

JBL

PowerBass™ Series

PB12

Powered Subwoofer

Service Manual



JBL Consumer Products
250 Crossways Park Dr.

Woodbury, New York 11797

Rev10 2/2004



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PB12 – DIFFERENCES IN REVISION 1 AND REVISION 2

| REVISION 1 | REVISION 2 |
|--|--|
| Amplifier faceplate says "Made in Canada" Amplifier serial number starts with "AM" Black (or silver) potted, non-serviceable output module | Amplifier serial number starts with "HA" Output transistors in the open, on a large black heatsink Large plastic cup enclosing the rear of the amp assembly Main PCB, bottom, solder-side contains all SMD devices "Made in Mexico" label on outer part of cabinet |

BOTH VERSIONS OF THESE AMPLIFIERS ARE NOT CONSIDERED INTERCHANGEABLE; THEY ARE NOT A DROP-IN REPLACEMENT IN THE CABINET OF THE OTHER VERSION.

SAFETY INFORMATION

Warning

Any person performing service of this unit will be exposed to hazardous voltages and the risk of electric shock. It is assumed that any person who removes the amplifier from this cabinet has been properly trained in protecting against avoidable injury and shock. Therefore, any service procedures are to be performed by qualified service personal ONLY!

Caution

Before the amplifier is plugged in, be sure its rated voltage corresponds to the voltage of the AC power source to be used. Incorrect voltage could cause damage to the amplifier when the AC power cord is plugged in. Do not exceed rated voltage by more than 10%: operation below 90% of rated voltage will cause poor performance or may shut the unit off.

Leakage/Resistance Check

Before returning the unit to the customer, perform a leakage or resistance test as follows:

Leakage Current. Connect the unit to its rated power source. Using an ammeter, measure the current between the neutral side of the AC supply and chassis ground of the unit under test. If leakage current exceeds 0.5mA, the unit is defective. Reverse the polarity of the AC supply and repeat.

Resistance. Measure the resistance from either side of the line cord to chassis ground, If it is less than 500k ohms, the unit is defective.

WARNING! DO NOT return the unit to the customer if it fails one of these tests until the problem is located and corrected.

Critical Components



All components identified with the IEC symbol in the parts list and schematic diagram designate components in which safety can be of special significance when replacing a component identified with. Use only the replacement parts designated in the parts list or parts with the same rating of resistance, wattage or voltage.

List of Safety Components Requiring Exact Replacements

| Revision 1 | Revision 2 | Description |
|----------------------------------|--|---|
| F1 - 80117 | 093-105202-300 | Line Fuse Slo Blo 2.0A |
| PWRCORD 80105 | 083-041802-009 | 250V UL approved SPT-2 or better with polarized plug, UL approved wired with the hot side to fused side. Use with factory replacement panel strain relief (70305) only. |
| TRX 80116 | 042-010053-003 | Power Transformer. Use only factory replacement. |
| BR RECT 50100 | BR1 052-400080-000 | Bridge diode. Use only factory replacement. |
| C1,2 (2200uF 100V) 30710 | C6,8 (3300uf 80v) 034-470745-200 | Large electrolytic filter caps. Be sure replacement part is at least the same working voltage and capacitance rating. Also the lead spacing is important. Incorrect spacing may cause premature failure due to internal cabinet pressure and vibration. |
| C10 30718 | Does not apply | 4.7uF, 100 volt NPE low df radial. (On Power amp PCB) |
| S64AMI 60302 | Does not apply | Power output module. Use only factory replacement |
| Faceplate 70325 | n/a | Use only factory replacement |
| Rear Amp Cover Does not apply | 063-531808-000 | Use only factory replacement |
| Inductor 80100 | Does not apply | CMC - Use only factory replacement |
| Inductor 80121 | Does not apply | L1 - Use only factory replacement |
| Does not apply | Inductor 043-300101-000 | L2 - Use only factory replacement |
| Does not apply | Inductor 043-700101-000 | L3 - Use only factory replacement |

BASIC SPECIFICATIONS PB12 Subwoofer

| | |
|-------------------------------|--|
| Output Power | 250 watts RMS |
| Driver | 12" Woofer |
| Frequency Response | 25Hz – Low-Pass Frequency setting |
| Inputs | Line Level (option: LFE); Speaker Level |
| Outputs | Speaker level fixed frequency 150Hz |
| Low-Pass Frequency | Variable from 50Hz – 150Hz |
| High-Pass Frequency | 150Hz when using Speaker Level Output |
| Dimensions (H x W x D) | 15 1/2" x 15" x 16" 394mm x 381mm x 406mm (with feet) 17 1/2" x 15" x 16" 445mm x 381mm x 406mm |
| Weight | 40 lb/18.2kg |

00261-1

Refinements may be made on occasion to existing products without notice but will always meet or exceed original specifications unless otherwise stated.
PowerBass is a registered trademark of JBL, Incorporated.

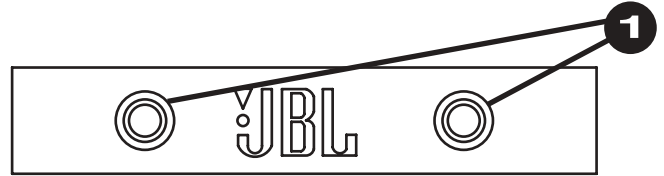
DETAILED SPECIFICATIONS PB12 Subwoofer

| JBL PB12 250W Powered Sub Amp | | | | | |
|---------------------------------|---------------|------------|----------------|--|--|
| LINE VOLTAGE | Yes/No | Hi/Lo Line | Nom. | Unit | Notes |
| US 120vac/60Hz | Yes | 108-132 | 120 | Vrms | Normal Operation |
| EU 230vac/50-60Hz | Yes | 207-264 | 230 | Vrms | Normal operation, MOMS required |
| Parameter | Specification | Unit | QA Test Limits | Conditions | Notes |
| Amp Section | | | | | |
| Type (Class AB, D, other) | D | n/a | n/a | | |
| Load Impedance (speaker) | 5.6 | Ohms | n/a | Nominal | |
| Rated Output Power (120VAC) | 250 | Watts | 140 | | Domestic version only 120 VAC-60 Hz |
| Rated Output Power (230VAC) | 250 | Watts | 130 | | EU Version only 230 VAC-50 Hz |
| THD @ Rated Power | 0.3 | % | 1 | 22k filter | 145 Watts |
| THD @ 1 Watt | 0.1 | % | 0.5 | 22k filter | |
| DC Offset | 10 | mV-DC | 20 | @ Speaker Outputs | |
| Damping factor | >50 | DF | 35 | Measured at amplifier board | At spkr cable. 150 Watts @ THD < 0.1 % @ 50 Hz |
| Input Sensitivity | | | | | |
| Input Frequency | 50 | Hz | 50 | Nominal Freq. | |
| L&R | 240 | mVrms | ±2dB | To 150 Watts | Single input driven |
| LFE input | 240 | mVrms | ±2dB | To 150 Watts | Single input driven, LFE switch ON |
| Speaker/Hi Level Input | 2.4 | Vrms | ±2dB | To 150 Watts | Single input driven |
| Signal to Noise | | | | | |
| SNR-A-Weighted | 90 | dB | 70 | relative to rated power | A-Weighting filter |
| SNR-unweighted | 85 | dB | 70 | relative to rated power | 22k filter |
| SNR rel. 1W-unweighted | 65 | dB | 60 | relative to 1W Output | 22k filter |
| Residual Noise Floor | 1 | mVrms | 3 | Volume @max, using RMS reading DMM/VOM (or A/P) BW=20 KHz. | Line level inputs must be terminated using 1KOHM |
| Residual Noise Floor | 1.5 | mVrms(max) | 3 | Volume @max, w/ A/P Swept Bandpass Measurement (Line freq.+ harmonics) (BW=20 KHz) | Line level inputs must be terminated using 1KOHM |
| Input Impedance | | | | | |
| Line Input (L, R,LFE) | 20K | ohms | n/a | Nominal | |
| Speaker/Hi Level Input | 4.7K | ohms | n/a | Nominal | |
| Filters | | | | | |
| LP filter 4th order fixed | 60-180 | Hz | ± 10 | | 2nd order variable + 2nd order fix-24 db/Octave |
| Subsonic filter (HPF) 3rd Order | Fixed | | | | |
| LFE Low pass 2nd order | 200>LP<1K | Hz | | | LFE input driven only |
| HP speaker out connector | 200 | Hz | ± 10 | | Speaker input driven - 4 Ohms |
| | 100 | Hz | ± 10 | | Speaker input driven - 8 Ohms |
| Features | | | | | |
| Volume pot Taper (lin/log) | LOG | -- | functional | | A Taper |
| HP Speaker out | YES | | functional | | Refer to Filter section |
| Phase switch | 0-180 | deg | functional | | |
| LP Filter defeat switch | YES | | functional | | Disables LP filter, intended for LFE |
| Input Configuration | | | | | |
| Line In (L,R) & LFE | YES | -- | functional | | Dual RCA jack |
| Spkr/Hi Level In | YES | -- | functional | | Binding post connector L&R |
| Signal Sensing (ATO) | | | | | |
| Auto-Turn-On (yes/no) | YES | | functional | | |
| ATO Input test frequency | 50 | Hz | functional | " | |
| ATO Level LFE Input | 4 | mV | functional | " | Maximum acceptable level. |
| ATO Level Speaker in | 50 | mV | functional | " | Maximum acceptable level. |
| ATO Turn-on time | 5 | ms | functional | Amp connected and AC on, then input signal applied | |
| Auto Mute/ Turn-OFF Time | 15 | minutes | 15 | T before muting, after signal is removed | Auto turn of time (T) must be 5 > T < 15 Minutes |
| Power on Delay time | | | | | |
| | 3 | sec. | 4 | AC Power Applied | |
| Transients/Pops | | | | | |
| ATO Transient | 5 | mV-peak | n/a | @ Speaker Outputs | |
| Turn-on Transient | 50 | mV-peak | 2v-pp | @ Speaker Outputs | AC Line cycled from OFF to ON |
| Turn-off Transient | 50 | mV-peak | 2v-pp | @ Speaker Outputs | AC Line cycled from ON to OFF |
| Efficiency | | | | | |
| | 65 | % | 64 | | Nominal Line voltage 120 VAC |
| Stand-by Input Power | 24 | Watts | 26 | @ nom. line voltage | Maximum allowable input power under nominal input voltage and frequency, HOT or COLD operation |
| Power Cons. @ rated power | 234 | Watts | 240 | @ nom. line voltage | 150 Watts @ 5.6 Ohms nominal line voltage |
| Protection | | | | | |
| Short Circuit Protection | YES | | functional | Direct short at output | Amplifier should resume operation after short circuit condition removal |
| Thermal Protection | YES | | functional | @ 1/8 max unclipped Power at 1.06 times the input voltage | |
| DC Offset Protection | YES | | - | DC present at Speaker Out leads | |
| Line Fuse Rating | | | | | |
| USA-Domestic | 2 | Amps | | Type-T or Slo Blo-250 V | |
| EU | 1.25 | Amps | | Type-T or Slo Blo-250 V | External fuse with UL/SEMKO rated holder |

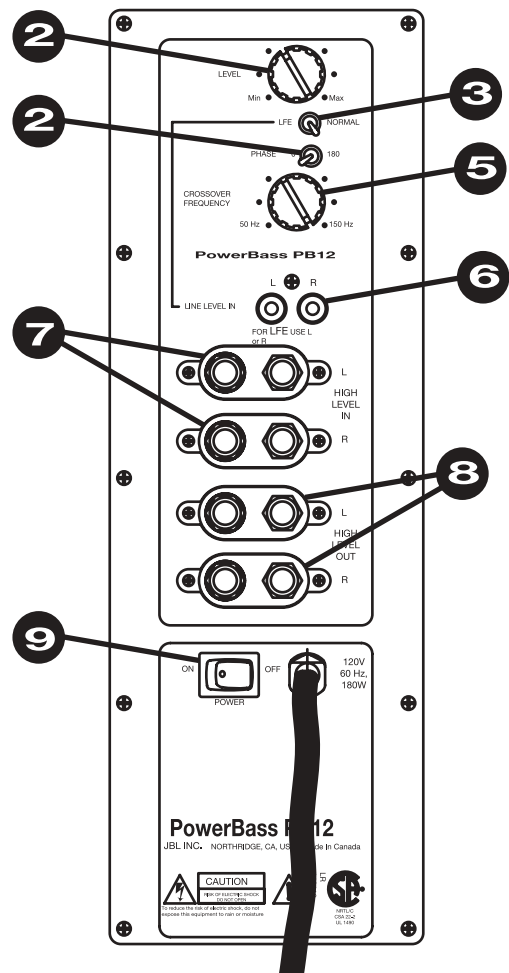
PB12 Subwoofer Controls and Their Function

1. **Power** - These lights will be red when the unit is plugged in and not receiving a signal; when the PB12 receives a signal, the lights will cycle to GREEN. If no signal is received after 10-15 minutes the lights will cycle back to RED (standby) until a signal is present again.
2. **Level Control** - The subwoofer Level Control, PB12, (located on the rear panel) adjusts the volume of the subwoofer relative to the rest of the system.
3. **LFE/Normal Switch** - Ordinarily placed in the Normal position - but switch to LFE when playing Dolby® Digital, DTS® or other digital surround modes - see page 9.
4. **Phase Switch** - Changes the subwoofer's output to be in phase or 180 degrees out of phase with the program material.
5. **Crossover Frequency** - Sets the highest frequency the subwoofer will reproduce.
6. **Line Input** - Main Input connection to subwoofer (preferred).
7. **Speaker In Jacks** - Main Input connection to subwoofer when line level, subwoofer, or pre-amp output connectors are not available, or when a high pass filter (set at 150Hz) to main loudspeakers is desired through the Speaker Output Jacks.
8. **Speaker Out Jacks** - Connected to main loudspeakers when the Speaker Input Jacks are used.
9. **Power Switch** - Turns the PB12 on or off.

Front Panel



Rear Panel



Speaker Connection

When we designed the PB12 powered subwoofers, our goal was to offer the user the best possible performance combined with the most flexible and complete installation options. Please look over the following three examples to determine which

description best matches your system and follow the corresponding hookup instructions.

To use the binding-post speaker terminals with bare wire, unscrew the collar until the hole through the center-

post is visible under the collar.

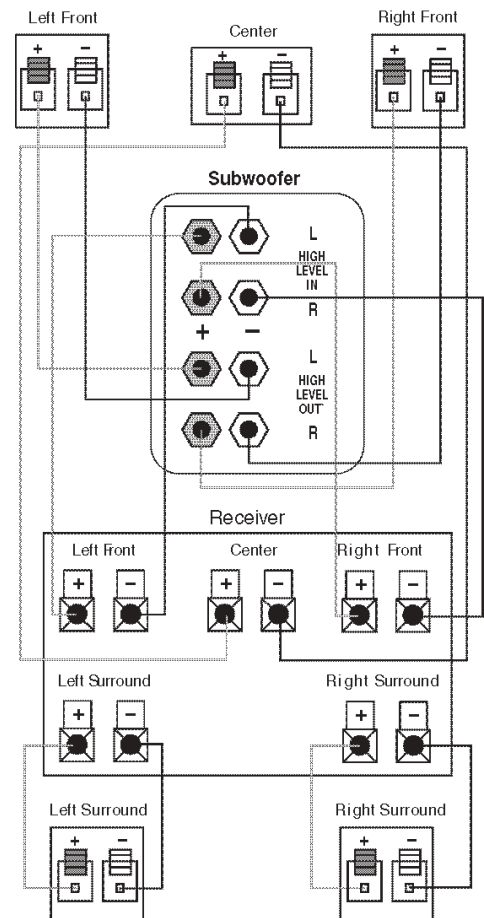
Insert the bare end of the wire through the hole in the post, then screw the collar back down until the connection is tight. The holes in the center of the collars are intended for banana-type connectors.

Dolby Pro Logic (Non-Digital) – Speaker Level

Use this installation method for Dolby Pro Logic applications (not Dolby Digital, DTS or other digital processing), where the receiver/processor does not have a subwoofer output or a volume-controlled preamp (line-) level output:

Connect your receiver or amplifier's front left and right speaker terminals to the left and right terminals on the subwoofer that are marked "High Level In." Connect the left and right terminals on the subwoofer that are marked "High Level Out" to the corresponding terminals on the back of your front left and right speakers.

Connect your receiver or amplifier's center, left and right surround-speaker terminals to the corresponding terminals on the back of your center, left and right surround speakers.



Dolby Pro Logic (Non-Digital) – Line Level

Use this installation method for Dolby Pro Logic applications (not Dolby Digital, DTS or other digital processing), where the receiver/processor is equipped with a subwoofer output or a volume-controlled preamp (line-) level output:

Use RCA-type patch cords to connect the line-level subwoofer outputs on your receiver or amplifier to the line-level inputs on the subwoofer. **IMPORTANT:** Make sure that the LFE toggle switch on the subwoofer is in the "Normal" position. Do not use the "LFE"

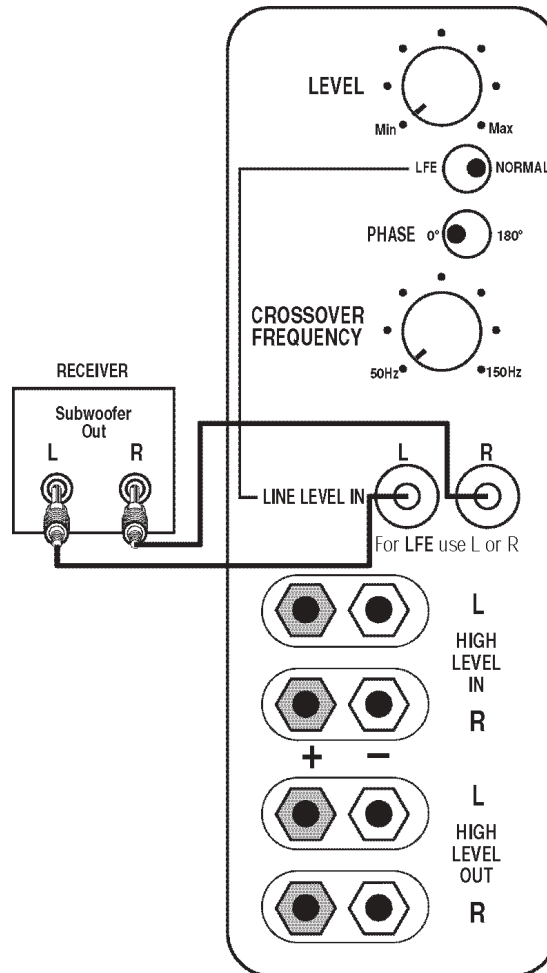
position with Dolby Pro Logic-only processors.

Note: If your receiver or amplifier only has one subwoofer output jack, then you may connect the subwoofer output on your receiver/preamplifier to either the left or right line-level input on the subwoofer. It makes no difference which jack you choose.

Connect each speaker to the corresponding speaker terminals on your receiver or amplifier.

Make sure your receiver or processor is configured correctly: Make sure that the subwoofer is configured as "On."

Note for advanced users: If your receiver/processor has a built-in low-pass crossover filter for the subwoofer output, then the LFE switch should be set to the "LFE" position to bypass the subwoofer's internal crossover.



Dolby Digital or DTS (or Other Digital Surround Mode) Connection

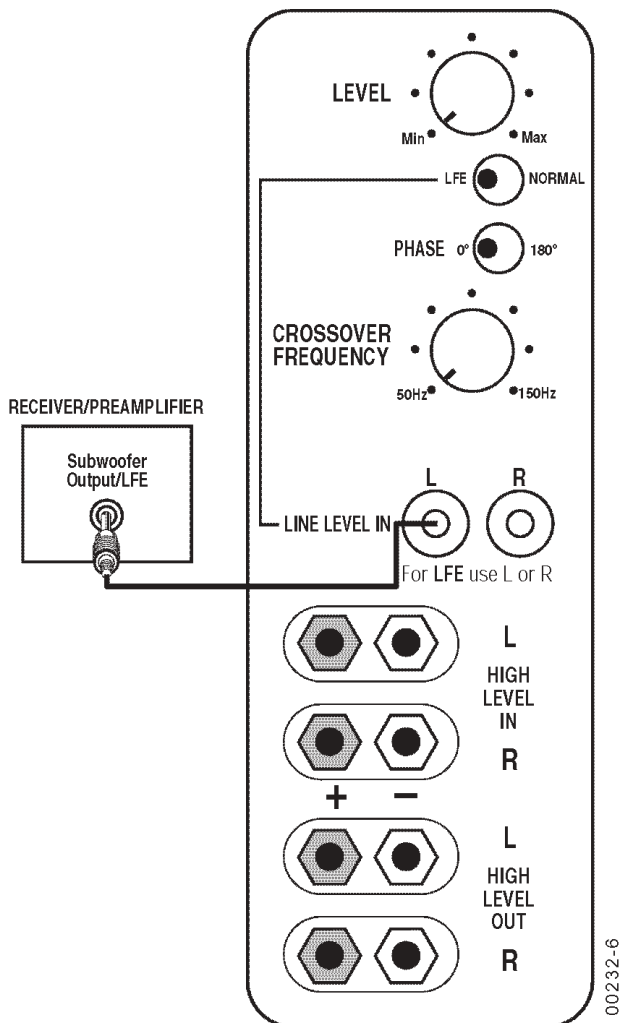
Use this installation method for Dolby Digital, DTS or other digital surround processors:

IMPORTANT: Make sure that the LFE toggle switch on the subwoofer is in the "LFE" position. Use the line-level input jacks for the Low-Frequency Effects channel. Connect these jacks to the LFE output or subwoofer output on your receiver or amplifier.

Note: If your receiver or amplifier only has one subwoofer output jack, then you may connect the subwoofer output on your receiver/preamplifier to either the left or right line-level input on the subwoofer. It makes no difference which jack you choose.

Connect each speaker to the corresponding speaker terminals on your receiver or amplifier.

Make sure that you have configured your surround-sound processor for "Subwoofer On" or "LFE On." The front left, front right, center and rear speakers should be set to "Small" or "Large" depending on their size and frequency response. Consult your receiver's or processor's owner's manual.



OPERATION

Power

When the unit is plugged in and the power switch is on and no signal is received, the LEDs on the front of the unit will turn red. When a signal is present, the LEDs will turn green.

Note: It will take several minutes for the LEDs to turn from green to red after the input signal to the subwoofer is removed. Due to JBL's unique, high-output, high-efficiency amplifier design, power consumption is minimal when the subwoofer is not receiving a signal.

