SYLVANIA

Bulletin	9-2
Models	1-076, 1-128
Chassis	1-108
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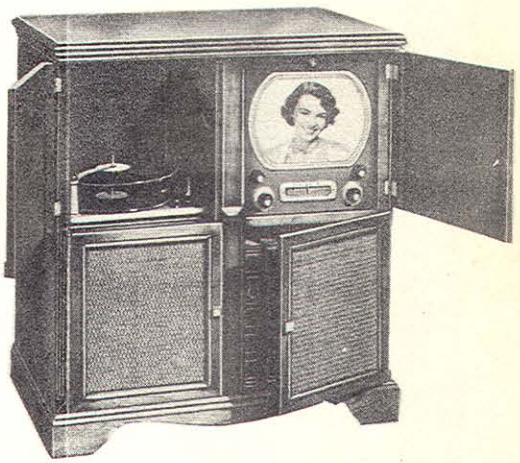
REPAIR PARTS and SERVICE INSTRUCTIONS

GENERAL DESCRIPTION

Models 1-076 and 1-128 are direct viewing television, radio and record changer phonograph combinations providing reception of all 12 commercial television channels, standard broadcast band and the frequency modulation band. The television picture is reproduced on either a 10 inch or 12 1/2 inch electromagnetically deflected, triode type picture tube. The models are electrically the same except for speakers and picture tubes.



Model 1-076

SPECIFICATIONS

FREQUENCY RANGE

TELEVISION ..... All 12 television channels, 54-88 Mc., 174-216 Mc.
Picture intermediate frequency, 26.4 Mc.
Sound intermediate frequencies, 4.5 Mc. & 21.9 Mc.

STANDARD BROADCAST (AM) ..... 540-1600 Kc.
Intermediate frequency, 455 Kc.

FREQUENCY MODULATION (FM) ..... 88-108 Mc.
Intermediate frequency, 10.7 Mc.

POWER SUPPLY

All models 105-120 volts 60 cycle AC, 240 watts.

LOUD SPEAKER

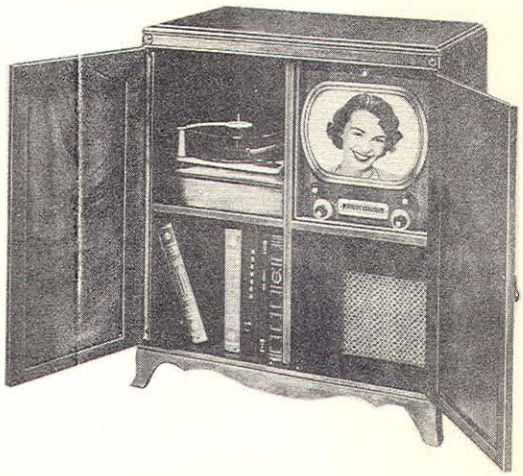
Model 1-076 ..... 10" P.M.
Model 1-128 ..... 12" P.M.

CABINET DIMENSIONS (inches)	Width	Height	Depth
Model 1-076	31.5	34.5	22.3
Model 1-128	33.3	37.3	22.3

Weight (pounds)	Net	Gross
Model 1-076	125	154
Model 1-128	141	175

ANTENNA INPUT IMPEDANCE

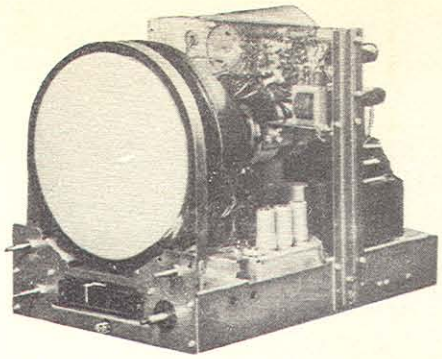
The receiver, having an antenna input impedance of 300 ohms, is shipped to the customer with the built-in antenna connected. However, this may be disconnected in those locations where an external antenna is necessary.



Model 1-128

Sylvania Tube Complement
(includes rectifiers and picture tube)

Symbol	Function	Type
	TELEVISION	
(V1)	1st RF Amplifier	6AG5
(V2)	2nd RF Amplifier	6AG5
(V3)	Oscillator-Mixer	6J6
(V4)	1st Video IF Amplifier	6BA6
(V5)	2nd Video IF Amplifier	6BA6
(V6)	3rd Video IF Amplifier	6AU6
(V7)	4th Video IF Amplifier	6AG5
(V8)	Video Det., AGC Line Clamper	6AL5
(V9)	Video Amplifier	6AQ5
(V10)	Sound IF Amplifier	6AU6
(V11)	Sound IF Limiter	6AU6
(V12)	Ratio Detector	6AL5
(V13)	1st Audio Amplifier	6AU6
(V14)	Audio Output	6Y6G
(V15)	AGC Amp., Vert. Osc.	12AU7
(V16)	Hor. & Vert. Sync. Sep.	12AX7
(V17)	Hor. & Vert. Sync. Clippers	12AU7
(V18)	Vertical Output	6AQ5
(V19)	Horizontal Discriminator	6AL5
(V20)	Horizontal Control	6AU6
(V21)	Hor. Osc. & Discharge	12AU7
(V22)	Horizontal Output	6BD5GT
(V23)	Damper	6W4GT
(V24)	High Voltage Oscillator	6SN7GT
(V25)	High Voltage Rectifier	1B3GT
(V26)	Low Voltage Rectifier (B+)	7X6
(V27)	Low Voltage Rectifier (B+)	5U4G
(V28)	Picture Tube (Model 1-076)	10MP4
(V28)	Picture Tube (Model 1-128)	12VP4
	RADIO TUNER	
(V29)	Oscillator-Mixer	12AT7
(V30)	1st IF Amplifier, AM & FM	6BA6
(V31)	2nd IF Amplifier, AM & FM	6BA6
(V32)	FM Ratio Detector, AM Detector	6T8



CHASSIS 1-108

CIRCUIT DESCRIPTION

The Sylvania television and AM-FM receiver chassis 1-108 operates with twenty-eight tubes, plus two low-voltage rectifiers, one high-voltage rectifier, and one picture tube. The operating controls on the front panel have been reduced to a minimum; which are Tone, AM-FM Radio Tuning, Volume, Function Switch, Contrast, Brightness, and TV Channel Selector and Band Switch. The remaining controls, which are seldom adjusted, are grouped under the chassis.

Special features of this receiver are as follows:

Continuous Tuning Channel Selector

A compact size, low-drift, twelve-channel RF tuner is provided in this chassis for simplicity of operation. Continuous tuning expels the need of a fine tuning control.

Self-Contained Antenna

Eliminating the cost and inconvenience of an ex-

CAUTION NOTICE

THE HIGH VOLTAGE LEAD TO THE PICTURE TUBE HAS A POTENTIAL OF 9,500 VOLTS. PRECAUTIONS SHOULD BE OBSERVED WHEN THE CHASSIS IS REMOVED FROM THE CABINET FOR SERVICE PURPOSES. DO NOT OPERATE THE RECEIVER WITH THE H V SUPPLY COVER REMOVED.

ALWAYS USE SAFETY GOGGLES AND GLOVES IF IT IS NECESSARY TO REMOVE THE PICTURE TUBE.

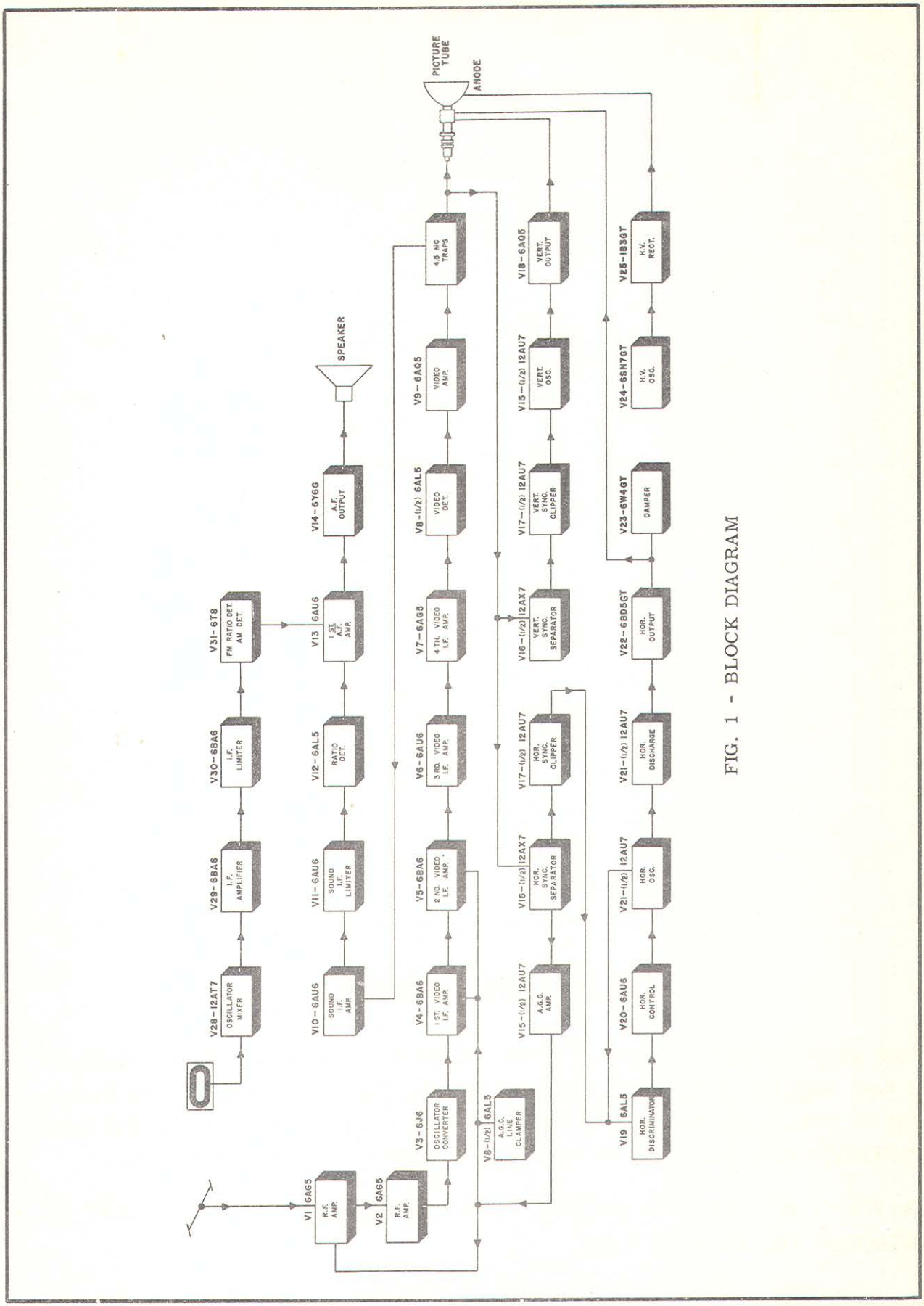


FIG. 1 - BLOCK DIAGRAM

ternal antenna in most locations, a Sylvania tuned dipole type antenna is built-in to provide satisfactory reception. The antenna is peaked for resonance to the individual channel by rotating the trimmer knob on the front of the receiver.

Automatic Gain Control

Simplified customer operation is provided by a very flat AGC system which has a high degree of noise immunity. Very little, if any, readjustment of controls is required in going from one station to another.

