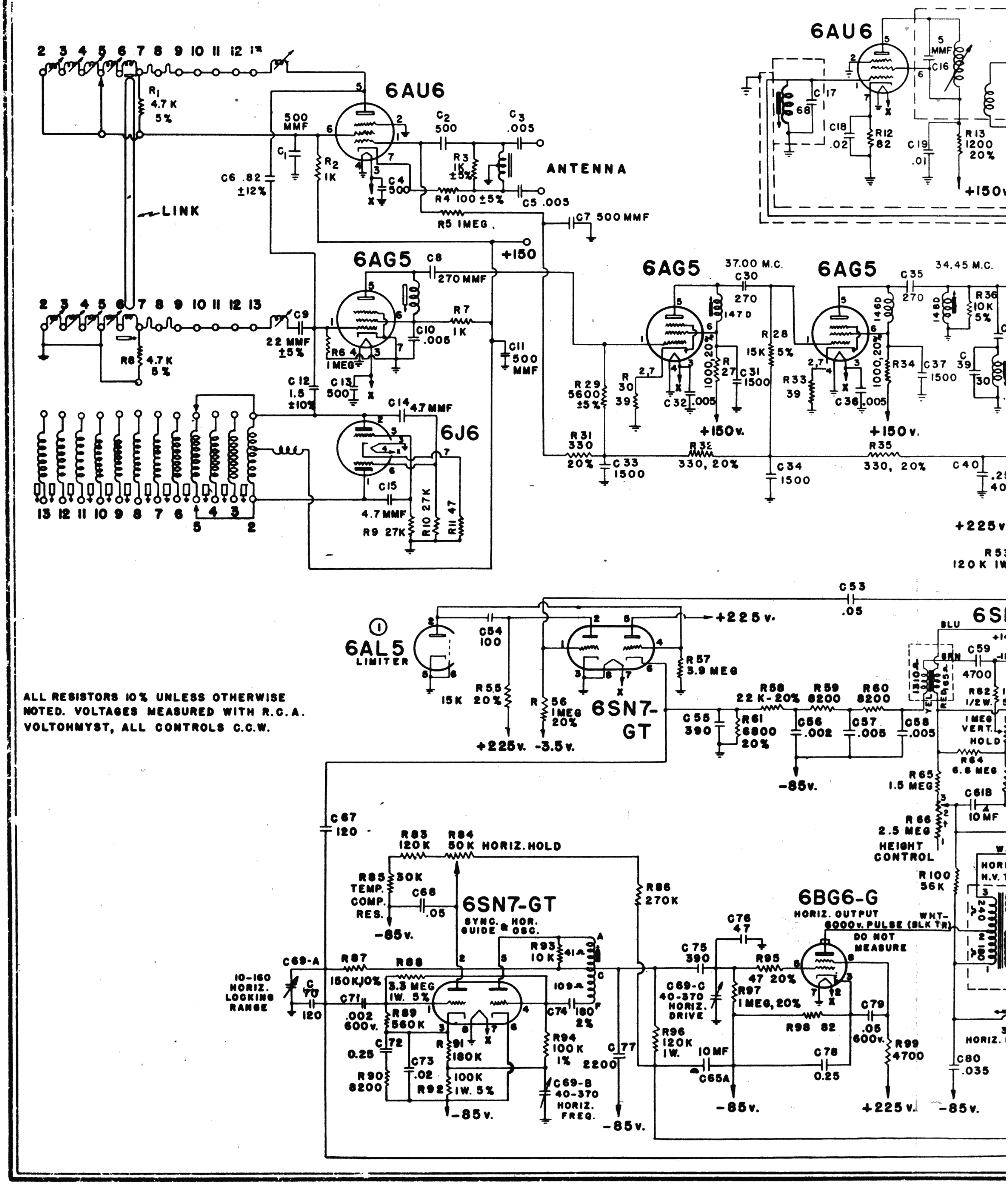
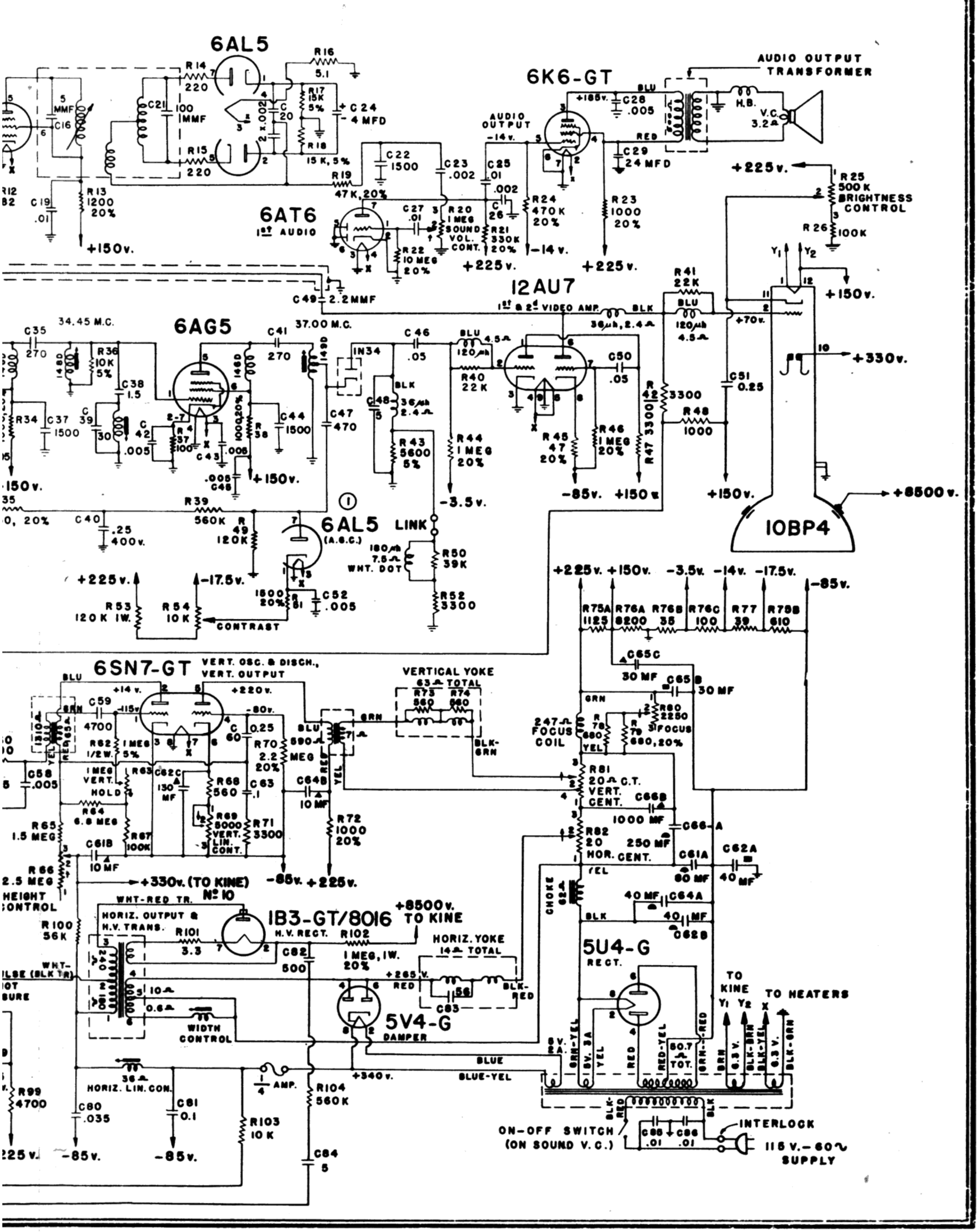
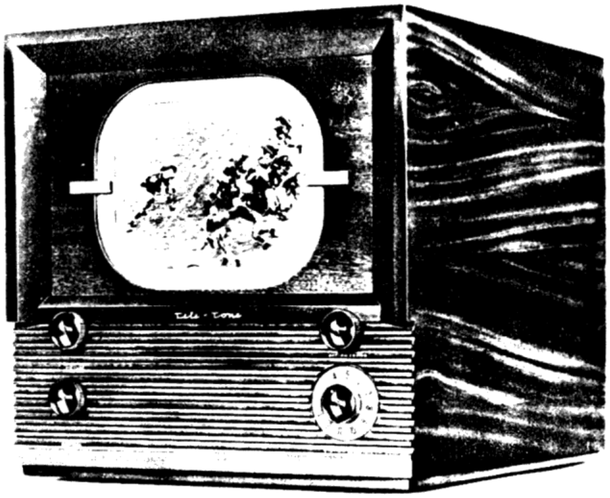


