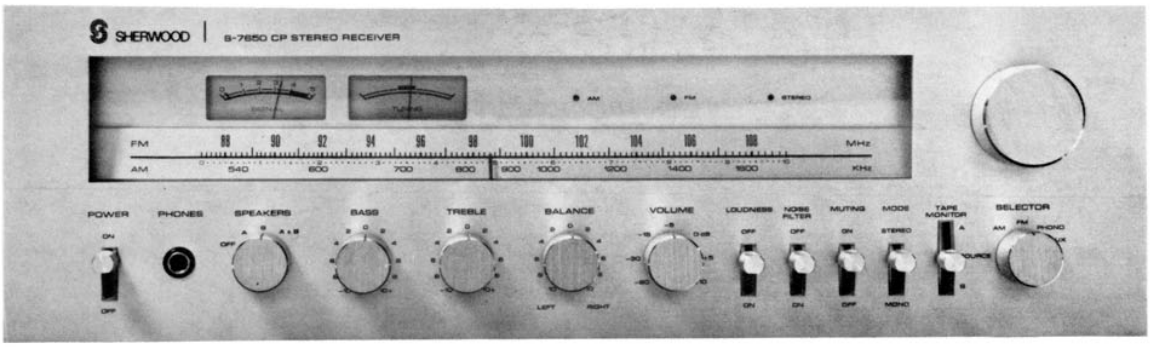
$3.00

SHERWOOD

S7650CP



SERVICE MANUAL

CONTENTS

FRONT PANEL FEATURES 1

BLOCK DIAGRAM 2

SERVICING AND ADJUSTMENT PROCEDURES

- AMPLIFIER SERVICING AND ADJUSTMENT 3
- USE OF A VARIAC 3
- LINE FUSE AND INITIAL CIRCUIT CHECKS 3
- AMPLIFIER FAULT ANALYSIS 3
- DISTORTION IN AMPLIFIER OUTPUT 4
- OUTPUT TRANSISTOR BIAS ADJUSTMENT 4
- BIAS ADJUSTMENT USING AN INTERMODULATION DISTORTION ANALYZER 4
- BIAS ADJUSTMENT USING A HARMONIC DISTORTION ANALYZER 5
- BIAS ADJUSTMENT USING A MILLIVOLTMETER 5
- BIAS ADJUSTMENT USING A LINE WATTMETER 5
- POWER SUPPLY SERVICING AND FAULT ANALYSIS 6
- AMPLIFIER ELECTRONIC PROTECTION AND SPEAKER SYSTEM CHECKS 6
- FM TUNER AND IF ALIGNMENT 6
- DETECTOR ALIGNMENT USING AN OSCILLOSCOPE 7
- DETECTOR ALIGNMENT USING A HARMONIC DISTORTION ANALYZER 7
- ZERO CENTER TUNING METER ADJUSTMENT 7
- PHASE LOCK LOOP MULTIPLEX ADJUSTMENT 7
- PLL ADJUSTMENT USING A DIGITAL FREQUENCY COUNTER AND A FM STEREO GENERATOR 7
- PLL ADJUSTMENT USING AN FM STEREO GENERATOR 8
- STEREO THRESHOLD ADJUSTMENT 8
- AM TUNER AND IF ALIGNMENT 8
- SIGNAL METER CALIBRATION 8
- DIAL STRINGING DETAIL 8

SPECIFICATIONS 9

PARTS LOCATION PICTORIALS

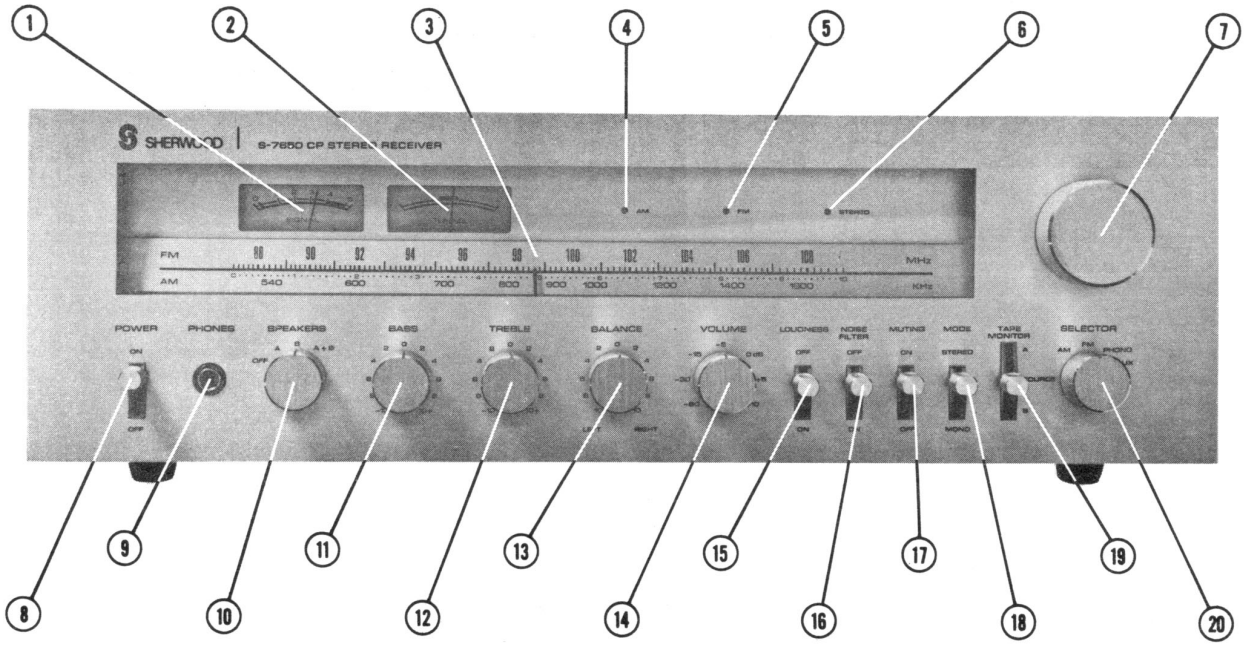
- CHASSIS BOTTOM VIEW 10
- CHASSIS TOP VIEW 11

REPLACEMENT PARTS LIST 12

SCHEMATIC DIAGRAM (See Supplements)

