

CABINET-REAR VIEW

## DISASSEMBLY INSTRUCTIONS

### CHASSIS REMOVAL

Remove seven screws holding cabinet back and remove back. Disconnect HV anode, CRT Socket, Deflection Yoke connector, Degaussing Coil connector, speaker connector, ground leads, and all required cabling. Slide Main (A) Board out of frame and cabinet. Remove five (5) screws holding K Board to cabinet front and remove board. Release two plastic clips holding R Board to cabinet front and remove board. Remove four screws holding Q Board to cabinet front and remove board.

### CRT REMOVAL

Follow "Chassis Removal" procedure and lay set facedown on a soft protective surface. Loosen and remove CRT neck assemblies. Remove four screws holding CRT to cabinet front and lift CRT out of cabinet. Do not lift CRT by the neck.

## SERVICING IN THE FIELD

### CRT IMPLSION PROTECTION AND CLEANING

Implosion protection is an integral part of the picture tube, cleaning accomplished without CRT removal.

### FUSE DEVICES

A 1.5-amp fuse is used for low-voltage power-supply protection. (See photo, Cabinet - Rear View.)

A 4-amp fuse is used for AC line protection. (See photo, Cabinet - Rear View.)

### VHF/UHF TUNER

See Miscellaneous Adjustments.

### CHANNEL TUNING

Channel Up and Down buttons are provided for channel scanning with ten numbered buttons (on Remote Transmitter) provided for one or two-

digit entry direct access channel selection. Fine tuning is automatic.

### HIGH VOLTAGE

For high voltage procedure, refer to Miscellaneous Adjustments.

### FOCUS

The focus may be varied by a Focus Control. (See photo, Cabinet - Rear View.)

### AGC

The RF AGC may be varied by an RF AGC Control. (See photo, Cabinet - Rear View.)

### CENTERING

Horizontal centering is accomplished by proper adjustment of the horizontal centering control. (See Main Board - Top View.)

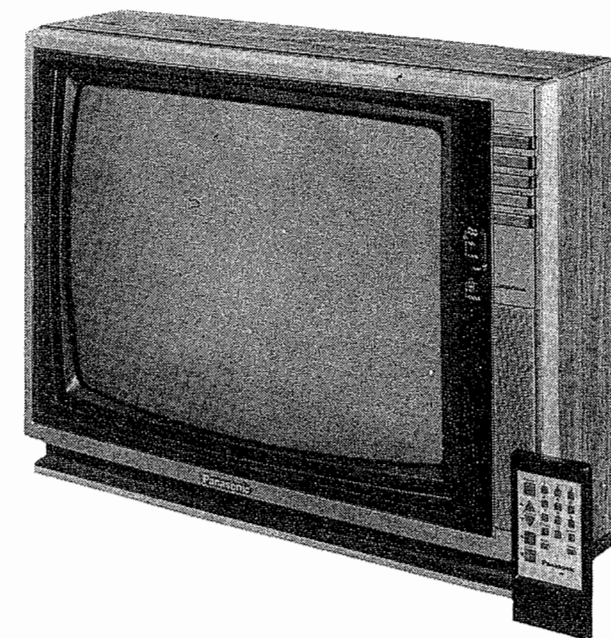
FOLDER 1  
SET 2723

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PANASONIC  
MODELS CTK-1942R, PC-20S49R



Model CTK-1942R

## SAFETY PRECAUTIONS

See Page 1A

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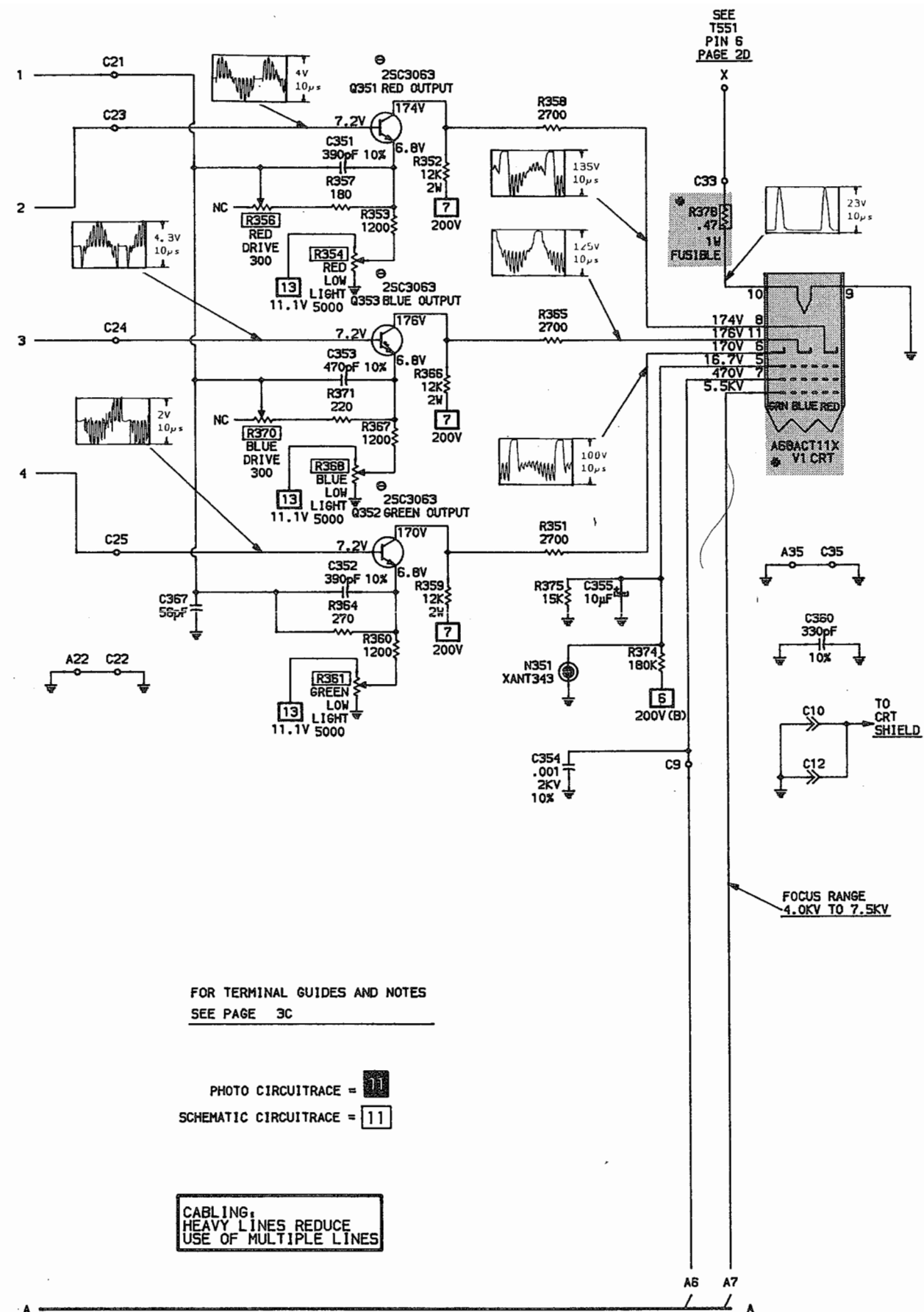
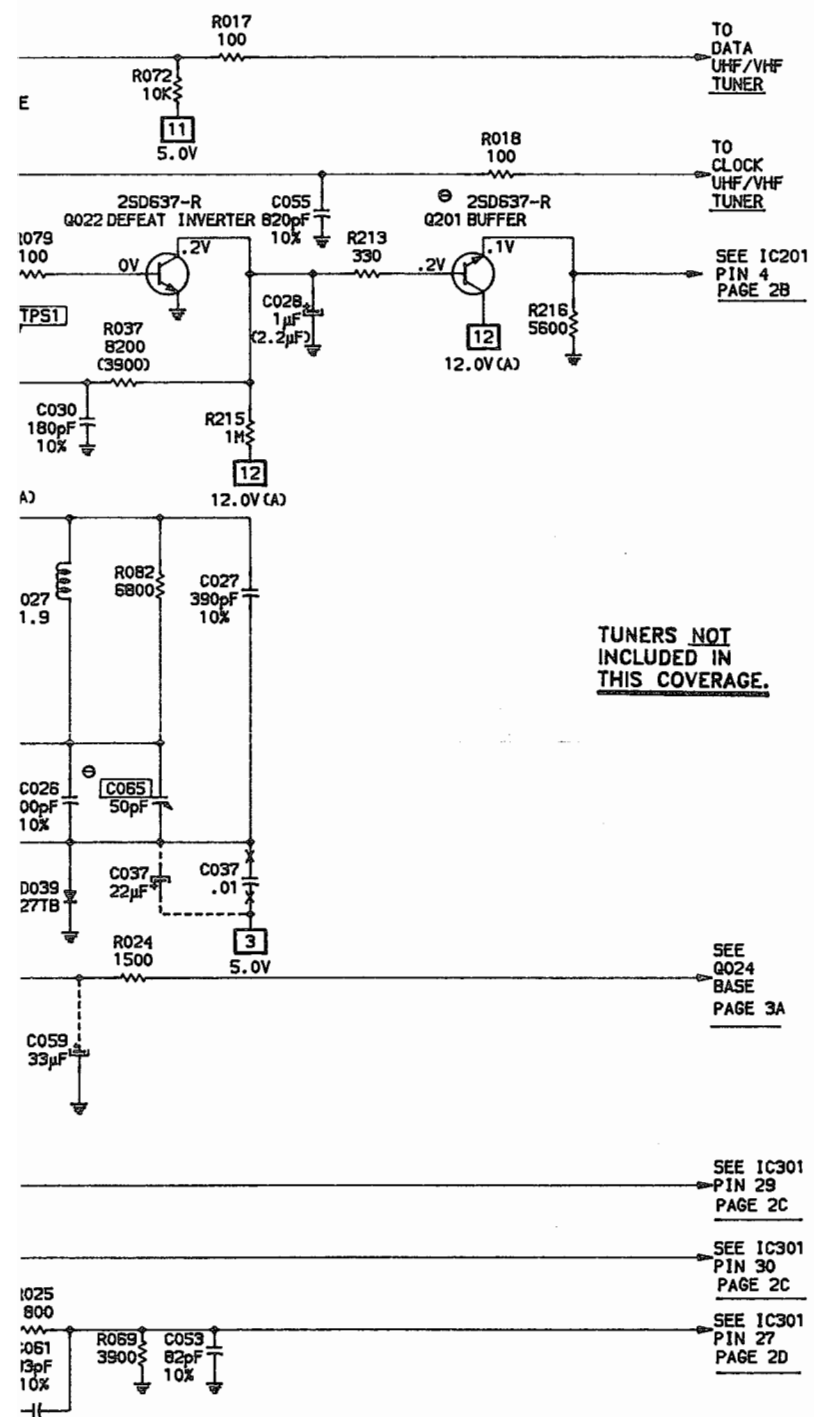
SET 2723 FOLDER 1



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SET 2723 FOLDER 1



A PHOTOFACIT STANDARD NOTATION SCHEMATIC  
WITH **CIRCUITRACE™**

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TEST EQUIPMENT

Test Equipment listed by Manufacturer illustrates typical or equivalent equipment used by SAMS' Engineers to obtain measurements and is compatible with most types used by field service technicians.

Equipment	B&K Precision Equipment No.	Sencore Equipment No.	Notes
OSCILLOSCOPE	1541A, 2120, 2125, 2160	SC61	
GENERATORS			
RGB	1249, 1260	RG67	
MULTIBURST SIGNAL	1251, 1260	VA62A	
COLOR BAR	1211A, 1249, 1251, 1260	VA62A, CG25, NT64	
ANALOG VOM	114, 117, 177, 214		
DIGITAL VOM	388HD, 2900 SERIES	DVM37, DVM56A, SC61	
FREQUENCY METER	1803, 1804, 1805	FC71, SC61	
HI-VOLTAGE PROBE VOM/DMM Accessory probes	HV-44 PR-28(HV)	HP200 TP212	
ISOLATION TRANSFORMER	TR110, 1604, 1653, 1655	PR57	
CAPACITANCE ANALYZER	820, 810, 830	LC76, LC101, LC102	
CRT ANALYZER	467, 470, 480, 490	CR70	
TEMPERATURE PROBE	TP-28, TP-30		
AC LEAKAGE TESTER	1655	PR57	
LOGIC PROBE	DP51, DP21		
LOGIC PULSER	DP101, DP31		
INDUCTANCE ANALYZER	875A	LC76, LC101, LC102	
FLYBACK YOKE TESTER	875A	VA62A, LC76, LC101, LC102	
TV STEREO GENERATOR	2009	ST65, ST66	
TV STEREO POWER MONITOR		SR68	
FIELD STRENGTH METER		FS73, FS74	
TRANSISTOR TESTER		TF46	
VIDEO ANALYZER		VA62A	

TV ALIGNMENT INSTRUCTIONS

Use an Isolation transformer and observe power supply polarity. Maintain line voltage at 120V AC. Allow a 20-minute warm-up period for receiver and test equipment.

Suggested Alignment Tools:

GC-THORSEN

L104, L152, L201, T201 ..... 9440

PRELIMINARY INSTRUCTIONS

Set the channel selector to the highest unused channel. Set scope sweep to external. Connect scope vertical input to scope vertical input on sweep/marker generator. Connect scope external horizontal input to scope horizontal input on sweep/marker generator. Ground test equipment to TV chassis unless specified otherwise. Use only enough generator output to provide a usable indication.

Note: Response may vary slightly from that shown.

Apply 6.1VDC to TP14.

TV ALIGNMENT INSTRUCTIONS (Continued)

VIDEO IF ALIGNMENT (SWEEP MARKER GENERATOR)

DIRECT PROBE FROM SWEEP/MARKER GENERATOR	SWEEP GENERATOR OUTPUT	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	REMARKS
TP12	TP101	44MHz (10MHz Sweep)	45.75MHz	Adjust L104 to place marker as shown in Figure 1.

VIDEO IF ALIGNMENT (BAR SWEEP GENERATOR)

BAR SWEEP GENERATOR	SCOPE INPUT	REMARKS
To Antenna	TP12	Perform Video IF Adjustments per SWEEP/MARKER GENERATOR Instructions above. See Figure 2.

AUTOMATIC FINE TUNING ALIGNMENT

Set AFT (AFC) Switch to ON.				
DIRECT PROBE FROM SWEEP/MARKER GENERATOR	SWEEP GENERATOR OUTPUT	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	REMARKS
TP110	TP101	44MHz	45.75MHz	Adjust L152 to set 45.75MHz marker at crossover. See Figure 3.

SOUND IF ALIGNMENT

Tune in a station and adjust T201 for maximum sound. Reduce signal strength at the antenna terminals until distortion appears. Continue to reduce the signal while aligning for undistorted output by adjusting L201.



