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.

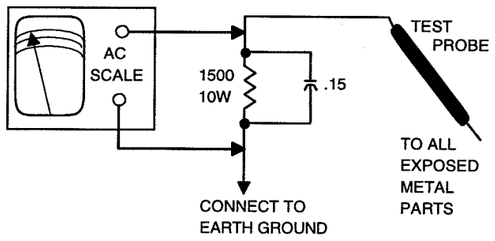
SAFETY CHECKS -- FIRE AND SHOCK HAZARD

Cold Leakage Checks for Receivers with Isolated Ground

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

Hot Leakage Current Check

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



HIGH VOLTAGE SHUTDOWN TEST

Apply 120VAC. Use remote transmitter to set customer controls for normal operation. Momentarily short XRP1 to XRP2. The receiver should lose raster and sound. If receiver does not lose raster and sound, the shutdown circuit should be repaired. To resume normal operation, remove AC power and wait 30 seconds, then turn the receiver on.

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Indianapolis, IN 46268 - 4149

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4357

SET 4357

MODEL 25GT240TX3 (CHASSIS CTC185AA9)

GE

PHOTOFACT® Technical Service Data

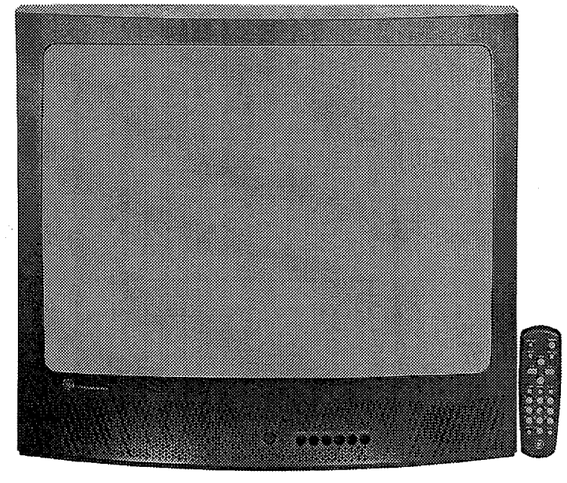
4357

INDEX

For Supplier Address, See PHOTOFACT Annual Index

GE

Model 25GT240TX3 (Chassis CTC185AA9)



Essential coverage for servicing a television receiver...

- Schematics
- Component locations
- Parts list

Coverage includes these additional models and chassis:

MODELS	CHASSIS
25GT240TX3	CTC185AA7
25GT240TX4	CTC185AA9

SAMS™ Technical Publishing

OCTOBER 2000 SET 4357

4357

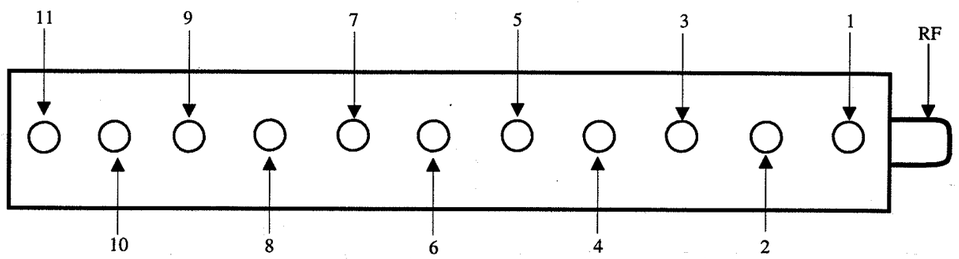
TUNER INFORMATION

TUNER VOLTAGE CHART

Pin		VHF Low Band	VHF High Band	UHF Band
1	(AGC)	2.4V	2.4V	2.0V
2	(NC)	1.0V	4.1V	5.1V
3	(ADD)	5.0V	5.0V	5.0V
4	(CLK)	4.9V	4.9V	4.9V
5	(DATA)	4.9V	4.9V	4.9V
6	(NC)	0V	0V	0V
7	(5V)	5.0V	5.0V	5.0V
8	(NC)	0V	0V	0V
9	(+ 33V)	34.3V	34.3V	34.3V
10	(NC)	0V	0V	0V
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



MISCELLANEOUS ADJUSTMENTS

NOTE: All procedures require an antenna connected and power applied to the set.

HIGH VOLTAGE CHECK

Tune in a picture. Set brightness, contrast, and color to minimum. Connect a high voltage probe to the CRT anode, High voltage should measure 25kV to 27kV.

COLOR TEMPERATURE

NOTE: See Service Adjustment Parameters to change drive and bias values.

Press menu button for collapsed raster service line. Set the TV to blank raster with no video signal. Preset the red, green, and blue drive values to mid-range value of 32. Preset the red, green, and blue bias values to provide 170VDC at the collector of the respective output transistor. Adjust screen control for a service line that is just visible. Adjust red, green, and blue drives to obtain a white raster. Check the low light to high light gray scale tracking. Repeat the procedure, if necessary, to obtain the best performance.

SERVICE MENU

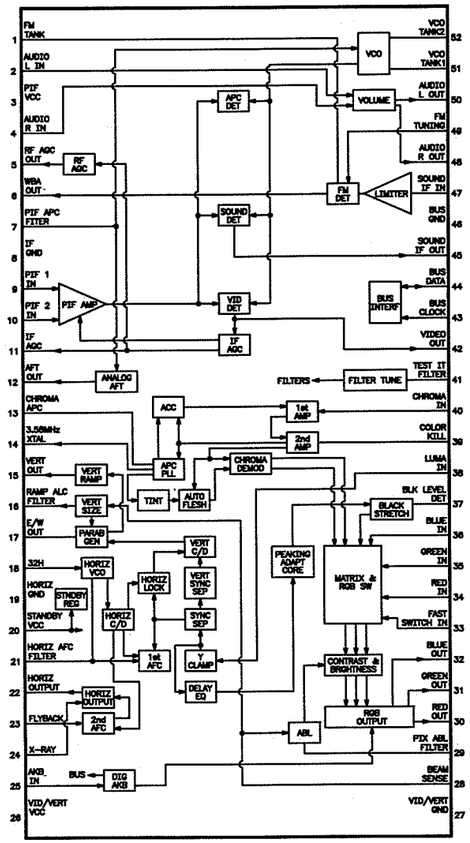
The following adjustment and alignment procedures are accessed thru a service menu. To access the service menu, turn the receiver on, press the menu button and hold it down while pressing the power button. While holding down the menu button, release the power button and press the volume + button. The screen will display a one line menu, on the left the parameter 0 00, and on the right the value of that parameter 00. Release buttons. Adjustments are made by selecting the proper parameter and changing the value of that parameter. To change the parameter number use channel up and down buttons. To adjust the current value of that parameter use volume + and - buttons. The two main groups of parameters are, the service adjustment parameters, and the tuner alignment parameters. To access and change any of the adjustments, the proper parameter pass number and value must be entered. This information is listed at the beginning of each alignment. When these parameters are modified, the T-Chip and the corresponding EEPROM are updated. All service adjustments are bus controlled, except focus and screen.

SERVICE ADJUSTMENT PARAMETERS

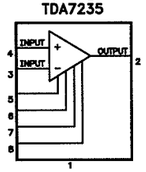
Parameter No.	Parameter Name	On Set Value	Value Range	Comment
0 00	Pass number for service adjustment parameters.	-	Must set to 76	May not advance until value is set.
0 01	Horizontal Phase	10	00 - 15	Adjust to center picture left to right.
0 02	Vertical DC	36	00 - 63	Adjust to center picture top to bottom.
0 03	Vertical S Correction	12	00 - 15	Set value to 12.
0 04	Vertical Size	78	00 - 127	Adjust for 1/4" overscan top and bottom of screen.
0 05	Red Bias	25	00 - 127	Press menu button on the TV set for setup line.
0 06	Green Bias	19	00 - 127	Press menu button on the TV set for setup line.
0 07	Blue Bias	5	00 - 127	Press menu button on the TV set for setup line.
0 08	Red Drive	50	00 - 63	Press menu button on the TV set for setup line.
0 09	Green Drive	40	00 - 63	Press menu button on the TV set for setup line.
0 10	Blue Drive	37	00 - 63	Press menu button on the TV set for setup line.
0 11	Sub Brightness	70	00 - 127	Tune in color bar signal, turn color off. Adjust to the point the black bar starts to turn gray, then decrease until it becomes black.
0 12	RF AGC	36	00 - 63	Set to the value when snow disappears from picture.
0 13	FM Level	19	00 - 31	Apply 1kHz, L+R signal. Adjust for a 333mVp-p waveform at pin 6 of U1001 (don't include carrier portion).
0 14	VCO Tuning	59	00 - 127	Adjust for 3.8V at pin 12 of U1001.
0 15	APC Detector Adjust	33	00 - 63	Short pin 11 of U1001 to ground. With no signal applied, adjust for 3.8V at pin 12 of U1001. Remove the short at pin 11 of U1001.
0 16	Tint Preset	63	00 - 127	Adjust waveform at the collector of Q5003 so that the second and the third peaks are of equal amplitude.
0 17	Color Preset	66	00 - 127	Adjust waveform at the collector of Q5003 so that the first and the fourth peaks are of equal amplitude.
0 18	Video level	4	00 - 07	Adjust waveform at the emitter of Q2301 for 1Vp-p.
0 19	Vertical Linearity	7	00 - 15	Set value to 07.
0 20	Vertical Countdown Mode	0	00 - 03	Set value to 00.

