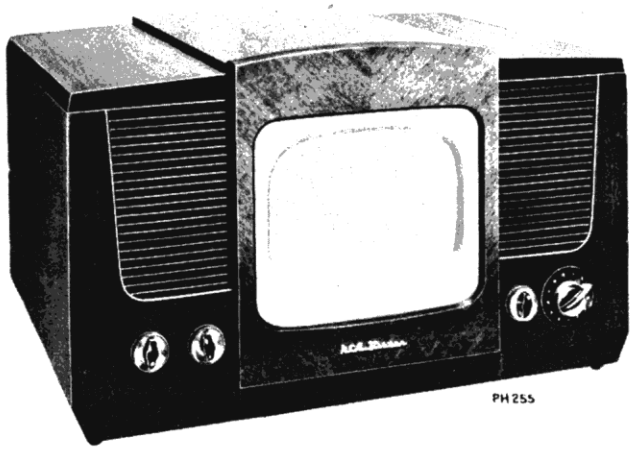
RADIO CORP. OF AMERICA

MODEL 8TS30, CHASSIS KCS-20J-1, KCS-20K-2



Walnut, Mahogany or Toasted Mahogany

GENERAL DESCRIPTION

a thirty-tube, direct-viewing, 10" table model, Television Receiver. The receiver is complete in one unit and is operated by the use of seven front-panel controls. Features of the receiver include: Full thirteen channel coverage; F-M sound system; Improved picture brilliance; A-F-C horizontal hold; Stabilized vertical hold; Two stages of video amplification; Noise saturation circuits; Three stage sync separator and clipper; Four mc. band width for picture channel, and Reduced hazard high voltage supply.

ELECTRICAL AND MECHANICAL SPECIFICATIONS

PICTURE SIZE ..... 6⅝" x 8½"—2" radius at corner

R-F FREQUENCY RANGES

Channel Number	Channel Freq. Mc.	Picture Carrier Freq. Mc.	Sound Carrier Freq. Mc.	Receiver R-F Osc. Freq. Mc.
1	44-50	45.25	49.75	71
2	54-60	55.25	59.75	81
3	60-66	61.25	65.75	87
4	66-72	67.25	71.75	93
5	76-82	77.25	81.75	103
6	82-88	83.25	87.75	109
7	174-180	175.25	179.75	201
8	180-186	181.25	185.75	207
9	186-192	187.25	191.75	213
10	192-198	193.25	197.75	219
11	198-204	199.25	203.75	225
12	204-210	205.25	209.75	231
13	210-216	211.25	215.75	237

FINE TUNING RANGE

Plus and minus approximately 300 kc on channel 1 and plus and minus approximately 750 kc on channel 13.

POWER SUPPLY RATING

KCS 20J-1 ..... 115 volts,, 60 cycles, 320 watts
KCS 20K-2 ..... 115 volts, 50 cycles, 320 watts

AUDIO POWER OUTPUT RATING

Undistorted ..... 2.5 watts
Maximum ..... 4 watts

LOUDSPEAKER (92573-2)

Type ..... 5 x 7 inch Permanent Magnet Dynamic
Voice Coil Impedance ..... 3.2 ohms at 400 cycles

WEIGHT

Chassis with Tubes in Cabinet (less Kinescope) ..... 80 lbs.
Shipping Weight ..... 93 lbs.

RECEIVER ANTENNA INPUT IMPEDANCE. .300 ohms balanced

DIMENSIONS (inches)	Length	Height	Depth
Cabinet (Outside	26	14½	19
Chassis Base (Outside)	19¼	3¾	15½
Chassis Overall	21¾	11¾	16⅛

RCA TUBE COMPLEMENT

	Tube Used	Function
(1)	RCA 6J6	R-F Amplifier
(2)	RCA 6J6	R-F Oscillator
(3)	RCA 6J6	Converter
(4)	RCA 6BA6	1st Sound I-F Amplifier
(5)	RCA 6BA6	2nd Sound I-F Amplifier
(6)	RCA 6AU6	3rd Sound I-F Amplifier
(7)	RCA 6AL5	Sound Discriminator
(8)	RCA 6AT6	1st Audio Amplifier
(9)	RCA 6K6GT	Audio Output
(10)	RCA 6AG5	1st Picture I-F Amplifier
(11)	RCA 6AG5	2nd Picture I-F Amplifier
(12)	RCA 6AG5	3rd Picture I-F Amplifier
(13)	RCA 6AG5	4th Picture I-F Amplifier
(14)	RCA 6AL5	Picture 2nd Detector and D-C Restorer
(15)	RCA 6AU6	1st Video Amplifier
(16)	RCA 6K6GT	2nd Video Amplifier
(17)	RCA 6SK7	1st Sync Amplifier
(18)	RCA 6SH7	Sync Separator
(19)	RCA 6SN7GT	2nd Sync Amplifier and Horizontal Discharge
(20)	RCA 6J5	Vertical Sweep Oscillaor and Discharge
(21)	RCA 6K6GT	Vertical Sweep Output
(22)	RCA 6AL5	Horizontal Sync Discriminator
(23)	RCA 6K6GT	Horizontal Sweep Oscillator
(24)	RCA 6AC7	Horizontal Sweep Oscillator Control
(25)	RCA 6BG6G	Horizontal Sweep Output
(26)	RCA 5V4G	Horizontal Reaction Scanning
(27)	RCA 1B3-GT/8016	High Voltage Rectifier
(28)	RCA 5U4G	Power Supply Rectifiers (2 tubes)
(29)	RCA 10BP4	Kinescope

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ELECTRICAL AND MECHANICAL SPECIFICATIONS (Continued)

PICTURE I-F FREQUENCIES

Picture Carrier Frequency	25.75 Mc.
Adjacent Channel Sound Trap	27.25 Mc.
Accompanying Sound Traps	21.25 Mc.
Adjacent Channel Picture Carrier Trap	19.75 Mc.

SOUND I-F FREQUENCIES

Sound Carrier Frequency	21.25 Mc.
Sound Discriminator Band Width between peaks)	350 kc

VIDEO RESPONSE ..... To 4 Mc.

FOCUS ..... Magnetic

SWEEP DEFLECTION ..... Magnetic

SCANNING ..... Interlaced, 525 line

HORIZONTAL SCANNING FREQUENCY ..... 15,750 cps

VERTICAL SCANNING FREQUENCY ..... 60 cps

FRAME FREQUENCY (Picture Repetition Rate) ..... 30 cps

OPERATING CONTROLS (front panel)

Channel Selector, Fine Tuning } ..... Dual Control Knobs

Picture, Sound Volume and On-Off Switch } ..... Dual Control Knobs

Picture Horizontal Hold, Picture Vertical Hold } ..... Dual Control Knobs

Brightness ..... Single Control Knob

NON-OPERATING CONTROLS not including r-f & i-f adjustments)

Horizontal Centering	rear chassis adjustment
Vertical Centering	rear chassis adjustment
Width	rear chassis screwdriver adjustment
Height	rear chassis adjustment
Horizontal Linearity	top chassis screwdriver adjustment
Vertical Linearity	rear chassis adjustment
Horizontal Drive	rear chassis adjustment
Horizontal Oscillator Frequency	rear chassis adjustment
Horizontal Oscillator Phase	bottom chassis adjustment
Focus	rear chassis adjustment
Focus Coil	top chassis wing nut adjustment
Ion Trap Magnet	top chassis thumb screw adjustment
Deflection Coil	top chassis wing nut 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 OPEN THE KINESCOPE SHIPPING CARTON, 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 these reasons, kinescopes 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. In installation, 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 kinescopes are shipped in special cartons and should be left in the cartons until ready for installation in the receiver. Keep the carton for possible future use.

OPERATING INSTRUCTIONS

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

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

2. Set the STATION SELECTOR to the desired channel.

3. Turn the PICTURE control fully counter-clockwise.

4. Turn the BRIGHTNESS control clockwise, until a glow appears on the screen then counter-clockwise until the glow just disappears.

5. Turn the PICTURE control clockwise until a glow or pattern appears on the screen.

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

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

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

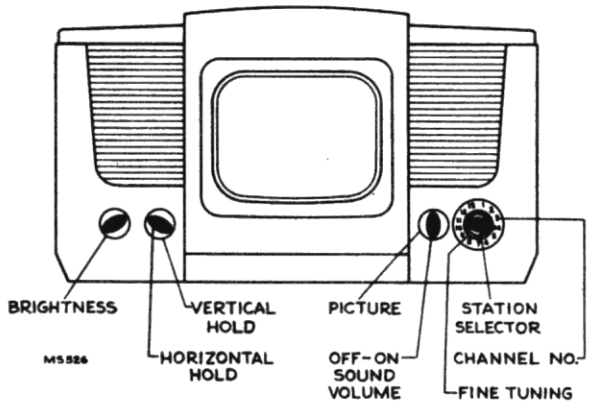

Figure 1—Receiver Operating Controls

9. Adjust the PICTURE control for suitable picture contrast.

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

11. In switching from one station to another, it may be necessary to repeat steps number 6 and 9.

12. When the set is turned on again after an idle period, it should not be necessary to repeat the adjustments if the positions of the controls have not been changed. If any adjustment is necessary, step number 6 is generally sufficient.

13. If the positions of the controls have been changed, it may be necessary to repeat steps number 1 through 9.

NOTE: If any difficulty is experienced with steps number 7 or 8, turn the PICTURE control ¼ turn counterclockwise and repeat those adjustments.

INSTALLATION INSTRUCTIONS

The Model television receiver is shipped complete in one carton except for the 10BP4 kinescope. The kinescope is shipped in a special carton and should not be unpacked until ready for installation.

UNPACKING—To unpack the receiver, tear open the carton bottom flaps, pick the receiver up from under the bottom of the cabinet and lift it out of the shipping carton.

The cabinet safety glass front panel is packed in a cardboard box. Remove the box and unpack the panel. Take off the cabinet top and back.

The operating control knobs are packed in a paper bag which is tied to the inside of the cabinet brace. Remove the bag.

Remove the protective cardboard shield from the 5U4G rectifier. Make sure all tubes are in place and are firmly seated in their sockets.

Loosen the two kinescope cushion adjustment wing screws and slide the cushion toward the rear of the chassis. Loosen the deflection yoke adjustment, slide the yoke toward the rear of the chassis and tighten. See Figure 2 for the location of the cushion and yoke adjustments.

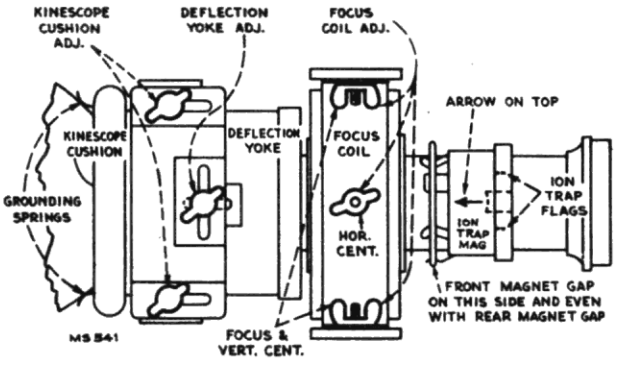

Figure 2—Yoke and Focus Coil Adjustments

From the front of the cabinet, look through the deflection yoke and check the alignment of the focus coil with the yoke. If the focus coil is not in line, loosen the three focus coil adjustment wingnuts and raise, lower, or rotate the coil until alignment is obtained. Tighten the wingnuts with the coil in this position.

Loosen the two lower kinescope face centering slides, and set them at approximately mid position. See Figure 3 for location of the slides and their adjustment screws.

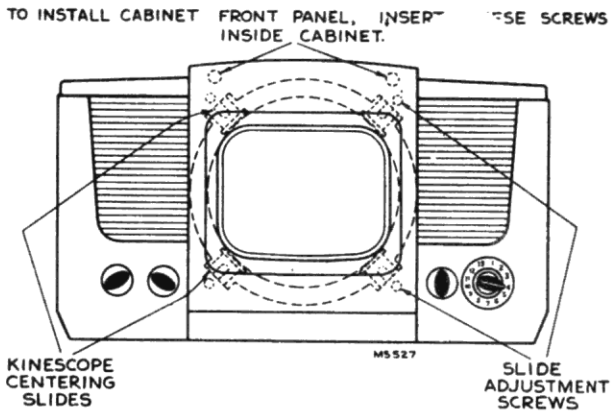

Figure 3—Cabinet, Front View

KINESCOPE HANDLING PRECAUTION—Do not open the kinescope shipping carton, 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. The shipping carton should be kept for use in case of future moves.

MODEL 8TS30, CHASSIS KCS-20J-1, KCS-20K-2

RADIO CORP. OF AMERICA

INSTALLATION INSTRUCTIONS

INSTALLATION OF KINESCOPE—The kinescope second anode contact is a recessed metal well in the side of the bulb. The tube must be installed so that this contact is approximately on top. The final orientation of the tube will be determined by the position of the ion trap flags. Looking at the kinescope gun structure, it will be observed that the second cylinder from the base inside the glass neck is provided with two small metal flags, as shown in Figure 4. The kinescope must be installed so that when looking down on the chassis, the two flags will be seen as shown in Figure 2.

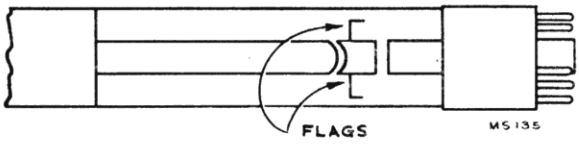

Figure 4—Ion Trap Flags

Insert the neck of the kinescope through the deflection and focus coils as shown in Figure 5 until the base of the tube protrudes approximately two inches beyond the focus coil. If the tube sticks, or fails to slip into place smoothly, investigate and remove the cause of the trouble. Do not force the tube.

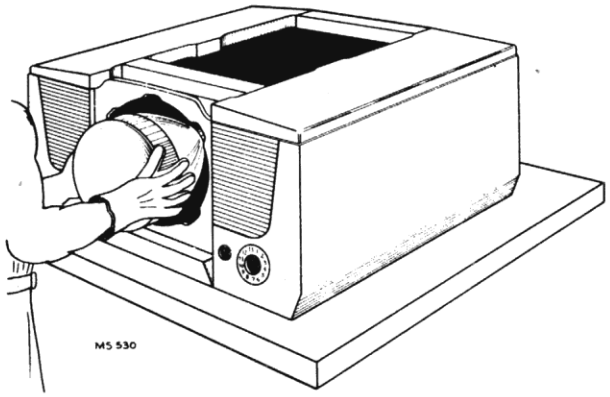

Figure 5—Kinescope Insertion

Early production receivers employed an EM type of ion trap magnet like that in the model 630TS receiver. Late production receivers employed a PM type magnet as shown in Figure 2.

If an EM type of magnet is applied, slip the assembly over the neck of the kinescope with the coils down and the large coil towards the base of the tube. Tighten the magnet adjustment thumbscrews sufficiently to hold it in position but still free enough to permit adjustment.

If the PM type is employed, slip the assembly over the neck of the kinescope with the large magnet towards the base of the tube and with the arrow on the assembly up as shown in Figure 2. The front magnet is movable on the assembly. The correct position of the front magnet is with the gap on the left side (from the rear of the cabinet) and even with the gap of the rear magnet.

Connect the kinescope socket to the tube base. Insert the kinescope until the face of the tube protrudes approximately one-quarter of an inch outside the front of the cabinet. Adjust the four centering slides until the face of the kinescope is in the center of the cabinet opening. Tighten the four slides securely.

Wipe the kinescope screen surface and front panel safety glass clean of all dust and finger marks with a soft cloth moistened with the Drackett Co.'s "Windex" or similar cleaning agent.

Install the cabinet front panel as indicated in Figure 3.

To install the front panel place the lip on the bottom of the panel in the recess below the kinescope opening and push the top in. Insert the two screws from the bag with the knobs into the back of panel as shown in Figure 3.

Slip the kinescope as far forward as possible. Slide the kinescope cushion firmly up against the flare of the tube and tighten the adjustment wing screws. Slide the deflection yoke as far forward as possible. Connect the high voltage lead to the kinescope second anode socket.

The antenna and power connections should now be made. Turn the power switch to the "on" position, the brightness control fully clockwise, and picture control counter-clockwise.

ION TRAP MAGNET ADJUSTMENT—The ion trap rear magnet poles should be approximately over the ion trap flags as shown in Figure 2. Starting from this position adjust the magnet by moving it forwards or backwards 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. Adjust the focus control (R184 on the chassis rear apron) until the line structure of the raster is clearly visible. Readjust the ion trap magnet for maximum raster brilliance. The final touches on this adjustment should be made with the brightness control at the maximum position with which good line focus can be maintained.

FOCUS COIL ADJUSTMENTS—Turn the centering controls R181 and R211 to mid position. See Figure 6 for location of these rear apron controls.

If a corner of the raster is shadowed, it indicates that the electron beam is striking the neck of the tube. Loosen the focus coil adjustment wing nuts and rotate the coil about its vertical and horizontal axis until the entire raster is visible, approximately centered and with no shadowed corners. Tighten the focus coil adjustment wing nuts with the coil in this position.

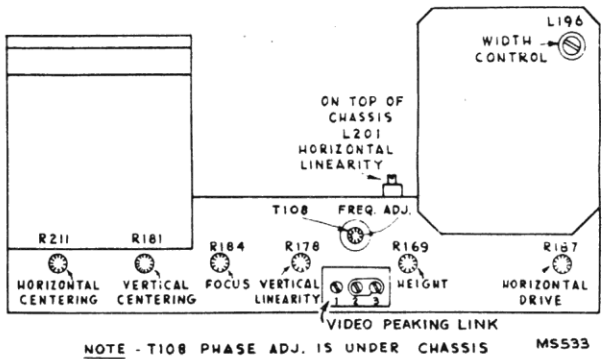

Figure 6—Rear Chassis Adjustments

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

PICTURE ADJUSTMENTS—It will now be necessary to obtain a test pattern picture in order to make further adjustments. See steps 2 through 9 and the note of the receiver operating instructions on page 3.

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

If the receiver passes the above checks and the picture is normal and stable, the horizontal oscillator is properly aligned. Skip "Alignment of Horizontal Oscillator and proceed with 'FOCUS' adjustment."

INSTALLATION INSTRUCTIONS

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

Slight Retouching Adjustments Tune in a Television Station and adjust the fine tuning control for best sound quality. Sync the picture and adjust the picture control for slightly less than normal contrast. Turn the horizontal hold control to the extreme position in which the oscillator fails to hold or to pull in. Momentarily remove the signal. Turn the T108 frequency adjustment on the chassis rear apron until the oscillator pulls into sync. Check hold and pull-in for the other extreme position of the hold control.

Complete Realignment—Tune in a Television Station and adjust the fine tuning control for best sound quality.

Turn the T108 frequency adjustment on rear apron until the picture is synchronized. Adjust the picture control so that the picture is somewhat below average contrast level.

