

CABINET-REAR VIEW

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

Remove thirteen screws holding cabinet back and remove back. Disconnect speaker connectors. Remove one screw holding A/V Board to cabinet bottom and remove assembly from cabinet. Disconnect HV anode, CRT socket, deflection yoke connectors, degaussing coil connector and ground leads. Remove four screws holding tuning selector panel to cabinet front and remove assembly from cabinet. Remove two screws holding tuner assembly to cabinet bottom and remove assembly from cabinet. Remove two screws holding main board assembly to cabinet bottom and slide assembly out of cabinet. Remove two screws holding audio assemblies to cabinet bottom and remove assembly from cabinet. Remove three screws holding S.C power supply and remove assembly from cabinet.

CRT REMOVAL

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

SERVICING IN THE FIELD

CRT IMPLSION PROTECTION AND CLEANING

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

FUSE DEVICES

A 5-amp fuse is used for AC line protection. (See photo, Cabinet - Rear View.)

VHF/UHF TUNER

See Miscellaneous Adjustments.

CHANNEL TUNING

Ten numbered buttons are provided for two digit entry channel selection. Ten numbered buttons (on remote) are provided for two digit entry channel selection with channel Up and Down buttons provided for channel scanning.

HORIZONTAL OSCILLATOR

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

WIDTH

The width may be varied by adjusting the width control. (See photo, Cabinet - Rear View.)

FOCUS

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

AGC

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



SET 2504 FOLDER 1

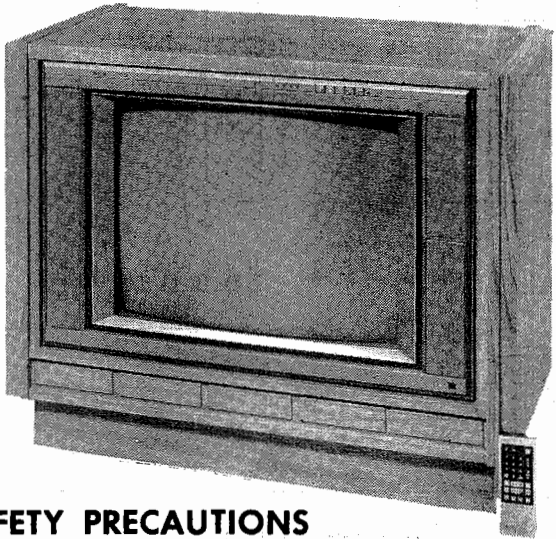
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SAMS

PHOTOFACT

For Supplier Address See PHOTOFACT Index

MODEL GLR891TR



SAFETY PRECAUTIONS

See Page 1

MODEL
GLR891TR
GLR895HR
GLR895LR
GLR899PR

CHASSIS
CTC130C
CTC130C
CTC130C
CTC130C

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CHASSIS CTC130C

INDEX

	Page		Page
Alignment		Photos (Continued)	
TV	1	PW Stereo Board and Power Expanded	
Convergence Adjustments	10	Board-Shield Locations	7
Disassembly Instructions	1	PW Vipur PS Board	8
IC Functions	6	Remote Control Preamp MCY005A	5
Miscellaneous Adjustments	10	Remote Control Transmitter	
Parts List		CRK40A	5
On Screen Display MSD002A,B	11	Tuner Control MTT001A	6
Remote Control Preamp MCY005A	12	Video In/Out Board	9
Remote Control Transmitter		Safety Precautions	1
CRK40A	11,12	Schematics	
Tuner Control MTT001A	11,12	Interconnect Diagram CTC/130C	5
TV	11	On Screen Display MSD002A,B	5
Photos		Power Supply	4
Audio Power Amp Board	10	PW Expander Board	3
Cabinet-Rear View	1	Remote Control Preamp MCY005A	4
CRT Neck Assembly	10	Remote Control Transmitter	
CRT Socket Board	7,9,10	CRK40A	5
Main Board	7	Stereo Broadcast Board	3
Main Board-Overall	7	Terminal Guides	6
Main Board-Shield Location		TV	2,5
(Bottom View)	10	Tuner Control MTT001A	4
On Screen Display MSD002A,B	5	Servicing in the Field	1
Power Relay Board	9	Test Equipment	1
PW Expander Board	8	Test Jig Hookup	1
PW Pin Board	8	Troubleshooting	1
PW Stereo Board	7,8,9	Troubleshooting Aid	11

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SET 2504 FOLDER 1

SAMS Howard W. Sams & Company
2647 Waterfront Parkway, East Drive, Suite 300, Indianapolis, Indiana 46214 U.S.A.

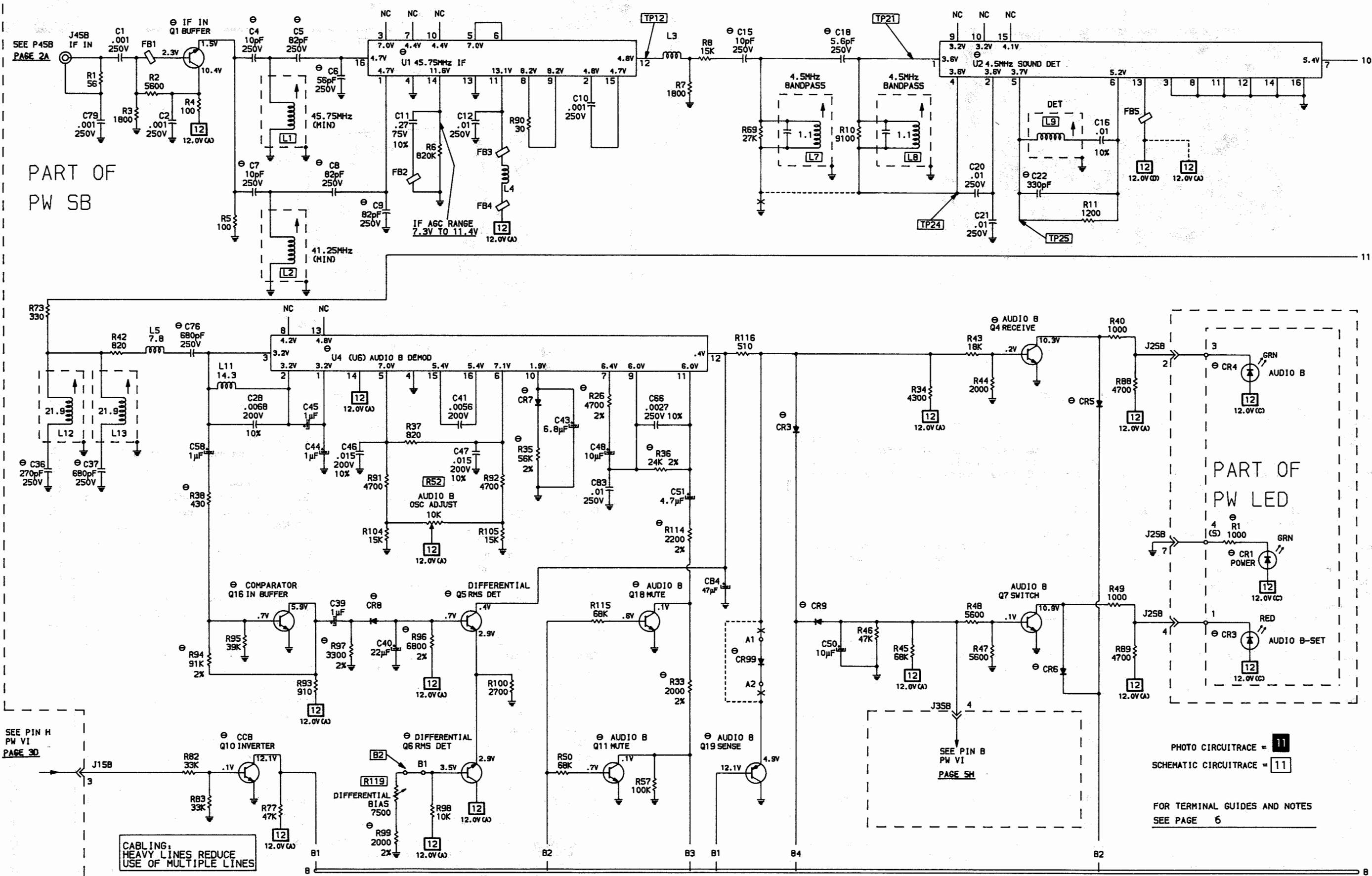
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SET 2504 FOLDER 1



PART OF
PW SB

PART OF
PW LED

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PHOTO CIRCUITRACE = 11
SCHEMATIC CIRCUITRACE = 11
FOR TERMINAL GUIDES AND NOTES
SEE PAGE 6

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	1560, 1564, 1541	SC61	
GENERATORS			
RGB	1249,1260		
MULTIBURST SIGNAL	1251,1260	VA62	
COLOR BAR	1211A,1249,1251,1260	VA62,CG25	
ANALOG VOM	277,111,116		
DIGITAL VOM	2830,2806	DVM37,DVM56,SC61	
FREQUENCY METER	1803,1805	FC71,SC61	
HI-VOLTAGE PROBE	HV-44	HP200	
VOM/DMM			
Accessory probes	PR-28(HV)		
ISOLATION TRANSFORMER	TR110,1604,1653,1655	PR57	
CAPACITANCE ANALYZER	820,810,830	LC53,LC75,LC76,LC77	
CRT ANALYZER	467,470	CR70	
TEMPERATURE PROBE	TP-28,TP-30		
AC LEAKAGE TESTER	1655	PR57	
LOGIC PROBE	DP51,DP21		
LOGIC PULSER	DP101,DP31		
INDUCTANCE ANALYZER	875	LC53,LC75,LC76,LC77	
FLYBACK YOKE TESTER	875	LC53,VA62	
TV STEREO GENERATOR	2009	ST65,ST66	
FIELD STRENGTH METER		FS73,FS74	

TV ALIGNMENT INSTRUCTIONS

Use an Isolation transformer and observe power supply polarity. Maintain line voltage at 120V AC. Allow a 20-minute warm-up period for receiver and test equipment.
Suggested Alignment Tools: GC ELECTRONICS L303, L304, T301..... 9440

PRELIMINARY INSTRUCTIONS

Set the channel selector to the highest unused channel. Set scope sweep to external. Connect scope vertical input to scope vertical input on sweep/marker generator. Connect scope external horizontal input to scope horizontal input on sweep/marker generator. Ground test equipment to TV chassis unless specified otherwise. Use only enough generator output to provide a usable indication.
Note: Response may vary slightly from that shown.
Connect a +8V bias to TP307.
Remove Tuner IF Link Cable from Tuner (P301).
Obtain Service Line (See Procedure In Miscellaneous Adjustments).

VIDEO IF ALIGNMENT (SWEEP MARKER GENERATOR)

DIRECT PROBE FROM SWEEP/MARKER GENERATOR	SWEEP GENERATOR OUTPUT	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	REMARKS
To TP301	To IF Input (TP303)		47.25MHz (Modulated)	Adjust L301 for MINIMUM. See Figure 1.
To TP301			45.75MHz	Adjust L303 for Maximum. See Figure 1.

TV ALIGNMENT INSTRUCTIONS (Continued)

VIDEO IF ALIGNMENT (BAR SWEEP GENERATOR)

BAR SWEEP GENERATOR	SCOPE INPUT	REMARKS
To Antenna Terminals	To TP301	Perform Video IF Adjustments per SWEEP/MARKER GENERATOR instructions above. See Figure 2.

4.5MHz TRAP ALIGNMENT

Tune in a strong TV signal and set the contrast at maximum. Adjust the fine tuning until a beat pattern is visible on the screen. Adjust T301 for MINIMUM beat interference.

SOUND IF ALIGNMENT

Tune in a station and adjust L201 and L202 for Maximum sound. Reduce signal strength at the antenna terminals until distortion appears. Continue to reduce the signal while aligning for undistorted output by adjusting L201.

AUTOMATIC FINE TUNING ALIGNMENT

Connect as explained in preliminary instructions unless specified otherwise. Connect a +5V bias to TP307.

DIRECT PROBE FROM SWEEP/MARKER GENERATOR	SWEEP GENERATOR OUTPUT	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	REMARKS
To TP319	No Signal			Adjust R332 (AFT Balance Control) for +6.5V.
Connect Direct Probe from Sweep/Marker Generator To TP319	To TP303 (IF Input)	44.00MHz (10MHz Sweep)	45.75MHz	Adjust L304 to place 45.75MHz marker at crossover as shown. See Figure 3.

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Figure 1



Figure 2

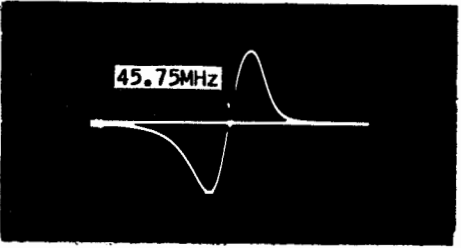


Figure 3

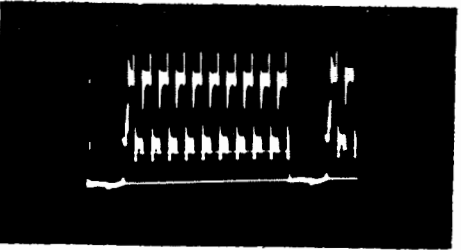
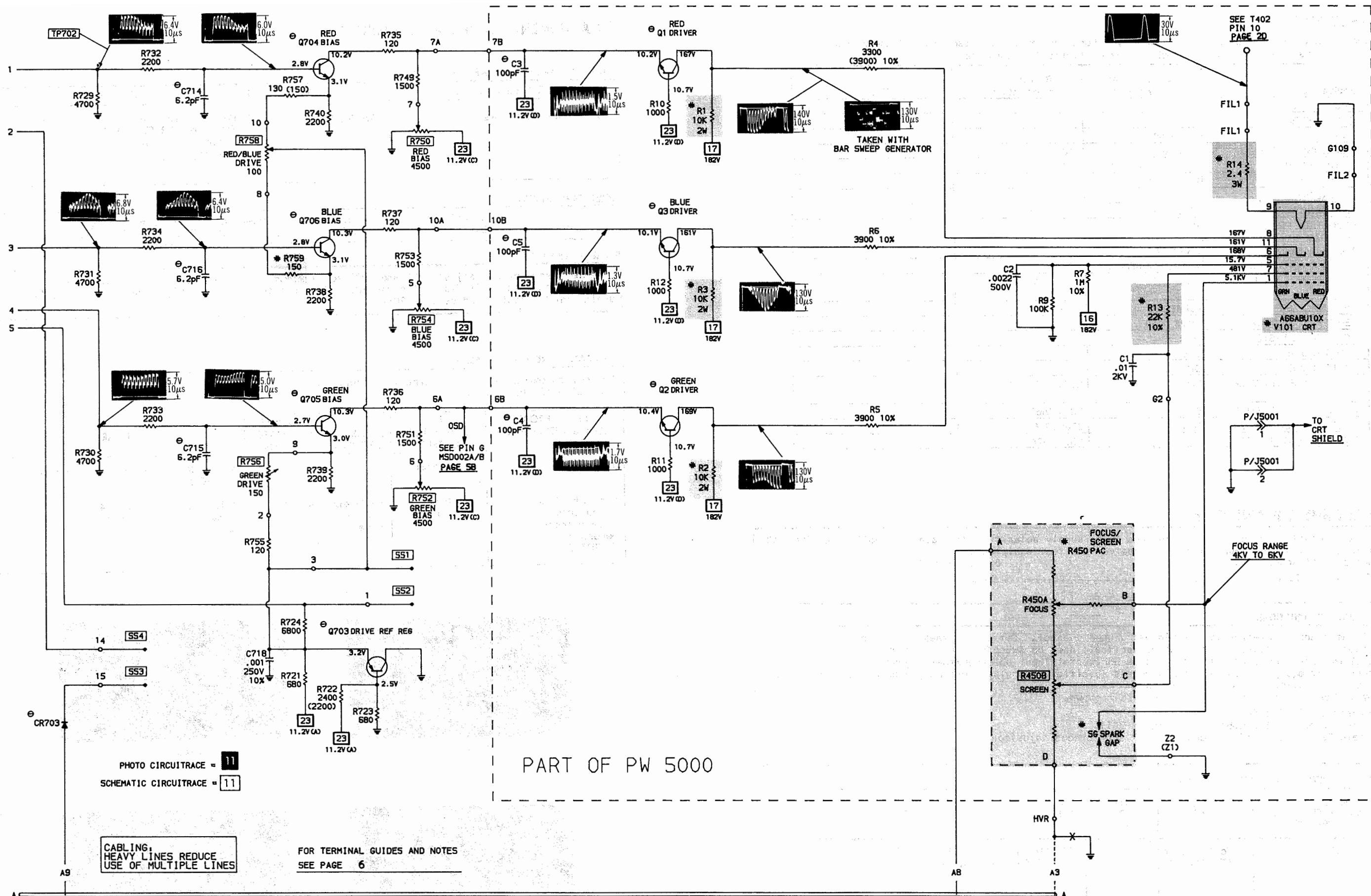


Figure 4



A PHOTOFACT STANDARD NOTATION SCHEMATIC
WITH **CIRCUITRACE**
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CRT SOCKET BOARD

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.

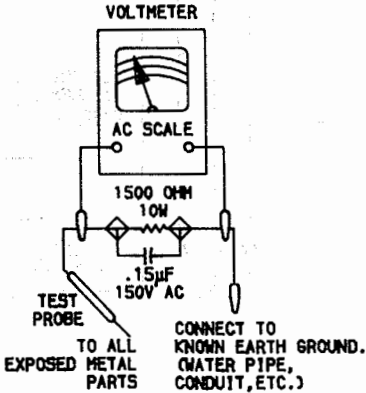
Leakage Current Hot Check

- 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.



TEST JIG HOOKUP

FUNCTION	Chek-A-Color ADAPTER NO.	RCA / TeleMatic ADAPTER NO.	ZENITH ADAPTER NO.
CRT YOKE YOKE SETTING	B243 D4142 YP1 Focus Tap	10J667 10J760 Horiz 1.2, Vert 14 FVS 3950 Focus Voltage supply	852-430 852-437 (1) Horiz 1.2, Vert 8 Focus Tap

"P401" PIN 1 or 2	"P401" PIN 3 or 4	"P501" PIN 1	"P501" PIN 2
RED	BLUE	YELLOW	GREEN

(P.C. Board)

(1)

TROUBLESHOOTING

POWER SUPPLY DESCRIPTION

When 120V AC is applied to the set, 177V* is developed at the cathode of Diode CR103 and 15.4V at the cathode of Diode CR5. The voltage developed at CR5 is used to provide standby power for the Tuner Control Module and On/Off Transistor (Q2). The voltage developed at CR103 is used to provide standby power for the Regulator IC (U2). As a result 11.2V* is produced at the cathode of CR3. Voltage is also supplied to pins 4 and 5 of Sync/Sweep IC (U401) from the 177V* source. In the standby mode, the On/Off Transistor (Q601) is turned on which takes its collector voltage to 0V. The collector of Q601 is connected to the base of Transistor Q2 and the cathode of CR405, as a result, Q2 is kept turned off and pins 5 and 6 of Sync/Sweep ICU401 is 0V. This condition prevents both the power supply and horizontal circuits from operating. When the power button is depressed Q601 is turned off, its collector voltages rises and turns on the power supply and horizontal circuits.

Voltage measured in standby mode.

U2			
Pin 1	5.5V*	Pin 9	.12V*
Pin 2	5.3V*	Pin 10	2.2V*
Pin 4	4.5V*	Pin 13	8.3V*
Pin 6	.1V*	Pin 14	5.3V*
Pin 7	10.5V		

* With respect to Isolated ground.

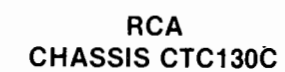
POWER SUPPLY

Check the AC Fuse (F101). If open, check Bridge Rectifier Diodes (CR101 thru CR104), Capacitors C101 thru C104, C110, Electrolytic C1, Resistor R120, Horizontal Output Transistor (Q402) and Regulator SCR (SCR101). If F101 is good apply 120V AC, depress the power switch and check for 150V at the cathode of

Diode CR10, 20.0V at the cathode of Diode CR7 and 25.0V at the cathode of Diode CR11. If none of these voltages are present, check the voltages, waveforms and components associated with Regulator IC (U2), VIPUR Transistor (Q1), Optic Isolator IC (U1) and VIPUR Transformer (T1) all on the Power Supply Board. Also, check the voltages on On/Off Transistor (Q2) on the Power Supply Board. If the proper voltages are present at the cathode of Diodes CR7, CR10 and CR11, refer to the "Horizontal" section of this Troubleshooting guide. If the current drain on Q1 becomes excessive, its emitter voltage will increase, and as a result, the voltage at pin 11 of U2 will increase which shuts down the power supply. The power supply will go into shutdown and remain in shutdown whenever the set is turned on so long as the defective condition exists. The power supply will also shutdown if the horizontal circuits go into shutdown, refer to the "High Voltage Shutdown" section of this Troubleshooting guide.

HORIZONTAL

Determine if the horizontal or power supply circuits are in shutdown, refer to the "Power Supply" and "High Voltage Shutdown" sections of this Troubleshooting guide. If the circuits are not in shutdown, depress the power switch and check for a horizontal drive signal at pin 16 of Deflection IC (U401) and a SCR drive signal at pin 7 of U401. If none of these signals are present, check the voltages, waveforms and components associated with pins 1 thru 16 of U401. If the proper waveforms are present at pins 7 and 16 of U401, check the voltages, waveforms and components associated with Regulator SCR (SCR101), Horizontal Driver Transistor (Q401), Horizontal Output Transistor (Q402) and Horizontal Output Transformer (T402). Check Diodes CR106, CR107, CR109 and associated parts for defects. The high voltage rectifier is part of Transformer T402 and if defective will affect the opera-



1

TROUBLESHOOTING (Continued)

tion of the horizontal circuits. If the horizontal oscillator is off frequency, check the voltages, waveforms and components associated with pins 4 and 5 of U401. Horizontal linearity or foldover problems may be caused by capacitors C431 thru C436 being defective.

HIGH VOLTAGE SHUTDOWN

The high voltage is monitored by Diode CR409 rectifying pulses from the Horizontal Output Transformer (T402) and applying the rectified voltage to the cathode of Zener Diode CR406. Should the high voltage increase, the voltage at the cathode of Diode CR406 will also increase and trigger CR406 and SCR401 into conduction. This action takes the B+ voltage of pins 4 and 5 of Deflection IC (U401) and the base of On/Off Transistor (Q2) on the power supply board near 0V, which shuts down the power supply and the horizontal circuits. To troubleshoot, disconnect Diodes CR408 from the circuit, disconnect the high voltage lead and use a variable power supply for AC voltage. Start at 70V AC and troubleshoot to locate the defect. Replace CR408 in the circuit.

NOTE: Care should be taken in defeating the high voltage shutdown circuit as this may cause excessive x-ray radiation and damage to the CRT and Transformer T401. Monitor the high voltage and troubleshoot.

Voltage taken in shutdown.

SCR401		
A	K	G
.9V	.0V	.7V

AUDIO

Select a station that is broadcasting a stereo signal, switch Front Panel Mono/Stereo Switch to the stereo position and check for an audio waveform at pin 7 of FM Detector IC (U2) on PW-SB Board. If there is no audio, check the voltages, waveforms and components associated with SIF IC (U1), SIF Input Buffer Transistor (Q1) and IC U2 all on PW-SB Board. If an audio waveform is present at pin 7 of U2, check for an audio waveform at pins 4 and 5 and .96V at pin 7 of Stereo Decoder IC (U3). If the waveforms and the voltage are missing, check the voltages, waveforms and components associated with IC (U3), Bandpass Reject Amp (Q3) and pins 10, 11, 12 and 14 of Switch IC (U5). If there is audio at pins 4 and 5 of U3, check for audio at Terminals 6 and 7 of PW-SB Board. If there is no audio, check the voltages, waveforms and components associated with Transistors Q8, Q12 and Q13. Select a station that is broadcasting a SAP signal and check for an audio waveform at the collector of (Audio B) Mute Transistor (Q11). If there is no audio, check the voltages, waveforms and components associated with (Audio B) Demodulator IC (U4) and Transistors Q5, Q6, Q11, Q16 and Q18. If there is audio at the collector of Q11 in SAP mode, check for an audio waveform at Terminals 4 and 3 of PW-SB in SAP/Mono/Stereo. If there is no audio at Terminal 4, check the voltages,

waveforms and components associated with pins 1, 2 and 11 thru 14 of IC (U4) on PW-EXP Board. If there is no audio at Terminal 3, check for an audio waveform at TP 1 on PW-EXP Board. If there is no audio, check the voltages, waveforms and components associated with IC (U1) on PW-EXP Board. If there is audio at TP, check the voltages, waveforms and components associated with IC (U3) on PW-EXP, High Band Amp (U2), High Band RMS Detector (U7), pins 5 thru 10 of IC U5, Lo Band TMS Detector (U6) and Wide Band Amp (U4) on PW-EXP Board. There will be audio at Terminals 3 and 7 of PW-SB in stereo and SAP modes only. If there is audio at Terminals 3 and 4 of PW-SB in all three modes, check for an audio waveform at pins 5 and 6 of Plug J1. If there is no audio, check the voltages, waveforms and components associated with Inverter Transistor (Q9), Right Matrix Transistor (Q14) and Left Matrix Transistor (Q15). If there is audio at pins 5 and 6 of Plug J1, check for audio at pins 6 and 8 of Plug J4 on (PW-V1002) Board. If there is no audio, check the voltages, waveforms and components associated with Audio Switches IC (U2), Audio Control IC (U6) and Audio Buffer Transistors (Q9, Q11, Q12 and Q13) on PW-V1002 Board. Check the voltage at pin 8 of U6, it should measure .39V at mute and 5.4V at Maximum. If there is audio at pins 6 and 8 of Plug J4, check the voltages, waveforms and components associated with the Audio Output IC's U1 and U2 on the SPA Board.

		SAP	MONO	ST
PW-SB				
U5	Pin 12	.10V	9.5V	9.5V
U3	Pin 7		10.5V	.96V

VIDEO

Inject a video signal at pin 12 of VIF/AFT/AGC IC (U301) 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 video waveform at Terminal M-4 on the Main Board. If there is no video, check the voltages, waveforms and components associated with Video Amp Transistor (Q303 and Q304), Video Buffer Transistors (Q4, Q5, Q6, Q15 and Q16) on PW-V1002 Board. If video is present at Terminal M-4, check for video at pins 20, 21 and 22 of Chroma Luminance IC (U701). If there is no video at pins 20, 21 and 22 of U701, check the voltages, waveforms and components associated with Phase Comp Transistor (Q701) and pins 20 thru 28 of IC U701. If there is a video at pins 20, 21 and 22, check the voltages, waveforms and components associated with the CRT, Red, Green and Blue Bias Transistors (Q704, Q705 and Q706) respectively and Output Transistors (Q1, Q2 and Q3) on the CRT Board. If the brightness is inadequate or cannot be controlled, check the voltages and components associated with pins 24, 25, 26 and 28 of IC U701. If there is no video on the CRT in external video mode, check the voltages, waveforms and components associated with Video Switches IC (U3 and U5) on the PW-V1002 Board.

VERTICAL

VERTICAL

If there is no vertical sweep, check the voltages on the Vertical Transistors (Q501 thru Q502). If any of the voltages are missing or questionable, check the Transistor and its associated components. Inject a vertical signal at pin 11 of the Deflection IC (U401). If vertical deflection is now present, check the voltages, waveforms and components associated with pin 18 of U401. If there is no vertical sweep, check the Deflection Yoke (DY1) and Pincushion Transistors (Q406 and Q409). Vertical linearity or foldover problems may be caused by the vertical feedback and bias circuits. Check Electrolytics C506, C508, C509 and associated components for defects.

SYNC

Check for vertical and horizontal sync pulses at TP302. If missing, check the voltages, waveforms and components associated with Sync Transistor (Q305). If vertical and horizontal sync pulses are present at TP302, check for the proper vertical waveforms at pin 18 of U401 and the proper horizontal waveforms at pin 16 of U401.

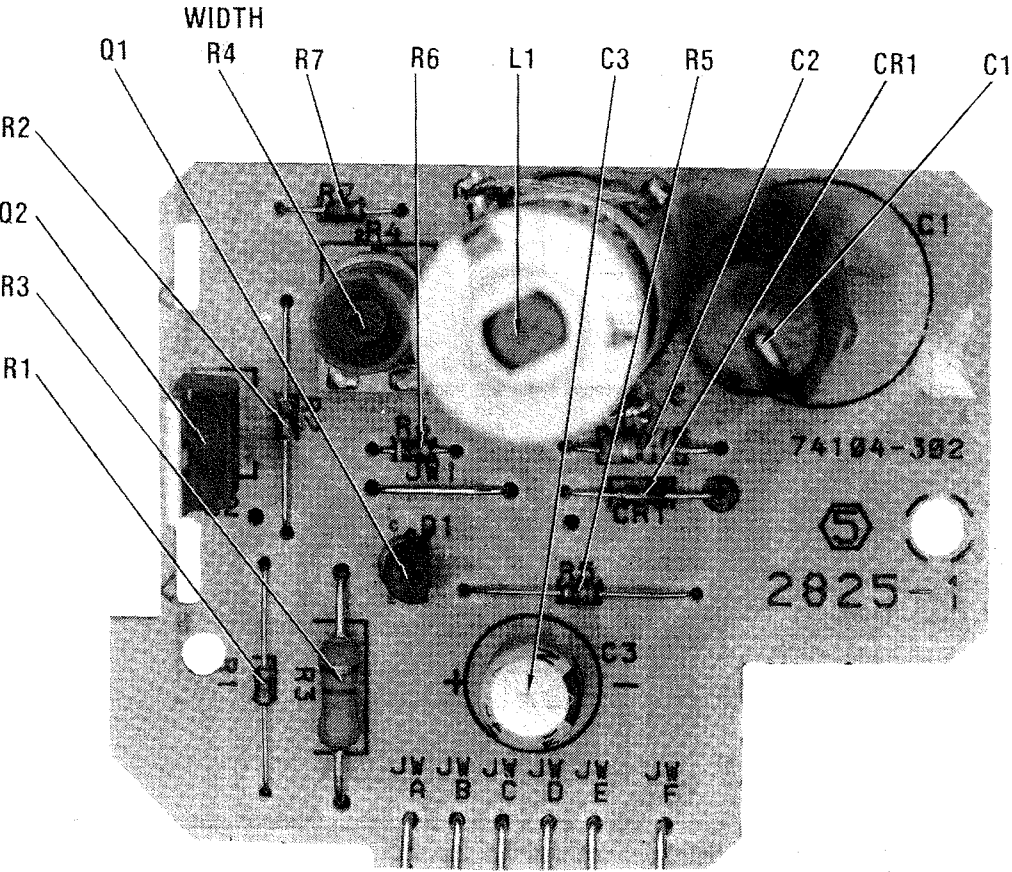
RASTER

Check the CRT and CRT voltages. If there is no red, check the voltages and components associated with pin 21 of Chroma Luminance IC (U701), Red Bias Transistor (Q704) and Red Output Transistor (Q1). If there is no green,

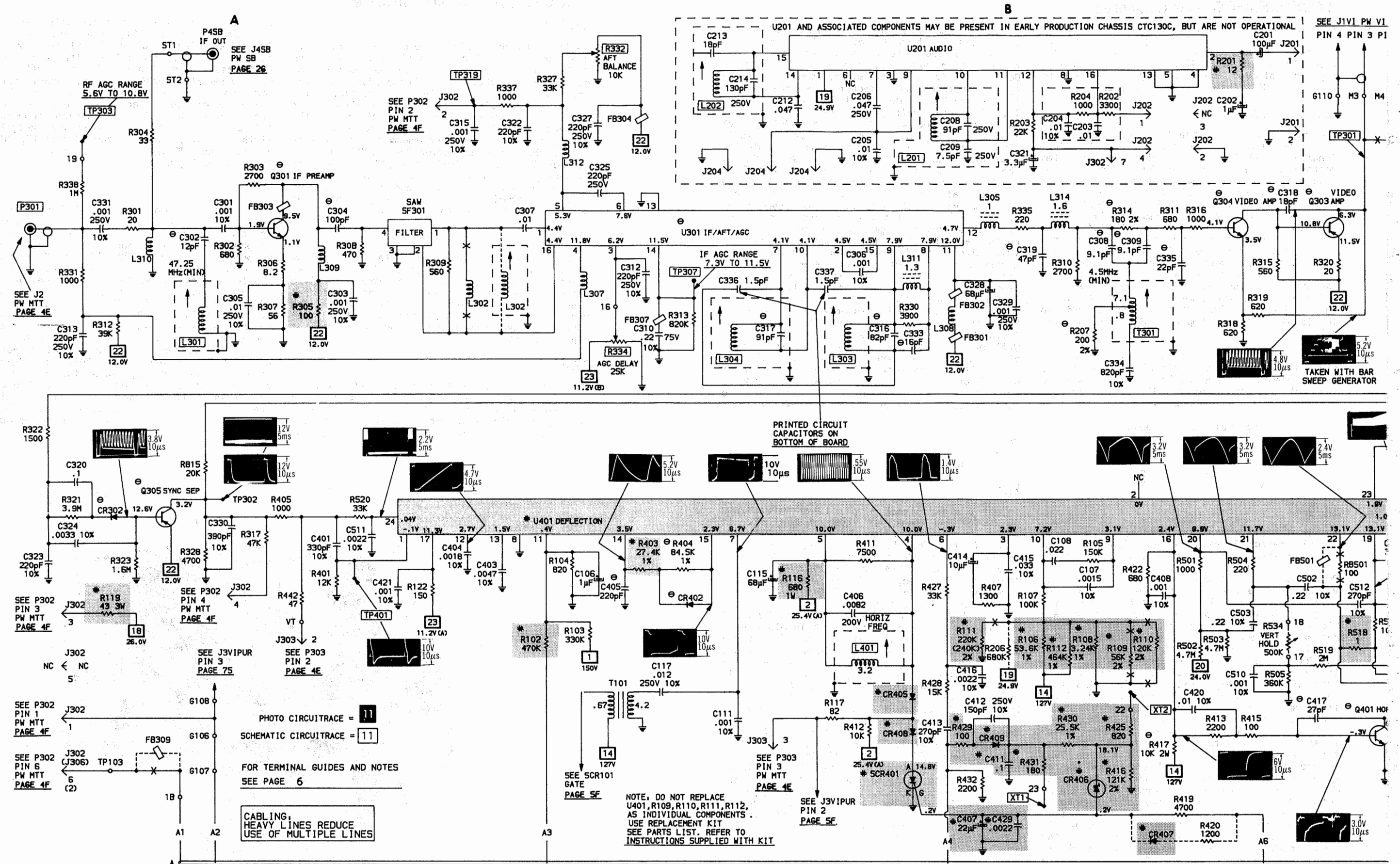
check the voltages and components associated with pin 20 of IC U701, Green Bias Transistor (Q705) and Green Output Transistor (Q2). If there is no blue, check the voltages and components associated with pin 22 of IC U701, Blue Bias Transistor (Q706) and Blue Output Transistor (Q3). If the raster has a pinclusion shape, check the voltages, waveforms and components associated with Pincushion Transistors (Q1 and Q2). If the raster has height or width problems, refer to the "Vertical", "Horizontal" and "Power Supply" section of this Troubleshooting guide.

