

Sherwood

MODEL S-8800a ALL-SILICON SOLID-STATE FM STEREO RECEIVER SERVICE MANUAL

MODEL S-8800a 160 WATTS

Serial No. R8110018 & UP



MODEL S-8800a STEREO RECEIVER SPECIFICATIONS

AMPLIFIER:

POWER OUTPUT (4 OHMS): music power 160 watts total, continuous power 50 watts X 2.

POWER OUTPUT (8 OHMS): music power 120 watts total, continuous power 40 watts X 2.

HARMONIC DISTORTION: 0.35% @ 8 Ω rated output, 0.10% @ 2 watts & 5 watts.

INTERMODULATION DISTORTION: 0.6% @ 8 Ω rated output, 0.15% @ 2 watts & 5 watts.

STEREO & MONO SPEAKER OUTPUT IMPEDANCE: 4, 8, or 16 ohms.

STEREO HEADPHONE OUTPUT: high or low impedance.

STEREO RECORDING OUTPUT: 500mv, 2K ohms.

POWER BANDWIDTH: 12-30KHz @ 1% Dist.

FREQUENCY RESPONSE: Aux. 20-20KHz \pm 1 db., Phono: RIAA Std. \pm 1.5db.

DAMPING FACTOR: 40:1 @ 8 ohms.

BASS CONTROL: \pm 15 db @ 40 Hz.

TREBLE CONTROL: \pm 15 db @ 15 KHz.

HIGH FILTER: -23db @ 20 KHz., -3 db @ 5 KHz.

INPUT SENSITIVITY (for rated output): Phono, 1.6 mv, variable to 50mv., Aux. 200mv., Tape Monitor, 200mv.

INPUT CAPABILITY for 1% dist.: Phono, 250mv., Aux. 2.5 v.

HUM AND NOISE (IHF):

Phono -65db.

Aux. -80db.

Vol. Control Min. -90db.

CROSSTALK: -40 db @ 1 KHz.

SPECIAL FEATURES: Mono speaker output, transistorized instant overload protection, Tone control flat response \pm 5 degrees, Front-panel tape dubbing jack.

TUNER:

FM SENSITIVITY (IHF): 1.8 μ v (-30db noise & dist.)

SIGNAL-TO-NOISE RATIO: -70db.

CAPTURE RATIO: 2.0db.

SUPPRESSION OF AM: -50db.

TUNING RANGE: 87.5 to 108.5 KHz.

DISTORTION: 0.15% @ 100% mod.

CROSSMODULATION REJECTION: -95db.

STABILITY: \pm 10 KHz (\pm .01%).

IMAGE REJECTION: -80db.

IF REJECTION: -90db.

ALTERNATE-CHANNEL SELECTIVITY: 55db.

STEREO SEPARATION: 40db @ 1 KHz.

FREQUENCY RESPONSE: Mono, 20-20 KHz \pm 1 db., Stereo, 20-15 KHz \pm 1 db.

ANTENNA: 300-ohm balanced or 75 ohm coax.

SPECIAL FEATURES: FET rf and mixer stages, Microcircuit IF & Synchrophase Limiter, Flywheel-assisted velvet tuning, Dial scale 7-3/4 inches long, 0.2MHz calibrations, Interchannel hush with front-panel level adjust, Zero-center tuning meter, Noise-protected automatic FM stereo/mono switching @ 8 μ v.

GENERAL:

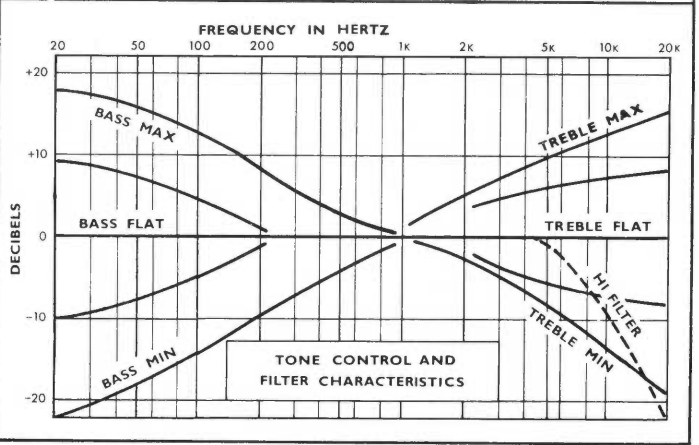
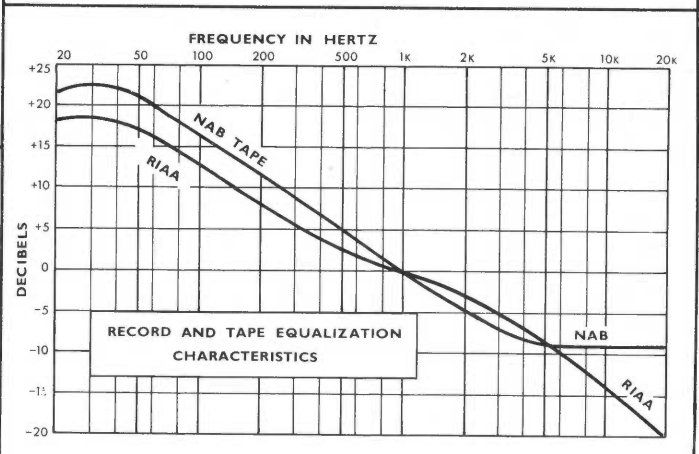
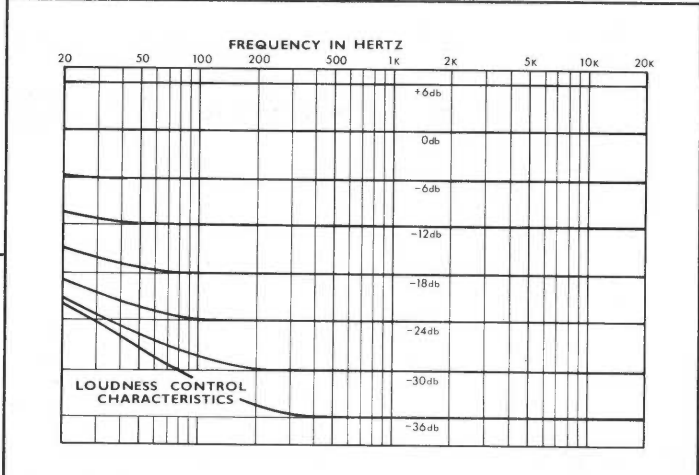
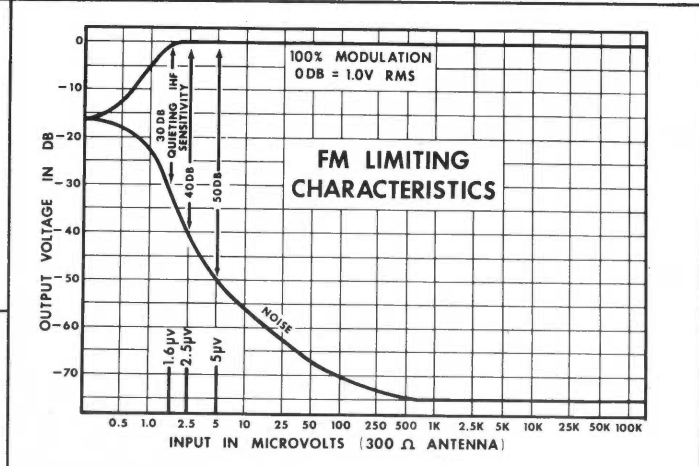
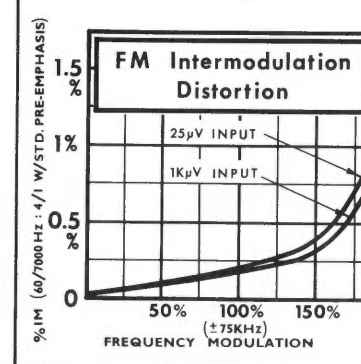
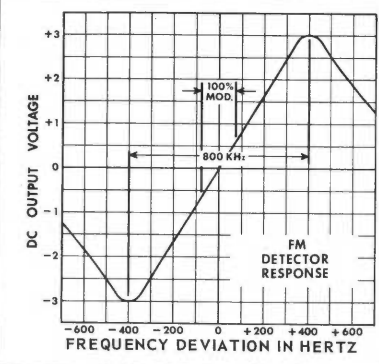
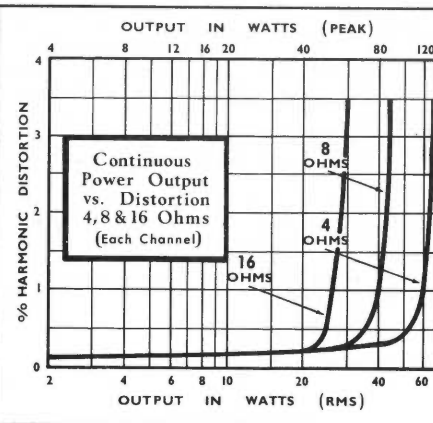
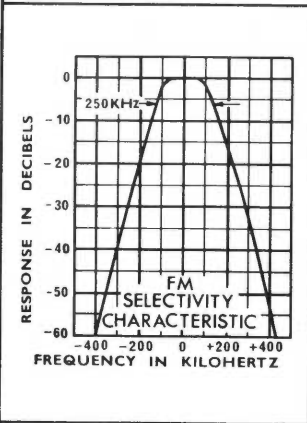
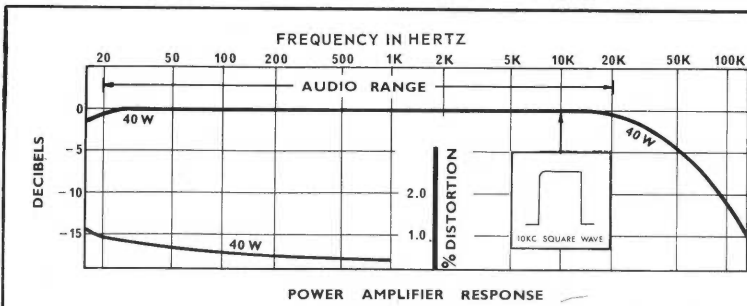
POWER REQUIREMENTS: 115-125v, 60 Hz, 30 to 160 watts fused.

AC OUTLETS: (1) 300W. switched, (1) 300W. unswitched.

DIMENSIONS: 16-1/4 L X 14 D X 4-1/4 H.

SHIPPING WEIGHT: 27 lbs.

OPTIONAL ACCESSORIES: Oiled Walnut Cabinet (W8) 17 L X 14 D X 5 H, Walnut-grained leatherette Case (Type D) 16-1/4 X 14 D X 4-1/2 H.



REALIGNMENT: To check alignment, refer to page 3. Do not attempt realignment unless adequate test equipment is available.

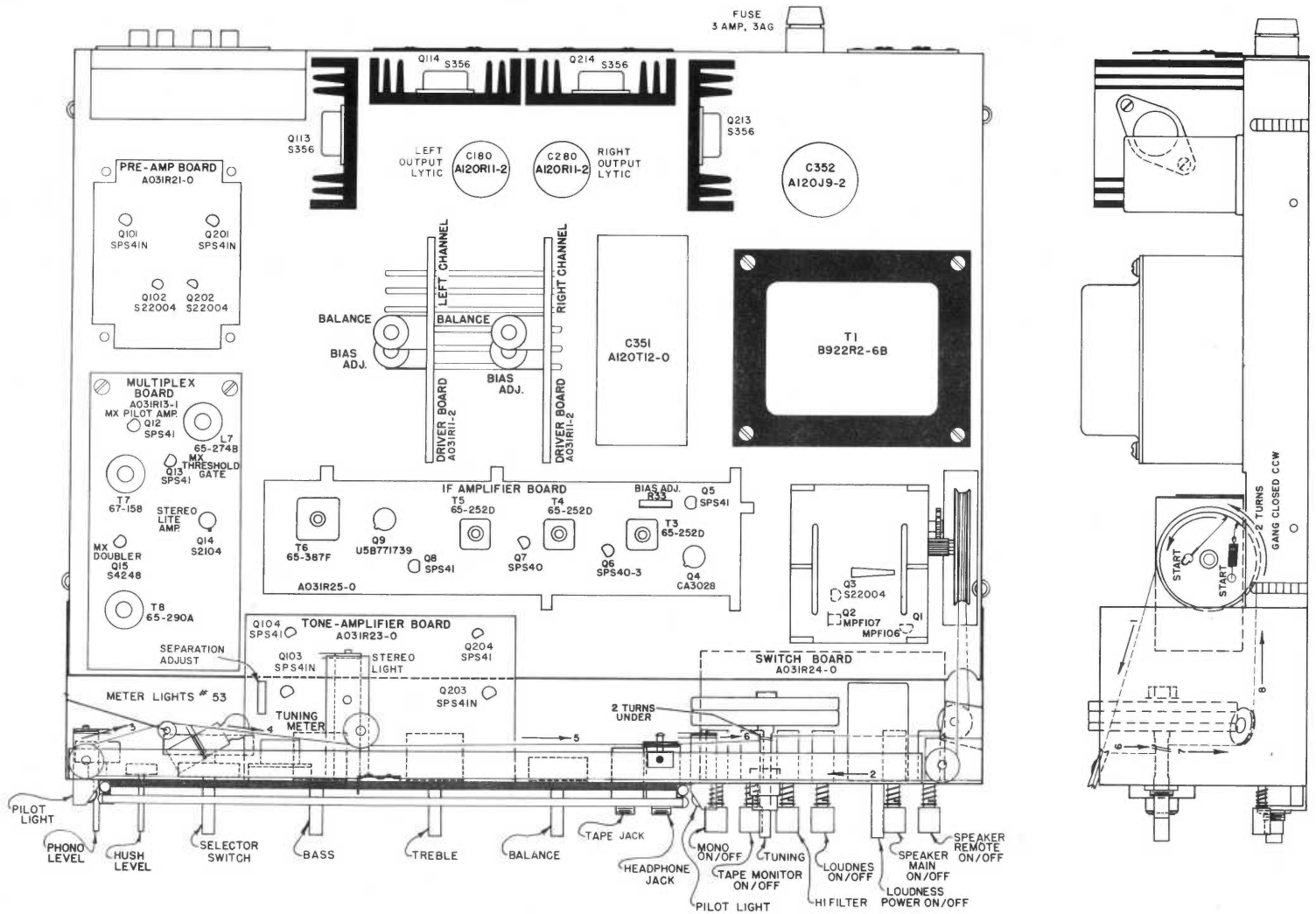
Optimum FM alignment, similar to the original factory alignment, consists of feeding a properly-terminated FM signal into the antenna terminals. To simulate a balanced 300-ohm input with the typical low-impedance single-ended generator, connect a 120-ohm carbon 1/2 watt resistor from each generator terminal to a receiver FM antenna input terminal. While observing the IF response curve with an oscilloscope through an RF PROBE, carefully adjust IF transformers, top and bottom, for the maximum symmetrical response. Check the bandpass for 150KHz flat top with 100% FM modulation. With this bandpass centered on the oscilloscope, repeat step 11 for a zero reading.

All Sherwood tuners are also adjusted and checked to see that they meet 1/3% IM distortion at 100% FM. To adjust, feed 60 Hz: 7KHz at 4:1 ratio into a low-distortion FM generator. With FM generator rf signal at 100% FM, feeding into antenna terminals, read IM distortion at FM detector output with receiver tuned for zero volts. Adjust primary of T6 for minimum distortion.

ALIGNMENT CHART

	switch position	signal generator input			dial setting	indicating instrument	adjust	indication	
		coupling	freq.	modulation					
FM ALIGNMENT	1	Selector FM Mode: Mono	none	none	none	pt. of no interf.	DC-VTVM across R36 1K Ω	R33 bias adj	2.0 V-DC
	2					Probe at Q6 base, CRO: HORIZ. EXT. MODULATION (Audio in all steps).	Short T4 & T5 Pin 4 to Gnd. (Short jumper wire).		
	3	300 Ant. Input	90MHz	400 or 60Hz \pm 300KHz FM	90MHz	"	L4, L2, L3, T2 & T3 top & bottom	IF response for max. deflection & symmetry about 10.7MHz marker.	
	Inject 10.7MHz marker into feethru C9 on tuner chassis (see pictorial on Tuner schematic).								
	4	"	"	106MHz	"	106MHz	"	C19,C2,C6	"
	5	Repeat steps 3 & 4 until no further improvement.							
	6	"	"	96MHz	"	96MHz	Probe at Q7 base.	(Remove T4 jumper short) T4 Top & Bottom	" (\pm 120KHz BW at -3db).
	7	"	"	"	"	"	Probe at Q9 Pin 1	(Remove T5 jumper short) T5 top & bottom	"
	8	Repeat step 1							
	9	"	"	"	400 or 60Hz \pm 75KHz FM. centered on IF	"	DC-VTVM across C55, 100pf.	T6 Top	0 V-DC
	10	"	"	"	400 or 60Hz \pm 300KHz FM	"	"	T6 bottom	FM detector response curve for maximum deflection & symmetry
11	"	"	100uv input	400 or 60Hz \pm 75KHz FM. centered on IF	"	CRO at Audio Left (across R390)	T6 bottom	Fine adjust for linear lissajous* (recheck for the 0 VDC of step 9).	
MX ALIGNMENT	1	Disconnect FM detector from Point A (Short Q13 emitter-base junction)							
	2	Selector FM Mode: Auto Stereo	10K source impedance	60MV RMS 19KHz into point A	none	point of no interf.	CRO &/or AC voltmeter base of Q15	T7 top & bottom	maximum deflection
	3	"	"	"	"	"	CRO &/or AC voltmeter T8 pin 1 to ground	T8 top & bottom	"
	4	"	"	1.0V RMS 67KHz into point A	"	"	"	L7	null
	5	"	"	feed composite MX sig. left CH modulation 1.7V p-p or 0.3V RMS 400Hz into point A	"	"	CRO &/or AC voltmeter across R390	none	Note: approx. 0.4V Audio at Left channel output
	6	"	"	"	"	"	CRO &/or AC voltmeter across R391	T7 top	null at unmodulated channel output (approx. -10db from left)
	7	"	"	switch off stereo gen. audio mod.	"	"	CRO &/or AC voltmeter across R390	none	residual 19KHz and 38KHz to be approx. -45db below 100% audio
	8	Reconnect FM detector to point A (Remove Q13 emitter-base short)							
	9	"	300 balanced input to FM ant. input	96MHz 100uv	\pm 75KHz composite stereo sig. left CH modulation only	96MHz	CRO &/or AC voltmeter across R391	fine adjust T7 top	null at unmodulated channel output.
	10	"	"	"	"	"	CRO &/or AC-VTVM at record output (right channel)	Adjust separation R136	Adjust for null separation (to be more than -30db)

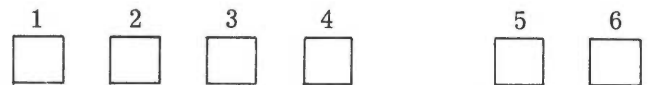
*If distortion analyzer is available, null T6 bottom for minimum distortion with 75KHz modulation.



B866R3 PUSH BUTTON SWITCH

REPAIR PROCEDURE

REMOVAL OF BROKEN PUSH BUTTON.



(a) depress and lock buttons 1, 2, 3, 5, & 6 (depress completely to lock)

(b) with thumb of left hand depress button #4 approx. 3/16" to 1/4" and hold in that position. With long nose pliers grasp flange of locking key. (located on right hand side of pushbutton #4) Pull key forward enough to clear tab on left side of switch and slide locking key as far to the right as it will go and release locking key from pliers. Then slide key to the left and slowly release the tension on push button #4.

(c) Each button may now be individually removed by depressing and then releasing the button slowly.

REINSERTION OF BUTTONS

(a) depress and lock buttons 1, 2, 3, 5, & 6.

(b) Slide locking key as far to the right as it will go. With thumb of right hand depress push button #4 approx. 1/4" to 3/8". With small screwdriver in left hand slide small tab (located just to left of push button #4) as far to the right as it will go.

Slowly release push button #4. It should return to its normal position and stop.

(c) With long nose pliers grasp locking key flange and pull it forward enough to clear small tab on left hand side of #4 push button. Then slide locking key to the left until small tab is visible through hole in locking key. Slowly allow locking key to return to a flush position against switch mounting plate, making sure small tab is encompassed by locking key.

(d) Using a pliers or screwdriver slide locking key flange gently to the right until lite snap is heard.

(e) All push buttons are now locked and may be returned to their normal position by depressing and releasing each button.

NOTE: If push button #4 binds, pin on right hand side of locking key has been caught by spring.

PARTS LIST

TRANSISTORS (All silicon)	PART NO.	PRICE
Audio, Low signal - No dot (High beta), (Q5, 8, 12, 13, 105, 205)	SPS41	\$0.31
Audio, Low signal, No dot, (Q102, 108, 202, 208)	S22004	0.63
Audio, Low signal - Green dot (Low Noise), (Q101, 103, 201, 203)	SPS41N	0.91
Audio, Low signal - White dot, (Q106, 206)	S22004V	0.73
Audio, PNP (Q10, 15)	S4248	0.50
Pre-Driver, NPN (Q107, 207)	SPS4199	0.95
Pre-Driver, PNP (Q110, 210)	S437	3.16
Pre-Driver, NPN (Q14, 109, 209)	S2104	0.92
Driver, NPN (Q111, 112, 211, 212)	S409F	2.70
Output, NPN (Q113, 114, 213, 214)	S356	8.33
B Supply, NPN (Q11)	37649	1.80
RF Amp., FET (Q1)	MPF106	2.12
RF Mixer, FET (Q2)	MPF107	2.21
RF, IF, NPN (Q3, 6, 7) (Use same beta code 1, 2, 3)	SPS40	0.90
Microcircuit, (Q4)	CA3028	4.01
Microcircuit, (Q9)	U5B771739	5.40

You will note that all transistors used in the S-8800a are color-coded with a dot or mark of some color prominently located on the top of their case. (Some transistors have no mark, but this also is identification.) When ordering replacement transistors, it is imperative that you indicate not only its part no., but the color dot on the transistor body: red, yellow, none, (1, - 2, - or - 3). This is particularly important when replacing output transistors.

DESCRIPTION	PART NO.	PRICE
0.5 μ f, 50V, (C150, 171, 250, 271)	B120X3	\$0.72
5 μ f, 20V, (C151, 152, 251, 252)	B120X6	0.59
1 μ f, 25V, (C90, 111, 211, 360)	B120X7	0.59
8 μ f, 40V, (C140, 142, 240, 242)	B120X8	0.45
20 μ f, 5V, (C160, 260)	B120X12	0.59
100 μ f, 3V, (C100, 102, 200, 202)	B120X24	0.45
1 μ f, 40V, (C163, 263)	B120X76	0.63
LYTICS - BYPASS		
0.5 μ f, 50V, (C20, 31, 34)	B120B3	0.59
8 μ f, 40V, (C374)	B120B8	0.45
10 μ f, 10V, (C161, 261)	B120B9	0.45
20 μ f, 50V, (C170, 270)	B120B14	0.45
500 μ f, 25V, (C353)	B120B31	0.99
250 μ f, 35V, (C340, 341, 343)	B120B33	0.86
125 μ f, 16V, (C18)	B120B26	0.46
250 μ f, 15V, (C342)	B120B74	0.59
50 μ f, 15V, (C25)	B120X36	0.90
Insulator, Mica (T0-3)	A021F1	0.05
Fuse, 3 Amp., 3AG	312003.	0.15
Dial Glass	B322R9-0	1.13
Knobs, Small, (w/indicator)	B467X1-2	1.98
Knobs, Mini.	A467X5-2	1.13
Knobs, Medium, (w/indicator)	B467X4-2	2.25
Tuning Meter	A550G3	6.30
Light Bulb, Pilot, #53	630B53	0.16
Light Bulb, Stereo, #1302	630B1302	0.64
Control, Bass, 100K, (R134A, B)	A670R20-0	1.67
Control, Treble, 100K, (R140A, B)	A670R20-0	1.67
Control, Balance, 100K, (R122)	A670R22-1	0.90
Control, Hush, 15K, (R35)	A670R18-2	0.95
Control, Ph. Level 1.5K, (R120A, B)	A670R19-2	2.12

DESCRIPTION	PART NO.	PRICE
Control, Loudness, Dual w/AC sw. 50K, (R121A, B)	A671R3-3	4.28
Pot., P. C., 500, (R183, 283)	A675T1-0A	0.45
Pot., P. C., 25K, (R136)	A675T8-0A	0.45
Pot., P. C., 250K, (R33)	A675T9-0A	0.72
Pot., P. C., 500K, (R174, 274)	A675T10-0A	0.63
Rectifier, Silicon, (X14)	A692T5	0.48
Diode, Silicon, (X2, 4, 6, 7, 8, 9, 10, 17)	A692X13	1.22
Rectifier, Silicon, (X12, 13)	A692X16	1.71
Rectifier, Silicon, (X15, 16)	A692X17	0.62
Diode, Zener, Silicon, 13V, 5%, (Z1)	A694X1	1.21
Socket, Driver Transistor, T0-5	A790T4M	0.23
Socket, Output Transistor, T0-3	A790T7	0.18
Stereo Headphone Jack	A795R3	0.95
Stereo Tape Jack	A795R3	0.95
Fuse Post	A796X2	0.70
Selector Switch, 3 Position, (S1)	A860R9-1	5.04
Switch, Push Button Assembly	B866R3-3A	7.69
Transformer, Power, Domestic, (T1)	B922R2-6	20.97
Transformer, Export, Power, (T1)	2B922R2X-6	27.95
Transformer, FM IF (T3, 4, 5)	65-252D	2.75
Transformer, FM Discrim., (T6)	65-387F	4.92
Transformer, FM Converter, (T2)	67-101	2.07
Transformer, 38KHz, (T8)	65-290A	1.52
Transformer, 19KHz, (T7)	67-158	2.43
Coil, 67KHz Null, (L7)	65-274B	0.96
Coil, Mixer (L3)	68-131	1.13
Coil, Balun, (L1)	67-288	0.86
Choke, RF, (L5, 6)	64-103	0.52

SERVICING

VOLTAGE CHECKS

Preliminary checks of the D.C. voltages present at various points in the S-8800a can prove useful in locating defective components. They are inconclusive, however, in determining if transistors are operating properly in all aspects. They can only indicate whether the transistor is open, shorted or functioning, not how well the transistor is functioning.

IN GENERAL:

Correct voltages indicate a functioning transistor.

The same voltage at the collector and emitter indicates a shorted transistor.

Full supply voltage on the collector and no voltage on the emitter indicates an open transistor.

OUTPUT TRANSISTOR BIAS

Of all the specifications which require checking to ascertain correct performance of the S-8800a, proper output transistor operation is the most important and critical. Adjustment of the output transistor bias is necessary if output transistors are replaced*, or the amplifier exhibits one or more of the following symptoms:

1. Overheating of the output transistors under normal operating conditions.
2. Excessive low level Intermodulation Distortion—more than 0.5% at 2.0 volts across 8 ohms (0.8 watts, IM power).

Adjustment of output transistor bias should then proceed as follows:

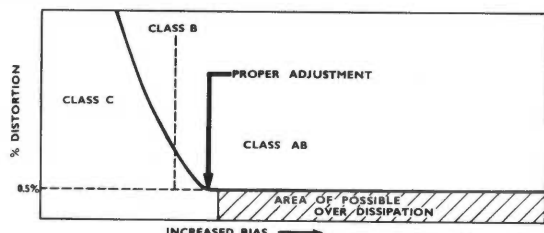


FIG. 1

1. Turn amplifier off.
2. Set output balance pots (left and right channels) to mechanical center and bias pots fully counter-clockwise.
3. Connect D.C. voltmeter of at least 3% known accuracy to transistor side of appropriate channel's output terminals.

*It is extremely important that the mica insulating washers used to separate the output transistors from their heat sinks be unbroken and installed properly with silicon grease liberally applied to all surfaces in contact with each other. Make certain the emitter and base pins of the output transistors do not contact any part of the heat sinks.

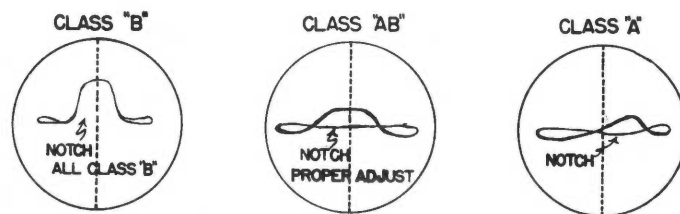
NOTE: Refer to speaker load connections on schematic, being careful to observe ground-connections.

4. Turn amp. on and adjust output balance pot for that channel so that approx. 1/2B+ voltage is on the output capacitor.
5. Connect an Intermodulation Distortion analyzer to the amplifier TP. MON. (aux.) input, turn volume control to maximum and adjust the analyzer output for an amplifier output of 2.0V across 8 ohms. (Because the output stages have been set into heavy class "B" operation by the "pre-setting" in Step 2, a class "B" notch in the distortion waveform will be obvious.) NOTE: When adjusting bias for class "AB", adjust until class "B" notch is almost eliminated. Class "A" begins beyond this point. Notch shifts to right.
6. Increase analyzer output until clipping can be observed. Fine adjust output balance pot. so that clipping is symmetrical.

IMPORTANT: Misadjustment of the bias pot can cause heavy class "A" operation of the output transistors, causing them to overheat.

The following performance indicates a properly operating output stage with 8 ohm load.

- Less than 0.5%IM distortion at 2.0V.
- Typically 0.6%IM distortion at 10 Volts.
- 18 watts of power per channel at clipping.



1. PROTECTIVE CIRCUITRY (IOP) & SPEAKER SYSTEM CHECK: The Model S-8800a incorporates special protective circuitry, (Instamatic Overload Protection), which turns off the drive to the power amplifiers when danger to the receiver output circuitry exists. If the receiver turns itself off, check the speaker connections for shorted wires. Speaker line resistance should not measure below 3 ohms.

The overload protective circuit consists of a type of bi-stable multivibrator. Transistor Q105 samples the output transistors current. At approximately 5A peak output current, Q105 is triggered and clamps the base of Q106 to ground and locks in this state, preventing AC drive to the power amplifier and thereby protecting it.

SERVICING

The circuit can be returned to its original state by turning the receiver's **LOUDNESS CONTROL** to the power **OFF** position, waiting ten seconds and then turning the receiver on again. If the fault has been corrected, the receiver will perform properly. If the protective circuitry continues to turn off the receiver audio output, determine cause of Q105's base drive voltage, which initiates the triggering cycle or suspect Q105 itself.

2. AMPLIFIER/PREAMP STAGE ISOLATION: Evaluate whether both channels are inoperative. If thus, B+ supply should be suspected for malfunction. If one channel only, evaluate with test signal whether signal feeds properly through phono preamp, auxiliary high-level input, or into volume control at high side (this isolates power amplifier section from tone amplifier section).

3. FAULT ISOLATED TO POWER AMPLIFIER: With DC voltmeter, verify accuracy of all power supply voltages, collector, emitter, and base voltages of transistors on the driver-circuit boards and of output transistors in the faulty power amplifier channel. The voltages should be verified against those shown on the schematic for 120V power line and also against those in the 2nd channel (assumed to be operating correctly). Note that output electrolytic coupling capacitor DC voltage (on transistor feed side) should read approx. 1/2 of B+ supply voltage. Note in most cases of a defective driver or output transistor, the fuse will open and prevent the taking of a usable center-point voltage reading. Therefore, it is valuable to operate the amplifier with a variable voltage power line (Variat) equipped with a line wattmeter (or ammeter) to identify abnormal power consumption.

With the Variac, reduce the power line voltage to zero, replace fuse, and slowly increase power line voltage upward while observing wattmeter. (The power consumption should not exceed 10-15 watts as the voltage is increased up to rated 120 volts. If power consumption reading begins to exceed 15 watts, starting from zero voltage, do not increase power line voltage further.) Now verify center-point voltage for half-voltage reading.

If center-point voltage reads extremely low, suspect defective output or driver transistors (or phase-inverting pre-driver on S-8800a) on low side (schematic shows these as bottom devices in each channel). If center-point voltage reads extremely high, suspect defective high-side output or driver transistors.

Remove both driver transistors from their sockets. If power consumption drops considerably, then faulty driver transistors should be suspected. If power consumption remains unusually high, then faulty output transistors should be suspected. If not, suspect pre-driver or bias-regulator transistor or associated components.

If all above seems not to be at fault, then verify that output coupling electrolytic capacitor is not shorted, other capacitors are not shorted, circuit board contains no solder or etching shorts, open resistors, or poor solder connections. (Note: a small error voltage at pre-driver base and/or emitter will disrupt grossly the operation of the driver and output transistors.)

If center-point voltage reads approximately 1/2 voltage in accordance with above check, apply audio signal to channel being investigated and measure distortion as per service instruction manual. Distortion which exceeds amplifier ratings might be due to one of the following:

1. Output transistor not matched beta.
2. Output bias requires readjustment.
3. Driver transistor has low beta.

4. FAULT ISOLATED TO TONE CONTROL AMPLIFIER: Check DC voltages at transistor collector, emitter, and base on tone circuit board and compare with schematic and with good channel. Feed 1KC audio signal to input connection to tone circuit board. Compare output voltage to input voltage which should have a gain ratio of about 6db (2X).

Isolate inoperative stage by checking signal at input of treble control (Record Output jack on S-8800a). Compare this voltage to input voltage which should result in 1st stage gain - approximately 6db (2X).

Evaluate distortion in conjunction with power amplifier. Verify bass and treble frequency response with bass and treble boost and cut characteristic curves shown in service manual.

5. FAULT ISOLATED TO PREAMP: Check DC voltages at transistor collector, emitter, and base on preamp circuit board and compare with schematic and with good channel. Feed 1KC audio signal to phono input jack. Compare output voltage at input of tone circuit board to input voltage. The resulting calculated gain ratio should be approximately 40db (100X) with preamp gain (phono level) control at maximum gain. Isolate the inoperative stage by checking signal voltage at collector of 1st stage. Verify frequency response with phono and tape equalization curves shown in service manual.

6. FAULT ISOLATED TO POWER SUPPLY: Check DC voltages at input, mid-point, and output filter capacitor sections and compare with those shown on schematic. If a voltage measures low, remove leads to amplifier or receiver loads to isolate possibility of leaky or shorted electrolytic capacitor section. Proper operation of zener diode regulating tuner section is 12 volts $\pm 5\%$. Higher voltage indicates open zener diode.

TROUBLE SHOOTING HINTS

SYMPTOM	POSSIBLE CAUSES AND SOLUTIONS
NO SOUND & DIAL IS <u>NOT</u> LIGHTED.	The main fuse is blown. (Replace it with a 3AG 3-amp fuse - do not use a slo-blo type.)
NO SOUND BUT DIAL IS LIGHTED.	The SPKRS ON-OFF switch is in the OFF position. (Switch it ON.) The NORM-TP MONTR switch is in the TP MONTR position. (Switch it to the NORM position.)
ONE CHANNEL IS DEAD	Check all speaker connections for shorted wires. Turn the receiver's LOUDNESS CONTROL to the power OFF position, wait ten seconds, and then turn the receiver on again. If the fault has been corrected the receiver will perform properly.
RECEIVER OPERATES IN PHONO MODE ONLY. NO FM RECEPTION.	The Hush level control is improperly set. Reread the section titled FM INTERCHANNEL HUSH in the Operation section of the manual. The FM antenna has become disconnected. Reread the ELECTRICAL CONNECTIONS Section of the manual, and re-install the antenna.
DISTORTED SOUND ON FM	If changing the position of the antenna results in a change in the sound, a better antenna is called for. FM Multipath reception might be suspected. See your local dealer for suggestions.
HUM ON PHONO BUZZ ON PHONO	The phono cables are not connected properly. Check for loose shield connections or lack of phono chassis ground wire. Move the tone arm on its pivot. If the hum changes, the phono cartridge is not properly shielded, or should be moved farther away from the receiver power transformer.
THE DIAL GLASS SEEMS CROOKED	With the case off the receiver, the dial glass may easily be straightened.
THE DIAL POINTER DOES NOT ACCURATELY LOG THE STATIONS	The dial pointer may also be moved in either direction on its cable to correct for minor logging error.

DIAL DRIVE SLIPPAGE: If turning knob does not result in corresponding movement of the dial pointer, dial drive string slippage should be suspected. To remedy, remove the chassis from its cabinet. Ascertain that no oil has reached the drive shaft string notch. If this has occurred, it will be necessary to remove the dial string and clean the notch with carbon tetrachloride. Replace string as per chassis diagram. Adjust spring in drum notch to furnish sufficient tension to prevent slippage on the drive shaft.

If dial pulleys and shaft appear to be dry or "squeak", apply one small drop of LUBRIPLATE to their bearings, being careful that no lubricant reaches the dial shaft string notch. If the dial string shows evidence of oil, it will be necessary to replace the string.

CLEANING ESCUTCHEON FACE PLATE: The beige escutcheon on your Sherwood equipment has been finished with a durable baked enamel. To clean, wipe with a chamois or cloth dampened with a water solution

of liquid detergent. Wipe with dry cloth. Do not use an abrasive scouring powder.

INDICATOR LIGHTS: To replace the indicator lights you must remove the receiver case and escutcheon. Push bulb in and twist counterclockwise.

FM DISTORTION: Your Sherwood receiver has been designed with the correct value of FM audio deemphasis feeding the audio system. Since this amount of deemphasis permits the overall FM audio response to be flat to 20,000 Hz, any distortion generated at the FM station will be heard without moderation by the receiver. With a good high-fidelity speaker system, your ear will be acutely aware of any distortion generated in the system. If you suspect distortion in your FM reception, check several other FM stations to ascertain the degree of distortion originating in the program. Your Sherwood FM receiver has been checked to have less than 1/3% intermodulation distortion before leaving the factory. Each FM program probably has not had a similar check.



ELECTRONIC LABORATORIES, INC.

