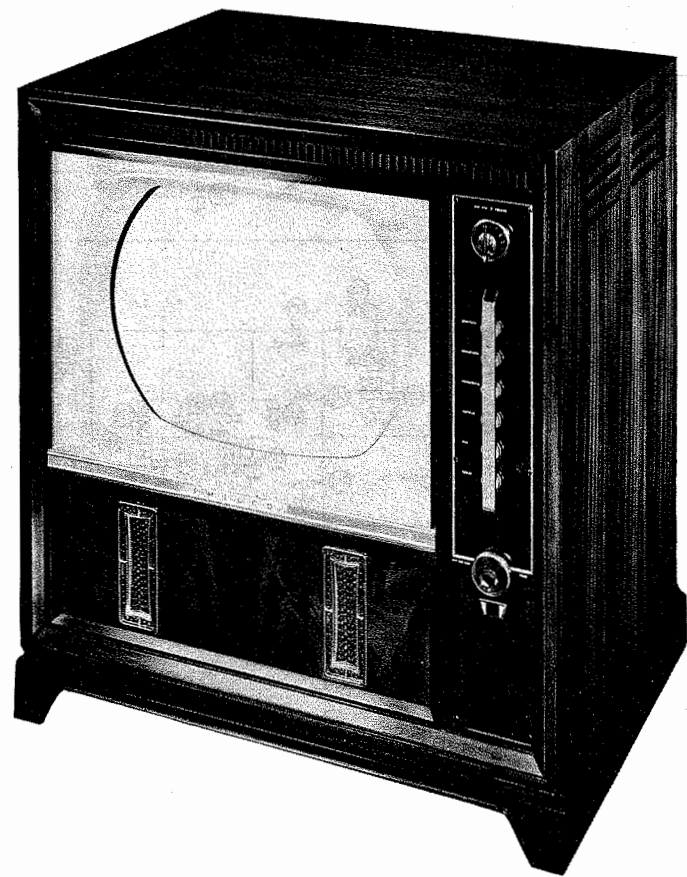


CABINET-REAR VIEW

DISASSEMBLY INSTRUCTIONS

- |  |   |
|--|---|
| <p><b>CHASSIS REMOVAL</b></p> <ol style="list-style-type: none"> <li>1. Remove 14 wood screws. Remove rear cover.</li> <li>2. Remove 10 push-on type control knobs.</li> <li>3. Remove 1 wing nut from inside front of cabinet.</li> <li>4. Remove 5 wood screws and control panel.</li> <li>5. Remove 2 speaker plugs, 2 antenna leads, picture tube socket, yoke plug, convergence yoke plug, neutralizing coil plug, and HV anode plug.</li> <li>6. Remove 1 metal screw holding bracket on HV cage.</li> <li>7. Remove 6 chassis board volts.</li> <li>8. Remove chassis.</li> <li>9. Remove 8 speaker nuts and 2 speakers.</li> </ol> <p><b>SIDE PANEL REMOVAL</b></p> <ol style="list-style-type: none"> <li>1. Remove rear cover as in "Chassis Removal".</li> <li>2. Remove 2 wing nuts from inside cabinet.</li> <li>3. Remove 2 wood screws and side panel.</li> </ol> | <p><b>PICTURE TUBE REMOVAL</b></p> <ol style="list-style-type: none"> <li>1. Remove chassis.</li> <li>2. Remove blue lateral corrector magnet, purity magnet, and convergence yoke assembly.</li> <li>3. Lay cabinet and tube front down.</li> <li>4. Remove 5 hex nuts, 1 wood screw and remove picture tube and yoke assembly.</li> <li>5. Remove 1 metal screw holding edge purity strap and yoke assembly. Remove these from tube.</li> <li>6. Remove insulating cone.</li> </ol> <p><b>SAFETY GLASS AND PICTURE TUBE CLEANING</b></p> <ol style="list-style-type: none"> <li>1. Remove 2 wood screws holding metal nameplate.</li> <li>2. Remove nameplate and using extreme care when removing safety glass.</li> </ol> |
|--|---|



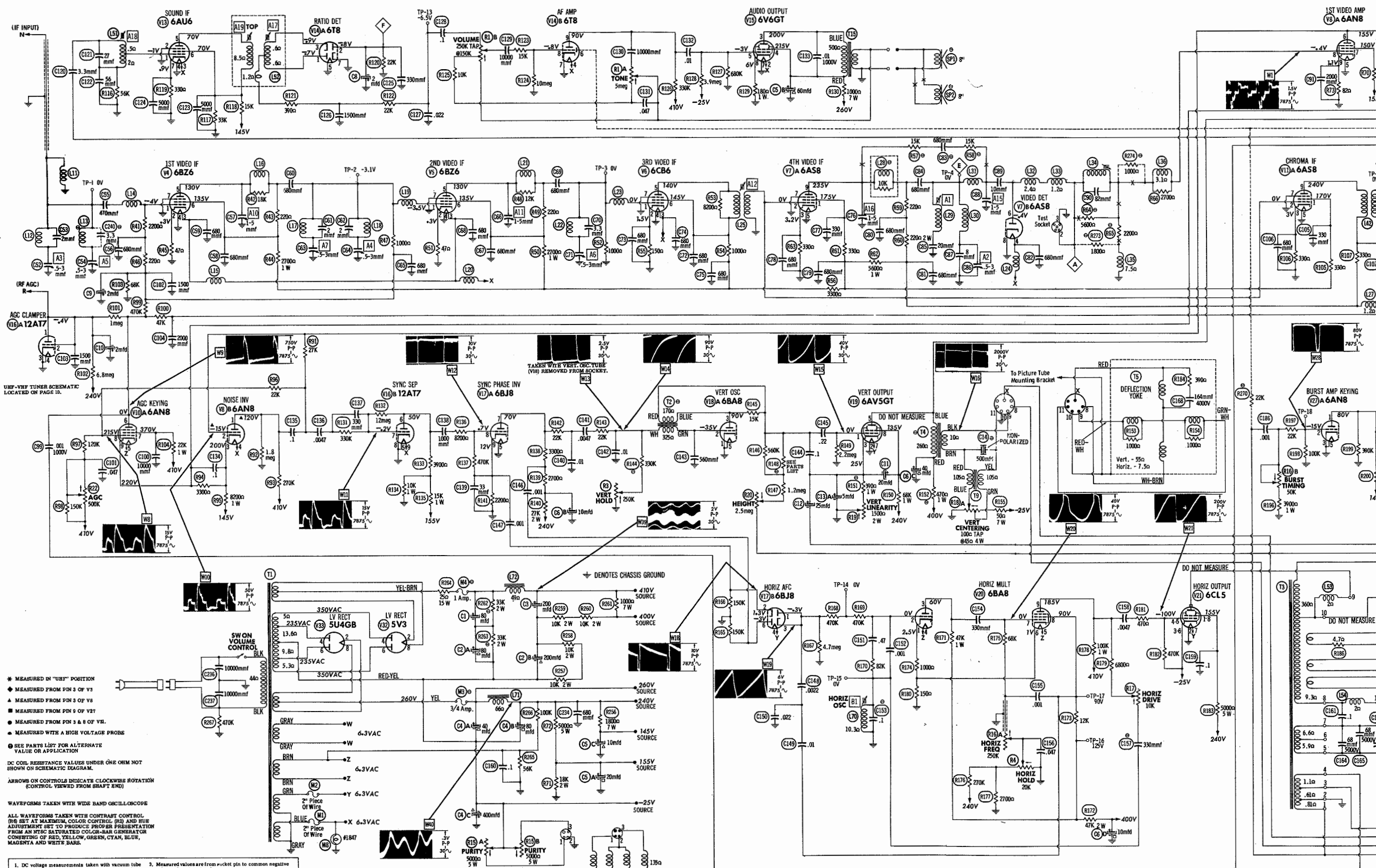
PHILCO MODEL 22D5102M (Ch. TV-123)

TRADE NAME	Philco Models 22D5100, L, 22D5102, L, M (Ch. TV-123)	
MANUFACTURER	Philco Corp., Tioga & "C" Streets, Philadelphia, Pa.	
TYPE SET	Color Television Receiver	
TUBES	Thirty-four	
POWER SUPPLY	110-120 Volts AC-60 Cycles	RATING 4.2 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)	
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PHILCO MODELS 22D5100, 22D5102, L, M (Ch. TV-123)

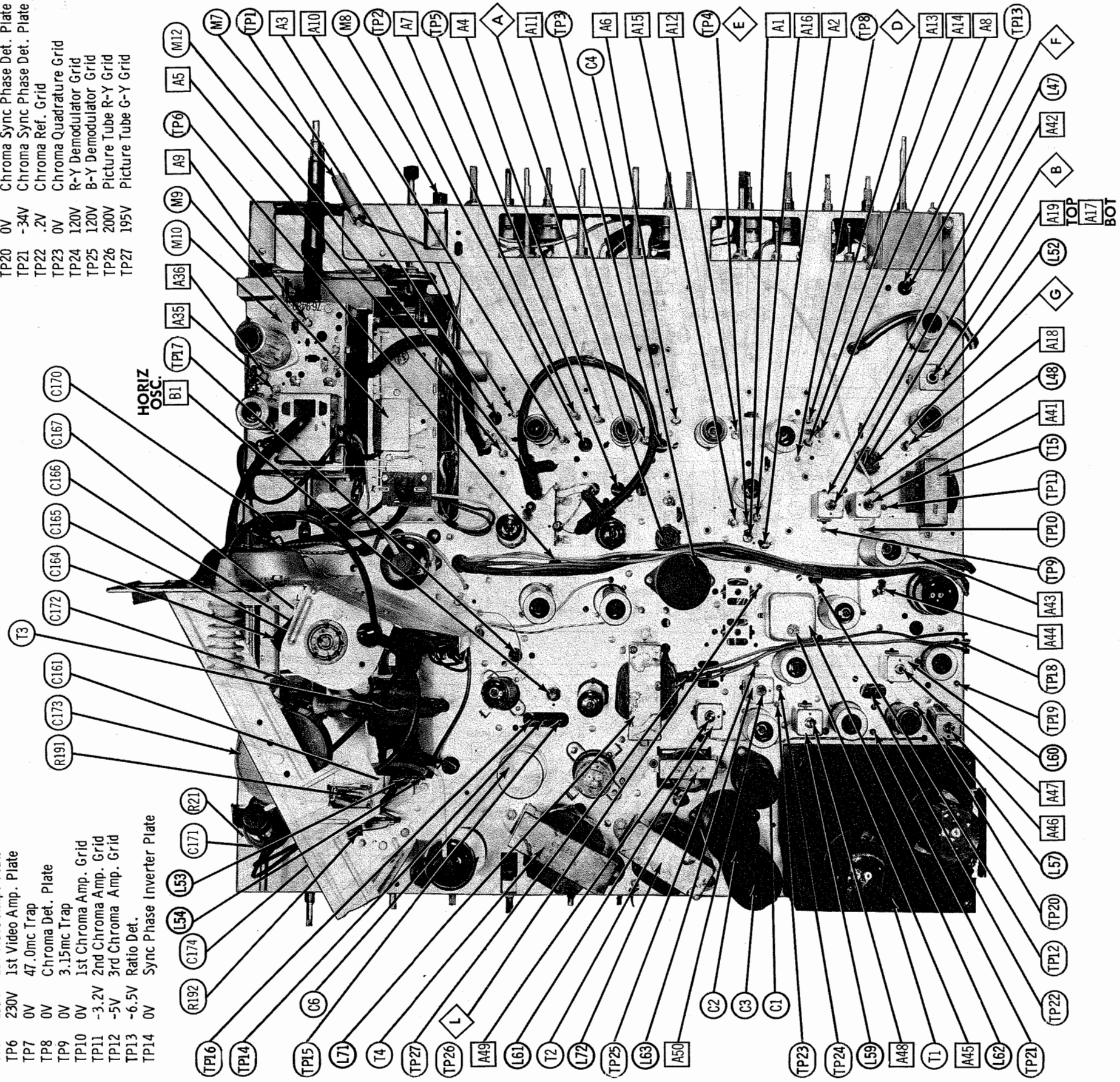


- \* MEASURED IN "OFF" POSITION
  - ◆ MEASURED FROM PIN 3 OF V3
  - ▲ MEASURED FROM PIN 3 OF V8
  - MEASURED FROM PIN 9 OF V7
  - MEASURED FROM PIN 3 & 8 OF V2
  - ▲ MEASURED WITH A HIGH VOLTAGE PROBE
  - SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
- DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM.
- ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
- WAVEFORMS TAKEN WITH WIDE BAND OSCILLOSCOPES
- ALL WAVEFORMS TAKEN WITH CONTRAST CONTROL (R6) SET AT MAXIMUM, COLOR CONTROL (R2) AND HUE ADJUSTMENT SET TO PRODUCE PROPER PRESENTATION FROM AN NTSC SATURATED COLOR-BAR GENERATOR CONSISTING OF RED, YELLOW, GREEN, CYAN, BLUE, MAGENTA AND WHITE BARS.
1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured at 1,000 ohms per volt.
  2. Pin numbers are counted in a clockwise direction on bottom of socket.
  3. Measured values are from socket pin to common negative unless otherwise stated.
  4. Line voltage maintained at 117 volts for voltage readings.
  5. All controls set for normal operation; no signal applied.

