

SAFETY PRECAUTIONS

SERVICE WARNING

Only qualified service technicians who are familiar with safety checks and guidelines should perform service work. Before replacing parts, disconnect power source to protect electrostatically sensitive parts. Do not attempt to modify any circuit unless so recommended by the manufacturer. When servicing the receiver, use an isolation transformer between the line cord and power receptacle.

SERVICING THE HIGH VOLTAGE AND CRT

Use EXTREME CAUTION when servicing the high voltage circuits. To discharge static high voltage, connect a 10K ohms resistor in series with a test lead between the receiver and CRT anode lead. DO NOT lift the CRT by the neck. Always wear shatterproof goggles when handling the CRT to protect eyes in case of implosion.

X-RAY RADIATION AND HIGH VOLTAGE LIMITS

Be aware of the instructions and procedures covering X-ray radiation. In solid-state receivers and monitors, the CRT is the only potential source of X-rays. Keep an accurate high voltage meter available at all times. Check meter calibration periodically. Whenever servicing a receiver, check the high voltage at various brightness levels to be sure it is regulating properly. Keep high voltage at rated value, NO HIGHER. Excessive high voltage may cause X-ray radiation or failure of associated components. DO NOT depend on protection circuits to keep voltage at rated value. When troubleshooting a receiver with excessive high voltage, avoid close contact with the CRT. DO NOT operate the receiver longer than necessary. To locate the cause of excessive high voltage, use a variable AC transformer to regulate voltage. In present receivers, many electrical and mechanical components have safety related characteristics which are not detectable by visual inspection. Such components are identified by a # on both the schematic and the parts list. For SAFETY, use only equivalent replacement parts when replacing these components.

GENERAL GUIDELINES

Perform a final SAFETY CHECK before returning receiver to customer. Check repaired area for poorly soldered connections, and check entire circuit board for solder splashes. Check inner board wiring for pinched wires or wires contacting any high wattage resistors. Check that all control knobs, shields, covers, grounds, and mounting hardware have been replaced. Be sure to replace all insulators and restore proper lead dress.

The listing of any available replacement part herein in no case constitutes a recommendation, warranty, or guarantee by Howard W. Sams & Company as to the quality and suitability of such replacement part. The numbers of the listed parts have been compiled from information furnished to Howard W. Sams & Company by the manufacturers of the specific type of replacement part listed.

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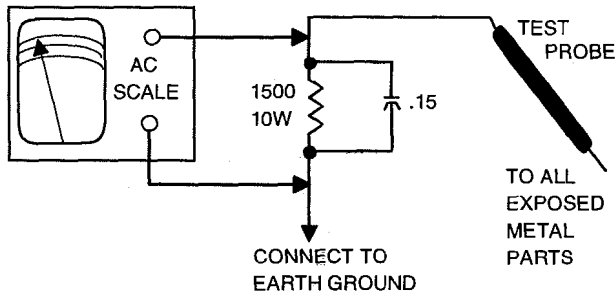
SAFETY CHECKS -- FIRE AND SHOCK HAZARD

Cold Leakage Checks for Receivers with Isolated Ground

Unplug the AC cord, connect a jumper across the plug prongs, and turn the power switch on (if applicable). Use an ohmmeter to measure the resistance between the jumped AC plug and any exposed metal cabinet parts such as antenna screw heads, control shafts, or handle brackets. Exposed metal parts with a return path should measure between 1M ohms and 5.2M ohms. Parts without a return path must measure infinity.

Hot Leakage Current Check

Plug the AC cord directly into an AC outlet. DO NOT use an isolation transformer. Use a 1500 ohms, 10W resistor in parallel with a .15µF capacitor to connect between any exposed metal parts on the receiver and a good earth ground. (See figure below.) Use an AC voltmeter with at least 5000 ohms per volt sensitivity to measure the voltage across the resistor. Check all exposed metal parts and measure voltage at each point. Voltage measurements should not exceed .75VAC, 500µA. Any value exceeding this limit constitutes a potential shock hazard and must be corrected. If the AC plug is not polarized, reverse the AC plug and repeat exposed metal part voltage measurement at each point.



HIGH VOLTAGE SHUTDOWN TEST

Set all customer controls for normal picture. Using an external power supply, apply 26.8V to TP651. The receiver should shut down. If the receiver fails to shut down, the high voltage shutdown circuit requires repair. To return to normal operation, remove AC power and momentarily place a short between TP652 and TP653. Restore AC power and check receiver for proper operation.

PHOTOFACT® Technical Service Data

SET 4057

MODELS CK13M10/M15, 13K-M100/M150

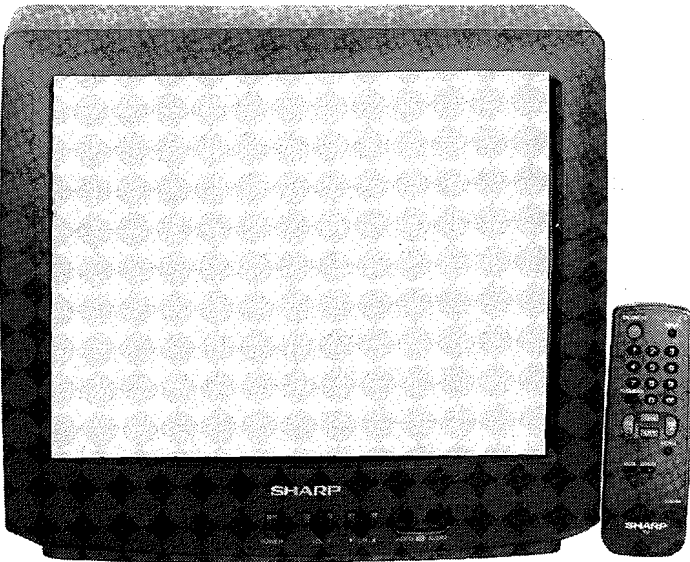
SHARP

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SHARP

Models CK13M10/M15, 13K-M100/M150



Model 13K-M100

Essential coverage
for servicing a television receiver...

- Schematics
- Component locations
- Parts list



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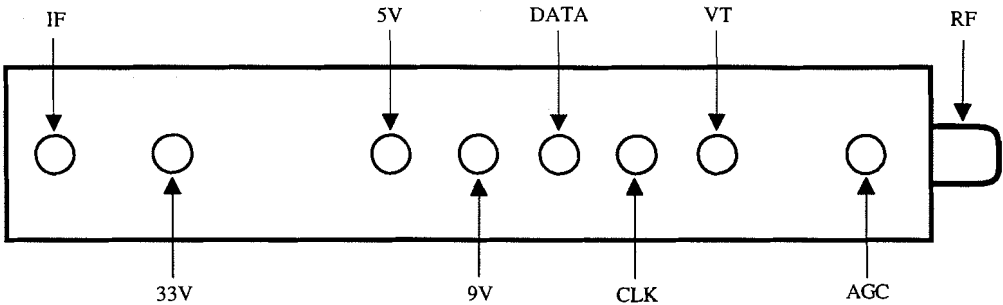
NOVEMBER 1998 SET 4057

TUNER INFORMATION

TUNER VOLTAGE CHART			
Pin	VHF Low Band	VHF High Band	UHF Band
AGC	5.0V	5.2V	4.1V
VT	0V	0V	0V
CLK	4.9V	4.9V	4.9V
DATA	4.9V	4.9V	4.9V
9V	5.1V	5.1V	5.1V
5V	5.1V	5.1V	5.1V
33V	32.7V	32.8V	32.8V
IF	0V	0V	0V

