

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.

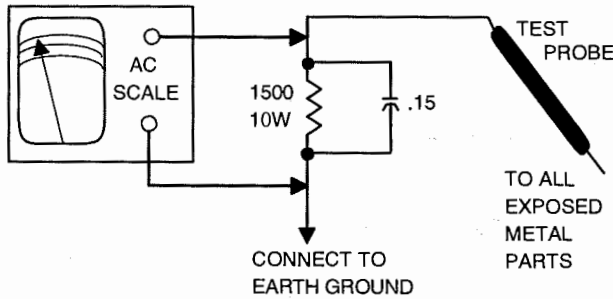
SAFETY CHECKS -- FIRE AND SHOCK HAZARD

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.



TEST JIG HOOKUP				
Function	Chek-A-Color Adapter No.	PC Board Plug No.	Chassis Pin No	Color
CRT	B239	P-Horiz	EY4409	Red
Yoke	D4160	P-Horiz	EY4413	Blue
Yoke Setting	YP3	P-Vert	P4501 1	Yellow
Comments	Focus Tap	P-Vert	P4501 4	Green

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.	

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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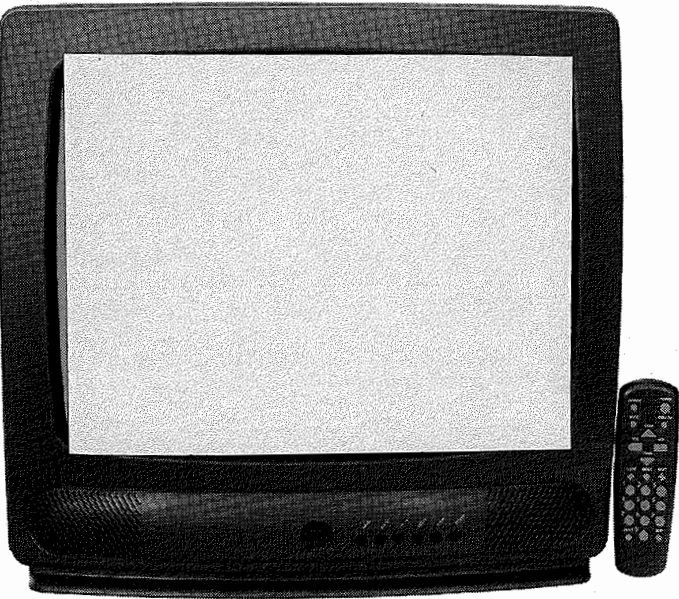
PHOTOFACT® Technical Service Data

SET 4178

MODEL 19GT317TX1 (CHASSIS CTC185A2)

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GE
Model 19GT317TX1 (Chassis CTC185A2)



Essential coverage
for servicing a television receiver...

- Schematics
- Component locations
- Parts list

Coverage includes these additional models and chassis:

MODELS	CHASSIS
19GT319TX1	CTC185A2
19GT320TX1	CTC185A2



HOWARD W. SAMS & COMPANY
AUGUST 1999 SET 4178

For Supplier Address,
See PHOTOFACT Annual Index

GE

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TUNER CIRCUIT VOLTAGE CHART

Pin	VHF Low Band	VHF High Band	UHF Band
U7301			
1	4.5V	4.5V	4.5V
2	3.1V	3.1V	3.2V
3	7.2V	7.1V	7.2V
4	3.1V	3.1V	3.2V
5	7.2V	7.2V	7.1V
6	0V	0V	0V
7	6.3V	6.3V	.2V
8	9.0V	9.0V	9.0V
9	3.4V	3.4V	3.4V
10	3.2V	3.2V	2.9V
11	3.2V	5.1V	10.0V
12	3.2V	3.2V	2.9V
13	0V	0V	0V
14	9.0V	9.0V	6.4V
15	3.5V	3.4V	3.2V
16	3.5V	3.4V	3.2V
U7401			
1	1.6V	1.6V	1.6V
2	2.6V	2.6V	2.6V
3	2.6V	2.6V	2.6V
4	34.5V	34.5V	34.5V
5	10.0V	10.0V	10.0V
6	1.7V	7.2V	6.3V
7	1.5V	5.8V	6.2V
8	.6V	7.2V	5.8V
9	5.0V	5.0V	5.0V
10	1.4V	1.4V	1.4V
11	1.4V	1.4V	1.4V
12	0V	0V	0V
13	0V	0V	0V
14	11.6V	11.6V	.3V
15	0V	0V	0V
16	0V	0V	0V
17	12.3V	.1V	.2V
18	4.9V	4.9V	4.9V
19	4.9V	4.9V	4.9V
20	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.			

Pin	VHF Low Band	VHF High Band	UHF Band
Q7101			
D	.5V	.5V	12.2V
G1	2.6V	2.6V	2.1V
G2	.2V	.2V	2.1V
S	0V	0V	0V
Q7102			
D	12.1V	12.1V	0V
G1	2.1V	2.1V	0V
G2	2.6V	2.6V	0V
S	0V	0V	0V
Q7402			
E	12.0V	12.0V	12.0V
B	12.3V	11.6V	11.5V
C	-12.0V	-12.2V	-12.2V
Q7403			
E	12.0V	12.0V	12.0V
B	.5V	.5V	12.2V
C	12.3V	12.3V	0V
Q7404			
E	12.0V	12.0V	12.0V
B	12.3V	12.3V	11.5V
C	.5V	.5V	12.2V
Note: VHF Low Band voltages taken on channel 2. VHF High Band voltages taken on channel 7. UHF Band voltages taken on channel 14.			

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 23kV to 25kV.

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 MENU CHART

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	09	00 - 15	Adjust to center picture left to right.
0 02	Vertical DC	31	00 - 63	Adjust to center picture top to bottom.
0 03	Vertical S Correction	06	00 - 15	Set value to 6.
0 04	Vertical Size	70	00 - 127	Adjust for 1/4" overscan top and bottom of screen.
0 05	Red Bias	05	00 - 127	Press menu button on the TV set for setup line.
0 06	Green Bias	20	00 - 127	Press menu button on the TV set for setup line.
0 07	Blue Bias	03	00 - 127	Press menu button on the TV set for setup line.
0 08	Red Drive	38	00 - 63	Press menu button on the TV set for setup line.
0 09	Green Drive	48	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	57	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	30	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 (do not include carrier portion).
0 14	VCO Tuning	87	00 - 127	Adjust for 3.8V at pin 12 of U1001.
0 15	APC Detector Adjust	30	00 - 63	Short pin 11 of U1001 to ground. Adjust for 3.8V at pin 12 of U1001.
0 16	Tint Preset	60	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	67	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	05	00 - 07	Adjust waveform at the emitter of Q2301 for 1Vp-p.
0 19	Vertical Linearity	07	00 - 15	Adjust for best linearity.
0 20	Vertical Countdown Mode	00	00 - 03	Set value to 00.