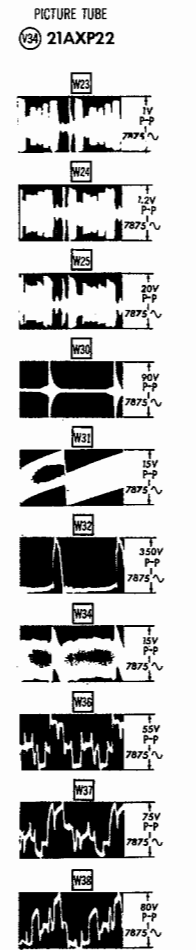
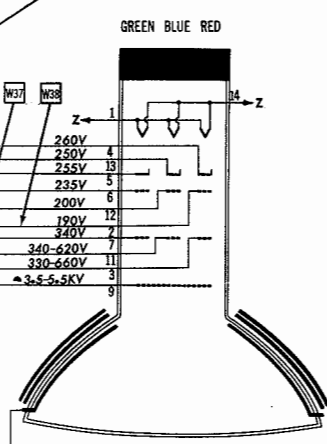
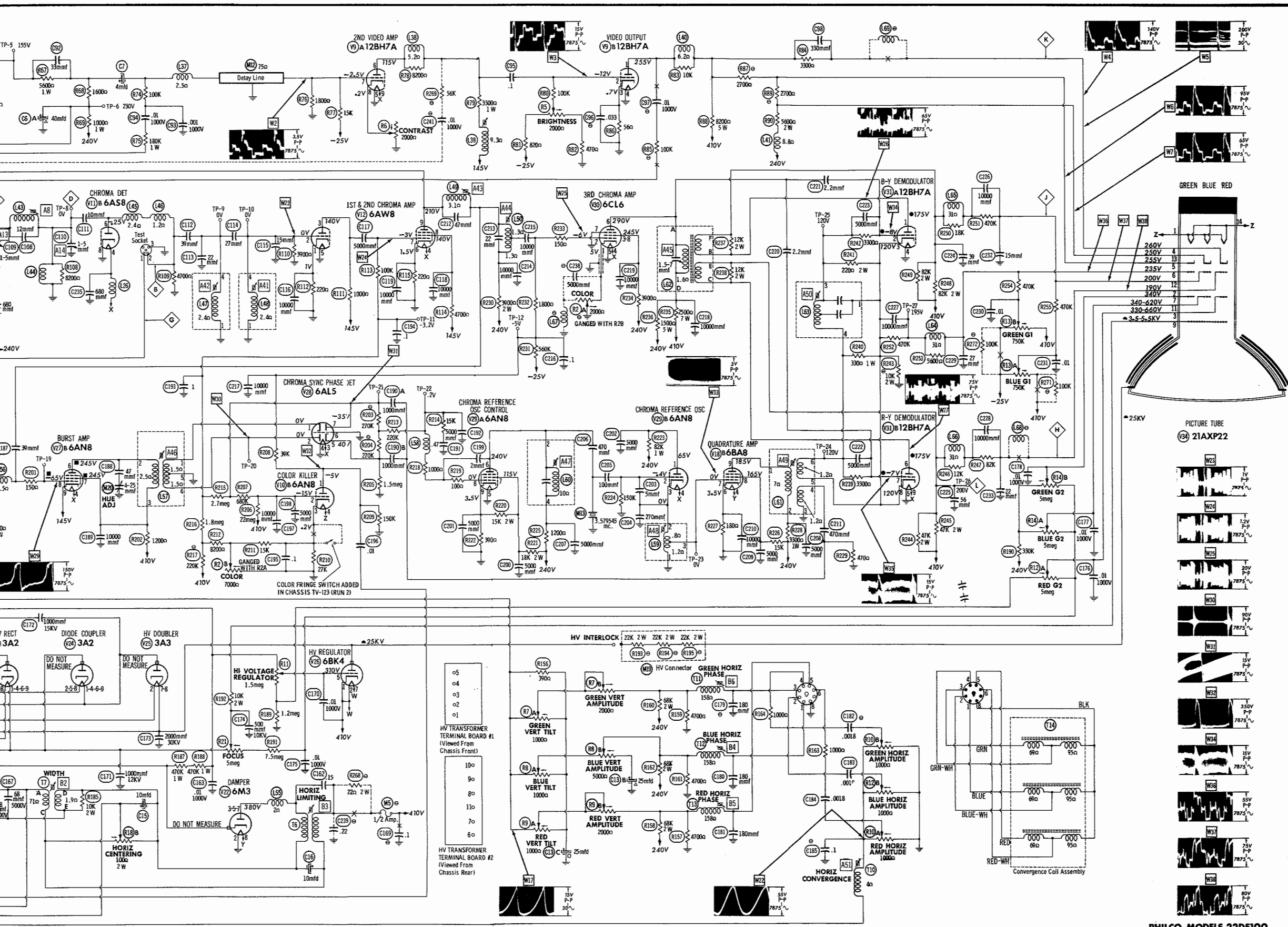
A PHOTOFAC STANDARD NOTATION SCHEMATIC  
© Howard W. Sams & Co., Inc. 1957

TP1 0V 1st Video IF Grid  
 TP2 -3.1V 2nd Video IF Grid  
 TP3 0V 3rd Video IF Grid  
 TP4 0V 41.25mc Trap  
 TP5 155V 1st Video Amp. Plate  
 TP6 230V 1st Video Amp. Plate  
 TP7 0V 47.0mc Trap  
 TP8 0V Chroma Det. Plate  
 TP9 0V 3.15mc Trap  
 TP10 0V 1st Chroma Amp. Grid  
 TP11 -3.2V 2nd Chroma Amp. Grid  
 TP12 -5V 3rd Chroma Amp. Grid  
 TP13 -6.5V Ratio Det.  
 TP14 0V Sync Phase Inverter Plate

TP15 0V Horiz. AFC  
 TP16 125V Horiz. Mult Plate  
 TP17 90V Horiz. Mult Grid  
 TP18 -13V Burst Keying Grid  
 TP19 80V Burst Amp. Grid  
 TP20 0V Chroma Sync Phase Det. Plate  
 TP21 -34V Chroma Sync Phase Det. Plate  
 TP22 .2V Chroma Ref. Grid  
 TP23 0V Chroma Quadrature Grid  
 TP24 120V R-Y Demodulator Grid  
 TP25 120V B-Y Demodulator Grid  
 TP26 200V Picture Tube R-Y Grid  
 TP27 195V Picture Tube G-Y Grid

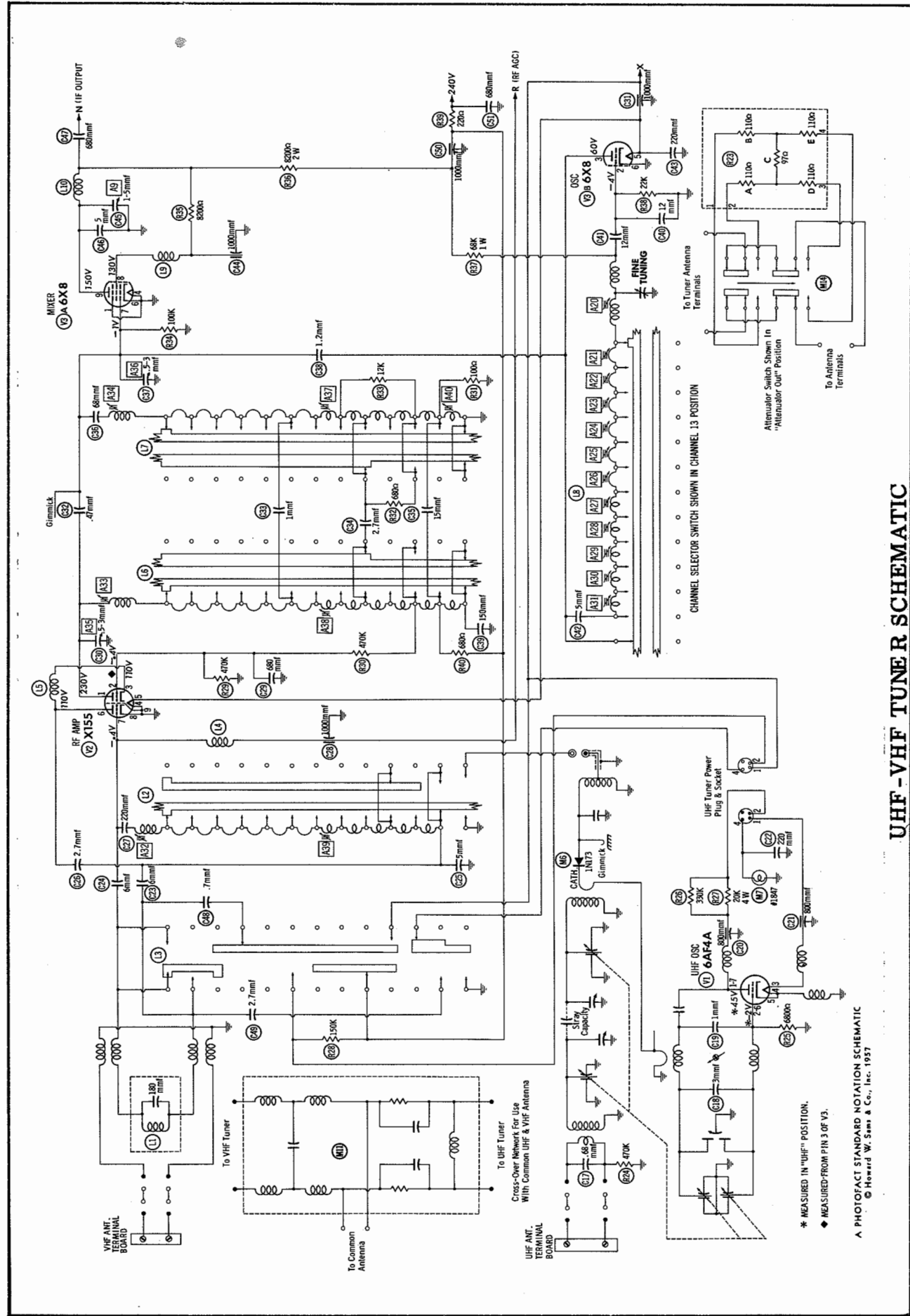


CHASSIS TOP VIEW

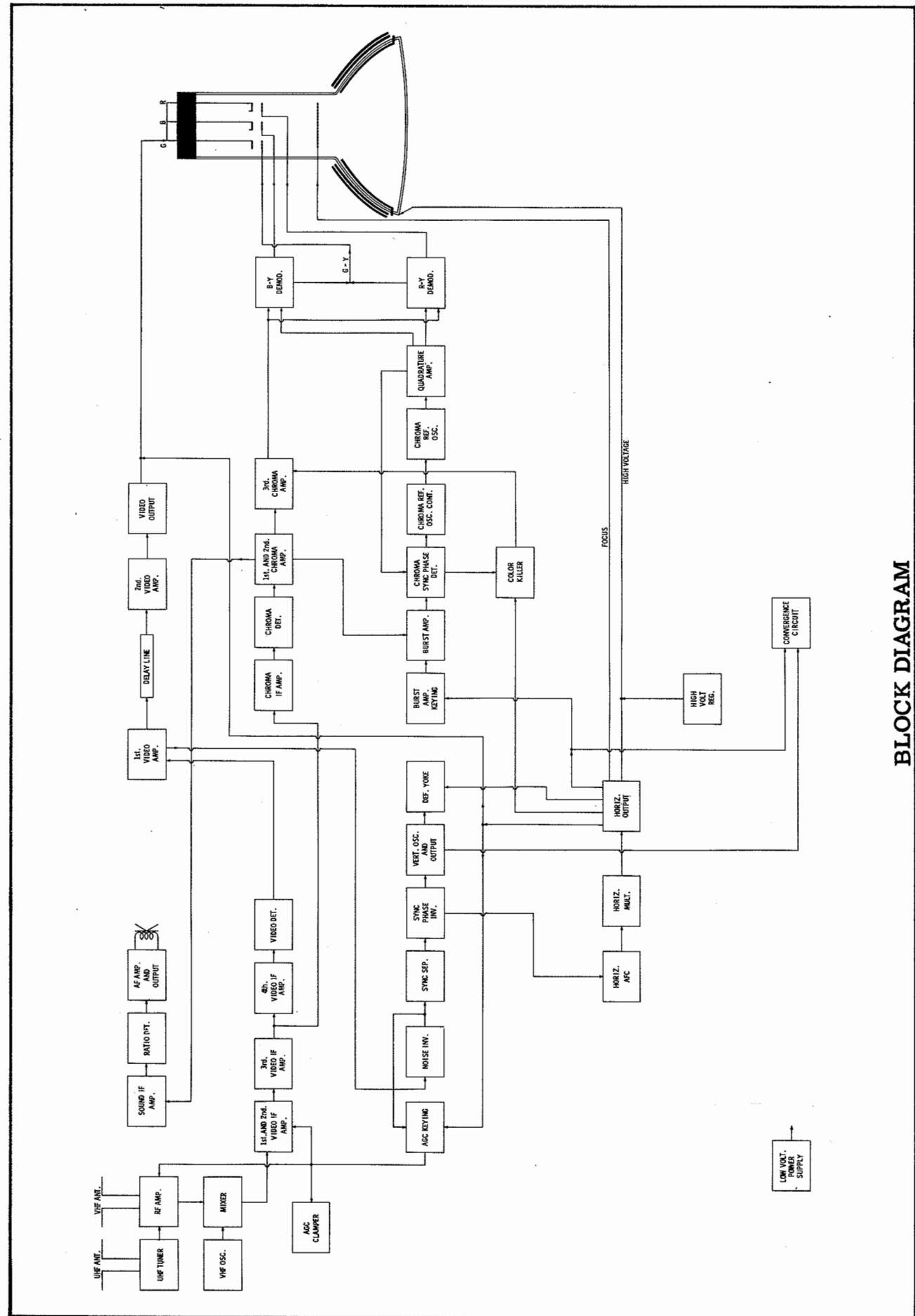


PHILCO MODELS 22D5100, 22D5102, L, M (Ch. TV-123)

PHILCO MODELS 22D5100, 22D5102, L, M (Ch. TV-123)



**UHF-VHF TUNER SCHEMATIC**



**PHILCO MODELS 22D5100, 22D5102, L, M (Ch. TV-123) BLOCK DIAGRAM**

## MISCELLANEOUS ADJUSTMENTS

### HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

1. Set the horizontal hold control to its mid-range position.
2. Connect clip leads from TP14 and TP15 to chassis.
3. Adjust horizontal frequency control R16A until the picture is almost in sync horizontally and just floats back and forth across the screen. Check the amount of deviation from 15750v at each extreme setting of the hold control by counting the number of slanted bars present on the screen. Retouch R16A until the deviation is the same at both extreme settings of the horizontal hold control. A tolerance of one bar is acceptable.
4. Remove the clip lead from TP15 and adjust the horizontal oscillator slug (B1) until the oscillator is again at sync frequency. Remove the clip lead from TP14. With the horizontal frequency control and the oscillator coil properly adjusted, the picture should not lose sync at either extreme setting of the horizontal hold control.
5. Connect the vertical amplifier of the scope to TP10 and low side to chassis. Adjust the burst timing control (R16B) until the right hand edge of the burst falls at the right hand edge of the gate pulse as in Fig. 12 with the horizontal hold control turned to full clockwise position. The burst must remain at the top of the gate pulse for any setting of the horizontal hold control. None of the chroma information following the burst must reach the top of the gate pulse for any setting of the horizontal hold control. This adjustment is made only while receiving a signal from a color program transmission.

Adjust width slug (B2) for a picture SLIGHTLY wider than necessary to fill the picture mask horizontally. Adjust horizontal limiter (B3) for best horizontal linearity.

### CONVERGENCE COIL

1. Calibrate the scope for 40 volts peak to peak.
2. Unplug the convergence assembly from its socket.
3. Connect the vertical amplifier of the scope to pin 2 of the convergence assembly socket. Connect the low side to chassis.
4. Turn the blue horizontal amplitude control fully clockwise.
5. Adjust A5 until the waveform on the scope is 40 volts peak to peak.

### COLOR PURITY

1. Check the following mechanical setups.
  - a. The yoke should be placed so that the space between the yoke and picture tube neck is equal all the way around.
  - b. The convergence coil and magnet assembly should be positioned directly over the internal pole pieces in the neck of the picture tube. The red, blue and green convergence magnet assemblies should be positioned to line up as closely as possible to exact position of the three guns. The blue magnet is marked with black paint on the screw and should always be at the top of the tube neck.

The blue lateral magnet assembly should be exactly over the two internal pole pieces with the adjustable magnet directly over the blue gun.
2. a. Using a white dot generator, adjust the red, blue and green convergence magnets to converge the three center dots to form a single white dot.
  - b. Adjust the focus control for the sharpest lines over the entire screen.
3. Turn off the green and blue guns using the green G1 control (R13A) & blue G1 control (R13E), leaving only a red field. Set up proper red purity in the following manner.
  - a. Adjust all purity magnets around the rim of the picture tube for minimum effect (out position).
  - b. Using a magnetic compass, face the set either magnetic east or magnetic west. If faced west, the purity control must be rotated fully counter clockwise. If faced east, the purity control must be rotated fully clockwise.
  - c. Rotate the color purity magnet (M18) around the neck of the picture tube for the best red saturation in the center of the screen. Also, adjust the purity magnet pole tabs, individually, for the best red center.
  - d. If there are edge impurities, adjust the yoke forward or backward being careful not to tilt the yoke or cause decentering. If the yoke is tilted, it will result in convergence errors.
  - e. Adjust purity magnet (M17) to eliminate impurities in the red screen and produce a pure red raster. Turn the brightness control down just past the point where the red gun is cut off. Increase the green G1 control and check field for purity. Turn down the green G1 control and turn up the blue G1 control and check field for purity. It may be necessary to compromise the edge magnets to obtain the best overall red, blue and green fields.
  - f. Increase the brightness control to normal and adjust G1 controls on blue and green guns for best white balance. Reset the edge magnets for the best white field but do not sacrifice red, green or blue purity any more than is necessary.
  - g. Return the receiver to the desired location and adjust the purity control to give the most uniform white. If necessary to overcome objectionable errors in the white field, the rim purity magnet (M17) may be slightly retouched.