Turn the T108 phase adjustment screw (under chassis) until the blanking bar, which may appear in the picture, moves to the right and off the raster. The range of this adjustment is such that it is possible to hit an unstable condition (ripples in the raster). The screw must be turned clockwise from the unstable position. The length of stud beyond the bushing in its correct position is usually about $\frac{1}{2}$ inch.

Turn horizontal hold to the extreme counter-clockwise position. Turn T108 frequency adjustment clockwise until the picture falls out of sync. Then turn it slowly counter-clockwise to the point where the picture falls in sync again.

Readjust T108 phase adjustment so that the left side of the picture is close to the left side of the raster, but does not begin to fold over.

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

Momentarily remove the signal. When the signal is restored, the picture should fall in sync. If it doesn't, turn T108 frequency adjustment counter-clockwise until the picture falls in sync.

Turn horizontal hold to the extreme counter-clockwise position. Remove the signal momentarily. When signal is restored, the picture should fall in sync.

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

There is a difference between the pull-in range and hold-in range of frequencies. Once in sync, the circuit will hold about 50% to 100% more variation in frequency than it can pull in. The range of the horizontal hold control is only approximately equal to the pull-in range, considerable variation may be found due to variations in the cut-off characteristic of the horizontal oscillator control tubes, V124.

FOCUS—Adjust the focus control R184 for maximum definition of the vertical wedge of the test pattern.

HEIGHT AND VERTICAL LINEARITY ADJUSTMENTS—Adjust the height control (R169 on chassis rear apron) until the picture fills the mask vertically ($6\frac{3}{8}$ inches). Adjust vertical linearity (R178 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 vertical centering to align the picture with the mask.

WIDTH AND HORIZONTAL LINEARITY ADJUSTMENTS—Turn the horizontal drive (R187 on rear apron) clockwise as far as possible without causing crowding of the right of the picture. This position provides maximum high voltage to the kinescope second anode. Adjust the width control (L196 on rear chassis) until the picture just fills the mask horizontally ($8\frac{1}{2}$ inches). Adjust the horizontal linearity control L201 (see Figure 6) until the test pattern is symmetrical left to right. A slight readjustment of the horizontal drive control may be necessary when the linearity control is used. Adjust horizontal centering to align the picture with the mask.

If repeated adjustments of drive width and linearity fail to give proper linearity, it may be necessary to move the tap on R209, which is located in the high voltage compartment. Adjustments of drive, width and linearity must then be repeated. **Check to see that all cushion, yoke, focus coil and ion trap magnet thumb screws are tight.** Replace the cabinet back and top. Make sure that the back is on tight, otherwise it may rattle at high volume.

CHECK OF R-F OSCILLATOR ADJUSTMENTS—With a crystal calibrated test oscillator or heterodyne frequency meter, check 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 8. The adjustments for channels 1 through 5 and 7 through 12 are available from the front of the cabinet by removing the station selector escutcheon as shown in Figure 7. Adjustments for channels 6 and 13 are under the chassis.

VIDEO PEAKING LINK—A video peaking link is provided (see Figure 6) to permit changing the video response. If the pictures from the majority of stations look better with the link closed, (2-3 position) then the link should be placed in that position. However, if transients are produced on high contrast pictures then the link should be left open (1-2 position).

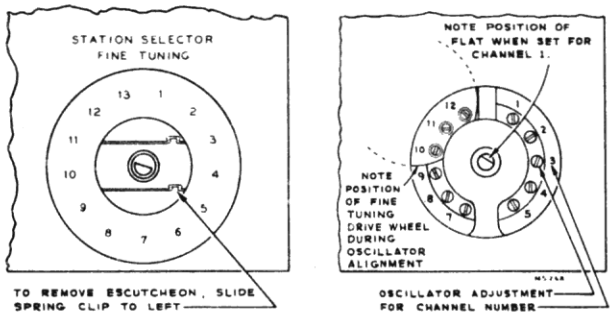

Figure 7—R-F Oscillator Adjustments

ANTENNA TRAP—In some instances interference may be encountered from FM stations that are on the image frequency of a television station. In other instances interference between two television stations may be observed.

Assume that two television stations in a city are operating on channels 6 and 10. When the receiver is tuned to channel 6, a small amount of the oscillator voltage (109 mc.) is present on the r-f amplifier grid. This 109 mc. voltage beats with the channel 10 picture carrier and produces an 84.25 mc. signal. This signal falls within the channel 6 range and interferes with the reception of channel 6. A similar case occurs between channels 5 and 7.

A series resonant trap across the r-f amplifier grid circuit will remove the oscillator voltage from the grids and will eliminate this type of interference. In production, this trap is adjusted to reject the channel 6-10 interference. However, in the field, it may be necessary to retouch the adjustments or to readjust the trap for channel 5-7 or FM image interference.

To adjust the trap in the field, tune in the station on which the interference is observed. Tune both cores of the trap for minimum interference in the picture. See Figure 8 for the location of the trap. Keep both cores approximately the same by visual inspection. Then, turn one core $\frac{1}{2}$ turn from the original position and repeak the second for maximum rejection. Repeat this process until the best rejection is obtained. For shop alignment of the trap see the alignment procedure

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RADIO CORP. OF AMERICA

CHASSIS TOP VIEW

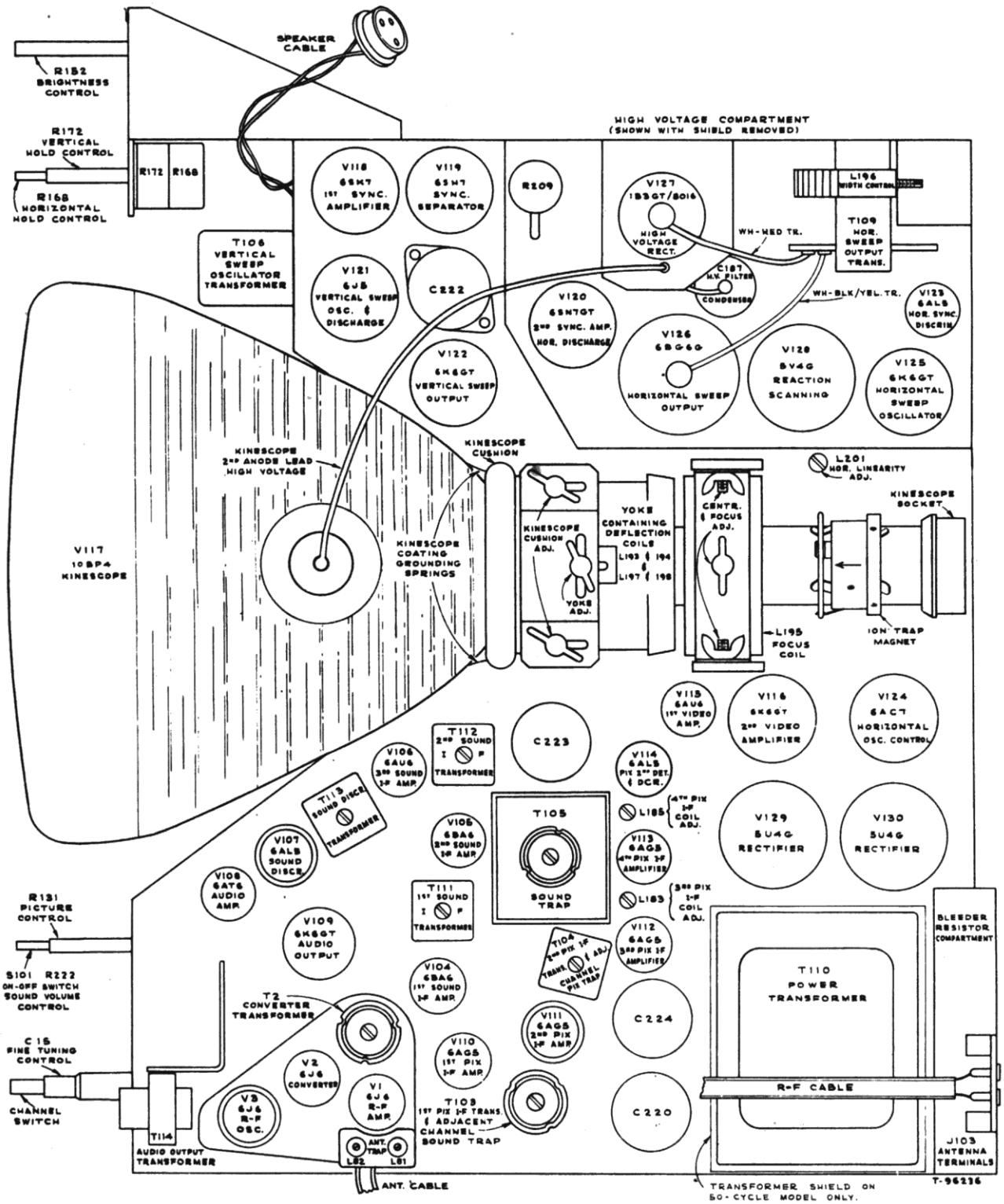

Figure 8—Chassis Top View

CHASSIS BOTTOM VIEW

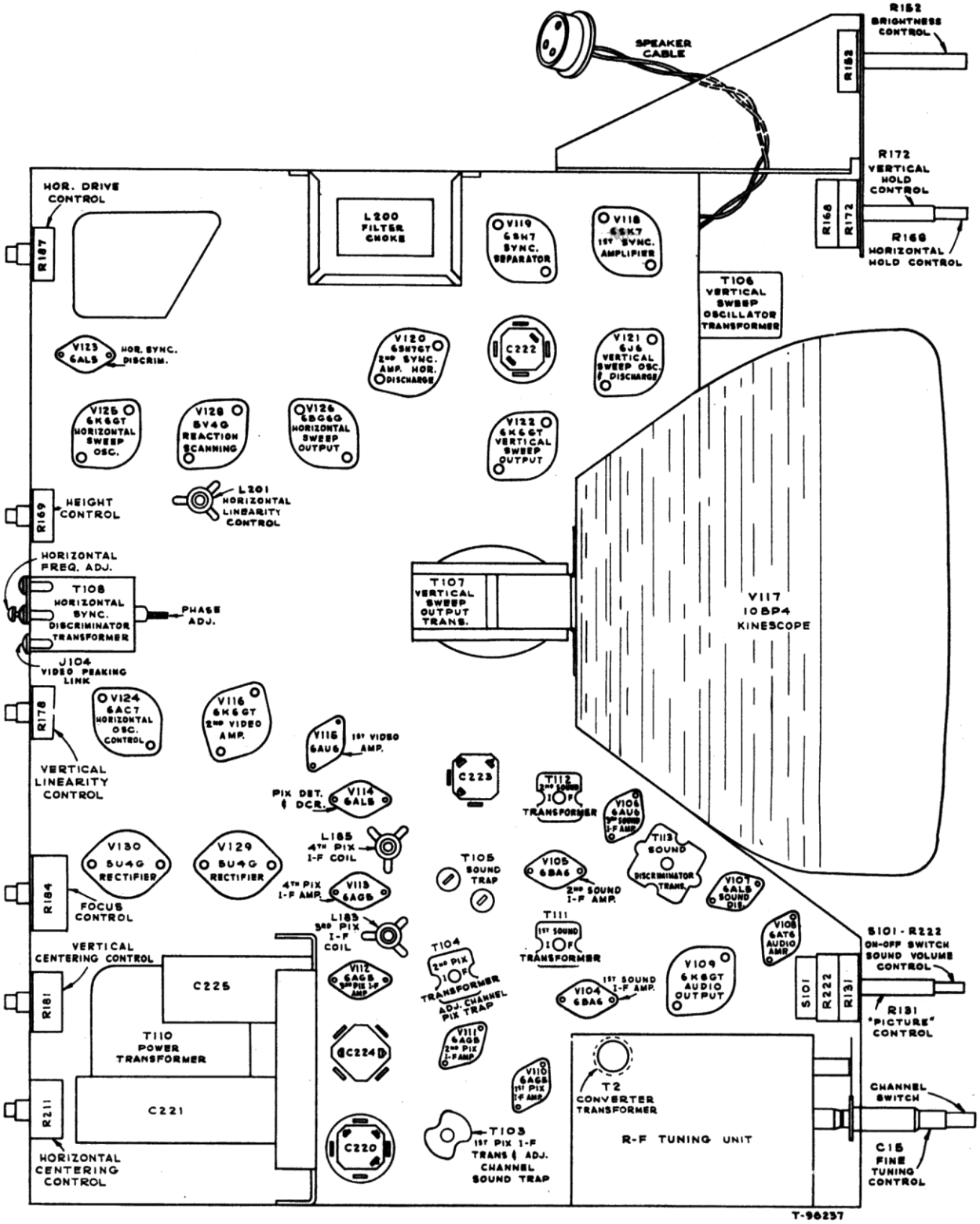

Figure 9—Chassis Bottom View

MODELS 8PC541, 8PC541-B, 8PC541-C

RADIO CORP. OF AMERICA

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
18 to 30 mc., 1 mc. sweep width
40 to 90 mc., 10 mc. sweep width
170 to 225 mc., 10 mc. sweep width

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

(c) Output constant on all ranges.

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

Cathode-ray Oscilloscope, preferably one with a wide band vertical deflection, an input calibrating source, and a low capacity probe.

Signal Generator to provide the following frequencies.

(a) I-F frequencies

19.75 mc. adjacent channel picture trap
21.25 mc. sound i-f and sound traps
21.8 mc. converter transformer
22.3 mc. second picture i-f transformer
23.4 mc. fourth picture i-f coil
25.2 mc. third picture i-f coil
25.3 mc. first picture i-f transformer
25 75 mc. picture carrier
27.25 mc. adjacent channel sound trap

(b) R-F frequencies

Channel Number	Picture Carrier Freq. Mc.	Sound Carrier Freq. Mc.
1	45.25	49.75
2	55.25	59.75
3	61.25	65.75
4	67.25	71.75
5	77.25	81.75
6	83.25	87.75
7	175.25	179.75
8	181.25	185.75
9	187.25	191.75
10	193.25	197.75
11	199.25	203.75
12	205.25	209.75
13	211.25	215.75

(c) Output on 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 "VoltOhmyst" type and a high voltage multiplier probe for use with this meter to permit measurements up to 10 kv.

Service Precautions—If necessary to remove the chassis from cabinet, the kinescope must first be removed. See Figures 3 and 5. If possible, the chassis should then be serviced without the kinescope. However, if it is necessary to view the raster during servicing, the kinescope should be inserted only after the chassis is turned on end. The kinescope should never be allowed to support its weight by resting in the deflecting yoke. A bracket should be used to support the tube at its viewing screen.

By turning the chassis on end with the power transformer down, all adjustments will be made conveniently available. Since this is the only safe position in which the chassis will rest and still leave all adjustments accessible, the trimmer location drawings are oriented similarly for ease of use.

CAUTION: Do not short the kinescope second anode lead. Its short circuit current is approximately 3 ma. This represents approximately 9 watts dissipation and a considerable overload on the high voltage filter resistor R235.

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

Due to the high frequencies at which the receiver operates the r-f oscillator line adjustment is critical and may be affected by a tube change. The line can be adjusted to proper frequency on channel 13 with practically any 6J6 tube in the oscillator socket. However, it may not then be possible to adjust the line to frequency on all of channels 7, 8, 9, 10, 11 and 12. To be satisfactory as an oscillator tube, it should be possible to adjust the line to proper frequency with the fine tuning control in the middle third of its range. It may therefore be necessary to select a tube for the oscillator socket. In replacing, if the old tube can be matched for frequency by trying several new ones, this practice is recommended. At best, however, it will probably be necessary to completely realign the oscillator line when changing the tube.

Tubes which cannot be used as oscillator will work satisfactorily as r-f amplifier or converter.

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

Sound discriminator
Sound i-f transformers
Picture i-f traps
Picture i-f transformers
R-F and converter lines
R-F oscillator line
Retouch picture i-f transformers
Antenna trap adjustment
Sensitivity check

SOUND DISCRIMINATOR ALIGNMENT—

Set the signal generator for approximately .1 volt output at 21.25 mc. and connect it to the third sound i-f grid.

Detune T113 secondary (bottom).

Set the "VoltOhmyst" on the 10 volt scale.

Connect the meter in series with a one megohm resistor to the junction of diode resistors R219 and R220. Do not remove the discriminator shield to make connection to R219 and R220.

Connection can be easily made by fashioning a hook on the 1 meg resistor lead and making connection to the transformer lug "C" through the hole provided for the adjusting tool.

Adjust the primary of T113 (top) for maximum output on the meter.

Connect the "VoltOhmyst" to the junction of R236 and C205. Adjust T113 secondary (bottom). It will be found that it is possible to produce a positive or negative voltage on the meter dependent upon this adjustment. Obviously to pass from a positive to a negative voltage, the voltage must go through zero. T113 (bottom) should be adjusted so that the meter indicates zero output as the voltage swings from positive to negative. This point will be called discriminator zero output.

Connect the sweep oscillator to the grid of the third sound i-f amplifier.

ALIGNMENT PROCEDURE

Adjust the sweep band width to approximately 1 mc. with the center frequency at approximately 21.25 and with an output of approximately .1 volt.

Connect the oscilloscope to the junction of R236 and C205. The pattern obtained should be similar to that shown in Figure 16A. If it is not, adjust the T113 (top) until the wave form is symmetrical.

The peak to peak bandwidth of the discriminator should be approximately 350 kc. and it should be linear from 21.75 mc. to 21.325 mc.

SOUND I-F ALIGNMENT—

Connect the sweep oscillator to the second sound i-f amplifier grid.

Connect the oscilloscope to the third sound i-f grid return (terminal A T112) in series with a 33,000 ohm isolating resistor. Insert a 21.25 mc. marker signal from the signal generator into the second sound i-f grid.

Adjust T112 (top and bottom) for maximum gain and symmetry about the 21.25 mc. marker. The pattern obtained should be similar to that shown in Figure 16B.

The output level from the sweep should be set to produce approximately .3 volt peak-to-peak at the third sound i-f grid return when the final touches on the above adjustment are made. It is necessary that the sweep output voltage should not exceed the specified values otherwise the response curve will be broadened, permitting slight misadjustment to pass unnoticed and possibly causing distortion on weak signals.

Connect the sweep and signal generator to the top end of the trap winding of T2 (on top of the chassis). Adjust T111 (top and bottom), for maximum gain and symmetry at 21.25 mc.

Reduce the sweep output for the final adjustments so that approximately .3 volt peak-to-peak is present at the third sound i-f grid return.

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

PICTURE I-F TRAP ADJUSTMENT—

Turn the receiver picture control for -3 volts on the picture i-f grids.

Set the channel switch to channel 13.

Connect the "VoltOhmyst" across the picture second detector load resistor R137.

Connect the output of the signal generator to the junction of C14 and R6. This connection is available on a terminal lug through a hole in the side apron of the chassis, beside the r-f unit. This hole is normally down when the chassis is in the recommended position. Connection can be easily made, however, by allowing the receiver to hang over the edge of the test bench by a few inches.

