Motorola® Television

SERVICE MANUAL

CHASSIS
TS-14
TS-23
TS-52
MODELS
SEE PAGE 2

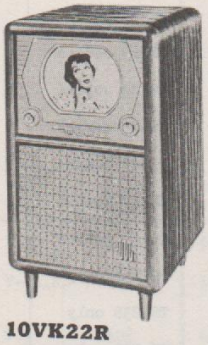
10T2

10VT10

10VT24R

10VK12

12T1



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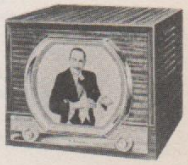

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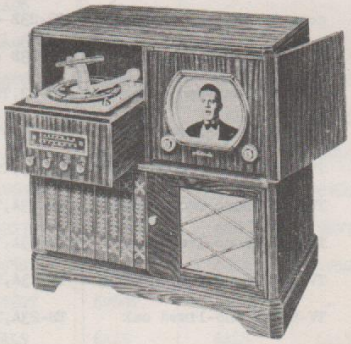

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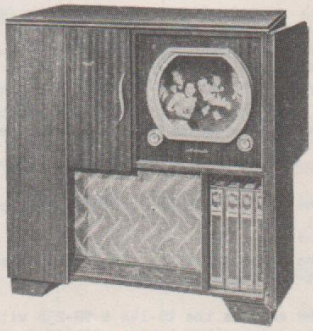

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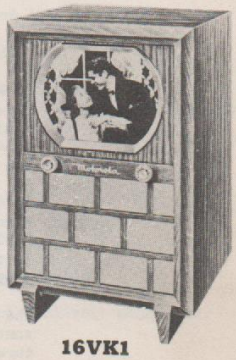

16VK1

4545 AUGUSTA BOULEVARD Motorola Inc. CHICAGO 51, ILLINOIS

PART NO. 54P700225

Price 25 Cents

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GENERAL INFORMATION

NOTE: This manual contains complete service information and replacement parts list for television chassis TS-14, TS-23 & TS-52, and also a parts list for the receiver cabinets. Service data for the AM-FM radio chassis and the record changer will be found in their respective service manuals.

RECEIVER MODEL BREAKDOWN CHART

MODEL	TYPE OF SET	TV CHASSIS USED	AM-FM CHASSIS USED	RECORD CHANGER USED
10VT10	table-brn mahogany	TS-14 series	-	-
10VT10R	table-red mahogany	TS-14 series	-	-
10VT10B	table-limed oak	TS-14 series	-	-
10VK12	console-brn mahogany	TS-14 series	-	-
10VK12R	console-red mahogany	TS-14 series	-	-
10VT24R	table-red mahogany	TS-14 series	-	-
10VK22R	console-red mahogany	TS-14 series	-	-
10T2	table-red-brn mahogany	TS-14B only	-	-
12VK11	console-brn mahogany	TS-23 series	-	-
12VK11R	console-red mahogany	TS-23 series	-	-
12VK11B	console-limed oak	TS-23 series	-	-
12VT13	table-brn mahogany	TS-23 series	-	-
12VT13R	table-red mahogany	TS-23 series	-	-
12VT13B	table-limed oak	TS-23 series	-	-
12T1	table-red-brn mahogany	TS-23B only	-	-
12T1B	table-limed oak	TS-23B only	-	-
12K1	console-red-brn mahogany	TS-23B only	-	-
12K1B	console-limed oak	TS-23B only	-	-
12K2	console-red-brn mahogany	TS-23B only	-	-
12K2B	console-limed oak	TS-23B only	-	-
12VF4R	TV-Rad-Phono-red mahogany	TS-23,TS-23A	HS-190	M4RC
12VF4B	TV-Rad-Phono-limed oak	TS-23,TS-23A	HS-190	M4RC
12VF4R-C	TV-Rad-Phono-red mahogany	TS-23,TS-23A	HS-190	W6RC
12VF26R	TV-Rad-Phono-red mahogany	TS-23A,TS-23B	HS-190A	M3RC
12VF26B	TV-Rad-Phono-limed oak	TS-23A,TS-23B	HS-190A	M3RC
12VF26R-C	TV-Rad-Phono-red mahogany	TS-23A,TS-23B	HS-190A	W5RC
12VF26B-C	TV-Rad-Phono-limed oak	TS-23A,TS-23B	HS-190A	W5RC
16VK1R	console-red mahogany	TS-52	-	-
16VK1B	console-limed oak	TS-52	-	-
16K2L	console-red-brn mahogany	TS-52	-	-
16K2LB	console-limed oak	TS-52	-	-

TV CHASSIS DESCRIPTION - Television chassis TS-14 uses 18 tubes, plus a 10BP4 picture tube. All the circuits are contained on a single chassis, along with a selenium rectifier, voltage doubler "B" power supply.

The TS-23 differs from the TS-14 only in the picture tube (12LP4) and high voltage transformer.

In the TS-14A & TS-23A the 3rd IF tube (V-5, 6AU6), was replaced by a 6AG5 tube and a bi-filar IF transformer replaced coil L-13.

In the TS-14B & TS-23B the video amplifier (V-6, 6AU6) was replaced by a 6AH6 tube and additional compensation was added to the contrast control.

The TS-52 is basically the same as the TS-14B & TS-23B with the exception of an extra 6BQ6GT horizontal output & high voltage generator tube, a 25L6GT for the vertical output tube, and a 16AP4 picture tube.

TV TUNING RANGE - Channels 2 through 13

TV ANTENNA - "Bilt-In-Tenna", with provision for connection of external antenna where necessary.

TV EXTERNAL ANTENNA IMPEDANCE - Balanced 300 ohms

TV POWER SUPPLY - 117V, 60 cycles AC

TV POWER CONSUMPTION - TV Chassis TS-14 - 160 watts
TS-23 - 160 watts
TS-52 - 170 watts

TV AUDIO OUTPUT - 4 watts

RADIO CHASSIS - Radio chassis HS-190 & HS-190A contain 6 tubes plus selenium rectifier and receive both AM and FM broadcasts. Except for common speakers, they operate entirely independently of the television receiver. Refer to HS-190 & HS-190A Service Manual for service information.

RECORD CHANGER - 3-speed Models M3RC, M4RC, W5RC & W6RC. Refer to respective Service Manuals for service information.

TV CHASSIS TUBE COMPLEMENT

REF. NO.	TS-14 TS-23	TS-14A TS-23A	TS-14B TS-23B	TS-52	FUNCTION
V-1	6AG5	6AG5	6AG5	6AG5	RF Amplifier
V-2A,B	12AT7	12AT7	12AT7	12AT7	1/2 tube (A) - mixer 1/2 tube (B) - oscillator
V-3	6AU6	6AU6	6AU6	6AU6	1st IF amplifier
V-4	6AU6	6AU6	6AU6	6AU6	2nd IF amplifier
V-5	6AU6	-	-	-	3rd IF amplifier
V-6	6AU6	6AU6	-	-	Video amplifier
V-7	6AU6	6AU6	6AU6	6AU6	Audio driver-limiter
V-8	6AL5	6AL5	6AL5	6AL5	Ratio detector
V-9	6J5GT	6J5GT	6J5GT	6J5GT	Audio amplifier
V-10	6V6GT	6V6GT	6V6GT	6V6GT	Audio output
V-11	6SN7GT	6SN7GT	6SN7GT	6SN7GT	1st & 2nd clippers
V-12	6J5GT	6J5GT	6J5GT	6J5GT	Vertical sweep generator
V-13	6V6GT	6V6GT	6V6GT	-	Vertical sweep output
V-14	6AL5	6AL5	6AL5	6AL5	Phase detector
V-15	6SN7GT	6SN7GT	6SN7GT	6SN7GT	Horizontal oscillator
V-16	6BQ6GT	6BQ6GT	6BQ6GT	6BQ6GT	Horiz. output & hi-volt generator
V-17	6W4GT	6W4GT	6W4GT	6W4GT	Damping diode
V-18	1B3GT or 1X2	1B3GT or 1X2	1B3GT or 1X2	1B3GT	High voltage rectifier
V-19	TS-14-10BP4 TS-23-12LP4	10BP4 12LP4	10BP4 12LP4	16AP4	Picture tube
V-20	-	6AG5	6AG5	6AG5	3rd IF amplifier
V-21	-	-	6AH6	6AH6	Video amplifier
V-22	-	-	-	25L6GT	Vertical sweep output
V-23	-	-	-	6BQ6GT	Horiz. output & hi-volt generator

HIGH VOLTAGE WARNING

Operation of this receiver outside its cabinet or with covers removed involves a shock hazard from the power supplies. No work should be attempted on this receiver by anyone not thoroughly familiar with the precautions necessary when working on high voltage equipment.

CATHODE RAY TUBE HANDLING PRECAUTIONS

Extreme care must be used in handling the picture tube. The tube is highly evacuated and, due to its large size, is subjected to a considerable atmospheric pressure. The handler should wear safety goggles and gloves for protection. Avoid nicking or scratching the glass by rough contact with other objects.

Before removing glass tubes, discharge the capacitor formed by the inner & outer aquadag coatings on the tube by shorting the anode contact on the side of the tube to the outer surface with a well insulated piece of wire.

Before removing the metal tubes, short the high voltage to the chassis to remove any charge from the metal shell of the tube.

INSTALLATION INSTRUCTIONS

RECEIVER LOCATION

The receiver may be placed anywhere in the room, but for greatest satisfaction it should be located:

1. Away from any bright light that may fall directly on the screen or be reflected from it. This includes windows and lamps. Some illumination in the room, off to one side, is desirable, however, to prevent eye-strain.
2. To provide comfortable viewing and ease in operation.
3. At least one-inch away from a wall to allow for cabinet ventilation. This is very important.

ANTENNAS

The choice of a television antenna depends entirely upon the location of the receiver, with respect to all television station transmitting antennas in any locality. Maximum pick-up is obtained when the receiving antenna is directly in line of sight with the transmitting antenna.

"BILT-IN-TENNA". All receivers using the TS-14, TS-23 and TS-52 series television chassis are equipped with the Motorola "BILT-IN-TENNA", mounted inside the cabinet, for use in "good signal" areas.

When this antenna is used, the following requirements should be observed for best reception:

1. In order to get maximum performance and satisfactory pictures from the "BILT-IN-TENNA", ample signals from the television station must be present at the location of the receiver. Normally, the strength of the signals will vary throughout the room in which the receiver is located. For this reason, better pictures will be obtained if the receiver is tried in all possible locations in the viewing room and is then placed where the clearest pictures are received from all stations. Avoid large metallic objects, such as radiators, metal panels, etc.
2. Lamps, vases, and metallic objects, when placed on top of the receiver, may affect the efficiency of the "BILT-IN-TENNA".

Indoor Antenna. If additional pick-up is necessary, an indoor type antenna placed on or near the receiver may be used. The antenna should be rotated and the arms should be adjusted for the best signal, with no ghosts or reflections. Normally, the arms should be extended on the low channels (2-6) and telescoped on the high channels (7-13).

Outdoor Antenna. The Motorola "BILT-IN-TENNA" or an indoor type antenna will give satisfactory reception in strong signal areas; but if the receiver is located in a fringe or weak signal area, an outdoor antenna is recommended.

In areas free of obstructions and reflections, within reasonable proximity to television transmitters, a dipole and reflector will prove satisfactory. Since such an antenna has a relatively small band coverage, a special antenna covering all twelve television channels should be used if it is desired to receive stations on channels of widely separated frequencies.

Location of the antenna should be decided upon from the standpoint of maximum signal pick-up. In general, the antenna should be broadside to the transmitting antenna and should be as high as possible.

Locating the antenna and lead-in as far away as possible from highways, hospitals, doctors' offices, electrical machinery, etc., will help to reduce noise pick-up from such sources. Also, it is desirable to keep the antenna at least 6 feet away from other antennas, metal roofs, gutters, or other metal objects to prevent unwanted reflections and shielding.

AM & FM Antennas. The AM-FM receiver chassis in the console combination receiver is provided with two built-in antennas; one for standard broadcast reception, and another for FM broadcast reception. In most locations these antennas will be satisfactory, but if certain stations are noisy or weak, reception from them can often be improved by attaching outdoor FM and broadcast antennas. The television, AM, and FM input circuits are independent of each other, so separate antennas for each type of reception are necessary.

LEAD-IN

In most cases, the standard 300 ohm twin lead line can be used for connecting the outside antenna to the receiver. Twisting the line one complete turn per foot of running length helps to reduce noise pick-up on the line. The lead-in should be supported on stand-off insulators and kept tight enough to prevent mechanical damage through swaying. Avoid running the lead-in close to metal gutters, iron standpipes, etc.

In areas of very strong signals, or where severe local electrical interference is encountered, 300 ohm shielded twin lead-in is recommended. The shield braid should be grounded.

Since the TS-14, TS-23 and TS-52 chassis are designed for 300 ohms input, a 300 ohm lead-in should be used for best efficiency. If a lead-in of 75 ohm impedance is used, a coaxial cable should replace the twin lead running from the antenna terminal strip to the receiver input. The cable should be connected across the center tap and one side of L-1, the antenna impedance matching coil.

An approved lightning arrestor should be used where the lead-in enters the house.

RECEIVER ANTENNA CONNECTION

The antenna lead-in to the television receiver is connected to the two screws of the terminal strip on the rear of the cabinet. Disconnect the "BILT-IN-TENNA" leads from the terminal strip before attaching an external antenna lead-in. Sometimes reversing the lead-in connections at the receiver may increase picture quality and overall performance.

OPERATING CONTROLS

There are two dual controls, consisting of a small and a large knob each, on the front panel of the receiver. The function of each control is marked on the front panel, the "circle" indicating the large knob, and the "dot" indicating the small knob. See Figure 1 for front panel control functions.

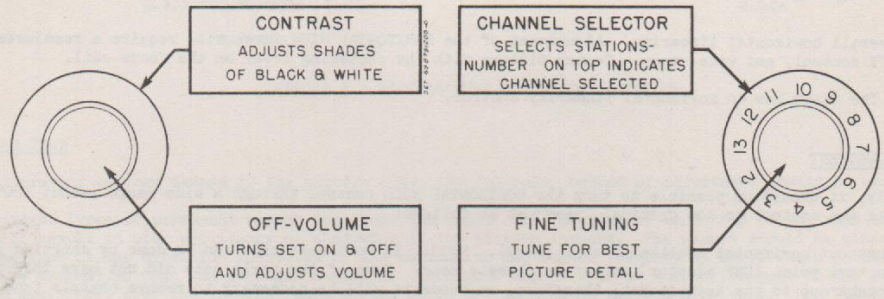

FIGURE 1. OPERATING CONTROLS

SERVICE ADJUSTMENT CONTROLS

The receiver is completely adjusted at the factory, so normally none other than the front panel control operating instructions need be followed in putting the receiver in operation. However, to provide for any misadjustment of the service controls, due to handling, the following instructions are in order. See Figure 2 for location of the service adjustment controls

FOCUS CONTROL

The FOCUS control should be adjusted until the fine horizontal line structure of the raster is clearly visible over the picture area. The control should be turned through the correct point several times so that optimum focus is obtained.

CENTERING

By means of a lever extending from the focus coil, through the rear screen, the focus coil can be shifted to center the picture in its mask.

VERTICAL SIZE AND VERTICAL LINEARITY

Adjust the VERTICAL SIZE control until the picture fills the mask vertically. Adjust the VERTICAL LINEARITY control for best overall vertical linearity. Adjustment of the VERTICAL SIZE control will require a readjustment of the VERTICAL LINEARITY control, and vice-versa. Center picture with the centering lever on the focus coil.

HORIZONTAL SIZE AND HORIZONTAL LINEARITY

Adjust the HORIZONTAL SIZE lever until the picture fills the mask horizontally. Adjust the HORIZONTAL LINEARITY

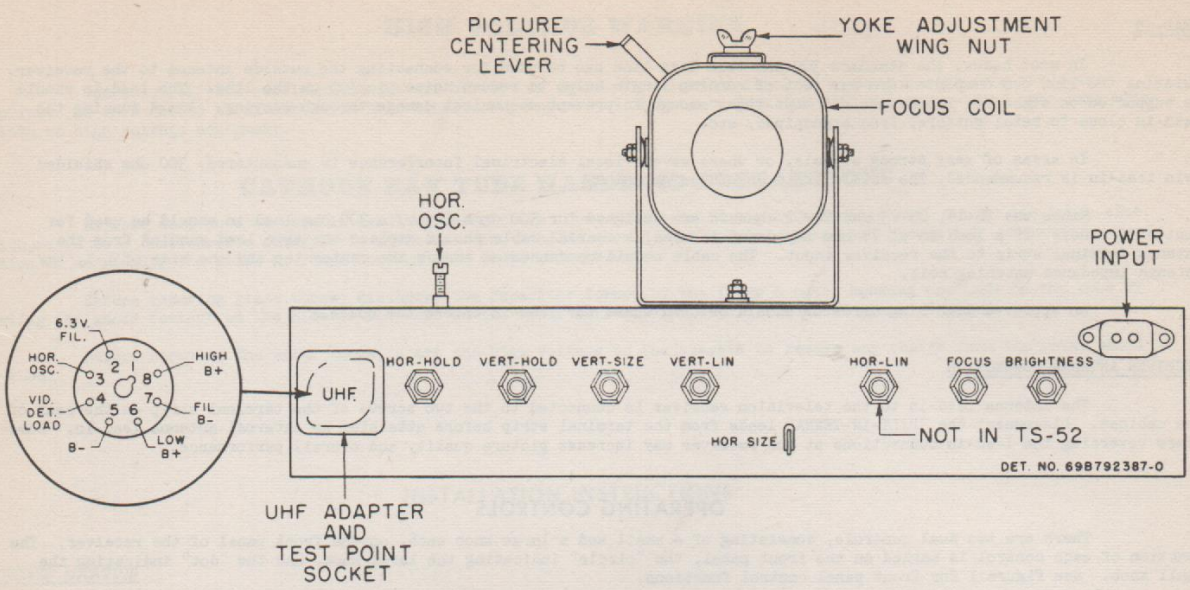

FIGURE 2. SERVICE ADJUSTMENT CONTROLS

control for best overall horizontal linearity. Adjustment of the HORIZONTAL SIZE lever will require a readjustment of the HORIZONTAL LINEARITY control, and vice-versa. Center picture with the centering lever on the focus coil.

NOTE: The TS-52 has no horizontal linearity control.

HORIZONTAL HOLD ADJUSTMENT

Normally, it should be possible to turn the HORIZONTAL HOLD control through a wide range (about 180°) without losing sync. Should the control be too critical, readjust as follows:

1. Short out horizontal oscillator coil (L-20). NOTE: In most sets this can be done by shorting pins 3 & 8 of the test point (UHF adaptor) socket on chassis rear. Some of the early sets did not have this connection brought out to the test socket; therefore, on these it will be necessary to remove chassis from cabinet and place a short directly across the coil.
2. Vary hold control until the "front porch" of the sync signal can be seen on the right of the raster. This appears as a gray vertical bar.
3. Remove short from horizontal oscillator coil.
4. Adjust horizontal oscillator until the same amount of "front porch" as in step 2 can be seen.

VERTICAL HOLD ADJUSTMENT

Adjust the VERTICAL HOLD control for the center of the vertical sync lock-in range.

BRIGHTNESS

Adjust the BRIGHTNESS control, in combination with the CONTRAST control for the most pleasing picture. Keep the brilliance slightly below maximum, however, in order to protect the fluorescent screen on the picture tube and to prevent poor picture detail.

ADJUSTMENT OF ION TRAP, DEFLECTION YOKE AND FOCUS COIL

Under conditions of rough shipment, it is possible for the ion trap, deflection yoke, or focus coil to become misaligned. The following instructions will enable the service man to bring the parts to their normal setting.

See Figure 3 for adjustment locations. A mirror placed in front of the receiver will help in making these adjustments.

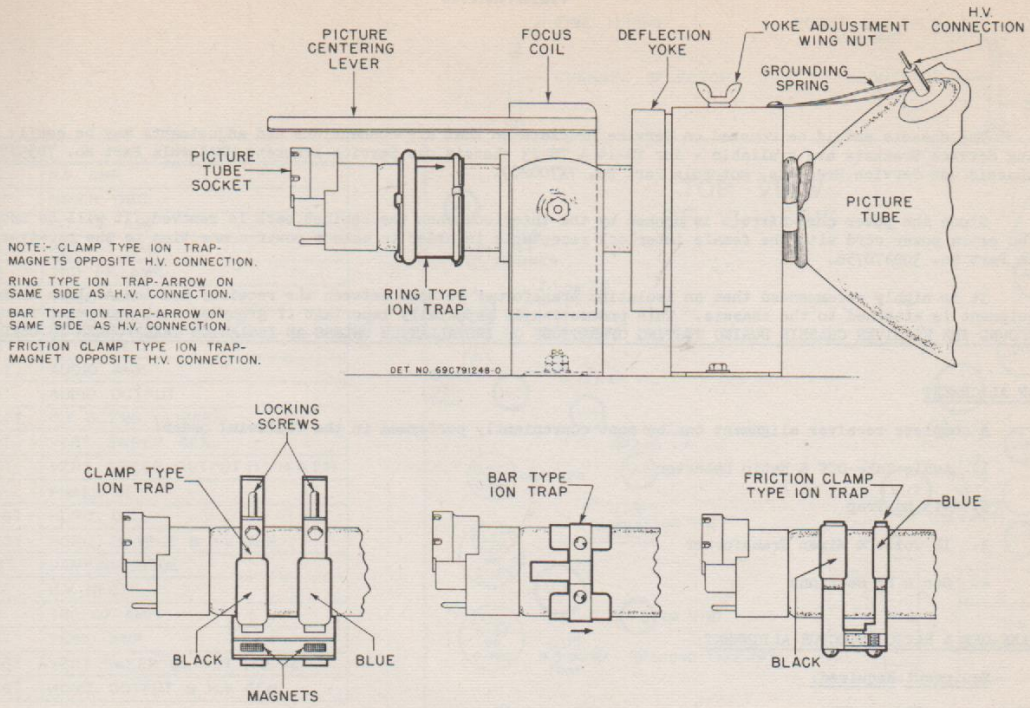

FIGURE 3. PICTURE TUBE ADJUSTMENT LOCATION

Ion Trap

To prevent serious damage to the picture tube, the following method of adjustment should be used:

Several types of permanent magnet ion traps are used. The function of each trap is the same and its shifting will result in poor brilliancy or shadowing of the picture corners. The magnet should be placed on the neck of the tube in the direction indicated by the marking on the magnet (usually an arrow which points to the picture tube screen) so that the stronger magnet of the double magnet type or the only magnet in the single magnet type is positioned over the internal pole pieces which are mounted on the gun structure. See Figure 3. Adjust the brightness control for low intensity and move the magnet a short distance forward and backward at the same time rotating it to obtain the brightest raster. If in obtaining the brightest raster the ion trap magnet has to be moved more than 1/4 inch from the gun pole pieces, the magnet is probably weak and a new magnet should be tried. Never correct for a shadowed raster with the ion trap magnet if such correction results in decreased brightness. The ion trap magnet must always be adjusted for maximum brightness and if shadows occur at this setting, they should be eliminated by adjusting the focus and deflection coils as explained under "Focus Coil and Deflection Yoke Adjustments". CAUTION: Keep brightness control at low intensity until ion trap is properly set. When adjustment is completed, make certain that the ion trap is held tightly in position.

Deflection Yoke

If the deflection yoke shifts the picture will be tilted. To correct, loosen the wing nuts on the top of the deflection yoke and rotate yoke until picture is straight. Before tightening the wing nut make certain that the deflection yoke is as far forward as possible.

Focus Coil

The normal position of the focus coil is about 1/4 inch behind deflection yoke when the focus coil is parallel to the deflection yoke. If the focus coil has shifted from its normal position and shadowing of the picture corners is noticed, loosen the focus coil bracket positioning screw nuts and move the focus coil to within 1/4 inch of the deflection yoke. In tightening the focus coil bracket positioning screw nuts, tighten the first one so that the spring washers will have enough tension to hold the bracket firmly, but not so tightly as to cause difficulty in making picture centering adjustment. Then tighten the lock nut to prevent loosening.

UHF ADAPTOR SOCKET

Provision is made for supplying filament and "B" voltages for the future use of a UHF converter, merely by plugging it into the socket on the rear of the chassis.

In addition, a test point from the video detector load is brought out to the socket for making comparative video sensitivity measurements with the set in the cabinet. See Figure 2 for socket connections. Shorting pins 3 & 8 of the socket provides a means of shorting the horizontal oscillator coil when making HORIZONTAL HOLD adjustment.

ALIGNMENT

GENERAL

The chassis should be mounted on Service Brackets so that all connections and adjustments may be easily made. The following Service Brackets are available - for TS-14 & TS-23 chassis use Service Brackets, Motorola Part No. 7B591556; for TS-52 chassis use Service Brackets, Motorola Part No. 7X700209.

Since the power cord circuit is broken by the interlock when the cabinet back is removed, it will be necessary to obtain an extra power cord with the female interlock receptacle in order to make a power connection to the receiver. Order Motorola Part No. 30B470756.

It is highly recommended that an isolation transformer be used between the receiver and the AC line whenever any test equipment is attached to the chassis. This precaution is especially important if grounded test equipment is used. NEVER GROUND THE RECEIVER CHASSIS DURING TESTING OPERATIONS OR INSTALLATION UNLESS AN ISOLATION TRANSFORMER IS USED.

ORDER OF ALIGNMENT

A complete receiver alignment can be most conveniently performed in the following order:

1. Audio Take-Off & Ratio Detector
2. 4.5 Mc Trap
3. IF Coils & Mixer Transformer
4. Osc & RF Sections

AUDIO TAKE-OFF & RATIO DETECTOR ALIGNMENT

Equipment Required:

AM Signal Generator: (Optional)	Accurately calibrated at 4.5 mc Adjustable output.
DC Meter:	Low range electronic voltmeter

Procedure:

Refer to Figure 4 for location of adjustments.