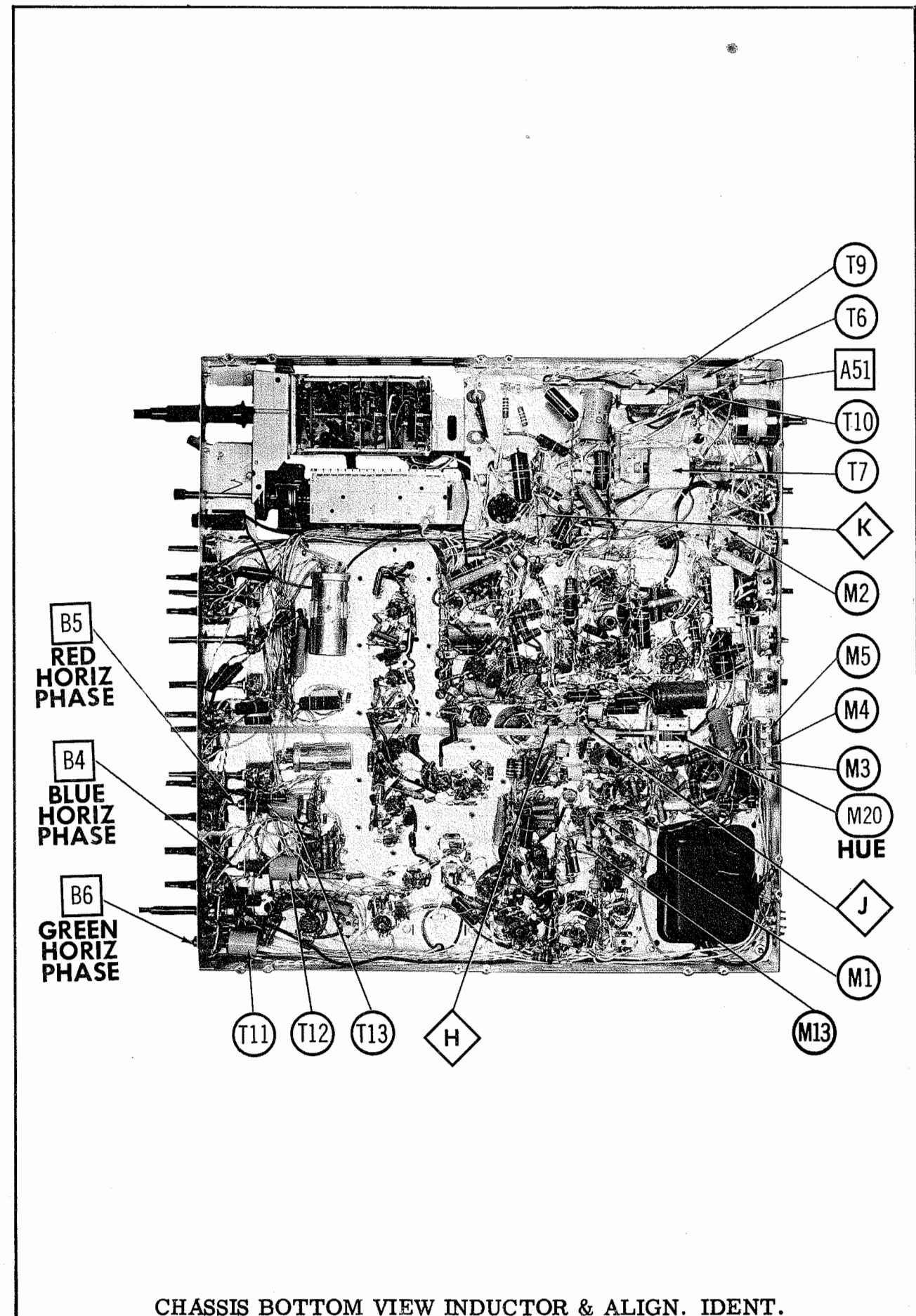
4. Using a white dot generator, again converge the red, green and white dots at the center of the screen to produce a white dot at the center.

### AGC CONTROL

1. Tune the receiver to a reasonably stationary signal (preferably a test pattern).
2. Calibrate the scope for 35 volts peak to peak.
3. Connect the vertical amplifier of the scope to TP5. Low side to chassis.
4. Adjust the scope centering control until the sync tips are even with the lower calibration line on the scope screen.
5. Using a clip lead, intermittently short point  $\Delta$  to chassis while observing the scope. This is to prevent the scope input from charging.
6. Set the AGC control (R22) for a 35 volt difference between sync tips and B+ which is the uppermost point of travel of the scope trace when point  $\Delta$  is momentarily shorted to chassis.

### DYNAMIC CONVERGENCE

1. Set the contrast control to mid-point. Advance the brightness control then lower to the point where the background just becomes black. Using the white dot generator, converge the center dots with the three convergence magnets and blue lateral magnet. (This is static or DC convergence.)
2. a. Turn all three vertical amplitude controls to approximately mid-position.
  - b. Adjust the red vertical tilt for even displacement of the center red row of dots with respect to the center vertical row of blue dots.
  - c. Adjust green vertical tilt for symmetrical displacement of the center vertical row of dots with respect to the center vertical row of blue dots.
  - d. Adjust the blue vertical tilt for even displacement of the vertical center row of blue dots with respect to the vertical center row of red and green dots.
  - e. Turn the red and green horizontal amplitude controls fully counter clockwise for MINIMUM effect.
  - f. Converge the center dots for a single white dot. Step 2 is to MINIMIZE the effects of interactions.
3. a. Turn off the green gun with the green G1 control.
  - b. Adjust the red vertical amplitude and tilt to make the center vertical row of red dots parallel to the center vertical row of blue dots.
  - c. Reconverge at the center using the red magnets.
4. a. Adjust the blue vertical amplitude and tilt for equal displacement of the blue dots and in the same direction from the red dots throughout the center vertical row.
  - b. Reconverge at the center with the blue magnet. At this point the red and blue dots should be completely converged (within limits) throughout the center vertical row of dots.
5. a. Turn up the green gun with the green G1 control.
  - b. Adjust the green vertical amplitude and tilt until the center vertical row of green dots are parallel to the center vertical row of magenta dots (the red and blue dots converged).
  - c. Reconverge at the center with the green magnet. The pattern should now be converged along the vertical center line within 3/4 of an inch of the top and bottom of the screen.
6. a. Adjust the blue horizontal amplitude control and blue horiz. phase (B4) to make the center horizontal row of blue dots parallel to the green and red horizontal row of dots.
  - b. Reconverge at the center using the blue magnet.
  - c. Turn off the blue gun with the blue G1 control.
7. a. Turn the red horizontal amplitude control fully clockwise.
  - b. Adjust the red horizontal phase (B5) for equal displacement of the red dots and in the same direction from the green dots throughout the center horizontal row.
  - c. Turn the red horizontal amplitude control fully counter clockwise.
8. a. Turn the green horizontal amplitude control fully clockwise.
  - b. Adjust green horizontal phase (B6) for equal displacement of the green dots and in the same direction from the red dots throughout the center horizontal row.
  - c. Turn the green horizontal amplitude control back fully counter clockwise.
9. a. Turn up the red and green amplitudes simultaneously to obtain equal displacement of the green dots and in the same direction from the red dots along the center horizontal row of dots.
  - b. Reconverge at the center using the red and green magnets. The red and green dots should now be converged (within limits) along both the vertical and horizontal center row of dots.



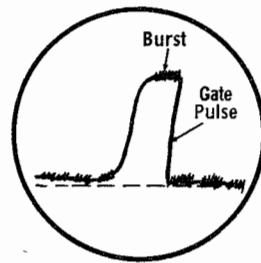
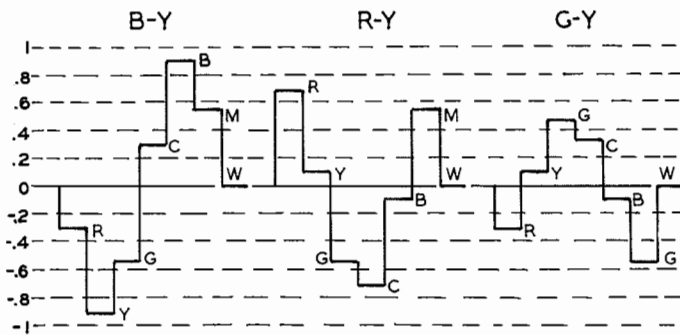
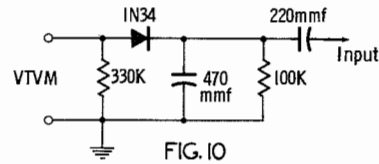
CHASSIS BOTTOM VIEW INDUCTOR & ALIGN. IDENT.

PHILCO MODELS 22D5100,  
22D5102, L, M (Ch. TV-123)

## ALIGNMENT INSTRUCTIONS (cont)

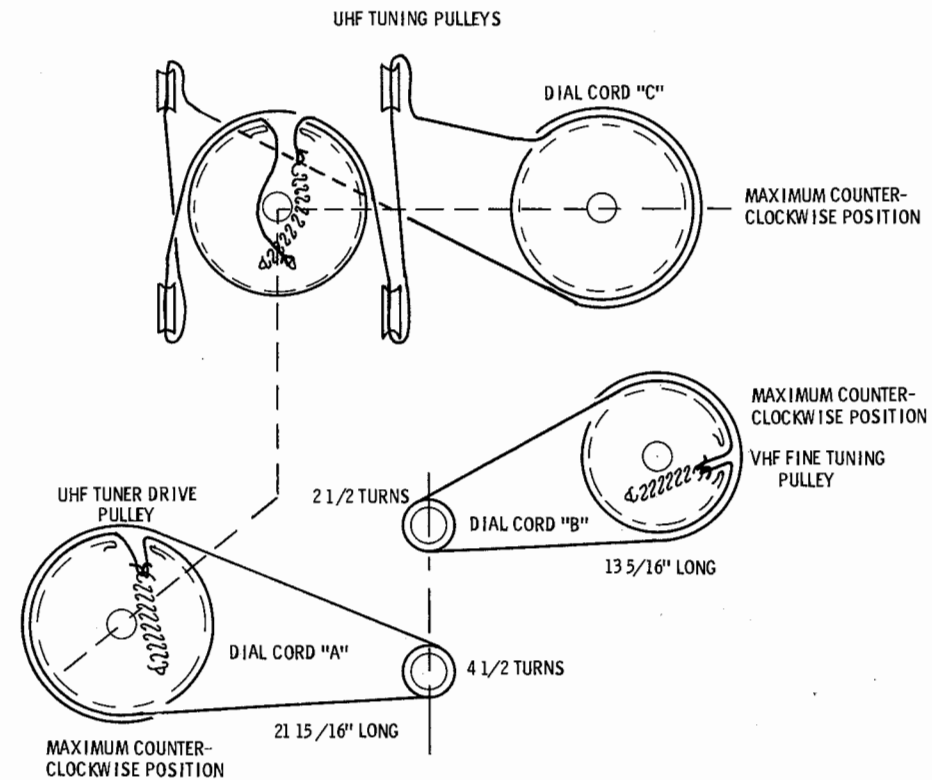
CHROMA SYNC PHASE DETECTOR, CHROMA REFERENCE OSCILLATOR AND DEMODULATOR ALIGNMENT

- Replace the horizontal output tube (V21) in its socket.
- Connect a color bar generator to the antenna terminals and set the selector for color bars.
  - Adjust the receiver for normal reception of the color bars and then set the "Hue" control (M20) at mid-range.
  - Burst alignment.
    - Connect the VTVM to TP-21 and chassis for a negative voltage reading.
    - Adjust A46 for maximum negative voltage on the VTVM.
  - Oscillator Drive.
    - Turn A47 seven turns in from full counter clockwise position.
    - Using the low capacity probe (Fig. 10). Connect the positive lead of the VTVM to pin 7 (grid) of V18. Connect negative lead to chassis.
    - Starting full counter clockwise position of A48 adjust clockwise until 1.75 volt ( $\pm$  .25 volts is obtained on VTVM. Remove the low capacity probe.
  - Oscillator Frequency.
    - Connect a clip lead from TP-18 to chassis.
    - Connect a clip lead from TP-12 to chassis.
    - Adjust A47 until the color in the bar pattern stops running and becomes as nearly stationary as possible. Remove the clip lead from TP-12.
  - Quadrature Amplifier.
    - Connect the VTVM to TP-21 for a negative voltage reading.
    - Adjust A49 for maximum negative DC voltage on the VTVM.
    - Remove the clip lead from TP-18 and chassis.
  - Master Phasing.
    - Check the setting of the "Hue" control (M20). It should be at mid-range.
    - Connect the vertical amplifier of the scope to point  $\diamond$ . Connect low side to chassis.
    - Retouch A46 until the color bar waveform on the scope appears in their proper ratios as in Fig. 11, B-Y.
  - Quadrature.
    - Connect the vertical amplifier of the scope to point  $\diamond$ . Positive to chassis.
    - Adjust A50 until the color bar waveform on the scope appears in their proper ratios as in Fig. 11, R-Y.
  - Phase Detector Balance Check.
    - Connect the DC probe of the VTVM to TP-22. Common to chassis. The voltage reading on the VTVM with the burst being received should not exceed  $\pm$  .5 volts. If a greater voltage is indicated on the meter, the circuit components and the chroma sync phase detector tube (V28) should be checked.
    - After completing the alignment, the voltage at TP-22 should be checked without a signal being received. This noise balance check should not exceed  $\pm$  .8 volts. If the voltage is higher than this amount, the circuit and components should be checked.



