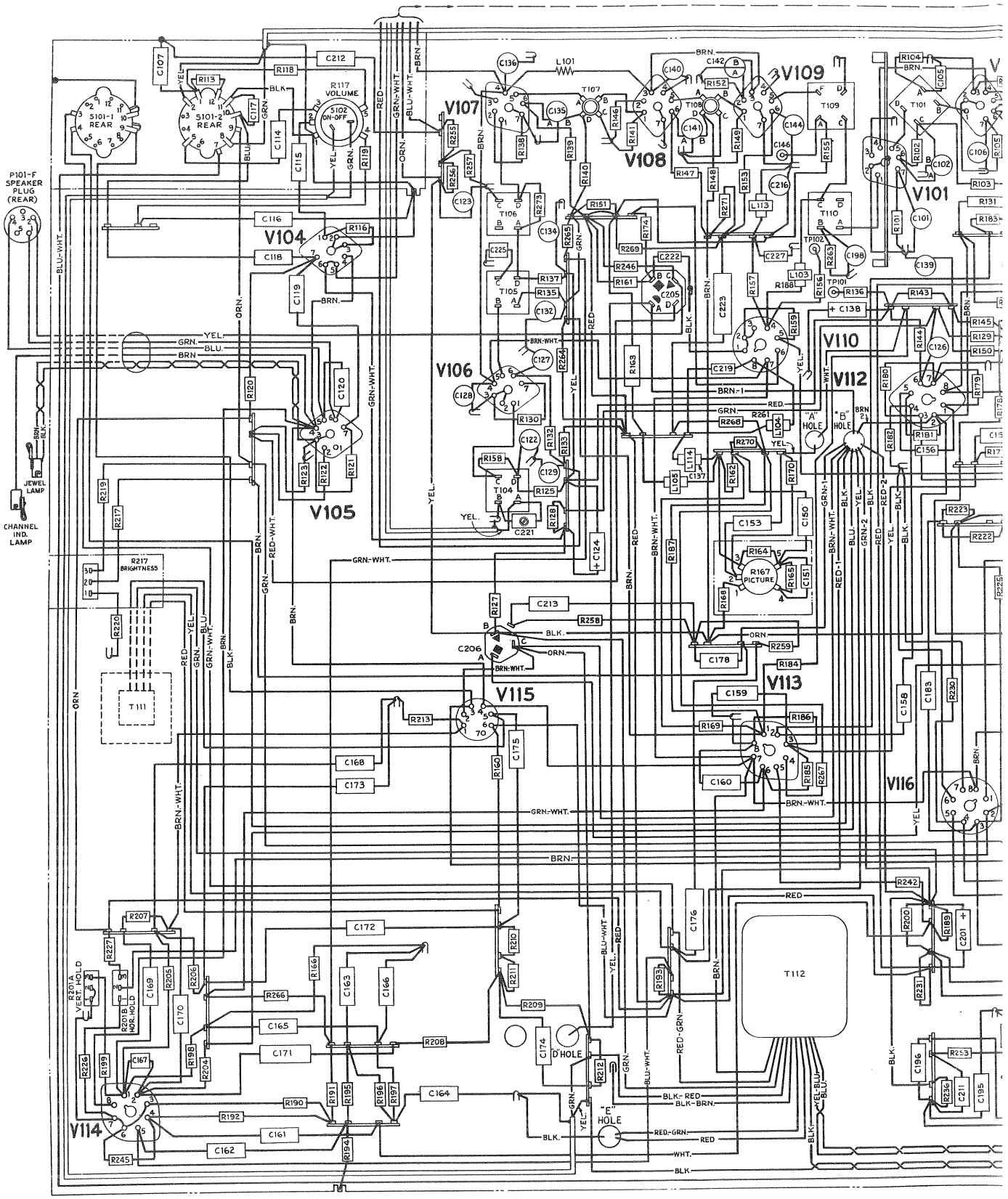
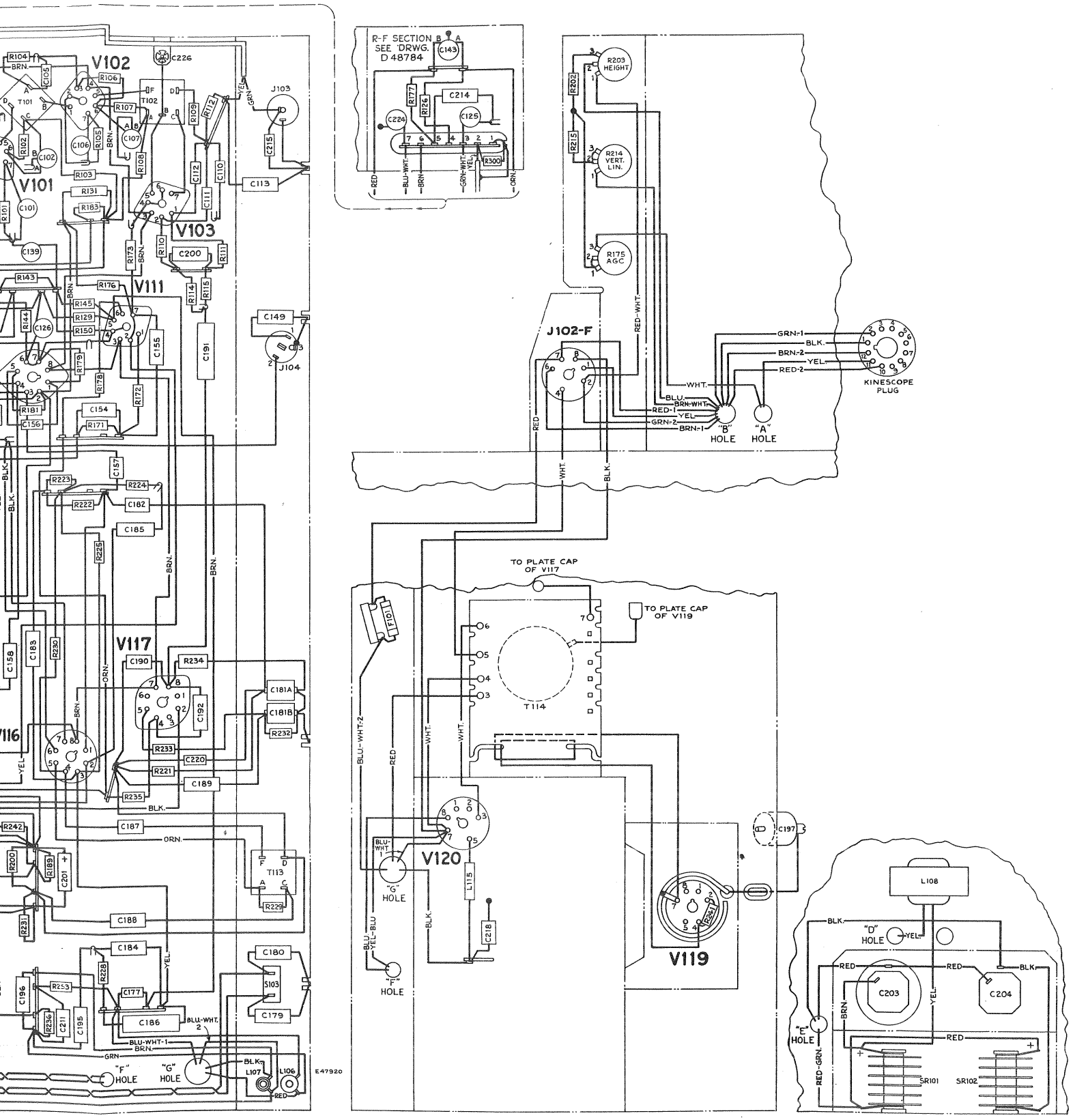


