Figure 9. PS1 Power Stand Electronics Module with Top Cover Removed
## Disassembly Procedures

### Power Stand Procedures

**Note:** Refer to Figure 9 for the following procedures.

1. **Lower Housing Removal**
   1.1 Place the power stand on a soft surface so that the line array opening faces down.
   1.2 Using a Phillips-head screwdriver, remove the 19 screws that secure the lower housing to the upper housing. Lift off the lower housing.

2. **Amplifier Housing Removal**
   2.1 Perform procedure 1.
   2.2 Make a note of the wiring, and disconnect the wiring harnesses and connectors that run to the amplifier housing. The amplifier housing is the large metal box with the four fans.
   2.3 Using a Phillips-head screwdriver, remove the four screws that secure the power stand base plate to the bottom of the line array cavity. Lift it off of the cavity. Be careful not to damage any wires.
   2.4 Once all of the wiring is disconnected, use a Phillips-head screwdriver to remove the 16 screws that secure the amplifier housing to the power stand upper housing. Carefully lift the amplifier housing out of the power stand upper housing.

3. **Line Array Cavity Removal**
   3.1 Perform procedure 2.
   3.2 Using a Phillips-head screwdriver, remove the three screws that secure the line array cavity to the upper housing. Lift the line array cavity off of the upper housing. The power stand foot pedal will disengage from the shaft.
4. Amplifier PCB Removal

4.1 Perform procedure 2.

4.2 Make a note of the wiring and disconnect all of the wiring harnesses that connect the power supply box to the DSP PCB and to the microprocessor PCB.

4.3 Using a Phillips-head screwdriver, remove the 24 screws that secure the power supply box top cover in place. Lift off the top cover.

4.4 Once you have the top cover off, make a note of the wiring configuration and unplug the wiring harnesses that connect to the amplifier PCB.

4.5 Using a Phillips-head screwdriver, remove the 6 screws that secure amplifier PCB in place. Lift the amplifier PCB out of the chassis.

5. Switching DC Power Supply Removal

5.1 Perform procedure 2.

5.2 Make a note of the wiring and disconnect all of the wiring harnesses that connect the power supply box to the DSP PCB and to the microprocessor PCB.

5.3 Using a Phillips-head screwdriver, remove the 24 screws that secure the power supply box top cover in place. Lift off the top cover.

5.4 Once you have the top cover off, make a note of the wiring configuration and unplug the wiring harnesses that connect to the switching DC power supply PCB you wish to remove.

5.5 Using a Phillips-head screwdriver, remove the 4 screws that secure power supply PCB in place. Lift the power supply PCB out of the chassis.
6. Auxiliary Power Supply Removal

6.1 Perform procedure 2.

6.2 Make a note of the wiring and disconnect all of the wiring harnesses that connect the power supply box to the DSP PCB and to the microprocessor PCB.

6.3 Using a Phillips-head screwdriver, remove the 24 screws that secure the power supply box top cover in place. Lift off the top cover.

6.4 Once you have the top cover off, make a note of the wiring configuration and unplug the wiring harnesses that connect to the switching DC power supply PCB you wish to remove.

6.5 Using a Phillips-head screwdriver, remove the 4 screws that secure power supply PCB in place. Lift the power supply PCB out of the chassis.

7. EMI Filter PCB Removal

7.1 Perform procedure 2.

7.2 Make a note of the wiring and disconnect all of the wiring harnesses that connect the power supply box to the DSP PCB and to the microprocessor PCB.

7.3 Using a Phillips-head screwdriver, remove the 24 screws that secure the power supply box top cover in place. Lift off the top cover.

7.4 Once you have the top cover off, make a note of the wiring configuration and unplug the wiring harnesses that connect to the EMI Filter PCB.

7.5 Using a Phillips-head screwdriver, remove the 4 screws that secure the EMI Filter PCB in place. Lift the EMI Filter PCB out of the chassis.
8. Chassis Fan Removal

8.1 Perform procedure 2.

8.2 Using a Phillips-head screwdriver, remove the 24 screws that secure the power supply box top cover in place. Lift off the top cover.

8.3 Using a Phillips-head screwdriver, remove the 4 screws that secure the fan to the chassis.

8.4 Follow the wire harness for the fan you are removing to the auxiliary power supply PCB and unplug it. Lift the fan out of the chassis.

Re-assembly note: When installing the new fan, be sure to match the orientation of the fan next to it so that it will move air in the proper direction when in use.

9. Microprocessor PCB Removal

9.1 Perform procedure 1.

9.2 Make a note of the wiring configuration and unplug the six wire harnesses from the connectors on the board.

9.3 Lift the microprocessor PCB off of the connectors that engage it on the bottom of the board and the pins that connect to the preset switches.