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 32. Preset the red, green, and blue bias values to provide 120VDC 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 raster. Check the low light to high light gray scale tracking. Repeat the procedure, if necessary, to obtain the best performance.

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

MISCELLANEOUS ADJUSTMENTS continued

ELECTRONIC TUNER ALIGNMENT

Use tuner alignment generator, RCA stock no. TAG001, and a VCR for signal source. Monitor IF AGC at pin 11 of U1001, and adjust for minimum voltage at each parameter. The entire Electronic Tuner Alignment procedure, once started, must be completed in its entirety.

Parameter No.	Parameter Name	Value Range	On Set Value
0 00	Pass number for tuner alignment parameters	Must set to 77	00
1 01	Ch. 2 secondary	00-62	25
1 02	Ch. 2 primary	00-62	20
1 03	Ch. 2 single	00-62	17
1 04	Ch. 6 secondary	00-62	49
1 05	Ch. 6 primary	00-62	37
1 06	Ch. 6 single	00-62	52
1 07	Ch. 98 secondary	00-62	52
1 08	Ch. 98 primary	00-62	43
1 09	Ch. 98 single	00-62	33
1 10	Ch. 15 secondary	00-62	57
1 11	Ch. 15 primary	00-62	56
1 12	Ch. 15 single	00-62	41
1 13	Ch. 17 secondary	00-62	47
1 14	Ch. 17 primary	00-62	57
1 15	Ch. 17 single	00-62	36
1 16	Ch. 18 secondary	00-62	30
1 17	Ch. 18 primary	00-62	24
1 18	Ch. 18 single	00-62	26
1 19	Ch. 9 secondary	00-62	38
1 20	Ch. 9 primary	00-62	30
1 21	Ch. 9 single	00-62	38
1 22	Ch. 29 secondary	00-62	41
1 23	Ch. 29 primary	00-62	34
1 24	Ch. 29 single	00-62	43
1 25	Ch. 39 secondary	00-62	48
1 26	Ch. 39 primary	00-62	42
1 27	Ch. 39 single	00-62	52

Parameter No.	Parameter Name	Value Range	On Set Value
1 28	Ch. 46 secondary	00-62	42
1 29	Ch. 46 primary	00-62	47
1 30	Ch. 46 single	00-62	46
1 31	Ch. 50 secondary	00-62	34
1 32	Ch. 50 primary	00-62	56
1 33	Ch. 50 single	00-62	47
1 34	Ch. 51 secondary	00-62	28
1 35	Ch. 51 primary	00-62	40
1 36	Ch. 51 single	00-62	37
1 37	Ch. 61 secondary	00-62	26
1 38	Ch. 61 primary	00-62	43
1 39	Ch. 61 single	00-62	31
1 40	Ch. 75 secondary	00-62	28
1 41	Ch. 75 primary	00-62	39
1 42	Ch. 75 single	00-62	27
1 43	Ch. 101 secondary	00-62	36
1 44	Ch. 101 primary	00-62	38
1 45	Ch. 101 single	00-62	36
1 46	Ch. 114 secondary	00-62	41
1 47	Ch. 114 primary	00-62	39
1 48	Ch. 114 single	00-62	42
1 49	Ch. 122 secondary	00-62	52
1 50	Ch. 122 primary	00-62	46
1 51	Ch. 122 single	00-62	50
1 52	Ch. 125 secondary	00-62	47
1 53	Ch. 125 primary	00-62	42
1 54	Ch. 125 single	00-62	42

MANUAL TUNER 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 adjust coils. This procedure is performed with top tuner cover removed and bottom tuner cover in place and soldered.

Band 1 Manual Alignment

1. Use tuner alignment generator, RCA stock no. TAG001, and a VCR for signal source. Connect DC voltmeter to pin 5 of U7401.
2. Set the tuner alignment generator for channel 17 output and tune to receive channel 17.
3. Adjust L7305 for 20.0V ±3V
4. Connect voltmeter to pin 11 of U1001.
5. Select parameter (1 13) and record the value. Adjust parameter (1 13) thru the value range and check for a null AGC voltage. If the null voltage does not appear, adjust L7115 and repeat step 5. If the null voltage appears, set parameter (1 13) to recorded value and continue to the next step.
6. Select parameter (1 14) and record the value. Adjust parameter (1 14) thru the value range and check for a null AGC voltage. If the null voltage does not appear, adjust L7114 and repeat step 6. If the null voltage appears, set parameter (1 14) to recorded value and continue to the next step.
7. Select parameter (1 15) and record the value. Adjust parameter (1 15) thru the value range and check for a null AGC voltage. If the null voltage does not appear, adjust L7112 and repeat step 7. If the null voltage appears, set parameter (1 15) to recorded value and continue to the next step.

