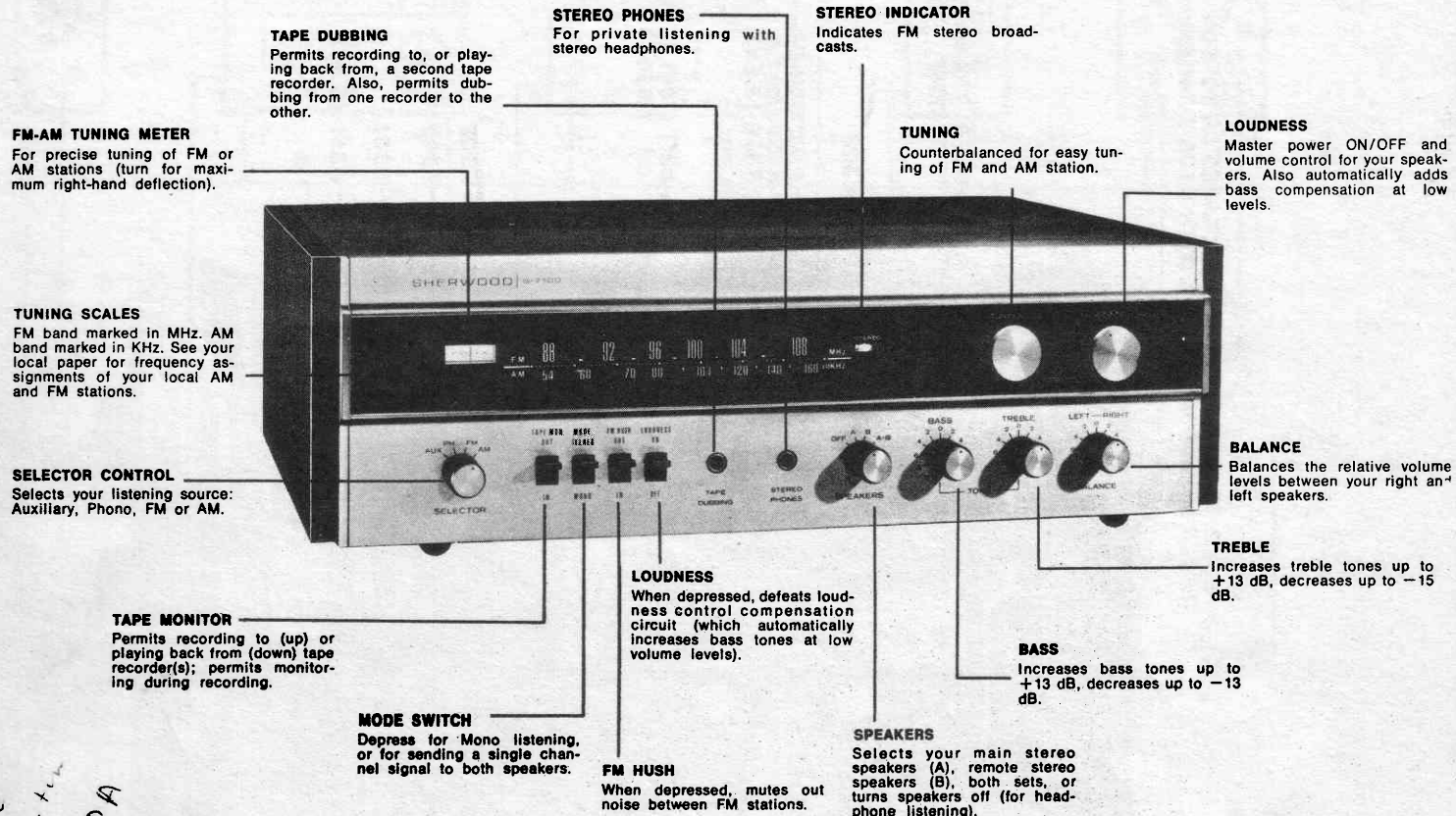


S 7100



SEE  
Bull. Rev  
7100A

### MODEL S-7100 STEREO RECEIVER SPECIFICATIONS

#### amplifier

##### POWER OUTPUT:

4 OHMS: music power 80 watts total—  
equivalent music power  $\pm 1$  dB  
100 watts  
rms power 30 watts X 2

8 OHMS: music power 70 watts total—  
equivalent music power  $\pm 1$  dB  
85 watts  
rms power 25 watts X 2

HARMONIC DISTORTION: 1.0% @ 8 ohm  
rated output, 0.20% @ 10 watts.

INTERMODULATION DISTORTION: 1.0% @  
8 ohm rated output, 0.35% @ 10 watts.

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

STEREO HEADPHONE OUTPUT: high or low impedance.

STEREO RECORDING OUTPUT: 200mv, 2K ohm.

POWER BANDWIDTH: 25 Hz – 20 kHz – 1% Distortion.

FREQUENCY RESPONSE: Aux. 30 Hz – 20 kHz  $\pm 2$  dB.  
Phono: RIAA Std.  $\pm 1.5$  dB.

DAMPING FACTOR: 30:1 @ 8 ohms.

BASS CONTROL:  $\pm 13$  dB @ 100 Hz.

TREBLE CONTROL: + 13, – 15 dB @ 10 kHz.

INPUT SENSITIVITY (for rated output):

Phono 1.5 mv.  
Auxiliary 200 mv.

INPUT CAPABILITY for 1% distortion:

Phono 60 mv.  
Auxiliary 3.8 V

HUM AND NOISE (IHF): Phono – 65 dB.

Aux. – 75 dB.  
Vol. Control Min. – 85 dB.

CROSSTALK: – 40 dB @ 1 kHz.

#### tuner (fm):

FM SENSITIVITY (IHF): 1.9  $\mu$ v.  
(– 30 dB noise & distortion)

SIGNAL-TO-NOISE RATIO: – 65 dB.

CAPTURE RATIO: 2.8 dB.

SUPPRESSION OF AM: – 50 dB.

TUNING RANGE: 87.5 to 108.5 MHz.

DISTORTION: 0.5% @ 100% modulation.

SPURIOUS RESPONSE REJECTION: – 87 dB.

STABILITY:  $\pm 15$  kHz ( $\pm .015\%$ ).

IMAGE REJECTION: – 78 dB.

IF REJECTION: – 90 dB.

ALTERNATE-CHANNEL SELECTIVITY: 40 dB.

STEREO SEPARATION: 40 dB @ 1 kHz.

FREQUENCY RESPONSE: 20 Hz – 15 kHz  $\pm 1$  dB.  
(stereo)

ANTENNA: 300-ohm balanced.

#### tuner (am):

SENSITIVITY: 5  $\mu$ v @ 60% modulation for 6 dB S/N.

SELECTIVITY: 7.5 kHz @ – 6 dB.

FREQUENCY RESPONSE: – 6 dB @ 4.0 kHz.

TUNING RANGE: 530 to 1625 kHz.

IMAGE REJECTION: – 50 dB @ 1 MHz.

IF REJECTION: – 45 dB @ 1 MHz.

ANTENNA: Ferrite Rod (rotatable),  
high impedance input.

#### general:

POWER REQUIREMENTS: 115-125 V,  
50/60 Hz. 10 to 100 W, fused.

AC OUTLETS: 200 W, switched.

DIMENSIONS: 17½" L x 13½" D x 5¾" H.

SHIPPING WEIGHT: 30 lbs.