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

TUNER TERMINAL GUIDE

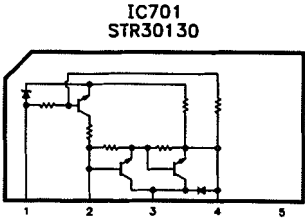


HS

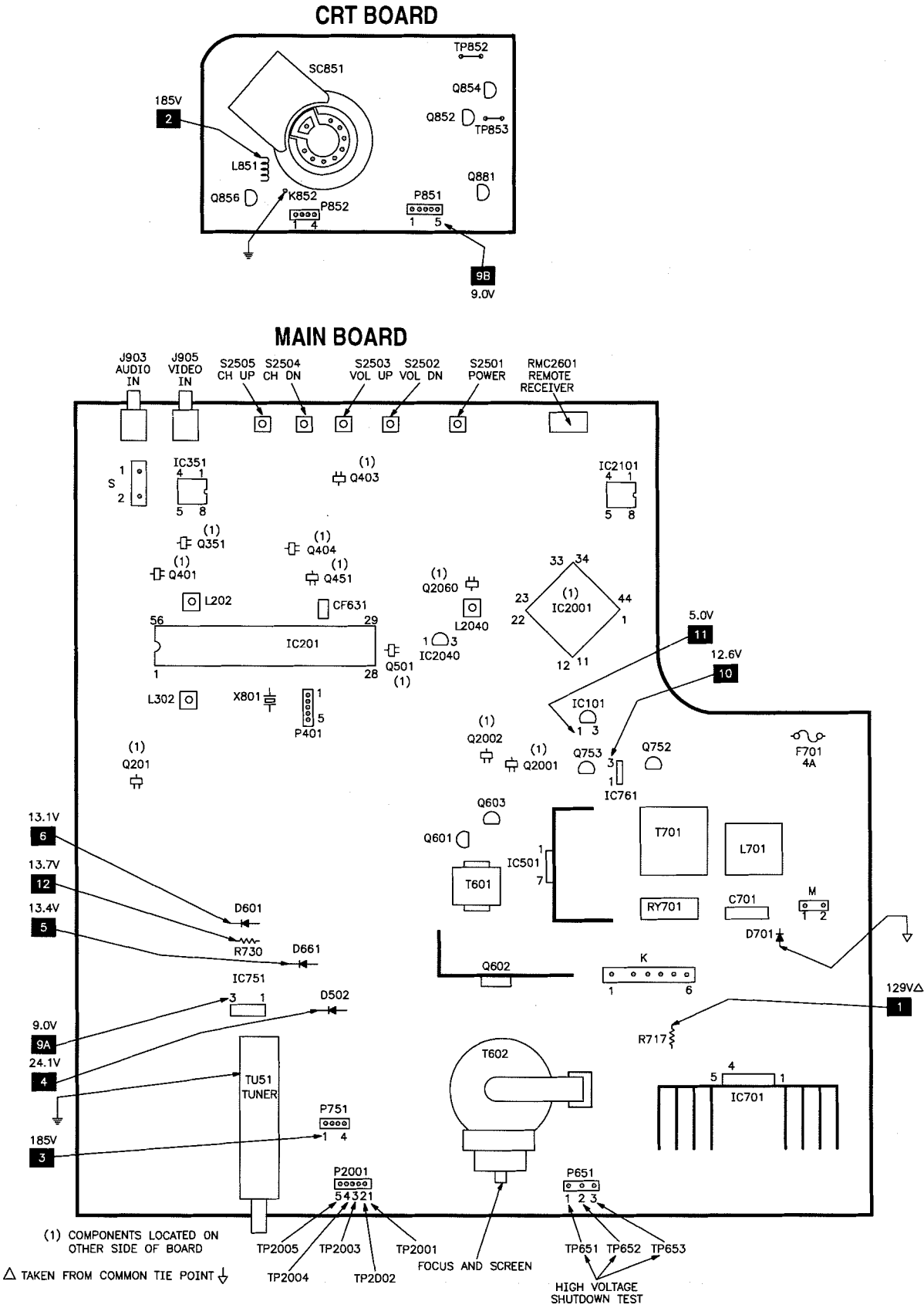
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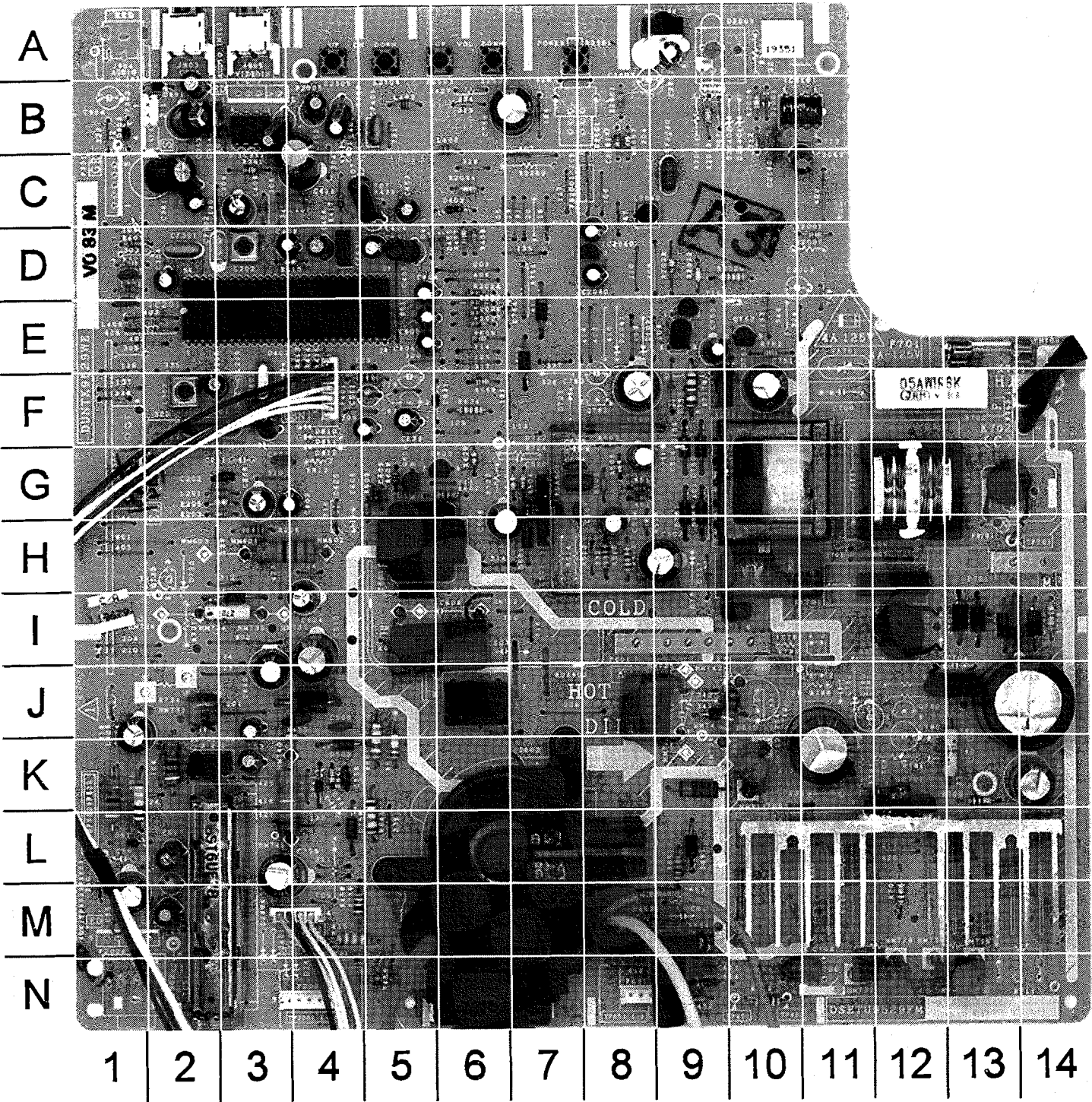
IC FUNCTIONS