IC FUNCTIONS

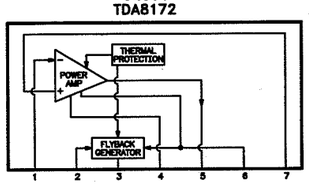
U1001
LA7612N



U1902
TDA7235



U4501
TDA8172



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.

- Philips ECG Company (ECG)
- Sencore, Inc.
- Terrell & Nobis (TNI Electronics)

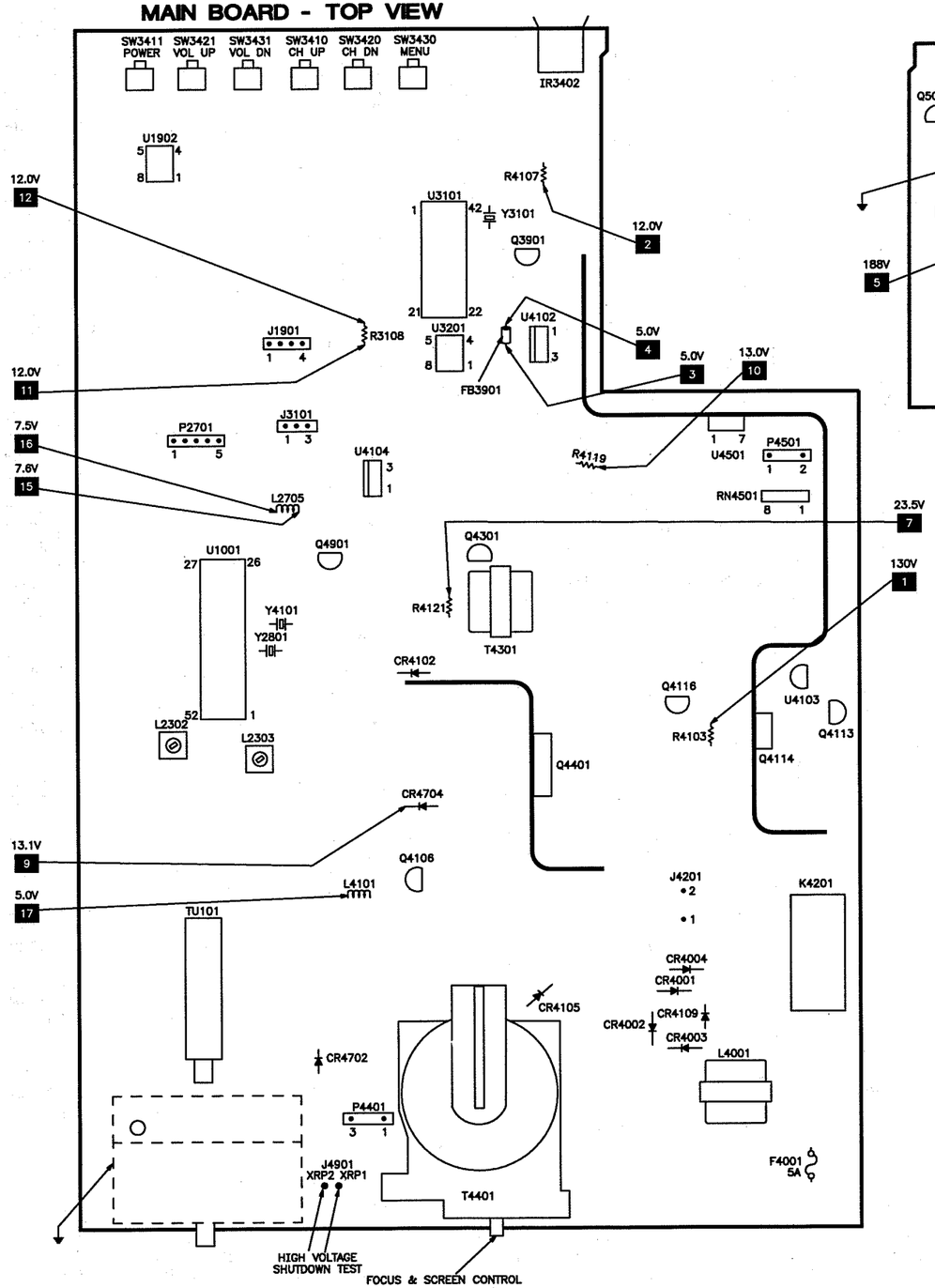
TEST EQUIPMENT

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.

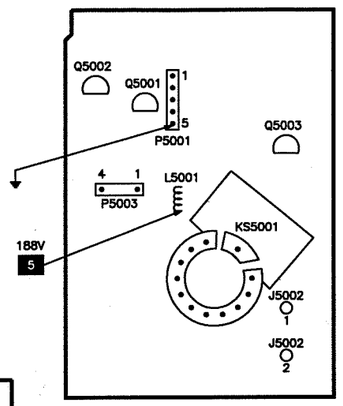
Equipment	Sencore No.	Equipment	Sencore No.
Oscilloscope	SC3100	Isolation Transformer	PR570
Generators		Capacitance Analyzer	LC102
RGB	CM2125	CRT Analyzer	CR7000
Multiburst Signal	VG91	AC Leakage Tester	PR570
Color Bar	VG91	Inductance Analyzer	LC102
TV Stereo	VG91	Flyback Yoke Tester	TVA92
Digital VOM	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

PLACEMENT CHART

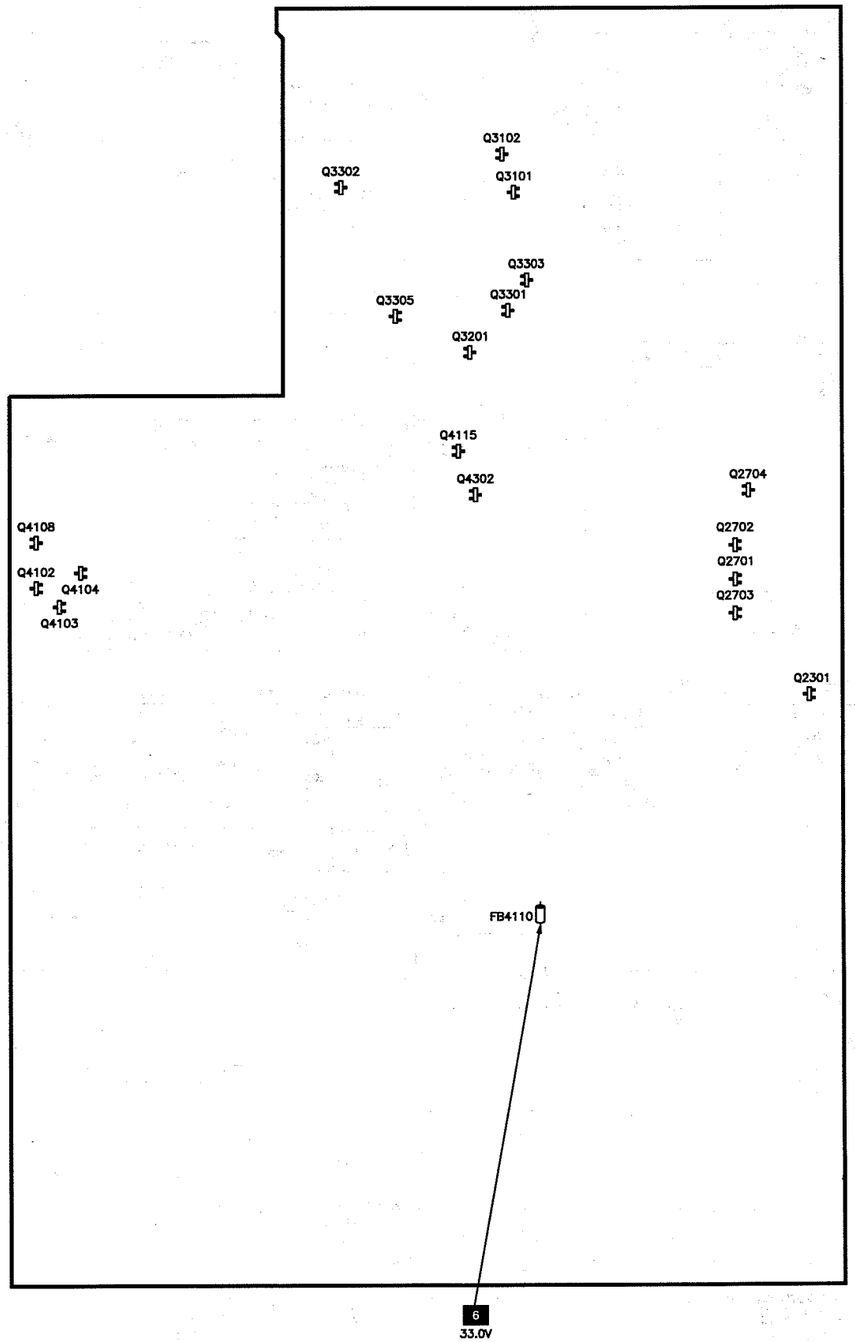
MAIN BOARD - TOP VIEW



CRT BOARD



MAIN BOARD - BOTTOM VIEW



GE

MODEL 25GT240TX3 (CHASSIS CTC185AA9)

