

CABINET-REAR VIEW

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

Remove six 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 two screws holding the Power board to cabinet side and remove from cabinet. Remove two screws holding Controls board to cabinet front and remove from cabinet. Remove four screws holding Key board/Remote receiver assembly to cabinet front, and remove from cabinet. Remove one screw holding Earphone Jack board to cabinet front and remove from cabinet. Slide Main 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 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 3.0-amp fuse is used for AC line protection. (See photo, Main Board - Top View.)

A 6.0-amp fuse is used for DC power-supply protection. (See photo, Power Board.)

VHF/UHF TUNER

See Miscellaneous Adjustments.

CHANNEL TUNING

Channel Up and Down buttons are provided for channel scanning. Fine tuning is automatic.

HORIZONTAL OSCILLATOR

Adjustment of the horizontal hold is accomplished by the proper setting of the Horizontal Hold Control.

HIGH VOLTAGE

For High Voltage procedure, refer to Miscellaneous Adjustments.

FOCUS

The focus may be varied by a Focus control.

AGC

The AGC may be varied by an AGC Control. (See photo, Main Board - Top View.)

FOLDER 1
SET 2774

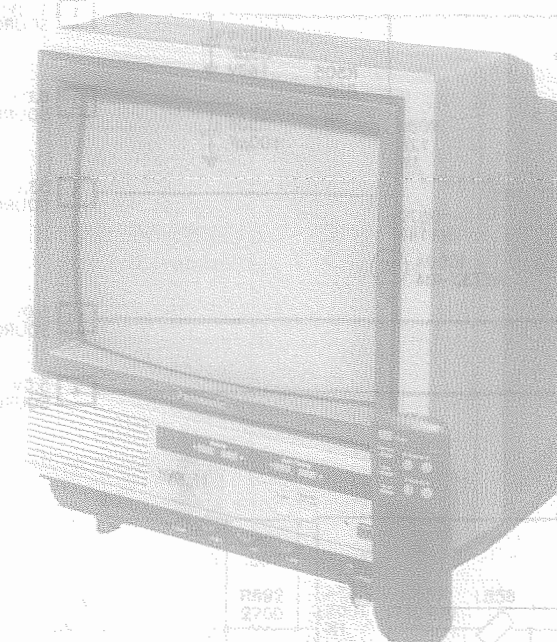
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For Supplier Address See PHOTOFACT Index

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Safety Precautions

See Page 1

INDEX

	Page		Page
Alignment		Photos (Continued)	
TV	1	Power Board	4
Convergence Adjustment	5	Power Board-Overall View	3
Disassembly Instructions	1	Quick-Checks Troubleshooting	
GridTrace Location Guide		CRT Board	4
CRT Board	4	Main Board	4
Main Board-Bottom View	5	Power Board	4
Main Board-Top View	5	Safety Precaution	1
Power Board-Bottom View	4	Schematics	
Power Board-Top View	4	CRT	2
IC Functions	3	Power Supply	2
Miscellaneous Adjustments	5	Terminal Guides and Notes	3
Parts List		Tuner Control/Key	3
TV	6	TV	2
Photos		Servicing in the Field	1
Cabinet-Rear View	1	Test Equipment	1
CRT Board	4	Troubleshooting	1
CRT Neck Assembly	5	Troubleshooting Aid	1
Key Board	4	Tuner Terminal Guide	3
Main Board-Bottom View	5	Tuner Voltage Chart	3
Main Board-Top View	4,5		
Main Board-Shield Location	3		

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SAMS

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The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co. as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co. by the manufacturers of the particular type of replacement part listed.

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SET 2774 FOLDER 1

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.

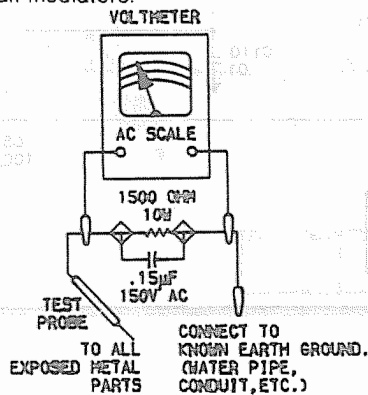
Leakage Current Hot Check

- 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 .15μF 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 (T502). Refer to "Troubleshooting" Power Supply and Horizontal circuits.

NO PIC, NO SOUND, HAS RASTER: Check IF-AGC and source voltages from Horizontal Output Transformer (T502). Refer to "Troubleshooting" IF-AGC and Horizontal circuits.

NO PIC, HAS SOUND, NO RASTER: Check Horizontal Output Transformer (T502) 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 (T502). 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.

TROUBLESHOOTING

POWER SUPPLY

Check the AC Fuse (F801). If Fuse F801 is open, check Bridge Rectifier Diodes D801 thru D804, Thermistor D805, Capacitors C801 thru C803, C807 and C808, Electrolytic C805, and Horizontal Output Transistor Q502. Apply 120V AC, depress power Switch and check for 157V at the cathode of Diode D801. If this voltage is missing, check Relay Drive Transistor Q831 and Power Relay RL831. If 157V is present at the cathode of Diode D801, check for 115V at TP93. If the voltage is missing, check voltages and components associated with Voltage Regulator IC (IC801) and Transistor Q502. If the proper voltage is present at TP93, refer to the "Horizontal" section of this Troubleshooting guide. If the voltage at TP93 is 143V, refer to the "Horizontal" and "High Voltage Shutdown" sections of this Troubleshooting guide.

HORIZONTAL

Determine if TV is in shutdown, refer to the "High Voltage Shutdown" section of this Troubleshooting guide. If TV is not in shutdown, inject a horizontal signal at the base of Horizontal Output Transistor (Q502). If horizontal deflection is now present, check voltages, waveforms and components associated with pins 1 thru 7 of Video/Sound IF/Chroma IC (IC101) and Horizontal Drive Transistor (Q501). If there is still no horizontal sweep, check the voltages, waveforms and components associated with Transistor Q502 and the Horizontal Output Transformer (T502). Check the voltages and components associated with Diodes D506, D507, and D401 for defects. The high voltage rectifier is part of Transformer T502 and if defective will affect the performance of the horizontal circuits. If the horizontal oscillator is off frequency, check the voltages, waveforms and components associated with pins 5, 6 and 7 of IC101. Horizontal linearity or foldover problems may be caused by Capacitors C507, C511, C518 and C519 being defective.

HIGH VOLTAGE SHUTDOWN

The high voltage is monitored by Diode D504, rectifying pulses from the Horizontal Output Transformer (T502). Should the high voltage increase, the rectified voltage at the cathode of Diode D504 will also increase and trigger Zener Diode D505 into conduction, shutting down the set. To troubleshoot, short pin 4 of Video/Sound IF/Chroma IC (IC101) to ground use a variable AC supply and check the voltage at TP93. If the voltage is greater than 115V troubleshoot the Power Supply. If the voltage at TP93 is less than 115V troubleshoot the Shutdown circuit. Remove short to ground from pin 4 of IC101.

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 T502 and associated components. Monitor the high voltage and troubleshoot.

Voltages Taken with TV in Shutdown		
IC101		
Pin 4		.8V

HIGH VOLTAGE SHUTDOWN TEST

Apply 120V AC, turn set On, set all customer controls for normal operation and apply a variable 30V supply through an isolation diode to the cathode of Diode D504. Set should lose raster and sound. If set does not lose raster and sound the shutdown circuit should be repaired. To resume normal operation, remove AC Power and wait 30 seconds then turn set On.

IF-AGC

Inject a video IF signal at the IF Input and check for video on the CRT. If video is present, check the Tuner, Tuner Control and Tuner AFC circuits. If there is no video on the CRT, check for a video waveform at TP12. If video is present at TP12, refer to the "Video" section of this Troubleshooting guide. If there is no video at TP12 apply AGC bias to pin 25 (TP14) of Video/Sound IF/Chroma IC (IC101). If video is now present at TP12, check voltages, waveforms and components associated with pins 24 and 25 of IC101. If there is still no video at TP12, check the voltages, waveforms and components associated with pins 14 thru 18 and 26 thru 29 of IC101 and IF Amp Transistor (Q101). 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 21		7.2V
Pin 24		5.5V
Pin 25		4.8V

AUDIO

Select an active TV channel and check for an audio waveform at pin 23 of Video/Sound IF/Chroma IC (IC101). If there is no audio, check the voltages, waveforms and components associated with pins 18, 19, 20, 22 and 23 of IC101. If audio is present at pin 23 of IC101, check for audio at pin 8 of Audio Output IC (IC201) with volume at Maximum. If there is no audio, check the voltages, waveforms and components associated with IC201. Check for .67V at mute and 11.9V at Maximum volume at pin 4 of IC201.

TROUBLESHOOTING (Continued)

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 42 of Video/Sound IF/Chroma IC (IC101). If there is no video, check voltages, waveforms and components associated with pins 12, 30 thru 33 and 42 of IC101, Video Amp Transistors (Q301, Q303), pins 6, 8, 9, 14 of Switch IC (IC0003) and pin 12 of IC101. If video is present at pin 42 of IC101 check voltages, waveforms and components associated with Video Output Transistor Q302, the CRT and Blue, Green, red Output Transistor (Q351, Q353, Q352). If the brightness is inadequate or cannot be controlled, check the voltages, waveforms and components associated with pins 31 and 33 of IC101 and pin 8 of the CRT.

VERTICAL

Inject a vertical drive signal at pin 10 of Video/Sound IF/Chroma IC (IC101). If vertical deflection is now present, check the voltages, waveforms and components associated with pins 8, 9 and 10 of IC101. If there is still no vertical sweep, check the voltages, waveforms and components associated with the Vertical Output (IC402). Vertical linearity or foldover problems may be caused by vertical feedback and bias circuits, check Electrolytics C409, C407, C410, C412, C414, C416 for defects.

SYNC

If there is no vertical or horizontal sync, check the voltages, waveforms and components associated with pin 17 of Video/Sound IF/Chroma IC (IC101). If there is no vertical

sync, check the voltages, waveforms and components associated with pins 8, 9 and 10 of IC101. If there is no horizontal sync, check voltages and components associated with pins 5, 6 and 7 of IC101.

RASTER

Check the CRT and CRT voltages. If there is no Red, check the voltages and components associated with pin 41 of Video/Sound IF/Chroma IC (IC101) and Red Output Transistor (Q352). If there is no Green, check the voltages and components associated with pin 40 of IC101 and Green Output Transistor (Q353). If there is no Blue, check the voltages and components associated with pin 39 of IC101 and Blue output Transistor (Q351). If raster has a keystone shape, check Deflection Yoke (L503). If raster has height or width problems, refer to the "Vertical", "Horizontal" and "Power" sections of this Troubleshooting guide.

CHROMA

Check for a chroma waveform at pin 13 of Video/Sound IF/Chroma IC (IC101). If the waveform is missing, check the components associated with pin 13. If a chroma waveform is present at pin 13, check for the proper chroma waveforms at pins 39, 40 and 41 of IC101. If these waveforms are missing, check the voltages, waveforms and components associated with pins 11, 13 and 34 thru 41 of IC101. Check the 3.58MHz oscillator at pin 37 of IC101. Check the voltages and components associated with the Color Control and pin 34 of IC101. If there is inadequate tint range, check the voltages, waveforms and components associated with the Tint Control and pins 35 thru 38 of IC101. If the proper chroma waveforms are present at pins 39, 40 and 41 of IC101, refer to the "Raster" section of this Troubleshooting guide.

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:
T101, T151

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 4.5V bias to TP14.

VIDEO IF ALIGNMENT (SWEEP MARKER GENERATOR)

DIRECT PROBE FROM SWEEP GENERATOR	SWEEP GENERATOR OUTPUT	MARKER GENERATOR FREQUENCY	REMARKS
TP12	TP on Tuner	45.75MHz	Adjust T101 for maximum gain and symmetry of IF response. See Figure 1

TV ALIGNMENT INSTRUCTIONS (Continued)
VIDEO IF ALIGNMENT (BAR SWEEP GENERATOR)

BAR SWEEP GENERATOR	SCOPE INPUT	REMARKS
Connected to Antenna Terminals	TP12	Perform video IF adjustments per Sweep/Marker Generator instructions. See Figure 2

SOUND IF ALIGNMENT

Tune in a station and adjust T202 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 T202.

AUTOMATIC FINE TUNING ALIGNMENT

Connect as explained in preliminary instructions unless specified otherwise.
Connect a 4.5V bias to TP14.

DIRECT PROBE FROM SWEEP GENERATOR	SWEEP GENERATOR OUTPUT	MARKER GENERATOR FREQUENCY	REMARKS
TP103	To TP on Tuner.	45.75MHz	Adjust T151 to place 45.75MHz marker at crossover as shown. See Figure 3