6AU6
R1 4.7 K 5%
500 MMF
C1
C6 .82 ±12%
R2 1K
C2 500
C3 .005
R3 1K ±5%
C4 500
R4 100 ±5%
C5 .005
ANTENNA
R5 1MEG.
C7 500 MMF
LINK
+150
6AG5
C8 270 MMF
C9 22 MMF ±5%
R6 1MEG
R7 1K
C10 .005
C11 500 MMF
R8 4.7K 5%
C12 1.5 ±10%
C13 500
C14 4.7 MMF
6J6
C15 4.7 MMF
R9 27K
R10 27K
R11 47
37.00 M.C.
C30 270
147 D
R 28 15K 5%
R 29 5600 ±5%
R 30 39
R 27
C31 1500
C32 .005
+150v.
R31 330 20%
C33 1500
R32 330, 20%
C34 1500
34.45 M.C.
C35 270
R36 10K 5%
R33 39
R34
C37 1500
C36 .005
R35 330, 20%
C40
C18 .02
R12 82
C17
68
C16
5 MMF
C19 .01
R13 1200 20%
+150v
+225v
120K 1W
C53 .05
6AL5 LIMITER
C54 100
+225 v.
R55 15K 20%
R 56 1MEG 20%
R57 3.9 MEG
6SN7-GT
+225v. -3.5v.
C55 390
R61 6800 20%
R58 22K-20%
R59 8200
R60 8200
C56 .002
C57 .005
C58 .005
-85v.
C59 4700
R62 1/2W.
1MEG VERT. HOLD
R64 6.8 MEG
R65 1.5 MEG
C61B 10MF
R66 2.5 MEG
HEIGHT CONTROL
R100 56K
ALL RESISTORS 10% UNLESS OTHERWISE NOTED. VOLTAGES MEASURED WITH R.C.A. VOLTOHMYST, ALL CONTROLS C.C.W.
C67 120
R83 120K
R84 50K HORIZ. HOLD
R85 30K TEMP. COMP. RES.
C68 .05
-85v.
6SN7-GT SYNC. GUIDE & HOR. OSC.
R86 270K
R93 10K
C69-A
10-160 HORIZ. LOCKING RANGE
C 70 120
R87 150K 10%
R88 3.3 MEG 1W. 5%
C71 .002 600v.
R89 560K
C72 0.25
R90 8200
C73 .02
R91 180K
R92 100K 1W. 5%
R94 100K 1%
C74 180 2%
C69-B 40-370 HORIZ. FREQ.
C77 2200
-85v.
6BG6-G HORIZ. OUTPUT
6000v. PULSE (BLK TR)
DO NOT MEASURE
C76 47
C75 390
R95 47 20%
C69-C 40-370 HORIZ. DRIVE
R97 1MEG, 20%
R96 120K 1W.
10MF C65A
R98 82
C78 0.25
C79 .05 600v.
R99 4700
+225v.
C80 .035
-85v.


6AL5
6K6-GT
AUDIO OUTPUT TRANSFORMER
6AT6
1st AUDIO
12AU7
1st & 2d VIDEO AMP.
6AG5
6AL5 (A.G.C.)
10BP4
6SN7-GT
VERT. OSC. & DISCH., VERT. OUTPUT
VERTICAL YOKE
1B3-GT/8016
H.V. RECT.
HORIZ. YOKE
5U4-G
RECT.
5V4-G
DAMPER
HORIZ. OUTPUT & H.V. TRANS.
WIDTH CONTROL
HORIZ. LIN. CON.
BRIGHTNESS CONTROL
CONTRAST
HEIGHT CONTROL
ON-OFF SWITCH (ON SOUND V.C.)
INTERLOCK
115 V.-60~ SUPPLY
TO HEATERS