1. If possible, it is desirable to align the audio section from an actual station signal, since the 4.5 mc alignment frequency will be exact. The fine tuning trimmer should be turned off the station slightly, to prevent overloading the ratio detector.
2. If a signal generator is used, tune it accurately to 4.5 mc, and adjust the output to approximately 10,000 microvolts. Connect the high side of the signal generator through a 1000 mmf capacitor to the grid of the video amplifier tube V-21 (6AH6, pin 1)* and the low side to B-.
3. From either side of capacitor C-58 (10 mf), connect a decoupling resistor of 10,000 ohms in series with an electronic voltmeter to B-.
4. Set the contrast control for maximum gain (fully clockwise).
5. Peak L-18 for maximum reading on meter.
6. Peak T-2 primary (top core) for maximum reading on meter.
7. Move the meter and decoupling resistor from C-58 to junction of R-34 (33K) and lead to volume control.
8. Adjust T-2 secondary (bottom core) for zero response on 2.5V scale of meter. This corresponds to the cross-over point on the FM detector curve. If desired, the symmetry of the curve may be checked by tuning the secondary to both sides of zero and noting the maximum voltage produced, reversing the meter connections as necessary. For proper balance of the ratio detector system, the maximum voltages in each direction should be approximately equal. If not, L-18 and T-2 primary should be retuned.

   NOTE: As the adjustments are brought to resonance, it is advisable to reduce signal generator output to prevent overloading.

   With a 10,000 microvolt signal into the grid of the video amplifier tube, with the contrast control turned fully clockwise, and the focus control fully counterclockwise, the voltage read from one side of capacitor C-58 should be greater than 5.0V.

*V-6 (6AU6) in TS-14, TS-14A, TS-23 & TS-23A

NO.	TYPE	FUNCTION
V-1	6AG5	R-F AMP.
V-2	12AT7	MIXER - OSC.
V-3	6AU6	IST. I-F AMP.
V-4	6AU6	2ND. I-F AMP.
V-5	6AU6	3RD. I-F AMP.
V-6	6AU6	VIDEO AMP.
V-7	6AU6	AUDIO DRIVER - LIMITER
V-8	6AL5	RATIO DET.
V-9	6J5GT	AUDIO AMP.
V-10	6V6GT	AUDIO OUTPUT
V-11	6SN7GT	IST. & 2ND. CLIPPER
V-12	6J5GT	VERT. SWEEP GEN.
V-13	6V6GT	VERT. SWEEP OUTPUT (TS-14 & 23)
V-14	6AL5	PHASE DET.
V-15	6SN7GT	HORIZ. OSC.
V-16	6BQ6GT	HORIZ. OUTPUT & H.V. GEN.
V-17	6W4GT	DAMPING DIODE
V-18	1B3GT	H.V. RECT.
V-20	6AG5	3RD. I-F AMP.
V-21	6AH6	VIDEO AMP.
V-22	25L6GT	VERT. SWEEP OUTPUT (TS-52)
V-23	6BQ6GT	HORIZ. OUTPUT & H.V. GEN.

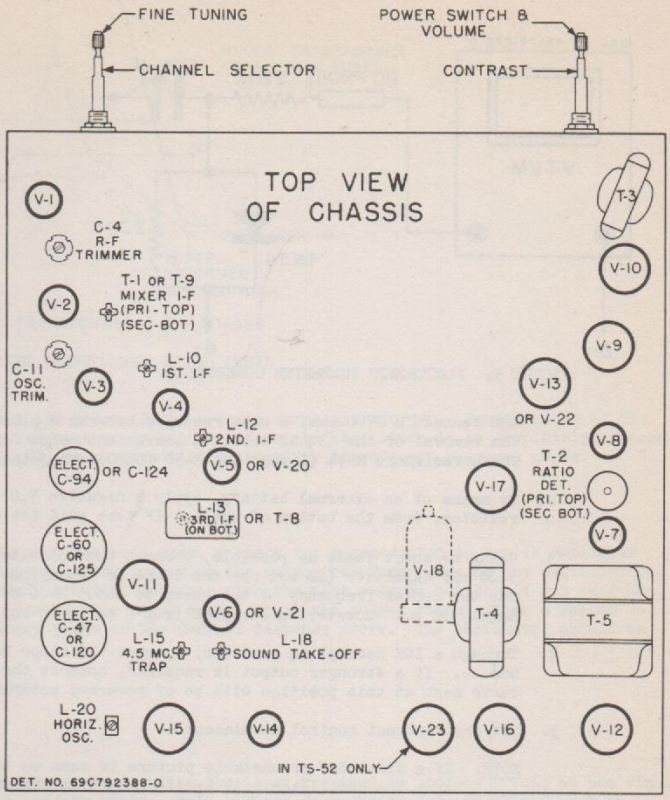

FIGURE 4. TUBE AND ALIGNMENT ADJUSTMENT LOCATIONS

4.5 MC TRAP ALIGNMENT

1. Connect the AM signal generator, through a 1000 mmf capacitor, across R-28 (1 meg), the grid resistor of the video amplifier tube V-21 (6AH6). [V-6 (6AU6) in TS-14, TS-14A, TS-23 & TS-23A]
2. Connect the voltmeter and germanium crystal rectifier, as shown in Figure 5, between the cathode of the picture tube (yellow lead) and B-. Use the lowest voltage scale on the meter.
3. With the signal generator accurately set at 4.5 mc and maximum output, adjust trap L-15 for minimum reading on the meter.

IF AMPLIFIER ALIGNMENT

Equipment Required:

IF Sweep Generator meeting the following requirements:

18 to 30 mc, approximately 12 mc sweep width. Output constant and adjustable to at least .1 volt maximum with accurately calibrated, adjustable markers.

5" Cathode-Ray Oscilloscope: preferably one with a calibrated input attenuator.

NOTE: If there is no built-in marker in the sweep generator, loosely couple the output of an accurately calibrated AM signal generator to the IF strip. At all times, keep the marker output low enough to prevent the marker from distorting the response curve.

If a wide band scope is used, the marker will be more distinct if a capacitor of 100 to 1000 mmf is placed across the scope input. Use the smallest size possible, since too large a value will affect the shape of the curve.

Procedure:

1. Remove the 6BQ6GT high voltage generator tube from its socket to eliminate RF interference in the oscilloscope,

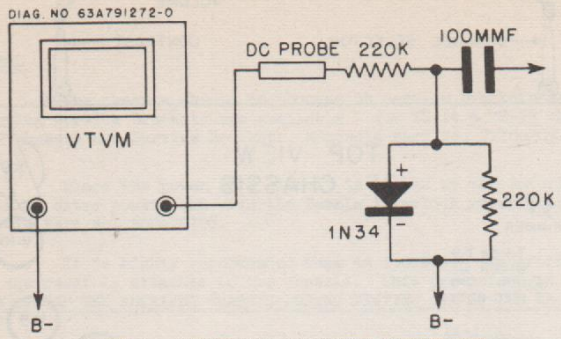

FIGURE 5. ELECTRONIC VOLTMETER CONNECTIONS

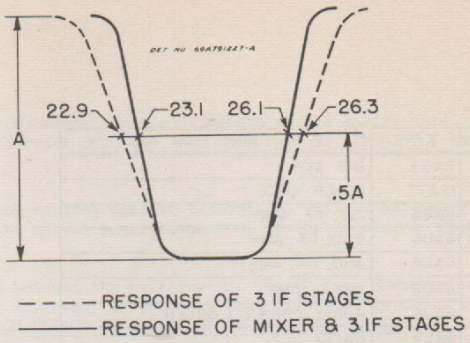

FIGURE 6. IF & MIXER RESPONSE CURVES

and connect a 2700 ohm, 6 watt resistor between B plus and B- to compensate for the change in load caused by the removal of the 6BQ6GT tube. A convenient point for connecting the resistor is the terminal strip on which resistors R-44 (1 meg) and R-50 (5600) are joined.

2. By means of an external battery, apply a negative 3.0 volt bias through a 4700 ohm to 10K ohm decoupling resistor, from the bottom of the 1st IF tube grid resistor R-111 (6800)* to B-.

3. Using as short leads as possible, connect the hot side of the sweep generator to the 1st IF grid through a 5000 mmf capacitor (do not use the loose or "spraying" method of coupling). The low side is connected to B-. Set the center frequency of the sweep to about 24.6 mc and adjust initially for a sweep deviation of approximately 12 mc. However, a sweep of from 8 to 10 mc may be found better for overall alignment.

4. Through a 10K decoupling resistor, connect the scope between the top of the detector load resistor R-23 (8200) and B-. If a stronger output is required, connect the scope between the picture tube cathode and B-. The curve seen at this position will be of reversed polarity as in Figure 7.

5. Set the contrast control at minimum.

NOTE: If a distorted or unstable picture is seen on the oscilloscope during alignment, it may be necessary to stop the oscillator tube by disconnecting resistor R-10 (1000) from the plate of the tube (pin 6), or by substituting another tube with pin 6 removed.

CAUTION: 1. Do not reduce the oscilloscope gain and increase signal input so that the top of the curve is flattened, due to limiting in the video or scope amplifiers.

2. It is important that the plate chokes (L-9 & L-11) lie close to the chassis.

3. If the AGC filter capacitor C-22 (.25 mf) has been replaced, make certain the leads are short to avoid regeneration on weak signals.

6. Peak the 1st IF coil, L-10, initially, for maximum response at about 26.0 mc. See Figure 4 for IF adjustment locations.

7. Tune the 2nd IF coil, L-12, initially, for peak response at about 24.6 mc.

8. Adjust the 3rd IF coil, T-8**, to place a 22.9 mc marker signal 50% (1/2) the way up the low side of the response waveform.

9. Adjust the 1st IF coil, L-10, to place a 26.3 mc marker signal 50% (1/2) the way up the high side of the response waveform. Refer to Figure 6 for marker positions on waveform obtained.

10. Then adjust the 2nd IF plate coil, L-12, to provide a flat top or a symmetrical curve to the response waveform obtained.

NOTE: It may be necessary to repeat the procedure to obtain the proper waveform. See Figure 6.

11. Connect the sweep generator across the mixer tube grid resistor R-6 (33K), with bias still applied to the 1st IF tube.

12. Bring both cores of transformer T-9*** simultaneously from extreme outside positions toward the center until the 26.1 mc marker is 50% (1/2) way up the high frequency slope, and the 23.1 mc marker is 50% (1/2) way up the low frequency slope. Correct waveform is shown in Figure 6.

In aligning the three IF coils, each coil is adjusted individually, but when adjusting the primary and secondary of the mixer transformer T-1, the adjustments should be made simultaneously. The important point to keep in mind is to obtain a flat response curve with as much gain as possible. The sides of the curve should be straight and as steep as possible with a sharp break at the base line. Simultaneous adjusting of the primary and secondary is the easiest way to obtain this result. The transformer by itself is, in effect, tuned for the same pass band as the three staggered circuits. See Figure 7.

*R-9 (5600) in TS-14 & TS-23
**L-13 in TS-14 & TS-23
***T-1 in TS-14 & TS-23

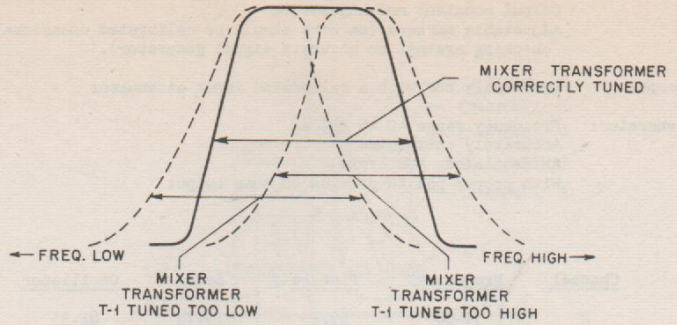

FIGURE 7. MIXER TRANSFORMER TUNING CURVE

The only difference in the overall waveform should be that the sides of the overall curve are steeper. Constant use of the 50% response marker signals to show the bandwidth of the response curve should be resorted to, since it is absolutely necessary to obtain the proper curve. A slight dip (not exceeding 10%) is permissible in the mixer transformer response curve.

REGENERATION CHECK

After the above IF and mixer transformer alignment has been made, a check for regeneration in the IF amplifier strip should be made. This is done by removing the battery bias and observing the output response curve on the oscilloscope, as taken between the picture tube cathode and B-. The bandwidth will decrease with the bias removed but should not fall below 2.3 mc. Set the contrast control to maximum gain. Decrease the input signal until the output signal shows a marked decrease. Any regeneration present will be indicated by sharp peaks on the overall response curve. The oscillator should be stopped during this procedure.

CAUTION: Do not inject too much marker signal.

BANDWIDTH

The bandwidth may be determined with an AM generator by doubling the input required to produce 1 volt at the video detector and tuning to each side of 24.6 mc until the meter again reads 1 volt. These frequencies correspond to the 6 db (50%) points on the skirts of the curve. The bandwidth will decrease from that shown in Figure 6 because the battery bias on the 1st IF tube has been removed, but the two 6 db points should be at least 2.3 mc apart. By making a plot of frequency versus voltage, the actual IF response curve may be traced out.

IF SENSITIVITY MEASUREMENTS

IF Stages

1. Remove the battery bias from 1st IF tube grid.
2. Connect an AM signal generator, set at 24.6 mc, through a blocking capacitor of 5000 mmf, between B- and the grid of the 1st IF tube V-3 (6AU6, pin 1).
3. Connect an electronic voltmeter across the video detector load, between the green lead and the yellow lead from the video detector assembly. Both leads from the meter should be decoupled with 100K ohm resistors.
4. Set the contrast control for maximum sensitivity.
5. Stop the oscillator tube by disconnecting resistor R-10 (1000) from the plate of the tube (pin 6), or by substituting another tube with pin 6 removed.
6. The signal required to produce 1 volt (negative) on the meter should be less than 200 microvolts.

Mixer & IF Stages

The preliminary preparations are the same as for checking the sensitivity of the IF stages, except:

1. Connect the AM signal generator, set at 24.6 mc, through a 5000 mmf capacitor, between B- and the grid of the mixer tube V-2A (12AT7, pin 2).
2. The signal required to produce 1 volt (negative) on the meter should be less than 50 microvolts.

OSCILLATOR, ANTENNA AND RF ALIGNMENT

Equipment Required:

Sweep Generator: Frequency range 40-220 mc; 10 mc sweep width

Output constant and adjustable
Adjustable markers (markers should be calibrated occasionally by checking against an accurate signal generator).

Oscilloscope: Preferably one with a calibrated input attenuator

Signal Generator: Frequency range 40 to 220 mc
Accurately calibrated
AM modulated, 400 cycle
With proper pad to provide 50 ohms output

Frequency Chart

Channel	Frequency	Picture	Sound	Oscillator
2	54-60	55.25	59.75	81.35
3	60-66	61.25	65.75	87.35
4	66-72	67.25	71.75	93.35
5	76-82	77.25	81.75	103.35
6	82-88	83.25	87.75	109.35
7	174-180	175.25	179.75	152.15
8	180-186	181.25	185.75	158.15
9	186-192	187.25	191.75	164.15
10	192-198	193.25	197.75	170.15
11	198-204	199.25	203.75	176.15
12	204-210	205.25	209.75	182.15
13	210-216	211.25	215.75	188.15

OSCILLATOR ADJUSTMENT

1. If the oscillator has been disconnected during the IF alignment, put it back into the circuit.

2. Connect the AM signal generator output cable to the antenna terminals of the receiver. Match the 50 ohm generator impedance to the 300 ohm input impedance of the receiver by using a 100 ohm resistor in series with the output terminal of the generator cable and a 150 ohm resistor in series with the ground terminal.

3. Connect the vertical input terminals of the oscilloscope from the cathode of the mixer tube V-2A (12AT7, pin 3) to B- through a shielded lead. Decouple this lead with a 4700 ohm to 10K ohm resistor. Set the vertical gain control at maximum. Synchronize the oscilloscope to 60 cycles or a harmonic of 60 cycles.

4. Set the fine tuning trimmer to mid-capacity.

5. Set the generator to the oscillator frequency of channel 10 (170.15 mc) and adjust the oscillator trimmer C-11 (see Figure 4) for zero beat viewed on the oscilloscope. Zero beat is indicated by the sharply defined trace that appears between the two wide traces as the trimmer is tuned through resonance.

   NOTE: If the pattern on your oscilloscope is too small to be observed readily, the following change from Service Manual procedure may be made to provide more amplitude on the scope. Instead of connecting the scope across R-7, the mixer cathode resistor, connect it between plate of the mixer (pin 1 of V-2A) and B-. Disconnect the low side of the mixer plate coil at the terminal strip and connect instead a 250K resistor from B plus on the terminal strip to the plate.

6. Check all high channels (7-13) to determine if zero beat occurs with fine tuner within 45 degrees of mid-setting. See chart above for oscillator frequencies. It may be necessary to adjust coil L-7 (high band oscillator coil, Figure 8) to bring channels 11, 12 or 13 within this range. Adjustment is made by compressing or spreading the coil with an insulated screwdriver. If L-7 is adjusted, it may be necessary to retune trimmer C-11 to channel 10 to bring channels 7 to 10 within the 90 degree range.

7. The low channels (2-6) are adjusted by starting at channel 6 and progressing through channel 2. Touching up a particular coil section is accomplished by spreading or compressing the individual coils. (See Figure 8 for location of various coil sections and chart above for oscillator frequencies).

   CAUTION: Before checking a given channel, be sure the station selector switch is in the proper position.

   To make certain that the trimmer is adjusted correctly, tune through the zero beat point and then back again to obtain the exact setting. Also, it is advisable when close to the zero beat setting, to vary the signal generator input voltage so as to obtain maximum response on the oscilloscope. Before making the final trimmer setting, reduce the generator input as low as possible so as to reduce the lock-in range and obtain a sharp zero beat setting.

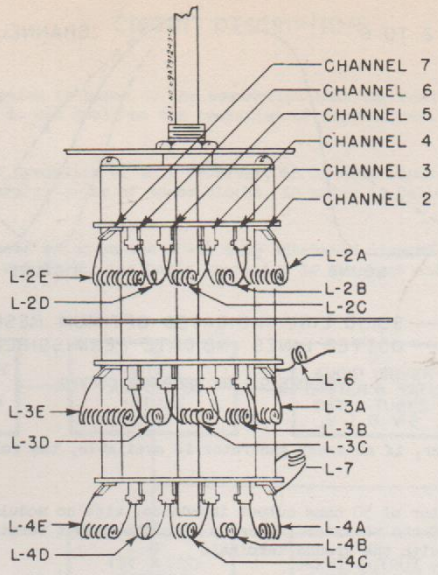

FIGURE 8. ANTENNA, RF AND OSC COIL LOCATIONS

ANTENNA & RF ALIGNMENT PROCEDURE

1. Remove the 6BQ6GT high voltage generator tube from its socket and connect a 2700 ohm, 6 watt resistor between B plus and B-. A convenient point for connecting the resistor is the terminal strip on which resistors R-44 (1 meg) and R-50 (5600) are joined.

2. Connect a sweep generator across the antenna terminals. Use internal markers or an accurately calibrated external signal generator for markers.

3. Stop the oscillator tube by disconnecting resistor R-10 (1000) from the plate of the tube (pin 6) or by substituting another tube with pin 6 removed.

4. Connect the oscilloscope, through a decoupling resistor of 4700 ohms to 10K ohms, across R-7 (1200), in the cathode circuit of the mixer tube V-2A (12AT7). The marker may be more distinct if a capacitor of 100 mmf to 1000 mmf is placed across the scope input.

5. Refer to Figure 4 for the RF trimmer location and to Figure 8 for the locations of the antenna and RF coils. The frequency chart listed previously gives the channel and alignment frequencies.

6. The antenna coils are tuned to the video carrier frequency and the RF coils are tuned to the sound carriers. Figure 9 shows the shape of the curve which should appear on the oscilloscope.

7. Turn the station selector switch to channel 10. Set the center frequency of the sweep generator to the center frequency of channel 10 (195 mc). Adjust RF trimmer C-4 to place a 195 mc marker at maximum amplitude of curve. There is no high frequency trimmer adjustment on the antenna coils.

8. Check channels 7 to 13, noting whether the mid-frequencies of these channels produce maximum amplitude on the curve. If it is necessary to adjust coil L-6 (see Figure 8) on channels 11, 12 or 13 to center the curve properly, trimmer C-4 may have to be retuned on channel 10.

   NOTE: As the bandwidth of the high channels is very broad, the mid-frequency marker may not fall exactly at the peak of the curves. A slight variation is permissible, as shown in Figure 9.

9. Check the low channels, starting at channel 6 and moving downward to channel 2. In each case, with the center frequency of the sweep generator at the channel center frequency, introduce markers corresponding to sound and picture carriers and compare with curve in Figure 9. It is permissible for the markers to appear slightly down on the skirt, but if they are too low (more than 6 db down), the curve may be changed by moving or bending the particular coil section. The RF coil affects the sound carrier and the antenna coil affects the video carrier.

   NOTE: A convenient method for determining if an antenna or RF coil is tuned correctly is to insert an iron or brass core into the coil. Brass decreases the inductance, and iron increases the inductance. The coil is properly tuned when the curve appears as in Figure 9.

   CAUTION: Be sure to turn station selector switch to correct channel before checking bandpass of that channel.

ALTERNATE ANTENNA & RF ALIGNMENT

Whenever possible, the preceding antenna & RF alignment procedure should be used, since the exact response curve may

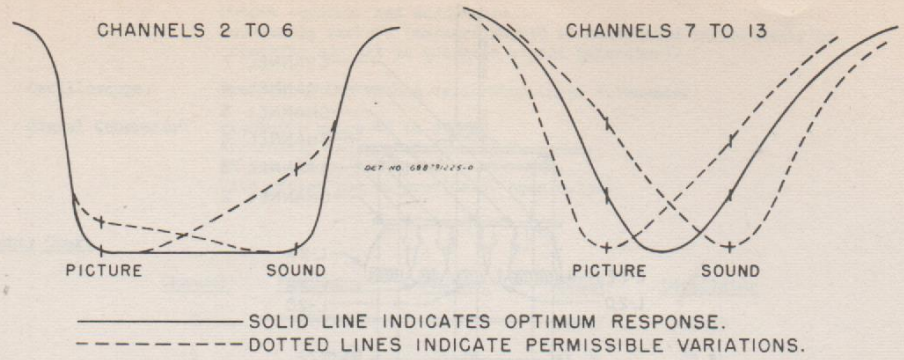

FIGURE 9. RF RESPONSE CURVES

be observed on the oscilloscope. However, if no sweep generator is available, the following method, using an AM signal generator, will suffice.

1. Connect a signal generator of 50 ohms output impedance, with no modulation, to the antenna terminals of the receiver. Connect a 100 ohm resistor in series with the output terminal of the generator cable and a 150 ohm resistor in series with the ground terminal.

2. Connect the electronic voltmeter across the video detector load resistor, between the green lead and the yellow lead from the detector assembly. Both leads from the meter should be decoupled with 100K ohm resistors.

3. If the oscillator tube has been disconnected, put it back into the circuit.

4. Figure 4 shows the location of the RF trimmer, and Figure 8 gives the location of the antenna and RF coils. The frequency chart listed previously gives the channel and alignment frequencies.

5. Except on channel 10, the antenna coils are tuned to the video carrier and the RF coils are tuned to the sound carrier.

6. Turn the station selector switch to channel 10, tune the signal generator to 195 mc, and peak the oscillator fine tuning trimmer for maximum output. Adjust RF trimmer C-4 for maximum response on the voltmeter. There is no high frequency trimmer adjustment on the antenna coils.

7. Check channels 7 to 13, noting whether the mid-frequencies of each channel produce maximum or near maximum reading on the voltmeter. If it is necessary to adjust coil L-6 (see Figure 8) on channels 11, 12 or 13 to center the curve properly, trimmer C-4 may have to be retuned on channel 10.

8. Check the low channels, starting with channel 6 and moving downward to channel 2. The RF coils should be adjusted for maximum voltage output at the sound carriers of the channels, and the antenna coils should be adjusted for their peak output at the video carriers. Brass and iron cores inserted alternately into the coils will determine if they have been tuned for maximum output, since brass decreases inductance and iron increases inductance. The coils are tuned properly when no further voltage increase is noted as the brass and iron cores are inserted, with the signal generator tuned to the proper carrier frequency. If the voltage at either carrier frequency is too low, adjust the particular coil section by spreading or compressing the individual coils.

OVERALL RECEIVER SENSITIVITY MEASUREMENT

An overall measurement of sensitivity is made as follows:

1. Connect an AM signal generator of 50 ohms output impedance, with no modulation, to the antenna terminals of the receiver. Place a 100 ohm resistor in series with the output terminal of the generator cable and a 150 ohm resistor in series with the ground terminal, to match the 50 ohm cable to the 300 ohm input of the receiver.

2. Connect a low range electronic voltmeter across the video detector load resistor, between the green lead and the yellow lead from the detector assembly. Both leads from the meter should be decoupled with 100K ohm resistors.

3. Set the contrast control for maximum sensitivity.

4. Tune the signal generator for the center frequency of each channel under test, and rotate the fine tuning trimmer for maximum output on the meter.

5. The signal as read on the attenuator of the generator, required to produce 1 volt (negative) on the meter should be less than 150 microvolts on channels 2-6 and less than 300 microvolts on channels 7-13. Because of the attenuation in the matching network, this corresponds to an actual sensitivity at the 300 ohm terminals of the receiver of 75 microvolts on channels 2-6 and 150 microvolts on channels 7-13.

CIRCUIT DESCRIPTION

The following circuit description is based on the assumption that the reader is familiar with a recent textbook of television principles. The discussions do not dwell on the operation of conventional circuits used in radio receivers, as these should be well-known.

For ease of understanding the operation of this receiver, an 11-unit block diagram is given below in Figure 10. The circuit description follows the numerical order of these blocks, in order to follow a signal logically through the receiver.

Reference numbers used are those found on the TS-14 & 23 schematic diagram. Although certain component changes were made in the TS-14A, 14B, 23A, 23B, and TS-52, the basic operation is the same and this description will apply.