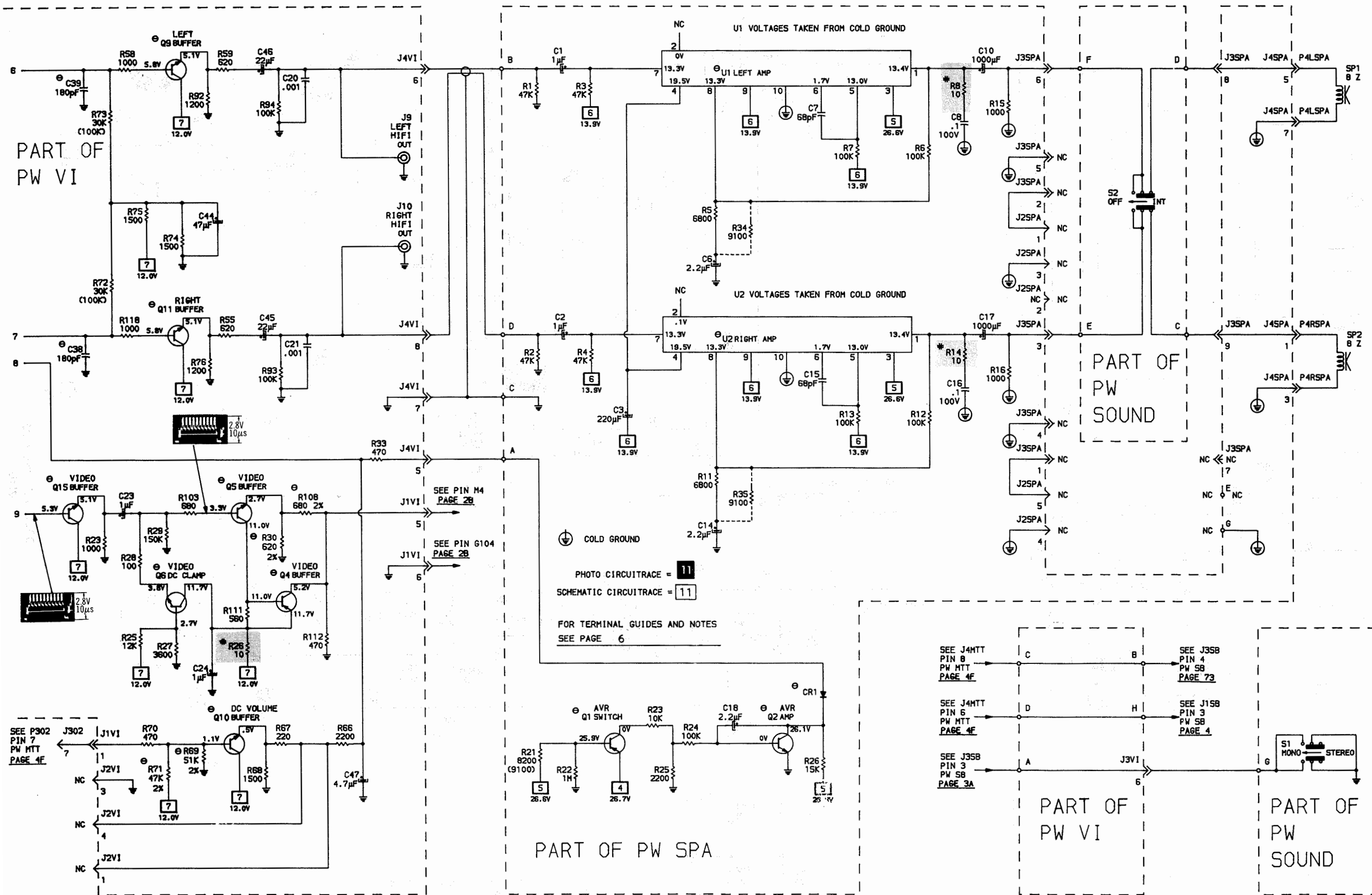
CHROMA

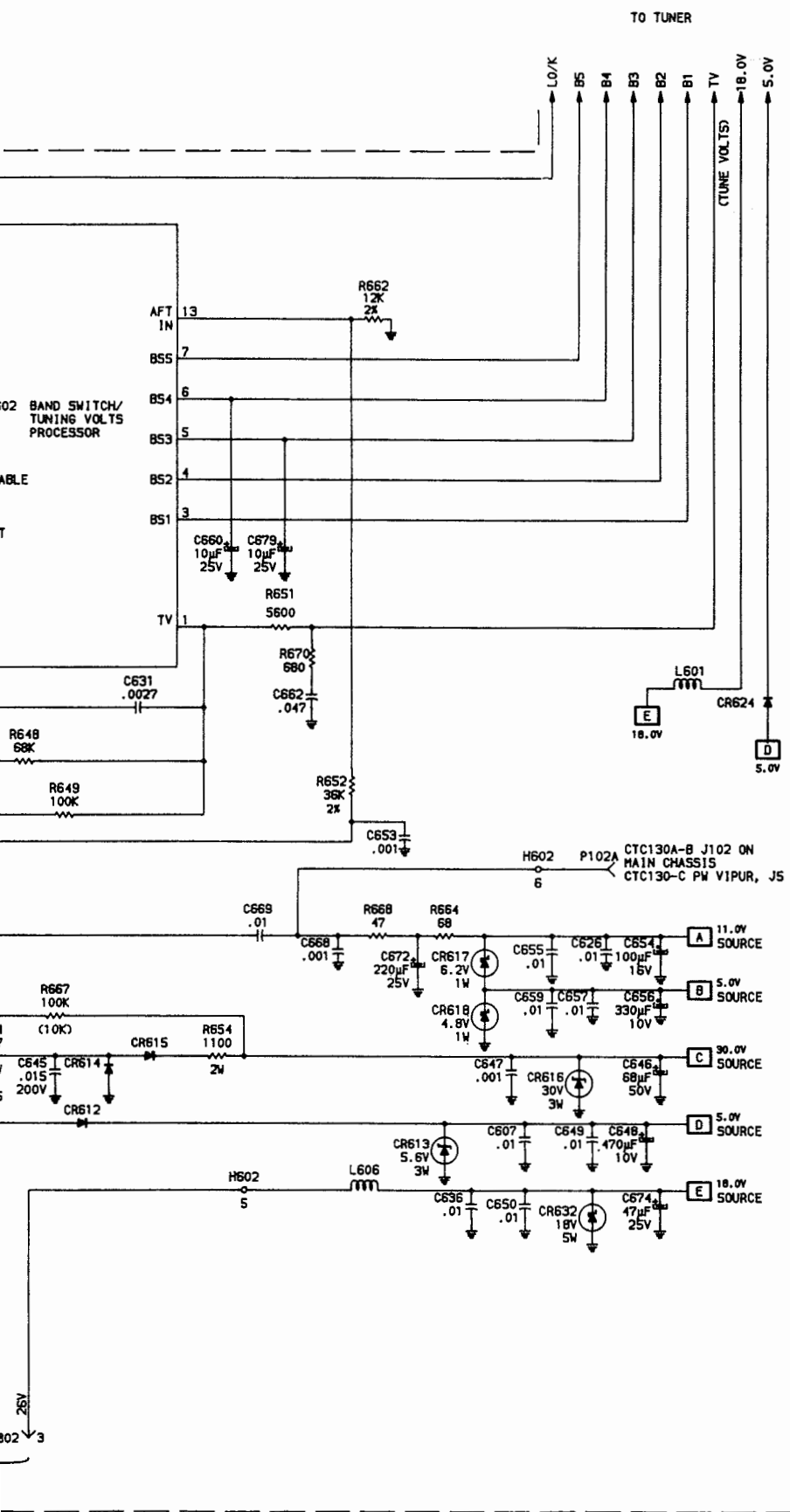
Check for a chroma waveform at TP801. If the waveform is missing, check the components associated with TP801. If a chroma waveform is present at TP801, check for the proper chroma waveforms at pins 20, 21 and 22 of Chroma Luminance IC (U701). If these waveforms are missing, check the voltages, waveforms and components associated with pins 1 thru 19 of U701. Check the 3.58MHz oscillator at pins 11, 12 and 13 of U701. Check the voltage and components associated with the color control and pin 2 of U701. If there is no color sync, check the voltages, waveforms and components associated with pin 7 of U701. If there is inadequate tint range, check the voltages and components associated with pin 14 of U701. If the proper chroma waveforms are present at pins 20, 21 and 22 of U701, refer to the "Raster" section of this Troubleshooting guide.



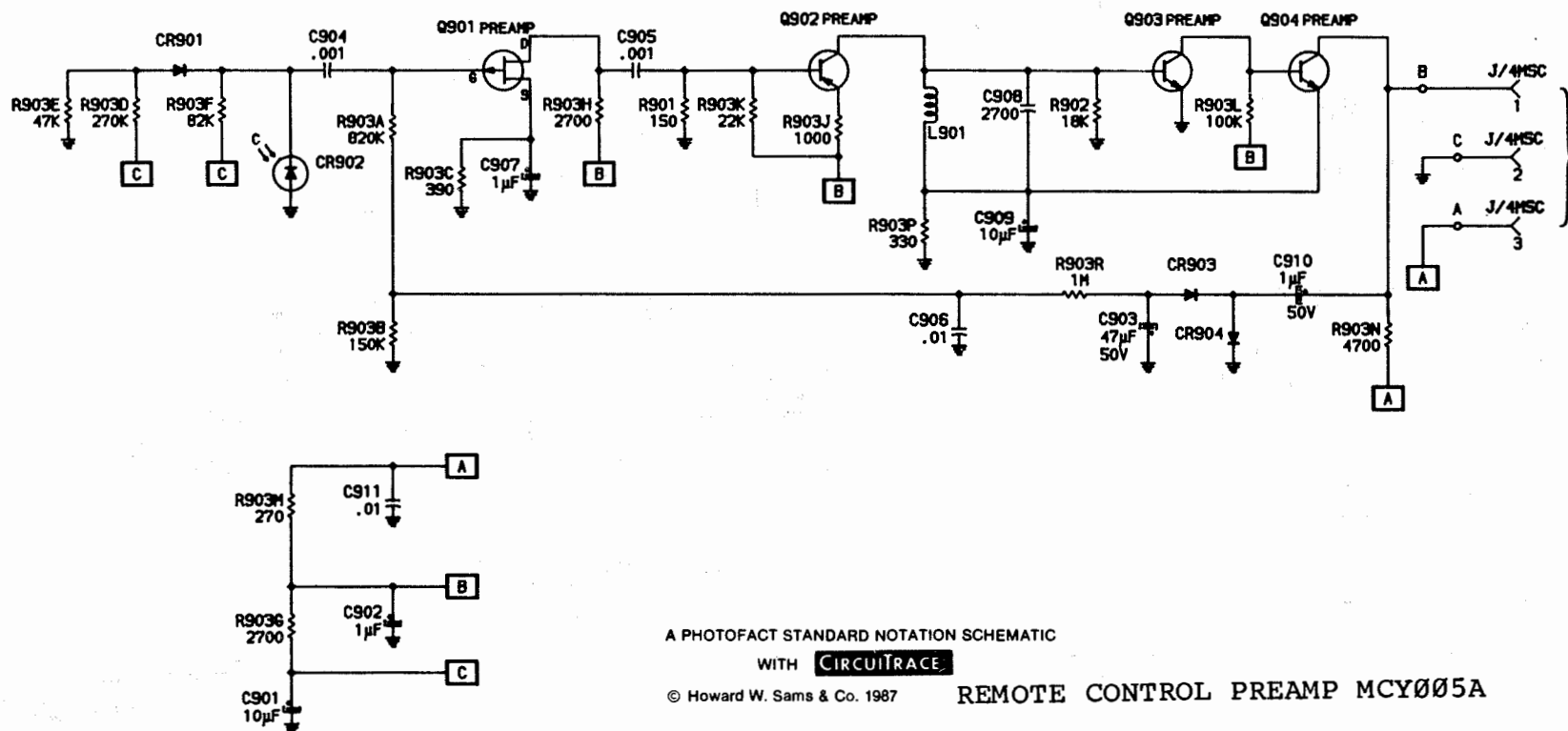
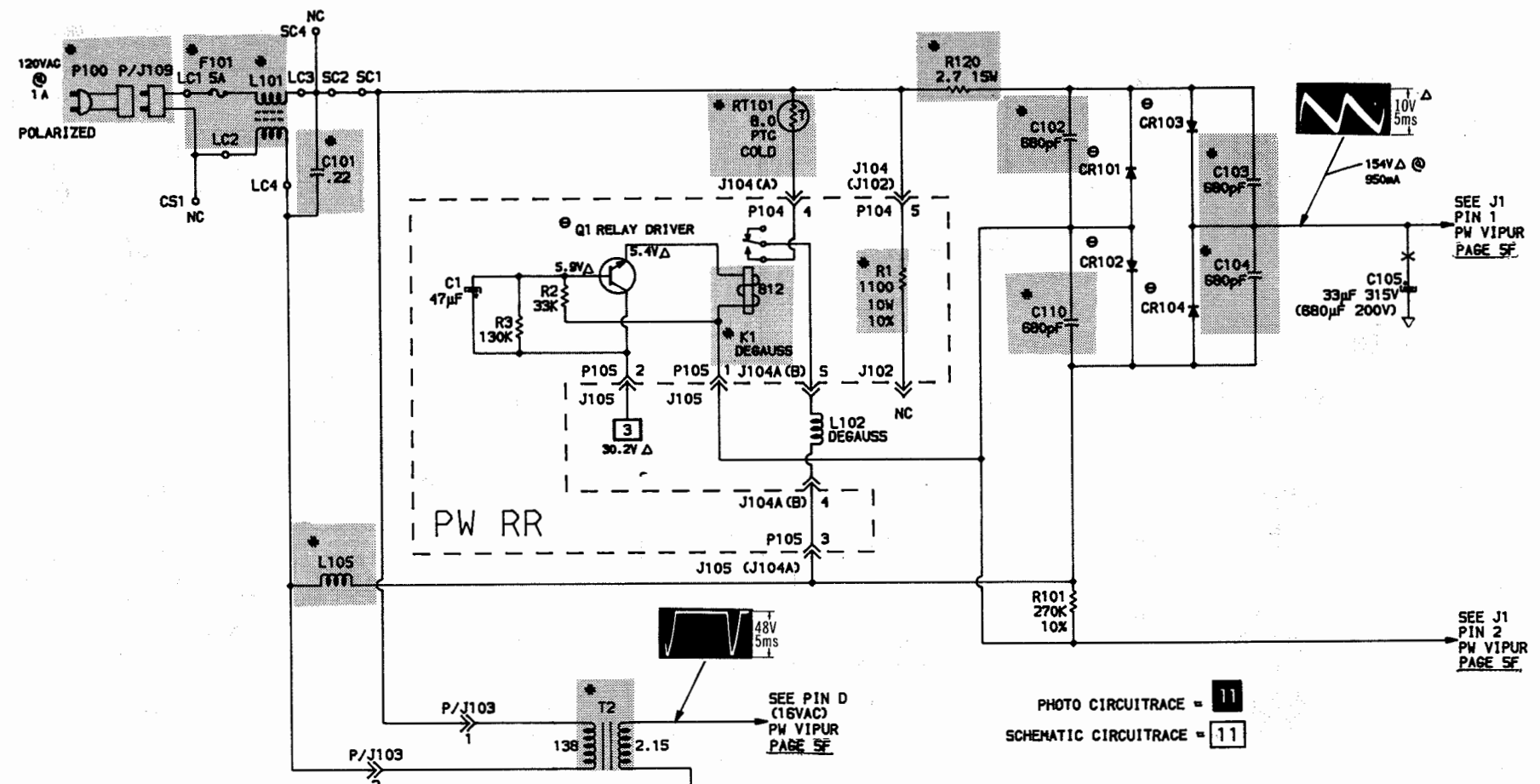
PW PIN BOARD



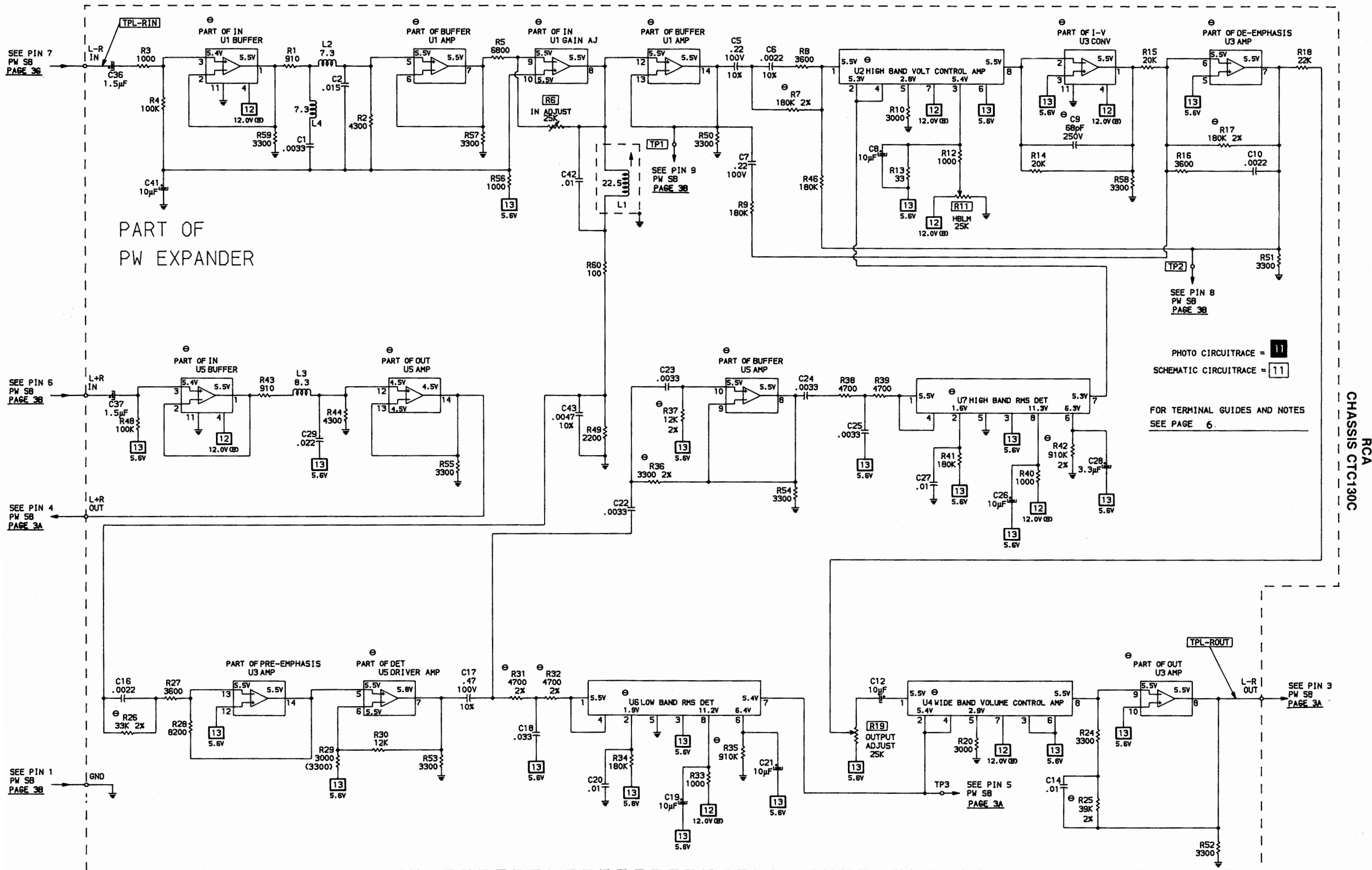




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SCHEMATIC CIRCUITRACE = 11
FOR TERMINAL GUIDES AND NOTES
SEE PAGE 6.