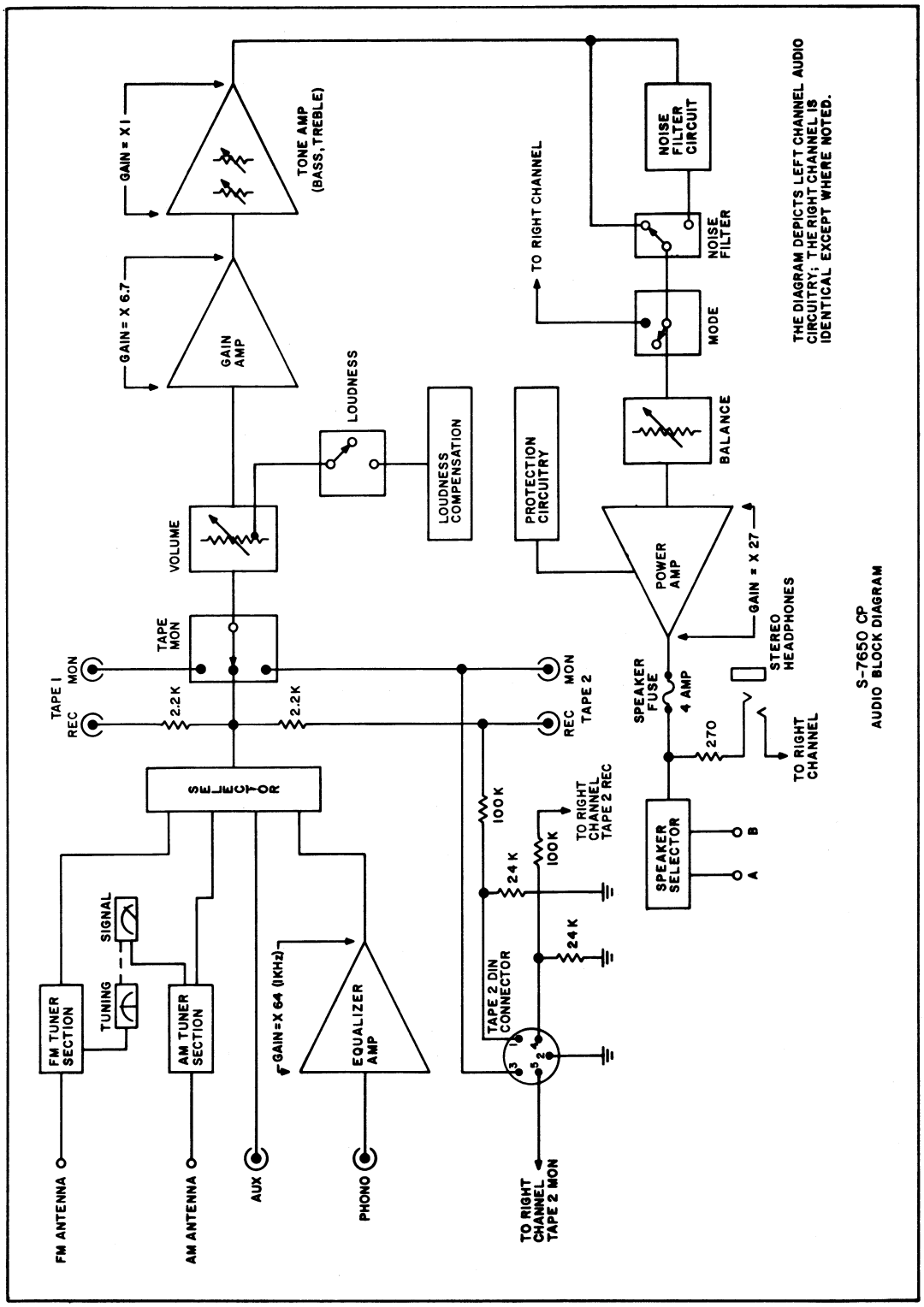
CIRCUIT BOARD COMPONENT LAYOUT (See Supplements)

Front Panel Features



1. SIGNAL STRENGTH METER: For precise tuning of AM stations and precise antenna orientation of FM.
2. CENTER TUNE METER: For precise tuning of FM stations.
3. ILLUMINATED TUNING SCALES.
4. AM MODE INDICATOR LED.
5. FM MODE INDICATOR LED.
6. FM STEREO INDICATOR LED: Indicates only when the output of the tuner section is in stereo.
7. TUNING CONTROL: Counter balanced for easy tuning.
8. POWER OFF-ON SWITCH.
9. STEREO HEADPHONE JACK.
10. SPEAKER SELECTOR SWITCH: Activates "A" speakers, "B" speakers, "A" and "B" speakers, or shuts off all speakers for headphone only listening.
11. BASS CONTROL: Varies low frequency levels as much as ±10dB.
12. TREBLE CONTROL: Varies high frequency levels as much as ±10dB.
13. BALANCE CONTROL: Balance the relative volume levels of the left and right speakers.
14. VOLUME CONTROL.
15. LOUDNESS SWITCH: Adds loudness compensation for low level listening.
16. NOISE FILTER: Removes "scratch" from records or background "hiss" from noisy FM.
17. FM MUTING SWITCH: Removes FM interstation noise.
18. STEREO-MONO MODE SWITCH: Combines left and right channels for monophonic playback.
19. TAPE MONITOR SWITCH: Permits tape playback or monitoring of a 3 head tape deck.
20. SELECTOR SWITCH: To select your listening source: AM, FM, FM Stereo, Phono, or Auxiliary.

Block Diagram



SERVICE and ADJUSTMENT PROCEDURE

AMPLIFIER SERVICE AND ADJUSTMENT:

NOTES:

1. For simplicity only the left channel and its related circuitry are described. The right channel is identical except for schematic reference symbol numbers (see Schematic Diagram).
2. As a convience for fast component location, this manual contains detailed pictorials of all the printed circuit boards. Reference to these pictorials should aid considerably in the quick, accurate fault analysis of an existing malfunction.
3. To facilitate servicing, the S7650 was designed so that the printed circuit boards are readily accessable. Components can be tested or unsoldered and replaced, if necessary, without removing boards or assemblies.

USE OF A VARIAC:

It is imperative that a variable voltage line source (Variac) equipped with a line wattmeter to identify abnormal power consumption be used when servicing power amplifiers and associated power supply circuitry. With the Volume (Loudness) control set at minimum, the power consumption should not exceed 25 watts as the voltage is increased by the Variac to the rated 120VAC. If the power consumption begins to exceed 25 watts, do NOT increase the line voltage any further. Determine if the malfunction is in the power amplifier, power supply, preamplifier, or tuner section of the receiver.

LINE FUSE AND INITIAL CIRCUIT CHECKS:

Verify that the line fuse is unopened and check quiescent power consumption. The main cause for abnormal power consumption, in order of decreasing occurance, are:

1. Open or shorted amplifier output, driver or pre-driver transistors.
2. Open or shorted power supply diodes.
3. Shorted power transformer.

AMPLIFIER FAULT ANALYSIS:

If an amplifier channel is in question, check related circuit boards for burned parts and replace. Check all the transistors with an ohmmeter* for opens or shorts and replace if defective.

* WARNING: Some ohmmeters may damage sensitive solid-state devices. Whenever possible, use a high resistance range (at least RX10).

IMPORTANT: For the following tests, an 8 ohm load resistor must be connected to each of the two power amplifier (speaker) output terminals.

Use the centerpoint voltage (measured from the plus [+] speaker terminal to ground) as a guide. The centerpoint voltage should always be Zero ±30mV. Any deviation suggests shorted or open devices.

If channel operation is still faulty, verify that there are no shorted capacitors, open resistors, etc., on the board.

Inspect the underside of the board for shorted pads, broken connections, etc.

When the board is restored, readjust the Output Bias (see the next page).

DISTORTION IN AMPLIFIER OUTPUT:

Distortion which exceeds the amplifier ratings (see Specification Section) may be due to the following:

1. Mismatched output transistors.
2. Defective (low-beta) driver transistors.
3. Incorrectly adjusted output transistor bias.

OUTPUT TRANSISTOR BIAS ADJUSTMENT:

Proper output transistor operation and output bias adjustment are most important to assure cool, low-distortion operation of the amplifier. Bias adjustment is necessary if the output transistors are replaced* or any of the transistors in the driver circuitry of 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 [IMD] or Total Harmonic Distortion [THD] - more than 0.08% at 3.0 volts across 8 ohms.

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

NOTE: For the following tests, an 8 ohm load resistor must be connected to each of the two power amplifier (speaker) output terminals.

The following are four methods for adjusting output transistor bias:

BIAS ADJUSTMENT USING AN INTERMODULATION DISTORTION (IMD) ANALYZER:

1. Connect the receiver amplifier for testing.
2. Connect an Intermodulation Distortion Analyzer with a ratio of 4:1 using 60Hz and 7000Hz to the receiver AUX inputs and set the SELECTOR switch to AUX.
3. Set the VOLUME (Loudness) control to maximum and adjust the generator for an amplifier output of 3.0 volts across the 8 ohm load of the amplifier channel under test.
4. While observing the resultant distortion waveform, adjust the left channel bias pot VR702a so that the crossover distortion is at the point of being eliminated (class "AB").

   NOTE: Class "A" operation (continued CW rotation) causes the output transistors to draw excessive current and consequently overheat. Refer to Figure 1 below.
5. Repeat Step 4 for the right channel.

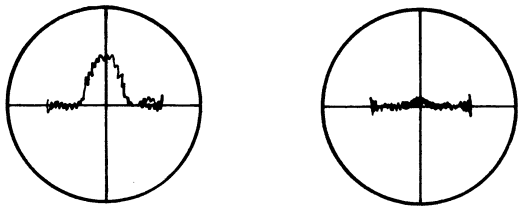


Figure 1

The following performance indicates a properly operating amplifier with both channels driven into 8 ohm loads:

1. Less than 0.08% Intermodulation Distortion (IMD) at 3.0V (typically 0.05%).
2. 45 watts of power per channel at no greater than 0.2% IMD.

