

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

Set all customer controls for normal picture. Check for 11.4V at TP653. Using an external power supply, apply 13.8V to TP653. 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 TP651 and TP652. Restore AC power and check receiver for proper operation.

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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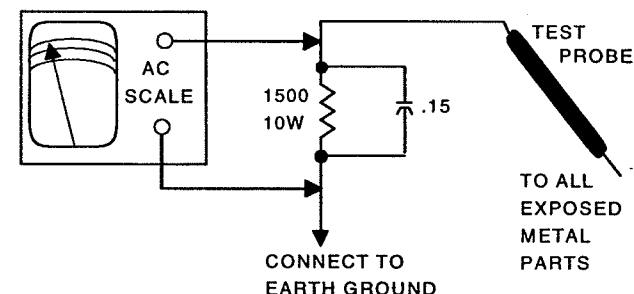
SAFETY CHECKS — FIRE AND SHOCK HAZARD

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.



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PHOTOFACT® Technical Service Data

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MODELS CN27S18, 27N-S180 (CHASSIS SN-91)

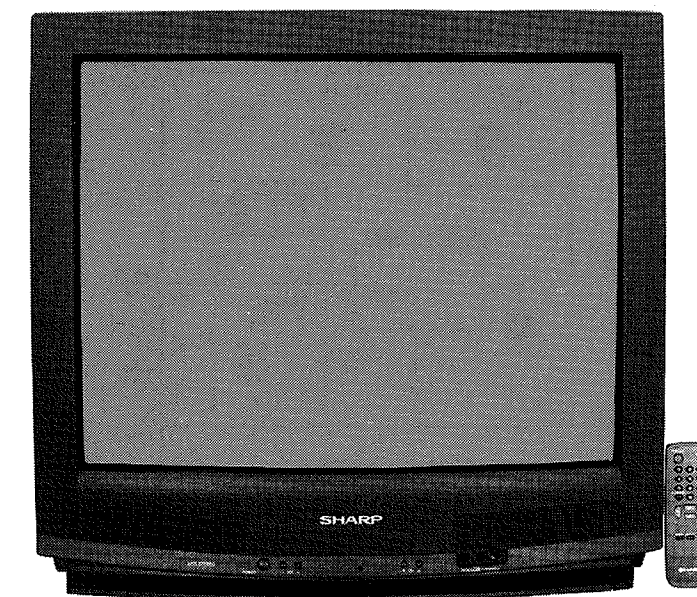
SHARP

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SHARP

Models CN27S18, 27N-S180 (Chassis SN-91)



Representative Model

Essential coverage
for servicing a television receiver...

- Schematics
- Component locations
- Parts list

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For Supplier Address,
See PHOTOFACT Annual Index

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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.

TEST EQUIPMENT

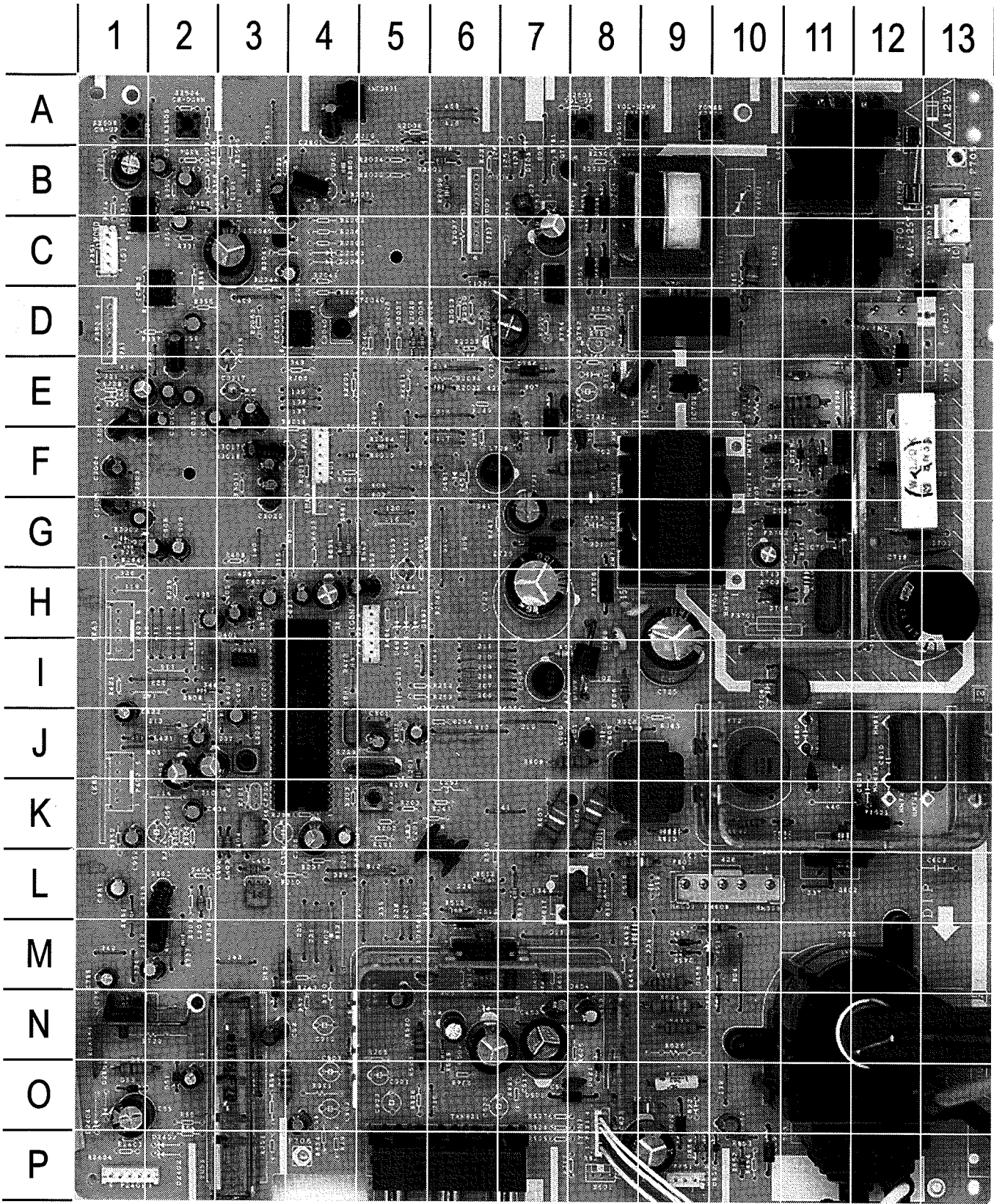
Test equipment listed by participating manufacturer illustrates typical or equivalent equipment used by Sams engineers to obtain measurements. This equipment is compatible with most types used by field service technicians.