A PHOTOFACIT STANDARD NOTATION SCHEMATIC

WITH CIRCUITRACE

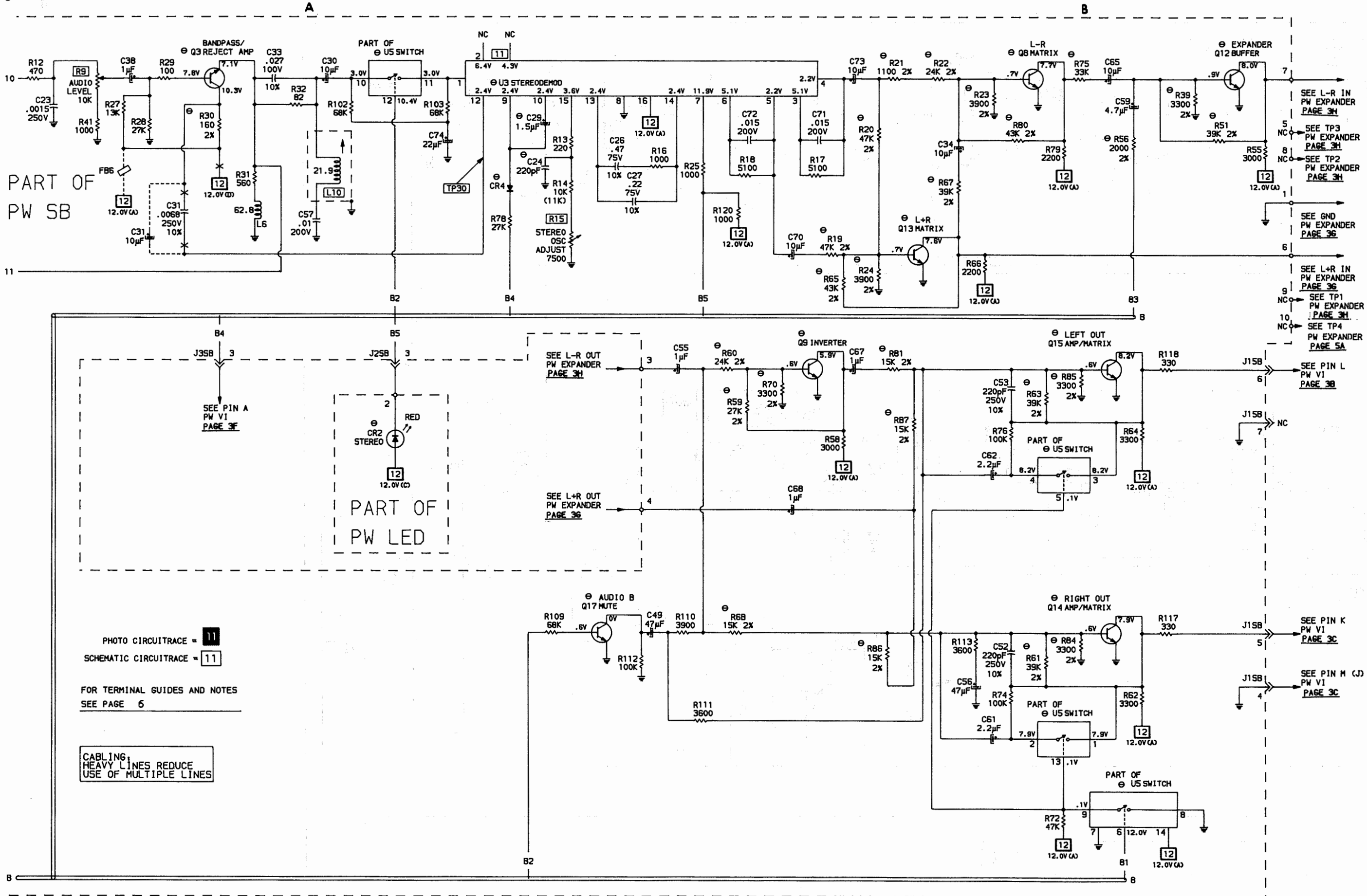
PW EXPANDER BOARD

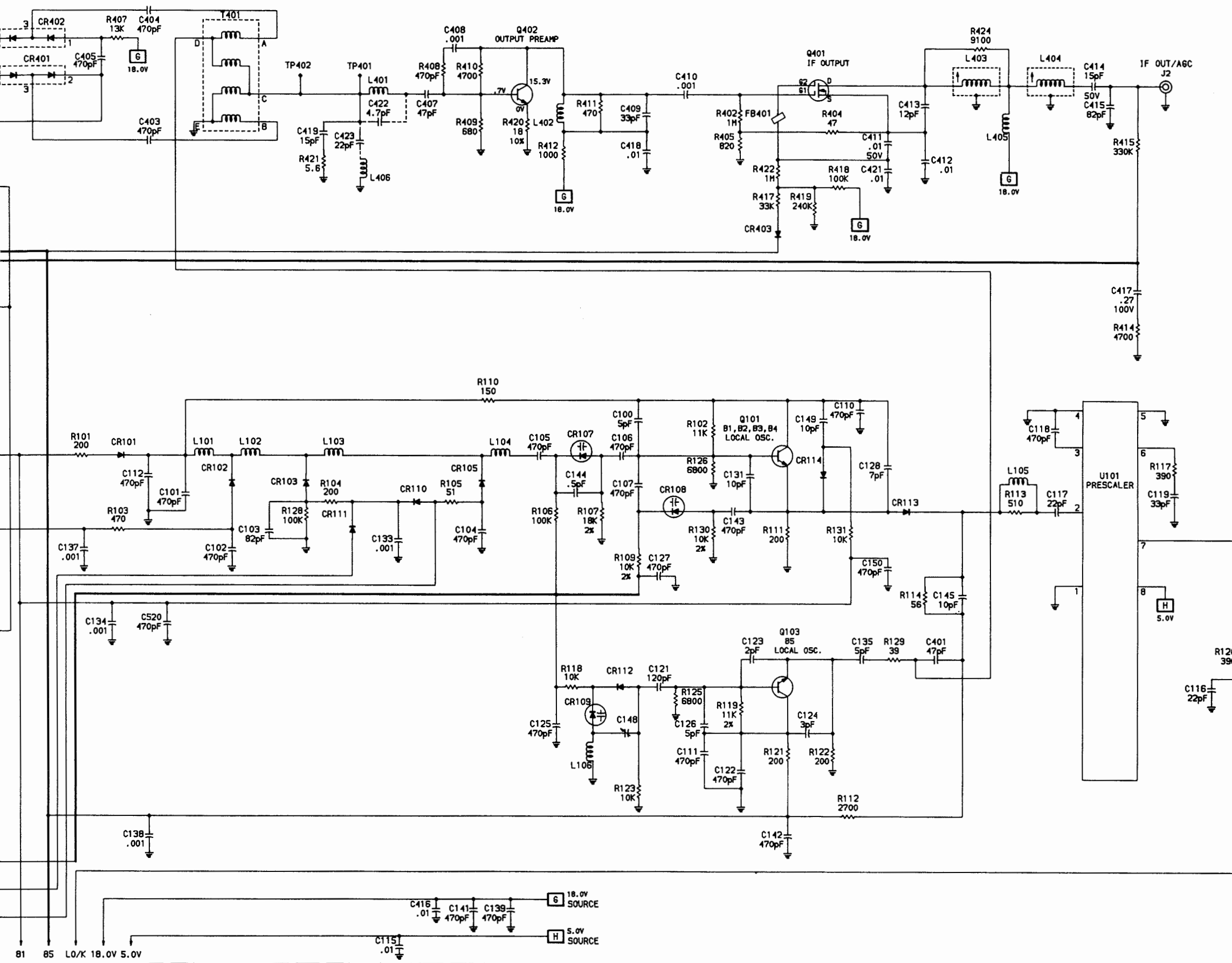
G

PW EXPANDER BOARD

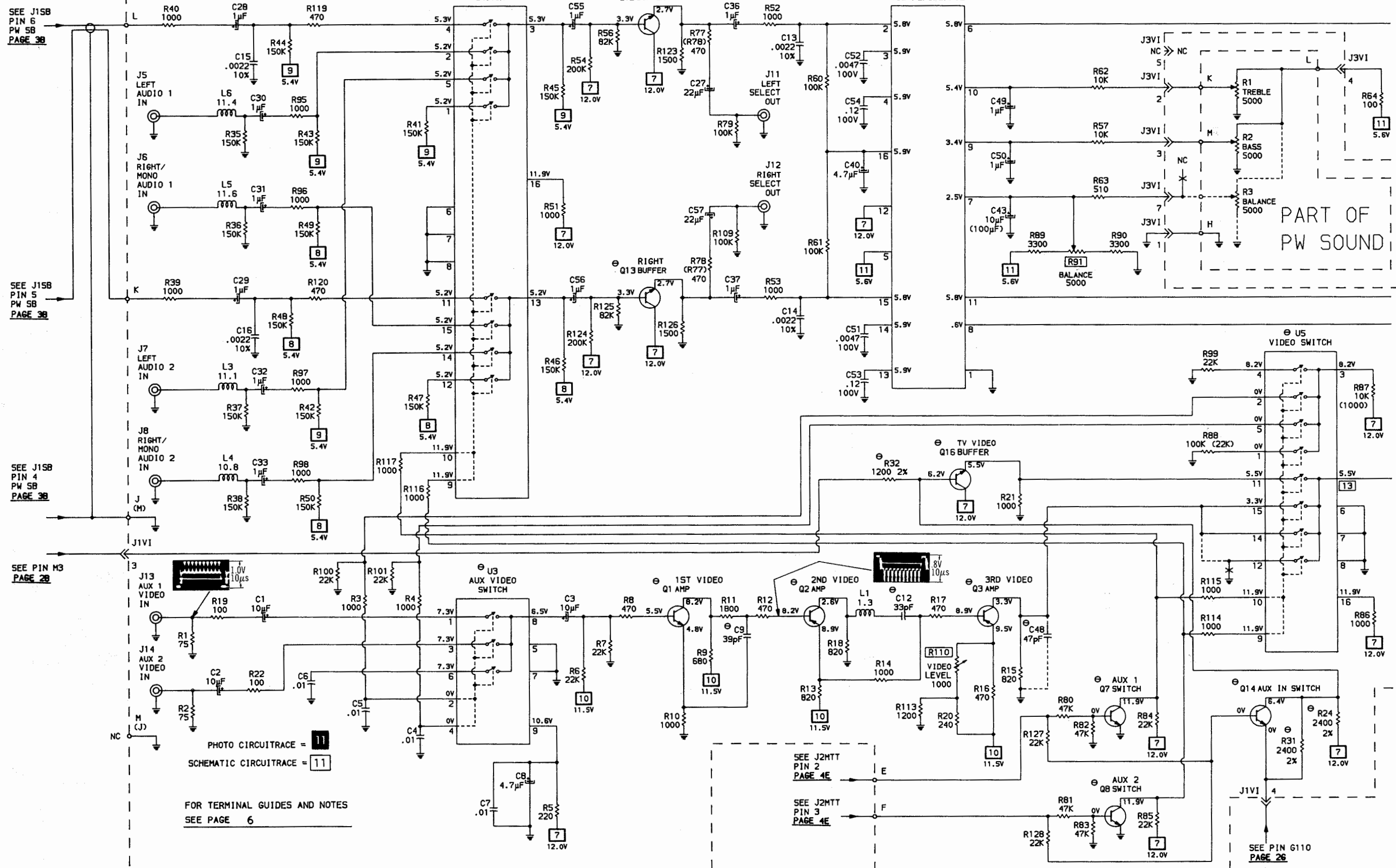
SET 2504 FOLDER 1

3



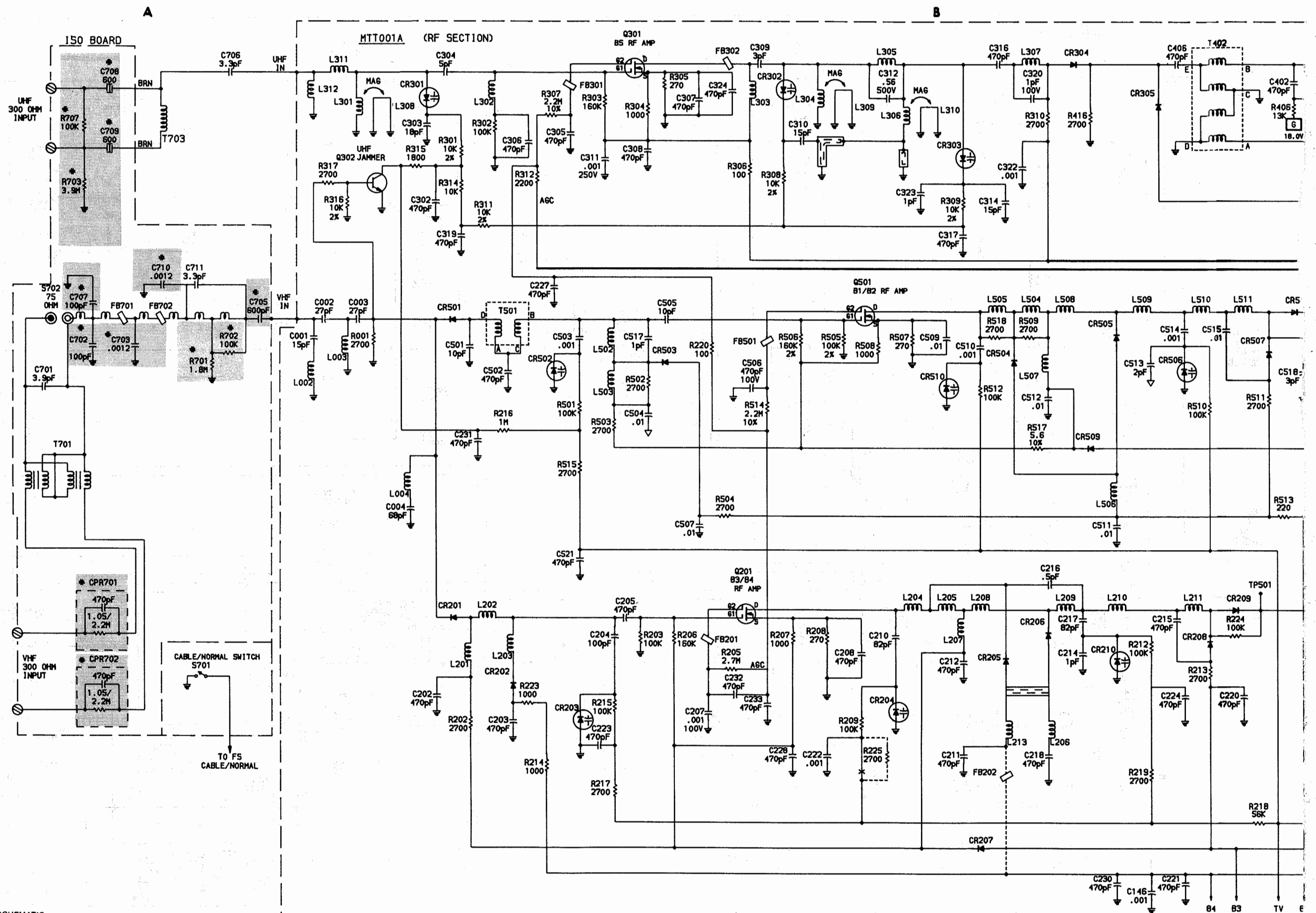


PART OF PW VI



A PHOTOFACIT STANDARD NOTATION SCHEMATIC

WITH CIRCUITRACE™



A PHOTOFACT STANDARD NOTATION SCHEMATIC

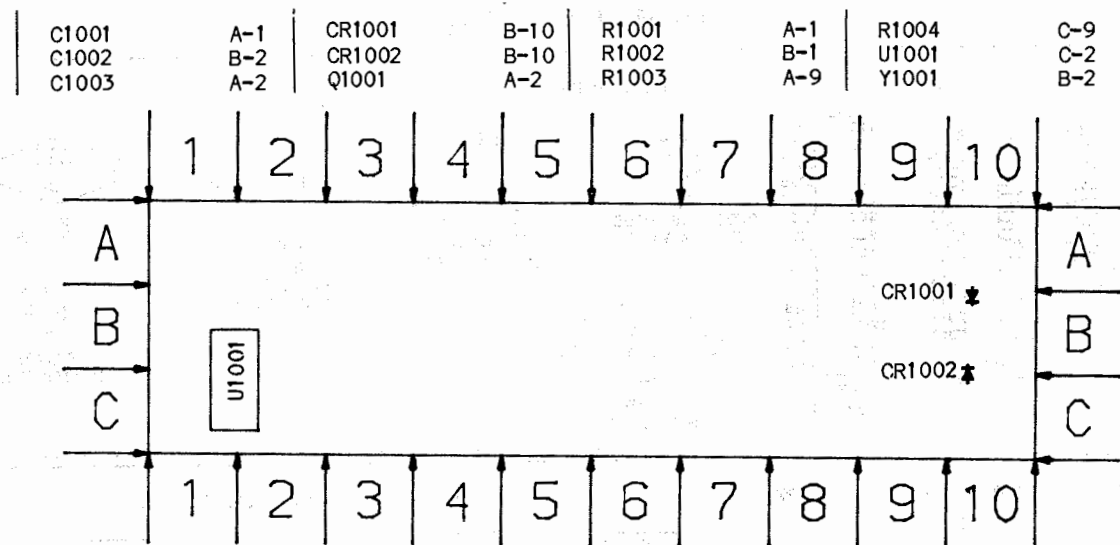
WITH CIRCUITRACE

© Howard W. Sams & Co. 1987

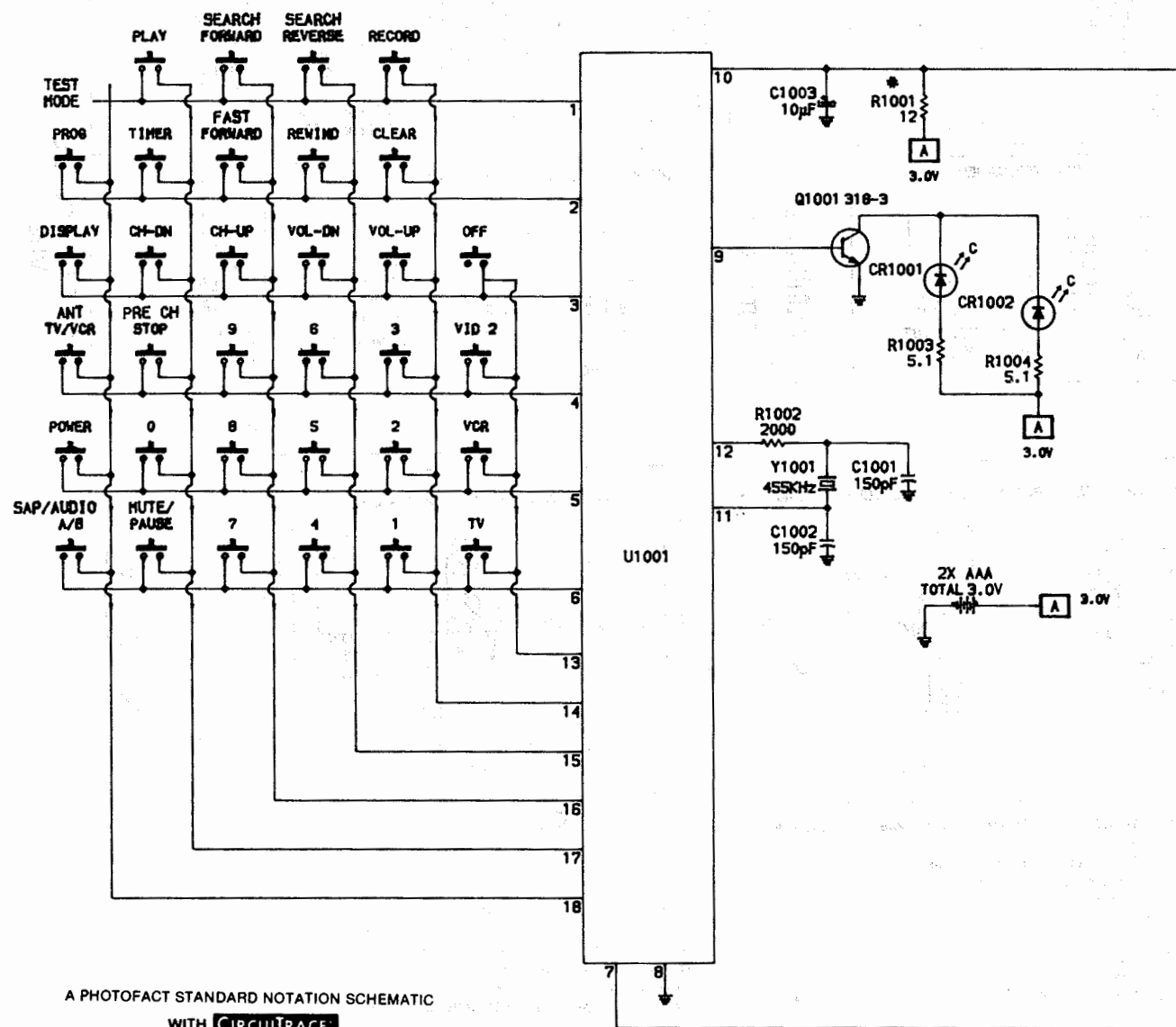
TUNER CONTROL MTT001A

TO SYNTHES

REMOTE CONTROL TRANSMITTER CRK40A-GridTrace LOCATION GUIDE



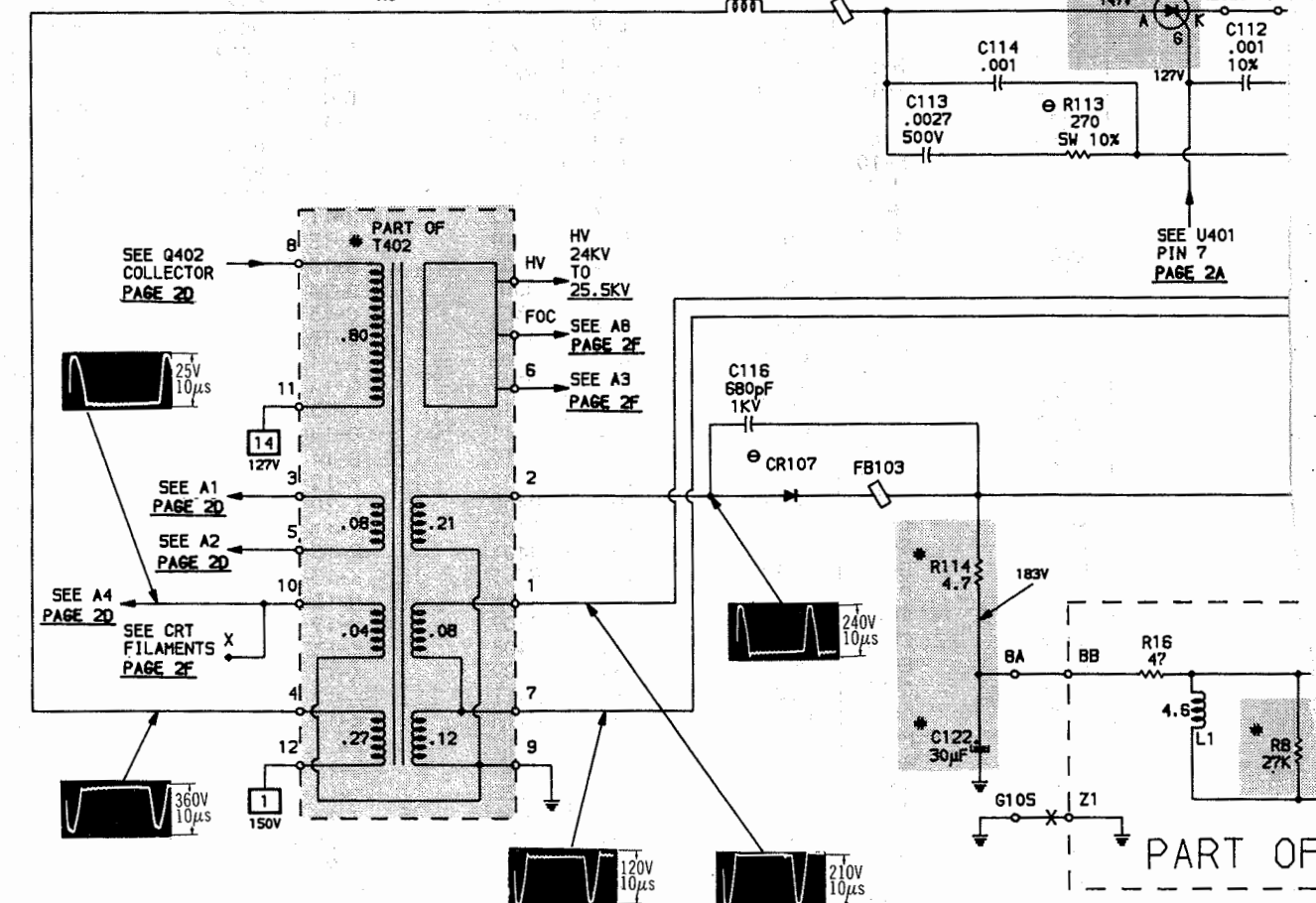
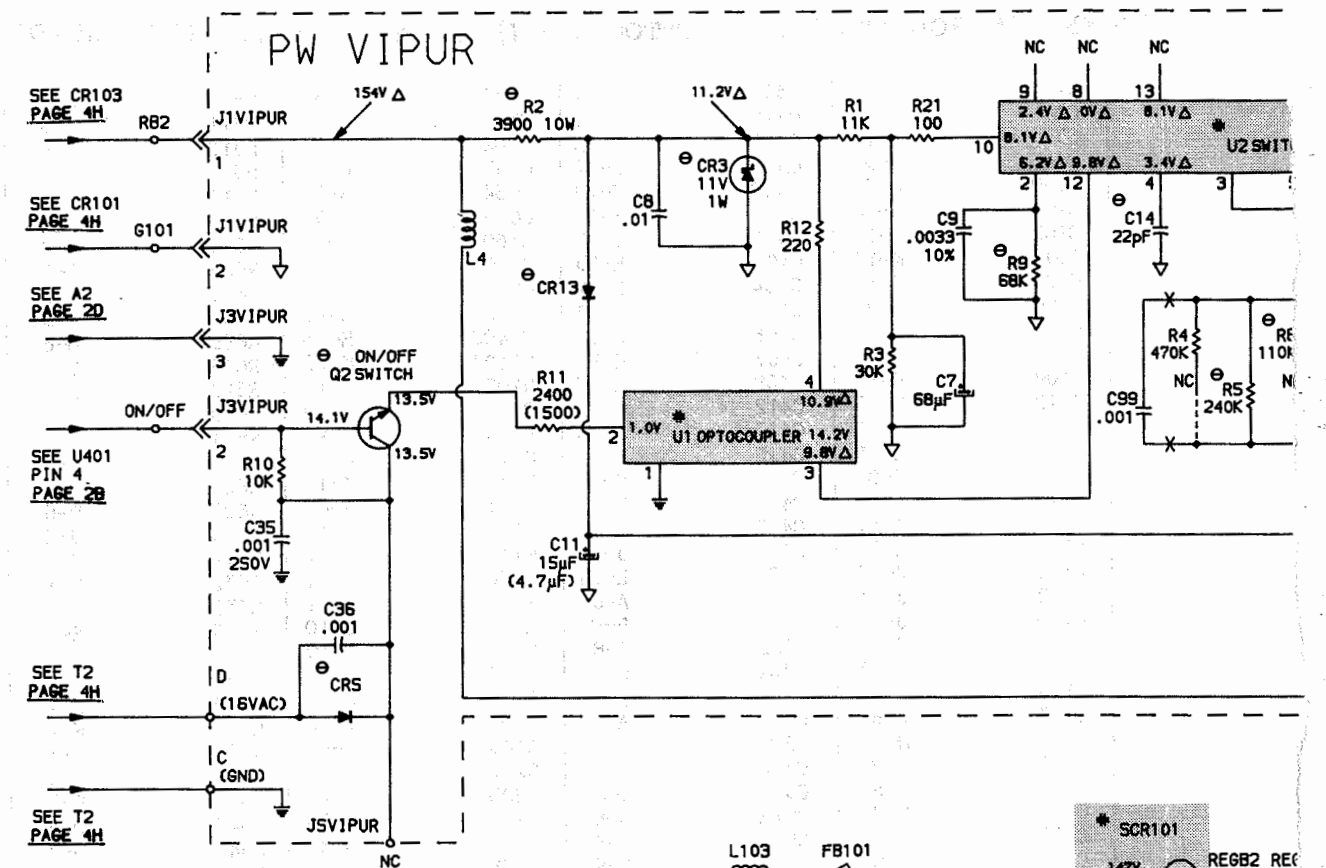
A Howard W. Sams **GRIDTRACE™** Photo



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

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REMOTE CONTROL TRANSMITTER CRK40A



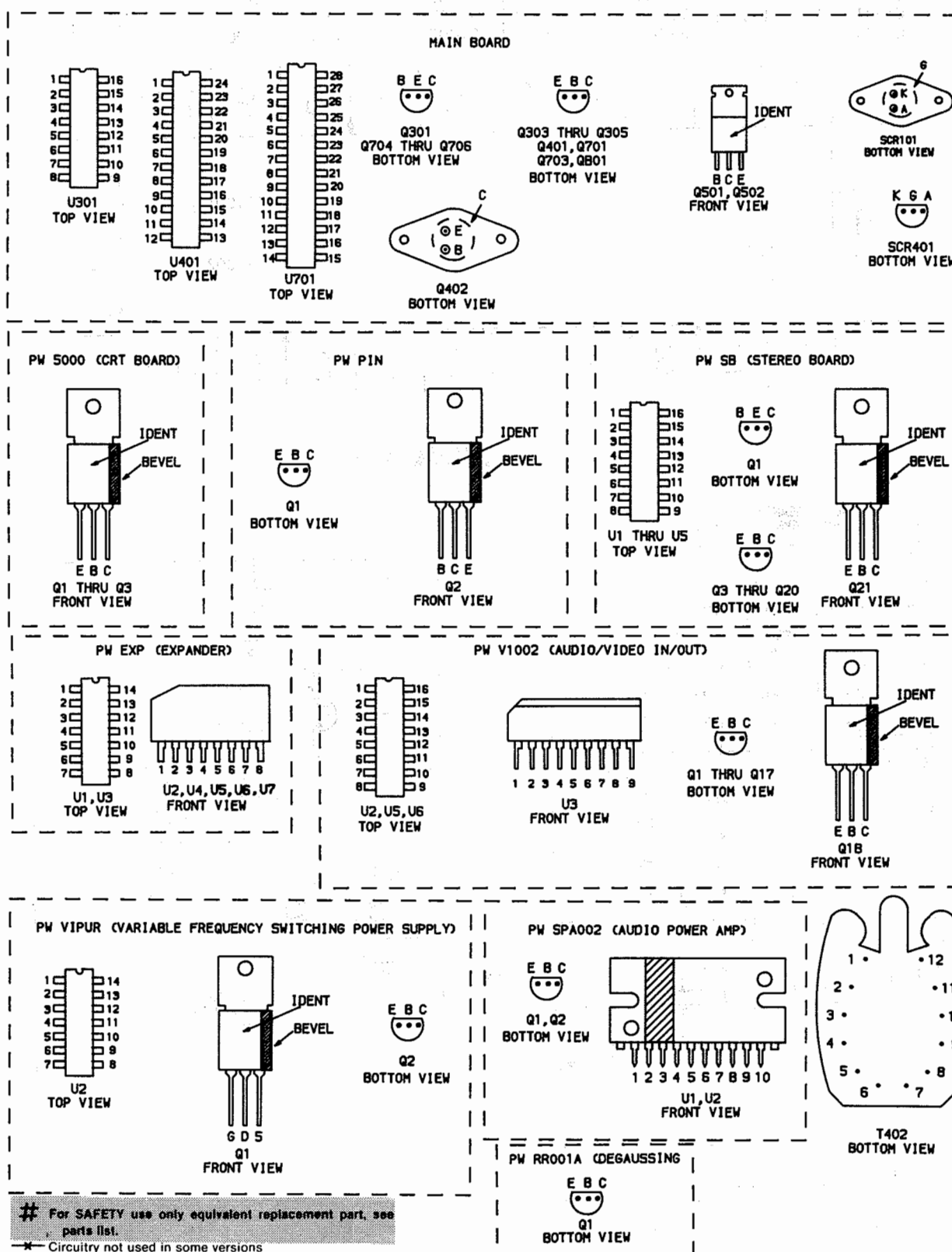
A PHOTOFAC STANDARD NOTATION SCHEMATIC
WITH **CIRCUITRACE™**

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TUNER CONTROL MTT001A (BOTTOM VIEW)-GridTrace LOCATION GUIDE

C1	A-11	C314	E-14	C657	L-5	R509	D-8
C2	A-10	C316	F-14	C659	C-5	R511	E-9
C3	A-10	C317	D-13	C662	C-7	R512	D-8
C4	A-9	C319	C-14	C663	H-1	R515	C-9
C100	H-9	C322	E-12	C664	H-1	R517	D-8
C101	L-10	C323	E-14	C668	L-3	R518	D-9
C102	L-10	C401	J-12	C669	L-4	R605	A-2
C103	K-10	C403	H-13	C670	F-1	R606	A-2
C104	J-10	C404	H-12	C673	D-3	R607	A-3
C105	J-9	C405	H-12	CR401	H-13	R608	A-3
C106	J-9	C406	F-12	CR402	H-13	R609	B-6
C107	H-9	C407	K-12	CR407	K-12	R618	C-5
C109	F-10	C408	K-13	R102	L-10	R619	B-6
C110	H-10	C412	K-13	R107	J-10	R620	C-1
C111	J-11	C413	L-13	R109	J-9	R621	C-1
C115	L-11	C415	J-14	R111	H-10	R625	B-7
C116	C-8	C416	K-14	R113	K-11	R627	B-6
C117	K-11	C418	L-12	R115	J-8	R628	B-6
C118	K-11	C419	J-13	R117	L-11	R630	J-2
C119	L-11	C420	J-1	R119	J-11	R631	J-2
C121	J-10	C421	L-14	R120	L-11	R632	K-1
C122	J-11	C501	A-8	R122	J-11	R633	J-1
C123	J-11	C502	B-9	R123	J-10	R635	E-2
C124	J-11	C503	B-8	R126	J-10	R636	H-3
C125	H-11	C504	B-8	R128	K-10	R637	D-2
C126	J-11	C505	B-8	R129	J-11	R639	E-1
C127	J-8	C507	A-8	R130	J-10	R640	K-2
C128	H-9	C509	C-8	R145	K-11	R641	L-1
C131	H-9	C510	C-8	R202	C-9	R643	D-3
C133	K-8	C511	E-8	R203	C-11	R645	D-7
C134	L-8	C512	D-8	R205	D-10	R646	D-6
C135	K-11	C513	E-8	R206	C-2	R647	D-7
C137	K-8	C514	E-9	R208	C-11	R648	D-6
C139	H-8	C515	E-9	R209	D-11	R649	E-6
C141	H-12	C516	B-9	R212	E-11	R652	K-3
C142	H-11	C517	B-8	R213	E-10	R660	J-3
C143	H-10	C518	F-10	R214	D-10	R661	K-2
C144	J-9	C521	D-9	R215	C-11	R662	K-2
C146	J-8	C601	A-2	R217	D-10	R666	E-2
C147	K-10	C602	A-2	R219	D-10	R667	H-4
C149	H-9	C603	A-3	R221	B-11	R670	C-7
C150	H-8	C604	A-3	R222	B-11		
C202	B-11	C605	B-1	R301	A-13		
C203	B-11	C607	C-3	R302	B-13		
C204	B-11	C608	A-3	R303	B-14		
C205	C-11	C609	A-4	R304	C-13		
C206	C-5	C610	A-4	R305	B-13		
C208	C-11	C611	A-4	R308	D-14		
C210	D-11	C612	A-4	R309	D-14		
C211	D-11	C613	A-5	R310	F-13		
C212	D-11	C614	A-5	R311	D-14		
C214	E-11	C615	C-5	R314	B-14		
C215	E-10	C616	B-5	R317	A-12		
C216	E-10	C617	D-1	R402	L-10		
C217	E-11	C618	D-1	R403	K-13		
C218	E-12	C619	A-5	R404	K-13		
C219	B-11	C620	J-1	R405	K-13		
C220	F-10	C622	J-2	R406	H-13		
C221	F-10	C623	K-2	R407	H-12		
C223	C-11	C624	D-1	R408	K-13		
C224	E-11	C625	E-1	R409	K-12		
C227	C-12	C626	F-1	R411	K-12		
C228	C-2	C627	E-1	R412	K-12		
C229	B-11	C630	D-6	R417	F-14		
C302	A-13	C631	E-6	R418	J-13		
C303	A-13	C634	F-7	R420	K-12		
C304	B-14	C635	K-6	R421	J-13		
C305	B-14	C636	H-5	R423	K-13		
C306	B-13	C637	J-1	R501	B-9		
C307	B-13	C638	K-7	R502	B-8		
C308	C-13	C649	L-7	R503	C-9		
C309	C-13	C650	L-3	R504	C-9		
C310	D-13	C652	L-1	R505	C-8		
C313	E-13	C653	L-2	R506	C-9		

TERMINAL GUIDES



RCA
CHASSIS CTC130C

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

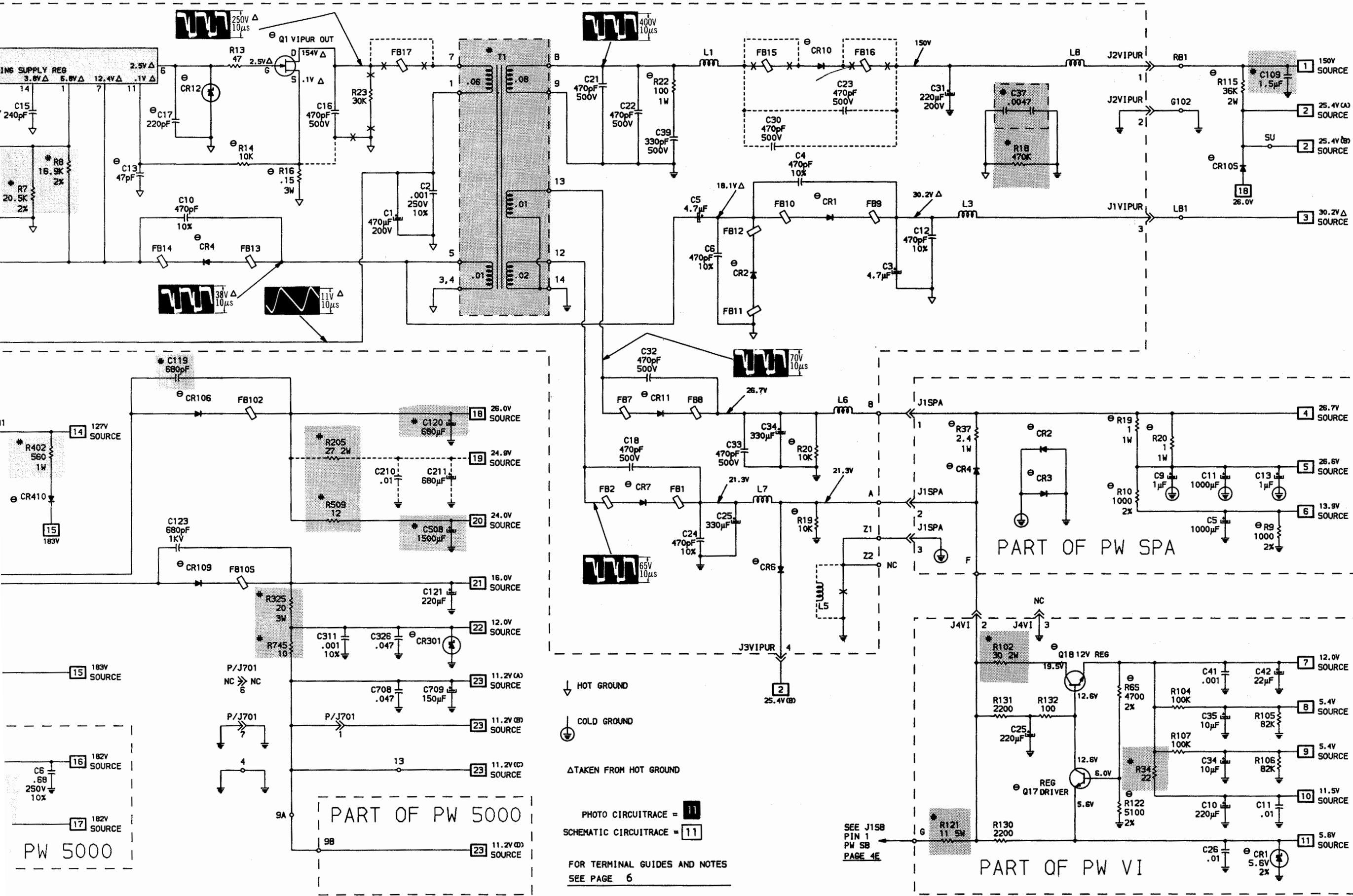
Common tie point

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

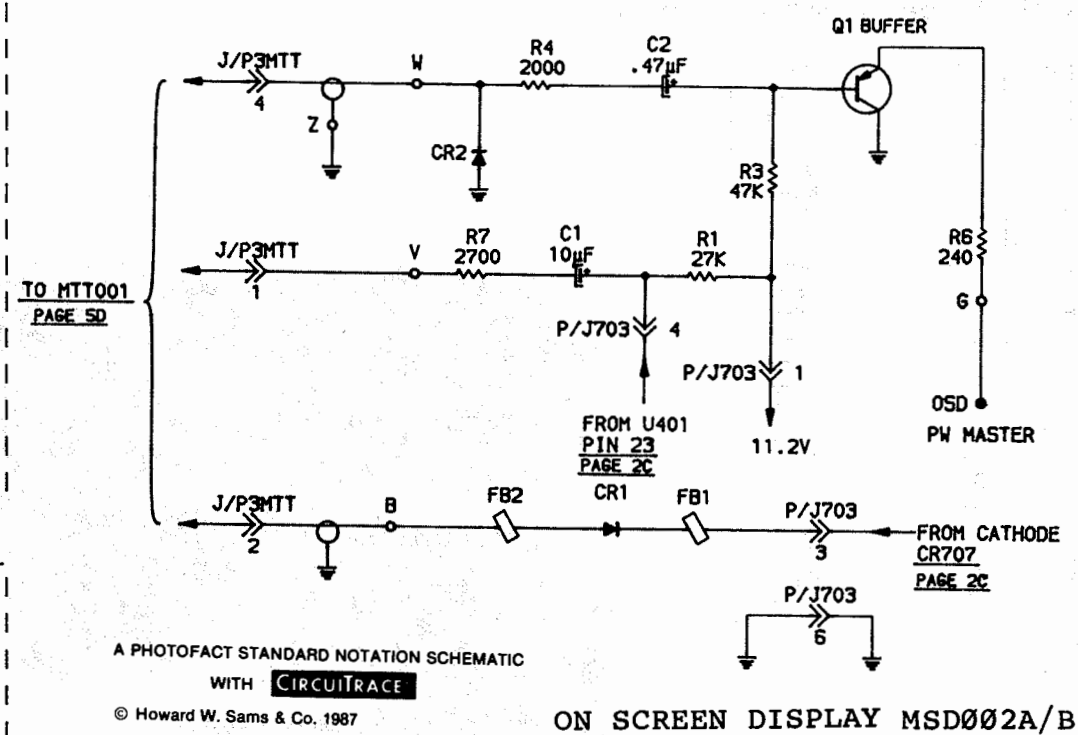
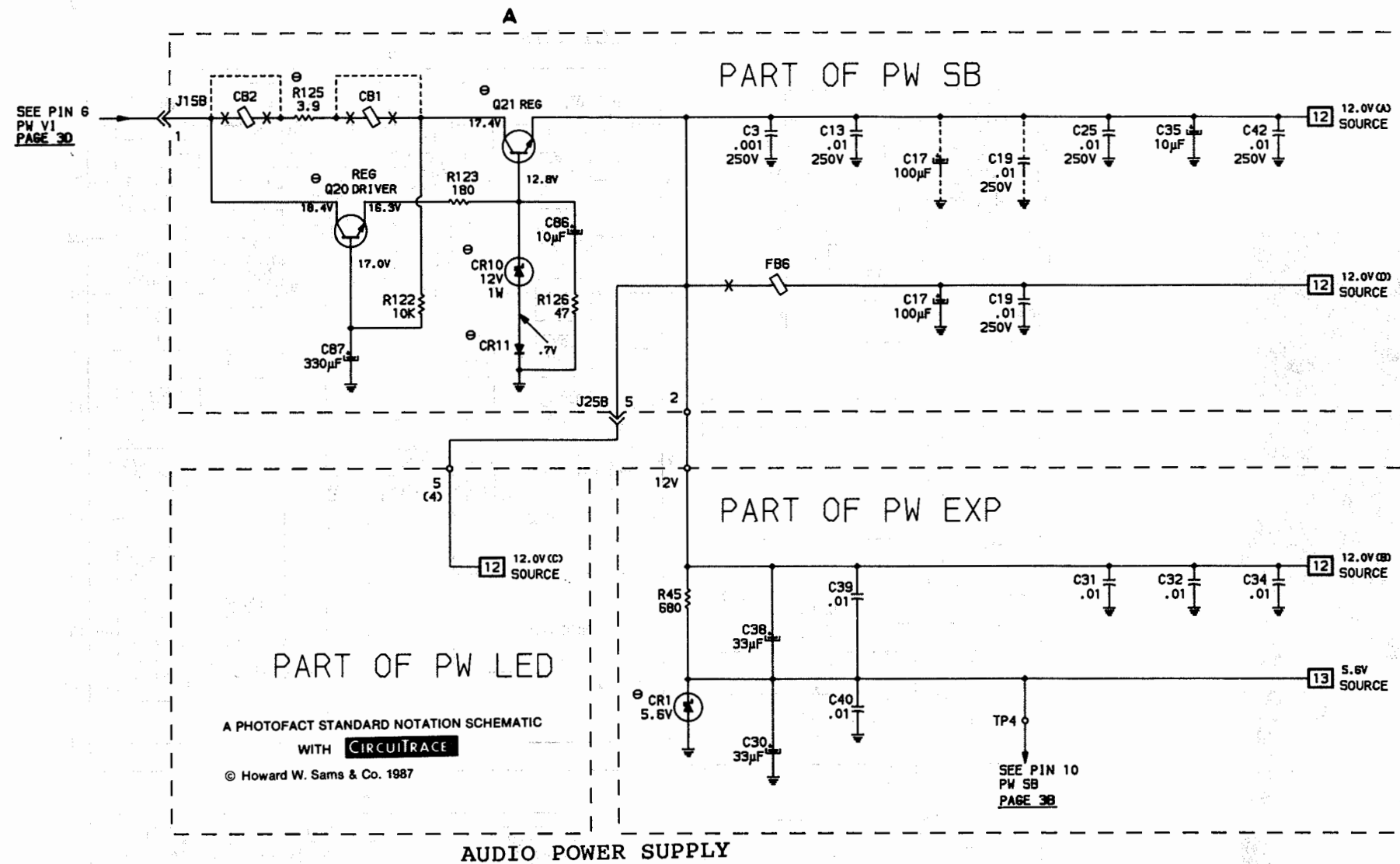
Waveforms: triggered scope, keyed rainbow generator.

Item numbers in rectangles appear in the alignment/adjustment instructions.

Supply voltages 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% unless noted. Electrolytic capacitors are 50 volts or less, 20% unless noted. Resistors are 1/2W or less, 5% unless noted. Value in () used in some versions.