## MISCELLANEOUS ADJUSTMENTS (cont.)

- Turn up the blue gun with the blue G1 control.
  - Readjust the blue horizontal amplitude control and blue horizontal phase (B4) to superimpose the blue center horizontal row of dots on the row of yellow dots (converged red and green dots).
  - It may be necessary to readjust the blue lateral correction magnet to obtain symmetrical displacement of the blue dots from the yellow dots along the center horizontal row.
  - The center horizontal and vertical rows of dots should now be converged (within limits). Slight misconvergence at the extreme corners is acceptable.
- WHITE BALANCE**
- Calibrate the scope for 65 volts peak to peak.
  - Be sure the AGC has been properly adjusted and set the line voltage to 117 volts.
  - Set the brightness control at mid-position.
  - Connect the vertical amplifier to point  $\diamond$ . Low side to chassis.
  - Turn the receiver to a station with a reasonably stationary picture containing blacks and whites. (A test pattern will suffice.)
  - Adjust the contrast control to provide 65 volts peak to peak of video information (black to white measurement) on the scope.
- Adjust the brightness control clockwise until the sync tips start to compress and then back off until compression disappears.
  - Set the blue G1 control and green G1 control fully counter clockwise.
  - Set the blue G2 control and green G2 control fully counter clockwise. If necessary, increase red G2 control until a red picture is obtained on the picture tube screen.
  - Adjust the vertical hold control until the blanking bar is approximately midway between the top and bottom of the screen.
  - Adjust the red G2 control until the blanking bar just becomes black.
  - Connect a bar generator to the antenna terminals and set pattern selector switch to the black and white bar position. A test pattern or a reasonably stationary black and white picture may be used if necessary.
  - Adjust the green G1 and G2 controls so that all levels of the bar chart are similar shades of yellow. The G2 control has primary effect over darker parts of the chart and the G1 controls the lighter areas. For example; if the light parts are too green and the darker parts too red, the green G1 control should be turned back and the green G2 control turned up.
  - Adjust the blue G1 control and the blue G2 control for a neutral gray and white in the bar pattern. The same procedure for adjusting the green G1 and G2 controls are used for adjusting the blue. For example; if the dark part of the picture is too blue and the light parts are too yellow, the blue G2 control should be turned down and the blue G1 advanced.



UHF VHF DRIVE CORD  
SET 349 FOLDER 9

PHILCO MODELS 22D5100,  
22D5102, L, M (Ch. TV-123)

# ALIGNMENT INSTRUCTIONS

## ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Disable the high voltage, by removing the horizontal output tube (V21) from its socket.

### VIDEO IF ALIGNMENT

Connect the negative lead of a 25 volt bias supply to point  $\diamond$ . Positive to chassis.  
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.  
Set the fine tuning control to the mid-position of its range.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1. Fig. 1	Across UHF antenna terminals thru matching network (Fig. 1).	41.25MC (400% 30% AM Mod.)	UHF	Vert. Amp. thru 10K to point $\diamond$ . Low side to chassis.	A1	Adjust for MINIMUM indication on scope.
2. "	"	47.25MC	"	"	A2	"
3. "	"	41.25MC	"	Vert. Amp. thru 10K to point $\diamond$ . Low side to chassis.	A3, A4	Preset A41 slug one inch from chassis. Adjust for MINIMUM indication on scope.
4. "	"	47.25MC	"	"	A5, A6	Adjust for MINIMUM indication on scope.
5. "	"	39.5MC	"	"	A7	"
6. "	"	47.0MC	"	"	A8	"
7. "	"	42.0MC	"	"	A9	Adjust for maximum indication on scope.
8. "	"	45.75MC	"	"	A10	"
9. "	"	43.0MC	"	"	A11	"
10. "	"	44.75MC	"	"	A12	"
11. "	"	44.75MC	"	"	A13	Insert 680Ω from point $\diamond$ to chassis. Adjust for maximum indication on scope.
12. "	"	44.0MC	"	"	A14	Insert 680Ω from point $\diamond$ to chassis. Adjust for maximum indication on scope.
13. "	"	44.25MC	"	Vert. Amp. thru 10K to point $\diamond$ . Low side to chassis.	A15, A16	Insert 680Ω from point $\diamond$ to chassis. Adjust for maximum indication on scope.

### OVERALL VIDEO IF RESPONSE CHECK

DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
14. Fig. 1	Across antenna terminals thru matching network (Fig. 1).	Not used	85.75MC (400% 30% AM Mod.)	4	Vert. Amp. thru 10K to point $\diamond$ . Low side to chassis.	Fine tuning	Adjust fine tuning for MINIMUM indication on scope. Leave fine tuning in this position for remainder of video IF alignment.
15. "	"	69MC (10MC Swp)	41.65MC 42.5MC 43.65MC	"	Vert. Amp. thru detector to point $\diamond$ . Low side to chassis.	A9, A10, A11, A12	Touch-up A9 thru A12 to obtain response similar to Fig. 3 with markers as indicated. A10 adjusts high frequency side of curve, A9 and A11 adjusts the low frequency side and A12 adjusts tilt.
16. "	"	"	"	"	Vert. Amp. to point $\diamond$ . Low side to chassis.	"	Adjust A15 and A16 if necessary to shape corner of curve. It may be necessary to retouch A12 to correct tilt. Adjust A2 to place 45.75MC marker at approximately 50% as in Fig. 4.
17. "	"	"	"	"	Vert. Amp. to point $\diamond$ . Low side to chassis.	A18, A13, A14	Touch-up A13 and A14 to obtain response similar to Fig. 5. Retouch A8 for proper placement of 45.75MC marker.

### SOUND IF ALIGNMENT

Turn the set on and tune in a TV station.  
Connect the negative lead of a variable bias to point  $\diamond$ . Connect positive to chassis. Adjust bias for -5 to -10 volts.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
18. Direct	Antenna to antenna terminals.	Not used	Any channel operating	DC probe thru detector (Fig. 6) to point $\diamond$ . Common to chassis.	A17, A18, A19	Adjust A17 and A18 for maximum indication on meter. Adjust A19 for maximum volume in sound.

### VHF OSCILLATOR ALIGNMENT

Connect bias as under "Video IF Alignment".  
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.  
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.  
Set the fine tuning control to the mid-position of its range.  
Adjustments are located on front of the tuner (See Fig. 7).

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
19. Direct	Across antenna terminals.	209.75MC	13	Vert. Amp. thru 10K to point $\diamond$ . Low side to chassis.	A20	Adjust for MINIMUM indication on scope.
20. "	"	203.75MC	12	"	A21	"
21. "	"	197.75MC	11	"	A22	"
22. "	"	191.75MC	10	"	A23	"
23. "	"	185.75MC	9	"	A24	"
24. "	"	179.75MC	8	"	A25	"
25. "	"	173.75MC	7	"	A26	"
26. "	"	81.75MC	6	"	A27	"
27. "	"	75.75MC	5	"	A28	"
28. "	"	65.75MC	4	"	A29	"
29. "	"	59.75MC	3	"	A30	"
30. "	"	53.75MC	2	"	A31	"

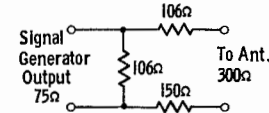


FIG. 1

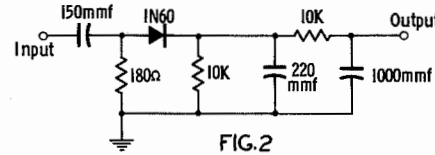


FIG. 2

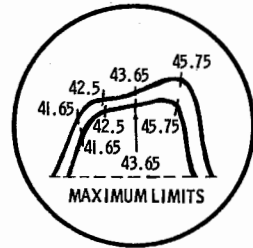


FIG. 3

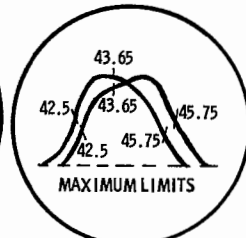


FIG. 4

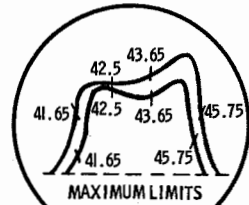


FIG. 5

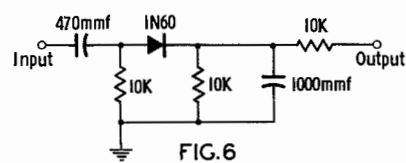


FIG. 6

### VHF OSCILLATOR ADJUSTMENTS

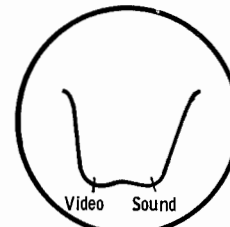
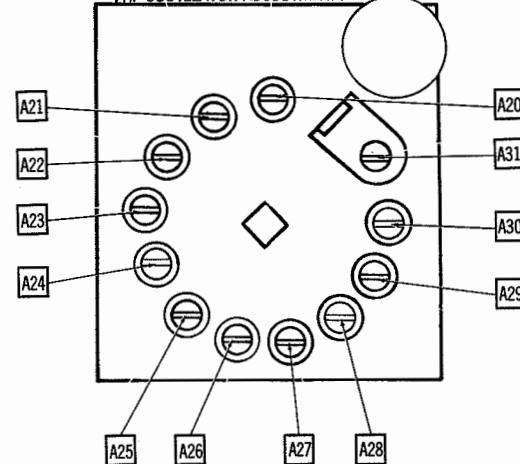


FIG. 8

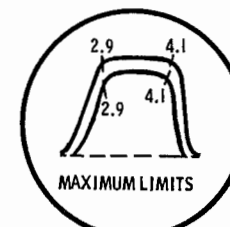


FIG. 9

### VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a variable bias to point  $\diamond$ . Positive to chassis. Adjust bias to produce -1.5 volts of bias at pin 1 of AGC clamper (V16A).  
Disconnect the orange B+ lead from the tuner and connect a 3300Ω, 2 watt carbon resistor in series with the lead and connect the resistor to the tuner B+ connection. Connect the vertical amplifier lead of the scope to the tuner side of the 3300Ω resistor and the ground lead to chassis.  
In some cases it may be necessary to connect approximately 50MFD from the B+ side of the resistor to chassis to help stabilize the waveform on the scope. Disconnect the chassis end of the tuner link lead and connect a 88Ω carbon resistor from the open end of the link to ground.  
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. Use only enough sweep generator output to provide usable pattern on scope.

DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
31. Fig. 1	Across VHF antenna terminals thru matching network.	213MC (10MC Swp)	211.25MC 215.75MC	13	See instructions.	A32	Adjust for response similar to Fig. 6 with markers as indicated.
32. "	"	"	"	13	"	A33, A34	Adjust A33 and A34 alternately to obtain maximum symmetrical response similar to Fig. 8. A33 adjusts gain and A34 adjusts tilt.
33. "	"	177MC (10MC Swp)	175.25MC 179.75MC	7	"	A35, A36	Adjust for response similar to Fig. 8 with markers as indicated. Repeat step 32, then 33 until desired response is obtained on channels 7 and 13.
34. "	"	85MC (10MC Swp)	83.25MC 87.75MC	6	"	A37	Adjust counter clockwise until single peak appears. Do not unscrew core to far out or it will drop out of coil.
35. "	"	"	85MC	"	"	A38	Adjust to place 85MC marker at peak of response.
36. "	"	"	"	"	"	A39	Adjust for maximum gain and symmetry of single peak.
37. "	"	"	"	"	"	"	Retouch A37 and A38 for symmetrical response centered about 85MC marker.
38. "	Across UHF antenna terminals thru network (Fig. 1).	43.5MC (10MC Swp)	Not used	UHF	"	A40	Adjust for flat response.

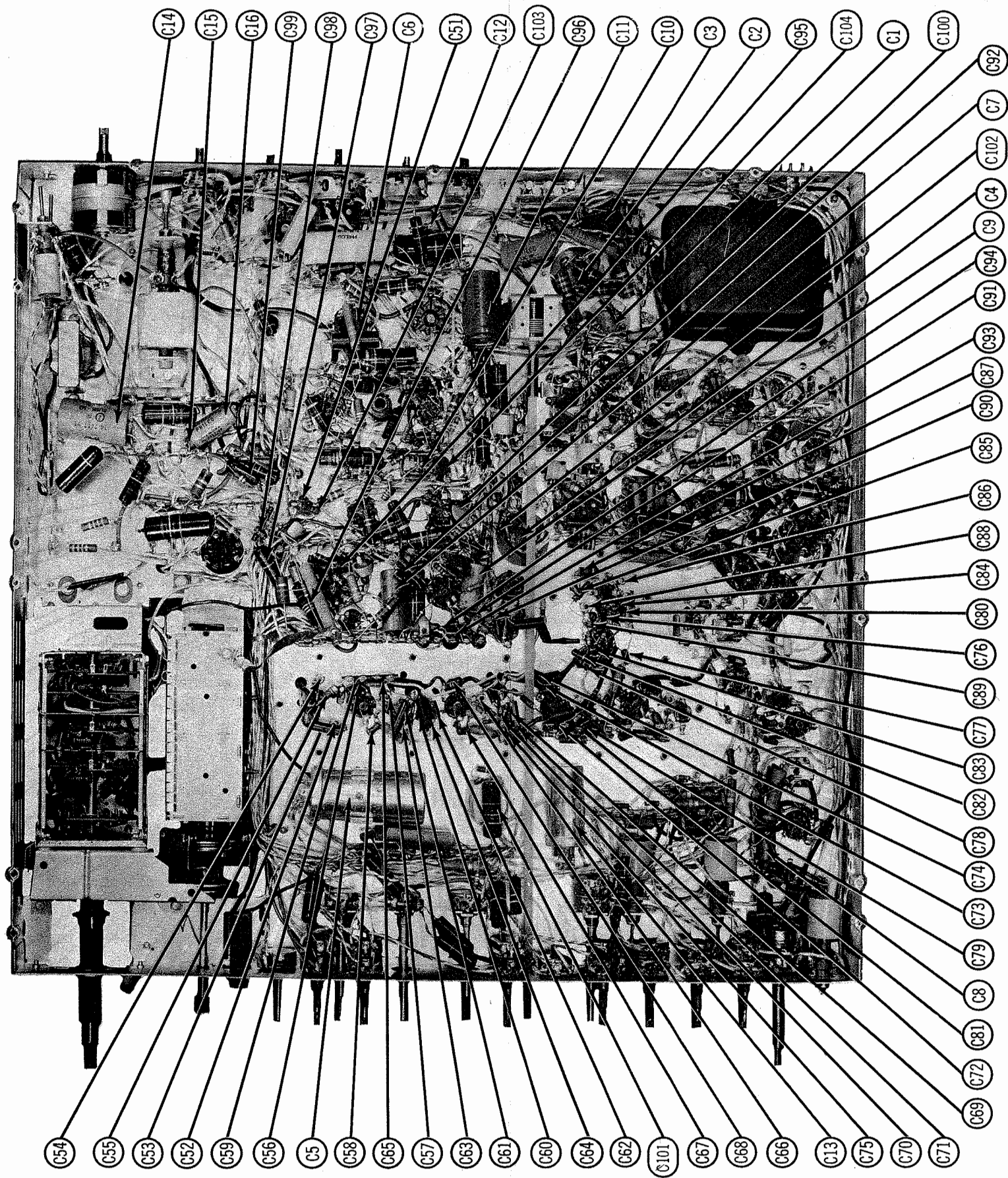
### CHROMA IF ALIGNMENT

Sound take-off coil (A18) must be properly adjusted before starting "Chroma IF Alignment" to prevent a notch in the chroma response.  
Connect the negative lead of a 35 volt bias supply to point  $\diamond$ . Positive to chassis.  
Turn chroma control counter clockwise 1/8 of its rotation range from full clockwise.  
Remove the chroma reference oscillator (V29) from its socket.  
Connect an .01MFD capacitor from TP-25 to chassis. Connect an .01MFD capacitor from TP-27 to chassis. Connect a lead from TP-23 to chassis.

DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
39. 10K Carbon Resistor	High side to point $\diamond$ . Low side to chassis.	Not used	3.15MC (30% 400% AM Mod)	Any Unused Channel	Vert. Amp. thru detector to point $\diamond$ . (Fig. 8). Low side to chassis.	A41	Connect a 1000Ω resistor from TP-9 to chassis while adjusting A41 for maximum indication on scope. Remove resistor.
40. "	"	"	3.75MC	"	"	A42	Connect 1000Ω resistor from TP-10 to chassis, while adjusting A42 for maximum scope indication. Remove resistor.
41. "	"	"	4.5MC	"	"	A43	Adjust for MINIMUM indication.
42. "	"	"	2.9MC	"	"	A44	Adjust for maximum indication.
43. "	"	"	3.58MC	"	"	A45	"
44. "	"	3.5MC (3MC Swp)	2.9MC 4.1MC	"	"	"	Retouch A41 and A44 for response similar to Fig. 9 with markers as indicated and flat top. Retouch A42 to correct shape of curve at 2.9MC marker. A45 is used to correct tilt of overall curve. Do not turn A45 more than 1/4 turn.

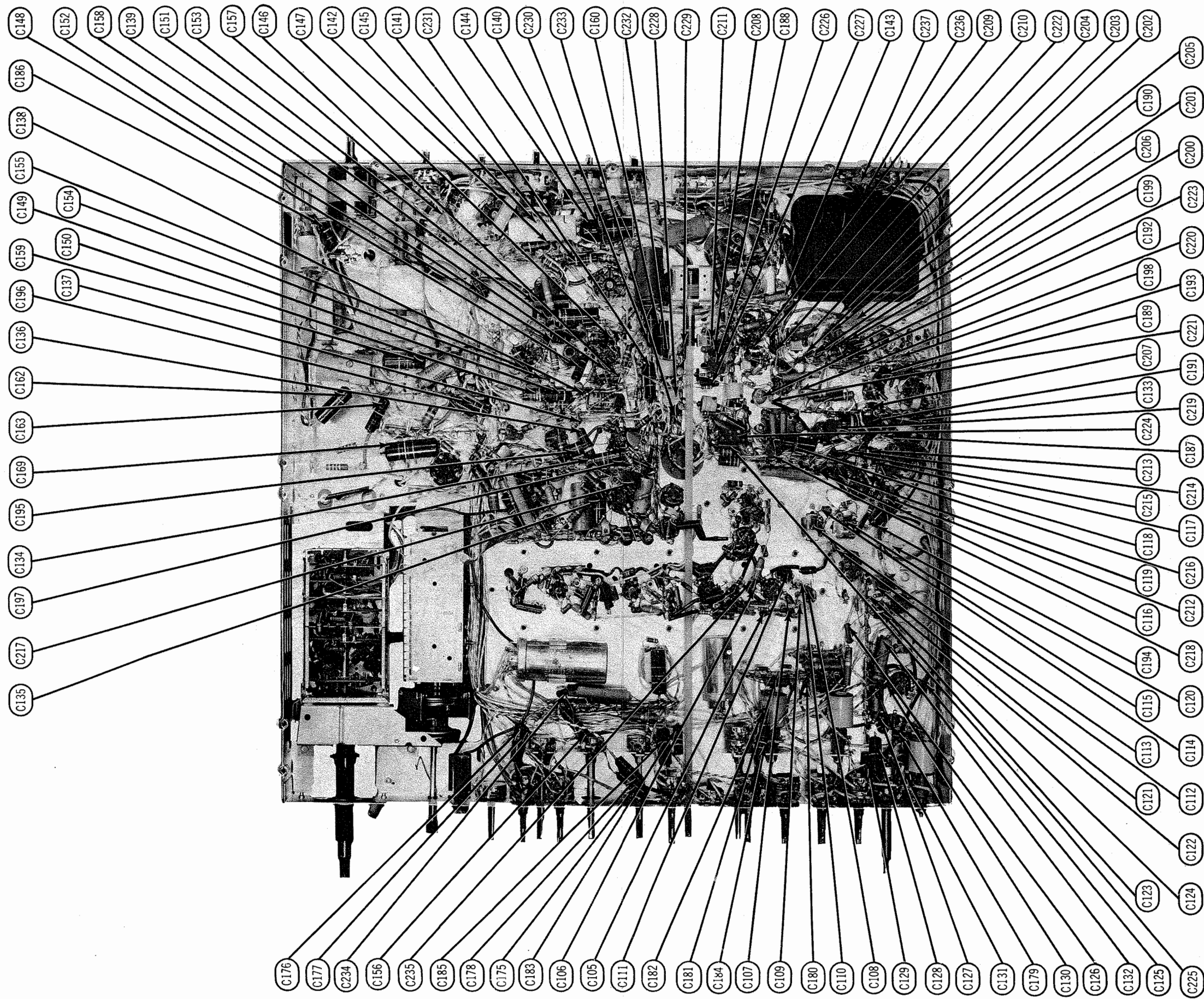
PHILCO MODELS 22D5100, 22D5102, L, M (Ch. TV-123)



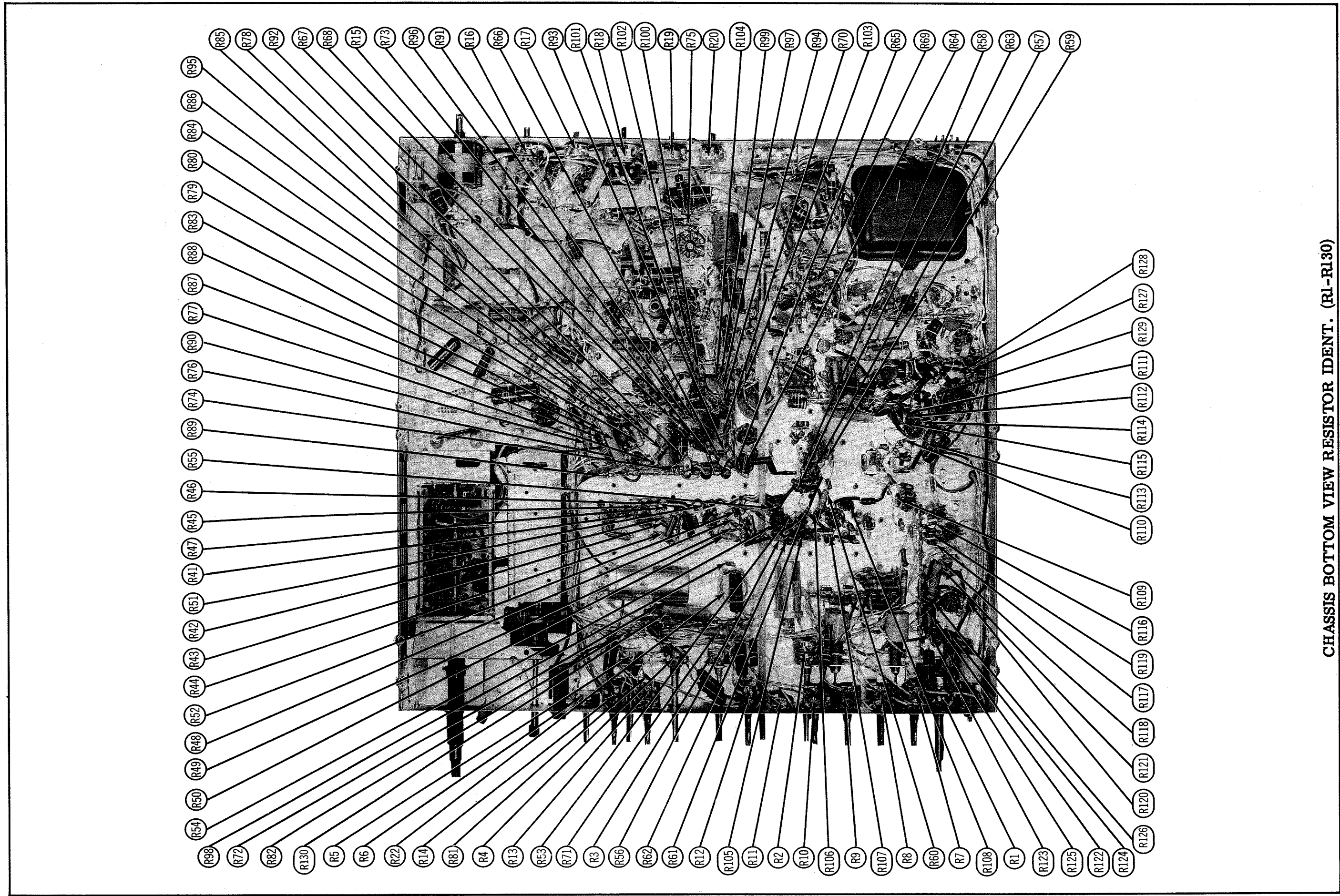


PHILCO MODELS 22D5100,  
 22D5102, L, M (Ch. TV-123)  
 CHASSIS BOTTOM VIEW CAPACITOR IDENT. (C1-C104)

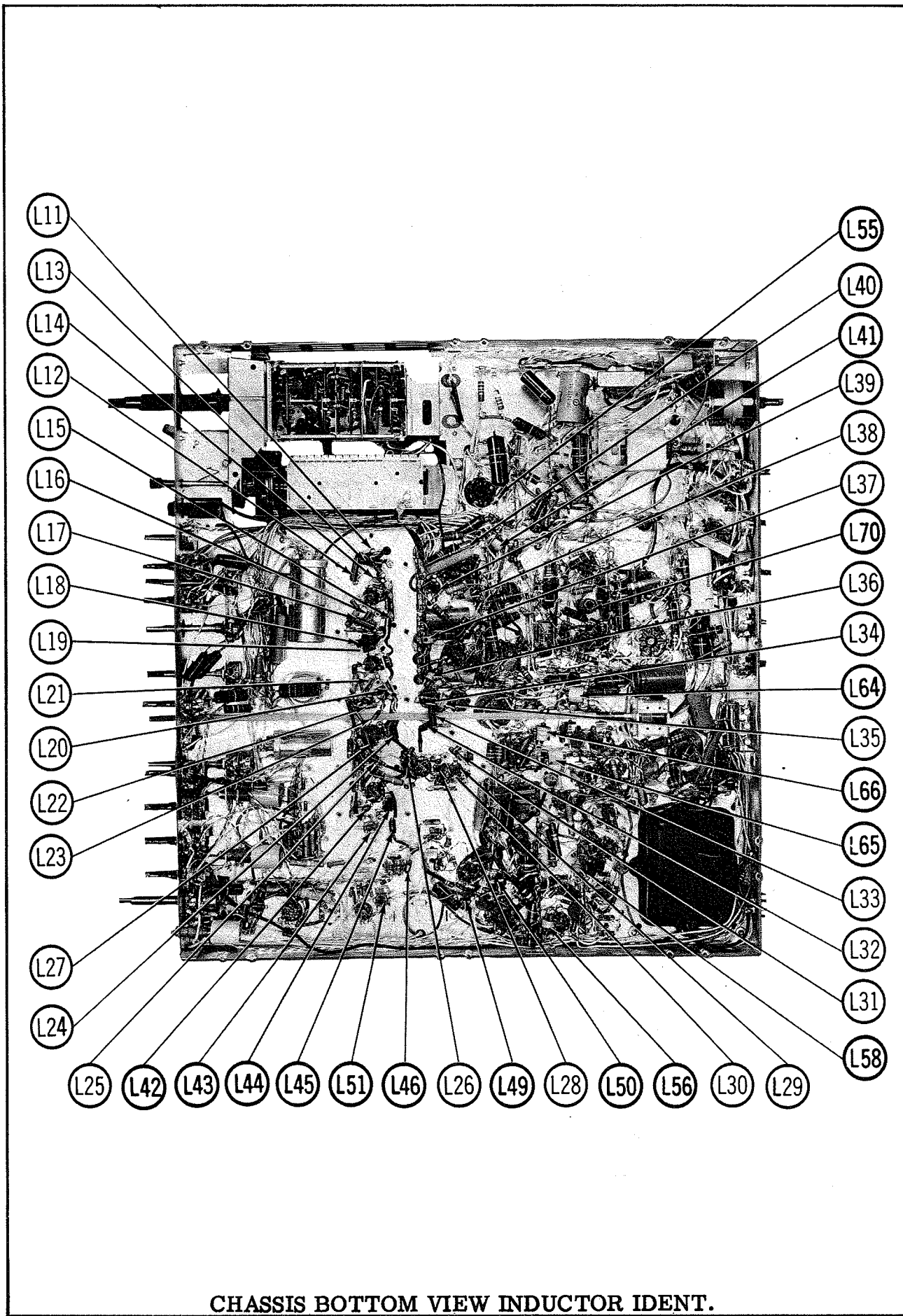




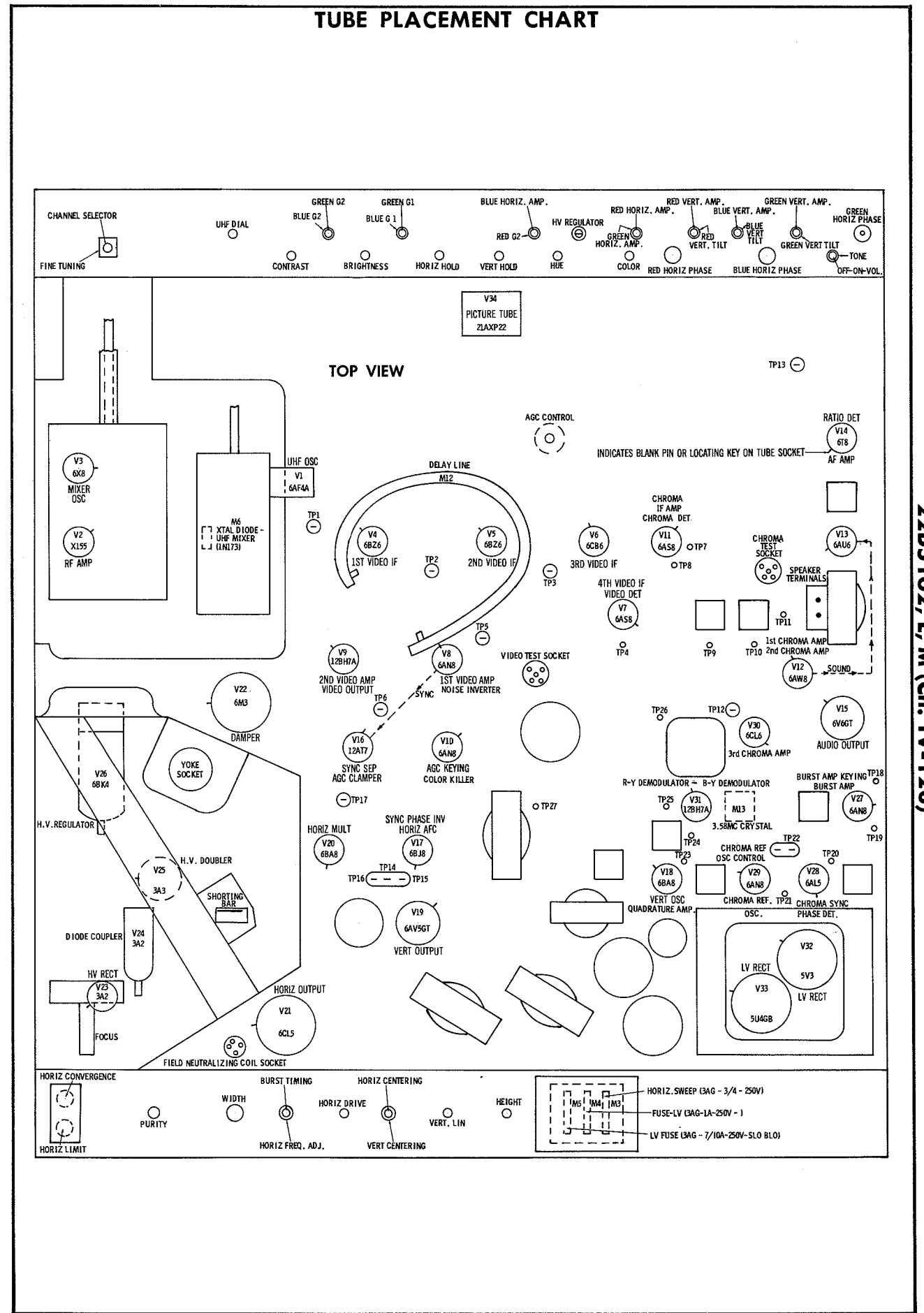
CHASSIS BOTTOM VIEW CAPACITOR IDENT. (C105 - C237)  
**PHILCO MODELS 22D5100,  
 22D5102, L, M (Ch. TV-123)**