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

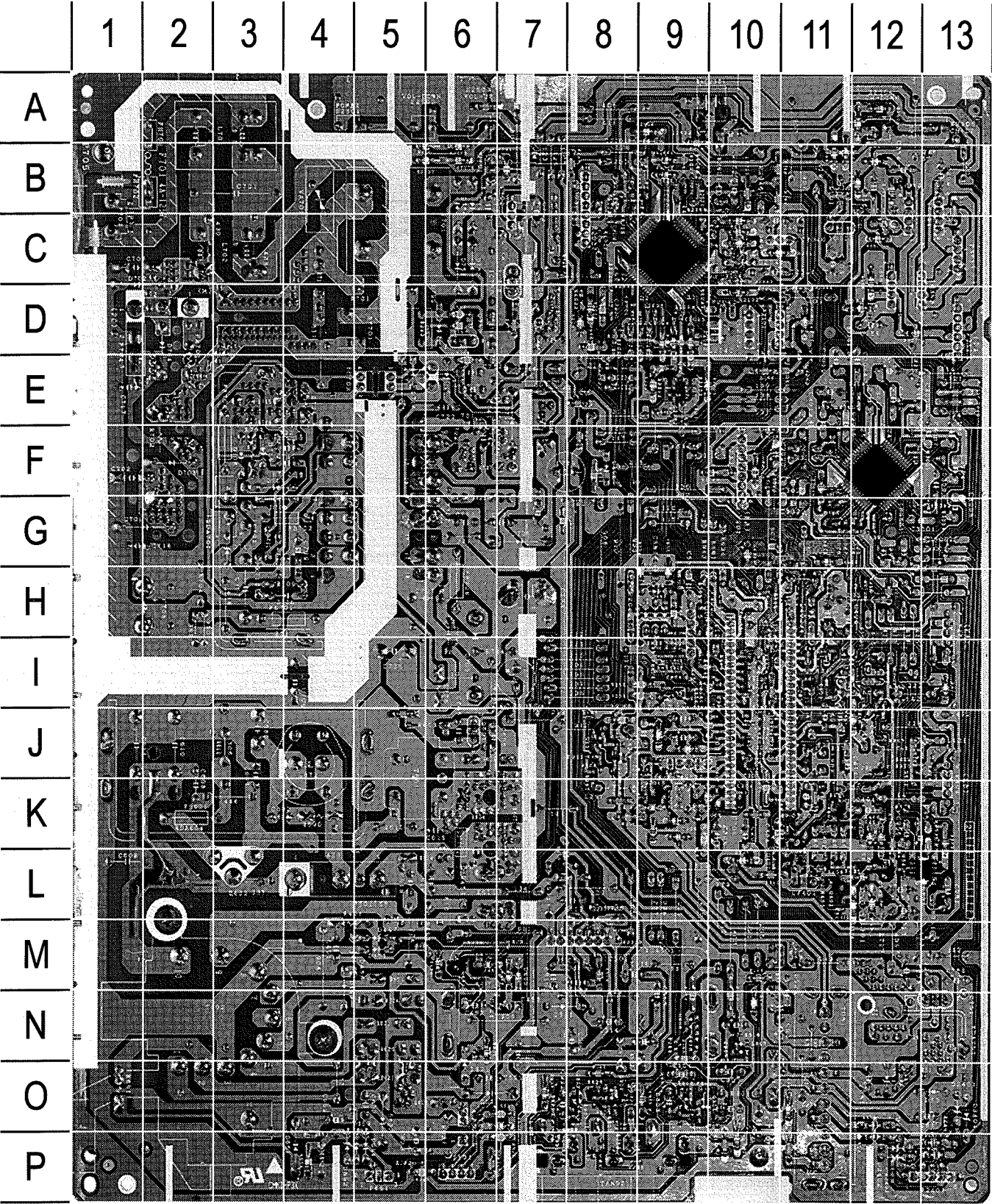
ACC701	A17	C706	C18	C2001	D26	D884	C13	Q853	C14	R501	E22	R871	B15	R2035	D26
C51	C1	C707	B21	C2002	B26	D1401	C34	Q854	C15	R510	D4	R872	B15	R2040	C26
C53	C2	C708	B19	C2040	D24	D1402	C34	Q855	B14	R511	D5	R873	B15	R2041	B26
C54	C1	C709	C19	C2041	B26	D1403	C34	Q856	B15	R512	D5	R874	B15	R2042	B26
C55	A1	C710	C20	C2060	D26	D1451	E34	Q881	C14	R513	D5	R881	C13	R2043	C26
C56	C1	C717	A19	C2061	D25	D1452	E34	Q901	D31	R514	D4	R882	C13	R2044	C27
C103	D19	C718	A20	C2062	D24	D1453	D34	Q902	C31	R519	D6	R883	C14	R2045	C27
C201	B1	C722	B18	C2201	C25	D1454	D33	Q903	E31	R520	D6	R884	C14	R2046	A26
C202	B2	C723	B24	C2202	C25	D2001	D26	Q904	E31	R523	D6	R895	C15	R2047	B27
C203	B2	C725	A24	C2601	A25	D2011	D26	Q1401	C34	R524	D7	R901	C22	R2048	B27
C204	C3	C726	B22	C2602	A26	DY601	D7	Q1402	A34	R526	D6	R903	C31	R2060	B27
C205	B3	C727	B22	C3001	C29	F701	A17	Q1403	A36	R551	D4	R904	C31	R2061	B27
C206	D24	C729	C22	C3002	C29	FB601	E6	Q1404	B35	R552	D3	R905	C31	R2062	C25
C207	D24	C730	B22	C3003	D29	FB702	B21	Q1405	B36	R553	D3	R906	C32	R2063	D26
C208	C11	C731	C24	C3004	A29	FB704	B21	Q1406	B37	R554	D4	R907	D31	R2064	D25
C209	B11	C732	C22	C3005	A29	FB706	A22	Q1407	C34	R604	E4	R908	D31	R2068	D27
C210	B2	C741	B22	C3006	B29	IC101	D20	Q2060	D25	R605	D3	R910	E31	R2069	E27
C251	D13	C742	B22	C3007	E30	IC201	A5	Q2201	C25	R606	E3	R911	E31	R2070	D27
C252	D13	C753	D19	C3008	D22	IC201	B11	Q2211	C25	R607	E5	R912	E31	R2071	E27
C253	D14	C755	C23	C3009	C23	IC201	B3	R51	C2	R609	E4	R913	E32	R2101	B27
C301	A3	C772	D18	C3010	D29	IC201	D2	R52	C2	R610	E5	R914	E31	R2102	B27
C302	B4	C801	C12	C3011	B30	IC351	A31	R53	A1	R611	D9	R915	E31	R2201	C26
C303	A6	C802	C12	C3012	D30	IC352	B31	R54	B28	R621	A16	R922	D31	R2202	C25
C307	A5	C803	B12	C3013	C30	IC501	D4	R55	B28	R622	A16	R923	E31	R2203	C25
C308	B6	C804	B11	C3014	D30	IC701	B20	R56	C2	R623	E21	R924	C6	R2211	C26
C309	C22	C805	B12	C3015	B30	IC702	B19	R57	C2	R624	E1	R925	B29	R2212	C25
C313	C24	C806	B12	C3016	D30	IC703	B18	R201	B1	R625	E1	R926	B29	R2213	C25
C351	B31	C807	B9	C3017	E30	IC750	D18	R202	B1	R627	E23	R931	E34	R2401	C27
C352	A30	C851	B14	C3018	E30	IC751	C22	R203	B1	R631	D3	R932	E33	R2402	B27
C354	A31	C852	C14	C3019	B29	IC951	B7	R204	B2	R632	E1	R951	C6	R2403	B27
C355	B30	C853	B14	C3020	C29	IC1401	A34	R205	B2	R633	D1	R952	C7	R2404	D27
C356	C31	C854	D16	C3021	B29	IC1403	D23	R206	B2	R634	E2	R953	C7	R2501	B25
C358	B24	C883	C14	C3022	B29	IC1451	A37	R207	D23	R651	E2	R961	A13	R2503	B25
C359	B31	C901	C31	CF301	A3	IC1451	A39	R208	B11	R652	E2	R962	A13	R2504	B25
C401	B6	C902	C24	CF401	B5	IC1451	B39	R209	D12	R653	E2	R1401	C33	R2505	B25
C402	B6	C903	E31	CF631	D3	IC2001	B26	R251	D13	R654	E2	R1402	D33	R2506	B25
C403	B10	C908	A30	CF2040	E25	IC2040	B25	R252	D13	R655	D2	R1403	D34	R2507	B26
C404	C23	C909	B30	D51	C1	IC2101	C27	R253	D13	R690	D7	R1404	A33	R2508	B25
C405	C12	C910	D31	D52	C2	IC3001	A30	R254	D13	R701	B18	R1405	A33	R2509	B25
C406	C12	C911	E30	D53	B1	J931	E33	R255	D13	R702	A18	R1406	A34	R2601	A25
C408	B13	C922	D31	D103	D19	J1001	C6	R256	D14	R704	A19	R1407	C35	R3001	A29
C409	B3	C923	E31	D401	C11	J1002	B29	R257	D14	R705	C20	R1408	B34	R3002	B29
C410	B10	C931	D31	D402	D11	J1003	C29	R258	D15	R706	C21	R1409	A35	R3003	C29
C411	C23	C932	E31	D454	E11	L201	B2	R259	D14	R707	C20	R1410	B36	R3004	C29
C412	C23	C951	C7	D455	E12	L202	A3	R301	B4	R709	C19	R1411	B35	R3005	E30
C413	D1	C952	C7	D456	E12	L251	D14	R302	A4	R710	C19	R1412	C35	R3007	D30
C422	C24	C954	C24	D457	E12	L301	B4	R303	A6	R711	C19	R1413	B36	R3008	D30
C451	E11	C955	C24	D458	E11	L302	A6	R304	A6	R715	B19	R1414	C36	R3010	E30
C452	E11	C956	B7	D459	E11	L401	B5	R305	A7	R723	C22	R1415	C36	R3011	B29
C453	E12	C1401	A33	D501	E23	L402	B6	R306	A7	R724	B19	R1416	C36	R3012	C29
C501	E23	C1402	A34	D510	D4	L403	B6	R351	B31	R725	B19	R1417	B37	R3013	C29
C502	E23	C1403	C34	D621	E1	L404	B6	R352	A30	R726	B17	R1418	B37	R3014	C29
C510	D6	C1404	C34	D622	E22	L672	D7	R353	A30	R727	C23	R1419	C38	R3015	C6
C511	D5	C1405	B35	D651	E2	L701	A17	R354	A31	R728	B23	R1420	B38	R3016	C6
C512	D4	C1406	C35	D652	E2	L702	A18	R355	B31	R734	B23	R1421	C34	R3017	B29
C513	D4	C1407	C35	D653	D2	L703	A18	R356	B30	R737	B22	R1422	C33	R3018	B29
C514	D5	C1408	C35	D654	D2	L705	B23	R357	B30	R751	E17	R1425	A36	RMC2601	A25
C515	D6	C1409	B34	D701	A19	L729	C23	R358	C31	R801	C12	R1451	D33	RY701	A18
C516	D6	C1410	B33	D702	A19	L851	E24	R401	B4	R802	A12	R1452	D34	RY701	E18
C517	D6	C1411	C33	D703	A19	L1401	C35	R402	B5	R803	A12	R1453	E34	S2501	A26
C518	D7	C1413	B35	D704	A19	L1402	B34	R403	B5	R804	A12	R1454	E35	S2502	A25
C551	D3	C1413	B35	D705	C19	L1403	A35	R404	B6	R805	A12	R1455	E35	S2503	A25
C552	B11	C1415	B34	D706	C19	L1405	B36	R405	B6	R806	B9	R2001	E27	S2504	A25
C606	E4	C1416	B34	D707	C19	L1406	D23	R406	B6	R851	A14	R2002	E27	S2505	B25
C607	E5	C1417	A35	D708	B20	L2040	E26	R407	B6	R852	A14	R2004	D27	SF201	B2
C610	E6	C1418	A36	D709	A22	PR701	A18	R408	B7	R853	A14	R2006	E27	SP1	A32
C611	E6	C1419	D24	D712	B22	Q201	B1	R409	D11	R855	A15	R2008	D26	SP2	B32
C615	E4	C1420	D24	D713	C19	Q251	D13	R410	B13	R856	A15	R2009	B26	T601	E5
C623	E23	C1421	B36	D715	B19	Q252	D14	R411	B3	R857	A15	R2010	B2	T602	D10
C631	E1	C1423	C36	D716	B18	Q253	D14	R412	D2	R858	A16	R2012	D26	T602	E21
C632	E1	C1424	B37	D717	B18	Q301	A7	R413	A13	R859	C14	R2016	E26	T701	C17
C633	E1	C1425	C37	D725	C22	Q401	B4	R414	C13	R860	C14	R2020	D26	T702	A21
C652	E2	C1426	C34	D751	C18	Q402	B5	R415	B13	R861	C14	R2023	D27	TAN921	B29
C653	D2	C1427	A36	D752	C18	Q403	B6	R416	B11	R863	C15	R2024	A27	TAN921	B29
C680	D7	C1428	B36	D753	C18	Q451	E12	R451	E11	R864	C15	R2025	A27	TAN921	C6
C682	D7	C1451	D34	D754	C18	Q601	E4	R452	E11	R865	C15	R2026	A27	TAN921	D32
C701	A17	C1452	D33	D755	E18	Q602	E6	R453	E11	R866	C15	R2027	B27	TAN921	E32
C702	A18	C1453	D24	D756	C18	Q751	E17	R454	E11	R867	B14	R2028	C26	V101	B16
C703	B19	C1454	B38	D881	C13	Q851	A14	R456	E12	R868	B14	R2029	E27	X801	B12
C705	A20	C1455	A38	D882	C13	Q852	A15	R458	E12	R869	B14	R2032	D27		

