

SAFETY PRECAUTIONS

SERVICE WARNING

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

SERVICING THE HIGH VOLTAGE AND CRT

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

X-RAY RADIATION AND HIGH VOLTAGE LIMITS

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

GENERAL GUIDELINES

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

TEST JIG HOOKUP				
Function	Chek-A-Color Adapter No.	PC Board Plug No.	Pin	Color
CRT	B239	P Horiz	E4401	Red
Yoke	D4160	P Horiz	E4402	Blue
Yoke Setting	YP3	P Vert	E4501	Yellow
Comments	Focus Tap	P Vert	E4502	Green

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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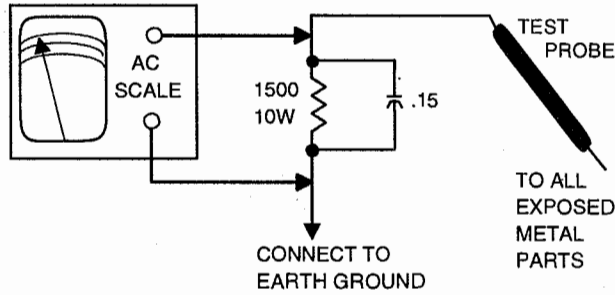
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2647 Waterfront Parkway East Drive, Suite 100  
Indianapolis, IN 46214-2012

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. Momentary 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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PHOTOFACT® Technical Service Data

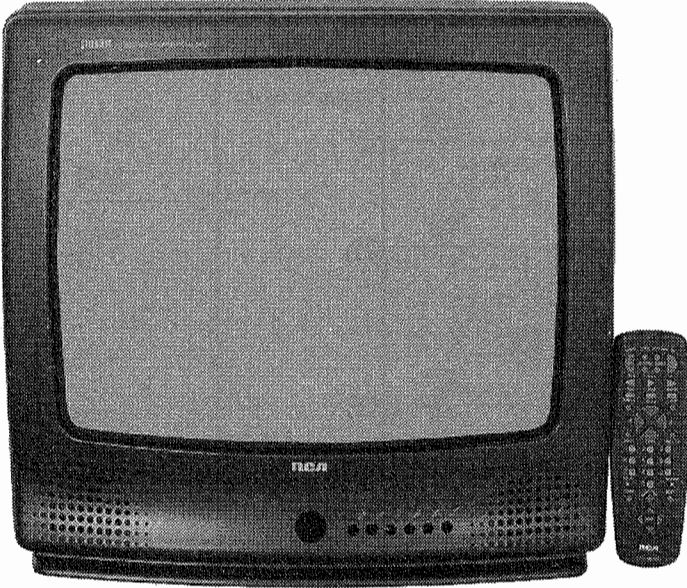
SET 3841

MODELS F19253BCJX1/TX1 (CHASSIS CTC176N2)

RCA

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RCA  
Models F19253BCJX1/TX1 (Chassis CTC176N2)



Model F19253BCTX1  
Complete coverage  
for servicing a television receiver...

- Schematics
- Component locations
- Parts list
- Troubleshooting guide

  
**HOWARD W. SAMS & COMPANY**  
JUNE 1997 SET 3841

TROUBLESHOOTING

POWER SUPPLY CIRCUIT DESCRIPTION

Check F4001. If F4001 is open check CR4001 thru CR4004, C4001, C4003, C4004, C4007, C4009, and C4010. Apply 120VAC and check for 150V\* at pin 11 of U4101. If 150V\* is missing, check CR4001 thru CR4004, L4001, R4001, and T4101. If 150V\* is present, check for 140V at the cathode of CR4106. If 140V is missing, check U4101, CR4109, and T4101. If 140V is present, check for 5.0V at the emitter of Q4105. If 5.0V is missing, check U4102, Q4105, CR4104, Q3101, and Q3102. If 5.0V is present at the emitter of Q4105, refer to the "Horizontal" section of this Troubleshooting guide.

\* Taken from common tie point.

HIGH VOLTAGE SHUTDOWN

**CAUTION:** When defeating the high voltage shutdown circuit, do not exceed the maximum high voltage specified on the schematic, as this may cause excessive X-radiation and damage to the CRT and associated components. Monitor high voltage while troubleshooting.

The high voltage from T4401 is monitored and rectified by CR4901. Should the high voltage increase, the rectified voltage at the cathode of CR4901 will also increase and trigger CR4902. Voltage at emitter of Q4901 will increase and turn on Q4901. Voltage at pin 26 of U1001 will increase, which will cause the receiver to shut down. To troubleshoot, disconnect one end of CR4902 and check Q4901, CR4901, and CR4902.

Voltages Taken With Receiver In Shutdown

	U1001		Q4901
Pin 24	2.6V	E	0V
Pin 26	.3V	B	0V
		C	.1V

HORIZONTAL

To determine if the receiver is in shutdown, refer to the "High Voltage Shutdown" section of this Troubleshooting guide. If the receiver is not in shutdown, inject a horizontal signal at the base of Q4401. If horizontal deflection is now present, check T4301, Q4301, Q4302, and pins 24 thru 27 of U1001. If horizontal sweep is missing, check Q4401, CR4702, CR4701, CR4113, CR4704, Q4101, CR4705, and T4401.

VERTICAL

Check pin 17 of U1001 for 3.0Vp-p vertical ramp signal. If the vertical ramp signal is present, check U4501. If the vertical ramp signal is missing, check for 7.5V at pin 32 of U1001 and check for 3.1V at pin 18 of U1001. If 3.1V is missing, check C4501, C4503, and U1001.

VIDEO & CHROMA

Check for the proper waveform at pin 51 of U1001. If the waveform is missing, refer to the "IF AGC" section of this Troubleshooting guide. If the waveform is present, check for the proper waveform at pin 48 of U1001. If the waveform is missing, check Q2704. If the waveform is present, check for the proper waveforms at pins 36, 37, and 38 of U1001. If the waveforms are missing, check U1001. If the waveforms are present at pins 36, 37, and 38 of U1001, refer to the "Raster" section of this Troubleshooting guide.

RASTER

Check the CRT and CRT voltages. If red is missing, check pin 36 of U1001 and Q5001. If green is missing, check pin 37 of U1001 and Q5002. If blue is missing, check pin 38 of U1001 and Q5003.

AUDIO

Select an active TV channel, and check for an audio waveform at pin 5 of U1701. If the audio waveform is missing, check pins 3, 55, 57, and 58 of U1001. If the audio waveform is present, check for audio waveforms at pins 59 and 60 of U1001. If audio waveforms are missing, check U1701 and pins 4, 5, 59, and 60 of U1001. If audio waveforms are present, check U1901 and Q1903.

IF AGC

Inject a video IF signal at pin 11 of U1001 and check for video on the CRT. If video is present, check the tuner circuit. Check for a video waveform at pin 51 of U1001. If the waveform is present refer to the "Video & Chroma" section of this Troubleshooting guide. Apply AGC bias to pin 13 of U1001. If video is now present, check pins 6, 12, 13, and 14 of U1001. If video is still missing, check U1001.

SERVICE TIPS

INTERMITTENT GROUND CONNECTIONS

Intermittent ground connections on the shield of the microcomputer and the tuner can result in a variety of symptoms. The intermittent connection is normally caused by the shield not being seated prior to soldering. The problem is most prevalent in early production units. Open ground tabs on the microcomputer shield can cause loss of audio and video, noise in the picture, and intermittent shutdown. Open ground tabs on the tuner shield can cause reduced height. Carefully inspect the ground connections, resolder if necessary. It is necessary to remove the bottom cover of the tuner in order to gain access to the ground connections on the shield. Failure to remove the bottom cover can result in repeat symptoms.

NO COLOR ON SOME CHANNELS

Early production units may have no color on some cable channels or when used with video games. These units have serial numbers lower than 401000000. To correct this problem, check the value of R2805. It should be 750 ohm 1/10W (part number 215200). Also R2806 should be a jumper (part number 205408). Finally, C2806 should be a 1µF capacitor (part number 220998).

NO VERTICAL AND NO AUDIO

This symptom can be caused by CR4704 being shorted or R4702 and R4517 being open. Replace CR4704 (part number 207878) or R4702 and R4517 as necessary.

INTERMITTENT TUNER

The picture may be good initially, but may have snow after warm-up. Y7401 may stop oscillating as the temperature increases. Check Y7401 (part number 182839) and replace as necessary.

COLORED BAR AT THE TOP OF PICTURE DURING TAPE PLAYBACK

While a tape is played a colored band may appear at the top of the picture. This occurs with a copy protected tape. The colored band is usually red, but can be green or blue. To repair this problem, replace U1001 (part number 215524). After replacing U1001, perform the "Service Adjustment Parameters" and the "Chassis Alignment Parameters" sections of Miscellaneous Adjustments.

TUNER LOCAL OSCILLATOR INOPERATIVE ON BAND TWO

When the tuner local oscillator stops working, the tuning voltage drops to 0V, and the chassis locks up all band two channels (off air channels 7 thru 13 and cable channels 18 thru 51). This problem occurs with higher temperatures. To repair this problem, replace C7311 (part number 194906). The value changes from 2pF to 6pF. After replacing C7311, it is necessary to perform "Electronic Tuner Alignment" section of Miscellaneous Adjustments.

NO STEREO OPERATION

This chassis may not enter the stereo mode even though the stereo mode is selected. C1707 may be open. Replace C1707 (part number 205230) as necessary.

DEAD SET OR INTERMITTENT SHUTDOWN CONDITION

This problem can be caused by loss of B+ due to bad solder connection at pin 8 of T4101. T4101 transformers with date codes 3266, 3272, and 3273 might have been made with an incorrect wire type that does not take solder at normal manufacturing temperatures. Replace T4101 with part number 215538.

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 noted otherwise.

Waveforms taken with triggered scope and colorbar signal. Waveform voltage is peak to peak. Timebase is per division. Waveforms shown at 10 divisions.

Supply voltages maintained as seen at input.

Voltages measured with digital meter and a 1000µV RF signal, with colorbar pattern, applied to antenna terminal.

Controls adjusted for normal operation.

Capacitors are 50 volts or less, 5% or greater unless noted.

Electrolytic capacitors are 50 volts or less, 20% or greater unless noted.

Resistors are 1/2W or less, 5% or greater unless noted.

Value in ( ) used in some versions.

Measurements with switching as shown, unless noted.

Rated voltage shown on zener diodes.

## MISCELLANEOUS ADJUSTMENTS

### PRETUNING

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

#### Auto Program

1. Press the menu button to select setup menu and highlight autoprogram.
2. Press the + button. All available channels are scanned and stored in memory.

#### Channel Memory

1. Press the menu button to select the setup menu.
2. Press channel down button to highlight channel memory.
3. Select channel to add or delete with number buttons.
4. Press + to add a channel or - to erase a channel.
5. Repeat steps 3 and 4 to add or erase other channels.

### 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 P 00, and on the right the value of that parameter V 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 three main groups of parameters are, the service adjustment parameters, the chassis alignment 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. After adjustment, exit the service menu by pressing the power button.

**WARNING:** When adjusting the horizontal frequency be careful not to exceed the value range, or the receiver will go into shutdown, and replacement of U3101 may be required. If the receiver goes into shutdown, connect a capacitor across C4402 with the same value, redo horizontal frequency adjustment, then remove the capacitor. It may be necessary to readjust the horizontal frequency again.