I. SPECIFICATIONS



A — TUBE COMPLEMENT

1.	6AU6	RF Amplifier
2.	6AG5	Converter
3.	6J6	RF Oscillator
4.	6AG5	1st Video IF Amplifier
5.	6AG5	2nd Video IF Amplifier
6.	6AG5	3rd Video IF Amplifier
7.	12AU7	1st and 2nd Video Amplifier
8.	6AU6	Sound Take-off Amplifier
9.	6AL5	Ratio Detector
10.	6AT6	1st Audio Amplifier
11.	6K6	Audio Output
12.	6AL5	Sync Limiter and AGC
13.	6SN7	Sync Separator and Amplifier
14.	6SN7	Vertical Oscillator, Discharge and Output
15.	6SN7	Horizontal Oscillator (Sync Guide)
16.	6BG6G	Horizontal Output
17.	1B3/8016	High Voltage Rectifier
18.	5V4-G	Damper
19.	5U4-G	Rectifier
20.	10BP4	Cathode Ray Tube
21.	1N34	Crystal Video Detector

B — DETAIL

Power Consumption
220 Watts

Power Output (Audio)
2 Watts (Undistorted)

Input Impedance
300 Ohms, Balanced

Picture Size
6⅜" x 8½"

Speaker
6" Oval PM—Voice Coil 3.2 ohms at 400 cycles

Dimensions
17½" wide x 17½" high x 20½" deep

Shipping Weight
Approximately 93 lbs.

C — FREQUENCY CHART

IF FREQ. SOUND — 32.8 Mc. PICTURE — 37.3 Mc.

CHANNEL	FREQUENCY	PICTURE FREQUENCY	SOUND FREQUENCY	RF OSCILLATOR FREQUENCY
2	54-60	55.25	59.75	92.55
3	60-66	61.25	65.75	98.55
4	66-72	67.25	71.75	104.55
5	76-82	77.25	81.75	114.55
6	82-88	83.25	87.75	120.55
7	174-180	175.25	179.75	212.55
8	180-186	181.25	185.75	218.55
9	186-192	187.25	191.75	224.55
10	192-198	193.25	197.75	230.55
11	198-204	199.25	203.75	236.55
12	204-210	205.25	209.75	242.55
13	210-216	211.25	215.75	248.55

II. CONTROLS

A — FRONT PANEL

1 — PICTURE — The Picture or contrast control varies the video IF gain through the AGC diode. Due to the use of AGC in the TV-249 the picture control should not require readjustment when channels are switched except where the signal received from different stations varies greatly.

2 — BRIGHTNESS — The Brightness control operates by varying the D.C. voltage on the cathode of the Cathode Ray Tube, thereby controlling the light on the face of the tube.

3 — HORIZONTAL — The horizontal control on the front panel is a fine frequency regulator for the horizontal sweep oscillator. Its setting is not critical and is used to restore sync when necessary.

4 — VERTICAL — The Vertical Control regulates the frequency of the vertical oscillator. Misadjustment of this control will cause the picture to "roll" up or down. The setting is not normally critical.

5 — VOLUME—ON-OFF — The volume control varies the input to the audio system. It controls the sound only and should have no effect on the picture. The ON-OFF switch is activated by rotating the control in clockwise direction until a click is heard.

6 — STATION SELECTOR — This control selects the channel desired for viewing.

7 — FINE TUNING — This control varies the local R.F. Oscillator Frequency. Correct adjustment will result in a picture with maximum definition. This is not a control for tuning the sound.

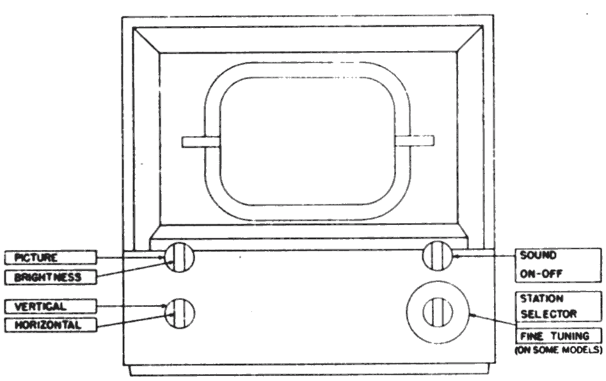


FIG. 1

B — CHASSIS (See Note)

1 — HEIGHT CONTROL — Varies the input to the vertical sweep amplifier. Since changes in height willl affect picture linearity this control should be used in conjunction with the:

2 — VERTICAL LINEARITY CONTROL — Adjusts the vertical sweep waveform and should be used with the height control.

3 — FOCUS CONTROL — Varies the current flowing through the focus coil.

4 — VERTICAL CENTERING CONTROL — Varies the direct current flowing in the vertical windings of the deflection yoke.

5 — HORIZONTAL CENTERING CONTROL — Varies the direct current flowing in the horizontal windings of the deflection yoke.

6 — HORIZONTAL LOCKING RANGE — Adjusts the sensitivity of the front panel Horizontal Hold control.

7 — HORIZONTAL FREQUENCY CONTROL — A coarse frequency control for the horizontal sweep oscillator.

8 — HORIZONTAL DRIVE CONTROL — Varies the input to the horizontal sweep amplifier and affects picture brightness and linearity.

9 — WIDTH CONTROL — This control permits variation of the picture width without affecting the high voltage.

10 — HORIZONTAL LINEARITY CONTROL — Adjusts the horizontal sweep waveform.

NOTE: — FOR PROPER ADJUSTMENT OF CHASSIS CONTROLS SEE "PICTURE ADJUSTMENTS" ON PAGE 9.

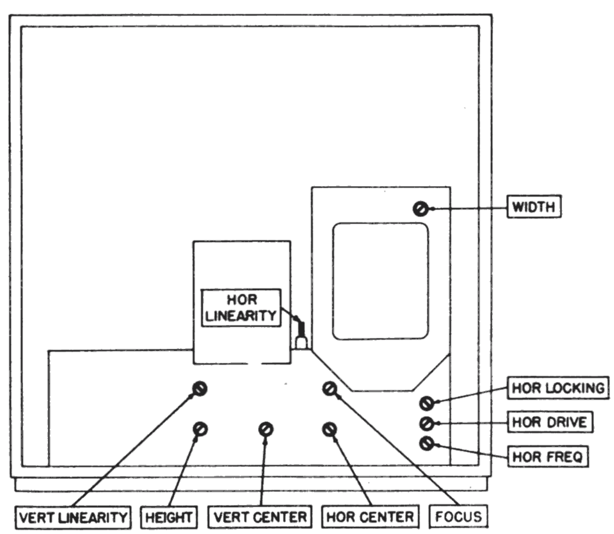
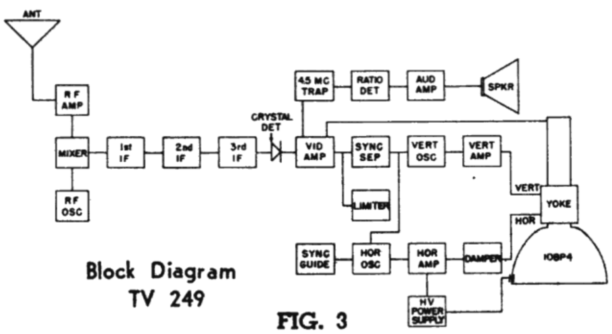