MAIN BOARD - TOP VIEW



MAIN BOARD - TOP VIEW, GRIDTRACE LOCATION GUIDE									
C51	O2	C722	E8	D501	O8	P901	F4	R2046	B4
C53	N3	C723	H7	D510	M6	PR701	D12	R2064	F5
C54	O4	C725	H9	D621	O8	Q601	J8	R2071	B4
C55	O1	C726	H8	D622	O9	Q602	L11	R2601	B4
C103	C3	C727	H8	D651	P10	Q751	B7	R3001	G1
C205	K4	C729	M2	D652	P10	R51	O1	R3002	G1
C206	K4	C730	D7	D653	P9	R52	M4	R3015	F4
C208	J5	C731	G7	D654	P9	R53	O4	R3017	F3
C251	I5	C732	G7	D701	G12	R353	B2	R3018	F3
C252	J5	C741	E7	D702	D13	R410	J3	RMC2601	A4
C253	J8	C742	F8	D703	F12	R412	I4	S2501	A10
C309	J2	C753	B7	D704	D12	R451	M10	S2502	A8
C313	M2	C755	M1	D705	G11	R452	M8	S2503	A8
C351	C2	C772	C7	D706	H10	R453	L8	S2504	A2
C354	B2	C801	J5	D707	F11	R501	M9	S2505	A1
C356	B2	C802	J5	D708	F11	R511	L7	SC401	H1
C358	B1	C901	O5	D709	I8	R512	L6	SC402	J1
C359	D2	C902	O4	D712	E7	R513	L6	SF201	J5
C404	K2	C903	O4	D713	G11	R519	N6	T601	K6
C405	H3	C908	G2	D715	F11	R523	N5	T602	N12
C406	H2	C909	G2	D716	E9	R524	L9	T701	B9
C408	J3	C922	O5	D717	E8	R604	K8	T702	G9
C409	J2	C923	O7	D725	G7	R605	I7	TAN921	P6
C410	I2	C951	L1	D751	B8	R606	J9	TP2401	P2
C411	J2	C952	K1	D752	C8	R607	K7	TP2402	P1
C422	J1	C955	L2	D753	C8	R609	J8	TP2403	P1
C451	M10	C956	K2	D754	B8	R610	K9	TP2404	P1
C452	N8	C2040	B3	D755	D8	R611	L8	TP2405	P1
C453	N7	C2041	C4	D756	E7	R621	O9	TU51	P8
C501	O8	C2062	B4	D2001	A5	R622	O9	X801	J4
C502	N6	C2601	A4	D2011	C6	R623	N9		
C510	M7	C3001	G1	F701	B12	R627	P8		
C511	M6	C3003	F1	FB601	K12	R631	H1		
C512	L6	C3004	F1	FB702	G10	R634	G4		
C513	M6	C3005	G1	FB704	F11	R651	O13		
C514	N6	C3006	E1	FB706	H8	R652	P10		
C515	N5	C3007	E2	IC101	C3	R653	P10		
C516	M6	C3009	E1	IC201	K4	R690	K10		
C517	N7	C3010	E2	IC351	C1	R701	D9		
C518	L8	C3011	D2	IC352	D2	R702	F12		
C551	G5	C3012	E2	IC501	M7	R704	H12		
C552	H5	C3014	E2	IC701	F11	R705	E11		
C606	J8	C3015	D3	IC702	E9	R706	E11		
C607	J11	C3016	E2	IC703	E8	R707	F11		
C610	J12	C3017	E3	IC750	C7	R709	H10		
C611	J13	C3018	E3	IC751	N1	R710	H11		
C615	K8	C3019	E3	IC2040	C3	R711	G11		
C623	P9	C3020	F3	IC2101	D4	R715	C10		
C631	H4	C3021	F3	J931	P4	R723	F8		
C632	H3	C3022	F3	L201	J5	R724	E10		
C633	H4	CF301	K3	L202	J3	R725	D7		
C652	O10	CF401	L3	L251	K6	R726	I8		
C653	H3	CF631	I3	L301	L2	R727	M2		
C680	J11	CF2040	D4	L302	K5	R728	C7		
C682	K11	D51	D2	L401	L3	R734	I7		
C701	B11	D52	D3	L402	K3	R737	F8		
C702	F13	D53	O1	L403	K3	R901	O4		
C703	C13	D103	B7	L404	K3	R951	L1		
C705	H13	D401	H3	L672	J10	R961	G4		
C706	I11	D402	H3	L701	A11	R962	G5		
C707	H11	D454	M8	L702	C11	R2001	B6		
C708	F10	D455	M7	L705	I7	R2009	B6		
C709	G10	D456	M9	L729	F6	R2024	D6		
C710	F10	D457	M9	L2040	D4	R2025	D5		
C717	E13	D458	M10	M	D12	R2026	D5		
C718	G13	D459	M10	P651	P9	R2032	E6		

MAIN BOARD - BOTTOM VIEW



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MAIN BOARD - BOTTOM VIEW, GRIDTRACE LOCATION GUIDE

C56	P11	R203	K9	R806	J10	R2505	A12
C201	K9	R204	J9	R903	N9	R2506	B11
C202	K9	R205	J9	R904	O7	R2507	B6
C203	J9	R206	K8	R905	O7	R2508	B6
C204	K10	R207	L10	R906	O8	R2509	B6
C207	I10	R208	J9	R907	O7	R3003	G13
C209	J10	R209	J10	R908	O7	R3004	G13
C210	J10	R251	J9	R910	M11	R3005	F12
C301	K11	R252	I9	R911	O10	R3007	E11
C302	L12	R253	I9	R912	O10	R3008	D11
C303	K11	R254	J8	R913	O10	R3010	E11
C307	K10	R255	J8	R914	O10	R3011	F11
C308	K9	R256	J8	R915	O9	R3012	F10
C352	B12	R257	J8	R922	O7	R3013	F10
C355	D12	R258	J8	R923	O8	R3014	F10
C401	K12	R259	J8	R924	P13	R3016	F10
C402	L11	R301	L12	R925	O7		
C403	I11	R302	K11	R926	O9		
C412	J10	R303	K9	R931	O9		
C413	I10	R304	L12	R932	P9		
C803	J9	R305	K12	R952	K13		
C804	J9	R306	K12	R953	K13		
C805	J9	R351	C12	R2002	B9		
C806	J9	R352	B12	R2004	B9		
C807	I12	R354	B12	R2006	D8		
C910	O7	R355	D12	R2008	A9		
C911	O9	R356	C12	R2010	D8		
C931	O7	R357	D12	R2012	C8		
C932	P7	R358	B12	R2016	C8		
C954	L12	R401	J10	R2020	C8		
C2001	C8	R402	K11	R2023	D8		
C2002	C8	R403	L11	R2027	D9		
C2060	C9	R404	L11	R2028	D9		
C2061	E11	R405	L11	R2029	D9		
C2201	E9	R406	L11	R2035	D8		
C2202	E9	R407	K11	R2040	D9		
C2602	A9	R408	K12	R2041	C11		
C3002	G13	R409	G11	R2042	C10		
C3008	F12	R411	J12	R2043	D10		
C3013	E12	R413	I10	R2044	D11		
IC951	L13	R414	J9	R2045	C10		
IC2001	C9	R415	I10	R2047	C10		
IC3001	F12	R416	I10	R2048	C10		
Q201	K9	R454	M6	R2060	C10		
Q251	I9	R456	M6	R2061	C10		
Q252	J8	R458	M7	R2062	C10		
Q253	J8	R510	K7	R2063	D11		
Q301	L12	R514	M8	R2068	B9		
Q401	L11	R520	N9	R2069	B9		
Q402	L11	R526	O7	R2070	B9		
Q403	K11	R551	I10	R2101	D10		
Q451	M6	R552	I10	R2102	D10		
Q901	O9	R553	H9	R2201	E9		
Q902	O8	R554	H9	R2202	E9		
Q903	O7	R625	N6	R2203	M8		
Q904	O7	R632	I10	R2211	E9		
Q2060	E11	R633	G10	R2212	E9		
Q2201	E9	R654	P4	R2213	E9		
Q2211	E9	R655	G11	R2401	O13		
R54	P12	R751	B7	R2402	P12		
R55	O12	R801	J9	R2403	P13		
R56	O11	R802	I10	R2404	P13		
R57	N10	R803	I9	R2501	B6		
R201	K9	R804	I9	R2503	A12		
R202	K9	R805	I9	R2504	B11		