BIAS ADJUSTMENT USING A HARMONIC DISTORTION ANALYZER:

1. Connect the receiver amplifier for testing.
2. Connect an oscillator with less than 0.01% distortion at 1KHz to the receiver Left AUX input and set the SELECTOR switch to AUX.
3. Set the VOLUME (Loudness) control to maximum and adjust the oscillator for an amplifier output of 3.0 volts across the 8 ohm load of the amplifier channel under test.
4. Using the Harmonic Distortion Analyzer, looking at the distortion of the amplifier properly nulled, make the adjustment as follows: Adjust bias for class "AB" operation by turning the bias potentiometer VR702a so that the crossover is at the point of being eliminated. NOTE: Class "A" operation (continued CW rotation) causes the output transistors to draw excessive current and overheat. Refer to Figure 2 below.
5. Repeat Steps 3 and 4 for the Right channel.

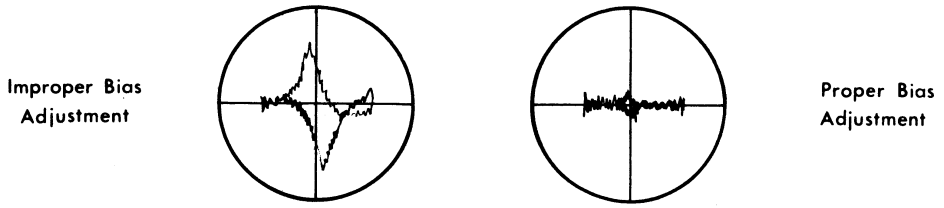


Figure 2

The following performance indicates a properly operating amplifier with both channels driven into 8 ohm loads:

1. Less than 0.08% THD at 3.0 volts (typically 0.05%).
2. 55 watts per channel at no more than 0.2% THD (1KHz).
3. 45 watts per channel at no greater than 0.2% THD (20-20,000Hz).

BIAS ADJUSTMENT USING A MILLIVOLTMETER:

If an accurate digital or analog voltmeter is available, the bias pots (VR702a Left and VR702b Right channel) can be adjusted to indicate 3.0 mV across an output transistor's emitter resistor. Proceed as follows:

1. Remove all amplifier input signals.
2. Rotate the LOUDNESS LEVEL control to minimum.
3. Connect the voltmeter across either R719a or R720a emitter resistors of the left channel power output transistors TR709a and TR710a.
4. Adjust bias potentiometer VR702a, located on the driver board, for 3.0 mV DC.
5. Repeat Steps 3 and 4 for the Right channel.

BIAS ADJUSTMENT USING A LINE WATTMETER:

When test equipment required for previous bias adjustment is not readily available and adjustment is absolutely necessary, the following procedure may be used which requires only an accurate line wattmeter:

1. Turn the VOLUME (Loudness) control to minimum.
2. Adjust the bias pots (VR702 Left and Right channel) one at a time to the point at which the amplifier begins to cause a very slight increase in line wattage consumption. Typical proper operation would develop a line wattage consumption of 25 watts.

POWER SUPPLY SERVICING AND FAULT ANALYSIS:

Power supply malfunctions are usually due to shorted or open power diodes (located on the Amplifier PC Board); shorted or open zener diodes or transistors located on the Amplifier PC Board, or a defective power transformer.

These devices may be easily checked using an ohmmeter. The transformer's operation may be checked by measuring secondary voltages with the associated circuit legs disconnected. This is easily accomplished by removing secondary fuses F801, F802 and F901. Shorted windings can cause abnormal power consumption in a unit that otherwise functions well.

AMPLIFIER ELECTRONIC PROTECTION AND SPEAKER SYSTEM CHECKS:

It is necessary in the design of a high powered receiver to provide protection for both the amplifier AND the speaker load. Each channel is protected with a 4 Amp fuse.

When there is no output to the speaker terminals, check the fuse for that channel. If the fuse is open, check the speaker connections for shorted wires or a shorted speaker (speaker load resistance should not indicate less than 4 ohms resistance on an ohmmeter). If the amplifier is suspect, the following explanation of its normal operation characteristics may be helpful.

The amplifier DC offset voltage [measured from the plus (+) speaker terminal to ground] should be Zero ±30mV. Any larger deviation suggests shorted or open devices. If power amplifier devices are replaced, the DC offset voltage should be rechecked. If the offset is shifted more than 30mV, adjust DC offset controls, VR701a for Left channel, and VR701b for Right channel, for a DC offset of Zero volts.

The complementary output transistors are load line limited, with the maximum current limited to 5.7A peak (equivalent to 65 watts @ 4 ohm). Signal voltages developed across the output transistor's emitter resistors R719a and R720a forward-bias transistors TR705a and TR706a shunting the output transistor current only when it is necessary, after which the circuit resumes normal operation.

FM TUNER AND IF ALIGNMENT: (Refer to PART LOCATION PICTORIALS)

1. Set the SELECTOR switch to FM and turn the FM MUTING switch off. Connect an FM Generator to the 300 ohm antenna terminals using a matching transformer with a 1:1 voltage ratio or, if necessary, use a 2:1 ratio resistive network as shown in Figure 3 below.
2. Tune the receiver to a point of no signal or interference near 90MHz.
3. Tune the FM Generator, modulated ±300KHz @ approximately 20uV output level, to the receiver frequency. Connect an RF Detector Probe to Test Point 1, TP-1 (Pin 1 of IC201, HA1137) and center the FM IF response on the oscilloscope. The FM IF bandpass characteristics are now being displayed. Adjust the core of the converter FM IF transformer T101 for maximum gain and symmetry, as illustrated in Figure 4 below.

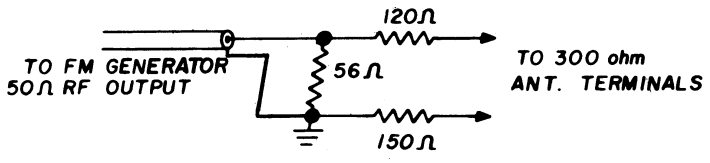


Figure 3

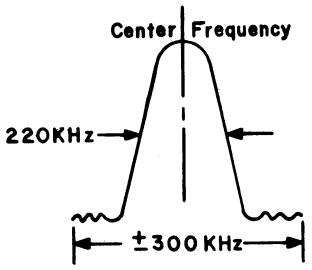


Figure 4

4. The FM Front End Alignment can also be determined while observing the oscilloscope display of Step 3. Tune the receiver and generator to a point of no interfering signal near 90MHz. Check that the receiver dial pointer indicates within ±100KHz from the FM generator frequency. (If the generator output is not accurately calibrated, a FM station can be used as a calibration reference.) If the dial deviation exceeds 100KHz,

adjust the local oscillator coil, L106, slightly, until optimum dial calibration is obtained. To adjust the coil, very slightly compress or expand its air core windings with a non-metalic tool until proper tuning inductance is obtained. Next, adjust the RF amplifier coils L102 and L103 for maximum gain. The antenna coil (L101) is a wider band tuned circuit, which is factory pretuned and normally does not require tuning. Tune the receiver and generator to a point of no interference near 106MHz. Check the dial calibration. If required, adjust the local oscillator trimmer , TC104, until optimum dial calibration is obtained. Now, adjust the antenna and RF amplifier trimmer capacitors, TC101, TC102 and TC103, for maximum gain. Repeat alignment at 90MHz and 106MHz until no further improvement is obtained.

5. DETECTOR ALIGNMENT USING AN OSCILLOSCOPE: To align the FM detector, leave the FM generator connected as in Step 1, and move the oscilloscope lead to the REC output jack on the rear panel. The detector recovered audio can also be observed at Test Point 2, TP-2. Reduce the modulation to ±75KHz. Adjust the bottom core of the detector transformer, T201, for a 0 VDC reading on a voltmeter connected across R218 or adjust for zero indication on the receiver zero center tuning meter. The top core of the transformer, T201, is adjusted for best linearity as observed on the oscilloscope (see Figure 5). Recheck the voltmeter 0 reading and readjust the bottom core again, if necessary.