Re-assembly note: When re-installing this PCB, be sure that all of the pins from the preset switches are straight and properly engage the connectors on the bottom of the microprocessor PCB.
10. DSP PCB Removal

10.1 Perform procedure 1.

10.2 Make a note of the wiring configuration and unplug the six wire harnesses from the connectors on the board.

10.3 Using a pair of needle-nose pliers, compress the bottoms of the plastic standoff posts used to attach the DSP PCB to the Input/Output PCB. Lift the DSP PCB off of the I/O PCB.

11. Input/Output PCB Removal

11.1 Perform procedures 9 and 10.

11.2 On the front panel of the power stand, remove the four knobs for the mic trim and level controls.

11.3 Using a nut driver, remove the nine nuts and washers for the 1/4 inch phono jacks.

11.4 Using a Phillips-head screwdriver, remove the 16 screws that secure the XLR, Data in/out and Neutrik connectors to the front panel.

11.5 Lift the I/O PCB off of the input panel.
## Disassembly Procedures

### Line Array Procedures

**Note:** The line arrays are divided into a lower line array, which plugs directly into the power stand, and an upper line array, which uses a bayonet arrangement to align the upper array to the lower array for connection. All electrical connections are automatically made when the arrays are mounted into the power stand and the upper array is mounted to the lower array.

**Note:** Refer to Figure 7 for the following procedures.

1. **Grille Removal**
   - 1.1 Using a Phillips-head screwdriver, remove the six screws that secure the end cap to the line array enclosure. Lift off the end cap. Unplug the molex connector from the speaker harness.
   - 1.2 Grasp the edge of the grille and gently lift it away from the enclosure.

2. **Nameplate Removal**
   - 2.1 Perform procedure 1.
   - 2.2 On the back of the grille, unbend the legs of the logo. Lift off the nameplate.

3. **Driver Removal**
   - 3.1 Perform procedure 1.
   - 3.2 Using a Phillips-head screwdriver, remove the four screws that secure the driver to the enclosure.
   - 3.3 Lift the driver out of the enclosure. Note the wiring configuration and cut the wires as close to the driver terminals as possible.

4. **Upper Line Array Top End Cap Removal**
   - 4.1 Using a Phillips-head screwdriver, remove the seven screws that secure the end cap to the line array enclosure. Lift off the end cap.
   - **Re-assembly note:** Make sure that the end cap gasket is properly aligned to achieve an airtight seal.

5. **Upper Line Array Bottom End Cap Removal**
   - 5.1 Using a Phillips-head screwdriver, remove the seven screws that secure the end cap to the line array enclosure. Lift the end cap away from the enclosure. Unplug the molex connector from the speaker harness.
   - **Re-assembly note:** Make sure that the end cap gasket is properly aligned to achieve an airtight seal.

6. **Lower Line Array Top End Cap Removal**
   - 6.1 Using a Phillips-head screwdriver, remove the six screws that secure the end cap to the line array enclosure. Lift off the end cap. Unplug the molex connector from the speaker harness.
   - **Re-assembly note:** Make sure that the end cap gasket is properly aligned to achieve an airtight seal.

7. **Lower Line Array Bottom End Cap Removal**
   - 7.1 Using a Phillips-head screwdriver, remove the seven screws that secure the end cap to the line array enclosure. Lift the end cap away from the enclosure. Unplug the molex connector from the speaker harness.
   - **Re-assembly note:** Make sure that the end cap gasket is properly aligned to achieve an airtight seal.
Disassembly Procedures

8. Front Cap Removal

8.1 Using a Phillips-head screwdriver, remove the four screws that secure the front cap to the bottom front of the line array enclosure. Lift the end cap away from the enclosure.

Bass Module Procedures

Note: Refer to Figure 8 for the following procedures.

1. Grille Removal

1.1 Using an allen wrench, remove the four screws that secure the grille to the upper and lower speaker end caps.

1.2 Lift off the grille.

2. Nameplate Removal

2.1 Perform procedure 1.

2.2 On the back of the grille, remove the retaining nut and spring from the post of the nameplate. Lift the nameplate off of the grille.

3. Driver Removal

3.1 Perform procedure 1.

3.2 Using a Phillips-head screwdriver, remove the four screws that secure the driver to the bass module enclosure.

3.3 Lift the driver out of the enclosure. Note the wiring configuration and cut the wires as close to the driver terminals as possible.

Re-assembly notes:
- When soldering the speaker harness wires to the new driver, be sure to observe polarity of the driver harness wires.
- Be sure to properly align the gasket behind the new driver to ensure an airtight fit.