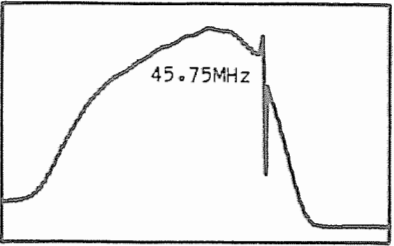


Figure 1

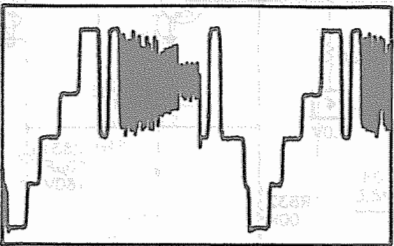


Figure 2

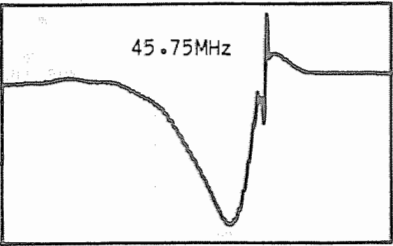
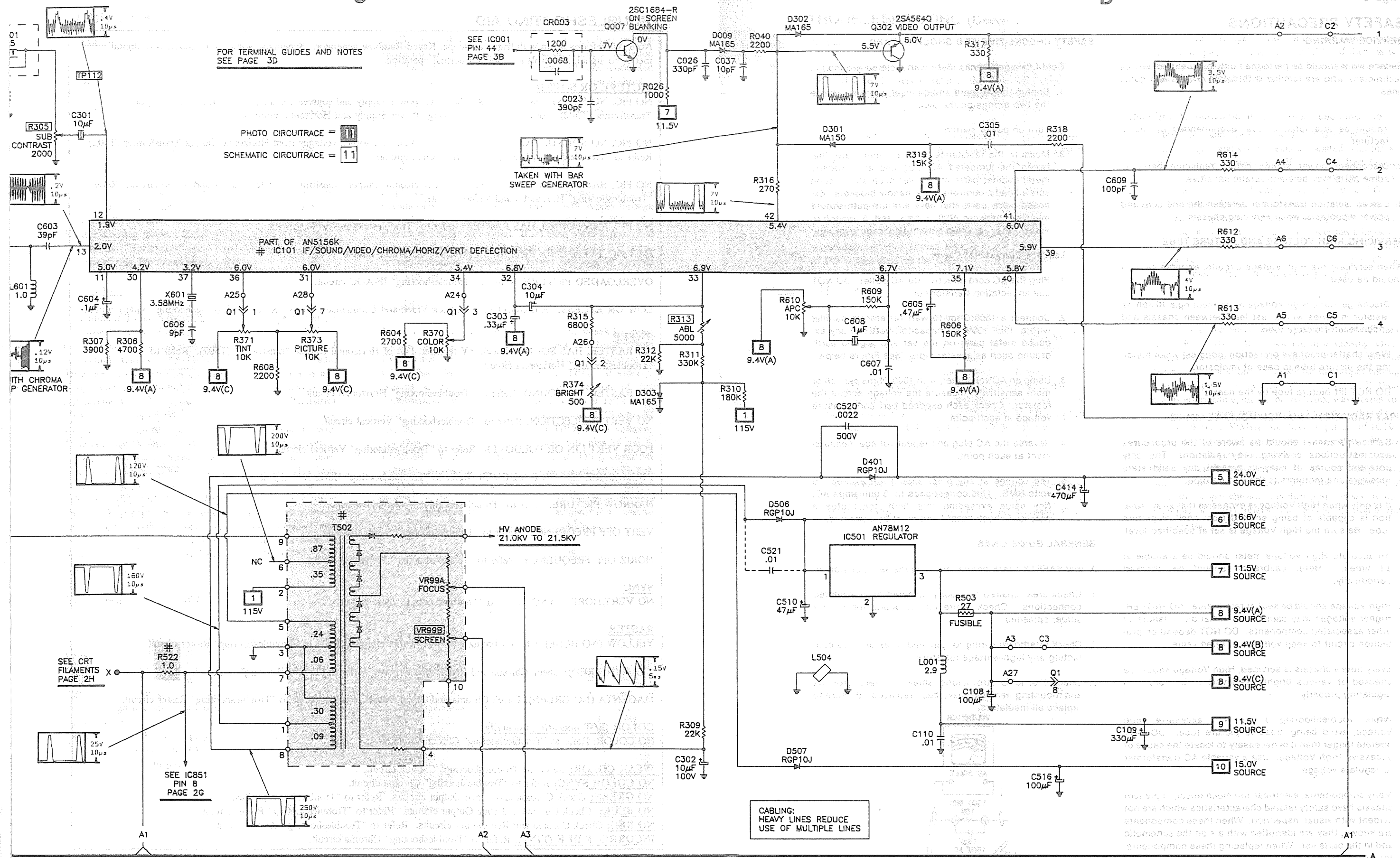
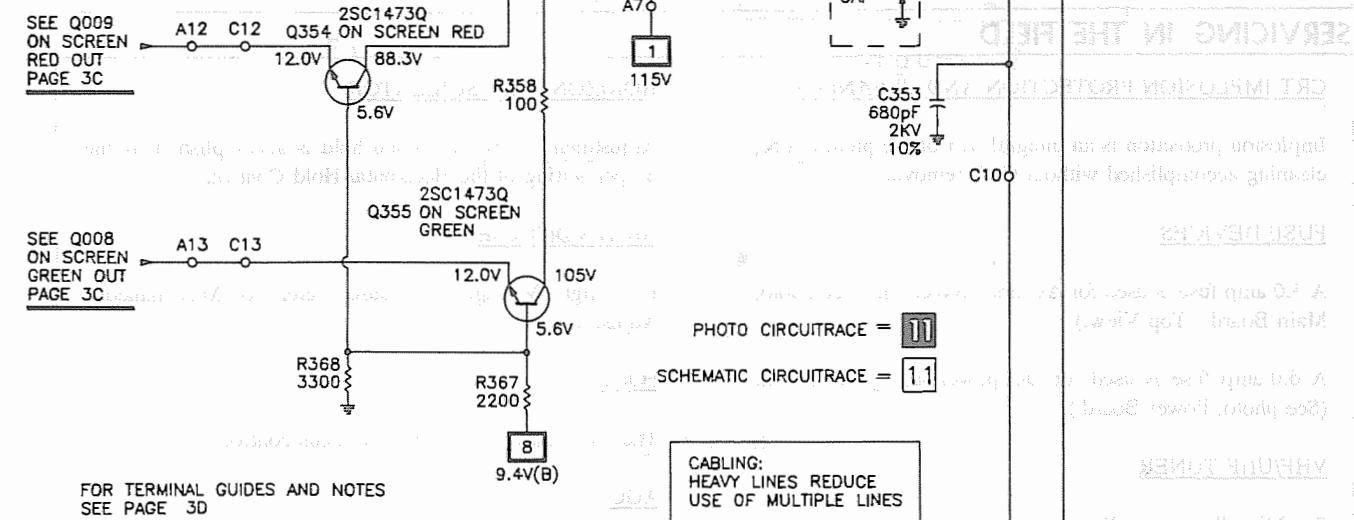
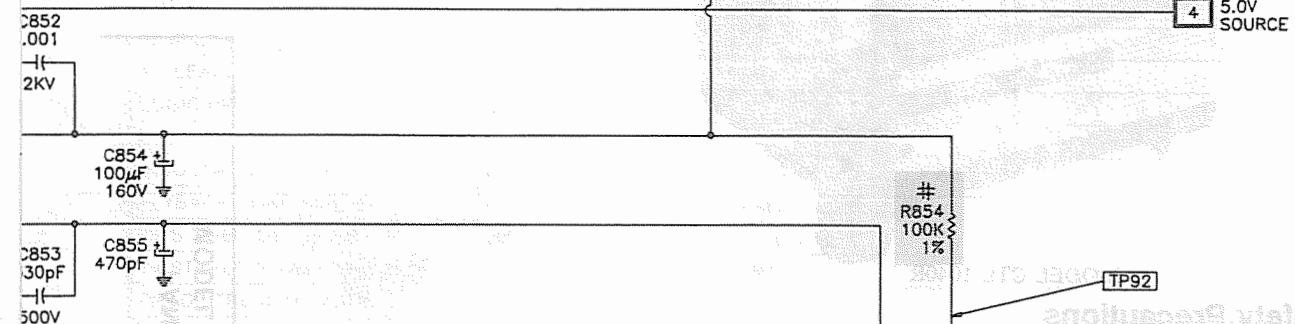


Figure 3

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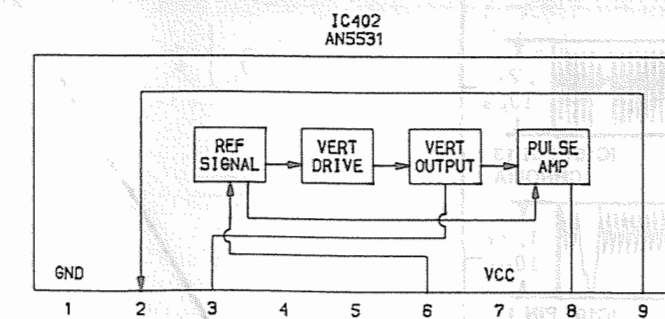
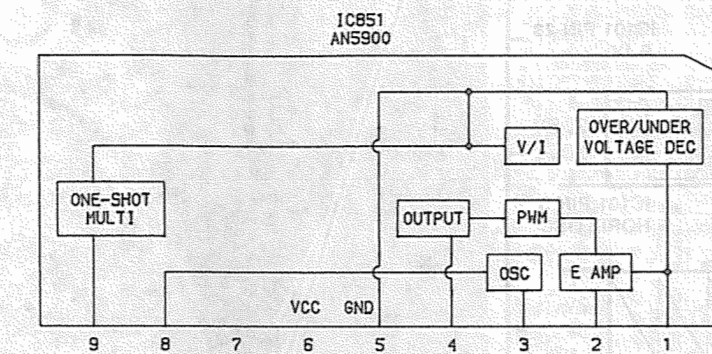
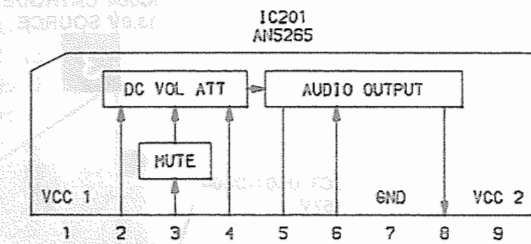
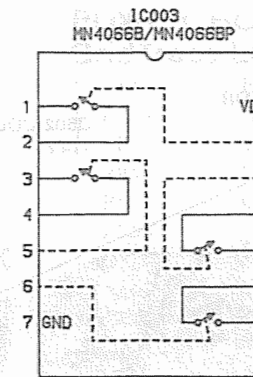
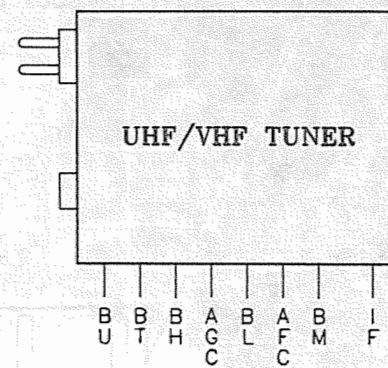


TUNER VOLTAGE CHART

	BU	BT	BH	AGC	BL	AFC	BM	IF
VHF Low Band	.2V	1.6V	0V	7.9V	11.5V	5.9V	11.5V	0V
VHF High Band	.2V	7.9V	11.5V	7.9V	.2V	5.9V	11.5V	0V
UHF Band	11.5V	2.2V	0V	7.9V	0V	5.9V	11.5V	0V

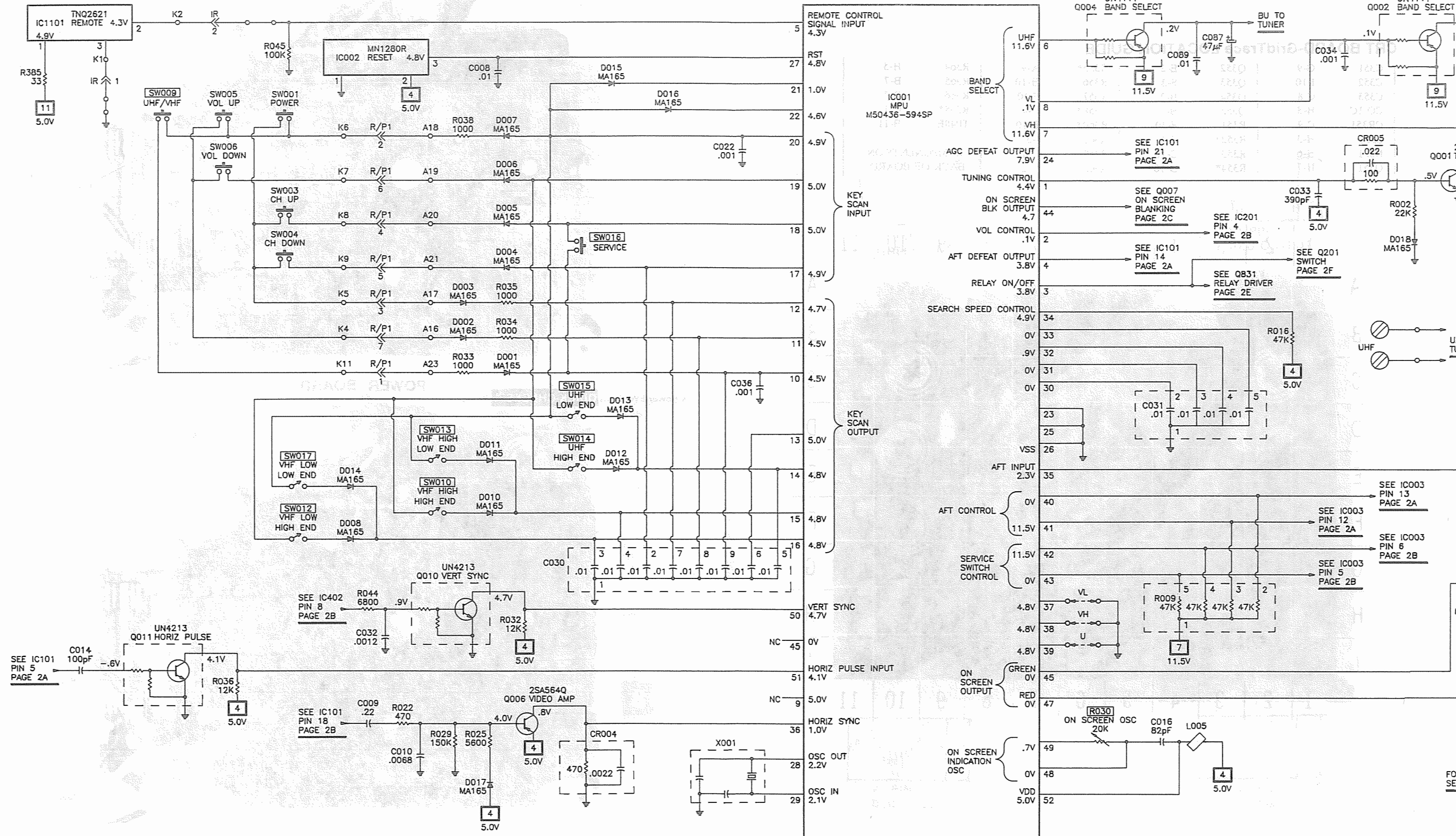
NOTE: VHF Low Band voltages taken on channel 2.
VHF High Band voltages taken on channel 7.
UHF Band voltages taken on channel 14.

