

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 ground 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 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.

HIGH VOLTAGE SHUTDOWN TEST

Apply 120VAC, Turn receiver on, and set all customer controls to normal operation. Measure voltage between TE7 and TP7. Voltage should be between 16.5V and 21.0V. If the voltage exceeds this range, the shutdown circuit should be repaired. Temporarily connect a 23.0V power supply thru a 100 ohms resistor to TP7 and ground. The receiver should lose raster and sound. If the receiver does not lose raster and sound, the shutdown circuit should be repaired. To resume normal operation, press the power switch.

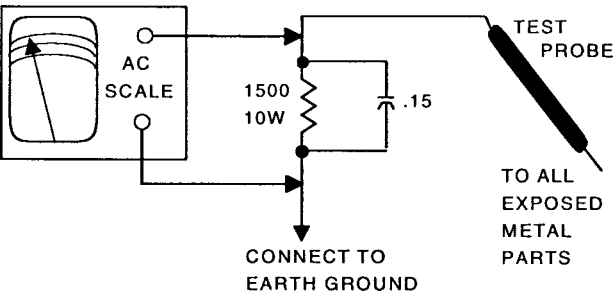
SAFETY CHECKS — FIRE AND SHOCK HAZARD

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.



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

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9850 East 30th Street  
Indianapolis, IN 46229

Printed in the United States of America 5 4 3 2 1

03PF02128

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PHOTOFACT® Technical Service Data

4737

4737

SANYO

Model DS25520 (Chassis 25520-00/01)



Model DS25520 (Chassis 25520-01)

Essential coverage  
for servicing a television receiver...

- Schematics
- Component locations
- Parts list



JUNE 2003 SET 4737

SET 4737

MODEL DS25520 (CHASSIS 25520-00/01)

SANYO

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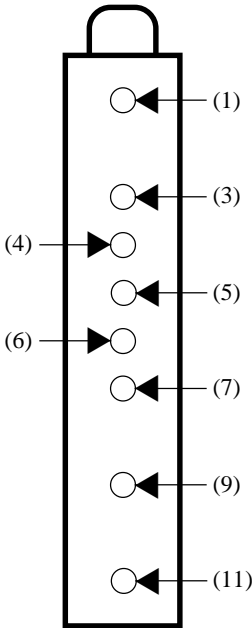
TUNER INFORMATION

TUNER VOLTAGE CHART

Pin	VHF Low Band	VHF High Band	UHF Band
(1) AGC	2.3V	2.4V	2.8V
(3) EN	0V	0V	0V
(4) SCL	4.2V	4.2V	4.2V
(5) SDA	4.2V	4.2V	4.2V
(6) MB	5.0V	5.0V	5.0V
(7) PB	5.0V	5.0V	5.0V
(9) TB	33.6V	33.6V	33.6V
(11) 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



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

SCHEMATIC COMPONENT LOCATION GUIDE

A1901	A33	C604	A27	C3436	B2	K1011	A1	R251	C19	R612	B28	R884	E37
C001	A5	C606	B26	C3437	C3	K1011	A13	R252	C19	R613	D28	R886	E37
C002	B5	C608	B29	C3439	D3	K1051	A14	R272	B19	R614	C27	R1001	B13
C003	A5	C609	A28	C3441	B1	L164	B13	R273	C19	R615	D28	R1002	A13
C004	B5	C612	C26	C3442	A1	L401	E14	R274	C19	R616	C27	R1003	A13
C006	B7	C613	C27	C3447	C1	L404	E12	R276	C19	R617	D27	R1004	A13
C010	B7	C614	D26	C3448	B1	L602	C28	R281	D10	R618	C26	R1006	B13
C011	A7	C625	A30	D001	B6	L611	C28	R284	B19	R619	D26	R1007	B13
C012	C5	C626	B30	D101	B39	L612	C28	R287	B21	R627	B31	R1051	A15
C015	B6	C628	A32	D351	E10	L623	B29	R288	B21	R628	C31	R1052	B14
C101	E32	C629	B32	D408	A32	L625	A29	R289	B21	R629	C30	R1053	A15
C103	B40	C631	A26	D421	D11	L801	E31	R321	A20	R630	A31	R1054	A15
C106	C9	C632	B28	D422	E11	L811	D37	R353	E10	R631	D29	R1059	A15
C131	B11	C634	D29	D428	B34	L812	C37	R400	D12	R632	D29	R1071	A17
C133	B11	C683	C30	D429	B34	L821	E31	R401	E9	R634	D29	R1073	A16
C134	B11	C689	B31	D471	E27	L851	E31	R402	E9	R683	C30	R1081	B16
C137	A11	C693	D30	D481	E27	L901	B26	R404	E12	R691	B30	R1082	B14
C141	C9	C701	B22	D482	E11	L902	D16	R405	D9	R692	D30	R1083	B15
C142	B11	C711	C22	D483	E26	L1901	E31	R406	E13	R693	D29	R1084	B15
C143	B9	C721	A23	D486	D31	LF601	A25	R407	E13	R694	D29	R1901	B34
C146	E32	C742	D24	D487	D19	PS601	A26	R411	E14	R695	D29	R1902	B34
C147	E32	C801	E32	D490	E31	Q001	B5	R416	E14	R701	B23	R1903	B33
C151	B10	C806	E31	D501	D14	Q005	B6	R421	E11	R703	B22	R1904	B33
C153	B10	C809	C37	D502	D15	Q135	A12	R422	E11	R704	B22	R1905	B33
C161	B9	C810	D37	D503	E28	Q202	B13	R423	D11	R706	B23	R1906	B33
C211	B17	C811	A36	D601	A27	Q208	C33	R426	D11	R707	B23	R1907	B33
C212	C18	C822	E32	D602	A27	Q401	E12	R428	B34	R711	C23	R1909	A35
C221	A18	C829	C35	D603	A27	Q402	E14	R430	E12	R713	C22	R1910	B34
C252	B19	C835	B35	D604	A27	Q486	D31	R441	C18	R714	C22	R3401	C2
C253	C19	C841	A20	D611	C28	Q490	E31	R442	C18	R716	C23	R3402	C2
C256	B19	C842	A20	D612	B26	Q601	B28	R443	C10	R717	C23	R3406	D3
C257	D32	C843	A19	D613	C27	Q611	B27	R444	C11	R721	B23	R3407	D3
C258	D32	C853	C34	D614	C27	Q612	C27	R449	D9	R723	A22	R3411	E2
C272	C19	C854	C35	D624	B29	Q613	C27	R471	E26	R724	A22	R3421	D2
C274	C19	C856	E37	D625	A30	Q627	B31	R472	B6	R726	A23	R3422	E2
C284	B19	C857	E37	D627	D30	Q635	D29	R481	E27	R727	A23	R3426	E2
C285	B19	C858	C36	D629	B30	Q681	C31	R482	E11	R803	B11	R3432	C3
C401	E9	C862	C36	D680	C31	Q693	D29	R483	E26	R804	B11	R3433	D3
C402	E9	C1001	B13	D683	B32	Q695	D29	R485	D19	R806	D37	R3434	C4
C403	D9	C1002	A13	D693	D29	Q701	B23	R486	D30	R807	D35	R3435	C3
C404	E12	C1051	A15	D801	B35	Q711	C23	R487	D30	R808	D35	R3436	C4
C405	D9	C1052	B15	D834	C34	Q721	A23	R488	E31	R809	C37	R3437	D3
C406	E13	C1059	A15	D836	C34	Q831	A35	R489	D30	R810	B36	R3441	B1
C407	E13	C1071	D31	D843	C35	Q901	B24	R491	D19	R813	A35	R3442	B1
C408	E13	C1080	D32	D1001	B13	Q1071	A17	R492	D19	R814	A35	R3443	A1
C411	E15	C1081	D32	D1002	A13	R001	A4	R493	D19	R816	A34	R3444	A1
C416	E16	C1902	E31	D1051	A15	R002	B4	R494	D19	R823	E35	R3445	C1
C417	E16	C3401	D2	D1052	B15	R003	A4	R495	D31	R829	E36	R3446	C1
C421	D11	C3404	A3	D1059	A15	R004	B4	R497	A24	R831	C35	R3447	B1
C427	D11	C3406	D4	D1901	E32	R005	C6	R499	E31	R833	C34	R3448	B1
C441	C18	C3407	D3	D1902	B39	R006	B6	R503	D12	R835	B35	RL601	A26
C471	E27	C3408	D2	F601	A25	R013	B5	R504	D13	R842	B38	RL601	B32
C473	E15	C3411	A2	IC001	A6	R106	B39	R505	D13	R843	C38	SP901	A8
C482	E27	C3412	D2	IC101	A11	R107	B39	R506	D13	R844	B38	SP902	B8
C484	E11	C3413	D2	IC101	B11	R131	A11	R507	D13	R846	B37	SW1901	B33
C487	E28	C3414	D32	IC101	B19	R133	B11	R508	D13	R847	B37	SW1902	B33
C489	D31	C3416	A2	IC101	D10	R137	A12	R509	D13	R848	C37	SW1903	B33
C493	D19	C3417	D2	IC501	D14	R142	C10	R511	D15	R849	B37	SW1904	B33
C497	E31	C3418	B3	IC601	D26	R143	B9	R513	D15	R851	E37	SW1905	B33
C502	D14	C3421	D2	IC681	E30	R151	C10	R517	D14	R852	B35	SW1906	C33
C503	D13	C3422	E2	IC801	B36	R161	B10	R518	D14	R853	C34	T151	A10
C504	D13	C3423	C2	IC802	D34	R162	B9	R601	A26	R854	C35	T401	E13
C505	D11	C3424	D3	IC1081	A14	R163	B12	R602	B26	R856	D38	T402	D17
C506	D13	C3426	C2	IC1081	A16	R164	B13	R603	A28	R857	C38	T402	E25
C508	C13	C3427	E2	IC1081	B16	R166	B12	R604	B29	R858	A37	T601	A29
C509	D11	C3431	E2	IC3401	A2	R167	B12	R606	B27	R862	C35	W601	A25
C511	D15	C3432	C2	K1001	B1	R201	B13	R607	C27	R864	C35	X141	B9
C516	D14	C3433	E2	K1001	B13	R208	C34	R608	C27	R881	D37	X161	B13
C601	A25	C3434	E2	K1001	C4	R209	C33	R609	C27	R882	C37	X251	B18
C603	A27	C3435	C3	K1001	C4	R212	C18	R611	C28	R883	E37	X801	B35