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

21.25 mc.—T2 (top)
21.25 mc.—T105 (top)
27.25 mc.—T103 (top)
19.75 mc.—T104 (top)

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."

21.8 mc.—T2 (bottom)
25.3 mc.—T103 (bottom)
22.3 mc.—T104 (bottom)
25.2 mc.—L183 (top of chassis)
23.4 mc.—L185 (top of chassis)

If T104 (bottom) required adjustment, it will be necessary to reset T104 (top) for minimum response at 19.75 mc.

Picture I-F Oscillation—If the receiver is badly misaligned and two or more of the i-f transformers are tuned to the same frequency, the receiver may fall into i-f oscillation. I-F oscillation shows up as a voltage in excess of 3 volts at the picture detector load resistor. This voltage is unaffected by r-f signal input and sometimes is independent of picture control setting. If such a condition is encountered, it is sometimes possible to stop oscillation by adjusting the transformers approximately to frequency by setting the adjustment stud extensions of T2, T103, T104, T105, L183, and L185 to be approximately equal to those of another receiver known to be in proper alignment. If this does not have the desired effect, it may now be possible to stop oscillation by increasing the grid bias. If so, it should then be possible to align the transformers by the usual method. Once aligned in this manner, the i-f should be stable with reduced bias.

If the oscillation cannot be stopped in the above manner, shunt the grids of the first three pix i-f amplifiers to ground with 1000 mmf. capacitors. Connect the signal generator to the fourth pix i-f grid and align L185 to frequency. Progressively remove the shunt from each grid and align the plate coil of that stage to frequency.

If this does not stop the oscillation, the difficulty is not due to i-f misalignment as the i-f section is very stable when properly aligned. Check all i-f by-pass condensers, transformer shunting resistors, tubes, socket voltages, etc.

R-F AND CONVERTER LINE ADJUSTMENT—

Connect the r-f sweep oscillator to the receiver antenna terminals. If the sweep oscillator has a 50 ohm single-ended output, it will be necessary to obtain balanced output by connecting as shown in Figure 10.

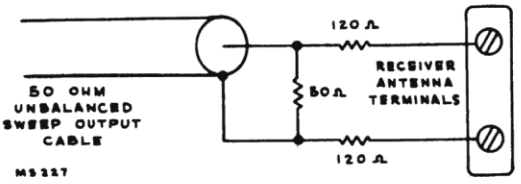

Figure 10—Unbalanced Sweep Cable Termination

Connect the oscilloscope to the junction of C14 and R6 (in the r-f tuning unit) through a 10,000 ohm resistor.

By-pass the first picture i-f grid to ground through a 1000 mmfd. capacitor. Keep the leads to this by-pass as short as possible. If this is not done, lead resonance may fall in the r-f range and cause an incorrect picture of the r-f response.

Turn the picture control for −1.5 volts on the r-f grids. Connect the signal generator loosely to the receiver antenna terminals.

Turn the antenna trap L81 and L82 cores fully counterclockwise so that the trap will not affect the channel 6 r-f response. Since channel 7 has the narrowest response of any of the

ALIGNMENT PROCEDURE

high frequency channels, it should be adjusted first.

Set the receiver channel switch to channel 7 (see Figure 15 for switch shaft flat location versus channel).

Set the sweep oscillator to cover channel 7.

Insert markers of channel 7 picture carrier and sound carrier 175.25 mc. and 179.75 mc.

Adjust L25, L26, L51 and L52 (see Figure 17) for an approximately flat topped response curve located symmetrically between the markers. Normally this curve appears somewhat overcoupled or double humped with a 10 or 15% peak to valley excursion and the markers occur at approximately 90% response. See Figure 17, channel 7. In making these adjustments, the stud extension of all cores should be kept approximately equal.

Check the response of channels 8 through 13 by switching the receiver channel switch, sweep oscillator and marker oscillator to each of these channels and observe the response obtained. See Figure 17 for typical response curves. It should be found that all these channels have the proper shaped response with the markers above 70% response. It the markers do not fall within this requirement on one or more high frequency channels, since there are no individual channel adjustments, it will be necessary to readjust L25, L26, L51 and L52, and possibly compromise some channel slightly in order to get the markers up on other channels. Normally however, no difficulty of this type should be experienced since the higher frequency channels become comparatively broad and the markers easily fall within the required range.

Channel 6 is next aligned in the same manner.

Set the receiver to channel 6.

Set the sweep oscillator to cover channel 6.

Set the marker oscillator to channel 6 picture and sound carrier frequencies.

Adjust L11, L12, L37 and L38, for an approximately flat-topped response curve located symmetrically between the markers.

Check channels 5 down through channel 1 by switching the receiver, sweep oscillator and marker oscillator to each channel and observing the response obtained. In all cases, the markers should be above the 70% response point. If this is not the case, L11, L12, L37 and L38 should be retouched. On final adjustment, all channels must be within the 70% specification.

Coupling between r-f and converter lines is augmented by a link between L12 and L37. This link is adjusted in the factory and should not require adjustment in the field. On channel 6 with the link in the minimum coupling position, the response is slightly overcoupled with approximately a 10% excursion from peak-to-valley. With the coupling at maximum, the response is somewhat broader and the peak-to-valley excursion is approximately 40%. The amount of coupling permissible is limited by the peak-to-valley excursion which should not be greater than 30% on any channel.

R-F OSCILLATOR LINE ADJUSTMENT—

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

Regardless of which method of oscillator alignment is used, the frequency standard must be crystal controlled or calibrated. If the receiver oscillator is to be adjusted by the heterodyne frequency meter method, the calibration frequency listed under R-F Osc. Freq. must be available.

If the receiver oscillator is adjusted by feeding in the r-f sound carrier frequency, the frequencies listed under sound carrier Freq. must be available.

Channel Number	Receiver R-F Osc. Freq. Mc.	R-F Sound Carrier Freq. Mc.
1	71	49.75
2	81	59.75
3	87	65.75
4	93	71.75
5	103	81.75
6	109	87.75
7	201	179.75
8	207	185.75
9	213	191.75
10	219	197.75
11	225	203.75
12	231	209.75
13	237	215.75

If the heterodyne frequency meter method is used, couple the meter probe loosely to the receiver oscillator.

If the r-f sound carrier method is used, connect the "Volt-Ohmyst" to the sound discriminator output (junction of R236 and C205.

Connect the signal generator to the receiver antenna terminals. The order of alignment remains the same regardless of which method is used.

Since lower frequencies are obtained by adding steps of inductance, it is necessary to align channel 13 first and continue in reverse numerical order.

Set the receiver channel switch to 13.

Adjust the frequency standard to the correct frequency (237 mc. for heterodyne frequency meter or 215.75 mc. for the signal generator).

Set the fine tuning control to the middle of its range while making the adjustment.

Adjust L77 and L78 for an audible beat on the heterodyne frequency meter or zero voltage from sound discriminator. The core stud extensions should be maintained equal by visual inspection.

Switch the receiver to channel 12.

Set the frequency standard to the proper frequency as listed in the alignment table.

Adjust L76 for indications as above.

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

After the oscillator has been set on all channels, start back at channel 13 and recheck to make sure that all adjustments are correct.

RETOUCHING OF PICTURE I-F ADJUSTMENTS—

The picture i-f response curve varies somewhat with change of bias and for this reason it should be aligned with approxi-

ALIGNMENT PROCEDURE

mately the same signal input as it will receive in operation. If the receiver is located at the edge of the service area, it should be aligned with approximately −1 volt i-f grid bias. However, for normal conditions, (signals of 1000 microvolts or greater), it is recommended that the picture i-f be aligned with a grid bias of −3 volts.

Connect the r-f sweep generator to the receiver antenna terminals.

Connect the signal generator to the antenna terminals and feed in the 25.75 mc i-f picture carrier marker and a 22.3 mc marker.

Connect the oscilloscope across the picture detector load resistor.

Turn the picture control for −3 volts at its arm.

Set the sweep output to produce approximately .3 volt peak-to-peak across the picture detector load resistor.

Observe and analyze the response curve obtained. The response will not be ideal and the i-f adjustments must be retouched in order to obtain the desired curve. See Figure 18.

If T104 (bottom) required any adjustment, it will be necessary to reset T104 (top) for minimum response at 19.75 mc.

On final adjustment the picture carrier marker must be at approximately 45% response. The curve must be approximately flat topped and with the 22.3 mc. marker at approximately 100% response.

The most important consideration in making the i-f adjustments is to get the picture carrier at the 45% response point. If the picture carrier operates too low on the response curve, loss of low frequency video response, of picture brilliance, of blanking, and of sync may occur. If the picture carrier operates too high on the response curve, the picture definition is impaired by loss of high frequency video response. In making these adjustments, care should be taken that no two transformers are tuned to the same frequency as i-f oscillation may result.

ANTENNA TRAP ALIGNMENT—When the receiver is aligned in the shop, the antenna trap should be adjusted to reject the type of interference which might be encountered at the customer's home. It can be adjusted by actual observation of the interference on the air or by the use of a signal generator. Two methods of adjustment are possible if a signal generator is employed. Select the type of interference and method to suit the test equipment involved.

Method 1 for channel 6-10 interference. Set the "VoltOhmyst" on the 3 volt scale and connect it to the junction of L188 and R137. Turn the picture control to the maximum clockwise position. Connect the signal generator to the antenna terminals through balancing network as shown in Figure 10. Tune the receiver oscillator to 109 mc. with the fine tuning control as determined by the method employed in the previous section on r-f oscillator line adjustment. Feed in the channel 10 picture carrier (193.25 mc.) from the signal generator. Adjust L81 and L82 for minimum reading on the "VoltOhmyst," keeping both cores about the same. For final touches, adjust L81 one-half turn clockwise and readjust L82 for minimum on the meter. If this minimum is lower than the previous, repeat until the lowest minimum is obtained. If this minimum was higher, adjust L81 one-half turn counterclockwse and readjust L82. Repeat for the lowest minimum.

Method 2 for channel 6-10 interference. With the same setup as above, switch the receiver to channel 3 and tune the receiver oscillator to 87 mc. Feed in a signal of 109 mc. from the signal generator and adjust the trap as above.

Method 1 for channel 5-7 interference. With the same setup as above, switch the receiver to channel 5 and tune the receiver oscillator to 103 mc. Feed in the picture 7 sound carrier (179.75 mc.) from the signal generator and adjust the trap as above.

Method 2 for channel 5-7 interference. With the same setup as above, switch the receiver to channel 2 and tune the receiver oscillator to 81 mc. Feed in a 103 mc. signal from the generator and adjust the trap as above.

Method for FM image interference. With the same setup as above, switch the receiver to channel 2 and tune the receiver oscillator to 81 mc. Feed in a signal of the frequency of the interfering FM station and adjust the trap as before.

To adjust the trap by observation of the picture under actual operating conditions, connect an antenna to the receiver and tune in the station on which the interference is observed. Adjust the trap as above for minimum interference in the picture.

Since the customer's antenna will affect these adjustments slightly, in cases of severe interference it may be necessary to retouch the trap adjustment when the receiver is installed in the customer's home.

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 an attenuator pad of the type shown in Figure 11. The number of stages in the pad depends upon the signal strength available at the antenna. A sufficient number of stages should be inserted so that a somewhat less than normal contrast picture is obtained when the picture control is at the maximum clockwise position. Only carbon type resistors should be used to construct the pad.

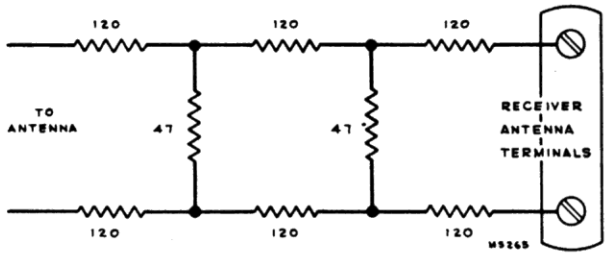

Figure 11—Attenuator Pad

RESPONSE CURVES—The response curves shown on page 14 and referred to throughout the alignment procedure were taken from a production set. Although these curves are typical, some variations can be expected. Channel 2 response (not shown) is similar to that of channel 3.

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 depnd upon the characteristics of the oscilloscope and the sweep generator. The curves may be seen inverted and/or switched from left to right depending on the deflection polarity of the oscilloscope and the phasing of the sweep generator.

ALIGNMENT TABLE—Both methods of oscillator alignment are presented in the alignment table. The service technician may thereby choose the method to suit his test equipment.

MODEL 8TS30, CHASSIS KCS-20J-1, KCS-20K-2

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ALIGNMENT TABLE

THE DETAILED ALIGNMENT PROCEDURE SHOULD BE READ BEFORE ALIGNMENT BY USE OF THE TABLE IS ATTEMPTED.

STEP No.	CONNECT SIGNAL GENERATOR TO	SIGNAL GEN. FREQ. MC.	CONNECT SWEEP GENERATOR TO	SWEEP GEN. FREQ. MC.	CONNECT OSCILLOSCOPE TO	CONNECT "VOLTOHMYST" TO	MISCELLANEOUS CONNECTIONS AND INSTRUCTIONS	ADJUST	REFER TO
	DISCRIMINATOR AND SOUND I-F ALIGNMENT								
1	3rd sound i-f grid (pin 1, V106)	21.25 .1 volt output	Not used		Not used	In series with 1 meg. to junction of R219 & R220		Detune T113 (bottom). Adjust T113 (top) for max. on meter	Fig. 14 Fig. 13 Fig. 12
2	"	"	"		"	Junct of R236 & C205	Meter on 3 volt scale	T113 (bottom) for zero on meter	Fig. 14 Fig. 13
3	"	"	3rd sound i-f grid (pin 1, V106)	21.25 center 1 mc. wide .1 v. out	Junction of R236 & C205	Not used	Check for symmetrical response waveform (positive & negative). If not equal adjust T113 (top) until they are equal		Fig. 14 Fig. 16 A
4	2nd sound i-f grid (pin 1, V105)	21.25 reduced output	2nd sound i-f grid	21.25 reduced output	Terminal A, T112 in series with 33,000 ohms	"	Sweep output reduced to provide .3 volt p-to-p on scope	T112 (top & bottom) for max. gain and symmetry at 21.25 mc.	Fig. 14 Fig. 12 Fig. 13 Fig. 16 B
5	Trap winding on T2 (top of chassis)	21.25 reduced output	Trap winding on T2	21.25 reduced output	"	"	"	T111 (top & bottom) for max. gain and symmetry at 21.25 mc.	Fig. 12 Fig. 13 Fig. 14 Fig. 16 B
	PICTURE I-F AND TRAP ADJUSTMENT								
6	Not used		Not used		Not used	Junction of R189 & R190		Picture control for -3 volts on meter	Fig. 14
7	Junction C14 and R6	21.25	"		"	Junction of L188 & R137	Meter on 3 volt scale. Receiver on channel 13	T105 (top) for min.	Fig. 12
8	"	21.25	"		"	"	"	T2 (top) for min.	Fig. 14 Fig. 12
9	"	27.25	"		"	"	"	T103 (top) for min.	"
10	"	19.75	"		"	"	"	T104 (top) for min. on meter	Fig. 12
11	"	21.8	"		"	"	"	T2 (bottom) for max.	Fig. 13
12	"	25.3	"		"	"	"	T103 (bottom) for max.	"
13	"	22.3	"		"	"	"	T104 (bottom) for max.	"
14	"	25.2	"		"	"	"	L183 (top chassis) for max.	Fig. 12
15	"	23.4	"		"	"	"	L185 (top chassis) for max.	"
16	If T104 (bottom) required adjustment in step 13, repeat step 10.								
	R-F AND CONVERTER LINE ALIGNMENT								
17	Not used		Not used		Not used	Pin 5 or 6 V108		Picture control for -1.5 volts on meter	Fig. 14 Fig. 13
18	Antenna terminal (loosely)	175.25 & 179.75	Antenna terminals (see text for precaution)	Sweeping channel 7	Junction C14 and R6 through 10,000 ohm series resistor	Not used	1st i-f grid bypass to gnd. with 1000 mmf. Receiver on channel 7	L25, L26, L51 & L52 for approx. flat top response between markers. Markers above 70%	Fig. 14 Fig. 13 Fig. 17 (7)
19	"	181.25 185.75	"	channel 8	"	"	Receiver on channel 8	Check to see that response is as above	Fig. 17 (8)
20	"	187.25 191.75	"	channel 9	"	"	Receiver on channel 9	"	Fig. 17 (9)
21	"	193.25 197.75	"	channel 10	"	"	Receiver on channel 10	"	Fig. 17 (10)
22	"	199.25 203.75	"	channel 11	"	"	Receiver on channel 11	"	Fig. 17 (11)
23	"	205.25 209.75	"	channel 12	"	"	Receiver on channel 12	"	Fig. 17 (12)
24	"	211.25 215.75	"	channel 13	"	"	Receiver on channel 13	"	Fig. 17 (13)
25	If the response on any channel (steps 19 through 24) is below 70% at either marker, switch to that channel and adjust L25, L26, L51, & L52 to pull response up on that channel. Then recheck steps 18 through 24.								

ALIGNMENT TABLE

STEP No.	CONNECT SIGNAL GENERATOR TO	SIGNAL GEN. FREQ. MC.	CONNECT SWEEP GENERATOR TO	SWEEP GEN. FREQ. MC.	CONNECT OSCILLOSCOPE TO	CONNECT "VOLTOHMYST" TO	MISCELLANEOUS CONNECTIONS AND INSTRUCTIONS	ADJUST	REFER TO
			R-F AND CONVERTER LINE ALIGNMENT (Cont'd)						
26	Antenna terminals (loosely)	83.25 87.75	Antenna terminals (see text for precaution)	Sweeping channel 6	Junction C14 and R6 through 10,000 ohm series resistor	Not used	Receiver on channel 6	L11, L12, L37 & L38 for response as above	Fig. 17 (6)
27	"	77.25 81.75	"	channel 5	"	"	Receiver on channel 5	Check to see that response is as above	Fig. 17 (5)
28	"	67.25 71.75	"	channel 4	"	"	Receiver on channel 4	"	Fig. 17 (4)
29	"	61.25 65.75	"	channel 3	"	"	Receiver on channel 3	"	Fig. 17 (3)
30	"	55.25 59.75	"	channel 2	"	"	Receiver on channel 2	"	
31	"	45.25 49.75	"	channel 1	"	"	Receiver on channel 1	"	Fig. 17 (1)
32	If the response on any channel (steps 27 through 31) is below 70% at either marker, switch to that channel and adjust L11, L12, L37 & L38 to pull response up on that channel. Then recheck steps 26 through 31.								