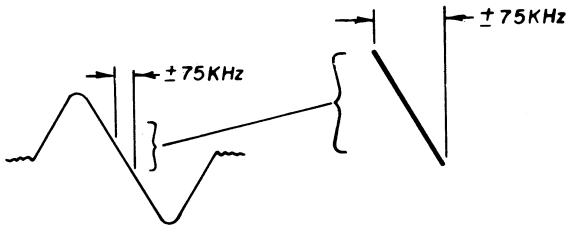


Figure 5

6. DETECTOR ALIGNMENT USING A HARMONIC DISTORTION ANALYZER: A Distortion Analyzer should be used in conjunction with an oscilloscope to obtain the best linearity, using 400Hz @ ±75KHz modulation. Fine adjust the top core of the detector transformer T201 for the lowest distortion (slight adjustment only). Recheck the voltmeter 0 reading and readjust the bottom core again, if necessary.

7. ZERO CENTER TUNING METER ADJUSTMENT: To adjust for the correct zero indication, leave the FM Generator connected as in Step 1 and tune the receiver to a point of no signal or interference.

   A. Connect a DVM or VOM across R218, 10K ohm, on the Tuner PC Board.

   B. Tune the bottom core of transformer T201 (Quadrature coil) for a Zero DC voltage indication on the voltmeter or zero indication on the receiver tuning meter.

PHASE LOCK LOOP MULTIPLEX ADJUSTMENT:

This receiver utilizes an integrated circuit phase lock loop (PLL) stereo demodulator. The phase lock loop is essentially a free-running 76KHz oscillator (subsequently divided down to 38KHz and 19KHz) which locks onto the stereo pilot tone of the transmitted signal, enabling accurate signal decoding. Proper adjustment of the free-running oscillator control VR202 is essential for stable and proper channel separation. The methods of making this adjustment are described below:

1. PLL ADJUSTMENT USING A DIGITAL FREQUENCY COUNTER AND AN FM STEREO GENERATOR: Tune the receiver to a point of no signal interference. Tune the generator to the receiver frequency and adjust it for an unmodulated signal at 100 microvolt output. With the digital frequency counter probe attached to pin 10 (Test Point 3, TP-3 provided) of IC202, adjust VR202 (FM MPX VCO) for 19KHz ±10Hz. Using a stereo signal, adjust VR203 for best total separation and minimum difference in the right-to-left and left-to-right separation. The separation should be 40dB minimum in reference to a 100% modulated audio at 1KHz. If 40dB is not obtainable, apply the pilot signal only and check the left and right multiplex outputs for 19KHz/38KHz residual. It should be a minimum of -60dB below audio reference.

2. PLL ADJUSTMENT USING AN FM STEREO GENERATOR: With the receiver tuned to a stereo signal, adjust VR202 to determine the end-points for stereo lock-in and then set VR202 halfway between these end-pcints. Using a stereo test signal, adjust VR203 for best separation.

STEREO THRESHOLD ADJUSTMENT: This receiver incorporates a stereo threshold circuit which automatically switches from mono to stereo FM mode if the station to which the receiver is tuned is transmitting a stereo program and if the station's signal strength (signal to noise ratio) is considered acceptable for stereo listening. Should the noise increase, the receiver will automatically switch to the mono mode.

To adjust the stereo threshold switching level, connect a FM Stereo Generator and an oscilloscope as used for multiplex alignment. With the receiver front panel STEREO/MONO switch in the STEREO mode, slowly increase the generator output from Zero to the automatic threshold level. Prior to the automatic switching point, the receiver will have equal (mono) Left and Right channel outputs. After the receiver's stereo threshold level is reached, the multiplex generator's Left channel modulation will appear only on the receiver's Left channel.

The receiver's desired stereo signal threshold level can be set by adjusting VR201. The recommended stereo threshold level is 4 microvolts.

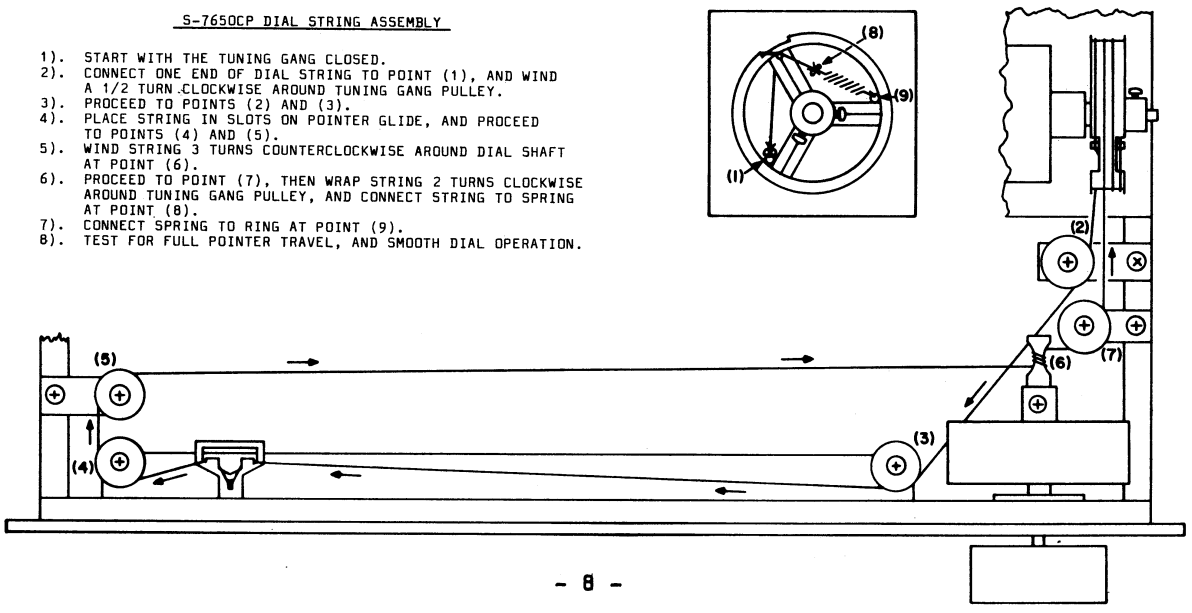
AM TUNER AND IF ALIGNMENT:

1. Set the receiver SELECTOR switch to AM. Tune the receiver to a point of no signal or interference near 600KHz. Connect the scope/VTVM to the REC output jack or Test Point 4, TP-4. Connect the AM Generator output to the receiver AM Antenna terminal through a 200pF capacitor.
2. Adjust the AM Generator for 455KHz RF output, modulated @ 400Hz, 50%. Tune the AM Converter/1st IF cores of T301 for maximum audio output.
3. Adjust the AM Generator for 600KHz. If required, adjust the AM Oscillator, L301, so that the generator signal is received by the receiver at 600KHz, as indicated on the dial scale. Adjust the Rod Antenna core, L901, located at the end of the antenna rod assembly and AM RF coil, L302, for maximum output as indicated on the scope/VTVM.
4. Tune the receiver and generator to a point of no interfering signal near 1400KHz. Check the dial calibration and if necessary adjust the AM Oscillator Trimmer, TC106, for optimum dial calibration. Adjust the Antenna and RF Trimmers, TC105 and TC107 for maximum output.
5. Repeat Steps 3 and 4 until no further improvement is obtained.

SIGNAL METER CALIBRATION: Adjust potentiometer VR301 for a 4½ division meter deflection with a 10,000uV signal generator input.