FIG. 2

III. BRIEF CIRCUIT ANALYSIS

The Tele-tone Television Receiver Model TV 249, uses the Inter-Carrier Sound System. The basic difference between this and conventional systems is that in the use of Inter-carrier, the sound and the picture information are both fed through a single I.F. and video channel. The sound is separated after the second video amplifier and is then fed through an amplifier to the ratio detector (discriminator). The picture components of the received signal are split up into sync and pix components, the former being applied to the appropriate sweep circuits and the video intelligence to the grid of the Cathode Ray tube. The main advantages of the use of a system of this type are that duplication of I.F. amplifiers is avoided and that drift in the local oscillator does not distort or cut off "sound" reception.

The horizontal sweep circuits employ an improved type of AFC which minimizes picture disturbances caused by ignition and similar types of interference. The sync circuits for the vertical oscillator provide sufficient control to avoid "rolling" in high interference or fringe areas.



Block Diagram TV 249

FIG. 3

R.F. AMPLIFIER — The antenna is fed between the grid and cathode of the R.F. amplifier. The input circuit of this stage is not tuneable. The R.F. stage is tuned by what is, electrically speaking, a single tapped inductance. Mechanically, this coil takes the form of several individual coils which are cut in or out of the plate circuit by the band switch. These coils, as well as the mixer coils, will rarely need touching.

MIXER — The output of the R.F. amplifier and the local oscillator are condenser fed into the control grid of the mixer stage. This circuit is tuned in much the same manner as the output of the R.F. Amplifier, previously described.

OSCILLATOR — The R.F. Oscillator is fairly straightforward in operation. Its main peculiarity is that the coil for Channel 2 is permanently parallel to all other Oscillator coils from 3 to 13. It is therefore necessary, when aligning the oscillators to ALIGN CHANNEL 2 FIRST and the rest of the coils in any order thereafter. They are tuned by brass slugs accessible from the outside of the cabinet by removing the Station Selector knob and the channel Escutcheon. Channel two is found at the top of the right hand slot and the others follow in regular order in a clockwise direction finishing with channel thirteen at the top of the left hand slot. (See figure 4). The oscillators in the TV 249 have a fine tuning control which is operated from the front panel. This control should be set at an approximate mid point when oscillator slugs are being adjusted.

NOTE: THE CHANNEL NUMBERS ON THE ESCUTCHEON DO NOT CORRESPOND TO THE LOCATION OF THE OSCILLATOR COILS.

FIG. 4

VIDEO I. F. — Each Video I.F. transformer has one adjustment, a powdered iron slug accessible from the top of the chassis. The Video I.F. string is stagger tuned to two frequencies. The first and third I.F. transformers are tuned to 34.45 Mc. and the second and fourth are tuned to 37.00 Mc. In addition there is a sound trap which should be tuned for minimum output at the Sound Carrier Frequency of 32.8 Mc. The response curve is broad enough to produce good definition.

VIDEO DETECTOR — A crystal detector is used in the TV 249. The use of a crystal in this circuit improves the detector sensitivity of the receiver.

VIDEO AMPLIFIERS — FIRST AND SECOND — A 12AU7, dual triode is used in this section of the receiver. The output of the crystal detector is fed to the grid of the first section (pin 2) and ultimately taken off plate of the second section of the tube (pin 6). It is at this point the three basic components of the received signal are separated and fed to their respective circuits. The sound is taken off and sent through the Driver, Ratio Detector and Audio Amplifiers to the speaker. The picture intelligence is fed to the grid of the Cathode Ray Tube and the synchronization pulses to the grid (pin 1) of the Sync Separator and from there to the Horizontal and Vertical oscillators.

D. C. COMPONENT — The D. C. component of the transmitted signal (which controls the background brightness) is substantially duplicated in the receiver by direct coupling from the plate of the second video amplifier to the kinescope grid.

SOUND SYSTEM — The sound Carrier is taken off the plate of the Video Amplifier by a 4.5 Megacycle trap and fed through a 4.5 MC Amplifier to the Ratio Detector, and then to the sound amplifier, audio output and speaker.

SWEEP SYSTEM — VERTICAL — One tube a 6SN7, dual triode serves as the Vertical oscillator, discharge and amplifier tube. The first section used as the oscillator and discharge tube is fed into the second section of the tube which in turn feeds through the vertical output transformer to the Vertical windings of the deflection yoke.

SWEEP SYSTEM — HORIZONTAL — The Horizontal Oscillator is essentially of the Blocking Oscillator type. The operation of the AFC system depends upon a correcting voltage developed in the control tube when the oscillator output and the incoming pulses differ in either phase or frequency. The control tube is maintained at cut-off until such time as the sync pulse is either ahead or behind the oscillator sawtooth peak. When either case occurs the control tube develops a voltage which is applied as a bias to the oscillator grid and alters the oscillator frequency to coincide with the frequency of the incoming pulses. The horizontal oscillator transformer has an adjustable core which is a coarse control of the oscillator frequency. The Horizontal Frequency Control (rear) is a fine adjustment in the same sense. The front panel Horizontal Hold Control permits slight adjustment of the frequency by adjusting the B voltage applied to the control tube plate. The Horizontal Locking range control affects the sensitivity of the control tube thus varying the range over which the AFC circuit will function.

NOTE: Many of the components in the Horizontal circuits are of critical value and therefor should only be replaced by the exact replacement part. Care should also be taken in dressing leads and parts when replaced. This can be accomplished by carefully noting parts positions before removal. For complete alignment procedure on these circuits see page 9.

