

CABINET-REAR VIEW

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

Remove five screws holding cabinet back and remove back. Disconnect HV anode, CRT socket, deflection yoke connectors, degaussing coil connectors, speaker connectors, ground leads, and all other required cabling. Remove the Strain relief (AC cord) assembly and release two latches holding main board assembly to cabinet bottom and slide board assembly from cabinet.

CRT REMOVAL

(Caution: Some sets employ a CRT with neck assemblies permanently bonded to CRT. Do Not attempt to remove these assemblies.)

Follow "Chassis Removal" procedure and lay set face down on a soft protective surface. Loosen and remove CRT neck assemblies. (See Caution.) 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 IMPLOSION PROTECTION AND CLEANING

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

FUSE DEVICES

A 1.0-amp fuse is used for low-voltage power-supply protection. (See photo, Chassis - Top View.)

A 4.0-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 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 adjusted by the Focus control. (See photo, Cabinet - Rear View.)

AGC

The RF AGC may be varied by an RF AGC control. (See photo, Chassis - Top View.)

FOLDER 2
SET 2749

RCA

CHASSIS CTC146B/C/D/E/F/G/H

SAMS PHOTOFACT®

For Supplier Address See PHOTOFACT Index



MODEL

CHASSIS

F20507WNA02	CTC146D
F20507WNA03	CTC146B
F20507WNA04	CTC146D
F20507WNN03	CTC146B
F20507WNN04	CTC146D
F20508BHN03	CTC146B
F20509AKN03	CTC146B
F20509AKN04	CTC146D
F20514WNA01	CTC146C
F20514WNA02	CTC146E
F20514WNA03	CTC146C
F20514WNA04	CTC146E

F20514WNN01	CTC146C	F20537CPA04	CTC146E
F20514WNN03	CTC146C	F20537CPN01	CTC146C
F20514WNN04	CTC146E	F20537CPN03	CTC146C
F20515EGN01	CTC146C	F20538DGA01	CTC146C
F20515EGN02	CTC146E	F20538DGA03	CTC146C
F20516BHA03	CTC146C	F20538DGA04	CTC146E
F20516BHN03	CTC146C	F20538DGN01	CTC146C
F20517WNA02	CTC146E	F20538DGN02	CTC146E
F20517WNA03	CTC146C	F20538DGN03	CTC146C
F20517WNN02	CTC146E	X20131EBA01	CTC146F
F20517WNN03	CTC146C	X20131EBA03	CTC146F
F20517WNN04	CTC146E	X20131EBN01	CTC146F
F20519AKA03	CTC146C	X20131EBN03	CTC146F
F20519AKN03	CTC146C	X20133WNA01	CTC146F
F20526AKA01	CTC146B	X20133WNA03	CTC146F
F20526AKN01	CTC146B	X20133WNN01	CTC146F
F20527CPA01	CTC146B	X20133WNN03	CTC146F
F20527CPN01	CTC146B	X20161EBA01	CTC146G
F20533BMA01	CTC146C	X20161EBA02	CTC146H
F20533BMA02	CTC146E	X20161EBA04	CTC146H
F20533BMA04	CTC146E	X20161EBN01	CTC146G
F20533BMN03	CTC146C	X20161EBN02	CTC146H
F20535DWA01	CTC146C	X20161EBN03	CTC146G
F20535DWA02	CTC146E	X20161EBN04	CTC146H
F20535DWA04	CTC146E	X20163WNA01	CTC146G
F20535DWN03	CTC146C	X20163WNA02	CTC146H
F20536EHA01	CTC146C	X20163WNA03	CTC146G
F20536EHA02	CTC146E	X20163WNA04	CTC146H
F20536EHA04	CTC146E	X20163WNN01	CTC146G
F20536EHN01	CTC146C	X20163WNN03	CTC146G
F20536EHN02	CTC146E	X20163WNN04	CTC146G
F20537CPA01	CTC146C		
F20537CPA03	CTC146C		

SAFETY PRECAUTIONS

See Page 1A

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DATE 6-90

SET 2749 FOLDER 2

CHASSIS CTC146B/C/D/E/F/G/H

RCA

SET 2749 FOLDER 2

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.

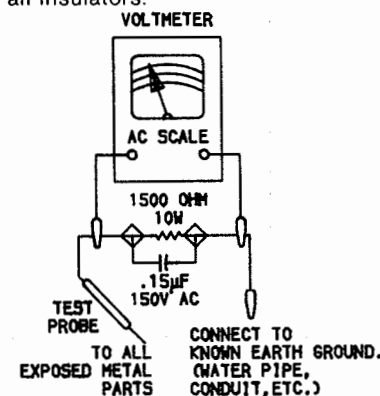
Leakage Current Hot Check

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 μ 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

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 (T4402). Refer to "Troubleshooting" Power Supply and Horizontal circuits.

NO PIC, NO SOUND, HAS RASTER: Check IF-AGC and source voltages from Horizontal Output Transformer (T4402). Refer to "Troubleshooting" IF-AGC and Horizontal circuits.

NO PIC, HAS SOUND, NO RASTER: Check Horizontal Output Transformer (T4402) sources and Video circuit. Refer to "Troubleshooting" Horizontal and Video circuits.

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 (T4402). 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.

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 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	HV-44	HP200	
VOM/DMM		TP212	
Accessory probes	PR-28(HV)		
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, or observe polarity, and maintain line voltage at 120VAC. Allow a 20 minute warm-up period for receiver and test equipment. Suggested Alignment tools: GC-THORSEN	
Alignment COILS: L2302	RECOMMENDED TOOLS: 9440

PRELIMINARY INSTRUCTIONS

Select highest unused channel. Set scope sweep to external or vector mode. 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 useable indication. Sweep Generator frequency is 44MHz with 10MHz Sweep. NOTE: Response may vary from that shown. Connect a 5.5V - 6.0V Bias to TP2305. L2302 is factory set. Do not adjust.

VIDEO IF ALIGNMENT (SWEEP MARKER GENERATOR)

DIRECT PROBE FROM SWEEP GENERATOR	SWEEP GENERATOR OUTPUT	MARKER GENERATOR FREQUENCY	REMARKS
TP2307	TP1221	45.75MHz	Adjust L2304 for best overall symmetry and position of marker as shown. See Figure 1

TV ALIGNMENT INSTRUCTIONS (CONTINUED)

VIDEO IF ALIGNMENT (BAR SWEEP GENERATOR)

BAR SWEEP GENERATOR	SCOPE INPUT	REMARKS
Antenna Terminal	TP1221	Perform in same manner as Video IF Alignment Sweep Generator Instructions above. See Figure 2

SOUND IF ALIGNMENT

Tune in a station and adjust L1201 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 L1201.

AUTOMATIC FINE TUNING ALIGNMENT

Connect as explained in preliminary instructions unless specified otherwise. Connect a 6.0V Bias to TP2305. Set AFT R2323 fully clockwise, perform instructions below and adjust R2323 for 3.0VDC at TP2342 after L2303 has been adjusted.			
DIRECT PROBE FROM SWEEP GENERATOR	SWEEP GENERATOR OUTPUT	MARKER GENERATOR FREQUENCY	REMARKS
TP2342	TP1221	45.75MHz	Adjust L2303 to place 45.75MHz marker at crossover. See Figure 3

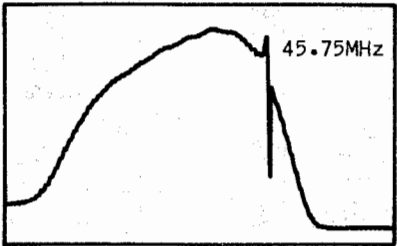


Figure 1



Figure 2

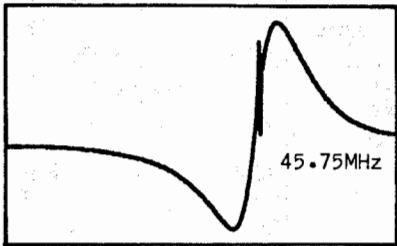


Figure 3

RCA
CHASSIS CTC146B/C/D/E/F/G/H

TEST JIG HOOKUP

FUNCTION	Chek-A-Color ADAPTER NO.	P.C. BOARD PLUG # P4451	PIN 1	BLACK
CRT YOKE YOKE SETTING	B239		PIN 2	YELLOW
	D482		PIN 3	BLUE
	YP3		PIN 4	RED
	FOCUS TAP			

TROUBLESHOOTING

POWER SUPPLY

Check AC Fuse (F4101) and DC Fuse (F4102). If Fuse F4101 is open, check Bridge Rectifier Diodes (CR4101 thru CR4104) Capacitors C4102 thru C4105 and Electrolytic C4106. If Fuse F4102 is open, check 140V Regulator (Q4102) and Horizontal Output Transistor (Q4402). Apply 120V AC and check for 160V at the cathode of CR4103. If 160V is missing at the cathode of CR4103, check Line Filter (L4101) and Resistor (R4101). If 160V is present at the cathode of CR4103, check for 140V at TP4110. If this voltage is missing, check voltages and components associated with Q4102 and the Horizontal Output Transistor (Q4402). If the proper voltage is present at TP4110, refer to the "Horizontal" section of this Troubleshooting guide. If the voltage at TP4110 is 160V and there is a ticking sound, the set may be in shutdown. Refer to the "High Voltage Shutdown" section of this Troubleshooting guide.

AUDIO

Select an active TV channel and check for an audio waveform at pin 28 of the IF/SIF/Chroma/Vert/Horiz/AFT IC (U1001). If there is no audio, check the voltages, waveforms and components associated with pins 28 thru 40 of U1001. If audio is present at pin 28, check for the audio at Speaker (SP1). If audio is missing, check the voltages, waveforms and components associated with Audio Amp Transistor Q1201 and the Audio Output Transistors (Q1202, Q1203).

VIDEO

Inject a video signal at TP07 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 53 of the IF/Chroma/Luma Process/Deflection (U1001). If video is missing at pin 53 of U1001, check the voltages, waveforms and components associated with pin 53. If video is present at pin 53 of U1001, check for a video waveform at pin 13 of U1001. If the waveform is missing, check the voltages, waveforms and components associated with pins 8, 13 thru 18, 51, 52, 53 of U1001. If the waveform is present at pin 13, check the voltages, waveforms and components associated with Output Transistors (Q5001, 5003) and the Luminance Buffer Transistor (Q2901). If the brightness is inadequate or cannot be con-

trolled, check the voltages, waveforms and components associated with pin 17 of U1001.

IF-AGC

Inject a video IF signal at the IF input and check for video on the CRT. If video is present, check Tuner, Tuner Control and Tuner AFC circuits. If there is no video on the CRT, check for a video waveform at TP2307. If video is present at TP2307, refer to the "Video" section of this Troubleshooting guide. If there is no video at TP2307, apply AGC bias to pin 202 of the IF/Chroma/Luma Process/Deflection (U1001). If video is now present at TP2307, check the voltages, waveforms and components associated with pins 18, 22 and 46 of U1001. If there is still no video at TP2307, check the voltages, waveforms and components associated with pins 18 thru 24, 42 thru 47 of U1001. IF Transistor (Q2302) and the Video Amp Transistor (Q2302). 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
U1001

Pin 18	2.0V
Pin 22	5.2V
Pin 46	6.2V

CHROMA

Check for a chroma waveform at pin 49 of the IF/Chroma/Luma Process/Deflection (U1001). If the waveform is missing, check the components associated with pin 49. If a chroma waveform is present at pin 49 of U1001, check for the proper waveforms at pins 9, 10, 11 of U1001. If these waveforms are missing, check the voltages, waveforms and components associated with pins 2 thru 7, 9, 10, 11 of U1001. Check the 3.58MHz oscillator at pins 4 and 36 of U1001. Check the voltages and components associated with the color control and pin 3 of U1001, it should be 0.28V at MINIMUM and 0.4V at Maximum. If there is inadequate tint range, check the voltages, waveforms and components associated with the tint control and pin 20 of U1001. If the proper waveforms are present at pins 9, 10, 11 of U1001, refer to the "Raster" section of this Troubleshooting guide.

TROUBLESHOOTING (Continued)

HORIZONTAL

Determine if the TV is in shutdown, refer to the "High Voltage Shutdown" section of this Troubleshooting guide. If the TV is not in shutdown, inject a horizontal signal at the base of the Horizontal Output Transistor (Q4402). If horizontal deflection is now present, check the voltages, waveforms and components associated with pins 58 thru 64 of the IF/SIF/Chroma/Vert/Horiz/AFT (U1001), and Horizontal Drive Transistor (Q4401). If there is still no horizontal sweep, check the voltages, waveforms and components associated with Horizontal Output Transistor (Q4402) and Horizontal Driver Transformer (T4401). Check the voltages and components associated with Diodes CR4120, CR4121, CR4122 for defects. The High Voltage Rectifier is part of Transformer T4402 and if defective will affect the performance of the horizontal circuits. If the horizontal oscillator is off frequency, pins 61, 62 and 63 of U1001. Horizontal linearity or foldover problems may be caused by Capacitors C4415 thru C4418 being defective.

HIGH VOLTAGE SHUTDOWN

The high voltage is monitored by Diode CR4401, rectifying pulses from the Horizontal Output Transformer (T4402). Should the high voltage increase, the rectified voltage at the cathode of Diode CR4401 will also increase and trigger Zener Diode CR4404 into conduction, shutting down the set. After 2 seconds the set will reset and turn on again. If the fault is still present, the high voltage will increase until shutdown again occurs. This process will continue until the fault is removed or the set is turned off. To troubleshoot, remove CR4401 from the circuit and use a variac for AC power. Start at 90V AC and increase as necessary until the defect is located and repaired. Return CR4401 to the circuit. NOTE: Care should be taken in defeating the high voltage shutdown circuit, as this may cause excessive X-radiation and damage to the CRT, Transformer (T4402) and associated components. Monitor the high voltage and troubleshoot.

Voltages Taken with TV in Shutdown

Pin 1	OV
TP4110	164V

HIGH VOLTAGE SHUTDOWN TEST

Apply 120V AC, turn set On, set all customer controls for normal operation and momentarily short XRP4001 to XRP4002. Set should lose raster and sound for about 2 seconds, then the set should resume normal operation. If the set does not lose raster and sound, the shutdown circuit should be repaired. To resume normal operation, remove AC power and wait 2 seconds then turn set On.

VERTICAL

Inject a vertical deflection signal at pin 54 of the IF/Chroma/Luma Process/Deflection (U1001). If vertical deflection is now present, check the voltages, waveforms and components associated with pin 54 of U1001. If there is still no vertical sweep, check the voltages, waveforms and components associated with OSC Sync Transistor (Q4501), the Vertical Output IC (U4501). Vertical linearity or foldover problems may be caused by vertical feedback and bias circuits, check Electrolytics C4501, C4503, C4504, C4505, C4510 and C4511 for defects.

SYNC

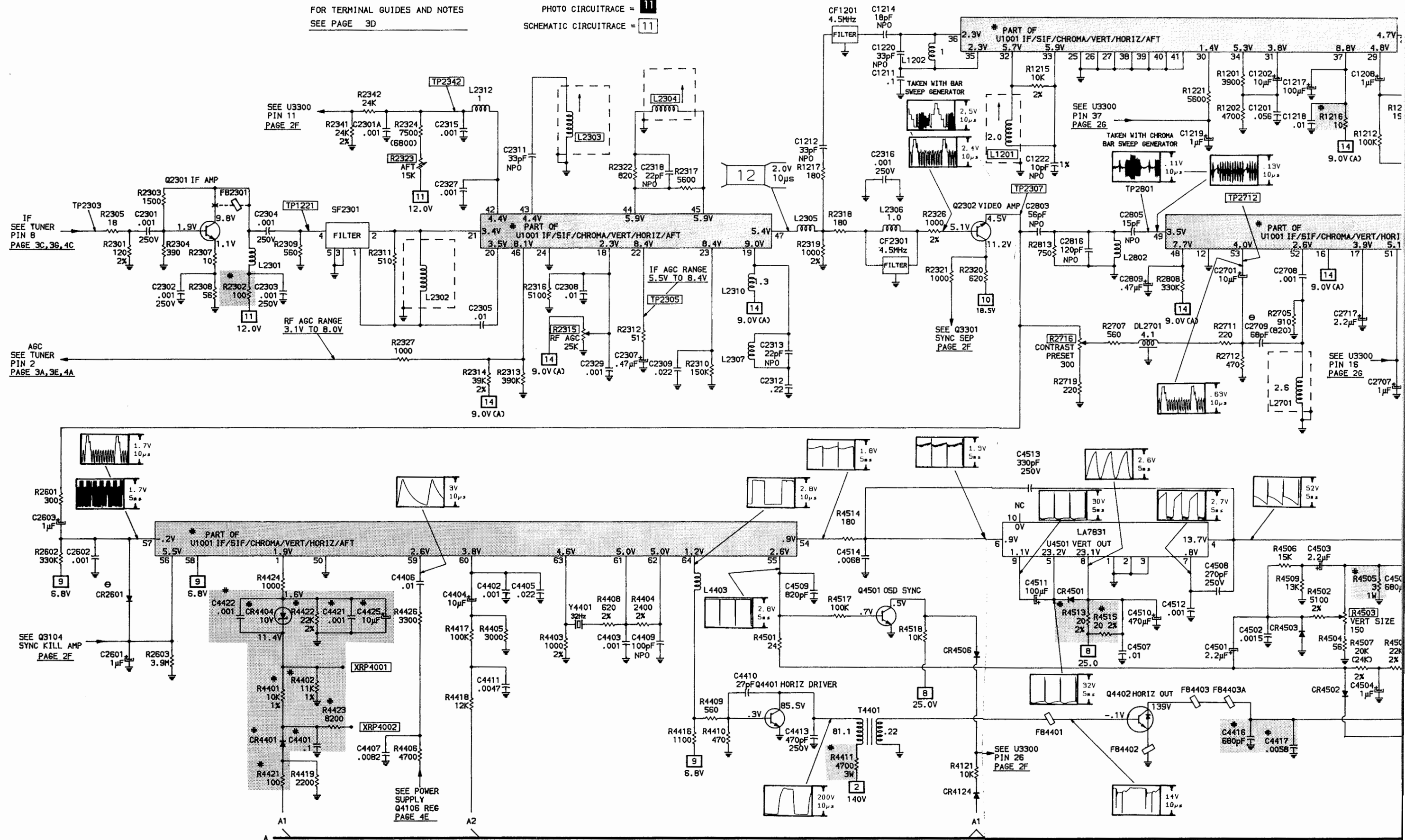
If there is no vertical or horizontal sync, check the voltages, waveforms and components associated with pins 56 and 57 of the IF/Chroma/Luma Process/Deflection (U1001). If there is no vertical sync, check the voltages, waveforms and components associated with pins 54, 55, 56 of U1001. If there is no horizontal sync, check the voltages and components associated with pins 56 thru 64 of U1001.