TELEVISION SCHEMATIC

A

B

TUNER NOT INCLUDED IN THIS COVERAGE

SEE U3101 PIN 19 PAGE 2G

SEE U3101 PIN 20 PAGE 2G

CF1201 4.5MHz FILTER

PART OF LA7612N #U1001 VIDEO, LUMA/CHROMA, DEFL

IF INPUT 2.2V | FM TANK 4.5V | FM TUNING 3.1V | LEFT OUT 3.6V | LEFT INPUT 3.2V | WBA OUTPUT 3.6V | RIGHT INPUT 3.2V | RIGHT OUTPUT 3.6V

C2302 .01 | R2303 120K 2% | R2302 120K 2% | 15 7.6V

C2714 43pF NPO | R2710 1000 | C2715 43pF NPO | R2711 1000

R1201 680 | CR2301 | C2304 .01 | R2308 100K | R2309 3900 | C2309 .001 | C2305 1.5µF 100V | L2303

C1201 .22 | C1202 .022 | R1202 3300 | C1206 .22

R1904 1500 | C1912 .0068 | R1902 4700 | C1902 10µF 63V | L1902 | R1906 2200

C1904 47µF | TDA7235 U1902 AUDIO OUTPUT | INPUT .44V | INPUT 0V | OUTPUT 10.7V | 23.0V

J/P1901 | SP1902 32Z | C1908 .22 | # R1907 4.7 | C1909 470µF | C1910 470µF | C1906 .1 | # R1908 33 2W | 7 23.5V | 1.6V 10µs

C2701 3.3µF 100V

SF2301 SAW FILTER | IF TO PIN 11 TUNER | 10

PART OF LA7612N #U1001 VIDEO, LUMA/CHROMA, DEFL

PIF2 IN 3.6V | 5.2V AFT OUTPUT | 4.9V BUS DATA | 4.9V BUS CLOCK | 3.7V SOUND IF OUTPUT | VIDEO OUTPUT 3.3V

PIF1 IN 3.6V | RF AGC OUTPUT 5.7V | IF AGC 7.6V | IF AGC IN 8.1V | VCO TANK2 8.5V | VCO TANK1 8.5V | BUS GND | IF GND | APC FILTER 3.7V

C2301 .01 | IF AGC RANGE 5.0V TO 7.5V | C2313 .022 | L2302

R2306 1800 | SEE Q3303 BASE PAGE 2G | 2.6V 10µs | 3.0V 10µs TAKEN WITH BAR SWEEP GENERATOR

R2317 1000 2% | L2301 | CF2301 4.5MHz TRAP | R2311 10 | R2304 1000 2%

Q2301 VIDEO AMP | 1.6V | 2.3V | R2307 1000 | 15 7.6V | C2805 120pF NPO | R2805 750 | C2802 .0056

.9V 10µs | .9V 10µs TAKEN WITH CHROMA BAR SWEEP GENERATOR

R2316 330 | C2308 .022 | C2307 .001

R7130 1000 | AGC TO PIN 1 TUNER | R2313 1000 | R2315 330K | C2306 .47 63V | R2314 430K | L2305 | C2314 33µF | C2312 .22 | 15 7.6V

SYNC

CHROMA INPUT 2.8V | 3.6V LUMA INPUT | PART OF LA7612N #U1001 VIDEO, LUMA/CHROMA, DEFL

COLOR KILL 3.6V | XTAL 3.1V | CHROMA AFC 5.7V | AKB IN | GND | VCC

C2801 1µF 100V | R2802 390K | R2801 30K 2% | R2804 27K 2% | 16 7.5V | Y2801 3.58MHz | C2803 15pF NPO | R2803 470 | C2807 .033 | C2808 1µF 100V | R2806 6200 | R2807 3000 | 15 7.6V | 16 7.5V

C

7.7V 10µs | 3.0V 5ms | 2.2V 5ms | 52V 5ms

PART OF LA7612N #U1001 VIDEO, LUMA/CHROMA, DEFL

HORIZ AFC 5.2V | 32H 4.7V | GND | X-RAY IN 0V | FLYBACK 2.3V | BEAM SENSE 6.5V | STBY VCC 7.5V | HORIZ OUTPUT 2.6V | RAMP ALC 3.5V | E/W OUTPUT 3.6V | VERT OUTPUT 3.6V

FB4501 | R4503 10K | RN4501 51K 51K 18K 18K 51K 51K | U4501 TDA8172 VERTICAL OUTPUT | 9.7V | 12.5V | 8.6V GND | 23.3V | 23.7V | 1.6V

R4507 1.5 1W | C4504 .22 100V | P4501 P-VERT | L4000 YOKE 1.4 13.1 | # P-HORIZ EY4409 | EY4413 | P4501 4

C4507 .1 | C4508 1000µF 35V | # R4511 1 2W | CR4501 1N4002 | C4505 220µF | R3318 10K | SEE U3101 PIN 27 PAGE 2G | 31V 5ms | 3.6V 5ms | 7 23.5V | 32V 5ms

R4519 .51 1W | # R4517 13 1W | 9 13.1V | R4518 680 1W | C4502 3300µF | R4501 360

C4308 .022 | R4307 1500 | Y4101 507.5kHz | C4307 2.2µF 100V

R4904 1000 | C4903 .33 | R4909 16K | # C4904 .22

(Q4902) # Q4901 SHUTDOWN | 11.1V | 0V | 10.7V

J4901 XRP2 2 | # J4901 XRP1 1 | R4905 20K | R4902 28K 1% | R4903 32.4K 1% | # R4906 1500 2% | CR4902 10.0V | C4902 .1 63V | C4901 150pF 250V | CR4901 | # R4901 100

R4320 1000 | R4313 910 | R4314 1000 | CR4302 1N4148 | 15 7.6V | SEE Q3305 EMITTER PAGE 2G | R4312 1000 | R4303 1000 | 15 7.6V

R2731 1000 | C4132 10µF 63V | C4133 .068 | R4102 200 | SEE Q4115 COLLECTOR PAGE 2G

R4311 1500 | R4301 7500 | C4501 .22 63V | 16 7.5V | R4801 10K

R4310 1000 | Q4302 AMP | 3.7V | 4.8V | 2 12.0V | C4309 .0047 | R4304 470 | C4302 .1 | CR4303 | R4309 2400

C4311 47pF NPO | R4308 100K | C4310 15pF NPO 250V 1% | Q4301 DRIVER | .12V | 65.4V | 181V 10µs | 1.9V 10µs

C4303 470pF NPO | C4305 .0022 250V | R4306 12K | T4301 | NC | 39 | 1 | 2 | 3 | 6 | 5 | .1

R4305 2400 (3800) 2% 3W | (1) | 1 130V | C4306 .047 250V

L4401 | C4401 470pF NPO | R4402 91 | # Q4401 2SD2578 HORIZ OUTPUT DO NOT MEASURE DC | .04V | FB4401 | C4402 .0143 1.8kV 2% | C4406 470pF 2kV | 16V 10µs