R-F OSCILLATOR ALIGNMENT

STEP No.	CONNECT SIGNAL GENERATOR TO	SIGNAL GEN. FREQ. MC.	CONNECT HETERODYNE FREQ. METER TO	HET. METER FREQ. MC.	CONNECT OSCILLOSCOPE TO	CONNECT "VOLTOHMYST" TO	MISCELLANEOUS CONNECTIONS AND INSTRUCTIONS	ADJUST	REFER TO
33	Antenna terminals	215.75	Loosely coupled to r-f osc.	237	Not used	Junction of R236 & C205 for sig. gen. method only	Fine tuning centered for all adjustments Receiver on channel 13	L77 & L78 for zero on meter or beat on het. feq. meter	Fig. 14 Fig. 13
34	"	209.75	"	231	"	"	Rec. on chan. 12	L76 as above	Fig. 15
35	"	203.75	"	225	"	"	Rec. on chan. 11	L74 as above	"
36	"	197.75	"	219	"	"	Rec. on chan. 10	L72 as above	"
37	"	191.75	"	213	"	"	Rec. on chan. 9	L70 as above	"
38	"	185.75	"	207	"	"	Rec. on chan. 8	L68 as above	"
39	"	179.75	"	201	"	"	Rec. on chan. 7	L66 as above	"
40	"	87.75	"	109	"	"	Rec. on chan. 6	L33 & L64 as above	Fig. 13
41	"	81.75	"	103	"	"	Rec. on chan. 5	L62 as above	Fig. 15
42	"	71.75	"	93	"	"	Rec. on chan. 4	L60 as above	"
43	"	65.75	"	87	"	"	Rec. on chan. 3	L58 as above	"
44	"	59.75	"	81	"	"	Rec. on chan. 2	L56 as above	"
45	"	49.75	"	71	"	"	Rec. on chan. 1	L54 as above	"
46	Repeat steps 33 through 45 as a check.								

RETOUCHING PICTURE I-F TRANSFORMERS

47			Not used		Not used	Junction of R189 & R190	Receiver & sweep on a channel between 1 and 6 known to have good r-f response	Picture control for -3 volts on meter	Fig. 14
48	Antenna terminals (loosely)	22.3 25.75	"		Junction L188 and R137	Not used	Retouch pix i-f adjustments (T2, T103, T104 bottoms L183 & L185) as necessary to provide proper response		Fig. 14 Fig. 13 Fig. 18
49	If T104 (bottom) was adjusted in step 48, repeat step 10 and step 48.								

ANTENNA TRAP ADJUSTMENT

	Select 1 of the 6 steps below for suitable method for type of interference encountered.								
50-1	Antenna terminals through termination	193.25	Loosely coupled to r-f osc.	109	Not used	Junction of L188 & R137	Rec. on chan. 6	L81 & L82 for min. on meter	Fig. 14 Fig. 12
50-2	"	109	"	87	"	"	Rec. on chan. 3	"	"
50-3	"	179.75	"	103	"	"	Rec. on chan. 5	"	"
50-4	"	103	"	81	"	"	Rec. on chan. 2	"	"
50-5	"	FM Sta. Freq.	"	81	"	"	"	"	"
50-6	Not used		Not used		Not used	Not used	Rec. on interfered channel	L81 & L82 for min. interference	"

SENSITIVITY CHECK

51	Connect antenna to receiver through attenuator pad to provide weak signal. Compare picture and sound obtained to that obtained on other receivers under the same conditions.								

MODEL 8TS30, CHASSIS KCS-20J-1, KCS-20K-2

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ALIGNMENT DATA

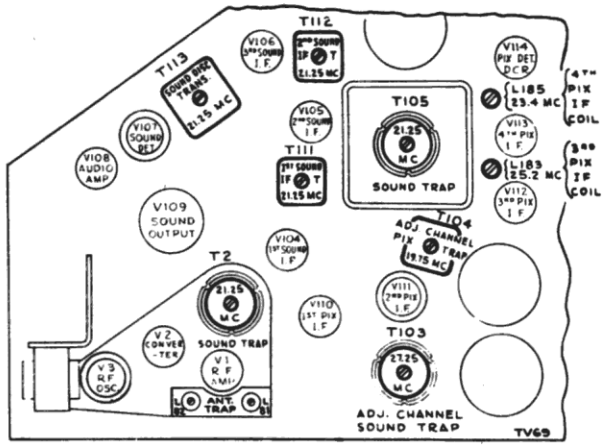


Figure 12—Top Chassis Adjustments

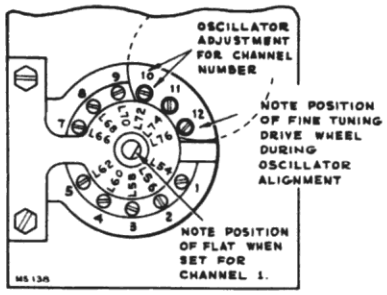


Figure 15—R-F Oscillator Adjustments

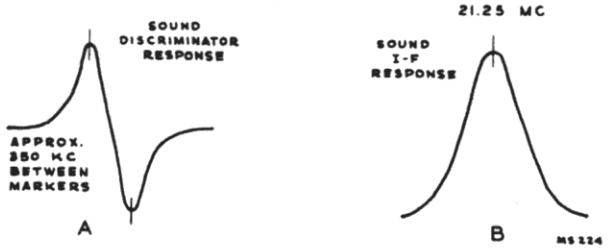


Figure 16—Sound Discriminator and I-F Response

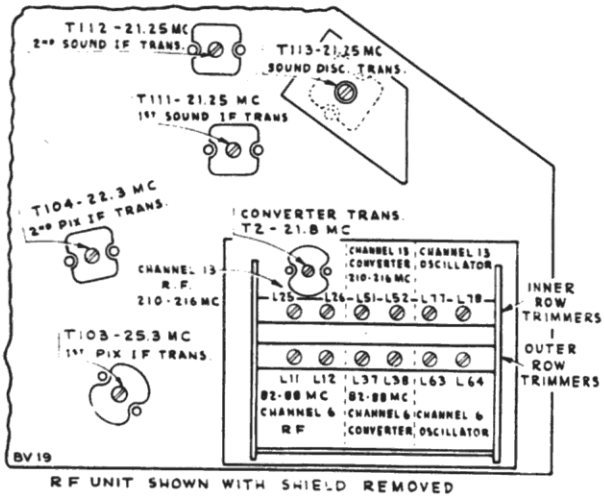


Figure 13—Bottom Chassis Adjustments

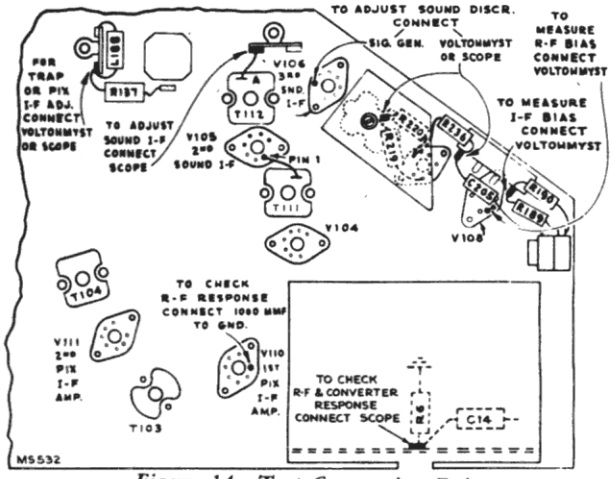


Figure 14—Test Connection Points

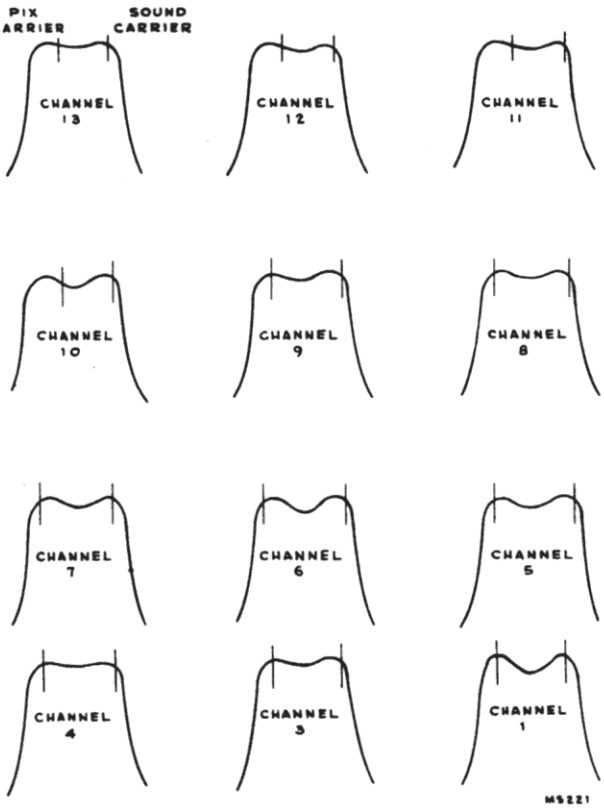


Figure 17—R-F Response

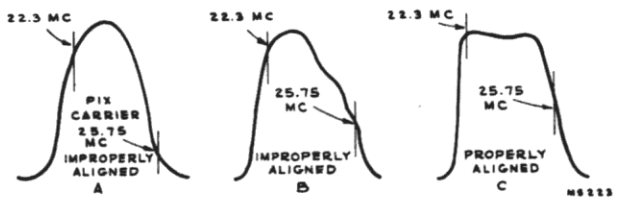


Figure 18—Overall Response

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—Coils reversed either front to back or top to bottom, ion trap magnet coil open.

(2) V126 or V127 inoperative—check voltage and waveform on grids and plates.

(3) No high voltage—If horizontal deflection is operating as evidenced by the correct waveform on terminal 4 of horizontal output transformer, the trouble can be isolated to the 8016 circuit. Either the T109 high voltage winding is open (points 2 to 3), the 8016 tube is defective, its filament circuit is open, C187 is shorted or R233 or R235 open.

(4) V125 and V120-B circuits inoperative—check for sine wave on V125 grid, pulse on V120-B grid, and sawtooth on V126 grid. Refer to schematic and wave form chart.

(5) Reaction scanning tube (V128) inoperative.

(6) Defective kinescope.

(7) R152 open, (terminal 3 to ground).

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

NO VERTICAL DEFLECTION:

(1) V121 or V122 inoperative. Check voltage and wave forms on grids and plates.

(2) T107 open.

(3) Vertical deflection coils open.

NO HORIZONTAL DEFLECTION:

(1) V125, V120B, V126 or V128 inoperative—check voltage and wave forms on grids and plate.

(2) T109 open.

(3) Horizontal deflection coil open.

SMALL RASTER:

(1) Low Plus B or low line voltage.

POOR VERTICAL LINEARITY:

(1) If adjustments cannot correct, change V122.

(2) Vertical output transformer defective.

(3) V121 inoperative—check voltage and wave forms on grid and plate.

(4) R174, C158, C221-C or C222-B defective.

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

POOR HORIZONTAL LINEARITY:

(1) If adjustments do not correct, change V128 or V126.

(2) T109 or L201 defective.

(3) C186 or C188 or R209 defective.

(4) C179, R187 or R210 defective.

WRINKLES ON LEFT SIDE OF RASTER:

(1) R180, R201 or C181 defective.

(2) Defective yoke.

PICTURE OUT OF PHASE HORIZONTALLY:

(1) T108 winding D to F incorrectly tuned or connected in reverse.

(2) R200 or R202 defective.

TRAPEZOIDAL OR NON-SYMMETRICAL RASTER:

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

(2) Defective yoke.

RASTER & SIGNAL ON KINESCOPE BUT NO SOUND:

(1) R-F oscillator off frequency.

(2) Sound i-f, discriminator or audio amplifier inoperative—check V104, V105, V106, V107, V108, V109 and their socket voltages.

(3) T114 or C209 defective.

(4) Speaker defective.

SIGNAL AT KINESCOPE GRID BUT NO SYNC:

(1) Picture control advanced too far.

(2) V114-B, V118, V119, or V120-A inoperative. Check voltage and waveforms at their grids and plates.

(3) C142 defective.

SIGNAL ON KINESCOPE GRID BUT NO VERTICAL SYNC:

(1) Check V121 and associated circuit—C154, T106, etc.

(2) Integrating network inoperative—Check C149, C151, C152, C153, R162, R163, R164 and R165.

SIGNAL ON KINESCOPE GRID BUT NO HORIZONTAL SYNC:

(1) T108 misadjusted—readjust as instructed on page 5.

(2) V123 or V124 inoperative—check socket voltages and waveforms.

(3) T108 defective.

(4) C166, C167, C170 or C171 defective.

(5) If horizontal speed is completely off and cannot be adjusted check C168, C169, R168 and R196.

SOUND & RASTER BUT NO PICTURE OR SYNC:

(1) Picture i-f, detector or video amplifier inoperative—check V110, V111, V112, V113, V114, V115 and N116—check socket voltages.

(2) Bad contact to kinescope grid.

PICTURE STABLE BUT POOR RESOLUTION:

(1) V114, V115 or V116 defective.

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

(3) C138, C140, C141 or C142 defective.

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

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

SERVICE SUGGESTIONS

PICTURE SMEAR:

(1) Video amplifier overloaded by excessive input—reduce picture control setting.

(2) Insufficient bias on V115 and V116 resulting in grid current on video signal. Check bias and possible grid current.

(3) Defective coupling condenser or grid load resistor—check C138, C140, C141, C223B, R138, R142, R143, R148, etc.

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

PICTURE JITTER:

(1) Picture control operated at excessive level.

(2) If regular sections at the left picture are displaced change V126.

(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, V3 and their socket voltages.

DARK VERTICAL LINE ON LEFT OF PICTURE:

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

(2) Replace V126.

LIGHT VERTICAL LINE ON LEFT OF PICTURE:

(1) C181 defective.

(2) V128 defective.

(3) Change tap on R209.

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.

Select a channel with a flat r-f response as outlined in the R-F and Converter Line adjustment section of the alignment procedure.

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

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

Figures 27 through 31 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.

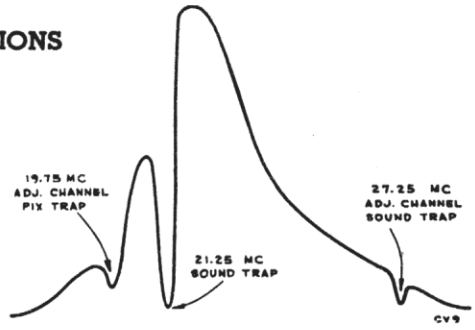


Figure 27—T2 Response

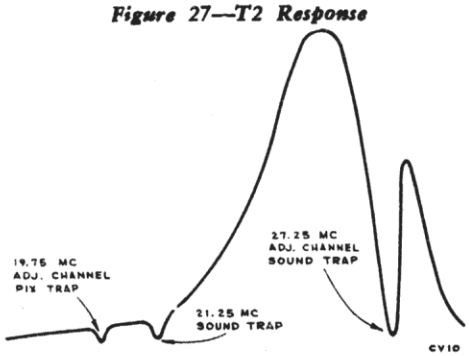


Figure 28—T103 Response

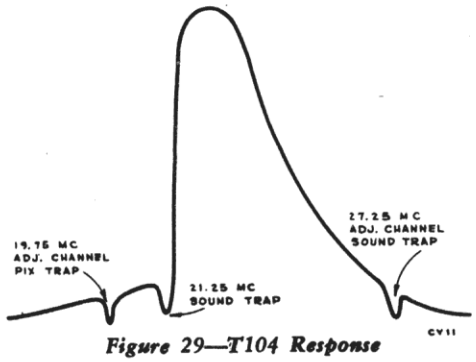


Figure 29—T104 Response

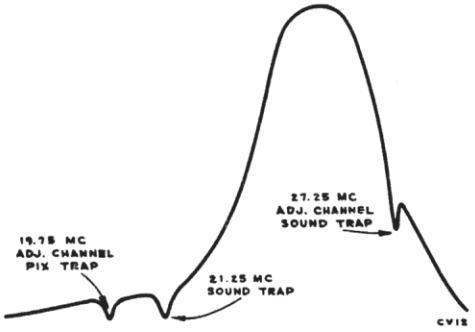


Figure 30—L183 Response

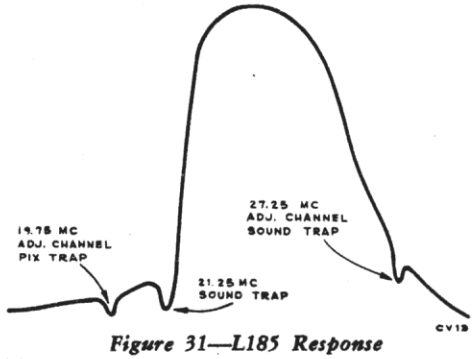
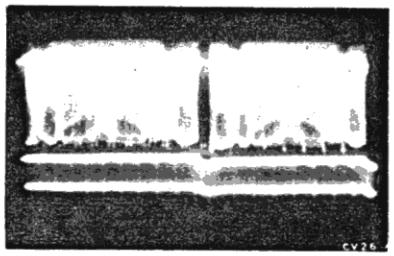


Figure 31—L185 Response

WAVEFORM PHOTOGRAPHS

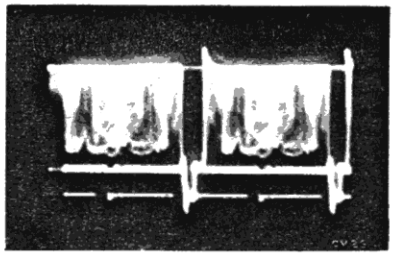


CV26A

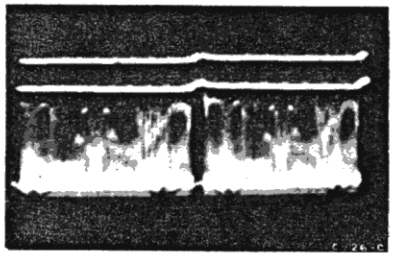
Video Signal Input to 1st Video Amplifier (Junction of L187, R136, L188 and C138)

Figure 32—Vertical (Oscilloscope Synced to ½ of Vertical Sweep Rate) (1.5 Volts PP)

Figure 33—Horizontal (Oscilloscope Synced to ½ of Horizontal Sweep Rate) (1.5 Volts PP)



CV26B

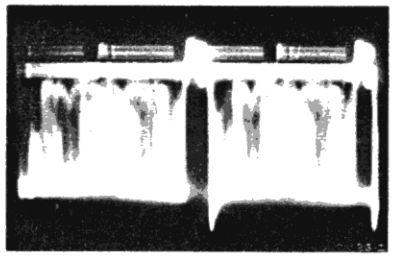


CV26C

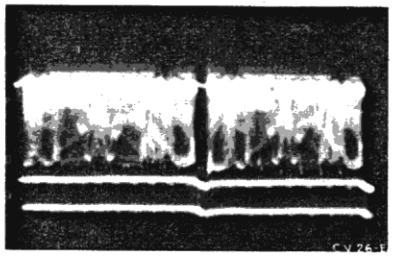
Output of 1st Video Amplifier (Junction of L189, R139, L190 and C140)

Figure 34—Vertical (10 Volts PP)

