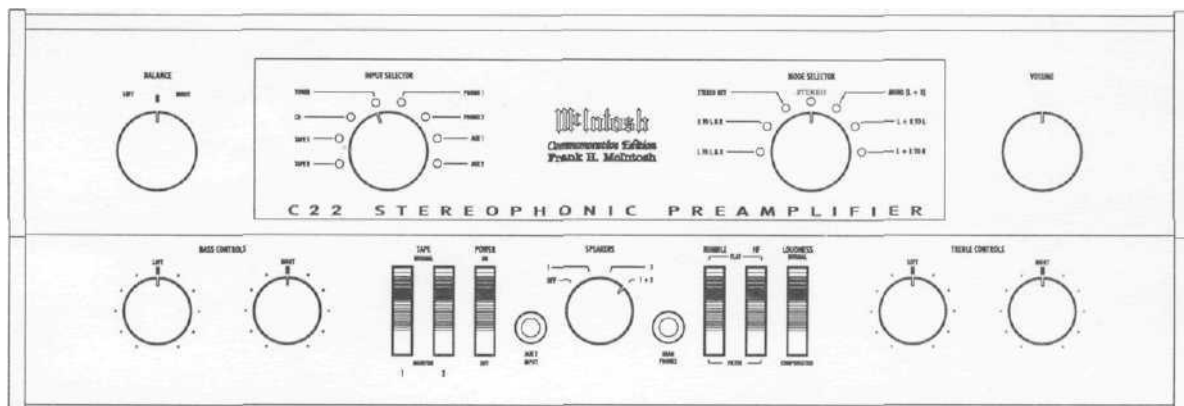


# C22 PREAMPLIFIER



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# McIntosh

## Service Manual



# Performance Specifications

## FREQUENCY RESPONSE

+0, -0.5dB from 20Hz to 20,000Hz

## RATED OUTPUT

2.5V at MAIN and SWITCHED 1 and 2, and BALANCED OUTPUTS

## MAXIMUM VOLTAGE OUTPUT

More than 8V at all outputs

## TOTAL HARMONIC DISTORTION

0.002% maximum IHF, 0.2% maximum from 20Hz to 20,000Hz at rated output

## SENSITIVITY

Phono: 2.2mV for 2.5V rated output, (0.45mV IHF)  
High Level: 250mV for 2.5V rated output, (50mV IHF)

## SIGNAL-TO-NOISE RATIO, A-WEIGHTED

Phono: 80dB below 10mV input  
High Level: 90dB below rated output

## VOLTAGE GAIN

Phono To Tape: 41 dB at 1000Hz  
Phono To Main: 61 dB at 1000Hz  
High Level To Tape: 0dB  
High Level To Main: 20dB

## INPUT IMPEDANCE

Phono: 47K ohms and 65pF Capacitance  
High Level: 22K ohms

## TONE CONTROLS

Bass and Treble stepped, 20dB boost to 20dB cut

## AC POWER OUTLETS

4 switched and 1 unswitched, Total capacity 1400 watts

## POWER REQUIREMENTS

120V, 50/60Hz, 37 watts

## DIMENSIONS

Front Panel: 16 inches (40.6cm) wide by 5-7/16 inches (13.8cm) high. Chassis depth behind mounting panel, including clearance for connectors: 14 inches (35.6cm). Knob clearance required in front of mounting panel: 1-1/2 inches (3.8cm).

## FINISH

Anodized gold and black front panel, chassis is black.

## WEIGHT

16 pounds (7.3Kg) net, 25 pounds (11.4Kg) in shipping carton

## Notes


1. The four types of heavy lines on the schematics denote the primary signal path in the following manner:

————— = LEFT CHANNEL  
- - - - - = RIGHT CHANNEL  
..... = LEFT BALANCED  
- - - - - = RIGHT BALANCED

2. Unless otherwise noted, all voltages indicated on the schematics are measured under the following conditions:
  - a. AC input at 120 volts, 50/60Hz.
  - b. All voltages are  $\pm 10\%$  with respect to ground. A high impedance (10 megohm) voltmeter must be used.
3. Unless otherwise specified:
  - a. Resistor values are in ohms.
  - b. Capacitor values are in microfarads ( $\mu\text{F}$ ).
4. The voltages enclosed in a box are signal voltages that are measured with a 2.2mV, 1kHz signal connected to both channels at the PHONO 1 INPUT JACKS.

FRONT PANEL CONTROLS are set at:

BALANCE. . . . . CENTER DETENT  
BASS and TREBLE. . . . . CENTER DETENT  
INPUT SELECTOR. . . . . PHONO 1  
LOUDNESS. . . . . NORMAL  
MODE. . . . . STEREO  
POWER. . . . . ON  
VOLUME. . . . . CLOCKWISE  
TAPE MONITOR 1 and 2. . . . . NORMAL  
RUMBLE and HF FILTERS. . . . . FLAT  
SPEAKERS. . . . . 1&2

5. On PC Board Drawings, Square Pad Indicates:
  - a. Polarized Capacitors - Positive
  - b. Diode - Cathode
  - c. Others - Pin 1
6. WARNING:  
Parts marked with the symbol  have critical characteristics. Use ONLY replacement parts recommended by the manufacturer.

