

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

Place a jumper between pins 3 and 4 of IC803. Connect a high voltage probe to the CRT anode. Set the AC supply to 45VAC. Apply 9.0V to the cathode of D001. Turn the receiver on and slowly increase the AC supply. Confirm the high voltage does not exceed 39.2kV when the horizontal just begins to pull out of sync. If the high voltage should exceed 39.2kV or the receiver fails to lose horizontal sync, the horizontal oscillator disable circuit should be repaired. Remove jumper and the 9.0V supply.

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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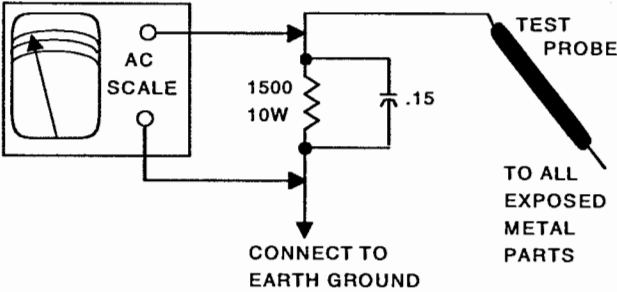
SAFETY CHECKS — FIRE AND SHOCK HAZARD

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.



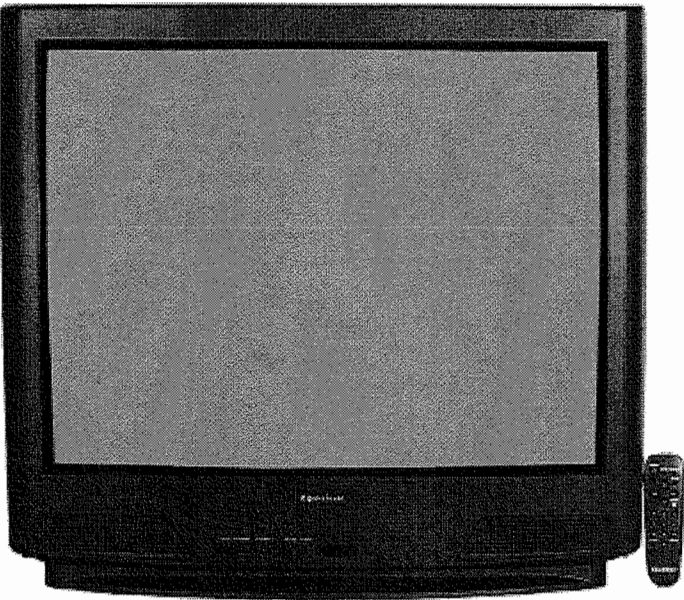
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PHOTOFACT[®] *Technical Service Data*
SILVER

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QUASAR
Models SP3229UV/9V (Chassis ALEDC282)



Representative Model

Essential coverage
for servicing a television receiver...

- Schematics
- Component locations
- Parts list



JUNE 2004 SET 4894

SET 4894

MODELS SP3229UV/9V (CHASSIS ALEDC282)

QUASAR

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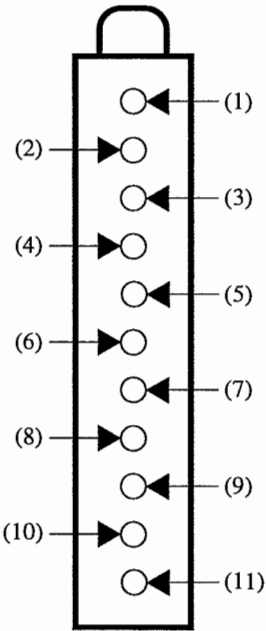
TUNER INFORMATION

TUNER VOLTAGE CHART

Pin	VHF Low Band	VHF High Band	UHF Band
(1) AGC	4.6V	5.1V	4.2V
(2) TU	1.3V	4.3V	4.4V
(3) ADD	0V	0V	0V
(4) SCL	3.6V	3.6V	3.6V
(5) SDA	3.5V	3.5V	3.5V
(6) BM	9.0V	9.0V	9.0V
(7) BPL	5.0V	5.0V	5.0V
(8) NC	0V	0V	0V
(9) BTL	4.5V	7.5V	7.6V
(10) NC	0V	0V	0V
(11) IF1	0V	0V	0V

NOTE: VHF Low Band voltages taken on channel 2.
VHF High Band voltages taken on channel 7.
UHF Band voltages taken on channel 14.

TUNER TERMINAL GUIDE



MISCELLANEOUS ADJUSTMENTS

NOTE: This receiver employs digital customer controls. All adjustments are at normalized position unless otherwise indicated.

B+ CHECK

Connect a digital DC voltmeter to the cathode of D825 and the common tie point. Set brightness and picture to minimum. With AC line voltage set to 120VAC, B+ voltage should read 130V ±1.0V.

HIGH VOLTAGE CHECK

Tune in a picture. Set brightness and picture for a black raster. Connect a high voltage probe to CRT anode. High voltage should read 28kV to 32kV.

PURITY CHECK

Press recall button on remote transmitter to enter purity check mode. Receiver must be in serviceman mode for purity colors to display on screen. Press recall button to cycle through white, red, green, blue, and normal screens.

Set Purity Check to display a green raster. Loosen deflection yoke and move it back as far as possible. Loosen locking ring and move the purity tabs to center the vertical green band. Slowly slide the deflection yoke forward until a uniform green screen is obtained.

CONVERGENCE

Connect a signal generator to antenna terminal and tune in a dot pattern. Adjust the four-pole magnets to converge the red and blue dots at the center of the screen. Adjust the six-pole magnets to converge the red/blue dots over the green dots at the center of the screen.

NOTE: Spread the two tabs of each set of magnets equally and opposite to converge vertically, and rotate both tabs in the same direction to converge horizontally. Since the four and six pole magnets interact, repeat the adjustment until center convergence is correct.

Tune in a crosshatch pattern. Remove rubber wedges between the deflection yoke and CRT. Tilt deflection yoke up or down to converge the vertical lines at the top and bottom of the screen and the horizontal lines at the left and right sides of the screen. Tilt the deflection yoke left or right to converge the horizontal lines at the top and bottom of the screen and the vertical lines at the left and right sides of the screen. Repeat convergence procedure if necessary to obtain the best overall convergence. Replace rubber wedges.

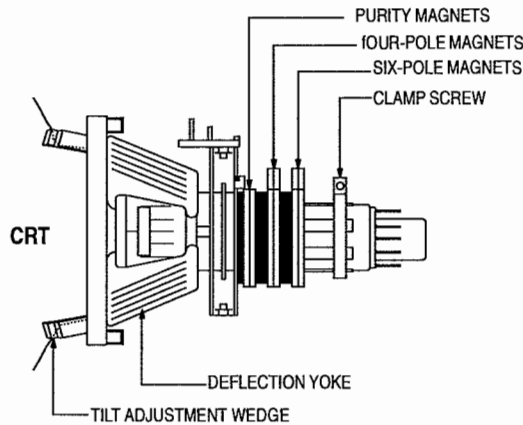
If the yoke or CRT is replaced, a convergence corrector strip (Part No. 0FMK014ZZ) may be required to match the yoke and CRT for optimum convergence. Position the strip between the CRT and yoke for best convergence at corners of screen and secure with tape.

ENTERING SERVICEMAN MODE

Turn the receiver on and momentarily short pins 3 and 8 of connector TP. In the upper left side of the picture, CHK is displayed in yellow. Press the action and volume up buttons on the receiver. The CHK display turns red. The serviceman mode is indicated by CHK displayed in red at the upper left side of the picture. Press the power button on the remote or the action and volume down buttons on the receiver repeatedly to select one of six service modes.

- B = Sub-Data Adjustments
- C = Cut-Off Adjustments
- S = Options Adjustments
- M = MTS Stereo Adjustments
- CHK = Normal operation of channel and volume buttons.

CRT NECK ASSEMBLY



EXIT SERVICEMAN MODE

Always exit serviceman mode when finished making adjustments.

Press action and power buttons on receiver control panel simultaneously for approximately 2 seconds to exit serviceman mode. The receiver will display a self check menu with audio on channel 3.

MISCELLANEOUS ADJUSTMENTS continued

SUB-DATA ADJUSTMENTS

NOTE: Write down On-Set Level values in detail before making any adjustments in case a misadjustment occurs. Factory preset adjustments are not to be adjusted.

Press channel up or down buttons on remote to select any of adjustment addresses. Press volume up or down buttons on remote to change level of adjustment.