Figure 35—Horizontal (10 volts PP)



CV26D

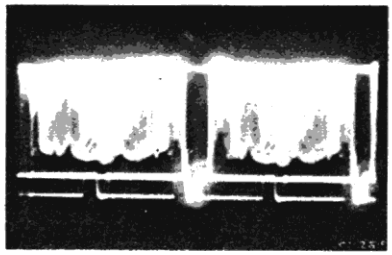


CV26E

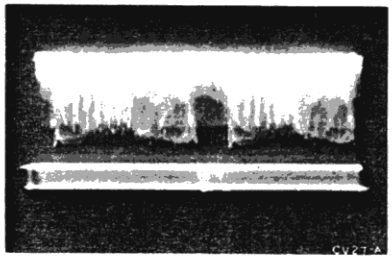
Input to Kinescope Grid (Junction of C141, R148 and Green Lead to Kinescope)

Figure 36—Vertical (38 Volts PP)

Figure 37—Horizontal (38 Volts PP)



CV26F

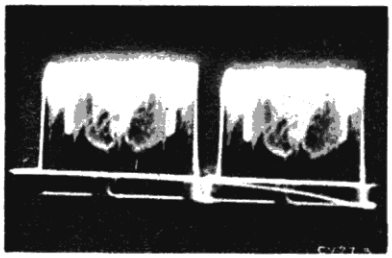


CV27A

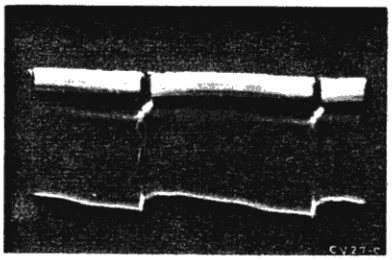
Cathode of D-C Resistor (Pin 5 of V114-B) (6AL5)

Figure 38—Vertical (36 Volts PP)

Figure 39—Horizontal (36 Volts PP)



CV27B

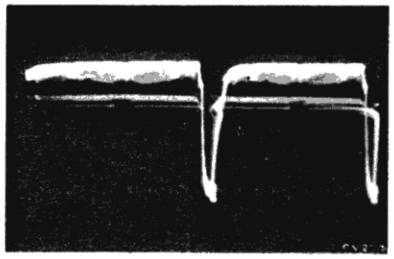


CV27C

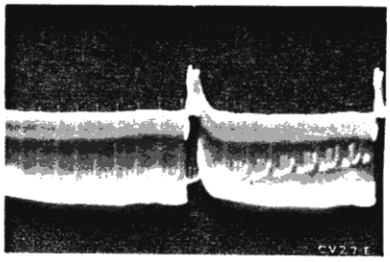
Plate of D-C Restorer (Pin 2 of V114-B) (6AL5)

Figure 40—Vertical (9 Volts PP)

Figure 41—Horizontal (9 Volts PP)



CV27D

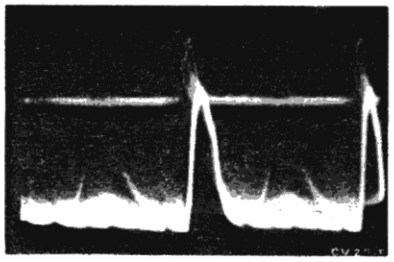


CV27E

Output of 1st Sync. Amplifier (Pin 8 of V118) (6SK7)

Figure 42—Vertical (58 Volts PP)

Figure 43—Horizontal (40 Volts PP)

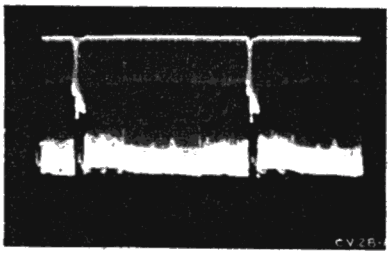


CV27F

MODEL 8TS30, CHASSIS KCS-20J-1, KCS-20K-2

RADIO CORP. OF AMERICA

WAVEFORM PHOTOGRAPHS

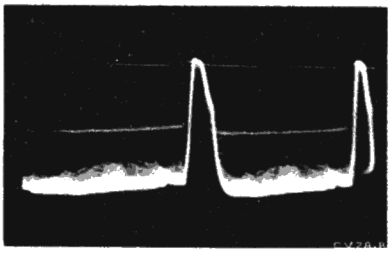


CV28A

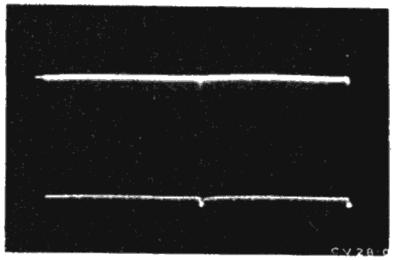
Input to Sync. Separator (Pin 4 of V119) (6SH7)

Figure 44—Vertical (35 Volts PP) ←

Figure 45—Horizontal (35 Volts PP) →



CV28B

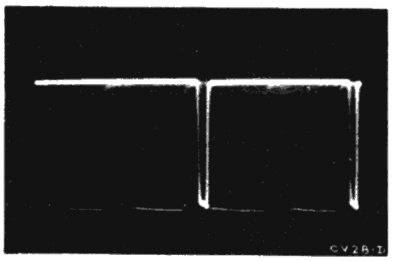


CV28C

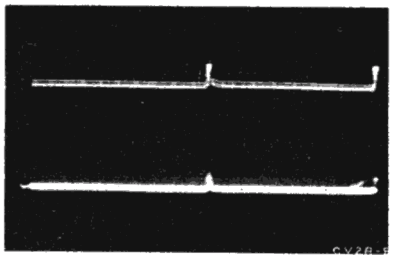
Output of Sync. Separator (Pin 8 of V119) (6SH7)

Figure 46—Vertical (75 Volts PP) ←

Figure 47—Horizontal (75 Volts PP) →



CV28D

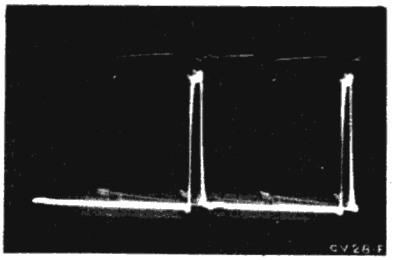


CV28E

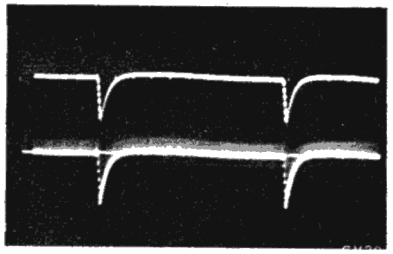
Output of 2nd Sync. Amplifier (Pin 2 of V120-A) (6SN7GT)

Figure 48—Vertical (35 Volts PP) ←

Figure 49—Horizontal (29 Volts PP) →



CV28F

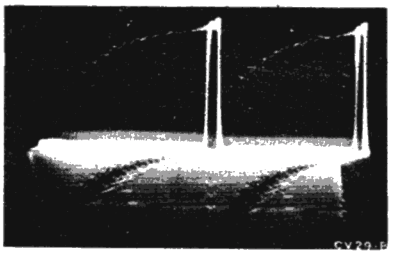


CV29A

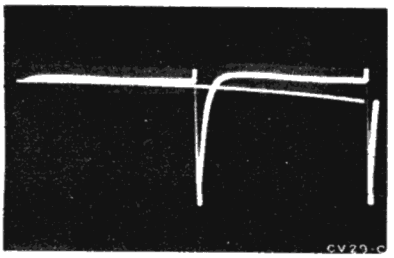
Input to Integrating Network (Junction of C149, R162 and R163)

Figure 50—Vertical (45 Volts PP) ←

Figure 51—Horizontal (30 Volts PP) →



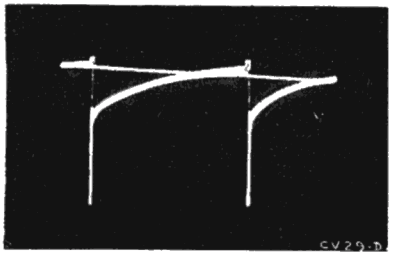
CV29B



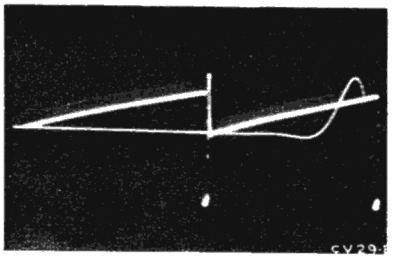
CV29C

Figure 52—Output of Integrating Network (Junction of R165, C153 and Yellow Lead of T106). Vertical (32 Volts PP) ←

Figure 53—Grid of Vertical Osc. (350 Volts PP) (Pin 5 of V121) (6J5) →



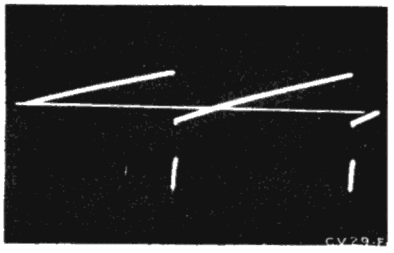
CV29D



CV29E

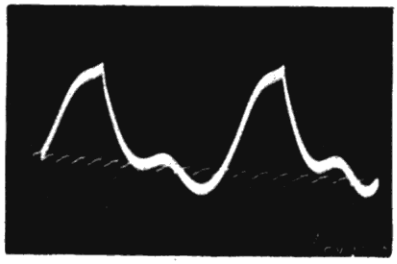
Figure 54—Plate of Vertical Osc. (140 Volts PP) (Pin 3 of V121) (6J5) ←

Figure 55—Input Coupling of Vertical Output (125 Volts PP) (Junction of C157, C158, R170 and Red Lead of T106) →



CV29F

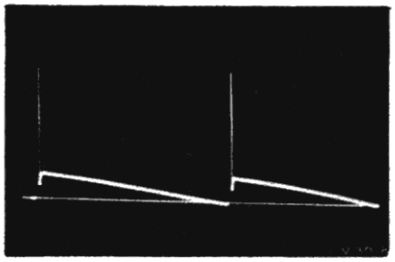
WAVEFORM PHOTOGRAPHS



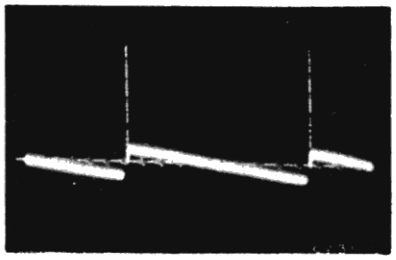
CV30A

Figure 56—Cathode of Vertical Output (.75 Volt PP) (Pin 8 of V122) (6K6GT)

Figure 57—Plate of Vertical Output (700 Volts PP) (Pin 3 of V122) (6K6GT)



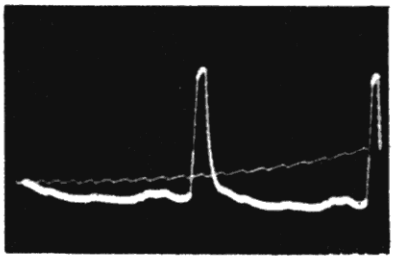
CV30B



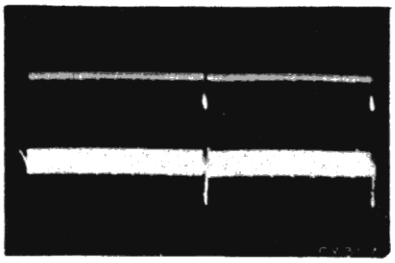
CV30C

Figure 58—Input to Vertical Deflection Coils (60 Volts PP) (Junction of Green Lead of T107 and Green Lead of Yoke)

Figure 59—Vertical Boost of 1st Sync. Amplifier (16 Volts PP) (Junction of R154, R155 and C146)



CV30D

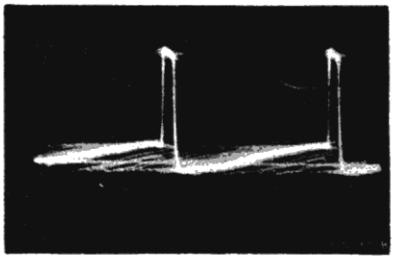


CV31A

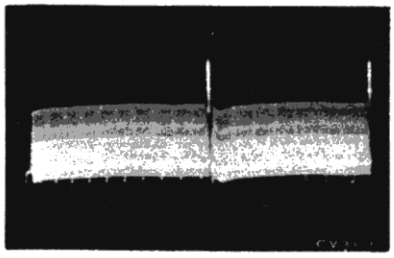
Terminal "E" of Sync Discriminator Transformer (T108)

Figure 60—Vertical (16 Volts PP)

Figure 61—Horizontal (13 Volts PP)



CV31B

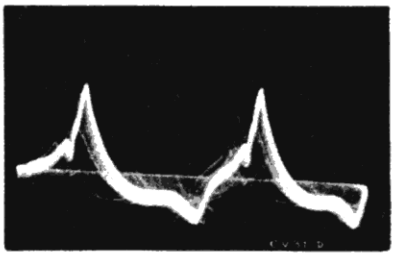


CV31C

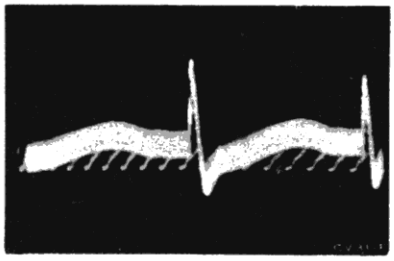
Junction of R191 and R192 (Cathode Resistors of Horizontal Sync. Discriminator)

Figure 62—Vertical (3 Volts PP)

Figure 63—Horizontal (1.7 Volts PP)



CV31D

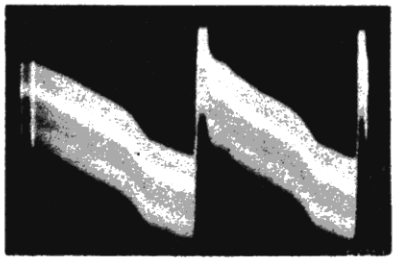


CV31E

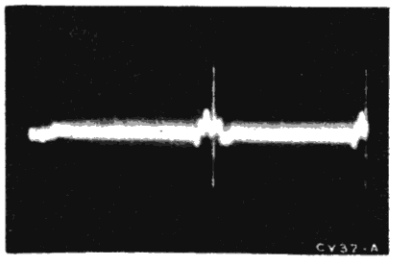
Cathode of Hor. Sync. Discriminator (Pin 1 of V123) (6AL5)

Figure 64—Vertical (.8 Volt PP)

Figure 65—Horizontal (.15 Volt PP)



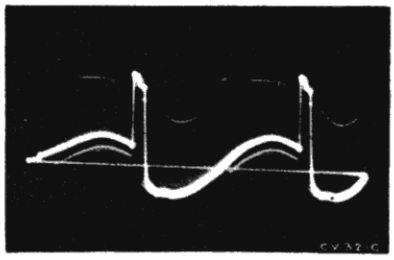
CV31F



CV32A

Figure 66—Cathode of Hor. Sync. Discr. (Pin 5 of V123) (6AL5) Horizontal (.19 Volt PP)

Figure 67—Plate of Hor. Sync. Discr. (Pin 7 of V123) (6AL5) Horizontal (23 Volts PP)



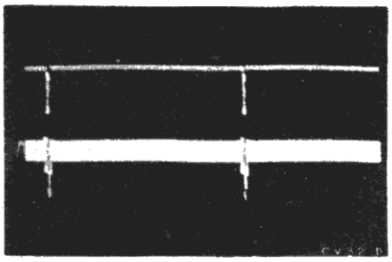
CV32C

WAVEFORM PHOTOGRAPHS

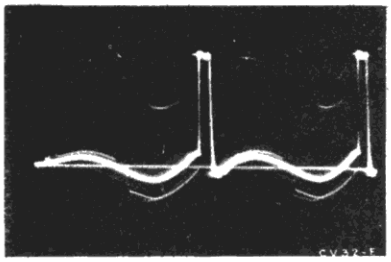
Plate of Hor. Sync. Discr. (Pin 2 of V123) (6AL5)

Figure 68—Vertical (21 Volts PP)

Figure 69—Horizontal (21 Volts PP)



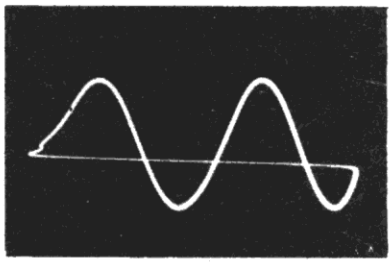
CV32D



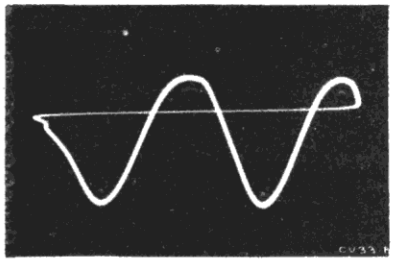
CV32E

Figure 70—Horizontal (95 Volts PP) Terminal "A" of Sync. Discriminator Transformer (T108)

Figure 71—Cathode of Horizontal Oscillator Control (1.5 Volts PP) (Pin 5 of V124) (6AC7)



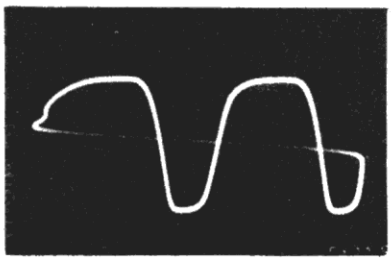
CV33A



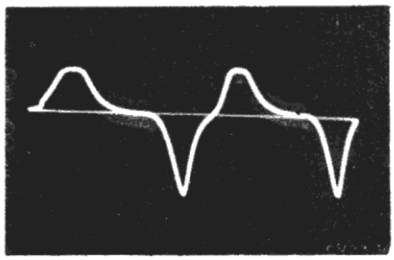
CV33B

Figure 72—Plate of Horizontal Oscillator (225 Volts PP) (Pin 3 of V125) (6K6GT)

Figure 73—Input of Horiz. Discharge (100 Volts PP) (Junction of C176, C177 and R202)



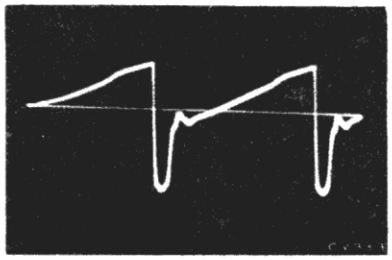
CV33C



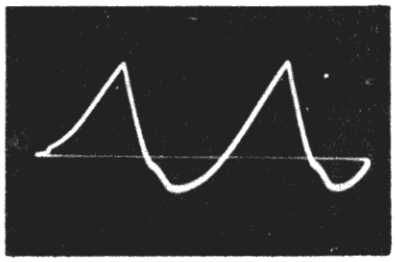
CV33D

Figure 74—Plate of Hor. Discharge (78 Volts PP) (Pin 5 of V120-B) (6SN7GT)

Figure 75—Cathode of Hor. Output (11.5 Volts PP) (Pin 3 of V126) (6BG6-G)



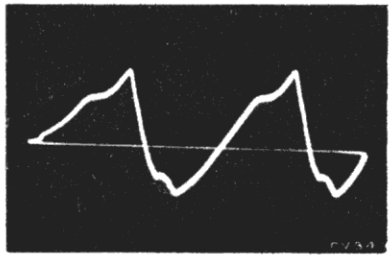
CV33E



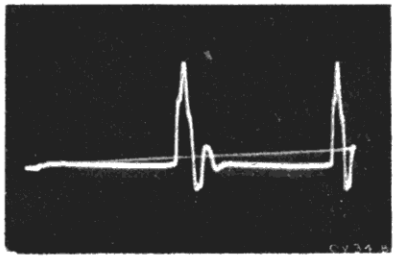
CV33F

Figure 76—Screen of Hor. Output (9 Volts PP) (Pin 8 of V126) (6BG6-G)

Figure 77—Plate of Horizonial Output (Approx. 6000 Volts PP) (Measured Through a Capacity Voltage Divider Connected from Top Cap of V126 to Ground)



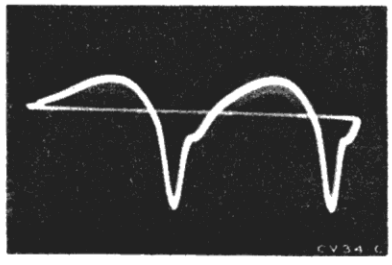
CV34A



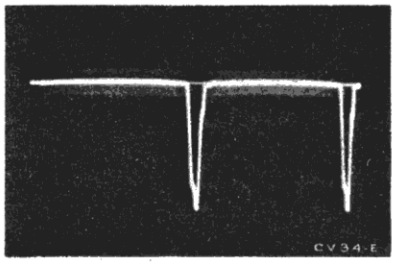
CV34B

Figure 78—Cathode of Reaction Scanning (60 Volts PP) (Pin 8 of V128) (5V4G)

Figure 79—Input to Horizontal Deflection Coils (1325 Volts PP) (Pin 4 of V128) (5V4G)



CV34C



CV34E

RADIO CORP. OF AMERICA MODEL 8TS30, CHASSIS KCS-20J-1, KCS-20K-2

VOLTAGE CHART

Measurements made with receiver operating on 117 volts 60 cycles a-c and with no signal input except where otherwise indicated. Voltages shown are as read with Jr. VoltOhmyst between indicated terminal and chassis ground except where otherwise noted. Symbol < means "less than."

