Installation Instructions

Amplifier Accessory Board
Kit # 26694703

Introduction

This installation instruction sheet provides the step-by-step installation instructions on how to install the Phonograph Accessory Board (Rowe Part Number 60792702) and shows you how to connect the accessory board to external audio equipment, so please read all of this introductory material.

This kit (Part Number 26694703) is compatible with all 610237XX and 607925XX Preamplifier Boards.

CD/45 Combo and Video Phonographs use the AUXILIARY INTERCONNECT connector on this phonograph accessory board. If you have a CD/45 Combo or Video Phonograph, you will not be able to use the AUXILIARY INTERCONNECT connector (P1).

After installing this kit, you may want to save these instructions for future accessory board connections. Many variations of these connections are possible, and additional options and configurations can be added to existing connections.

If you want to use the accessory board in a configuration that is not described, or if you have difficulty installing one of the configurations, refer to the accessory board block diagram *(figure 4)*, the schematic diagram *(figure 5)*, and the installation tips and techniques at the end of this installation instruction.

Parts Included In This Kit:

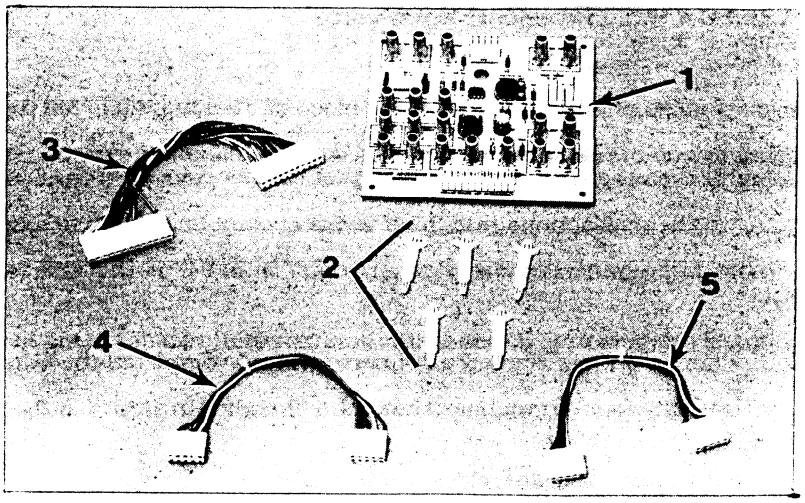


Figure 1. Accessory Kit Parts

Parts List

Ref.	Description	Part No.	Qty.
	Instruction Sheet	21541206	1
1.	Accessory Circuit Board	60792702	1
2.	Circuit Board Supports	70500018	5
3.	Amplifier Interconnect Cable	30426003	1
4.	Auxiliary Interconnect Cable	30426002	1
5.	Microphone Interconnect Cable	30879201	1
6.	Circuit Board Jumpers (Not Shown)	21621001	1

ROWE
ROWE INTERNATIONAL INC
1500 UNION AVE., S.E., GRAND RAPIDS, MI 49507
(616) 243-3633

Printed in USA

Tools Required

A pair of needle-nose pliers, a 1/8-inch blade screwdriver (as an adjusting tool).

Preparation

Before you begin to install this kit, study the configuration that you wish to use to determine which jumpers and audio cables will be needed to complete the installation (external cables, connecting from the accessory board to other equipment, must be purchased or assembled).

When you have obtained all of the cables, continue with the installation.

Step-By-Step Installation Instructions

1. Open the top door.
2. Remove the amplifier compartment covers.
3. Snap four circuit board supports into place as shown in figure 2 (five circuit board supports are included in this kit; one is a spare).
4. Unplug the amplifier's 13-pin jumper plug located next to the heat sink. Save it for future use (you will need it if you remove the kit). Replace the 13-pin jumper with one end of the amplifier interconnect cable *(figure 1-ref. 3)*. Plug the other end into P2 of the accessory board.
5. Plug the auxiliary interconnect cable *(figure 1-ref. 4)* into the amplifier's aux input and P1 of the accessory board.

6. IMPORTANT

The microphone interconnect cable (figure 1-ref.5) must always be installed.

- Do steps A and C if two microphones are used:
- Do steps B and C if one microphone is used:
- Do step C if no microphones are used:

a. Use needle nose (or similar) pliers to slide the filler block off the amplifier "Microphone input" header pins.

Plug the cable going to one of the microphones into the amplifier's microphone input. Push it all the way down. Plug the cable going to the other microphone into P3 of the Accessory board. Go to step c.

b. Plug the cable going to the microphone into P3 of the accessory board. Go to step C.

c. Plug the microphone interconnect cable *(figure 1-ref.5)* into P4 of the accessory board and the amplifier's microphone input.

7. Connect the accessory board jumpers and cables for the configuration you are using by following all of the instructions on the appropriate page. When you have made the connections and completed the adjustments, continue with step 8.
8. Snap the accessory board onto the four circuit board supports (installed in step 3) and plug the phonograph into the 120 volt outlet.
9. Replace the amplifier compartment cover and close the top door.

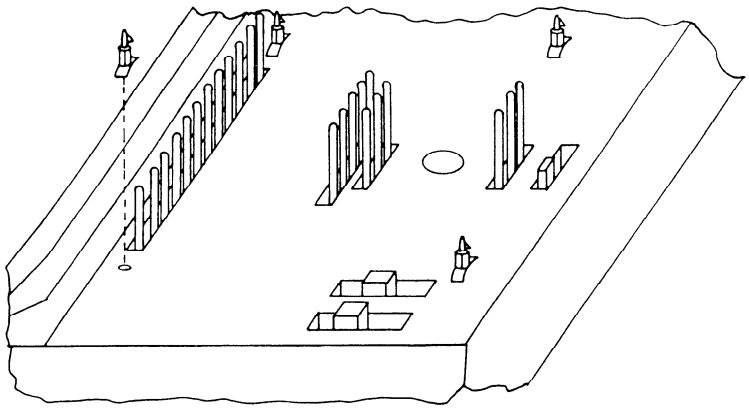


Figure 2. Mounting the Circuit Board Supports

INDEX TO JUMPER AND CABLE CONNECTIONS

STEREO BACKGROUND MUSIC INPUT

Connect a stereo device to this input if you want the device volume and tone control to control the device's tone and volume. A device connected to this input will not be heard during pages, or while the phonograph is playing a selection.

WARNING:

Be sure that the equipment that you are connecting to the phonograph has an isolation transformer type power supply. Equipment that does not have an isolation transformer can damage the phonograph and/or create a shock hazard.

Instructions

Cables and Jumpers

Obtain two shielded audio cables long enough to reach between the input device (fm radio, Customusic, tv, tape player, etc.) and the phonograph accessory board.

This configuration requires three jumpers on the accessory board. Connect these three jumpers between:

1. J9 (LEFT CH POWER AMP INPUT) and J14 (INVERTOR OUTPUT).
2. J11 (INVERTER INPUT) and J16 (LEFT CH PREAMP OUTPUT).
3. J13 (RIGHT CHANNEL POWER AMP INPUT) and J20 (RIGHT CHANNEL PREAMP OUTPUT).

Input Level Considerations

The Background Music input can accept a wide range of input levels. You can connect speaker lines, Aux. outputs, Line outputs, or 70 Volt lines to the accessory board Background Music inputs.

Although 70 Volt inputs to the Accessory Board will work, we recommend that you use the lower level inputs (speakers, Aux., Line) whenever you consider using a 70 Volt line.