PLACEMENT CHART



MAIN BOARD - TOP VIEW

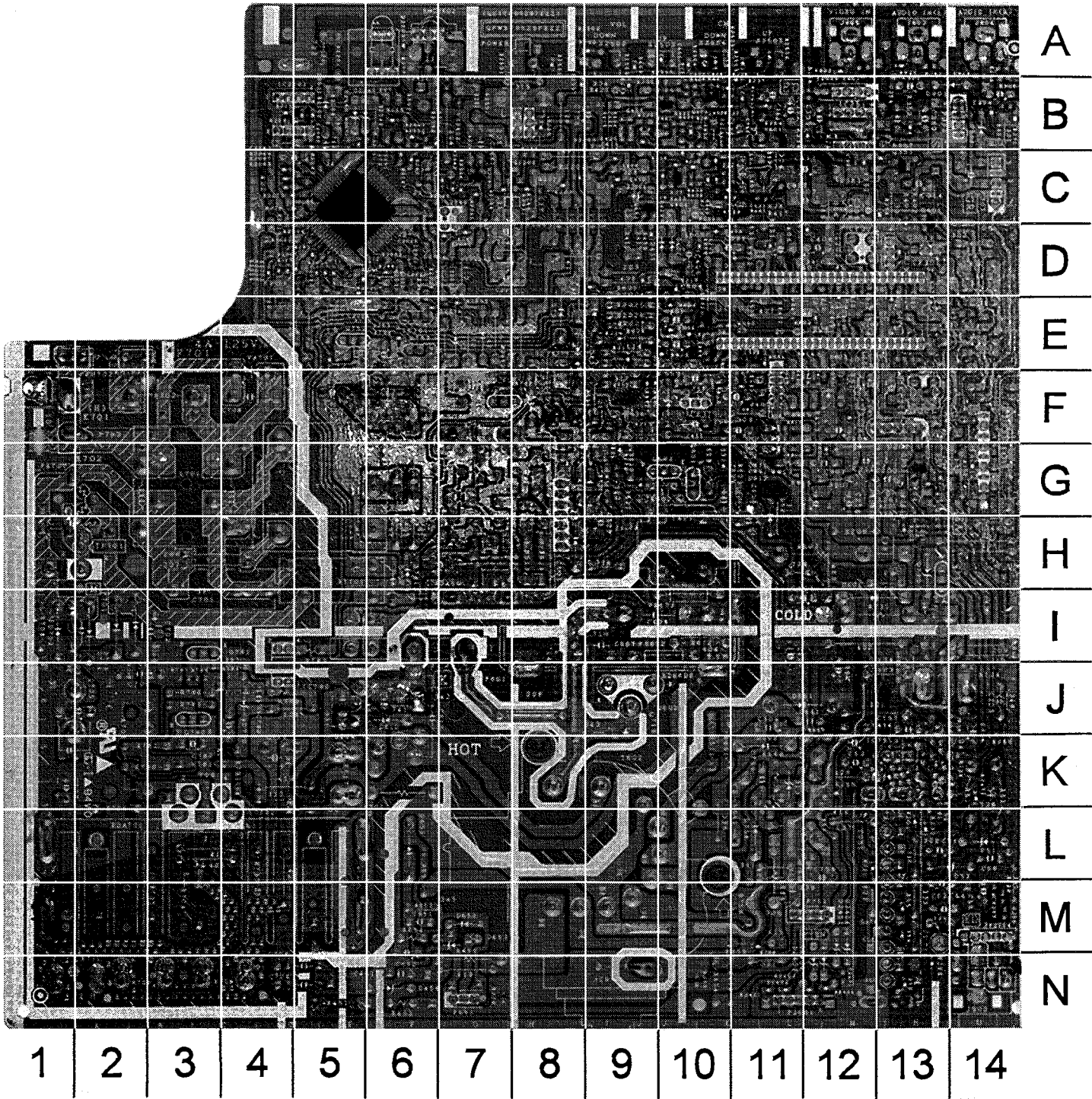


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MAIN BOARD - TOP VIEW, GRIDTRACE LOCATION GUIDE

C51	L-2	C702	I-12	D703	I-13	R51	K-1	R704	M-12
C52	L-2	C703	I-14	D704	I-13	R52	K-1	R705	M-13
C53	K-3	C704	J-13	D753	F-9	R53	K-3	R706	K-13
C54	M-2	C705	J-14	D754	E-7	R203	G-3	R707	K-13
C55	M-1	C706	N-11	D755	E-7	R205	G-3	R708	I-14
C202	G-3	C707	K-14	D756	G-9	R206	H-3	R709	N-12
C205	F-3	C712	K-11	D757	H-9	R301	D-1	R717	K-10
C206	G-3	C751	F-10	D758	L-4	R361	C-3	R730	I-3
C208	F-3	C754	J-1	D760	G-9	R403	D-1	R750	F-9
C304	D-2	C755	E-9	D761	G-9	R410	D-4	R752	E-10
C305	D-1	C756	B-7	D762	G-9	R412	F-5	R755	K-2
C306	E-1	C757	J-2	D763	F-10	R413	F-4	R758	M-4
C309	C-3	C758	L3	D901	B-2	R414	F-4	R2001	D-11
C314	C-2	C759	K-4	D902	B-1	R415	F-4	R2008	B-10
C352	B-4	C760	F-8	D2001	B-10	R417	C-4	R2020	D-10
C353	B-2	C801	G-3	F701	E-13	R451	N-10	R2022	D-9
C354	B-3	C802	G-4	FB602	I-6	R452	N-9	R2024	D-6
C355	B-3	C804	D-5	FB603	H-5	R454	N-5	R2025	E-6
C361	C-2	C805	E-5	IC101	E-9	R455	J-4	R2026	E-6
C362	B-4	C806	E-5	IC201	E-2	R457	D-6	R2027	E-6
C405	D-5	C905	B-2	IC351	B-3	R458	N-5	R2028	D-9
C406	D-4	C2040	D-8	IC501	G-7	R459	D-6	R2048	B-9
C407	C-4	C2041	D-8	IC701	K-12	R504	G-7	R2063	B-8
C408	D-4	C2060	B-10	IC751	K-2	R506	G-8	R2064	C-6
C409	C-5	C2061	B-8	IC761	F-10	R507	G-8	R2601	B-8
C411	B-4	C2062	C-11	IC2040	D-8	R508	G-8	RMC2601	A-9
C451	N-9	C2601	A-9	IC2101	B-11	R510	H-8	RY701	H-10
C454	J-3	CF301	D-2	J903	A-2	R511	K-5	S	B-2
C502	H-9	CF401	B-5	J905	A-3	R512	H-8	S2501	A-7
C504	G-7	CF631	D-4	K	I-8	R516	G-8	S2502	A-6
C505	G-7	CF2040	C-9	L201	G-3	R517	G-8	S2503	A-6
C507	G-7	D51	L-1	L202	D-3	R518	H-8	S2504	A-5
C508	H-6	D52	K-2	L301	D-1	R525	G-7	S2505	A-4
C509	J-4	D53	L-2	L302	F-2	R552	F-6	SF201	F-2
C510	I-4	D401	D-5	L401	B-5	R602	G-6	T601	H-5
C511	I-10	D402	C-6	L402	B-5	R603	H-3	T602	L-7
C513	G-8	D454	N-9	L406	B-6	R606	E-6	T701	G-10
C514	H-8	D455	D-6	L408	C-3	R608	G-5	TP651	N-8
C551	F-5	D501	H-7	L701	G-12	R609	G-5	TP652	N-8
C552	F-5	D502	K-4	L2040	C-8	R610	J-10	TP653	N-8
C604	I-4	D601	I-3	M	H-13	R620	G-6	TP2001	N-4
C608	I-6	D603	E-7	P401	E-4	R634	F-6	TP2002	N-4
C609	G-5	D610	J-9	P651	N-8	R641	L-5	TP2003	N-4
C612	J-8	D631	F-6	P751	M-3	R642	K-4	TP2004	N-4
C631	D-5	D641	K-4	P2001	N-4	R651	L-9	TP2005	N-3
C633	F-5	D651	L-9	PR701	G-13	R654	M-9	TU51	N-2
C652	M-9	D652	M-8	Q601	G-5	R659	M-4	X801	F-3
C653	C-5	D653	M-8	Q602	J-6	R661	J-5		
C661	J-4	D661	J-4	Q603	G-6	R701	K-9		
C662	J-3	D701	I-13	Q752	E-10	R702	F-12		
C701	H-12	D702	I-14	Q753	E-9	R703	N-13		