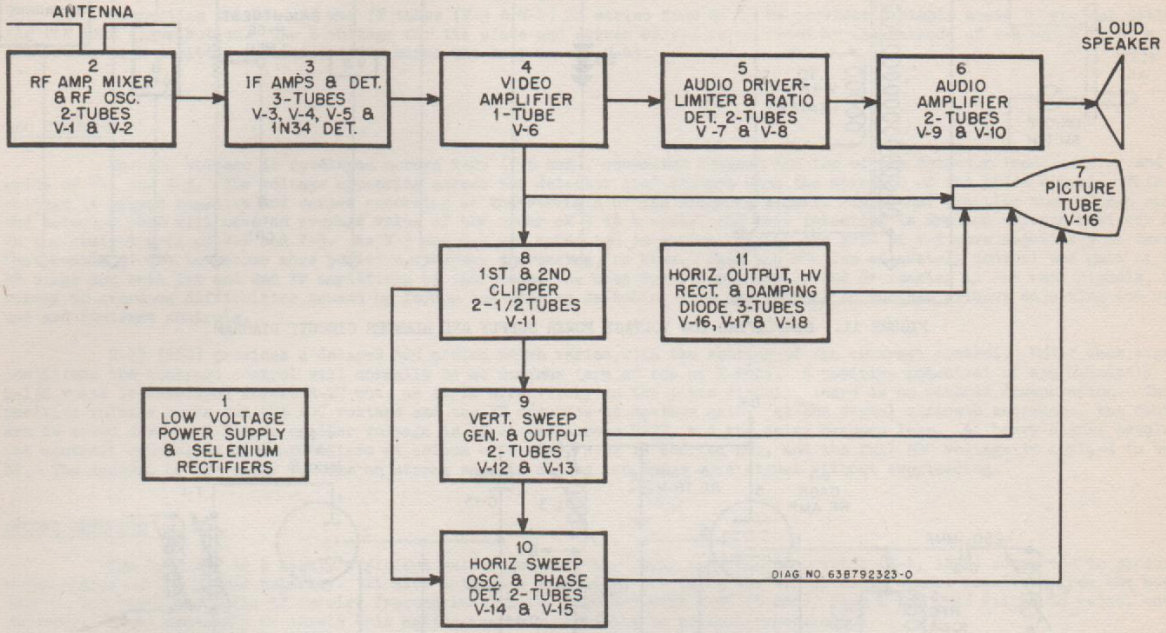

FIGURE 10. FUNCTIONAL BLOCK DIAGRAM

LOW VOLTAGE POWER SUPPLY

The low voltage power supply provides heater and plate voltage for all except the high voltage circuits. Figure 11 shows a change incorporated in present chassis not shown on the original schematic. By placing the filament transformer secondary in series with the line, advantage is taken of its output to raise the B voltage approximately 10 volts.

The plate supply is a voltage doubler system using selenium rectifiers.

The filament transformer has an additional secondary winding which supplies the heaters of V-4 and V-7. As the cathodes of these tubes are at a relatively high positive voltage, their heater winding is connected to B+ instead of B- to reduce filament-to-cathode potential.

Because of the high voltage applied to the filaments of the damping diode (V-17), a specially insulated, low-capacity transformer (T-6) is provided for its heater supply.

ANTENNA INPUT

The input is wired for 300 ohm reception, but can be adapted to a 75 ohm antenna by replacing the twin lead with a coaxial cable. The cable is connected between the center tap and one side of the antenna coil L-1.

RF UNIT

The RF unit consists of a 6AG5 RF amplifier (V-1) and 12AT7 dual triode, (V-2), used as a mixer and oscillator. Switching is accomplished by means of a three-wafer, 12-position Station Selector Switch. See circuit diagram, Figure 12.

Instead of individually tuned coils, the tuner consists of single pre-tuned, tapped inductances mounted on each wafer. Thus, the position of the Station Selector Switch will determine the amount of inductance in the tuner circuits.

The antenna coils mounted to switch wafer S-1B match the input impedance of the 6AG5 RF amplifier to the antenna circuit. Since the input impedance of the RF amplifier tube decreases as the square of the frequency, it was found practical

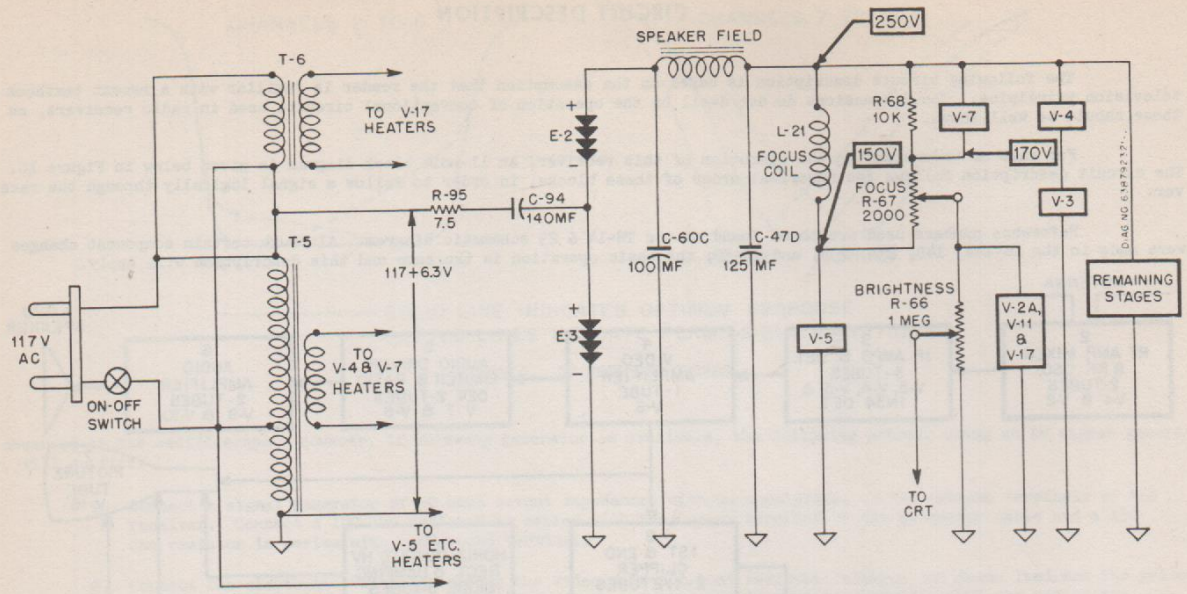

FIGURE 11. SIMPLIFIED LOW VOLTAGE POWER SUPPLY AND BLEEDER CIRCUIT DIAGRAM

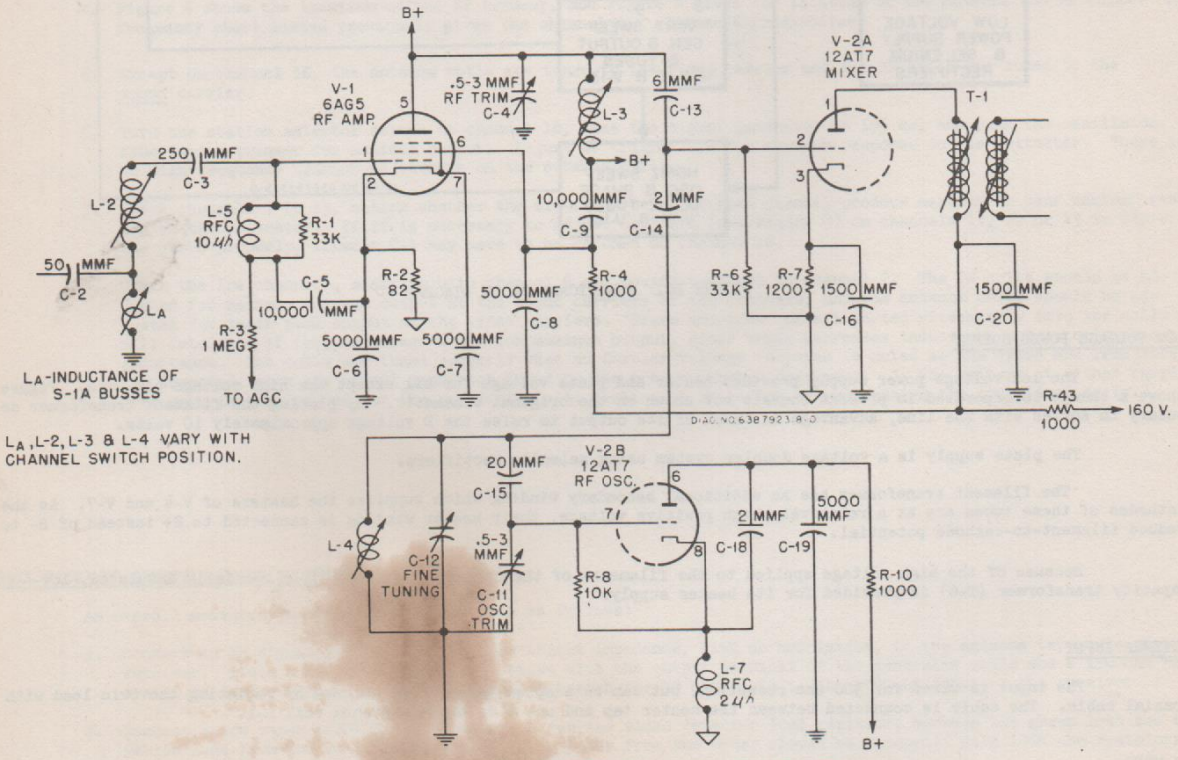

FIGURE 12. SIMPLIFIED RF, MIXER AND OSC STAGES CIRCUIT DIAGRAM

to form the antenna coils for channels 7 to 13 from a stamped, flat metal plate. The bandwidth of these coils ranges between 8 and 10 mc and no tuning is necessary. The antenna coils for the low channels (2-6) can be tuned as described in the alignment procedure.

The RF coils, mounted on switch wafer S-1C are formed in a manner similar to the antenna coils. Unlike the antenna coils, however, a ceramic trimmer, C-4, is provided to compensate for the variations in tubes when aligning the high channels. The RF coils are in the plate circuit of the RF amplifier and are tuned to the audio carrier. The antenna coils are tuned to

the video carrier and the combination of the two result in the proper bandpass for each channel.

V-2B, in conjunction with the coils of wafer S-1E, is a modified Colpitts circuit which generates the proper oscillator frequencies. The arrangement of coils is similar to that of the RF section and again a trimmer (C-11) is provided to align the high channels. Optimum oscillator injection is obtained by means of C-14 (2 mmf). C-12 is the fine tuning trimmer which offers a means of tuning the oscillator for best picture.

IF AMPLIFIERS

The IF amplifier strip consists of three stagger-tuned stages. The mixer plate utilizes a tuned transformer, while each successive stage has one tuned circuit. The transformer and following coils are tuned to different frequencies to obtain adequate gain and bandwidth. The last three IF coils are stagger-tuned as a group for bandpass curve, while the mixer transformer is coupled to cover the same bandwidth.

Connecting the 1st and 2nd IF tubes (V-3 & V-4) in series from B- to B+ provides a simple means to prevent disturbing the load distribution. The B voltage for the plate and screen of V-3 is provided by the cathode of V-4 which is at a relatively high positive potential (250V minus the drop across V-4).

AGC CIRCUIT

The AGC voltage is developed across R-25 (1.5 meg), connected between the top of the detector load resistor and the grids of V-1 and V-3. The voltage appearing across the detector load depends upon the strength of the video signal. This voltage is always negative and varies according to the strength of the incoming signal. In actual practice the voltage across the detector load will have an average value of the order of 3 to 4 volts, and this potential is applied through resistor R-25 to the control grid of V-1 and V-3. As V-3 and V-4 are connected in series, making the grid of V-3 more negative will cause the cathode of V-4 to become more positive, thereby increasing its bias. Thus the AGC can adequately control the gain of the RF stage and both 1st and 2nd IF amplifiers by increasing the bias for strong signals and decreasing it for weak signals. This serves to overcome difficulties caused by fading and enables switching from one channel to another without adjusting the volume and contrast controls.

R-27 (180) provides a delayed AGC action which varies with the setting of the contrast control. Under weak signal conditions the contrast control will normally be at maximum (arm at top of R-26A). A positive potential of approximately 2-1/2 volts is developed across R-27 but, as it is effectively in the plate circuit, there is no cathode degeneration. This positive voltage bucks out the AGC voltage and the IF operates at maximum gain. As the signal strength increases, the contrast arm is moved down on R-26A, a smaller voltage is developed across R-27, and the delay becomes less. At heavy signal levels, the contrast control is at minimum (arm at bottom of R-26A), R-27 is shorted out, and the full AGC voltage is applied to the IF. The removal of the delay voltage on strong signals allows ten times more signal without overloading.

SECOND DETECTOR

The detector is a highly efficient half-wave rectifier using a germanium crystal (E-1, 1N34) connected to produce a video signal of the proper polarity. It also acts as a converter, providing the 4.5 mc audio signal resulting from the beat between the video and audio IF carrier frequencies. L-14, together with C-95 (6 mmf), form a low pass filter to reject the IF carriers. It is necessary to shield this entire assembly carefully to prevent regeneration.

VIDEO AMPLIFIER

The video amplifier stage has four functions: (a) amplifies the detected video signal to a suitable driving voltage for the picture tube; (b) amplifies the sync pulses which control the deflection circuits; (c) separates the audio and video signals; (d) acts as a noise limiter.

Noise peaks in the sync pulse will represent the maximum amplitude of the video signal. As the polarity of the signal is negative, the peaks drive the video amp to cut off and are limited.

The video output is coupled through C-48 (.1) to the picture tube. As the picture phase is negative, it is necessary to modulate the cathode instead of the grid.

L-16 and L-17 are compensating coils which provide peaking of the high frequencies, while C-47A (20 mf) furnishes low frequency compensation by effectively raising the plate load at low frequencies.

Additional compensation is gained in the cathode circuit. At low frequencies the cathode is unbypassed resulting in degeneration. The amount of degeneration will decrease with the rise in frequencies. Thus, the high frequencies are effectively peaked by de-emphasizing the lows.

C-49 (2 mmf) couples the audio signal (4.5 mc) to the audio section.

R-26A, the contrast control, governs the bias on V-6 and thereby determines the black level of the picture.

L-15 and C-46 prevent the picture tube cathode from being modulated by the audio signal.

STABILIZED BRIGHTNESS CONTROL

Instead of using the DC component of the video signal to govern the average illumination of any scene, a unique system of AC brightness stabilization is used. Self-bias is developed across resistors R-66 and R-69. The total picture tube cathode current develops a bias voltage across these resistors which automatically sets the correct picture tube bias for line voltage or high voltage variations. A vernier control of brightness is obtained by varying R-66. Thus the instantaneous average potential developed on the tube varies about the average value of the video signal. The contrast control is set for most pleasing picture.

AUDIO DRIVER LIMITER & RATIO DETECTOR

The second audio IF frequency (4.5 mc) is removed from the video amplifier plate circuit through C-49, C-51 and L-18 acting as a bandpass filter. L-18 peaks the filter to 4.5 mc. V-7 (6AU6) amplifies the audio signal and also limits extreme amplitude peaks.

A ratio detector is used for FM detection. The detector load is represented by R-36 and R-37 (6800) and is bypassed by capacitor C-58 (10 mf). The audio signal is derived from the voltage variations across capacitor C-57 (500 mmf).

AUDIO AMPLIFIER & AUDIO OUTPUT

The audio amplifier and audio output stages are conventional.

CLIPPERS

The composite video signal is taken from the top of the video plate load resistor R-30 (6800) and fed to the grid of the first clipper (V-11, 6SN7GT) through R-46 (10K) and C-63 (.001 mf). As the polarity of the signal is positive at this point, the first sync pulse drives the grid of the first clipper very positive and the grid current charges C-63 negatively. A voltage is developed across R-45 which biases the tube to the point where only the most positive portions of the signal cause tube conduction. Since the sync pulses represent the maximum amplitude of the signal, only they will appear in the plate of the first clipper. The pulses, now of negative polarity, are applied to the grid of the second clipper. The most negative portion of the pulse will contain any irregularities due to noise, hum modulation, etc. This portion drives the tube beyond cut-off and is limited. The output of V-11 is, therefore, a composite sync signal of the proper polarity and amplitude.

VERTICAL SWEEP

The vertical sync pulse is separated from the horizontal by the integrating network composed of R-51 (22K), R-52 (8200), C-66 (.005) & C-67 (.005).

V-12 and V-13 form a multivibrator which generates the deflection voltage for the vertical scanning of the picture tube. The waveform is the same as that in Figure 13 except in frequency. V-12 is cut off from A to C while V-13 conducts. From C to E, V-12 conducts and V-13 is driven to cut-off. Assume V-12 to be initially cut-off. As the voltage across a capacitor cannot change instantly, the moment V-12 cuts off the full B voltage (minus the drop across R-57 and R-58) appears across R-56 (8200). See point A, Figure 13. C-70 (.05 mf) then begins charging toward B+ (B to C). At point C, V-12 conducts. At the first instant the entire drop in plate voltage appears across R-56 (C to D). Then C-70 discharges through the tube (D to E). As V-12 conducts, its grid is driven positive charging C-69 (.005 mf). The grid is then driven to cut off, the condenser charge leaks off through R-54 (680K) and R-55 (Vertical Hold), and the cycle repeats itself.

R-65 (22K) and C-74 (.002 mf), in the plate of V-13, form an integrating circuit which aids the interlace by removing the high frequency components (especially the horizontal pulses) from the pulse being fed back to V-12 during the period C to E. This pulse is positive and aids the tube conduction and the charging of C-69.

R-61, the vertical linearity control, determines the operating point of V-13 and thus controls the amount of distortion in the deflection voltage.

Since the value of resistance in the grid circuit of V-12 will determine the length of time the tube is cut off, making R-55 variable provides a means of controlling the frequency of the multivibrator.

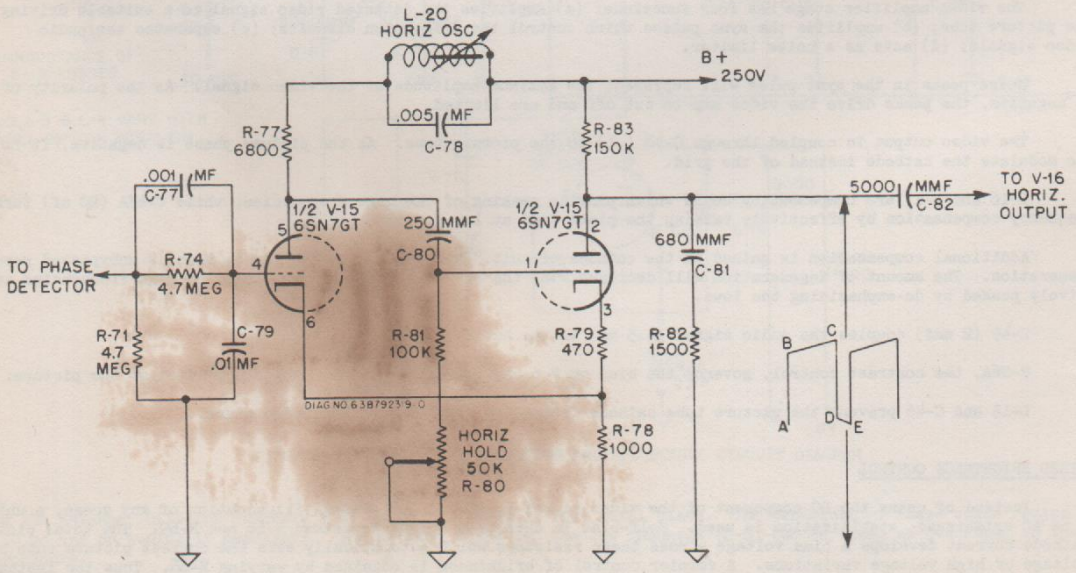

FIGURE 13. SIMPLIFIED HORIZONTAL MULTIVIBRATOR CIRCUIT DIAGRAM

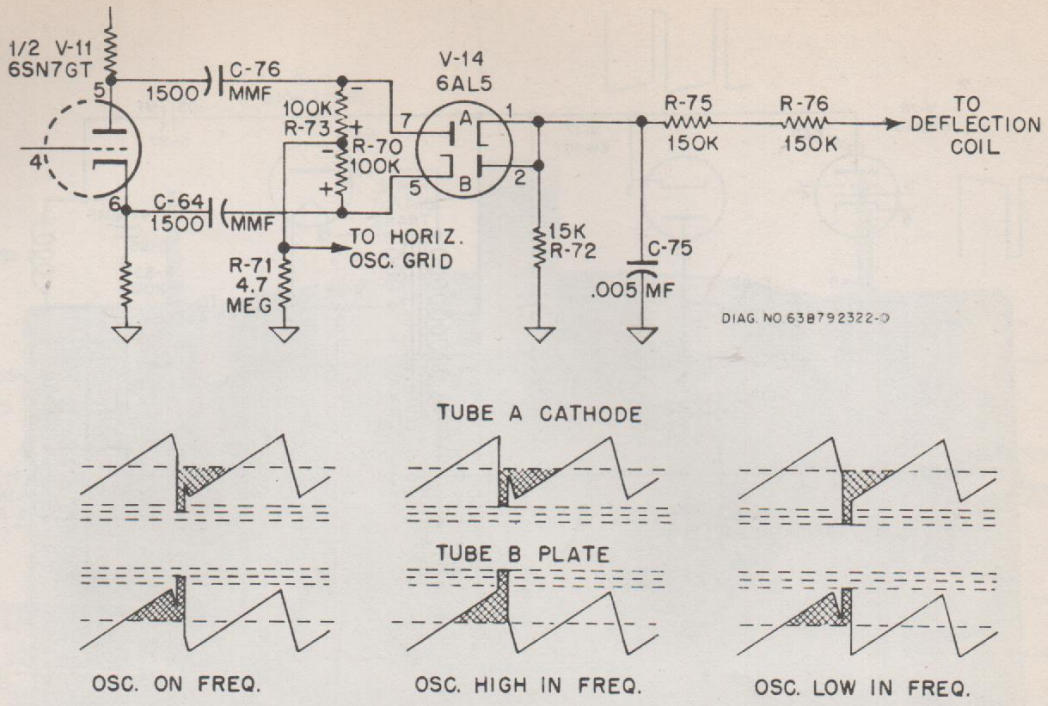

FIGURE 14. SIMPLIFIED PHASE DETECTOR CIRCUIT DIAGRAM

HORIZONTAL SWEEP

A cathode coupled multivibrator (V-15, 6SN7GT) is employed to generate the horizontal deflection voltage (Figure 13). The left section of V-15 conducts from A to C while the right triode conducts from C to E.

When the left triode starts conducting, the grid of the right section is driven negative by the voltage drop across R-77. C-80 (250 mmf) then discharges through R-80 and R-81 holding the right section cut-off. During this period, C-81 charges toward B+ and the portion of the voltage from A to C is developed across it and R-82. As the discharge current grows smaller, the right grid bias reaches cut-off, conduction starts, and C-81 discharges through R-82 and the right triode, developing the retrace portion of the sweep voltage (C to E). The sudden pulse of current which occurs in the cathode resistor R-78 (1000) when C-81 discharges will bias the left triode beyond cut-off. The plate current of the right triode gradually diminishes until the bias developed across R-78 no longer holds the left section at cut-off, conduction begins, and the cycle repeats itself.

The main frequency-controlling element is the tuned circuit L-20 and C-78 which resonates at 15,750 cps. The tank also lends the stability of the sine wave oscillator to the inherently unstable multivibrator. With the tank shorted out, the multivibrator would still operate but would be much less stable due to its sensitivity to bias changes.

PHASE DETECTOR

V-14 (6AL5) acts as a phase sensitive frequency control for the horizontal sweep oscillator. Its action is as follows (See Figure 14):

A negative sync pulse is fed from the cathode of the second clipper, V-11, to the cathode of diode B. A positive sync pulse is coupled to the plate of tube A from the second clipper plate. The pulses are compared, with respect to time, with a wave which represents the horizontal oscillator frequency. The latter is a sharp pulse taken from the deflection coil, integrated into a sawtooth by R-75, R-76 and C-75, and applied to pins 1 and 2 of the phase detector. If the horizontal oscillator is too fast, the current in diode B will increase, while that in tube A will decrease. If it is too slow, there will be an increase in current in tube A and a decrease in tube B.

In either case, a difference voltage is developed at the junction of R-70 and R-73 which varies the bias of the horizontal oscillator and corrects its frequency.

C-79 (.01 mf) is part of a long time constant filter which, by filtering out rapid AC pulses, allows pin 4 to respond to DC changes only.

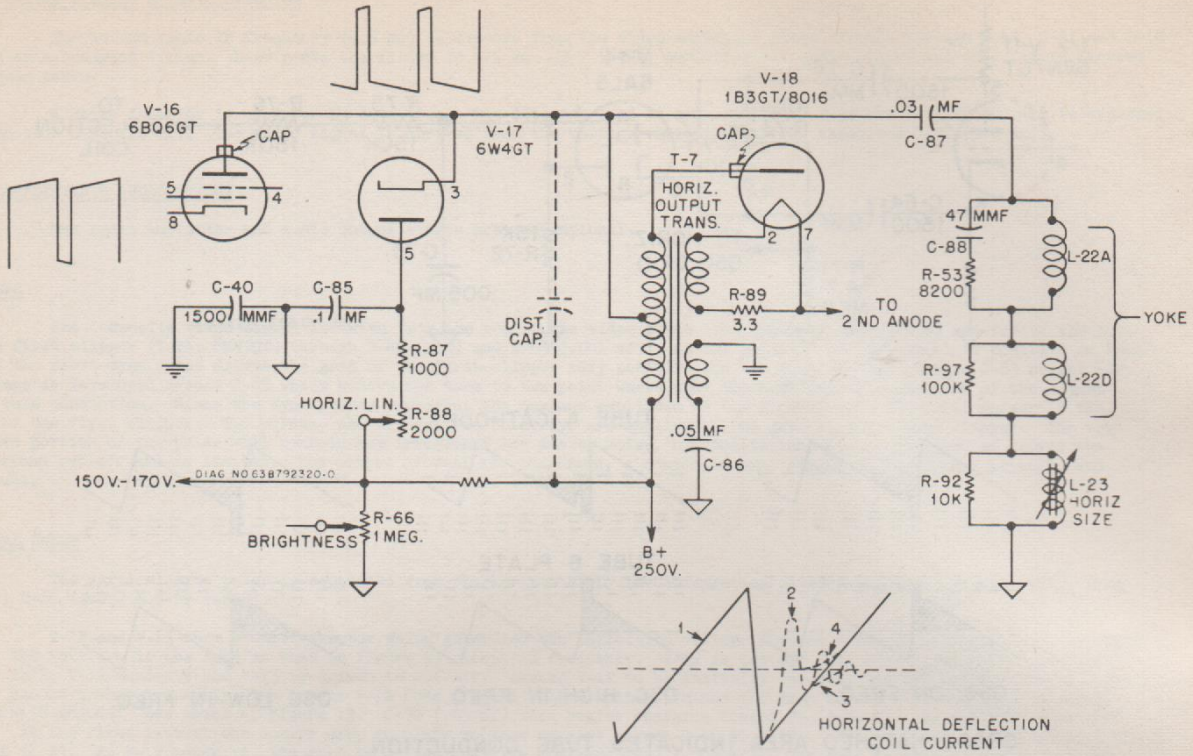

FIGURE 15. SIMPLIFIED HORIZONTAL OUTPUT AND HIGH VOLTAGE CIRCUIT DIAGRAM

HORIZONTAL OUTPUT & HIGH VOLTAGE POWER SUPPLY

V-16 (6BQ6GT) is the driver for the horizontal deflection system. It converts the scanning voltage waveform into a current sawtooth wave by applying it to the deflection coil and the output transformer T-7, Figure 15. The retrace portion (C to E) of the grid voltage causes a sharp pulse in the plate of the 6BQ6. The lower half of T-7 is an inductive load for the 6BQ6 and, due to the auto-transformer action, a potential of about 10 KV is induced in the upper half, applied to the plate of V-18 (1B3GT), and rectified. The capacity between the CRT inner and outer coating is great enough so that no filter condenser is needed.

