Emerson Radio

TELEVISION SERVICE MANUAL

MODEL 571

Emerson
Radio and
Television

EMERSON RADIO AND PHONOGRAPH CORPORATION

111 EIGHTH AVENUE **NEW YORK 11, N. Y.**

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I. GENERAL DESCRIPTION

TYPE—The Emerson Television Receiver Model 571 is a table model wide-band video receiver which produces pictures of high definition, fine detail and brilliance, combined with an FM audio receiver for accompanying high fidelity sound. The receiver is complete in one unit, including a 10-inch picture tube. It is operated by seven front panel controls and incorporates the most modern, as well as the most advanced circuit arrangements. It contains full coverage of all thirteen channels.

FREQUENCY RANGE

Channel Number	Channel Freq. Mc.	Picture Carrier Freq. Mc.	Sound Carrier Freq. Mc.	Receiver RF Osc. Freq. Mc.
1	44-50	45.25	49.75	71.0
2	54-60	55.25	59.75	81.0
3	60-66	61.25	65.75	87.0
4	66-72	67.25	71.75	93.0
5	76-82	77.25	81.75	103.0
6	82-88	83.25	87.75	109.0
7	174-180	175.25	179.75	201.0
8	180-186	181.25	185.75	207.0
9	186-192	187.25	191.75	213.0
10	192-198	193.25	197.75	219.0
11	198-204	199.25	203.75	225.0
12	204-210	205.25	209.75	231.0
13	210-216	211.25	215.75	237.0

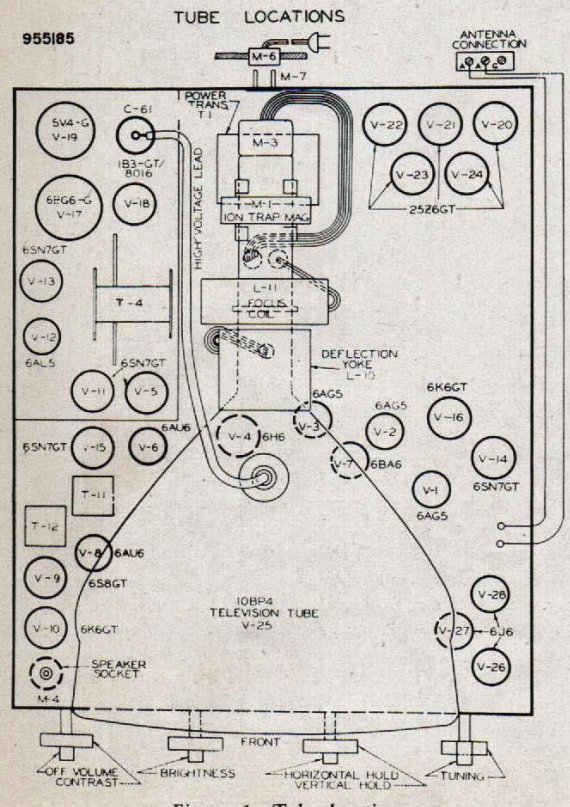


Figure 1—Tube locations

CHASSIS DESIGNATION—120066B.

FINE TUNING RANGE—Plus and minus approximately 300Kc. on channel 1, to plus and minus approximately 750Kc. on channel 13.

VOLTAGE RATING—105-125 volts, 60 cycles only.

POWER CONSUMPTION—275 Watts.

POWER OUTPUT—1.5 Watts maximum.

LOUDSPEAKER—4" x 6" Oval Alnico 5 permanent magnet dynamic speaker.

RECEIVER ANTENNA INPUT IMPEDANCE—300 Ohms balanced.

TUBE COMPLEMENT

Item No.	Tube	Function
V-1	6AG5	1st Video & Sound IF Amp.
V-2	6AG5	2nd Video IF Amp.
V-3	6AG5	3rd Video IF Amp.
*V-4	6H6	Video Detector & AGC
V-5	6SN7GT	Video Amplifier
V-6	6AU6	Sync. Separator & DC Restorer
V-7	6BA6	2nd Sound IF Amp.
V-8	6AU6	Limiter
V-9	6S8GT	Discriminator—A.F. Amp.
V-10	6K6GT	Power Output
V-11	6SN7GT	Sync. Inverter—DC Amp.
V-12	6AL5	A.F.C. Phase Detector
V-13	6SN7GT	Hor. Blocking Osc.—Discharge
V-14	6SN7GT	Vert. Blocking Osc.—Discharge
V-15	6SN7GT	Sync. Amplifier
V-16	6K6GT	Vert. Amplifier
V-17	6BG6G	Hor. Amplifier
V-18	1B3GT/8016	High-Voltage Rectifier
V-19	5V4G	Reaction Damper
V-20	25Z6GT	Low-Voltage Rectifier (Positive)
V-21	25Z6GT	Low-Voltage Rectifier (Positive)
V-22	25Z6GT	Low-Voltage Rectifier (Positive)
V-23	25Z6GT	Low-Voltage Rectifier (Negative)
V-24	25Z6GT	Low-Voltage Rectifier (Negative)
V-25	10BP4	Picture Tube
V-26	6J6	Oscillator
V-27	6J6	Mixer
V-28	6J6	RF Amplifier

* NOTE: In later production V-4 (6H6) was replaced by 6AL5.

II ANTENNA INSTALLATION

GENERAL—When the location for the receiver has been selected, the antenna should be installed. The antenna plays a major part in the installation and the following factors must be taken into account.

Very high frequency radio waves, such as those used in television, have some important characteristics that differ from those used in ordinary broadcasting. The most important difference is the straight line travel of television waves, called "line of sight" propagation. The television wave does not follow the curvature of the earth's surface and thus reliable reception beyond the horizon is not possible. The broadcast can be intercepted by a hill or other obstruction, thus preventing reception by a receiver located behind such an obstruction. For this reason, it is necessary to locate the antenna as high as possible. Another peculiarity of television waves is that they reflect from solid objects. By this action, a television signal can reach a receiver antenna from more than one direction, often resulting in reception of the same signal at slightly different times. This effect produces multiple pictures, or "ghosts" on the television screen. If reflections are encountered, it may be possible to eliminate them by rotation of the antenna, by adding reflectors, by changing to a more directive type of antenna, or by moving the position of the antenna.

Television reception requires the use of special antenna. The most common type is the half wave dipole, consisting of two rods, each a quarter wave long, separated by an insulating member. This type of antenna is bi-directional and is indicated where signals are to be received from two directions and where "ghosts" are not prevalent. Where interference may take place, it becomes necessary to use an antenna with a reflector. Moreover, the dipole with reflector will provide a stronger received signal.

The following table shows the length of the dipole (consisting of two quarter wave rods—and the reflector for each channel.)

Channel	Freq. Mc.	Dipole Length (Ft.)	Reflector Light (Ft.)
1	44-50	10.00	10.50
2	54-60	8.20	8.60
3	60-66	7.50	7.85
4	66-72	6.80	7.15
5	76-82	5.90	6.20
6	82-88	5.50	5.80
7	174-180	2.65	2.78
8	180-186	2.56	2.69
9	186-192	2.48	2.60
10	192-198	2.40	2.52
11	198-204	2.33	2.44
12	204-210	2.26	2.37
13	210-216	2.17	2.30

POINTS OF EMPHASIS

(1)—The antenna must be placed in a high position, clear of all obstructions, and in line of sight of the transmitting station.

(2)—The antenna must be properly aimed to obtain maximum signal strength and freedom from echoes and interference.

(3)—In areas of low signal strength, it may be necessary to use an antenna of specific length to obtain best results.

(4)—The use of special upper and lower band antennas one for the low frequency band and the other for the high frequency band, may be necessary for sufficient signal strength where conditions are favorable.

III TELEVISION RECEIVER INSTALLATION

PLACEMENT—Serious consideration must be given to the location of the television receiver in the home. Place the receiver where a minimum of bright light falls directly on the screen. Consider the location which will give the maximum visibility to the seating arrangement of the room. Position where antenna and power outlet can conveniently be used.

The Emerson Model 571 Television Receiver has been designed for long life. Its components have been placed and designed for optimum operation. The television receiver requires good ventilation. Do not cover any ventilating holes or slots. Locate the receiver where the good ventiation designed in the set is not impeded.

CAUTION

Only experienced service personnel should attempt to make this installation. Extreme care should be taken in handling the picture tube. When the picture tube is being handled, gloves and safety goggles should be worn and the tube should not be held close to the body.

MECHANICAL ADJUSTMENTS

(1)—Check to see that high-voltage lead is firmly in its receptacle on top of the picture tube. If it has come unplugged, lift the rubber insulator away from the lead contact and insert contact in the receptacle, then release the rubber. This will cause a slight vacuum to hold the contact in place.

(2)—The ion trap (M1) should be positioned behind the focus coil with the permanent magnets down. The poles with the blue covering must be toward the picture tube face, and the poles with the black covering should be over the two "flags" which extend from each side of the electron gun assembly. This is an approximate setting. Final positioning is made under "Electrical Adjustments."

(3)—The deflection coil (L10) and focus coil (L11) have been adjusted at the factory; however, the deflection coil holder rubber edges must be snug against the picture tube. If they are not, check to see if the tube may have slipped forward. The rim of the picture tube face should not extend past the front edge of the chassis more than ⅜". If it does, loosen the two wingnuts holding the band around the picture tube and slide the tube back. Do not exert more than a slight pressure. If tube binds, the neck of the tube may break. After tube is properly positioned on the chassis, loosen the two wingnuts on each side of the deflection yoke and slide yoke holder forward until rubber edges are snug against the picture tube. The wingnut on top of the yoke holder controls the final adjustment described under "Electrical Adjustments."

The receiver is now ready to be turned on. At this point, it is recommended that the operating instructions furnished with the receiver be studied. Before turning the receiver on, make certain that the power line is between 105 and 125 volts, 60 cycles A.C., and capable of delivering 275 watts; that all plugs are firmly placed in their sockets; that all tubes are firmly seated in their sockets. Then insert the power plug in the wall receptacle.

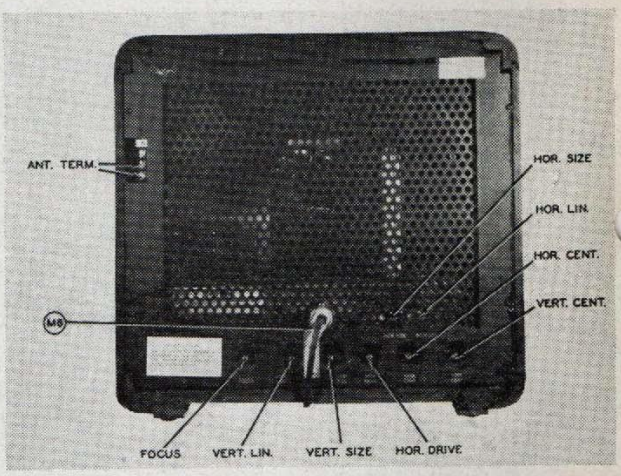


Figure 2—**Rear view of chassis in cabinet**

ELECTRICAL ADJUSTMENTS

(1)—Turn receiver on by rotating the "Off-Volume" control clockwise. Wait about one minute for the tubes to come to operating temperature. Set the "Contrast" control at maximum, counterclockwise. Set the "Brightness" control about half clockwise.

(2)—Adjust the ion trap (M1) by moving back and forth slowly, and rotating slightly until maximum brightness appears on the screen of the picture tube. When adjustment is completed, tighten the screws on the ion trap magnet.

(3)—The deflection coil and focus coil have been adjusted at the factory and if the high voltage control contact is facing up, the raster should fill the opening adequately. If the rectangular raster is cut off on one side, slight movement of the focus coil should fill in the raster. The focus coil is held by two thumb nuts which, when loosened, will allow for this adjustment. Check all thumb screws and thumb nuts to make sure they are tight after these adjustments. If the raster is not complete after above adjustments, slight movement of the deflection coil may be required. If the lines on the tube face are not horizontal, rotate the deflection yoke around the tube until lines are horizontal.

(4)—Attach antenna lead to the two terminals back of chassis "A-A."

(5)—All adjustments on the rear of the chassis have been set at the factory and in the event they have been disturbed, they must be carefully readjusted. Each control is labelled as to its function. When adjustments are required, these should be made on a transmitting station "pattern." Most stations transmit such a pattern prior to each scheduled program.

1V OPERATING INSTRUCTIONS

CONTROLS—The front panel controls are indicated in the following diagram. A complete description of the function of all controls, both front panel and rear, is included in the section of this manual covering circuit description.

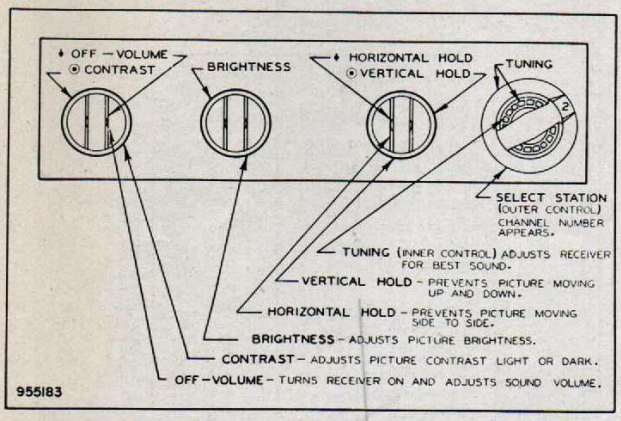


Figure 3—Front panel controls

OPERATING AND TUNING

(1)—Turn the "Off-Volume" control clockwise approximately a quarter turn. This turns the receiver on and sets the sound volume to a reasonable level.