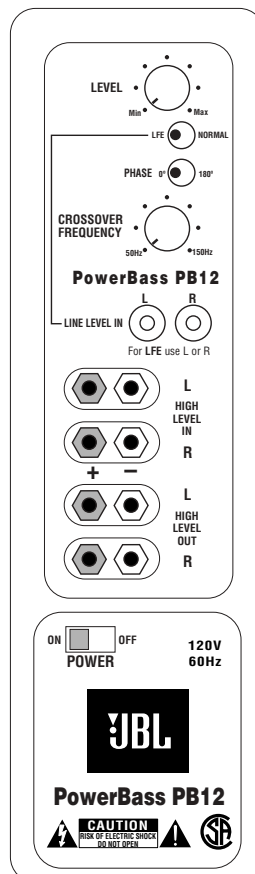
Level Control

The subwoofer Level Control adjusts the volume of the subwoofer relative to the rest of the system. Proper level adjustments depend on several variables such as room size,

subwoofer placement, type of main speakers and listener position. Adjust the subwoofer level so that the volume of the bass information is pleasing to you.

Crossover Adjustments

The Crossover Frequency Control determines the highest frequency at which the subwoofer reproduces sounds. If your main speakers can comfortably reproduce some low-frequency sounds, set this control to a lower frequency setting, between 50Hz – 100Hz. This will concentrate the subwoofer's efforts on the ultradeep bass sounds required by today's films and music. If you are using smaller bookshelf speakers that do not extend to the lower bass frequencies, set the low-pass crossover control to a higher setting, between 120Hz – 150Hz. This control is not used when the LFE switch is in the "LFE" position.



Phase Control



The Phase Control determines whether the subwoofer's piston-like action moves in and out in phase with the main speakers or opposite the main speakers. There is no correct or incorrect setting. Proper phase adjustment depends on several variables such as subwoofer placement and listener position. Adjust the

phase switch to maximize bass output at the listening position.

Remember, every system, room and listener is different. There are no right or wrong settings; this switch offers the added flexibility to adjust your subwoofer for optimum performance for your specific listening conditions without having to move your speakers.

If at some time in the future you happen to rearrange your listening room and move your speakers, you should experiment with the phase switch in both positions, and leave it in the position that maximizes bass performance.

TROUBLESHOOTING

If you used the high-level (speaker) inputs and there is no sound from any of the speakers:

- Check that receiver/amplifier is on and a source is playing.
- Check that powered subwoofer is plugged into an active electrical outlet and is switched on.
- Check all wires and connections between receiver/amplifier and speakers. Make sure all wires are connected. Make sure none of the speaker wires are frayed, cut or punctured.
- Review proper operation of your receiver/amplifier.

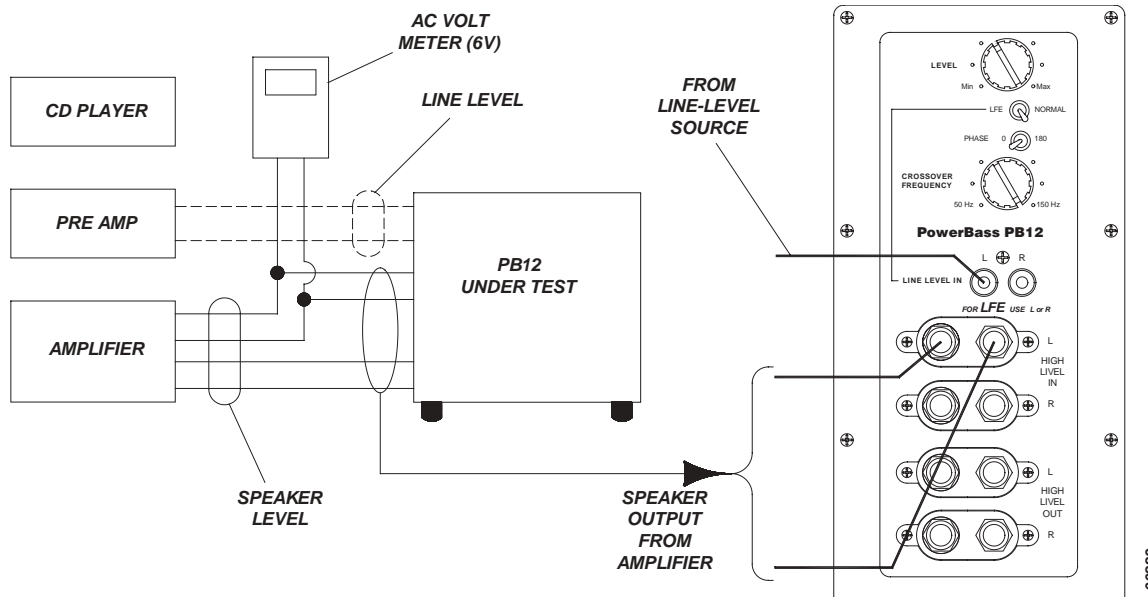
If there is low (or no) bass output:

- Make sure the connections to the left and right "Speaker Inputs" have the correct polarity (+ and -).
- Make sure that the subwoofer is plugged into an active electrical outlet and switched on.
- Adjust the crossover point.
- Flip the Phase Control switch to the opposite position.
- If you are using a Dolby Digital/DTS receiver or processor, make sure that the subwoofer adjustments on the receiver/processor are set up correctly.
- Slowly turn the Level Control clockwise until you begin to hear the desired amount of bass.

If you used the line-level inputs and there is no sound from the subwoofer:

- Check that receiver/amplifier is on and a source is playing.
- Check that powered subwoofer is plugged into an active electrical outlet and is switched on.
- Check all wires and connections between receiver/ amplifier and subwoofer. Make sure all wires are connected. Make sure none of the wires are frayed, cut or punctured.
- Review proper operation of your receiver/amplifier.
- Slowly turn the Level Control clockwise until you begin to hear the desired amount of bass.
- Make sure that you have configured your receiver/ processor so that the subwoofer/LFE output is on.

PB12 TEST SETUP AND PROCEDURE



General Function

UUT = Unit Under Test

1. Connect one line level input cable (RCA) from signal generator to either Right or Left Level input on UUT. VOLUME control should be full counterclockwise. Make sure the LFE/Normal switch is in the NORMAL position.
2. Turn on generator, adjust to **100mV, 50Hz**.
3. Plug in UUT; Turn Main Power switch ON. LED's on the front panel may be either Red or Green. Turn VOLUME control full clockwise. Low Pass control should be set fully clockwise (150Hz).
4. LED should turn Green; immediately bass response should be heard and felt from port tube opening.
5. Turn off generator, turn VOLUME control fully counterclockwise, disconnect RCA cables.
6. Connect one pair of speaker cables to either high level input terminal on UUT. Cables should be connected to an integrated amplifier fed by the signal generator.
7. Turn on generator and adjust so that speaker level output is **1.0V, 50Hz**. Turn VOLUME control full clockwise.
8. Green LED should light, immediate bass response should be heard and felt from the port tube opening.

Sweep Function

1. Follow steps 1-4 above, using a sweep generator as a signal source.
2. Sweep generator from 20Hz to 300Hz. Listen to the cabinet and drivers for any rattles, clicks, buzzes or any other noises. If any unusual noises are heard, remove driver and test.

Driver Function

1. Remove driver from cabinet; detach + and - wire clips.
2. Check DC resistance of driver; it should be **4.8 ohms**.
3. Connect a pair of speaker cables to driver terminals. Cables should be connected to an integrated amplifier fed by a signal generator and adjust so that speaker level output is **5.0V**.
4. Sweep generator from 20Hz to 1kHz. Listen to driver for any rubbing, buzzing, or other unusual noises.

Service Bulletin

Service Bulletin JBL2001-03 Rev1 – January 2002

This is considered a Minor repair

To: All JBL Service Centers

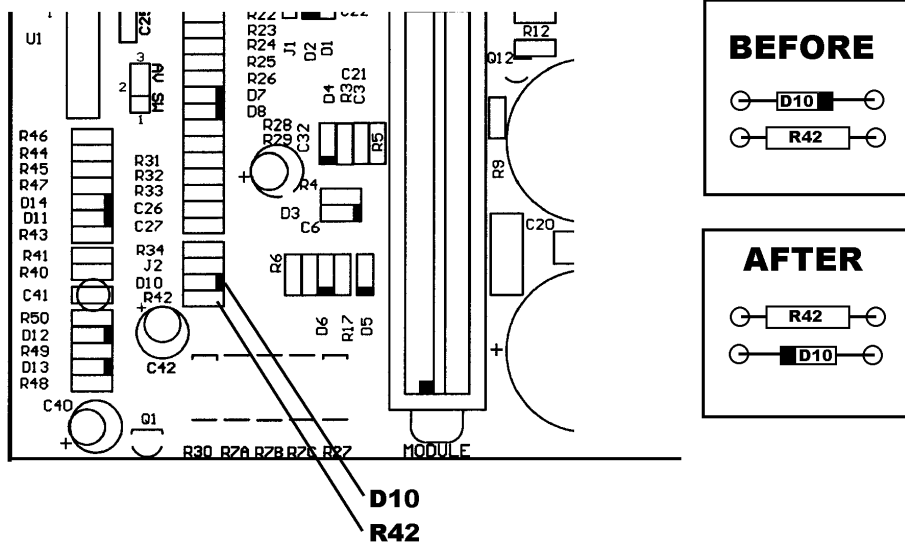
Models: PB10, PB12 (Revision 1 only)*

Subject: Unit Will Not Switch to Standby Mode

When the power cord of the PB series subwoofer is plugged into a wall outlet (and for the PB12 only, the power switch is on), and an audio signal is present, the LED's on the cabinet face will turn green, indicating the subwoofer is in the ON mode. With the audio signal removed, it will take 10 - 15 minutes for the LEDs to turn from green to red, indicating the subwoofer is now in the STANDBY mode. Power consumption is minimal in this mode.

In the event you receive a PB10 or PB12 subwoofer with the complaint: "The unit will not switch to standby mode, even when the audio signal is removed" (indicated by the subwoofer's green LED's remaining on), perform the following modification:

- 1) Set the unit on a padded surface and remove all external cables.
- 2) On the amplifier faceplate, remove the (10) Phillips mounting screws around the perimeter.
- 3) Remove the amplifier assembly from the enclosure. If the amp is turned and supported correctly, no other connectors need to be unplugged.
- 4) Locate Zener Diode D10 and Resistor R42 (22kΩ). See illustration. These parts must be "swapped", i.e., R42 soldered into the D10 location, and D10 soldered into the R42 location. VERY IMPORTANT: Observe polarity on D10 in new location.
- 5) Replace amplifier; test subwoofer to assure the unit goes into the standby mode 10 - 15 minutes after removing the Audio input signal.



| Model | Serial number | Status | Action |
|------------------|-----------------------------|-------------------------------------|--|
| PB10 * PB12 * | All serial numbers affected | Unit may not switch to Standby mode | Swap locations: Zener Diode D10, Resistor R42 (22kΩ). Observe D10 polarity. |

* **Revision 1 of the PB10/12:** Amplifier faceplate says "Made in Canada"; Amplifier serial number starts with "AM"
Black (or silver) potted, non-serviceable S53/64AMI output module. PB10 only – No Power switch



Service Bulletin

Service Bulletin JBL2001-04 Rev2 – February 2003

This is considered a Minor repair

To: All JBL Service Centers

Models: PB10, PB12 (Revision 1 only)*

Subject: Hum, Buzz or “Thumping”

In the event you receive a PB10 or PB12 subwoofer complaint: “There is an audible hum or buzz”, or the subwoofer “thumps” or “pops” every 10 seconds, then review the conditions below to determine the most effective solution:

A) *Audible Hum with unit on, Green LED is ON, hum disappears completely when the connecting input cables (RCA or Speaker-Level) are disconnected:*

Very long runs of line-level input cables, particularly in parallel with AC power cords, may induce hum in the audio cables. Check audio cables for defects, broken ground connections, or replace low quality cables. Try plugging the AC power cord from the subwoofer into a different AC service outlet other than the outlet the rest of the audio equipment is plugged into.

B) *Mild Audible Hum under all circumstances when power cord is plugged in outlet. Hum level does not change whether the LED’s are Red or Green, or input cables are connected or disconnected. Level control adjustments do not change the hum level.*

This may be a mechanical hum caused by the power transformer. Note that a slight hum, within design limits, may be noticeable in a very quiet room, when you are close to the unit. This is acceptable within the PB10/12’s product and price category to most customers, but not to others. If the mechanical hum is unacceptable to the customer, then replace Power Transformer. PB10: JBL part# 80135. PB12: JBL part# 80116

C) *Loud Hum, under all circumstances. It may be louder when LED’s are Green vs. Red ; it may be affected by the position of the Level control. The subwoofer may “thump” or “pop” approximately every 10 seconds.*

Reset the digital subwoofer amplifier by unplugging the AC power cord. Wait 30 seconds, then plug the cord back in. Repeat this 2-3 times if necessary.

For #B only - If the unit still does not function correctly, then check and replace main Power Supply capacitors C1 and C2.

Both Value and df should be checked, with a GenRad model 1657 Digibridge or equivalent

Value should be the rating listed below, within this tolerance: +80/-20 %

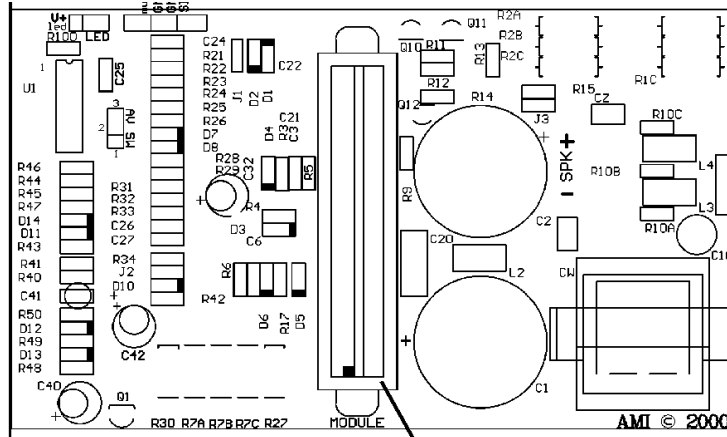
A df value of higher than 15% (.15) should be considered defective.

| | | |
|------|------------------------|-----------------|
| PB10 | 4700 μ F 50v 105c | JBL part# 30706 |
| PB12 | 2200 μ F 100v 105c | JBL part# 30710 |

For #C only - If the unit still does not function correctly, then replace Power Amp Module S53/64AMI as per instructions below: PB10: JBL part# 60301 PB12: JBL part# 60302

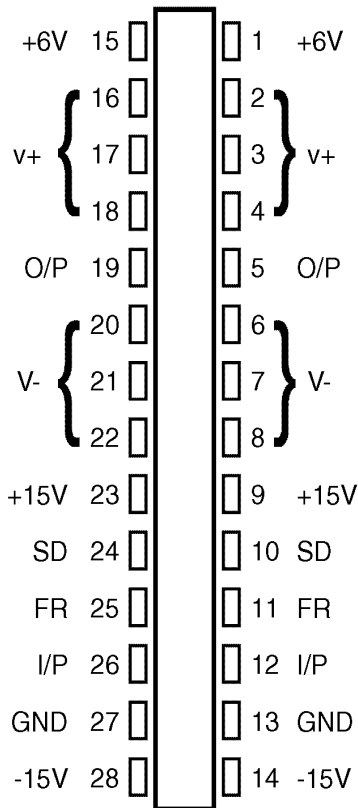
- 1) Set the unit on a padded surface and remove all external cables.
- 2) On the amplifier faceplate, remove the (10) Phillips mounting screws around the perimeter.
- 3) Remove the amplifier assembly from the enclosure. If the amp is supported correctly, no other connectors need to be unplugged.
- 4) Locate the Power Amp Module S53/64AMI, see location on the following page. It is the large black or gray component with a metal case. On the solder side of the circuit board are 28 soldered connections. NOTE: See special handling instructions for S53/64AMI on the following page.
- 5) Replace the amplifier assembly back into the cabinet; replace the screws.
- 6) Test the unit and confirm the original problem has been corrected. **NOTE: THE PB10/12 REVISION 1 AMPLIFIER MUST ALWAYS BE TESTED WITH A WOOFER OR 4 OHM RESISTIVE LOAD.**

PB10/12 Revision 1 Only



S53/64AMI POWER AMP MODULE

S53AMI/S64AMI - Power Amp module SAFETY PART



NOTE: THE FOLLOWING PROCEDURES MUST BE FOLLOWED WHEN INSTALLING NEW S53AMI/S64AMI AMP MODULES: FAILURE TO FOLLOW ONE OR MORE OF THESE STEPS MAY RESULT IN THE INSTANT DESTRUCTION OF THE MODULE WHEN POWERED UP.

- 1) Align white indent marker on Amp Module with indent marker on main PCB; alternately observe position of label on the top of the module; incorrectly replacing the Module 180° in the PCB slot will result in its destruction.
- 2) All AC powered test instruments (meters, oscilloscopes, etc.) must have a floating ground, i.e. be connected to an isolation transformer.
- 3) Align and position the Amp Module before soldering.
- 4) Attach the amp Module with the mounting screws before soldering or powering up.
- 5) Use only rosin-core or non-acid core solder; thoroughly de-flux the surfaces after soldering.

If the new S53AMI/S64AMI Amp Module has larger mounting hole(s) in the case, and the stock screws no longer will fit, and screws of the proper type cannot be obtained locally order:

- (2) part# 60301S (screws)
- (2) part# 60301N (nuts)

| MODEL | Serial Number (120v) Serial numbers are located on the cabinet directly below the amplifier faceplate. | STATUS | ACTION |
|-------|---|-------------------------|---|
| PB10 | See serial numbers on Page 3 for factory modified units | Hum, Buzz or "Thumping" | Replace Power Amp Module S53AMI for symptoms described in #C only |
| PB12 | | Hum, Buzz or "Thumping" | Replace Power Amp Module S64AMI for symptoms described in #C only |

* **Revision 1 of the PB10/12:** Amplifier faceplate says "Made in Canada"; Amplifier serial number starts with "AM"
Black (or silver) potted, non-serviceable S53/64AMI output module. PB10 only – No Power switch

FACTORY MODIFIED PB-10 SERIAL NUMBERS

| | | | | | | | |
|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 1953 | 23000 | 25270-25272 | 25852-25864 | 26465 | 26718-26720 | 28283 | 30526-30533 |
| 7720 | 23896 | 25276 | 25866-25868 | 26474 | 26722-26725 | 28286 | 30535-30625 |
| 8579 | 23904-23905 | 25278-25291 | 25870 | 26477 | 26729-26730 | 28288 | 30627-30649 |
| 10145 | 23989 | 25294-25297 | 25874-25881 | 26479-26480 | 26732-26743 | 28291 | 30651-30686 |
| 10448 | 23991 | 25300 | 25883-25886 | 26483 | 26745-26747 | 28293-28294 | 30688-30748 |
| 10458 | 23993 | 25302-25303 | 25888 | 26486 | 26750 | 28296 | 30750-30930 |
| 11772 | 23997 | 25306-25307 | 25890-25891 | 26498 | 26752-26753 | 28298 | 30932-31025 |
| 11792 | 24004 | 25309 | 25893-25894 | 26503 | 26755 | 28300 | 31027-31072 |
| 11939 | 24010 | 25311 | 25896-26000 | 26510-26512 | 26757-26759 | 28302-28303 | 31074-31123 |
| 13128 | 24166 | 25313-25314 | 26002-26012 | 26514 | 26762-26768 | 28305-28331 | 31125 |
| 13296 | 24230 | 25333-25334 | 26014-26076 | 26517 | 26770-26771 | 28333-28343 | 31127-31139 |
| 14371 | 24874-24875 | 25341 | 26079 | 26520 | 26773-26778 | 28345-28354 | 31256 |
| 14508 | 24888 | 25345 | 26081 | 26781 | 27376-27399 | 28369 | 31771 |
| 14510 | 24902 | 25347-25348 | 26083 | 26783 | 27401-27503 | 28379-28689 | 35089 |
| 14519 | 24905-24907 | 25351-25352 | 26086-26087 | 26786 | 27532 | 28691-28697 | 35733 |
| 14674 | 24909 | 25358 | 26089-26091 | 26789 | 27553 | 28699-28708 | 36186 |
| 14822 | 24913-24914 | 25360-25361 | 26093-26094 | 26791 | 27624-27647 | 28710-28715 | 37400 |
| 15092 | 24919 | 25363-25364 | 26096-26097 | 26793 | 27649-27698 | 28717-28720 | 39339 |
| 15525 | 24924 | 2536825369 | 26099-26101 | 26795-26797 | 27701-27720 | 28722-28724 | 80749 |
| 15634 | 24926 | 25371 | 26103-26104 | 26799-26801 | 27722-27769 | 28726-28731 | |
| 15644-15645 | 24928-24929 | 25375 | 26106 | 26804 | 27771-27774 | 28734 | |
| 15649 | 24931-24932 | 25384-25386 | 26108 | 26807 | 27776-27852 | 28736 | |
| 15654 | 24934 | 25391-25392 | 26110 | 26810 | 27854-27866 | 28738-28740 | |
| 15657 | 24936 | 25394 | 26112 | 26813 | 27868-27911 | 28742-28744 | |
| 15659 | 24939 | 25396 | 26115 | 26815-26816 | 27913-27999 | 28746-28750 | |
| 15662 | 24944 | 25399 | 26118-26119 | 26820 | 28001-28067 | 28752-28754 | |
| 15673-15674 | 24948 | 25402 | 26121-26124 | 26822 | 28069 | 28756-28821 | |
| 15676-15677 | 24950 | 25406 | 26126 | 26825 | 28070 | 28823-29130 | |
| 15679 | 24960 | 25408 | 26128 | 26827 | 28072-28073 | 29132-29142 | |
| 15681 | 24986 | 25416 | 26130-26131 | 26829 | 28075 | 29144-29219 | |
| 15683 | 24988 | 25419 | 26133-26134 | 26833-26834 | 28078 | 29221-29276 | |
| 15692 | 24991 | 25421 | 26136-26137 | 26838 | 28087 | 29278-29280 | |
| 15696 | 24994 | 25426 | 26139 | 26840 | 28092-28094 | 29282-29327 | |
| 15702 | 24996 | 26141-26150 | 26522 | 26843 | 28096-28097 | 29329-29338 | |
| 15705 | 24998 | 26152-26172 | 26525 | 26844 | 28099 | 29340-29379 | |
| 16413 | 25001 | 26174 | 26528 | 26846 | 28101-28102 | 29381-29389 | |
| 17723 | 25003-25005 | 26176-26185 | 26531 | 26850 | 28105 | 29391-29451 | |
| 17740 | 25007 | 26187-26197 | 26533 | 26857 | 28108 | 29453-29455 | |
| 18274 | 25015 | 26198-26201 | 26536 | 26874 | 28110-28114 | 29457 | |
| 19665 | 25018 | 26203 | 26540-26541 | 26876-26880 | 28116-28117 | 29459-29528 | |
| 20470 | 25020 | 26206 | 26543-26544 | 26882 | 28119-28120 | 29530-29531 | |
| 21026 | 25025 | 26209 | 26546-26554 | 26885-26886 | 28122-28123 | 29533-29605 | |
| 21124 | 25029-25030 | 26211 | 26556-26557 | 26888-26894 | 28125 | 29607-29624 | |
| 21126 | 25033 | 26213-26214 | 26560 | 26913 | 28130-28131 | 29626-29634 | |
| 21637 | 25037 | 26217 | 26565 | 26915-26917 | 28133 | 29636-29790 | |
| 22892 | 25039 | 26235 | 26568 | 26922-26935 | 28137 | | |
| 22894-22895 | 25041 | 26238 | 26573 | 26967 | 28140-28150 | | |
| 22901 | 25043-25056 | 26242 | 26587 | 26984-27001 | 28152-28158 | | |
| 22905-22906 | 25058-25115 | 26244 | 26599 | 27010-27033 | 28160-28161 | | |
| 22908 | 25117 | 26246 | 26604 | 27100 | 28167 | | |
| 22913 | 25119-25142 | 26251-26252 | 26614-26615 | 27103-27104 | 28172 | | |
| 22917 | 25144-25147 | 26254-26255 | 26624-26625 | 27122-27126 | 28177 | | |
| 22927 | 25149-25152 | 26266 | 26627 | 27142-27143 | 28181 | | |
| 22933 | 25154-25156 | 26273 | 26629 | 27148-27149 | 28184 | | |
| 25158-25159 | 25436 | 26278 | 26632 | 27151 | 28186-28187 | | |
| 25161 | 25691 | 26282 | 26638 | 27153 | 28193 | | |
| 25164 | 25694 | 26286 | 26641-26643 | 27190 | 28196 | | |
| 25168 | 25698-25699 | 26384 | 26645 | 27192 | 28202-28203 | | |
| 25171 | 25704 | 26388 | 26655 | 27196-27273 | 28207 | | |
| 25174 | 25706 | 26390-26391 | 26658 | 27275-27277 | 28211 | | |
| 25179 | 25710 | 26399-26400 | 26662 | 27279-27312 | 28215 | | |
| 25185 | 25712-25713 | 26402 | 26665 | 27314-27329 | 28217-28218 | | |
| 25187 | 25715-25719 | 26405-26406 | 26669 | 27331-27351 | 28220-28221 | | |
| 25189 | 25721-25730 | 26408-26409 | 26671 | 27353-27370 | 28223 | | |
| 25194 | 25732 | 26411 | 26673 | 27372 | 28227 | | |
| 25214 | 25734 | 26413-26415 | 26675-26677 | 27374 | 28231-28234 | | |
| 25218-25219 | 25735 | 26417 | 26680 | 28236-28237 | 29792-29860 | | |
| 25229 | 25737-25739 | 26419 | 26686 | 28239-28241 | 29862-29915 | | |
| 25234-25236 | 25742-25745 | 26421 | 26692-26694 | 28243 | 29917-30062 | | |
| 25238-25243 | 25747-25770 | 26432 | 26696-26697 | 28245 | 30064-30133 | | |
| 25247-25249 | 25772-25777 | 26438-26439 | 26700 | 28250 | 30152-30288 | | |
| 25251-25252 | 25779-25791 | 26443 | 26702 | 28256 | 30290-30345 | | |
| 25256-25257 | 25793-25833 | 26451-26452 | 26706 | 28259 | 30347-30413 | | |
| 25261-25263 | 25835-25845 | 26457-26458 | 26708 | 28264-28267 | 30415-30490 | | |
| 25265-25267 | 25847-25850 | 26460-26462 | 26713-26716 | 28270-28271 | 30492-30524 | | |