4. Input Panel Removal

4.1 Using a Phillips-head screwdriver, remove the four screws that secure the input panel to the bass module enclosure.

4.2 Lift the input panel away from the bass module enclosure.

4.3 Make a note of the wiring configuration and un-solder the speaker harness wires from the input panel.
Test Procedures

PS1 Power Stand Tests

Equipment Required
- dB Meter
- Digital Multi-meter
- Audio Signal Generator
- Distortion Meter
- 3 - 4 Ohm, 250 Watt Load Resistors
- Test cables, see Appendix

Overall PS1 System Tests

Notes:
1. Do not connect the R1 remote control for the following tests, unless specified. Powering up the PS1 power stand without the remote has the same effect as setting all of the controls on the remote to the midpoint.
2. On the front panel of the PS1, set the Channel 1 and Channel 2 Preset Select switches to 00. Short out the 2+ and 2- connections on the Amp 3 out connector using the test cable described in section 1 of the appendix of this manual. This will put the PS1 into debug mode for the following tests. In this mode the crossover, the compressor and the EQ are disabled. The DSP will pass a flat response. The level controls and the clip indicators still operate in this mode.
3. Refer to Figure 10, PS1 Block Diagram, for the following procedures.

1. Channel 1 and 2 Mic Input Gain Tests

1.1 Place a 1/4” mono shorting plug into the Amp 2 IN and Amp 3 IN jacks on the right hand side of the input/output panel. This will disable the channel 2 and 3 amplifiers while testing the channel 1 amplifier.

1.2 On the left hand side of the input/output panel, set the channel 1 Mic Trim control to the 6 setting. Ensure that the Phantom Power push button is not pushed in.

1.3 Using a balanced XLR male input cable, apply a 1 kHz, -30dBV signal to the channel 1 input.

1.4 Reference a dB meter to the input level. Measure the gain output at the Amp 1 OUT jack. It should be +48.5 dB + 3 dB.

1.5 Move the shorting plug from the Amp 2 IN jack to the Amp 1 IN jack and repeat steps 1.1 to 1.4 for the channel 2 Mic input.

2. Channel 1 and 2 Mic Input Frequency Response and Distortion Tests

2.1 Place a 1/4” mono shorting plug into the Amp 2 IN and Amp 3 IN jacks on the right hand side of the input/output panel. This will disable the channel 2 and 3 amplifiers while testing the channel 1 amplifier.

2.2 On the left hand side of the input/output panel, set the channel 1 Mic Trim control to the 6 setting. Ensure that the Phantom Power push button is not pushed in.

2.3 Using a balanced XLR male input cable, apply a 1 kHz, -30 dBV signal to the channel 1 input.

2.4 Use an 80kHz low-pass filter on your measuring equipment. Reference a dB meter to the input level. Measure the frequency response at the Amp 1 OUT jack. It should be 0 dB + 3 dB from 30 Hz to 15 kHz.

2.5 Measure the Total Harmonic Distortion (THD) level at the Amp 1 OUT jack. It should be 0.25% max at 1 kHz and 1.5% max at 15 kHz.

2.6 Move the shorting plug from the Amp 2 IN jack to the Amp 1 IN jack and repeat steps 2.1 to 2.5 for the channel 2 Mic input.
Test Procedures

3. Channel 1 and 2 Mic Input Signal to Noise Ratio (Dynamic Range) Tests

3.1 Place a 1/4” mono shorting plug into the Amp 2 IN and Amp 3 IN jacks on the right hand side of the input/output panel. This will disable the channel 2 and 3 amplifiers while testing the channel 1 amplifier.

3.2 On the left hand side of the input/output panel, set the channel 1 Mic Trim control to the 6 setting. Ensure that the Phantom Power push button is not pushed in.

3.3 Using a balanced XLR male input cable, apply a 1 kHz, -30 dBV signal to the channel 1 input.

3.4 Reference a dB meter to the output level at the Amp 1 OUT jack. Remove the input signal and measure the A-Weighted output level. It should be -80 dB minimum.

3.5 Move the shorting plug from the Amp 2 IN jack to the Amp 1 IN jack and repeat steps 3.1 to 3.4 for the channel 2 Mic input.

4. Channel 1 and 2 Mic Input Phantom Power Test

4.1 Plug an XLR connector into the channel 1 Mic input. Do not connect any cables to the channel 1 or channel 2 Mic inputs. Power on the unit.

4.2 Press the channel 1 phantom power switch. Verify that the LED lights. Using a DMM, measure the DC voltage level across pins 1 and 2 of the XLR connector. Verify that the DC level is +24Vdc + 1Vdc relative to pin 1.

4.3 Measure the DC voltage level across pins 1 and 3 of the XLR connector. Verify that the DC level is +24Vdc + 1Vdc relative to pin 1.

4.4 Repeat steps 4.1 to 4.3 for channel 2.

5. Channel 1 and 2 Line Input Gain Tests

5.1 Place a 1/4” mono shorting plug into the Amp 2 IN and Amp 3 IN jacks on the right hand side of the input/output panel. This will disable the channel 2 and 3 amplifiers while testing the channel 1 amplifier.