(2)—Set the "Selector" control so that the desired channel number appears. This control may be rotated in either direction.

(3)—Allow approximately 15 seconds for warm-up period. (This time is necessary to allow the tubes to attain the proper temperature for operation.)

(4)—If the desired station is broadcasting, music or speech will be heard. Adjust the "Fine Tuning" control for best sound quality. Readjust the "Volume" control for desired sound level.

(5)—Rotate the "Contrast" control to the maximum counter-clockwise position.

(6)—Rotate the "Brightness" control to the maximum counter-clockwise position and then adjust slowly clockwise, until light is just visible on the screen.

(7)—Adjust the "Contrast" control until a picture appears on the screen and desired contrast is attained.

(8)—If the picture moves vertically or horizontally, make the adjustment indicated in steps 9 and/or 10.

(9)—Adjust the "Vertical Hold" control until the picture stops moving up or down.

(10)—Adjust the "Horizontal Hold" control until the picture stops moving.

(11)—Readjust the "Contrast" control until the desired contrast is obtained. It may be necessary to readjust the "Brightness" control slightly at the same time.

(12)—It may be desirable to readjust the "Fine Tuning" control to make sure that the sound and picture are tuned for the best quality. After the receiver is in operation, for some time, the "Fine Tuning" may require adjustment to maintain the best sound quality. Because of the automatic control circuits embodied in the Emerson Television Receiver, (Model 571) readjustment of the "Vertical Speed" and "Horizontal Speed" controls is rarely necessary if the control settings for good operation are not disturbed.

CHANGING STATION DURING BROADCAST

(1)—Set the "Selector" so the desired channel number appears.

(2)—Readjust the "Fine Tuning" control if necessary to obtain the best sound quality.

(3)—Readjust the "Contrast" control slowly, until the desired picture quality is obtained.

(4)—Readjust "Volume" to a suitable level.

INTERFERENCE — The Emerson engineers have designed into the Model 571 Television Receiver all known means of suppressing interference from the many possible sources. Static, which manifests itself audibly in radio reception, appears visually, as well, in television. The possible sources of excessive interference in a locality must be studied and checked before installation is made. The antenna installation must take these facts into consideration. It should be noted that the signal-to-noise ratio is dependent upon the signal strength as well as the noise level in the immediate vicinity of the installation. Where the signal is weak, a normal noise level will be sufficient, in comparison, to act the same as a high noise level for normal signal strength. It is possible to solve this problem either by increasing signal strength through relocation of the antenna or by using a high gain and/or directive antenna; or to eliminate the noise at its source through filtering, shielding, bonding, etc.

Some typical types of interference which may be encountered are:

Automobile ignition interference causes speckles on the picture and when this effect is severe, it may cause vertical picture movement. Electrical motor driven appliances cause similar effects.

Electrically operated medical equipment, such as diathermy, will cause a herringbone pattern across the screen. Proximity to such equipment may obliterate part of the picture.

Radio frequency interference from transmitting and receiving short wave equipment may cause interference in the form of moving diagonal lines through the picture. (Fig. 13).

Reflections or ghosts, which appear as multiple images, are caused by signals arriving at the receiver from different points —one usually directly from the transmitter, and others by reflections from buildings, mountains, large bridges, etc. Proper antenna installation will minimize this effect.

Picture fading may also be caused by interaction between reflected and direct signals.

A few words about radio frequency interference from transmitting and receiving high frequency equipment, are in order. This type of inteference, which manifests itself as vertically or horizontally moving lines across the screen, can be eliminated by wave traps. Variations in the pattern of interference will depend on the modulation of the interfering signals. Unmodulated carrier interference causes a "spotty" or "Herring-bone" pattern on the screen.

A wave-trap may be required to remove this interference (generally from an FM, undesired television or amateur transmitter) must be a tuned circuit that resonates at the image frequency, caused by the interfering station. The trap should be either a parallel circuit in series, with the underground side of the antenna lead in, or a series circuit placed across the lead in (at the terminal board on the rear of the set).

If the interference is at the same frequency as the desired television station, naturally a trap will eliminate both the wanted and unwanted signals unless the interfering signal is weaker than the wanted signal. In this case the interference can be attenuated until

TEST PATTERN PHOTOGRAPHS

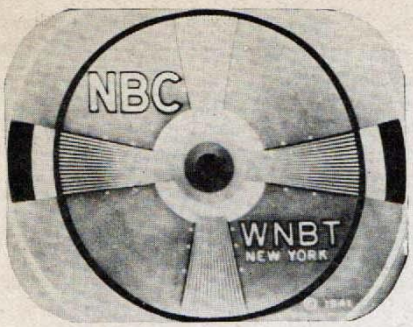


Figure 4—Correctly Adjusted

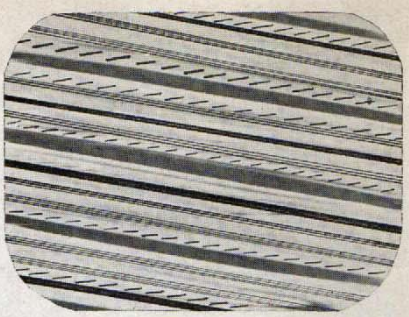


Figure 8—Horizontal Hold Misadjusted

Figure 5—Too Much Brightness

Figure 9—Tuning Misadjusted

Figure 6—Too Much Contrast

Figure 10—Automobile Interference

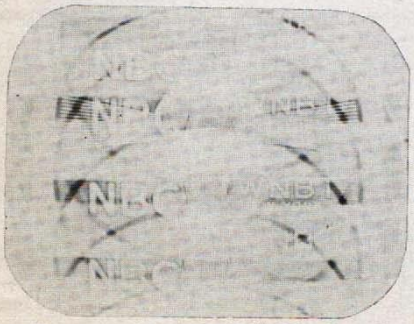


Figure 7—Vertical Hold Misadjusted

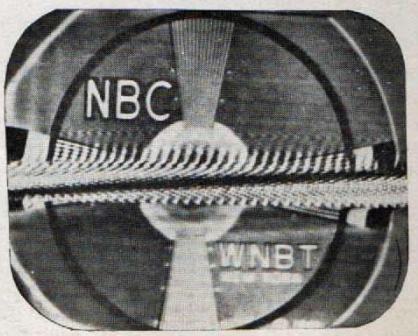


Figure 11—Diathermy

Figure 12—Radio Frequency Interference

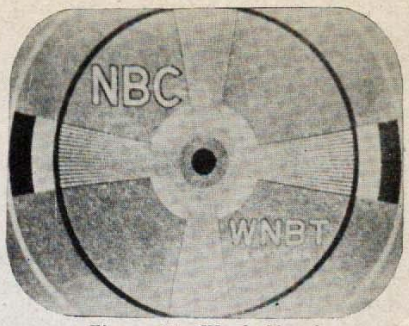


Figure 14—Weak Signal

Figure 13—Reflection

Figure 15—Focus Misadjusted

it no longer causes difficulty. Relocation and the use of a more directive antenna may also be effective in such cases.

It can readily be seen from this discussion of interference how important a part the antenna can play in achieving satisfactory results from a television receiver.

WEAK PICTURES—When an installation is made near the limit of the service area of a transmitter, the picture may become speckled, having a "snow" effect, with the background very light, even with the "Contrast" control at full clockwise position. Further, the picture may not hold steady on the screen. This is caused either by lack of signal strength from the transmitter of a defective antenna, which should be checked.

V CIRCUIT DESCRIPTION

R-F UNIT—The r-f Unit is a separate sub-chassis of the receiver. On this sub-chassis are the r-f amplifier, converter, oscillator, fine-tuning control, channel switch, converter input transformer and oscillator tuned circuits. The tuning adjustments for the thirteen television channels are found in this assembly. This unit functions to select and amplify the desired picture and sound carriers and converts these to provide at the converter plate a picture IF carrier at 25.75 mc. and a sound i-f carrier of 21.25 mc.

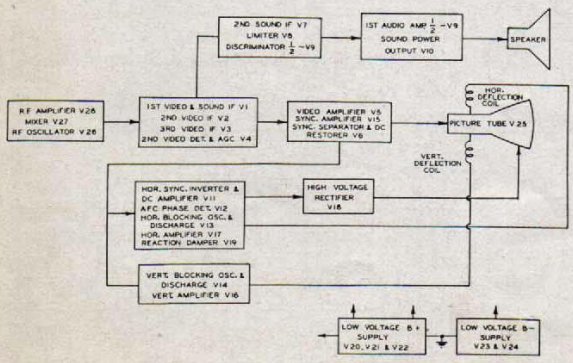


Figure 16—Block Diagram

SOUND I-F AND DISCRIMINATOR—A portion of the energy from the first video and sound i-f is fed to the second sound i-f amplifier. Two stages of amplification are used to provide adequate sensitivity. The second stage acts as a limiter to reject amplitude modulation and noise. A conventional discriminator circuit is used to demodulate the signal.

AUDIO AMPLIFIER AND SPEAKER — The Audio amplifier is the triode section of a 6S8GT and a 6K6GT power output tube which feeds the p.m. speaker.

THE VIDEO SECTION—The i-f signals from the converter stage are amplified in the first video and sound stage of the video i-f section. The audio i-f trap in the output of the first i-f video and sound amplifier rejects the sound signal and passes only the composite video i-f signal to the second video i-f amplifier. The trap in the input of the third video i-f amplifier removes the adjacent sound i-f signal, allowing only the composite video signal of the desired station to be amplified. In the video detector stage, the negative portion of the video i-f signal is rectified and the resultant signal is amplified in the video amplifier and then applied to the control grid of the picture tube. In the second portion of the video detector, the video i-f signal is rectified and used as an automatic gain control bias for the preceding stages.

D-C RESTORER—Since the video amplifier is an A-C amplifier, the D-C component of video signal, which represents the average illumination of the original scene, will not be passed. Unless this D-C component is restored, difficulty will be experienced in maintaining proper scene illumination. For any given scene, the illumination could be set properly by the brightness control, however, the restorer accomplishes this setting automatically by providing bias

on the picture tube grid, which varies with the individual scene. The D-C is developed across resistor (R50) which is directly coupled to the picture tube grid.

PICTURE TUBE—The picture tube is a 10" cathode ray tube, employing a new type of screen material which provides considerably improved picture brilliance. The inside and outside of the flaring portion of the bulb are given a metallic coating. The inner, which is the second anode, is the connection to the high voltage supply. The outer coating is grounded by means of small springs on the deflection yoke support. The capacitance between these two coatings is used as part of the high voltage filter.

SWEEP SECTION — The video signal from the video detector is coupled to a sync. amplifier (½ - V15) where it is amplified and inverted. The positive sync. pulses are then coupled to the sync. separator and DC restorer (V-6). The cathode voltage of V-6, which varies as the average black-white level changes, is directly coupled to the grid of the picture tube to achieve DC restoration. The negative sync. pulses appearing on the plate of V-6 are coupled to another sync. amplifier (½-V-15), where they are further amplified. These positive pulses are then fed to both the horizontal and vertical sync. separator circuits.

In each of the circuits, the time constants have been chosen to accept the correct sync. pulses and reject the others. (Vertical sync. pulses have approximately 35 times the duration of the horizontal sync. pulses.) In this manner, the horizontal sweep generator is controlled by the short time horizontal pulses, while the vertical sweep generator is controlled by the longer duration vertical sync. pulses.

The function of these circuits is to provide a saw-tooth of current of the proper frequency to perform the vertical and horizontal scanning of the picture tube. To produce such a current in the vertical deflection coil, a somewhat differently shaped voltage wave is required. This wave is produced by a capacitor discharge.

The first section of V-14 (6SN7GT—Vertical oscillator and discharge tube), with its associated components, forms a blocking oscillator and discharge circuit. In the absence of a sync. pulse input, this oscillator operates at a frequency determined by C88, R96, and R3B. During picture reception, the 60-cycle vertical sync. pulse is applied to the grid of the oscillator. This pulse reaches the grid of the tube just before it would trip in its free-running position. The magnitude of the sync. pulse is sufficient to drive the tube to conduction. In this manner, the sync. pulse maintains control of the oscillator frequency when the "Vertical Hold" control is adjusted correctly.

V-16 (6K6GT) is used as the vertical output stage. Variable resistor (R8) is provided as the "Vertical Linearity" control. Since the grid voltage-plate current curve is not a straight line over its entire range, the effect of adjusting (R8) is to produce variations in the shape of the saw-tooth scanning wave by changing the operating point on the tube characteristic. This will vary the gain of the tube. The sync. output of this tube is inductively coupled to the vertical coils of yoke (L10).