## MISCELLANEOUS ADJUSTMENTS

### B+ CHECK

Connect a digital DC voltmeter to the cathode of D625. Set brightness and picture to minimum. With AC line set to 120VAC, B+ should read 130V ±2.0V.

### HIGH VOLTAGE CHECK

Tune in a picture. Set customer controls to minimum. Connect a high voltage probe to CRT anode. High voltage should measure 26kV to 28kV.

### ENTERING SERVICE MODE

Disconnect the AC power cord. While pressing the menu button on the front of the set, connect the AC power cord. Use the channel up and down buttons to select the service number. Use volume up and down buttons to change the value. Press the menu button to exit the service mode.

### HORIZONTAL WIDTH

Tune in a crosshatch pattern. Enter the service mode and select service item number 47 EWD. Adjust for the proper horizontal width.

### HORIZONTAL POSITION

Tune in a crosshatch pattern. Enter the service mode and select service item number 03 HP. Adjust for the best horizontal centering.

### RF AGC DELAY

Tune in a picture. Enter the service mode and select service number 42 RAD. Adjust where no snow (noise) appears in picture.

### VERTICAL SIZE

Tune in a crosshatch pattern. Enter the service mode and select service item number 04 VS. Adjust for proper vertical size and best vertical linearity.

### VERTICAL CENTERING

Tune in a crosshatch pattern. Check that the pattern is centered. If too low, replace resistor R513 1000 ohms 1/2W with a 470 ohms 1W. If too high, remove resistor R513 1000 ohms 1/2W.

### VCO

VCO must be adjusted after IC101, IC802, or T151 is replaced. Tune in a picture. Connect positive lead of a digital voltmeter to pin 58 of IC101 and the negative lead to TE7. Adjust T151 to obtain a reading of 3.6V ± 0.2V.

### VIDEO LEVEL

Tune in a color bar pattern. Set picture and brightness to normal. Connect an oscilloscope to the emitter of Q202, and the negative lead to ground. Enter the service mode and select service number 46 VL. Adjust for 1.0Vp-p ±0.1Vp-p waveform on the oscilloscope.

### GRAY SCALE

Tune in an active channel. Enter the service mode. Set the value of service numbers 15 RB, 16 GB, and 17 BB to 0. Set the value of service numbers 18 RD and 20 BD to 55. Set screen control, color, brightness, and picture to minimum. Adjust screen control, if necessary, to obtain a barely visible horizontal line. Select service number 73. Adjust the bias levels for a white line. Select service number 72 DRV and adjust the drive values for normal black and white picture at all brightness levels.

### SUB BRIGHTNESS

Tune in a color bar pattern. Set picture and brightness to normal. Connect positive lead of a digital voltmeter to TP51 and the negative lead to TP50. Enter the service mode and select service number 53 SB. Adjust for 820mV ±10mV.

### SUB COLOR, SUB TINT, SUB SHARPNESS

Tune in a picture. Enter the service mode. Select service number 54 SCO. Adjust for normal color level. Select service number 55 STI. Adjust for normal flesh tones. Select service number 56 SSH. Adjust for contrast range.

### OSD HORIZONTAL POSITION

Tune in a local channel. Enter the service mode and select service item number 59 HR. Adjust for centered on screen menu.

### SOUND

Tune in a local channel. Connect an oscilloscope to the base of Q135, and the negative lead to ground. Enter the service mode and select service number 45 FL. Adjust for 0.693Vp-p ± 0.07Vp-p waveform on the oscilloscope

### INPUT LEVEL

Set generator to 1kHz audio frequency and L-R modulating signal. Connect an oscilloscope to pin 38 of IC3401. Enter service mode and select the service item number 60 ATT. Adjust for 0.7Vp-p waveform.

### SEPARATION

Set generator to pilot, 300Hz audio frequency, and left modulating signal. Connect an oscilloscope to pin 38 of IC3401 and ground. Enter the service mode and select service number 61 WDB. Adjust for minimum amplitude of the waveform. Set generator to 8kHz audio frequency. Select service number 62 SPC and adjust for minimum amplitude of the waveform.

### PURITY

NOTE: Operate the receiver for 15 minutes to allow warm-up of CRT. Use a degaussing coil to demagnetize the CRT. Tune in a green raster. Loosen the clamp screw. Slide deflection yoke back as far as possible. Adjust purity tabs to center the vertical green band. Slide the deflection yoke forward to produce a uniform green screen. Tighten the clamp screw.

### CONVERGENCE

Tune in a dot pattern. Loosen the clamp screw. Adjust the 4 pole magnets to converge the red and blue dots at the center of the screen. Adjust 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. The 4 and 6 pole magnets interact, repeat adjustment until center convergence is correct.

Tune in a crosshatch pattern. Remove the tilt adjustment wedges between deflection yoke and the CRT. Loosen the clamp screw. Tilt the deflection yoke up or down to converge the vertical lines at the top and bottom of the screen and the horizontal lines at the right and left sides of the screen. Tilt the deflection yoke to the right or left to converge the horizontal line at the top and bottom of the screen and the vertical line at the right and left sides of the screen. Repeat convergence procedure if necessary to obtain best overall convergence. Replace the tilt adjustment wedges. Tighten the clamp screw.

### CRT NECK ASSEMBLY

### IC802 REPLACEMENT

Perform the following adjustments after replacing IC802. Enter the service mode, select service number 03 HP and set value to 14. Select service number 07 VLN and set value to 13. Select service number 28 PRE and set value to 3. Select service number 37 AF and set value to 1. Select service number 57 OPT and set value to 100. Select service number 58 OP2 and set value to 32. Press the menu button to exit service mode.