S-7650CP DIAL STRING ASSEMBLY

1). START WITH THE TUNING GANG CLOSED.
2). CONNECT ONE END OF DIAL STRING TO POINT (1), AND WIND A 1/2 TURN CLOCKWISE AROUND TUNING GANG PULLEY.
3). PROCEED TO POINTS (2) AND (3).
4). PLACE STRING IN SLOTS ON POINTER GLIDE, AND PROCEED TO POINTS (4) AND (5).
5). WIND STRING 3 TURNS COUNTERCLOCKWISE AROUND DIAL SHAFT AT POINT (6).
6). PROCEED TO POINT (7), THEN WRAP STRING 2 TURNS CLOCKWISE AROUND TUNING GANG PULLEY, AND CONNECT STRING TO SPRING AT POINT (8).
7). CONNECT SPRING TO RING AT POINT (9).
8). TEST FOR FULL POINTER TRAVEL, AND SMOOTH DIAL OPERATION.



SPECIFICATIONS

Power Amplifier

POWER OUTPUT: 45 watts per channel (16.5dBW) minimum RMS, at 8 Ohms from 20Hz-20KHz with no more than 0.2% Total Harmonic Distortion. 65 watts RMS, at 4 Ohms, at 1000Hz.

INTERMODULATION DISTORTION: 60 & 7000Hz, 4:1) Less than 0.2% @ 8 Ohm rated output.

DAMPING FACTOR: 30:1 @ 8 Ohm.

HEADPHONE OUTPUT: 4 Ohm or Greater.

Preamplifier

INPUT SENSITIVITY (and Impedance) FOR RATED OUTPUT @ 1KHz:
Phono: 2.5mV (47K Ohm/220pF)
Aux: 160mV (50K Ohm)
Tape Monitor: 160mV (50K Ohm)

PHONO INPUT CAPABILITY° FOR 0.2% THD @ 10.25V,

RECORD OUTPUT:	(1000Hz)	(10,000Hz)
Phono:	160mV	780mV

INPUT CAPABILITY FOR 0.2% THD, 1000Hz:
Aux: Greater than 10V
Tape Monitor: Greater than 10V

SIGNAL TO NOISE: (IHF "A" Wtg.) (Unweighted)
Reference to 10mV at Phono Input:

Phono:	92dB	80dB

Referenced to Input Sensitivity:

Phono:	80dB	68dB
Aux:	95dB	85dB
Volume Minimum:	100dB	90dB

PHONO EQUIVALENT INPUT NOISE:
Unweighted: -120dBV, 1.0uV
IHF "A" weighting: -132dBV, 0.25uV

PHONO GAIN: 36dB

AUX GAIN: 42dB

RECORD OUTPUT IMPEDANCE: 3K Ohm

DIN RECORD OUTPUT IMPEDANCE: 18K Ohm

FREQUENCY RESPONSE:
Phono: ±0.5dB RIAA Standard. Subsonic Response:-3dB @ 10Hz, -10dB @ 4Hz
Aux, Tape Monitor: 20-20,000Hz ±0.5dB
Bass Control: ±14dB @ 50Hz (Detented)
Treble Control: ±12dB @ 15,000Hz (Detented)
High Filter: -3dB @ 7000Hz, -20dB @ 20KHz, 12dB/Octave
Loudness Compensation @ -30dB setting: +8dB @ 100Hz, +2.5dB @ 10,000Hz

CROSSTALK: Better than 40dB from 20Hz-20KHz

*All specifications with 120VAC; specifications and design subject to possible change without notice.

°Since the RIAA Standard has a boost of 4.87 @ 10KHz, there is as much freedom from overload at 10KHz as at 1KHz.

FM Tuner

IHF SENSITIVITY: 9.84dBf (1.7uV)

Mono Sensitivity for 50dB S/N:	1386dBf (2.7uV)
Stereo Sensitivity for 50dB S/N:	36.82dBf (38uV)

TOTAL HARMONIC DISTORTION (THD) @ 1000Hz:
Mono: 0.15% @ 100% Modulation.
Stereo: 0.25% @ 100% Modulation.

SIGNAL TO NOISE RATIO:
Mono: -70dB
Stereo: -66dB

CAPTURE RATIO: 1.0dB

STEREO SEPARATION:
Better than 40dB @ 1000Hz.
Better than 30dB 20-20,000Hz.

ALTERNATE CHANNEL SELECTIVITY (IHF): 70dB

SPURIOUS RESPONSE REJECTION: -95dB

IF REJECTION: -60dB

AM REJECTION: -60dB

SCA REJECTION: -65dB

FREQUENCY RESPONSE (Stereo and Mono):
20-15,000Hz +0.5dB, -1.5dB

MUTING THRESHOLD: 4uV

AM Tuner

IHF SENSITIVITY: 20uV

TUNING RANGE: 530-1625KHz

SELECTIVITY: 25dB ±10,000Hz

FREQUENCY RESPONSE: -6dB @ 4000Hz

IMAGE REJECTION: -40dB @ 1MHz

IF REJECTION: -40dB @ 1MHz

SPURIOUS RESPONSE REJECTION: -40dB

General

POWER REQUIREMENTS:
Domestic Units: 115-125VAC, 50/60Hz
Export Units: 230-240VAC, 50/60Hz

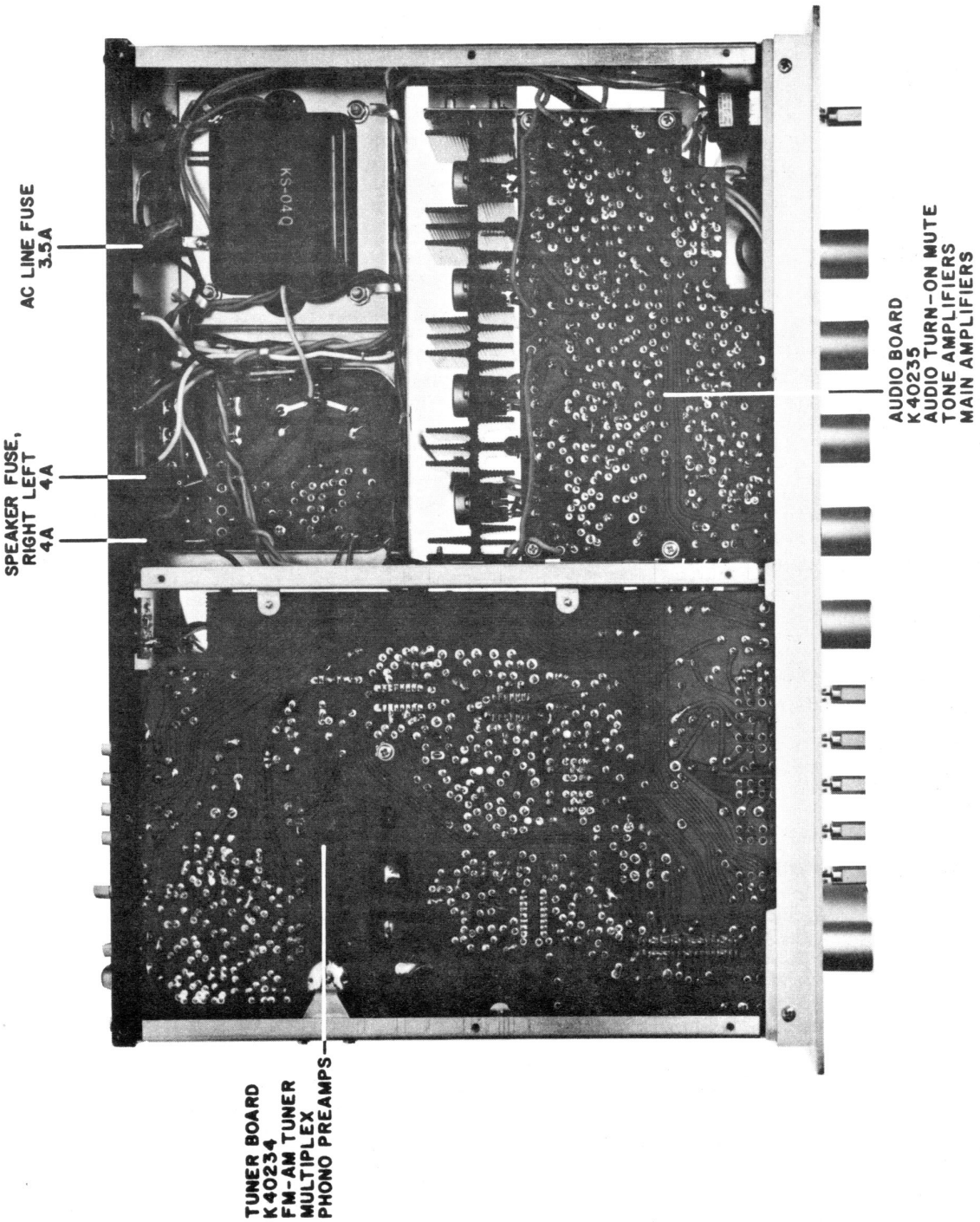
RATED POWER CONSUMBTION: 25-200 watts

FUSES:	Power line:	Domestic:	3.5 Amp 3AG
		Export:	1.5 Amp 3AG
	Pilot Lamps:		1.5 Amp 3AG
	Speaker Protection:		4.0 Amp 3AG
	B+/B- Supply:		8.0 Amp 3AG