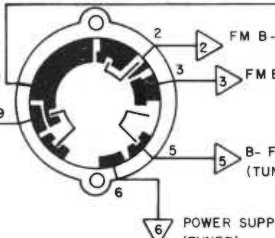
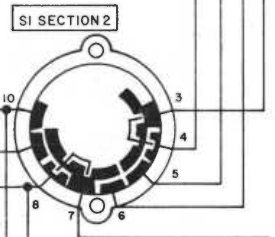
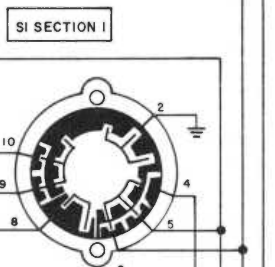
4300 NORTH CALIFORNIA AVENUE, CHICAGO, ILLINOIS 60618 IRVING 8-7300

LEFT CHANNEL INPUTS
PH
AUX

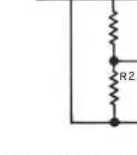
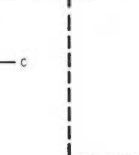
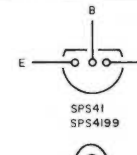
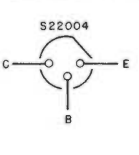
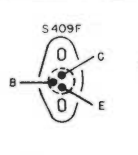
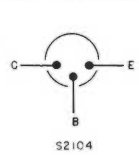
FM
FM

RIGHT CHANNEL INPUTS
PH
AUX

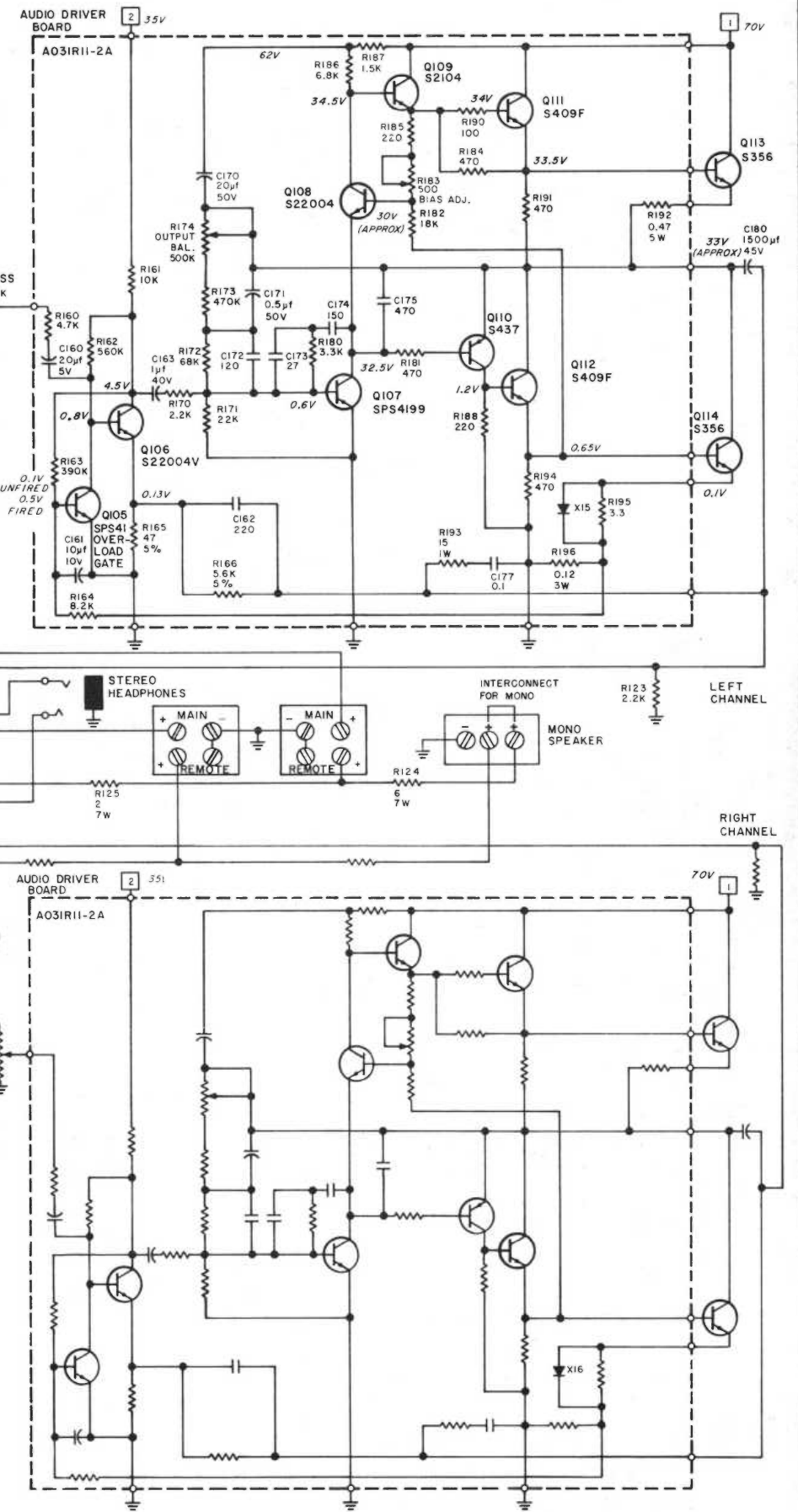
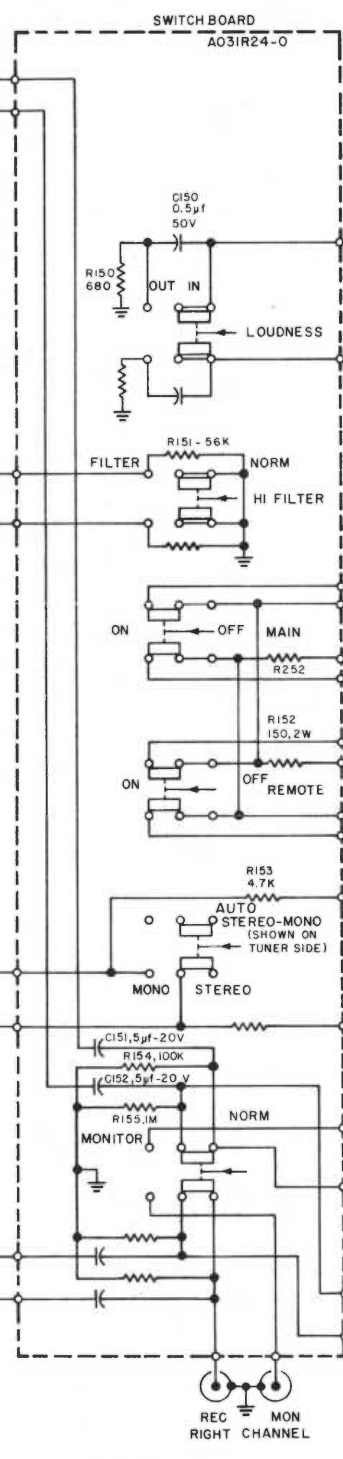
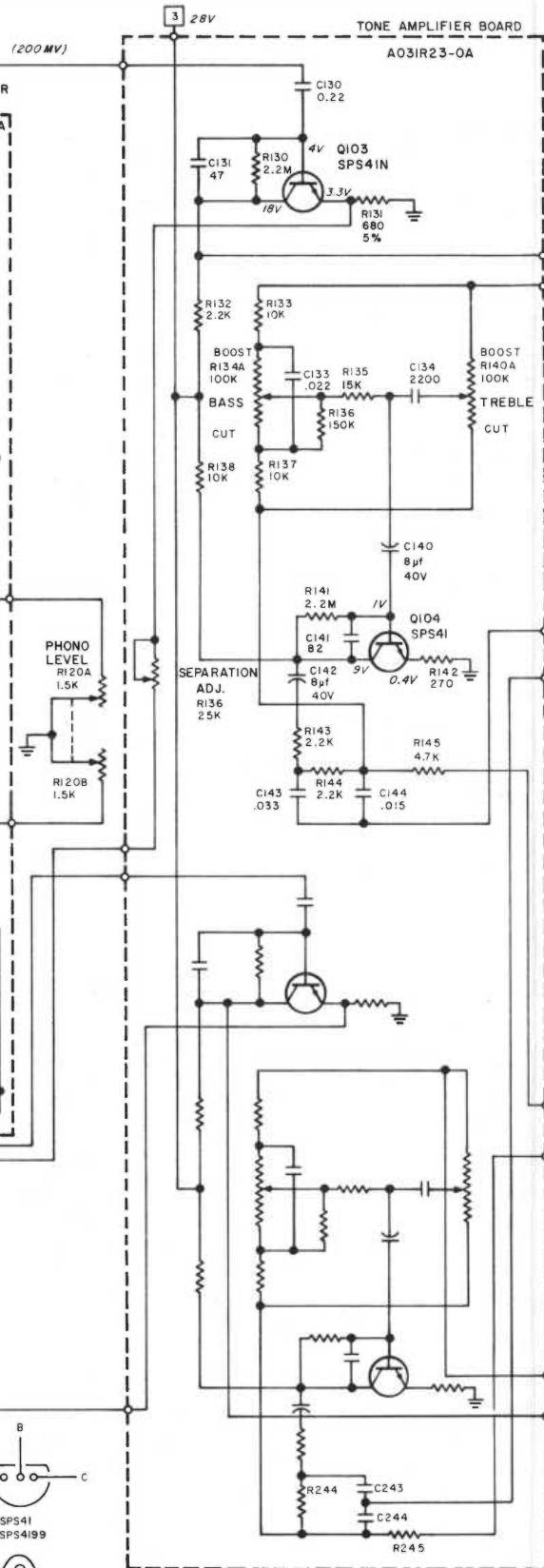
SEP/L (AUDIO)
SEP/R (AUDIO)



SELECTOR SWITCH POSITIONS	SENSITIVITY FOR RATED OUTPUT
1 PHONO	1.8MV
2 FM STEREO	200MV
3 AUX	

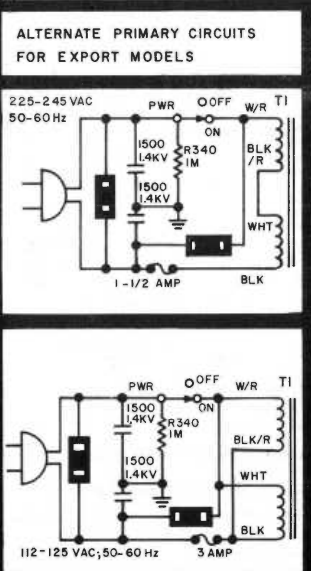
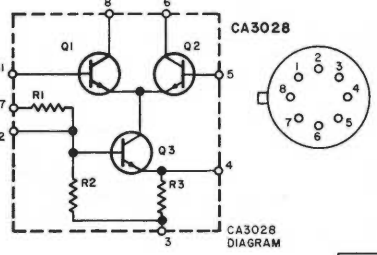
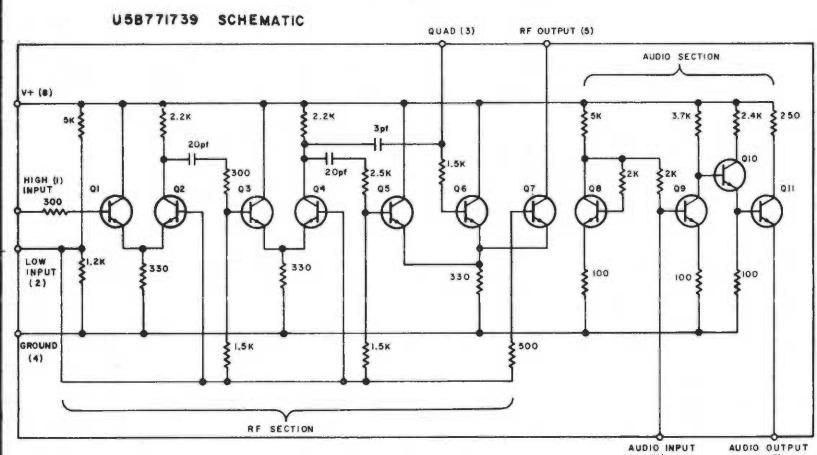
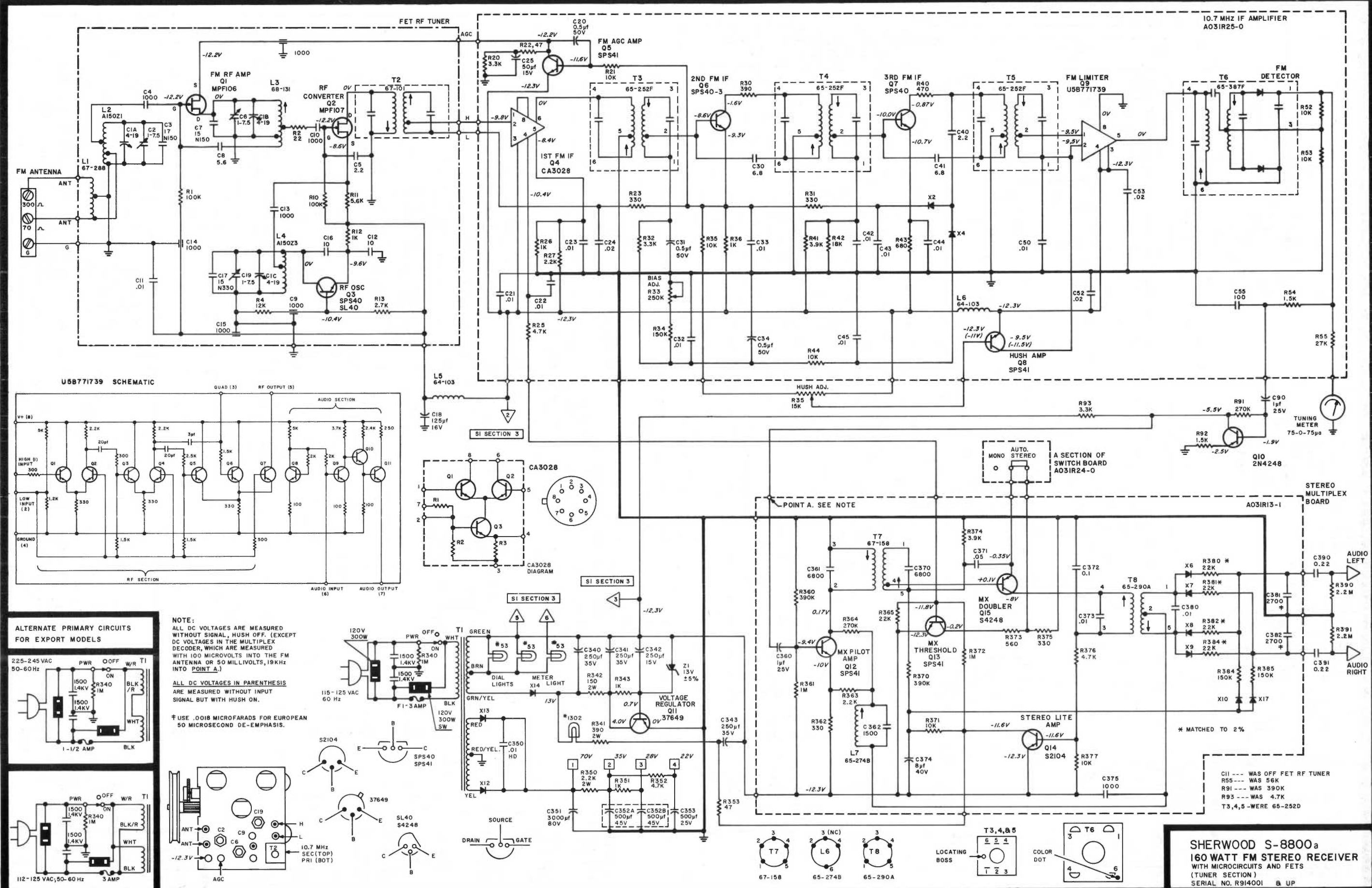


SHERWOOD S-8800a
160WATT FM STEREO RECEIVER
WITH MICROCIRCUITS AND FETS
(AMPLIFIER SECTION)
SERIAL NO. R914001 & UP

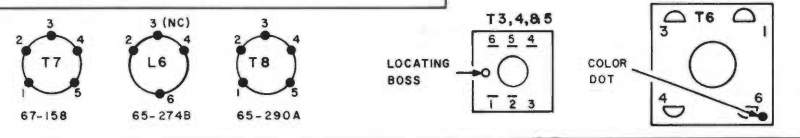
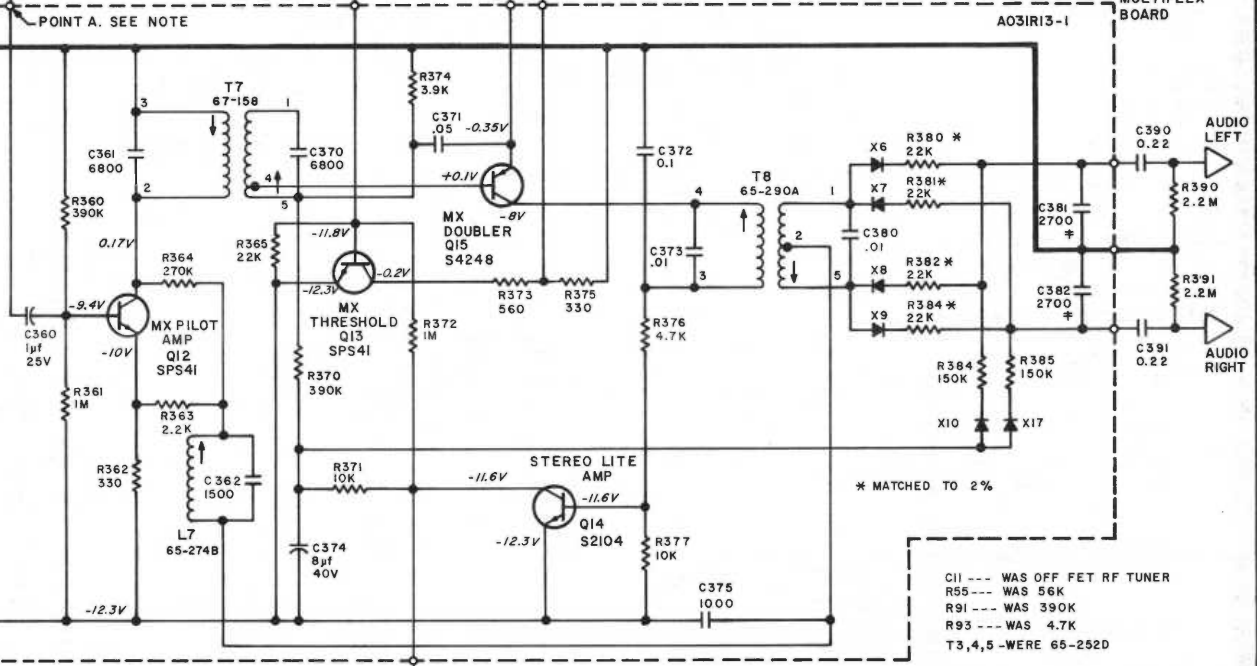
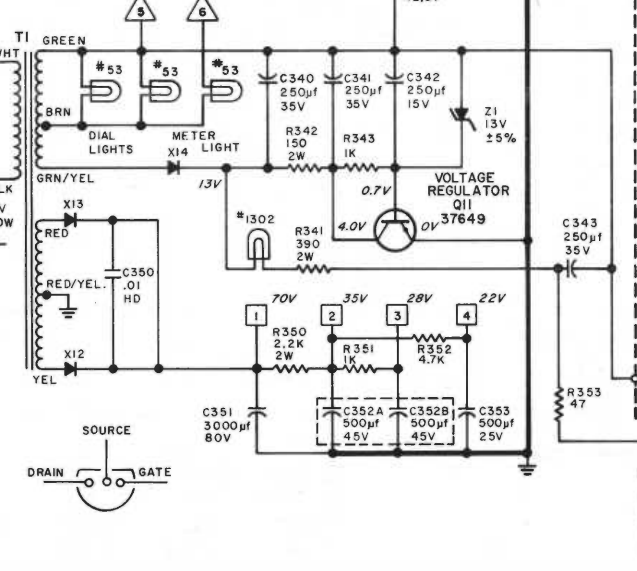
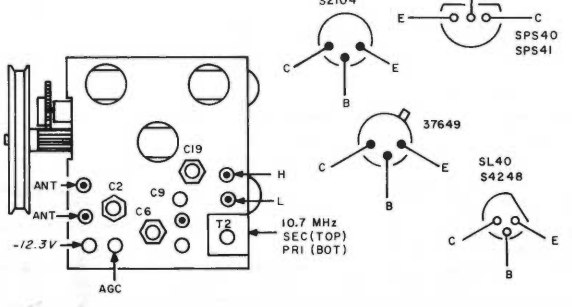


ALL RESISTORS ARE 1/2 WATT OR LESS, 10% TOLERANCE UNLESS OTHERWISE SPECIFIED.
ALL FRACTIONAL-VALUE CAPACITORS ARE IN μ F. OTHER CAPACITORS EXCEPT ELECTROLYTICS ARE IN pF.

RIGHT CHANNEL: COMPONENT SYMBOLS ARE THE SAME AS THE LEFT CHANNEL ABOVE, EXCEPT FOR AN INCREASE IN NUMBERING BY ONE HUNDRED.

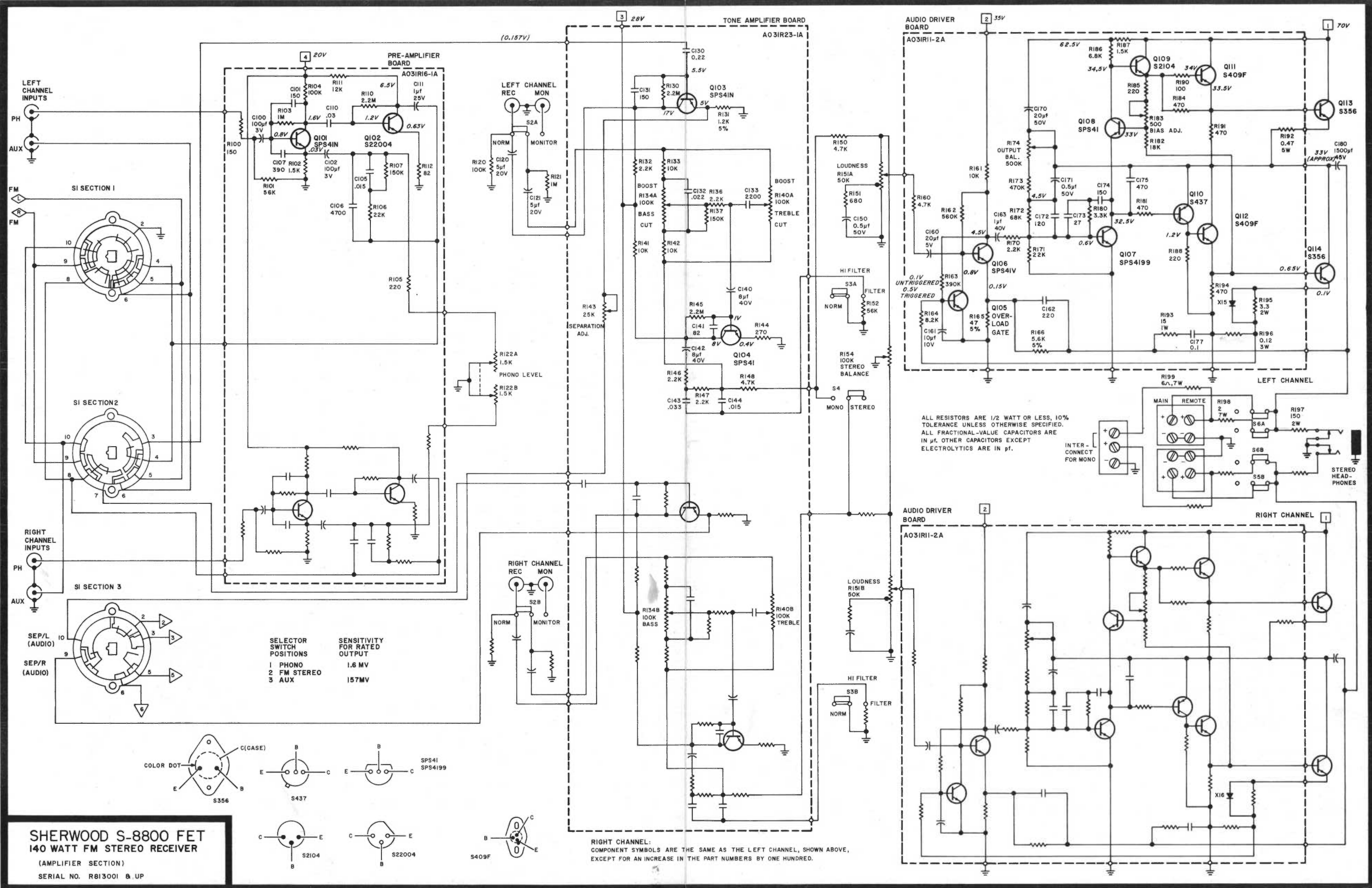


NOTE:
 ALL DC VOLTAGES ARE MEASURED WITHOUT SIGNAL, HUSH OFF. (EXCEPT DC VOLTAGES IN THE MULTIPLEX DECODER, WHICH ARE MEASURED WITH 100 MICROVOLTS INTO THE FM ANTENNA OR 50 MILLIVOLTS, 19KHz INTO POINT A.)
 ALL DC VOLTAGES IN PARENTHESES ARE MEASURED WITHOUT INPUT SIGNAL BUT WITH HUSH ON.
 † USE .0018 MICROFARADS FOR EUROPEAN 50 MICROSECOND DE-EMPHASIS.



SHERWOOD S-880a
160 WATT FM STEREO RECEIVER
 WITH MICROCIRCUITS AND FETS
 (TUNER SECTION)
 SERIAL NO. R914001 B UP

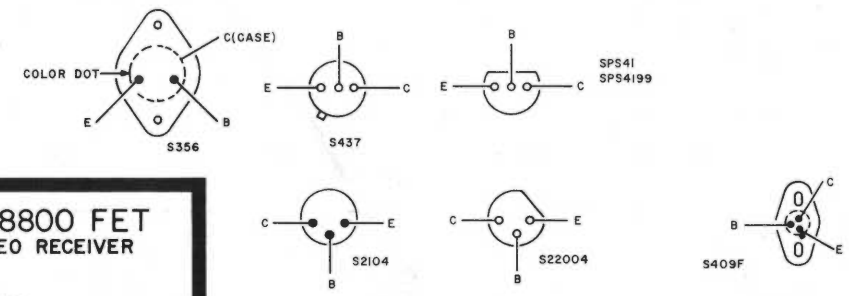
C11 --- WAS OFF FET RF TUNER
 R55 --- WAS 56K
 R91 --- WAS 390K
 R93 --- WAS 4.7K
 T3,4,5 - WERE 65-252D

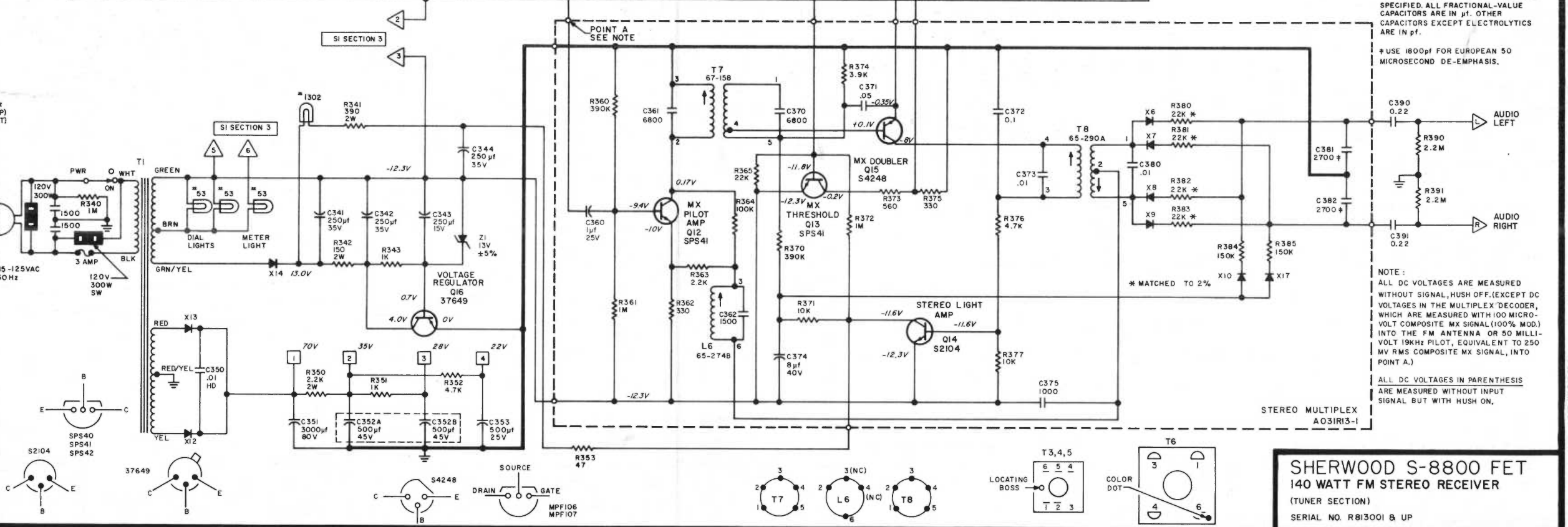
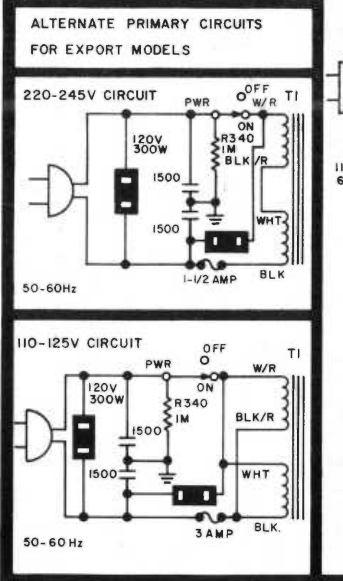
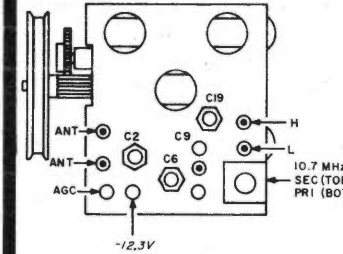
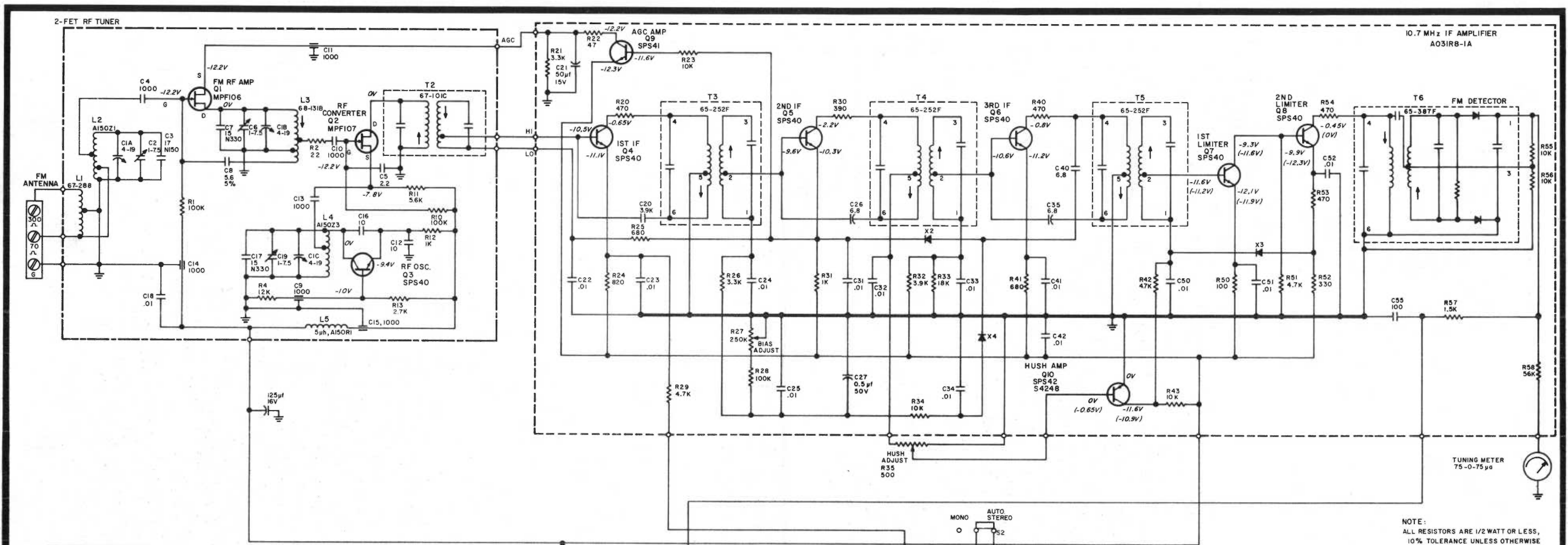


ALL RESISTORS ARE 1/2 WATT OR LESS, 10% TOLERANCE UNLESS OTHERWISE SPECIFIED. ALL FRACTIONAL-VALUE CAPACITORS ARE IN μ F, OTHER CAPACITORS EXCEPT ELECTROLYTICS ARE IN pF.

RIGHT CHANNEL: COMPONENT SYMBOLS ARE THE SAME AS THE LEFT CHANNEL, SHOWN ABOVE, EXCEPT FOR AN INCREASE IN THE PART NUMBERS BY ONE HUNDRED.

SHERWOOD S-8800 FET
140 WATT FM STEREO RECEIVER
 (AMPLIFIER SECTION)
 SERIAL NO. R813001 & UP





NOTE:
ALL RESISTORS ARE 1/2 WATT OR LESS,
10% TOLERANCE UNLESS OTHERWISE
SPECIFIED. ALL FRACTIONAL-VALUE
CAPACITORS ARE IN μ F. OTHER
CAPACITORS EXCEPT ELECTROLYTICS
ARE IN pF.

* USE 1800pF FOR EUROPEAN 50
MICROSECOND DE-EMPHASIS.

NOTE:
ALL DC VOLTAGES ARE MEASURED
WITHOUT SIGNAL, HUSH OFF. (EXCEPT DC
VOLTAGES IN THE MULTIPLEX DECODER,
WHICH ARE MEASURED WITH 100 MICRO-
VOLT COMPOSITE MX SIGNAL (100% MOD.)
INTO THE FM ANTENNA OR 50 MILLI-
VOLT 19KHz PILOT, EQUIVALENT TO 250
MV RMS COMPOSITE MX SIGNAL, INTO
POINT A.)
ALL DC VOLTAGES IN PARENTHESIS
ARE MEASURED WITHOUT INPUT
SIGNAL BUT WITH HUSH ON.

SHERWOOD S-8800 FET
140 WATT FM STEREO RECEIVER
(TUNER SECTION)
SERIAL NO. R813001 & UP

SERVICING

VOLTAGE CHECKS

Preliminary checks of the D.C. voltages present at various points in the S-8800a can prove useful in locating defective components. They are inconclusive, however, in determining if transistors are operating properly in all aspects. They can only indicate whether the transistor is open, shorted or functioning, not how well the transistor is functioning.

IN GENERAL:

Correct voltages indicate a functioning transistor.

The same voltage at the collector and emitter indicates a shorted transistor.

Full supply voltage on the collector and no voltage on the emitter indicates an open transistor.

OUTPUT TRANSISTOR BIAS

Of all the specifications which require checking to ascertain correct performance of the S-8800a, proper output transistor operation is the most important and critical. Adjustment of the output transistor bias is necessary if output transistors are replaced*, or the amplifier exhibits one or more of the following symptoms:

1. Overheating of the output transistors under normal operating conditions.
2. Excessive low level Intermodulation Distortion—more than 0.5% at 2.0 volts across 8 ohms (0.8 watts, IM power).

Adjustment of output transistor bias should then proceed as follows:

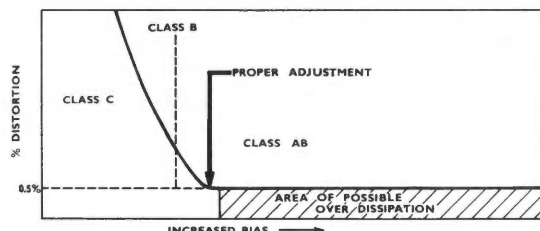


FIG. 1

1. Turn amplifier off.
2. Set output balance pots (left and right channels) to mechanical center and bias pots fully counter-clockwise.
3. Connect D.C. voltmeter of at least 3% known accuracy to transistor side of appropriate channel's output terminals.

*It is extremely important that the mica insulating washers used to separate the output transistors from their heat sinks be unbroken and installed properly with silicon grease liberally applied to all surfaces in contact with each other. Make certain the emitter and base pins of the output transistors do not contact any part of the heat sinks.

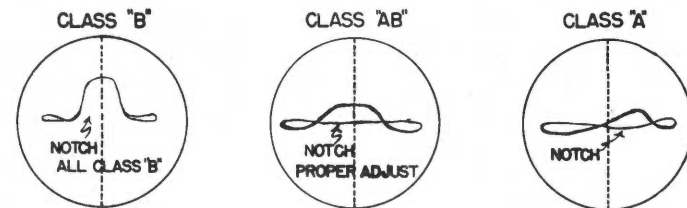
NOTE: Refer to speaker load connections on schematic, being careful to observe ground-connections.

4. Turn amp. on and adjust output balance pot for that channel so that approx. 1/2B+ voltage is on the output capacitor.
5. Connect an Intermodulation Distortion analyzer to the amplifier TP. MON. (aux.) input, turn volume control to maximum and adjust the analyzer output for an amplifier output of 2.0V across 8 ohms. (Because the output stages have been set into heavy class "B" operation by the "pre-setting" in Step 2, a class "B" notch in the distortion waveform will be obvious.) NOTE: When adjusting bias for class "AB", adjust until class "B" notch is almost eliminated. Class "A" begins beyond this point. Notch shifts to right.
6. Increase analyzer output until clipping can be observed. Fine adjust output balance pot. so that clipping is symmetrical.

IMPORTANT: Misadjustment of the bias pot can cause heavy class "A" operation of the output transistors, causing them to overheat.

The following performance indicates a properly operating output stage with 8 ohm load.

- Less than 0.5%IM distortion at 2.0V.
- Typically 0.6%IM distortion at 10 Volts.
- 18 watts of power per channel at clipping.



1. PROTECTIVE CIRCUITRY (IOP) & SPEAKER SYSTEM CHECK: The Model S-8800a incorporates special protective circuitry, (Instamatic Overload Protection), which turns off the drive to the power amplifiers when danger to the receiver output circuitry exists. If the receiver turns itself off, check the speaker connections for shorted wires. Speaker line resistance should not measure below 3 ohms.

