

CABINET-REAR VIEW

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

Remove three screws (indicated by arrow) from the control section on the front of the set. Lay set face down on a soft protective surface. Remove eighteen screws from cabinet back. Screws are indicated by an arrow. Lift cabinet back off. Disconnect HV anode, CRT anode, CRT socket, deflection yoke connector, speaker connectors, degaussing coil connector, ground leads and all required cabling. Depress one latch on outside of Power Input board and slide board out of cabinet. Remove two screws holding Front Controls and Switch boards assembly. Slide

assembly backwards out of cabinet. Release two latches holding Switch, two latches holding Control board and two latches holding small switch board. Remove boards from assembly mounting bracket.

CRT REMOVAL

Follow "Chassis Removal" procedure and lay set face down on a soft protective surface. Loosen and remove CRT neck assemblies. Remove degaussing coil and plastic holders. Remove four nuts holding CRT to cabinet front and lift CRT out of cabinet. **DO NOT LIFT CRT BY THE NECK.**

SERVICING IN THE FIELD

CRT IMPLOSION PROTECTION AND CLEANING

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

FUSE DEVICES

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

CHANNEL TUNING

Channel Up and Down buttons are provided for channel scanning with ten numbered buttons, (on remote transmitter) provided for one or two digit entry direct access channel selection. Fine tuning is automatic.

HIGH VOLTAGE

For High Voltage procedure, refer to Miscellaneous Adjustments.

WIDTH

Horizontal width is accomplished by proper adjustment of the Horizontal Width Control. (See photo, Main Board - Top View.)

FOCUS

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

AGC

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

CENTERING

Vertical centering is accomplished by proper adjustment of the vertical linearity/centering control. (See photo, Main Board-Top View.)

SET 2781 FOLDER 1

SAMS

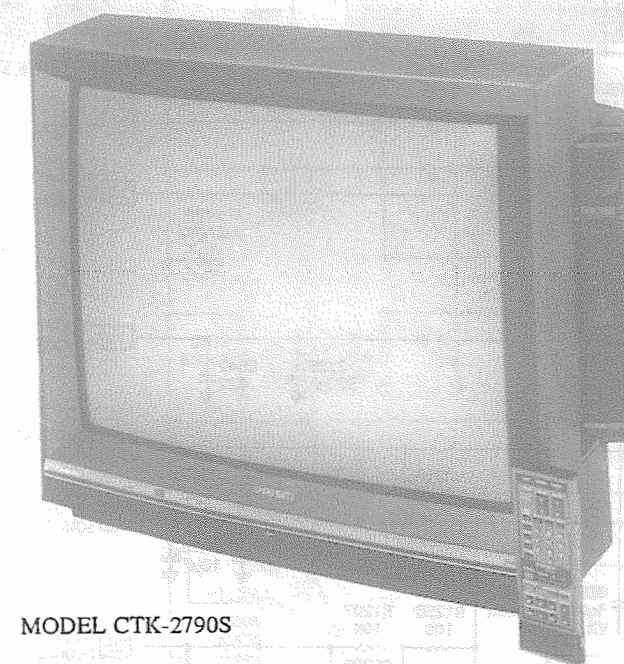
PHOTOFACT®

For Supplier Address See PHOTOFACT Index

PANASONIC MODELS

CTK-2790S, PC-29S90S (CH.AEDP152, YAEDP152)

MODEL	CHASSIS
CTK-2790S	AEDP152
PC-29S90S	YAEDP152



MODEL CTK-2790S

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SAMS

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

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SET 2781 FOLDER 1

CTK-2790S, PC-29S90S (CH.AEDP152, YAEDP152)

PANASONIC MODELS

SET 2781 FOLDER 1



10 9 8 7 6 5 4 3 2 1 0

SAFETY PRECAUTIONS

SERVICE WARNING

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

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

SERVICING HIGH VOLTAGE AND PICTURE TUBE

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

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

X-RAY RADIATION AND HIGH VOLTAGE LIMITS

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

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

SAFETY CHECKS-FIRE AND SHOCK HAZARD

Cold Leakage Checks (Sets with isolated ground.)

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

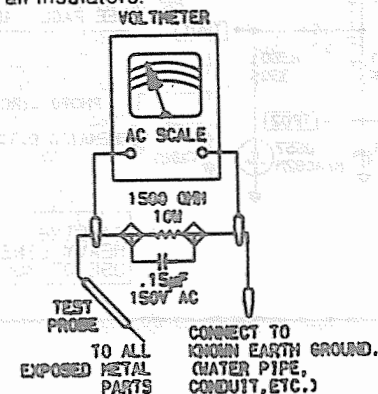
Leakage Current Hot Check

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

GENERAL GUIDE LINES

A final SAFETY check before returning the set to customer.

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



TROUBLESHOOTING AID

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

PICTURE OR SOUND

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

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

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

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

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

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

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

SWEEP

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

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

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

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

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

NARROW PICTURE: Refer to "Troubleshooting" Horizontal circuit.

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

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

SYNC

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

RASTER

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

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

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

COLOR (B/W operating normally)

NO COLOR: Refer to "Troubleshooting" Chroma circuit.

WEAK COLOR: Refer to "Troubleshooting" Chroma circuit.

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

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

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

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

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

TEST JIG HOOKUP

FUNCTION	Chek-A-Color ADAPTER NO.	PIN 1	RED
		PIN 2	YELLOW
CRT	B239	PIN 3	BLUE
YOKE	D482	PIN 4	BLACK
YOKE SETTING	YP1A		
COMMENTS	FOCUS TAP		

TROUBLESHOOTING

POWER SUPPLY

Check the AC Fuse F001. If Fuse F001 is open, check Bridge Rectifier Diodes (D801 thru D804), Capacitors C802, C804, C805, C810, Electrolytics C806. Apply 120V AC and check vor 160V* at the cathode of Diode D802. If this voltage is missing, check Line Filters (L801, L802), Power Relay (RL001). If voltage is present, check for 116V at TP116. If this voltage is missing, check the voltages and components associated with the Horizontal Output Transistor (Q551), Power Out IC (IC801) and Error Amp IC (IC804). If the proper voltage is present at TP116, refer to the "Horizontal" section of this Troubleshooting guide.

*With respect to common tie point.

HORIZONTAL

Determine if the TV is in shutdown, refer to the "High Voltage Shutdown" section, of this Troubleshooting guide. If the TV is not in shutdown, inject a horizontal signal at the base of the Horizontal Output Transistor (Q551). If horizontal deflection is now present, check the voltages, waveforms and components associated with Pins 15 thru 21 of the Video/Chroma/Jungle/Hold Down IC (IC301) and the Horizontal Driver Transistor (Q501). If there is still no horizontal sweep, check the voltages, waveforms and components associated with Horizontal output Transformer (T551) and Q551. Check the voltages and components associated with Diode D506 and D551 for defects. The high voltage rectifier is part of Transformer T551 and if defective will affect the performance of the horizontal circuits. If the Horizontal Oscillator is off frequency, check the voltages, waveforms and components associated with Pins 17 and 18 of IC301. Horizontal linearity or foldover problems may be caused by Capacitors C553, C554, C557, C561 being defective.

IF-AGC

Inject a video IF signal at the IF input and check for video on the CRT. If video is present, check the tuner, tuner control and tuner AFC circuits. If there is no video on the CRT, check for a video waveform at Pin 3 of IC101. If video is present at Pin 3, refer to the "Video" section of this Troubleshooting guide. If there is no video at Pin 3, apply

C bias to Pin 6 of the VIF/AFC/SIF/DET IC (IC101).

If video is now present at Pin 3, check the voltages, waveforms and components associated with Pins 1, 4 and 6 of IC101. If there is still no video at Pin 3, check the voltages, waveforms and components associated with Pins 1 thru 10, 22 thru 30 of IC101 and IF Amp Transistor Q101. A defective AGC circuit can cause an overloaded picture, excessive snow or loss of audio and video. See the AGC Voltage Chart for AGC voltages with signal.

AGC VOLTAGE CHART

IC101

Pin 1 4.6V

Pin 6 4.9V

VIDEO

Inject a video signal at Pin 3 of the VIF/AFC/SIF/DET IC (IC101) and check for video on the CRT. If video is present, refer to the "IF-AGC" section of this Troubleshooting guide. If there is no video on the CRT, check for a video waveform at Pin 46 of the Video/Chroma/Jungle/Hold Down IC (IC301). If video is missing at Pin 46 of IC301, check the voltages, waveforms and components associated with Switch IC (IC2901), Switch IC (IC2502), Emitter Follower Transistors (Q304, Q305, Q2510, Q3001, Q3005), Y-Amp (Q3006, Q3007), Switch IC (IC3001). If video is present at Pin 46, check for a video waveform at TP13. If the waveform is missing, check the voltages, waveforms and components associated with Pins 2, 23, 44, 45, 46, 47, 49, 56 of IC 301 and Y-Amp Transistors (Q301, Q314). If the waveform is present at TP13, check the voltages, waveforms and components associated with the CRT Output Transistors (Q351 thru Q356). If the brightness is inadequate or cannot be controlled, check the voltages, waveforms and components associated with Pin 44 of IC301 and Pin 7 of the CRT.

CHROMA

Check for a chroma waveform at pin 42 of the Video/Chroma/ Jungle/Hold Down IC (IC301). If the waveform is missing, check the components associated with pin 42. Check the voltages, waveforms and components associated with the video Chroma Mixer Transistors

TROUBLESHOOTING (Continued)

(Q3002, Q3003), Emitter Follower Transistors (Q3012, Q3014), and Switch IC (IC3001). If a chroma waveform is present at pin 42 of IC301, check for the proper waveforms at pins 24, 25, 26 of IC301. If these waveforms are missing, check the voltages, waveforms and components associated with pins 24 thru 42 of IC301. Check the 3.58MHz oscillator at pin 34 of IC301. Check the voltages and components associated with the color control and pin 40 of IC301. If there is inadequate tint range, check the voltages, waveforms and components associated with the tint control and pin 37 of IC301. If the proper waveforms are present at pins 24, 25, 26 of IC301, refer to the "Raster" section of this Troubleshooting guide.

VERTICAL

Inject a vertical drive signal at Pin 6 of the Video/Chroma/ Hold Down IC (IC301). If vertical deflection is now present, check voltages, waveforms and components associated with pins 6 thru 11 of IC301. If there is still no vertical deflection, check the voltages, waveforms and components associated with the Vertical Out IC (IC451). Vertical linearity or foldover problems may be caused by vertical feedback and bias circuits, check electrolytics C402, C404, C405, C451, C457 for defects.

HIGH VOLTAGE SHUTDOWN

The high voltage is monitored by Diode D506, rectifying pulses from the Horizontal Output Transformer (T551). Should the high voltage increase, the rectified voltage at the cathode of Diode D506 will also increase and trigger the Hold Down Circuit at Pin 12 of IC301. To troubleshoot, remove Resistor (R523) from the circuit and use a variac for AC Power. Start at 90VAC and increase as necessary to locate and repair the defect. Return R523 to the circuit.

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

Voltages Taken with TV in Shutdown
IC301

Pin 12 6.2V

Pin 14 6.1V

AUDIO

Select an active TV channel and check for an audio waveform at Pin 19 of the VIF/AFC/SIF/SET IC (IC101). If there is no audio, check the voltages, waveforms and components associated with Pins 11 thru 15, 17, 18, 19 of IC101. If an audio waveform is present at Pin 19 of IC101,

select a station that is transmitting a stereo signal and check for audio waveforms at Pins 28 and 41 of the Multisound Decoder IC (IC2200). If audio is missing, check the voltages, waveforms and components associated with Pins 1, 28 thru 42 of IC2200. Select the Stereo Mode and check for audio at Pin 27 of IC2200. If audio is missing check the voltages, waveforms and components associated with Pins 15, 16, 17, 20, 24 and 27 of IC2200 and DBX Noise Reduction IC (IC2201). Select a station transmitting a SAP signal, select the SAP Mode and check for SAP Audio at Pin 24 of IC2200. If audio is missing, check the voltages, waveforms and components associated with Pins 5 thru 14, 18 and 24 of IC2200. Check for audio at TPE10 and TPE11 in the Stereo/SAP/Mono Modes. If audio is missing, check the voltages, components and waveforms associated with Pins 15, 16, 17, 22, 23 of IC2200 Right and Left Amp Transistors (Q2203, Q2204). If audio is present, check for audio at Pins 11, 13 of the Audio Amp IC (IC2301). If there is no audio at Pins 11, 13 of IC2301, check the voltages, waveforms and components associated with the Audio Control IC (IC2303), OP AMP IC's (IC1501, IC1503) Switch IC (IC2901). Check the voltage at Pin 12 of IC2303, it should measure .13V at mute and 10.6V at Maximum volume.

SYNC

If there is no vertical or horizontal sync, check the voltages, waveforms and components associated with Pins 5 and 16 of the Video/Chroma/Jungle/Hold Down IC (IC301). If there is no vertical sync, check the voltages, waveforms and components associated with Pins 5 thru 10 and 16 of IC301. If there is no horizontal sync, check the voltages and components associated with Pins 5, 16, 17, 21 of IC301.

RASTER

Check the CRT and CRT voltages. If there is no Red, check the voltages and components associated with Pin 26 of the Video/ Chroma/Jungle/Hold Down IC (IC301) and Red Output Transistors (Q351, Q354). If there is no Green, check the voltages and components associated with Pin 25 of IC301 and Green Output Transistors (Q353, Q356). If there is no Blue, check the voltages and components associated with Pin 24 of IC301 and Blue Output Transistors (Q352, Q355). If the raster has a keystone shape, check the Deflection Yoke (DY1). If the raster has height or width problems, refer to the "Vertical", "Horizontal" and "Power" sections of this Troubleshooting guide.

TEST EQUIPMENT

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

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

TV ALIGNMENT INSTRUCTIONS

Use an isolation transformer, or observe polarity, and maintain line voltage at 120VAC. Allow a 20 minute warm-up period for receiver and test equipment. Suggested Alignment tools: GC-THORSEN	
Alignment COILS: L105, L107, L201	RECOMMENDED TOOLS: 9440

PRELIMINARY INSTRUCTIONS

Select highest unused channel. Set scope sweep to external or vector mode. Connect scope vertical input to scope vertical input on sweep/marker generator. Connect scope external horizontal input to scope horizontal input on sweep/marker generator. Ground test equipment to TV chassis unless specified otherwise. Use only enough generator output to provide a useable indication. Sweep Generator frequency is 44MHz with 10MHz Sweep. NOTE: Response may vary from that shown. Connect a 4.5V Bias to TP14.
--

VIDEO IF ALIGNMENT (SWEEP MARKER GENERATOR)

DIRECT PROBE FROM SWEEP GENERATOR	SWEEP GENERATOR OUTPUT	MARKER GENERATOR FREQUENCY	REMARKS
TP12	TP15	45.75MHz	Adjust L106 for Maximum 45.75MHz. See Figure 1

TV ALIGNMENT INSTRUCTIONS (Continued)

VIDEO IF ALIGNMENT (BAR SWEEP GENERATOR)

BAR SWEEP GENERATOR	SCOPE INPUT	REMARKS
TP15	TP12	Perform PIF Adjustments per Sweep/Marker Instructions. See Figure 2

SOUND IF ALIGNMENT

Tune in a station and adjust L201 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.			
DIRECT PROBE FROM SWEEP GENERATOR	SWEEP GENERATOR OUTPUT	MARKER GENERATOR FREQUENCY	REMARKS
TP18	TP15	45.75MHz	Adjust L107 to place 45.75MHz as shown in Figure 3.

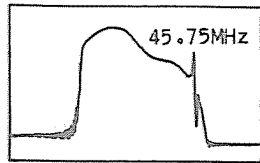


Figure 1

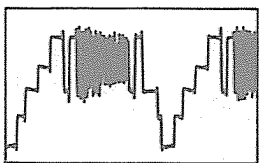


Figure 2

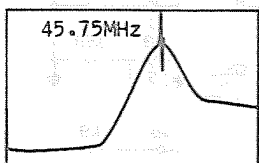


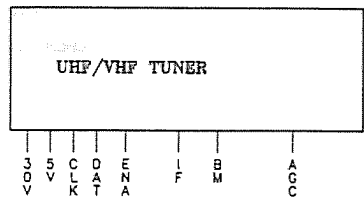
Figure 3

TUNER VOLTAGE CHART

	30V	5V	CLK	DAT	ENA	IF	BM	AGC
VHF Low Band	12.2V	5.1V	.2V	.1V	.4V	1.1V	12.0V	7.6V
VHF High Band	7.6V	5.1V	.2V	.1V	.4V	1.1V	12.0V	7.6V
UHF Band	7.0V	5.1V	.2V	.1V	.4V	1.1V	12.0V	7.6V

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

TUNER TERMINAL GUIDE

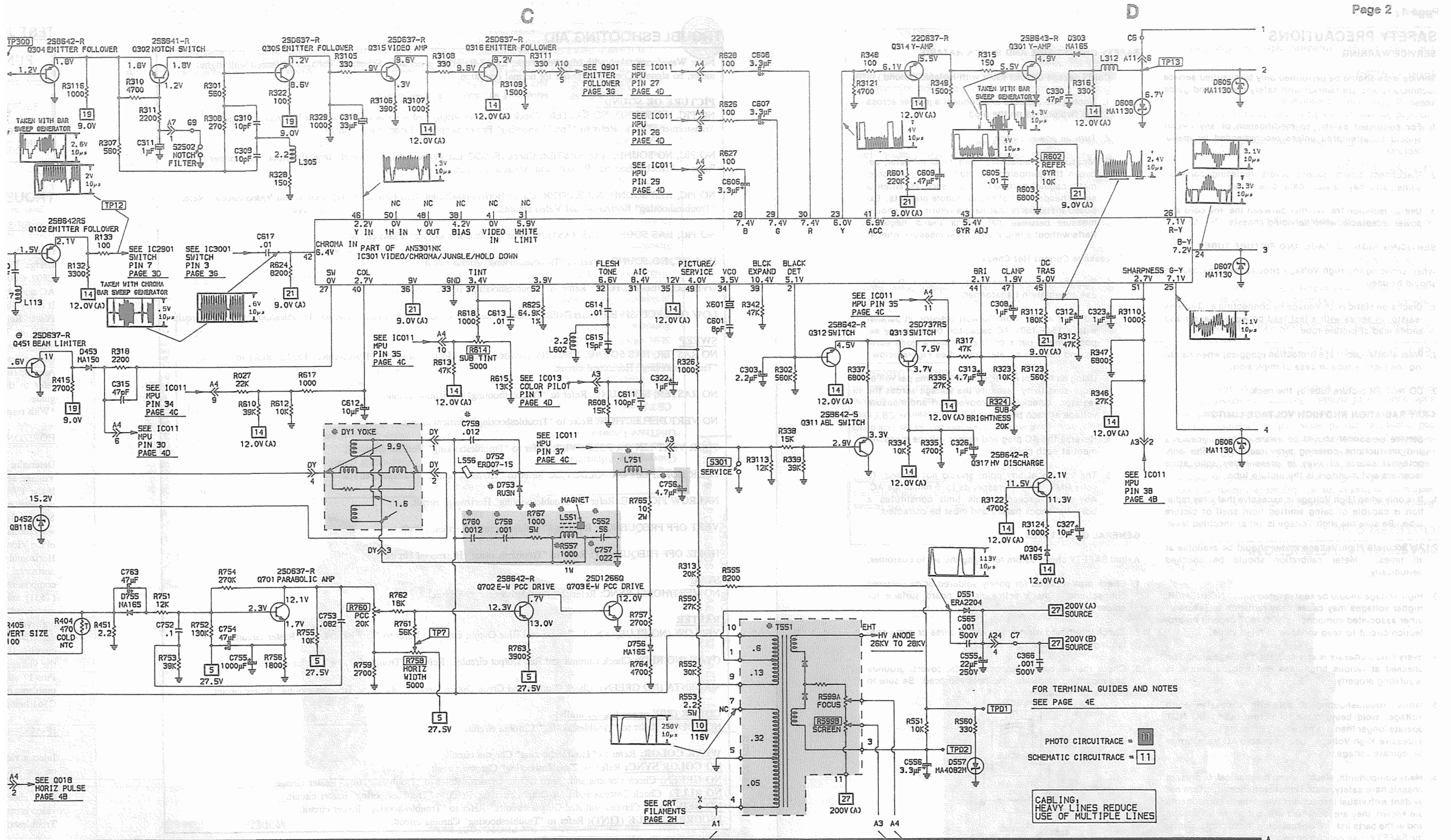


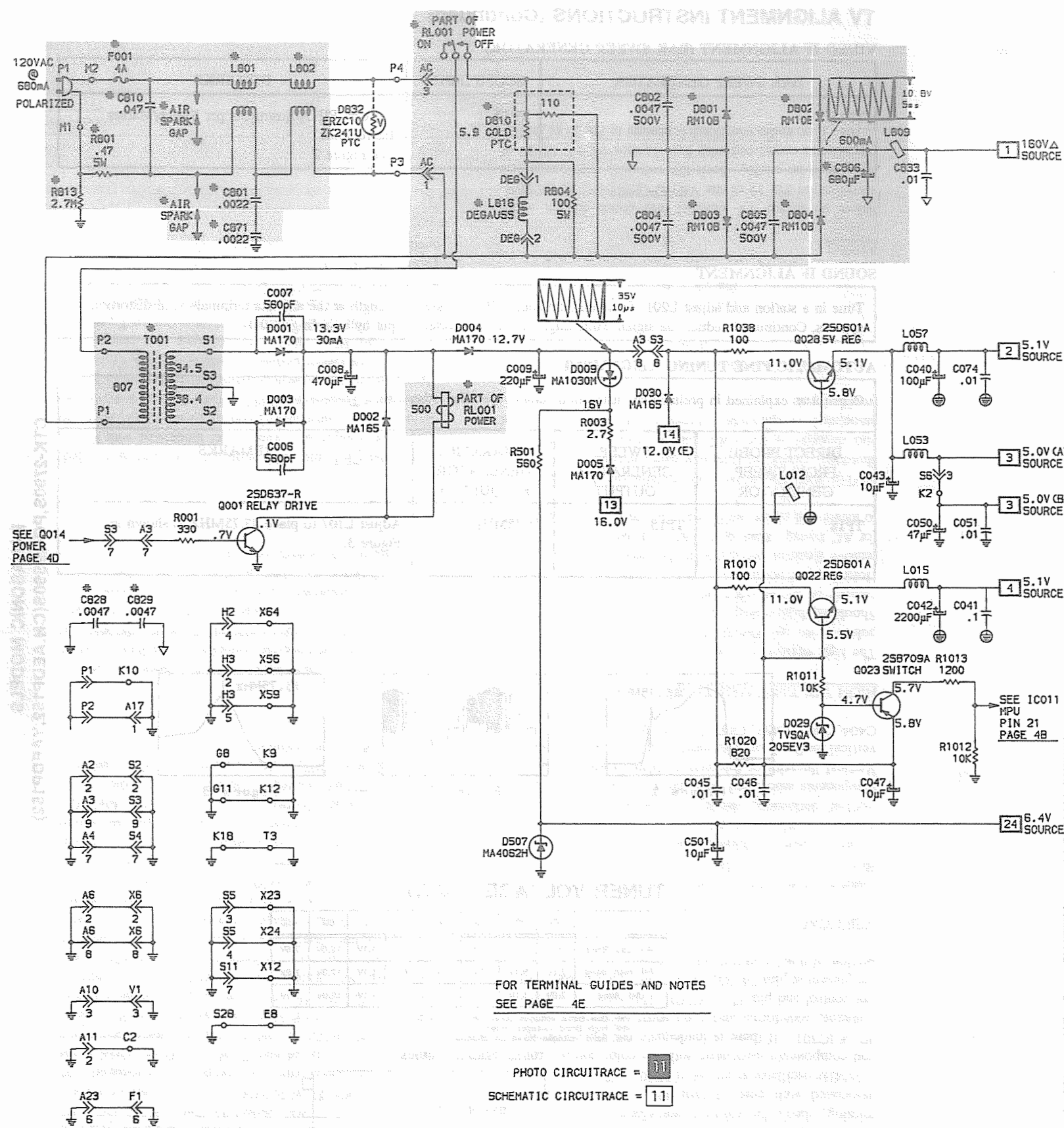
PANASONIC MODELS
CTK-2790S, PC-29S90S (CH, AEDP152, YAEDP152)

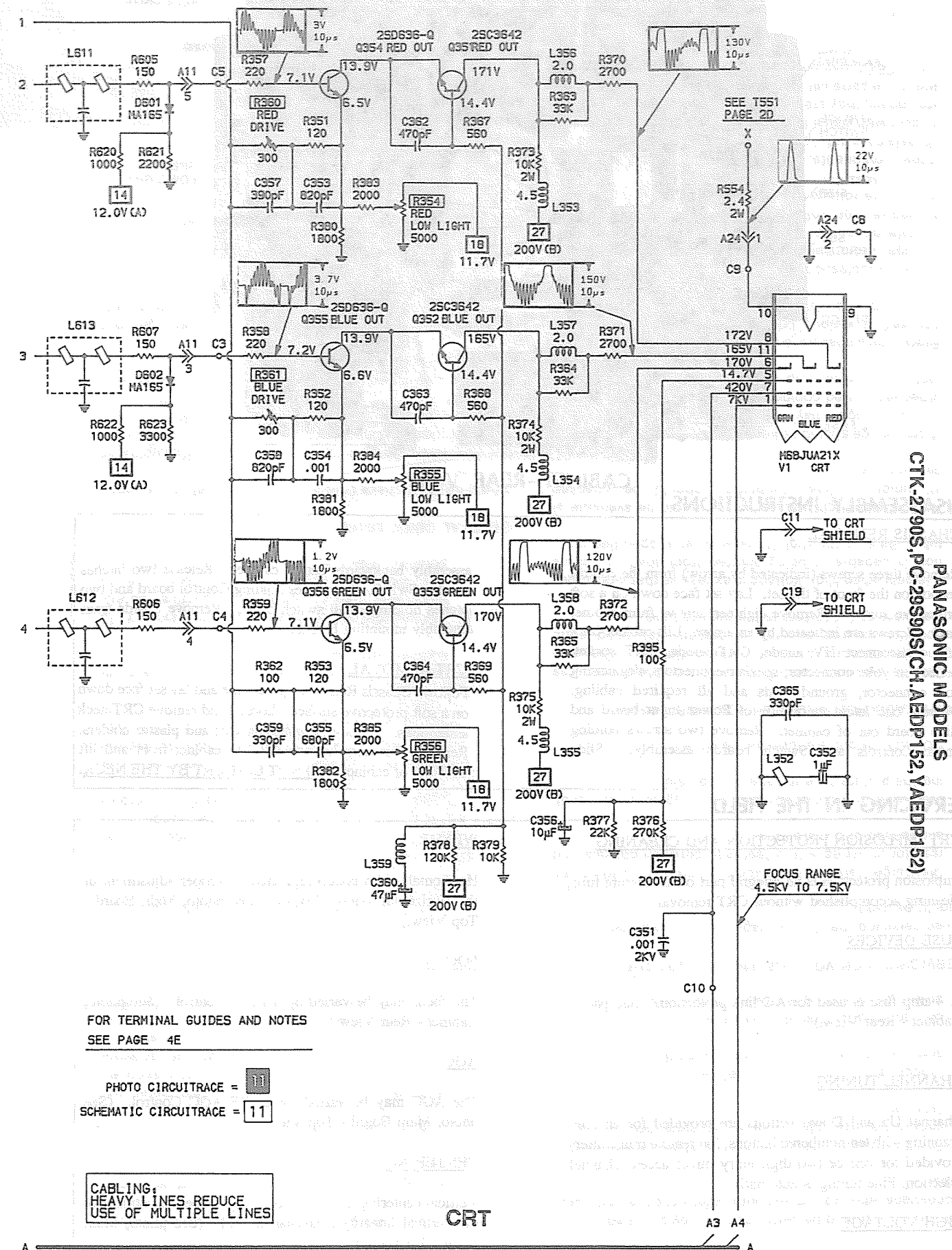
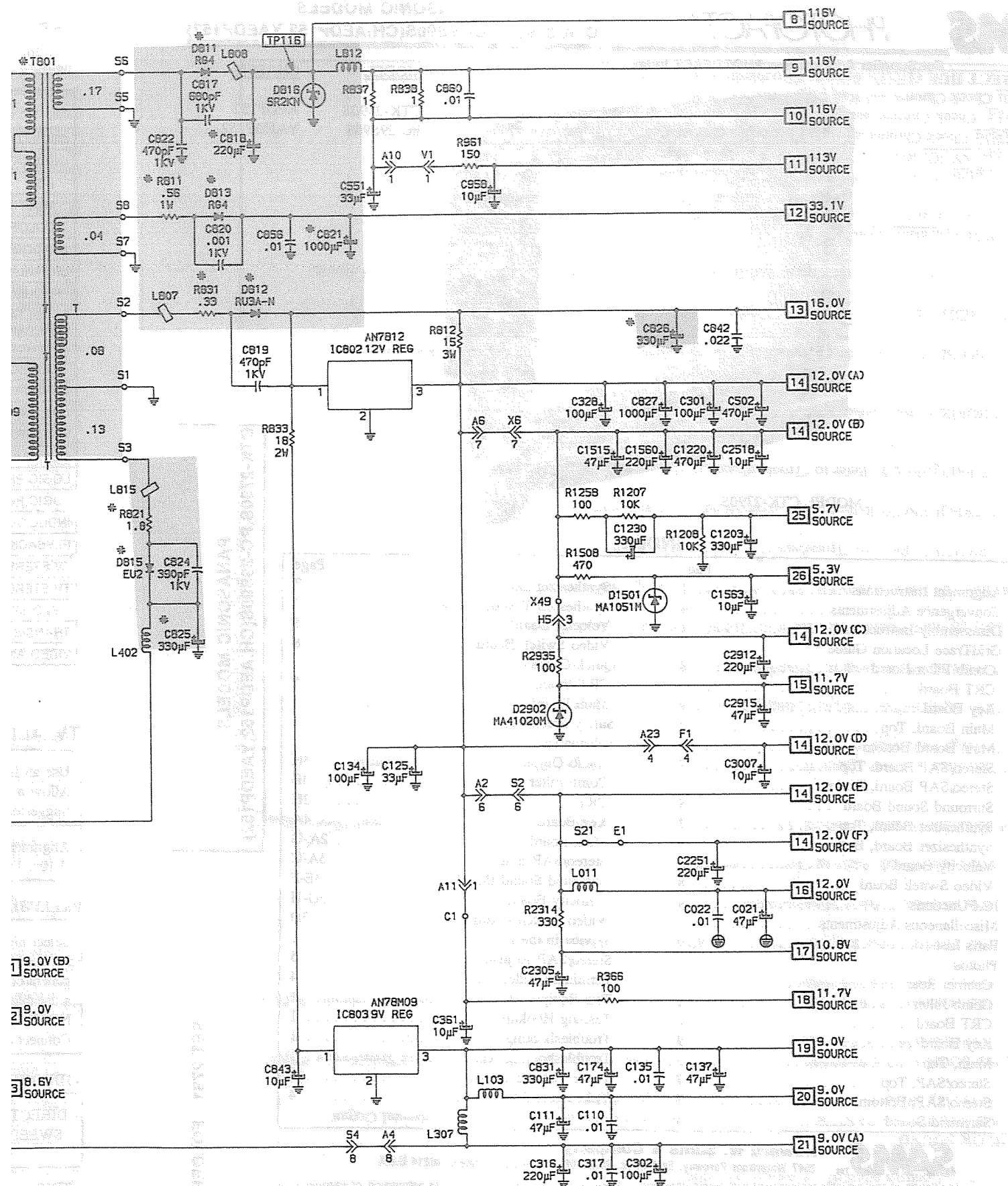