Service Bulletin

Service Bulletin JBL2001-05 Rev2 - February 2002

This is considered a Minor repair

To: All JBL Service Centers

Models: PB12 (Revision 1 only)*

Subject: Popping Every Few Seconds During Play

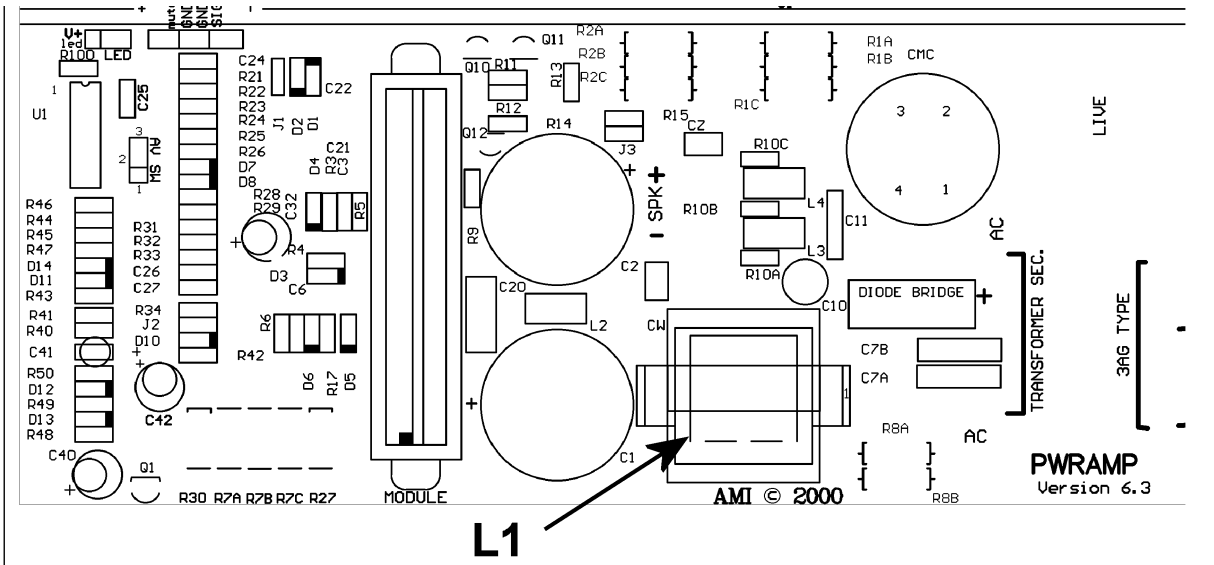
In the event you receive a PB12 subwoofer with the complaint: “The subwoofer “thumps” or “pops” every few seconds of play”, follow the procedure below:

Probable Cause:

Inductor L1 (220uH) may be damaged.

Check and Replace L1 if necessary:

- 1) Set the unit on a padded surface and remove all external cables.
- 2) On the amplifier faceplate, remove the (10) Phillips mounting screws around the perimeter.
- 3) Remove the amplifier assembly from the enclosure. If the amp is supported correctly, no other connectors need to be unplugged.
- 4) Locate Inductor L1 on the main PCB. If the windings appear charred or burnt, it must be replaced.
- 5) Order JBL part# 80121 and replace L1.
- 6) Replace the amplifier assembly back into the cabinet; replace the screws.
- 7) Test the unit and confirm the original problem has been corrected.



| Model | Serial number (120V) | Status | Action |
|--------|------------------------|--|---------------------------------|
| PB12 * | AM0035-24318 and below | L1 may be damaged if experiencing above symptoms | Replace L1 with JBL part# 80121 |
| PB12 * | AM0035-24319 and above | Modified by factory | None required |

* **Revision 1 of the PB12:** Amplifier faceplate says “Made in Canada”; Amplifier serial number starts with “AM”
 Black (or silver) potted, non-serviceable S64AMI output module.

Service Bulletin

Service Bulletin JBL2001-07 Rev1 - February 2002

This is considered a Minor repair

To: All JBL Service Centers

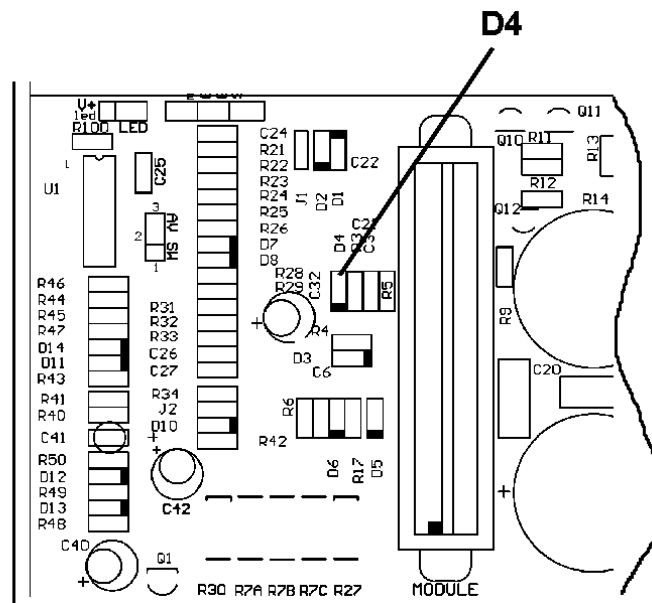
Model: PB12 (Revision 1 only)*

Subject: Possible Missing Diode D4

In the event you receive a PB12 subwoofer for any servicing reason, check for the presence of diode D4 on the Main PCB close to the Power Amp Module (see illustration). If D4 is missing or has been "cut out" of the circuit, it should be replaced; add JBL part# 50115. Observe polarity.

Note: The presence or absence of D4, in itself, does not contribute to, or solve, an amplifier failure.

Purpose of D4 is to reduce the possibility of an occasional Turn-OFF pop noise.



Reference for general location only; all parts or designators may not conform exactly to this drawing.

*** Revision 1 of the PB12:**

Amplifier faceplate says "Made in Canada"; Amplifier serial number starts with "AM"
Black (or silver) potted, non-serviceable S64AMI output module.

Service Bulletin JBL2003-08 – July 2003

This is considered a Minor repair

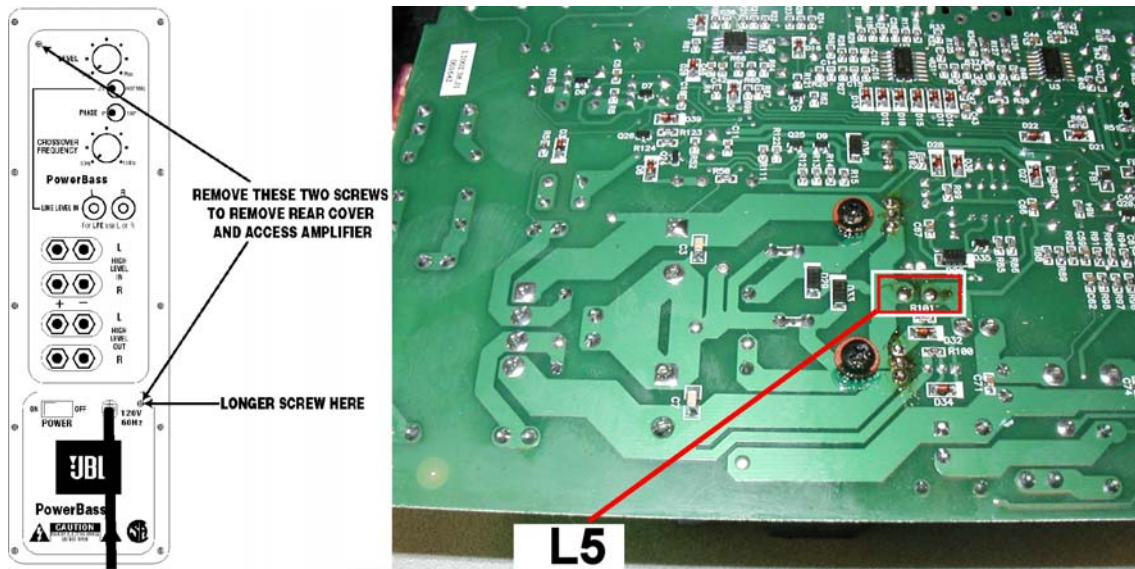
To: All JBL Service Centers

Models: PB12 (Revision 2, PCB Revision “C” or “D” only) *

Subject: Service Modification – L5 Bypass

In the event you receive a PB12 subwoofer for servicing, the following modification should be performed to the amplifier, after identification that it is Revision 2, and with PCB Revision “C” or “D”:

- 1) Set the unit on a padded surface and remove all external cables.
- 2) On the amplifier faceplate, remove the (10) Phillips mounting screws around the perimeter.
- 3) Remove the amplifier assembly from the enclosure. If the amp is supported correctly, no other connectors need to be unplugged.
- 4) Remove the plastic rear cover to access the components.
- 5) Locate L5 Ferrite Bead; on the opposite side of the PCB (SMD component side), solder a 16-18 gauge jumper or buss wire across its two connections.
- 6) Complete any other repairs; reassemble and test the unit.



NOTE: Some woofers that were used in the PB12 had similar terminals (both .205") so there is no polarity-keying if the woofer wires are unplugged for any reason, (even though the amp output terminals themselves are dissimilar (.205 and .250). In this case, assure the polarity is correct if the woofer wires have been unplugged. Green = Positive (.250"), Black = Negative (.205"). The "+" and "-" markings are on the woofer terminal block. Assure the Faston connectors are tight and crimped on the terminals.

| MODEL | * Identification of the PB12 Revision 2: (120v) | STATUS | ACTION |
|-------|---|---|--|
| PB12 | 1) Amplifier serial number starts with "HA" Output transistors in the open, on a large black heatsink Large plastic cup enclosing the rear of the amp assembly Main PCB, bottom, solder-side contains all SMD devices "Made in Mexico" label on outer part of cabinet 2) PCB Revision "C" and "D" – Revision silkscreen can be found on the long outer edge of the PCB | All PB12 amplifiers Revision 2 and PCB Revision "C" and "D" should be modified during any service procedure to avoid Q18,Q22 damage | Solder a jumper or buss wire across L5 to bypass it. |



TECH TIPS

Troubleshooting tips and solutions to common service problems

For models: PB10, PB12 (Revision 2) *

TIP# JBLTT2003-04

Subject: Replacing MOSFETS Q18, Q22

In the event you need to replace MOSFET transistors Q18 or Q22 as part of a repair, it is important to use ONLY the JBL part# FE106401110 *or* only the brands: International Rectifier, or Fairchild.

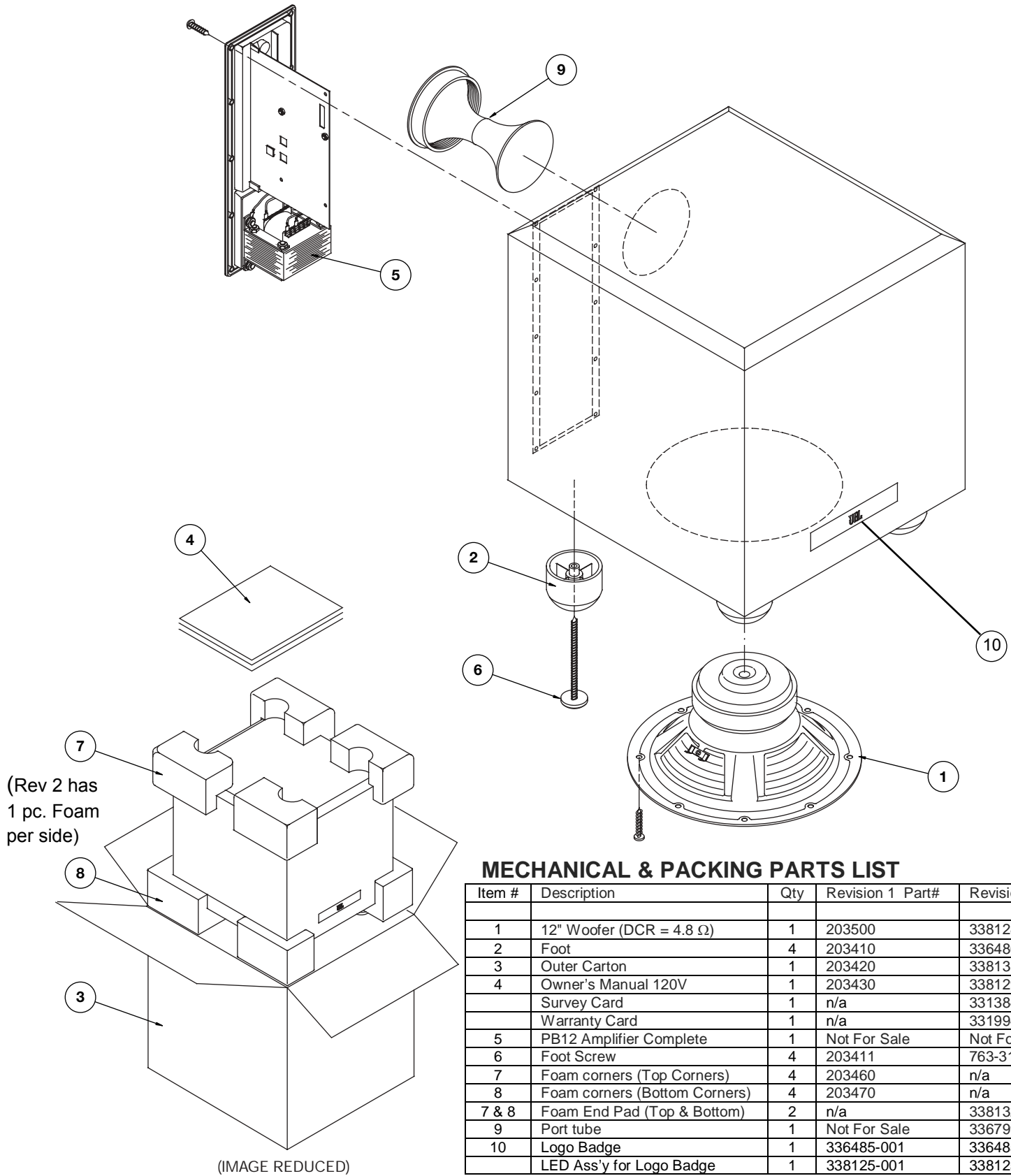
Replace both Q18 and Q22 MOSFET's in the circuit, even if only one seems to be damaged.

Do NOT mix & match these components from different manufacturers, or batches. They should be identical.

* Late version PB10 or PB12 subwoofers (Revision 2 in the service manual) can be identified by:

- Amplifier serial number starts with "HA"
- Output transistors in the open, on a large black heatsink
- Large plastic cup enclosing the rear of the amp assembly
- Main PCB, bottom, solder-side contains all SMD devices

Exploded and Packaging Views

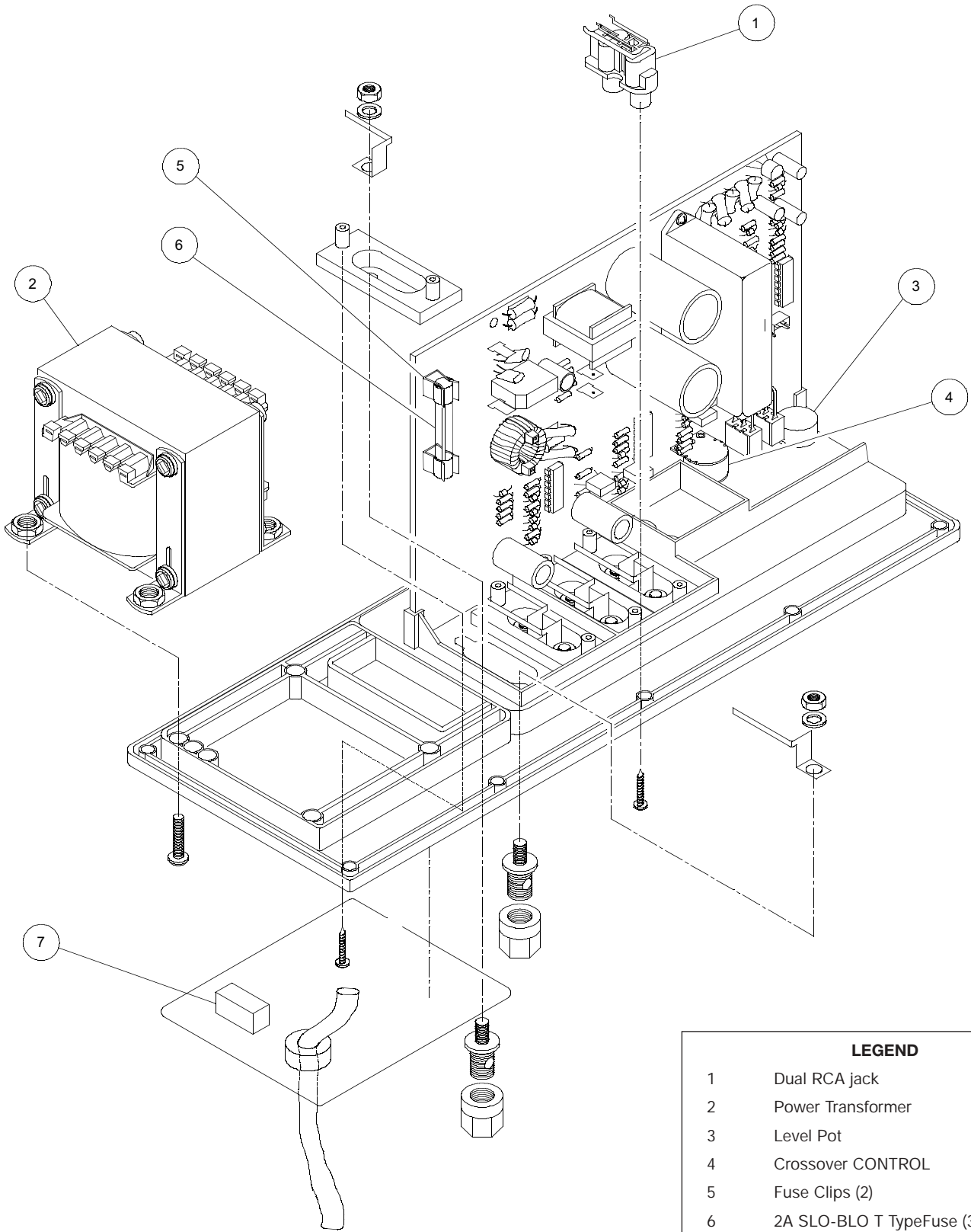


MECHANICAL & PACKING PARTS LIST

| Item # | Description | Qty | Revision 1 Part# | Revision 2 Part# |
|--------|-------------------------------|-----|------------------|------------------|
| 1 | 12" Woofer (DCR = 4.8 Ω) | 1 | 203500 | 338128-001 |
| 2 | Foot | 4 | 203410 | 336486-001 |
| 3 | Outer Carton | 1 | 203420 | 338131-001 |
| 4 | Owner's Manual 120V | 1 | 203430 | 338129-001 |
| | Survey Card | 1 | n/a | 331384-001 |
| | Warranty Card | 1 | n/a | 331994-001 |
| 5 | PB12 Amplifier Complete | 1 | Not For Sale | Not For Sale |
| 6 | Foot Screw | 4 | 203411 | 763-31110-40 |
| 7 | Foam corners (Top Corners) | 4 | 203460 | n/a |
| 8 | Foam corners (Bottom Corners) | 4 | 203470 | n/a |
| 7 & 8 | Foam End Pad (Top & Bottom) | 2 | n/a | 338132-001 |
| 9 | Port tube | 1 | Not For Sale | 336799-001 |
| 10 | Logo Badge | 1 | 336485-001 | 336485-001 |
| | LED Ass'y for Logo Badge | 1 | 338125-001 | 338125-001 |

Identification Of PB12 Revisions 1 and 2 can be found on Page 2.