R2702 7500 2% | CR2702 1N4148 | C2708 22µF | 15 7.6V | R4706 1130 1% | 15 7.6V

ADDITIONAL SCHEMATIC NOTES, SEE PAGE 2H

(1) USED IN CHASSIS CTC185AA7

A PHOTOFACT STANDARD NOTATION SCHEMATIC WITH CIRCUITRACE®

A1 A2

TELEVISION SCHEMATIC continued

SEE U3101 PIN 16 PAGE 2G
R3310 3000
R3309 360
C2711 .022
SEE U3101 PIN 18 PAGE 2G
R3126 1000
R2714 1000
R3127 1000
SEE U3101 PIN 17 PAGE 2G
R3320 3000
R3316 360
C2709 .022
SEE U3101 PIN 15 PAGE 2G
R3311 3000
R3322 360
C2710 .022
33 0V FAST SW
35 1.5V GREEN INPUT
36 1.7V BLUE INPUT
34 1.7V RED INPUT
30 2.7V RED OUTPUT
BLUE OUTPUT 2.7V
GREEN OUTPUT 2.6V
32
31
BLK LEVEL DET 4.2V
ABL FILTER 2.2V
TEST 5.3V
37
29
41
R2703 820K
C2702 2.2µF 100V
16 7.5V
R2726 2700
C2713 4.7µF 100V
C2703 1µF 100V
C2704 4.7µF 100V
R2705 100K
16 7.5V
R2707 390
4.2V 10µs
R2708 390
4.3V 10µs
R2706 390
3.6V 10µs
Q2702 BUFFER
2.7V 11.3V 2.1V
R2719 100
R2720 270
C2717 330pF NPO
Q2703 BLUE BUFFER
2.7V 11.3V 2.1V
R2723 100
R2724 270
C2718 330pF NPO
Q2701 GREEN BUFFER
2.6V 11.4V 2.0V
R2715 100
R2716 270
C2716 330pF NPO
Q2704 BIAS
.81V 1.4V
R2713 1200
R2712 10K
16 7.5V
R2721 220 2%
R2722 100K
P2701 P5001 2 4
R2725 220 2%
R2727 100K
P2701 P5001 4 2
R2717 220 2%
R2718 100K
P2701 P5001 3 3
P2701 P5001 5 1
11 12.0V
P2701 P5001 1 5
Q5001 2SC2482 RED DRIVE
11,9V 137V 12.5V
R5007 620
Q5003 2SC2482 BLUE DRIVE
11,9V 137V 12.5V
R5009 620
Q5002 2SC2482 GREEN DRIVE
11.9V 139V 12.5V
R5008 620
R5001 20K 2W 2%
R5003 20K 2W 2%
R5002 20K 2W 2%
5 188V
153V 10µs
145V 10µs
122V 10µs
R5004 2200
R5006 2200
R5005 2200
PART OF KS5001 CRT SOCKET
SPARK GAP
24V 10µs
9 10
137V 8
137V 11
139V 6
0V 5
22.5V 7
5kV 1
GRN BLUE RED
A63ADT15X09 V5000 CRT
J5002 1
J5002 2
TO CRT SHIELD
R5018 2200
FOCUS RANGE 5kV TO 7kV
EY5010
EY4008
R4703 1.8 3W
C5001 .001 3kV
E5014
A3 A4 A1
T4401 BOTTOM VIEW
1 2 3 4 5 6 7 8 9 10
300V 10µs
T4401
HV RANGE 25kV TO 27kV
TO CRT HV ANODE
R5050 IS INTEGRAL PART OF FOCUS LEAD
R5050
10 .5 2 1 3 .2 4 6 .1 9 7 .1 .1 5 8
1 130V
FOCUS
SCREEN
SEE POWER SUPPLY PAGE 2E
SEE POWER SUPPLY PAGE 2E
224V 10µs
PRINTED SPARK GAP
R4704 82K
R4705 27K
C4710 .01 1kV
PRINTED SPARK GAP
30V 10µs
A1 A3 A4 A2
SEE Q4104 EMITTER PAGE 2E
120V 10µs
C4704 680pF 1kV
CR4702
R4701 10
C4702 680pF 1kV
CR4701
C4703 10µF 250V
P4401 P5003 4 1
P4401 P5003 1 4
L5001
5 188V SOURCE
C4120 680pF 1kV
CR4102
R4121 1000
R4122 2000 (1000) (1500)
C4110 .1 63V
C4118 10µF 63V
CR4108 33.0V
C4125 .01
C4117 1µF 100V
FB4110
6 33.0V SOURCE
7 23.5V SOURCE
C4701 680µF
CR4704
C4706 680pF 1kV
R4119 10
R4710 3 2W
C4715 100pF NPO
9 13.1V SOURCE
C4111 10µF 63V
10 13.0V SOURCE
C4107 .068
C4713 100pF NPO
C4714 1000µF
11 12.0V SOURCE
R3108 10
12 12.0V SOURCE
R4108 8.2 1W
U4104 L78S75CV +7.6V REG
INPUT 10.9V
OUTPUT
GND
C4105 10µF 63V
L2705
C4101 4.7µF 100V
15 7.6V SOURCE
C2708 .22
C2707 180µF
16 7.5V SOURCE
R4130 33 1W
Q4106 +5V REG
L4101
8.4V
5.7V
C7416 100pF NPO
C7414 470µF
17 5.0V SOURCE
R4131 820
R4132 22
C4130 .22
CR4115 5.6V
ADDITIONAL SCHEMATIC NOTES, SEE PAGE 2H
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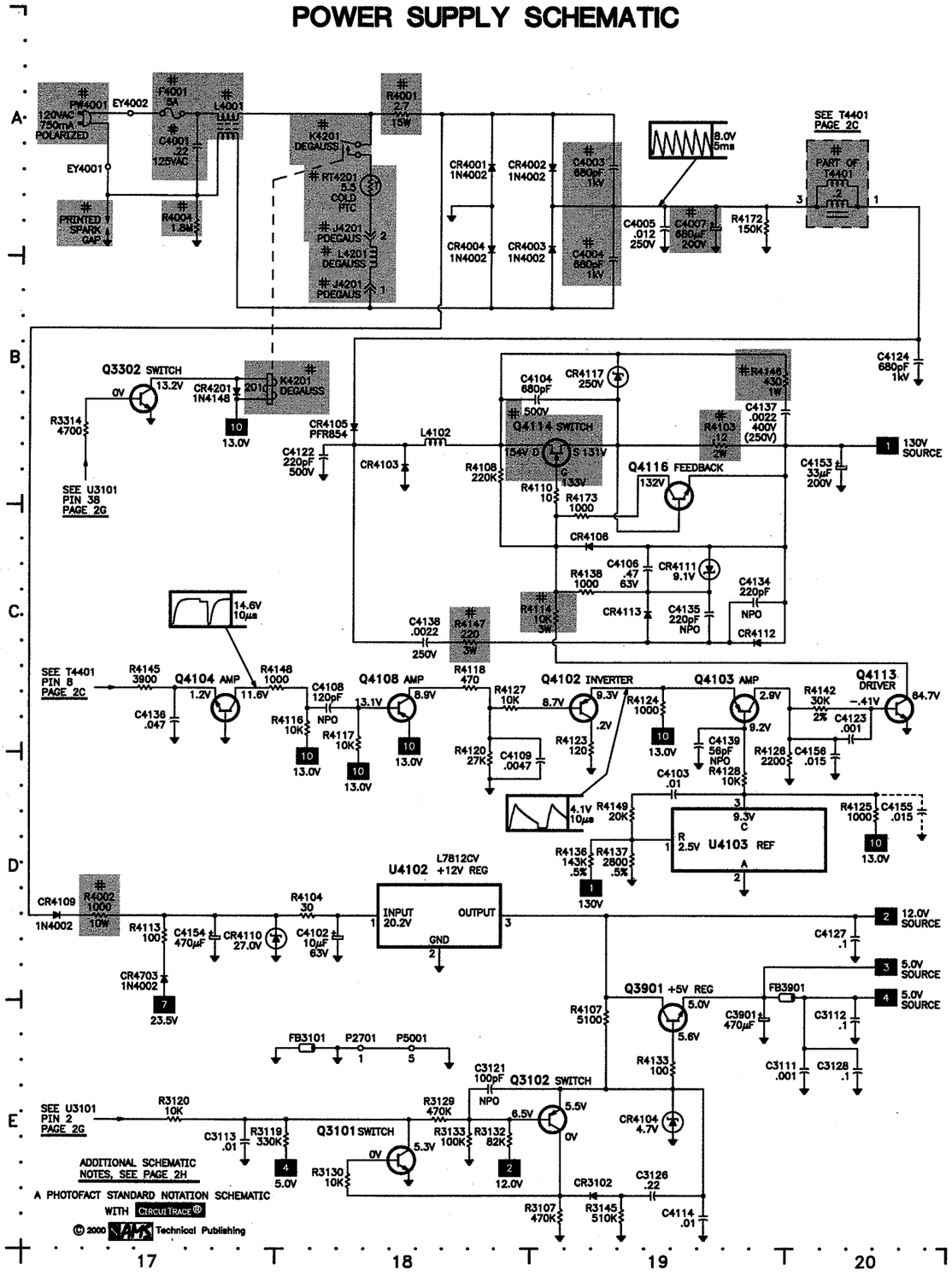
9 10 11 12 13 14 15 16

