

# TEST JIG HOOKUP

Function	Chek-A-Color Adapter No.	PC Board Plug	Pin	Color
CRT	B239	# DY	1	Red
Yoke	D482		2	Blue
Yoke Setting	YP3		3	Yellow
Comments	Focus Tap		4	Black

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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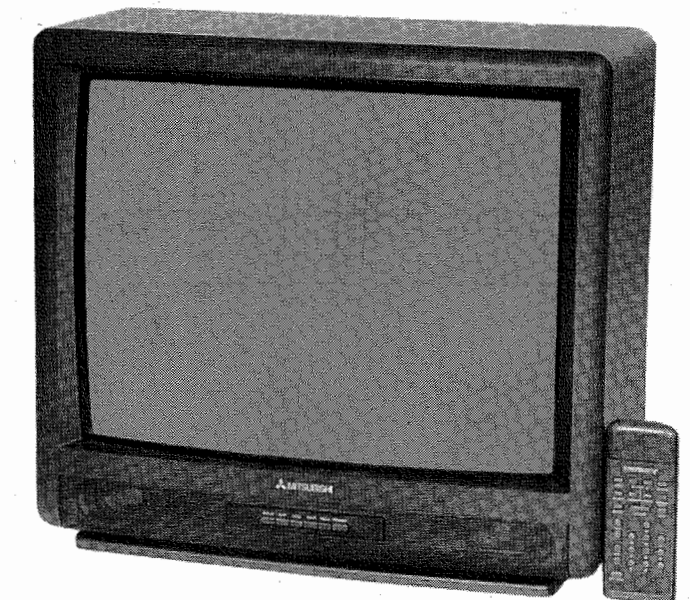
2963

SET 2963

MODEL CS-2005R

2963

MITSUBISHI  
Model CS-2005R



Essential coverage  
for servicing a television receiver...