FIGURE 1

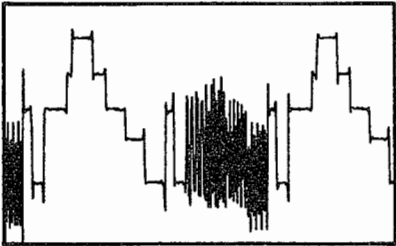


FIGURE 2

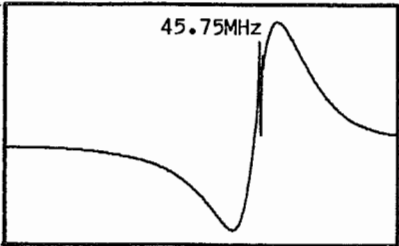
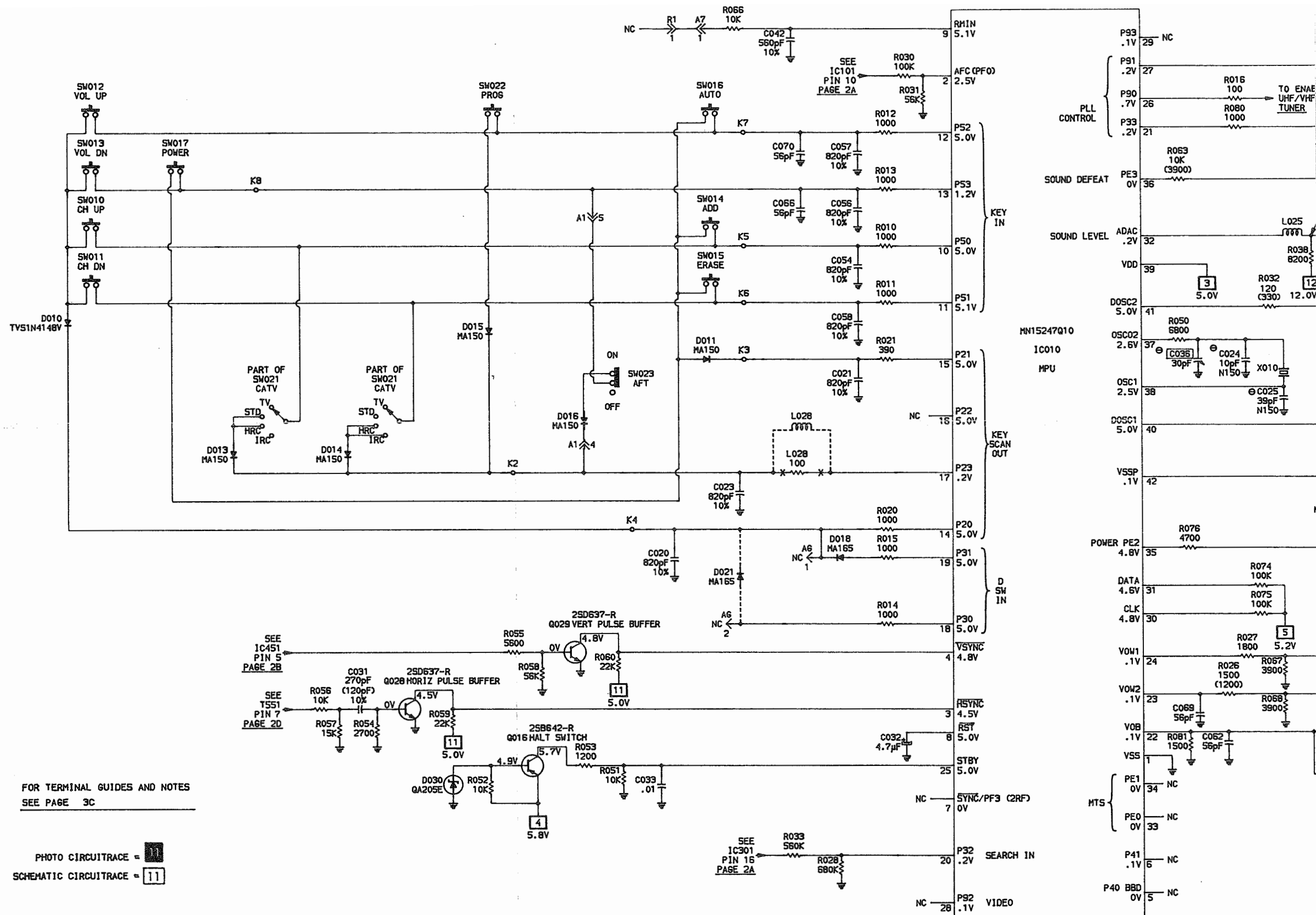


FIGURE 3

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MODELS CTX-1942R, PC-20S49R



TUNER CONTROL

F

## SAFETY PRECAUTIONS

### SERVICE WARNING

Service work should be performed only by qualified service technicians who are familiar with safety checks and guide lines.

1. For continued safety, no modification of any circuit should be attempted unless recommended by manufacturer.
2. Disconnect power source before replacing parts as some parts may be electrostatic sensitive.
3. Use an isolation transformer between the line cord and power receptacle, when servicing chassis.

### SERVICING HIGH VOLTAGE AND PICTURE TUBE

When servicing the High Voltage circuits, extreme caution should be used.

1. Discharge static High Voltage by connecting a 10 kohms resistor in series with a test lead between chassis and anode lead of picture tube.
2. Wear shatter-proof eye protection (goggles) when handling the picture tube in case of implosion.
3. DO NOT lift picture tube by the neck.

### X-RAY RADIATION AND HIGH VOLTAGE LIMITS

Service personnel should be aware of the procedures and instructions covering x-ray radiation. The only potential source of x-ray in present day solid state receivers and monitors is the picture tube.

1. It is only when High Voltage is excessive that x-ray radiation is capable of being emitted from shell of picture tube. Be sure the High Voltage is set at specified level.
2. An accurate High Voltage meter should be available at all times. Meter calibration should be checked periodically.
3. High Voltage should be kept at rated value - NO HIGHER. Higher voltages may cause x-ray radiation or failure of other associated components. DO NOT depend on protection circuit to keep voltages at rated value.
4. Every time a chassis is serviced, High Voltage should be checked at various brightness levels to be sure it is regulating properly.
5. While troubleshooting a set with excessive High Voltage, avoid being close to picture tube. DO NOT operate longer than it is necessary to locate the cause of excessive High Voltage. Use a variable AC transformer to regulate voltage.
6. Many components, electrical and mechanical, in present chassis have safety related characteristics which are not evident with visual inspection. When these components are known, they are identified with a # on the schematic and in the parts list. When replacing these components, for SAFETY, use only an equivalent replacement part.

### SAFETY CHECKS-FIRE AND SHOCK HAZARD

#### Cold Leakage Checks (Sets with isolated ground.)

1. Unplug the AC cord and connect a jumper across the two prongs on the plug.
2. Turn on power switch.
3. Measure the resistance, with an Ohm meter, between the jumpered AC plug and any exposed metal cabinet parts on the set such as: antenna screw heads, control shafts, handle brackets. Exposed metal parts that have a return path should measure between 200 kohms and 5 megohm. Parts without a return path must measure infinity.

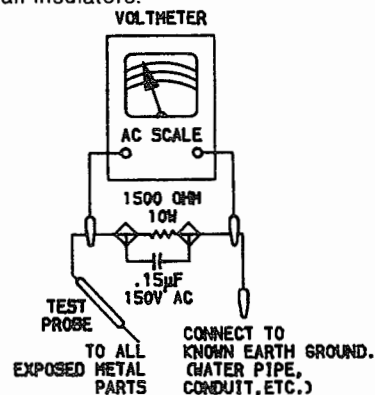
#### Leakage Current Hot Check

1. Plug the AC cord directly into AC outlet. DO NOT use an isolation transformer.
2. Connect a 1500 Ohm 10 watt resistor, in parallel with a .15 $\mu$ F 150V AC capacitor, between any exposed metal parts on the set and a good earth ground such as a water pipe. (See Figure below.)
3. Using an AC volt meter, with 1000 Ohms per volt or more sensitivity, measure the voltage across the resistor. Check each exposed part and measure voltage at each point.
4. Reverse the AC plug and repeat voltage measurement at each point.
5. The voltage at any point should not exceed .75 volts RMS. This corresponds to .5 milliamps AC. Any value exceeding this limit constitutes a potential shock hazard and must be corrected.

### GENERAL GUIDE LINES

A final SAFETY check before returning the set to customer.

1. Check area repaired for poorly soldered or de-soldered connections. Check entire circuit board surface for solder splashes.
2. Check interboard wiring for pinched wires or wires contacting any high-wattage resistors.
3. Check that all control knobs, shields, covers, grounds and mounting hardware have been replaced. Be sure to replace all insulators.



## TROUBLESHOOTING AID

Note: Waveforms taken with triggered scope, Keyed-Rainbow generator. Schematic voltages measured with digital meter, no signal. Controls adjusted for normal operation.

### PICTURE or SOUND

NO PIC, NO SOUND, NO RASTER: Check AC power supply and sources generated from Horizontal Output Transformer (T551). Refer to "Troubleshooting" Power Supply and Horizontal circuits.

NO PIC, NO SOUND, HAS RASTER: Check IF-AGC and source voltages from Horizontal Output Transformer (T551). Refer to "Troubleshooting" IF-AGC and Horizontal circuits.

NO PIC, HAS SOUND, NO RASTER: Check Horizontal Output Transformer (T551) sources and Video circuit. Refer to "Troubleshooting" Horizontal and Video circuits.

NO PIC, HAS SOUND, HAS RASTER: Refer to "Troubleshooting" Video circuit.

HAS PIC, NO SOUND: Refer to "Troubleshooting" Audio circuit.

OVERLOADED PICTURE: Refer to "Troubleshooting" IF-AGC circuit.

LOW OR EXCESSIVE BRIGHTNESS: Check Video and Luminance circuits. Refer to "Troubleshooting" Video circuit.

### SWEEP

NO RASTER, HAS SOUND: Check HV rectifier, Part of Horizontal Output Transformer (T551). Refer to "Troubleshooting" Horizontal circuit.

NO RASTER, NO SOUND: Refer to "Troubleshooting" Horizontal circuit.

NO VERT DEFLECTION: Refer to "Troubleshooting" Vertical circuit.

POOR VERT LIN OR FOLDOVER: Refer to "Troubleshooting" Vertical circuit.

POOR HORIZ LIN OR FOLDOVER: Refer to "Troubleshooting" Horizontal circuit.

NARROW PICTURE: Refer to "Troubleshooting" Horizontal circuit.

VERT OFF FREQUENCY: Refer to "Troubleshooting" Vertical circuit.

HORIZ OFF FREQUENCY: Refer to "Troubleshooting" Horizontal circuit.

### SYNC

NO VERT/HORIZ SYNC: Refer to "Troubleshooting" Sync circuit.

### RASTER

YELLOW (NO BLUE): Check Chroma and Blue Output circuits. Refer to "Troubleshooting" Raster circuit.

CYAN (NO RED): Check Chroma and Red Output circuits. Refer to "Troubleshooting" Raster circuit.

MAGENTA (NO GREEN): Check Chroma and Green Output circuits. Refer to "Troubleshooting" Raster circuit.

### COLOR (B/W operating normally)

NO COLOR: Refer to "Troubleshooting" Chroma circuit.

WEAK COLOR: Refer to "Troubleshooting" Chroma circuit.

NO COLOR SYNC: Refer to "Troubleshooting" Chroma circuit.

NO GREEN: Check Chroma and Green Output circuits. Refer to "Troubleshooting" Raster circuit.

NO BLUE: Check Chroma and Blue Output circuits. Refer to "Troubleshooting" Raster circuit.

NO RED: Check Chroma and Red Output circuits. Refer to "Troubleshooting" Raster circuit.

INCORRECT HUE (TINT): Refer to "Troubleshooting" Chroma circuit.





## TEST JIG HOOKUP

FUNCTION	Chek-A-Color ADAPTER NO.	P.C. BOARD PLUG # DY	PIN 1	BLACK
CRT YOKE YOKE SETTING	B239		PIN 2	YELLOW
	D482		PIN 4	BLUE
	YP3		PIN 6	RED
	FOCUS TAP			

## TROUBLESHOOTING

## POWER SUPPLY

Check the AC Fuse F001 and DC Fuse F002. If Fuse F001 is open, check Bridge Rectifier Diodes (D801 thru D804), Capacitors C802, C803, C804, C812 and Electrolytic C805. If Fuse F002 is open, check Power Regulator IC (IC801) and Horizontal Output Transistor (Q551). Apply 120V and check for 160V\* at the cathode of D802. If 160V\* is missing at the cathode of D802, check Line Filter (L801) and Power Relay (RL010). If 160V\* is present at the cathode of D802, check for 129V\* at TP91. If this voltage is missing, check voltages and components associated with IC801, Resistor R810 and Transistor Q551. If the proper voltage is present at TP91, refer to the "Horizontal" section of this Troubleshooting guide.

\*With respect to isolated ground.

## HORIZONTAL

Inject a horizontal signal at the base of the Horizontal Output Transistor (Q551). If horizontal deflection is now present, check voltages, waveforms and components associated with pins 15 thru 22 of Video/Chroma Jungle/Hold-Down IC (IC301) and Horizontal Drive Transistor (Q501). If there is still no horizontal sweep, check voltages, waveforms and components associated with Transistor Q551 and Horizontal Output Transformer (T551). Check Diodes D531, D552, D553, D554, D559 and associated components. The high voltage rectifier is part of Transformer T551 and if defective will affect the performance of the horizontal circuits. If horizontal oscillator is off frequency and cannot be locked into sync, check pins 17 and 18 of IC301 and refer to the "Horizontal Oscillator Disable" section of this Troubleshooting guide. Horizontal linearity or width problems may be caused by Capacitors C551, C552, C580, C581, C582 and Coil L553.

## HORIZONTAL OSCILLATOR DISABLE

The high voltage is monitored by Diode D531 rectifying pulses from Horizontal Output Transformer (T551) and applying the rectified voltage to pin 12 of Video/Chroma Jungle/Hold-Down IC (IC301). Should the high voltage increase, the voltage at pin 12 of

IC301 will also increase and trigger X-ray protect circuit at pins 12 and 14 of IC301. This action throws the Horizontal Oscillator off frequency, lowering the high voltage. To troubleshoot, remove Diode D531 from circuit and use a variable AC power supply. Check voltage at TP91. If voltage is greater than 129V\* and cannot be adjusted down to 129V\*, troubleshoot power supply. If voltage at TP91 is 129V\* or less, check voltages, waveforms and components associated with pins 12, 14 thru 18 of IC301. Return D531 to the circuit. When the X-ray protect circuit is activated the following voltages will be measured.

\*Taken from Common Tie Point.