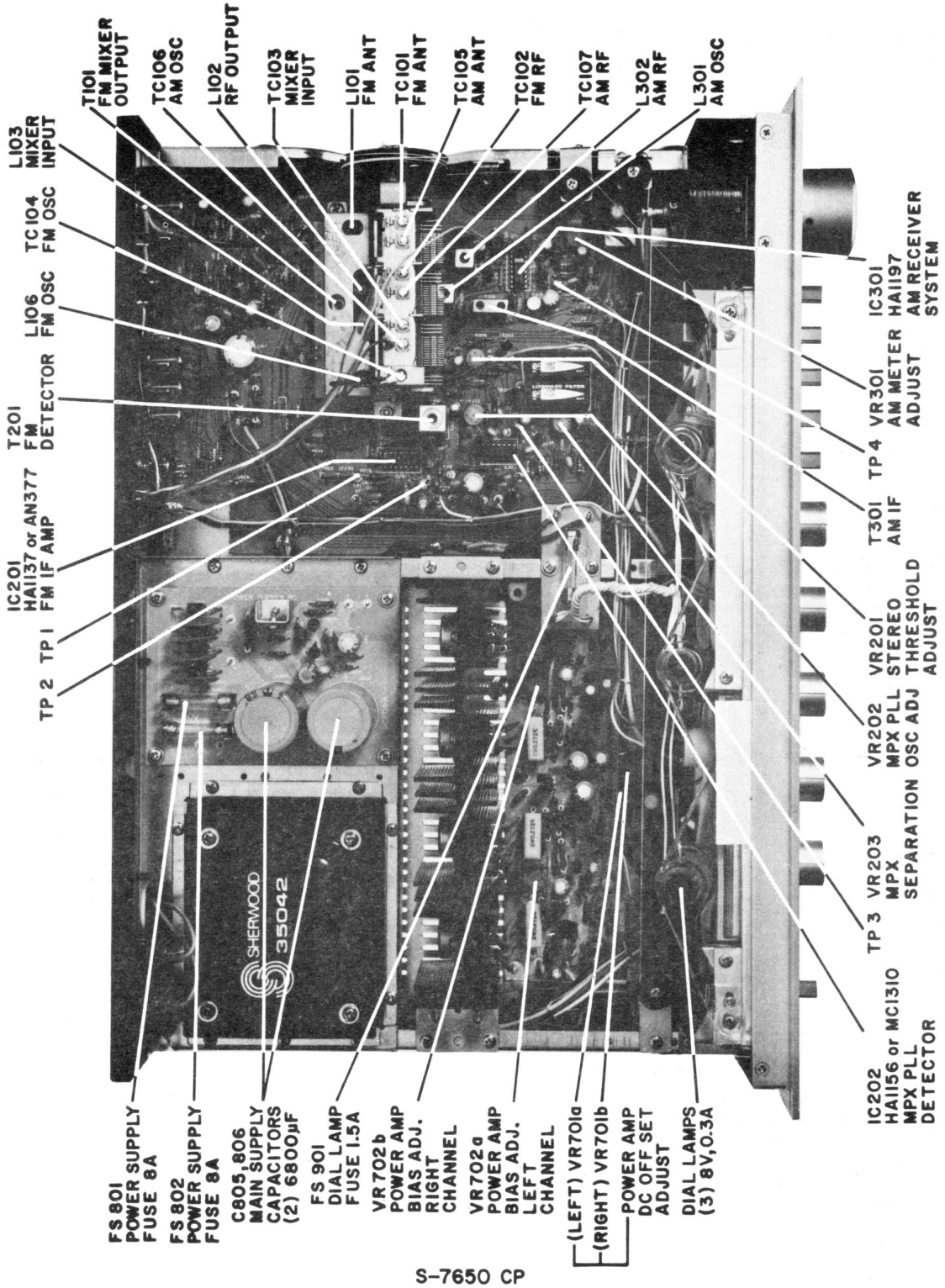
AC OUTLETS: 1 Switched 100 watts Max.
1 Unswitched 150 watts Max.

SEMICONDUCTORS: 49 transistors, 1 Dual-Gate MOS-FET, 3 integrated circuits, 4 power diodes, 3 zener diodes, 11 signal diodes, 3 LEDs.

Part Location Pictorials



S-7650 CP
BOTTOM VIEW



S-7650 CP
TOP VIEW

Replacement Parts List

TRANSISTORS AND FETS	REFERENCE NUMBERS	PART NO.	LIST PRICE
2SA841	TR401a,b; 402a,b; 602a,b		$1.24
2SB557 (PNP OUTPUT)	TR710a,b		8.01
2SC374	TR604		.84
2SC710	TR103		1.18
2SC734	TR803, 804		.87
2SC785	TR102		1.56
2SC1000	TR701a,b; 702a,b		1.28
2SD234 or TIP31B	TR801		1.70
2SD427 (NPN OUTPUT)	TR709a,b		6.48
2SK45 (Dual-Gate MOS-FET)	TR101		2.75
CS9012	TR605, 706a,b		.87
CS9013	TR606a,b; 704a,b		.87
CS9018 or 9016	TR201		.87
MPS-A06	TR708a,b		1.18
MPS-A55	TR404a,b		1.18
MPS-A56	TR707a,b; 711		1.18
MPS-L51	TR703a,b		1.18
MPS-9630	TR202, 203, 705a,b		.85
MPS-9633	TR204, 205, 403a,b; 601a,b; 603a,b		1.03
INTEGRATED CIRCUITS			
HA1137	IC201		6.61
HA1156	IC202		6.44
HA1197	IC301		5.91
DIODES, SIGNAL, POWER, ZENER AND LED			
MA150 or CDG24 (Signal)	D201, 202, 203, 204, 301, 501, 701, 702, 704a,b; 705a,b		.59
1N4002, 1 Amp, 100PIV	D601		.61
1N5402, 3 Amp, 200PIV	D801, 802, 803, 804		1.32
1N757A, 9.1V Zener, 400mW	D805		.94
1N968B/BZY88C20, 20V Zener, 400mW	D401, 703		.89
LEDS, SAR5133	D901, 902, 903	64034	1.50
ELECTROLYTIC CAPACITORS (Capacitance in microfarads. PC mounting unless otherwise specified)			
1/50WV	C711a,b; 715a,b	50AL-109-50E	.60
4.7/16WV	C208, 210, 214, 217, 230, 231, 309, 310, 410a,b; 605a,b; 611a,b	50AL-479-16E	.61
10/16WV	C317, 401a,b; 602, 809	50AL-100-16E	.63
22/16WV	C408a,b; 703a,b	50AL-220-16E	.72
22/25WV	C613, 712	50AL-220-25E	.73
22/35WV	C412	50AL-220-35E	.81
47/16WV	C315	50AL-470-16E	.81
47/50WV	C713, 714	50AL-470-50E	1.03
100/6.3WV	C506	50AL-101-6.3E	.75
100/16WV	C615	50AL-101-16E	.86
100/25WV	C811	50AL-101-25E	1.11
100/35WV	C807	50AL-101-35E	1.14
220/16WV	C220	50AL-221-16E	1.00
1000/25WV	C411	50AL-102-25E	1.61
6800/50WV	C805, 806	50001-04	7.93
0.22/16WV(Solid Aluminum)	C224	50AS-228-16J	.59
0.47/16WV(Solid Aluminum)	C223, 225, 313, 701a,b	50AS-478-16J	.59
1.0/16WV (Solid Aluminum)	C205, 228, 229, 601a,b; 609a,b	50AS-109-16J	.59
COILS, TRANSFORMERS AND CERAMIC FILTERS			
ANTENNA, AM ROD ASSY.	T901	67025-04	3.65
COIL, BALUN	T1	30049-02	1.03
COIL, QUADRATURE	T201 [#13]	30064	1.81
COIL, MPX FILTER	LPF201, 202	31007/35000070	2.57
COIL, AM OSCILLATOR	T301	30101	1.08