Figure 77—KCS66D



re 77—KCS66D *Chassis Wiring Diagram*

R-F UNIT WIRING DIAGRAM

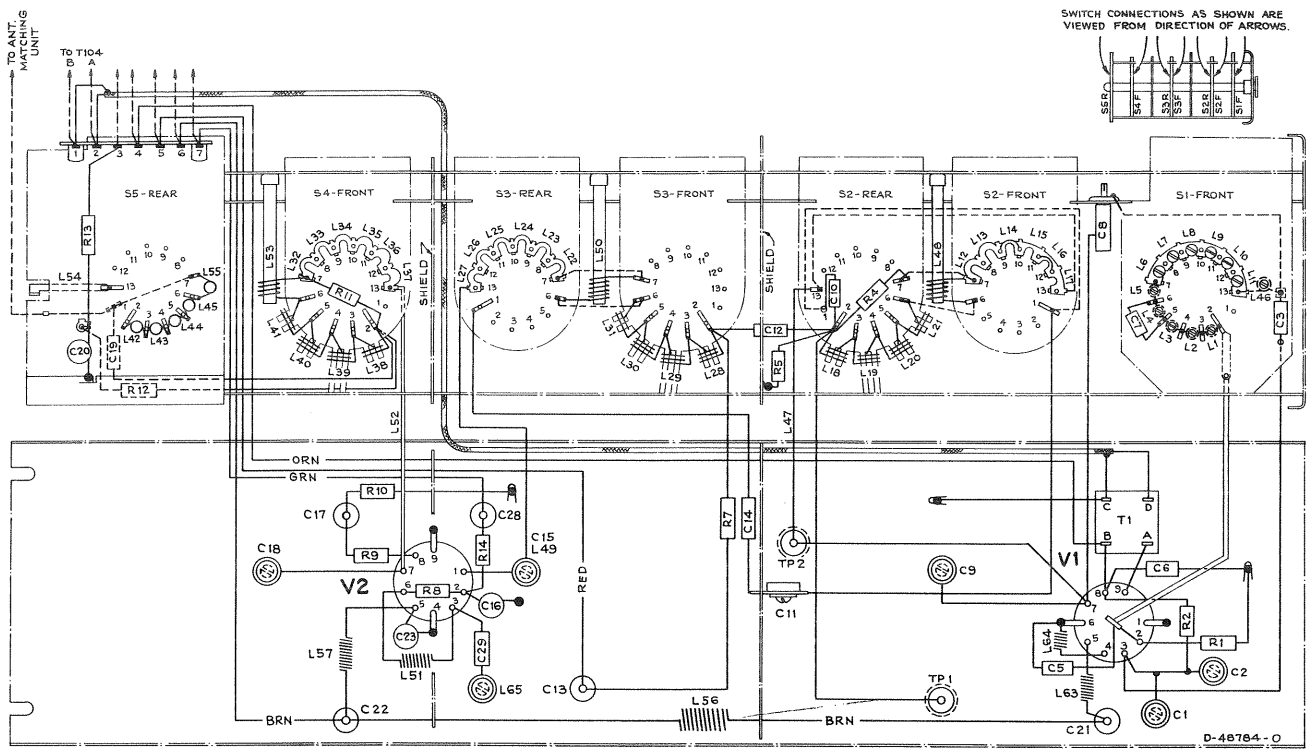
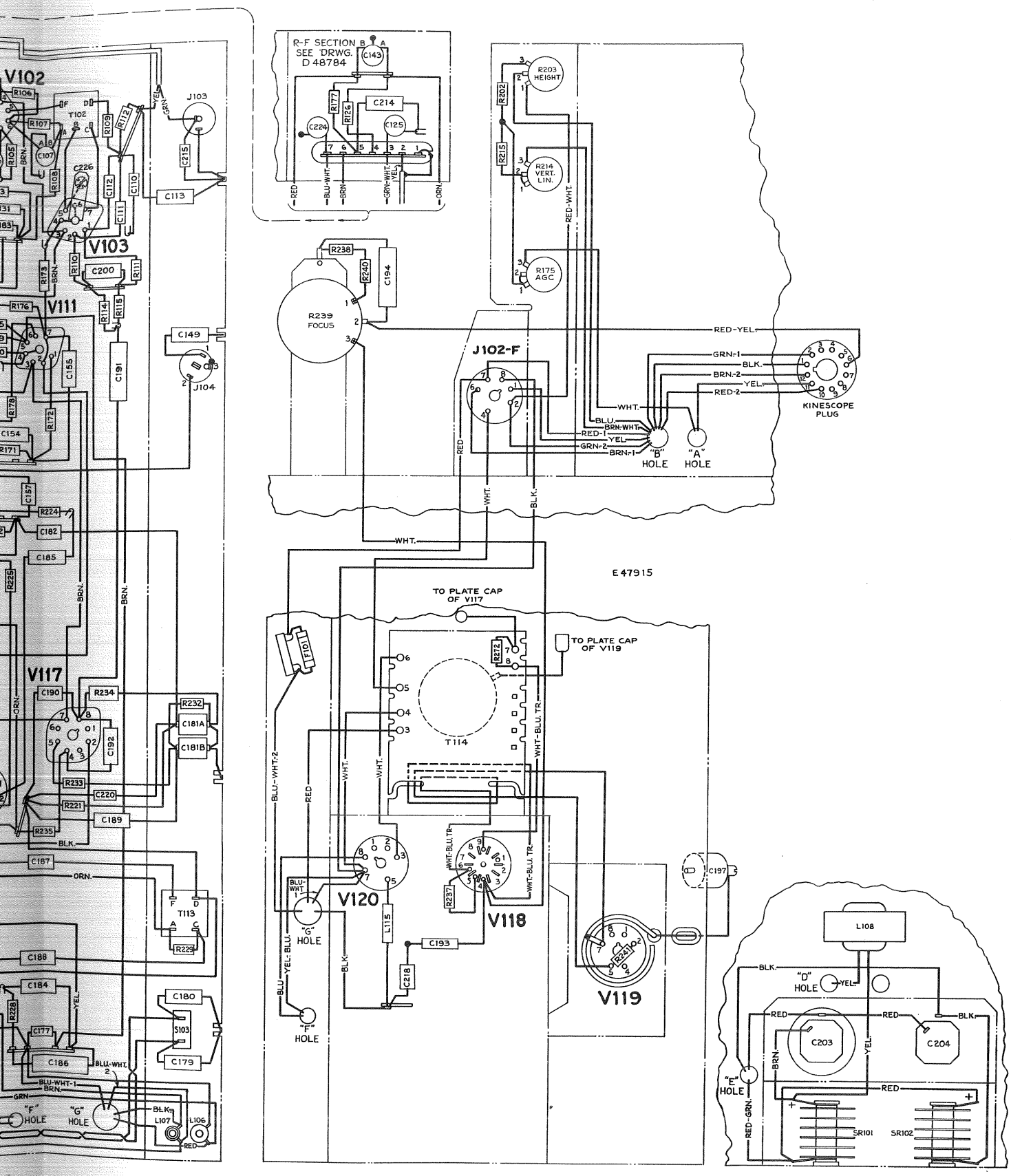


Figure 79—R-F Unit Wiring Diagram

CRITICAL LEAD DRESS:

1. Keep all wiring in the pix i-f, sound i-f and video circuits as short as possible.
2. Keep the leads on C110, C111, C112, C200, R109, R110, R111, R112, R114, R115 and R233 as short and direct as possible.
3. Do not change the bus wire connection to pin 2 of V101 and V102. Sleeving is used on these wires to insure length and to prevent shorting.
4. Dress C114 down between R117 (volume control) and wafer S101-2.
5. Ground R130 to pin 3 of V106 and R138 to pin 7 of V107.
6. Do not change the grounding of R141, R146 and R149.
7. Keep the bus wire from T109-A to C146 (plug in capacitor) short and direct.
8. Ground the filaments of sockets V107, V108 and V109 independently of the socket center pin. Use ground lances provided near each socket.
9. Dress C198 straight up to act as a shield between T101-A and V110-4.
10. Dress C153 and R170 (kine cathode) up in the air above the terminal board.
11. Keep the leads connected to T113-C and T113-D (synchoguide) down so that they will not short out when the chassis is placed in the cabinet.
12. Do not reroute any wires between T104 and the terminal board along side it. Keep all leads on the foot side of the terminal board.
13. Dress all wires routed past T104, shielded wires W102 and W103 under the big lances near T104.
14. Dress all a-c leads to S102 under the large lances on the front apron.
15. Dress R116 close to the chassis with leads as short as possible.
16. Dress C212 and C221 up in the air and away from all other leads and components.
17. The blue lead from pin 5 of V111 to the terminal board under the high voltage cage should be routed between V117 socket and the rear apron.
18. Dress all 2 watt resistors away from each other and all other wires and components.
19. Dress all wires away from damper tube V120.
20. Blue wire from pin 5 V116 to T113-A should not be more than 5 inches long.
21. Dress all peaking coils up and away from the base.
22. Dress C193 at V118 socket about one half inch away from any component or metallic object.
23. Dress the lead from pin 4 of V118 socket to the focus pot R239 through the high voltage compartment between the insulating board, mounting V119 at the metal shield, then through the vent hole in the shield to the pot. Dress this lead clear of the tubes and other high voltage components.
24. Dress all leads in the high voltage compartment away from each other and away from the high voltage transformer.