	IC301	D531
Pin 12	3.0V	K 23.6V
Pin 14	6.6V	

NOTE: Care should be taken in defeating the high voltage shutdown circuit as this may cause excessive X-ray radiation and damage to the CRT, Transformer T551 and associated components. Monitor the high voltage and troubleshoot.

## IF-AGC

Inject a video IF signal at IF Input and check for video on CRT. If video is present, check Tuner and Tuner Control circuits. If there is no video on CRT, check for a video waveform at TP12. If video is present at TP12, refer to the "Video" section of this Troubleshooting guide. If video is not present at TP12, apply AGC bias to TP14. If video is now present at TP12, check voltages and components associated with AGC circuit at pins 5, 6 and 7 of VIF/SIF/AFT/Det IC (IC101). If there is still no video at TP12, check voltages, waveforms and components associated with Post Amp Transistor (Q101) and pins 1 thru 20 of IC101. A defective AGC circuit can cause an overloaded picture, excessive snow or loss of audio and video. See the AGC Voltage Chart for AGC voltages with signal.

AGC VOLTAGE CHART	
IC101	
Pin 5	4.2V
Pin 6	4.8V
Pin 7	5.6V

## TROUBLESHOOTING (Continued)

## RASTER

Check the CRT and CRT voltages. If there is no red, check voltages and components associated with pin 26 of Video/Chroma Jungle/Hold-Down IC (IC301) and Red Output Transistor (Q351). If there is no green, check voltages and components associated with pin 25 of IC301 and Green Output Transistor (Q352). If there is no blue, check voltages and components associated with pin 24 of IC301 and Blue Output Transistor (Q353). If the raster has a key-stone shape, check Deflection Yoke. If raster has height or width problems, refer to the "Vertical", "Horizontal" and "Power Supply" sections of this Troubleshooting guide.

## VIDEO

Inject a video signal at TP12 and check for video on the CRT. If video is present, refer to the "IF-AGC" section of this Troubleshooting guide. If there is no video on the CRT, check for a video waveform at Pin 46 of the Video/Chroma Jungle/Hold-Down IC (IC301). If video is missing at Pin 46 of IC301, check the voltages, waveforms and components associated with the Video Amp Transistors (Q174, Q175) and Pin 46 of IC301. If video is present at Pin 46 of IC301, check for a video waveform at TP13. If the waveform is missing, check the voltages, waveforms and components associated with Pins 2, 23, 44 thru 52 of IC301. If the waveform is present at TP13, check the voltages, waveforms and components associated with the Red, Green and Blue Output Transistors (Q351, Q352, Q353). If the brightness is inadequate or cannot be controlled, check the voltages, waveforms and components associated with Pin 44 of IC301.

## CHROMA

Check for a chroma waveform at pin 42 of the Video/Chroma Jungle/Hold-Down IC (IC301). If the waveform is missing, check the components associated with pin 42. If a chroma waveform is present at pin 42 of IC301, check for the proper waveforms at pins 24, 25, 26 of IC301. If these waveforms are missing, check the voltages, waveforms and components associated with pins 24 thru 43 of IC301. Check the 3.58MHz oscillator at pin 34 of IC301. Check the voltages and components associated with the color control and pin 40 of IC301. If

there is inadequate tint range, check the voltages, waveforms and components associated with the tint control and pin 37 of IC301. If the proper waveforms are present at pins 24, 25 and 26 of IC301, refer to the "Raster" section of this Troubleshooting guide.

## HORIZONTAL OSCILLATOR DISABLE TEST

Connect a variable 30V Power Supply through an Isolation diode to the cathode of Diode D531. The Horizontal Oscillator should go out of sync when the Power Supply voltage reaches 25.5V. If the Horizontal Oscillator does not go out of sync, the X-ray protect circuit needs repair.

## VERTICAL

Inject a vertical signal at pin 6 of Video/Chroma Jungle/Hold-Down IC (IC301). If vertical deflection is now present, check voltages, waveforms and components associated with Pins 6 thru 11 of IC301. If there is still no vertical deflection, check voltages, waveforms and components associated with Vertical Output IC (IC451). Vertical linearity or height problems may be caused by vertical feedback and bias circuits, check electrolytics C401, C404, C405, C407, C452 and C455.

## SYNC

If there is no vertical or horizontal sync, check pin 5 of Video/Chroma Jungle/Hold-Down IC (IC301). If the proper voltages and waveforms are present at Pin 5 of IC301, check for vertical waveforms at Pins 6 thru 11 of IC301 and horizontal waveforms at Pins 15 thru 21 of IC301.

## AUDIO

Select an active TV channel and check for an audio waveform at Pin 26 of the VIF/SIF/AFT/DET IC (IC101). If there is no audio, check the voltages, waveforms and components associated with Pins 22 thru 28 of IC101. If audio is present at Pin 26 of IC101, check for audio at Pin 8 of the Audio Output IC (IC201). If audio is missing check the voltages, waveforms and components associated with IC201. Check the voltage at Pin 4 of IC201. It should measure .2V at mute and 10.5V at Maximum volume.



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# MISCELLANEOUS ADJUSTMENTS

## PRETUNING

- Auto Program
1. Connect antenna or CATV to unit.
  2. Momentarily depress the Power button.
  3. Select CATV/TV switch position.
  4. Press the Prog (Time) and Auto button.

- Add Channel
1. Select channel. Use direct channel access buttons.
  2. Press the Prog (Time) and Auto button.
  3. Repeat steps one and two to add other channels.

- Erase Channel
1. Select channel. Use channel scan buttons.
  2. Press the Prog (Time) and Erase button.
  3. Repeat steps one and two to erase other channels.

- Set Time
1. Press and hold the Prog (Time) button, until desired time is displayed on screen.

- Sleep Timer
1. Press the Sleep button on remote transmitter. Unit can be set to turn off after 30, 60 or 90 minutes by pressing the Sleep button.

The following Control settings were used for all adjustments unless otherwise indicated, Cable Switch (SW021) to TV, Auto Color Switch (SW601) to OFF, Sharpness (R307), Brightness (R312), Picture (R320), Color (R603), and Tint (R610) Controls to Normal Viewing Levels.

## B+ CHECK

Connect a Digital DC Voltmeter to TP91, low side to TP92. Set Brightness (R312), Picture (R320), and Color (R603) Controls to MINIMUM. With AC Line Voltage at 120VAC, B+ should read 130.5VDC  $\pm$  1VDC.

## HIGH VOLTAGE CHECK

Tune in a picture. Connect a High Voltage Probe to CRT anode. Set Brightness (R312), Picture (R320), and Color (R603) Control to MINIMUM. High voltage should read 27.0KV to 29.5KV. High Voltage must never exceed 30.0KV.

## RF AGC ADJUSTMENT

Tune in a picture. Adjust RF AGC Control (R101) Counterclockwise until snow appears in picture, then clockwise to a point where snow disappears.

## SUB BRIGHTNESS ADJUSTMENT

Tune in a picture. Set Brightness (R312), Color (R603), and Picture (R320) Controls to MINIMUM. Adjust Sub Brightness Control (R316) for just visible highlights. Check for blooming on all channels, readjust Sub Brightness if required.

## SUB CONTRAST ADJUSTMENT

Tune in a Crosshatch Pattern. Set Picture Control (R320) to Maximum. Set Brightness Control (R312) to detent. Connect an Oscilloscope to TP13, low side to Ground. Adjust Sub Contrast Control (R309) for 4.0V p-p.

## HORIZONTAL CENTERING ADJUSTMENT

Tune in a Color Bar pattern. Adjust Horizontal Center Control (R524) to center picture.

## REFERENCE OSCILLATOR ADJUSTMENT

Tune in a picture. Set Volume to Midrange. Connect a frequency Counter to TPS1, Low side to Ground. Adjust Reference Oscillator Control (C036) for 15.625kHz (64.0uS).

## DISPLAY POSITION ADJUSTMENT

Tune in a picture. Press Recall button on Remote Transmitter. Adjust Display Position Control (C065) to place display 2" from right side of screen.

## REFERENCE GYRATOR ADJUSTMENT

Tune in an NTSC Color Bar pattern. Set Brightness (R312) and Picture (R320) Controls to Midrange. Connect a Dual Trace Oscilloscope to TP300, Low side to Ground, and Channel 2 Input to TP13, Invert Channel 2. Select Chop, and 20 microsecond delay time. Place Trace 1 over trace 2 so that they are equal. Expand by 10X. Adjust horizontal position control on Oscilloscope to view a vertical transition. Adjust Reference Gyrator Control (R612) for a 230  $\pm$  10nS delay between signals.

## COLOR PURITY ADJUSTMENT

Operate the receiver for 15 minutes with Brightness Control (R312) at Maximum. Short TP14 to Ground for blank raster. Use a Degaussing Coil to demagnetize the CRT and mounting hardware. Set Picture Control (R320) to MINIMUM, Brightness Control (R312) to produce a visible raster. Set Red (R354), and Blue (R368) Low Light Controls to MINIMUM, and Green Low Light Control (R361) to produce a green raster. Loosen the Deflection Yoke Clampscrew and slide the Deflection Yoke backward to obtain a Vertical green band. Rotate and spread the purity magnet tabs until the green band is centered on the screen. Move magnet tabs until the green band is centered on the screen. Move the Deflection Yoke forward until a uniform green screen is obtained. Check red and blue purity by adjusting Low Light Controls.

## COLOR TEMPERATURE ADJUSTMENT (B/W TRACKING)

Tune in a picture. Short TP14 to Ground for blank raster. Set Color Control (R603), Brightness Control (R312), Picture Control

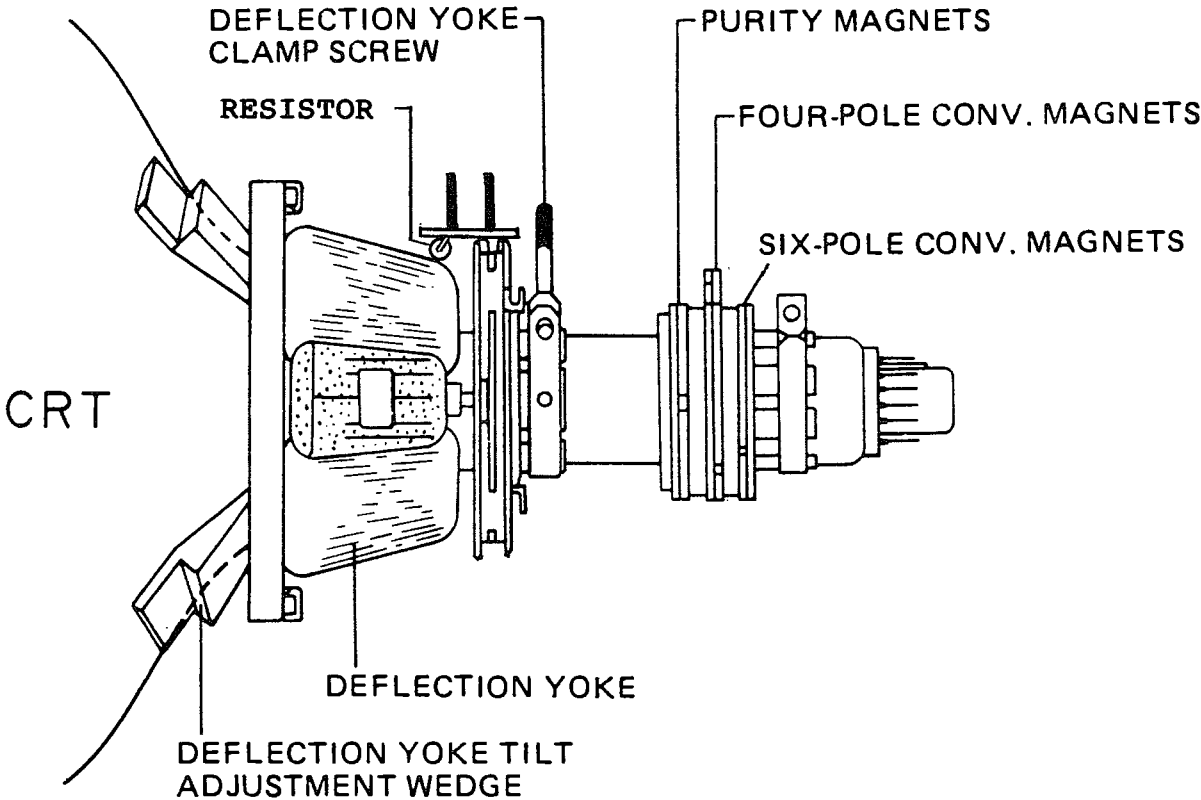
# MISCELLANEOUS ADJUSTMENTS (Continued)

(R320), Screen Control (R551B), Red (R354), Blue (R368), and Green (R361) Low Light Controls to MINIMUM. Set Red (R356) and Blue (R370) Drive Controls to MINIMUM. Set Service Switch (SW301) to Service position. Slowly advance Screen Control to obtain a dim horizontal line of one color. Adjust 2 Low Light Controls not of visible color to obtain a dim white line. Place Service Switch to Normal. Remove Short to TP14. Set Brightness and Picture Controls to Maximum. Adjust the Blue and Red Drive Controls for best best Black and White picture. Check tracking at low and high brightness. If necessary, readjust tracking at low and high brightness. If necessary, readjust Controls slightly.