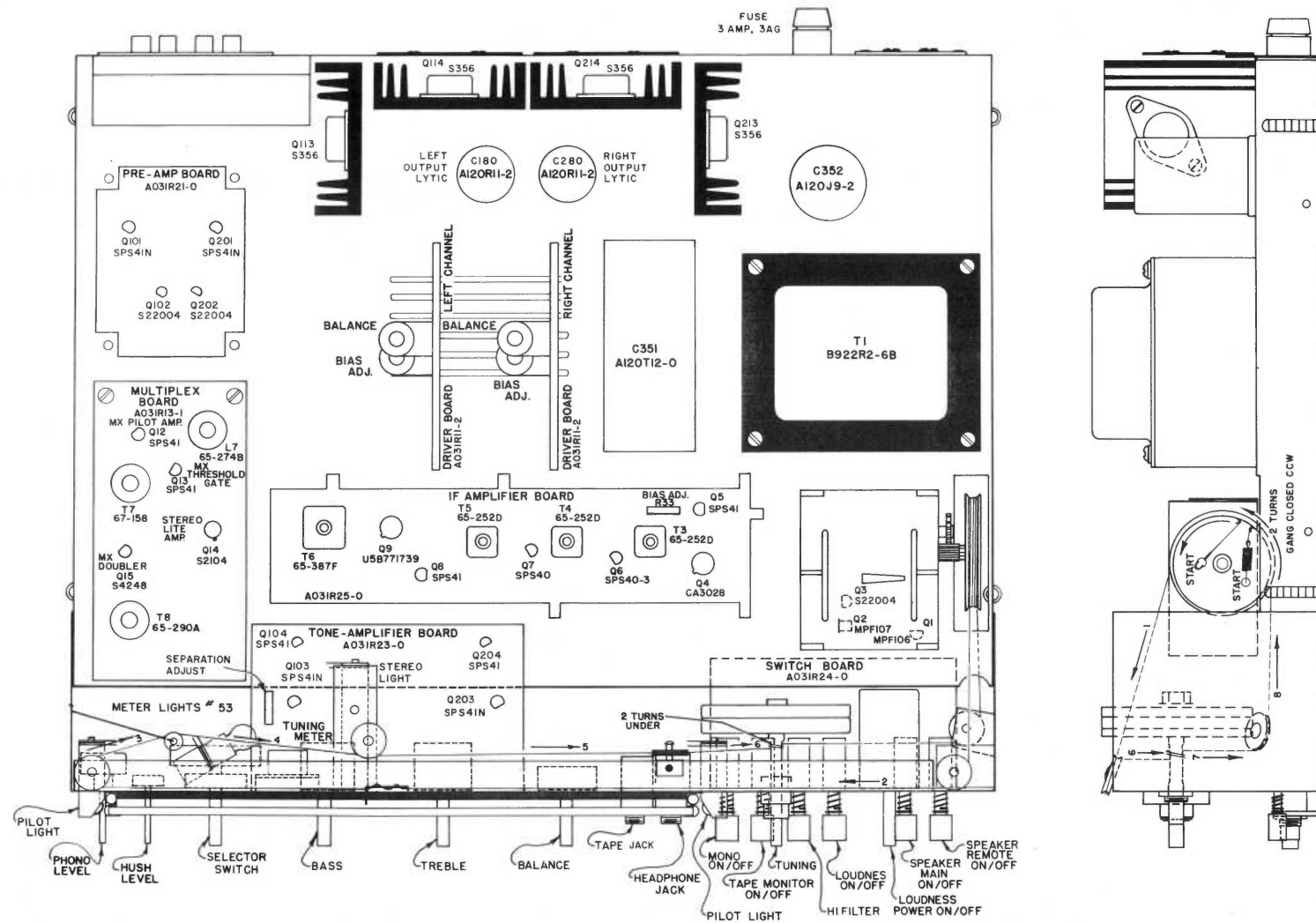
The overload protective circuit consists of a type of bi-stable multivibrator. Transistor Q105 samples the output transistors current. At approximately 5A peak output current, Q105 is triggered and clamps the base of Q106 to ground and locks in this state, preventing AC drive to the power amplifier and thereby protecting it.

ALIGNMENT CHART

	switch position	signal generator input			dial setting	indicating instrument	adjust	indication	
		coupling	freq.	modulation					
FM ALIGNMENT	1	Selector FM Mode: Mono	none	none	none	pt. of no interf.	DC-VTVM across R36 1KΩ	R33 bias adj	2.0 V-DC
	2					Probe at Q6 base. CRO: HORIZ. EXT. MODULATION (Audio in all steps).	Short T4 & T5 Pin 4 to Gnd. (Short jumper wire).		
	3	"	300 Ant. Input	90MHz	400 or 60Hz ± 300KHz FM	90MHz	"	L4, L2, L3, T2 & T3 top & bottom	IF response for max. deflection & symmetry about 10.7MHz marker.
	Inject 10.7MHz marker into feethru C9 on tuner chassis (see pictorial on Tuner schematic).								
	4	"	"	106MHz	"	106MHz	"	C19, C2, C6	"
	5	Repeat steps 3 & 4 until no further improvement.							
	6	"	"	96MHz	"	96MHz	Probe at Q7 base.	(Remove T4 jumper short) T4 Top & Bottom	" (± 120kHz BW at -3db).
	7	"	"	"	"	"	Probe at Q9 Pin 1	(Remove T5 jumper short) T5 top & bottom	"
	8	Repeat step 1							
	9	"	"	"	400 or 60Hz ± 75KHz FM. centered on IF	"	DC-VTVM across C55, 100pf.	T6 Top	0 V-DC
	10	"	"	"	400 or 60Hz ± 300KHz FM	"	"	T6 bottom	FM detector response curve for maximum deflection & symmetry
11	"	"	100uv input	400 or 60Hz ± 75KHz FM. centered on IF	"	CRO at Audio Left (across R390)	T6 bottom	Fine adjust for linear lissajous* (recheck for the 0 VDC of step 9).	
MX ALIGNMENT	1	Disconnect FM detector from Point A (Short Q13 emitter-base junction)							
	2	Selector FM Mode: Auto Stereo	10K source impedance	60MV RMS 19KHz into point A	none	point of no interf.	CRO &/or AC voltmeter base of Q15	T7 top & bottom	maximum deflection
	3	"	"	"	"	"	CRO &/or AC voltmeter T8 pin 1 to ground	T8 top & bottom	"
	4	"	"	1.0V RMS 67KHz into point A	"	"	"	L7	null
	5	"	"	feed composite MX sig. left CH modulation 1.7V p-p or 0.3V RMS 400Hz into point A		"	CRO &/or AC voltmeter across R390	none	Note: approx. 0.4V Audio at Left channel output
	6	"	"	"	"	"	CRO &/or AC voltmeter across R391	T7 top	null at unmodulated channel output (approx. -10db from left)
	7	"	"	"	switch off stereo gen. audio mod.	"	CRO &/or AC voltmeter across R390	none	residual 19KHz and 38KHz to be approx. -45db below 100% audio
	8	Reconnect FM detector to point A (Remove Q13 emitter-base short)							
	9	"	300 balanced input to FM ant. input	96MHz	± 75KHz composite stereo sig. left CH modulation only	96MHz	CRO &/or AC voltmeter across R391	fine adjust T7 top	null at unmodulated channel output.
	10	"	"	"	"	"	CRO &/or AC-VTVM at record output (right channel)	Adjust separation R136	Adjust for null separation (to be more than -30db)

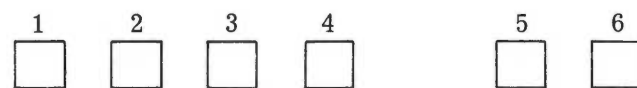
*If distortion analyzer is available, null T6 bottom for minimum distortion with 75KHz modulation.

PARTS LIST



B866R3 PUSH BUTTON SWITCH

REPAIR PROCEDURE



REMOVAL OF BROKEN PUSH BUTTON.

- depress and lock buttons 1, 2, 3, 5, & 6 (depress completely to lock)
- with thumb of left hand depress button #4 approx. 3/16" to 1/4" and hold in that position. With long nose pliers grasp flange of locking key. (located on right hand side of pushbutton #4) Pull key forward enough to clear tab on left side of switch and slide locking key as far to the right as it will go and release locking key from pliers. Then slide key to the left and slowly release the tension on push button #4.
- Each button may now be individually removed by depressing and then releasing the button slowly.

REINSERTION OF BUTTONS

- depress and lock buttons 1, 2, 3, 5, & 6.
- Slide locking key as far to the right as it will go. With thumb of right hand depress push button #4 approx. 1/4" to 3/8". With small screwdriver in left hand slide small tab (located just to left of push button #4) as far to the right as it will go.

- Slowly release push button #4. It should return to its normal position and stop.
- With long nose pliers grasp locking key flange and pull it forward enough to clear small tab on left hand side of #4 push button. Then slide locking key to the left until small tab is visible through hole in locking key. Slowly allow locking key to return to a flush position against switch mounting plate, making sure small tab is encompassed by locking key.

- Using a pliers or screwdriver slide locking key flange gently to the right until lite snap is heard.
- All push buttons are now locked and may be returned to their normal position by depressing and releasing each button.

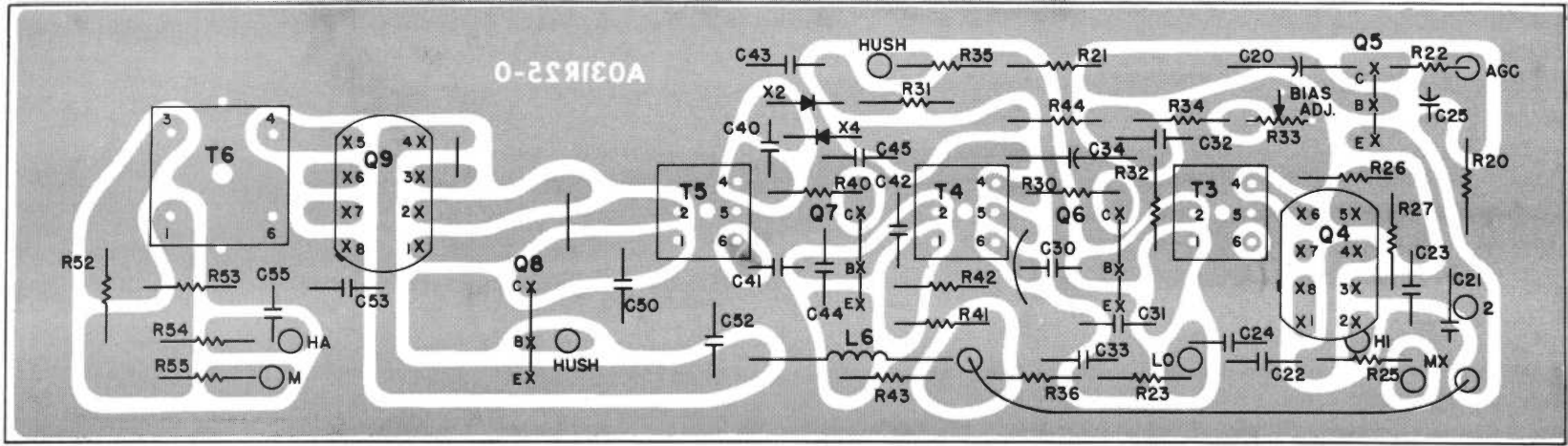
NOTE: If push button #4 binds, pin on right hand side of locking key has been caught by spring.

TRANSISTORS (All silicon)	PART NO.	PRICE
Audio, Low signal - No dot (High beta), (Q5, 8, 12, 13, 105, 205)	SPS41	\$0.31
Audio, Low signal, No dot, (Q102, 108, 202, 208)	S22004	0.63
Audio, Low signal - Green dot (Low Noise), (Q101, 103, 201, 203)	SPS41N	0.91
Audio, Low signal - White dot, (Q106, 206)	S22004V	0.73
Audio, PNP (Q10, 15)	S4248	0.50
Pre-Driver, NPN (Q107, 207)	SPS4199	0.95
Pre-Driver, PNP (Q110, 210)	S437	3.16
Pre-Driver, NPN (Q14, 109, 209)	S2104	0.92
Driver, NPN (Q111, 112, 211, 212)	S409F	2.70
Output, NPN (Q113, 114, 213, 214)	S356	8.33
B Supply, NPN (Q11)	37649	1.80
RF Amp., FET (Q1)	MPF106	2.12
RF Mixer, FET (Q2)	MPF107	2.21
RF, IF, NPN (Q3, 6, 7) (Use same beta code 1, 2, 3)	SPS40	0.90
Microcircuit, (Q4)	CA3028	4.01
Microcircuit, (Q9)	U5B771739	5.40

You will note that all transistors used in the S-8800a are color-coded with a dot or mark of some color prominently located on the top of their case. (Some transistors have no mark, but this also is identification.) When ordering replacement transistors, it is imperative that you indicate not only its part no., but the color dot on the transistor body: red, yellow, none, (1, - 2, - or - 3). This is particularly important when replacing output transistors.

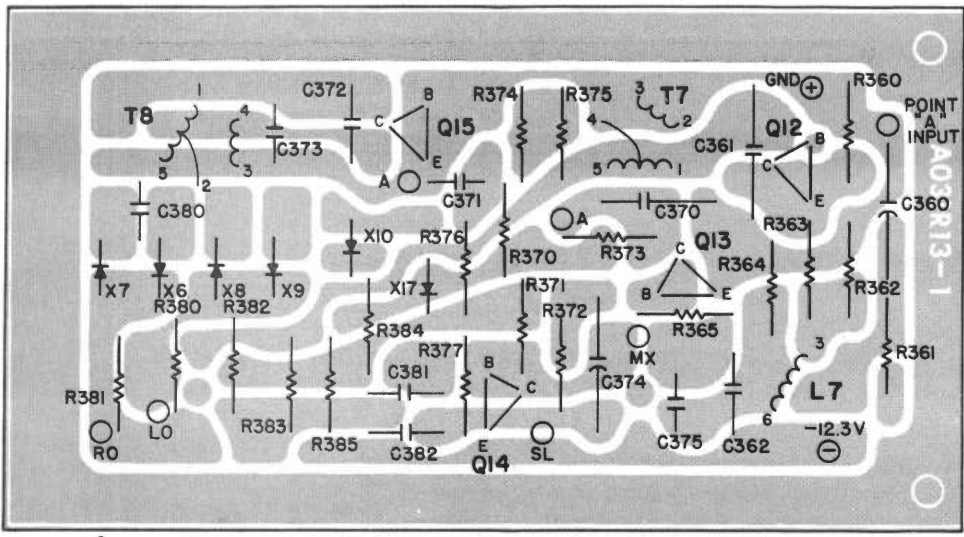
DESCRIPTION	PART NO.	PRICE
0.5µf, 50V, (C150, 171, 250, 271)	B120X3	\$0.72
5µf, 20V, (C151, 152, 251, 252)	B120X6	0.59
1µf, 25V, (C90, 111, 211, 360)	B120X7	0.59
8µf, 40V, (C140, 142, 240, 242)	B120X8	0.45
20µf, 5V, (C160, 260)	B120X12	0.59
100µf, 3V, (C100, 102, 200, 202)	B120X24	0.45
1µf, 40V, (C163, 263)	B120X76	0.63
LYTICS - BYPASS		
0.5µf, 50V, (C20, 31, 34)	B120B3	0.59
8µf, 40V, (C374)	B120B8	0.45
10µf, 10V, (C161, 261)	B120B9	0.45
20µf, 50V, (C170, 270)	B120B14	0.45
500µf, 25V, (C353)	B120B31	0.99
250µf, 35V, (C340, 341, 343)	B120B33	0.86
125µf, 16V, (C18)	B120B26	0.46
250µf, 15V, (C342)	B120B74	0.59
50µf, 15V, (C25)	B120X36	0.90
Insulator, Mica (T0-3)	A021F1	0.05
Fuse, 3 Amp., 3AG	312003.	0.15
Dial Glass	B322R9-0	1.13
Knobs, Small, (w/indicator)	B467X1-2	1.98
Knobs, Mini.	A467X5-2	1.13
Knobs, Medium, (w/indicator)	B467X4-2	2.25
Tuning Meter	A550G3	6.30
Light Bulb, Pilot, #53	630B53	0.16
Light Bulb, Stereo, #1302	630B1302	0.64
Control, Bass, 100K, (R134A, B)	A670R20-0	1.67
Control, Treble, 100K, (R140A, B)	A670R20-0	1.67
Control, Balance, 100K, (R122)	A670R22-1	0.90
Control, Hush, 15K, (R35)	A670R18-2	0.95
Control, Ph. Level 1.5K, (R120A, B)	A670R19-2	2.12

DESCRIPTION	PART NO.	PRICE
Control, Loudness, Dual w/AC sw. 50K, (R121A, B)	A671R3-3	4.28
Pot., P. C., 500, (R183, 283)	A675T1-0A	0.45
Pot., P. C., 25K, (R136)	A675T8-0A	0.45
Pot., P. C., 250K, (R33)	A675T9-0A	0.72
Pot., P. C., 500K, (R174, 274)	A675T10-0A	0.63
Rectifier, Silicon, (X14)	A692T5	0.48
Diode, Silicon, (X2, 4, 6, 7, 8, 9, 10, 17)	A692X13	1.22
Rectifier, Silicon, (X12, 13)	A692X16	1.71
Rectifier, Silicon, (X15, 16)	A692X17	0.62
Diode, Zener, Silicon, 13V, 5%, (Z1)	A694X1	1.21
Socket, Driver Transistor, T0-5	A790T4M	0.23
Socket, Output Transistor, T0-3	A790T7	0.18
Stereo Headphone Jack	A795R3	0.95
Stereo Tape Jack	A795R3	0.95
Fuse Post	A796X2	0.70
Selector Switch, 3 Position, (S1)	A860R9-1	5.04
Switch, Push Button Assembly	B866R3-3A	7.69
Transformer, Power, Domestic, (T1)	B922R2-6	20.97
Transformer, Export, Power, (T1)	2B922R2X-6	27.95
Transformer, FM IF (T3, 4, 5)	65-252D	2.75
Transformer, FM Discrim., (T6)	65-387F	4.92
Transformer, FM Converter, (T2)	67-101	2.07
Transformer, 38KHz, (T8)	65-290A	1.52
Transformer, 19KHz, (T7)	67-158	2.43
Coil, 67KHz Null, (L7)	65-274B	0.96
Coil, Mixer (L3)	68-131	1.13
Coil, Balun, (L1)	67-288	0.86
Choke, RF, (L5, 6)	64-103	0.52



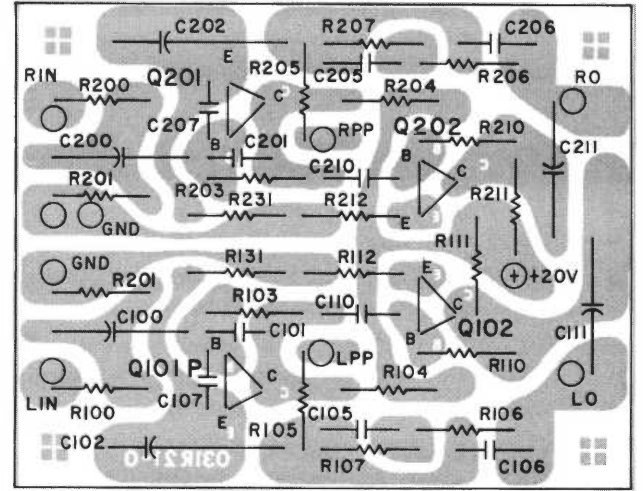
- C B E
 X X X
 TRANSISTOR
- HA - HUSH AMP.
 AGC - TO TUNER
- HUSH - TO POT
 HI - HI INPUT
- M - TO TUNING METER
 LO - LO INPUT
- MX - TO MX BOARD
 2 - FM B- (TUNER)

A031R25-0 I.F. AMP. BOARD



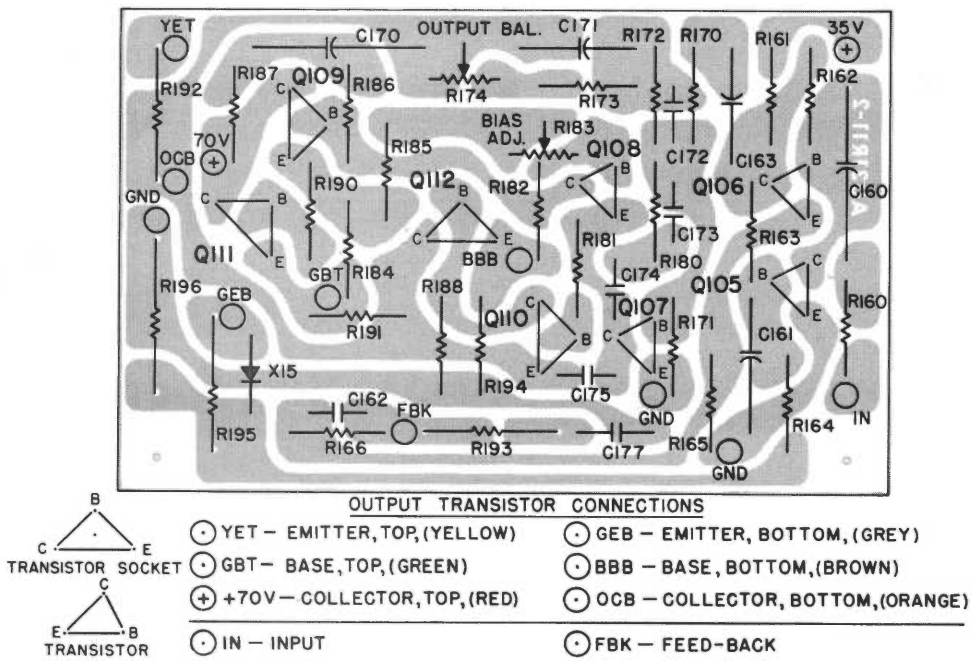
- C B E
 TRANSISTORS
- RO - RIGHT OUTPUT
 LO - LEFT OUTPUT
 SL - TO STEREO LIGHT
- A - TO AUTOMATIC STEREO-MONO SW.
 MX - MX GATE FROM I.F. BOARD

A031R13-1 MULTIPLEX BOARD



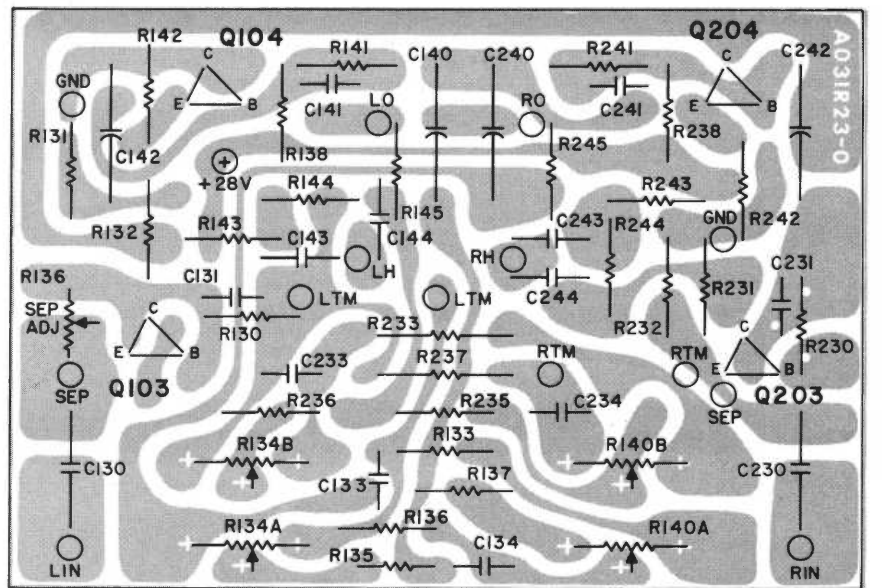
- C B E
 TRANSISTOR
- RIN - RIGHT INPUT
 LIN - LEFT INPUT
 RO - RIGHT OUTPUT
 LO - LEFT OUTPUT
- RPP - RIGHT PHONO LEVEL
 LPO - LEFT PHONO LEVEL

A031R21-0A PRE-AMP BOARD



- C B E
 TRANSISTOR SOCKET
- C B E
 TRANSISTOR
- YET - EMITTER, TOP, (YELLOW)
 GEB - EMITTER, BOTTOM, (GREY)
 GBT - BASE, TOP, (GREEN)
 BBB - BASE, BOTTOM, (BROWN)
 +70V - COLLECTOR, TOP, (RED)
 OCB - COLLECTOR, BOTTOM, (ORANGE)
 IN - INPUT
 FBK - FEED-BACK

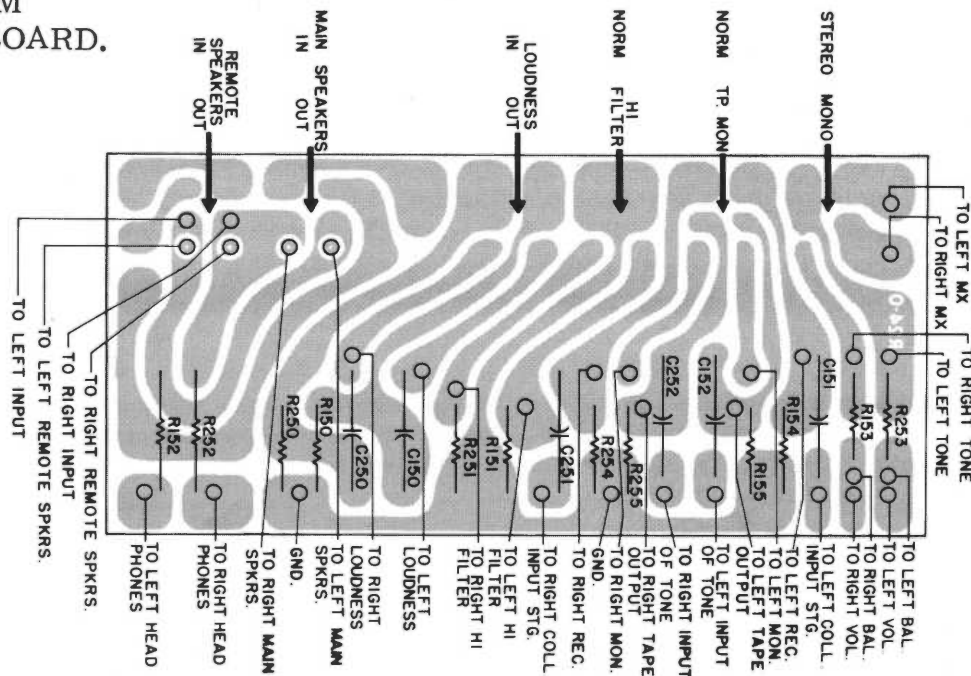
A031R11-2 DRIVER BOARD



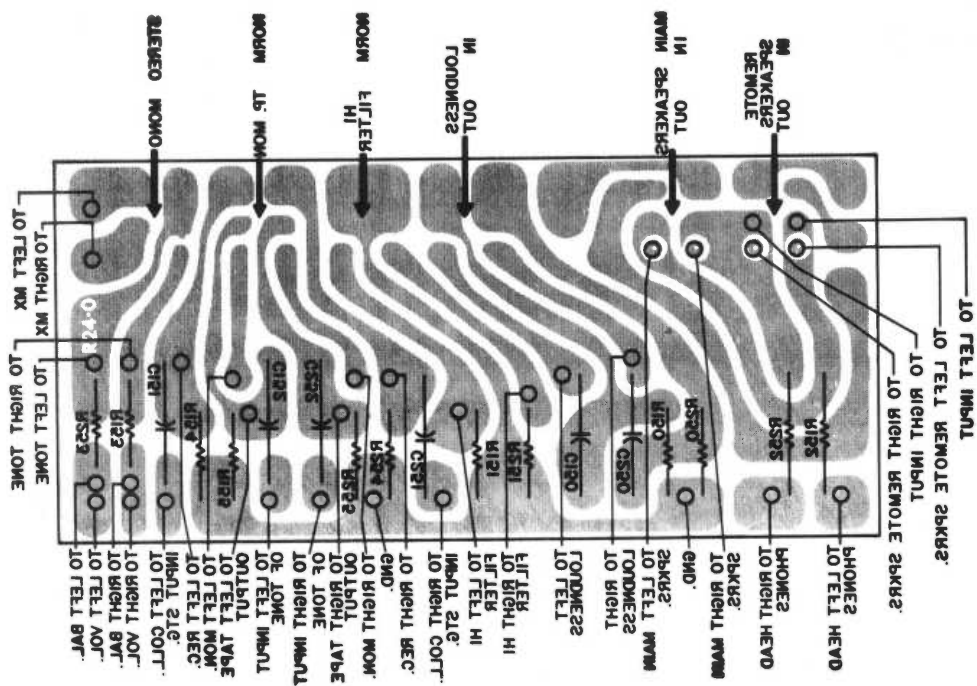
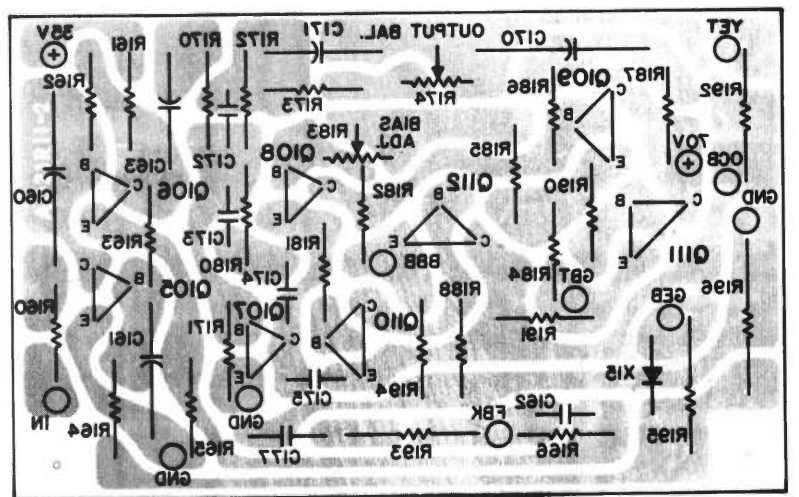
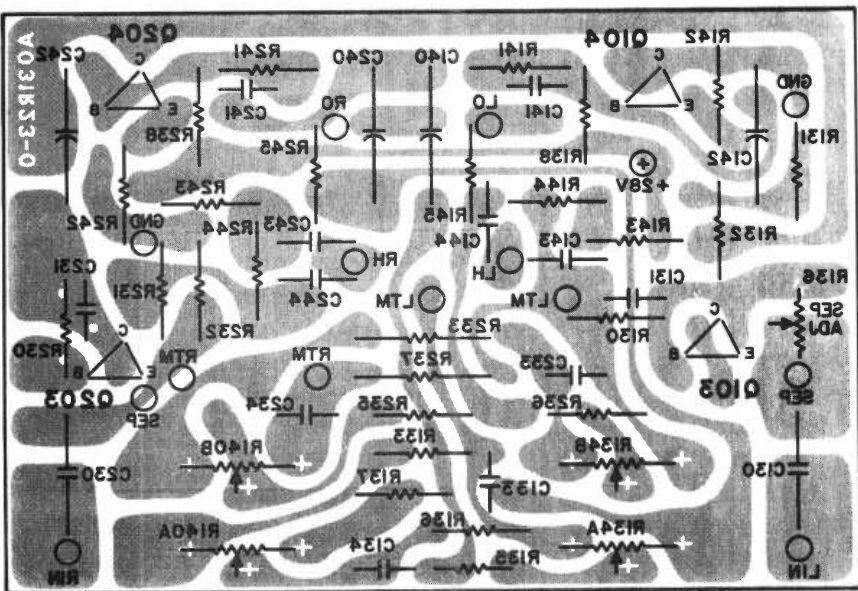
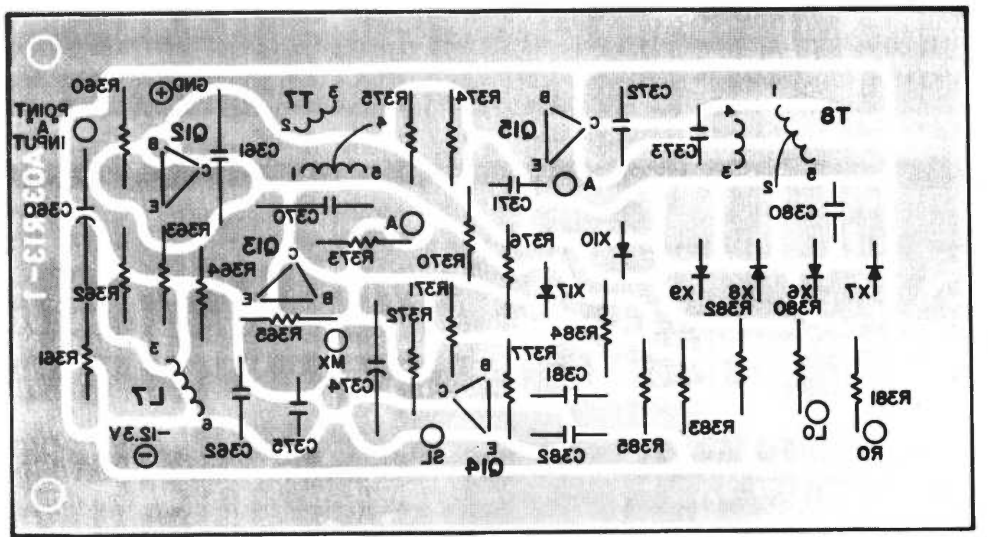
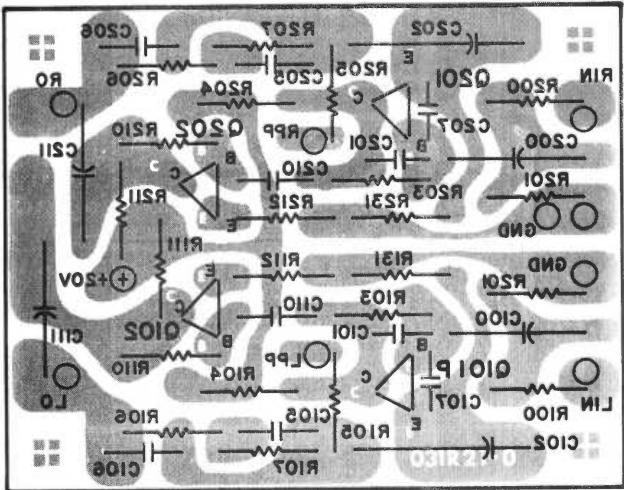
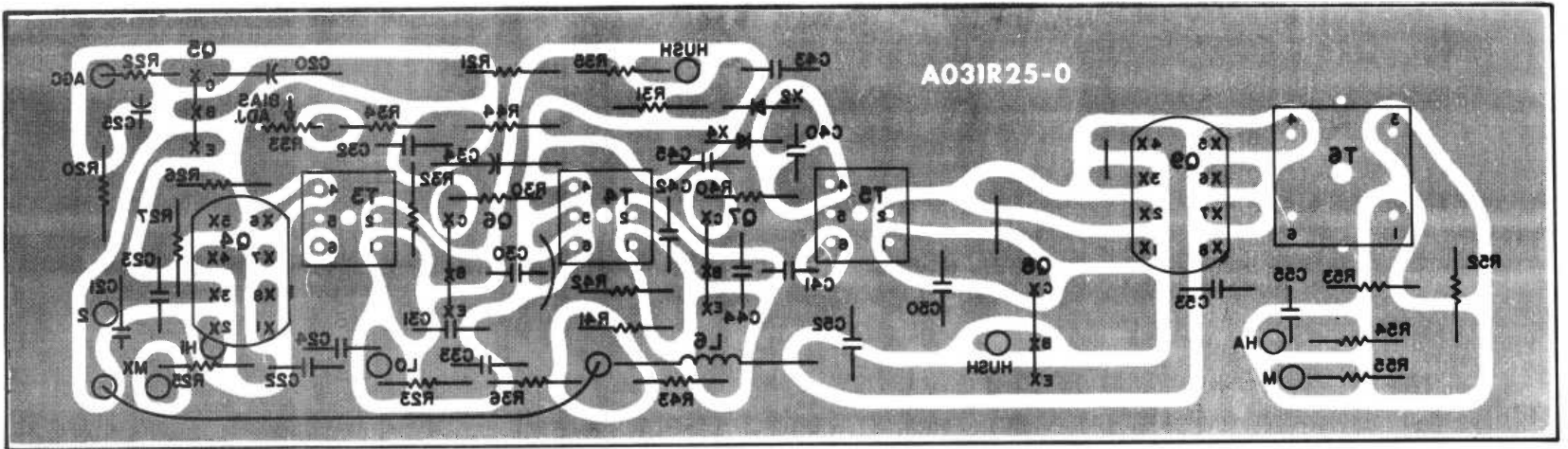
- C B E
 TRANSISTOR
- LIN - LEFT INPUT
 LH - TO LEFT HI FILTER SWITCH
 LTM - TO LEFT TAPE MONITOR SW.
 LO - LEFT OUTPUT
 SEP ADJ - SEPARATION ADJUSTMENT
 SEP - TO SELECTOR SWITCH
- RIN - RIGHT INPUT
 RH - TO RIGHT HI FILTER SWITCH
 RTM - TO RIGHT TAPE MONITOR SW.
 RO - RIGHT OUTPUT
 SEP - TO SELECTOR SWITCH

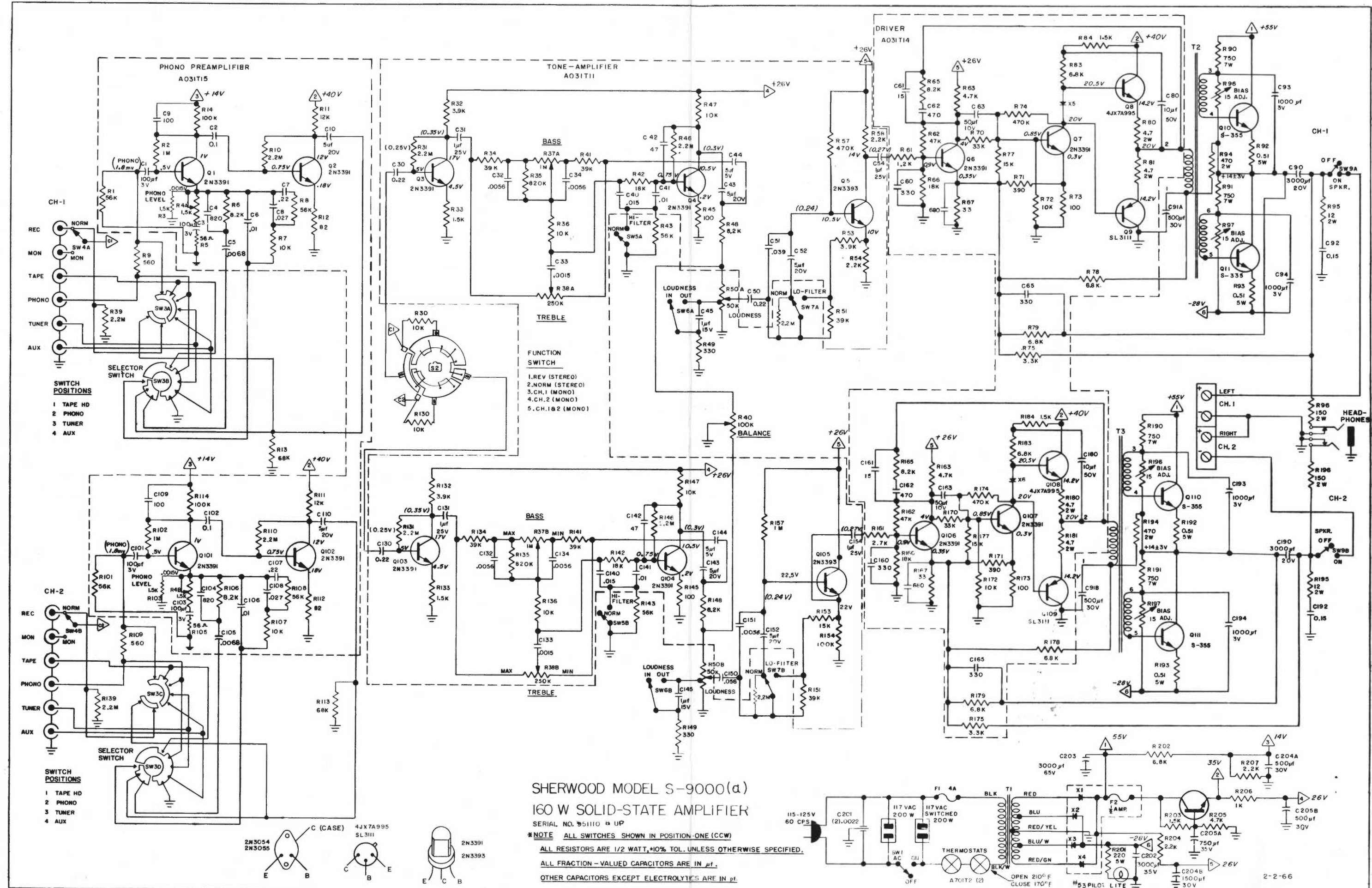
A031R23-0 TONE BOARD

NOTE: AS VIEWED FROM COMPONENT SIDE OF BOARD.