No.	Service Adjustment	Value Range	Initial Ref Value	Initial Set Up Value	On-Set Value	Notes
01	HFR	0 - 63	29	29	29	Horizontal Frequency
02	AFC	0, 1	0	0	0	AFC Gain
03	HP	0 - 31	15	14	14	H-Position (H-Centering)
04	VS	0 - 127	64	64	51	Vertical Size
05	VPO	0 - 63	5	5	5	Vertical Position
06	VSP	0, 1	0	0	0	Vertical Set Up
07	VLN	0 - 31	18	13	13	Vertical Linearity
08	CRS	0 - 3	0	0	0	Cross B/W
09	GRY	0, 1	1	1	1	Gray Mode
10	VSC	0 - 31	8	8	8	Vertical S Correction
11	HBR	0 - 7	3	3	3	H BLK R
12	HBL	0 - 7	4	4	4	H BLK L
13	CDM	0, 1	0	0	0	CD Mode
14	VC	0 - 7	7	7	7	Vertical Compression
15	RB	0 - 255	0	0	0	Red Bias
16	GB	0 - 255	0	0	0	Green Bias
17	BB	0 - 255	0	0	7	Blue Bias
18	RD	0 - 127	64	64	85	Red Drive
19	GD	0 - 15	8	8	8	Green Drive
20	BD	0 - 127	64	64	62	Blue Drive
21	SBI	0 - 127	48	48	48	Sub Bias
22	OSD	0 - 3	3	3	3	OSD Contrast
23	POS	0, 1	0	0	0	Pre/Over/SW
24	FLS	0 - 7	1	1	1	Filter System
25	CKO	0 - 7	3	3	3	Color Killer Operation
26	GYA	0, 1	0	0	0	G-Y Angle
27	CRG	0 - 3	2	2	2	Coring Gain
28	PRE	0 - 3	1	3	3	Pre Shoot Adjust
29	WP	0, 1	0	1	1	White Peak Limiter, 0 = On, 1 = Off
30	FSW	0, 1	0	0	0	FBP Blanking Switch
31	VBL	0, 1	0	0	0	Vertical Blanking Switch
32	BSG	0 - 3	2	2	2	Black Stretch Gain
33	BSS	0 - 3	1	1	1	Black Stretch Start
34	DCR	0 - 3	1	1	1	DC Reset
35	YGM	0 - 3	1	1	1	Y Gamma
36	CBP	0, 1	0	0	0	C Bypass
37	AF	0, 1	0	1	1	Auto Flesh, 0 = Off, 1 = On
38	BAT	0 - 7	4	4	4	Bright ABL Threshold
39	MSD	0, 1	0	0	0	Mid Stop Def
40	ABL	0, 1	0	0	0	ABL Defeat, 0 = On, 1 = Off
41	RYA	0 - 15	2	2	2	R-Y/B-Y Angle
42	RAD	0 - 63	15	15	37	RF AGC Delay
43	IAS	0, 1	0	0	0	IF AGC Switch, 0 = TV (Normal), 1 = AV (IF Gain Minimum)
44	FMM	0, 1	0	0	0	FM Mute
45	FL	0 - 31	15	15	10	FM Level
46	VL	0 - 7	4	4	5	Video Level
47	EWD	0 - 63	39	39	39	EW DC
48	EWA	0 - 63	30	30	30	EW Amp
49	EWT	0 - 63	34	34	34	EW Tilt
50	EWP	0 - 7	7	7	7	EW Corner Top
51	EWB	-	8	8	8	EW Corner Bottom
52	HSC	-	7	7	7	Horiz Size Comp
53	SB	0 - 63	32	32	31	Sub Brightness
54	SCO	0 - 31	7	7	7	Sub Color
55	STI	0 - 31	20	20	20	Sub Tint
56	SSH	0 - 15	12	12	12	Sub Sharpness
57	OPT	0 - 255	0	100	100	Option, data 1 should be set to 100, in binary 8 bit 01100100
58	OP2	0 - 255	0	32	32	Option, data 2 should be set to 32, in binary 8 bit 0 0100000
59	HR	0 - 63	27	27	27	OSD Horizontal Position
60	ATT	0 - 15	10	7	8	Attenuation
61	WDB	0 - 63	32	32	34	Wide Band
62	SPC	0 - 63	32	32	11	Spectral
63	SBO	0 - 255	5	5	5	Sub Bright Offset
64	PCO	0 - 63	40	40	40	PIP Color
65	PTI	0 - 63	40	40	40	PIP Tint
66	PUV	0 - 63	24	24	24	PIP Top Position
67	PDV	0 - 255	147	147	147	PIP Bottom Position
68	PLH	0 - 63	10	10	10	PIP Left Position
69	PRH	0 - 255	101	101	101	PIP Right Position
70	PCN	0 - 63	42	42	52	PIP Y Level
71	PBS	0 - 63	15	15	15	PIP BGP Phase
72	DRV	0 - 127	64	64	R 85	Red Drive, press 1 to decrease value and 3 to increase value.
	DRV	0 - 127	64	64	B 62	Blue Drive, press 7 to decrease value and 9 to increase value.
73	-	0 - 255	0	0	0	Red Bias, press 1 to decrease value and 3 to increase value.
	-	0 - 255	0	0	0	Green Bias, press 4 to decrease value and 6 to increase value.
	-	0 - 255	0	0	0	Blue Bias, press 7 to decrease value and 9 to increase value.
74	R00					
Thru	Thru					
146	R72	0 - 255	-	0	0	-