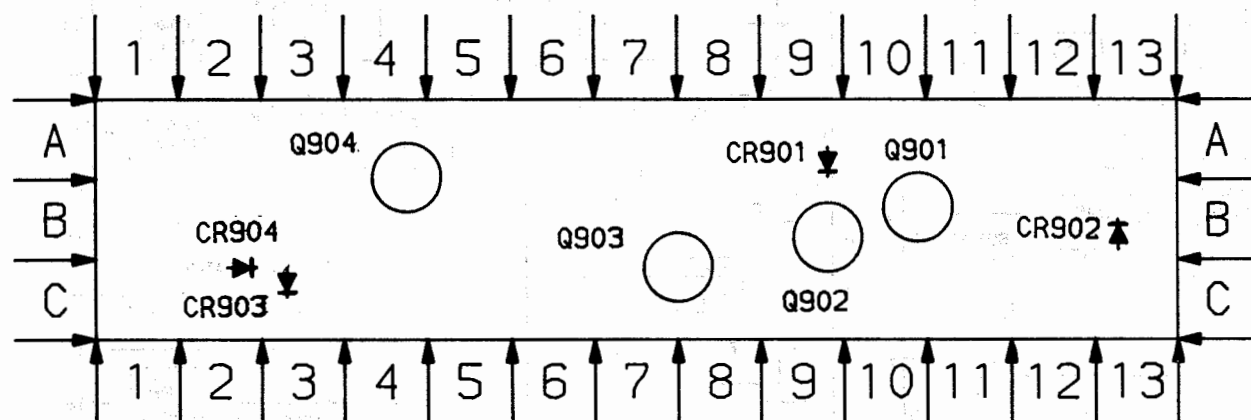


RCA
CHASSIS CTC130C

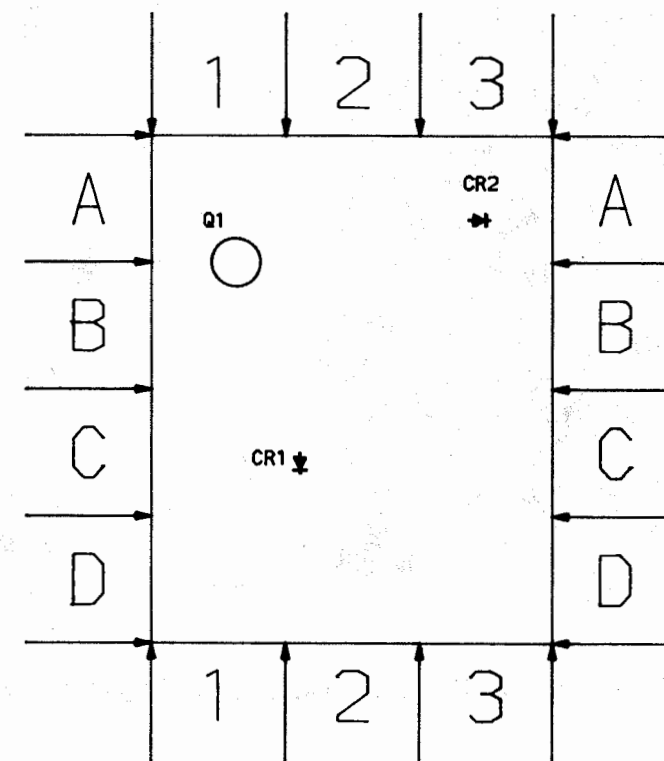


MCY005A REMOTE CONTROL PREAMP-GridTrace LOCATION GUIDE

C901	A-12	C907	C-12	CR902	B-12	Q903	C-8
C902	B-6	C908	C-7	CR903	C-2	Q904	B-4
C903	B-1	C909	C-5	CR904	C-3	R901	C-10
C904	B-11	C910	B-4	L901	C-6	R902	C-8
C905	B-8	C911	A-2	Q901	B-10	R903	A-7
C906	B-2	CR901	A-9	Q902	C-9	R904	B-2



A Howard W. Sams **GRIDTRACE™** Photo

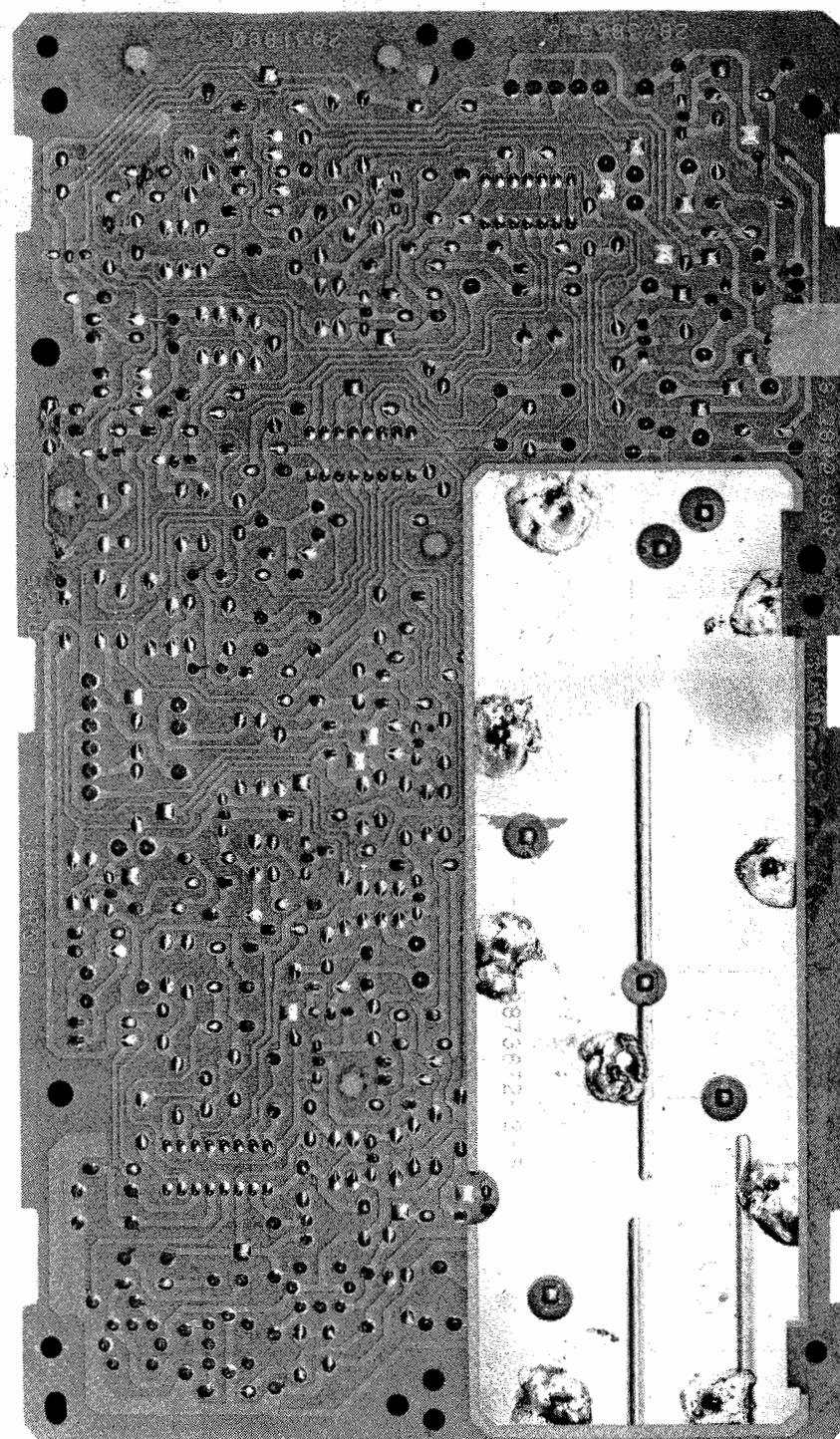


ON SCREEN DISPLAY MSD002A/B-GridTrace LOCATION GUIDE

C1	C-2
C2	B-2
CR1	C-2
CR2	A-3
FB1	C-1
FB2	B-2
Q1	B-1
R1	C-1
R2	B-3
R3	C-1
R4	B-3
R6	A-2
R7	B-3

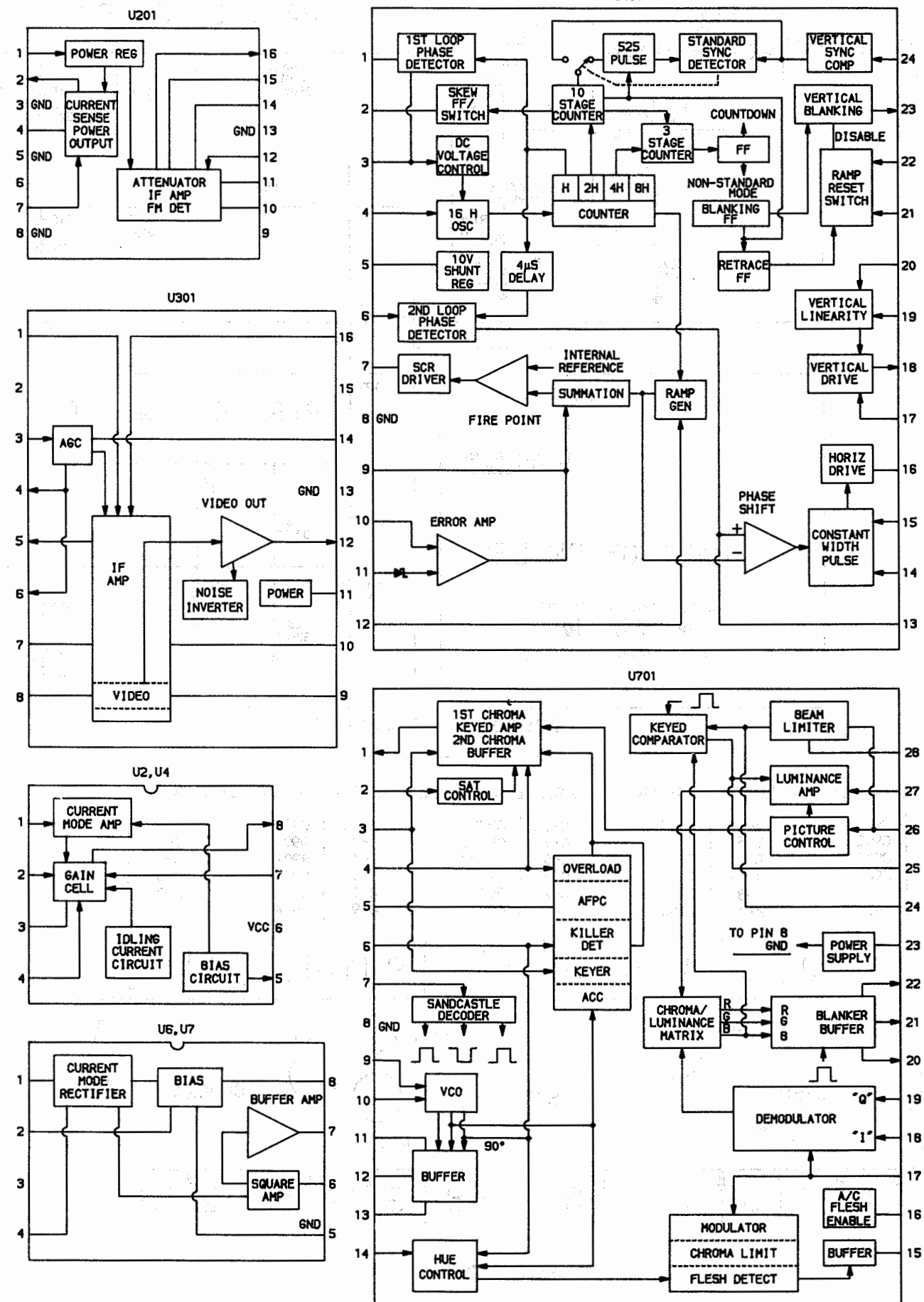
A Howard W. Sams **GRIDTRACE™** Photo

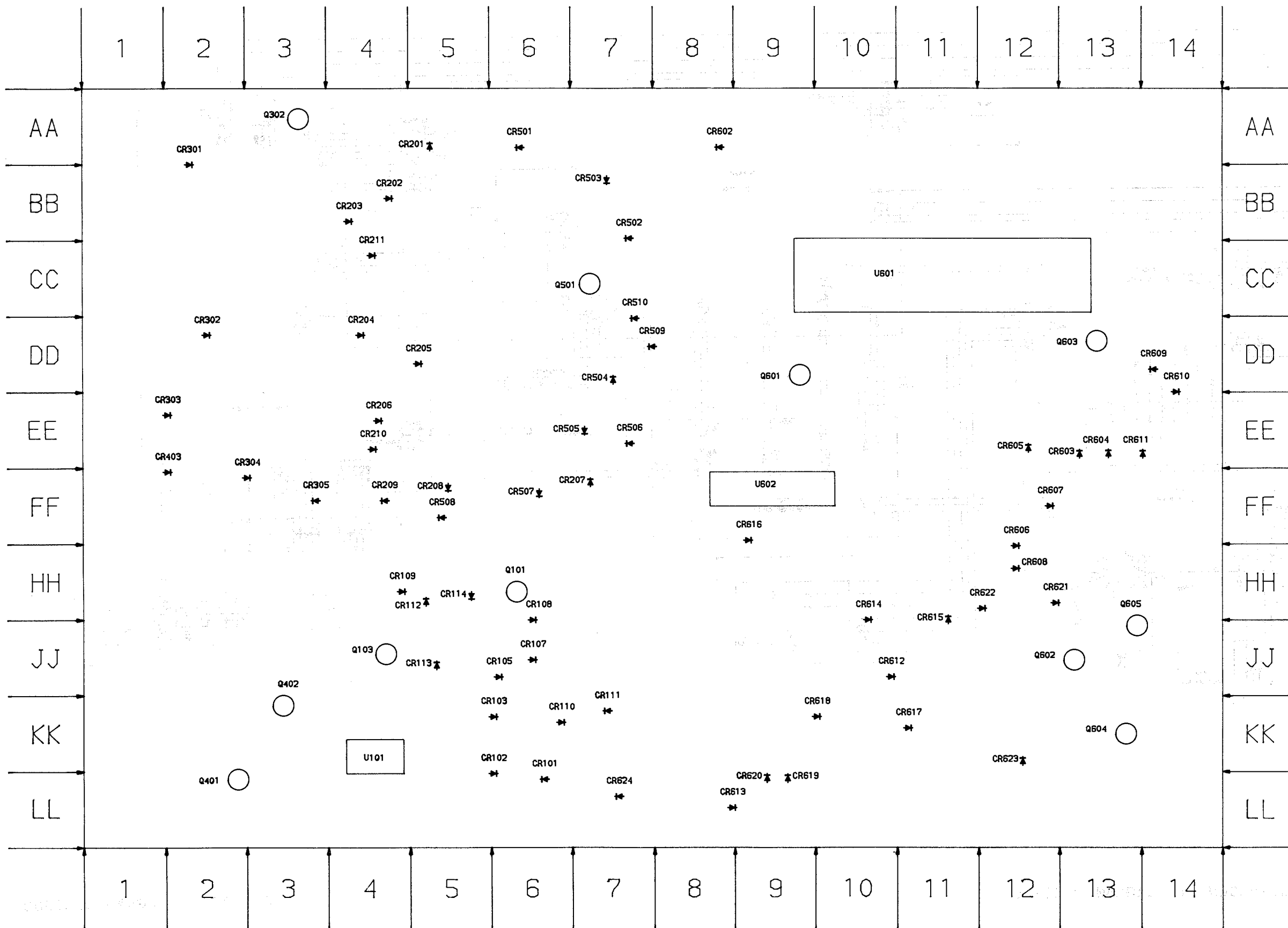
LL-2	R106	JJ-7
CC-6	R110	HH-6
AA-4	R112	JJ-3
AA-5	R118	HH-4
AA-6	R121	JJ-4
LL-6	R124	KK-4
KK-6	R131	HH-6
KK-6	R207	LL-4
JJ-6	R211	DD-5
KK-4	R216	EE-3
HH-4	R218	DD-6
AA-4	R220	CC-4
BB-5	R223	FF-4
BB-5	R306	CC-2
DD-5	R307	BB-2
DD-4	R312	DD-3
DD-4	R315	AA-2
DD-4	R316	AA-2
EE-4	R414	HH-1
EE-4	R415	HH-1
EE-5	R416	FF-3
FF-5	R419	HH-2
BB-4	R422	KK-2
DD-4	R507	CC-7
BB-2	R508	CC-7
BB-2	R513	FF-7
CC-2	R514	CC-6
DD-2	R601	BB-13
DD-1	R602	BB-13
EE-1	R603	BB-12
FF-2	R604	BB-12
BB-2	R610	BB-13
CC-2	R611	BB-12
EE-1	R612	BB-12
AA-1	R613	BB-11
AA-2	R614	BB-11
JJ-2	R615	BB-11
LL-5	R616	BB-11
LL-1	R617	BB-10
JJ-1	R626	CC-9
KK-1	R629	CC-9
BB-7	R634	FF-13
BB-7	R638	DD-13
DD-7	R642	CC-14
DD-6	R644	CC-8
EE-7	R651	EE-8
DD-7	R653	JJ-11
DD-6	R654	HH-10
EE-6	R655	JJ-10
EE-6	R664	KK-11
FF-6	R668	LL-11
HH-9	R669	EE-10
DD-12	T401	JJ-3
HH-13	T402	FF-2
HH-13	T501	AA-6
KK-13	U101	KK-4
HH-6	U601	CC-11
JJ-4	U602	FF-9
CC-4	Y601	BB-10
CC-1		
AA-3		
LL-2		
KK-3		
CC-7		
DD-9		
JJ-13		
DD-13		
KK-13		
JJ-14		
AA-5		
KK-6		
KK-6		
KK-6		



PW STEREO BOARD-SHIELD LOCATION-(BOTTOM VIEW)

IC FUNCTIONS

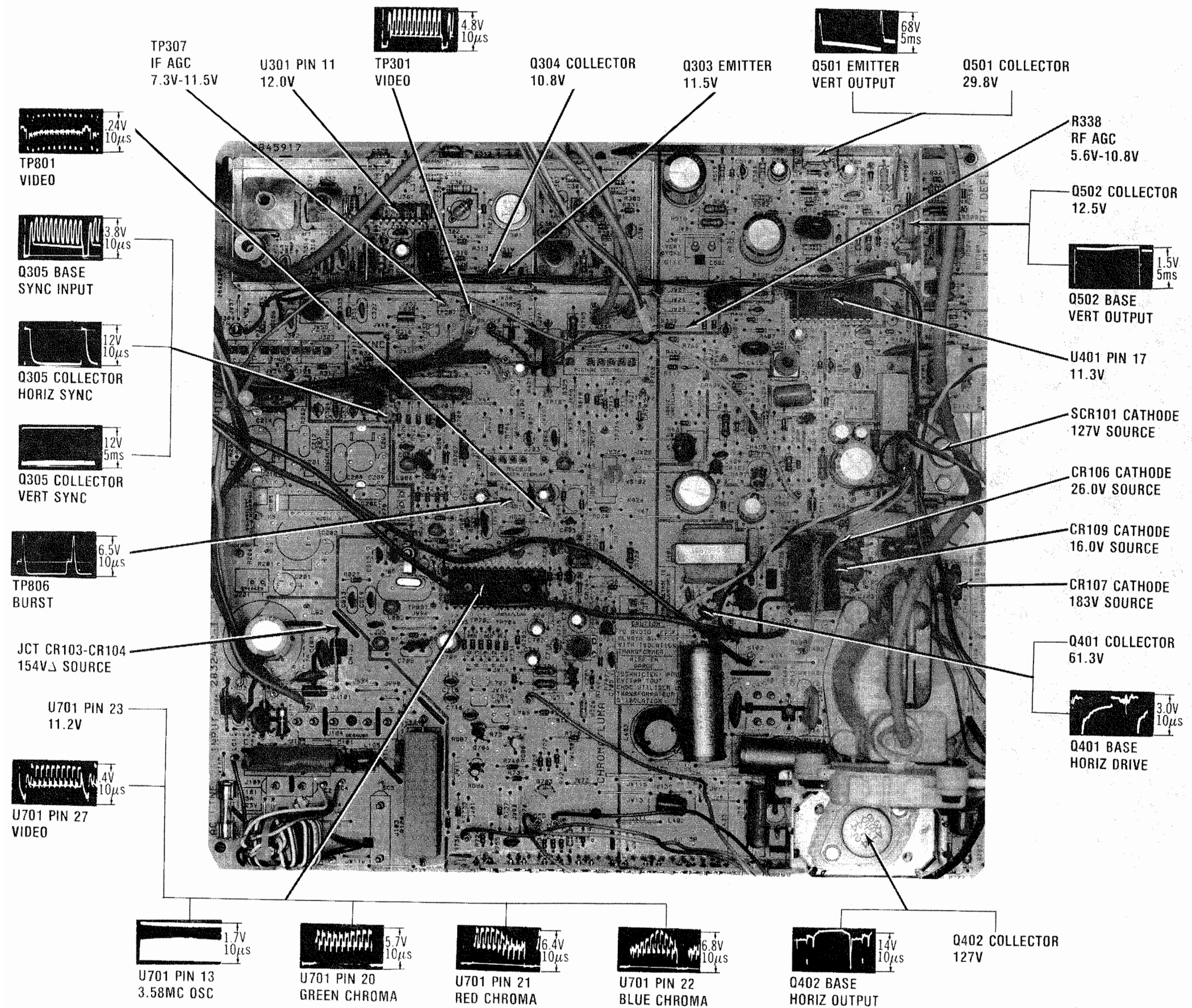




TUNER CONTROL MTT001A

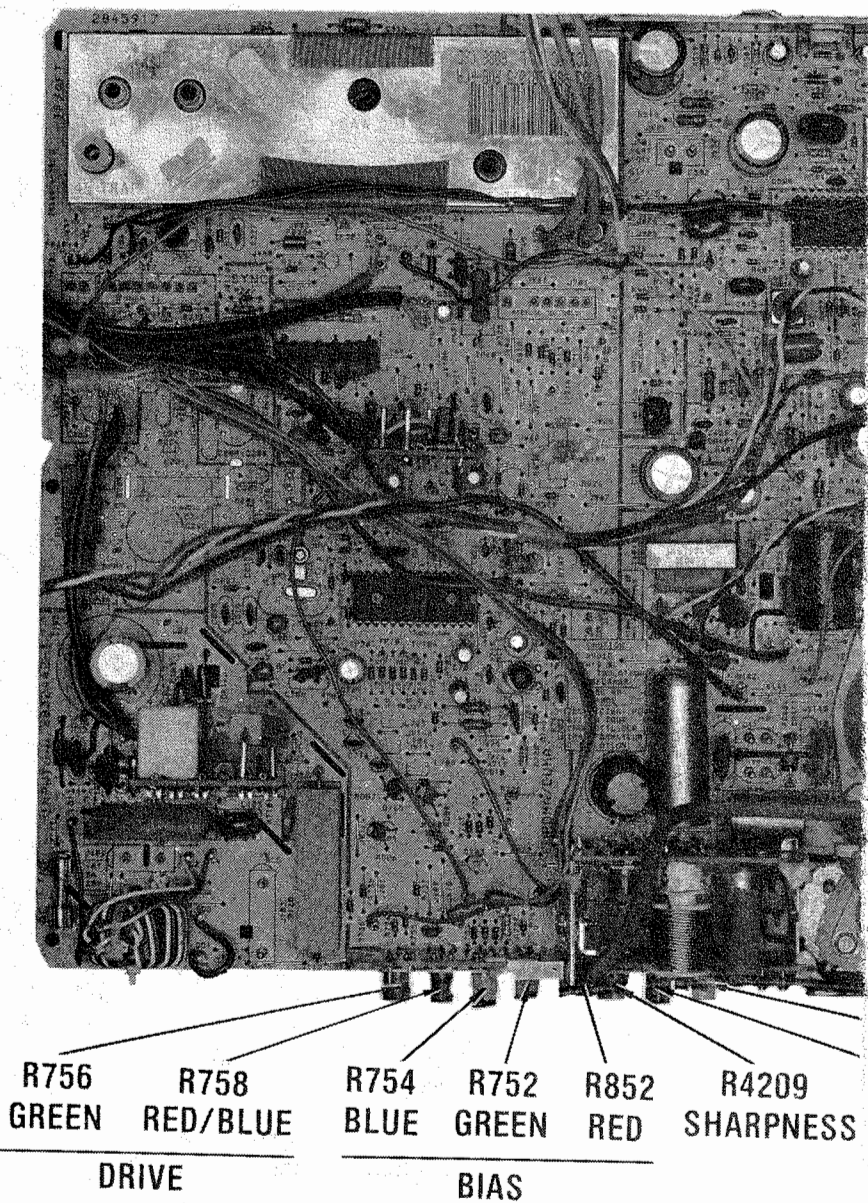
A Howard W. Sams GRIDTRACE™ Photo

C148	HH-4	FB401
C207	CC-4	FB501
C209	EE-6	L1
C222	DD-4	L2
C225	BB-5	L3
C226	EE-5	L101
C311	AA-1	L102
C312	DD-1	L103
C320	FF-2	L104
C411	LL-2	L105
C414	HH-1	L106
C417	FF-1	L201
C506	CC-2	L202
C519	BB-6	L203
C628	KK-14	L204
C629	DD-8	L205
C632	DD-9	L206
C633	EE-9	L207
C644	JJ-11	L208
C645	HH-10	L209
C646	FF-10	L210
C647	FF-8	L211
C648	LL-8	L212
C654	LL-11	L213
C656	LL-10	L301
C665	BB-8	L302
C667	LL-13	L303
C671	BB-13	L304
C672	LL-11	L305
C674	JJ-9	L306
C675	FF-11	L307
CR101	LL-6	L308
CR102	LL-5	L309
CR103	KK-5	L310
CR105	JJ-5	L311
CR107	JJ-6	L312
CR108	JJ-6	L401
CR109	HH-4	L402
CR110	KK-6	L403
CR111	KK-6	L404
CR112	HH-5	L405
CR113	JJ-5	L502
CR114	HH-5	L503
CR201	AA-5	L504
CR202	BB-4	L505
CR203	BB-4	L506
CR204	DD-4	L507
CR205	DD-4	L508
CR206	EE-4	L509
CR207	FF-7	L510
CR208	FF-5	L511
CR209	FF-4	L601
CR210	EE-4	L603
CR211	CC-4	L604
CR212	EE-5	L605
CR301	AA-2	L606
CR302	DD-2	Q101
CR303	EE-1	Q103
CR304	FF-2	Q201
CR305	FF-3	Q301
CR403	FF-1	Q302
CR501	AA-6	Q401
CR502	BB-7	Q402
CR503	AA-7	Q501
CR504	DD-7	Q601
CR505	EE-7	Q602
CR506	EE-7	Q603
CR507	FF-6	Q604
CR508	FF-5	Q605
CR509	DD-8	R1
CR510	CC-7	R101
FB201	CC-5	R103
FB301	BB-1	R104
FB302	BB-2	R105

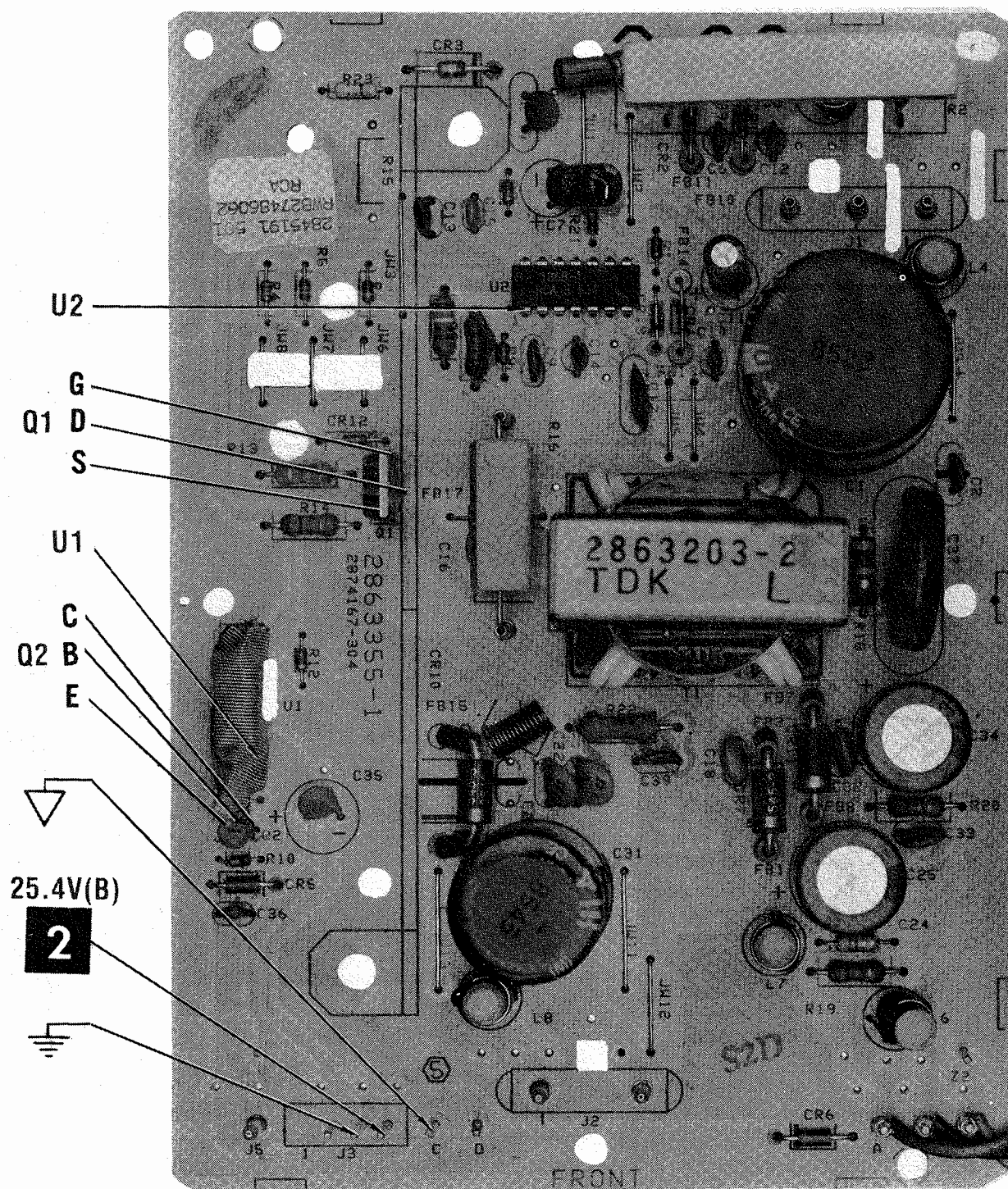


MAIN BOARD

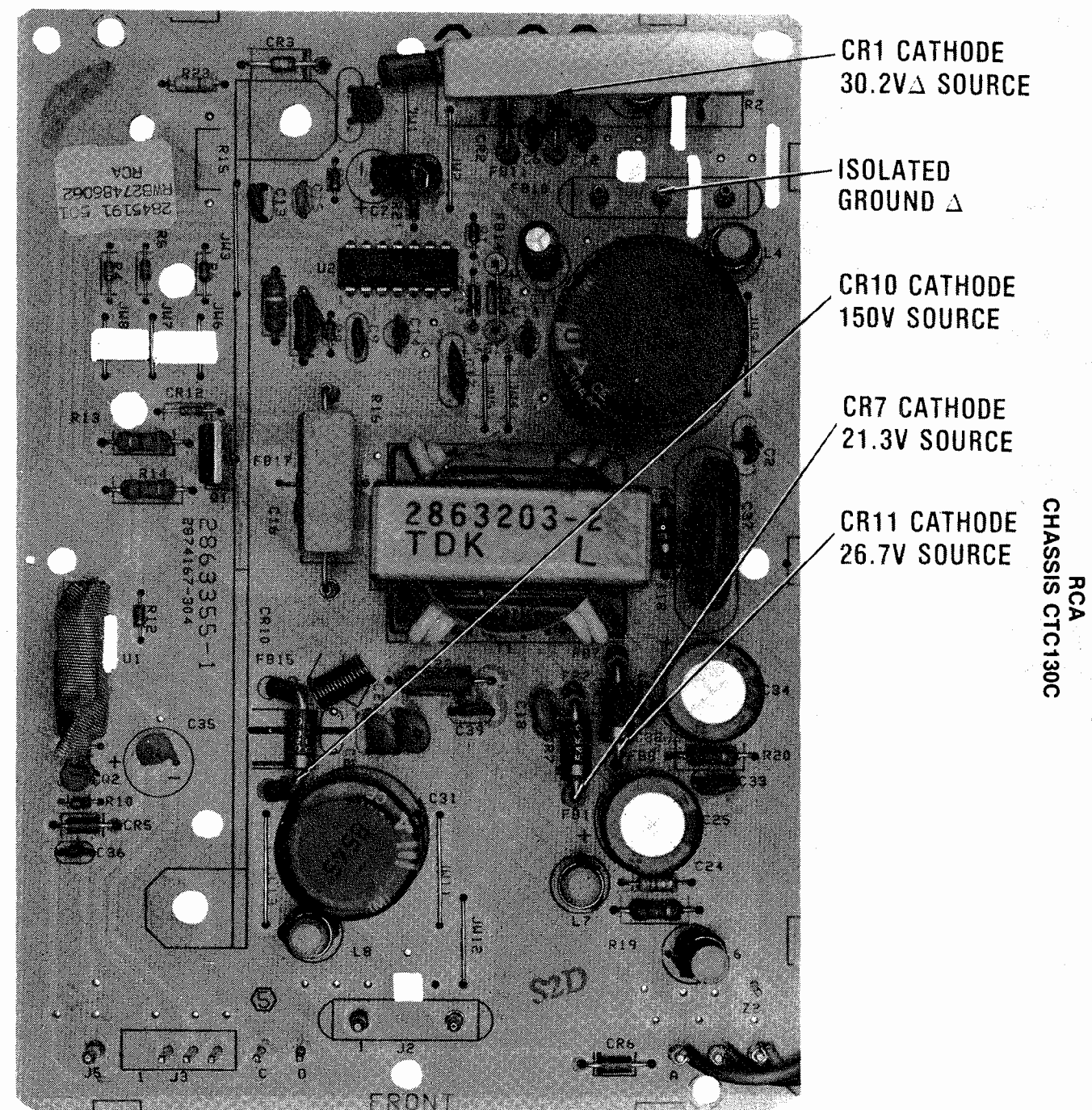
MAIN BOARD

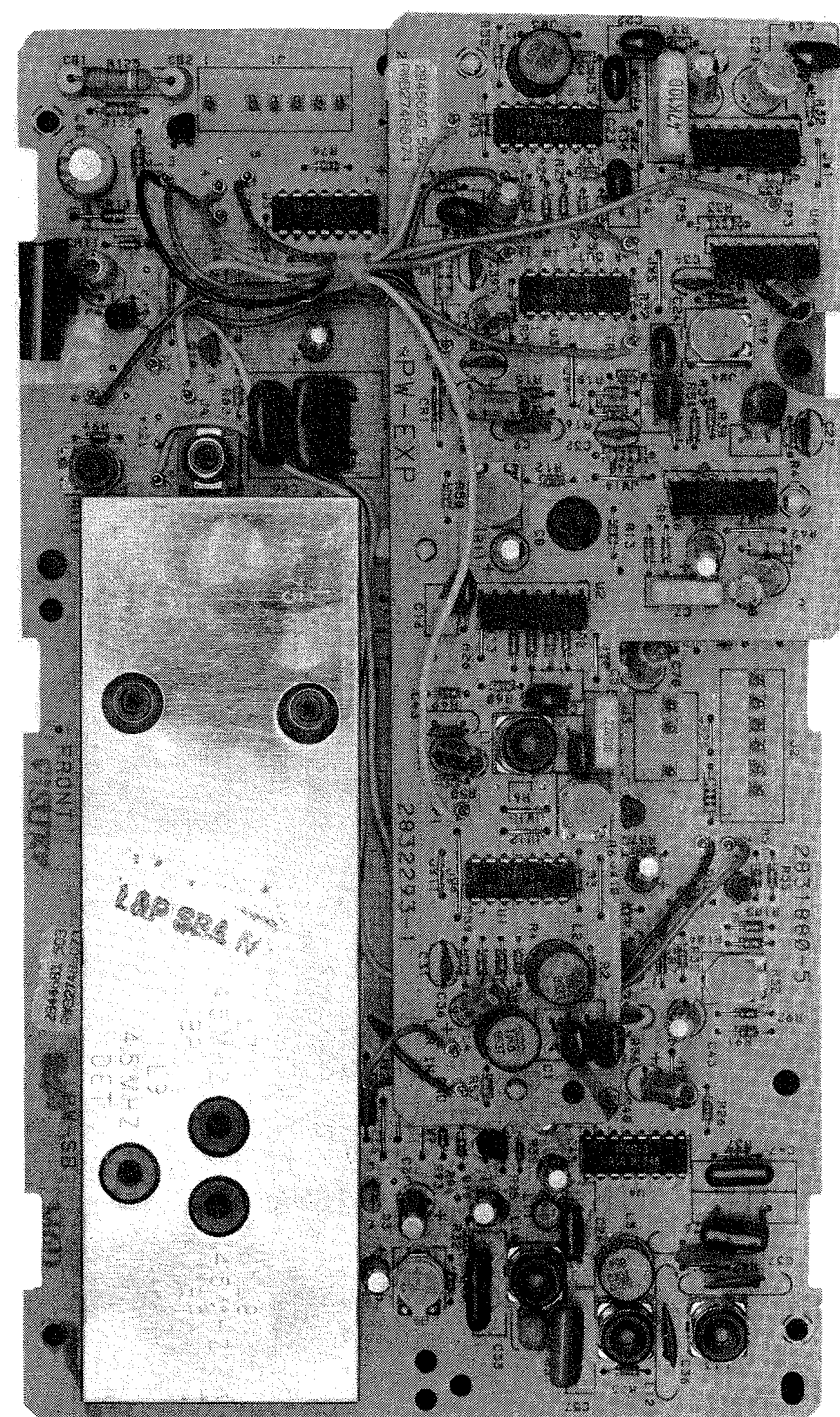
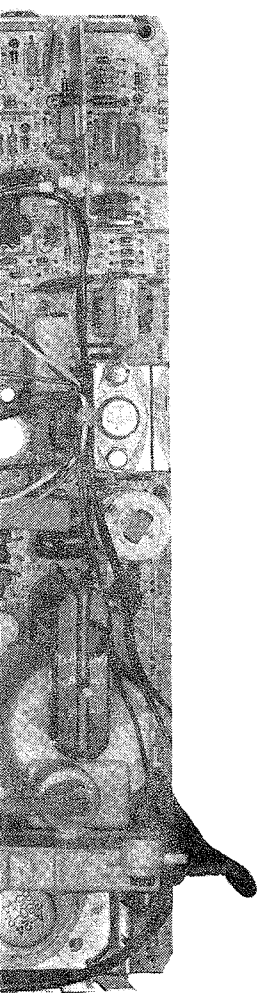