Tube No.	Tube Type	Function	Operating Condition **	E. Plate		E. Screen		E. Cathode		E. Grid		I Plate (ma.)	I Screen (ma.)	Notes on Measurements
				Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts			
V1	6J6	R-F Amplifier	Pictr. Min.	1 & 2	130	—	—	7	0	5 & 6	-9.2	<.1*	—	*Per Plate
			Pictr. Max.	1 & 2	55	—	—	7	0	5 & 6	+.05	7.0*	—	*Per Plate
V2	6J6	Converter	Pictr. Min.	1 & 2	125	—	—	7	0	5 & 6	-3 to -6.	.5 to 4*	—	*Per Plate
			Pictr. Max.	1 & 2	100	—	—	7	0	5 & 6	-2 to -5.	.2 to 3*	—	*Per Plate
V3	6J6	R-F Oscillator	Pictr. Min.	1 & 2	108	—	—	7	.25	5 & 6	-4.5 to -6.5	2.5	—	
			Pictr. Max.	1 & 2	90	—	—	7	.15	5 & 6	-3.5 to -5.	1.7	—	
V104	6BA6	1st Sound I-F Amplifier	Pictr. Min.	5	120	6	120	7	1.9	1	0	12.0	5.0	
			Pictr. Max.	5	110	6	110	7	1.6	1	0	10.5	4.5	
V105	6BA6	2d Sound I-F Amplifier	Pictr. Min.	5	122	6	118	7	1.9	1	0	12.5	4.9	
			Pictr. Max.	5	113	6	108	7	1.6	1	0	10.5	4.2	
V106	6AU6	3d Sound I-F Amplifier	Pictr. Min.	5	48	6	48	7	0	1	-.5	3.3	1.4	
			Pictr. Max.	5	41	6	41	7	0	1	-.5	2.8	1.2	
V107	6AL5	Sound Discrim.	Pictr. Min.	2 & 7	-.35	—	—	4 & 5	—	—	—	—	—	
			Pictr. Max.	2 & 7	-.45	—	—	4 & 5	—	—	—	—	—	
V108	6AT6	1st Audio Amplifier	Pictr. Min.	7	80	—	—	2	0	1	-.75	.5	—	
V109	6K6-GT	Audio Output	Pictr. Min.	3	233	4	245	8	0	5	-18	27.5	4.0	
V110	6AG5	1st Pix. I-F Amplifier	Pictr. Min.	5	135	6	135	2 & 7	0	1	-5.0	<.1	<.1	
			Pictr. Max.	5	109	6	109	2 & 7	.26	1	-1.0	5.5	.9	
V111	6AG5	2d Pix. I-F Amplifier	Pictr. Min.	5	135	6	135	2 & 7	0	1	-5.0	<.1	<.1	
			Pictr. Max.	5	113	6	113	2 & 7	.26	1	-1.0	5.6	.9	
V112	6AG5	3d Pix. I-F Amplifier	Pictr. Min.	5	135	6	135	2 & 7	0	1	-5.0	<.1	<.1	
			Pictr. Max.	5	98	6	117	2 & 7	.26	1	-1.0	5.7	.9	
V113	6AG5	4th Pix. I-F Amplifier	Pictr. Min.	5	99	6	127	2 & 7	1.2	1	0	6.8	1.7	
			Pictr. Max.	5	89	6	117	2 & 7	1.1	1	0	6.8	1.7	
V114-A	6AL5	Picture 2d Det.	Pictr. Min.	7	-.1	—	—	1	0	—	—	—	—	
V114-B	6AL5	DC Restorer	Brightness Min.	2	-100	—	—	5	-90	—	—	—	—	
			Brightness Max.	2	-1	—	—	5	-.9	—	—	—	—	
V115	6AU6	1st Video Amplifier	Pictr. Min.	5	240	6	135	7	0	1	-2.15	4.0	1.55	
			Pictr. Max.	5	255	6	125	7	0	1	-2.2	2.8	1.05	
V116	6K6-GT	2d Video Amplifier	Pictr. Min.	3	105	4	135	8	3.7	5	-7.5	9.6	1.6	
			Pictr. Max.	3	95	4	125	8	2.9	5	-7.5	7.5	1.3	

** Where separate readings are not listed for max. and min. gain settings of the picture control, the effect of the control is slight and readings are given for "Picture Min."

MODEL 8TS30, CHASSIS KCS-20J-1, KCS-20K-2

RADIO CORP. OF AMERICA

VOLTAGE CHART

Tube No.	Tube Type	Function	Operating Condition **	E. Plate		E. Screen		E. Cathode		E. Grid		I Plate (ma.)	I Screen (ma.)	Notes on Measurements
				Pin No.	Volts	Pin No.	Volts	Pin No.	Volts	Pin No.	Volts			
V117	10-BP4	Kinescope	Brightness Min.	Cap	9200*	10	275	11	0	2	-100	0	0	*Measured with VoltOhmyst and high voltage multiplier probe
			Brightness Max.	Cap	6000*	10	275	11	0	2	0	.7	—	
			Brightness Average	Cap	9000*	10	275	—	—	—	—	.05	—	
V118	6SK7	1st Sync. Amplifier	Pictr. Min.	8	163	6	129	5	0	4	-4.3	11.5	3.8	
			Pictr. Max.	8	185	6	115	5	0	4	-4.4	9.2	2.9	
V119	6SH7	Sync. Separator	Pictr. Min.	8	134	6	135	5	0	4	-5.2	.1	.05	
			Pictr. Max.	8	123	6	125	5	0	4	-9*	.3	.1	*Depends on noise
V120-A	6SN7 GT	2d Sync. Amplifier	Pictr. Min.	2	88	—	—	3	0	1	-.5	9.0	—	
			Pictr. Max.	2	80	—	—	3	0	1	-9*	7.9	—	*Depends on noise
V120-B	6SN7 GT	Horizontal Discharge	Pictr. Min.	5	-37	—	—	6	-100	4	-140	.5	—	
V121	6J5	Vertical Oscillator	Pictr. Min.	3	70*	—	—	8	-100	5	-150	.15	—	*Height, linearity and hold affect readings 2 to 1
V122	6K6-GT	Vertical Output	Pictr. Min.	3	180	4	180*	8	-70	5	-100	9.0	*	*Screen connected to plate
V123	6AL5	Horizontal Sync. Discr.	Pictr. Min.	2 & 7	-6.5	—	—	1 & 5	-2.1	—	—	—	—	
V124	6AC7	Horizontal Osc. Control	Pictr. Min.	8	194	6	105	5	.05	4	-2.0	3.8	1.1	
V125	6K6-GT	Horizontal Oscillator	Hold Max. Resistance	3	190	4	208	8	0	5	-30	17.0	6.7	
			Hold Min. Resistance	3	180	4	194	8	0	5	-23.5	19.5	8.2	
V126	6BG6-G	Horizontal Output	Pictr. Min.	Cap	Do not Meas.*	8	134	3	-91	5	-113	77.0	11.5	* 6000 volt pulse present
V127	8016	H. V. Rectifier	Brightness Min.	Cap	*	—	—	2 & 7	9200	—	—	0	—	*9200 volt pulse present
			Brightness Max.	Cap	*	—	—	2 & 7	6700	—	—	.7	—	*9200 volt pulse present
V128	5V4G	Reaction Scanning	Pictr. Min.	4 & 6	Do not Meas.*	—	—	8	350	—	—	90	—	* 1200 volt pulse present
V129	5U4G	Rectifier	Pictr. Min.	4 & 6	390*	—	—	2 & 8	300	—	—	146	—	*A-C measured from plate to trans center tap
V130	5U4G	Rectifier	Pictr. Min.	4 & 6	390*	—	—	2 & 8	300	—	—	146	—	

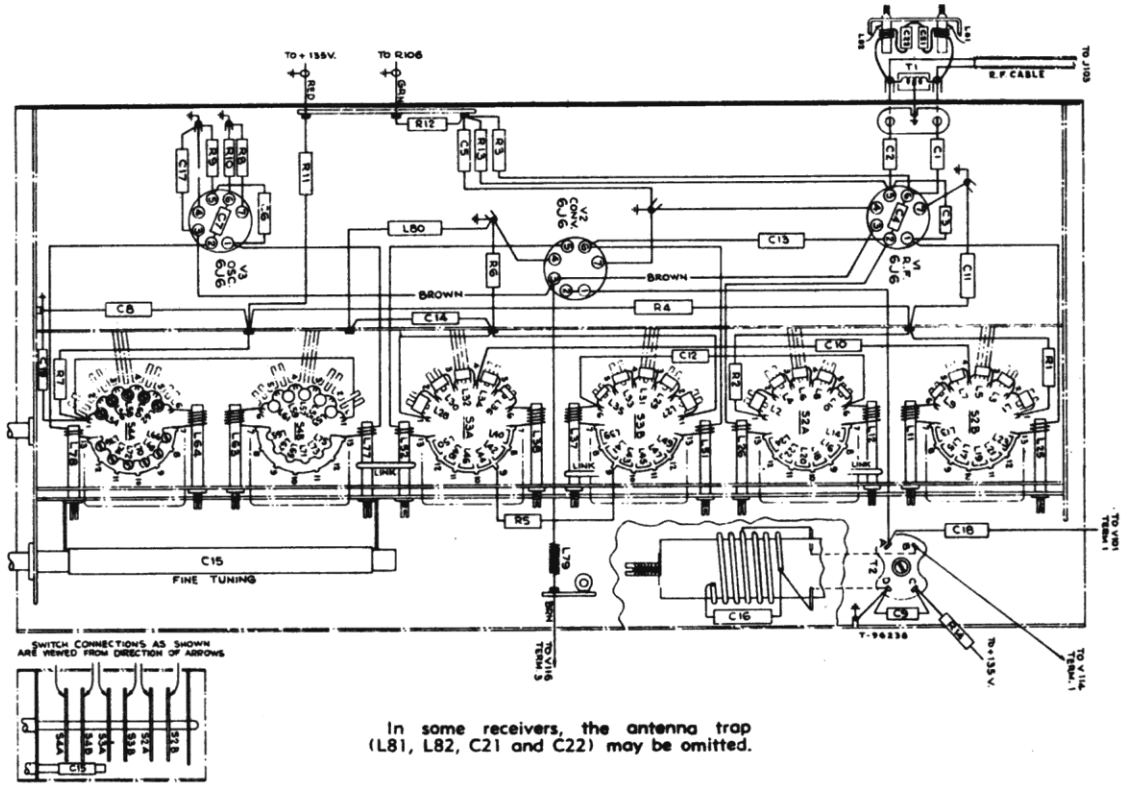
** Where separate readings are not listed for max. and min. gain settings of the picture control, the effect of the control is slight and readings are given for "Picture Min."

Following readings taken with video signal applied through video amplifiers to produce 25 volts peaks to peak on Kinescope grid.

V114-B	6AL5	DC Restorer	Pictr. Min.	2	-41	—	—	5	-27	—	—	—	—	
V119	6SH7	Sync. Separator	Pictr. Min.	8	136	6	142	5	0	4	-21.5	.9	.8	
V120-A	6SN-7GT	2d Sync. Amplifier	Pictr. Min.	2	88	—	—	3	0	1	-5.4	9.0	—	
V123	6AL5	Horizontal Sync. Discr.	Pictr. Min.	2 & 7	-20	—	—	1 & 5	K_1* K_2 -2.1	—	—	—	—	*See grid voltage of V124
V124	6AC7	Horizontal Osc. Control	Pull-in*	8	200(a)	6	100(b)	5	<.1	4	-1.5 to -3	<8.	<2.5	*Varying Hor. Osc. tuning
			Hold*	8	200(c)	6	100(d)	5	<.1	4	(e)	<8.	<2.5	

(a) Pull-in range varies with tubes from 110-210 to 195-270.
(b) Pull-in range varies with tubes from 80-100 to 100-115.
(c) Hold range varies with tubes from 110-270 to 140-270.
(d) Hold range varies with tubes from 80-115 to 90-115.
(e) Hold range varies with tubes from 1.5-7.0 to 1.-4.5.

R-F UNIT WIRING DIAGRAM



In some receivers, the antenna trap (L81, L82, C21 and C22) may be omitted.

Figure 80—R-F Unit Wiring Diagram

CRITICAL LEAD DRESS:

1. Dress spaghetti-covered leads from A and B on discriminator transformer T113 to pin 7 and 2 on V107 tube socket approximately 3/16" above chassis.
2. Dress video capacitors C-138, C-140 and C-141 up and away from chassis.
3. Dress video peaking coils L-187, L-188, L-189, L-190, L-191 and L-192 up and away from chassis.
4. Contact between the r-f oscillator frequency adjustment screws and the oscillator coils or channel switch eyelets must be avoided.
5. Dress leads from L196 (width control coil) away from the lead to the cap of V127 (h-v rectifier). Contact between these leads will cause arcing and fire.
6. Dress T109 winding leads as shown in Figure 81.