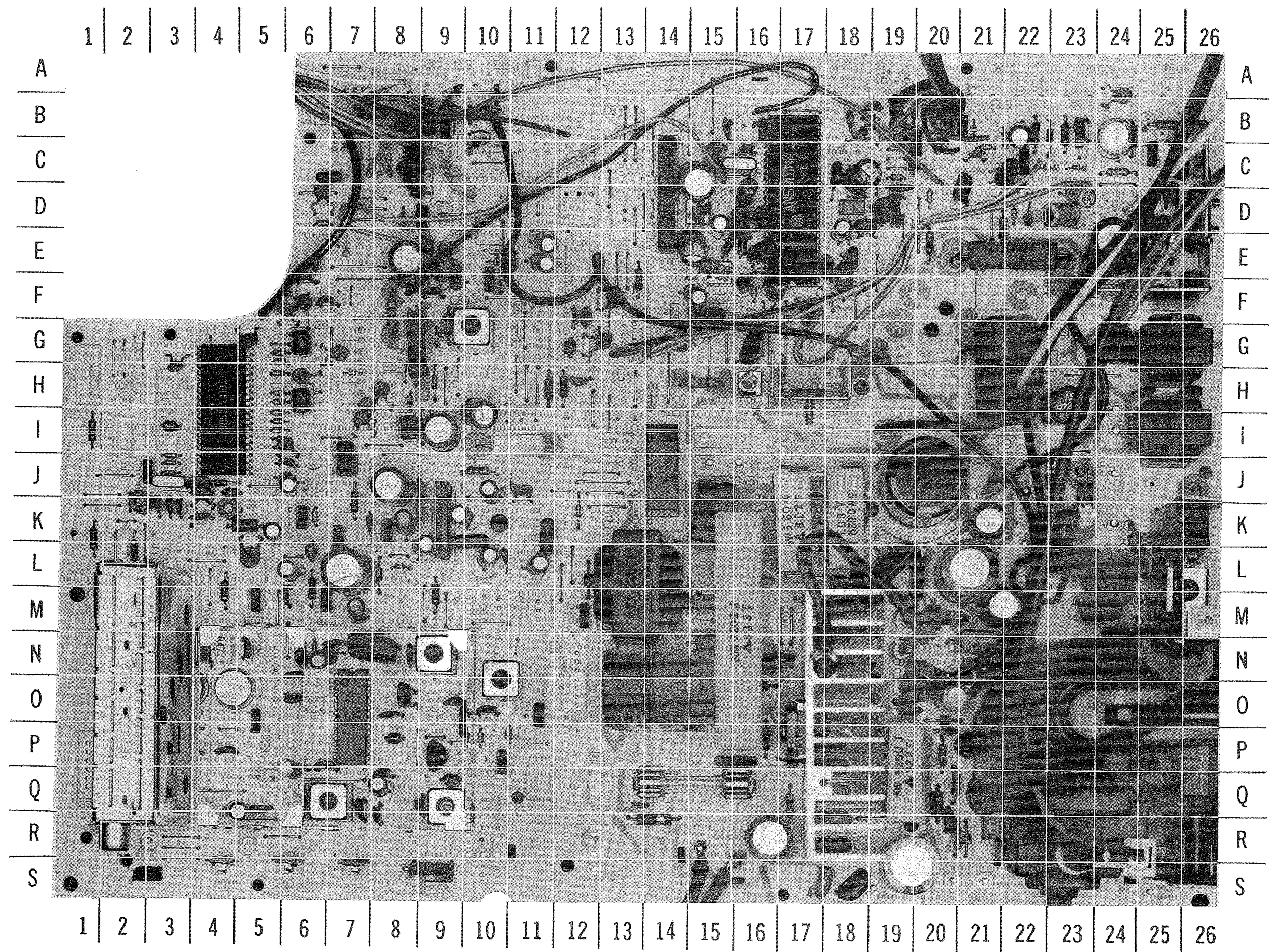
## CONVERGENCE ADJUSTMENTS

Operate the receiver for 15 minutes. Connect a Color Bar Generator to the antenna terminals and tune in a dot pattern. Adjust the 4-pole magnet tabs to converge the red and blue dots at the center of the screen. Adjust the 6-pole magnet tabs to converge the red, blue dots over the green dots at the center of the

screen. NOTE: Rotate the two tabs of each set of magnets equally and opposite to converge Vertically and rotate both tabs in the same direction to converge Horizontally. Four and six pole magnets interact, repeat adjustment until center convergence is correct. Tune in a Crosshatch pattern and remove the rubber wedges between the Deflection Yoke and the CRT. Tilt the Deflection Yoke up or down to converge the Vertical lines at top and bottom of screen and the Horizontal lines at the right and left sides of the screen. Tilt the Deflection Yoke right or left to converge Horizontal lines at top and bottom of screen and Vertical lines at the right and left sides of the screen. Repeat convergence procedure if necessary to obtain best overall convergence. Apply adhesive to wedges and carefully replace on CRT. If misconvergence is still present on circumference of screen, place Permalloy Convergence Corrector Strip, Part Number OFMK014ZZ, between Deflection Yoke and CRT behind area needing correction. Move and/or rotate for best correction. Adhere to CRT rear.

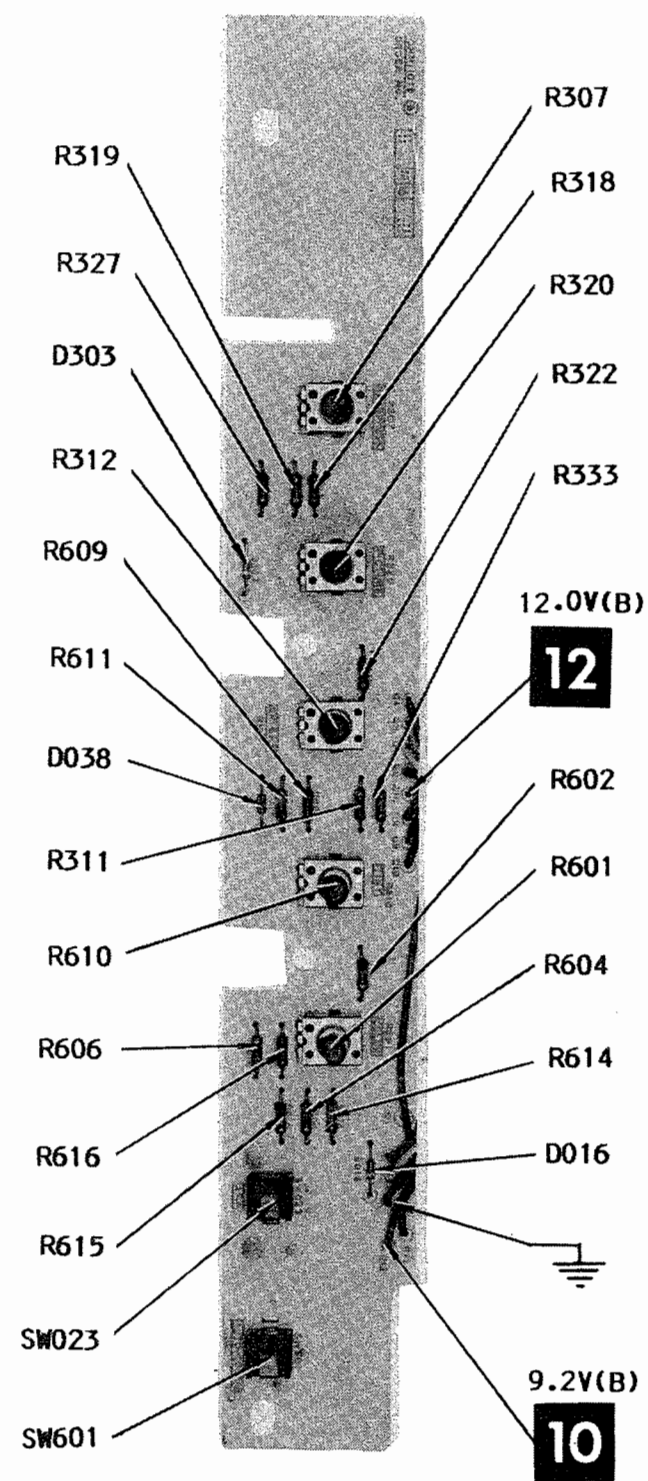


CRT NECK ASSEMBLY

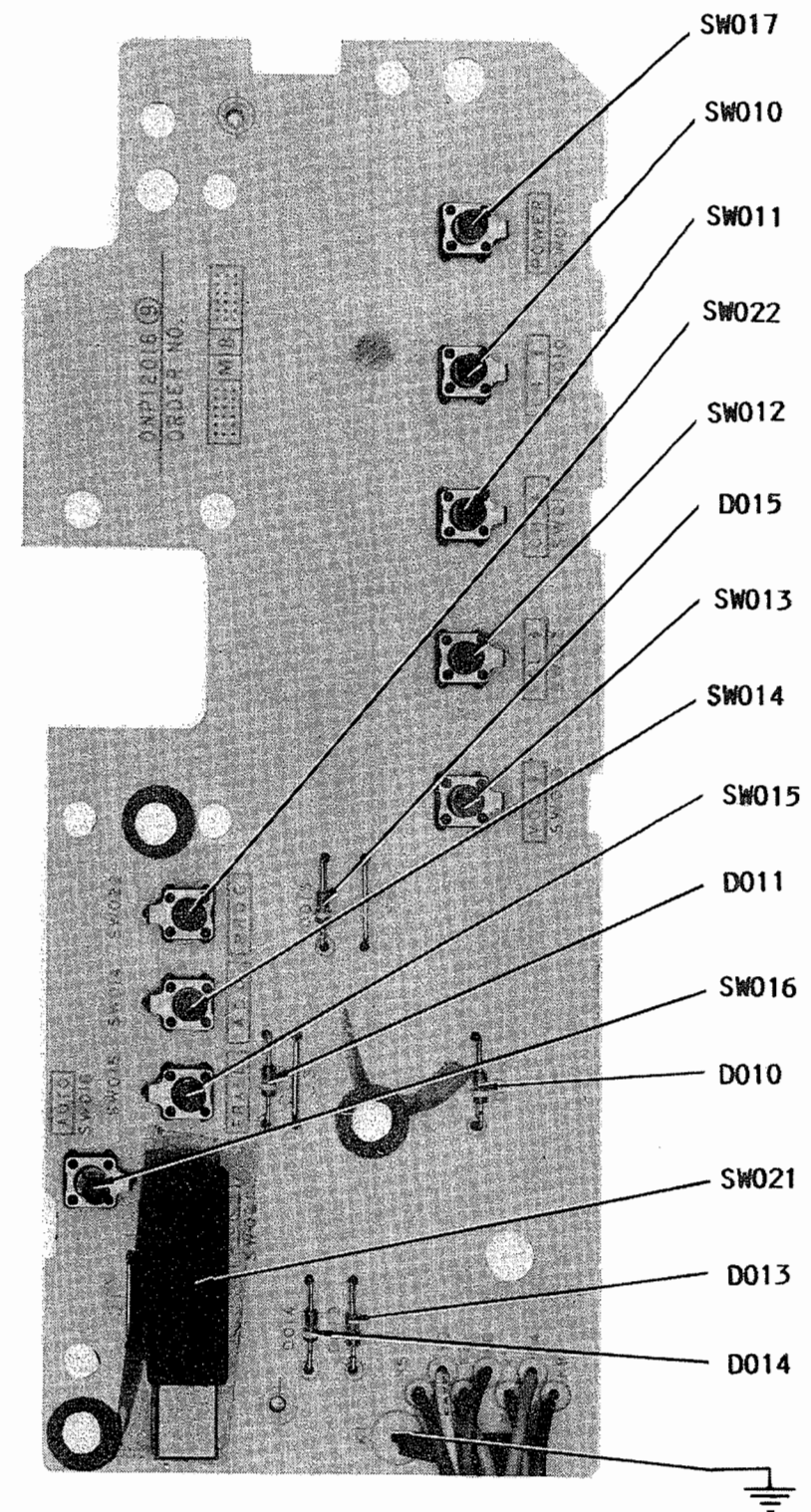


PANASONIC  
MODEL S CTK-1942R, PC-20S49R





CONTROL BOARD  
G



SWITCH BOARD

H SET 2723 FOLDER 1

PANASONIC  
MODELS CTK-1942R, PC-20S49R

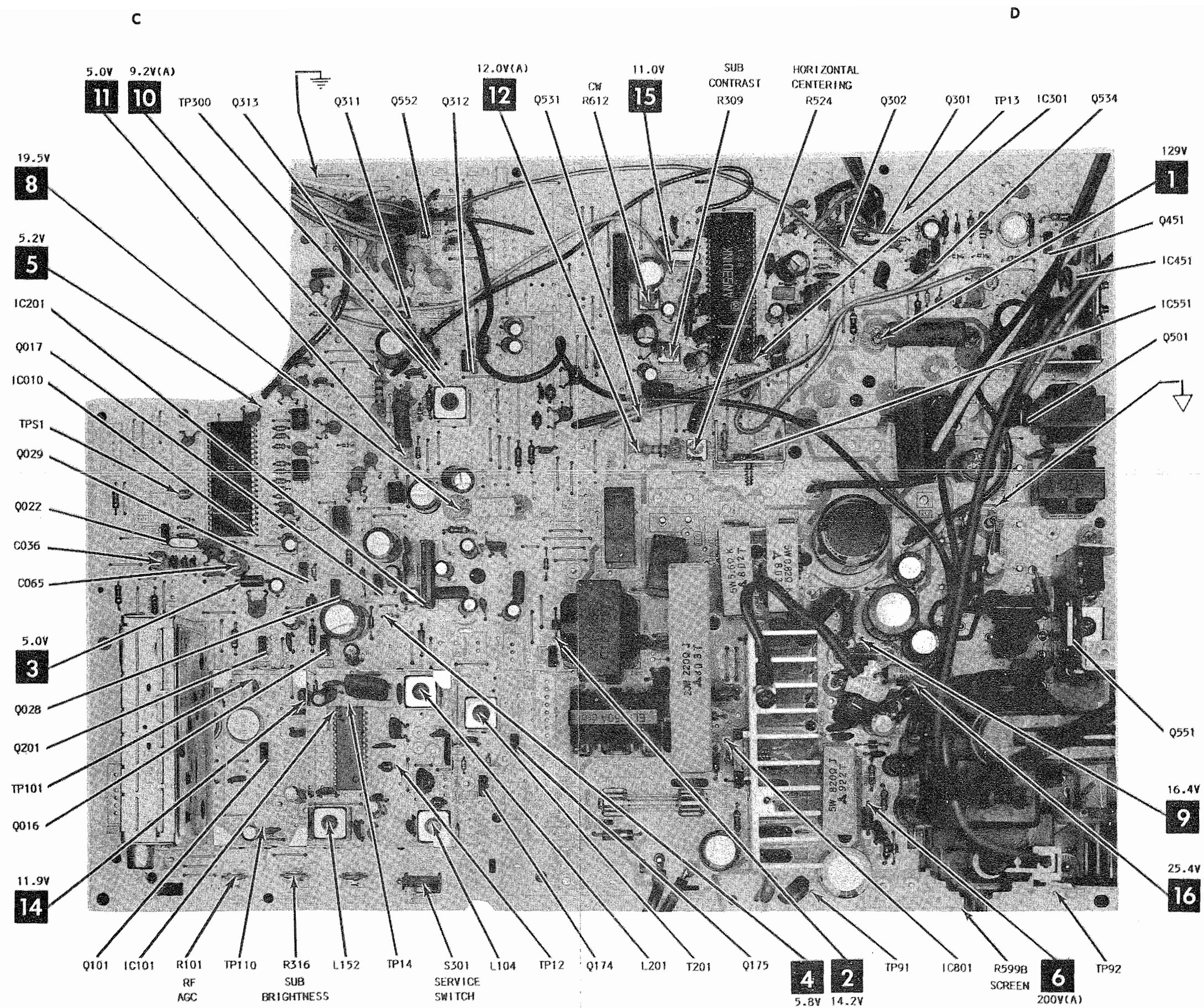
# MAIN BOARD-TOP VIEW-GridTrace LOCATION GUIDE