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FOR TERMINAL GUIDES AND NOTES
SEE PAGE 4E

PHOTO CIRCUITRACE = 11
SCHEMATIC CIRCUITRACE = 11

CABLING:
HEAVY LINES REDUCE
USE OF MULTIPLE LINES

CRT

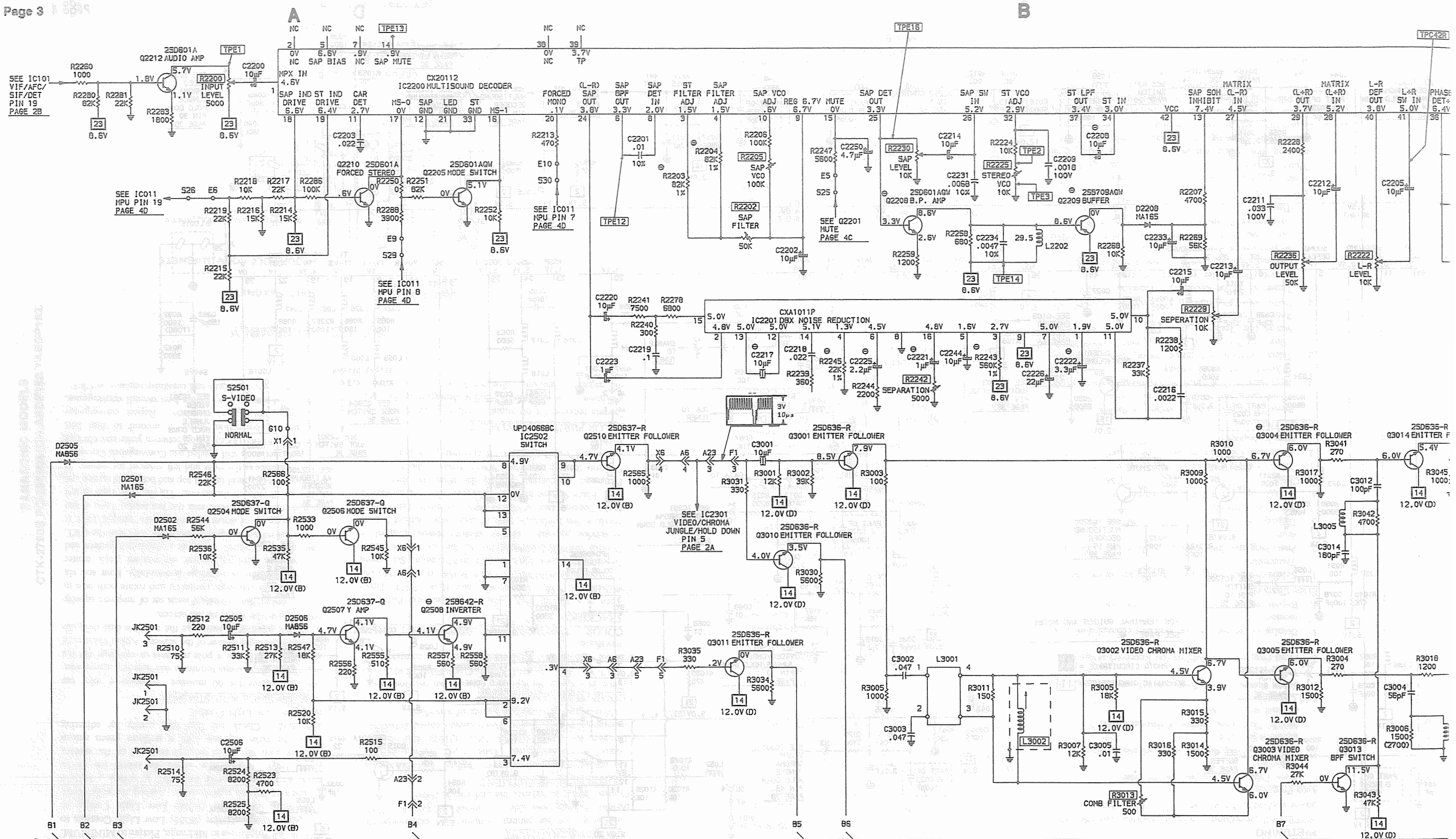
A PHOTOFAC STANDARD NOTATION SCHEMATIC

WITH CIRCUITRACE

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SET 2781 FOLDER 1

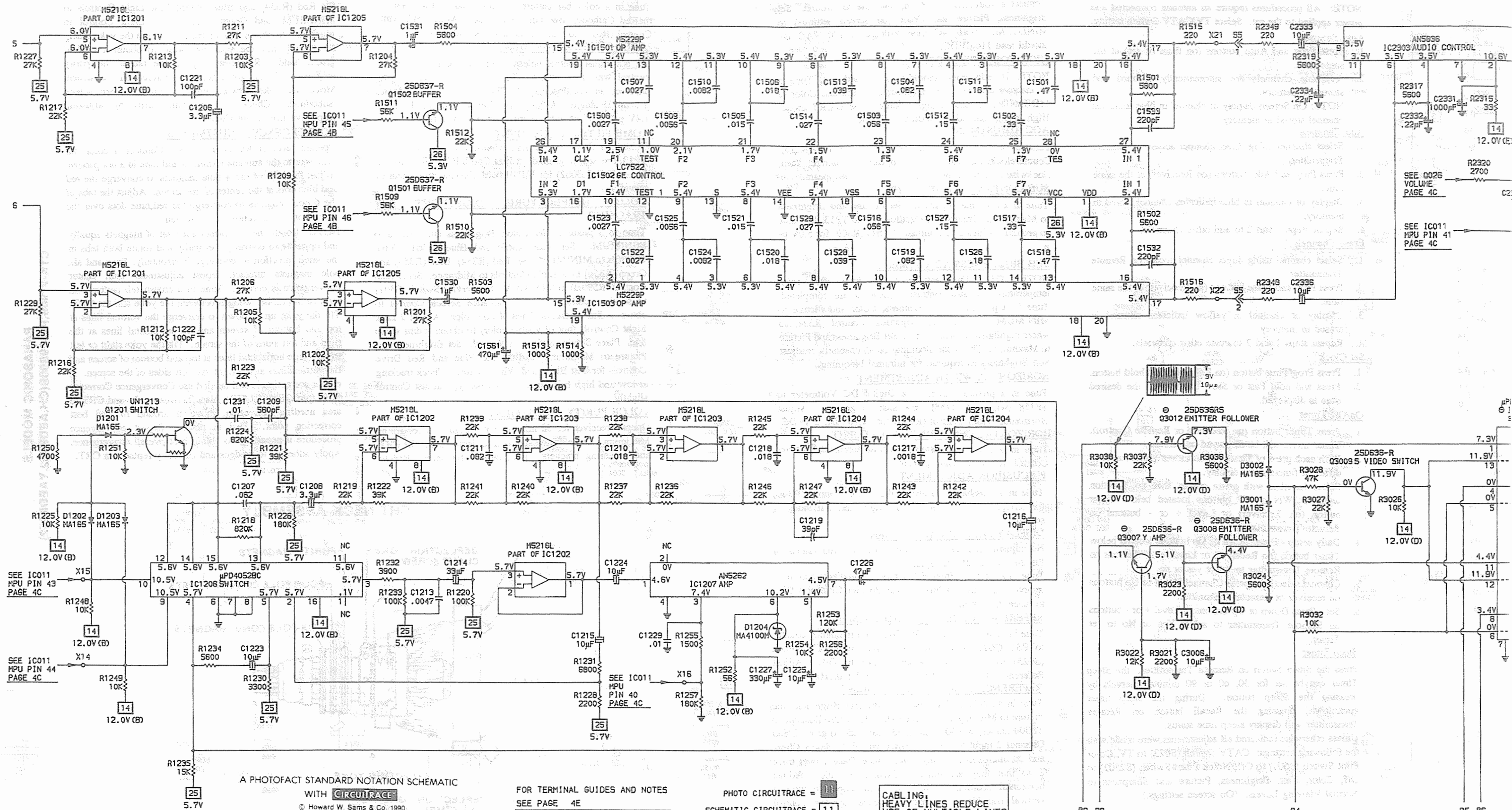
Page 2

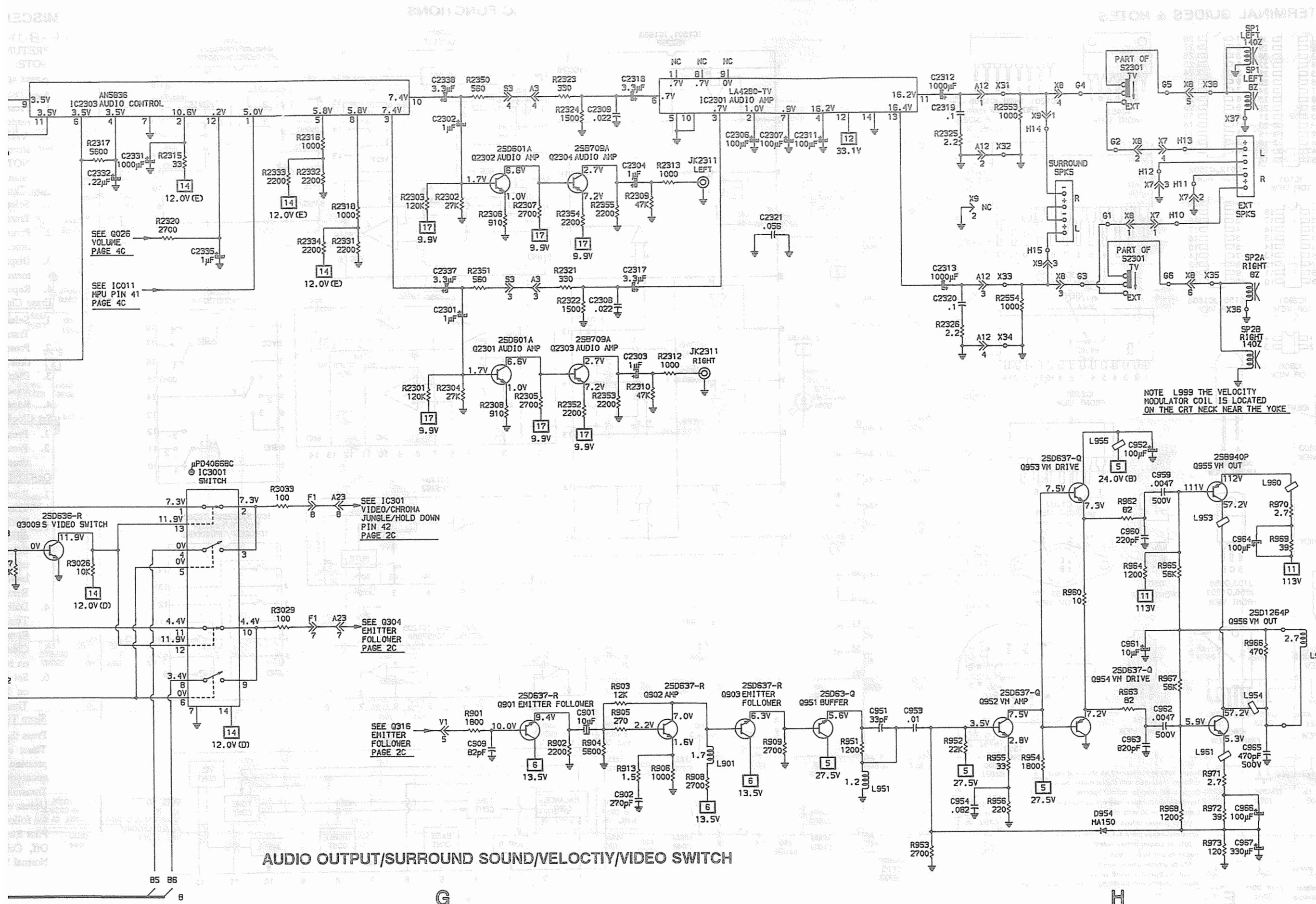


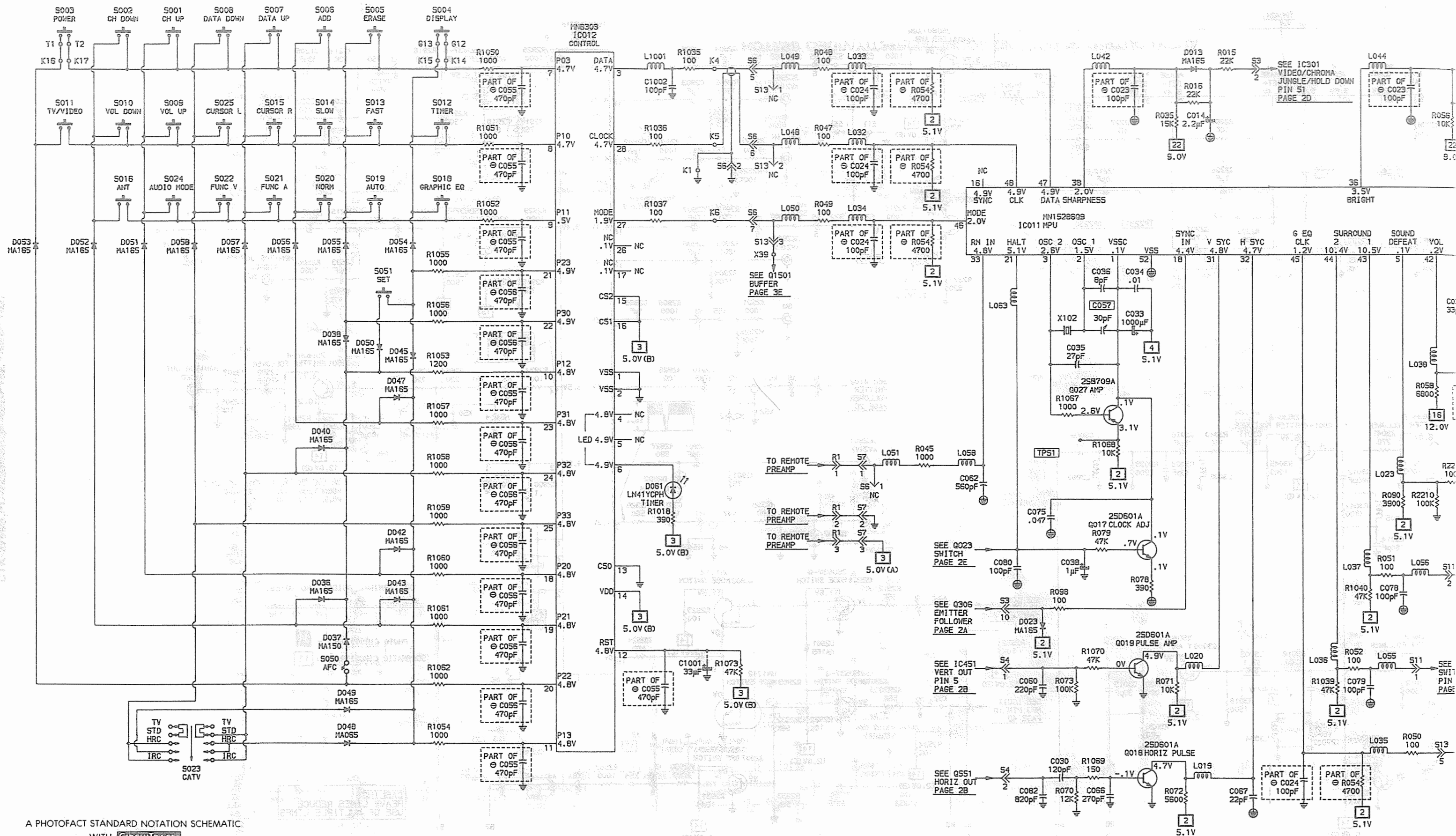
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WITH **CIRCUITRACE**



• **B**







A PHOTOFAC STANDARD NOTATION SCHEMATIC

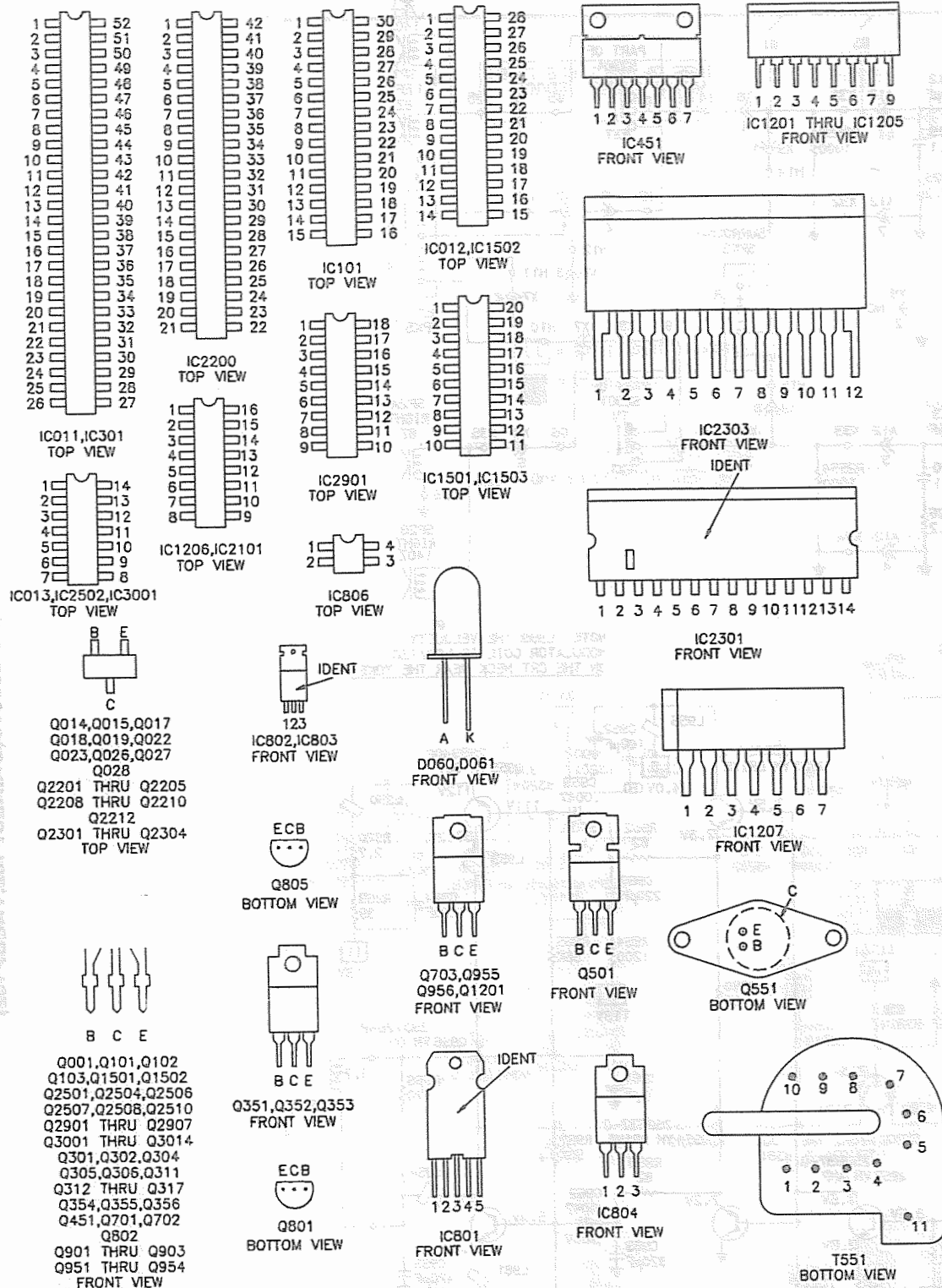
WITH **CIRCUITACE**

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KEYBOARD



TERMINAL GUIDES & NOTES



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

Circuitry not used in some versions

Circuitry used in some versions

See Parts List

Nominal value

Ground

Chassis

Common tie point

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

Waveforms: triggered scope, keyed rainbow generator.

Item numbers in rectangles appear in the alignment/ad-

Supply voltage maintained as shown at input.

Voltages measured with digital meter, no signal.

Controls adjusted for normal operation.

Terminal identification may not be found on unit.

Capacitors are 50 volts or less.

5% or greater unless noted.

Electrolytic capacitors are 50 volts or less.

20% or greater unless noted.

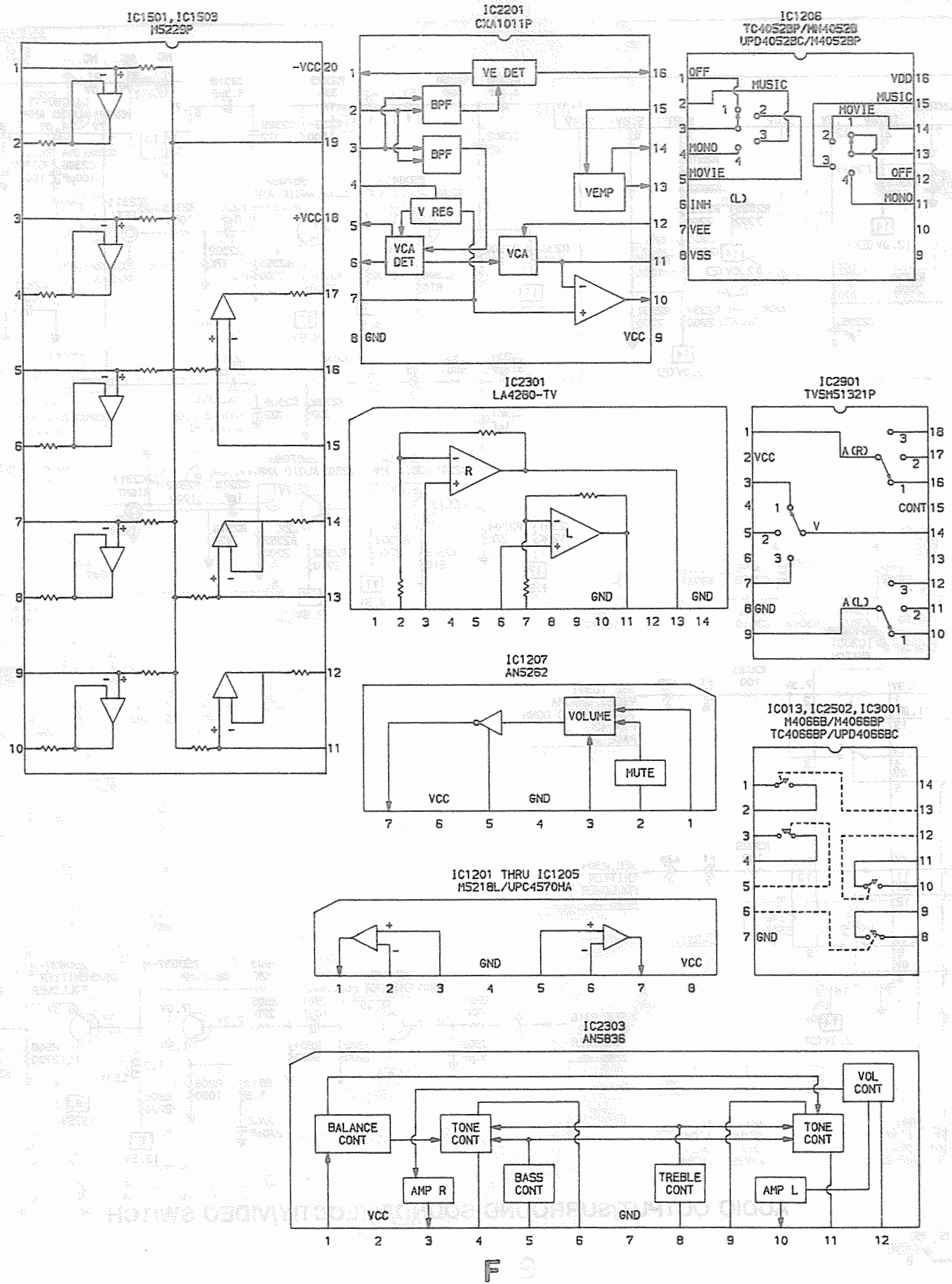
Resistors are 1/2W or less.

5% or greater unless noted.

Value in () used in some versions.

Measurements with switching as shown, unless noted.

IC FUNCTIONS



MISCELL

PRETUNING

NOTE: All power appl

Auto Program

- Press P same ti
- Available stored i

NOTE: channel

Add Channel

- Select c Transm
- Press P time.
- Display memory
- Repeat Erase Chan

1. Select (Transm

2. Press P time.

3. Display erased

4. Repeat

Set Clock

- Press F
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On/Off Tim

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MISCELLANEOUS ADJUSTMENTS

PRETUNING

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

Auto Program

1. Press Prog and Auto buttons (on front of set) at the same time.
2. Available channels are automatically scanned and stored in memory.

NOTE: On Screen display of channel in blue indicates channel stored in memory.

Add Channels

1. Select channel using direct channel access on Remote Transmitter.
2. Press Prog and Add buttons (on Receiver) at the same time.
3. Display of channel in blue indicates channel stored in memory.
4. Repeat steps 1 and 2 to add other channels.