A.G.C. — The receiver uses an AGC circuit operating on the R.F. and the first 2 IF stages. While it is quite effective in most locations, the receiver may overload in regions of very high field intensity. The contrast can generally be adjusted for a normal picture under such conditions but spurious beats, jagged vertical lines (i.e. poor resolution) and a "Moire" pattern may appear. These effects can be eliminated by the use of a resistor network of 3 to 10 db attenuation in series with the antenna lead at the point where it is connected to the receiver. In the absence of such a network temporarily disconnecting one side of the lead-in may serve to reduce the signal strength to a satisfactory level.

HIGH VOLTAGE POWER SUPPLY — The energy stored in the horizontal windings of the deflection yoke during the forward sweep produces high voltage surges during retrace. This is "stepped up" by an "auto winding" on the horizontal output transformer and then rectified by a 1B3/8016, to provide approximately 8500 volts for the Cathode Ray Tube 2nd anode.

B VOLTAGE POWER SUPPLY — The B Supply of the TV 249 utilizes a standard type of transformer — rectifier circuit. It should be noted that there is a separate filament winding for the Cathode ray tube (6.3 volts) and a separate 5 volt winding for the 5V4 Damper tube. The return of the B voltage developed by this supply is NOT grounded. Voltages are developed through a bleeder network of plus 225, plus 150, minus 3.5, minus 14, minus 17.5 and minus 85 volts WITH RESPECT TO GROUND (chassis).

IV. ALIGNMENT PROCEDURE

A — TEST EQUIPMENT

CATHODE RAY OSCILLOSCOPE — The main requirement in a Cathode Ray Oscilloscope is that it should have a good high frequency response up to 1 Mc. The tube size is relatively unimportant, however, anything under 5" usually makes fine adjustment quite difficult.

SWEEP GENERATOR — The sweep generator used should have linear coverage of a center range from 30 to 220 megacycles. The output should be fairly flat over wide frequency variation of the sweep. It should be capable of an output of 0.1 volt with attenuation down to about 50 microvolts. It is preferable that the generator have a deflection output for the test oscilloscope.

AM SIGNAL GENERATOR — This generator should have a frequency of from 4.5 to 220 megacycles. As this generator is used occasionally as a marker generator, accuracy is an important factor. It should be capable of 0.1 volt output with attenuation down to about 50 microvolts and should be linear through the range.

VACUUM TUBE VOLTMETER — Almost any standard make VTVM will do. It should have reversible polarity switch.

B — RF ALIGNMENT

In the alignment of the RF section of the TV 249 three pieces of test equipment are necessary. A sweep generator, a signal generator and a cathode Ray Oscilloscope. For specifications see "Test Equipment" above.

The output of the Sweep Generator should be fed into the antenna. The signal generator (C.W.) should be loosely coupled to the antenna terminals. The sweeper will provide the overall response curve with the oscilloscope properly connected. The signal generator is used as a marker as described below. Some Sweep generators made today contain their own marker oscillator. In cases where a generator of this type is used the Signal Generator may be eliminated.

The "hot" or "high" side of the Oscilloscope input should be connected to the junction point of the 5600 ohm detector load resistor and the peaking coil. The "low" or ground side should be connected to the nearest convenient ground point on the receiver chassis. Care should be taken that the generator and the scope leads are well separated to avoid regeneration.

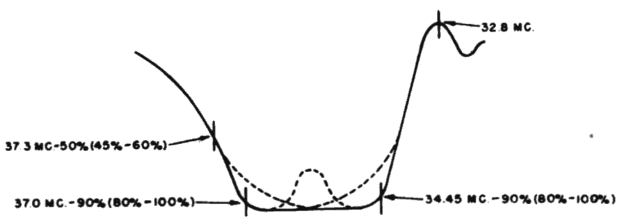
The R.F. section of the receiver is tuned channel by channel. The proper frequency settings for any given channel can be determined by consulting the Frequency Chart on Page (2). For example in aligning channel 2 the sweep generator should be set to some mid frequency between 54 and 60 megacycles. This adjustment is not a fine one. After setting the sweeper in the general vicinity of the desired frequency it should be tuned to center the response curve on the Oscilloscope face. For picture and sound markers the signal generator should carefully be adjusted to the frequencies indicated in the Frequency chart. For example In the case of channel 2 the picture marker frequency is 55.25 Mc. and the Sound 59.75 Mc.

It is important to note at this point that the oscillator coil for channel 2 is in parallel with every other oscillator coil from 3 to 13. It is therefor imperative that channel 2 be aligned first and the others in any desired order thereafter.

Starting with channel 2 and applying the proper frequencies as indicated above, the output of the sweeper should be attenuated to the point where further attenuation will not affect the wave shape.

The Oscillator should then be adjusted to bring the sound carrier into the 32.8 Mc. trap valley. With the oscillator so adjusted the picture carrier should fall at a point approximately 50% up on the slope of the opposite side of the band pass curve. Certain variations in the waveshape and the location of the picture carrier are acceptable. The picture carrier may vary in position from a point between 45% and 60% of the slope and the overall waveshape may differ from the ideal, flat-topped response by being either slightly rounded or slightly dipped in the center. See figure (5).

If the position of the picture carrier varies beyond the 45% to 60% points on all channels correction may be made by turning to channel 6, applying the proper input signals and slightly realigning the I.F. transformers.



IDEAL VIDEO IF RESPONSE CURVE
DOTTED LINES INDICATE ACCEPTABLE VARIATIONS

FIG. 5

C — VIDEO IF ALIGNMENT

An adequate signal may be fed through the I.F. string by feeding the output of the signal generator into a tube shield placed over the mixer tube. Care should be taken that this shield is NOT grounded. The ground side of the generator output can be conveniently grounded to the shield of the adjacent oscillator tube. The antenna terminals should be short circuited at the tuner.

The vacuum tube voltmeter should be connected across the 5600 ohm detector load resistor, and should be set on the minus 3 Volt scale.

The contrast control should be set to approximately three-quarters of maximum.

The Signal generator should be set to a frequency of 34.45 Mc. The output of the generator should be adjusted to the point where the reading on the VTVM is between minus 1 to minus 1.5 volts.

The First and Third I.F. coils should be peaked for a maximum reading on the VTVM. As the voltage reading increases with tuning, the generator should be attenuated to maintain a maximum of minus 1.5 volts.

Set the Signal Generator to a Frequency of 37.0 Mc and tune the Second and Fourth I.F. coils in the same manner as above.

Set the Signal Generator to a frequency of 32.8 and tune the trap for a MINIMUM reading on the VTVM.