Direct Coupled Video System

A direct coupled video system eliminates all video coupling capacitors and also eliminates the need for a DC Restorer. This reduces the visible effects of noise.

Horizontal Automatic Frequency Control

A sine-wave type of Horizontal AFC is employed which provides excellent picture stability, even in the presence of noise and weak signals.

For convenience of tracing circuits, a block diagram of the television chassis is shown in Figure 1. The TV circuit is as follows. The antenna lead-in is connected to the input of the R.F. tuner. This tuner functions to select the desired TV channel by continuous tuning. The output of the tuner unit is at intermediate frequency and the band width up to this point is wide enough to pass both picture carrier and sound carrier of the desired channel signal.

The output of the tuner unit is then applied to the chain of video IF Amplifiers which also passes both the picture and sound carriers. Suitable traps are provided in the video amplifier channel to reject the adjacent channel carriers and to attenuate the co-sound carrier, to the required level.

The video signal out of the video detector is amplified by a single stage and impressed upon the picture tube.

Automatic gain control voltage is obtained from the Horizontal Sync Separator, and amplified by the AGC Amplifier and applied to the RF & IF Amplifiers. The Horizontal Sync Separator and clipper are separate from the Vertical Sync Separator and clipper to insure good interlace.

Vertical synchronizing pulses from the Vertical Sync Clipper are applied to the Vertical Oscillator and hold this oscillator in synchronism with the incoming sync pulses. The Vertical Oscillator produces a saw-tooth voltage which is applied to the Vertical Output stage which energizes the Vertical Deflection Coils of the picture tube.

Horizontal synchronizing information from the Sync Clipper is supplied to the Horizontal Discriminator. A signal from the Horizontal Oscillator is also supplied to the Horizontal Discriminator. The output of the Horizontal Discriminator is applied to the horizontal control tube which then functions to hold the Horizontal Oscillator in synchronism with the incoming horizontal sync pulses.

The output of the Horizontal Oscillator actuates the Horizontal Discharge tube which produces a saw-tooth of voltage suitable for application to the Horizontal Output stage which energizes the Horizontal Deflection Coils on the picture tube. Associated with the horizontal output stage is the Damper tube which is necessary to obtain horizontal deflection. The AGC Line Clamper keeps the AGC voltage from going positive under weak signal conditions.

TELEVISION CHANNELS & FREQUENCIES

CHANNEL NO.	FREQ. MC.	PICTURE CARRIER MC.	SOUND CARRIER MC.	HETERODYNE OSC. FREQ. MC.
2	54 - 60	55.25	59.75	81.65
3	60 - 66	61.25	65.75	87.65
4	66 - 72	67.25	71.75	93.65
5	76 - 82	77.25	81.75	103.65
6	82 - 88	83.25	87.75	109.65
7	174 - 180	175.25	179.75	201.65
8	180 - 186	181.25	185.75	207.65
9	186 - 192	187.25	191.75	213.65
10	192 - 198	193.25	197.75	219.65
11	198 - 204	199.25	203.75	225.65
12	204 - 210	205.25	209.75	231.65
13	210 - 216	211.25	215.75	237.65

ANTENNA INSTALLATION

Television

The 1-108 chassis models have a built-in TV antenna, which is connected to the four screw terminal board at the left on the rear of the chassis. The internal antenna connects to the two top screws; the input of the R.F. tuner is 300 ohms and is permanently internally connected to the two lower screws.

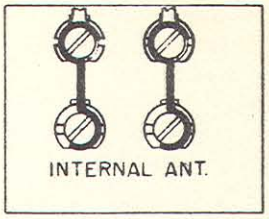


FIG. 2A

Figure 2A shows the internal antenna connected for operation. For many receiver installations, the built-in antenna will provide satisfactory reception. A variable capacitor, located on the front of the receiver over the picture mask, adjusts the antenna circuit to resonance. At each individual channel, the capacitor should be rotated for best picture quality.

If, for satisfactory reception, the installation of an outside antenna is deemed necessary, matching 300 ohm twin lead may be connected to the two lower terminal screws as shown in Figure 2B. A 300 ohm line is especially recommended in those areas where the lead-in is in excess of 100 feet.

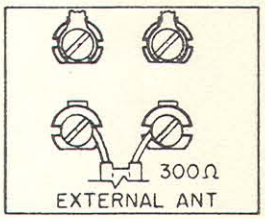


FIG. 2B

A 73 ohm shielded coaxial input may be used with the 1-108 chassis if an impedance changing circuit is wired between the lead-in and the antenna terminals. A coaxial lead-in will be the only solution in some areas where high noise signals prevail.

AM - FM Radio

The AM-FM antenna terminal board, shown in Figure 2C is located at the right on the rear of the television chassis. Connections are as follows:

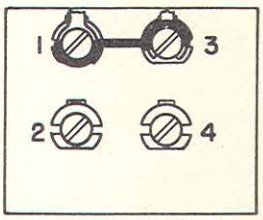


FIG. 2C

AM RECEPTION - Excellent local reception may be obtained by the use of only the built-in loop which is installed on all 1-108 chassis models. However, if an outside installation is desirable, connect the antenna lead-in to terminal 2 shown in Figure 2C.

FM RECEPTION - Provisions are also made on this chassis for FM reception without the use of an external antenna. For this circuit operation, connect the wire jumper between terminals 1 and 3 as shown in Figure 2C. In this manner, one side of the AC power line is used as an FM antenna. If reception is not satisfactory and an external installation is desirable, remove the jumper from terminals 1 and 3 and connect antenna lead-in to terminals 3 and 4.

OPERATING INSTRUCTIONS

TUNING

A. To adjust and tune this receiver for television reception, refer to Figure 3 and proceed as follows:

1. Turn the FUNCTION switch (4) to TV.
2. Turn BAND switch (5) fully clockwise to tune any channel from 2 through 6 and fully counterclockwise to tune any channel 7 through 13.
3. Allow several minutes warm-up period.
4. Rotate the CHANNEL SELECTOR (6) until the red line on the background is in line with the channel number of the station it is desired to receive.
5. Turn the CONTRAST control (8) to mid-position.
6. Turn the BRIGHTNESS control (7) fully counterclockwise, and then slowly clockwise until activity is clearly visible on the screen.
7. Adjust the CHANNEL SELECTOR (6) for best picture quality.
8. Adjust the VOLUME control (3) for desired volume and TONE control (1) for desired tone.
9. The CONTRAST control (8) may now be adjusted to obtain the desired degree of contrast between the light and dark parts of the picture.

Slight adjustment of the BRIGHTNESS control (7) may be necessary to obtain the best possible picture.

B. To change from one television station to another:

1. Turn the BAND switch (5) fully clockwise to tune any channel from 2 through 6 or fully counterclockwise to tune any channel from 7 through 13.

2. Rotate the CHANNEL SELECTOR (6) until the red line on the background is in line with the channel number on the BAND switch and adjust for best picture quality.

3. If necessary, adjust the CONTRAST and BRIGHTNESS controls (8 and 7) until the picture is at its best. Only slight adjustment of these controls should be necessary.