Erase Channels

1. Select channel using direct channel access on Remote Transmitter.
2. Press Prog and Erase buttons (on Receiver) at the same time.
3. Display of channel in yellow indicates channel is erased in memory.
4. Repeat steps 1 and 2 to erase other channels.

Set Clock

1. Press Prog/Time button (on Receiver) and hold button.
2. Press and hold Fast or Slow button until the desired time is displayed.

On/Off Timer

1. Press Timer button (on Receiver or Remote Control). Timer menu will be displayed on screen.
2. With each press of Timer button moves green cursor to different functions of display.
3. Select function with green cursor, then set function using DOWN or UP buttons located below Timer button (on Receiver) or Level + or - buttons on Remote Transmitter.
4. Daily setup - Press Down or Up buttons located below Timer button (on Receiver) or Level + or - buttons on Remote Transmitter to select yes or no.
5. Channel selection - press Channel Down or Up buttons on receiver or Remote Transmitter.
6. Set - Press Down or Up buttons or Level + or - buttons on Remote Transmitter to select Yes or No to set Timer.

Sleep Timer

Press the Sleep button on Remote Transmitter. the Sleep Timer can be set for 30, 60 or 90 minute intervals by pressing the Sleep button. During the sleep timer countdown, pressing the Recall button on Remote Transmitter will display sleep time status.

Unless otherwise indicated all adjustments were made with the following settings: CATV Switch (S023) to TV, Color Pilot Switch (S601) to Off, Notch Filter Switch (S2502) to Off, Color, Tint, Brightness, Picture and Sharpness to Normal Viewing Levels. (On screen settings.)

B+ CHECK

Connect a voltmeter to TP116, low side to Ground. Set Brightness, Picture and Color (on screen settings) to MINIMUM. With AC Line Voltage at 120 VAC B+ should read 116.0VDC.

HIGH VOLTAGE CHECK

NOTE: B+ adjustment should be performed first. Tune in an inactive channel. Set Brightness, Picture and Color to MINIMUM. Connect a high voltage probe to CRT anode. High voltage should be 26.0KV to 28.0KV.

AGC ADJUSTMENT

Tune in a picture. Adjust RF AGC Control (R113) Counterclockwise until snow appears in picture, then clockwise to a point just past where snow disappears.

SUB CONTRAST ADJUSTMENT

Tune in a Crosshatch pattern. Set Picture, and Brightness to Maximum. Connect an Oscilloscope to TP13, low side to ground. Adjust Sub Contrast Control (R309) for 5.0V p-p.

SUB BRIGHTNESS ADJUSTMENT

NOTE: This adjustment must be done after color temperature and sub contrast adjustment are completed. Tune in a picture. Set Brightness, Color and Picture to MINIMUM. Adjust Sub Brightness Control (R324) to where highlights are just visible. Set Brightness and Picture to Maximum. Check for blooming on all channels, readjust Sub Brightness as required for minimal blooming.

HORIZONTAL WIDTH ADJUSTMENT

Tune in a picture. Connect a Digital DC Voltmeter to TP758 (wiper of R758), low side to ground. Adjust Horizontal Width Control (R758) for 14.70VDC \pm 1VDC.

HORIZONTAL CENTERING ADJUSTMENT

Tune in a color bar pattern. Adjust Horizontal Center Control (R524) to center picture.

PINCUSHION ADJUSTMENT

Tune in a crosshatch pattern. Adjust PCC Control (R760) for straight vertical lines at the right and left sides of screen.

DISPLAY POSITION ADJUSTMENT

No adjustment necessary unless IC011 or components of Pin 24 and Pin 25 are replaced.

Tune in a picture. Press EQ (Graphic Equalizer) button on remote transmitter. Adjust Display Position Control (C058) to place display in center of screen.

REFERENCE OSCILLATOR ADJUSTMENT

Tune in picture (Channel 13). Connect a frequency counter to TPS1 (Q027,E), low side to ground. Set CATV Switch (S023) to TV, AFC Switch (S050) to Off. Adjust Reference Oscillator (C057) for 32768.0 \pm 0.1Hz.

REFERENCE GYRATOR ADJUSTMENT

Tune in an NTSC Color Bar pattern. Set Brightness and Picture to Midrange. Connect a Dual Trace Oscilloscope to TP300 (Junction R309 and R343), low side to ground, and Channel 2 input to TP13, invert Channel 2. Select Chop, and 20 microsecond delay time. Place Trace 1 over trace 2 so that they are equal. Expand by 10X. Adjust horizontal position control (on oscilloscope) to view a vertical transition. Adjust Reference Gyrator Control (R602) for 230 \pm 10nS delay between signal.

MISCELLANEOUS ADJUSTMENTS (Continued)

SUB TINT ADJUSTMENT

Tune in a color bar pattern. Connect an oscilloscope to the Red Cathode, low side to Ground. Adjust Sub Tint Control (R614) to balance the 2nd and 3rd bars.

VIDEO LEVEL ADJUSTMENT

Do not adjust control unless control has been replaced or control was misadjusted. Tune in a color bar pattern. Connect an oscilloscope to TP12 (Q102), low side to ground (IF shield). Adjust Video Level Control (R136) for 1.4V p-p level of video component of waveform.

COMB FILTER ADJUSTMENT

Tune in a Color bar pattern. Connect an oscilloscope to TP13, low side to ground. Adjust Comb Filter (R3013) and Phase Coil (L3002) for MINIMUM chroma component of waveform.

COLOR TEMPERATURE ADJUSTMENT (B/W TRACKING)

Tune in a picture. Set Color, Brightness and Picture to MINIMUM. Set Red (R360) and Blue (R361) Drive Controls to MINIMUM. Set Red (R354), Blue (R355) and Green (R356) Low Light Controls to Midrange. Set Screen Control (R599B) to MINIMUM. Set Service Switch (S301) to service position. Slowly advance Screen Control to obtain a dim horizontal lines of one color. Adjust 2 Low Light Controls (not of visible color) to obtain a dim white line. Place Service Switch to Normal. Set Brightness and Picture to Maximum. Adjust the Blue and Red Drive Controls for best Black and White picture. Check tracking at low and high brightness. If necessary, readjust Control slightly.

COLOR PURITY ADJUSTMENT

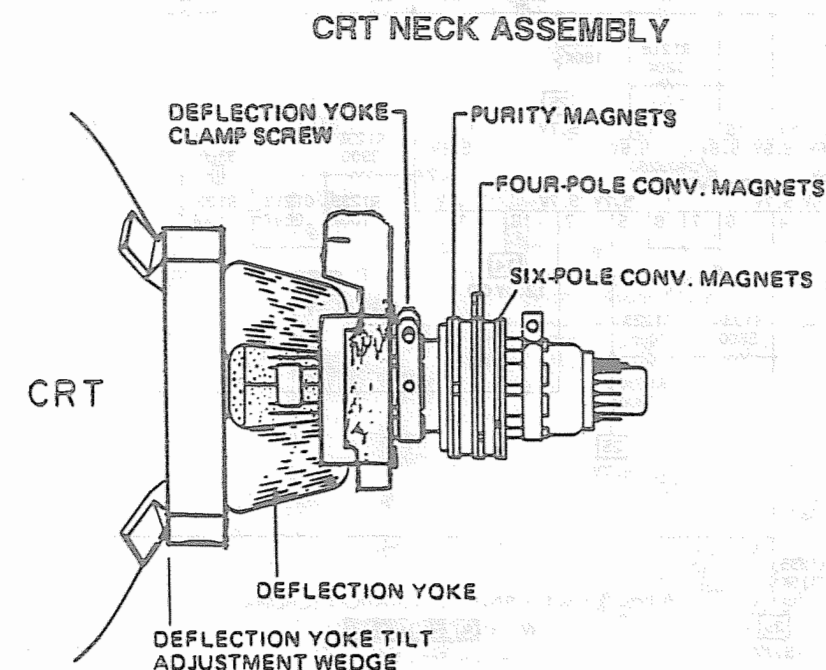
Operate receiver for 60 minutes with brightness control at Maximum. Use a degaussing coil to demagnetize the CRT and mounting brackets. For blank raster short TP14 to

ground. Set Brightness to Midrange, Picture to MINIMUM. Set Red (R354) and Blue (R355) Low Light Controls to MINIMUM, and Green (R356) Low Light Control to Maximum to obtain a green raster. Loosen the yoke clamp screw and slide the yoke backward to obtain a vertical green band. Rotate and spread the tabs of the purity magnets until the green band is centered on the screen. Move the yoke forward until a uniform green screen is obtained. Check red and blue purity by adjusting respective Low Light Control.

CONVERGENCE ADJUSTMENTS

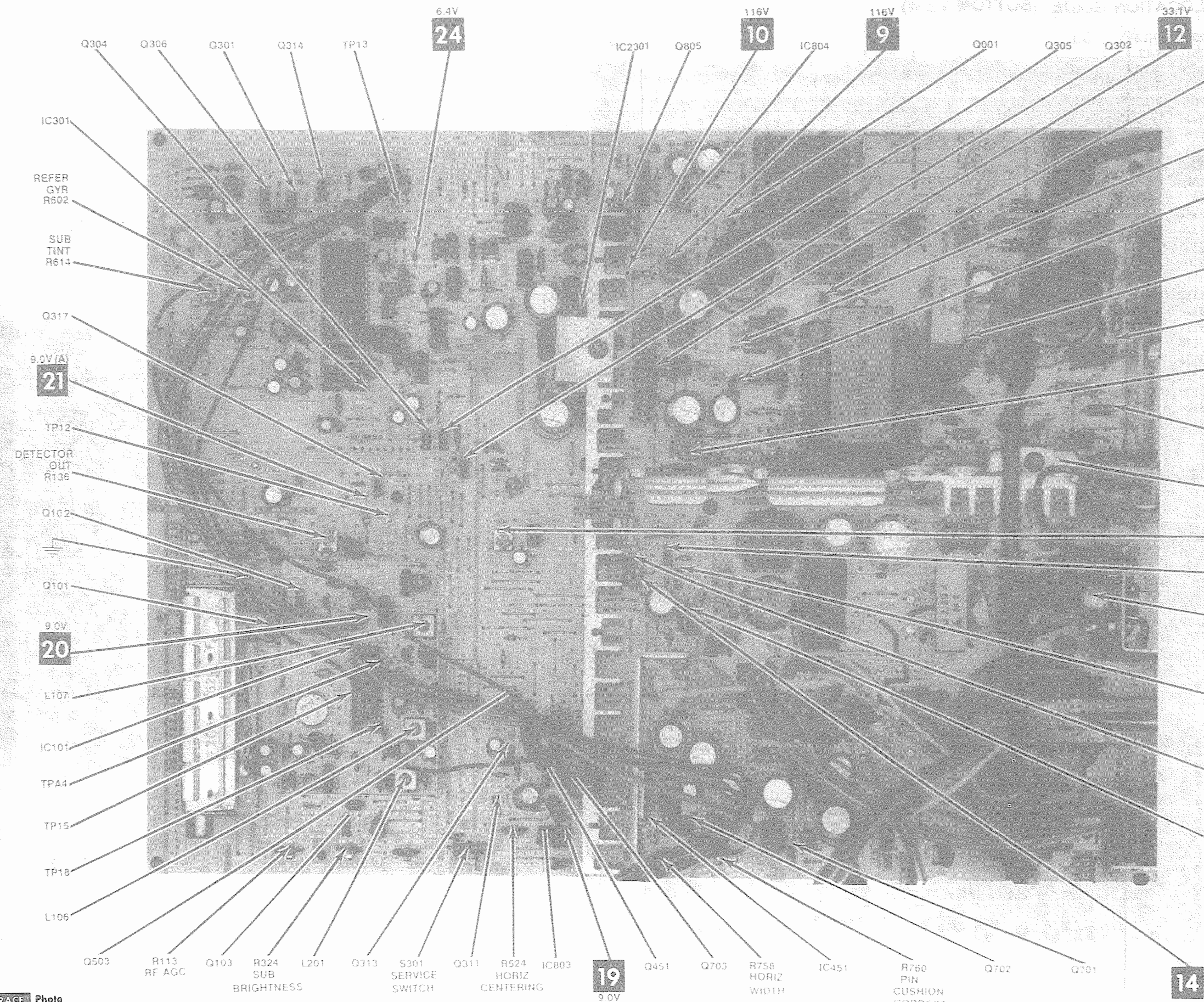
Operate receiver for 60 minutes. Connect a color bar generator to the antenna terminals and tune in a dot pattern. Adjust the tabs of the 4 pole magnets to converge the red and blue dots at the center of the screen. Adjust the tabs of the 6 pole magnets to converge the red, blue dots over the green dots at the center of the screen.

NOTE: Rotate the two tabs of each set of magnets equally and opposite to converge vertically and rotate both tabs in the same direction to converge horizontally. Four and six pole magnets interact, repeat adjustment until center convergence is correct. Tune in a crosshatch pattern and remove the rubber wedges between the yoke and the CRT. Tilt the yoke up or down to converge the vertical lines at top and bottom of screen and the horizontal lines at the right and left sides of the screen. Tilt the yoke right or left to converge horizontal lines at top and bottom of screen and the vertical lines at the right and left sides of the screen. If corner correction is still needed use Convergence Corrector Strip (p/n OFMK014ZZ), place between yoke and CRT in area needing correction, move it around to find best correction point. Seal in place. Repeat convergence procedure if necessary to obtain best overall convergence. Apply adhesive to wedges and carefully replace on CRT.



CALL-TOUCH P.C. 50802 (CHY/EPH/LS/VE/00/155)
HAWAIIANIC MODEL

USE
SWITCH
Q804
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A Howard W. Sams **CIRCUITRACE** Photo

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

MAIN BOARD-TOP VIEW

SET 2781 FOLDER 1

STEREO/SAP ADJUSTMENTS

NOTE: Adjustments were made using B+K Model 2009 MTS TV/STEREO Generator. Equivalent generator may be used. Unless otherwise indicated all adjustments were made with the following control settings. Balance set to Midrange, Graphic Equalizer (Music) set to Maximum. Mode setting is accomplished by using audio mode (S024) switch on receiver or AUDIO MODE key on remote transmitter.

INPUT LEVEL ADJUSTMENT

Connect generator to antenna terminals. Select Stereo on TV. Select PILOT, 1kHz Audio Frequency, and L-R Modulating Signal on generator. Connect oscilloscope to TPE1, low side to ground. Adjust input Level Control (R2200) for 800mV \pm 10mV p-p amplitude of waveform.

L-R LEVEL ADJUSTMENT

Connect generator to antenna terminals. Select STEREO on TV. Select PILOT, 1kHz Audio Frequency, and L-R Modulating Signal. Select "Stereo" mode on TV. Connect oscilloscope to TPE11. Adjust L-R Level Control (R2222) for 400mV \pm 10mV p-p amplitude of waveform.

STEREO PILOT DETECTOR ADJUSTMENT

Connect generator to antenna terminals. Select STEREO on TV. Select PILOT, 1kHz audio frequency, L+R modulating signal. Connect a Digital DC Voltmeter to TP2231 (IC2200 pin 31), low side to TP2230 (IC2200 pin 30). Adjust Pilot Cancel Control (R2226) for 175mV \pm 5mVDC.

STEREO VCO ADJUSTMENT

Connect generator to antenna terminals. Select "Stereo" mode on TV. Select Pilot, 1kHz audio frequency and L-R Modulating signal. Connect an Oscilloscope to TPE2, low side to TPE3 (GROUND). Adjust Stereo VCO Control (R2225) for 240mV p-p.

SAP FILTER ADJUSTMENT

Select SAP on TV. Connect generator to antenna terminals. Select SAP, 1kHz audio frequency, and L-R modulating signal. Connect oscilloscope to TPE12. Adjust SAP Filter Control (R2202) for Maximum.

SAP VCO ADJUSTMENT

Select SAP mode on TV. Connect generator to antenna terminals. Select SAP, 1kHz audio frequency, and L-R modulating signal. Connect a jumper from TPE13 to TPE14. Connect a DC voltmeter to TPE16, low side to TPE3 and record voltage. Remove jumper and reconnect from TPE13 to Ground. Adjust SAP VCO Control (R2205) for the same reading as recorded \pm 0.01VDC.

SAP LEVEL ADJUSTMENT

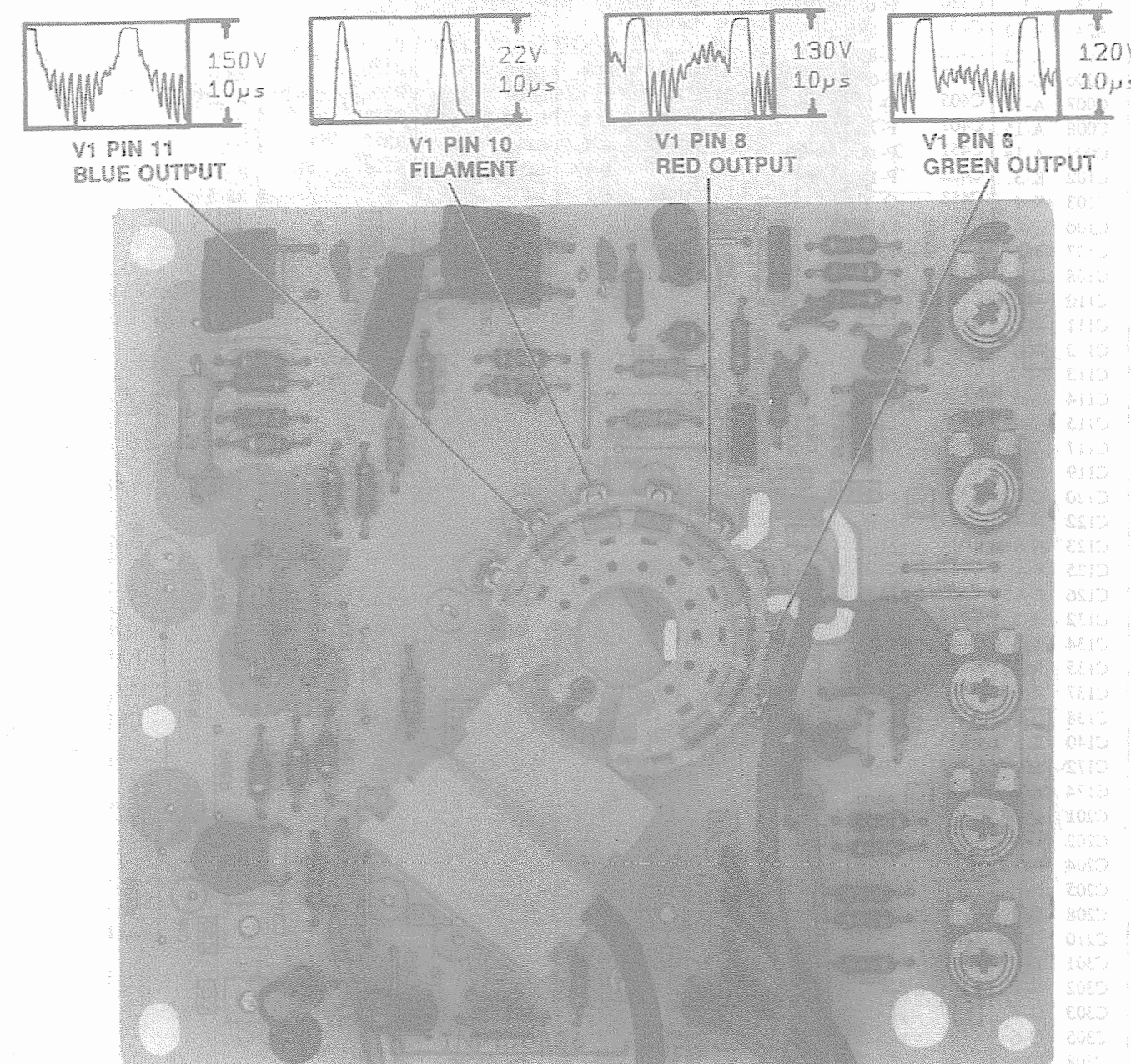
Select SAP mode on TV. Connect generator to antenna terminals. Select SAP, 1kHz audio frequency, and L-R modulating signal. Connect oscilloscope to TPE11, low side to ground. Adjust SAP level Control (R2230) for 800mV p-p \pm 20mV p-p.

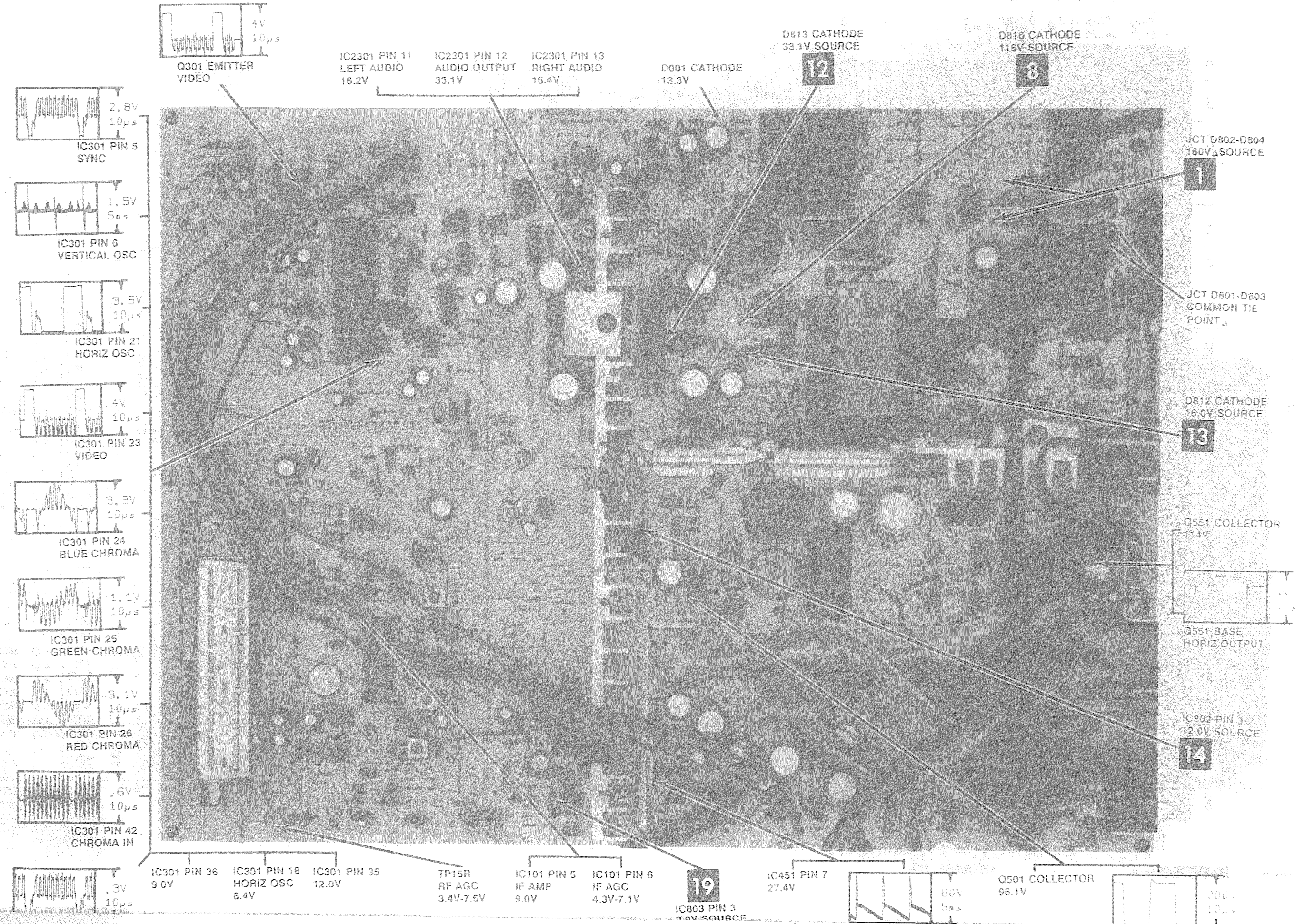
SEPARATION ADJUSTMENT

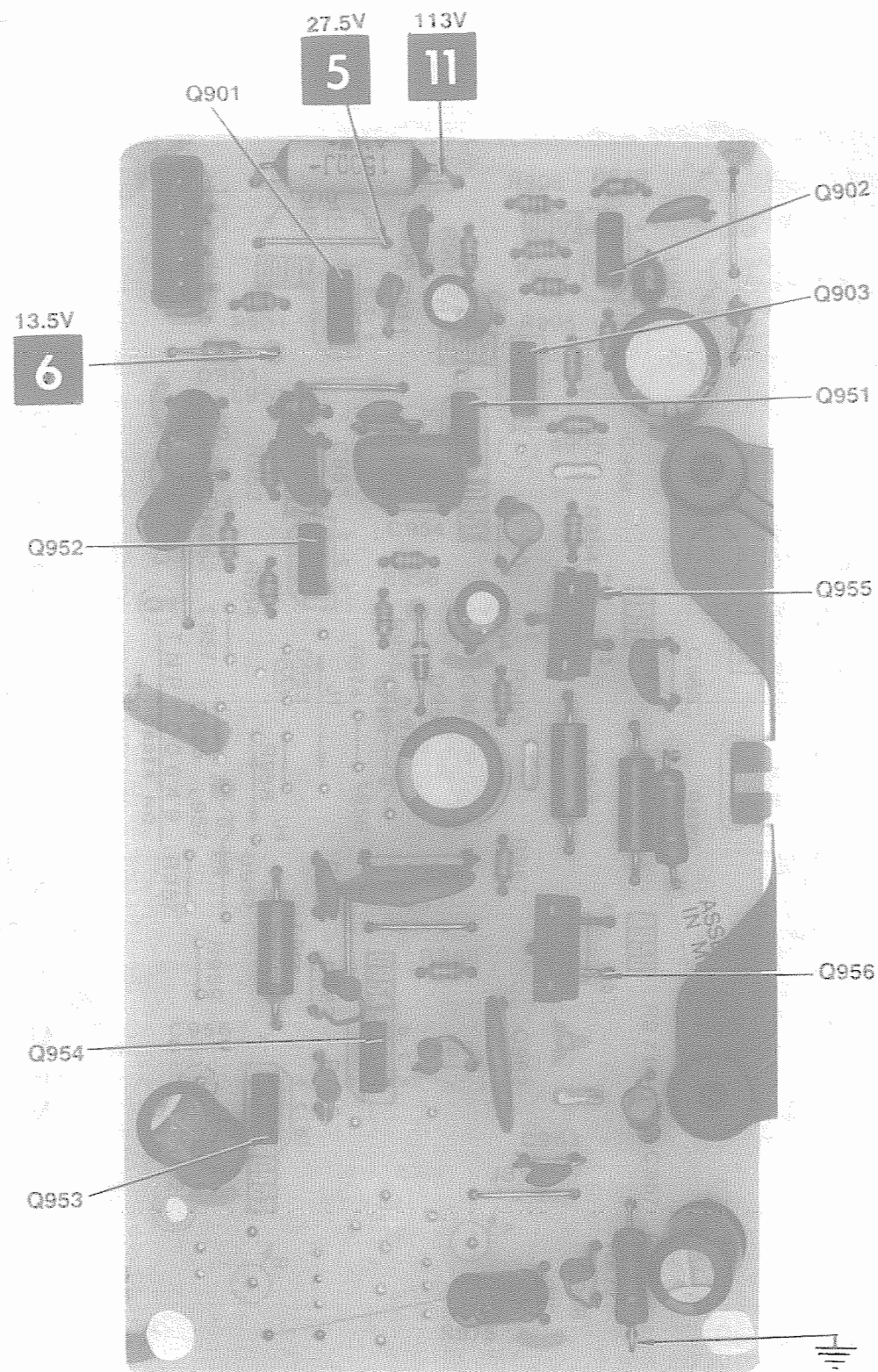
Connect generator to antenna terminals. Select "Stereo" Mode on Tv. Set generator to Pilot, 300Hz audio frequency and "LEFT" modulating signal. Connect an oscilloscope to TPE10, low side to ground. Adjust Separation Control (R2229) for MINIMUM amplitude of waveform. Change Audio frequency to 8kHz. Adjust Separation Control (R2242) for MINIMUM amplitude of waveform. Repeat until no further decrease in amplitude is obtained with adjustment.

OUTPUT LEVEL ADJUSTMENT

Connect generator to antenna terminals. Select MONO mode on receiver. Release both SAP and PILOT buttons. Select 1kHz audio frequency, and L+R modulating signal. Connect an oscilloscope TPE11, low side to TPE3. Adjust Output Level Control (R2236) for 300mV p-p.