# Rear Panel

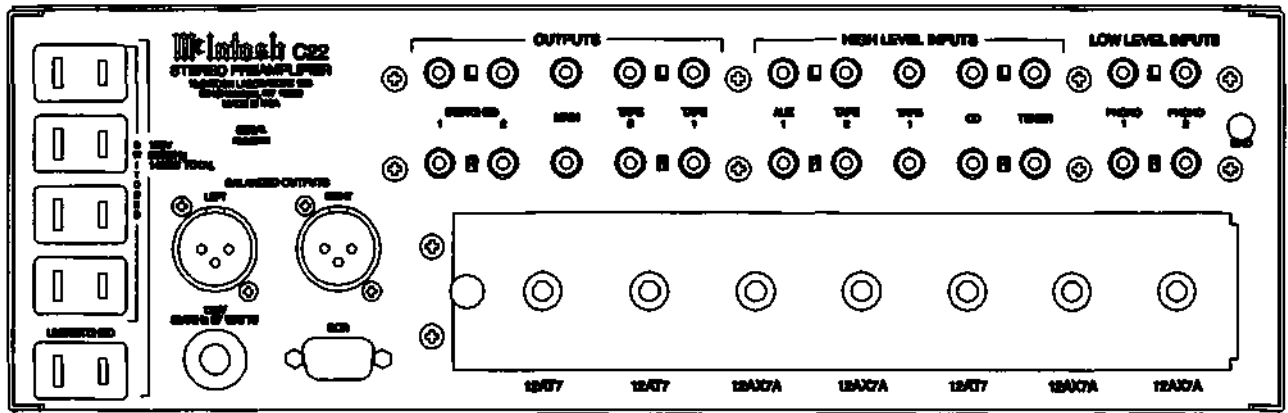


Fig. 1 Rear view

## FRONT PANEL and TRIM PARTS LIST

| <i>Symbol</i>  | <i>Description</i>           |
|----------------|------------------------------|
| 016340         | Indicator Glass              |
| 016334         | Front Panel Glass            |
| 018511         | Top Panel Extrusion          |
| 018512         | Lower Panel Extrusion        |
| 018520         | End Cap Left                 |
| 018521         | End Cap Right                |
| C22-FrontPanel | Front Panel Complete W/Glass |
| 090242         | Input/Mode Knob              |
| 090243         | Balance/Volume Knob          |
| 090244         | Bass/Speaker/Treble Knob     |
| 101035         | Screw, 4-40 x 5/16 Fill Head |
| 104143         | Felt Washer 3/4" Dia         |
| 104144         | Felt Washer 5/8" Dia         |