Band 2 Manual Alignment

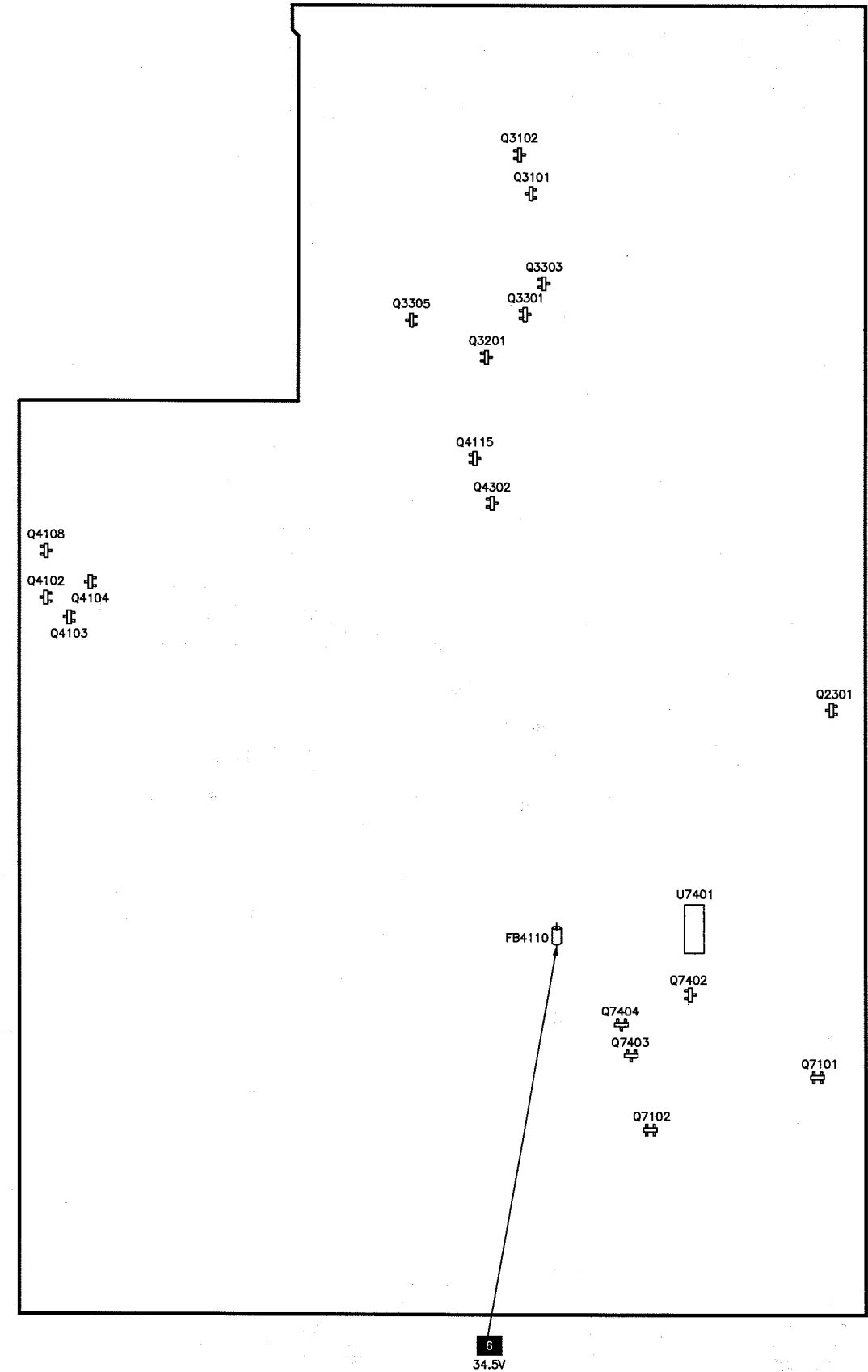
1. Use tuner alignment generator, RCA stock no. TAG001, and a VCR for signal source. Connect DC voltmeter to pin 5 of U7401.
2. Set the tuner alignment generator for channel 50 output and tune to receive channel 50.
3. Adjust L7304 for 23.7V ±3V
4. Connect voltmeter to pin 11 of U1001.
5. Select parameter (1 31) and record the value. Adjust parameter (1 31) thru the value range and check for a null AGC voltage. If the null voltage does not appear, adjust L7110 and repeat step 5. If the null voltage appears, set parameter (1 31) to recorded value and continue to the next step.
6. Select parameter (1 32) and record the value. Adjust parameter (1 32) thru the value range and check for a null AGC voltage. If the null voltage does not appear, adjust L7113 and repeat step 6. If the null voltage appears, set parameter (1 32) to recorded value and continue to the next step.
7. Select parameter (1 33) and record the value. Adjust parameter (1 33) thru the value range and check for a null AGC voltage. If the null voltage does not appear, adjust L7111 and repeat step 7. If the null voltage appears, set parameter (1 33) to recorded value and continue to the next step.

Band 3 Manual Alignment

1. Use tuner alignment generator, RCA stock no. TAG001, and a VCR for signal source. Connect DC voltmeter to pin 5 of U7401.
2. Set the tuner alignment generator for channel 125 output and tune to receive channel 125.
3. Adjust L7303 for 23.2V ±3V
4. Connect voltmeter to pin 11 of U1001.
5. Select parameter (1 52) and record the value. Adjust parameter (1 52) thru the value range and check for a null AGC voltage. If the null voltage does not appear, adjust L7102 and repeat step 5. If the null voltage appears, set parameter (1 52) to recorded value and continue to the next step.
6. Select parameter (1 53) and record the value. Adjust parameter (1 53) thru the value range and check for a null AGC voltage. If the null voltage does not appear, adjust L7105 and repeat step 6. If the null voltage appears, set parameter (1 53) to recorded value and continue to the next step.
7. Select parameter (1 54) and record the value. Adjust parameter (1 54) thru the value range and check for a null AGC voltage. If the null voltage does not appear, adjust L7104 and repeat step 7. If the null voltage appears, set parameter (1 54) to recorded value.

MODEL 19GT317TX1 (CHASSIS CTC185A2)