HASSIS WIRING DIAGRAM



KCS66A Chassis Wiring Diagram

KCS66 AND KCS66A CHASSIS WIRIN

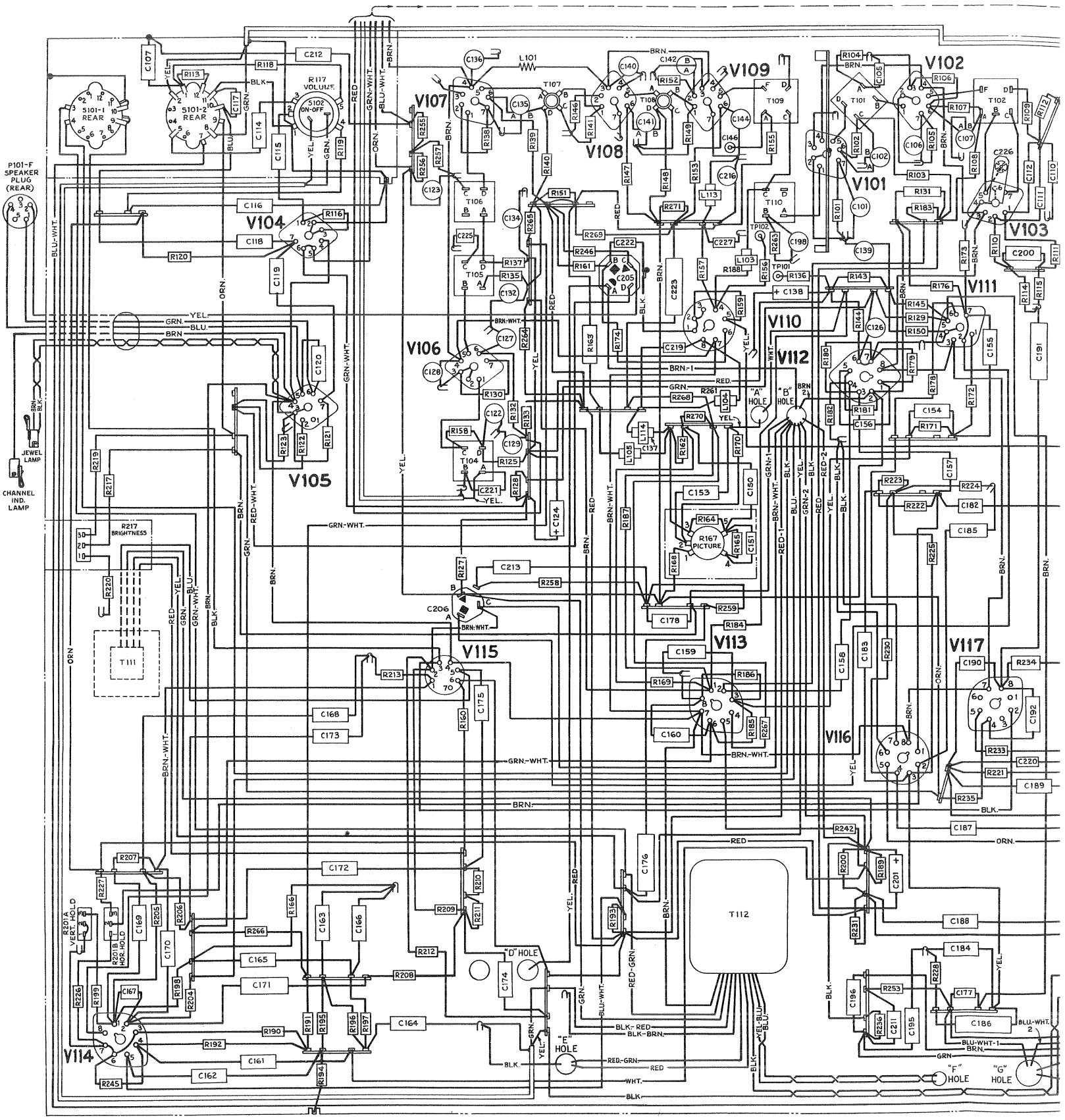
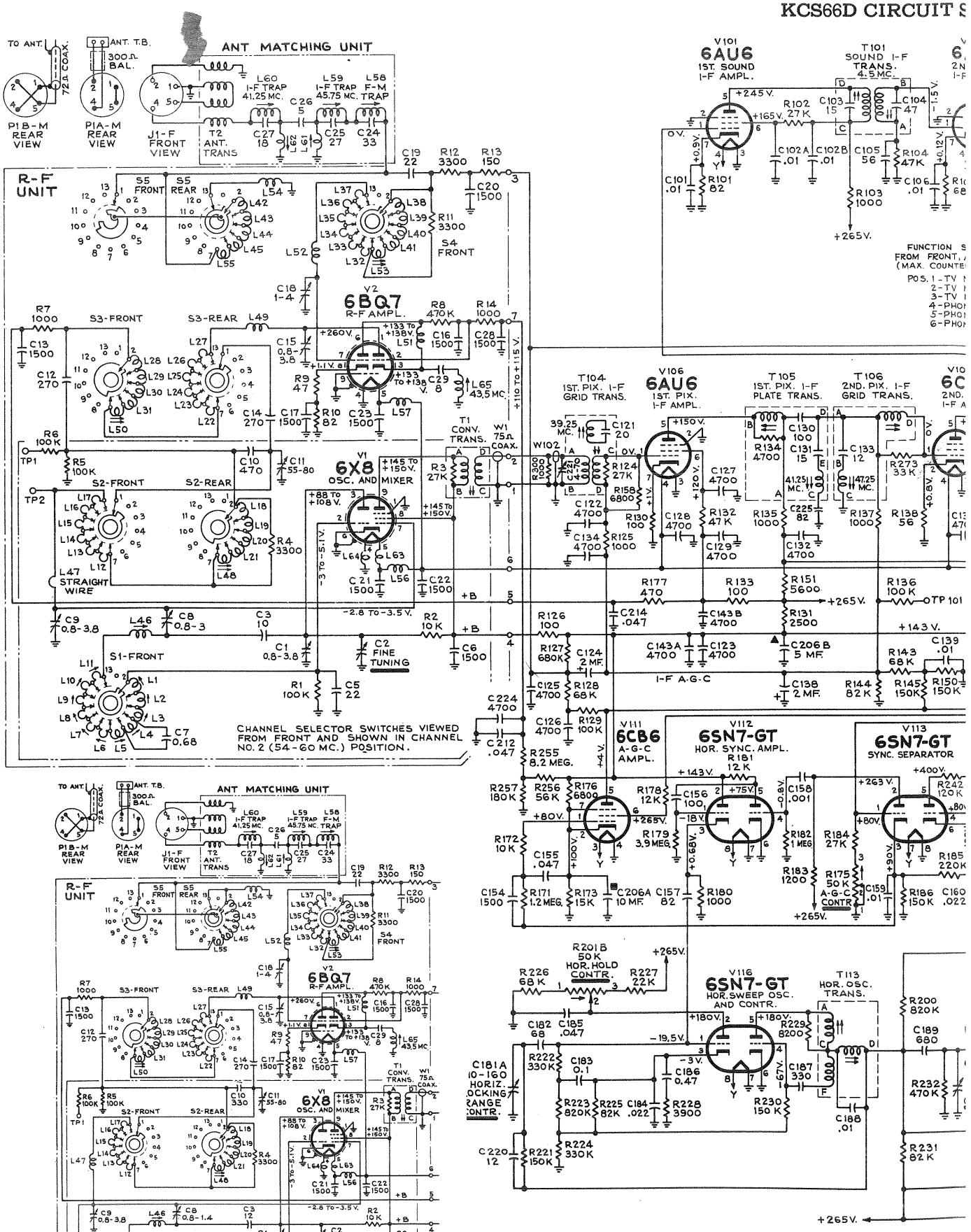


Figure 78—KCS66 and KCS66A Chassis Wirin



In early production units of all models, the r-f unit was wired as shown in the partial schematic insert to the left. All r-f units wired as shown in figures 19 and 20 are coded "M1".

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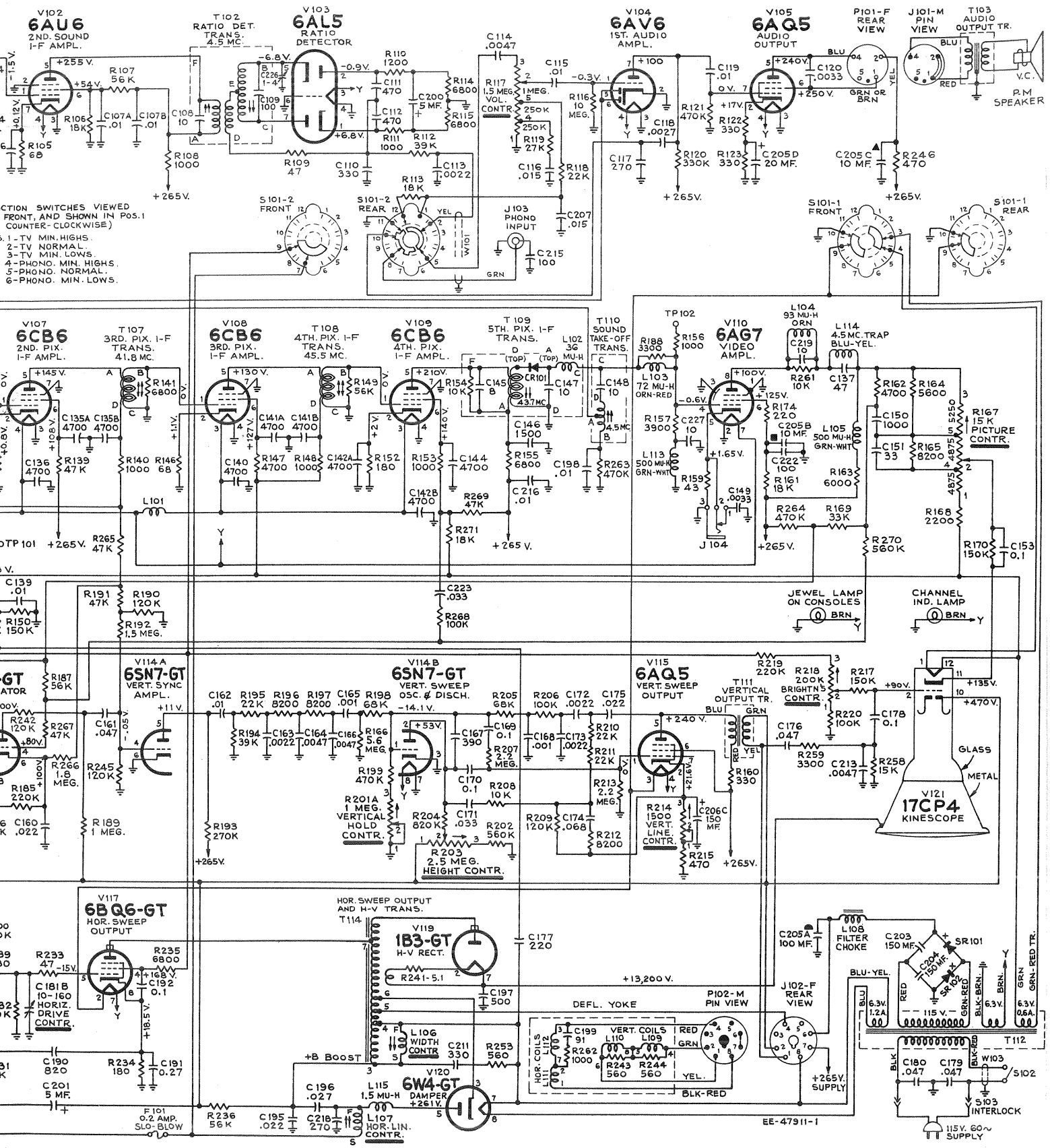
K=1000.