Input Connections

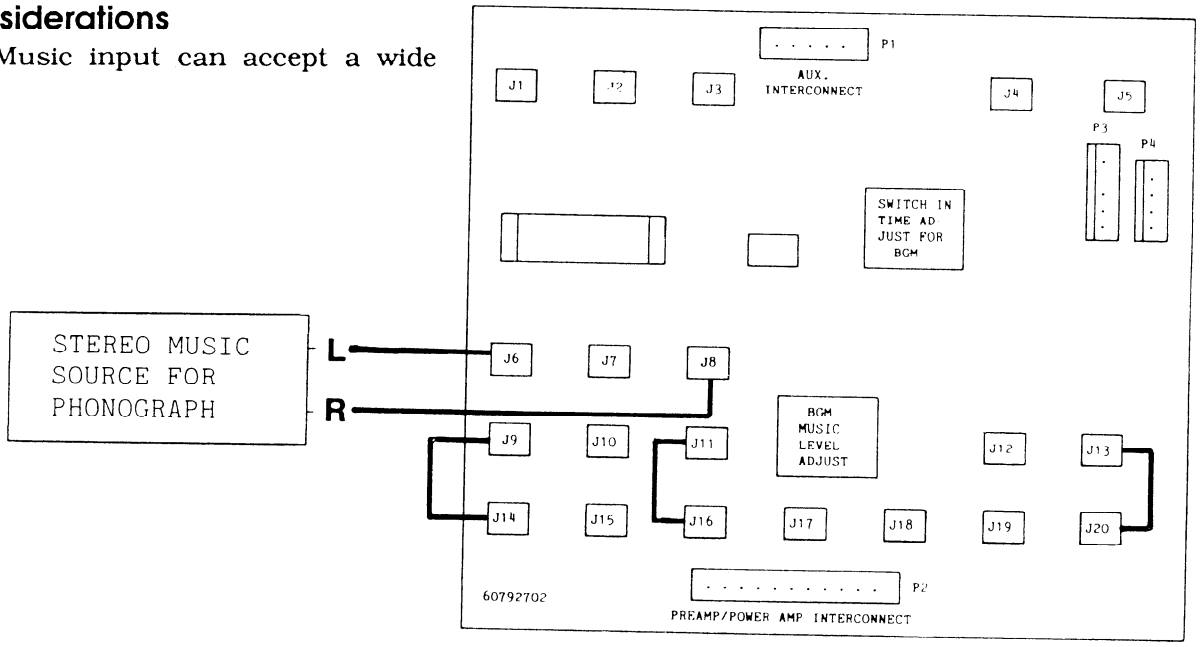
Connect the input cable from the music source as follows:

Music source Right Channel to J8 (RIGHT CH BGM).

Music source Left Channel to J6 (LEFT CH BGM).

Background Level and Time Delay Adjustment

Go to page 12 and follow the instructions for background level and time delay adjustment.



Stereo Background Music Connections
(See the Schematic and the Block Diagram for circuit details)

MONAURAL BACKGROUND MUSIC INPUT

Connect a monaural device to this input if you want the device's volume and tone to control the device tone and volume. A device connected to this input will not be heard during pages, or while the phonograph is playing a selection.

WARNING:

Be sure that the equipment that you are connecting to the phonograph has an isolation transformer type power supply. Equipment that does not have an isolation transformer can damage the phonograph and/or create a shock hazard.

Instructions

Cables and Jumpers

Obtain one shielded audio cable long enough to reach between the input device (fm radio, Customusic, tv, tape player, etc.) and the phonograph accessory board.

This configuration requires three jumpers on the accessory board. Connect these three jumpers between:

1. J9 (LEFT CH POWER AMP INPUT) and J14 (INVERTER OUTPUT).
2. J11 (INVERTER INPUT) and J16 (LEFT CH PREAMP OUTPUT).
3. J13 (RIGHT CHANNEL POWER AMP INPUT) and J20 (RIGHT CHANNEL PREAMP OUTPUT).

Input Level Considerations

The Background Music input can accept a wide rangeof input levels. You can connect speaker lines, Aux. outputs, Line outputs, or 70 Volt lines to the accessory board Background Music inputs.

Although 70 Volt inputs to the Accessory Board will work, we recommend that you use the lower level inputs (speakers, Aux., Line) whenever you consider using a 70 Volt line.

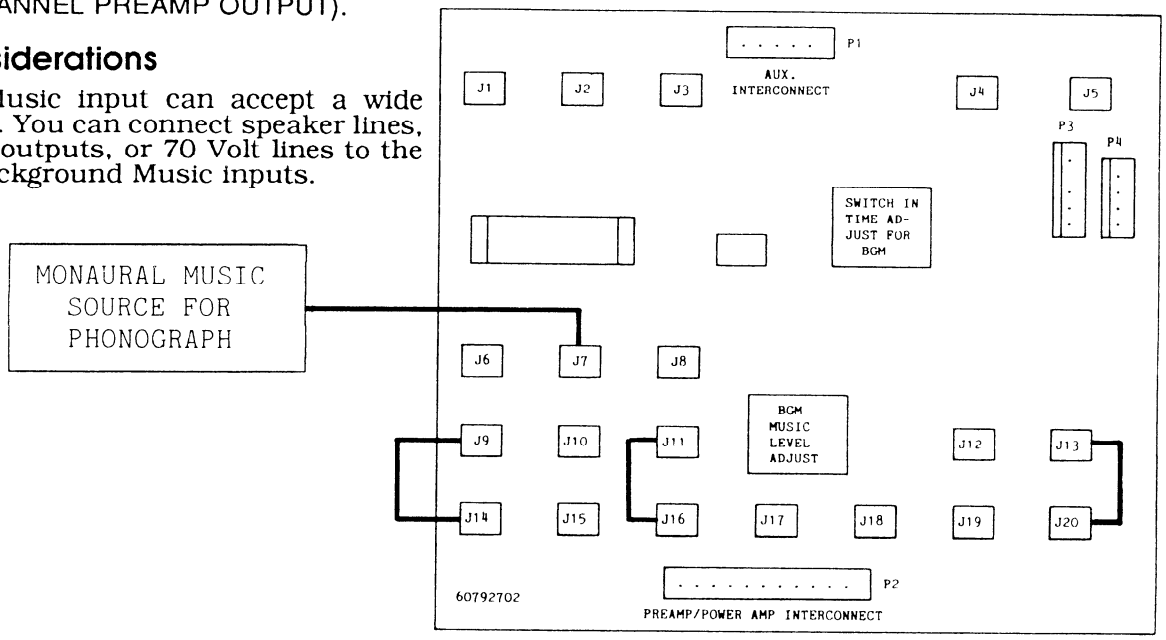
Input Connections

Connect the input cable from the music source as follows:

Music source output to J7 (BGM MONO).

Background Level and Time Delay Adjustment

Go to page 12 and follow the instructions for background level and time delay adjustment.



Monaural Background Music Connections
(See the Schematic and the Block Diagram for circuit details)

EXTERNAL TONE CONTROL

Use this configuration if you want the volume and tone to be controlled by an external preamplifier.

WARNING:

Be sure that the equipment that you are connecting to the phonograph has an isolation transformer type power supply. Equipment that does not have an isolation transformer can damage the phonograph and/or create a shock hazard.

Instructions

Cables and Jumpers

Obtain four shielded audio cables long enough to reach between the external preamp and the phonograph accessory board.

This configuration requires one jumper on the accessory board. Connect this jumper between:

J9 (LEFT CH POWER AMP INPUT) and J14 (INVERTER OUTPUT).

Input level considerations

The Background Music input can accept a wide range of input levels. You can connect speaker lines, Aux. outputs, Line outputs, or 70 Volt lines to the accessory board Background Music inputs.

Although 70 Volt inputs to the Accessory Board will work, we recommend that you use the lower level inputs (Speakers, Aux., Line) whenever you consider using a 70 Volt line.