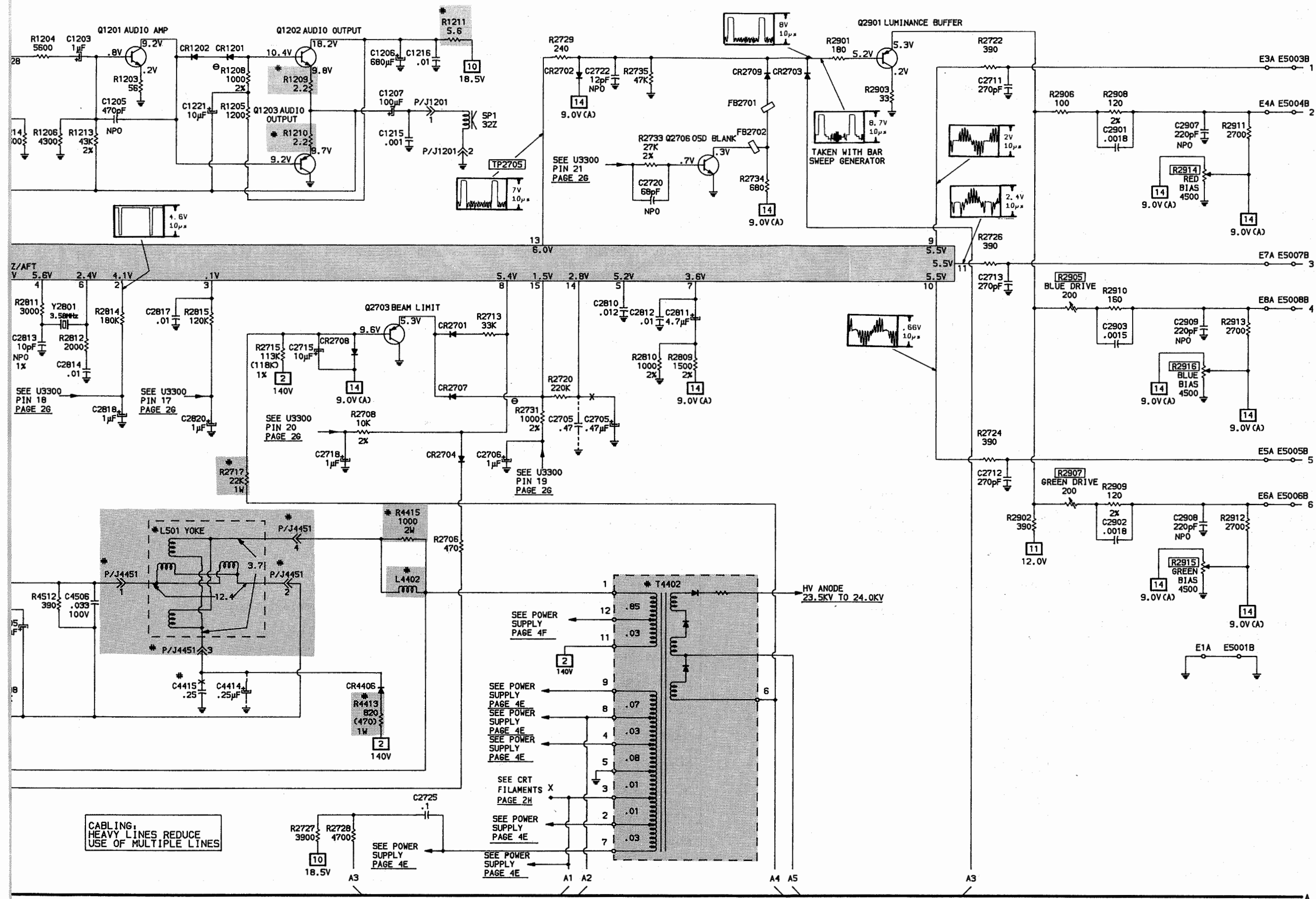
RASTER

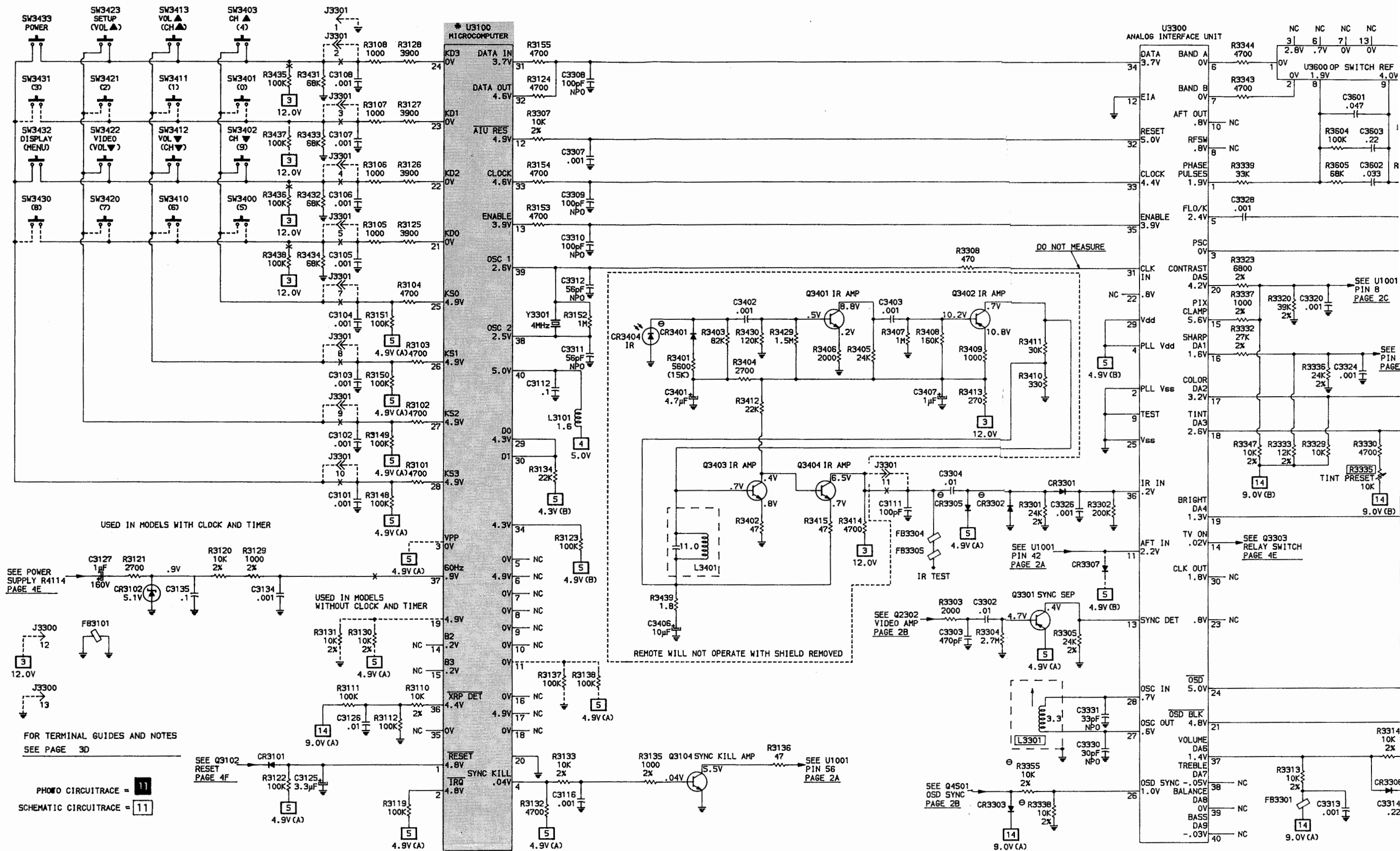
Check the CRT and CRT voltages. If there is no red, check the voltages and components associated with pin 9 of the IF/Chroma/Luma Process/Deflection (U1001), and Red Output Transistor (Q5001). If there is no green, check the voltages and components associated with pin 10 of U1001 and Green Output Transistor (Q5002). If there is no blue, check the voltages and components associated with pin 11 of U1001 and Blue Output Transistor (Q5003). If the raster has a keystone shape, check the Deflection Yoke (L501). If the raster has height or width problems, refer to the "Vertical", "Horizontal" and "Power Supply" sections of this Troubleshooting guide.

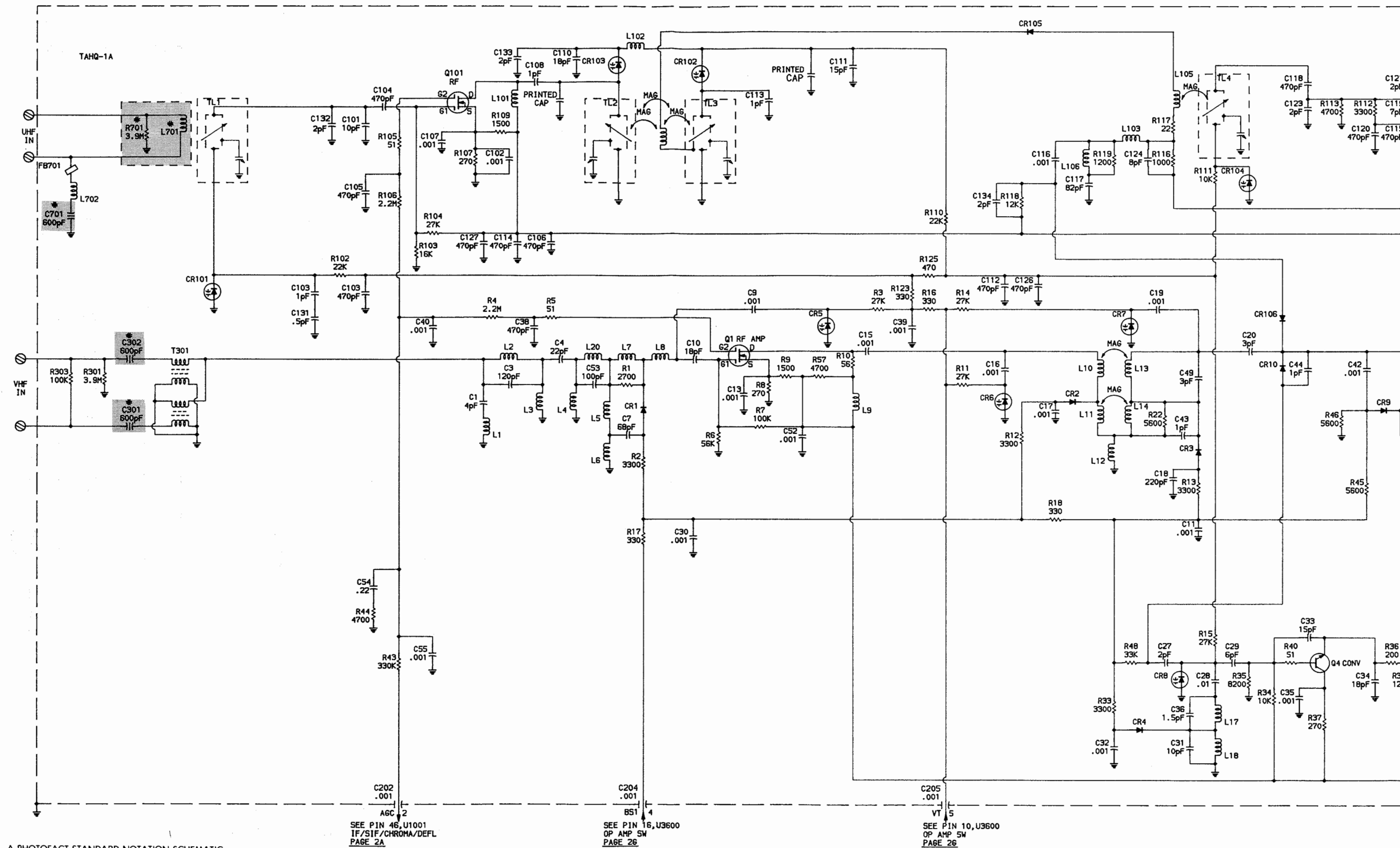
FOR TERMINAL GUIDES AND NOTES
SEE PAGE 3D

PHOTO CIRCUITRACE = 11
SCHEMATIC CIRCUITRACE = 11









A PHOTOFACT STANDARD NOTATION SCHEMATIC
WITH **CIRCUITRACE™**
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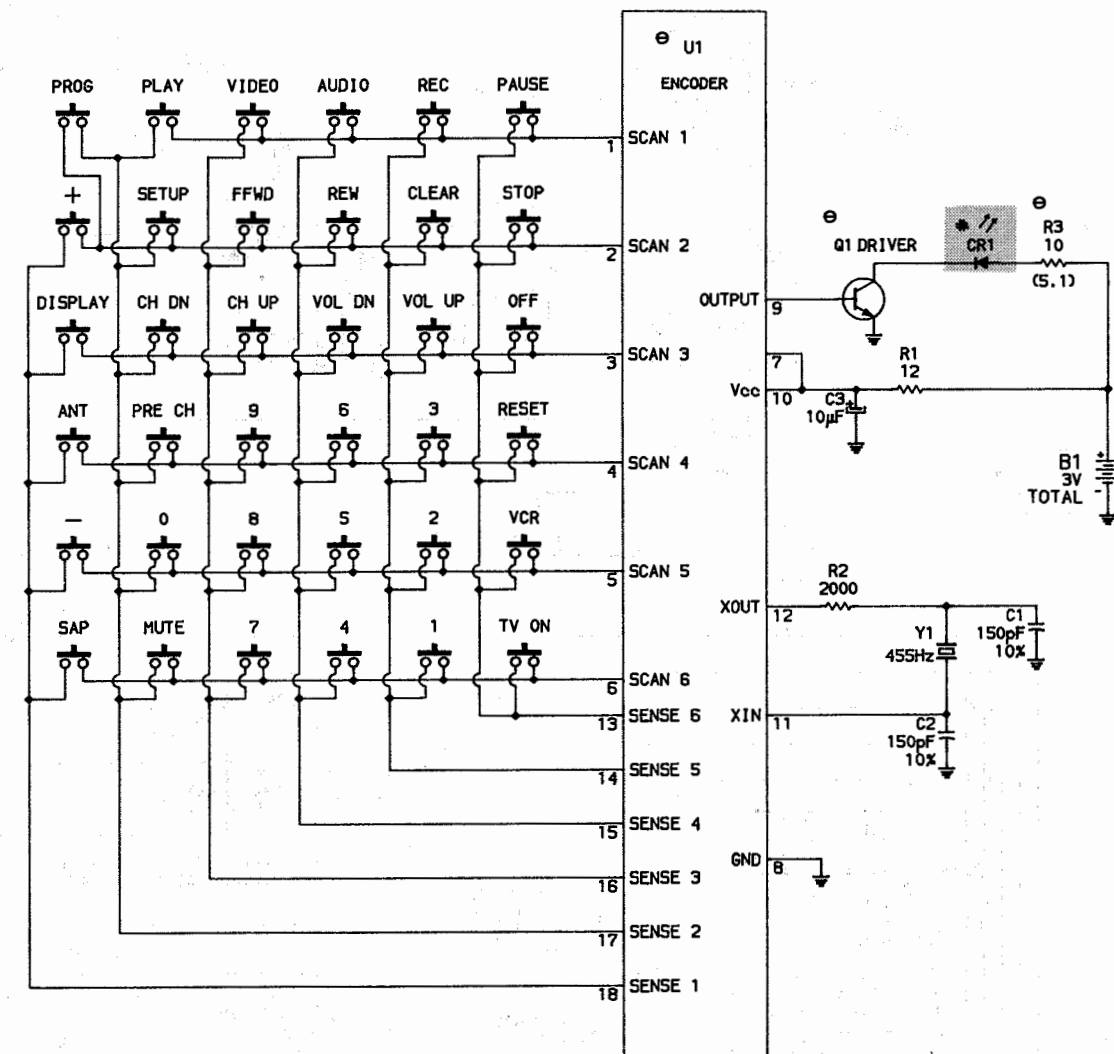
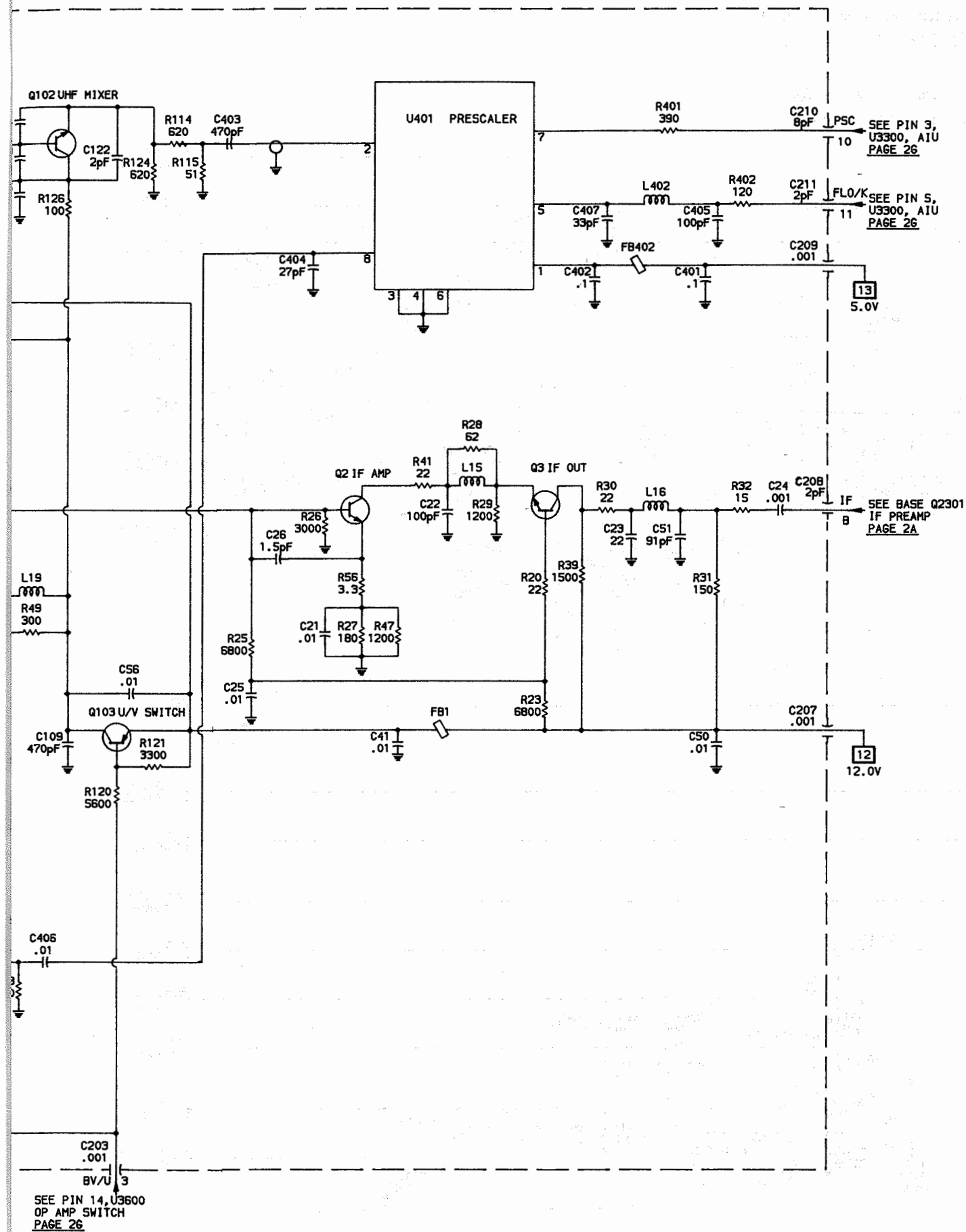
SEE PIN 46, U1001
IF/SIF/CHROMA/DEFL
PAGE 2A