Sub-Data Adjustments Chart

Adjustment	Range	Default Level	On-Set Level
Sub Color (B0)	0-63	33	25
Sub Tint (B1)	0-63	33	44
Sub Brightness (B2)	0-255	80	92
Sub Contrast (B3)	0-63	34	31
Killer/ABL/Gamma (B4)	0-7	5	5
Video (B5)	0-15	8	8
Audio (B6)	0-31	16	17
Vertical Size (B7)	0-63	20	44

Sub Color (B0)

Tune in a color bar signal. Connect oscilloscope to pin 1 of connector C1 on the C board. Connect TPD2 to ground. Enter Serviceman Mode and select Sub-Data Adjustments. Select Sub Color (B0). Adjust waveform for .9Vp-p ±.05Vp-p. Remove jumper.

Sub Tint (B1)

Tune in a color bar signal. Connect oscilloscope to pin 1 of connector C1 on the C board. Connect TPD2 to ground. Enter Serviceman Mode and select Sub-Data Adjustments. Select Sub Tint (B1). Adjust waveform so the 1st and 4th peaks are of equal amplitude. Remove jumper.

Sub Contrast (B3)

NOTE: This adjustment is factory set, DO NOT adjust unless CRT or C board is replaced.

Connect a color bar signal to the antenna input. Connect an oscilloscope to pin 2 of connector C1 on C board. Connect TPD2 to ground. Enter Serviceman Mode and select Sub-Data Adjustments. Select Sub Contrast (B3). Adjust for 2.8Vp-p ±.1Vp-p from white to black level not including sync tip in measurement. Remove jumper.

Sub Brightness (B2)

This adjustment must be made after Sub Contrast and Color Temperature Adjustments are made. Do not adjust screen after Sub Brightness is set. Connect a color bar signal with pure white and pure black to the antenna input. Set color to minimum. Enter Serviceman Mode and select Sub-Data Adjustments. Select Sub Brightness (B2). Adjust until the black bars start to turn gray, then decrease adjustment until bars turn black.

Audio (B6)

NOTE: This adjustment is factory set, do not adjust unless IC101 is replaced.

On generator select pilot, 300Hz audio frequency, and L+R modulating signal. Connect an oscilloscope to junction of R202 and R203 and to ground. Enter Serviceman Mode and select Sub-Data Adjustments. Select Audio (B6). Adjust the data value for .7Vp-p ±.2Vp-p.

CUT-OFF ADJUSTMENTS

Follow the same procedure used for Sub-Data Adjustments.

Cut-Off Adjustments Chart

Adjustment	Range	Default Level	On-Set Level
Red Cutoff (C0)	0 0 thru 1 255	0 128	0 118
Green Cutoff (C1)	0-255	64	64
Blue Cutoff (C2)	0 0 thru 1 255	0 128	0 128
Red Drive (C3)	0-127	64	69
Blue Drive (C4)	0-127	64	69
YNR Switch (C5)	0-1	0	0
AFT (C6)	0 0 thru 1 255	0 120	0 120
RF AGC (C7)	0-127	64	65
YNR (C8)	0-7	0	0
Horiz Centering (C9)	0-31	16	11
Beam Limit (Ca)	0-7	0	4
Y Delay (Cb)	0-2	0	0

Color Temperature (C0 thru C4)

NOTE: Observe low and high brightness areas of a B/W picture for proper tracking.

Enter Serviceman Mode and select Cut-Off Adjustments. Set the Red Cutoff (C0), Green Cutoff (C1), and Blue Cutoff (C2) for a gray picture. Set the Red Drive (C3) and Blue Drive (C4) for correct white areas.

RF AGC (C7)

Tune in a picture. Enter Serviceman Mode and select Cut-Off Adjustments. Decrease the On-Set Level until snow appears in picture, then increase the data value to a point just past where snow disappears.

Horizontal Centering (C9)

Tune in a crosshatch pattern. Enter Serviceman Mode and select Cut-Off Adjustments. Select Horizontal Centering (C9) adjustment and adjust crosshatch pattern for correct horizontal centering.

Beam Limit (Ca)

Tune in a picture. Enter Serviceman Mode and select Cut-Off Adjustments. Adjust beam limit for best picture.

MTS STEREO ADJUSTMENTS

All adjustments were made using a MTS TV / stereo generator connected to the antenna terminal. Set the customer controls to normal listening levels and select stereo mode. Follow the same procedure used for Sub-Data Adjustments.

MTS Stereo Adjustments Chart

Adjustment	Range	Default Level	On-Set Level
Input Level (M0)	0-63	31	33
Stereo PLLVCO (M1)	0-63	31	33
Filter (M2)	0-63	31	33
Low - Level Separation (M3)	0-63	31	16
High - Level Separation (M4)	0-63	31	33

Input Level (M0)

On generator select pilot, 1kHz audio frequency, and L+R modulating signal. Connect an oscilloscope to pin 25 of IC2201. Enter Serviceman Mode and select MTS Stereo Adjustments. Select Input Level (M0). Adjust the data value for 1Vp-p.

Stereo PLLVCO (M1)

On generator select pilot, 1kHz audio frequency, and L+R modulating signal. Connect a 1000 ohms resistor between IC101 pin 29 and ground. Connect a 22µF 16V capacitor between the junction of resistors R202 and R203 and ground. Connect a frequency counter to pin 25 of IC2201. Enter Serviceman Mode and select MTS Stereo Adjustments. Select Stereo PLLVCO Level (M1). Adjust the data value to read 15.534kHz ±50Hz on the frequency counter.

Filter (M2)

On generator select pilot, 15.734kHz sine wave audio frequency, and L+R modulating signal. Connect an oscilloscope to pin 26 of IC2201 and ground, and connect an RMS meter between the junction of resistors R202 and R203 and ground. Adjust the sine wave signal generator output level so that the 15.734kHz sine wave would measure 1005mVrms ±5mVrms at the junction of resistors R202 and R203. Enter Serviceman Mode and select MTS Stereo Adjustments. Select Filter (M2). Adjust the data value for minimum amplitude on the scope.

Low - Level Separation (M3) and High - Level Separation (M4)

On generator select pilot, 300Hz audio frequency, and left modulating signal. Connect an oscilloscope to pin 25 of IC2201. Enter Serviceman Mode and select MTS Stereo Adjustments. Select Low - Level Separation (M3). Adjust the data value for minimum amplitude of waveform. On generator select 8kHz audio frequency. Select High - Level Separation (M4). Adjust the data value for minimum amplitude of the waveform. Repeat until no further decrease in amplitude can be obtained.

OPTIONS ADJUSTMENTS

Follow the same procedure used for Sub-Data Adjustments.

Options Adjustments Chart

Adjustment	Range	Default Level	On-Set Level
PIP Color (S0)	0-63	80	100
PIP Contrast (S1)	0-127	52	52
Up 1/9 (S2)	0-255	26	26
Down 1/9 (S3)	0-255	146	146
Left 1/9 (S4)	0-255	9	13
Right 1/9 (S5)	0-255	103	103
Up 1/16 (S6)	0-255	27	26
Down 1/16 (S7)	0-255	163	163
Left 1/16 (S8)	0-255	9	13
Right 1/16 (S9)	0-255	118	118
Freerun (Sa)	-	N/A	-
Clock Adjustment (Sb)	0-255	128	78
PIP Tint (Sc)	0-63	50	58
Loudness Compensation (Sd)	0-63	52	52

Clock Adjustment (Sb)

Connect a frequency counter to pin 13 of IC001. Turn receiver off. Record the frequency. Turn the receiver on and enter Serviceman Mode and select Options Adjustments. Select Clock Adjustment (Sb). Adjust (Sb) based on the following formula:

$$(Sb) = 128 + 0.901 \times 1000000 \times \frac{[244.1406 - \text{pin 13 (measured in Hz)}]}{244.1406}$$

VCO

Connect a balance antenna, select channel 11, and attenuate the signal strength for a weak noisy video. Adjust L105 for best picture, check other channels and repeat the process while applying stronger signal.