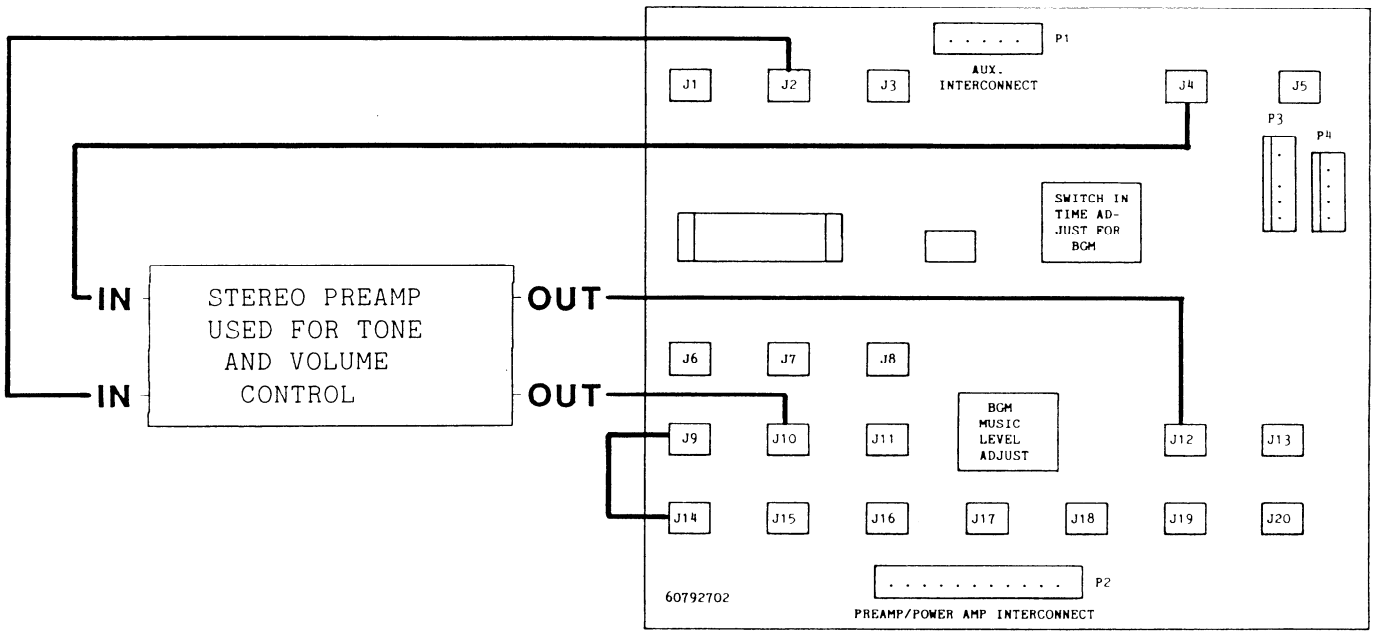
Input And Output Connections

Connect the input to the external preamp as follows:

1. Preamp RIGHT CH INPUT to J4 (RIGHT CH PREAMP AUX OUTPUT).
2. Preamp LEFT CH INPUT to J2 (LEFT CH PREAMP AUX OUTPUT).

Connect the external preamp output as follows:

1. External preamp RIGHT CH OUTPUT to J12 (RIGHT CH POWER AMP INPUT).
2. External preamp LEFT CH OUTPUT to J10 (INVERTER INPUT).



External Preamp Connections
(See the Schematic and the Block Diagram for circuit details)

EXTERNAL TURNTABLE INPUT

Use this configuration to connect an external turntable (the turntable volume and tone to be controlled by both the phonograph tone and volume controls and the turntable controls).

WARNING:

Be sure that the equipment that you are connecting to the phonograph has an isolation transformer type power supply. Equipment that does not have an isolation transformer can damage the phonograph and/or create a shock hazard.

Instructions

Cables and Jumpers

Obtain four shielded audio cables long enough to reach between:

- The turntable and the turntable preamp (two cables).
- The turntable preamp and the phonograph accessory board (two cables).

This configuration requires three jumpers on the accessory board. Connect these three jumpers between:

1. J9 (LEFT CH POWER AMP INPUT) and J14 (INVERTOR OUTPUT).
2. J11 (INVERTER INPUT) and J16 (LEFT CH PREAMP OUTPUT).
3. J13 (RIGHT CHANNEL POWER AMP INPUT) and J20 (RIGHT CHANNEL PREAMP OUTPUT)

Input Level Considerations

The Background Music input can accept a wide range of input levels. You can Connect speaker lines, Aux. outputs, line outputs, or 70 Volt lines to the Accessory Board Background Music inputs.

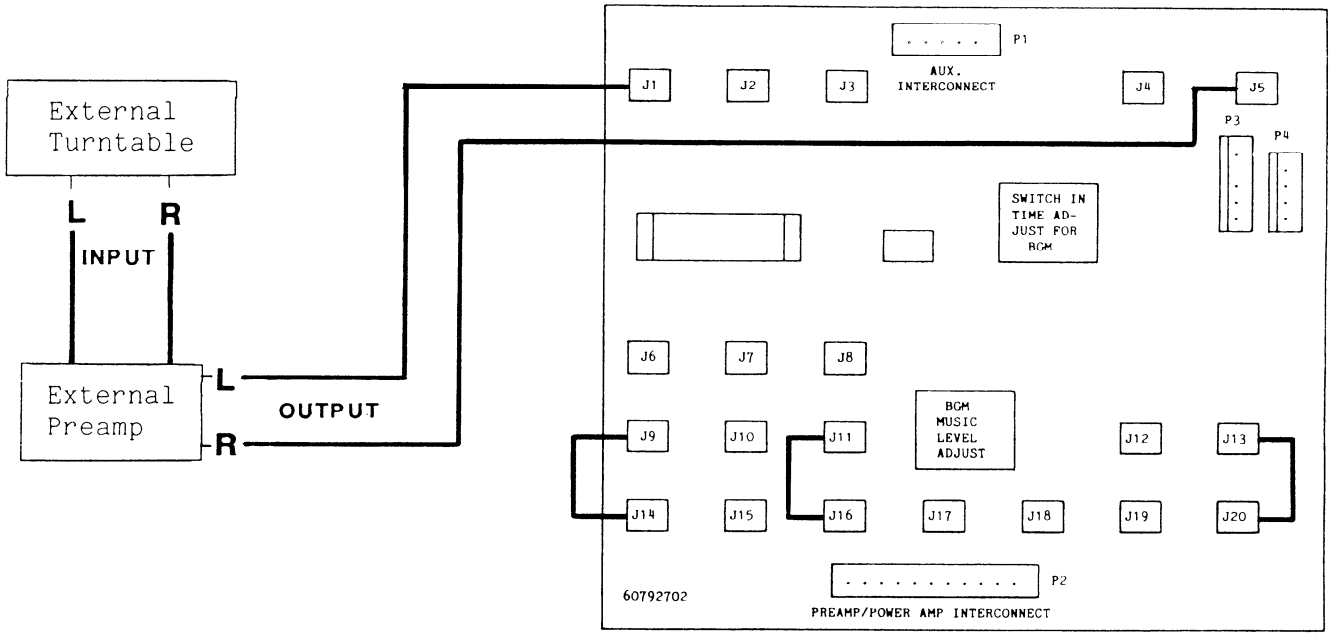
Although 70 Volt inputs to the Accessory Board will work, we recommend that you use the lower level inputs (Speakers, aux., line) whenever you consider using a 70 Volt line.

Input Connections

Make the connections between the turntable nd the turntable preamp in accordance with the turntable preamp instructions.