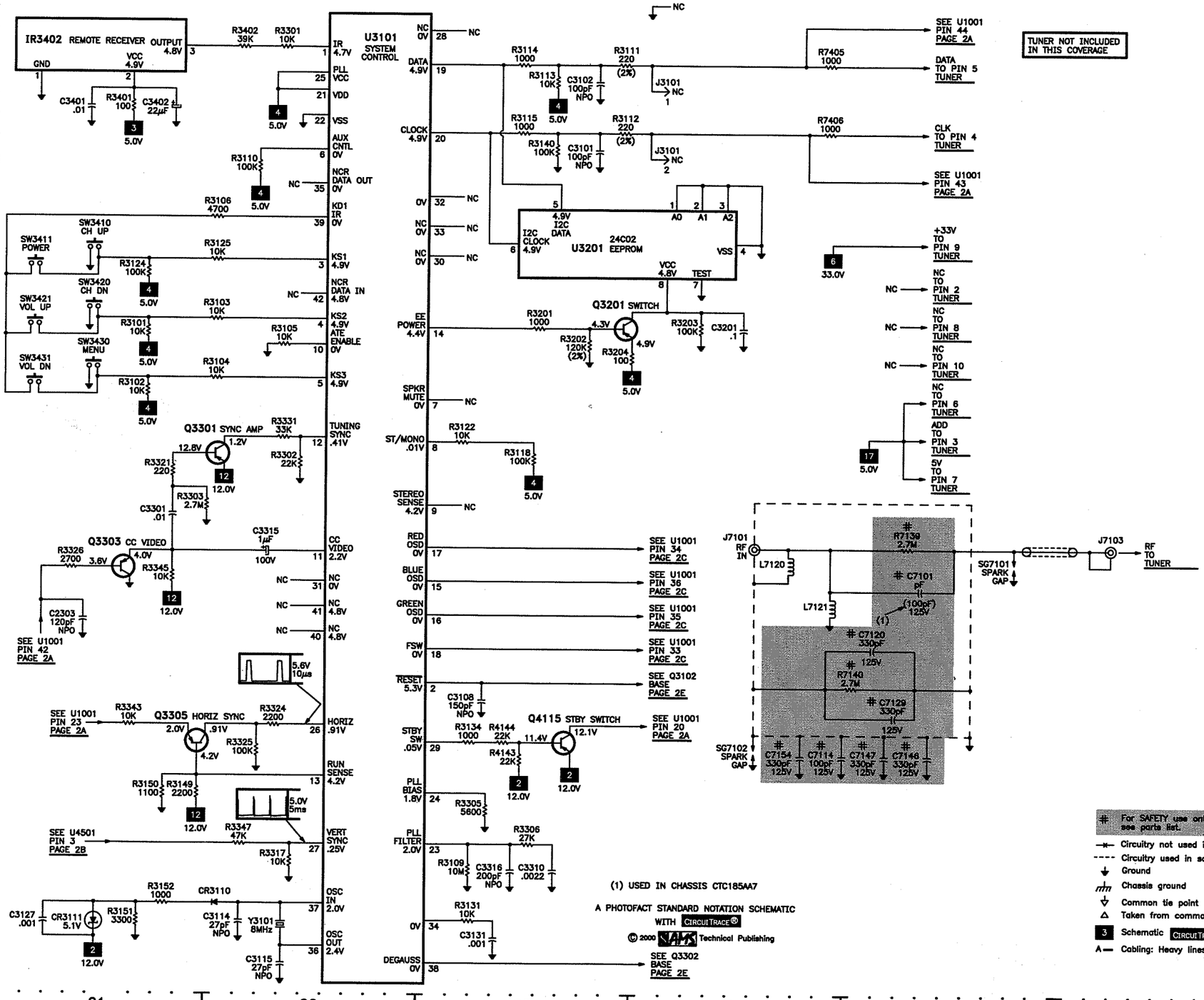
E
POWER SUPPLY SCHEMATIC



SCHEMATIC COMPONENT LOCATION GUIDE

C1201	A4	C4101	E15	C7114	D24	L7121	D24	R2723	B12	R3331	C22	R4518	D5
C1202	B5	C4102	D18	C7120	D25	PW4001	A17	R2724	B12	R3343	D21	R4519	D5
C1206	A5	C4103	D19	C7129	D25	Q2301	B5	R2725	B12	R3345	D21	R4701	D11
C1902	A6	C4104	B18	C7146	D25	Q2701	C12	R2726	B9	R3347	E22	R4703	D16
C1904	A7	C4105	E13	C7147	D25	Q2702	A12	R2727	B13	R3401	A21	R4704	D10
C1906	A7	C4106	C19	C7154	D24	Q2703	B12	R2731	D3	R3402	A22	R4705	D11
C1908	A8	C4107	D14	C7414	E15	Q2704	C12	R2801	B7	R4001	A18	R4706	E2
C1909	A8	C4108	C18	C7416	E15	Q3101	E18	R2802	B6	R4002	D17	R4710	D13
C1910	A8	C4109	D19	CF1201	A3	Q3102	E19	R2803	C7	R4004	A17	R4801	D4
C1912	A6	C4110	D11	CF2301	B4	Q3201	B23	R2804	B7	R4102	D3	R4901	E2
C2301	B1	C4111	D15	CR2301	B3	Q3301	C21	R2805	B5	R4103	B19	R4902	D1
C2302	B1	C4114	E19	CR2702	E3	Q3302	B17	R2806	C7	R4104	D18	R4903	D1
C2303	D21	C4117	D12	CR3102	E19	Q3303	D21	R2807	C8	R4106	D13	R4904	D2
C2304	A4	C4118	D11	CR3110	E22	Q3305	D21	R3101	B21	R4107	E19	R4905	D1
C2305	B4	C4120	D11	CR3111	E21	Q3901	E19	R3102	C21	R4108	B18	R4906	D2
C2306	C1	C4122	B18	CR4001	A18	Q4102	C19	R3103	B21	R4110	C19	R4909	D2
C2307	B3	C4123	D20	CR4002	A19	Q4103	C19	R3104	C21	R4113	D17	R5001	A14
C2308	B3	C4124	B20	CR4003	B19	Q4104	C17	R3105	B22	R4114	C19	R5002	C14
C2309	B3	C4125	D12	CR4004	B18	Q4106	E14	R3106	B21	R4116	C18	R5003	B14
C2312	C2	C4127	D20	CR4102	D11	Q4108	C18	R3107	E19	R4117	D18	R5004	A15
C2313	B2	C4130	E13	CR4103	B18	Q4113	C20	R3108	D14	R4118	C18	R5005	C15
C2314	C2	C4132	D3	CR4104	E19	Q4114	B18	R3109	E23	R4119	D13	R5006	B15
C2701	B6	C4133	D3	CR4105	B18	Q4115	D23	R3110	B22	R4120	D18	R5007	A14
C2702	B9	C4134	C19	CR4106	C19	Q4116	C19	R3111	A23	R4121	D11	R5008	C14
C2703	B10	C4135	C19	CR4108	D12	Q4301	E5	R3112	A23	R4122	D11	R5009	B14
C2704	B10	C4136	C17	CR4109	D17	Q4302	E4	R3113	A23	R4123	D19	R5018	C16
C2706	E3	C4137	B19	CR4110	D17	Q4401	E6	R3114	A23	R4124	C19	R5050	D10
C2707	E15	C4138	C18	CR4111	C19	Q4901	D1	R3115	A23	R4125	D20	R7130	C1
C2708	E15	C4139	D19	CR4112	C19	Q5001	A14	R3118	C23	R4126	D19	R7139	C25
C2709	B10	C4153	B20	CR4113	C19	Q5002	C14	R3119	E18	R4127	C18	R7140	D24
C2710	B10	C4154	D17	CR4115	E14	Q5003	B14	R3120	E17	R4128	D19	R7405	A24
C2711	A9	C4155	D20	CR4117	B19	R1201	B3	R3122	C23	R4130	E13	R7406	A24
C2713	B9	C4156	D20	CR4201	B17	R1202	A5	R3124	B21	R4131	E13	RN4501	C6
C2714	A2	C4302	E4	CR4302	D2	R1902	A6	R3125	B21	R4132	E14	RT4201	A18
C2715	B2	C4303	E4	CR4303	E4	R1904	A6	R3126	A9	R4133	E19	SF2301	B1
C2716	C12	C4304	E5	CR4401	D7	R1906	A6	R3127	B9	R4136	D19	SP1902	A8
C2717	B12	C4305	E5	CR4501	D6	R1907	A8	R3129	E18	R4137	D19	SW3410	B21
C2718	B12	C4306	E5	CR4701	D11	R1908	B7	R3130	E18	R4138	C19	SW3411	B21
C2801	B6	C4307	D1	CR4702	D12	R2302	B1	R3131	E23	R4142	C20	SW3420	B21
C2802	B5	C4308	D1	CR4703	D17	R2303	B1	R3132	E18	R4143	D23	SW3421	B21
C2803	B7	C4309	E4	CR4704	C13	R2304	B4	R3133	E18	R4144	D23	SW3430	C21
C2805	B5	C4310	E4	CR4901	E2	R2306	B4	R3134	D23	R4145	C17	SW3431	C21
C2806	B8	C4311	E3	CR4902	D2	R2307	B5	R3140	B23	R4146	B19	T4301	E5
C2807	B7	C4401	E6	F4001	A17	R2308	A4	R3145	E19	R4147	C18	T4401	A20
C3101	B23	C4402	E7	FB3101	E18	R2309	B3	R3149	E21	R4148	C17	T4401	D9
C3102	A23	C4403	D8	FB3901	E19	R2311	B4	R3150	E21	R4149	D19	U1001	A4
C3108	D23	C4404	D8	FB4110	D12	R2313	C1	R3151	E21	R4172	A19	U1001	B2
C3111	E20	C4405	D7	FB4401	D7	R2314	C2	R3152	E21	R4173	C19	U1001	B6
C3112	E20	C4406	E7	FB4501	C4	R2315	C2	R3201	B23	R4301	D3	U1001	C1
C3113	E17	C4501	D3	IR3402	A21	R2316	B3	R3202	B23	R4303	E2	U1902	A7
C3114	E22	C4502	D5	J7101	C24	R2317	B4	R3203	B24	R4304	E4	U3101	A22
C3115	E22	C4504	D7	J7103	C26	R2702	E3	R3204	C23	R4305	E5	U3201	B23
C3121	E18	C4505	D6	K4201	A18	R2703	B9	R3301	A22	R4306	E5	U4102	D18
C3126	E19	C4506	D6	K4201	B17	R2705	B10	R3302	C22	R4307	D1	U4103	D19
C3127	E21	C4507	D5	KS5001	A15	R2706	C11	R3303	C21	R4308	E3	U4104	D14
C3128	E20	C4701	D13	L1902	A6	R2707	A11	R3305	E23	R4309	E4	U4501	C6
C3131	E23	C4702	D11	L2301	B4	R2708	B11	R3306	E23	R4310	E3	V5000	B16
C3201	B24	C4703	D12	L2302	B3	R2710	B2	R3309	A9	R4311	D3	Y2801	B7
C3301	C21	C4704	C12	L2303	B4	R2711	B2	R3310	A9	R4312	D2	Y3101	E22
C3310	E23	C4706	D13	L2305	C2	R2712	C12	R3311	B10	R4313	D2	Y4101	D1
C3315	C22	C4710	D11	L2705	E14	R2713	C12	R3314	B17	R4314	D2		
C3316	E23	C4713	D15	L4000	C7	R2714	B9	R3316	A10	R4320	D2		
C3401	A21	C4714	D15	L4001	A17	R2715	C12	R3317	E22	R4401	D8		
C3402	A21	C4715	C15	L4101	E14	R2716	C12	R3318	D6	R4402	E6		
C3901	E19	C4901	E1	L4102	B18	R2717	C12	R3320	A10	R4403	D7		
C4001	A17	C4902	E1	L4201	B18	R2718	C13	R3321	C21	R4501	D7		
C4003	A19	C4903	D2	L4401	E6	R2719	B12	R3322	B10	R4503	C4		
C4004	B19	C4904	D2	L4402	D8	R2720	B12	R3324	D22	R4507	C7		
C4005	A19	C5001	D15	L5001	D12	R2721	A12	R3325	D22	R4511	D6		
C4007	A19	C7101	D25	L7120	C24	R2722	A13	R3326	D21	R4517	D5		

SYSTEM CONTROL SCHEMATIC



SCHEMATIC NOTES

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

—|— Circuitry not used in some versions.