## G

## H

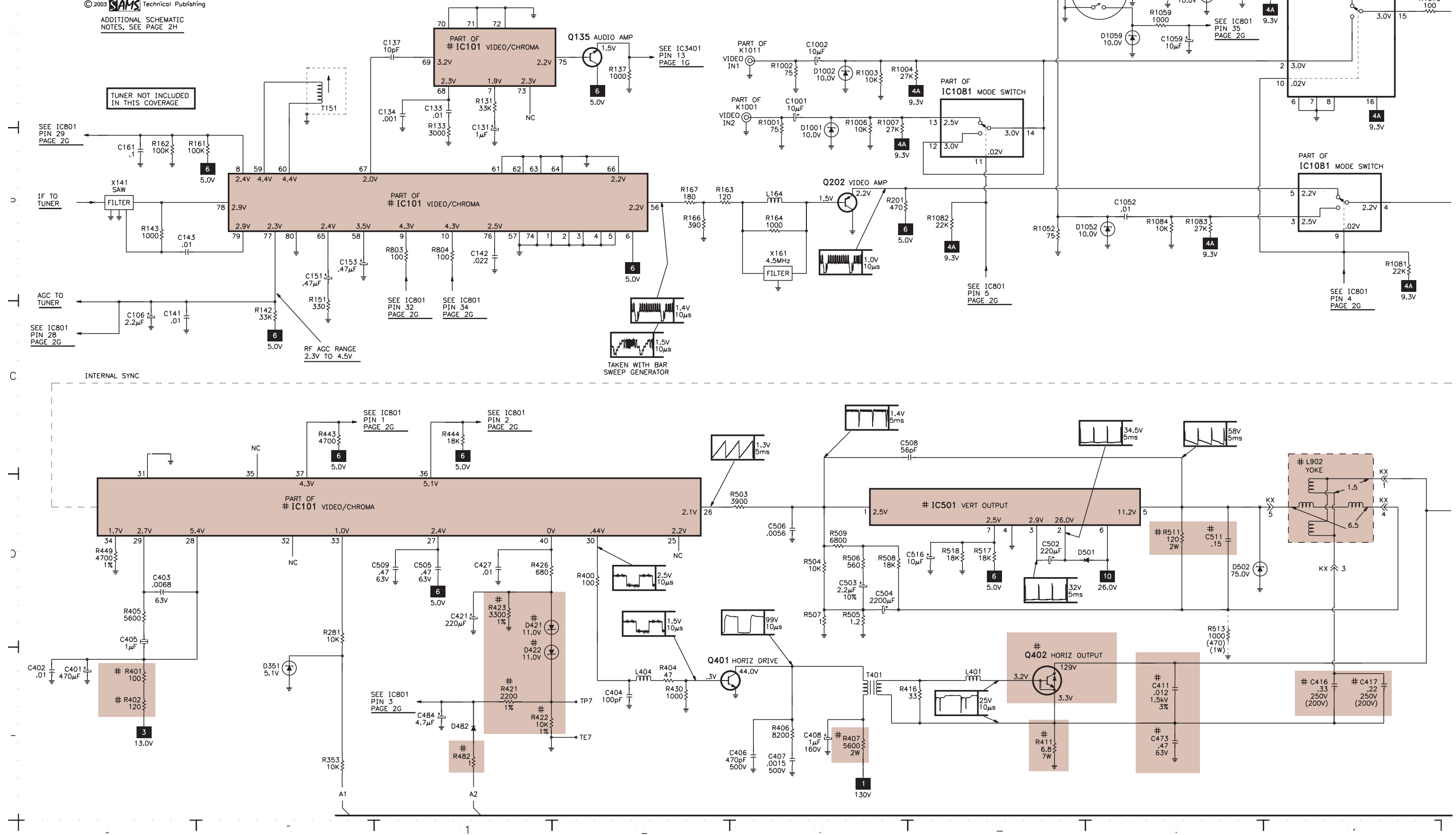


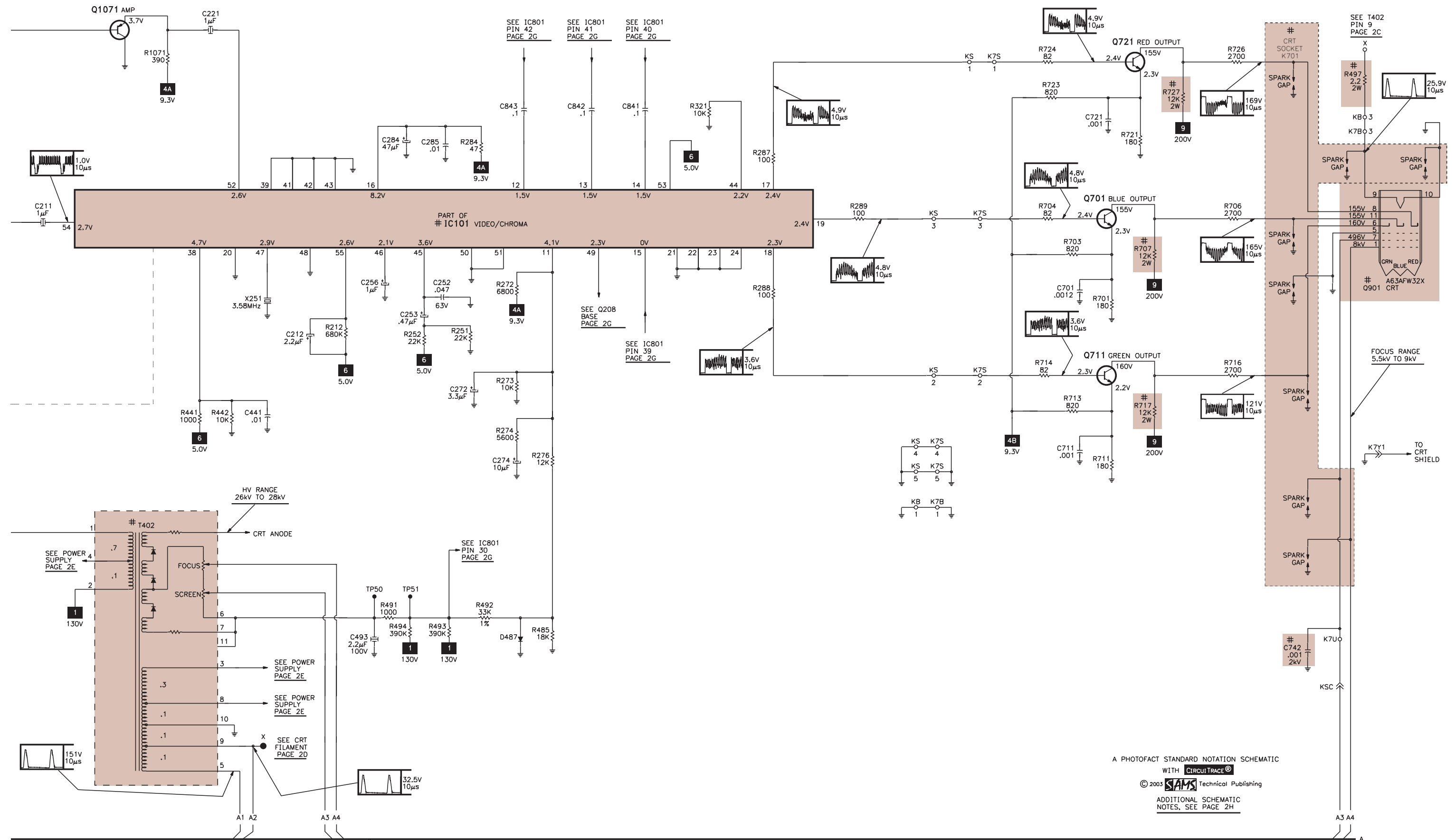
**MODEL DS25520 (CHASSIS 25520-00/01)**

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## B

TUNER NOT INCLUDED  
IN THIS COVERAGE



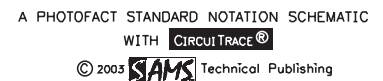
**TELEVISION SCHEMATIC continued**



## F



A PHOTOFACT STANDARD NOTATION SCHEMATIC  
WITH **CIRCUITRACE®**  
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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