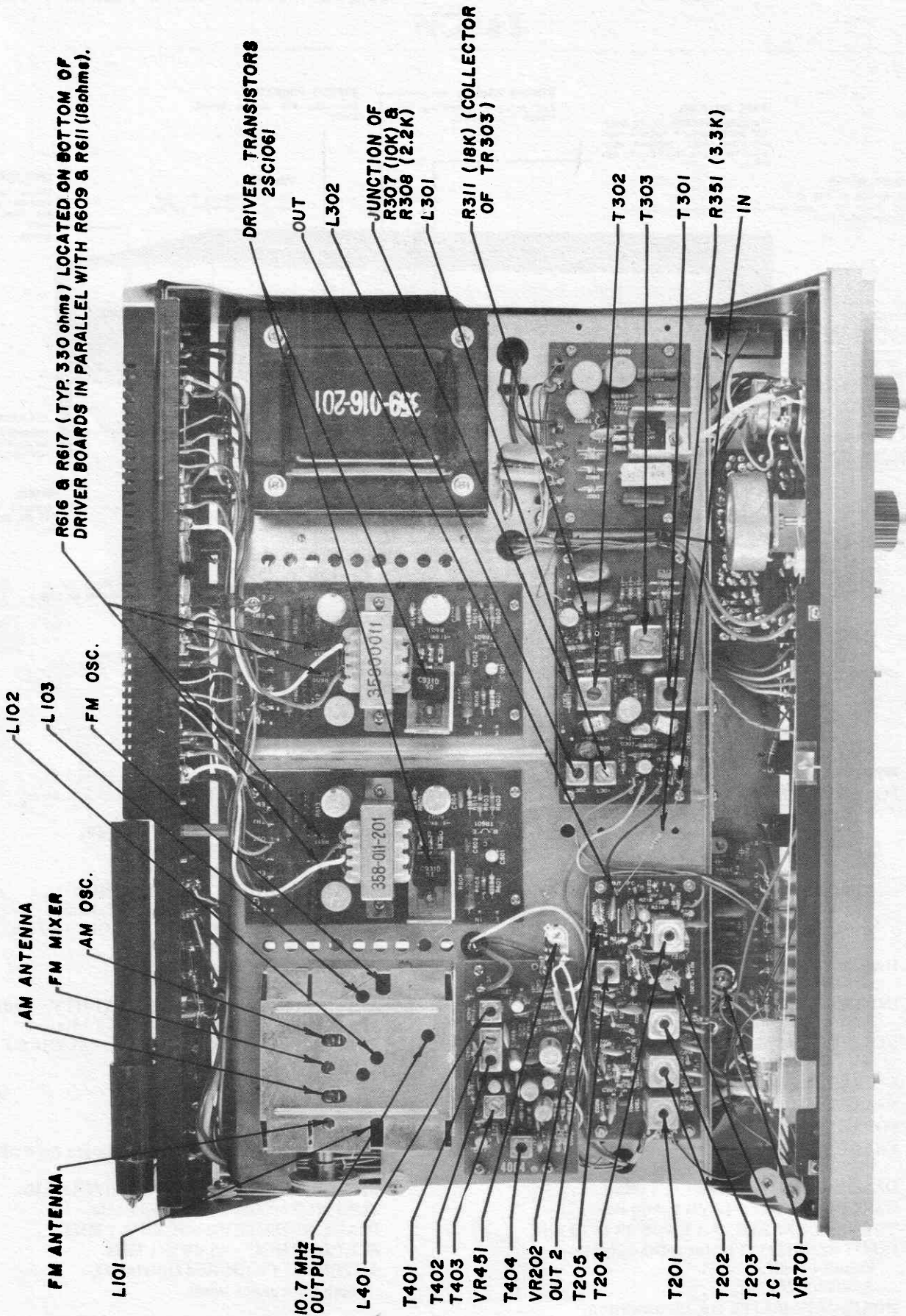


Figure 1

## S-7100 TEST AND ALIGNMENT SECTION

### I. FM ALIGNMENT

1. Set the SELECTOR switch to "FM" and the HUSH switch to "out". Connect an FM Sweep Generator to the 300 ohm FM antenna terminals using a matching network if necessary. Set the Sweep Generator for a 50 microvolt RF output with  $\pm$  300 KHz deviation at 400 Hz.
2. Find a "quiet" spot on the band near 90 MHz and tune the Sweep Generator to this frequency. A scope demodulator probe is now connected to Pin 1 of IC 1. (see Figures 1 and 2).

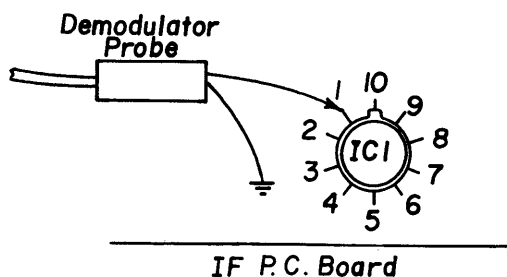


Figure 2.

The FM I.F. Bandpass characteristics can now be observed. A scope presentation such as Figure 3 may be obtained.

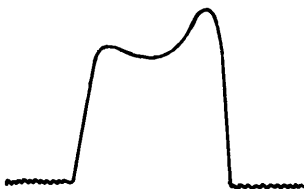


Figure 3.

3. Realign the front end 10.7 MHz output, along with T201, T202 and T203 (all top and bottom slugs) for maximum gain while maintaining bandwidth and symmetry, resulting in I.F. selectivity characteristics similar to Figure 4.

To verify front end RF alignment, observe the oscilloscope display and tune L101 and L102 for maximum deflection. Tune to a "quiet" spot near 106 MHz and then tune the Sweep Generator to this frequency. Now adjust "FM ANT" and "FM MIX" trimmer capacitors for maximum deflection and symmetry. Repeat at 90 MHz and 106 MHz until no further improvement is obtainable.

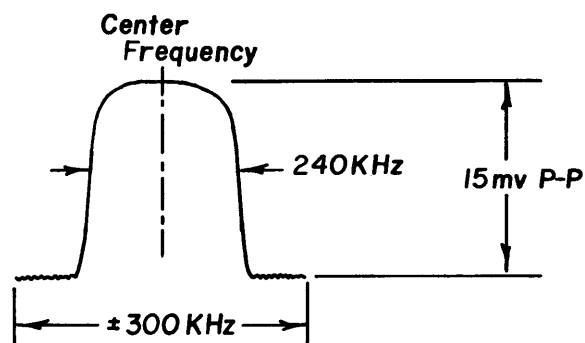


Figure 4.

4. Remove the demodulator probe from Pin 1 of IC 1 and attach a straight-through probe to R351 (3.3K), wired between I.F. board "out" and Multiplex Board "in", on the multiplex side. With generator output reduced to approximately 5 microvolts, adjust T204, bottom slug, for maximum gain and "straightness"; T204, top slug, for equal + and - swings about the horizontal center line of the display, Figure 5. Reduce deviation to  $\leq 75$  KHz, centering sweep display. Increase generator output to 1000

microvolts and if necessary slightly retune T204 top for best "straightness". An Intermodulation or Harmonic distortion analyzer should be used, if available, for absolute discriminator distortion null. Note, the audio output level at "REC OUT" for later reference (see AM alignment, step 4).

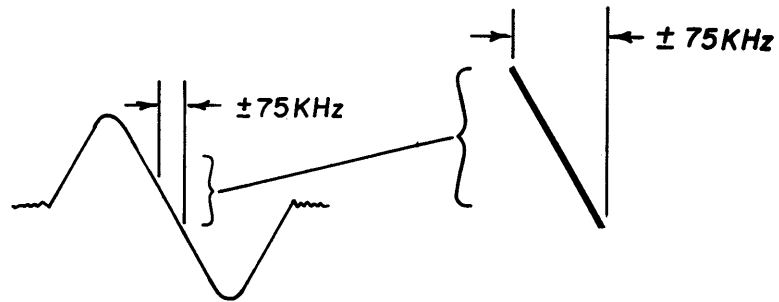


Figure 5.

5. Move the probe to "out 2" on the I.F. board and adjust T205 for maximum gain. Reduce RF input as necessary to prevent limiting.