MAIN BOARD - BOTTOM VIEW



A

B

TELEVISION SCHEMATIC

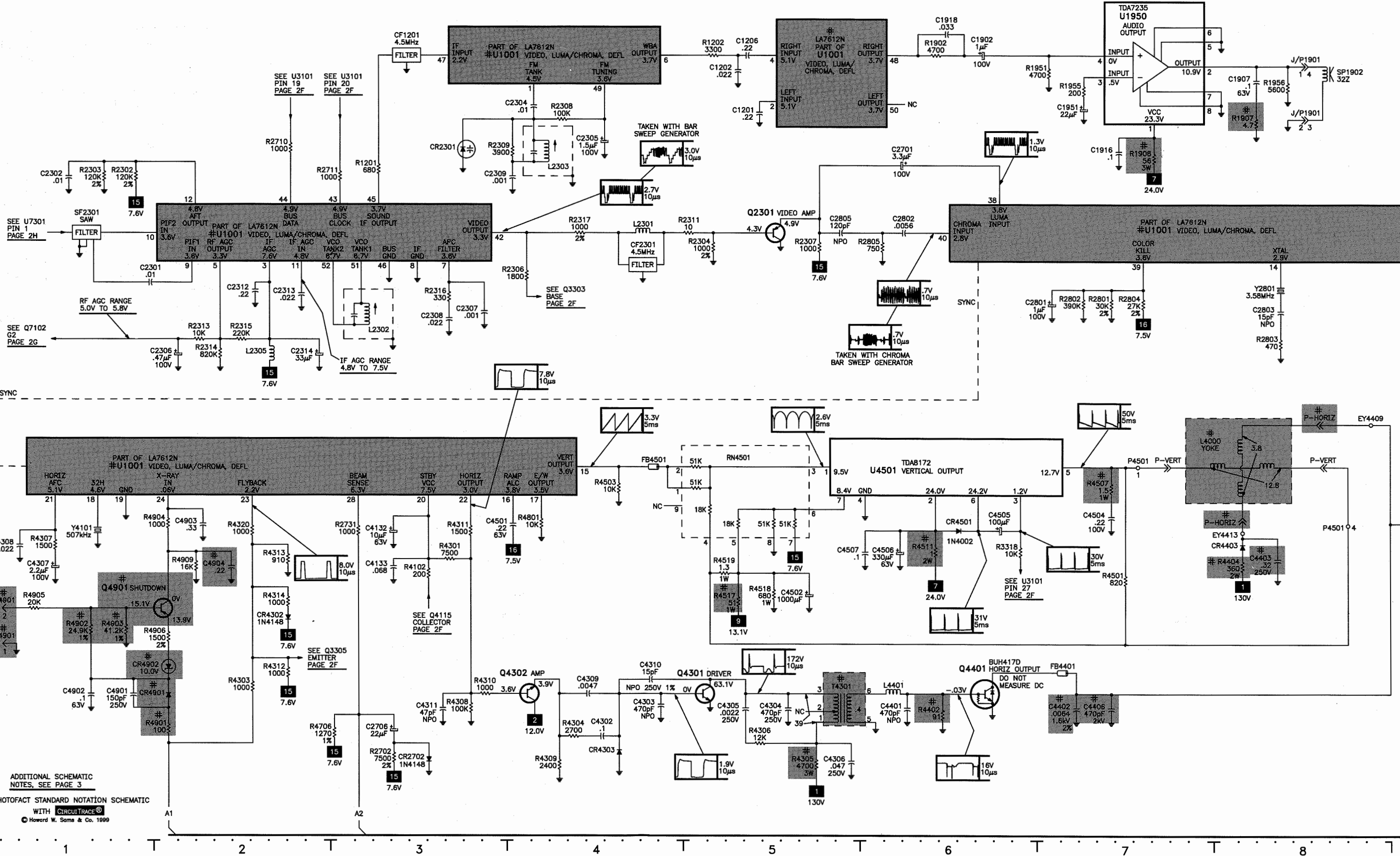
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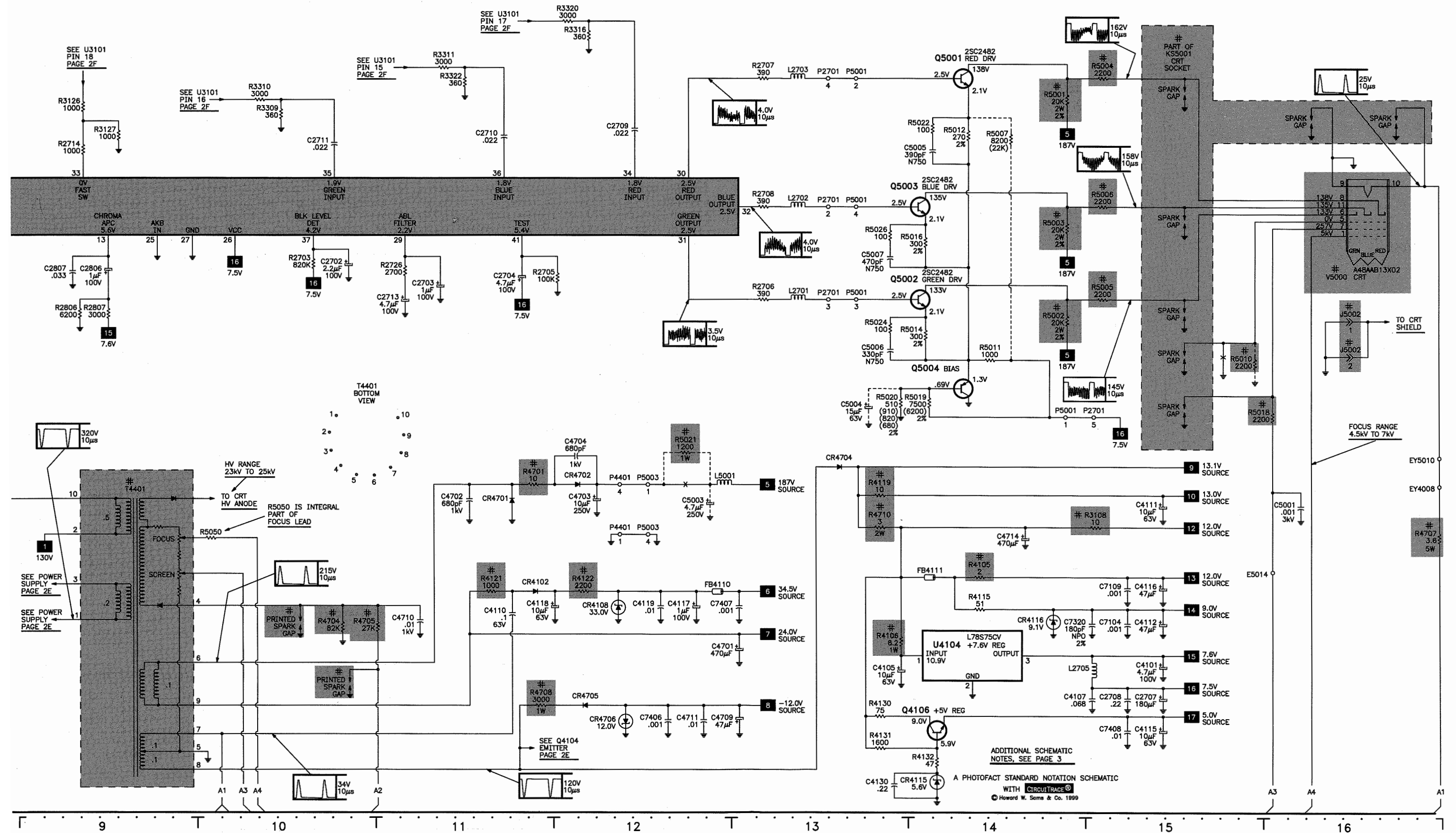
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ADDITIONAL SCHEMATIC NOTES, SEE PAGE 3