The sharp pulse shocks the transformer, deflection coil, and their associated capacitances into oscillation. Allowed to go unchecked, the oscillations would appear as in Figure 15, curve 2. After a half cycle, however, the cathode of the damping diode becomes negative and the tube conducts, causing the decay of the oscillations (Figure 15, curve 3). As the decay approaches zero, it becomes non-linear but V-16 starts to conduct (Figure 15, curve 4) and the result of curves 3 and 4 is a straight line (curve 1).

As the decay rate of the oscillation is determined by the resistance in the damping circuit, R-88 offers a means of controlling the linearity of the deflection current.

NOTE: The TS-52 has no horizontal linearity control.

L-23 varies the horizontal size by varying the amount of voltage applied to the deflection coil.

It was found that a voltage was developed between chassis and B- which modulated the video signal and resulted in vertical bars on the screen. This was remedied by placing a one-turn winding on T-7 between chassis and B- which developed a voltage equal to and opposing the interfering voltage.

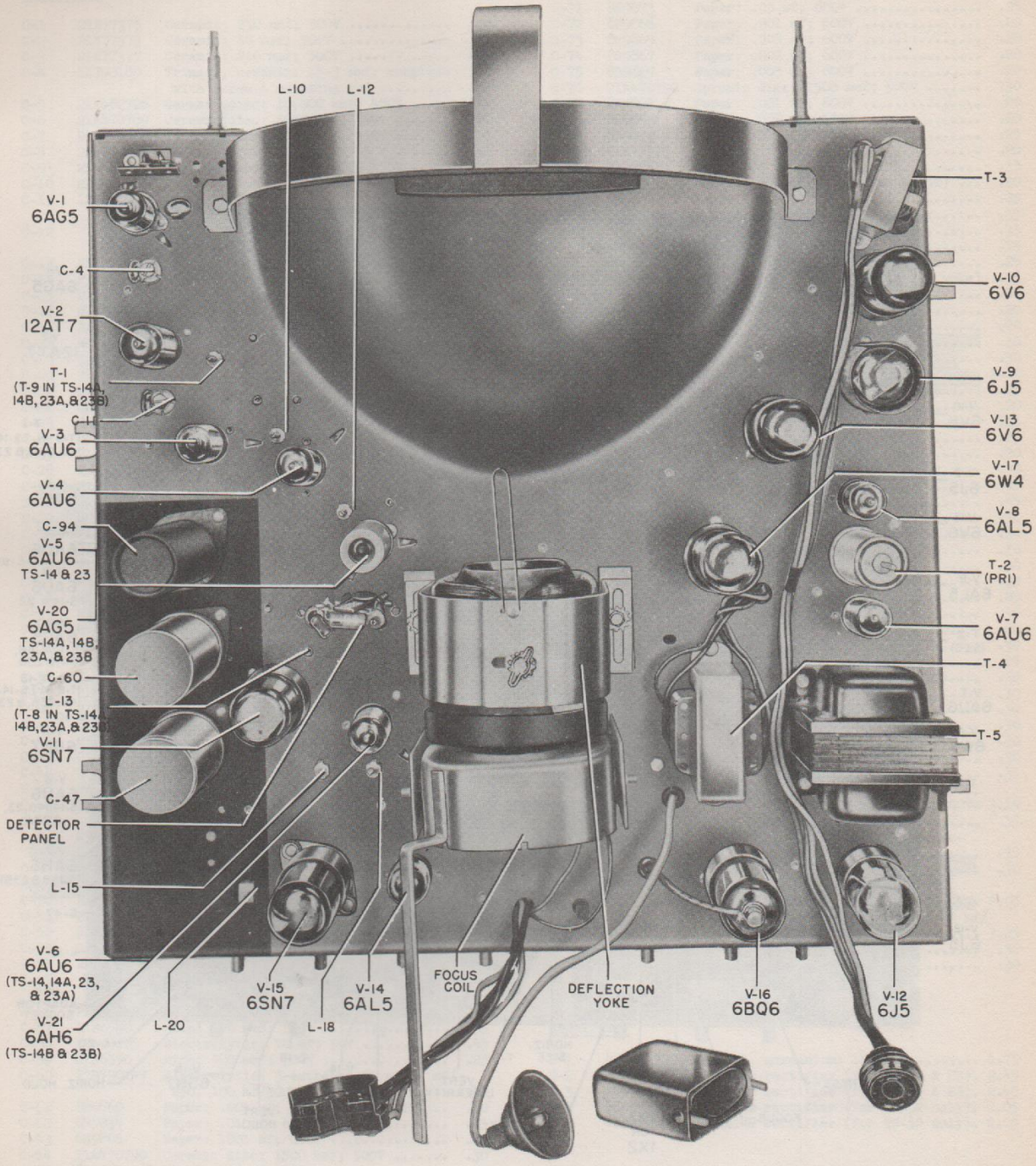

FIGURE 16. TS-14, TS-14A & TS-14B CHASSIS TOP VIEW
MAJOR PARTS LOCATION

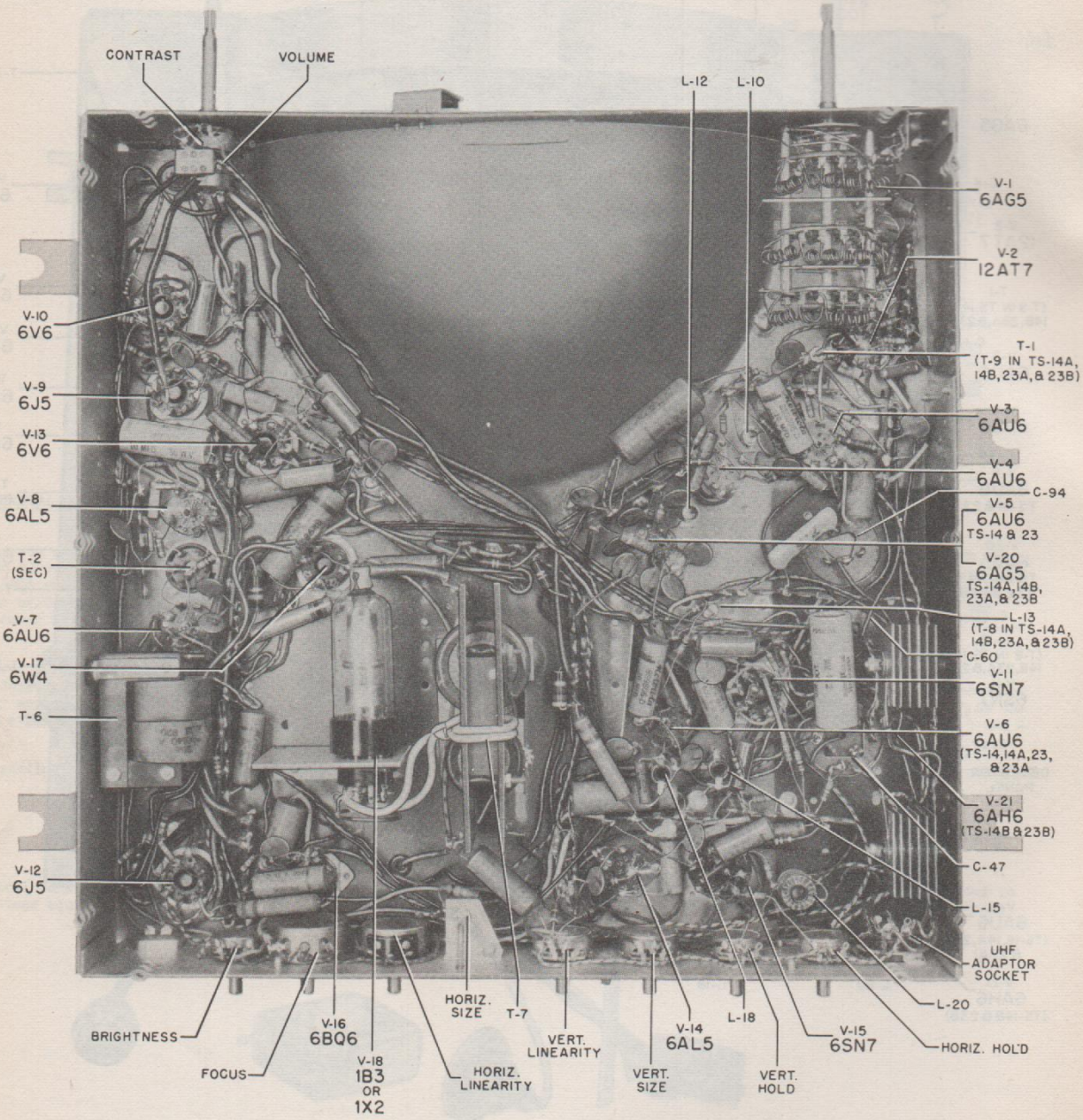

FIGURE 17. TS-14, TS-14A & TS-14B CHASSIS BOTTOM VIEW
MAJOR PARTS LOCATION

REPLACEMENT PARTS LIST

CHASSIS TS-14, TS-23 & TS-52 ELECTRICAL PARTS

Capacitors

Ref. No.	Part Number	Description	List Price
C-1	21K77375	Ceramic: 250 mmf; 500V	.20
C-2	21K77373	Ceramic: 50 mmf; 500V	.20
C-3	21K77375	Ceramic: 250 mmf; 500V	.20
C-4	1X790189	Trimmer, ceramic: .5-3 mmf; complete with screw & mounting nut	.20
C-5	21K482726	Ceramic disc: 10,000 mmf; 450V	.30
C-6	21A470789	Ceramic disc: 5000 mmf; 450V	.30
C-7	21A470789	Ceramic disc: 5000 mmf; 450V	.30
C-8	21A470789	Ceramic disc: 5000 mmf; 450V	.30
C-9	21K482726	Ceramic disc: 10,000 mmf; 450V	.30
C-10	21K482726	Ceramic disc: 10,000 mmf; 450V	.30
C-11	1X790189	Trimmer, ceramic: .5-3 mmf; complete with screw & mounting nut	.20
C-12	-	Fine Tuning Trimmer (part of station selector switch)	-
C-13	21K470324	Molded: 6 mmf; 500V	.25
C-14	21K478280	Molded: 2 mmf; 500V	.25
C-15	21K470322	Ceramic: 20 mmf; 500V	.25
C-16	21A470790	Ceramic disc: 1500 mmf; 500V	.30
C-17	21A470789	Ceramic disc: 5000 mmf; 450V	.30
C-18	21K478280	Molded: 2 mmf; 500V	.25
C-19	21A470789	Ceramic disc: 5000 mmf; 450V	.30
C-20	21A470790	Ceramic disc: 1500 mmf; 500V	.30
C-21	21A470790	Ceramic disc: 1500 mmf; 500V	.30
C-22	8R9810	Paper: .25 mf; 100V	.25
C-23	21A470789	Ceramic disc: 5000 mmf; 450V	.30
C-24	8R9822	Paper: .5 mf; 200V	.45
C-25	21A470789	Ceramic disc: 5000 mmf; 450V	.30
C-26	21A470789	Ceramic disc: 5000 mmf; 450V	.30
C-27	21A470790	Ceramic disc: 1500 mmf; 500V	.30
C-28	21A470790	Ceramic disc: 1500 mmf; 500V	.30
C-29	8R9806	Paper: .1 mf; 200V	.25
C-30	21A470789	Ceramic disc: 5000 mmf; 450V	.30
C-31	21A470789	Ceramic disc: 5000 mmf; 450V	.30
C-32	21A470790	Ceramic disc: 1500 mmf; 500V	.30
C-33	21A470790	Ceramic disc: 1500 mmf; 500V	.30
C-34	21A470789	Ceramic disc: 5000 mmf; 450V	.30
C-35	21A470789	Ceramic disc: 5000 mmf; 450V	.30
C-36	21A470789	Ceramic disc: 5000 mmf; 450V	.30
C-37	21K478234	Molded: 8 mmf; 500V (in detector panel)	.25
C-38	21A470789	Ceramic disc: 5000 mmf; 450V	.30
C-39	21A470789	Ceramic disc: 5000 mmf; 450V	.30
C-40	21A470790	Ceramic disc: 1500 mmf; 500V	.30
C-41	8R9806	Paper: .1 mf; 200V	.25
C-42	21K478410	Ceramic: 1000 mmf; 500V	.25
C-43	21K780598	Ceramic: 750 mmf; 500V	.25
C-44	21K77375	Ceramic: 250 mmf; 500V	.20
C-45	21A470789	Ceramic disc: 5000 mmf; 450V	.30
C-46	21K470328	Molded: 70 mmf; 500V	.25
C-47A, B,C,D	23B790148	Electrolytic: 4-section; 20 mf/250V; 20 mf/25V; 100 mf/30V; 125 mf/300V.	2.95
C-48	8R9874	Paper: .1 mf; 600V	.35
C-49	21K478280	Molded: 2 mmf; 500V	.25
C-50	21A470789	Ceramic disc: 5000 mmf; 450V	.30
C-51	21K790683	Molded: 60 mmf; 500V	.25
C-52	21A470789	Ceramic disc: 5000 mmf; 500V	.30
C-53	21A470789	Ceramic disc: 5000 mmf; 500V	.30
C-54	21A470790	Ceramic disc: 1500 mmf; 500V	.30
C-55	-	Silver mica: 15 mmf (part of T-2 base)	-
C-56	21A790131	Ceramic: 150 mmf (in T-2 shield can)	.35
C-57	21R6590	Mica: 500 mmf; 500V	.25
C-58	23A90205	Electrolytic: 10 mf; 50V	.45
C-59	21R6590	Mica: 500 mmf; 500V	.25
C-60	23B790147	Electrolytic: 3-section; 20 mf-60 mf/ 250, 100 mf/300V	2.35
C-61	8R9869	Paper: .005 mf; 600V (for TS-52)	.20
C-62	8R9834	Paper: .01 mf; 600V	.25
C-63	8R9866	Paper: .001 mf; 600V	.20
C-64	21A470790	Ceramic disc: 1500 mmf; 500V	.30
C-65	8R9873	Paper: .05 mf; 600V	.25
C-66	21A470789	Ceramic disc: 5000 mmf; 450V	.30
C-67	21A470789	Ceramic disc: 5000 mmf; 450V	.30
C-68	8R9867	Paper: .002 mf; 600V	.20
C-69	8R9869	Paper: .005 mf; 600V	.20
C-70	8R9873	Paper: .05 mf; 600V	.25
C-71	8R9873	Paper: .05 mf; 600V	.25
C-72	8R9866	Paper: .001 mf; 600V	.20
C-73	8R9869	Paper: .005 mf; 600V	.20
C-74	8R9867	Paper: .002 mf; 600V	.20
C-75	8R9869	Paper: .005 mf; 600V	.20
C-76	21A470790	Ceramic disc: 1500 mmf; 500V	.30
C-77	8R9866	Paper: .001 mf; 600V	.20
C-78	8R9869	Paper: .005 mf; 600V	.20
C-79	8R9870	Paper: .01 mf; 600V	.25
C-80	21K77375	Ceramic: 250 mmf; 500V	.20
C-81	21R2741	Mica: 680 mmf; 500V	.35
C-82	8R9869	Paper: .005 mf; 600V (for TS-52)	.20
C-83	8R9806	Paper: .1 mf; 200V	.25
C-84	8R9874	Paper: .1 mf; 600V	.35
C-85	8R9874	Paper: .1 mf; 600V	.35
C-86	8R9819	Paper: .05 mf; 600V	.25
C-87	8R9872	Paper: .03 mf; 600V	.25
C-88	21A790181	Ceramic: 47 mmf (in deflection yoke)	.35
C-89	21K77375	Ceramic: 250 mmf; 500V	.20
C-90	21K77375	Ceramic: 250 mmf; 500V	.20
C-91	21K77375	Ceramic: 250 mmf; 500V	.20
C-92	21A470790	Ceramic disc: 1500 mmf; 500V	.30
C-93	21A470790	Ceramic disc: 1500 mmf; 500V	.30
C-94	23B484097	Electrolytic: 140 mf; 150V	1.70
C-95	21K470324	Molded: 6 mmf (in detector panel)	.25
C-96	21R6642	Mica: 68 mmf; 500V	.20
C-97	21K470322	Molded: 20 mmf; 500V	.25
C-98	8R9869	Paper: .005 mf; 600V	.20
C-99	8R9869	Paper: .005 mf; 600V	.20
C-100	21A470790	Ceramic disc: 1500 mmf; 500V	.30
C-101	8R9866	Paper: .001 mf; 600V	.20
C-102	23A90205	Electrolytic: 10 mf; 50V	.45
C-103	21A470790	Ceramic disc: 1500 mmf; 500V	.30
C-104	21A470790	Ceramic disc: 1500 mmf; 500V	.30
C-105	21A470790	Ceramic disc: 1500 mmf; 500V	.30
C-106	21A470790	Ceramic disc: 1500 mmf; 500V	.30
C-107	21A470790	Ceramic disc: 1500 mmf; 500V	.30
C-108	8R9866	Paper: .001; 600V	.20
C-109	21A470790	Ceramic disc: 1500 mmf; 500V	.30
C-110	8R9866	Paper: .001 mf; 600V	.20
C-111	21A791808	Ceramic: 27 mmf; 3000V	.30
C-112	21K780599	Ceramic: 1000 mmf; 500V	.25
C-113	8R9866	Paper: .001 mf; 600V	.20
C-114	21A470789	Ceramic disc: 5000 mmf; 450V	.30
C-115	21A470790	Ceramic disc: 1500 mmf; 500V	.30
C-116	21A470790	Ceramic disc: 1500 mmf; 500V	.30
C-117	21A470790	Ceramic disc: 1500 mmf; 500V	.30
C-118	21A470790	Ceramic disc: 1500 mmf; 500V	.30
C-119	8R9875	Paper: .15 mf; 600V	.35
C-120	23B791741	Electrolytic: 4-section; 25 mf/250V, 20 mf/25V, 100 mf/50V, 200 mf/300V.	3.15
C-121	8R9875	Paper: .15 mf; 600V	.35
C-122	21K790574	Ceramic: 60 mmf; 1500V (in deflection yoke)	.35
C-123	21A470789	Ceramic disc: 5000 mmf; 450V	.30
C-124	23B791692	Electrolytic: 1-section; 300 mf/ 150V	2.05
C-125	23B791721	Electrolytic: 3-section; 20 mf-60 mf/ 250V, 200 mf/300V	3.25
C-126	21A470789	Ceramic disc: 5000 mmf; 450V	.30
C-127	21A470790	Ceramic disc: 1500 mmf; 500V	.30

Rectifiers

E-1	48A90173	Crystal, germanium: 1N34	1.75
E-2	48B780584	Selenium rectifier (for TS-14 & 23).	2.45
E-3	48B780584	Selenium rectifier (for TS-14 & 23).	2.45
E-4	48B791694	Selenium rectifier (for TS-52 only).	2.05
E-5	48B791694	Selenium rectifier (for TS-52 only).	2.05

Coils

L-1	24A790033	Antenna Impedance Matching Coil	.50

Ref. No.	Part Number	Description	List Price
L-2	24C790535	Antenna Coil: includes L-2A through L-2E (L-2F through L-2L are part of switch)	.20
L-3	24K790536	RF Coil: includes L-3A through L-3E (L-3F through L-3L are part of switch)	.20
L-4	24K790537	Oscillator Coil: includes L-4A through L-4E (L-4F through L-4L are part of switch)	.20
L-5	24K791446	RF choke: molded; 10 microhenries	.35
L-6	24K790607	RF coil (channel 13)	.10
L-7	24K790606	Oscillator coil (channel 13)	.05
L-8	24K780128	RF choke: molded; 2 microhenries	.20
L-9	24K790035	RF choke: molded; 5.6 microhenries	.30
L-10	24K791433	1st IF: less core & clip	.35
L-11	24K790035	RF choke: molded; 5.6 microhenries	.30
L-12	24K791433	2nd IF: less core & clip	.35
L-13	24A790175	3rd IF: less core & clip	.35
L-14	24B791476	RF choke (in detector panel)	.30
L-15	24A470159	4.5 mc trap: less core & clip	.35
L-16	24A790579	Compensating coil: green dot (wound on R-29)	.50
L-17	24A790594	Compensating coil: blu-black dot	.50
L-18	24A470159	Sound Take-off: less core & clip	.35
L-19	24K790145	RF choke: molded; .47 microhenries	.20
L-20	24B790055	Horizontal Oscillator: complete with core & clip	1.45
L-21	24B780176	Focus coil (TS-14 & TS-23 only)	9.00
	24B791690	Focus coil (TS-52 only)	9.00
L-22	24C780542	Deflection yoke: complete	9.00
L-23	24B791170	Horizontal Size: complete with core and clip	.95
L-24	24K790145	Choke, RF: molded; 0.47 microhenries	.20
L-25	24K790145	Choke, RF: molded; 0.47 microhenries	.20
L-26	24K790145	Choke, RF: molded; 0.47 microhenries	.20
L-27	24K790145	Choke, RF: molded; 0.47 microhenries	.20
L-28	24K791446	RF choke: molded; 10 microhenries	.35
L-29	24B790129	RF choke (in detector panel)	.30
L-30	24K791181	Deflection yoke: complete (TS-14 & TS-23 only)	10.00
	24C791723	Deflection yoke: complete (TS-52 only)	9.00
L-31	24K791446	RF choke: molded; 10 microhenries	.35

Speakers

LS-1	50C790154	Speaker: 5" electrodynamic; 100 ohm field (hot); 3.2 ohm voice coil (10VT10, 10VT24, 10T2)	4.15
			exch 3.10
	50C791426	Speaker: 5" electrodynamic; 100 ohm field (hot) 3.2 ohm voice coil (12VF4, 12VF26)	4.15
			exch 3.10
	50K791483	Speaker: 6" electrodynamic; 100 ohm field (hot) 3.2 ohm voice coil (10VK22, 12VT13, 12T1)	4.65
			exch 3.50
	50C791118	Speaker: 8" electrodynamic; 100 ohm field (hot) 3.2 ohm voice coil (10VK12, 12VK11, 12K1, 12K2)	5.90
			exch 4.45
	50C791689	Speaker: 8" electrodynamic; 50 ohm field (hot) 3.2 ohm voice coil (16VK1)	5.90
			exch 4.45
	50C791427	Speaker: 10" electrodynamic; 3.2 ohm voice coil (12VF4, 12VF26)	5.95
			exch 4.45

Resistors

Note: All resistors are insulated carbon type unless otherwise specified.