HORIZONTAL INVERTER D-C AMPLIFIER PHASE DETECTOR—These circuits are primarily employed to insure ease of operation, stability, and good noise immunity. The first section of V-11 (6SN7GT) amplifies the horizontal sync. pulses and feeds them to the sync. discriminator or phase detector V-12 (6AL5) 180° out of phase, with respect to plate and cathode. At the same time, the 6AL5 receives voltages being fed back to it from the horizontal output tube. Any phase shift between the horizontal sync. pulses and the horizontal oscillator frequency will cause the input voltage applied to one diode section of the V-12 to differ from that of the other and result in a D-C bias voltage on the grid of the second section of V-11. This bias voltage will be proportional to the phase displacement between the incoming sync. pulses and the horizontal oscillator wave and of a polarity determined by the lead or lag of the oscillator frequency. Since the plate resistance of this tube is part of the bias network of the grid circuit of horizontal oscillator V-13, the output of the phase detector, V-19, will synchronize the oscillator to the horizontal pulses of the video signal from the transmitter.

HORIZONTAL OSCILLATOR AND DISCHARGE—The horizontal oscillator and discharge circuits are similar to the vertical oscillator and discharge circuits previously described. V-13 (6SN7GT) performs these functions.

HORIZONTAL OUTPUT AND REACTION DAMPER—The function of V-17 (6BG6-G) is to supply sufficient current of the proper wave form to the horizontal deflection coils of yoke (L-10) to provide horizontal scanning of the picture tube (V-25). The function of the reaction damping tube (V-19) (5V4G) is to stop oscillations which might occur over certain parts of the horizontal scanning cycle and help to provide a linear trace.

HIGH-VOLTAGE POWER SUPPLY—The high-voltage power supply makes use of the energy stored in the inductance of the horizontal deflection coils of yoke (L-10). When the plate current of V-17 (6BG6G) is cut off at the instant of retrace of horizontal scanning, a positive pulse occurs across the primary of the horizontal output transformer (T4), due to the collapsing field of the horizontal deflection coils of yoke (L-10). This pulse voltage is stepped up and applied to the high-voltage rectifier V-18 (1B3GT). This rectified voltage is then filtered and applied to the second anode of the picture tube V-25.

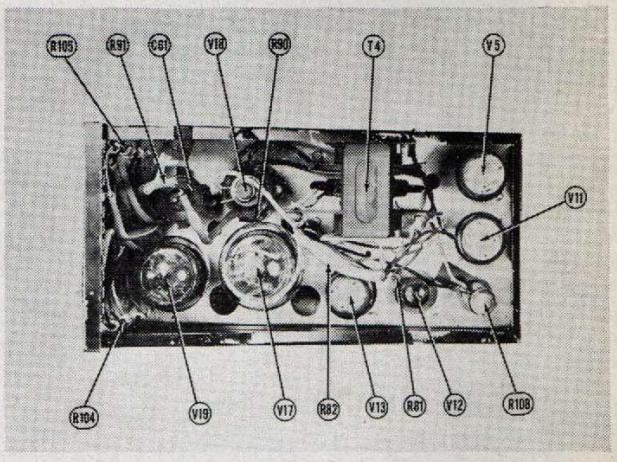


Figure 17—High Voltage Power Supply

LOW-VOLTAGE POWER SUPPLY—Two voltage double circuits are employed. The positive doubler uses three 25Z6GT tubes in parallel to provide the necessary current. The negative doubler uses two 25Z6GT tubes in parallel. Each doubler circuit supplies approximately 200 volts, making a total of 400 volts from B— to B+.

FRONT PANEL CONTROLS — Figure (3).

OFF-VOLUME—Controls power line switch and volume control (R1B) to turn the set "off" or "on" and adjust the volume level of the sound channel. This control does not affect the video signal

CONTRAST—Adjust R1A controlling the gain of the video amplifier (½-V-5), thus controlling the difference in black-to-white range of the picture.

FINE TUNING—Adjusts the frequency of the r-f oscillator by varying the capacitance of the fine tuning capacitor. Adjustment is made for clearest sound.

CHANNEL SELECTOR—Selects and indicates the desired channel by connecting the correct coils into the circuits of the selector.

VERTICAL HOLD—Adjusts R3B, which regulates the free-running frequency of the vertical blocking oscillator (V-14) (6SN7GT), preventing up or down movement of the picture.

HORIZONTAL HOLD—Adjusts R3A, which controls the free-running frequency of the horizontal blocking oscillator V-13, preventing side-to-side movement of the picture.

BRIGHTNESS — Operates R2, regulating the average D-C bias of the picture tube and affects only the background light.

REAR CONTROLS—(See Figure 2).

FOCUS—Adjusts (R9) controlling the amount of current flowing in the focusing coil (L11). This is the only one of the eight controls that may be adjusted by other than a qualified service technician.

VERTICAL SIZE—Adjusts (R7) controlling the amount of vertical deflection signal fed to the vertical output tube V-16 (6K6GT) and, therefore, governing the vertical dimension of the picture on the screen.

VERTICAL LINEARITY — Adjusts (R-8) controlling the linearity of the vertical sweep by changing the operating characteristics of the vertical sweep output tube V-16 (6K6GT). This affects the relative proportion of the upper and lower to the central portion of the picture.

HORIZONTAL SIZE—Adjusts inductance (L-9) regulating the amount of current flowing in the horizontal deflection coil of yoke (L-10), thereby determining the horizontal picture dimension.

HORIZONTAL LINEARITY — Adjusts inductance (L-8) to shift the phase of the ripple of the damper tube V-19 (5V4G) cathode. This affects the relative proportions of the ends of the horizontal scan to the central portion of the picture.

HORIZONTAL DRIVE — Adjusts control resistor (R-6), which determines ratio of saw-tooth to peak voltage applied to the horizontal output tube V-17 (6BG6G). This affects the point on the horizontal trace at which the tube conducts. The drive control affects the width of the picture.

VERTICAL CENTERING—Adjusts (R-4) controlling the magnitude and polarity of the D-C centering current flowing in the vertical deflection coil. Adjustments of this control will move the picture up or down.

HORIZONTAL CENTERING—Adjusts (R-5) controlling the magnitude and polarity of the D-C centering current flowing in the horizontal deflection coil. Adjustments of this control moves the picture from side to side.

VI MAINTENANCE AND ADJUSTMENT

GENERAL—Adjustments inside the cabinet must be made only by **qualified television service technicians.** If reception difficulty is experienced, first tune in another station or turn off the receiver and try it again at a later time, as the faulty performance may be due to technical difficulties at the transmitter.

Of the eight labeled controls at the rear of the cabinet, only the "Focus" control should be adjusted by other than competent service personnel. Periodic adjustment of "Focus" may be required to compensate for aging of tubes, changes in line voltage, etc.

CAUTION—High voltage of approximately 9000 volts is used for picture tube accelerating potential in this receiver. Always turn off ALL power before soldering, making connections, removing the chassis, or doing any work on the receiver. Use only one hand in making adjustments. Always wear gloves and safety goggles when handling the picture tube. Do not use tools near the tube; do not bump tube against hard objects. Stand tube on its face on a thick piece of felt, or insert it in a tube carton if it is removed from the cabinet.

Although it is possible to write volumes on trouble-shooting any equipment as complex as a television set, it is important to emphasize that the nature, location, and correction of troubles must be **analyzed** by the repairman. To do this requires a good working knowledge of the circuits of the inoperative television set, as well as an understanding of television principles. Circuits should not be tested indiscriminately; be logical, and from the symptoms, isolate and localize the trouble in the particular circuit or stage involved. In any case, the picture tube itself often offers the best means of seeking a clue to the trouble. When one can actually see the effect of a receiver fault, rather than having to listen to it, the fault can usually be more easily located, provided, of course, the observed condition is properly interpreted.

TEST EQUIPMENT REQUIRED—Alignment of circuits and diagnosis of faulty operation of a television receiver should not be attempted unless the service technician has available the proper test equipment.

To properly align the Model 571, it is recommended that the following test equipment be available:

R-F Sweep Generator: The sweep generator must meet the following requirements:

1—**Frequency Range:** 18 to 30 mc., 40 to 90 mc., and 170 to 225 mc.

2—**Sweep Width:** Variable up to 10 mc. (5 mc. deviation).

3—**Output:** 1 volt maximum desirable.

4—**Output Characteristics:** The output must be constant over the sweep width at any output frequency, and it is also desirable that it be "flat" on all ranges and at all attenuator positions.

The "Mega-Sweep" manufactured by the Kay Electric Co., or equivalent, is a satisfactory instrument if accompanied by a marker frequency generator or accurately calibrated signal generator. This instrument has a maximum output of approximately .1 volt.

MARKER PIP GENERATOR—In addition to the sweep generator, it is necessary to provide a source of radio frequency voltages of known accuracy. This marker voltage is inserted in parallel with the sweep voltage to establish correct alignment of associated and adjacent channel sound traps, video and sound i-f channel wave shapes, oscillator alignment and r-f input bandpass characteristics. The marker pip generator for alignment of the Model 571 must provide the following frequencies: 21.25 mc. for sound i-f alignment, 61.25 mc., 64.5 mc., and the frequencies of the associated sound channels given in the table on page 3 for r-f oscillator and input circuit alignment. The marker pip frequencies in the range of from 18 to 30 megacycles are provided by a crystal calibrated generator similar to the "Mega Marker" of the Kay Electric Company. The 45 mc. to 220 mc. marker pips can be provided by an accurately calibrated signal generator or a heterodyne frequency meter with crystal calibrator. The accuracy of reading and re-settability of the marker source should be $\pm$ .05 mc. or better.

CATHODE-RAY OSCILLOSCOPE—The cathode-ray oscilloscope used for alignment should have the following features:

1—**Vertical Sensitivity:** .07 volts per inch, if sweep generator provides .1 volt output; .2 volts per inch, if sweep generator provides 1 volt output.

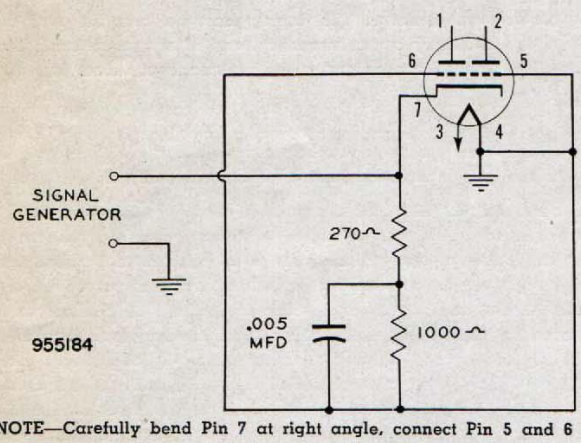
2—**Vertical Band Width:** If used only for r-f and i-f alignment a wide-band scope is not necessary. In this instance, the sweep frequency is between 50 and 150 cycles and high-frequency response is not required. It is necessary, however, to be certain that the scope vertical amplifier has not only good low frequency response, but also does not cause excessive phase shift of the very low frequencies, with respect to the middle audio frequencies. Such phase shift results in a distorted curve and the receiver is actually misaligned to compensate for the oscilloscope phase shift.

A wide-band scope (one flat to 4 mc) is desirable if performance of the video amplifier is to be observed. It is not an absolute necessity, however, as the picture tube itself becomes a good instrument for the determination of defects in the video amplifier and scanning circuits.

VACUUM TUBE VOLTMETER—A multirange vacuum tube voltmeter is required for the measurements of operating voltages, especially those occurring in high resistance circuits. Many good instruments are available. It is desirable to provide an instrument with a high voltage multiplier probe to permit measurements of picture tube accelerating potentials

DUMMY MIXER TUBE—In preliminary alignment of the video i-f and sound traps, it is necessary to connect the sweep generator to the input of the mixer. The "tuned line" type input circuit would act as a vertual short circuit for the i-f frequency voltage. For this reason, it is necessary for the service technician to construct a dummy tube in which the cathode pin is bent out and does not make contact with the socket clips or chassis.

The components and wiring associated with this tube are shown in figure (18). The miniature size components can be fastened to the tube envelope with strips of cellulose Scotch tape. Care should be taken in bending tube pin 7 so that the glass header, or tube base, is not damaged.



NOTE—Carefully bend Pin 7 at right angle, connect Pin 5 and 6 to Pin 4 which is grounded at the socket. Connect other components as shown.

Figure 18—Dummy Mixer Tube

VII. TEST AND ALIGNMENT PROCEDURE

ADJUSTMENT OF SWEEP CIRCUITS USING TRANSMITTED STATION TEST PATTERN AS SIGNAL SOURCE

ADJUSTMENTS—(To Be Made In The Following Sequence)

1—"Horizontal Drive":
Set control (R6) to counterclockwise position.

2—"Brightness Control":
Starting from a counterclockwise position, turn control (R2) until picture tube starts to brighten (appearance of the Raster).

3—"Contrast Control":
Turn control (R1A) closely (to avoid overload) until test pattern appears.

4—"Horizontal And Vertical Hold Controls":
Adjust horizontal (R3A) and vertical (R3B) hold controls for desired hold, keeping contrast control at minimum signal position. The horizontal control should then be turned rapidly to either side of hold position to ascertain positioning (near center). It should again be checked by slow rotation to determine control voltage capabilities (AFC). A 40° rotation to either side of hold position should be obtained. The vertical control should also hold near the central position.

5—"Focus Control":
Adjust control (R9) for best definition, making certain defocusing occurs to either side of optimum setting.

6—"Centering Control":
Adjust vertical (R4) and horizontal (R5) controls for best centering of test pattern.

7—"Horizontal Size Control":
Adjust control (L9) to obtain horizontal width one-half inch short of picture tube mask.