5.2 On the left hand side of the input/output panel, set the channel 1 Mic Trim control to the 6 setting. Ensure that the Phantom Power push button is not pushed in.

5.3 Using an unbalanced 1/4” phono jack input cable, apply a 1 kHz, -10 dBV signal to the channel 1 input.

5.4 Reference a dB meter to the input level. Measure the gain output at the Amp 1 OUT jack. It should be +28.5 dB + 4 dB.

5.5 On the signal generator, turn the input level all the way down. Verify that the channel 1 Signal/OL LED is off. Increase the signal generator level. Verify that the LED lights green. Increase the signal level again and verify that the LED lights red.

Note: You may have to increase the Mic Trim level on the PS1 channel 1 input as well to get the LED to light red.

5.5 Move the shorting plug from the Amp 2 IN jack to the Amp 1 IN jack and repeat steps 5.1 to 5.5 for the channel 2 Line input.

6. Channel 1 and 2 Line Input Frequency Response and Distortion Tests

6.1 Place a 1/4” mono shorting plug into the Amp 2 IN and Amp 3 IN jacks on the right hand side of the input/output panel. This will disable the channel 2 and 3 amplifiers while testing the channel 1 amplifier.

6.2 On the left hand side of the input/output panel, set the channel 1 Mic Trim control to the 6 setting. Ensure that the Phantom Power push button is not pushed in.
6.3 Using an unbalanced 1/4” phono jack input cable, apply a 1 kHz, -10 dBV signal to the channel 1 input.

6.4 Use an 80 kHz low-pass filter on your measuring equipment. Reference a dB meter to the input level. Measure the frequency response at the Amp 1 OUT jack. It should be 0 dB + 3 dB from 30 Hz to 15 kHz.

6.5 Measure the Total Harmonic Distortion (THD) level at the Amp 1 OUT jack. It should be 0.25% max at 1 kHz and 1.5% max at 15 kHz.

6.6 Move the shorting plug from the Amp 2 IN jack to the Amp 1 IN jack and repeat steps 6.1 to 6.5 for the channel 2 Line input.

7. Channel 1 and 2 Line Input Signal to Noise Ratio (Dynamic Range) Tests

7.1 Place a 1/4” mono shorting plug into the Amp 2 IN and Amp 3 IN jacks on the right hand side of the input/output panel. This will disable the channel 2 and 3 amplifiers while testing the channel 1 amplifier.

7.2 On the left hand side of the input/output panel, set the channel 1 Mic Trim control to the 6 setting. Ensure that the Phantom Power push button is not pushed in.

7.3 Using an unbalanced 1/4” phono jack input cable, apply a 1 kHz, -10 dBV signal to the channel 1 input.

7.4 Reference a dB meter to the output level at the Amp 1 OUT jack. Remove the input signal and measure the A-Weighted output level. It should be -80 dB minimum.

7.5 Move the shorting plug from the Amp 2 IN jack to the Amp 1 IN jack and repeat steps 7.1 to 7.4 for the channel 2 Line input.

8. Channel 3 and 4 Line Input Gain Tests

8.1 Place a 1/4” mono shorting plug into the Amp 1 IN and Amp 2 IN jacks on the right hand side of the input/output panel. This will disable the channel 1 and 2 amplifiers while testing the channel 3 amplifier.

8.2 On the left hand side of the input/output panel, set the channel 3 Level control to the 6 setting.

8.3 Using an unbalanced 1/4” phono jack input cable, apply a 1 kHz, -20 dBV signal to the channel 1 input.

8.4 Reference a dB meter to the input level. Measure the gain output at the Bass/Amp 3 OUT jack. It should be +40.1 dB + 3 dB.

8.5 Repeat steps 8.1 to 8.4 for the channel 4 Line input.

9. Channel 3 and 4 Line Input Frequency Response and Distortion Tests

9.1 Place a 1/4” mono shorting plug into the Amp 1 IN and Amp 2 IN jacks on the right hand side of the input/output panel. This will disable the channel 1 and 2 amplifiers while testing the channel 3 amplifier.

9.2 On the left hand side of the input/output panel, set the channel 4 Mic Trim control to the 6 setting.

9.3 Using an unbalanced 1/4” phono jack input cable, apply a 1 kHz, -20 dBV signal to the channel 1 input.

9.4 Use an 80 kHz low-pass filter on your measuring equipment. Reference a dB meter to the input level. Measure the frequency response at the Amp 1 OUT jack. It should be 0 dB + 3 dB from 30 Hz to 15 kHz.

9.5 Measure the Total Harmonic Distortion (THD) level at the Amp 1 OUT jack. It should be 0.25% max at 1 kHz and 1.5% max at 15 kHz.
9.6 Repeat steps 9.1 to 9.5 for the channel 4 Line input.