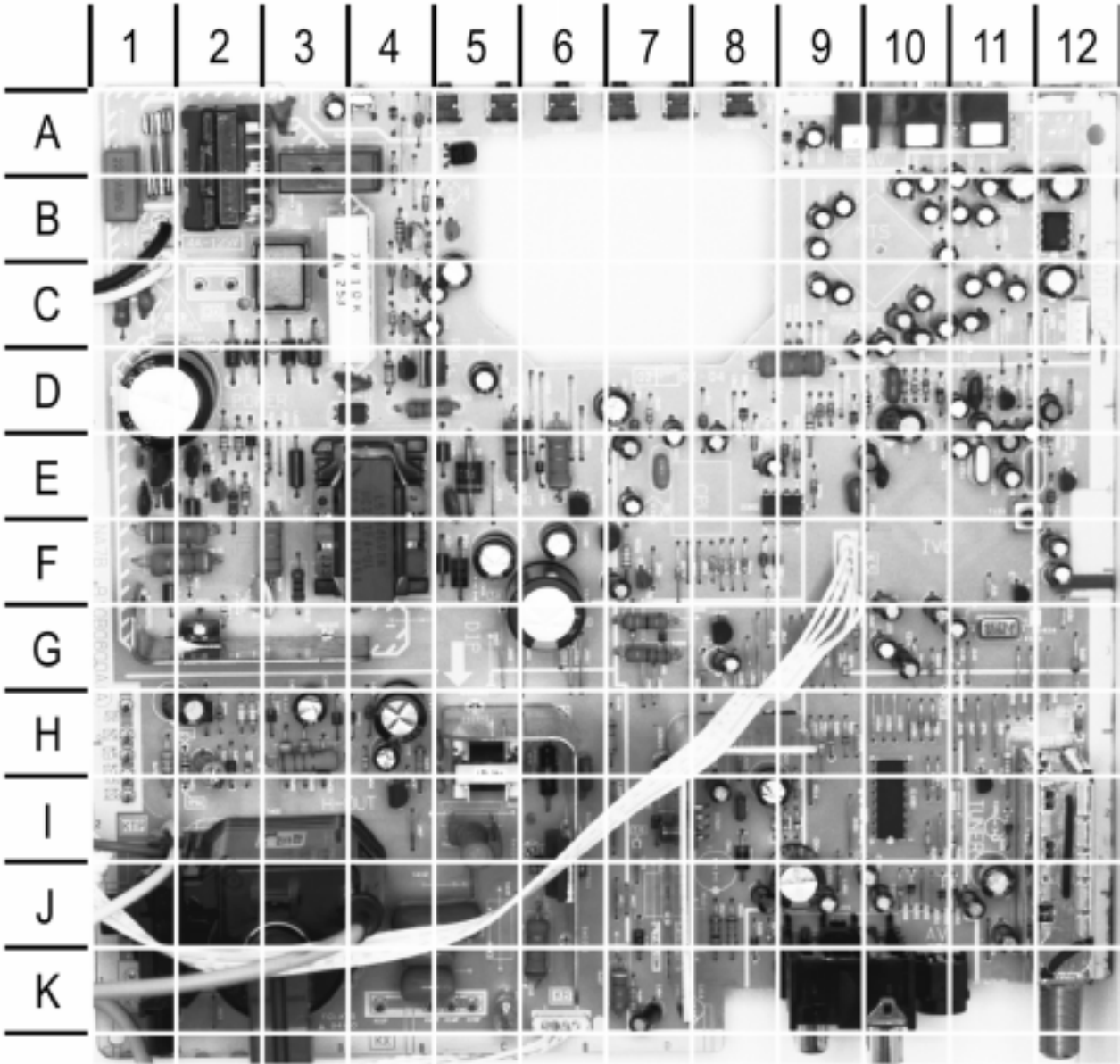
△ Taken from common tie point

3 Schematic CIRCUITRACE® Voltage source tie point.

A — Cabling: Heavy lines reduce use of multiple lines.  
Waveforms and voltages are taken from ground, unless otherwise noted.  
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.