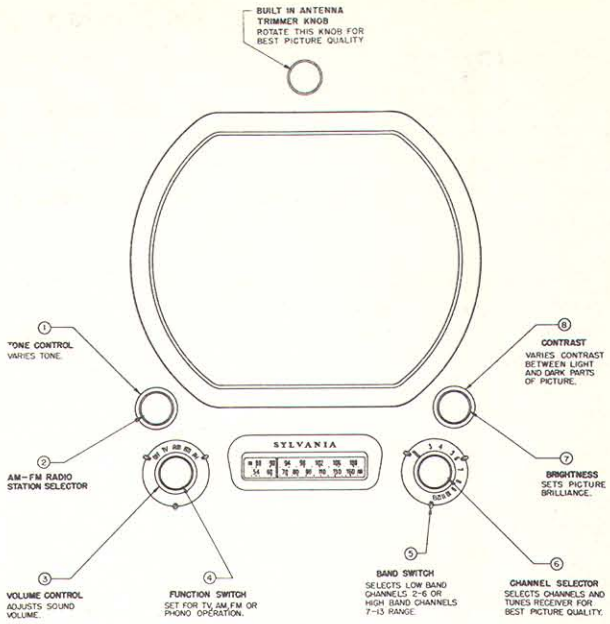


FIG. 3
FRONT OF CABINET CONTROLS

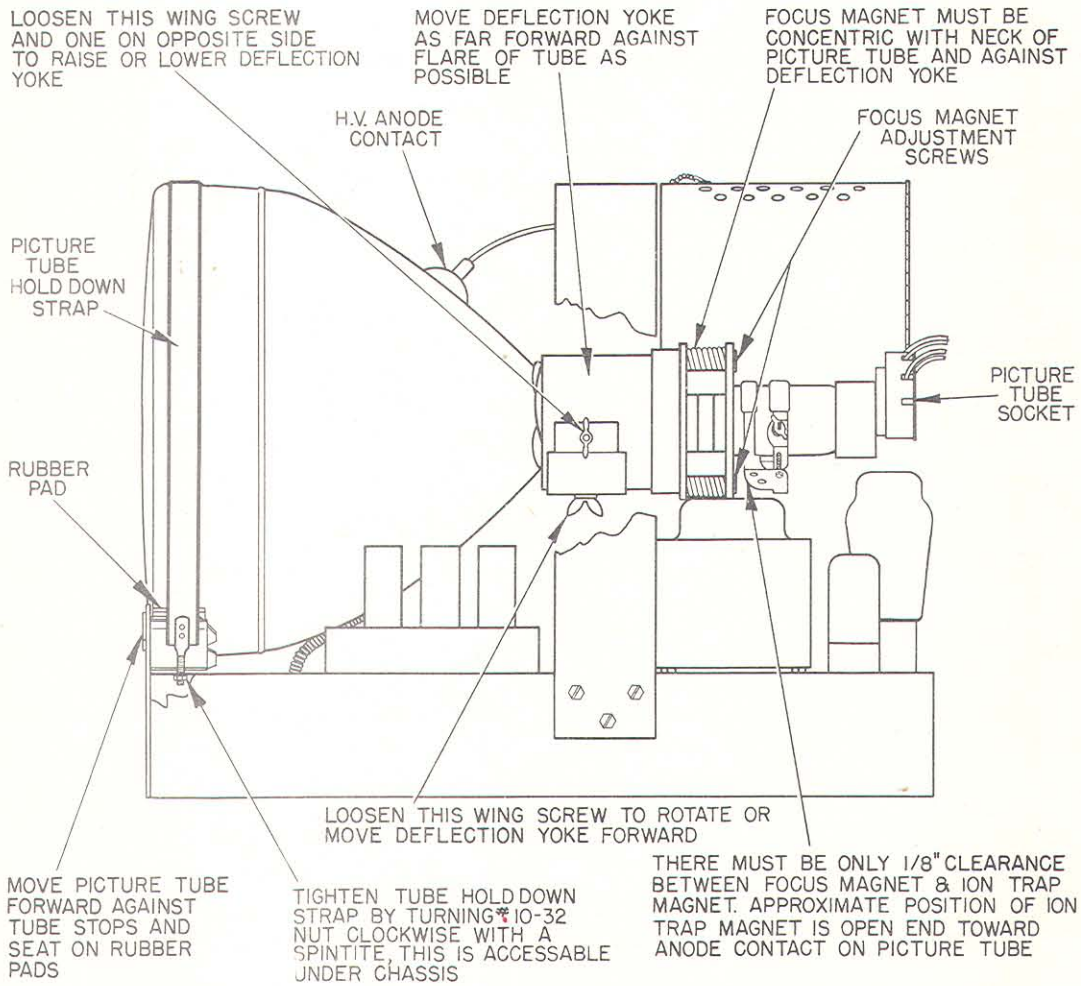


FIG. 4 - PICTURE TUBE INSTALLATION

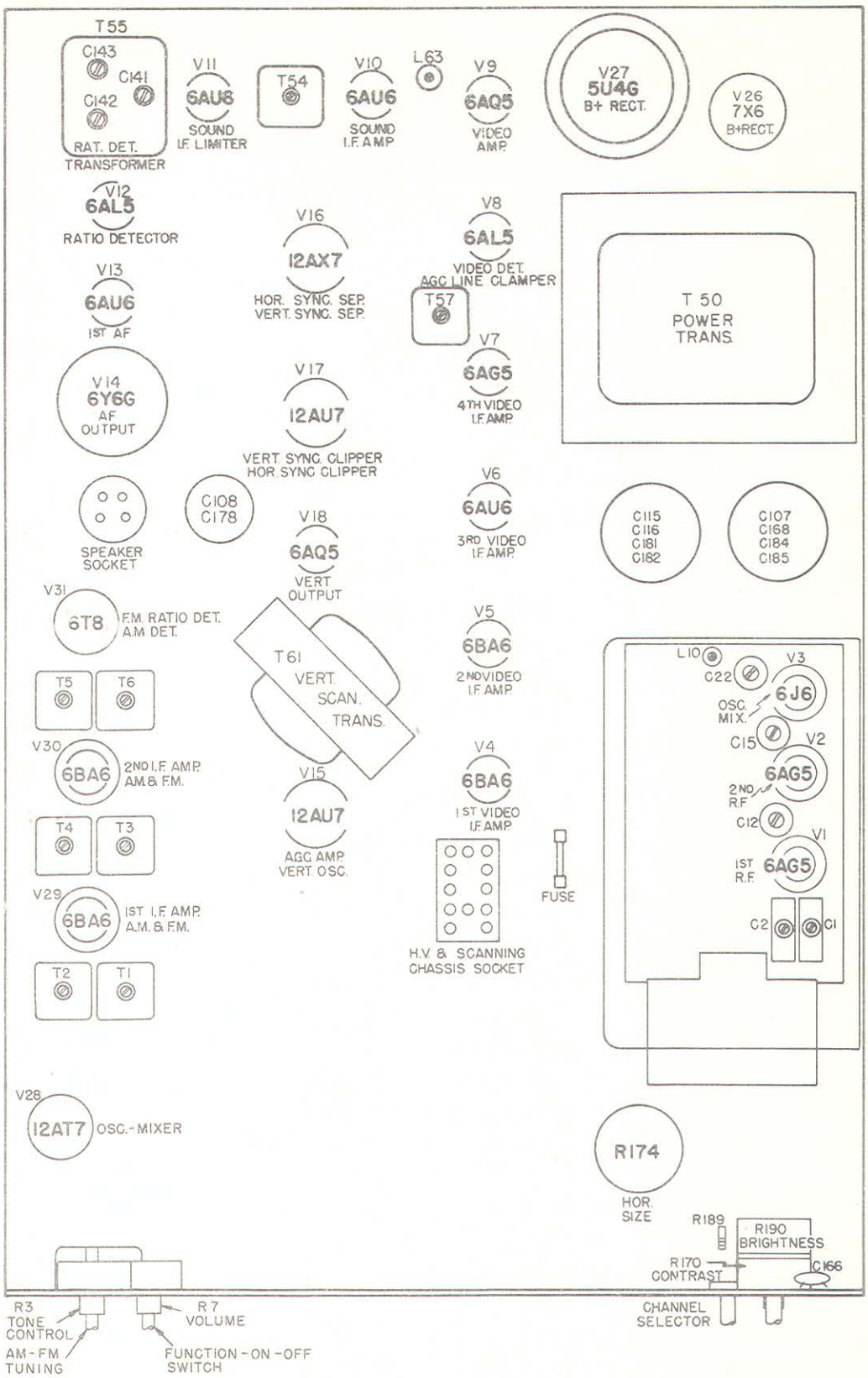


FIG. 5 - CHASSIS TOP LAYOUT

INSTALLATION AND SERVICE INSTRUCTIONS

Picture Tube Handling

All Sylvania model television receivers incorporating chassis 1-108 are shipped complete with the picture tube installed on the chassis and connected for operation. However, if it becomes necessary to re-install a picture tube due to replacement or servicing, the following precautions should be observed.

1. Do not open the picture tube carton until ready to install the picture tube.
2. Do not handle the picture tube unless protective goggles and gloves are worn. People not so equipped with such safety devices should be kept at a distance while the picture tube is being handled.
3. Keep the picture tube as far from the body as possible while handling.

Picture Tube Replacement

To remove the picture tube from the television chassis, remove the picture tube socket and loosen the ion trap magnet so that it can be pulled to the rear and off the neck of the tube. Remove the picture tube hold down strap by unscrewing the No. 10-32 nut with a spintite which holds down one end of the strap at the tuner unit side. When the rim of the picture tube is free from the strap, carefully pull out the picture tube through the focus unit and deflection coils.

To replace a picture tube follow the above procedure in reverse order being careful not to force the picture tube if the neck binds. Investigate and remove the cause of trouble. Before resting the bell of the tube on the rubber pads against the picture tube stops, rotate the picture tube to the left so that the anode contact is directly below the high voltage lead coming out of the H.V. Supply. Clean the face of the tube to remove dirt and finger marks before installing the chassis into the cabinet.

Preset Controls Adjustment

All pre-set controls are grouped under the chassis for greater ease of adjustment. These controls are located on the front right side of the television chassis and are accessible from the front of the cabinet. Refer to Fig. 6 when making the following adjustments.

Vertical Hold (11)

Adjust the Vertical Hold control until the pattern stops vertical movement.

Vertical Size (10) and Vertical Linearity (9)

Adjust the Vertical Size control until the picture fills the screen vertically. Adjust the Vertical Linearity until the pattern is symmetrical from top to bottom. Adjustment of either control will require a readjustment of the other.

Horizontal Centering (14)

Adjust the Horizontal Centering control until the picture is centered in the screen from left to right.

Horizontal Size (12)

Adjust the Horizontal Size control until the picture just fills the screen horizontally. If necessary, adjust the Horizontal Centering (13) control to align the picture with the mask.

Horizontal Linearity (13)

With the Horizontal Size (12) control set for approximately the correct picture width, rotate the Horizontal Linearity control fully counterclockwise. Slowly turn the linearity control clockwise until crowding is visible in the center of the picture. Now carefully turn the control back (counterclockwise) only sufficient to remove the crowding in the picture or pattern. Note: Do not operate the receiver with this control mis-adjusted. On some chassis, it may not be possible to obtain crowding of the picture. In such cases, the control should be set to the fully clockwise position.

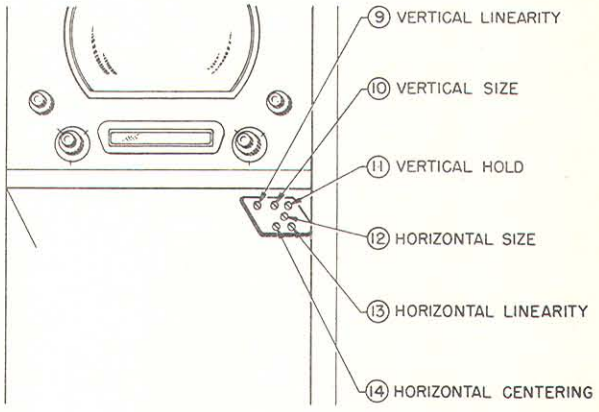


FIG. 6 - UNDER CHASSIS CONTROLS

Chassis Removal

To remove chassis from the cabinet, proceed as follows:

1. Remove all panel control knobs from the front of cabinet.
2. From the rear of the cabinet take out the chassis holddown screws which hold the chassis to the mounting shelf.
3. Disconnect the twin lead and the white wire from the loop antenna mounted in the compartment beneath the television chassis.
4. Disconnect the television antenna, radio antenna, phono power cord, and phono input cable from the rear of the television chassis.
5. Remove the cabinet back interlock cover screws so that the interlock cover will hinge back and hang at the rear of the cabinet.
6. Remove speaker plug and feed cable down through hole in chassis mounting shelf. Pull up twin lead and white wire from the lower compartment which were connected to the loop antenna.
7. Slide the chassis all the way out the back of the cabinet.

To reinstall chassis, follow above procedure in reverse order.

Adjustment of Ion Trap Magnet and Focus Magnet

The adjustment of the ion trap and focus magnets is interdependent and therefore it is necessary to check the adjustment of both magnets at the same time.

Before making any adjustments, the function of each magnet should be noted.

The ion trap magnet is used to obtain maximum brilliance of the raster or picture and should be adjusted to obtain maximum brilliance as described below.

The focus magnet is used to obtain correct focus of the picture and also to position the picture vertically in the screen mask (the picture is positioned horizontally by adjustment of the horizontal centering control, located on the underside of the chassis). There should be no gap between the yoke and the focus magnet. If the magnet is not correctly positioned against the yoke, do so by adjusting the two knurled nuts and the two hexagon nuts holding the focus magnet mounting bracket to the upper chassis of the receiver.

Before proceeding with adjustment of the focus of the receiver, check for correct adjustment of the ion trap magnet. Loosen the wingnut holding the ion trap magnet to the neck of the picture tube. Check that the magnet is the correct way round; the smaller of the two polepieces or clips should be adjacent to the focus magnet.

Set the contrast control almost at minimum and the brightness control at maximum. Position the ion trap magnet so that there is approximately 1/8" between the ion trap magnet and the focus magnet. The ion trap magnet should be slowly rotated until a picture (or raster, if the receiver is not yet tuned to a station) is visible on the screen. The brightness should now be reduced by means of the brightness control and the ion trap magnet carefully twisted and moved a small amount backwards and forwards on the neck of the tube, to obtain maximum brightness. Finally, adjust the brightness control to obtain the maximum brightness and then carefully adjust the ion trap magnet; it may be possible to increase the brightness still more by turning the contrast control towards maximum and again adjusting the ion trap magnet. The correct position of the ion trap magnet is where it ensures the greatest possible brightness of the raster or picture before it enlarges and fades out as the setting of the brightness control is increased. Do not leave the brightness control in this position as the condition causes severe overload of the high voltage supply.

The high voltage supply should be operating to give the correct voltage (9.5 KV. with brightness and contrast controls at minimum). If the picture is not centered vertically on the screen, this should be done by moving the focus magnet up or down as required - lock it in position by means of the two hexagon nuts. If the picture is not centered horizontally, adjust the horizontal centering control.

In order to correctly adjust the focus of the receiver it is desirable to make the adjustment when a test pattern is being received, so that the focus may be checked in a horizontal direction, as evidenced by optimum resolution of the closely spaced vertical lines, etc., on the test pattern. Correct focus in the vertical direction is evidenced by the clarity or sharpness of the scanning lines; it will usually be found that a compromise has to be made between optimum horizontal and vertical focus, since optimum focus of the scanning lines will not necessarily ensure optimum focus in the horizontal direction.

