

SAFETY PRECAUTIONS

SERVICE WARNING

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

SERVICING THE HIGH VOLTAGE AND CRT

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

X-RAY RADIATION AND HIGH VOLTAGE LIMITS

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

GENERAL GUIDELINES

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

HIGH VOLTAGE SHUTDOWN TEST

Apply 120VAC, turn the receiver on, and set all customer controls for normal operation. Measure the voltage at TP7. Voltage should measure between 16.5V and 21.0V. If voltage exceeds this range the circuit must be repaired. Momentarily connect a jumper between TP7 and the cathode of D421. 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 for 30 seconds and then restore AC power.

The listing of any available replacement part herein in no case constitutes a recommendation, warranty, or guarantee by SAMS Technical Publishing, LLC as to the quality and suitability of such replacement part. The numbers of the listed parts have been compiled from information furnished to SAMS Technical Publishing, LLC by the manufacturers of the specific type of replacement part listed.

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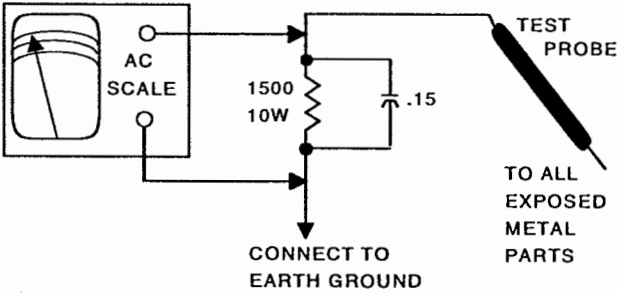
SAFETY CHECKS — FIRE AND SHOCK HAZARD

Cold Leakage Checks for Receivers with Isolated Ground

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

Hot Leakage Current Check

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



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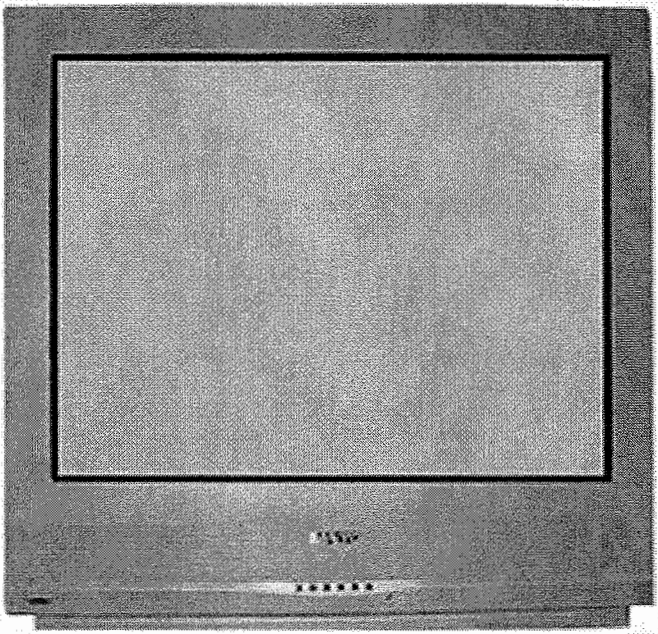
MODEL DS31820 (CHASSIS 31820-00)

SANYO

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SANYO
Model DS31820 (Chassis 31820-00)



Representative Model

Essential coverage
for servicing a television receiver...

- Schematics
- Component locations
- Parts list



OCTOBER 2004 SET 4943

For a Complete List of Manuals,
Visit www.samswebsite.com

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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	CM2125
Multiburst Signal	VG91
Color Bar	VG91
TV Stereo	VG91
Digital VOM	SC3100
Frequency Meter	SC3100
Hi-Voltage Probe	HP200
Accessory Probes	TP212
Isolation Transformer	PR570
Capacitance Analyzer	LC102
CRT Analyzer	CR7000
AC Leakage Tester	PR570
Inductance Analyzer	LC102
Flyback Yoke Tester	TVA92
Field Strength Meter	SL753
Transistor Tester	TF46
Horizontal Analyzer	HA-2500
Video Analyzer	VG91, TVA92

MISCELLANEOUS ADJUSTMENTS

B+ CHECK

Connect a digital DC voltmeter to the cathode of D625. Set brightness and picture to minimum. With AC line set to 120VAC, B+ should read 130V \pm 2.0V.

HIGH VOLTAGE CHECK

Tune in a picture. Set customer controls to minimum. Connect a high voltage probe to CRT anode. High voltage should measure 27kV to 32kV.

ENTERING SERVICE MODE

Disconnect the AC power cord. While pressing the menu button on the front of the set, connect the AC power cord. Use the channel up and down buttons to select the service number. Use volume up and down buttons to change the value. Press the menu button to exit the service mode.

HORIZONTAL WIDTH

Tune in a crosshatch pattern. Enter the service mode and select service item number 8 EWD. Adjust for the proper horizontal width.

HORIZONTAL POSITION

Tune in a crosshatch pattern. Enter the service mode and select service item number 07 HP. Adjust for the best horizontal centering.

VERTICAL SIZE

Tune in a crosshatch pattern. Enter the service mode and select service item number 04 VS. Adjust for proper vertical size and best vertical linearity.

VERTICAL CENTERING

Tune in a crosshatch pattern. Check that the pattern is centered. If too low, change resistor R513 from 1000 ohms 1W to 330 ohms 1W. If too high, remove resistor R513 1000 ohms 1W.

VCO

VCO must be adjusted after IC101, IC802, or T151 is replaced. Tune in a picture. Connect positive lead of a digital voltmeter to pin 58 of IC101 and the negative lead to TE7. Adjust T151 to obtain a reading of 3.6V \pm 0.2VDC.

VIDEO LEVEL

Tune in a color bar pattern. Set picture and brightness to normal. Connect an oscilloscope to the emitter of Q202, and the negative lead to ground. Enter the service mode and select service number 46 VL. Adjust for 1.0Vp-p \pm 0.1Vp-p waveform on the oscilloscope.

GRAY SCALE

Tune in a crosshatch pattern. Enter the service mode. Set the value of service number 21 RB to 6, and set the value of service number 16 GB, and 17 BB to 0. Set the value of service numbers 18 RD, 19 GD, and 20 BD to 31. Set screen control, color, brightness, and picture to minimum. Adjust screen control, if necessary, to obtain a barely visible lines. Select service number 119. Adjust the bias levels for white lines. Select service number 118 DRV and adjust the drive values for normal black and white picture at all brightness levels.

SUB BRIGHTNESS

Tune in a color bar pattern. Set picture and brightness to normal. Connect positive lead of a digital voltmeter to TP51 and the negative lead to TP50. Enter the service mode and select service number 28 SB. Adjust for 820mV \pm 10mV.

SUB COLOR, SUB TINT, SUB SHARPNESS

Tune in a picture. Enter the service mode. Select service number 27 SCO. Adjust for normal color level. Select service number 26 STI. Adjust for normal flesh tones. Select service number 29 SSH. Adjust for contrast range.

INPUT LEVEL

Set generator to 1kHz audio frequency and L-R modulating signal. Connect an oscilloscope to pin 38 of IC3401. Enter service mode and select the service item number 105 ATT. Adjust for 0.7Vp-p waveform.

SEPARATION

Set generator to pilot, 300Hz audio frequency, and left modulating signal. Connect an oscilloscope to pin 38 of IC3401 and ground. Enter the service mode and select service number 106 WDB. Adjust for minimum amplitude of the waveform. Set generator to 8kHz audio frequency. Select service number 107 SPC and adjust for minimum amplitude of the waveform.

CONVERGENCE / PURITY

The deflection yoke is bonded to the CRT. Convergence and purity adjustments are not required.