PCC (R761) AND HORIZONTAL SIZE (R760)

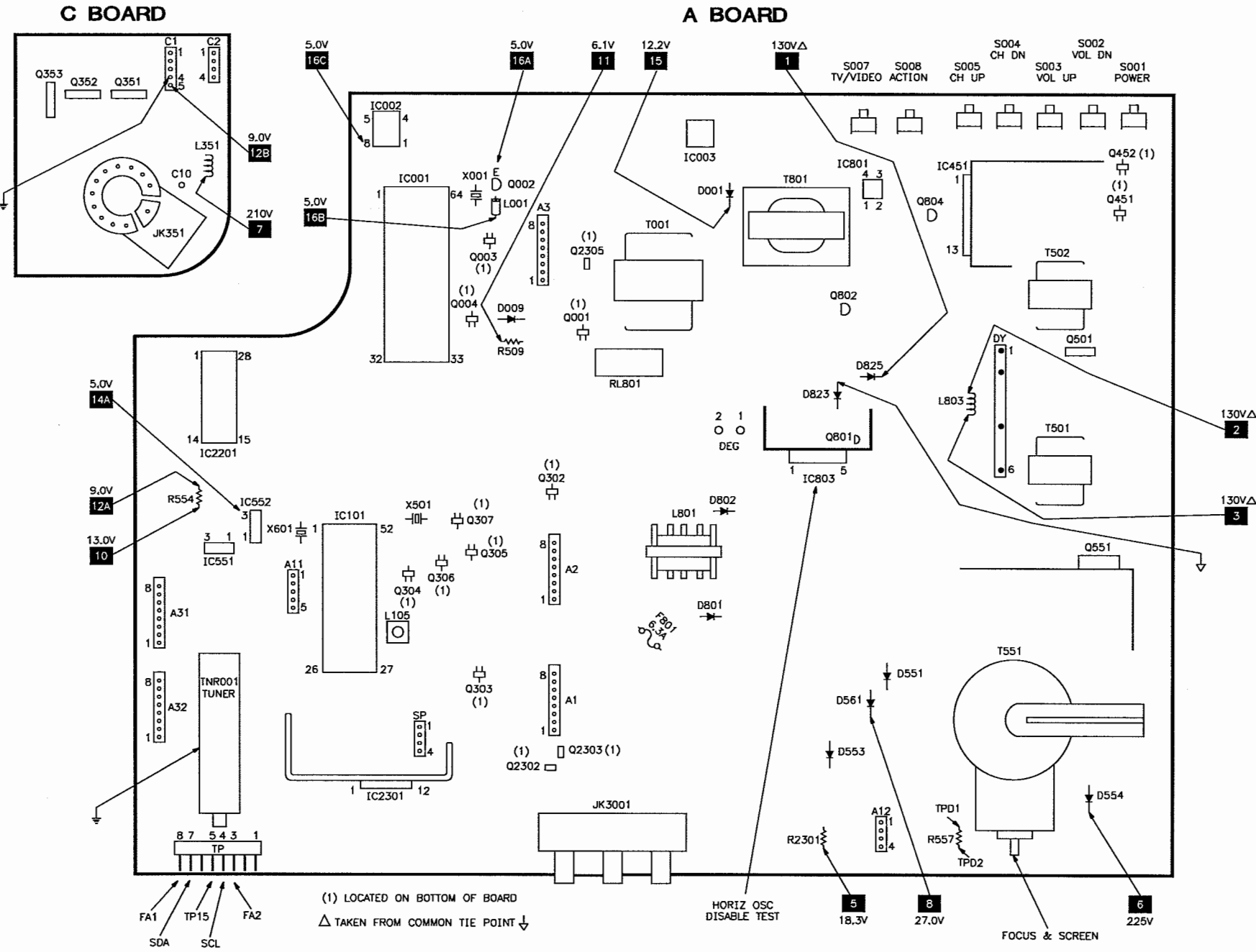
Tune in a crosshatch pattern. Adjust R760 to mid position. Adjust R761 for straight vertical lines on the left and right side of the crosshatch pattern. Adjust R760 for equal horizontal size of boxes on the left and right side of the crosshatch pattern.

SERVICE INFORMATION

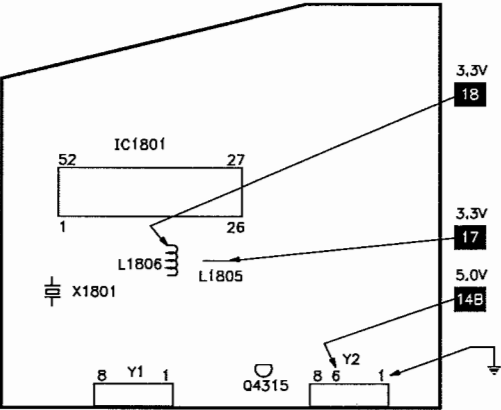
CRT PROTECTION

The CRT protection circuit is made up of Q451 and Q452. This circuit blanks out the CRT if vertical deflection failure occurs. It is important for the life of the CRT that this circuit be tested before returning the receiver to the customer. To test, short the base of Q452 to ground. The screen should go blank, if not this circuit needs repair.

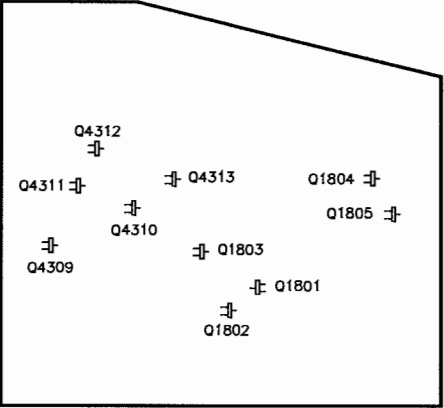
PLACEMENT CHART



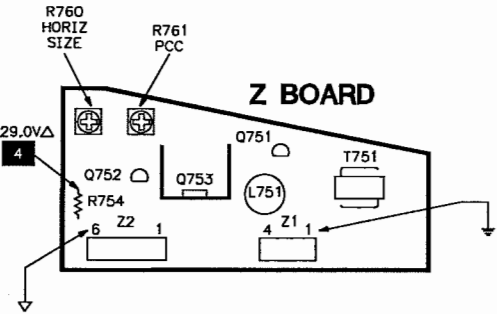
Y BOARD - TOP VIEW



Y BOARD - BOTTOM VIEW



Z BOARD



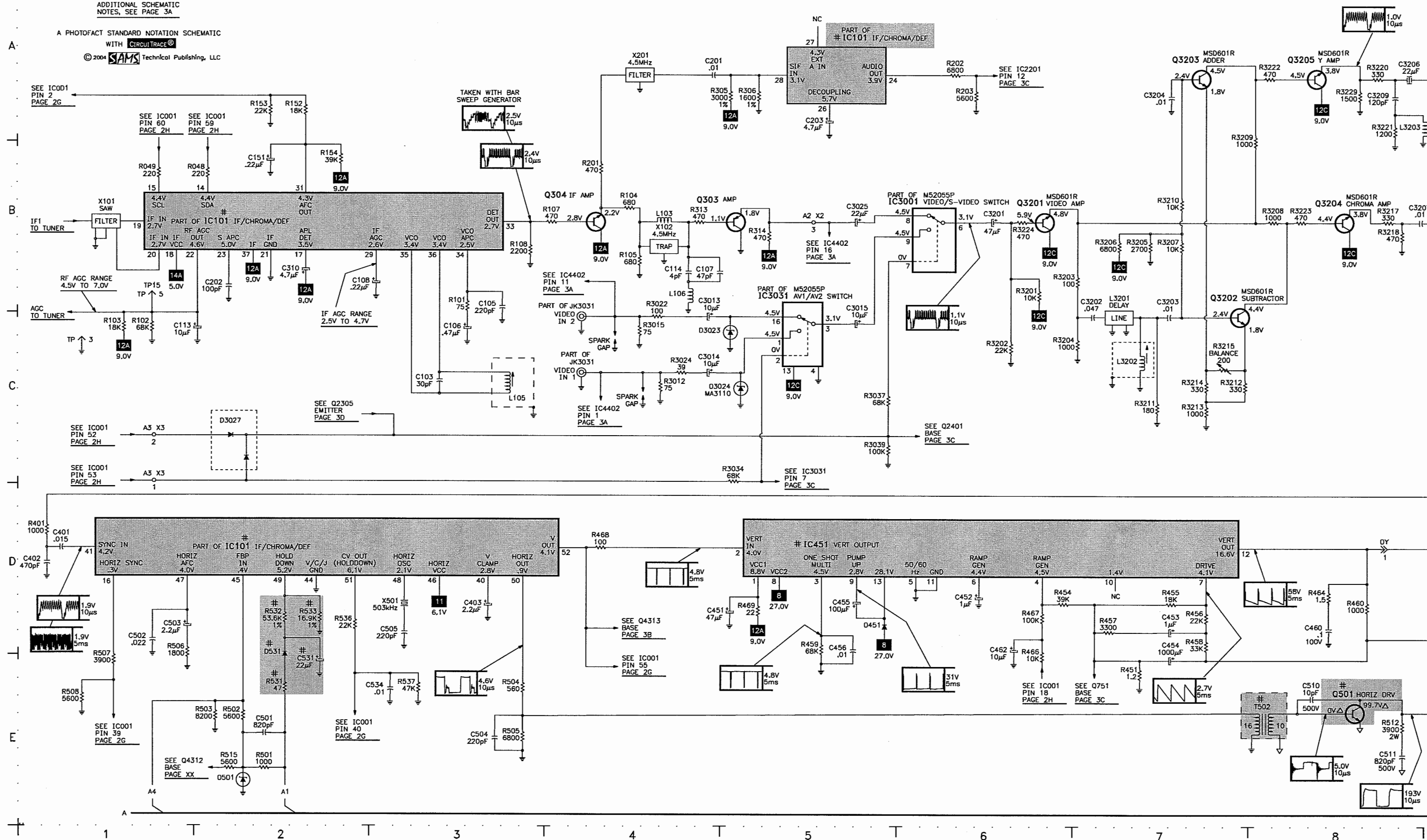
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MODELS SP3229UV/9V (CHASSIS ALEDC282)