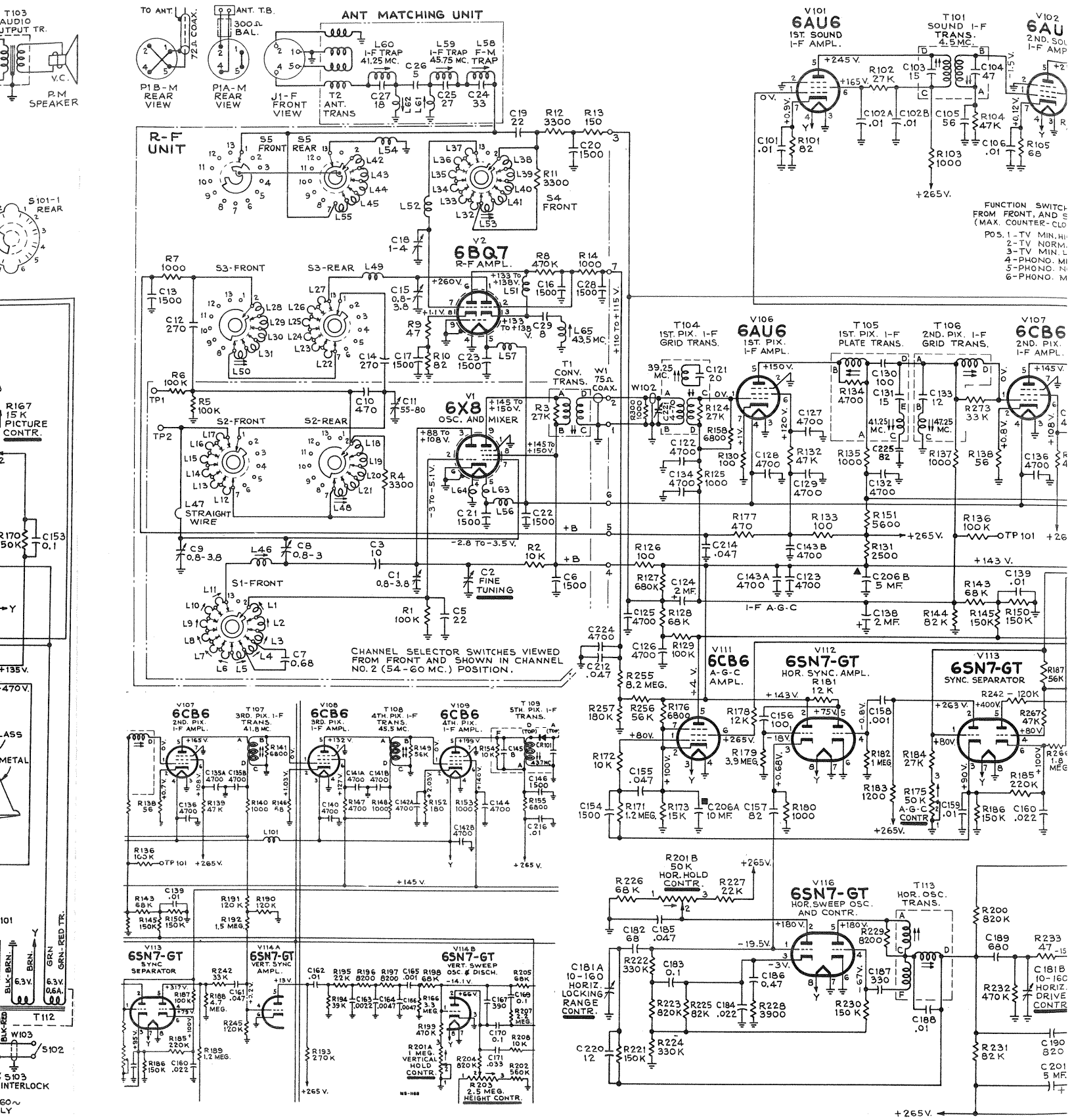


In some receivers, R174 was omitted.
In some receivers, R273 was omitted.
All resistance values in ohms.
=1000.

All capacitance values less than 1 in MF and above 1 in MMF unless otherwise noted.
Direction of arrows at controls indicates clockwise rotation.

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

Figure 80—KCS66D Circuit Schematic Diagram



In a few early production receivers the V113 sync separator circuit was wired as shown in the above partial schematic diagram.

In some receivers, focus bleeder resistors R238 was 12 meg and R240 was 15 meg. In some receivers, R238 and R240 are combined into one 18 meg resistor.

In some receivers, R264 (in video amp at sync take-off) was 220 k.

In some receivers, r-f unit terminal 7 by-pass capacitor C224 was omitted.

In some receivers, terminal C of I-F trans. T105 was connected to ground and C225 was omitted.

In some receivers ratio detector trimmer C226 was omitted.

In some receivers, C193 was connected from V118-5 to ground.

In some receivers a 22 k resistor, R142 was connected from V110-8 to junction of L105, L114.

In some receivers, C227 (at video amp) was omitted.

In some receivers, R272 at V118 was omitted.

In some receivers, R271 in the fourth pix i-f screen circuit was omitted.

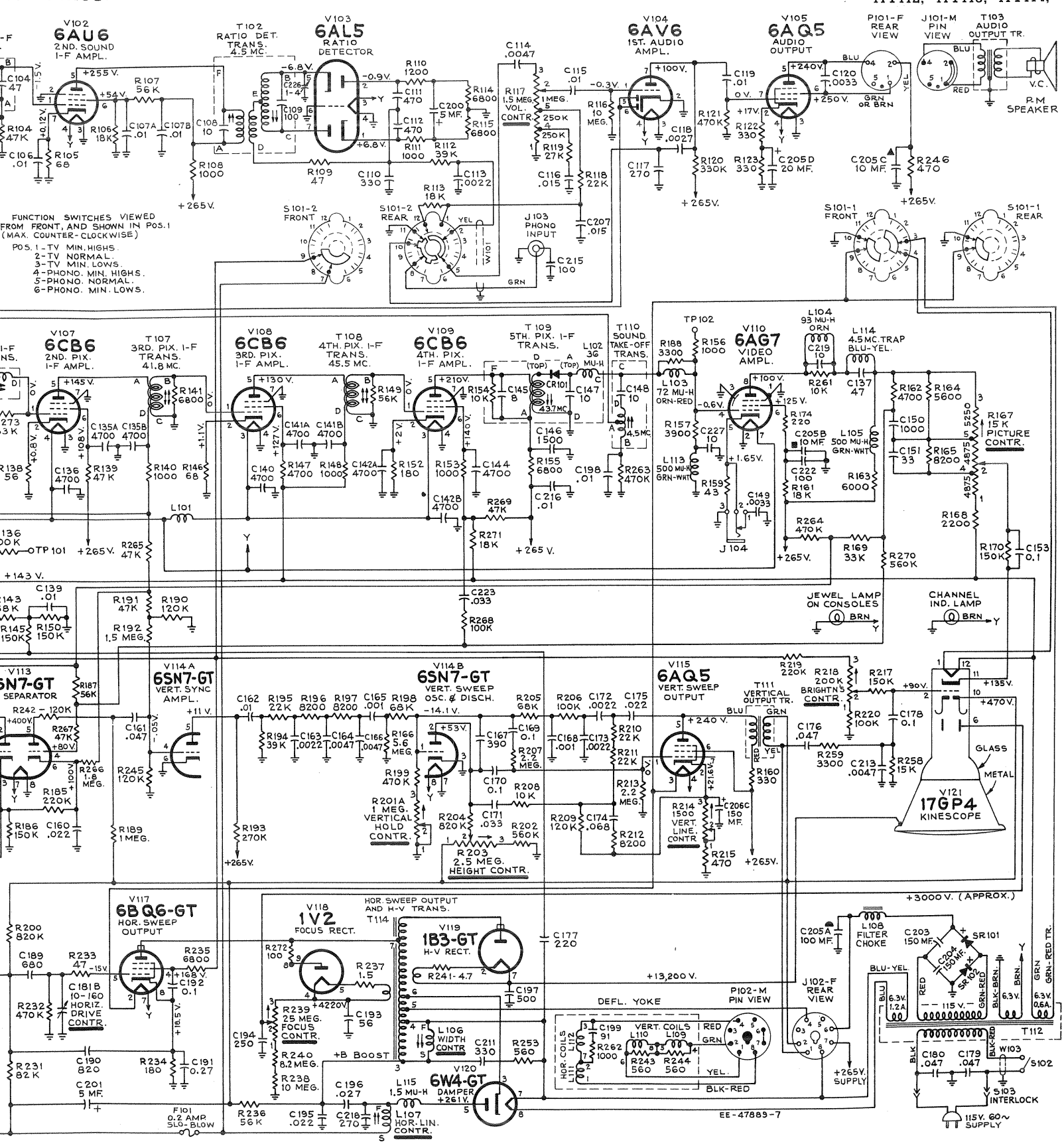
In some receivers integrator resistor R165 was 3.3 megs.