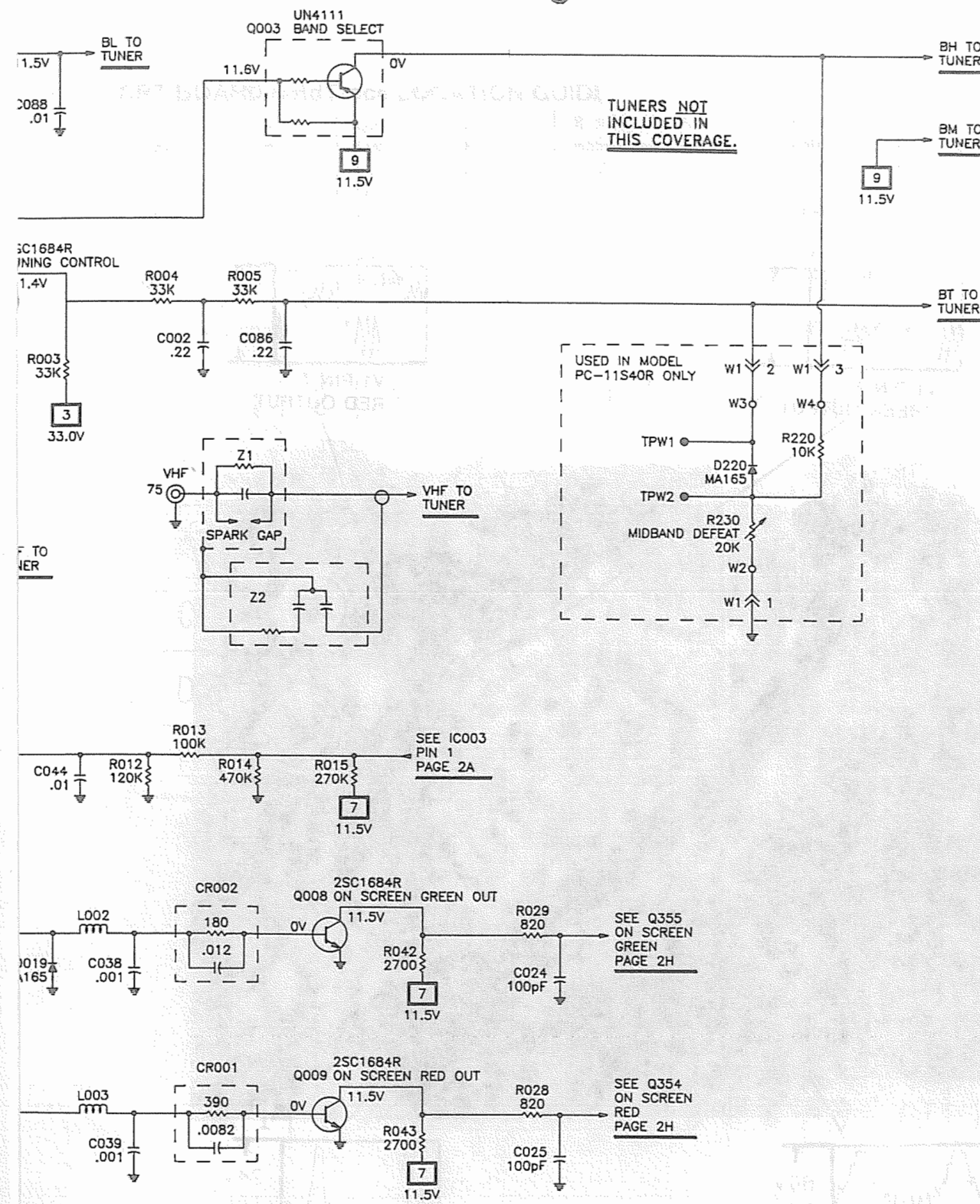
TUNER TERMINAL GUIDE



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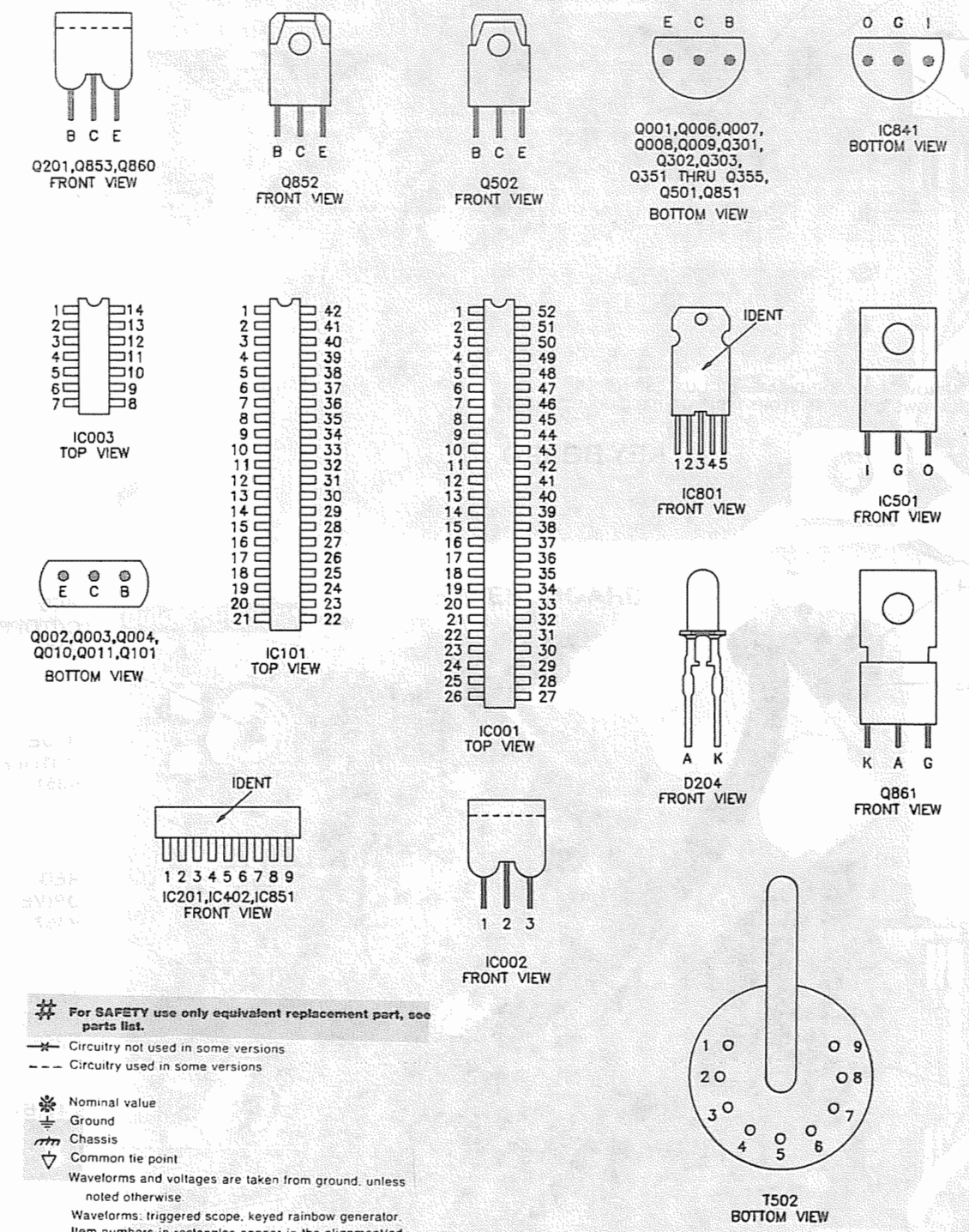
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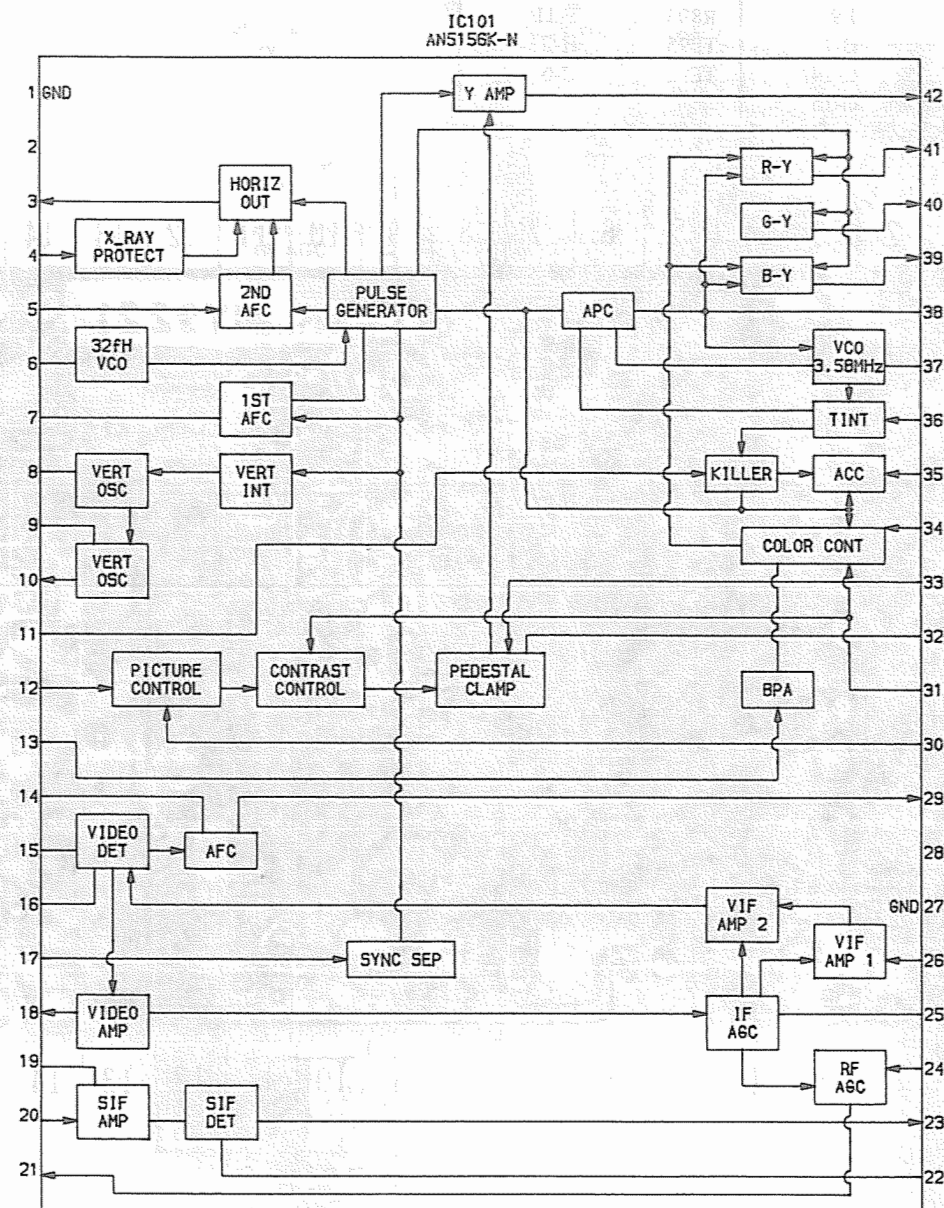