# Section Locations

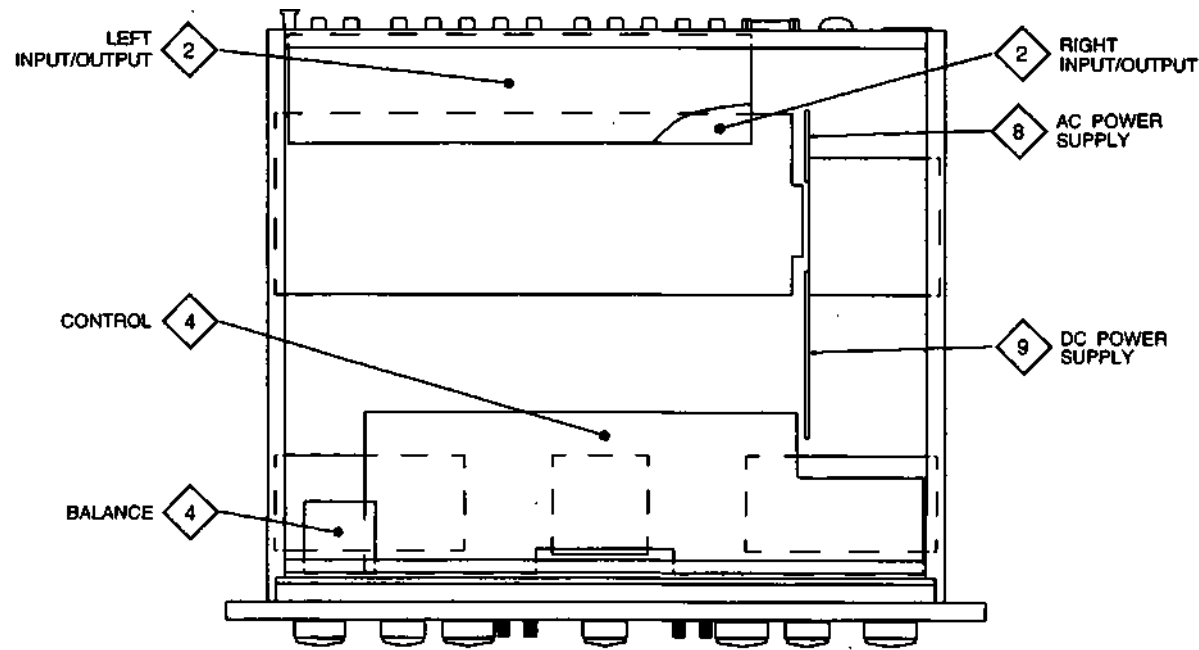


Fig. 2 Top view with cover removed

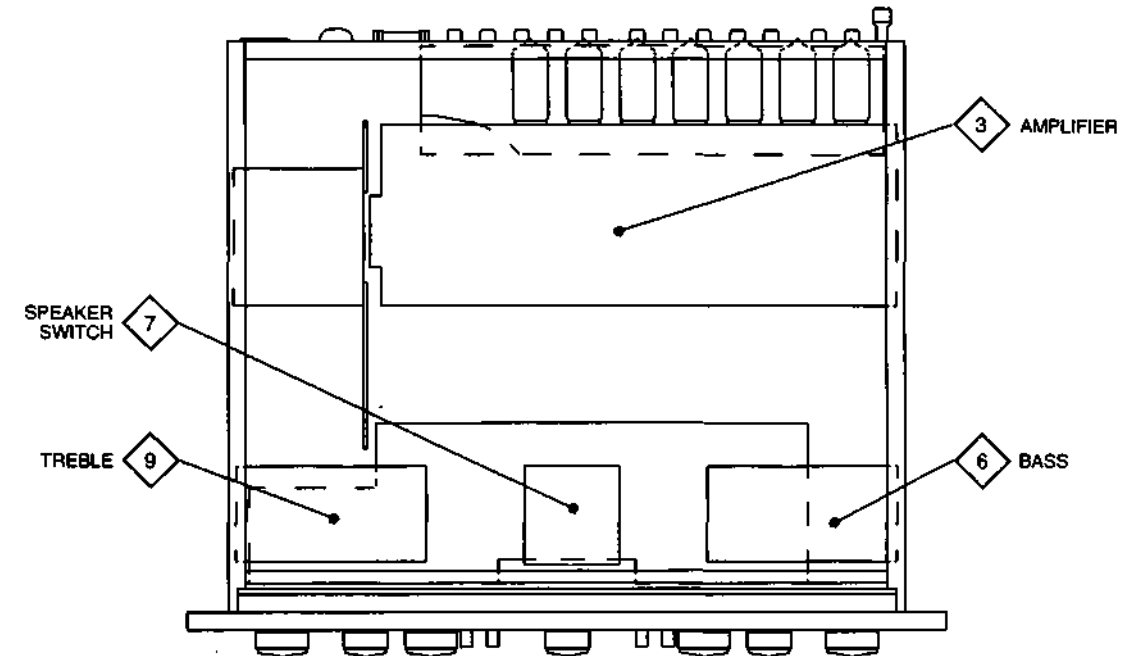
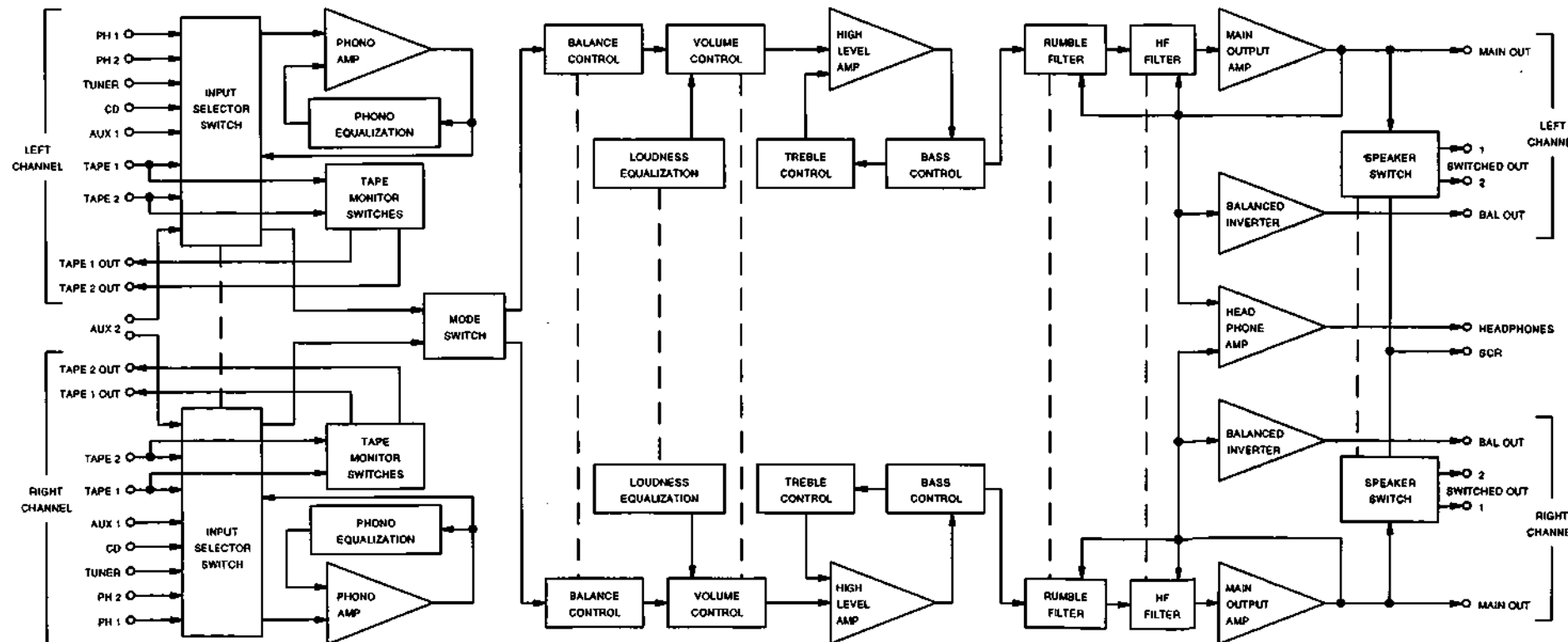