MAIN BOARD OVERALL



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

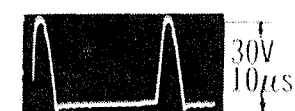
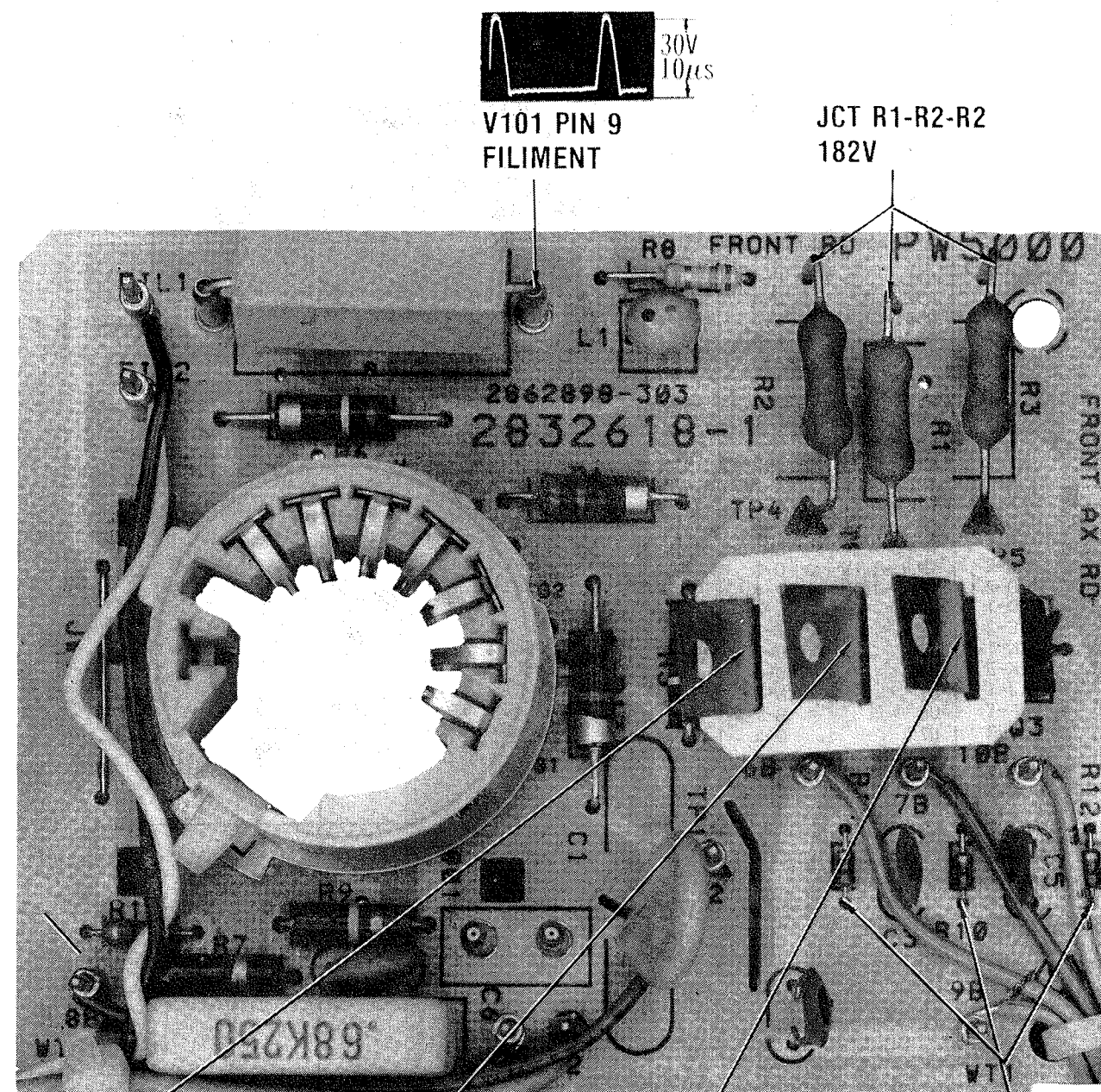




R334
AGC
DELAY

R534
VERT
HOLD

PW STEREO BOARD & PW EXPANDER BOARD-SHIELD LOCATION

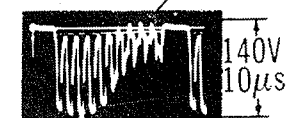


V101 PIN 9
FILAMENT

JCT R1-R2-R2
182V



Q2 COLLECTOR
GREEN OUTPUT



Q1 COLLECTOR
RED OUTPUT



Q3 COLLECTOR
BLUE OUTPUT

JCT R10-R11-R12
11.2V

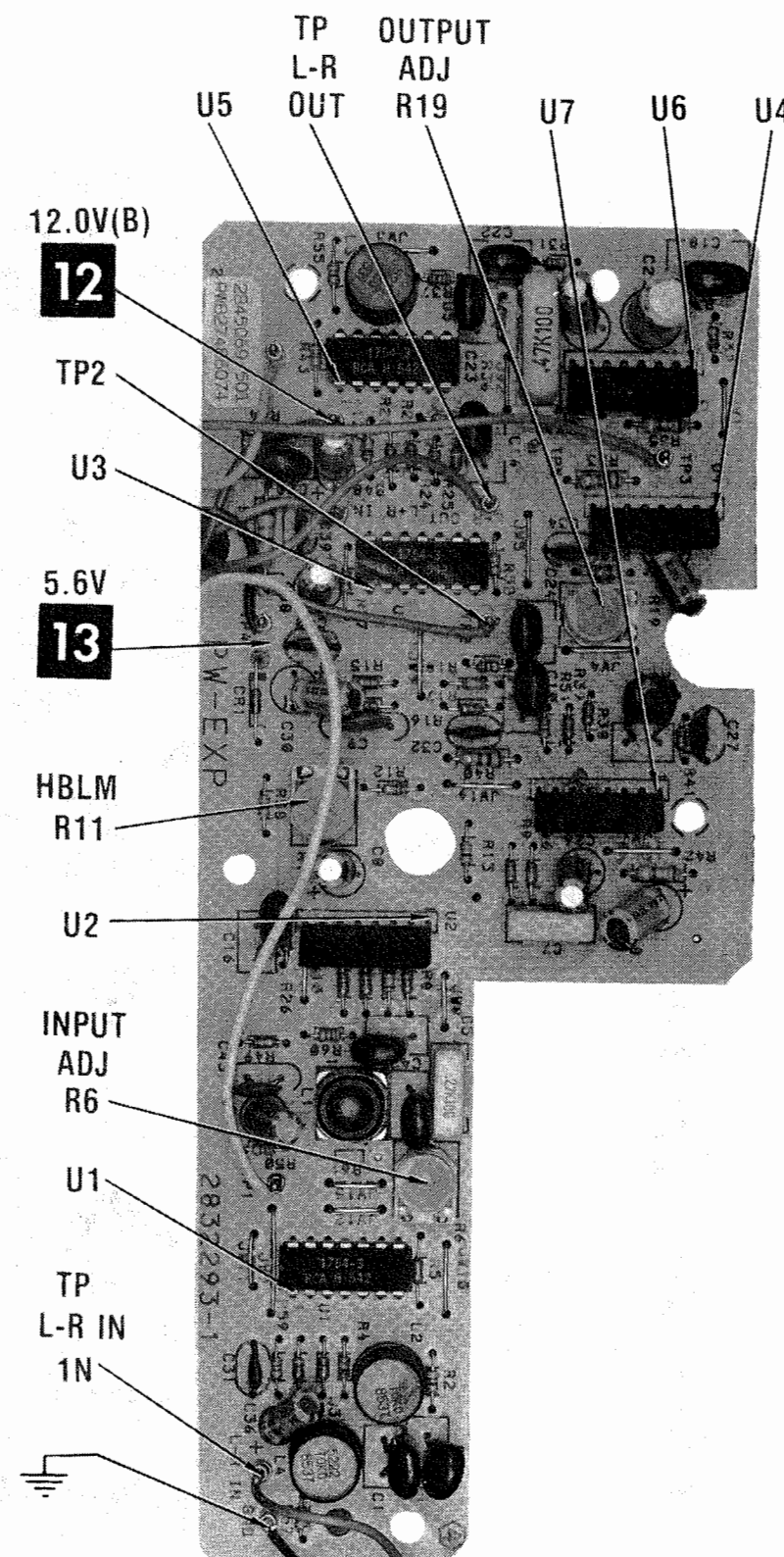
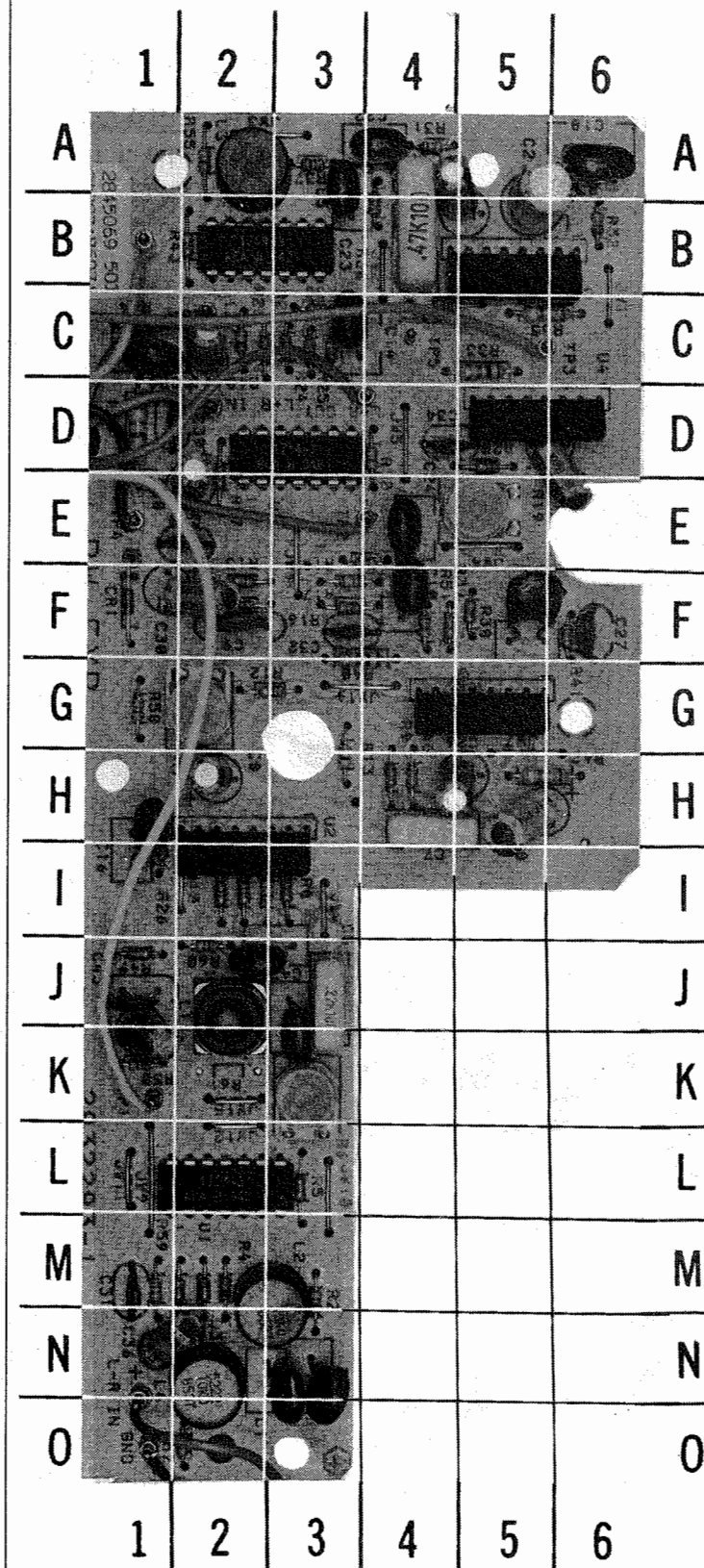
RCA
CHASSIS CTC130C

CRT SOCKET BOARD

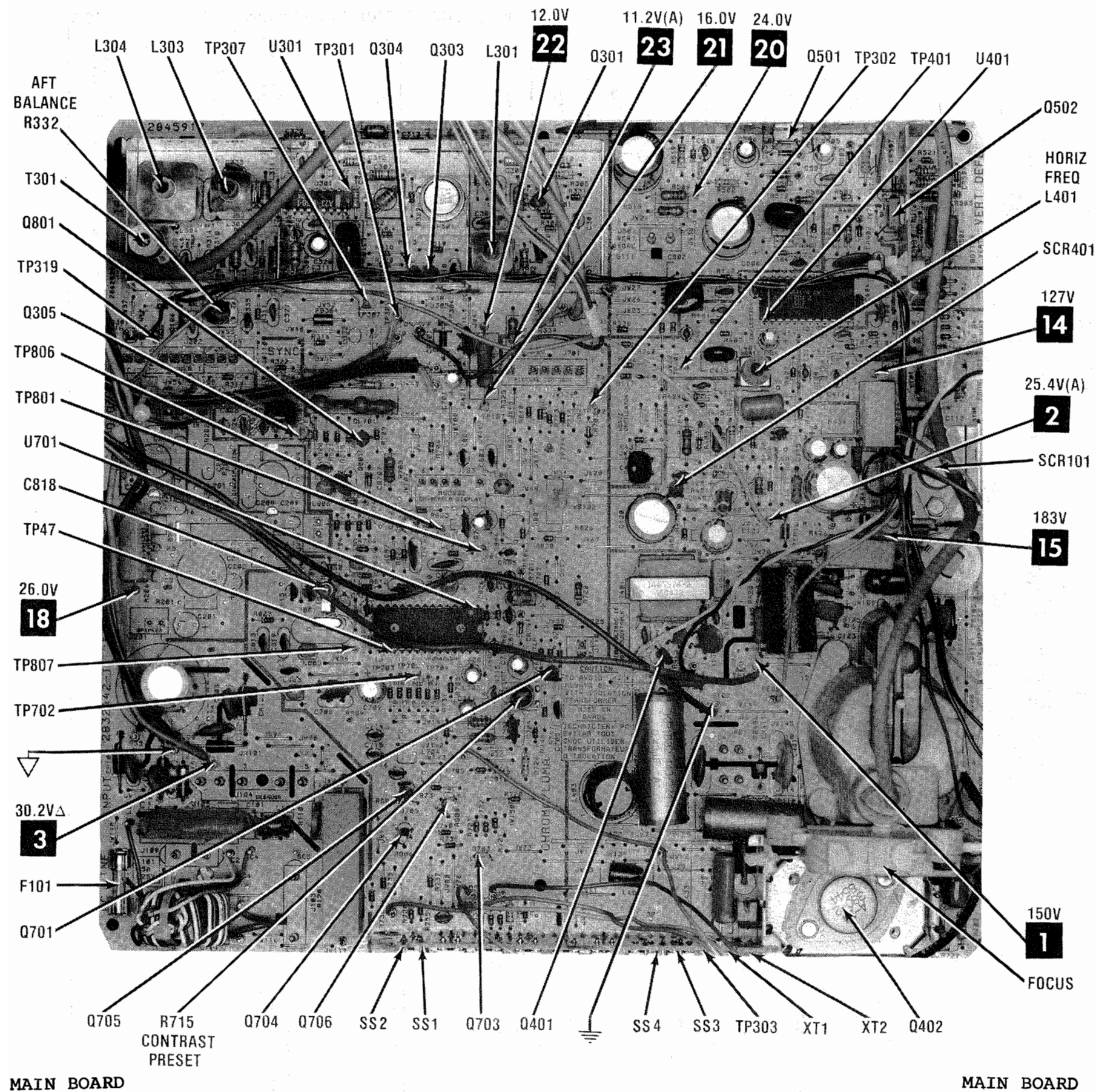
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PW EXPANDER BOARD- GridTrace LOCATION GUIDE

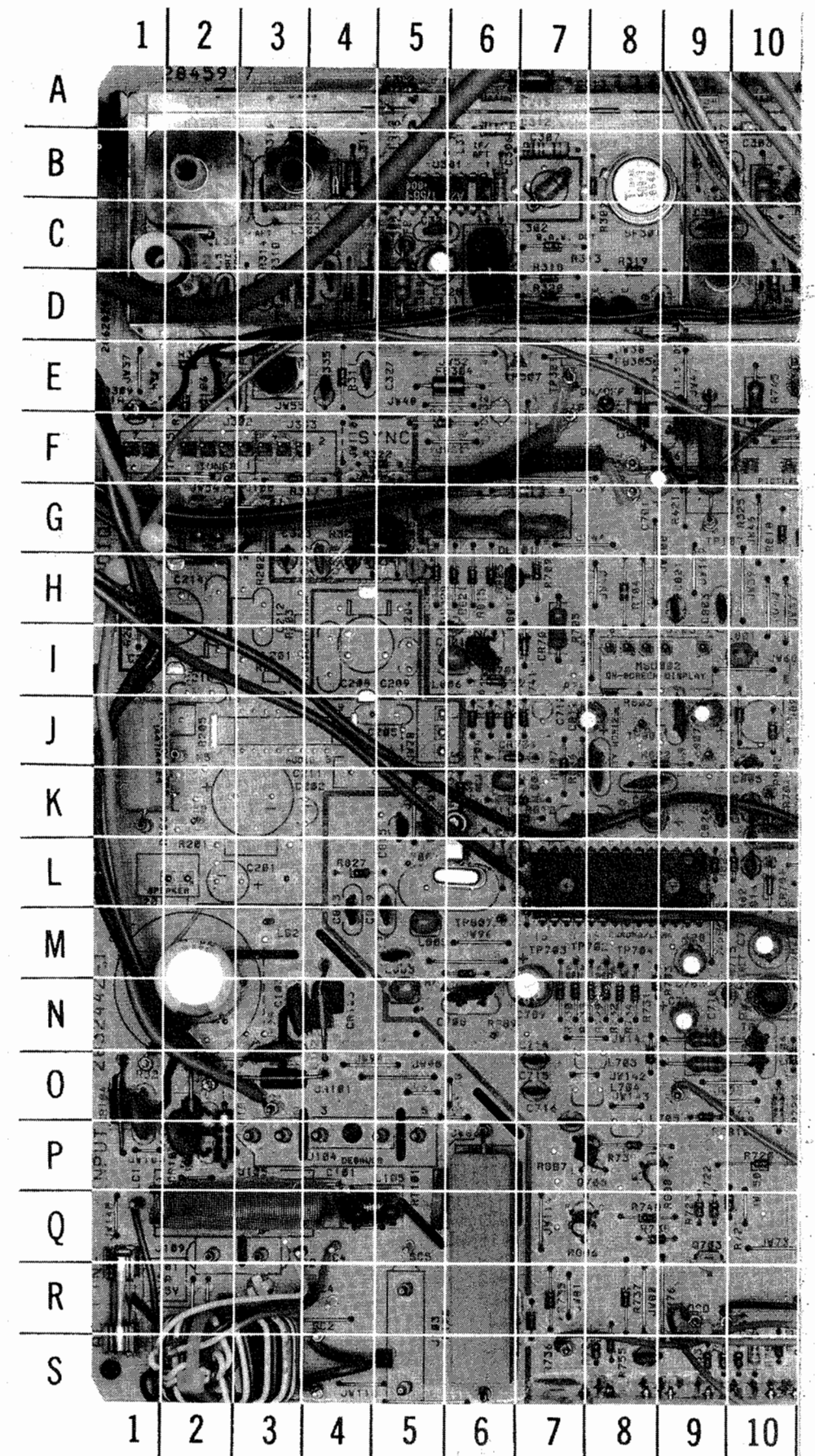
C1	N-3	R35	C-6
C2	N-3	R36	B-4
C5	J-3	R37	A-3
C6	J-2	R38	F-5
C7	H-4	R39	F-4
C8	H-2	R40	G-3
C9	F-2	R41	F-6
C10	F-4	R42	H-5
C12	D-6	R43	B-2
C14	C-3	R44	C-2
C16	H-1	R45	D-1
C17	B-4	R46	H-4
C18	A-6	R48	C-2
C17	A-4	R49	J-1
C20	C-5	R50	K-1
C21	A-5	R51	F-4
C22	A-4	R52	D-4
C23	A-3	R53	C-4
C24	E-4	R54	F-5
C25	F-5	R55	A-2
C26	H-5	R56	I-2
C27	F-6	R57	O-2
C28	H-5	R58	G-1
C29	C-2	R59	M-1
C30	F-2	R60	J-2
C31	M-1	TP1	K-1
C32	F-3	TP2	E-4
C34	D-4	TP3	C-5
C36	N-1	TP4	E-1
C37	C-2	TP L-R IN	O-1
C38	D-2	TP L-R OUT	D-4
C39	D-1	U1	L-2
C40	E-2	U2	I-2
C41	K-1	U3	D-2
C42	K-3	U4	D-6
C43	J-1	U5	B-2
CR1	F-1	U6	B-5
L1	J-2	U7	G-5
L2	M-3		
L3	A-2		
L4	N-2		
L+R IN	D-2		
L+R OUT	B-1		
R1	M-2		
R2	M-3		
R3	M-2		
R4	M-2		
R6	L-3		
R6	K-3		
R7	I-2		
R9	I-3		
R9	H-4		
R10	I-2		
R11	G-2		
R12	G-3		
R13	H-3		
R14	F-2		
R15	F-2		
R16	F-3		
R17	F-3		
R18	E-4		
R19	E-5		
R20	D-5		
R24	C-3		
R25	C-3		
R26	I-1		
R27	E-2		
R28	C-2		
R29	C-3		
R30	C-3		
R31	A-4		
R32	B-6		
R33	C-5		
R34	A-6		



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



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0 BOARD-GridTrace LOCATION GUIDE

N-9	CB1	O-1	R20	C-12	R97	H-21
N-12	CB2	M-2	R21	E-8	R98	F-19
L-12	CR3	Q-18	R22	E-7	R99	O-9
J-11	CR5	B-12	R23	E-7	R100	G-2
L-13	CR5	H-16	R24	O-12	R102	H-13
L-15	CR6	I-16	R25	B-12	R103	H-12
K-15	CR7	D-19	R26	O-22	R104	B-19
M-13	CR8	H-21	R27	K-23	R105	B-18
M-15	CR9	F-15	R28	K-24	R109	H-5
N-15	CR10	O-4	R29	K-24	R110	E-4
O-16	CR11	N-5	R30	K-23	R111	D-4
L-16	CR99	I-18	R31	F-27	R112	G-4
M-17	FB1	M-12	R32	H-25	R113	F-6
K-19	FB2	K-16	R33	E-17	R114	E-17
K-21	FB3	L-18	R34	G-18	R115	G-17
O-24	FB4	J-18	R35	C-19	R116	F-19
J-27	FB5	M-27	R36	E-21	R117	E-2
L-22	FB6	F-22	R37	B-23	R118	I-2
L-26	J1	L-2	R38	G-23	R119	O-9
L-25	J2	B-15	R39	C-18	R120	C-16
L-25	J3	D-14	R40	H-16	R122	O-2
N-25	J4	M-9	R41	H-26	R123	N-3
O-27	L1	K-14	R42	C-25	R125	O-1
E-11	L2	N-14	R43	H-18	R126	O-6
E-9	L3	M-19	R44	H-18	TP12	M-19
K-8	L4	K-18	R45	I-12	TP21	L-25
J-8	L5	D-25	R46	H-13	TP24	M-25
E-25	L6	F-27	R47	I-15	TP25	M-24
J-7	L7	M-22	R48	G-14	TP30	G-9
I-24	L8	M-24	R49	G-15	U1	N-17
K-23	L9	N-23	R50	F-16	U2	M-26
G-26	L10	F-26	R51	B-17	U3	H-9
C-6	L11	F-24	R52	B-20	U4	E-23
E-10	L12	D-27	R55	B-17	U5	K-4
D-27	L13	C-27	R56	E-18		
B-26	Q1	M-12	R57	D-17		
I-26	Q3	J-24	R58	B-5		
H-22	Q4	H-18	R59	C-4		
H-20	Q5	F-21	R60	E-3		
E-21	Q6	F-20	R61	H-6		
E-20	Q7	H-15	R62	H-5		
C-2	Q8	B-9	R63	B-7		
G-24	Q9	C-3	R64	C-8		
F-23	Q10	M-7	R65	D-10		
B-25	Q11	D-16	R66	D-7		
B-23	Q12	B-18	R67	D-7		
D-22	Q13	C-9	R68	E-4		
G-4	Q14	G-6	R69	J-20		
G-14	Q15	A-5	R70	E-3		
F-18	Q16	G-23	R72	J-5		
H-6	Q17	H-4	R73	D-27		
B-6	Q18	F-17	R74	I-5		
F-3	Q19	O-6	R75	A-9		
F-5	Q20	M-2	R76	J-3		
F-27	Q21	P-6	R77	L-5		
F-22	R1	M-11	R78	E-15		
D-17	R2	M-12	R79	C-8		
I-4	R3	N-12	R80	B-8		
A-4	R4	K-11	R81	C-5		
A-11	R5	N-13	R82	N-6		
E-19	R6	J-16	R83	L-8		
C-5	R7	L-19	R84	B-7		
E-5	R8	L-20	R85	D-5		
D-13	R9	I-26	R86	D-5		
F-13	R10	L-25	R87	H-16		
F-12	R11	M-25	R88	G-16		
D-12	R12	N-27	R89	N-19		
F-14	R13	G-10	R90	B-21		
C-25	R14	F-11	R91	B-20		
L-10	R15	F-10	R92	H-23		
E-20	R16	K-8	R93	H-23		
H-19	R17	E-13	R94	G-23		
O-5	R18	E-12	R95	H-21		
O-3	R19	D-12	R96			

PW VIPUR BOARD-GridTrace LOCATION GUIDE

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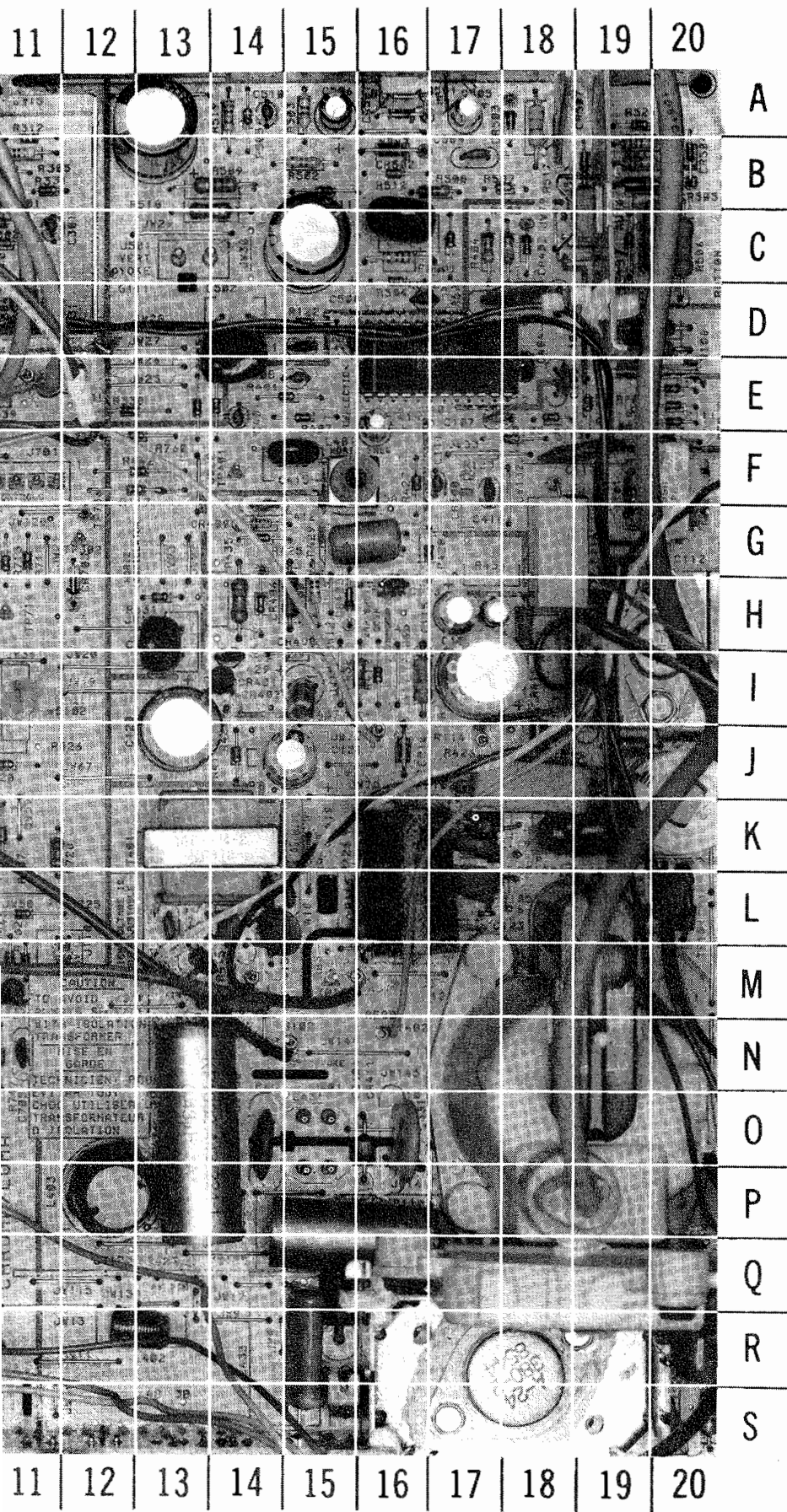
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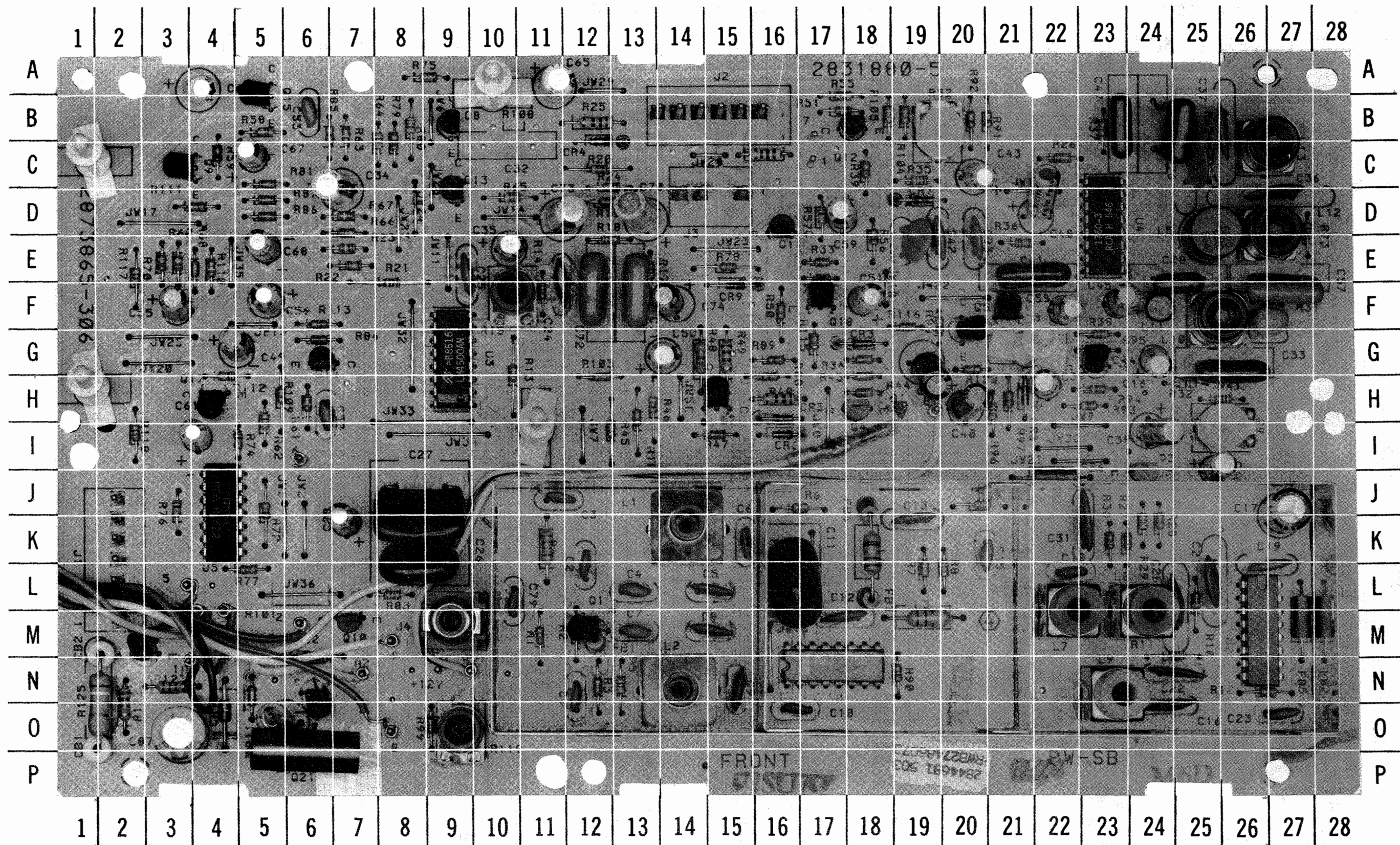


MAIN BOARD

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MAIN BOARD-GridTrace LOCATION GUIDE