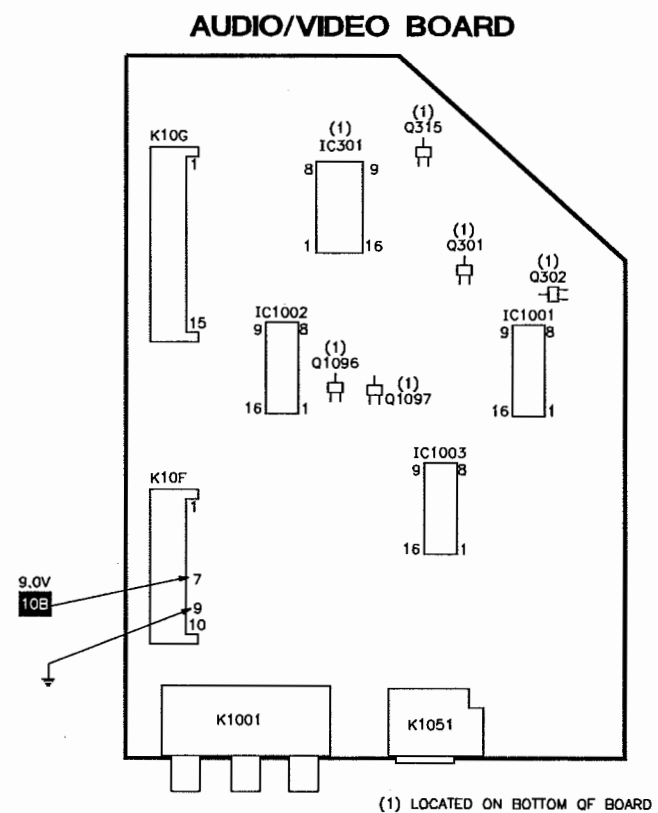
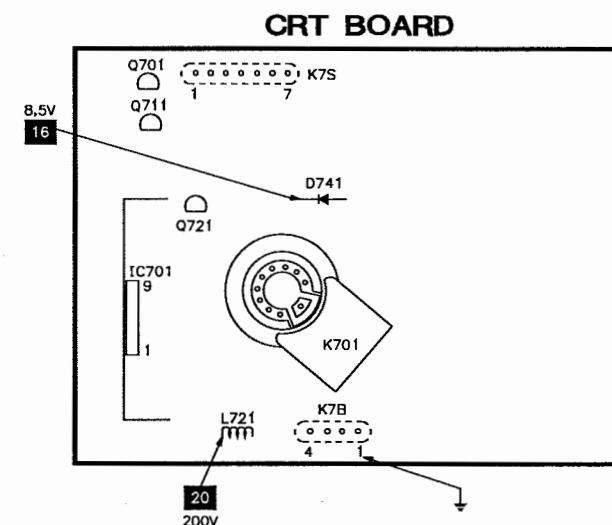
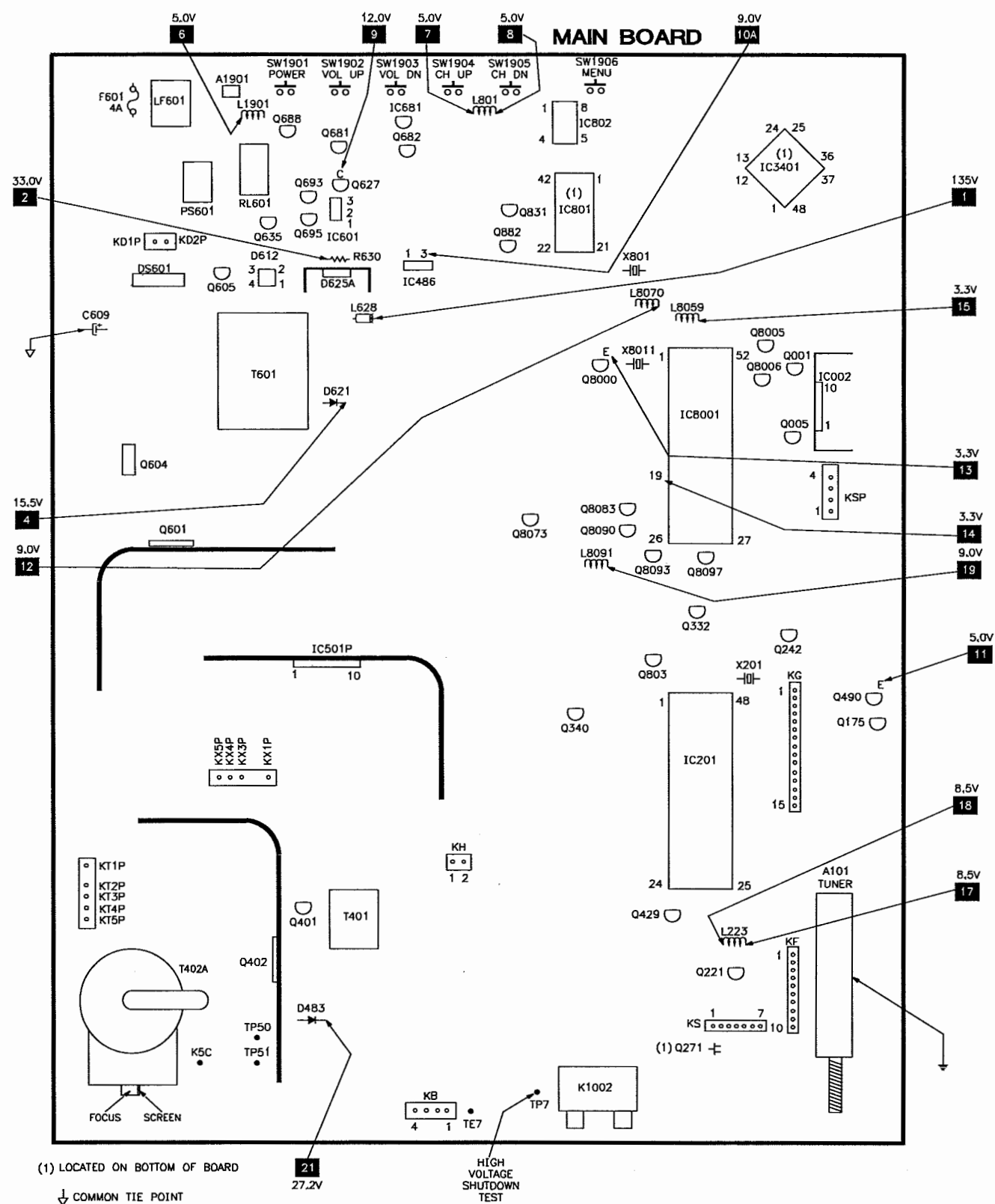
IC802 REPLACEMENT

Perform the following adjustments after replacing IC802. Enter the service mode, select service number 4 VS and set value to 17. Select service number 5 VLN and set value to 8. Select service number 6 VSC and set value to 2. Select service number 7 HP and set value to 24. Select service number 8 EWD and set value to 34. Select service number 9 EWA and set value to 35. Select service number 10 EWP and set value to 34. Select service number 12 BOW and set value to 7. Select service number 13 ANG and set value to 8. Select service number 14 UVL and set value to 0. Select service number 15 LVL and set value to 0. Select service number 16 EWT and set value to 4. Select service number 17 VC and set value to 5. Select service number 21 RB and set value to 6. Select service number 22 GB and set value to 0. Select service number 23 BB and set value to 0. Select service number 25 SCN and set value to 12. Select service number 26 STI and set value to 15. Select service number 27 SCO and set value to 9. Select service number 28 SB and set value to 12. Select service number 29 SSH and set value to 2. Select service number 33 DCO and set value to 0. Select service number 39 DCR and set value to 3. Select service number 40 YGM and set value to 2. Select service number 51 HBR and set value to 0. Select service number 60 OPT and set value to 32. Select service number 61 OP2 and set value to 82. Select service number 62 HR and set value to 34. Select service number 63 SCA and set value to 2. Select service number 64 STA and set value to 254. Select service number 67 SBT and set value to 5. Select service number 68 SBL and set value to 12. Select service number 70 RTN and set value to 0. Select service number 71 RCL and set value to 0. Select service number 74 PPR and set value to 1. Select service number 79 DTN and set value to 4. Select service number 80 DCL and set value to 16. Select service number 92 EVB and set value to 2. Select service number 95 EVA and set value to 22. Select service number 97 SED and set value to 255. Select service number 98 SEA and set value to 255. Select service number 103 VAP and set value to 26. Select service number 104 VSR and set value to 31. Select service number 105 ATT and set value to 6. Select service number 106 WDB and set value to 31. Select service number 107 SPC and set value to 21. Select service number 109 PCO and set value to 40. Select service number 110 PTI and set value to 40. Select service number 111 PUV and set value to 26. Select service number 113 PLH and set value to 13. Select service number 114 PRH and set value to 105. Select service number 115 PCN and set value to 43. Press menu button to exit service mode.