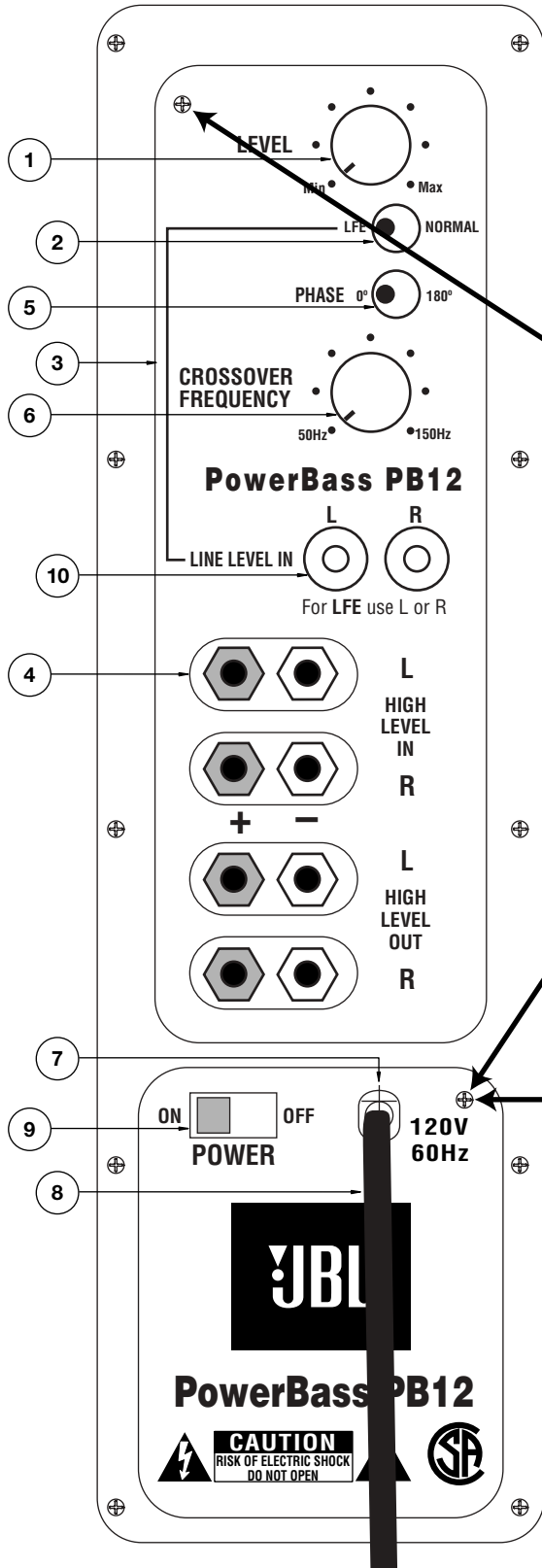
Amplifier Exploded View (Revision 1 Only)



00263

| LEGEND | | |
|--------|------------------------------|--------|
| 1 | Dual RCA jack | 108320 |
| 2 | Power Transformer | 80116 |
| 3 | Level Pot | 40402 |
| 4 | Crossover CONTROL | 40707 |
| 5 | Fuse Clips (2) | 70323 |
| 6 | 2A SLO-BLO T Type Fuse (3AG) | 80117 |
| 7 | Power Switch | 70151 |

Amplifier Faceplate/Access



**REMOVE THESE TWO SCREWS
TO REMOVE REAR COVER
AND ACCESS AMPLIFIER**

LONGER SCREW HERE

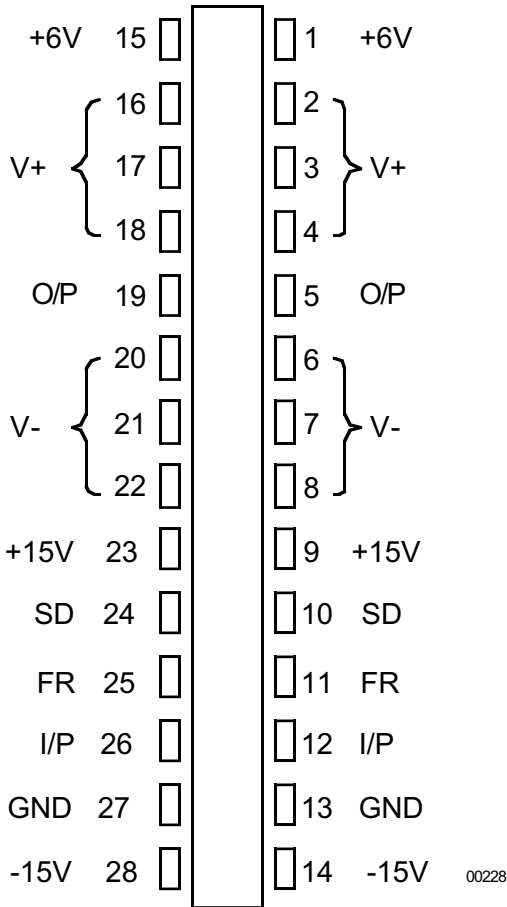
MECHANICAL & PACKING PARTS LIST

| Item # | Description | Qty | Revision 1 Part# | Revision 2 Part# |
|--------|-----------------------------|-----|------------------|------------------|
| 1 | Level Knob | 1 | 70313 | 061-020000-000 |
| 2 | LFE Defeat Switch | 1 | 70150 | 074-030002-000 |
| 3 | PB12 faceplate | 1 | 70325 | n/a |
| 4 | HI LEVEL Input/Output Jacks | 4 | 108116 | 072-060170-000 |
| 5 | Phase Switch | 1 | 70150 | 074-030002-000 |
| 6 | Crossover Frequency Knob | 1 | 70313 | 061-020000-000 |
| 7 | Strain Relief Plug | 1 | 70305 | 061-314002-000 |
| 8 | Power Cord | 1 | 80105 | 083-041802-009 |
| 9 | Power Switch | 1 | 70151 | 074-020018-000 |
| 10 | RCA Input jacks | 1 | 108324 | 072-010007-000 |

Identification Of PB12 Revisions 1 and 2 can be found on Page 2.

Integrated Circuit Diagrams (Revision 1 Only)

S53AMI/S64AMI - Power Amp Module SAFETY PART



NOTE: THE FOLLOWING PROCEDURES MUST BE FOLLOWED WHEN INSTALLING NEW S53AMI/S64AMI AMP MODULES:

FAILURE TO FOLLOW ONE OR MORE OF THESE STEPS MAY RESULT IN THE INSTANT DESTRUCTION OF THE MODULE WHEN POWERED UP.

1. Align white indent marker on Amp Module with indent marker on main PCB; alternately observe position of label on top of the Module; incorrectly replacing the Module 180° in the PCB slot will result in its destruction.
2. All AC powered test instruments (meters, oscilloscopes, etc.) must have a floating ground, i.e., be connected to an isolation transformer.
3. Align and position the Amp Module before soldering.
4. Attach the Amp Module with the mounting screws before soldering or powering up.
5. Use only rosin-core or non-acid core solder; thoroughly de-flux the surfaces after soldering.

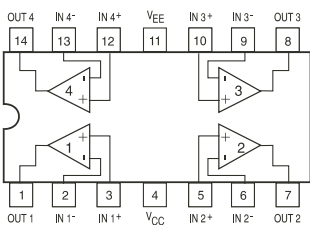
If the new S53AMI/S64AMI Amp Module has larger mounting hole(s) in the case, and the stock screws no longer will fit, and screws of the proper type cannot be obtained locally order:

(2) part# 60301S (screws)

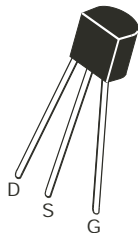
(2) part# 60301N (nuts)

NOTE: THE PB10/12 REVISION 1 AMPLIFIER MUST ALWAYS BE TESTED WITH A WOOFER OR 4 OHM RESISTIVE LOAD.

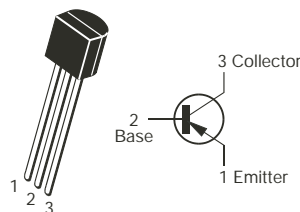
LM324, TLO64, U1, U2



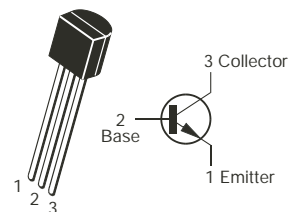
N-Chan JFET
Q1 2N5457



MPSA56, Q10, Q11

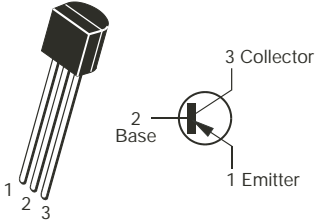


2N4401, Q12

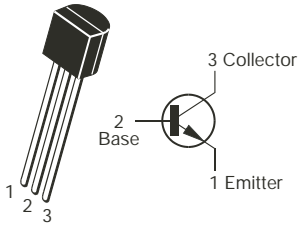


Integrated Circuit Diagrams (Revision 2 Only)

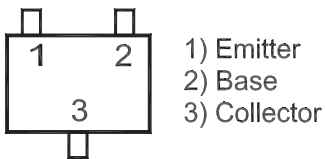
2N5401
Q1



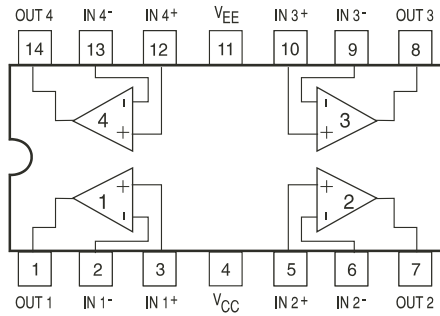
MPSW06RLRA,
MPSW56RLRAMPQ,
MPS2222ARLRA,
2N2907A, 2N5551,
Q2, 16, 3, 21, 19, 23, 17



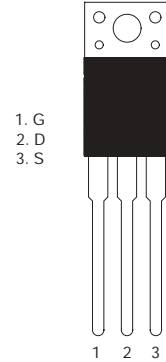
MMBT3904LTI SOT23,
MMBT3906LTI SOT23,
DTC114EK SMT3,
MMBT5401 LTI,
MMBT5551 LTI
Q11, 14, 13, 5, 8, 9, 6, 10,
12, 15, 7, 20, 24, 26, 25



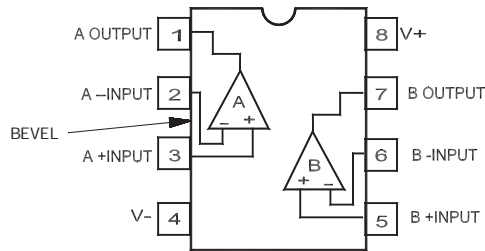
OPAMP, QUAD
TL074CDR
U2, 3



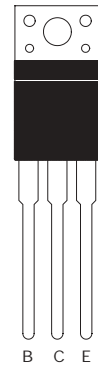
MOSFET IRF640
Q18, 22



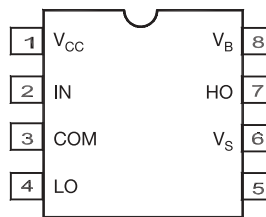
OPAMP, DUAL
TL072CDR SO-8,
NJM4558M-TE3
U5, 6, 4



TIP31C
Q4



IR2111 HALF-BRIDGE
DRIVER
U7





PB12 Testing Procedure (Revision 1 Only)

A. Power Amp Section

| | |
|------------------|---|
| Resistance Check | Resistance from O/P of the module to GND should be >1M (NO LOAD) |
| | Resistance from V+ of the module to V- of the module should read >10k |
| | Resistance from V+ of the module to O/P of the module should read >1M |
| | Resistance from V- of the module to O/P of the module should read >1M |

2. Power Up LED RED

With a 5mV signal to Low level input, LED should change to GREEN

-Voltage measurements (DVM)

| LED | OP AMP | |
|-------|---------|---------|
| | P-U1(1) | P-U1(7) |
| RED | 0Vrms | 14VDC |
| GREEN | 12Vrms | -14VDC |

3. D.C. Operation

-Voltage measurements (DVM) on Power Amp Module

| | | | | | | | | | | |
|------------------|--------|--------|-----|--------|--------|-------|-----|-----|-----|--------|
| Between | +6V | V+ | O/P | V- | +15V | S/D | FR | I/P | GND | -15V |
| And This Point | V- | GND | GND | GND | GND | V- | GND | GND | GND | GND |
| Get this Reading | +5.75V | +91.2V | 0V | -91.2V | +15.5V | +5.1V | 0V | 0V | 0V | -15.5V |

4. Check Switching Frequency

Use scope (EITHER USES AN ISOLATION TRANSFORMER OR ATTACHES THE PROBE TIP TO SPK- and REFERENCE LEAD TO SPK+)

A 10mV signal may need from the input to trigger the **Switch** turn on

Reading 100kHz +/-10%,500mVpp

B. Pre Amp Section

1. Low Level Input Sensitivity

-Set up Turn level , Low-Pass Pot Fully CW and LFE switch off
 Generator set at 200mV@50Hz
 Signal to Low level input

00279-1

PB12 Testing Procedure (Cont.) (Revision 1 Only)

-Voltage measurements

| OP AMP | | | | | | | | | SPEAKER OUTPUT |
|--------|-------|-------|-------|--------|--------|-------|-------------|--------|-------------------|
| U1(7) | U2(7) | U1(1) | U2(1) | U1(14) | U2(14) | U2(8) | PU1(1 4) | PU1(8) | |
| 354mV | 529mV | 520mV | 736mV | 699mV | 661mV | 1.40V | 5.53V | 4.79V | 26.7V |

2. High Level Input Sensitivity

-Set up Turn level , Lo Pass Pot Fully CW and LFE switch off
Set Generator at 2.0V@50Hz
Signal to High level input

-Voltage measurements 24.5V at speaker output

3. Low-Pass

-Set up Set Generator at 200mV@100Hz
Signal to Low level input
Measure voltage at speaker output

-Voltage measurement

| Low-Pass Pot Setting | Output |
|----------------------|--------|
| CW | 16.1V |
| CCW | 4.60V |

4. LFE

-Set up Set Generator at 200mV@200Hz
Signal to Low level input
Measure voltage at speaker output

-Voltage measurement

| LFE Switch Setting | Output |
|--------------------|--------|
| OFF | 702mV |
| ON | 8.40V |

00279-2

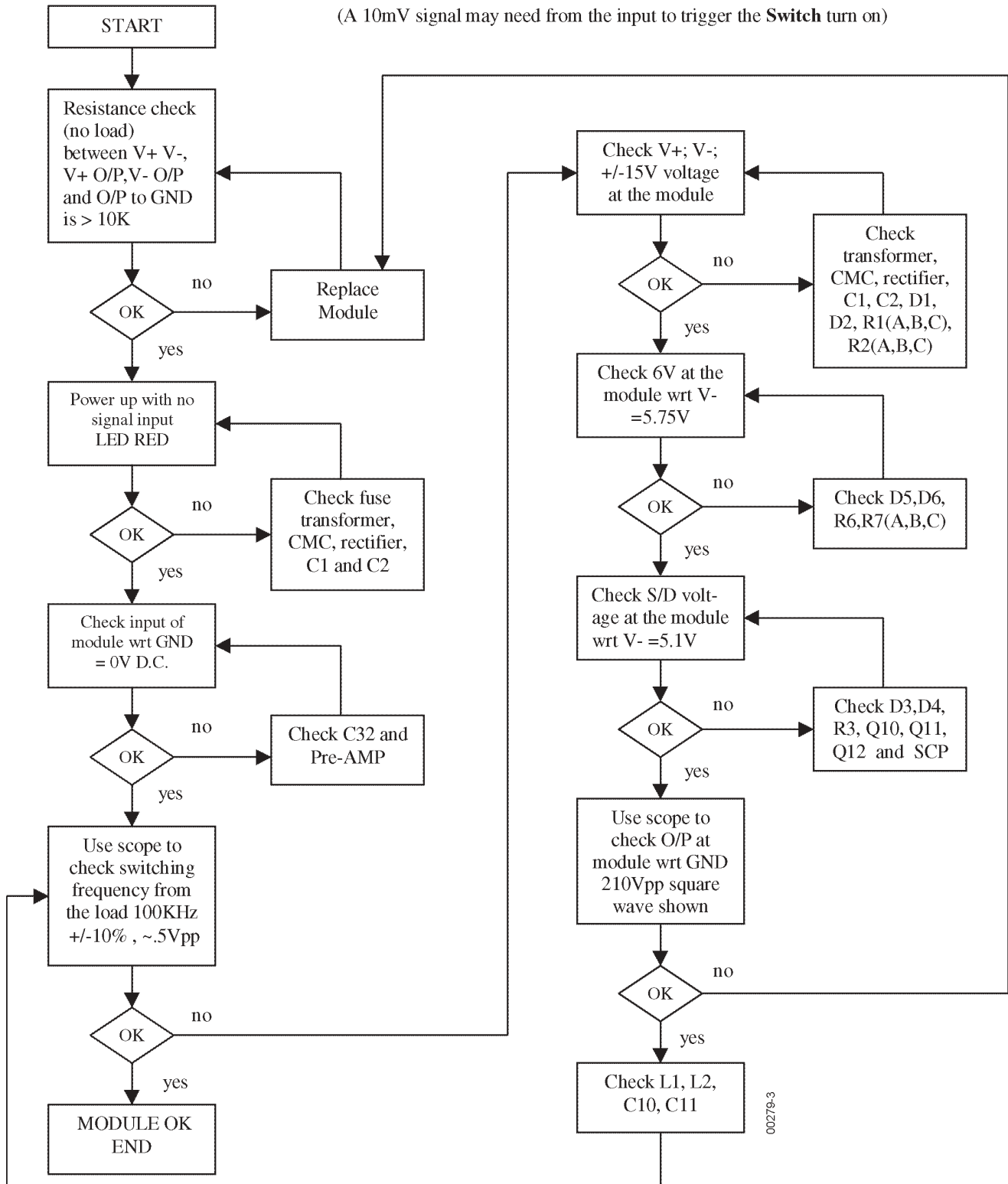
See flow chart next page for diagnostics.

PB12 Testing Procedure (Cont.) (Revision 1 Only)

PB12 POWER MODULE TESTING FLOW CHART

CAUTION : MODULE OUTPUT IS FLOATING AND IS **NOT** PROTECTED AGAINST A SHORT TO GROUND. ALL TEST INSTRUMENTS CONNECTED TO THE OUTPUT **MUST** BE FLOATING. ATTACH THE SCOPE PROBE TIP TO SPK - and REFERENCE LEAD TO SPK+.

(A 10mV signal may need from the input to trigger the Switch turn on)



PB12 Testing Procedure (Cont.) (Revision 2 Only)

A. Power Amp Section

| | |
|------------------|--|
| Resistance Check | Resistance from S+ (SPK O/P) to GND should be $>1M \Omega$ (NO LOAD) |
| | Resistance from V+ (C6 P+) to V- (C8 P-) gradually Fully CHARGED should read $>10k \Omega$ |
| | Resistance from V+ (C6 P+) to S+ (SPK O/P) should read $>1M\Omega$ |
| | Resistance from V- (C8 P-) to S+ (SPK O/P) should read $>1M \Omega$ |

2. Power Up LED RED

With a 5mV signal to Low level input, LED should change to GREEN

-Voltage measurements (DVM)

| LED | OP AMP | |
|-------|----------|-----------|
| | P-U4(1) | P-U4(7) |
| RED | 0Vrms | 11.84VDC |
| GREEN | 7.13Vrms | -12.93VDC |

3. D.C. Operation

-Voltage measurements (DVM) on CLASS D POWER AMP

| Between | V+ | Q4(E) | Q1(C) | Q10(C) | U7(1) | U7(2) | U7(4) | U7(6) | U7(7) | U7(8) |
|------------------|-------|-------|--------|--------|--------|--------|--------|-------|-------|-------|
| And This Point | GND | V- | GND | GND | GND | GND | GND | GND | GND | GND |
| Get this Reading | 71.7V | 0V | -71.7V | 0V | -71.7V | -71.5V | -71.2V | 0V | 0V | 4.65V |

4. Check Switching Frequency

- Oscilloscope - **USE THE PROBE TIP TO U6(7) TO GND**
- Reading 100kHz +/-10%,24Vp-p

B. Pre Amp Section

Line Level Input Sensitivity

-Set up

Turn level, X'OVER FREQ POT Fully CW and LFE switch off
Generator Set at 200mV@50Hz
Signal to Line level input

PB12 Testing Procedure (Cont.) (Revision 2 Only)

- Voltage measurements

| OP AMP | | | | | | | | | SPEAKER |
|---------|--------|-------|-------|-------|--------|--------|-------|-------|---------|
| U2(1) | U2(14) | U2(8) | U3(7) | U3(1) | U3(14) | U3(8) | U5(7) | U5(1) | O/P |
| 306.9mV | 461mV | 460mV | 658mV | 628mV | 598mV | 2.326V | 2.02V | 3.57V | 23.33V |

2. High Level Input Sensitivity

-Set up Turn level, X'OVER FREQ POT Fully CW and LFE switch off
 Set Generator at 1.3V@50Hz
 Signal to High level input

-Voltage measurements 15.3V at speaker output

3. Low-Pass

-Set up Set Generator at 200 mV@100Hz
 Signal to Line level input
 Measure voltage at S+ speaker output

-Voltage measurement

| X'OVER FREQ. Setting | Output |
|----------------------|--------|
| CW | 14.03V |
| CCW | 4.8V |

4. LFE

-Set up Set Generator at 200mV@200Hz
 Signal to Line level input
 Measure voltage at S+ speaker output