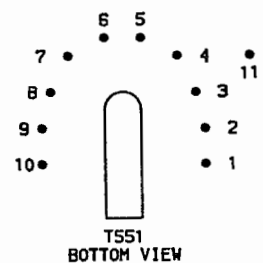
A1	H-6	C223	K-9	C605	D-16	L104	Q-9	R308	B-20	TP101	N-5
A7	I-7	C302	E-8	C607	C-8	L105	N-6	R309	E-15	TP110	Q-5
A18	C-14	C303	F-18	C608	C-8	L106	P-9	R316	S-6	TP300	F-9
AG	G-6	C305	F-15	C609	D-15	L107	Q-9	R330	C-21	TPS1	I-3
C018	E-9	C308	F-16	C613	B-16	L109	P-8	R337	E-9	X010	J-3
C019	J-9	C309	D-16	C614	B-15	L112	Q-6	R339	E-9	X101	O-4
C020	G-7	C311	H-12	C615	C-16	L152	Q-7	R345	F-13	X102	P-9
C021	H-6	C312	E-16	C616	B-9	L201	N-9	R347	H-12	X201	O-9
C023	F-6	C313	G-16	C617	B-18	L305	G-10	R348	B-20	X501	D-18
C024	K-3	C314	D-16	C618	B-18	L306	G-12	R349	B-19	X601	C-16
C025	K-3	C315	C-7	C802	M-15	L307	F-12	R350	B-20		
C026	K-4	C316	G-12	C803	N-16	L553	H-23	R382	B-20		
C027	J-4	C317	F-12	C805	J-20	L554	M-20	R384	H-11		
C028	L-6	C318	F-13	C806	R-16	L555	Q-20	R401	E-18		
C030	K-3	C319	F-15	C812	N-15	L558	M-21	R403	E-18		
C031	K-7	C321	E-15	C821	L-18	L563	L-25	R405	S-7		
C032	J-6	C326	F-16	C822	L-19	L564	K-23	R452	B-25		
C033	M-6	C332	E-11	C824	S-18	L567	M-26	R453	E-25		
C035	L-1	C333	E-9	CRA801	S-18	L601	C-15	R455	B-24		
C036	K-2	C334	E-11	D018	H-7	L801	O-14	R456	C-24		
C037	J-4	C365	Q-15	D023	D-8	Q016	M-6	R462	D-21		
C040	J-8	C366	E-15	D025	L-8	Q017	K-8	R501	D-20		
C041	L-9	C368	B-19	D026	H-9	Q022	J-2	R507	K-26		
C042	J-6	C401	F-17	D030	L-8	Q024	M-12	R510	E-22		
C043	L-7	C402	D-18	D031	L-12	Q028	K-7	R513	D-19		
C047	K-9	C403	E-18	D032	K-12	Q029	K-6	R517	D-19		
C048	K-8	C404	D-23	D039	J-4	Q101	P-5	R524	H-16		
C049	L-5	C405	D-24	D101	N-8	Q174	P-10	R531	E-20		
C050	K-5	C406	F-26	D307	C-18	Q175	O-11	R532	D-22		
C053	D-6	C407	D-23	D309	B-21	Q201	M-5	R533	B-23		
C054	I-7	C408	E-18	D311	E-8	Q301	B-21	R534	C-21		
C055	G-3	C421	D-25	D314	B-20	Q302	B-20	R535	B-22		
C056	I-6	C452	E-24	D451	E-25	Q311	D-9	R537	B-23		
C057	H-8	C453	C-25	D452	C-23	Q312	F-10	R538	H-17		
C058	I-7	C455	D-25	D453	B-21	Q313	F-9	R551	G-8		
C061	F-6	C456	D-25	D503	G-9	Q451	C-25	R552	H-15		
C062	F-6	C501	C-18	D506	G-8	Q501	G-24	R553	F-8		
C065	K-4	C502	B-22	D507	D-18	Q531	G-14	R554	G-20		
C066	A-24	C503	D-19	D531	D-22	Q534	C-22	R560	C-19		
C068	G-5	C504	C-21	D533	B-23	Q551	L-25	R563	R-21		
C069	F-6	C505	C-22	D534	C-22	Q552	B-9	R564	P-20		
C070	B-8	C506	C-18	D551	B-10	R010	I-5	R566	B-9		
C101	N-5	C507	D-18	D552	M-20	R011	I-5	R567	B-10		
C102	P-4	C508	D-19	D553	N-21	R012	I-5	R568	B-10		
C103	Q-6	C509	F-25	D554	R-21	R013	I-5	R572	Q-20		
C104	N-6	C510	H-26	D555	Q-25	R014	G-5	R574	N-20		
C105	N-7	C511	L-26	D556	O-1	R015	G-5	R575	N-21		
C106	N-6	C512	C-21	D559	O-20	R016	I-1	R612	D-15		
C107	R-5	C513	H-25	D560	J-23	R018	K-1	R618	B-18		
C108	Q-8	C531	B-24	D561	J-23	R020	H-5	R620	B-18		
C109	Q-6	C532	B-23	D603	B-19	R021	H-5	R624	B-20		
C111	P-6	C551	G-22	D801	M-15	R026	E-6	R625	B-19		
C113	N-7	C552	K-23	D802	N-16	R030	L-2	R801	K-18		
C114	Q-9	C553	F-9	D803	O-16	R033	E-11	R802	K-18		
C115	Q-8	C555	Q-19	D804	N-15	R038	M-4	R803	Q-19		
C151	Q-7	C557	N-19	D805	K-15	R039	L-20	R804	M-16		
C152	R-8	C558	K-21	DEG	J-15	R049	G-9	R805	K-17		
C154	Q-5	C559	P-20	DY	H-24	R050	J-3	R807	Q-17		
C201	O-9	C561	H-21	F001	Q-15	R053	M-6	R808	P-16		
C202	O-10	C562	M-22	F002	J-17	R055	K-7	R810	K-17		
C203	O-8	C563	N-21	IC010	H-4	R056	H-8	R815	R-14		
C204	O-8	C564	L-21	IC101	O-7	R058	K-6	R826	M-17		
C206	N-8	C565	O-20	IC201	K-9	R063	J-3	SW301	S-9		
C208	K-10	C568	R-20	IC301	D-17	R066	I-5	T201	O-10		
C209	M-7	C569	M-24	IC451	D-26	R067	D-6	T501	I-25		
C210	J-10	C571	Q-19	IC551	H-17	R076	J-3	T502	G-25		
C211	I-9	C572	B-9	IC801	P-17	R101	S-4	T551	O-24		
C212	K-11	C577	S-20	L020	L-6	R117	P-10	T801	L-13		
C214	L-11	C580	M-24	L024	K-5	R182	P-10	TP12	P-8		
C215	I-10	C581	L-24	L025	I-3	R206	M-9	TP13	B-21		
C216	L-10	C582	M-24	L027	J-4	R209	I-11	TP14	N-7		
C217	J-11	C583	D-19	L028	H-5	R211	J-10	TP91	S-19		
C221	L-10	C601	C-15	L101	N-4	R304	F-16	TP92	S-25		



## POWER SUPPLY



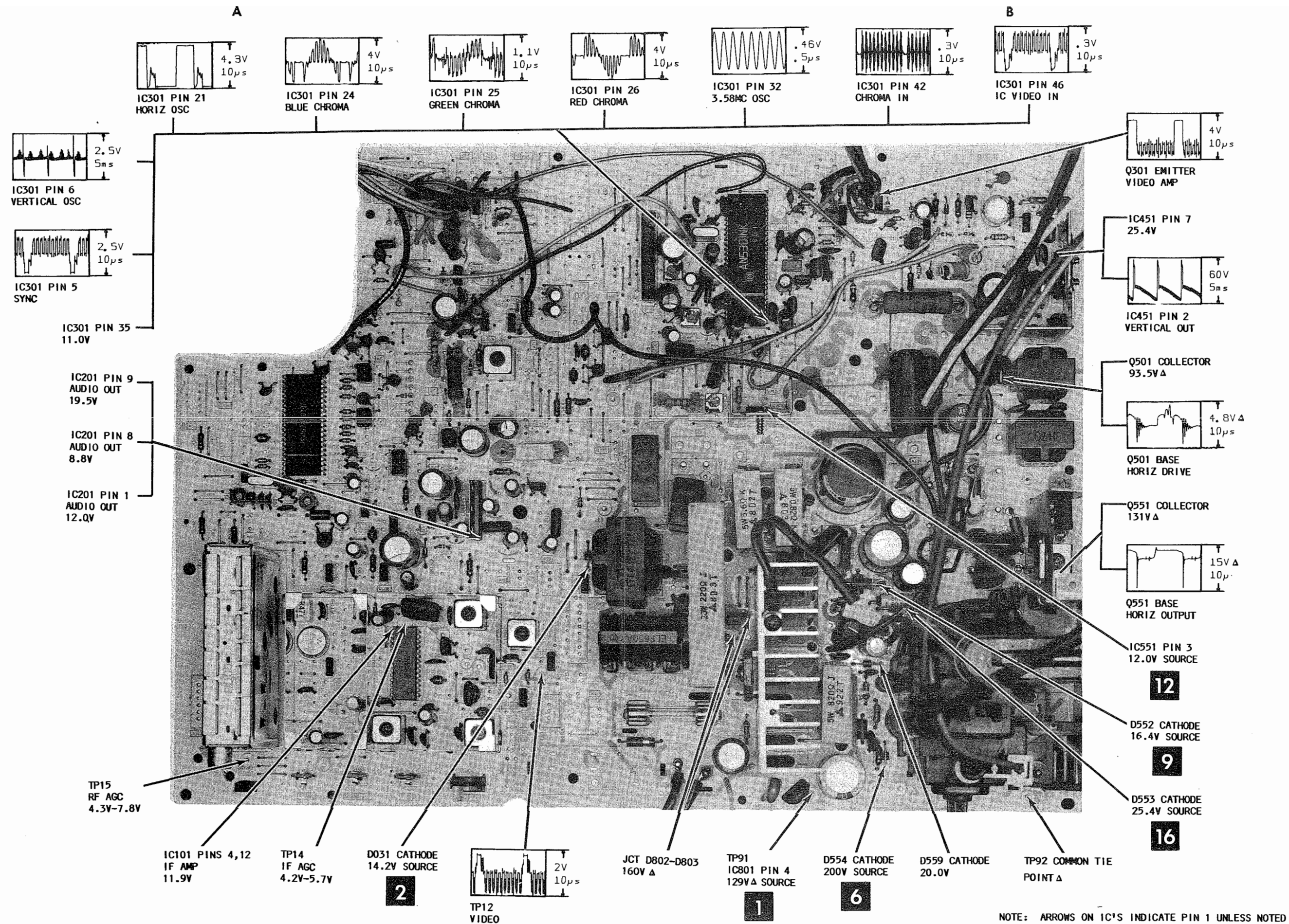




## TERMINAL GUIDES AND NOTES





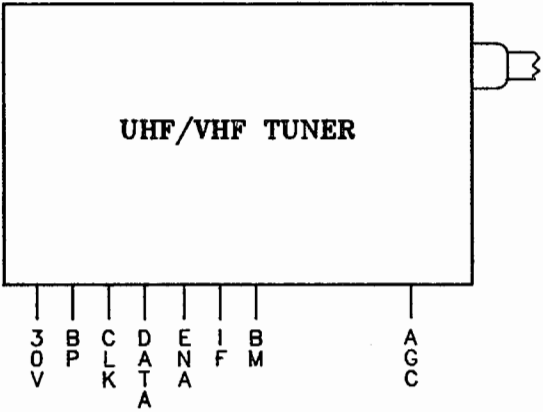


TUNER VOLTAGE CHART

	30V	BP	CLK	DATA	ENA	BM	AGC
VHF Low Band	4.2V	5.0V	.2V	.2V	.7V	12.0V	7.8V
VHF Band	14.8V	5.0V	.2V	.2V	.7V	12.0V	7.8V
UHF Band	4.5V	5.0V	.2V	.2V	.7V	12.0V	7.8V

NOTE: VHF Low Band voltages taken on channel 2.  
VHF High Band voltages taken on channel 7.  
UHF Band voltages taken on channel 14.

TUNER TERMINAL GUIDE



MAIN BOARD-BOTTOM VIEW-GridTrace LOCATION GUIDE

C320	F-11	R075	G-23	R565	P-6
C554	L-25	R079	J-26	R569	Q-2
JA1	B-20	R080	H-23	R601	D-12
JA2	A-19	R081	F-21	R605	D-12
JA3	S-19	R082	J-23	R607	D-12
JA4	L-24	R102	P-21	R608	D-12
JA5	O-19	R103	P-22	R619	C-9
JA6	Q-25	R104	O-21	R622	B-11
JA9	S-23	R105	Q-22	R629	C-12
JA10	D-10	R107	O-21	R809	R-10
JA11	J-18	R108	P-19		
JA12	F-2	R109	P-20		
JA13	I-15	R110	Q-18		
JA14	G-14	R112	Q-23		
JA15	I-15	R113	R-21		
JA16	R-14	R114	P-21		
JA17	C-10	R115	R-21		
JA18	F-3	R152	P-21		
JA19	F-3	R153	R-23		
JA20	C-1	R181	P-16		
JA21	E-8	R184	P-15		
JA22	D-3	R185	O-16		
JA23	C-3	R203	O-18		
JA24	B-10	R208	J-16		
JA25	H-10	R210	K-16		
JA26	H-9	R213	L-22		
JA27	H-10	R214	K-16		
JA28	G-9	R215	L-22		
JA29	A-11	R216	L-22		
JA30	F-16	R221	L-17		
JA31	G-16	R223	L-16		
JA32	J-17	R300	D-11		
JA33	C-14	R302	G-16		
JA34	G-14	R315	E-12		
JA36	A-17	R321	H-13		
JA37	A-16	R324	F-12		
JA38	H-11	R326	E-13		
JA39	B-19	R329	C-20		
JA40	B-19	R336	F-15		
JA41	C-18	R338	D-18		
JA42	C-15	R340	F-17		
JA43	D-17	R341	F-18		
JA44	R-6	R344	H-17		
JA46	J-16	R346	H-15		
JA47	N-16	R355	S-20		
JA52	L-7	R362	E-12		
JA53	D-11	R376	E-19		
JA54	D-12	R390	F-12		
JA56	E-14	R402	D-4		
JA57	E-13	R404	D-3		
JA58	F-11	R406	D-3		
R017	M-25	R407	S-20		
R019	E-19	R408	E-2		
R022	J-16	R409	D-4		
R024	M-15	R412	E-10		
R025	F-20	R420	E-2		
R027	F-20	R459	D-3		
R028	F-16	R461	D-3		
R031	I-22	R502	D-6		
R032	J-23	R503	E-17		
R037	L-23	R504	C-10		
R048	K-19	R508	D-6		
R051	M-21	R509	G-18		
R052	L-19	R511	B-2		
R054	K-20	R512	F-2		
R057	J-19	R536	D-5		
R059	L-19	R540	B-3		
R060	K-20	R541	F-11		
R064	J-18	R555	F-13		
R068	E-20	R556	Q-4		
R069	D-20	R557	Q-3		
R072	H-25	R559	P-2		
R074	H-24	R562	F-19		

## PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

## SEMICONDUCTORS (Select replacement for best results)

ITEM No.	MFGR. PART No./ TYPE No.				NOTES
		NTE PART No.	ECG PART No.	TCE PART No.	
Q302	D637-R 2SD637-R 2SD637QR 2SD637	NTE16 NTE16 NTE16 NTE16	ECG16 ECG16 ECG16 ECG16	SK9664 SK9664 SK9664 SK9664	
Q311	B642-Q 2SB642-Q 2SB642QR 2SB642	NTE19 NTE19 NTE19 NTE19	ECG19 ECG19 ECG19 ECG19	SK3912 SK3912 SK3912 SK3912	
Q312,313	D637-R 2SD637-R 2SD637QR 2SD637	NTE16 NTE16 NTE16 NTE16	ECG16 ECG16 ECG16 ECG16	SK9664 SK9664 SK9664 SK9664	
Q351,2,3	C3063 2SC3063 2SC3063RL 2SC2923RL	NTE157 NTE157 NTE157 NTE157	ECG157 ECG157 ECG157 ECG157	SK3747/157 SK3747/157 SK3747/157 SK3747/157	
Q451	D637-R 2SD637-R 2SD637QR 2SD637	NTE16 NTE16 NTE16 NTE16	ECG16 ECG16 ECG16 ECG16	SK9664 SK9664 SK9664 SK9664	
Q501	C2653H 2SC2653HCL 2SC2653(H)CL	NTE198 NTE198 NTE198	ECG198 ECG198 ECG198	SK3220/198 SK3220/198 SK3220/198	
Q531	B642-Q 2SB642-Q 2SB642QR 2SB642 2SA564AQR 2SA564A	NTE19 NTE19 NTE19 NTE19 NTE290A NTE290A	ECG19 ECG19 ECG19 ECG19 ECG290A ECG290A	SK3912 SK3912 SK3912 SK3912 SK3932/91 SK3932/91	
Q534	D637-R 2SD637-R 2SD637QR 2SD637	NTE16 NTE16 NTE16 NTE16	ECG16 ECG16 ECG16 ECG16	SK9664 SK9664 SK9664 SK9664	
Q551	D1439P 2SD1439P 2SD1439PLB	NTE2302 NTE2302 NTE2302	ECG2302 ECG2302 ECG2302	SK9422 SK9422 SK9422	#
Q552	D637-R 2SD637-R 2SD637QR 2SD637	NTE16 NTE16 NTE16 NTE16	ECG16 ECG16 ECG16 ECG16	SK9664 SK9664 SK9664 SK9664	

# For SAFETY use only equivalent replacement part.

## PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

## ELECTROLYTIC CAPACITORS

ITEM No.	RATING	MFGR. PART No.	ITEM No.	RATING	MFGR. PART No.
# C035	100 6.3V	ECEA0JU101	# C558	470 25V	ECEA1EU471
# C209	10 NP 16V	ECEA1CN100S	# C562	470 35V	ECEA1VGE471
# C309	4.7 NP 25V	ECEA1EN4R7S	# C564	33 250V	ECEA2EG330S
# C401	2.2 25V	ECSZ25EF2R2N	# C565	1 NP 160V	ECEA160N1
# C402	1 NP 50V	ECEA1HN010S	# C577	33 160V	ECEA160V33Z
# C531	47 35V	ECEA35Z47	# C805	330 500V	ECES2DU331G
# C555	220 25V	ECEA1EU221	# C806	22 160V	ECEA2CS220

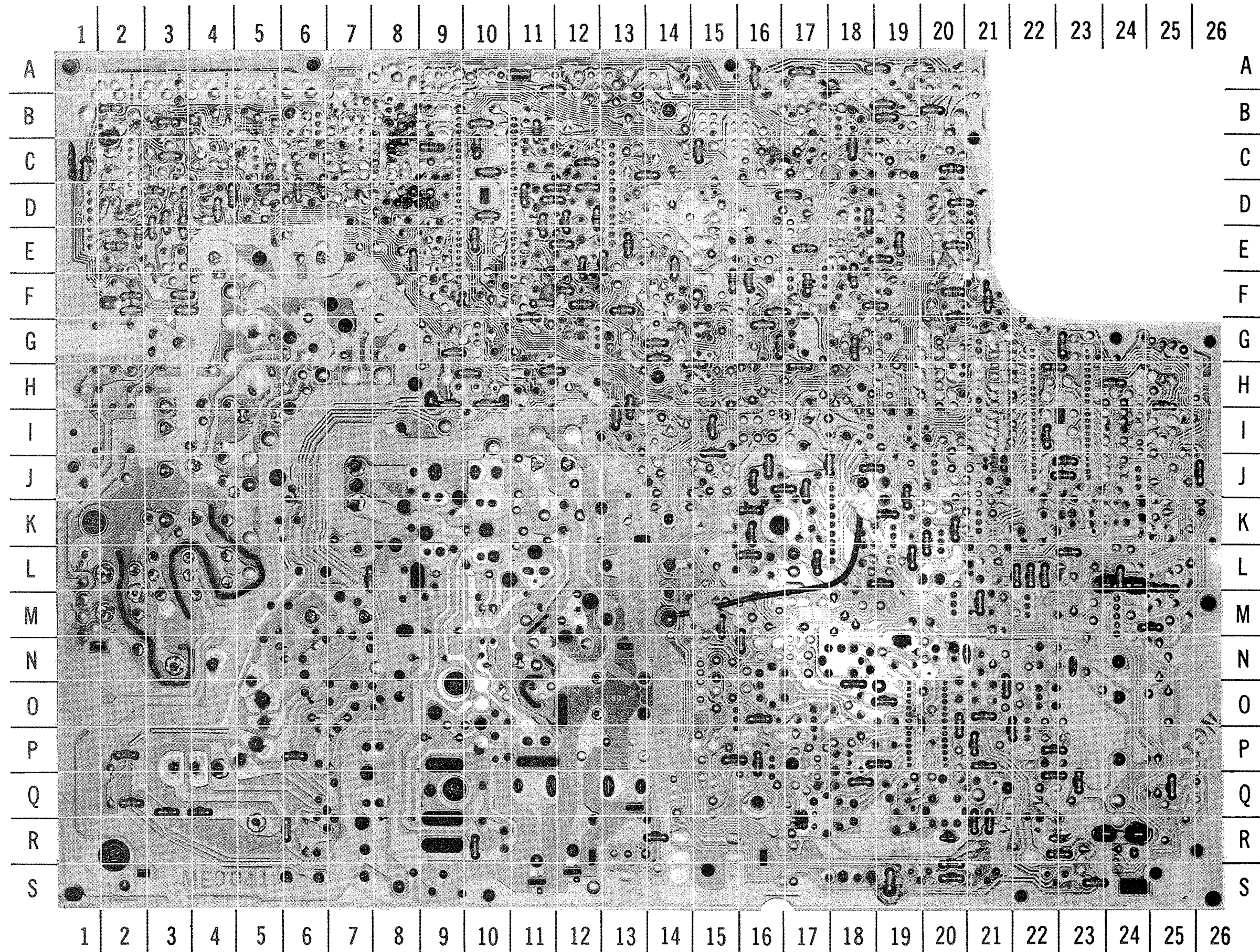
# For SAFETY use only equivalent replacement part.  
Items not listed are normally available at local distributors.

## CAPACITORS

ITEM No.	RATING	MFGR. PART No.	ITEM No.	RATING	MFGR. PART No.
C024	10pF N150 50V ±.5pF	ECCF1H100DP	# C552	.0033 1.2KV 5%	ECWH12H332JS
C025	39pF N150 50V 5%	ECCF1H390JP	# C561	.47 200V 5%	ECQF2H474JS
C036	30pF Trimmer	ECRHA030E41	# C569	470pF 2KV 5%	ECKD3D471JB
C065	50pF Trimmer	ECRHA050G41	# C580	.001 2KV 5%	ECKD3D102JB
C114	6pF NPO 50V ±.25pF	ECCF1H060CC		.0012 2KV 5%	ECKD3D122JB
C115	3pF NPO 50V ±.25pF	ECCF1H030CC	# C581	.0033 1.2KV 5%	ECWH12H332JS
C151	56pF N075 50V 5%	ECCF1H560JL	# C582	.001 2KV 5%	ECKD3D102JB
C152	12pF NPO 50V 5%	ECCF1H120JC	# C601	8pF N750 50V ±.5pF	ECCF1H080DU
C201	3pF 50V ±.5pF	ECCF1H030D	# C613	100pF NPO 50V 5%	ECCF1H101JC
C202	82pF N150 50V 10%	ECCF1H820KP	# C615	15pF NPO 50V 5%	ECCF1H150JC
C206	82pF N150 50V 10%	ECCF1H820KP	# C802	.01 250VAC	ECKDAE103ZVD
C316	18pF NPO 50V 5%	ECKF1H180JC	# C803	.01 250VAC	ECKDAE103ZVD
C317	33pF NPO 50V 5%	ECCF1H330JC	# C812	.01 250VAC	ECKDAE103ZVD
C503	470pF N750 50V 5%	ECCF1H471JU	# C821	.015 125VAC 10%	ECQU1A153KH
# C551	.15 200V 5%	ECQM2154JZ	# C822	.015 125VAC 10%	ECQU1A153KH
			# C824	.0022 125VAC	ECKCFL222ZE

# For SAFETY use only equivalent replacement part.  
Items not listed are normally available at local distributors.





## PARTS LIST AND DESCRIPTION

When ordering parts, state Model, Part Number, and Description

## SEMICONDUCTORS (Select replacement for best results)

ITEM No.	MFGR. PART No./ TYPE No.				
		NTE PART No.	ECG PART No.	TCE PART No.	NOTES
D010, 11 D013 THRU D015 D016 D018 D023	MA150 MA150 MA150 MA165 EQA0313B	NTE519 NTE519 NTE519 NTE519	ECG519 ECG519 ECG519 ECG519	SK3100/519 SK3100/519 SK3100/519 SK3100/519	#
D025 D026 D030	MA165 MA161 QA205E TVSQA205E	NTE519 NTE519 NTE5010A NTE5010A	ECG519 ECG519 ECG5010A ECG5010A	SK3100/519 SK3100/519 SK5A1/5010A SK5A1/5010A	
D031	ERA1501	NTE552	ECG552	SK9000/552	
D032 D039	MA162 MA27WATA MA27WA	NTE519 NTE605A NTE605A	ECG519 ECG605A ECG605A	SK3100/519 SK7952/605A SK7952/605A	
D101	QA207M3 TVSQA207M3	NTE5014A NTE5014A	ECG5014A ECG5014A	SK6A8/5014A SK6A8/5014A	
D303 D307, 9, 11 D314	MA150 MA165 QA213B TVSQA213B	NTE519 NTE519 NTE5022A NTE5022A	ECG519 ECG519 ECG5022A ECG5022A	SK3100/519 SK3100/519 SK13A/5022A SK13A/5022A	
D451 D452, 3 D503, 6 D507	ERA1501 MA165 MA165 MA4062H	NTE552 NTE519 NTE519 NTE5013A	ECG552 ECG519 ECG519 ECG5013A	SK9000/552 SK3100/519 SK3100/519 SK6A2/5013A	
D531	AS01 ERA2204 AU01	NTE552 NTE552 NTE552	ECG552 ECG552 ECG552	SK9000/552 SK9000/552 SK9000/552	#
D533	QA206M TVSQA206M	NTE5012A NTE5012A	ECG5012A ECG5012A	SK6A0/5012A SK6A0/5012A	#
D534, 551	MA165	NTE519	ECG519	SK3100/519	
D552	RU2AM TVSRU2AM	NTE552 NTE552	ECG552 ECG552	SK9000/552 SK9000/552	#
D553	AS01 AS01V0 ERA2204	NTE552 NTE552 NTE552	ECG552 ECG552 ECG552	SK9000/552 SK9000/552 SK9000/552	#
D554	AS01 AU01 ERA2204	NTE552 NTE552 NTE552	ECG552 ECG552 ECG552	SK9000/552 SK9000/552 SK9000/552	#
D555 D556	MA150 QA205C TVSQA205C	NTE519	ECG519	SK3100/519	#
D559	AU01 AU02 AS01 ERA2204	NTE552 NTE552 NTE552 NTE552	ECG552 ECG552 ECG552 ECG552	SK9000/552 SK9000/552 SK9000/552 SK9000/552	
D560	RU2M EU2 TVSEU2	NTE552 NTE552 NTE552	ECG552 ECG552 ECG552	SK9000/552 SK9000/552 SK9000/552	
D561	ERC0615 RH2FM TVSRH2FM	NTE525 NTE525 NTE525	ECG525 ECG525 ECG525	SK3925/525 SK3925/525 SK3925/525	#