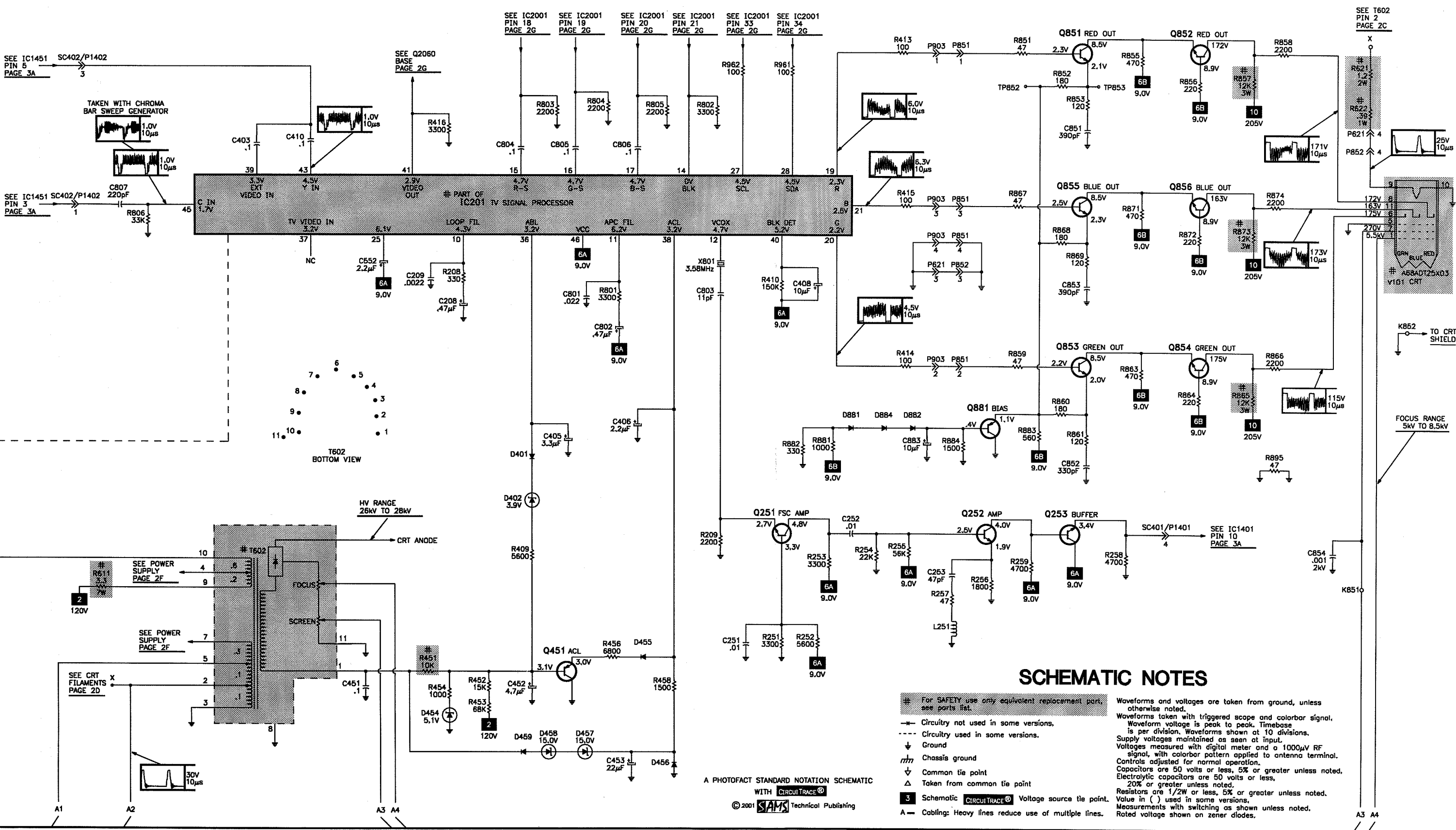
SHARP

MODELS CN27S18, 27N-S180 (CHASSIS SN-91)

B



TELEVISION SCHEMATIC continued



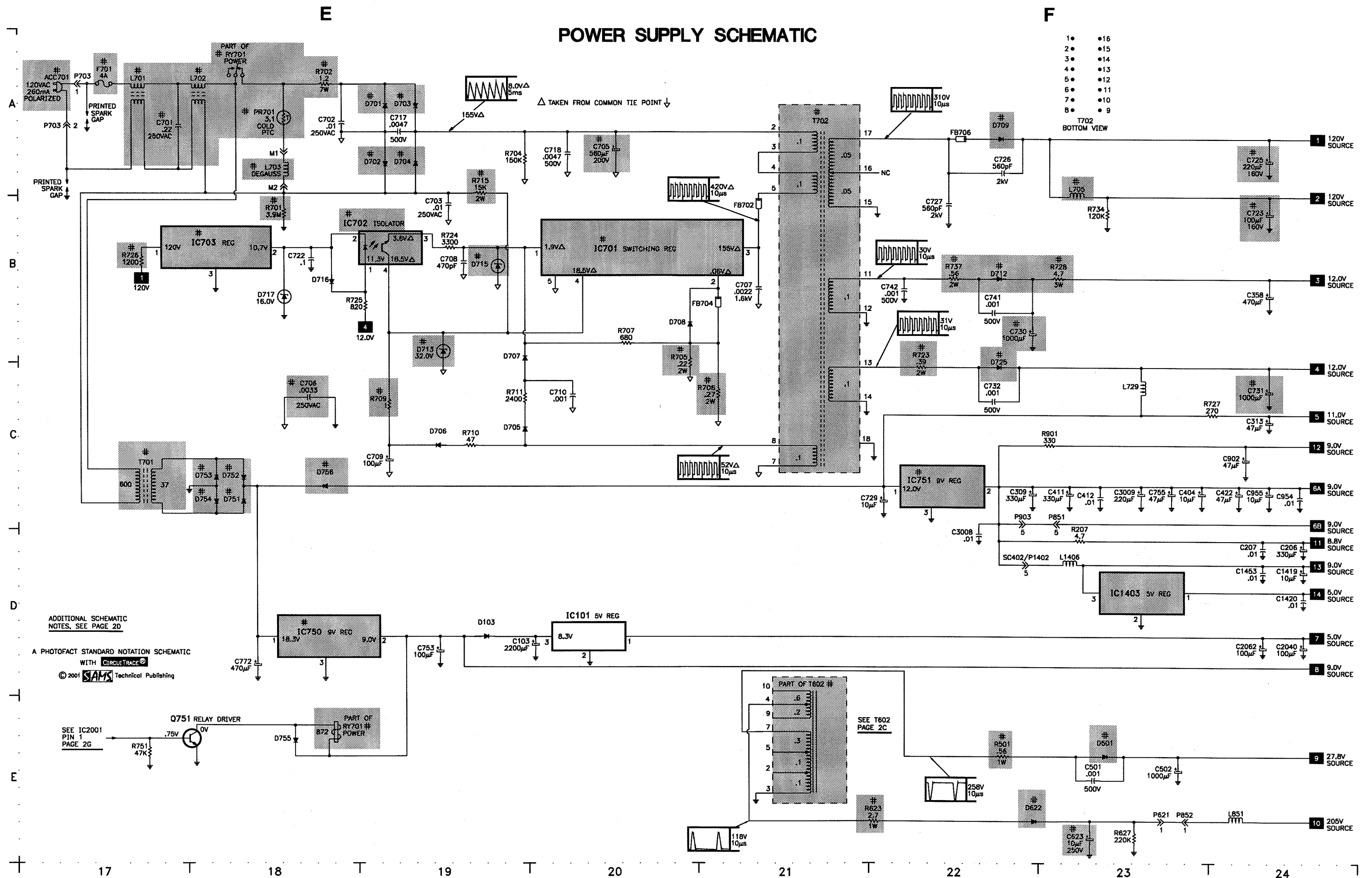
SCHEMATIC NOTES

- # For SAFETY use only equivalent replacement parts, see parts list.
- Circuitry not used in some versions.
- Circuitry used in some versions.
- ⊥ Ground
- ⊥ Chassis ground
- ⊥ Common tie point
- Δ Taken from common tie point
- 3 Schematic CIRCUITRACE® Voltage source tie point.
- A= Cabling: Heavy lines reduce use of multiple lines.