COILS, TRANSFORMERS (Cont.)	REFERENCE NUMBERS	PART NO.	LIST PRICE
COIL, AM W/CERAMIC FILTER	T303	30102	$1.67
COIL, AM IFT2	T302	30103	1.24
COIL, AM RF	L302	30104	1.08
COIL, 18uH	L201 [144Hz-180J]	30112/35500310	.84
COIL, 2.7uH	L701a,b	30045	.84
COIL, 39mH	L501a,b	30113	.81
FILTER, CERAMIC, FM IF	CF201, 202, 203 [SFE-10.7 MA8]	31008/35300012	1.61
TRANSFORMER, POWER	T2 120VAC, 50/60Hz	35042	42.39
ELECTRICAL COMPONENTS			
FUSE, 1.5 AMP, 3AG	F901 [Dial Lights]	312001.5	$ .30
FUSE, 3.5 AMP, 3AG	F902 [AC Line]	312003.5	.30
FUSE, 4.0 AMP, 3AG	F903a,b [Speaker Protection]	312004	.30
FUSE, 8.0 AMP, 3AG	F801, 802 [B- and B+ Supply]	312008	.30
LAMP, 8V, 300mA, w/leads	Dial Lights	64058	1.87
METER, SIGNAL STRENGTH	M1	75017-01	7.30
METER, ZERO CENTER	M2	75017-02	7.30
POTENTIOMETER, DUAL, 100K	VR602a,b [Volume]	15063	3.28
POTENTIOMETER, DUAL, 100K	VR612a,b; 615a,b [Tone]	15064	2.40
POTENTIOMETER, 100K	VR624 [Balance]	15058-03	1.47
SWITCH, LEVER	S8 [Power On-Off] (TV5 Rated)	90111-01	8.00
SWITCH, LEVER (DPDT)	S3,4,5,6 [Loudness,Muting,Mode,Noise]	90132A	4.07
SWITCH, LEVER (DPTT)	S2 [Tape Monitor]	90130A	2.11
SWITCH, ROTARY, 4 Pos.	S9 [Speaker Selector]	90133-02	2.46
SWITCH, ROTARY, 4 Pos.	S1 [Selector]	90129-02	5.13
SWITCH, SLIDE, (DPTT)	S7 [De-emphasis]	90138	1.24
TRIMMER RESISTOR, 4.7K	VR202, 701a,b [MPX Osc. Adj; DC Offset]	16000	.84
TRIMMER RESISTOR, 47K	VR201 [Muting & Stereo Threshold Adj.]	16002	.84
TRIMMER RESISTOR, 22K	VR203 [Stereo Separation Adj.]	16003	.84
TRIMMER RESISTOR, 2.2K	VR301, 702a,b [AM Meter Adj; Output Bias]	16004	.84
MECHANICAL COMPONENTS			
ESCUTCHEON ASSEMBLY		61066	24.50
DIAL POINTER		66023-02	1.50
DIAL GLASS		63053A-03	1.61
DIAL SCALE (Aluminum)		63052C	7.76
FUSE HOLDER (Rear Panel)		69020-02	1.53
JACK, STEREO PHONE, OPEN CIRCUIT		95035	1.87
KNOB, TUNING		72136	4.56
KNOB, CONTROL		72135	1.87
KNOB, LEVER		72087-02	1.36
RECEPTACLE BOARD, 4 PHONO JACKS		95042-01	1.68
RECEPTACLE BOARD, 8 PHONO JACKS		95042-03	2.81
TERMINAL, SPEAKER, 8 SPRING POSTS		76006	4.36
TERMINAL, ANTENNA, 4 SCREW POSTS, 1 SCREW TERMINAL & CABLE CLAMP		76008	1.76
WOODEN CABINET ASSEMBLY (W/Grille)		74103-02	28.00

ORDERING REPLACEMENT PARTS

When ordering replacement parts, always include part numbers (see Parts List above).

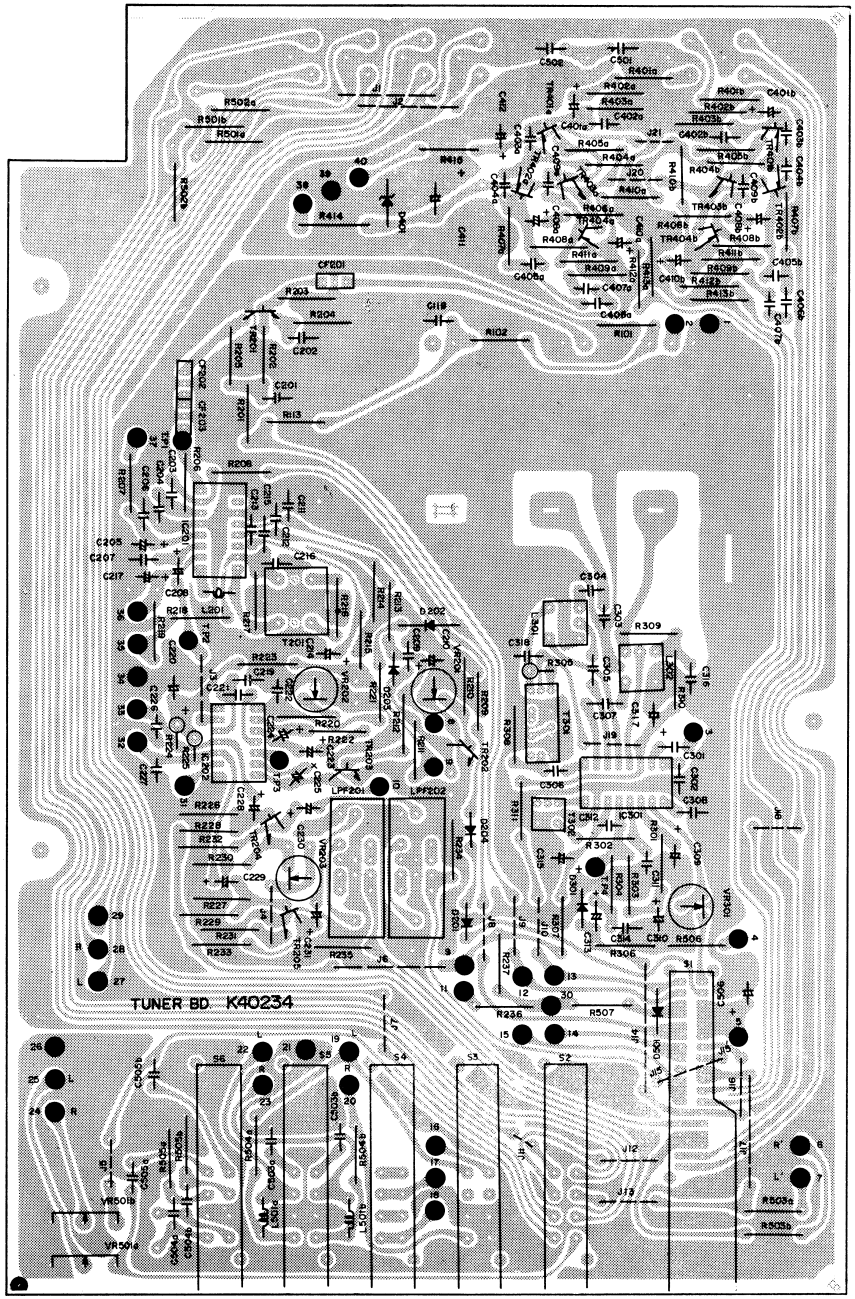
When defective parts are returned for replacement under warranty (Authorized Service Stations only) include a list by part number and value, of the part returned. Request either credit or replacement parts.

