

SECTION 4 - SOUND SYSTEM MAINTENANCE

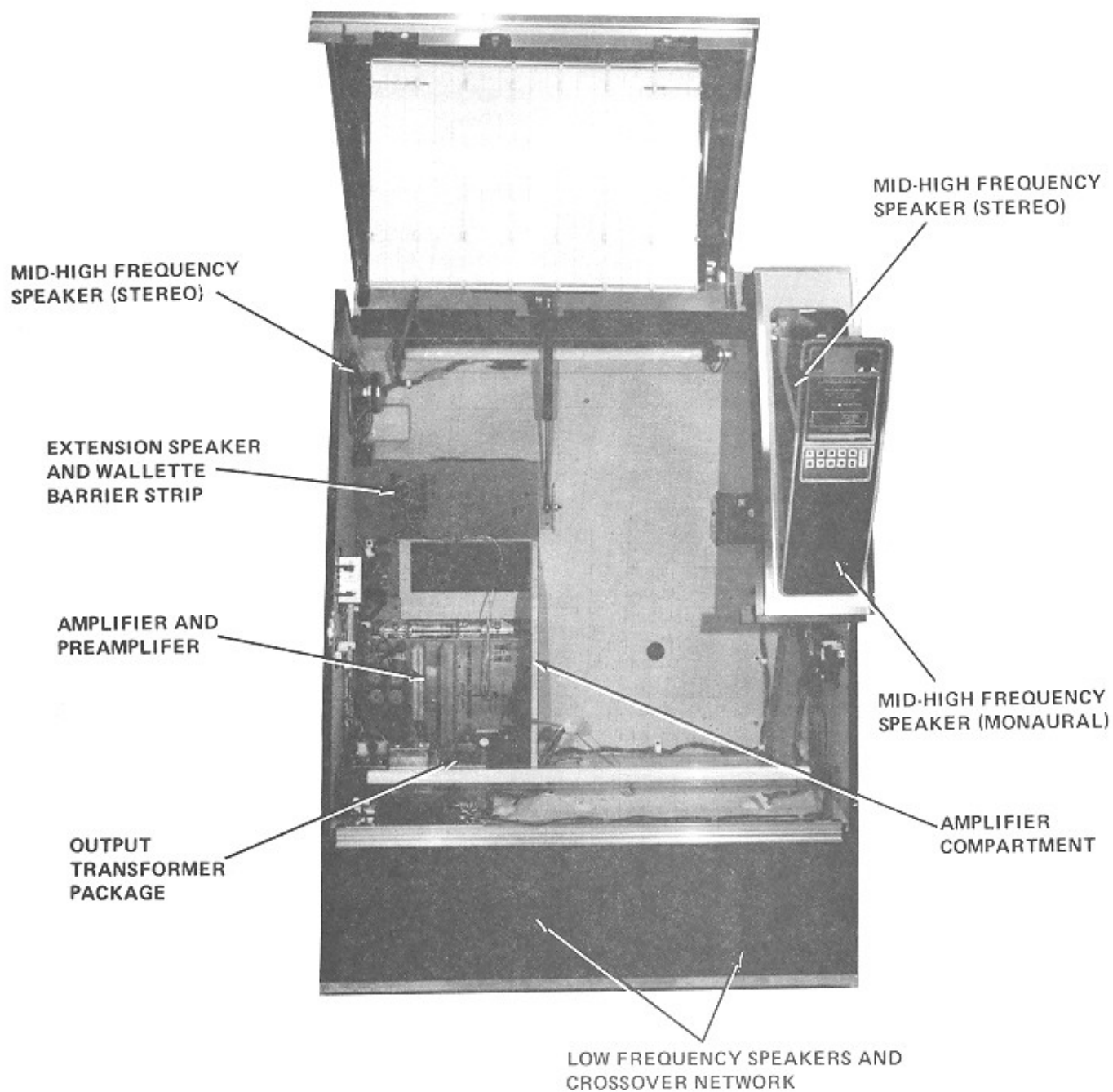


FIGURE 2-24. SOUND SYSTEM MAJOR COMPONENTS

INTRODUCTION

This section contains explanations of, and connection charts for, extension speaker and Walette operation. Sound system troubleshooting is covered and principles of operation of the sound system is completely detailed.

EXTENSION SPEAKER OPERATION

70-VOLT CONSTANT VOLTAGE EXTENSION SPEAKER OPERATION

Where sound coverage is required in rooms or areas not covered by the phonograph, extension speakers are required. Rowe recommends using the amplifier 70-volt output with 70-volt extension speakers to provide trouble-free operation. Each Rowe/AMI 70-volt speaker includes a matching transformer. The matching transformer has power taps so that power consumed by each speaker in the system can be adjusted. To obtain the total power required for the whole system, simply add the wattage settings of each extension speaker to the wattage setting of the phonograph speaker system. The total wattage must not exceed the rated wattage of the amplifier; otherwise the amplifier will be overloaded. Overloading the amplifier will result in distorted sound and reduced loudness. It is always advantageous to approximately match the total speaker power to the power rating of the amplifier because in low volume installations, the amplifier can be operated with a reduced volume control setting. This results in greater bass boost and a more pleasing tonal balance.

NON-70-VOLT EXTENSION SPEAKER OPERATION

Though less desirable than 70-volt operation, speakers may be connected to impedance taps on the output transformer package. Speaker power ratings and impedance must be considered so that each speaker will get the proper proportion of power. Three requirements must be met:

1. The speakers must be wired so that the power consumed by the phonograph and extension speakers does not exceed the amplifier power rating.
2. Each speaker must receive the right amount of audio power to have equal loudness to the other speakers in the system or have higher or lower loudness as required.
3. All speakers must be connected with the proper polarity.

REMOTE VOLUME AND CANCEL CONTROL

Connect the 3-06322-01 remote volume and cancel control to the Phonograph as shown below.

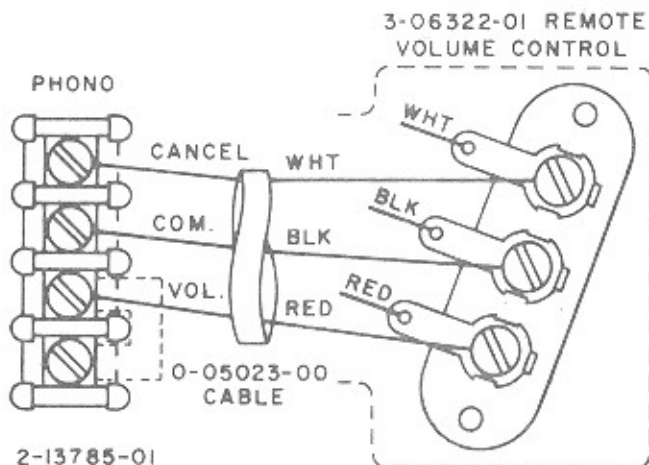


FIGURE 2-25. REMOTE VOLUME AND CANCEL CONTROL CONNECTIONS

FULL COVERAGE SOUND SYSTEM CONNECTION CHART

See figure 2-26 on page 2-58 for Stereo Sound system connection chart. Observe the following notes when making connections:

1. Connections shown for 70-volt extension speakers are for Models EX-201, EX-301, and EX-401.
2. Connections shown for 8-ohm extension speakers are for 8-watt level. See the table below for information on other power levels and for use of speakers having other impedances.

3. Polarity of connections between amplifier, wallbox speakers, and extension speakers must be observed for correct phasing of extension speakers, wallbox speakers, and Phonograph speakers.
4. Amplifier watts per channel for speakers connected across both channels (for monaural extension of sound) is one half watts per speaker power.
5. Allow 1.4 watt per channel for each Wallette wallbox connected (normal connection).
6. Connect remote volume control to barrier strip on top of amplifier compartment door.

TABLE 2-7. SPEAKER CONNECTION CHART

CHART NO. 1			CHART NO. 2		
SPEAKERS CONNECTED TO EITHER LEFT CHANNEL OR RIGHT CHANNEL - USED IN PAIRS FOR STEREO EXTENSION OF SOUND			SPEAKERS CONNECTED ACROSS BOTH CHANNELS - FOR MONAURAL EXTENSION OF SOUND		
	TERMINALS	WATTS PER SPEAKER		TERMINALS	WATTS PER SPEAKER
8 OHM SPEAKERS	E1 - E2	0.5	8 OHM SPEAKERS	E2 - E2	2
	E1 - E3	2		E3 - E3	8
	E2 - E4	4.5		E4 - E4	32
	E1 - E4	8	16 OHM SPEAKERS	E2 - E2	1
	E1 - E5	14		E3 - E3	4
	E2 - E6	24		E4 - E4	16
16 OHM SPEAKERS	E1 - E3	1	E5 - E5	28	
	E2 - E4	2.25	CONSTANT VOLTAGE SPEAKERS	A1 - A2	DETERMINED BY POWER SETTING AT EXTENSION SPEAKER
	E1 - E4	4		OR	
	E1 - E5	7		A2 - A1	
	E2 - E6	12	AMPLIFIER FULL POWER OUTPUT VOLTAGES (PER CHANNEL)		
E1 - E6	16				
45 OHM WALL BOX SPEAKERS	E1 - E3 E1 - E4 E1 - E5	0.35 1.4 (NORMAL) 5			
CONSTANT VOLTAGE SPEAKERS	A1 - A2	DETERMINED BY POWER SETTING AT EXTENSION SPEAKER			
NOTE: WATTS PER CHANNEL FOR SPEAKERS CONNECTED ACROSS BOTH CHANNELS (FOR MONAURAL EXTENSION OF SOUND) IS ONE HALF OF "WATTS PER SPEAKER" INDICATED IN CHART 2.					

The use of 301-65327 Amplifier Overload Tester is recommended to warn the installer if the extension speaker hookup causes an overload.