A preliminary adjustment of the screws on the focus magnet should now be made to bring the raster or picture in focus. This preliminary adjustment will not, of course, be necessary if the raster or picture is already in focus. (NOTE: Use a non-magnetic screwdriver to adjust the focus screws).

Adjust the focus screws to obtain the best horizontal and vertical definition, as previously described. The two screws should be adjusted alternately in step so that maximum focus will be obtained with both screws having approximately equal air gap. (NOTE: Some

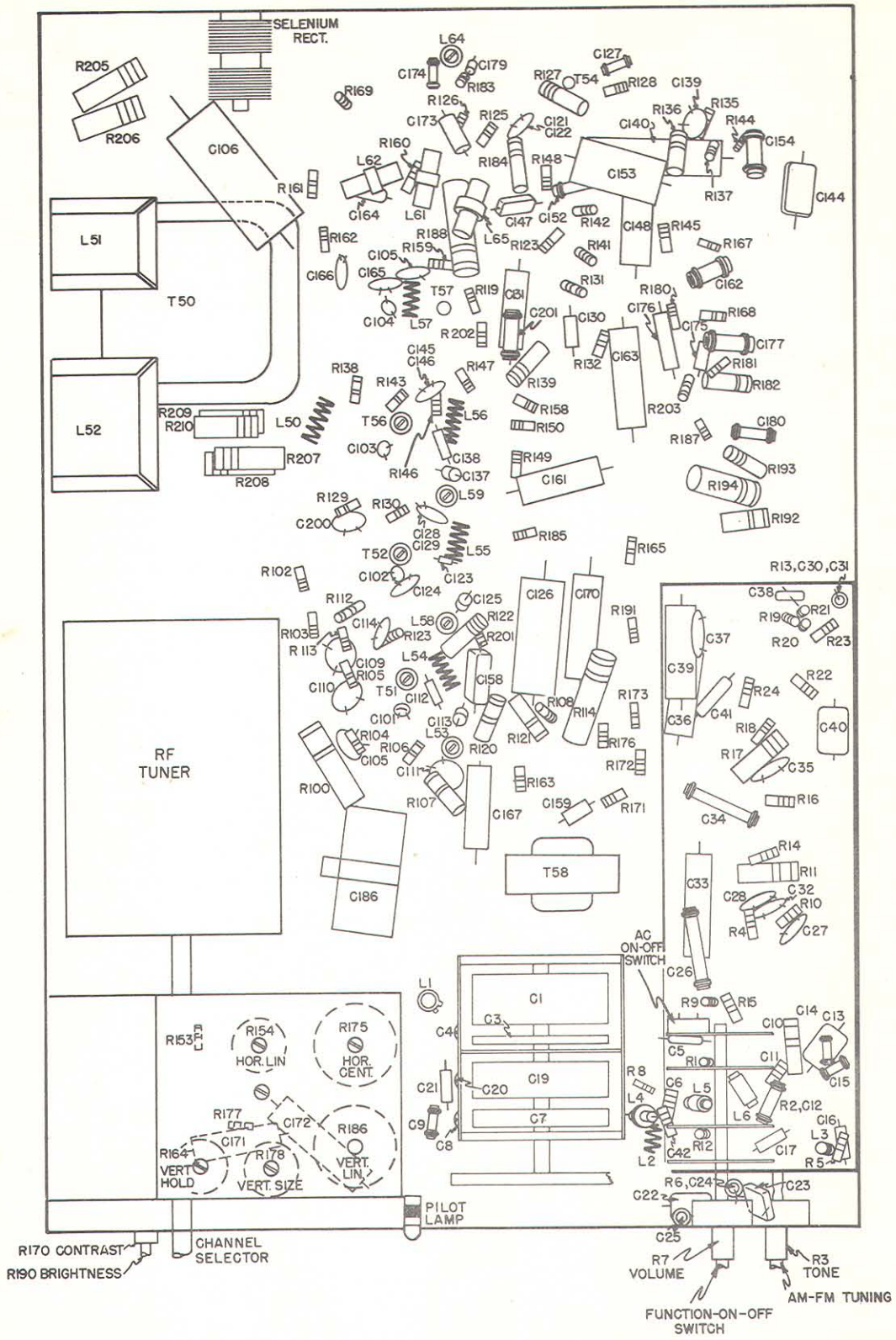


FIG. 7 - CHASSIS BOTTOM LAYOUT

chassis may incorporate focus magnets having one screw only. In this case, the same procedure should be followed, focusing with one screw).

Deflection Yoke Adjustment

The deflection yoke must be positioned against the flare of the picture tube. To do this, loosen the wing screw located underneath the yoke and push the yoke as far forward as possible. If the picture is not square with the mask, rotate the yoke. Loosen the two side wing screws to raise or lower the yoke so that the neck of the picture tube will seat parallel with the chassis.

Check of Horizontal Sync Operation

The operation of the horizontal synchronizing circuit should be checked as follows:

A. Remove the signal by tuning the channel selector to a "free" channel; i.e., a channel on which no signal is received, then re-tuning to the original channel. The picture should immediately fall into synchronization.

B. Switch "off" the power to the receiver for about five minutes and then switch receiver "on" and check that the picture pulls into synchronization.

C. Check for correct phasing of the synchronizing circuit by observing that there is approximately 1/8" of "blanking" visible on the right hand edge of the picture. It will be necessary to turn the contrast control almost to minimum and to readjust the brightness control.
NOTE: Before making check "C" above, be sure the horizontal linearity control is correctly adjusted. Refer to "Preset Controls Adjustment", Page 8.

If the receiver passes the above checks, no adjustments to the horizontal synchronizing circuit need be made.

If either check "A" or "B" cannot be passed, the adjustments under "Slight Retouching Adjustments" should be made.

If check "C" cannot be passed, it will be necessary to proceed to "Complete Realignment."

Slight Retouching Adjustment

A. Remove the 6AL5 horizontal discriminator tube located on the upper chassis, from its socket.

B. Carefully turn the frequency adjustment screw (top of discriminator transformer T53) until the picture moves back and forth across the screen of the picture tube with the blanking bar vertical.

C. Insert the 6AL5 horizontal discriminator tube located on the upper chassis from its socket.

Complete Realignment

A. Turn the core screw in the horizontal "ringing" coil L60 all the way out (counterclockwise). Short out 4700 ohm horizontal charge circuit peaking resistor R211. Refer to "Preset Controls Adjustment," Page 8 and adjust horizontal linearity control.

B. Remove the 6AL5 horizontal discriminator tube located on the upper chassis from its socket.

C. Carefully turn the frequency adjustment screw (top of discriminator transformer T53) until the picture moves back and forth across the screen of the picture tube with the blanking bar vertical.

D. Insert the 6AL5 horizontal discriminator tube back into its socket.

E. Adjust the phase adjustment screw (under side of discriminator transformer T53) until approximately 1/8" of "blanking" is visible on the right-hand edge of the picture. In order to see the "blanking," it will be necessary to turn the contrast control almost to minimum and to readjust the brightness control.

F. Check the "free-running" of the horizontal oscillator as described under paragraphs "B," "C," and "D" and if necessary, readjust the frequency adjustment screw on top of horizontal discriminator transformer T53.

G. Make a final check of the phasing as described in paragraph "E" above. It is important that both the "free-running" and the phasing are correct.

H. Remove short from across 4700 ohm resistor 211 and re-adjust the horizontal linearity control as described under "Preset Controls Adjustment," Page 8. Turn the core of the horizontal "ringing" coil L60 clockwise until approximately 1/8" of "blanking" is again visible on the right edge of the picture.

I. The "pull-in" range of the circuit should now be checked. Turn the oscillator fre-

quency adjustment screw (top of transformer T53) in either direction until the picture falls out of sync as indicated by the presence of a number of diagonal bars. Slowly turn the adjustment screw so as to decrease the number of bars visible just before the picture again falls into sync. The last number of bars visible must not be less than three or more than four. The total number of bars may appear either as several full bars and two half bars or all as full bars. The adjustment screw must be turned very slowly and carefully after the number of bars has been reduced to five or six, in order to get an accurate indication of the minimum number of bars it is possible to obtain.

Turn the adjustment screw in the opposite direction until the picture again falls out of sync and repeat the foregoing procedure. Again the total number of bars visible just before the picture falls into sync must not be less than three or more than four.

J. After checking the "pull-in" range, it is necessary to repeat the procedure described in paragraphs "B," "C," and "D."

K. Remove the signal by tuning to a "free" channel, then re-tuning to the original channel. The picture should immediately fall into synchronization.

L. Switch off the receiver for about five minutes and then switch on again and check that the picture pulls into synchronization.

High Voltage Adjustment

The trimmer capacitor C191 in the high voltage power supply is adjusted to set the frequency of the R.F. oscillator for correct operation of the circuit. The trimmer is adjusted as follows:

(a) Turn the contrast and brightness controls to minimum.
(b) Screw the trimmer C191 to minimum capacity (all the way out).
(c) Slowly screw in the trimmer and at the same time observe the reading on the voltmeter with a high voltage probe connected to the output of the high voltage supply (anode connector on picture tube). A peak voltage (approximately 12 KV. should be reached. Continue to turn the trimmer C191 towards maximum capacity until the voltage reads 9.5 KV. The trimmer is now adjusted to the correct position. NOTE: (1) Make certain that the large cover shielding the high voltage supply is in proper position before adjusting the trimmer capacitor. (2) The high voltage supply can still provide an output, although much less than normal, when the 250 ma. fuse in the receiver has blown. This is due to the fact that the fuse is in the B+ supply only and the high voltage oscillator uses both the B+ and B- supplies.

"Ringing" Coil Adjustment

Refer to "Complete Realignment," Page 11.

Caution

Do not operate the receiver under any of the following conditions:

(a) Excessive horizontal scan (horizontal size control misadjusted).
(b) Horizontal linearity mal-adjusted. (Refer to Preset Controls Adjustment).
(c) High Voltage Supply trimmer capacitor mal-adjusted. (Refer to High Voltage Adjustment).