Fig. 3. Bottom view with cover removed

# Block Diagram

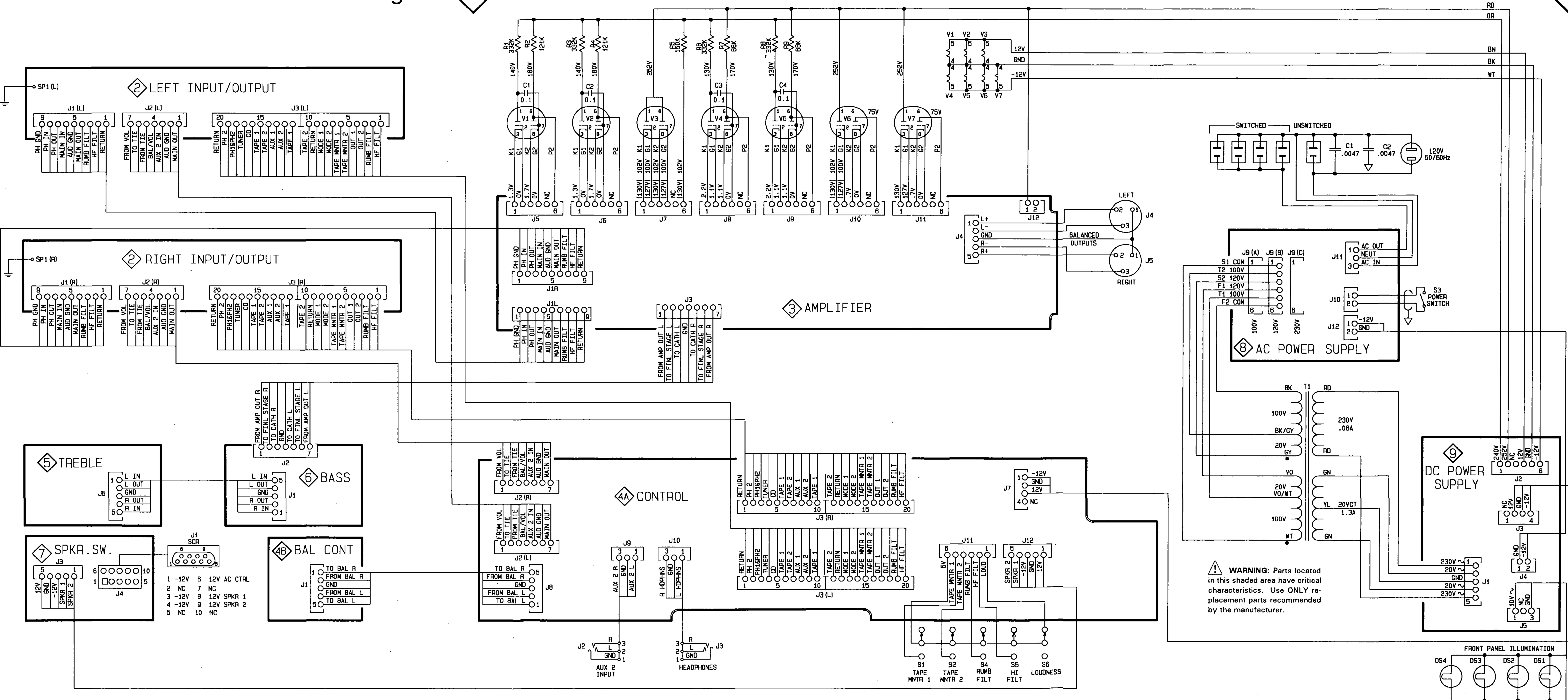


## INTERCONNECTION PARTS LIST

| Symbol                  | Part   | Description               |
|-------------------------|--------|---------------------------|
| <b>CAPACITORS</b>       |        |                           |
| C1,C2                   | 061276 | DISC CAP, .0047uF, 400VAC |
| <b>JACKS</b>            |        |                           |
| J2,J3                   | 117563 | Phone Jack                |
| J4,J5                   | 117437 | XLR Connector, Male       |
| <b>LIGHTING DEVICES</b> |        |                           |
| DS1,DS2                 | 058138 | Lamp Fuse Style           |
| DS3,DS4                 | 058137 | Lamp Disc Indicator       |
| <b>SWITCHES</b>         |        |                           |
| S1-S6                   | 148068 | Slide Switch (SPDT)       |
| <b>TRANSFORMERS</b>     |        |                           |
| T1                      | 159248 | Power Transformer         |