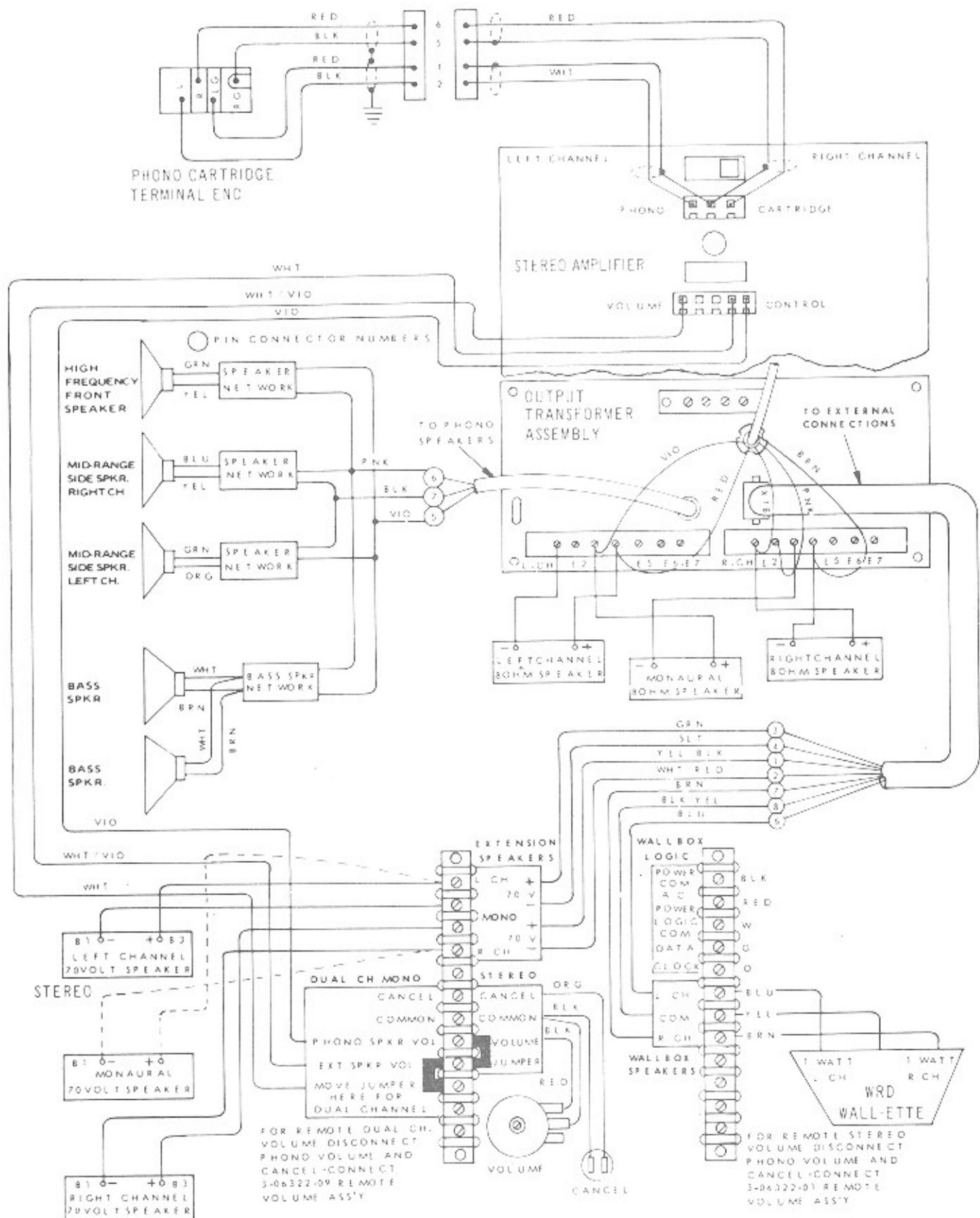
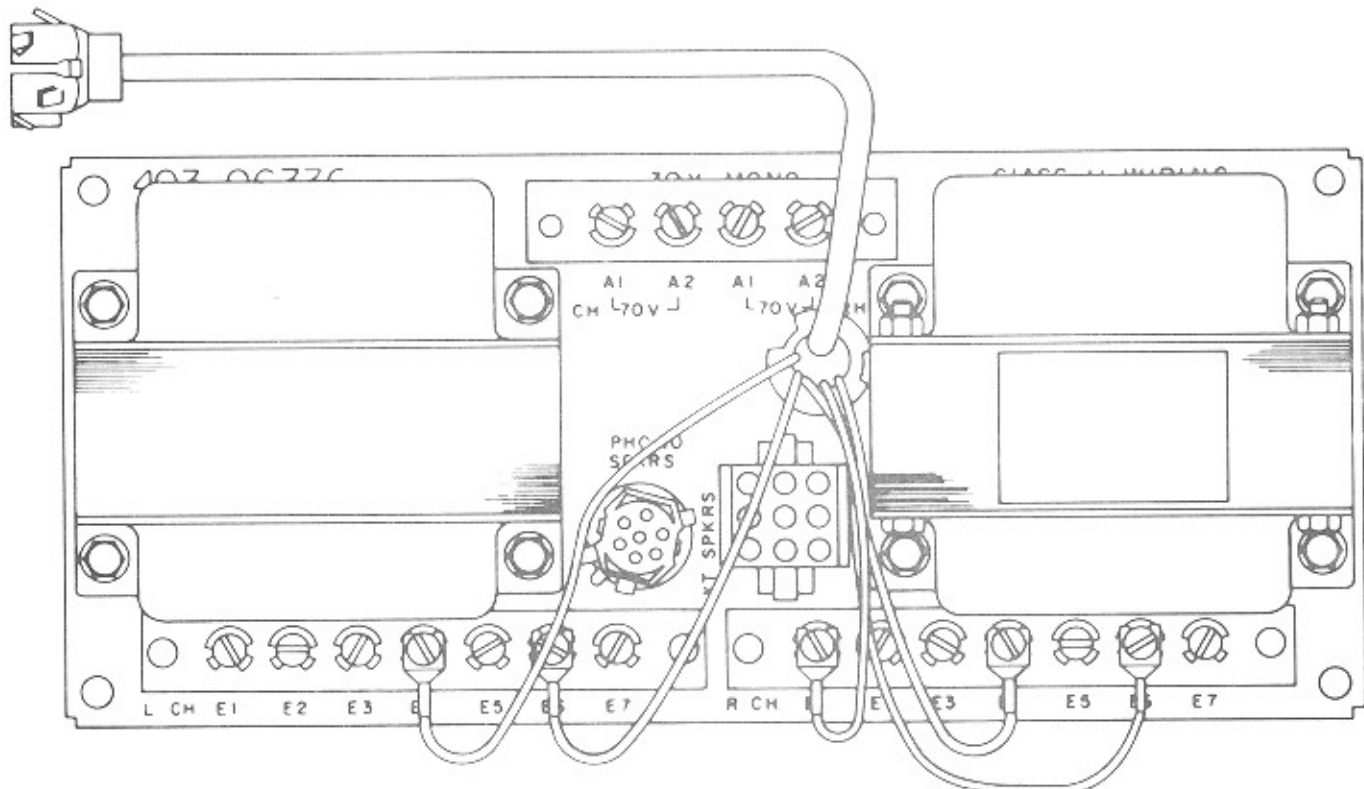


FIGURE 2-26. STEREO SOUND SYSTEM CHART
For Stereo Phonograph, Extension Speakers & Wallethe Speakers



PHONO SPEAKER POWER LEVEL	PHONO SPEAKERS		POWER PER CHANNEL FOR EXT. SPEAKERS
	L.CH. Violet Lead	R.CH. Pink Lead	125 Watt Amplifier
64	E6	E6	31
28	E5	E5	49
16	E4	E4	55
4	E3	E3	61
1	E2	E2	62
Black lead to E1 (Common) for all above power levels	CAUTION: Total power rating of load must not exceed 62.5 watts per channel for the 125 watt amplifier.		

FIGURE 2-27. POWER LEVEL SETTINGS

POWER LEVEL SETTINGS

Power level settings to the phonograph speaker system are adjustable by moving the speaker leads on the output transformer package terminal strip. When setting levels for extension speakers be sure not to exceed the extension speaker rating with the volume control set to maximum position. Speaker damage may result. Change the level as follows:

1. Make a selection. Refer to table 2-7 and check that speaker power ratings will not be exceeded. Set volume control to maximum position.
2. With a selection playing, refer to figure 2-27 and change wiring to increase power one level at a time. Do not exceed extension speaker power rating.
3. The desired loudness will usually fall between two adjacent power levels. Choose the higher of the two levels. Control the sound level with the volume control.

This procedure will result in a "normal" frequency response. Some locations may require more bass than is obtained with this procedure and a "max" bass boost setting. Additional bass response can be obtained by using a higher power level setting and lowering the volume control setting accordingly.

WALLETTE SPEAKER POWER LEVELS

Wiring for Wallette speakers is normally connected to terminal E4 for a 1.4 watt power level per speaker. For higher or lower levels, change wiring as shown in table 2-8.

TABLE 2-8. ALTERNATE POWER LEVELS FOR WALLETTE SPEAKERS

Connections of Red Brown Leads at Terminal Strip	Watts Per Speaker
Terminal E3	0.35
Terminal E4(normal)	1.4
Terminal E5	5

SOUND SYSTEM QUIK CHEK

Rowe/AMI solid state sound systems are service designed for easy, fast repair. The following check list will enable locating troubles on location with your finger, a paper clip or an inexpensive VOM. Be sure not to plug in or unplug circuit boards with power on. Checks should be made with the mechanism in the record playing position. Perform the checks in the order listed.

NO SOUND - BOTH CHANNELS

1. **POWER - SECOND LEVEL** - Check that the amplifier is plugged in and is receiving power from the junction box. Disconnect mute plug. Press the circuit breaker reset pushbutton on the amplifier chassis to make sure that it not tripped. Application of power to the amplifier should result in an audible "thump" through the speaker system.
2. **MUTE RELAY** - Mute relay must be energized. Unplug mute relay plug from amplifier chassis socket. If the contacts transfer, the relay is OK, listen for a click. If the contacts do not transfer, replace the relay or entire preamp. Other mute circuit components and their operations are described in the service manual.
3. **VOLUME CONTROL** - Disconnect the volume control plug from the amplifier chassis and short out socket pins 2 and 6 with a paper clip. Full volume indicates an open volume control or line. If full volume at all times is the problem and disconnecting the volume control plug does not kill the sound, replace the preamp board.
4. **CARTRIDGE CONNECTIONS** - Make sure that the stylus is not bent or broken; replace if necessary. With a selection playing, unplug the tone arm cable from the amplifier. Press a finger against the plug pins and check for a hum in both sound channels. If hum is present, check cartridge wiring against the service manual; replace the cartridge if necessary.
5. **EXTENSION SPEAKERS** - To check if extension speakers are shorting out the amp, simply disconnect the extension speaker plug from the transformer package receptacle.
6. **OUTPUT DEVICES** - Visually inspect the driver board fuses for an open condition. If a fuse is open, replace the associated output device. The two devices used in each channel are not interchangeable; check the part number on the case and install an identical or equivalent replacement. Before mounting the device onto the heat sink, be sure that the heat sink surface is flat and that there are no burrs around the mounting holes to cause a short. Be sure that one and only one mica insulator is between the device and the heat sink and heat transfer compound(spec. 53) is On Both Sides Of Insulator,

7. **FILTER CAPACITORS** - Check for 30 VDC in the amplifier power supply. Connect the negative meter lead to ground and check the voltage at the terminals of the large electrolytic filter capacitors located on the amplifier chassis next to the power transformer. When taking readings on the capacitor with the outer shell isolated from chassis ground, move the negative meter lead from the chassis to one of the shell tabs. Check that the voltage on each capacitor terminal is the same. A lowered voltage at one of the capacitor pins indicates that the capacitor maybe defective and should be replaced, or that one or more rectifier diodes is defective. Another indication of defective filter capacitors is excessive hum in the sound output.
8. **PREAMP OUTPUT** - Set volume control to full volume position. With a selection playing, unplug the tone arm plug from the amplifier chassis. Press a finger against the plug pins and check for approximately 1VAC at the preamplifier output (pins 3 and 5 of 13 pin connector). Replace preamp board if voltage is not present.
9. **DRIVER BOARD OUTPUT** - With the volume control set to full, a selection playing and one finger against the amp input pins, check for 16 VAC between center pin driver board 5 pin connector and ground. If 16 VAC is not present, replace driver board.

NO SOUND, LOW SOUND OR DISTORTED SOUND RIGHT OR LEFT CHANNEL ONLY

1. ✓ **BALANCE CONTROL** - Adjust control for equal sound from each channel. Leave in mid position if adjustment is not possible.
2. ✓ **REVERSE CARTRIDGE LEADS** - With a selection playing, reverse tone arm cable connections to the amplifier. If the sound switches channels, check cartridge connections against the service manual. Replace the cartridge if connections are OK. Make sure that the stylus is not bent or broken; replace if necessary.
3. **EXTENSION SPEAKERS** -
See Step 5 above
4. **OUTPUT DEVICES** -
See Setp 6 above
5. **PREAMP** -
See Step 8 above

- ✓ **DRIVER BOARDS** - See Step 9 above. If one driver board is defective, switch input to "Mono" and use one good channel in emergency.

CONSTANT HIGH VOLUME - CAN NOT BE ADJUSTED AT VOLUME CONTROL

- ✓ **VOLUME CONTROL** - Disconnect volume control plug from amplifier chassis. No sound indicates that there is a short in the volume control line.
- ✓ **PREAMP** - If there is full volume with the volume control plug disconnected, replace the preamplifier board.

EXCESSIVE RECORD SCRATCH

- ✓ **WORN RECORDS** - Replace worn records.
- ✓ **DAMAGED STYLUS** - Make sure that the stylus is not worn or broken; replace if necessary. Check stylus force.
- ✓ **TREBLE RANGE CONTROL TOO HIGH** - Reduce setting of control for worn or noisy records.

EXCESSIVE HUM, LOW VOLUME

- ✓ **OPEN SHIELD** - Be sure that shield or wires are not broken between cartridge and the amplifier input plug.
- ✓ **CARTRIDGE DEFECTIVE** - Substitute a good cartridge.
- ✓ **FILTER CAPACITORS** - Check filter capacitor, parallel an extra 500 Mfd. 50V capacitor across capacitor in chassis. If hum drops, replace capacitor.