SEE PIN 16, U3600
OP AMP SW
PAGE 26

SEE PIN 10, U3600
OP AMP SW
PAGE 26

TUNER TAHQ-1A

F SET 2749 FOLDER 2



RCA
CHASSIS CTC146B/C/D/E/F/G/H

KEYS NOT USED ON CRK52

PLAY	VCR
FAST FWD	PROG
REWIND	STOP
REC	DISPLAY
PAUSE	ANT

KEYS NOT USED ON CRK53

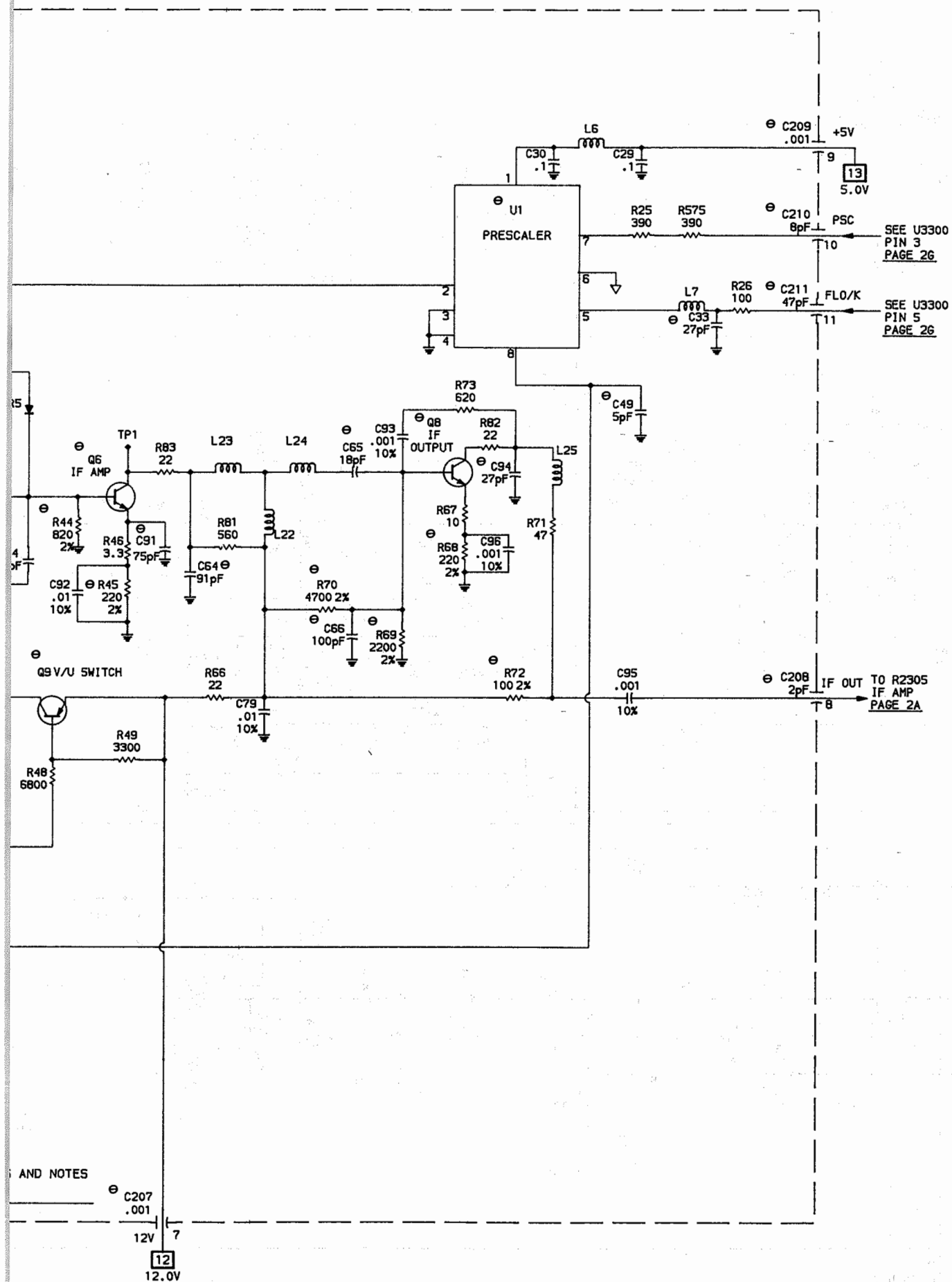
PLAY	VCR
FAST FWD	PROG
REWIND	STOP
REC	
PAUSE	

A PHOTOFAC STANDARD NOTATION SCHEMATIC
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REMOTE CONTROL CRK50E

H SET 2749 FOLDER 2

3



AND NOTES

For SAFETY use only equivalent replacement part, see parts list.

— Circuitry not used in some versions

--- Circuitry used in some versions

⊖ See Parts List

⊖ Nominal value

⊖ Ground

⊖ Chassis

⊖ Common tie point

Waveforms and voltages are taken from ground, unless noted otherwise.

Waveforms: triggered scope, keyed rainbow generator. Item numbers in rectangles appear in the alignment/adjustment instructions.

Supply voltage maintained as shown at input.

Voltages measured with digital meter, no signal.

Controls adjusted for normal operation.

Terminal identification may not be found on unit.

Capacitors are 50 volts or less.

5% or greater unless noted.

Electrolytic capacitors are 50 volts or less.

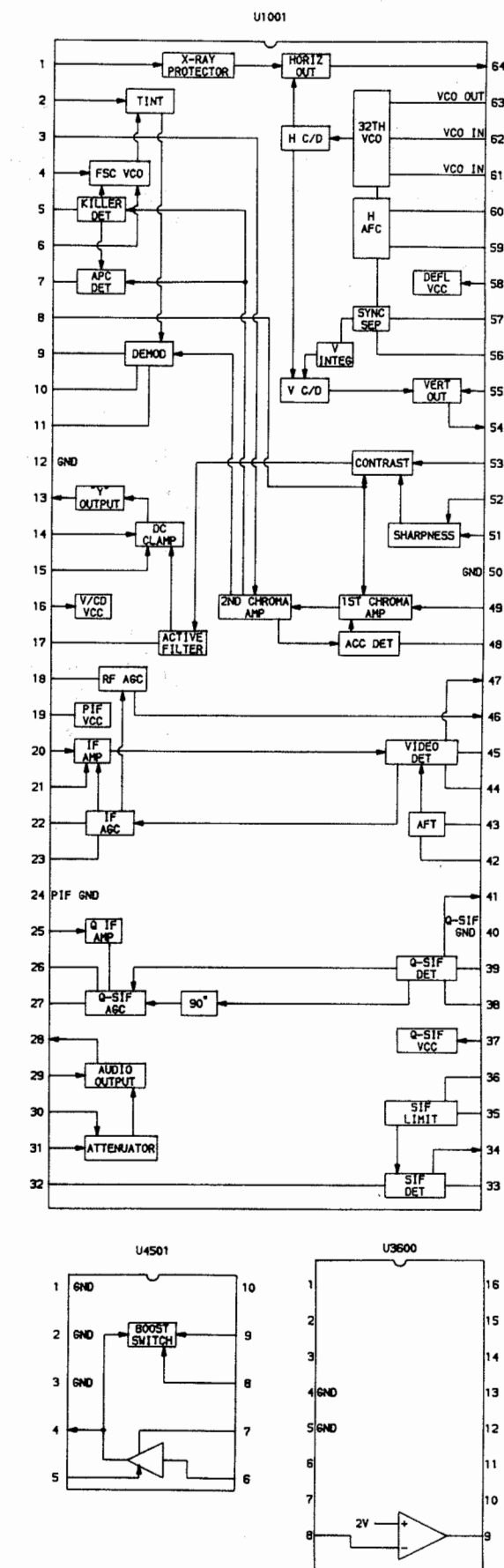
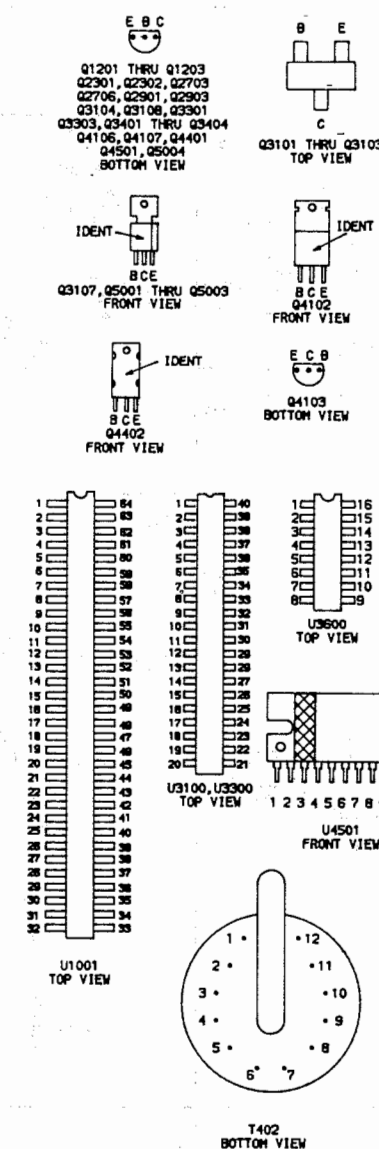
20% or greater unless noted.

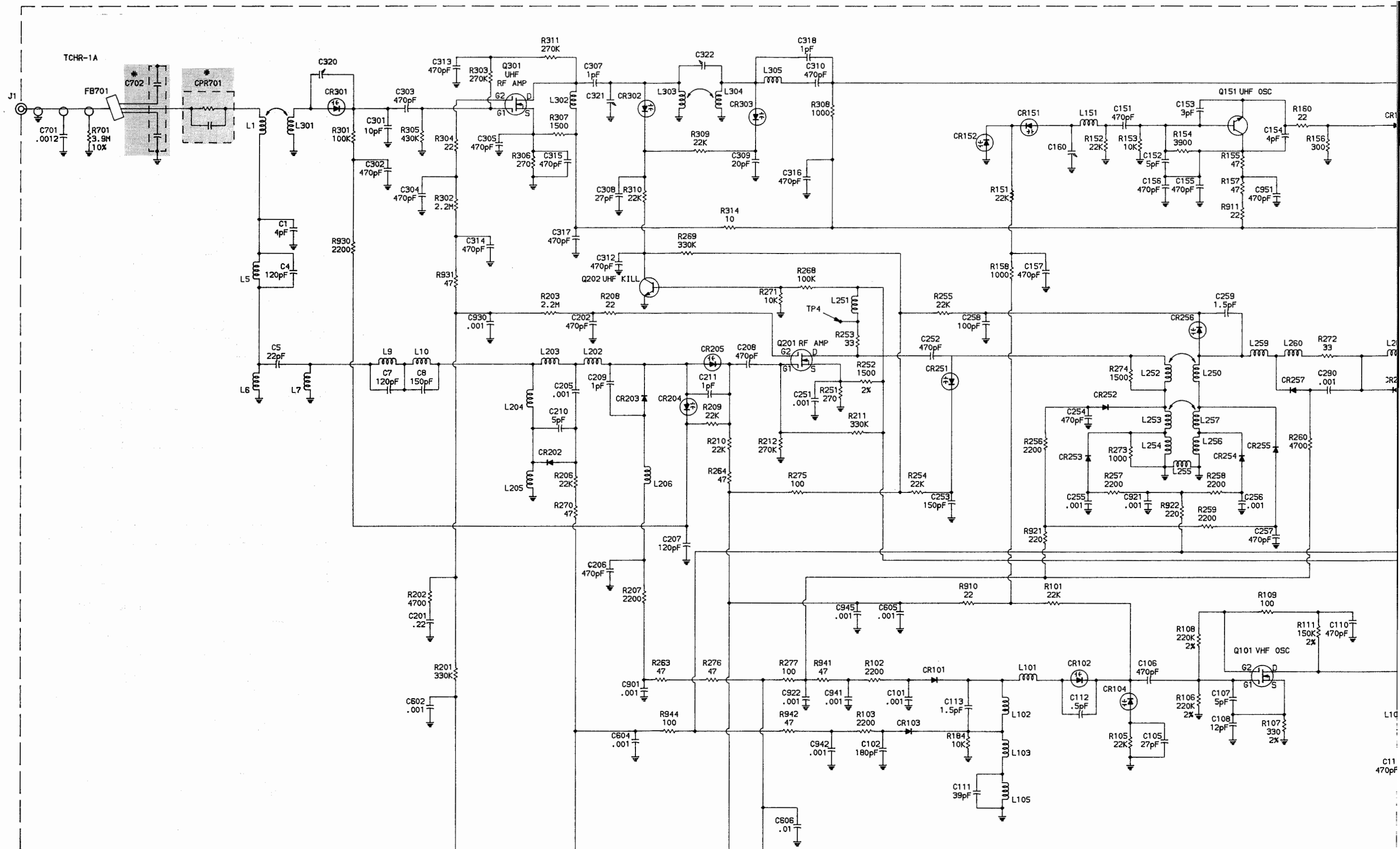
Resistors are 1/2W or less.

5% or greater unless noted.

Value in () used in some versions.

Measurements with switching as shown, unless noted.





A PHOTOFAC STANDARD NOTATION SCHEMATIC

WITH **CircuitTrace**

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AGC 2
SEE PIN 46, U1001
IF/SIF/CHROMA/DEFL
PAGE 2A

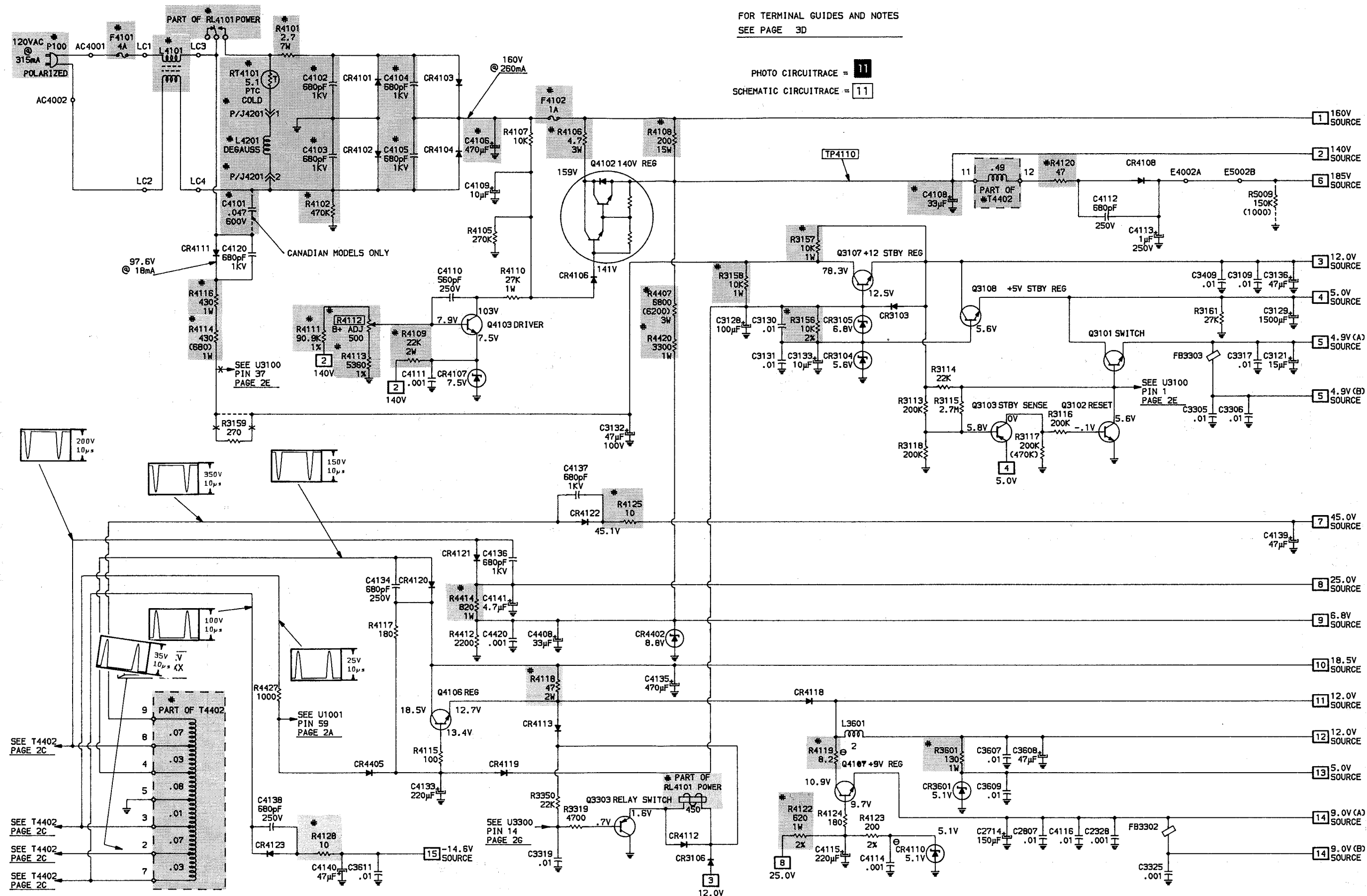
BS1 4
SEE PIN 16, U3600
OP AMP SW
PAGE 2G

SEE PIN 1
U3300, A1U
PAGE 2G

SEE PIN 15, U3600
OP AMP SW
PAGE 2G

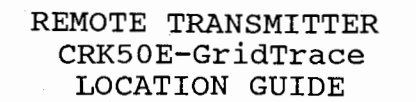
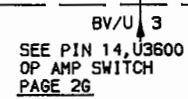
TUNER TCHR-1A