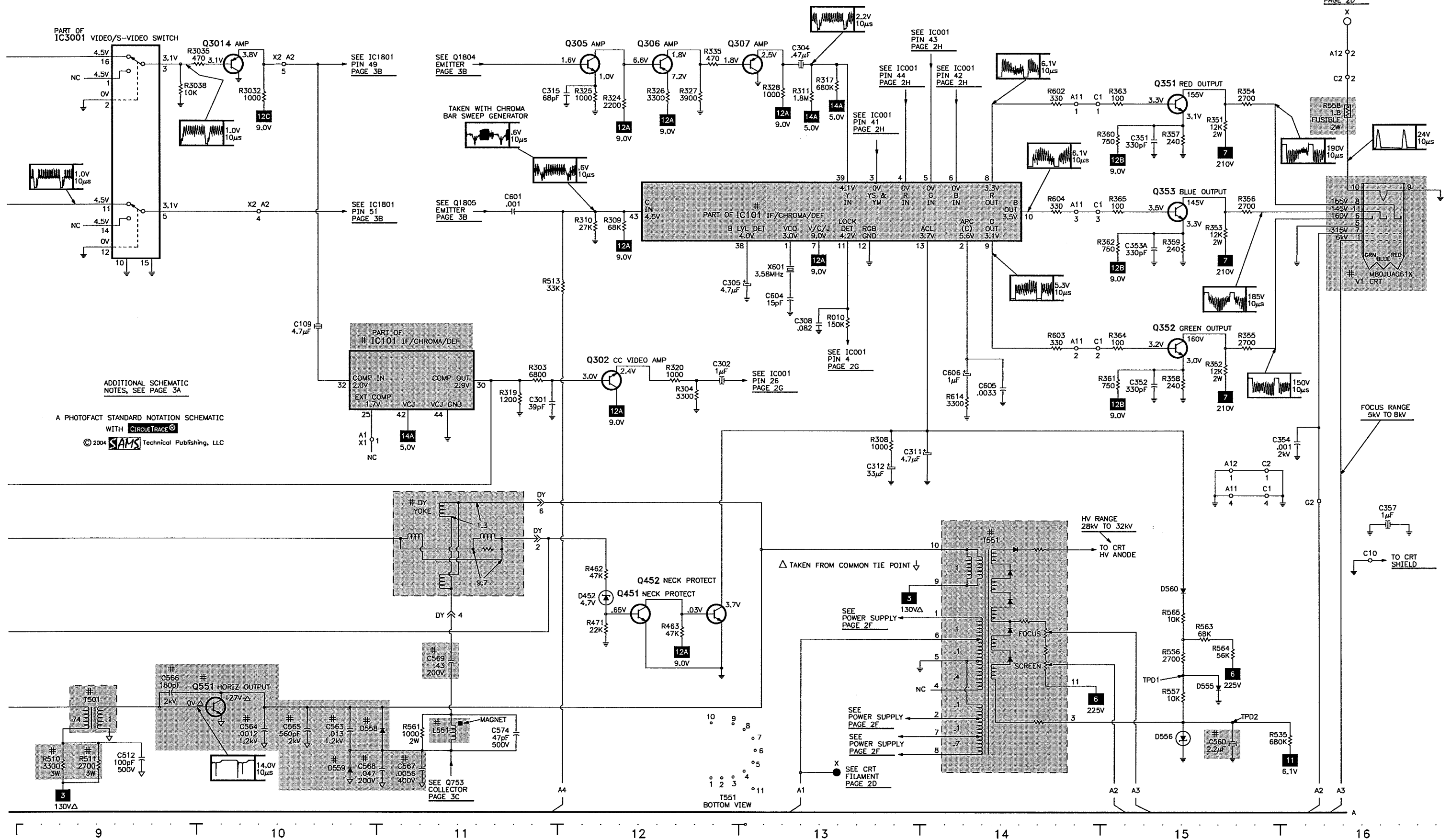
ADDITIONAL SCHEMATIC
NOTES, SEE PAGE 3A

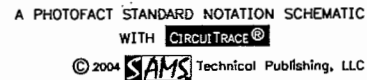
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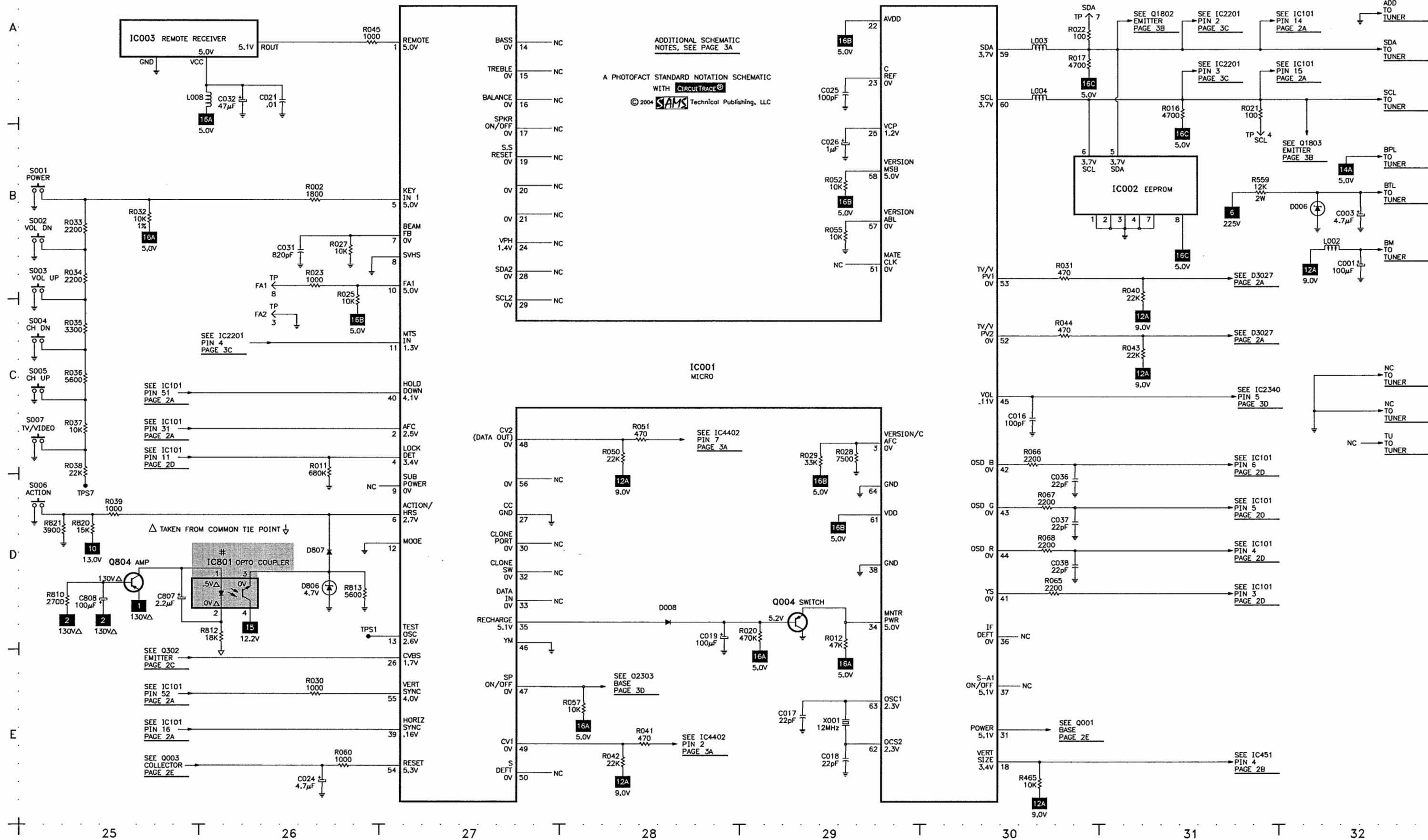