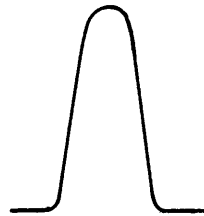


Figure 6.

6. Set the Sweep Generator RF output to 5 microvolts and set the HUSH switch to "IN". Audio should be present at the output of the receiver. VR201 on the FM I.F. Board may be adjusted so that audio is hushed at less than 5 microvolts of RF input.

## II. MULTIPLEX ALIGNMENT

1. Feed a Multiplex composite signal modulated Left channel only, into the "IN" terminal of the multiplex board. (This signal may be used to modulate an FM generator if desired.) Connect a scope or AC VTVM to R311 (COLLECTOR OF TR303) (see Figure 1). Adjust T301, T302, T303 for maximum output.
2. Move the probe to the "REC OUT" jack of the unmodulated (Right) channel. Adjust VR701 for minimum output. This should be at least -26dB from the modulated (Left) channel output.
3. Move the probe to the junction of R307 and R308 (see Figure 1). Feed a 19 KHz signal into multiplex board "IN" terminal. Adjust L302 for minimum output.
4. Now feed 67 KHz into the multiplex "IN" terminal. Adjust L301 for minimum.

### III. AM ALIGNMENT

1. Set the receiver to AM and couple an AM RF generator to the ferrite rod by wrapping three turns of wire around it. Set the RF generator for a 200 microvolt RF output and 50% modulation. Find a "quiet" spot on the band near 600 KHz and tune the generator to this frequency. The tuning meter should deflect to between the 2nd and 3rd dot.
2. Refer to Figure 1. Adjust L401, T401, T402, T403 and T404 for maximum deflection of the signal strength meter.
3. Tune to a "quiet" spot near 1400 KHz and set the RF generator to this frequency. Adjust "AM ANT" for maximum deflection of the tuning meter.
4. Set the RF generator for 80% modulation. Adjust RV451 for an audio output at REC OUT equal to the reference obtained under FM alignment step 4.

#### IV. AMPLIFIER SERVICING AND ADJUSTMENT

Preliminary checks of the dc voltages present at various points in the S-7100 can prove useful in locating defective components. They can indicate whether a transistor is open, shorted, or functioning normally. Dynamic tests may be required, however, to determine how well the transistor is functioning.

##### Fuse and Speaker System Check:

If the speaker fuse is open, measure the speaker system line with an ohmmeter. Speaker line resistance should not measure less than 4 ohms.

While servicing a receiver it is valuable to operate the receiver using a variable voltage power line (Variac) equipped with a line wattmeter to identify abnormal power consumption, especially when the line fuse has been blown.

Using the Variac, slowly increase power line voltage upward while observing the wattmeter. The power consumption should not exceed 40 watts as the voltage is increased up to rated 120 volts. If power consumption reading begins to exceed 40 watts, do not further increase power line voltage. At this time, determine whether malfunction is in the power supply, tuner or amplifier section.

If the power amplifier is suspected, verify center-point voltage on the dc side of the output electrolytic, C653, for one-half of the B+ supply voltage. If the center-point voltage reads extremely low, suspect a defective output transistor on the low side (schematic shows transistor as bottom device in each channel).

If center-point voltage reads extremely high, suspect a defective



high side output transistor.

If the output transistors are not at fault, then verify that the output coupling electrolytic capacitor is not shorted, other capacitors are not shorted, circuit board contains no solder or etching shorts, open resistors, poor solder connections, or faulty driver transformer.

#### Dynamic Testing, Output Transistor Bias:

Of all the specifications which require checking to ascertain correct performance of the S-7100, proper output transistor operation is the most important. Adjustment of the output transistor bias may be necessary if output transistors are replaced\*, or if the amplifier exhibits one or more of the following symptoms:

1. Overheating of the output transistors under normal operating conditions.
2. Excessive low level harmonic distortion -- greater than 0.4% at 2.0 volts across 8 ohm.

Adjustment of output transistor bias should then proceed as follows:

Measure the receiver's harmonic distortion with an audio oscillator, at 1000 Hz, fed into the AUX input. Turn the receiver volume control to maximum and adjust the oscillator output of 2.0 volts across 8 ohms. While observing harmonic distortion, select resistors R616a

\*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.

and R617a, both of equal value until distortion reaches a minimum or until class "AB" operation is noted (see figure 7 and 8). Resistors R616a and R617a are soldered to the bottom of the driver board. Repeat test procedure on receiver's second channel. (R616b and R617b) A typical value for R616 and R617 is 330 ohms.

Important: Class A operation will cause the output transistors to over heat (see figure 9).

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

Less than 0.4% THD at 2.0 volts.

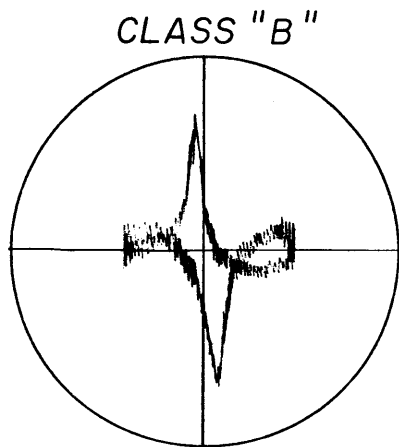
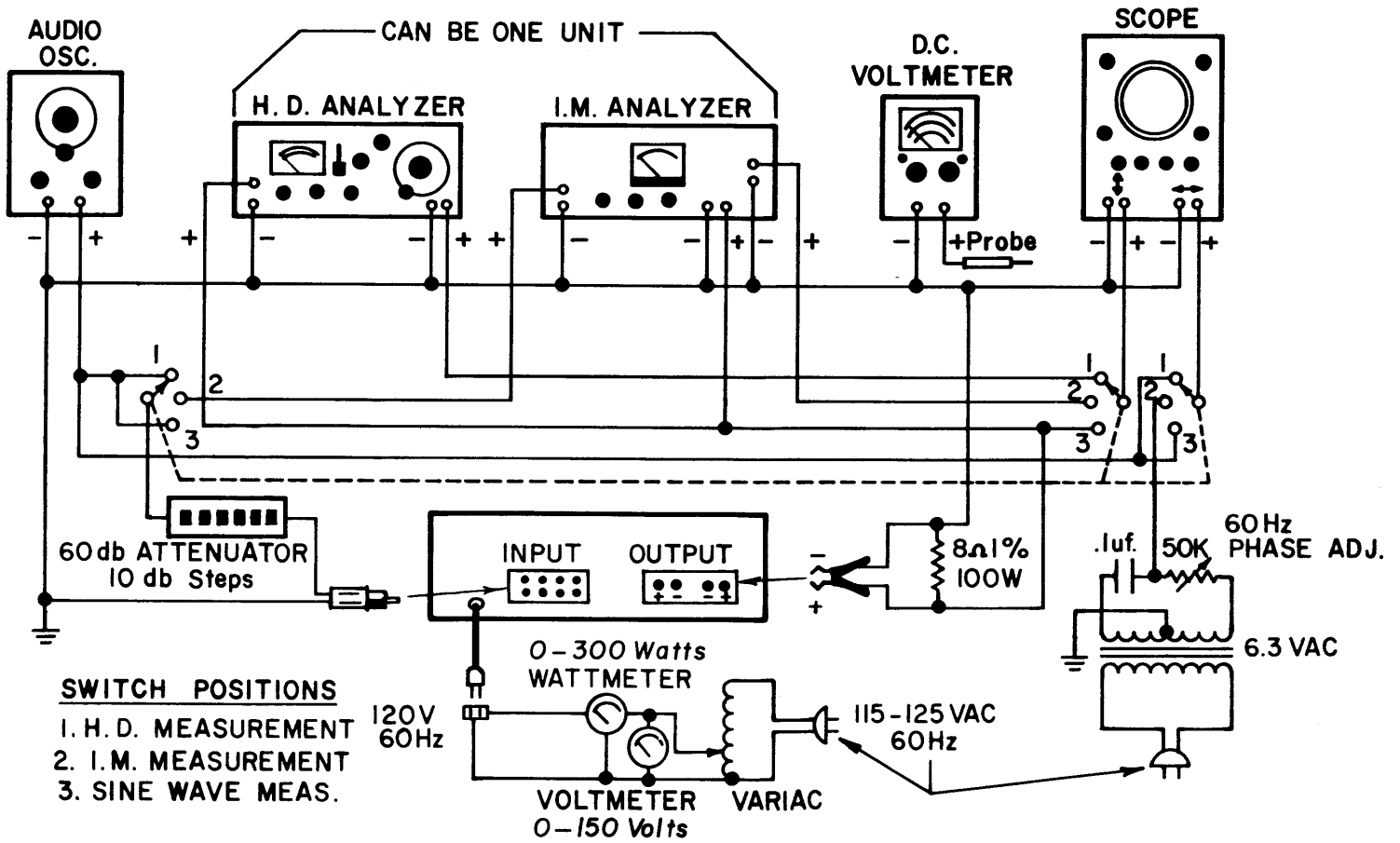
Typically 0.5% THD at 10 volts.