SERVICE MODE ADJUSTMENT CHART

No.	Service Adjustment	Value Range	Initial Ref Value	Initial Set Up Value	On-Set Value	Notes	No.	Service Adjustment	Value Range	Initial Ref Value	Initial Set Up Value	On-Set Value	Notes
01	HFR	0 - 63	7	7	7	Horizontal Frequency	63	SCA	0 - 255	0	2	2	Color Offset (00 in Adjust), Set data value to 2.
02	C16	0 - 255	244	244	244	16:9 Mode Contrast Offset.	64	STA	0 - 255	0	254	254	Tint Offset (00 in Adjust), Set data value to 254.
03	VPO	0 - 63	0	0	0	Vertical Position	65	SUB	-	-	-	-	Not Used
04	VS	0 - 63	29	17	17	Vertical Size, Set data value to 17.	66	SBC	0 - 15	11	11	11	Sub Contrast
05	VLN	0 - 15	6	8	8	Vertical Linearity, Set data value to 8.	67	SBT	0 - 15	15	5	5	Sub Tint for Adjustment, Set data value to 5.
06	VSC	0 - 15	0	2	2	Vertical S Correction, Set data value to 2.	68	SBL	0 - 31	15	12	12	Sub Color for Adjustment, Set data value to 12.
07	HP	0 - 63	20	24	24	H-Position (H-Centering), Set data value to 24.	69	RCN	0 - 255	0	0	0	Contrast Offset for RF
08	EWD	0 - 63	29	34	34	H-Width, Set data value to 34.	70	RTN	0 - 255	253	0	0	Tint Offset for RF, Set data value to 0.
09	EWA	0 - 63	43	35	35	Pin Amp, Set data value to 35.	71	RCL	0 - 255	2	0	0	Color Offset for RF, Set data value to 0.
10	EWP	0 - 63	29	34	34	Up Corner Pin, Set data value to 34.	72	RBR	0 - 255	0	0	0	Bright Offset for RF
11	EWB	0 - 63	37	37	35	Bottom Corner Pin	73	RSP	0 - 255	0	0	0	Sharpness Offset for RF
12	BOW	0 - 15	10	7	7	AFC Bow, Set data value to 7.	74	PPR	0, 1	0	1	1	Pre/Overshoot Ratio for RF, Set data value to 1.
13	ANG	0 - 15	9	8	8	AFC Angle, Set data value to 8.	75	SSF	0 - 3	3	3	3	Sharpness FO for S Input
14	UVL	0 - 15	2	0	0	Upper Vertical Linearity, Set data value to 0.	76	AKB	0 - 255	48	48	48	AKB Timer
15	LVL	0 - 15	1	0	0	Lower Vertical Linearity, Set data value to 0.	77	VMT	0 - 255	72	72	72	Video Mute Timer
16	EWT	0 - 15	8	4	4	Pin Phase, Set data value to 4.	78	DCN	0 - 255	249	249	249	Contrast Offset for YUV
17	VC	0 - 15	6	5	5	Vertical Compression, Set data value to 5.	79	DTN	0 - 255	254	4	4	Tint Offset for YUV, Set data value to 4.
18	RD	0 - 63	31	31	31	Red Drive	80	DCL	0 - 255	10	16	16	Color Offset for YUV, Set data value to 16.
19	GD	0 - 63	31	31	31	Green Drive	81	DBR	0 - 255	0	0	0	Bright Offset for YUV
20	BD	0 - 63	31	31	31	Blue Drive	82	DSP	0 - 255	0	0	0	Sharpness Offset for YUV
21	RB	0 - 15	13	6	6	Red Bias, Set data value to 6.	83	DVM	0 - 255	0	0	0	Velocity Offset for YUV
22	GB	0 - 15	2	0	0	Green Bias, Set data value to 0.	84	CBO	0 - 15	7	7	7	Cb Offset for YUV
23	BB	0 - 15	8	0	0	Blue Bias, Set data value to 0.	85	CRO	0 - 15	7	7	7	Cr Offset for YUV
24	FLS	0 - 3	3	3	2	Filter System	86	DRD	0 - 255	0	0	0	Red Drive Offset for YUV
25	SCN	0 - 15	11	11	12	Sub Contrast	87	DGD	0 - 255	0	0	0	Green Drive Offset for YUV
26	STI	0 - 15	7	15	15	Sub Tint, Set data value to 15.	88	DBD	0 - 255	0	0	0	Blue Drive Offset for YUV
27	SCO	0 - 15	7	9	9	Sub Color, Set data value to 9.	89	DRC	0 - 255	0	0	0	Red Cutoff Offset for YUV
28	SB	0 - 31	7	12	12	Sub Bright, Set data value to 12.	90	DGC	0 - 255	0	0	0	Green Cutoff Offset for YUV
29	SSH	0 - 255	0	2	2	Sub Sharpness, Set data value to 2.	91	DBC	0 - 255	0	0	0	Blue Cutoff Offset for YUV
30	AFC	0 - 3	0	0	0	AFC Gain	92	EVB	0 - 3	3	2	2	Vertical Blanking Width Top for 16:9, Set data value to 2.
31	REF	0, 1	0	0	0	Reference Pulse Position	93	EWV	0, 1	0	0	0	Vertical Blanking Width Bottom for 16:9
32	CDM	0 - 3	3	3	3	CD Mode	94	EVS	0 - 255	0	0	0	Vertical Position Offset for 16:9
33	DCO	0, 1	1	0	0	Dynamic Color Switch, Set data value to 0.	95	EVA	0 - 255	14	22	22	Vertical Size Offset for 16:9, Set data value to 22.
34	ABL	0, 1	1	1	1	ABL Mode Switch	96	ERE	0, 1	0	0	0	Reference Pulse Position for 16:9
35	BAT	0, 1	1	1	1	ABL Level Switch 4:3 Mode	97	SED	0 - 255	254	255	255	Horizontal Width Offset for 16:9, Set data value to 255.
36	B16	0, 1	1	1	1	ABL Level Switch 16:9 Mode	98	SEA	0 - 255	254	255	255	Pin Offset for 16:9, Set data value to 255.
37	CTP	0, 1	1	1	1	Chroma Trap Off Switch	99	SET	0 - 255	255	255	255	Pin Phase Offset for 16:9
38	CBP	0 - 7	0	0	0	Chroma Bandpass Filter Switch	100	DHS	0 - 255	0	0	0	Horizontal Width Offset for YUV
39	DCR	0 - 3	2	3	3	DC Transmission Select Switch, Set data value to 3.	101	DHC	0 - 255	0	0	0	Horizontal Center Offset for YUV
40	YGM	0 - 3	1	2	2	Y Gamma, Set data value to 2.	102	EDC	0, 1	0	0	0	EW DC On/Off
41	POS	0, 1	1	1	1	Pre Shoot/ Over Shoot Switch	103	VAP	0 - 63	32	26	26	V Aspect, Set data value to 26.
42	WP	0 - 3	0	0	0	White Peak Limiter	104	VSR	0 - 63	17	31	31	V Scroll, Set data value to 31.
43	VM	0 - 3	3	3	3	Velocity Modulation	105	ATT	0 - 15	10	6	6	MTS Input Level, Set data value to 6.
44	GYA	0, 1	0	0	0	G-Y Angle	106	WDB	0 - 63	32	31	31	MTS Low Separation, Set data value to 31.
45	CRS	0, 1	0	0	0	Aging Mode	107	SPC	0 - 63	32	21	21	MTS Hi Separation, Set data value to 21.
46	HMA	0, 1	1	1	1	H Mask On/Off Switch	108	SBO	0 - 255	0	0	0	Sub Bright Detector Voltage Offset
47	HBS	0, 1	1	1	1	Horiz Blanking Switch	109	PCO	0 - 127	90	40	40	PIP Chroma Gain, Set data value to 40.
48	VBL	0 - 3	0	0	0	Vertical Blanking	110	PTI	0 - 63	42	40	40	PIP Tint, Set data value to 40.
49	WVB	0, 1	0	0	0	WV Blanking Select	111	PUV	0 - 255	24	26	26	PIP Top Position, Set data value to 26.
50	HBL	0 - 15	15	15	15	Horiz Blanking Left	112	PDV	0 - 255	147	147	147	PIP Bottom Position
51	HBR	0 - 15	5	0	0	Horiz Blanking Right, Set data value to 0.	113	PLH	0 - 255	15	13	13	PIP Left Position, Set data value to 13.
52	AFR	0 - 3	0	0	0	AFC Gain TV Mode	114	PRH	0 - 255	101	105	105	PIP Right Position, Set data value to 105.
53	RHS	0, 1	0	0	0	Horizontal Sync Slice Level for RF	115	PCN	0 - 127	67	43	43	PIP Y Level, Set data value to 43.
54	RVS	0, 1	0	0	0	Vertical Sync Slice Level for RF	116	PBS	0 - 63	15	15	15	PIP BGP Phase for VCXO
55	EHS	0, 1	0	0	0	Horizontal Sync Slice Level for AV	117	-	-	-	-	-	Not Used
56	EVV	0, 1	1	1	1	Vertical Sync Slice Level for AV	118	DRV	0 - 63	31	31	R 30	Red Drive, Press 1 to decrease value and 3 to increase value.
57	CDR	0 - 3	3	3	3	CD Mode (TV)		DRV	0 - 63	31	31	B 30	Blue Drive, Press 7 to decrease value and 9 to increase value.
58	BGP	0, 1	1	1	1	BGP Switch	119	-	0 - 255	0	0	0	Red Bias, Press 1 to decrease value and 3 to increase value.
59	FSC	0, 1	1	1	1	FSC Switch		-	0 - 255	0	0	0	Green Bias, Press 4 to decrease value and 6 to increase value.
60	OPT	0 - 255	0	32	32	Option, data 1 should be set to 32, in binary 8 bit 00100000.		-	0 - 255	0	0	0	Blue Bias, Press 7 to decrease value and 9 to increase value.
61	OP2	0 - 255	2	82	82	Option, data 2 should be set to 82, in binary 8 bit 01010010.							
62	HR	0 - 63	23	34	34	OSD Horizontal Position, Set data value to 34.							

PLACEMENT CHART



Important Parts Information

- **Parts not listed in the parts list are commonly available at your local electronics parts retailer.**
- 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:

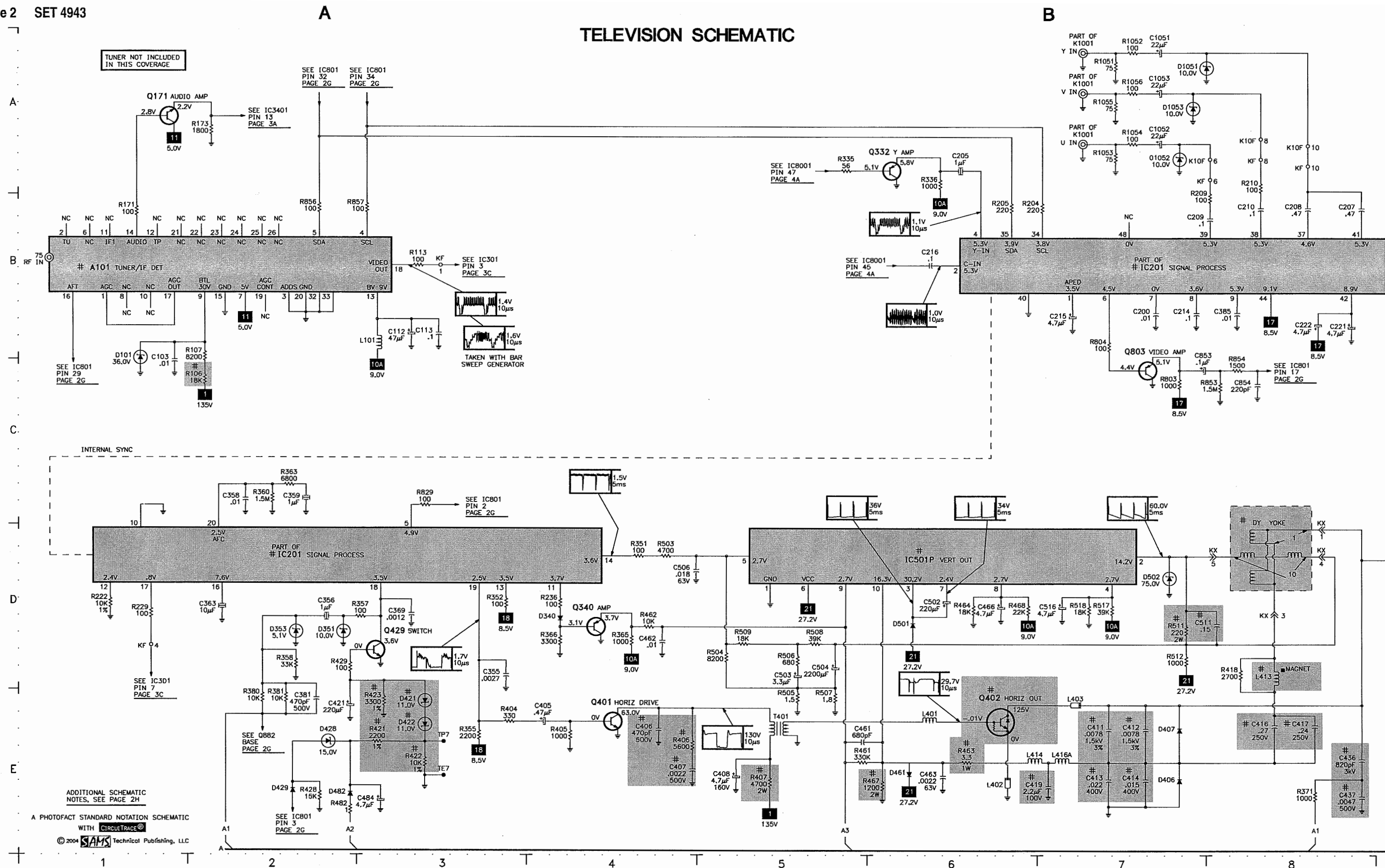
800-428-7267

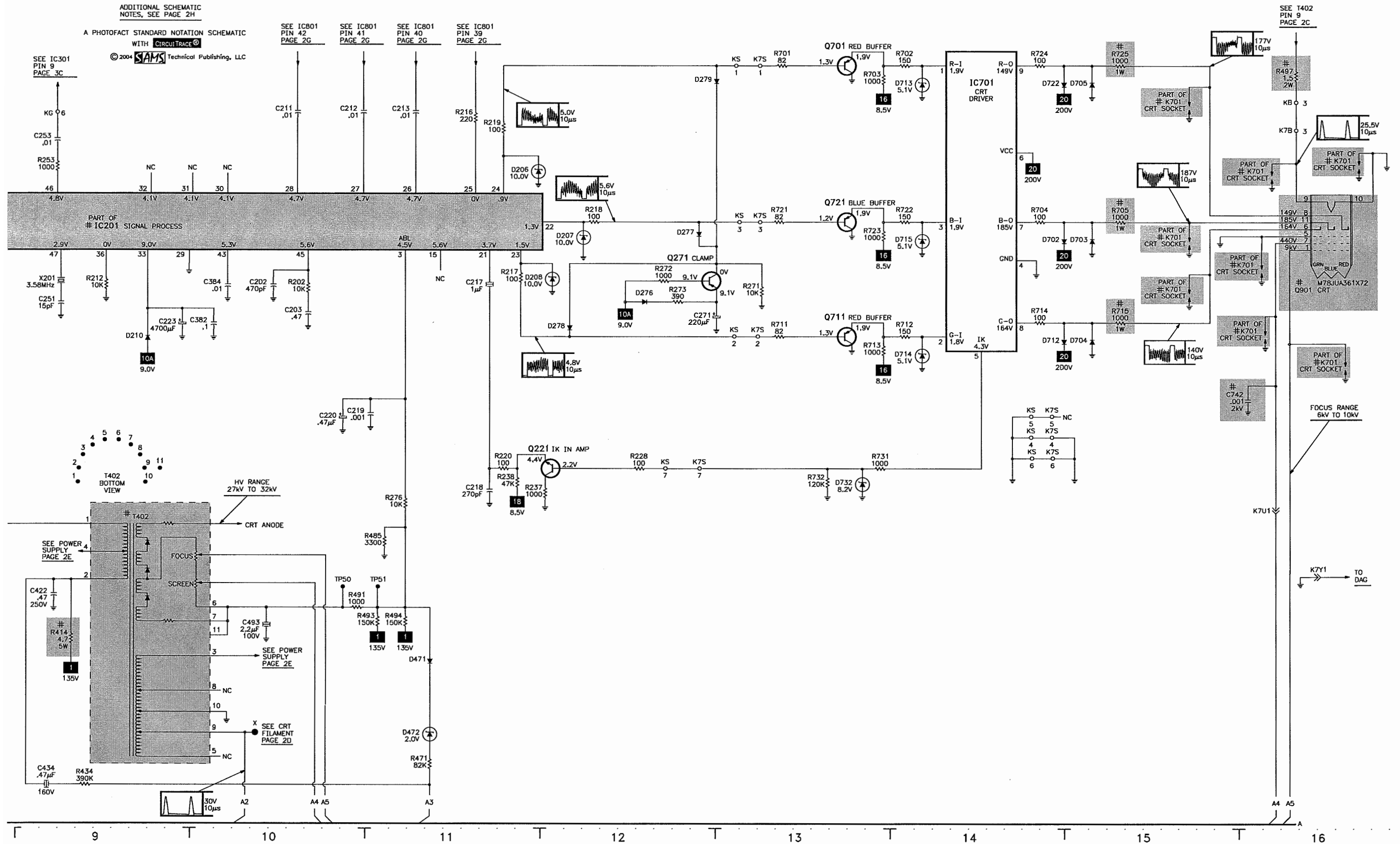
Participating Vendors

Information on test equipment and replacement parts is listed in these pages for the following participating vendors.

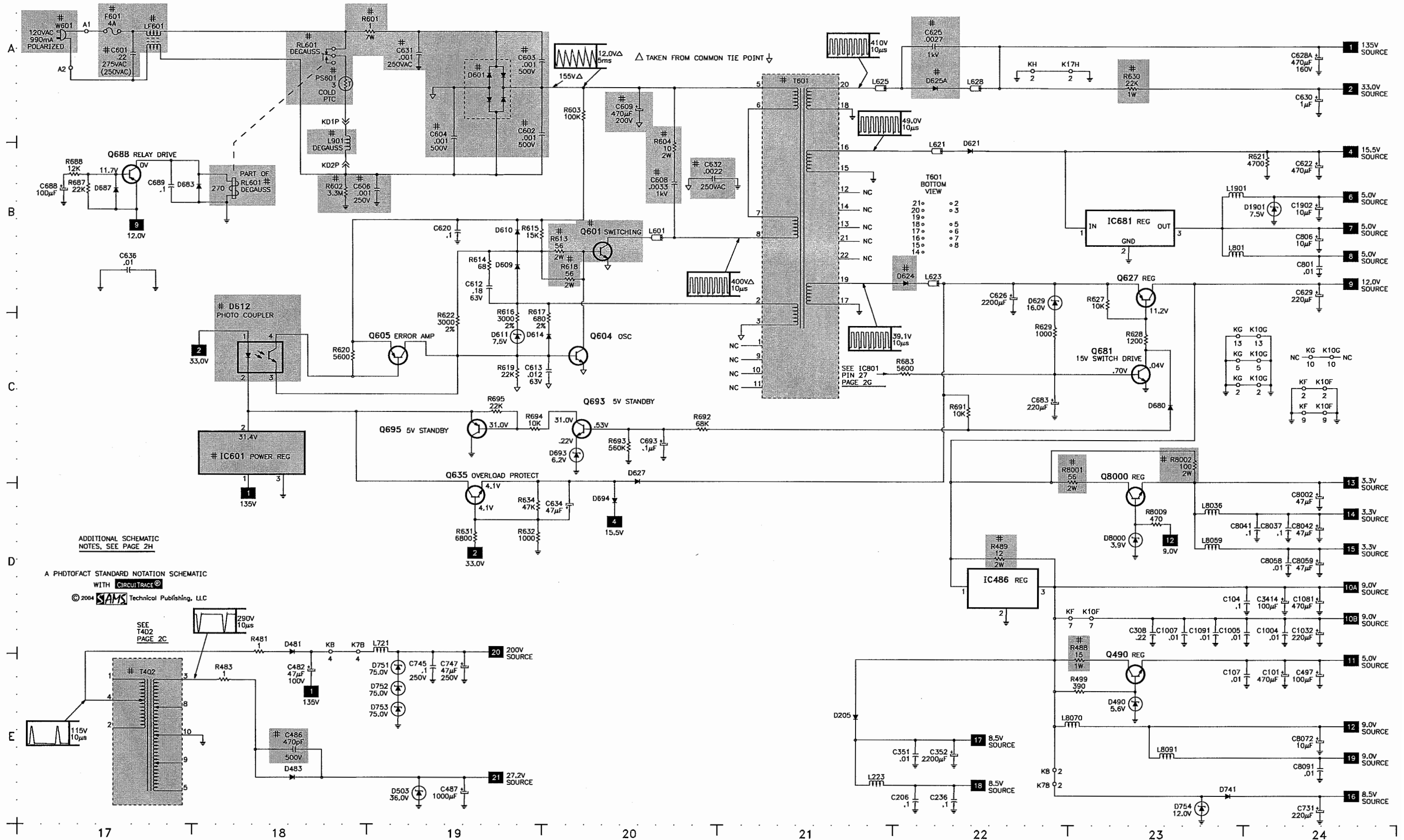
- NTE Electronics, Inc. (NTE)
- Sencore, Inc.