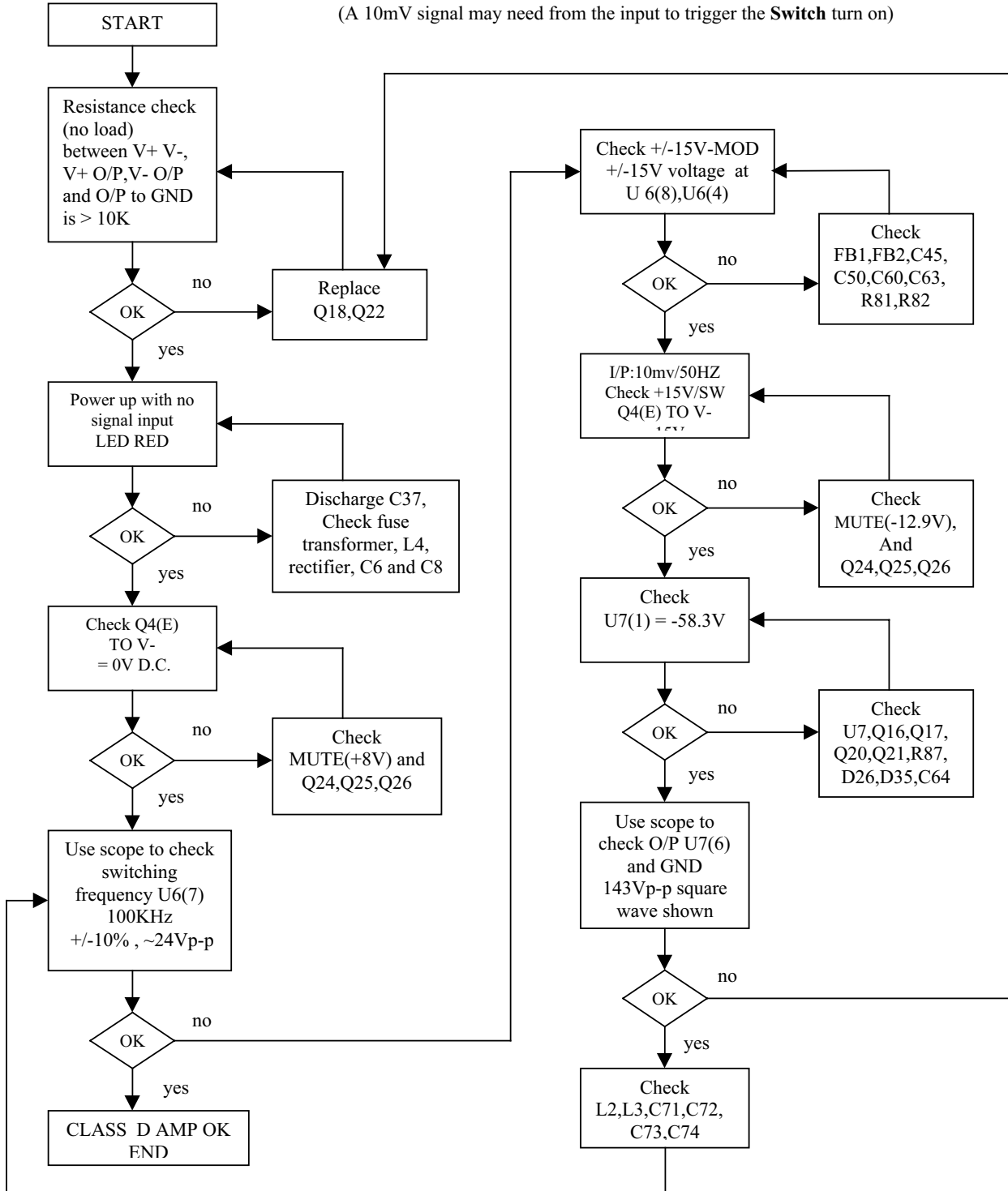
| LFE switch Setting | Output |
|--------------------|--------|
| Normal | 6V |
| LFE | 18.32V |

See flow chart next page for diagnostics.

PB12 Testing Procedure (Cont.) (Revision 2 Only)

PB12 POWER MODULE TESTING FLOW CHART

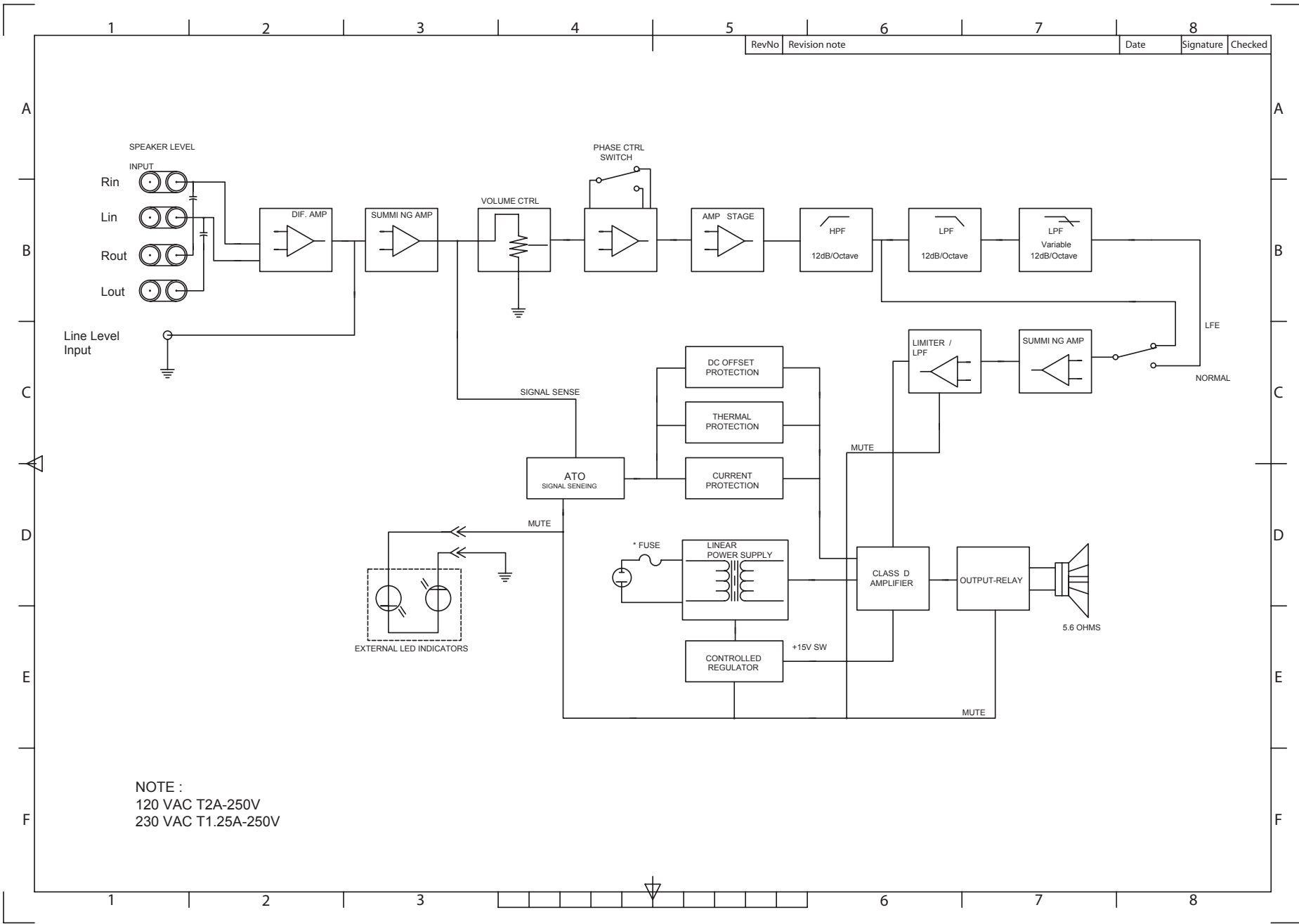
CAUTION : SPEAKER OUTPUT IS FLOATING AND IS **NOT** PROTECTED AGAINST A SHORT TO GROUND. ALL TEST INSTRUMENTS CONNECTED TO THE OUTPUT **MUST** BE FLOATING. ATTACH THE SCOPE PROBE TIP TO S - and REFERENCE LEAD TO S+.



PB12 Block Diagram Revision 2 Only



| RevNo | Revision note | Date | Signature | Checked |
|-------|---------------|------|-----------|---------|
| | | | | |



NOTE :
 120 VAC T2A-250V
 230 VAC T1.25A-250V

PB12 Electrical Parts List (Revision 1 Only)

PB12 POWER AMP section of PCB Version 6.3 -7.0.

| Part # | Designator | Description | | | |
|-------------------|------------|-------------|------|-----------|----------------------|
| 50100 | BR RECT | RS604 | 6AMP | | Bridge rectifier |
| 50105 | D1 | 1N4744A | 15V | | 1w Zener |
| 50112 | D10 | 1N5242B | 12V | | .5w Zener |
| 50104 | D11 | 1N4148 | | | Sig Diode |
| 50112 | D12 | 1N5242B | 12V | | .5w Zener |
| 50104 | D13 | 1N4148 | | | Sig Diode |
| 50104 | D14 | 1N4148 | | | Sig Diode |
| 50105 | D2 | 1N4744A | 15V | | 1w Zener |
| 50114 | D3 | 1N5265B | 62V | | .5w Zener |
| 50104 | D4 | 1N4148 | | | Sig Diode |
| 50113 | D5 | 1N4735A | 6.2V | | 1W |
| 50103 | D6 | 1N5234B | 6V | | .5w Zener |
| 50104 | D7 | 1N4148 | | | Sig Diode |
| 50104 | D8 | 1N4148 | | | Sig Diode |
| 60157 | Q1 | 2N5457 | 25V | | N-chnl FET |
| 60155 | Q10 | 2N5401 | 120V | | PNP 600mA |
| 60155 | Q11 | 2N5401 | 120V | | PNP 600mA |
| 60156 | Q12 | 2N4401 | 40V | | NPN 600mA |
| 60102 | U1 | TLO64 | | | Quad OpAmp |
| <i>Capacitors</i> | | | | | |
| 30710 | C1 | 2200uF | 100V | +80 / -20 | Electrolytic 105C |
| 30718 | C10 | 4u7F | 100V | | BP/NP Electr DF<.1 |
| 30523 | C11 | 330nF | 100V | | mono ceramic |
| 30710 | C2 | 2200uF | 100V | +80 / -20 | Electrolytic 105C |
| 30532 | C20 | 220nF | 250V | | metallized polyester |
| 30502 | C21 | 100nF | 50V | | mono ceramic |
| 30502 | C22 | 100nF | 50V | | mono ceramic |
| 30527 | C24 | 330nF | 50V | | mono ceramic |
| | C25 | NOT USED | | | |
| 30508 | C26 | 10nF | 50V | | mono ceramic |
| 30513 | C27 | 3n3F | 50V | | mono ceramic |
| 30502 | C3 | 100nF | 50V | | mono ceramic |
| 30711 | C32 | 22uF | 35V | +80/-20 | Electrolytic |
| 30715 | C40 | 10uF | 16V | +80/-20 | Electrolytic |
| 30716 | C41 | 1uF | 16V | +80/-20 | Electrolytic |
| 30717 | C42 | 100uF | 16V | +80/-20 | Electrolytic |
| 30502 | C6 | 100nF | 50V | | mono ceramic |
| 30521 | C7A | 100nF | 250V | | ceramic/film |
| 30521 | C7B | 100nF | 250V | | ceramic/film |
| | CW | NOT USED | | | |
| 30505 | CZ | 100nF | 100V | | ceramic/film |

PB12 Electrical Parts List (Revision 1 Only)

PB12 POWER AMP section of PCB Version 6.3 -7.0.

| Part # | Designator | Description | | |
|------------------|------------|-------------|-------|--------|
| <i>Resistors</i> | | | | |
| | R100 | NOT USED | | |
| 40105 | R10A | 0.1R | .5W | metal |
| 40105 | R10B | 0.1R | .5W | metal |
| 40105 | R10C | 0.1R | .5W | metal |
| 40420 | R11 | 1k | .25W | carbon |
| 40420 | R12 | 1k | .25W | carbon |
| 40417 | R13 | 47k | .25W | carbon |
| 40718 | R14 | 3k3 | .25W | carbon |
| | R15 | NOT USED | | |
| 40735 | R1A | 7k5 | 2W | metal |
| 40735 | R1B | 7k5 | 2W | metal |
| 40735 | R1C | 7k5 | 2W | metal |
| 40405 | R21 | 4K7 | .25W | carbon |
| 40736 | R22 | 42K2 | .25W | metal |
| 40737 | R23 | 187k | .25W | metal |
| | R24 | NOT USED | | |
| | R25 | NOT USED | | |
| 40722 | R26 | 6k8 | .25W | carbon |
| 40738 | R27 | 10k | 2W | metal |
| 40739 | R28 | 1k2 | 0.25W | carbon |
| 40739 | R29 | 1k2 | 0.25W | carbon |
| 40735 | R2A | 7k5 | 2W | metal |
| 40735 | R2B | 7k5 | 2W | metal |
| 40735 | R2C | 7k5 | 2W | metal |
| 40703 | R3 | 8M2 | .25W | carbon |
| 40738 | R30 | 10k | 2W | metal |
| 40417 | R31 | 47k | .25W | carbon |
| 40417 | R32 | 47k | .25W | carbon |
| 40427 | R33 | 23k7 | .25W | metal |
| 40403 | R34 | 10k | .25W | metal |
| 40740 | R4 | 33k | 1W | metal |
| 40420 | R40 | 1k | .25W | carbon |
| 40701 | R41 | 1000k | .25W | carbon |
| 40741 | R42 | 22k | .5W | metal |
| 40701 | R43 | 1000k | .25W | carbon |
| 40406 | R44 | 100k | .25W | carbon |
| 40415 | R45 | 470K | .25W | carbon |
| 40701 | R46 | 1000k | .25W | carbon |
| 40409 | R47 | 10k | .25W | carbon |
| 40409 | R48 | 10k | .25W | carbon |
| 40726 | R49 | 15k | .25W | carbon |
| 40732 | R5 | 56k2 | .25W | metal |
| 40727 | R50 | 2k2 | .25W | carbon |
| 40111 | R6 | 47R | .25W | carbon |
| 40738 | R7A | 10k | 2W | metal |
| 40738 | R7B | 10k | 2W | metal |
| 40738 | R7C | 10k | 2W | metal |
| 40738 | R8A | 10k | 2W | metal |
| 40738 | R8B | 10k | 2W | metal |
| | R9 | NOT USED | | |

PB12 Electrical Parts List (Revision 1 Only)

PB12 POWER AMP section of PCB Version 6.3 -7.0.

| Part # | Designator | Description | | |
|----------------------|------------------|----------------------------|--------------------|----------------------|
| <i>Miscellaneous</i> | | | | |
| 80121 | L1 | 220uH | 5 Amp | Gapped Ecore choke |
| 80122 | L2 | 8u5H | 5 Amp | ferrite bead |
| 80122 | L3 | 8u5H | 5 Amp | ferrite bead |
| 80122 | L4 | 8u5H | 5 Amp | ferrite bead |
| 80100 | CMC | 2m2H | 5 Amp | choke |
| 60302 | MODULE | S64AMI | | |
| 108326 | Led Harness | With two LED's, Molex plug | Glued into cabinet | |
| 80116 | Transformer | MCI4632 | 100VA | 4632 transformer |
| 70151 | Switch | SW SPST | | Power Switch |
| 70322 | LED socket | | | PCB mount LED socket |
| 80117 | 3AG FUSE | | | 2A SloBlo T type |
| 70324 | 0.187" PCB Tabs | 7 | | |
| 70323 | PCB Fuse Holders | 2 | | |
| 70325 | PB12 faceplate | | | PB12 faceplate |
| 80105 | Power cord | | | Power cord |
| 70305 | Strain relief | | | Strain relief |

PB12 PREAMP PCB Version #6.3

| Part # | Designator | Description | | |
|--|------------|-------------|------|-----------------|
| <i>Semiconductors</i> | | | | |
| 60102 | U1 | TLO 64 | | OP amp |
| 60100 | U2 | LM324 | | OP amp |
| <i>Capacitors</i> Film Caps may be used in any position EXCEPT C1,C2 | | | | |
| 30707 | C1 | 200uF | 50V | BP Electrolytic |
| 30504 | C10 | 100nF | 50V | mono ceramic |
| 30504 | C11 | 100nF | 50V | mono ceramic |
| 30504 | C12 | 100nF | 50V | mono ceramic |
| 30504 | C13 | 100nF | 50V | mono ceramic |
| 30530 | C16 | 100nF | 50V | mono ceramic |
| 30531 | C17 | 150nF | 50V | mono ceramic |
| 30100 | C18 | 330pF | 50V | mono ceramic |
| 30100 | C19 | 330pF | 50V | mono ceramic |
| 30707 | C2 | 200uF | 50V | BP Electrolytic |
| 30502 | C20 | 100nF | 50V | mono ceramic |
| 30502 | C21 | 100nF | 50V | mono ceramic |
| 30502 | C22 | 100nF | 50V | mono ceramic |
| 30502 | C23 | 100nF | 50V | mono ceramic |
| 30101 | C3 | 220pF | 50V | mono ceramic |
| | C30 | NOT USED | | |
| 30101 | C4 | 220pF | 50V | mono ceramic |
| 30101 | C5 | 220pF | 50V | mono ceramic |
| 30101 | C6 | 220p | 50V | mono ceramic |
| | C7 | Or | | |
| | C8 | Or | | |
| 40730 | C9 | 1k | .25W | Metal Resistor |

PB12 Electrical Parts List (Revision 1 Only)

PB12 POWER AMP section of PCB Version 6.3 -7.0.

| Part # | Designator | Description | | | |
|----------------------|-------------------|--------------|---------|-----------------|--------------|
| <i>Resistors</i> | | | | | |
| 40405 | R1 | 4k7 | .25W | carbon | |
| 40409 | R10 | 10k | .25W | carbon | |
| 40731 | R11 | 59k | .25W | carbon | |
| 40504 | R12 | 45k3 | .25W | metal | |
| 40412 | R13 | 33k2 | .25W | metal | |
| 40709 | R14 | 68k1 | .25W | metal | |
| | R15 | NOT USED | | | |
| | R16 | NOT USED | | | |
| 40732 | R17 | 56k2 | .25W | metal | |
| 40722 | R18 | 6k8 | .25W | carbon | |
| 40722 | R19 | 6k8 | .25W | carbon | |
| 40405 | R2 | 4k7 | .25W | carbon | |
| 40722 | R20 | 6k8 | .25W | carbon | |
| | R21 | 0r | | | |
| 40722 | R22 | 6k8 | .25W | carbon | |
| | R23 | 0r | | | |
| 40109 | R24 | 604r | .25W | metal | |
| 40412 | R25 | 33k2 | .25W | metal | |
| 40405 | R26 | 4k7 | .25W | metal | |
| 40109 | R27 | 604r | .25W | metal | |
| 40412 | R28 | 33k2 | .25W | metal | |
| 40406 | R3 | 100k | .25W | carbon | |
| 40403 | R30 | 10k | .25W | metal | |
| 40733 | R33 | 12k1 | .25W | metal | |
| 40734 | R34 | 120k | .25W | metal | |
| 40451 | R35 | 137k | .25W | metal | |
| 40406 | R4 | 100k | .25W | carbon | |
| 40406 | R5 | 100k | .25W | carbon | |
| 40406 | R6 | 100k | .25W | carbon | |
| 40717 | R8 | 2k7 | .25W | carbon | |
| 40717 | R9 | 2k7 | .25W | carbon | |
| <i>Miscellaneous</i> | | | | | |
| 108320 | RCA CONNECTOR | | | DUAL RCA-yellow | |
| 108116 | HI LEVEL I/O | Binding Post | OUT | Binding Post | |
| 108116 | HI LEVEL I/O | Binding Post | IN | Binding Post | |
| 40402 | LEVEL | 5k POT | | Log (A) Pot | |
| 40707 | Crossover CONTROL | | 20k POT | | Lin (B) Pot. |
| 70150 | LFE switch | SW SPDT | | mini-Toggle | |
| 70150 | Phase Switch | SW SPDT | | mini-Toggle | |

PB12 Electrical Parts List (Cont.) (Revision 1 Only)

PB12 POWER AMP section of PCB Version 7.2.

| Part # | Designator | Description | | | | |
|------------------|------------|-------------|-------|----|--------|--------|
| <i>Resistors</i> | | | | | | |
| 40735 | R1A | 7k5 | 2W | 5% | metal | SAFETY |
| 40735 | R1B | 7k5 | 2W | 5% | metal | SAFETY |
| 40735 | R1C | 7k5 | 2W | 5% | metal | SAFETY |
| 40735 | R2A | 7k5 | 2W | 5% | metal | SAFETY |
| 40735 | R2B | 7k5 | 2W | 5% | metal | SAFETY |
| 40735 | R2C | 7k5 | 2W | 5% | metal | SAFETY |
| 40703 | R3 | 8M2 | .25W | 5% | carbon | |
| 40740 | R4 | 33k | 1W | 5% | metal | SAFETY |
| 40732 | R5 | 56k2 | .25W | 1% | metal | |
| 40111 | R6 | 47 ohms | .25W | 5% | carbon | |
| 40738 | R7A | 10k | 2W | 5% | metal | SAFETY |
| 40738 | R7B | 10k | 2W | 5% | metal | SAFETY |
| 40738 | R7C | 10k | 2W | 5% | metal | SAFETY |
| 40738 | R8A | 10k | 2W | 5% | metal | SAFETY |
| 40738 | R8B | 10k | 2W | 5% | metal | SAFETY |
| | R9 | NOT USED | | | | |
| 40105 | R10A | 0.1 ohms | .5W | 5% | metal | |
| 40105 | R10B | 0.1 ohms | .5W | 5% | metal | |
| 40105 | R10C | 0.1 ohms | .5W | 5% | metal | |
| 40420 | R11 | 1k | .25W | 5% | carbon | |
| 40420 | R12 | 1k | .25W | 5% | carbon | |
| 40417 | R13 | 47k | .25W | 5% | carbon | |
| 40718 | R14 | 3k3 | .25W | 5% | carbon | |
| | R15 | NOT USED | | | | |
| 40405 | R21 | 4K7 | .25W | 5% | carbon | |
| 40736 | R22 | 42K2 | .25W | 1% | metal | |
| 40737 | R23 | 187k | .25W | 1% | metal | |
| | R24 | NOT USED | | | | |
| | R25 | NOT USED | | | | |
| 40722 | R26 | 6k8 | .25W | 5% | carbon | |
| 40738 | R27 | 10k | 2W | 5% | metal | SAFETY |
| 40739 | R28 | 1k2 | 0.25W | 5% | carbon | |
| 40739 | R29 | 1k2 | 0.25W | 5% | carbon | |
| 40738 | R30 | 10k | 2W | 5% | metal | SAFETY |
| 40417 | R31 | 47k | .25W | 5% | carbon | |
| 40417 | R32 | 47k | .25W | 5% | carbon | |
| 40427 | R33 | 23k7 | .25W | 1% | metal | |
| 40403 | R34 | 10k | .25W | 1% | metal | |
| 40407 | R35 | 220K | .25W | 5% | carbon | |
| 40420 | R40 | 1k | .25W | 5% | carbon | |
| 40701 | R41 | 1000k | .25W | 5% | carbon | |
| 40741 | R42 | 22k | .5W | 5% | metal | |
| 40701 | R43 | 1000k | .25W | 5% | carbon | |
| 40406 | R44 | 100k | .25W | 5% | carbon | |
| 40415 | R45 | 470K | .25W | 5% | carbon | |
| 40701 | R46 | 1000k | .25W | 5% | carbon | |
| 40409 | R47 | 10k | .25W | 5% | carbon | |
| 40409 | R48 | 10k | .25W | 5% | carbon | |
| 40726 | R49 | 15k | .25W | 5% | carbon | |
| 40727 | R50 | 2k2 | .25W | 5% | carbon | |

PB12 Electrical Parts List (Cont.)