8—"Horizontal Drive":
Position control (R6) to obtain picture width to cover edge of mask.

9—"Horizontal Linearity":
Adjust (L8) for best horizontal linearity of test pattern. This control will affect horizontal linearity at the left side of the test pattern.

10—"Vertical Linearity And Vertical Size':
Adjust (R7) for Vertical picture size and (R) for linearity. The linearity control will affect the top of the test pattern.

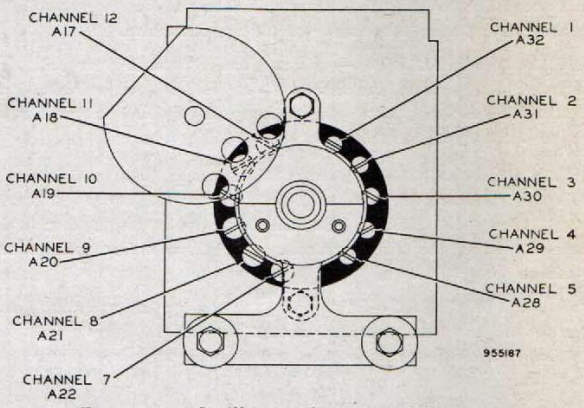


Figure 19—Oscillator Alignment Points

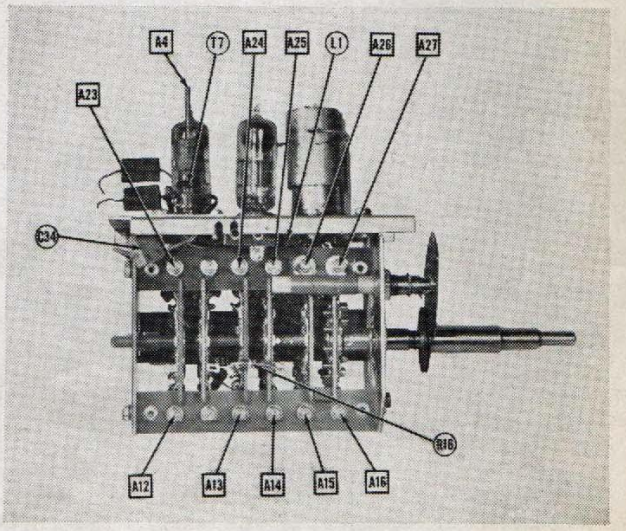


Fig. 20—RF Tuning Unit (a)

VIII. WAVE TRAP ADJUSTMENT

Beginning May 17, 1948, television receiver Model 571 production was equipped with a trap at the factory. This trap is tunable and designed to remove various types of interference encountered in television reception. It is found to be very effective in the following conditions:

A. Image interference on Channels 2-6, due to FM stations, VHF aircraft beacon transmitters, and airport blind landing systems.

B. Inter-channel interference caused by Channel 7 interfering with reception on Channel 5, or a Channel 10 station interfering with reception on Channel 6.

C. Interference from adjacent receivers on Channel 2 due to another receiver tuned to Channel 6.

These traps will be adjusted in the factory so as to eliminate interference between Channels 5 and 7 and we are listing below various methods of adjusting these traps for different interference conditions.

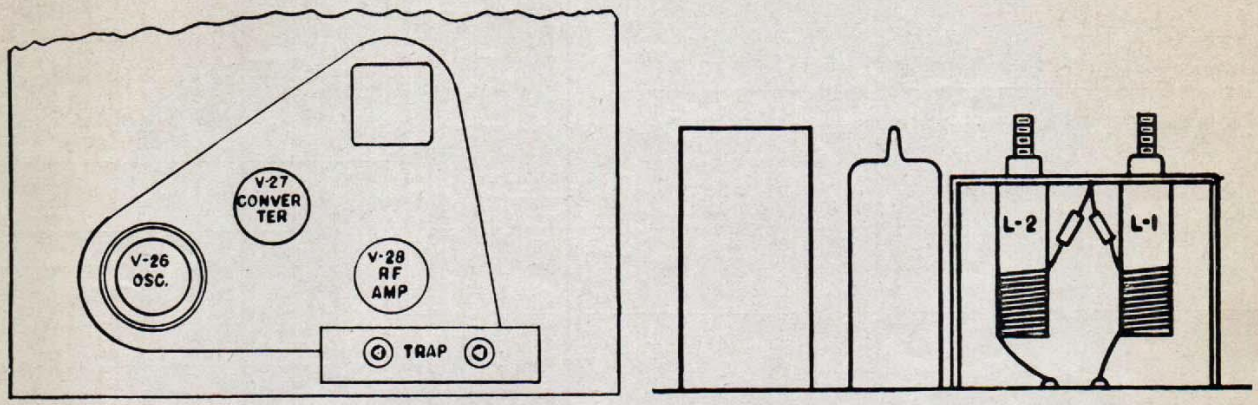


Fig. 21—Wave trap location and adjustment

1. TO ADJUST THE TRAP IN THE FIELD, tune in the station on which interference is observed. Tune the cores of L1 and L2 for maximum rejection of interference in the picture. Keep the stud extensions of the cores approximately the same by visual inspection. If this does not completely eliminate the interference turn one core (L1) ½ turn clockwise and readjust L2 for minimum interference in the picture. If this adjustment reduced the interference still further, continue until the greatest rejection is obtained. If, however, the interference becomes worse, then turn L1 counter clockwise ½ turn and readjust L2. Continue until maximum rejection is obtained.

2. WHEN THE RECEIVER WITH THE TRAP IS ALIGNED IN THE SHOP, the antenna trap should be adjusted to reject the type of interference encountered at the customer's home. It can be adjusted by actual observation of the interference condition or by rejection of the signal fed in from a signal generator. Two methods of adjustment are possible if a signal generator is employed. Select the method and the frequency to suit the test equipment available and the channel on which the interference is obtained. Method one is the most direct, but is subject to difficulty if the adjustment is made in a location where the signal from the station (5 or 6 as the case may be) is on very strong at the time the adjustment is made.
Method two may also be subject to difficulty if a very strong signal is received on the channel on which the receiver channel switch is set. Between the two methods, however, one method undoubtedly will be workable.

3. METHOD ONE FOR CHANNELS 6-10 INTERFERENCE. Switch the receiver to Channel 6 and tune the receiver to 109 mc. by frequency meter or by tuning in the Channel 6 station. Connect a VTVM to the video detector and set it on the three or ten volt scale. Connect the signal generator to the receiver antenna terminals, and feed in a Channel 10 picture carrier frequency signal (193.25 mc.) Set the contrast control for the maximum gain possible without overloading the receiver. Adjust L1 and L2 for minimum reading on the VTVM keeping both core stud extensions about the same by visual inspection. For a final touch adjust one core ½ turn clockwise and readjust the other for maximum rejection. Repeat as described previously for maximum rejection.

4. METHOD TWO FOR CHANNELS 6-10 INTERFERENCE. With the same set up as described in Method One 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 before for minimum reading on the VTVM.

5. METHOD ONE FOR CHANNELS 5-7 INTERFERENCE. With the same set up as above, set the receiver on Channel 5 and tune the receiver oscillator to 103 mc. Feed in a Channel 7 sound carrier frequency signal (179.75 mc.) and adjust the trap as before.

6. METHOD TWO FOR CHANNELS 5-7 INTERFERENCE. With the same set up as above, set the receiver and Channel 2 and tune the receiver oscillator to 81 mc. Feed in a 103 mc. signal from the generator and adjust the trap as before.

7. METHOD FOR FM IMAGE INTERFERENCE. With the same set up 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.

Paragraphs 2 through 7 apply to shop methods of eliminating the various types of interference. In cases of severe interference it may be necessary to retouch these adjustments when the receiver is installed in the customer's home.

When a complete receiver alignment is necessary in the shop it is advisable to detune the antenna trap by screwing the L1 and L2 cores all the way counter clockwise to prevent the trap adversely affecting the Channel 6 response shape. After the receiver has been completely aligned, the trap should then be retuned.

With the trap tuned to eliminate the Channel 5-7 interference, the Channel 6 sensitivity of the receiver is reduced somewhat. This reduction in sensitivity, however, is tolerable in practically all instances.

Emerson Radio

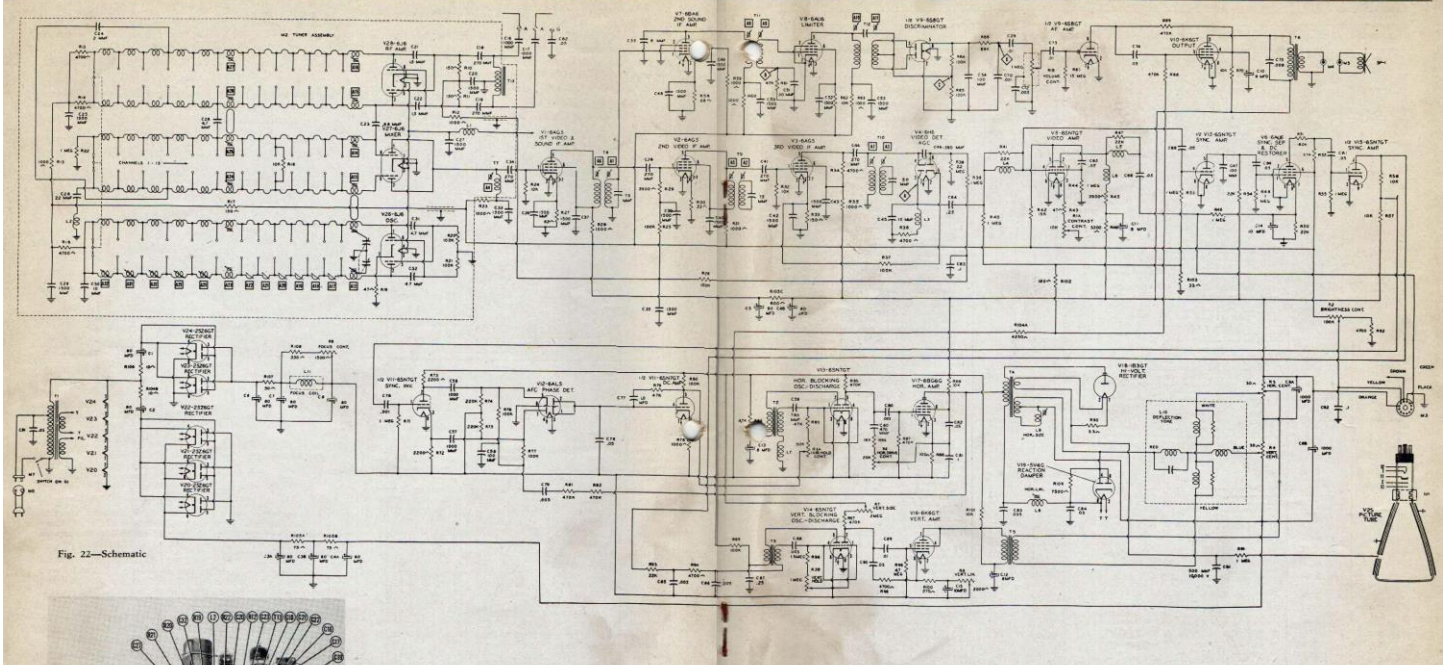


Fig. 22—Schematic

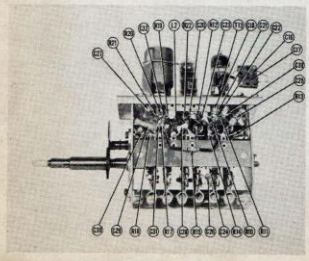


Fig. 23—RF Tuning Unit (b)