Connect the turntable preamp to the accessory board as follows:

1. RIGHT CH PREAMP OUTPUT to J5 (RIGHT CH AUX. INPUT) of the accessory board.
2. LEFT CH PREAMP OUTPUT to J1 (RIGHT CH AUX. INPUT) of the accessory board.



External turntable Connections
(See the Schematic and the Block Diagram for circuit details)

STEREO SLAVE AMPLIFIER OUTPUT

Connect a stereo slave amplifier in this configuration if you want the amplifier volume and tone to be controlled by the phonograph tone and volume controls.

WARNING:

Be sure that the equipment that you are connecting to the phonograph has an isolation transformer type power supply. Equipment that does not have an isolation transformer can damage the phonograph and/or create a shock hazard.

Instructions

Cables and Jumpers

Obtain two shielded audio cables long enough to reach between the slave amplifier and the phonograph accessory board.

This configuration requires three jumpers on the accessory board. Connect these three jumpers between:

1. J9 (LEFT CH POWER AMP INPUT) and J14 (INVERTER OUTPUT).
2. J11 (INVERTER INPUT) and J16 (LEFT CH PREAMP OUTPUT).
3. J13 (RIGHT CHANNEL POWER AMP INPUT) and J20 (RIGHT CHANNEL PREAMP OUTPUT).

Input Level Considerations

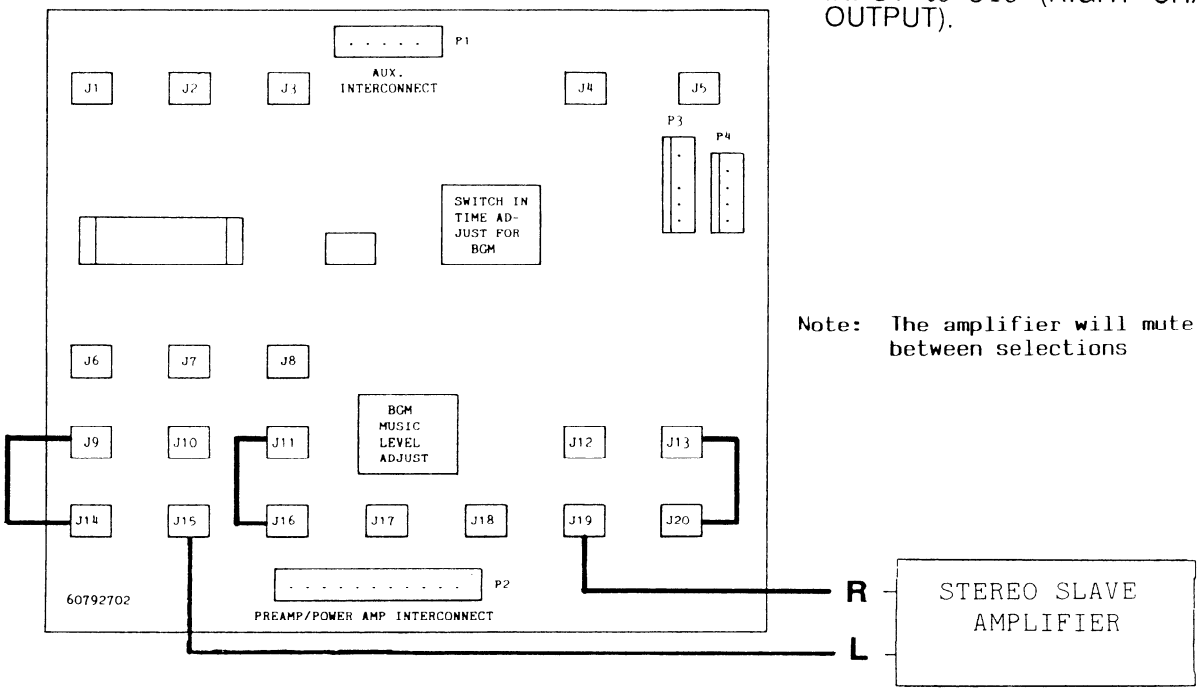
The Background Music input can accept a wide range of input levels. You can Connect speaker lines, Aux. outputs, line outputs, or 70 Volt lines to the accessory board background music inputs.

Although 70 Volt inputs to the Accessory Board will work, we recommend that you use the lower level inputs (Speakers, aux., line) whenever you consider using a 70 Volt line.

Input Connections

Connect the input cable from the slave amplifier to the accessory board as follows:

1. Connect the slave amplifier LEFT CHANNEL INPUT to J15 (INVERTER OUTPUT).
2. Connect the slave amplifier RIGHT CHANNEL INPUT to J19 (RIGHT CHANNEL PREAMP OUTPUT).



Note: The amplifier will mute between selections

Stereo Slave Amplifier Connections (Controlled By Phono Volume)
(See the Schematic and the Block Diagram for circuit details)

MONAURAL SLAVE AMPLIFIER OUTPUT

Connect a monaural slave amplifier in this configuration if you want the amplifier volume and tone to be controlled by the phonograph tone and volume controls.

WARNING:

Be sure that the equipment that you are connecting to the phonograph has an isolation transformer type power supply. Equipment that does not have an isolation transformer can damage the phonograph and/or create a shock hazard.

Instructions

Cables and Jumpers

Obtain two shielded audio cables long enough to reach between the slave amplifier and the phonograph accessory board.

This configuration requires three jumpers on the accessory board. Connect these three jumpers between:

1. J9 (LEFT CH POWER AMP INPUT) and J14 (INVERTER OUTPUT).
2. J11 (INVERTER INPUT) and J16 (LEFT CH PREAMP OUTPUT).
3. J13 (RIGHT CHANNEL POWER AMP INPUT) and J20 (RIGHT CHANNEL PREAMP OUTPUT).

Input Level Considerations

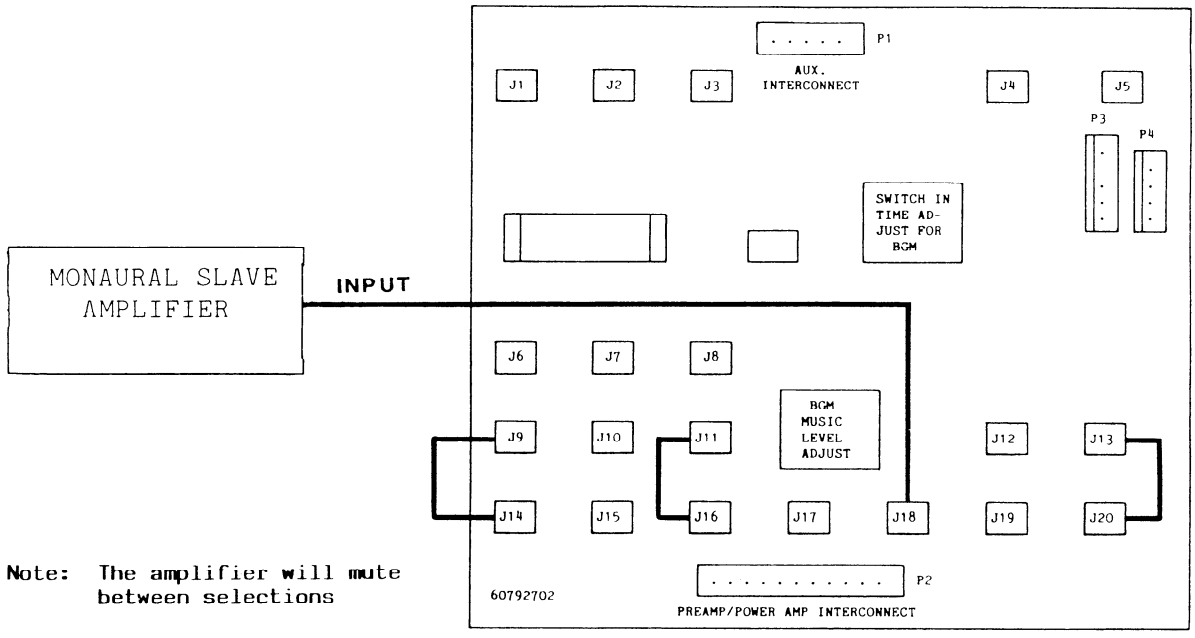
The Background Music input can accept a wide range of input levels. You can Connect speaker lines, Aux. outputs, line outputs, or 70 Volt lines to the accessory board background music inputs.