- Schematics
- Component locations
- Parts lists

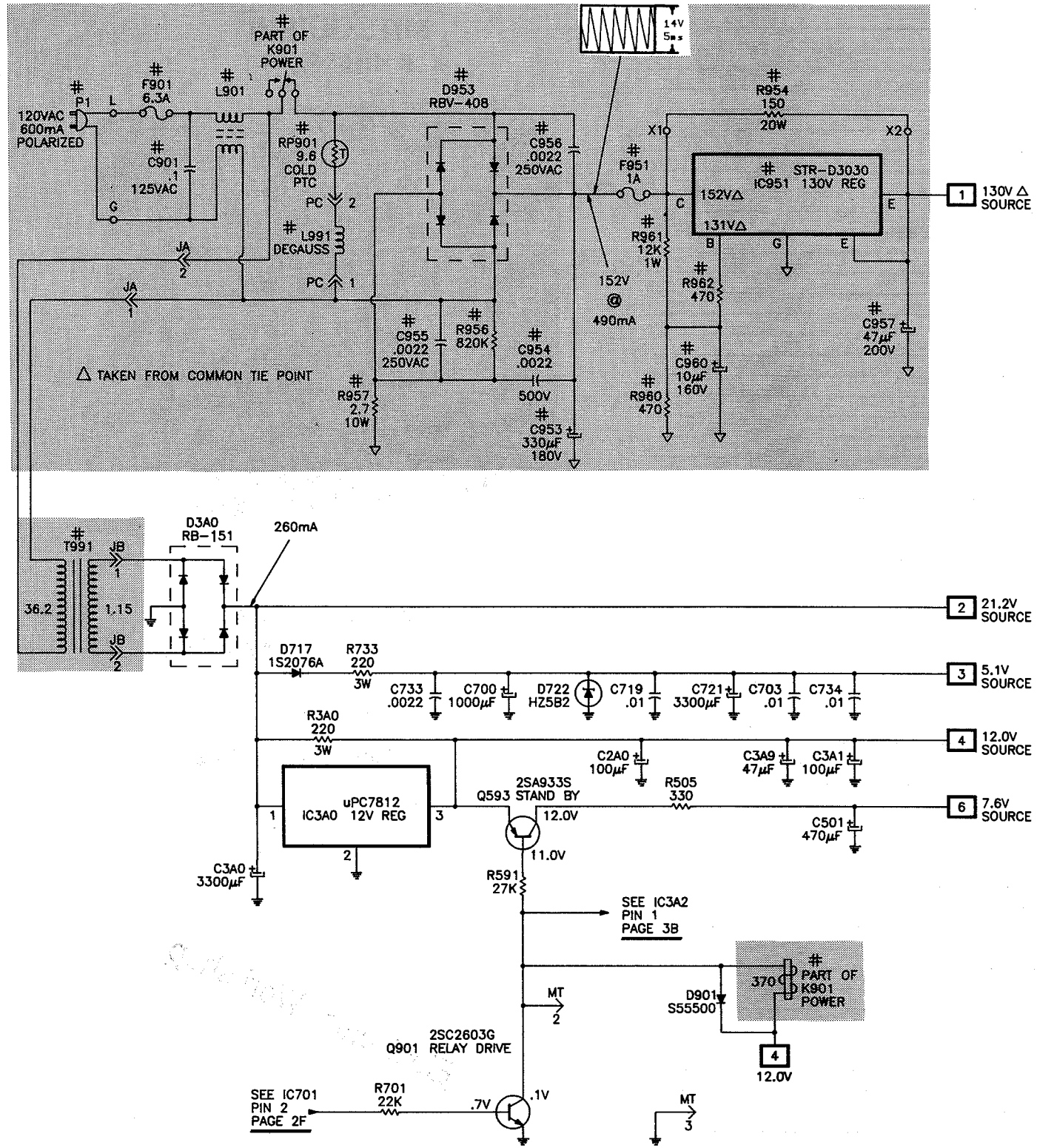


HOWARD W. SAMS & COMPANY

MARCH 1992 SET 2963

For Supplier Address,  
See PHOTOFACT Annual Index

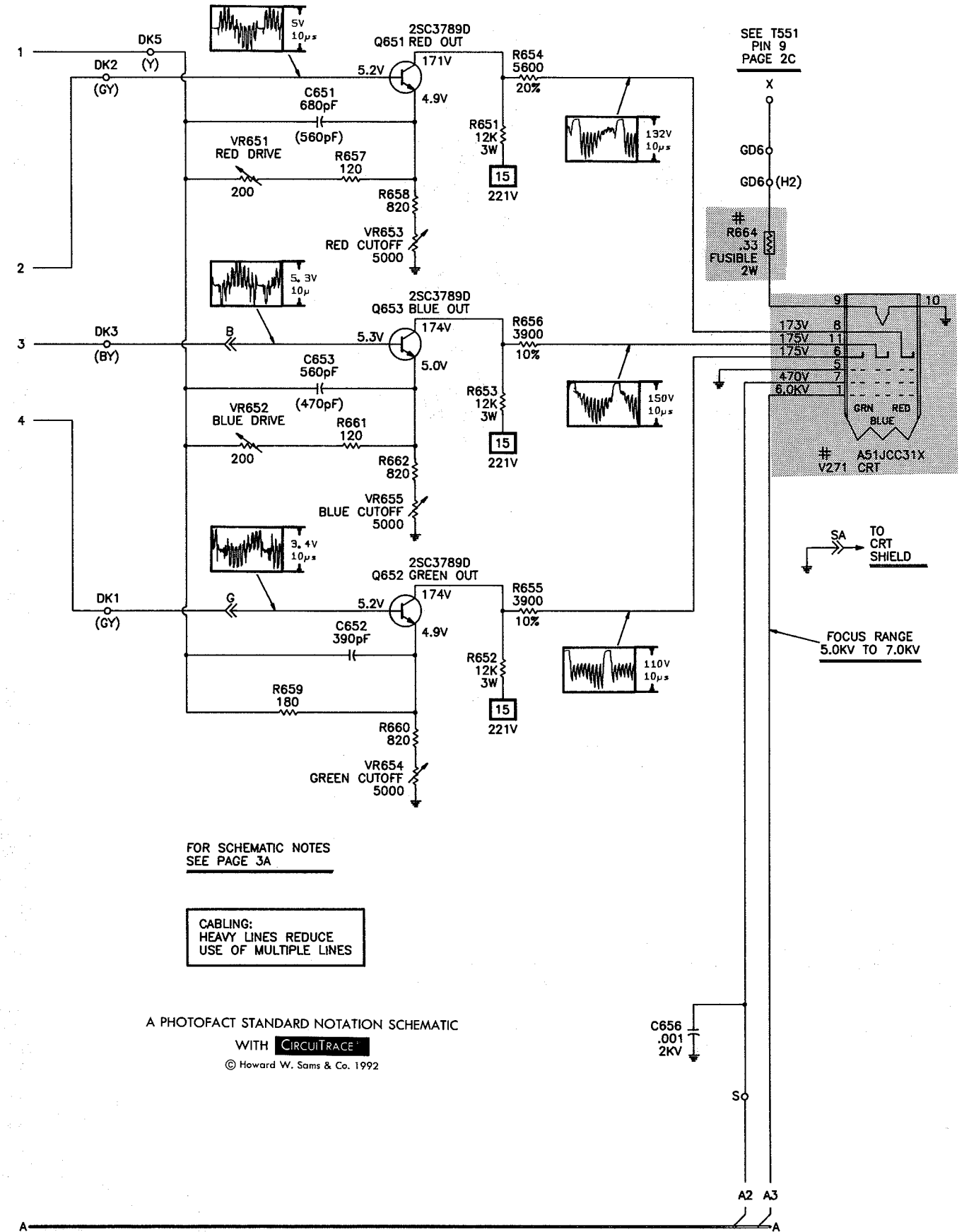
## POWER SUPPLY SCHEMATIC



A PHOTOFACT STANDARD NOTATION SCHEMATIC  
WITH **CIRCUITRACE**  
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## G

## CRT SCHEMATIC



**mitsubishi**

**MODEL CS-2005R**

PARTS LIST continued

CAPACITORS

Item	Rating	Mfr. Part No.
# C506	.001 50V 10%	141P190090
# C552	.0091 1.6KV 5%	172P173010
# C554	680 2KV 10%	154P251060
# C901	.1 250V	189033050
# C910	.01 250V	189P133010
# C911	.01 250V	189P133010
# C954	.0022 500V	142P014000
# C955	.0022 250V	189P060060
# C956	.0022 250V	189P060060

# For SAFETY use only equivalent replacement part.

ELECTROLYTIC CAPACITORS

Item	Rating	Mfr. Part No.
# C583	10 100V 20%	181P187040
# C953	330 180V	185D052030
# C957	47 200V 20%	181P189080
# C960	10 160V 20%	181P188060

# For SAFETY use only equivalent replacement part.

MISCELLANEOUS

Item No.	Description	Mfr. Part No.	Notes
BP330	Ceramic Filter	296P067010	4.5MHz
CF100	Ceramic Filter	296P024020	4.5MHz
CF501	Ceramic Resonator	299P051030	-
DL201	Delay Line	337P110040	-
# F901	Fuse	283D060030	6.3 Amp
# F951	Fuse	283D076010	1 Amp
# K901	Power Relay	287P049020	-
# L991	Degaussing Coil	409B059090	-
# P1	AC Line Cord	242C499040	-
S201	Switch	129P007090	Service
S701	Switch	432P066070	Power
S702	Switch	432P066070	Volume Up
S703	Switch	432P066070	Volume Down
S704	Switch	432P066070	Channel Up
S705	Switch	432P066070	Channel Down
S706	Switch	432P066070	-
SF101	SAW Filter	296P032050	-
# V271	CRT	A51JCC31X	-
X601	Crystal Resonator	285P015010	3.58MHz
X701	Crystal Resonator	285P029030	4MHz
	Antenna Terminal	44P086010	-
	CRT Socket	44C081090	-
	IR Transmitter	939P302040	-
	PC Board	920D273040 (1)	CRT
	PC Board	920A391001 (1)	Main
	Tuner	295P082010	ET-43ZNPk
	Yoke Wedge	641D758010	-

# For SAFETY use only equivalent replacement part.

(1) Replacement available from PTS Electronics Corporation; order by manufacturer's part number.

TEST EQUIPMENT

Test equipment listed by participating manufacturers 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	B&K Precision No.	Sencore No.
Oscilloscope	1541A, 2120, 2125, 2160, 2190, 2522	SC61
Generators		
RGB	1249A, 1260	RG67
Multiburst Signal	1251, 1260	VA62A
Color Bar	1211A, 1249A, 1251, 1260	VA62A, CG25, NT64
TV Stereo	2009	ST65, ST66
Analog VOM	114, 117, 177, 214	-
Digital VOM	377, 388HD, 2700 Series, 2831A, 2860, 2900 Series	DVM37, DVM56A, SC61
Frequency Meter	1803A, 1804A, 1805, 1822, 1851, 1855	FC71, SC61
Hi-Voltage Probe	HV-44	HP200
VOM/DMM	-	TP212
Accessory Probes	PR-28(HV)	-
Isolation Transformer	TR110, 1604, 1653, 1655	PR57
Capacitance Analyzer	810A, 815, 820, 830	LC76, LC101, LC102
CRT Analyzer	480, 490	CR70
Temperature Probe	TP-28, TP-30	-
AC Leakage Tester	1655	PR57
Logic Probe	DP21, DP51	-
Logic Pulser	DP31, DP101	-
Inductance Analyzer	875A	LC76, LC101, LC102
Flyback Yoke Tester	875A	VA62A, LC76, LC101, LC102
TV Stereo Power Monitor	-	SR68
Field Strength Meter	-	FS73, FS74
Transistor Tester	510, 520B, 530	TF46
Video Analyzer	-	VA62A
Modulator/Converter	1201	-