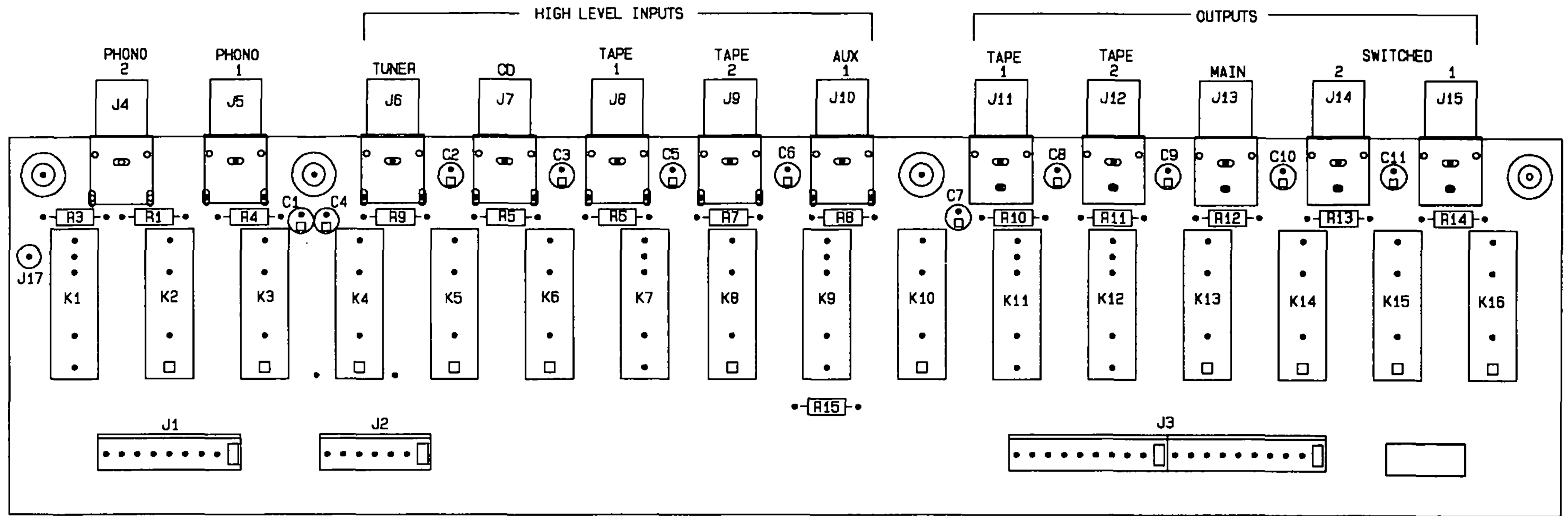
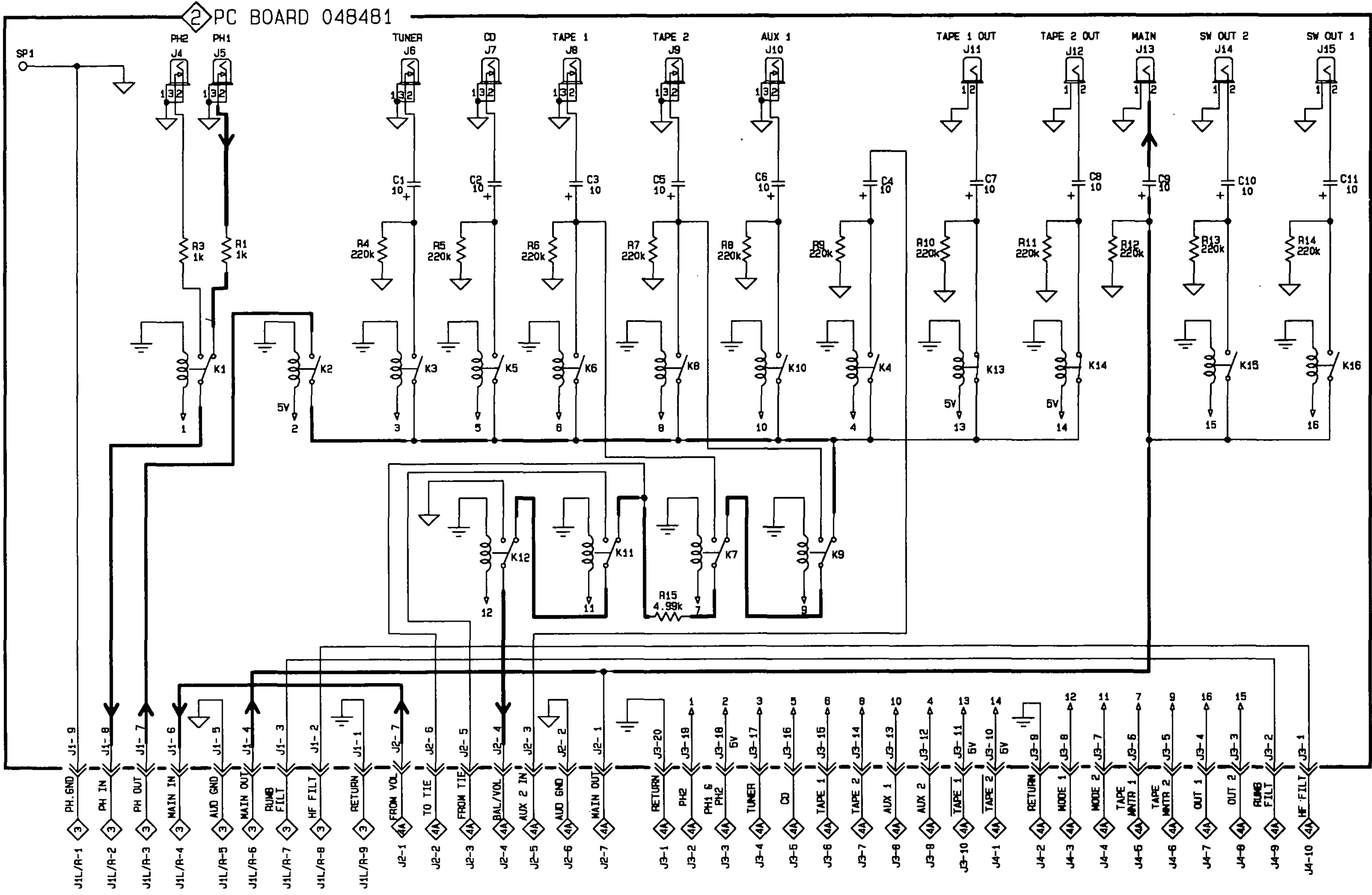
# Interconnection Diagram 1

1



**WARNING:** Parts located in this shaded area have critical characteristics. Use ONLY replacement parts recommended by the manufacturer.

# 2 Input/Output, Left and Right



### INPUT/OUTPUT PARTS LIST

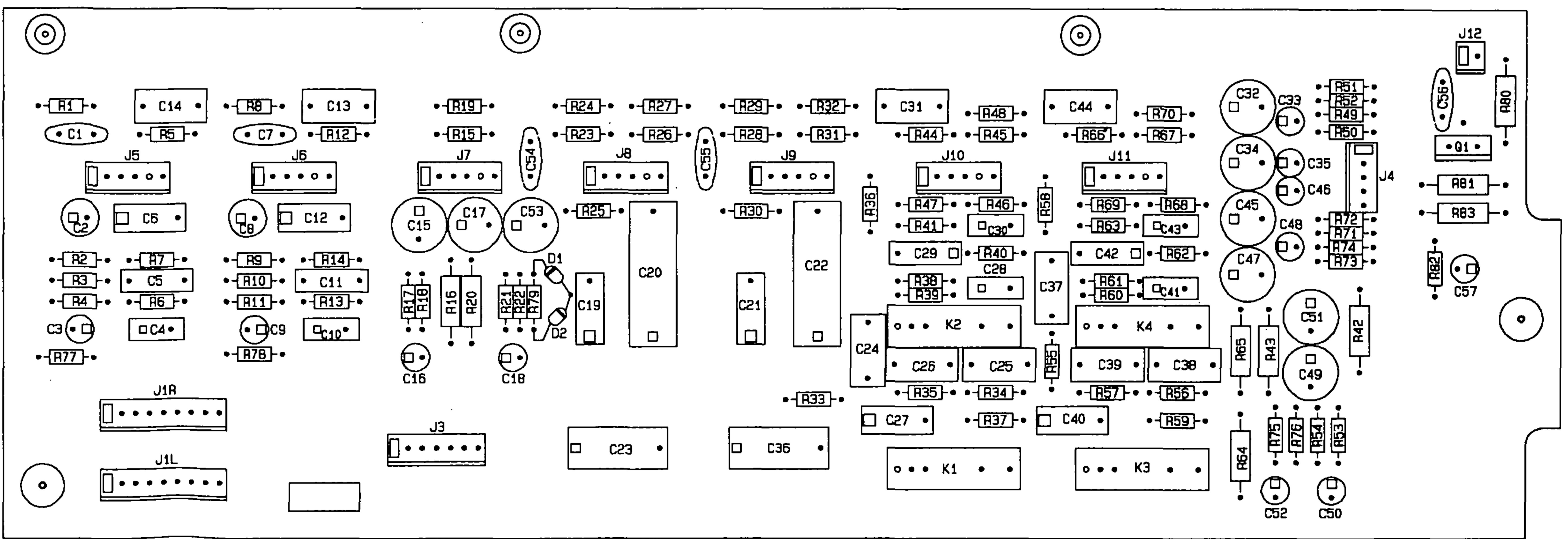
| Symbol                  | Part   | Description                      |
|-------------------------|--------|----------------------------------|
| <b>RELAYS</b>           |        |                                  |
| K1, K7, K9, K11, K12    | 087056 | Form 1C, 5VDC, Reed, HE3321C0500 |
| K2-K6, K8, K10, K13-K16 | 087050 | SPST, 5VDC, Reed, HE3321A0400    |