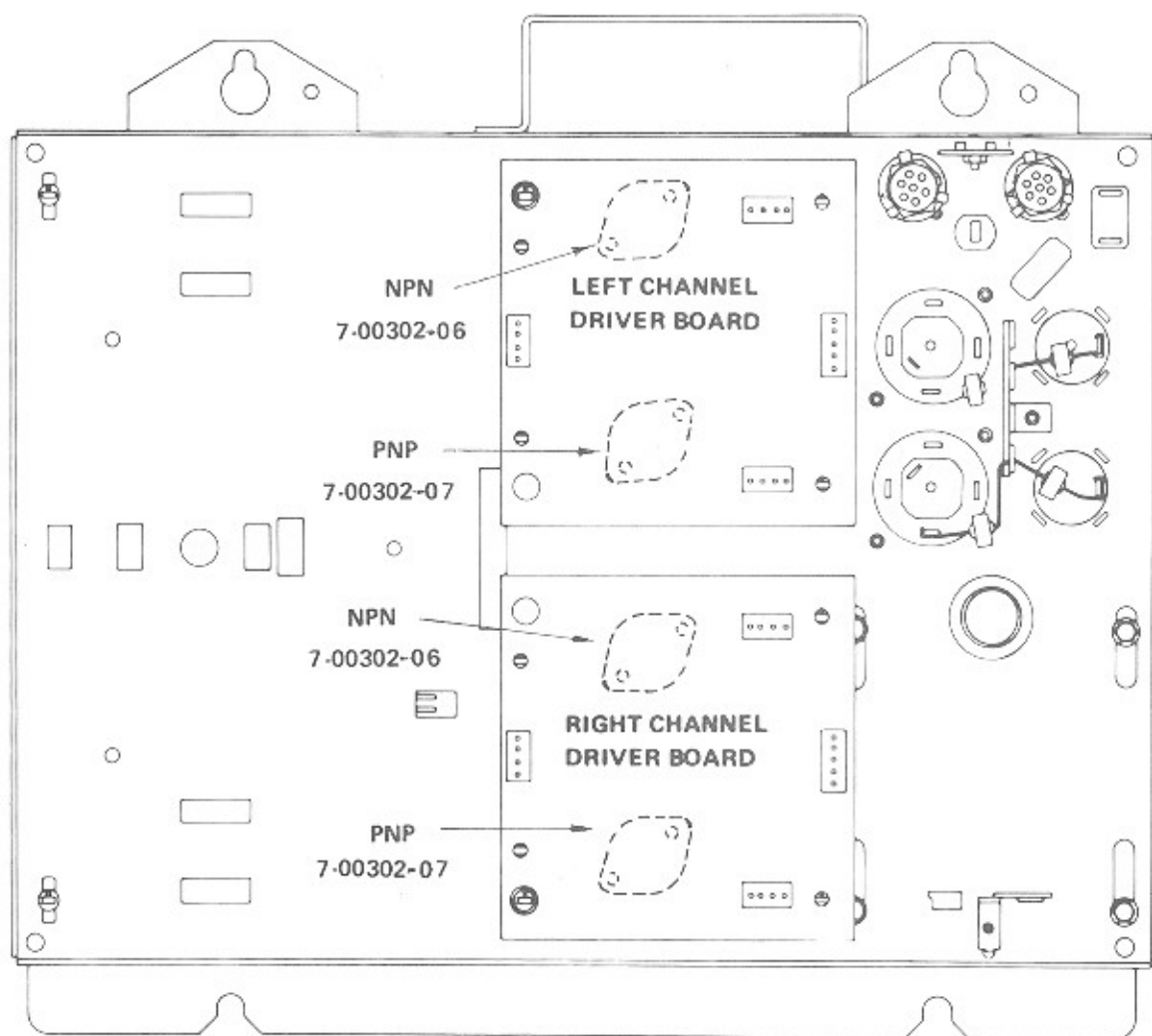


FIGURE 2-28. AMPLIFIER CHASSIS - BOTTOM VIEW

SOUND SYSTEM PRINCIPLES OF OPERATION

The phonograph sound system translates stylus vibration into electrical voltage, amplifies the voltage and the speaker converts it into sound. The sound system consists of a stylus and cartridge, a stereo preamplifier and amplifier unit, a speaker system, a volume control and an output transformer package. Identification and location of each major component is shown in figure 2-24. The purpose and description of each major component is explained in the following paragraphs.

Stylus and Cartridge The stylus and cartridge convert mechanical movement into equivalent electrical voltage. The unit is mounted on the record changer tone arm. This output voltage is transmitted through shielded cable to the preamplifier.

Preamplifier and Amplifier (see figure 2-29). The amplifier unit amplifies phonograph cartridge output and drives the speaker system. The latest concepts in silicon transistor circuitry are designed into the 125 watt stereo system. It delivers a full 62.5 watts rms power per channel. Its wide frequency response and low distortion assure good record reproduction. The unit incorporates automatic volume control (AVC).

The output stage is coupled to the speakers. Treble range and bass boost controls are provided on the preamplifier to compensate for differences in room acoustics. A mute relay silences the amplifier while a record is being transferred to or from the turntable. Preamplifier circuitry is completely solid state for durability and long service life.

Protection is included for voltage transients, excessive heat and accidental shorting of speaker leads.

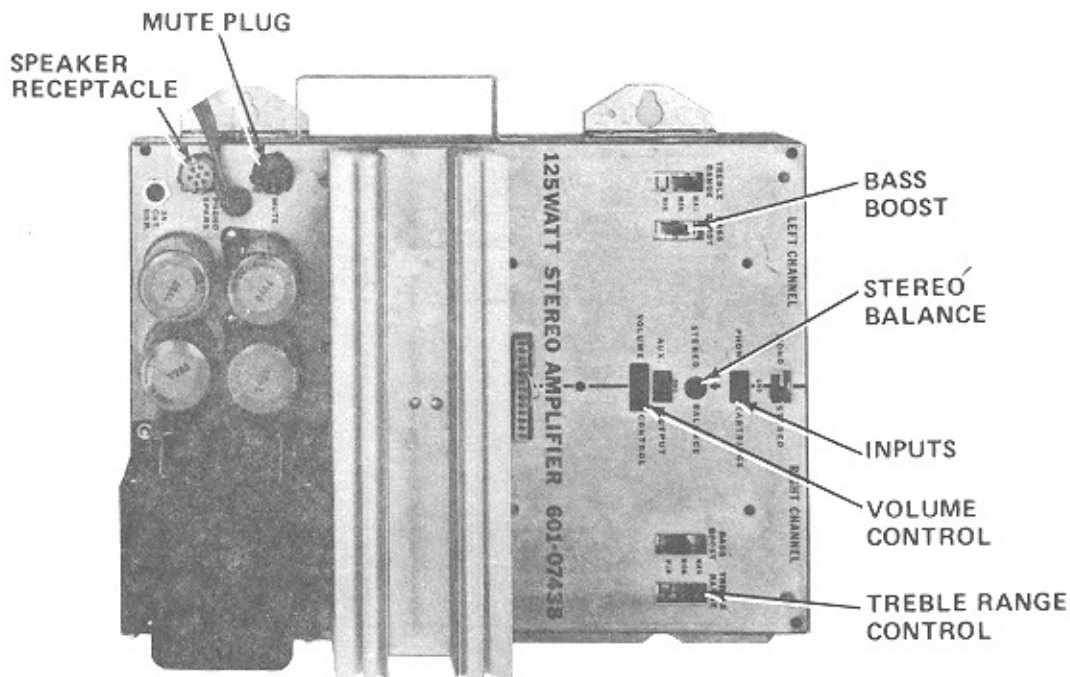
Preamplifier (see figure 2-31). The preamplifier amplifies the phonograph cartridge output to drive the power amplifier. The components for both the right and left audio channels are contained in a single plug-in circuit board mounted under the amplifier chassis. Because both channels are identical, only the left channel will be described.

Signal voltage from the phono cartridge is applied from P7-1 through C1 and C3 to pin 9 the positive phase input of integrated circuit amplifier Z1-1. The output from pin 13 of Z1-1 is fed back through C-11, C-13, R-9 and R-11 to pin 8, the negative phase input to control the gain of the amplifier. C-9, R-3 and R-5 pre-emphasize the low frequencies in accordance with the RIAA recording standard.

The signal from pin 13 is also fed through C-15, R-17, to the junction of CR1 and CR3 and then through C17 to pin 5, the positive phase input of Z1-2. Direct current through CR1 and CR2 controls the signal level through the AVC circuit.

Output from pin 1 of Z1-2 is fed back through C23 and R23 to pin 6 to control the stage gain. C25, C30, R19, R22 and R89 provide balance control to adjust balance between the left and right channels.

Output from pin 1 is also applied through CR5 to the base of Q9 where it is amplified and applied to the base of Q10. Current pulses from Q10 charge C91 through R78. C91 discharges through R37 through CR1 and CR3. As the signal voltage increases this current increases, lowering the effect resistance of CR1 and CR3. CR1 and CR3 in parallel act as a variable resistor which in combination with R17 forms a voltage divider to control the signal level at pin 5 of Z1-2. This AVC circuit holds the average signal level at the output of the second stage at about .85 volts regardless of the recording level of the record. AVC control voltage can be measured at TP-1.



The output of Z1-2 is connected to P6-1 through C29 and is available to drive auxiliary equipment.

The output of Z1-2 is also fed through the tone control switching circuits to Q1 and then through R43 and C53 to the junction of CR13 and CR15. These two diodes are part of the volume control circuit. The volume control circuit will be explained later.

The signal from the junction of CR13 and CR15 is led through C55 to pin 5 of Z3-2. This is the positive phase input of integrated circuit amplifier Z3-2. The output is fed back through C65 and R51 to the negative phase input to control the gain. The output is also led through C63 and the contacts of mute relay K1 to P3-2 and also the base of Q3. Q3 inverts the signal and the inverted signal is connected to P3-1. Jumpers wired to a plug connect the pins of P3 to provide the desired output signals from the pre-amp at P3-3 which plugs into the input of the driver board.

The right channel is identical to the left except that there is no inverter.

Switch S5 ties the two input pins together. This results in dual channel monophonic operation.

Volume Control Circuit

The preamplifier is designed to use either of two volume controls.

A single 2 wire volume control can control both channels for stereo operation. Pins 1 and 5 of P5 are tied together and a 10K volume control is connected from this junction to ground (Pin 3). When the volume control is set at 10K ohms about 2 volts DC will be applied to Z3-1 pin 9. As the volume control resistance decreases to zero the voltage at pin 9 also decreases to zero. Lamp DS1 and zener diode CR11 prevent damage to the circuit if excessive voltage is accidentally applied to the volume control circuit.

age is accidentally applied to the volume control circuit. Z3-1 is connected as a unity gain amplifier so the output voltage will follow the input. This output voltage causes direct current to flow through R63, CR15 and CR13. When the current is zero the effective resistance of these diodes is very high. As the current increases the effective resistance decreases to a very low value. The effective resistance of the two diodes in parallel in series with R43 forms a voltage divider to control the signal voltage at the junction of the two diodes and so controls the volume of sound produced.

The effective resistance of the diodes varies somewhat due to temperature change. R65, R67, R69 and RT1 modify the gain of Z3-1 to compensate for this temperature sensitivity so as to hold the volume constant as its set value regardless of ambient temperature change.

Independent dual channel control may be accomplished as follows:

1. Tie pins 1 and 2 of P5 together and to one side of one volume control.
2. Tie P5 pin 5 to one side of a second volume control.
3. Tie the other side of both controls to P5 pin 3 (ground).

Power Amplifier (see figure 2-31). The power amplifier features fully protected output stages. The two driver boards, one for each audio channel, plug in for ease of replacement and are completely interchangeable.

The preamplifier output arrives at pin 3 of P4 of the driver board and is fed to the base of Q3 through R1 and C4. Q7 has two collector outputs. The left side output, as viewed on the schematic, is amplified from the base to collector of Q8. The signal from the collector of Q8 is fed to output devices Q101 and Q102.