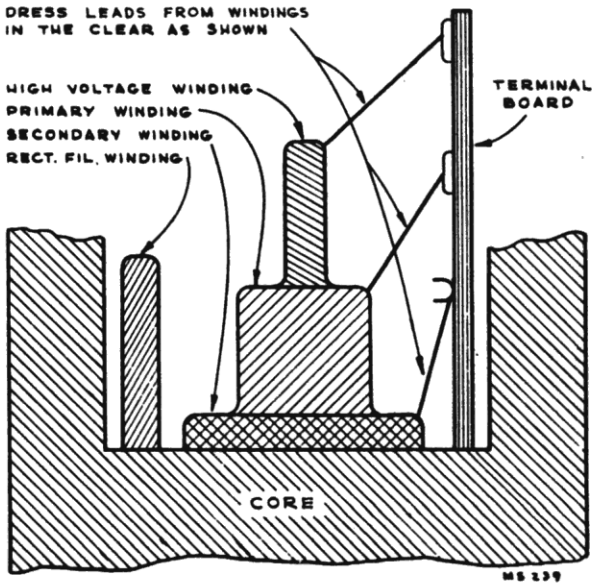


Figure 81—T109 Lead Dress

MODEL 8TS30, CHASSIS KCS-20J-1, KCS-20K-2

RADIO CORP. OF AMERICA

REPLACEMENT PARTS

STOCK No.	DESCRIPTION
	R-F UNIT ASSEMBLY KRK2
71504	Capacitor—Ceramic, 0.68 mmf. (C13)
71500	Capacitor—Ceramic, 1.5 mmf. (C3, C4)
71502	Capacitor—Ceramic, 2.2 mmf. (C10)
71520	Capacitor—Ceramic, 4.7 mmf. (C6, C7, C12)
33101	Capacitor—Ceramic, 22 mmf. (C14)
71540	Capacitor—Ceramic, 270 mmf. (C1, C2)
65401	Capacitor—Mica, 270 mmf. (C18)
71501	Capacitor—Ceramic, 1500 mmf. (C5, C8, C9, C11, C17)
72122	Coil—Channel #1 r-f amplifier plate coil—front or rear section or channel #1 converter grid coil—front or rear section (L1, L2, L27, L28)
71479	Coil—Channel #2 r-f amplifier plate coil—front or rear section or channels #2 and #4 converter grid coil—front or rear section (L3, L4, L29, L30, L33, L34)
71480	Coil—Channel #4 r-f amplifier plate coil—front or rear section (L7, L8)
71481	Coil—Channel #5 r-f amplifier plate coil—front or rear section or channel #5 converter grid coil—front or rear section (L9, L10, L35, L36)
71492	Coil—Channel #6 oscillator, converter grid or r-f amplifier plate coil—front or rear sections (L11, L12, L37, L38, L63, L64)
71491	Coil—Channel #13 converter grid or r-f amplifier plate coil—rear section (L25, L51)
71490	Coil—Channel #13 converter grid or r-f amplifier plate coil—front section (L26, L52)
72597	Coil—Channel #3 converter grid coil—front or rear section and channel #3 r-f amplifier plate coil—front or rear section (L5, L6, L31, L32)
71469	Coil—Channel #1 oscillator coil—front or rear section (L53, L54)
71471	Coil—Channel #5 oscillator coil—front section or channel #2 oscillator coil—rear section (L55, L62)
71470	Coil—Channels #2, 3 and 4 oscillator coil—front sections (L56, L58, L60)
72552	Coil—Channel #3 oscillator coil—rear section (L57)
72553	Coil—Channel #4 oscillator coil—rear section (L59)
71472	Coil—Channel #5 oscillator coil—rear section (L61)
71489	Coil—Channel #13 oscillator coil—rear section (L77)
71488	Coil—Channel #13 oscillator coil—front section (L78)
71505	Coil—Heater choke coil (L79)
71506	Coil—Converter grid i-f choke coil (L80)
71493	Connector—Segment connector
71597	Core—Channel #13 front and rear oscillator coils' adjustable core and stud
71498	Core—Channels #6 and #13 front and rear converter grid coils or front and rear r-f amplifier plate coils' adjustable core and stud
71497	Core—Channel #6 front and rear oscillator coils' adjustable core and stud
72743	Detent—Detent mechanism and fibre shaft
71465	Disc—Rotor disc for fine tuning control (Part of C15)
72744	Drive—Fine tuning pinch washer drive
71487	Form—Coil form only for channels #6 and #13 coils—less winding
71462	Loop—Oscillator to converter grid coupling loop
	Resistor—Fixed composition, 47 ohms ±20%, ½ watt (R8)
	Resistor—Fixed composition, 150 ohms ±10%, ½ watt (R3, R11, R13)
	Resistor—Fixed composition, 1000 ohms ±20%, ½ watt (R4, R12, R14)
	Resistor—Fixed composition, 4700 ohms ±20%, ½ watt (R1, R2, R7)
	Resistor—Fixed composition, 10,000 ohms ±10%, ½ watt (R5)
	Resistor—Fixed composition, 100,000 ohms ±20%, ½ watt (R9, R10)
	Resistor—Fixed composition, 1 megohm ±20%, ½ watt (R6)
14343	Ring—Retaining ring for drive
71475	Screw—#4-40 x 15/32" adjusting screw for coils L54, L56, L58, L60, L62
71476	Screw—#4-40 x ¼" binder head screw for adjusting coils L66, L68, L70, L72, L74, L76
71473	Segment—Converter grid section front segment—less coils or r-f amplifier plate section front segment—less coils (Part of S2, S3)
71474	Segment—Converter grid section rear section less coils or r-f amplifier plate section rear segment—less coils (Part of S2, S3)
71467	Segment—Oscillator section front segment—less coils (Part of S4)
71468	Segment—Oscillator segment rear section—less coils (Part of S4)
72951	Shield—Lead tube shield for V3
71494	Socket—Tube socket—miniature
71461	Spring—Snap spring to hold fine tuning shaft
71466	Stator—Oscillator fine tuning stator and bushing (Part of C15)
71507	Transformer—Antenna transformer (T1)
71495	Transformer—Converter transformer (T2, C16)
73239	Trap—Antenna trap (L81, L82, C21, C22)
	TELEVISION CHASSIS KCS20J-1, KCS20K-2
71894	Bearing—Bearing assembly for R-F Unit shaft
71460	Board—Antenna board
72615	Capacitor—Mica, 10 mmf. (C137)
71771	Capacitor—Ceramic, 51 mmf. (C197)
73090	Capacitor—Mica, 82 mmf. (C166)
71514	Capacitor—Ceramic, 82 mmf. (C131)
73091	Capacitor—Mica, 270 mmf. (C116, C123, C128, C134, C145, C147, C203)
39642	Capacitor—Mica, 390 mmf. (C176)
39644	Capacitor—Mica, 470 mmf. (C161)
71450	Capacitor—High-voltage capacitor, 500 mmf. (C187)
39648	Capacitor—Mica, 680 mmf. (C179)
72638	Capacitor—Ceramic, 1200 mmf. (C164)
71501	Capacitor—Ceramic, 1500 mmf. (C112, C113, C114, C115, C118, C119, C120, C121, C122, C126, C127, C129, C130, C133, C135, C136, C185, C189, C191, C194, C196)
72524	Capacitor—Mica, 4700 mmf. (C154)
71690	Capacitor—Ceramic, 6500 mmf. (C200)
71394	Capacitor—Tubular, .0015 mfd., 600 volts (C207)
70602	Capacitor—Tubular, .0025 mfd., 400 volts (C205)
70642	Capacitor—Tubular, .001 mfd., 1000 volts (C178)
70601	Capacitor—Tubular, .002 mfd., 400 volts (C151)
70605	Capacitor—Tubular, .004 mfd., 400 volts (C167, C172)
70647	Capacitor—Tubular, .004 mfd., 1000 volts (C173)
70606	Capacitor—Tubular, .005 mfd., 400 volts (C152, C204, C208)
70627	Capacitor—Tubular, .005 mfd., 600 volts (C209)
71516	Capacitor—Tubular, oil impregnated, .015 mfd., 400 volts (C168, C169)
73100	Capacitor—Tubular, oil impregnated, .035 mfd., 1000 volts (C188)
70610	Capacitor—Tubular, .01 mfd., 400 volts (C149, C177, C183, C184, C192, C206)
70615	Capacitor—Tubular, .05 mfd., 400 volts (C138, C144, C148, C170)
70636	Capacitor—Tubular, .05 mfd., 600 volts (C140, C141, C142, C174, C175, C180)
71515	Capacitor—Tubular, oil impregnated, .05 mfd., 600 volts (C158)
73093	Capacitor—Tubular, oil impregnated, .05 mfd., 1000 volts (C186)
70617	Capacitor—Tubular, 0.1 mfd., 400 volts (C157, C182)
70638	Capacitor—Tubular, 0.1 mfd., 600 volts (C146)
70618	Capacitor—Tubular, 0.25 mfd., 400 volts (C125, C143)
71432	Capacitor—Electrolytic, comprising 2 sections of 40 mfd., 450 volts, and 1 section of 10 mfd., 450 volts (C221A, C221B, C221C)
71433	Capacitor—Electrolytic, comprising 1 section of 80 mfd., 450 volts and 1 section of 50 mfd., 50 volts (C222A, C222B)
71434	Capacitor—Electrolytic, comprising 1 section of 40 mfd., 450 volts, 1 section of 10 mfd., 450 volts, and 1 section of 10 mfd., 350 volts (C223A, C223B, C223C)

RADIO CORP. OF AMERICA

MODEL 8TS30, CHASSIS KCS-20J-1, KCS-20K-2

REPLACEMENT PARTS

STOCK No.	DESCRIPTION
71431	Capacitor—Electrolytic, comprising 1 section of 40 mfd., 450 volts, 1 section of 10 mfd., 450 volts, and 1 section of 80 mfd., 150 volts (C220A, C220B, C220C)
71435	Capacitor—Electrolytic, comprising 1 section of 20 mfd., 450 volts, and 1 section of 80 mfd., 350 volts (C224A, C224B)
71436	Capacitor—Electrolytic, comprising 1 section of 250 mfd., 10 volts, and 1 section of 1000 mfd., 6 volts (C225A, C225B)
*73154	Choke—Filter choke (L200)
71505	Coil—Choke coil (L180, L181, L182, L184, L186)
71421	Coil—Focus coil (L195)
71449	Coil—Horizontal linearity control coil (L201)
71526	Coil—Peaking coil (L188)
71529	Coil—Peaking coil (L187, L189, L191, R136, R139, R145)
71527	Coil—Peaking coil (L190, L192)
71426	Coil—Third or fourth picture i-f coil (L183, L185)
71429	Coil—Width control coil (L196)
71523	Connector—Anode connector
71521	Contact—High-voltage capacitor lead contact
*73156	Control—Brightness control (R152)
71442	Control—Focus control (R184)
71440	Control—Height control (R169)
71447	Control—Horizontal drive control (R187)
72734	Control—Vertical and horizontal hold control (R168, R172)
71443	Control—Vertical and horizontal centering control (R181, R211)
71441	Control—Vertical linearity control (R178)
*73157	Control—Picture control, volume control and power switch (R131, R222, S101)
71457	Cord—Power cord and plug
71437	Cover—Insulating cover for electrolytics #71431 and #71433
71509	Cushion—Deflection yoke hood upper cushion
71510	Cushion—Deflection yoke hood lower cushion
*73155	Grommet—Rubber grommet for anode connector and kine. grid lead holes
71522	Magnet—Ion trap magnet (EM type) (L202, L203)
*73301	Magnet—Ion trap magnet (PM type)
71455	Nut—#8-32 wing nut for mounting focus coil (3 required)
71451	Nut—Speed nut to mount high-voltage capacitor
18469	Plate—Bakelite mounting plate for electrolytics #71431 and #71433
5119	Plug—3 contact female plug for speaker cable
71448	Plug—2 prong male plug for power cable
71918	Resistor—Wire wound, 2.2 ohms, 1 watt (R230)
71513	Resistor—3.3 ohms, ⅓ watt (R233)
	Resistor—Fixed composition, 10 ohms ±10%, ½ watt (R194)
73098	Resistor—Wire wound, 12 ohms, 1 watt (R240)
	Resistor—Fixed composition, 39 ohms ±10%, ½ watt (R116, R121, R126)
	Resistor—Fixed composition, 56 ohms ±10%, 1 watt (R232), in some sets
	Resistor—Fixed composition, 100 ohms ±10%, 2 watts (R206)
	Resistor—Fixed composition, 100 ohms ±20%, ½ watt (R212, R215)
	Resistor—Fixed composition, 150 ohms ±10%, ½ watt (R114, R119, R124, R130, R133)
39505	Resistor—Wire wound, 270 ohms, 2 watts (R182)
	Resistor—Fixed composition, 330 ohms ±10%, ½ watt (R144)
	Resistor—Fixed composition, 560 ohms ±10%, ½ watt (R195)
	Resistor—Fixed composition, 680 ohms ±10%, ½ watt (R132)
	Resistor—Fixed composition, 1000 ohms ±20%, ½ watt (R117, R118, R122, R123, R128, R135, R213, R216)
	Resistor—Fixed composition, 1000 ohms ±10%, ½ watt (R161)
	Resistor—Fixed composition, 1800 ohms ±10%, ½ watt (R177)
71512	Resistor—Wire wound, 1800 ohms, 1 watt (R183)
	Resistor—Fixed composition, 2200 ohms ±20%, 2 watts (R226, R227)
	Resistor—Fixed composition, 2700 ohms ±10%, ½ watt (R129)
	Resistor—Fixed composition, 2700 ohms ±5%, ½ watt (R127)
	Resistor—Fixed composition, 3300 ohms ±20%, ½ watt (R234)
	Resistor—Fixed composition, 3300 ohms ±10%, 1 watt (R147)
	Resistor—Fixed composition, 3300 ohms ±10%, ½ watt (R140)
	Resistor—Fixed composition, 3900 ohms ±5%, ½ watt (R137)
	Resistor—Fixed composition, 4700 ohms ±10%, ½ watt (R160)
	Resistor—Fixed composition, 4700 ohms ±5%, ½ watt (R125)
	Resistor—Fixed composition, 4700 ohms ±10%, 1 watt (R154, R155)
45876	Resistor—Wire wound, 5000 ohms, 5 watts (R200)
	Resistor—Fixed composition, 5600 ohms ±5%, ½ watt (R134)
	Resistor—Fixed composition, 6800 ohms ±10%, ½ watt (R141, R158, R202, R210)
	Resistor—Fixed composition, 8200 ohms ±10%, ½ watt (R164, R165, R190)
	Resistor—Fixed composition, 8200 ohms ±5%, ½ watt (R174)
	Resistor—Fixed composition, 10,000 ohms ±10%, ½ watt (R146, R175, R237)
	Resistor—Fixed composition, 10,000 ohms ±5%, ½ watt (R115, R120)
	Resistor—Fixed composition, 10,000 ohms ±20%, 1 watt (R179)
	Resistor—Fixed composition, 10,000 ohms ±10%, 1 watt (R199, R201, R218)
	Resistor—Fixed composition, 18,000 ohms ±10%, ½ watt (R189)
	Resistor—Fixed composition, 18,000 ohms ±10%, 1 watt (R208)
	Resistor—Fixed composition, 22,000 ohms ±20%, ½ watt (R162, R163, R236)
	Resistor—Fixed composition, 22,000 ohms ±10%, ½ watt (R217)
	Resistor—Fixed composition, 22,000 ohms ±10%, 1 watt (R207)
	Resistor—Fixed composition, 27,000 ohms ±10%, ½ watt (R196)
	Resistor—Fixed composition, 27,000 ohms ±10%, 1 watt (R188)
	Resistor—Fixed composition, 39,000 ohms ±10%, 1 watt (R197)
	Resistor—Fixed composition, 39,000 ohms ±5%, 1 watt (R231)
	Resistor—Fixed composition, 47,000 ohms ±10%, ½ watt (R150)
	Resistor—Fixed composition, 47,000 ohms ±10%, 1 watt (R198)
	Resistor—Fixed composition, 56,000 ohms ±10%, ½ watt (R173)
	Resistor—Fixed composition, 82,000 ohms ±10%, ½ watt (R221)
	Resistor—Fixed composition, 100,000 ohms ±20%, ½ watt (R148)
	Resistor—Fixed composition, 100,000 ohms ±10%, ½ watt (R166, R219, R220)
	Resistor—Fixed composition, 150,000 ohms ±20%, ½ watt (R239)
	Resistor—Fixed composition, 150,000 ohms ±10%, ½ watt (R151)
	Resistor—Fixed composition, 220,000 ohms ±20%, ½ watt (R203)
	Resistor—Fixed composition, 220,000 ohms ±10%, ½ watt (R170)

MODEL 8TS30, CHASSIS KCS-20J-1, KCS-20K-2

RADIO CORP. OF AMERICA

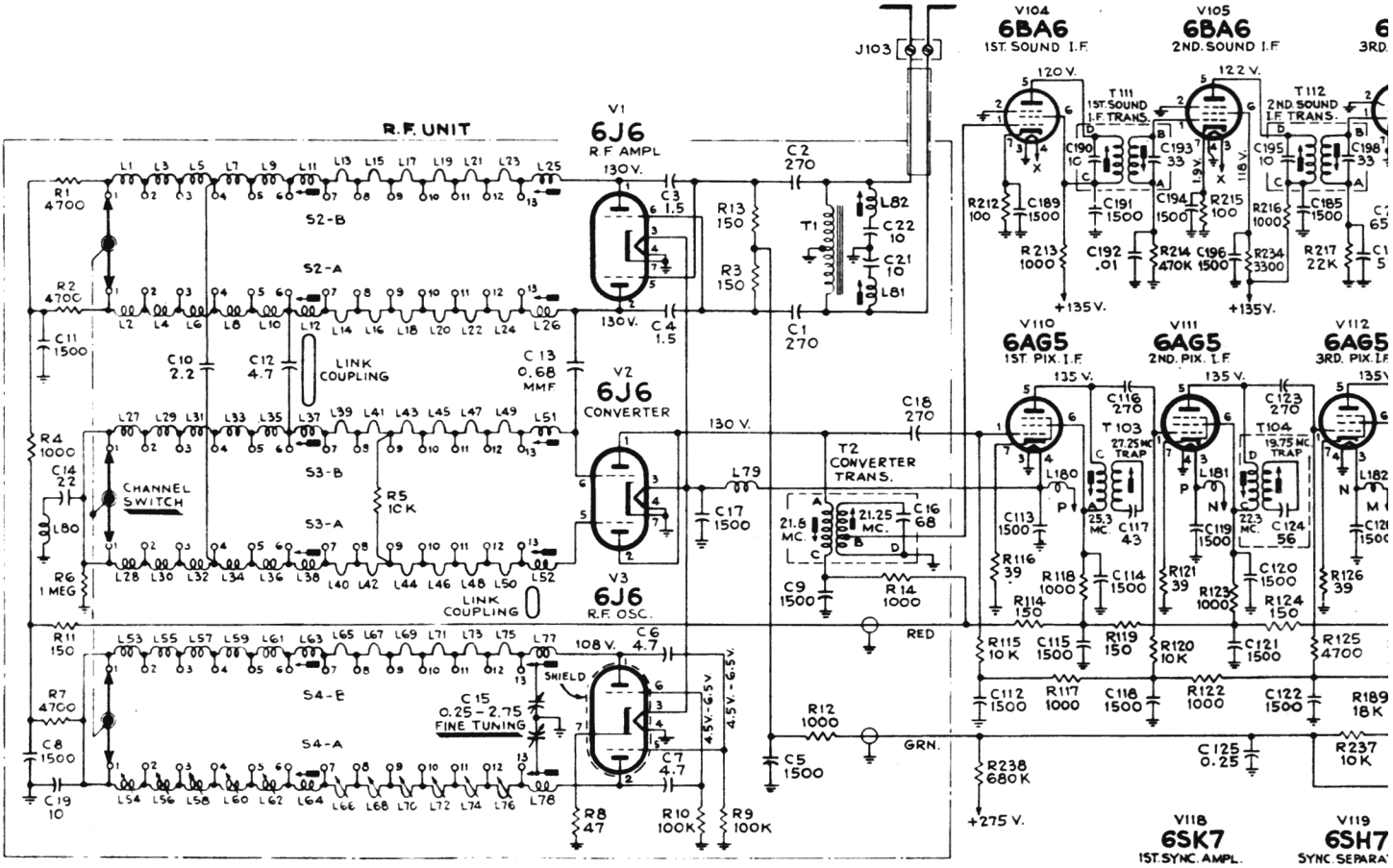
REPLACEMENT PARTS (Continued)