### LEFT INPUTS/OUTPUTS PCB 048481 AND RIGHT INPUTS/OUTPUTS PCB 048476

### AMPLIFIER PARTS LIST

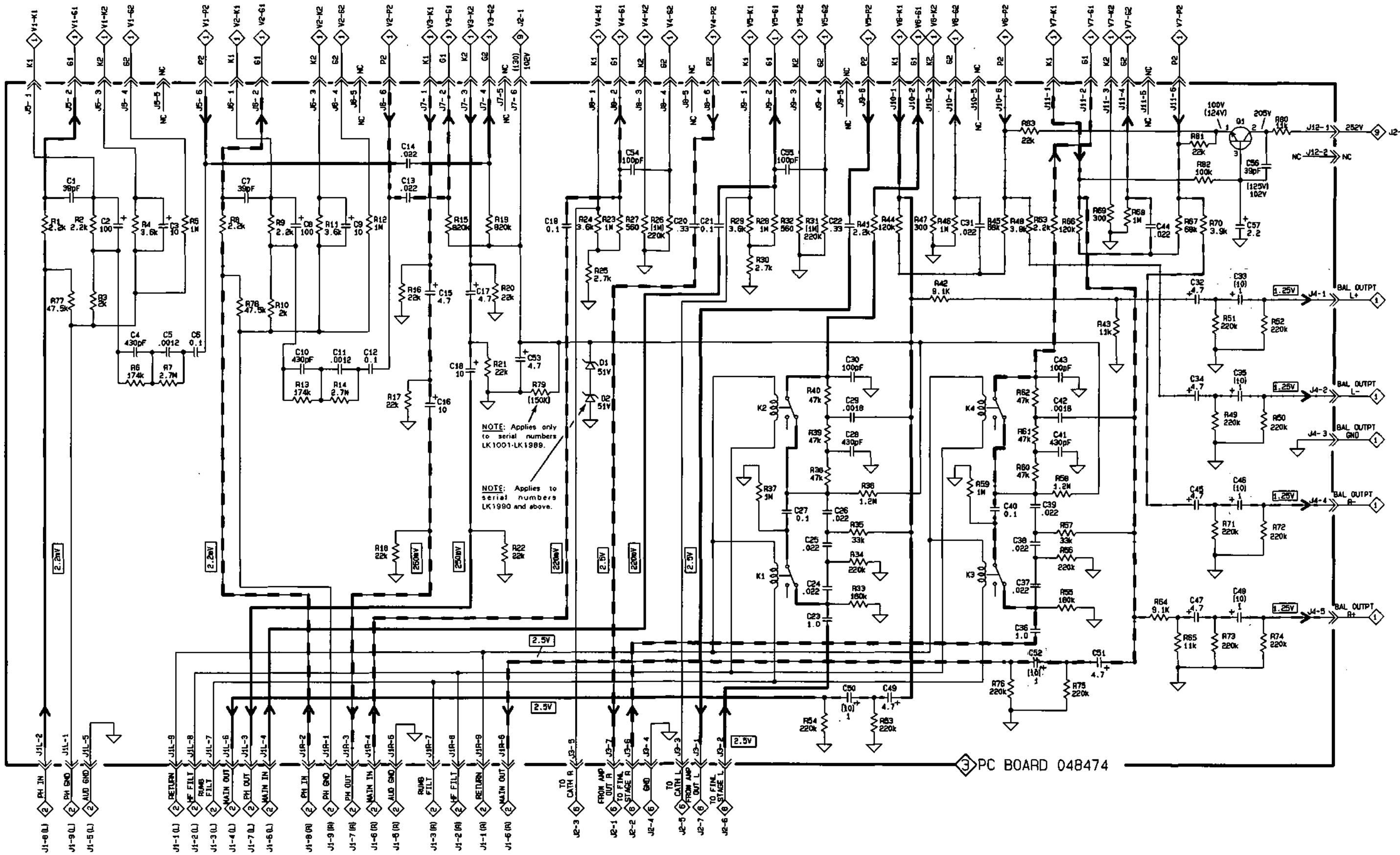
| Symbol             | Part   | Description                      |
|--------------------|--------|----------------------------------|
| <b>RELAYS</b>      |        |                                  |
| K1-K4              | 087056 | Form 1C, 5VDC, Reed, HE3321C0500 |
| <b>DIODES</b>      |        |                                  |
| D1, D2             | 070102 | Zener: 51V, 5%, 400mW            |
| <b>TRANSISTORS</b> |        |                                  |
| Q1                 | 132248 | NPN, 300V, 2SC3790D or E         |