R-1	6R6410	33,000 10% 1/2W	doz 1.00
R-2	6R2035	82 10% 1/2W (Allen-Bradley only)	doz 1.00
R-3	6R6046	1 meg 10% 1/2W (IRC only)	doz 1.00
R-4	6R6229	1000 10% 1/2W	doz 1.00
R-5	6R5659	3900 10% 1/2W (Allen-Bradley only)	doz 1.00
R-6	6R6410	33,000 10% 1/2W	doz 1.00
R-7	6R6393	1200 10% 1/2W	doz 1.00
R-8	6R6320	10,000 10% 1/2W	doz 1.00
R-9	6R6117	5600 10% 1/2W (Allen-Bradley only)	doz 1.00
R-10	6R6229	1000 10% 1/2W	doz 1.00
R-11	6R2035	82 10% 1/2W (Allen-Bradley only)	doz 1.00
R-12	6R6270	220 10% 1/2W	doz 1.00
R-13	6R6446	4.7 meg 10% 1/2W	doz 1.00
R-14	6R6397	22,000 10% 1/2W	doz 1.00
R-15	6R2035	82 10% 1/2W (Allen-Bradley only)	doz 1.00
R-16	6R490110	3.9 meg 10% 1/2W	doz 1.00
R-17	6R6270	220 10% 1/2W	doz 1.00
R-18	6R5659	3900 10% 1/2W (Allen-Bradley only)	doz 1.00
R-19	6R2035	82 10% 1/2W (Allen-Bradley only)	doz 1.00
R-20	6R6270	220 10% 1/2W	doz 1.00
R-21	6R6270	220 10% 1/2W	doz 1.00
R-22	6R6475	680,000 10% 1/2W (IRC only)	doz 1.00
R-23	6R2004	8200 10% 1/2W (in detector panel)	doz 1.00
R-24	6R6031	100,000 10% 1/2W (IRC only)	doz 1.00
R-25	6R6460	1.5 meg 10% 1/2W	doz 1.00
R-26 A,B	18A790166	Contrast & Volume control, dual: 2000 & 1 meg; with power switch	2.25
R-27	6R5660	180 10% 1/2W	doz 1.00
R-28	6R6046	1 meg 10% 1/2W (IRC only)	doz 1.00
R-29		18,000 (not replaceable; part of compensating coil)	
R-30	6R5690	6800 10% 2W (Allen Bradley only)	.20
R-31	6R5671	4700 10% 2W (Allen Bradley only)	.20
R-32	6R6373	150 10% 1/2W	doz 1.00
R-33	6R6229	1000 10% 1/2W	doz 1.00
R-34	6R6410	33,000 10% 1/2W	doz 1.00
R-35	6R6270	220 10% 1/2W	doz 1.00
R-36	6R6428	6800 10% 1/2W	doz 1.00
R-37	6R6428	6800 10% 1/2W	doz 1.00
R-38	6R6229	1000 10% 1/2W	doz 1.00
R-39	6R6328	100,000 10% 1W	each .15 doz 1.45
R-40	6R6377	470,000 10% 1/2W	doz 1.00
R-41	6R6377	470,000 10% 1/2W	doz 1.00
R-42	6R6270	220 10% 1/2W	doz 1.00
R-43	6R6229	1000 10% 1/2W	doz 1.00
R-44	6R6046	1 meg 10% 1/2W (IRC only)	doz 1.00
R-45	6R6046	1 meg 10% 1/2W (IRC only)	doz 1.00
R-46	6R6320	10,000 10% 1/2W	doz 1.00
R-47	6R6229	1000 10% 1/2W	doz 1.00
R-48	6R6069	2200 10% 1/2W	doz 1.00
R-49	6R6397	22,000 10% 1/2W	doz 1.00
R-50	6R6117	5600 10% 1/2W (Allen-Bradley only)	doz 1.00
R-51	6R6397	22,000 10% 1/2W	doz 1.00
R-52	6R2004	8200 10% 1/2W	doz 1.00
R-53	6R2004	8200 10% 1/2W (in deflection yoke)	doz 1.00
R-54	6R6475	680,000 10% 1/2W	doz 1.00
R-55	18A90147	Vertical Hold control: 1 meg	.80
R-56	6R2004	8200 10% 1/2W	doz 1.00
R-57	18A90145	Vertical Size control: 5 meg	.80
R-58	6R6377	470,000 10% 1/2W	doz 1.00
R-59	6R6433	2.2 meg 10% 1/2W	doz 1.00
R-60	6R6398	150,000 10% 1/2W	doz 1.00
R-61	18A791132	Vertical Linearity Control: 5000	.80
R-62	6R6090	470 10% 1/2W	doz 1.00
R-63	6R6031	100,000 10% 1/2W (IRC only)	doz 1.00
R-64	6R6031	100,000 10% 1/2W (IRC only)	doz 1.00
R-65	6R6397	22,000 10% 1/2W	doz 1.00
R-66	18A90147	Brightness Control: 1 meg	.80
R-67	18A790162	Focus control: 2000	1.75
R-68	6R6299	10,000 10% 2W	.20
R-69	6R6048	47,000 10% 1/2W	doz 1.00
R-70	6R6031	100,000 10% 1/2W (IRC only)	doz 1.00
R-71	6R6446	4.7 meg 10% 1/2W	doz 1.00
R-72	6R6477	15,000 10% 1/2W	doz 1.00

Ref. No.	Part Number	Description	List Price
R-73	6R6031	100,000 10% 1/2W (IRC only) ...doz	1.00
R-74	6R6446	4.7 meg 10% 1/2W .....doz	1.00
R-75	6R5721	150,000 10% 1W .....each	.15
		doz	1.45
R-76	6R5721	150,000 10% 1W .....each	.15
		doz	1.45
R-77	6R6428	6800 10% 1/2W .....doz	1.00
R-78	6R6229	1000 10% 1/2W .....doz	1.00
R-79	6R6090	470 10% 1/2W .....doz	1.00
R-80	18A790167	Horizontal Hold Control: 50,000	.80
R-81	6R6031	100,000 10% 1/2W (IRC only)....doz	1.00
R-82	6R6038	1500 10% 1/2W .....doz	1.00
R-83	6R6398	150,000 10% 1/2W .....doz	1.00
R-84	6R6377	470,000 10% 1/2W.....doz	1.00
R-85	6R5550	47 10% 1/2W (Allen-Bradley only)doz	1.00
R-86	6R5690	6800 10% 2W (Allen-Bradley only)..	.20
R-87	6R3922	1000 10% 2W	.20
R-88	18A790146	Horizontal Linearity Control: 2000..	1.50
R-89	17K485412	Wire Wound: 3.3 10% 1/2W	.10
R-90	6R6291	560 10% 1/2W (In deflection yoke) .....doz	1.00
R-91	6R6291	560 10% 1/2W (In deflection yoke) .....doz	1.00
R-92	6R6320	10,000 10% 1/2W .....doz	1.00
R-93	6R6377	470,000 10% 1/2W .....doz	1.00
R-94	6R6229	1000 10% 1/2W .....doz	1.00
R-95	17A791166	Wire Wound: 7.5 10% 2-1/2W	.35
R-96	6R3922	1000 10% 2W	.20
R-97	6R6031	100,000 10% 1/2W (in deflection yoke) (TS-14 & 23) .....doz	1.00
	6R6328	100,000 10% 1W (in deflection yoke) (TS-52) .....each	.15
		doz	1.45
R-98	6R2109	10 meg 20% 1/2W .....doz	1.00
R-99	6R2004	8200 10% 1/2W .....doz	1.00
R-100	6R6022	330 10% 1/2W .....doz	1.00
R-101	6R6428	6800 10% 1/2W .....doz	1.00
R-102	6R6477	15,000 10% 1/2W .....doz	1.00
R-103	6R6031	100,000 10% 1/2W (IRC only) ...doz	1.00
R-104	6R5631	120,000 10% 1/2W .....doz	1.00
R-105	18A791574	Horizontal Hold Control: 100,000....	.80
R-106	6R6117	5600 10% 1/2W .....doz	1.00
R-107	6R5577	2700 10% 1/2W .....doz	1.00
R-108	6R2013	27,000 10% 2W (Allen-Bradley or Stackpole only)	.20
R-109	6R2013	27,000 10% 2W (Allen-Bradley or Stackpole only)	.20
R-110	6R6414	270,000 10% 1/2W .....doz	1.00
R-111	6R6428	6800 10% 1/2W .....doz	1.00
R-112	6R6400	33,000 10% 1W .....each	.15
		doz	1.45
R-113	6R6373	150 10% 1/2W .....doz	1.00
R-114	6R6326	100 10% 1/2W .....doz	1.00
R-115	6R6038	1500 10% 1/2W .....doz	1.00
R-116	6R6048	47,000 10% 1/2W .....doz	1.00
R-117	6R5550	47 10% 1/2W (Allen-Bradley only) .....doz	1.00
R-118	6R5660	180 10% 1/2W .....doz	1.00
R-119	6R6497	3.3 meg 10% 1/2W .....doz	1.00
R-120	6R6048	47,000 10% 1/2W .....doz	1.00
R-121	6R5631	120,000 10% 1/2W .(IRC only)...doz	1.00
R-122	6R5659	3900 10% 1/2W (Allen-Bradley only) .....doz	1.00
R-123	6R6406	22 10% 1/2W (Allen-Bradley only) .....doz	1.00
R-124	6R6090	470 10% 1/2W .....doz	1.00
R-125	17A791717	Wire Wound: 3300 10% 7W	.50
R-126	6R2108	47 20% 1/2W .....doz	1.00
R-127	6R2108	47 20% 1/2W .....doz	1.00
R-128	6R5577	2700 10% 1/2W (in deflection yoke) .....doz	1.00
R-129	17A791696	Wirewound: 5 10% 2.5W.....	.40
R-130	6R490751	750 10% 3W	.35
R-131	6R490753	9100 10% 3W	.35
R-132	6R6444	180,000 10% 1/2W .....doz	1.00
R-133	6R6487	39,000 10% 1/2W .....doz	1.00

Switches

S-1	1X780177	Station Selector Switch, Fine Tuning Trimmer & Coils Assembly	10.00
S-2	-	Power Switch: part of Contrast & Volume Control	-

Transformers

T-1	24K791134	Mixer IF: less tuning cores	.35
T-2	24B790125	Ratio Detector: with cores & clips; less shield can	2.00
T-3	25B790686	Audio Output	1.40
T-4	25C790151	Vertical Output Transformer (for TS-14 & TS-23 only)	2.45
	25K791804	Vertical Output Transformer (for TS-52 only)	2.10
T-5	25B790141	Filament Transformer (for TS-14 & TS-23 only)	4.95
	25B791793	Filament Transformer (for TS-52 only)	5.10
T-6	25B790140	Filament Transformer (for V-17).....	3.05
T-7	24A790184	High Voltage Transformer: complete (TS-14 only)	7.85
	24K791974	High Voltage Transformer: complete (TS-23 only)	7.85
	24C791823	High Voltage Transformer: complete (TS-52 only)	7.85
T-8	24A791937	3rd IF Transformer: less core & clip	1.10
T-9	24K792006	Mixer IF Transformer: less cores & clips	.35

Tubes

V-1	6AG5	RF Amp	-
V-2	12AT7	Mixer-Osc	-
V-3	6AU6	1st IF Amp	-
V-4	6AU6	2nd IF Amp	-
V-5	6AU6	3rd IF Amp	-
V-6	6AU6	Video Amp	-
V-7	6AU6	Audio Driver-Limiter	-
V-8	6AL5	Ratio Detector	-
V-9	6J5GT	Audio Amp	-
V-10	6V6GT	Audio Output	-
V-11	6SN7GT	1st & 2nd Clipper	-
V-12	6J5GT	Vertical Sweep Generator	-
V-13	6V6GT	Vertical Sweep Output	-
V-14	6AL5	Phase Detector	-
V-15	6SN7GT	Horizontal Oscillator	-
V-16	6BQ6GT	Horizontal Output & High Voltage Generator	-
V-17	6W4GT	Damping Diode	-
V-18	1B3GT or 1X2	High Voltage Rectifier	
V-19	10BP4	10 inch Picture Tube	-
	12LP4	12 inch Picture Tube	-
	16AP4	16 inch Picture Tube	-
V-20	6AG5	3rd IF Amplifier	-
V-21	6AH6	Video Amplifier	-
V-22	25L6GT	Vertical Sweep Output (TS-52)	-
V-23	6BQ6GT	Horizontal Output & HV Generator ...	-

Part Number	Description	List Price
CHASSIS TS-14 & 23 MECHANICAL PARTS		
7A791168	Bracket, coil mtg (horiz. size coil).....	.05
1X790185	Bracket, deflection coil mtg: with grounding clip & yoke bumper mtg	.50
7B790142	Bracket, focus coil mtg	.35
7A791965	Bracket, interlock safety	.05
7K791676	Bracket, yoke bumper mtg: left-hand	.10
7B791675	Bracket, yoke bumper mtg: right-hand	.10
35A791679	Bumper, yoke mtg: rubber	.15
42B70721	Clip, coil mounting (T-2 secondary) ...doz	.25
42K470074	Clip, coil retainer (L-20) .....doz	.30
42K471342	Clip, grid (HV rect. cap)	.05

Part Number	Description	List Price
42A5480	Clip, grid (V-16 cap) .....doz	.15
41A790182	Clip, grounding spring (on deflection yoke bracket)	.05
42A72609	Clip, grounding (grounds V-9 shield).....	.05
42A780193	Connector, 2nd anode (picture tube HV)....	1.00
39K17396	Contact, pin terminal (in spkr receptacle) .....per/c	.50
46K480256	Core, iron, & screw (T-1 & T-9 secondary).	.15
46A70023	Core, iron, & screw (T-2 primary).....	.15
46A470302	Core, iron, & screw (T-2 secondary).....	.20
46A470310	Core, iron, & screw (L-18, T-1 & T-9 primary)	.15
46K471143	Core, iron, & screw (L-20)	.15
46A791119	Core, iron: with slide adjustment (horiz. size)	.45
46A478242	Core, tuning: brass (L-10, L-12, L-13 & T-8)	.15
5A790684	Grommet, rubber (for V-15 socket).....doz	.35
14A780184	Insulator, antenna lead: fish paper....doz	.15
14K87179	Insulator, coil (T-2) .....doz	.25
9A484098	Insulator, electrolytic mtg: 3-lug; impregnated .....doz	.50
9K471267	Insulator, electrolytic mtg: 4-lug; impregnated .....doz	.35
14A482132	Insulator, shield (detector panel shield).	.05
4S7655	Lockwasher, internal: 3/8"; cad pl...per/c	.50
4S7650	Lockwasher, internal: #6; cad pl.....per/c	.50
4S9751	Lockwasher, internal-external; #8 cad pl (deflection yoke mtg).....per/c	.50
3S7247	Lockscrew: 6-32 x 3/16 slotted hex head; cad pl (detector panel mtg) .....doz	.15
2A780608	Nut, coil tuning (soldered on horiz osc tuning core) .....per/c	.50
2S7004	Nut, hex: 3/8-32 x 9/16; cad pl (station selector shaft) .....doz	.20
2S7005	Nut, hex: 6-32 x 1/4 (selenium rect. mtg) .....per/c	.50
2S7003	Nut, hex: 8-32 x 5/16; cad pl (focus coil mtg brkt) .....per/c	.50
2S7051	Nut, hex: palnut; 3/8-32 x 9/16; cad pl (rear chassis controls) .....doz	.15
2S7050	Nut, hex: palnut; 6-32 x 5/16; cad pl (detector shield mtg) .....per/c	.50
2A470049	Nut, mounting (coil & core mtg) (L-10, L-12, L-13 & T-8) .....doz	.50
2K791404	Nut, mounting (coil & core mtg) (L-23).doz	.50
2B70703	Nut: special palnut (T-2 pri coil mtg).doz	.30
35A790110	Pad, cushion (for picture tube - on chassis).	.10
35A780085	Pad, felt (focus coil)	.10
35K790169	Pad, felt:2" x 1" x 1/8 thick (picture tube retainer strap) .....doz	.15
35A790168	Pad, felt: 10" long (on picture tube retainer strap)	.10
64A790177	Plate, chassis cover (chassis side plate-remove to expose RF tuner).....	.25
64K791818	Plate, chassis cover (10VT24 series only).	.30
28K471323	Plug, line cord (interlock on chassis)....	.20
9A22367	Receptacle, 5-prong (on speaker cable)....	.15
5S7770	Rivet: .088 x 5/32 steel; nickel pl (antenna lead insulator).....per/c	.50
5S7771	Rivet: .088 x 3/16 steel; nickel pl (for V-1, V-2 & V-5 socket mtg).....per/c	.50
5S7774	Rivet: .088 x 1/4 stl; nkl pl (for miniature 7-prong socket mtg).....per/c	.50
5S7701	Rivet: .122 x 3/16 steel; nkl pl (interlock) .....per/c	.50
5S7707	Rivet: .122 x 5/32 stl; nkl pl (for terminal strips & all octal socket mtgs except V-15 & V-18).....per/c	.50
5S7703	Rivet: .122 x 7/32 steel; nkl pl (electrolytic mtg).....per/c	.50
5S490370	Rivet: .140 x 5/32 steel; nkl pl (audio output transformer mtg).....per/c	.50
5K11072	Rivet, shoulder (for V-15 socket).....doz	.15
3S490368	Screw, machine: 6-32 x 1-1/8 slotted binderhead; brass (on horiz output transformer).....doz	.15
3S490365	Screw, machine: 6-32 x 1-1/2 plain hex head; cad pl (selenium rect mtg).....doz	.15
3S7163	Screw, machine: 8-32 x 1/4 plain hex head; cad pl (HV tube mtg brkt).....per/c	.50
3S490374	Screw, machine: 8-32 x 1/4 slotted fillister head; brass (horizontal output transformer mtg).....per/c	.50
3S2957	Screw, machine: 8-32 x 1/2 plain hex head; cad pl (focus coil mtg brkt).....per/c	.50
3S7454	Screw, sheet metal: #8 x 1/4 PKZ plain hex head; cad pl (horizontal size coil mtg brkt).....per/c	.50
3S7467	Screw, sheet metal: #8 x 3/8 PKZ plain hex head; cad pl (fil trans mtg).....doz	.15
3S7512	Screw, sheet metal: #8 x 1/2 PKZ plain hex head; cad pl (picture tube retaining strap) .....doz	.15
3S7453	Screw, sheet metal: #8 x 1 PKZ plain hex head; cad pl (picture tube retaining strap) .....doz	.15
3K790107	Screw, thumb: 8-32; cad pl (deflection yoke mtg).....doz	.50
1X791875	Shield & Bolts Assembly (detector panel shield)	.25
26K485936	Shield, coil (T-2)	.20
26A790150	Shield, corona (on V-18 socket)	.05
26A90301	Shield, tube (miniature).....	.15
9B790153	Socket, picture tube: 5-pin type; with leads	.70
9B790161	Socket, picture tube: 12-pin type; with leads	.80
9K780442	Socket, tube: miniature 7-prong (V-3, V-4)	.20
9A471343	Socket, tube: miniature 7-prong (with shield base) (for V-1 & V-5)	.35
9K484816	Socket, tube: noval; 9-prong (for V-2)....	.40
9K471270	Socket, tube: octal (for all octal tubes except V-15 & high voltage rectifier)....	.20
9A790685	Socket, tube: octal (for V-15).....	.20
41A70705	Spring, coil (T-2 primary) .....doz	.15
41K791809	Spring, tension (10" picture tube support)	.15
1X790190	Strap, Picture tube retainer: with felt pads	.90
31A471254	Strip, terminal (in detector panel).....	.25
31A21990	Strip, terminal: 2-screw (antenna input)..	.10
31A791889	Strip, terminal: 1 ins, #2 gnd; 1/2" spacing	.05
31K71393	Strip, terminal: 2 ins, #3 gnd; 3/8" spacing	.05
31K471565	Strip, terminal: 3 ins #4 gnd; 3/8"spacing	.05
31K37494	Strip, terminal: 4 ins #3 gnd; 3/8"spacing	.10
31A790122	Strip, terminal: 4 ins #3 gnd; 1/2"spacing	.10
31K22174	Strip, terminal: 4 ins #4 mtg; 3/8"spacing	.10
31K26658	Strip, terminal: 5 ins #3 gnd; 3/8"spacing	.10
31K90046	Strip, terminal: 5 ins #4 gnd; 3/8"spacing	.10
31A791402	Strip, terminal: 6 ins #4 gnd; 3/8"spacing	.10
24A790646	Trap, ion: permanent magnet type	1.15
1X780165	Tube Mtg Plate Assembly: complete with socket & bracket (for HV rectifier).....	.65
4K470939	Washer, insulated: 3/8 x .136 x .062 (electrolytic mtg) .....per/c	.50
4A790132	Washer, spring (focus coil mtg).....doz	.35
4S490367	Washer, flat: 7/32 x .136 x .030; cad pl (Picture tube grounding clip mtg)...per/c	.50
4S7569	Washer, flat: 5/16 x .145 x .027; cad pl (for V-15 socket mtg) .....per/c	.50
4S490366	Washer, flat: 3/8 x .156 x .125; stl; cad pl .....per/c	.50
4A7562	Washer, flat: 7/16 x .187 x .033; cad pl (focus coil mtg brkt) .....per/c	.50

CHASSIS TS-23 MECHANICAL PARTS - Same as TS-14 except:

1X790629	Bracket, deflection coil mtg: with grounding clip	.65
7K790558	Bracket, focus coil mtg	.40
35K790637	Pad, felt: 12" long (on picture tube retainer strap)	.10
41A471379	Spring, tension (12" picture tube support)	.25
1X790634	Strap, picture tube retainer: with felt pads	1.20

CHASSIS TS-52 MECHANICAL PARTS -Same as TS-14 & 23 except:

37K790951	Band, rubber (stretched around picture tube gasket)	.05

Part Number	Description	List Price
7K485464	Bracket, chassis mtg	.10
7A791971	Bracket, deflection coil mtg (lower "L" bracket)	.15
1X791834	Bracket, deflection coil mtg: with focus mtg brkt, yoke bumper mtg brkts & reinforcing brkt	1.25
7A791956	Bracket, tube mtg	.15
35A791679	Bumper, yoke mtg: rubber	.15
39A790979	Contact, high voltage lead (16" picture tube)	.10
15B791111	Cover, test socket	.10
32D790946	Gasket, tube mtg (16" picture tube)	4.60
5K470916	Grommet, insulating: 3/16" hole (lead from 6BQ6 plate caps) ....doz	.20
14K791892	Insulator, shield (detector panel shield) ....doz	.35
4S8406	Lockwasher, internal: #2; cad pl ....per/c	.50
4S7657	Lockwasher, external: #8; cad pl (selenium rect mtg) ....per/c	.50
13D790936	Mask, picture tube (16" tube)	3.10
64D791722	Plate, front tube support: pressed wood	.70
5S7728	Rivet: .122 x 5/16 stl; nkl pl (V-18 socket mtg) ....per/c	.50
5S6846	Rivet: .140 x 5/32 stl; nkl pl (vertical output transformer mtg) ....doz	.15
3S7257	Screw, machine: 8-32 x 5/8 plain hex head; cad pl (focus coil brkt mtg)....doz	.15
3S490718	Screw, machine: 10-32 x 1-3/4 plain hex head; cad pl ....doz	.15
3S490490	Screw, sheet metal: #8 x 3/8 PKA plain hex head (deflection coil mtg brkt).per/c	.50
1X791875	Shield & Bolts Assembly (detector panel shield)	.25
26A790150	Shield, corona (on V-18 socket)	.05
26C790937	Shield, picture tube (16" tube)	3.75
26A790508	Shield, video: cad pl (shields video amp from HV transformer) ....doz	.35
9K791691	Socket, picture tube: 5 pin; with leads (16" tube)	.80
9K484167	Socket, tube: miniature 7-prong (V-7, V-8, V-14 & V-21)	.20
9A480274	Socket, tube: octal (for V-18)	.20
41A791727	Spring, grounding	.05
41K791811	Spring, tension (picture tube)	.20
42A791958	Strap, tube retainer (16" tube)	.40
31K71393	Strip, terminal: 2 ins, #3 mtg; 3/8"spacing	.05
31A791402	Strip, terminal: 6 ins, #4 gnd; 3/8"spacing	.10
24K791477	Trap, ion	.95
1X791832	Tube mtg plate: complete with socket, corona shield & bracket (for HV rectifier)	.65
4S1722	Washer, flat: 7/16 x .187 x .048 stl; cad pl ....doz	.15
4A791447	Washer, insulating (on filament trans).doz	.15
4A77577	Washer, insulating (on horizontal size coil) ....doz	.15
61C790865	Window, picture tube (16")	8.20

MODEL 10VT10 CABINET PARTS

1X790593	Back Cover Assembly: complete with centering adjustment cover, picture tube rear cover, and line cord	3.60
37K471416	Band, rubber (on window mtg brkts)...per/c	.50
13D790409	Bezel, picture tube (window frame)	6.15
3S488134	Bolt, chassis mtg: 1/4-20 x 1-1/2; cad pl ....doz	.50
7K485464	Bracket, chassis mtg	.10
7A790538	Bracket, picture tube window mtg; cad pl ....doz	.25
1X790002	Bracket, tube positioning: with felt pad (on front of chassis)	.15
16F790486	Cabinet, table model: brown mahogany; complete less window, gasket, picture tube bezel & control knob escutcheon	-
11M490361	Cloth, grille: negre	3.00
30B470756	Cord, line: with plug & receptacle	1.50
15B791076	Cover, centering adjustment: rubber	.40
26D780589	Cover, chassis bottom	1.85
15A790586	Cover, picture tube rear: statuary bronze.	.30

Part Number	Description	List Price
35K790169	Cushion, felt (on tube positioning bracket) ....doz	.15
13D790410	Escutcheon: control knob	4.00
5S3139	Eyelet, .202 x .475; brass; antique copper finish (on back cover) ....doz	.15
32C790532	Gasket, picture tube: rubber	3.50
14A791829	Insulator, threaded (bezel mtg)	.10
14A791827	Insulator, tube base: round (in picture tube rear cover)	.05
14K791828	Insulator, tube base: rectangular (in picture tube rear cover)	.05
36B790506	Knob, control (channel selector)	.80
36B790505	Knob, control (contrast)	.65
36A485457	Knob, control: black (hold controls on chassis rear)	.15
36K780522	Knob, control: ivory (hold controls on chassis rear)	.15
36C790507	Knob, control: wal-mahog (fine tuning & Off-Volume)	.45
4S9751	Lockwasher: #8 internal-external; cad pl ....per/c	.50
2S7003	Nut, hex: 8-32 x 5/16 stl; cad pl (spkr mtg) ....per/c	.50
5S7751	Rivet: .122 x 1/4 stl; antique copper (pic tube rear cover mtg) ....per/c	.50
5S7700	Rivet: .122 x 1/4 stl; nkl pl (chassis mtg brkt) ....per/c	.50
5K790482	Rivet, shoulder: annealed; (line cord mtg)	.05
3S490483	Screw, machine: 6-32 x 1/2 plain hex head cone point; cad pl (window mtg)..doz	.15
3S8153	Screw, sheet metal: #8 x 3/4 PKA plain hex head; cad pl (bottom cover mtg)...doz	.15
3S7454	Screw, sheet metal: #8 x 1/4 PKZ plain hex head; cad pl (mounts tube positioning brackets) ....per/c	.50
3S490332	Screw, sheet metal: #6 x 7/8 PKA plain hex head; statuary bronze (cabinet back) ....per/c	.50
3S7536	Screw, sheet metal: #6 x 3/8 PKA slotted acorn head; antique copper finish (cabinet back) ....per/c	.50
3K27913	Screw, spkr mtg ....doz	.20
3S8302	Screw, wood: #6 x 5/8 slotted acorn head; antique copper (cabinet back) ....doz	.15
3S488319	Screw, wood: #4 x 1/2 Phillips oval head; statuary bronze (knob escutcheon mtg).doz	.15
2S490359	Speednut (on spkr mtg screw) ....doz	.15
35A791581	Strip, antenna lead (dresses loop ant lead from RF) ....doz	.20
2S490424	Teenut (holds window mtg brkts)	.05
4A484894	Washer, cut: cad pl (chassis mtg)....doz	.25
61C790408	Window, picture tube: safety glass	3.60