MAIN BOARD - BOTTOM VIEW

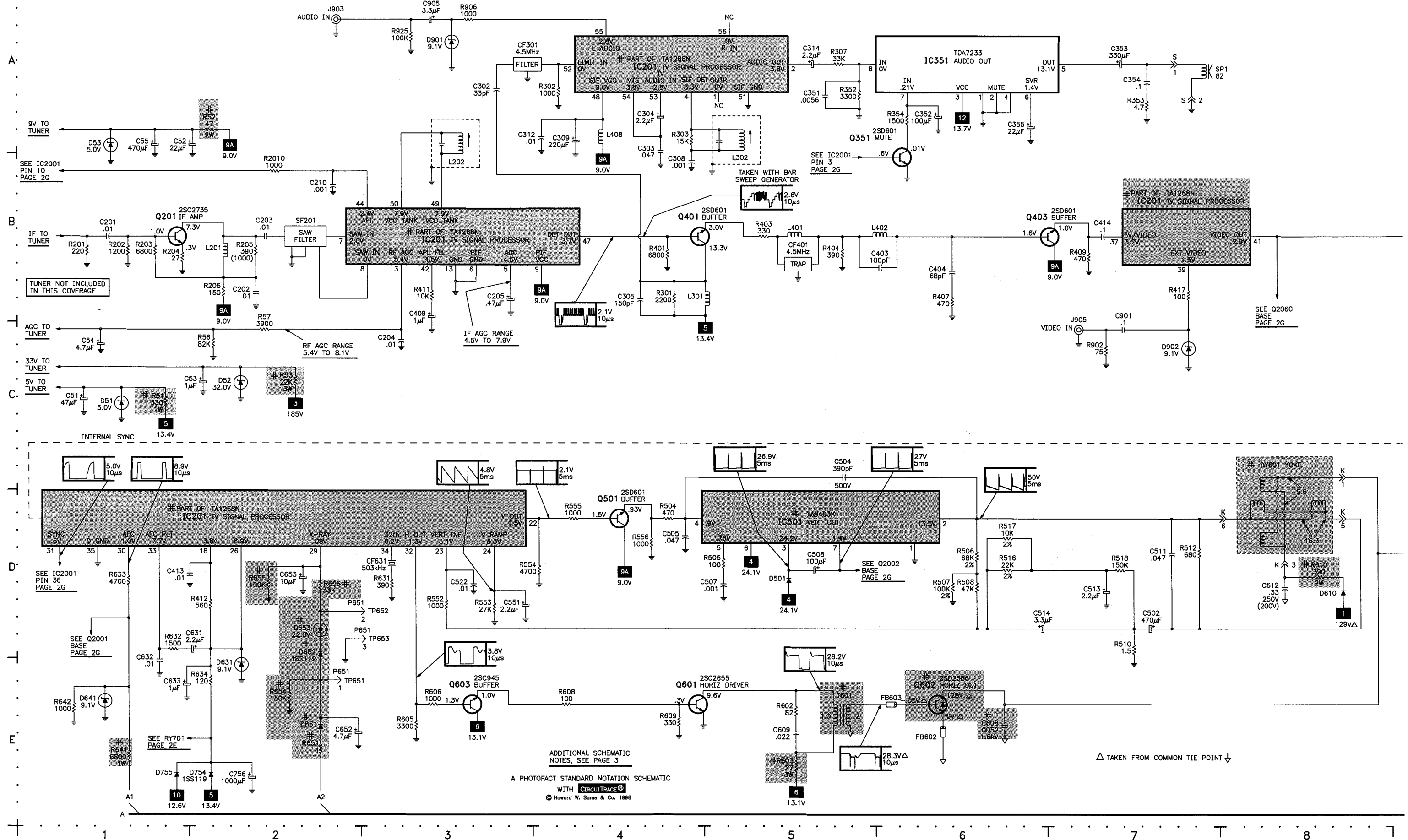


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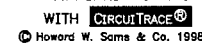
MAIN BOARD - BOTTOM VIEW, GRIDTRACE LOCATION GUIDE

C201	H-13	C2023	D-7	R353	B-13	R754	E-6	R2047	C-6
C203	G-13	C2024	D-6	R354	B-12	R757	E-5	R2049	B-6
C204	E-13	C2051	C-6	R364	B-11	R801	G-12	R2054	E-6
C207	E-12	C2402	B-6	R401	D-13	R802	E-12	R2055	E-7
C209	E-12	C2602	B-7	R404	B-11	R803	E-10	R2060	B-5
C210	D-12	IC2001	C-5	R407	B-11	R804	E-10	R2061	B-4
C302	D-13	Q201	G-13	R409	B-9	R805	E-10	R2062	B-5
C303	E-13	Q351	C-13	R411	D-11	R806	E-12	R2066	C-4
C308	F-13	Q401	D-13	R416	C-9	R902	A-12	R2067	C-4
C312	E-12	Q403	B-10	R418	C-10	R906	B-14	R2068	C-4
C351	C-12	Q404	C-10	R419	B-9	R925	A-13	R2070	C-4
C403	B-10	Q451	C-9	R423	C-10	R961	F-9	R2101	B-5
C404	B-10	Q501	E-10	R426	C-10	R962	F-9	R2102	B-5
C410	C-9	Q2001	F-8	R440	C-10	R2002	D-4	R2401	N-11
C413	F-12	Q2002	F-8	R456	D-9	R2006	D-4	R2402	N-11
C414	B-9	Q2060	C-7	R505	H-8	R2009	D-4	R2403	N-12
C419	C-9	R54	M-13	R524	F-9	R2010	D-5	R2404	N-12
C420	C-9	R55	M-13	R553	F-11	R2011	D-5	R2501	A-8
C517	H-9	R56	N-13	R554	E-11	R2012	D-5	R2503	A-10
C522	E-11	R57	G-13	R555	E-10	R2029	C-7	R2504	A-10
C632	D-11	R201	L-13	R556	E-10	R2031	D-5	R2505	A-11
C803	F-12	R202	H-13	R605	D-9	R2032	D-6	R2506	A-11
C807	C-11	R204	G-13	R621	G-9	R2040	D-7	R2507	B-8
C901	B-12	R208	F-12	R631	D-11	R2041	C-7	R2508	A-10
C2001	D-5	R302	E-13	R632	D-11	R2042	C-7	R2509	A-9
C2002	D-5	R303	F-13	R633	G-10	R2043	B-6		
C2021	D-6	R307	C-13	R655	D-10	R2044	C-7		
C2022	D-6	R352	C-12	R656	D-10	R2045	C-7		