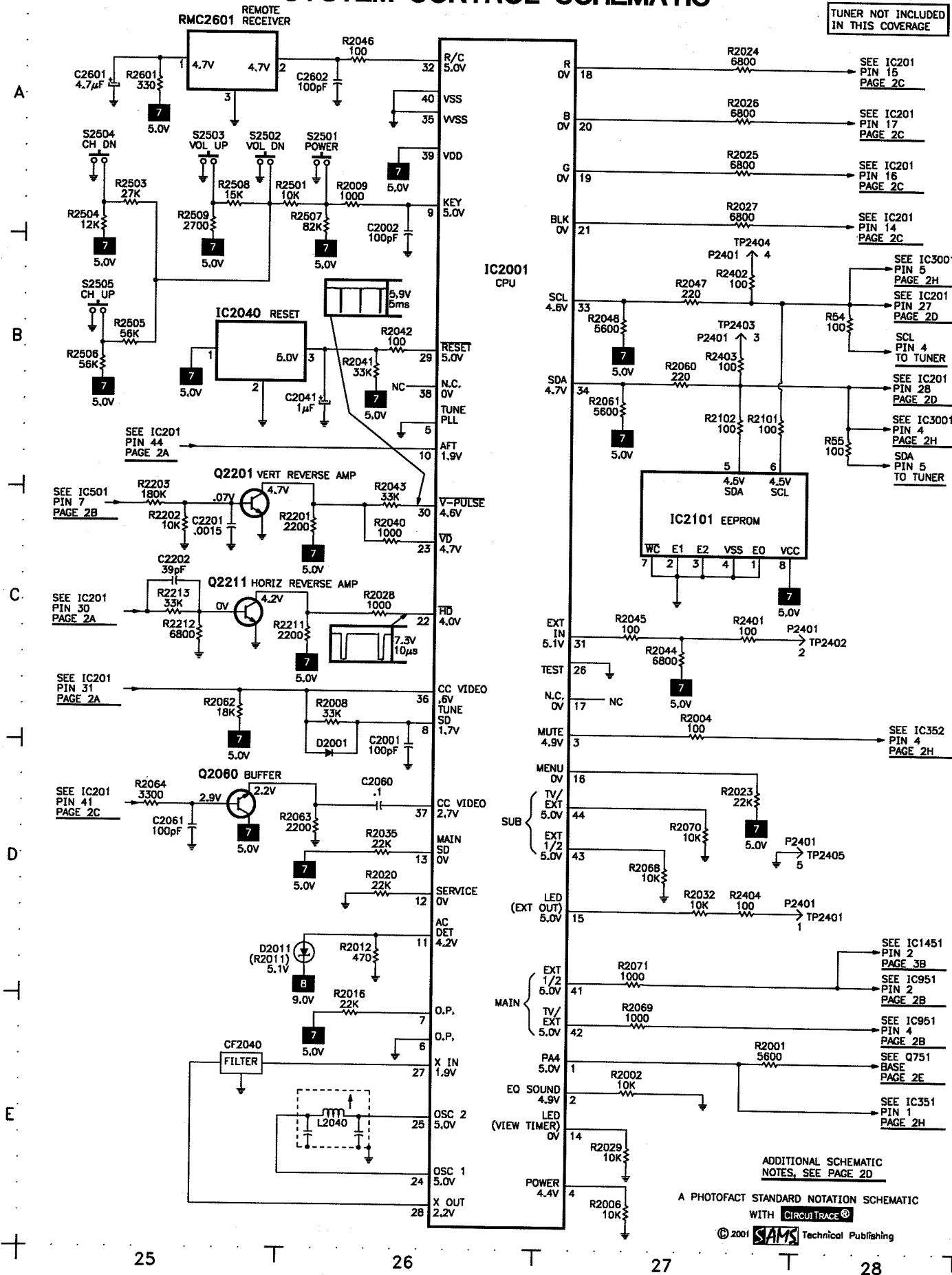
Waveforms and voltages are taken from ground, unless otherwise noted.
Waveforms taken with triggered scope and colorbar signal. Waveform voltage is peak to peak. Timebase is per division. Waveforms shown at 10 divisions. Supply voltages maintained as seen at input. Voltages measured with digital meter 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.

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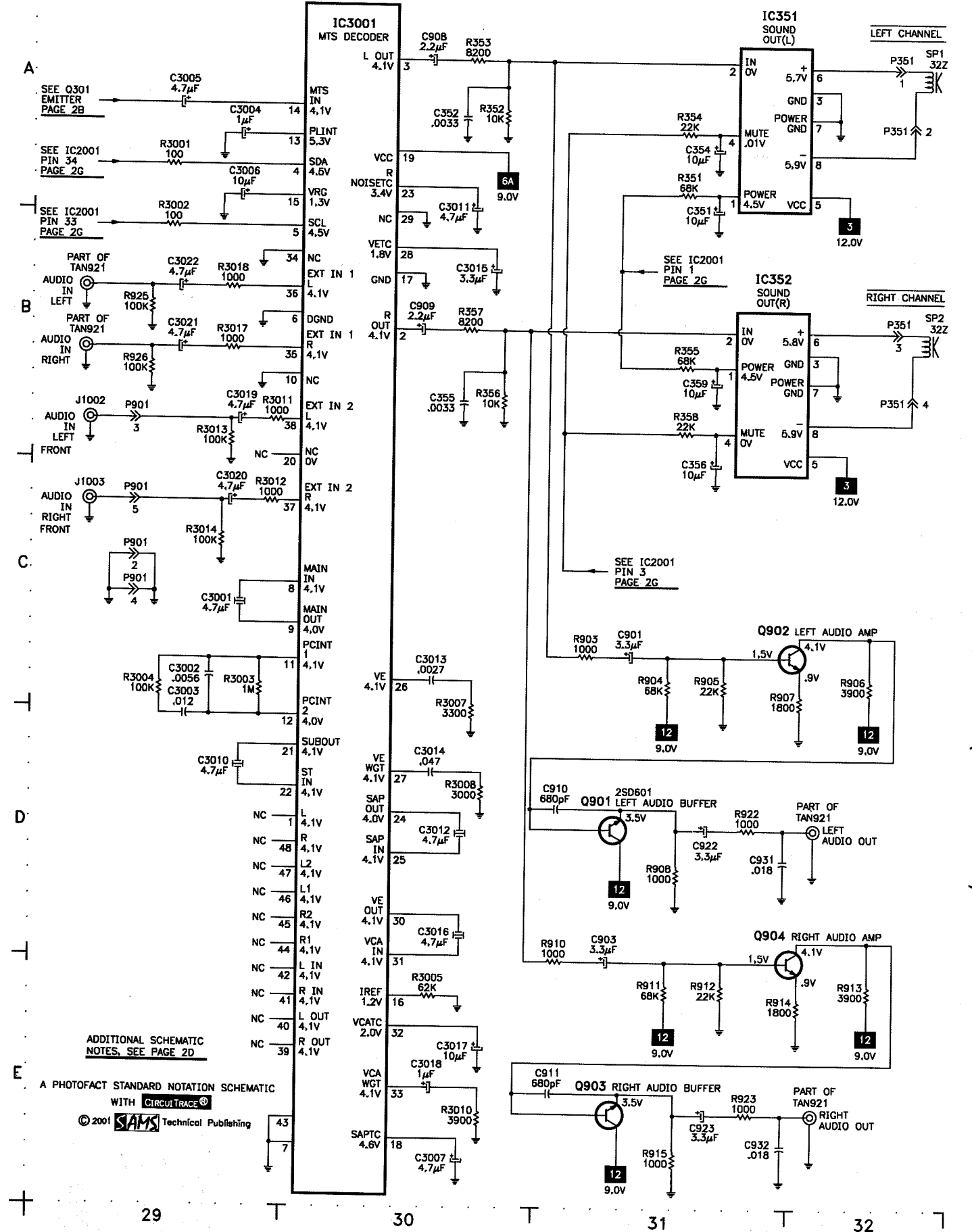
POWER SUPPLY SCHEMATIC



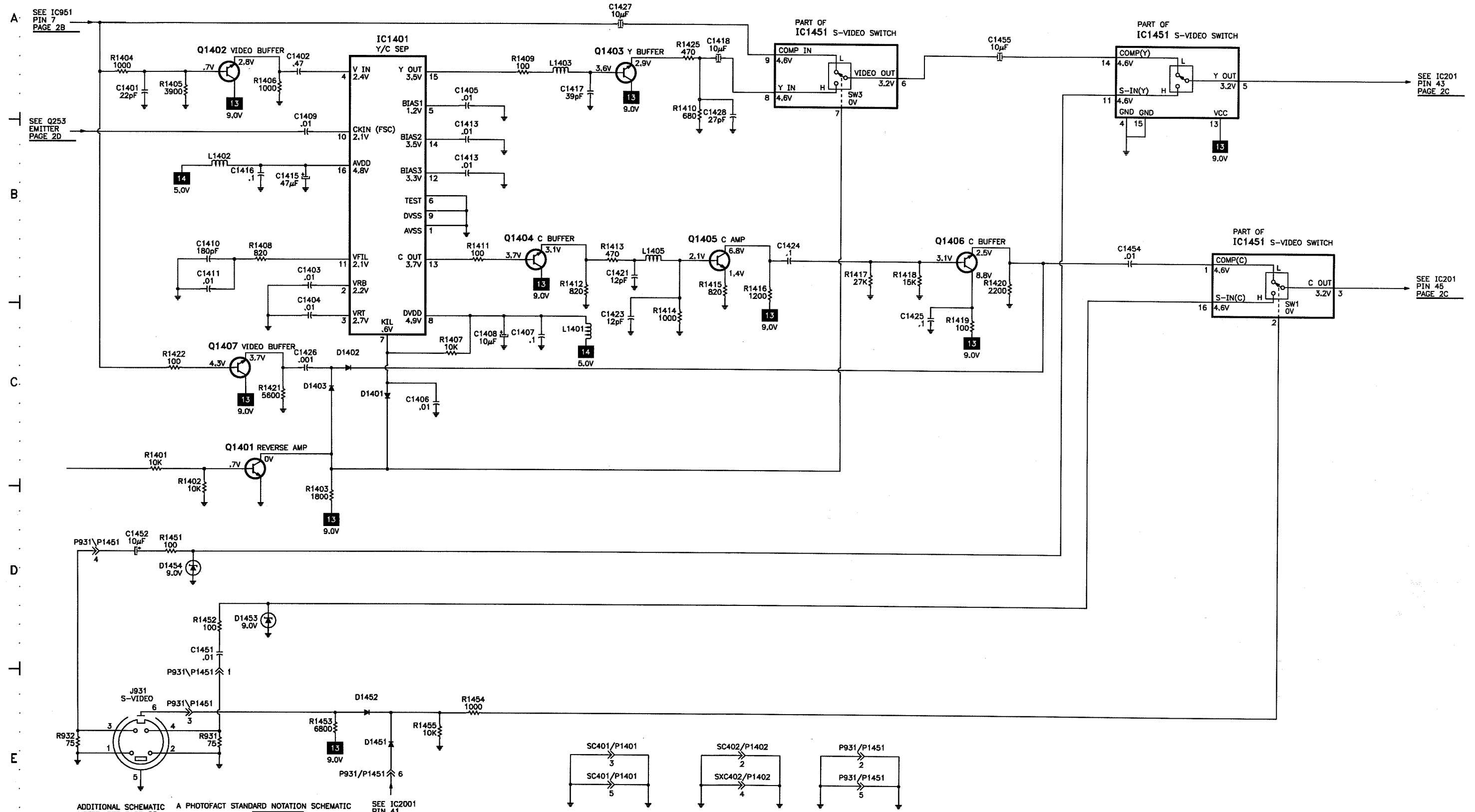
G SYSTEM CONTROL SCHEMATIC



H AUDIO SCHEMATIC



VIDEO SWITCHING SCHEMATIC



ADDITIONAL SCHEMATIC NOTES, SEE PAGE 2D

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SEE IC2001 PIN 41 PAGE 2G

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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 26kV to 28kV.