C101	Q-1	C421	D-15	CR410	J-18	Q704	Q-7	R424	R-17	R748	M-11
C102	N-3	C422	R-17	CR411	O-16	Q705	P-7	R425	G-14	R749	S-10
C103	N-3	R423	P-15	CR412	Q-15	Q706	P-8	R426	J-18	R751	S-9
C104	O-1	C425	O-13	CR501	A-16	Q801	H-6	R427	F-16	R753	S-9
C105	N-2	C429	I-14	CR502	B-16	R101	P-2	R428	G-17	R755	S-8
C106	H-17	C431	O-16	CR503	A-18	R102	S-20	R429	H-15	R757	S-10
C107	E-17	C433	R-15	CR504	B-20	R103	L-16	R430	H-15	R759	S-10
C108	E-18	C434	O-14	CR505	B-19	R104	E-18	R431	H-13	R760	F-12
C109	L-16	C435	N-13	CR507	B-19	R105	F-18	R432	I-16	R761	O-8
C110	P-2	C4436	O-13	CR701	K-10	R106	D-20	R436	P-13	R802	J-10
C111	F-17	C502	D-14	CR703	H-12	R107	E-19	R442	F-12	R804	J-10
C112	H-20	C503	C-16	CR704	L-10	R108	D-20	R450A	Q-18	R806	J-7
C113	I-19	C504	B-17	CR705	I-6	R109	E-20	R450B	Q-18	R807	J-7
C114	H-19	C505	A-17	CR706	J-6	R110	E-20	R501	C-17	R808	L-7
C115	H-17	C506	A-15	CR707	I-7	R111	E-20	R502	B-15	R809	M-6
C116	L-20	C507	C-19	DL701	G-7	R112	F-20	R503	A-15	R810	N-6
C117	K-19	C508	C-15	F101	R-1	R113	G-18	R504	C-16	R811	K-7
C118	R-20	C509	A-13	FB101	J-19	R114	J-18	R505	A-14	R812	K-7
C119	K-17	C510	A-14	FB102	K-17	R115	L-16	R506	C-20	R813	K-6
C120	J-13	C511	D-15	FB103	L-20	R116	I-16	R507	B-18	R814	L-6
C121	J-15	C512	D-16	FB105	L-17	R117	F-12	R508	B-17	R815	H-6
C122	I-17	C701	F-8	FB301	D-5	R119	J-1	R509	B-14	R818	G-10
C123	L-17	C703	M-9	FB302	C-5	R120	Q-6	R511	B-15	R819	G-11
C301	C-11	C704	O-10	FB303	B-10	R122	D-15	R512	B-16	R820	J-11
C302	D-10	C705	N-11	FB304	E-6	R207	H-1	R513	B-19	R821	H-6
C303	A-10	C706	M-10	FB307	C-6	R301	D-11	R514	B-19	R822	J-9
C304	C-9	C707	K-10	FB401	Q-18	R302	C-11	R515	C-19	R823	L-9
C305	B-10	C708	N-6	J103	R-5	R303	C-11	R516	C-19	R824	L-10
C306	B-6	C709	N-7	J104	P-3	R304	D-11	R517	A-18	R825	H-6
C307	B-7	C710	N-9	J105	P-5	R305	B-11	R518	B-13	R827	L-4
C308	D-3	C711	N-9	J109	Q-2	R306	B-11	R519	A-14	RB501	C-16
C309	D-2	C713	M-9	J302	F-2	R307	B-9	R520	E-14	RT101	Q-5
C310	C-6	C714	Q-7	J303	F-3	R308	B-9	R521	A-19	SCR101	H-20
C311	D-5	C715	Q-7	J401	O-15	R309	B-8	R701	G-5	SCR401	I-14
C312	A-6	C716	Q-7	J501	C-13	R310	D-3	R702	M-11	SF301	B-8
C313	A-8	C717	G-7	J701	F-11	R311	E-4	R703	M-8	T101	F-20
C315	E-2	C718	S-8	J703	I-8	R312	B-11	R704	H-8	T301	C-1
C316	B-3	C801	H-9	L101	S-2	R313	C-7	R705	I-7	T401	K-13
C317	B-2	C803	H-9	L103	K-20	R314	D-8	R707	K-11	T402	O-19
C318	D-8	C805	J-10	L104	K-19	R315	D-7	R709	H-7	TP47	M-7
C319	C-4	C806	K-8	L105	Q-4	R316	F-5	R710	J-6	TP301	E-7
C320	G-4	C807	J-9	L301	C-9	R317	F-3	R711	J-6	TP302	G-12
C322	A-5	C808	J-9	L302	B-7	R318	D-7	R713	G-11	TP303	S-14
C323	H-3	C809	K-8	L303	B-3	R319	C-8	R715	N-10	TP307	E-6
C324	H-4	C810	J-8	L304	B-2	R320	D-7	R716	J-6	TP319	F-12
C325	A-5	C811	K-8	L305	D-4	R321	F-4	R718	G-11	TP401	E-14
C326	F-9	C812	J-8	L307	A-7	R322	F-5	R719	Q-9	TP701	N-10
C327	E-4	C813	L-4	L308	D-5	R323	H-4	R720	P-10	TP702	M-8
C328	C-5	C814	K-5	L309	B-10	R325	F-9	R721	Q-10	TP801	J-9
C329	C-5	C815	K-5	L310	C-10	R327	E-2	R722	Q-9	TP806	J-8
C330	H-4	C816	L-10	L311	B-4	R328	H-5	R723	Q-9	TP807	M-6
C331	D-11	C818	K-6	L312	A-5	R330	B-4	R724	S-8	U301	B-6
C333	B-3	C819	M-5	L314	D-4	R331	B-11	R725	L-11	U401	E-16
C334	D-2	C820	M-5	L401	F-15	R332	E-3	R726	O-10	U701	L-9
C335	E-4	C821	H-6	L402	R-12	R335	D-4	R727	S-20	Y801	L-6
C401	E-14	C822	I-6	L403	P-12	R337	E-2	R728	K-11		
C403	D-18	C823	K-10	L701	N-9	R338	E-12	R729	N-8		
C404	E-1	C825	L-7	L702	Q-9	R401	E-15	R730	N-7		
C405	D-18	C826	K-9	L801	I-10	R402	H-18	R731	N-8		
C406	G-16	CR101	O-3	L803	N-5	R403	C-18	R732	N-8		
C407	I-15	CR102	O-2	L804	K-6	R404	C-17	R733	N-7		
C408	E-15	CR103	N-4	L805	M-5	R405	E-13	R734	N-8		
C409	S-16	CR104	O-1	L806	I-6	R407	E-15	R735	R-7		
C410	L-13	CR105	J-16	P301	E-12	R411	G-16	R736	R-7		
C411	H-13	CR106	K-17	Q301	B-10	R412	I-16	R737	R-8		
C412	G-14	CR107	L-20	Q303	D-8	R413	L-14	R738	Q-8		
C413	H-16	CR109	L-17	Q304	D-8	R415	L-14	R739	P-8		
C414	E-16	CR301	F-8	Q305	H-5	R416	H-14	R740	Q-8		
C415	F-15	CR302	G-5	Q401	M-13	R417	M-14	R741	J-7		
C416	F-17	CR402	C-18	Q402	R-18	R418	S-15	R743	M-11		
C417	L-14	CR405	H-15	Q501	J-16	R419	I-14	R744	I-8		
C418	L-15	CR406	H-14	Q502	B-19	R421	F-9	R745	E-10		
C419	K-15	CR408	I-15	Q701	M-11	R422	N-13	R746	O-10		
C420	L-14	CR409	G-14	Q703	Q-9	R423	L-14	R747	N-11		



PW STEREO BOARD

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PW STEREO BOARD

PW STER

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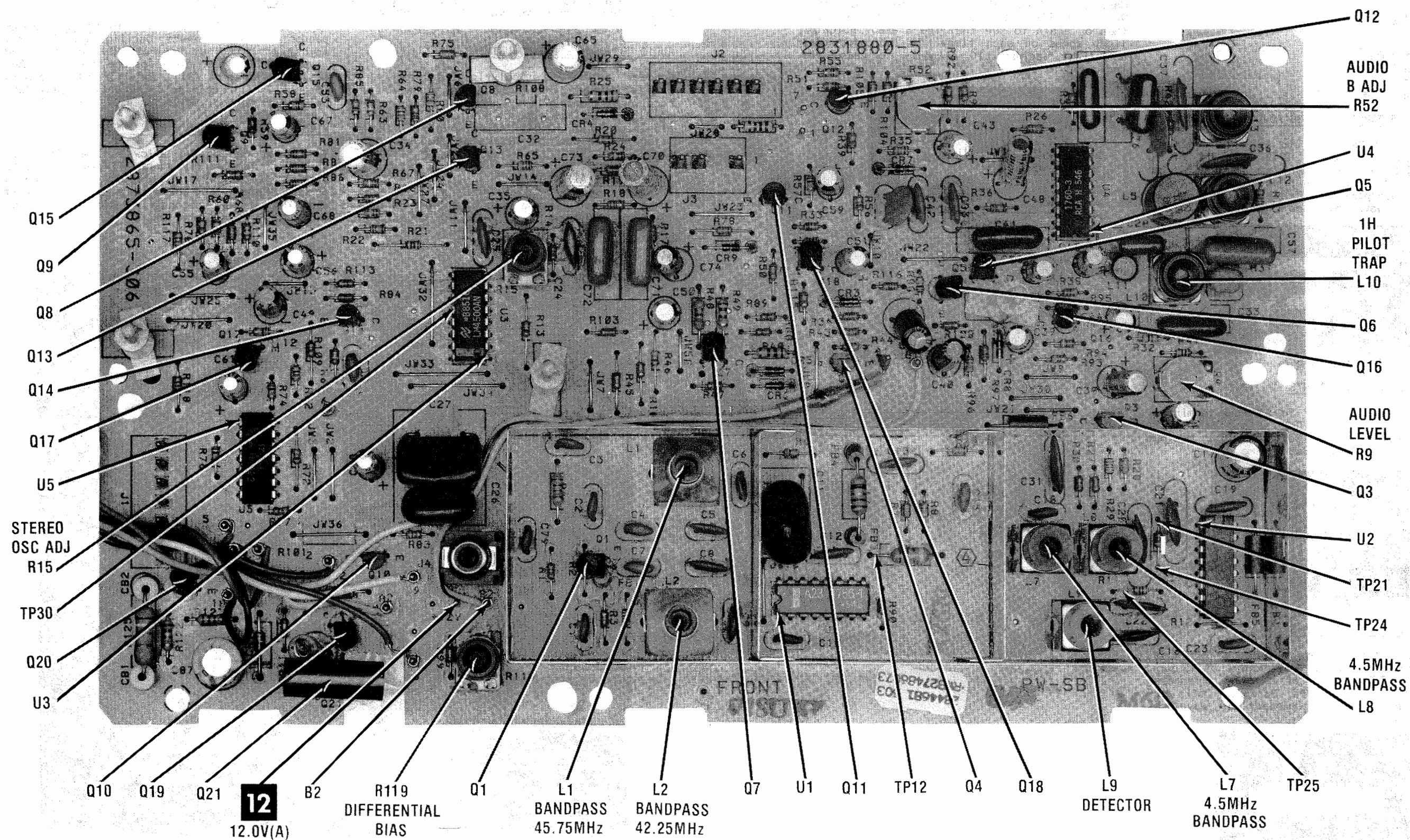
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1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19

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VIDEO IN/OUT BOARD



PW STEREO BOARD

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PW STEREO BOARD

MISCELLANEOUS ADJUSTMENTS (Continued)

STEREO/AUDIO B ADJUSTMENTS

NOTE: Adjustments were made using B & K Model 2009 MTS TV/Stereo Generator. Equivalent generator may be used.

STEREO ADJUSTMENTS

Generator Settings
Pilot Switch ON
SAP Switch OFF
Audio Frequency 1kHz
Modulating Signal L + R

41.25MHz, 45.75MHz BANDPASS ADJUSTMENTS

Connect Stereo Generator to antenna terminals. Connect Oscilloscope to TP12 (pin 12 of IC U1). Adjust 45.75MHz Bandpass Coil (L1) for MINIMUM Component in waveform. Adjust 41.25MHz Bandpass Coil (L2) for Maximum Component in waveform. See Figure 6.

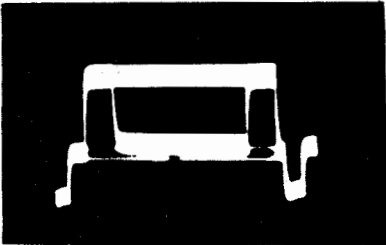


Figure 6

4.5MHz DETECTOR ADJUSTMENTS

Connect Stereo Generator to antenna terminals. Connect Oscilloscope to TP25 (Pin 5 of IC U2). Adjust 4.5MHz Detector Coil (L9) for Maximum Amplitude of waveform. See Figure 7.

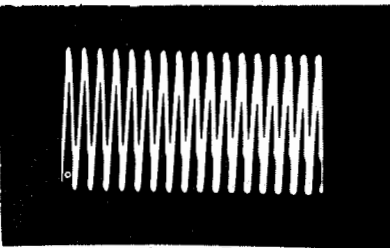


Figure 7

4.5MHz BANDPASS ADJUSTMENTS

Connect Stereo Generator to antenna terminals. Connect Oscilloscope to TP21 (Pin 1 of IC U2), low side to TP24 (Pin 4 of IC U2). Alternately adjust the two 4.5MHz Bandpass Coils (L7 and L8) for Maximum component of waveform. See Figure 8.

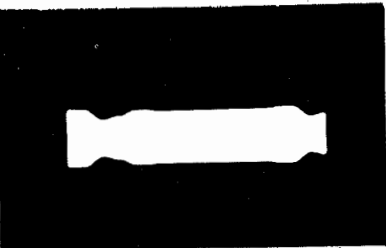


Figure 8

1H PILOT TRAP ADJUSTMENT

Connect Stereo Generator to antenna terminals. Connect Oscilloscope to TP30 (Pin 12 of IC U3). Adjust 1H Pilot Trap Coil (L10) for Maximum amplitude of the waveform. See Figure 9. Turn Pilot Switch on generator off and then on again to see that the Stereo Indicator light comes on each time. If indicator does not light, adjust L10 slightly to cause the indicator to light.

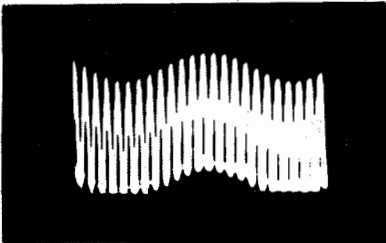


Figure 9

MISCELLANEOUS ADJUSTMENTS (Continued)

OUTPUT LEVEL ADJUSTMENT
(Stereo Broadcast Board)

Apply a 4.5MHz (1kHz Rate) FM signal at 500MV to the antenna input. Connect an Oscilloscope to U3 pin 4 (or pin 5) low side to ground. Adjust Audio Level Control (R9) for 100MV P-P waveform.

AUDIO "B" OSCILLATOR ADJUSTMENT

Connect a 10uF Electrolytic Capacitor + to base of Q3 and (-) negative to ground. Turn receiver on and allow a warm-up period. With no signal applied connect Frequency Counter to pin 15 or 16 of IC U4. Adjust Audio "B" Oscillator Adjust Control (R52) for 78.67kHz reading.

STEREO OSCILLATOR ADJUST

Connect a 10uF Electrolytic Capacitor (+) positive to the base of Q3 and (-) negative to

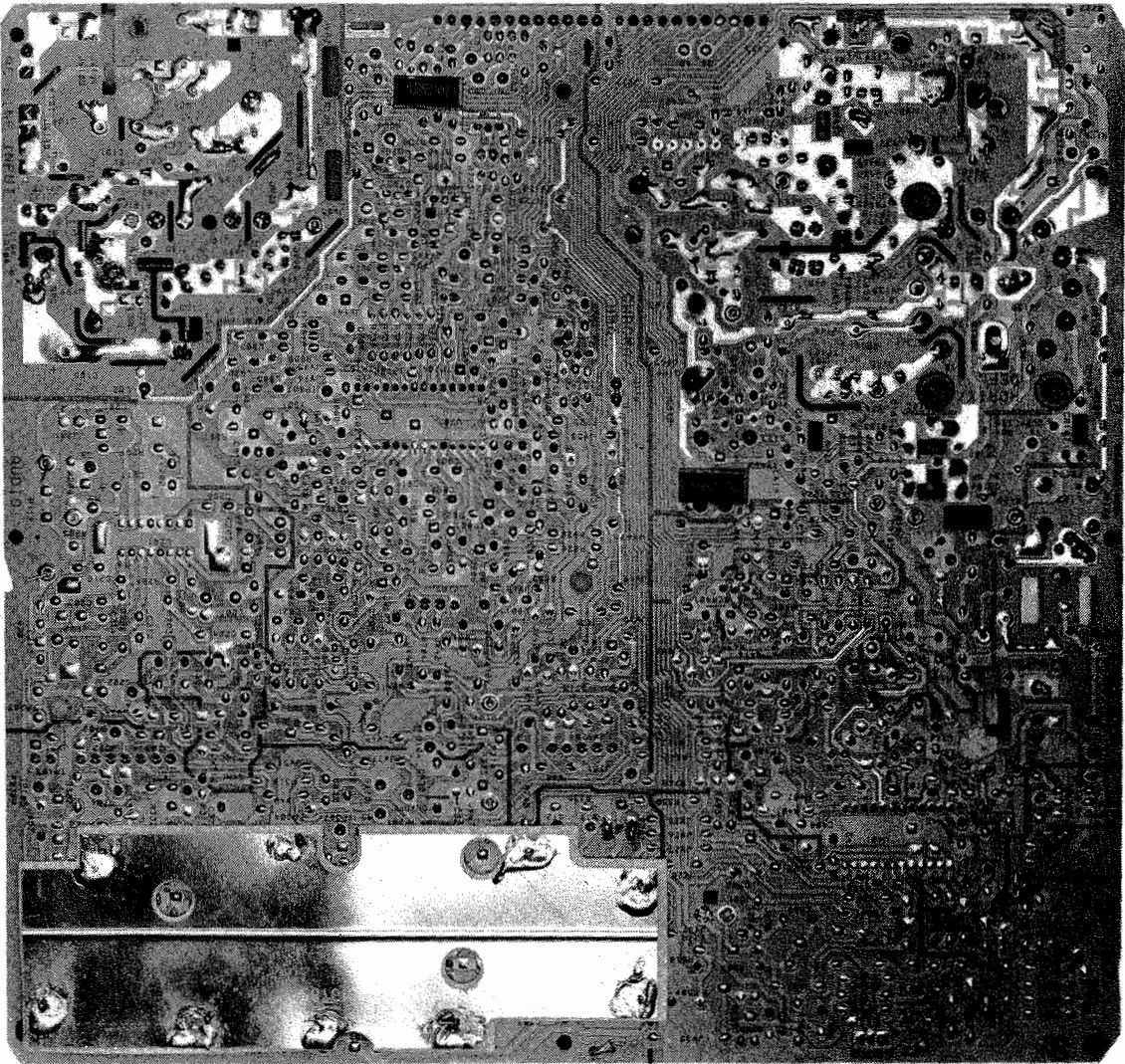
ground. Connect Frequency Counter to pin 11 of IC U3 low side to ground. With no signal applied adjust Stereo Oscillator Adjust Control (R15) for 15734HZ reading.

EXPANDER ADJUSTMENTS

Apply a 2.0V P-P 1kHz signal to TPL-RIN on expander board. Connect Oscilloscope to TP1. Adjust Input Adjust Control (R6) for 2.0V P-P waveform. Connect Oscilloscope to TP2. Adjust HBLM Control (R11) for 1.3V P-P waveform. Connect Oscilloscope to TPL-R Out. Adjust Output Adjust Control (R19) for 4.0V P-P reading.

HIGH VOLTAGE SHUTDOWN CIRCUIT TEST

Tune in a station and allow a 15-minute warm-up time. Temporarily short XT1 and XT2 stakes with a jumper wire. Loss of raster should occur. Remove AC power from unit and wait approximately 30 seconds. Restore power and check for proper operation.



MAIN BOARD-SHIELD LOCATION (BOTTOM VIEW)

RCA
CHASSIS CTC130C

R110
VIDEO
LEVEL

Q1

Q2

Q3

Q10

U5

10
11.5V

7
12.0V

Q16

Q15

Q6

Q14

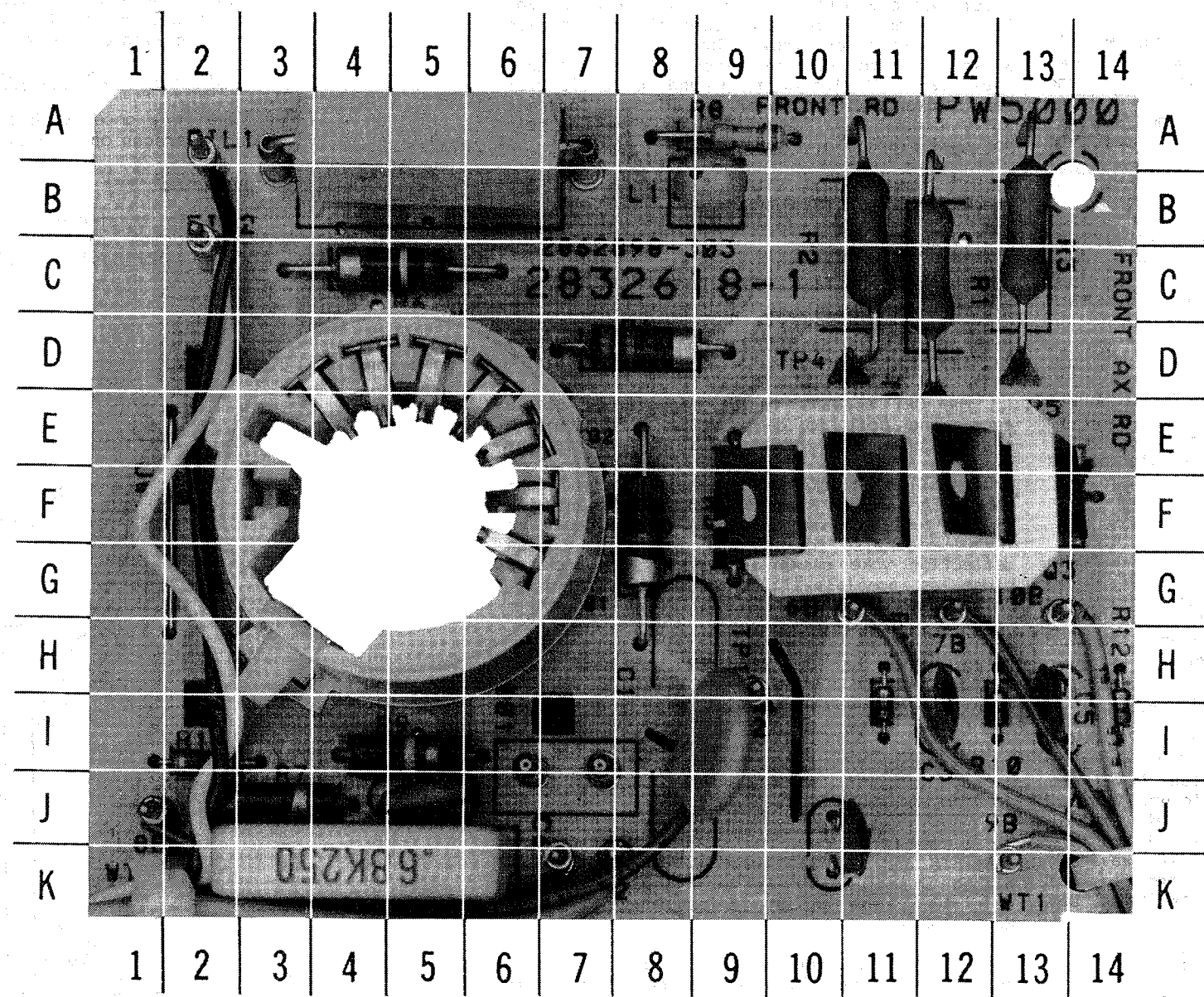
Q5

Q4

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

VIDEO IN/OUT BOARD



CRT SOCKET
BOARD-
GridTrace
LOCATION GUIDE

C1	I-9
C2	J-5
C3	I-12
C4	J-11
C5	I-13
C6	K-4
J5001	I-7
L1	B-9
Q1	F-11
Q2	F-10
Q3	F-13
R1	C-12
R2	B-11
R3	B-13
R4	D-8
R5	F-9
R6	C-5
R7	J-3
R8	A-9
R9	I-5
R10	I-13
R11	I-11
R12	I-14
R13	F-8
R14	A-5
R16	I-2

RCA
CHASSIS CTC130C

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CRT SOCKET BOARD

MISCELLANEOUS ADJUSTMENTS

PRETUNING

1. Connect antenna.
2. Turn on TV.
3. Open the auxiliary control door.
4. Momentarily depress the AUTO PRO button. Active channels within your viewing area will be automatically programmed into channel scan memory.
5. Close auxiliary control door.

Suggested Alignment Tools for:

R332, R333, R334, R805, L401..... 9440
C818..... 5000

HIGH VOLTAGE

No provision is made for high voltage adjustment. To check, connect a high voltage meter to the anode of the CRT. Turn Black Level and Color Controls to MINIMUM. High voltage should never exceed 32.0KV. At normal brightness and contrast high voltage should be 25.8KV.

AGC DELAY ADJUSTMENT

Tune in a weak local station and adjust set for a normal picture. Adjust AGC Delay Control (R334) for MINIMUM snow without overload (pulling, jitter, tearing, etc.). Check operation on all available stations.

HORIZONTAL FREQUENCY ADJUSTMENT

Tune in a TV station and adjust for a normal picture. Connect a short jumper from TP401 to ground. Adjust Horizontal Oscillator Coil (L401) until picture stops or floats across screen. Remove jumper.

3.58MHz OSCILLATOR ADJUSTMENT

Connect a color bar generator to the antenna terminals. Adjust controls for normal color bar pattern. Connect a jumper from TP801 to ground. Connect a 270pF capacitor from TP301 to TP47. Adjust C818 until colors stop or float on screen. Remove capacitor.

CONTRAST PRESET CONTROL (R715) ADJUSTMENT

Connect a color bar generator to the antenna terminals and tune in a color bar pattern. Connect a scope to TP702. Set Black Level and Color Controls to MINIMUM and Picture Control to Maximum. Adjust Picture Preset Control (R715) fully clockwise and then adjust counterclockwise for Maximum amplitude of waveform without distortion. NOTE: Do not include blanking in measurement of waveform, see Figure 4.

SERVICE LINE/WHITE RASTER PROCEDURES

To obtain a service line, connect a jumper from Stakes SS1 to SS2. Short Stakes SS3 and SS4 to ground. To obtain a white raster, short Stake SS4 to ground and set Color Control fully counterclockwise.

COLOR TEMPERATURE ADJUSTMENT

Tune in a picture and set Black Level and Picture Controls to midrange. Obtain Service Line, (see Service Line/White Raster Procedure). Set Color Bias Controls (R754, R752 and R750) fully counterclockwise. Set Color Drive Controls (R758 and R756) fully clockwise. Set Screen Control R5015B fully counterclockwise. Advance Screen Control clockwise until a horizontal line just appears, (either blue, green or red). Depending on the color line on the screen, advance the remaining color bias controls clockwise to just produce a horizontal white line.

NOTE: At completion of color bias control adjustment, one of the bias controls must remain fully counterclockwise. Remove jumpers from Stakes SS1 to SS2 and from SS3 to ground. Keep Stake SS4 shorted to ground for white raster. Advance Black Level and Picture Controls fully clockwise. Adjust Color Drive Controls for best black and white picture.

Remove jumper from Stake SS4 to ground and check for proper tracking.

PURITY ADJUSTMENT

NOTE: Magnetic Tape (Beam Bender) is not adjustable and is not reusable. If CRT is replaced or adjustment is necessary, an adjustable type beam bender is required, RCA Part No. 145381.

If the CRT appears to be magnetized, use a degaussing coil to demagnetize CRT. Perform center convergence. Obtain a white raster by shorting Stake SS4 to ground. Turn Screen Control (R5015B) clockwise to obtain a bright raster. Turn Blue Bias (R754) and Green Bias (R752) fully counterclockwise. Turn Red Bias (R750) clockwise to obtain red raster. Loosen deflection yoke clamp and slide yoke back as close as possible to beam bender assembly. Rotate beam bender purity tabs to center vertical red raster on the screen.

Slide deflection yoke forward until best overall red raster is obtained. Tighten deflection yoke retaining screw and beam bender locking ring.

Remove jumper from Stake SS4 to ground.

CONVERGENCE ADJUSTMENT

NOTE: Magnetic Tape (Beam Bender) is not adjustable and is not reusable. If CRT is replaced or adjustment is necessary, an adjustable type beam bender is required, RCA Part No. 145381.

Connect a color bar generator to the antenna terminals and tune in a dot pattern. If necessary, adjust Vertical Height, Focus and Horizontal Centering before doing convergence. Static convergence (center) is accomplished by two sets of eccentric magnets on the beam bender assembly.

MISCELLANEOUS ADJUSTMENTS (Continued)

Adjust the center set of magnets to converge blue to green at center of screen. Adjust the rear set of magnets to converge red to green at center of screen.

NOTE: Green is stationary. Dynamic Convergence is achieved by tilting the yoke up or down or right or left.

Remove the three wedges from under front of yoke. Using a wedge at the 1 o'clock position, rock the yoke up or down to converge left and right sides of the screen. Secure the wedge in the 1 o'clock position. Rock the yoke from side to side to converge the top and bottom of the screen. Replace remaining wedges in the 5 o'clock and 9 o'clock positions and secure the wedges, while maintaining the position of the yoke.

HORIZONTAL WIDTH ADJUSTMENT

Tune in a crosshatch pattern. Adjust R4 for a 10% overscan on each side.

SHARPNESS

Tune in a strong station. Set all controls for normal picture. Set Sharpness Control (R4209) for best overall sharpness of picture.

DIFFERENTIAL BIAS ADJUSTMENT

NOTE: Adjustments were made using B & K Model 2009 MTS TV/Stereo Generator. Equivalent generator may be used.

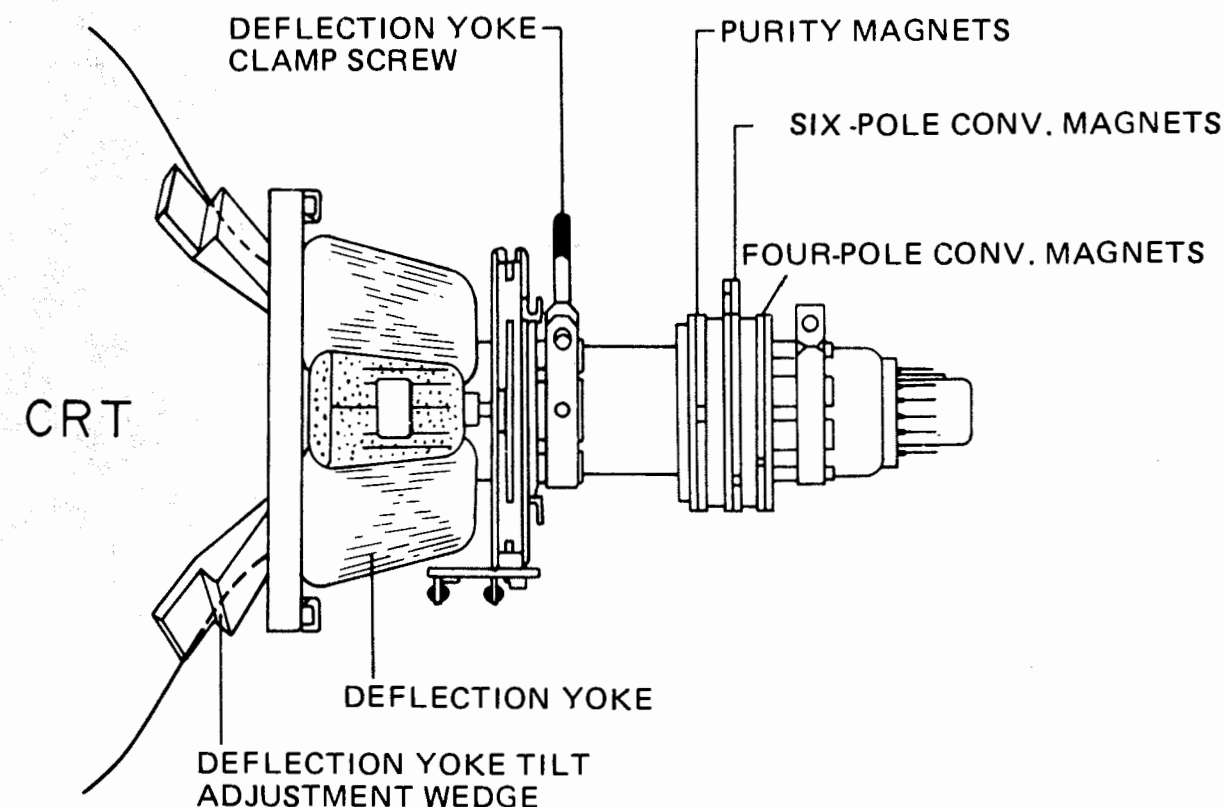
Connect generator to antenna terminal. Set Pilot Switch to Off and SAP Switch to On. Select 1kHz L-R signal. Place Stereo/Mono Switch in stereo position and Audio B Switch to On. Connect DC meter to B2 low side to ground. Adjust Differential Bias Control (R119) for 3.5 ±.1 volts DC.

AUDIO BALANCE ADJUSTMENT

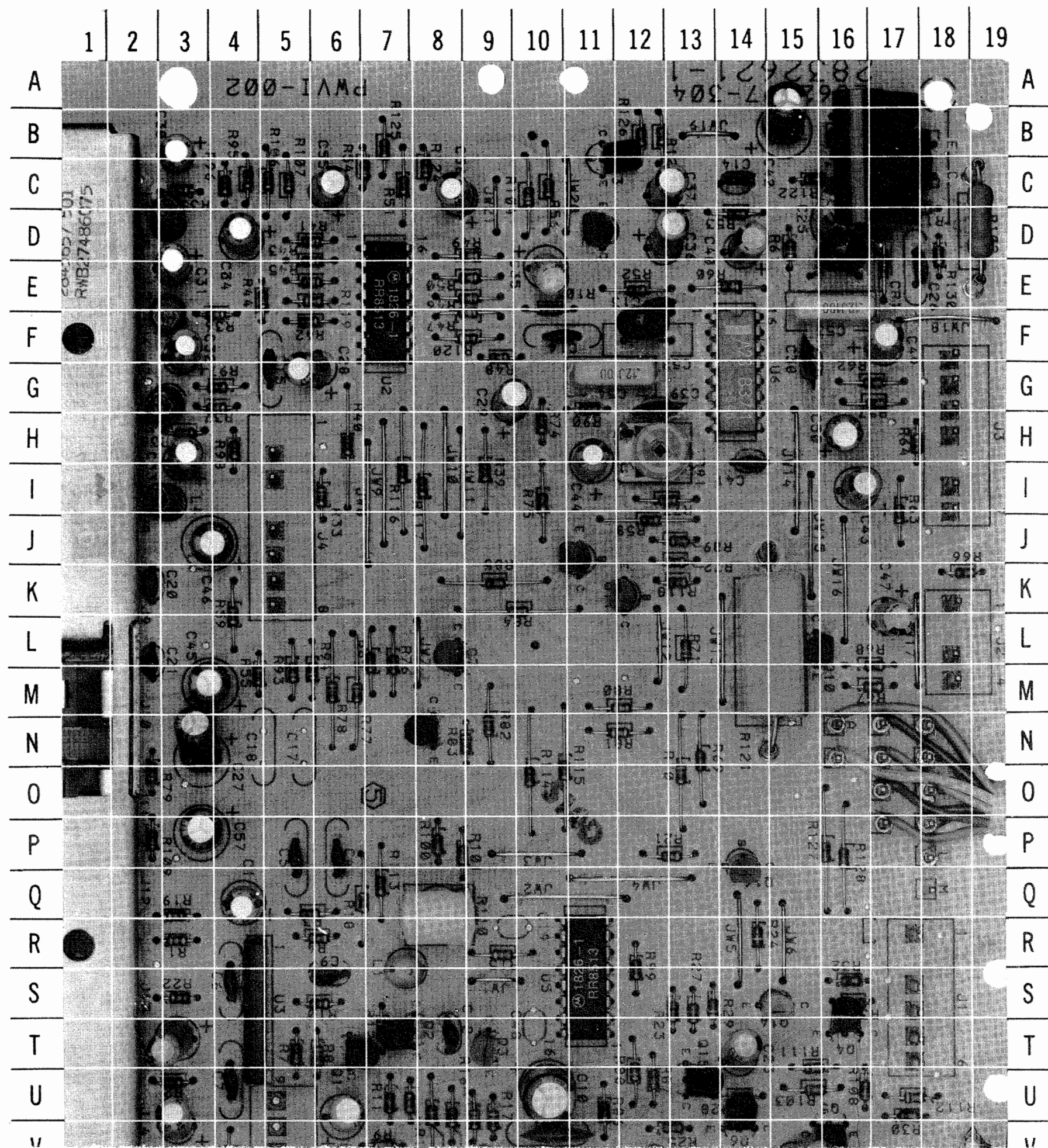
Connect a 420mV RMS, 1kHz signal to Audio IN 1 Input R/Mono terminal. Connect an .8 ohm load across the Audio Select Output Terminals L and R. Using a dual-trace scope, adjust Balance Control R91 for the same level across both loads.