A031R24-0 SWITCH BOARD

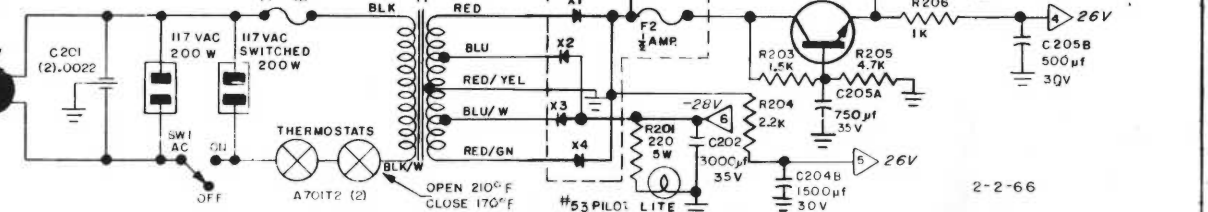


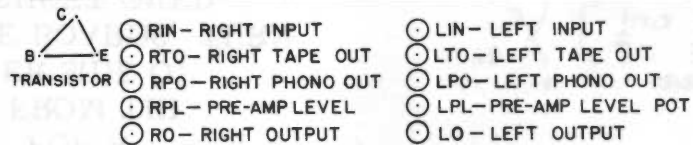
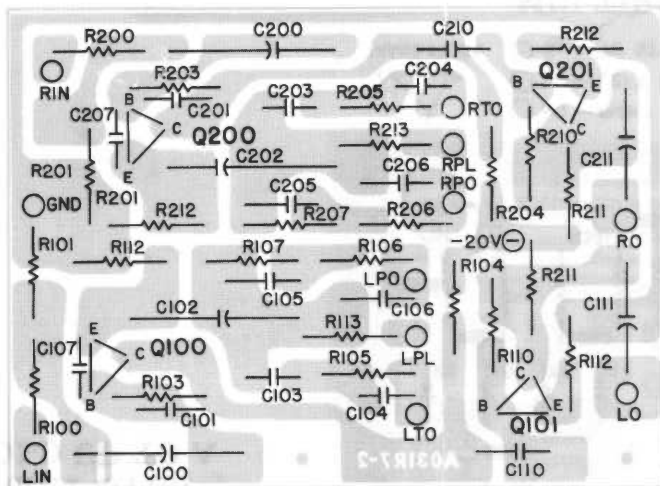


SHERWOOD MODEL S-9000(a)
160 W SOLID-STATE AMPLIFIER

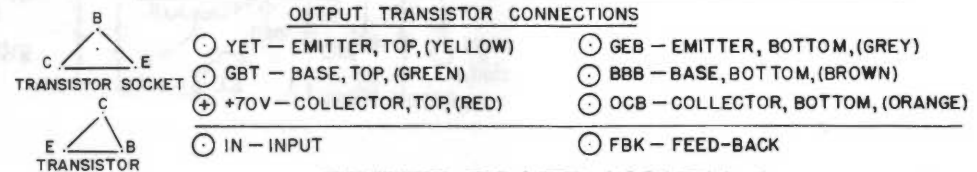
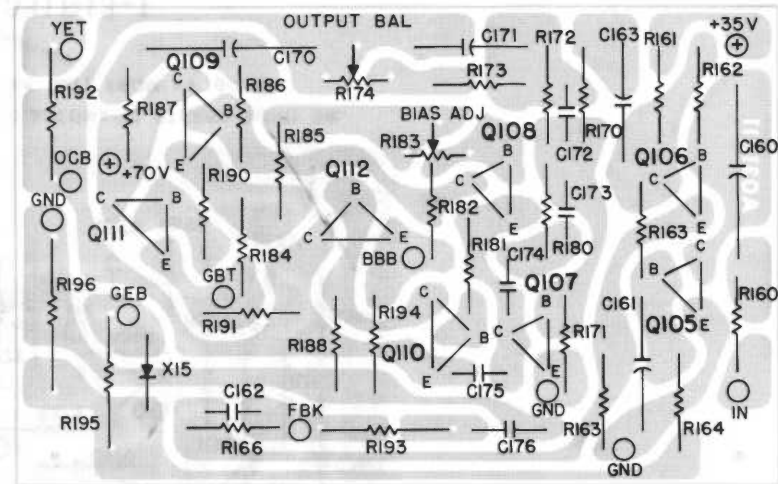
SERIAL NO. 951110 & UP

- NOTE** ALL SWITCHES SHOWN IN POSITION-ONE (CCW)
- ALL RESISTORS ARE 1/2 WATT, ±10% TOL. UNLESS OTHERWISE SPECIFIED.
 - ALL FRACTION-VALUED CAPACITORS ARE IN μf .
 - OTHER CAPACITORS EXCEPT ELECTROLYTICS ARE IN μf .

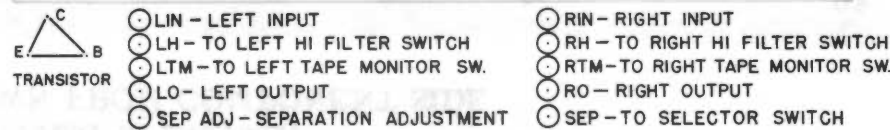
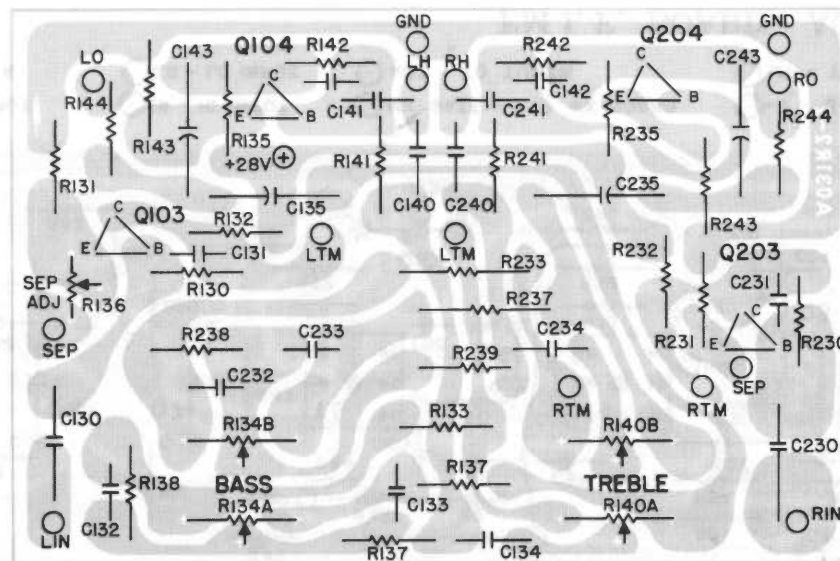




PRE-AMP BOARD A031R7-2



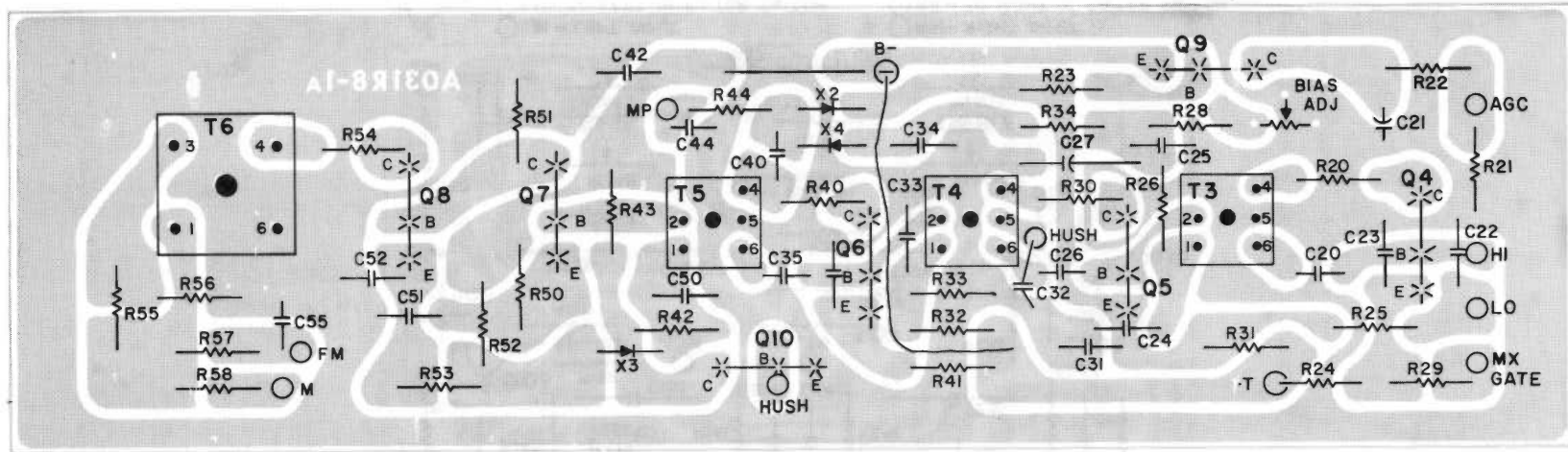
DRIVER BOARD A031R11-1



TONE BOARD A031R2-2

Shenwood

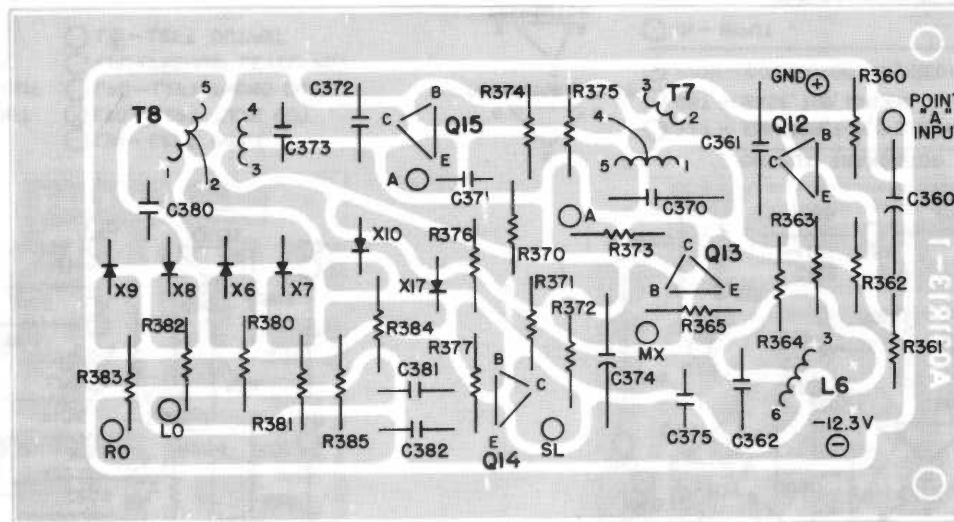
MODEL S-8800 (Serial No. 706201 to R707950)
 CIRCUIT BOARDS ARE SHOWN FROM COMPONENT SIDE



- | | | | | | |
|------------|----------------|---------------|-----------------------|-----------------|------------------------------|
| | | | | | |
| TRANSISTOR | FM - FM OUTPUT | HI - HI INPUT | MX GATE - TO MX BOARD | T - B- TO TUNER | HUSH - TO POT. |
| | | | | | |
| | M - TO METER | LO - LO INPUT | AGC - TO TUNER | | MP - TO MULTIPATH TEST POINT |

FM I. F. BOARD A031R8 - 1a

NOTE: FOR A VIEW FROM THE COPPER SIDE OF THESE BOARDS, TURN THIS SHEET OVER AND HOLD UP TO A LIGHT.



- | | | |
|-------------|----------------------|----------------------------------|
| | | |
| TRANSISTORS | RO - RIGHT OUTPUT | A - TO AUTOMATIC STEREO-MONO SW. |
| | | |
| | LO - LEFT OUTPUT | MX - MX GATE FROM I.F. BOARD |
| | | |
| | SL - TO STEREO LIGHT | |

MULTIPLEX BOARD A031R13-1

SERVICING

VOLTAGE CHECKS

Preliminary checks of the D.C. voltages present at various points in the S-8800a can prove useful in locating defective components. They are inconclusive, however, in determining if transistors are operating properly in all aspects. They can only indicate whether the transistor is open, shorted or functioning, not how well the transistor is functioning.

IN GENERAL:

Correct voltages indicate a functioning transistor.

The same voltage at the collector and emitter indicates a shorted transistor.

Full supply voltage on the collector and no voltage on the emitter indicates an open transistor.

OUTPUT TRANSISTOR BIAS

Of all the specifications which require checking to ascertain correct performance of the S-8800a, proper output transistor operation is the most important and critical. Adjustment of the output transistor bias is necessary if output transistors are replaced*, or the amplifier exhibits one or more of the following symptoms:

1. Overheating of the output transistors under normal operating conditions.
2. Excessive low level Intermodulation Distortion—more than 0.5% at 2.0 volts across 8 ohms (0.8 watts, IM power).

Adjustment of output transistor bias should then proceed as follows:

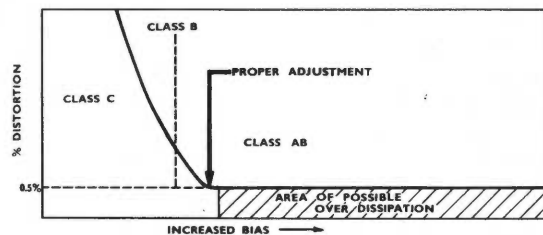


FIG. 1

1. Turn amplifier off.
2. Set output balance pots (left and right channels) to mechanical center and bias pots fully counter-clockwise.
3. Connect D.C. voltmeter of at least 3% known accuracy to transistor side of appropriate channel's output terminals.

*It is extremely important that the mica insulating washers used to separate the output transistors from their heat sinks be unbroken and installed properly with silicon grease liberally applied to all surfaces in contact with each other. Make certain the emitter and base pins of the output transistors do not contact any part of the heat sinks.

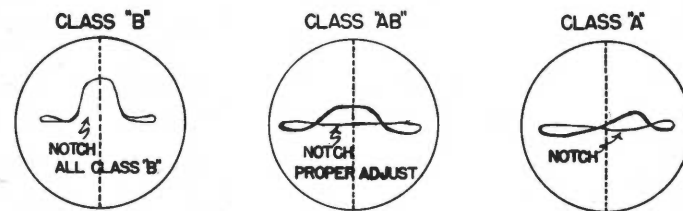
NOTE: Refer to speaker load connections on schematic, being careful to observe ground-connections.

4. Turn amp. on and adjust output balance pot for that channel so that approx. $1/2B+$ voltage is on the output capacitor.
5. Connect an Intermodulation Distortion analyzer to the amplifier TP. MON. (aux.) input, turn volume control to maximum and adjust the analyzer output for an amplifier output of 2.0V across 8 ohms. (Because the output stages have been set into heavy class "B" operation by the "pre-setting" in Step 2, a class "B" notch in the distortion waveform will be obvious.) NOTE: When adjusting bias for class "AB", adjust until class "B" notch is almost eliminated. Class "A" begins beyond this point. Notch shifts to right.
6. Increase analyzer output until clipping can be observed. Fine adjust output balance pot. so that clipping is symmetrical.

IMPORTANT: Misadjustment of the bias pot can cause heavy class "A" operation of the output transistors, causing them to overheat.

The following performance indicates a properly operating output stage with 8 ohm load.

- Less than 0.5% IM distortion at 2.0V.
- Typically 0.6% IM distortion at 10 Volts.
- 18 watts of power per channel at clipping.



1. PROTECTIVE CIRCUITRY (IOP) & SPEAKER SYSTEM CHECK: The Model S-8800a incorporates special protective circuitry, (Instamatic Overload Protection), which turns off the drive to the power amplifiers when danger to the receiver output circuitry exists. If the receiver turns itself off, check the speaker connections for shorted wires. Speaker line resistance should not measure below 3 ohms.

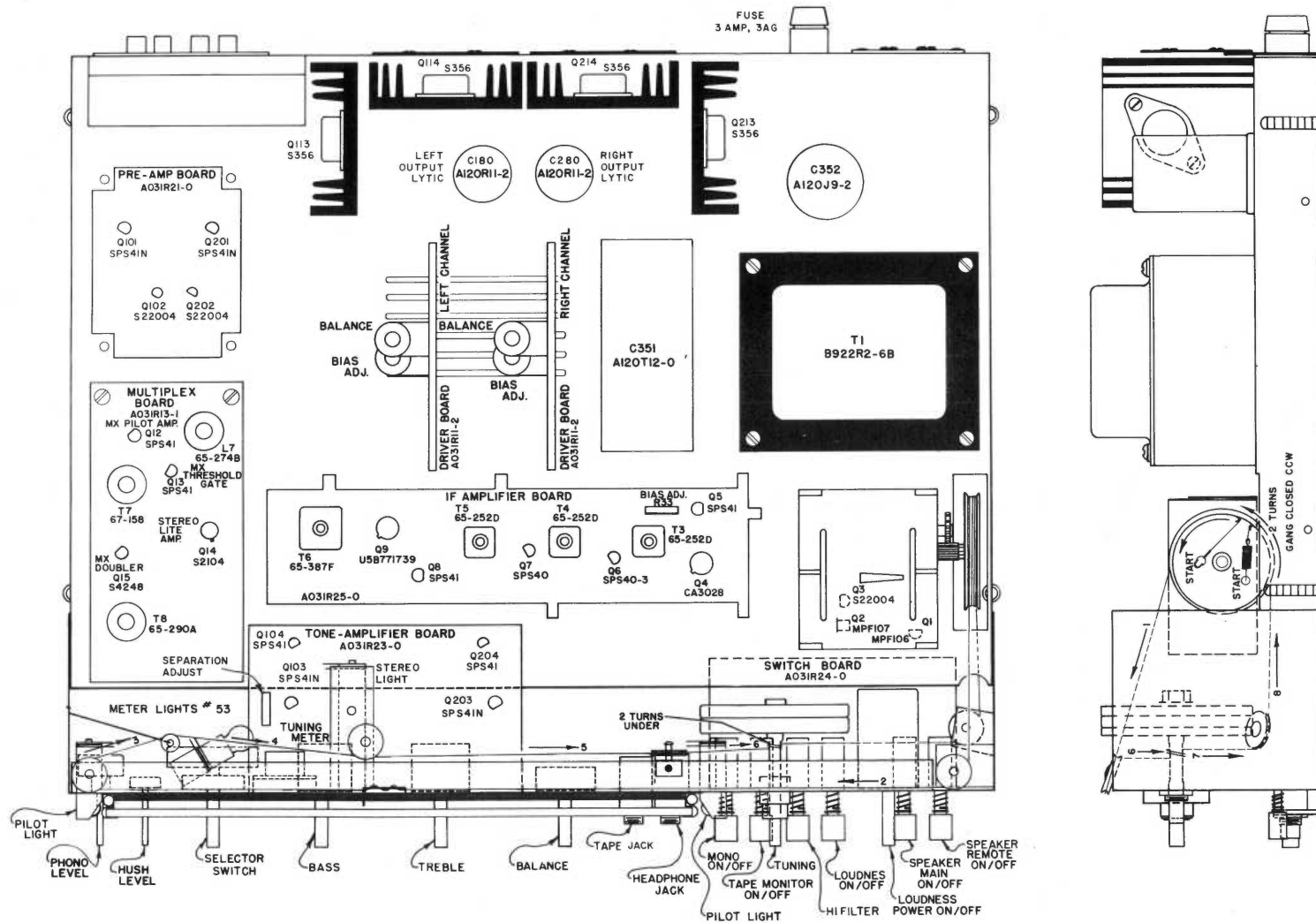
The overload protective circuit consists of a type of bi-stable multivibrator. Transistor Q105 samples the output transistors current. At approximately 5A peak output current, Q105 is triggered and clamps the base of Q106 to ground and locks in this state, preventing AC drive to the power amplifier and thereby protecting it.

ALIGNMENT CHART

	switch position	signal generator input			dial setting	indicating instrument	adjust	indication		
		coupling	freq.	modulation						
FM ALIGNMENT	1	Selector FM Mode: Mono	none	none	none	pt. of no interf.	DC-VTVM across R36 1KΩ	R33 bias adj	2.0 V-DC	
	2						Probe at Q6 base, CRO: HORIZ. EXT. MODULATION (Audio in all steps).	Short T4 & T5 Pin 4 to Gnd. (Short jumper wire).		
	3		300 Ant. Input	90MHz	400 or 60Hz ±300KHz FM	90MHz			L4, L2, L3, T2 & T3 top & bottom	IF response for max. deflection & symmetry about 10.7MHz marker.
	Inject 10.7MHz marker into feethru C9 on tuner chassis (see pictorial on Tuner schematic).									
	4				106MHz		106MHz		C19, C2, C6	
	5	Repeat steps 3 & 4 until no further improvement.								
	6				96MHz		96MHz	Probe at Q7 base.	(Remove T4 jumper short) T4 Top & Bottom	(±120KHz BW at -3db).
	7							Probe at Q9 Pin 1	(Remove T5 jumper short) T5 top & bottom	
	8	Repeat step 1								
	9				400 or 60Hz ±75KHz FM. centered on IF			DC-VTVM across C55, 100pF.	T6 Top	0 V-DC
10				400 or 60Hz ±300KHz FM				T6 bottom	FM detector response curve for maximum deflection & symmetry	
11			100uv input	400 or 60Hz ±75KHz FM. centered on IF			CRO at Audio Left (across R390)	T6 bottom	Fine adjust for linear lissajous* (recheck for the 0 VDC of step 9).	
MX ALIGNMENT	1 Disconnect FM detector from Point A (Short Q13 emitter-base junction)									
	2	Selector FM Mode: Auto Stereo	10K source impedance	60MV RMS 19KHz into point A	none	point of no interf.	CRO &/or AC voltmeter base of Q15	T7 top & bottom	maximum deflection	
	3						CRO &/or AC voltmeter T8 pin 1 to ground	T8 top & bottom		
	4			1.0V RMS 67KHz into point A				L7	null	
	5			feed composite MX sig. left CH modulation 1.7V p-p or 0.3V RMS 400Hz into point A				CRO &/or AC voltmeter across R390	none	Note: approx. 0.4V Audio at Left channel output
	6						CRO &/or AC voltmeter across R391	T7 top	null at unmodulated channel output (approx. -10db from left)	
	7			switch off stereo gen. audio mod.			CRO &/or AC voltmeter across R390	none	residual 19KHz and 38KHz to be approx. -45db below 100% audio	
	8 Reconnect FM detector to point A (Remove Q13 emitter-base short)									
	9		300 balanced input to FM ant. input	96MHz	±75KHz composite stereo sig. left CH modulation only	96MHz		CRO &/or AC voltmeter across R391	fine adjust T7 top	null at unmodulated channel output.
	10							CRO &/or AC-VTVM at record output (right channel)	Adjust separation R136	Adjust for null separation (to be more than -30db)

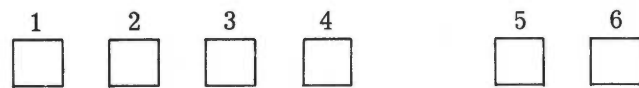
*If distortion analyzer is available, null T6 bottom for minimum distortion with 75KHz modulation.

PARTS LIST



B866R3 PUSH BUTTON SWITCH

REPAIR PROCEDURE



REMOVAL OF BROKEN PUSH BUTTON.

- (a) depress and lock buttons 1, 2, 3, 5, & 6 (depress completely to lock)
- (b) with thumb of left hand depress button #4 approx. 3/16" to 1/4" and hold in that position. With long nose pliers grasp flange of locking key. (located on right hand side of pushbutton #4) Pull key forward enough to clear tab on left side of switch and slide locking key as far to the right as it will go and release locking key from pliers. Then slide key to the left and slowly release the tension on push button #4.
- (c) Each button may now be individually removed by depressing and then releasing the button slowly.

REINSERTION OF BUTTONS

- (a) depress and lock buttons 1, 2, 3, 5, & 6.
- (b) Slide locking key as far to the right as it will go. With thumb of right hand depress push button #4 approx. 1/4" to 3/8". With small screwdriver in left hand slide small tab (located just to left of push button #4) as far to the right as it will go.

Slowly release push button #4. It should return to its normal position and stop.

(c) With long nose pliers grasp locking key flange and pull it forward enough to clear small tab on left hand side of #4 push button. Then slide locking key to the left until small tab is visible through hole in locking key. Slowly allow locking key to return to a flush position against switch mounting plate, making sure small tab is encompassed by locking key.

(d) Using a pliers or screwdriver slide locking key flange gently to the right until lite snap is heard.

(e) All push buttons are now locked and may be returned to their normal position by depressing and releasing each button.

NOTE: If push button #4 binds, pin on right hand side of locking key has been caught by spring.

TRANSISTORS (All silicon)	PART NO.	PRICE
Audio, Low signal - No dot (High beta), (Q5, 8, 12, 13, 105, 205)	SPS41	\$0.31
Audio, Low signal, No dot, (Q102, 108, 202, 208)	S22004	0.63
Audio, Low signal - Green dot (Low Noise), (Q101, 103, 201, 203)	SPS41N	0.91
Audio, Low signal - White dot, (Q106, 206)	S22004V	0.73
Audio, PNP (Q10, 15)	S4248	0.50
Pre-Driver, NPN (Q107, 207)	SPS4199	0.95
Pre-Driver, PNP (Q110, 210)	S437	3.16
Pre-Driver, NPN (Q14, 109, 209)	S2104	0.92
Driver, NPN (Q111, 112, 211, 212)	S409F	2.70
Output, NPN (Q113, 114, 213, 214)	S356	8.33
B Supply, NPN (Q11)	37649	1.80
RF Amp., FET (Q1)	MPF106	2.12
RF Mixer, FET (Q2)	MPF107	2.21
RF, IF, NPN (Q3, 6, 7) (Use same beta code 1, 2, 3)	SPS40	0.90
Microcircuit, (Q4)	CA3028	4.01
Microcircuit, (Q9)	U5B771739	5.40

You will note that all transistors used in the S-8800a are color-coded with a dot or mark of some color prominently located on the top of their case. (Some transistors have no mark, but this also is identification.) When ordering replacement transistors, it is imperative that you indicate not only its part no., but the color dot on the transistor body: red, yellow, none, (1, - 2, - or - 3). This is particularly important when replacing output transistors.

DESCRIPTION	PART NO.	PRICE
0.5µf, 50V, (C150, 171, 250, 271)	B120X3	\$0.72
5µf, 20V, (C151, 152, 251, 252)	B120X6	0.59
1µf, 25V, (C90, 111, 211, 360)	B120X7	0.59
8µf, 40V, (C140, 142, 240, 242)	B120X8	0.45
20µf, 5V, (C160, 260)	B120X12	0.59
100µf, 3V, (C100, 102, 200, 202)	B120X24	0.45
1µf, 40V, (C163, 263)	B120X76	0.63
LYTICS - BYPASS		
0.5µf, 50V, (C20, 31, 34)	B120B3	0.59
8µf, 40V, (C374)	B120B8	0.45
10µf, 10V, (C161, 261)	B120B9	0.45
20µf, 50V, (C170, 270)	B120B14	0.45
500µf, 25V, (C353)	B120B31	0.99
250µf, 35V, (C340, 341, 343)	B120B33	0.86
125µf, 16V, (C18)	B120B26	0.46
250µf, 15V, (C342)	B120B74	0.59
50µf, 15V, (C25)	B120X36	0.90
Insulator, Mica (T0-3)	A021F1	0.05
Fuse, 3 Amp., 3AG	312003.	0.15
Dial Glass	B322R9-0	1.13
Knobs, Small, (w/indicator)	B467X1-2	1.98
Knobs, Mini.	A467X5-2	1.13
Knobs, Medium, (w/indicator)	B467X4-2	2.25
Tuning Meter	A550G3	6.30
Light Bulb, Pilot, #53	630B53	0.16
Light Bulb, Stereo, #1302	630B1302	0.64
Control, Bass, 100K, (R134A, B)	A670R20-0	1.67
Control, Treble, 100K, (R140A, B)	A670R20-0	1.67
Control, Balance, 100K, (R122)	A670R22-1	0.90
Control, Hush, 15K, (R35)	A670R18-2	0.95
Control, Ph. Level 1.5K, (R120A, B)	A670R19-2	2.12

DESCRIPTION	PART NO.	PRICE
Control, Loudness, Dual w/AC sw. 50K, (R121A, B)	A671R3-3	4.28
Pot., P. C., 500, (R183, 283)	A675T1-0A	0.45
Pot., P. C., 25K, (R136)	A675T8-0A	0.45
Pot., P. C., 250K, (R33)	A675T9-0A	0.72
Pot., P. C., 500K, (R174, 274)	A675T10-0A	0.63
Rectifier, Silicon, (X14)	A692T5	0.48
Diode, Silicon, (X2, 4, 6, 7, 8, 9, 10, 17)	A692X13	1.22
Rectifier, Silicon, (X12, 13)	A692X16	1.71
Rectifier, Silicon, (X15, 16)	A692X17	0.62
Diode, Zener, Silicon, 13V, 5%, (Z1)	A694X1	1.21
Socket, Driver Transistor, T0-5	A790T4M	0.23
Socket, Output Transistor, T0-3	A790T7	0.18
Stereo Headphone Jack	A795R3	0.95
Stereo Tape Jack	A795R3	0.95
Fuse Post	A796X2	0.70
Selector Switch, 3 Position, (S1)	A860R9-1	5.04
Switch, Push Button Assembly	B866R3-3A	7.69
Transformer, Power, Domestic, (T1)	B922R2-6	20.97
Transformer, Export, Power, (T1')	2B922R2X-6	27.95
Transformer, FM IF (T3, 4, 5)	65-252D	2.75
Transformer, FM Discrim., (T6)	65-387F	4.92
Transformer, FM Converter, (T2)	67-101	2.07
Transformer, 38KHz, (T8)	65-290A	1.52
Transformer, 19KHz, (T7)	67-158	2.43
Coil, 67KHz Null, (L7)	65-274B	0.96
Coil, Mixer (L3)	68-131	1.13
Coil, Balun, (L1)	67-288	0.86
Choke, RF, (L5, 6)	64-103	0.52

SERVICING

VOLTAGE CHECKS

Preliminary checks of the D.C. voltages present at various points in the S-8800 can prove useful in locating defective components. They are inconclusive, however, in determining if transistors are operating properly in all aspects. They can only indicate whether the transistor is open, shorted or functioning, not how well the transistor is functioning.

IN GENERAL:

Correct voltages indicate a functioning transistor.

The same voltage at the collector and emitter indicates a shorted transistor.

Full supply voltage on the collector and no voltage on the emitter indicates an open transistor.

OUTPUT TRANSISTOR BIAS

Of all the specifications which require checking to ascertain correct performance of the S-8800, proper output transistor operation is the most important and critical. Adjustment of the output transistor bias is necessary if output transistors are replaced*, or the amplifier exhibits one or more of the following symptoms:

- Overheating of the output transistors under normal operating conditions.
- Excessive low level Intermodulation Distortion—more than 0.5% at 2.0 volts across 8 ohms (0.8 watts, IM power).

Adjustment of output transistor bias should then proceed as follows:

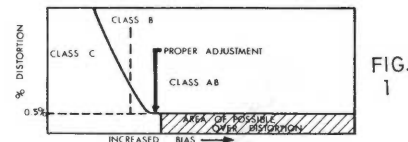


FIG. 1

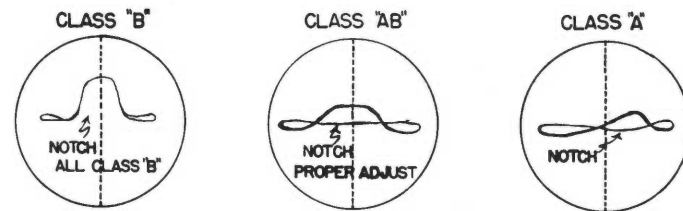
- Turn amplifier off.
- Set output balance pots (left and right channels) to mechanical center and bias pots fully counter-clockwise.
- Connect D.C. voltmeter of at least 3% known accuracy to transistor side of appropriate channel's output terminals.

- Turn amp. on and adjust output balance pot for that channel so that approx. $1/2B+$ voltage is on the output capacitor.
- Connect an Intermodulation Distortion analyzer to the amplifier TP. MON. (aux.) input, turn volume control to maximum and adjust the analyzer output for an amplifier output of 2.0V across 8 ohms. (Because the output stages have been set into heavy class "B" operation by the "pre-setting" in Step 2, a class "B" notch in the distortion waveform will be obvious.) NOTE: When adjusting bias for class "AB", adjust until class "B" notch is almost eliminated. Class "A" begins beyond this point. Notch shifts to right.
- Increase analyzer output until clipping can be observed. Fine adjust output balance pot. so that clipping is symmetrical.

IMPORTANT: Misadjustment of the bias pot can cause heavy class "A" operation of the output transistors, causing them to overheat.

The following performance indicates a properly operating output stage with 8 ohm load.

- Less than 0.5% IM distortion at 2.0V.
- Typically 0.6% IM distortion at 10 Volts.
- 18 watts of power per channel at clipping.



1. PROTECTIVE CIRCUITRY (IOP) & SPEAKER SYSTEM CHECK: The Model S-8800 incorporates special protective circuitry, (Instamatic Overload Protection), which turns off the drive to the power amplifiers when danger to the receiver output circuitry exists. If the receiver turns itself off, check the speaker connections for shorted wires. Speaker line resistance should not measure below 3 ohms.

The overload protective circuit consists of a type of bi-stable multivibrator. Transistor Q105 samples the output transistors current. At approximately 5A peak output current, Q105 is triggered and clamps the base of Q106 to ground and locks in this state, preventing AC drive to the power amplifier and thereby protecting it.

*It is extremely important that the mica insulating washers used to separate the output transistors from their heat sinks be unbroken and installed properly with silicon grease liberally applied to all surfaces in contact with each other. Make certain the emitter and base pins of the output transistors do not contact any part of the heat sinks.

NOTE: Refer to speaker load connections on schematic, being careful to observe ground-connections.