- - - Circuitry used in some versions.

Ground

Chassis ground

Common tie point

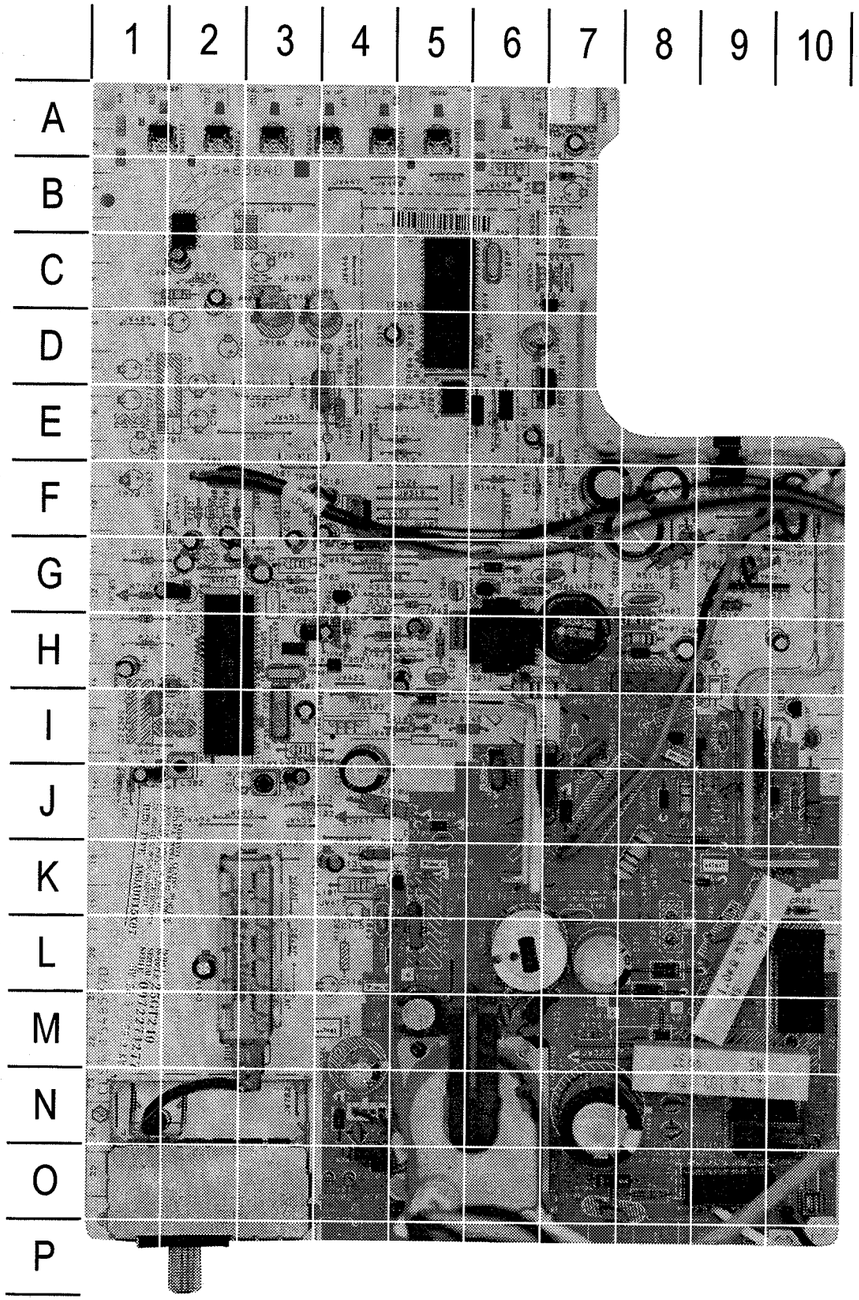
Taken from common tie point

3 Schematic 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



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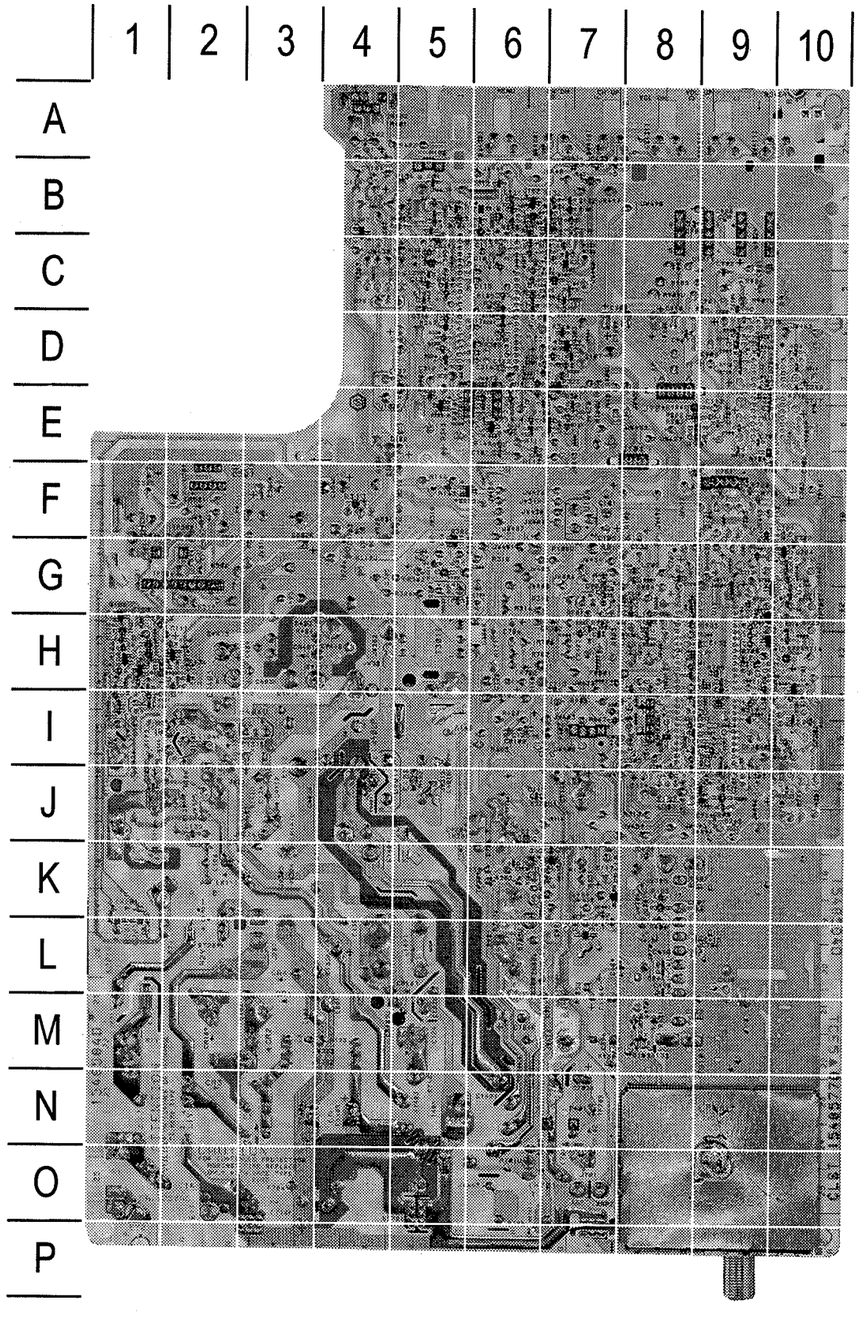
MAIN BOARD - TOP VIEW, GRIDTRACE LOCATION GUIDE