TELEVISION SCHEMATIC



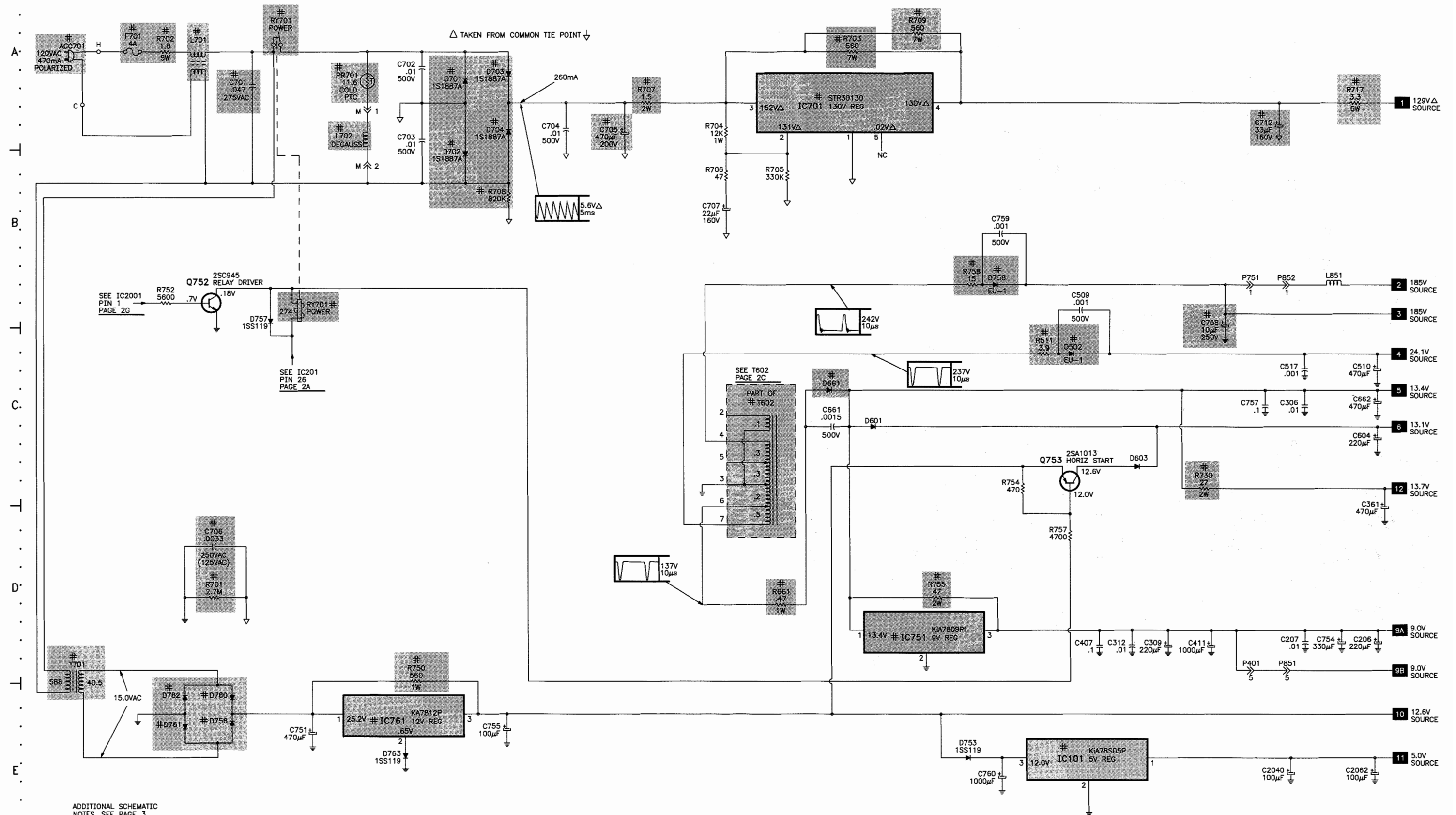
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POWER SUPPLY SCHEMATIC

E

F



ADDITIONAL SCHEMATIC
NOTES, SEE PAGE 3

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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ACC701	A-17	C612	D-8	D502	C-22	Q403	B-6	R505	D-5	R859	C-14	R2503	B-25
C51	C-1	C631	E-1	D601	C-21	Q404	A-10	R506	D-6	R860	C-15	R2504	B-25
C52	B-2	C632	E-1	D603	C-23	Q451	E-12	R507	D-6	R861	C-15	R2505	B-25
C53	C-2	C633	E-1	D610	D-8	Q501	D-4	R508	D-6	R865	C-15	R2506	B-25
C54	C-1	C652	E-2	D631	E-2	Q601	E-4	R510	D-7	R866	C-15	R2507	B-26
C55	B-1	C653	D-2	D641	E-1	Q602	E-6	R511	C-22	R867	B-14	R2508	B-25
C201	B-1	C661	C-21	D651	E-2	Q603	E-3	R512	D-7	R868	B-15	R2509	B-25
C202	B-2	C662	C-24	D652	E-2	Q752	B-17	R516	D-6	R869	B-15	R2601	A-25
C203	B-2	C701	A-18	D653	D-2	Q753	C-22	R517	D-6	R873	B-15	RMC2601	A-25
C204	C-3	C702	A-19	D661	C-21	Q852	A-15	R518	D-7	R874	B-15	RY701	A-18
C205	B-3	C703	B-19	D701	A-19	Q854	C-15	R524	C-25	R881	D-13	RY701	B-18
C206	D-24	C704	A-19	D702	B-19	Q856	B-15	R525	C-25	R882	C-13	S2501	A-25
C207	D-24	C705	B-20	D703	A-19	Q881	C-14	R552	D-3	R883	C-14	S2502	A-25
C208	C-11	C706	D-18	D704	B-19	Q2001	C-25	R553	D-3	R884	C-14	S2503	A-25
C209	B-11	C707	B-20	D753	E-22	Q2002	C-25	R554	D-3	R886	C-13	S2504	A-25
C210	B-2	C712	A-23	D754	E-2	Q2060	D-25	R555	D-4	R887	D-15	S2505	B-25
C302	A-3	C751	E-18	D755	E-1	R51	C-1	R556	D-4	R902	C-7	SF201	B-2
C303	B-4	C754	D-24	D756	E-18	R52	B-2	R602	E-5	R906	A-3	SP1	A-7
C304	A-4	C755	E-19	D757	C-18	R53	C-2	R603	E-5	R925	A-3	T601	E-5
C305	B-4	C756	E-2	D758	B-22	R54	B-28	R605	E-3	R961	A-13	T602	C-21
C306	C-24	C757	C-23	D760	E-18	R55	B-28	R606	E-3	R962	A-13	T602	D-10
C308	B-4	C758	C-23	D761	E-17	R56	C-2	R608	E-4	R2001	E-27	T701	D-17
C309	B-4	C759	B-22	D762	E-17	R57	C-2	R609	E-4	R2002	B-26	V101	B-16
C309	D-23	C760	E-22	D763	E-19	R201	B-1	R610	D-8	R2006	E-27	X801	B-13
C312	B-4	C801	C-12	D881	C-13	R202	B-1	R620	C-25	R2008	D-26		
C312	D-23	C802	C-12	D882	C-13	R203	B-1	R621	C-25	R2009	B-26		
C314	A-5	C803	C-13	D885	C-13	R204	B-1	R631	D-3	R2010	B-2		
C351	A-5	C804	B-11	D901	A-3	R205	B-2	R632	E-1	R2011	D-26		
C352	A-6	C805	B-12	D902	C-7	R206	B-2	R633	D-1	R2012	D-26		
C353	A-7	C806	B-12	D2001	D-26	R208	B-11	R634	E-2	R2020	D-26		
C354	A-7	C807	B-9	DY601	D-8	R301	B-4	R641	E-1	R2022	D-27		
C355	A-6	C851	B-15	F701	A-17	R302	A-4	R642	E-1	R2024	A-27		
C361	D-24	C852	C-15	FB602	E-6	R303	B-4	R651	E-2	R2025	A-27		
C362	D-27	C853	C-15	FB603	E-5	R307	A-5	R654	E-2	R2026	A-27		
C403	B-5	C854	D-16	IC101	E-22	R352	A-5	R655	D-2	R2027	B-27		
C404	B-6	C881	C-13	IC201	A-4	R353	A-7	R656	D-2	R2028	C-26		
C405	C-12	C883	C-14	IC201	B-11	R354	A-6	R659	A				

MISCELLANEOUS ADJUSTMENTS

HIGH VOLTAGE CHECK

Tune in a picture. Set brightness, color, picture, and screen control to minimum. Connect a high voltage probe to CRT anode. High voltage should measure 22kV to 24.5kV.

COLOR PURITY

Operate the receiver for 15 minutes. Tune in a green raster. Use a degaussing coil to demagnetize the CRT and mounting brackets. Loosen the deflection yoke clamp screw and slide the deflection yoke backward to obtain a vertical green band. Rotate and spread the purity magnet tabs until the green band is centered on the screen. Move the deflection yoke forward to obtain a uniform green screen.

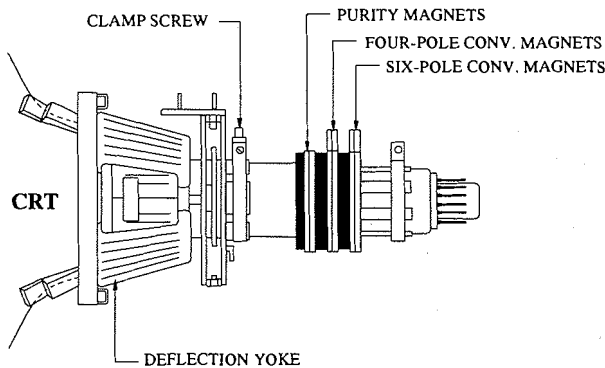
CONVERGENCE

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

NOTE: Rotate the two tabs of each set of magnets equally and opposite to converge vertically and rotate both tabs in the same direction to converge horizontally. Since the 4-pole and 6-pole magnets interact, repeat the adjustment until center convergence is correct.