B+ CHECK

Tune in a picture. Connect voltmeter to the cathode of D709 and ground. Check for 120V ±1V.

COLOR PURITY / CONVERGENCE

The CRT and yoke are bonded. Adjustment is not recommended.

ENTERING SERVICE MODE

Service mode adjustments are required when IC201 and IC2101 are replaced. If CRT is replaced perform only adjustments relating to the picture tube. If IC3001 is replaced perform adjustments relating to audio only.

Turn on receiver and use reset function in the video adjustment menu to ensure that customer controls are in their proper reset position. Remove AC power. Press and hold the channel up and volume up buttons on the receiver while restoring AC power. The service mode will now be displayed.

When in the service mode a letter S with a number is displayed in the upper left part of the screen and a data number is displayed in the upper center part of the screen. The channel number is displayed in the upper right part of the screen. 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 on-set data value 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 on the receiver 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.

PIF 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 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 .26V on the digital voltmeter. Adjust screen control, if necessary, to obtain a barely visible raster. Adjust service numbers S11, S12, and S13 for a good gray scale with normal white at high and low brightness. Set color to midrange. Adjust screen control for normal brightness.

MTS ADJUSTMENTS

INPUT Level

Connect an MTS/TV stereo generator to the antenna input jack. Select pilot, 300Hz audio frequency, and right modulating signal. Enter the service mode and select M01. Connect an oscilloscope to pin 39 of IC3001. Adjust the data value for 1.4Vp-p.

Stereo VCO

Disconnect the antenna. Connect a 100µF 50V electrolytic capacitor to pin 14 of IC3001 and ground. Enter the service mode and select M02. Connect a frequency counter to pin 39 of IC3001. Adjust the data value for 62.94kHz ± 750Hz.

Separation

Connect an MTS/TV stereo generator to the antenna input jack. Select pilot, 300Hz audio frequency, and right modulating signal. Enter the service mode and select M04. Connect an oscilloscope to pin 40 of IC3001. Adjust the data value for minimum amplitude of the waveform. Select 8kHz audio frequency on the generator. Select M05 and adjust the data value for minimum amplitude of the waveform.

Filter

Connect an MTS/TV stereo generator to the antenna input jack. Select pilot, 300Hz audio frequency, and L-R modulating signal. Enter the service, select M03 and set data value to 00. Increase the data value until OK appears on-screen. Note the data value. Increase the data value until OK disappears from the screen. Note the data value. Set the data value to the average of the noted data values.

SERVICE MODE ADJUSTMENT CHART

Service No.	Service Adjustment	Data Value Range	Initial Data Value	On-Set Data Value	Notes
S01	Sub Picture	00 - 7F	55	47	Set brightness to minimum, picture to maximum. Adjust for normal contrast range.
S02	Sub Tint	00 - 7F	46	41	Adjust for normal flesh tones.
S03	Sub Color	00 - 7F	32	2E	Adjust for normal color level.
S04	Sub Brightness	00 - 7F	40	4A	Adjust for normal brightness level.
S05	Sharpness	00 - 3F	28	28	Must be set to 28.
S06	Vertical Phase	00 - 07	00	00	Must be set to 00.
S07	Horizontal Phase	00 - 1F	12	13	Adjust for best horizontal centering on screen.
S08	RF AGC	00 - 3F	23	29	00 produces black raster.
S09	Vertical Amp	00 - 3F	20	18	Adjust for proper vertical size with best linearity.
S10	PIF VCO	00 - 7F	2C	2C	-
S11	Red Cut-Off	00 - FF	00	14	-
S12	Green Cut-Off	00 - FF	00	03	-
S13	Blue Cut-Off	00 - FF	00	00	-
S14	Green Gain	00 - FF	7F	85	-
S15	Blue Gain	00 - FF	7F	8F	-
S16	3.58MHz Trap	00, 01	00	00	00= On, 01= Off. Must be set to 00.
S17	Balance	00 - 3F	20	20	Must be set to 20.
S18	Caption Position	00 - 7F	17	23	Adjust to center the black box on the screen.
S19	Y-Mute	00, 01, 03	00	00	00= Normal, 01= No Y, and 03= No Vertical.
S20	Energy Save Offset	00 - 3F	20	23	Must be set to 23.
S21	D. D. E. Offset	00 - 1F	03	03	Must be set to 03.
S22	OSD Setup	00 - 03	00	00	Must be set to 00.
S23	Tuner Setup	00, 01	00	00	Must be set to 00.
OP1	Option 1 (Set to each model)	00 - FF	00	B7	Use B7 for 27N-S180, A7 for CN27S18.
OP2	Option 2 (Set to each model)	00 - FF	00	A7	-
M01	INPUT Level	00 - 0F	0A	06	-
M02	Stereo VCO	00 - 3F	20	23	-
M03	Filter	00 - 3F	1C	1B	-
M04	Wide Band (Low Separation)	00 - 3F	20	2A	-
M05	Spectral (High Separation)	00 - 3F	1B	0F	-

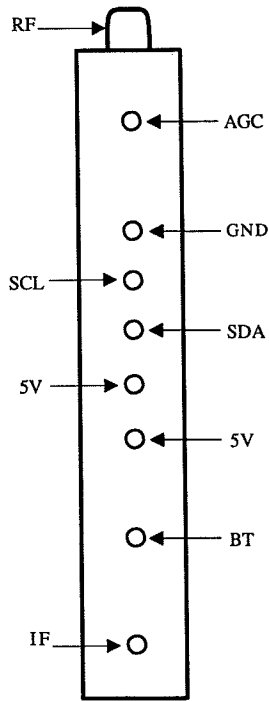
TUNER INFORMATION

TUNER VOLTAGE CHART

Pin	VHF Low Band	VHF High Band	UHF Band
AGC (1)	3.4V	3.3V	3.7V
GND (3)	0V	0V	0V
SCL (4)	4.5V	4.5V	4.5V
SDA (5)	4.5V	4.5V	4.5V
5V (6)	5.1V	5.1V	5.1V
5V (7)	5.1V	5.1V	5.1V
BT (9)	31.9V	31.9V	31.9V
IF (11)	0V	0V	0V