C1902	C2	C4710	O7	Q3901	C7	R4313	G3
C1904	C2	C4714	J4	Q4106	K5	R4314	G5
C1909	C3	C4901	L4	Q4113	I10	R4401	H8
C1910	C3	C4902	L4	Q4114	I9	R4402	J6
C2305	J1	C7414	L2	Q4116	I8	R4403	H8
C2306	M4	CF1201	I2	Q4301	G6	R4501	F9
C2314	J3	CF2301	I1	Q4401	J7	R4507	F10
C2701	H1	CR2702	H5	Q4901	G4	R4511	G8
C2702	G2	CR4001	L8	R1906	C2	R4517	F7
C2703	G2	CR4002	M8	R1907	C2	R4518	F8
C2704	G2	CR4003	N9	R1908	E4	R4519	G9
C2706	H5	CR4004	L7	R2307	F1	R4701	J5
C2707	H3	CR4102	I5	R2313	J3	R4703	L5
C2713	G2	CR4103	L6	R2702	H5	R4704	O7
C2801	F2	CR4104	B7	R2703	F2	R4705	O5
C2806	I3	CR4105	M6	R2710	J1	R4706	H4
C3315	D4	CR4106	J10	R2711	J1	R4901	L5
C3402	A7	CR4108	I5	R2712	F2	R4902	H4
C3901	D6	CR4109	M9	R2714	H1	R4903	H4
C4001	O9	CR4110	G7	R2717	G1	R4904	G3
C4003	N8	CR4111	K9	R2721	G1	R4905	I4
C4004	N8	CR4112	J8	R2725	H1	RN4501	G10
C4005	M8	CR4113	J9	R2731	F2	RT4201	L9
C4007	N7	CR4117	I9	R2804	F2	SF2301	I3
C4101	F4	CR4201	K10	R3108	E4	SW3410	A4
C4102	E6	CR4302	H4	R3111	E5	SW3411	A1
C4104	I9	CR4303	G6	R3112	E5	SW3420	A4
C4105	F4	CR4401	H8	R3126	E5	SW3421	A2
C4106	K9	CR4501	F9	R3318	F6	SW3430	A4
C4110	K5	CR4701	O4	R3343	E6	SW3431	A3
C4111	H10	CR4702	N4	R3401	A7	T4301	H6
C4117	K4	CR4703	G7	R3402	A6	T4401	N6
C4118	H5	CR4704	J5	R4001	M9	TU101	M3
C4120	H5	CR4901	J4	R4002	L9	U1001	I3
C4122	M6	CR4902	H4	R4004	O8	U1902	C2
C4124	M6	F4001	O10	R4102	F4	U3101	C5
C4132	F3	FB3101	E6	R4103	J9	U3201	E5
C4137	I8	FB3901	E6	R4104	E7	U4102	D7
C4138	K7	FB4401	J7	R4106	G4	U4103	I10
C4153	L7	FB4501	H4	R4107	B7	U4104	F4
C4154	F7	IR3402	A7	R4108	J9	U4501	F9
C4304	H5	J1901	D3	R4110	J9	XRP1	O4
C4305	G7	J3101	E3	R4114	J10	XRP2	O4
C4306	H5	J4201	L8	R4119	G7	Y2801	H3
C4307	H3	J4901	O4	R4121	H5	Y3101	C6
C4310	G6	J7101	P2	R4122	I5	Y4101	H3
C4402	J7	J7103	N1	R4130	K4		
C4403	H8	K4201	L10	R4131	K4		
C4404	H8	L2301	H2	R4133	C7		
C4405	G8	L2302	J2	R4136	J10		
C4406	I7	L2303	J3	R4138	J9		
C4501	G3	L2305	I3	R4144	F6		
C4502	F8	L2705	G3	R4145	I6		
C4504	F10	L4001	N9	R4146	J8		
C4505	F10	L4101	K4	R4147	K8		
C4506	F8	L4102	L6	R4172	M7		
C4701	M5	L4401	J6	R4173	I10		
C4702	N4	L4402	H7	R4303	K5		
C4703	N4	P2701	F2	R4305	H7		
C4704	N4	P4401	N4	R4306	G6		
C4706	J5	P4501	G9	R4312	G5		

MAIN BOARD - BOTTOM VIEW



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MAIN BOARD - BOTTOM VIEW, GRIDTRACE LOCATION GUIDE

C1201	J9	C4302	G5	R2720	G10	R3324	D5
C1202	I9	C4303	G5	R2722	F9	R3325	E5
C1206	I9	C4308	H8	R2723	H10	R3326	D7
C1906	B9	C4309	G5	R2724	H10	R3331	D6
C1908	C9	C4311	G8	R2726	G9	R3345	D7
C1912	E9	C4401	J5	R2727	F9	R3347	D5
C2301	I8	C4507	F3	R2801	H9	R4113	F4
C2302	I8	C4713	H5	R2802	H9	R4116	H1
C2303	I10	C4715	J6	R2803	H8	R4117	H1
C2304	I8	C4903	H8	R2805	H9	R4118	H1
C2307	I9	C4904	G8	R2806	I7	R4120	H1
C2308	I9	C7416	K7	R2807	I7	R4123	H1
C2309	J9	CR2301	J9	R3101	C6	R4124	H1
C2312	I9	CR3102	B6	R3102	C7	R4125	H1
C2313	I9	CR3110	C5	R3103	C6	R4126	I1
C2708	G8	CR3111	C5	R3104	C6	R4127	H1
C2709	F10	CR4115	K7	R3105	C6	R4128	H1
C2710	H9	FB4110	K7	R3106	B5	R4132	K7
C2711	H10	L1902	C9	R3107	B7	R4137	I1
C2714	J9	Q2301	H10	R3109	D5	R4142	I1
C2715	J9	Q2701	G9	R3110	C6	R4143	F5
C2716	G10	Q2702	G9	R3113	E6	R4148	H2
C2717	G10	Q2703	H9	R3114	E6	R4149	H2
C2718	F10	Q2704	G10	R3115	E6	R4301	H8
C2802	H9	Q3101	B7	R3118	C7	R4304	G5
C2803	H8	Q3102	B6	R3119	B7	R4307	H8
C2805	H9	Q3201	E6	R3120	C6	R4308	G8
C2807	H8	Q3301	D7	R3122	C6	R4309	G5
C3101	E6	Q3302	C4	R3124	C7	R4310	G5
C3102	E6	Q3303	D7	R3125	C6	R4311	H8
C3108	C6	Q3305	E5	R3127	E7	R4320	G8
C3111	D6	Q4102	H1	R3129	C7	R4503	H7
C3112	D6	Q4103	H1	R3130	B7	R4801	H8
C3113	C6	Q4104	H2	R3131	C5	R4906	H7
C3114	C6	Q4108	H1	R3132	B7	R4909	G8
C3115	C6	Q4115	F5	R3133	B7	R7130	M7
C3121	B6	Q4302	F5	R3134	D5	R7405	K8
C3126	B6	R1201	I9	R3140	E6	R7406	K8
C3127	B5	R1202	I8	R3145	B6		
C3128	B7	R1902	E8	R3149	D6		
C3131	C5	R1904	E8	R3150	D6		
C3201	E6	R2302	I7	R3151	B5		
C3301	D6	R2303	I8	R3152	C5		
C3310	D5	R2304	I10	R3201	D6		
C3316	D6	R2306	I10	R3202	D6		
C3401	A4	R2308	J9	R3203	E6		
C4103	H1	R2309	J8	R3204	E6		
C4107	F8	R2311	I10	R3301	B6		
C4108	H1	R2314	I9	R3302	C6		
C4109	H1	R2315	I8	R3303	D7		
C4114	B4	R2316	I8	R3305	D6		
C4123	I1	R2317	I9	R3306	D5		
C4125	I7	R2705	H9	R3309	H10		
C4127	D5	R2706	H9	R3310	E6		
C4130	K7	R2707	H9	R3311	E6		
C4133	H9	R2708	H9	R3314	B5		
C4134	J3	R2713	G9	R3316	F9		
C4135	J2	R2715	G10	R3317	D6		
C4136	H2	R2716	G10	R3320	E6		
C4139	I1	R2718	F9	R3321	D7		
C4156	H1	R2719	G10	R3322	G10		

PARTS LIST

SEMICONDUCTORS

(Select the replacement that gives the best results.)

Item No.	Type No.	Mfr. Part No.	ECG Part No.
CR2301	-	227051	-
CR2702	1N4148	198589	ECG519
CR3102, 10	-	232709	-
CR3111	-	239195	-
CR4001 Thru			
CR4004	1N4002	147015	ECG116
CR4102	-	227066	-
CR4103	-	233082	-
CR4104	-	223083	-
CR4105	PFR854	164589	ECG576
CR4106	-	207878	ECG519
CR4108	-	215489	-
	-	247780	-
CR4109	1N4002	155276	ECG116
CR4110	-	233084	-
CR4111	-	225702	-
CR4112, 13	-	207878	ECG519
CR4115	-	243276	-
CR4117	-	242171	-
CR4201	1N4148	198589	ECG519
CR4302	1N4148	198589	ECG519
CR4303	-	176296	ECG552
# **CR4401**	-	140971	ECG558
CR4501	1N4002	155276	ECG116
CR4701	-	241304	-
CR4702	-	176296	ECG552
CR4703	1N4002	155276	ECG116
CR4704	-	207878	ECG519
# **CR4901**	-	157301	ECG177
# **CR4902**	-	159429	ECG5019T1
Q2301	-	215496	-
Q2701, 02, 03	-	215495	-
Q2704	-	215496	-
Q3101	-	215495	-
Q3102	-	215496	-
Q3201	-	215496	-
Q3301	-	215496	-
Q3302	-	219412	-
Q3303, 05	-	215496	-
Q3901	-	229220	-
Q4102, 03	-	215496	-
Q4104	-	215495	-
Q4106	-	177788	ECG31
Q4108	-	215496	-
Q4113	-	146851	ECG287
# **Q4114**	-	242204	-
Q4115	-	215496	-
Q4116	-	229220	-
Q4301	-	146851	ECG287
Q4302	-	215495	-

 # For SAFETY use only equivalent replacement part.

SEMICONDUCTORS continued

(Select the replacement that gives the best results.)