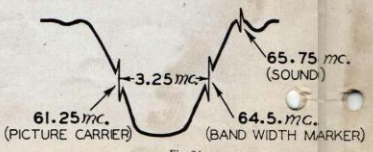


Fig. 24

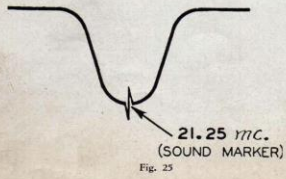


Fig. 25

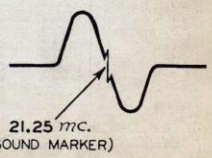


Fig. 26

SYMBOL	PART No.	DESCRIPTION
V1	800535	6AG5, 1st Video and Sound IF amplifier
V2	800535	6AG5, 2nd Video IF amplifier
V3	800535	6AG5, 3rd Video IF amplifier
V4A	800330	6H6, Video det. and AGC
V4B	800541	6AL5, Video det. and AGC
V5	800380	6SN7GT, Video amplifier
V6	800533	6AU6, Sync. separator and DC rest.
V7	800531	6BA6, 2nd Sound IF amplifier
V8	800533	6AU6 Limiter
V9	800015	6S8GT, Disc.-AF amplifier
V10	800016	6K6GT, Power output
V11	800380	6SN7GT, Sync. inv.-DC amplifier
V12	800541	6AL5, AFC phase det.
V13	800380	6SN7GT, Hor. blocking osc.-discharge
V14	800380	6SN7GT, Ver. blocking osc.-discharge
V15	800380	6SN7GT, Sync. amplifier
V16	800016	6K6GT, Ver. amplifier
V17	800004	6BG6-G, Hor. amplifier
V18	800450	1B3GT/8016, High-voltage rect.
V19	800011	5V4-G, Reaction damper
V20	800480	25Z6GT, Rectifier
V21	800480	25Z6GT, Rectifier
V22	800480	25Z6GT, Rectifier
V23	800480	25Z6GT, Rectifier
V24	800480	25Z6GT, Rectifier
V25	810000	10BP4, Picture tube
V26	800536	6J6, Oscillator, part of Tuning Unit 950049
V27	800536	6J6, Mixer, part of Tuning Unit 950049
V28	800536	6J6, RF amplifier, part of Tuning Unit 950049
C1A	925089	Doubler capacitor, 80 mfd., 150 volt condenser
C1B	925098	Alternate part, 80 mfd., 150 volt condenser
*C2	925099	Doubler cap. (See Note 1), 80 mfd., 175 volt condenser
C3A	925086	Filter, 80 mfd., 300 volt condenser
B		Filter, 80 mfd., 300 volt condenser
**C4A	925087	Filter, (See Note 2), 80 mfd., 300 volt condenser
B		Filter, 80 mfd., 300 volt condenser
**C5	925088	Filter, (See Note 2), 80 mfd., 300 volt condenser
C6	925091	Filter, 80 mfd., 250 volt condenser
C7	925093	Filter, 80 mfd., 250 volt condenser
C8	925093	Filter, 80 mfd., 250 volt condenser
***C9A	925092	Hor. cent. cont. bypass (See Note 3), 1000 mfd., 15 volt condenser
B		Vert. cent. cont. bypass, 1000 mfd., 15 volt condenser
C10	925111	Decoupling filter, 8 mfd., 250 volt condenser
C11	925111	Decoupling filter, 8 mfd., 250 volt condenser
C12	925111	Decoupling filter, 8 mfd., 250 volt condenser
C13	925111	Decoupling filter, 8 mfd., 250 volt condenser
C14	925072	DC restorer cath. bypass, 10 mfd., 50 volt condenser
†C15	925180	Vert. lin. cont. bypass (See note 4), 10 mfd., 25 volt condenser
C16A	910013	Ant. coupling, 1000 mmf.
B	928003	Ant. coupling, 1000 mmf.
C17A	910013	Ant. coupling, 1000 mmf.
B	928003	Ant. coupling, 1000 mmf.
C18		Ant. coupling, 270 mmf.
C19		Ant. coupling, 270 mmf.
C20	928006	RF bypass, 1500 mmf., 400 volt condenser
C21		RF neutralizing, 1.5 mmf.
C22		RF neutralizing, 1.5 mmf.
C23		RF coupling, .68 mmf.
C24		RF coupling, 2 mmf.
C25	928006	RF decoupling, 1500 mmf., 400 volt condenser
C26		RF coupling, 4.7 mmf.
C27	928006	Fil. bypass, 1500 mmf., 400 volt condenser
C28		RF bypass, 22 mmf.
C29	928006	RF decoupling, 1500 mmf., 400 volt condenser
C30		RF decoupling, 10 mmf.
C31	923004	Osc. feedback, 4.7 mmf., 400 volt condenser
C32	923004	Osc. feedback, 4.7 mmf., 400 volt condenser
C33	928006	RF decoupling, 1500 mmf., 400 volt condenser
C34	910015	IF coupling, 270 mmf., 400 volt condenser
C35	928006	AGC filter, 1500 mmf., 400 volt condenser
C36	928006	1st Video IF cath. bypass, 1500 mmf., 400 volt condenser
C37	928006	1st Video IF screen bypass, 1500 mmf., 400 volt condenser
C38	910015	IF coupling, 270 mmf., 400 volt condenser
C39	928006	AGC filter, 1500 mmf., 400 volt condenser
C40	928006	2nd Video IF screen bypass, 1500 mmf., 400 volt condenser
C41	910015	IF coupling, 270 mmf., 400 volt condenser
C42	928006	3rd Video IF cath. bypass, 1500 mmf., 400 volt condenser
C43	928006	3rd Video IF screen bypass, 1500 mmf., 400 volt condenser
C44	910015	IF coupling, 270 mmf., 400 volt condenser
C45	910130	Fixed trimmer, 10 mmf., 400 volt condenser
C46	910359	IF coupling 390 mmf.
C47	910010	RF bypass, 100 mmf.
C48	928006	Sound IF cath. bypass, 1500 mmf., 400 volt condenser
C49	928006	Sound IF screen bypass, 1500 mmf., 400 volt condenser
C50	928006	Sound IF plate decoup., 1500 mmf., 400 volt condenser
C51	910290	Limiter grid filter, 30 mmf., 400 volt condenser
C52	928006	Limiter screen bypass, 1500 mmf., 400 volt condenser
C53	928006	Limiter plate decoup., 1500 mmf., 400 volt condenser
C54	910010	RF bypass, 100 mmf.
††C55	928017	Fixed trimmer, (See Note 5), 5 mmf.
C56	910140	Hor. sync. coupling., 1000 mmf., 400 volt condenser
C57	910140	Hor. sync. coupling., 1000 mmf., 400 volt condenser
C58	910010	AFC filter, 100 mmf.
C59	910023	Hor. osc. grid, 780 mmf., 400 volt condenser
C60	910017	Hor. discharge, 470 mmf., 400 volt condenser
C61	923003	High-volt. filter titanium oxide, 500 mmf., 10,000 volt condenser
C62	922101	External gnd. isolation, .05 mfd., 400 volt condenser
C63	923067	AGC filter, .1 mfd., 200 volt condenser
C64	923080	Video coupling, .25 mfd., 200 volt condenser
C65	923062	Video coupling .05 mfd., 400 volt condenser
C66	923062	Video coupling .05 mfd., 400 volt condenser
C67	923062	Sync. coupling, .05 mfd., 400 volt condenser
C68	923062	Sync. coupling, .05 mfd., 400 volt condenser
C69	923062	Sync. coupling, .05 mfd., 400 volt condenser
C70	923079	De-emphasis, .001 mfd., 600 volt condenser
C71	923076	Audio coupling, .01 mfd., 200 volt condenser
C72	923078	Vol. cont. isolation, .005 mfd., 400 volt condenser
C73	923076	Audio coupling, .01 mfd., 200 volt condenser
C74	923062	Audio coupling, .05 mfd., 200 volt condenser
C75	923063	Output plate bypass, .008 mfd., 400 volt condenser
C76	923071	Sync. coupling, .001 mfd., 400 volt condenser
C77	923072	Phase shift cap., 1.0 mfd., 200 volt condenser
C78	923068	Diode load cap., .05 mfd., 200 volt condenser
C79	923077	Hor. AFC coupling, .005 mfd., 600 volt condenser
C80	923079	Hor. sweep coupling, .001 mfd., 600 volt condenser
C81	923067	Hor. amp. cath. bypass, .1 mfd., 200 volt condenser
C82	923073	Hor. amp. screen bypass, .05 mfd., 600 volt condenser
C83	923074	Damper filter, .035 mfd., 600 volt condenser
C84	923073	Damper filter, .05 mfd., 600 volt condenser
C85	923078	Integrator net, .005 mfd., 400 volt condenser
C86	923078	Integrator net, .005 mfd., 400 volt condenser
C87	923066	Vert. osc. decoupling, .25 mfd., 400 volt condenser
C88	923069	Vert. osc. grid, .003 mfd., 600 volt condenser
C89	923075	Vert. sweep coupling, .01 mfd., 600 volt condenser
C90	923073	Vert. discharge, .05 mfd., 600 volt condenser
C91	923062	Line Filter, .05 mfd., 400 volt condenser
C92	923067	Picture tube cathode bypass, .1 mfd., 200 volt condenser
A)		Contrast control-front section, 10K ohm, ½ watt resistor
R1 B)	390034	Volume control-rear section, 1 meg., ½ watt resistor
C)		Power switch, switch
R2	390032	Brightness control, 100K ohm, ½ watt resistor
R3 A	390036	Hor. hold control-rear section, 50K ohm., ½ watt resistor
B		Vert. hold control-front section, 1 meg., ½ watt resistor
R4	390033	Vert. centering control 30-tapped 15 ohm
R5	390033	Hor. centering control 30-tapped 15 ohm
R6	390035	Hor. drive control, 20K ohm, ½ watt resistor
R7	390038	Vert. size control, 2 meg., ½ watt resistor
R8	390039	Vert. linearity control, 5000 ohm, ½ watt resistor
R9	390037	Focus control, 1500 ohm, 4 watt resistor
R10	340292	RF grid, 150 ohm, ½ watt resistor
R11	340292	RF grid, 150 ohm, ½ watt resistor
R12	340492	AGC network, 1000 ohm, ½ watt resistor
R13	340652	RF decoupling, 4700 ohm, ½ watt resistor
R14	340652	RF decoupling, 4700 ohm, ½ watt resistor
R15	350492	RF decoupling, 1000 ohm, ½ watt resistor
R16	340732	Mixer input shunt, 10K ohm, ½ watt resistor
R17	340292	Decoupling, 150 ohm, ½ watt resistor
R18	350652	Osc. decoupling, 4700 ohm, ½ watt resistor
R19	350172	Osc. cathode, 47 ohm, ½ watt resistor
R20	350972	Osc. grid, 100K ohm, ½ watt resistor
R21	350972	Osc. grid, 100K ohm, ½ watt resistor
R22	351212	Mixer grid, 1 meg., ½ watt resistor
R23	340492	Mixer decoupling, 1000 ohm, ½ watt resistor
R24	330731	1st Video IF grid, 10K ohm, ½ watt resistor
R25	340972	AGC network, 100K ohm, ½ watt resistor
R26	340972	AGC network, 100K ohm, ½ watt resistor
R27	340232	1st Video IF cathode, 82 ohm, ½ watt resistor
R28	340492	1st Video IF decoupling, 1000 ohm, ½ watt

* NOTE 1: Some models use two 40 mfd., 150 V. in parallel in this application. Part No. 925085.
** NOTE 2: Alternate part No. 925096 80-80-60 mfd., 250-250-200 v. Replaces Items C4 and C5
*** NOTE 3: Alternate part No. 925097 1000-1000 mfd., 15 V.
† NOTE 4: Some models use a 10 mfd., 50 v., Part No. 925072 in this application.
†† NOTE 5: Some models use an 8 mmf. ceramic capacitator, ± .25 mmf. in this application.