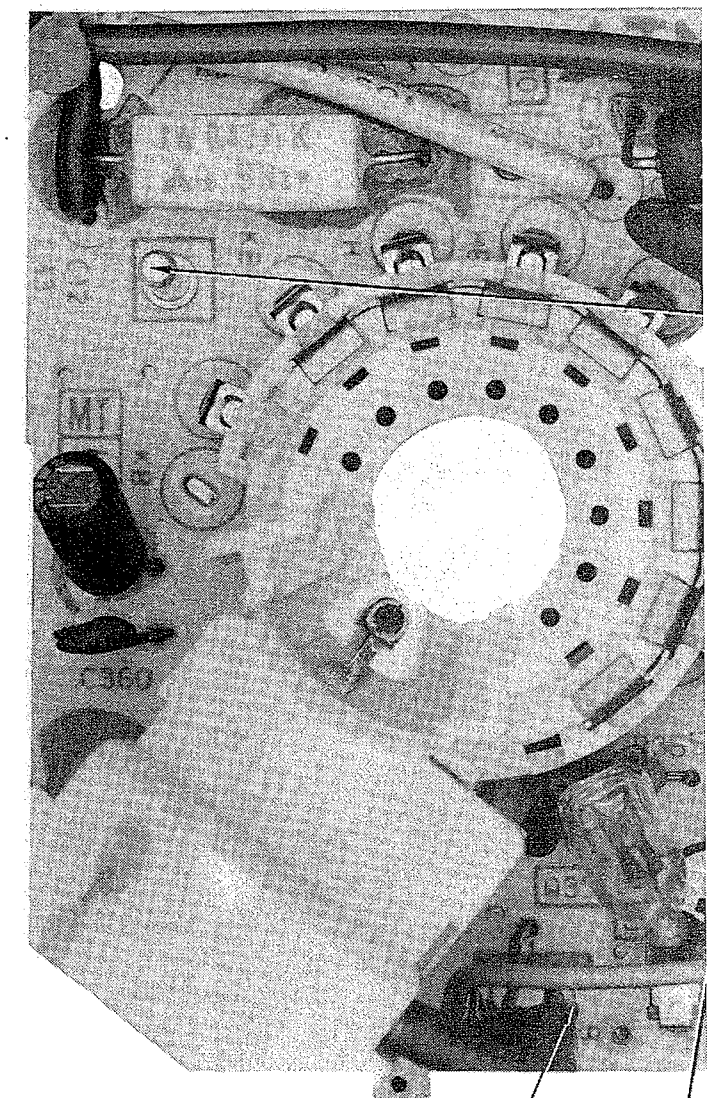
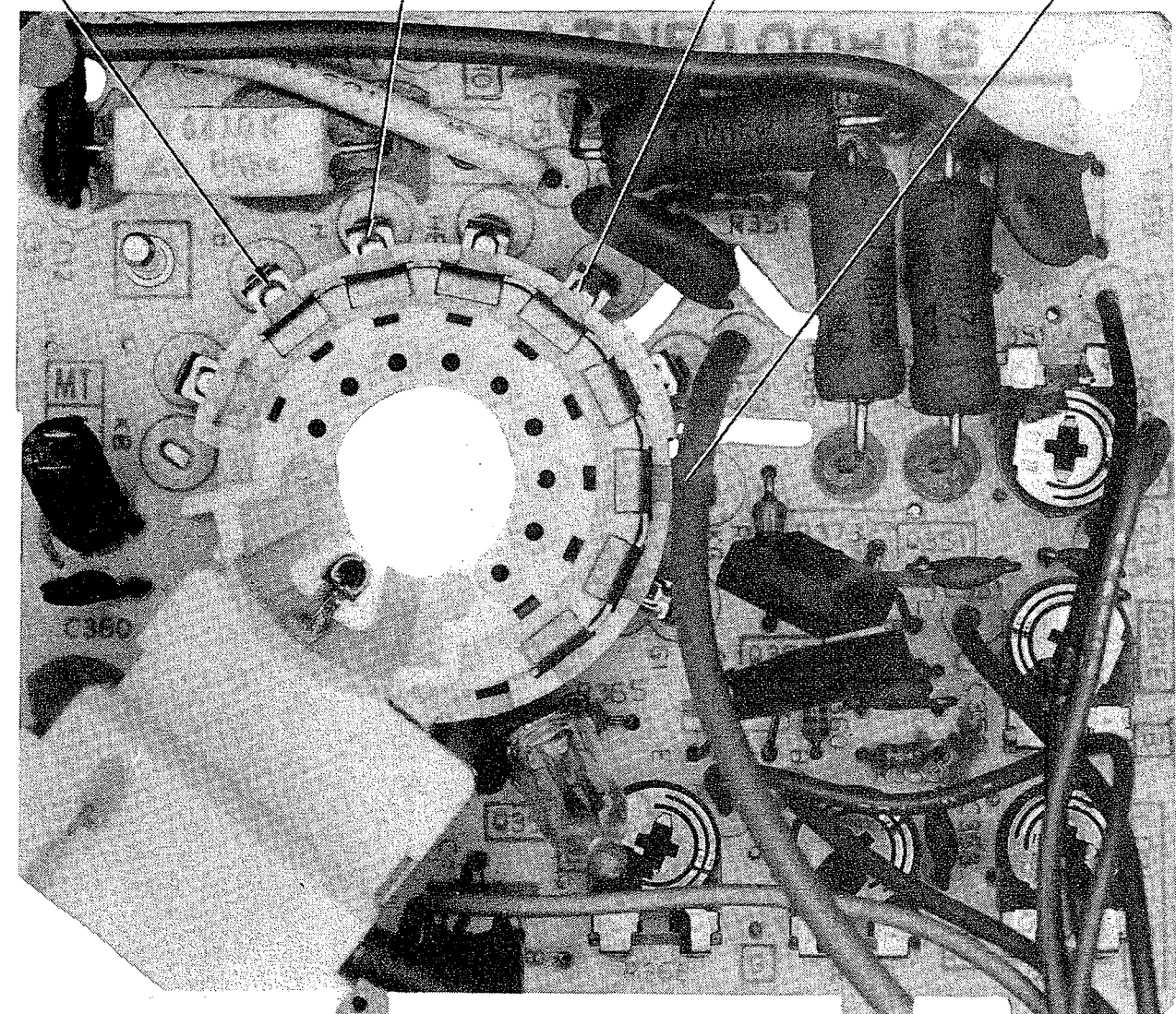
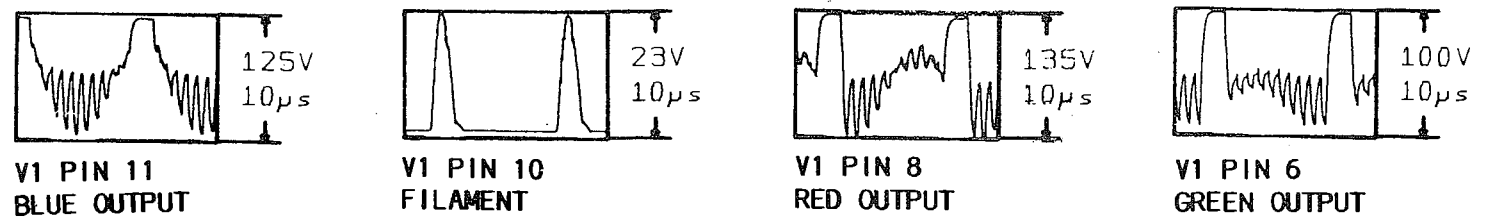
## PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

## SEMICONDUCTORS (Select replacement for best results)

ITEM No.	MFGR. PART No./ TYPE No.				
		NTE PART No.	ECG PART No.	TCE PART No.	NOTES
D603 D801 THRU D804	MA165 EM02BM RM11B ERC0508 ERC1208 ERC1308	NTE519 NTE125 NTE125 NTE125 NTE125 NTE125	ECG519 ECG125 ECG125 ECG125 ECG125 ECG125	SK3100/519 SK3081/125 SK3081/125 SK3081/125 SK3081/125 SK3081/125	#
IC010	MN15247Q10A MN15247Q10				
IC101	AN5136K AN5136KR				
IC201 IC301	AN5265 AN5301NK	NTE1789	ECG1789		#
IC451 IC551	AN5521 AN78M12 AN78M12LB	NTE1782 NTE966 NTE966	ECG1782 ECG966 ECG966	SK9730 SK3592/966 SK3592/966	# # #
IC801	STR30130	NTE15032	ECG1777		
Q016	B642-R 2SB642PQR 2SB642	NTE19 NTE19 NTE19	ECG19 ECG19 ECG19	SK3912 SK3912 SK3912	
Q017	D637-R 2SD637PQR 2SD637 2SC1685PQR 2SC1685	NTE16 NTE16 NTE16 NTE85 NTE85	ECG16 ECG16 ECG16 ECG85 ECG85	SK9664 SK9664 SK9664 SK9229/85 SK9229/85	
Q022, 4, 8, 9	D637-R 2SD637QR 2SD637 2SC1685QR 2SC1685	NTE16 NTE16 NTE16 NTE85 NTE85	ECG16 ECG16 ECG16 ECG85 ECG85	SK9664 SK9664 SK9664 SK9229/85 SK9229/85	
Q101	C2377-C 2SC2377C 2SC2377	NTE15 NTE15 NTE15	ECG15 ECG15 ECG15	SK9663 SK9663 SK9663	
Q174	B642-Q 2SB642QR 2SB642	NTE19 NTE19 NTE19	ECG19 ECG19 ECG19	SK3912 SK3912 SK3912	
Q175	D637-R 2SD637-R 2SD637QR 2SD637	NTE16 NTE16 NTE16 NTE16	ECG16 ECG16 ECG16 ECG16	SK9664 SK9664 SK9664 SK9664	
Q201	D637-R 2SD637-R 2SD637QR 2SD637	NTE16 NTE16 NTE16 NTE16	ECG16 ECG16 ECG16 ECG16	SK9664 SK9664 SK9664 SK9664	
Q301	B643-R 2SB643-R 2SB643RS 2SB643 2SA719RS 2SA719	NTE19 NTE19 NTE19 NTE19 NTE290A NTE290A	ECG19 ECG19 ECG19 ECG19 ECG290A ECG290A	SK3912 SK3912 SK3912 SK3912 SK3114A/290A SK3114A/290A	





Q353  
R368  
BLUE  
LOW LIC

NOTE: ARROWS ON TRANSISTORS

PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

MISCELLANEOUS

ITEM No.	PART NAME	MFG. PART No.	NOTES
# CRA801	Caprister	EXNG131P155	130pF, 1.5M
# F001	Fuse 4.0AMP @ 125V	XBA1F40NU100	
# F002	Fuse 1.5AMP @ 125V	XBA1C15NU100	
L024	Ferrite Bead	TSC925-4	
L554	Ferrite Bead	TSC925-4	
L555	Ferrite Bead	TSC925-4	
L558	Ferrite Bead	TSC925-4	
# L561	Ferrite Bead	TSC925-4	
L563	Ferrite Bead	TLP408C	
L564	Ferrite Bead	TSC910	
# L801	Line Filter	ELF18D650A	
# L805	Degaussing Coll	OLK19009M	
N351	Neon Lamp	XANT343	
# P001	AC Cord	TSX3134X	Polarized
# RL010	Power Relay	TSE1854	
SW010	Switch	EVQQS607T	Channel Up
SW011	Switch	EVQQS607T	Channel Down
SW012	Switch	EVQQS607T	Volume Up
SW013	Switch	EVQQS607T	Volume Down
SW014	Switch	EVQQS607T	Add
SW015	Switch	EVQQS607T	Erase
SW016	Switch	EVQQVC13K	Auto
SW017	Switch	EVQQS607T	Power
SW021	Switch	ESD323241	CATV
SW022	Switch	EVQQS607T	Program
# SW023	Switch	ESB6460	AFT
SW301	Switch	EVQR7AL13	Service
SW601	Switch	ESB6460	Auto-Color (Color Pilot)
# V1	CRT	A48JJY81X	19"
X010	Crystal	EYXTE405S13	Synthesizer Clock
X101	SAW Filter	EFCH45MVK11T	
X102	Filter	EFCS4R5MW3BA	4.5MHz Trap
X201	Filter	EFCS4R5MS4	4.5MHz Bandpass
X501	Crystal	TAFCSB503F33	Horizontal Oscillator
X601	Crystal	TSS816M	3.5MHz Oscillator
	Antenna	TSA100008	VHF
	Antenna Terminal	TJB1723500M	
	Permalloy Convergence	OFMK014ZZ	
	Corrector Strip		
	Converter	TJB1723600	75/300 OHM
	CRT Socket	TJS1A5050	
	DAG Ground	TXF3A01SBTM	CTK-1942R
	DAG Ground	TXF3A01SBTC	PC-20S49R
	Fuse Holder	TJC6319	Two used For F001
	Fuse Holder	TJC6320	Two used For F002
	RC Receiver	EUR37234	
	RC Transmitter	EUR50349	
#	UHF/VHF Tuner	ENV56822G3	Model PC-20S49R
#	UHF/VHF Tuner	ENV56826G3	Model CTK-1942R
	Yoke Wedge	TMM27504	Three Used

# For SAFETY use only equivalent replacement part.

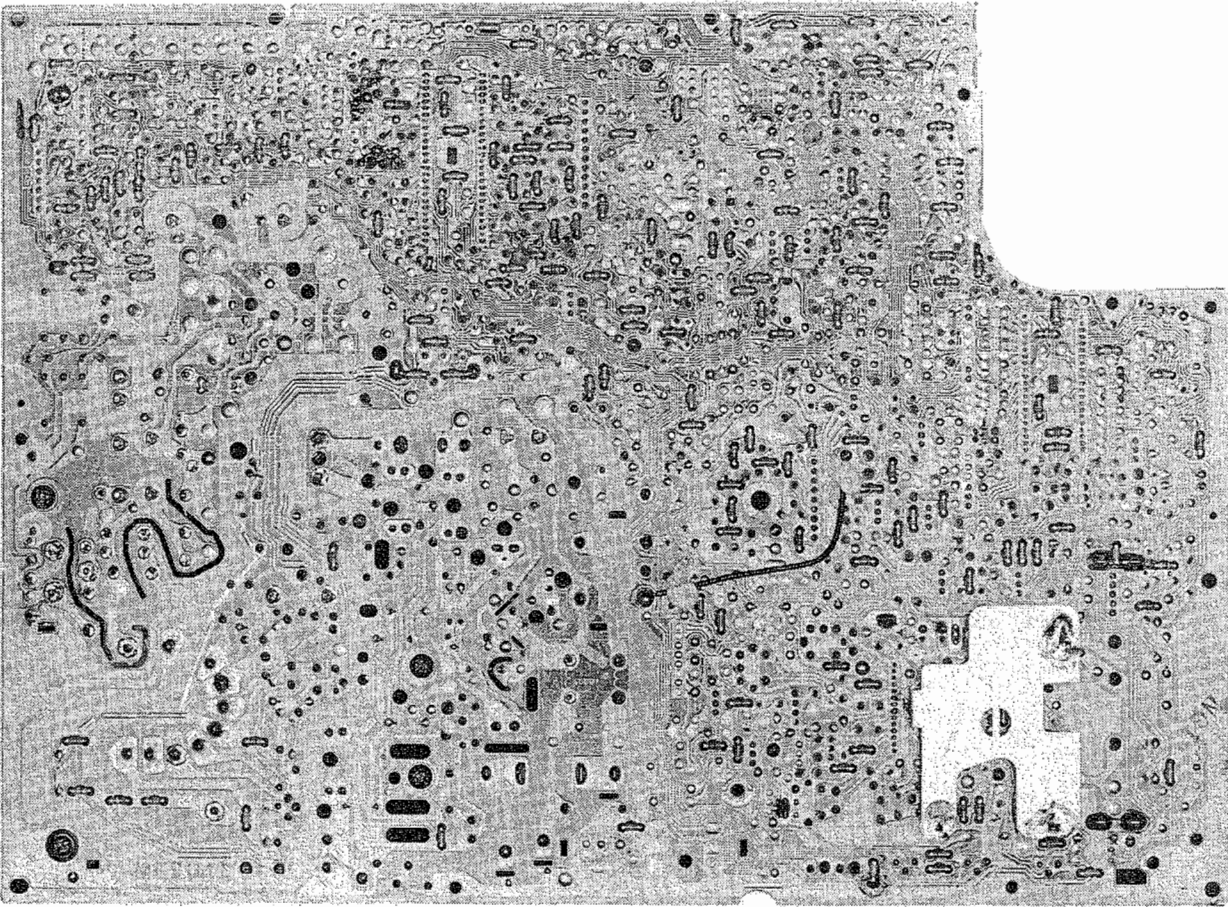
PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