# 3



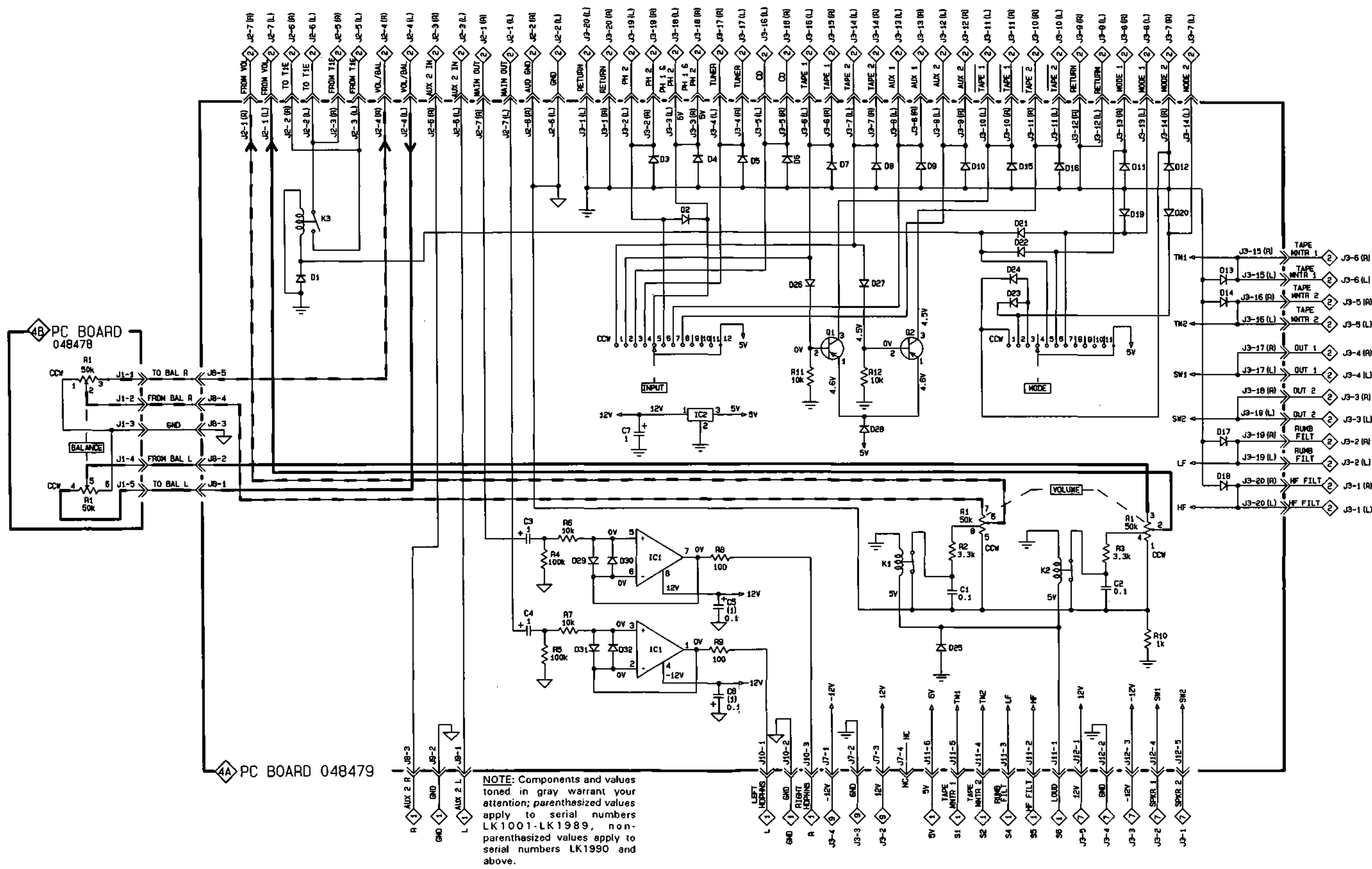
NOTE: Components and values  
 toned in gray warrant your  
 attention; parenthesized values  
 apply to serial numbers  
 LK1001-LK1989. non-  
 parenthesized values apply to  
 serial numbers LK1990 and  
 above.