25 watts of power per channel at clipping.

If amplifier will not reach full rated power (14V @ 8 ohms) with symmetrical clipping, suspect driver transistor (2SC1061) or mismatched output transistors.

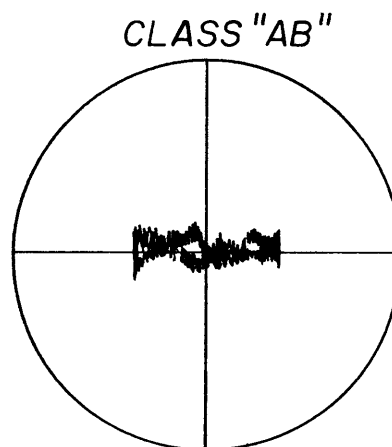
Fault isolation in the preamplifier, tone amplifier and driver stages can generally be isolated by checking the dc voltages or comparing gain measurements at 1 KHz as indicated on the schematic.

# SUGGESTED AMPLIFIER TEST BENCH SET-UP



IMPROPER ADJUSTMENT  
NOTCH ALL CLASS "B"

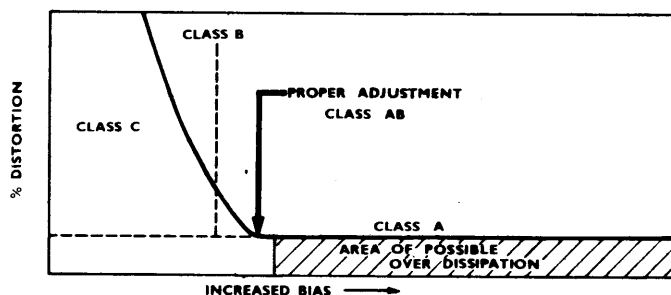
Figure 7



PROPER ADJUSTMENT  
SLIGHT NOTCH

Figure 8

Figure 9



## S-7100 PARTS LIST

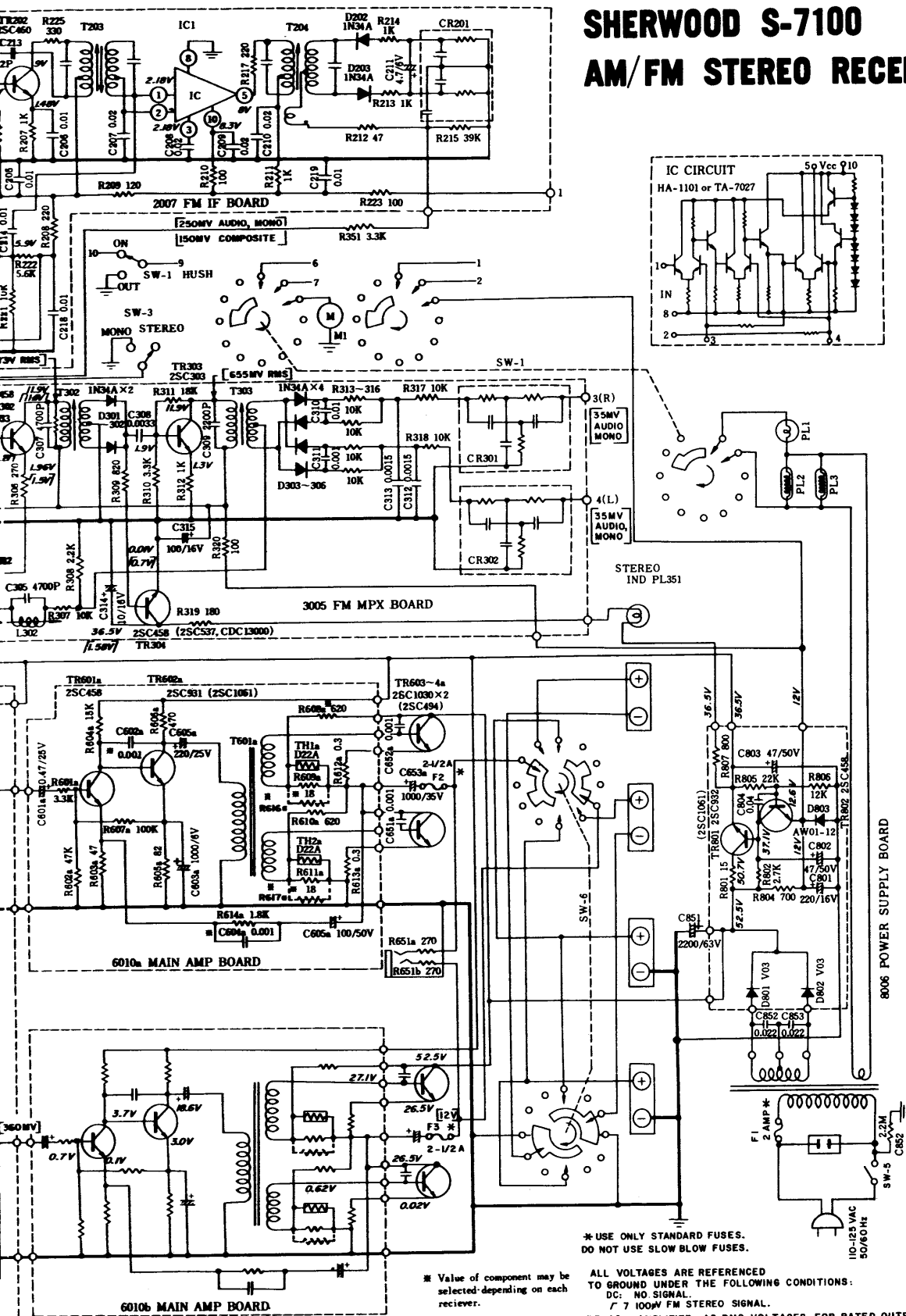
PART DESCRIPTION	SCHEMATIC REFERENCE NO.	PART NO.	LIST PRICE*
<b>TRANSISTORS</b>			
2SA202B	TR402	30000021	.74
2SA203B	TR403	30000032	.74
2SA354	TR401	30000010	.80
2SC458C	TR601a, 601b, 802	30200053	1.04
2SC460A	TR203	30200061	.96
2SC460B	TR201, 202	30200062	.96
2SC461	TR102, 103	30200091	.96
2SC537E	TR301, 302	30200143	.98
2SC537G	TR303, 304, 305	30200142	.98
2SC870E	TR902a, 902b	30200311	1.20
2SC871E	TR501a&b, 502a&b, 901a&b	30200301	1.20
2SC931E	TR801	30200162	2.64
2SC1030	TR603a, 603b, 604a, 604b	30200101	5.40
2SC1061C	TR602a, 602b	30200033	2.64
2SK19	TR101	30400021	2.68
TA-7027M	IC1	30900030	5.80
<b>DIODES</b>			
IN34A	D201, 202, 203, 204, 205, 302, 303, 304, 305, 306, 307	30600020	.40
IN60 GERMANIUM	D401, 402, 403	30600010	.30
IS1212 SILICON	D301	30600090	.42
V03C RECTIFIER	D801, 802	30600040	.68
AW01-12 ZENER 12V	D803	30600140	1.68
<b>CAPACITORS, ELECTROLYTIC</b>			
0.47uf @ 25V	C418, 601a, 601b, 901a, 901b	65043474	.32
1uf @ 50V	C508a, 508b, 321, 322, 323, 309	64045105	.32
4.7uf @ 25V	C211	64043475	.48
4.7uf @ 16V	C501a, 501b	65042475	.32
10uf @ 10V	C301, 302, 310, 404	64041106	.32
10uf @ 16V	C324	64042106	.48
10uf @ 25V	C507a, 507b, 904a, 904b, 905a, 905b	64043106	.48
10uf @ 50V	C308	64045106	.56
33uf @ 6.3V	C903a, 903b	64040336	.32
33uf @ 16V	C409	64042336	.48
47uf @ 50V	C502a, 502b, 803	64045476	1.20
100uf @ 6.3V	C420	64040107	.48
100uf @ 16V	C311, 414	64042107	.56
100uf @ 50V	C606a, 606b	64045107	1.25
220uf @ 6.3V	C503a, 503b	64040227	.56
220uf @ 16V	C801	64042227	.68
220uf @ 25V	C605a, 605b	64043227	.78
220uf @ 50V	C802	64045227	1.45