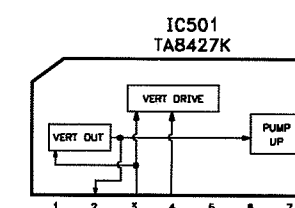
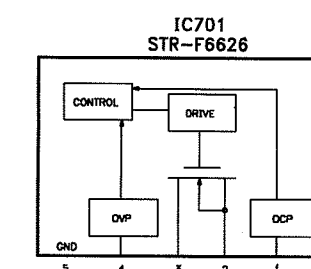
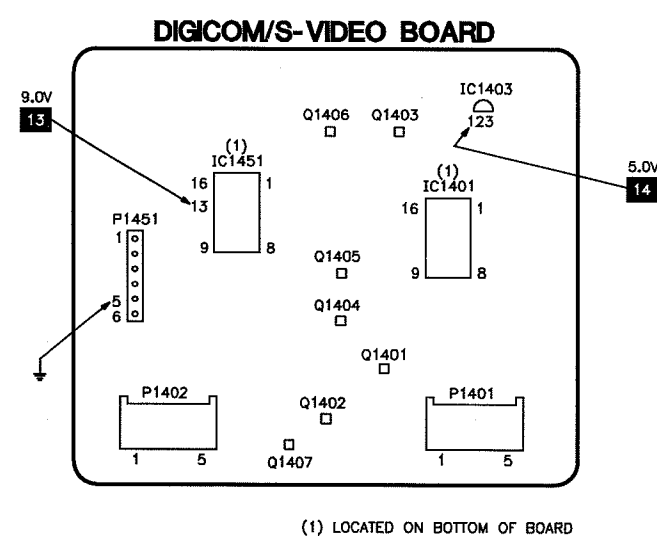
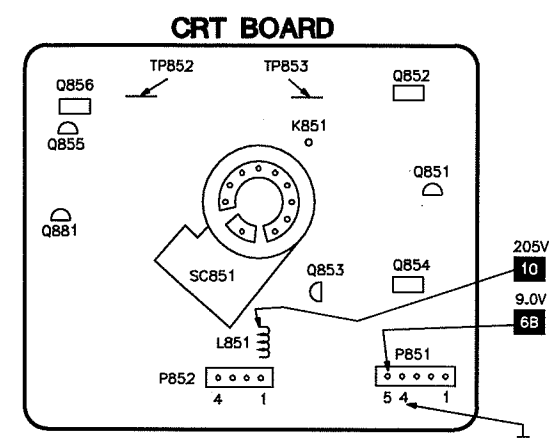
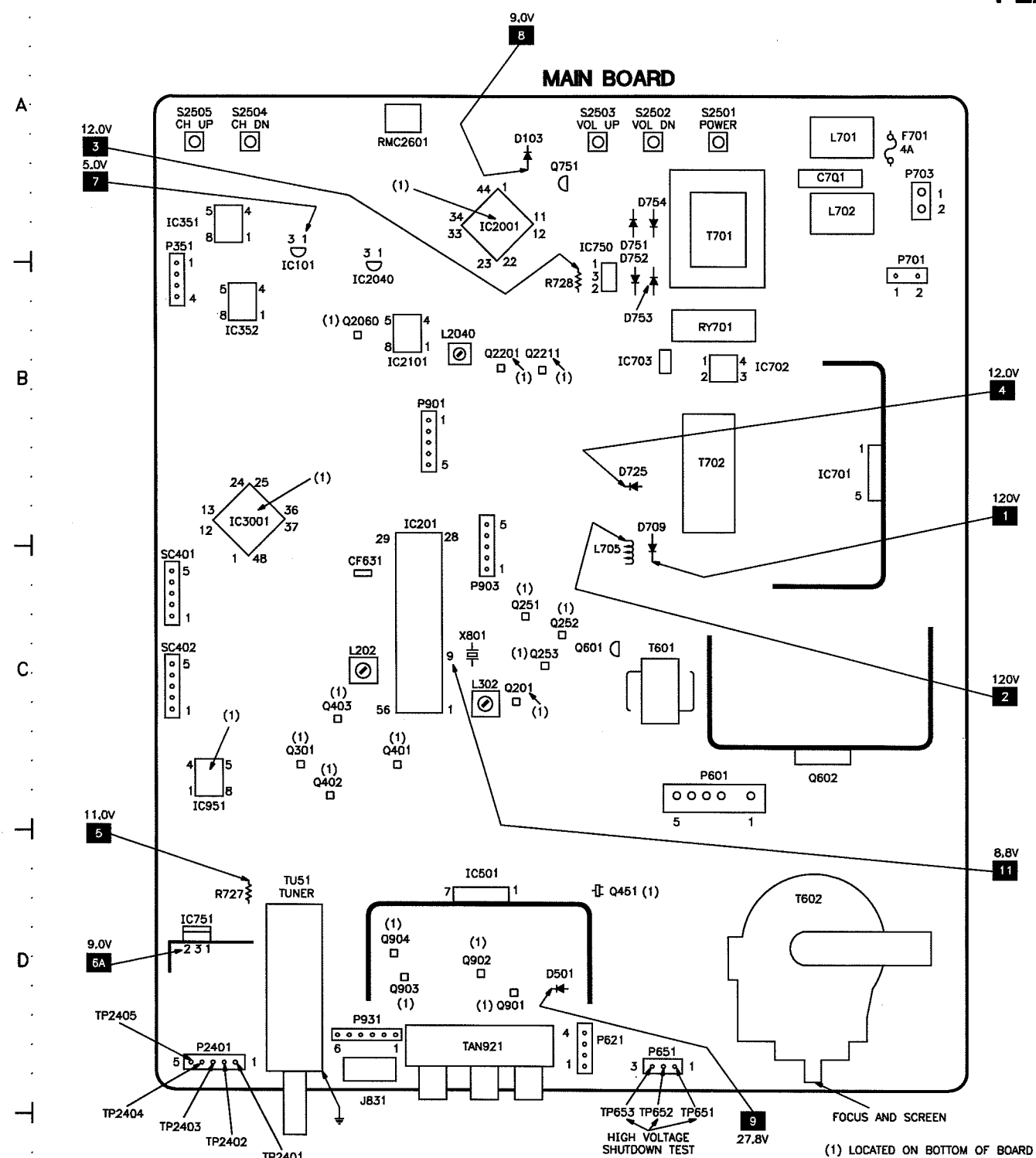
NOTE:VHF Low Band voltages taken on channel 2.
VHF High Band voltages taken on channel 7.
UHF Band voltages taken on channel 14.