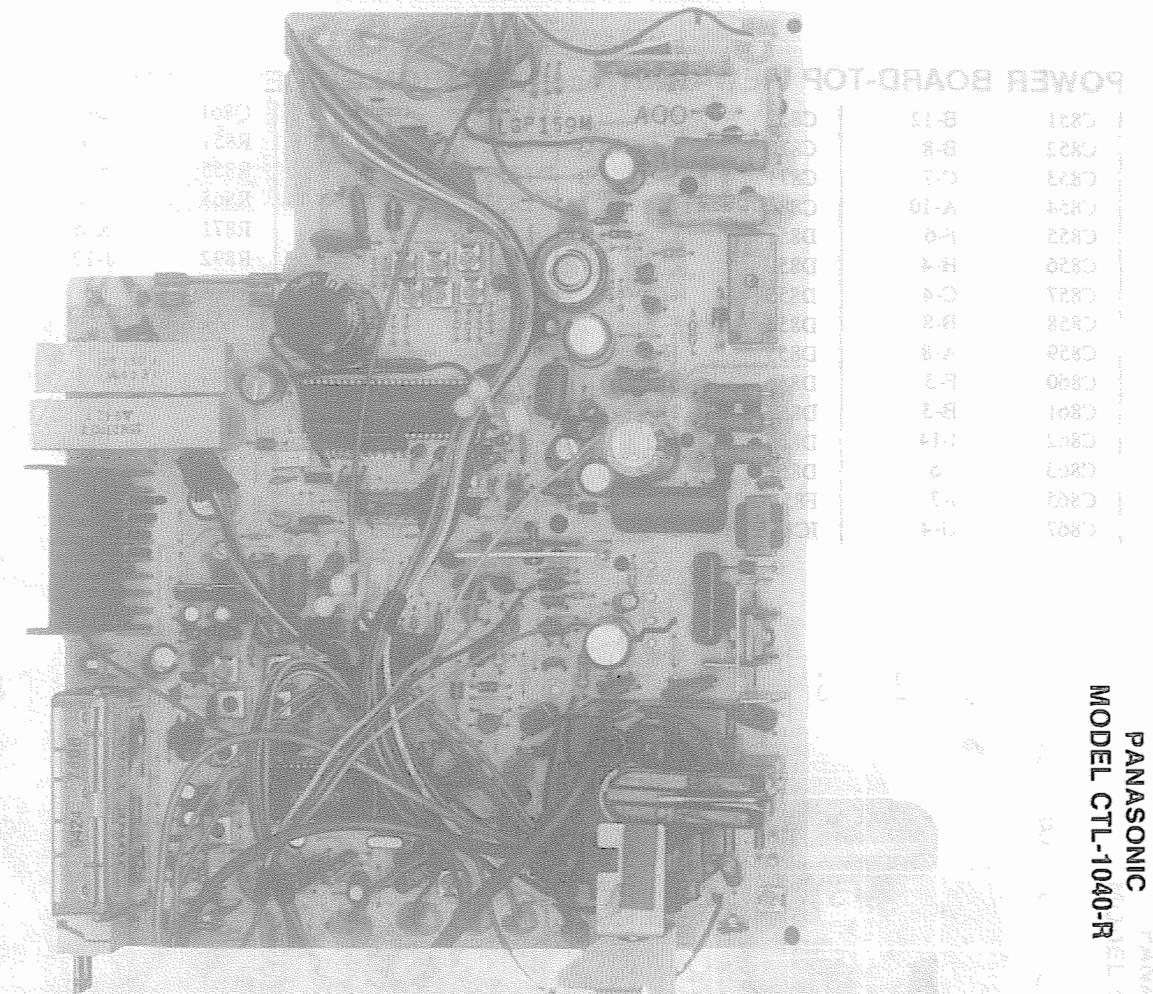
TERMINAL GUIDES AND NOTES
PAGE 3D

PHOTO CIRCUITRACE = 11
SCHEMATIC CIRCUITRACE = 11

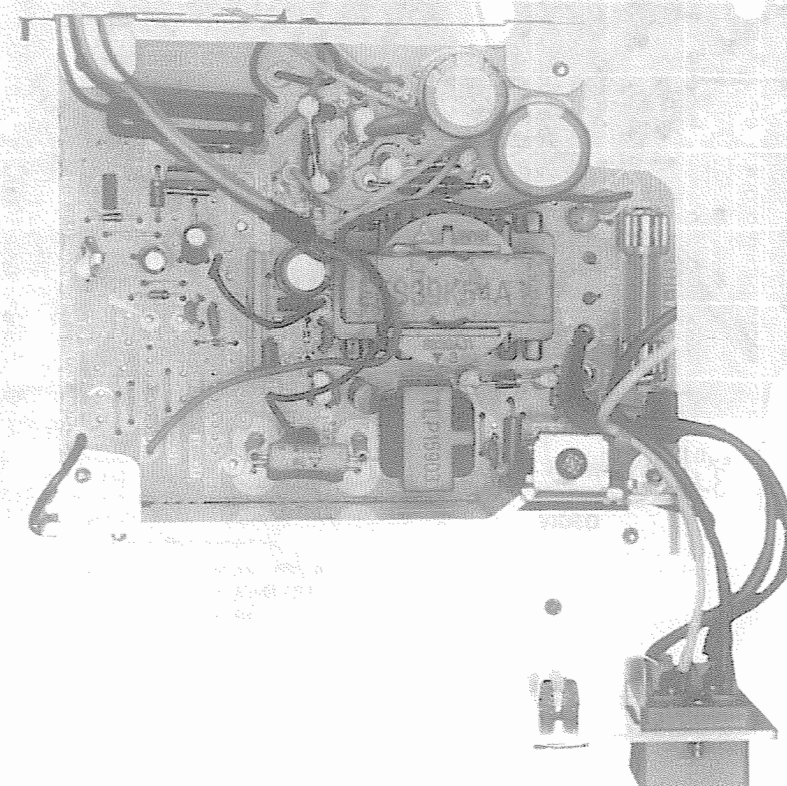




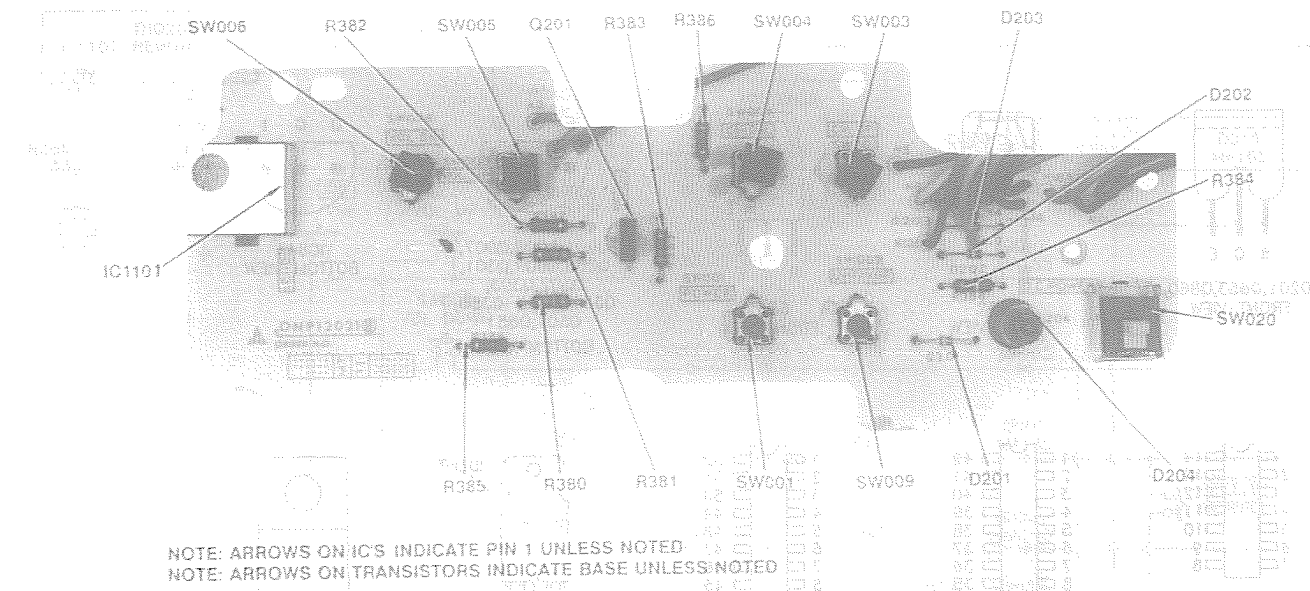
IC FUNCTIONS



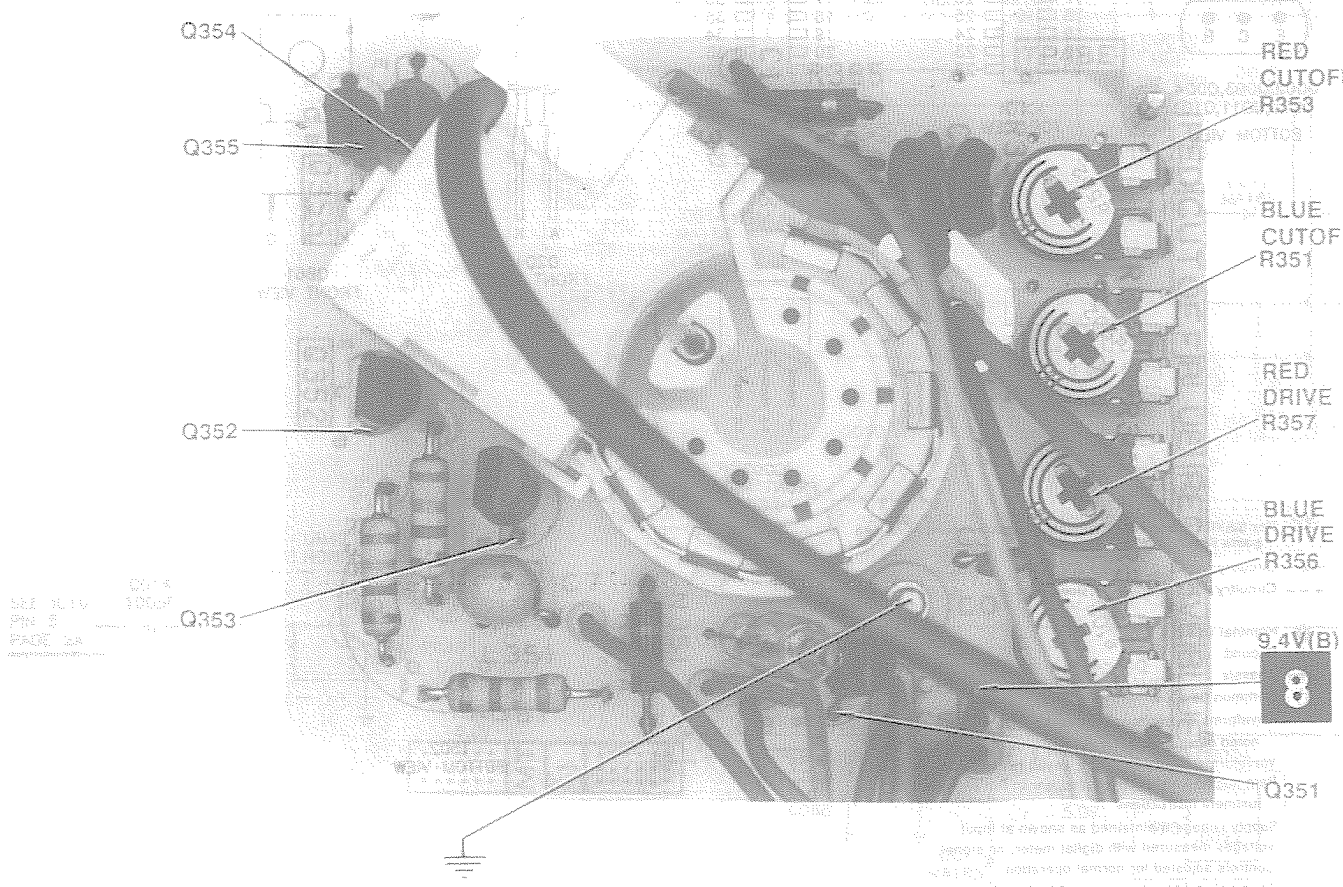
MAIN BOARD-SHIELD LOCATION



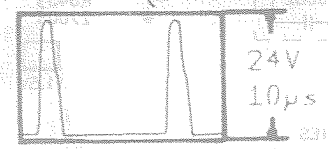
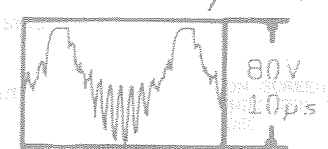
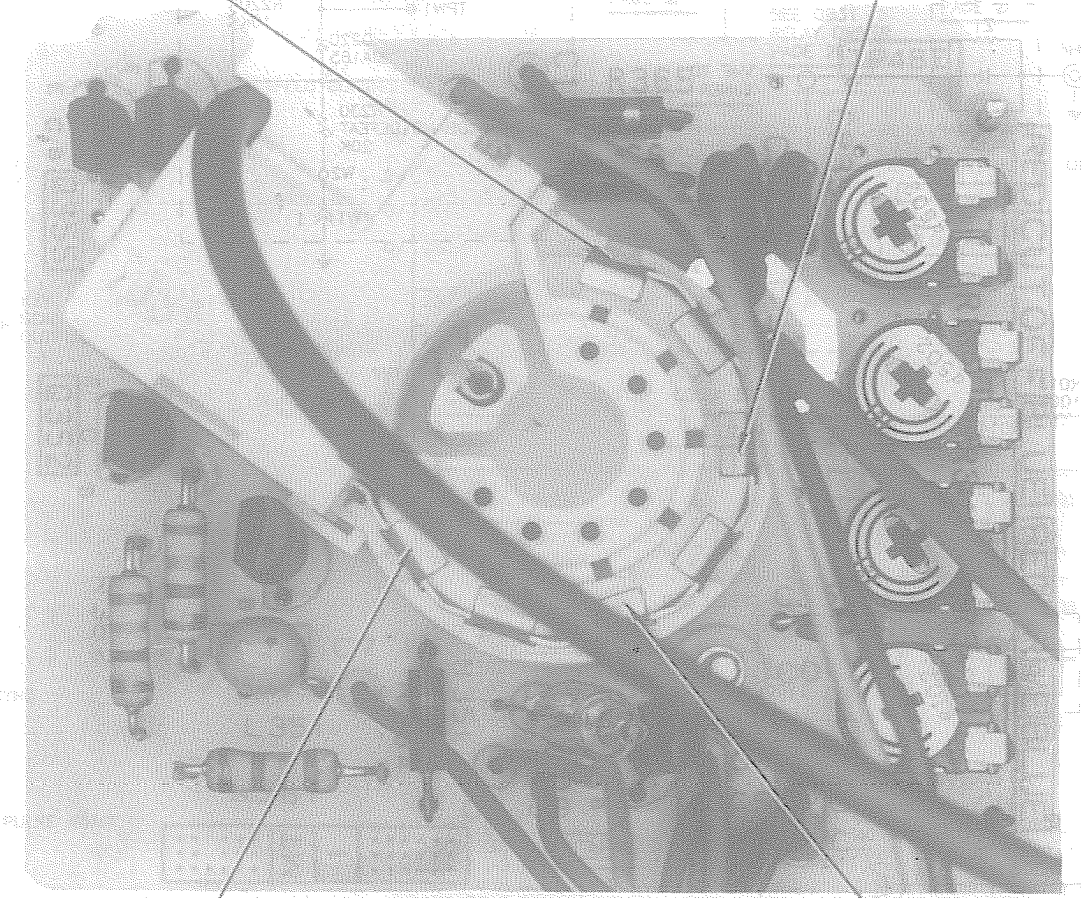
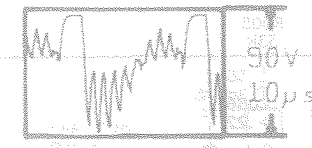
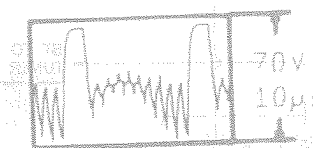
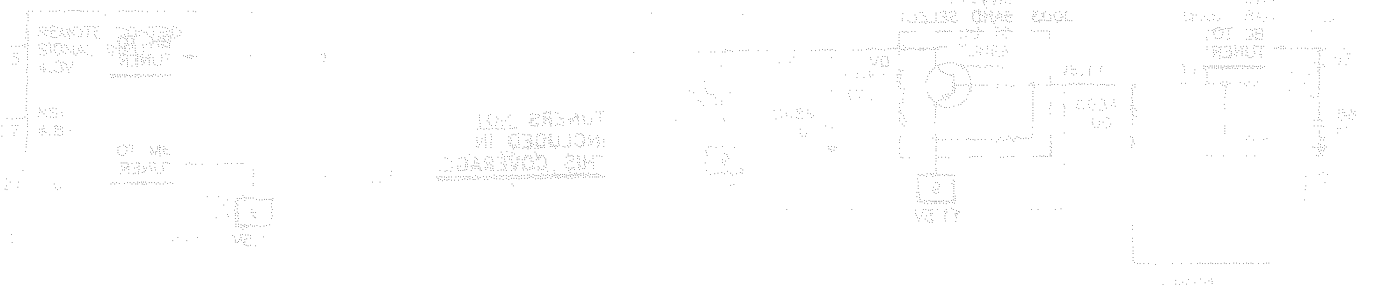
POWER BOARD-OVERALL VIEW