PART DESCRIPTION	SCHEMATIC REFERENCE NO.	PART NO.	LIST PRICE*
<b>CAPACITORS, ELECTROLYTIC (CONT.)</b>			
470uf @ 6.3V	C603b,603b	64040477	1.20
1000uf @ 35V	C653a,653b	64144108	2.75
2200uf @ 63V	C851	64246228	3.25
<b>COILS AND TRANSFORMERS</b>			
COIL, FM ANT (101A)	L101	35501011	1.04
COIL, FM RF (102B)	L102	35501022	1.20
COIL, FM OSC (101L)	L103	35501016	1.04
COIL, FM CHOKE	L105	35500070	.30
COIL, 67KHz MPX (304E)	L301	35603045	1.80
COIL, 19KHz MPX (307E)	L302	35603075	1.80
COIL, 19KHz MPX (306E)	L303,304	35603065	1.80
COIL, AM OSC (402L)	L401	35704026	2.05
AM ANTENNA		35400121	3.65
POWER TRANSFORMER		35900016	22.77
TRANSFORMER, FM IF	T101	35701011	1.20
TRANSFORMER, FM IF (202A)	T201	35702021	1.20
TRANSFORMER, FM IF (202B)	T202	35702022	1.86
TRANSFORMER, FM IF (202C)	T203	35702023	1.86
TRANSFORMER, FM IF (202E)	T205	35702025	1.10
TRANSFORMER, FM DISC (204D)	T204	35702044	2.10
TRANSFORMER, 19KHz (307A)	T301	35603071	2.40
TRANSFORMER, 19KHz (307B)	T302	35603072	2.40
TRANSFORMER, 38KHz (303D)	T303	35603034	2.40
TRANSFORMER, AM IF (401A)	T401	35704011	2.05
TRANSFORMER, AM IF (401B)	T402	35704012	2.05
TRANSFORMER, AM IF (401D)	T403	35704014	2.05
TRANSFORMER, DRIVER	T601a,601b	35800015	4.20
<b>GENERAL SECTION</b>			
METER LIGHT 8V/150ma.	PL1	37008005	.50
DIAL LIGHT FUSE TYPE 8V/300ma.	PL2,3	37008008	.90
STEREO LIGHT 8V/30ma.	PL351	37008012	1.20
TUNING METER	M1	60150006	5.70
SWITCH, ROTARY (F3104)	SW5	27100009	4.20
SWITCH, ROTARY (F144)	SW6	27100018	2.40
SWITCH, FLIP LEVER	SW1,2,3,4	27600001	1.68
P.C. NETWORK (5DL03B)	CR201	43200003	.89
R.C. NETWORK (F38)	CR301,302	43300002	1.53
THERMISTER (D-22A)	TH1a,1b,2a,2b	30700010	.72
<b>VARIABLE RESISTORS</b>			
STEREO THRESHOLD 100K	VR201	28100020	.78
SEPARATION ADJUST 5K	VR701	28100029	1.32
BALANCE 100K	VR502a,502b	28000008	2.88
VOLUME 100K WITH SWITCH	VR503a,503b	28000029	3.90
TONE CONTROL 50K	VR901a,901b,902a,902b	28000011	2.88
AM LEVEL 10K	VR451	28100021	.78

PART DESCRIPTION	SCHEMATIC REFERENCE NO.	PART NO.	LIST PRICE*
MECHANICAL PARTS			
DIAL STRING		84048001	.24
DIAL SPRING		19017001	.20
HEADPHONE JACK (SG7702)		33030400	1.20
DIAL GLASS		20019003	2.40
POWER TRANSISTOR SOCKET		34011001	.48
DIAL DRUM		21003001	.90
KNOB, LARGE WITH MARK		29031001	1.20
KNOB, LARGE WITHOUT MARK		29032001	1.20
KNOB, SMALL		29033001	.96
ESCUTCHEON BLACK OUT STRIP		71001002	1.60
FEET, PLASTIC		74038001	.36
PLASTIC PULLEY		84010001	.12
FLYWHEEL		22002001	2.40
LIGHT HOLDER, FUSE TYPE		34005001	.54
DIAL POINTER		25007001	.48
METER LIGHT SOCKET		34018001	.48
PLASTIC AM ANTENNA HOLDER		63030001	.56
AC OUTLET (S-19122)		34016002	.90
SPEAKER TERMINAL BOARD		53082000	1.90
INPUT BOARD		33080300	2.75
ANTENNA TERMINAL BOARD		53041600	1.50
FUSE HOLDER		34009001	1.25
FUSE 2A		38100020	.12
FUSE 2.5A		38000025	.12
POLYETHYLENE BAG		81100007	.48
CARTON BOX & FILLER		1400B130N1	5.40
WOOD CABINET		85012003	28.00
ESCUTCHEON			11.40

\*NOTE: PRICES SUBJECT TO CHANGE WITHOUT NOTICE.