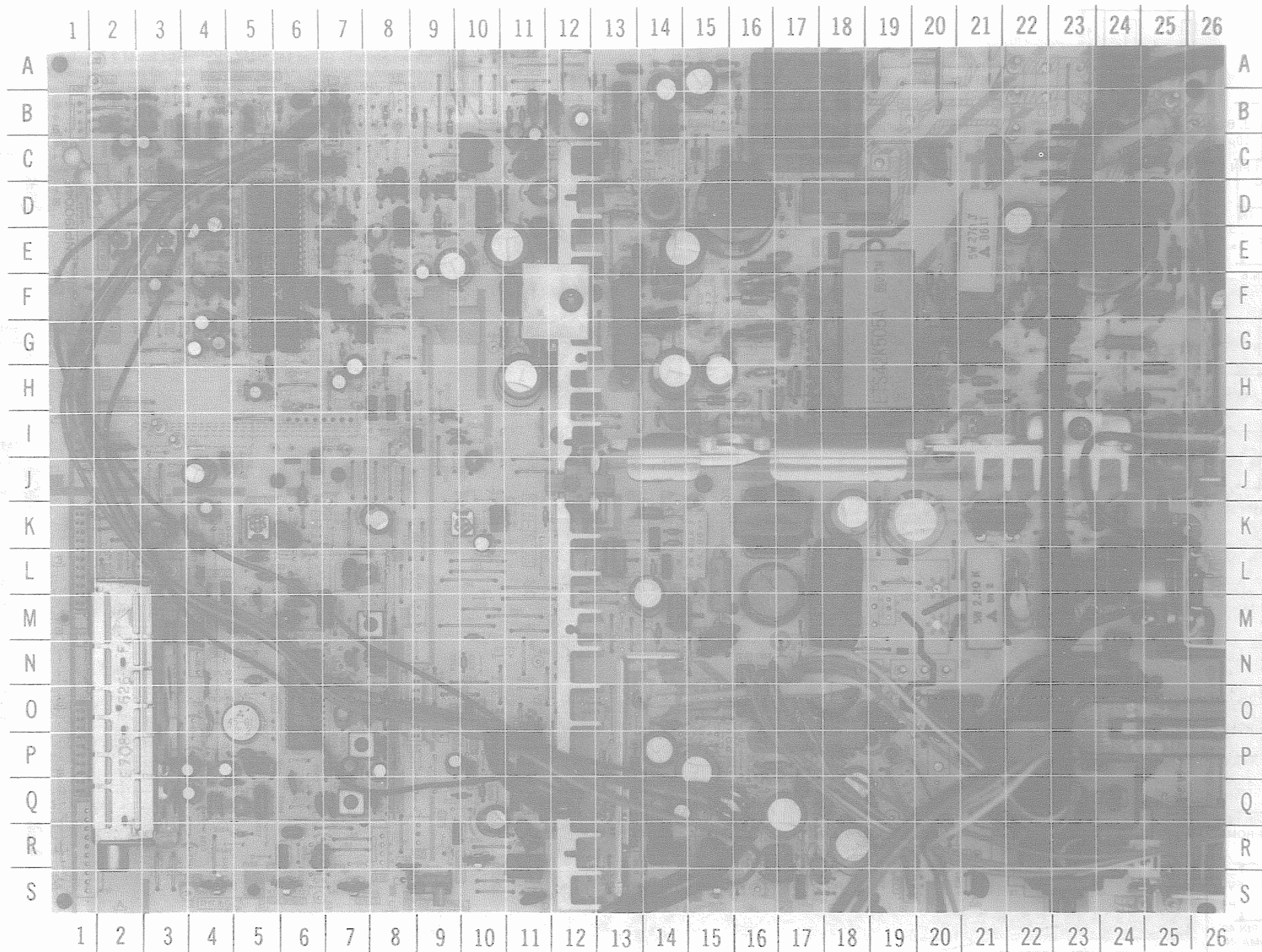




NOTE: ARROWS ON TRANSISTORS INDICATE BASE UNLESS NOTED

C901	C-5	R965	G-5
C902	A-7	R966	I-7
C903	D-1	R967	I-5
C904	E-1	R968	K-5
C909	B-4	R969	C-8
C951	D-4	R970	E-5
C952	M-1	R971	L-7
C953	D-3	R972	N-6
C954	E-4	R973	N-7
C958	C-7	V1	A-1
C959	I-4		
C960	J-3		
C961	H-4		
C962	L-5		
C963	M-6		
C964	F-5		
C965	G-7		
C966	N-5		
C967	N-7		
D901	C-2		
D954	G-4		
L901	B-7		
L951	D-3		
L953	H-6		
L954	H-7		
L955	J-2		
L960	E-5		
L961	L-7		
Q901	B-3		
Q902	B-7		
Q903	C-5		
Q951	D-5		
Q952	E-3		
Q953	L-2		
Q954	K-4		
Q955	F-6		
Q956	J-6		
R901	B-2		
R902	B-5		
R903	B-6		
R904	C-6		
R905	B-6		
R906	A-6		
R908	C-6		
R909	D-6		
R911	B-4		
R913	A-7		
R951	D-4		
R952	E-2		
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R954	F-2		
R955	F-4		
R956	F-4		
R960	L-3		
R961	A-3		
R962	K-3		
R964	E-6		

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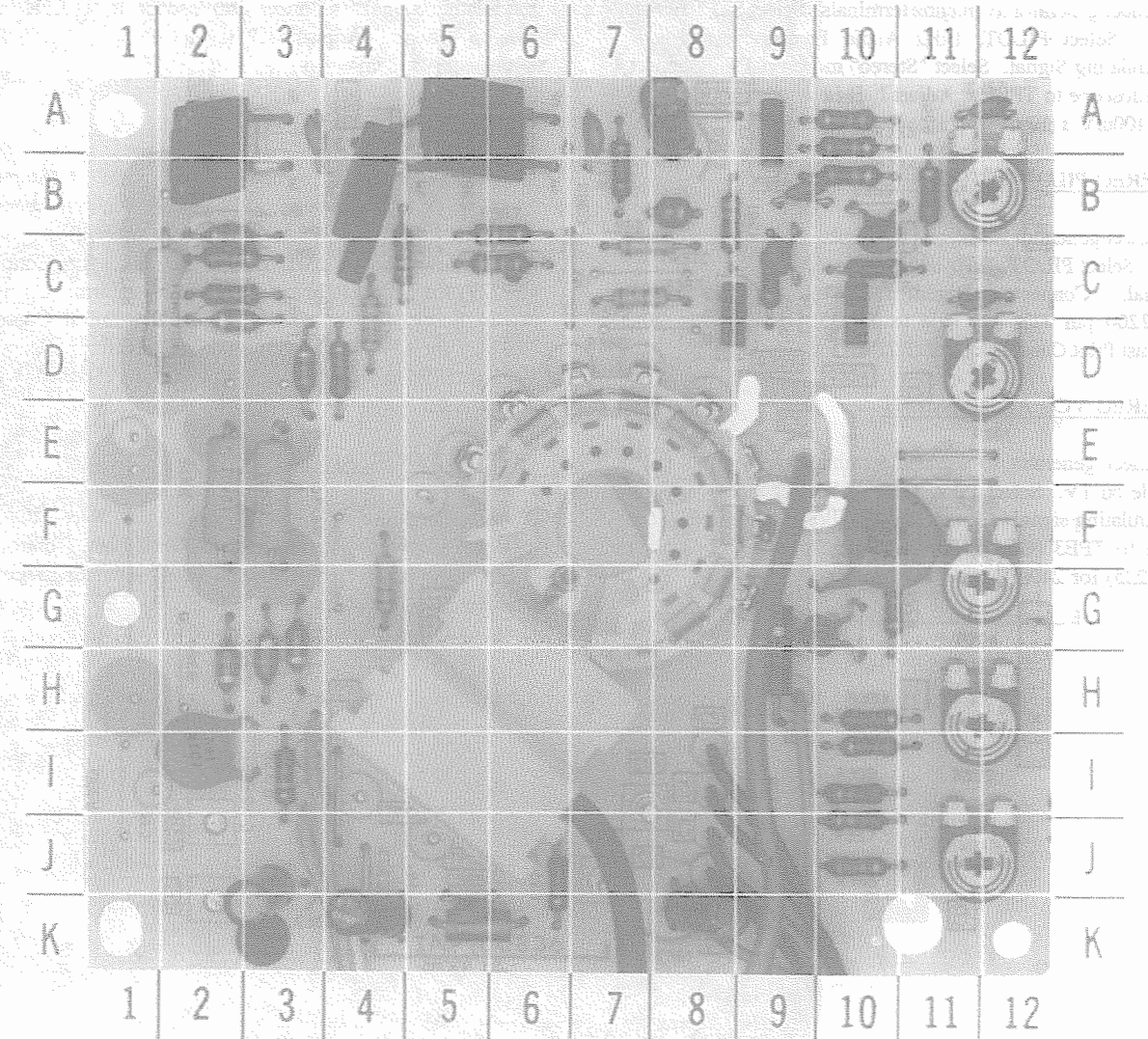


MAIN BOARD -GridTrace-LOCATION GUIDE (TOP VIEW)

A2	O-1	C317	J-4	C753	R-15	C2320	F-11	IC802	L-13	Q551	L-25	R806	E-21
A3	K-1	C318	H-7	C754	Q-14	C2321	E-13	IC803	R-11	Q701	S-17	R808	G-21
A4	G-1	C319	C-4	C755	Q-15	D001	A-15	IC804	B-14	Q702	R-14	R809	F-22
A6	O-9	C322	H-7	C756	K-18	D002	D-17	IC806	I-21	Q703	Q-11	R811	F-16
A10	N-16	C323	G-4	C757	K-21	D003	B-16	IC2301	F-11	Q801	F-22	R812	F-13
A11	B-7	C326	P-9	C758	L-23	D004	A-13	L101	L-4	Q802	E-18	R815	F-13
A12	D-10	C327	H-5	C759	O-19	D005	G-14	L103	L-6	Q805	C-13	R817	E-19
A17	L-3	C329	F-7	C760	O-20	D009	F-14	L104	D-5	R003	E-14	R820	H-23
A23	I-7	C330	B-6	C763	R-17	D104	R-5	L105	O-8	R027	I-2	R821	I-16
A24	R-20	C401	F-6	C802	C-25	D303	B-4	L106	P-7	R104	M-4	R825	G-23
AC	A-22	C402	E-8	C804	D-25	D304	H-6	L107	M-7	R113	J-4	R826	F-20
C006	C-16	C403	F-6	C805	C-23	D307	H-8	L108	L-7	R136	K-5	R831	H-16
C007	A-15	C405	Q-18	C806	E-24	D401	G-7	L109	K-4	R302	N-10	R832	B-13
C008	A-15	C407	F-7	C807	F-22	D402	G-8	L110	N-5	R309	K-10	R833	P-11
C009	A-14	C451	P-14	C809	I-25	D403	F-8	L113	L-5	R317	M-10	R837	D-13
C102	K-3	C452	P-14	C811	G-23	D451	P-13	L201	Q-7	R324	S-6	R838	D-13
C103	K-4	C453	Q-17	C812	F-22	D452	P-17	L202	P-5	R328	K-8	R841	C-13
C106	Q-4	C454	Q-14	C813	G-21	D453	B-9	L305	J-10	R329	I-9	R842	E-25
C107	P-8	C455	R-14	C814	H-20	D501	C-9	L307	J-6	R334	O-10	R852	J-25
C108	Q-4	C456	P-15	C815	G-23	D502	E-9	L312	B-7	R337	P-10	R2321	B-11
C110	M-6	C457	Q-17	C816	D-22	D506	F-9	L401	O-14	R338	Q-10	R2323	B-11
C111	M-6	C501	D-6	C817	E-17	D507	D-7	L402	I-14	R404	S-11	R2325	D-10
C112	M-7	C502	E-9	C818	D-16	D508	C-1	L551	O-18	R405	S-7	R2326	G-11
C113	M-4	C503	D-7	C819	H-17	D551	R-21	L552	L-26	R408	Q-18	R3107	K-14
C114	Q-6	C504	E-7	C820	F-14	D552	K-24	L555	L-26	R411	K-11	R3108	K-14
C115	Q-4	C505	E-8	C821	E-14	D555	B-9	L556	M-22	R413	P-11	R3109	L-14
C117	O-7	C506	D-8	C822	F-17	D557	R-20	L602	C-4	R414	P-11	R3111	M-14
C119	O-8	C507	C-8	C824	I-15	D601	B-8	L611	C-6	R415	R-10	R3129	H-8
C120	O-7	C509	F-8	C825	H-15	D602	B-6	L612	C-6	R451	N-10	RL001	D-18
C122	N-7	C510	E-9	C826	H-14	D752	M-22	L613	C-6	R452	P-16	S301	S-9
C123	N-8	C511	M-15	C827	M-14	D753	K-21	L751	L-16	R453	P-16	T001	B-18
C125	P-4	C512	C-7	C828	C-21	D755	S-17	L803	H-21	R501	D-8	T501	K-16
C126	P-4	C513	N-15	C829	C-20	D756	R-14	L805	I-22	R502	D-9	T551	P-24
C132	R-6	C514	D-8	C830	E-19	D801	D-25	L806	H-25	R503	D-9	T801	G-19
C134	K-3	C515	C-9	C831	Q-10	D802	B-23	L807	H-17	R504	C-9	TP7	S-15
C135	R-8	C551	K-19	C832	A-13	D803	D-25	L808	E-16	R509	E-8	TP12	J-7
C137	R-6	C552	L-18	C833	F-25	D804	C-23	L809	F-25	R510	E-8	TP13	B-9
C138	N-8	C553	L-23	C834	E-25	D805	H-25	L812	D-14	R515	L-15	TP15	O-6
C140	L-5	C554	K-24	C835	I-25	D806	G-23	L815	I-17	R516	K-15	TP18	P-6
C172	M-5	C555	R-18	C836	H-23	D807	H-21	LC116	N-1	R523	Q-19	TP116	F-16
C174	K-6	C556	Q-18	C837	I-24	D808	F-22	LC117	N-1	R524	R-10	TP300	K-9
C201	Q-6	C557	L-25	C838	F-21	D810	A-24	Q001	C-15	R553	M-21	TPA4	N-6
C202	P-7	C558	L-24	C842	K-14	D811	F-16	Q101	M-4	R554	Q-19	X101	O-5
C204	P-5	C559	L-23	C843	R-11	D812	G-16	Q102	L-4	R557	O-17	X102	L-7
C205	P-7	C561	K-24	C845	H-25	D813	F-14	Q103	R-6	R560	R-20	X201	Q-5
C208	Q-7	C565	S-21	C846	H-22	D815	H-15	Q301	B-4	R602	E-3	X501	E-7
C210	Q-8	C601	C-3	C847	I-17	D816	F-16	Q302	I-9	R614	E-2	X601	D-3
C301	D-4	C605	F-4	C854	J-25	D817	F-21	Q304	H-8	R625	H-5		
C302	E-4	C606	B-3	C855	J-25	D818	H-17	Q305	H-8	R626	B-2		
C303	G-7	C607	C-3	C861	B-12	D819	I-14	Q306	B-3	R627	B-2		
C305	G-6	C608	C-2	C2306	D-11	D827	I-16	Q311	R-9	R628	B-2		
C308	G-4	C609	F-4	C2307	C-11	D828	C-15	R312	O-10	R753	R-16		
C309	I-9	C611	C-3	C2308	B-12	DEG	B-25	R313	P-10	R754	R-17		
C310	I-9	C612	F-3	C2309	B-11	DY	N-20	Q314	B-5	R756	R-15		
C311	K-10	C613	E-4	C2311	E-11	HHS	B-13	Q315	K-14	R758	S-14		
C312	G-4	C614	D-4	C2312	E-11	IC101	O-6	Q316	L-14	R760	S-15		
C313	F-4	C615	C-3	C2313	H-11	IC301	E-5	Q317	J-6	R765	O-14		
C315	B-3	C617	G-5	C2317	B-11	IC451	Q-13	Q451	Q-11	R767	P-17		
C316	J-4	C752	R-17	C2318	B-11	IC801	I-23	Q501	M-14	R804	C-24		
				C2319	C-10					R805	G-24		

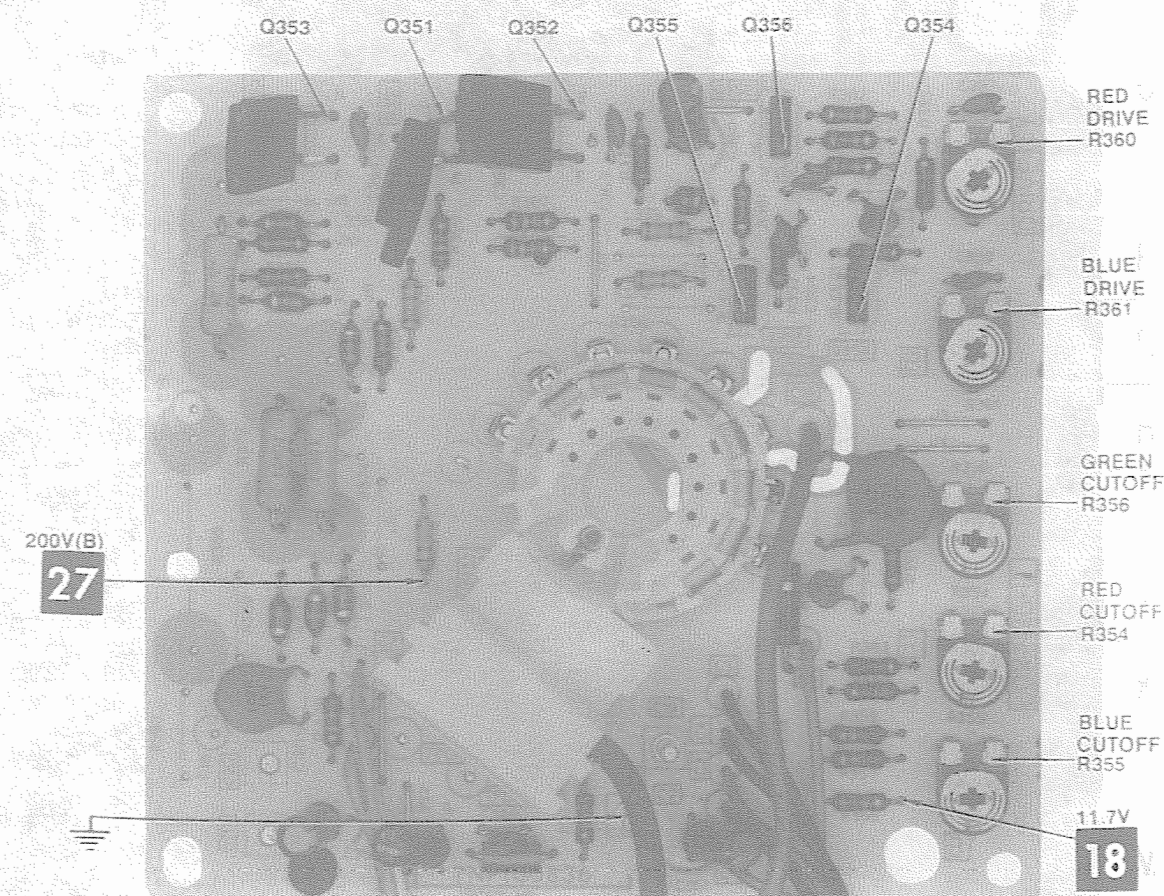
CRT BOARD -GridTrace-LOCATION GUIDE

C11	J-7	L355	H-3	R360	B-12	R379	B-7
C19	J-7	L356	B-2	R361	D-12	R380	I-10
CS51	F-10	L357	D-3	R362	B-11	R381	B-8
C352	K-4	L358	C-2	R363	C-2	R382	A-10
C353	G-10	L359	B-8	R364	D-4	R383	H-10
C354	C-9	Q351	B-4	R365	C-2	R384	C-10
C355	B-9	Q352	A-6	R366	J-10	R385	B-11
C356	J-3	Q353	A-2	R367	B-6	R395	H-9
C357	A-12	Q354	C-10	R368	C-6		
C358	C-11	Q355	C-8	R369	C-4		
C359	B-10	Q356	A-9	R370	C-7		
C360	A-8	R351	G-10	R371	D-4		
C361	K-8	R352	C-9	R372	C-7		
C362	A-5	R353	A-10	R373	C-2		
C363	A-7	R354	H-12	R374	F-3		
C364	A-3	R355	J-12	R375	F-2		
C365	K-5	R356	G-12	R376	I-3		
C366	I-2	R357	J-10	R377	J-6		
L352	K-5	R358	I-9	R378	G-4		
L353	H-2	R359	I-10				
L354	G-3						



MAIN BOARD-GridTrace-LOCATION GUIDE (BOTTOM VIEW)

C005	L-25	R322	I-18	R759	Q-12
C104	O-23	R323	S-20	R761	S-12
C105	O-22	R326	H-19	R762	R-12
C139	N-22	R328	J-17	R763	R-12
C203	P-21	R330	B-23	R764	R-13
C839	C-13	R335	P-17	R803	G-2
C856	G-13	R336	p-17	R816	E-5
C860	D-14	R339	Q-17	R818	E-8
D605	C-22	R340	B-24	R824	I-11
D606	C-22	R341	C-22	R839	C-14
D607	C-22	R342	F-23	R840	B-14
D608	C-19	R343	H-19	R2322	B-15
JA1	C-15	R346	I-24	R2324	B-17
JA2	C-15	R347	J-23	R3105	N-16
JA47	J-21	R348	B-22	R3106	L-13
JA191	O-25	R349	C-22	R3110	J-22
R001	A-15	R401	E-20	R3112	G-23
R101	L-23	R402	O-16	R3113	R-17
R102	M-23	R403	D-14	R3114	L-17
R103	L-23	R406	R-14	R3116	I-19
R106	M-21	R407	Q-9	R3121	C-21
R108	M-22	R409	P-9	R3122	I-20
R109	M-21	R412	G-21	R3123	H-22
R111	N-21	R505	D-19	R3124	H-21
R112	S-20	R506	D-18	R3126	G-20
R114	S-22	R507	D-18		
R115	N-22	R508	E-20		
R116	N-22	R511	C-19		
R117	Q-21	R512	C-19		
R118	R-20	R513	L-14		
R119	N-19	R514	L-12		
R122	L-20	R518	C-18		
R124	M-19	R527	D-20		
R125	M-20	R528	D-19		
R130	N-20	R550	Q-1		
R131	N-20	R551	Q-1		
R132	K-13	R552	P-1		
R133	K-22	R555	Q-1		
R134	K-21	R601	F-23		
R135	M-22	R603	E-24		
R137	R-21	R605	B-21		
R138	R-21	R606	C-20		
R139	R-21	R607	B-21		
R140	R-22	R608	C-24		
R142	Q-20	R610	G-24		
R143	N-23	R612	G-23		
R201	P-21	R613	E-25		
R202	Q-21	R615	F-24		
R203	P-21	R617	G-24		
R206	Q-19	R618	E-23		
R301	I-18	R620	B-19		
R307	J-17	R621	B-19		
R308	H-18	R622	B-22		
R310	J-17	R623	B-21		
R311	K-17	R624	F-23		
R312	G-23	R751	R-9		
R313	N-17	R752	R-10		
R315	C-22	R755	Q-12		
R316	B-23	R757	Q-14		
R318	B-24				

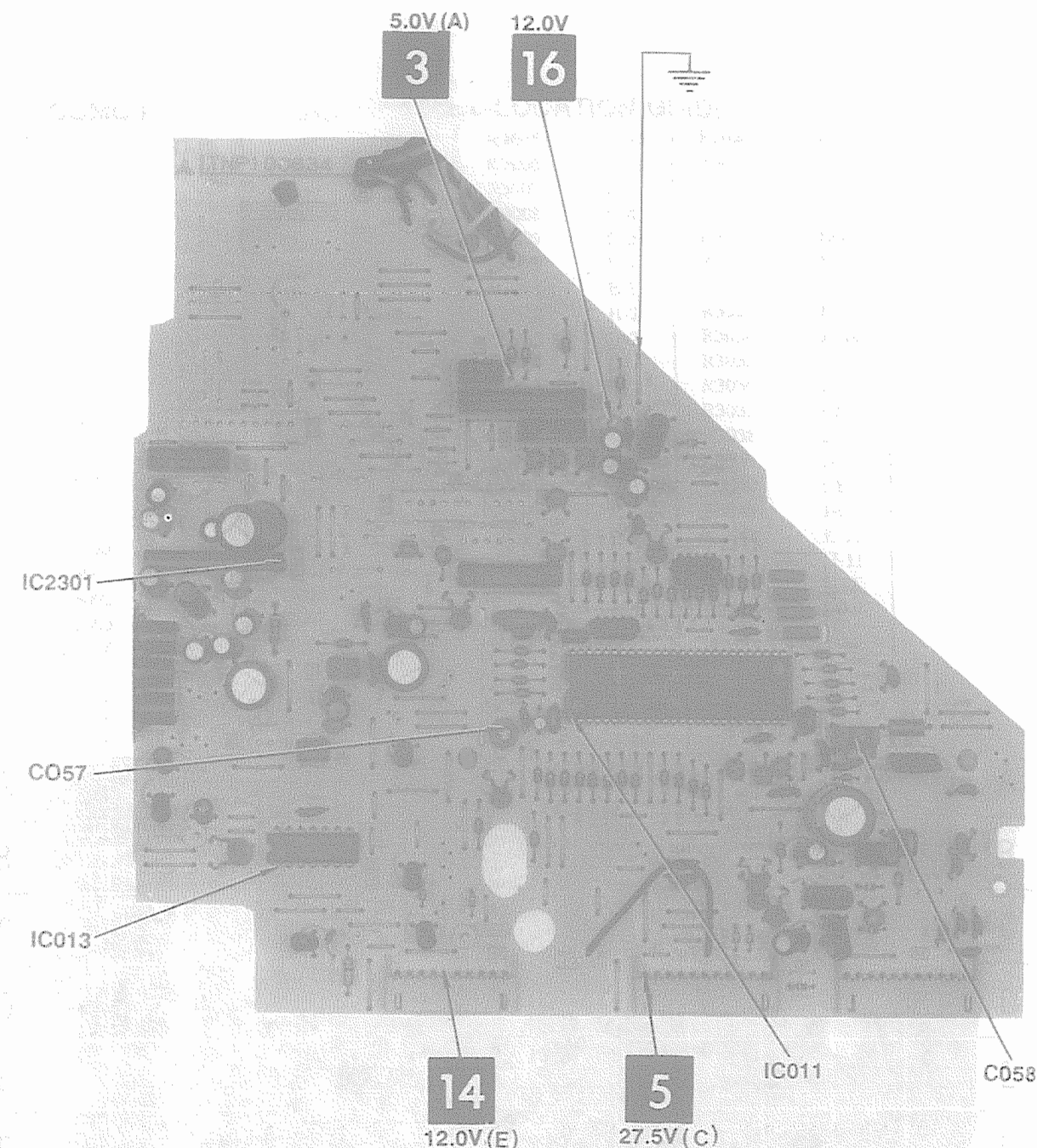
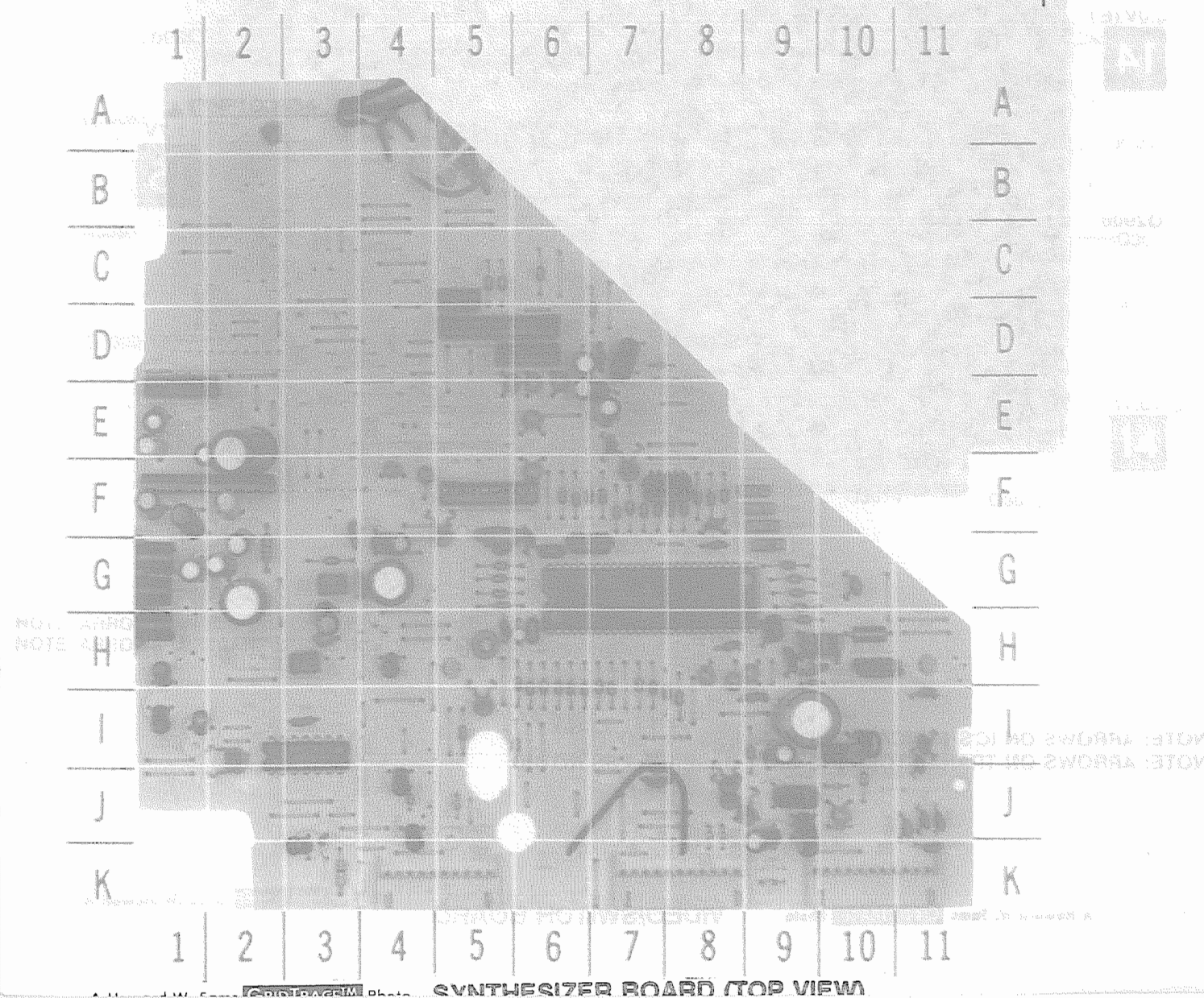