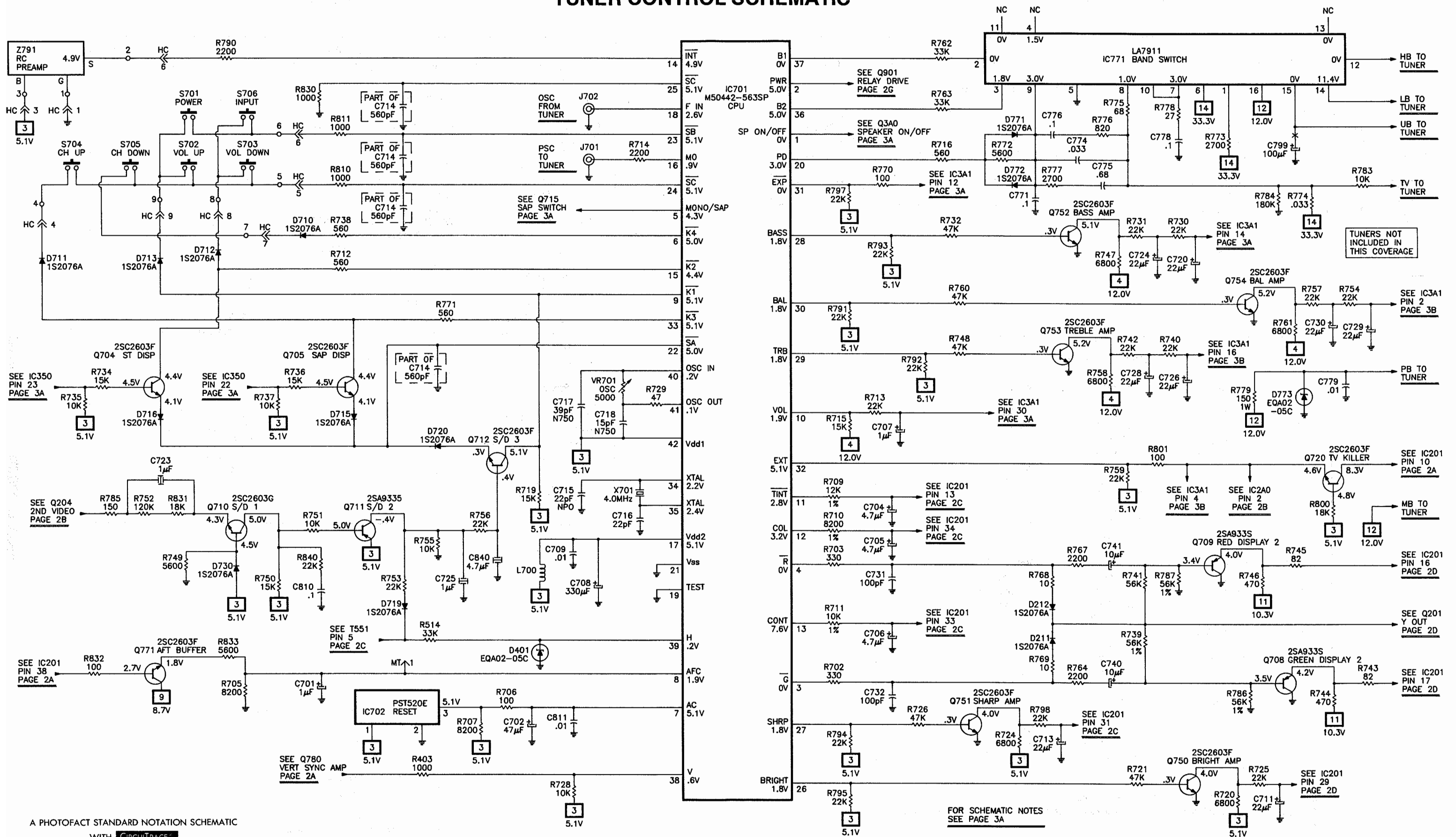
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& Company.

J. Kocha, D. Cobb,  
B. Buchanan, M. McDonald,  
J. Young

mitsubishi

MODEL CS-2005R

# TUNER CONTROL SCHEMATIC



A PHOTOFACT STANDARD NOTATION SCHEMATIC  
 WITH CIRCUITRACE  
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PARTS LIST

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.

- B&K Precision
- Custom Components Corporation (Chek-A-Color)
- EVG / Russell Industries, Inc.
- NTE Electronics, Inc. (NTE)
- Philips ECG Company (ECG)
- PTS Electronics Corporation (PTS)
- Quam-Nichols Co. (Quam)
- Sencore, Inc.
- Thomson Consumer Electronics, Inc. (SK, TCE)

SEMICONDUCTORS

(Select replacement for best results.)

Item No.	Type No.	Mfr. Part No.	NTE Part No.	ECG Part No.	TCE Part No.
D3A0	RB-151	264P544010	NTE5304	ECG5304	SK3106
D3A2, 3	1S2471	264P045040	NTE519	ECG519	SK3100
D3F0	1S2471	264P045040	NTE519	ECG519	SK3100
D3F1	1S2471	264P045040	NTE519	ECG519	SK3100
D202	RD8.2FB3	264P486020	NTE5072A	ECG5072A	SK8V2
D205, 6, 8	1S2471	264P045040	NTE519	ECG519	SK3100
D209	EQA02-05F	-	NTE5010A	ECG5010A	SK5A1
	RD5.6FB1	264P484020	NTE136A	ECG136A	SK5V6
D210 - D213	1S2471	264P045040	NTE519	ECG519	SK3100
D401	EQA02-05C	264P460060	NTE5010A	ECG5010A	SK5A1
D410	RD10FB1	264P486080	-	-	-
D451	S5500	264P285010	NTE116	ECG116	SK3313
	EM1Z	-	NTE552	ECG552	SK9000
D490	1S2471	264P045040	NTE519	ECG519	SK3100
D501, 2	1S2471	264P045040	NTE519	ECG519	SK3100
# D503	EQA02-33A	264P471010	NTE5036A	ECG5036A	SK33A
	RD36EB1	-	NTE5037A	ECG5037A	SK36A
D506	1S2471	264P045040	NTE519	ECG519	SK3100
D552, 3	TVR1G	264P295020	NTE552	ECG552	SK9000
	ES1	-	NTE552	ECG552	SK9000
D561	RU-3B	264P102020	NTE552	ECG552	SK3318A
# D582	S5500D	264P285010	NTE116	ECG116	SK3313
	EM1Z	-	NTE552	ECG552	SK9000
D593, 4	S5500D	264P285010	NTE116	ECG116	SK3313
	EM1Z	-	NTE552	ECG552	SK9000
D701, 2	1S2471	264P045040	NTE519	ECG519	SK3100
D710 - D713	1S2471	264P045040	NTE519	ECG519	SK3100
D715 - D717	1S2471	264P045040	NTE519	ECG519	SK3100
D719, 20	1S2471	264P045040	NTE519	ECG519	SK3100
D722	HZ5B2	264P341090	NTE5009A	ECG5009A	SK4A7
D730	1S2471	264P045040	NTE519	ECG519	SK3100
D771, 2	1S2471	264P045040	NTE519	ECG519	SK3100
D773	EQA02-05C	264P460060	NTE5010A	ECG5010A	SK5A1
D901	S5500D	264P285010	NTE116	ECG116	SK3313
	EM1Z	-	NTE552	ECG552	SK9000
# D953	RBV-408	-	NTE5311	ECG5311	SK5031
	RBV-40C	264P512020	NTE5311	ECG5311	SK5031
D2000	1S2471	264P045040	NTE519	ECG519	SK3100
D2010	EQA02-07C	-	NTE5014A	ECG5014A	SK6A8
	RD7.5FB1	264P485050	-	-	-
D2011	1S2471	260P045040	NTE519	ECG519	SK3100
IC2A0	LA7655	272P238010	-	ECG1863	-
IC3A0	UPC7812H	266P934020	NTE966	ECG966	SK3592
IC3A1	LA7953	272P139010	-	-	-
IC3A2	LA4270	272P140010	NTE1798	ECG1798	SK9745
# IC201	LA7655N	-	-	ECG1863	-
	LA7655	272P238010	-	ECG1863	-
IC330	LA7510	272P188010	-	-	-
IC350	UPC1871CU	272P351020	-	-	-