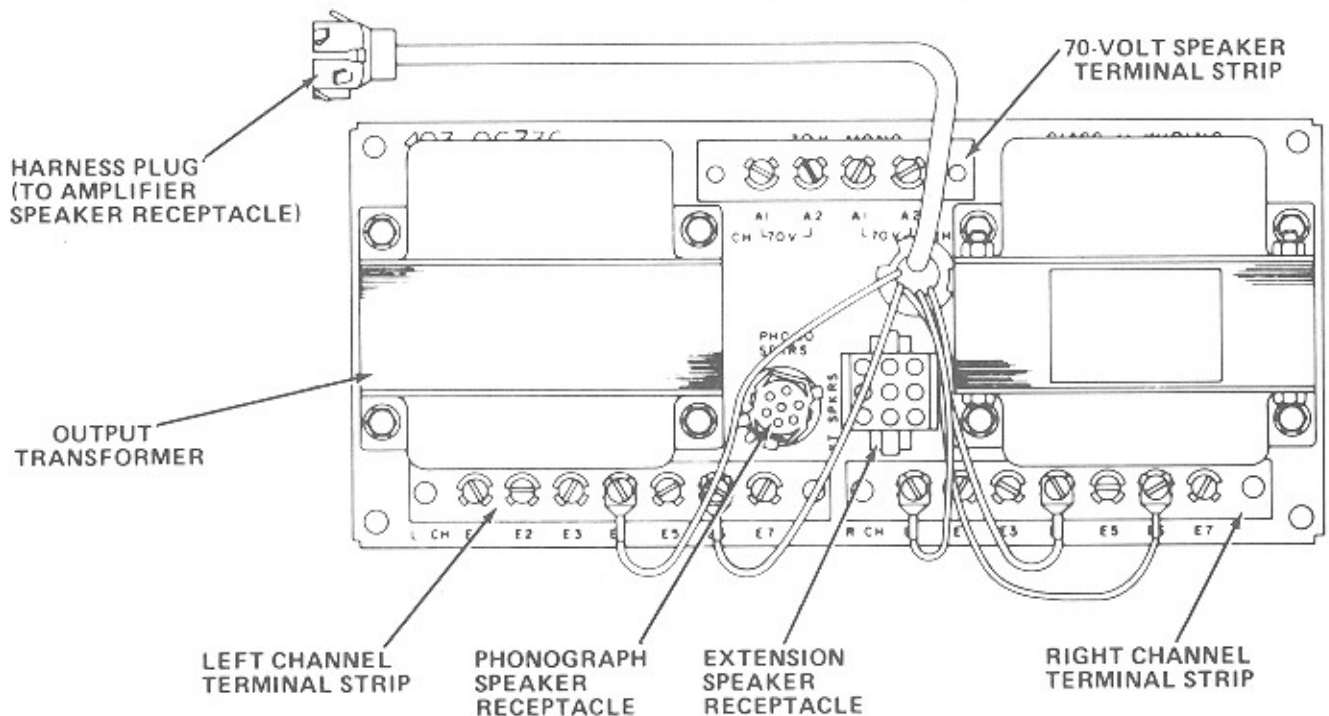


FIGURE 2-30. OUTPUT TRANSFORMER PACKAGE COMPONENTS

Q101 and Q102 are mounted on a heat sink. These complementary darlington devices, although more reliable than conventional designs, are fused to prevent damage to driver board components. See page 2-1 for troubleshooting and replacement data on these devices.

Transistor Q9 is part of the positive clamp circuit. Output device Q101 draws current through resistor R29, Q4 drops the base of output device Q101 to below R29 limiting current to a safe value. Q6 acts on the negative signal component in the same manner as positive clamp Q9.

Output Transformer Package (see figure 2-30). The transformer package enables the amplifier to operate 70-volt lines for extension speakers. The package also provides terminal strips for obtaining several different power levels for both phonograph and extension speakers. The unit consists of two output transformers and associated parts mounted on a single chassis. The chassis is mounted to the floor of the cabinet to the left of the record changer mechanism.

The output transformer secondary connections are available at three terminal strips. Phonograph speaker power is selected by connecting the violet and pink leads according to figure 2-27. Extension speakers can be connected as directed in figure 2-26, speaker connection chart.

Speaker System. The speaker system consists of two 10-inch low frequency speakers, two 6-inch wide range speakers, and one front firing 5-1/4 inch speaker for mid and high frequencies.

The 10-inch, heavy duty speakers are mounted in a duct-tuned enclosure at the bottom of the cabinet. The 6-inch speakers are mounted at the sides of the cabinet. The 5-1/4 inch speaker is located on the selector panel.

Two Wire Volume Control. A Rowe/AMI exclusive, the two wire volume control simplifies large, complex installations and saves costs. Redesigned preamplifier circuitry permits remote volume control operation using two unshielded wires. Any wires can be used - there are no special requirements for conductor size and shielding.

AMPLIFIER OUTPUT TRANSISTOR REPLACEMENT

Rowe Amplifiers are designed for easy replacement of the output transistors. In most cases when an output transistor is replaced the amplifier will perform properly without further attention.

However, certain faults in other components may cause early transistor failures due to overheating caused by unbalance or excessive idle current.

Whenever an output transistor is replaced we recommend that the following tests be performed.

A. Check the balance as follows:

1. Set a volt-ohm-millimeter (VOM) to the 10 volt DC scale. Connect one lead to the chassis of the amplifier. Connect the other lead to the output terminal of the driver board of the channel to be checked. Green wire for right channel, yellow for left.
2. Disconnect any load from the amplifier (including transformer package).
3. The reading should be zero. If it is not, adjust the balance potentiometer on the driver board to get a zero reading. NOTE: The pot was sealed at the factory. When starting this procedure it will be necessary to break the seal.
4. Set the VOM to its 1 ma. current scale and carefully readjust for zero. When a zero reading is reached switch polarity of the meter and watch to see that the needle does not move more than 1/16 inch.
5. Reseal the potentiometer with a drop of glyptal or household cement (DUCO). Be careful to seal the knob of the pot to the body and avoid getting glyptal or cement inside the pot.

B. Check idle current as follows:

1. First check balance as indicated in Section A.
2. Remove the fuse in the positive side of the driver board.
3. Set the VOM to the 100 ma. current scale. Connect the positive lead to the supply side of the fuse. Connect the negative lead of the meter to the transistor side of the fuse.
4. The current shall be ± 10 milliamps.

NOTE:

1. If current is excessive look for a fault in the bias (diode package) circuit by checking voltage as shown on the schematic.
2. Identify the test points referred to above by reference to the schematic for the particular amplifier you are working on.

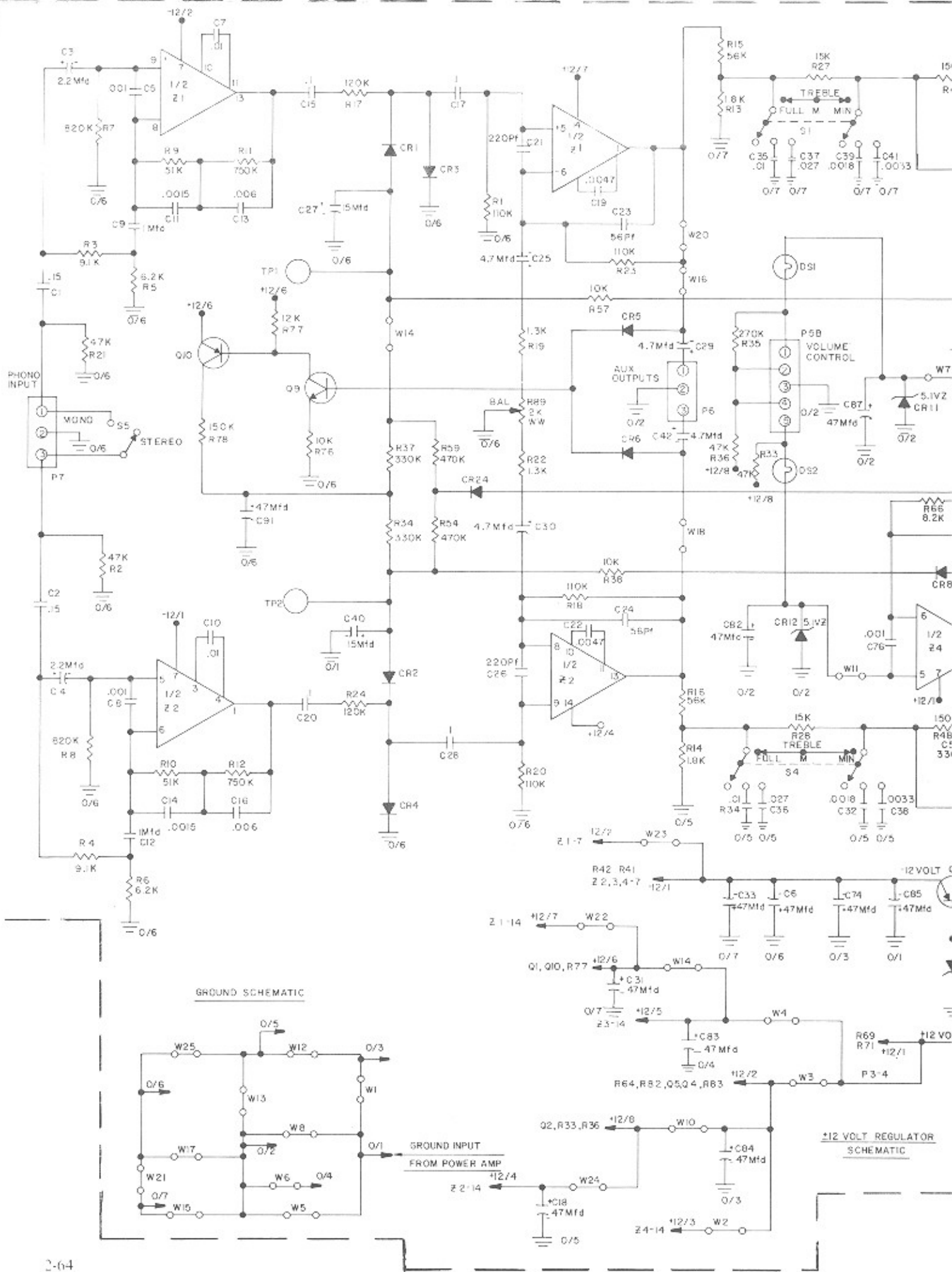
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COMPONENT REF. DESIGNATION	DESCRIPTION	ROW# PART NO.	COMPONENT REF. DESIGNATION	DESCRIPTION
<u>PRE-AMPLIFIER ASSEMBLY 6-08552-01</u>			C84	Capacitor - Electrolytic (
C1	Capacitor - Mylar (.15 MFD)	7-00241-04	C85	Capacitor - Electrolytic (
C2	Capacitor - Mylar (.15 MFD)	7-00241-04	C86	
C3	Capacitor - Electrolytic (2.2 MFD)	7-00238-05	C87	Capacitor - Electrolytic (
C4	Capacitor - Electrolytic (2.2 MFD)	7-00238-05	C88	Capacitor - Electrolytic (
C5	Capacitor - Disc (.001 MFD)	7-00224-02	C89	Capacitor - Mylar (.1 MFD)
C6	Capacitor - Electrolytic (47 MFD)	7-00238-12	C90	Capacitor - Electrolytic (
C7	Capacitor - Disc (.01 MFD)	7-00224-21	C91	Capacitor - Electrolytic (
C8	Capacitor - Disc (.001 MFD)	7-00224-02	CR1	Diode - Silicon
C9	Capacitor - Mylar (.1 MFD)	7-00241-07	CR2	Diode - Silicon
C10	Capacitor - Disc (.01 MFD)	7-00224-21	CR3	Diode - Silicon
C11	Capacitor - Mylar (.0015 MFD)	7-00241-10	CR4	Diode - Silicon
C12	Capacitor - Mylar (.1 MFD)	7-00241-07	CR5	Diode - Silicon
C13	Capacitor - Mylar (.006 MFD)	7-00241-08	CR6	Diode - Silicon
C14	Capacitor - Mylar (.0015 MFD)	7-00241-10	CR7	Diode - Silicon
C15	Capacitor - Mylar (.1 MFD)	7-00240-02	CR8	Diode - Silicon
C16	Capacitor - Mylar (.006 MFD)	7-00241-08	CR9	Diode - Silicon
C17	Capacitor - Mylar (.1 MFD)	7-00240-02	CR10	Diode - Silicon
C18	Capacitor - Electrolytic (47 MFD)	7-00238-12	CR11	Diode - Zener
C19	Capacitor - Disc (.0047 PFD)	7-00224-23	CR12	Diode - Zener
C20	Capacitor - Mylar (.1 MFD)	7-00240-02	CR13	Diode - Silicon
C21	Capacitor - Disc (220 PFD)	7-00224-06	CR14	Diode - Silicon
C22	Capacitor - Disc (.0047 MFD)	7-00224-23	CR15	Diode - Silicon
C23	Capacitor - Disc (56 PFD)	7-00224-20	CR16	Diode - Silicon
C24	Capacitor - Disc (56 PFD)	7-00224-20	CR17	Diode - Silicon
C25	Capacitor - Electrolytic (4.7 MFD)	7-00238-06	CR18	Diode - Silicon
C26	Capacitor - Disc (220 PFD)	7-00224-06	CR19	Diode - Silicon
C27	Capacitor - Electrolytic (15 MFD)	7-00238-09	CR20	Diode - Zener
C28	Capacitor - Mylar (.1 MFD)	7-00240-02	CR21	Diode - Silicon
C29	Capacitor - Electrolytic (4.7 MFD)	7-00238-06	CR22	Diode - Silicon
C30	Capacitor - Electrolytic (4.7 MFD)	7-00238-06	CR23	Diode - Silicon
C31	Capacitor - Electrolytic (47 MFD)	7-00238-12	CR24	Diode - Silicon
C32	Capacitor - Disc (.0018 MFD)	7-00224-12	CR25	Diode - Zener
C33	Capacitor - Electrolytic (47 MFD)	7-00238-12	DS1	Lamp
C34	Capacitor - Mylar (.1 MFD)	7-00240-07	DS2	Lamp
C35	Capacitor - Mylar (.1 MFD)	7-00240-07	K1	Relay - DPDT
C36	Capacitor - Mylar (.027 MFD)	7-00240-22	P1	Board Connector - Top Entry
C37	Capacitor - Mylar (.027 MFD)	7-00240-22	P2	Board Connector - Top Entry
C38	Capacitor - Mylar (.0033 MFD)	7-00240-12	P3	Non-Polarizing Wafer Assemb
C39	Capacitor - Disc (.0018 MFD)	7-00224-12	P4	Polarizing Wafer Assembly
C40	Capacitor - Electrolytic (15 MFD)	7-00238-09	P5	Non-Polarizing Wafer Assemb
C41	Capacitor - Mylar (.0033 MFD)	7-00240-12	P6	Non-Polarizing Wafer Assemb
C42	Capacitor - Electrolytic (4.7 MFD)	7-00238-06	P7	Non-Polarizing Wafer Assemb
C43	Capacitor - Disc (330 PFD)	7-00224-04	Q1	Transistor - J Fet - N Chan
C44	Capacitor - Mylar (.0047 MFD)	7-00240-16	Q2	Transistor - J Fet - N Chan
C45	Capacitor - Mylar (.0047 MFD)	7-00240-16	Q3	Transistor - Silicon (NPN)
C46	Capacitor - Mylar (.022 MFD)	7-00241-06	Q4	Transistor - Silicon (PNP)
C47	Capacitor - Mylar (.022 MFD)	7-00241-06	Q5	Transistor - Silicon (PNP)
C48	Capacitor - Mylar (.22 MFD)	7-00241-14	Q6	Transistor - Silicon (PNP)
C49	Capacitor - Mylar (.22 MFD)	7-00241-14	Q7	Transistor - Silicon (PNP)
C50	Capacitor - Mylar (.01 MFD)	7-00240-07	Q8	Transistor - Silicon (NPN)
C51	Capacitor - Mylar (.01 MFD)	7-00240-07	Q9	Transistor - Silicon (NPN)
C52	Capacitor - Disc (330 PFD)	7-00224-04	Q10	Transistor - Silicon (PNP)
C53	Capacitor - Electrolytic (1 MFD)	7-00238-04	R1	Resistor - Carbon (1/4 W 5%
C54	Capacitor - Electrolytic (4.7 MFD)	7-00238-06	R2	Resistor - Carbon (1/4 W 5%
C55	Capacitor - Mylar (.15 MFD)	7-00241-04	R3	Resistor - Carbon (1/4 W 5%
C56	Capacitor - Mylar (.22 MFD)	7-00241-14	R4	Resistor - Carbon (1/4 W 5%
C57	Capacitor - Disc (220 PFD)	7-00224-06	R5	Resistor - Carbon (1/4 W 5%
C58	Capacitor - Electrolytic (1 MFD)	7-00238-04	R6	Resistor - Carbon (1/4 W 5%
C59	Capacitor - Disc (.0047 MFD)	7-00224-23	R7	Resistor - Carbon (1/4 W 5%
C60	Capacitor - Mylar (.15 MFD)	7-00241-04	R8	Resistor - Carbon (1/4 W 5%
C61	Capacitor - Mylar (.22 MFD)	7-00241-14	R9	Resistor - Carbon (1/4 W 5%
C62	Capacitor - Electrolytic (47 MFD)	7-00238-12	R10	Resistor - Carbon (1/4 W 5%
C63	Capacitor - Electrolytic (4.7 MFD)	7-00238-06	R11	Resistor - Carbon (1/4 W 5%
C64	Capacitor - Electrolytic (47 MFD)	7-00238-12	R12	Resistor - Carbon (1/4 W 5%
C65	Capacitor - Disc (18 PFD)	7-00224-25	R13	Resistor - Carbon (1/4 W 5%
C66			R14	Resistor - Carbon (1/4 W 5%
C67	Capacitor - Electrolytic (4.7 MFD)	7-00238-06	R15	Resistor - Carbon (1/4 W 5%
C68	Capacitor - Disc (18 PFD)	7-00224-25	R16	Resistor - Carbon (1/4 W 5%
C69	Capacitor - Electrolytic (4.7 MFD)	7-00238-06	R17	Resistor - Carbon (1/4 W 5%
C70	Capacitor - Disc (.0047 MFD)	7-00224-23	R18	Resistor - Carbon (1/4 W 5%
C71	Capacitor - Electrolytic (47 MFD)	7-00238-12	R19	Resistor - Carbon (1/4 W 5%
C72	Capacitor - Disc (220 PFD)	7-00224-06	R20	Resistor - Carbon (1/4 W 5%
C73	Capacitor - Electrolytic (47 MFD)	7-00238-12	R21	Resistor - Carbon (1/4 W 5%
C74	Capacitor - Electrolytic (47 MFD)	7-00238-12	R22	Resistor - Carbon (1/4 W 5%
C75	Capacitor - Mylar (.1 MFD)	7-00240-02	R23	Resistor - Carbon (1/4 W 5%
C76	Capacitor - Disc (.001 MFD)	7-00224-02	R24	Resistor - Carbon (1/4 W 5%
C77	Capacitor - Disc (.01 MFD)	7-00224-21	R25	Resistor - Carbon (1/4 W 5%
C78	Capacitor - Disc (.01 MFD)	7-00224-21	R26	Resistor - Carbon (1/4 W 5%
C79	Capacitor - Disc (.001 MFD)	7-00224-02	R27	Resistor - Carbon (1/4 W 5%
C80	Capacitor - Mylar (.1 MFD)	7-00240-02	R28	Resistor - Carbon (1/4 W 5%
C81			R29	Resistor - Carbon (1/4 W 5%
C82	Capacitor - Electrolytic (47 MFD)	7-00238-12		
C83	Capacitor - Electrolytic (47 MFD)	7-00238-12		