Tune in a crosshatch pattern and remove the rubber wedges between the deflection yoke and the CRT. Tilt the deflection yoke up or down to converge the vertical lines at top and bottom of screen and the horizontal lines at the right and left sides of the screen. Tilt the deflection yoke right or left to converge horizontal lines at top and bottom of screen and the vertical lines at the right and left sides of the screen. Repeat convergence procedure if necessary to obtain best overall convergence.

CRT NECK ASSEMBLY



ENTERING SERVICE MODE

Service mode adjustments are required when IC201 and IC2101 are replaced. If the CRT is replaced, perform only adjustments relating to the picture tube.

Turn on receiver and use reset function in the video adjustment menu to ensure that customer controls are in their proper reset position. To enter the service mode, remove the AC power, and press and hold the channel up and volume up buttons while restoring AC power. The receiver will come on with the service mode displayed.

When in the service mode a letter S with a number is displayed in the upper left part of the screen and the data number is displayed in the upper center part of the screen. The current channel number is displayed in the upper right part of the picture. The S number is the service number and it is changed by pressing the channel up / down buttons on the receiver or remote transmitter. The data number is the data value of the service number and it can be changed by pressing the volume up / down buttons on the receiver or remote transmitter. For a complete listing of the service adjustments, refer to the "Service Mode Adjustment Chart".

EXIT SERVICE MODE

Turn off the power or unplug the receiver to exit service mode.

RESETTING TO INITIAL VALUES

The initial values are written to IC2101 by entering the service mode and pressing the channel up and down buttons for more than two seconds.

RF AGC

Tune in a picture. Enter the service mode and select service number S08. Set the data value to a point where no snow (noise) appears in picture. Exit the service mode to select another channel. Check all channels for proper operation.

CAPTION POSITION

Enter the service mode and select service number S18. A black text box appears on screen. Adjust data value to center text box.

VCO

Connect a digital voltmeter to pin 44 of IC201 and ground. Tune in a local channel. Enter the service mode and select service number S10. Set the data value to obtain 2.2V on the digital voltmeter.

WHITE BALANCE

Operate the receiver for 15 minutes. Enter the service mode and select service number S03. Set the data value to 00. Set brightness for a visible raster. Alternately adjust data value of service numbers S14 and S15 until a good gray scale with normal white is obtained. Select service number S03. Set the data value for normal color level.

GRAY SCALE

Connect a digital voltmeter between TP852 and TP853 on the CRT board. Tune in an active channel. Set color, brightness, and picture to minimum. Enter the service mode and select service number S04 and adjust the data value to obtain .17V on the digital voltmeter. Adjust screen control, if necessary, to obtain a barely visible raster. Adjust service numbers S11, S12, S13, for a good gray scale with normal white at high and low brightness. Set color to midrange. Adjust screen control for normal brightness.

SERVICE MODE ADJUSTMENT CHART

Service No.	Service Adjustment	Data Range	Data Value (Initial Value)	Data Value (On-Set Value)	Notes
S01	Sub Picture	00-7F	55	54	Set brightness to minimum and picture to maximum. Adjust for normal contrast range.
S02	Sub Tint	00-7F	46	3A	Adjust for normal flesh tones.
S03	Sub Color	00-7F	32	33	Adjust for normal color level.
S04	Sub Brightness	00-7F	40	4D	Adjust for normal brightness level.
S05	Sharpness	00-3F	28	24	Adjust for proper sharpness of picture. Center of range is 28.
S06	Vertical Phase	00-07	00	05	Adjust for best vertical centering.
S07	Horizontal Position	00-1F	12	0D	Adjust for best horizontal centering on screen.
S08	RF AGC	00-3F	2A	2D	"00" produces black raster
S09	Vertical Size	00-3F	20	1C	Adjust for proper vertical size with best linearity.
S10	VCO	00-7F	2C	19	-
S11	Red Cutoff	00-FF	00	19	-
S12	Green Cutoff	00-FF	00	12	-
S13	Blue Cutoff	00-FF	00	00	-
S14	Green Gain	00-FF	7F	A1	-
S15	Blue Gain	00-FF	7F	8F	-
S16	3.58MHz Trap	00, 01	00	00	"00"= On, "01"= Off
S17	Balance	00-3F	20	20	-
S18	Caption Position	00-7F	18	1D	Adjust to center the black box on the screen.
S19	Y-Mute	00, 01, 03	00	00	"00"=Normal picture, "01"=No Y, and "03"=Vertical collapse

Schematic Notes

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

- ✕ Circuitry not used in some versions.
- Circuitry used in some versions.
- ⏏ Ground
- ⏏ Chassis ground
- ▽ Common tie point
- △ Taken from common tie point
- 3 Schematic CIRCUI TRACE ® Voltage source tie point.
- A Cabling: Heavy lines reduce use of multiple lines.

Waveforms and voltages are taken from ground, unless noted otherwise.
Waveforms taken with triggered scope and colorbar signal. Waveform voltage is peak to peak. Timebase is per division. Waveforms shown at 10 divisions. Supply voltages maintained as seen at input. Voltages measured with digital meter and a 1000µV RF signal, with colorbar pattern, applied to antenna terminal. Controls adjusted for normal operation. 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. Rated voltage shown on zener diodes.

Important Parts Information

- The parts listed here are those not usually available from a well-stocked supply cabinet or bin.
- Where items may be replaced with equivalent parts, several alternates are shown from participating vendors.
- On the parts lists, safety items are marked with a # to remind you that only exact replacements are recommended for these items.
- When ordering parts, state the model number, part number, and description.

Obtaining Parts

Many of these parts are available from your local Sams authorized distributor or the manufacturer of the equipment. Call Sams for the name of your nearest distributor:

800-428-7267

Or consult the Sams Annual Index for the address of the original equipment manufacturer.

Participating Vendors

Information on test equipment and replacement parts is listed in these pages for the following participating vendors. Consult the Sams Annual Index for their current address.

- Custom Components Corporation (Chek-A-Color)
- Terrell & Nobis (TNI Electronics)
- NTE Electronics, Inc. (NTE)
- Sencore, Inc.
- Philips ECG Company (ECG)
- Thomson Consumer Electronics, Inc. (SK, TCE)

TEST EQUIPMENT

Test equipment listed by participating manufacturer illustrates typical or equivalent equipment used by Sams engineers to obtain measurements. This equipment is compatible with most types used by field service technicians.

Equipment	Sencore No.	Equipment	Sencore No.
Oscilloscope	SC3100	Isolation Transformer	PR570
Generators		Capacitance Analyzer	LC102
RGB	CM2125	CRT Analyzer	CR7000
Multiburst Signal	VG91	AC Leakage Tester	PR570
Color Bar	VG91	Inductance Analyzer	LC102
TV Stereo	VG91	Flyback Yoke Tester	TVA92
Digital VOM	SC3100	Field Strength Meter	SL753
Frequency Meter	SC3100	Transistor Tester	TF46
Hi-Voltage Probe	HP200	Horizontal Analyzer	HA-2500
Accessory Probes	TP212	Video Analyzer	VG91, TVA92

PARTS LIST

SEMICONDUCTORS

(Select the replacement that gives the best results.)