PHOTO CIRCUITRACE = 11
SCHEMATIC CIRCUITRACE = 11



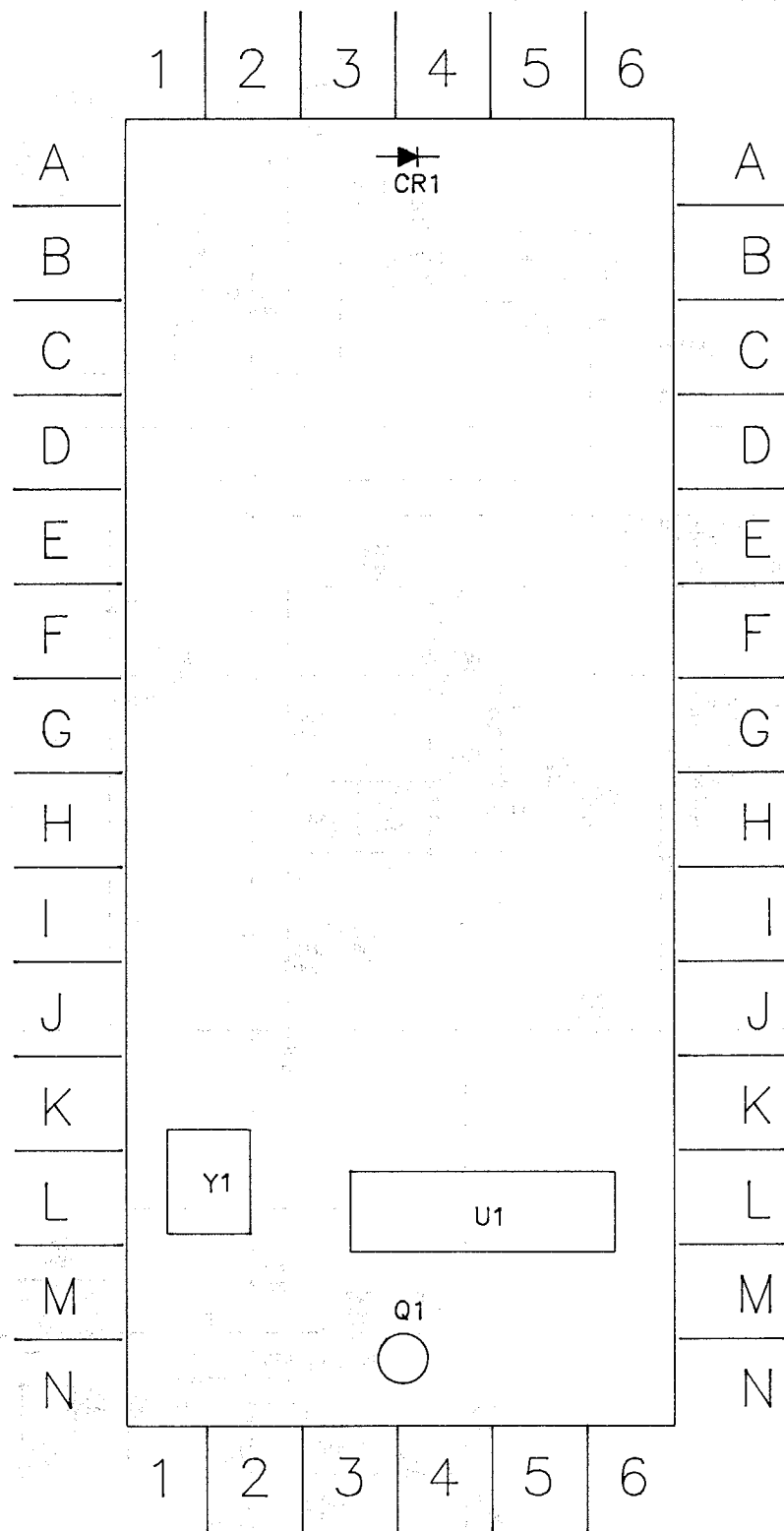
A PHOTOFAC STANDARD NOTATION SCHEMATIC
WITH **CIRCUITRACE**
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POWER SUPPLY



0	G-2
1	G-1
2	G-3
3	G-4
4	H-1
5	H-2
6	H-4
7	I-1
8	I-2
9	I-4
ANT	F-3
C1	L-2
C2	L-1
C3	M-2
CH-DN	I-5
CH-UP	H-5
CLEAR	D-5
CR1	A-3
MUTE	K-5
OFF	C-1
ON	K-2
PAUSE	D-3
PC	F-5
PLAY	D-1
PROG	E-1
Q1	M-1
R1	M-2
R2	M-3
R3	B-2
REC	D-4
RESET	F-4
SAP	F-1
SEARCH	E-3
SET	K-4
STATUS	C-5
STOP	D-5
TV	C-3
U1	M-4
VCR	C-4
VIDEO	K-1
VOL-DN	J-5
VOL-UP	H-5
Y1	L-3
+	J-4
-	J-1

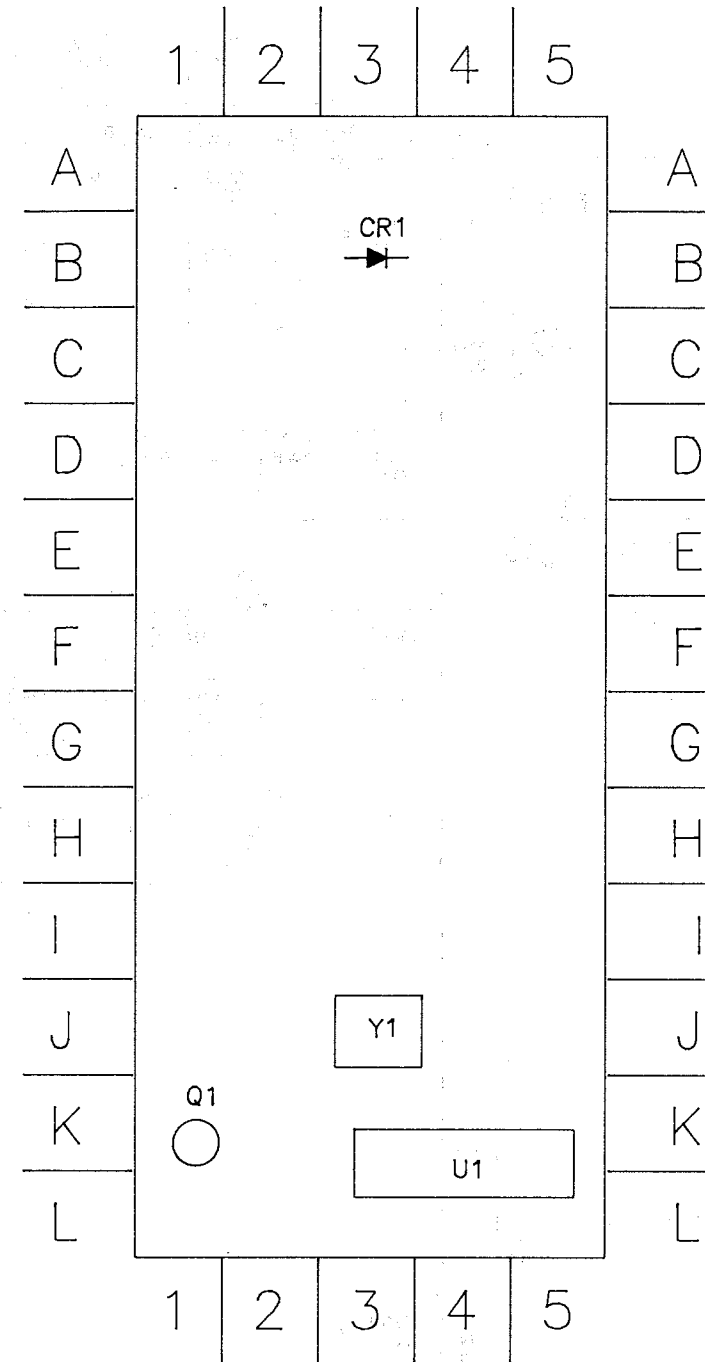
A Howard W. Sams **GRIDTRACE™** Photo



REMOTE TRANSMITTER CRK52A

REMOTE TRANSMITTER
CRK52A-GridTrace
LOCATION GUIDE

0	I-3
1	E-2
2	E-2
3	E-4
4	F-2
5	F-3
6	F-4
7	G-2
8	G-3
9	G-4
AUDIO	J-2
C1	N-5
C2	M-5
C3	N-2
CH-DN	F-6
CH-UP	E-6
CLEAR	C-3
CR1	A-4
MUTE	J-6
OFF	B-4
ON/DSPY	B-6
PC	C-6
Q1	N-4
R1	M-1
R2	K-3
R3	B-2
RESET	C-4
SAP	C-2
SETUP	J-4
U1	L-4
VIDEO	J-3
VOL-DN	I-6
VOL-UP	H-6
Y1	L-2
-	I-2
+	I-4

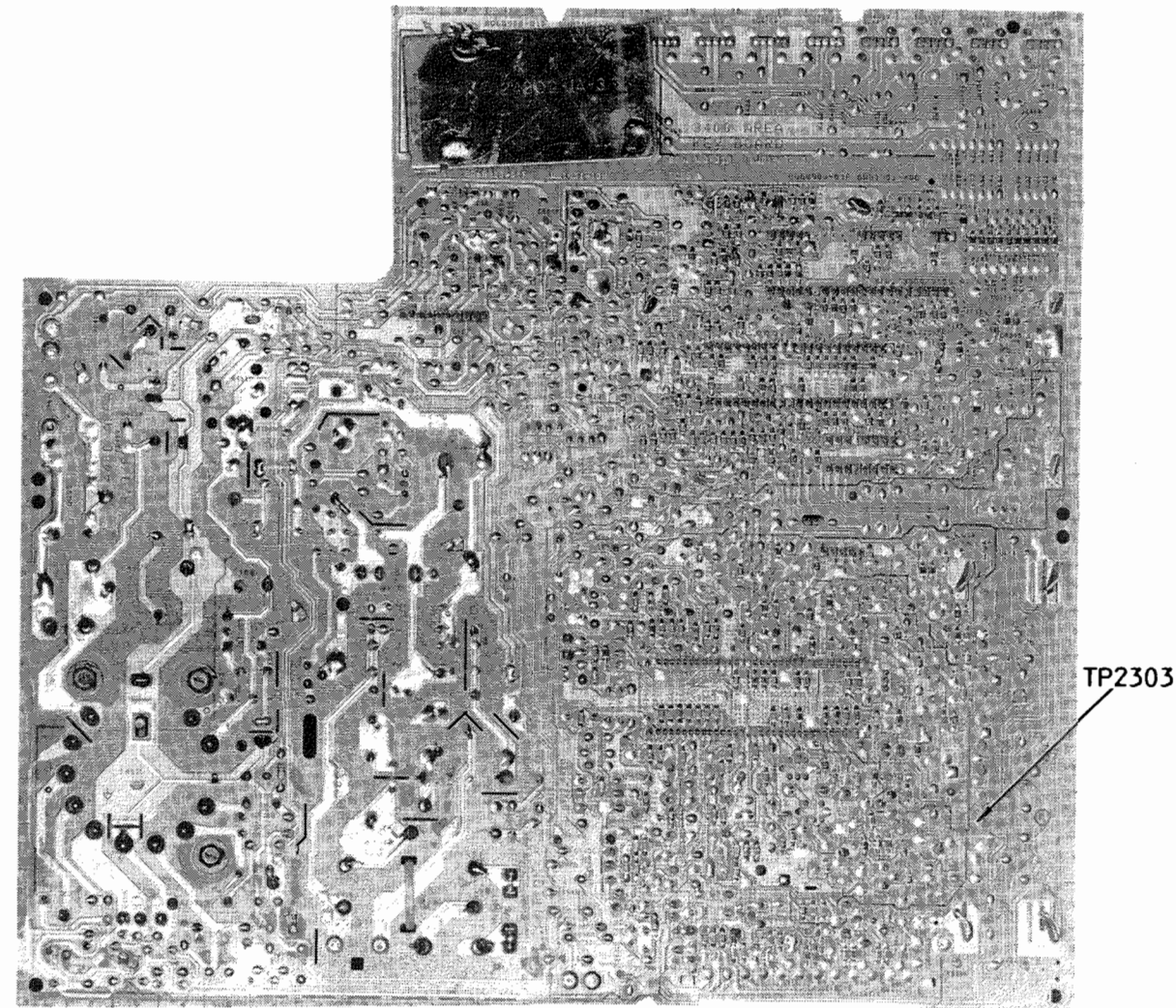


REMOTE TRANSMITTER CRK53D

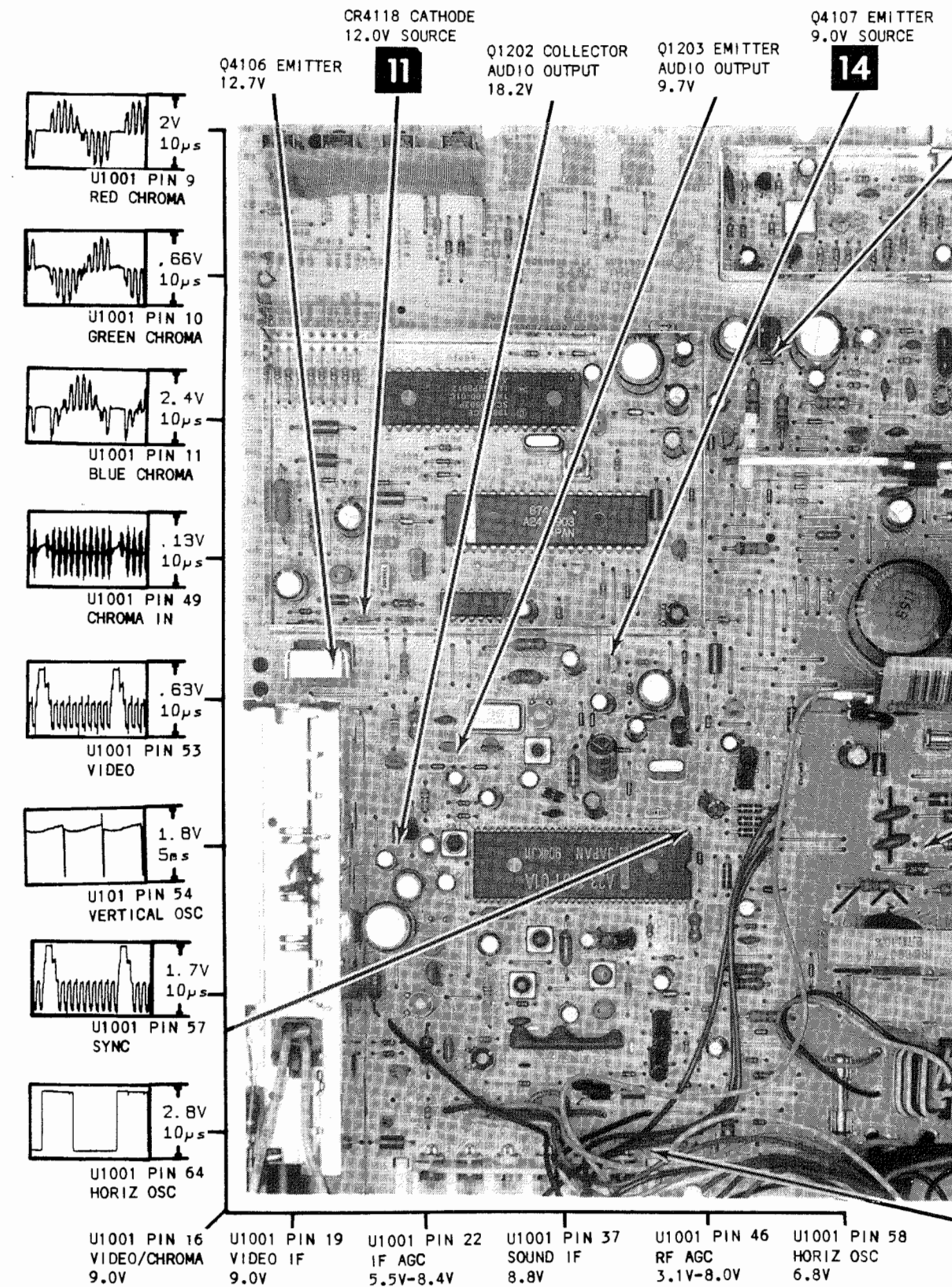
REMOTE TRANSMITTER
CRK53D-GridTrace
LOCATION GUIDE

0	H-2
1	E-1
2	E-2
3	E-4
4	F-1
5	F-3
6	F-4
7	G-1
8	G-2
9	G-4
ANT	D-3
AUDIO	I-2
C1	J-2
C2	J-2
C3	K-2
CH-DN	F-5
CH-UP	E-5
CLEAR	D-5
CR1	B-3
DISPLAY	C-4
MUTE	I-5
OFF	C-1
ON	C-2
PC	C-5
Q1	K-1
R1	K-2
R2	K-3
R3	B-2
RESET	D-4
SAP	D-1
SET	I-4
U1	K-4
VIDEO	I-1
VOL-DN	H-5
VOL-UP	G-5
Y1	J-3
-	H-1
+	H-4