DESCRIPTION	ROWE PART NO.	COMPONENT DESIGNATION	DESCRIPTION	ROWE PART NO.	
FD)	7-00238-12	R30	Resistor - Carbon (1/4 W 5%)	22 K	7-9901-223
FD)	7-00238-12	R31	Resistor - Carbon (1/4 W 5%)	68 K	7-9901-683
		R32	Resistor - Carbon (1/4 W 5%)	68 K	7-9901-683
FD)	7-00238-12	R33	Resistor - Carbon (1/4 W 5%)	47 K	7-9901-473
FD)	7-00238-12	R34	Resistor - Carbon (1/4 W 5%)	330 K	7-9901-334
	7-00240-02	R35	Resistor - Carbon (1/4 W 5%)	270 K	7-9901-274
FD)	7-00238-12	R36	Resistor - Carbon (1/4 W 5%)	47 K	7-9901-473
FD)	7-00238-12	R37	Resistor - Carbon (1/4 W 5%)	330 K	7-9901-334
	7-00350-07	R38	Resistor - Carbon (1/4 W 5%)	10 K	7-9901-103
	7-00350-07	R39	Resistor - Carbon (1/4 W 5%)	220 K	7-9901-224
	7-00350-07	R40	Resistor - Carbon (1/4 W 5%)	220 K	7-9901-224
	7-00350-07	R41	Resistor - Carbon (1/4 W 5%)	100 K	7-9901-104
	7-00350-07	R42	Resistor - Carbon (1/4 W 5%)	100 K	7-9901-104
	7-00350-07	R43	Resistor - Carbon (1/4 W 5%)	3.9 K	7-9901-392
	7-00350-07	R44	Resistor - Carbon (1/4 W 5%)	3.9 K	7-9901-392
	7-00350-07	R45	Resistor - Carbon (1/4 W 5%)	6.8 K	7-9901-682
	7-00350-07	R46	Resistor - Carbon (1/4 W 5%)	6.8 K	7-9901-682
	7-00350-07	R47	Resistor - Carbon (1/4 W 5%)	150 K	7-9901-154
	7-00355-01	R48	Resistor - Carbon (1/4 W 5%)	150 K	7-9901-154
	7-00355-01	R49	Resistor - Carbon (1/4 W 5%)	820 K	7-9901-824
	7-00350-07	R50	Resistor - Carbon (1/4 W 5%)	22 K	7-9901-223
	7-00350-07	R51	Resistor - Carbon (1/4 W 5%)	820 K	7-9901-824
	7-00350-07	R52	Resistor - Carbon (1/4 W 5%)	180 K	7-9901-184
	7-00350-07	R53	Resistor - Carbon (1/4 W 5%)	22 K	7-9901-223
	7-00350-07	R54	Resistor - Carbon (1/4 W 5%)	470 K	7-9901-474
	7-00350-07	R55	Resistor - Carbon (1/4 W 5%)	180 K	7-9901-184
	7-00350-02	R56	Resistor - Carbon (1/4 W 5%)	1 Meg	7-9901-105
	7-00355-06	R57	Resistor - Carbon (1/4 W 5%)	10 K	7-9901-103
	7-00350-02	R58	Resistor - Carbon (1/4 W 5%)	820 K	7-9901-824
	7-00350-02	R59	Resistor - Carbon (1/4 W 5%)	470 K	7-9901-474
	7-00350-02	R60	Resistor - Carbon (1/4 W 5%)	820 K	7-9901-824
	7-00350-02	R61	Resistor - Carbon (1/4 W 5%)	1 Meg	7-9901-105
	7-00355-06	R62	Resistor - Carbon (1/4 W 5%)	4.7 K	7-9901-472
	2-13338-01	R63	Resistor - Carbon (1/4 W 5%)	4.7 K	7-9901-472
	2-13338-01	R64	Resistor - Carbon (1/4 W 5%)	15 K	7-9901-153
	3-07882-01	R65	Resistor - Carbon (1/4 W 5%)	910 Ohms	7-9901-911
	7-00748-02	R66	Resistor - Carbon (1/4 W 5%)	8.2 K	7-9901-822
	7-00748-02	R67	Resistor - Carbon (1/4 W 5%)	8.2 K	7-9901-822
	7-00749-31	R68	Resistor - Carbon (1/4 W 5%)	910 Ohms	7-9901-911
	7-00750-02	R69	Resistor - Carbon (1/4 W 5%)	15 K	7-9901-153
	7-00749-23	R70			
	7-00749-21	R71	Resistor - Carbon (1/4 W 5%)	1.1 K	7-9901-112
	7-00749-21	R72			
	7-00309-01	R73	Resistor - Carbon (1/4 W 5%)	220 K	7-9901-224
	7-00309-01	R74			
	7-00300-08	R75	Resistor - Carbon (1/4 W 5%)	1 K	7-9901-102
	7-00301-04	R76	Resistor - Carbon (1/4 W 5%)	10 K	7-9901-103
	7-00301-04	R77	Resistor - Carbon (1/4 W 5%)	12 K	7-9901-123
	7-00301-04	R78	Resistor - Carbon (1/4 W 5%)	150 K	7-9901-154
	7-00304-02	R79	Resistor - Wire Wound (2 W)	150 Ohms	7-00126-08
	7-00330-05	R80	Resistor - Carbon (1/4 W 5%)	1.5 K	7-9901-152
	7-00301-04	R81	Resistor - Carbon (1/4 W 5%)	10 K	7-9901-103
	7-00301-04	R82	Resistor - Carbon (1/4 W 5%)	10 K	7-9901-103
	7-9901-114	R83	Resistor - Carbon (1/4 W 5%)	10 K	7-9901-103
	7-9901-473	R84	Resistor - Carbon (1/4 W 5%)	6.8 K	7-9901-682
	7-9901-912	R85	Resistor - Carbon (1/4 W 5%)	1 K	7-9901-102
	7-9901-912	R86	Resistor - Carbon (1/4 W 5%)	10 K	7-9901-103
	7-9901-622	R87	Resistor - Carbon (1/4 W 5%)	750 Ohms	7-9901-751
	7-9901-622	R88	Resistor - Wire Wound (2 W)	220 Ohms	7-00113-22
	7-9901-824	R89	Potentiometer		2-15402-01
	7-9901-824	RT1	Thermistor - 51 K		7-00370-01
	7-9901-513	RT2	Thermistor - 51 K		7-00370-01
	7-9901-513	S1	Slide Switch (DP3T)		3-07862-03
	7-9901-513	S2	Slide Switch (DP3T)		3-07862-03
	7-9901-754	S3	Slide Switch (DP3T)		3-07862-03
	7-9901-754	S4	Slide Switch (DP3T)		3-07862-03
	7-9901-122	S5	Slide Switch (SPDT)		3-07862-02
	7-9901-122	W1 thru W26	Bare Wire		0-05039-00
	7-9901-563	Z1	I C Dual Stereo Pre-Amp		3-08002-06
	7-9901-563	Z2	I C Dual Stereo Pre-Amp		3-08002-06
	7-9901-124	Z3	I C Dual Stereo Pre-Amp		3-08002-06
	7-9901-114	Z4	I C Dual Stereo Pre-Amp		3-08002-06
	7-9901-132				
	7-9902-114				
	7-9901-473				
	7-9901-132				
	7-9901-114				
	7-9901-124				
	7-9901-104				
	7-9901-104				
	7-9901-153				
	7-9901-153				
	7-9901-223				

Min. working voltage 15 VDC on all capacitors.