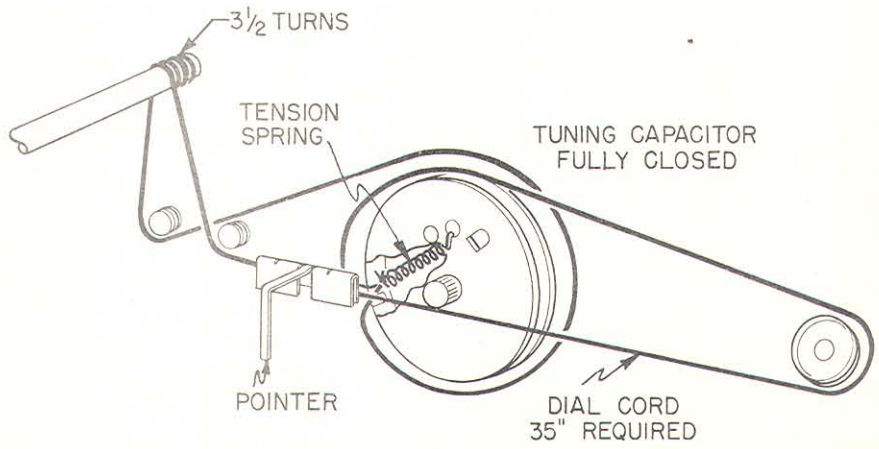


FIG. 8 - DIAL CORD HOOKUP

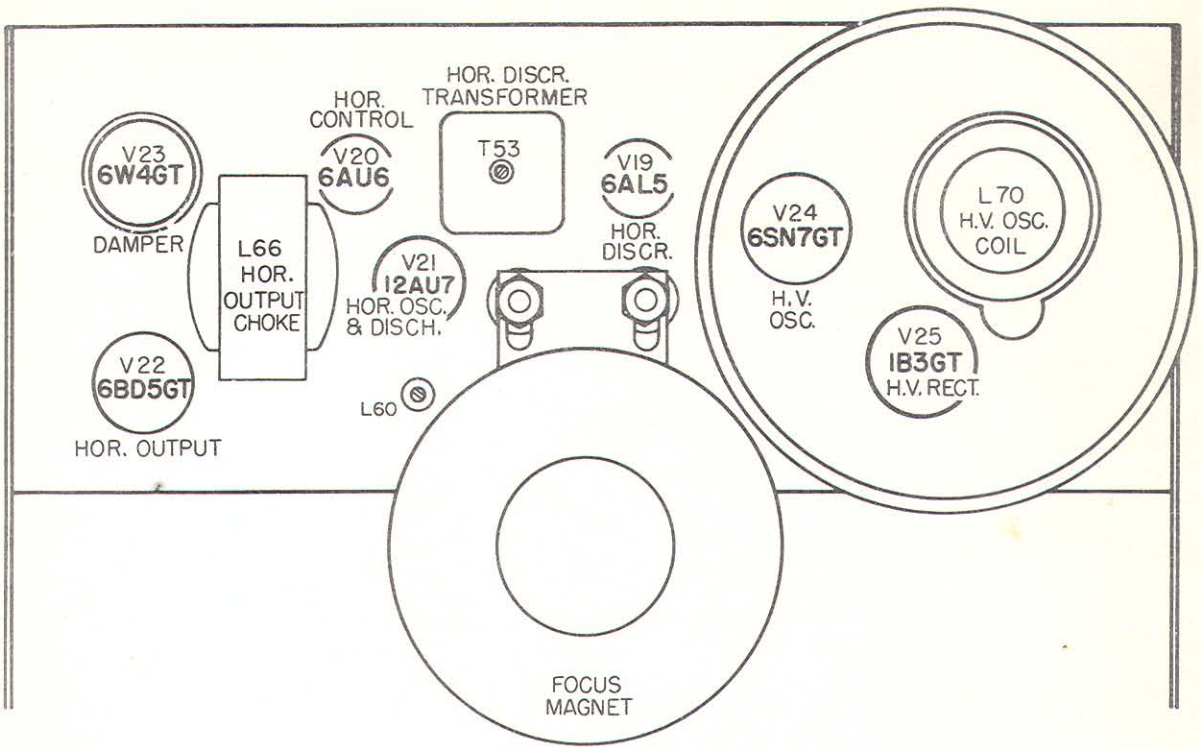


FIG. 9 - UPPER CHASSIS TOP LAYOUT

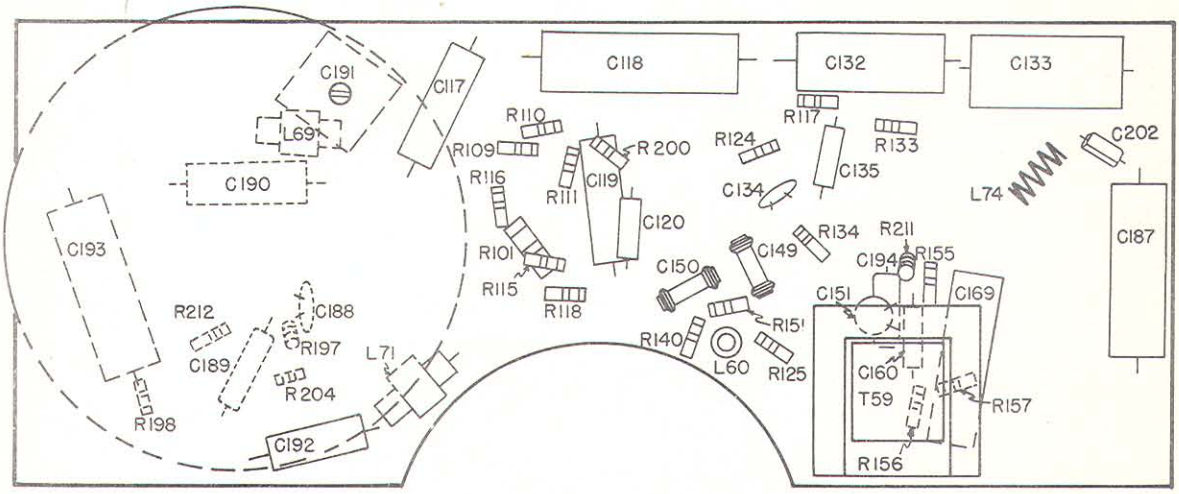
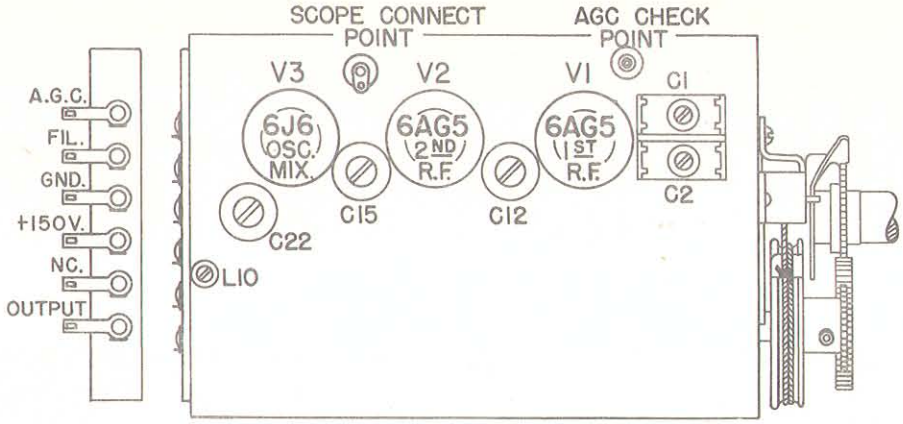
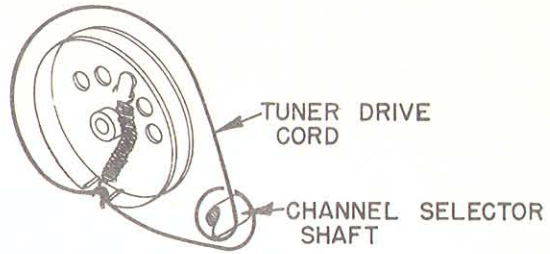
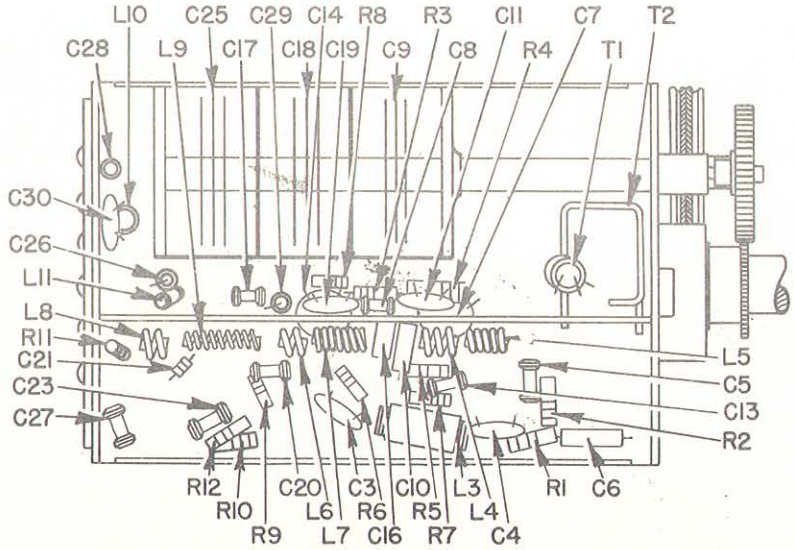


FIG. 10 - UPPER CHASSIS BOTTOM LAYOUT





CHANNEL SELECTOR & DRIVE CORD SHOWN IN EXTREME COUNTERCLOCKWISE POSITION.



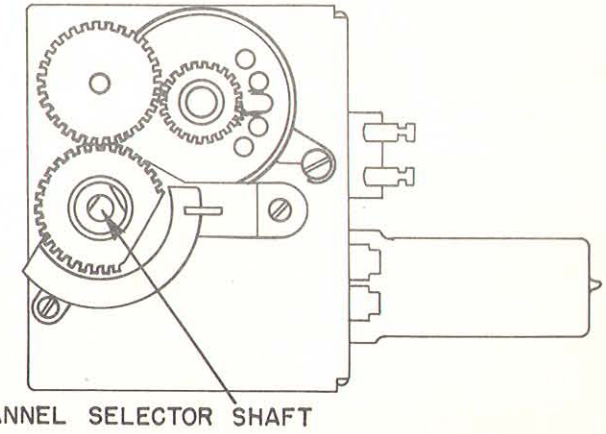


FIG. 11 - R.F. TUNER LAYOUT

Note: This RF tuner has been thoroughly tested at the factory and should provide trouble free reception throughout the life of the chassis. However, if service other than alignment is required, return the complete tuner to the factory for replacement.