PART OF
IC3001 VIDEO/S-VIDEO SWITCH

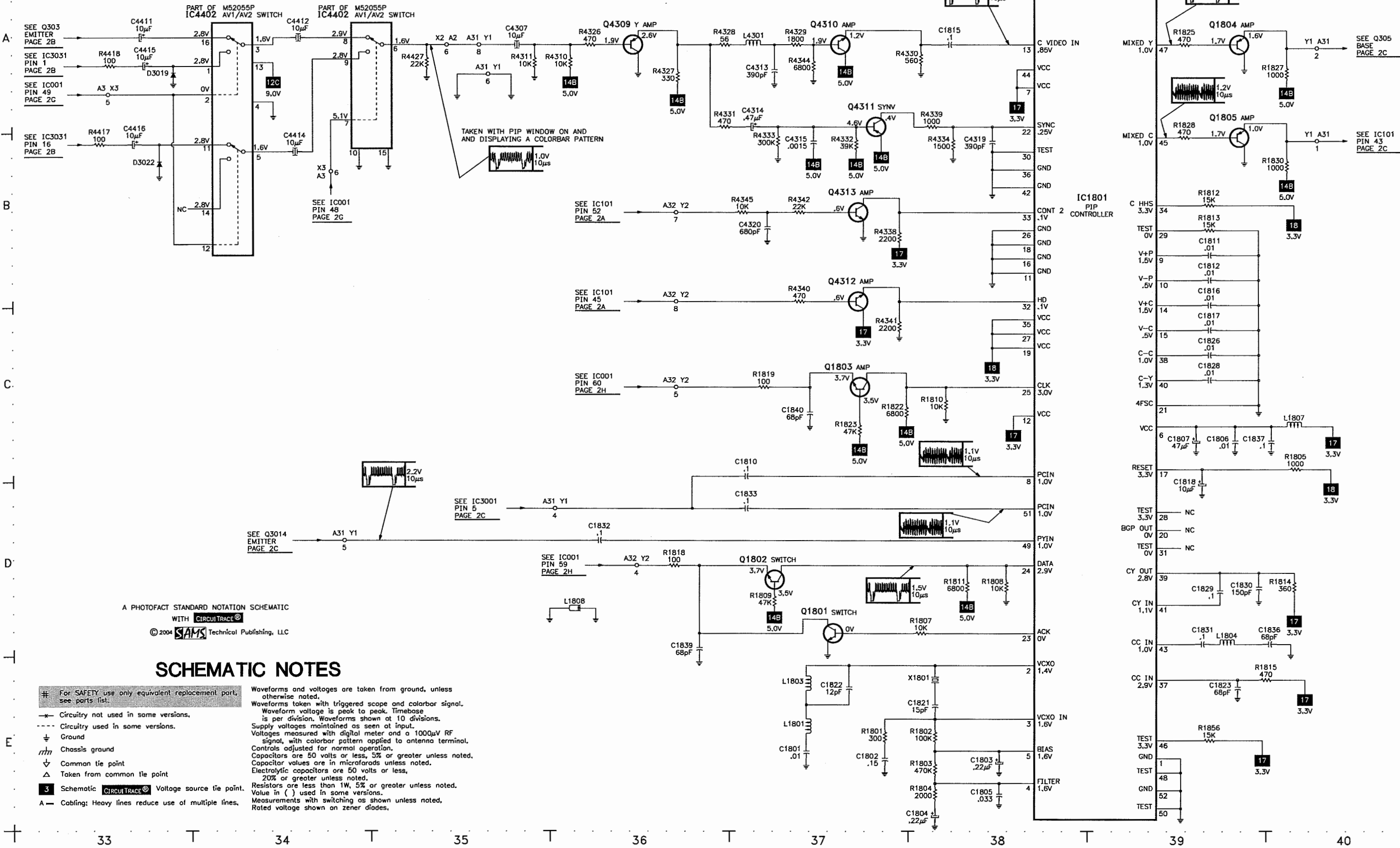


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SYSTEM CONTROL SCHEMATIC



PIP SCHEMATIC



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SCHEMATIC NOTES

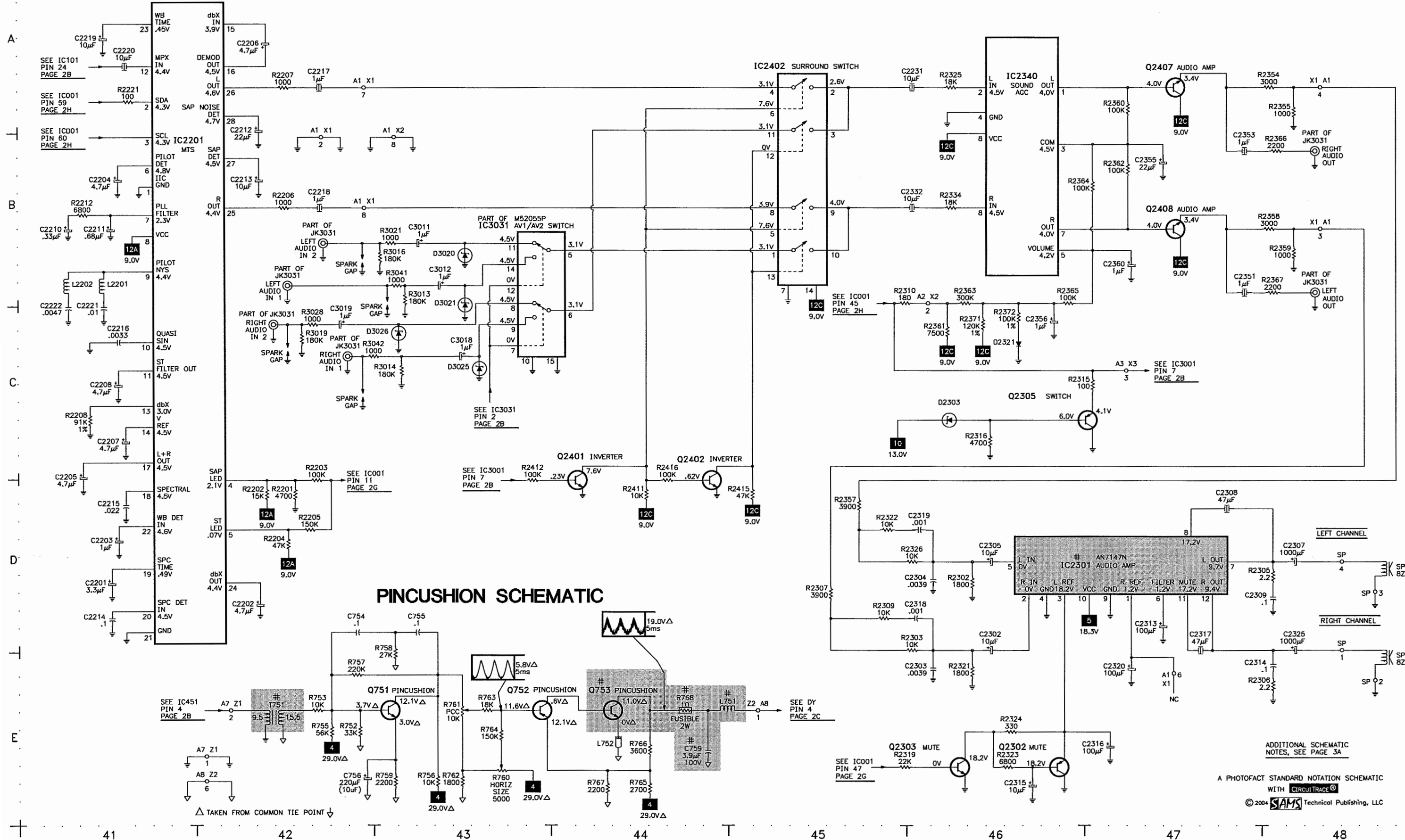
- # For SAFETY use only equivalent replacement part, see parts list.
- Circuitry not used in some versions.
- Circuitry used in some versions.
- ⊥ Ground
- ⊥ Chassis ground
- ⊥ Common tie point
- Δ Taken from common tie point
- 3 Schematic CIRCUITRACE® Voltage source tie point.
- A — Cabling: Heavy lines reduce use of multiple lines.