### SERVICE ADJUSTMENT PARAMETERS

Parameter No.	Parameter Name	Value Range	On-Set Value	Comment
00	Pass number for service adjustment parameters.	Must set to 76	00	May not advance until value is set.
01	Horizontal Frequency	00 - 63	12	Adjust for stable or slowly moving horizontal lines.
02	Horizontal Phase	00 - 15	09	Adjust to center picture left to right.
03	EW DC	00 - 15	07	Used in 27" receivers.
04	EW Amplitude	00 - 07	03	Used in 27" receivers.
05	Vertical DC	00 - 15	08	Adjust to center picture top to bottom.
06	Vertical Size	00 - 31	17	Adjust to 1/4" overscan top and bottom of screen.
07	Red Bias	00 - 127	46	Press menu button on the receiver for setup line.
08	Green Bias	00 - 127	59	Press menu button on the receiver for setup line.
09	Blue Bias	00 - 127	71	Press menu button on the receiver for setup line.
10	Red Drive	00 - 63	24	Press menu button on the receiver for setup line.
11	Green Drive	00 - 63	24	Press menu button on the receiver for setup line.
12	Blue Drive	00 - 63	21	Press menu button on the receiver for setup line.

### 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 25.5kV to 27.5kV.

### COLOR TEMPERATURE

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

Press menu button on the receiver for collapsed raster setup line. Disconnect the antenna. Preset the red, green, and blue drive values to 32. Preset the red, green, and blue bias values to provide 170V at the collector of the respective output transistors. Adjust screen control for a service line that is just visible. Adjust red, green, and blue drives to obtain a white line. Check the low light to high light gray scale tracking. Repeat the procedure, if necessary, to obtain the best performance.

### PURITY / CONVERGENCE

Yoke is bonded and part of the CRT. Adjustment is not recommended.

### CHASSIS ALIGNMENT PARAMETERS

Parameter No.	Parameter Name	Value Range	On Set Value	Comment
13	Pass number for chassis alignment parameters.	Must set to 77	00	May not advance to higher parameter until value is set.
14	PLL Tuning	00 - 63	36	Apply 4.0V to pin 14 of U1001. Short the junction of R7130 and R2313 to ground. Connect 41.25MHz marker to pin 1 of SF2301. Connect an oscilloscope to pin 55 of U1001. Adjust value for 2.2µs sinewave.
15	4.5MHz Trap	00 - 07	03	Short the junction of R7130 and R2313 to ground. Apply 45.75MHz (300mV) and 41.25MHz (100mV) to pin 1 of SF2301. Connect an oscilloscope to pin 63 of U1001, and adjust value for minimum 4.5MHz sinewave.
16	Video Level	00 - 07	05	Tune in a color bar pattern, 100% modulation, super pulse display. Connect oscilloscope to pin 63 of U1001. Adjust value range to produce 2.0Vp-p response.
17	FM Level	00 - 15	07	Connect signal generator to pin 55 of U1001, inject 4.5MHz carrier, 1kHz modulation, with 25kHz deviation. Apply 4.0V to pin 14 of U1001. Connect oscilloscope to pin 3 of U1001, and adjust value range for 1.2Vp-p of 1kHz component.
18	B+ Trim	00 - 15	04	Adjust for the B+ to be 140V ± .5V.
19	RF AGC (1)	00 - 31	21	Manually tune channel 6.
20	D-PIP Chroma	00-127	00	Used in models with PIP only.
21	D-PIP Tint	00-255	00	Used in models with PIP only.
22	D-PIP Brightness	00-31	00	Used in models with PIP only.
23	D-PIP Contrast	00-63	00	Used in models with PIP only.
24	Factory Tint	00 - 63	28	-

(1) RF AGC has been preset at time of manufacture for optimum operation over a wide range of RF signal input conditions. Readjustment should not be required unless the tuner has been repaired, U1001, U3101, or U3201 has been replaced, or unusual signal conditions exist. Use weakest local signal to adjust RF AGC parameter setting.

### TUNER COIL ALIGNMENT

The tuner coil alignment is preset at the time of manufacture and should require no further adjustment. The following recommended procedure should be performed only in event a complete tuner alignment is necessary, which is unlikely. Use plastic or wooden tool to knife coils. This procedure is performed with top tuner cover removed and bottom tuner cover in place and soldered.

1. Manually tune the receiver and the tuner alignment generator to channel 125 (band 3) and enter parameter 154. Connect voltmeter to tuner side of R7525. Check for voltage reading between 4.6V and 4.8V. If incorrect, expand or compress L7303 to set voltage within these limits.
2. Manually tune the receiver and the tuner alignment generator to channel 50 (band 2) and enter parameter 127. Check for voltage reading between 4.8V and 5.0V. If incorrect, expand or compress L7304 to set voltage within these limits.
3. Manually tune the receiver and the tuner alignment generator to channel 17 (band 1) and enter parameter 109. Check for voltage reading between 4.4V and 4.6V. If incorrect, expand or compress L7305 to set voltage within these limits.
4. Manually tune the receiver and the tuner alignment generator to channel 125 (band 3) and enter parameter 154. Connect a voltmeter to pin 8 of U7501. Set parameter value range to 31. Expand or compress L7105 for minimum RF AGC voltage.

5. Enter parameter 155 and set parameter value range to 31. Expand or compress L7104 for minimum RF AGC voltage.
6. Enter parameter 156 and set parameter value range to 31. Expand or compress L7102 for minimum RF AGC voltage.
7. Manually tune the receiver and the tuner alignment generator to channel 50 (band 2) and enter parameter 127. Set parameter value range to 31. Expand or compress L7113 for minimum RF AGC voltage.
8. Enter parameter 128 and set parameter value range to 31. Expand or compress L7111 for minimum RF AGC voltage.
9. Enter parameter 129 and set parameter value range to 31. Expand or compress L7107 for minimum RF AGC voltage.
10. Manually tune the receiver and the tuner alignment generator to channel 17 (band 1) and enter parameter 109. Set parameter value range to 31. Expand or compress L7114 for minimum RF AGC voltage.
11. Enter parameter 110 and set parameter value range to 31. Expand or compress L7112 for minimum RF AGC voltage.
12. Enter parameter 111 and set parameter value range to 31. Expand or compress L7106 for minimum RF AGC voltage.
13. Perform the entire Electronic Tuner Alignment.

MISCELLANEOUS ADJUSTMENTS continued

ELECTRONIC TUNER ALIGNMENT

Use tuner alignment generator, RCA stock no. TAG001, and a VCR for signal source. Monitor RF AGC at pin 12 of U1001, and adjust for minimum voltage at each parameter. The entire Electronic Tuner Alignment procedure, once started, must be completed in its entirety. Electronic Tuner Alignment is performed with top and bottom covers in place with bottom cover soldered.

Parameter No.	Parameter Name	Value Range	On-Set Value
25	Pass number for tuner alignment parameters.	Must set to 78	00
100	Ch. 2 secondary	00-63	20
101	Ch. 2 primary	00-63	18
102	Ch. 2 single	00-63	05
103	Ch. 6 secondary	00-63	50
104	Ch. 6 primary	00-63	42
105	Ch. 6 single	00-63	27
106	Ch. 14 secondary	00-63	57
107	Ch. 14 primary	00-63	53
108	Ch. 14 single	00-63	52
109	Ch. 17 secondary	00-63	29
110	Ch. 17 primary	00-63	42
111	Ch. 17 single	00-63	46
112	Ch. 18 secondary	00-63	40
113	Ch. 18 primary	00-63	30
114	Ch. 18 single	00-63	40
115	Ch. 13 secondary	00-63	52
116	Ch. 13 primary	00-63	41
117	Ch. 13 single	00-63	47
118	Ch. 34 secondary	00-63	57
119	Ch. 34 primary	00-63	42
120	Ch. 34 single	00-63	51
121	Ch. 37 secondary	00-63	57
122	Ch. 37 primary	00-63	42
123	Ch. 37 single	00-63	50
124	Ch. 48 secondary	00-63	40
125	Ch. 48 primary	00-63	41
126	Ch. 48 single	00-63	35

Parameter No.	Parameter Name	Value Range	On-Set Value
127	Ch. 50 secondary	00-63	29
128	Ch. 50 primary	00-63	33
129	Ch. 50 single	00-63	27
130	Ch. 51 secondary	00-63	44
131	Ch. 51 primary	00-63	31
132	Ch. 51 single	00-63	31
133	Ch. 57 secondary	00-63	47
134	Ch. 57 primary	00-63	29
135	Ch. 57 single	00-63	26
136	Ch. 63 secondary	00-63	47
137	Ch. 63 primary	00-63	26
138	Ch. 63 single	00-63	23
139	Ch. 76 secondary	00-63	45
140	Ch. 76 primary	00-63	23
141	Ch. 76 single	00-63	21
142	Ch. 83 secondary	00-63	45
143	Ch. 83 primary	00-63	26
144	Ch. 83 single	00-63	23
145	Ch. 93 secondary	00-63	45
146	Ch. 93 primary	00-63	27
147	Ch. 93 single	00-63	25
148	Ch. 110 secondary	00-63	49
149	Ch. 110 primary	00-63	26
150	Ch. 110 single	00-63	22
151	Ch. 117 secondary	00-63	55
152	Ch. 117 primary	00-63	26
153	Ch. 117 single	00-63	19
154	Ch. 125 secondary	00-63	63
155	Ch. 125 primary	00-63	29
156	Ch. 125 single	00-63	16

TUNER CIRCUIT VOLTAGE CHART

Pin No.	VHF Low Band	VHF High Band	UHF Band	Pin Name	VHF Low Band	VHF High Band	UHF Band
U7301				Q7101			
1	5.7V	5.6V	5.5V	G1	0V	0V	4.8V
2	3.0V	3.0V	3.2V	G2	5.0V	6.5V	7.2V
3	8.2V	8.1V	7.9V	D	.2V	.2V	11.3V
4	3.0V	3.0V	3.2V	S	.2V	.2V	4.8V
5	7.8V	7.7V	7.6V	Q7102			
6	0V	0V	0V	G1	4.6V	4.6V	4.6V
7	3.0V	3.1V	.1V	G2	5.3V	6.9V	7.2V
8	9.5V	9.3V	9.2V	D	11.3V	11.2V	11.4V
9	3.0V	3.0V	3.4V	S	4.1V	4.2V	11.3V
10	3.4V	3.2V	2.9V	Q7401			
11	4.9V	5.1V	10.0V	E	0V	0V	0V
12	3.4V	3.3V	2.9V	B	.6V	.6V	.6V
13	0V	0V	0V	C	2.1V	3.9V	17.8V
14	9.5V	9.3V	5.4V	Q7402			
15	3.5V	3.4V	2.9V	E	12.0V	12.0V	12.0V
16	3.5V	3.4V	2.9V	B	11.3V	10.5V	10.6V
U7401				C	-14.9V	11.1V	11.2V
1	1.7V	2.1V	1.7V	Q7403			
2	2.1V	2.1V	2.1V	E	0V	0V	0V
3	2.1V	2.1V	2.1V	B	.7V	.7V	0V
4	4.8V	4.8V	4.8V	C	.1V	.1V	11.3V
5	4.7V	4.7V	4.7V	Q7404			
6	0V	0V	0V	E	12.0V	12.0V	12.0V
7	1.3V	1.3V	1.3V	B	11.0V	11.9V	10.6V
8	11.5V	0V	0V	C	.1V	.1V	11.3V
9	7.4V	7.4V	0V	NOTE: VHF Low Band voltages taken on channel 2.			
10	4.8V	4.8V	4.8V	VHF High Band voltages taken on channel 7.			
11	2.3V	2.3V	2.3V	UHF Band voltages taken on channel 14.			
12	2.3V	2.3V	2.3V				
13	0V	0V	0V				
14	.6V	.6V	.6V				
U7501							
1	1.4V	1.6V	1.8V				
2	1.4V	1.6V	1.8V				
3	1.4V	1.6V	1.8V				
4	33.0V	33.0V	33.0V				
5	1.3V	1.5V	1.5V				
6	1.3V	1.5V	1.5V				
7	2.5V	4.2V	4.2V				
8	1.7V	3.7V	4.6V				
9	1.2V	1.4V	1.5V				
10	1.2V	1.4V	1.5V				
11	0V	0V	0V				
12	1.3V	1.4V	1.5V				
13	1.3V	1.4V	1.5V				
14	2.3V	3.4V	4.4V				