TELEVISION SCHEMATIC

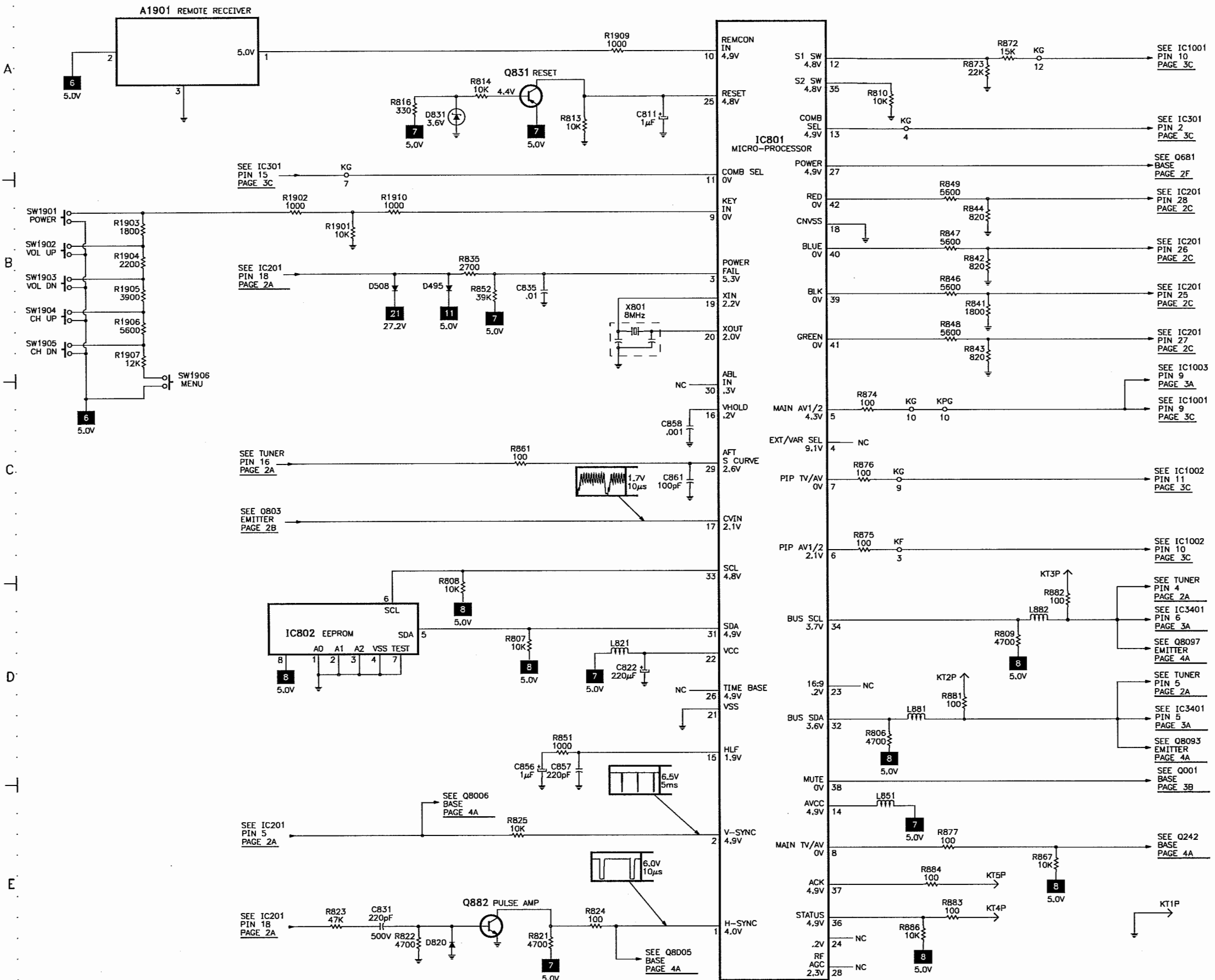


TELEVISION SCHEMATIC continued

POWER SUPPLY SCHEMATIC



SYSTEM CONTROL SCHEMATIC



A PHOTOFAC STANDARD NOTATION SCHEMATIC
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SCHEMATIC NOTES

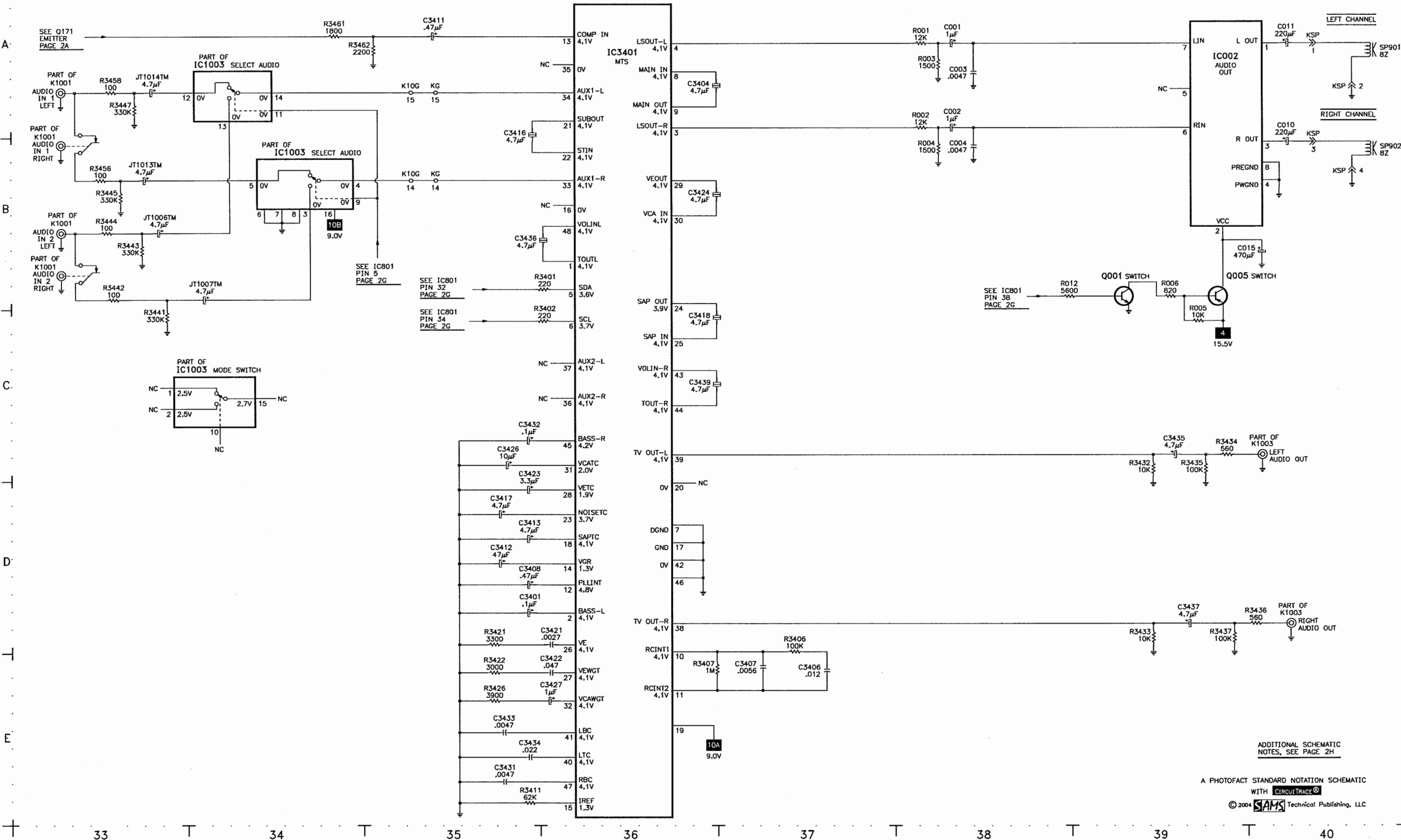
- # For SAFETY use only equivalent replacement part, see parts list.
- Circuitry not used in some versions.
- - - Circuitry used in some versions.
- ⊥ Ground
- ⏏ Chassis ground
- ▽ Common tie point
- △ Taken from common tie point
- 3 Schematic CIRCUITTRACE® Voltage source tie point.
- A Cabling: Heavy 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. Capacitor values are in microfarads unless noted. Electrolytic capacitors are 50 volts or less, 20% or greater unless noted. Resistors are less than 1W, 5% or greater unless noted. Value in () used in some versions. Measurements with switching as shown unless noted. Rated voltage shown on zener diodes.

SANYO
MODEL DS31820 (CHASSIS 31820-00)

A

B

AUDIO SCHEMATIC

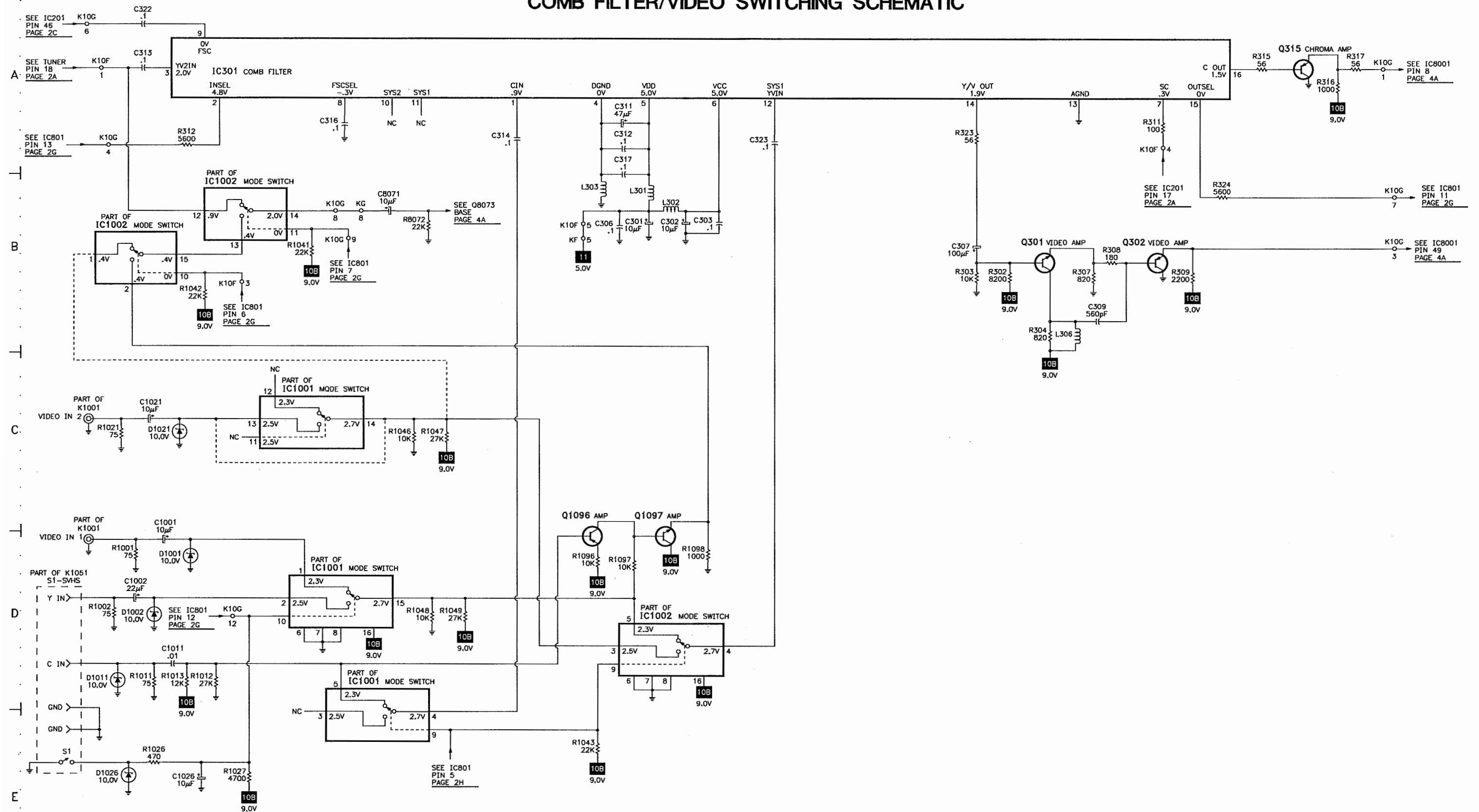


ADDITIONAL SCHEMATIC NOTES, SEE PAGE 2H

A PHOTOFAC STANDARD NOTATION SCHEMATIC WITH CIRCUIT TRACE

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COMB FILTER/VIDEO SWITCHING SCHEMATIC