PB12 POWER AMP section of PCB Version 7.2.

| Part # | Designator | Description | | | | |
|-----------------------|---|------------------|-------|---------|----------------------|--------|
| <i>Capacitors</i> | | | | | | |
| 30710 | C1 | 2200uF | 100V | +80/-20 | Electrolytic 105C | SAFETY |
| 30710 | C2 | 2200uF | 100V | +80/-20 | Electrolytic 105C | SAFETY |
| 30502 | C3 | 100nF | 50V | 20% | mono ceramic | |
| 30502 | 6 | 100nF | 50V | 20% | mono ceramic | |
| 30521 | C7A | 100nF | 250V | 20% | ceramic/film | SAFETY |
| 30521 | C7B | 100nF | 250V | 20% | ceramic/film | SAFETY |
| 30718 | C10 | 4u7F | 100V | 20% | BP/NP Electr DF<.1 | |
| 30523 | C11 | 330nF | 100V | 20% | mono ceramic | |
| 30532 | C20 | 220nF | 250V | 20% | metallized polyester | |
| 30502 | C21 | 100nF | 50V | 20% | mono ceramic | |
| 30502 | C22 | 100nF | 50V | 20% | mono ceramic | |
| 30527 | C24 | 330nF | 50V | 5% | mono ceramic | |
| | C25 | NOT USED | | | | |
| 30508 | C26 | 10nF | 50V | 10% | mono ceramic | |
| 30513 | C27 | 3n3F | 50V | 10% | mono ceramic | |
| 30711 | C32 | 22uF | 35V | +80/-20 | Electrolytic | |
| 30715 | C40 | 10uF | 16V | +80/-20 | Electrolytic | |
| 30716 | C41 | 1uF | 16V | +80/-20 | Electrolytic | |
| 30717 | C42 | 100uF | 16V | +80/-20 | Electrolytic | |
| | CW | NOT USED | | | | |
| 30505 | CZ | 100nF | 100V | 20% | ceramic/film | |
| <i>Semiconductors</i> | | | | | | |
| 50105 | D1 | 1N4744A | 15V | | 1w Zener | |
| 50105 | D2 | 1N4744A | 15V | | 1w Zener | |
| 50114 | D3 | 1N5265B | 62V | | .5w Zener | |
| 50115 | D4 | 1N4938 | | 5% | Sig Diode | |
| | EDN 10025 changes D4 on poweramp section from 1N4148 to 1N4938 part # 50115 June 26 | | | | | |
| 50113 | D5 | 1N4735A | 6.2V | 1W | | |
| 50103 | D6 | 1N5234B | 6V | | .5w Zener | |
| 50104 | D7 | 1N4148 | | 5% | Sig Diode | |
| 50104 | D8 | 1N4148 | | 5% | Sig Diode | |
| 50112 | D10 | 1N5242B | 12V | 5% | .5w Zener | |
| 50104 | D11 | 1N4148 | | | Sig Diode | |
| 50112 | D12 | 1N5242B | 12V | | .5w Zener | |
| 50104 | D13 | 1N4148 | | | Sig Diode | |
| 50104 | D14 | 1N4148 | | | Sig Diode | |
| 60157 | Q1 | 2N5457 | 25V | | N-chnl FET | |
| 60155 | Q10 | 2N5401 | 120V | | PNP 600mA | |
| 60155 | Q11 | 2N5401 | 120V | | PNP 600mA | |
| 60156 | Q12 | 2N4401 | 40V | | NPN 600mA | |
| 50100 | DIODE BRIDGE | RS604 | 6AMP | | Bridge rectifier | SAFETY |
| 60102 | U1 | TLO64 Quad OpAmp | | | | |
| 60302 | MODULE | S64AMI | | | Power Amp Module | SAFETY |
| <i>Miscellaneous</i> | | | | | | |
| 80121 | L1 | 220uH | 5 Amp | 5% | Gapped Ecore choke | |
| 80122 | L2 | 8u5H | 5 Amp | 5% | ferrite bead | |

PB12 Electrical Parts List (Cont.)

PB12 PREAMP section of PCB Version 7.2.

| Part # | Designator | Description | | | | |
|--------|----------------|----------------|--------------------|----|------------------------|--------|
| 80122 | L3 | 8u5H | 5 Amp | 5% | ferrite bead | |
| 80122 | L4 | 8u5H | 5 Amp | 5% | ferrite bead | |
| 80138 | CMC | 3m6H | 5 Amp | | choke | SAFETY |
| 70322 | LED 3 | Molex 2 header | | | Male connector | |
| 108326 | LED Harness | Molex 2 socket | Glued into cabinet | | With 2 Bi-color LED | |
| 70323 | 3AG TYPE | 3AG PC CLIP | | | 2 PCB-mount fuse clips | SAFETY |
| 80117 | 3AG FUSE | 2A fuse | | | SloBlo, 3AG | SAFETY |
| 70324 | 0.187" Tabs | | 6 | | 0.187" PCB fastons | |
| 70328 | 0.250" Tabs | | 1 | | 0.250" PCB fastons | |
| 70325 | PB12 faceplate | | | | PB12 faceplate | |
| 80105 | Power cord | | | | Power cord | SAFETY |
| 70305 | Strain relief | | | | Strain relief | SAFETY |
| 70151 | Switch | SW SPST | | | Power Switch | SAFETY |
| 80116 | Transformer | MCI4632 | 100VA | | 4632 transformer | SAFETY |

PREAMP section of PCB Version 7.2

Resistors

| | | | | | | |
|-------|--------|--------------|------|-----|--------------|--|
| 40405 | R1 | 4k7 | .25W | 5% | carbon | |
| 40405 | R2 | 4k7 | .25W | 5% | carbon | |
| 40406 | R3 | 100k | .25W | 5% | carbon | |
| 40406 | R4 | 100k | .25W | 5% | carbon | |
| 40406 | R5 | 100k | .25W | 5% | carbon | |
| 40406 | R6 | 100k | .25W | 5% | carbon | |
| 40717 | R8 | 2k7 | .25W | 5% | carbon | |
| 40717 | R9 | 2k7 | .25W | 5% | carbon | |
| 40409 | R10 | 10k | .25W | 5% | carbon | |
| 40731 | R11 | 59k | .25W | 5% | carbon | |
| 40504 | R12 | 45k3 | .25W | 1% | metal | |
| 40412 | R13 | 33k2 | .25W | 1% | metal | |
| 40709 | R14 | 68k1 | .25W | 1% | metal | |
| | R15 | NOT USED | | | | |
| | R16 | NOT USED | | | | |
| 40732 | R17 | 56k2 | .25W | 1% | metal | |
| 40722 | R18 | 6k8 | .25W | 5% | carbon | |
| 40722 | R19 | 6k8 | .25W | 5% | carbon | |
| 40722 | R20 | 6k8 | .25W | 5% | carbon | |
| | R21 | 0 ohms | | | | |
| 40722 | R22 | 6k8 | .25W | 5% | carbon | |
| | R23 | 0 ohms | | | | |
| 40109 | R24 | 604 ohms | .25W | 1% | metal | |
| 40412 | R25 | 33k2 | .25W | 1% | metal | |
| 40405 | R26 | 4k7 | .25W | 1% | metal | |
| 40109 | R27 | 604 ohms | .25W | 1% | metal | |
| 40412 | R28 | 33k2 | .25W | 1% | metal | |
| 40403 | R30 | 10k | .25W | 1% | metal | |
| 40733 | R33 | 12k1 | .25W | 1% | metal | |
| 40734 | R34 | 120k | .25W | 1% | metal | |
| 40451 | R35 | 137k | .25W | 1% | metal | |
| 40402 | LEVEL | 5k POT | | 20% | Log (A) Pot | |
| 40707 | LOPASS | Dual 20k POT | | 20% | Lin (B) Pot. | |

PB12 Electrical Parts List (Cont.)

PB12 PREAMP section of PCB Version 7.2.

| Part # | Designator | Description | | | |
|---|--------------|---------------|-------------|-----|-----------------|
| <i>Capacitors</i> Film Caps may be used in any position EXCEPT C1, C2 | | | | | |
| 30707 | C1 | 200uF | 50V | 20% | BP Electrolytic |
| 30707 | C2 | 200uF | 50V | 20% | BP Electrolytic |
| 30101 | C3 | 220pF | 50V | 20% | mono ceramic |
| 30101 | C4 | 220pF | 50V | 20% | mono ceramic |
| 30101 | C5 | 220pF | 50V | 20% | mono ceramic |
| 30101 | C6 | 220p | 50V | 20% | mono ceramic |
| | C7 | 0r | | | |
| | C8 | 0r | | | |
| 40730 | C9 | 1k | .25W | 1% | Metal Resistor |
| 30504 | C10 | 100nF | 50V | 10% | mono ceramic |
| 30504 | C11 | 100nF | 50V | 10% | mono ceramic |
| 30504 | C12 | 100nF | 50V | 10% | mono ceramic |
| 30504 | C13 | 100nF | 50V | 10% | mono ceramic |
| 30530 | C16 | 100nF | 50V | 5% | mono ceramic |
| 30531 | C17 | 150nF | 50V | 5% | mono ceramic |
| 30100 | C18 | 330pF | 50V | 20% | mono ceramic |
| 30100 | C19 | 330pF | 50V | 20% | mono ceramic |
| 30502 | C20 | 100nF | 50V | 20% | mono ceramic |
| 30502 | C21 | 100nF | 50V | 20% | mono ceramic |
| 30502 | C22 | 100nF | 50V | 20% | mono ceramic |
| 30502 | C23 | 100nF | 50V | 20% | mono ceramic |
| | C30 | NOT USED | | | |
| <i>Semiconductors</i> | | | | | |
| 50104 | D50 | 1N4148 | | 5% | Sig Diode |
| 50104 | D51 | 1N4148 | | 5% | Sig Diode |
| 50104 | D52 | 1N4148 | | 5% | Sig Diode |
| 50104 | D53 | 1N4148 | | 5% | Sig Diode |
| 50104 | D54 | 1N4148 | | 5% | Sig Diode |
| 50104 | D55 | 1N4148 | | 5% | Sig Diode |
| 60102 | U1 | TLO 64 | | | Quad OP-AMP |
| 60100 | U2 | LM324 | | | Quad OP-AMP |
| <i>Miscellaneous (See pages 15-17 for more external parts)</i> | | | | | |
| 70150 | LP DEFEAT | SW SW SPDT | mini-Toggle | | |
| 70150 | PHASE SWITCH | SW SPDT | mini-Toggle | | |
| 108324 | Li, Ri | RCA connector | 90 Deg | | DUAL RCA-yellow |
| 108116 | HI LEVEL I/O | Binding Post | OUT | | Binding Post |
| 108116 | HI LEVEL I/O | Binding Post | IN | | Binding Post |

PB12 Electrical Parts List (Cont.) Revision 2 Only

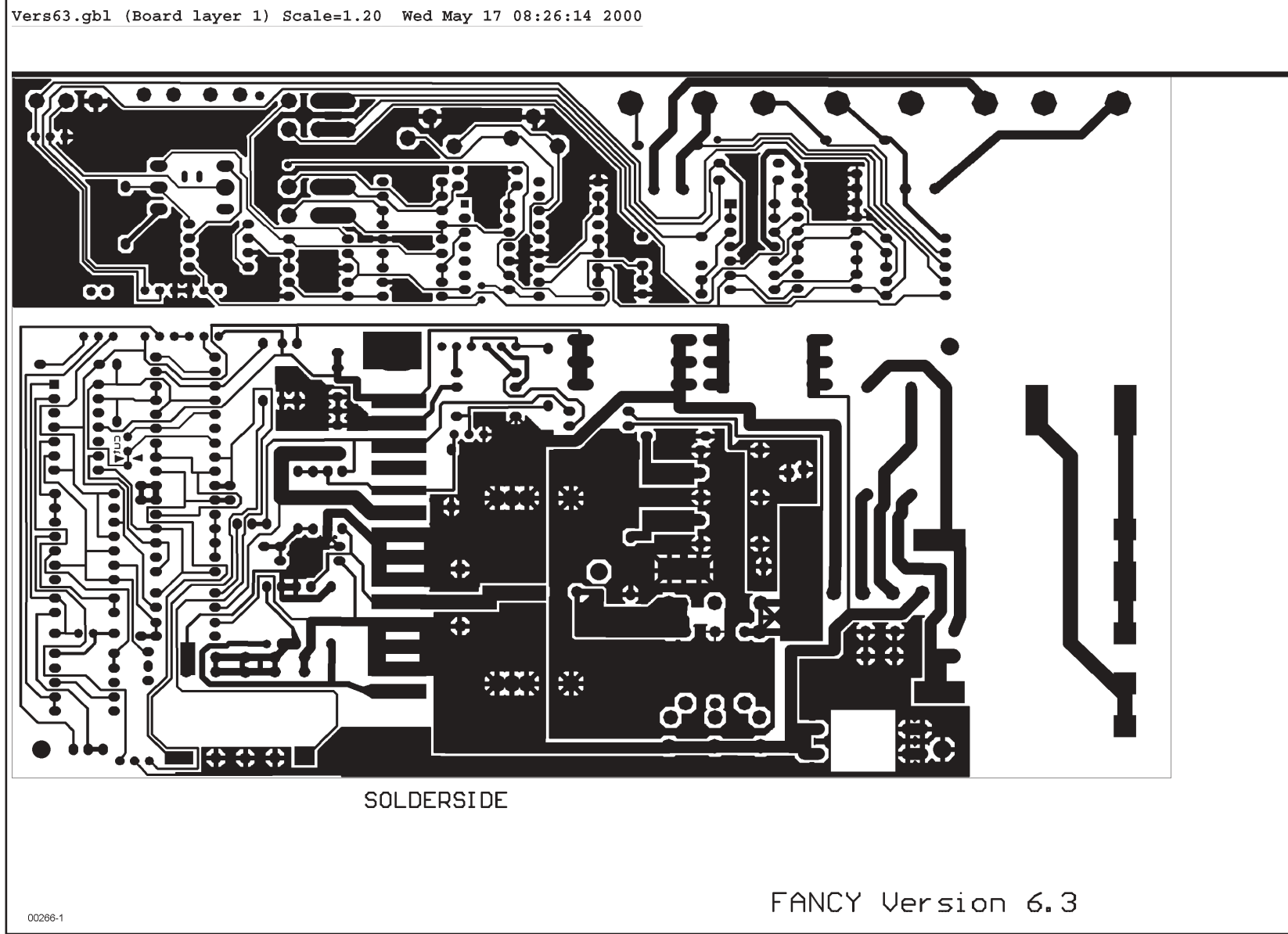
| Part Number | Description | | Qty | Reference designators |
|------------------|-------------------|----------------------------|-----|---|
| <i>Resistors</i> | | | | |
| 020-220497-120 | Film Resistor | 2K2 1/4W J | 1 | R11 |
| 021-100401-120 | MOF Resistor | 1K 1W J | 1 | R103 |
| 021-120403-020 | MOF Resistor | 1K2 3WS J | 1 | R9 |
| 021-120405-020 | MOF Resistor | 1K2 5WS J | 1 | R6 |
| 022-500003-020 | KNP Resistor | 0 ohms05 3WS J | 1 | R104 |
| 024-000098-120 | SMD Resistor | 0 ohms 1/8W J | 2 | R125, 126 |
| 024-100298-120 | SMD Resistor | 10 ohms 1/8W J | 2 | R81, 82 |
| 024-100398-120 | SMD Resistor | 100 ohms 1/8W J | 1 | R62 |
| 024-100498-120 | SMD Resistor | 1K 1/8W J | 10 | R79, 83, 92, 95, 96, 105, 108, 127, 65 |
| 024-100598-120 | SMD Resistor | 10K 1/8W J | 30 | R2, 17, 19, 20, 21, 37, 54, 58, 63, 69, 71, 72, 74, 75, 84, 88, 89, 97, 106, 109, 111, 113-117, 119, 120, 123, 124 |
| 024-100698-120 | SMD Resistor | 100K 1/8W J | 6 | R3, 22-25, 112 |
| 024-110598-100 | SMD Resistor | 11K 1/8W F | 1 | R98 |
| 024-120698-120 | SMD Resistor | 120K 1/8W J | 1 | R39 |
| 024-121598-100 | SMD Resistor | 12K1 1/8W F | 1 | R38 |
| 024-137698-100 | SMD Resistor | 137K 1/8W F | 1 | R32 |
| 024-150498-120 | SMD Resistor | 1K5 1/8W J | 2 | R67, 68 |
| 024-180598-120 | SMD Resistor | 18K 1/8W J | 1 | R29 |
| 024-187698-100 | SMD Resistor | 187K 1/8W F | 1 | R45 |
| 024-200598-120 | SMD Resistor | 20K 1/8W J | 1 | R94 |
| 024-220398-120 | SMD Resistor | 220 ohms 1/8W J | 1 | R90 |
| 024-220498-121 | SMD Resistor | 2K2 1/8W J | 3 | R1, 87, 61 |
| 024-220598-120 | SMD Resistor | 22K 1/8W J | 1 | R118 |
| 024-220798-120 | SMD Resistor | 2M2 1/8W J | 2 | R80, 121 |
| 024-237598-120 | SMD Resistor | 23K7 1/8W F | 1 | R48 |
| 024-243698-100 | SMD Resistor | 243K 1/8W F | 1 | R36 |
| 024-270498-120 | SMD Resistor | 2K7 1/8W J | 2 | R73, 64 |
| 024-300398-120 | SMD Resistor | 300 ohms 1/8W J | 1 | R55 |
| 024-300598-120 | SMD Resistor | 30K 1/8W J | 1 | R56 |
| 024-330498-120 | SMD Resistor | 3K3 1/8W J | 9 | R7, 8, 26, 27, 12-15, 59 |
| 024-330598-120 | SMD Resistor | 33K 1/8W J | 2 | R4, 5 |
| 024-360498-120 | SMD Resistor | 3K6 1/8W J | 1 | R28 |
| 024-390498-120 | SMD Resistor | 3K9 1/8W J | 1 | R93 |
| 024-390598-120 | SMD Resistor | 39K 1/8W J | 1 | R77 |
| 024-430498-100 | SMD Resistor | 4K3 1/8W F | 1 | R78 |
| 024-453598-100 | SMD Resistor | 45K3 1/8W F | 1 | R30 |
| 024-470298-120 | SMD Resistor | 47 ohms 1/8W J | 2 | R101, 102 |
| 024-470398-120 | SMD Resistor | 470 ohms 1/8W J | 3 | R76, 99, 100 |
| 024-470498-120 | SMD Resistor | 4K7 1/8W J | 2 | R85, 86 |
| 024-470598-120 | SMD Resistor | 47K 1/8W J | 4 | R44, 47, 49, 107 |
| 024-470698-120 | SMD Resistor | 470K 1/8W J | 1 | R70 |
| 024-470798-120 | SMD Resistor | 4.7M 1/8W J | 1 | R60 |
| 024-487498-100 | SMD Resistor | 4K87 1/8W F | 2 | R51, 53 |
| 024-510398-120 | SMD Resistor | 510 ohms 1/8W J | 1 | R57 |
| 024-560598-120 | SMD Resistor | 56K 1/8W J | 1 | R122 |
| 024-620398-100 | SMD Resistor | 620 ohms 1/8W F | 2 | R16, 18 |
| 024-680498-120 | SMD Resistor | 6.8K 1/8W J | 6 | R46, 91, 40, 41, 43, 42 |
| 024-680598-120 | SMD Resistor | 68K 1/8W J | 6 | R33, 34, 31, 50, 52, 66 |
| 024-820598-120 | SMD Resistor | 82K 1/8W J | 1 | R69 |
| 026-200595-269 | VR2 FREQUENCY POT | PN:RD163121R034-20KBx2(EJ) | 1 | VR2 |
| 026-500495-252 | VR1 LEVEL POT | P/N:RK163111R522-5KA (EJ) | 1 | VR1 |

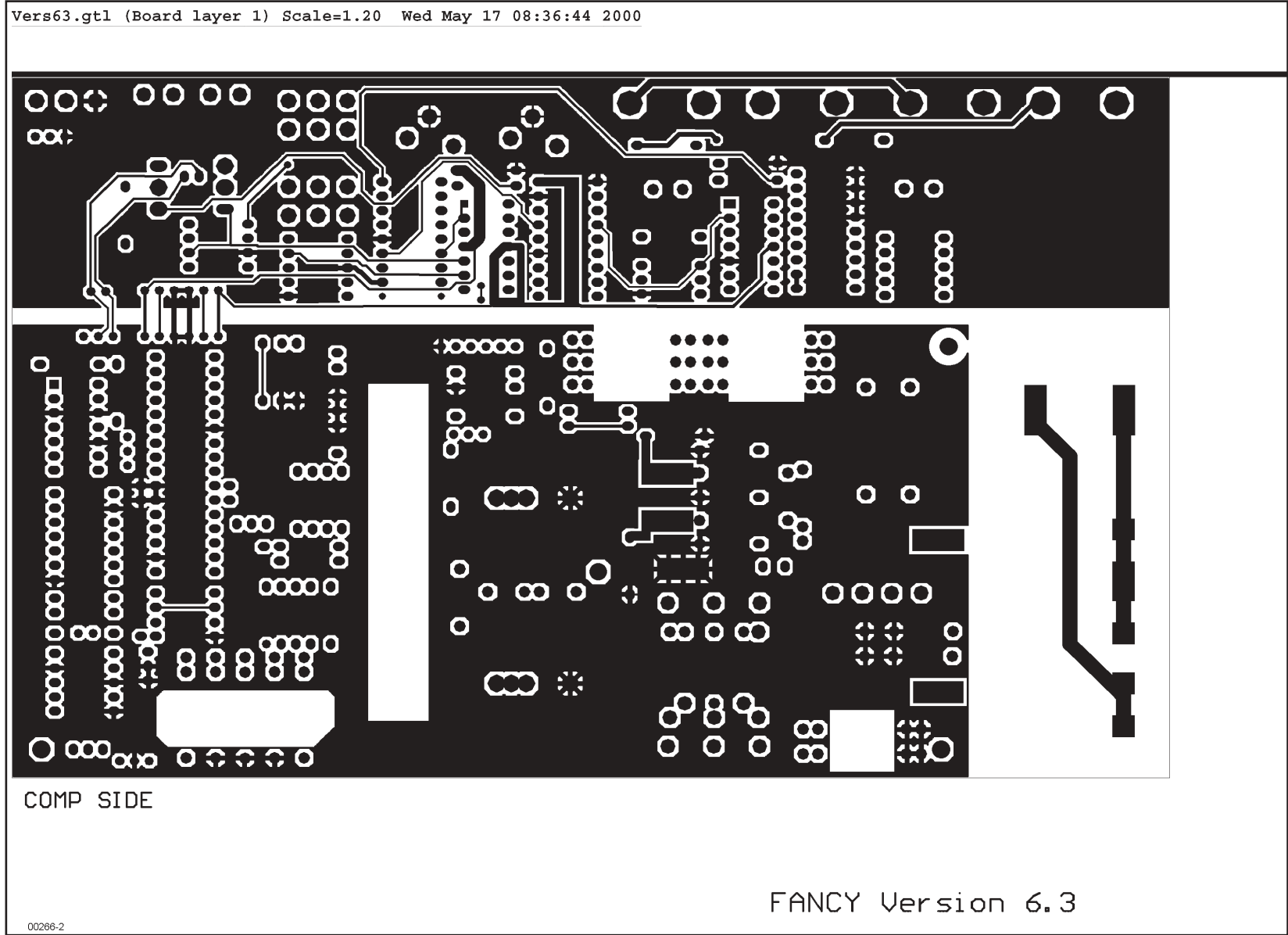
PB12 Electrical Parts List (Cont.) Revision 2 Only