Although 70 Volt inputs to the Accessory Board will work, we recommend that you use the lower level inputs (Speakers, aux., line) whenever you consider using a 70 Volt line.

Input Connections

Connect the input cable from the slave amplifier to the accessory board as follows:

Connect the input cable from the slave amplifier INPUT to J18 (PREAMP MONO OUTPUT).



Monaural Slave Amplifier Connections (Controlled By Phono Volume)
(See the Schematic and the Block Diagram for circuit details)

STEREO SLAVE AMPLIFIER OUTPUT

Connect a stereo slave amplifier in this configuration if you want the amplifier volume and tone to be independent of the phonograph tone and volume controls.

> **WARNING:**
>
> **Be sure that the equipment that you are connecting to the phonograph has an isolation transformer type power supply. Equipment that does not have an isolation transformer can damage the phonograph and/or create a shock hazard.**

Instructions

Cables and Jumpers

Obtain two shielded audio cables long enough to reach between the slave amplifier and the phonograph accessory board.

This configuration requires three jumpers on the accessory board. Connect these three jumpers between:

1. J9 (LEFT CH POWER AMP INPUT) and J14 (INVERTER OUTPUT).
2. J11 (INVERTER INPUT) and J16 (LEFT CH PREAMP OUTPUT).
3. J13 (RIGHT CHANNEL POWER AMP INPUT) and J20 (RIGHT CHANNEL PREAMP OUTPUT).

Input Level Considerations

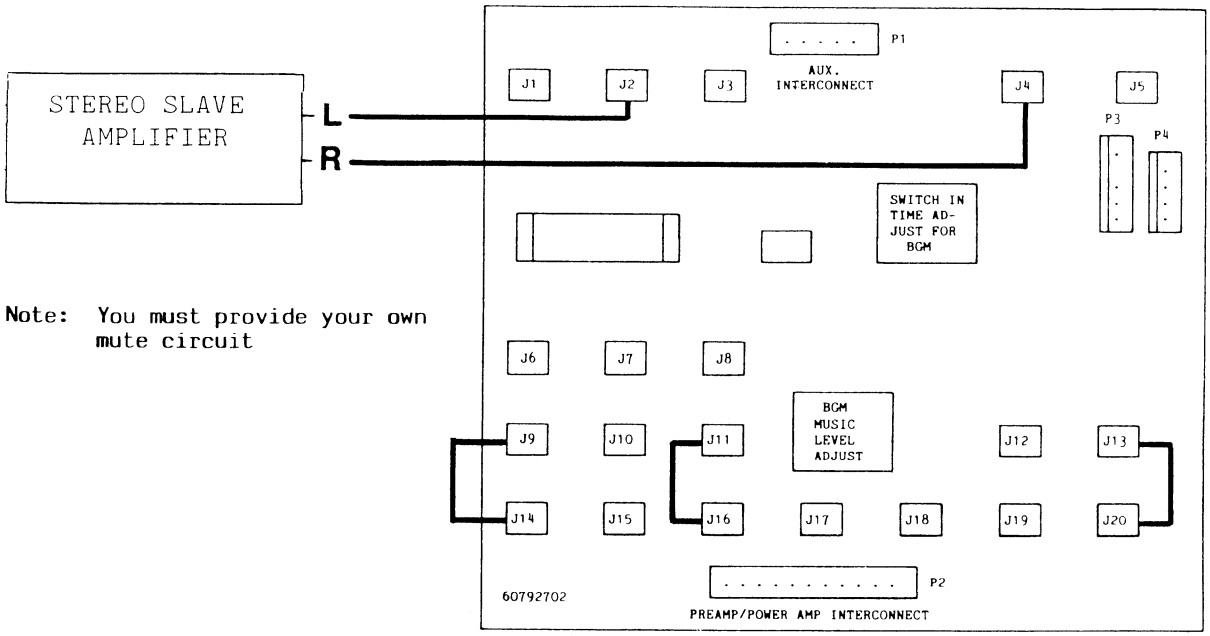
The Background Music input can accept a wide range of input levels. You can Connect speaker lines, Aux. outputs, line outputs, or 70 Volt lines to the accessory board background music inputs.

Although 70 Volt inputs to the Accessory Board will work, we recommend that you use the lower level inputs (Speakers, aux., line) whenever you consider using a 70 Volt line.

Input Connections

Connect the input cable from the slave amplifier to the accessory board as follows:

1. Connect the slave amplifer LEFT CHANNEL INPUT to J2 (LEFT CH. AUX. OUTPUT).
2. Connect the slave amplifier. RIGHT CHANNEL INPUT to J4 (RIGHT CH. AUX OUTPUT).



Stereo Slave Amplifier Connections (Independent Of Phono Volume)
(See the Schematic and the Block Diagram for circuit details)

MONAURAL SLAVE AMPLIFIER OUTPUT

Connect a monaural slave amplifier in this configuration if you want the amplifier volume and tone to be independent of the phonograph tone and volume controls.

WARNING:

Be sure that the equipment that you are connecting to the phonograph has an isolation transformer type power supply. Equipment that does not have an isolation transformer can damage the phonograph and/or create a shock hazard.

Instructions

Cables and Jumpers

Obtain one shielded audio cable long enough to reach between the slave amplifier and the phonograph accessory board.

This configuration requires three jumpers on the accessory board. Connect these three jumpers between:

1. J9 (LEFT CH POWER AMP INPUT) and J14 INVERTER OUTPUT.
2. J11 (INERTER INPUT) and J16 (LEFT CH PREAMP OUTPUT).
3. J13 (RIGHT CHANNEL POWER AMP INPUT) and J20 (RIGHT CHANNEL PREAMP OUTPUT).

Input Level Considerations

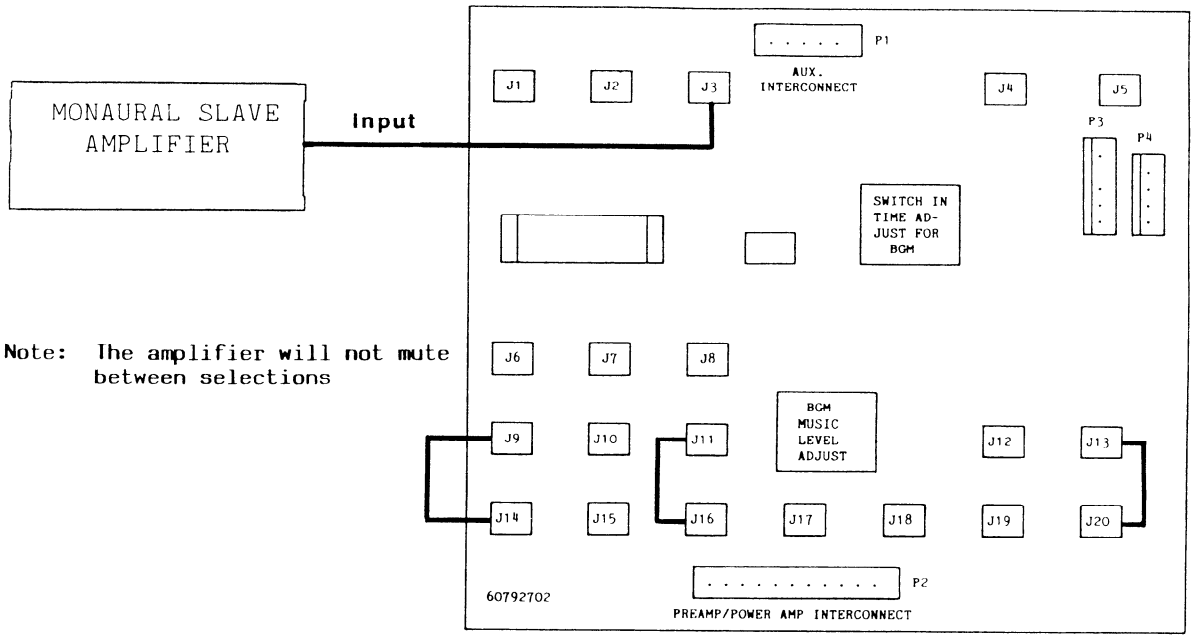
The Background Music input can accept a wide range of input levels. You can Connect speaker lines, Aux. outputs, line outputs, or 70 Volt lines to the accessory board background music inputs.