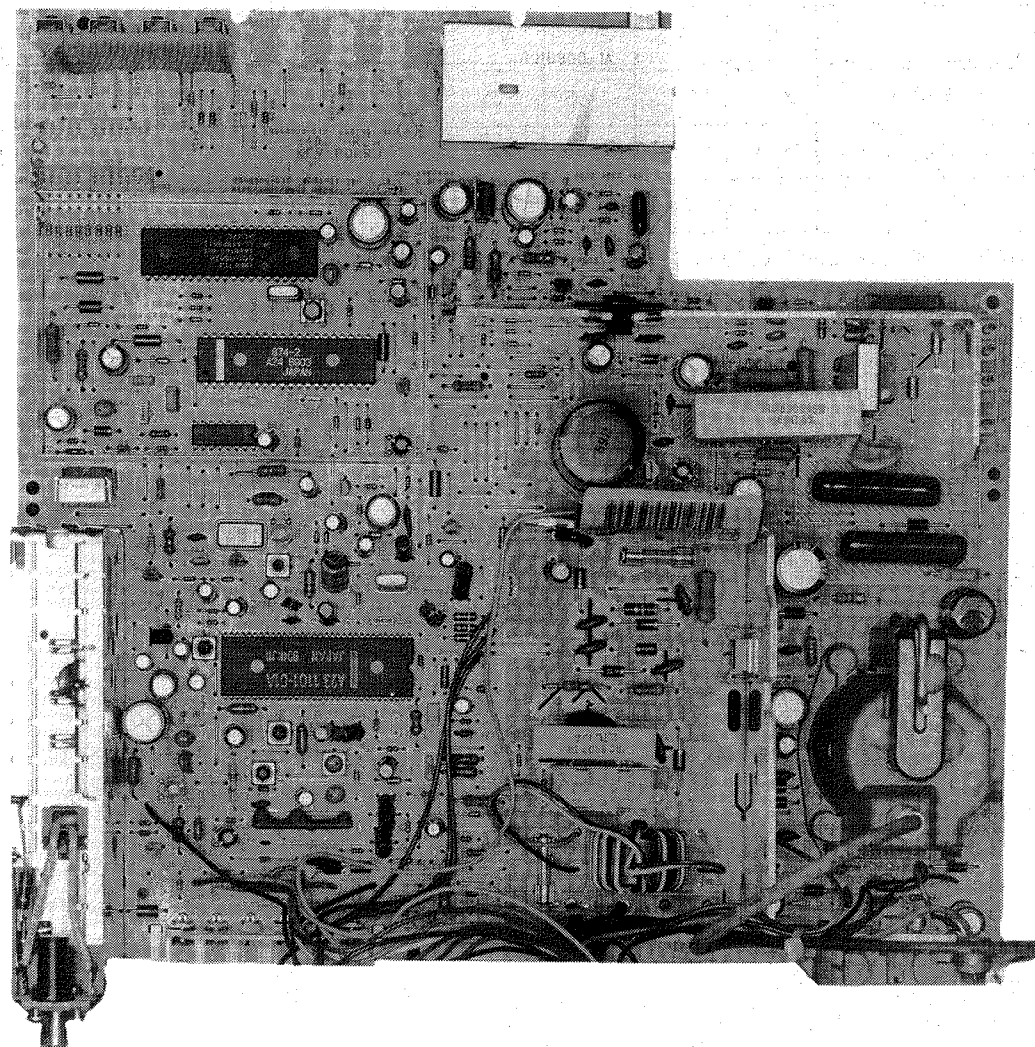
RCA
CHASSIS CTC146B/C/D/E/F/G/H



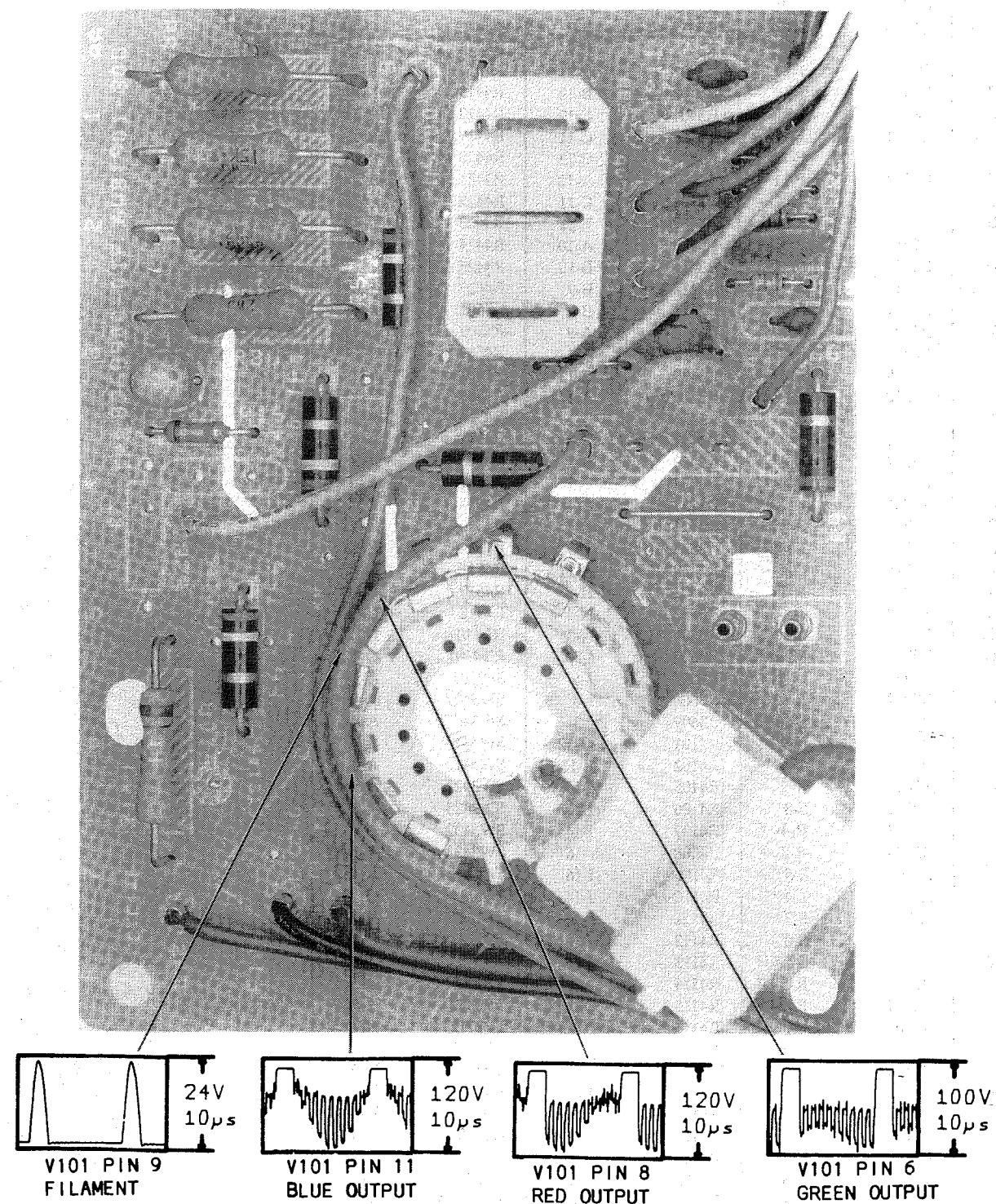
MAIN BOARD-BOTTOM VIEW-SHIELD LOCATION



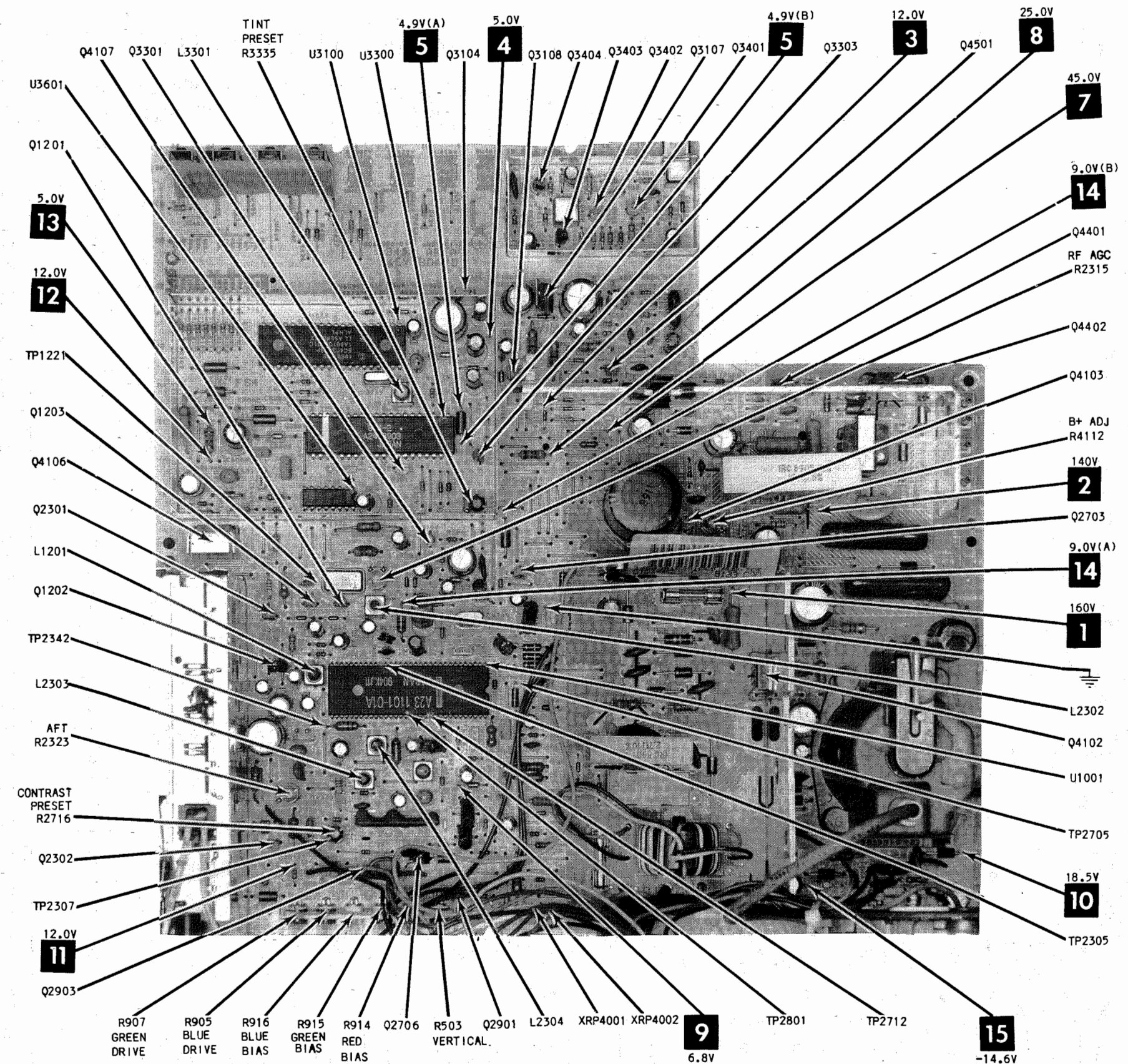
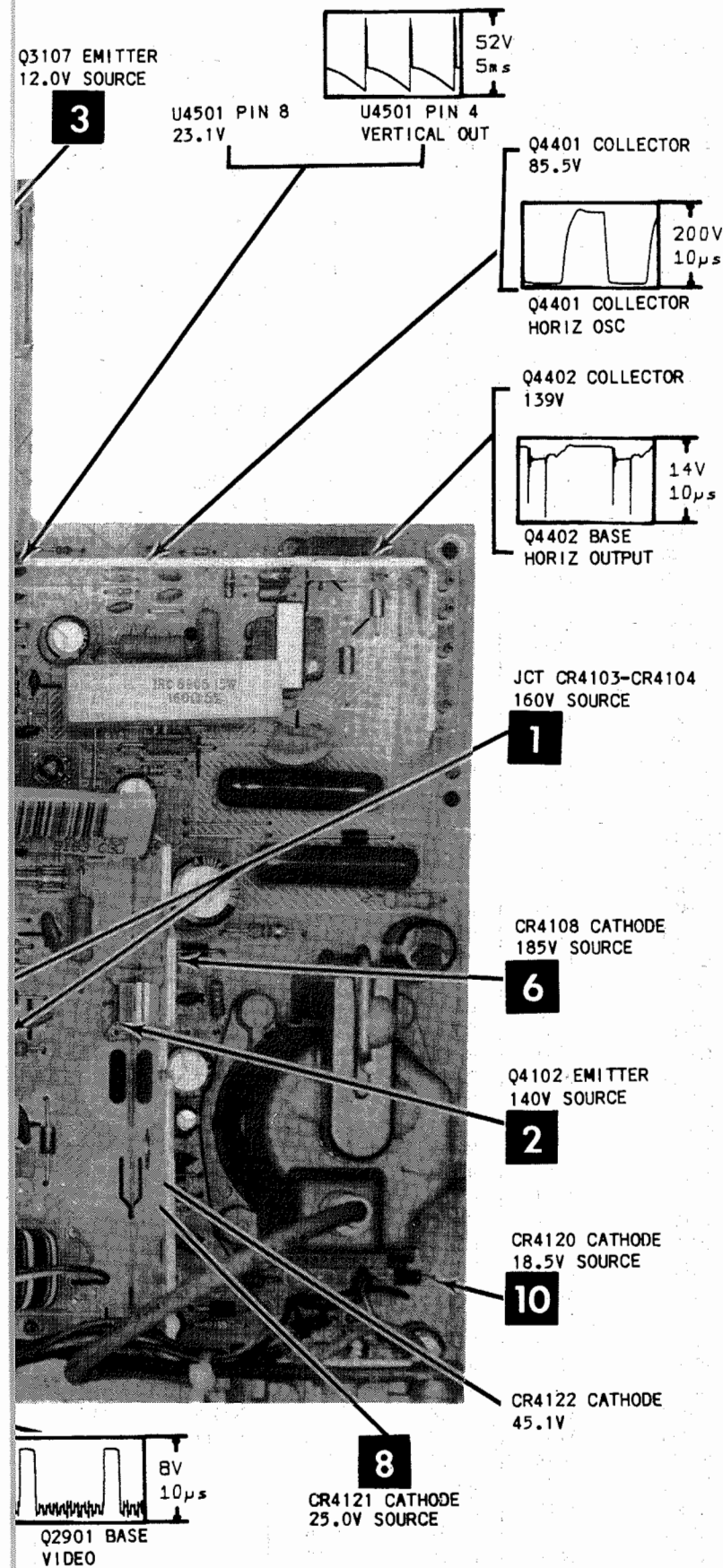
MAIN BOARD -TOP