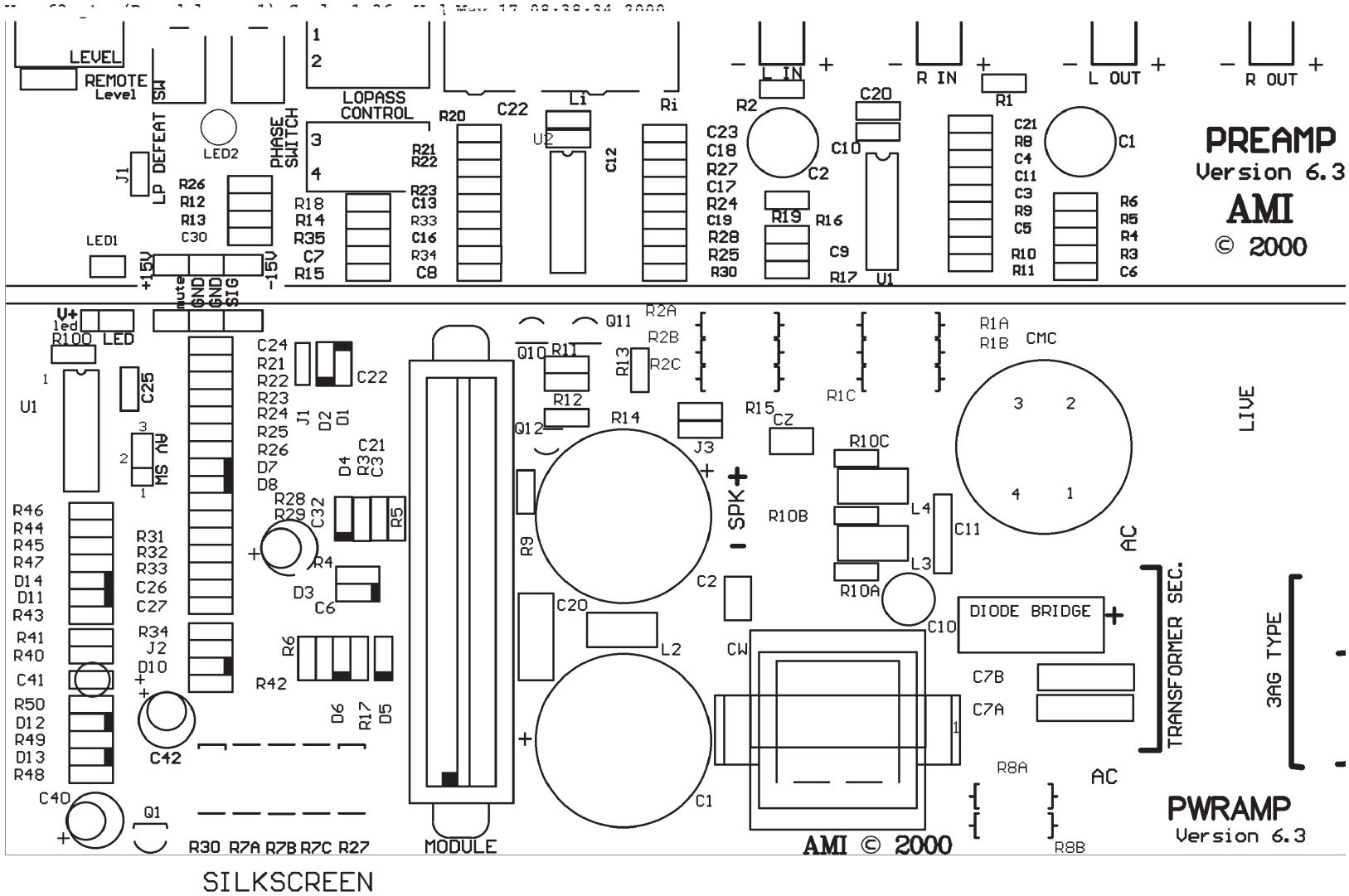
| Part Number | Description | | Qty | Reference designators |
|-----------------------|------------------------|-----------------------|-----|---|
| <i>Capacitors</i> | | | | |
| 031-100244-100 | SMD Ceramic Capacitor | 0u01/50V K | 7 | C33, 45, 51, 66, 67, 5, 10 |
| 031-100343-100 | SMD Capacitor | 100pF/50V J | 3 | C16, 36, 58 |
| 031-100344-100 | SMD Capacitor | 0u1/50V K | 16 | C11, 42-44, 46-49, 52, 54, 55, 60, 63, 71, 74, 77 |
| 031-100364-100 | SMD Capacitor | 0.1uF/100V K | 2 | C3, 7 |
| 031-220344-100 | SMD Capacitor | 220pF/50V J | 5 | C14, 15, 20, 21, 19 |
| 031-330444-300 | SMD Capacitor | 3300pF/50V K | 2 | C40, 34 |
| 031-470244-102 | SMD Capacitor | 0u047/50V K | 2 | C62, 59 |
| 031-560243-100 | SMD Capacitor | 56pF/50V J | 2 | C57, 61 |
| 031-560343-102 | SMD Capacitor | 560pF/50V J | 1 | C56 |
| 032-100484-200 | END PE Capacitor | 1uF/250V K | 2 | C70, C70B |
| 033-200645-300 | NP Capacitor | 200u/50V M | 2 | C17, 18 |
| 033-470444-270 | NPE | 4u7/50V K | 1 | C73 |
| 033-680464-270 | NPE | 6u8/100V K | 1 | C72 |
| 034-100525-300 | Electrolytic Capacitor | 10uF/25V M | 1 | C35 |
| 034-100625-300 | Electrolytic Capacitor | 100uF/25V M | 1 | C64 |
| 034-220525-301 | Electrolytic Capacitor | 22uF/25V M | 6 | C4, 9, 41, 39, 50, 53 |
| 034-220615-301 | Electrolytic Capacitor | 220uF/16V M | 1 | C37 |
| 034-330525-300 | Electrolytic Capacitor | 33uF/25V M | 1 | C1 |
| 034-330615-300 | Electrolytic Capacitor | 330uF/16V M | 2 | C12, 78 |
| 034-330780-300 | Electrolytic Capacitor | 3300uF/80V M | 2 | C6, 8 |
| 034-470415-301 | Electrolytic Capacitor | 4u7/50V M | 1 | C2 |
| 034-470615-301 | Electrolytic Capacitor | 470uF/16V M | 1 | C65 |
| 038-100363-300 | MPE Capacitor | 0u1/100V J | 7 | C68, 69, 26, 27, 28, 29, 30 |
| 038-150393-300 | MPE Capacitor | 0u15/63V J | 1 | C25 |
| 038-330393-300 | MPE Capacitor | 0u33/63V J | 1 | C31 |
| 039-100390-100 | UL Capacitor | 0u1/275V | 1 | CXAC1 |
| <i>Semiconductors</i> | | | | |
| 051-000600-100 | NPN Transistor | MPSW06RLRA | 2 | Q2, Q16 |
| 051-005600-100 | NPN Transistor | MPSW56RLRA MPQ TO-92 | 1 | Q3 |
| 051-222200-100 | NPN Transistor | PN:MPS2222ARLRA TO-92 | 1 | Q21 |
| 051-290700-100 | NPN Transistor | P2N2907A TO-92 | 2 | Q19, 23 |
| 051-540101-000 | PNP Transistor | 2N5401 TO-92 | 1 | Q1 |
| 051-555100-000 | NPN Transistor | 2N5551 TO-92 | 1 | Q17 |
| 052-400080-000 | Bridge rectifier | PN:RS804 400V, 8A | 1 | BR1 |
| 053-211100-000 | IC:Half-Bridge Driver | PN:IR2111 | 1 | U7 |
| 054-000100-100 | SMD Diode | ES1D 200V, 1A, 35ns | 5 | D5, 26, 29, 33, 38 |
| 054-001001-100 | SMD Zener Diode | 10V SOT-23 DZ23C10 | 1 | D35 |
| 054-001500-100 | SMD Zener Diode | 15V SOT-23 DZ23C15 | 3 | D6, 7, 9 |
| 054-007200-100 | SMD IC Dual Op-Amp | TL072CDR SO-8 (TI) | 2 | U5, 6 |
| 054-007400-100 | SMD IC Quad Op-Amp | PN:TL074CDR (TI) | 2 | U2, 3 |
| 054-033904-100 | SMD TR NPN (MOTOROLA) | MMBT3904LT1 SOT23 | 6 | Q11, 14, 13, 5, 8, 9 |
| 054-033906-100 | SMD TR PNP (MOTOROLA) | MMBT3906LT1 SOT23 | 4 | Q6, 10, 12, 15 |
| 054-045580-100 | SMD Dual Op-Amp | NJM4558M-TE3 DMP-8 | 1 | U4 |
| 054-050600-100 | SMD Zener Diode | 5.6V SOT-23 DZ23C5V6 | 3 | D24, 36, 37 |
| 054-211400-100 | SMD NPN Transistor | DTC114EK SMT3 | 1 | Q7 |
| 054-414803-100 | SMD Zener Diode | LL4148 | 26 | D1-4, 8, 10-23, 27, 28, 30-32, 34, 39 |
| 054-540100-100 | SMD PNP Transistor | MMBT5401 LT1 | 3 | Q20, 24, 26 |
| 054-555100-100 | SMD NPN Transistor | MMBT5551 LT1 | 1 | Q25 |
| 051-003100-000 | NPN Transistor | TIP31C TO-220 | 1 | Q4 |
| FE1064011100 | MOSFET | IRF640 TO-220 | 2 | Q18, 22 |

PB12 Electrical Parts List (Cont.) Revision 2 Only

| Part Number | Description | | Qty | Reference designators |
|----------------------|-------------------------------|-----------------------------|-----|------------------------------------|
| <i>Miscellaneous</i> | | | | |
| 041-115001-000 | Bead Coil | YT-10911 | 1 | L5 |
| 043-300101-000 | Inductor | 30uH YT-10033 | 1 | L2 |
| 043-324300-000 | Inductor | 324uH YT-10778 | 1 | |
| 043-560200-000 | Inductor | 56uH YT-10779 | 1 | |
| 043-700101-000 | Toroidal Inductor | 70uH YT-10682 | 1 | L3 |
| 044-100100-000 | SMD Ferrite Bead | 600R/100MHz 1206 | 2 | FB1, FB2 |
| 072-010007-000 | RCA Housing | SCJ-1020 2P(G) WHT, RED | 1 | CONN1 |
| 072-040039-000 | Terminal | PC205 (t=0.8m/m) T205MA | 1 | S- |
| 072-040064-000 | Terminal | PC250(t=0.8), T250MA | 1 | S+ |
| 072-040096-000 | Terminal | (t=0.8mm) PC187(0.8) | 7 | AC1, AC3, T1, T2, AC2, SW2, SW4 |
| 072-040169-000 | Connector | 2 PIN JS-1001-2 P:2.5mm | 1 | CONN3A |
| 072-060170-000 | Binding Posts | HI LEVEL Input/Output Jacks | 4 | BP/IP, BP/OP |
| 093-105202-300 | Fuse | UL GSL(2AG) 250V, 5*20mm | 1 | |
| 073-050001-000 | FUSE CLIP | P/N:CFFH1206 | 2 | |
| 074-030002-000 | Toggle SW | P/N L101 | 2 | SW5, SW6 |
| 074-300018-000 | Relay | PN:943-1C-48D | 1 | K1 |
| 042-010053-003 | Power Transformer | YT-10616-4 | 1 | |
| 061-020000-000 | Level-Volume Knob | 20 x 15 m/m UL 94V-0 Blk | 2 | |
| 061-314002-000 | Strain relief | SB4F-2 | 2 | |
| 063-010012-000 | Clamps for output transistors | TRK-1 | 4 | |
| 063-531808-000 | Rear plastic cover w/G | ABS | 1 | |
| 073-032315-601 | Heatsink | 70 x 58 x 20 mm | 1 | |
| 074-020018-000 | Main Power switch | RF1003-BB4-0 | 1 | |
| 083-041802-009 | Power Cord 120V | SPT-2 BLK #18 T187 | 1 | |
| 181-911600-161 | Output wires | #16 AWG UL1007 Blk | 1 | |
| 181-911655-135 | Output wires | #16 AWG UL1007 Green | 1 | |
| 181-921600-000 | Output wires | #16 AWG UL1015 Blk | 1 | |
| 181-921699-000 | Output wires | #16 AWG UL1015 Wht | 1 | |



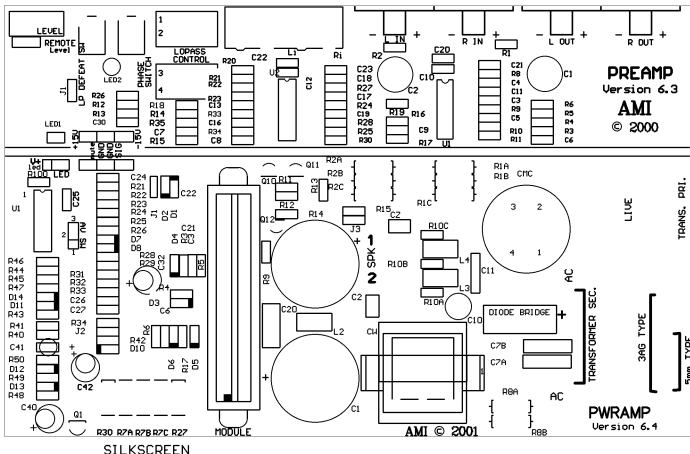


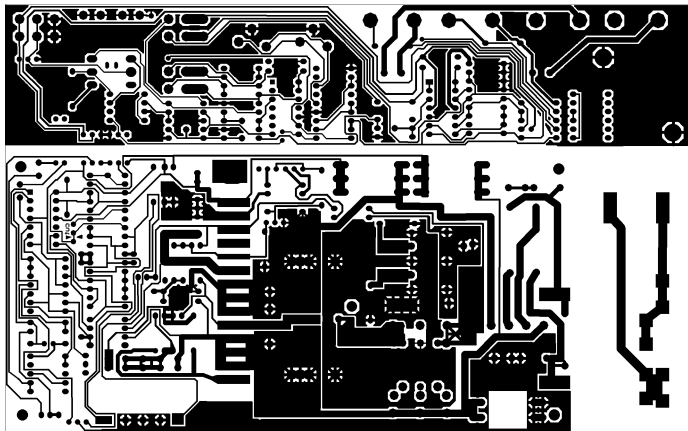


00266-3

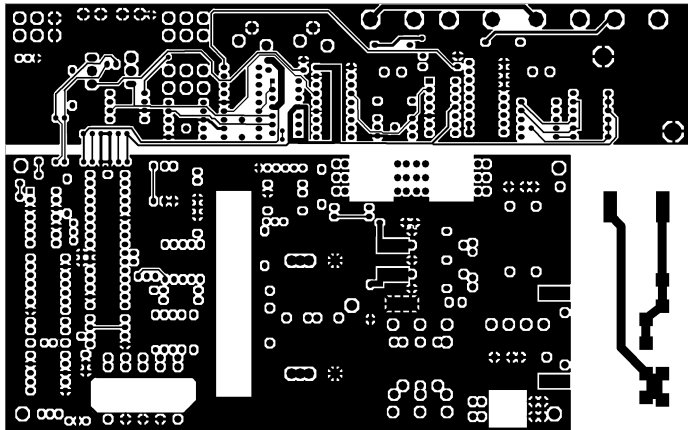
FANCY Version 6.3

PB12 (PCB version 6.4) Power Amp Only (Revision 1 Only)



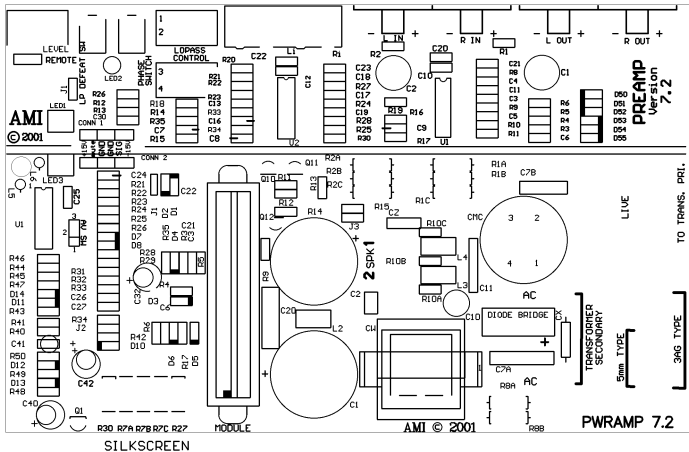


SOLDERSIDE



COMP SIDE

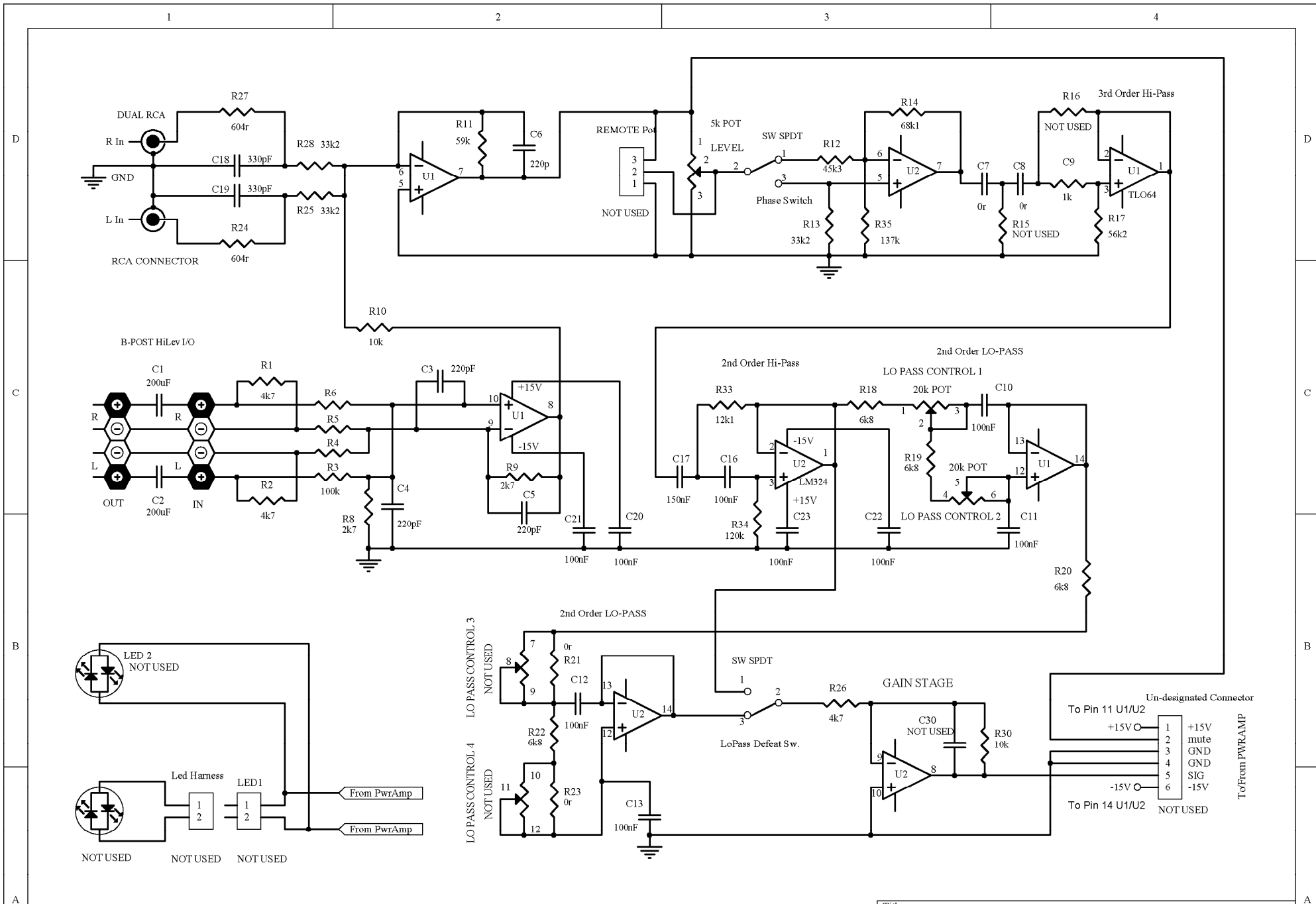
PB12 (PCB version 7.2) (Revision 1 Only)