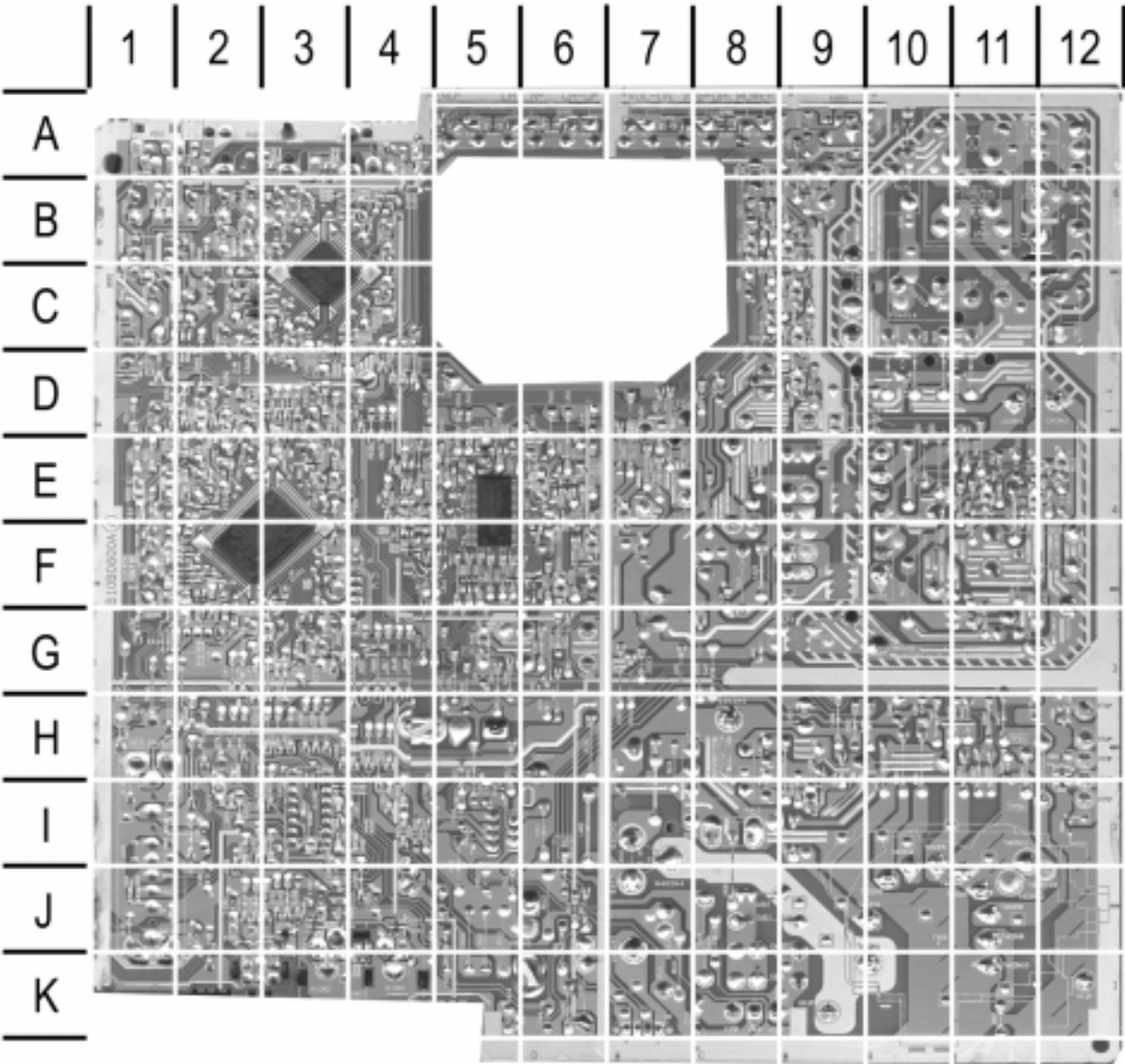
MAIN BOARD - TOP VIEW



MAIN BOARD - TOP VIEW, GRIDTRACE LOCATION GUIDE

A101	I12	C613	E2	D487	H2	L851	D7	R491	H2	SW1901	A5
A1901	A4	C614	E1	D490	G7	L1901	A4	R492	H2	SW1902	A5
C001	C11	C625	E5	D501	I7	LF601	A2	R493	H2	SW1903	A6
C002	C11	C626	F5	D502	I8	PS601	C3	R494	H2	SW1904	A7
C010	B12	C628	G6	D503	H4	Q001	F7	R495	G7	SW1905	A7
C011	B11	C629	D5	D601	D3	Q005	F7	R497	K7	SW1906	A8
C012	F7	C631	A3	D602	D3	Q135	F11	R499	G8	T151	E11
C015	C12	C632	D4	D603	D2	Q202	E12	R503	H9	T401	H5
C101	J11	C634	C4	D604	D2	Q208	D11	R504	I9	T402	J3
C106	J11	C683	C5	D611	F2	Q401	I4	R505	J8	T601	E4
C131	G10	C693	C5	D612	D4	Q402	J6	R506	I9	TE7	H12
C147	G11	C806	D7	D613	E2	Q486	E6	R507	J8	TP7	H12
C151	F12	C811	E7	D614	E2	Q490	G8	R508	I8	TP50	I2
C153	F12	C822	E8	D624	F5	Q601	G2	R509	I9	TP51	H2
C211	D12	C829	E8	D625	E5	Q611	E2	R511	J6	X141	G11
C212	E11	C853	E7	D627	C4	Q612	E1	R517	H7	X161	E11
C221	E11	C856	E7	D629	B5	Q613	E1	R601	C3	X251	E11
C252	D11	C1001	J10	D680	B4	Q627	B4	R602	C1	X801	E7
C253	D11	C1002	A9	D683	A4	Q635	C4	R603	E3		
C256	E11	C1051	J11	D693	C4	Q681	B5	R604	F3		
C258	E11	C1059	J9	D801	G8	Q693	C4	R606	E2		
C272	G10	C1081	J10	D834	D8	Q695	D4	R607	E2		
C274	G10	C1902	A3	D843	E8	Q1071	I11	R611	G2		
C284	G10	C3401	B9	D1001	J10	R006	F7	R612	F3		
C401	D10	C3404	B9	D1002	A9	R013	F7	R613	F2		
C403	E10	C3408	B10	D1051	J10	R106	H7	R614	E1		
C405	E10	C3411	B11	D1052	J11	R107	H11	R615	F2		
C406	I5	C3412	B10	D1901	A4	R201	E12	R617	E2		
C407	H5	C3413	B10	D1902	A9	R252	D11	R618	E2		
C408	H4	C3414	B11	F601	A1	R276	G9	R628	B4		
C411	J4	C3416	B11	IC001	B12	R284	G9	R630	D4		
C416	K4	C3417	B11	IC501	I7	R353	H2	R631	D4		
C417	K4	C3418	B10	IC601	D4	R400	G9	R634	C4		
C421	D11	C3424	C11	IC681	A5	R401	D10	R683	D7		
C471	H2	C3427	C10	IC802	E9	R402	D9	R692	B4		
C473	H6	C3432	C9	IC1081	I10	R404	H4	R694	C4		
C482	H3	C3435	D9	K1001	K9	R406	H4	R803	G10		
C484	K7	C3436	B9	K1011	A10	R407	H3	R804	G10		
C487	H4	C3437	D10	K1051	K10	R411	I5	R823	D9		
C489	F6	C3439	C9	KB	K6	R416	H6	R829	D9		
C493	H2	C3441	C11	KD	C2	R421	H9	R833	G7		
C497	G8	C3442	C10	KS	F9	R422	H12	R846	F8		
C502	I8	C3447	C10	KSP	C12	R428	J8	R847	F8		
C503	J8	C3448	C10	KTP	H1	R430	I4	R848	F8		
C504	J9	D001	B12	KX	K4	R441	D10	R849	F8		
C505	D10	D101	I11	L164	E12	R443	D10	R856	H10		
C506	I8	D351	D9	L401	H6	R444	D10	R857	H10		
C509	E9	D408	H3	L404	H4	R471	H1	R883	E9		
C511	K5	D421	D10	L602	E3	R472	D9	R884	E9		
C516	I8	D422	G12	L611	F1	R481	H3	R1053	I10		
C601	B1	D428	J8	L612	E2	R482	K7	R1054	I10		
C603	D3	D429	H9	L623	F5	R483	H3	R1059	J10		
C604	D2	D471	H2	L625	E5	R485	H2	R1071	I10		
C606	C1	D481	H3	L801	E9	R486	E6	R1073	I9		
C608	F3	D482	J7	L811	F8	R487	E7	R1909	C9		
C609	D1	D483	H3	L812	F8	R488	G7	R1910	C9		
C612	E1	D486	E6	L821	D8	R489	E5	RL601	A3		

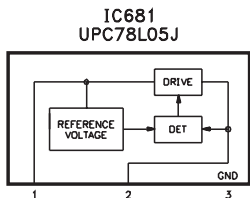
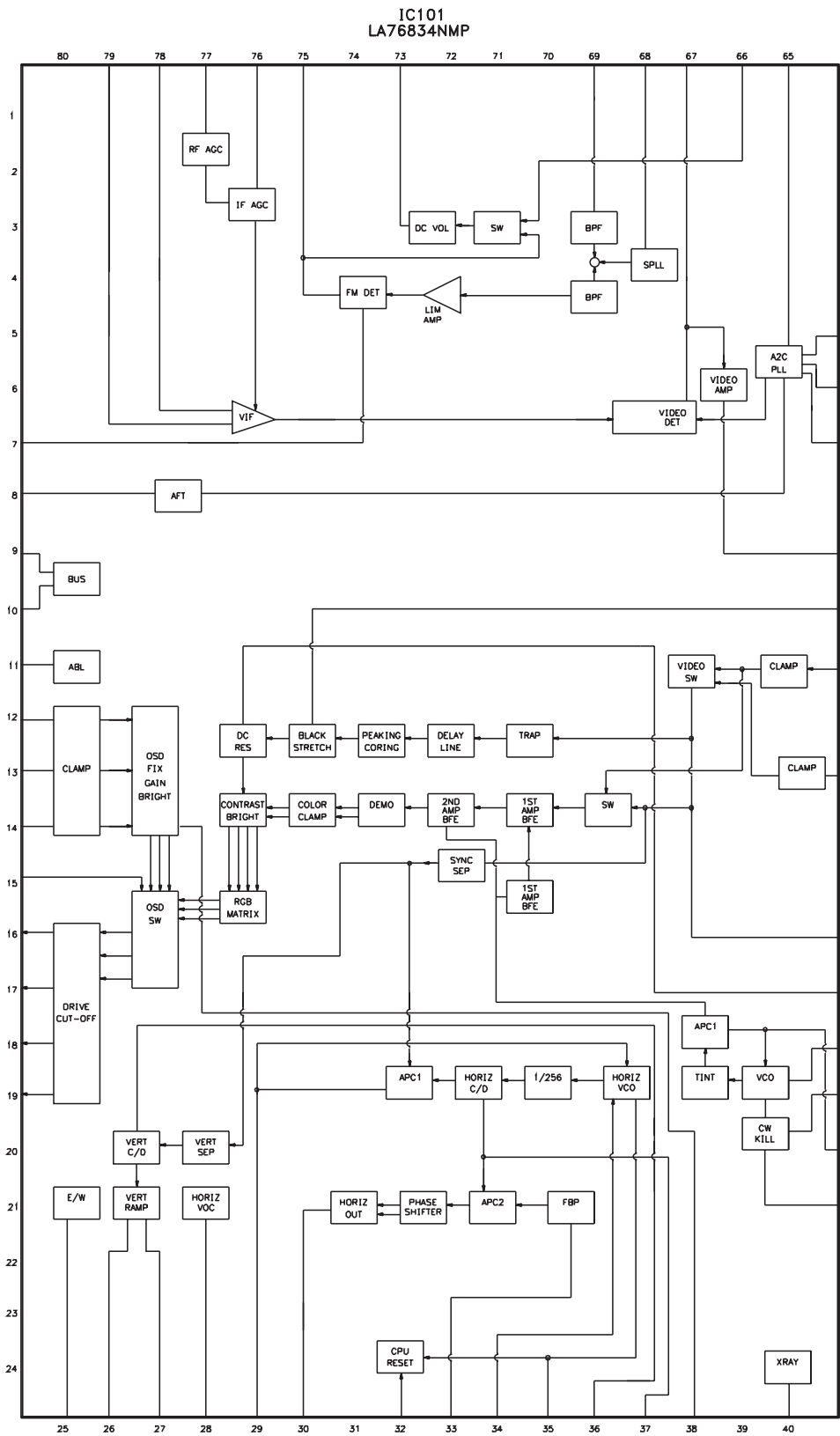
MAIN BOARD - BOTTOM VIEW