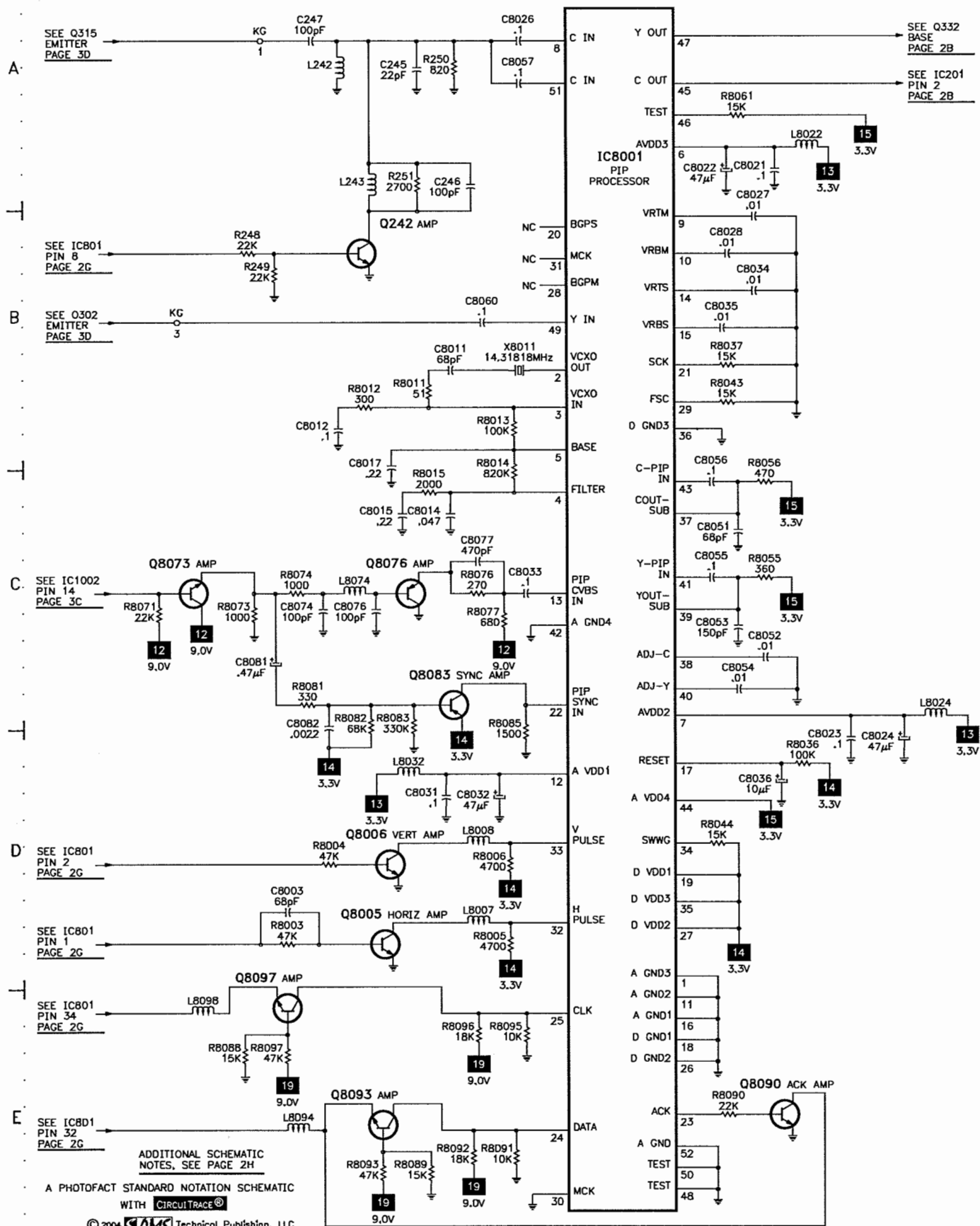


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MODEL DS31820 (CHASSIS 31820-00)

ADDITIONAL SCHEMATIC
NOTES, SEE PAGE 2H
A PHOTOFAC STANDARD NOTATION SCHEMATIC
WITH CIRCUIT TRACE
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A
PIP SCHEMATIC