# SHERWOOD S-7100 AM/FM STEREO RECEIVER

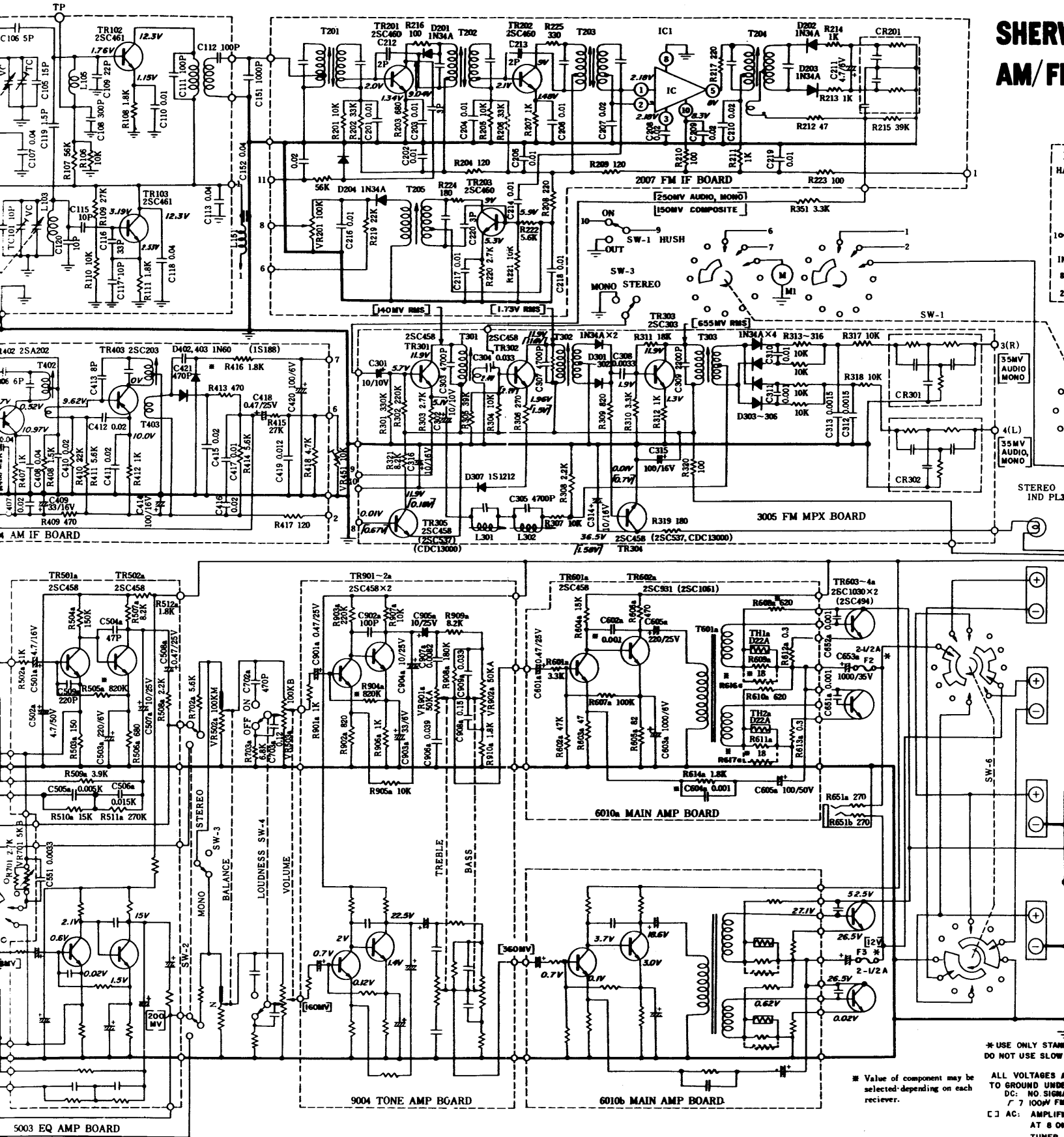


\* USE ONLY STANDARD FUSES.  
DO NOT USE SLOW BLOW FUSES.

ALL VOLTAGES ARE REFERENCED TO GROUND UNDER THE FOLLOWING CONDITIONS:  
DC: NO SIGNAL.  
/ 7 100μV FM STEREO SIGNAL.

[ ] AC: AMPLIFIER - AC RMS VOLTAGES FOR RATED OUTPUT AT 8 OHMS LOAD, WITH VOLUME MAX.  
TUNER - RMS VOLTAGES, 100μV ANTENNA INPUT, FM STEREO SIGNAL, EXCEPT WHERE INDICATED AS MONO SIGNAL.

\* Value of component may be selected depending on each receiver.



\* USE ONLY STAMPED COMPONENTS  
DO NOT USE SLOW

# Value of component may be selected depending on each receiver.

ALL VOLTAGES ARE TO GROUND UNLESS OTHERWISE SPECIFIED.  
DC: NO SIGNAL  
AC: 100V FM AT 800 TUNER-SIGNAL.