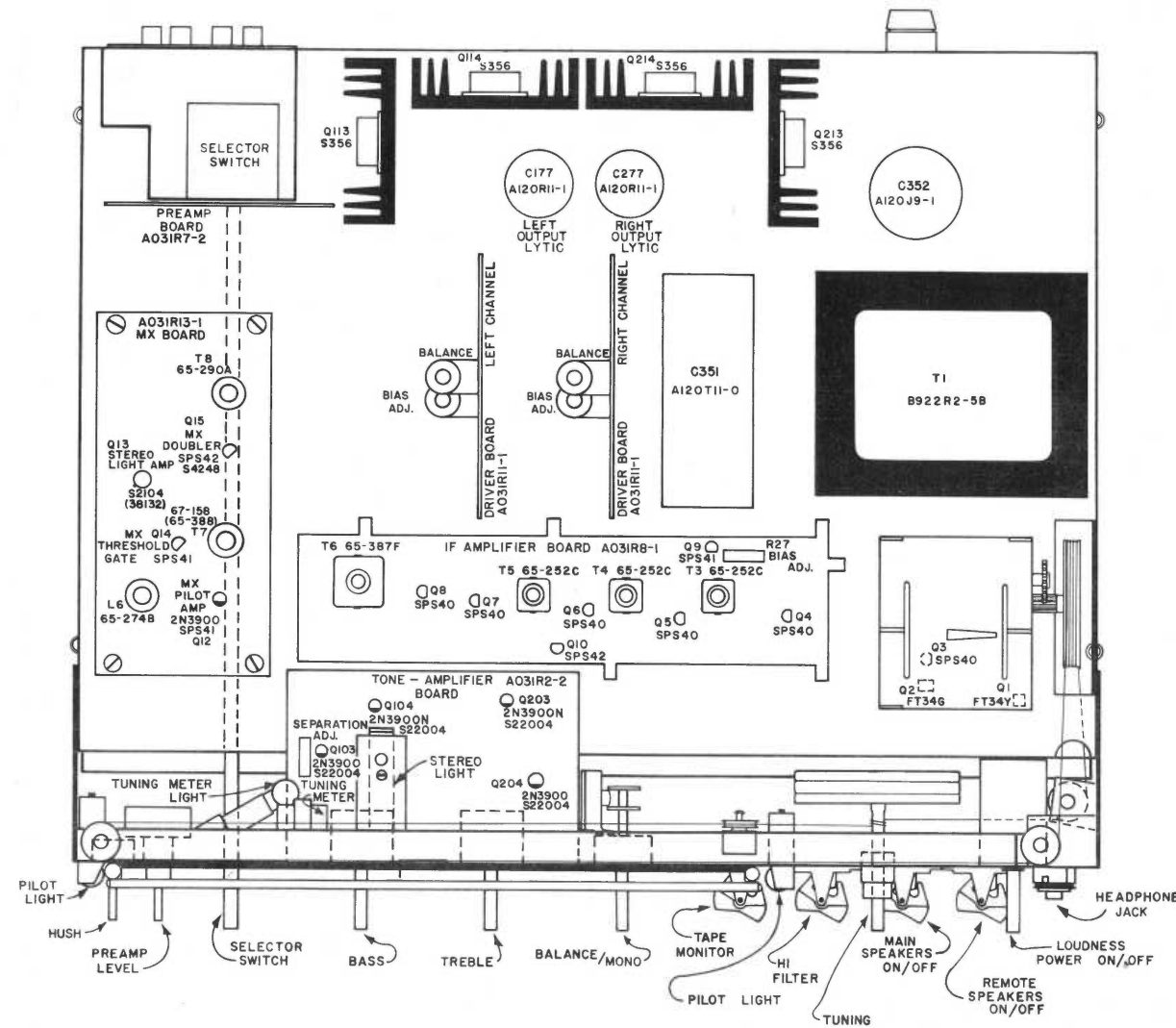
ALIGNMENT CHART

	switch position	signal generator input			dial setting	indicating instrument	adjust	indication	
		coupling	freq.	modulation					
FM ALIGNMENT	1	Selector: FM Mode: Mono	none	none	none	pt. of no interf.	R27 bias adj	1.2V-DC	
	2	"	.01uf to base of Q4 (HI INPUT)	10.7MHz	400 or 60 Hz ±300KHz FM	"	T3, T4, T5 top & bot.	maximum deflection & symmetry	
	3	"	"	"	none	"	T6 top	0V-DC	
	4	Repeat Step #1							
	5	"	300Ω ant. input	90MHZ	400 or 60 Hz ±300KHz FM	90MHZ	CRO thru 10KΩ to Collector of Q7 & shunt CRO input w/.005uf.	L2, L3, L4, T2 top & bottom	maximum deflection & symmetry
	6	"	"	106MHz	"	106MHz	"	C2, C6, C19	"
	7	Repeat Steps 5 & 6 until no further improvement							
	8	Same as Step 5			±300KHz FM	"	CRO thru 10KΩ to Collector of Q7	T2, T3, T4, T5 top & bottom	recheck for max. deflection & adj. for symmetry *
	9	"			NONE	90MHZ	DC VTVM across C55	T6 top	recheck for 0 V-DC
	10	"			400 or 60Hz ±75KHz FM	"	CRO & DC VTVM across C55	T6 bottom	maximum deflection & symmetry *
MX ALIGNMENT	1	Disconnect FM detector from Point A							
	2	Selector: FM Mode: Auto Stereo	10K source impedance	60MV RMS 19KHz into point A	none	point of no interf. & short Q13 emitter base junction.	AC voltmeter base of Q15	T7 top & bottom	maximum deflection
	3	"	"	"	"	"	AC voltmeter T8 pin 1 to ground	T8 top & bottom	"
	4	"	"	1.0V RMS 67KHz into point A	"	"	"	L6	null
	5	"	"	feed composite MX sig, left CH modulation 1.7V p-p or 0.3V RMS 400Hz into point A		"	AC voltmeter across C382	T7 top	null at unmodulated channel output
	6	Reconnect FM detector to point A							
	7	"	300Ω balanced input to FM ant. input	96MHz	100μv	±75KHz composite stereo sig. left CH modulation only	96MHz	"	fine adjust T7 top null at unmodulated channel output. separation 30db

* If distortion analyzer is available, null T6 bottom for minimum distortion with 75KHz modulation.

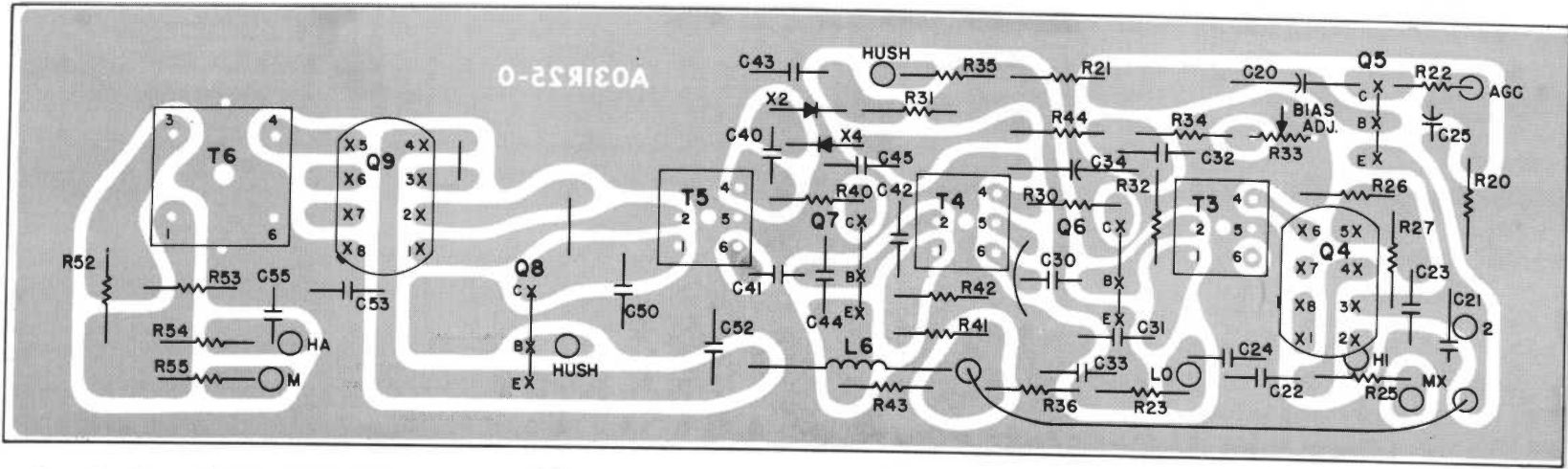
PARTS LIST
(continued)

You will note that all transistors used in the S-8800 are color-coded with a dot or mark of some color prominently located on the top of their case. (Some transistors have no mark, but this also is identification.) When ordering replacement transistors, it is imperative that you indicate not only its part no., but the color dot on the transistor body: red, yellow, none, (1, - 2, - or - 3). This is particularly important when replacing output transistors.



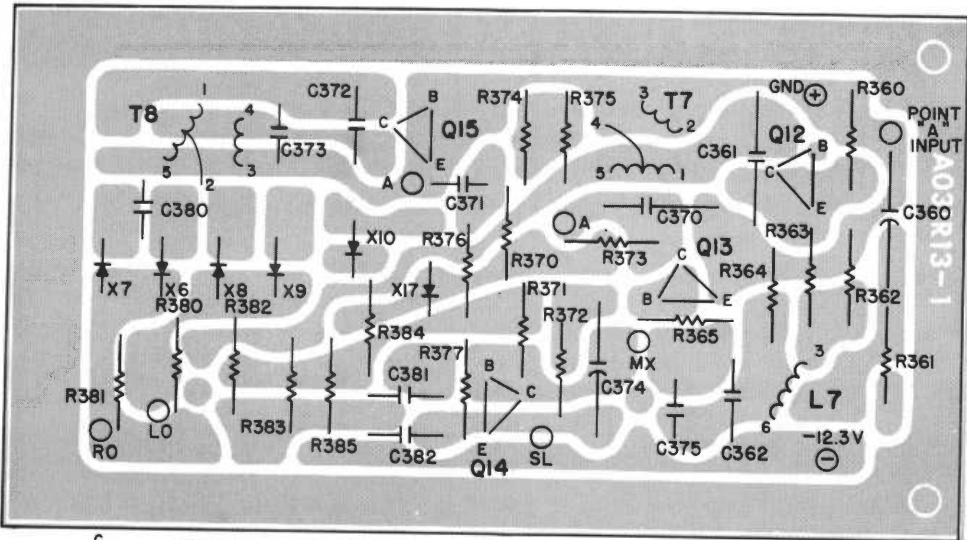
TRANSISTOR (All are silicon)	PART NO.	PRICE
Audio, Low signal - no dot (Hi-beta), (Q9, 12, 102, 103, 108, 202, 203, 208)	2N3900	\$1.04
	S22004	0.63
	SPS41	0.81
Audio, Low signal - Green dot (Low Noise), (Q100, 104, 200, 204)	2N3900N	1.14
	SPS41	0.81
Audio, Low signal - White dot (40 volts), (Q106, 206)	2N3900V	1.14
Audio, NPN (Q13, 105, 205)	SPS41	0.81
Audio, PNP (Q10, 15)	SPS42	0.90
Audio, NPN (Q14) (Replace with S2104)	S4248	0.50
	S2104	0.92
	38132	----
	7A1011	----
	7A995	----
Pre-Driver, NPN (Q107, 207)	16E1330	1.26
Pre-Driver, PNP (Q110, 210)	S437F	3.16
Pre-Driver, NPN (Q109, 209)	S2104	0.92
Driver, NPN (Q111, 112, 211, 212)	S409F	2.70
Output, NPN (Q113, 114, 213, 214)	S356	8.33
B Supply, NPN (Q13)	37649	1.80
RF Amp., FET (Q1) (Yellow dot)	FT34Y	2.70
RF Mixer, FET (Q2) (Green dot)	FT34G	2.70
RF, IF, NPN (Q3, 4, 5, 6, 7, 8) (Use same beta code -1, -2, -3 or B, R, O)	SPS40	0.90
	SL40	0.95

DESCRIPTION		
500 - 500µf, 45V (C352A, B)	A120J9-2	2.49
1500µf, 45V (C180, 280)	A120R11-2	2.88
2500µf, 80V (C351)	A120T11-0	6.35
0.5µf, 50V (C27, 163, 171, 263, 271)	B120X3	0.59
1µf, 25V (C111, 120, 121, 211, 220, 221, 360)	B120X7	0.59
8µf, 40V (C135, 143, 235, 243, 374)	B120X8	0.45
10µf, 10V (C161, 261)	B120X9	0.65
20µf, 5V (C160, 260)	B120X12	0.63
20µf, 50V (C170, 270)	B120X14	0.68
100µf, 3V or 125µf, 4V (C100, 102, 200, 202)	B120X24	0.45
500µf, 25V or 640µf, 25V (C353)	B120X31	1.31
250µf, 35V or 40V (C341, 342, 344)	B120X33	0.95
50µf, 15V (Plug-In) (C21)	B120X36	0.77
5µf, 15V (C150, 250)	B120X73	0.68
250µf, 15V (C343)	B120X74	0.95
Insulator, Mica (T0-3)	A021F1	0.05
Fuse, 3 AMP, 3AG	312003.	0.14
Knobs, Small	B467X1	1.98
Knobs, Large (unmarked)	B467X2	2.16
Knobs, Large (w/indicator)	B467X3	2.20
Light Bulb, Pilot	630B53	0.14
Light Bulb, Stereo	630B1302	0.23
Dial Glass	B322R4-1	1.13
Control, Bass, 1MΩ, dual, (R134A, B)	A670R6-3A	2.70
Control, Treble, 250KΩ, dual, (R140A, B)	A670R7-3A	2.03
Control, Phono Level, 1.5KΩ, (R122A, B)	A670R10-6A	1.18
Control, Hush, 500Ω, (R35)	A670R11-2B	1.02
Control, Balance, 100KΩ, w/Mono Sw. (R154, S2)	A671R2-4A	1.71
Control, Loudness, 50KΩ, dual, (R151A, B)	A671R3-3	4.23
Pot., P.C., 25KΩ, (R136)	A675T8-0A	0.40
Pot., P.C., 500Ω, (R183, 283)	A675T1-0A	0.54
Pot., P.C., 250KΩ, (R27, 174, 274)	A675T9-0A	0.72
Diode, Germanium (X3)	A691M4	0.27
Diode, Silicon, (X2, 4, 6, 7, 8, 9, 10, 17)	B692X13	0.44
Rectifier, Silicon, (X12, 13)	A692X16	1.71
Rectifier, Silicon, (X15, 16)	A692X17	0.62
Rectifier, Silicon, (X14)	A692T5	0.48
Diode, Zener, 13V, 5%, (Z1)	A694X1	1.21
Socket, Driver Transistor (T0-5)	A790T4	0.23
Socket, Output Transistor (T0-3)	A790T7	0.18
Stereo Headphone Jack	A795L1	1.08
Fuse Post	A796X2	0.95
Switch, Selector, 4 Pos. (S1)	A860R5-1B	3.66
Switch, Rocker (Black slide) (S3A & B)	A864H22-5	0.90
Switch, Rocker (Red or Grey slide) (S4A & B, 6A & B)	A864H23-5	0.90
Transformer, Power, (T1)	B922R2-5B	22.36
Transformer, FM IF (T3, 4, 5)	65-252C	2.75
Transformer, FM Discrim. (T6)	65-387F	4.92
Transformer, FM Converter (T2)	67-101	2.07
Transformer, 38KHz (T8)	65-290A	1.52
Transformer, 19KHz (T7) (Replace 65-388 with 67-158)	67-158	2.25
Coil, 67KHz (L6)	65-274B	0.96
Coil, RFC (L5)	64-103	0.52



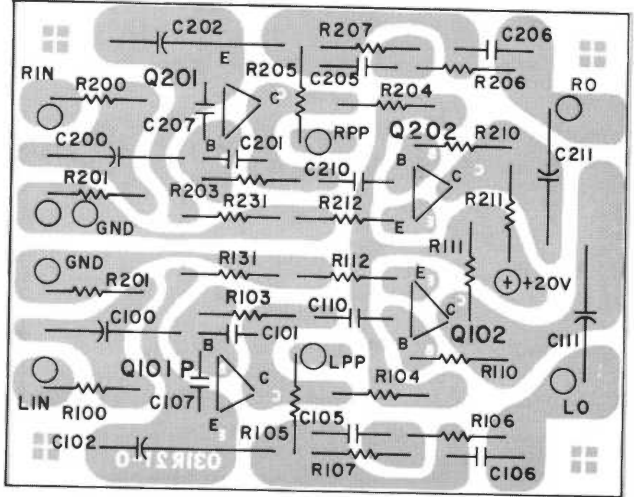
- C B E
- X X X
- TRANSISTOR
- HA - HUSH AMP.
- AGC - TO TUNER
- HUSH - TO POT
- HI - HI INPUT
- M - TO TUNING METER
- LO - LO INPUT
- MX - TO MX BOARD
- 2 - FM B- (TUNER)

A031R25-0 I.F. AMP. BOARD



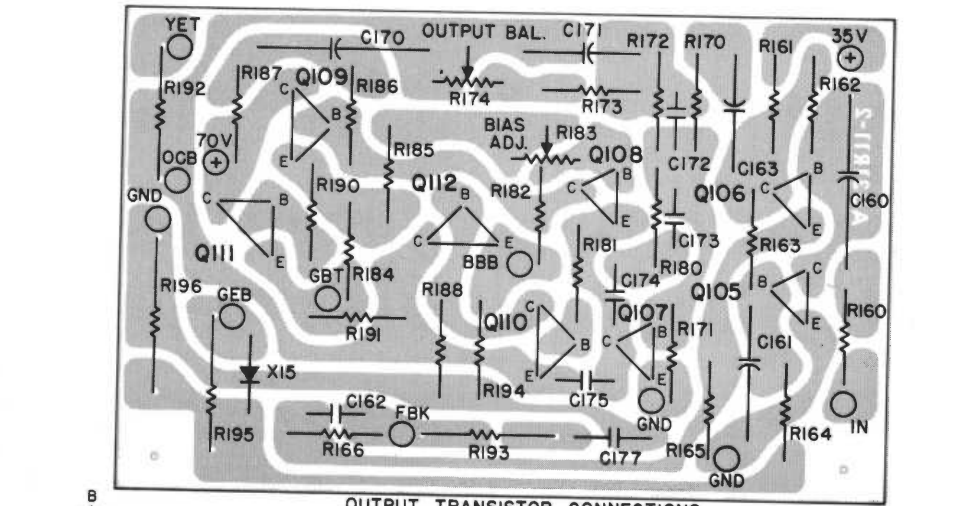
- C B E
- E B
- TRANSISTORS
- RO - RIGHT OUTPUT
- LO - LEFT OUTPUT
- SL - TO STEREO LIGHT
- A - TO AUTOMATIC STEREO-MONO SW.
- MX - MX GATE FROM I.F. BOARD

A031R13-1 MULTIPLEX BOARD



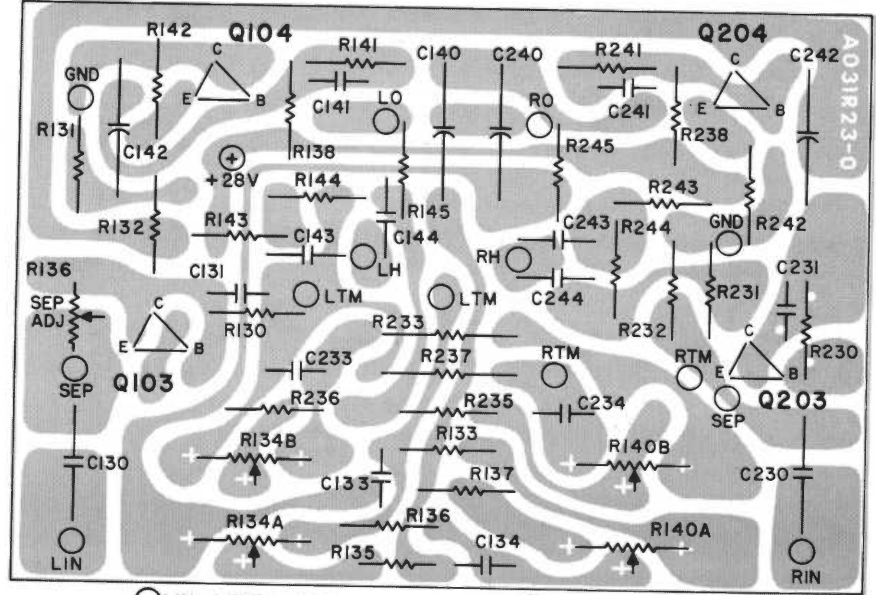
- C B E
- TRANSISTOR
- RIN - RIGHT INPUT
- LIN - LEFT INPUT
- RPP - RIGHT PHONO LEVEL
- LPO - LEFT PHONO LEVEL
- RO - RIGHT OUTPUT
- LO - LEFT OUTPUT

A031R21-0A PRE-AMP BOARD



- OUTPUT TRANSISTOR CONNECTIONS
- YET - EMITTER, TOP, (YELLOW)
 - GEB - EMITTER, BOTTOM, (GREY)
 - IN - INPUT
 - FBK - FEED-BACK
 - GBT - BASE, TOP, (GREEN)
 - BBB - BASE, BOTTOM, (BROWN)
 - +70V - COLLECTOR, TOP, (RED)
 - OCB - COLLECTOR, BOTTOM, (ORANGE)

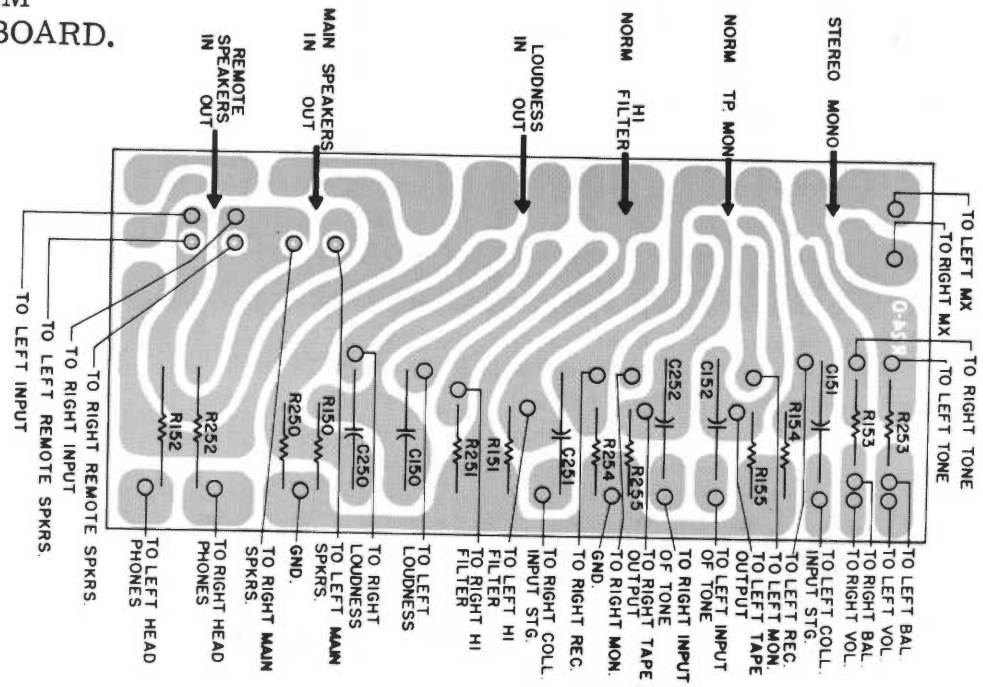
A031R11-2 DRIVER BOARD



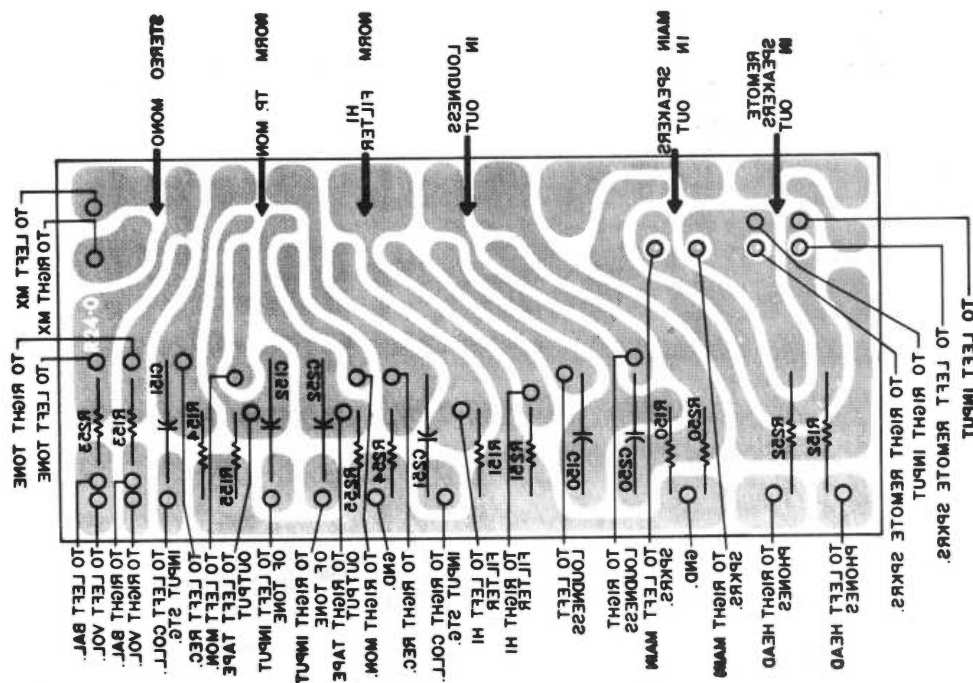
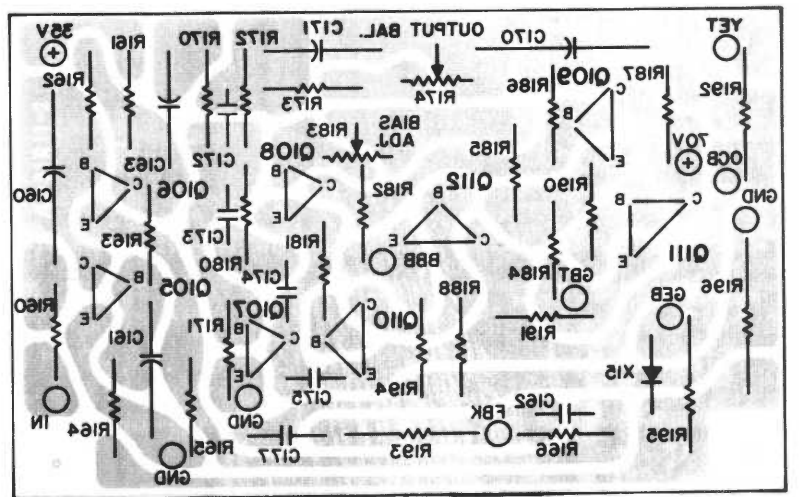
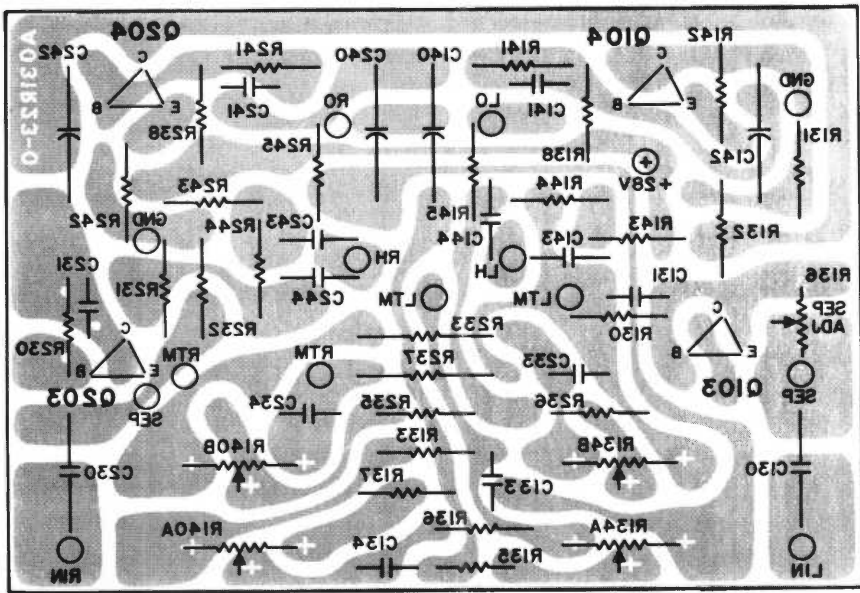
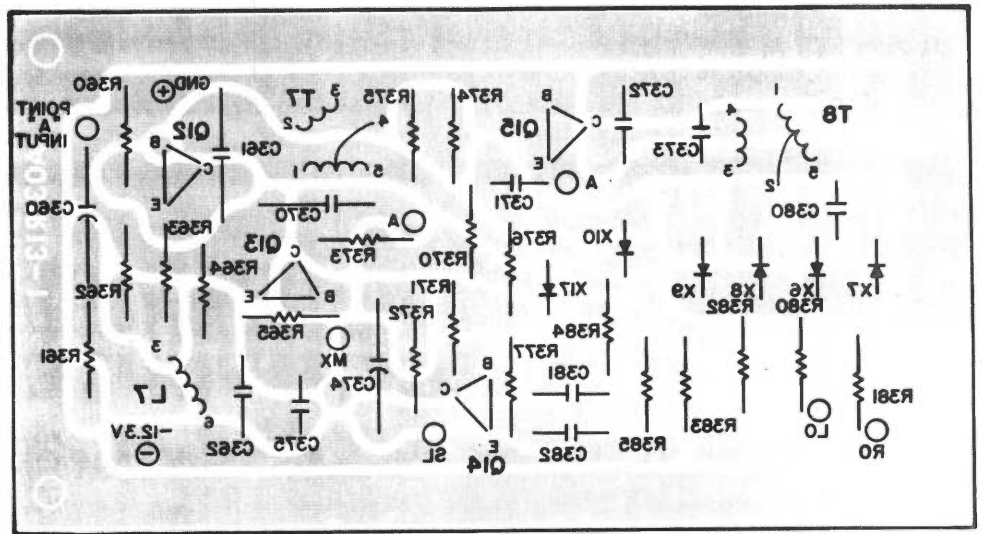
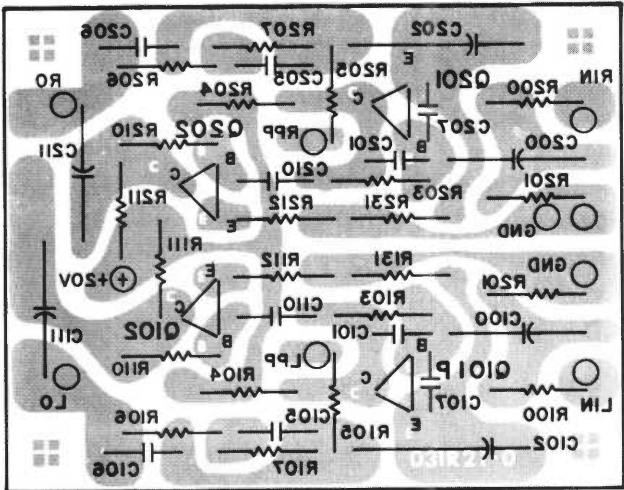
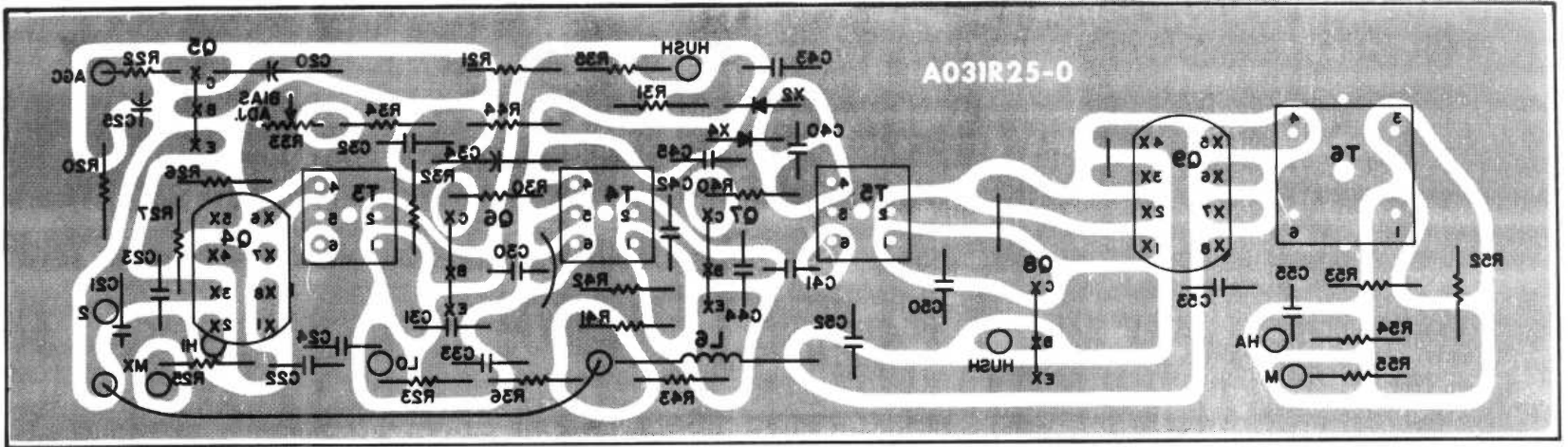
- C B E
- TRANSISTOR
- LIN - LEFT INPUT
- RIN - RIGHT INPUT
- LH - TO LEFT HI FILTER SWITCH
- RH - TO RIGHT HI FILTER SWITCH
- LTM - TO LEFT TAPE MONITOR SW.
- RTM - TO RIGHT TAPE MONITOR SW.
- LO - LEFT OUTPUT
- RO - RIGHT OUTPUT
- SEP ADJ - SEPARATION ADJUSTMENT
- SEP - TO SELECTOR SWITCH

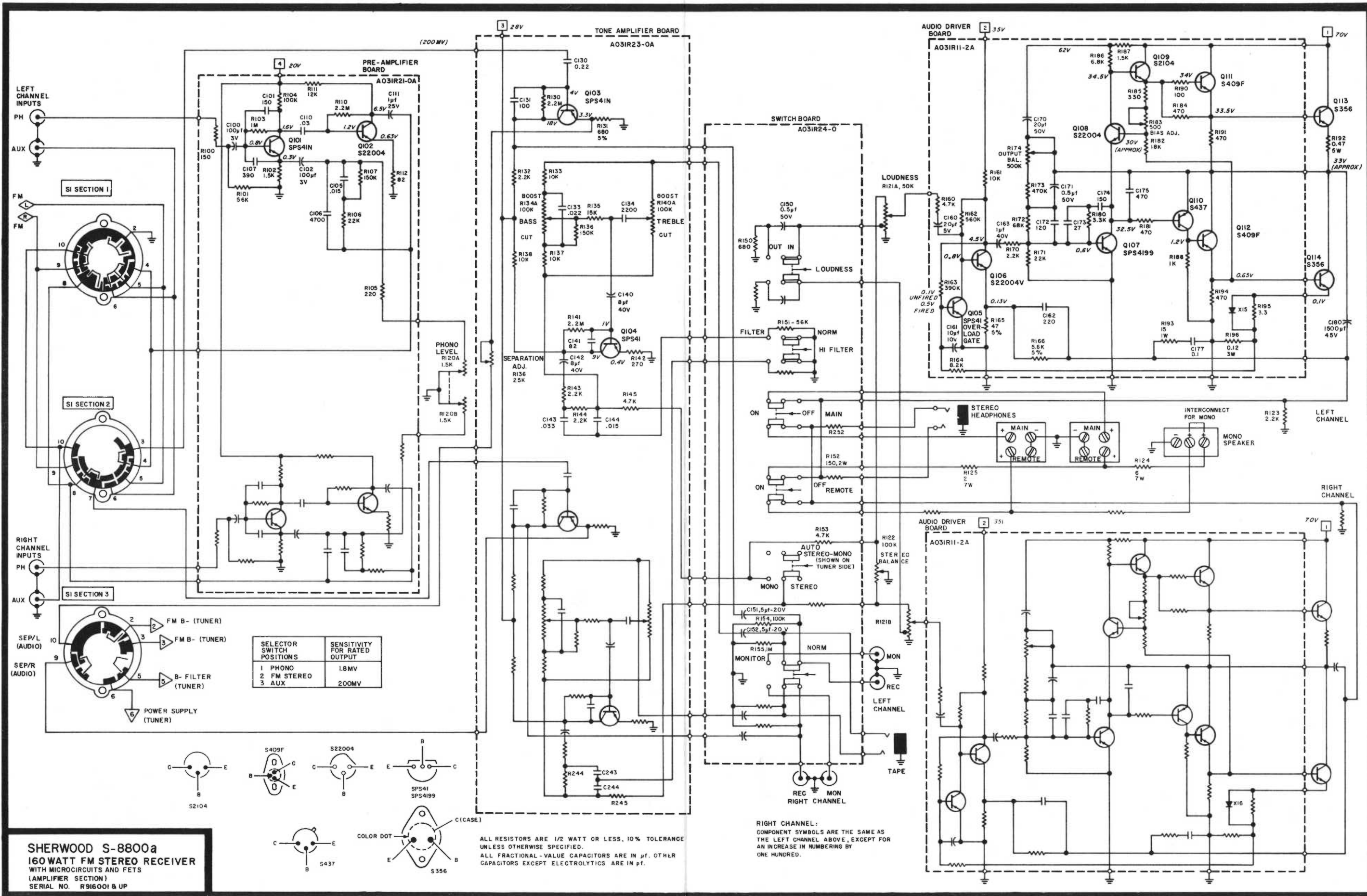
A031R23-0 TONE BOARD

NOTE: AS VIEWED FROM COMPONENT SIDE OF BOARD.