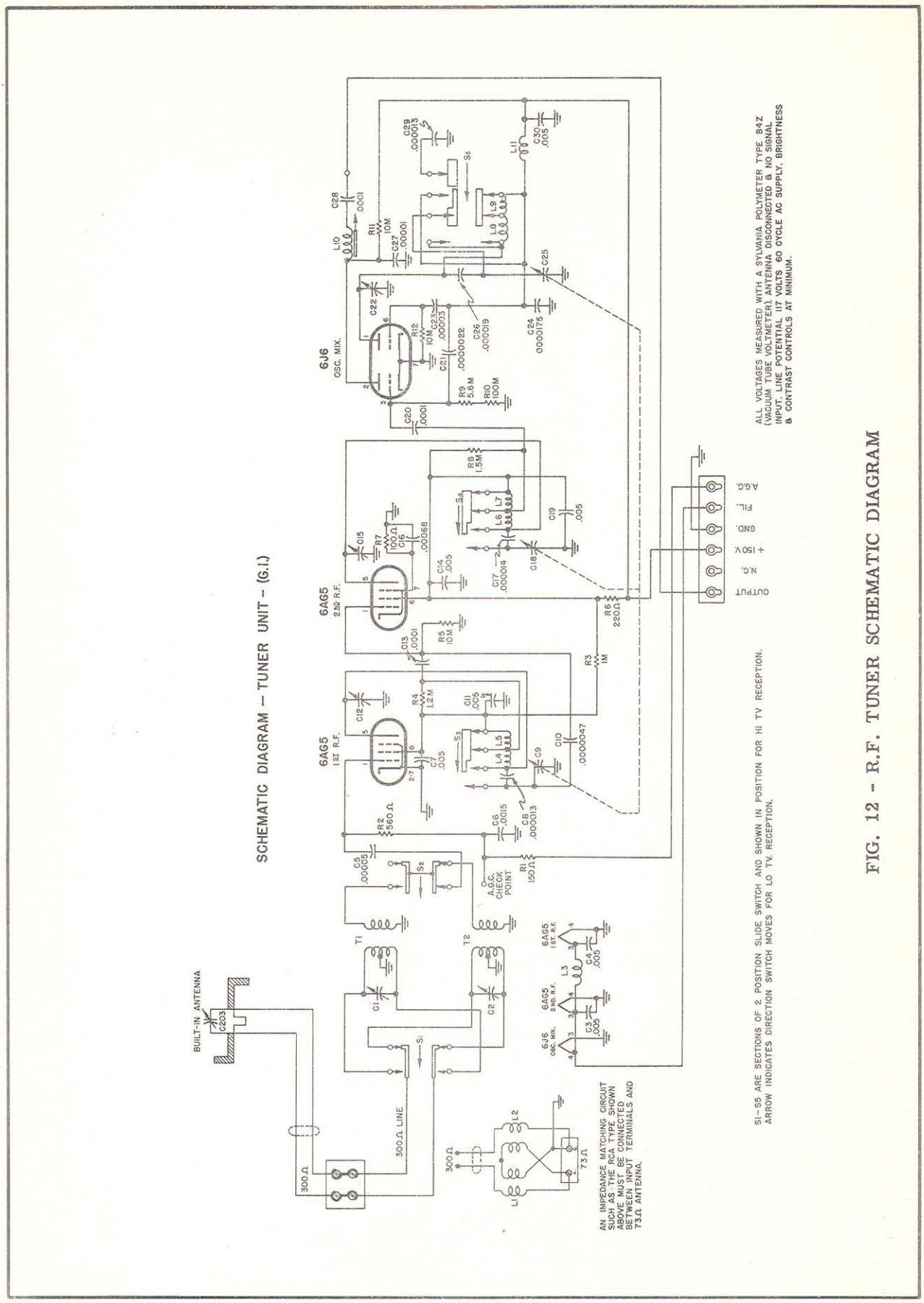


FIG. 12 - R.F. TUNER SCHEMATIC DIAGRAM

ALIGNMENT PROCEDURE

The television portion of this chassis alignment is the same as that alignment procedure appearing in Bulletin 9-1 for chassis 1-139 and has therefore been omitted from this bulletin.

The alignment procedure to follow is for the AM-FM tuner only. Refer to Bulletin 9-1 for television alignment.

Approximate FM IF Alignment

Indicating meter connection ..... DC voltmeter connected across 68,000 ohm 6T8 Cathode Resistor R24
Generator ground lead connection ..... Receiver Chassis
Generator modulation ..... Off
Position of volume control ..... Fully on
Position of tone control ..... "HI"
Position of pointer with tuner fully closed ..... Last line below the 88 MC. calibration mark on the dummy dial

SELECTOR SWITCH POSITION	POSITION OF TUNER	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	CORE ADJUSTMENTS (IN ORDER SHOWN)	CORE FUNCTION
FM	Closed	10.7 Mc.	0.1 mfd.	Trans.-Grid (Pin 2)	T3-A, T3-B, T1-A, T-1B	I.F.

Adjust for maximum reading on DC voltmeter. (Must be vacuum tube voltmeter with high input resistance). As cores are adjusted, decrease the output of the generator to maintain approximately 2.5 volts.

AM Alignment

Output meter connection ..... Across speaker voice coil
Generator ground lead connection ..... Receiver Chassis
Generator modulation ..... 30%, 400 cycles
Position of volume control ..... Fully on
Position of tone control ..... "HI"
External antenna disconnected

SELECTOR SWITCH POSITION	POSITION OF TUNER	GENERATOR FREQUENCY	DUMMY ANTENNA	GENERATOR CONNECTION	CORE & TRIMMER ADJUSTMENTS (IN ORDER SHOWN)	CORE & TRIMMER FUNCTION
AM	Closed	455 Kc.	0.1 mfd.	Trans.-Grid (Pin 2)	T5-B, T4-A, T4-B, T2-A T2-B	I.F.
AM	1600 KC.	1600 KC.	50 mmfd.	Hazeltine Loop	C23	Osc.
AM	1400 KC.	1400 KC.	50 mmfd.	Hazeltine Loop	C6	Ant.

Final FM Alignment

A. Repeat APPROXIMATE FM I.F. ALIGNMENT to obtain exact maximum on DC voltmeter connected across 68,000 ohm resistor 6T8 cathode resistor R24.

B. If a 10.7 Mc. frequency modulated generator is available, connect to translator grid (Pin 2) through a 270 to 500 ohm resistor and proceed to Section D.

Note: Variable capacitor trimmers C4, C8 and C20 are accessible for adjustment through holes in the right side of the chassis.

ALIGNMENT PROCEDURE

C. If a 10.7 Mc. frequency modulated generator is not available, connect an R.F.-FM generator to antenna terminals through two 120 ohm resistors, one in series with each terminal of the generator.

D. Connect the sweep output of the generator to the X-axis (horizontal) amplifier of the oscilloscope.

E. Connect the Y-axis (vertical) amplifier of the oscilloscope across 100,000 ohm resistor R23 through 10,000 to 100,000 ohms at receiver end of one lead.

F. Adjust the generator for 300 Kc. deviation. Use full gain of the oscilloscope Y-axis amplifier and only as much output from the generator as is necessary.

G. Adjust T5-A for maximum output, vertically:

Adjust T6-A and T6-B until the center of the pattern becomes a straight lines diagonally across the oscilloscope screen. Repeak these three cores to obtain a symmetrical pattern of maximum vertical amplitude. See oscilloscope pattern in Figure 13.

H. Connect an R.F.-FM generator to antenna terminals through two 120 ohm resistors, one in series with each terminal of the generator. Adjust the generator for 22.5 Kc. deviation.

I. Remove the dial background. Set the pointer to 108 Mc. on the dummy dial. Tune the generator to 108 Mc. Adjust C8 to maximum output meter reading. If two such points are found by tuning C8, use the higher frequency. (Lowest capacity setting of C8).

J. Tune the generator and receiver to 106 Mc. and peak C4 for maximum output meter reading.

K. Remove the signal generator, oscilloscope, and resistors, restoring receiver to normal operating condition.

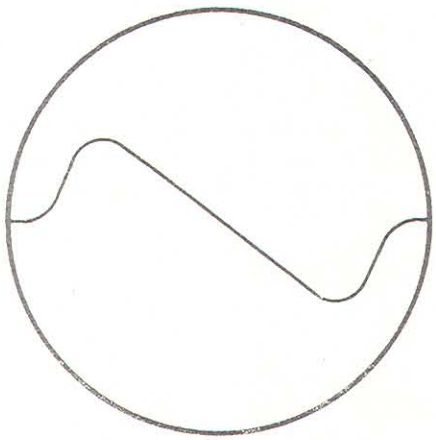


FIG. 13 - FM DISCRIMINATOR OUTPUT

REPAIR PARTS LIST

SCHEMATIC LOCATION	SERVICE PART NUMBER	DESCRIPTION
	196-0002	Anode Connector & Lead Assembly
	582-0002	Antenna Assembly
	582-0001	Antenna Loop Assembly - Bc.
	726-0001	Background - Dial
	482-0002	Base (for AM-FM Tuner Tube Shields)
	400-0002	Beam Bender
	715-0001	Bezel - 10" (for Model 1-076)
	715-0003	Bezel - Station Dial
	715-0002	Bezel - 12 1/2" (for Model 1-128)
	416-0005	Board - Antenna Terminal
	487-0005	Button - Snap - Dial Background Mtg.
C131	162-0622	Capacitor - Paper - .002 Mfd. - 600 V.
C119	162-0625	Capacitor - Paper - .005 Mfd. - 600 V.
C167	162-04115	Capacitor - Paper - .015 Mfd. - 400 V.
C171	162-0612	Capacitor - Paper - .02 Mfd. - 600 V.
C190	160-42122	Capacitor - Paper - Molded - .022 Mfd. - 400 V.
C33,C36,C161,C192	162-0615	Capacitor - Paper - .05 Mfd. - 600 V.
C148,C163,C169, C170,C172	162-0601	Capacitor - Paper - 0.1 Mfd. - 600 V.
C118,C140,C187	162-0402	Capacitor - Paper - 0.2 Mfd. - 400 V.
C112,C138	168-0004P	Capacitor - Ceramic - .00000068 Mfd. - 500 V.
C123	168-0001P	Capacitor - Ceramic - .0000015 Mfd. - 500 V.
C6	168-0006P	Capacitor - Ceramic - .000002 Mfd. - 500 V.
C174	168-0005P	Capacitor - Ceramic - .0000047 Mfd. - 500 V.
C9,C11,C17,C137	166-0006P	Capacitor - Ceramic - .000006 Mfd. - 500 V.
C113,C125,C164,C173	166-0010P	Capacitor - Ceramic - .00001 Mfd. - 500 V.
C21	166-0015P	Capacitor - Ceramic - .000015 Mfd. - 500 V.
C127,C179	166-0050N	Capacitor - Ceramic - .00005 Mfd. - 500 V.
C16,C42	166-0050P	Capacitor - Ceramic - .00005 Mfd. - 500 V.
C15	166-0075N	Capacitor - Ceramic - .000075 Mfd. - 500 V.
C10,C120,C135,C175	166-0100P	Capacitor - Ceramic - .0001 Mfd. - 500 V.
C159	166-0250P	Capacitor - Ceramic - .00025 Mfd. - 500 V.
C130	166-0500P	Capacitor - Ceramic - .0005 Mfd. - 500 V.
C101,C102,C103,C104	166-1000D	Capacitor - Ceramic - .001 Mfd. - 600 V.
C160	166-1000P	Capacitor - Ceramic - .001 Mfd. - 500 V.
C176	166-2000P	Capacitor - Ceramic - .002 Mfd. - 500 V.
C14	166-2000N	Capacitor - Ceramic - .002 Mfd. - 500 V.
C121,C122,C128, C129,C145,C146	168-0003D	Capacitor - Ceramic - .004 Mfd. - Dual - 450 V.
C100,C105,C109,C110, C111,C114,C124,C134, C139,C151,C165,C166, C183,C188,C200	166-5000D	Capacitor - Ceramic - .005 Mfd. - 450 V.
C25,C117,C149,C150, C152,C154,C162,C177, C180,C201	168-0002N	Capacitor - Ceramic - .01 Mfd. - 500 V.
C27,C28,C32,C35,C37	168-0002D	Capacitor - Ceramic - .01 Mfd. - 500 V.
C26,C34	168-0007N	Capacitor - Ceramic - .02 Mfd. - 500 V.
C5	163-0025	Capacitor - Mica - .000025 Mfd. - 500 V.
C22,C155,C202	163-0050	Capacitor - Mica - .00005 Mfd. - 500 V.
C18	163-0100	Capacitor - Mica - .0001 Mfd. - 500 V.
C23,C156,C204	163-0200	Capacitor - Mica - .0002 Mfd. - 500 V.
C147	163-0220	Capacitor - Mica - .00022 Mfd. - 500 V.
C41	163-0250	Capacitor - Mica - .00025 Mfd. - 500 V.
C13,C40	163-0500	Capacitor - Mica - .0005 Mfd. - 500 V.
C38,C144,C194	163-0680	Capacitor - Mica - .00068 Mfd. - 500 V.
C158	163-1000	Capacitor - Mica - .001 Mfd. - 500 V.
C189	163-1500	Capacitor - Mica - .0015 Mfd. - 300 V.
C132	160-42115	Capacitor - Molded Polystyrene - .015 Mfd. - 400 V.
C193	160-14350	Capacitor - Molded - .0005 Mfd. - 10,000 V.