Waveforms and voltages are taken from ground, unless otherwise noted.
Waveforms taken with triggered scope and colorbar signal.
Waveform voltage is peak to peak. Timebase is per division. Waveforms shown at 10 divisions.
Supply voltages maintained as seen at input.
Voltages measured with digital meter and a 1000μV RF signal, with colorbar pattern applied to antenna terminal.
Controls adjusted for normal operation.
Capacitors are 50 volts or less, 5% or greater unless noted.
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.

AUDIO SCHEMATIC

C

D



QUASAR MODELS SP3229UV/9V (CHASSIS ALEDC282)

SCHEMATIC COMPONENT LOCATION GUIDE

C001	B32	C560	E15	C2207	C41	D016	D19	L106	B4	R021	B31	R456	D7	R827	B20	R3037	C5
C003	B32	C561	D23	C2208	C41	D017	D19	L351	C24	R022	A30	R457	D7	R828	B20	R3038	A9
C008	C20	C562	E21	C2209	D24	D451	D5	L551	E11	R023	C26	R458	D7	R829	B21	R3039	C5
C010	D19	C563	E10	C2210	B41	D452	D12	L554	E21	R025	C26	R459	D5	R1801	E37	R3041	C43
C011	D20	C564	E10	C2211	B41	D501	E2	L555	E22	R027	B26	R460	D8	R1802	E38	R3042	C42
C013	D19	C565	E10	C2212	B42	D531	E2	L556	D22	R028	C29	R462	D12	R1803	E38	R3201	B6
C016	C30	C566	E9	C2213	B42	D532	D23	L751	E44	R029	C29	R463	D12	R1804	E38	R3202	C6
C017	E29	C567	E11	C2214	D41	D551	D21	L752	E44	R030	E26	R464	D8	R1805	D40	R3203	B6
C018	E29	C568	E11	C2215	D41	D554	C22	L800	B18	R031	C30	R465	E30	R1807	D37	R3204	C6
C019	D28	C569	E11	C2216	C41	D555	E15	L801	A17	R032	B25	R466	E6	R1808	D38	R3205	B7
C020	D20	C571	D24	C2217	A42	D556	E15	L803	A23	R033	B25	R467	D6	R1809	D37	R3206	B7
C021	A26	C572	E24	C2218	B42	D557	E21	L804	A20	R034	B25	R468	D4	R1810	C38	R3207	B7
C022	C20	C573	E22	C2219	A41	D558	E11	L805	B23	R035	C25	R469	D5	R1811	D38	R3208	B8
C024	E26	C574	E11	C2220	A41	D559	E10	L1801	E37	R036	C25	R471	D12	R1812	B39	R3209	B7
C025	A29	C601	B11	C2221	C41	D560	D15	L1803	E37	R037	C25	R501	E2	R1813	B39	R3210	B7
C026	B29	C604	C13	C2222	C41	D561	C23	L1804	D39	R038	D25	R502	E2	R1814	D40	R3211	C7
C031	B26	C605	C14	C2231	A45	D751	B24	L1806	E19	R039	D25	R503	E2	R1815	E39	R3212	C7
C032	A26	C606	C14	C2301	B24	D801	A19	L1807	C40	R040	C31	R504	E3	R1818	D36	R3213	C7
C036	D30	C754	D42	C2302	E46	D802	A19	L1808	D36	R041	E28	R505	E3	R1819	C37	R3214	C7
C037	D30	C755	D43	C2303	E46	D805	A18	L2201	B41	R042	E28	R506	E1	R1822	C37	R3215	C7
C038	D30	C756	E42	C2304	D46	D806	D26	L2202	B41	R043	C31	R507	E1	R1823	C37	R3217	B8
C101	D23	C757	B24	C2305	D46	D807	D26	L3201	C7	R044	C30	R508	E1	R1825	A39	R3218	B8
C102	D23	C759	E44	C2307	D48	D809	B23	L3202	C7	R045	A26	R509	D23	R1827	A40	R3220	A8
C103	C3	C801	A19	C2308	D47	D820	B20	L3203	B8	R048	B2	R510	E9	R1828	B39	R3221	B8
C105	C3	C802	A19	C2309	D47	D821	B20	L4301	A37	R049	B1	R511	E9	R1830	B40	R3222	A8
C106	C3	C803	B20	C2313	D47	D822	C20	P800	A17	R050	C28	R512	E8	R1856	E39	R3223	B8
C107	B4	C804	A20	C2314	E47	D823	B22	Q001	B19	R051	C28	R513	C12	R2201	D42	R3224	B6
C108	B3	C805	A19	C2315	E46	D824	B21	Q002	D19	R052	B29	R515	E2	R2202	D42	R3229	A8
C109	C10	C806	B19	C2316	E47	D825	A23	Q003	D19	R055	B29	R531	E2	R2203	D42	R4310	A36
C110	E23	C807	D25	C2317	E47	D826	B20	Q004	D29	R057	E28	R532	D2	R2204	D42	R4311	A35
C111	E23	C808	D25	C2318	D45	D829	B20	Q302	C12	R060	E26	R533	D2	R2205	D42	R4326	A36
C113	C2	C809	A23	C2319	D45	D830	B23	Q303	B4	R065	D30	R535	E16	R2206	B42	R4327	A36
C114	B4	C810	C17	C2320	E47	D2303	C46	Q304	B4	R066	D30	R536	D2	R2207	A42	R4328	A36
C151	B2	C811	C17	C2325	E48	D2321	C46	Q305	A12	R067	D30	R537	E3	R2208	C41	R4329	A37
C201	A4	C812	B17	C2332	B45	D3019	A33	Q306	A12	R068	D30	R551	D21	R2212	B41	R4330	A38
C202	B2	C814	B20	C2351	C47	D3020	B43	Q307	A13	R101	C3	R552	C22	R2221	A41	R4331	B36
C203	A5	C815	B20	C2353	B47	D3021	C43	Q351	B15	R102	C1	R554	D22	R2301	B23	R4332	B37
C301	C11	C818	B22	C2355	B47	D3022	B33	Q352	C15	R103	C1	R556	E15	R2302	D46	R4333	B37
C302	C12	C820	B21	C2356	C46	D3023	C5	Q353	B15	R104	B4	R557	E15	R2303	E45	R4334	B38
C304	A13	C821	C23	C2358	E24	D3024	C5	Q451	D12	R105	B4	R558	B16	R2305	D47	R4336	E18
C305	C13	C822	B23	C2359	E23	D3025	C43	Q452	D12	R107	B3	R559	B31	R2306	E47	R4338	B37
C306	E24	C823	B24	C2360	B47	D3026	C43	Q501	E8	R108	B3	R560	C23	R2307	D45	R4339	B38
C308	C13	C824	B20	C3011	B43	D3027	C2	Q551	E10	R152	A2	R561	E11	R2309	D45	R4340	C37
C309	D24	C825	B20	C3012	C43	D4301	E18	Q751	E43	R153	A2	R563	E15	R2310	C45	R4341	C37
C310	B2	C1801	E37	C3013	C4	DY	D11	Q752	E43	R154	B2	R564	E15	R2315	C46	R4342	B37
C311	C14	C1802	E37	C3014	C4	F801	A17	Q753	E44	R201	B4	R565	D15	R2316	C46	R4344	A37
C312	D13	C1803	E38	C3015	C5	IC001	C28	Q801	B21	R202	A6	R566	E21	R2319	E45	R4345	B36
C315	A12	C1804	E38	C3016	E23	IC002	B31	Q802	B20	R203	A6	R602	B14	R2321	E46	R4417	B33
C351	B15	C1805	E38	C3018	C43	IC003	A25	Q804	D25	R303	C11	R603	C14	R2322	D45	R4418	A33
C352	C15	C1806	C39	C3019	C42	IC101	A5	Q1801	D37	R304	C12	R604	B14	R2323	E46	R4427	A35
C353	D23	C1807	C39	C3020	E23	IC101	B13	Q1802	D37	R305	A5	R614	C14	R2324	E46	RL801	A18
C353A	B15	C1808	E20	C3023	E23	IC101	B2	Q1803	C37	R306	A5	R752	E42	R2325	A46	RL801	B19
C354	C16	C1809	E20	C3024	E23	IC101	C11	Q1804	A39	R308	C13	R753	E42	R2326	D45	S001	B25
C357	D16	C1810	D37	C3025	B5	IC101	D2	Q1805	B39	R309	B12	R754	B24	R2334	B46	S002	B25
C401	D1	C1811	B39	C3201	B6	IC451	D5	Q2302	E46	R310	B12	R755	E42	R2354	A47	S003	C25
C402	D1	C1812	B39	C3202	C7	IC551	D22	Q2303	E46	R311	A13	R756	E43	R2355	A48	S004	C25
C403	D3	C1813	E19	C3203	C7	IC552	E22	Q2305	C46	R313	B4	R757	E42	R2357	D45	S005	C25
C451	D5	C1814	E19	C3204	A7	IC801	D26	Q2401	D44	R314	B5	R758	E43	R2358	B47	S006	D25
C452	D6	C1815	A38	C3206	A8	IC803	A21	Q2402	D44	R317	A13	R759	E43	R2359	B48	S007	C25
C453	D7	C1816	C39	C3207	B8	IC1801	B38	Q2407	A47	R319	C11	R760	E43	R2360	A47	SP1	D48
C454	E7	C1817	C39	C3209	A8	IC2201	B41	Q2408	B47	R320	C12	R761	E43	R2361	C46	SP2	E48
C455	D5	C1818	D39	C4304	E18	IC2301	D46	Q3014	A10	R324	B12	R762	E43	R2362	B47	T001	C18
C456	D5	C1819	E19	C4307	A35	IC2340	A46	Q3201	B6	R325	A12	R763	E43	R2363	C46	T501	E9
C459	C23	C1820	E19	C4313	A37	IC2402	A45	Q3202	C7	R326	A12	R764	E43	R2364	B46	T502	E7
C460	D8	C1821	E38	C4314	B37	IC3001	A9	Q3203	A7	R327	A12	R765	E44	R2365	C46	T551	C21
C462	D6	C1822	E37	C4315	B37	IC3001	B6	Q3204	B8	R328	A13	R766	E44	R2366	B47	T551	D14
C501	E2	C1823	E39	C4316	E19	IC3031	B43	Q3205	A8	R335	A12	R767	E44	R2367	C47	T751	E42
C502	D1	C1826	C39	C4317	E19	IC3031	C5	Q4309	A36	R351	B15	R768	E44	R2371	C46	T801	A22
C503	D1	C1827	E19	C4319	B38	IC4402	A34	Q4310	A37	R352	C15	R801	A19	R2372	C46	V1	B16
C504	E3	C1828	C39	C4320	B37	IC4402	A34	Q4311	B37	R353	B15	R804	B20	R2411	D44	X001	E29
C505	D3	C1829	D39	C4357	E23	JK3031	B42	Q4312	C37	R354	B15	R805	A19	R2412	D43	X101	B1
C506	D24	C1830	D39	C4358	E24	JK3031	B48	Q4313	B37	R355	C15	R806	B19	R2415	D45	X102	B4
C510	E8	C1831	D39	C4411	A33	JK3031	C4	Q4315	E18	R356	B15	R808	A23	R2416	D44	X201	A4
C511	E8	C1832	D36	C4412	A34	JK3031	C4	R002	B26	R357	B15	R809	A23	R3012	C4	X501	D3
C512	E9	C1833	D37	C4414	B34	JK3031	C42	R003	B18	R358	C15	R810	D25	R3013	C43	X601	B13
C531	E2	C1835	E20	C4415	A33	JK3031	C42	R004	D19	R359	B15	R812	D26	R3014	C43	X1801	E38
C532	D24	C1836	D39	C4416	B33	JK3031	C42	R005	C19	R360	B15	R813	D26	R3015	C4		
C534	E3	C1837	C39	CRA801	B18	JK3031	C48	R006	D19	R361	C15	R815	B17	R3016	B43		
C551	C24	C1839	D36	CRA802	C17	L001	D19	R007	D19	R362	B15	R819	B22	R3019	C42		
C552	E21	C1840	C37	D001	C18	L002	B32	R008	D19	R363	B15	R820	D25	R3021	B43		
C554	D21	C2201	D41	D002	B19	L003	A30	R010	C13	R364	C15	R821	D25	R3022	C4		
C555	C24	C2202	D42	D003	D19	L004	B30	R011	D26	R365	B15	R822	B20	R3024	C4		
C556	D22	C2203	D41	D006	B32	L006	D19	R012	D29	R401	D1	R823	B19	R3028	C42		
C557	C22	C2204	B41	D008	D28	L008	A26	R016	B31	R451	E7	R824	C20	R3032	A10		
C558	E21	C2205	D41	D009	D23	L103	B4	R017	A30	R454	D6	R825	B21	R3034	D4		
C559	C23	C2206	A42	D011	D23	L105	C3	R020	D29	R455	D7	R826	A21	R3035	A9		