SYMBOL	PART No.	DESCRIPTION
R29	340362	2nd Video IF grid, 3900 ohm, ½ watt resistor
R30	340132	2nd Video IF cathode, 33 ohm, ½ watt resistor
R31	340492	2nd Video IF decoupling, 1000 ohm, ½ watt resistor
R32	330732	3rd Video IF grid, 10K ohm, ½ watt resistor
R33	340292	3rd Video IF cathode, 150 ohm, ½ watt resistor
R34	330652	3rd Video IF plate, 4700 ohm, ½ watt resistor
R35	340492	3rd Video IF decoupling, 1000 ohm, ½ watt resistor
R36	330652	Video det. diode load, 4700 ohm, ½ watt resistor
R37	340972	Delayed AGC network, 100K , ½ watt resistor
R38	341292	AGC diode load, 2.2 meg., ½ watt resistor
R39	341212	AGC filter network, 1 meg., ½ watt resistor
R40	341212	Video amp. grid, 1 meg., ½ watt resistor
R41	340812	Peaking coil shunt, 22K ohm, ½ watt resistor
R42	330532	1st Video amp. plate, 15K ohm, ½ watt resistor
R43	340172	2nd Video amp. cathode, 47 ohm, ½ watt resistor
R44	341212	2nd Video amp. grid, 1 meg., ½ watt resistor
R45	340632	2nd Video amp. plate, 3900 ohm, ½ watt resistor
R46	340612	2nd Video amp. decoupling, 3300 ohm, ½ watt resistor
R47	340812	Peaking coil shunt, 22K ohm, ½ watt resistor
R48	341212	DC restorer grid, 1 meg., ½ watt resistor
R49	341212	Picture tube grid, 1 meg., ½ watt resistor
R50	340812	DC restorer cathode, 22K ohm, ½ watt resistor
R51	341032	DC restorer plate, 180K ohm, ½ watt resistor
R52	340892	DC restorer plate, 47K ohm, ½ watt resistor
R53	341212	1st sync. amp. grid, 1 meg., ½ watt resistor
R54	370812	1st sync. amp. plate, 22K ohm, 1 watt resistor
R55	341212	2nd sync. amp. grid, 1 meg., ½ watt resistor
R56	340732	2nd sync. amp. plate, 10K ohm, ½ watt resistor
R57	340732	2nd sync. amp. plate, 10K ohm, ½ watt resistor
R58	340212	Second IF cathode, 68 ohm, ½ watt resistor
R59	340492	Sound IF screen, 1000 ohm, ½ watt resistor
R60	340492	Sound IF decoupling, 1000 ohm, ½ watt resister
R61	340892	Limiter grid, 47K ohm, ½ watt resistor
R62	340732	Limiter screen dropping, 10K ohm, ½ watt resistor
R63	340492	Limiter plate decoupling, 1000 ohm, ½ watt resistor
R64	340972	Disc. diode load, 100K ohm, ½ watt resistor
R65	340972	Disc. diode load, 100K ohm, ½ watt resistor
R66	340932	De-emphasis, 68K ohm, ½ watt resistor
R67	351492	Audio amp. grid, 15 meg., ½ watt resistor
R68	341132	Power output grid, 470K ohm, ½ watt resistor
R69	341132	Audio amp. plate, 470K ohm, ½ watt resistor
R70	340732	Decoupling, 10K ohm, ½ watt resistor
R71	341212	Sync. phase inv. grid, 1 meg., ½ watt resistor
R72	330572	Sync. phase inv. cathode, 2200 ohm, ½ watt resistor
R73	330572	Sync. phase Inv. plate, 2200 ohm, ½ watt resistor
R74	341052	Phase det. cathode load, 220K ohm, ½ watt resistor
R75	341052	Phase det. plate load, 220K ohm, ½ watt resistor
R76	330972	Hor. pulse inj. network, 100K ohm, ½ watt resistor
R77	330972	Hor. pulse inj. network, 100K ohm, ½ watt resistor
R78	330492	DC amp. cathode, 1000 ohm, ½ watt resistor
R79	340892	Phase shift res., 47K ohm, ½ watt resistor
R80	360972	DC amp. plate, 100K ohm, 1 watt resistor
R81	371132	Hor. pulse inj. network, 470K ohm, 1 watt resistor
R82	371132	Hor. pulse inj. network, 470K ohm, 1 watt resistor
R83	340892	Hor. osc. grid, 47K ohm, ½ watt resistor
R84	370652	Hor. osc. decoupling, 4700 ohm, 1 watt resistor
R85	331132	Hor. discharge plate, 470K ohm, ½ watt resistor
R86	340792	Hor. discharge network, 18K ohm, ½ watt resistor
R87	341132	Hor. amp. grid, 470K ohm, ½ watt resistor
R88	370252	Hor. amp. cathode, 100 ohm, 1 watt resistor
R89	397014	Hor. amp. screen, 10K ohm, 2 watt resistor
R90	397041	Filament dropping, 3.3 ohm, 1 watt resistor
R91	371212	High-voltage filter, 1 meg., ½ watt resistor
R92	340652	Picture tube cathode, 4700 ohm, ½ watt resistor
R93	340812	Integrator network, 22K ohm, ½ watt resistor
R94	340652	Integrator network, 4700 ohm, ½ watt resistor
R95	370972	Vert. osc. decoupling, 100K ohm, 1 watt resistor
R96	331252	Vert. osc. grid, 1.5 meg., ½ watt resistor
R97	341132	Vert. discharge plate, 470K ohm, ½ watt resistor
R98	340672	Vert. discharge network, 4700 ohm, ½ watt resistor
R99	341372	Vert. amp. grid, 4.7 meg., ½ watt resistor
R100	340352	Vert. amp. cathode, 270 ohm, ½ watt resistor
R101	370732	Vert. amp. decoupling, 10K ohm, 1 watt resistor
R102	370312	Bias network, 180 ohm, 1 watt resistor
R103	340132	Bias network, 33 ohm, ½ watt resistor
R104 A)	394022	Bias network, 4250 ohm, 10 watt resistor
B)		Rectifier baliast, 10 ohm, 5 watt resistor
A)		Filter, 75 ohm, 5 watt resistor
R105 B	394021	Filter, 75 ohm, 5 watt resistor
C)		Filter, 600 ohm, 5 watt resistor
R106	394027	Rectifier ballast, 10 ohm, 3 watt resistor
*R107	394033	Filter (See Note 1), 50 ohm, 3 watt resistor
R108	394034	Focus coil shunt, 330 ohm, 3 watt resistor
R109	394007	Reaction damper plate load, 7500 ohm, 25 watt resistor
T1	730007	Power transformer
T2	738008	Hor. blocking osc. transformer
T3	738004	Vert. blocking osc. transformer
T4A	738000	Hor. output transformer
T4B	738009	Alternate Hor. output transformer
T5A	738010	Vert. output transformer
T5B	738011	Alternate vert. output transformer
T6	734018	Sound output transformer
T7	720041	1st Video and sound IF transformer
T8	720042	2nd Video and sound IF transformer
T9	720043	3rd Video IF transformer
T10	720044	4th Video IF transformer
T11	720027	Sound IF transformer
T12	708008	Discriminator transformer
T13		Antenna transformer (Part of tuner assembly Part No. 950049)
SP 1A	180038	4" x 6" oval permanent magnet speaker
SP 1B	180019	4" x 6" oval permanent magnet speaker (Alternate speaker)
SP 2A		Speaker cone (Part of 180038)
SP 2B		Speaker cone (Part of 180019)
L1		Tuner filament choke (Part of tuner assembly Part No. 950049)
L2		Mixer grid choke (Part of tuner assembly Part No. 950049)
L3	708093	Video det. peaking coil, inductance = 35 microhenries
L4	708094	Video peaking coil, inductance = 125 microhenries
L5	708095	Video peaking coil, inductance = 180 microhenries
L6	708093	Video peaking coil, inductance = 35 microhenries
L7	705009	Hor. osc. grid choke, inductance = 3 millihenries
L8	708003	Hor. linearity coil, slug adjusted
L9	708082	Hor. size coil, slug adjusted
L10 A	708030	Hor. deflection coil
B		Vert. deflection coil
L11	708141	Focus coil
M1	708084	Ion trap—PM
M2	950049	Tuner assembly
M3	470232	Picture tube socket and cable assembly
M4	508010	Speaker socket
M5 A	505040	Speaker plug
B	505048	Speaker plug (Alternate part)
M6	470339	Interlock socket and assembly
M7	505007	Interlock plug
	140146	Cabinet
	635010	Safety glass
	620067	Cabinet back
	583014	Line cord and plug
	450036	Knob-fine tuning
	450037	Knob-selector (with hole)
	450031	Knob-selector
	450032	Knob-dual-large
	450034	Knob-dual-small
	450035	Knob-dual-small
	410352	Tube front mask

* NOTE 1: Some models use three 180-ohm, 1-watt carbon resistors, Part No. 370312, in parallel in this application.

VIDEO IF ALIGNMENT

1—Waveforms shown may be inverted depending on the number of amplifying stages in the vertical amplifier of the particular scope being used.

2—In the alignment notes the sweep width is given. Some generators are calibrated in deviation. The frequency deviation, which is plus and minus, is, by definition, half the sweep width.

3—The marker pip signal required in steps 9, 10, and 11 is coupled to one of the dipole terminals. This signal should be unmodulated and derived from an accurately calibrated signal generator. Attenuate the signal so that a small "pip" is visible. A strong signal will cause undesirable AGC action and will distort or swamp the picture.

4—Connect the synchronized sweep voltage from the signal generator to the horizontal input of the scope for horizontal deflection.

5—The schematic of the dummy mixer tube is given in Figure 18.

STEP	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1	5000 mmf.	High side to dummy mixer cathode. Low side to chassis.	21.25 mc. (unmodulated)	3	DC probe to pin 3 of V4 (point A). Common to chassis.	A1, A2	Adjust for **minimum** deflection.
2	5000 mmf.	"	27.25 mc.	3	"	A3	" " " "
3	5000 mmf.	"	23.0 mc.	3	"	A4	Adjust for maximum deflection.
4	5000 mmf.	"	25.25 mc.	3	"	A5	" " " " "
5	5000 mmf.	"	23.4 mc.	3	"	A6	" " " " "
6	5000 mmf.	"	24.5 mc.	3	"	A7	" " " " "
7	REPEAT STEPS 1 and 2						Remove dummy mixer tube and replace 6J6 mixer. Remove VTVM connections.

STEP	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8	Direct	High side to one ant. term. Low side to chassis.	63.0 mc. Freq. Mod. (10 mc. sweep).	3	Vert. input to point A in series with 22K ohm carbon resistor. Low side to chassis.	—	Leave FM signal generator at this setting throughout steps 9-12.
9	"	High side of marker generator to other ant. terminal. Low side to chassis.	65.75 mc. (unmodulated)	3	"	—	Adjust fine tuning control for placement of marker pip as shown in Fig. 24. Leave at this setting for steps 10 and 11.
10	"	" "	61.25 mc.	3	"	A5	Adjust for placement of marker pip as shown in Fig. 24.
11	"	" "	64.5 mc.	3	"	A4	" " " " "
12	"	" "	63.0 mc. Freq. Mod. (10 mc. sweep)	3	"	A6, A7	Make minor adjustments, if necessary, for proper slope shape and band width per Fig. 24.

SOUND IF ALIGNMENT

Loosely couple the signal from the marker generator to the input by placing output lead near the FM signal generator output lead. Use only enough signal to give visible pip. Set marker generator to produce a 21.25 mc. unmodulated signal for use in Steps 13-16 inclusive.

STEP	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13	5000 mmf.	High side to Pin No. 1 of 1st video amp. V-1. Low side to chassis.	21.25 mc. Freq. Mod. (600KC sweep)	3	Vert. input to point B. Low side to chassis.	A8, A9	Adjust for maximum amplitude and symmetry with marker pip at peak of curve per Fig. 25.
14	5000 mmf.	"	"	3	"	A1	" " " "
15	5000 mmf.	"	"	3	Vert. input to point C. Low side to chassis.	A10	" " " " "
16	5000 mmf.	"	"	3	Vert. input to point D. Low side to chassis.	A11	Adjust for maximum straightness of diagonal line with marker pip at center of line per Fig. 26. Continue with Step 17.

ALTERNATE SOUND IF ALIGNMENT USING VTVM

STEP	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
13	5000 mmf.	High side to Pin No. 1 of 1st video IF amp. V-1. Low side to chassis	21.25 mc. (unmodulated).	3	DC probe to point B. Common to chassis.	A8, A9, A1	Adjust for maximum deflection.
14	5000 mmf.	" "	"	3	DC probe to point C. Common to chassis.	A10	" " " " "
15	5000 mmf.	" "	"	3	DC probe to point D. Common to chassis.	A11	Adjust for zero reading. (Make certain readings of opposite polarity are obtained on each side of zero setting.)
16	5000 mmf.	" "	Tune 75KC. above and below 21.25 mc. and note meter readings.	3	"	A10	Adjust A10, if necessary, for equal readings (of opposite polarity) 75KC above and below 21.25mc.

RF ALIGNMENT—CHANNELS 1-13

1—Set fine tuning control to a position approximately 140° from its full counterclockwise position. This aligns the holes in the drive disc with the adjustment screws on the oscillator switch wafer. Do not change this setting during entire r-f alignment.

2—Attenuate signal from marker generator to give as small a "pip" as possible to prevent AGC action.

STEP	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
17	300 ohm carbon resistor	High side to one ant. terminal. Low side to chassis. High side to marker generator directly to other ant. term. Low side to chassis.	213 mc. Freq. Mod. (10 mc. sweep Marker generator at 215.75 mc. (unmodulated).	13	Vert. input to point A. in series with 22K ohm carbon resistor. Ground to chassis.	A12	Adjust for placement of sound marker per Fig. 24.
18	300 ohm carbon resistor	" "	"	13	"	A13, A14, A15, A16	Adjust for shaping to conform to Fig. 24.
19	300 ohm carbon resistor	" "	207 mc. Freq. Mod. (10 mc. sweep). Marker gen. at 209.75mc.	12	"	A17	Adjust for placement of sound marker per Fig. 24.
20	300 ohm carbon resistor	" "	201 mc. Freq. Mod. ((10 mc. Marker gen. at 203.75mc.	11	"	A18	" " " "
21	300 ohm carbon resistor	" "	195 mc. Freq. Mod. ((10 mc. sweep). Marker gen. at 197.75 mc.	10	"	A19	" " " "
22	300 ohm carbon resistor	"	189 mc. Freq. Mod. ((10 mc. sweep). Marker gen. at 191.75 mc.	9	"	A20	" " " "
23	300 ohm carbon resistor	"	183 mc. Freq. Mod. ((10 mc. sweep). Marker gen. at 185.75 mc.	8	"	A21	" " " "
24	300 ohm carbon resistor	"	177 mc. Freq. Mod. (10 mc. sweep) Marker gen. at 179.75 mc.	7	"	A22	" " " "
25	300 ohm carbon resistor	"	85 mc. (10 mc. sweep) Marker gen. at 87.75 mc.	6	"	A23	Adjust for placement of sound marker per Fig. 24.
26	300 ohm carbon resistor	"	"	6	"	A24, A25, A26, A27	Adjust for shaping to conform to Fig. 24.