RCA

MODELS F19253BCJX1/TX1 (CHASSIS CTC176N2)



The schematic diagram illustrates the internal circuitry of the LA7610 T-CHIP, a central component in a television receiver. The chip is shown as a large rectangular block with numerous pins and internal functional blocks. Key components and connections include:

- Inputs and Outputs:**
  - VIDEO INPUT:** Connected to pin 1401, passing through a printed spark gap and a 75Ω resistor (R1401).
  - VIDEO IN:** Pin 1, connected to the internal video input stage.
  - VIDEO OUT:** Pin 63, connected to the internal video output stage.
  - AGC (Automatic Gain Control):** Pins 13 and 14, connected to the internal AGC circuit.
  - IF (Intermediate Frequency) and RF (Radio Frequency) sections:** Pins 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776,

SYNC

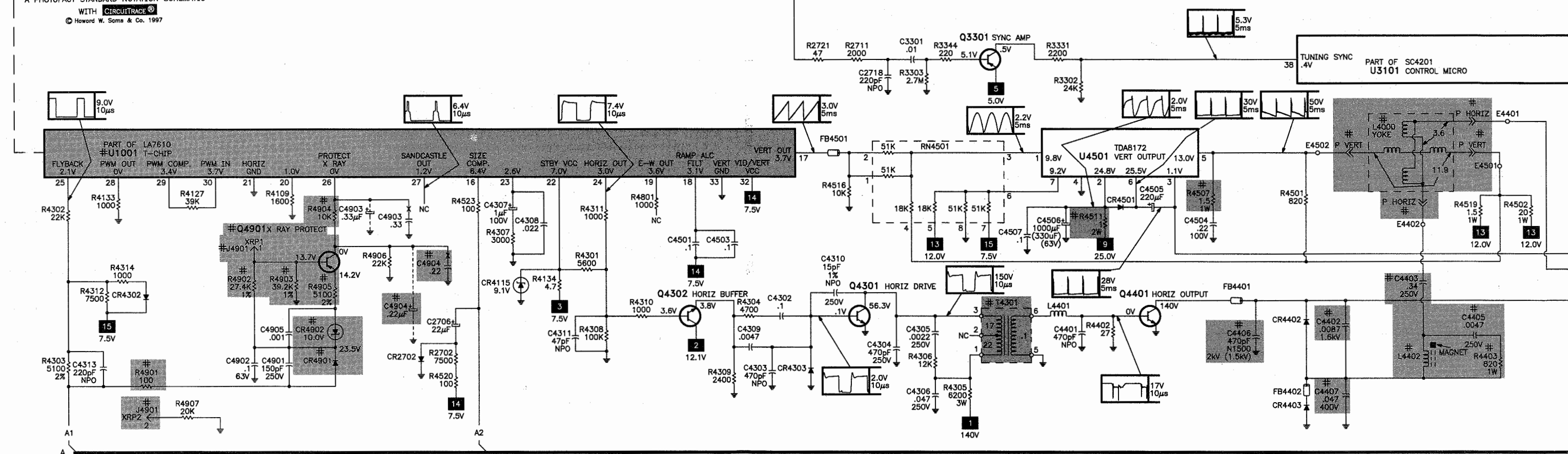
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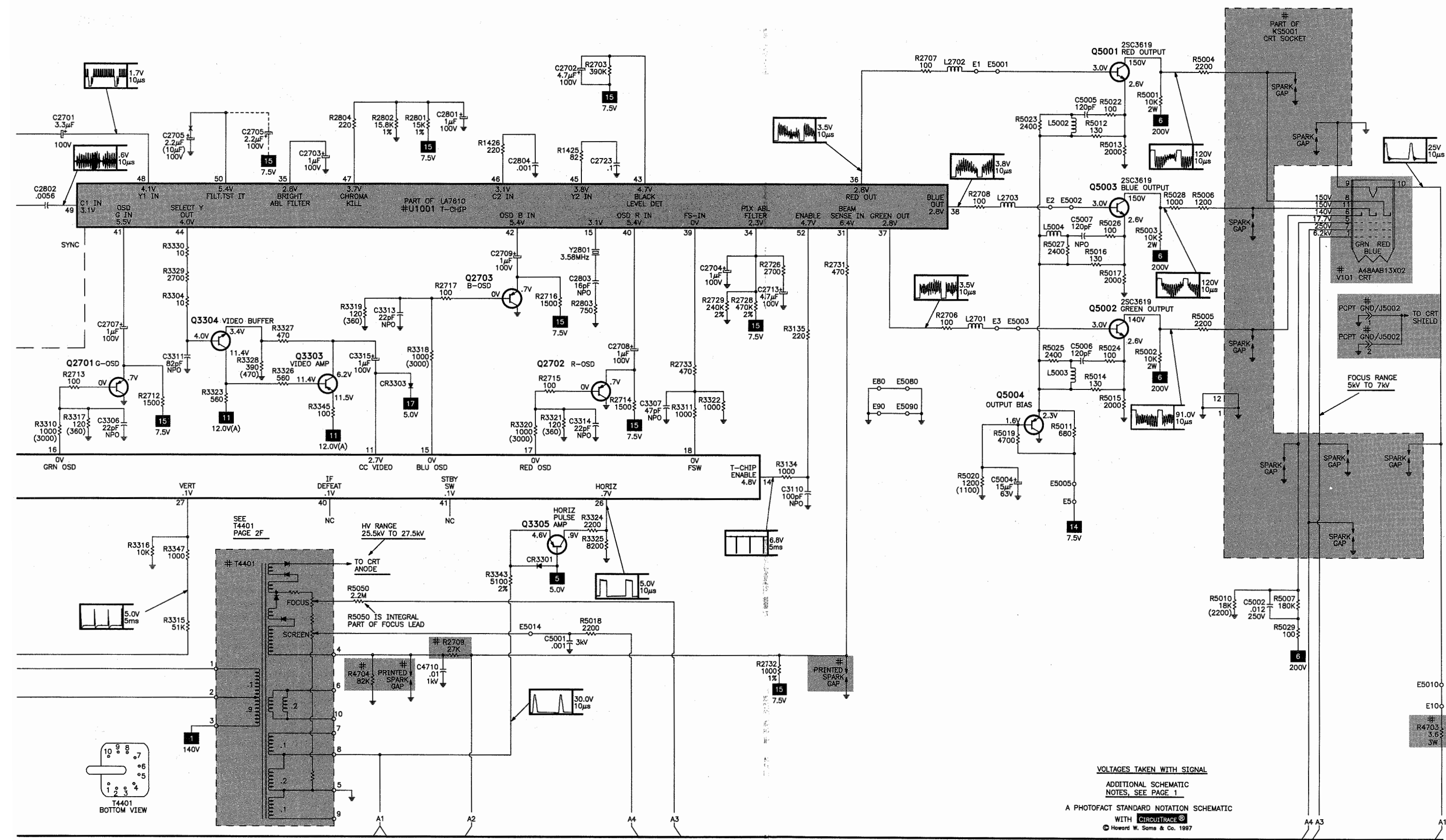
ADDITIONAL SCHEMATIC  
NOTES, SEE PAGE 1

### A PHOTOFACT STANDARD NOTATION SCHEMATIC

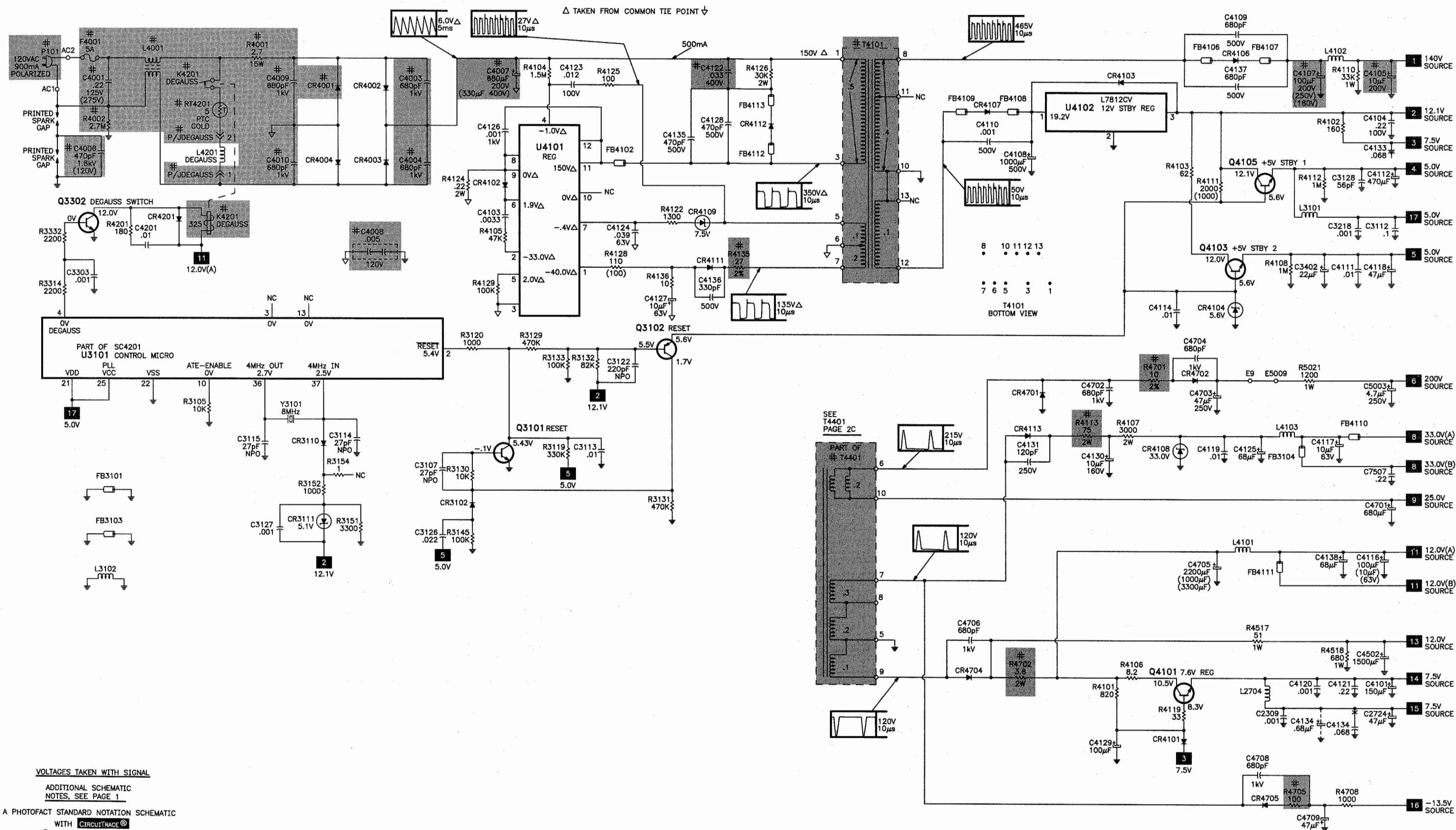
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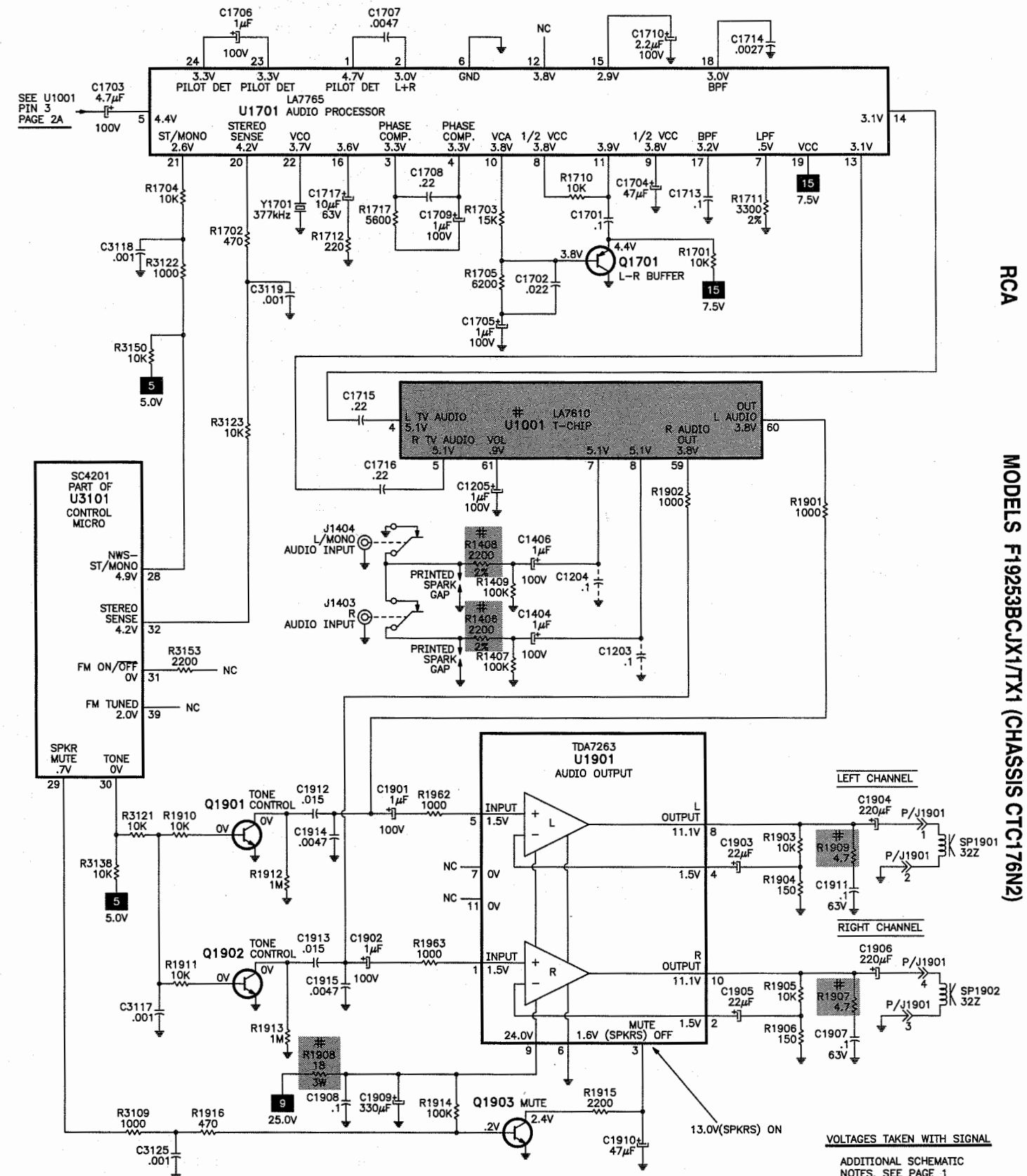