# For SAFETY use only equivalent replacement part.

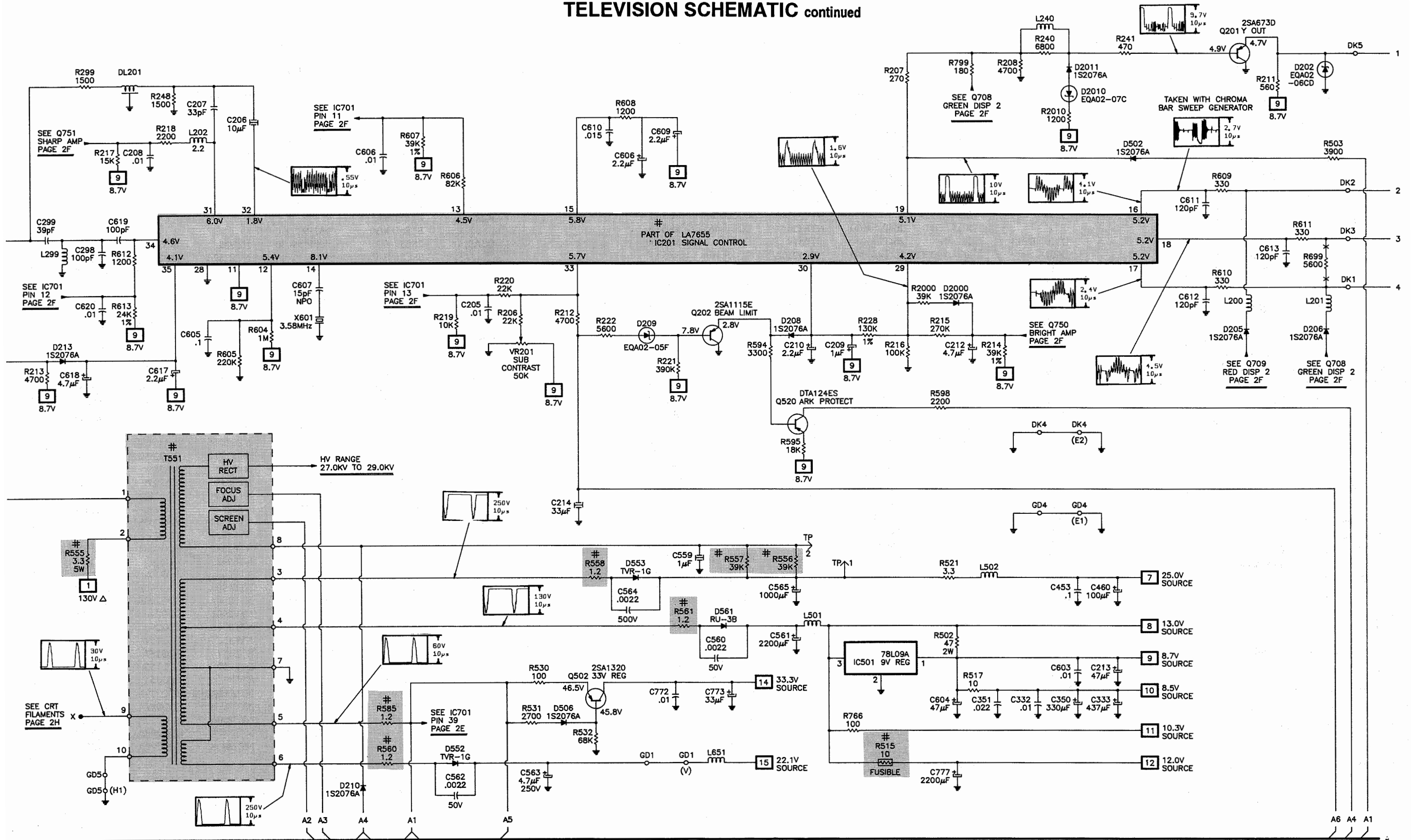
SEMICONDUCTORS continued

(Select replacement for best results.)

Item No.	Type No.	Mfr. Part No.	NTE Part No.	ECG Part No.	TCE Part No.
IC401	LA7837	272P239030	NTE1855	ECG1855	SK10085
IC501	78L09K	-	-	-	-
	NJM78L09K	266P923010	-	-	-
IC701	M50442-563SP	263P229010	-	-	-
IC702	PST520E	266P130030	-	-	-
IC771	LA7911	266P197010	-	-	-
# IC951	STRD3030	-	-	-	-
	STR-D3030	267P925010	-	-	-
Q3A0, 1	2SC1740S	260P559030	NTE85	ECG85	SK3122
	2SC2603-E	-	NTE289A	ECG289A	SK9137
	2SC2603-F	-	NTE289A	ECG289A	SK9137
Q101	2SC2058S	-	NTE85	ECG85	SK9229
	2SC2058S-P	260P654020	NTE85	ECG85	SK9229
	2SC2724-C	-	NTE289A	ECG289A	SK3122
	2SC2724-D	-	NTE289A	ECG289A	SK3122
Q130	2SC1906	260P356010	NTE107	ECG107	SK3293
Q201	2SA673D	-	NTE290A	ECG290A	SK9132
	2SA950-Y	260P255040	NTE290A	ECG290A	SK3841
Q202	2SA933SR	-	NTE290A	ECG290A	SK9132
	2SA933S-S	260P560040	NTE290A	ECG290A	SK9132
	2SA1115-E	-	NTE290A	ECG290A	SK9138
	2SA1115-F	-	NTE290A	ECG290A	SK9138
Q204	2SC1740S	260P559030	NTE85	ECG85	SK3122
	2SC2603-E	-	NTE289A	ECG289A	SK9137
	2SC2603-F	-	NTE289A	ECG289A	SK9137
	2SC711A-E	-	NTE85*	ECG85*	SK3899*
	2SC711A-F	-	NTE85*	ECG85*	SK3899*
Q502	2SA1320	-	NTE288*	ECG288*	SK3434*
	2SA1321	260P469010	NTE288*	ECG288*	SK3434*
Q520	UN4112	-	NTE2358*	ECG2358*	SK9741*
	DTA124ES	260P603010	NTE2358	ECG2358	SK9741
# 2SD1878	260P607010	-	NTE2331	ECG2331	SK10088
Q552	2SC2655Y	-	NTE293	ECG293	SK3849
	2SC2655-Y	260P325030	NTE293	ECG293	SK3849
Q593	2SA933S	-	NTE290A	ECG290A	SK9132
	2SA933S-S	260P560040	NTE290A	ECG290A	SK9132
	2SA1115-E	-	NTE290A	ECG290A	SK9138
	2SA1115-F	-	NTE290A	ECG290A	SK9138
Q651 - Q653	2SC3789D	-	NTE157	ECG157	SK3747
	2SC3789-C	260P571010	NTE157	ECG157	SK3747
	2SC3789-D	-	NTE157	ECG157	SK3747
Q704, 5	2SC1740S	260P559030	NTE85	ECG85	SK3122
	2SC2603-E	-	NTE289A	ECG289A	SK9137
	2SC2603-F	-	NTE289A	ECG289A	SK9137
Q708, 9	2SA933S	-	NTE290A	ECG290A	SK9132
	2SA933S-S	260P560040	NTE290A	ECG290A	SK9132
	2SA1115-F	-	NTE290A	ECG290A	SK9138

# For SAFETY use only equivalent replacement part.

\* Lead configuration may vary from original.