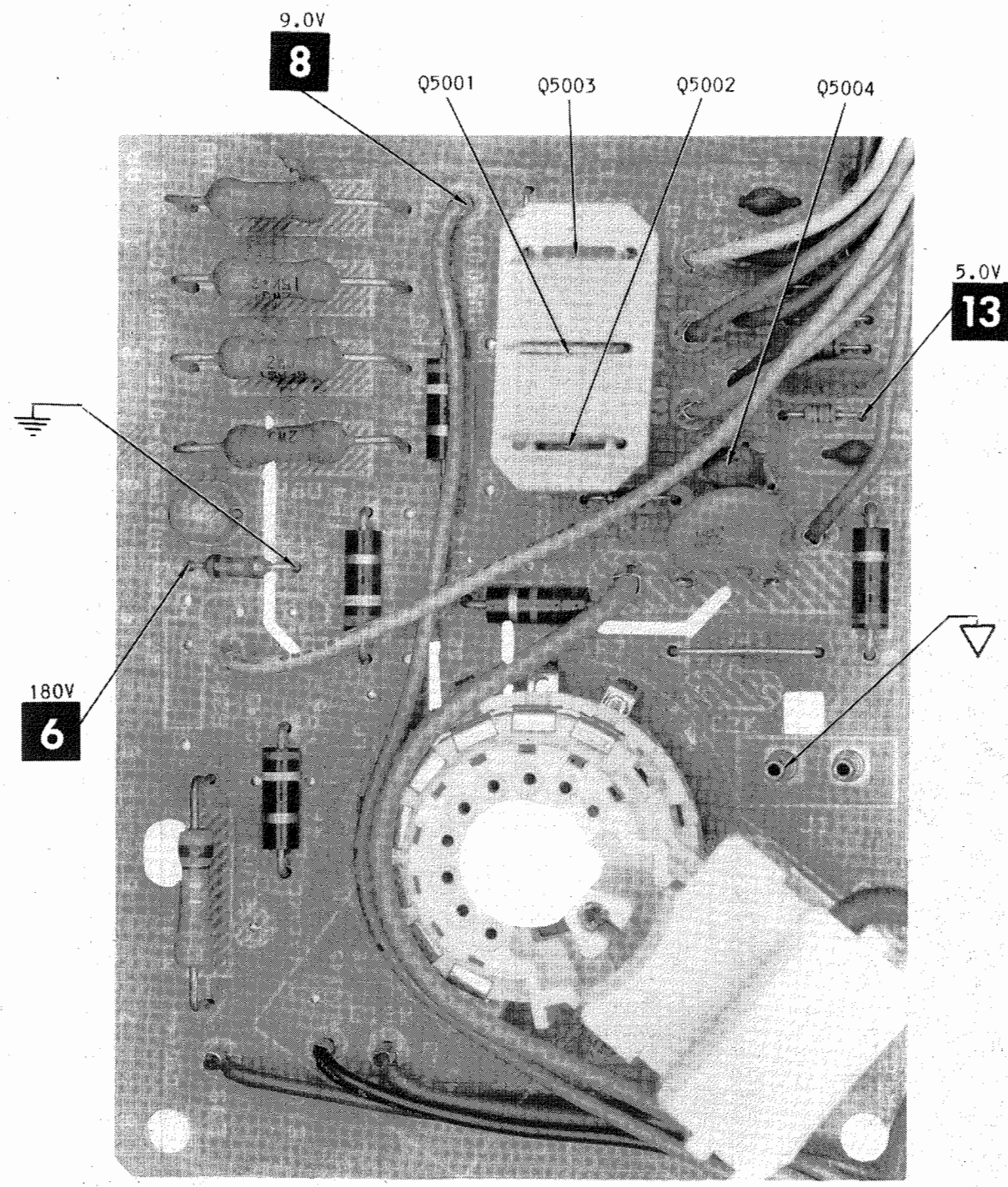
MAIN BOARD-TOP VIEW-SHIELD LOCATION



CRT BOARD



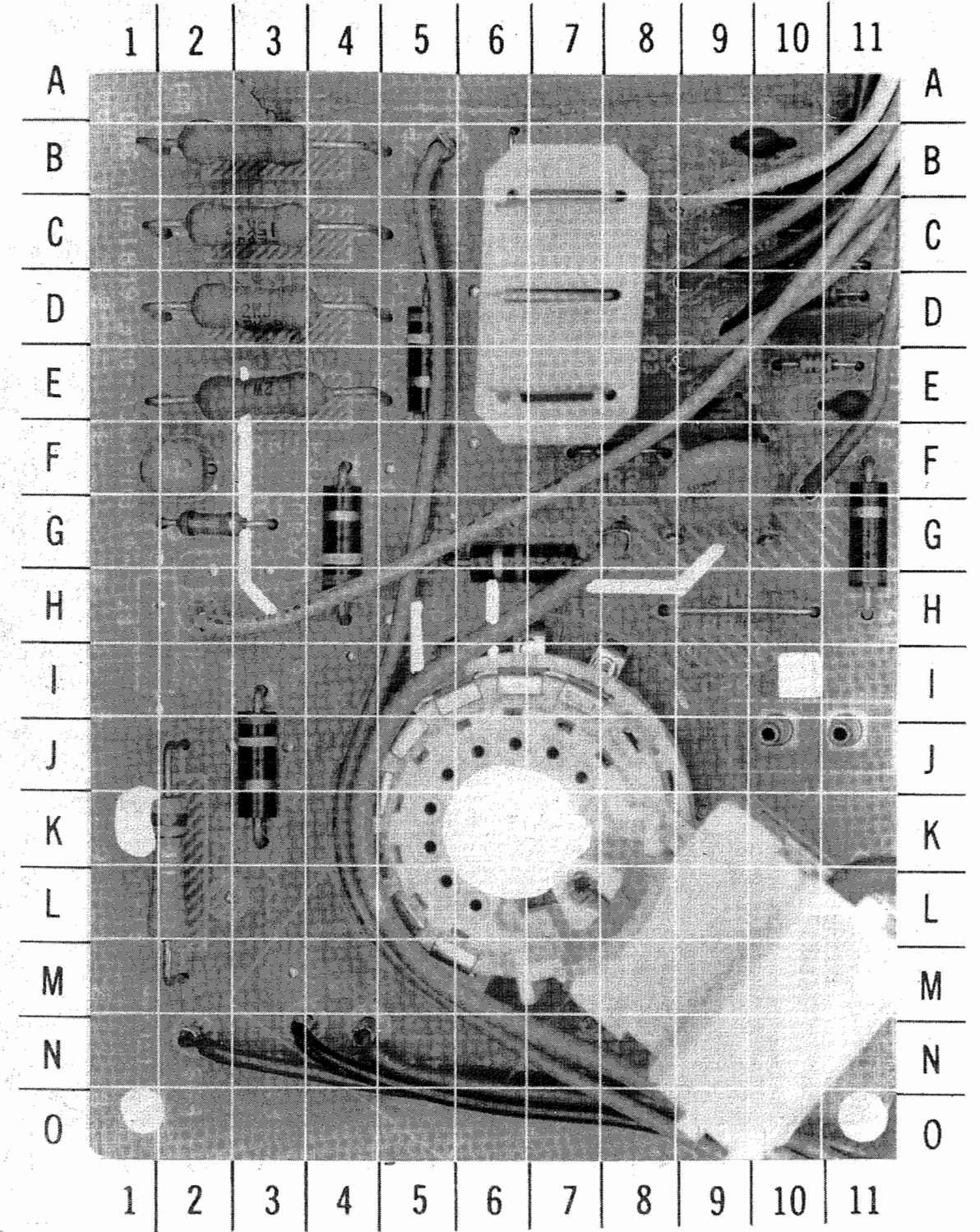
MAIN BOARD -TOP VIEW



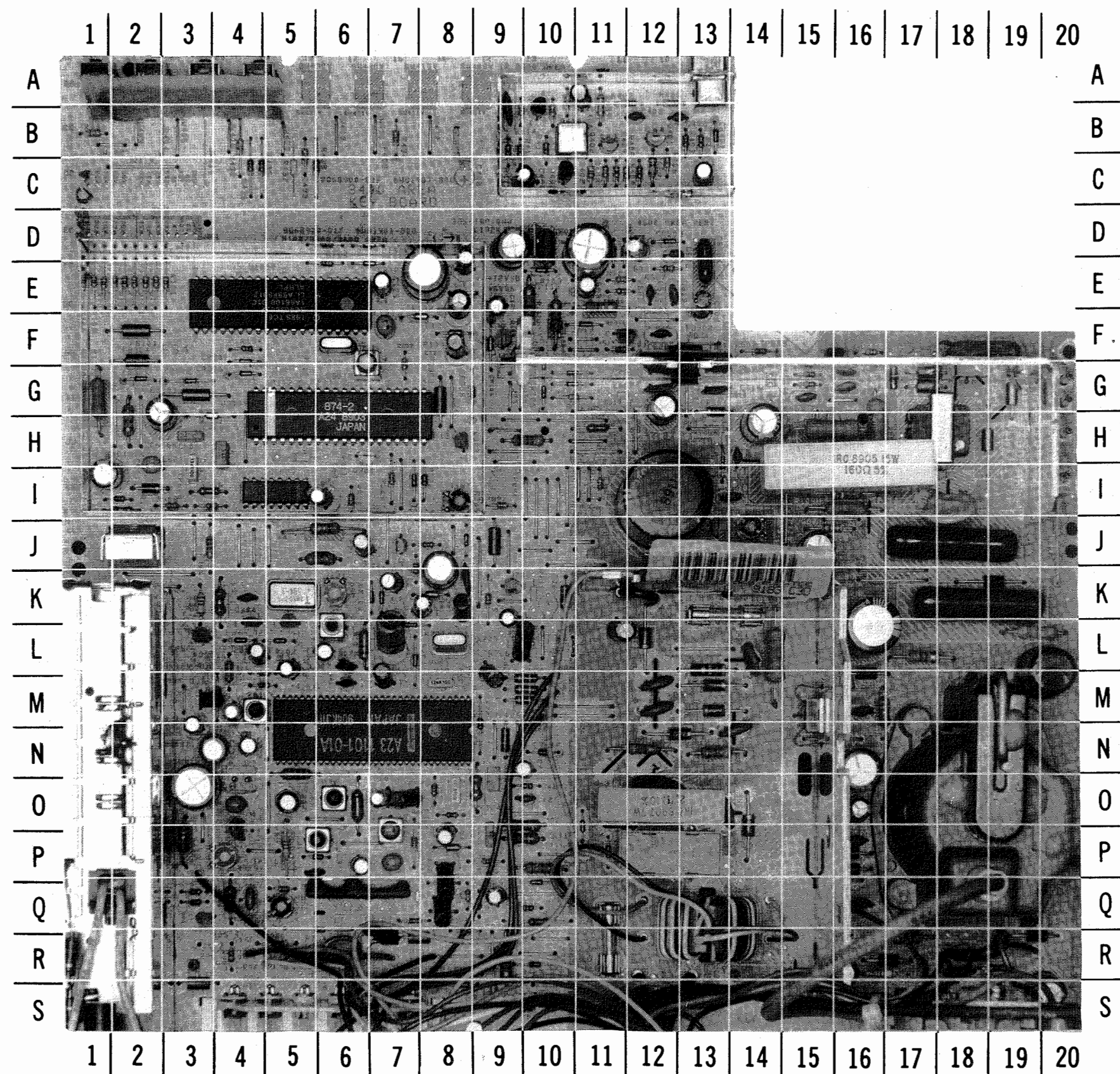
CRT BOARD

CRT BOARD-GridTrace LOCATION GUIDE

CS001	F-9	Q5002	E-7	R5009	G-11
CS002	B-9	Q5003	B-7	R5013	G-7
CS006	E-11	Q5004	F-9	R5014	E-10
CR5001	B-6	R5001	C-3	R5018	E-10
CR5002	F-8	R5002	D-3	R5019	C-11
J1	J-10	R5003	B-3	R5020	C-11
L5001	F-2	R5006	J-3	R5021	C-11
Q5001	D-7	R5008	E-3		



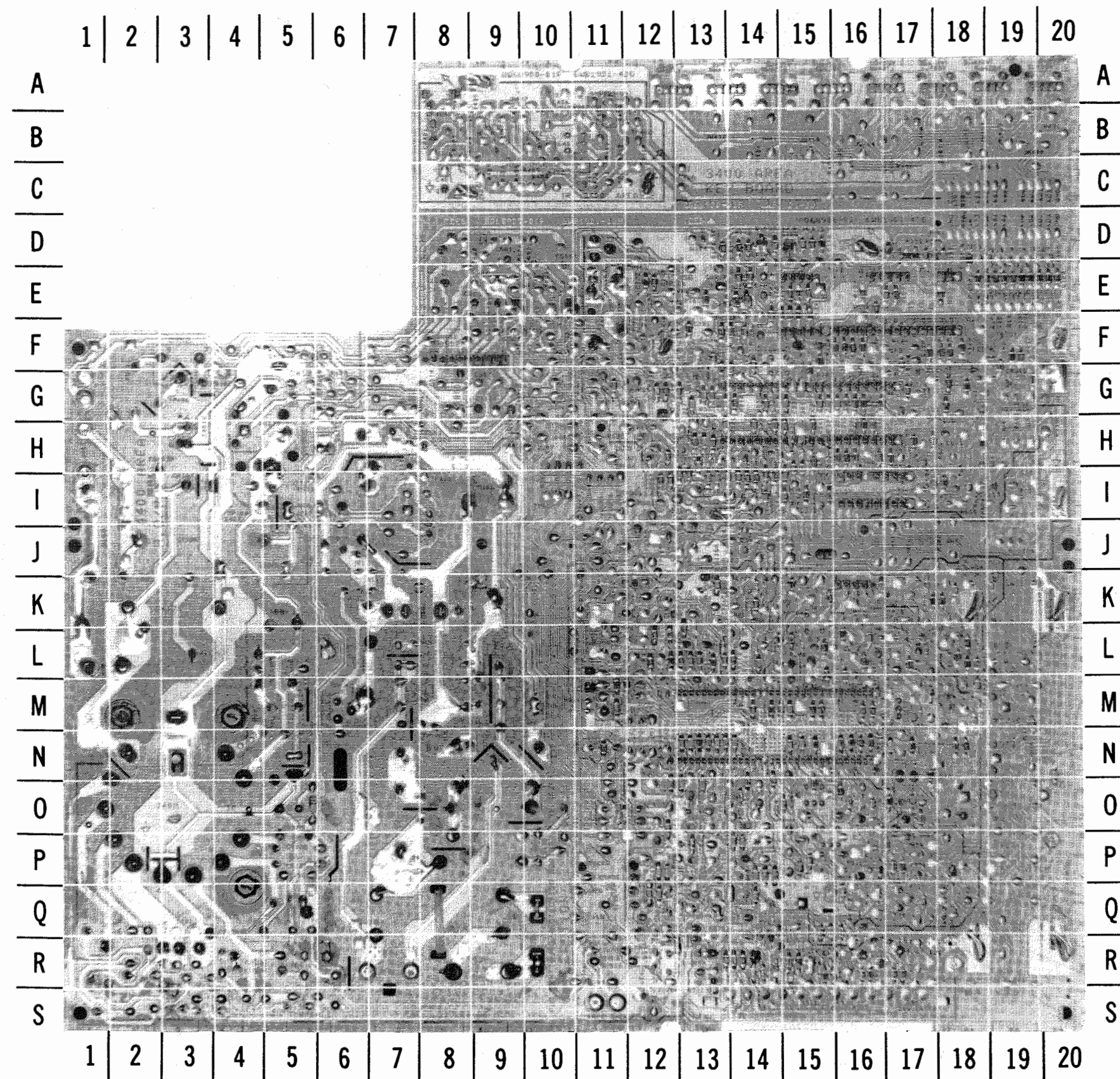
CRT BOARD



MAIN BOARD-TOP VIEW

MAIN BOARD-TOP VIEW-GridTrac

C1202	N-4	C4137	P-16
C1203	L-5	C4138	R-17
C1206	O-3	C4139	O-16
C1207	N-4	C4140	R-16
C1208	L-4	C4141	R-16
C1217	O-5	C4401	P-9
C1219	M-4	C4403	O-8
C1221	N-3	C4404	P-8
C2304	K-3	C4408	P-8
C2307	L-6	C4410	G-15
C2313	M-6	C4413	G-16
C2316	P-5	C4415	I-18
C2601	Q-9	C4416	I-18
C2603	Q-8	C4417	K-18
C2701	O-7	C4421	O-10
C2705	K-7	C4425	N-10
C2706	K-8	C4501	D-12
C2707	O-7	C4502	D-12
C2714	L-7	C4503	E-11
C2715	J-6	C4504	E-13
C2717	M-7	C4505	D-11
C2718	K-9	C4506	D-13
C2725	S-18	C4507	G-12
C2809	P-6	C4508	F-12
C2810	M-8	C4510	H-14
C2811	K-8	C4511	G-12
C2818	L-9	C4512	E-12
C2820	L-9	C4513	E-12
C2905	R-16	C4514	G-13
C3121	F-8	CF1201	O-4
C3125	E-7	CF2301	Q-4
C3128	E-8	CR1201	L-4
C3129	E-7	CR1202	L-5
C3132	D-9	CR2601	Q-8
C3133	E-9	CR2701	L-7
C3136	D-8	CR2702	R-8
C3401	C-13	CR2703	Q-8
C3402	B-12	CR2704	L-7
C3403	B-12	CR2707	K-7
C3406	A-11	CR2708	K-6
C3407	C-10	CR2709	R-8
C3409	A-9	CR3101	E-6
C3601	H-3	CR3103	E-10
C3602	I-3	CR3104	F-8
C3603	H-4	CR3105	F-9
C3606	G-2	CR3106	G-10
C3608	I-6	CR3301	F-4
C4102	M-12	CR3302	G-3
C4103	L-14	CR3303	G-8
C4104	M-12	CR3304	I-7
C4105	N-14	CR3305	G-2
C4106	I-12	CR3306	G-10
C4108	K-16	CR3401	B-13
C4109	J-15	CR3404	A-13
C4110	I-14	CR3601	G-3
C4111	H-14	CR4101	L-12
C4113	M-16	CR4102	N-13
C4115	K-8	CR4103	N-12
C4116	K-8	CR4104	M-13
C4120	O-14	CR4106	K-15
C4126	R-18	CR4107	H-13
C4133	I-1	CR4108	M-16
C4134	R-19	CR4110	K-8
C4135	S-20	CR4111	O-14
C4136	Q-16	CR4112	P-11



MAIN BOARD-BOTTOM VIEW

MAIN BOARD-BOTTOM VIEW-GridTrace LOCATION GUIDE

C1201	N-17	C3306	H-16	R1214	L-17	R3129	F-14
C1205	L-16	C3307	G-15	R1215	M-16	R3130	D-7
C1211	N-16	C3308	G-16	R1217	P-17	R3132	E-15
C1212	P-17	C3309	G-15	R2301	L-18	R3133	D-15
C1214	O-17	C3310	G-16	R2303	L-18	R3135	D-13
C1215	N-17	C3311	E-15	R2304	L-18	R3148	D-18
C1216	N-18	C3312	F-15	R2305	M-18	R3149	D-19
C1218	N-16	C3313	G-16	R2308	K-18	R3150	E-19
C1220	O-17	C3314	G-18	R2309	K-16	R3151	E-19
C1222	N-17	C3316	H-16	R2310	M-15	R3152	F-15
C2301	L-18	C3317	G-13	R2311	K-15	R3153	E-17
C2302	K-18	C3318	G-13	R2312	L-15	R3154	F-16
C2303	K-17	C3319	H-13	R2313	N-15	R3155	F-16
C2305	M-15	C3320	H-13	R2314	P-15	R3156	E-12
C2308	M-14	C3321	I-13	R2316	M-15	R3161	E-14
C2309	M-16	C3322	I-14	R2317	N-15	R3301	G-18
C2311	O-16	C3323	I-14	R2318	P-16	R3302	G-16
C2312	L-15	C3324	I-15	R2319	O-15	R3304	I-15
C2315	O-17	C3325	I-14	R2322	O-16	R3305	H-15
C2318	O-15	C3326	G-16	R2324	P-17	R3307	E-17
C2327	N-15	C3328	H-16	R2326	Q-17	R3308	G-15
C2328	L-14	C3330	G-14	R2601	Q-17	R3313	G-17
C2329	K-15	C3331	G-15	R2603	Q-12	R3314	G-17
C2602	N-13	C3332	G-12	R2705	P-13	R3318	G-14
C2708	O-14	C3334	G-13	R2707	Q-16	R3319	H-13
C2709	O-14	C3335	G-14	R2708	R-13	R3320	H-13
C2711	M-11	C3604	I-17	R2712	P-13	R3322	I-12
C2712	M-11	C3605	I-18	R2713	L-14	R3323	H-13
C2713	M-11	C3607	I-15	R2720	L-14	R3324	I-12
C2720	Q-14	C3609	G-18	R2731	K-14	R3325	I-13
C2722	O-11	C3611	O-20	R2733	P-14	R3327	I-14
C2803	P-14	C3612	O-18	R2735	R-13	R3330	I-13
C2805	M-14	C4114	K-13	R2808	P-15	R3331	I-12
C2807	M-14	C4402	N-13	R2810	L-12	R3332	I-14
C2812	H-13	C4405	N-13	R2811	L-13	R3333	I-14
C2813	L-12	C4406	O-13	R2812	L-18	R3336	I-15
C2814	L-13	C4407	P-13	R2813	P-14	R3337	H-13
C2816	P-14	C4409	N-13	R2814	L-12	R3338	G-14
C2817	L-12	C4411	P-12	R2815	L-13	R3339	H-17
C2901	R-14	C4420	N-13	R2906	R-14	R3340	H-16
C2902	R-17	C4422	N-11	R2908	R-14	R3341	H-15
C2903	R-16	C4509	N-14	R2909	R-17	R3342	H-16
C2907	R-14	JC1	E-17	R2910	R-16	R3343	H-16
C2908	R-15	JC3	E-14	R2911	R-14	R3344	H-16
C2909	R-15	JC4	E-13	R2912	R-15	R3347	H-12
C3101	D-18	JC6	F-13	R2913	R-16	R3349	G-12
C3102	E-18	JC9	G-11	R2917	R-15	R3350	H-13
C3103	E-19	JC12	N-19	R3110	E-16	R3351	G-13
C3104	E-19	JC13	M-16	R3111	G-19	R3355	G-14
C3105	E-19	JC14	M-14	R3112	F-19	R3604	G-14
C3106	E-20	JC15	O-16	R3113	E-13	R3605	H-17
C3107	E-20	JC16	Q-12	R3114	E-14	R3611	I-18
C3108	E-20	JC17	K-19	R3115	E-14	R4403	N-13
C3109	D-17	JC-18	G-13	R3116	D-15	R4404	O-13
C3111	D-18	Q3101	E-14	R3117	D-14	R4408	O-12
C3112	E-15	Q3102	D-15	R3118	D-14	R4416	O-12
C3116	D-15	Q3103	D-14	R3119	E-15	R4417	P-12
C3126	F-19	R1201	N-16	R3120	F-14		
C3130	E-12	R1202	N-16	R3121	F-14		
C3131	F-13	R1203	L-16	R3123	F-16		
C3301	H-15	R1204	L-16	R3124	F-16		
C3302	I-15	R1205	N-18	R3125	F-18		
C3303	H-15	R1206	L-16	R3126	F-18		
C3304	G-19	R1208	M-17	R3127	F-18		
C3305	G-13	R1212	M-17	R3128	F-19		

e LOCATION GUIDE

CR4113	Q-11	Q3107	D-10	R3158	F-10	R4402	P-10
CR4118	I-2	Q3108	F-9	R3159	H-11	R4405	O-8
CR4119	J-8	Q3301	H-6	R3303	I-6	R4406	P-9
CR4120	R-19	Q3303	H-8	R3321	I-9	R4407	H-15
CR4121	P-16	Q3401	B-12	R3326	I-7	R4409	G-15
CR4122	P-16	Q3402	B-11	R3329	I-7	R4410	F-16
CR4123	R-17	Q3403	C-10	R3335	I-8	R4411	H-16
CR4124	S-19	Q3404	B-10	R3352	F-7	R4412	Q-19
CR4401	S-9	Q4102	M-15	R3401	B-13	R4413	L-17
CR4402	P-8	Q4103	J-13	R3402	C-11	R4414	R-9
CR4404	N-10	Q4106	J-2	R3403	B-13	R4415	L-19
CR4405	Q-10	Q4107	J-7	R3404	C-12	R4418	Q-10
CR4406	K-19	Q4401	F-16	R3405	C-11	R4419	R-19
CR4501	G-13	Q4402	F-18	R3406	C-12	R4420	P-10
CR4502	F-11	Q4501	F-11	R3407	A-12	R4421	S-20
CR4503	D-12	R1209	M-4	R3408	C-11	R4422	O-10
CR4506	G-10	R1210	M-4	R3409	B-11	R4423	R-10
DL2701	Q-6	R1211	P-3	R3410	A-10	R4424	N-9
F4101	R-11	R1213	M-4	R3411	B-10	R4426	O-8
F4102	K-13	R1216	P-5	R3412	B-9	R4427	S-17
FB2701	R-7	R1221	M-4	R3413	B-9	R4501	E-11
FB2702	R-6	R2302	J-3	R3414	A-9	R4502	D-11
FB3101	F-2	R2307	K-3	R3415	A-1	R4503	S-7
FB3301	G-3	R2315	K-6	R3429	C-12	R4504	I-11
FB3302	J-9	R2320	Q-3	R3430	A-12	R4505	E-11
FB3303	G-8	R2321	Q-3	R3431	B-1	R4506	D-11
FB3304	F-2	R2323	P-4	R3432	B-4	R4507	E-12
FB3305	R-3	R2327	P-6	R3433	B-5	R4508	F-14
FB4401	G-19	R2602	Q-8	R3434	B-7	R4509	E-11
FB4402	G-17	R2706	K-10	R3435	C-4	R4512	F-14
FB4403	H-19	R2711	P-7	R3436	C-4	R4513	H-15
FB4403A	G-19	R2715	I-16	R3438	C-5	R4514	F-11
J1201	O-4	R2716	Q-5	R3439	A-11	R4515	H-15
J4201	R-14	R2717	R-17	R3601	H-2	R4517	F-11
J4451	H-20	R2719	Q-5	R3602	N-3	R4518	G-10
L1201	M-4	R2722	L-10	R3603	N-3	RL4101	P-12
L1202	O-4	R2724	M-10	R3606	I-3	RT4101	O-12
L2301	K-3	R2726	M-10	R3607	J-6	SF2301	K-5
L2302	K-6	R2727	R-18	R3608	I-3	SW3402	A-4
L2303	P-6	R2728	S-16	R3609	I-3	SW3403	A-4
L2304	O-6	R2729	N-9	R4101	O-12	SW3412	A-3
L2305	O-6	R2734	Q-6	R4102	L-13	SW3413	A-3
L2306	Q-4	R2809	K-9	R4105	J-15	SW3422	A-2
L2307	L-6	R2901	S-8	R4106	L-14	SW3423	A-2
L2310	L-6	R2902	R-4	R4107	J-14	SW3432	A-1
L2312	N-5	R2903	R-8	R4108	I-16	SW3433	A-1
L2701	P-7	R2905	S-5	R4109	I-16	T4401	H-18
L2802	P-7	R2907	S-4	R4110	J-14	T4402	O-19
L3101	F-7	R2914	S-7	R4111	I-16	TP1221	K-4
L3301	F-6	R2915	S-6	R4112	J-14	TP2303	O-1
L3401	B-10	R2916	S-5	R4113	J-16	TP2305	M-6
L3601	H-2	R2919	R-5	R4114	N-12	TP2307	Q-5
L4101	Q-13	R2920	R-5	R4115	I-2	TP2342	N-5
L4402	L-20	R3101	E-3	R4116	N-12	TP2712	N-7
L4403	O-9	R3102	E-2	R4117	I-2	TP2801	N-7
Q1201	L-5	R3103	E-2	R4118	G-1	TP4110	I-16
Q1202	M-3	R3104	E-2	R4119	J-6	U1001	N-7
Q1203	L-4	R3105	E-2	R4120	M-16	U3100	E-5
Q2301	L-3	R3106	E-2	R4121	S-18	U3300	G-4
Q2302	Q-3	R3107	E-1	R4122	H-10	U3600	I-5
Q2703	K-9	R3108	E-1	R4123	K-8	U4501	F-13
Q2706	R-7	R3122	D-6	R4124	J-8	XRP4001	S-10
Q2901	S-8	R3134	F-4	R4125	O-16	XRP4002	S-10
Q2903	R-6	R3136	Q-10	R4128	R-18	Y2801	L-8
Q3104	D-8	R3157	E-10	R4401	P-10	Y3301	F-6