KEY BOARD

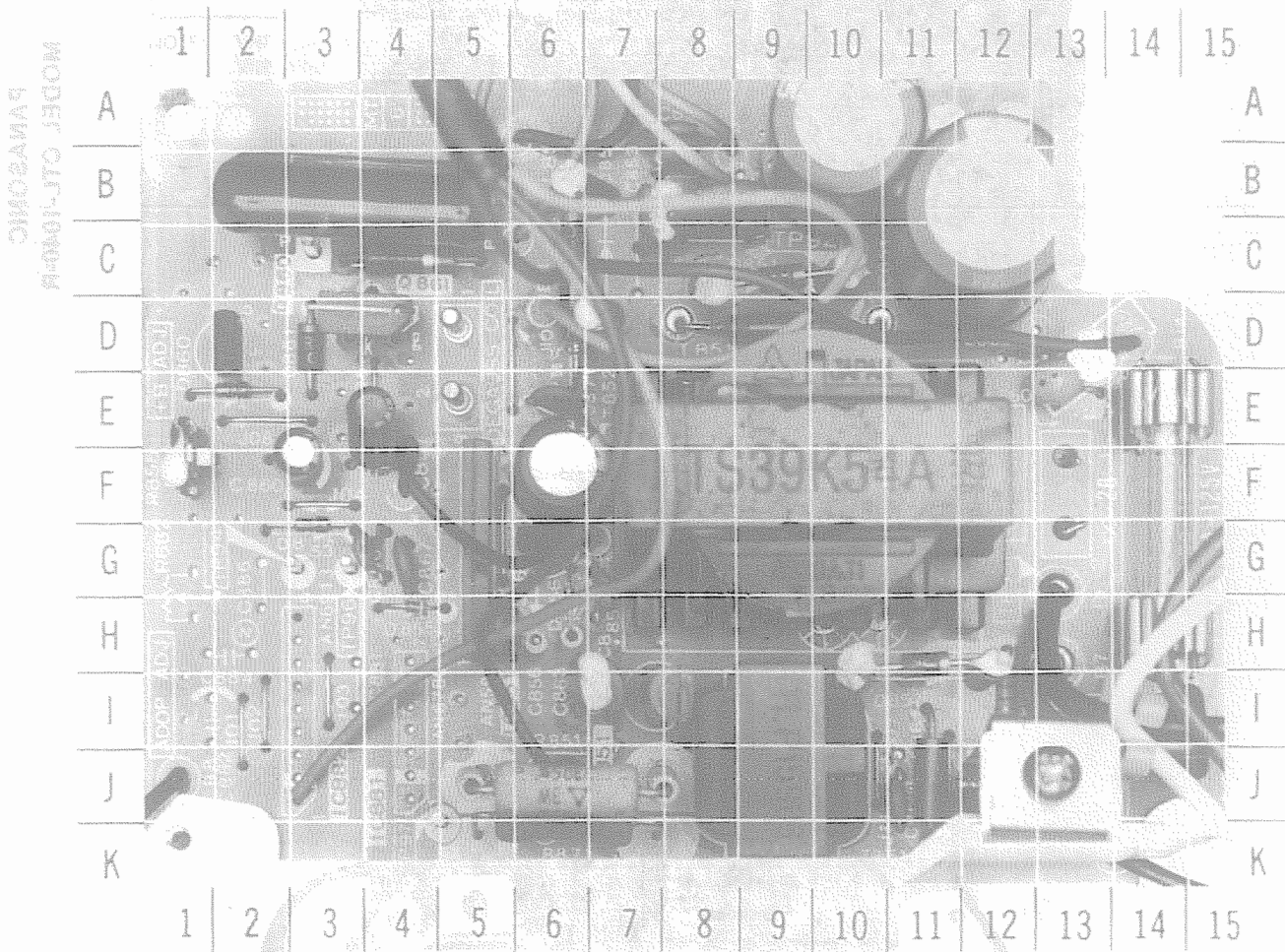


NOTE: ARROWS ON TRANSISTORS INDICATE BASE UNLESS NOTED



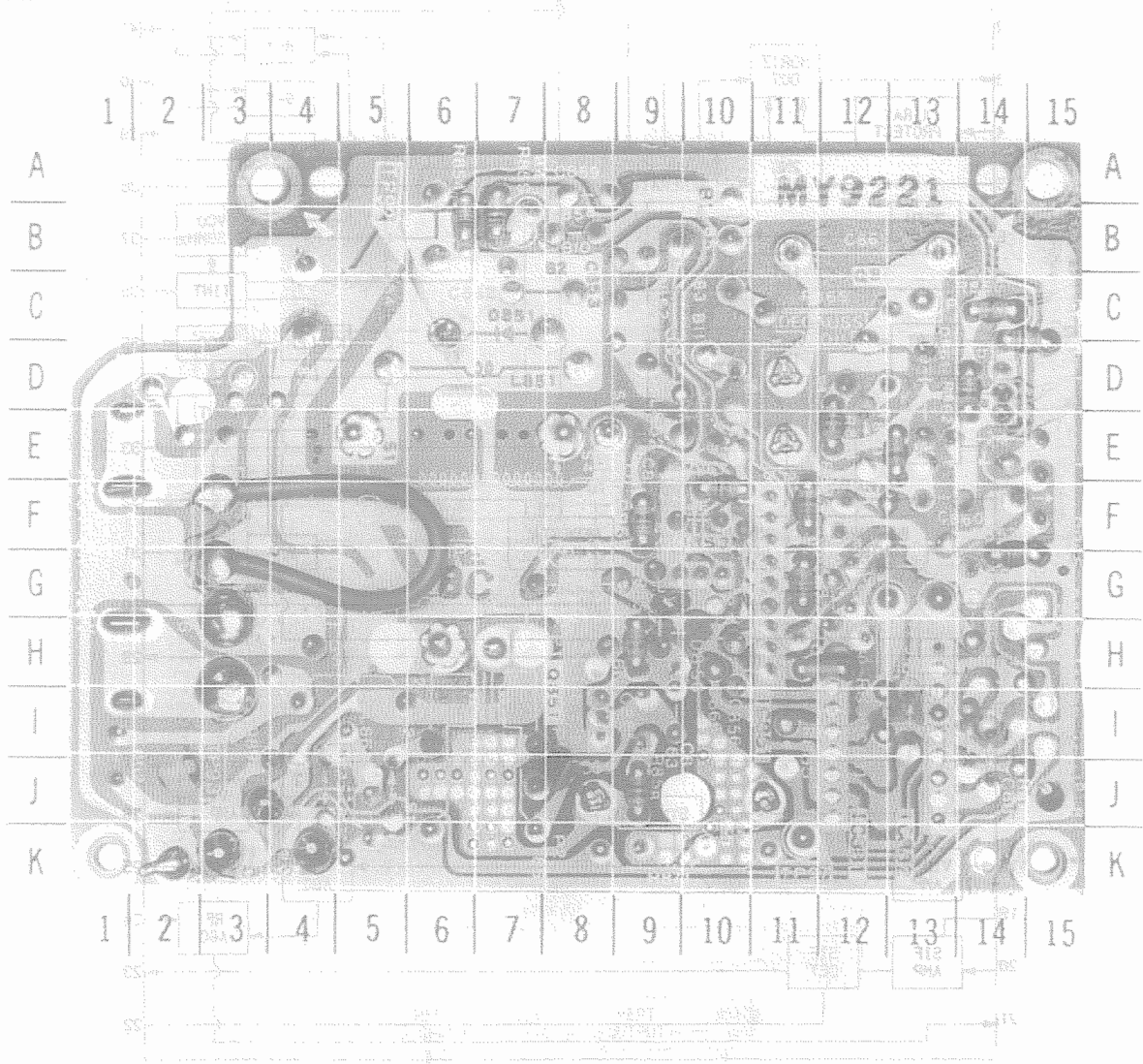
POWER BOARD-TOP VIEW-GridTrace LOCATION GUIDE

C851	B-12	C868	G-4	L851	D-9	Q861	D-4
C852	B-8	C870	J-11	L852	C-6	R851	J-6
C853	C-7	C871	E-6	L853	C-8	R855	F-1
C854	A-10	C885	H-7	L854	C-10	R865	C-4
C855	F-6	D851	C-9	L855	D-7	R871	K-6
C856	H-4	D852	C-6	L856	B-7	R892	I-12
C857	C-4	D853	G-3	L857	H-12	T851	J-9
C858	B-8	D854	F-8	L858	H-10	T852	F-10
C859	A-8	D855	H-4	L860	E-13	TP94	G-3
C860	F-3	D856	H-6	L861	J-11	TP96	G-3
C861	B-3	D857	H-11	P	C-3	TP97	K-5
C862	I-14	D860	E-2	Q851	I-7	1	D-5
C863	I-6	D861	D-3	Q852	J-13	2	E-5
C865	I-7	F851	F-14	Q853	G-6		
C867	G-4	IC851	G-5	Q860	D-2		



POWER BOARD-BOTTOM VIEW-GridTrace LOCATION GUIDE

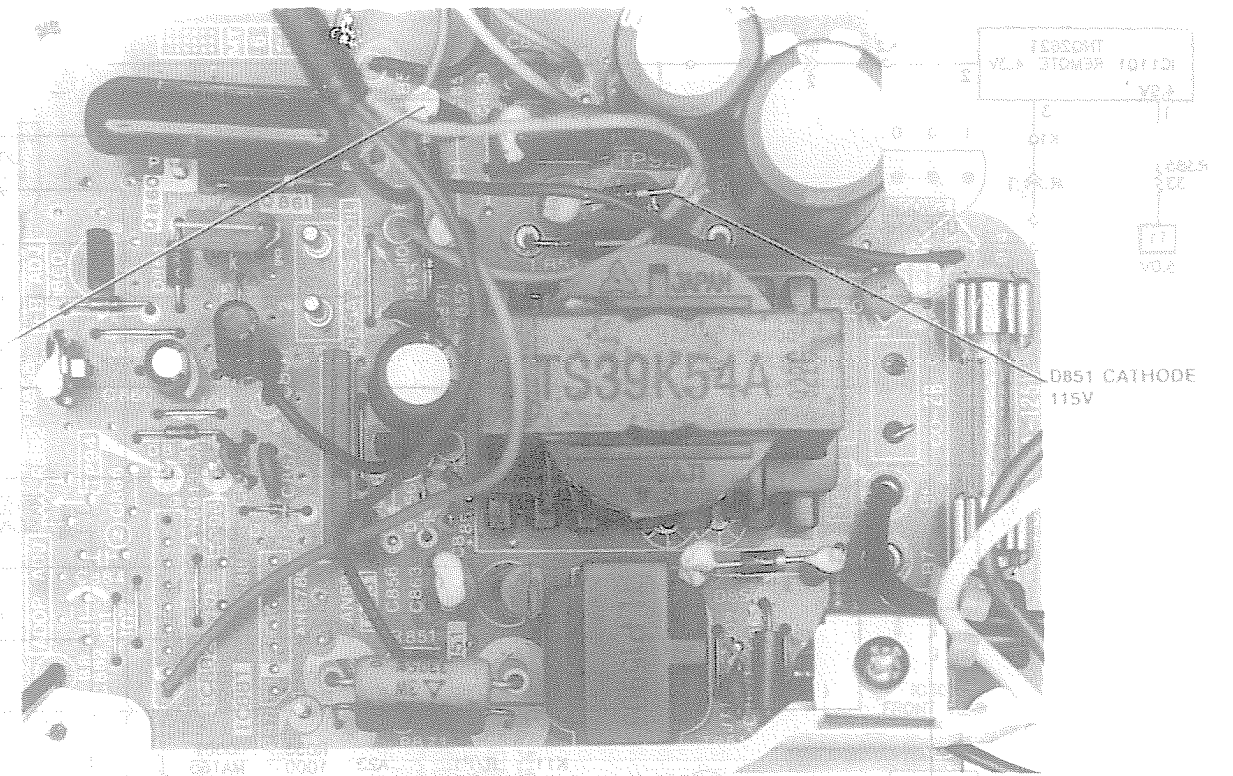
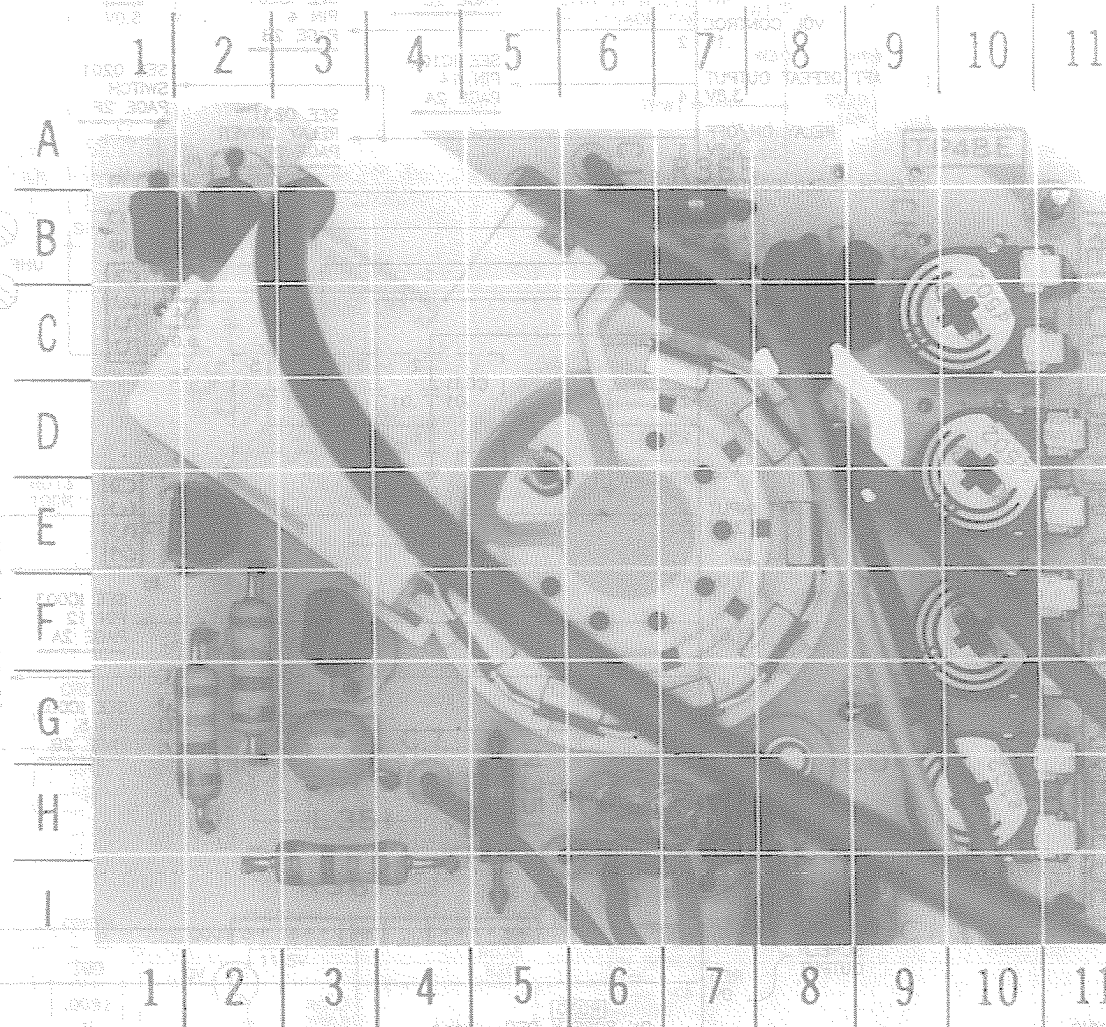
R852	F-9	R862	D-14
R853	H-12	R863	E-13
R854	B-6	R864	E-12
R856	G-14	R866	H-9
R857	G-11	R867	F-10
R858	J-9	R893	F-11
R859	B-7	TP95	H-3
R860	C-14	TP92	C-6
R861	C-15		