**PARTS LIST continued****SEMICONDUCTORS continued**

(Select replacement for best results.)

Item No.	Type No.	Mfr. Part No.	NTE Part No.	ECG Part No.	TCE Part No.
Q710	2SC1740S	-	NTE85	ECG85	SK3122
	2SC1740S-E	260P559050	NTE85	ECG85	SK3122
	2SC2603-G	-	NTE289A	ECG289A	SK9137
Q711	2SA933S	-	NTE290A	ECG290A	SK9132
	2SA933S-S	260P560040	NTE290A	ECG290A	SK9132
	2SA1115	-	NTE290A	ECG290A	SK9138
Q712	2SC1740S	260P559030	NTE85	ECG85	SK3122
	2SC2603-E	-	NTE289A	ECG289A	SK9137
	2SC2603-F	-	NTE289A	ECG289A	SK9137
Q715	2SA933S	-	NTE290A	ECG290A	SK9132
	2SA933S-S	260P560040	NTE290A	ECG290A	SK9132
	2SA1115-F	-	NTE290A	ECG290A	SK9138
Q720	2SC1740S	260P559030	NTE85	ECG85	SK3122
	2SC2603-E	-	NTE289A	ECG289A	SK9137
	2SC2603-F	-	NTE289A	ECG289A	SK9137
Q750 - Q754	2SC1740S	260P559030	NTE85	ECG85	SK3122
	2SC2603-E	-	NTE289A	ECG289A	SK9137
	2SC2603-F	-	NTE289A	ECG289A	SK9137
Q771	2SC1740S	260P559030	NTE85	ECG85	SK3122
	2SC2603-E	-	NTE289A	ECG289A	SK9137
	2SC2603-F	-	NTE289A	ECG289A	SK9137
Q780	UN4212	-	NTE2357	ECG2357	SK9742
	DTC124ES	260P632010	NTE2357	ECG2357	SK9742
Q901	2SC1740S	-	NTE85	ECG85	SK3122
	2SC1740S-E	260P559050	NTE85	ECG85	SK3122
	2SC2603-G	-	NTE289A	ECG289A	SK9137

**CONTROLS**

(All wattages 1/2 watt or less, unless otherwise listed.)

Item No.	Function	Resistance	Mfr. Part No.
VR100	RF AGC	10K	127C081010
VR201	Sub Contrast	50K	127C081010
VR350	Comp Level	10K	127C080080
VR351	ST Filter	20K	127C080090
VR353	Separation	5K	127C080070
VR354	Spectral	5K	127C080070
VR355	ST VCO	50K	127C091010
VR401	Vertical Height	50K	127C081010
VR402	Vertical Linearity	10K	127C080080
VR651	Red Drive	200	127C030010
VR652	Blue Drive	200	127C030010
VR653	Red Cutoff	5K	127C030070
VR654	Green Cutoff	5K	127C030070
VR655	Blue Cutoff	5K	127C030070
VR701	OSC	5K	127C080070

**COILS (RF-IF)**

Item No.	Rating	Mfr. Part No.
L100	Video IF	323P172010
L101	Video IF	323P171010
L102	10uH	325C106030
L130	Trap	320P026030
L134	1.2uH	325C110020
L137	1.5uH	325C110030
L200	8.2uH	325C101020
L201	8.2uH	325C101020
L202	180uH	325C177080
L240	100uH	325C122050
L299	10uH	325C106030
L300	Sound IF	327P073020
L331	1.5uH	325C120030
L333	18uH	325C106060
L340	1.2uH	325C120020
L501	33uH	321C031090
L502	1uH	321C030010
L552	Horiz Linearity	333P027060
L556	.47uH	321D019010
L651	180uH	325C307080
L700	10uH	325C111030
L901	Line Filter	351P017010

**RESISTORS**

Item No.	Rating	Mfr. Part No.	NTE Replacement
# R111	4700 1/4W 5% Carbon Film	103P713030	QW247
# R3C4	4700 1/4W 5% Carbon Film	103P713030	QW247
# R3C5	68K 1/4W 5% Carbon Film	103P714070	QW368
# R455	2.2 1/4W 5% Carbon Film	103P418040	QW2D2
# R507	1200 1/4W 5% Carbon Film	103P712060	QW212
# R508	1200 1/4W 5% Carbon Film	103P712010	QW212
# R510	680 1/4W 5% Carbon Film	103P712030	HW168
# R515	10 1/2W 5% Fusible	103P390010	-
# R517	10 1/4W 5% Carbon Film	103P410010	QW010
# R520	3300 1/4W Metal Film	103P463070	QW233
# R551	270 1/2W 5% Metal Film	109D027010	HW127
# R555	3.3 5W 10% Wirewound	109D055060	5W3D3
# R556	33K 1/4W 5% Carbon Film	103P414030	QW333
# R558	1.2 1/4W 5% Carbon Film	103P338010	QW1D2
# R560	1.2 1/4W 5% Carbon Film	103P338010	QW1D2
# R561	1.2 1/4W 5% Carbon Film	103P338010	QW1D2
# R585	1.2 1/4W 5% Carbon Film	103P338010	QW1D2
# R590	470 3W 5% Metal Film	103C192010	3W147
# R594	3300 1/4W 5% Carbon Film	103P413010	QW233
# R595	18K 1/4W 5% Carbon Film	103P414000	QW318
# R598	2200 1/4W 5% Carbon Film	103P412090	QW222
# R664	.33 2W 5% Fusible	103P437040	-
# R910	4.7M 1/2W 10% Carbon Comp	109D036020	HW547
# R954	150 20W 10% Wirewound	109D052030	-
# R956	820K 1/2W 10% Carbon Comp	101P824030	HW482
# R957	2.7 10W 10% Wirewound	109D067070	10W2D7
# R960	470K 1/4W 5% Carbon Film	103P415070	QW447
# R961	12K 1W 5% Metal Film	103C173080	1W312
# R962	470 1/4W 5% Carbon Film	103P412010	QW141

# For SAFETY use only equivalent replacement part.

**CABINET PARTS**

Item	Part No.
Cabinet Front	701B224010
Cabinet Rear	700A559010

**SPEAKERS**

Item No.	Description	Mfr. Part No.	Quam Part No.
SP391, 2	3" PM 3W 8ohms	480P013020	30C25Z8

**COILS & TRANSFORMERS**

Item No.	Function	Mfr. Part No.	Russell Part No.
# L491	Yoke 90° Horiz 2.86mH Vert 29.0mH	330P152020	-
# T551	Horiz Output	334P159040	FTB-230
# T552	Horiz Drive	336P012040	-
		P01204 (1)	-
# T901	Power	350P439010	-