PHILCO MODELS 22D5100,  
 22D5102, L, M (Ch. TV-123)  
 CHASSIS BOTTOM VIEW RESISTOR IDENT. (R1-R130)

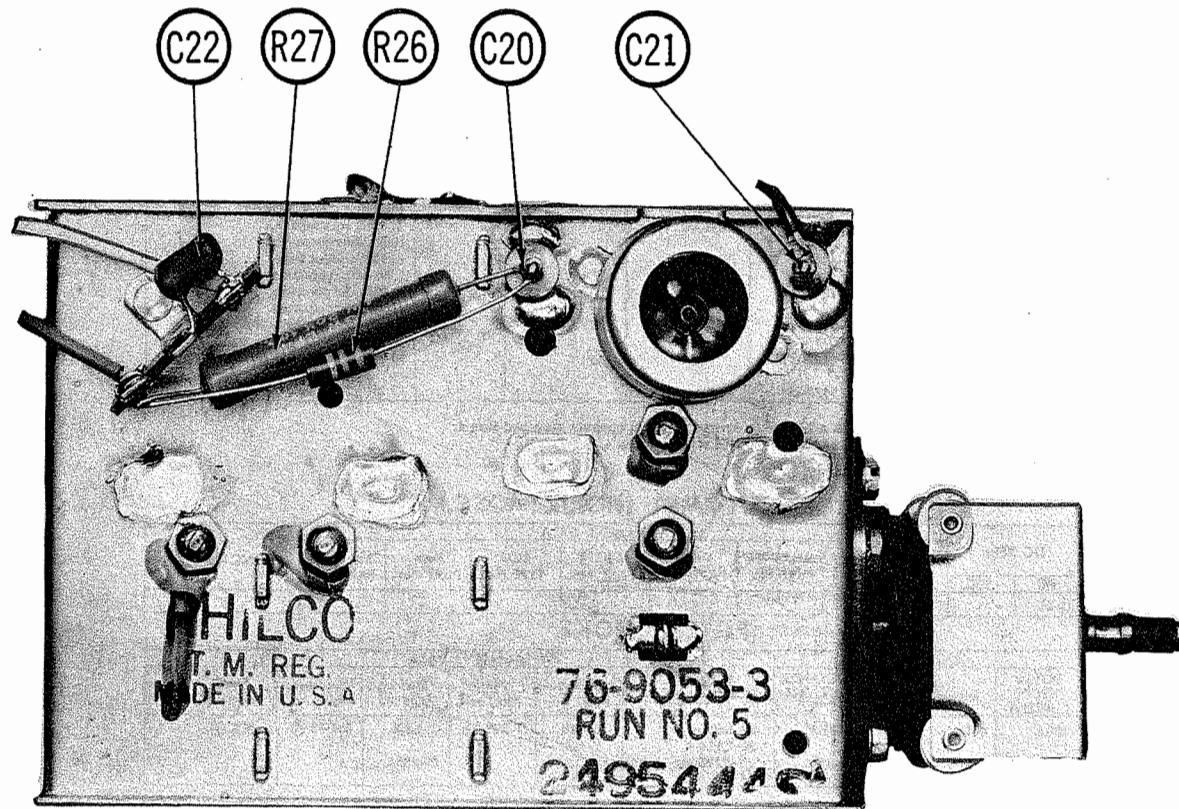


CHASSIS BOTTOM VIEW INDUCTOR IDENT.

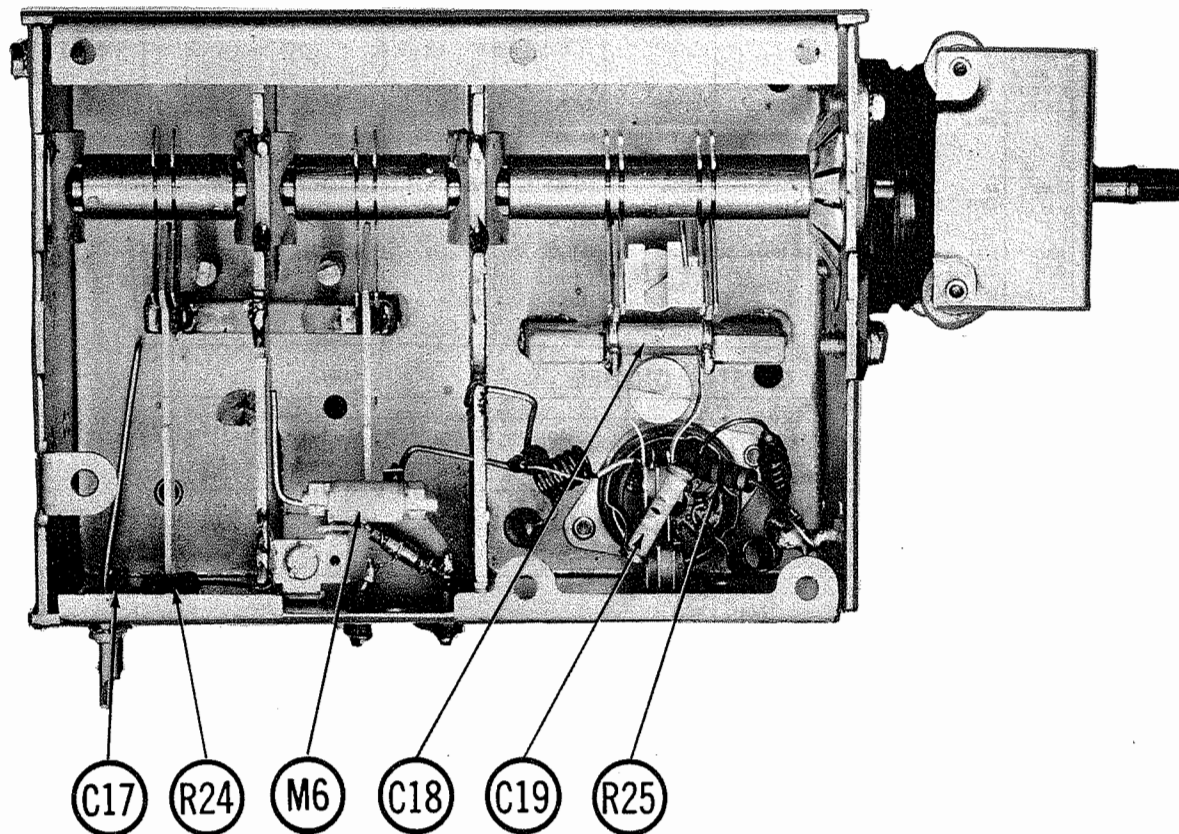


PHILCO MODELS 22D5100, 22D5102, L, M (Ch. TV-123)





UHF TUNER TOP VIEW



UHF TUNER-BOTTOM VIEW

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AF4A	*20K	6800Ω	.1Ω	0Ω	0Ω	6800Ω	*20K		
V2	X155	†900Ω	220K	INF	0Ω	.1Ω	INF	900K	0Ω	0Ω
V3	6X8	0Ω	22K	†68K	0Ω	.1Ω	0Ω	100K	†17K	8.5K
V4	6BZ6	65K	47Ω	.1Ω	0Ω	†11.6K	†11.4K	0Ω		
V5	6BZ6	65K	47Ω	.1Ω	0Ω	†11.6K	†11.4K	0Ω		
V6	6CB6	1000Ω	150Ω	.1Ω	0Ω	†9.9K	†9.9K	0Ω		
V7	6AS8	6000Ω	.1Ω	330Ω	.1Ω	0Ω	2200Ω	0Ω	0Ω	500Ω
V8	6AN8	†240K	†8300Ω	†3000Ω	.1Ω	0Ω	†8200Ω	†3600	2200Ω	82Ω
V9	12BH7	†5000Ω	100K	56Ω	0Ω	0Ω	†4400Ω	1800Ω	•7Ω	.1Ω
V10	6AN8	100K	†2Meg	10K	†40K	†40K	†470K	†22K	†138K	†1000Ω
V11	6AS8	†6000Ω	.1Ω	330Ω	.1Ω	0Ω	4700Ω	0Ω	0Ω	†350Ω
V12	6AW8	220Ω	2.3Ω	†2500Ω	.1Ω	0Ω	220Ω	†1.4Meg	†6300Ω	†3800Ω
V13	6AU6	56K	0Ω	.1Ω	0Ω	†11K	†11K	330Ω		
V14	6T8	INF	22K	INF	.1Ω	0Ω	NC	0Ω	10Meg	†330K
V15	6V6GT	NC	0Ω	†1500Ω	†1000Ω	520K	TP	.1Ω	180Ω	
V16	12AT7	†950K	†950K	0Ω	0Ω	0Ω	†10K	†12Meg	0Ω	.1Ω
V17	6BJ8	4.7Meg	150K	4.7Meg	.1Ω	0Ω	150K	†33K	470K	2200Ω
V18	6BA8	0Ω	•430K	•†2.7Meg	.1Ω	0Ω	180Ω	1Ω	†15K	†3400Ω
V19	6AV5GT	2.2Meg	0Ω	•1200Ω	NC	†1700Ω	TP	.1Ω	†68K	
V20	6BA8	1150Ω	5.5Meg	†90K	†40K	†40K	150Ω	•160K	†55K	†100K
V21	6CL5	†6000Ω	0Ω	120Ω	470K	470K	120Ω	.1Ω	†6000Ω	TOP CAP †133Ω
V22	6M3	NC	0Ω	†110Ω	NC	†110Ω	NC	†110Ω	.1Ω	TOP CAP 2.7Meg
V23	3A2	20Meg	20Meg	NC	20Meg	20Meg	20Meg	NC	20Meg	TOP CAP †11.3Ω
V24	3A2	PINS 1 THRU 9 HAVE INF RESISTANCE								TOP CAP 20Meg
V25	3A3	PINS 1 THRU 9 HAVE INF RESISTANCE								TOP CAP INF
V26	6BK4	†75Ω	†75Ω	NC	NC	•1Meg	NC	†75Ω	NC	TOP CAP INF
V27	6AN8	†7500Ω	•27K	0Ω	.1Ω	0Ω	†1200Ω	†1200Ω	†7500Ω	†1400Ω
V28	6AL5	1.5Ω	1.5Ω	.1Ω	0Ω	1.5Meg	0Ω	2Meg		
V29	6AN8	†80K	150K	2Ω	.1Ω	0Ω	†1200Ω	†9000Ω	2Meg	390Ω
V30	6CL6	•1600Ω	120K	†3900Ω	.1Ω	0Ω	†1500Ω	0Ω	†3900Ω	NC
V31	12BH7A	†35K	12K	10K	0Ω	0Ω	†22K	12K	10K	.1Ω
V32	5V3	NC	6000Ω	NC	96Ω	NC	96Ω	NC	6000Ω	
V33	5U4GB	NC	4600Ω	NC	90Ω	NC	90Ω	NC	4600Ω	
V34	21AXP22	40K	†100K	900K	†8300Ω	†8300Ω	†240K	†300K	1.5Meg	NC
		PIN 10	PIN 11	PIN 12	PIN 13	PIN 14				•†8Meg
		NC	†1.5Meg	†270K	†5600Ω	40K				

† MEASURED FROM PIN 8 OF V33.  
 † MEASURED FROM PIN 8 OF V32.  
 • THIS READING WILL VARY, CONTROL SET FOR NORMAL OPERATION.  
 \* MEASURED IN UHF POSITION.  
 † MEASURED FROM TOP CAP OF V22.

PHILCO MODELS 22D5100,  
22D5102, L, M (Ch. TV-123)

**PARTS LIST AND DESCRIPTIONS**  
**TUBES (GENERAL ELECTRIC, SYLVANIA)**

ITEM No.	USE	TYPE	NOTES	ITEM No.	USE	TYPE	NOTES
V1	UHF Osc.	6AF4A		V17	Sync Phase Inverter-Horiz. AFC	6BJ8	
V2	RF Amp.	X155		V18	Vert. Osc. - Quadrature Amp.	6BA8	
V3	Mixer-Osc.	6X8		V19	Vert. Output	6AV5GT	
V4	1st Video IF Amp.	6BZ6		V20	Horiz. Mult.	6BA8	
V5	2nd Video IF Amp.	6BZ6		V21	Horiz. Output	6CL5	
V6	3rd Video IF Amp.	6CB6		V22	Damper	6M3	
V7	4th Video IF Amp. - Video Det.	6AS8		V23	HV Rectifier	3A2	
V8	1st Video Amp. - Noise Inverter	6AN8		V24	HV Diode Coupler	3A2	
V9	2nd Video Amp. - Video Output	12BH7A		V25	HV Doubler	3A3	
V10	AGC Keying-Color Killer	6AN8		V26	HV Regulator	6BK4	
V11	Chroma IF Amp. - Chroma Det.	6AS8		V27	Burst Amp. Keying-Burst Amp.	6AN8	
V12	1st Chroma Amp. - 2nd Chroma Amp.	6AW8		V28	Chroma Sync	6AN8	
V13	Sound IF Amp.	6AU6		V29	Chroma Ref. Osc. Control-Chroma Ref. Osc.	6CL6	
V14	Ratio Det. - AF Amp.	6T8		V30	3rd Chroma Amp.	6AN8	
V15	Audio Output	6V6GT		V31	R-Y Demodulator - B-Y Demodulator	12BH7A	
V16	Sync Sep. - AGC Clamper	12AT7		V32	LV Rectifier	5V3	
				V33	LV Rectifier	5U4GB	

**PICTURE TUBE**

ITEM No.	REPLACEMENT DATA				NOTES
	PHILCO PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	
V34	21AXP22			21AXP22 21AXP22A	

**ELECTROLYTIC CAPACITORS**

ITEM No.	RATING		REPLACEMENT DATA							
	CAP.	VOLT.	PHILCO PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.	
C1	80	300	30-2568-66	AFH1-35	XA0331	FP128	TMS-39	S-185	TVL-1573	
C2A	80	300	30-2568-69	AFH3-35-50		FP227.7		Q-225	R2333 *	
C3	200	300	30-2568-67	AFHSL-37-30	CO200	FP227.7		S-195		
C4A	40	350	30-2568-68	AFH3-112-60	CO350	FP330.23		S-200	TVL-2841	
C4B	80	350			BR5005			Q-220	R2332 *	
C5A	20	350	30-2584-64	AFH4-04	CO310	FP377.6	TMT-42	S-060		
C5B	60	350							TVL-4635	
C5C	10	350								
C6A	440	350	30-2584-63	AFH4-20-50	DO910	FP464.9		Q-467	R2334 *	
C6B	10	350				TC60		T-135		
C6C	40	475								
C6D	10	475								
C7	4	450	30-2417-53	PRS450V4	BR445	TC70	TD-4-450	FM-4504	TVA-1702	
C8	2	50	45-3035-4	PRS50V2	BBR2-50	TC302	TD-2-50	MT-0502	TVA-1301	
C9	2	50	45-3035-4	PRS50V2	BBR2-50	TC302	TD-2-50	MT-0502	TVA-1301	
C10	2	50	45-3035-4	PRS50V2	BBR2-50	TC302	TD-2-50	MT-0502	TVA-1301	
C11	20	350	30-2417-44	PRS450V20	BR2035	TC65	TD-20-350	FM-4520	TVA-1606	
C12	25	50	30-2417-30	PRS50V25	BBR25-50	TC36	TD-25-50	FM-0525	TVA-1306	
C13A	5	50	30-2590-2	AFH3-08	BBRD2215	FP211		MTD-1520	TVL-3435	
C13B	25	50			BBR5-50	TC30		MMT-0505		
C14	500	10	30-2417-51 (Note 1)	NP-PRS10-VNP500	BRH1510	TC412			R2243 *	
C15	10	25	30-2417-49	PRS25V10	BBR10-25	TC22	TD-10-25	FM-0210	TVA-1204	
C16	10	25	30-2417-49	PRS25V10	BBR10-25	TC22	TD-10-25	FM-0210	TVA-1204	

Note 1. Non-polarized unit.  
† Connect negative leads together.  
\* Non-catalog item.