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.</

PARTS LIST

Item No.	Type No.	Mfr. Part No.	NTE Part No.
D001	-	ERA15-01	NTE116
D002	-	MA165	NTE519
D003	-	MA4047M	NTE5009A
D006	-	MA4330H	-
D008, 09	-	MA165	NTE519
D011, 16, 17	-	MA165	NTE519
D451	-	ERA15-01	NTE116
D452	-	MA4047M	NTE5009A
D501	-	MA4082L	-
# D531	-	AS01	NTE552
# D532	-	MA4062L	NTE5012A
# D551	RU2N	TVSRU2N	NTE552
# D554	-	BYD33G-143	NTE552
D555	-	MA165	NTE519
D556	-	MA4360H	-
# D557	-	BYD33G-143	NTE552
# D558	-	RS3FS	NTE506
# D559	-	BYD33G-113	-
D560	-	MA165	NTE519
# D561	-	BYD33G-143	NTE552
D751	-	MA2270B	-
# D801, 02	-	RM10BLFA1	NTE125
D806	-	MA4047H	NTE5009A
D807	-	MA165	NTE519
# D809	-	BYD33G-143	NTE552
D820, 21, 22	-	EU02V1	NTE552
D823	-	RL30A	-
D824	-	EU02V1	NTE552
# D825	SR2KL	TVSSR2KL	-
D826	-	EU02V1	NTE552
D829	-	MA165	NTE519
D830	-	MA4270M	NTE146A
D2303	-	MA4068M	NTE5014A
D2321	-	MA151K	NTE593
D3019 Thru	-	-	-
D3026	-	MA3110M	-
D3027	-	MA151K	NTE593
D4301	-	MA3036H	-
IC001	-	MN1873265T9G	-
IC002	-	24LC02BIP	-
# IC101	-	AN5165K	-
# IC451	-	LA7838	NTE7039
# IC551	-	AN78M09	NTE1910
IC552	-	AN78M05	NTE960
# IC801	-	0N3131R	NTE3098
# IC803	-	STR58041A	NTE7078
IC1801	-	MN65617SP	-
IC2201	-	AN5819K	-
# IC2301	-	AN7147N	NTE7061
IC2340	-	M5222L	-
IC2402	-	TC4066BP	NTE4066B
IC3001, 31	-	M52055P	NTE7110
IC4402	-	M52055P	NTE7110
Q001	MSD601	MSD601-RT1	NTE2408
Q002	-	JC501PQ	NTE85
Q003, 04	MSB709	MSB709-RT1	NTE2409
Q302	MSD601	MSD601-RT1	NTE2408
Q303	MSB709	MSB709-RT1	NTE2409
Q304, 05	MSD601	MSD601-RT1	NTE2408
Q306, 07	MSB709	MSB709-RT1	NTE2409
Q351, 52, 53	2SC3063RL	2SC3063	NTE157
Q451, 52	MSD601	MSD601-RT1	NTE2408
# Q501	-	2SC4212H	NTE2501
# Q551	-	BU2508DF	NTE2353
Q751	-	JC501PQ	NTE85
Q752	-	JA101PQ	NTE290A
# Q753	-	2SD1266	NTE377
Q801	2SC1685Q	2SC1685QRS	NTE85
Q802	2SC1384	2SC1384RS	NTE293
Q804	2SA1767	2SA1767Q	NTE2362
Q1801, 02, 03	MSD601	MSD601-RT1	NTE2408
Q1804, 05	MSB709	MSB709-RT1	NTE2409
Q2302	MSB709	MSB709-RT1	NTE2409
Q2303	MSD601	MSD601-RT1	NTE2408
Q2305	MSB709	MSB709-RT1	NTE2409