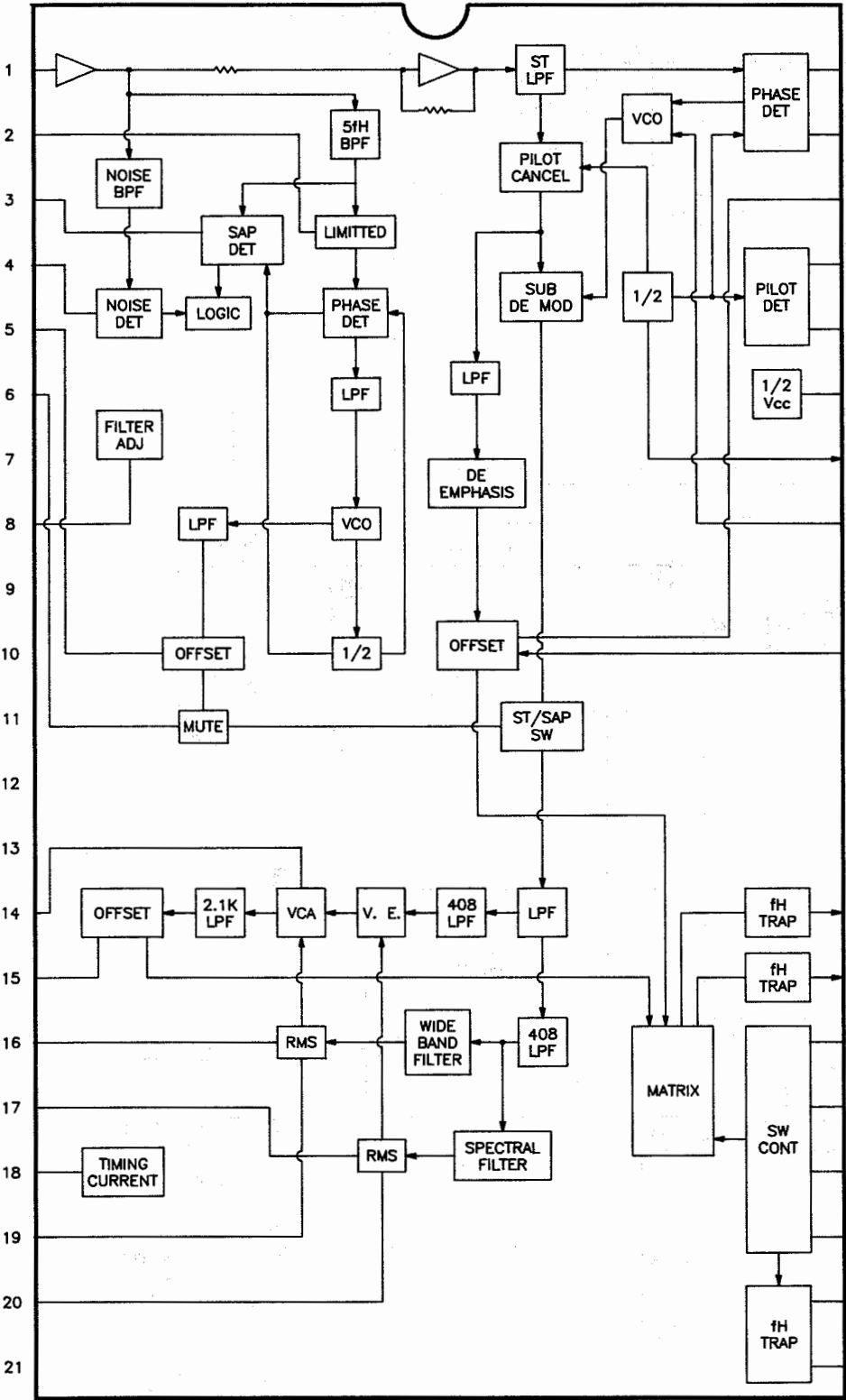
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(1) Number on unit.