10. Channel 3 and 4 Line Input Signal to Noise Ratio (Dynamic Range) Tests

10.1 Place a 1/4" mono shorting plug into the Amp 1 IN and Amp 2 IN jacks on the right hand side of the input/output panel. This will disable the channel 1 and 2 amplifiers while testing the channel 3 amplifier.

10.2 On the left hand side of the input/output panel, set the channel 3 Level control to the 6 setting.

10.3 Using an unbalanced 1/4" phono jack input cable, apply a 1 kHz, -10 dBV signal to the channel 1 input.

10.4 Reference a dB meter to the output level at the Bass/Amp 3 OUT jack. Remove the input signal and measure the A-Weighted output level. It should be -80 dB minimum.

10.5 Repeat steps 10.1 to 10.4 for the channel 4 Line input.

11. Channel 1 and 2 Remote Control, Preset Switch and Insert Function Tests

11.1 Connect the PS1 power stand to a known good L1 line array. Set the channel 1 preset switch to 00. Connect the remote control to the unit using the remote control MIDI cable supplied with the PS1.

11.2 Connect an analog audio source to the Channel 1 line input 1/4 inch jack. This source can be a CD player with a music disc.

11.3 Adjust the trim level so that the LED is lit mostly green. The audio should sound normal.

11.4 With the audio playing, change the channel 1 preset to 97 and back to 00. The channel should mute gracefully when the preset switch is operated. The audio should fade back in again about a second after the switch has stopped operating.

Note: Preset 97 is a 1 kHz band pass (telephone-type sound). Preset 00 should sound normal.

11.5 Operate all channel 1 controls on the remote (high, mid, low, volume and master volume). All tone controls should have a clearly audible effect and operate smoothly. Channel volume may display a little “zipper” noise, which is normal.

Note: Channel volume all the way down does not mute the channel, but the output level should be very low. There is a small, but noticeable time delay between operating the control and the audible effect. This is normal. The master volume control should operate smoothly without any artifacts.

11.6 Insert a 1/4 inch phono jack all the way into the channel 1 Insert jack. The audio should sound normal.

11.7 Insert a 1/4 inch phono jack into the channel 3 Line IN jack and operate the volume control on the power stand. The audio should sound normal.

11.8 Repeat steps 11.1 to 11.7 for the channel 2 input.

12. Channel 1 Send, Line Output and Digital Output Tests

Note: For these tests you will need an external device that can accept both 1/4 inch and XLR inputs. A small mixer, such as a Mackie or Behringer with headphones connected works well for this. The master volume control on the PS1’s remote control should be set all the way down to mute all sound coming from the unit under test.
## Test Procedures

### 12. Test Procedures

| 12.1 | Connect the PS1 power stand to a known good L1 line array. Set the channel 1 preset switch to 00. Connect the remote control to the unit using the remote control MIDI cable supplied with the PS1. |
| 12.2 | Connect an analog audio source to the Channel 1 Line IN 1/4 inch jack. This source can be a CD player with a music disc. |
| 12.3 | Adjust the trim level so that the LED is lit mostly green. The audio should sound normal. |
| 12.4 | Insert a 1/4 inch plug halfway into the channel 1 Insert jack. The audio should sound normal. |
| 12.5 | Connect the PS1 channel 1 XLR Line OUT jack to the XLR input of the mixer. The audio should sound normal. |

**Note:** The PS1 puts out a “professional” +4dBu level. You may have to turn the input trim control on the mixer all the way down to prevent overloading the signal and distorting it.

| 12.6 | Connect the Data Out jack of the PS1 to a device that accepts a 48 kHz S/PDIF data stream. The audio should sound normal. |

### 13. Power Amplifier Tests

| 13.1 | Connect the PS1 power stand to a known good L1 line array. Set the channel 1 preset switch to 00. Connect the remote control to the unit using the remote control MIDI cable supplied with the PS1. |
| 13.2 | Connect an analog audio source to the Amp 1 IN 1/4 inch phono jack. This source can be a CD player with a music disc. |
| 13.3 | Verify that the audio comes from the upper section of the L1 line array. The audio should sound clean and undistorted. |

| 13.4 | Connect the audio source to the Amp 2 IN 1/4 inch phono jack. Verify that the audio comes from the lower section of the L1 line array. The audio should sound clean and undistorted. |
| 13.5 | Connect a B1 bass module to the PS1 power stand at the Bass/Amp 3 OUT jack. Connect the audio source to the Amp 3 IN 1/4 inch phono jack. Sound should come from the bass module only and be clean and undistorted. |
| 13.6 | Connect the audio source to the All Amps IN 1/4 inch phono jack. Sound should come from both of the L1 line array sections and the bass module simultaneously. The audio should be clear and undistorted. |