A PHOTOFACT STANDARD NOTATION SCHEMATIC WITH CIRCUITTRACE® © Howard W. Sams & Co. 1999

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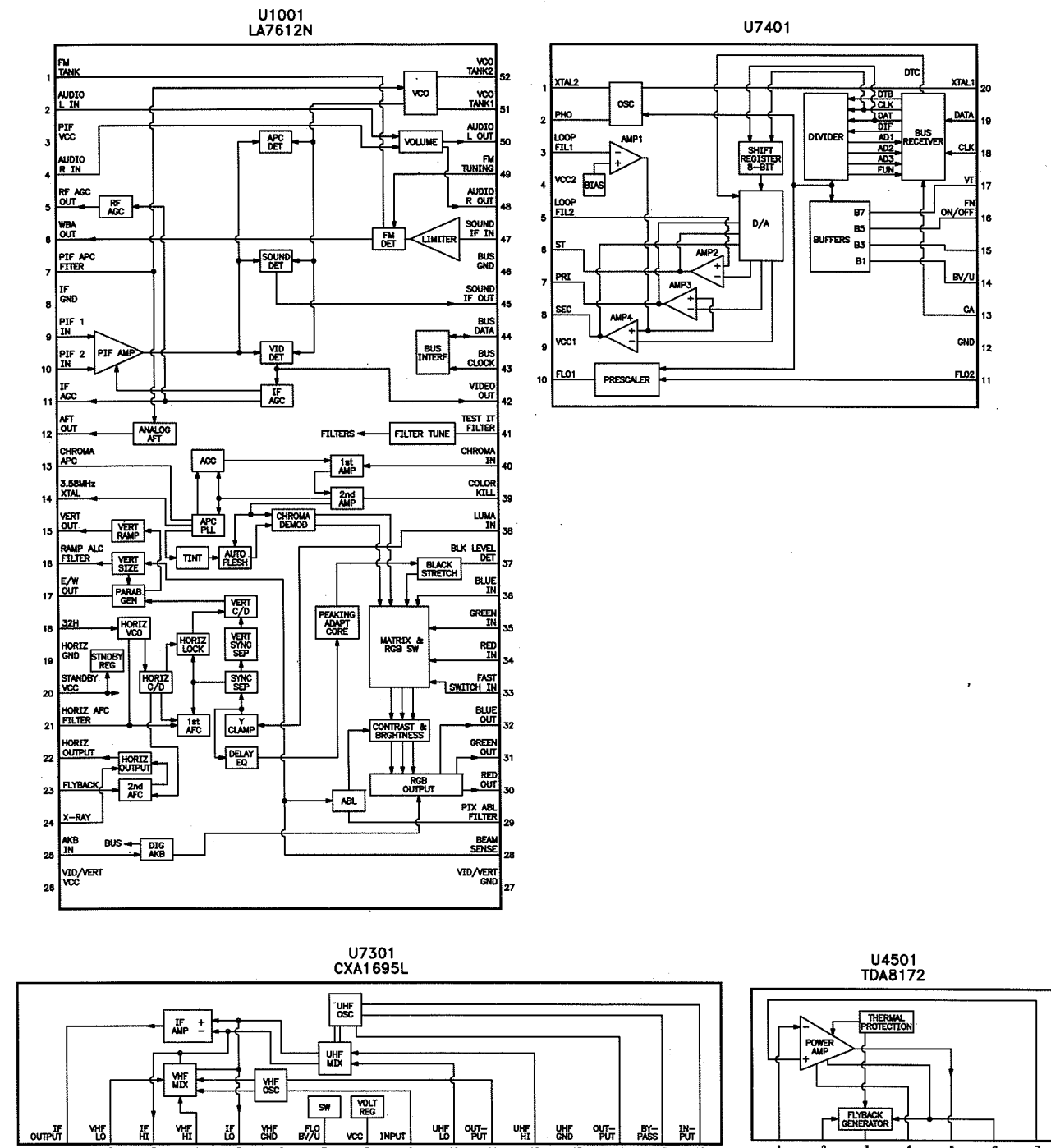
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IC FUNCTIONS