NOTE: ARROWS ON TRANSISTORS INDICATE BASE UNLESS NOTED

PANASONIC MODELS
CTK-2790S, PC-29S90S (CH, AEDP152, VAEDP152)

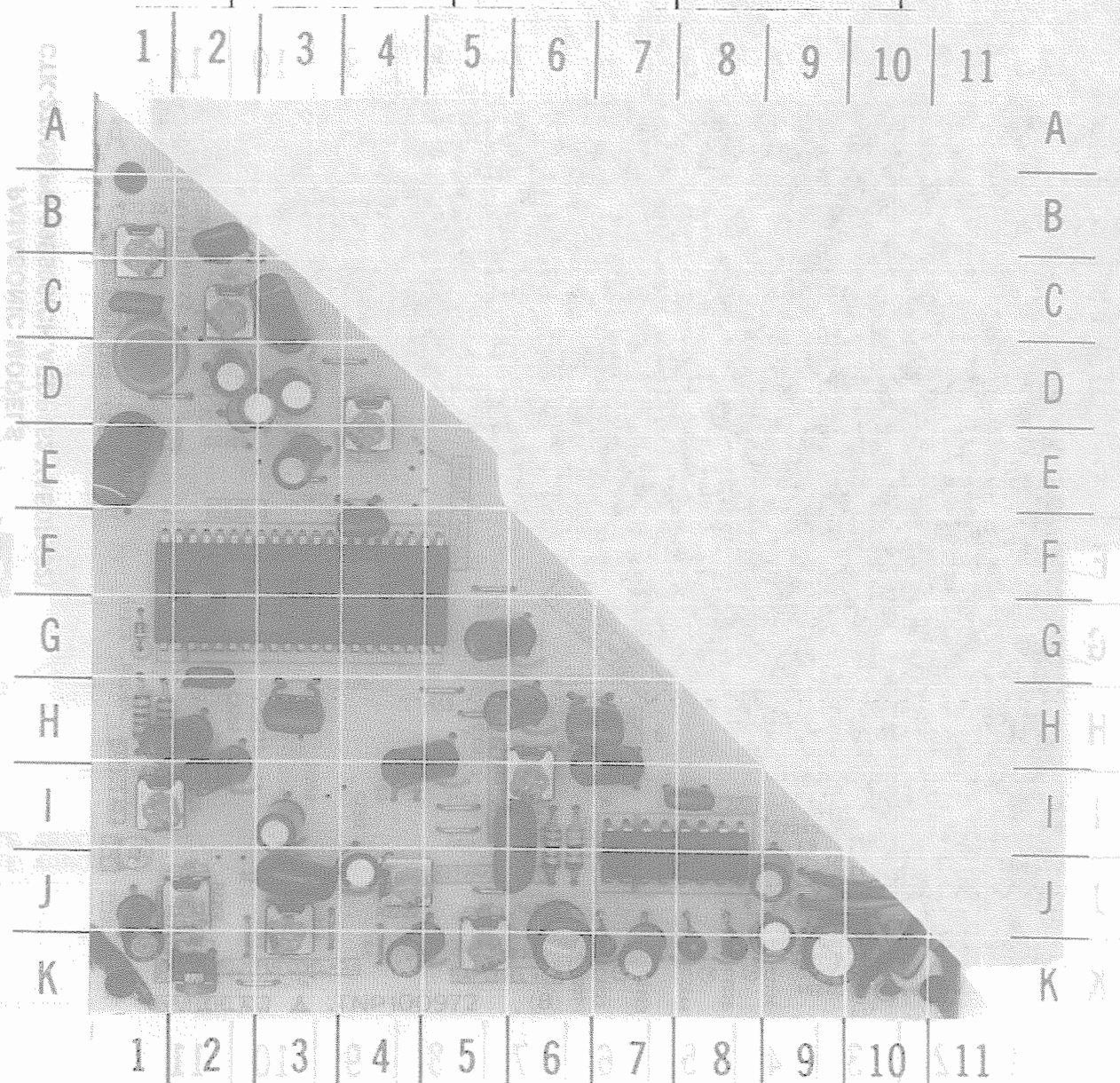
SYNTHESIZER BOARD (TOP VIEW)-GridTrace-LOCATION GUIDE

C011	D-7	C037	H-9	C068	I-3	C2334	E-1	L011	D-7	L034	F-7	L056	F-6
C013	E-6	C038	H-4	C069	I-2	C2335	F-1	L012	H-10	L035	F-7	L057	G-3
C014	I-9	C040	G-4	C070	J-8	C2336	E-1	L013	H-3	L036	F-7	L058	F-8
C015	J-9	C041	H-9	C071	J-8	C2337	G-2	L014	H-7	L037	F-7	L059	F-4
C016	J-9	C042	I-9	C072	J-9	C2338	F-1	L015	I-5	L038	F-7	L060	F-4
C017	J-9	C043	J-4	C073	H-9	D011	D-7	L016	H-8	L039	F-7	L061	I-8
C018	I-10	C045	J-7	C074	F-3	D013	I-9	L017	H-8	L040	F-8	L062	J-10
C019	E-7	C046	J-7	C075	H-6	D014	J-9	L018	H-9	L041	F-8	L063	G-5
C021	D-6	C047	J-4	C077	I-10	D016	J-9	L019	F-8	L042	H-8	L064	J-10
C022	D-7	C048	K-3	C078	E-7	D017	J-10	L020	F-8	L043	G-8	L065	I-9
C023	H-6	C052	I-1	C079	F-7	D018	J-10	L022	H-6	L044	G-8	L066	I-6
C024	G-10	C057	H-5	C080	I-5	D021	J-3	L023	H-6	L045	G-8	L067	G-5
C025	F-7	C058	H-10	C081	F-5	D022	J-8	L024	H-6	L046	F-8	LC014	F-9
C026	G-10	C059	H-8	C082	K-11	D023	J-8	L025	H-6	L047	G-5	LC015	F-9
C027	G-6	C060	J-11	C083	I-9	D029	J-4	L026	H-6	L048	E-6	LC016	F-9
C028	G-6	C061	H-9	C2301	H-1	D030	J-5	L027	H-6	L049	E-5	LC017	G-9
C029	G-5	C062	G-8	C2302	I-1	D031	K-9	L028	H-7	L050	E-6	R054	G-6
C030	J-11	C063	I-11	C2303	G-2	D033	H-9	L029	H-7	L051	C-6	R1014	K-3
C032	H-3	C064	I-11	C2304	G-1	IC011	G-7	L030	I-7	L052	C-5	R2315	G-2
C033	G-4	C065	J-11	C2305	G-2	IC013	I-3	L031	I-7	L053	C-5	TPS2	I-1
C034	G-4	C066	I-11	C2331	E-2	IC2303	F-1	L032	F-6	L054	G-5	TPS16	J-5
C036	H-5	C067	F-8	C2332	F-2	JK2311	G-1	L033	F-6	L055	E-6	X011	F-5
				C2333	E-1							X012	H-6

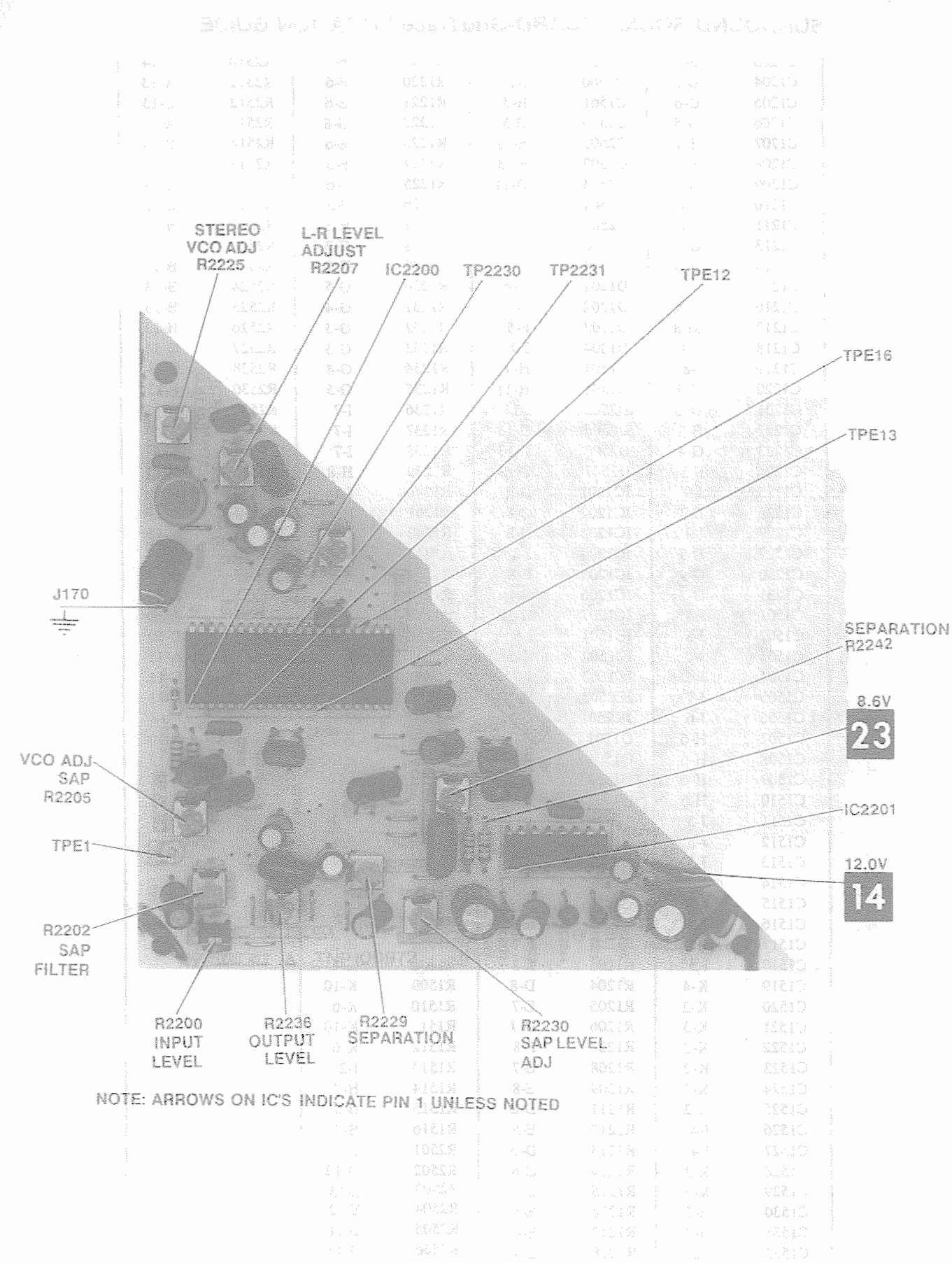


STEREO/SAP BOARD (TOP VIEW)-GridTrace-LOCATION GUIDE

C2200	I-1	C2217	I-7	IC2200	G-3
C2201	H-2	C2218	H-7	IC2201	I-7
C2202	H-2	C2219	I-6	L2202	D-1
C2203	H-3	C2220	G-6	R2200	K-2
C2204	E-1	C2221	H-6	R2202	J-2
C2205	D-2	C2222	K-7	R2203	H-1
C2206	D-3	C2223	K-7	R2204	H-1
C2207	C-3	C2225	K-8	R2205	I-1
C2208	D-2	C2226	K-9	R2222	C-2
C2209	B-2	C2227	K-6	R2225	B-1
C2210	E-3	C2231	F-4	R2226	E-4
C2211	J-3	C2233	H-2	R2229	J-4
C2212	J-4	C2234	C-1	R2230	K-5
C2213	H-5	C2244	K-8	R2236	K-3
C2214	K-4	C2250	I-3	R2242	I-6
C2215	J-9	C2251	K-9	R2243	I-6
C2216	I-8	D2208	G-1	R2245	I-6
				TPE1	J-1



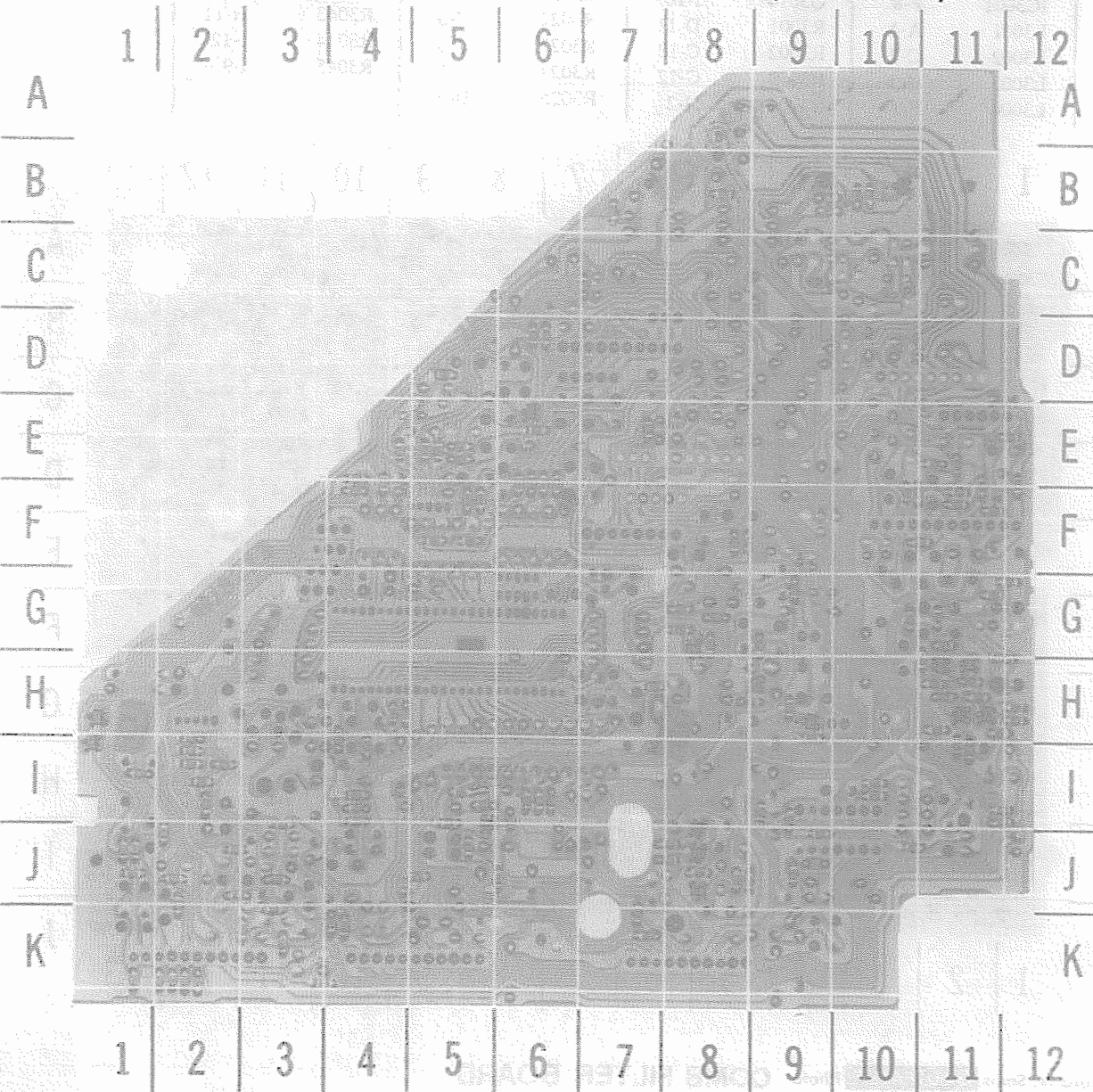
A Howard W. Sams **GRIDTRACE** Photo **STEREO/SAP BOARD (TOP VIEW)**



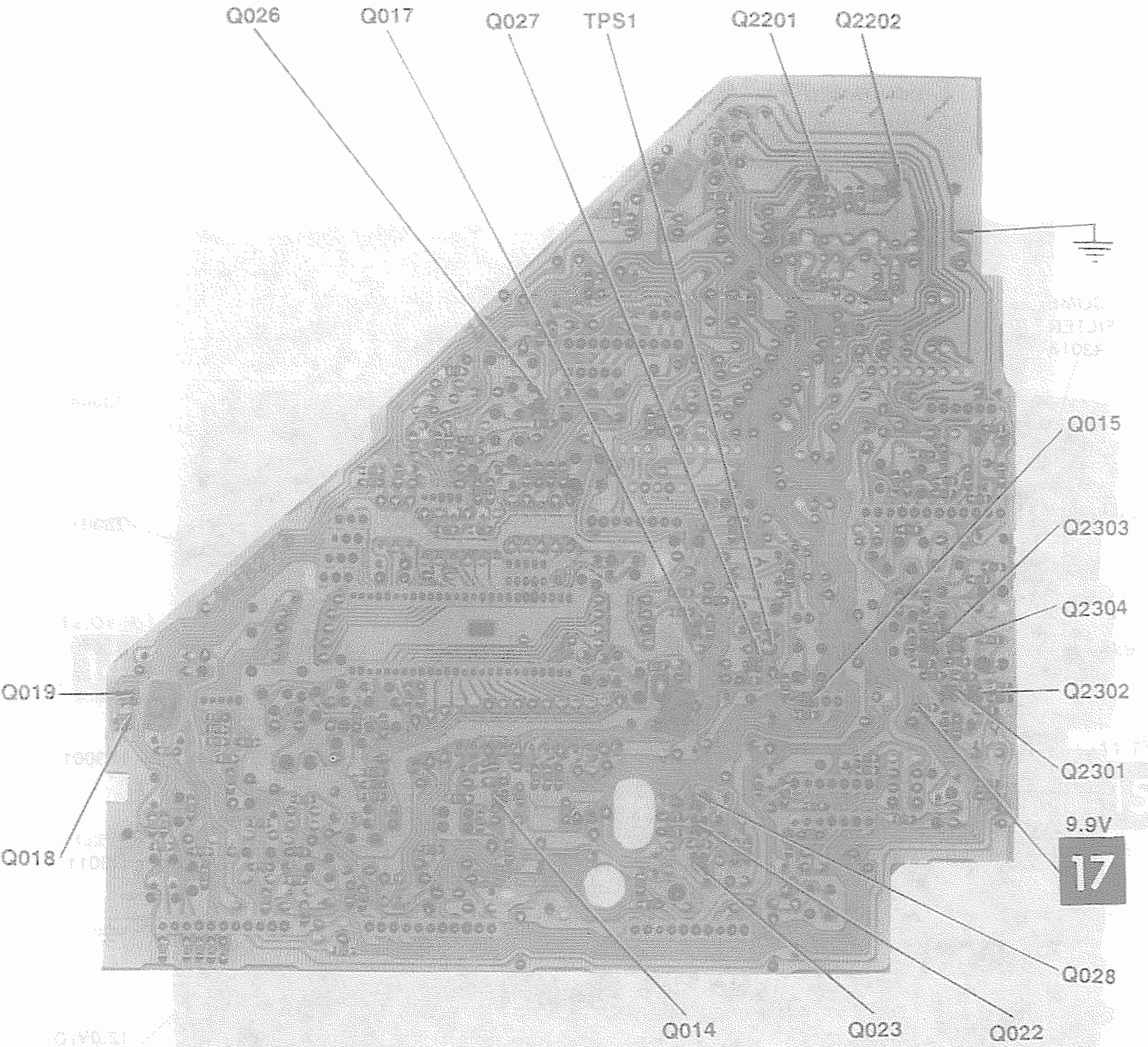
A Howard W. Sams **CIRCUITTRACE** Photo **STEREO/SAP BOARD (TOP VIEW)**

SYNTHESIZER BOARD (BOTTOM VIEW) -GridTrace-LOCATION GUIDE

Q014	J-5	R018	E-5	R041	K-2	R072	E-4	R1003	K-7	R1069	J-2	R2312	G-11
Q015	H-9	R019	E-5	R042	K-2	R073	K-1	R1004	J-5	R1070	J-2	R2313	G-11
Q017	G-8	R020	K-4	R045	F-4	R075	H-9	R1010	J-8	R1071	K-4	R2314	H-11
Q018	I-1	R021	J-3	R047	F-6	R076	H-9	R1011	J-8	R1072	C-9	R2316	F-10
Q019	H-1	R022	K-3	R048	F-6	R078	G-8	R1012	J-9	R1077	I-4	R2317	F-11
Q022	J-8	R023	K-3	R049	F-6	R079	G-8	R1013	J-8	R2210	B-9	R2318	F-11
Q023	J-8	R025	J-2	R050	F-6	R084	I-6	R1020	J-5	R2211	B-9	R2319	F-11
Q026	E-6	R026	J-2	R051	F-5	R085	F-9	R1026	I-10	R2212	B-10	R2320	E-12
Q027	H-9	R028	J-2	R052	F-5	R086	F-8	R1028	I-9	R2256	B-10	R2331	F-11
Q028	J-8	R029	E-5	R055	I-2	R088	G-8	R1029	I-9	R2287	B-8	R2332	E-11
Q2201	B-9	R030	D-6	R056	I-2	R089	I-5	R1030	I-10	R2289	B-7	R2333	F-11
Q2202	B-10	R031	D-6	R057	E-4	R090	J-6	R1031	J-9	R2301	I-11	R2334	F-11
Q2301	H-11	R032	E-7	R058	E-5	R092	I-6	R1032	J-9	R2302	H-12	R2348	E-11
Q2302	H-11	R033	I-2	R061	I-2	R093	I-6	R1033	J-10	R2303	I-11	R2349	E-12
Q2303	H-11	R034	I-2	R063	I-4	R094	J-6	R1038	J-8	R2304	H-11	R2350	I-11
Q2304	H-11	R035	I-2	R065	I-5	R095	I-4	R1039	F-5	R2305	H-11	R2351	I-11
R011	C-7	R036	J-2	R066	J-5	R096	I-4	R1040	F-5	R2306	H-12	R2352	H-11
R012	D-5	R037	I-1	R067	G-9	R097	I-4	R1063	K-2	R2307	H-11	R2353	G-10
R015	K-4	R038	J-2	R068	I-6	R098	H-4	R1066	G-8	R2308	H-11	R2354	G-11
R016	J-3	R039	J-2	R070	J-1	R099	H-4	R1067	H-9	R2309	G-12	R2355	H-11
R017	E-6	R040	K-2	R071	F-4	R1002	K-7	R1068	G-9	R2310	G-11	TPS1	H-9



A Howard W. Sams GRIDTRACE™ Photo SYNTHESIZER BOARD (BOTTOM VIEW)