MODEL 10VT10B CABINET PARTS -Same as 10VT10 except:

16K790488	Cabinet, table model: limed oak: complete less window gasket, picture tube bezel & control knob escutcheon	-
36K791484	Knob, control: tan (fine tuning & Off-Volume)	.45

MODEL 10VT10R CABINET PARTS - Same as 10VT10 except:

16K790487	Cabinet, table model: red mahogany; complete less window, gasket, picture tube bezel & control knob escutcheon	-
4S7651	Lockwasher: #8 int; cad pl ....per/c	.50

MODEL 10VK12 CABINET PARTS

1X790598	Back Cover Assembly: complete with centering adjustment cover, picture tube rear cover and line cord	4.50
37K471416	Band, rubber (on window mtg brkts)...per/c	.50
13K790597	Bezel, picture tube (window frame)	6.15
7A790538	Bracket, picture tube window mtg: cad pl ....doz	.25

Part Number	Description	List Price
1X791934	Bracket, tube positioning: with cushion (on chassis front)	.15
16F790601	Cabinet, consolette: brown mahogany; complete less window, gasket & picture tube bezel	-
13K791112	Cloth, grille: brown mahogany; 14-1/8 x 19-7/8	3.75
30B470756	Cord, line: with plug & receptacle	1.50
15B791076	Cover, centering adjustment: rubber	.40
26D780589	Cover, chassis bottom	1.85
15A790586	Cover, tube rear: statuary bronze	.30
35K790169	Cushion, felt (on tube positioning bracket) ....doz	.15
5S3139	Eyelet: .202 x .475; brass; ant. copper finish (on back cover) ....doz	.15
32C790532	Gasket, picture tube: rubber	3.50
55K791114	Glide, 3-prong: stainless steel (cabinet feet)	.05
13K791113	Grille, metal: brushed brass	3.80
14A791829	Insulator, threaded (bezel mtg)	.10
14A791827	Insulator, tube base: round (in picture tube rear cover)	.05
14K791828	Insulator, tube base: rectangular (in picture tube rear cover)	.05
36A485457	Knob, control: black (hold controls on chassis rear)	.15
36K780522	Knob, control: ivory (hold controls on chassis rear)	.15
36C790507	Knob, control: wal-mahog (fine tuning & Off-Volume)	.45
36B790506	Knob, control (channel selector)	.80
36B790505	Knob, control (contrast)	.65
4S7657	Lockwasher: #8 ext: cad pl....per/c	.50
4S7651	Lockwasher: #8 int; cad pl ....per/c	.50
4S9751	Lockwasher: #8 int-ext: cad pl....per/c	.50
2S7003	Nut, hex: 8-32 x 5/16; cad pl (spkr mtg) ....per/c	.50
2S7007	Nut, hex: 8-32 x 1/4; cad pl (spkr mtg) ....per/c	.50
62K70581	Overlay, logotype: brushed brass (Motorola name-plate)	.40
56B791612	Pad, antenna support strap (lower loop antenna support)	.15
5S7751	Rivet: .122 x 1/4 stl; antique copper (picture tube rear cover mtg)....per/c	.50
5K790482	Rivet, shoulder: annealed (line cord mtg)	.05
3S2991	Screw, machine: 6-32 x 1/2" plain hex head; cad pl (window mtg)....doz	.15
3S8104	Screw, sheet metal: #8 x 1-1/2 PKA plain hex head; cad pl (chassis bottom cover) ....doz	.15
3S8153	Screw, sheet metal: #8 x 3/4 PKA plain hex head; cad pl (chassis bottom cover) ....doz	.15
3S7454	Screw, sheet metal: #8 x 1/4 PKZ plain hex head; cad pl (mounts tube positioning bracket) ....per/c	.50
3S490332	Screw, sheet metal: #6 x 7/8 PKA plain hex head; statuary bronze (cabinet back) ....per/c	.50
3S7536	Screw, sheet metal: #6 x 3/8 PKA slotted acorn head; antique copper (cabinet back) ....per/c	.50
3K653	Screw, speaker mtg ....doz	.20
3S8302	Screw, wood: #6 x 5/8 slotted acorn head; antique copper (cabinet back) ....doz	.15
35A791581	Strip, antenna lead (dresses loop ant lead from RF) ....doz	.20
2S490424	Teenut: cad pl (holds window mtg brkts)	.05
4S7614	Washer, flat: 11/16 x 11/64 x .036 stl; cad pl (bottom cover mtg) ....doz	.15
61C790408	Window, picture tube: safety glass	3.60

MODEL 10VK12R CABINET PARTS - Same as 10VK12 except:

16K790602	Cabinet, consolette: red mahogany; complete less window, gasket & picture tube bezel	-
13K791116	Cloth, grille: red mahogany; 14-1/8 x 19-7/8	3.75
36A790507	Knob, control (fine tuning & off-volume)	.45

MODEL 10VT24R CABINET PARTS

1X791543	Back Cover Assembly: complete with line cord, rear tube cover, and centering adj cover	3.25
1X790002	Bracket, tube positioning: with felt cushion (on front of chassis)	.15
37A12748	Bumper, recess: rubber (cabinet feet)	.05
16K791486	Cabinet, table model: red mahogany; complete, less window & gasket assembly	-
13K791505	Cloth, grille	2.50
30B470756	Cord, line (with plug & receptacle)	1.50
15B791076	Cover, centering adjustment: rubber (on cabinet back cover)	.40
15C791821	Cover, chassis bottom	1.40
15A790586	Cover, picture tube rear: statuary bronze (on cabinet back cover)	.30
35K790169	Cushion, felt (on tube positioning brkt) ....doz	.15
5S3139	Eyelet: .202 x .475 brass; ant cop pl (cabinet back cover) ....doz	.15
32C791526	Gasket, picture tube: rubber (around picture tube face)	1.70
14K791828	Insulator, tube base: rectangular (in picture tube rear cover)	.05
14A791827	Insulator, tube base: round (inside picture tube rear cover)	.05
36B790505	Knob, control (contrast)	.65
36B790506	Knob, control (station selector)	.80
36A790507	Knob, control: wal-mahog (off and volume)	.45
36A485457	Knob, control: black (hold controls on chassis rear)	.15
36K780522	Knob, control: ivory (hold controls on chassis rear)	.15
4S9751	Lockwasher: #8 int-ext; cad pl (spkr mounting) ....per/c	.50
62K480492	Logotype: "Motorola"	.20
2S7003	Nut: 8-32 x 5/16 stl; cad pl (spkr mounting) ....per/c	.50
2S490359	Nut, speednut (spkr mtg) ....doz	.15
64K791818	Plate, chassis cover: cop pl (side of chassis at tuner)	.30
5S7751	Rivet: .122 x 1/4 stl; ant cop (picture tube rear cover mtg) ....per/c	.50
5K790482	Rivet, shoulder (line cord mtg)	.05
3A791824	Screw, insulated head; statuary bronze (spkr mtg) ....doz	.15
3S7536	Screw, sheet metal: #6 x 3/8 PKA slotted acorn head; ant copper (antenna lead strip mtg) ....per/c	.50
3S490454	Screw, sheet metal: #6 x 5/8 PKA plain acorn head; ant cop (cabinet back cover) ....doz	.15
3S490508	Screw, sheet metal: #6 x 3/4 PKA plain acorn head; cad pl (window mtg)....doz	.15
3S490332	Screw, sheet metal: #6 x 7/8 PKA plain hex head; statuary bronze (cabinet back cover) ....per/c	.50
3S7454	Screw, sheet metal: #8 x 1/4 PKZ plain hex head; cad pl (chassis cover plate mounting) ....per/c	.50
3S3396	Screw, sheet metal: #8 x 1-1/4 PKA plain hex head; cad pl (chassis bottom cover mtg) ....per/c	.50
35A791581	Strip, antenna lead (dresses lead from RF) ....doz	.20
16K791509	Strip, glass mtg: wood strip on window sides)	.20
16B791508	Strip, glass mtg: wood strip at window top)	.20
35K791534	Strip, rubber (on cabinet at bottom of window)	.05
35K791535	Strip, rubber (sides of picture window)	.05
35K790462	Strip, rubber (top of picture window)	.10
1X791539	Window & Gasket Assembly: complete with rubber strips 12.15	

Part Number	Description	List Price
	MODEL 10VK22R CABINET PARTS	
1X791525	Back Cover Assembly: complete with line cord, picture tube rear cover & centering adj cover	3.50
1X790648	Bracket, tube positioning: with felt cushion (on chassis front)	.20
16K791488	Cabinet, consolette: red mahogany; complete, less window & gasket assembly	
3K791517	Cloth, grille: mahogany-gold	3.75
30B470756	Cord, line: with plug & receptacle	1.50
15B791076	Cover, centering adjustment: rubber (on cabinet back)	.40
26D780589	Cover, chassis bottom cover: aluminum	1.85
15A790586	Cover, picture tube rear: statuary bronze (on cabinet back)	.30
35K790169	Cushion, felt (on tube positioning bracket) ....doz	.15
5S3139	Eyelet: .202 x .475; ant cop pl (back cover mtg) ....doz	.15
32C791526	Gasket, picture tube: rubber (around picture tube face)	1.70
14K791828	Insulator, tube base: rectangular (inside picture tube rear cover)	.05
14A791827	Insulator,tube base: round (inside picture tube rear cover)	.05
36B790505	Knob, control (contrast)	.65
36B790506	Knob, control (station selector)	.80
36C790507	Knob, control: wal-mahog (off and volume)	.45
36A485457	Knob, control: black (hold controls on chassis rear)	.15
36K780522	Knob, control: ivory (hold controls on chassis rear)	.15
4S9751	Lockwasher: #8 int-ext; cad pl (speaker mounting) ....per/c	.50
13A790824	Medallion: brass ("M" on grille cloth)	.50
2S7003	Nut: 8-32 x 5/16 stl; cad pl (spkr mounting) ....per/c	.50
2S7988	Nut, speednut (medallion mtg) ....per/c	.50
5S7751	Rivet: .122 x 1/4 stl; ant cop pl (picture tube rear cover mtg) ....per/c	.50
5K791856	Rivet, shoulder (line cord mtg) ....doz	.30
56B791612	Pad, antenna support strap (bottom loop support)	.15
64A790177	Plate, chassis cover: cop pl (side of chassis at tuner)	.25
3S490453	Screw, sheet metal: #6 x 3/8 PKA plain acorn head; ant cop (back cover mtg) ..doz	.15
3S7536	Screw, sheet metal: #6 x 3/8 PKA slotted acorn head; ant cop pl (antenna lead strip mounting) ....per/c	.50
3S490454	Screw, sheet metal: #6 x 5/8 PKA plain acorn head; ant cop (back cover mtg) ..doz	.15
3S490332	Screw, sheet metal: #6 x 7/8 PKA plain hex head; statuary bronze (back cover mtg) ....per/c	.50
3S490507	Screw, sheet metal: #6 x 1 PKA plain acorn head; cad pl (window mounting strips) ....doz	.15
3S8153	Screw, sheet metal: #8 x 3/4 PKA plain hex head; cad pl (chassis bottom cover mtg) ....doz	.15
3S7454	Screw, sheet metal: #8 x 1-1/4 PKZ plain hex head; cad pl (chassis side plate mtg) ....per/c	.50
3S8104	Screw, sheet metal: #8 x 1-1/2 PKA plain hex head; cad pl (chassis bottom cover mtg) ....doz	.15
3K27913	Screw, speaker mtg: 1" ....doz	.20
35A791581	Strip, antenna lead (dresses lead from RF) ....doz	.20
35K791929	Strip, chipboard: 15" (picture window mtg-bottom)	.05
16K791519	Strip, glass mtg: wood; (on sides of window)	.20
16B791518	Strip, glass mtg: wood (on top of window)	.25
35A790461	Strip, rubber (picture window mtg-sides)	.05
35K790462	Strip, rubber: 15" (picture window mtg-top)	.10
4K780040	Washer, felt: 13/16 x 11/16 x 1/16 (under control knobs) ....doz	.25
4S1719	Washer, flat: 3/8 x .140 x .030; cad pl (line cord mtg) ....per/c	.50
4S7629	Washer, flat: 1/2 x 3/16 x .048; cad pl (chassis bottom mtg) ....per/c	.50
4S7646	Washer, flat: 11/16 x 3/16 x .067; cad pl (chassis bottom mtg) ....per/c	.50
1X791524	Window, picture tube: with gasket & rubber strip 14.25	
	MODEL 10T2 CABINET PARTS	
1X791543	Back Cover: complete with centering adjustment cover, picture tube rear cover, and line cord	3.25
13K790597	Bezel, picture tube(window frame)	6.15
1X792767	Bracket, picture tube positioning: with cushion (on front of chassis)	.20
7A790538	Bracket, picture tube window mtg: cad pl ....doz	.25
37A12748	Bumper, recess: rubber (cabinet feet)	.05
16F792039	Cabinet, table model: red-brown mahogany; less bezel, window & gasket	-
13K792046	Cloth, grille: gold (cabinet front)	2.95
13K792045	Cloth, grille: red mahogany (on spkr baffle)	.55
30B470756	Cord, line: with plug & receptacle	1.50
15B791076	Cover, centering adjustment: rubber (on back cover)	.40
15A790586	Cover, picture tube rear (on back cover)	.30
15C791821	Cover, chassis bottom	1.40
5S3139	Eyelet: .202 x .495 brass; ant cop (on back cover) ....doz	.15
32C790532	Gasket, picture tube: rubber	3.50
14A791829	Insulator, threaded (bezel mtg)	.10
14A791827	Insulator, tube base: round (in picture tube rear cover)	.05
14K791828	Insulator, tube base: rectangular (in picture tube rear cover)	.05
36A485457	Knob, control: black (hold controls on chassis rear)	.15
36B790505	Knob, control: contrast	.65
36K780522	Knob, control: ivory (hold controls on chassis rear)	.15
36B790506	Knob, control: station selector switch	.80
36C790507	Knob, control: wal-mahog (volume & fine tuning)	.45
62K70581	Logotype: "Motorola"	.40
4S7650	Lockwasher: #6 int; cad pl (line cord mtg) ....per/c	.50
4S9751	Lockwasher: #8 int-ext; cad pl (spkr mtg) ....per/c	.50
2S7003	Nut: 8-32 x 5/16 stl; cad pl ....per/c	.50
35K792740	Pad, cushion (on picture tube positioning brkt)	.05
35A792459	Pad, cushion (on window mtg brkts) ....doz	.20
64K791818	Plate, chassis cover: cop pl (on side of chassis-to expose tuner)	.30
5K791856	Rivet, shoulder: annealed (line cord mtg) ....doz	.30
5S7751	Rivet: .122 x 1/4 stl; ant cop (picture tube rear cover mtg) ....per/c	.50
3S490483	Screw, machine: 6-32 x 1/2" plain hex head; cone point; cad pl (window mtg brkts) .doz	.15
3S7509	Screw, sheet metal: #6 x 5/8 PKA slotted acorn head; ant cop ....doz	.15
3S490819	Screw, sheet metal: #6 x 7/8 PKA slotted acorn head; statuary bronze (back cover mtg) ....doz	.15
3S8126	Screw, sheet metal: #8 x 1-1/4 PKA plain hex head; cad pl (bottom cover mtg) ...doz	.20
3S7454	Screw, sheet metal: #8 x 1/4 PKZ plain hex head; cad pl (chassis cover plate mtg) ....per/c	.50
3K791825	Screw, speaker mtg: 8-32 x 1 ....doz	.15
3S7536	Screw, wood: #6 x 3/8 PKA slotted acorn head; ant cop (back cover mtg) ....per/c	.50
2S490359	Speednut (spkr mtg) ....doz	.15
35A791581	Strip, antenna lead (dresses loop antenna lead from RF) ....doz	.20

Part Number	Description	List Price
2S490424	Teenut (bezel mtg)	.05
4S7614	Washer, flat: 11/16 x 11/64 x .036 stl; cad pl (bottom cover mtg) .....doz	.15
4K470786	Washer, fibre (bezel mtg) .....doz	.35
61C790408	Window, picture tube: 10"	3.60

MODEL 12VK11 CABINET PARTS

1X791075	Back Cover Assembly: complete with centering adjustment cover, picture tube rear cover and line cord	3.75
37K471416	Band, rubber (on window mtg brkts)...per/c	.50
13D790489	Bezel, picture tube (window frame).....	7.65
3K780454	Bolt, speaker mtg: 8-32 x 1-1/2 .....doz	.15
7A790538	Bracket, picture tube window mtg: cad pl ..... doz	.25
1X790657	Bracket, tube positioning: with felt pad (on front of chassis)	.40
16F790664	Cabinet, consolette: brown mahogany; complete, less window, gasket & picture tube bezel	-
13K791083	Cloth, grille: brown	3.75
30B470756	Cord, line: with plug & receptacle	1.50
15B791076	Cover, centering adjustment: rubber	.40
26D780589	Cover, chassis bottom	1.85
15A790586	Cover, picture tube rear: statuary bronze.	.30
35K790169	Cushion, felt (on tube positioning bracket) .....doz	.15
5S3139	Eyelet: .202 x .475 brass; ant copper finish (on back cover) .....doz	.15
32D790654	Gasket, picture tube: rubber	4.25
14A791829	Insulator, threaded (bezel mtg)	.10
14A791827	Insulator, tube base: round (inside picture tube rear cover)	.05
14K791828	Insulator, tube base: rectangular (inside picture tube rear cover)	.05
36A485457	Knob, control: black (hold controls on chassis rear)	.15
36B790506	Knob, control (channel selector)	.80
36B790505	Knob, control (contrast)	.65
36K780522	Knob, control: ivory (hold controls on chassis rear)	.15
36C790507	Knob, control: wal-mahog (fine tuning & off-volume)	.45
4S7657	Lockwasher, #8 ext; cad pl .....per/c	.50
4S9751	Lockwasher: #8 int-ext; cad pl .....per/c	.50
13A790824	Medallion: brass pl	.50
2S7003	Nut, hex: 8-32 x 5/16; cad pl (speaker mounting) .....per/c	.50
2S7007	Nut, hex: 8-32 x 1/4; cad pl .....per/c	.50
56B791612	Pad, antenna support strap (lower loop antenna support)	.15
5S7751	Rivet: .122 x 1/4 steel; antique copper finish (picture tube rear cover mtg)per/c	.50
5K790482	Rivet, shoulder: annealed (line cord plug)	.05
3S2991	Screw, machine: 6-32 x 1/2 plain hex head; cad pl (window mtg brackets) .....doz	.15
3S8104	Screw, sheet metal: #8 x 1-1/2 PKA plain hex head; cad pl (bottom cover mtg)...doz	.15
3S8153	Screw, sheet metal: #8 x 3/4 PKA plain hex head (bottom cover mtg).....doz	.15
3S7454	Screw, sheet metal: #8 x 1/4 PKZ plain hex head; cad pl (mounts tube positioning bracket .....per/c	.50
3S490332	Screw, sheet metal: #6 x 7/8 PKA plain hex head; statuary bronze (cabinet back) .....per/c	.50
3S490454	Screw, sheet metal: #6 x 5/8 PKA plain acorn head; antique copper finish (cabinet back) .....doz	.15
3S490453	Screw, sheet metal: #6 x 3/8 plain acorn head; ant copper finish (cabinet back)doz	.15
2S490424	Teenut: cad pl (holds window mtg brkts)...	.05
4K780040	Washer, felt (under control knobs).....doz	.25
4S7614	Washer, flat: 11/16 x 11/64 x .036 stl; cad pl (bottom cover mtg).....doz	.15
61K790653	Window, picture tube: safety glass.....	4.50

Part Number	Description	List Price
	MODEL 12VK11R CABINET PARTS - Same as 12VK11 except:	
16K790665	Cabinet, consolette: red mahogany; complete less window, gasket & picture tube bezel	-
3S7536	Screw, sheet metal: #6 x 3/8 PKA slotted acorn head; ant copper (cabinet back) .....per/c	.50
3S8302	Screw, wood: #6 x 5/8 slotted acorn head; ant copper (cabinet back).....doz	.15

MODEL 12VK11B CABINET PARTS - Same as 12VK11 except:

16K790666	Cabinet, consolette: limed oak; complete less window, gasket & picture tube bezel.	-
13K791084	Cloth, grille: blonde	3.75
36K791431	Knob, control (fine tuning & off-volume)..	.45

MODEL 12VT13 CABINET PARTS

1X791078	Back Cover Assembly: complete with centering adjustment cover, picture tube rear cover, and line cord	4.75
37K471416	Band, rubber (on window mtg brkts)...per/c	.50
13K791059	Bezel, picture tube (window frame)	7.65
3S488134	Bolt, chassis mtg: 1/4-20 x 1-1/2; hex head; cad pl .....doz	.50
7K485464	Bracket, chassis mtg	.10
7A790538	Bracket, picture tube window mtg: cad pl .....doz	.25
1X790002	Bracket, tube positioning: with felt pad (on front of chassis)	.15
37A12748	Bumper, recess: rubber (cabinet feet).....	.05
16E791045	Cabinet, table model: brown mahogany; complete less window, gasket, picture tube bezel, and control knob escutcheon..	-
13K791038	Cloth, grille: mahogany	.65
30B470756	Cord, line: with plug & receptacle	1.50
15B791076	Cover, centering adjustment: rubber	.40
26D780589	Cover, chassis bottom	1.85
15K791052	Cover, picture tube rear: statuary bronze.	.30
35K790169	Cushion, felt (on tube positioning bracket) .....doz	.15
13K790718	Escutcheon, control knob	4.00
5S3139	Eyelet: .202 x .475 brass; antique copper finish (on back cover).....doz	.15
32D790654	Gasket, picture tube: rubber	4.25
14A791829	Insulator, threaded (bezel mtg)	.10
14A791827	Insulator, tube base: round (in picture tube rear cover).....	.05
14K791828	Insulator, tube base: rectangular (in picture tube rear cover).....	.05
36A485457	Knob, control: black (hold controls on chassis rear)	.15
36K780522	Knob, control: ivory (hold controls on chassis rear)	.15
36C790507	Knob, control: wal-mahog (fine tuning & off-volume)	.45
36B790506	Knob, control (channel selector).....	.85
36B790505	Knob, control (contrast)	.65
4S7657	Lockwasher: #8 ext; cad pl.....per/c	.50
4S9751	Lockwasher: #8 int-ext: cad pl .....per/c	.50
2A484897	Nut, chassis mtg: 1/4-20 special 5/8 x 1/2 x 3/16	.05
2S7003	Nut, hex: 8-32 x 5/16; cad pl (spkr mounting) .....per/c	.50
2S7007	Nut, hex: 8-32 x 1/4; cad pl .....per/c	.50
5S7751	Rivet: .122 x 1/4 stl; ant copper (picture tube rear cover mtg).....per/c	.50
5S7700	Rivet: .122 x 1/4 steel; nkl pl (chassis mtg bracket) .....per/c	.50
5K790482	Rivet, shoulder: annealed (line cord plug)	.05
3K791035	Screw, decorative head: 8-32 x 1; statuary bronze .....doz	.35
3S2991	Screw, machine: 6-32 x 1/2 plain hex head; cad pl (window mtg brkts).....doz	.15
3S8153	Screw, sheet metal: #8 x 3/4 PKA plain hex head (bottom cover mtg).....doz	.15

Part Number	Description	List Price
3S7454	Screw, sheet metal: #8 x 1/4 PKZ plain hex head; cad pl (mounts tube positioning brkt) .....per/c	.50
3S490332	Screw, sheet metal: #6 x 7/8 PKA plain hex head; statuary bronze (cabinet back) .....per/c	.50
3S490454	Screw, sheet metal: #6 x 5/8 PKA plain acorn head; antique copper (cabinet back) .....doz	.15
3S490453	Screw, sheet metal: #6 x 3/8 PKA plain acorn head; antique copper (cabinet back) .....doz	.15
3S488319	Screw, wood: #4 x 1/2 Phillips oval head; statuary bronze (knob escutcheon mtg).doz	.15
35A791581	Strip, antenna lead (dresses loop ant lead from RF) .....doz	.20
2S490424	Teenut: cad pl (holds window mtg brkts)...	.05
4A484894	Washer, cut: cad pl (chassis mounting bolts) .....doz	.25
61K790653	Window, picture tube: safety glass.....	4.50

MODEL 12VT13R CABINET PARTS - Same as 12VT13 except:

16K791046	Cabinet, table model: red mahogany; complete less window, gasket, picture tube bezel & control knob escutcheon.....	-

MODEL 12VT13B CABINET PARTS - Same as 12VT13 except:

16K791047	Cabinet, table model: limed oak; complete less window, gasket, picture tube bezel, & control knob escutcheon	-
13K791037	Cloth, grille: blonde; 7 x 8	.65
36K791484	Knob, control (fine tuning & off-volume)..	.45
3K791033	Screw, decorative head: 8-32 x 1; brass .....doz	.35