# POWER SUPPLY SCHEMATIC



## AUDIO SCHEMATIC



MODEL S E40E3BC IY1/TY1 (CHASSIS CTC176N2)

VOLTAGES TAKEN WITH SIGNAL

ADDITIONAL SCHEMATIC  
NOTES, SEE PAGE 1

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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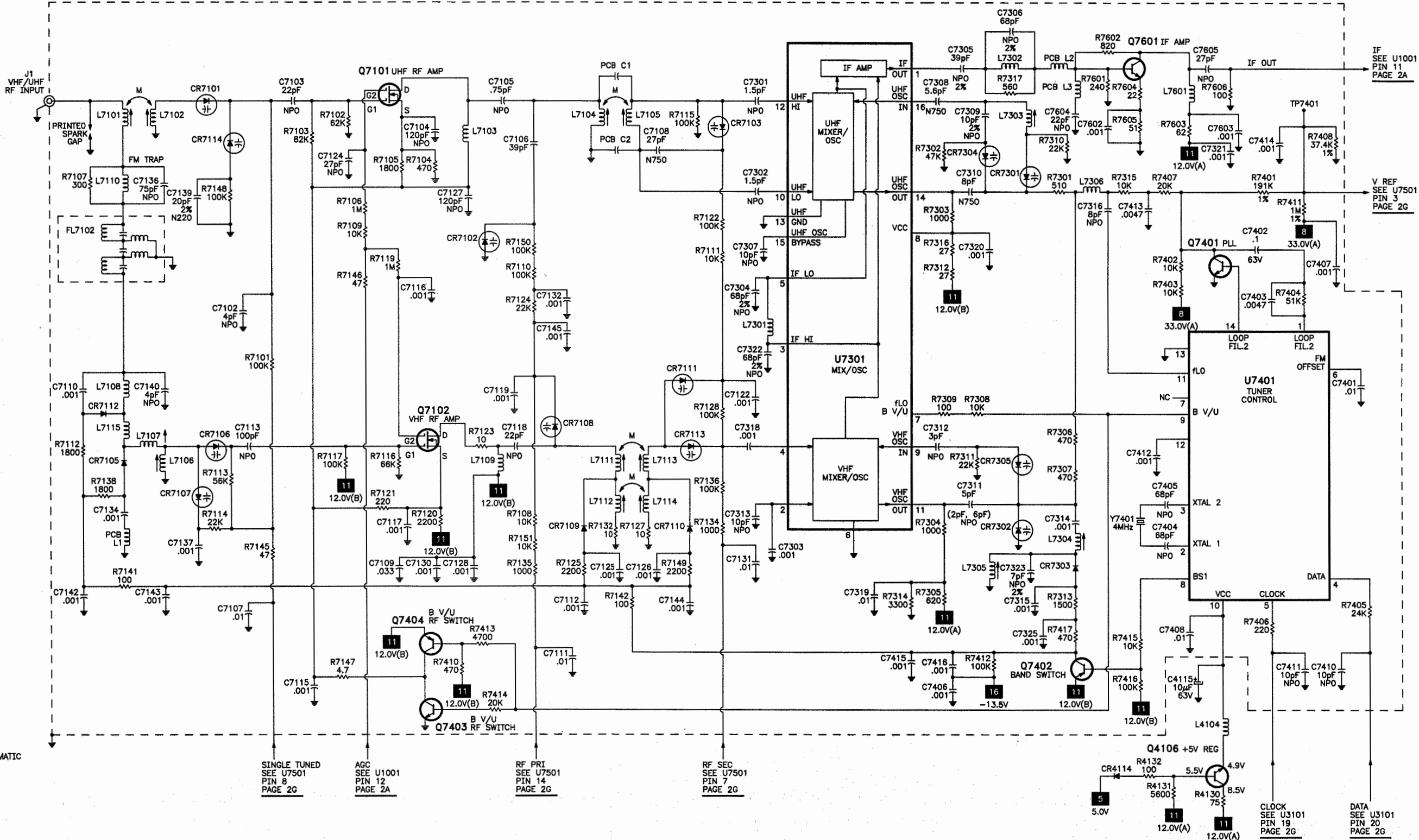
SET 3841 Page 2



A

TUNER SCHEMATIC

B



VOLTAGES TAKEN WITH SIGNAL

ADDITIONAL SCHEMATIC  
NOTES, SEE PAGE 1

A PHOTOFAC STANDARD NOTATION SCHEMATIC

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SEE U7501  
PIN 8  
PAGE 2G

AGC  
SEE U1001  
PIN 12  
PAGE 2A

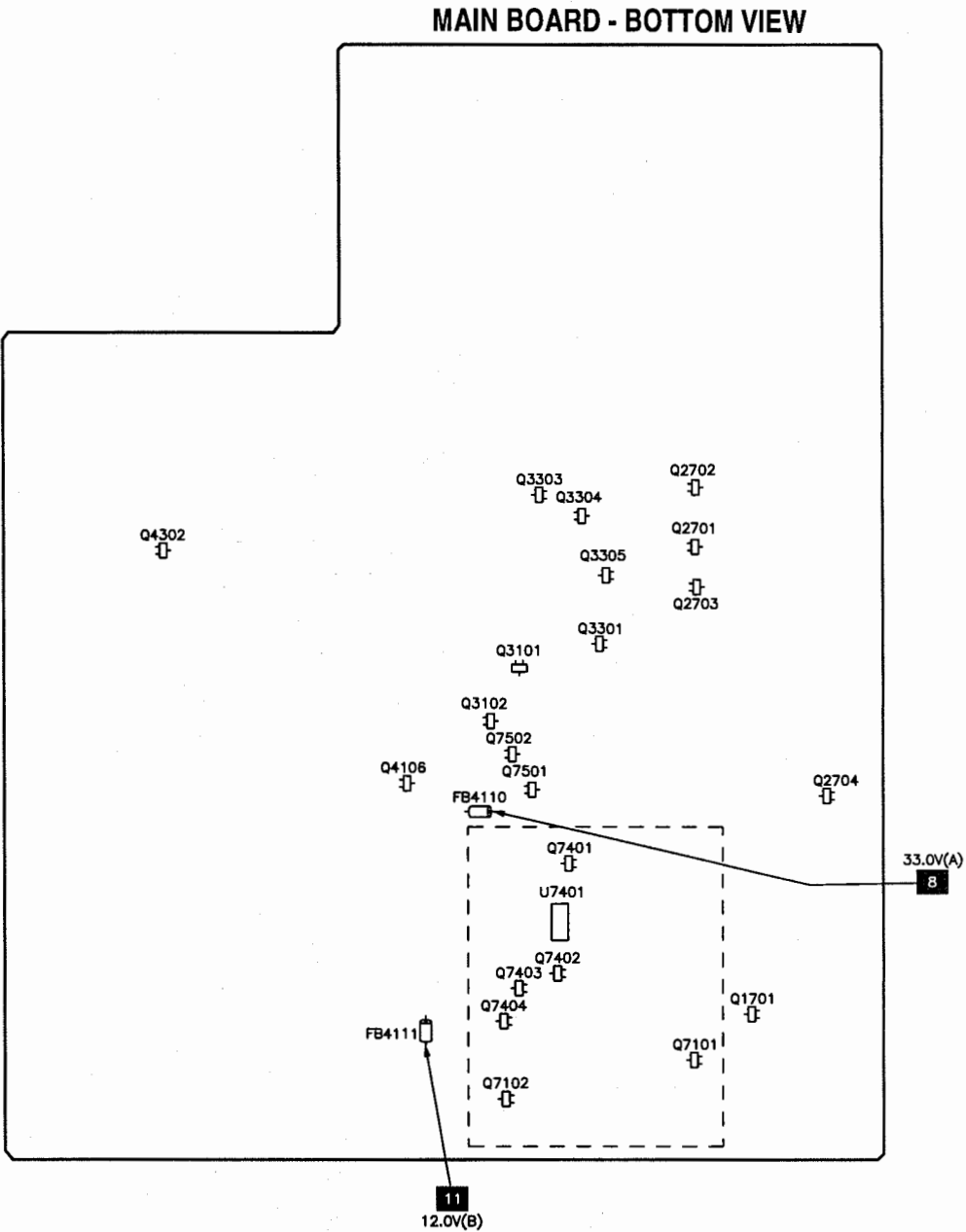
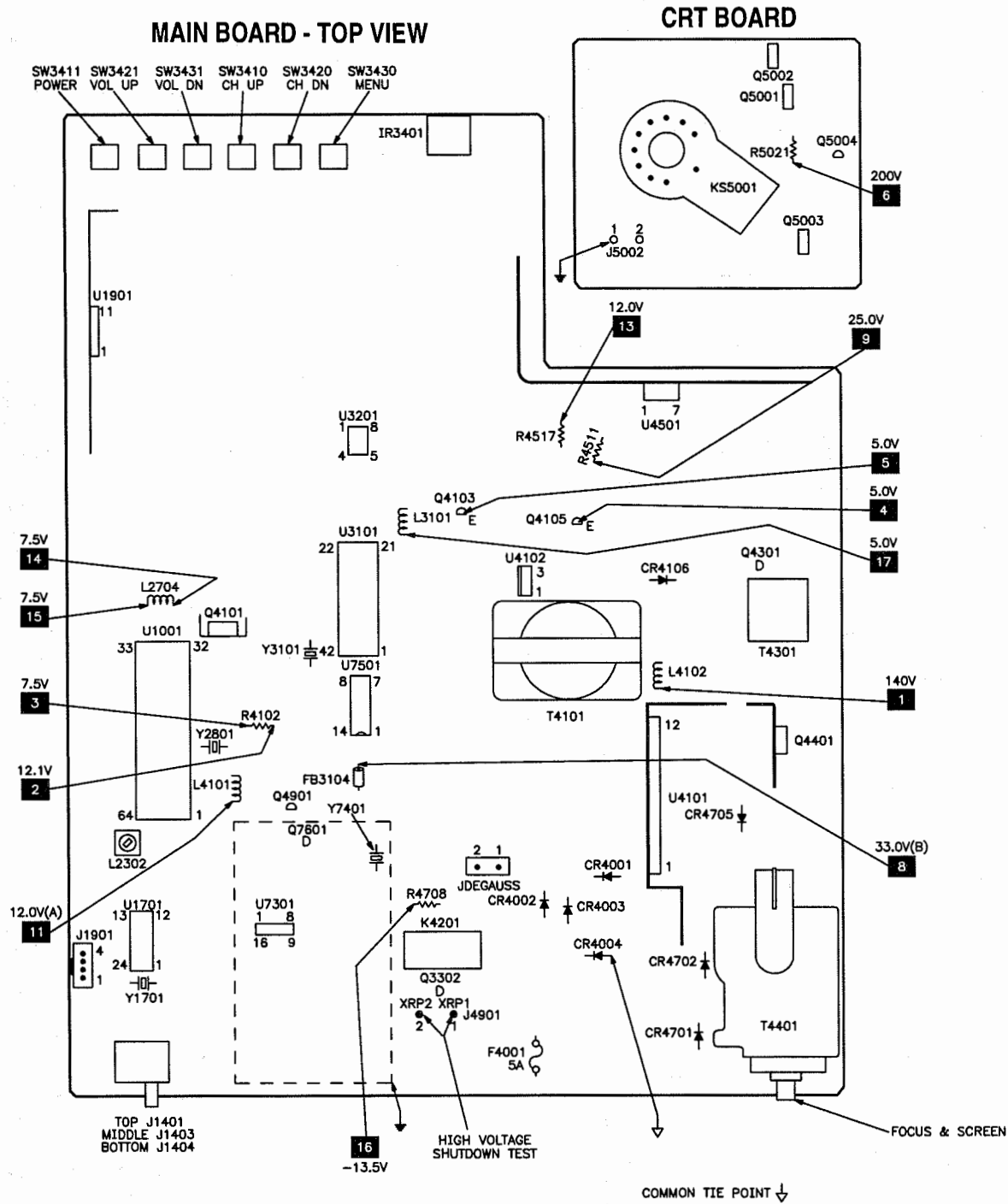
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PAGE 2G