Although 70 Volt inputs to the Accessory Board will work, we recommend that you use the lower level inputs (Speakers, aux., line) whenever you consider using a 70 Volt line.

Input Connections

Connect the input cable from the slave amplifier to the accessory board as follows:

Connect the slave amplifier INPUT to J3 (AUX. OUTPUT MONO).



Monaural Slave Amplifier Connections (Independent of Phono Volume)
(See the Schematic and the Block Diagram for circuit details)

BACKGROUND LEVEL AND SWITCH-IN TIME DELAY ADJUSTMENTS

Background Level Adjustment

1. Select a song from the phonograph and make sure that the phonograph volume is at the desired level.
2. Cancel the song, turn the SWITCH-IN TIME adjustment clockwise as far as it will go.
3. When the Background Music begins to play (in approximately 10 seconds), adjust the BGM MUSIC LEVEL control for the desired Background Music level.

Switch-In Time Adjustment

The Switch-In Time can be adjusted from a minimum of approximately 10 seconds to a maximum of approximately two minutes. To set this time:

1. Make another selection, while the song is playing, turn the SWITCH-IN TIME ADJUST *(see figure 3)* fully clockwise. (it should already be in this position if you have just finished the Background music adjustment) Cancel the record. Approximately 10 seconds after the selection finishes, the background music will begin playing.
2. Turn the SWITCH-IN TIME ADJUST control counter clockwise slightly, play and cancel a record, and note the switch-in time.
3. Repeat step two until the desired switch in time is reached.