CRT BOARD-GridTrace LOCATION GUIDE

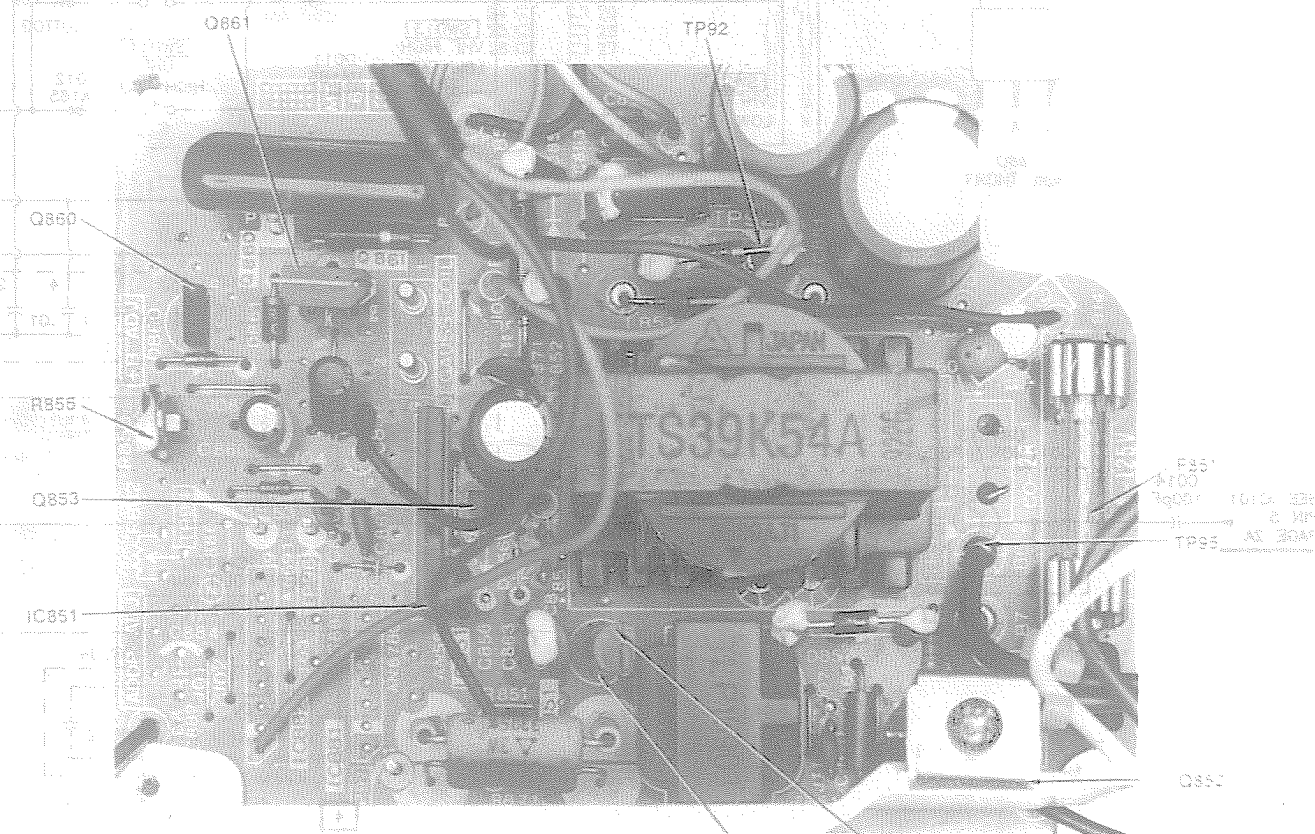
C351	G-9	Q352	E-2	R355*	A-9	R364	H-5
C352	I-10	Q353	F-3	R356	H-10	R365	B-7
C353	C-8	Q354	B-2	R357	F-10	R366	B-7
CO-1C	H-8	Q355	B-1	R358*	C-4	R368*	C-1
CR351	C-9	R351	E-10	R360*	B-10	TP48E	B-11
L351	H-3	R352*	F-9	R361	I-3		
N351	H-6	R353	C-10	R362	G-2	*COMPONENTS ON BACK OF BOARD.	
Q351	H-7	R354*	D-10	R363	G-2		

*COMPONENTS ON
BACK OF BOARD.



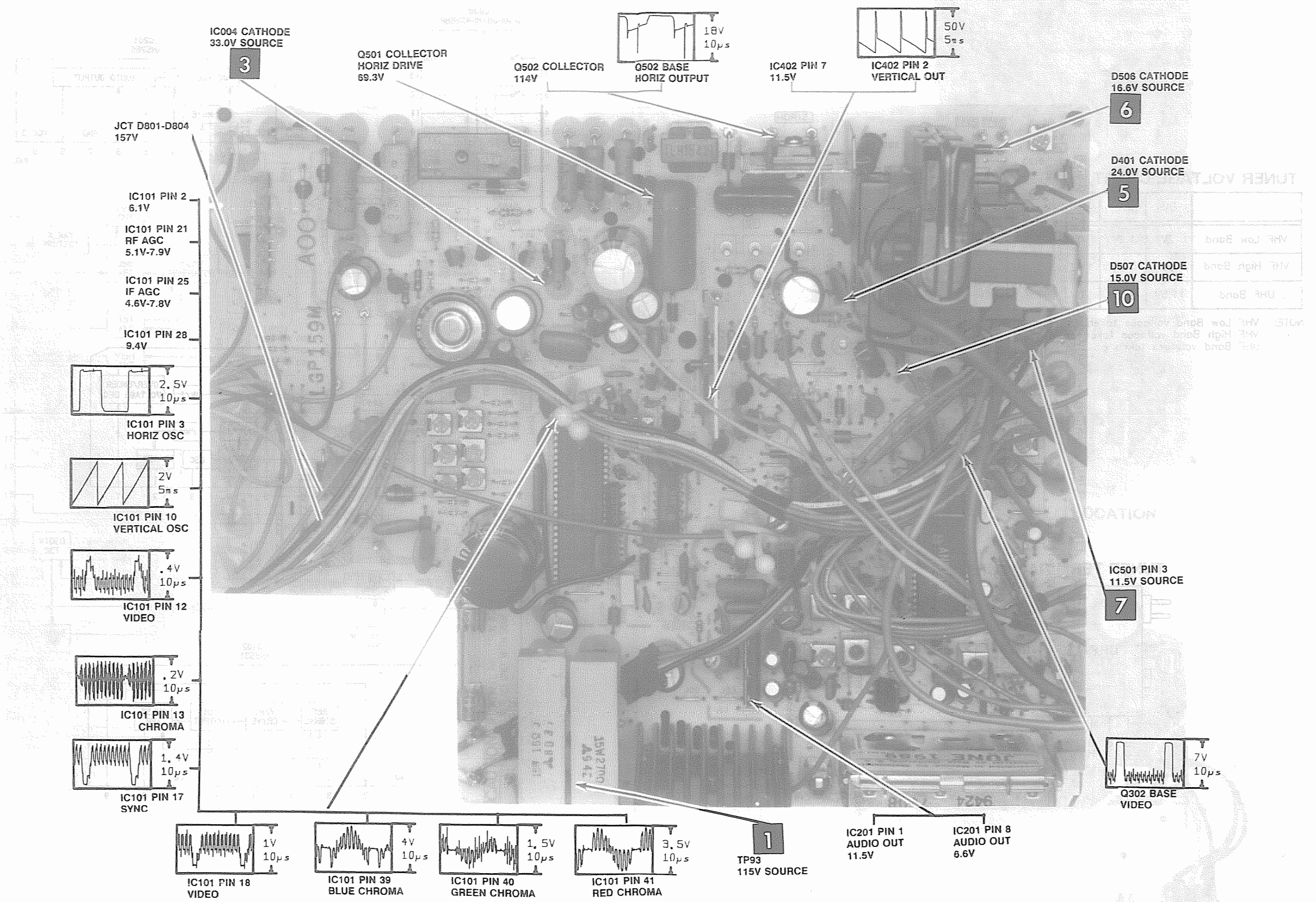
POWER BOARD

A Howard W. Sams **QUICK-CHECKS™** Photo



NOTE: ARROWS ON IC'S INDICATE PIN 1 UNLESS NOTED
NOTE: ARROWS ON TRANSISTORS INDICATE BASE UNLESS NOTED

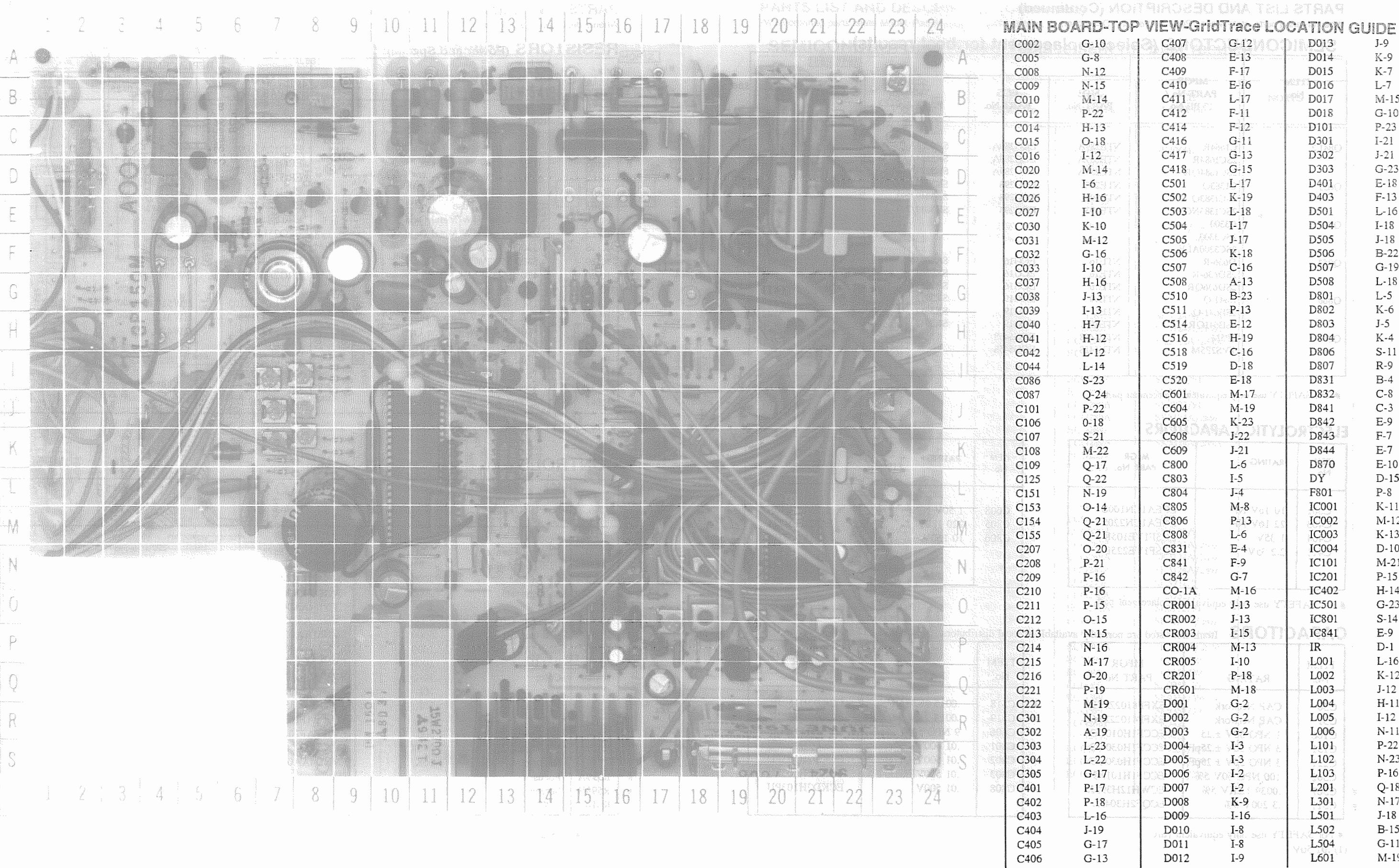
POWER BOARD





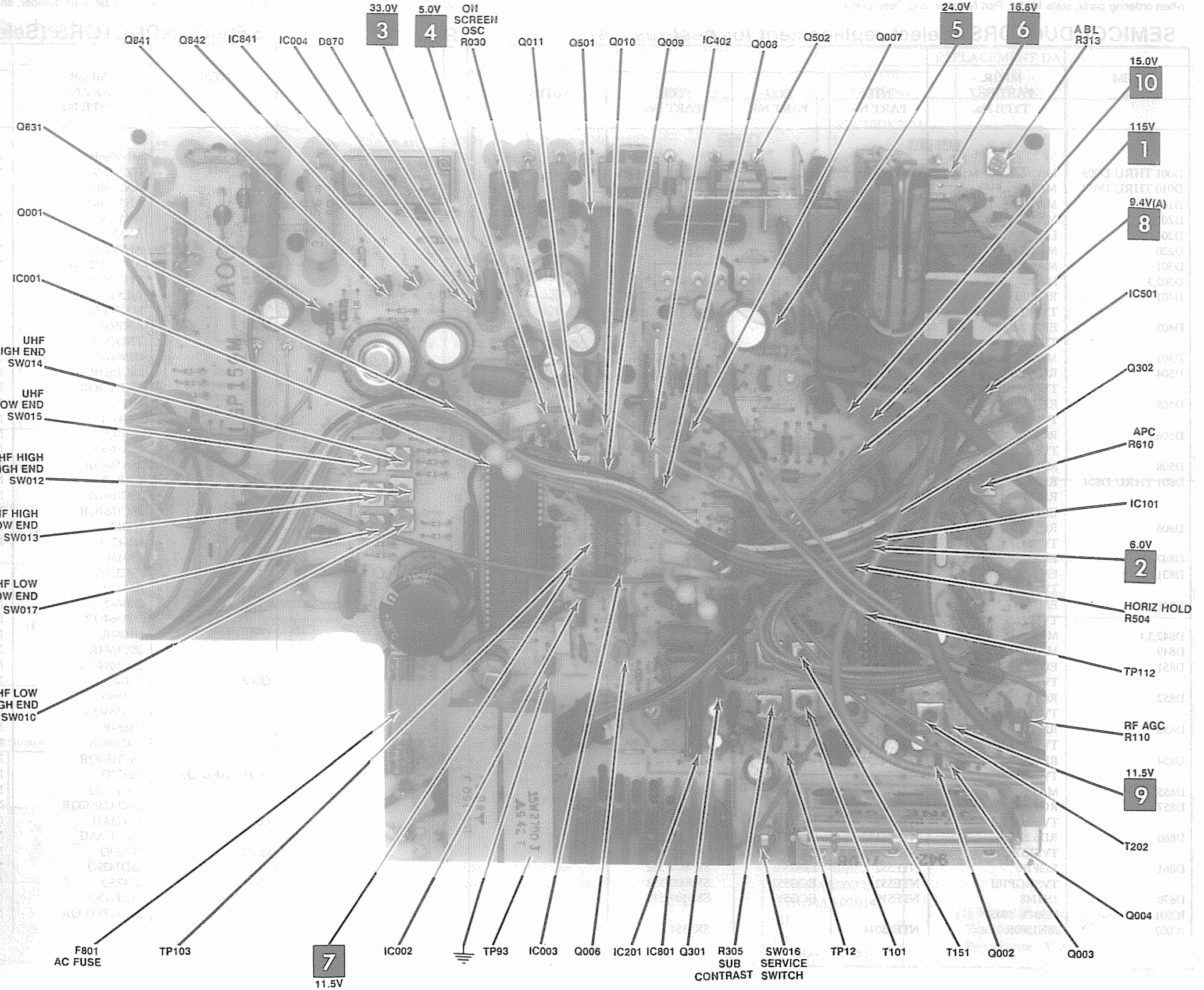
**MAIN BOARD-BOTTOM VIEW-
GridTrace LOCATION GUIDE**