C

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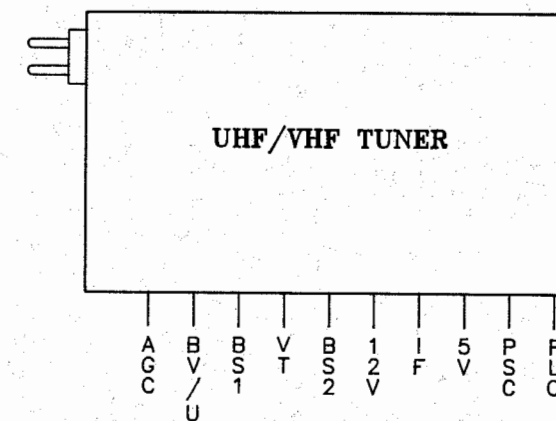
6

TUNER VOLTAGE CHART

	AGC	BV/U	BS1	VT	BS2	12V	5V	PSC	FLO
VHF Low Band	8.0V	11.5V	-14.6V	2.8V	-14.6V	12.0V	5.0V	.07V	3.6V
VHF High Band	8.0V	11.5V	11.1V	12.5V	-12.4V	12.0V	5.0V	.07V	3.6V
UHF Band	8.0V	.2V	11.2V	1.9V	-12.4V	12.0V	5.0V	.07V	3.7V

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



MISCELLANEOUS ADJUSTMENTS

PRETUNING

NOTE: All procedures require an antenna connected and power applied to the set. Select TV/CATV.

Auto Memory

1. Press the Set-up button until Autoprogram is displayed.
2. Press the Volume (+) button. Available channels are scanned and stored in memory.

Add Channel

1. Press the Set-up button until Channel Memory is displayed.
2. Select channel.
3. Press the Volume (+) button to add channel.
4. Repeat steps two and three to add other channels.

Delete Channel

1. Press the Set-up button until Channel Memory is displayed.
2. Select channel.
3. Press the Volume (-) button to erase channel.
4. Repeat steps two and three to erase other channels.

Clock Set

1. Press the Set-up button, until clock set is displayed.
2. Press and hold the Minus button to set the hours.
3. Press and hold the Plus button to set the minutes.
4. Press the Clear button to end.

Sleep Timer

1. Press the Set-up button until sleep timer is displayed.
2. Press the Minus button, the receiver may be set to turn off after the first 30 minutes, or in up to four hours in 30 minute intervals by pressing the Minus button.
3. Press the Clear button to end.

This set employs Digital Customer Controls. Use Video Button (SW3422) to select video function to be altered; use Set-up button (SW3423) to select Set-up function to be altered; use Volume up (+) button (SW3413) to increase setting, Volume down (-) button (SW3412) to decrease setting. Use Reset value for all adjustments unless otherwise indicated.

B+ ADJUSTMENT

Tune in a picture. Set Brightness, Contrast and Color to MINIMUM. Connect a DC voltmeter to TP4110, low side to ground. With 120V AC line input, adjust B+ Control (R4112) for 140V DC.

HIGH VOLTAGE CHECK

Tune in a picture. Set Brightness, Color and Contrast Controls to MINIMUM. Connect a high voltage probe to CRT anode. High voltage must measure 23.5KV to 24.0KV. High voltage must never exceed 25.0KV.

RF AGC ADJUSTMENT

Tune in a picture. Adjust RF AGC Control (R2315) clockwise until snow (noise) appears in picture and then counterclockwise until snow disappears.

CONTRAST PRESET ADJUSTMENT

Tune in a picture. Set Brightness and Color to MINIMUM, Contrast to midrange. Adjust Contrast Preset Control (R2716) to a point where highlights are just visible.

DISPLAY POSITION ADJUSTMENT

Tune in a picture. Press the Video button (SW3422). Adjust OSD Oscillator (L3301) to center the display.

TINT PRESET ADJUSTMENT

Tune in a color bar pattern. Connect an oscilloscope to the red cathode pin 8, of CRT, low side to ground. Adjust Tint Preset Control (R3335) to balance the 1st and 4th bars and the 2nd and 3rd bars of waveform.

COLOR PURITY ADJUSTMENT

Tune in a crosshatch pattern. Operate the receiver for 20 minutes. Use a degaussing coil to demagnetize the CRT and mounting hardware. Set Color, Contrast, Red Bias (R2914) and Blue Bias (R2916) to MINIMUM brightness for a visible raster and Green Bias (R2915) to obtain 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 the Deflection Yoke forward until a uniform green screen is obtained. Check red and blue purity.

COLOR TEMPERATURE ADJUSTMENT (B/W TRACKING)

Tune in a crosshatch pattern. Set Color, Contrast, Red Bias (R2914), Green Bias (R2915), Blue Bias (R2916) and Screen (R4210B) to MINIMUM, Green Drive (R2907), Blue Drive (R2905) and Brightness to midrange. Advance Screen Control until lines are just visible. Adjust 2 Bias controls to obtain white lines. Set Brightness and Contrast Controls to Maximum. Adjust the Green and Blue Drive Controls for best black and white picture. Check tracking at low and high brightness.

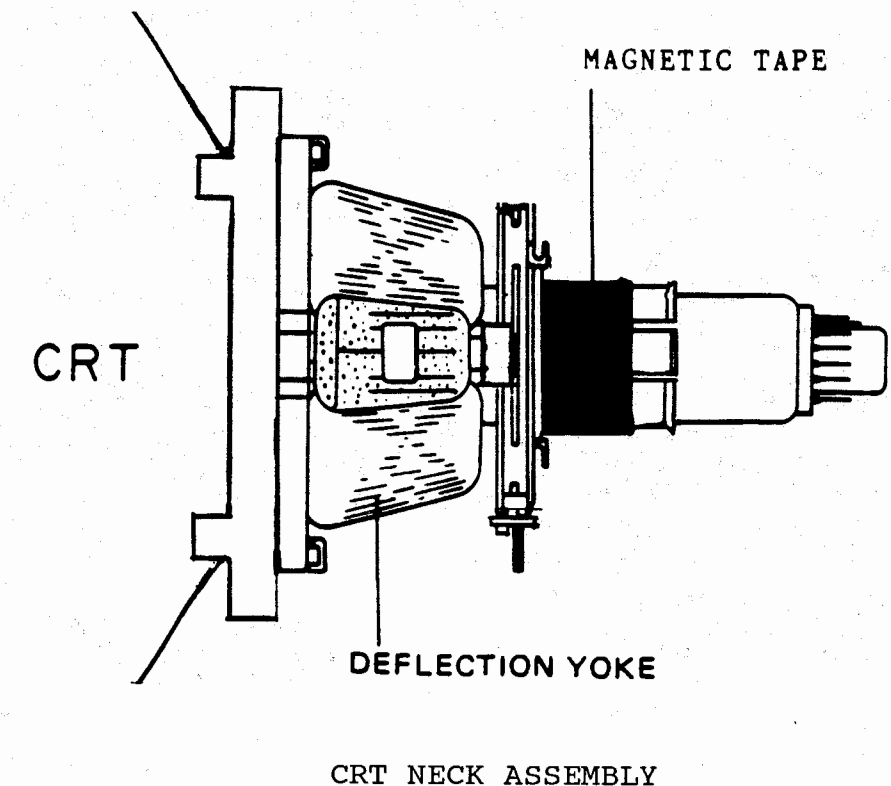
CONVERGENCE ADJUSTMENTS

Operate the receiver for 20 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 horizontally and rotate both tabs in the same direction to converge vertically. Four and six pole magnets interact, repeat adjustment until center convergence is correct. Remove the rubber wedges from the CRT. Slightly

MISCELLANEOUS ADJUSTMENTS (Continued)

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 hori-

zontal lines at top and bottom of screen and the vertical lines at the right and left sides of the screen. Apply adhesive to wedges and carefully replace on CRT. Tighten Deflection Yoke clampscrew.



RCA
CHASSIS CTC146B/C/D/E/F/G/H

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
CR1201,2	164874	NTE177	ECG177	SK9091/177	
CR2601	164874	NTE177	ECG177	SK9091/177	
CR2701,2,3,4,7,8,9	164717	NTE519	ECG519	SK3100/519	
CR3101	164874	NTE177	ECG177	SK9091/177	
CR3102	146320	NTE135A	ECG135A	SK5V1/135A	
CR3103	164717	NTE519	ECG519	SK3100/519	
CR3104	176746	NTE5011A	ECG5011A	SK5A6/5011A	
CR3105	132616	NTE5071A	ECG5071A	SK6V8/5071A	
CR3106	164717	NTE519	ECG519	SK3100/519	
CR3301,2,3,4,5,6	164874	NTE177	ECG177	SK9091/177	
CR3307					SOME VERSIONS
CR3401	164874	NTE177	ECG177	SK9091/177	
CR3404	150711				
CR3601	146320	NTE135A	ECG135A	SK5V1/135A	
CR4101,2,3,4	147993	NTE125	ECG125	SK3033A	
CR4106	139706	NTE177	ECG177	SK9091/177	
CR4107	180338				
CR4108	176296	NTE552	ECG552	SK9000/552	
CR4110	146320	NTE135A	ECG135A	SK5V1/135A	
CR4111	147993	NTE125	ECG125	SK3033A	
CR4112,3	164717	NTE519	ECG519	SK3100/519	
CR4118	147015	NTE125	ECG125	SK5010A/117A	
CR4119	164874	NTE177	ECG177	SK9091/177	#
CR4120,1,2,3	176296	NTE552	ECG552	SK9000/552	
CR4124	164717	NTE519	ECG519	SK3100/519	
CR4401	157301	NTE177	ECG177	SK9091/177	
CR4402	132616	NTE5071A	ECG5071A	SK6V8/5071A	#
CR4404	159429	NTE5019T1	ECG5019T1		
CR4405	164717	NTE519	ECG519	SK3100/519	
CR4406	176296	NTE552	ECG552	SK9000/552	
CR4501	147015	NTE125	ECG125	SK5010A/117A	
CR4502,3,6	164717	NTE519	ECG519	SK3100/519	
CR5001,2	139706	NTE177	ECG177	SK9091/177	
Q1201	146847	NTE123AP	ECG123AP	SK3854/123AP	
Q1202	177788	NTE31	ECG31	SK3866A/31	
Q1203	177789	NTE32	ECG32	SK3867A/32	
Q2301	146848	NTE229	ECG229	SK3246A/229	
Q2302	146847	NTE123AP	ECG123AP	SK3854/123AP	
Q2703	143806	NTE159	ECG159	SK3466/159	
Q2706	146847	NTE123AP	ECG123AP	SK3854/123AP	
Q2901,3	143806	NTE159	ECG159	SK3466/159	
Q3101,2	179740	NTE2406	ECG2406		
Q3103	179741	NTE2407	ECG2407		
Q3104	146847	NTE123AP	ECG123AP	SK3854/123AP	
Q3107	146826	NTE171	ECG171	SK3201/171	
Q3108	146847	NTE123AP	ECG123AP	SK3854/123AP	
Q3301	143802	NTE159	ECG159	SK3466/159	
Q3303	146850	NTE159	ECG159	SK3466/159	
Q3401	148061	NTE123AP	ECG123AP	SK3854/123AP	

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
Q3402	145410	NTE159	ECG159	SK3466/159	
Q3403,4	148061	NTE123AP	ECG123AP	SK3854/123AP	
Q4102	193057				
Q4103	193058				
Q4106	146849	NTE210	ECG210	SK3202/210	
Q4107	177788	NTE31	ECG31	SK3866A/31	
Q4401	146851	NTE287	ECG287	SK3433/287	
Q4402	177791	NTE2302	ECG2302	SK9422	
Q4501	146847	NTE123AP	ECG123AP	SK3854/123AP	
Q5001,2,3	146826	NTE171	ECG171	SK3201/171	
Q5004	146851	NTE287	ECG287	SK3433/287	#
U1001	A23-1101-01A				
U3100	193082				
	SC4036037P				
	193084				
U3300	179732				
U3600	179733				
U4501	LA7831	NTE1797	ECG1797	SK9753	
	176853	NTE1797	ECG1797	SK9753	

For SAFETY use only equivalent replacement part.

PARTS LIST AND DESCRIPTION (Continued)

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

RESISTORS (Power and Special)

	ITEM No.	RATING	MPGR PART No.	NTE PART No.	
	R1208	1000 2% 1/8W Chip Metal Film	190462		
#	R1209	2.2 5% 1/4W Carbon Film	152829	QW2D2	
#	R1210	2.2 5% 1/4W Carbon Film			
#	R1211	5.6 5% Nonflammable Metal Film			
#	R1213	43K 2% 1/8W Carbon Film	161038	EW343	
	R1215	10K 2% 1/8W Chip Metal Film	174364		
	R1216	10 5% 1/4W Nonflammable Metal Film	829010	QW010	
	R2301	120 2% 1/8W Chip Metal Film	181485		
	R2302	100 5% 1/4W Nonflammable Carbon Film	829110	QW110	
	R2307	10 5% 1/4W Nonflammable Metal Film	829010	QW010	
	R2314	39K 2% 1/8W Chip Metal Film	151939		
	R2319	1000 2% 1/8W Chip Metal Film	190462		
	R2326	1000 2% 1/8W Chip Metal Film	190462		
	R2708	10K 2% 1/8W Chip Metal Film	174364		
	R2715	113K 1% 1/4W Metal Film			
		118K 1% 1/4W Carbon Film	194892		
#	R2717	22K 5% 1W Nonflammable Metal Film	179259	1W322	
	R2731	1000 2% 1/8W Chip Metal Film	190462		
	R2733	27K 2% 1/8W Chip Metal Film	193061		
	R2809	1500 2% 1/8W Carbon Film	161041	EW115	
	R2810	1000 2% 1/8W Chip Metal Film	190462		
	R2908	120 2% 1/8W Chip Metal Film	181485		
	R2909	120 2% 1/8W Chip Metal Film	181485		
	R3110	10K 2% 1/8W Chip Metal Film	174364		
	R3120	10K 2% 1/8W Chip Metal Film	174364		
	R3129	1000 2% 1/8W Chip Metal Film	190462		
	R3133	10K 2% 1/8W Chip Metal Film	174364		
	R3135	1000 2% 1/8W Chip Metal Film	190462		
	R3156	10K 2% 1/8W Chip Metal Film	174364		
#	R3157	10K 5% 1W Nonflammable Metal Film	180029	1W310	
	R3158	10K 5% 1W Nonflammable Metal Film	180029	1W310	
		mx00 5% 1W Nonflammable Metal Film	831275	1W275	
	R3301	24K 2% 1/8W Chip Metal Film	181061		
	R3305	24K 2% 1/8W Chip Metal Film	181061		
	R3307	10K 2% 1/8W Chip Metal Film	174364		
	R3313	10K 2% 1/8W Chip Metal Film	174364		
	R3314	10K 2% 1/8W Chip Metal Film	174364		
	R3320	39K 2% 1/8W Chip Metal Film	161030		
	R3322	10K 2% 1/8W Chip Metal Film	174364		
	R3323	6800 2% 1/8W Chip Metal Film	157377		
	R3324	3900 2% 1/8W Chip Metal Film	157377		
	R3325	820 2% 1/8W Chip Metal Film	176814		
	R3327	10K 2% 1/8W Chip Metal Film	174364		
		8200 2% 1/8W Chip Metal Film	181065		
	R3331	15K 2% 1/8W Chip Metal Film	192835		
	R3332	27K 2% 1/8W Chip Metal Film	193061		
	R3333	12K 2% 1/8W Chip Metal Film	174365		
	R3336	24K 2% 1/8W Chip Metal Film	181061		
	R3337	1000 2% 1/8W Chip Metal Film	190462		
	R3338	10K 2% 1/8W Chip Metal Film	174364		
	R3341	24K 2% 1/8W Chip Metal Film	181061		
	R3342	24k 2% 1/8w Chip Metal Film	181061		
	R3347	10K 2% 1/8W Chip Metal Film	174364		
	R3355	10K 2% 1/8W Chip Metal Film	174364		
#	R3601	130 5% 1W Nonflammable Metal Film	175783		
#	R3607	820 5% 1/2W Nonflammable Metal Film	193065	HW182	
#	R4101	2.7 10% 7W Wirewound	194300		
#	R4102	470K 10% 1/2W Carbon Comp	180243	HW447	
#	R4106	4.7 5% 3W Nonflammable Metal Film	193068	3W4D7	

PARTS LIST AND DESCRIPTION (Continued)

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

RESISTORS (Power and Special)