**FIXED CAPACITORS**

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA								NOTES
	CAP.	VOLT.	PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.		
C17	.68				TCZ-R68		TCO-.68				
C18	3										
C19	1										
C20	800										
C21	800										
C22	220		62-122001001	SI220	D6-221	LT6T22	GP-220	UC-5322	5GA-T22		
C23	6		30-1224-9								
C24	6		30-1224-9								
C25	5		30-1224-78	NP0-SI5	TCZ-4R7	LT6V5	TCO-5	ZT-555	5TCCB-V47		
C26	2.7		30-1221-18								
C27	220		62-122001001	SI 220	D6-221	LT6T22	GP-220	UC-5322	5GA-T22		
C28	1000		32-1245-6								
C29	680		62-168001011	SI 680	D6-681	LT6T68	GP-680	UC-5368	5GA-T68		
C30	.5-3		31-6520-3		829-3		3115-D	CT565A			
C31	1000		30-1245-6								
C32	.47		30-1221-15								
C33	1		30-1221-19	NP0-SI 1	TCZ-1		TCO-1		5TCCB-VI		
C34	2.7		30-1221-18								
C35	15		62-015300001	NP0-SI 15	TCZ-15	LTQ5	TCO-15				
C36	68		62-068409011								
C37	.5-3		31-6520-3		829-3		3115-D	CT565A	5TCC-QI5		
C38	1.2		30-1224-70								
C39	150		30-1238-9	DI-00015	DD-151	LT10T15	ED-150	UC-5315	5GA-T15		
C40	12		30-1224-119								
C41	12		30-1224-119								
C42	5		30-1221-13	NP0-SI 5	TCZ-4R7		TCO-5	ZT-555	5TCCB-V47		
C43	220		62-122001001	SI 220	D6-221	LT6T22	GP-220	UC-5322	5GA-T22		
C44	1000		30-1245-6								
C45	1-5		31-6520-10								
C46	5		30-1224-28	NP0-SI 5	TCZ-4R7	LT6V5	TCO-5	ZT-555	5TCCB-V47		

**PARTS LIST AND DESCRIPTIONS (Continued)**  
**COILS (cont)**

ITEM No.	USE	REPLACEMENT DATA				NOTES
		PHILCO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L57	Phase Det.	32-4657A				25 Microhenries
L58	Series Peaking Coil	32-4143-24				
L59	Chroma Reference Osc. Coil	32-4660-7A				
L60	Chroma Plate Coil	32-4660-5A				Tapped @ 1.2Ω
L61	Demodulator Trans.	32-4660-4A				Tertiary winding = 1.2Ω Includes trimmer cap. 1.5-7MMF.
L62	Quadrature Coil	32-4659-1				
L63	Demodulator Delay	32-4660-3A				Includes Caps. Tapped. 3.4MC Resonance, 1960 Microhenries.
L64	RF Choke	32-4668-1	19-5101			
L65	RF Choke	32-4666-1	19-5101			3.4MC Resonance, 1960 Microhenries. 3.4MC Resonance, 1960 Microhenries.
L66	RF Choke	32-4666-1	19-5101			
L67	Cathode Choke	32-4480-1				40 Microhenries - Note 3
L68	Series Peaking Coil	32-4422-27				
L69	Series Peaking Coil	32-4422-27				10 Microhenries - Note 4

Parallel with 10K resistor.  
Note 1: Alternate part #32-4548-39 is a 2.2 Microhenries used in chassis stamped Run 4.  
Note 2: Alternate part #66-3108340 is used in chassis stamped Run 4.  
Note 3: Used in chassis stamped Run 2.  
Note 4: Used in chassis stamped Run Z.

**TRANSFORMER (HORIZ. OSC.)**

ITEM No.	DC RES.	REPLACEMENT DATA							NOTES
		PHILCO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	
L70	10, 3Ω	32-4557-5							

**FILTER CHOKE**

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 C <sub>u</sub> )	PHILCO PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L71	.190A	66Ω	2.65 HY	32-8438-1	C5030	C-2974①	C-2325	28C43 ①	C-21X ①
L72	.350A	47Ω	2.3 HY	32-8438 *					
				32-8478-4					
				32-8478-2*					

① Drill one new mounting hole.  
\* Alternate Philco part number.

**FUSES**

ITEM No.	TYPE	RATING	REPLACEMENT DATA							
			PHILCO PART No.		LITTELFUSE PART No.		BUSS PART No.			
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER		
M1	2" piece #26 wire									
M2	2" piece #26 wire									
M3	3AG	3/4A 250V	AD-2245-6	76-9875	312.750 (3AG-3/4A)	357003	AGC 3/4	4411		
			45-2656-22*		313.750 (3AG-S/B-7/0)	357003	MDL 7/10	4411		
M4	3AG	1A 250V	AD-2245-7	76-9875	312001 (3AG-1A)	357003	AGC 1	4411		
			45-2656-32*		313001 (3AG-S/B-1A)	357003	MDL 1	4411		
M5	3AG S/B	1/2A 250V	AD-2246-10	76-9875	313.500 (3AG-S/B-1/2A)	357003	MDL 1/2	4411		
			45-2656-31*		313.400 (3AG-S/B-4/10A)	357003	MDL 4/10	4411		

\* Alternate part number used in Run #4.

**CRYSTAL DIODES**

ITEM No.	ORIG. TYPE	REPLACEMENT DATA		NOTES
		PHILCO PART No.	SYLVANIA PART No.	
M6	1N173		1N82A	UHF Mixer (Clip In)

**MISCELLANEOUS**

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M7	Dial Light	3463-4	#1847, UHF.
M8	Dial Light	3463-4	#1847, VHF.
M9	Tuner	UT26A	UHF.
M10	Tuner	76-9480-3	VHF.
M11	Ant. Crossover Network	76-9042-1	Includes coils, resistors and caps.
M12	Delay Line	32-4656-2	Luminance Channel.
M13	Crystal	34-8028	3.579545MC Oscillator.
M14	Switch	42-2060	Attenuator, VHF Antenna, Slide Type (2 Position)
M15	Switch	42-2056	Antenna Changeover (Slide Type)
M16	Magnet	76-9852-2	Blue Lateral Beam Positioning
M17	Magnet Ass'y.	76-10016	Purity Ring Ass'y., Retaining Clip Part #228-0062 (8 Used)
M18	Magnet Ass'y.	76-9861	Color Purity
M19	High Voltage Cable	41-4216-2	Includes R183, R104 & R195.
M20	Variable Cap.	31-5630-1	Hue, 4-25MMF.
	Insulator Ring	54-9666	
	Insulating Cone	54-9653	
	Safety Glass	54-9212-41	Model 22D5102.
	Safety Glass	54-9212-40	Model 22D5100.
	Mask	54-6241	Model 22D5100.
	Mask	54-6241-1	Model 22D5100.

PHILCO MODELS 22D5100,  
22D5102, L, M (Ch. TV-123)



**PARTS LIST AND DESCRIPTIONS (Continued)**  
**TRANSFORMERS (SWEEP CIRCUITS)**

ITEM No.	USE	REPLACEMENT DATA							NOTES	
		PHILCO PART No.	Halldarson PART No.	Merit PART No.	RCA TYPE No.	Ram PART No.	Stancor PART No.	Thordarson PART No.		Triad PART No.
T2	Vert. Osc. Trans.	32-8431-14 ①	B8705 ②	A-3004 ②		V404 ②	VBO-200	28A02 ②	A-120Z ②	
T3	Horiz. Output Trans.	32-8716-1								
T4	Vert. Output Trans.	32-8599-2 ③	Z1900 ④ ⑤							
T5A	Yoke-Horiz. (12.3MH)	76-9649-1								
T6	Horiz. Limiting Coil	32-4661-2								
T7A	Width-Series Coil (13-L 36MH)	32-4658-2								
T8	Parallel Coil (90-305ME)									
T9	Neutralizing Coil Assy.	76-10055 ⑤								
T10	Vert. Centering Choke	32-8717-1								
T11	Horiz. Convergence Coil	32-4661-6								
T12	Green Horiz. Phase Coil	32-4661-4								
T13	Blue Horiz. Phase Coil	32-4661								
T14	Red Horiz. Phase Coil	32-4661								
T15	Convergence Yoke Assy.	76-9650-1 ⑥								

- ① Some versions may use alternate Philco part no. 32-8431.
- ② Drill new mounting hole(s).
- ③ Some versions may use alternate Philco part no. 32-8599.
- ④ Use 7 to 1 turns ratio.
- ⑤ Does not include neutralizing coil assembly plug. (Philco part no. 27-6302-14)
- ⑥ Does not include convergence yoke assembly plug. (Philco part no. 27-6225-6)

**TRANSFORMER (AUDIO OUTPUT)**

ITEM No.	IMPEDANCE	REPLACEMENT DATA							NOTES
		PHILCO PART No.	Halldarson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.		
T15	5200Ω 3-4Ω	32-8665	Z1002	A-3019	A-3849	28S49	S-5Z		

**SPEAKER**

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		PHILCO PART No.	QUAM PART No.	
SP1	8" PM 6-8Ω	36-1651-16 ①	8A21Z6	① Used in models 22D5102L, 22D5102M.
SP2	8" PM 6-8Ω	36-1651-8 ②	8A21Z6	② Used in model 22D5100 only.

**COILS (RF-IF)**

ITEM No.	USE	PHILCO PART No.	NOTES	ITEM No.	USE	PHILCO PART No.	NOTES
L2	VHF Ant. Coils	328-0061		L8	VHF Osc. Coils	328-0051	
L3	VHF Aux. Ant.	328-0080		L9	RF Choke	32-4623-67	
L4	RF Choke	32-4642-1		L10	Conv. Plate	32-4548-6	
L5	Neut. Coil	32-4623-50					
L6	VHF RF Coils	328-0052					

ITEM No.	USE	REPLACEMENT DATA				NOTES
		PHILCO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L11	RF Choke	32-4597-16				.23 Microhenry
L12	4L 25MC Trap	32-4548-37				3 Microhenries
L13	47.25MC Trap	32-4548-37				3 Microhenries - Note 1
L14	1st Video IF Grid Coil	32-4548-3				1.1 Microhenries
L15	IF Choke	32-4112-49				3 Microhenries
L16	1st Video IF Plate Coil	32-4112-31	19-3001	TV-189	6175	.85 Microhenry
L17	39.5MC Trap	32-4548-37				3 Microhenries
L18	4L 25MC Trap	32-4548-37				3 Microhenries
L19	2nd Video IF Grid Coil	32-4548-3				1.1 Microhenries
L20	IF Choke	32-4112-49				3 Microhenries
L21	2nd Video IF Plate Coil	32-4548-38				2.2 Microhenries
L22	47.25MC Trap	32-4548-39				2.2 Microhenries
L23	3rd Video IF Grid Coil	32-4797-21				1.24 Microhenries
L24	IF Choke	32-4112-49				3 Microhenries
L25	4th Video IF	32-4486-49				
L26	IF Choke	32-4112-49				
L27	RF Choke Channel 8 Beat	32-4112-56				
L28	Series Peaking Coil	32-4112-31	19-3001	TV-189	6175	.85 Microhenry; Wound on 15K Resistor - Note 2
L29	4L 25MC Trap	32-4662-1				
L30	47.25MC Trap	32-4548-3				
L31	Series Peaking Coil	32-4597-20			4906	2.7 Microhenries
L32	Series Peaking Coil	32-4674	19-1005		4612	10 Microhenries
L33	RF Choke Channel 8 Beat	32-4112-56				7.2 Microhenries
L34	3.58MC Trap	32-4487-25	17-6017			
L35	Shunt Peaking Coil	32-4480-5	19-4400		6136	400 Microhenries
L36	Series Peaking Coil	32-4480-3	19-3100	TV-181	6112	100 Microhenries
L37	Series Peaking Coil	32-4480-11			6110	60 Microhenries
L38	Series Peaking Coil	32-4480-15	19-3250		6154	220 Microhenries
L39	Shunt Peaking Coil	32-4487-23	19-1922			180-512 Microhenries
L40	Series Peaking Coil	32-4480-18	19-3160		6120	150 Microhenries
L41	Shunt Peaking Coil	32-4480-4	19-3250	TV-185	6181	250 Microhenries
L42	Chroma & Sound IF Trans.	32-4598-12				
L43	Chroma & Sound IF Det.	32-4662-3				
L44	Chroma Det.	32-4112-31	19-3001	TV-189	6175	.85 Microhenry
L45	Series Peaking Coil	32-4674	19-1005		4612	10 Microhenries
L46	RF Choke Channel 8 Beat	32-4112-56				7.2 Microhenries
L47	1st Chroma IF Grid Coil	32-4660-6A				
L48	1st Chroma IF Grid Coil	32-4660-6A				
L49	4.5MC Trap	32-4483-15	20-1004	TV-151	1469	
L50	2nd Chroma IF Plate Coil	32-4662				
L51	Sound IF	32-4662-2				Tapped @ 2Ω
L52	Ratio Det.	32-4631-1A	17-3497	TV-115	6205	
L53	RF Choke	32-4112-50	19-1006		4624	15 Microhenries
L54	RF Choke	32-4112-50	19-1006		4624	15 Microhenries
L55	RF Choke	32-4112-50	19-1006		4624	15 Microhenries
L56	Series Peaking Coil	32-4480-5	19-4400		6136	400 Microhenries