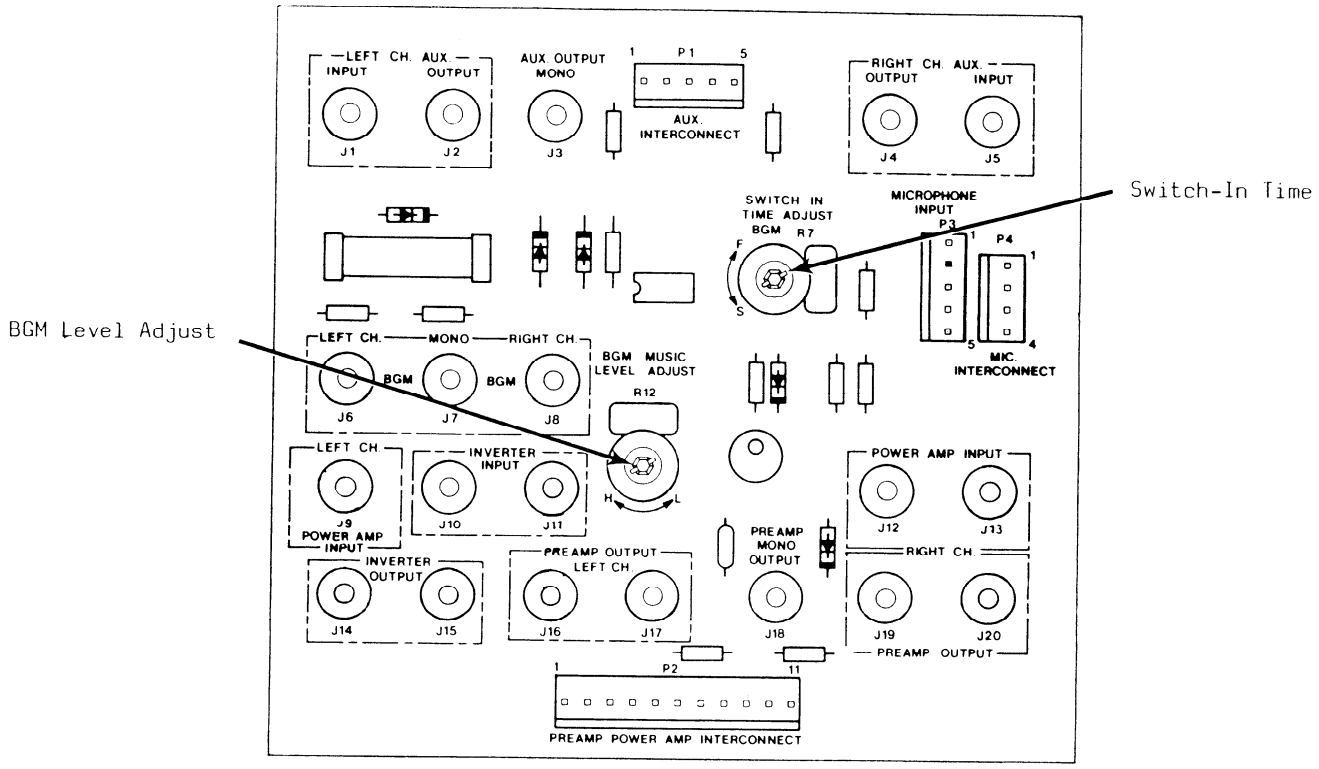


Figure 3. Adjustment Locations

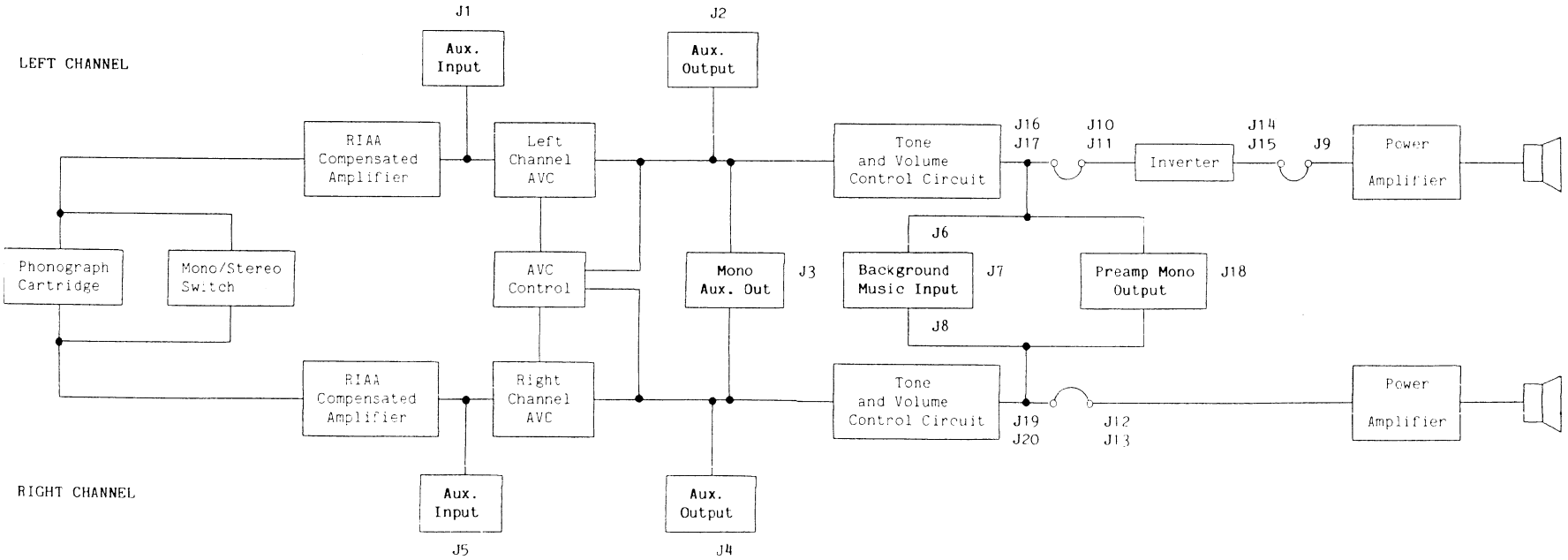
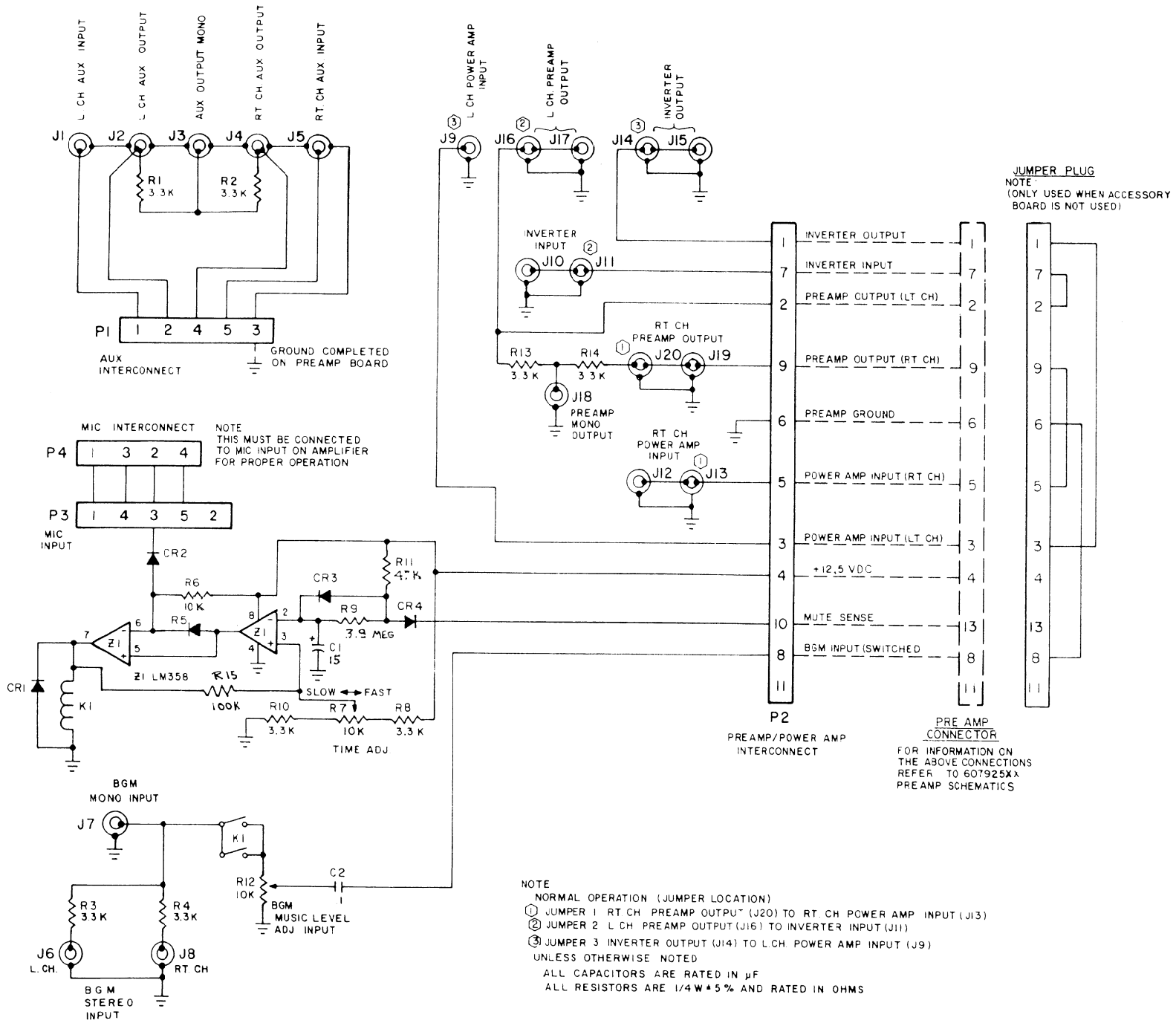