RF SEC  
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PAGE 2G

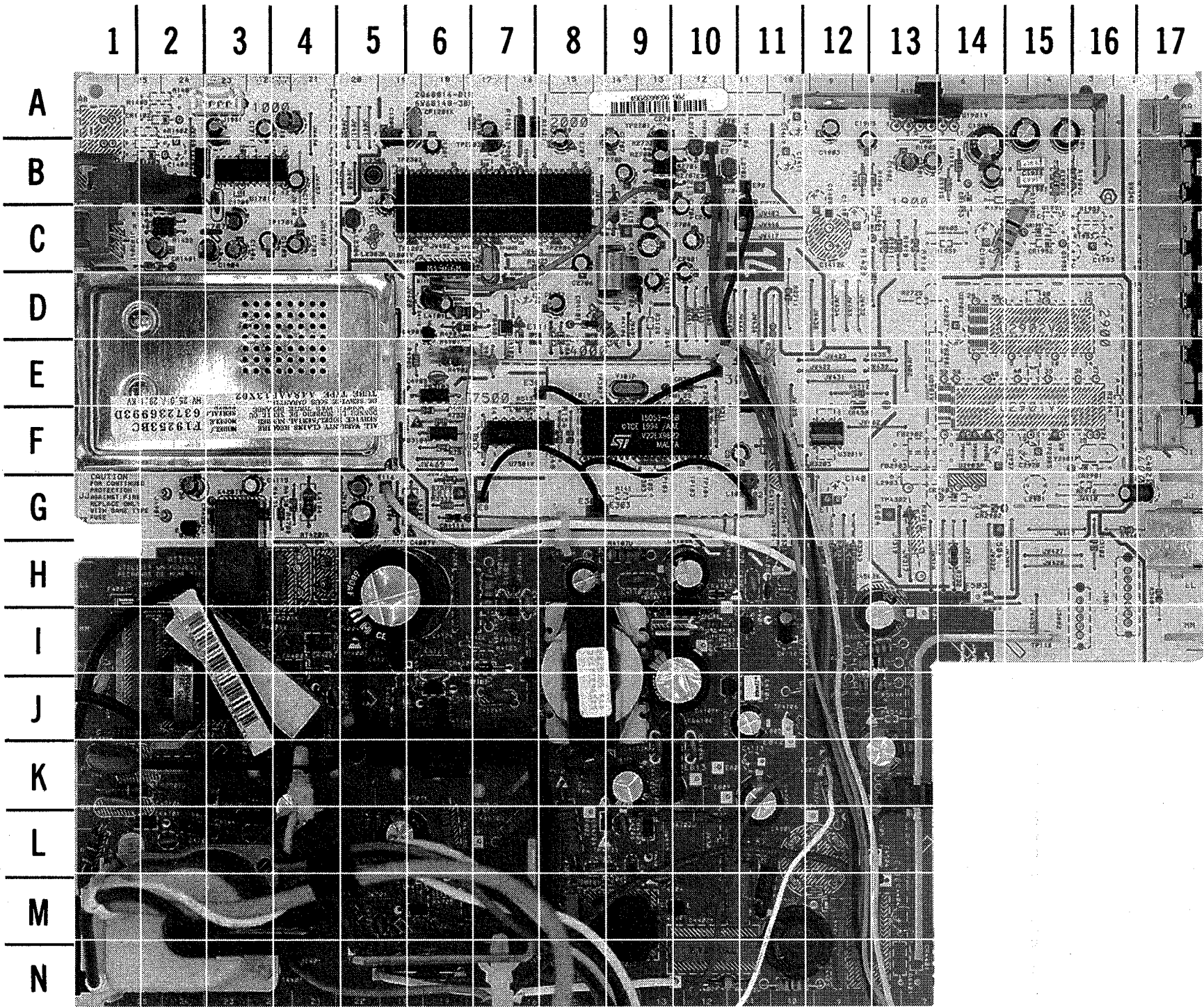
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PAGE 2G