A031R24-0 SWITCH BOARD



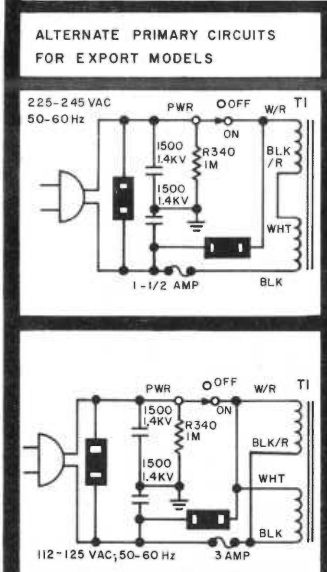
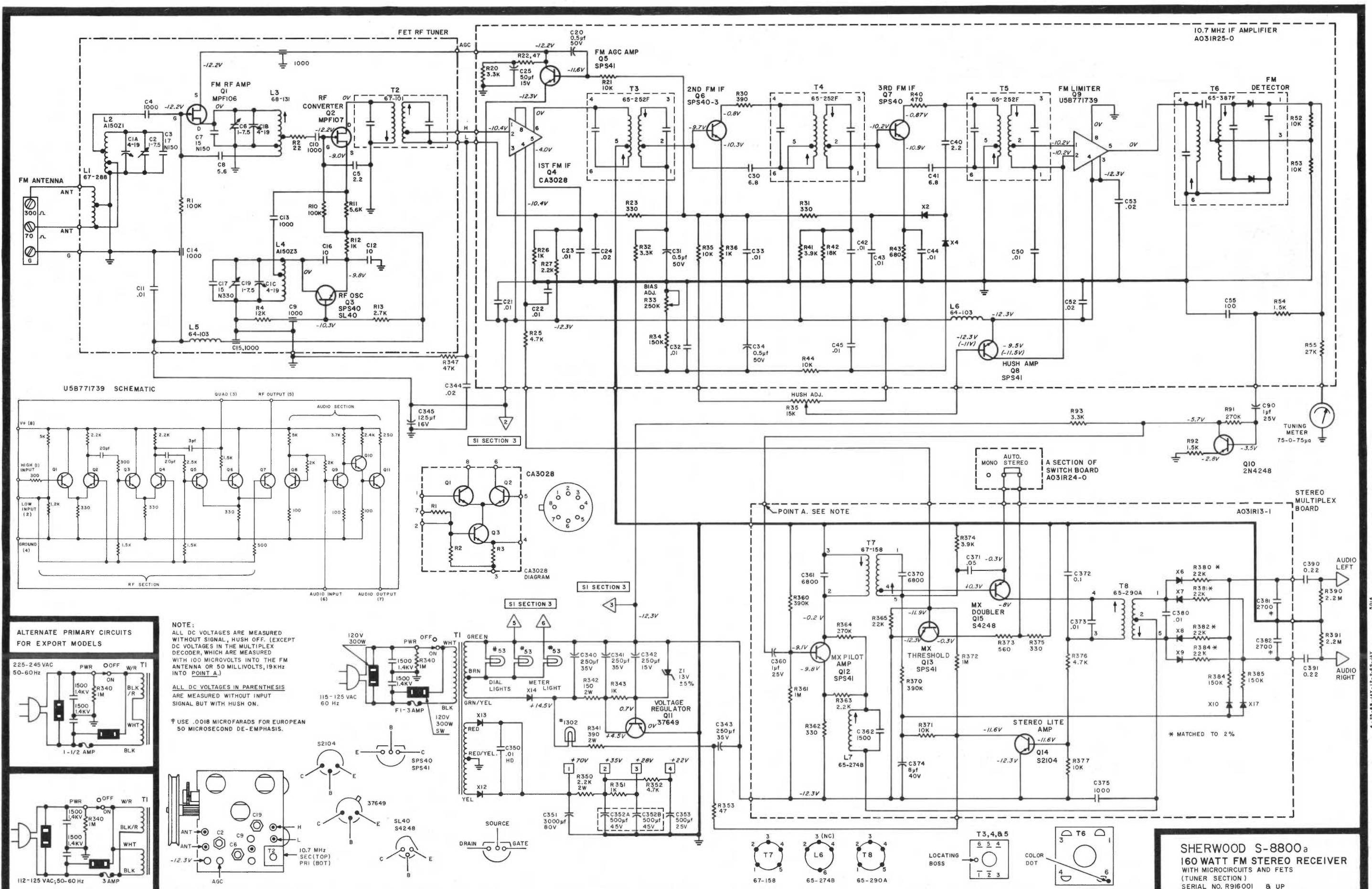


SELECTOR SWITCH POSITIONS	SENSITIVITY FOR RATED OUTPUT
1 PHONO	1.8MV
2 FM STEREO	200MV
3 AUX	

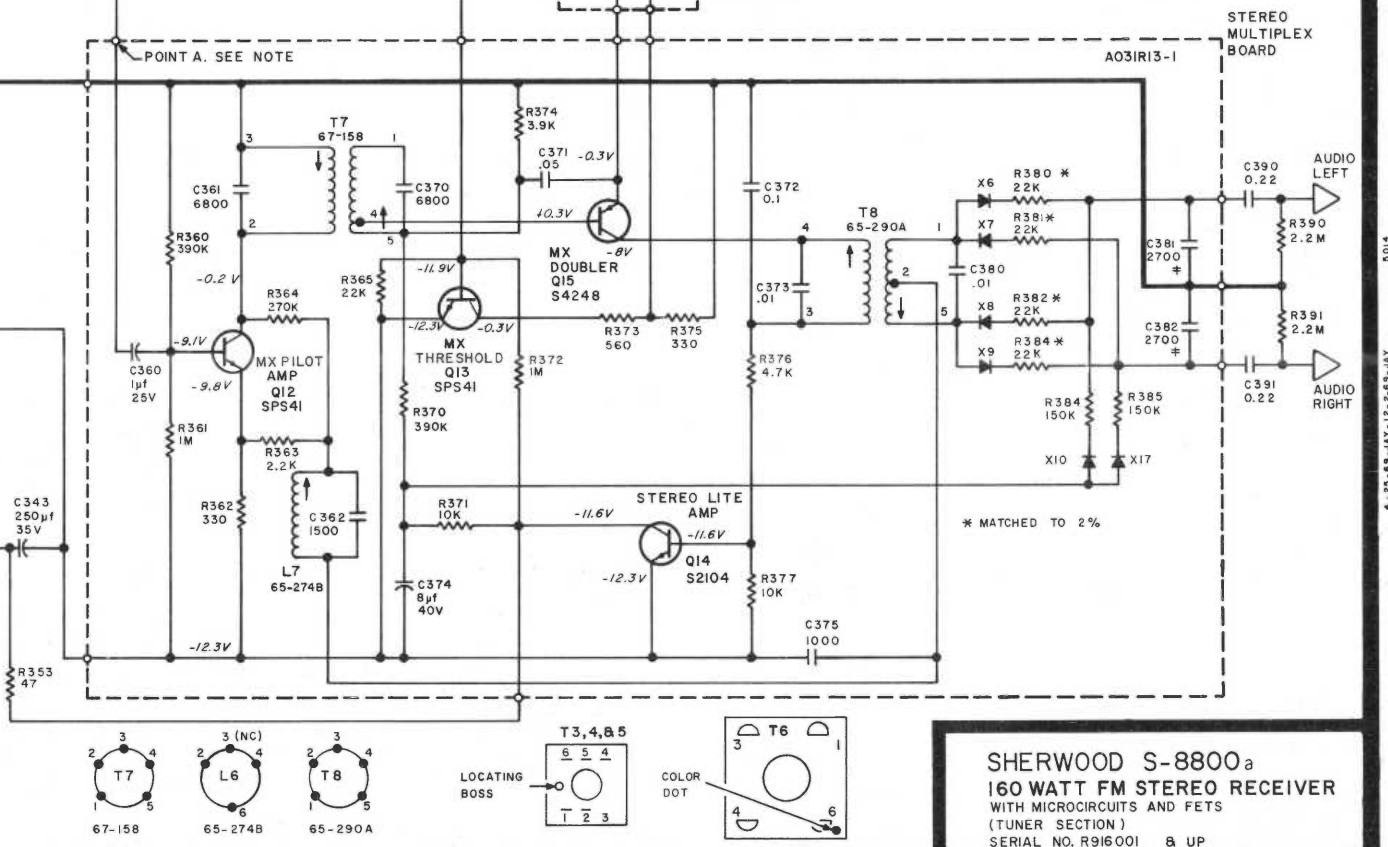
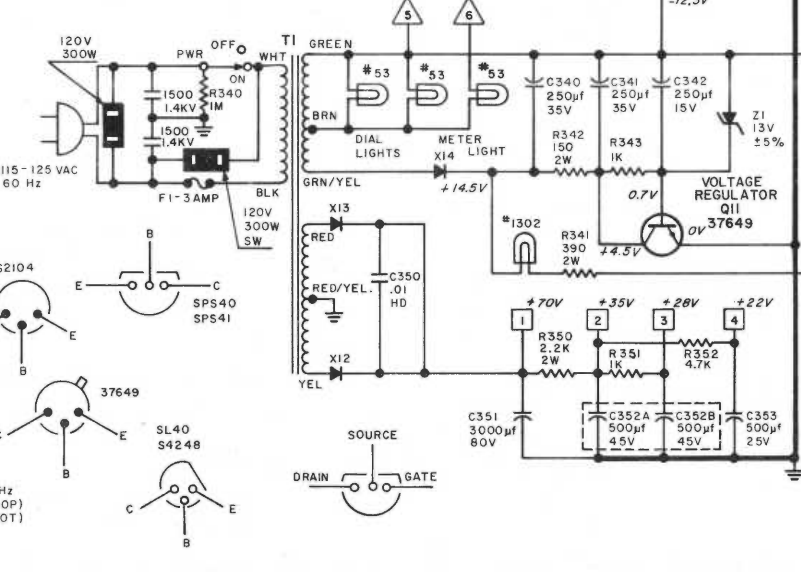
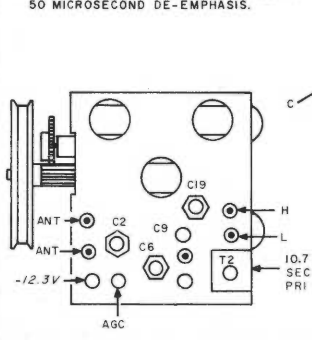
SHERWOOD S-8800a
160 WATT FM STEREO RECEIVER
 WITH MICROCIRCUITS AND FETS
 (AMPLIFIER SECTION)
 SERIAL NO. R916001 & UP

ALL RESISTORS ARE 1/2 WATT OR LESS, 10% TOLERANCE UNLESS OTHERWISE SPECIFIED.
 ALL FRACTIONAL-VALUE CAPACITORS ARE IN μ F. OTHER CAPACITORS EXCEPT ELECTROLYTICS ARE IN pF.

RIGHT CHANNEL:
 COMPONENT SYMBOLS ARE THE SAME AS THE LEFT CHANNEL ABOVE, EXCEPT FOR AN INCREASE IN NUMBERING BY ONE HUNDRED.

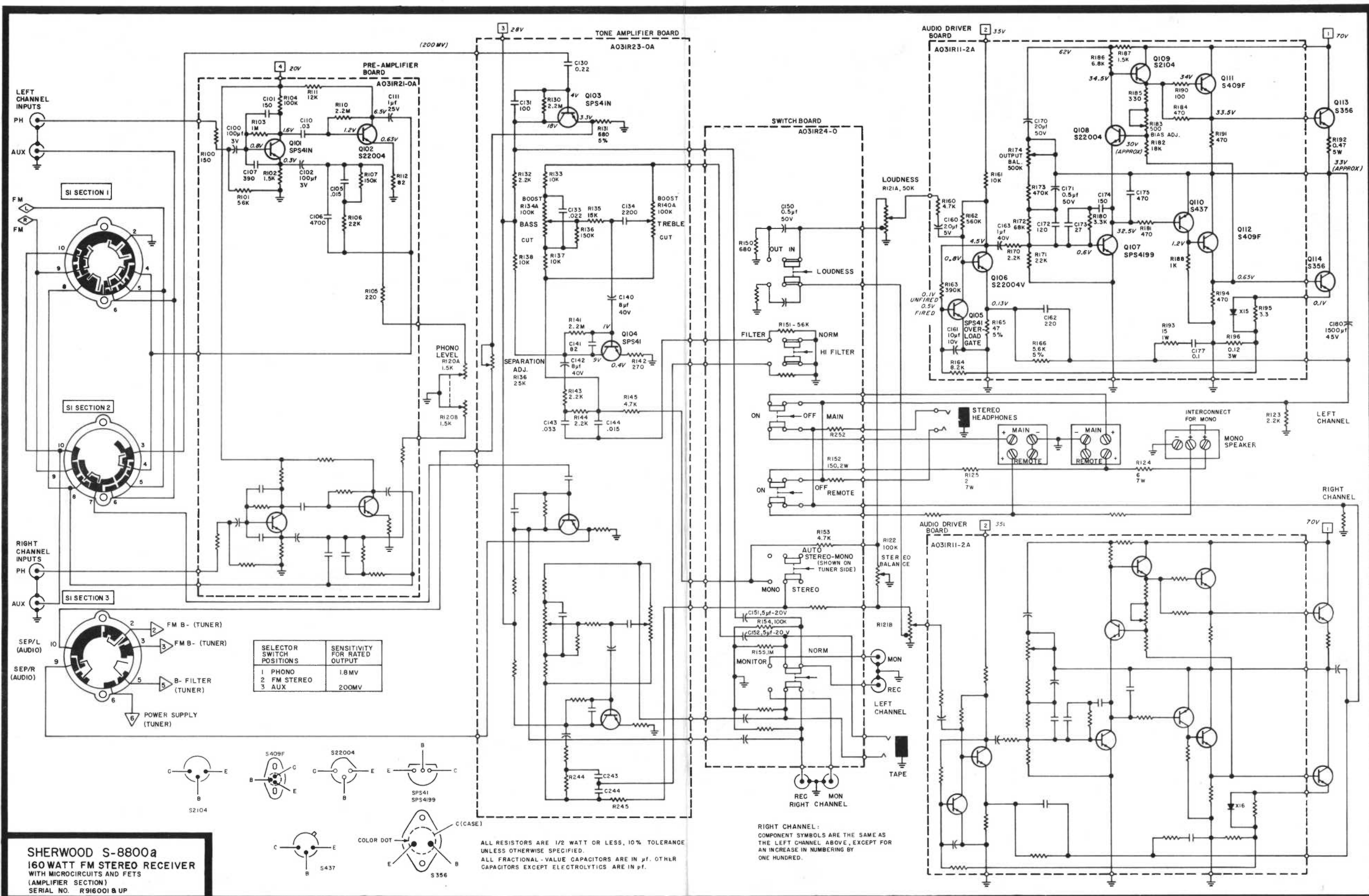


NOTE:
 ALL DC VOLTAGES ARE MEASURED WITHOUT SIGNAL, HUSH OFF. (EXCEPT DC VOLTAGES IN THE MULTIPLEX DECODER, WHICH ARE MEASURED WITH 100 MICROVOLTS INTO THE FM ANTENNA OR 50 MILLIVOLTS, 19KHZ INTO POINT A.)
 ALL DC VOLTAGES IN PARENTHESIS ARE MEASURED WITHOUT INPUT SIGNAL BUT WITH HUSH ON.
 * USE .0018 MICROFARADS FOR EUROPEAN 50 MICROSECOND DE-EMPHASIS.



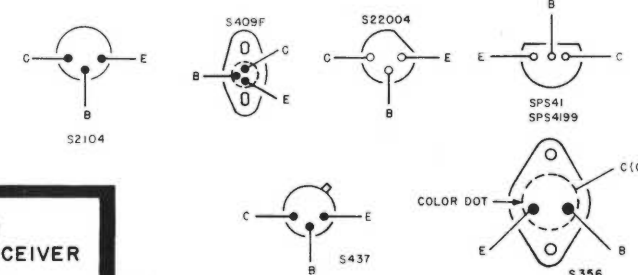
SHERWOOD S-8800a
 160 WATT FM STEREO RECEIVER
 WITH MICROCIRCUITS AND FETS
 (TUNER SECTION)
 SERIAL NO. R916001 & UP

4-25-89-JAY-12-2-65-JAY 504



SHERWOOD S-8800a
160 WATT FM STEREO RECEIVER
 WITH MICROCIRCUITS AND FETS
 (AMPLIFIER SECTION)
 SERIAL NO. R916001 & UP

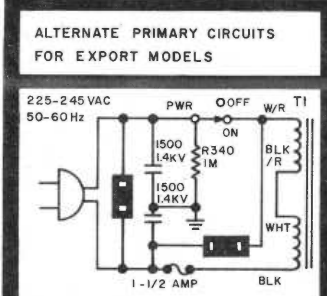
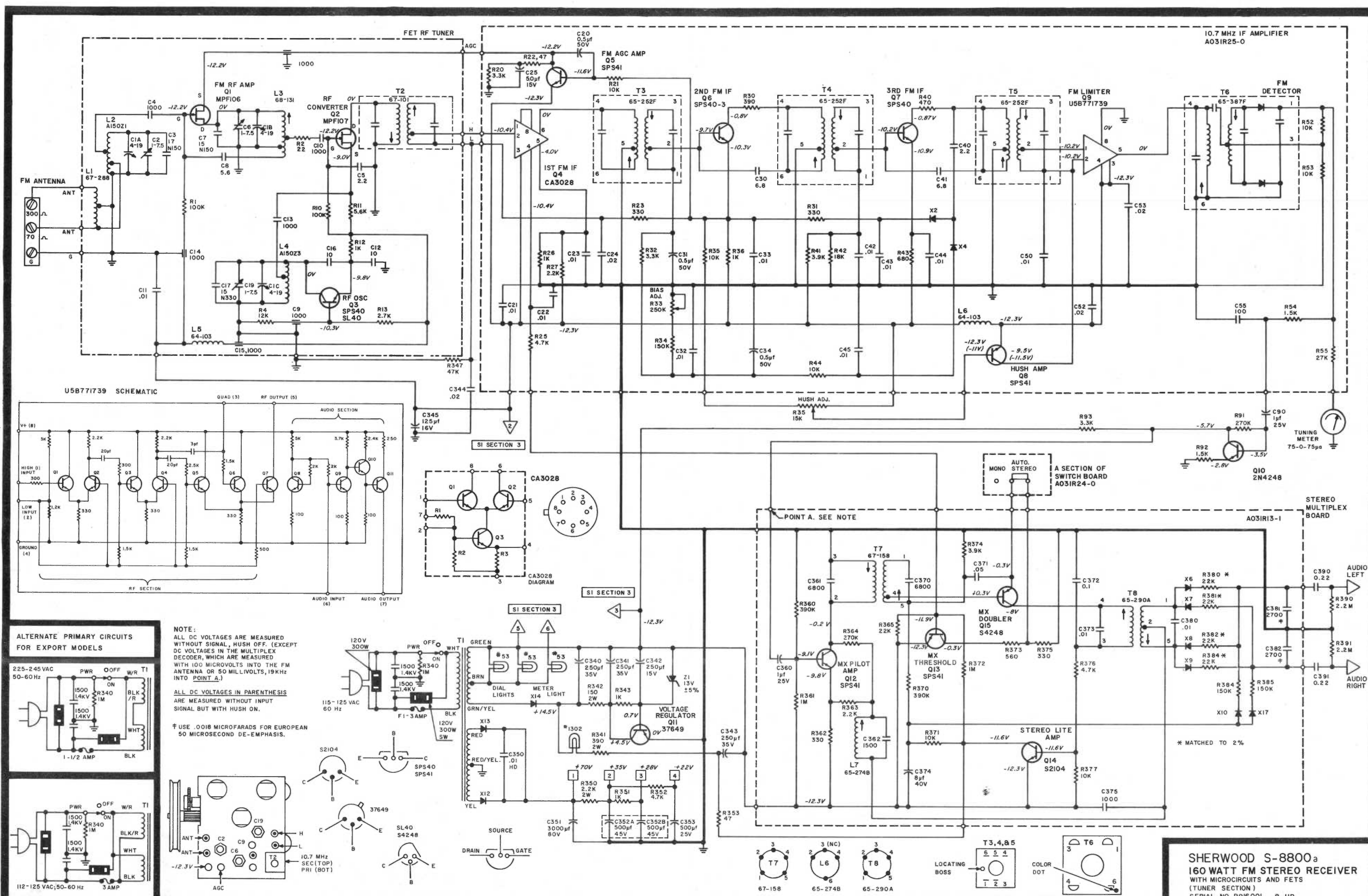
SELECTOR SWITCH POSITIONS	SENSITIVITY FOR RATED OUTPUT
1 PHONO	1.8 MV
2 FM STEREO	200MV
3 AUX	



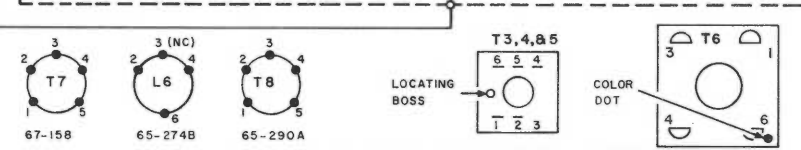
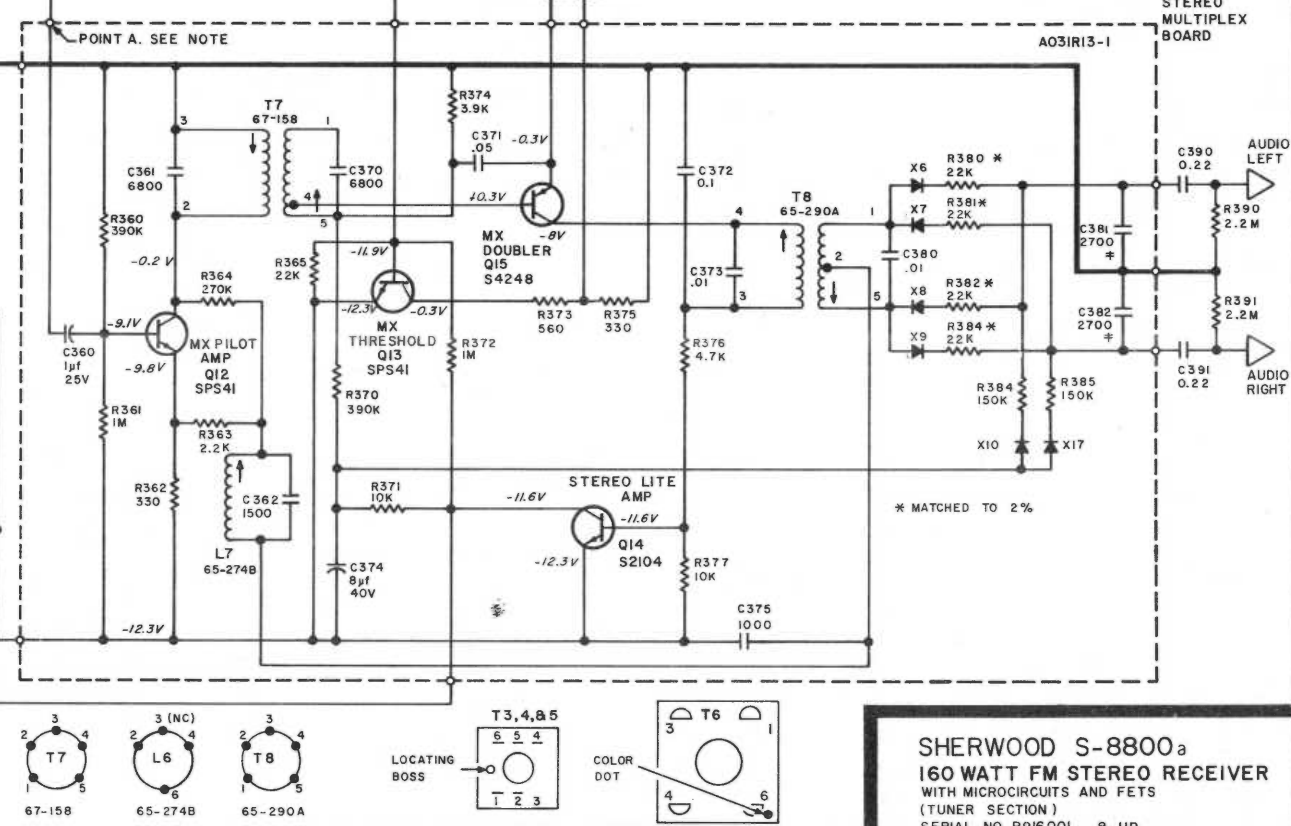
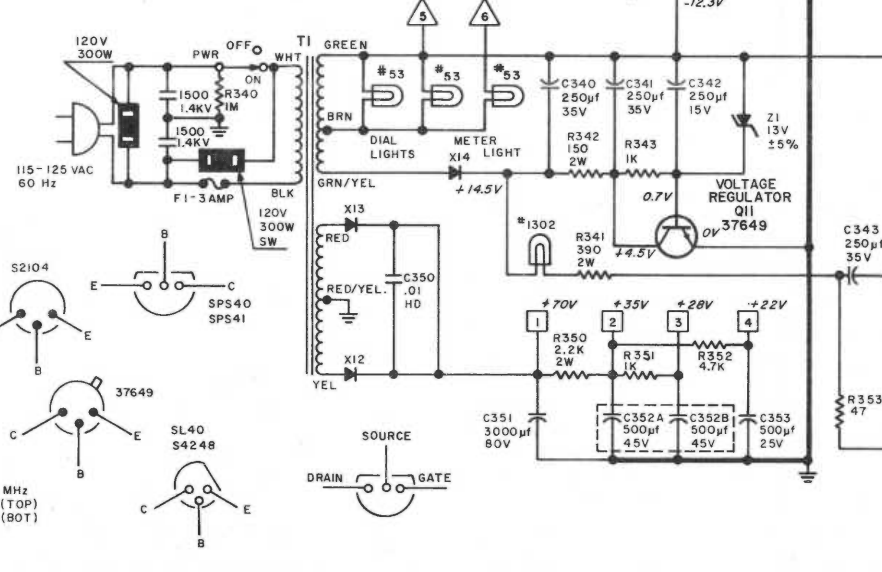
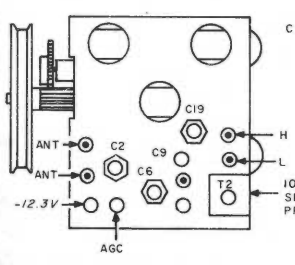
ALL RESISTORS ARE 1/2 WATT OR LESS, 10% TOLERANCE UNLESS OTHERWISE SPECIFIED.
 ALL FRACTIONAL-VALUE CAPACITORS ARE IN μ F. OTHER CAPACITORS EXCEPT ELECTROLYTICS ARE IN pF.

RIGHT CHANNEL: COMPONENT SYMBOLS ARE THE SAME AS THE LEFT CHANNEL ABOVE, EXCEPT FOR AN INCREASE IN NUMBERING BY ONE HUNDRED.

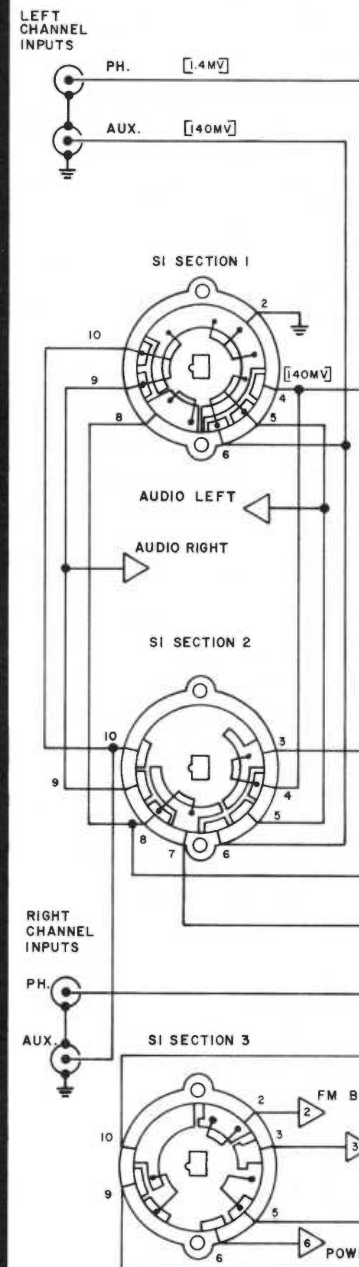
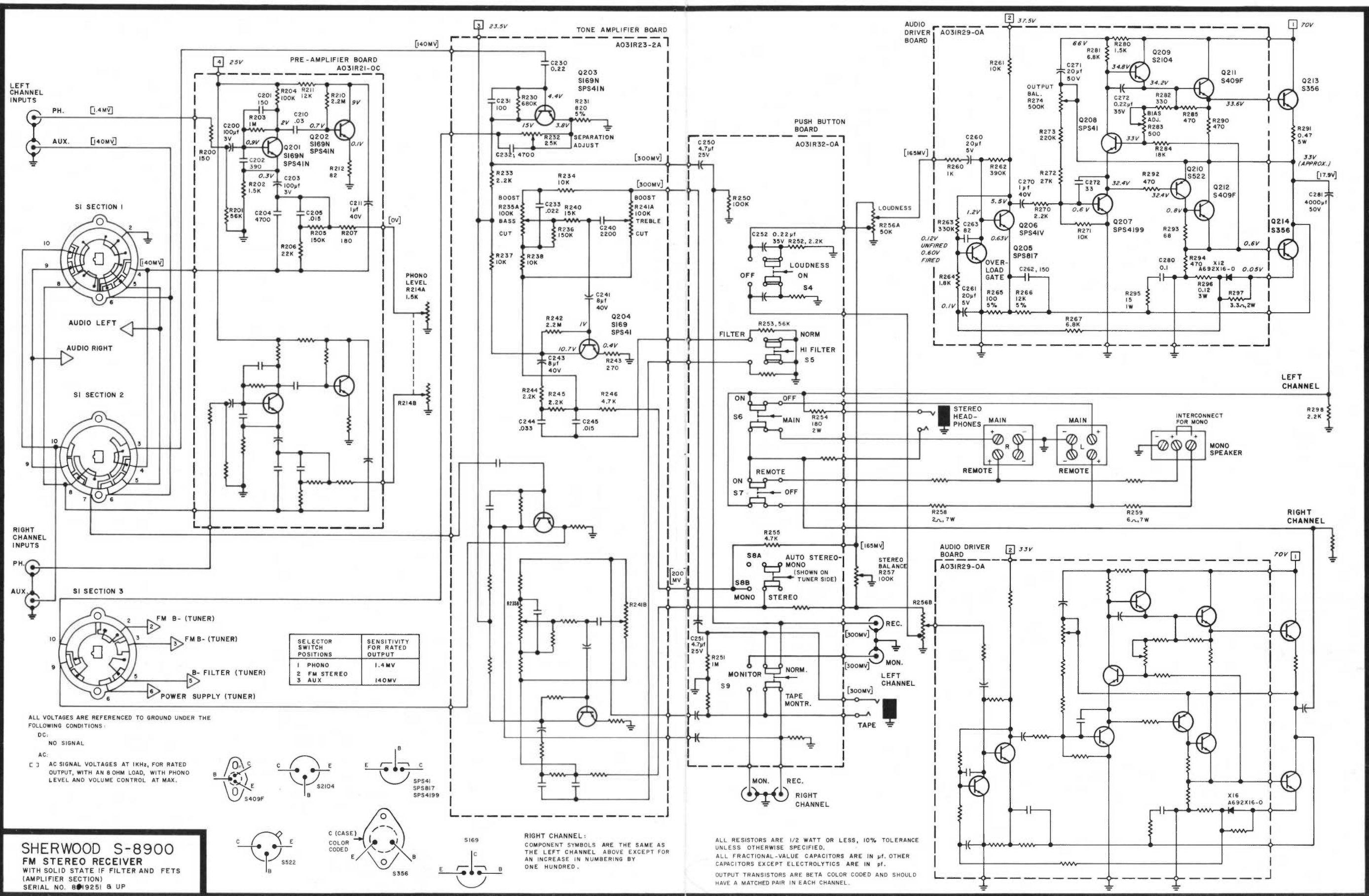
S-8800A



NOTE:
 ALL DC VOLTAGES ARE MEASURED WITHOUT SIGNAL, HUSH OFF. (EXCEPT DC VOLTAGES IN THE MULTIPLEX DECODER, WHICH ARE MEASURED WITH 100 MICROVOLTS INTO THE FM ANTENNA OR 50 MILLIVOLTS, 19KHZ INTO POINT A.)
 ALL DC VOLTAGES IN PARENTHESIS ARE MEASURED WITHOUT INPUT SIGNAL BUT WITH HUSH ON.
 † USE .0018 MICROFARADS FOR EUROPEAN 50 MICROSECOND DE-EMPHASIS.

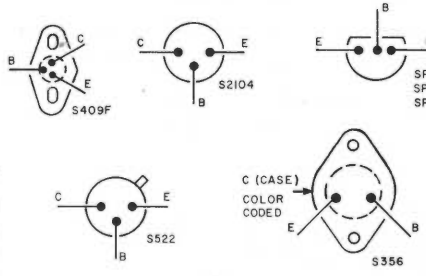


SHERWOOD S-8800a
 160 WATT FM STEREO RECEIVER
 WITH MICROCIRCUITS AND FETS
 (TUNER SECTION)
 SERIAL NO. R916001 & UP



SELECTOR SWITCH POSITIONS	SENSITIVITY FOR RATED OUTPUT
1 PHONO	1.4 MV
2 FM STEREO	140 MV
3 AUX	140 MV

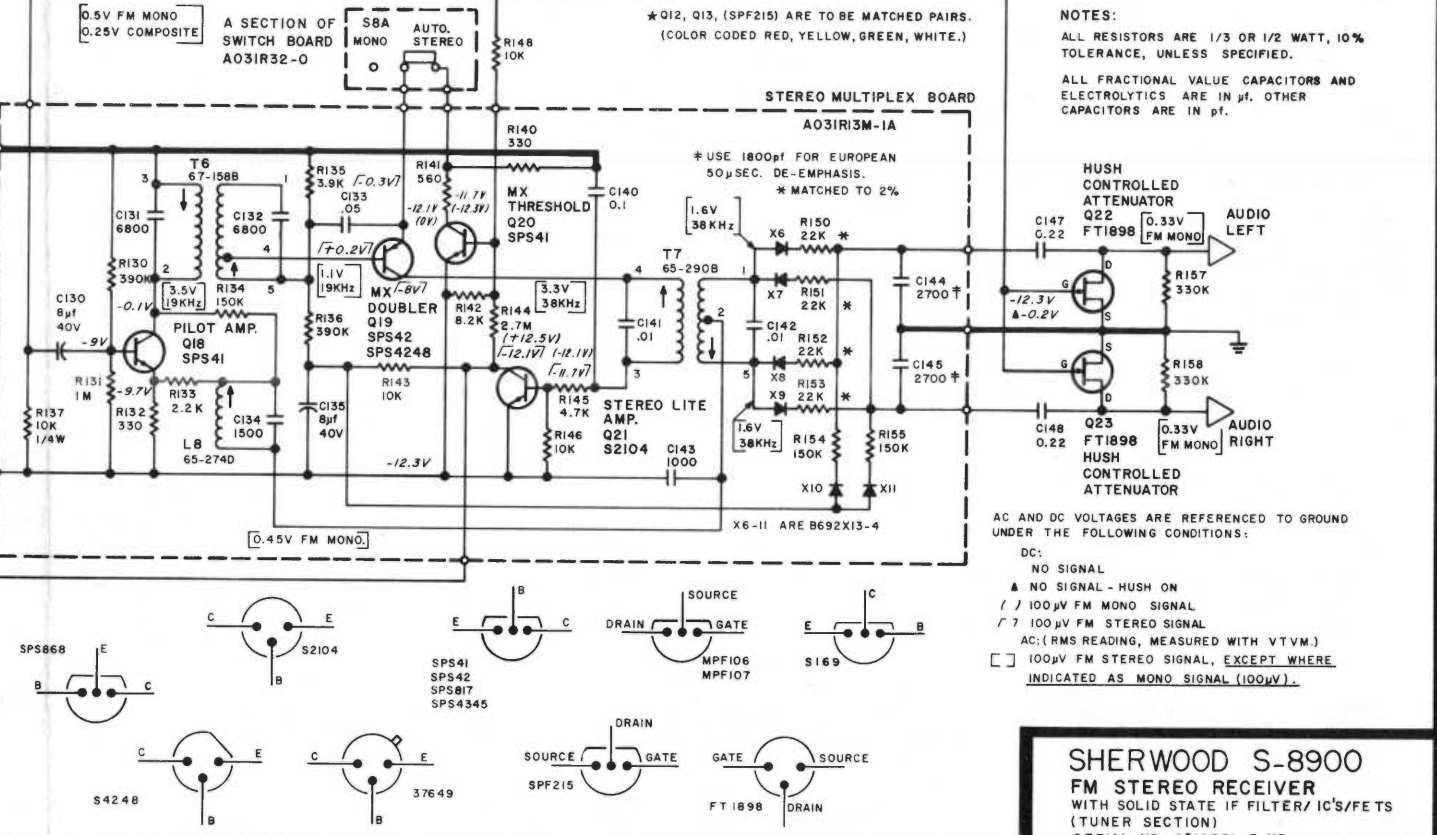
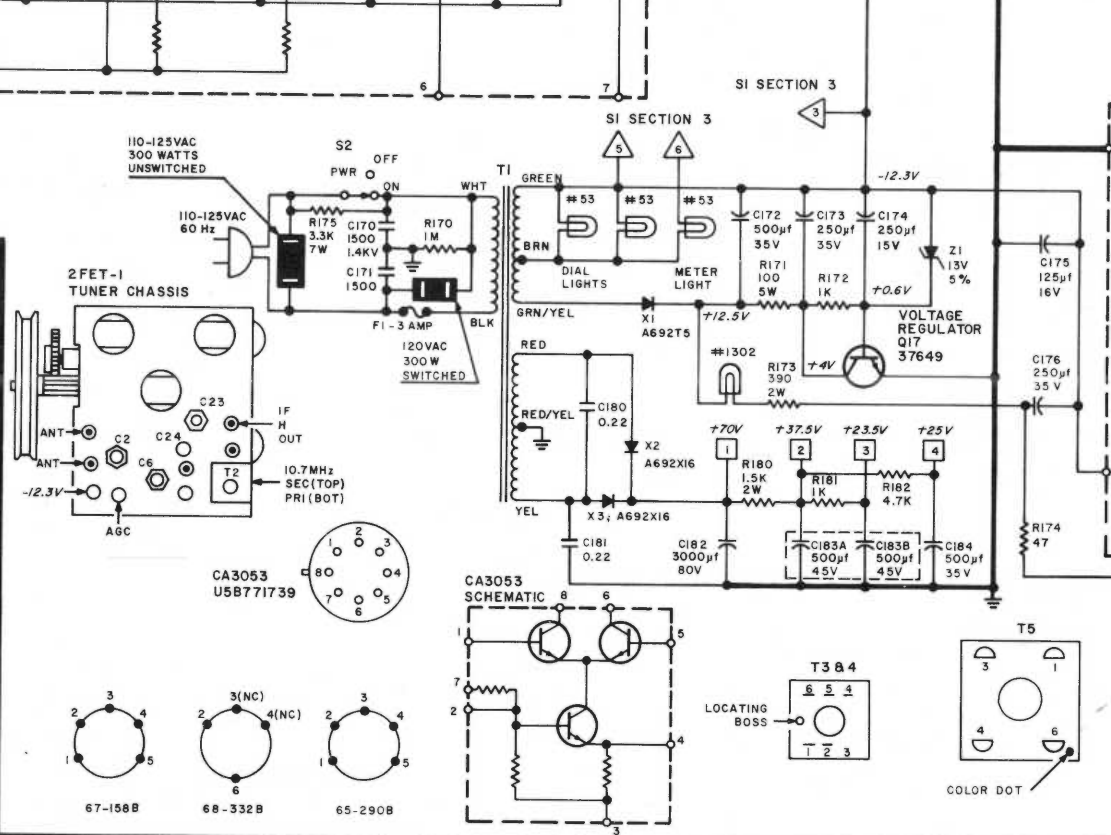
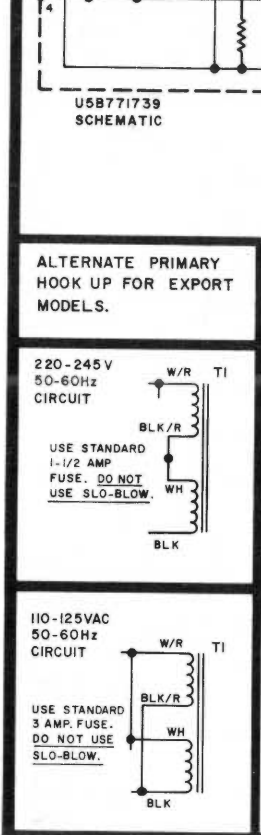
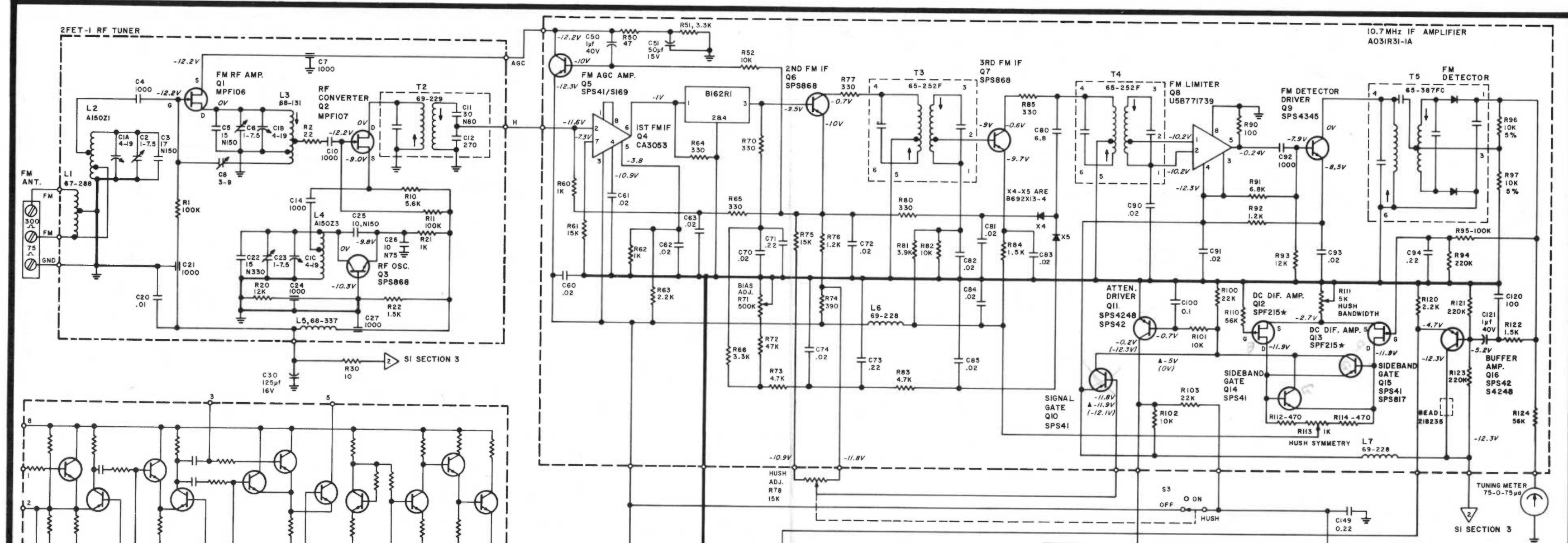
ALL VOLTAGES ARE REFERENCED TO GROUND UNDER THE FOLLOWING CONDITIONS:
 DC: NO SIGNAL
 AC: AC SIGNAL VOLTAGES AT 1KHz, FOR RATED OUTPUT, WITH AN 8 OHM LOAD, WITH PHONO LEVEL AND VOLUME CONTROL AT MAX.