REPAIR PARTS LIST

SCHEMATIC LOCATION	SERVICE PART NUMBER	DESCRIPTION
	190-0002	Capacitor-Resistor Combination
C157		Capacitor - .01 Mfd.
R199		Resistor - 82,000 Ohm
	190-0004	Capacitor-Resistor Combination
C12		Capacitor - .01 Mfd.
R2		Resistor - 1,500 Ohm - 1/2 W.
	190-0003	Capacitor-Resistor Combination
C30,C31		Capacitor - .0001 Mfd.
R13		Resistor - 47,000 Ohm - 1/2 W.
	190-0002	Capacitor-Resistor Combination
C24		Capacitor - .01 Mfd.
R6		Resistor - 82,000 Ohm - 1/2 W.
C191	172-0022	Capacitor - Trimmer - H.V. Supply
C203	172-0023	Capacitor - Trimmer - Antenna Assembly
C39,C153	161-1001	Capacitor - Electrolytic - 2 Mfd. - 50 V.
C106	161-1003	Capacitor - Electrolytic - 60 Mfd. - 200 V.
C184	161-4000	Capacitor - Electrolytic - 100 Mfd. - 50 V.
C185		10 Mfd. - 450 V.
C168		10 Mfd. - 300 V.
C107		60 Mfd. - 200 V.
C133	161-1005	Capacitor - Electrolytic - 20 Mfd. - 250 V.
C108	161-2001	Capacitor - Electrolytic - 40 Mfd. - 250 V.
C178		25 Mfd. - 25 V.
C126	161-1004	Capacitor - Electrolytic - 10 Mfd. - 12 V., 150 V.
C181	161-4001	Capacitor - Electrolytic - 20 Mfd. - 150 V.
C115		40 Mfd. - 250 V.
C116		80 Mfd. - 250 V.
C182		60 Mfd. - 250 V.
C186	161-1002	Capacitor - Electrolytic - 100 Mfd. - 50 V.
C1,C3,C7,C19	170-0001	Capacitor - AM-FM Variable Tuning
L52	145-0001	Choke - Filter - B+
L51	145-0002	Choke - Filter - B-
L66	241-0002	Choke - Horizontal Output
L50,L54,L55,L56, L57,L74	147-0014	Choke - I.F. Heater
L3	146-0009	Choke - Oscillator Cathode
L5	146-0008	Choke - Oscillator Plate
L4	113-0011	Coil - Bc. Oscillator
L1	111-0006	Coil - F.M. Antenna
L2	113-0012	Coil - F.M. Oscillator
L70	113-0010	Coil - H.V. Supply
L77	147-0015	Coil - H.V. Filament
L69,L71	146-0006	Coil - Filter - H.V. Supply
T51,T52,T56	125-0001	Coil - I.F. Interstage
L53,L58,L59	118-0003	Coil - I.F. Trap
L6,L75,L76	146-0007	Coil - Power & Filament Line Choke
L60	146-0005	Coil - Ringing
L63,L64	129-0001	Coil - Sound Take-Off - 4.5 Mc. Trap
L61	146-0001	Coil - Video Peaking #1
L62	146-0002	Coil - Video Peaking #2
L65	146-0004	Coil - Video Peaking #3
R3	153-0004	Control - Tone
R7	153-0003	Control - Volume
R170,R190	155-0003	Control - Brightness & Contrast
R175	153-3002	Control - Horizontal Centering
R154	153-0002	Control - Horizontal Linearity
R174	153-3001	Control - Horizontal Size

REPAIR PARTS LIST

SCHEMATIC LOCATION	SERVICE PART NUMBER	DESCRIPTION
R164	153-0001	Control - Vertical Hold
R186	153-3000	Control - Vertical Linearity
R178	153-0001	Control - Vertical Size
	195-0001	Cord - A.C. Line
	760-0001	Cover - Bottom
	483-0006	Cover & Chain Assy. - H.V. Supply
	722-0009	Dial - Function Switch
	400-0001	Focus Magnet Assembly
	191-0005	Fuse - 1/4 Amp. - 250 V.
	743-0001	Knob - Channel Assembly
	740-0001	Knob - Inner - Shaft
	744-0005	Knob - Outer - Shaft
	740-0002	Knob - Function Switch
	611-0007	Lamp - 117 V. - Compartment Light
	611-0047	Lamp - Mazda Type #47
	591-0003	Leaflet - Customer Instruction
	199-0002	Light Assembly - Compartment
	552-0016	Nut - Bezel Mounting
	488-0001	Pad - Rubber - Picture Tube Mounting
	792-0002	Pointer - AM-FM Dial
	792-0001	Pointer - TV Tuning
	415-0001	Plug - 3 Prong
	196-0001	Plug & Leads Assembly
	494-0006	Pulley - Metal (.250 Dia.)
	494-0005	Pulley - Metal (.500 Dia.)
	517-0001	Rectifier - Selenium
R1	189-0008	Resistor - 2.2 Ohm - 1/2 W.
R101	189-0007	Resistor - 4.3 Ohm - 1/2 W.
R8	181-0120	Resistor - 12 Ohm - 1/2 W.
R10,R16,R125, R169,R187	181-0680	Resistor - 68 Ohm - 1/2 W.
R106,R123,R157	181-0820	Resistor - 82 Ohm - 1/2 W.
R146,R147,R162,R204	181-0101	Resistor - 100 Ohm - 1/2 W.
R143	181-0151	Resistor - 150 Ohm - 1/2 W.
R14	181-0471	Resistor - 470 Ohm - 1/2 W.
R195,R196	181-0561	Resistor - 560 Ohm - 1/2 W.
R105,R113,R133,R185, R191	181-0102	Resistor - 1000 Ohm - 1/2 W.
R165	181-0122	Resistor - 1200 Ohm - 1/2 W.
R18,R104	181-0152	Resistor - 1500 Ohm - 1/2 W.
R124,R130	181-0222	Resistor - 2200 Ohm - 1/2 W.
R112	181-0272	Resistor - 2700 Ohm - 1/2 W.
R161,R176,R197	181-0392	Resistor - 3900 Ohm - 1/2 W.
R203,R211	181-0472	Resistor - 4700 Ohm - 1/2 W.
R159	181-0562	Resistor - 5600 Ohm - 1/2 W.
R183	181-0682	Resistor - 6800 Ohm - 1/2 W.
R117	181-0822	Resistor - 8200 Ohm - 1/2 W.
R123,R142	181-0103	Resistor - 10,000 Ohm - 1/2 W.
R116	181-01035	Resistor - 10,000 Ohm - 1/2 W.
R129,R138	181-0153	Resistor - 15,000 Ohm - 1/2 W.
R131	181-0183	Resistor - 18,000 Ohm - 1/2 W.
R160	181-02235	Resistor - 22,000 Ohm - 1/2 W.
R140,R171	181-0223	Resistor - 22,000 Ohm - 1/2 W.
R4,R5,R12	181-0273	Resistor - 27,000 Ohm - 1/2 W.
R22,R115,R135,R189	181-0333	Resistor - 33,000 Ohm - 1/2 W.
R155,R201	181-0393	Resistor - 39,000 Ohm - 1/2 W.
R126,R128	181-0473	Resistor - 47,000 Ohm - 1/2 W.
R152	181-0563	Resistor - 56,000 Ohm - 1/2 W.
R24,R145	181-0683	Resistor - 68,000 Ohm - 1/2 W.
R9,R20,R23,R103,R110, R111,R118,R134,R137, R144,R173,R180,R184	181-0104	Resistor - 100,000 Ohm - 1/2 W.