DATA  
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PIN 20  
PAGE 2G

PLACEMENT CHART



MAIN BOARD - TOP VIEW



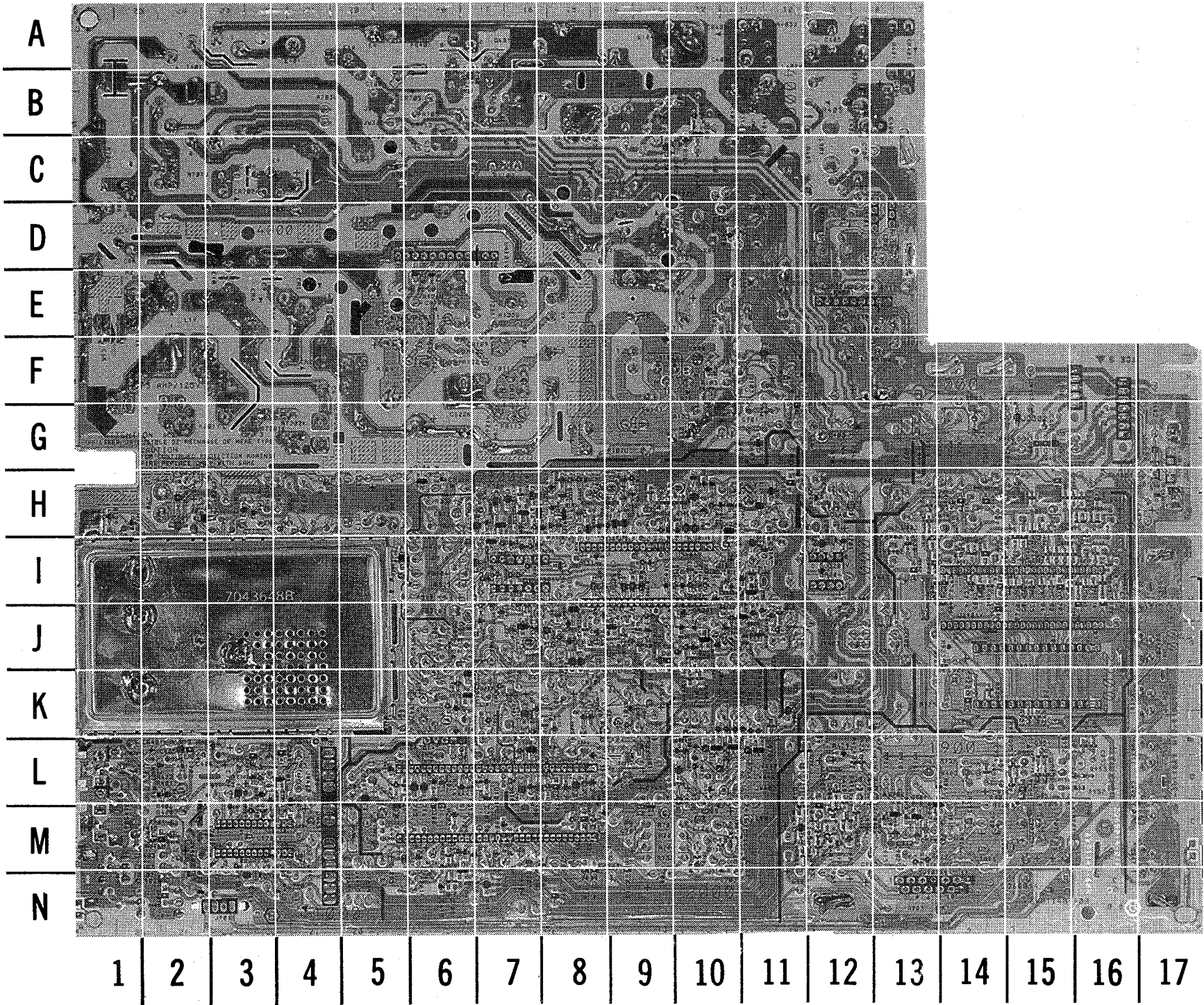
A HOWARD W. SAMS    GridTrace™    PHOTO

MAIN BOARD - TOP VIEW, GRIDTRACE LOCATION GUIDE

C1201	B-6	C4130	H-8	E4401	N-4	R2718	A-6	R7518	F-6
C1205	A-5	C4131	L-6	F4001	H-1	R2732	H-14	R7519	F-6
C1401	C-2	C4135	H-7	FB3101	E-11	R2733	B-10	R7520	G-6
C1404	C-3	C4136	J-6	FB3103	E-6	R3102	H-16	R7525	F-6
C1406	C-3	C4137	K-9	FB3104	F-6	R3143	D-10	RN4501	J-12
C1703	C-4	C4138	G-2	FB4102	I-7	R3154	F-8	RT4201	H-4
C1704	B-4	C4304	M-9	FB4106	J-10	R3203	F-12	SF2301	C-6
C1705	C-3	C4305	L-8	FB4107	K-10	R3311	F-10	SW3410	D-17
C1706	A-3	C4306	M-8	FB4108	I-10	R3315	H-11	SW3411	A-17
C1707	B-3	C4307	D-8	FB4109	I-9	R3329	D-11	SW3420	E-17
C1709	C-3	C4308	L-7	FB4112	I-7	R3332	G-6	SW3421	B-17
C1710	A-4	C4309	C-9	FB4113	H-7	R3343	H-12	SW3430	F-17
C1901	B-13	C4310	L-9	FB4401	N-6	R3348	F-8	SW3431	C-17
C1902	B-13	C4402	N-10	FB4402	M-11	R3401	G-16	T4101	I-8
C1903	A-12	C4403	M-12	FB4501	D-7	R3402	H-17	T4301	M-9
C1904	A-15	C4405	N-12	IR3401	G-17	R4001	I-2	T4401	M-2
C1905	B-12	C4406	N-8	J1401	C-1	R4102	D-7	U1001	C-5
C1906	A-15	C4407	M-11	J1403	C-1	R4103	I-10	U1701	B-3
C1907	B-15	C4502	I-13	J1404	C-1	R4104	I-5	U1901	A-13
C1909	B-14	C4504	L-13	K4201	G-3	R4105	J-6	U3101	F-8
C1910	B-14	C4505	L-13	L2302	B-5	R4106	D-9	U3201	F-12
C1911	B-15	C4506	K-13	L2304	C-5	R4107	H-9	U4101	K-5
C2306	D-6	C4701	L-5	L2701	B-10	R4110	L-7	U4102	I-9
C2311	B-5	C4702	L-2	L2702	B-10	R4111	I-10	U4501	K-13
C2701	A-7	C4703	L-4	L2703	A-10	R4113	L-6	U7501	F-7
C2702	C-10	C4704	L-3	L2704	C-9	R4122	I-7	XRP1	G-2
C2703	B-9	C4705	K-11	L3101	G-11	R4124	J-6	XRP2	G-2
C2704	B-10	C4706	L-9	L3102	F-11	R4125	I-7	Y1701	B-2
C2705	C-10	C4708	M-5	L4001	J-2	R4126	H-7	Y2801	C-7
C2706	C-8	C4709	M-7	L4101	D-6	R4128	J-5	Y3101	E-9
C2707	A-9	C4710	K-1	L4102	K-8	R4130	G-4		
C2708	B-9	C4901	H-11	L4103	G-6	R4131	G-3		
C2709	A-8	C4902	H-11	L4104	G-4	R4135	J-7		
C2713	C-9	C4905	E-6	L4201	H-4	R4303	H-12		
C2724	C-11	CF1201	A-6	L4401	M-7	R4305	L-8		
C2801	C-10	CR1401	C-2	L4402	N-11	R4306	M-8		
C3315	F-11	CR2702	D-9	Q3302	G-2	R4310	L-10		
C3402	G-16	CR3301	E-10	Q4101	C-9	R4312	E-12		
C4001	I-2	CR4001	J-4	Q4103	I-11	R4402	M-7		
C4003	J-4	CR4002	I-4	Q4105	J-10	R4403	N-11		
C4004	I-4	CR4003	I-4	Q4301	M-10	R4501	J-12		
C4006	J-1	CR4004	J-3	Q4401	N-6	R4502	I-13		
C4007	H-5	CR4101	D-8	Q4901	D-6	R4507	K-12		
C4008	K-1	CR4102	J-6	R1401	C-2	R4511	J-12		
C4009	J-4	CR4103	H-10	R1406	B-2	R4516	G-14		
C4010	J-3	CR4104	I-11	R1408	B-2	R4517	J-12		
C4101	C-9	CR4106	K-10	R1422	C-2	R4518	I-13		
C4104	J-11	CR4107	H-10	R1425	A-7	R4519	J-13		
C4105	K-9	CR4108	G-5	R1426	A-7	R4523	C-8		
C4107	J-10	CR4109	I-7	R1903	A-13	R4701	L-2		
C4108	H-10	CR4111	J-6	R1904	B-12	R4702	L-10		
C4109	K-10	CR4112	I-7	R1905	A-13	R4703	M-5		
C4110	H-9	CR4113	M-6	R1906	B-13	R4704	L-1		
C4112	J-11	CR4114	G-6	R1907	B-15	R4705	M-6		
C4115	G-3	CR4201	G-3	R1908	C-15	R4708	G-4		
C4116	D-6	CR4302	E-12	R1909	B-16	R4801	L-7		
C4117	G-5	CR4303	L-9	R1910	C-13	R4901	H-12		
C4118	I-11	CR4402	N-10	R1911	C-13	R4902	E-6		
C4122	H-6	CR4403	M-11	R1914	B-14	R4903	D-6		
C4123	I-6	CR4501	K-12	R1915	B-14	R4904	D-8		
C4124	I-6	CR4701	L-2	R1916	C-13	R4905	E-6		
C4125	G-5	CR4702	L-3	R2706	B-9	R4906	E-7		
C4126	J-7	CR4704	L-9	R2707	B-9	R4907	D-6		
C4127	I-5	CR4705	M-6	R2708	B-9	R7512	F-7		
C4128	H-7	CR4901	H-11	R2709	K-1	R7515	F-7		
C4129	D-9	CR4902	E-6	R2711	D-11	R7516	I-8		



MAIN BOARD - BOTTOM VIEW



MAIN BOARD - BOTTOM VIEW, GRIDTRACE LOCATION GUIDE

C1405	L-2	C3310	I-10	Q3303	I-11	R3101	H-9	R3325	I-10
C1701	M-4	C3311	I-11	Q3304	J-11	R3103	H-9	R3326	J-11
C1702	L-3	C3312	H-9	Q3305	J-10	R3104	H-9	R3327	I-10
C1708	L-3	C3313	H-10	Q4106	H-6	R3105	I-9	R3328	I-11
C1713	N-3	C3314	I-11	Q4302	B-10	R3106	H-8	R3330	M-8
C1714	N-3	C3316	I-10	Q7501	I-7	R3109	J-10	R3331	J-8
C1715	L-6	C3401	H-17	Q7502	H-7	R3111	H-10	R3344	J-8
C1716	L-6	C4103	E-6	R1201	M-6	R3112	H-10	R3345	J-11
C1717	A-3	C4111	F-11	R1203	M-6	R3114	H-10	R3347	J-10
C1908	M-15	C4114	D-11	R1407	L-2	R3115	H-10	R4101	K-9
C1912	M-13	C4119	H-4	R1409	L-2	R3118	H-8	R4108	G-11
C1913	M-13	C4120	L-8	R1427	L-5	R3119	H-8	R4109	L-7
C1914	M-13	C4121	L-8	R1701	M-4	R3120	H-8	R4112	F-11
C1915	M-13	C4133	K-7	R1702	N-4	R3121	J-10	R4119	K-9
C2301	L-6	C4134	M-9	R1703	L-3	R3122	J-10	R4127	K-8
C2302	L-6	C4201	H-2	R1704	M-3	R3123	J-9	R4129	E-6
C2307	L-7	C4302	C-10	R1705	L-3	R3124	H-8	R4132	H-6
C2308	L-6	C4303	B-9	R1710	L-3	R3125	H-9	R4133	L-8
C2309	L-5	C4311	L-8	R1711	M-3	R3129	H-8	R4134	K-7
C2312	M-5	C4313	H-12	R1712	N-4	R3130	H-8	R4136	E-5
C2313	L-6	C4401	B-7	R1717	M-3	R3131	H-8	R4201	H-2
C2718	J-9	C4501	L-9	R1901	M-12	R3132	H-7	R4301	L-7
C2723	M-2	C4503	L-9	R1902	M-12	R3133	H-7	R4302	K-7
C2802	M-7	C4507	D-13	R1912	M-13	R3134	H-9	R4304	C-10
C2803	K-7	C4903	L-7	R1913	M-13	R3135	H-10	R4307	K-7
C2804	N-2	C4904	K-6	R1962	M-13	R3138	J-10	R4308	L-8
C2805	M-7	C7109	L-4	R1963	M-13	R3140	H-10	R4309	B-10
C3101	H-10	C7123	H-1	R2301	K-6	R3142	H-9	R4311	L-8
C3102	H-10	C7501	I-8	R2312	L-7	R3145	H-7	R4314	J-12
C3103	H-9	C7502	I-7	R2313	K-6	R3150	J-10	R4520	K-8
C3104	H-9	C7503	J-8	R2314	L-6	R3151	J-7	R7129	H-1
C3106	H-9	C7504	I-6	R2315	K-6	R3152	J-8	R7130	H-1
C3107	H-8	C7505	J-6	R2316	L-6	R3153	J-9	R7131	H-3
C3109	H-9	C7506	J-7	R2702	K-8	R3201	I-12	R7133	H-3
C3110	H-10	C7507	H-7	R2703	L-10	R3202	I-12	R7501	I-7
C3112	I-10	CR3102	H-8	R2704	M-6	R3204	I-12	R7502	I-7
C3113	H-8	CR3110	J-8	R2705	M-6	R3301	H-8	R7503	I-7
C3114	I-8	CR3111	J-7	R2712	L-10	R3302	I-8	R7504	I-9
C3115	I-9	CR3303	H-10	R2713	K-10	R3303	J-8	R7505	I-9
C3117	J-11	CR4115	L-7	R2714	L-11	R3304	J-11	R7506	I-9
C3118	J-11	FB4110	I-5	R2715	K-11	R3305	I-10	R7507	I-7
C3318	I-10	FB4111	H-2	R2716	L-10	R3306	I-10	R7508	H-7
C3119	J-9	Q1701	L-4	R2717	K-10	R3310	H-10	R7509	I-7
C3122	H-8	Q1901	M-13	R2721	M-5	R3314	I-8	R7510	I-7
C3125	J-10	Q1902	M-13	R2726	M-8	R3316	I-9	R7511	I-7
C3126	H-8	Q1903	M-13	R2728	L-10	R3317	K-11	R7513	J-7
C3127	J-7	Q2701	L-10	R2729	L-10	R3318	H-9	R7514	J-7
C3128	H-11	Q2702	L-11	R2731	L-8	R3319	K-10	R7517	I-7
C3201	I-12	Q2703	L-10	R2801	L-10	R3320	I-11	R7521	H-7
C3301	J-8	Q2704	N-6	R2802	L-10	R3321	K-11	R7522	I-8
C3303	H-7	Q3101	H-8	R2803	K-7	R3322	J-10	R7523	J-7
C3306	H-11	Q3102	H-7	R2804	M-7	R3323	J-11	R7524	I-7
C3307	J-11	Q3301	J-9	R2805	M-7	R3324	J-10		