TUNER TERMINAL GUIDE



PLACEMENT CHART

IC FUNCTIONS



PARTS LIST

Item No.	Type No.	Mfr. Part No.	NTE Part No.	Item No.	Type No.	Mfr. Part No.	NTE Part No.	Item No.	Function/Rating	Mfr. Part No.	Notes
D51	-	RH-EX0611GEZZ	NTE135A	Q853	2SC3198(Y)	VS2SC3198-Y-1	NTE85	L1405	33μH	VP-XF330K0000	-
D52	-	RH-EX0673GEZZ	-	Q854	2SC3789	VS2SC3789//2E	NTE2501	L1406	10μH	VP-XF100K0000	-
D53	-	RH-EX0611GEZZ	NTE135A	-	2SC3619LB	VS2SC3619LB1E	NTE157	L2040	Oscillator	RCiLB0131CEZZ	-
D103	1SS119	VHD1SS119//-1	NTE519	Q855	2SC3198(Y)	VS2SC3198-Y-1	NTE85	# PR701	3.1 Cold PTC	RMPTP0092CEZZ	-
D401	1SS119	RH-DX0475CEZZ	-	Q856	2SC3789	VS2SC3789//2E	NTE2501	# R51	150 5% 1W	VRS-RG3AB151J	-
D402	-	VHD1SS119//-1	NTE519	Q881	2SC3619LB	VS2SC3619LB1E	NTE157	# R52	12K 5% 2W	VRS-RG3DB123J	-
D454	-	RH-DX0475CEZZ	-	Q901 Thru	2SA1266(Y)	VS2SA1266-Y-1	NTE290A	# R53	47 5% 1W	VRS-RG3AB470J	-
D455, 56	1SS119	RH-EX0604GEZZ	-	Q904	2SD601AR	VS2SD601AR/-1	NTE2408	# R451	10K 5% 1/2W	VRS-RG2HC103J	-
D457, 58	-	VHD1SS119//-1	NTE519	Q1401 Thru	2SC2412-C-1	VS2SC2412-C-1	-	# R501	.56 5% 1W	VRN-RL3ABR56J	-
D459	1SS119	RH-DX0475CEZZ	NTE5024A	Q1407	2SD601AR	VS2SD601AR/-1	NTE2408	R511	82K 2% 1/8W	VRD-RA2BE823G	-
# D501	-	VHD1SS119//-1	NTE519	Q2060	2SC2412K	VS2SC2412KQ-1	NTE2408	R512	120K 2% 1/8W	VRD-RA2BE124G	-
# D510	-	RH-DX0475CEZZ	NTE552	Q2201, 11	2SD601AR	VS2SD601AR/-1	NTE2408	R519	15K 2% 1/8W	VRD-RA2BE153G	-
D621	-	RH-DX0441CEZZ	NTE116	-	2SD601AR	VS2SD601AR/-1	-	# R524	390 5% 1W	VRS-RG3AB391J	-
# D622, 51	-	RH-EX0631GEZZ	NTE552	-	2SC2412-C-1	VS2SC2412-C-1	NTE2408	# R604, 07	3900 5% 3W	VRS-RG3LB392J	-
# D652	-	RH-DX0131CEZZ	-	-	2SD601AR	VS2SD601AR/-1	-	# R609	5600 5% 1W	VRS-RG3AB562J	-
# D653, 54	1SS119	RH-EX1313CEZZ	NTE519	-	2SC2412-C-1	VS2SC2412-C-1	-	# R611	3.3 10% 7W	VRS-KA3NG3R3K	-
# D701 Thru	-	RH-DX0475CEZZ	-	Item No.	Function/Rating	Mfr. Part No.	Notes	# R621	1.2 5% 2W	VRN-RL3DB1R2J	-
# D704	-	RH-DX0154CEZZ	NTE116	# ACC701	Line Cord	QACCD3065CESA	AC, Polarized	# R622	.39 5% 1W	VRN-RL3ABR39J	-
D705	1SS82	VHD1SS822///1A	NTE177	C516	.68μF 10% 35V Tantalum	VCSATA1VE684K	-	# R623	2.7 5% 1W	VRN-RL3AB2R7J	-
D706	-	RH-DX0066GEZZ	-	C551	2.2μF 10% 16V Tantalum	VCSATA1CE225K	-	# R624	3300 5% 2W	VRS-RG3DB332J	-
D707	1SS82	VHD1SS822///1A	NTE177	# C610, 11	.0077 +50% -10% 1.6kV	VCFPVC3CA772H	-	# R651	27 5% 1/2W	VRS-RG2HC270J	-
D708	-	RH-DX0066GEZZ	-	# C623	10μF 20% 250V	VCEA4A2EN106N	-	# R652	10K 1% 1/8W	VRD-RA2BK103F	-
# D709	-	RH-DX0229CEZZ	NTE580	# C701	.22 +80% -20% 250VAC	RC-FZ012SCEZZ	-	# R653	8200 1% 1/8W	VRD-RA2BK822F	-
# D712	-	RH-DX0407CEZZ	-	-	.22 +80% -20% 250VAC	RC-FZ037SCEZZ	-	# R654	180K 5% 1/8W	VRD-MN2BE184J	-
# D713	-	RH-EX0673GEZZ	-	-	.22 +80% -20% 250VAC	RC-FZ012SCEZZ	-	# R655	100K 5% 1/16W	VRS-CY1JF104J	-
# D715	-	RH-EX0610GEZZ	-	C702, 03	.01 +80% -20% 250VAC	RC-KZ0029CEZZ	-	# R701	3.9M 20% 1/2W	RR-HZ0048CEZZ	-
D716	1SS119	VHD1SS119//-1	NTE519	# C705	560μF 200V	RC-EZ0800CEZZ	-	# R702	1.2 10% 7W Wirewound	VRW-KQ3NC1R2K	-
D717	-	RH-DX0475CEZZ	-	-	560μF 200V	RC-EZ0719CEZZ	-	# R705	.22 5% 2W	VRN-RL3DBR22J	-
# D725	-	RH-EX0650GEZZ	-	# C706	560μF 200V	RC-EZ0719CEZZ	-	# R706	.27 5% 2W	VRN-RL3DBR27J	-
# D751 Thru	-	RH-DX0407CEZZ	-	C707	.0033 250VAC	RC-EZ0719CEZZ	-	# R709	1 5% 1/4W	VRN-GA2EB1R0J	-
# D754	-	RH-DX0407CEZZ	-	# C723	.0022 1.6kV	RC-KZ0092GEZZ	-	# R715	15K 5% 2W	VRS-RG3DB153J	-
D755	1SS119	RH-DX0441CEZZ	NTE116	# C725	100μF 160V	RC-KZ0092GEZZ	-	# R723	.39 5% 2W	VRN-RL3DBR39J	-
# D756	-	VHD1SS119//-1	NTE519	# C726, 27	220μF 160V	VCFPVC3CA222H	-	# R726	1200 5% 1/2W	VRS-RG2HC122J	-
D881, 82, 84	1SS119	RH-DX0475CEZZ	NTE116	# C730, 31	560pF 10% 2kV	RC-KZ0092GEZZ	-	# R728	4.7 5% 3W	VRN-RL3LB4R7J	-
D1401, 02, 03	1SS119	RH-DX0475CEZZ	NTE519	C854	1000μF 16V	RC-KZ0024CEZZ	-	# R737	.56 5% 2W	VRN-RL3DBR56J	-
D1451, 52	1SS119	VHD1SS119//-1	NTE519	-	.001 10% 2kV	VCKYPB3DE472Z	-	# R857, 65, 73	12K 5% 3W	VRS-VV3LB123J	-
D1453, 54	-	RH-DX0475CEZZ	-	C956	10μF 20% 16V NP	VCEA0A1CW106M	-	RMC2601	Receiver	RRMCU0235CEZZ	Remote
D2001	1SS119	RH-DX0475CEZZ	NTE519	C1418	10μF 20% 50V NP	VCEA0A1HW106M	-	# RY701	Relay	RRLYJ0081CEZZ	Power
D2011	-	RH-DX0475CEZZ	-	C1427	10μF 20% 16V NP	VCE9GA1CW106M	-	-	Relay	RRLYJ0088CEZZ	Power
IC101	KA78S05P	RH-EX0631GEZZ	NTE519	C1455	10μF 20% 16V NP	VCE9GA1CW106M	-	-	Relay	RRLYJ0094CEZZ	Power
# IC201	TA1268AN	VHD1SS119//-1	NTE519	C3001	4.7μF 50V NP	VCE9GA1HW475M	-	S2501	Switch	QSW-K0079GEZZ	Power
IC351, 52	AN7511	RH-DX0475CEZZ	-	C3010,12	4.7μF 50V NP	VCE9GA1HW475M	-	S2502	Switch	QSW-K0202PEZZ	Power
# IC501	TA8427K	VHD1SS119//-1	NTE519	C3015	3.3μF 10% 16V Tantalum	VCSATA1CE335K	-	S2503	Switch	QSW-K0079GEZZ	Volume Down
# IC701	STR-F6626	RH-DX0475CEZZ	-	C3016	4.7μF 20% 50V NP	VCE9GA1HW475M	-	S2504	Switch	QSW-K0202PEZZ	Volume Down
# IC702	PC817	RH-DX0475CEZZ	-	C3017	10μF 10% 16V Tantalum	VCSATA1CE106K	-	S2505	Switch	QSW-K0079GEZZ	Volume Up
# IC703	SE120N	RH-DX0611GEZZ	-	CF301	Filter	RFiLC0029TAZZ	4.5MHz	S2505	Switch	QSW-K0202PEZZ	Volume Up
# IC750, 51	KA7809PI	VHika78S05P-1	-	CF401	Filter	RFiLC0013CEZZ	4.5MHz	SC851	Socket	QSW-K0079GEZZ	Channel Down
IC951	MM1113XFBE	RH-IX3253CEZZ	-	CF631	Filter	RFiLA0034CEZZ	503kHz	SF201	Filter	QSW-K0202PEZZ	Channel Up
IC1401	TC90A45F	VHIA7511//-1	NTE3098	CF2040	Filter	RFiLA0099CEZZ	-	SP1, 2	Speaker	QSOVC0937CEZZ	Channel Up
IC1403	KIA78L05BP	VHIT8724K/-1	-	# DY601 (1)	Yoke	-	-	T601	Speaker	QSOVC0937CEZZ	CRT
IC1451	MS2055FP	VHISTRF66261E	-	# F701	Fuse	QFS-B4023CEZZ	Horiz 1.1mH, Vert 17.7mH	# T602 (2)	Horizontal Driver	RFiLC0405CEZZ	SAW
IC2001	TMPA8700CPF-164	RH-FX0002GEZZ	NTE3098	-	Fuse	QFS-B4021CEZZ	4Amp, 125V, Slow Blow	-	Horizontal Output	VSP0080PBL4YS	3" Round, 32 Ohms, 2W
IC2040	KIA7045A	VHISE120N//-1	-	FB601	Ferrite Bead	RBLN-0047CEZZ	4Amp, 125V, Slow Blow	# T701	Horizontal Output	VSP0080PBK9YA	3" Round, 32 Ohms, 2W
IC2101	M24C16-BN6	VHITC90A45F-1	NTE1966	FB702	Ferrite Bead	RBLN-0036CEZZ	-	# T702	Horizontal Output	RTRN20057PEZZ	-
IC3001	CXA2074Q	VHITC90A45F-1	NTE977	FB704, 06	Ferrite Bead	RBLN-0037CEZZ	-	-	Power	RTRNF0033MEZZ	-
Q201	2SC2735	VHITC90A45F-1	-	FH701	Fuse Holder	RBLN-0037CEZZ	-	-	SMT	RTRNF0037MEZZ	-
Q251, 52, 53	2SD601AR	VHIM24C16B/-1	-	FH702	Fuse Holder	QFSDH1013CEZZ	For F701	TAN921	SMT	RTRNZ0022MEZZ	-
Q301	2SC2412	VHIM24C16B/-1	-	J931	Socket	QFSDH1014CEZZ	For F701	# TU51	Jack	QTANJ0523CEZZ	Assembly
Q401	2SD601AR	VHICXA2074Q-1	-	J1001	Jack	QSODC0430CEZZ	S-Video	-	Tuner	VTUVTST5UF78S	-
Q402	2SC2412	VS2SC2735//1E	NTE2402	J1002	Jack	QJAKE0053GEZZ	Video In Front	# V101	Tuner	VTU115B8035AH	-
Q403	2SD601AR	VS2SD601AR/-1	NTE2408	J1003	Jack	QJAKE0055GEZZ	Audio In Left Front	X801	CRT	VB68AADT2503*S	A68ADT25X03
Q451	2SC2412	VS2SC2412-C-1	NTE2408	L201	VCO	QJAKE0059GEZZ	Audio In Right Front	-	Crystal	RCRSB0205CEZZ	3.58MHz
Q601	2SB709AR	VS2SD601AR/-1	NTE2408	L202	VCO	VP-XF1R2K0000	-	-	Crystal	RCRSB0001PEZZ	3.58MHz
Q751	2SA1037KR	VS2SC2412-C-1	NTE2408	L251	39μH	VP-XF8R2K0000	-	-	Button	JBTN-1096MEKA	Power, Volume Up/Down
Q851	2SD601AR	VS2SB709AR/-1	NTE2408	L301	8.2μH	VP-XF3R3K0000	-	-	Button	JBTN-1097MEKA	Channel, Up/Down
Q852	2SC3789	VS2SA1037KR-1	NTE2408	L302	SIF	RCiLJ0613CEZZ	-	-	Button	DUNTK910WEK1	CRT
	2SC3619LB	VS2SD601AR/-1	NTE2408	L401	SIF	RCiLJ0605CEZZ	-	-	PC Board	DUNTKA115WEK0	DIGICOM/S-Video Unit
		VS2SC2412-C-1	NTE2408	L402	6.8μH	VP-XF6R8K0000	-	-	PC Board	DUNTK9310WEK1	Front AV Unit
		VS2SB709AR/-1	NTE2409	L403, 04	3.3μH	VP-XF8R2K0000	-	-	PC Board	DUNTKA126WEK5	Main
		VS2SA1037KQ-1	NTE2409	L672	-	RCiLZ0101MEZZ	-	-	Transmitter	RRMCG1395CESA	Remote
		VS2SC2482//-1	NTE2409	# L701, 02	Line Filter	RCiLZ0102MEZZ	-	-			
		VS2SD2539//1E	NTE2353	# L703	Degaussing	RCiLF0025PEZZ	-	-			
		VS2SC3198-Y-1	NTE85	# L705	-	RCiLG0038MEZZ	-	-			
		VS2SC3198-Y-1	NTE85	L729	-	RCiLP0179CEZZ	-	-			
		VS2SC3789//2E	NTE85	L851	82μH	RCiLP0179CEZZ	-	-			
		VS2SC3619LB1E	NTE2501	L1401, 02	10μH	VP-MK820K0000	-	-			
			NTE157	L1403	15μH	VP-XF100K0000	-	-			
						VP-XF150K0000	-	-			