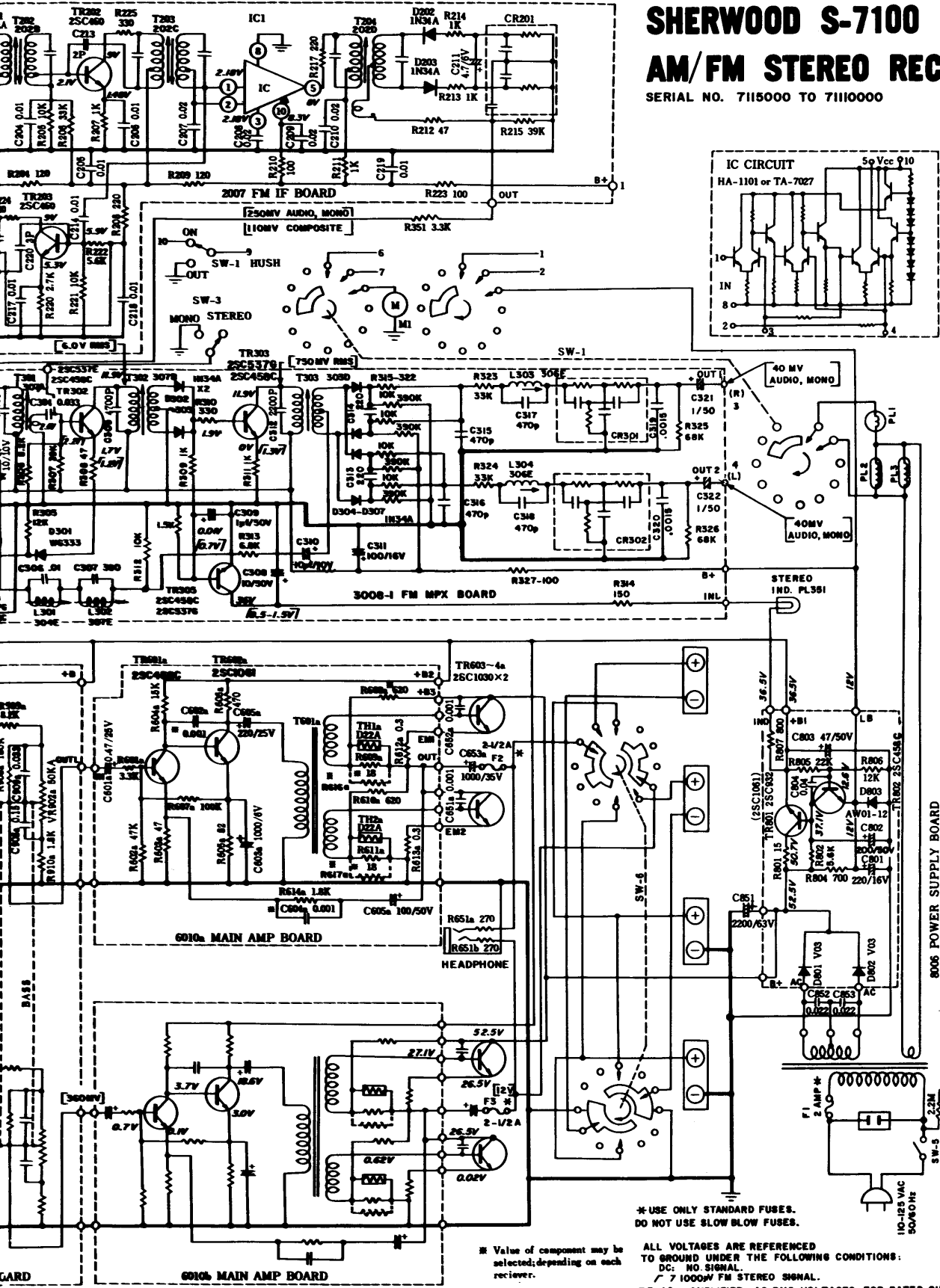




# SHERWOOD S-7100

## AM/FM STEREO RECEIVER

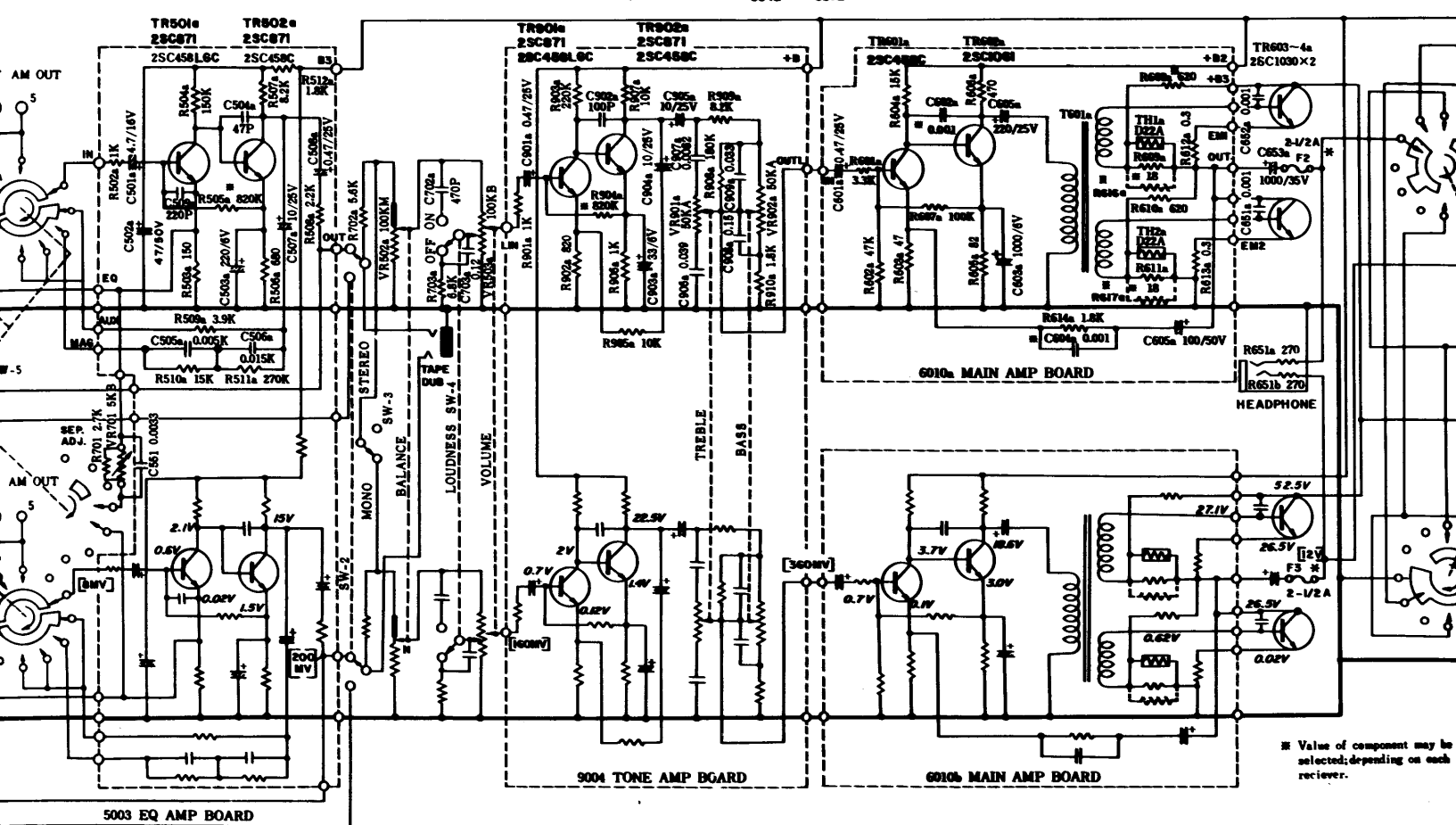
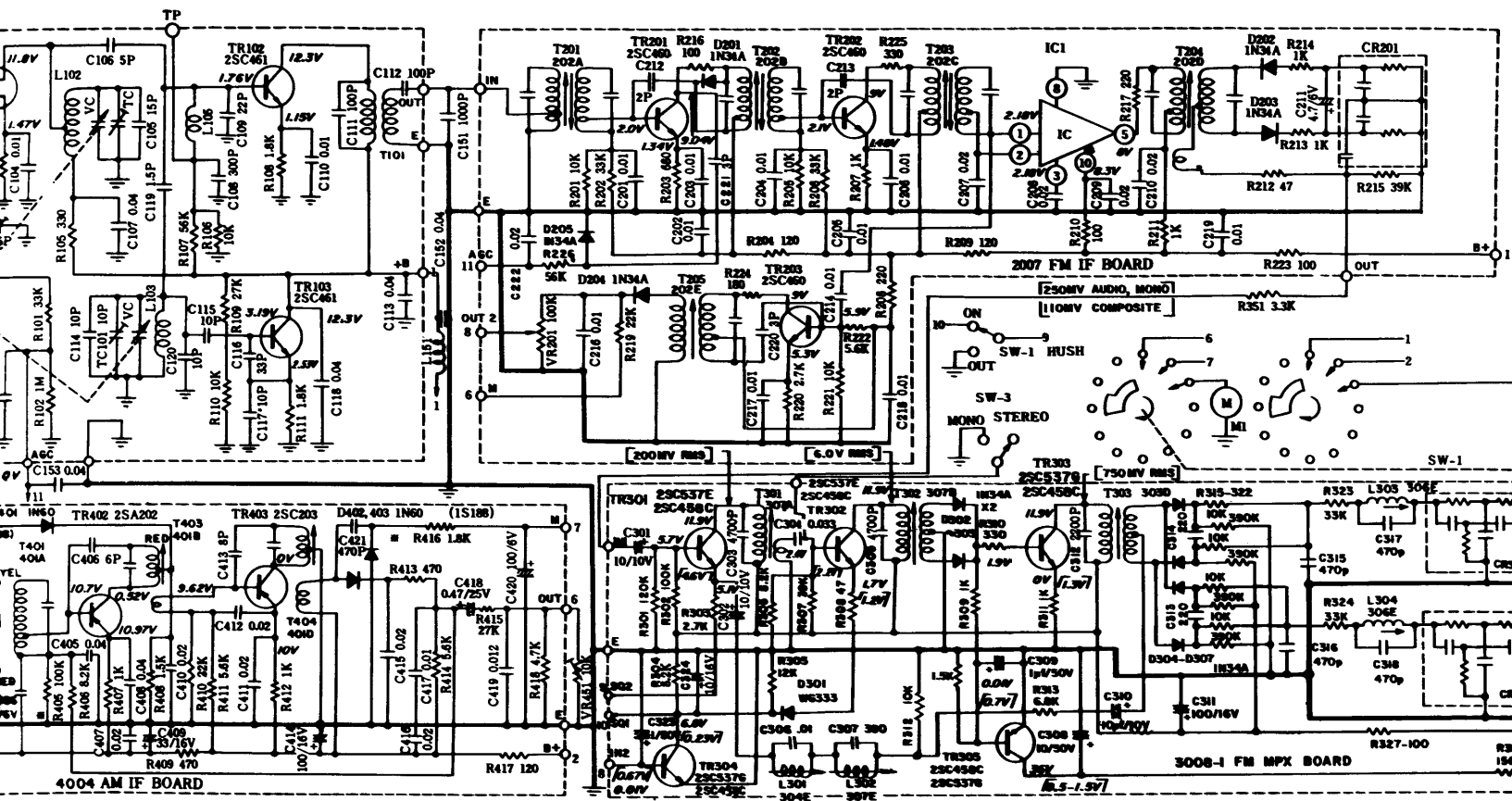
SERIAL NO. 7115000 TO 71110000