SCHEMATIC COMPONENT LOCATION GUIDE

A101	B1	C486	E18	C8011	B50	D702	B14	L8007	D50	R276	D11	R691	C22	R1904	B25
A1901	A25	C487	E19	C8012	B50	D703	B15	L8008	D50	R302	B46	R692	C20	R1905	B25
C001	A38	C493	D10	C8014	C50	D704	C15	L8022	A51	R303	B46	R693	C20	R1906	B25
C002	B38	C497	E24	C8015	C50	D705	A15	L8024	D52	R304	B46	R694	C19	R1907	B25
C003	A38	C502	D6	C8017	C50	D712	C14	L8032	D50	R307	B46	R695	C19	R1909	A27
C004	B38	C503	D5	C8021	A51	D713	A14	L8036	D23	R308	B46	R701	A13	R1910	B26
C010	B40	C504	D5	C8022	A51	D714	C14	L8059	D23	R309	B47	R702	A14	R3401	C36
C011	A40	C506	D4	C8023	D52	D715	B14	L8070	E22	R311	A47	R703	A13	R3402	C36
C015	B40	C511	D7	C8024	D52	D722	A14	L8074	C50	R312	A41	R704	B14	R3406	E37
C101	E24	C516	D7	C8026	A50	D732	D13	L8091	E23	R315	A47	R705	B15	R3407	E36
C103	C1	C601	A17	C8027	B51	D741	E23	L8094	E49	R316	A48	R711	C13	R3411	E35
C104	D23	C602	B19	C8028	B51	D751	E19	L8098	E49	R317	A48	R712	C14	R3421	E35
C107	E23	C603	A19	C8031	D50	D752	E19	LF601	A17	R323	A46	R713	C13	R3422	E35
C112	B3	C604	B19	C8032	D50	D753	E19	PS601	A18	R324	B47	R714	C14	R3426	E35
C113	B3	C606	B19	C8033	C50	D754	E23	Q001	C39	R335	B5	R715	C15	R3432	C39
C200	B7	C608	B20	C8034	B51	D820	E27	Q005	C39	R336	B6	R721	B13	R3433	D39
C202	B10	C609	A20	C8035	B51	D831	A27	Q171	A1	R351	D4	R722	B14	R3434	C39
C203	C10	C612	B19	C8036	D51	D1001	D41	Q221	C12	R352	D3	R723	B13	R3435	C39
C205	B6	C613	C19	C8037	D24	D1002	D41	Q242	B50	R355	E3	R724	A14	R3436	D39
C206	E22	C620	B19	C8041	D24	D1011	D41	Q271	B12	R357	D2	R725	A15	R3437	D39
C207	B8	C622	B24	C8042	D24	D1021	C41	Q301	B46	R358	D2	R731	C13	R3441	C33
C208	B8	C625	A22	C8051	C51	D1026	E41	Q302	B47	R360	C2	R732	D13	R3442	C33
C209	B7	C626	B22	C8052	C51	D1051	A7	Q315	A47	R363	C2	R803	C7	R3443	B33
C210	B8	C629	B24	C8053	C51	D1052	A7	Q332	B6	R365	D4	R804	C7	R3444	B33
C211	A10	C630	A24	C8054	C51	D1053	A7	Q340	D4	R366	D4	R806	D29	R3445	B33
C212	A11	C631	A19	C8055	C51	D1901	B24	Q401	E4	R371	E8	R807	D27	R3447	A33
C213	A11	C632	B20	C8056	C51	D625A	A22	Q402	E6	R380	E2	R808	D27	R3456	B33
C214	B7	C634	D20	C8057	A50	D8000	D23	Q429	D3	R381	E2	R809	D29	R3458	A33
C215	B7	C636	B17	C8058	D24	DY	D8	Q490	E23	R404	E3	R810	A29	R3461	A34
C216	B6	C683	C22	C8059	D24	F601	A17	Q601	B20	R405	E4	R813	A27	R3462	A35
C217	B11	C688	B17	C8060	B50	IC002	A39	Q604	C20	R406	E4	R814	A27	R8001	D22
C218	D11	C689	B17	C8071	B42	IC201	B7	Q605	C19	R407	E5	R816	A26	R8002	C23
C219	C11	C693	C20	C8072	E24	IC201	B9	Q627	C23	R414	D9	R821	E27	R8003	D49
C220	C10	C731	E24	C8074	C50	IC201	D2	Q635	D19	R418	D8	R822	E26	R8004	D50
C221	B8	C742	C16	C8076	C50	IC301	A42	Q681	C23	R421	E3	R823	E26	R8005	D50
C222	B8	C745	E19	C8077	C50	IC486	D22	Q688	B17	R422	E3	R824	E27	R8006	D50
C223	C9	C747	E19	C8081	C49	IC601	C18	Q693	C20	R423	E3	R825	E27	R8009	D23
C236	E22	C801	B24	C8082	D50	IC681	B23	Q695	C19	R428	E2	R829	C3	R8011	B50
C245	A50	C806	B24	C8091	E24	IC701	A14	Q701	A13	R429	D2	R835	B27	R8012	B50
C246	B50	C811	A28	CRT SOC	A15	IC801	A28	Q711	C13	R434	E9	R841	B29	R8013	B50
C247	A50	C822	D27	CRT SOC	B15	IC802	D26	Q721	B13	R461	E5	R842	B29	R8014	C50
C251	B9	C831	E26	CRT SOC	B15	IC1001	C42	Q803	C7	R462	D4	R843	B29	R8015	C50
C253	B9	C835	B27	CRT SOC	B16	IC1001	D42	Q831	A27	R463	E6	R844	B29	R8036	D51
C271	C12	C853	C7	CRT SOC	B16	IC1001	D42	Q882	E27	R464	D6	R846	B29	R8037	B51
C301	B44	C854	C8	CRT SOC	B16	IC1002	B41	Q901	B16	R467	E6	R847	B29	R8043	B51
C302	B44	C856	D27	CRT SOC	C16	IC1002	B42	Q1096	D44	R468	D6	R848	B29	R8044	D51
C303	B44	C857	D27	CRT SOC	C16	IC1002	D44	Q1097	D44	R471	E11	R849	B29	R8055	C51
C306	B44	C858	C28	D101	C1	IC1003	A34	Q8000	D23	R481	E18	R851	D27	R8056	C51
C307	B46	C861	C28	D205	E21	IC1003	B34	Q8005	D50	R482	E2	R852	B27	R8061	A51
C308	D23	C1001	D41	D206	B11	IC1003	C34	Q8006	D50	R483	E18	R853	C8	R8071	C49
C309	B46	C1002	D41	D207	B12	IC3401	A36	Q8073	C49	R485	D11	R854	C8	R8072	B43
C311	A44	C1004	D24	D208	B12	IC501P	D6	Q8076	C50	R488	E22	R856	B2	R8073	C49
C312	B44	C1005	D23	D210	C9	IC8001	A51	Q8083	C50	R489	D22	R857	B3	R8074	C49
C313	A41	C1007	D23	D276	C12	JT1006TM	B33	Q8090	E51	R491	D10	R861	C27	R8076	C50
C314	A43	C1011	D41	D277	B12	JT1007TM	C34	Q8093	E50	R493	D11	R867	E29	R8077	C50
C316	A42	C1021	C41	D278	C12	JT1013TM	B33	Q8097	E49	R494	D11	R872	A29	R8081	C50
C317	B44	C1026	E41	D279	A12	JT1014TM	A33	R001	A38	R497	A16	R873	A29	R8082	D50
C322	A41	C1032	D24	D340	D4	K1001	A33	R002	B38	R499	E22	R874	C29	R8083	D50
C323	A45	C1051	A7	D351	D2	K1001	A7	R003	A38	R503	D4	R875	C29	R8085	D50
C351	E22	C1052	A7	D353	D2	K1001	A7	R004	B38	R504	D5	R876	C29	R8088	E49
C352	E22	C1053	A7	D406	E7	K1001	A7	R005	C39	R505	E5	R877	E29	R8089	E50
C355	D3	C1081	D24	D407	E7	K1001	B33	R006	C39	R506	D5	R881	D29	R8090	E51
C356	D2	C1091	D23	D421	E3	K1001	C41	R102	C38	R507	E5	R882	D30	R8091	E50
C358	C2	C1902	B24	D422	E3	K1001	D41	R106	C2	R508	D5	R883	E29	R8092	E50
C359	C2	C3401	D35	D428	E2	K1003	C39	R107	C2	R509	D5	R884	E29	R8093	E50
C363	D2	C3404	A36	D429	E2	K1003	D40	R113	B3	R511	D7	R886	E29	R8095	E50
C369	D3	C3406	E37	D461	E6	L101	B3	R171	B1	R512	D7	R1001	D41	R8096	E50
C381	E2	C3407	E37	D471	E11	L223	E21	R173	A2	R517	D7	R1002	D41	R8097	E49
C382	C10	C3408	D35	D472	E11	L242	A50	R202	B10	R518	D7	R1011	D41	RL601	A18
C384	B10	C3411	A35	D481	E18	L243	B50	R204	B6	R601	A18	R1012	D42	RL601	B18
C385	B8	C3412	D35	D482	E2	L301	B44	R205	B6	R602	B18	R1013	D41	SP901	A40
C405	E4	C3413	D35	D483	E18	L302	B44	R209	B7	R603	A20	R1021	C41	SP902	B40
C406	E4	C3414	D24	D490	E23	L303	B44	R210	B8	R604	B20	R1026	E41	SW1901	B25
C407	E4	C3416	B35	D495	B27	L306	B46	R212	B9	R613	B20	R1027	E42	SW1902	B25
C408	E5	C3417	D35	D501	D6	L401	E6	R216	A11	R614	B19	R1041	B42	SW1903	B25
C411	E7	C3418	C36	D502	D7	L402	E6	R217	B11	R615	B19	R1042	B41	SW1904	B25
C412	E7	C3421	E35	D503	E19	L403	E7	R218	B12	R616	C19	R1043	E44	SW1905	B25
C413	E7	C3422	E35	D508	B26	L413	D8	R219	A11	R617	C19	R1046	C43	SW1906	C25
C414	E8	C3423	D35	D601	A19	L414	E6	R220	C11	R618	B20	R1047	C43	T401	E5
C416	E8	C3424	B36	D609	B19	L601	B20	R222	D1	R619	C19	R1048	D43	T402	D9
C417	E8	C3426	C35	D610	B19	L621	B22	R228	C12	R620	C18	R1049	D43	T402	E17
C419	E7	C3427	E35	D611	C19	L623	B22	R229	D1	R621	B24	R1051	A7	T601	A21
C421	E2	C3431	E35	D612	C18	L625	A21	R236	D4	R622	C19	R1052	A7	W601	A17
C422	D9	C3432	C35	D614	C19	L628	A22	R237	D12	R627	C23	R1053	A7	X201	B9
C434	E9	C3433	E35	D621	B22	L721	E19	R238	D11	R628	C23	R1054	A7	X801	B27
C436	E8	C3434	E35	D624	B22	L801	B23	R248	B49	R629	C22	R1055	A7	X8011	B50
C437	E8	C3435	C39	D627	D20	L821	D27	R249	B49	R630	A23	R1056	A7		
C461	E5	C3436	B35	D629	C22	L851	E29	R250	A50	R631	D19	R1096	D44		
C462	D4	C3437	D39	D680	C23	L881	D29	R251	B50	R632	D19	R1097	D44		
C463	E6	C3439	C36	D683	B18	L882	D29	R253	B9	R634	D19	R1098	D44		
C466	D6	C628A	A24	D687	B17	L901	B18	R271	B13	R683	C21	R1901	B26		
C482	E18	C8002	D24	D693	C20	L1901	B23	R272	B12	R687	B17	R1902	B26		
C484	E3	C8003	D49	D694	D20	L416A	E7	R273	C12	R688	B17	R1903	B25		

PARTS LIST

Item No.	Type No.	Mfr. Part No.	NTE Part No.
D101	MTZJ36A	408 047 6205	-
D205	SB07-03N	407 108 5300	-
D206, 07, 08	UDZS10B	407 206 5608	-
D210	SB07-03N	407 108 5300	-
D276 Thru			
D279	1SS355TE-17	407 149 0807	NTE519
D340	1SS355TE-17	407 149 0807	NTE519
D351	UDZS10B	407 206 5608	-
D353	RD5.1EB1	407 056 7906	NTE5010A
D406	ERB44-04	407 006 4108	NTE552
D407	ERD07-15L	407 095 8001	NTE506
# D421, 22	HZ11B2L	407 158 1307	NTE5020A
D428	MTZJ15A	408 047 4409	-
D429	1S2076A	407 013 4306	NTE519
D461	1S2076	407 013 4207	NTE177
D471	1S2076A	407 013 4306	NTE519
D472	MTZJ2.0B	407 166 7605	-
D481	ES1	407 007 6606	NTE552
D482	TVR1G	407 011 4407	NTE552
D483	ES1	407 007 6606	NTE552
D490	MTZJ5.6C	408 047 7707	-
D495	1S2076A	407 013 4306	NTE519
D501	ERA15-02	407 005 8602	NTE552
D502	1Z75	407 118 2207	NTE5093A
D503	MTZJ36A	408 047 6205	-
D508	1S2076A	407 013 4306	NTE519
# D601	RBV-608	407 124 9801	-
D609	ES1Z	407 007 6903	NTE552
D610	1S2076A	407 013 4306	NTE519
D611	RD7.5EB1	407 057 6304	NTE5015A
# D612	PC817C	407 104 2402	NTE3098
D614	1S2076A	407 013 4306	NTE519
D621	EU2	407 007 7603	NTE552
# D624	RU4YXLF-L1	407 129 6706	NTE580
# D625A	FML-G16S	407 191 3900	NTE598
D627	1S2076A	407 013 4306	NTE519
D629	RD16EB1	407 054 7007	NTE5025A
D680, 83, 87	1S2076A	407 013 4306	NTE519
D693	RD6.2EB2	407 057 2702	NTE5013A
D694	1S2076A	407 013 4306	NTE519
D702 Thru			
D705	ERB43-04	407 006 3903	NTE552
D712	ERB43-04	407 006 3903	NTE552
D713, 14, 15	MTZJ5.1A	408 047 6502	NTE5010T1
D722	ERB43-04	407 006 3903	NTE552
D732	RD8.2EB2	407 057 8308	NTE5016A
D741	1S2076A	407 013 4306	NTE519
D751, 52, 53	1Z75	407 118 2207	NTE5093A
D754	MTZJ12B	408 048 2404	NTE5021T1
D820	1SS355TE-17	407 149 0807	NTE519
D831	UDZS-TE-173.6B	407 222 5903	-
D1001, 02	RD10EB2	407 054 0008	NTE5019A
D1011, 21, 26	RD10EB2	407 054 0008	NTE5019A
D1051, 52, 53	RD10EB2	407 054 0008	NTE5019A
D1901	MTZJ7.5C	408 047 9206	-
D8000	MTZJ3.9A	407 099 4504	-
IC002	LA4525	409 275 7903	-
# IC201	CXA2142BS	409 496 1506	-
IC301	TDA9183T/N1	409 491 5608	-
IC486	UPC78M09AHF	409 366 7904	-
# IC501P	LA7847P	409 492 9704	-
# IC601	SE130NH	409 172 8102	-
IC681	UPC78L05J	409 066 7303	NTE977
IC701	TDA6108JF/N1	409 476 5104	-
IC801	-	410 433 2609	-
IC802	24LC02B/P	409 333 3700	-
IC1001, 02, 03	TC4053BP	409 051 3006	NTE4053B
IC3401	CXA2134Q-T6	409 467 1108	-
IC8001	M65667SP	409 466 6302	-
Q001	2SC1740S-Q	405 011 8401	NTE85
Q005	2SB764-E	405 008 4805	NTE383
Q171	2SC1740S-Q	405 011 8401	NTE85
Q221	2SA1015-O(SAN)	405 001 7407	NTE290A
Q242	2SC1740S-Q	405 011 8401	NTE85
Q271	2SA1037K-T-96-R	405 002 0308	NTE2409