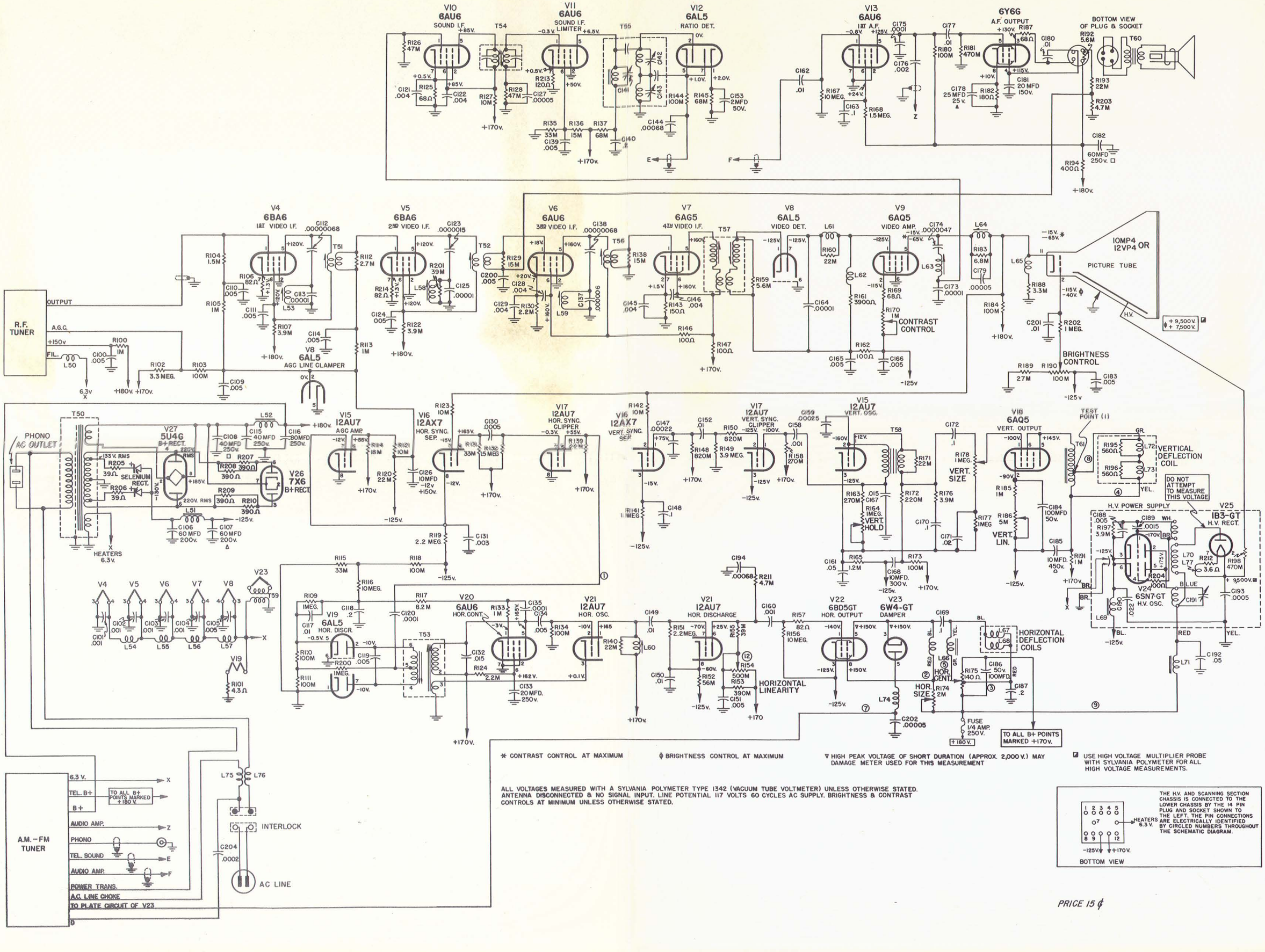
REPAIR PARTS LIST

SCHEMATIC LOCATION	SERVICE PART NUMBER	DESCRIPTION
R172	181-0224	Resistor - 220,000 Ohm - 1/2 W.
R21,R158,R163	181-0274	Resistor - 270,000 Ohm - 1/2 W.
R153	181-0394	Resistor - 390,000 Ohm - 1/2 W.
R181,R198	181-0474	Resistor - 470,000 Ohm - 1/2 W.
R148,R150	181-0824	Resistor - 820,000 Ohm - 1/2 W.
R108,R141,R177, R200,R202	181-0105	Resistor - 1 Megohm - 1/2 W.
R15,R109	181-01055	Resistor - 1 Megohm - 1/2 W.
R132,R168	181-0155	Resistor - 1.5 Megohm - 1/2 W.
R19,R119,R151	181-0225	Resistor - 2.2 Megohm - 1/2 W.
R102	181-0335	Resistor - 3.3 Megohm - 1/2 W.
R149	181-0395	Resistor - 3.9 Megohm - 1/2 W.
R156,R167	181-0106	Resistor - 10 Megohm - 1/2 W.
R182	182-0181	Resistor - 180 Ohm - 1 W.
R107,R122	182-0392	Resistor - 3,900 Ohm - 1 W.
R121,R127	182-0103	Resistor - 10,000 Ohm - 1 W.
R11,R17,R139,R193	182-0223	Resistor - 22,000 Ohm - 1 W.
R120	182-02235	Resistor - 22,000 Ohm - 1 W.
R136	182-0393	Resistor - 39,000 Ohm - 1 W.
R205,R206	183-0390	Resistor - 39 Ohm - 2 W.
R207,R208,R209,R210	183-0391	Resistor - 390 Ohm - 2 W.
R100	183-0102	Resistor - 1000 Ohm - 2 W.
R188	183-0332	Resistor - 3300 Ohm - 2 W.
R192	183-0562	Resistor - 5600 Ohm - 2 W.
R114	183-01835	Resistor - 18,000 Ohm - 2 W.
R194	187-0001	Resistor - 400 Ohm - 5 W.
	483-0007	Ring - Corona Shield - H.V. Supply
	551-0014	Screw - #2 x 3/4 Flat Head x Rec. - On-Off Dial Mtg.
	551-0015	Screw - #6-32 x 3/4 Fr. Hd. x Rec. - Bezel Mtg.
	551-0016	Screw - #8 x 1/2 Rd. Hd. x Rec. - Wood
	483-0005	Shell - Plug & Leads Assy.
	482-0005	Shield - Tube (for 6W4GT Tube)
	482-0003	Shield - Tube (for AM-FM Tuner)
	417-0002	Socket - 1 Prong - Phono
	414-0004	Socket - 4 Prong
	412-0012	Socket - 9 Prong (for 12AT7 Tube)
	417-0001	Socket - 14 Prong
	411-0007	Socket - Pilot Lamp
	412-0011	Socket - Tube - 7 Prong Miniature for Video Chassis
	412-0013	Socket - Tube - 7 Prong Miniature for AM-FM Chassis
	412-0001	Socket - Tube - 8 Prong Lock-in
	412-0006	Socket - Tube - 8 Prong Octal
	412-0009	Socket - Tube - 8 Prong Octal (for 1B3GT tube only - includes retaining ring)
	412-0010	Socket - Tube - 9 Prong Miniature
	539-1000	Speaker - 10" P.M. (for Model 1-076)
	539-1200	Speaker - 12" P.M. (for Model 1-128)
	496-0022	Spring - Picture Tube Grounding
	496-0023	Spring - Dial Cord Tension
	499-0001	Strap Assembly - Picture Tube Mtg. (for Model 1-076)
	499-0012	Strap Assembly - Picture Tube Mtg. (for Model 1-128)
	571-0002	Switch - AC - ON-OFF
	573-0001	Switch - Function - ON-OFF
T1	121-0011	Transformer - 1st I.F. (10.7 Mc.)
T2	121-0010	Transformer - 1st I.F. (455 Kc.)
T3	122-0011	Transformer - 2nd I.F. (10.7 Mc.)
T4	122-0010	Transformer - 2nd I.F. (455 Kc.)

REPAIR PARTS LIST

SCHEMATIC LOCATION	SERVICE PART NUMBER	DESCRIPTION
T5	119-0001	Transformer - Discr. Primary & 3rd A.M.
T6	128-0003	Transformer - 10.7 Mc. Discriminator
T60	143-0010	Transformer - Speaker Output
T55	128-0002	Transformer - 4.5 Mc. Sound Discriminator
T59	240-0001	Transformer - Heater Isolation
T53	128-0001	Transformer - Horizontal Discriminator
T57	120-0002	Transformer - I.F. Band Pass
T50	141-0008	Transformer - Power - 60 C.
T54	120-0001	Transformer - Sound I.F.
T58	242-0001	Transformer - Vertical Oscillator
T61	241-0001	Transformer - Vertical Scanning
	623-0001	Tube - 6AG5
	623-0002	Tube - 6J6
	623-0003	Tube - 6AL5
	623-0004	Tube - 6BA6
	623-0005	Tube - 6AU6
	633-0002	Tube - 1B3GT
	633-0003	Tube - 5U4G
	623-0006	Tube - 12AU7
	633-0004	Tube - 6W4GT
	622-0005	Tube - 6SN7GT
	623-0007	Tube - 6AQ5
	623-0008	Tube - 12AX7
	622-0006	Tube - 6Y6G
	622-0007	Tube - 6BD5GT
	632-0003	Tube - 7X6
	623-0009	Tube - 12AT7
	623-0010	Tube - 6T8
	642-0001	Tube - 10" (for Model 1-076)
	642-0002	Tube - 12 1/2" (for Model 1-128)
	323-0001	Tuner Unit Assembly
	553-0026	Washer - Fibre - Spacer - .032"
L67,L68,L72,L73	100-0001	Yoke - Vertical & Horizontal Deflection

SCHEMATIC DIAGRAM FOR I-108 TV CHASSIS



* CONTRAST CONTROL AT MAXIMUM

ϕ BRIGHTNESS CONTROL AT MAXIMUM

▽ HIGH PEAK VOLTAGE OF SHORT DURATION (APPROX. 2,000 V.) MAY DAMAGE METER USED FOR THIS MEASUREMENT

◪ USE HIGH VOLTAGE MULTIPLIER PROBE WITH SYLVANIA POLYMETER FOR ALL HIGH VOLTAGE MEASUREMENTS.

ALL VOLTAGES MEASURED WITH A SYLVANIA POLYMETER TYPE 1342 (VACUUM TUBE VOLTMETER) UNLESS OTHERWISE STATED. ANTENNA DISCONNECTED & NO SIGNAL INPUT. LINE POTENTIAL 117 VOLTS 60 CYCLES AC SUPPLY. BRIGHTNESS & CONTRAST CONTROLS AT MINIMUM UNLESS OTHERWISE STATED.

THE H.V. AND SCANNING SECTION CHASSIS IS CONNECTED TO THE LOWER CHASSIS BY THE 14 PIN PLUG AND SOCKET SHOWN TO THE LEFT. THE PIN CONNECTIONS ARE ELECTRICALLY IDENTIFIED BY CIRCLED NUMBERS THROUGHOUT THE SCHEMATIC DIAGRAM.

PRICE 15 ¢

FIG. 14 - CHASSIS 1-108 SCHEMATIC DIAGRAM

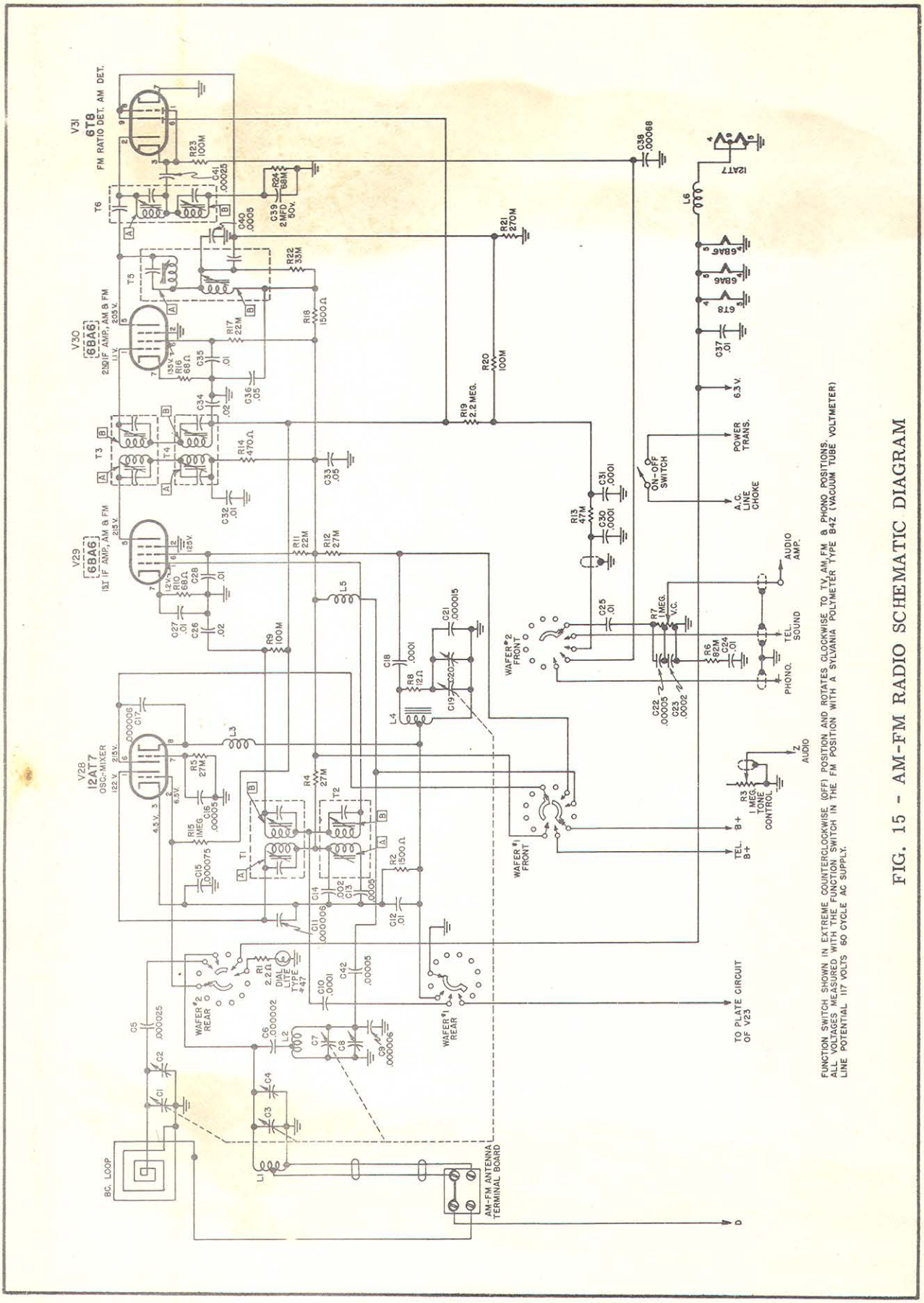


FIG. 15 - AM-FM RADIO SCHEMATIC DIAGRAM