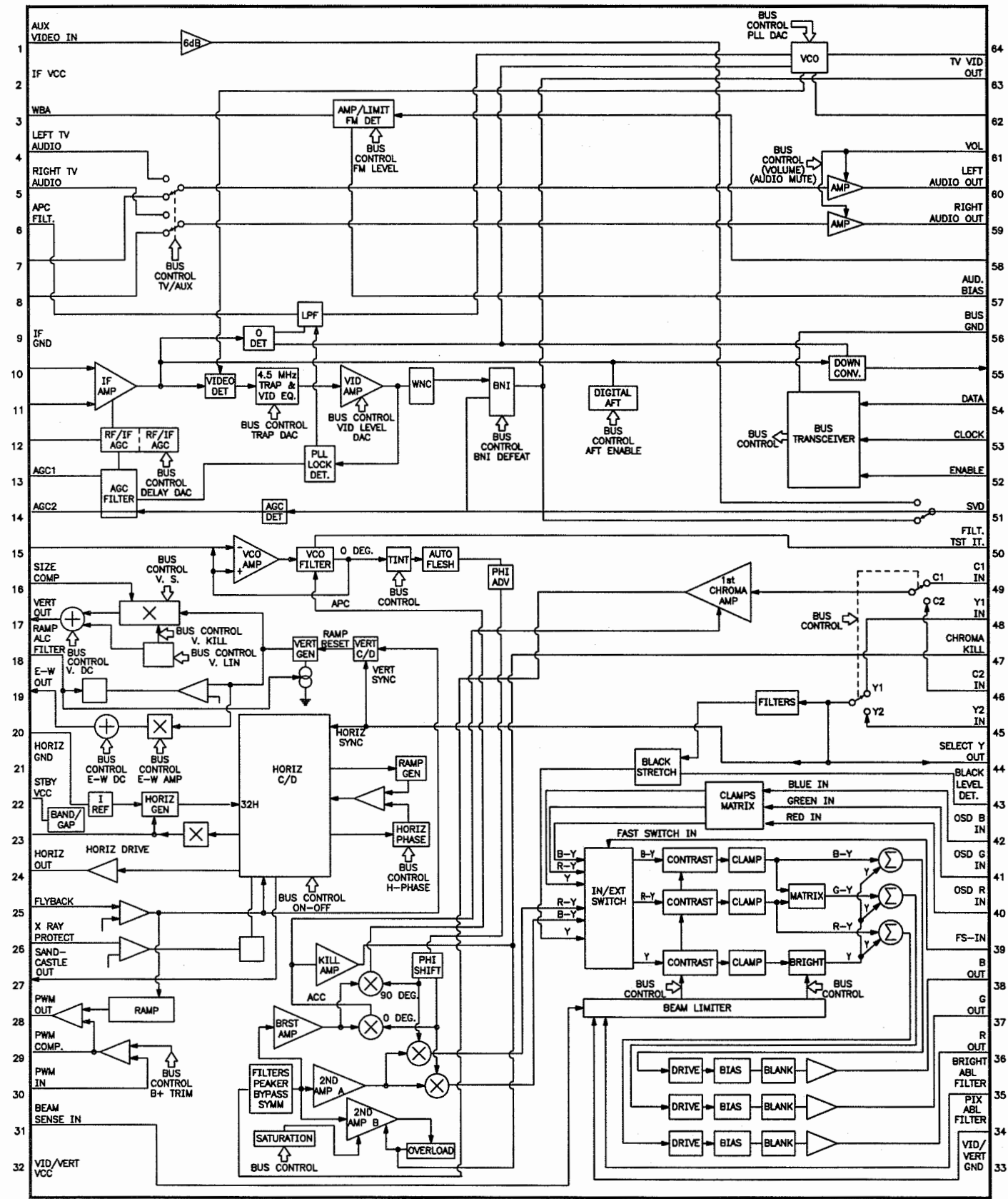
RCA

MODELS F19253BCJX1/TX1 (CHASSIS CTC176N2)

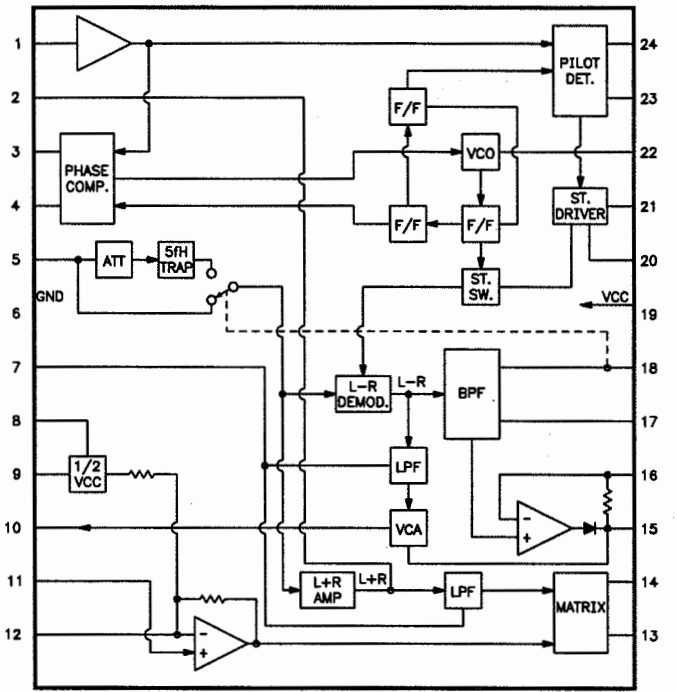


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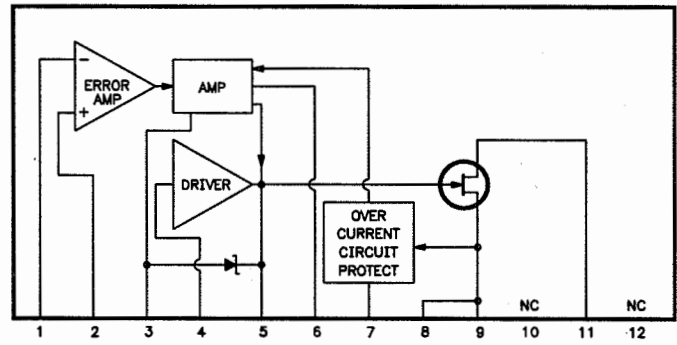
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LA7610



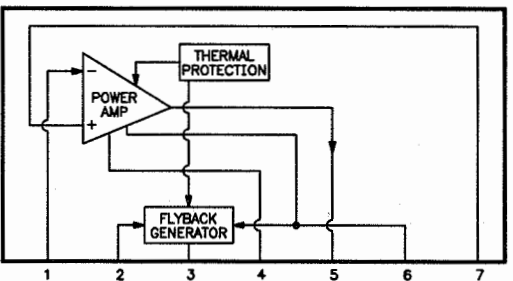
U1701  
LA7765



U4101  
STK730-010



U4501  
TDA8172



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.
Oscilloscope	SC3100
Generators	
RGB	CM2000
Multiburst Signal	VG91
Color Bar	VG91
TV Stereo	VG91
Digital VOM	SC3100
Frequency Meter	SC3100
Hi-Voltage Probe	HP200
Accessory Probes	TP212
Isolation Transformer	PR57
Capacitance Analyzer	LC101, LC102
CRT Analyzer	CR70
AC Leakage Tester	PR57
Inductance Analyzer	LC101, LC102
Flyback Yoke Tester	TVA92
TV Stereo Power Monitor	SR68, PA81
Field Strength Meter	SL750
Transistor Tester	TF46
Video Analyzer	VG91, TVA92



Created with pride by the employees of Howard W. Sams & Company.

J. Barker, N. Beck, A. Bonner,  
B. Buchanan, T. Clensy,  
G. Farrell, B. Fink, M. Herkless,  
J. Kocha, F. Malek, B. Medaris,  
R. Raus, B. Skinner

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.

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

SEMICONDUCTORS

(Select the replacement that gives the best results.)

Item No.	Type No.	Mfr. Part No.	NTE Part No.	ECG Part No.	TCE Part No.
CR1401	-	215487	-	-	-
CR2702	-	164717	NTE519	ECG519	SK3100
CR3102, 10	-	201133	-	-	-
CR3111	-	218987	-	-	-
CR3301	-	164717	NTE519	ECG519	SK3100
CR3303	-	201133	-	-	-
CR4001 Thru	-	-	-	-	-
CR4004	-	147015	NTE125	ECG125	SK5010A
CR4101	-	164874	NTE177	ECG177	SK9091
CR4102	-	176296	NTE125	ECG125	SK5010A
CR4103	-	164717	NTE519	ECG519	SK3100
CR4104	-	215488	-	-	-
CR4106	-	164589	NTE558	ECG558	SK3998
CR4107	-	164590	NTE580	ECG580	SK5036
CR4108	-	217306	-	-	-
	-	215489	-	-	-
CR4109	-	215490	-	-	-
CR4111	-	176296	NTE125	ECG125	SK5010A
CR4112	-	140971	NTE552	ECG552	SK9000
CR4113	-	176296	NTE125	ECG125	SK5010A
CR4114	-	164874	NTE177	ECG177	SK9091
CR4115	-	215491	-	-	-
CR4201	-	164717	NTE519	ECG519	SK3100
CR4302	-	164717	NTE519	ECG519	SK3100
CR4303	-	176296	NTE125	ECG125	SK5010A
CR4402	-	198596	-	-	-
CR4403	-	164589	NTE558	ECG558	SK3998
CR4501	-	147015	NTE125	ECG125	SK5010A
CR4701	-	207878	-	-	-
CR4702	-	176296	NTE125	ECG125	SK5010A
CR4704	-	207878	-	-	-
	-	164588	NTE587	ECG587	SK9937
CR4705	-	176296	NTE125	ECG125	SK5010A
# CR4901	-	157301	NTE177	ECG177	SK9091
# CR4902	-	159429	NTE5019T1	ECG5019T1	SK9970
CR7101, 02, 03 (1)	-	215492	-	-	-
CR7105	-	215493	-	-	-
CR7106, 07, 08 (2)	-	215494	-	-	-
CR7109, 10	-	215493	-	-	-
CR7111	-	215494	-	-	-
CR7112	-	215493	-	-	-
CR7113	-	215494	-	-	-
CR7114	-	215492	-	-	-
CR7301	-	215492	-	-	-
CR7302	-	215494	-	-	-
CR7303	-	215493	-	-	-
CR7304	-	215492	-	-	-
CR7305	-	215494	-	-	-
Q1701	-	215496	-	-	-
Q1901, 02, 03	-	215495	-	-	-
Q2701 Thru	-	-	-	-	-
Q2704	-	215496	-	-	-
Q3101	-	215495	-	-	-
Q3102	-	215496	-	-	-
Q3301	-	215496	-	-	-
Q3302	-	229220	-	-	-
Q3303	-	215496	-	-	-
Q3304	-	215495	-	-	-

# For SAFETY use only equivalent replacement part.  
(1) Part of Diode Kit (CR7101).  
(2) Part of Diode Kit (CR7106).

PARTS LIST continued

SEMICONDUCTORS continued

(Select the replacement that gives the best results.)

Item No.	Type No.	Mfr. Part No.	NTE Part No.	ECG Part No.	TCE Part No.
Q3305	-	215496	-	-	-
Q4101	-	157627	NTE54	ECG54	SK9366
Q4103, 05	-	229220	-	-	-
Q4106	-	215495	-	-	-
Q4301	-	146851	NTE287	ECG287	SK3433
Q4302	-	215495	-	-	-
Q4401	-	217654	-	-	-
# Q4901	-	147665	NTE159	ECG159	SK3466
Q5001, 02, 03	2SC3619	215497	NTE157	ECG157	SK3747
Q5004	-	143806	NTE159	ECG159	SK3466
	-	219025	NTE159	ECG159	SK3466
Q7101, 02	-	200566	-	-	-
Q7401	-	215495	-	-	-
Q7402	-	215496	-	-	-
Q7403	-	215495	-	-	-
Q7404	-	215496	-	-	-
Q7501, 02	-	215495	-	-	-
Q7601	-	146848	NTE229*	ECG229*	SK3246A*
# U1001	LA7610	215524	-	-	-
U1701	LA7765	215525	-	-	-
U1901	TDA7263	215526	-	-	-
U3101	SC4201	223909	-	-	-
U3201 (1)	24C021	223932	-	-	-
U4101	-	215530	-	-	-
U4102	L7812CV	162394	-	-	-
U4501	TDA8172	215531	NTE1788	ECG1788	SK9875
U7301	-	215532	-	-	-
U7401	-	215533	-	-	-
U7501	-	215534	-	-	-

# For SAFETY use only equivalent replacement part.  
\* Lead configuration may vary from original.  
(1) U3201 part number by chassis number.