The third I.F. coil should then be readjusted as described previously.

The Generator should now be shut off (or tuned to different band) and the VTVM should read no more than minus 0.20 volts. If there is a higher voltage reading, check for regeneration in the I.F. stages.

By shunting the signal generator with a sweep generator and substituting a Cathode Ray Oscilloscope for the Vacuum tube Voltmeter in the above procedure the actual pass band of the Video I.F. circuits may be studied. Ideally the response curve should appear on the face of the oscilloscope in the form indicated in Figure (6) A. A slight slope of the top of the curve in either direction or a small dip in the center are acceptable as indicated in Figure (6) B, and C.

A- IDEAL RF-IF WAVESHAPE B & C- ACCEPTABLE WAVESHAPES
1- PICTURE CARRIER
2- SOUND CARRIER

FIG. 6

D — SOUND ALIGNMENT

Sound alignment of the TV 249 is best accomplished with the AM Signal Generator and a vacuum tube volt meter. By feeding a 4.5 Megacycle signal into the grid (pin 7) of the second section of the 12AU7 Video amplifier and placing the vacuum tube voltmeter between pin 2 of the ratio detector and ground, the primary of the ratio detector and the 4.5 megacycle trap may be adjusted. The signal generator should be attenuated so that the VTVM does not read more than minus 3 or minus 4 volts. These two slugs should be tuned for maximum deflection of the VTVM and the generator attenuated as needed to keep the above mentioned level. The VTVM should then be placed at the junction of the 47,000 ohm resistor and the .0015 condenser and the secondary of the ratio detector should be tuned for a zero reading on the VTVM.

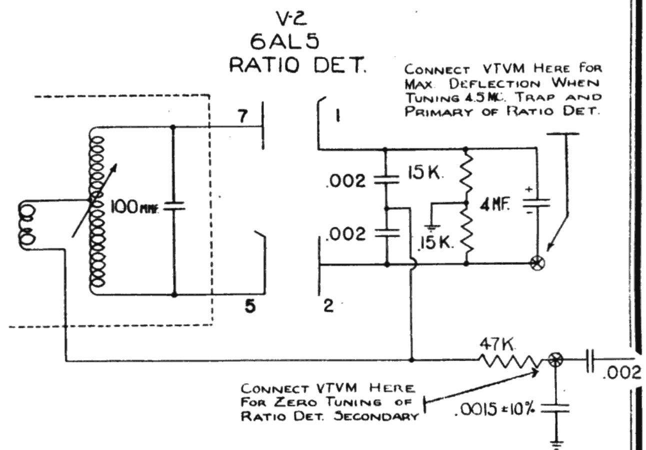


FIG. 7

V. PICTURE ADJUSTMENTS

A — ION TRAP, FOCUS AND YOKE

To properly adjust the Ion Trap, Focusing coil and the Deflection Yoke the following procedure should be followed.

The Deflection Yoke should be placed in position closest to the "bell" of the Cathode Ray Tube as far forward on the neck of the tube as is possible. The Focus Coil is next in line and the Ion Trap last. The blue "arm" of the Ion Trap should be closest to the front of the tube.

The antenna should NOT be connected to the receiver, the set should be turned on, the brilliance control turned to MAXIMUM and the picture control at MINIMUM.

The Ion Trap should be moved forward and backward and at the same time rotated to achieve the brightest raster on the face of the CRT.

Reduce the brilliance control to a point slightly over normal brightness and adjust the Focus Control on the rear of the chassis for clearest and sharpest horizontal sweep lines. The Ion Trap should then be readjusted slightly for the brightest response on the face of the tube.

The Horizontal and the Vertical Centering controls, on the rear of the chassis, should then be set at approximately mid-position, and the Focus Coil itself should be moved to secure a complete raster, approximately centered and with no corners cut off. This being accomplished the focus coil and the Ion trap should be secured by the thumb screws provided.

Finally the Deflection Yoke should be rotated to "square" the raster with the chassis as a reference. The thumb screws on the yoke brackets should then be set.

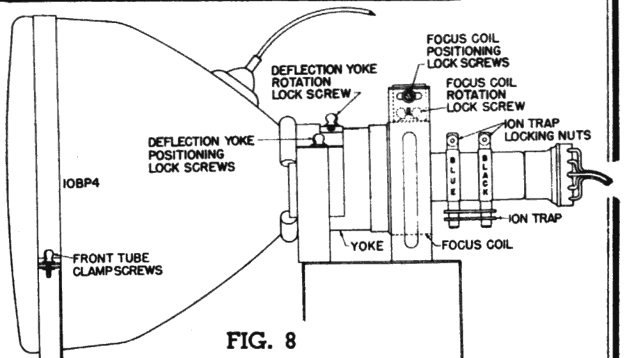


FIG. 8

B — HORIZONTAL OSCILLATOR ALIGNMENT

To adjust the Horizontal oscillator and its control circuits it is necessary to first connect a working antenna to the receiver. It is preferable to use a test pattern as the incoming signal rather than a picture.

With the receiver turned on and the brightness and picture controls adjusted to a normal position the Horizontal Frequency trimmer and the Horizontal Locking trimmer (rear of chassis) should be turned out to about one (1) turn less than maximum.

The Horizontal Hold Control (front panel) should be turned to a maximum clockwise position.

The core of the Horizontal Oscillator Transformer should then be adjusted. Variation of this core will cause the pattern to resolve into a series of black and white bars sloping either to the right or the left depending upon the degree of adjustment. The transformer should be adjusted to the point where the picture resolves into a series of from 3½ to 4½ bars sloping downwards to the right.

The Horizontal Hold Control (front panel) should now be rotated to a full counterclockwise position and the incoming signal momentarily interrupted. This can be done most easily by shorting the antenna terminals for a moment.

The Horizontal Hold Control (front panel) should now be rotated slowly in a clockwise direction. As the control is turned the number of bars sloping downward to the left should decrease. At approximately 90 degrees of rotation there should remain between 3½ and 4½ bars just prior to the time that the picture "falls into" sync. The picture should remain in sync for an additional 90 degrees of rotation. If MORE than 4½ bars are evident just before the picture syncs the Horizontal Locking Range trimmer (rear of Chassis) should be tightened slightly. If LESS than 3½ bars the same trimmer should be loosened.