VIDEO LEVEL ADJUSTMENT

Connect the VTR standard 1V pp video into the video 1 Input. Set the TV for video Input 1 mode. Connect a scope to pin 13 of U5. Adjust Video Level Adjustment (R110) for 2.6V pp.

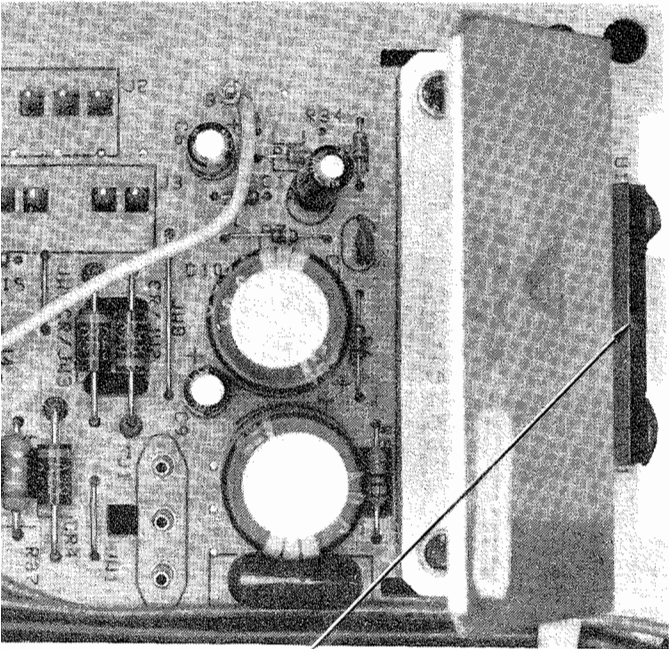


CRT NECK ASSEMBLY



VIDEO IN/OUT BOARD -GridTrace LOCATION GUIDE

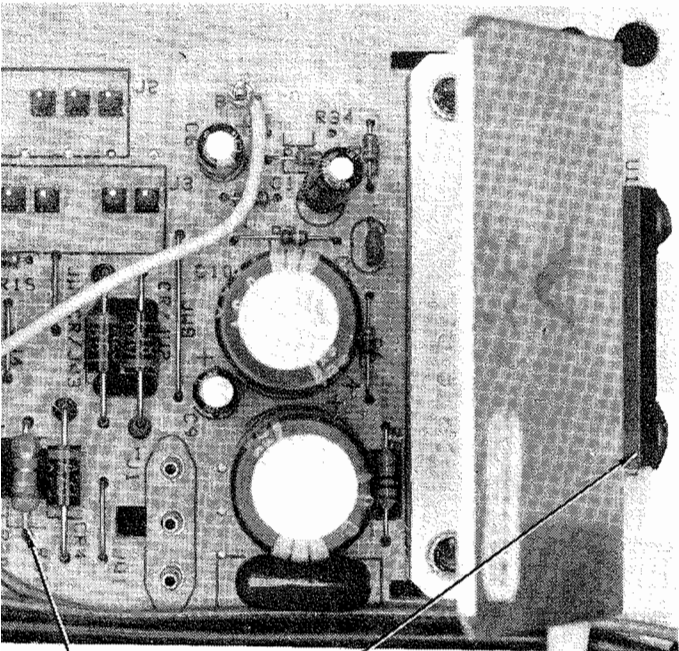
A	N-16	J13	S-1	R47	F-9	R121	L-15
B	N-16	J14	U-1	R48	F-9	R122	C-15
C	N-17	K	P-18	R49	D-9	R123	B-12
C1	Q-4	L	P-18	R50	E-9	R124	C-8
C2	T-3	L1	S-7	R51	C-7	R125	B-7
C3	J-6	L3	G-3	R52	F-12	R126	B-12
C4	P-6	L4	I-2	R53	D-14	R127	P-16
C5	P-5	L5	F-3	R54	C-7	R128	P-16
C6	S-4	L6	C-3	R55	M-4	R130	D-18
C7	U-4	M	Q-18	R56	C-10	R131	C-18
C8	U-3	Q1	T-6	R57	G-17	R132	B-17
C9	S-6	Q2	T-7	R58	J-12	U2	E-7
C10	U-10	Q3	T-9	R59	L-4	U3	S-4
C11	V-10	Q4	S-16	R60	E-14	U5	R-11
C12	T-8	Q5	V-16	R61	D-15	U6	F-14
C13	E-12	Q6	U-14	R62	G-17		
C14	C-14	Q7	L-8	R63	J-17		
C15	G-5	Q8	N-8	R64	H-17		
C16	F-10	Q9	J-11	R65	B-16		
C20	K-2	Q10	L-15	R66	K-18		
C21	L-2	Q11	K-12	R67	M-17		
C23	T-14	Q12	D-11	R68	M-17		
C24	V-15	Q13	B-12	R69	N-13		
C25	C-16	Q14	S-15	R70	O-13		
C26	E-18	Q15	U-13	R71	L-13		
C27	N-3	Q16	Q-14	R72	J-13		
C28	G-5	Q17	B-16	R73	I-13		
C29	Q-9	Q18	C-17	R74	H-10		
C30	B-3	R1	R-3	R75	I-10		
C31	D-3	R2	U-3	R76	L-7		
C32	F-3	R3	Q-5	R77	M-6		
C33	H-3	R4	R-6	R78	M-6		
C34	D-4	R5	V-4	R79	Q-2		
C35	E-10	R6	V-7	R80	M-12		
C36	D-13	R7	T-5	R81	N-12		
C37	C-13	R8	T-6	R82	N-9		
C38	F-15	R9	V-7	R83	N-9		
C39	G-12	R10	S-6	R84	K-10		
C40	D-14	R11	U-7	R85	K-9		
C41	H-14	R12	T-7	R86	U-11		
C42	A-15	R13	U-7	R87	U-12		
C43	I-16	R14	U-8	R88	U-12		
C44	H-11	R15	R-9	R89	J-13		
C45	M-3	R16	U-9	R90	G-11		
C46	J-3	R17	U-9	R91	H-12		
C47	L-17	R18	Q-6	R92	L-7		
C49	F-17	R19	Q-4	R93	M-5		
C50	H-16	R20	U-8	R94	M-5		
C51	D-16	R21	P-13	R95	C-4		
C52	F-12	R22	S-3	R96	C-4		
C53	E-16	R23	S-13	R97	G-4		
C54	G-11	R24	R-14	R98	H-4		
C55	C-6	R25	V-13	R99	J-12		
C56	Q-8	R26	W-13	R100	P-8		
C57	P-3	R27	S-13	R101	P-8		
CR1	E-17	R28	U-14	R102	D-19		
D	N-17	R29	S-13	R103	U-15		
E	Q-17	R30	U-17	R104	C-10		
F	P-17	R31	S-16	R105	F-10		
G	N-18	R32	S-16	R106	C-5		
H	N-18	R33	I-6	R107	C-5		
J	Q-18	R34	W-10	R108	U-16		
J1	S-17	R35	C-3	R109	P-2		
J2	L-18	R36	F-4	R110	Q-8		
J3	H-18	R37	Q-4	R111	U-15		
J4	J-5	R38	H-3	R112	U-17		
J5	C-1	R39	I-9	R113	Q-7		
J6	E-1	R40	H-6	R114	O-10		
J7	G-1	R41	D-6	R115	O-10		
J8	I-1	R42	F-5	R116	I-7		
J9	K-1	R43	D-6	R117	I-8		
J10	M-1	R44	E-5	R118	K-13		
J11	Q-1	R45	E-6	R119	E-6		
J12	Q-1	R46	E-9	R120	F-9		



A Howard W. Sams QUICK-CHECKS™ Photo

U1 PIN 9
LEFT CHANNEL OUT
13.9V

AUDIO POWER AMP BOARD

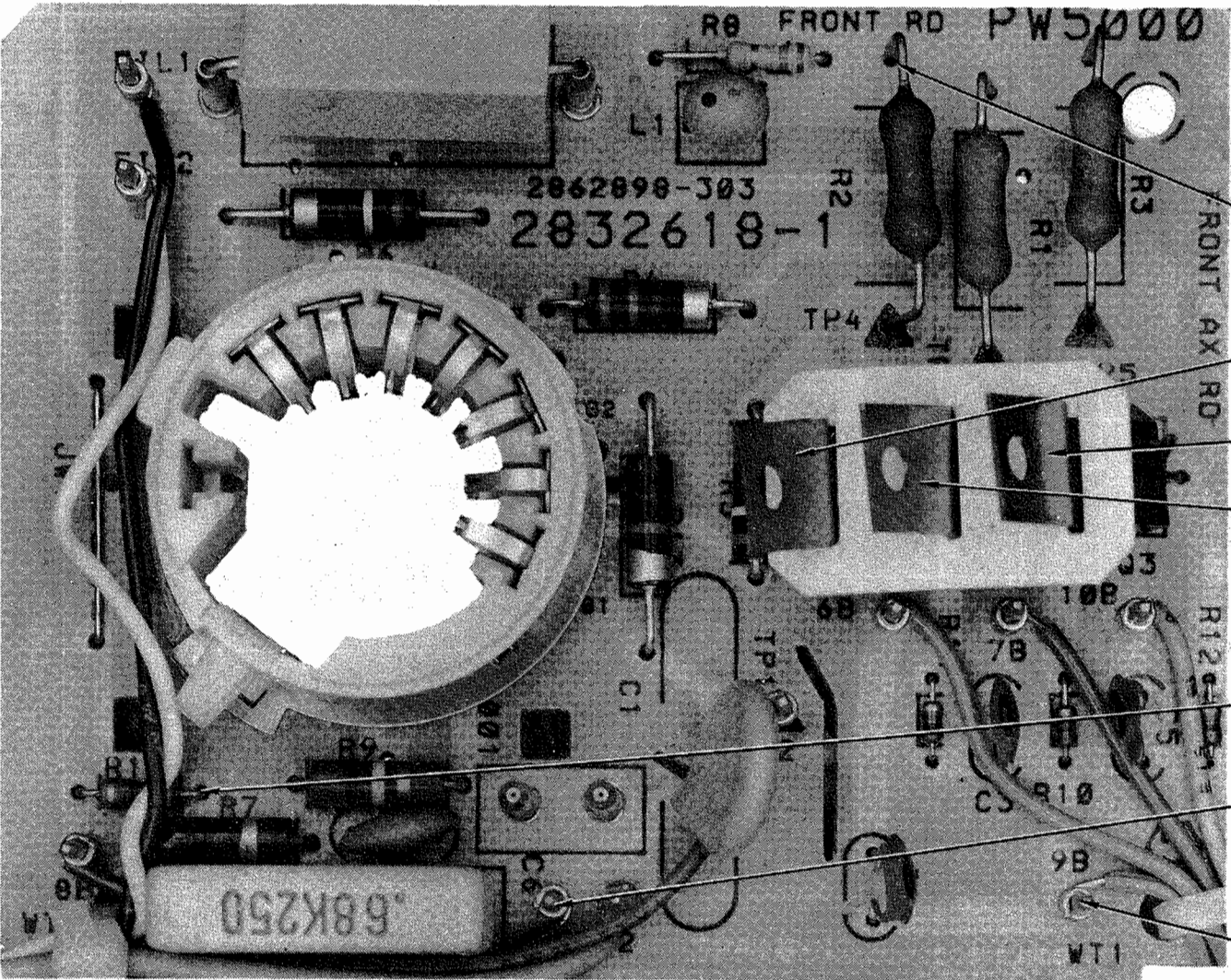


A Howard W. Sams CIRCUITRACE® Photo

AUDIO POWER AMP BOARD

4
26.7V

U1



182V
17

Q2

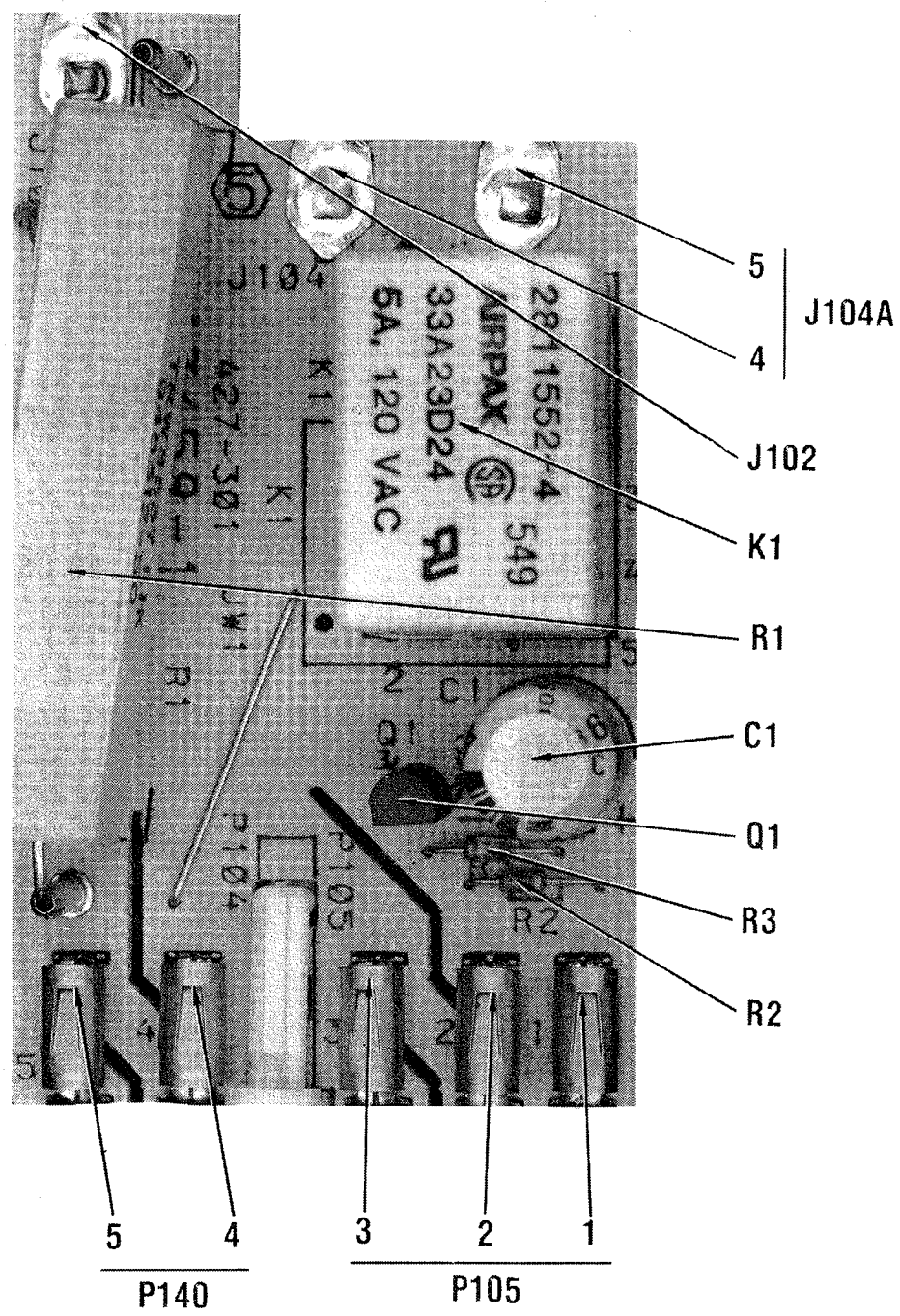
Q3

Q1

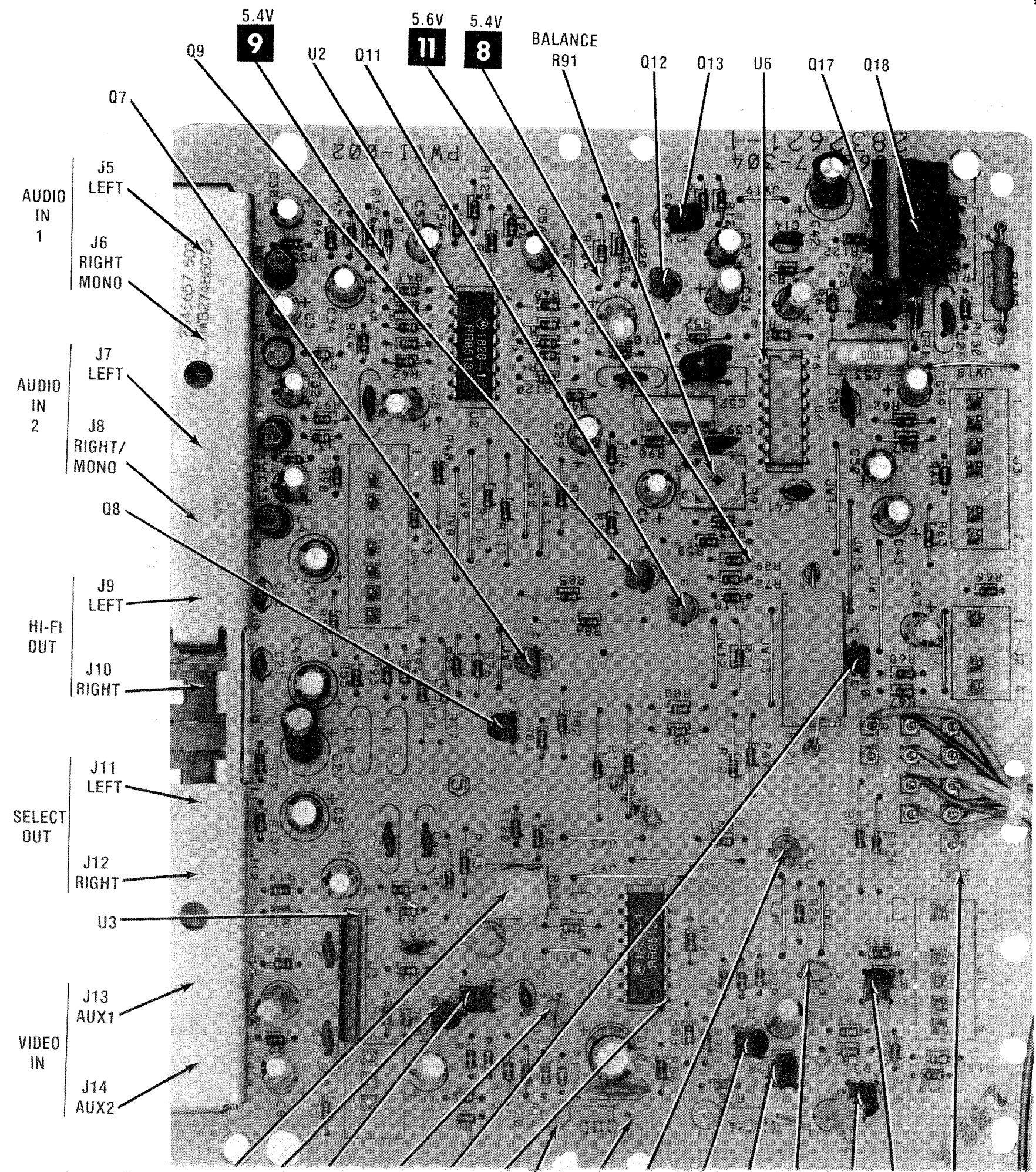
182V
16

11.2V(D)
23

A Howard W. Sams CIRCUITRACE® Photo CRT SOCKET BOARD

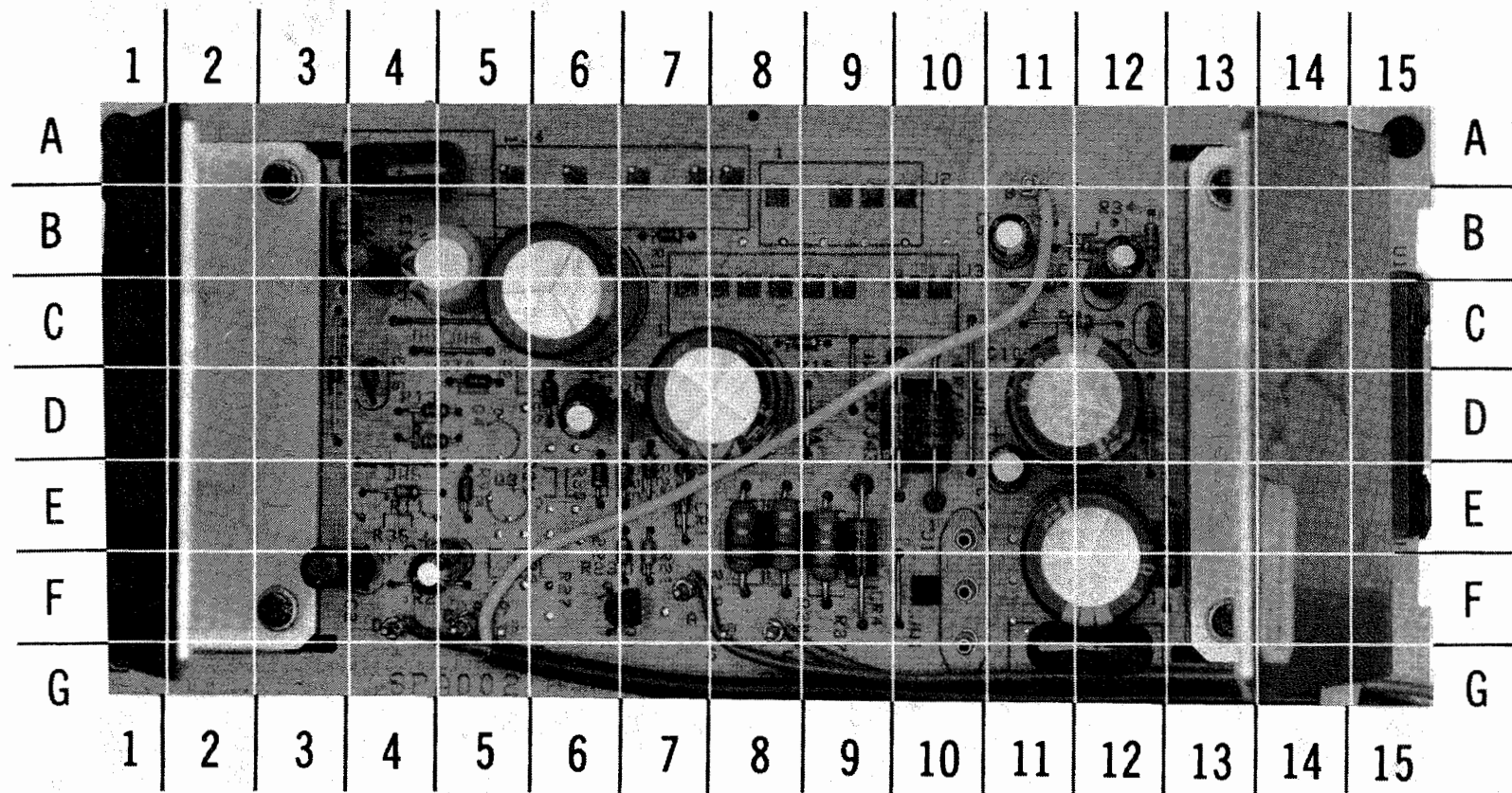


POWER RELAY BOARD

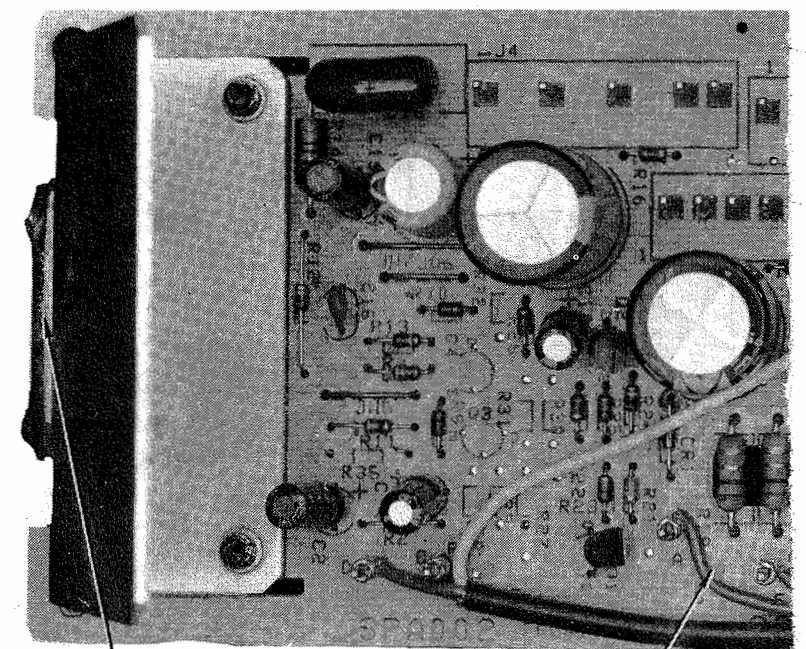


AUDIO POWER AMP BOARD-GridTrace LOCATION GUIDE

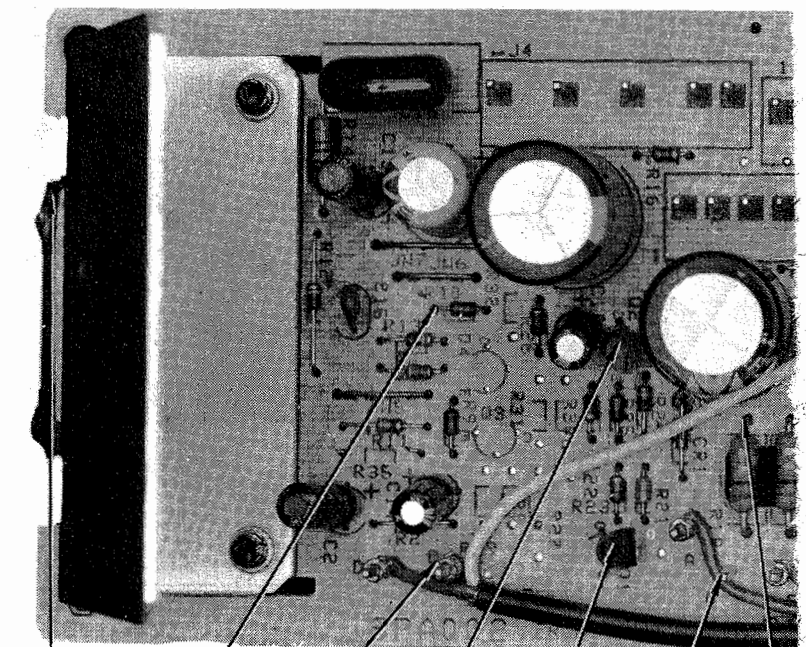
A	F-7	C9	E-11	CR2	D-10	J4	A-7	R8	F-13	R20	E-8
B	A-11	C10	D-11	CR3	D-10	Q1	F-7	R9	E-5	R21	F-7
C	F-5	C11	F-12	CR4	E-9	Q2	D-7	R10	D-5	R22	E-6
C1	B-12	C13	B-4	D	F-4	R1	C-11	R11	E-4	R23	E-7
C2	F-3	C14	F-4	E	F-5	R2	F-4	R12	D-3	R24	E-7
C3	B-5	C15	D-4	F	F-8	R3	B-12	R13	D-4	R25	E-7
C5	D-8	C16	A-4	G	F-8	R4	D-4	R14	B-3	R26	D-6
C6	B-11	C17	C-6	J1	F-10	R5	B-12	R15	C-9	U1	E-15
C7	C-12	C18	D-6	J2	B-9	R6	D-12	R16	B-7	U2	C-1
C8	G-12	CR1	E-7	J3	C-8	R7	C-12	R19	E-8		



A Howard W. Sams GRIDTRACE™ Photo AUDIO POWER AMP BOARD

U2 PIN 9
RIGHT CHANNEL OUT
13.9V

ISOLATED GROUND



U2

6
13.9V

Q2

Q1

5
26.6

NOTE: ARROWS ON IC'S INDICATE PIN 1 UNLESS NOT

PARTS LIST AND DESCRIPTION (Continued)

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

SEMICONDUCTORS (Select replacement for best results)

ITEM No.	TYPE No.	MFGR. PART No.	REPLACEMENT DATA			
			NTE PART No.	ECG PART No.	RCA PART No.	ZENITH PART No.
CR701,3,4,5,6,7 Q301 Q303 Q304 Q305 Q401 Q402 Q501,2 Q701 Q703 Q704,5,6 Q801 # SCR101 SCR401 U301 # U401 U701		164717	NTE519	ECG519	SK3100/519	103-131
		146848	NTE229	ECG229	SK3246A/229	121-Z9021
		146850	NTE159	ECG159	SK3466/159	121-Z9003
		146847	NTE123AP	ECG123AP	SK3854/123AP	121-Z9000A
		146850	NTE159	ECG159	SK3466/159	121-Z9003
		153677	NTE255	ECG255	SK9412/255	
		146823	NTE238	ECG238	SK3710/238	121-Z9001
		146856	NTE152	ECG152	SK3893/152	121-987-03
		146847	NTE123AP	ECG123AP	SK3854/123AP	121-Z9000A
		143806	NTE159	ECG159	SK3466/159	121-Z9003
Q1,2,3	PW 5000 (CRT BOARD)	146847	NTE229	ECG229	SK3246A/229	121-Z9021
		146847	NTE123AP	ECG123AP	SK3854/123AP	121-Z9000A
		146847	NTE123AP	ECG123AP	SK3854/123AP	121-Z9000A
		149251	NTE230	ECG230	SK3042/230	185-Z9001
		153682	NTE5402	ECG5402	SK3638/5402	185-Z9006*
		146857	NTE1545	ECG1545	SK9379/1545	
			NTE868	ECG868	SK7692/868	
		176222	NTE868	ECG868	SK7692/868	
		152051	NTE844	ECG844	SK9381/844	221-Z9171
CR1 Q1 Q2	PW PIN	153680	NTE171	ECG171	SK3201/171	121-822
		164874	NTE177	ECG177	SK9091/177	103-131
		146847	NTE123AP	ECG123AP	SK3854/123AP	121-Z9000A
		153350	NTE153	ECG153	SK3274/153	121-988-03
		164717	NTE519	ECG519	SK3100/519	103-131
		164874	NTE177	ECG177	SK9091/177	103-131
		150363	NTE142A	ECG142A	SK12V/142A	103-Z9003
		164717	NTE519	ECG519	SK3100/519	103-131
CR3 thru CR7 CR8,9 CR10 CR11	PW SB (STEREO BOARD)	146848	NTE177	ECG177	SK9091/177	103-131
		146847	NTE229	ECG229	SK3246A/229	121-Z9021
			NTE123AP	ECG123AP	SK3854/123AP	121-Z9000A
		141421	NTE159	ECG159	SK3466/159	121-Z9003
		139366	NTE340*	ECG340*	SK3452/108	121-883*
		142251	NTE188	ECG188	SK3199/188	121-Z9036
		146857	NTE1545	ECG1545	SK9379/1545	
		150368				
		161362				
		162297				
U2 U3	LM4500AN	154027	NTE4016B	ECG4016B	SK4016B	HE-442-99
U4 (U6) U5						

PARTS LIST AND DESCRIPTION (Continued)

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

SEMICONDUCTORS (Select replacement for best results)

ITEM No.	TYPE No.	MFGR. PART No.	REPLACEMENT DATA			
			NTE PART No.	ECG PART No.	RCA PART No.	ZENITH PART No.
CR1 U1 U2 U3 U4 U5 U6, U7	PW EXP (EXPANDER)	161081	NTE5011A	ECG5011A	SK5A6/5011A	103-Z9007
		163434	NTE987	ECG987	SK3643/987	HE-442-602
		161326				
		163434	NTE987	ECG987	SK3643/987	HE-442-602
		163434	NTE987	ECG987	SK3643/987	HE-442-602
		161325				
		161081	NTE5011T1	ECG5011T1	SK3854/123AP	121-Z9000A
		146847	NTE123AP	ECG123AP	SK3466/159	121-Z9003
		145410	NTE159	ECG159	SK3854/123AP	121-Z9000A
Q1 Q2,3,4 Q5,6,7,8 Q9 Q10 Q11 Q12,3 Q14,5,6,7 Q18 U2 U3 U5 U6	PW V1002 (AUDIO/VIDEO IN/OUT)	146847	NTE123AP	ECG123AP	SK3452/108	121-883*
		146847	NTE123AP	ECG123AP	SK3854/123AP	121-Z9000A
		139366	NTE340*	ECG340*	SK3452/108	121-883*
		146847	NTE123AP	ECG123AP	SK3854/123AP	121-Z9000A
		146849	NTE210	ECG210	SK3202/210	121-Z9000A
		161079	NTE4052B	ECG4052B	SK4052B	121-Z9055
		176873				905-381
		161079	NTE4052B	ECG4052B	SK4052B	905-381
		176226	NTE1576	ECG1576	SK7672/1576	
CR1 CR2,3,4 Q1 Q2 U1,2	PW SPA002 (AUDIO POWER AMP)	164717	NTE519	ECG519	SK3100/519	103-131
		147993	NTE125	ECG125	SK3033A	903-334
		145410	NTE159	ECG159	SK3466/159	121-Z9003
		146847	NTE123AP	ECG123AP	SK3854/123AP	121-Z9000A
		175722				
		164874	NTE177	ECG177	SK9091/177	103-131
		145817	NTE5074A	ECG5074A	SK11V/5074A	103-Z9042
		164874	NTE177	ECG177	SK9091/177	103-131
		147015	NTE116	ECG116	SK3311	212-76-02
CR1,2 CR3 CR4 CR5,6 CR7 CR10 CR11 CR12 CR13 Q1 Q2 # U2	99203-203	164590				
		164589				
		164590				
		176666	NTE5024A	ECG5024A	SK15A/5024A	103-Z9013
		164874	NTE177	ECG177	SK9091/177	103-131
		164599				
		146847	NTE123AP	ECG123AP	SK3854/123AP	121-Z9000A
		164600				
Q1	PW RR001A (DEGAUSSING)	148907	NTE123AP	ECG123AP	SK3854/123AP	121-Z9000A

For SAFETY use only equivalent replacement part.
* Lead configuration may vary from original.