CABINETS & CABINET PARTS (When ordering specify model, chassis & color)

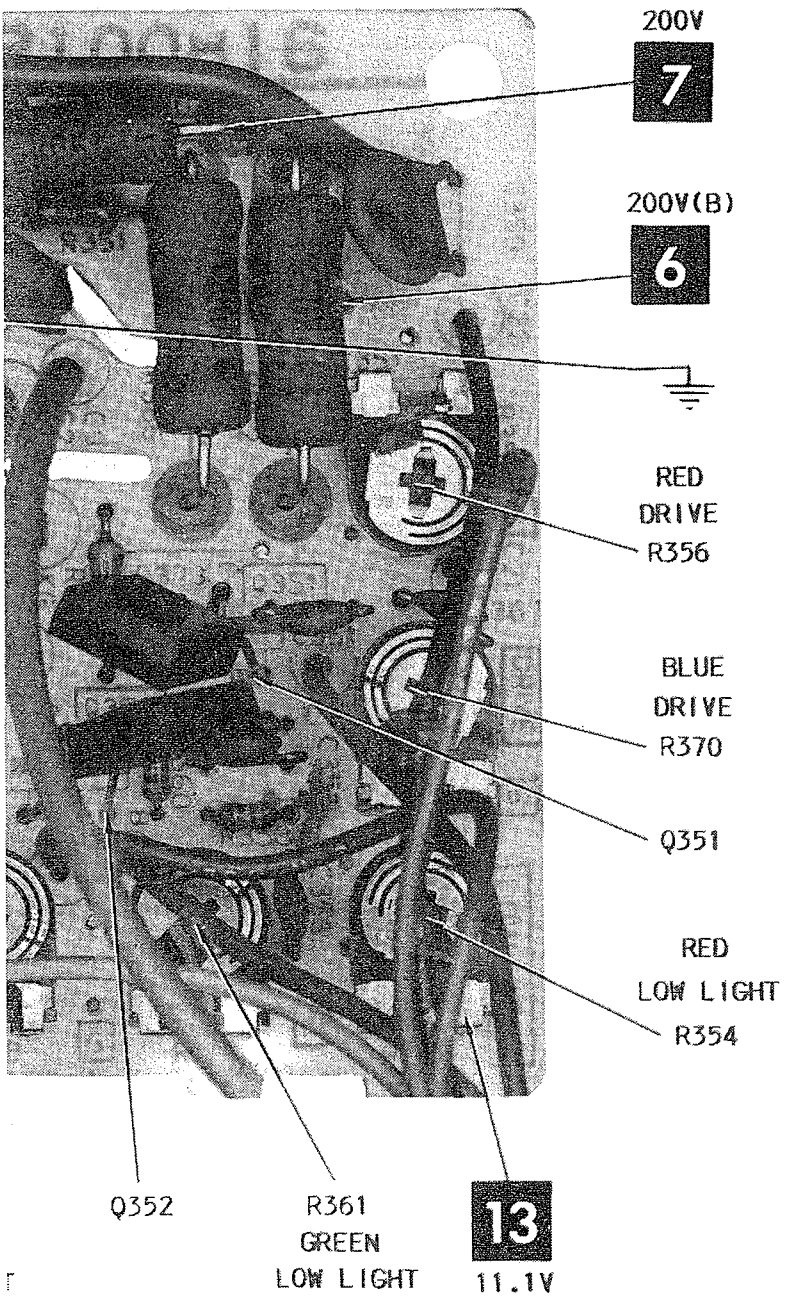
ITEM	PART No.	ITEM	PART No.
Cabinet Front Assembly	TXFKY407SER (1)	Button-AFC, Color Pilot On/	TBX2A51001
	TXFKY437SER (2)	Off (2 Used)	
Cabinet Back Assembly	TXFKU387SER (1)	Grille Speaker	TKP1756974 (1)
	TXFKU417SER (2)		TKP1756975 (2)
Knob-Sharpness,Picture,	TBX2A50502	Control Panel Overlay	TKP2717843
Bright,Tint,Color (5 Used)			

(1) Used In Model: CTK-1942R.  
(2) Used In Model: PC-20S49R.

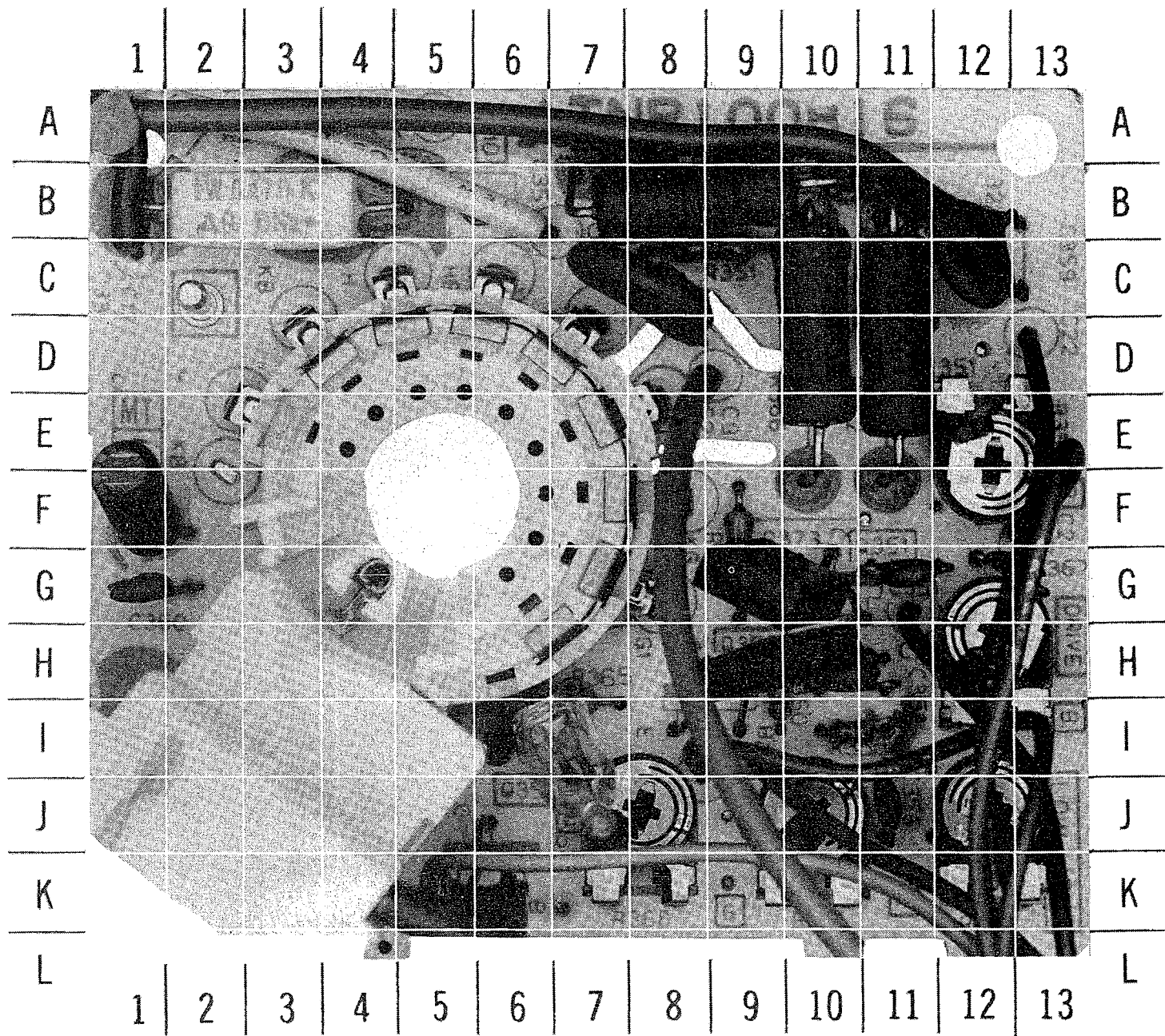


PANASONIC  
MODELS CTK-1942R, PC-20S49R





INDICATE BASE UNLESS NOTED



CRT BOARD  
-GridTrace  
LOCATION GUIDE

C12	C-2
C351	G-11
C352	H-10
C353	J-11
C354	C-8
C355	F-1
C359	C-12
C360	G-1
C367	G-12
L351	D-11
N351	I-7
Q351	G-10
Q352	H-9
Q353	K-6
R351	C-9
R352	D-11
R353	I-10
R354	J-12
R356	E-12
R357*	F-12
R358	F-9
R359	B-9
R360	I-9
R361	J-10
R364	H-11
R365	I-7
R366	C-10
R367*	J-7
R368	J-8
R370	H-12
R371*	J-12
R374*	B-11
R375*	D-1
R378	B-3
R380	J-9
R381*	C-12

\*Located on bottom of board.

PANASONIC  
MODELS CTK-1942R, PC-20S49R



PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

CONTROLS (All wattages 1/2 watt, or less, unless listed)

ITEM NO.	FUNCTION	RESISTANCE	MFGR. PART NO.	NOTES
R101	RF AGC	20K	EVN64AA00B24	
R307	Sharpness	10K	EVUF2AF25B14	
R309	Sub Contrast	1000	EVND4AA00B13	
R312	Brightness	50K	EVUF3AF2554S	
R316	Sub Brightness	20K	EVN64AA00B24	
R320	Picture	50K	EVUF2AF25B54	
R354	Red Low Light	5000	EVN89AA00B53	
R356	Red Drive	300	EVN89AA00B32	
R361	Green Low Light	5000	EVN89AA00B53	
R368	Blue Low Light	5000	EVN89AA00B53	
R370	Blue Drive	300	EVN89AA00B32	
R405	Vertical Size	200	EVN64AA00B22	
R524	Horizontal Centering	200	EVND4AA00B22	
R603	Color	10K	EVUF2AF25B14	
R610	Tint	10K	EVUF2AF25B14	
R612	Reference Gyrator (CW)	10K	EVND4AA00B14	

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		
		MFGR. PART No.	NTE PART No.	
# D805	5.0 PTC Cold	ERPF5B0M050K		
R209	22 5% 1W Fusible	ERQ1CJP220	F1W022	
R304	53.6K 2W Fusible	EROS2CKF5362		
# R378	.47 10% 1W Fusible			
	.56 10% 1W Fusible	ERQ1CKPR56		
# R510	2200 5% 3W Metal Oxide	ERG3ANJ222	3W222	
# R531	47 5% 1/4W Carbon Film	ERD25FJ470	QW047	
# R532	24.5K 1% 2W Metal Oxide	EROS2CKF2432		
# R533	10K 1% 1/4W Metal Oxide	ERD25CKF1002		
# R534	6800 5% 1/4W Carbon Film	ERDS2TJ682	QW268	
# R535	820 5% 1/4W Carbon Film	ERD25TJ821	QW182	
# R538	680K 5% 1/2W Carbon Film	ERDS1TJ684	HW468	
# R551	100 5% 2W Metal Oxide	ERG2ANJ101	2W110	
# R552	47 5% 1W Metal Oxide	ERG1SJ470	1W047	
# R553	300 5% 1W Metal Oxide	ERG1SJ301	1W130	
# R554	820 5% 2W Fusible	ERQ2CJP821	F2W182	
# R562	560 5% 1/4W Carbon Film Leadless	ERD25TLJ561		
# R572	1 5% 1/2W Carbon Film	ERDS1FJ1R0	HW1D0	
# R574	1 5% 1W Fusible	ERQ1CJP1R0	F1W1D0	
# R575	1 5% 1/2W Fusible	ERQ12HJ1R8		
# R801	.82 10% 5W Wirewound	ERF5ZKR82	5WD82	
# R802	150K 5% 1/2W Carbon Film	ERDS1TJ154	HW415	
# R803	820 5% 5W Metal Film	ERG5ZJ821		
# R804	220 5% 20W Wirewound	ERF20ZJ221		
# R805	10K 5% 1/2W Carbon Film	ERDS1TJ103	HW310	
# R807	47 5% 1/4W Carbon Film	ERD25FJ470	QW047	
# R808	33 5% 1/4W Carbon Film	ERD25FJ330	QW033	
# R809	220K 5% 1/4W Carbon Film	ERD25TLJ224	QW422	
# R810	5.6 10% 5W Wirewound	ERF5ZK5R6		
# R815	2.7M 10% 1/2W Carbon Comp	ERC12ZGK275	HW527	
# R826	1 10% 1/2W Wirewound	ERW12PK1R0		

# For SAFETY use only equivalent replacement part.

PARTS LIST AND DESCRIPTION (Continued)

When ordering parts, state Model, Part Number, and Description

COILS & TRANSFORMERS

ITEM No.	FUNCTION	MFGR. PART No.	OTHER IDENTIFICATION	NOTES
# L561	Yoke 90° Horiz 2.24mh Vert 18.2mh	OLY15303F	OLY15303F (1)	
# T501	Horizontal Driver	ETH19Y70AX	H70 (1)	
# T502	Horizontal Coupling	ETE19Z30AY	E1930 (1)	
# T551	Horizontal Out	TLF15526F	TLF15526F (1)	
# T801	Power	TLP16297	TLP16297 (1)	

# For SAFETY use only equivalent replacement part.  
(1) Number on unit.

COILS (RF-IF)

ITEM No.	FUNCTION	MFGR. PART No.	ITEM No.	FUNCTION	MFGR. PART No.
L020	RF Choke (22uH)	ELEPH220KA	L112	Peaking (1.0uH)	TLQ010K205C
L025	Peaking (4.7uH)	ELEPH4R7KA	L152	AFT	TL167394-1
L027	Peaking (39uH)	ELEPH390KA	L201	Quadrature	TL563318-2
L028	Peaking (22uH)	ELEPH220KA	L306	Peaking (10uH)	ELEPH100JA
L101	Peaking (.47uH)	TLQR47N205C	L307	Peaking (15uH)	ELEPH150JA
L104	Video IF	TL1158755	L351	Peaking (150uH)	ELEPH151KA
L105	RF Choke (3.3uH)	ELEPH3R3KA	# L553	Linearity	TLH15654P
L106	Peaking (15uH)	ELEPH150KA	L601	Peaking (82uH)	ELEPH820KA
L107	Peaking (4.7uH)	ELEPH4R7KA	T201	Audio IF	TL562366-1
L109	Peaking (1.0uH)	ELEPH1R0KA			

# For SAFETY use only equivalent replacement part.

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
SP201	2 1/4" x 6 1/4" PM 1.5W 14 Ohm	EAS16D63SXT	26A07Z8	