C — HEIGHT, WIDTH AND LINEARTY

To adjust the overall size and linearity of the picture it it almost mandatory that a pattern transmitted from a local station be used. Linearity adjustments, particularly, cannot be accurately made on moving transmissions. It should also be remembered that in areas where more than one station is being received, that pictures transmitted from different station will vary slightly in size. The smallest transmitted picture should be made to fill the area delineated by the mask.

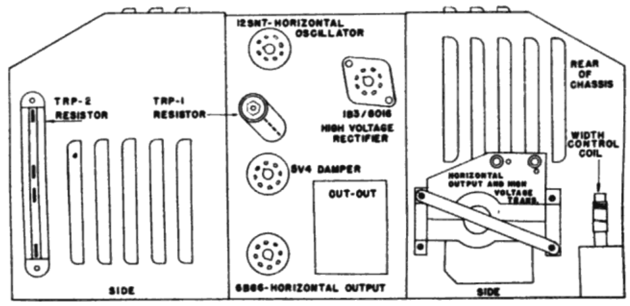
The first step in linearity and size adjustment is to turn the Width control (rear of chassis) all the way in. (clockwise)

The Horizontal Drive trimmer should then be adjusted for the best compromise between maximum brightness and good horizontal linearity. This control will affect the left side of the picture primarily. The Horizontal Linearity control (top rear of chassis) should then be adjusted for linearity of the right side of the picture.

The Width Control should now be readjusted to achieve a picture 8½" wide.

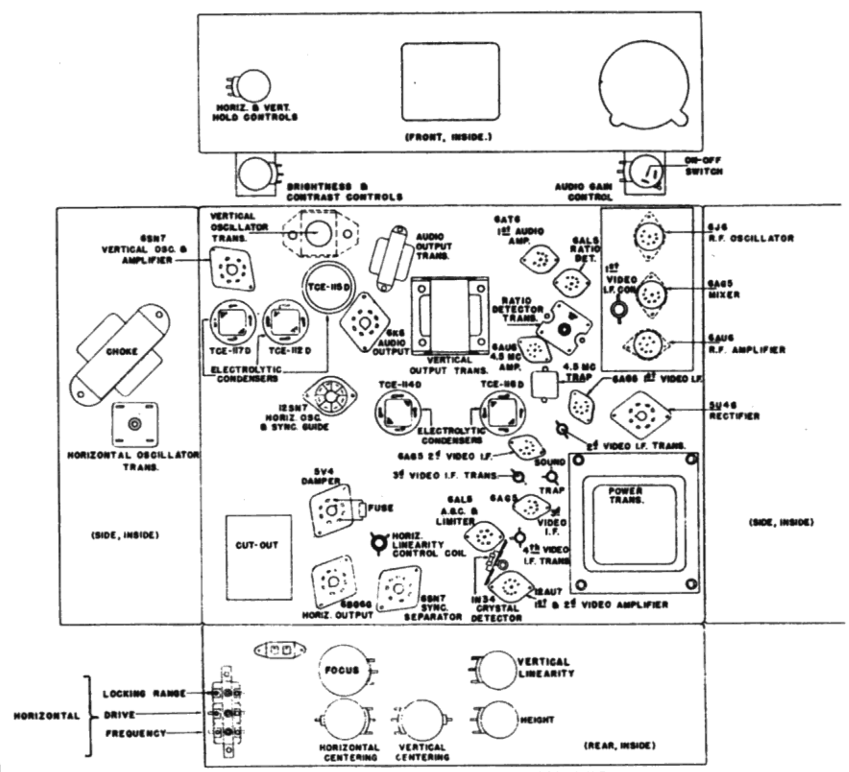
The Height and Vertical Linearity controls (both rear of chassis) should then be adjusted for a linear picture 6⅜" high.

The Horizontal and Vertical Centering controls on the rear of the chassis should finally be adjusted to center the picture in the cabinet mask. At this point the Focus control, previously set, should be retouched for maximum definition of the lines in the vertical wedge. Proper adjustment and alignment of the receiver should result in clear, sharp definition down to about 300 lines.



TOP VIEW—HIGH VOLTAGE SUPPLY—PARTS LOCATION

FIG. 9



PARTS LOCATION—MAIN CHASSIS—UNDERSIDE VIEW

FIG. 10

TELE-TONE RADIO CORP.