PARTS LIST AND DESCRIPTION (Continued)

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

MISCELLANEOUS

ITEM No.	PART NAME	MFGR. PART No.	NOTES
FB307	Ferrite Bead	152012	SAW 3.58MHz
FB308	Ferrite Bead	154052	
FB309	Ferrite Bead	154042	
FB401	Ferrite Bead	154322	
FB404	Ferrite Bead	152012	
FB405	Ferrite Bead	152012	
FB406	Ferrite Bead	154322	
FB407	Ferrite Bead	154322	
FB501	Ferrite Bead	154052	
SF301	Filter	147639	
Y801	Crystal	161235	
	Spark Gap	151286	
	PW VIPUR		
FB1	Ferrite Bead	154042	
FB2	Ferrite Bead	154042	
FB7	Ferrite Bead	154042	
FB8	Ferrite Bead	154042	
FB9	Ferrite Bead	152103	
FB10	Ferrite Bead	152103	
FB11	Ferrite Bead	152103	
FB12	Ferrite Bead	152103	
FB13	Ferrite Bead	152103	
FB14	Ferrite Bead	152103	
FB15	Ferrite Bead	154042	
FB16	Ferrite Bead	154042	
FB17	Ferrite Bead	153328	
	TUNER CONTROL MTT001A		
FB201	Ferrite Bead	152124	IF Out/AGC 4MHz
FB202	Ferrite Bead	157346	
FB301	Ferrite Bead	152124	
FB302	Ferrite Bead	152124	
FB401	Ferrite Bead	152124	
FB501	Ferrite Bead	152124	
J2	Jack	131222	
Y601	Crystal	158618	

For SAFETY use only equivalent replacement part.

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

ITEM	PART No.	PART No.	PART No.	PART No.
MODEL	GLR891TR	GLR895HR	GLR895LR	GLR899PR
Front Mask	MK0366	MK0367	MK0367	MK0367
Back Cover	BK0368	BK0369	BK0369	BK0369
Door, Aux Controls	176595	176595	176595	176595
Knob, Sharpness	176606	176606	176606	176606
Latch, Door	161908	161908	161908	161908
Overlay, Door	176603	176603	176603	176603
Overlay, Left Speaker	176599	176599	176599	176599
Overlay, Right Speaker	176600	176600	176600	176600

For SAFETY use only equivalent replacement part.

PARTS LIST MCY005A REMOTE CONTROL PREAMP

ITEM No.	DESCRIPTION	MFGR. PART No.	NOTES
L901	MCY005A	157642	
	COILS		
	Peaking 3mH		
R903	RESISTORS	157643	
	Resistor Network		

RCA
CHASSIS CTC130C

WIRING DATA

High Voltage Lead	Use BELDEN No. 9867 (30 KV)
Shielded Hook-up Wire	Use BELDEN No. 8401 or 8421 (Single-Conductor)
	8208 (Two-Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8529 (Solid) Available in 13 Colors
	8522 (Stranded) Available in 13 Colors
300-Ohm Tuner Input Lead	Use BELDEN No. 8225
75-Ohm Tuner Input Lead	Use BELDEN No. 8241
300-Ohm Antenna Lead-In	Use BELDEN No. 8275 (Foam Core) or 8285 (Foam Jacketed)
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) 4-Conductor
	8485 (Round) 5-Conductor
	8488 (Round) 8-Conductor

PARTS LIST AND DESCRIPTION (Continued)

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

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	MFGR. PART No.
	MAIN BOARD	
# C120	680 35V 20%	146217
# C407	22 25V 20%	153991
# C506	4.7 100V 10%	151238
# C508	1500 25V	162422
# C509	1500 25V	162422

For SAFETY use only equivalent replacement part.
Items Not Listed Are Normally Available At Local Distributors.

CAPACITORS Items Not Listed Are Normally Available At Local Distributors.

ITEM No.	RATING	MFGR. PART No.
	AUDIO/VIDEO IN/OUT ASSEMBLY	
C9	39 NPO 50V 5%	149151
C12	33 NPO 50V 10%	176879
C38	180 NPO 50V 5%	
	560 50V 10%	143878
C39	180 NPO 50V 5%	
	560 50V 10%	143878
C48	18 NPO 50V 1%	146538
	PW EXPANDER	
C9	68 NPO 250V 5%	160129
	MAIN BOARD	
# C101	.22 600V 20%	145613
# C102	680 1KV 20%	113165
# C103	680 1KV 20%	113165
# C104	680 1KV 20%	113165
# C109	1.5 200V 10%	147600
# C110	680 1KV 20%	113165
# C119	680 1KV 20%	113165
C302	12 NPO 50V 5%	145676
C304	100 NPO 250V 5%	153973
C308	9.1 NPO 250V $\pm 5pF$	153971
C309	9.1 NPO 250V $\pm 5pF$	153971
C316	82 NPO 250V 5%	145376
C317	91 NPO 250V 5%	142336
C318	18 NPO 50V 5%	146538
C319	47 NPO 150V 10%	157314
C333	16 NPO 250V 5%	147628
C335	22 NPO 50V 10%	150821
C405	220 NPO 250V $\pm 1\%$	153234
C411	.1 50V 20%	159640
C417	27 NPO 250V 5%	143755
C423	.0155 1.2KV 2%	161372
C425	.43 200V 5%	154269
C429	.0022 50V 10%	143881
C431	560 N1500 1.5KV 5%	154268
C434	330 N1500 1.5KV 5%	146822
C504	33 NPO 250V 5%	161213
C705	68 NPO 50V 5%	145676
C714	6.2 NPO 50V 5%	176617
C715	6.2 NPO 50V 5%	176617
C716	6.2 NPO 50V 5%	176617

For SAFETY use only equivalent replacement part.

ITEM No.	RATING	MFGR. PART No.
# C1	PW PIN 4.7 100V 20% 4.7 35V 20%	163970

#

ITEM No.	RATING	MFGR. PART No.
# C717	8.2 NPO 50V 5%	176618
C801	33 NPO 50V 5%	146833
C803	91 NPO 50V 5%	146254
C813	75 NPO 50V 5%	149774
C814	47 NPO 50V 5%	143867
C815	27 NPO 50V 5%	143866
C818	5 25pF Trimmer	138701
C819	75 NPO 50V 5%	149774
C820	82 NPO 50V 5%	143869
C823	56 NPO 50V 5%	145316
	KINE SOCKET (PW5000)	
C3	100 NPO 50V 5%	143871
(5003)		
C4	100 NPO 50V 5%	143871
(5004)		
C5	100 NPO 50V 5%	143871
(5005)		
	PW VIPUR	
C13	47 NPO 50V 10%	143867
	22 NPO 50V 10%	150821
C14	22 NPO 50V 10%	150821
C17	220 NPO 50V 10%	149233
C37	.0047 1.4KV 20%	
	.0034 1.4KV 20%	149201
	.0005 1.4KV 20%	
	STEREO DECODER (SOUND ASSEMBLY PW SB001B)	
C4	10 NPO 250V $\pm 5pF$	161099
C5	82 NPO 250V 5%	145376
C6	56 NPO 250V 5%	173059
C7	10 NPO 250V $\pm 5pF$	161099
C8	82 NPO 250V 5%	145376
C9	82 NPO 250V 5%	145376
C15	10 NPO 250V $\pm 5pF$	161099
C18	5.6 NPO 250V $\pm 25pF$	157278
C22	330 N330 50V 5%	147634
C24	220 N220 50V 5%	
C36	270 N220 250V 5%	142753
C37	680 N2000 250V 5%	143854
C76	680 N2000 250V 5%	143854

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
	AUDIO/VIDEO IN/OUT ASSEMBLY			
R91	Balance	5000	157493	
R110	Video Level	1000	175372	
	PW EXPANDER			
R6	Input	25K	151297	
R11	High Band Level	25K	151297	
	Match			
R19	Output	25K	151297	
	PW FAC			
R4202	Black Level (Brightness)	170K	164893	
R4203	Color	100K	164894	
R4204	Tint	100K	164894	
R4207	Picture (Contrast)	125K	161401	
	MAIN BOARD			
R332	AFT	10K	151270	
R450A	Focus		175506	
R450B	Screen		175506	
R715	Contrast	10K	151270	
	PW PIN			
R4	Width	1000	147615	
	PW RC			
R334	AGC	25K	176662	
R534	Vertical Height	5000K	147618	
R750	Red Bias	4500	147617	
R752	Green Bias	4500	147617	
R754	Blue Bias	4500	147617	
R756	Green Drive	150	147619	
R758	Red/Blue Drive	100	147616	
R4209	Sharpness	500	176663	
	STEREO DECODER (SOUND ASSEMBLY PW SB001B)			
R9	Audio Level	10K	148417	
R15		1500		
R52	Audio B Osc	10K	161220	
R119	Audio B Threshold	7500	161383	

For SAFETY use only equivalent replacement part.

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		
		MFGR. PART No.	NTE PART No.	WORKMAN PART No.
	AUDIO AMPLIFIER			
# R8	10 5% 1/4W Flame Proof Carbon Film	829010	QW010	22-1048
R9	1000 2% 1/4W Carbon Film	175055	QW210	
R10	1000 2% 1/4W Carbon Film	175055	QW210	
# R14	10 5% 1/4W Flame Proof Carbon Film	829010	QW010	22-1048
R19	1 5% 1W Flame Proof Metal Film	176889	1W1D0	
R20	1 5% 1W Flame Proof Metal Film	176889	1W1D0	
R37	2.4 5% 1W Flame Proof Metal Film	176887	1W2D4	

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.
	MAIN BOARD			PW SB001B (STEREO/ BROADCAST)	
# L101	Line Choke	176619	L1	45.75MHz Bandpass	161095
L103	RF Choke	154026	L2	45.75MHz Bandpass	161095
# L104	RF Choke (68uH)	153987	L3	Peaking (2.2uH)	143893
# L105	RF Choke (3.8uH)	153986	L4	RF Choke (2.2uH)	143893
L301	47.25MHz Trap	146198	L5	Peaking (6.8MH)	161385
L302	Video IF	146200	L6	RF Choke (6800uH)	161088
L303	Video IF	143899	L7	4.5MHz Bandpass	151247
L304	AFT	143831	L8	4.5MHz Bandpass	151247
L305	Peaking (2.2uH)	143893	L9	Detector 4.5MHz	151248
L307	Peaking (1uH)	147637	110	Trap 1H Pilot	161323
L308	RF Choke (2.2uH)	143893	L11	Peaking	161384
L309	RF Choke (.82uH)	148420	L12	Trap 6H Audio B	161323
L310	RF Choke		L13	Trap 4H Audio B	161323
L311	Peaking (15uH)	157133		PW EXP (EXPANDER)	
L312	Peaking (1.2uH)	154047	L1	Peaking (10uH)	161323
L314	Peaking (3.3uH)	154048	L2	Peaking (8.2MH)	161087
L401	Horiz Frequency	160969	L3	Peaking (8.2MH)	161087
L402	RF Choke (3.8uH)	153986	L4	Peaking (8.2MH)	161087
L403	Horiz Linearity	161369		PW V1002 (AUDIO/ VIDEO)	
L701	Peaking (56uH)	176621	L1	Peaking (33uH)	153921
L702	Peaking (56uH)	176621	L3	Peaking (470uH)	163028
L801	RF Choke (12uH)	149175	L4	Peaking (470uH)	163028
L803	Peaking (39uH)	154050	L5	Peaking (470uH)	163028
L804	Peaking (56uH)	161090	L6	Peaking (470uH)	163028
L805	Peaking (27uH)	160517		Tuner Control	MTT001A
L806	RF Choke (470uH)	176622	L403	Adjust W/CAN	174435
T301	Trap 4.5MHz	154041	L404	Adjust W/CAN	174435
	PW 5000 (KINE SOCKET)		L601	RF Choke (33uH)	174436
L1	RF Choke (270uH)	176659	L603	Trap	174437
	PW PIN		L604	Peaking (4.7uH)	158726
# L1	Peaking	164015	L605	Peaking (15uH)	174438
			L606	RF Choke (68uH)	160184
			T401	Balun	174439
			T402	Balun	174439
			T501	Antenna Transformer	151544
					176810
			T703	Balun	174425
				Remote Control	MCY005A
			L901	Peaking (3MH)	157642

For SAFETY use only equivalent replacement part.

COILS & TRANSFORMERS

ITEM No.	FUNCTION	MFGR. PART No.	OTHER IDENTIFICATION	NOTES
# DY1	Yoke Horiz 1.3mH	164608	2842022-503 (1)	
	100° Vert 22.4mH			
T1	Switch Mode	176674	2863203-2 (1)	
T2	Standby	176675	2863308-1 (1)	
T101	Regulator	159346	2870941-7 (1)	
T401	Horiz Drive	160372	1467974-2 (1)	
# T402	Horiz Output	164581	1455874-501 (1)	

For SAFETY use only equivalent replacement part.

(1) Number on unit.

PARTS LIST AND DESCRIPTION (Continued)

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

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
SP1	3-1/4" x 8-1/8 PM 8 Ohms	2863211-002		
SP2	3-1/4" x 8-1/8" PM 8 Ohms	2863211-002		

FUSE DEVICES

ITEM NO.	DESCRIPTION	MFGR. PART NO.		NOTES
		DEVICE	HOLDER	
# F101	5 Amp @ 125VAC Fast Acting	175425		

For SAFETY use only equivalent replacement part.

MISCELLANEOUS

ITEM No.	PART NAME	MFGR. PART No.	NOTES
	INSTRUMENT ASSEMBLY		
CR1	LED	175393	Power
CR2	LED	175394	Stereo
CR3	LED	175394	Audio B
CR4	LED	175393	Audio B
K1	Relay	160093	
# L102	Degaussing Coil	164121	
# P100	Cord	176595	AC Power, Polarized
# V101	CRT	A66ABU10X	
	Antenna		UHF, RUSSELL Replacement Type B0W-4H
	Antenna		VHF, RUSSELL Replacement
	Magnet	145381	
	PC Board	176891	Audio Amplifier
	PC Board	176892	PW VIPUR
	PC Board	176867	KINE Socket
	PC Board	176868	PW Pin
	PC Board	176869	PW RC (Control Board)
	PC Board	176611	PW Sound
	PC Board	164898	PW FAC Front Auxiliary Control Assembly
	PC Board	176865	PW SB001B Sound Assembly
	PC Board		Expander (Part of Sound Assembly)
	PC Board		Audio/Video In/Out Assembly
	PC Board	176866	PW XRP Latch
	PC Board	174442	
	Remote Control	156387	MCY005A
	Remote Transmitter	163982	CRK40A
	Tuning Module	164137	MTT001A
	Wedge	164921	Yoke
	MAIN BOARD		
DL701	Delay Line	153674	
FB101	Ferrite Bead	154052	
FB102	Ferrite Bead	152012	
FB103	Ferrite Bead	152012	
FB105	Ferrite Bead	152012	
FB301	Ferrite Bead	152012	
FB302	Ferrite Bead	152012	
FB303	Ferrite Bead	154103	
FB304	Ferrite Bead	154052	

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 (T402). Refer to "Troubleshooting" Power Supply and Horizontal circuits.

NO PIC, NO SOUND, HAS RASTER: Check IF-AGC and source voltages from Horizontal Output Transformer (T402). Refer to "Troubleshooting" IF-AGC and Horizontal circuits.

NO PIC, HAS SOUND, NO RASTER: Check Horizontal Output Transformer (T402) 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 (T402). 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.

PARTS LIST AND DESCRIPTION

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.	RCA PART No.	ZENITH PART No.
CRK40A					
Q1	148996	NTE123AP	ECG123AP	SK3854/123AP	121-Z9000A
U1	173219				
MCY005A					
CR901	164874	NTE177	ECG177	SK9091/177	103-131
CR902	150711				
CR903,4	164874	NTE177	ECG177	SK9091/177	103-131
Q901	148070	NTE451	ECG451	SK9164/451	
Q902	145410	NTE159	ECG159	SK3466/159	121-Z9003
Q903,4	148061				
MSD002A					
CR1,2	164717	NTE519	ECG519	SK3100/519	103-131
Q1	143806	NTE159	ECG159	SK3466/159	121-Z9003
MTT001A					
CR101	164717	NTE519	ECG519	SK3100/519	103-131
CR102,3	174378				
CR105	129095	NTE553	ECG553	SK3322	
CR107	174449				
CR108					
CR109	174450				
CR110,111	164717	NTE519	ECG519	SK3100/519	103-131
CR112					
CR113,4,5	129095	NTE553	ECG553	SK3322	
CR201,2	129095	NTE553	ECG553	SK3322	
CR203,4					
CR205,6	129095	NTE553	ECG553	SK3322	
CR207	164717	NTE519	ECG519	SK3100/519	103-131
CR208,9	129095	NTE553	ECG553	SK3322	
CR210					
CR211	164717	NTE519	ECG519	SK3100/519	103-131
CR212	164717	NTE519	ECG519	SK3100/519	103-131
	129095	NTE553	ECG553	SK3322	
CR301,2,3					
CR304,5	174378				
CR401,2	174381				
CR403	164717	NTE519	ECG519	SK3100/519	103-131
CR501	129095	NTE553	ECG553	SK3322	
CR502					
CR503,4,5	129095	NTE553	ECG553	SK3322	
CR506					
CR507,8	129095	NTE553	ECG553	SK3322	
CR509	129095	NTE553	ECG553	SK3322	
	164717	NTE519	ECG519	SK3100/519	103-131
CR510					
CR602	164874	NTE177	ECG177	SK9091/177	103-131

PARTS LIST AND DESCRIPTION (Continued)

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

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		
		MFGR. PART No.	NTE PART No.	WORKMAN PART No.
R19	10K 5% 1/2W Flame Proof Carbon Film	830310	HW310	22-2120
R20	10K 5% 1/2W Flame Proof Carbon Film	830310	HW310	22-2120
R22	100 5% 1W Flame Proof Metal Film	176673	1W110	22-3072
	STEREO DECODER (SOUND ASSEMBLY PW SB001B)			
R19	47K 2% 1/8W Carbon Film	157376	EW347	
R20	47K 2% 1/8W Carbon Film	157376	EW347	
R21	1100 2% 1/8W Carbon Film	161037	EW211	
R22	24K 2% 1/8W Carbon Film	161032	EW324	
R23	3900 2% 1/8W Carbon Film	157377	EW239	
R24	3900 2% 1/8W Carbon Film	157377	EW239	
R26	4700 2% 1/8W Carbon Film	157379	EW247	
R30	160 2% 1/8W Carbon Film	161034	EW116	
R33	2000 2% 1/8W Carbon Film	157339	EW220	
R35	56K 2% 1/8W Carbon Film	159642	EW356	
R36	24K 2% 1/8W Carbon Film	161032	EW324	
R38	430 2% 1/8W Carbon Film	161031	EW143	
	330 2% 1/8W Carbon Film		EW133	
R39	3300 2% 1/8W Carbon Film	157337	EW233	
	3500 2% 1/8W Carbon Film			
R51	39K 2% 1/8W Carbon Film	161030	EW339	
R56	2000 2% 1/8W Carbon Film	157339	EW220	
R59	27K 2% 1/8W Carbon Film	159641	EW327	
R60	24K 2% 1/8W Carbon Film	161032	EW324	
R61	39K 2% 1/8W Carbon Film	161030	EW339	
R63	39K 2% 1/8W Carbon Film	161030	EW339	
R63	36K 2% 1/8W Carbon Film		EW336	
R65	43K 2% 1/8W Carbon Film	161038	EW343	
R67	39K 2% 1/8W Carbon Film	161030	EW339	
R68	15K 2% 1/8W Carbon Film	159643	EW315	
R70	3300 2% 1/8W Carbon Film	157337	EW233	
R75	33K 2% 1/8W Carbon Film	161321	EW333	
R80	43K 2% 1/8W Carbon Film	161038	EW343	
R81	15K 2% 1/8W Carbon Film	159643	EW315	
R84	3300 2% 1/8W Carbon Film	157337	EW233	
R85	3300 2% 1/8W Carbon Film	157337	EW233	
R86	15K 2% 1/8W Carbon Film	159643	EW315	
R87	15K 2% 1/8W Carbon Film	159643	EW315	
R94	91K 2% 1/8W Carbon Film	161040	EW391	
R96	6800 2% 1/8W Carbon Film	161033	EW268	
R97	3300 2% 1/8W Carbon Film	157337	EW233	
R99	2000 2% 1/8W Carbon Film	157339	EW220	
R114	2200 2% 1/8W Carbon Film	160117	EW222	
R125	3.9 5% 1W Flame Proof Metal Film	176591	1W309	

For SAFETY use only equivalent replacement part.
(1) Part of #U401 DEF Kit.

PARTS LIST AND DESCRIPTION (Continued)

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

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		
		MFGR. PART No.	NTE PART No.	WORKMAN PART No.
	TUNER CONTROL MTT001A			
R115	18K 2% 1/8W Metal Film	174366	EW318	
	11K 5% 1/8W Metal Film	176822	EW311	
R119	30K 2% 1/8W Metal Film	174368	EW330	
	11K 5% 1/8W Metal Film	176822	EW311	
R123	10K 2% 1/8W Metal Film	174364	EW310	
R130	10K 2% 1/8W Metal Film	174364	EW310	
	11K 5% 1/8W Metal Film	176822	EW311	
R203	100K 2% 1/8W Metal Film	176817	EW410	
	120K 5% 1/8W Metal Film	174357	EW412	
R206	160K 2% 1/8W Metal Film	176815	EW416	
	160K 5% 1/8W Metal Film	174358	EW416	
R207	1000 2% 1/4W Carbon Film	829210	QW210	
	1500 5% 1/8W Carbon Film	173922	EW215	
R208	270 2% 1/4W Carbon Film	175420	QW127	
	390 5% 1/8W Metal Film	174345	EW139	
R301	10K 2% 1/8W Metal Film	174364	EW310	
R302	100K 2% 1/8W Metal Film	176816	EW410	
	120K 5% 1/8W Metal Film	174357	EW412	
R303	160K 2% 1/8W Metal Film	176815	EW416	
R304	1000 2% 1/4W Carbon Film	175055	QW210	
	1500 5% 1/8W Metal Film	162001	EW215	
R305	270 2% 1/4W Carbon Film	175055	QW127	
	390 5% 1/8W Metal Film	174345	EW139	
R308	10K 2% 1/8W Metal Film	174364	EW310	
R309	10K 2% 1/8W Metal Film	174364	EW310	
R311	10K 2% 1/8W Metal Film	174364	EW310	
R405	820 2% 1/8W Metal Film	176814	EW182	
	390 5% 1/8W Metal Film	174345	EW139	
R407	13K 2% 1/8W Carbon Film	157334	EW313	
	13K 5% 1/8W Metal Film	174352	EW313	
R417	33K 2% 1/8W Metal Film	176813	EW333	
	180K 5% 1/8W Metal Film	174359	EW418	
R418	100K 2% 1/8W Metal Film	176816	EW410	
	100K 5% 1/8W Metal Film	174356	EW410	
R419	240K 2% 1/4W Carbon Film	829424	QW424	
R505	100K 2% 1/8W Metal Film	174356	EW410	
	120K 5% 1/8W Metal Film	174357	EW412	
R506	160K 2% 1/8W Metal Film	176815	EW416	
R507	270 2% 1/4W Carbon Film	175420	QW127	
	390 5% 1/8W Carbon Film	173069	EW139	
R508	1000 2% 1/4W Carbon Film	175055	QW210	
	1500 5% 1/8W Carbon Film	173922	EW215	
R605	22K 2% 1/8W Metal Film	174367	EW322	
R606	22K 2% 1/8W Metal Film	174367	EW322	
R607	22K 2% 1/8W Metal Film	174367	EW322	
R608	22K 2% 1/8W Metal Film	174367	EW322	
R631	10K 2% 1/8W Metal Film	174364	EW310	
R652	36K 2% 1/8W Metal Film	174369	EW336	
R660	22K 2% 1/8W Metal Film	174367	EW322	
R661	22K 2% 1/8W Metal Film	174367	EW322	
R662	22K 2% 1/8W Metal Film	174367	EW322	

PARTS LIST AND DESCRIPTION (Continued)

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

SEMICONDUCTORS (Select replacement for best results)

NOTES	ITEM No.	MFGR. PART No./ TYPE No.					NOTES
			NTE PART No.	ECG PART No.	RCA PART No.	ZENITH PART No.	
MATCHED SET INCLUDES CR108,CR203,CR204,CR210, CR502,CR502,CR506,CR510 USE CR107 MATCHED SET MATCHED SET INCLUDES CR112,CR301,CR302,CR303 USE CR109 MATCHED SET USE CR107 MATCHED SET USE CR107 MATCHED SET USE CR109 MATCHED SET # # # # USE CR107 MATCHED SET USE CR107 MATCHED SET USE CR107 MATCHED SET	CR603 THRU CR608 CR609,10,11 CR612 CR613 CR614,5 CR616 CR617 CR618 CR619 THRU CR622 CR623 CR624,5 Q101 Q103 Q201 Q301 Q302 Q401 Q402 Q501 Q601 Q602 Q603 Q604 Q605 Q606 U101 U601 U602	164717 164874 137652 174431 139706 156313 174370 164594 164717 142417 164717 174373 174374 174372 174372 143794 148085 146848 148085 146847 143802 146847 145410 146847 157808 174377 174375 174376	NTE519 NTE177 NTE116 NTE177 NTE5141A NTE5069A NTE519 NTE5077A NTE519 NTE123AP NTE222 NTE229 NTE222 NTE123AP NTE159 NTE123AP NTE159 NTE123AP NTE159	ECG519 ECG177 ECG116 ECG177 ECG5141A ECG5069A ECG519 ECG5077A ECG519 ECG123AP ECG222 ECG229 ECG222 ECG123AP ECG159 ECG123AP ECG159 ECG123AP ECG159	SK3100/519 SK9091/177 SK3313/116 SK9091/177 SK30X/5141A SK4V7/5069A SK3100/519 SK18V/5077A SK3100/519 SK3854/123AP SK3065/222 SK3246A/229 SK3065/222 SK3854/123AP SK3466/159 SK3854/123AP SK3466/159 SK3854/123AP SK3466/159	103-131 103-131 212-76-02 103-131 103-Z9006 103-131 103-Z9022 103-131 121-Z9000A 121-826 121-Z9021 121-826 121-Z9000A 121-Z9003 121-Z9000A 121-Z9003 121-Z9000A 121-Z9003	Used in some versions
	CR101,2, 3,4 CR105 CR106,7,9 CR301 CR302 CR402 # CR405 # CR406 # CR407 # CR408,9 CR410 CR411 CR412 CR501 CR502 CR503 CR504 CR505 CR507	2811925-002 99203-203 99203-206 99203-203	147015 147015 176296 149930 164717 139706 139706 175424 157301 157301 147015 146316 156317 139706 147015 164717 164874 149731 139706	NTE125 NTE116 NTE552 NTE5021A NTE519 NTE177 NTE177 NTE5029A NTE177 NTE177 NTE116 NTE525 NTE177 NTE116 NTE519 NTE177 NTE116 NTE177	ECG125 ECG116 ECG552 ECG5021A ECG519 ECG177 ECG177 ECG5029A ECG177 ECG177 ECG116 ECG525 ECG177 ECG116 ECG519 ECG177 ECG116 ECG177	SK5010A/117A SK3311 SK9000/552 SK12A/5021A SK3100/519 SK9091/177 SK9091/177 SK9091/177 SK20A/5029A SK9091/177 SK9091/177 SK3312 SK3925/525 SK9091/177 SK3311 SK3100/519 SK9091/177 SK3312 SK9091/177	212-Z9000 212-76-02 103-287 103-279-21 103-131 103-131 103-131 103-Z9023 103-131 103-131 212-76-02 212-Z9010 103-131 212-76-02 103-131 212-76-02 103-131

PARTS LIST AND DESCRIPTION (Continued)

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

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		
		MFGR. PART No.	NTE PART No.	WORKMAN PART No.
	AUDIO/VIDEO IN/OUT ASSEMBLY			
R24	2400 2% 1/8W Carbon Film	176876	EW224	
# R26	10 5% 1/4W Flame Proof Carbon Film	829010	QW010	22-1048
R30	620 2% 1/4W Carbon Film	176647	QW162	
R31	2400 2% 1/8W Carbon Film	176876	EW224	
R32	1200 2% 1/4W Carbon Film	175308	QW212	
# R34	22 5% 1/4W Flame Proof Carbon Film	829022	QW022	22-1056
R65	4700 2% 1/4W Carbon Film	175413	QW247	
R69	51K 2% 1/4W Carbon Film	175315	QW351	
R71	47K 2% 1/4W Carbon Film	175322	QW347	
# R102	30 5% 2W Flame Proof Metal Film	176875	2W030	
R108	680 2% 1/4W Carbon Film	175312	QW168	
# R121	11 5% 5W WW	176874		
R122	5100 2% 1/4W Carbon Film	175417	QW251	
	INSTRUMENT ASSEMBLIES			
# R1	1000 5% 1/8W Carbon Film		EW210	
	1100 10% 10W WW	175614		
	KIN SOCKET (PW5000)			
# R1	10K 5% 2W Flame Proof Metal Film	176656	2W310	22-4120
(5001)				
# R2	10K 5% 2W Flame Proof Metal Film	176656	2W310	22-4120
(5002)				
# R3	10K 5% 2W Flame Proof Metal Film	176656	2W310	22-1420
(5003)				
# R8	27K 5% 1/4W Carbon Film	829327	QW327	22-1130
(5008)				
# R13	22K 10% 1/2W Carbon Composition	502322	HW322	22-2128
(5013)				
# R14	2.4 10% 3 W WW	176660		
(5014)				
	PW EXPANDER			
R7	180K 2% 1/8W Carbon Film	161379	EW418	
R17	180K 2% 1/8W Carbon Film	161379	EW418	
R25	39K 2% 1/8W Carbon Film	161030	EW339	
R26	33K 2% 1/8W Carbon Film	161321	EW333	
R31	4700 2% 1/8W Carbon Film	157379	EW247	
R32	4700 2% 1/8W Carbon Film	157379	EW247	
R35	910 2% 1/4W Carbon Film	829491	QW191	
R36	3300 2% 1/8W Carbon Film	157337	EW233	
R37	12K 2% 1/8W Carbon Film	161328	EW312	
R42	910K 2% 1/4W Carbon Film	829491	QW491	
	PW FAC			
R799	LDR			
	PW PIN			
R2	10K 2% 1/4W Carbon Film	175317	QW310	22-1120
R3	10K 5% 1/4W Carbon Film	176653	QW310	22-3092
	680 5% 1W Flame Proof Metal Film		1W168	
	MAIN BOARD			
# R102	470K 5% 1/2W Flame Proof Carbon Film	830447	HW447	22-2160
	47K 5% 1/2W Flame Proof Carbon Film		HW347	22-2136
# R106	53.6K 1% 1/2W Metal Film			
	54.9K 1% 1/2W Metal Film	176624		
# R108	3240 1% 1/2W Metal Film	176625		

PARTS LIST AND DESCRIPTION (Continued)

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

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		
		MFGR. PART No.	NTE PART No.	WORKMAN PART No.
# R109	56K 2% 1/8W Carbon Film	(1)	EW356	
	62K 2% 1/8W Carbon Film		EW362	
# R110	110K 2% 1/8W Carbon Film	(1)	EW411	
# R111	220K 2% 1/8W Carbon Film	(1)	EW422	
	240K 2% 1/8W Carbon Film		EW424	
# R112	464K 1% 1/8W Carbon Film	(1)		
	510K 1% 1/8W Carbon Film			
R113	270 10% 5W WW	115166	5W127	
# R114	4.7 5% 1/2W Flame Proof Carbon Film	830A47	HW407	22-2040
R115	36K 5% 2W Flame Proof Metal Film	176657	2W336	
# R116	680 5% 1W Flame Proof Metal Film	176653	1W168	22-3092
# R119	43 5% 3W WW	176279	3W043	
# R120	2.7 10% 15W WW	160238		
R207	200 2% 1/4W Carbon Film	175363	QW120	
# R305	100 5% 1/4W Flame Proof Carbon Film	829110	QW110	22-1072
R314	180 2% 1/4W Carbon Film	176646	QW118	
# R325	20 5% 3W Flame Proof Metal Film	176658	3W020	
# R402	560K 5% 1W Flame Proof Metal Film	176652	1W456	
R403	27.4K 1% 1/4W Metal Film	151883		
R404	84.5K 1% 1/4W Metal Film	154258		
# R416	121K 1% 1/2W Metal Film	153978		
R417	10K 5% 2W Flame Proof Metal Film	176656	2W310	22-4120
# R418	.24 5% 2W WW	162412		
# R423	5600 5% 1/2W Carbon Film	175369	HW256	22-2114
# R425	820 5% 1/4W Carbon Film	175043	QW182	22-1094
# R426	4700 5% 5W WW	162413	5W247	
# R429	100 5% 1/4W Flame Proof Carbon Film	829110	QW110	22-1072
# R430	25.5K 1% 1/2W Metal Film	149782		
# R431	180 5% 1/4W Carbon Film	176628	QW118	22-1078
# R436	220 5% 1/2W Carbon Film	176651	HW122	22-2080
# R506	6800 5% 2W Flame Proof Metal Film	176655	2W268	22-4116
# R509	12 5% 1/2W Flame Proof Carbon Film	830012	HW012	22-2050
# R511	10 5% 1/4W Carbon Film	175753	QW010	22-1048
# R513	10 5% 1/4W Flame Proof Carbon Film	829010	QW010	22-1048
# R514	10 5% 1/4W Flame Proof Carbon Film	829010	QW010	22-1048
# R518	1 5% 1/2W Flame Proof Metal Film	830010	HW1D0	
R718	10K 2% 1/4W Carbon Film		QW310	
	10K 5% 1/4W Carbon Film	175317	QW310	22-1120
# R726	180 5% 1/4W Flame Proof Metal Film	829118	QW118	
# R727	33K 5% 1W Flame Proof Metal Film	176654	1W333	22-3132
R728	9530 1% 1/4W Metal Film	176862		
# R745	10 5% 1/2W Flame Proof Carbon Film	830010	HW010	22-2048
R746	2700 2% 1/4W Carbon Film	176648	QW227	
R747	150 2% 1/4W Carbon Film	176645	QW115	
# R759	150 5% 1/4W Flame Proof Carbon Film	829115	QW115	22-1076
R761	200 2% 1/4W Carbon Film	175363	QW120	
	2000 2% 1/4W Carbon Film		QW220	
R802	360 5% 1/4W Carbon Film		QW136	
	330 2% 1/4W Carbon Film	175045	QW133	
R804	620 2% 1/4W Carbon Film	176647	QW162	
R811	820 2% 1/4W Carbon Film	175043	QW182	
R823	10K 2% 1/4W Carbon Film		QW310	
	10K 5% 1/4W Carbon Film	175317	QW310	22-1120
# RT101	PTC 8 Cold	149680		FR605
	PW VIPUR			
R2	3900 5% 10W WW	176667	10W239	
R5	240K 2% 1/4W Carbon Film	175328	QW424	
R6	110K 2% 1/4W Carbon Film	175309	QW411	
# R7	20.5K 1% 1/2W Metal Film	176671		
# R8	16.9K 1% 1/2W Metal Film	176672		
R9	68K 2% 1/4W Carbon Film	175306	QW368	
R14	10K 5% 1/2W Flame Proof Carbon Film	830310	HW310	22-2120
R16	.15 5% 3W WW	175331		
# R18	470K 10% 1/2W Carbon Composition	502447	HW447	22-2160
	8.2M 10% 1/2W Carbon Composition		HW582	