C024	I-11	R209	O-10
C025	I-11	R301	M-10
C034	J-15	R302	N-8
C035	J-15	R303	M-8
C036	N-15	R304	O-7
C043	G-9	R306	M-3
C088	Q-4	R309	A-5
C089	Q-2	R310	A-5
C102	O-2	R311	A-3
C103	M-3	R312	D-2
C204	P-6	R315	H-2
C206	N-4	R316	J-4
C415	L-5	R317	I-4
D019	J-12	R318	F-8
L007	L-9	R320	L-9
R002	H-16	R401	P-8
R003	F-15	R402	P-8
R004	G-16	R406	L-6
R005	H-15	R408	G-14
R007	G-19	R409	F-13
R008	G-18	R412	F-10
R013	L-11	R413	G-14
R014	L-11	R414	C-2
R015	K-11	R501	L-5
R016	N-12	R502	L-7
R018	O-15	R508	E-14
R022	N-11	R510	J-8
R023	N-12	R512	K-6
R025	M-11	R513	J-7
R026	H-9	R514	L-7
R028	I-12	R515	K-8
R029	J-11	R606	K-3
R032	I-14	R609	I-3
R033	F-23	R612	J-5
R034	G-22	R613	J-5
R035	H-22	R614	J-6
R036	I-14	R843	F-17
R037	G-19	R844	F-18
R038	H-19	R845	F-17
R041	F-19	R846	F-17
R042	J-10	R847	E-18
R045	F-23	R848	E-17
R101	Q-2	TP12	N-5
R102	P-2		
R104	O-2		
R105	N-3		
R106	M-5		
R108	M-4		
R109	P-1		
R111	Q-2		
R152	Q-6		
R153	Q-5		
R202	O-3		
R203	O-4		
R204	N-5		
R205	N-4		
R206	P-10		
R207	O-10		
R208	O-10		



MAIN BOARD-TOP VIEW

N801	Q-10	R849	E-8
Q001	H-9	R851	E-6
Q002	Q-22	RL831	B-8
Q003	Q-22	SW010	K-8
Q004	R-24	SW012	J-8
Q006	N-13	SW013	J-7
Q007	H-15	SW014	I-8
Q008	J-15	SW015	I-7
Q009	I-13	SW016	S-17
Q010	H-13	SW017	K-7
Q011	H-12	T101	O-18
Q301	O-16	T151	N-18
Q302	J-21	T202	P-20
Q501	C-13	T501	B-14
Q502	B-16	T502	E-21
Q831	E-6	TP14	N-21
Q841	E-7	TP15	S-20
Q842	E-8	TP15E	S-20
R009	K-12	TP85	A-22
R010	K-16	TP86	A-22
R012	L-14	TP93	S-10
R017	G-16	TP103	K-13
R039	O-15	X001	N-12
R040	J-16	X101	O-23
R044	G-15	X102	P-16
R089	E-10	X201	P-19
R103	Q-23	X601	K-22
R107	P-17		
R110	P-24		
R151	O-17		
R210	H-17		
R305	P-17		
R313	B-23		
R319	I-21		
R403	I-19		
R407	B-24		
R410	F-15		
R411	E-15		
R503	G-23		
R504	L-19		
R505	H-21		
R507	K-16		
R511	K-16		
R518	B-10		
R519	B-11		
R520	B-20		
R522	F-12		
R610	J-23		
R802	L-6		
R804	Q-11		
R805	P-12		
R807	R-11		
R808	R-10		
R831	C-6		
R832	D-7		
R833	F-6		
R840	A-3		
R841	C-4		
R842	C-9		



MISCELLANEOUS ADJUSTMENTS

PRETUNING

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

Add Channel

1. Select VHF/UHF by pressing the VHF/UHF button.
2. Select channel.
3. Press and hold the "A" button for 2 seconds.
4. Press the "B" button.
5. Press and hold the "A" button for 2 seconds.
6. Repeat steps 1 thru 5 to add other channels.

Delete Channel

1. Select channel.
2. Press and hold the "A" button for 2 seconds.
3. Press the "1" button.
4. Press and hold the "A" button for 2 seconds.
5. Repeat steps 1 thru 4 to Delete other channels.

The following Control settings were used for all adjustments unless otherwise indicated: Brightness (R374), Picture (R373), Color (R370), and Tint (R371) to normal viewing levels, Vertical Hold (R372) for a stable picture, UHF/VHF Switch (SW009) to select UHF/VHF, and D.C. Power Switch (SW020) to select AC/DC power input.

B+ ADJUSTMENT (AC)

Tune in a picture. Set Brightness (R374), Picture (R373), and Color (R370) Controls to MINIMUM. Connect a Digital DC Voltmeter to TP93, Low side to Ground. With AC Line Voltage at 120VAC, B+ should read 115.0 VDC ± 1 VDC.

B+ ADJUSTMENT (DC)

Connect a 12VDC source (with a 6 amp capacity) to the power connector. Connect a Digital DC Voltmeter to TP92, low side to TP95. Adjust DC B+ (R855) for 113.0 VDC ± 0.5 VDC.

HIGH VOLTAGE CHECK

Tune in a picture. Set Brightness (R374), Picture (R373), and Color (R370) to MINIMUM. Connect a High Voltage Probe to CRT anode. High Voltage should be 10.9 KV to 22.0 KV. High Voltage must never exceed 23.5KV.

AGC ADJUSTMENT

Tune in a picture. Adjust RF AGC Control (R110) Counterclockwise until snow appears in picture, then Clockwise to a point just past where snow disappears.

SUB BRIGHTNESS ADJUSTMENT

Tune in a picture. Set Brightness (R374), Color (R370), and Picture (R373) Controls to MINIMUM. Adjust Sub Brightness (ABL) (R313) for just visible highlights. Set Brightness and Picture Controls to Maximum Readjust Sub Brightness if required.

SUB CONTRAST ADJUSTMENT

Tune in a picture. Set Picture (R373), and Brightness (R374) to MINIMUM. Connect an Oscilloscope to TP112 (IC101 Pin 12), low side to Ground. Adjust Sub Contrast (R305) for 0.3V p-p video portion of waveform.

HORIZONTAL HOLD ADJUSTMENT

Tune in a picture. Adjust Horizontal Hold Control (R504) until picture stands straight.

CW ADJUSTMENT

Tune in a Color Bar pattern. Set APC Control (R610) fully Clockwise. Adjust APC Control Counterclockwise until color just locks in. Tune from channel to channel and check color sync, readjust if required.

CHANNEL NUMBER DISPLAY LOCATION ADJUSTMENT

Tune in a picture. Press and hold recall button on remote transmitter. Adjust Position (R030) to center the channel number display on the screen.

TUNING DISPLAY INDICATOR ADJUSTMENT

Press and hold recall button on remote transmitter throughout this adjustment.

VHF low channels 2 - 6

Tune in channel 2 or closest station. Set (SW017) to center the tuning indicator under the channel number selected.

Tune in channel 6 or closest station. Set (SW010) to center the tuning indicator under the channel number selected.

VHF high band channels 7 - 13

Tune in channel 7 or closest station. Set (SW013) to center the tuning indicator under the channel number selected.

Tune in channel 13 or closest station. Set (SW012) to center the tuning indicator under the channel number selected.

MISCELLANEOUS ADJUSTMENTS (Continued)

UHF channels 14 - 69

Tune in channel 69 or closes station. Set (SW014) to center the tuning indicator under the channel number selected.

COLOR PURITY ADJUSTMENT

Operate the receiver for 15 minutes with brightness control at Maximum. Tune in a blank raster or crosshatch pattern. Use a Degaussing coil to demagnetize the CRT and mounting hardware. Set Picture (R373), Color (R370), Red (R353), and Blue (R351) Cut Off Controls to MINIMUM. Set Brightness (R374) to produce a visible (green) raster. Loosen the Deflection Yoke clamp screw and slide the Deflection Yoke backward to obtain a Vertical green band. Rotate and spread the tabs of the purity magnets 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 Cut Off Controls.

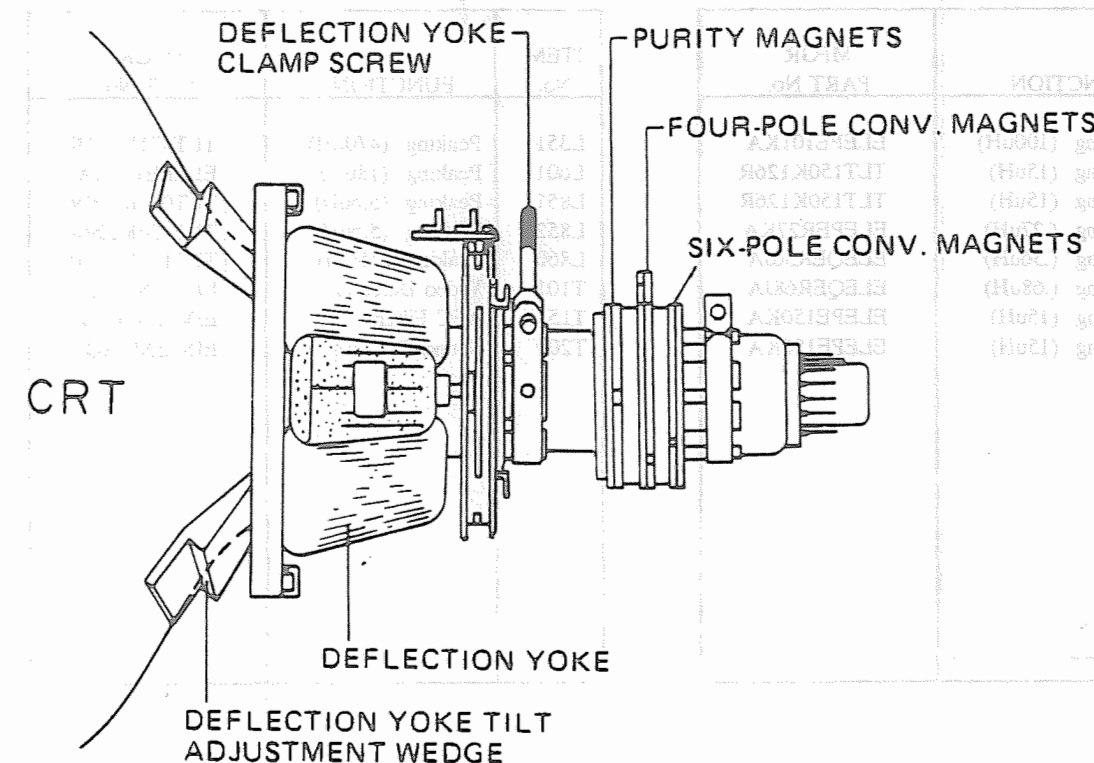
COLOR TEMPERATURE ADJUSTMENT (B/W TRACKING)

Tune in a picture. Set Color (R370), Brightness (R374), Picture (R373), Red (R353), Blue (R351), Cut Off Controls, and Screen Control (VR99B) to MINIMUM. Set Red (R357), and Blue (R356) Drive Controls to Midrange. Set Service Switch (SW016) to Service Position. Slowly advance Screen Control to obtain a dim Horizontal line of one color. Adjust Cut Off Controls to obtain a white line.

Place Service Switch to Normal. Set Brightness and Picture Control to Maximum. Adjust the Blue and Red Drive Controls for best Black and White picture. Check 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 the 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.



CRT NECK ASSEMBLY

PARTS LIST AND DESCRIPTION (Continued)

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

SEMICONDUCTORS (Select replacement for best results)

ITEM No.	MFR. PART No./ TYPE No.				
		NTE PART No.	ECG PART No.	TCE PART No.	NOTES
D001 THRU D009	MA165	NTE519	ECG519	SK3100/519	
D010 THRU D019	MA165	NTE519	ECG519	SK3100/519	
D101	MA27TA	NTE605A	ECG605A	SK7952/605A	
D201,2,3	MA165	NTE519	ECG519	SK3100/519	
D204	LN29RFP				
D220	MA165	NTE519	ECG519	SK3100/519	
D301	MA150	NTE519	ECG519	SK3100/519	
D302,3	MA165	NTE519	ECG519	SK3100/519	
D401	RGP10J	NTE552	ECG552	SK9000/552	
	TVSRGP10J	NTE552	ECG552	SK9000/552	
D403	ERB12-02	NTE116	ECG116	SK3311	
	TVSB1202	NTE116	ECG116	SK3311	
D501	MA4047M	NTE5009A	ECG5009A	SK4A7/5009A	
D504	RGP-10J	NTE552	ECG552	SK9000/552	
	TVSRGP10J	NTE552	ECG552	SK9000/552	
D505	RD12EBM	NTE5021A	ECG5021A	SK12A/5021A	#
	TVSRD12EB1	NTE5021A	ECG5021A	SK12A/5021A	
D506,7	RGP10J	NTE552	ECG552	SK9000/552	
	TVSRGP10J	NTE552	ECG552	SK9000/552	
D508	MA4030M	NTE5004A	ECG5004A	SK3A0/5004A	
D801 THRU D804	RM11B	NTE125	ECG125	SK3081/125	#
	RM-11B	NTE125	ECG125	SK3081/125	
	ERC0508	NTE125	ECG125	SK3081/125	
D806	RGP10J	NTE552	ECG552	SK9000/552	#
	TVSRGP10J	NTE552	ECG552	SK9000/552	
D807	ERZC10DK241U	NTE2V150	ECG2V150	SKMV150J/2V150	#
D831,2	EM1	NTE116	ECG116	SK3313/116	
	TVSEM1	NTE116	ECG116	SK3313/116	
D841	EM1	NTE116	ECG116	SK3313/116	
	TVSEM1	NTE116	ECG116	SK3313/116	
D842,3,4	MA165	NTE519	ECG519	SK3100/519	
D849	MA165	NTE519	ECG519	SK3100/519	
D851	EU2A	NTE552	ECG552	SK9000/552	
	TVSEU2A	NTE552	ECG552	SK9000/552	
D852	RGP10J	NTE552	ECG552	SK9000/552	
	TVSRGP10J	NTE552	ECG552	SK9000/552	
D853	RD6.2EB1	NTE5013A	ECG5013A	SK6A2/5013A	#
	TVSRD6.2EB1	NTE5013A	ECG5013A	SK6A2/5013A	
D854	RD6.2EB1	NTE5013A	ECG5013A	SK6A2/5013A	
	TVSRD6.2EB1	NTE5013A	ECG5013A	SK6A2/5013A	
D855,6	MA165	NTE519	ECG519	SK3100/519	
D857	RGP10J	NTE552	ECG552	SK9000/552	
	TVSRGP10J	NTE552	ECG552	SK9000/552	
D860	RD6.2EB3	NTE5013A	ECG5013A	SK6A2/5013A	
	TVSRD6.2EB	NTE5013A	ECG5013A	SK6A2/5013A	
D861	RGP10J	NTE552	ECG552	SK9000/552	
	TVSRGP10J	NTE552	ECG552	SK9000/552	
D870	1N4148	NTE519	ECG519	SK3100/519	
IC001	M50436-594SP				
IC002	MN1280R	NTE15044		SK9854	

PARTS LIST AND DESCRIPTION (Continued)

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

SEMICONDUCTORS (Select replacement for best results)