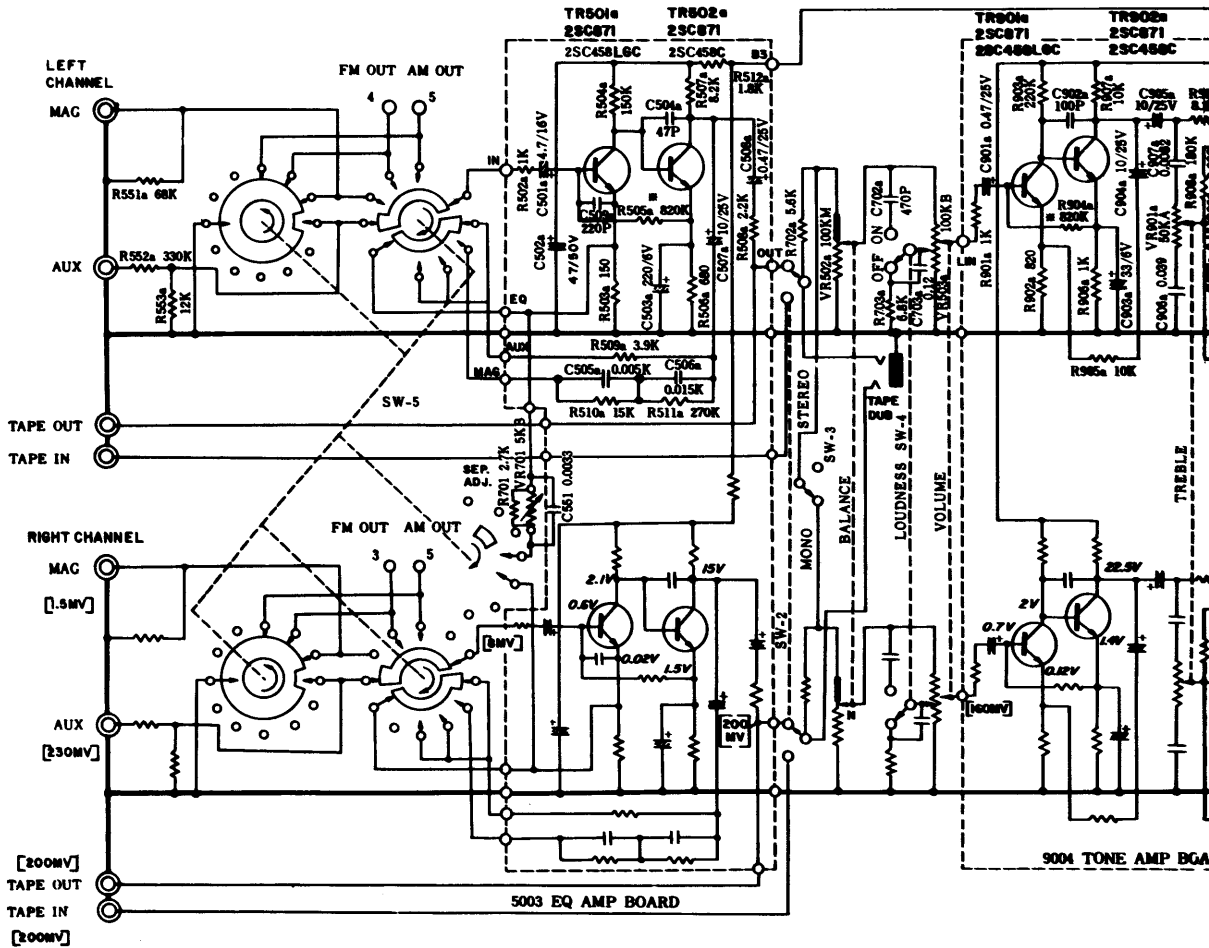
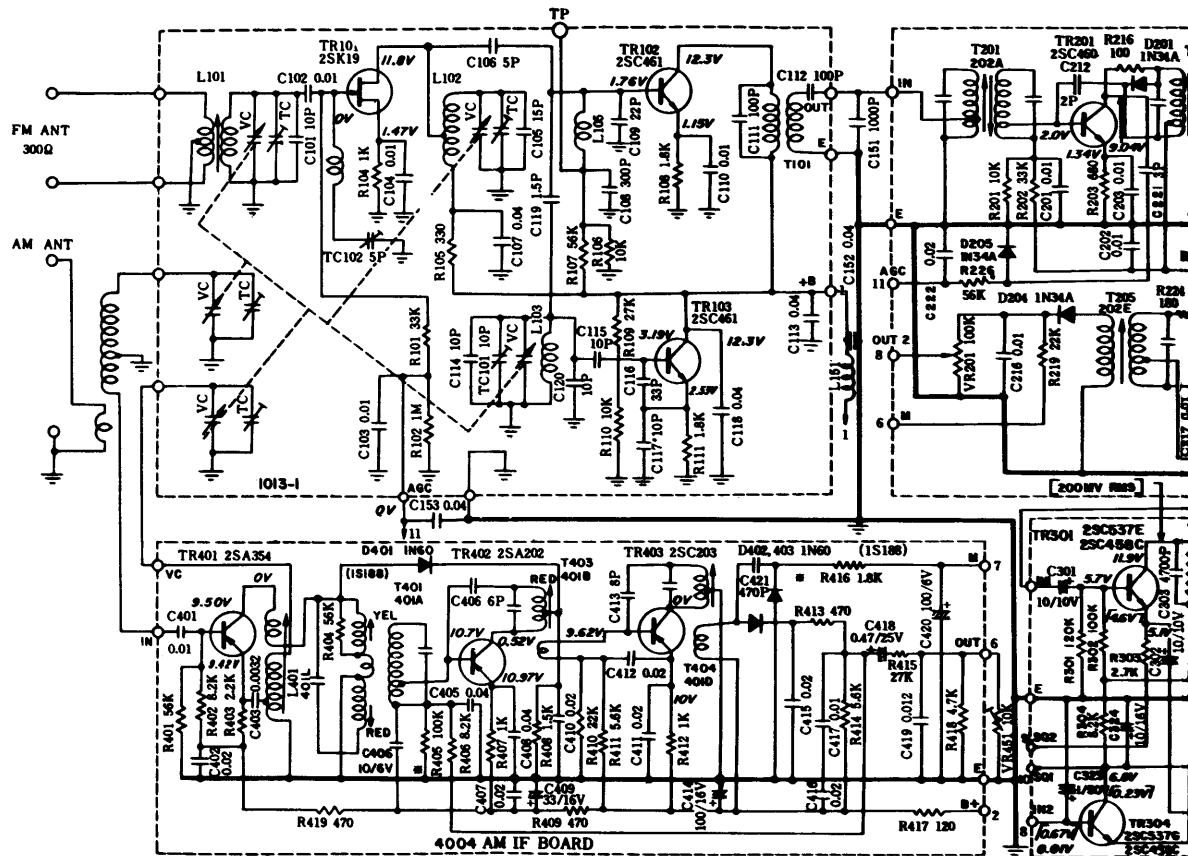
\* USE ONLY STANDARD FUSES.  
DO NOT USE SLOW BLOW FUSES.

ALL VOLTAGES ARE REFERENCED TO GROUND UNDER THE FOLLOWING CONDITIONS:  
DC: NO SIGNAL.  
/ 7 1000V FM STEREO SIGNAL.

[ ] AC: AMPLIFIER - AC RMS VOLTAGES FOR RATED OUTPUT AT 8 OHMS LOAD, WITH VOLUME MAX.  
TUNER - RMS VOLTAGES, 100V ANTENNA INPUT, FM STEREO SIGNAL, EXCEPT WHERE INDICATED AS MONO SIGNAL.



\* Value of component may be selected, depending on each receiver.



# NOTES

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**SHERWOOD** ELECTRONIC LABORATORIES, INC.  
4300 NORTH CALIFORNIA AVENUE, CHICAGO, ILLINOIS 60618 (312) 478-7300

LITHO 10-70 IN U.S.A.