SCHEMATIC COMPONENT LOCATION GUIDE

C1201	A5	C4118	D12	C7126	C29	CR4117	B19	L7304	D30	R3103	B21	R4120	D18	R5020	C13	U1001	B2
C1202	A5	C4119	D12	C7127	B28	CR4201	B17	L7305	D30	R3104	C21	R4121	D11	R5021	C12	U1001	B7
C1206	A5	C4122	B18	C7129	B25	CR4302	D2	L7306	D30	R3105	B22	R4122	D12	R5022	B14	U1001	C1
C1902	A6	C4123	D20	C7130	B28	CR4303	E4	PCBC1	A29	R3106	B21	R4123	D19	R5024	C13	U1950	A7
C1907	A8	C4124	B20	C7131	D29	CR4403	D8	PCBC2	A29	R3107	E19	R4124	C19	R5026	B13	U3101	A22
C1916	B7	C4127	D20	C7132	B29	CR4501	D6	PW4001	A17	R3108	D14	R4125	D20	R5050	D10	U3201	B23
C1918	A6	C4130	E13	C7134	C27	CR4701	D11	Q2301	B5	R3109	E23	R4126	D19	R7101	B26	U4102	D18
C1951	A7	C4132	D3	C7136	C26	CR4702	D12	Q3101	E18	R3110	B22	R4127	C18	R7106	A27	U4103	D19
C2301	B1	C4133	D3	C7137	C27	CR4703	D17	Q3102	E19	R3111	A23	R4128	D19	R7108	D29	U4104	E14
C2302	B1	C4134	C19	C7139	A26	CR4704	D13	Q3201	B23	R3112	A23	R4130	E13	R7109	B27	U4501	C6
C2303	D21	C4135	C19	C7140	C26	CR4705	E12	Q3301	C21	R3113	A23	R4131	E13	R7110	B29	U7301	A31
C2304	A4	C4136	C17	C7142	C26	CR4706	E12	Q3302	B17	R3114	A23	R4132	E14	R7111	B30	U7401	E27
C2305	B4	C4137	B19	C7143	C28	CR4901	E2	Q3303	C21	R3115	A23	R4133	E19	R7112	C27	V5000	B16
C2306	C2	C4138	C18	C7145	B29	CR4902	E2	Q3305	D21	R3118	C23	R4136	D19	R7113	C27	Y2801	B8
C2307	C3	C4153	B20	C7146	B25	CR7101	A26	Q3901	E19	R3119	E18	R4137	D19	R7114	C27	Y3101	E22
C2308	C3	C4154	D17	C7147	B25	CR7102	A29	Q4102	C19	R3120	E17	R4138	C19	R7115	A30	Y4101	D1
C2309	B3	C4302	E4	C7148	D27	CR7103	A30	Q4103	C19	R3122	C23	R4142	C20	R7119	B28	Y7401	E29
C2312	B2	C4303	E4	C7149	C25	CR7105	C27	Q4104	C17	R3124	B21	R4143	D23	R7122	B30		
C2313	B2	C4304	E5	C7150	C26	CR7106	C27	Q4106	E14	R3125	B21	R4144	D23	R7123	C28		
C2314	C2	C4305	E5	C7151	C26	CR7107	C27	Q4108	C18	R3126	B9	R4145	C17	R7124	B29		
C2701	B6	C4306	E5	C7152	C26	CR7108	B29	Q4113	C20	R3127	B9	R4146	B19	R7125	C28		
C2702	B10	C4307	D1	C7153	C26	CR7109	C28	Q4114	B18	R3129	E18	R4147	C18	R7127	C29		
C2703	C11	C4308	D1	C7301	A30	CR7110	C29	Q4115	D23	R3130	E18	R4148	C17	R7128	B30		
C2704	B11	C4309	E4	C7302	A30	CR7111	B29	Q4116	C19	R3131	E23	R4149	D19	R7129	D27		
C2706	E3	C4310	E4	C7303	B31	CR7112	C27	Q4301	E5	R3132	E18	R4172	A19	R7130	B27		
C2707	E15	C4311	E3	C7304	C31	CR7113	C29	Q4302	E4	R3133	E18	R4173	C19	R7132	C29		
C2708	E15	C4401	E6	C7305	A32	CR7114	A26	Q4401	E6	R3134	D23	R4301	D3	R7136	D30		
C2709	B12	C4402	E7	C7307	C32	CR7301	B30	Q4901	D1	R3140	A23	R4303	E2	R7138	C27		
C2710	B11	C4403	D8	C7308	B31	CR7302	C31	Q5001	A14	R3145	E19	R4304	E4	R7139	A25		
C2711	B10	C4406	E7	C7309	B31	CR7303	D29	Q5002	C13	R3149	D21	R4305	E5	R7140	B25		
C2713	C11	C4501	D3	C7310	B31	CR7304	B31	Q5003	B13	R3150	D21	R4306	E5	R7141	C28		
C2801	B7	C4502	D5	C7311	C31	F4001	A17	Q5004	C14	R3201	B23	R4307	D1	R7142	C28		
C2802	B6	C4504	D7	C7312	C31	FB3101	E18	Q7101	A28	R3202	B23	R4308	E3	R7145	D27		
C2803	C8	C4505	D6	C7314	C30	FB3901	E19	Q7102	C28	R3203	B24	R4309	E4	R7147	B28		
C2805	B5	C4506	D6	C7315	D29	FB4110	D12	Q7402	D28	R3204	B23	R4310	E3	R7148	A26		
C2806	B9	C4507	D5	C7316	D30	FB4111	D14	Q7403	B28	R3301	A22	R4311	D3	R7149	C30		
C2807	B9	C4701	E13	C7318	C30	FB4401	E7	Q7404	B27	R3302	C22	R4312	E2	R7150	A29		
C3101	A23	C4702	D11	C7320	D15	FB4501	C4	R1201	B3	R3303	C21	R4313	D2	R7151	D29		
C3102	A23	C4703	D12	C7322	B32	IR3402	A21	R1202	A5	R3305	D23	R4314	D2	R7301	B30		
C3108	D23	C4704	D12	C7323	D30	J7101	A25	R1902	A6	R3306	D23	R4320	D2	R7302	B31		
C3111	E20	C4709	E13	C7325	D29	K4201	A18	R1907	A8	R3309	B10	R4402	E6	R7303	C31		
C3112	E20	C4710	D11	C7326	A32	K4201	B17	R1908	B7	R3310	B10	R4404	D8	R7306	C30		
C3113	E17	C4711	E12	C7402	D30	K55001	A15	R1951	A7	R3311	A11	R4501	D7	R7307	C30		
C3114	E22	C4714	D14	C7403	D30	L2301	B4	R1955	A7	R3314	B17	R4503	D4	R7308	C30		
C3115	E22	C4901	E1	C7404	D30	L2302	C3	R1956	A8	R3316	A12	R4507	D7	R7309	C31		
C3121	E18	C4902	E1	C7405	E29	L2303	B4	R2302	B1	R3317	E22	R4511	D6	R7310	B30		
C3126	E19	C4903	D2	C7406	E12	L2305	C2	R2303	B1	R3318	D6	R4517	D5	R7311	B31		
C3128	E20	C4904	D2	C7407	D13	L2701	C13	R2304	B5	R3320	A12	R4518	D5	R7313	D29		
C3131	E23	C5001	D16	C7408	E15	L2702	B13	R2306	B4	R3321	C21	R4519	D5	R7315	D30		
C3201	B24	C5003	D12	C7409	D26	L2703	A13	R2307	B5	R3322	A11	R4701	D11	R7316	A31		
C3301	C21	C5004	C13	C7410	E26	L2705	E15	R2308	A4	R3324	D22	R4704	D10	R7317	A32		
C3310	E23	C5005	B14	C7411	E26	L4000	C7	R2309	B3	R3325	D22	R4705	D11	R7401	D31		
C3315	C22	C5006	C13	C7412	E28	L4001	A17	R2311	B4	R3326	C21	R4706	E2	R7404	D30		
C3316	E23	C5007	B13	C7413	D30	L4102	B18	R2313	C2	R3331	C22	R4707	D16	R7405	E26		
C3401	A21	C7101	A25	C7415	D28	L4200	B18	R2314	C2	R3343	D21	R4708	E11	R7406	E26		
C3402	A21	C7102	A26	CF1201	A3	L4401	E6	R2315	C2	R3345	C21	R4710	D13	R7407	D30		
C3901	E19	C7103	A27	CF2301	B4	L5001	D12	R2316	B3	R3347	E22	R4801	D4	R7408	D31		
C4001	A17	C7104	D15	CR2301	B3	L7101	A25	R2317	B4	R3401	A21	R4901	E2	R7410	B27		
C4003	A19	C7105	A29	CR2702	E3	L7102	A26	R2702	E3	R3402	A22	R4902	D1	R7412	D28		
C4004	B19	C7106	A29	CR3102	E19	L7103	A28	R2703	B10	R4001	A18	R4903	D1	R7413	B27		
C4005	A19	C7107	D27	CR4001	A18	L7104	A29	R2705	B12	R4002	D17	R4904	D2	R7414	B28		
C4007	A19	C7108	A30	CR4002	A19	L7105	A29	R2706	C13	R4004	A17	R4905	D1	R7415	D28		
C4101	E15	C7109	D15	CR4003	B19	L7106	C26	R2707	A13	R4102	D3	R4906	D2	R7416	D28		
C4102	D18	C7110	C27	CR4004	B18	L7107	C26	R2708	B13	R4103	B19	R4909	D2	R7417	D29		
C4103	D19	C7111	D29	CR4102	D11	L7108	C27	R2710	B2	R4104	D18	R5001	A14	RT4201	A18		
C4104	B18	C7112	C30	CR4103	B18	L7109	B28	R2711	B3	R4105	D14	R5002	C14	SF2301	B1		
C4105	E13	C7113	C28	CR4104	E19	L7110	C27	R2714	B9	R4106	E13	R5003	B14	SP1902	A8		
C4106	C19	C7114	B25	CR4105	B18	L7111	C29	R2726	B11	R4107	E19	R5004	A15	SW3410	B21		
C4107	E15	C7115	B28	CR4106	C19	L7112	C29	R2731	D3	R4108	B18	R5005	C15	SW3411	B21		
C4108	C18	C7116	B28	CR4107	C17	L7113	C29	R2801	B7	R4110	C19	R5006	B15	SW3420	B21		
C4109	D19	C7117	C28	CR4108	D12	L7114	C29	R2802	B7	R4111	D19	R5007	B14	SW3421	B21		
C4110	D11	C7118	C28	CR4109	D17	L7115	C27	R2803	C8	R4113	D17	R5010	C15	SW3430	C21		
C4111	D15	C7119	B29	CR4110	D17	L7116	C25	R2804	B7	R4114	C19	R5011	C14	SW3431	C21		
C4112	D15	C7120	A25	CR4111	C19	L7117	C26	R2805	B6	R4115	D14	R5012	B14	T4301	E5		
C4114	E19	C7122	B29	CR4112	C19	L7118	C26	R2806	C9	R4116	C18	R5014	C14	T4401	A20		
C4115	E15	C7123	B27	CR4113	C19	L7301	B32	R2807	C9	R4117	D18	R5016	B14	T4401	D9		
C4116	D15	C7124	A27	CR4115	E14	L7302	A32	R3101	B21	R4118	C18	R5018	C16	U1001	A4		
C4117	D12	C7125	C28	CR4116	D14	L7303	B30	R3102	C21	R4119	D13	R5019	C14	U1001	A5		

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 CIRCUITTRACE® 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.