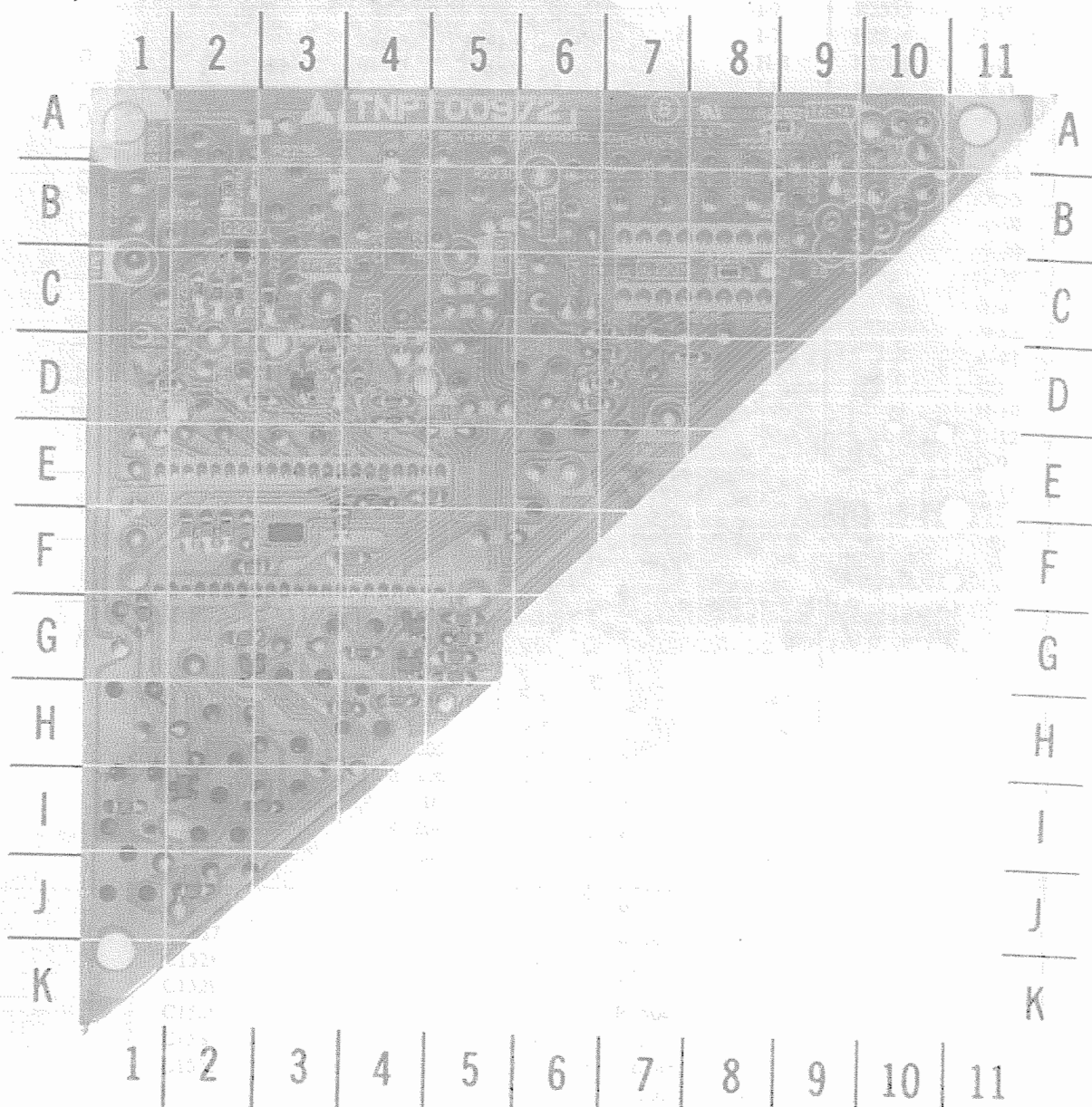
NOTE: ARROWS ON TRANSISTORS INDICATE BASE UNLESS NOTED

A Howard W. Sams CIRCUITRACE Photo

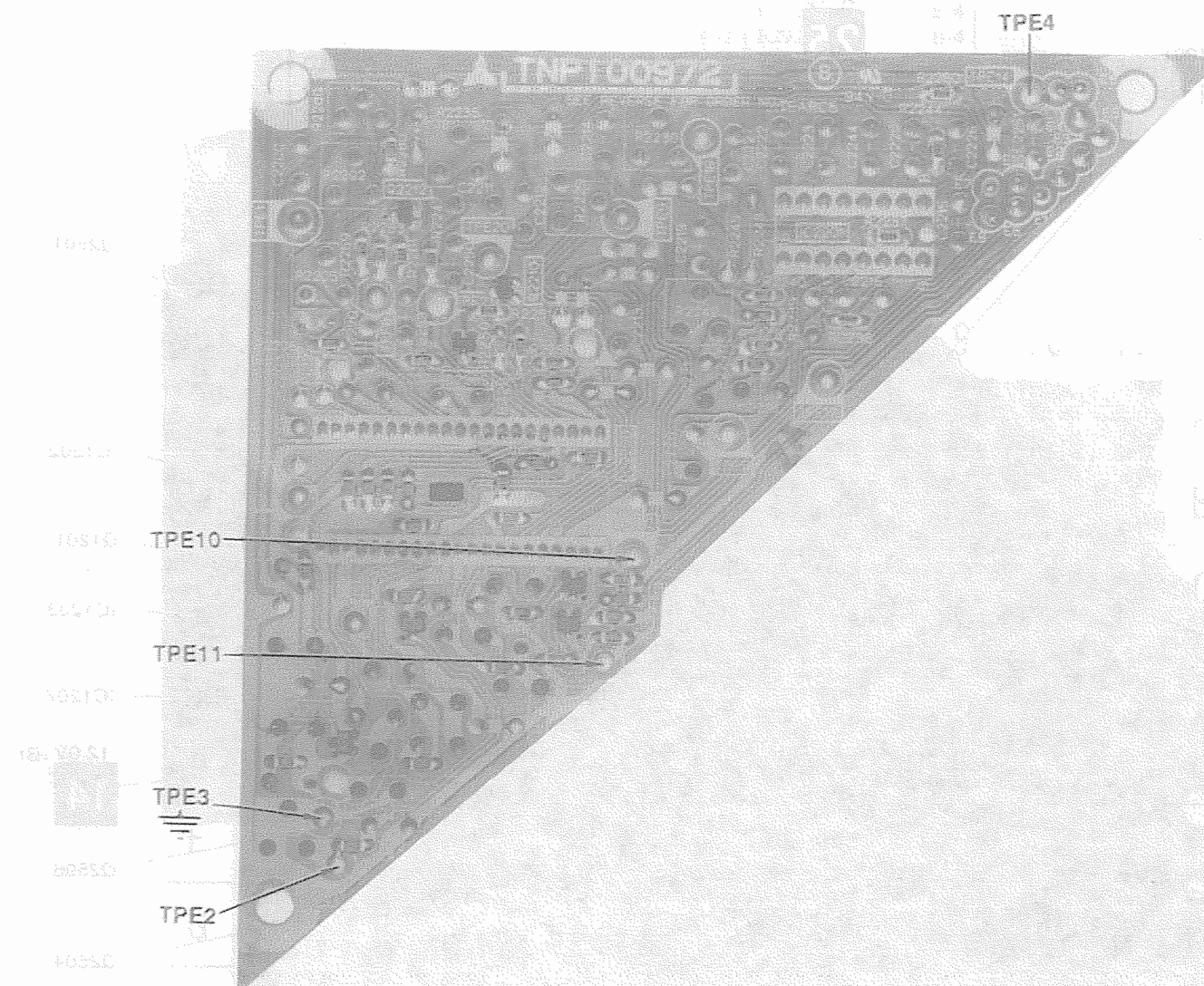
SYNTHESIZER BOARD (BOTTOM VIEW)

STEREO/SAP BOARD (BOTTOM VIEW) -GridTrace-LOCATION GUIDE

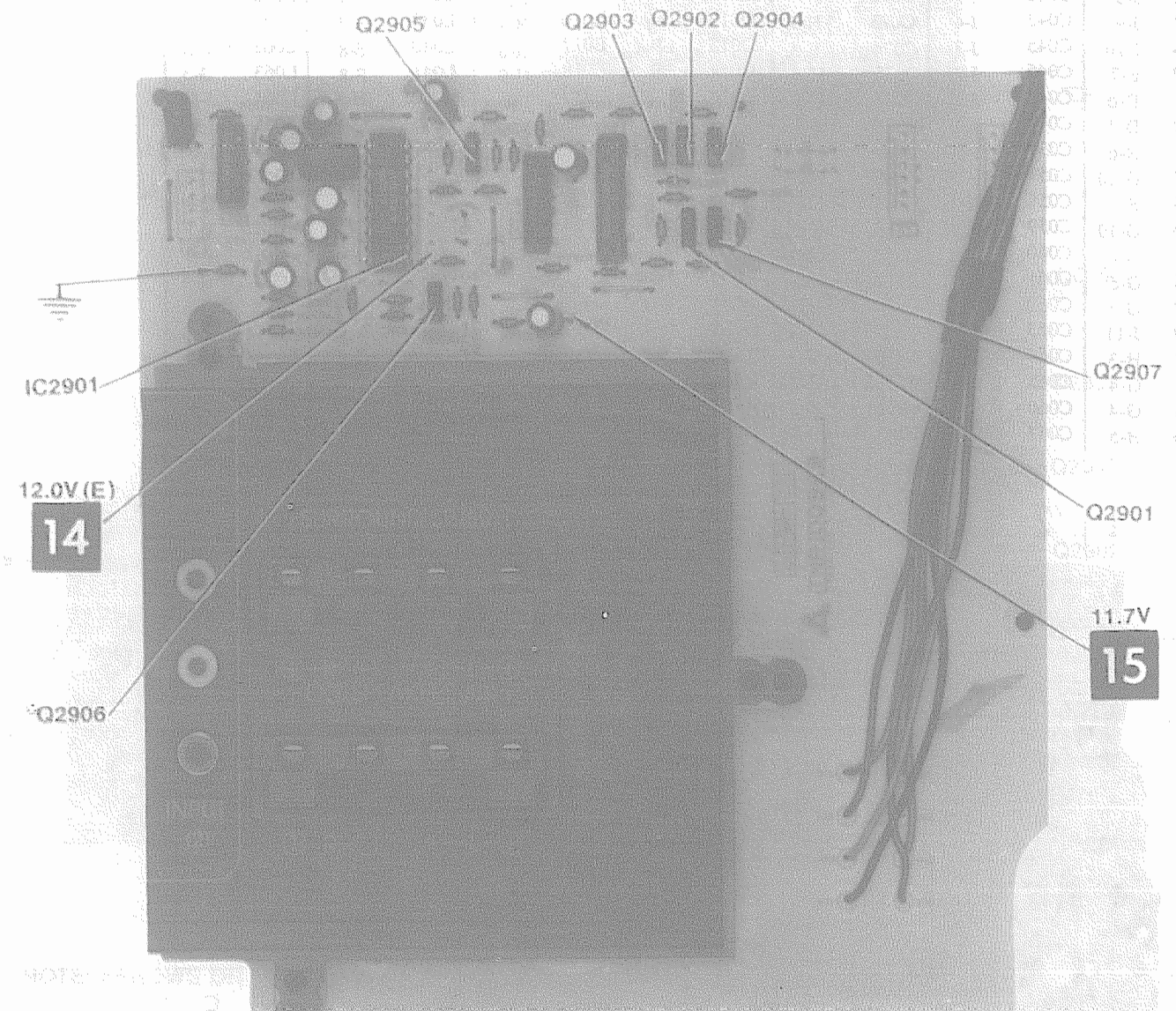
Q2203	G-4	R2227	H-4	R2275	G-5	TPE10	F-5
Q2204	G-4	R2228	F-4	R2276	G-5	TPE11	A-4
Q2205	D-3	R2237	C-8	R2277	H-4	TPE12	D-2
Q2208	G-2	R2238	D-8	R2278	D-7	TPE13	F-1
Q2209	I-2	R2239	D-7	R2279	G-5	TPE14	A-10
Q2210	C-3	R2240	C-7	R2280	B-2	TPE16	B-6
Q2212	B-2	R2241	D-6	R2281	C-2	TPE20	C-3
R2201	F-2	R2244	B-9	R2283	C-2		
R2206	D-1	R2247	C-3	R2285	G-5		
R2207	D-3	R2250	D-3	R2286	D-4		
R2213	D-4	R2251	D-3	R2288	D-4		
R2214	F-2	R2252	F-2	TP2230	E-3		
R2215	F-2	R2258	I-1	TP2231	E-3		
R2216	F-4	R2259	G-2	TPE2	J-2		
R2217	E-4	R2260	A-9	TPE3	J-1		
R2218	F-2	R2268	G-1	TPE5	E-6		
R2219	E-5	R2269	C-2	TPE8	D-2		
R2223	I-3	R2274	G-4	TPE9	C-5		
R2224	J-2						



A Howard W. Sams GRIDTRACE™ Photo STEREO/SAP BOARD (BOTTOM VIEW)



STEREO/SAP BOARD (BOTTOM VIEW)



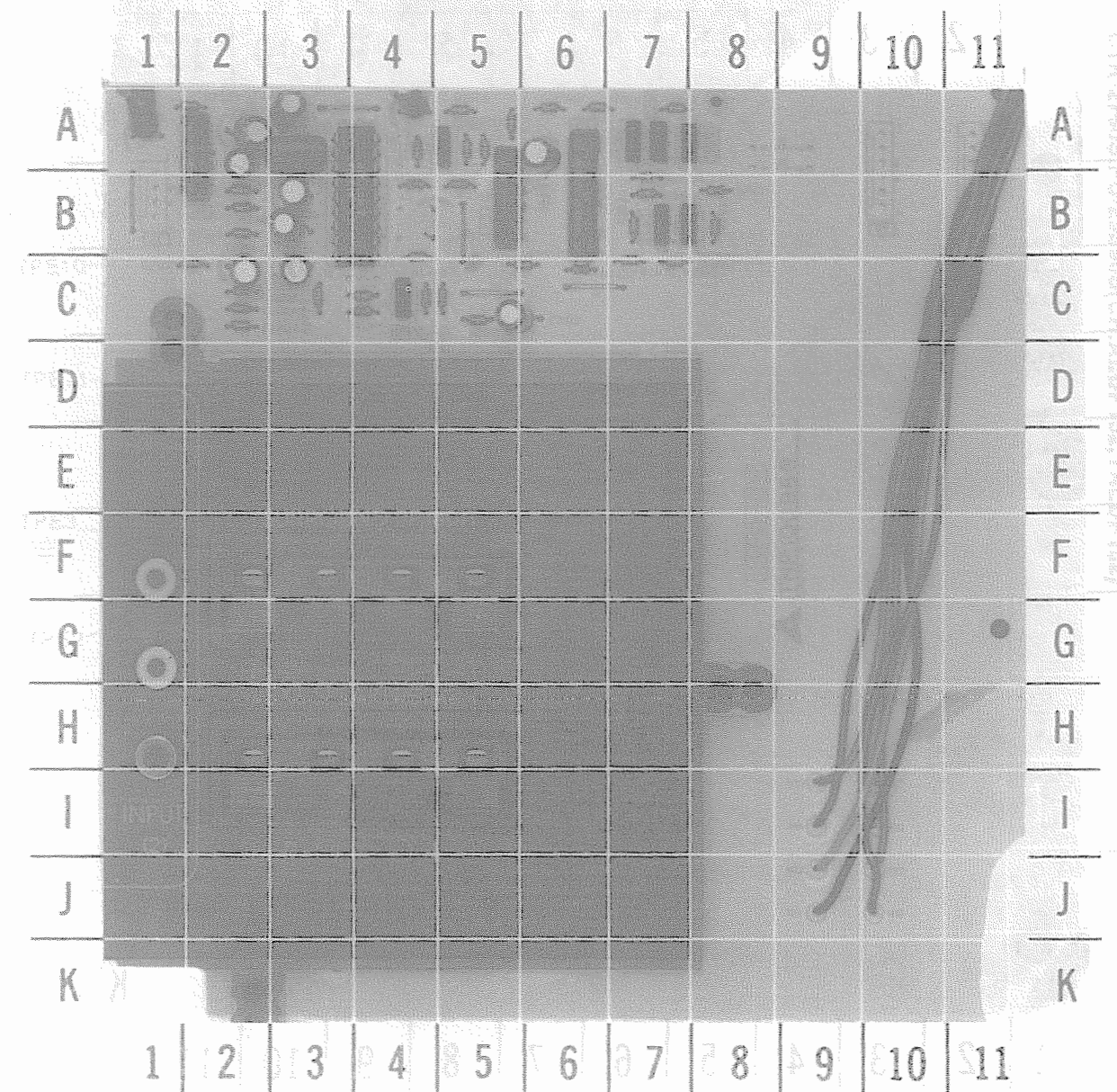
NOTE: ARROWS ON IC'S INDICATE PIN 1 UNLESS NOTED
 NOTE: ARROWS ON TRANSISTORS INDICATE BASE UNLESS NOTED

SURROUND SOUND BOARD-GridTrace LOCATION GUIDE

C1203	F-7	C1533	H-5	R1219	F-7	R2510	C-14
C1204	D-6	C1560	I-1	R1220	F-6	R2511	A-13
C1205	C-6	C1561	H-3	R1221	E-6	R2512	C-13
C1206	D-5	C1563	G-5	R1222	G-8	R2513	A-13
C1207	E-4	C2501	E-12	R1223	E-6	R2514	D-14
C1208	E-6	C2502	F-13	R1224	F-6	R2515	C-12
C1209	G-8	C2503	D-11	R1225	F-6	R2516	E-13
C1210	I-8	C2504	E-11	R1226	F-5	R2520	C-12
C1211	I-8	C2505	B-14	R1227	E-6	R2521	H-14
C1213	G-3	C2506	C-13	R1228	G-3	R2522	F-13
C1214	G-6	C2518	C-12	R1229	E-6	R2523	B-13
C1215	J-7	D1201	G-6	R1230	G-5	R2524	B-13
C1216	G-5	D1202	F-5	R1231	G-4	R2525	B-13
C1217	M-8	D1203	F-5	R1232	G-3	R2526	H-13
C1218	J-8	D1204	I-9	R1233	G-3	R2527	G-14
C1219	J-8	D1501	H-4	R1234	G-4	R2528	F-13
C1220	G-9	D2501	H-11	R1235	G-5	R2530	F-13
C1221	D-6	D2502	I-11	R1236	I-7	R2532	H-12
C1222	E-5	D2505	C-13	R1237	I-7	R2533	I-11
C1223	G-4	D2506	B-13	R1238	I-7	R2534	J-11
C1224	F-8	D2507	E-13	R1239	H-8	R2535	I-11
C1225	J-9	IC1201	D-6	R1240	I-8	R2536	J-11
C1226	E-9	IC1202	G-8	R1241	H-8	R2544	A-10
C1227	I-9	IC1203	H-8	R1242	K-7	R2545	K-11
C1229	H-9	IC1204	J-8	R1243	K-8	R2546	A-12
C1230	G-9	IC1205	E-8	R1244	K-8	R2547	C-13
C1231	G-7	IC1206	F-4	R1245	J-8	R2553	A-10
C1501	J-4	IC1207	H-10	R1246	J-8	R2554	A-10
C1502	J-5	IC1501	I-6	R1247	I-8	R2555	B-10
C1503	J-6	IC1502	K-5	R1248	E-4	R2556	A-11
C1504	J-6	IC1503	J-3	R1249	E-4	R2557	B-11
C1505	J-7	IC2502	B-12	R1250	F-5	R2558	A-11
C1506	J-6	JK2501	G-14	R1251	G-6	R2559	E-13
C1507	H-6	Q1201	G-7	R1252	H-9	R2563	H-10
C1508	H-6	Q1501	K-6	R1253	H-10	R2564	D-12
C1509	H-6	Q1502	J-6	R1254	I-10	R2565	D-9
C1510	H-6	Q2501	E-13	R1255	H-9	R2566	A-11
C1511	J-5	Q2504	J-11	R1256	F-9		
C1512	J-5	Q2506	I-11	R1257	F-9		
C1513	J-5	Q2507	B-10	R1258	G-9		
C1514	J-6	Q2508	B-10	R1501	H-4		
C1515	J-1	Q2510	D-9	R1502	I-2		
C1516	K-4	R1201	E-7	R1503	I-2		
C1517	I-3	R1202	F-7	R1504	H-3		
C1518	I-3	R1203	E-8	R1508	G-4		
C1519	K-4	R1204	D-8	R1509	K-10		
C1520	K-2	R1205	E-7	R1510	K-6		
C1521	K-3	R1206	D-7	R1511	K-10		
C1522	K-2	R1207	F-8	R1512	K-6		
C1523	K-2	R1208	E-7	R1513	I-2		
C1524	K-2	R1209	E-8	R1514	H-3		
C1525	K-2	R1211	D-8	R1515	B-8		
C1526	I-4	R1212	E-5	R1516	B-7		
C1527	I-4	R1213	D-6	R2501	D-12		
C1528	K-3	R1214	C-6	R2502	D-12		
C1529	K-3	R1215	C-6	R2503	E-13		
C1530	H-2	R1216	E-6	R2504	E-12		
C1531	H-2	R1217	E-6	R2505	E-14		
C1532	I-2	R1218	E-4	R2506	G-13		
				R2509	F-13		

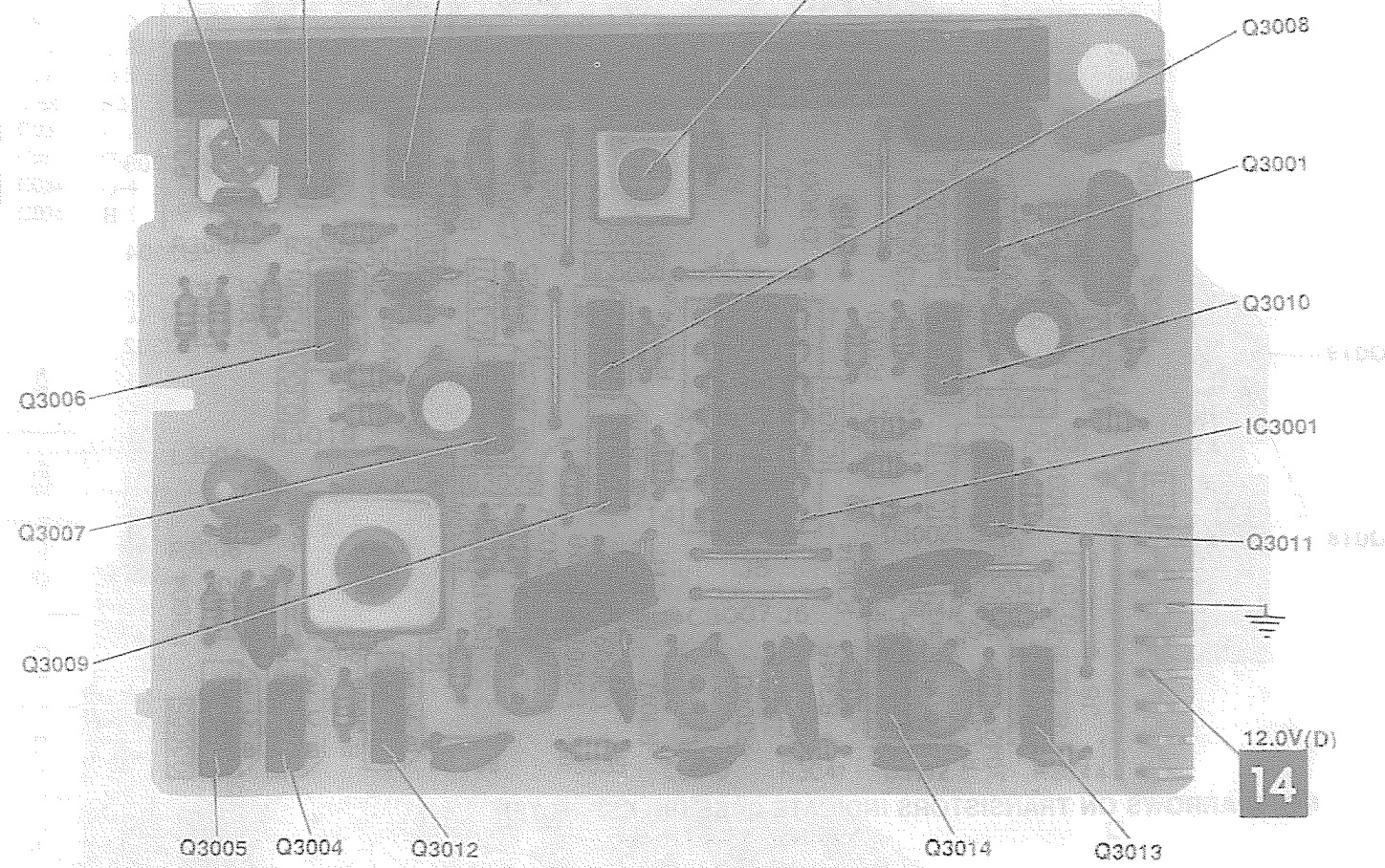
VIDEO/SWITCH BOARD-GridTrace LOCATION GUIDE

C2901	C-2	Q2901	B-7	R2912	B-7	R2929	C-4
C2902	A-3	Q2902	A-7	R2913	C-5	R2930	C-7
C2903	A-2	Q2903	A-7	R2914	C-4	R2931	B-8
C2904	A-2	Q2904	A-7	R2915	C-4	R2932	C-7
C2905	A-4	Q2905	A-5	R2916	A-6	R2933	B-8
C2906	B-3	Q2906	C-4	R2917	A-5	R2934	A-6
C2907	C-3	Q2907	B-7	R2918	B-5	R2935	C-4
C2908	A-3	R2901	C-2	R2919	B-4		
C2909	B-3	R2903	C-2	R2919	B-4		
C2910	A-1	R2904	C-2	R2920	B-7		
C2911	A-6	R2905	B-2	R2922	C-6		
C2912*	B-4	R2906	B-2	R2923	A-7		
C2915	C-5	R2907	A-5	R2924	A-6		
D2901	B-7	R2908	A-3	R2925	A-4		
D2902	C-2	R2909	A-5	R2926	A-2		
IC2901	B-4	R2910	B-2	R2927	C-3		
JK2901	G-1	R2911	C-5	R2928	C-6		



PANASONIC MODELS
CTK-2790S, PC-29S90S (CH.AEDP152, Y.AEDP152)

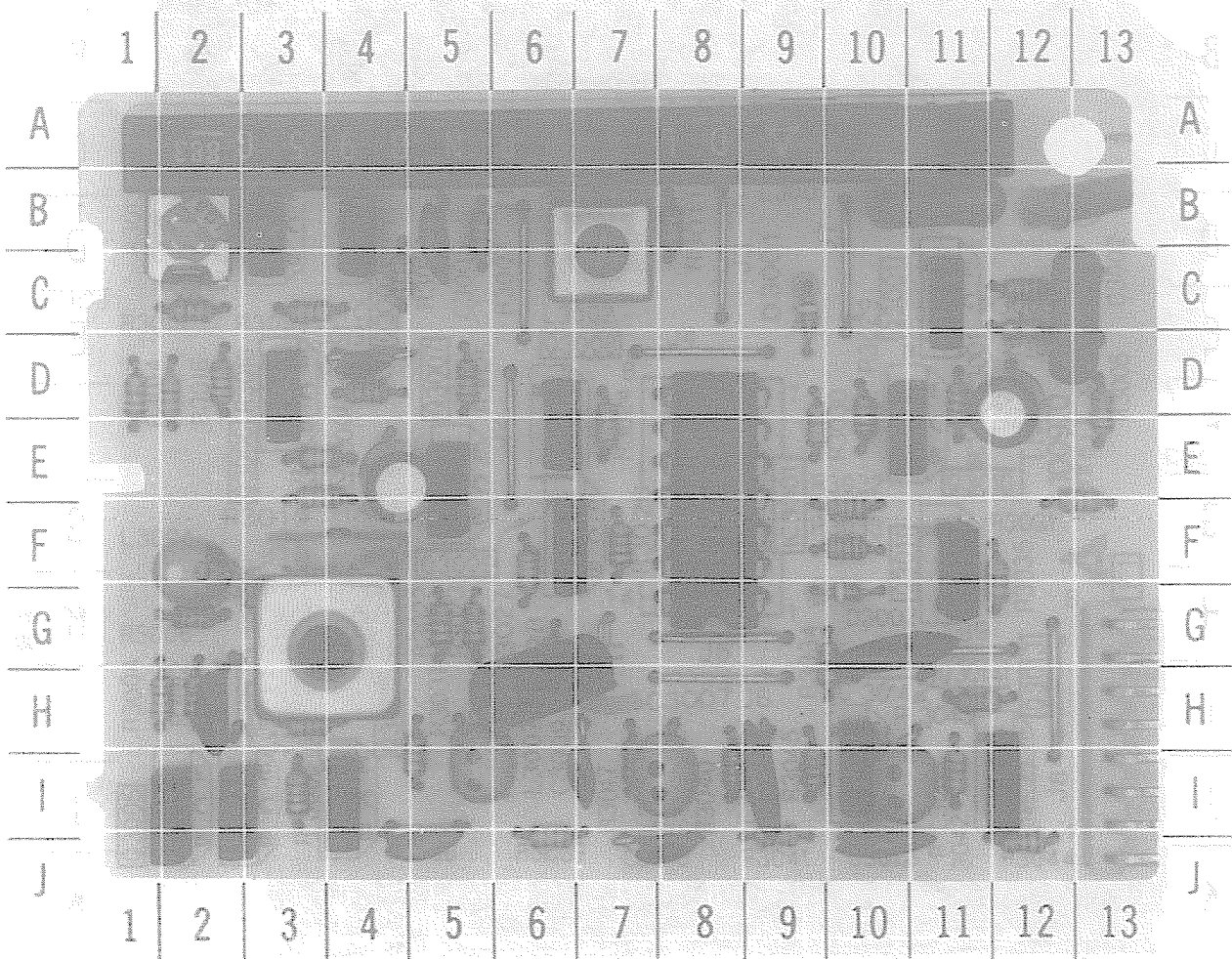
Q3001	D-12	L3005	I-10	R3005	O-13	R3026	F-7
Q3002	D-12	L3006	I-8	R3006	G02	R3027	F-6
Q3003	B-11	L3007	I-5	R3007	B-5	R3028	H-6
Q3004	H-2	Q3001	C-11	R3008	C-4	R3029	D-10
Q3005	B-5	Q3002	B-4	R3009	C-3	R3030	E-9
Q3006	E-4	Q3003	B-3	R3010	D-2	R3031	F-13
Q3007	H-6	Q3004	I-2	R3011	B-8	R3032	F-10
Q3008	J-5	Q3005	I-2	R3012	H-2	R3033	F-10
Q3009	I-7	Q3006	D-3	R3013	B-2	R3034	H-10
Q3010	I-7	Q3007	E-5	R3014	D-1	R3035	F-12
Q3011	I-9	Q3008	E-6	R3015	C-2	R3036	I-5
Q3012	J-10	Q3009	F-6	R3016	D-2	R3037	I-5
Q3013	D-4	Q3010	E-10	R3017	I-7	R3038	I-3
Q3014	G-10	Q3011	F-11	R3018	H-3	R3039	J-6
D3001	C-9	Q3012	I-4	R3019	E-3	R3040	I-8
D3002	G-10	Q3013	I-12	R3020	D-4	R3041	J-9
IC3001	F-8	Q3014	I-10	R3021	E-3	R3042	K-11
L3001	A-4	R3001	D-11	R3022	G-5	R3043	H-11
L3002	C-7	R3002	C-12	R3023	G-5	R3044	J-12
L3003	G-3	R3003	C-12	R3024	E-7	R3045	I-9
L3004	F-2	R3004	H-2	R3025	D-5		