ITEM No.	MFR. PART No./ TYPE No.				
		NTE PART No.	ECG PART No.	TCE PART No.	NOTES
IC003	MN4066B	NTE4066B	ECG4066B	SK4066B	
IC004	HZT33-04	NTE615P	ECG615A		
IC101	AN5156K				#
	AN5156KN				
IC201	AN5265	NTE1789	ECG1789		
IC402	AN5531				#
IC501	AN78M12	NTE966	ECG966	SK3592/966	
	AN78M12-LB	NTE966	ECG966	SK3592/966	
IC801	STR30115				#
IC841	78L56				
	M5278L56				
IC851	AN5900				
IC1101	TNQ2621				
Q001	C1684R	NTE289A	ECG289A	SK3124A/289A	
	2SC1684R	NTE289A	ECG289A	SK3124A/289A	
	2SC1684QR	NTE289A	ECG289A	SK3124A/289A	
Q002,3,4	N4111	NTE2356	ECG2356		
	UN4111	NTE2356	ECG2356		
Q006	A564Q	NTE290A	ECG290A	SK3932/91	
	2SA564Q	NTE290A	ECG290A	SK3932/91	
	2SA564QR	NTE290A	ECG290A	SK3932/91	
Q007,8,9	C1684R	NTE289A	ECG289A	SK3124A/289A	
	2SC1684R	NTE289A	ECG289A	SK3124A/289A	
	2SC1684QR	NTE289A	ECG289A	SK3124A/289A	
Q010,11	N4213	NTE2359	ECG2359		
	UN4213	NTE2359	ECG2359		
Q101	C3315C				
	2SC3315C				
Q201	B642-Q	NTE19	ECG19	SK3912	
	2SB642-Q	NTE19	ECG19	SK3912	
	2SA564QR	NTE290A	ECG290A	SK3932/91	
Q301	C1684R	NTE289A	ECG289A	SK3124A/289A	
	2SC1684R	NTE289A	ECG289A	SK3124A/289A	
	2SC1684QR	NTE289A	ECG289A	SK3124A/289A	
Q302	A564Q	NTE290A	ECG290A	SK3932/91	
	2SA564Q	NTE290A	ECG290A	SK3932/91	
	2SA564QR	NTE290A	ECG290A	SK3932/91	
Q303	C1684R	NTE289A	ECG289A	SK3124A/289A	
	2SC1684R	NTE289A	ECG289A	SK3124A/289A	
	2SC1684QR	NTE289A	ECG289A	SK3124A/289A	
Q351 THRU Q355	C1473Q	NTE399	ECG399	SK9352/399	
	2SC1473Q	NTE399	ECG399	SK9352/399	
	2SC1473NCQR	NTE399	ECG399	SK9352/399	
Q501	C1473AH	NTE399	ECG399	SK9352/399	
	2SC1473AH	NTE399	ECG399	SK9352/399	
Q502	D1439Q	NTE2302	ECG2302	SK9422	#
	2SD1439Q	NTE2302	ECG2302	SK9422	
Q831	C1473Q	NTE399	ECG399	SK9352/399	
	2SC1473Q	NTE399	ECG399	SK9352/399	
	2SC1473NCQR	NTE399	ECG399	SK9352/399	

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
# L503	Yoke 90° Horiz 3.75mh Vert 21.9mh	TLY15395F1	TLY15395F (1)	
T501	Horizontal Drive	TLH15419	TLH15419 (1)	
# T502	Horizontal Output	TLF14743F	TLF14743F (1)	
# T203	Earphone	ETA16Z17AY	A1617 (1)	
T851	Converter Drive	TLP15903	TLP15903 (1)	
# T852	Converter Output	ETS39K54A	ETS39K54A (1)	

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

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR PART No.	QUAM PART No.	
SP1	Speaker 16 Ohm 2 1/2"	EAS65P34DG		On Unit 65P34D-G

COILS (RF-IF)

ITEM No.	FUNCTION	MFGR PART No.
L001	Peaking (100uH)	ELEPE101KA
L002	Peaking (15uH)	TLT150K126R
L003	Peaking (15uH)	TLT150K126R
L004	Peaking (.27uH)	ELEPER27KA
L101	Peaking (.56uH)	ELEQER56JA
L102	Peaking (.68uH)	ELEQER68JA
L103	Peaking (15uH)	ELEPE150KA
L201	Peaking (15uH)	ELEPE150KA

ITEM No.	FUNCTION	MFGR PART No.
L351	Peaking (470uH)	TLT471K991R
L601	Peaking (18uH)	ELEPE180KA
L851	Peaking (5.6uH)	TLT056K109R
L852	Peaking (5.6uH)	TLT056K109R
L860	Peaking (150uH)	TLT151K991R
T101	Video Detector	EIV7EN059B
T151	AFC Filter	EIV7EN060B
T202	Sound Detector	EIS7EN008B

PARTS LIST AND DESCRIPTION (Continued)

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

MISCELLANEOUS

ITEM No.	DESCRIPTION	MFGR. PART No.	NOTES
CR001	Capristor	EXRP391K123S	
CR002	Capristor	EXRP181K822S	
CR003	Capristor	EXRP122K682S	
CR004	Capristor	EXRP471K222S	
CR005	Capristor	EXRP101K223S	
CR201	Capristor	EXPP820K333C	
CR351	Capristor	EXRP331K471T	
CR601	Capristor	EXRP180K332S	
# F801	Fuse, AC	XBA1F30NU100	3 Amp @ 125VAC Slow Blow
F801A	Fuse Holder	TJC6319	Two used
# F851	Fuse, DC	XBA1F60NU100	6 Amp @ 125VAC Slow Blow
F851A	Fuse Holder	TJC6319	Two used
IC1101	Remote Receiver	TNQ2621	
L005	Ferrite Bead	TSK1008	
L006	Ferrite Bead	TSK1008	
L007	Ferrite Bead	TSK1008	
L301	Delay Line	EIK7EN002Q	
L501	Ferrite Bead	TSK1008	
L502	Ferrite Bead	TSK1008	
# L802	Degaussing Coil	TLK159025M	
N351	Lamp, Neon	XANT137	Spark Suppression, CRT Filament
# N801	Lamp, Neon	XANT141	Spark Suppression, Power Supply
# RL831	Relay	TSE1838	Power
SW001	Switch	EVQQSN04T	Power
SW003	Switch	EVQQSN04T	Channel Up
SW004	Switch	EVQQSN04T	Channel Down
SW005	Switch	EVQQSN04T	Volume Up
SW006	Switch	EVQQSN04T	Volume Down
SW009	Switch	EVQQSN04T	UHF/VHF
SW010	Switch	EVND48A00	Adjustable, Range, VHF Low Band
SW012	Switch	EVND48A00	Adjustable, Range, VHF High Band
SW013	Switch	EVND48A00	Adjustable, Position, VHF High Band
SW014	Switch	EVND48A00	Adjustable, Range, UHF Band
SW015	Switch	EVND48A00	Adjustable, Positopm UHF Band
SW016	Switch	EVQQSN04T	Service
SW017	Switch	EVND48A00	Adjustable Position, VHF Low Band
SW020	Switch	ESB6460	DC Power
X001	Crystal	EF0FC4194A4	Tuning Clock
X101	Saw Filter	EFCH45MVK11T	4.5MHz
X102	Trap	EFCS4R5MW3	4.5MHz Bandpass
X201	Filter	EFCS4R5MS4E	3.58MHz Oscillator
X601	Crystal	TSS816E	
#	AC Cord	TSX117	
	Antenna, UHF	OSA1100021	

PARTS LIST AND DESCRIPTION (Continued)

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

SEMICONDUCTORS (Select replacement for best results)

ITEM No.	MFR. PART No./ TYPE No.	REPLACEMENT DATA			NOTES
		NTE PART No.	ECG PART No.	TCE PART No.	
Q841,2	C1684R	NTE289A	ECG289A	SK3124A/289A	
	2SC1684R	NTE289A	ECG289A	SK3124A/289A	
	2SC1684QR	NTE289A	ECG289A	SK3124A/289A	
Q851	C1383Q	NTE293	ECG293	SK3849/293	
	2SC1383Q	NTE293	ECG293	SK3849/293	
	2SC1383NC	NTE293	ECG293	SK3849/293	
Q852	C3300				
	2SC3300				
	2SC3300ALF				
Q853	D636-R	NTE16	ECG16	SK9664	
	2SD636-R	NTE16	ECG16	SK9664	
	2SD636QR	NTE16	ECG16	SK9664	
Q860	B641-Q	NTE19	ECG19	SK3912	
	2SB641-Q	NTE19	ECG19	SK3912	
	2SB641QR	NTE19	ECG19	SK3912	
Q861	2P5M	NTE5458	ECG5458		
	TVS2P5M	NTE5458	ECG5458		

For SAFETY use only equivalent replacement part.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	MFR. PART No.
C301	10 16V NP	ECEA1CN100S
C403	22 16V NP	ECEA1CN220S
C404	1 35V	ECSF1VE105K
C411	2.2 35V	ECSF1VE225B

For SAFETY use only equivalent replacement part.

CAPACITORS Items not listed are normally available at local distributors.

ITEM No.	RATING	MFR. PART No.
C30	CAP Network	EXFP8102ZF(1)
C31	CAP Network	EXFP41022ZF(1)
C106	1 NPO 50V \pm .25	ECCF1H010CC
C151	3 NPO 50V \pm .25pF	ECCF1H030CC
C221	3 NPO 50V \pm .25pF	ECCF1H030CC
C502	100 NPO 50V 5%	ECCF1H101JC
# C507	.0039 1.2KV 5%	ECWH12H392JS
# C511	.3 200V 5%	ECQF2H304JZ

For SAFETY use only equivalent part.

(1) .01 50V

PARTS LIST AND DESCRIPTION (Continued)

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

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA	
		MFR. PART No.	NTE PART No.
# D807	Varistor	ERZC10DK241U	
R009	Resistor Network	(1)	
# R210	10 5% 1/2W Fuse	ERQ12AJ100	
# R361	15K 5% 1W Metal Oxide	ERG1SJ153	1W315
# R362	15K 5% 1W Metal Oxide	ERG1SJ153	1W315
# R363	15K 5% 1W Metal Oxide	ERG1SJ153	1W315
R503	27 5% 1/2W Fuse	ERQ12AJ270	
# R512	3.92K 1% 1/4W Metal Oxide	ERO25LKF3921	
# R513	2.94K 1% 1/4W Metal Oxide	ERO25LKF2941	
# R518	3300 5% 2W Metal Oxide	ERG2AHJ332	2W233
# R519	3300 5% 2W Metal Oxide	ERG2ANJ332	2W233
# R520	470 5% 2W Metal Oxide	ERG2ANJ471	2W147
# R522	1.0 5% 1/2W Fuse	ERQ12AJ1RO	
# R802	1M 10% 1/2W Carbon Comp	ERC12ZGK105	HW510
# R804	12K 5% 1/2W Carbon Film	ERDS1TJ123	HW312
# R805	180K 5% 1/4W Carbon Film	ERDS2TJ184	QW418
# R806	Fusible	UN11010	
# R807	270 5% 15W WW	ERF15ZYJ271	
# R808	15 5% 15W WW	ERF15ZYJ150	
R831	3300 5% 5W Metal Oxide	ERG5SJ332	
R841	2200 5% 3W Metal Oxide	ERG3ANJ222	3W222

For SAFETY use only equivalent replacement part.

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

ITEM No.	FUNCTION	RESISTANCE	MFR. PART No.	NOTES
R030	Channel Number Display Adjust	20K	EVND4AA00B24	
R110	RF AGC	2000	EVN59UA00B23	
R305	Subcontrast	2000	EVND4AA00B23	
R313	ABL	5000	EVND4AA00B53	
R351	Blue Cut Off	5000	EVN61AA00B53	
R353	Red Cut Off	5000	EVN61AA00B53	
R356	Blue Drive	1000	EVN61AA00B13	
R357	Red Drive	1000	EVN61AA00B13	
R370	Color	10K	EVJFPAF20B14	
R371	Tint	10K	EVJFPAF20B14	
R372	V Hold	30K	EVUF2AE35A34	
R373	Picture	10K	EVJFPAF20B14	
R374	Brightness	500	EVJFPAF20B52	
R407	V Height (size)	200K	EVN64AA00B25	
R504	Horizontal Hold	10K	EVND4AA00B14	
# R599A	Focus		(1)	(1) Part of Horizontal Output Transformer T502, Part Number TLF14743F.
# R599B	Screen		(1)	
R610	APC	10K	EVND4AA00B14	

For SAFETY use only equivalent part.

PARTS LIST AND DESCRIPTION (Continued)

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

MISCELLANEOUS

ITEM No.	DESCRIPTION	MFGR. PART No.	NOTES
#	Antenna, VHF	TSA8108-10Y	
	Power Socket	TJS29780-IPS	
#	CRT	A26JGZ91X	
	CRT Socket	TJS1A5081	
#	DC Cord	TSX1304-2M	Car Battery Cord, Model CTK-1040R
		TXX1304-3M	Car Battery Cord, Model PC-1154OR
#	Magnet Rings	TLC2042	Purity and Static Convergence
	Tuner	ENV76808F2	UHF/VHF

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.	PART No.	PART No.	PART No.
MODEL	CTK-1040R	CTL-1040R	CTL-1041R	PC-11S40R
Pushbutton, Power	TBX2A51302	TBX2A51302	TBX2A51302	TBX2A51302
Knob, Control (4 used)	TBX6628	TBX6628	TBX6628	TBX6628
Antenna Terminal Board	TBJ724406	TJB724406	TJB724406	TJB724406
Lens, Infra-red	TKP2719031	TKP2719031	TKP2719031	TKP2719031
Bracket, Antenna Mounting	TUW2A54901	TUW2A54901	TUW2A54901	TUW2A54901
Cabinet Back	TXFKU198SER	TXFKU049SER	TXFKU049SER	TXFKU208SER
Cabinet Front	TXFKY268SER	TXFKY268SER	TXFKY268SER	TXFKY268SER
Battery Cover, Transmitter	UR50EC782	UR50EC782	UR50EC782	UR50EC782
Upper Case, Transmitter	UR50VCS672	UR50VCS672	UR50VCS672	UR50VCS672
Bottom Case, Transmitter	UR50VCS673A	UR50VCS683	UR50VCS683	UR50VCS673A
MODEL	PC-11T40R			
Pushbutton, Power	TBX2A51302			
Knob, Control (4 used)	TBX6628			
Antenna Terminal Board	TJB724406			
Lens, Infra-red	TKP2719031			
Bracket, Antenna Mounting	TUW2A54901			
Cabinet Back	TXFKU049SER			
Cabinet Front	TXFKY268SER			
Battery, Cover Transmitter	UR50EC782			
Upper Case, Transmitter	UR50VCS672			
Bottom Case, Transmitter	UR50VCS683			

For SAFETY use only equivalent part.

PANASONIC
MODEL CTL-1040-R