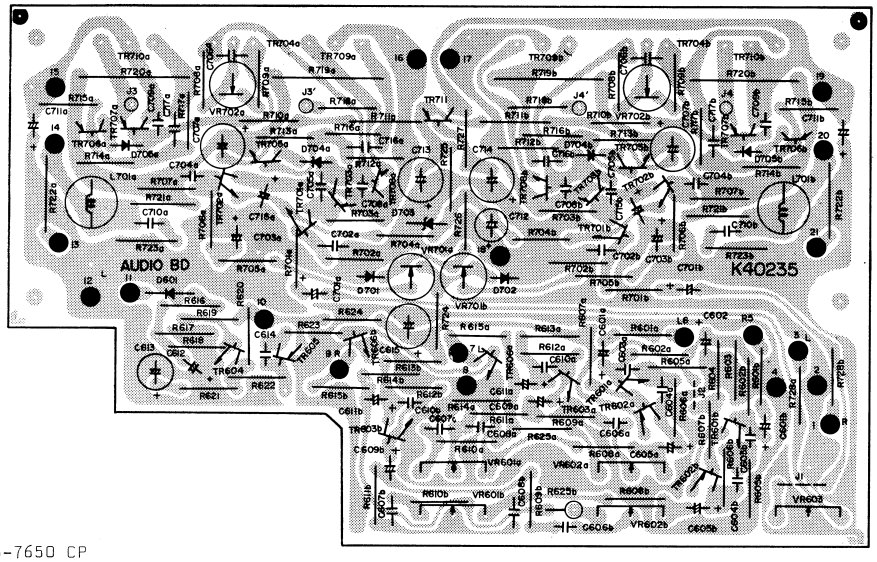
The return of entire circuit boards for replacement is not covered by the warranty except where component failure has resulted in physical damage to the board itself.

If a set or board cannot be repaired, return the complete receiver to the Sherwood Factory Service Laboratory, 4300 N. California Ave., Chicago, IL 60618 (312)478-7300. Include a complete description of the malfunction.

SHERWOOD ELECTRONIC LABORATORIES, INC., 4300 N. CALIFORNIA AVE., CHICAGO, IL 60618 USA

Litho in USA 7/78

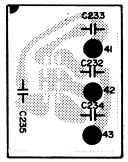




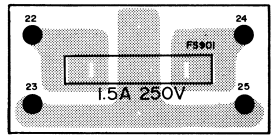
S-7650 CP

PRINTED CIRCUIT BOARD ASSEMBLIES

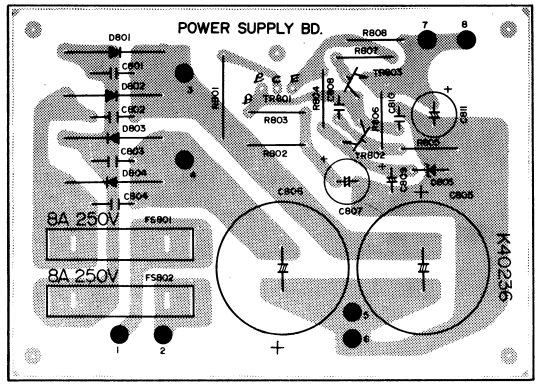
CIRCUIT BOARDS ARE SHOWN FROM THE COMPONENT SIDE; FOR A VIEW FROM THE COPPER SIDE, TURN THIS SHEET OVER AND HOLD UP TO A LIGHT.



FM DE-EMPHASIS BOARD



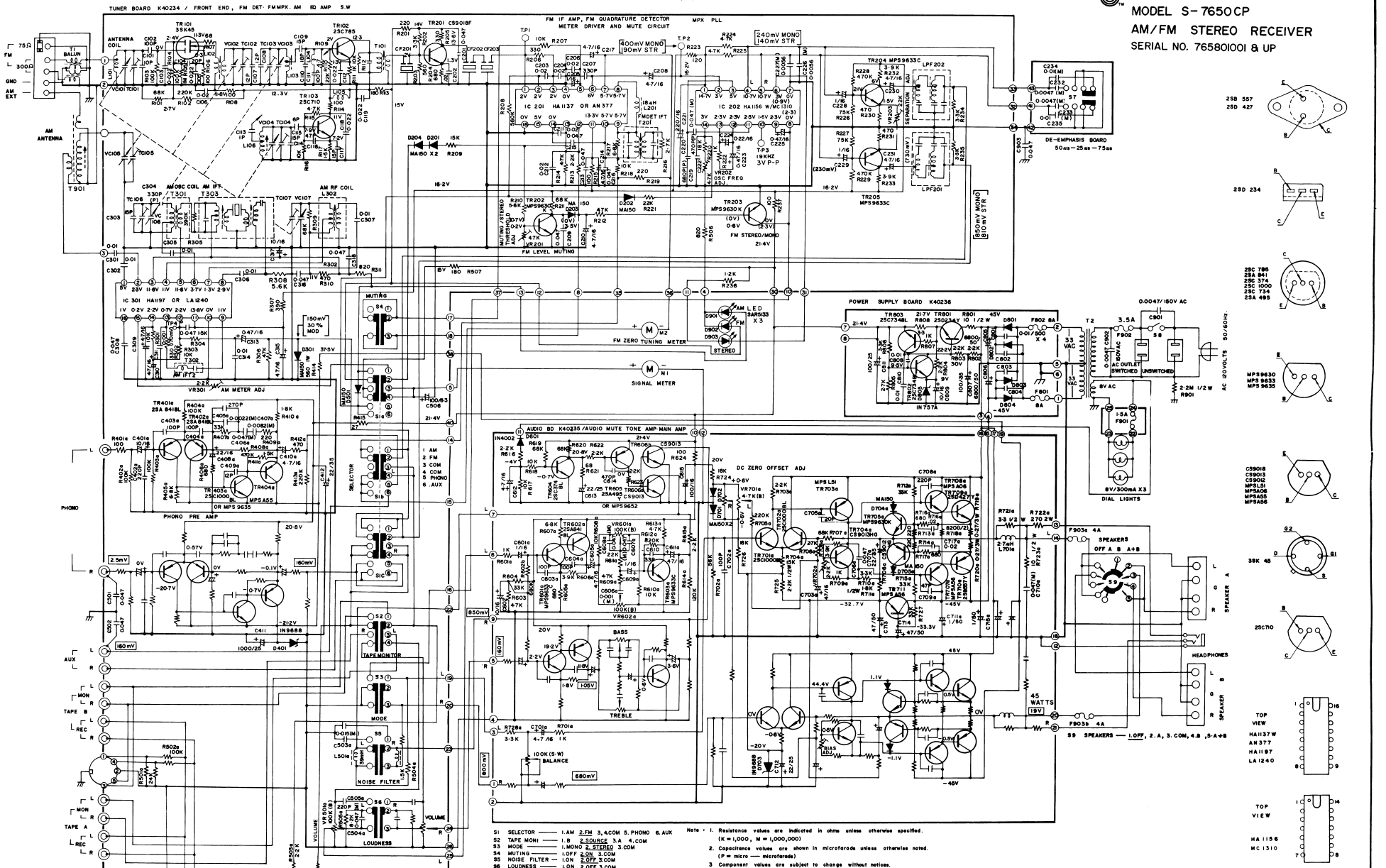
DIAL LIGHT FUSE BOARD



SHERWOOD ELECTRONIC LABORATORIES, INC.
4300 NORTH CALIFORNIA AVENUE
CHICAGO, ILLINOIS 60618

SCHEMATIC DIAGRAM

SHERWOOD
MODEL S-7650CP
AM/FM STEREO RECEIVER
SERIAL NO. 76580100I & UP



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