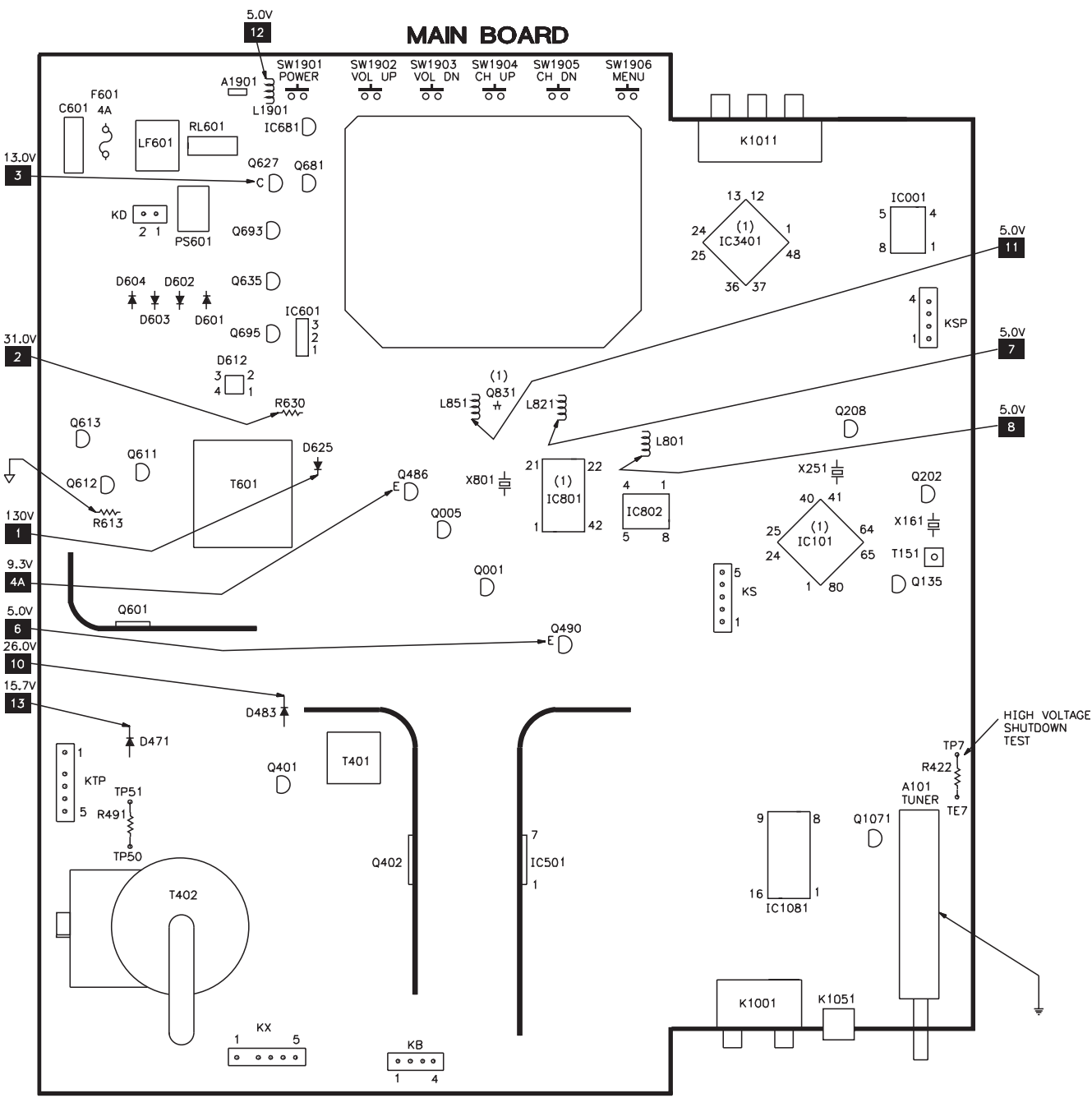
MAIN BOARD - BOTTOM VIEW, GRIDTRACE LOCATION GUIDE

C003	C2	C862	E5	R161	G3	R632	C8	R1004	I3	R3441	A3
C004	B2	C1052	I2	R162	G3	R691	B8	R1006	I4	R3442	A3
C006	C1	C1071	H1	R163	F1	R693	C9	R1007	I4	R3443	A3
C103	I1	C1080	I3	R164	F1	R695	D9	R1051	J2	R3444	A3
C133	F2	C3406	B3	R166	F1	R806	F4	R1052	J3	R3445	J3
C134	F2	C3407	B3	R167	E2	R807	F4	R1081	I3	R3446	J3
C137	F2	C3421	C2	R208	D2	R808	E4	R1082	I3	R3447	J3
C141	G2	C3422	C2	R209	E2	R809	F4	R1083	I3	R3448	J3
C142	F2	C3423	C2	R212	E2	R810	F5	R1084	I3		
C143	G2	C3426	C2	R251	E2	R813	E5	R1901	A5		
C146	G2	C3431	C4	R272	G3	R814	E5	R1902	A8		
C161	G3	C3433	C4	R273	G3	R816	E5	R1903	A8		
C257	E2	C3434	C4	R274	G3	R831	E4	R1904	A7		
C285	G4	D836	E5	R281	E3	R835	F6	R1905	A6		
C402	E3	D1059	J3	R287	F3	R842	F5	R1906	A6		
C404	G5	IC101	F3	R288	F3	R843	F5	R1907	A5		
C427	E3	IC801	F5	R289	F3	R844	F5	R3401	B4		
C441	E3	IC3401	C3	R321	E3	R851	E6	R3402	B4		
C508	I5	Q831	E5	R405	E3	R852	F6	R3406	B3		
C689	B9	R001	C2	R423	D2	R853	E6	R3407	B3		
C801	E5	R002	C2	R426	D2	R854	E6	R3411	B3		
C809	F4	R003	C2	R442	E3	R858	F6	R3421	B2		
C810	F5	R004	C2	R449	E3	R862	E5	R3422	B2		
C835	F5	R005	F6	R518	I5	R864	E5	R3426	C2		
C841	G3	R131	F3	R608	E11	R881	E4	R3432	D3		
C842	G4	R133	F1	R609	E11	R882	E4	R3433	D3		
C843	G3	R137	F1	R616	E11	R886	F4	R3434	J3		
C854	E6	R142	G1	R619	E12	R1001	J3	R3435	J3		
C857	E6	R143	G2	R627	B9	R1002	A2	R3436	J4		
C858	E6	R151	F1	R629	B8	R1003	H3	R3437	J4		