All even number discrete components pertain to right channel, and all odd number discrete components pertain to left channel, except resistors R75-R85, capacitors CR8-C91, diode CR19-CR25, relay K1 and switch S5. These components are common to both channels.



MIN. WORKING VOLTAGE 15 VDC ON ALL CAPACITORS, ALL EVEN NUMBER DISCRETE COMPONENTS PERTAIN TO RIGHT CHANNEL, AND ALL ODD NUMBER DISCRETE COMPONENTS PERTAIN TO LEFT CHANNEL, EXCEPT RESISTORS R75-R89. CAPACITORS C88-C91, DIODES CR19-CR25, RELAY K1 AND SWITCH S5. THESE COMPONENTS ARE COMMON TO BOTH CHANNELS.

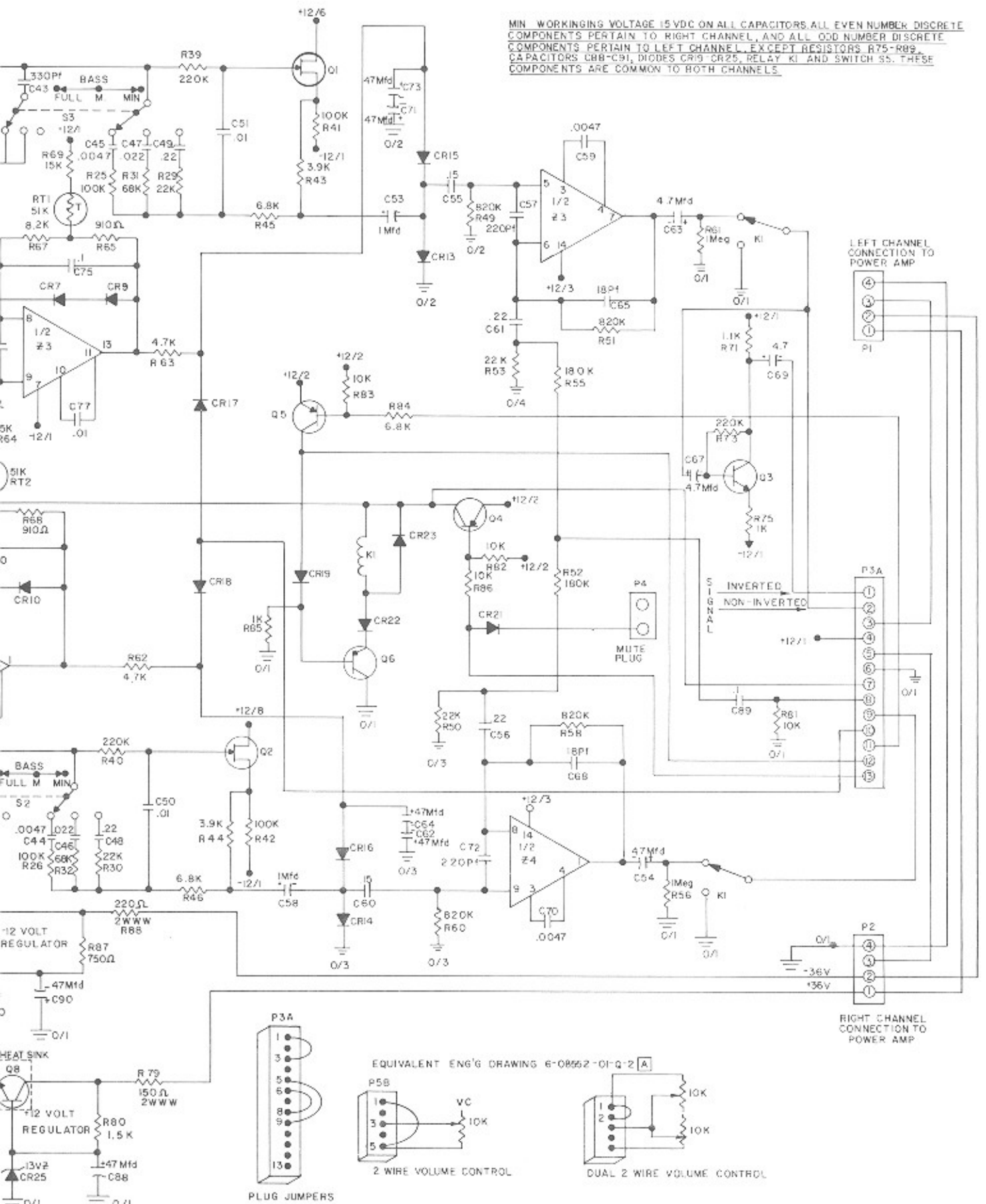


FIGURE 2-31. 125 WATT AMPLIFIER SCHEMATIC DIAGRAM

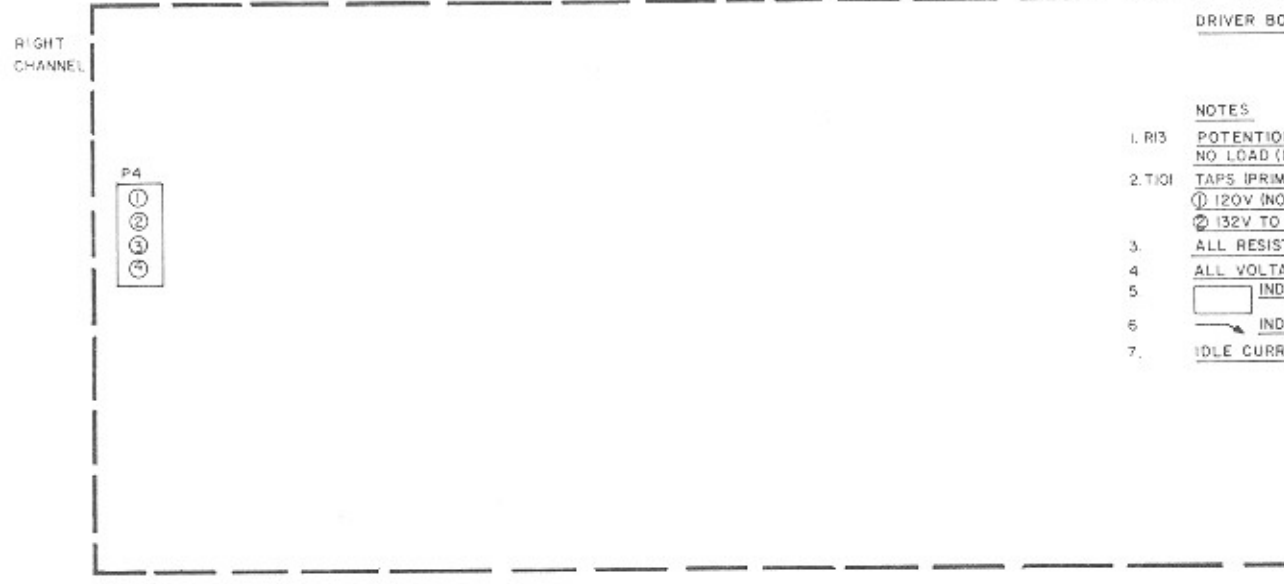
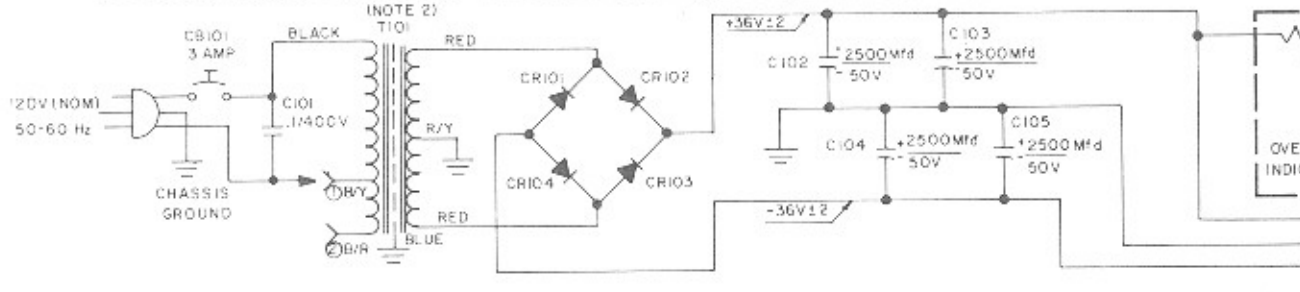
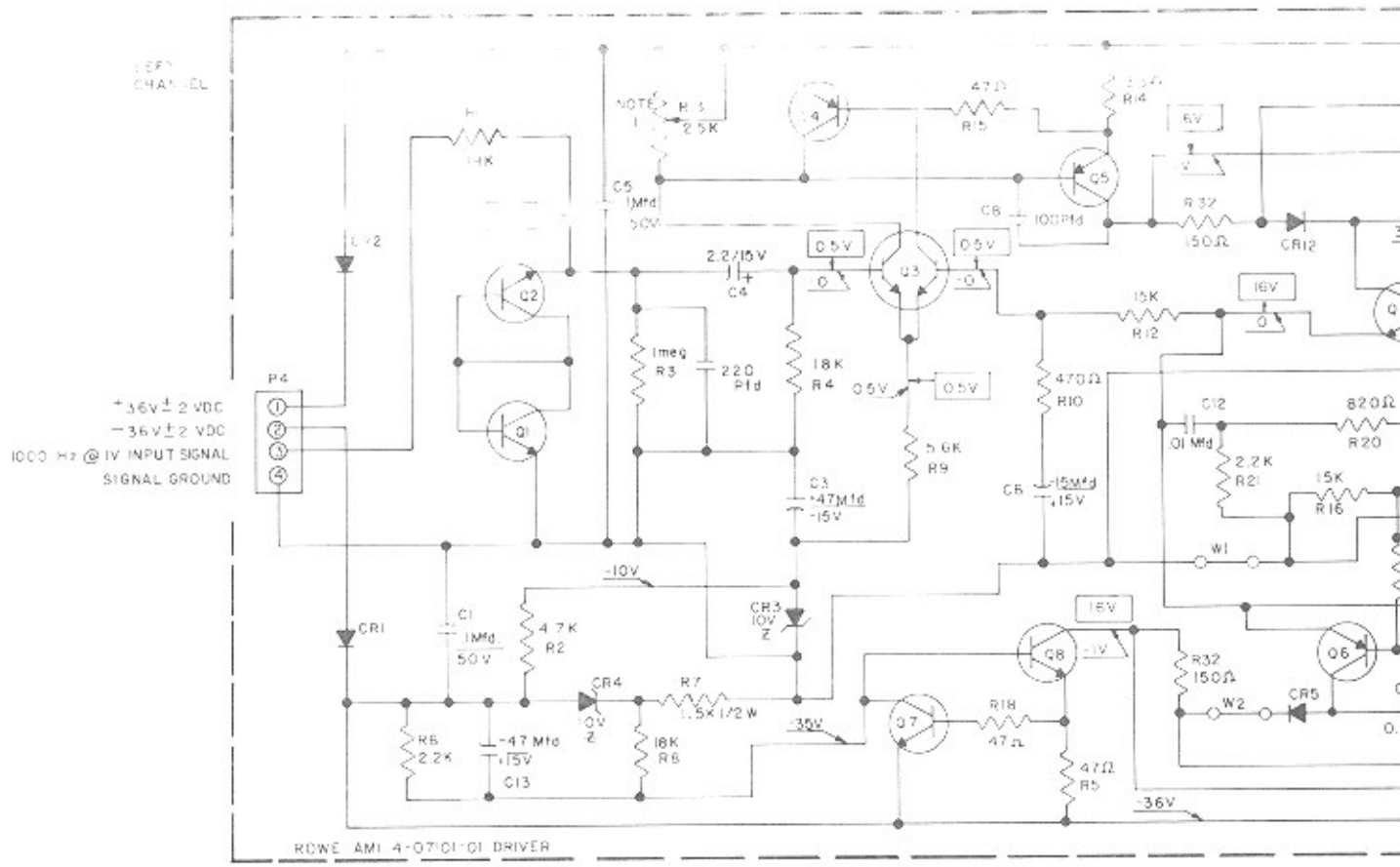
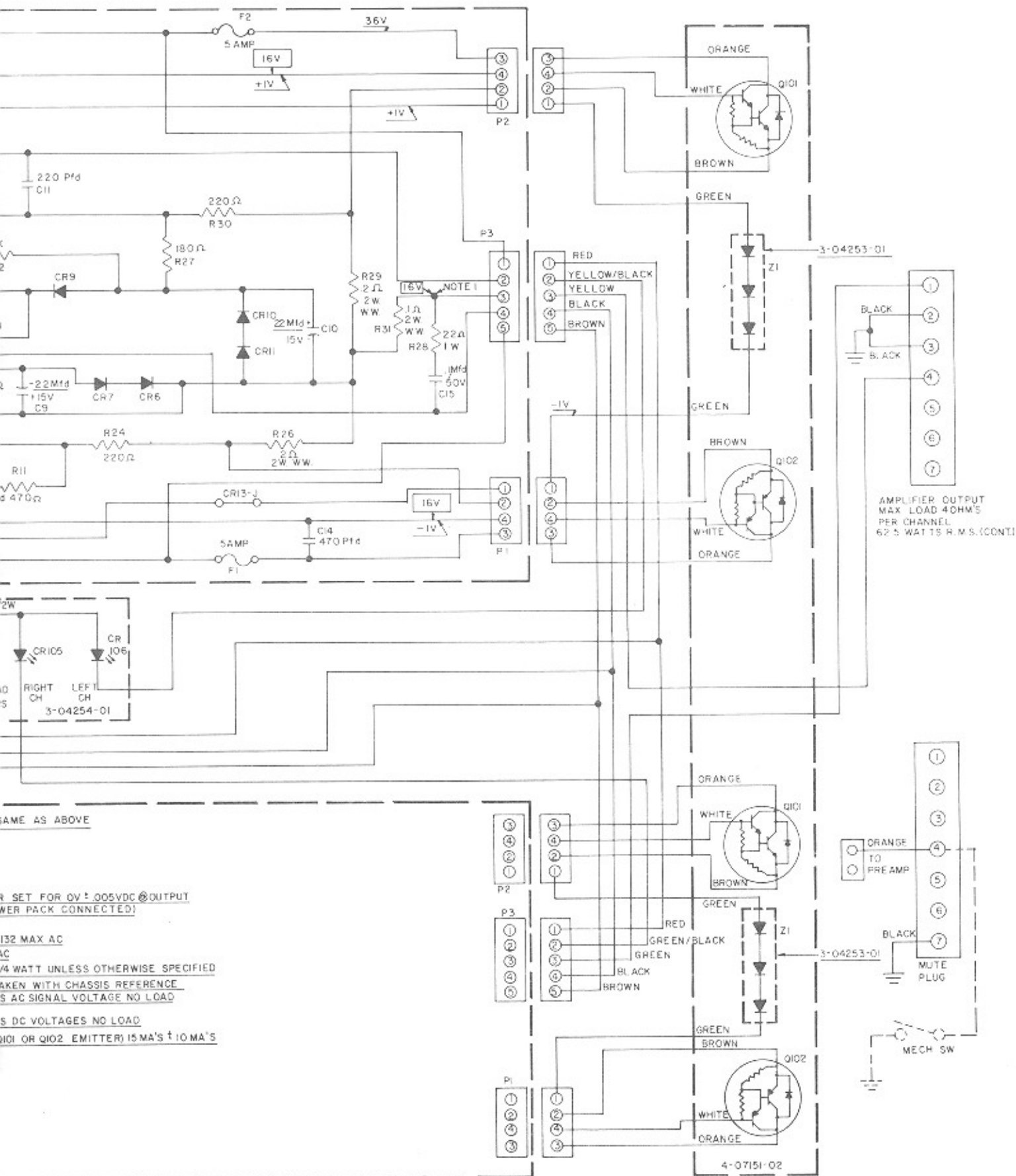