Item No.	Type No.	Mfr. Part No.	ECG Part No.
# **Q4401** (1)	2SD2578	231532	-
# **Q4401** (2)	-	242224	-
# **Q4901**	-	215496	-
Q5001, 02, 03	2SC2482	185197	ECG399
# **U1001**	LA7612N	241266	-
U1902	TDA7235	231531	-
U3101	-	247408	-
U3201	24C02	247778	-
U4102	L7812CV	162394	ECG966
U4103	-	231525	-
U4104	L78S75CV	231526	-
U4501	TDA8172	215531	ECG1788

 # For SAFETY use only equivalent replacement part.
(1) Used with chassis CTC185AA9.
(2) Used with chassis CTC185AA7.

CABINET PARTS

Item	Mfr. Part No.
Button Assembly	233123
# Button Cap	241027
# Chassis Mounting Tray	
# Mask & Back Assembly	MK2055
# IR Window	234040
Transmitter	
# Battery Door	226900

 # For SAFETY use only equivalent replacement part.

CAPACITORS & ELECTROLYTICS

Item No.	Rating	Mfr. Part No.
C2303	120pF 5% 50V NPO	194902
C2714, 15	43pF 5% 50V NPO	214029
C2716, 17, 18	330pF 5% 50V NPO	205227
C2803	15pF 5% 50V NPO	200538
C2805	120pF 5% 50V NPO	194902
C3101, 02	100pF 5% 50V NPO	193340
C3108	150pF 5% 50V NPO	214032
C3114, 15	27pF 5% 50V NPO	197604
C3121	100pF 5% 50V NPO	193340
C3316	200pF 5% 50V NPO	218986
# **C4001**	.22 20% 125VAC	231451
# **C4003, 04**	680pF 20% 1kV	190538
# **C4007**	680µF 20% 200V	190560
C4108	120pF 5% 50V NPO	194902
C4120, 24	680pF 20% 1kV	190538
C4134, 35	220pF 5% 50V NPO	205551
C4139	56pF 10% 50V NPO	222396
C4303	470pF 5% 50V NPO	214732
C4310	15pF 1% 250V NPO	223899
C4311	47pF 5% 50V NPO	210689
C4401	470pF 5% 50V NPO	195918
# **C4402**	.0143 2% 1.6kV	235375
# **C4403**	.45 5% 250V	203739
# **C4404**	2.2µF 20% 200V	196050
# **C4405**	.0047 10% 250V	142765
# **C4406**	470pF 5% 2kV	227068
C4702	680pF 20% 1kV	190538
C4704, 06	680pF 20% 1kV	190538
C4710	.01 20% 1kV	137583
C4713	100pF 5% 50V NPO	193340
C4715	100pF 5% 50V NPO	174412
# **C4904**	.22 +80% -20% 25V	217298
C5001	.001 10% 3kV	120696
# **C7101** (1)	330pF 20% 125V	235376
# **C7101** (2)	100pF 20% 125V	217315
# **C7114**	100pF 20% 125V	235377
# **C7120, 29**	330pF 20% 125V	235376
# **C7146, 47**	330pF 20% 125V	235376
# **C7154**	330pF 20% 125V	235376
C7416	100pF 5% 50V NPO	193340

 # For SAFETY use only equivalent replacement part.
NOTE: SMD capacitor kit (146 values, 5 each), Mfr. Part No. 199349.
(1) Used in chassis CTC185AA9.
(2) Used in chassis CTC185AA7.

CONTROLS & RESISTORS

	Item No.	Function/Rating	Mfr. Part No.
#	**R1907**	4.7 5% 1/4W	200197
#	**R1908**	33 5% 2W	196014
	R2302, 03	120K 2% 1/10W	207834
	R2304, 17	1000 2% 1/10W	197638
	R2702	7500 2% 1/4W	175761
	R2717, 21, 25	220 2% 1/4W	175324
	R2801	30K 2% 1/10W	200176
	R2804	27K2% 1/4W	175326
#	**R3108**	10 5% 1/4W	241259
	R3111, 12	220 2% 1/4W	175324
	R3202	120K 2% 1/10W	207834
#	**R4001**	2.7 10% 15W Wirewound	190487
#	**R4002**	1000 5% 10W	231504
#	**R4004**	1.8M 10% 1/2W	245269
#	**R4103**	.12 5% 2W Wirewound	242202
#	**R4106**	8.2 5% 1W	235378
#	**R4114**	10K 5% 3W	189989
#	**R4119**	10 5% 1/4W	241259
#	**R4121**	1000 5% 1/2W	175350
#	**R4122**	2000 5% 1/4W	175321
		1000 5% 1/4W	202069
		1500 5% 1/4W	175367
	R4136	143K .5% 1/4W	245270
	R4137	2800 .5% 1/10W	245271
	R4142	30K 2% 1/10W	200176
#	**R4146**	430 5% 1W	242207
#	**R4147**	220 5% 3W	231461
#	**R4305** (1)	2400 2% 3W	235380
#	**R4305** (2)	3600 5% 3W	181235
#	**R4401**	15K 5% 1W	190557
#	**R4402**	91 5% 1/2W	227249
#	**R4403**	820 5% 1W	175349
#	**R4507**	1.5 5% 1W	178619
#	**R4511**	1 10% 2W Wirewound	215577
#	**R4517**	13 5% 1W	231508
#	**R4701**	10 10% 1/2W	241261
#	**R4703**	1.8 5% 3W Wirewound	231515
#	**R4704**	82K 10% 1/2W	239116
#	**R4705**	27K 10% 1/2W	238958
	R4706	1130 1% 1/4W	233070
#	**R4710**	3 5% 2W Wirewound	223898
#	**R4901**	100 5% 1/4W	198667
#	**R4902**	28K 1% 1/4W	195731
#	**R4903**	32.4K 1% 1/4W	210066
#	**R4906**	1500 2% 1/10W	197628
#	**R5001, 02, 03**	20K 2% 2W Nonflammable	233034

 # For SAFETY use only equivalent replacement part.
NOTE: SMD resistor kit (302 values, 5 each), Mfr. Part No. 199350.
(1) Used in chassis CTC185AA9.
(2) Used in chassis CTC185AA7.

CONTROLS & RESISTORS continued

	Item No.	Function/Rating	Mfr. Part No.
#	**R5004, 05, 06**	2200 5% 1/2W	247669
#	**R5018**	2200 5% 1/2W	247669
#	**R7139, 40**	2.7M 20% 1/2W	217662
	RN4501	Resistor Network	215499
#	**RT4201**	5.5 PTC Cold	207768

 # For SAFETY use only equivalent replacement part.

COILS & TRANSFORMERS

	Item No.	Function/Rating	Mfr. Part No.
	FB3101	Ferrite Bead	226467
	FB3901	Ferrite Bead	226467
	FB4110	Ferrite Bead	215546
	FB4401	Ferrite Bead	161237
	FB4501	Ferrite Bead	215547
	L1902	10µH	243675
	L2301	15µH	197613
	L2302	VCO	215502
	L2303	FM	233056
	L2305	10µH	175409
	L2705	10µH	175409
#	**L4000** (1)	Yoke Horiz 1.25mH Vert 9.8mH	-
#	**L4001**	Line Choke	190507
	L4101	100µH	160186
	L4102	200µH	231464
#	**L4201**	Degaussing	247788
	L4401	2.2µH	190480
#	**L4402**	29µH Horizontal Linearity	193335
	L5001	180µH	247787
	L7120 (2)	-	247981
	L7120 (3)	-	247980
	L7121 (2)	-	247981
	L7121 (3)	-	243674
#	**T4301**	Horizontal Driver	215541
#	**T4401** (4)	Horizontal Output	231449

 # For SAFETY use only equivalent replacement part.
(1) Bonded part of CRT.
(2) Used in chassis CTC185AA9.
(3) Used in chassis CTC185AA7.
(4) Screen and focus controls are part of T4401.

MISCELLANEOUS

	Item No.	Description	Mfr. Part No.	Notes
	CF1201	Filter	195702	4.5MHz
	CF2301	Trap	181125	4.5MHz
#	**F4001**	Fuse	175425	5Amp, 125V, Fast Acting
	IR3402	Receiver	244227	Remote
	J7101	Jack	215543	RF Input
#	**K4201**	Relay	190490	Degaussing
#	**KS5001**	Socket	233120	CRT
#	**PW4001**	Line Cord	215576	AC, Polarized
	SF2301	Filter	217318	SAW
	SP1902	Speaker	233442	2 1/4" X 3 1/2", 32 Ohms, 1.5W
	SW3410	Switch	215500	Channel Up
	SW3411	Switch	215500	Power
	SW3420	Switch	215500	Channel Down
	SW3421	Switch	215500	Volume Up
	SW3430	Switch	215500	Menu
	SW3431	Switch	215500	Volume Down
#	**V5000**	CRT	-	A63ADT15X09
		CRT	HA63ADT159	A63ADT15X07
	Y2801	Crystal	161235	3.58MHz
	Y3101	Crystal	217322	8MHz
	Y4101	Crystal	227064	507.5kHz
		Fuse Clip	176642	For F4001 (2 Used)
		PC Board (1)	247786	CRT
		PC Board (2)	247779	CRT
		Transmitter	240961	Remote, CRK20A1
		Tuner (3)	247439	UHF/VHF

 # For SAFETY use only equivalent replacement part.
(1) Used in chassis CTC185AA9.
(2) Used in chassis CTC185AA7.
(3) Contact TNI Electronics for replacement; order by manufacturer's part number.