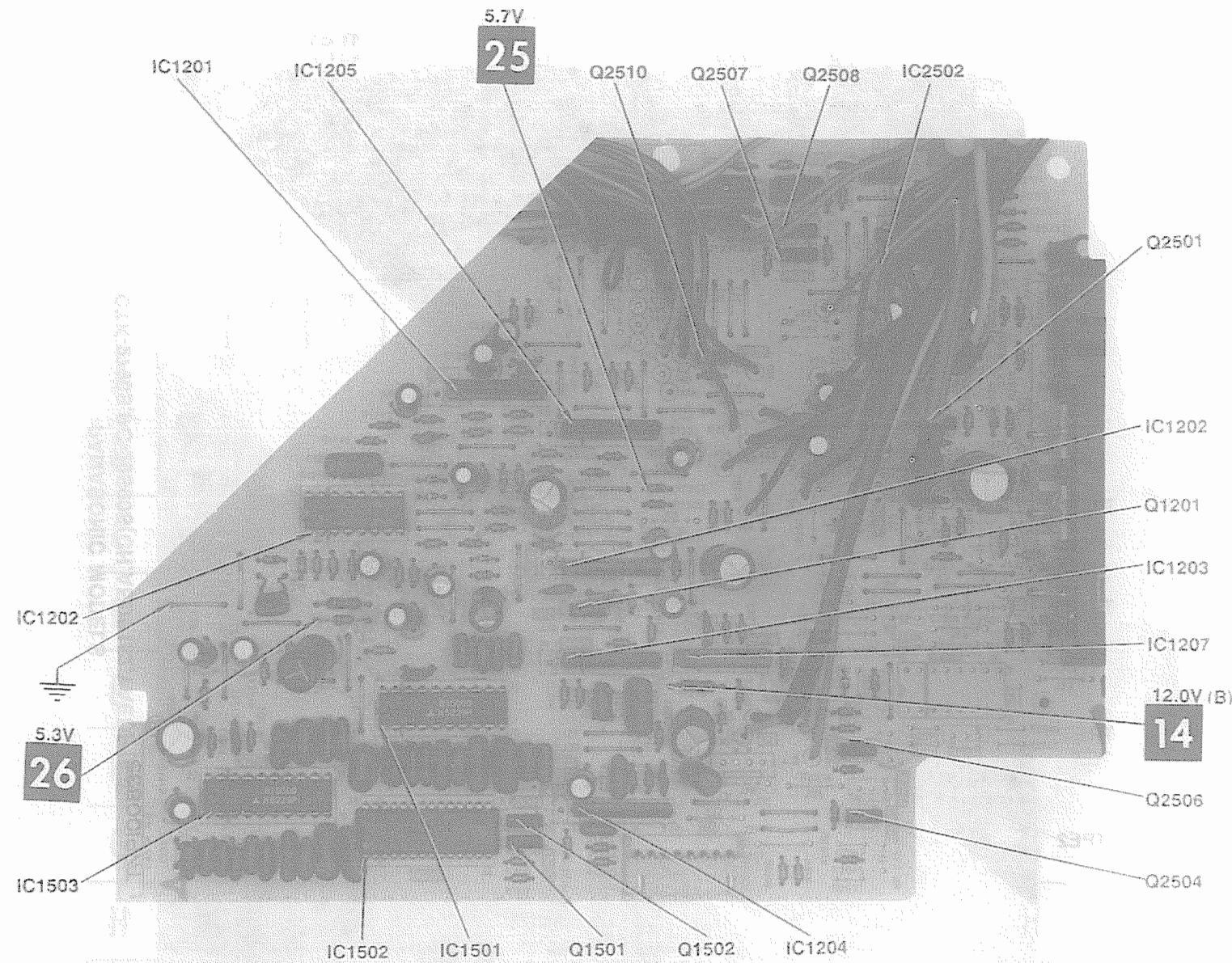


NOTE: ARROWS ON IC'S INDICATE PIN 1 UNLESS NOTED
NOTE: ARROWS ON TRANSISTORS INDICATE BASE UNLESS NOTED

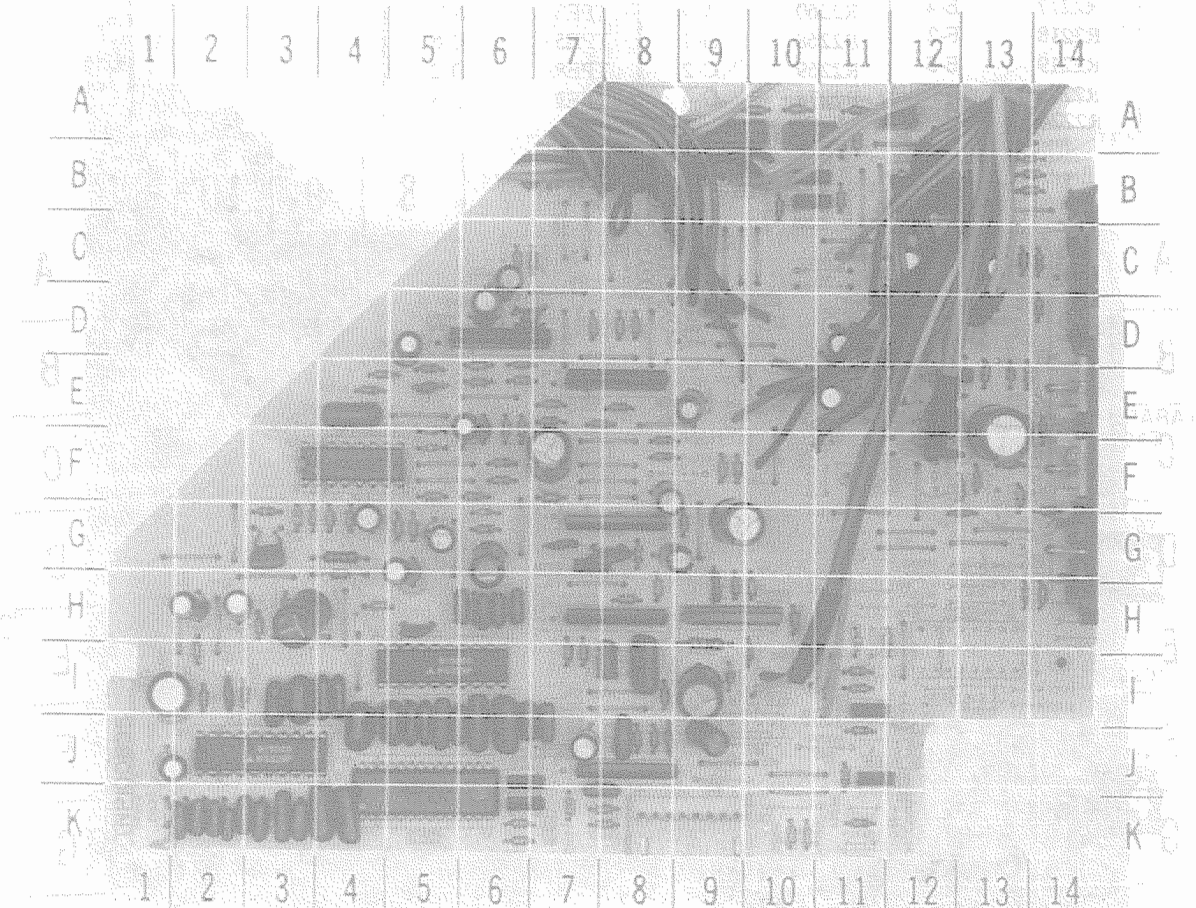
COMB FILTER BOARD-GridTrace-LOCATION GUIDE

C3001	D-12	L3005	I-10	R3005	O-13	R3026	F-7
C3002	D-12	L3006	I-8	R3006	G02	R3027	F-6
C3003	B-11	L3007	I-5	R3007	B-5	R3028	H-6
C3004	H-2	Q3001	C-11	R3008	C-4	R3029	D-10
C3005	B-5	Q3002	B-4	R3009	C-3	R3030	E-9
C3006	E-4	Q3003	B-3	R3010	D-2	R3031	F-13
C3007	H-6	Q3004	I-2	R3011	B-8	R3032	F-10
C3008	J-5	Q3005	I-2	R3012	H-2	R3033	F-10
C3009	I-7	Q3006	D-3	R3013	B-2	R3034	H-10
C3010	I-7	Q3007	E-5	R3014	D-1	R3035	F-12
C3011	I-9	Q3008	E-6	R3015	C-2	R3036	I-5
C3012	J-10	Q3009	F-6	R3016	D-2	R3037	I-5
C3013	D-4	Q3010	E-10	R3017	I-7	R3038	I-3
C3014	G-10	Q3011	F-11	R3018	H-3	R3039	J-6
D3001	C-9	Q3012	I-4	R3019	E-3	R3040	I-8
D3002	G-10	Q3013	I-12	R3020	D-4	R3041	J-9
IC3001	F-8	Q3014	I-10	R3021	E-3	R3042	K-11
L3001	A-4	R3001	D-11	R3022	G-5	R3043	H-11
L3002	C-7	R3002	C-12	R3023	G-5	R3044	J-12
L3003	G-3	R3003	C-12	R3024	E-7	R3045	I-9
L3004	F-2	R3004	H-2	R3025	D-5		





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



PARTS LIST AND DESCRIPTION (Continued)
(When ordering parts, state Model, Part Number, and Description)

5.0V(B)

3

IC012

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

A Howard W. Sams

CIRCUITRACE

Photo

KEY BOARD

PARTS LIST AND DESCRIPTION (Continued)
(When ordering parts, state Model, Part Number, and Description)

SEMICONDUCTORS (Select replacement for best results)

ITEM No.	MFGR. PART No./ TYPE No.	NTE PART No.	ECG PART No.	TCE PART No.	NOTES
IC2901	M51321P				
IC3001	TVSM51321P				
	D4066BC	NTE4066B	ECG4066B	SK4066B	
	UPD4066BC	NTE4066B	ECG4066B	SK4066B	
	TVSUPD4066BC	NTE4066B	ECG4066B	SK4066B	
	TC4066BP	NTE4066B	ECG4066B	SK4066B	
	MN4066B	NTE4066B	ECG4066B	SK4066B	
	M4066BP	NTE4066B	ECG4066B	SK4066B	
Q001	D637-R	NTE16	ECG16	SK9664	
	2SD637-R	NTE16	ECG16	SK9664	
	2SD637	NTE16	ECG16	SK9664	
	2SD637RS	NTE16	ECG16	SK9664	
	2SC1685	NTE85	ECG85	SK9229/85	
	2SC1685RS	NTE85	ECG85	SK9229/85	
Q014,5,7,8,9	2SD601A	NTE2408	ECG2408		
	2SD601AW	NTE2408	ECG2408		
Q022	2SD601A	NTE2408	ECG2408		
	2SD601AW	NTE2408	ECG2408		
Q023	2SB709A	NTE159	ECG159	SK3466/159	
	2SB709AW	NTE159	ECG159	SK3466/159	
Q026	2SD601A	NTE2408	ECG2408		
	2SD601AW	NTE2408	ECG2408		
Q027	2SB709A	NTE159	ECG159	SK3466/159	
	2SB709AW	NTE159	ECG159	SK3466/159	
Q028	2SD601A	NTE2408	ECG2408		
	2SD601AW	NTE2408	ECG2408		
Q101	C2377-C	NTE15	ECG15	SK9663	
	2SC2377-C	NTE15	ECG15	SK9663	
	2SC2377C	NTE15	ECG15	SK9663	
	2SC1047C	NTE107	ECG107	SK3122	
Q102	B642-R	NTE19	ECG19	SK3912	
	2SB642-R	NTE19	ECG19	SK3912	
	2SB642	NTE19	ECG19	SK3912	
	2SB642RS	NTE19	ECG19	SK3912	
	2SA564A	NTE290A	ECG290A	SK3932/91	
	2SA564RS	NTE290A	ECG290A	SK3932/91	
Q103	D637-R	NTE16	ECG16	SK9664	
	2SD637-R	NTE16	ECG16	SK9664	
	2SD637	NTE16	ECG16	SK9664	
	2SD637RS	NTE16	ECG16	SK9664	
	2SC1685	NTE85	ECG85	SK9229/85	
	2SC1685RS	NTE85	ECG85	SK9229/85	

KEY BOARD GridTrace-LOCATION GUIDE

C050	D-1	S013	I-3				
C051	D-1	S014	H-3				
C055	G-1	S015	K-3				
C056	F-2	S016	M-3				
C1001	D-1	S018	M-3				
C1002	D-1	S019	M-3				
D036	C-2	S020	J-3	A			A
D037	N-2	S021	I-3				
D038	K-2	S022	H-3				
D040	O-2	S023	N-3	B			B
D042	C-2	S024	E-3				
D043	C-2	S025	L-3				
D045	L-2	S050	N-3				
D047	J-2	S051	J-3	C			C
D048	N-2						
D049	N-2						
D050	K-2			D			D
D051	H-2						
D052	C-2						
D053	F-3			E			E
D054	L-2						
D055	K-2						
D056	J-2			F			F
D057	O-3						
D058	O-3						
D060	K-1			G			G
D061	I-1						
IC012	F-1			H			H
L1001	O-2						
R1018	H-2						
R1022	G-1						
R1035	C-1						
R1036	D-2						
R1037	B-2						
R1050	M-2						
R1051	M-2						
R1052	M-3						
R1053	H-2						
R1054	I-2						
R1055	I-2						
R1056	I-2						
R1057	F-3						
R1058	F-1						
R1059	E-2						
R1060	D-2						
R1061	D-2						
R1062	F-2						
R1073	G-1						
S001	A-3						
S002	B-3						
S005	L-3						
S006	K-3						
S007	F-3						
S008	G-3						
S009	C-3						
S010	D-3						
S011	D-3						
S012	G-3						

PARTS LIST AND DESCRIPTION

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

SEMICONDUCTORS (Select replacement for best results)

ITEM No.	MFGR. PART No./ TYPE No.	NTE PART No.	ECG PART No.	TCE PART No.	NOTES
D001	MA170	NTE519	ECG519	SK3100/519	
D002	MA165	NTE519	ECG519	SK3100/519	
D003,4,5	MA170	NTE519	ECG519	SK3100/519	
D009	MA1030M	NTE5004A	ECG5004A	SK3A0/5004A	
D011,3,4,6,7,8	MA165	NTE519	ECG519	SK3100/519	
D021	MA4051M	NTE5010A	ECG5010A	SK5A1/5010A	
D022,3	MA165	NTE519	ECG519	SK3100/519	
D029	TVSQA205EV3	NTE5010A	ECG5010A	SK5A1/5010A	
	TVSQA205E	NTE5010A	ECG5010A	SK5A1/5010A	
D030,1	MA165	NTE519	ECG519	SK3100/519	
D033	MA29WB				
D036,7,8	MA165	NTE519	ECG519	SK3100/519	
D040,2,3,5,7,8,9	MA165	NTE519	ECG519	SK3100/519	
D050 THRU D058	MA165	NTE519	ECG519	SK3100/519	
D060	LN21RCPH	NTE3022	ECG3022	SK2022/3022	
D061	LN41YCPH	NTE3021	ECG3021	SK2021/3021	
D104	MA165	NTE519	ECG519	SK3100/519	
D303,4	MA165	NTE519	ECG519	SK3100/519	
D307	MA150	NTE519	ECG519	SK3100/519	
D401,2	MA165	NTE519	ECG519	SK3100/519	
D403	MA4056	NTE5011A	ECG5011A	SK5A6/5011A	
D451	ERA1501	NTE552	ECG552	SK9000/552	
	EM1Z	NTE116	ECG116	SK3311	
D452	QB118	NTE5077A	ECG5077A	SK18V/5077A	
	TVSQB118	NTE5077A	ECG5077A	SK18V/5077A	
D453	MA150	NTE519	ECG519	SK3100/519	
D501	MA4082M	NTE5016A	ECG5016A	SK8A2/5016A	
D502	QA206M	NTE5012A	ECG5012A	SK6A0/5012A	#
	TVSQA206M	NTE5012A	ECG5012A	SK6A0/5012A	
D506	ERA2204	NTE552	ECG552	SK9000/552	#
D507	MA4062H	NTE5013A	ECG5013A	SK6A2/5013A	
D508	MA4047M	NTE5009A	ECG5009A	SK4A7/5009A	
D551	ERA2204	NTE552	ECG552	SK9000/552	
D552	MA162	NTE519	ECG519	SK3100/519	
D555	MA4180M	NTE5027A	ECG5027A	SK18A/5027A	
D557	MA4082M	NTE5016A	ECG5016A	SK8A2/5016A	
D601,2	MA165	NTE519	ECG519	SK3100/519	
D605,6,7,8	MA1130	NTE5022A	ECG5022A	SK13A/5022A	
D752	ERD07-15	NTE551	ECG551	SK3125A/551	
	ERD0715	NTE551	ECG551	SK3125A/551	
D753	RU3N	NTE580	ECG580	SK5036/580	#
	TVSRU3N	NTE580	ECG580	SK5036/580	

PARTS LIST AND DESCRIPTION (Continued)
(When ordering parts, state Model, Part Number, and Description)

SEMICONDUCTORS (Select replacement for best results)

ITEM No.	MFGR. PART No./ TYPE No.	NTE PART No.	ECG PART No.	TCE PART No.	NOTES
D755,6 D801 THRU D804 D805	MA165 RM10B QB118 TVSQB118	NTE519 NTE125 NTE5077A NTE5077A	ECG519 ECG125 ECG5077A ECG5077A	SK3100/519 SK3081/125 SK18V/5077A SK18V/5077A	#
D806	AU01Z				
D807	EU02A	NTE552	ECG552	SK9000/552	
D808	AU02Z				
D811	RG4	NTE580	ECG580	SK5036/580	#
	RG4LFM1	NTE580	ECG580	SK5036/580	
D812	RU3AN	NTE552	ECG552	SK9000/552	#
	TVSRU3AN	NTE552	ECG552	SK9000/552	
	RU3AM	NTE580	ECG580	SK3318A	
D813	RG4	NTE580	ECG580	SK5036/580	#
	RG5LFM1	NTE580	ECG580	SK5036/580	
D815	EU2	NTE552	ECG552	SK9000/552	#
	TVSEU2	NTE552	ECG552	SK9000/552	
D816	SR2KN TVSSR2KN				
D817	AU02Z				
D818,9	MA165	NTE519	ECG519	SK3100/519	
D827	MA4200H				
D828	AS01	NTE552	ECG552	SK9000/552	
D832	ERZC10ZK241U	NTE2V150	ECG2V150	SKMV150J/2V150	
D901	MA1120M QA211CD				
D954	MA150	NTE519	ECG519	SK3100/519	
D1201,2,3	MA165	NTE519	ECG519	SK3100/519	
D1204	MA4100M	NTE5019A	ECG5019A	SK10A/5019A	
D1501	MA1051M	NTE5010T1	ECG5010T1		
D2208	MA165	NTE519	ECG519	SK3100/519	
D2501,2	MA165	NTE519	ECG519	SK3100/519	
D2505,6	MA856	NTE519	ECG519	SK3100/519	
D2507	MA4120M	NTE5021A	ECG5021A	SK12A/5021A	
D2901	MA165	NTE519	ECG519	SK3100/519	
D2902	MA4120M	NTE5021A	ECG5021A	SK12A/5021A	
D3001,2	MA165	NTE519	ECG519	SK3100/519	
IC011	MN15286Q9				
IC012	MN8303(IC)				

PARTS LIST AND DESCRIPTION (Continued)
(When ordering parts, state Model, Part Number, and Description)

SEMICONDUCTORS (Select replacement for best results)

ITEM No.	MFGR. PART No./ TYPE No.	NTE PART No.	ECG PART No.	TCE PART No.	NOTES
IC013	D4066BC MN4066B UPD4066BC TVSUPD4066BC	NTE4066B NTE4066B NTE4066B NTE4066B	ECG4066B ECG4066B ECG4066B ECG4066B	SK4066B SK4066B SK4066B SK4066B	
IC101	M51366SP				
IC301	AN5301NK				
IC451	AN5521	NTE1782	ECG1782	SK9730	#
IC801	STR60001				#
IC802	AN7812	NTE966	ECG966	SK3592/966	
IC803	AN78M09				
IC804	S1854M4				#
IC806	S1854LBM-4 P621				#
IC1201,2,3,4,5	TLP621GR M5218L TVSM5218L UPC4570HA				
IC1206	D4052BC UPD4052BC TVSUPD4052BC TC4052BP MN4052B M4052BP	NTE4052B NTE4052B NTE4052B NTE4052B NTE4052B NTE4052B	ECG4052B ECG4052B ECG4052B ECG4052B ECG4052B ECG4052B	SK4052B SK4052B SK4052B SK4052B SK4052B SK4052B	
IC1207	AN5262		ECG1783		
IC1501	M5229P				
IC1502	LC7522				
IC1503	M5229P				
IC2200	CX20112	NTE15007			
IC2201	A1011(IC) CXA1011P	NTE15023 NTE15023			
IC2301	LA4280				
	LA4280-TV				
IC2303	AN5836	NTE1780	ECG1780	SK9731	
IC2502	D4066BC UPD4066BC TVSUPD4066BC TC4066BC MN4066B M4066BP	NTE4066B NTE4066B NTE4066B NTE4066B NTE4066B NTE4066B	ECG4066B ECG4066B ECG4066B ECG4066B ECG4066B ECG4066B	SK4066B SK4066B SK4066B SK4066B SK4066B SK4066B	

PARTS LIST AND DESCRIPTION (Continued)
(When ordering parts, state Model, Part Number, and Description)

SEMICONDUCTORS (Select replacement for best results)

ITEM No.	MFGR. PART No./ TYPE No.				NOTES
		NTE PART No.	ECG PART No.	TCE PART No.	
Q301	B643-R	NTE19	ECG19	SK3912	
	2SB643-R	NTE19	ECG19	SK3912	
	2SB643	NTE19	ECG19	SK3912	
	2SB643RS	NTE19	ECG19	SK3912	
	2SA684	NTE294	ECG294	SK3841/294	
	2SA684RS	NTE294	ECG294	SK3841/294	
Q302	B641-R	NTE19	ECG19	SK3912	
	2SB641-R	NTE19	ECG19	SK3912	
	2SB641	NTE19	ECG19	SK3912	
	2SB641RS	NTE19	ECG19	SK3912	
	2SA564	NTE290A	ECG290A	SK3932/91	
	2SA564RS	NTE290A	ECG290A	SK3932/91	
Q304	B642-R	NTE19	ECG19	SK3912	
	2SB642-R	NTE19	ECG19	SK3912	
	2SB642	NTE19	ECG19	SK3912	
	2SB642RS	NTE19	ECG19	SK3912	
	2SA564A	NTE290A	ECG290A	SK3932/91	
	2SA564RS	NTE290A	ECG290A	SK3932/91	
Q305,6	D637-R	NTE16	ECG16	SK9664	
	2SD637-R	NTE16	ECG16	SK9664	
	2SD637	NTE16	ECG16	SK9664	
	2SD637RS	NTE16	ECG16	SK9664	
	2SC1685	NTE85	ECG85	SK9229/85	
	2SC1685RS	NTE85	ECG85	SK9229/85	
Q311	B642-S	NTE19	ECG19	SK3912	
	2SB642-S	NTE19	ECG19	SK3912	
	2SB642	NTE19	ECG19	SK3912	
	2SB642RS	NTE19	ECG19	SK3912	
	2SA564A	NTE290A	ECG290A	SK3932/91	
	2SA564RS	NTE290A	ECG290A	SK3932/91	
Q312,3,4,5,6	D637-R	NTE16	ECG16	SK9664	
	2SD637-R	NTE16	ECG16	SK9664	
	2SD637	NTE16	ECG16	SK9664	
	2SD637RS	NTE16	ECG16	SK9664	
	2SC1685	NTE85	ECG85	SK9229/85	
	2SC1685RS	NTE85	ECG85	SK9229/85	
Q317	B642-R	NTE19	ECG19	SK3912	F
	2SB642-R	NTE19	ECG19	SK3912	
	2SB642	NTE19	ECG19	SK3912	
	2SB642RS	NTE19	ECG19	SK3912	
	2SA564A	NTE290A	ECG290A	SK3932/91	
	2SA564RS	NTE290A	ECG290A	SK3932/91	
Q351,2,3	C3942				
	2SC3942				
	2SC3942RL				

PARTS LIST AND DESCRIPTION (Continued)
(When ordering parts, state Model, Part Number, and Description)

SEMICONDUCTORS (Select replacement for best results)

ITEM No.	MFGR. PART No./ TYPE No.				NOTES
		NTE PART No.	ECG PART No.	TCE PART No.	
Q354,5,6	D636-Q	NTE16	ECG16	SK9664	
	2SD636-Q	NTE16	ECG16	SK9664	
	2SC1685	NTE85	ECG85	SK9229/85	
	2SC1685QR	NTE85	ECG85	SK9229/85	
	2SD636	NTE16	ECG16	SK9664	
	2SD636QR	NTE16	ECG16	SK9664	
	2SD637	NTE16	ECG16	SK9664	
	2SD637QR	NTE16	ECG16	SK9664	
		NTE16	ECG16	SK9664	
Q451	D637-R	NTE16	ECG16	SK9664	
	2SD637-R	NTE16	ECG16	SK9664	
	2SD637	NTE16	ECG16	SK9664	
Q501	2SC1685	NTE85	ECG85	SK9229/85	
	C2653(H)	NTE198	ECG198	SK3220/198	
	2SC2653(H)	NTE198	ECG198	SK3220/198	
	2SC2653H	NTE198	ECG198	SK3220/198	
		NTE198	ECG198	SK3220/198	
Q551 Q701	2SD1175	NTE89	ECG89	SK9411/389	#
	D637-R	NTE16	ECG16	SK9664	
	2SD637-R	NTE16	ECG16	SK9664	
	2SD637	NTE16	ECG16	SK9664	
	2SD637QR	NTE16	ECG16	SK9664	
	2SC1685	NTE85	ECG85	SK9229/85	
	2SC1685QR	NTE85	ECG85	SK9229/85	
		NTE85	ECG85	SK9229/85	
		NTE85	ECG85	SK9229/85	
Q702	B642-R	NTE19	ECG19	SK3912	
	2SB642-R	NTE19	ECG19	SK3912	
	2SB642	NTE19	ECG19	SK3912	
	2SB642QR	NTE19	ECG19	SK3912	
	2SA564A	NTE290A	ECG290A	SK3932/91	
	2SA564QR	NTE290A	ECG290A	SK3932/91	
Q703	D1266Q	NTE377	ECG377	SK9112/377	
	2SD1266Q	NTE377	ECG377	SK9112/377	
	2SD1266PQ	NTE377	ECG377	SK9112/377	
Q801	C1384S	NTE293	ECG293	SK3849/293	
	2SC1384S	NTE293	ECG293	SK3849/293	
	2SC1384	NTE293	ECG293	SK3849/293	
	2SC1384RS	NTE293	ECG293	SK3849/293	
Q802	D637-S	NTE16	ECG16	SK9664	
	2SD637-S	NTE16	ECG16	SK9664	
	2SD637	NTE16	ECG16	SK9664	
	2SD637RS	NTE16	ECG16	SK9664	
	2SC1685	NTE85	ECG85	SK9229/85	
	2SC1685RS	NTE85	ECG85	SK9229/85	
Q805	A879Q	NTE288	ECG288	SK3434/288	
	2SA879Q	NTE288	ECG288	SK3434/288	
	2SA879	NTE288	ECG288	SK3434/288	
Q901,2,3	D637-R	NTE16	ECG16	SK9664	
	2SD637-R	NTE16	ECG16	SK9664	
	2SD637	NTE16	ECG16	SK9664	
	2SD637QR	NTE16	ECG16	SK9664	
		NTE16	ECG16	SK9664	

PANASONIC MODELS
CTK-2790S, PC-29S90S(CH, AEDP152, YAEDP152)

PARTS LIST AND DESCRIPTION (Continued)
(When ordering parts, state Model, Part Number, and Description)

SEMICONDUCTORS (Select replacement for best results)