FIGURE 2-32. 125 WATT AMPLIFIER SCHEMATIC DIAGRAM



SAME AS ABOVE

SET FOR 0V ± .005VDC @ OUTPUT
 POWER PACK CONNECTED

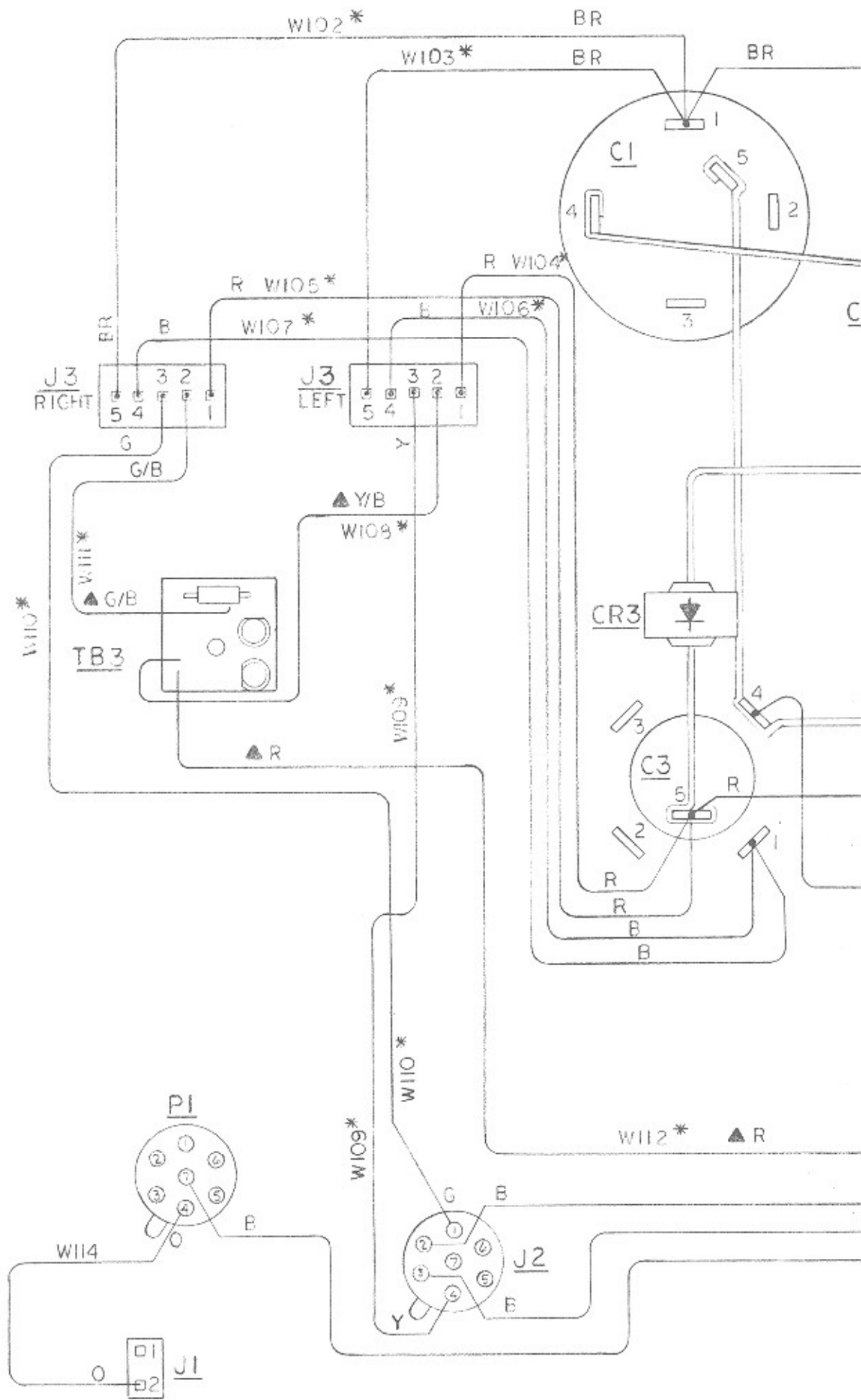
132 MAX AC
 AC
 1/4 WATT UNLESS OTHERWISE SPECIFIED
 TAKEN WITH CHASSIS REFERENCE
 S AC SIGNAL VOLTAGE NO LOAD
 S DC VOLTAGES NO LOAD
 Q101 OR Q102 EMITTER 15 MA'S ± 10 MA'S

EQUIVALENT ENG'G DRAWING 6-07438-01-Q-2 [A]

COMPONENT REF. DESIGNATION	DESCRIPTION	ROWE PART NO.
<u>125 W POWER AMPLIFIER 6-07438-01</u>		
C101	Capacitor, Mylar, 0.1 MFD, 400V (Paktron Type MB; Sprague Type 225P; Electromotive No. P91141-1)	7-00213-01
C102 to C105	Capacitor, Electrolytic, 2500 MFD, 50V	2-15181-01
CB101	Circuit Breaker, 3 Amp (ETA Products Co. Series 41-06-P30-1125)	7-00733-17
CR101 to CR104	Diode, Silicon (Motorola No. MR752, Sarkes-Tarzian 6 AL-2)	7-00351-10
Q101	Power Transistor (NPN Darlington)	7-00302-06
Q102	Power Transistor (PNP Darlington)	7-00302-07
T101	Transformer, Power Overload Indicator	4-06337-01 3-04254-01
MISCELLANEOUS PARTS		
	Cord and Plug Assembly	7-00502-02
	Strain Relief	7-02322-05
	Chassis Assembly with Lettering	6-07441-01
	Circuit Board Support (8 required)	7-05000-06
	Housing Plug, Combo-Line, 7 Circuit (Phono Speakers)	2-13540-01
	Housing Plug, Combo-Line, 7 Circuit Brown (Mute)	2-13540-04
DRIVER BOARD ASSEMBLY 4-07101-01		
C1	Capacitor - Mylar (.10 MFD/100 VDC)	7-00240-02
C2	Capacitor - Disc (220 PFD/500 VDC)	7-00224-06
C3	Capacitor - Electrolytic (47/50 MFD/15 VDC)	7-00280-05
C4	Capacitor - Electrolytic (2.2 MFD/80 VDC)	7-00238-05
C5	Capacitor - Mylar (.10 MFD/100 VDC)	7-00240-02
C6	Capacitor - Electrolytic (15 MFD/50 VDC)	7-00238-09
C7	Capacitor - Disc (.01 MFD/100 VDC)	7-00224-21
C8	Capacitor - Disc (100 PFD/500 VDC)	7-00224-07
C9	Capacitor - Electrolytic (22/25 MFD/25 VDC)	7-00280-03
C10	Capacitor - Electrolytic (22/25 MFD/25 VDC)	7-00280-03
C11	Capacitor - Disc (220 PFD/500 VDC)	7-00224-06
C12	Capacitor - Disc (.01 MFD/100 VDC)	7-00224-21
C13	Capacitor - Electrolytic (47/50 MFD/15 VDC)	7-00280-05
C14	Capacitor - Disc (470 PFD/500 VDC)	7-00224-01
C15	Capacitor - Mylar (.10 MFD/100 VDC)	7-00240-02
CR1	Diode - Silicon	7-00350-02
CR2	Diode - Silicon	7-00350-02
CR3	Diode - Zener 10 V	7-00355-14
CR4	Diode - Zener 10 V	7-00355-14
CR5	Diode - Silicon	7-00350-02
CR6	Diode - Silicon	7-00350-02
CR7	Diode - Silicon	7-00350-02
CR8	Diode - Silicon	7-00350-02
CR9	Diode - Silicon	7-00350-02
CR10	Diode - Silicon	7-00350-02
CR11	Diode - Silicon	7-00350-02
CR12	Diode - Silicon	7-00350-02
CR13	Bare Wire	0-05039-00
F1	Fuse - 5 Amp	7-00720-10
F2	Fuse - 5 Amp	7-00720-10