MODEL 12T1 CABINET PARTS

1X791078	Back Cover: with centering adjustment cover, picture tube rear cover and line cord	4.75
13D790489	Bezel, picture tube (window frame).....	7.65
3S488134	Bolt, chassis mtg: 1/4-20 x 1-1/2 hex head cad pl .....doz	.50
7K485464	Bracket, chassis mtg	.10
7A790538	Bracket, picture window mtg; cad pl ...doz	.25
1X792767	Bracket, tube positioning: with pad (on chassis front)	.20
37A12748	Bumper, recess: rubber (cabinet feet).....	.05
16E792106	Cabinet, table model: red-brown mahogany; less window, bezel & gasket	-
13K791038	Cloth, grille: 7 x 8; mahogany (spkr grille)	.65
13K792108	Cloth, grille: 13-1/2 x 18-1/2; negre (cabinet front)	2.95
30B470756	Cord, line: with plug & receptacle.....	1.50
15B791076	Cover, centering adjustment lever: rubber (on back cover)	.40
1X792755	Cover, chassis bottom: with high voltage insulator	1.85
15K791052	Cover, picture tube rear (on back cover)..	.30
5S3139	Eyelet: .202 x .475 brass; ant cop (on back cover) .....doz	.15
32D790654	Gasket, picture tube: rubber	4.25
14B792069	Insulator, high voltage (on bottom cover).	.20
14A791827	Insulator, picture tube base: round (in picture tube rear cover).....	.05
14A791858	Insulator, picture tube base (in picture tube rear cover).....	.10
14A791829	Insulator, threaded (bezel mtg).....	.10
36A485457	Knob, control: black (hold controls on chassis rear)	.15
36B790505	Knob, control (contrast).....	.65
36K780522	Knob, control: ivory (hold controls on chassis rear)	.15
36B790506	Knob, control (station selector).....	.80
36B790507	Knob, control: wal-mahog (volume & fine tuning)	.45
62K70581	Logotype: "Motorola"	.40
4S7650	Lockwasher: #6 int; cad pl (high volt insulator mtg) .....per/c	.50
4S9751	Lockwasher: #8 int-ext; cad pl (spkr mounting) .....per/c	.50
2A484897	Nut, chassis mtg: 5/8 x 1/2 x 3/16; cop pl	.05
2S7007	Nut, hex: 8-32 x 1/4; cad pl (spkr mounting) .....per/c	.50
2S7003	Nut, hex:8-32 x 5/16 stl; cad pl.....per/c	.50
35K792740	Pad, cushion (on tube positioning brkt)...	.05
35K792459	Pad, cushion (on window mtg brkts).....doz	.20
5S6846	Rivet: .145 x 5/32 stl; cad pl (high-volt insulator mtg) .....doz	.15
5S7751	Rivet: .122 x 1/4 stl; cad pl (picture tube rear cover mtg) .....per/c	.50
5K791856	Rivet, shoulder (line cord mtg).....doz	.30
3S2991	Screw, machine: 6-32 x 1/2 plain hex head; cad pl (window mtg brkts).....doz	.15
3S7536	Screw, sheet metal: #6 x 3/8 PKA slotted acorn head; ant cop (antenna strip & back cover mtg) .....per/c	.50
3S476115	Screw, sheet metal: #6 x 1/4 PKZ plain hex head;cad pl .....doz	.15
3S7509	Screw, sheet metal: #6 x 5/8 PKA slotted acorn head; ant cop (back cover mtg)..doz	.15
3S490819	Screw, sheet metal: #6 x 7/8 PKA slotted acorn head; statuary bronze (back cover mtg) .....doz	.15
3S7454	Screw, sheet metal: #8 x 1/4 PKZ plain hex head; cad pl (tube positioning brkt mounting) .....per/c	.50
3S3397	Screw, sheet metal: #8 x 5/16 PKZ plain hex head; cad pl (chassis mtg brkt).per/c	.50
3S8153	Screw, sheet metal: #8 x 3/4 PKA plain hex head; cad pl (bottom cover mtg)...doz	.15
3K791825	Screw, spkr mtg: 8-32 x 1; statuary bronze .....doz	.15
35A791581	Strip, antenna lead (dresses loop antenna lead from RF) .....doz	.20
2S490424	Teenut: cad pl (bezel mtg)	.05
4A484894	Washer, cut: cad pl (bottom cover mtg).doz	.25
4K470786	Washer, fibre: 1/2 x 3/16 x 1/16 (bezel mtg) .....doz	.35
4S7629	Washer, flat: 1/2 x 3/16 x .048; stl; cad pl (bottom cover mtg).....per/c	.50
61K790653	Window, picture tube: 12"; safety glass...	4.50

MODEL 12T1B CABINET PARTS - Same as 12T1 except:

16K792107	Cabinet, table model: limed oak; less window, bezel, and gasket	-
13K791037	Cloth, grille: 7 x 8; blonde (spkr grille)	.65
36K791484	Knob, control: tan (volume & fine tuning).	.45
3A791824	Screw, spkr mtg: 8-32 x 1; brass pl ...doz	.15

MODEL 12K1 CABINET PARTS

1X792153	Back Cover: complete with centering adjustment cover, picture tube rear cover & line cord	3.75
13D790489	Bezel, picture tube (window frame).....	7.65
1X792768	Bracket, picture tube positioning: with cushion	.20
7A790538	Bracket, picture tube window mtg: cad pl .....doz	.25
16F792064	Cabinet, console: red-brown mahogany; less bezel, window and gasket	-
13K792066	Cloth, grille (cabinet front).....	3.75
30B470756	Cord, line: with plug & receptacle.....	1.50
15B791076	Cover, centering adjustment: rubber	.40
26D780589	Cover, chassis bottom	1.85
15A790586	Cover, picture tube rear (on back cover)..	.30
32D790654	Gasket, picture tube window: rubber	4.25
14A791829	Insulator, threaded (bezel mtg).....	.10
14A791827	Insulator, tube base: round (in picture tube rear cover).....	.05
14K791828	Insulator, tube base: rectangular (in picture tube rear cover).....	.05

Part Number	Description	List Price
36A485457	Knob, control (hold controls on chassis rear)	.15
36B790505	Knob, control: contrast	.65
36K780522	Knob, control: ivory (hold controls on chassis rear)	.15
36B790506	Knob, control: station selector	.80
36C790507	Knob, control: wal-mahogany (volume & fine tuning)	.45
4S7650	Lockwasher: #6 int; cad pl.....per/c	.50
4S9751	Lockwasher: #8 int-ext; cad pl (speaker mounting).....per/c	.50
4S7657	Lockwasher: #8 ext; cad pl (spkr mtg)per/c	.50
62K70581	Logotype: "Motorola"	.40
13A790824	Medallion ("M" on grille cloth).....	.50
2S7007	Nut, hex: 8-32 x 1/4; cad pl (speaker mounting).....per/c	.50
2S7003	Nut, hex: 8-32 x 5/16 stl; cad pl (spkr mounting).....per/c	.50
56B791612	Pad, antenna support strap	.15
35K792459	Pad, cushion (window mtg brkts).....doz	.20
35K792740	Pad, cushion (on tube positioning brkt)...	.05
64A790177	Plate, chassis cover: cop pl (on side of chassis-to expose tuner)	.25
5K791856	Rivet, shoulder: annealed (line cord mounting).....doz	.30
5S7751	Rivet: .122 x 1/4 stl; ant cop pl (picture tube rear cover mtg).....per/c	.50
3S2991	Screw, machine: 6-32 x 1/2 plain hex head; cad pl (window mtg brkts).....doz	.15
3S476115	Screw, sheet metal: #6 x 1/4 PKZ plain hex head; cad pl .....doz	.15
3S7536	Screw, sheet metal: #6 x 3/8 PKA slotted acorn head; ant cop pl (back cover mounting).....per/c	.50
3S7509	Screw, sheet metal: #6 x 5/8 PKA slotted acorn head; ant cop pl (back cover mounting).....doz	.15
3S490819	Screw, sheet metal: #6 x 7/8 slotted acorn head; statuary bronze pl (back cover mounting).....doz	.15
3S8153	Screw, sheet metal: #8 x 3/4 PKA plain hex head; cad pl (bottom cover mtg).....doz	.15
3S8104	Screw, sheet metal: #8 x 1-1/2 PKA plain hex head; cad pl .....doz	.15
3K653	Screw, spkr mtg: 8-32 x 1-1/4 .....doz	.20
2S490424	Teenut: cad pl (bezel mtg).....	.05
4K780040	Washer, felt (under control knobs).....doz	.25
4K470786	Washer, fibre: 1/2 x 3/16 x 1/16 (bezel mounting).....doz	.35
4S7646	Washer, flat: 11/16 x 3/16 x .067; wrought iron; cop pl (bottom cover mtg).....per/c	.50
4S7629	Washer, flat: 1/2 x 3/16 x .048 stl; (bottom cover mtg) .....per/c	.50
61K790653	Window, picture tube: 12"; safety glass...	4.50

MODEL 12K1B CABINET PARTS - Same as 12K1 except:

16K792065	Cabinet, console: limed oak; less bezel, window, and gasket	-
13K792067	Cloth, grille: egg-shell (cabinet front)..	3.75
36K791484	Knob, control: tan (volume & fine tuning).	.45

MODEL 12K2 CABINET PARTS

1X792485	Back Cover: complete with centering adjustment cover, picture tube rear cover, and line cord	3.75
13D790489	Bezel, picture tube (picture window frame)	7.65
1X792484	Bracket, picture tube window mtg: with pad	.10
1X792769	Bracket, picture tube positioning: with cushion	.20
16F792455	Cabinet, console: red-mahogany: less window, bezel & gasket	-
55K791116	Cloth, grille: red mahogany; 13-5/16 x 19-7/8	3.75
30B470756	Cord, line: with plug & receptacle	1.50
15B791076	Cover, centering adjustment: rubber (on back cover)	.40
26D780589	Cover, chassis bottom	1.85

Part Number	Description	List Price
15A790586	Cover, picture tube rear (on back cover)..	.30
5S3139	Eyelet: .202 x .475 brass; ant cop.....doz	.15
32D790654	Gasket, picture tube: rubber	4.25
55K791113	Grille, metal: brushed brass (on grille cloth)	3.80
14A791829	Insulator, threaded (bezel mtg).....	.10
14K791828	Insulator, picture tube base: rectangular (inside tube rear cover).....	.05
14A791827	Insulator, picture tube base: round; (inside tube rear cover).....	.05
36A485457	Knob, control: black (hold controls on chassis rear)	.15
36B790505	Knob, control (contrast).....	.65
36K780522	Knob, control: ivory (hold controls on chassis rear)	.15
36B790506	Knob, control (station selector).....	.80
36C790507	Knob, control: wal-mahogany (volume & fine tuning)	.45
4S7650	Lockwasher: #6 int; cad pl (line cord mounting).....per/c	.50
4S9751	Lockwasher: #8 int-ext; cad pl (speaker mounting).....per/c	.50
4S7657	Lockwasher: #8 ext; cad pl (spkr mtg)per/c	.50
62K70581	Logotype: "Motorola", brushed brass.....	.40
2S7007	Nut, hex: 8-32 x 5/16; cad pl (speaker mounting).....per/c	.50
2S7003	Nut, hex: 8-32 x 5/16; stl; cad pl (spkr mounting).....per/c	.50
35K792740	Pad, cushion (picture tube positioning brkt)	.05
35K792459	Pad, cushion (on window mtg brkt).....doz	.20
64A790177	Plate, chassis cover: cop pl (on side of chassis-to expose tuner)	.25
5K791856	Rivet, shoulder: annealed (line cord mounting).....doz	.30
5S7751	Rivet: .122 x 1/4 stl; ant cop (picture tube rear cover mtg).....per/c	.50
3S2991	Screw, machine: 6-32 x 1/2 plain hex head; cad pl (window mtg brkts).....doz	.15
3S476115	Screw, sheet metal: #6 x 1/4 PKA plain hex head; cad pl (bottom cover mtg)...doz	.15
3S7536	Screw, sheet metal: #6 x 3/8 PKA slotted acorn head; ant cop (back cover mtg)per/c	.50
3S7509	Screw, sheet metal: #6 x 5/8 PKA slotted acorn head; ant cop (back cover mtg)..doz	.15
3S490819	Screw, sheet metal: #6 x 7/8 PKA slotted acorn head; statuary bronze (back cover mounting).....doz	.15
3S7454	Screw, sheet metal: #8 x 1/4 PKZ plain hex head; cad pl (tube positioning brkt)per/c	.50
3S8153	Screw, sheet metal: #8 x 3/4 PKA plain hex head; cad pl (bottom cover mtg)...doz	.15
3S8104	Screw, sheet metal: #8 x 1-1/2 PKA plain hex head; cad pl (bottom cover mtg)...doz	.15
3K653	Screw, spkr mtg .....doz	.20
35A791581	Strip, antenna lead (dresses loop antenna lead from RF) .....doz	.20
2S490424	Teenut: cad pl (bezel mtg).....	.05
4K780040	Washer, felt (under control knobs).....doz	.25
4K470786	Washer, fibre: 1/2 x 3/16 x 1/16 (bezel mounting) .....doz	.35
4S7646	Washer, flat: 11/16 x 3/16 x .067; wrought iron (bottom cover mtg).....per/c	.50
4S7629	Washer, flat: 1/2 x 3/16 x .048 stl; cad pl (bottom cover mtg).....per/c	.50
61K790653	Window, picture tube: 12"; safety glass...	4.50

MODEL 12K2B CABINET PARTS - Same as 12K2 except:

16K792456	Cabinet, console: limed oak; less window, bezel, and gasket	-
13K791115	Cloth, grille: blonde; 14-1/8 x 19-7/8....	3.75
36K791431	Knob, control: tan (volume & fine tuning).	.45

MODEL 12VF4R CABINET PARTS

1X791558	Back Cover Assembly: with line cord, picture tube rear cover & centering adjustment cover	3.60

Part Number	Description	List Price
13K791529	Bezel, picture tube (window frame).....	6.65
3A790744	Bolt, anchor: statuary bronze (record changer mtg)	.05
7A790538	Bracket, picture window mtg .....doz	.25
1X790657	Bracket, tube positioning: with cushion (on front of chassis).....	.40
16K791022	Cabinet, console: red mahogany	-
55K72308	Catch, bullet & strike: statuary bronze (for door latching)	.05
42K75826	Clip, plug & receptacle mtg .....doz	.40
42K791422	Clip, record spindle (33-1/3 & 78 RPM)....	.10
42K791421	Clip, record spindle (45 RPM)	.15
13K791009	Cloth, grille	2.75
30K21859	Cord, line: with plug; 9 ft (power connection to AM-FM chassis)	1.00
1X790756	Cord, line: with plug & receptacle (TV chassis)	1.35
15B791076	Cover, centering adj: rubber (on back cover)	.40
26D780589	Cover, chassis bottom	1.85
15A790586	Cover, picture tube rear: statuary bronze (on back cover)	.30
35K790169	Cushion, felt (on tube positioning bracket) .....doz	.15
5S3139	Eyelet: .202 x .475; ant cop pl (on back cover) .....doz	.15
5S7820	Eyelet: .450 x .125; CSP (spkr leads)..doz	.15
5S7855	Eyelet: .484 x .156; CSP (spkr leads)..doz	.15
13K790751	Escutcheon, dial (FM-AM dial escutcheon)..	2.10
32D790654	Gasket, picture tube: rubber	4.25
55K791010	Grille, metal	2.50
55K791027	Hinge, door: semi-concealed; statuary bronze	.25
14A791829	Insulator, threaded (bezel mtg)	.10
14A791827	Insulator, tube base: round (inside picture tube rear cover)	.05
14K791828	Insulator, tube base: rectangular;(inside picture tube rear cover)	.05
36B790505	Knob, control (contrast).....	.65
36A485457	Knob, control (hold controls on chassis rear)	.15
36B790506	Knob, control (station selector).....	.80
36C790507	Knob, control: wal-mahogany (fine tuning & volume)	.45
36K691070	Knob, control: wal-mahogany (four radio controls)	.40
4S7657	Lockwasher (on spkr mtg screws).....per/c	.50
4S9751	Lockwasher: #8 int-ext; cad pl (spkr mounting) .....per/c	.50
2S7007	Nut, hex: 8-32 (on spkr mtg screws)..per/c	.50
2S7003	Nut, hex: 8-32 x 5/16 stl; cad pl (spkr mtg) .....per/c	.50
2S490429	Nut, speednut: 1/4-20 (record changer mounting) .....doz	.30
56B791612	Pad, antenna support strap (bottom loop support)	.15
35K792459	Pad, cushion (on window mtg brkts).....doz	.20
35K791015	Pad, felt (door) .....doz	.15
35A791417	Pad, phono turntable .....doz	.15
35K791016	Pad, sponge rubber (record changer drawer bumper).....	.05
64C791006	Panel, cabinet back (covers radio, phono & album comp)	1.40
64A790746	Panel, separator: chipboard; 15"	.25
64A790177	Plate, chassis cover: cop pl (chassis side at tuner)	.25
28A791030	Plug: 2-pin (line cord)	.05
55K791018	Pull, door (album compartment).....	.65
55K791017	Pull, door (TV-Radio)	.65
9A15907	Receptacle: 2-prong (line cord to AM-FM chassis)	.10
9K690618	Receptacle: 4-pin (FM-AM antenna input)...	.10
1X791005	Receptacle: with shell & leads (FM-AM ant input).....	.45
5S7751	Rivet: .122 x 1/4 stl; ant cop pl (picture tube rear cover mtg).....per/c	.50
5K791856	Rivet, shoulder (line cord mtg).....doz	.30
5K790482	Rivet, shoulder (line cord mtg).....	.05
3S7471	Screw, machine: 6-32 x 1/4 thread cutting plain hex head, cad pl (interlock receptacle mtg) .....doz	.15
3S2991	Screw, machine: 6-32 x 1/2 plain hex head; cad pl (picture window mtg).....doz	.15
3S7439	Screw, sheet metal: #4 x 1/2 slotted acorn head; ant cop (loop panel mtg).....per/c	.50
3S7536	Screw, sheet metal: #6 x 3/8 PKA slotted acorn head; ant cop (antenna lead strip mtg & back cover mtg) .....per/c	.50
3S7509	Screw, sheet metal: #6 x 5/8 PKA slotted acorn head; ant cop pl (back cover mounting) .....doz	.15
3S490819	Screw, sheet metal: #6 x 7/8 PKA slotted acorn head; statuary bronze (back cover mounting) .....doz	.15
3S7454	Screw, sheet metal: #8 x 1/4 PKZ plain hex head; cad pl (tube positioning brkt mtg) .....per/c	.50
3S490452	Screw, sheet metal: #8 x 3/8 PKA plain acorn head; ant cop pl .....doz	.15
3S8153	Screw, sheet metal: #8 x 3/4 PKA plain hex head; cad pl (bottom cover mtg)...doz	.15
3S7457	Screw, sheet metal: #8 x 7/8 PKA plain hex head; cad pl (AM-FM chassis mtg)..doz	.15
3S8104	Screw, sheet metal: #8 x 1-1/2 PKA plain hex head; cad pl (bottom cover mtg)...doz	.15
3K653	Screw, speaker mounting .....doz	.20
3S1343	Screw, wood: #4 x 3/8 Phillips oval head; statuary bronze (spindle clip mtg)....doz	.15
3S8340	Screw, wood: #5 x 3/8 slotted round head; blk nkl (clip mtg) .....doz	.15
3S1340	Screw, wood: #6 x 1/2 flat head; statuary bronze .....per/c	.50
15A690616	Shell, receptacle, & insulator (FM-AM ant input).....	.05
15K74442	Shell, receptacle & plug (line cord).....	.10
35A791581	Strip, antenna lead .....doz	.20
2S490424	Teenut (bezel mtg)	.05
4K24125	Washer "C": .437 x .250 (record changer mounting) .....per/c	.50
4K780040	Washer, felt (beneath control knobs). doz	.25
4S7607	Washer, flat: 9/32 x .125 x .027; cad pl (loop panel mtg) .....per/c	.50
4S7629	Washer, flat: 1/2 x 3/16 x .048; cad pl (bottom cover mtg) .....per/c	.50
4S490412	Washer, flat: 11/16 x .156 x .031; cad pl (AM-FM chassis mtg) .....doz	.15
4S7646	Washer, flat: 11/16 x 3/16 x .067; cop pl (bottom cover mtg) .....per/c	.50
4A482258	Washer, insulating (record changer mtg)doz	.15
61K790653	Window, picture tube: 12"	4.50

MODEL 12VF4B CABINET PARTS - Same as 12VF4R except:

16K791023	Cabinet, console: limed oak	-
55K482793	Catch, bullet & strike: brushed brass (for door latching)	.05
13K791028	Cloth, grille: ivory	3.50
55K791019	Grille, metal: brushed bronze	4.10
55K791024	Hinge, door: semi-concealed; brass.....	.25
36K791431	Knob, control: tan (fine tuning & volume).	.45
36K791432	Knob, control: tan (radio controls).....	.45
55B791025	Pull, door: brushed brass (album compartment)	.65
55B791026	Pull, door: brushed brass (TV-radio).....	.65

MODEL 12VF4R-C CABINET PARTS - Same as 12VF4R except:

16K791992	Cabinet, console: red mahogany	-
49A791936	Disc, record adaptor (adapts 7" large centerhole records to small spindle).....	.10
5S3139	Eyelet: .202 x .475; brass antique copper finish (7" record shelf mtg) .....doz	.15
3S490332	Screw, sheet metal: #6 x 7/8 PKA, plain hex head; statuary bronze (7" record shelf mtg) .....per/c	.50

MODEL 12VF26R CABINET PARTS

1X791664	Back Cover (FM-AM): complete with loop antenna, line cord, receptacle & leads	4.75

Part Number	Description	List Price
1X791663	Back Cover (TV): complete with line cord, picture tube rear cover and centering adjustment cover	3.05
13D790489	Bezel, picture tube (picture window frame)	7.65
1X792768	Bracket, tube positioning: with cushion (on chassis front)	.20
7A790538	Bracket, window mtg ....doz	.25
16K791669	Cabinet, console: red mahogany (less window, gasket, bezel & dial escutcheon).	-
55B72307	Catch, bullet: statuary bronze (door latch)	.05
42K75826	Clip, plug & receptacle mtg (phono plug & receptacle holder) ....doz	.40
13K791685	Cloth, grille: red mahogany	3.50
30K21859	Cord, line & plug: 9 ft (FM-AM chassis)...	1.00
1X790358	Cord, line: with plug & shell (TV chassis)	1.35
15B791076	Cover, centering adjustment: rubber (on back cover)	.40
26D780589	Cover, chassis bottom	1.85
15A690556	Cover, interlock switch: cad pl (AM-FM back cover)	.15
15A790586	Cover, picture tube rear (on back cover)..	.30
13K791032	Escutcheon, dial: polished bronze (radio dial escutcheon)	2.30
5S3139	Eyelet: .202 x .475 brass; ant cop pl (on back cover) ....doz	.15
32D790654	Gasket, picture tube: rubber	4.25
55K791681LH	Hinge, semi-invisible (bottom left-hand)..	.25
55K791681RH	Hinge, semi-invisible (bottom right-hand).	.25
55K790733LH	Hinge, stop: semi-invisible; statuary bronze (top left-hand)	.25
55K790733RH	Hinge, stop: semi-invisible; statuary bronze (top right-hand)	.25
14K790743	Insulator, chassis base (beneath AM-FM chassis)	.50
14K791482	Insulator, shield: 2-1/2 x 3/4 ....doz	.25
14A791829	Insulator, threaded (bezel mtg)	.10
14K791858	Insulator, tube base: rectangular (inside picture tube rear cover)	.10
14A791827	Insulator, tube base: round (inside picture tube rear cover)	.05
36B790505	Knob, control (contrast)	.65
36A485457	Knob, control (hold controls on chassis rear)	.15
36B790506	Knob, control (station selector)	.80
36K690886	Knob, control: wal-mahogany (4 radio controls)	.45
36C790507	Knob, control: wal-mahogany (fine tuning	.45
4S7650	Lockwasher: #6 int; cad pl (interlock cover mtg) ....per/c	.50
4S7657	Lockwasher: #8 ext; cad pl (spkr mtg)per/c	.50
13K791842	Medallion: wal-mahogany ("M" on grille)...	.30
2S7007	Nut, hex: 8-32 (on spkr mtg screws)..per/c	.50
2S7003	Nut, hex: 8-32 x 5/16 stl; cad pl (spkr mounting) ....per/c	.50
2A71185	Nut, teenut (bezel mtg)	.05
2S490424	Nut, teenut: (front panel)	.05
56K791859	Pad, antenna support strap (supports bottom loop ant)	.15
35K792740	Pad, cushion (on picture tube positioning bracket)	.05
35K792459	Pad, cushion (on window mtg brkt)....doz	.20
64C791659	Panel, cabinet back (covers radio, phono & album compartment)	1.10
64C791628	Panel, changer compartment baseboard.....	.45
29A5400	Pin, terminal: .125 x 11/16; nkl pl (spkr lead terminals) ....doz	.20
29K5401	Pin, terminal: .156 x 11/16; nkl pl (spkr lead terminals) ....doz	.20
28A791030	Plug: 2-pin (connects TV chassis to power source)	.05
55K791688	Pull, door: brushed brass satin finish....	1.10
9A791031	Receptacle: 2-prong (connects TV chassis to power source)	.05
9A15907	Receptacle: 2-prong (interlock receptacle)	.10
9K690618	Receptacle: 4-pin (FM-AM ant input)	.10
5S7700	Rivet: .122 x 1/4 stl; nkl pl (interlock cover mtg) ....per/c	.50
5S7751	Rivet: .122 x 1/4 stl; ant cop pl (picture tube rear cover mtg) ....per/c	.50
5K791856	Rivet, shoulder (TV line cord mtg) ....doz	.30