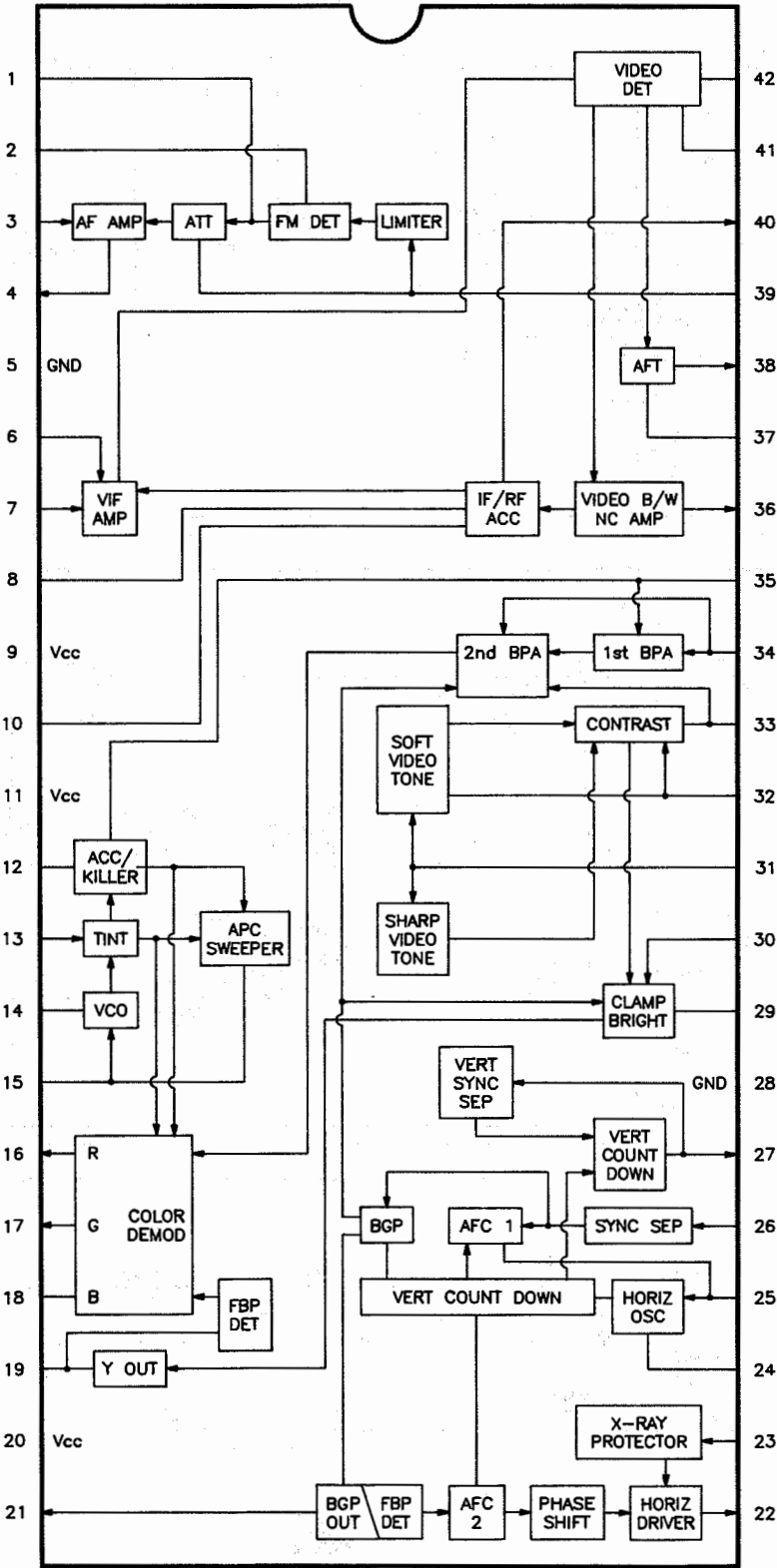




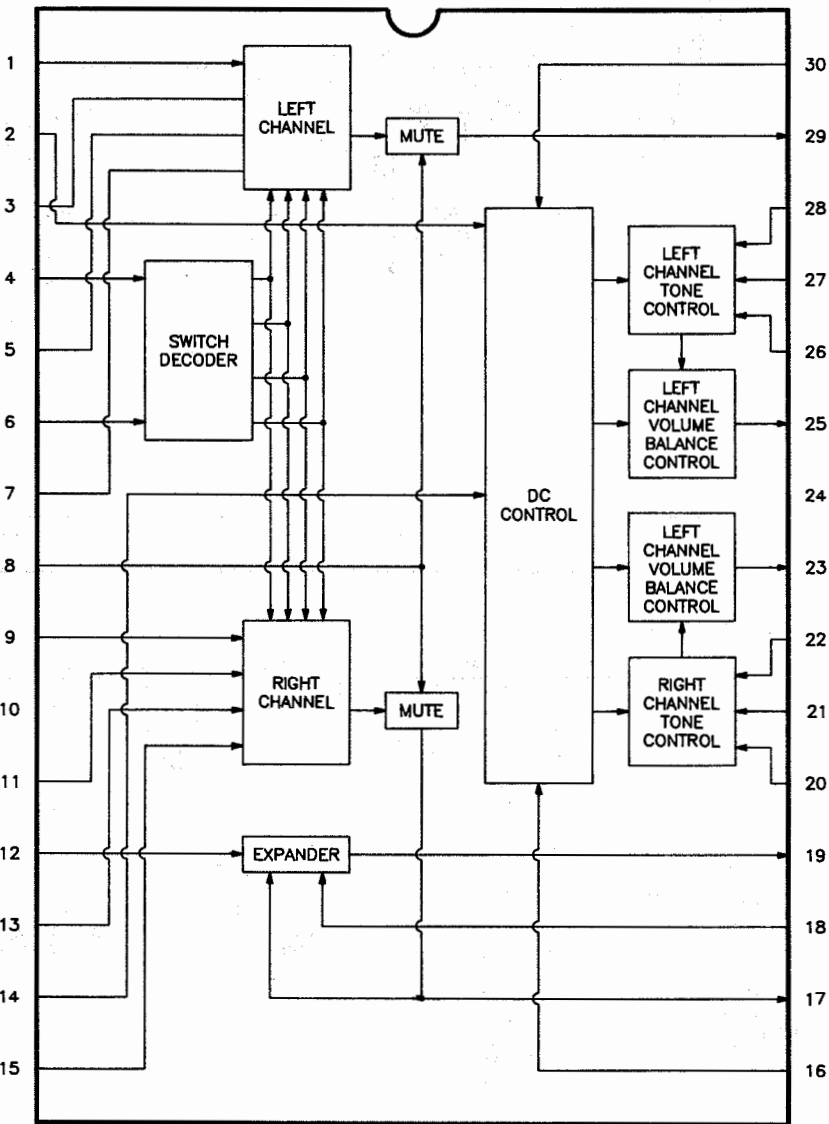
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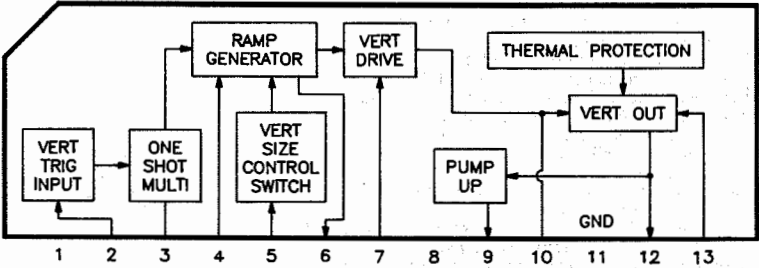
UPC1871CU  
IC350



LA7655  
IC201

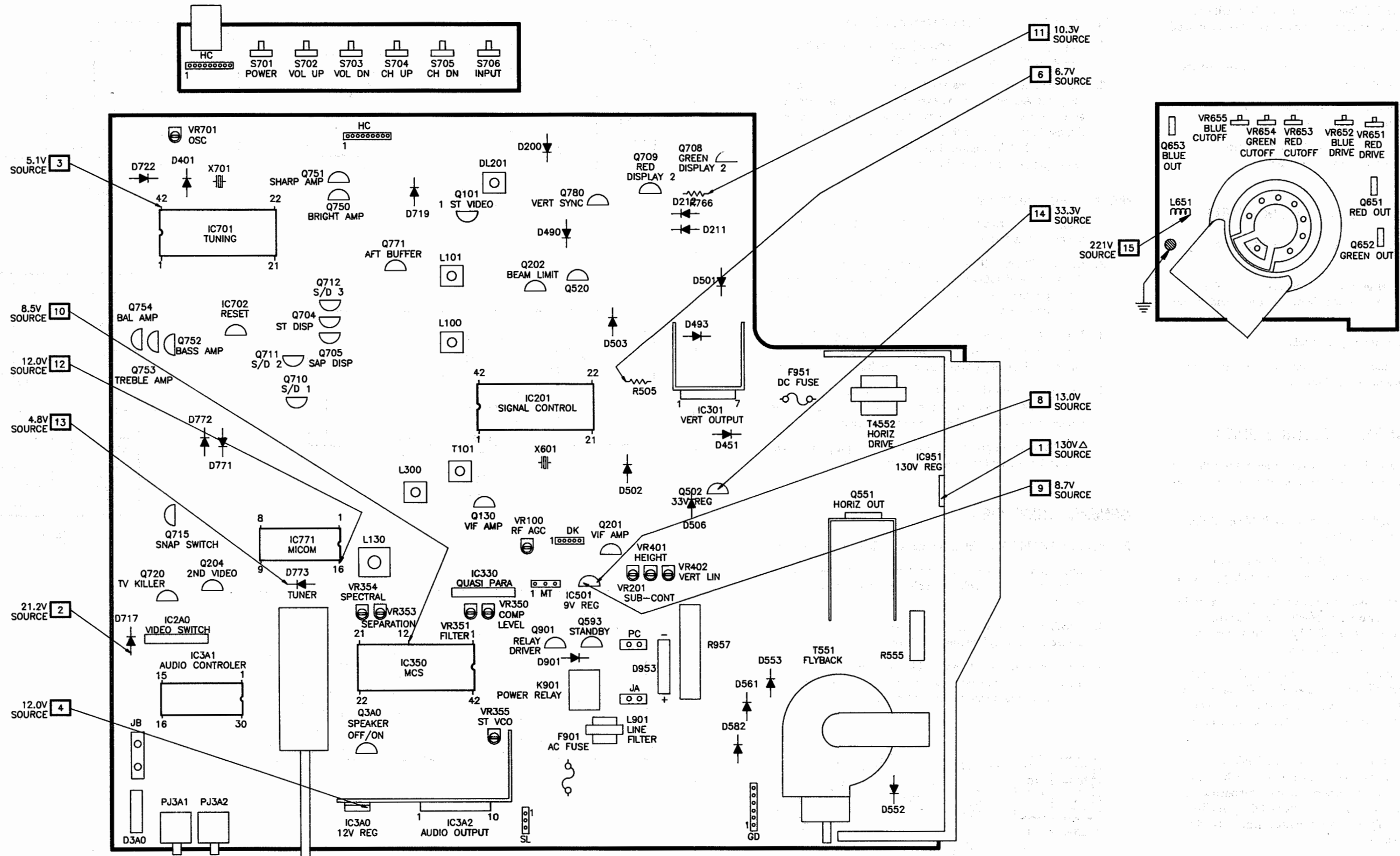


LA7953  
IC3A1



LA7837  
IC401

# PLACEMENT CHART



MITSUBISHI

MODEL CS-2005R

SAFETY PRECAUTIONS

SERVICE WARNING

ONLY qualified service technicians who are familiar with safety checks and guidelines should perform service work. For continued SAFETY:

- 1. Before replacing parts, disconnect power source to protect electrostatically sensitive parts.
- 2. Do not attempt to modify any circuit unless so recommended by the manufacturer.
- 3. When servicing chassis, use an isolation transformer between the line cord and power receptacle.