### 14. High SPL System Sweep Test

**CAUTION:** This test will be extremely loud. Hearing protection is advised.

| 14.1 | Connect a R1 remote control to the PS1 power stand under test. Set the channel 1 controls to mid-level. Set the master volume control on the remote to the 1 o’clock position. Set the channel 1 Mic Trim control on the PS1 to 6. Connect a L1 line array to the PS1. Connect a B1 bass module to the PS1. |
| 14.2 | Connect a signal generator to the channel 1 input on the PS1. Adjust the signal generator and/or trim control so that the Signal/OL LED is just below red. |
| 14.3 | Sweep the input frequency from 40 Hz to 14 kHz. Listen for any unusual noises and excessive distortion or drop-outs. |

### 15. Bass Module Auto-EQ Test

| 15.1 | Connect a L1 line array to the PS1 power stand. Connect an R1 remote control to the power stand. Connect a B1 bass module to the Bass/Amp 3 OUT jack on the power stand. Connect an audio source to the channel 1 and 2 inputs of the power stand. |
Test Procedures

15.2 Set the channel 1 and 2 level controls to identical settings so that both LEDs are mainly green.

15.3 While the audio is playing, disconnect the B1 bass module from the power stand. The system should mute and un-mute and audio should resume. The audio should sound normal, but not punchy (no deep bass).

15.4 Plug a dummy 1/4 inch phono jack into the Bass Line Out jack. The system should mute and un-mute again, but the audio should sound thinner than before.

15.5 Remove the dummy plug. The system should mute and un-mute and the audio should sound normal again.

15.6 Re-connect the B1 bass module to the power stand. The audio should mute and un-mute again and sound normal.

15.7 Connect a second B1 bass module to the first one. The audio should mute and un-mute. The audio will sound very similar to having only one bass module attached. Disconnect the second bass module. The system should mute and un-mute and the audio should sound normal again.

L1 Line Array Tests

Set up the unit under test as shown below.

1. Air Leak Test

1.1 Apply a 100 Hz, 10 Vrms sine wave to the unit under test.

1.2 Listen carefully for air leaks from around the end cap, the transducers and the grille. Air leaks will be heard as a hissing or sputtering sound. All repairs must be hidden. Test duration should be 5 seconds minimum.

2. Transducer Rub and Tick Test

2.1 Remove the transducer you wish to test using the disassembly procedures in this manual. Do not unplug the wires at the transducer assembly terminals.

2.2 Connect a signal generator directly to the terminals of the transducer assembly under test.

2.3 Apply a 20 Hz, 5 Vrms signal to the transducer assembly.

2.4 Listen carefully for any extraneous noises such as rubbing, scraping or ticking.

Note: To distinguish between normal suspension noise and rubs or ticks, displace the cone slightly with your fingers. If the noise stays the same, it is normal suspension noise and the driver is good. Suspension noise will not be heard with program material.

3. Transducer Phase Test

3.1 Apply a DC voltage of 10V, positive applied to the positive tab of the dual banana jack on the line array test cable and negative applied to negative (gnd) tab.

3.2 All of the driver cones should move outward when the DC voltage is applied.

3.3 Rewire any incorrectly connected transducers.
Test Procedures

4. L1 Line Array Sweep Test

4.1 Set up the upper or lower line array section as shown in the figure on the previous page.

4.2 Apply a 100 Hz, 10 Vrms sine wave to the input.

4.3 While listening to the output of the system, sweep the input frequency slowly from 100 Hz to 15 kHz.

4.4 Listen carefully for any extraneous noises such as buzzing and ticking.

B1 Bass Module Tests

Set up the unit under test as shown below.

1. Air Leak Test

1.1 Apply a 100 Hz, 20 Vrms sine wave to the unit under test.

1.2 Listen carefully for air leaks from around the end cap, the transducers and the grille. Air leaks will be heard as a hissing or sputtering sound. All repairs must be hidden. Test duration should be 5 seconds minimum.

2. Transducer Rub and Tick Test

2.1 Remove the transducer you wish to test using the disassembly procedures in this manual. Do not unplug the wires at the transducer assembly terminals.

2.2 Connect a signal generator directly to the terminals of the transducer assembly under test.

2.3 Apply a 10 Hz, 10 Vrms signal to the transducer assembly.

2.4 Listen carefully for any extraneous noises such as rubbing, scraping or ticking.

Note: To distinguish between normal suspension noise and rubs or ticks, displace the cone slightly with your fingers. If the noise stays the same, it is normal suspension noise and the driver is good. Suspension noise will not be heard with program material.

3. Transducer Phase Test

3.1 Apply a DC voltage of 20V, positive applied to the positive tab of the dual banana jack on the bass module test cable and negative applied to negative (gnd) tab.