Item No.	Type No.	Mfr. Part No.	NTE Part No.
Q2401, 02	MSD601	MSD601-RT1	NTE2408
Q2407, 08	MSD601	MSD601-RT1	NTE2408
Q3014	MSB709	MSB709-RT1	NTE2409
Q3201 Thru	-	-	-
Q3205	MSD601	MSD601-RT1	NTE2408
Q4309	MSB709	MSB709-RT1	NTE2409
Q4310	MSD601	MSD601-RT1	NTE2408
Q4311	MSB709	MSB709-RT1	NTE2409
Q4312, 13	MSD601	MSD601-RT1	NTE2408
Q4315	2SC1384	2SC1384Q	NTE293

Item No.	Function/Rating	Mfr. Part No.	Notes
C109	4.7µF 50V NP	ECEA1EN4R7U	-
C302	1µF 50V NP	ECEA1HN010U	-
C304	.47µF 50V NP	ECEA1HNR47U	-
C354	.001 10% 2kV	ECKD3D102KB	-
C357	1µF 50V NP	ECEA1HN010U	-
C452	1µF 25V Tantalum	ECSEF1EE105	-
# C531	22µF 25V	ECA1EM220	-
# C551	330µF 35V	ECA1VM331	-
# C555	22µF 250V	ECEA2EU220	-
# C556	1000µF 16V	ECA1CM102	-
# C560	2.2µF 50V NP	ECEA1HN2R2U	-
# C563	.013 5% 1.2kV	ECWH12H133JS	-
# C564	.0012 5% 2kV	ECWH12H122JS	-
# C565	560pF 5% 2kV	ECKD3D561JB	-
# C566	180pF 5% 2kV	ECKD3D181JB	-
# C567	.0056 5% 400V	ECQM4562JZ	-
# C568	.047 5% 400V	ECQM4473JZ	-
# C569	.43 5% 200V	ECWF2434JBK	-
# C759	3.9µF 10% 100V	ECQE1395KN	-
# C801 Thru	-	-	-
# C804	.0047 +100% -0% 500V	ECKD2H472PU	-
# C805, 06	330µF 200V	EC0S2DA331BB	-
# C809	150µF 200V	EC0S2DG151DG	-
# C810, 11	.015 20% 250VAC	ECQU2A153MN	-
# C812	.22 20% 250VAC	ECQU2A224MV	-
C818	820pF 10% 1kV	ECKD3A821KB	-
# C820	10µF 63V	ECEA1JGE100	-
# C822	220µF 25V	ECA1EM221	-
# C823	33µF 160V	ECEA160V33Z	-
C824	330pF 10% 1kV	ECKD3A331KB	-
C825	470pF 10% 1kV	ECKD3A471KB	-
C2201	3.3µF 16V Tantalum	AP335K016CAE	-
C2217, 18	1µF 50V NP	ECEA1HN010U	-
C2219	10µF 16V Tantalum	AP106K016CAE	-
C2220	10µF 16V NP	ECEA1CN100U	-
C2308, 17	47µF 25V NP	ECEA1EN470U	-
C2331, 32	10µF 16V NP	ECEA1CN100U	-
C2351, 53	1µF 50V NP	ECEA1HN010U	-
C3206	22µF 25V NP	ECA1EM220	-
C4307	10µF 16V NP	ECEA1CKN100	-
C4412, 14	10µF 16V NP	ECEA1CM100	-
# CRA801, 02	Capristor	EXNG471P365	470pF 125VAC, 3.6M, Spark Gap
# D805	5 Cold PTC	TRPW5B0M030D	-
# DY	Yoke	TLYA007	Horiz 1mH, Vert 22.5mH
# F801	Fuse	0BA1C63NU100	6.3Amp, 125V, Slow Blow
IC003	Receiver	RPM-637CBRS1	Remote
JK3031	Jack	TJB18623	Assembly
L001	Ferrite Bead	TSKA074	-
L002	39µH	TLTACT390K	-
L003, 04	2.2µH	TLUABTA2R2K	-
L006	Ferrite Bead	TSKA072	-
L008	47µH	TLUABTA470K	-
L103	12µH	TLTACT120J	-
L105	VCO	EIV7EN053B	-
L106	18µH	TLTACT180J	-
L351	100µH	TLUABTA101K	-
# L551	Horizontal Linearity	TLH6663P	-
L554, 55, 56	Ferrite Bead	TSKA072	-
# L751	-	ELC18B301L	-
L752	Ferrite Bead	EXCELDR35	-
# L800	Degaussing	OLK19050	-
# L801	Line Filter	ELF20N020A	-

Item No.	Function/Rating	Mfr. Part No.	Notes
# L803	Line Filter	ELF17N017A	-
L804, 05	Ferrite Bead	TSKA072	-
L1801	-	TLTACT1R5K	-
L1803	2.2µH	TLUABTA2R2K	-
L1804	15µH	TLTACT150J	-
L1806, 07	1µH	TLTACT1R0K	-
L1808	-	EXCELDR25	-
L2201	1000µH	TLTACT102J	-
L2202	470µH	TLTACT471J	-
L3201	Delay Line	EFDEN645B35B	-
L3202	730µH	EQK7ES731B	-
L3203	18µH	TLTACT180K	-
L4301	2.2µH	TLTACT2R2K	-
# P800	Line Cord	TSX2AA0011	AC, Polarized
R032	10K 1% 1/4W	ERJ6ENF1002	-
R305	3000 1% 1/4W	ER0S2CKF3001	-
R306	1600 1% 1/10W	ERJ6ENF1601	-
# R510	3300 5% 3W	ERG3FJ332H	-
# R511	2700 5% 3W	ERG3FJ272H	-
# R531	47 5% 1/4W	ERD25FJ470	-
# R532	53.6K 1% 1/10W	ERJ6ENF5362	-
# R533	16.9K 5% 1/10	ERJ6ENF1692	-
# R551, 52	1 5% 1/2W	ERDS1FJ1R0	-
R554	27 5% 3W	ERG3FJ270H	-
# R558	1.8 5% 2W Fusible	ERQ2CJP1R8	-
# R566	1 5% 1/2W	ERDS1FJ1R0	-
R760	5000 Horizontal Size	EVND8AA03B53	-
R761	10K PCC	EVND8AA03B14	-
# R768	10 5% 2W Fusible	ERQ2CJP100	-
# R801	1.5 10% 7W	ERF7ZK1R5	-
# R815	8.2M 20% 1/2W	ERC12ZGM825	-
# R819	1 5% 1/2W	ERDS1FJ1R0	-
R824	39 5% 3W	ERG3FJ390	-
# R826	.22 10% 2W	ERF2AKR22	-
R828	47 5% 3W	ERG3FJ470	-
R829	6.8 5% 1/4W Fusible	ERQ14AJ6R8	-
R2208	91K 1% 1/10W	ERJ6ENF9102	-
R2301	8.2 5% 2W Fusible	ERQ2CJP8R2	-
R3215	200 Balance	EVND8AA03B22	-
# RL801	Power	TSEH8007	Relay
S001	Switch	EVQQKH06K	Power
S002	Switch	EVQQKH06K	Volume Down
S003	Switch	EVQQKH06K	Volume Up
S004	Switch	EVQQKH06K	Channel Down
S005	Switch	EVQQKH06K	Channel Up
S006	Switch	EVQQKH06K	Action
S007	Switch	EVQQKH06K	TV/Video
SP1, 2	Speaker	TAS2AA0005	16 Ohms, 1.5W
# T001	Power	TLP16297	-
# T501	Horizontal Driver	TLH15452	-
# T502	Horizontal Coupling	ETE19Z30AY	-
# T551 (1)	Horizontal Output	KFT5AB106F	-
# T751	Pincushion	ETE19Z30BY	-
# T801	Power	ETS29AK1N6NC	-
# TNR001	Tuner	ENV56D18G3	-
# V1	CRT	M80JUA061X	-
X001	Crystal	TSS2080MX	12MHz
X101	Filter	M1969M	SAW
X102	Trap	EFCWS4504AB	4.5MHz
X201	Filter	EFC54R5MS5W	4.5MHz
X501	Crystal	TAFC5B503F38	503kHz
X601	Crystal	TSS2AA001	3.58MHz
X1801	Oscillator	TSSA050	-
	Magnet	0FMK014ZZ	Convergence Corrector Strip
	Magnet	ETC33X82NA	Purity/Convergence
	PC Board	TNP2AH004BB	A
	PC Board	TNP2AA006C	C
	PC Board	TNP2A007AC	X
	PC Board	TNP2AA009AB	Y
	PC Board	TNP2AA010N1L	Z
#	Socket	TJSC00300	CRT
	Transmitter	EUR511011A	Remote
	Wedge	TMM2A30702	Yoke Positioning (3 Used)

For SAFETY use only equivalent replacement part.
(1) Screen and focus controls are part of T551.