Part Number	Description	List Price
3S7471	Screw, machine: 6-32 x 1/4 thread cutting plain hex head; cad pl (interlock plug mounting) ....doz	.15
3S2991	Screw, machine: 6-32 x 1/2 plain hex head cad pl (window mtg brackets) ....doz	.15
3S490354	Screw, machine: 6-32 x 5/8 slotted hex head; cad pl (FM-AM chassis mtg) ....doz	.15
3K489169	Screw, machine: 8-32 x 1 cross slot head (door pull mtg) ....doz	.15
3S7439	Screw, sheet metal: #4 x 1/2 slotted acorn head; ant cop ....per/c	.50
3S476115	Screw, sheet metal: #6 x 1/4 PKA plain hex head; cad pl (loop ant term strip) ...doz	.15
3S7536	Screw, sheet metal: #6 x 3/8 PKA slotted acorn head; ant cop (back cover mtg) .doz	.15
3S7509	Screw, sheet metal: #6 x 5/8 slotted acorn head; antique copper finish (back cover mtg) ....doz	.15
3S490819	Screw, sheet metal: #6 x 7/8 PKA slotted acorn head; statuary bronze finish (back cover mtg) ....per/c	.50
3S7454	Screw, sheet metal: #8 x 1/4 PKZ plain hex head; cad pl (tube positioning bracket mtg) ....per/c	.50
3S490452	Screw, sheet metal: #8 x 3/8 PKA plain acorn head; antique copper finish (FM-AM back cover mtg) ....doz	.15
3S8153	Screw, sheet metal: #8 x 3/4 PKA plain hex head; cad pl (bottom cover mtg)...doz	.15
3S7457	Screw, sheet metal: #8 x 7/8 PKA plain hex head; cad pl (FM-AM chassis mtg)..doz	.15
3S8104	Screw, sheet metal: #8 x 1-1/2 PKA plain hex head; cad pl (bottom cover mtg) ..doz	.15
3S490722	Screw, sheet metal: #8 x 2" PKA slotted hex head; cad pl ....doz	.20
3K653	Screw, speaker mtg ....doz	.20
3S8340	Screw, wood: #5 x 3/8 slotted round head; blk nkl pl (clip mtg) ....doz	.15
15A690616	Shell, receptacle & insulator (on FM-AM ant receptacle)	.05
15K74443	Shell, receptacle & plug: 2-pin (on TV power receptacle) (sold only with receptacle)	-
15K74442	Shell, receptacle & plug: 2-pin (on TV power plug)	.10
55K72308	Strike & nail: statuary bronze (door latch)	.05
35A791581	Strip, antenna lead (dresses ant lead from RF) ....doz	.20
55K74787	Track, record changer: statuary bronze (left-hand)	1.15
55C74786	Track, record changer: statuary bronze (right-hand)	1.15
4K470786	Washer, fibre: 1/2 x 3/16 x 1/16 (bezel mounting) ....doz	.35
4S1719	Washer, flat: 3/8 x .140 x .030 stl; cad pl (TV line cord mtg) ....per/c	.50
4S7562	Washer, flat: 7/16 x .187 x .033 stl; cad pl (spkr mtg) ....per/c	.50
4S7629	Washer, flat: 1/2 x 3/16 x .048 stl; cad pl (bottom cover mtg) ....per/c	.50
4S7614	Washer, flat: 11/16 x 11/64 x .036 stl; cad pl (bottom cover mtg) ....doz	.15
4S490412	Washer, flat: 11/16 x .156 x .031 stl; cad pl (AM-FM chassis mtg) ....doz	.15
61K790653	Window, picture tube: 12"	4.50

MODEL 12VF26B CABINET PARTS - Same as 12VF26R except:

16K791670	Cabinet, console: limed oak (less window, gasket, bezel & dial escutcheon)	-
55K482792	Catch, bullet: brass (door latch)	.05
13K791686	Cloth, grille: blonde	3.50
55K791687LH	Hinge, semi-invisible: brushed brass (bottom left-hand)	.25
55K791687RH	Hinge, semi-invisible: brushed brass (bottom right-hand)	.25
55K790734LH	Hinge, stop: semi-invisible; brushed brass (top left-hand)	.25
55K790734RH	Hinge, stop: semi-invisible: brushed brass (top right-hand)	.25

Part Number	Description	List Price
36K791484	Knob, control: tan (fine tuning & volume).	.45
36K691195	Knob, control: tan (four radio controls)..	.45
13K791843	Medallion: tan ("M" on grille).....	.30
3K489170	Screw, machine: 8-32 x 1 cross slot head; satin brass (door pull mtg) .....doz	.15
55K482793	Strike and nail: brs (door latch).....	.05

MODEL 12VF26B-C CABINET PARTS - Same as 12VF26R-C except:

16K791985	Cabinet, console: limed oak (less window, gasket, bezel & dial escutcheon).....	-
36K791484	Knob, control: tan (volume & fine tuning).	.45
36K691195	Knob, control: tan (four radio controls)..	.45

MODEL 12VF26R-C CABINET PARTS - Same as 12VF26R except:

16K791984	Cabinet, console: red mahogany (less window, gasket, bezel & dial escutcheon	-
49A791936	Disc, record adaptor (adapts 7" large center hole records to small spindle)....	.10
5S3139	Eyelet: .202 x .475 brass; ant cop (7" record shelf mtg) .....doz	.15
3S490332	Screw, sheet metal: #6 x 7/8 PKA plain hex head; statuary bronze (7" record shelf mounting) .....per/c	.50

MODEL 16VK1R CABINET PARTS

1X791874	Back Cover Assembly: complete with line cord, picture tube rear cover, centering adjustment cover and brackets.....	4.60
13D790560	Bezel, picture tube (window frame).....	6.65
7A791854	Bracket, line cord: cop pl (mounts line cord plug to chassis).....	.20
7A791878	Bracket mounting: cad pl (on bottom of back cover)	.15
16K791786	Cabinet, console: red mahogany: complete less bezel	-
13K791775	Cloth, grille	3.75
30B470756	Cord, line: with plug & receptacle.....	1.50
15K792068	Cover, centering adjustment: rubber (on back cover)	.40
1X792099	Cover, chassis bottom: with hi-voltage insulator and rubber strips	2.50
15B790987	Cover, picture tube rear (on back cover)..	.70
14B792069	Insulator, high voltage (on chassis bottom cover)	.20
14K791858	Insulator, tube base: rectangular (in picture tube rear cover).....	.10
14A791827	Insulator, tube base: round (in picture tube rear cover).....	.05
36B790505	Knob, control (contrast).....	.65
36B790506	Knob, control (station selector).....	.80
36K792078	Knob, control: wal-mahog (fine tuning & off-volume)	.45
36A485457	Knob, control: black (hold controls on chassis rear)	.15
36K780522	Knob, control: ivory (hold controls on chassis rear).....	.15
4S7650	Lockwasher: #6 int; cad pl (hi-volt insulator mtg) .....per/c	.50
4S7657	Lockwasher: #8 ext; cad pl (spkr mtg)per/c	.50
4S7678	Lockwasher: 1/4 ext .....per/c	.50
62K70581	Logotype: "Motorola"; brushed brass.....	.40
2S7003	Nut, hex: 8-32 x 5/16 stl; cad pl (speaker mounting) .....per/c	.50
2S7007	Nut, hex: 8-32 x 1/4; cad pl (spkr mounting) .....per/c	.50
2S7022	Nut, hex: 1/4-20 x 7/16 steel; cad pl (chassis mtg) .....doz	.15
56B791612	Pad, antenna support strap (lower loop antenna support)	.15
5S7751	Rivet: .122 x 1/4 stl; ant cop (picture tube rear cover mtg).....per/c	.50
5S6846	Rivet: .145 x 5/32 steel; nkl pl (hi-volt insulator mtg) .....doz	.15

Part Number	Description	List Price
5K790011	Rivet, shoulder: annealed (line cord plug) .....doz	.25
3S2226	Screw, machine: 1/4-20 x 1-1/4 plain hex head; stl; cad pl (chassis mtg).....doz	.50
3S7205	Screw, machine: 8-32 x 1/4 slotted lock hex head; cad pl (bezel mtg).....doz	.15
3S490453	Screw, sheet metal: #6 x 3/8 PKA plain acorn head; ant cop finish (back cover mounting) .....doz	.15
3S7536	Screw, sheet metal: #6 x 3/8 PKA slotted acorn head; ant cop finish .....per/c	.50
3S3385	Screw, sheet metal: #6 x 3/8 PKZ plain hex head; statuary bronze finish (back cover mounting) .....doz	.15
3S490454	Screw, sheet metal: #6 x 5/8 PKA plain acorn head; ant cop finish (back cover mounting) .....doz	.15
3S8140	Screw, sheet metal: #8 x 3/16 PKZ plain hex head; cad pl (back cover mtg)...per/c	.50
3S8153	Screw, sheet metal: #8 x 3/4 PKA plain hex head; cad pl (bottom cover mtg).....doz	.15
3S8104	Screw, sheet metal: #8 x 1-1/2 PKA plain hex head; cad pl (bottom cover mtg)...doz	.15
3K653	Screw, speaker mtg .....doz	.20
3S7536	Screw, wood: #6 x 3/8 PKA slotted acorn head; ant cop finish (antenna lead strip mounting) .....per/c	.50
35A791581	Strip, antenna lead (dresses lead from RF) .....doz	.20
35K791534	Strip, rubber: 6" (chassis bottom cover)..	.05
35K792059	Strip, rubber: 13" (chassis bottom cover).	.05
4A484894	Washer, cut: cad pl (chassis mtg).....doz	.25
4K780040	Washer, felt (under control knobs).....doz	.25
4S1720	Washer, flat: 3/8 x .156 x .030 stl; cad pl (line cord brkt) .....per/c	.50
4S7562	Washer, flat: 7/16 x .187 x .033 stl; cad pl (speaker mtg) .....per/c	.50
4S7629	Washer, flat: 1/2 x 3/16 x .048 stl; cad pl .....per/c	.50
4S8205	Washer, flat: 9/16 x 17/64 x .048 stl; cad pl .....doz	.20
4S7563	Washer, flat: 5/8 x .203 x .033 stl; cad pl (bezel mtg) .....doz	.15
4S7614	Washer, flat: 11/16 x 11/64 x .036 stl; cad pl .....doz	.15

MODEL 16VK1B CABINET PARTS - Same as 16VK1R except:

16K791868	Cabinet, console: limed oak; less bezel	-
13K791869	Cloth, grille: ivory	3.75
36K792079	Knob, control: tan (fine tuning & off-volume)	.45

MODEL 16K2L CABINET PARTS - Same as 16VK1R except:

13K792792	Bezel, picture tube (picture window frame)	6.65
16F792007	Cabinet, console: red-brown mahogany; less bezel	-

MODEL 16K2LB CABINET PARTS - Same as 16K2L except:

16K792008	Cabinet, console: limed oak; less bezel...	-

BILT-IN-TENNAS

Model TA-4 Television Double Loop Bilt-In-Tenna

1X791759	TA-4 Television Double Loop Antenna: complete (Bilt-In-Tenna for all floor models except 12VF26)	6.50
21K70720	Capacitor, mica: 5 mmf 500V	.10
21R6593	Capacitor, molded mica: 15 mmf 300V.....	.20
24A791771	Coil, antenna loading	.25
31K471564	Strip, terminal: 3 ins #2 gnd; 3/8" spacing	.05

Part Number	Description	List Price
Model TA-5 Television Double Loop Bilt-In-Tenna		
1X791840	TA-5 Television Double Loop Antenna (same as TA-4 except for longer leads; used on 12VF26)	6.50
Model TA-6 Television Single Loop Bilt-In-Tenna		
1X791900	TA-6 Television Single Loop Antenna: complete (Bilt-In-Tenna for table models 10VT10, 10VT24, 12VT13, 12T1 & 10T2)	4.00

Part Number	Description	List Price
21R2763	Capacitor, molded mica: 6 mmf 300V	.20
21R2764	Capacitor, molded mica: 18 mmf 300V	.20
24A791748	Coil, antenna loading	.25
24A791847	Coil, high frequency compensating	.25
31K34326	Strip, terminal: 2 ins #3 gnd; 3/8" spacing	.05

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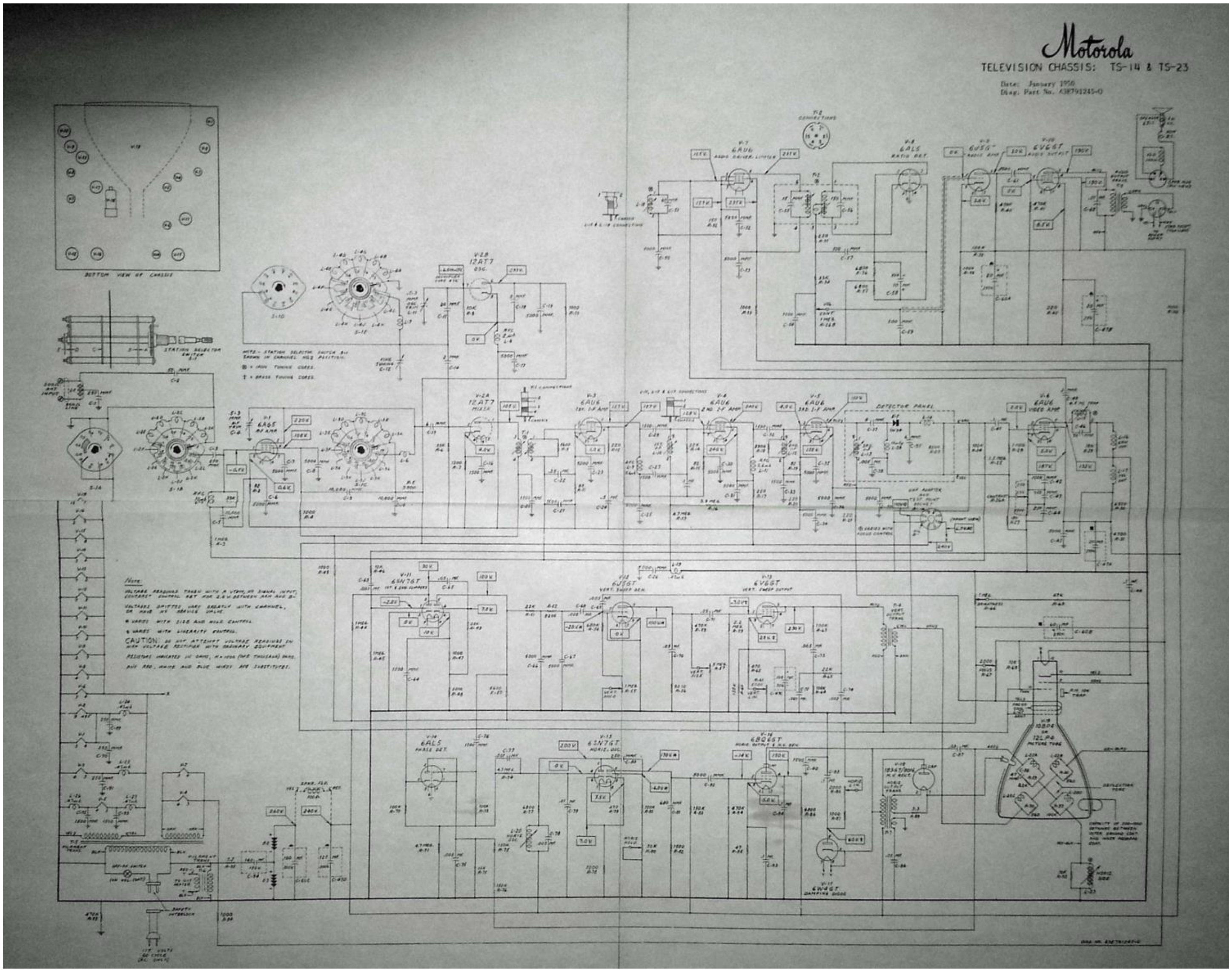
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TELEVISION CHASSIS: TS-14 & TS-23
Date: January 1950

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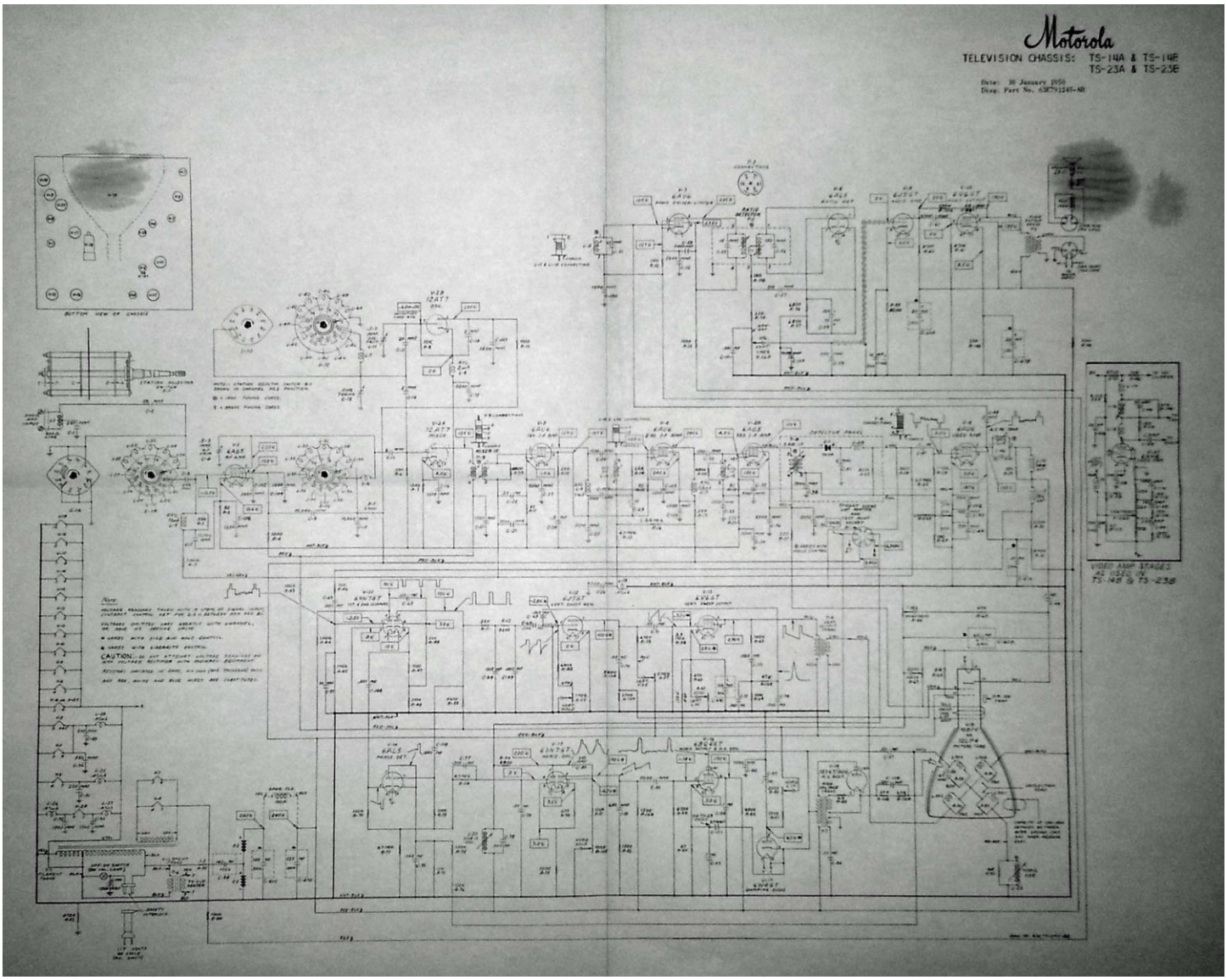
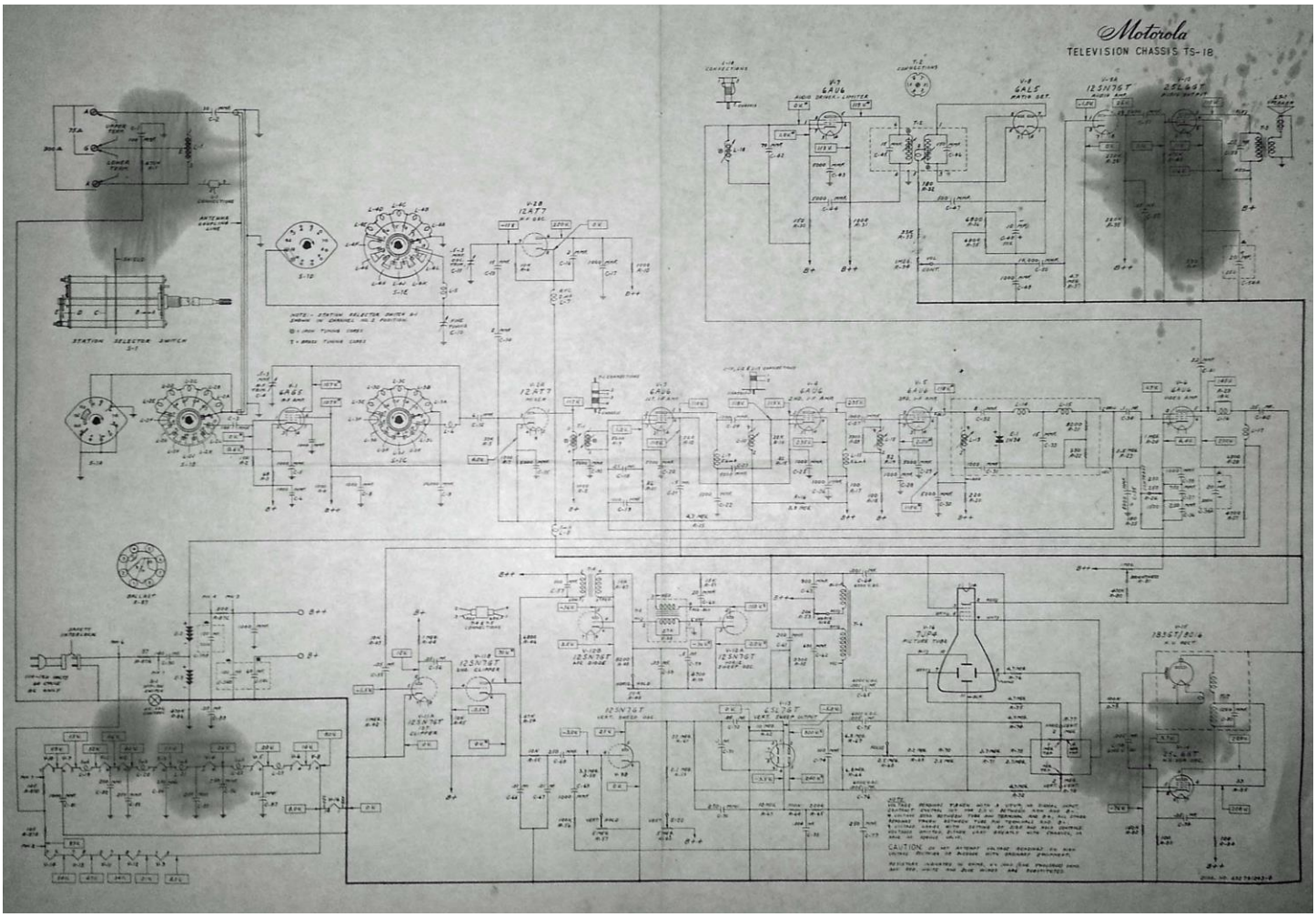
TELEVISION CHASSIS: TS-14A & TS-14E
TS-23A & TS-23E

Date: 30 January 1950
Drwg. Part No. 63C7913A5-A8

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TELEVISION CHASSIS TS-18
STATION SELECTOR SWITCH S-1
CAUTION

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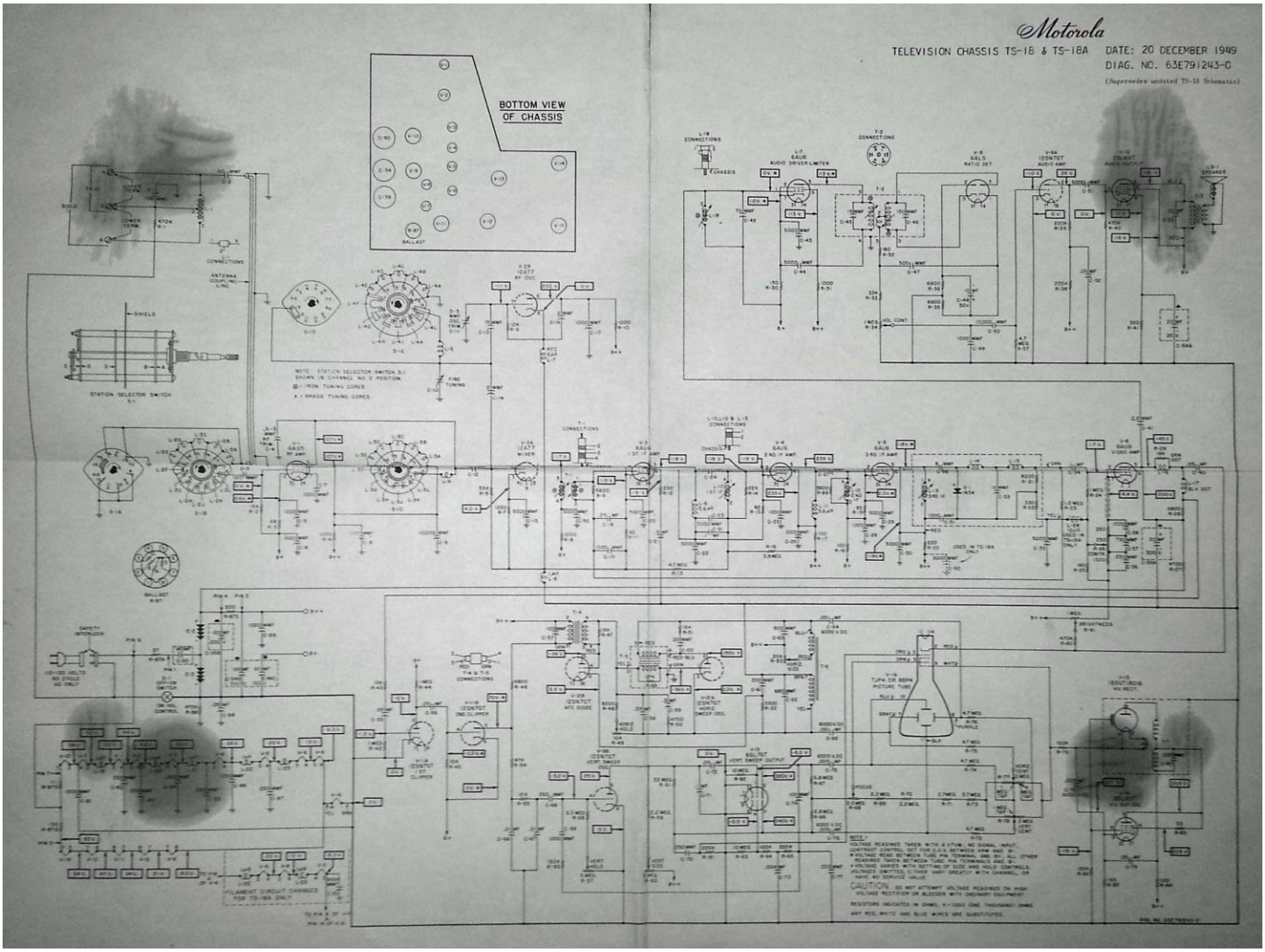
TELEVISION CHASSIS TS-18 & TS-18A DATE: 20 DECEMBER 1949

DIAG. NO. 63E791243-C

(Supersedes undated TS-18 Schematic)



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TELEVISION CHASSIS: TS-52

Date: 30 January 1950

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