COMPONENT REF. DESIGNATION	DESCRIPTION	ROWE PART NO.
P1	Polarizing Wafer Assembly	7-00750-04
P2	Polarizing Wafer Assembly	7-00750-04
P3	Polarizing Wafer Assembly	7-00750-05
P4	Non-Polarizing Wafer Assembly	7-00749-04
Q1	Transistor - NPN	7-00300-01
Q2	Transistor - NPN	7-00300-01
Q3	Transistor - Dual NPN	7-00303-01
Q4	Transistor - PNP	7-00301-04
Q5	Transistor - PNP	7-00301-04
Q6	Transistor - PNP	7-00301-04
Q7	Transistor - NPN	7-00300-08
Q8	Transistor - NPN	7-00300-08
Q9	Transistor - NPN	7-00300-08
R1	Resistor - Carbon (1/4 W 5%) (18 K)	7-9901-183
R2	Resistor - Carbon (1/4 W 5%) (4.7 K)	7-9901-472
R3	Resistor - Carbon (1/4 W 5%) (1 Meg)	7-9901-105
R4	Resistor - Carbon (1/4 W 5%) (18 K)	7-9901-183
R5	Resistor - Carbon (1/4 W 5%) (47 Ohm)	7-9901-470
R6	Resistor - Carbon (1/4 W 5%) (2.2 K)	7-9901-222
R7	Resistor - Carbon (1/4 W 5%) (1.5 K)	7-00104-05
R8	Resistor - Carbon (1/4 W 5%) (18 K)	7-9901-183
R9	Resistor - Carbon (1/4 W 5%) (5.6 K)	7-9901-562
R10	Resistor - Carbon (1/4 W 5%) (470 Ohms)	7-9901-471
R11	Resistor - Carbon (1/4 W 5%) (470 Ohms)	7-9901-471
R12	Resistor - Carbon (1/4 W 5%) (16 K)	7-9901-163
R13	Resistor - Potentiometer, Linear (1/4 W) (2.5 K)	7-00400-01
R14	Resistor - Carbon (1/4 W 5%) (33 Ohms)	7-9901-330
R15	Resistor - Carbon (1/4 W 5%) (47 Ohms)	7-9901-470
R16	Resistor - Carbon (1/4 W 5%) (15 K)	7-9901-153
R17		
R18	Resistor - Carbon (1/4 W 5%) (47 Ohms)	7-9901-470
R19	Resistor - Carbon (1/4 W 5%) (180 Ohms)	7-9901-181
R20	Resistor - Carbon (1/4 W 5%) (820 Ohms)	7-9901-821
R21	Resistor - Carbon (1/4 W 5%) (2.2 K)	7-9901-222
R22	Resistor - Carbon (1/4 W 5%) (15 K)	7-9901-153
R23	Resistor - Carbon (1/4 W 5%) (150 Ohms)	7-9901-151
R24	Resistor - Carbon (1/4 W 5%) (220 Ohms)	7-9901-221
R25		
R26	Resistor - Wire Wound (2 W 10%) (.2 Ohms)	7-00126-01
R27	Resistor - Carbon (1/4 W 5%) (180 Ohms)	7-9901-181
R28	Resistor - Carbon (1 W 10%) (22 Ohms)	7-00108-16
R29	Resistor - Wire Wound (2 W 10%) (.2 Ohms)	7-00126-01
R30	Resistor - Carbon (1/4 W 5%) (220 Ohms)	7-9901-221
R31	Resistor - Wire Wound (2 W 10%) (.1 Ohms)	7-00126-02
R32	Resistor - Carbon (1/4 W 5%) (150 Ohms)	7-9901-151
W1 - W2	Bare Wire	0-05039-00
MISCELLANEOUS PARTS		
Fuse Clip (4 required)		2-50775-00
Drive Circuit Board (1 required)		4-07100-01

ELECTRONIC PARTS LIST, 125 WATT AMPLIFIER
(See Schematic, Page 2-65)



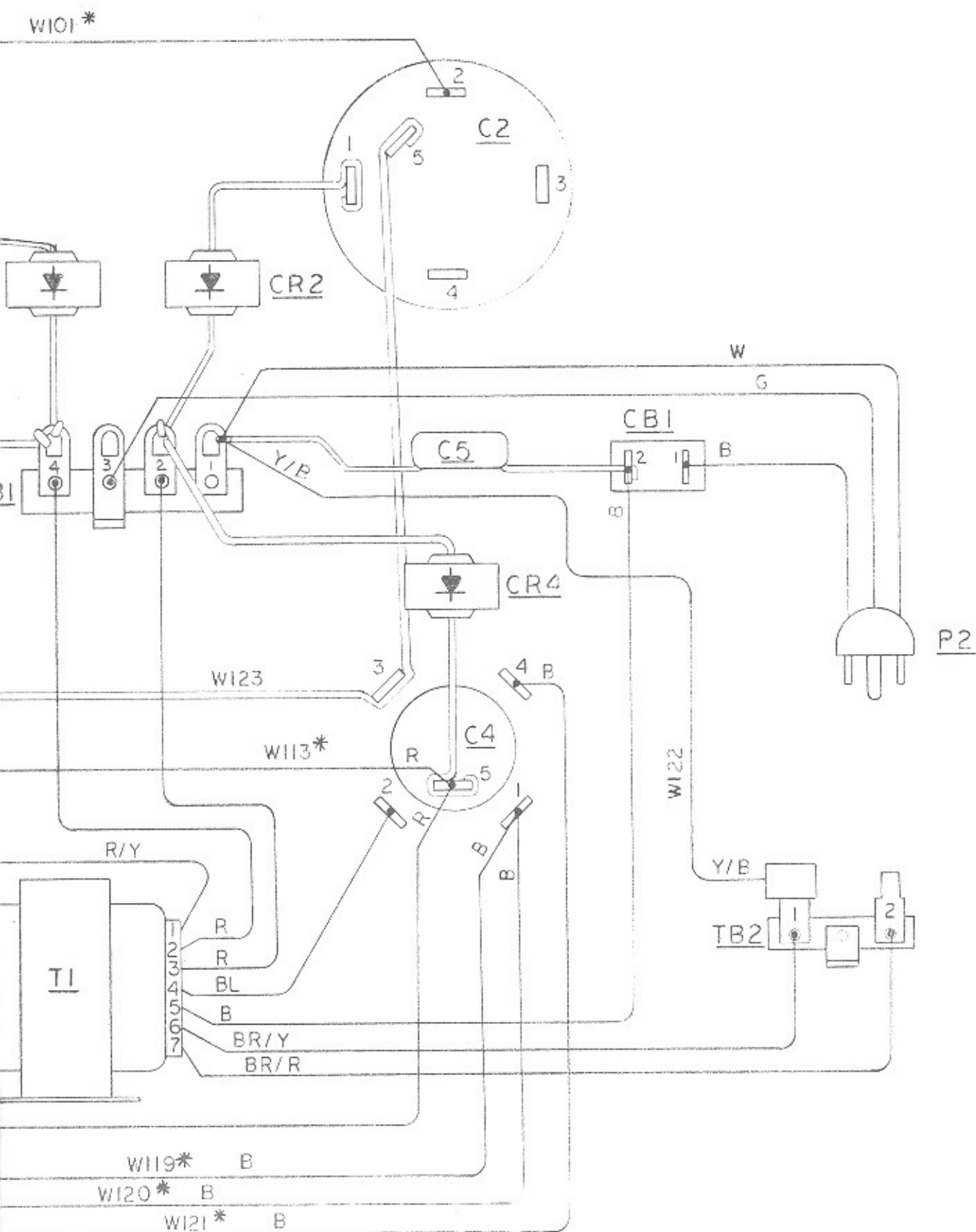
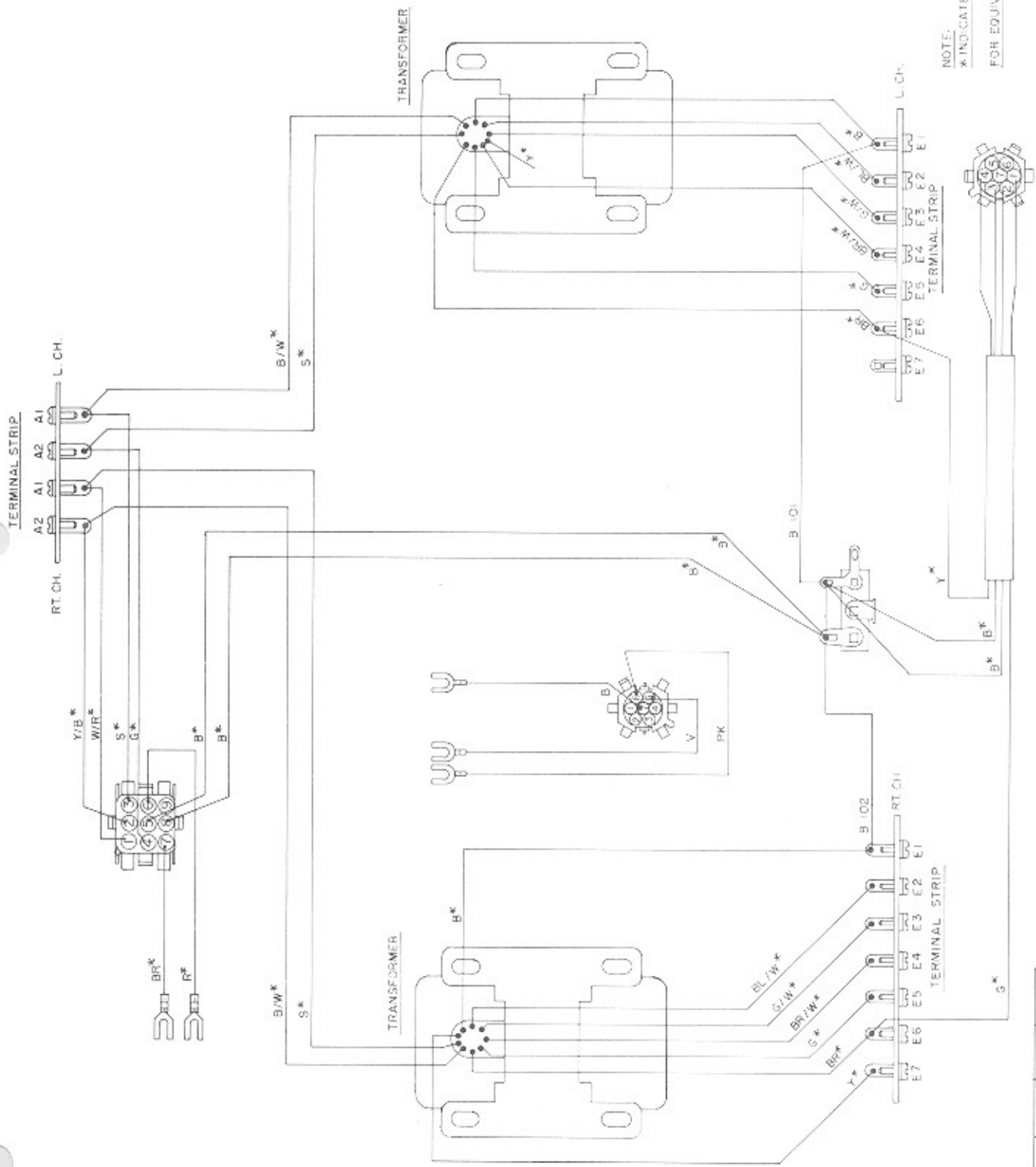


FIGURE 2-33. AMPLIFIER WIRING DIAGRAM



NOTE:
 * INDICATES LEADS FURNISHED
 FOR EQUIV. ENG'G DWG SEE I-6396C-Q-1

CODE	REQD	LENGTH	STRIP	COLOR	SPEC
101	1	4	7/32 X 1/4	BLACK	503B
102	1	4	7/32 X 7/32	BLACK	503B

FIGURE 2-31. OUTPUT TRANSFORMER PACKAGE WIRING DIAGRAM