3.2 Notice carefully that all driver cones should move outward when the DC voltage is applied.

3.3 Rewire any incorrectly connected transducers.

4. System Sweep Test

4.1 Set up the system as shown in the figure at left.

4.2 Apply a 10 Hz, 20 Vrms sine wave to the input.

4.3 While listening to the output of the system, sweep the input frequency slowly from 10 Hz to 400 Hz.

4.4 Listen carefully for any extraneous noises such as buzzing and ticking.
Appendix

PS1 Power Stand Test Cables

Note: In order to be able to properly test the PS1 Power Stand, you will need to make up a few test cables.

1. Amplifier Output Test Cable:

Parts needed:
1- Neutrik NL4FX Speakon X-Line/4 Pole connector.
4 - Dual banana jacks
2 - 10k ohm, 1/4 Watt resistors
16 or 18 AWG twisted pair wire, 6 feet
18 AWG twisted pair wire, 2 feet

This cable is used to connect the Amp 1 OUT, Amp 2 OUT or Bass/Amp3 OUT jacks to the load resistors used in the test procedures. The connector used is a Neutrik NL4FX Speakon X-Line / 4 Pole type. This connector has 4 terminals labeled 1+, 1-, 2+ and 2-. Terminals 1+ and 1- are used to connect to the load resistors. Use 18 or 16 AWG wire for these terminals. Use twisted pair wires to avoid inducing noise into the cable during use.

The 2+ and 2- terminals will be used to sense the loads connected to the Speakon connector when used with the Bass/Amp3 OUT jack. This jack automatically senses the load on this jack to properly tailor the EQ and output level for the connection of one or two bass modules. It does this by sensing the resistive value across terminals 2+ and 2-. The bass modules have a 10k ohm resistor across these terminals. When only one bass module is connected, the PS1 sees the 10k resistance and sets the EQ and output level accordingly. When two bass modules are connected, it sees 5k and sets the EQ and output level accordingly. For the test cable, you will use 18 AWG twisted pair wire to a dual banana jack.

It is also useful to have 3 spare banana jacks, one with a short across it and 2 with a 10k Ohm, 1/4 Watt resistor each to simulate a bass module connected to the terminals. The Amp 1 OUT and Amp 2 OUT jacks to not sense this load.

![Diagram of Amplifier Output Test Cable Wiring](image)

Figure 11. Amplifier Output Test Cable Wiring Diagram
Appendix

PS1 Power Stand Test Cables (continued)

2. XLR Microphone Input Test Cable

Parts needed:
1 - XLR male connector
1 - Dual banana jack
18 AWG shielded twisted pair wire, 6 feet

This cable is used to test the channel 1 and 2 microphone inputs on the PS1 Power Stand. These input jacks are dual purpose jacks that will accept either XLR or 1/4" TRS phono jack balanced inputs.

Connect the dual banana jack’s positive (+) connection to pin 2 of the XLR jack. Connect the dual banana jack negative (-) connection to pin 3 of the XLR jack. Connect the cable shield to pin 1 of the XLR jack.

3. Line Input 1/4” Phono Jack Test Cable

Parts needed:
1 - Mono 1/4” phono jack
1 - Dual banana jack
18 AWG shielded twisted pair wire, 6 feet

This cable is used to test the channel 1 and 2 line inputs on the PS1 Power Stand.

Connect the dual banana jack’s positive (+) connection to the tip connection of the 1/4” phono jack. Connect the dual banana jack negative (-) connection to the ring connection of the 1/4” phono jack.

4. Insert Jack Test Cable

This cable is used to test the channel 1 and 2 insert jacks on the PS1 Power Stand. When you plug it into the channel 1 or channel 2 insert jack, you will be able to separate the sections of the electronics. Refer to the PS1 Power Stand block diagram on page 78. The RETURN dual banana jack will give you the output of the circuitry up to the output of the 2 channel digital volume control. The SEND dual banana jack will allow you to input a signal to test the circuitry after the insert jack, which is the input to the A/D converter and DSP.

Parts needed:
1 - Tip/Ring/Sleeve (stereo) 1/4” phono jack
2 - Dual banana jacks
Shielded stereo cable, 6 feet

For each of the shielded stereo pairs of wires, connect the dual banana jack’s positive (+) connection to the center conductor. Connect the dual banana jack’s negative (-) connection to the shield wires. Use an Ohmmeter to determine which of the center conductors is connected to the ring of the 1/4 inch TRS phono jack. Using a permanent black magic marker, label this dual banana connector SEND. Determine which of the center conductors is connected to the tip of the 1/4 inch TRS phono jack. Label this dual banana connector RETURN. The sleeve portion of the jack is the common ground where the shields are connected.
Appendix

5. L1 Line Array Test Cables

These two cables will allow you to test the upper and lower line array sections without a PS1 power stand. Use these cables for the line array test procedures in this service manual.