	ITEM No.	RATING	MPGR PART No.	NTE PART No.	
	R4108	160 5% 15W Wirewound	193069		
#	R4109	22K 5% 2W Nonflammable Metal Film	179956	2W322	
	R4110	27K 5% 1W Nonflammable Metal Film	831327	1W327	
#	R4111	90.9K 1% 1/2W Metal Film	193071		
	R4113	5360 1% 1/4W Metal Film	193072		
	R4114	430 5% 1W Nonflammable Metal Film	831143	1W143	
		680 5% 1W Nonflammable Metal Film	194895	1W168	
#	R4116	430 5% 1W Nonflammable Metal Film	831143	1W143	
#	R4118	47 5% 2W Nonflammable Metal Film	176806	2W047	
#	R4119	8.2 5% 1/2W Nonflammable Metal Film	120595	HW8D2	
#	R4120	4.7 5% 1/2W Nonflammable Carbon Film	830A47	HW4D7	
		47 5% 1/4W Nonflammable Metal Film	829047	QW047	
#	R4122	620 2% 1W Nonflammable Metal Film	193092	1W162	
	R4123	200 2% 1/4W Carbon Film	175363	QW120	
#	R4125	10 5% 1/4W Nonflammable Metal Film	829010	QW010	
#	R4128	10 5% 1/4W Nonflammable Metal Film	829010	QW010	
#	R4401	10K 1% 1/2W Metal Film	160155		
#	R4402	11K 1% 1/2W Metal Film	193076		
	R4403	1000 2% 1/8W Chip Metal Film	190462		
	R4404	2400 2% 1/8W Chip Metal Film	192829		
#	R4407	6800 5% 3W Nonflammable Metal Film		3W268	
		6200 5% 3W Nonflammable Metal Film	179249	3W262	
	R4408	620 2% 1/8W Chip Metal Film	181493		
#	R4411	4700 5% 3W Nonflammable Metal Film	175368	3W247	
#	R4413	820 5% 1W Nonflammable Metal Film	175349		
		470 5% 1W Nonflammable Metal Film	831147	1W147	
#	R4414	820 5% 1W Nonflammable Metal Film	175349	1W182	
#	R4415	1000 5% 2W Nonflammable Metal Film	180175	2W210	
#	R4420	3300 5% 1W Nonflammable Metal Film	831A33	1W233	
#	R4421	100 5% 1/2W Carbon Film	176796	HW110	
#	R4422	22K 2% 1/4W Carbon Film	175054	QW322	
#	R4423	10K 5% 1/4W Carbon Film	175317	QW310	
	R4428	680 5% 1W Nonflammable Metal Film	176653	1W168	
	R4502	5100 2% 1/8W Carbon Film	161042	EW251	
#	R4505	3 5% 1W Nonflammable Metal Film	179256	1W3D0	
		20K 2% 1/8W Carbon Film	161032	EW320	
	R4507	20K 2% 1/8W Carbon Film	157783	EW320	
		24K 2% 1/8W Carbon Film		EW324	
	R4508	22K 2% 1/4W Carbon Film	175054	QW322	
#	R4513	20 2% 1/4W Carbon Film	829020	QW020	
#	R4515	20 2% 1/4W Carbon Film	829020	QW020	
#	R5001	15K 5% 1W Nonflammable Metal Film	179236	2W315	
#	R5002	15K 5% 1W Nonflammable Metal Film	179236	2W315	
#	R5003	15K 5% 1W Nonflammable Metal Film	179236	2W315	
#	R5008	10K 5% 3W Nonflammable Metal Film	176656	2W310	
#	R5014	.22 10% 2W Metal Film		2WD22	
		.22 10% 2W Wirewound	193108		
#	R5023	6.8 10% 2W Wirewound	193109		
#	R5026	3.3M 10% 1/2W Carbon Comp	181986	HW533	
#	RT4101	5.1 PTC Cold	190002		

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
#	L501	Yoke 90° Horiz 3.1mH Vert 22.9mH	192467	2G27006-501(1)	
#	T4401	Horizontal Drive	196128	2821709-8(1)	
#	T4402	Horizontal Output	193081	2G25003-501(1)	

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

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
SP1	Speaker 2.25" x 3.5" 32 Ohms	183163 1870110-01A(1)		(1) Number on unit.

PARTS LIST AND DESCRIPTION (Continued)

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

COILS (RF-IF)

ITEM No.	FUNCTION	MFGR. PART No.	ITEM No.	FUNCTION	MFGR. PART No.
L1201	Sound IF	190504	L2312	Peaking (2.2uH)	143893
L1202	Peaking (28uH)	161245	L2701	Sharpness (68uH)	149167
	Peaking (18uH)	194934	L2802	Peaking (8.2uH)	149170
L2301	RF Choke (.82uH)	193051	L3101	RF Choke (10uH)	160518
L2302	Peaking	193052	L3301	OSD	190505
L2303	AFT	190506	L3401	Remote	181240 (1)
L2304	Video Detector	190503	L3601	RF Choke (100uH)	161243
L2305	Peaking (1.8uH)	160143	L4101	Line Filter	193053
L2306	Peaking (8.2uH)	181472	# L4402	Linearity	196126
L2307	Peaking		L4403	Peaking (6.8uH)	193056
L2310	RF Choke (2.2uH)	143893	L5001	RF Choke	176622

For SAFETY use only equivalent replacement part.
(1) Remote Control models only.

RCA
CHASSIS CTC146B/C/D/E/F/G/H

PARTS LIST AND DESCRIPTION (Continued)

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

ELECTROLYTIC CAPACITORS

Items Not Listed Are Normally Available At Local Distributors.

ITEM No.	RATING	MFGR PART No.
# C4106	470 200V	179809
# C4108	33 200V	193038
# C4425	10 50V 20%	179229

For SAFETY use only equivalent replacement part.

CAPACITORS

Items Not Listed Are Normally Available At Local Distributors.

ITEM No.	RATING	MFGR PART No.
C1205	470 NPO 50V 10%	174416
C1212	333pF NPO 50V 5%	174408
C1214	18pF NPO 50V 5%	174405
C1220	33pF NPO 50V 5%	174408
C1222	10pF NPO 50V 1%	174402
C2311	33pF NPO 50V 5%	174408
C2313	22pF NPO 50V 5%	157199
C2318	22pF NPO 50V 5%	174406
C2709	68pF NPO 50V 5%	174410
C2720	68pF NPO 50V 5%	174410
C2722	12pF NPO 50V 5%	174403
C2803	56pF NPO 50V 5%	190542
C2805	15pF NPO 50V 5%	174404
C2813	10pF NPO 50V 1%	174402
C2816	120pF NPO 50V 10%	193033
C2907	220pF NPO 50V 5%	178188
C2908	220pF NPO 50V 5%	178188
C2909	220pF NPO 50V 5%	178188
C3111	100pF NPO 50V 5%	174412
C3308	100pF NPO 50V 5%	174412
C3309	100pF NPO 50V 5%	174412
C3310	100pF NPO 50V 5%	174412

For SAFETY use only equivalent replacement part.
(1) Canadian models only.

ITEM	RATING	MFGR PART No.

ITEM No.	RATING	MFGR PART No.
C3311	56pF NPO 50V 5%	190542
C3312	56pF NPO 50V 5%	190542
C3316	220pF NPO 50V 5%	178188
C3318	39pF NPO 50V 5%	181090
C3330	33pF NPO 50V 5%	174408
C3331	33pF NPO 50V 5%	174408
C3332	12pF NPO 50V 5%	174403
# C4101	.047 600V	144658 (1)
# C4102	680pF 1KV 20%	190538
# C4103	680pF 1KV 20%	190538
# C4104	680pF 1KV 20%	190538
# C4105	680pF 1KV 20%	190538
# C4401	.01 50V 10%	159640
C4409	100pF NPO 50V 5%	174412
C4410	27pF NPO 250V 5%	143755
C4415	.35 250V 5%	193048
# C4416	680pF 1.5KV 5%	194445
# C4417	.0073 1.6KV	193879
# C4421	.001 50V 10%	143879
# C4422	.001 50V 10%	181460

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
R2315	RF AGC	25K	193059	
R2323	AFT Slope	15K	193059	
R2716	Contrast Preset	300	190525	
R2905	Blue Drive	200	193062	
R2907	Green Drive	200	193062	
R2914	Red Bias	4500	190533	
R2915	Green Bias	4500	190533	
R2916	Blue Bias	4500	190533	
R3335	Tint Preset	10K	181107	
R4112	B+ Adjust	500	181112	
# R4210A	Focus		(1)	
# R4210B	Screen		(1)	
R4503	Vertical Size	150	193062	

For SAFETY use only equivalent replacement part.
(1) Part of Focus Pack Part No. 193075.

PARTS LIST AND DESCRIPTION (Continued)

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

CABINETS & CABINET PARTS

NOTES
(6) Used in Models: F20536EHA01/A02/A04/N01/N02, F20537CPA01/A03/A04/N01/N03
(7) Used in Models: F20514WNA01/A02/A03/A04/N01/ N03/N04, F20515EGN01/N02, F20516BHA03/N03, F20517WNA02/A03/N02/N03/N04, F20519AKA03/N03,
(9) Used in Models: F20536EHA01/A02/A04/N01/N02, F20537CPA01/A03/A04/N01/N03, X 20161EBA01/A02/A04/N01/N02/ N03/N04, X 20163WNA01/A02/A03/A04/N01/ N03/N04
(10) Used in Models: F20515EGN01/N02, F20516BHA03/N03, F20517WNA02/A03/N02/N03/N04, F20519AKA03/N03

PARTS LIST AND DESCRIPTION (Continued)

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

CABINETS & CABINET PARTS

NOTES
(11) Used in Models: F20507WNA02/A03/A04/N03/N04
(12) Used in Models: F20508BHN03
(13) Used in Models: F20509AKN03/N04
(14) Used in Models: F20514WNA01/A02/A03/A04/N01/ N03/N04
(15) Used in Models: F20516BHA03/N03
(16) Used in Models: F20517WNA02/A03/N02/N03/N04
(17) Used in Models: F20519AKA03/N03
(18) Used in Models: X 20131EBA01/A03/N01/N03
(19) Used in Models: X20133WNA01/A03/N01/N03
(20) Used in Models: X20161EBA01/A02/A04/N01/N02/ N03/N04
(21) Used in Models: X 20163WNA01/A02/A03/A04/N01/ N03/N04
(22) Used in Models: F20526AKA01/N01
(23) Used in Models: F20527CPA01/N01
(24) Used in Models: F20533BMA01/A02/A04/N03
(25) Used in Models: F20535DWA01/A02/A04/N03
(26) Used in Models: F20536EHA01/A02/A04/N01/N02
(27) Used in Models: F20537CPA01/A03/A04/N01/N03
(28) Used in Models: F20515EGN01/N02
(29) Used in Models: F20536EHA01/A02/A04/ N01/N02, F20537CPA01/ A03/A04/N01/N03

RCA
CHASSIS CTC146B/C/D/E/F/G/H

PARTS LIST AND DESCRIPTION (Continued)

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

MISCELLANEOUS

NOTES
(1) Used in all Models except: F20514WNN01, F20515EGN01/ N02, F20517WNN02, F20526AKN01, F20527CPN01, F20536EHN01/N02, F20537CPN01, F20538DGN01/N02, X20133WNN01, X20161EBN01/N02, X20163WNN01, F20533BMA01
(2) Used in Models: F20514WNN01, F20515EGN01/ N02, F20517WNN02, F20526AKN01, F20527CPN01, F20536EHN01/N02, F20537CPN01, F20538DGN01/N02, X20133WNN01, X20161EBN01/N02, X20163WNN01, F20533BMA01
(3) Used in Models: F20533BMA01/A02/A04/N03, F20535DWA01/A02/A04/N03, F20536EHA01/A02/A04/N01/N02, F20537CPA01/A03/A04/N01/N03, F20538DGA01/A03/A04/N01/N02/ N03
(4) Used in Models: F20514WNA01/A02/A03/A04/N01/ N03/N04, X20161EBA01/A02/A04/N01/N02/N03/N04, X20163WNA01/A02/A03/A04/N01/ N03/N04
(5) Used in Models: X20161EBA01/A02/A04/N01/N02/ N03/N04, X20163WNA01/A02/A03/A04/N01/ N03/N04

PARTS LIST AND DESCRIPTION (Continued)

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

MISCELLANEOUS

NOTES
(6) Used in Models: F20536EHA01/A02/A04/N01/N02, F20537CPA01/A03/A04/N01/N03
(7) Used in Models: F20514WNA01/A02/A03/A04/N01/ N03/N04, F20515EGN01/N02, F20516BHA03/N03, F20517WNA02/A03/N02/N03/N04, F20519AKA03/N03, F20533BMA01/A02/A04/N03, F20535DWA01/A02/A04/N03, F20538DGA01/A03/A04/N01/N02/ N03
(8) Used in Models: F20514WNA01/A02/A03/A04/N01/ N03/N04, F20515EGN01/N02, F20516BHA03/N03, F20517WNA02/A03/N02/N03/N04, F20519AKA03/N03, F20533BMA01/A02/A04/N03, F20535DWA01/A02/A04/N03, F20536EHA01/A02/A04/N01/N02, F20537CPA01/A03/A04/N01/N03, F20538DGA01/A03/A04/N01/N02/ N03, X20161EBA01/A02/A04/N01/N02/ N03/N04, X20163WNA01/A02/A03/A04/N01/ N03/N04

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, Back	BK0832 (1)	Mask, Cabinet Front	MK0927 (13)
Cabinet, Back	BK0968 (2)	Mask, Cabinet Front	MK0958 (14)
Window, IR	194933 (3)	Mask, Cabinet Front	MK0829 (28)
Buttons	194938 (4)	Mask, Cabinet Front	MK0928 (15)
Remote Transmitter	CRK53D (5)	Mask, Cabinet Front	MK0830 (16)
Buttons	195609 (29)	Mask, Cabinet Front	MK0929 (17)
Buttons	192035 (7)	Mask, Cabinet Front	MK0959 (18)
Buttons	192558 (5)	Mask, Cabinet Front	MK0960 (19)
Case, Bottom	181034 (29)	Mask, Cabinet Front	MK0961 (20)
Case, Bottom	192033 (7)	Mask, Cabinet Front	MK0962 (21)
Case, Bottom	191568 (5)	Mask, Cabinet Front	MK0971 (22)
Case, Top	181033 (6)	Mask, Cabinet Front	MK0967 (23)
Case, Top	192034 (7)	Mask, Cabinet Front	MK0973 (24)
Case, Top	191567 (5)	Mask, Cabinet Front	MK0974 (25)
Contact, Dual Battery	173214 (7)	Mask, Cabinet Front	MK0972 (26)
Contact, Negative Battery	173215 (9)	Mask, Cabinet Front	MK0969 (27)
Contact, Negative Battery	192036 (29)	Mask, Cabinet Front	MK0975 (28)
Contact, Positive Battery	192037 (7)	Remote Transmitter	CRK50E (29)
Door, Battery	181035 (29)	Remote Transmitter	CRK52A (7)
Door, Battery	192038 (7)	Door, Battery	191570 (5)
Buttons	192379 (10)	Window, IR	181036 (6)
Mask, Cabinet Front	MK0925 (11)	Window, IR	191569 (5)
Mask, Cabinet Front	MK0926 (12)		
Contact, Positive Battery	173215 (5)		
Contact, Negative Battery	173216 (5)		
Door, Battery	191570 (5)		
Buttons	194940 (19)		

PARTS LIST AND DESCRIPTION (Continued)

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

CABINETS & CABINET PARTS

NOTES
(1) Used in Models: F20507WNA02/A03/A04/N03/N04, F20508BHN03, F250509AKN03/N04 F20514WNA01/A02/A03/A04/N01/N03/N04 F20515EGN01/N02 F20516BHA03/N03, F20517WNA02/A03/N02/N03/N04, F20519AA03/N03, X 20131EBA01/A03/N01/N03, X 20133WNA01/A03/N01/N03, X20161EBA01/A02/A04/N01/N02/N03/N04, H20163WNA01/A02/A03/A04/N01/N03/N04
(2) Used in Models: F20526AKA01/N1, F20527CPA01/N01, F20533BMA01/A02/A04/N03, F20535DWA01/A02/A04/N03, F20536EHA01/A02/A04/N01/N02, F20537CPA01/A03/A04/N01/N03, F20538DGA01/A03/A04/N01/N02/N03
(3) Used in Models: F20533BMA01/A02/A04/N03, F20535DWA01/A02/A04/N03, F20536EHA01/A02/A04/N01/N02, F20537CPA01/A03/A04/N01/N03, F20538DGA01/A03/A04/N01/N02/N03
(4) Used in Models: F20514WNA01/A02/A03/A04/N01/N03/N04, X20161EBA01/A02/A04/N01/N02/N03/N04, H20163WNA01/A02/A03/A04/N01/N03/N04
(5) Used in Models: H20161EBA01/A02/A04/N01/N02/N03/N04, X20163WNA01/A02/A03/A04/N01/N03/N04

PARTS LIST AND DESCRIPTION (Continued)

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

MISCELLANEOUS

ITEM No.	PART NAME	MFGR. PART No.	NOTES
	CF1201 Ceramic Filter	160139	
	CF2301 Ceramic Filter	160140	
	DL2701 Delay Line	177795	
#	F4101 Fuse	177793	
	4 Amp @ 125V		
#	F4102 Fuse	193050	
	1 Amp @ 250V		
	FB2701 Ferrite Bead	154052	
	FB2702 Ferrite Bead	152102	
	FB3101 Ferrite Bead	153328	
	FB3301 Ferrite Bead	153328	
	FB3302 Ferrite Bead	153328	
	FB3303 Ferrite Bead	153328	
	FB3304 Ferrite Bead	154052	
	FB3305 Ferrite Bead	154052	
	FB4401 Ferrite Bead	154052	
	FB4402 Ferrite Bead	154052	
	FB4403 Ferrite Bead	154053	
	Ferrite Bead	154052	
#	L4201 Degaussing Coil	191794	
#	RL4101 Power Relay	193078	
	SF2301 SAW Filter	176852	
	SW3400 Switch	193087	(Five)
	SW3401 Switch	193087	(Zero)
	SW3402 Switch	193087	Channel Down (Nine)
	SW3403 Switch	193087	Channel Up (Four)
	SW3410 Switch	193087	(Six)
	SW3411 Switch	193087	(One)
	SW3412 Switch	193087	Volume Down (Channel Down)
	SW3413 Switch	193087	Volume Up (Channel Up)
	SW3420 Switch	193087	(Seven)
	SW3421 Switch	193087	(Two)
	SW3422 Switch	193087	Video (Volume Down)
	SW3423 Switch	193087	Setup (Volume Up)
	SW3430 Switch	193087	(Eight)
	SW34341 Switch	193087	(Three)
	SW3432 Switch	193087	Display (Menu)
	SW3433 Switch	193087	Power
#	P100 AC Cord	182239	
#	P4201 Degaussing Connector	158677	
#	P4451 Connector Yoke	192541	

PARTS LIST AND DESCRIPTION (Continued)

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

MISCELLANEOUS

ITEM No.	PART NAME	MFGR. PART No.	NOTES
#	V101 CRT	A51ACG14X02 (1)	
	CRT	A51ACG14X (2)	
	Y2801 Crystal	161235	3.58MHz
	Y3301 Crystal	182839	
	Y4401 Ceramic Resonator	179267	
	Antenna Adapter	189263	
#	CRT Socket	189986	
#	Focus Box	193086	
#	Focus Cover	193088	
	Fuse Clip	176642	
	RC Transmitter	192551 (3)	CRK50E
	RC Transmitter	187986 (4)	CRK52A
	RC Transmitter	192108 (5)	CRK53D
#	Two Pin Connector	193085	
	UHF/VHF Tuner	TCHR-1A (6)	
	UHF/VHF Tuner	TCHQ-1A (7)	
	UHF/VHF Tuner	TAHQ-1A (8)	
	UHF Antenna	10E0113	
	VHF Antenna	156265	
	Yoke Wedge	149903	Three used

For SAFETY use only equivalent replacement part.