CTC176 Family 1, 2				
U3201	218540	2F51002-02D	CTC176C	
U3201	218541	2F51008-05C	CTC176D2	
U3201	217657	2F51006-08A	CTC176E	
U3201	217658	2F51006-09A	CTC176F	
U3201	223923	2F51008-59C	CTC176F2	
U3201	221097	2F51008-02C	CTC176H2, J2	
U3201	224836	2F51008-61C	CTC176G2	
U3201	226422	2F51008-07C	CTC176J2	
U3201	221098	2F51008-03B	CTC176K2	
U3201	221099	2F51008-04B	CTC176L2	
U3201	223932	2F51008-62C	CTC176N2	
U3201	224752	2F51008-15B	CTC176P	
U3201	224836	2F51008-61C	CTC176P2	

CONTROLS & RESISTORS

Item No.	Function/Rating	Mfr. Part No.	NTE Part No.
# R1401	75 5% 1/4W	175756	QW075
# R1406, 08	2200 2% 1/4W Nonflammable	829222	QW222
# R1422	22 2% 1/4W Nonflammable	829022	QW022
R1711	3300 2% 1/4W	195938	QW233
# R1907	4.7 5% 1/4W	200197	QW4D7
# R1908	18 5% 3W	181234	3W018
# R1909	4.7 5% 1/4W	200197	QW4D7
R2704, 05	1000 2% 1/10W	197638	-
# R2709	27K 5% 1/2W	206037	HW327
R2728	470K 2% 1/10W	205381	-
R2729	240K 2% 1/8W	215687	EW424
R2732	1000 1% 1/4W	179753	-
R2801	15K 1% 1/10W	215198	-
R2802	15.8K 1% 1/10W	215199	-
R3343	5100 2% 1/4W	175417	QW251
# R4001	2.7 10% 15W Wirewound	190487	-
# R4002	2.7M 10% 1/2W	217662	HW527
# R4113	75 5% 2W Wirewound	205066	-
# R4135	27 2% 1/2W	830027	HW027
R4303	5100 2% 1/4W	175417	QW251
R4305	6200 5% 3W	179252	3W262
# R4403	820 5% 1W	175349	1W182
# R4507	1.5 5% 1W	178619	1W1D5
# R4511	1 10% 2W Wirewound	215577	-
# R4701	10 2% 1/2W Nonflammable	830010	HW010
# R4702, 03	3.6 5% 3W Wirewound	217655	-
# R4704	82K 5% 1/2W	830382	HW382
# R4705	100 5% 1/4W	829110	QW110
# R4901	100 5% 1/4W	829110	QW110
# R4902	27.4K 1% 1/4W	151883	-
# R4903	39.2K 1% 1/4W	190469	-
# R4904	10K 5% 1/4W	175317	QW310
# R4905	5100 2% 1/4W	175417	QW251
R7401	191K 1% 1/10W	215214	-
R7408	37.4K 1% 1/10W	215215	-
R7411	1M 1% 1/10W	215216	-
R7501 Thru			
R7503	10K 1% 1/10W	215217	-
R7504 Thru			
R7506	26.1K 1% 1/8W	215218	-
R7507	14.3K 1% 1/10W	215219	-
R7508	453 1% 1/8W	215220	-
R7509	15.8K 1% 1/10W	215199	-
R7510, 13	100K 1% 1/10W	215221	-
R7512, 15	15.8K 1% 1/4W	181121	-
R7516	100K 1% 1/10W	215221	-
RN4501	Resistor Network	215499	-
# RT4201	5 Cold PTC	207768	-

# For SAFETY use only equivalent replacement part.

COILS & TRANSFORMERS

Item No.	Function/Rating	Mfr. Part No.
FB3101, 03, 04	Ferrite Bead	153328
FB4102	Ferrite Bead	161237
FB4106, 07	Ferrite Bead	154322
FB4108, 09	Ferrite Bead	154042
FB4110, 11	Ferrite Bead	215546
FB4112, 13	Ferrite Bead	154042
FB4401	Ferrite Bead	161237
FB4402	Ferrite Bead	206390
FB4501	Ferrite Bead	215547
L2302	VCO	215502
L2304	2.2μH	197616
L2701, 02, 03	2.2μH	197616
L2704	10μH	175409
L3101	10μH	161243
L3102	100μH	160186
# L4000 (2)	Yoke Horiz 3.1mH Vert 23.6mH	-
# L4001	Line Filter	190507
L4101	10μH	175409
L4102	22μH	215504
L4103, 04	10μH	175409
L4201	Degaussing	221042
L4401	6.8μH	191141
# L4402	Horizontal Linearity	223176
	Horizontal Linearity	217308
L5002, 03, 04	56μH	196107
L7101	-	215507
L7102	-	215508
L7103	-	223929
L7104, 05	-	223917
L7106	-	215509
L7107	-	215510
L7108	-	215511
L7109	3.9μH	200559
L7110	-	223288
L7111	-	215512
L7112	-	215513
L7113	-	215514
L7114	-	215513
L7115	-	215515
L7301	-	223928
L7302	-	223930
L7303	-	215516
L7304	-	223920
L7305	-	215517
L7306	-	215554
L7601	.0068μH	195708
# T4101	Switch Mode	215538
	Switch Mode	221948
# T4301	Horizontal Driver	215541
# T4401 (1)	Horizontal Output	223931

# For SAFETY use only equivalent replacement part.  
(1) Focus and screen controls are part of T4401.  
(2) Yoke is bonded part of CRT.

PARTS LIST continued

CAPACITORS & ELECTROLYTICS

Item No.	Rating	Mfr. Part No.
C2302	470pF 5% 50V NPO	214732
C2718	220pF 5% 50V NPO	205551
C2803	16pF 2% 50V NPO	214736
C2805	120pF 5% 50V NPO	194902
C3101, 02	100pF 5% 50V NPO	193340
C3107	27pF 5% 50V NPO	197604
C3110	100pF 5% 50V NPO	193340
C3114, 15	27pF 5% 50V NPO	197604
C3122	220pF 5% 50V NPO	178188
C3306	22pF 5% 50V NPO	194903
C3307	47pF 5% 50V NPO	210689
C3311	82pF 5% 50V NPO	192049
C3313, 14	22pF 5% 50V NPO	194903
C3316	100pF 5% 50V NPO	193340
# C4001	200pF 5% 50V NPO	218986
	.22 275V	-
# C4003, 04	.22 20% 125V	214067
	680pF 20% 1kV	190538
# C4006	470pF 20% 120V	250102
	470pF 1.8kV	-
# C4007	680µF 20% 200V	190560
	330µF 20% 400V	203734
# C4008	.005 20% 120V	195697
# C4009, 10	680pF 20% 1kV	190538
# C4105	10µF 20% 200V	214743
	10µF 20% 200V	226507
# C4107	100µF 200V	-
	100µF 20% 180V	214744
# C4122	100µF +30% -10% 250V	218374
	.033 5% 400V	214747
C4126	.001 10% 1kV	160461
C4303	470pF 5% 50V NPO	214732
C4310	15pF 1% 250V NPO	223899
C4311	47pF 5% 50V NPO	210689
C4313	220pF 5% 50V NPO	178188
C4401	470pF 5% 50V NPO	195918
# C4402	.0087 1.6kV	203737
# C4403	.34 5% 250V	217303
# C4405	.0047 10% 250V	190534
# C4406	470pF 5% N1500 2kV	227068
	470pF 5% N1500 1.5kV	143242
# C4407	.047 5% 400V	214754
C4701	.01 20% 1kV	137583
C4702, 04	680pF 20% 1kV	190538
C4706, 08	680pF 20% 1kV	190538
C4710	.01 20% 1kV	137583
# C4904	.22µF +80% -20% 25V	214739
	C5001	.001 10% 3kV
C5005, 06, 07	120pF 5% 50V NPO	194902
	120pF 5% 50V NPO	174414
C7102	4pF ±.25pF 50V NPO	214757
C7103	22pF 5% 50V NPO	194903
C7104	120pF 5% 50V NPO	194902
C7105	.75pF ±.25pF 50V NPO	214758
C7108	27pF 5% 50V N750	214760
C7113	100pF 5% 50V NPO	193340
C7118	22pF 5% 50V NPO	194903
C7124	27pF 5% 50V NPO	197604
C7127	120pF 5% 50V NPO	194902
C7136	75pF 5% 50V NPO	192061

# For SAFETY use only equivalent replacement part.

CAPACITORS & ELECTROLYTICS continued

Item No.	Rating	Mfr. Part No.
C7139	20pF 2% 50V N220	214761
C7140	4pF ±.5pF 50V NPO	194901
C7301, 02	1.5pF ±.1pF 50V NPO	194904
	1.5pF ±.5pF 50V NPO	223146
C7304	68pF 2% 50V NPO	214762
C7305	39pF 2% 50V NPO	215556
C7306	68pF 2% 50V NPO	214762
C7307	10pF 5% 50V NPO	214740
C7308	5.6pF ±.25pF N750 50V	214764
C7309	10pF 2% 50V NPO	214765
C7310	8pF ±.5pF 50V N750	214766
C7311	5pF ±.5pF 50V NPO	193917
	2pF ±.5pF 50V NPO	194905
C7312	6pF ±.5pF 50V NPO	194906
	3pF ±.5pF 50V NPO	214767
C7313	10pF 5% 50V NPO	214740
C7316	8pF ±.5pF 50V NPO	194909
C7322	68pF 2% 50V NPO	214762
C7323	7pF 2% 50V NPO	214768
C7404, 05	68pF 5% 50V NPO	193339
C7410, 11	10pF 5% 50V NPO	214740
C7604	22pF 5% 50V NPO	194903
C7605	27pF 5% 50V NPO	197604

CABINET PARTS

Item	Mfr. Part No.
Models F19253BCJX1/TX1	
Button, Keyboard	226736
Mask, Cabinet Front	MK1875
Window, IR	226737
Remote Transmitter	
Battery Door	224263

MISCELLANEOUS

Item No.	Description	Mfr. Part No.	Notes
CF1201	Filter	195702	4.5MHz
# F4001	Fuse	175425	5Amp, 125V, Fast Acting
FL7102	Filter	181470	LC High Pass
IR3401	Remote	229217	Receiver
J1401	Jack	215544	Video Input
J1403	Jack	215544	R Audio Input
J1404	Jack	215544	L/mono Audio Input
# K4201	Relay	190490	Degaussing
# KS5001	Socket	189986	CRT
# P101	Line Cord	215576	AC, Polarized
SF2301	Filter	217318	SAW
SP1901	Speaker	183163	2 1/4" X 3 1/2", 32 Ohms
SP1902	Speaker	183163	2 1/4" X 3 1/2", 32 Ohms
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
V101	CRT	A48AAB132	A48AAB13X02
Y1701	Resonator	215501	377kHz
Y2801	Crystal	161235	3.58MHz
Y3101	Crystal	217322	8MHz
Y7401	Crystal	182839	4MHz
Adapter	Fuse Clip	193983	Antenna 75 To 300 Ohms
		176642	For F4001
		221133	Remote (CRK74B1)
		149903	Yoke Positioning (3 Used)

# For SAFETY use only equivalent replacement part.

RCA

MODELS F19253BCJX1/TX1 (CHASSIS CTC176N2)