ITEM No.	MFGR. PART No./ TYPE No.	NTE			NOTES
		PART No.	PART No.	PART No.	
Q951,2,3	D637-Q	NTE16	ECG16	SK9664	
	2SD637-Q	NTE16	ECG16	SK9664	
	2SD637	NTE16	ECG16	SK9664	
	2SC1685	NTE85	ECG85	SK9229/85	
Q954	B642-S	NTE19	ECG19	SK3912	
	2SB642-S	NTE19	ECG19	SK3912	
	2SB642	NTE19	ECG19	SK3912	
Q955	B940P	NTE398	ECG398	SK9363/398	
	2SB940P	NTE398	ECG398	SK9363/398	
	2SB940PLB	NTE375	ECG375	SK9118/375	
	2SB940APLB	NTE375	ECG375	SK9118/375	
Q956	D1264P	NTE375	ECG375	SK9118/375	
	2SD1264P	NTE375	ECG375	SK9118/375	
	2SD1264PLB	NTE375	ECG375	SK9118/375	
	2SD1264APLB	NTE375	ECG375	SK9118/375	
Q1201	N1213	NTE2359	ECG2359		
	UN1213	NTE2359	ECG2359		
Q1501,2	D637-R	NTE16	ECG16	SK9664	
	2SD637-R	NTE16	ECG16	SK9664	
	2SD637	NTE16	ECG16	SK9664	
	2SD637QR	NTE16	ECG16	SK9664	
	2SC1685	NTE85	ECG85	SK9229/85	
	2SC1685QR	NTE85	ECG85	SK9229/85	
Q2201,2	2SD601A	NTE2408	ECG2408		
	2SD601AW	NTE2408	ECG2408		
Q2203,4,5,8	2SD601AQW	NTE2408	ECG2408		
	2SB709AQW	NTE159	ECG159	SK3466/159	
Q2210,2	2SD601A	NTE2408	ECG2408		
	2SD601AQW	NTE2408	ECG2408		
Q2301,2	2SD601A	NTE2408	ECG2408		
	2SD601AW	NTE2408	ECG2408		
Q2303,4	2SB709A	NTE159	ECG159	SK3466/159	
	2SB709AW	NTE159	ECG159	SK3466/159	
Q2501	D637-R	NTE16	ECG16	SK9664	
	2SD637-R	NTE16	ECG16	SK9664	
	2SD637	NTE16	ECG16	SK9664	
	2SD637QR	NTE16	ECG16	SK9664	
	2SC1685	NTE85	ECG85	SK9229/85	
	2SC1685QR	NTE85	ECG85	SK9229/85	
Q2504,6	D637-Q	NTE16	ECG16	SK9664	
	2SD637-Q	NTE16	ECG16	SK9664	
	2SD637	NTE16	ECG16	SK9664	
	2SC1685	NTE85	ECG85	SK9229/85	

PARTS LIST AND DESCRIPTION (Continued)
(When ordering parts, state Model, Part Number, and Description)

SEMICONDUCTORS (Select replacement for best results)

ITEM No.	MFGR. PART No./ TYPE No.	NTE			NOTES
		PART No.	PART No.	PART No.	
Q2507	D637-R	NTE16	ECG16	SK9664	
	2SD637-R	NTE16	ECG16	SK9664	
	2SD637	NTE16	ECG16	SK9664	
	2SD637QR	NTE16	ECG16	SK9664	
	2SC1685	NTE85	ECG85	SK9229/85	
Q2508	2SC1685QR	NTE85	ECG85	SK9229/85	
	B642-R	NTE19	ECG19	SK3912	
	2SB642-R	NTE19	ECG19	SK3912	
	2SB642	NTE19	ECG19	SK3912	
	2SB642QR	NTE19	ECG19	SK3912	
Q2510	2SA564A	NTE290A	ECG290A	SK3932/91	
	2SA564QR	NTE290A	ECG290A	SK3932/91	
Q2901	D637-R	NTE16	ECG16	SK9664	
	2SD637-R	NTE16	ECG16	SK9664	
	2SD637RS	NTE16	ECG16	SK9664	
	2SC1685RS	NTE85	ECG85	SK9229/85	
	D637-Q	NTE16	ECG16	SK9664	
Q2902	2SD637	NTE16	ECG16	SK9664	
	2SC1685	NTE85	ECG85	SK9229/85	
Q2903	N1112	NTE2358	ECG2358	SK9741	
	UN1112	NTE2358	ECG2358	SK9741	
Q2904	N1212	NTE2357	ECG2357	SK9742	
	UN1212	NTE2357	ECG2357	SK9742	
Q2905,6	D637-Q	NTE16	ECG16	SK9664	
	2SD637-Q	NTE16	ECG16	SK9664	
	2SD637	NTE16	ECG16	SK9664	
	2SC1685	NTE85	ECG85	SK9229/85	
	2SC1685RS	NTE85	ECG85	SK9229/85	
Q2907	D637-Q	NTE16	ECG16	SK9664	
	2SD637-Q	NTE16	ECG16	SK9664	
	2SD637	NTE16	ECG16	SK9664	
	2SC1685	NTE85	ECG85	SK9229/85	
	D636-R	NTE16	ECG16	SK9664	
	2SD636-R	NTE16	ECG16	SK9664	
Q3001 THRU Q3014	2SD636RS	NTE16	ECG16	SK9664	
	2SD637RS	NTE16	ECG16	SK9664	
	2SD1685RS				

For SAFETY use only equivalent replacement part.

PARTS LIST AND DESCRIPTION (Continued)
(When ordering parts, state Model, Part Number, and Description)

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		
		MFGR. PART No.	NTE PART No.	
# R806	27 5% 5W Wirewound	ERF5ZJ270	5QW027	
# R808	39K 5% 2W Metal Oxide	ERG2ANJ393	2W339	
# R811	0.56 10% 1W Fusible	ERQ1CKPR56		
# R812	15 5% 3W Metal Oxide	ERG3ANJ150	3W015	
# R813	2.7M 5% 1/2W Carbon Comp	ERC12Z6K275	HW527	
# R821	1.8 5% 1/2W Fusible	ERQ12HJ1R8		
# R825	470 5% 1/4W Fusible	ERQ14AJ471		
# R831	0.33 5% 1/2W Metal Oxide	ERX12SJR33		
R961	150 5% 1/2W Fusible	ERQ12HJ151		
R2203	82K 1% 1/4W Metal Oxide	ER025CKF8202		
R2204	82K 1% 1/4W Metal Oxide	ER025CKF8202		
R2243	560K 1% 1/4W Metal Oxide	ER025CKF5603		
R2245	22K 1% 1/4W Metal Oxide	ER025CKF2202		
R2315	33 5% 1/4W Fusible	ERQ14AJ330		

For SAFETY use only equivalent replacement part.

COILS (RF-IF)

ITEM No.	FUNCTION	MFGR. PART No.	ITEM No.	FUNCTION	MFGR. PART No.
I011	Peaking (5.6uH)	ELEXT5R6KA	L048	Peaking (5.6uH)	TLTACC5R6KR
L013	Peaking (5.6uH)	TLTACC5R6KA	L049	Peaking (5.6uH)	TLTACC5R6KR
L014	Peaking (5.6uH)	ELEXT5R6KA	L050	Peaking (5.6uH)	TLTACC5R6KR
L015	Peaking (5.6uH)	ELEXT5R6KA	L051	Peaking (5.6uH)	ELEXT5R6KA
L016	Peaking (1.0uH)	TLTACC1R0KR	L052	Peaking (5.6uH)	ELEXT5R6KA
L017	Peaking (1.0uH)	TLTACC1R0KA	L053	Peaking (5.6uH)	ELEXT5R6KA
L018	Peaking (6.8uH)	TLTACC6R8KA	L054	Peaking (5.6uH)	ELEXT5R6KA
L019	Peaking (5.6uH)	ELEXT5R6KA	L055	Peaking (5.6uH)	TLTACC5R5KR
L020	Peaking (5.6uH)	ELEXT5R6KA	L056	Peaking (5.6uH)	TLTACC5R5KR
L022	Peaking (2.2uH)	ELEXT2R2KA	L057	Peaking (5.6uH)	ELEXT5R6KA
L023	Peaking (5.6uH)	ELEXT5R6KA	L058	Peaking (5.6uH)	ELEXT5R6KA
L024	Peaking (5.6uH)	ELEXT5R6KA	L059	Peaking (5.6uH)	TLTACC5R6KR
L025	Peaking (5.6uH)	ELEXT5R6KA	L060	Peaking (5.6uH)	TLTACC5R6KR
L026	Peaking (5.6uH)	ELEXT5R6KA	L061	Peaking (5.6uH)	ELEXT5R6KA
L027	Peaking (5.6uH)	ELEXT5R6KA	L062	Peaking (5.6uH)	ELEXT5R6KA
L028	Peaking (5.6uH)	ELEXT5R6KA	L063	Peaking (5.6uH)	ELEXT5R6KA
L029	Peaking (5.6uH)	ELEXT5R6KA	L064	Peaking (5.6uH)	TLTACC5R6KR
L030	Peaking (2.2uH)	ELEXT2R2KA	L065	Peaking (5.6uH)	ELEXT5R6KA
L031	Peaking (2.2uH)	ELEXT2R2KA	L066	Peaking (5.6uH)	ELEXT5R6KA
L032	Peaking (2.2uH)	ELEXT2R2KA	L067	Peaking (5.6uH)	ELEXT5R6KA
L033	Peaking (2.2uH)	ELEXT2R2KA	L101	Peaking (1.2uH)	ELEQE1R2JA
L034	Peaking (2.2uH)	ELEXT2R2KA	L103	Peaking (68uH)	TLT680K991R
L035	Peaking (2.2uH)	ELEXT2R2KA	L104	Peaking (68uH)	TLT680K991R
L036	Peaking (5.6uH)	ELEXT5R6KA	L105	Peaking (150uH)	TLT151K991R
L037	Peaking (5.6uH)	ELEXT5R5KA	L106	VCO	EIV7EN053B
L038	Peaking (5.6uH)	ELEXT5R6KA	L107	AFT	E1V7EN052B
L039	Peaking (5.6uH)	ELEXT5R6KA	L108	Peaking (15uH)	TLT150K991R
L040	Peaking (5.6uH)	ELEXT5R6KA	L109	Peaking (68uH)	TLT680K991R
L041	Peaking (5.6uH)	ELEXT5R6KA	L110	Peaking (0.56uH)	ELEQER56JA
L042	Peaking (5.6uH)	ELEXT5R6KA	L113	Peaking (100uH)	TLT101J991R
L043	Peaking (5.6uH)	ELEXT5R6KA	L201	Quadrature	EIS7ES004B
L044	Peaking (5.6uH)	ELEXT5R6KA	L202	Peaking (1.2pF)	ELEQH1R2JA
L045	Peaking (5.6uH)	ELEXT5R6KA	L305	Peaking (82uH)	TLT820K991R
L046	Peaking (5.6uH)	ELEXT5R6KA	L307	Peaking (4.7uH)	TLQ047K236
L047	Peaking (5.6uH)	ELEXT5R6KA	L312	Peaking (0.22uH)	TLQR22L186

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.
L353	Peaking (180uH)	TLQ181K186	# L613	Noise Filter	ELKTH150GA
L354	Peaking (180uH)	TLQ181K186	# L751	Pincushion	TLH13711
L355	Peaking (180uH)	TLQ181K186	# L801	Line Filter	ELF18D850C
L356	Peaking (47uH)	TLQ470K186	# L802	Line Filter	ELF18D666A
L357	Peaking (47uH)	TLQ470K186	L812	Rf Filter	ELC108011
L358	Peaking (47uH)	TLQ470K186	L901	Peaking (33uH)	ELEPH330KA
L359	Peaking (1.0uH)	ELEPH1ROMA	L951	Peaking (15uH)	ELEPH150KA
L401	Peaking (12uH)	TLQ120K236	L2202	Peaking (12uH)	TLX123J116
L402	RF Choke	ELC08D058	L3002	VC Mixer Coil	E1K7ES010B
# L551	Linearity	TLH6626P	L3004	Peaking (39uH)	TLT390J991R
L602	Peaking (82uH)	TLT820K991R	L3005	Peaking (12uH)	TLT120J991R
L611	Noise Filter	ELKTH150GA	L3006	Peaking (10uH)	TLT100J991R
L612	Noise Filter	ELKTH150GA	L3007	Peaking (15uH)	TLT150J991R

For SAFETY use only equivalent replacement part.

COILS & TRANSFORMERS

ITEM No.	FUNCTION	MFGR. PART No.	OTHER IDENTIFICATION	NOTES
# DY1	Yoke 110' Horiz .821mh Vert 25.5mh	TLY15422F1	TLY15422F1 (1)	
# T001	Power	ETP28Z181AY	P181 (1)	
# T501	Horizontal Drive	ETH19Y70AY	H70 (1)	
# T551	Horizontal Output	TLF15521F2	TLF15521F (1)	
# T801	Switch Mode Power	ETS42K505A	ETS42K505A 91)	

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

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
SP1A, SP1B	Speakers Housing Assembly (Left)	TXFAB017SER	On Unit #EAS-15S02V On Unit #4FP10R	
SP1A SP1B	2 1/2" x 6" PM, 8 Ohm 2" Piezo, 140 Ohm			
SP2A, SP2B	Speaker Housing Assembly (Right)	TXFAB027SER	On Unit #EAS-15S02V On Unit #4FP10R	
SP2A SP2B	2 1/2" x 6" PM 8 Ohm 2" Piezo, 140 Ohm			

MISCELLANEOUS

ITEM No.	PART NAME	MFGR. PART No.	NOTES
CRA801	Capristor	LN219RP	240pF, 10K, Spark Gap
D060	LED	LN419YF	Power, Red
D061	LED	XBA1F40NU100	TIMER, Orange
F001	Fuse (4.0A @ 125V)		
JK2311-1	Jack	(1)	Left Audio In
JK2311-2	Jack	(1)	Right Audio In
JK2501-1	Jack	(2)	S-Video "
JK2501-2	Jack	(2)	Monitor Out Video

PARTS LIST AND DESCRIPTION (Continued) (When ordering parts, state Model, Part Number, and Description)

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	MFGR. PART No.
C205	10pF NP 16V	ECEA1CN100S
C31F	1pF NP 50V	ECEA1HN010S
C318	33pF NP 16V	ECEA1CN330
C352	1pF NP 50V	ECEA1HN010S
C404	10pF Tantalum 25V	ECSZ25EF10N
# C756	4.7pF NP 63V	ECEA63W4R71
# C806	680pF 500V	ECES2DG681V
# C818	220pF 160V	ECES2CG221
# C821	1000pF 35V	ECEA1VGE102
# C825	330pF 35V	ECEA1VGE331
# C826	330pF 25V	ECEA1EF331
C901	10pF NP 16V	ECEA1CN100S
C1206	3.3pF NP 25V	ECEA1EN3R3S
C1208	3.3pF NP 25V	ECEA1EN3R3S

For SAFETY use only equivalent replacement part.

CAPACITORS

ITEM No.	RATING	MFGR. PART No.
C023	100pF 50V 20% Network	EXFP4101MBW
C024	100pF 50V 20% Network	EXFP4101MBW
C025	100pF 50V 20% Network	EXFP4101MBW
C028	33pF NPO 50V 5%	ECCF1H330JC
C029	33pF NPO 50V 5%	ECCF1H330JC
C036	8pF NPO 50V ± 25 pF	ECCF1H080CC
C037	68pF NPO 50V 5%	ECCF1H680JC
C055	470pF 50V +80% -20% Network	EXFP6471ZF
C056	470pF 50V +80% -20% Network	EXFP6471ZF
C057	30pF Trimmer	TCRHA030E11
C058	60pF Trimmer	ECRHB060G31
C119	27pF N330 50V 5%	ECCF1H270JS
C122	8pF NPO 50V ± 0.5 pF	ECCF1H080DC
C123	56pF N220 50V 5%	ECCF1H560JR
C138	33pF NPO 50V 5%	ECCF1H330JC
C140	10pF NPO 50V ± 0.5 pF	ECCF1H100DC
C172	5pF NPO 50V ± 0.5 pF	ECCF1H050DC
C175	4pF 50V ± 0.25 pF	TCBL1H040C
C202	5pF 50V ± 0.25 pF	ECCF1H050CC
C208	82pF NPO 50V 5%	ECCF1H820JC
C309	10pF N220 50V ± 0.5 pF	ECCF1H100DR
	22pF N220 50V	
C310	10pF N220 50V ± 0.5 pF	ECCF1H100DR
C315	47pF N220 50V 5%	ECCF1H470JR
C503	470pF N750 50V 5%	ECCF1H471JU
# C552	0.56 200V 5%	ECQF2H564JZ

For SAFETY use only equivalent replacement part.

MODEL NUMBER

ITEM No.	RATING	MFGR. PART No.
C1214	33pF NP 16V	ECEA1CN330S
C1215	10pF NP 16V	ECEA1CN100S
C1216	10pF NP 16V	ECEA1CN100S
C1223	10pF NP 16V	ECEA1CN100S
C1224	10pF NP 16V	ECEA1CN100S
C2217	10pF NP 16V	ECEA1CN100S
C2222	3.3pF Tantalum 16V	ECSZ16EF3R3
C2225	2.2pF Tantalum 16V	ECSZ16EF2R2
C2244	10pF Tantalum 16V	ECXZ16EF10
C2333	10pF NP 16V	ECEA1CN100S
C2336	10pF NP 16V	ECEA1CN100S
C2904	1pF NP 50V	ECEA1HSN010
C2907	1pF NP 50V	ECEA1HSN010
C3001	10pF NP 16V	ECEA1CN100S

ITEM No.	RATING	MFGR. PART No.
# C553	820pF 2000V 5%	ECKD3D821JB
# C554	0.033 50V 5%	ECQH1H333JV
# C557	0.0012 1200V 5%	ECWH12H122JS
# C558	0.0015 1200V 5%	ECWH12H152JS
# C559	470pF 2000V 5%	ECKD3D471JB
# C561	0.033 50V 5%	ECQM1H333JV
C601	8pF N750 50V ± 0.5 pF	ECCF1H080DU
C611	100pF NPO 50V 5%	ECCF1H101JC
C615	15pF NPO 50V 5%	ECCF1H150JC
# C757	0.022 400V 5%	ECQM4223JZ
# C758	0.012 1200V 5%	ECWH12H123JS
# C759	0.001 2000V 10%	ECKD3D102KB
# C760	0.0012 2000V 10%	ECKD3D122KB
# C801	0.0022 125VAC +80% -20%	ECKCFL222ZE
# C804	0.0047 500V +100% -0%	ECKD2H472PE
# C805	0.0047 500V +100% -0%	ECKD2H472PE
# C810	0.047 125VAC 10%	ECQU1A473KH
C828	0.0047 125VAC +80% -20%	ECKDFL472ZE
C829	0.0047 125VAC +80% -20%	ECKDFL472ZE
C854	100pF 125VAC 20%	ECKCFL101ME
C855	100pF 125VAC 20%	ECKCFL101ME
C871	0.0022 125VAC +80% -20%	ECKCFL222ZE
C3004	56pF NPO 50V 5%	ECCF1H330JC
C3010	18pF NPO 50V 5%	ECCF1H180JC
C3011	150pF N150 50V 5%	ECCF1H151JP
C3012	100pF N150 50V 5%	ECCF1H101JP
C3013	33pF NPO 50V 5%	ECCF1H330JC
C3014	180pF NPO 50V 5%	ECCF1H181JC

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
R113	RF AGC	5000	EVN64AA00B53	
R136	Video Level	1000	EVND4AA00B13	
R309	Sub Contrast	500	EVND4AA00B52	
R324	Sub Brightness	20K	EVN54AA00B24	
R354	Red Cutoff	5000	EVN89AA00B53	
R355	Blue Cutoff	5000	EVN89AA00B53	
R356	Green Cutoff	5000	EVN89AA00B53	
R360	Red Drive	300	EVN89AA00B32	
R361	Blue Drive	300	EVN89AA00B32	
R405	Vertical Size	100	EVN64AA00B12	
R524	Horizontal Center	200	EVN64AA00B22	
# R599A	Focus	(1)		
# R599B	Screen	(1)		
R602	GYR	10K	EVND4AA00B14	
R614	Sub Tint	5000	EVND4AA00B53	
R758	Horizontal Width	5000	EVN64AA00B53	
R760	PCC	20K	EVN64AA00B24	
R2200	Input Level	5000	EVND1AA00B53	
R2202	SAP Filter	50K	EVND4AA00B54	
R2205	SAP VCO	100K	EVND4AA00B15	
R2222	L-R Level	10K	EVND4AA00B14	
R2225	Stereo VCO	10K	EVND4AA00B14	
R2226	Pilot Cancel	500K	EVND4AA00B55	
R2229	Separation	10K	EVND4AA00B14	
R2230	SAP Level	10K	EVND4AA00B14	
R2236	Output Level	50K	EVND4AA00B54	
R2242	Separation	5000	EVND4AA00B53	
R3013	Balance	500	EVND4AA00B52	

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA	
		MFGR. PART No.	NTE PART No.
# D810	5.9 PTC Cold	TRPW580M0509	
R054	4700 Network	EXBZ5E472J	
R404	470 NTC C04	ERPF3A2M471M	
R452	10 5% 1/4W Fusible	ERQ14AJ100	
# R506	820 5% 1/4W Carbon Film	ERD25TLJ821	QW182
# R507	680 5% 1/4W Carbon Film	ERD25TLJ681	QW168
# R509	7320 1% 1/4W Metal Oxide	ER025CKF7321	
# R510	24.3K 1% 1/4W Metal Oxide	ER025CKF2432	
# R513	560 5% 1/4W Carbon Film	ERD25TLJ561	QW156
R515	3300 5% 3W Metal Oxide	ERG3SJS332	3W233
# R516	680 5% 2W Fusible	ERQ2CJP681	F2W168
# R523	1.0 5% 1/2W Carbon Film	ERDS1FJ1RO	1W1D0
R553	2.2 10% 5W Wirewound	ERF5ZK@R2	5W2D2
R554	2.4 5% 2W Fusible	ERQ2CJ2R4	F2W2D4
# R557	1000 5% 1W Fusible	ERQ1CJP102	F1W210
R625	64.9K 1% 1/4W Metal Oxide	EROS2CKF6492	
R765	10 5% 2W Fusible	ERQ2CJP100	F2W010
# R767	1000 5% 5W Metal Oxide	ERG5SJI02	
# R801	0.47 10% 5W Wirewound	ERF5AKR47	5WD47
# R804	100 5% 5W Metal Oxide	ERG5SJI01	
# R805	10 5% 1W Metal Oxide	ERG1ANJ100	1W010

PARTS LIST AND DESCRIPTION (Continued)
(When ordering parts, state Model, Part Number, and Description)

MISCELLANEOUS

ITEM No.	PART NAME	MFGR. PART No.	NOTES
JK2501-3	Jack	(2)	Monitor Out Left
JK2501-4	Jack	(2)	Monitor Out Right
JK2501-5	Jack	(2)	AV1 IN Video
JK2501-6	Jack	(2)	AV1 IN Left
JK2501-7	Jack	(2)	AV1 In Right
JK2901-1	Jack	(3)	AV2 Video
JK2901-2	Jack	(3)	AV2 Left
JK2901-3	Jack	(3)	AV2 Right
JK2901-4	Jack	(3)	Surround Speakers Jack
JK2901-5	Jack	(3)	External Speaker Jack
L012	Ferrite Bead		TSC925-4
L352	Ferrite Bead		TSC925-4
L552	Ferrite Bead		TSC925-4
L555	Ferrite Bead	TSC911	
L556	Ferrite Bead	TSC910	
L803	Ferrite Bead	TSC925-4	
L805	Ferrite Bead	TSC925-4	
L806	Ferrite Bead	TSC925-4	
L807	Ferrite Bead	TSC925-4	
L808	Ferrite Bead	TSC925-4	
L809	Ferrite Bead	TSC925-4	
L815	Ferrite Bead	TSC937	
L953	Ferrite Bead	TSC929-6	
L954	Ferrite Bead	TSC929-6	
L955	Ferrite Bead	TSC929-6	
L960	Ferrite Bead	TSC932	
L961	Ferrite Bead	TSC932	
L3001	Delay Line	EFDBN645B95G	1 Henry
L3003	Delay Line	ELT10Z321	
LC014	Noise Filter	ELKTH150GA	
LC015	Noise Filter	ELKTH150GA	
LC016	Noise Filter	ELKTH150GA	
LC017	Noise Filter	ELKTH150GA	
LC116	IF Filter	ELB5A062	
LC117	IF Filter	ELB5A063	
RL001	Power Relay	TSE1854	
S001	Switch	EVQQS605T	Channel Up
S002	Switch	EVQQS605T	Channel Down
S003	Switch	EVQQS605T	Power
S004	Switch	EVQQVC13T	Display
S005	Switch	EVQQVC13T	Erase
S006	Switch	EVQQVC13T	Add
S007	Switch	EVQQVC13T	Data Up
S008	Switch	EVQQVC13T	Data Down
S009	Switch	EVQQS605T	Volume Up
S010	Switch	EVQQS605T	Volume Down
S011	Switch	EVQQS605T	TV/Video
S012	Switch	EVQQVC13T	Timer
S013	Switch	EVQQVC13T	Fast
S014	Switch	EVQQVC13T	Slow
S015	Switch	EVQQVC13T	Cursor Right
S016	Switch	EVQQVC13T	Antenna
S018	Switch	EVQQVC13T	Graphic Equalizer
S019	Switch	EVQQVC13T	Auto
S020	Switch	EVZZVC13T	Normal
S021	Switch	EVQQVC13T	Function Audio
S022	Switch	EVQQVC13T	Function Video

PARTS LIST AND DESCRIPTION (Continued)
(When ordering parts, state Model, Part Number, and Description)

MISCELLANEOUS

ITEM No.	PART NAME	MFGR. PART No.	NOTES
S023	Switch	ESD32216	
S024	Switch	EVQQS605T	
S025	Switch	EVQQVC13T	
S050	Switch	ESB64613	AFC
S051	Switch	EVQQVC13T	Set
S301	Switch	EVQR7AL13	Service
S601	Switch	ESB64613	Color Pilot
S2301	Switch	ESD1512250	External Video
S2501	Switch	ESD1512250	Video-Normal
S2502	Switch	ESB64613	Notch Filter
X011	Crystal	TAFCSA200MG	Clock 2MHz
X012	Crystal	TSS1013-D	Oscillator 32.7kHz
X101	SAW Filter	EFCH45MNQ1	
X102	Trap	EFCS4R5MW3BA	4.5MHz
X201	Filter	EFCS4R5MS4W	4.5MHz Bandpass
X501	Crystal	TAFCSB503F33	Horizontal oscillator
X601	Crystal	TSS816M	3.58MHz oscillator
#	AC Line Cord	TSX3134	Polarized
	Antenna Assembly	TJB1723701	
	Converter	TJB1723600	75-300 Ohm
	Convergence Correction Strip	OFMK014ZZ	
#	CRT	M68JUA21X	27 Inch
	CRT Socket	TJS1A5050	
	Dag Ground Assembly	TXF3AOUARM	
#	Degaussing Coil	TLK259073	
	Fuse Holder	TJC6319	2 used F001
	Pad Rubber	TMM27504	Yoke
	Remote Control	EUR37234	Receiver
	Remote Control	EUR51512A	Transmitter used in PC-29S90S
	Remote Control	EUR51510A	Transmitter used in CTK2790S
	Spring	TES2A20310	Dag Ground
	U/V Tuner	ENV56826G3	
	Yoke	ETC35X7F	Convergence
	Yoke	TLY15422F1	Deflection

(1) Part of J2311 Assembly, Part Number TJB15620
(2) Part of JK2501 Assembly, Part Number TJP17627
(3) Part of JK2901 Assembly, Part Number TJB17628
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.
<u>MODEL</u>	<u>CTK-2790</u>	<u>SPC-29S90S</u>		
Cabinet Back	TXFKU287SER	TXFKU3475SER		
Cabinet Front	TXFKY297SER	TXFKY297SER		
Control Door Assembly	TXFKP217SER	TXFKP217SER		
Damper, Control Door	TEK13321	TEK13321		
Door, Catch	TEK17918	TEK17918		
<u>REMOTE TRANSMITTER</u>	<u>EUR51510</u>	<u>EUR51510A</u>	<u>EUR51512</u>	<u>EUR51512A</u>
Bottom Case	UR51VCS436	UR51VCS436C	UR51VCS436B	UR51VCS436E
Cover, Battery	UR51VCS445	UR51VCS445	UR51VCS445	UR51VCS445

PANASONIC MODELS
CTK-2790S, PC-29S90S (CH, AEDP152, Y AEDP152)