In some receiv
B was omitted.

In some receiv
was connected be
a resistor R216,
between V115-6 a

In some receiv
R212 near V115 w

566A CIRCUIT SCHEMATIC DIAGRAM



In some receivers, R300 across T104 A and B was omitted.

In some receivers a 30 mfd capacitor C202 was connected between V115-6 and V115-2 and a resistor R216, 470 ohms was connected between V115-6 and the 265 volt bus.

In some receivers, the Junction of R209 and R212 near V115 was connected to ground.

In some receivers, a capacitor, C152, 7 mmf was connected between terminals 1 and 4 of the picture control R167.

In some receivers, the V110 screen resistor R174 was omitted.

In some receivers the r-f unit was wired as shown in the partial schematic shown on page 13. R-F units wired as shown above are marked "M1".

In some receivers, R273 across T106 A & D was omitted.

All resistance values in ohms. K=1000.

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

Direction of arrows at controls indicates clockwise rotation.

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

Figure 81—KCS66 and KCS66A Circuit Schematic Diagram

REPLACEMENT PARTS

STOCK No.	DESCRIPTION
	R-F UNIT ASSEMBLIES
	KRK11
76539	Board—Antenna matching transformer terminal board less coils L58, L59, L60 and less capacitors C24, C25, C26, C27
76531	Board—Terminal board, 5 contact and ground
76522	Bracket—Vertical bracket for holding r-f amplifier tube (6BQ7) shield (early production)
76845	Bracket—Vertical Bracket for holding oscillator-mixer tube shield (production marked "M1")
75186	Capacitor—Ceramic, variable, for fine tuning—plunger type (C2)
93056	Capacitor—Ceramic, 5 mmf. (C26)
70597	Capacitor—Ceramic, 8 mmf. (C29)
55326	Capacitor—Ceramic, 10 mmf. (C3) (production marked "M1")
76550	Capacitor—Ceramic, 12 mmf. (C3) (early production)
54207	Capacitor—Ceramic, 18 mmf. (C27)
76557	Capacitor—Ceramic, 22 mmf. (C19)
76558	Capacitor—Ceramic, 22 mmf. (C5)
70835	Capacitor—Ceramic, 27 mmf. (C25)
76739	Capacitor—Ceramic, 33 mmf. (C24)
76527	Capacitor—Mica trimmer, 55-80 mmf. (C11)
75199	Capacitor—Ceramic, 270 mmf. (C12, C14)
76552	Capacitor—Ceramic, 330 mmf. (C10) (early production)
75198	Capacitor—Ceramic, 470 mmf. (C10) (production marked "M1")
75166	Capacitor—Ceramic, 1500 mmf. (stand-off) (C13, C17, C21, C22, C28)
73748	Capacitor—Ceramic, 1500 mmf. (C16, C20, C23)
75610	Capacitor—Ceramic, 1500 mmf. (C6)
71088	Capacitor—Ceramic, 0.68 mmf. (C7)
75184	Capacitor—Ceramic, adjustable, 0.75-4 mmf. complete with adjusting stud (C1, C9)
76545	Capacitor—Tubular, steatite, adjustable 0.8-2.25 mmf. (C8) (early production)
76781	Capacitor—Tubular, steatite, adjustable 0.8-2.25 mmf. (C8) (production marked "M1")
76532	Capacitor—Adjustable trimmer, steatite, 1.0-4.0 mmf. (C18)
76143	Clip—Tubular, clip for mounting stand-off capacitors
73591	Coil—Antenna matching coil (2 req'd)
76560	Coil—Channel #13 converter coil (L47) (early production)
73477	Coil—Choke coil (L57)
76763	Coil—Filament choke coil (L63, L64)
76562	Coil—R-F amplifier coupling coil (L51)
76537	Coil—Shunt coil complete with adjustable core (L61)
76538	Coil—Shunt coil complete with adjustable core (L62)
76529	Coil—Trimmer coil (3 turns) with adjustable inductance core and capacitor stud (screw adjustment) for r-f section (L49, C15)
76559	Connector—Oscillator grid connector
38853	Connector—4 contact female connector—part of antenna matching transformer
76460	Contact—Test point contact
75187	Core—Adjustable core for fine tuning capacitor
76543	Core—Adjusting core for FM trap
76521	Detent—Detent mechanism and fibre shaft
73453	Form—Coil form for coils L48, L50 & L53
76524	Link—Link assembly for fine tuning
	Resistor—Fixed, composition:—
503047	47 ohms, ±10%, ½ watt (R9)
503082	82 ohms, ±10%, ½ watt (R10)
504115	150 ohms, ±20%, ½ watt (R13)
504210	1000 ohms, ±20%, ½ watt (R7, R14)
503233	3300 ohms, ±10%, ½ watt (R4, R11, R12)
504310	10,000 ohms, ±20%, ½ watt (R2)
504410	100,000 ohms, ±20%, ½ watt (R1, R5, R6)
504447	470,000 ohms, ±20%, ½ watt (R8)
14343	Retainer—Fine tuning shaft retaining ring
75164	Rod—Actuating plunger rod (fibre) for fine tuning link
76547	Screw— #4-40 x ¼" adjusting screw for coils L6, L7, L8, L9, L10, L11
76548	Screw— #4-40 x 5/16" adjusting screw for coils L1, L2, L3, L4, L46
76549	Screw— #4-40 x ⅜" adjusting screw for coil L5
76519	Shaft—Channel selector shaft and plate
76134	Shaft—Fine tuning shaft and cam
76518	Shield—Front shield complete with shaft bushing and bracket
76534	Shield—Tube shield plain for V2 (also V1 in M1 production)
76533	Shield—Tube shield (lead coated) for V1 (early production)

STOCK No.	DESCRIPTION
76336	Socket—Tube socket, 9 pin, miniature, bakelite, saddle mounted
76530	Socket—Tube socket, 9 pin, miniature, ceramic, saddle mounted
75191	Spacer—Insulating spacer for front plate (4 req'd)
75163	Spring—Friction spring (formed) for fine tuning cam
30340	Spring—Hairpin spring for fine tuning link
76523	Spring—Retaining spring for oscillator-mixer tube shield (early production)
75068	Spring—Retaining spring for oscillator-mixer tube shield (production marked "M1")
73457	Spring—Return spring for fine tuning control
76554	Stator—Antenna stator complete with rotor, coils, capacitor and resistor (S5, L42, L43, L44, L45, L54, L55, C20)
76551	Stator—Converter stator complete with rotor, coils, capacitors and resistors (S2, L12, L13, L14, L15, L16, L17, L18, L19, L20, L21, L48, C10, C12, R4, R5, R6) (early production)
76780	Stator—Converter stator complete with rotor, coils, capacitors and resistors (S2, L12, L13, L14, L15, L16, L17, L18, L19, L20, L21, L48, C10, C12, R4, R5, R6) (production marked "M1")
76546	Stator—Oscillator stator complete with rotor, coils, and capacitor (S1, C3, C7, L1, L2, L3, L4, L5, L6, L7, L8, L9, L10, L11, L46) (early production)
76779	Stator—Oscillator stator complete with rotor, coils, and capacitor (S1, C3, C7, L1, L2, L3, L4, L5, L6, L7, L8, L9, L10, L11, L46) (production marked "M1")
76556	Stator—R-F grid stator complete with rotor, coils and resistors (S4, L32, L33, L34, L35, L36, L37, L38, L39, L40, L41, L53, C19, R11, R12)
76553	Stator—R-F plate stator complete with rotor, coils, capacitor and resistor (S3, L22, L23, L24, L25, L26, L27, L28, L29, L30, L31, L50, C14, R7)
76561	Strap—Channel #13 r-f grid strap (L52)
76526	Strip—Coil segment mounting strip—L.H. lower
76544	Strip—Coil segment mounting strip—L.H. upper—less trimmer
76525	Strip—Coil segment mounting strip—R.H. center
75446	Stud—Capacitor stud—brass— #4-40 x 13/16" with 3/64" screw driver slot for trimmer coil L49, C15 uncoded and coded "ER"
75447	Stud—Capacitor stud—brass— #4-40 x 13/16" with 3/64" screw driver slot for trimmer coil L49, C15 coded numerically and "Hi Q"
76740	Stud—#6-32 x 1" adjusting stud for capacitor No. 76545 (early production)
75173	Stud—6-32 x 13/16" adjusting stud for capacitor No. 76781 (production marked "M1")
76536	Transformer—Antenna matching transformer complete (T2, C24, C25, C26, C27, L58, L59, L60, L61, L62, J1)
76528	Transformer—Converter transformer (T1, R3)
76540	Trap—FM trap complete with adjustable core (L58)
76535	Trap—I-F trap (L65)
76542	Trap—I-F trap (41.25 MC) complete with core (L60)
76541	Trap—I-F trap (45.75 MC) complete with core (L59)
75190	Washer—Insulating washer (neoprene) for mounting capacitor on coil strip
	CHASSIS ASSEMBLIES
	KCS 66—Models 17T153, 17T154, 17T155, 17T160
	KCS 66A— Models 17T172, 17T173, 17T174
	KCS 66D—Models 17T172K, 17T173K, 17T174K
76456	Bracket—Channel indicator lamp bracket
76454	Bracket—Mounting bracket complete with insulator for picture control
76800	Capacitor—Adjustable trimmer, steatite, 1-4 mmf. (C226)
71496	Capacitor—Adjustable
31709	Capacitor—Ceramic, 10 mmf. (C219, C227)
75217	Capacitor—Mica trimmer dual 10-160 mmf. (C181A, C181B)
33380	Capacitor—Ceramic, 12 mmf. (C220)
38868	Capacitor—Ceramic, 33 mmf. (C151)
71924	Capacitor—Ceramic, 56 mmf. (C105)
76384	Capacitor—Ceramic, 56 mmf., 7000 volts (C193) (KCS66 & KCS66A)
76475	Capacitor—Mica, 68 mmf. (C182)
76474	Capacitor—Mica, 82 mmf. (C157)
71514	Capacitor—Ceramic, 82 mmf. (C225)
39396	Capacitor—Ceramic, 100 mmf. (C156, C215)
75437	Capacitor—Ceramic, 100 mmf. (C222)
76673	Capacitor—Ceramic, 220 mmf. (C177)
47617	Capacitor—Ceramic, 270 mmf. (C117)
73091	Capacitor—Mica, 270 mmf. (C218)