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)
- 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.	ECG Part No.	NTE Part No.	TCE Part No.
CR2301	-	227051	-	-	-
CR2702	1N4148	164717	ECG519	NTE519	SK3100
CR3102	-	232709	-	-	-
CR4001 Thru	-	-	-	-	-
CR4004	-	147015	ECG125	NTE125	SK5010A
CR4102	-	227066	-	-	-
CR4103	-	233082	-	-	-
CR4104	-	223083	-	-	-
CR4105	-	164589	ECG558	NTE558	SK3998
CR4106	-	207878	-	-	-
CR4107	-	164717	ECG519	NTE519	SK3100
CR4108	-	215489	-	-	-
CR4109	1N4002	155276	ECG116	NTE116	SK3311
CR4110	-	233084	-	-	-
CR4111	-	225702	-	-	-
CR4112, 13	-	207878	-	-	-
CR4115	-	215488	-	NTE136	-
CR4116	-	227362	-	-	-
CR4117	-	242171	-	-	-
CR4201	1N4148	164717	ECG519	NTE519	SK3100
CR4302	1N4148	164717	ECG519	NTE519	SK3100
CR4303	-	176296	ECG125	NTE125	SK5010A
CR4403	-	176296	ECG125	NTE125	SK5010A
CR4501	1N4002	155276	ECG116	NTE116	SK3311
CR4701	-	241304	-	-	-
CR4702	-	176296	ECG125	NTE125	SK5010A
CR4703	1N4002	155276	ECG116	NTE116	SK3311
CR4704	-	207878	-	-	-
CR4705	-	227066	-	-	-
CR4706	-	220637	-	-	-
# CR4901	-	157301	ECG177	NTE177	SK9091
# CR4902	-	159429	ECG5019T1	NTE5019T1	SK9970
CR7101	-	215492	-	-	-
CR7102 (1)	-	-	-	-	-
CR7103 (1)	-	-	-	-	-
CR7105	-	215493	-	-	-
CR7106	-	233085	-	-	-
CR7107, 08	-	211863	-	-	-
CR7109, 10	-	215493	-	-	-
CR7111	-	211863	-	-	-
CR7112	-	215493	-	-	-
CR7113	-	233085	-	-	-
CR7114 (1)	-	-	-	-	-
CR7301 (1)	-	-	-	-	-
CR7302	-	211863	-	-	-
CR7303	-	215493	-	-	-
CR7304 (1)	-	-	-	-	-
Q2301	-	215496	-	-	-
Q3101	-	215495	-	-	-
Q3102	-	215496	-	-	-
Q3201	-	215496	-	-	-
Q3301	-	215496	-	-	-
Q3302	-	223704	-	-	-
Q3303, 05	-	215496	-	-	-
Q3901	-	229220	-	-	-
Q4102, 03	-	215496	-	-	-
Q4104	-	215495	-	-	-
Q4106	-	229220	-	-	-
Q4108	-	215496	-	-	-

For SAFETY use only equivalent replacement part.
(1) Part of CR7101 diode kit.

SEMICONDUCTORS continued

(Select the replacement that gives the best results.)

Item No.	Type No.	Mfr. Part No.	ECG Part No.	NTE Part No.	TCE Part No.
Q4113	-	146851	ECG287	NTE287	SK3433
Q4114	-	242204	-	-	-
-	-	231523	-	-	-
Q4115	-	215496	-	-	-
Q4116	-	229220	-	-	-
Q4301	-	146851	ECG287	NTE287	SK3433
Q4302	-	215495	-	-	-
Q4401	BUH417D	233182	-	-	-
# Q4901	-	147665	ECG159	NTE159	SK3466
Q5001, 02, 03	2SC2482	231533	ECG399	NTE399	SK9352
Q5004	-	219025	ECG159	NTE159	SK3466
Q7101, 02	-	226973	-	-	-
Q7402	-	215496	-	-	-
Q7403	-	231534	-	-	-
Q7404	-	215496	-	-	-
# U1001	LA7612N	241266	-	-	-
U1950	TDA7235	231531	-	-	-
U3101	-	233180	-	-	-
U3201	24C02	233181	-	-	-
U4102	-	162394	-	NTE966	-
U4103	-	231525	-	-	-
U4104	L78S75CV	231526	-	-	-
U4501	TDA8172	215531	ECG1788	NTE1788	SK9875
U7301	CXA1695L	231528	-	-	-
U7401	-	231529	-	-	-

For SAFETY use only equivalent replacement part.

GE

MODEL 19GT317TX1 (CHASSIS CTC185A2)

PARTS LIST continued

CONTROLS & RESISTORS			
Item No.	Function/Rating	Mfr. Part No.	NTE Part No.
# R1907	4.7 5% 1/4W	200197	QW4D7
# R1908	56 5% 3W	231514	3W056
R2302, 03	120K 2% 1/10W	207834	-
R2304, 17	1000 2% 1/10W	197638	-
R2702	7500 2% 1/4W	175761	QW275
R2801	30K 2% 1/10W	200176	-
R2804	27K 2% 1/4W	175326	QW327
# R3108	10 5% 1/4W	241259	QW010
R3111, 12	220 5% 1/4W	-	QW122
	220 2% 1/4W	175324	QW122
R3202	120K 2% 1/10W	207834	-
	120K 5% 1/10W	-	-
# R4001	2.7 10% 15W Wirewound	190487	-
# R4002	1000 5% 10W Wirewound	231504	10W210
# R4004	1.8M 10% 1/2W	220333	HW518
# R4103	.12 5% 2W	242202	2WD12
# R4105	2 5% 1/4W	181419	QW2D0
# R4106	8.2 5% 1W	235378	1W8D2
R4111	100K 1% 1/10W	215221	-
# R4114	10K 5% 3W	189989	3W310
# R4119	10 5% 1/4W	241259	QW010
# R4121	1000 5% 1/2W	175350	HW210
# R4122	2200 5% 1/4W	175042	QW222
R4136	143K 1% 1/4W	184980	-
R4137	2870 1% 1/10W	231505	-
R4142	30K 2% 1/10W	200176	-
# R4146	430 5% 1W	242207	1W143
# R4147	220 5% 3W	231461	3W122
# R4305	4700 5% 3W	175368	3W247
# R4402	91 5% 1/2W	227249	HW091
# R4404	360 5% 2W	231465	2W136
# R4507	1.5 5% 1W	178619	1W1D5
# R4511	1 10% 2W Wirewound	215577	-
# R4517	51 5% 1W	217314	1W051
# R4701	10 10% 1/2W	241261	HW010
# R4704	82K 10% 1/2W	239116	HW382
# R4705	27K 10% 1/2W	238958	HW327
R4706	1270 1% 1/4W	231516	-
# R4707	3.6 5% 5W	235699	-
# R4708	3000 5% 1W	200446	1W230
# R4710	3 5% 2W Wirewound	223898	-
# R4901	100 5% 1/4W Nonflammable	198667	QW110
# R4902	24.9K 1% 1/4W	235700	-
# R4903	41.2K 1% 1/4W	176500	-
R4906	1500 2% 1/10W	197628	-
# R5001, 02, 03	20K 2% 2W Nonflammable	233034	2W320
# R5004, 05	2200 10% 1/2W	502222	HW222
# R5006, 10	2200 10% 1/2W	502222	HW222
R5012	270 2% 1/4W	178282	QW127
R5014, 16	300 2% 1/4W	175354	QW130
# R5018	2200 10% 1/2W	502222	HW222
R5019	7500 2% 1/4W	175761	QW275
	6200 2% 1/4W	-	QW262
R5020	510 2% 1/4W	240937	QW151
	910 2% 1/4W	203097	QW191
	820 2% 1/4W	175043	QW182
	680 2% 1/4W	175312	QW168
# R5021	1200 5% 1W	179782	1W212
# R7139, 40	1.8M 10% 1/2W	220333	HW518
RN4501	Network	215499	-
# RT4201	5.5 PTC Cold	207768	-
# For SAFETY use only equivalent replacement part.			