Figure 4. Sound System Block Diagram

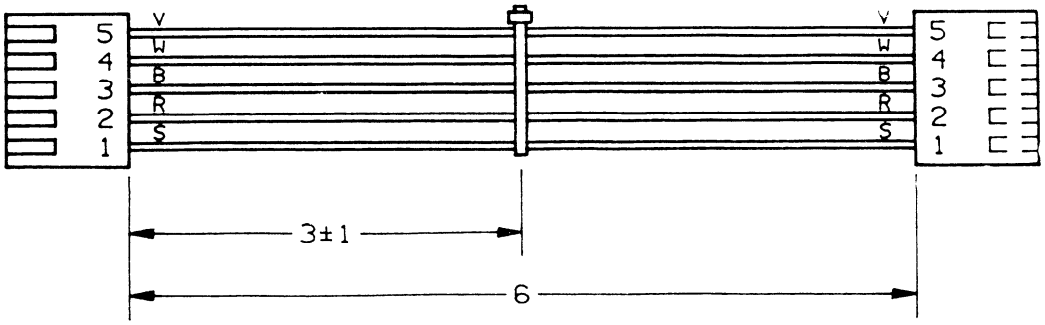


For Equivalent Engineering Dwg. See 60792702-Q2 G

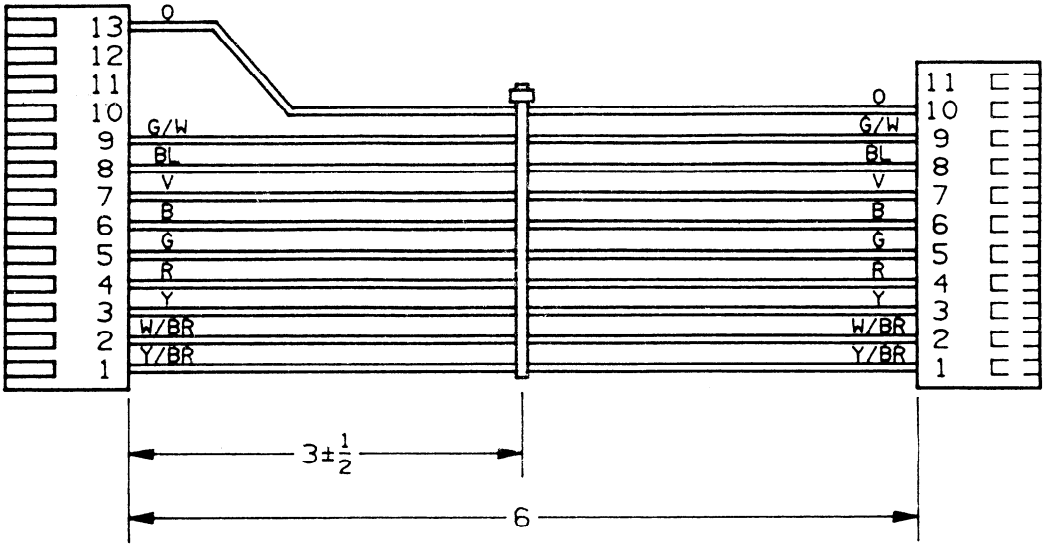
Figure 5. Sound System Block Diagram

COMPONENT LIST FOR 60797202 CKT. BD. ASSY - PREAMP ACCESSORY BD

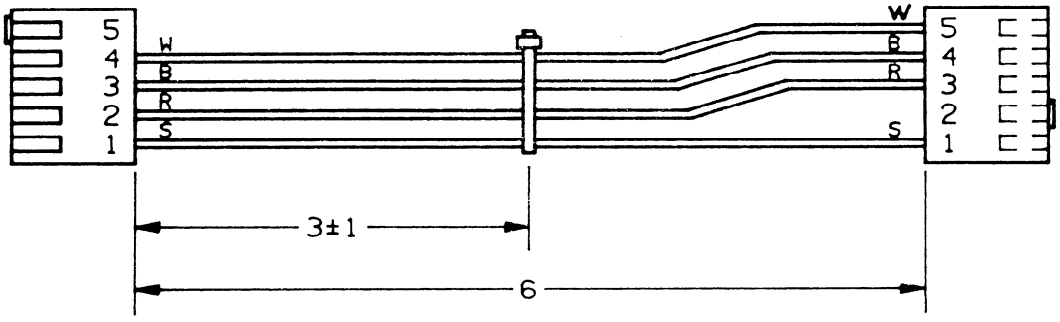
C1	Capacitor - Electrolytic		(15 MFD) 50V	70023809
C2	Capacitor - Mono Ceramic		(.1 MFD)	70028514
CR1	Diode - Silicon	1N4148		70035012
CR2	Diode - Silicon	1N4148		70035012
CR3	Diode - Silicon	1N4148		70035012
CR4	Diode - Silicon	1N4148		70035012
J1-J20	Receptacle - P.C.			21540902
K1	Relay - Reed (P.C. 12/15V)			70042208
P1	Wafer - Non - Polarizing		(5 CKT)	70074923
P2	Wafer - Polarizing		(11 CKT)	70075011
P3	Wafer - Polarizing		(5 CKT)	70075005
P4	Wafer - Polarizing		(4 CKT)	70075004
R1	Resistor - Carbon 3.3K		(1/4W, 5%)	79901332
R2	Resistor - Carbon 3.3K		(1/4W, 5%)	79901332
R3	Resistor - Carbon 3.3K		(1/4W, 5%)	79901332
R4	Resistor - Carbon 3.3K		(1/4W, 5%)	79901332
R5	Diode - Silicon Ω			70035012
R6	Resistor - Carbon 10K		(1/4W, 5%)	79901103
R7	Potentiometer (10K -20%)			70040014
R8	Resistor - Carbon 47K		(1/4W, 5%)	79901332
R9	Resistor - Carbon 3.9 MEG		(1/4W, 5%)	79901332
R10	Resistor - Carbon 3.3K		(1/4W, 5%)	79901332
R11	Resistor - Carbon 47K		(1/4W, 5%)	79901395
R12	Potentiometer (10K-20%)			70040014
R13	Resistor - Carbon 3.3K		(1/4W, 5%)	79901392
R14	Resistor - Carbon 3.3K		(1/4W, 5%)	79901392
R15	Resistor - Carbon 100K		(1/4W, 5%)	79901104
Z1	IC - Dual OP - AMP		(LM358)	30800214
Wave Solder Per Spec:				00005600



3-04260-02 HARNESS ASS'Y-AUXILIARY INTERCONNECT



3-04261-03 HARNESS ASS'Y-AMPLIFIER INTERCONNECT



3-08792-01 HARNESS ASS'Y-MICROPHONE INTERCONNECT

INSTALLATION TIPS AND TECHNIQUES

If you are having difficulty with your Accessory Board installation, review the following list of installation tips for the problem that matches or nearly matches your situation.

Excessive Hum

The primary cause of hum is poor grounding. Make sure that each audio line connecting the Accessory Board to the added equipment has a good ground at both ends. If the wires are soldered, check for a cold solder connection. If the ground connections are crimped, look for an incomplete or forgotten crimp.

If the audio grounding is not the fault, you might have a voltage difference between the phonograph and the added equipment. To check for this condition, unplug one cable at a time, and measure the voltage between the ground on the cable and the phonograph ground. You should not be able to measure any AC or DC voltage between the two units. If you do measure any voltage, you must isolate the added equipment from the power line. Sometimes this can be avoided by reversing the 120 volt plug (2-prong plugs only).

If the added equipment is causing the hum and the hum is due to a voltage differential, but the 120 plug on the equipment has a 3-prong plug, we do not advise using an isolation plug to correct the problem. Rowe suggests, in this situation, that you have a competent repair center make the needed repairs.

Noise Between Audio Selections

This condition can exist if you have chosen a configuration which does not allow the phonograph Mute circuit to quiet the phonograph between selections. If this condition exists, consult a competent electronics technician or engineer for the circuit necessary to mute the specific added equipment and phonograph combination.

Crosstalk

Crosstalk can exist when an external preamp is used between the tone and volume circuits (J16, J17 and J19, J20) and the power amplifier (J10, J11 and J12, J13). Crosstalk will exist because R13 and R14 (see schematic) will "mix" the Left and Right channel signals.

To correct this problem, make a shorting plug (connect the center of the plug to the case) and plug it into J18.

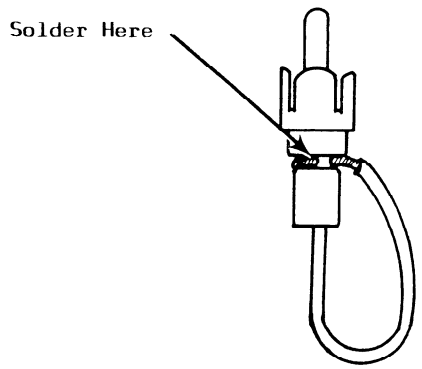


Figure 6. Shorting Plug

Rowe Amplifier Accessory Board
Kit # 26694703 Notes

Production Changes

Resistor R5 was changed to a diode for improved operation. To upgrade, remove resistor R5 (47 ohm, 1/4 watt) and replace with a common 1N4148 diode. Install with the cathode facing the J3 jack (Aux Out Mono) the same as diode CR2 right next to it.

Resistor R15 (100 k, 1/4 watt) is soldered to the foil side of the board from integrated circuit Z1, pin 7 to the wiper of trimpot R7 (Switch-in Time Adjust).

Part Notes

Diodes that are Rowe # 70035012 are really common type 1N4148 diodes.

Capacitor C1 is 15 uf @ 50 volts with radial leads

Relay K1 is a PC mount reed relay operating on 12 to 15 volts DC. The Rowe part number for it is 70042208. The original relay manufacturer's # is 8402-12-000. It can be replaced with ECG # RLY 5532 or NTE # R44-11D2-12.

Operation Notes

If you wish to use an external graphic equalizer to control the tone and volume of the jukebox, the instructions on sheet 6 pertaining to "External preamp tone and volume control" will apply for this usage.

Purchasing This Kit

Many coin operated jukebox dealers stock this kit along with many coin machine parts distributors such as Happ Controls, Mazzco, Betson-Imperial, etc. It sells in the $156 price range. The original Rowe part number of 26694703 is what many dealers/distributors use when you order this kit.

Happ Controls # 26694703 Rowe Amplifier Kit, Models R90 thru CD-100 series

November 16, 2005