REPLACEMENT PARTS (Continued)

STOCK No.	DESCRIPTION
76473	Capacitor—Mica, 330 mmf. (C110)
76476	Capacitor—Mica, 330 mmf. (C187, C211)
73094	Capacitor—Mica, 390 mmf. (C167)
39644	Capacitor—Mica, 470 mmf. (C111, C112)
76461	Capacitor—Ceramic, 500 mmf., 20,000 volts (C197)
76477	Capacitor—Mica, 820 mmf. (C190)
75166	Capacitor—Ceramic, 1500 mmf. (stand-off) (C146)
76470	Capacitor—Ceramic, dual 4700 mmf. (C135A, C135B, C141A, C141B, C142A, C142B, C143A, C143B)
73473	Capacitor—Ceramic, 4700 mmf. (C122, C123, C125, C126, C127, C128, C129, C132, C134, C136, C140, C144, C224)
73960	Capacitor—Ceramic, 10,000 mf. (C101, C106, C139, C198, C216)
75877	Capacitor—Ceramic, dual 10,000 mmf. (C102A, C102B, C107A, C107B)
76742	Capacitor—Electrolytic, 2 mfd., 10 volts (C124, C138)
74521	Capacitor—Electrolytic, 5 mfd., 50 volts (C200)
28417	Capacitor—Electrolytic, 5 mfd., 450 volts (C201)
75218	Capacitor—Electrolytic comprising 1 section of 10 mfd., 350 volts, 1 section of 5 mfd., 350 volts and 1 section of 150 mfd., 50 volts (C206A, C206B, C206C)
76451	Capacitor—Electrolytic comprising 1 section of 100 mfd., 350 volts, 2 sections of 10 mfd., 350 volts and 1 section of 20 mfd., 50 volts (C205A, C205B, C205C, C205D)
75220	Capacitor—Electrolytic, 150 mfd., 200 volts (C203, C204)
75250	Capacitor—Tubular, moulded paper, oil impregnated, .00025 mfd., 12,500 volts (C194) (KCS66 & KCS66A)
76479	Capacitor—Tubular, moulded paper, oil impregnated, .00068 mfd., 600 volts (C189)
75643	Capacitor—Tubular, paper, oil impregnated, .001 mfd., 600 volts (C150, C158, C165)
73801	Capacitor—Tubular, paper, oil impregnated, .001 mfd., 1000 volts (C168)
73598	Capacitor—Tubular, paper, oil impregnated, .0015 mfd., 600 volts (C154)
73595	Capacitor—Tubular, paper, oil impregnated, .0022 mfd., 1000 volts (C113, C163, C173)
73803	Capacitor—Tubular, paper, oil impregnated, .0022 mfd., 1000 volts (C172)
73599	Capacitor—Tubular, paper, oil impregnated, .0027 mfd., 600 volts (C118)
73795	Capacitor—Tubular, paper, oil impregnated, .0033 mfd., 600 volts (C120, C149)
73920	Capacitor—Tubular, paper, oil impregnated, .0047 mfd., 600 volts (C114, C164, C166, C213)
73561	Capacitor—Tubular, paper, oil impregnated, .01 mfd., 400 volts (C115, C119, C159, C162)
73594	Capacitor—Tubular, moulded paper, oil impregnated, .01 mfd., 600 volts (C188)
73797	Capacitor—Tubular, paper, oil impregnated, .015 mfd., 600 volts (C116, C207)
73562	Capacitor—Tubular, paper, oil impregnated, .022 mfd., 400 volts (C160, C184)
73798	Capacitor—Tubular, paper, oil impregnated, .022 mfd., 600 volts (C175)
73810	Capacitor—Tubular, paper, oil impregnated, .022 mfd., 1000 volts (C195)
73811	Capacitor—Tubular, paper, oil impregnated, .027 mfd., 1000 volts (C196)
73552	Capacitor—Tubular, paper, oil impregnated, .033 mfd., 400 volts (C223)
73596	Capacitor—Tubular, paper, oil impregnated, .033 mfd., 1000 volts (C171)
73558	Capacitor—Tubular, paper, oil impregnated, .047 mfd., 200 volts (C155)
73553	Capacitor—Tubular, paper, oil impregnated, .047 mfd., 400 volts (C212)
75071	Capacitor—Tubular, moulded paper, .047 mfd., 400 volts (C179, C180)
73592	Capacitor—Tubular, paper, oil impregnated, .047 mfd., 600 volts (C161, C185, C214)
73564	Capacitor—Tubular, paper, oil impregnated, .047 mfd., 1000 volts (C176)
73792	Capacitor—Tubular, paper, oil impregnated, .068 mfd., 400 volts (C174)
73784	Capacitor—Tubular, paper, oil impregnated, 0.1 mfd., 200 volts (C153, C169)

STOCK No.	DESCRIPTION
73551	Capacitor—Tubular, paper, oil impregnated, 0.1 mfd., 400 volts (C178, C183)
73557	Capacitor—Tubular, paper, oil impregnated, 0.1 mfd., 600 volts (C170, C192)
73786	Capacitor—Tubular, paper, oil impregnated, 0.27 mfd., 200 volts (C191)
73787	Capacitor—Tubular, paper, oil impregnated, 0.47 mfd., 200 volts (C186)
76498	Choke—Filter choke (L108)
76143	Clip—Tubular clip to mount stand-off capacitor
73477	Coil—Choke coil (L101)
76442	Coil—Horizontal linearity coil complete with adjustable core (L107)
76646	Coil—Peaking coil (72 muh) (L103, R188)
72619	Coil—Peaking coil (93 muh) (L104, R261)
75252	Coil—Peaking coil (500 muh) (L105, L113)
76640	Coil—R-F choke (1.5 muh) (L115)
76441	Coil—Width coil complete with adjustable core (L106)
35787	Connector—Phono input connector (J103)
74594	Connector—2 contact male connector for power cord
5040	Connector—4 contact female connector for speaker cable (P101)
75542	Connector—6 contact male connector—part of deflection yoke (P102)
50367	Connector—6 contact female connector for deflection yoke leads (J102)
76457	Connector—2nd. anode lead connector—mounted on hi-voltage capacitor
76460	Contact—Test point contact
75517	Contact—2nd. anode connector contact only
76447	Control—AGC control (R175)
76444	Control—Brightness control (R218)
76503	Control—Focus control (R239) (KCS66 & KCS66A)
76448	Control—Height control (R203)
76443	Control—Horizontal and vertical hold control (R201A, R201B)
76445	Control—Picture control (R167)
76449	Control—Vertical linearity control (R214)
76171	Control—Volume control and power switch (R117)
	Crystal—See Rectifier—Crystal
74956	Cushion—Rubber cushion for deflection yoke hood (2 req'd)
74839	Fastener—Push fastener for mounting tube sockets
76801	Fuse—0.2 amp., 250 volts (F101)
37396	Grommet—Rubber grommet for mounting tube sockets
76459	Grommet—Rubber grommet for 2nd. anode lead exit
76376	Hood—Deflection yoke hood less rubber cushions (KCS66 & KCS66A)
76169	Hood—Deflection yoke hood less rubber cushions (KCS66D)
76377	Insulator—Focus control insulator (KCS66 & KCS66A)
75482	Jack—Video jack (J104)
74969	Knob—Focus control knob (KCS66 & KCS66A)
76480	Lead—Anode lead complete with eyelet
76375	Magnet—Centering magnet (KCS66 & KCS66A)
76168	Magnet—Focus magnet complete (KCS66D)
76141	Magnet—Ion trap magnet (PM) (KCS66 & KCS66A)
76317	Magnet—Ion trap magnet (PM) (KCS66D)
76728	Nut—Speed nut for trimmer capacitor C226
18469	Plate—Bakelite mounting plate for electrolytic 75220
76464	Plate—Hi-voltage plate—bakelite—complete with tube socket and corona ring
76675	Rectifier—Picture Detector Crystal rectifier (CR101)
76452	Rectifier—Selenium rectifier (SR101, SR102)
76796	Resistor—Wire wound, 5.1 ohms, 1/3 watt (KCS66D)
76639	Resistor—Wire wound, 180 ohms, 2 watts (R234)
76465	Resistor—Wire wound, 330 ohms, 1 watt (R122, R123)
76468	Resistor—Wire wound, 1.5 ohms, 1/3 watt (R237) (KCS66 & KCS66A)
72633	Resistor—Wire wound, 4.7 ohms, 1/3 watt (R241) (KCS66 & KCS66A)
76469	Resistor—Wire wound, 2500 ohms, 10 watts (R131)
76390	Resistor—Wire wound, 5600 ohms, 5 watts (R151)
76638	Resistor—Wire wound, 6000 ohms, 10 watts (R163)