**PARTS LIST AND DESCRIPTIONS (Continued)**  
**CAPACITORS (cont)**

ITEM No.	RATING CAP. VOLT	REPLACEMENT DATA								NOTES
		PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.		
C47	680	62-16800101	SI 680	D6-681	LT8T68	GP-680	UC-5368	5GA-T68		
C48	2.7	30-1224-125								
C49	2.7	30-1224-125								
C50	1000	30-1245-6								
C51	680	62-16800101	SI 680	D6-681	LT8T68	GP-680	UC-5368	5GA-T68		
C52	5-3	31-6520-12								
C53	2	30-1256	NP0-SI 2.2	TCZ-2R2	22R5V2	TCO-2.2		5TCCB-V22		
C54	5-3	31-6520-12								
C55	470	62-14700101	SI 470	D6-471	LT8T47	GP-470	UC-5347	5GA-T47		
C56	680	62-16800101	SI 680	D6-681	LT8T68	GP-680	UC-5368	5GA-T68		
C57	1-5	31-6520-9								
C58	680	62-16800101	SI 680	D6-681	LT8T68	GP-680	UC-5368	5GA-T68		
C59	680	62-16800101	SI 680	D6-681	LT8T68	GP-680	UC-5368	5GA-T68		
C60	680	62-16800101	SI 680	D6-681	LT8T68	GP-680	UC-5368	5GA-T68		
C61	2	30-1256	NP0-SI 2.2	TCZ-2R2	22R5V2	TCO-2.2		5TCCB-V22		
C62	2	30-1256	NP0-SI 2.2	TCZ-2R2	22R5V2	TCO-2.2		5TCCB-V22		
C63	5-3	31-6520-12								
C64	5-3	31-6520-12								
C65	680	62-16800101	SI 680	D6-681	LT8T68	GP-680	UC-5368	5GA-T68		
C66	1-5	31-6520-9								
C67	680	62-16800101	SI 680	D6-681	LT8T68	GP-680	UC-5368	5GA-T68		
C68	680	62-16800101	SI 680	D6-681	LT8T68	GP-680	UC-5368	5GA-T68		
C69	680	62-16800101	SI 680	D6-681	LT8T68	GP-680	UC-5368	5GA-T68		
C70	3.3	30-1224-103	NP0-SI 3.3	TCZ-3R3	CTA6V33C	TCO-3.3		5TCCB-V33		
C71	5-3	31-6520-12								
C72	680	62-16800101	SI 680	D6-681	LT8T68	GP-680	UC-5368	5GA-T68		
C73	680	62-16800101	SI 680	D6-681	LT8T68	GP-680	UC-5368	5GA-T68		
C74	680	62-16800101	SI 680	D6-681	LT8T68	GP-680	UC-5368	5GA-T68		
C75	680	62-16800101	SI 680	D6-681	LT8T68	GP-680	UC-5368	5GA-T68		
C76	1-5	31-6520-9								
C77	330	62-133001001	SI 330	D6-331	LT8T33	GP-330	UC-5333	5GA-T33		
C78	680	62-16800101	SI 680	D6-681	LT8T68	GP-680	UC-5368	5GA-T68		
C79	680	62-16800101	SI 680	D6-681	LT8T68	GP-680	UC-5368	5GA-T68		
C80	680	62-16800101	SI 680	D6-681	LT8T68	GP-680	UC-5368	5GA-T68		
C81	680	62-16800101	SI 680	D6-681	LT8T68	GP-680	UC-5368	5GA-T68		
C82	680	62-16800101	SI 680	D6-681	LT8T68	GP-680	UC-5368	5GA-T68		
C83	680	62-16800101	SI 680	D6-681	LT8T68	GP-680	UC-5368	5GA-T68		
C84	680	62-16800101	SI 680	D6-681	LT8T68	GP-680	UC-5368	5GA-T68		
C85	20	62-020309011	NP0-SI 20	TCZ-20	CTA6Q2C	TCO-20	ZT-545	5TCC-Q2		
C86	5-3	31-6520-12								
C87	8	30-1224-46	NP0-SI 8.2							
C88	1-5	31-6520-9								
C89	10	62-010409001	NP0-SI 10	TCZ-10	CTA6Q1C	TCO-10	ZT-541	5TCC-Q1		
C90	82	62-082409011	1469-000082	D6-820	CTA6Q82C	ED-82		MS-482		
C91	2000	30-1238-12	DI-002	DD-202	BYA10D2	GP-200	UC-522	5GA-D2		
C92	33	62-033409011	NP0-SI 33	D6-330	CTA6Q33C	TCO-33	ZT-5433	5TCC-Q3		
C93	.001	30-4650-66	P1088N-001	DD-102	CUB16D1	HD15-1000	GEM-1021	10TM-D1		
C94	.01	30-4650-92	P1088N-01	DD-103	CUB16S1		GEM-1011	10TM-S1		
C95	.1	30-4650-47	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1		
C96	.033	30-4650-44	BPD-03	DF-303	CUB6S33		GEM-4133	6TM-S33		
C97	.01	30-4650-92	P1088N-01	DD-103	CUB16S1		GEM-1011	10TM-S1		
C98	330	62-133001001	SI 330	D6-331	LT8T33	GP-330	UC-5333	5GA-T33		
C99	.001	30-4650-66	P1088N-001	DD-102	CUB16D1	HD15-1000	GEM-1021	10TM-D1		
C100	10000	30-1238-2	BPD-01	DD-103	BYA8S1	ED-01	DC511	5HK-S1		
C101	.047	30-4650-62	BPD-05	DF-503	CUB6S47		GEM-6147	6TM-S47		

CAPACITORS (cont)

ITEM No.	RATING CAP.	VOLT	REPLACEMENT DATA							NOTES
			PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C154	330	500	60-10335337	1469-00033	D6-102	5R5T33	GP-1000	GEM-621	MS-333	Note 6
C155	.001	400	30-4650-52	BPD-001	D6-331	CUB6D1	GEM-4147	6TM-D1	2TM-847	
C156	.047	500	30-4650-45	BPD-005	DF-503	CUB2S47		MS-333		
C157	330	500	60-10335417	1469-00033	D6-331	5R5T33	ED-330	MS-333		
C158	.0047	600	30-4650-56	BPD-0047	D6-472	CUB6D47	GP-4700	GEM-6247	6TM-D47	
C159	.1	400	30-4650-47	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C160	.1	200	30-4650-47	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C161	.1	400	30-4650-47	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C162	.15	200	30-4650-48	P288N-15	DF-104	CUB2P1		GEM-2015	2TM-P15	
C163	.01	1000	30-4650-92	P1088N-01	DD-103	CUB2P15		GEM-1011	10TM-S1	
C164	68	5000	30-1246-5	HD-60-68						
C165	68	5000	30-1246-5	HD-60-68						
C166	68	5000	30-1246-5	HD-60-68						
C167	68	5000	30-1246-5	HD-60-68						
C168	164	4500								
C169	.1	800	30-4650-64	P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C170	.01	1000	30-4650-92	P1088N-01	DD-103	CUB16S1		GEM-1011	10TM-S1	
C171	1000	12000	30-1229-11							
C172	1000	15000	30-1229-11							
C173	2000	30000	30-1229-12							
C174	500	10000	45-3507-2							
C175	.01	1000	30-4650-92	P1088N-01	DD-103	CUB16S1		GEM-1011	10TM-S1	
C176	.01	1000	30-4650-92	P1088N-01	DD-103	CUB16S1		GEM-1011	10TM-S1	
C177	.01	1000	30-4650-92	P1088N-01	DD-103	CUB16S1		GEM-1011	10TM-S1	
C178	.01	1000	30-4650-92	P1088N-01	DD-103	CUB16S1		GEM-1011	10TM-S1	
C179	180	500	60-10185417	NFO-SI 180	D6-181	22R5T18	ED-180	MS-318		
C180	180	500	60-10185417	NFO-SI 180	D6-181	22R5T18	ED-180	MS-318		
C181	180	500	60-10185417	NFO-SI 180	D6-181	22R5T18	ED-180	MS-318		
C182	.0018	400	30-4651-24	1464-0018	IR5D18	ED-1800		MS-218		
C183	.0018	400	30-4651-24	1464-0018	IR5D18	ED-1800		MS-218		
C184	.0018	400	30-4651-24	1464-0018	IR5D18	ED-1800		MS-218		
C185	.1	200	30-4650-47	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C186	.001	400	30-4650-52	BPD-001	D6-102	CUB6D1	GP-1000	GEM-621	6TM-D1	
C187	39		62-039409011	NPO-SI 39	D6-390	CTA6Q39C	ED-390	5TCC-Q39		
C188	47		62-047009001	SI 47	D6-470	L7RQ47	GP-47	UC-5447	5GA-Q47	
C189	10000		30-1238-2	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C190A	1000		30-1259	BPD-2X001	DD2-102	BYC6DD1	ED2-001	DCD521	5HK-ZD1	
C191	.47	200	30-4651-16	P288N-47	DD-502	CUB2P47	ED-005	DC525	5HK-D5	
C192	5000		30-1238-1	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C193	.1	200	30-4650-47	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C194	.1	200	30-4650-47	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C195	.1	200	30-4650-47	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C196	.01	400	30-4650-41	BPD-01	D6-103	CUB4S1	GP-10000	GEM-411	4TM-S1	
C197	10000		30-1238-1	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C198	5000		30-1238-1	BPD-005	DD-503	BYA10D5	ED-005	DC525	5HK-D5	
C199	5000		30-1238-1	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C200	5000		30-1238-1	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C201	5000		30-1238-1	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C202	5000		30-1238-1	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C203	5		30-1224-28	NFO-SI 5	TCZ-4R7	L10V5	TCO-5	ZT-555	5TCCB-V47	
C204	270	500	60-10275417	NFO-SI 270	D6-271	5R5T27	ED-270	MS-347	5TCC-T1	
C205	100		62-10409001	NFO-SI 100	D6-101	L7R71	ED-100	ZT-581		
C206	470		62-147001001	1464-00047	D6-471	5R5T47	ED-470	MS-347	5TCC-T1	
C207	5000		30-1238-1	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C208	5000		30-1238-1	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C209	5000		30-1238-1	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C210	10000		30-1238-1	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C211	470		62-147001001	1464-00047	D6-471	5R5T47	ED-470	MS-347	5TCC-T1	
C212	47		62-047009001	SI 47	D6-470	L7RQ47	GP-47	UC-5447	5GA-Q47	
C213	22		62-022009001	SI 22	D6-220	L7RQ22	GP-22	UC-5422	5GA-Q22	
C214	10000		30-1238-2	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C215	10000		30-1238-2	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C216	.1	200	30-4650-47	P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C217	10000		30-1238-2	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C218	10000		30-1238-2	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C219	10000		30-1238-2	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C220	2		30-1221-6	NPO-SI 2	TCZ-2R2	CTA6V22C	TCO-2.2	5TCCB-V22		
C221	2		30-1221-6	NPO-SI 2	TCZ-2R2	CTA6V22C	TCO-2.2	5TCCB-V22		
C222	5000		30-1238-1	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C223	5000		30-1238-1	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C224	39	500	60-00955337	NFO-SI 39	TCZ-39	22R5Q39	TCO-39	MS-439		
C225	56	500	60-00555337	NFO-SI 56	TCZ-56	22R5Q56	TCO-56	MS-456		
C226	10000		30-1238-2	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C227	10000		30-1238-2	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C228	10000		30-1238-2	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C229	27	500	60-00275327	NPO-SI 27	TCZ-27	22R5Q27	TCO-27	MS-427		
C230	.01	600	30-4650-58	BPD-01	D6-103	CUB6S1	GP-10000	GEM-611	6TM-S1	
C231	.01	600	30-4650-58	BPD-01	D6-103	CUB6S1	GP-10000	GEM-611	6TM-S1	
C232	15		62-00155417	SI 15	D6-150	L7RQ15	GP-15	UC-5415	5GA-Q15	
C233	22		62-002209001	SI 22	D6-220	L7RQ22	GP-22	UC-5422	5GA-Q22	
C234	680		62-16800101	SI 680	D6-681	L7R768	GP-680	UC-5368	5GA-T68	
C235	680		62-16800101	SI 680	D6-681	L7R768	GP-680	UC-5368	5GA-T68	
C236	10000	500	30-4650-58	BPD-01	D6-103	CUB6S1	GP-10000	GEM-611	6TM-S1	
C237	10000	500	30-4650-58	BPD-01	D6-103	CUB6S1	GP-10000	GEM-611	6TM-S1	
C238	5000		30-1238-14	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C239	.22	600	30-4676-66	P688N-25	DD-103	CUB6P22	GP-10000	GEM-6022	6TM-P22	
C240	3.3			NFO-SI 3.3	TCZ-3R3	C10V33C	TCO-3.3	ZT-5533	5TCCB-V33	
C241	.01	1000	30-4650-92	P1088N-01	DD-103	CUB16S1		GEM-1011	10TM-S1	

Note 2. Deleted in chassis TV-123, Run 4.  
 Note 3. Chassis TV-123, Run 4 uses .01MFD in this application (part #30-4650-41).  
 Note 4. Chassis TV-123, Run 3 uses 270MMF in this application (part #60-10275417).  
 Note 5. Special unit. Must be ordered from Mfg.  
 Note 6. Deleted in chassis TV-123, Run 3.  
 Note 7. Chassis TV-123, Run 4 uses 220MMF in this application (part #60-10225417).  
 Note 8. Chassis TV-123, Run 4 uses .0022MFD, 5%, 400V unit in this application (part #30-4651-23).  
 Note 9. Chassis TV-123, Run 2 uses .15MFD in this application (part #30-4650-48).  
 Note 10. Added in chassis TV-123, Run 2.  
 Note 11. Added in chassis TV-123, Run 3.  
 Note 12. Added in chassis TV-123, Run 4.

PARTS LIST AND DESCRIPTIONS (Continued)

ITEM No.	RATING RESISTANCE	WATTS	REPLACEMENT DATA					NOTES
			PHILCO PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
RIA	5Meg		33-5573-11					
R2A	2000Ω		33-5573-18					
R3A	250K		33-5565-93	B-50	A47-250K-S	Q1-130	UE3270S	Tone Volume - Tap @150K
R4A	20K		33-5565-94	B-22	A47-20K-S	Q1-119	UE3270S	Color - Note 1
R5A	2000Ω		33-5565-92	Not Req.	A47-2000-S	Q1-110	UE3270S	Color
R6A	2000Ω		33-5565-103	Not Req.	A47-2000-S	Q1-110	UE3270S	Color - Note 1
R7A	1000Ω		33-5573-7	Not Req.	A47-10K-S	Q1-118	TA155L	Vert. Hold
R8A	1000Ω		33-5573-8					Horiz. Hold
R9A	1000Ω		33-5573-7					Brightness
R10A	1000Ω		33-5573-9					Contrast
R11A	1.5Meg		33-5572-28					Green Vert. Tilt
R12A	5Meg		33-5573-6					Green Vert. Amp.
R13A	750K		33-5573-15					Blue Vert. Amp.
R14A	5Meg		33-5573-10					Red Vert. Tilt
R15A	5000Ω		33-5582					Red Vert. Amp.
R16A	5000Ω		33-5573-17					Red Horiz. Amp.
R17A	10K		33-5572-32	AB-14	A47-10K-S	Q1-118	TA14L	Blue G2
R18A	100Ω		33-5546-66	AK-1	FKS-1/4	RQ	TA255L	Green G1
R19A	1500Ω		33-5565-78	VK-131	A43-2000	WPS1500	R2500L	Blue G2
R20A	2.5Meg		33-5572-1	AB-83	A47-2.5Meg-S	Q1-239	TA255L	Green G2
R21	5Meg		33-5577-1	AK-1	FKS-1/4	RQ		Purity
R22A	500K		33-5572-26	AB-59	A47-500K-S	Q1-133	TA55L	Purity