Item No.	Type No.	Mfr. Part No.	NTE Part No.	ECG Part No.	TCE Part No.
D51	-	RH-EX0611GEZZ	-	-	-
D52	-	RH-EX0676GEZZ	-	-	-
-	-	RH-EX0701GEZZ	-	-	-
D53	-	RH-EX0611GEZZ	-	-	-
D401	1SS119	VHD1SS119//-1	NTE519	ECG519	SK3100
-	-	RH-DX0446CEZZ	-	-	-
D402	-	RH-EX0092CEZZ	NTE5006A	ECG5006A	SK3A6
D454	-	RH-EX0103CEZZ	NTE5011A	ECG5011A	SK5A6
D455	1SS119	VHD1SS119//-1	NTE519	ECG519	SK3100
-	-	RH-DX0446CEZZ	-	-	-
D501	-	RH-DX0441CEZZ	-	-	-
-	-	RH-DX0110CEZZ	NTE116	ECG116	SK3312
# D502	EU-1	RH-DX0131CEZZ	NTE552	ECG552	SK9000
D601, 03	-	RH-DX0441CEZZ	-	-	-
-	-	RH-DX0110CEZZ	NTE116	ECG116	SK3312
D610	-	RH-DX0131CEZZ	NTE552	ECG552	SK9000
D631, 41	-	RH-EX0630GEZZ	-	-	-
# D651	-	RH-DX0131CEZZ	NTE552	ECG552	SK9000
# D652	1SS119	VHD1SS119//-1	NTE519	ECG519	SK3100
-	-	RH-DX0446CEZZ	-	-	-
# D653	-	RH-EX0091CEZZ	NTE5030A	ECG5030A	SK22A
-	-	RH-EX0660GEZZ	-	-	-
-	-	RH-EX1311CEZZ	-	-	-
# D661	-	RH-DX0444CEZZ	-	-	-
# D701 Thru	-	-	-	-	-
# D704	1S1887A	RH-DX0154CEZZ	NTE552	ECG552	SK9000
D753, 54	1SS119	VHD1SS119//-1	NTE519	ECG519	SK3100
-	-	RH-DX0446CEZZ	-	-	-
D755	-	RH-DX0441CEZZ	-	-	-
-	-	RH-DX0110CEZZ	NTE116	ECG116	SK3312
# D756	-	RH-DX0441CEZZ	-	-	-
-	-	RH-DX0110CEZZ	NTE116	ECG116	SK3312
D757	1SS119	VHD1SS119//-1	NTE519	ECG519	SK3100
-	-	RH-DX0446CEZZ	-	-	-
# D758	EU-1	RH-DX0131CEZZ	NTE552	ECG552	SK9000
# D760, 61, 62	-	RH-DX0441CEZZ	-	-	-
-	-	RH-DX0110CEZZ	NTE116	ECG116	SK3312
D763	1SS119	VHD1SS119//-1	NTE519	ECG519	SK3100
-	-	RH-DX0446CEZZ	-	-	-
D881, 82, 85	1SS119	VHD1SS119//-1	NTE519	ECG519	SK3100
-	-	RH-DX0446CEZZ	-	-	-
D901, 02	-	RH-EX0630CEZZ	-	-	-
D2001	1SS119	VHD1SS119//-1	NTE519	ECG519	SK3100
-	-	RH-DX0446CEZZ	-	-	-
# IC101	KiA78S05P	VHiKA78S05P-1	-	-	-
-	-	VHiTA7805S/-1	-	-	-
# IC201	TA1268N	RH-iX2933CEZZ	-	-	-
IC351	TDA7233	VHiTDA7233/-1	-	-	-
# IC501	TA8403K	VHiTA8403K/-1	-	-	-
# IC701	STR30130	VHiSTR30130E	NTE1777	ECG1777	SK9870
# IC751	KiA7809Pi	VHiKA7809Pi-1	NTE1966	ECG1966	-
-	-	VHiTA7809S/-1	NTE1966	ECG1966	-

For SAFETY use only equivalent replacement part.

SEMICONDUCTORS continued

(Select the replacement that gives the best results.)

Item No.	Type No.	Mfr. Part No.	NTE Part No.	ECG Part No.	TCE Part No.
# IC761	KA7812P	VHiKA7812Pi	-	-	-
-	-	VHiTA7812S/-1	-	-	-
IC2001	-	RH-iX3087CEZZ	-	-	-
IC2040	PST994C	VHiPST994C/-1	-	-	-
IC2101	ST24C01B6	RHiX2447CEN1	-	-	-
-	-	RHiX2448CEN1	-	-	-
Q201	2SC2735	VS2SC2735//1E	NTE2402	ECG2402	SK10095
Q351	2SD601	VS2SD601AR/-1	NTE2408	ECG2408	SK10099
-	2SC2462	VS2SC2462-C-1	NTE2408	ECG2408	SK10099
Q401, 03	2SD601	VS2SD601AR/-1	NTE2408	ECG2408	SK10099
-	2SC2462	VS2SC2462-C-1	NTE2408	ECG2408	SK10099
Q404, 51	2SB709	VS2SB709AR/-1	NTE2409	ECG2409	SK10100
Q501	2SD601	VS2SD601AR/-1	NTE2408	ECG2408	SK10099
-	2SC2462	VS2SC2462-C-1	NTE2408	ECG2408	SK10099
Q601	2SC2655	VS2SC2655Y/-1	NTE293	ECG293	SK3849
# Q602	2SD2586	VS2SD2586//1E	-	-	-
-	2SD2095	VS2SD2095//1E	NTE2331	ECG2331	SK10088
Q603	2SC945	VS2SC945AQ/-1	NTE85	ECG85	SK3124A
-	2SC1815Y	VS2SC1815YW-1	NTE85	ECG85	SK3124A
-	2SC3198Y	VS2SC3198-Y-1	NTE85	ECG85	SK9229
Q752	2SC945	VS2SC945AQ/-1	NTE85	ECG85	SK3124A
Q753	2SA1013	VS2SA1013//1E	NTE32	ECG32	SK3867A
Q852, 54, 56	2SC2229(O)	VS2SC22290/1E	NTE399	ECG399	SK3244
Q881	2SA1266(Y)	VS2SA1266-Y-1	NTE290A	ECG290A	SK9132
-	2SA1015Y	VS2SA1015Y/-1	NTE290A	ECG290A	SK9132
Q2001, 02, 60	2SD601	VS2SD601AR/-1	NTE2408	ECG2408	SK10099
-	2SC2462	VS2SC2462-C-1	NTE2408	ECG2408	SK10099

For SAFETY use only equivalent replacement part.

CABINET PARTS

Item	Mfr. Part No.	Item	Mfr. Part No.
Model CK13M10		Model 13K-M100	
Buttons	JBTN-0258PESA	Buttons	JBTN-0258PESA
Cabinet	GCABB2325PEKA	Cabinet	GCABB2309PEKA
Cabinet Assembly	CCABA2409WEV0	Cabinet Assembly	CCABA2395WEV0
IR Lens	GCOVA0078PEKA	IR Lens	GCOVA0078PEKA
Model CK13M15		Model 13K-M150	
Buttons	JBTN-0258PESA	Buttons	JBTN-0258PESA
Cabinet	GCABB2325PEKB	Cabinet	GCABB2309PEKB
Cabinet Assembly	CCABA2409WEV2	Cabinet Assembly	CCABA2395WEV2
IR Lens	GCOVA0078PEKA	IR Lens	GCOVA0078PEKA

PARTS LIST continued

CONTROLS & RESISTORS

Item No.	Function/Rating	Mfr. Part No.	NTE Part No.
# PR701	11.6 Cold PTC	RMPTP0026CEZZ	-
# R51	330 5% 1W	VRS-VV3AB331J	1W133
# R52	47 5% 2W	VRS-VV3DB470J	2W047
# R53	22K 5% 3W	VRS-VV3LB223J	2W322
# R451	10K 5% 1/2W	VRS-SV2HC103J	HW310
R506	68K 2% 1/8W	VRD-RA2BE683G	EW368
R507	100K 2% 1/8W	VRD-RA2BE104G	EW410
# R511	3.9 5% 1/2W	VRN-SVHB3R9J	HW3D9
R516	22K 2% 1/8W	VRD-RA2BE223G	EW322
R517	10K 2% 1/8W	VRD-RA2BE103G	EW310
# R603	27 5% 3W	VRS-VV3LB270J	3W027
# R610	390 5% 2W	VRS-VV3DB391J	2W139
# R641	6800 5% 1W	VRS-VV3AB682J	1W268
# R651	1 5% 1/2W	VRD-RM2HD1R0J	HW1D0
# R654	150K 5% 1/8W	VRD-RA2BE154J	EW415
# R655	100K 5% 1/10W	VRD-MD2AL104J	-
# R656	33K 5% 1/10W	VRN-MD2AL333J	-
# R659	1.8 5% 1W	VRS-VV3AB1R8J	1W1D8
# R661	.47 5% 1W	VRN-VV3ABR47J	1WD47
# R701 (1)	2.7M 10% 1/2W	VRC-UA2HG275K	HW527
# R701 (2)	2.7M 10% 1/2W	VRC-UB2HG275K	HW527
# R702	1.8 10% 5W Wirewound	VRW-KP3HC1R8K	5W1D8
# R703	560 5% 7W	VRS-KA3NG561J	-
# R707	1.5 5% 2W	VRN-VV3DB1R5J	2W1D5
# R708	820K 5% 1/2W	VRD-RM2HD824J	HW482
# R709	560 5% 7W	VRS-KA3NG561J	-
# R717	3.3 10% 5W	VRS-KA3HG3R3K	5W3D3
# R730	27 5% 2W	VRS-VV3DB270J	2W027
# R750	560 5% 1W	VRS-VV3AB561J	1W156
# R755	47 5% 2W	VRS-VV3DB470J	2W047
# R758	15 5% 1/2W	VRS-SV2HC150J	HW015
# R857, 65, 73	12K 5% 1W	VRS-VV3AB123J	1W312