RIGHT CHANNEL: COMPONENT SYMBOLS ARE THE SAME AS THE LEFT CHANNEL ABOVE EXCEPT FOR AN INCREASE IN NUMBERING BY ONE HUNDRED.

ALL RESISTORS ARE 1/2 WATT OR LESS, 10% TOLERANCE UNLESS OTHERWISE SPECIFIED.
 ALL FRACTIONAL-VALUE CAPACITORS ARE IN μ F, OTHER CAPACITORS EXCEPT ELECTROLYTICS ARE IN pF.
 OUTPUT TRANSISTORS ARE BETA COLOR CODED AND SHOULD HAVE A MATCHED PAIR IN EACH CHANNEL.

SHERWOOD S-8900
FM STEREO RECEIVER
 WITH SOLID STATE IF FILTER AND FETS (AMPLIFIER SECTION)
 SERIAL NO. 8019251 & UP



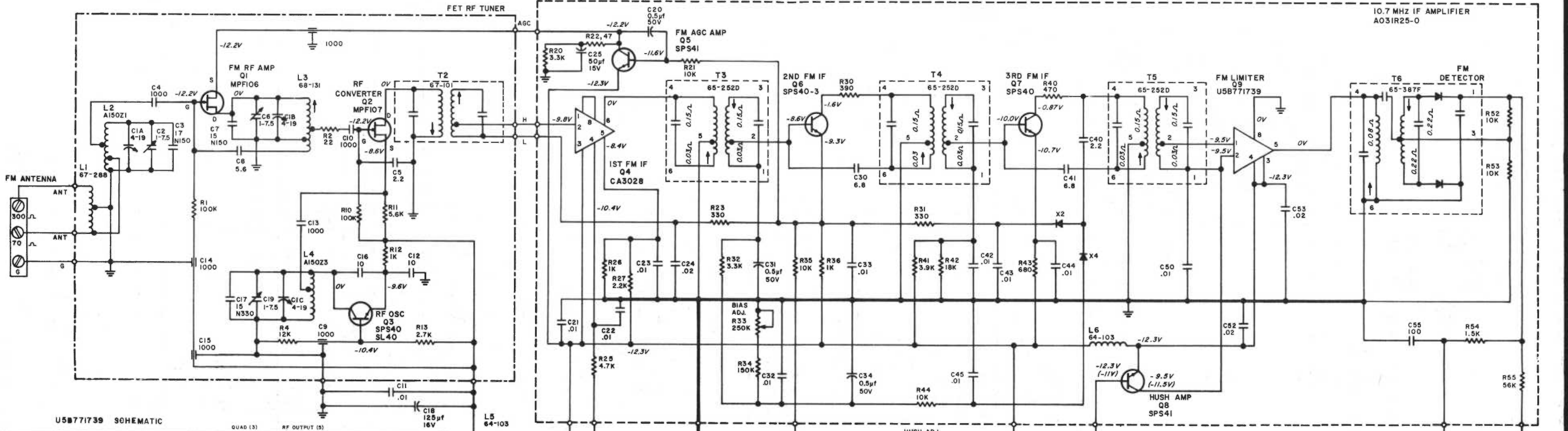
NOTES:

- ALL RESISTORS ARE 1/3 OR 1/2 WATT, 10% TOLERANCE, UNLESS SPECIFIED.
- ALL FRACTIONAL VALUE CAPACITORS AND ELECTROLYTICS ARE IN μF. OTHER CAPACITORS ARE IN pF.
- *Q12, Q13, (SPF215) ARE TO BE MATCHED PAIRS. (COLOR CODED RED, YELLOW, GREEN, WHITE.)
- AC AND DC VOLTAGES ARE REFERENCED TO GROUND UNDER THE FOLLOWING CONDITIONS:

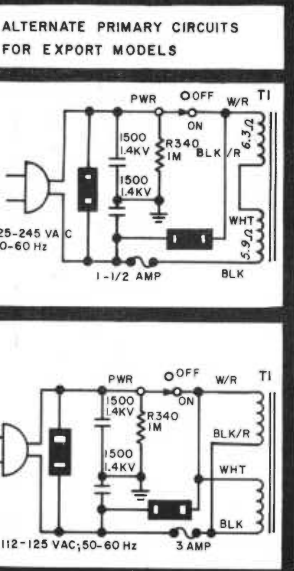
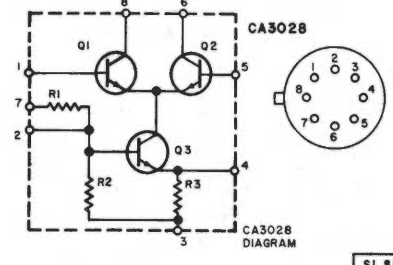
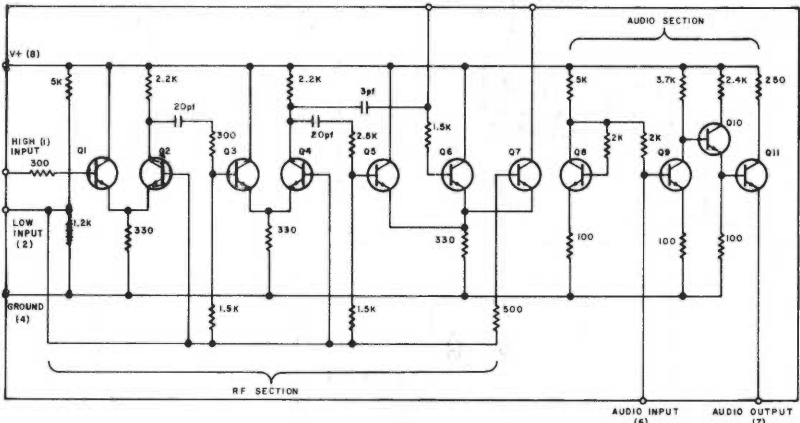
DC:

- NO SIGNAL
- ▲ NO SIGNAL - HUSH ON
- () 100μV FM MONO SIGNAL
- ∩ 100μV FM STEREO SIGNAL
- AC: (RMS READING, MEASURED WITH VTVM)
- [] 100μV FM STEREO SIGNAL, EXCEPT WHERE INDICATED AS MONO SIGNAL (100μV).

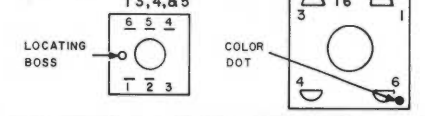
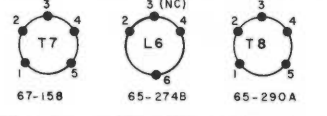
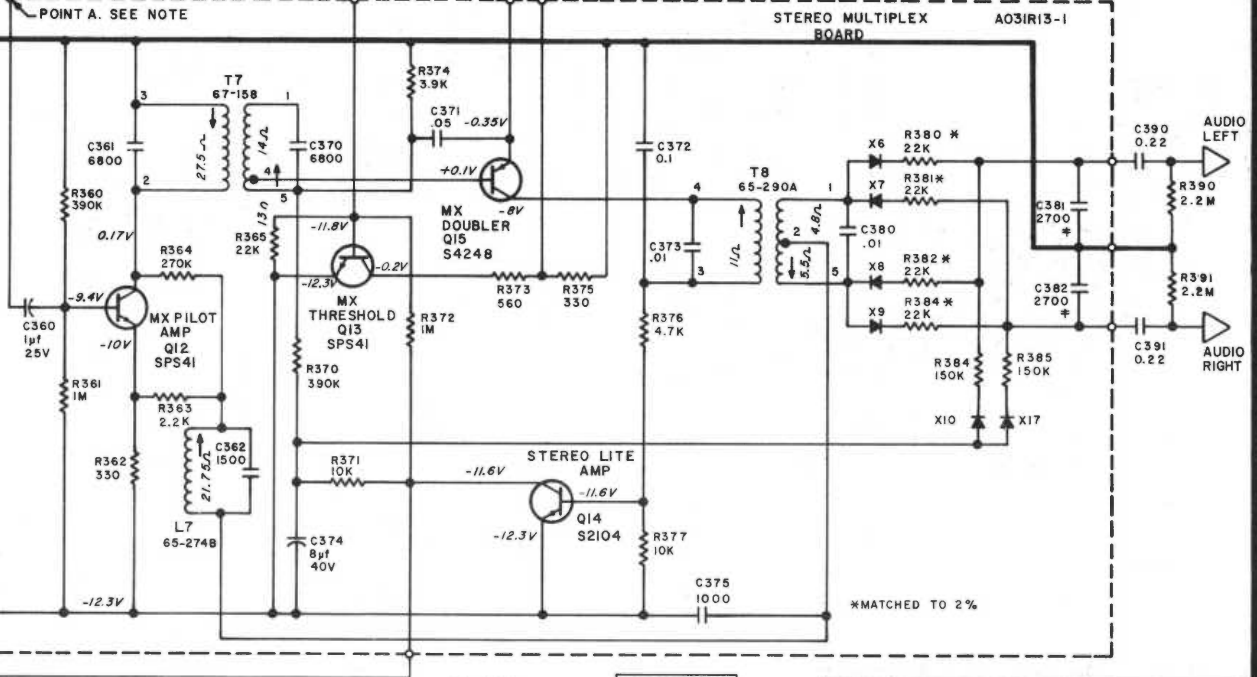
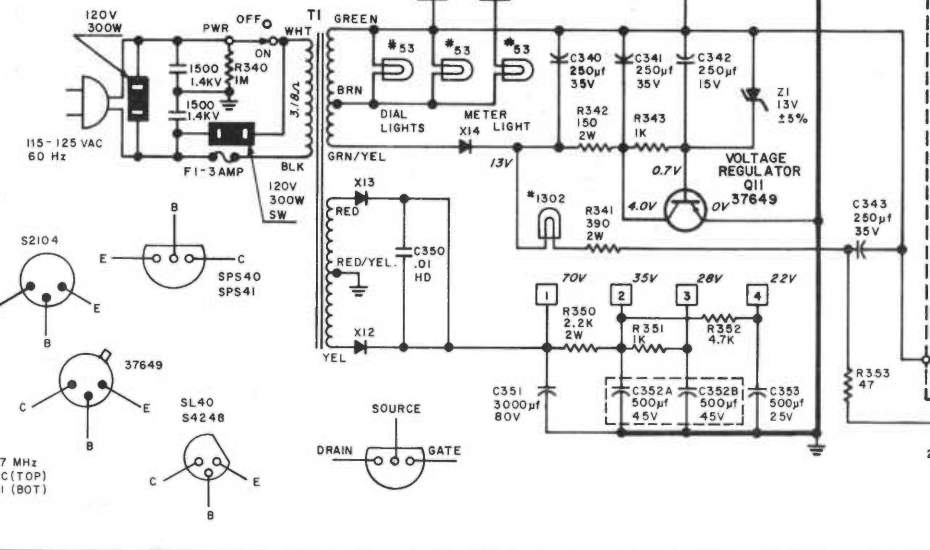
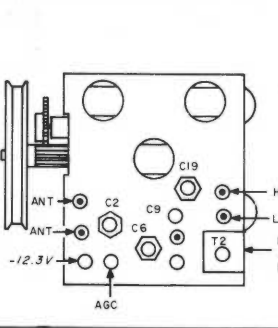
SHERWOOD S-8900
FM STEREO RECEIVER
 WITH SOLID STATE IF FILTER/IC'S/FET'S
 (TUNER SECTION)
 SERIAL NO. 8019251 & UP



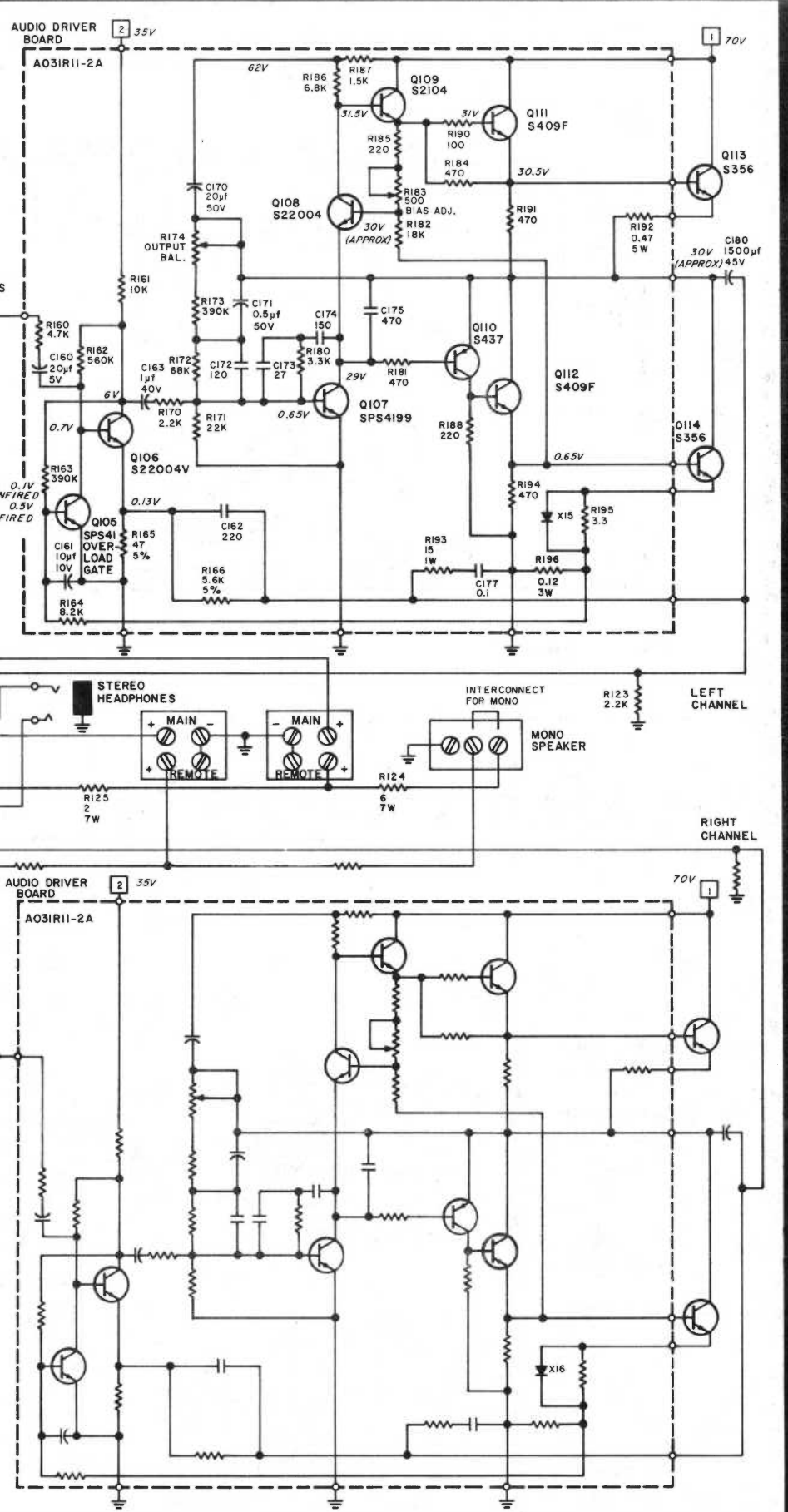
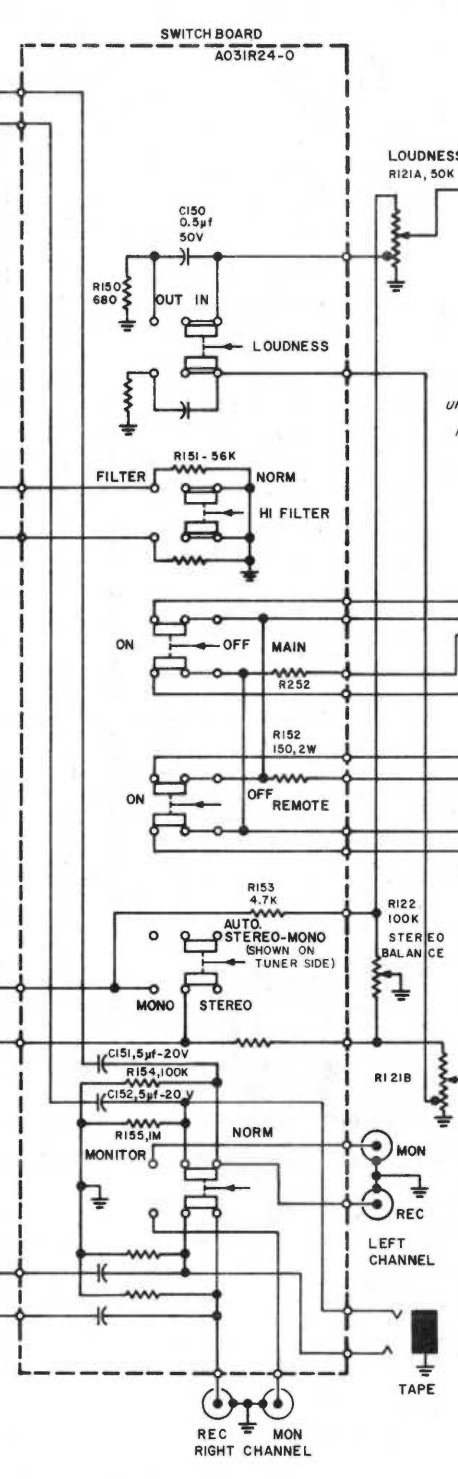
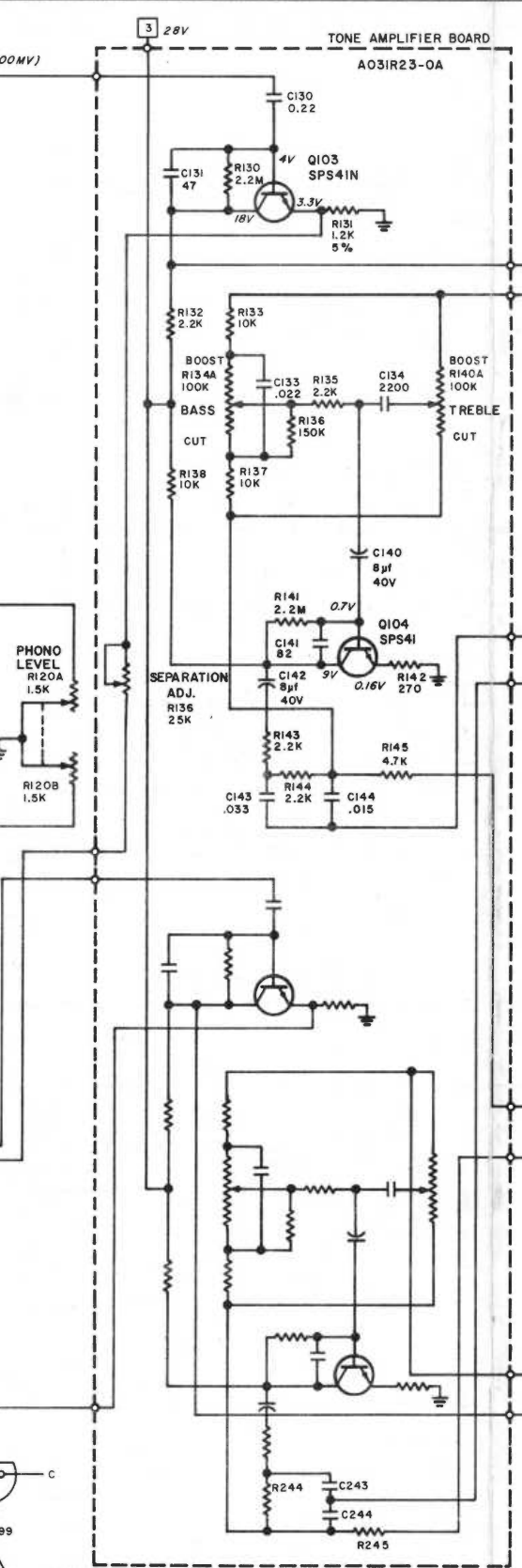
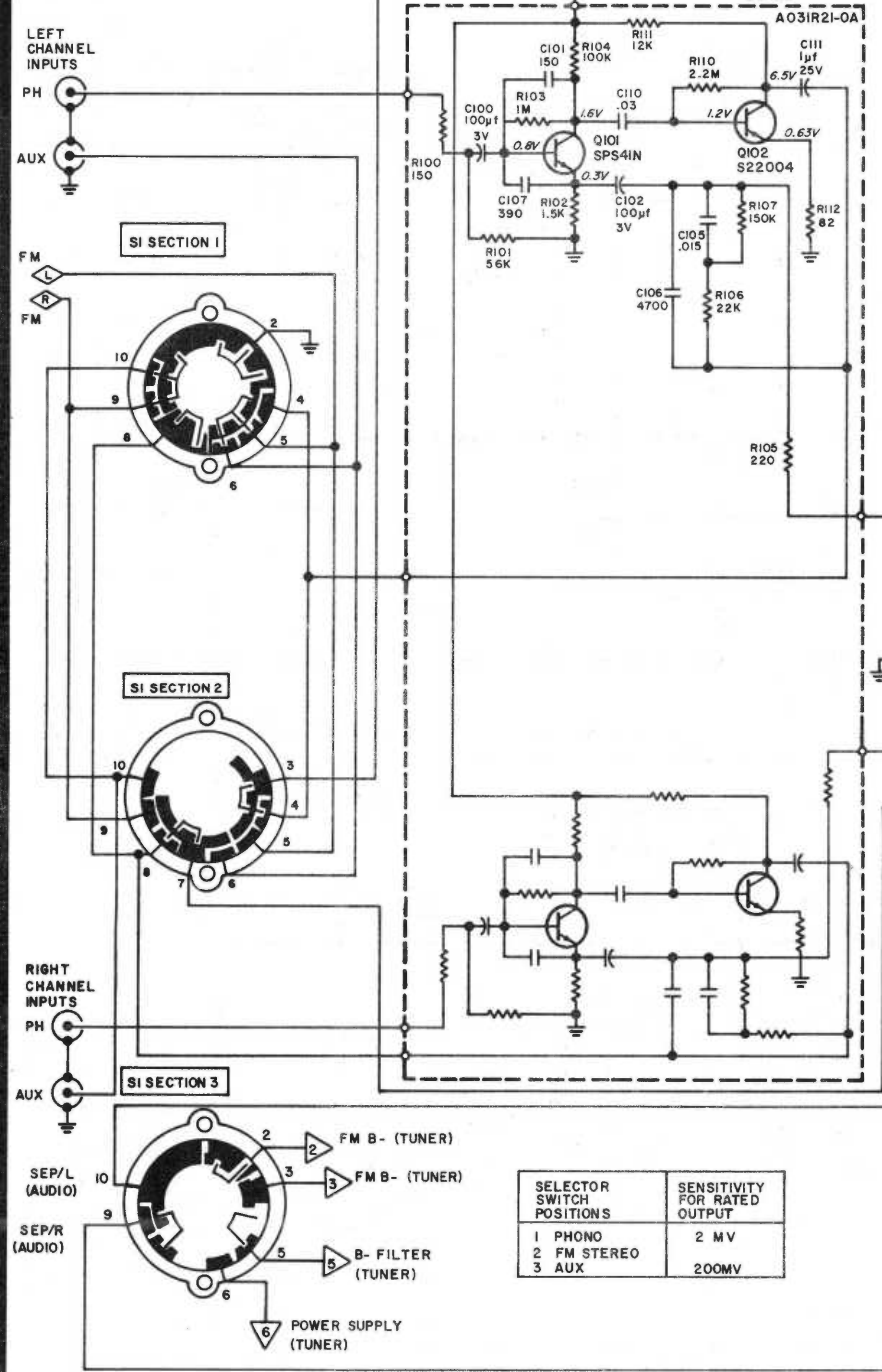
U58771739 SCHEMATIC



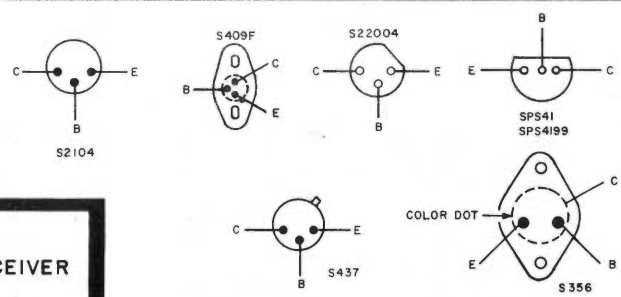
NOTE:
 ALL DC VOLTAGES ARE MEASURED WITHOUT SIGNAL, HUSH OFF (EXCEPT DC VOLTAGES IN THE MULTIPLEX DECODER WHICH ARE MEASURED WITH 100 MICROVOLTS INTO THE FM ANTENNA OR 50 MILLIVOLTS, 19KHZ INTO POINT A.)
 ALL DC VOLTAGES IN PARENTHESIS ARE MEASURED WITHOUT INPUT SIGNAL BUT WITH HUSH ON.
 † USE .0018 MICROFARADS FOR EUROPEAN 50 MICROSECOND DE-EMPHASIS.



SHERWOOD S-8800a
 160 WATT FM STEREO RECEIVER
 WITH MICROCIRCUITS AND FETS
 (TUNER SECTION)
 SERIAL NO. R81001 & UP



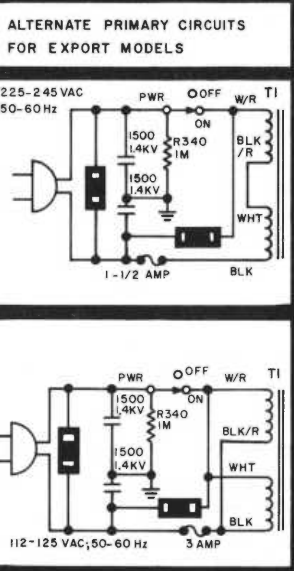
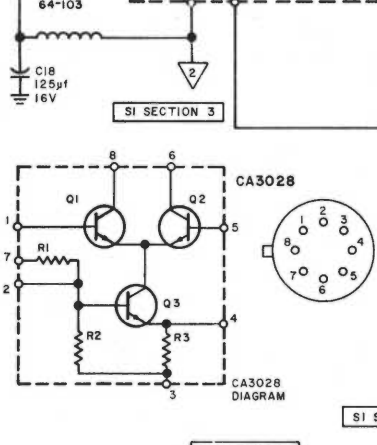
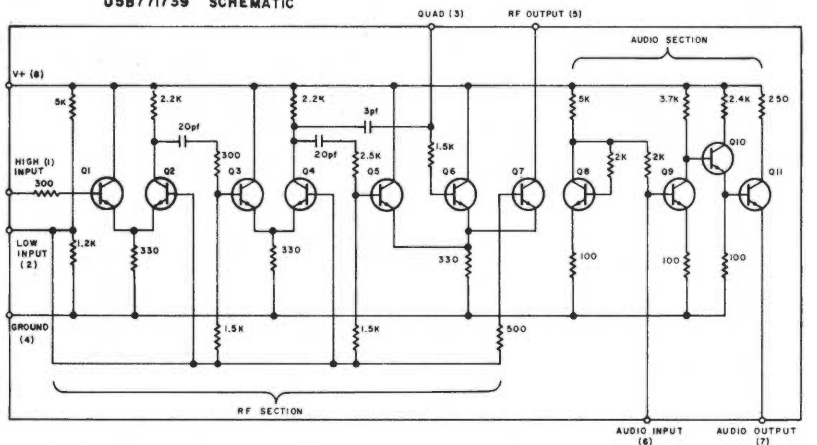
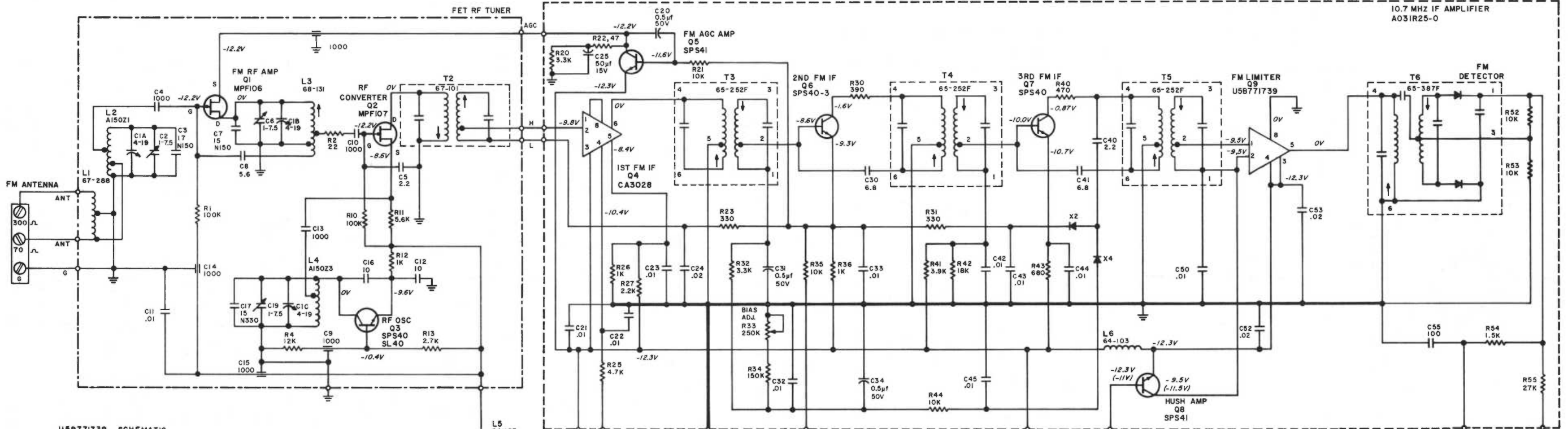
SELECTOR SWITCH POSITIONS	SENSITIVITY FOR RATED OUTPUT
1 PHONO	2 MV
2 FM STEREO	200MV
3 AUX	



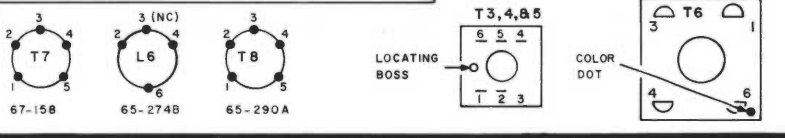
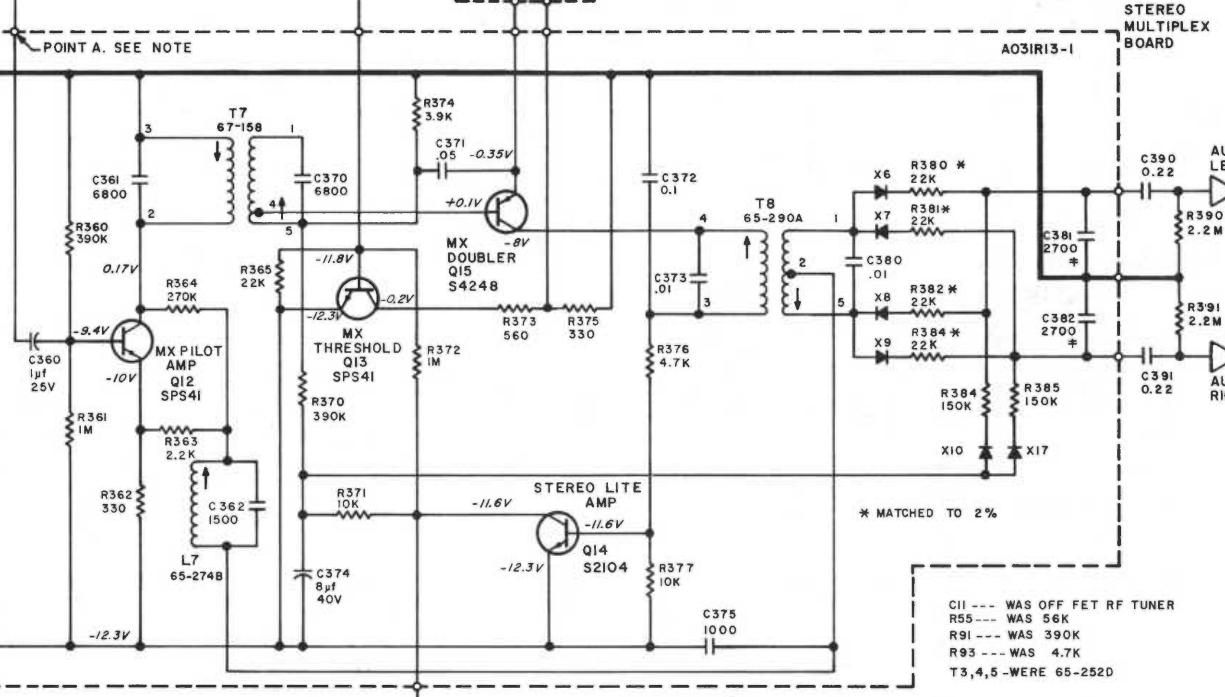
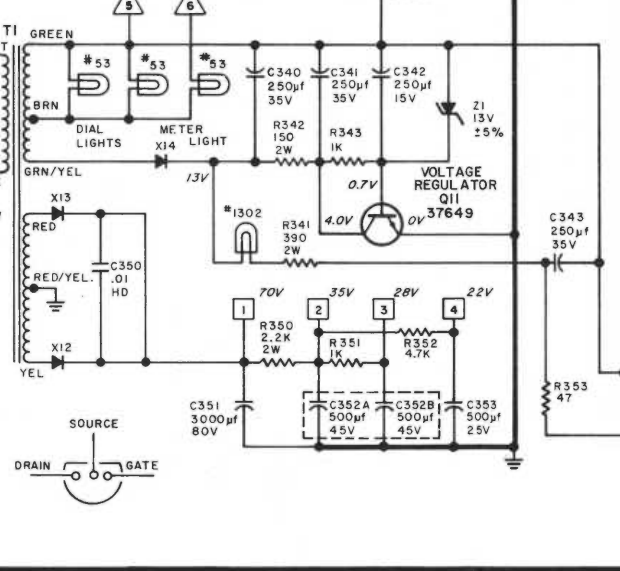
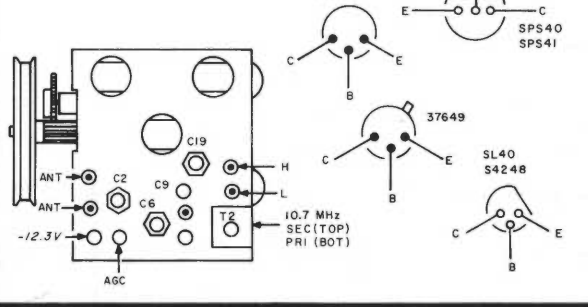
ALL RESISTORS ARE 1/2 WATT OR LESS, 10% TOLERANCE UNLESS OTHERWISE SPECIFIED.
ALL FRACTIONAL-VALUE CAPACITORS ARE IN μ F. OTHER CAPACITORS EXCEPT ELECTROLYTICS ARE IN pF.

RIGHT CHANNEL: COMPONENT SYMBOLS ARE THE SAME AS THE LEFT CHANNEL ABOVE, EXCEPT FOR AN INCREASE IN NUMBERING BY ONE HUNDRED.