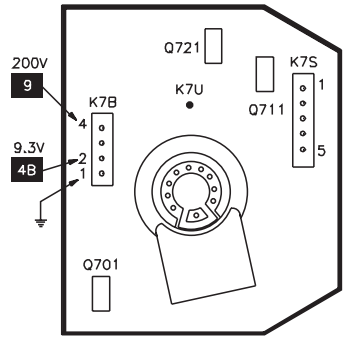
IC FUNCTIONS



PLACEMENT CHART



CRT BOARD



PARTS LIST

Item No.	Type No.	Mfr. Part No.	NTE Part No.
D001	MTZJ15B	408 047 4706	NTE5023A
D101	MTZJ36A	408 047 6205	-
D351	MTZJ5.1A	408 047 6502	NTE5010T1
D408	1Z150	407 222 4401	NTE5100A
# D421, 22	HZ11B2L	407 158 1307	NTE5020A
D428	RD15EB3	407 054 5904	NTE5024A
D429	1S2076A	407 013 4306	NTE519
D471	ERB44-04	407 006 4108	NTE552
D481	ES1	407 007 6606	NTE552
D482	TVR1G	407 011 4407	NTE552
D483	ES1	407 007 6606	NTE552
D486	RD10EB2	407 054 0008	NTE5019A
D487	ERA15-02	407 005 8602	NTE552
D490	MTZJ5.6C	407 047 7707	-
D501	ERA15-02	407 005 8602	NTE552
D502	1Z75	407 118 2207	NTE5093A
D503	MTZJ36A	408 047 6205	-
# D601 Thru			
# D604	EM2B	407 005 7605	NTE125
D611	1S2076A	407 013 4306	NTE519
# D612	PC817C	407 104 2402	NTE3098
D613	RD9.1EB3	407 057 9800	NTE5018A
D614	ERA91-02	407 006 0100	NTE587
# D624	RU3YX	407 106 2806	NTE588
# D625	RU4AMLF-L1	407 129 7000	NTE580
D627	1S2076A	407 013 4306	NTE519
D629	RD16EB1	407 054 7007	NTE5025A
D680, 83	1S2076A	407 013 4306	NTE519
D693	RD6.2EB3	407 057 2801	NTE5013A
D801	1S2076A	407 013 4306	NTE519
D831	UDZS-TE-173.6B	407 222 5903	-
D834	MTZJ15B	408 047 4706	NTE5023A
D836, 43	1S2076A	407 013 4306	NTE519
D1001, 02	MTZJ10B	408 047 2306	-
D1051, 52	MTZJ10B	408 047 2306	-
D1059	UDZS10B	407 206 5608	-
D1901	MTZJ6.8A	408 047 8605	-
D1902	MTZJ10B	408 047 2306	-
IC001	LA4525	409 275 7903	-
# IC101	LA76834NM-TBM	409 491 4809	-
# IC501	LA78041	409 453 5905	-
# IC601	SE130NH	409 172 8102	-
IC681	UPC78L05J	409 066 7303	NTE977
IC801	MM37272M6-542FP	410 418 8602	-
IC802	24LC02B/P	409 333 3700	-
IC1081	TC4053BP	409 051 3006	NTE4053B
IC3401	CXA2134Q-T6	409 467 1108	-
Q001	2SC1740S-Q	405 011 8401	NTE85
Q005	2SB764-E	405 008 4805	NTE383
Q135	2SC1740S-Q	405 011 8401	NTE85
Q202, 08	2SA1015-O(SAN)	405 001 7407	NTE290A
Q401	2SC2271-D-CTV	405 013 6207	NTE399
# Q402	2SD2578-YB	405 153 0202	-
Q486, 90	2SD400-E-MP	405 023 5009	NTE382
# Q601	2SK2872	405 166 7601	-
Q612	2SA984E	405 006 6504	-
Q611, 13	2SC2274-E	405 013 6801	NTE289A
Q627	2SB985-S	405 009 6907	-
Q635, 81, 93	2SC1740S-Q	405 011 8401	NTE85
Q695	2SA1015-Y(SAN)	405 001 7605	NTE290A
Q701, 11, 21	2SC2621-D-RA	405 041 6507	NTE157
Q831	2SA1037K-T-96-R	405 002 0308	NTE2409
Q1071	2SA1015-O(SAN)	405 001 7407	NTE290A
Item No.	Function/Rating	Mfr. Part No.	Notes
# A101	Tuner	645 052 6077	1AV4F1BAM0290
A1901	Receiver	645 047 6228	Remote
C211, 21	1µF 20% 50V NP	404 084 6901	-
C405	1µF 20% 50V NP	404 084 6901	-
# C411	.012 3% 1.5kV	403 343 7703	-
# C416	.33 5% 250V	403 346 7225	-
	.33 20% 200V	404 081 2807	-
# C417	.22 5% 250V	403 346 6921	-
	.22 20% 200V	404 081 2401	-

Item No.	Function/Rating	Mfr. Part No.	Notes
# C473	.47 5% 53V	404 084 5706	-
C493	2.2µF 20% 100V NP	404 056 5307	-
C503	2.2µF 10% 50V	403 276 0208	-
# C511	.15 10% 50V	403 058 5407	-
# C601	.22 20% 275VAC	404 066 2204	-
	.22 20% 250VAC	404 071 2404	-
# C603, 04	.001 10% 500V	403 075 7101	-
# C606	.001 20% 250VAC	404 088 2909	-
# C608	.0022 10% 1kV	403 222 1907	-
# C609	470µF 20% 200V	404 075 5005	-
# C625	.0012 10% 1kV	403 262 2308	-
# C631, 32	.001 20% 250VAC	404 088 2909	-
# C742	.001 +80% -20% 2kV	403 077 2807	-
C3404, 16, 18	4.7µF 20% 25V NP	403 086 0108	-
C3423	3.3µF 10% 10V Tantalum	403 342 9203	-
C3424	4.7µF 20% 25V NP	403 086 0108	-
C3426	10µF 10% 10V Tantalum	403 299 1820	-
C3436, 39	4.7µF 20% 25V NP	403 086 0108	-
# F601	Fuse	423 007 1601	4Amp, 125V, Fast Acting
# K701	Socket	645 025 6103	CRT
K1001	Jack	645 038 1898	Assembly
K1011	Jack	645 051 1271	Assembly
K1051	Jack	-	S Video Input
L164	15µH	645 003 9713	-
L401	1µH	645 036 4198	-
L404	100µH	645 003 9676	-
L602	Ferrite Bead	645 005 0763	-
L611, 12	Ferrite Bead	610 078 5946	-
L623, 25	Ferrite Bead	610 078 5946	-
L801	5.6µH	645 008 2894	-
L811, 12	1µH	645 006 2490	-
L821, 51	5.6µH	645 008 2894	-
# L901	Degaussing	645 044 9147	-
# L902	Yoke	610 003 4846	Horiz 1.3mH, Vert 16.5mH
L1901	5.6µH	645 008 2894	-
# LF601	Line Filter	645 012 0589	-
# PS601	3 Cold PTC	408 046 5209	-
# Q901 (1)	CRT	414 009 1300	A63AHC26X
# Q901 (2)	CRT	414 007 7000	A63AFW32X
# R106	18K 5% 1/2W	401 008 2001	-
# R401	100 5% 1/4W	401 012 4503	-
# R402	120 5% 1/4W	401 013 4205	-
# R407	5600 5% 2W	401 068 8807	-
# R411	6.8 10% 7W	402 080 3702	-
# R421	2200 1% 1/6W	401 053 1202	-
# R422	10K 1% 1/16W	401 052 6802	-
# R423	3300 1% 1/10W	401 264 9301	-
R449	4700 1% 1/10W	401 265 1700	-
# R471	1 5% 1/2W Nonflammable	401 006 7701	-
# R472	8.2 5% 2W	401 069 5607	-
# R481	47 5% 1/2W Nonflammable	401 010 2600	-
# R482	1 5% 1/4W Nonflammable	401 011 9004	-
# R483	1 5% 1/2W Nonflammable	401 006 7701	-
# R486	8.2 5% 2W	401 069 5607	-
# R488	15 5% 1W	401 059 1602	-
# R489	22 5% 2W	401 066 5204	-
R492	33K 1% 1/6W	401 156 8504	-
# R495	33 5% 1W	401 061 1706	-
# R497	2.2 5% 2W	401 066 3002	-
	4.7 5% 1W	401 061 8903	-
# R511	120 5% 2W	401 065 2808	-
# R601	1 10% 7W	402 083 6106	-
# R602	3.3M 20% 1/2W	402 000 1603	-
# R604	2.2 5% 2W	401 066 3002	-
# R612	10 5% 1/2W	402 001 8502	-
# R613, 15	.47 5% 2W	401 180 8402	-
# R630	22K 5% 1W	401 060 5002	-
# R707, 17, 27	12K 5% 2W	401 065 4604	-
# RL601	Relay	645 000 4155	Power
SP901, 02	Speaker	645 040 8618	2" X 3 1/2", 8 Ohms, 1W
SW1901	Switch	645 027 7382	Power
SW1902	Switch	645 027 7382	Volume Up
SW1903	Switch	645 027 7382	Volume Down
SW1904	Switch	645 027 7382	Channel Up
SW1905	Switch	645 027 7382	Channel Down

Item No.	Function/Rating	Mfr. Part No.	Notes
SW1906	Switch	645 027 7382	Menu
T151	Oscillator, 45.75MHz	645 049 3775	-
T401	Horizontal Drive	610 000 1442	-
# T402 (1)	Horizontal Output	645 045 8521	-
# T601	Power	645 051 2384	-
	Power	645 051 4951	-
# W601	Line Cord	645 030 5290	AC, Polarized
X141	Filter	421 008 9008	SAW
X161	Trap	610 015 3059	4.5MHz
X251	Crystal	610 012 0655	3.58MHz
X801	Crystal	645 000 6692	8MHz
	Fuse Holder	645 000 5077	For F601 (2 Used)
	Magnet	610 217 7794	Purity/Convergence
	PC Board (1)	610 295 5965	CRT
	PC Board (2)	610 296 1553	CRT
	PC Board (1)	610 295 5958	Main
	PC Board (2)	610 296 1546	Main
	Transmitter	645 053 8698	Remote
	Wedge	610 117 0154	Yoke Positioning (3 Used)

# For SAFETY use only equivalent replacement part.  
(1) Used in chassis 25520-00.  
(2) Used in chassis 25520-01.  
(3) Screen and focus controls are part of T402.

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.

- NTE Electronics, Inc. (NTE)
- Sencore, Inc.