For SAFETY use only equivalent replacement part.
(1) Used in models 13K-M100 and 13K-M150.
(2) Used in models CK13M10 and CK13M15.

COILS & TRANSFORMERS

Item No.	Function/Rating	Mfr. Part No.
# DY601 (2)	Yoke Horiz 3.7mH Vert 29.4mH	RCiLH0141MEZZ
# DY601 (3)	Yoke	RCiLH0142PEZZ
# DY601 (4)	Yoke	RCiLH0143PEZZ
# DY601 (5)	Yoke	RCiLH0144PEZZ
FB602, 03	Ferrite Bead	RBLN-0037CEZZ
L201	1.2µH	VP-XF1R2K0000
L202	VCO	RCiLi0612CEZZ
	VCO	RCiLi0588CEZZ
L301	8.2µH	VP-XF8R2K0000
L302	SIF	RCiLi0613CEZZ
	SIF	RCiLi0605CEZZ
L401	12µH	VP-XF120K0000
L402	10µH	VP-XF100K0000
L406	68µH	VP-XF680K0000
L408	10µH	VP-XF100K0000
# L701	Line Filter	RCiLF0029PEZZ
	Line Filter	RCiLi0235CEZZ
	Line Filter	RCiLi0087CEZZ
	Line Filter	RCiLF0090CEZZ
# L702	Degaussing	RCiLG0386PEZZ
L851	150µH	VP-DF151K0000
L2040	Oscillator	RCiLB0159CEZZ
# T601	Horizontal Driver	RTRNZ0168CEZZ
# T602 (1)	Horizontal Output	RTRNF0151PEZZ
	Horizontal Output	RTRNF0148PEZZ
# T701	Power	RTRNP0527CEZZ
	Power	RTRNP0518CEZZ

For SAFETY use only equivalent replacement part.
(1) Focus and screen controls are part of T602.
(2) Used with CRT A34KPU02XX.
(3) Used with CRT 37GDA86X.
(4) Used with CRT A34KFQ90X, CPJ370BVBK1S, and CPJ370BVBK1UBC.
(5) Used with CRT A34JLL40X.

MISCELLANEOUS

Item No.	Description	Mfr. Part No.	Notes
# ACC701 (2)	Line Cord	QACCD3038CESA	AC, Polarized
	Line Cord	QACCD3051CESA	AC, Polarized
	Line Cord	QACCD3037CESA	AC, Polarized
	Line Cord	QACCD3056CESA	AC, Polarized
	Line Cord	QACCD3055CESA	AC, Polarized
# ACC701 (3)	Line Cord	QACCD3037CESB	AC, Polarized
	Line Cord	QACCD3055CESB	AC, Polarized
CF301	Filter	RFiLC0403CEZZ	4.5MHz
	Filter	RFiLC0029TAZZ	4.5MHz
CF401	Trap	RFiLC0013CEZZ	4.5MHz
	Trap	RFiLC0004PEZZ	4.5MHz
CF631	Crystal	RFiLA0034CEZZ	503kHz
CF2040	Filter	RFiLC0121GEZZ	-
# F701	Fuse	QFS-B4023CEZZ	4Amp, 125VAC, Slow Blow
	Fuse	QFS-B4021CEZZ	4Amp, 125VAC, Slow Blow
FH701	Fuse Holder	QFSDH1013CEZZ	-
FH702	Fuse Holder	QFSDH1014CEZZ	-
J903	Jack	QJAKE0159CEZZ	Audio In
J905	Jack	QJAKE0158CEZZ	Video In
RMC2601	Receiver	RRMCU0227CEZZ	Remote
	Receiver	RRMCU0222CEZZ	Remote
# RY701	Relay	RRLYU0036CEZZ	Power
	Relay	RRLYU0038CEZZ	Power
	Relay	RRLYJ0077CEZZ	Power
S2501	Switch	QSW-K0079GEZZ	Power
S2502	Switch	QSW-K0079GEZZ	Volume Down
S2503	Switch	QSW-K0079GEZZ	Volume Up
S2504	Switch	QSW-K0079GEZZ	Channel Down
S2505	Switch	QSW-K0079GEZZ	Channel Up
SC851	Socket	QSOCV0839CEZZ	CRT
	Socket	QSOCV0829CEZZ	CRT
SF201	Filter	RFiLC0405CEZZ	SAW
SP1	Speaker	VSP0080PBK58A	3" Round, 8 Ohms, 2W
# TU51 (1)	Tuner	VTUVTST6UF78/	UHF/VHF
# V101	CRT	VB37GDA86X/1E	37GDA86X
	CRT	VB370BVBK1U-S	CPJ370BVBK1UBC
	CRT	VB370BVBK1S-S	CPJ370BVBK1S
	CRT	VB34JFQ90X/*S	A34KFQ90X
	CRT	VB34KPU02X/*S	A34KPU02XX
	CRT	VB34JLL40X/*S	A34JLL40X
X801	Crystal	RCRSB0001PEZZ	3.58MHz
	Crystal	RCRSB0205CEZZ	3.58MHz
	Antenna	QANTR0022PEZZ	Rod
	Magnet	PMAGF3041CEZZ	Purity/Convergence
	PC Board	DUNTK9530WEV0	CRT
	PC Board (2)	DUNTK9529WEV0	Main
	PC Board (3)	DUNTK9529WEV4	Main
	Transmitter (2)	RRMCG1324CESA	Remote
	Transmitter (3)	RRMCG1324CESB	Remote
	Wedges	PSPAG0004PEZZ	Yoke Positioning (3 Used)

For SAFETY use only equivalent replacement part.
(1) Contact TNI Electronics for replacement; order by part number on tuner.
(2) Used in models CK13M10 and 13K-M100.
(3) Used in models CK13M15 and 13K-M150.

CAPACITORS & ELECTROLYTICS

Item No.	Rating	Mfr. Part No.	Item No.	Rating	Mfr. Part No.
C52	22µF 10% 16V Tantalum	VCSATA1CE226K	# C705	470µF 200V	RC-EZ0422CEZZ
C551	2.2µF 10% 16V Tantalum	VCSATA1CE225K		470µF 200V	RC-EZ0522CEZZ
# C608	.0052 +50% -10% 1.6kV	VCFPPD3CA522H	# C706	.0033 20% 250VAC	-
# C701	.047 275VAC	RC-FZ015SCEZZ		.0033 125VAC	RC-KZ0092GEZZ
	.047 275VAC	RC-FZ002SCEZZ		.0033 125VAC	RC-KZ0311CEZZ
	.047 275VAC	RC-FZ004SCEZZ	# C712	33µF 160V	RC-EZ0638CEZZ
	.047 275VAC	RC-FZ027SCEZZ		33µF 160V	RC-EZ0658CEZZ
	.047 275VAC	RC-FZ059SCEZZ	# C758	10µF 20% 250V	VCEAGA2EW106M
	.047 275VAC	RC-FZ0279CEZZ	C854	.01 +80% -20% 250VAC	-
				.01 1.4kV	RC-KZ0016CEZZ

For SAFETY use only equivalent replacement part.