CAPACITORS & ELECTROLYTICS		
Item No.	Rating	Mfr. Part No.
C2303	120pF 5% 50V NPO	194902
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% 250VAC	-
	.22 20% 125VAC	231451
# C4003, 04	680pF 20% 1kV	190538
# C4007	470µF 20% 200V	242196
C4108	120pF 5% 50V NPO	194902
C4124	680pF 20% 1kV	190538
C4134, 35	220pF 5% 50V NPO	205551
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	.0064 2% 1.6kV	231456
# C4403	.32 5% 250V	223819
# C4406	470pF 5% 2kV	227068
C4702, 04	680pF 20% 1kV	190538
C4710	.01 20% 1kV	137583
# C4904	.22 +80% -20% 25V	217298
C5001	.001 10% 3kV	120696
C5005	390pF 5% 50V N750	220630
C5006	330pF 5% 50V N750	147667
C5007	470pF 5% 50V N750	233025
# C7101	330pF 20% 125VAC	235376
C7102	4pF +0pF -.25pF 50V NPO	214757
C7103	22pF 5% 50V NPO	194903
C7105	.75pF ±.25pF 50V NPO	214758
C7108	27pF 5% 50V N750	214760
C7110	1.5pF ±.1pF 50V NPO	223146
# C7114	100pF 20% 120V	235377
C7117	2pF ±.5pF 50V NPO	194905
C7118	22pF 5% 50V NPO	194903
# C7120	330pF 20% 125VAC	235376
C7124	27pF 5% 50V NPO	197604
C7127	120pF 5% 50V NPO	194902
# C7129	330pF 20% 125VAC	235376
C7136	180pF 2% 50V NPO	241265
C7137	330pF 5% 50V NPO	205227
C7139	20pF 2% 50V N220	214761
C7140	6pF ±.25pF 50V NPO	227250
# C7146, 47	330pF 20% 125VAC	235376
C7149	22pF 5% 50V NPO	194903
C7150	150pF 5% 50V NPO	214032
C7151	20pF 5% 50V NPO	220150
C7152	43pF 5% 50V NPO	214029
C7153	39pF 5% 50V NPO	202905
C7301, 02	1.5pF ±.1pF 50V NPO	223146
C7304	2pF ±.25pF 50V NPO	194905
C7305	75pF 5% 50V NPO	192061
C7307	20pF 5% 50V NPO	220150
C7308	5pF ±.25pF 50V N750	231457
C7309	10pF 50V N750	231458
C7310	8pF ±.5pF 50V N750	214766
# For SAFETY use only equivalent replacement part.		

CAPACITORS & ELECTROLYTICS continued		
Item No.	Rating	Mfr. Part No.
C7311, 12	5pF ±.25pF 50V N750	231457
C7316	8pF ±.5pF 50V NPO	194909
C7320	180pF 2% 50V NPO	241265
C7322	24pF 2% 50V NPO	231459
C7323	6pF ±.25pF 50V NPO	227250
C7326	82pF 2% 50V NPO	231460
C7405	33pF 5% 50V NPO	194911
C7410, 11	10pF 5% 50V NPO	200537

CABINET PARTS	
Item	Mfr. Part No.
Model 19GT317TX1	
# Button, Cap	233540
# Button, Cluster	233123
# Mask & Back Assembly	MK1970
# Window, IR	233539
Model 19GT319TX1	
# Button, Cap	233540
# Button, Cluster	233123
# Mask & Back Assembly	MK1971
# Window, IR	233539
Model 19GT320TX1	
# Button, Cap	239235
# Button, Cluster	233123
# Mask & Back Assembly	MK2117
# Window, IR	240826
# For SAFETY use only equivalent replacement part.	

PARTS LIST continued



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COILS & TRANSFORMERS

Item No.	Function/Rating	Mfr. Part No.
FB3101	Ferrite Bead	226467
FB3901	Ferrite Bead	226467
FB4110, 11	Ferrite Bead	215546
FB4401	Ferrite Bead	227410
FB4501	Ferrite Bead	215547
L2301	15µH	197613
L2302	VCO	215502
L2303	FM Tank	233056
L2305	10µH	175409
L2701, 02, 03	8.2µH	149170
L2705	10µH	175409
# L4000 (1)	Yoke Horiz 3.0 mH Vert 23.0mH	
# L4001	Line Choke	190507
L4102	320µH	231466
L4200	Degaussing	221042
L4401	6.8µH	191141
L5001	180µH	231467
L7101	-	215507
L7102	-	236641
L7103	-	223929
L7104, 05	-	236642
L7106	-	237456
L7107	-	233057
L7108	-	233074
L7109	3.9µH	200559
L7110	-	233075
L7111	-	233076
L7112	-	231441
L7113	-	233077
L7114	-	231441
L7115	-	233078
L7116	-	237461
L7117	-	237460
L7118	-	237461
L7301	-	231443
L7302	-	231444
L7303	-	233079
L7304	-	233080
L7305	-	236643
L7306	-	231448
# T4301	Horizontal Driver	215541
# T4401 (2)	Horizontal Output	231530

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

MISCELLANEOUS

Item No.	Description	Mfr. Part No.	Notes
CF1201	Filter	195702	4.5MHz
CF2301	Filter	181125	4.5MHz
# F4001	Fuse	175425	5Amp, 125V, Fast Acting
IR3402	Receiver	237682	Remote
# 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", 1.5W, 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
# V5000	CRT	A48AAB132	A48AAB13X02
Y2801	Crystal	161235	3.58MHz
Y3101	Crystal	217322	8MHz
Y4101	Crystal	227064	507kHz
Y7401	Crystal	230708	4MHz
	Fuse Holder	176642	For F4001 (2 Used)
	Transmitter	240961	Remote, CRK20A2

For SAFETY use only equivalent replacement part.

GE

MODEL 19GT317TX1 (CHASSIS CTC185A2)