STOCK No.	DESCRIPTION
	Resistor—Fixed, composition:—
502043	43 ohms, ±5%, ½ watt (R159)
30732	47 ohms, ±5%, ½ watt (R109)
504047	47 ohms, ±20%, ½ watt (R233)
502056	56 ohms, ±5%, ½ watt (R138)
34763	68 ohms, ±5%, ½ watt (R105, R146)
13961	82 ohms, ±5%, ½ watt (R101)
502110	100 ohms, ±5%, ½ watt (R130)
504110	100 ohms, ±20%, ½ watt (R126, R133)
503118	180 ohms, ±10%, ½ watt (R152)
503122	220 ohms, ±10%, ½ watt (R174)
503133	330 ohms, ±10%, ½ watt (R160)
503147	470 ohms, ±10%, ½ watt (R215)
513147	470 ohms, ±10%, 1 watt (R246)
504147	470 ohms, ±20%, ½ watt (R177)
513156	560 ohms, ±10%, 1 watt (R253)
34766	1000 ohms, ±5%, ½ watt (R111)
503210	1000 ohms, ±10%, ½ watt (R135, R137, R153, R180, R300)
504210	1000 ohms, ±20%, ½ watt (R103, R108, R125, R140, R148, R156)
30731	1200 ohms, ±5%, ½ watt (R110)
503212	1200 ohms, ±10%, ½ watt (R183)
503222	2200 ohms, ±10%, ½ watt (R168)
504233	3300 ohms, ±20%, ½ watt (R259)
30694	3900 ohms, ±5%, ½ watt (R157)
503239	3900 ohms, ±10%, ½ watt (R228)
503247	4700 ohms, ±10%, ½ watt (R162)
504247	4700 ohms, ±20%, ½ watt (R147)
503256	5600 ohms, ±10%, ½ watt (R164)
14659	6800 ohms, ±5%, ½ watt (R114, R115, R141)
503268	6800 ohms, ±10%, ½ watt (R158, R176)
513268	6800 ohms, ±10%, 1 watt (R155)
523268	6800 ohms, ±10%, 2 watts (R235)
502282	8200 ohms, ±5%, ½ watt (R229)
503282	8200 ohms, ±10%, ½ watt (R165, R196, R197, R212)
503310	10,000 ohms, ±10%, ½ watt (R208)
504310	10,000 ohms, ±20%, ½ watt (R172)
503312	12,000 ohms, ±10%, ½ watt (R178, R181)
503315	15,000 ohms, ±10%, ½ watt (R258)
523315	15,000 ohms, ±10%, 2 watts (R173)
503318	18,000 ohms, ±10%, ½ watt (R106, R113, R271)
523318	18,000 ohms, ±10%, 2 watts (R161)
503322	22,000 ohms, ±10%, ½ watt (R118, R195)
71989	22,000 ohms, ±5%, 1 watt (R210, R211)
513322	22,000 ohms, ±10%, 1 watt (R227)
503327	27,000 ohms, ±10%, ½ watt (R102, R119)
513327	27,000 ohms, ±10%, 1 watt (R184)
503333	33,000 ohms, ±10%, ½ watt (R242) (KCS66 & KCS66A)
513333	33,000 ohms, ±10%, 1 watt (R169)
503339	39,000 ohms, ±10%, ½ watt (R112, R194)
503347	47,000 ohms, ±10%, ½ watt (R104, R191, R265, R267)
513347	47,000 ohms, ±10%, 1 watt (R132, R139, R269)
502356	56,000 ohms, ±5%, ½ watt (R149)
503356	56,000 ohms, ±10%, ½ watt (R187, R236, R256)
513356	56,000 ohms, ±10%, 1 watt (R107)
503368	68,000 ohms, ±10%, ½ watt (R128, R143)
504368	68,000 ohms, ±20%, ½ watt (R198, R205)
513368	68,000 ohms, ±10%, 1 watt (R226)
8064	82,000 ohms, ±5%, ½ watt (R144)
512382	82,000 ohms, ±5%, 1 watt (R231)
513382	82,000 ohms, ±10%, 1 watt (R225)
503410	100,000 ohms, ±10%, ½ watt (R129, R206, R220, R268)
504410	100,000 ohms, ±20%, ½ watt (R136, R187)
30180	120,000 ohms, ±5%, ½ watt (R209)
503412	120,000 ohms, ±10%, ½ watt (R190, R191, R245)
503415	150,000 ohms, ±10%, ½ watt (R145, R150, R186, R221)
504415	150,000 ohms, ±20%, ½ watt (R170, R217)
512415	150,000 ohms, ±5%, 1 watt (R230)
503418	180,000 ohms, ±10%, ½ watt (R257)
503422	220,000 ohms, ±10%, ½ watt (R185, R219)
503427	270,000 ohms, ±10%, ½ watt (R193)
503433	330,000 ohms, ±10%, ½ watt (R120, R222)
512433	330,000 ohms, ±5%, 1 watt (R224)
503447	470,000 ohms, ±10%, ½ watt (R199, R232, R264)
504447	470,000 ohms, ±20%, ½ watt (R121, R263)
503456	560,000 ohms, ±10%, ½ watt (R202, R270)
30562	680,000 ohms, ±5%, ½ watt (R127)
503482	820,000 ohms, ±10%, ½ watt (R200, R204, R223)
503510	1 megohm, ±10%, ½ watt (R189) (KCS66D)
504510	1 megohm, ±20%, ½ watt (R182)
503512	1.2 megohm, ±10%, ½ watt (R171) (R189 in KCS66D)
503515	1.5 megohm, ±10%, ½ watt (R192)
11769	1.8 megohm, ±5%, ½ watt (R260) (KCS66D)
504522	2.2 megohm, ±20%, ½ watt (R207, R213)
503539	3.9 megohm, ±10%, ½ watt (R179)
503547	4.7 megohm, ±10%, ½ watt (R188) (KCS66 & KCS66A)
503556	5.6 megohm, ±10%, ½ watt (R166)
503582	8.2 megohm, ±10%, ½ watt (R255)
523582	8.2 megohm, ±10%, 2 watts (R240) (KCS66 & KCS66A)
504610	10 megohm, ±20%, ½ watt (R116)
523610	10 megohm, ±10%, 2 watts (R238) (KCS66 & KCS66A)
71456	Screw— #8-32 x 7/16" wing screw to mount deflection yoke
76455	Shaft—Connecting shaft (nylon) for picture and brightness controls
73584	Shield—Tube shield
75718	Socket—Channel indicator lamp socket and lead
74834	Socket—Kinescope socket
31364	Socket—Pilot lamp socket for KCS66A & KCS66D
75222	Socket—Tube socket, octal, ceramic, plate mounted
76453	Socket—Tube socket, octal, moulded bakelite, plate mounted
31251	Socket—Tube socket, octal, wafer
76462	Socket—Tube socket, noval, moulded saddle mounted
50367	Socket—Tube socket, 6 pin, moulded saddle mounted
73115	Socket—Tube socket, 7 pin, moulded plate mounted, miniature
73117	Socket—Tube socket, 7 pin, wafer miniature
71508	Socket—Tube socket for 1B3GT/8016
14270	Spring—Retaining spring for focus control knob (KCS66 & KCS66A)
75173	Stud—Adjusting stud for trimmer capacitor C226
76636	Stud—Adjusting stud complete with guard for focus magnet
76428	Support—Bakelite support only—part of hi-voltage shield
76446	Switch—Tone control and phono switch (S101)
76463	Terminal—Screw type grounding terminal
76432	Transformer—First pix i-f, grid transformer complete with adjustable cores (T104, C121, R124)
76434	Transformer—First pix i-f plate transformer complete with adjustable cores (T105, C130, C131, R134)
76435	Transformer—Second pix i-f grid transformer complete with adjustable cores (T106, C133)
76433	Transformer—Third or fourth pix i-f transformer (T107, T108)
76436	Transformer—Fifth pix i-f transformer (T109, C145, C147, L102, R154, CR101)
76430	Transformer—Hi-voltage transformer (T114, R272) (KCS66 & KCS66A)
76795	Transformer—Hi-voltage transformer T114 (KCS66D)
76440	Transformer—Horizontal oscillator transformer complete with adjustable cores (T113)
76429	Transformer—Power transformer, 115 volts, 60 cycle (T112)
76439	Transformer—Ratio detector transformer complete with adjustable cores (T102, C108, C109)
76437	Transformer—Sound take-off transformer complete with adjustable cores (T110, C148)
76438	Transformer—Sound i-f transformer complete with adjustable cores (T101, C103, C104)
76431	Transformer—Vertical output transformer (T111)
76482	Trap—4.5 mc trap (L114, C137)
76616	Yoke—Deflection yoke complete with 6 contact male connector (L109, L110, L111, L112, C199, R243, R244, R262, P102)
	SPEAKER ASSEMBLIES 971490-2W RL 105C18 RMA 274
75024	Cone—Cone and voice coil (3.2 ohms)
5039	Connector—4 prong male plug for speaker (J101)
75022	Speaker—8" P.M. speaker complete with cone and voice coil (3.2 ohms) less transformer and plug
75520	Transformer—Output transformer (T103)
	NOTE: If stamping on speaker in instrument does not agree with above speaker numbers, order replacement parts by referring to model number of instrument, number stamped on speaker and full description of part required.
	SPEAKER ASSEMBLIES 971490-2-R RMA-285
77129	Cone—Cone and voice coil
	SPEAKER ASSEMBLIES 92569-14-W RL-111A11 RMA-274 (For Model 17T172 & 17T173)
75682	Cone—Cone and voice coil (3.2 ohms)
5039	Connector—4 contact male connector