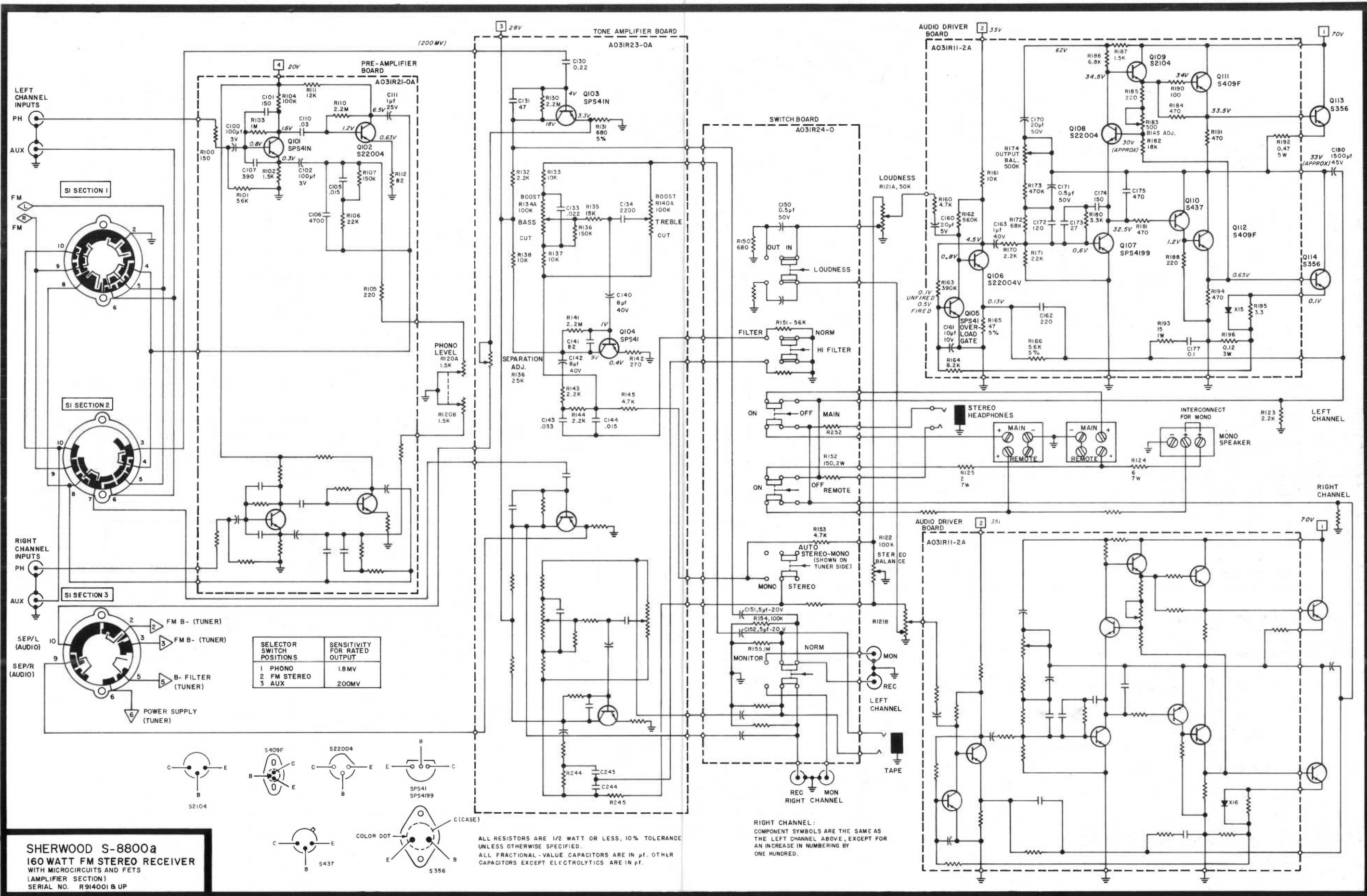
SHERWOOD S-8800a
160 WATT FM STEREO RECEIVER
WITH MICROCIRCUITS AND FETS
(AMPLIFIER SECTION)
SERIAL NO. R81100 & UP



NOTE:
 ALL DC VOLTAGES ARE MEASURED WITHOUT SIGNAL. HUSH OFF. (EXCEPT DC VOLTAGES IN THE MULTIFLEX DECODER, WHICH ARE MEASURED WITH 100 MICROVOLTS INTO THE FM ANTENNA OR 50 MILLIVOLTS, 19KHZ INTO POINT A.)
 ALL DC VOLTAGES IN PARENTHESIS ARE MEASURED WITHOUT INPUT SIGNAL BUT WITH HUSH ON.
 * USE .0018 MICROFARADS FOR EUROPEAN 50 MICROSECOND DE-EMPHASIS.



SHERWOOD S-880a
160 WATT FM STEREO RECEIVER
 WITH MICROCIRCUITS AND FETS
 (TUNER SECTION)
 SERIAL NO. R914001 & UP

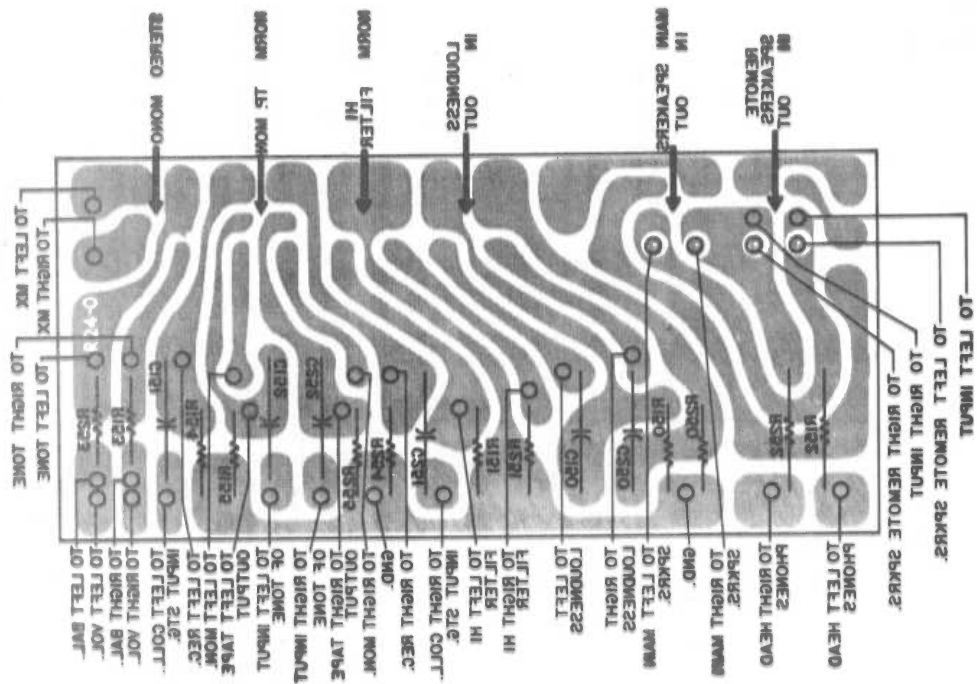
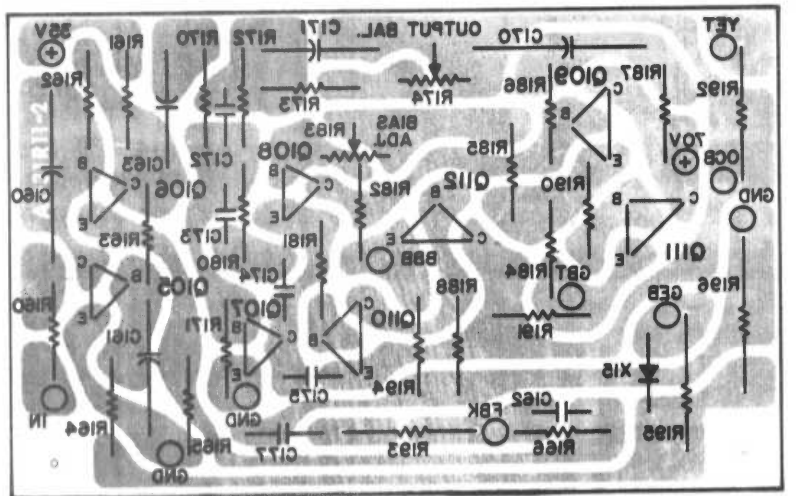
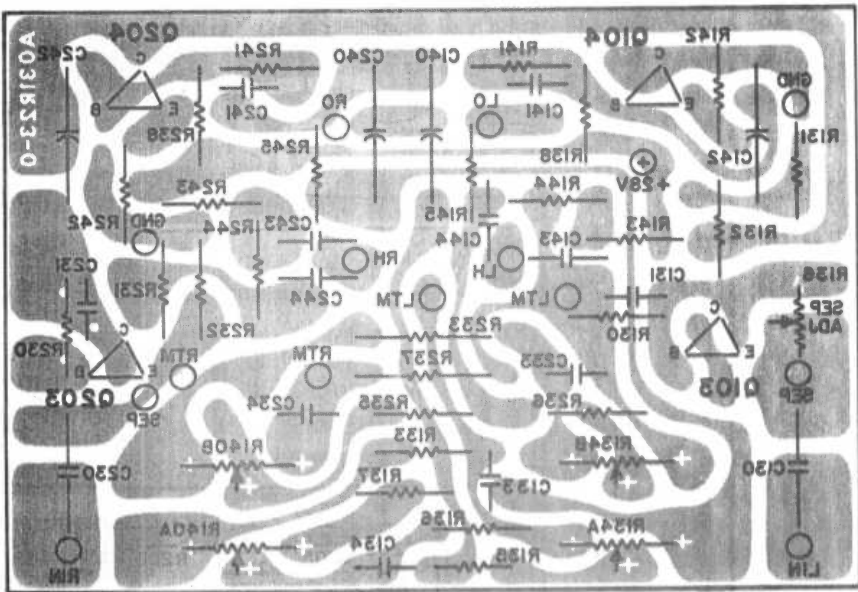
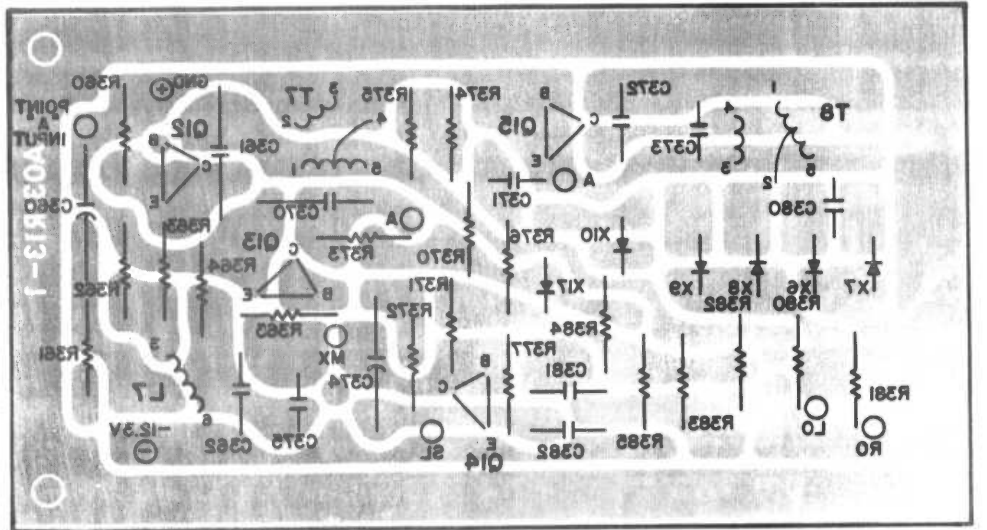
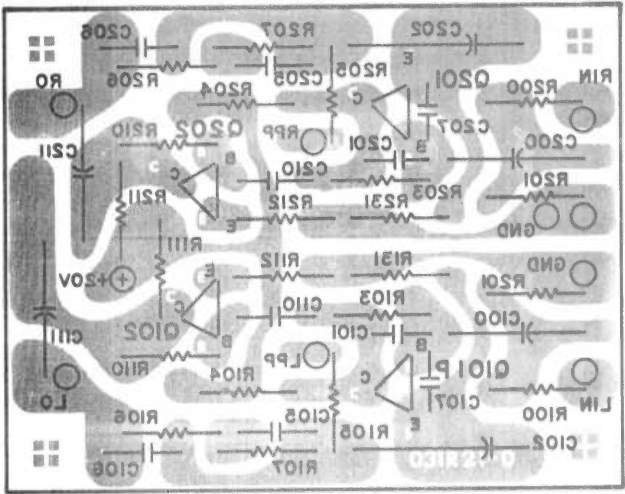
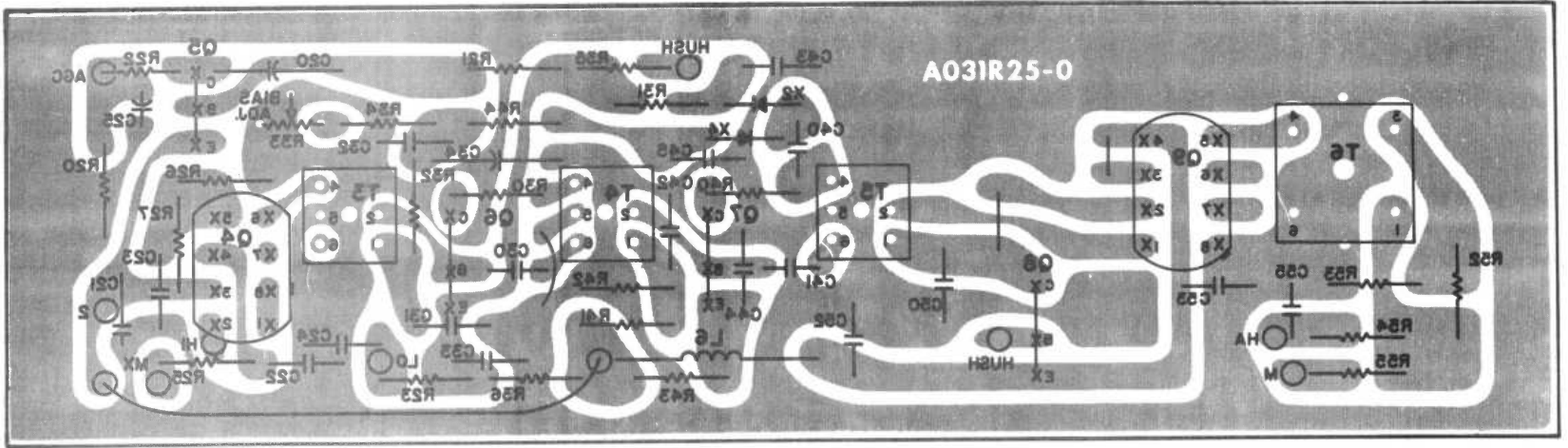


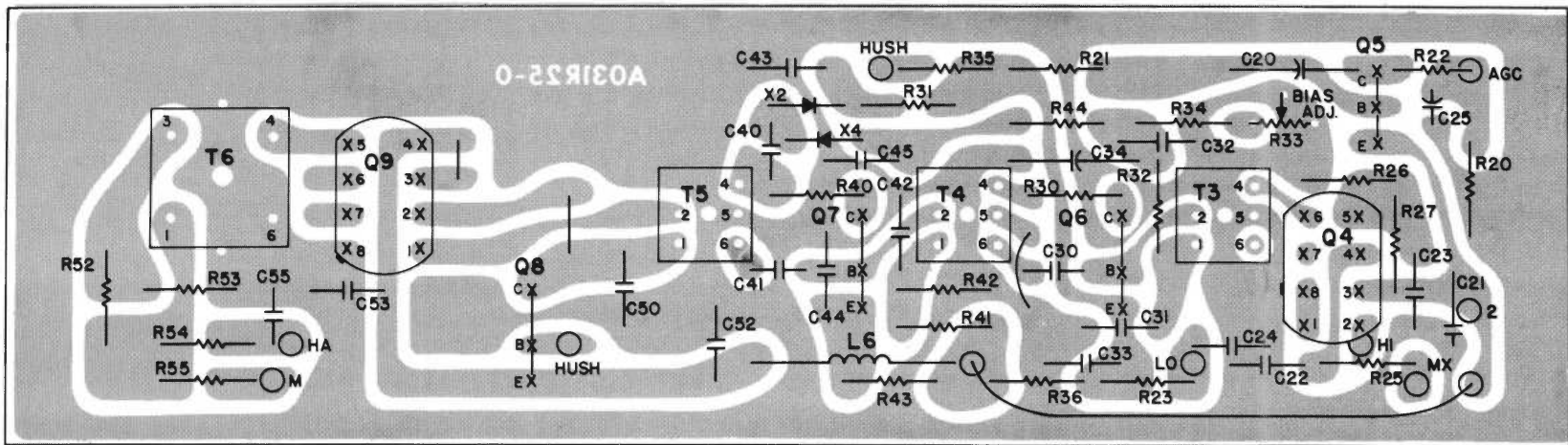
SELECTOR SWITCH POSITIONS	SENSITIVITY FOR RATED OUTPUT
1 PHONO	1.8MV
2 FM STEREO	200MV
3 AUX	

ALL RESISTORS ARE 1/2 WATT OR LESS, 10% TOLERANCE UNLESS OTHERWISE SPECIFIED.
ALL FRACTIONAL-VALUE CAPACITORS ARE IN μ f. OTHER CAPACITORS EXCEPT ELECTROLYTICS ARE IN p.f.

RIGHT CHANNEL:
COMPONENT SYMBOLS ARE THE SAME AS THE LEFT CHANNEL ABOVE, EXCEPT FOR AN INCREASE IN NUMBERING BY ONE HUNDRED.

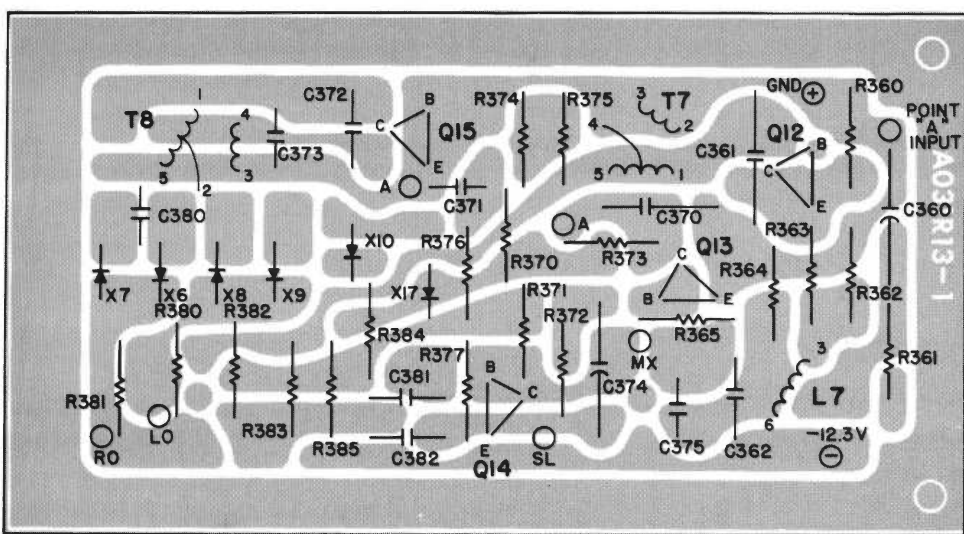
SHERWOOD S-8800a
160 WATT FM STEREO RECEIVER
WITH MICROCIRCUITS AND FETS
(AMPLIFIER SECTION)
SERIAL NO. R914001 & UP





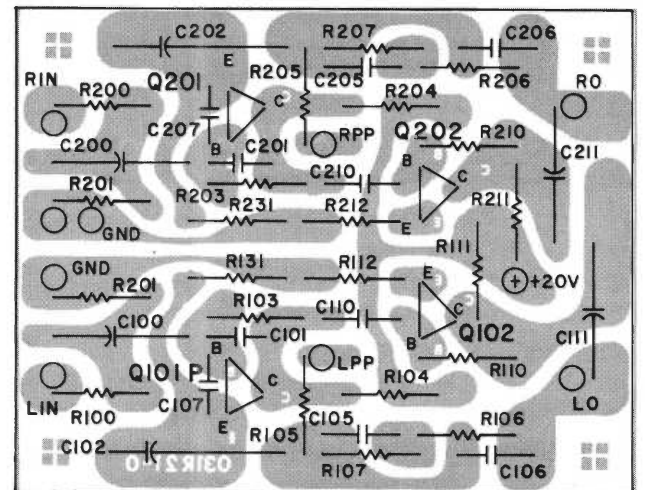
- C B E
- X X X
- TRANSISTOR
- HA - HUSH AMP
- AGC - TO TUNER
- HUSH - TO POT
- HI - HI INPUT
- M - TO TUNING METER
- LO - LO INPUT
- MX - TO MX BOARD
- 2 - FM B - (TUNER)

A031R25-0 I.F. AMP. BOARD



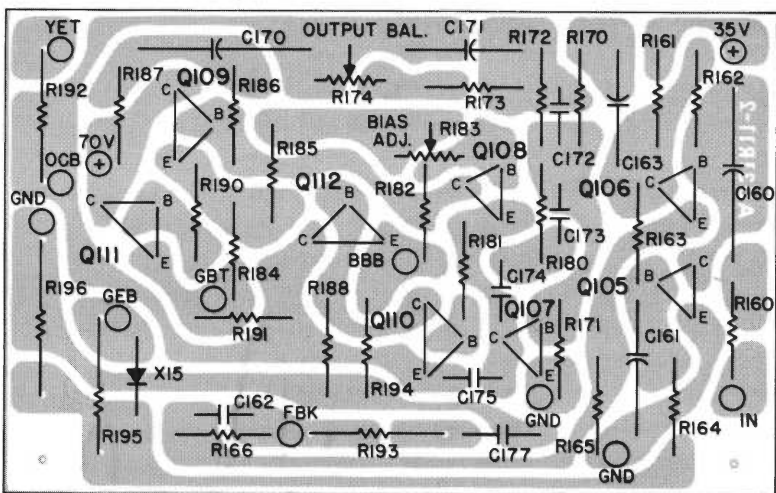
- C B E
- E B
- TRANSISTORS
- RO - RIGHT OUTPUT
- LO - LEFT OUTPUT
- SL - TO STEREO LIGHT
- A - TO AUTOMATIC STEREO-MONO SW.
- MX - MX GATE FROM I.F. BOARD

A031R13-1 MULTIPLEX BOARD



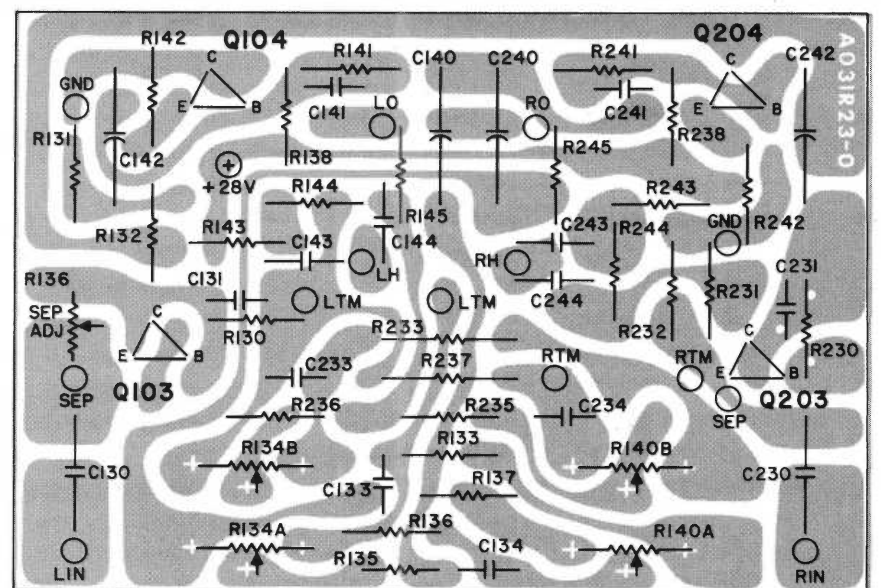
- C B E
- TRANSISTOR
- RIN - RIGHT INPUT
- LIN - LEFT INPUT
- RPP - RIGHT PHONO LEVEL
- LPP - LEFT PHONO LEVEL
- RO - RIGHT OUTPUT
- LO - LEFT OUTPUT

A031R21-0A PRE-AMP BOARD



- OUTPUT TRANSISTOR CONNECTIONS
- C B E
 - TRANSISTOR SOCKET
 - E B
 - TRANSISTOR
 - YET - EMITTER, TOP, (YELLOW)
 - GBT - BASE, TOP, (GREEN)
 - +70V - COLLECTOR, TOP, (RED)
 - OCB - COLLECTOR, BOTTOM, (ORANGE)
 - IN - INPUT
 - FBK - FEED-BACK
 - GEB - EMITTER, BOTTOM, (GREY)
 - BBB - BASE, BOTTOM, (BROWN)

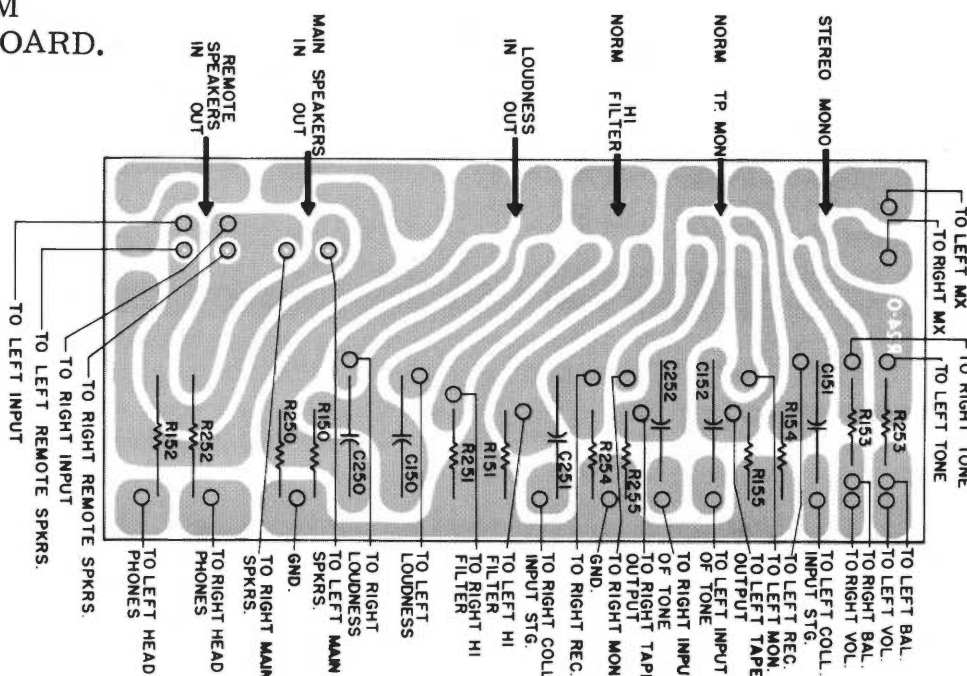
A031R11-2 DRIVER BOARD



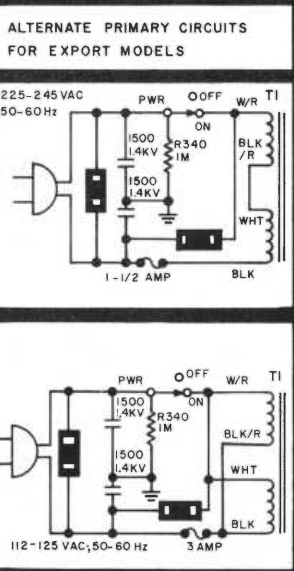
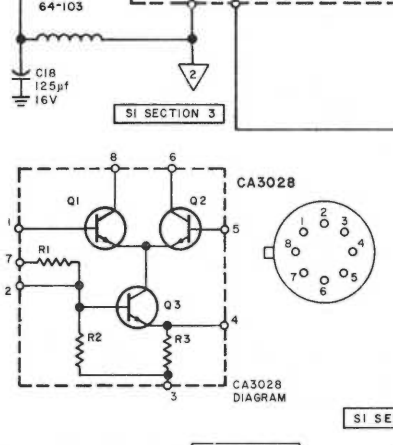
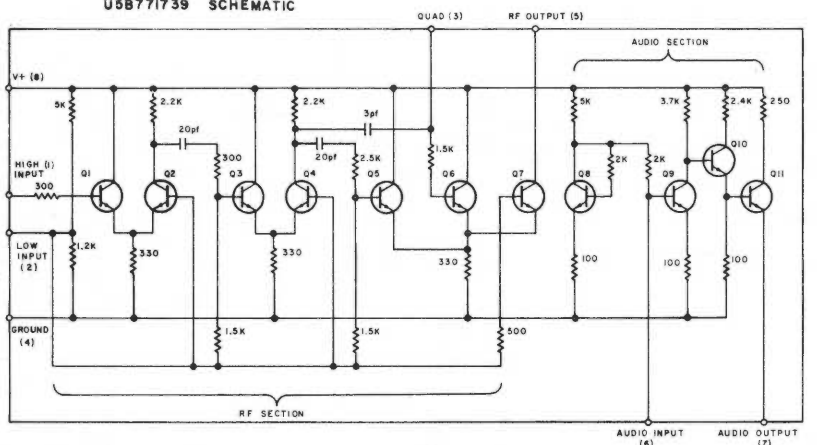
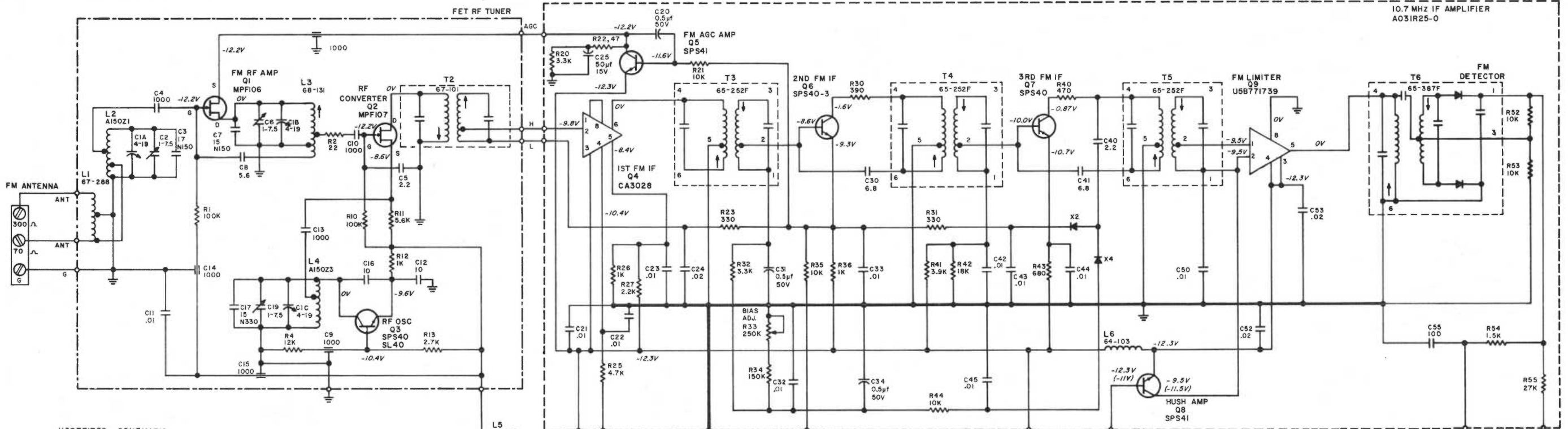
- C B E
- TRANSISTOR
- LIN - LEFT INPUT
- LH - TO LEFT HI FILTER SWITCH
- LTM - TO LEFT TAPE MONITOR SW.
- LO - LEFT OUTPUT
- SEP ADJ - SEPARATION ADJUSTMENT
- SEP - TO SELECTOR SWITCH
- RIN - RIGHT INPUT
- RH - TO RIGHT HI FILTER SWITCH
- RTM - TO RIGHT TAPE MONITOR SW.
- RO - RIGHT OUTPUT

A031R23-0 TONE BOARD

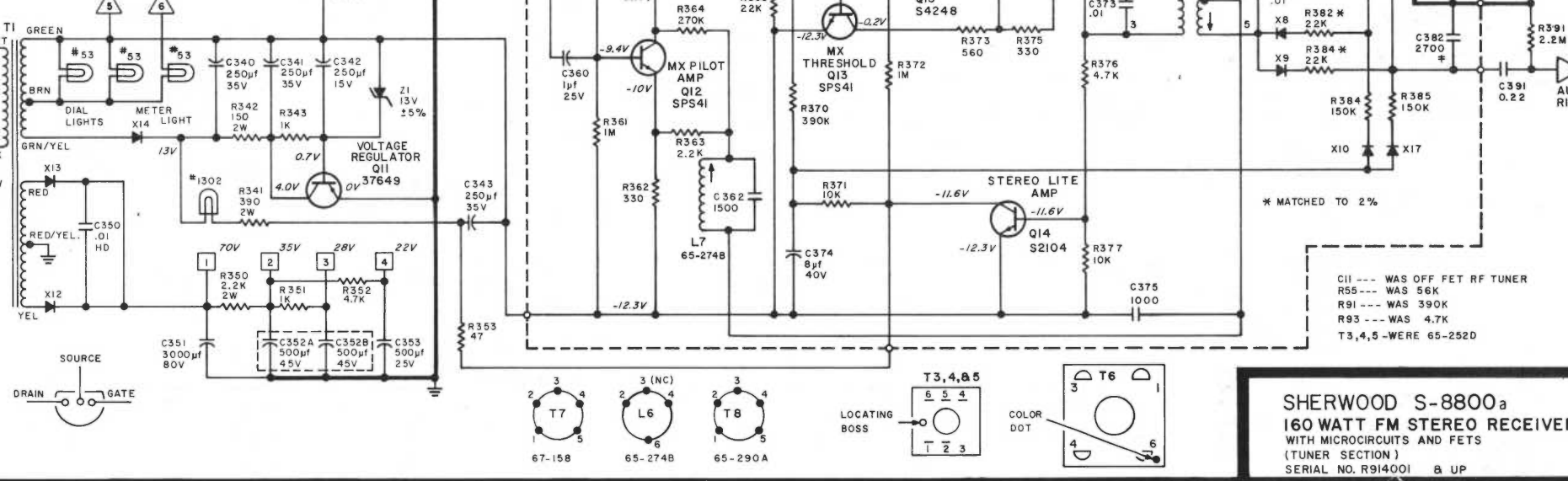
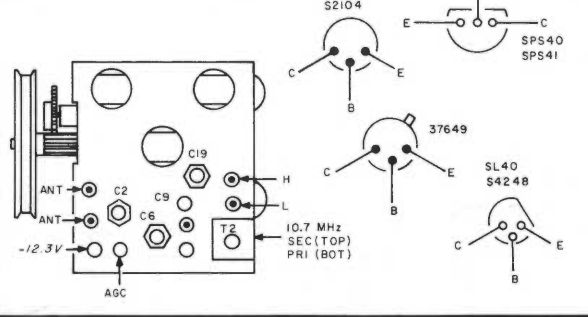
NOTE: AS VIEWED FROM COMPONENT SIDE OF BOARD.



A031R24-0 SWITCH BOARD

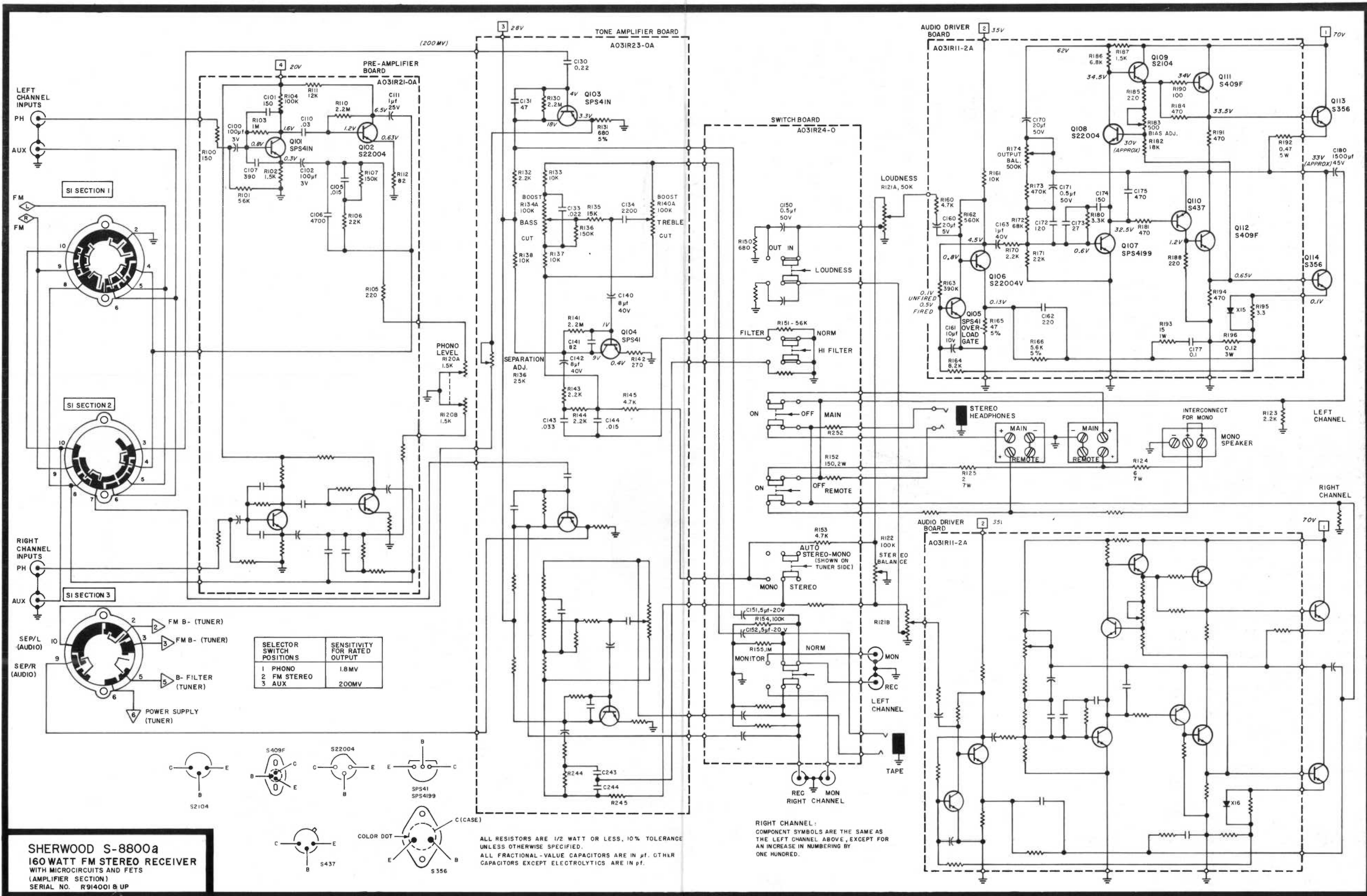


NOTE:
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 ALL DC VOLTAGES IN PARENTHESIS ARE MEASURED WITHOUT INPUT SIGNAL BUT WITH HUSH ON.
 * USE .0018 MICROFARADS FOR EUROPEAN 50 MICROSECOND DE-EMPHASIS.



C11 --- WAS OFF FET RF TUNER
 R55 --- WAS 56K
 R91 --- WAS 390K
 R93 --- WAS 4.7K
 T3,4,5 --- WERE 65-252D

SHERWOOD S-8800a
160 WATT FM STEREO RECEIVER
 WITH MICROCIRCUITS AND FETS
 (TUNER SECTION)
 SERIAL NO. R914001 & UP



SHERWOOD S-8800a
160 WATT FM STEREO RECEIVER
 WITH MICROCIRCUITS AND FETS
 (AMPLIFIER SECTION)
 SERIAL NO. R914001 & UP

SELECTOR SWITCH POSITIONS	SENSITIVITY FOR RATED OUTPUT
1 PHONO	1.8MV
2 FM STEREO	200MV
3 AUX	

ALL RESISTORS ARE 1/2 WATT OR LESS, 10% TOLERANCE UNLESS OTHERWISE SPECIFIED.
 ALL FRACTIONAL-VALUE CAPACITORS ARE IN μ f. OTHER CAPACITORS EXCEPT ELECTROLYTICS ARE IN pf.

RIGHT CHANNEL:
 COMPONENT SYMBOLS ARE THE SAME AS THE LEFT CHANNEL ABOVE, EXCEPT FOR AN INCREASE IN NUMBERING BY ONE HUNDRED.