FANCY Version 7.2

.125 holes NOT thru-plated

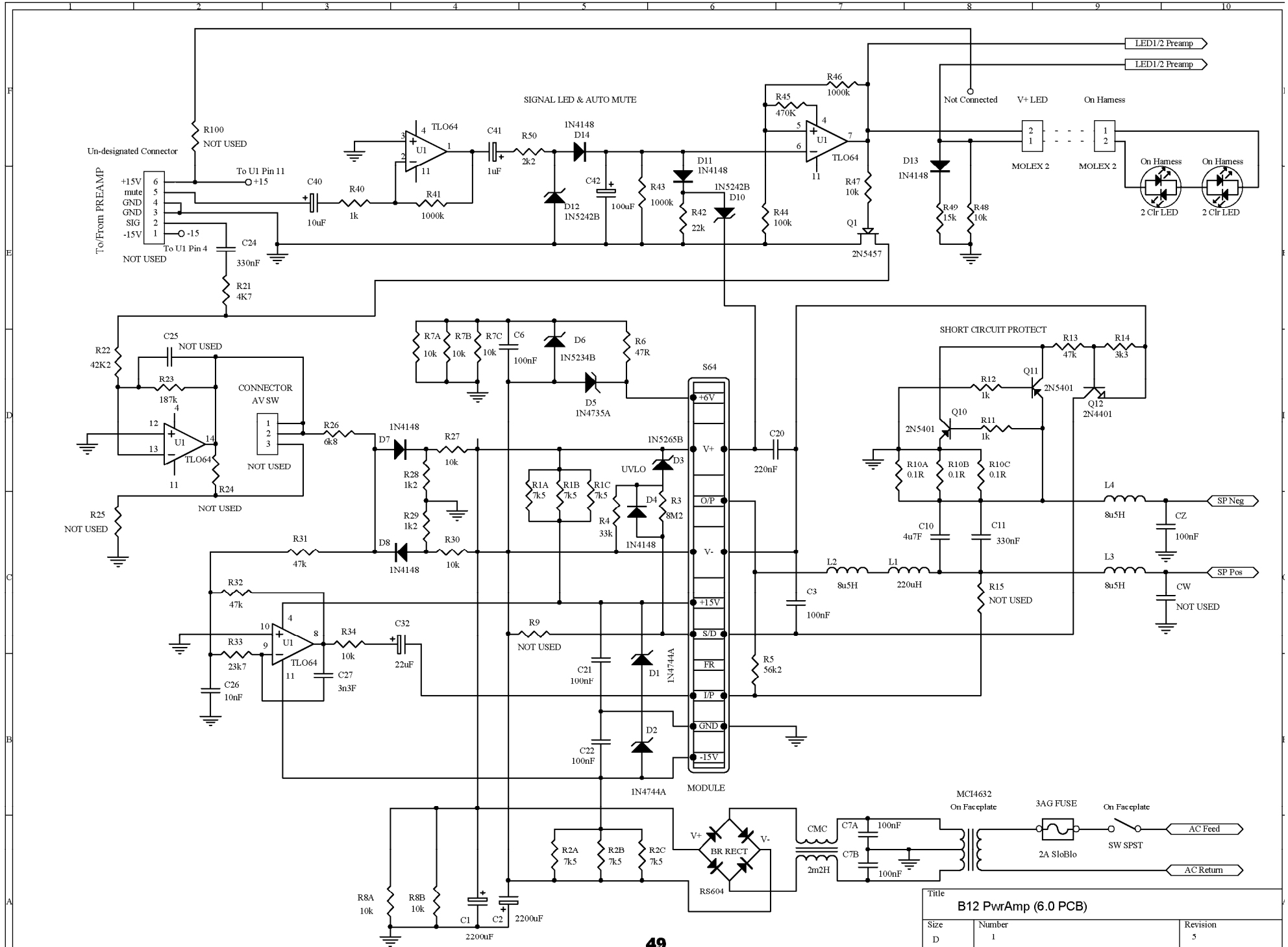
PB12 Revision 1 Schematic Diagrams PREAMP (PCB version 6.3)



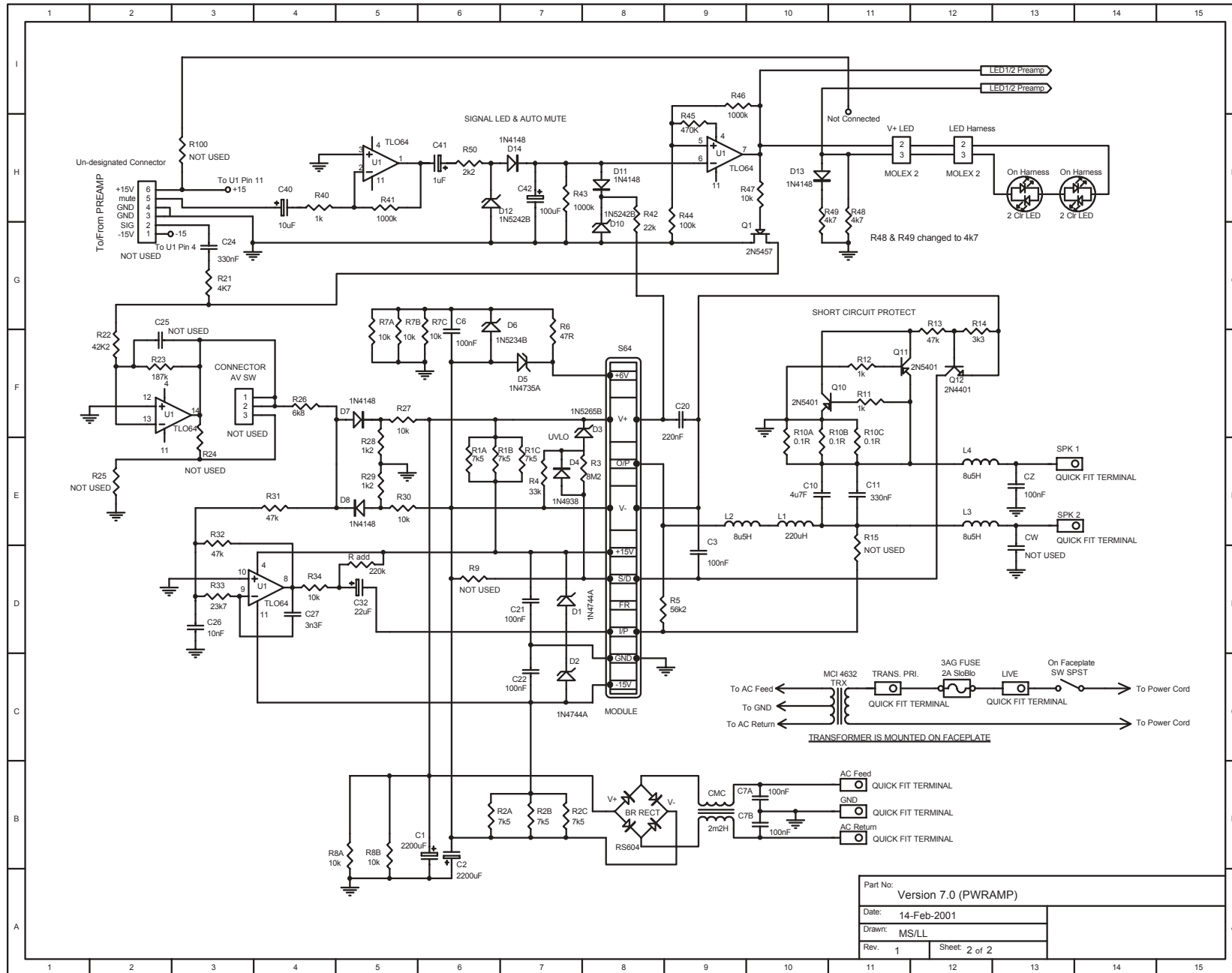
| | | |
|----------------------|---|--------------|
| Title | | |
| B12 PREAMP (6.3 pcb) | | |
| Size | Number | Revision |
| Tabloid | | 5 |
| Date: | 20-Apr-2000 | Sheet 1 of 1 |
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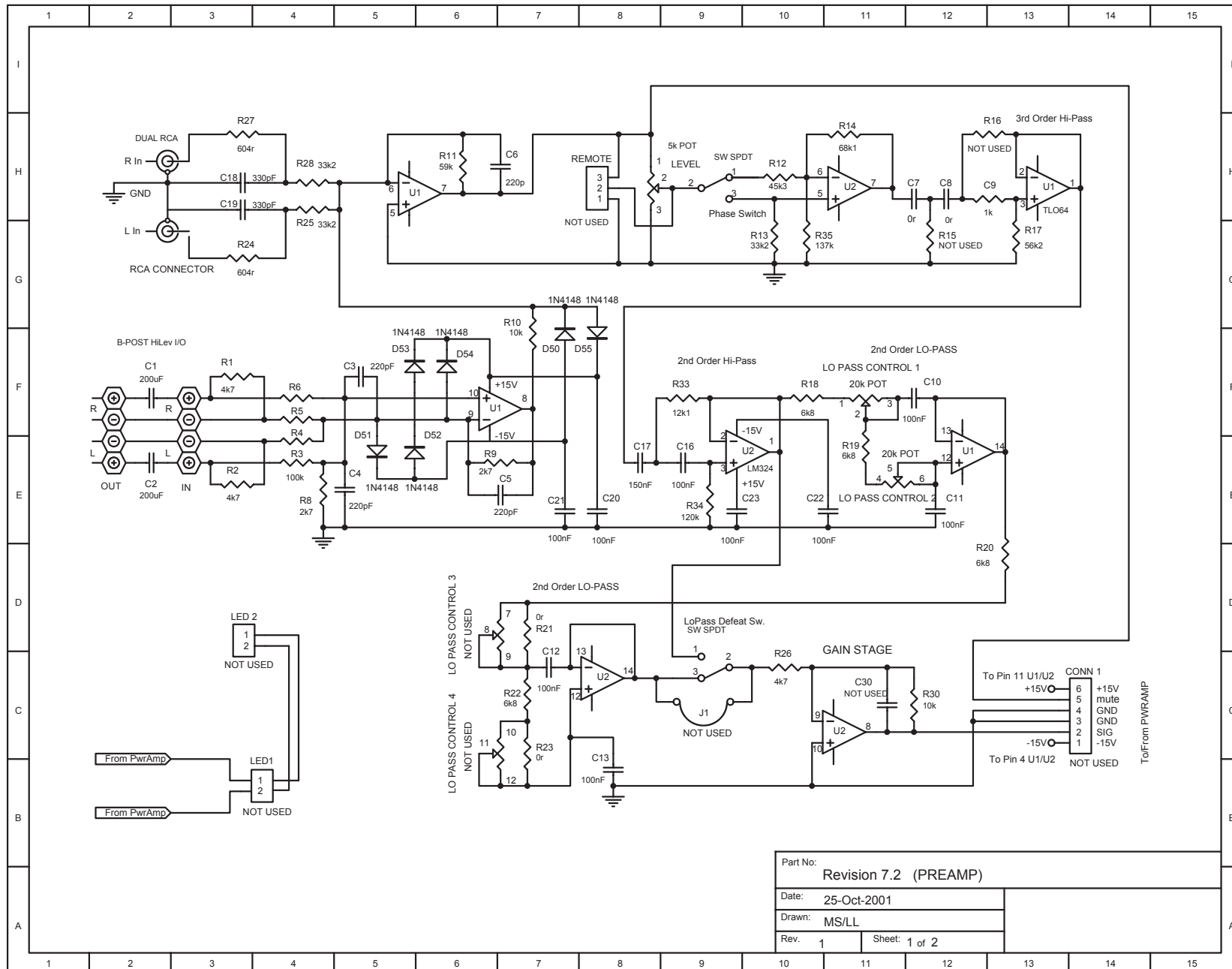
PB12 Revision 1 Schematic Diagrams

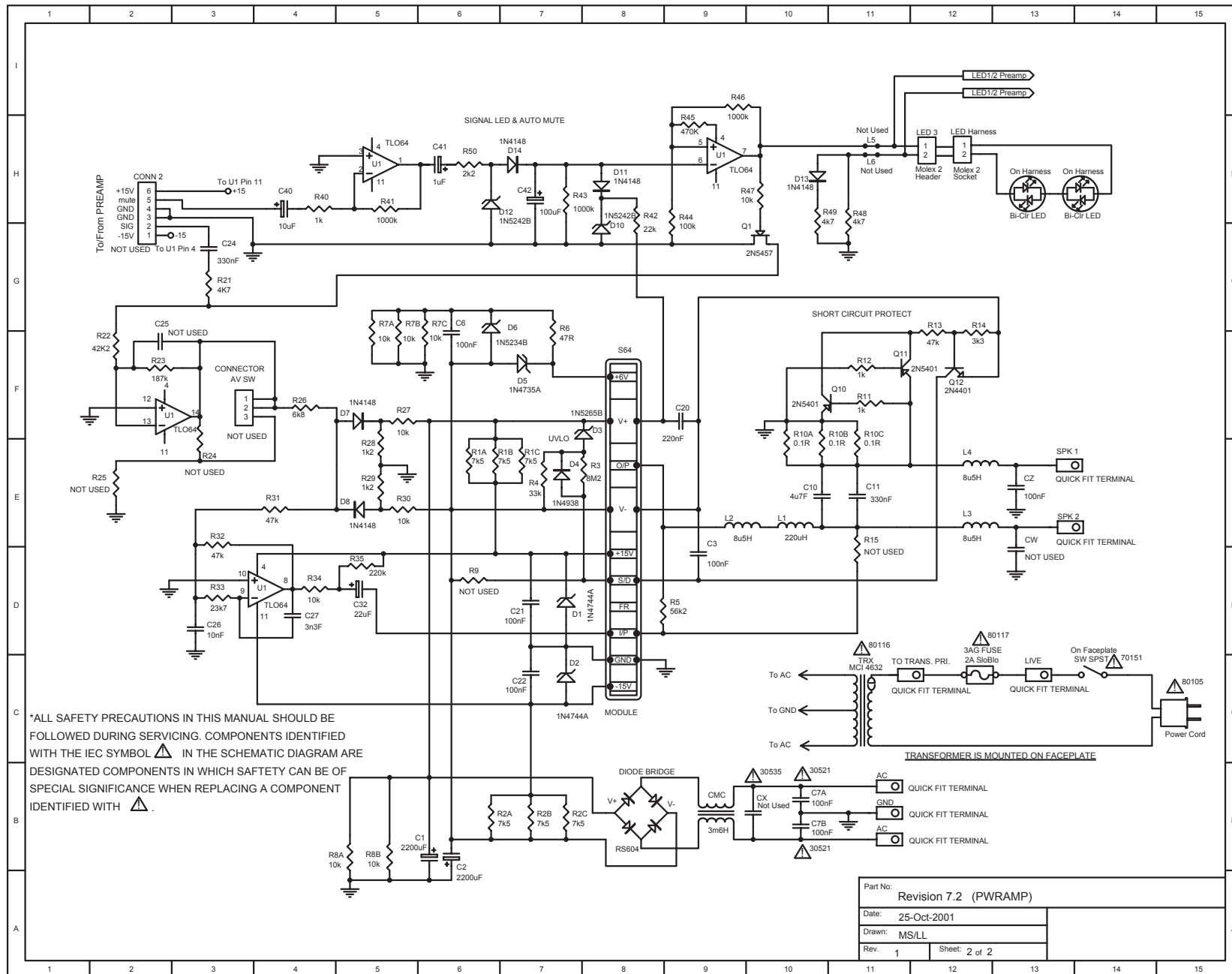
(Power Amp PCB version 6.0 - 6.3)

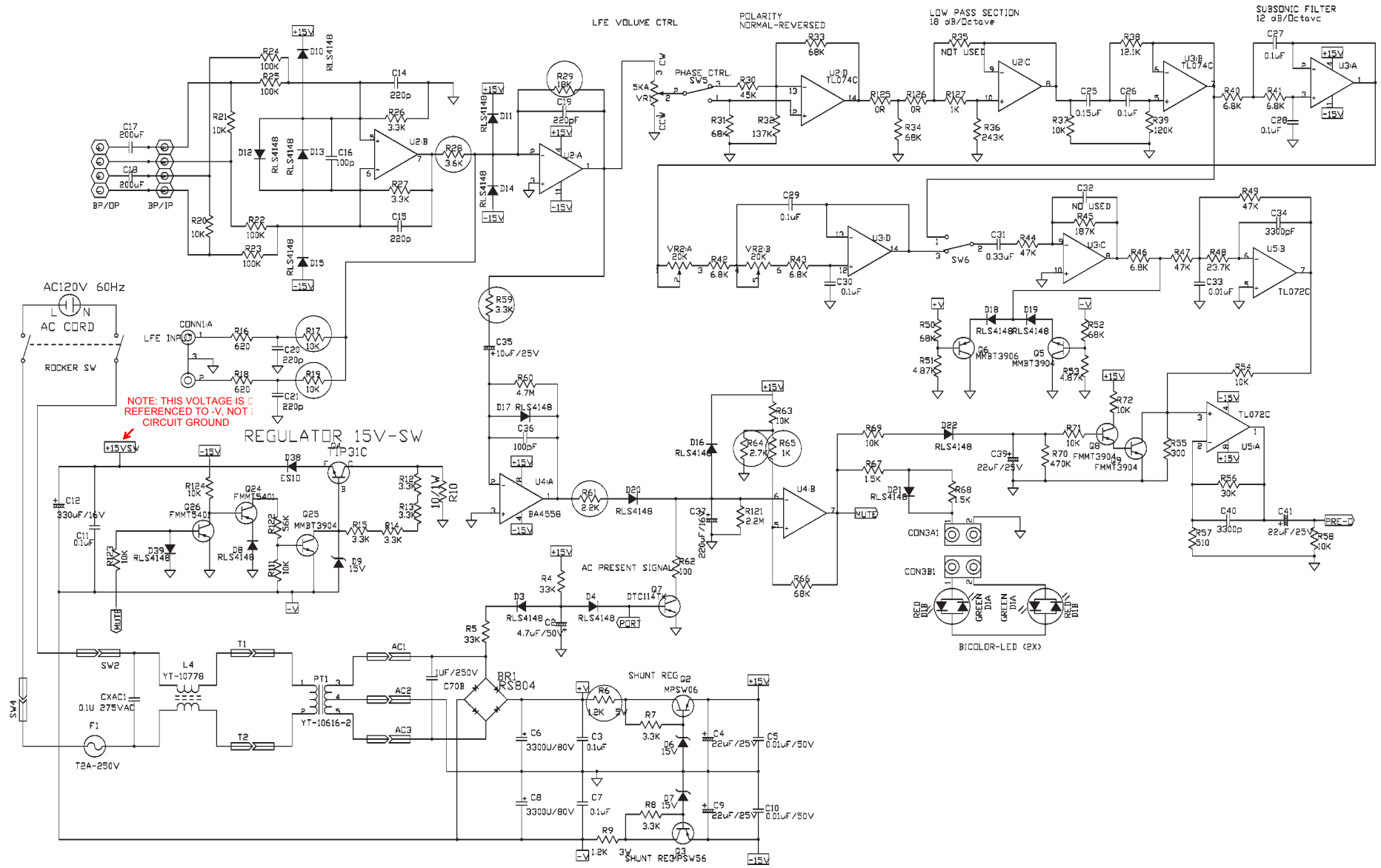


| | | |
|--------------------------------------|--------------|--|
| Title B12 PwrAmp (6.0 PCB) | | |
| Size D | Number 1 | Revision 5 |
| Date: 20-Apr-2000 | Sheet 1 of 1 | File: T:\PB12 sch Folder_\PB12 PwrAmp Rev5 |
| Drawn By: MA / LL | | |

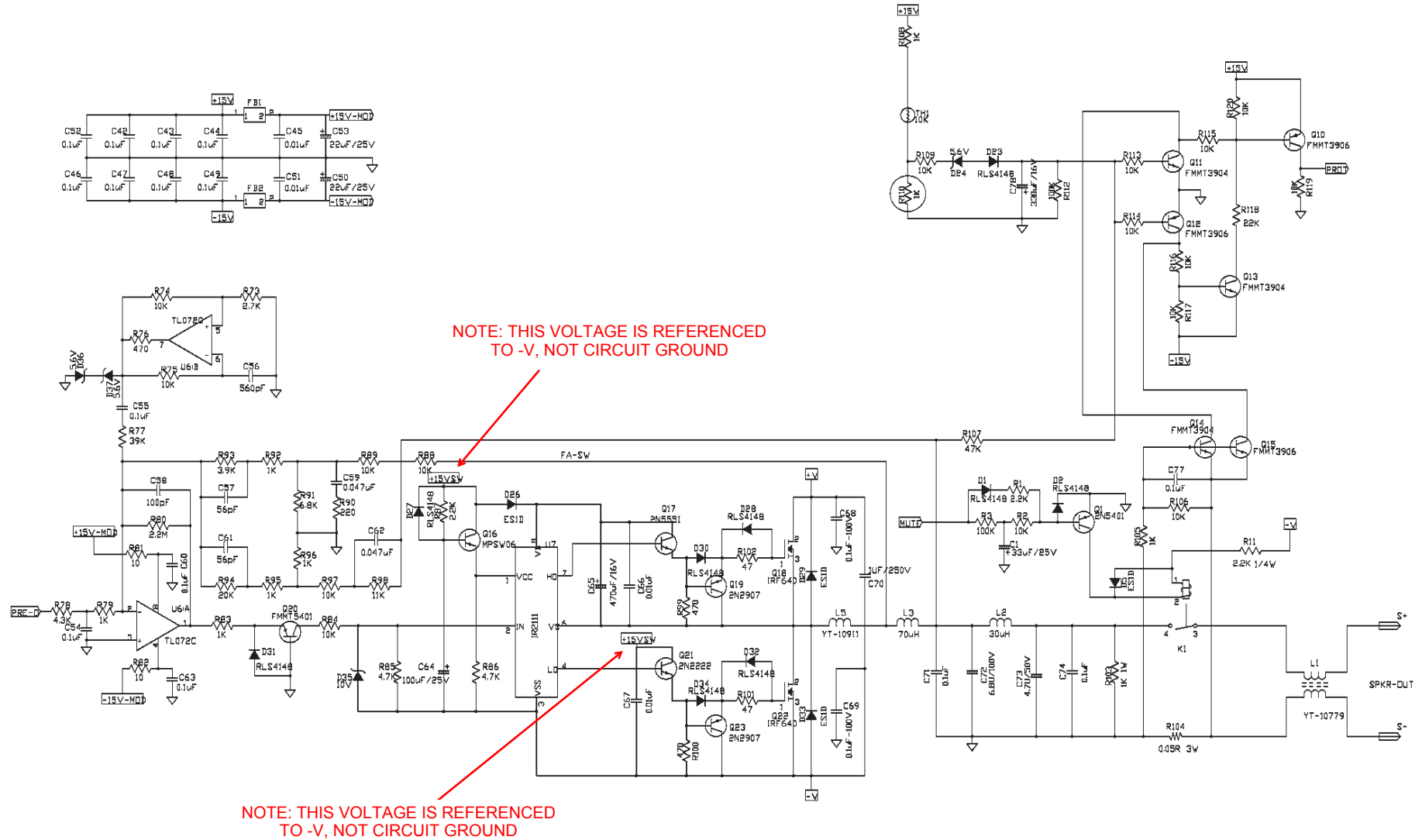








PRE-AMP



POWER-AMP