REPLACEMENT PARTS (Continued)

STOCK No.	DESCRIPTION
76833	Speaker—12" P.M. speaker complete with cone and voice coil less transformer and plug
75520	Transformer—Output transformer
	SPEAKER ASSEMBLIES
	971494-1W
	RL-111B2
	RMA-274
	(For Model 17T172)
76296	Cone—Cone and voice coil (3.2 ohms)
5039	Connector—4 contact male connector
76389	Speaker—12" P.M. speaker complete with cone and voice coil (3.2 ohms) less output transformer and plug
75520	Transformer—Output transformer
	7CB4 STAND
	(Used with Model 17T155)
76097	Catch—Door catch and strike (1 set)
74308	Hinge—Lower hinge for door (consists of both L.H. and R.H. hinges)
76096	Hinge—Upper hinge for door (consists of both L.H. and R.H. hinges)
X3233	Pull—Door pull—mahogany
X3234	Pull—Door pull—walnut
X3235	Pull—Door pull—oak
76637	Screw— #10 x 1¼" cross recessed oval head wood screw for door pull
	7CB5 STAND
	(Used with Model 17T155)
76094	Pull—Door pull
	7CB6 STAND
	(Used with Model 17T153, 17T154)
X3241	Pull—Door pull—mahogany (1 set)
X3247	Pull—Door pull—blonde (1 set)
	MISCELLANEOUS
76605	Back—Cabinet back complete with power cord and terminal board for Model 17T153
76643	Back—Cabinet back complete with power cord and terminal board for Model 17T155
76644	Back—Cabinet back complete with power cord and terminal board for Model 17T160
76606	Back—Cabinet back complete with power cord for Model 17T162
76607	Back—Cabinet back complete with power cord for Model 17T172
76777	Back—Cabinet back complete with power cord for Model 17T173
76608	Back—Cabinet back complete with power cord for Model 17T174
76831	Back—Cabinet back complete with power cord for Model 17T172K
76835	Back—Cabinet back complete with power cord for Model 17T173K
76832	Back—Cabinet back complete with power cord for Model 17T174K
76184	Board—Antenna terminal board
76590	Bracket—Hanger bracket from cabinet top panel to support deflection yoke hood
76599	Bracket—"U" shape bracket to anchor "L" shape rods for kinescope mounting (2 req'd) for Models 17T155, 17T160, 17T162, 17T172, 17T173, 17T174
71599	Bracket—Pilot lamp bracket for Models 17T162, 17T172 & 17T174
13103	Cap—Pilot lamp cap for Models 17T162, 17T172, 17T174
71892	Catch—Bullet catch and strike for cabinet doors for Model 17T173, 17T174
X3232	Cloth—Baffle board and grille cloth for walnut and mahogany Model 17T174
X3239	Cloth—Baffle board and grille cloth for oak Model 17T174
X3120	Cloth—Grille cloth for Model 17T173
X1917	Cloth—Grille cloth for mahogany or walnut instruments for Models 17T155 & 17T160
X1918	Cloth—Grille cloth for oak instruments for Models 17T155 & 17T160
X3199	Cloth—Grille cloth for mahogany or walnut instruments for Models 17T162, 17T172
X3089	Cloth—Grille cloth for oak instruments for Models 17T162, 17T172
75474	Connector—Single contact male connector for television antenna cable (2 req'd)
39153	Connector—4 contact male connector for television antenna cable
71457	Cord—Power cord and plug
76631	Cushion—Rubber cushion for dust sealing the kinescope
76582	Cushion—Rubber cushion (channel) for safety glass for Model 17T153
76627	Cushion—Rubber cushion for safety glass (4 req'd) for Models 17T155, 17T160, 17T162, 17T172, 17T173, 17T174
76512	Decal—Control function decal for oak instruments
76511	Decal—Control function decal for Model 17T153 or for mahogany or walnut instruments
71984	Decal—Trade mark decal for Model 17T174
74809	Emblem—"RCA Victor" emblem

STOCK No.	DESCRIPTION
75456	Escutcheon—Channel marker escutcheon
74889	Feet—Felt feet for cabinet (4 req'd) for Model 17T153
72113	Foot—Rubber foot for cabinet (4 req'd) for Model 17T155
76581	Glass—Safety glass for Model 17T153
76615	Glass—Safety glass for mahogany or walnut Models 17T155, 17T160, 17T162, 17T172, 17T173 & 17T174
76680	Glass—Safety glass for oak Models 17T155, 17T160, 17T162, 17T172 & 17T174
37396	Grommet—Rubber grommet for mounting speaker (3 req'd) for Models 17T172, 17T173
74308	Hinge—Cabinet door hinge (1 set) for Models 17T172, 17T173 & 17T174
76596	Knob—Brightness control or vertical hold control—beige—for oak instruments (outer)
76595	Knob—Brightness control or vertical hold control knob—maroon—for mahogany or walnut instruments (outer)
76594	Knob—Channel selector knob—beige—for oak instruments (inner)
76593	Knob—Channel selector knob—maroon—for mahogany or walnut instruments (inner)
76592	Knob—Fine tuning control knob—beige—for oak instruments (outer)
76591	Knob—Fine tuning control knob—maroon—for mahogany or walnut instruments (outer)
75464	Knob—Picture control, horizontal hold control or volume control and power switch knob—beige—for oak instruments (inner)
74963	Knob—Picture control, horizontal hold control or volume control and power switch knob—maroon—for mahogany or walnut instruments (inner)
76598	Knob—Tone control and phono switch knob—beige—for oak instruments (outer)
76597	Knob—Tone control and phono switch knob—maroon—for mahogany or walnut instruments (outer)
11765	Lamp—Channel marker escutcheon or pilot lamp—Mazda #51
75459	Mask—Channel marker escutcheon, light mask—burgundy—for mahogany or walnut instruments
76589	Mask—Channel marker escutcheon light mask—medium dark beige—for oak instruments for Models 17T155, 17T160, 17T162, 17T172 & 17T174
76580	Mask—Polystyrene masking panel for kinescope for Model 17T153
76679	Mask—Polystyrene masking panel for Models 17T155, 17T160, 17T162, 17T172, 17T173 & 17T174
73634	Nut—Speed nut for speaker mounting screws (3 req'd) for Models 17T162, 17T172, 17T173 & 17T174
71455	Nut— #8-32 wing nut to mount yoke hood to hanger bracket
76177	Nut— #10-32 special nut for deflection yoke hood support rods (2 req'd)
76601	Pad—Kinescope edge support pad (2 req'd)
76515	Plate—Back plate for door pull (2 req'd) for Model 17T172
73034	Pull—Door pull (rosette design) (2 req'd) for Model 17T172
76513	Pull—Door pull (basket weave design) (2 req'd) for Model 17T172
76774	Pull—Door pull, upper for Model 17T173
76775	Pull—Door pull, lower for Model 17T173
76176	Rod—"L" shape threaded rod to support deflection yoke hood assembly (2 req'd)
74307	Screw—#8-32 x 1⅛" trimit head screw for door pull 73034
76514	Screw—#10-24 x 1⅛" trimit head screw for door pull 76513
76632	Screw— #8 x ⅝" self tapping hex head wood to mount polystyrene panel (12 req'd) or hanger bracket (2 req'd) for Models 17T155, 17T160, 17T162, 17T172 & 17T174
76776	Screw—#4-40 x 13/16" trimit head screw for door pull 76775
76180	Spring—Formed spring for kinescope masking panel (6 req'd)
30330	Spring—Retaining spring for knobs #74963 & 75464
72845	Spring—Retaining spring for knobs #76591 & 76592
14270	Spring—Retaining spring for knobs #76593, 76594, 76595, 76596, 76597, 76598
73643	Spring—Spring clip for channel marker escutcheon
72936	Stop—Cabinet door stop for Model 17T174
76600	Strap—Grounding strap (copper strip ½" x 18" long) for Models 17T155, 17T160 & 17T174
75457	Washer—Felt washer—dark brown—between knob and channel marker escutcheon for metal, mahogany or walnut instruments
75458	Washer—Felt washer—beige—between knob and channel marker escutcheon for oak instruments
75500	Washer—Felt washer for cabinet back screws (4 req'd)
76836	Washer—Cellulose washer—gold for knobs for Models 17T162, 17T172, 17T173 & 17T174

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

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