STEP	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
27	300 ohm carbon resistor	High side to one ant. term. Low side to chassis. High side of marker generator directly to other ant. ter. Low side to chassis.	79 mc. Freq. Mod. (10 mc. sweep) Marker gen. at 81.75 mc.	5	Vert. input to point A. in series with 22K ohm carbon resistor. Ground to chassis.	A28	Adjust for placement of sound marker for Fig. 24.
28	300 ohm carbon resistor	" "	69 mc. Freq. Mod. (10 mc. sweep) Marker gen. at 71.75 mc.	4	"	A29	" " " "
29	300 ohm carbon resistor	"	63 mc. Freq. Mod. (10 mc. sweep) Marker gen. at 65.75 mc.	3	"	A30	" " " "
30	300 ohm carbon resistor	"	57 mc. Fred. Mod. (10 mc. sweep) Marker gen. at 59.75 mc.	2	"	A31	" " " "
31	300 ohm carbon resistor	"	47 mc. Fred. Mod. (10 mc. sweep) Marker gen. at 49.75 mc.	1	"	A32	" " " "

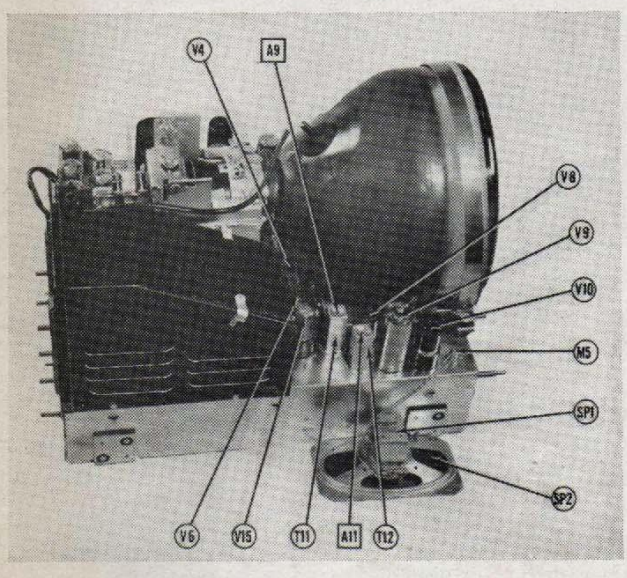


Fig. 27—Top view of chassis (a)

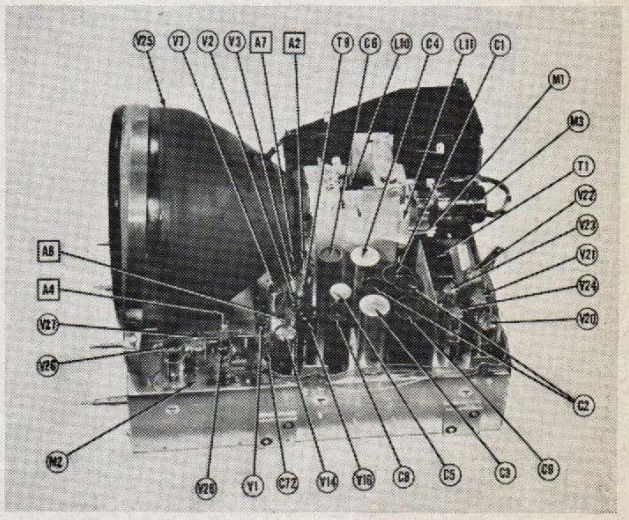


Fig. 28—Top view of chassis (b)

VOLTAGE AND RESISTANCE READINGS

NOTE: 1—DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.

2—Socket connections are shown as bottom views

3—Measured values are from socket pin to common negative, unless otherwise stated.

4—Line voltage maintained at 117 volts for voltage readings.

5—No signal applied for voltage measurements.

6—Minimum and maximum readings are given where two readings appear, depending on rear panel control settings.

VOLTAGE READINGS

ITEM	TUBE	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8	CAP
1	6AG5	-.4 DC	.9 DC	0	6.3 AC	120 DC	120 DC	.9 DC		
2	6AG5	-1.1 DC	.2 DC	0	6.3 AC	125 DC	125 DC	.2 DC		
3	6AG5	0	1.8 DC	0	6.3 AC	120 DC	160 DC	1.8 DC		
4	6H6	0	0	-2.6 DC	0	-.2 DC	-.4 DC	6.3 AC	1.2 DC	
5	6SN7GT	0	105 DC	.8 DC	-.5 DC	117 DC	0	6.3 AC	0	
6	6AU6	0	0	0	6.3 AC	100 DC	132 DC	4.2 DC		
7	6BA6	0	0	0	6.3 AC	120 DC	125 DC	1.4 DC		
8	6AU6	-.4 DC	0	0	6.3 AC	122 DC	95 DC	0		
9	6S8GT	-.3 DC	0	-.3 DC	-.5 DC	-.1 DC	82 DC	6.3 AC	0	-.7 DC
10	6K6GT	0	0	170 DC	150 DC	-2.8 DC	-9.7 DC	6.3 AC	0	
11	6SN7GT	*0	*370 DC	*15 DC	0	*28 DC	*1.2 DC	6.3 AC	0	
12	6AL5	*0	*0	0	6.3 AC	*.6 DC	0	.6 DC		
13	6SN7GT	*60 DC	*340 DC	*0	*-60 DC	*75 DC	*0	6.3 AC	0	
14	6SN7GT	*-145 DC	*280 DC	*0	*-145 DC	*300 DC	*0	6.3 AC	0	
15	6SN7GT	0	70 DC	0	-.5 DC	68 DC	0	6.3 AC	0	
16	6K6GT	0	0	*360 DC	*360 DC	*0	*34 DC	6.3 AC	*34 DC	
17	6BG6-G	0	0	*9 DC	*0	*-13 DC	*0	6.3 AC	*225 DC	†
18	1B3GT	Do Not	Measure							
19	5V4-G	0	*480 DC	0	*400 DC	0	*400 DC	0	*480 DC	
20	25Z6GT	0	0	0	145 AC	145 AC	0	25 AC	220 DC	
21	25Z6GT	0	50 AC	0	145 AC	145 AC	0	25 AC	220 DC	
22	25Z6GT	0	50 AC	0	145 AC	145 AC	0	75 AC	220 DC	
23	25Z6GT	0	100 AC	-237 DC	150 AC	150 AC	0	75 AC	0	
24	25Z6GT	0	100 AC	-237 DC	150 AC	150 AC	0	125 DC	0	
25	**10BP4	0	8 DC	0	0	0	0	0	0	
26	6J6	75 DC	75 DC	6.3 AC	0	§-11 DC	§-11 DC	.2 DC		
27	6J6	130 DC	130 DC	6.3 AC	0	-3.1 DC	-4.3 DC	0		
28	6J6	105 DC	105 DC	6.3 AC	0	-.7 DC	-.7 DC	0		

** 10BP4 (Contd.) **PIN 9** 0 **PIN 10** 180 DC **PIN 11** 7.5 DC **PIN 12** 6.3 AC

† Do not measure. § Measure with VTVM. * Readings taken from Pin No. 6 of V14.

RESISTANCE READINGS

ITEM	TUBE	PIN 1	PIN 2	PIN 3	PIN 4	PIN 5	PIN 6	PIN 7	PIN 8	CAP
1	6AG5	10K	82	0	.1	†1800	†1800	82		
2	6AG5	3.5 meg.	33	0	.1	†1800	†1800	33		
3	6AG5	10K	150	0	.1	†6000	†1300	150		
4	6H6	0	0	4700	.2	2.2 meg.	4700	.1	100K	
5	6SN7GT	1 meg.	†7500	75	1 meg.	†2200	0	.1	0	
6	6AU6	1 meg.	0	0	.1	†220K	†800	22K		
7	6BA6	0	0	0	.1	†1800	†1800	68		
8	6AU6	50K	0	0	.1	†1800	†10K	0		
9	6S8GT	100K	0	100K	Inf.	200K	†470K	.1	0	15 meg.
10	6K6GT	0	0	†520	†10K	470K	210	.1	0	
11	6SN7GT	*1 meg.	†2400	*2200	*Inf.	†100K	*1000	.1	0	
12	6AL5	Inf.	Inf.	0	.1	*150K	0	*150K		
13	6SN7GT	†200K	†5400	0	†200K	†470K	*0	.1	0	
14	6SN7GT	*2.5 meg.	†470K	0	*2.5 meg.	†100K	*0	.1	0	
15	6SN7GT	1 meg.	†20K	0	1 meg.	†22K	0	.1	0	
16	6K6GT	Inf.	0	†10K	†10K	*5 meg.	*5000 *10K	.1	*300 *5000	
17	6BG6-G	Inf.	0	*100	*0	*470K	*0	.1	†10K	†7500
18	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	†7800
19	5V4-G	Inf.	†7500	Inf.	†160	Inf.	†160	Inf.	†7500	
20	25Z6GT	Inf.	0	0	80K	80K	Inf.	10	†0	
21	25Z6GT	Inf.	15	0	80K	80K	Inf.	10	†0	
22	25Z6GT	Inf.	16	0	80K	80K	Inf.	15	†0	
23	25Z6GT	Inf.	12	*240	1 meg.	1 meg.	Inf.	16	0	
24	25Z6GT	Inf.	12	*240	1 meg.	1 meg.	Inf.	3	0	
25	**10BP4	0	1 meg.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	
26	6J6	†6000	†6000	.1	0	100K	100K	47		
27	6J6	†1800	†1800	.1	0	1 meg.	1 meg.	0		
28	6J6	†4200	†4200	.1	0	3 meg.	3 meg.	0		

** 10BP4 (Contd.) **PIN 9** Inf. **PIN 10** †220 **PIN 11** †30K **PIN 12** .1

All resistance readings taken from chassis unless noted otherwise.
Set all front panel controls to full clockwise position.
All resistance readings are in ohms unless otherwise noted.

†Readings taken from Pin No. 8 of V22 Rectifier tube.
*Readings taken from Pin No. 6 of V14.

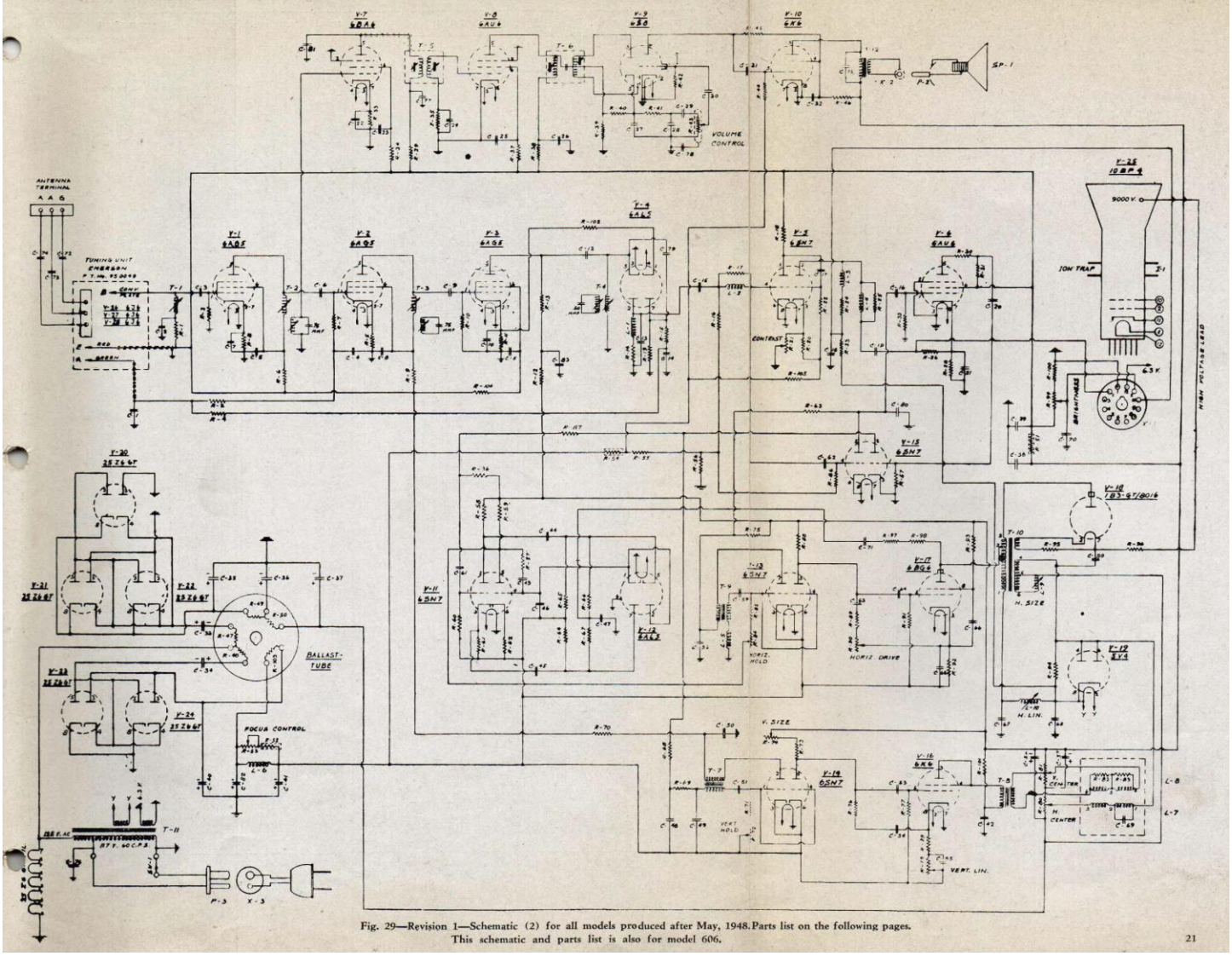


Fig. 29—Revision 1—Schematic (2) for all models produced after May, 1948. Parts list on the following pages. This schematic and parts list is also for model 606.