Item No.	Type No.	Mfr. Part No.	NTE Part No.
Q301	2SC2412K-T-96-R	405 014 4509	NTE2408
Q302, 15	2SA1037K-T-96-R	405 002 0308	NTE2409
Q332, 40	2SA1015-O(SAN)	405 001 7407	NTE290A
Q401	2SC2271-D-CTV	405 013 6207	NTE399
# Q402	2SD2634-YB	405 157 1304	-
Q429	2SC1740S-Q	405 011 8401	NTE85
Q490	2SD400-E-MP	405 023 5009	NTE382
# Q601	2SC4423-CTV	405 095 9004	NTE2308
Q604	2SC3807-R-CTV-YA	405 058 0208	NTE2504
Q605	2SA1015-O(SAN)	405 001 7407	NTE290A
Q627	2SB985-S	405 009 6907	-
Q635, 81	2SC1740S-Q	405 011 8401	NTE85
Q688	2SA1015-Y(SAN)	405 001 7605	NTE290A
Q693	2SC1740S-Q	405 011 8401	NTE85
Q695	2SA1015-Y(SAN)	405 001 7605	NTE290A
Q701, 11, 21	2SA1015-O(SAN)	405 001 7407	NTE290A
Q803, 31	2SA1015-O(SAN)	405 001 7407	NTE290A
Q882	2SC1740S-Q	405 011 8401	NTE85
Q1096	2SA1037K-T-96-R	405 002 0308	NTE2409
Q1097	2SC2412K-T-96-R	405 014 4509	NTE2408
Q8000	2SD400-E-MP	405 023 5009	NTE382
Q8005, 06	2SC1740S-Q	405 011 8401	NTE85
Q8073	2SC1740S-Q	405 011 8401	NTE85
Q8076, 83	2SA1015-O(SAN)	405 001 7407	NTE290A
Q8090	2SC1740S-Q	405 011 8401	NTE85
Q8093, 97	2SC3114-T	405 017 1901	NTE289A

Item No.	Function/Rating	Mfr. Part No.	Notes
# A101	Tuner/IF Detector	645 053 4553	-
A1901	Receiver	645 047 6228	Remote
C205, 17	1µF 20% 50V NP	404 084 6901	-
C356, 59	1µF 20% 50V NP	404 084 6901	-
C363	10µF 20% 25V NP	403 258 9304	-
# C406	470pF 10% 500V	403 076 3607	-
# C407	.0022 10% 500V	403 076 0507	-
# C411, 12	.0078 3% 1.5kV	403 343 8205	-
# C413	.022 5% 400V	403 083 4307	-
# C414	.015 5% 400V	403 083 3409	-
# C416	.27 5% 250V	403 346 7126	-
# C417	.24 5% 250V	403 379 0303	-
# C419	2.2µF 10% 100V	403 158 9107	-
C434	.47µF 20% 160V NP	403 087 1302	-
# C436	820pF 10% 3kV	403 324 3106	-
# C437	.0047 10% 500V	403 076 4000	-
# C486	470pF 10% 500V	403 076 3607	-
C493	2.2µF 20% 100V NP	404 056 5307	-
# C511	.15 10% 50V	403 058 5407	-
# C601	.22 20% 275VAC	404 066 2204	-
	.22 20% 250VAC	404 071 2404	-
# C602, 03, 04	.001 10% 500V	403 075 7101	-
# C606	.001 20% 250V	404 088 2909	-
# C608	.0033 10% 1kV	403 271 9701	-
# C609	470µF 20% 200V	404 075 5005	-
# C625	.0027 10% 1kV	403 266 5008	-
# C631	.001 20% 250VAC	404 088 2909	-
# C632	.0022 20% 250VAC	404 088 3005	-
# C742	.001 +80% -20% 2kV	403 077 2807	-
C3404, 16, 18	4.7µF 20% 50V NP	404 089 6500	-
C3423	3.3µF 10% 10V Tantalum	403 342 9203	-
C3424	4.7µF 20% 50V NP	404 089 6500	-
C3426	10µF 10% 10V Tantalum	403 299 1820	-
C3436, 39	4.7µF 20% 50V NP	404 089 6500	-
# DY (1)	Yoke	-	Horiz .88mH, Vert 22.5mH
# F601	Fuse	423 007 1601	4Amp, 125VAC
F601A, B	Fuse Holder	645 000 5077	For F601 (2 Used)
# K701	Socket	645 025 6103	CRT
K1001	Terminal	645 052 6886	Assembly
K1003	Jack	645 032 8954	Assembly
K1051	Socket	645 052 6619	S1-SVHS
L101	5.6µH	645 008 2894	-
L223	2.7µH	645 011 0276	-
L242	10µH	645 003 9652	-
L243	56µH	645 015 5000	-

Item No.	Function/Rating	Mfr. Part No.	Notes
L301, 02, 03	5.6µH	645 008 2894	-
L306	39µH	645 008 2856	-
L401	1µH	645 036 4327	-
L402	Ferrite Bead	652 000 2180	-
L403	Ferrite Bead	610 078 6820	-
# L413	Horizontal Linearity	645 029 8035	-
L414	202µH	610 031 1367	-
L416A	350µH	645 013 8676	-
L601	Ferrite Bead	610 078 6820	-
L621, 23, 25, 28	Ferrite Bead	610 078 5946	-
L721	150µH	645 001 4796	-
L801, 21, 51	5.6µH	645 008 2894	-
L881, 82	1µH	645 006 2490	-
# L901	Degaussing	645 039 2559	-
L1901	5.6µH	645 008 2894	-
L8007, 08	5.6µH	645 008 2894	-
L8022, 24	10µH	610 031 3873	-
L8032, 36, 59	10µH	610 031 3873	-
L8070	5.6µH	645 008 2894	-
L8074	33µH	645 003 9812	-
L8091	5.6µH	645 008 2894	-
L8094, 98	1µH	645 006 2490	-
# LF601	Line Filter	645 042 7510	-
# PS601	3 Cold PTC	408 046 5209	-
# Q901	CRT	414 010 6905	M78JUA361X72
# R106	18K 5% 1/2W	401 008 2001	-
R222	10K 1% 1/10W	401 264 1909	-
# R406	5600 5% 1/2W	401 010 8305	-
# R407	4700 5% 2W	401 068 4700	-
# R414	4.7 5% 5W	402 080 3108	-
# R421	220 1% 1/6W	401 053 1202	-
# R422	10K 1% 1/6W	401 052 6802	-
# R423	3300 1% 1/10W	401 264 9301	-
# R463	3.3 5% 1W	401 061 0006	-
# R467	1200 5% 2W	401 065 3706	-
# R488	15 5% 1W	401 059 1602	-
# R489	12 5% 2W	401 065 1801	-
# R497	1.5 5% 2W	401 064 5305	-
# R511	220 5% 2W	401 066 6102	-
# R601	1 10% 7W	402 083 6106	-
# R602	3.3M 20% 1/2W	402 000 1603	-
# R604	10 5% 2W	401 064 6302	-
# R613	56 5% 2W	401 068 6902	-
R616	3000 2% 1/6W	401 026 2809	-
R617	680 2% 1/6W	401 099 1501	-
# R618	56 5% 2W	401 068 6902	-
R622	3000 2% 1/6W	401 026 2809	-
# R630	22K 5% 1W	401 060 5002	-
# R705, 15, 25	1000 5% 1W	401 058 3706	-
# R8001	56 5% 2W	401 068 6902	-
# R8002	100 5% 2W	401 064 7507	-
# RL601	Relay	645 000 4155	Degaussing
SP901, 02	Speaker	645 013 6306	8 Ohms
SW1901	Switch	645 006 9673	Power
SW1902	Switch	645 006 9673	Volume Up
SW1903	Switch	645 006 9673	Volume Down
SW1904	Switch	645 006 9673	Channel Up
SW1905	Switch	645 006 9673	Channel Down
SW1906	Switch	645 006 9673	Menu
T401	Horizontal Drive	610 000 1138	-
# T402 (2)	Horizontal Output	645 032 8978	-
# T601	Power	645 035 9910	-
# W601	Line Cord	645 030 5290	AC, Polarized
X201	Crystal	610 015 3899	3.58MHz
X801	Crystal	645 000 6692	8MHz
X8011	Crystal	645 041 1564	14.31818MHz
	PC Board	610 300 2132	AV
	PC Board	610 300 6802	CRT
	PC Board	610 300 2125	Main
	Transmitter	645 052 5018	Remote

For SAFETY use only equivalent replacement part.
(1) Bonded part of CRT.
(2) Screen and focus controls are part of T402.

SANYO

MODEL DS31820 (CHASSIS 31820-00)