**Lower Line Array Section Test Cable**

**Parts needed:**
- 1 - 10 pin Molex male connector, Molex part number 39-00-0039 (F)
- 4 - Molex crimp-on pins for above connector, Molex part number 39-00-0039
- 1 - dual banana jack
- 12 feet of 16 or 18AWG twisted pair wire

Cut the 12 foot length of twisted pair wire in half. Strip all of the wires back about 1/4 inch. Crimp the molex pins onto the wires. The positive (+) side of the twisted pair wires will go into pins 3 and 8 of the Molex connector. The negative (-) side of the twisted pair wires will go into pins 4 and 9 of the Molex connector. Connect the wires that go to pins 3 and 8 of the Molex connector to the positive (+) side of the dual banana jack. Connect the wires that go to pins 4 and 9 of the Molex connector to the negative (-) side of the dual banana jack.

**Upper Line Array Section Test Cable**

**Parts needed:**
- 1 - 4 pin Molex male connector, Molex part number 39-01-2041
- 4 - Molex crimp-on pins for above connector, Molex part number 39-00-0041 (M)
- 1 - dual banana jack
- 12 feet of 16 or 18AWG twisted pair wire

Cut the 12 foot length of twisted pair wire in half. Strip all of the wires back about 1/4 inch. Crimp the molex pins onto the wires. The positive (+) side of the twisted pair wires will go into pins 2 and 4 of the Molex connector. The negative (-) side of the twisted pair wires will go into pins 1 and 3 of the Molex connector. Connect the wires that go to pins 2 and 4 of the Molex connector to the positive (+) side of the dual banana jack. Connect the wires that go to pins 1 and 3 of the Molex connector to the negative (-) side of the dual banana jack.

6. Bass Module Test Cable

**Parts needed:**
- 1 - Neutrik Speakon NL4FX connector
- 1 - dual banana jack
- 6 feet of 16 or 18AWG twisted pair wire

Strip all of the wires back about 1/4 inch. Connect the dual banana jack’s positive (+) connection to the 1+ connection of the Speakon connector. Connect the dual banana jack negative (-) connection to the 1- connection of the Speakon connector.
Appendix

PS1 Power Stand Software Update Procedure

Required Equipment:

- CD player with a S/PDIF digital output (do not use a Bose® Lifestyle® media center)
- PS1 Power Stand update CD (see the instructions for creating this disc below)
- S/PDIF video cable, part number 183200, or an audio cable with RCA connectors
- PS1 Power Stand AC line cord, part number 273790

PS1 Power Stand Update CD Procedure:

• Go to the Bose Technical Service web page at http://intranet.bose.com/tsg (Bose internal repair centers) or http:serviceops.bose.com (external Bose affiliated repair centers).
• Navigate to the Personal Amplification System web page. The link to it is located on the Pro Products web page.
• Scroll down the page until you see the table that the link to the PS1 Power Stand software update is located in. Download the file to your computer's desktop.
• Using a CD burner and your CD burner software, burn the file onto a blank CD-R or CD-RW disc. Once this disc is successfully created, label the disc with the revision of the software.

Update Procedure:

• Plug the CD player into an AC mains outlet.
• Connect the S/PDIF cable to the Audio Outputs/Digital jack on the back of the CD player.
• Connect the other end of the S/PDIF cable to the DATA IN jack on the PS1 Power Stand's input panel. This jack is located in the middle of the panel. It's an RCA jack with a white center.
• Connect the PS1 Power Stand’s AC line cord to the AC mains jack on the PS1 input panel. This jack is located on the right side next to the power switch.
• Connect the other end of the AC line cord to an AC mains outlet.
• Power up the PS1 Power Stand by moving the power switch to the ON position. Wait for the power LED to light steady green.
• Load the update CD into the CD player. Press the PLAY CD/DVD button on the remote control. The update process should begin.
• Wait about 5 seconds while the disc is playing. The green power LED on the PS1 Power Stand should blink rapidly, about 10 times per second. After about 10 seconds, the LED should begin to blink slower, about twice a second.
• The update process is complete. Power down the PS1 Power Stand. Disconnect the S/PDIF cable from the DATA IN jack.
• Verify proper operation of the PS1 Power Stand using the test procedures in this service manual before returning the unit to the customer.

Troubleshooting:

Problems with this update procedure are indicated by the PS1 Power Stand’s power LED. Typical indicators are:
• LED stays a steady green.
• LED blinks slowly red

In either case, simply repeat the process above. Make sure you wait 5 seconds after power up of the PS1 Power Stand before playing the update disc. Ensure all of the cables are properly connected.
## Service Manual Revision History

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Personalized Amplification System™
PS1 Power Stand, R1 Remote Control, L1 Line Array and
B1 Bass Module
US/Canada, European, UK and Australian Versions 1.0 and 1.1