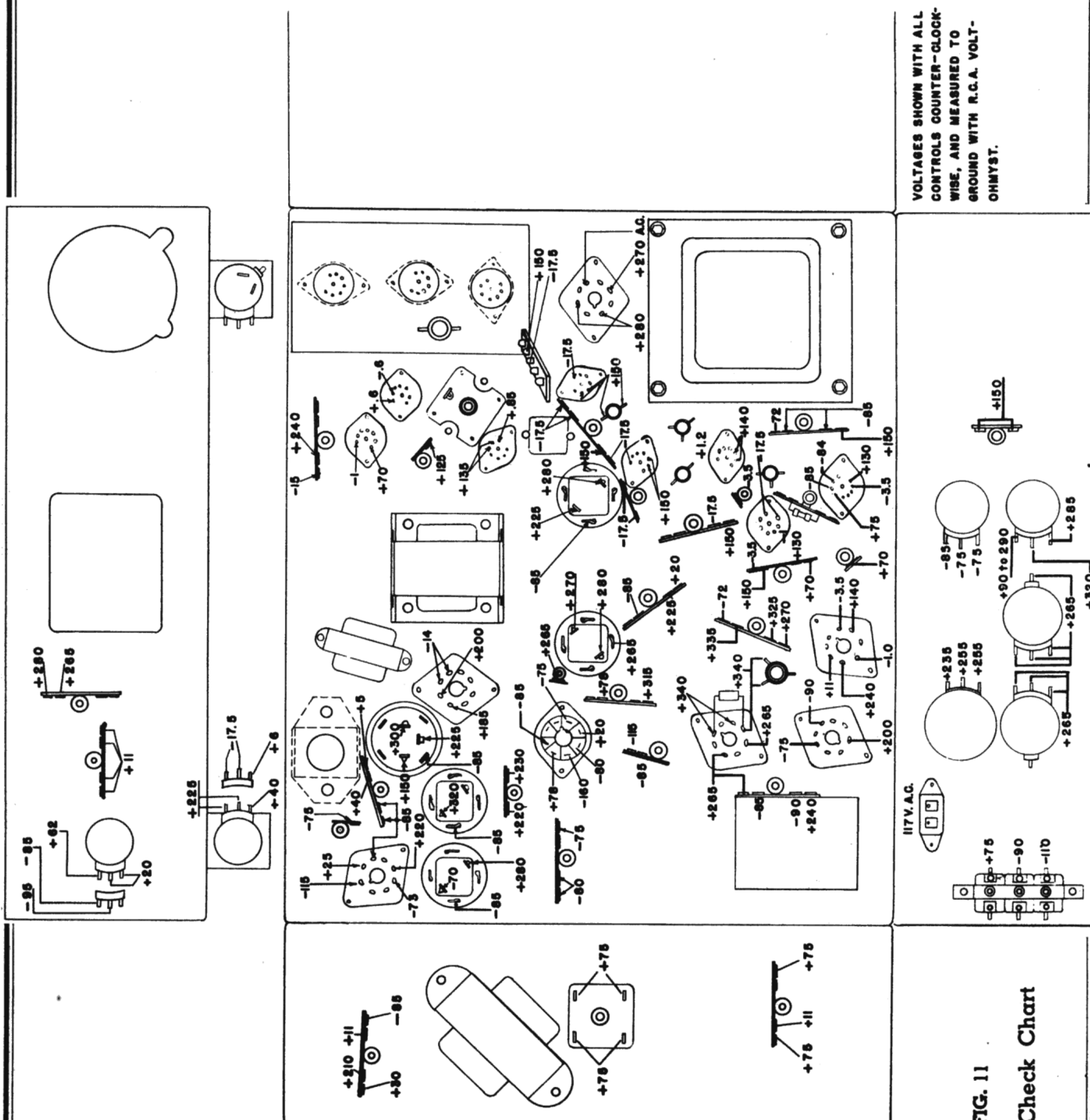


FIG. 11
Voltage Check Chart

TELE-TONE RADIO CORP.

CONTROL POSITIONS:

CONTRAST – FULLY CLOCKWISE
BRIGHTNESS – FULLY CLOCKWISE
HORIZONTAL HOLD – FULLY CLOCKWISE
VERTICAL HOLD – FULLY CLOCKWISE
FOCUS – FULLY COUNTER-CLOCKWISE
VERTICAL LIN. – FULLY CLOCKWISE
HEIGHT – FULLY CLOCKWISE
H. CENTERING – FULLY CLOCKWISE
V. CENTERING – FULLY COUNTER-CLOCKWISE

ALL TUBES LEFT IN SOCKETS.

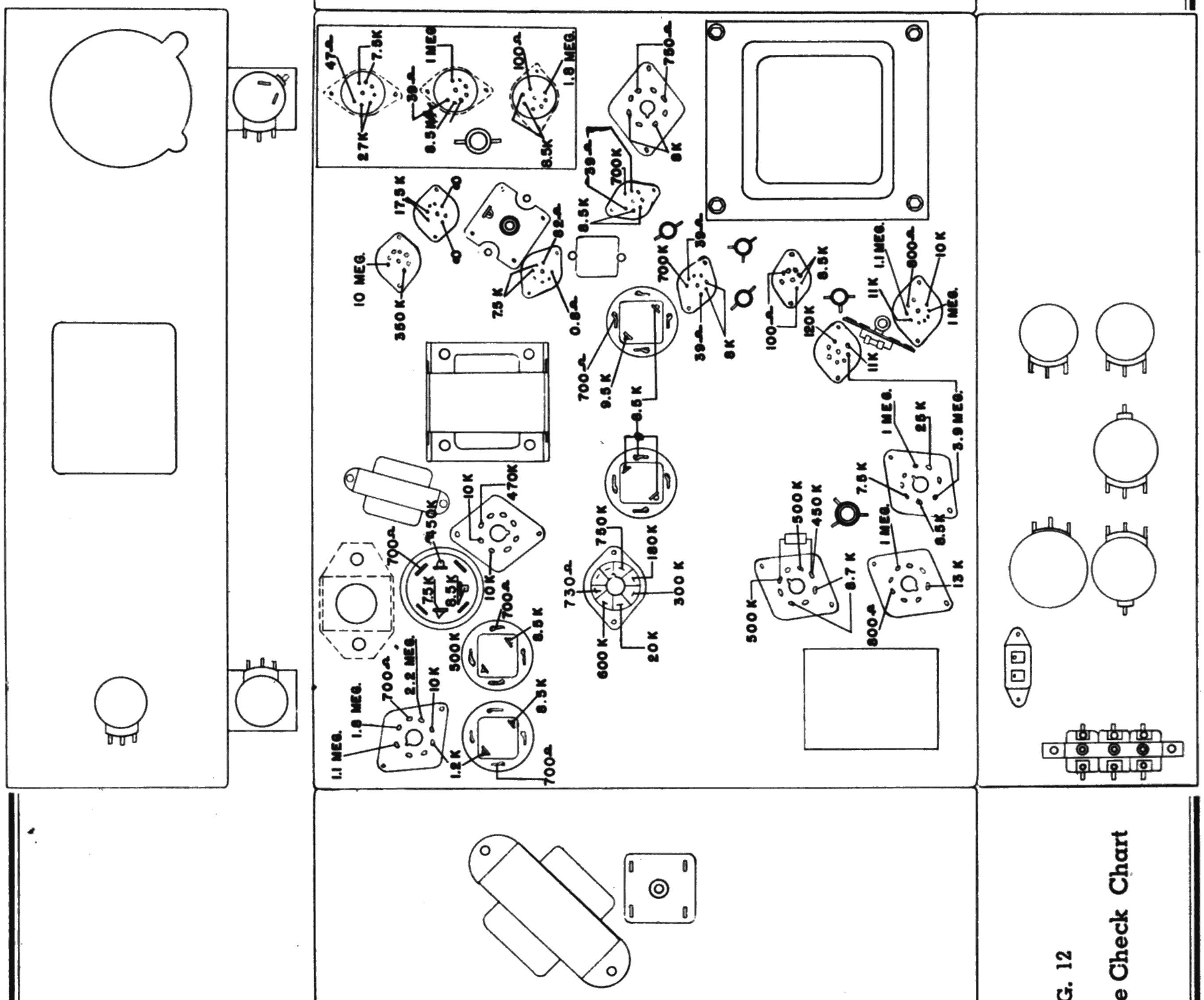


FIG. 12
Resistance Check Chart