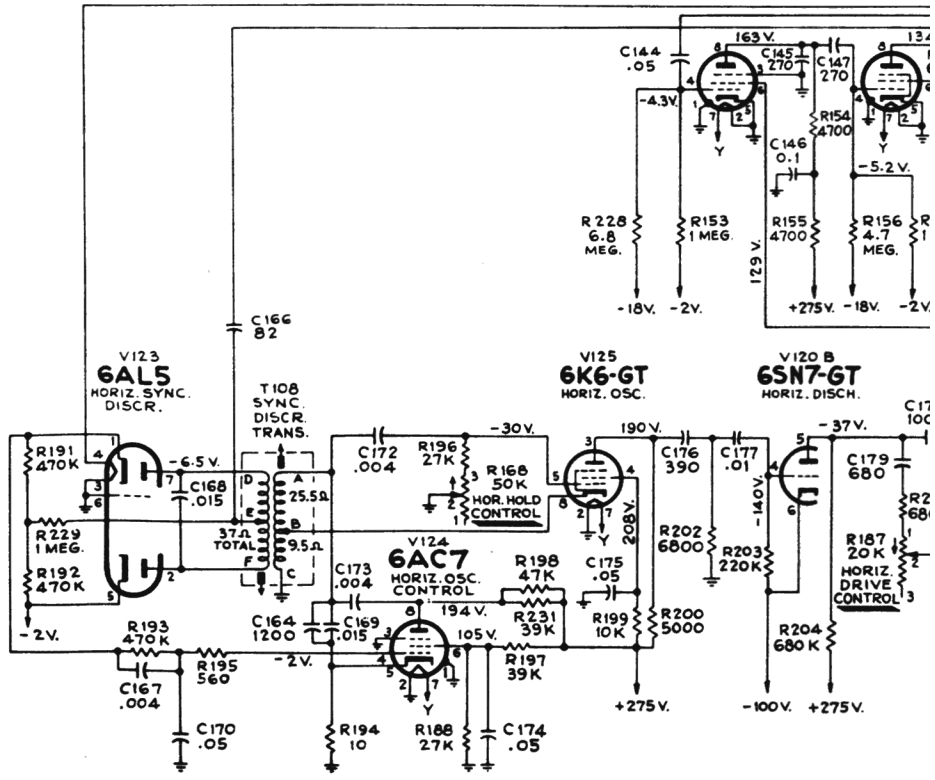
STOCK No.	DESCRIPTION
	Resistor—Fixed composition, 270,000 ohms ±10%, ½ watt (R225)
	Resistor—Fixed composition, 470,000 ohms ±20%, ½ watt (R138, R193, R214)
	Resistor—Fixed composition, 470,000 ohms ±10%, ½ watt (R191, R192, R205)
	Resistor—Fixed composition, 330,000 ohms ±20%, ½ watt (R224)
	Resistor—Fixed composition, 680,000 ohms ±5%, ½ watt (R204, R238)
	Resistor—Fixed composition, 820,000 ohms ±5%, ½ watt (R142)
71458	Resistor—Wire wound, comprising 1 section of 1360 ohms, 17 watts, and 1 section of 230 ohms, 10 watts (R185A, R185B)
71439	Resistor—Wire wound, comprising 1 section of 5300 ohms, 20 watts, and 2 sections of 500 ohms, 2 watts (R209)
73097	Resistor—Voltage divider, comprising 1 section of 6750 ohms, 3.2 watts, and 1 section of 93 ohms, 4 watts (R186)
	Resistor—Fixed composition, 1 megohm ±20%, ½ watt (R149, R153, R159)
	Resistor—Fixed composition, 1 megohm ±10%, ½ watt (R157, R229)
	Resistor—Fixed composition, 1 megohm ±10%, 1 watt (R235)
	Resistor—Fixed composition, 1.2 megohms ±5%, ½ watt (R143)
	Resistor—Fixed composition, 1.5 megohms ±5%, ½ watt (R171)
	Resistor—Fixed composition, 2.2 megohms ±10%, ½ watt (R167, R176)
	Resistor—Fixed composition, 4.7 megohms ±10%, ½ watt (R156)
	Resistor—Fixed composition, 6.8 megohms ±10%, ½ watt (R228)
	Resistor—Fixed composition, 10 megohms ±20%, ½ watt (R223)
71456	Screw—Wing screw for mounting deflection yoke
71452	Sleeve—Rubber sleeve for focus coil
71559	Spring—Grounding spring for high-voltage capacitor
71525	Socket—Kinescope socket
72516	Socket—Tube socket, miniature
31251	Socket—Tube socket, wafer
71508	Socket—Tube socket for 8016
71453	Stud—Threaded stud for focus coil mounting brackets (2 required)
71423	Transformer—First picture i-f transformer (T103, C117)
71425	Transformer—Second picture i-f transformer (T104, C124)
71418	Transformer—Vertical oscillator transformer (T106)
71417	Transformer—Vertical output transformer (T107)
71428	Transformer—Horizontal oscillator transformer (T108)
71416	Transformer—Horizontal output and high-voltage transformer (T109)
*72775	Transformer—Power transformer, 115 volt, 50 cycle (T110)
71415	Transformer—Power transformer, 115 volt, 60 cycle (T110)
71424	Transformer—First or second sound i-f transformer (T111, T112, C190, C193, C195, C198)
71427	Transformer—Sound discriminator transformer (T113, C199, C201, C202)
71419	Transformer—Audio output transformer (T114)
71422	Trap—Sound trap (T105, C132)
71420	Yoke—Deflection yoke (L193, L194, L197, L198, C181, R180, R201)
	SPEAKER ASSEMBLIES 92573-2
*73236	Speaker—5" x 7" PM speaker complete with cone and voice coil
	MISCELLANEOUS
71860	Back—Cabinet back
X1751	Cloth—Grille cloth
*73232	Decal—Control function decal for toasted mahogany instruments
71983	Decal—Control function decal (Off-On Sound and Station Selector) for walnut and mahogany instruments
71982	Decal—Control function decal (Brightness and Horizontal-Vertical) for walnut and mahogany instruments
*73221	Escutcheon—Channel marker escutcheon for toasted mahogany instruments
*73220	Escutcheon—Channel marker escutcheon for walnut and mahogany instruments
72113	Foot—Cabinet foot—rubber (4 required)
*73177	Glass—Safety glass
*73222	Knob—Fine tuning control knob (burgundy) for walnut and mahogany instruments
*73223	Knob—Fine tuning control knob (tan) for toasted mahogany instruments
*73226	Knob—Picture control, brightness control, or vertical hold control knob (burgundy) for walnut and mahogany instruments
*73227	Knob—Picture control, brightness control or vertical hold control knob (tan) for toasted mahogany instruments
*73224	Knob—Station selector knob (burgundy) for walnut and mahogany instruments
*73225	Knob—Station selector knob (tan) for toasted mahogany instruments
*73228	Knob—Volume control and power switch or horizontal hold control knob (burgundy) for walnut and mahogany instruments
*73229	Knob—Volume control and power switch or horizontal hold control knob (tan) for toasted mahogany instruments
*73230	Knob—Brightness control knob (burgundy) for walnut and mahogany instruments
*73231	Knob—Brightness control knob (tan) for toasted mahogany instruments
*73180	Name Plate—"RCA-Victor" name plate
71539	Slide—Kinescope centering slide complete with rubber cushion (4 required)
71538	Spring—Channel marker escutcheon spring
*72845	Spring—Retaining spring for knobs #73222 and #73223
14270	Spring—Retaining spring for knobs #73224, #73225, #73226, #73227, #73230 and #73231
30330	Spring—Retaining spring for knobs #73228 and #73229
*73178	Trim—Grille trim—L. H.
*73179	Trim—Grille trim—R. H.

Note: A few early production instruments were supplied with the type of escutcheon and knobs employed by the Model 630TS Receiver. These items are listed below.

71598	Escutcheon—Channel marker escutcheon
71535	Knob—Picture, brightness or vertical hold knob
71537	Knob—Dummy brightness control knob
71533	Knob—Fine tuning knob
71536	Knob—Horizontal hold or volume control knob
71534	Knob—Station selector knob
71538	Spring—Spring clip fo rescutcheon
4982	Spring—Retaining spring for knob #71533
14270	Spring—Retaining spring for knob #71534, #71535 and #71537
30330	Spring—Retaining spring for knob #71536

CIRCUIT SCHEMATIC DI





NOTES

K = 1000

All resistance values are in ohms. Capacitance values less than 1 are in mfd. and above 1 in mmfd., unless otherwise noted.

Direction of arrows at controls indicates clockwise rotation.

All voltages measured with VoltOhmyst and with picture control counterclockwise. Voltages should hold within ±20% with 117 v. a-c supply.

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

In some receivers, the antenna trap (L81, L82, C21 and C22) may be omitted.

In some receivers, an EM type of ion trap magnet is employed. In these sets, the magnet coils and the shunting resistor R232 are connected as shown by the dotted lines of the schematic. In this case, the jumper across R232 is omitted.

RP. OF AMERICA

MODEL 8TS30, CHASSIS
KCS-20J-1, KCS-20K-2

MATIC DIAGRAM

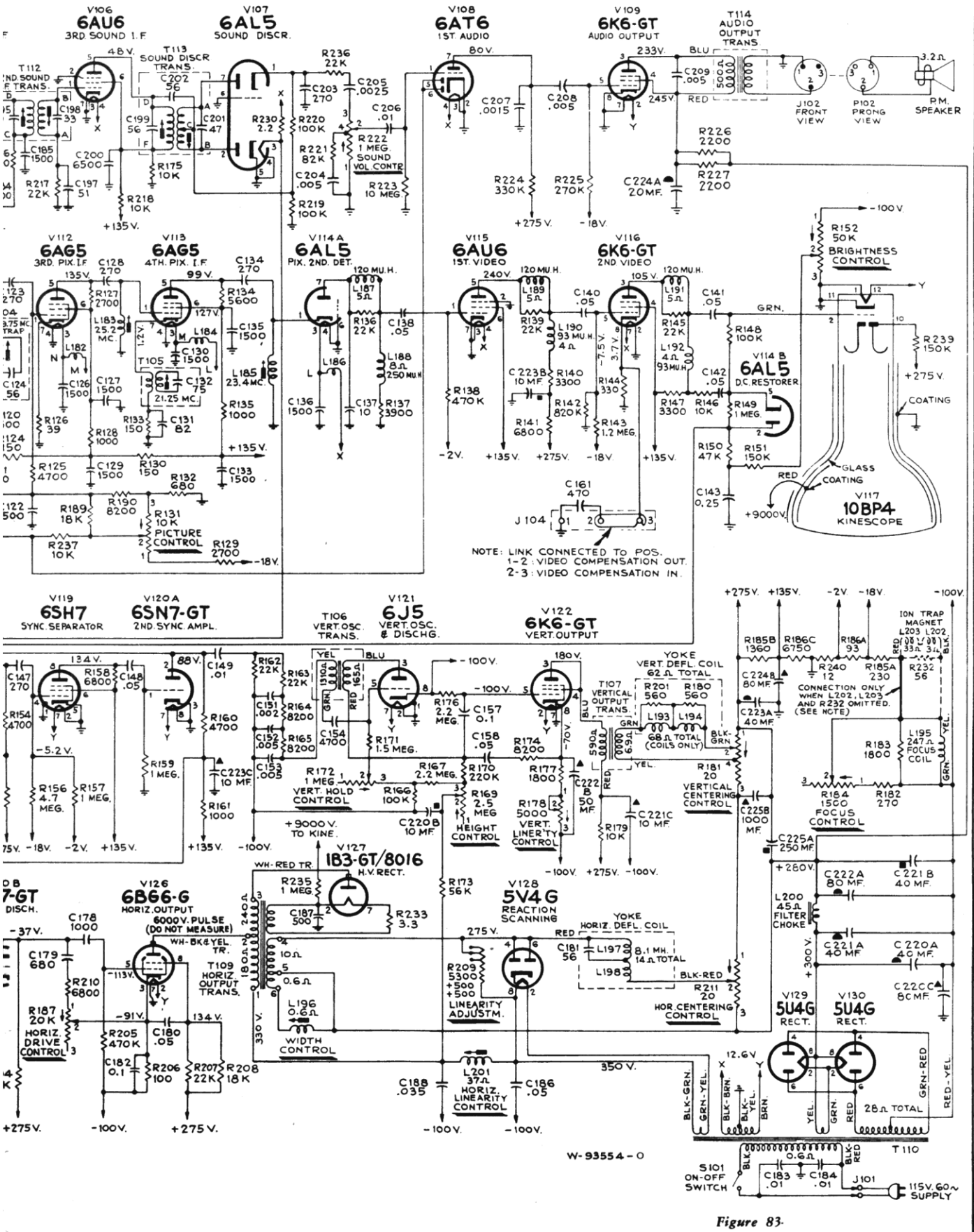
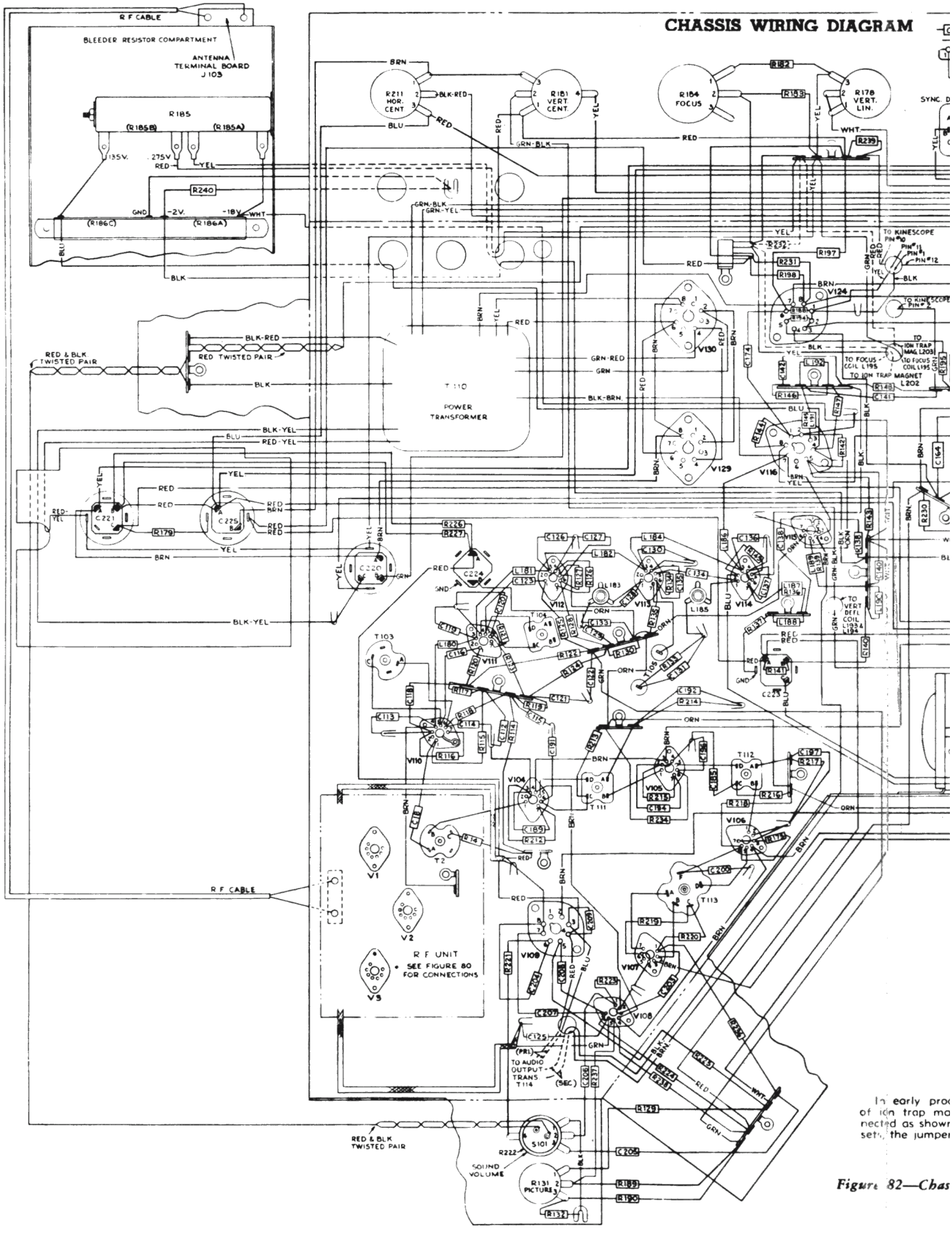


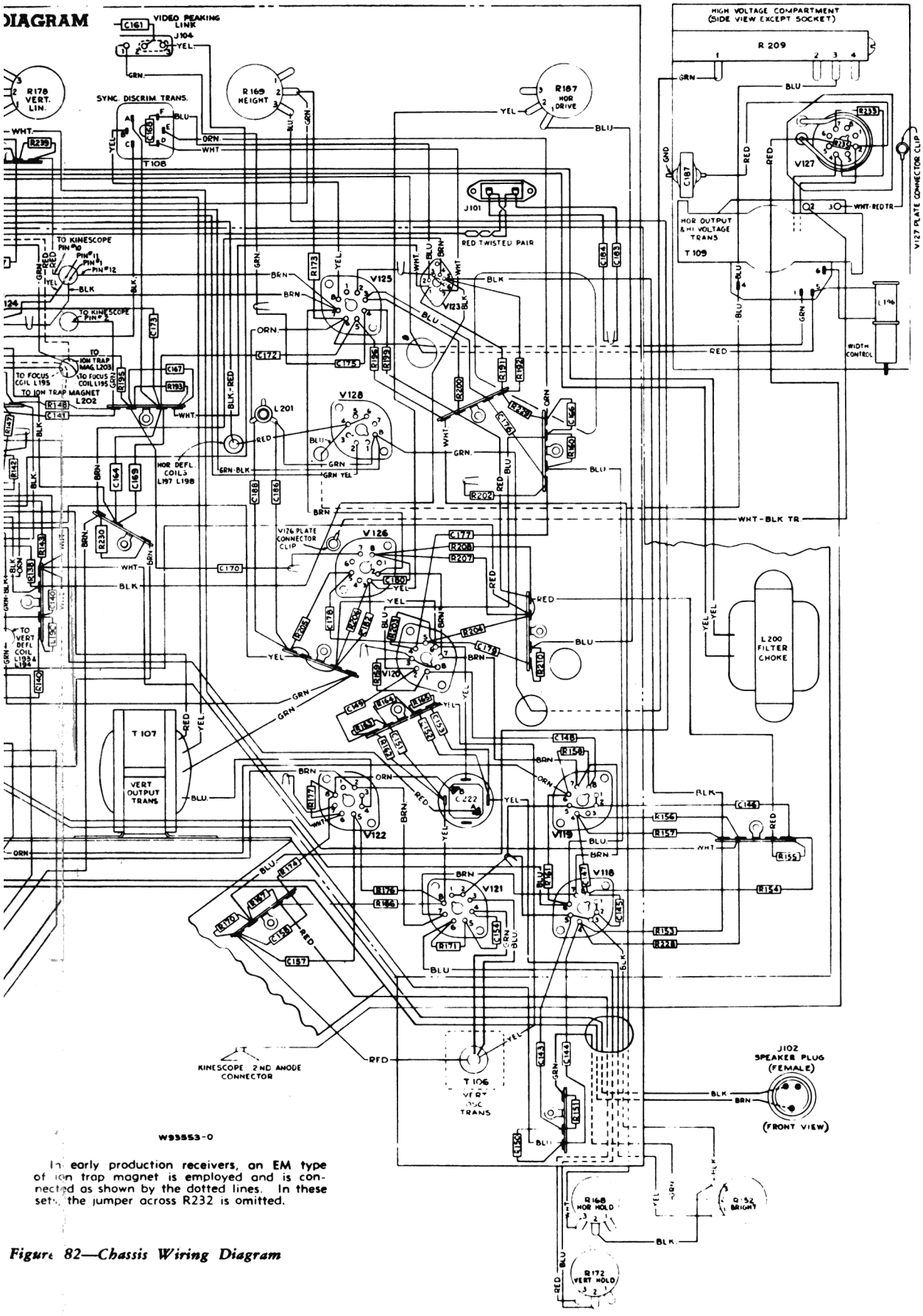
Figure 83.

MODEL 8TS30, CHASSIS
KCS-20J-1, KCS-20K-2



In early prod
of ion trap ma
nected as shown
set, the jumper

Figure 82—Chas



W93553-0

In early production receivers, an EM type of ion trap magnet is employed and is connected as shown by the dotted lines. In these sets, the jumper across R232 is omitted.

Figure 82—Chassis Wiring Diagram