SERVICING HIGH VOLTAGE AND PICTURE TUBE

Use EXTREME CAUTION when servicing the High Voltage circuits.

- 1. To discharge static High Voltage, connect a 10-kilohm resistor in series with a test lead between chassis and picture tube anode lead.
- 2. DO NOT lift picture tube by the neck.
- 3. ALWAYS wear shatterproof goggles when handling picture tube 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 picture tube is the only potential source of x-rays.

- 1. Keep an accurate High Voltage meter available at all times. Check meter calibration periodically.
- 2. Whenever servicing a chassis, check High Voltage at various brightness levels to be sure it is regulating properly.
- 3. 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.
- 4. When troubleshooting a set with excessive High Voltage, avoid close contact with picture tube. DO NOT operate set longer than necessary. To locate the cause of excessive High Voltage, use a variable AC transformer to regulate voltage.
- 5. In present chassis, 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.

SAFETY CHECKS – FIRE AND SHOCK HAZARD

Cold Leakage Checks for Sets with Isolated Ground

- 1. Unplug the AC cord, connect a jumper across the plug prongs, and turn the power switch ON.
- 2. Use an ohmmeter to measure the resistance between the jumpered 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 200 kilohms and 5 megohms. Parts without a return path must register infinity.

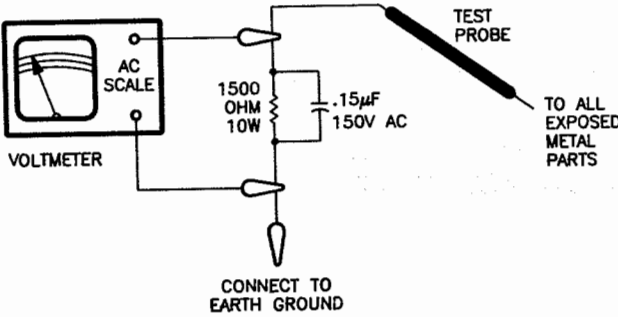
Hot Leakage Current Check

- 1. Plug the AC cord directly into AC outlet. DO NOT use an isolation transformer.
- 2. Use a 1500-ohm, 10-watt resistor in parallel with a .15-microfarad 150-volt AC capacitor to connect between any exposed metal parts on the set and a good earth ground. (See figure below.)
- 3. Use an AC voltmeter with at least 1000 ohms-per-volt sensitivity to measure the voltage across the resistor. Check all exposed metal parts and measure voltage at each point.
- 4. Voltage readings should not exceed .75 volts RMS (5 milliamps AC). Any value exceeding this limit constitutes a potential shock hazard and must be corrected.
- 5. If AC plug is not polarized, reverse the AC plug and repeat exposed metal part voltage measurement at each point.

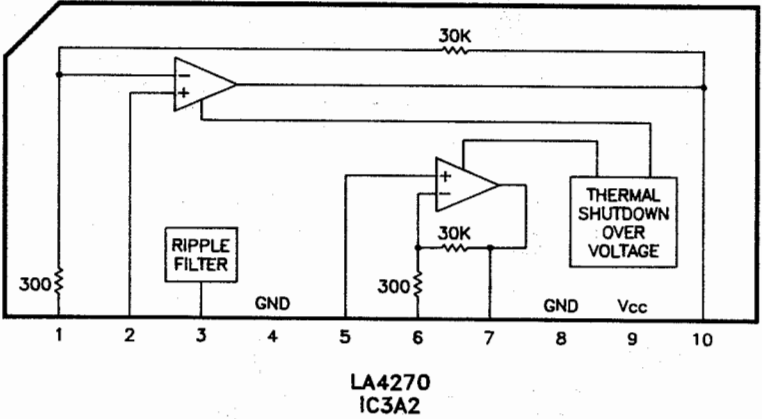
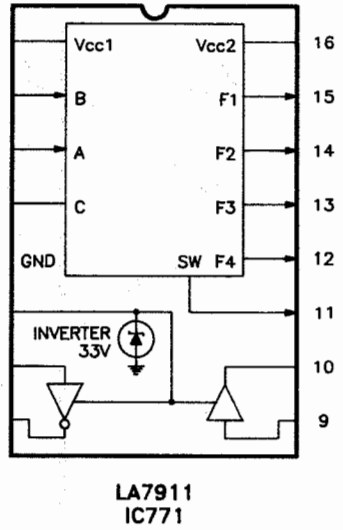
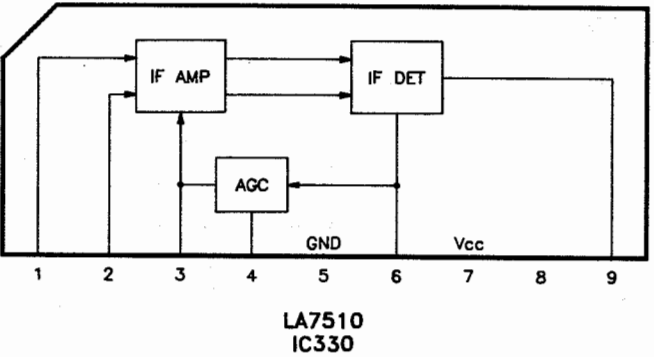
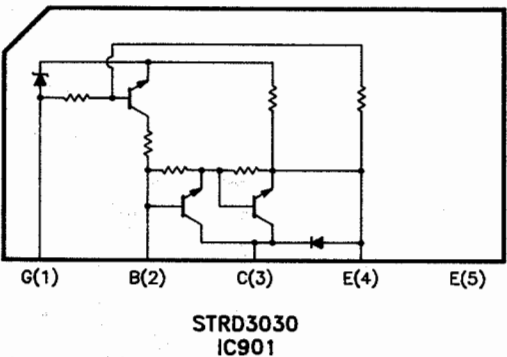
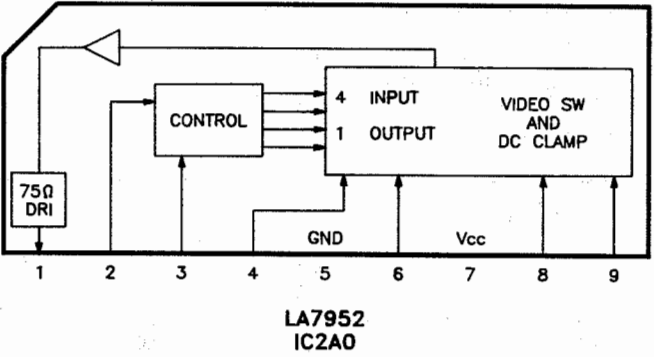
GENERAL GUIDELINES

Perform a final SAFETY CHECK before returning set to customer.

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



IC FUNCTIONS continued



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