ITEM	PART No.	DESCRIPTION
V-1	800535	Tube, 6AG5
V-2	800535	Tube, 6AG5
V-3	800535	Tube, 6AG5
V-4	800541	Tube, 6AL5
V-5	800380	Tube, 6SN7GT
V-6	800533	Tube, 6AU6
V-7	800531	Tube, 6BA6
V-8	800533	Tube, 6AU6
V-9	800015	Tube, 6S8GT
V-10	800016	Tube, 6K6GT
V-11	800380	Tube, 6SN7GT
V-12	800541	Tube, 6AL5
V-13	800380	Tube, 6SN7GT
V-14	800380	Tube, 6SN7GT
V-15	800380	Tube, 6SN7GT
V-16	800016	Tube, 6K6GT
V-17	800004	Tube, 6BG6-G
V-18	800450	Tube, 1B3-GT/8016
V-19	800011	Tube, 5V4-G
V-20	800480	Tube, 25Z6GT
V-21	800480	Tube, 25Z6GT
V-22	800480	Tube, 25Z6GT
V-23	800480	Tube, 25Z6GT
V-24	800480	Tube, 25Z6GT
V-25	810000	Tube, 10BP4
V-26	800536	Tube, 6J6 (Part of Pt. No. 950049)
V-27	800536	Tube, 6J6 (Part of Pt. No. 950049)
V-28	800536	Tube, 6J6 (Part of Pt. No. 950049)
C-1	928006	1500 mmf., 400 volt condenser
C-2	928006	1500 mmf., 400 volt condenser
C-3	910015	270 mmf., 400 volt condenser
C-4	928006	1500 mmf., 400 volt condenser
C-5	928006	1500 mmf., 400 volt condenser
C-6	910015	270 mmf., 400 volt condenser
C-7	928006	1500 mmf., 400 volt condenser
C-8	928006	1500 mmf., 400 volt condenser
C-9	910015	270 mmf., 400 volt condenser
C-10	928006	1500 mmf., 400 volt condenser
C-11	928006	1500 mmf., 400 volt condenser
C-12	910015	270 mmf., 400 volt condenser
C-13	910130	10 mmf., 400 volt condenser
C-14	923067	.1 mf., 200 volt condenser
C-15	923080	.25 mf., 200 volt condenser
C-16	923062	.05 mf., 400 volt condenser
C-17	923062	.05 mf., 400 volt condenser
C-18	925111	.08 mf., 250 volt condenser
C-19	923062	.05 mf., 400 volt condenser
C-20	923062	.05 mf., 400 volt condenser
C-21	925072	10 mf., 25 volt condenser
C-22	928006	1500 mmf., 400 volt condenser
C-23	928006	1500 mmf., 400 volt condenser
C-24	910290	30 mmf., 400 volt condenser
C-25	928006	1500 mmf., 400 volt condenser
C-26	928006	1500 mmf., 400 volt condenser
C-27	910010	110 mmf.
C-28	923071	.001 mf., 400 volt condenser
C-29	923076	.01 mf., 200 volt condenser
C-30	923076	.01 mf., 200 volt condenser
C-31	923062	.05 mf., 400 volt condenser
C-32	925111	8 mf. 250 volt condenser
C-33	925099	80 mf., 175 volt condenser
C-34	925098	80 mf., 150 volt condenser
C-35		80 mf., 300 volt condenser
C-36	925086	80 mf., 300 volt condenser
C-37		80 mf., 350 volt condenser
C-38	925096	80 mf., 350 volt condenser
C-39		60 mf., 350 volt condenser
C-40	925091	80 mf., 250 volt condenser
C-41	925093	80 mf., 250 volt condenser
C-42	925111	8 mf., 250 volt condenser
C-43	923072	1 mf., 200 volt condenser
C-44	910140	.001 mf., 400 volt condenser
C-45	910140	.001 mf., 400 volt condenser
C-46	923068	.05 mf., 200 volt condenser
C-47	910010	110 mmf.,
C-48	923078	.005 mf., 400 volt condenser
C-49	923078	.005 mf., 400 volt condenser
C-50	923066	.25 mf., 400 volt condenser
C-51	923069	.003 mf., 600 volt condenser
C-52	925111	8 mf., 250 volt condenser
C-53	923075	.01 mf., 600 volt condenser
C-54	923073	.05 mf., 600 volt condenser
C-55	925072	10 mf., 25 volt condenser
C-56	925097	1000 mf., 15 volt condenser
C-57		1000 mf., 15 volt condenser
C-58	923003	.0005 mf., 10,000 volt condenser
C-59	910028	780 mmf., 400 volt condenser
C-60		
C-61	923079	.001 mf., 600 volt condenser
C-62	923062	.05 mf., 400 volt condenser
C-63	910017	470 mmf., 400 volt condenser
C-64	923079	.001 mf., 600 volt condenser
C-65	923067	.1 mf., 200 volt condenser
C-66	923073	.05 mf., 600 volt condenser
C-67	923074	.035 mf., 600 volt condenser
C-68	923073	.05 mf., 600 volt condenser
C-69	910090	50 mmf., 500 volt condenser
C-70	923067	.1 mf., 200 volt condenser
C-71	923077	.005 mf., 600 volt condenser
C-72	922101	.05 mf. 400 volt condenser
C-73	910013	1000 mmf.
	928003	1000 mmf.
C-74	910013	1000 mmf.
	928003	1000 mmf.
C-75	923063	.0082 mf., 400 volt condenser
C-76	923062	.05 mf., 400 volt condenser
C-77	928006	1500 mmf., 400 volt condenser
C-78	923078	.005 mf., 400 volt condenser
C-79	910100	100 mmf.
C-80	910010	110 mmf.
C-81	928017	5 mmf.
C-82	925093	80 mf., 250 volt condenser
C-83	928003	1000mmf.
I-1	708084	Ion trap—P.M.
	470372	Wave trap
L-1	708093	Peaking coil—35 uh
L-2	708094	Peaking coil—125 uh
L-3	708093	Peaking coil—35 uh
L-4	708095	Peaking coil—180 uh
L-5	705009	R.F. choke—3.0 mh.
L-6	708141	Focus coil
L-7	708130	Deflection yoke—horiz. coils
L-8		Deflection yoke—vert. coils
L-9	708082	Size coil
L-10	708003	Linearity coil
P-2	505040	Connector plug—speaker
	505048	Connector plug—speaker
P-3	505007	Plug—interlock switch
R-1	340492	1000 ohm, ½ watt resistor
R-2	340972	100,000 ohm, ½ watt resistor
R-3	330732	10,000 ohm, ½ watt resistor
R-4	340972	100,000 ohm, ½ watt resistor
R-5	340132	33 ohm, ½ watt resistor
R-6	340492	1,000 ohm, ½ watt resistor
R-7	340632	3900 ohm, ½ watt resistor
R-8	340232	82 ohm, ½ watt resistor
R-9	340492	1,000 ohm, ½ watt resistor
R-10	330732	10,000 ohm, ½ watt resistor
R-11	340292	150 ohm, ½ watt resistor
R-12	340492	1,000 ohm, ½ watt resistor
R-13	330652	4700 ohm, ½ watt resistor
R-14	330652	4700 ohm, ½ watt resistor
R 15	341212	1 megohm, ½ watt resistor
R-16	341212	1 megohm, ½ watt resistor
R-17	340812	22,000 ohm, ½ watt resistor
R-18	330532	1500 ohm, ½ watt resistor
R-19	341292	2.2 megohm, ½ watt resistor
R-20	340772	15,000 ohm, ½ watt resistor
R-21	Pt. of R-43	10,000 ohm, contrast control
R-22	341212	1 megohm, ½ watt resistor
R-23	340612	3300 ohm, ½ watt resistor
R-24	340632	3900 ohm, ½ watt resistor
R-25	340812	22,000 ohm, ½ watt resistor
R-26	341212	1 megohm, ½ watt resistor
R-27	340892	47,000 ohm, ½ watt resistor
R-28	340812	22,000 ohm, ½ watt resistor
R-29	340492	1000 ohm, ½ watt resistor
R-30	341032	180,000 ohm, ½ watt resistor
R-31	340892	47,000 ohm, ½ watt resistor
R-32	341212	1 megohm, ½ watt resistor
R-33	340212	68 ohm, ½ watt resistor
R-34	340492	1000 ohm, ½ watt resistor
R-35	340892	47,000 ohm, ½ watt resistor
R-36	340732	10,000 ohm, ½ watt resistor
R-37	340732	10,000 ohm, ½ watt resistor
R-38	340492	1000 ohm, ½ watt resistor
R-39	330972	100,000 ohm, ½ watt resistor
R-40	340972	100,000 ohm, ½ watt resistor
R-41	340932	68,000 ohm, ½ watt resistor
R-42	351492	15 megohm ½ watt resistor
R-43	390034	1 megohm vol. control and switch
R-44	341132	470,000 ohm, ½ watt resistor
R-45	341132	470,000 ohm, ½ watt resistor
R-46	340732	10,000 ohm, ½ watt resistor
R-47	Part of	10 ohm, wirewound, 3 watt resistor
R-48	Ballast	10 ohm, wirewound, 3 watt resistor
R-49	Tube	75 ohm, wirewound,5 watt resistor
R-50	No. 397021	75 ohm, wirewound,5 watt resistor
R-51	394035	600 ohm, wirewound 5 watt resistor
R-52		330 ohm, wirewound, 3 watt resistor
R-53	390037	1500 ohm, wirewound focus control, 4 watt resistor
R-54	394036	4250 ohm, wirewound, 10 watt resistor
R-55	370312	180 ohm, 1 watt resistor
R-56	340132	33 ohm, ½ watt resistor
R-57	341212	1 megohm, ½ watt resistor
R-58	330572	2200 ohm, ½ watt resistor
R-59	360972	100,000 ohm, 1 watt resistor
R-60	341212	1 megohm, ½ watt resistor
R-61	330572	2200 ohm, ½ watt resistor
R-62	330492	1000 ohm, ½ watt resistor
R-63	370812	22,000 ohm, 1 watt resistor
R-64	341052	220,000 ohm, ½ watt resistor
R-65	341052	220,000 ohm, ½ watt resistor
R-66	330972	100,000 ohm ½ watt resistor
R-67	330972	100,000 ohm, ½ watt resistor
R-68	340812	22,000 ohm, ½ watt resistor
R-69	340652	4700 ohm, ½ watt resistor
R-70	370972	100,000 ohm, 1 watt resistor
R-71	331252	1.5 megohm, ½ watt resistor
R-72	390036	1 megohm, vert. hold control

ITEM	PART No.	DESCRIPTION
R-73	341132	470,000 ohm, ½ watt resistor
R-74	390038	2 megohm, vert. size control
R-75	370652	4700 ohm, 1 watt resistor
R-76	340672	5600 ohm, ½ watt resistor
R-77	341372	4.7 megohm, ½ watt resistor
R-78	340352	270 ohm, ½ watt resistor
R-79	390039	5000 ohm, vert. linearity control
R-80	390033	30 ohm, horiz. cent. control
R-81	390033	30 ohm, vert. cent. control
R-82	340432	560 ohm, ½ watt resistor
R-83	340432	560 ohm, ½ watt resistor
R-84	340892	47,000 ohm, ½ watt resiseor
R-85	Part of R-72	50,000 ohm, horiz. hold control
R-86	341212	1 megohm, ½ watt resistor
R-87	340732	10,000 ohm, ½ watt resistor
R-88	331132	470,000 ohm, ½ watt resistor
R-89	340792	18,000 ohm, ½ watt resistor
R-90	390035	20,000 ohm, horiz. drive control
R-91	341132	470,000 ohm, ½ watt resistor
R-92	370252	100 ohm, 1 watt resistor
R-93	397014	10,000 ohm, 2 watt resistor
R-94	394007	7500 ohm, wirewound, 25 watt resistor
R-95	397041	3.3 ohm, 1 watt resistor
R-96	371212	1 megohm, 1 watt resistor
R-97	371132	470,000 ohm, 1 watt resistor
R-98	371132	470,000 ohm, 1 watt resistor
R-99	390032	100,000 ohm, brightness control
R-100	340652	4700 ohm, ½ watt resistor
R-101	370732	10,000 ohm, 1 watt resistor
R-102	340972	100,000 ohm, ½ watt resistor
R-103	Pt. of 397021	75 ohm, wirewound 3 watt resistor
R-104	340492	1000 ohm, ½ watt resistor
R-105	340772	15,000 ohm, ½ watt resistor
SP-1	180047	Speaker 4" x 6"
	†180050	Speaker—12"
SW-1	Pt. of R-43	On-Off switch
T-1	720041	1st Video I.F. transformer
T-2	720042	2nd Video I.F. transformer
T-3	720043	3rd Video I.F. transformer
T-4	720044	4th Video I.F. transformer
T-5	720027	Sound I.F transformer
T-6	708008	Discriminator coil
T-7	738004	Vertical B. osc. transformer
	738010	Vertical output transformer
T-8	738011	Vertical output transformer
T-9	728008	Horiz. B. osc. transformer
	738000	Horiz. output transformer
T-10	738009	Horiz. output transformer
T-11	730007	Power transformer
T-12	734018	Sound output transformer
X-1	470232	Socket, cable assembly
X-2	508100	Socket, speaker
X-3	470339	Socket, shell holder assembly
	140205	†Cabinet,
	140146	Cabinet
	635010	†Safety glass
	620067	†Cabinet back
	583014	†Line cord and plug
	450036	†Knob-fine tuning
	450037	†Knob-selector (with hole)
	450031	†Knob-selector
	450032	†Knob-dual-large
	450034	†Knob-dual-small
	450035	†Knob-dual-small
	410352	†Tube front mask

† These parts also used on Model 606B.

NOTE: Specify Part Number when ordering.

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