# Amplifier



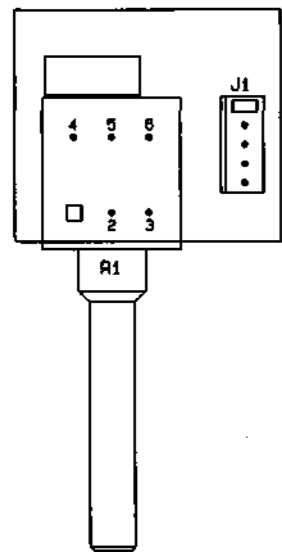


# 4 Control and Balance Control

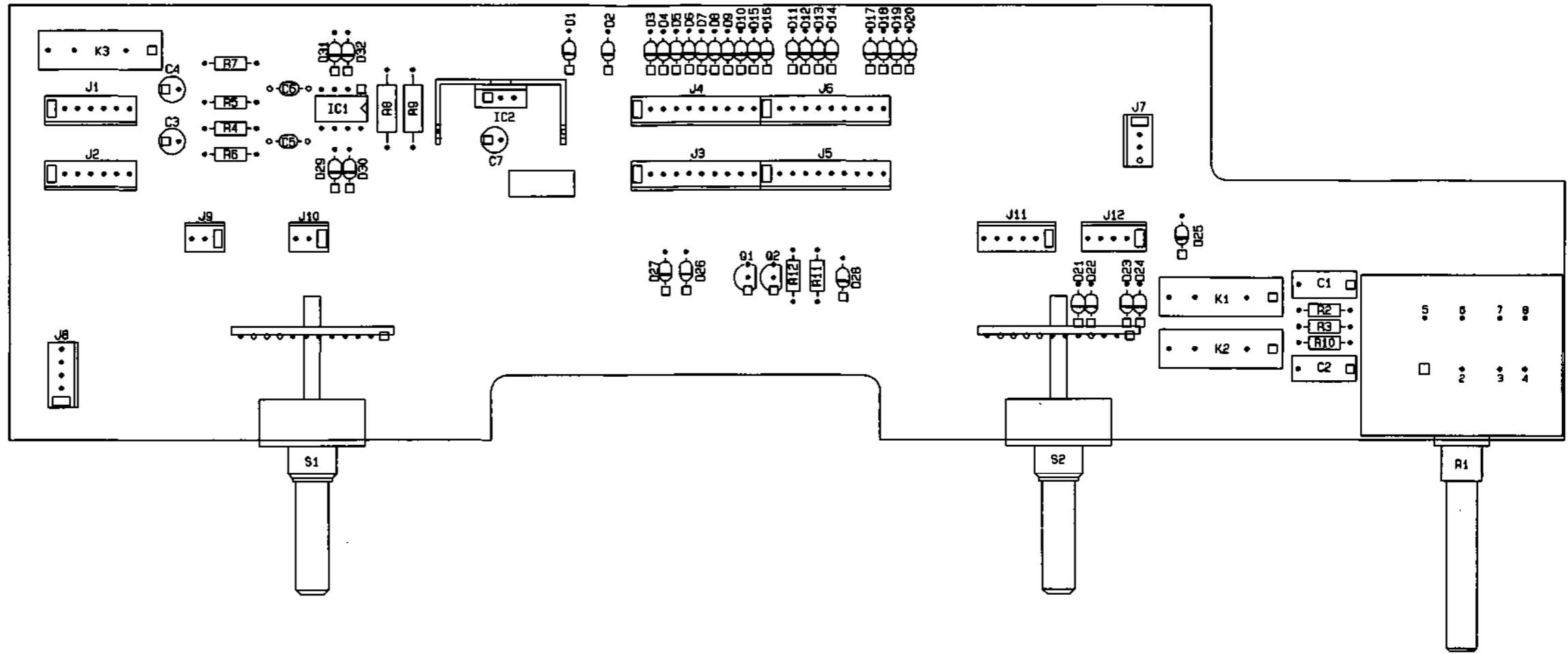


**NOTE:** Components and values toned in gray warrant your attention; parenthesized values apply to serial numbers LK1001-LK1989, non-parenthesized values apply to serial numbers LK1990 and above.

# Control and Balance Control 4



BALANCE CONTROL  
PCB 048478



CONTROL PCB 048479

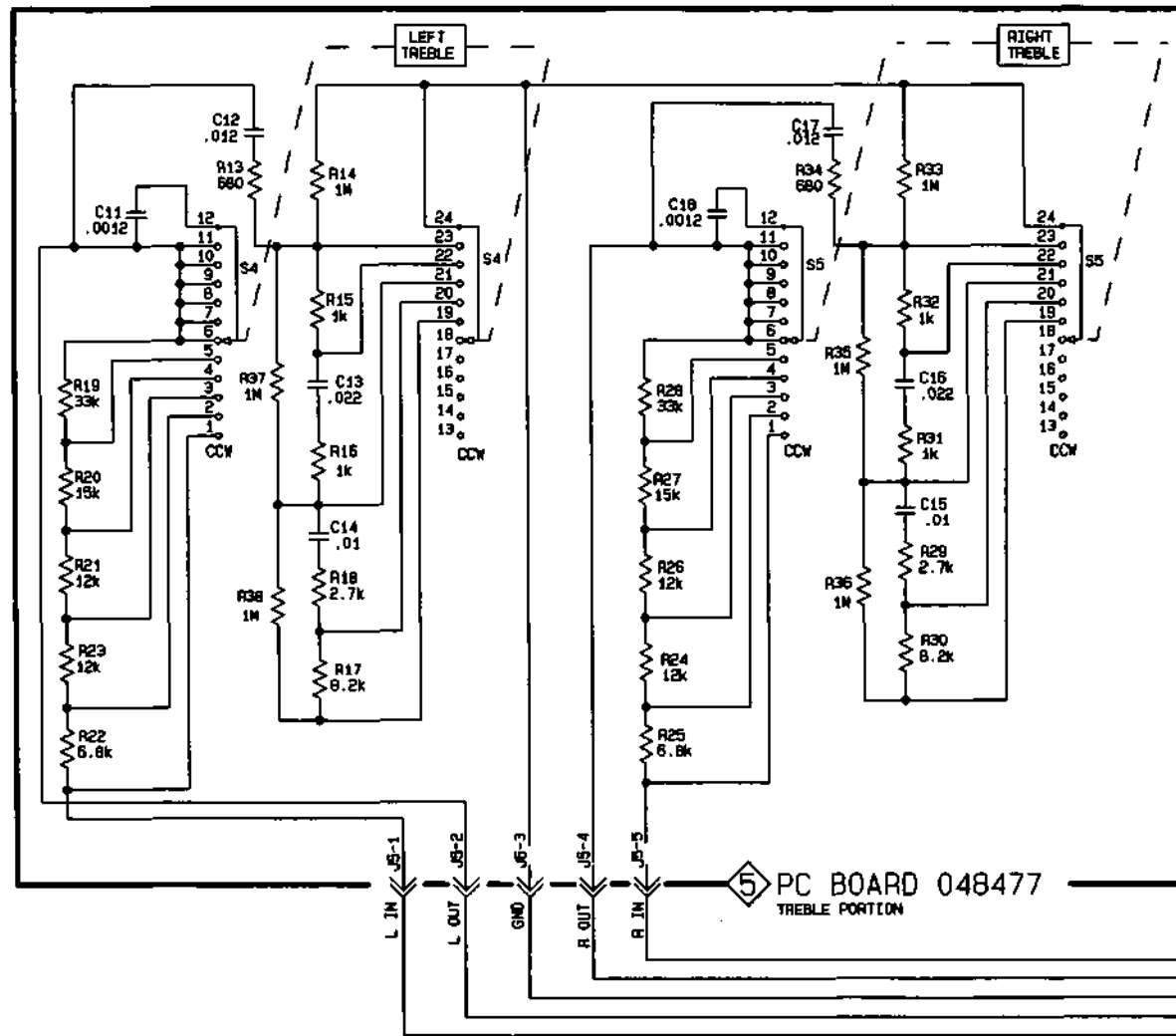
## BALANCE CONTROL PARTS LIST

| Symbol                              | Part   | Description     |
|-------------------------------------|--------|-----------------|
| <b>RESISTORS and POTENTIOMETERS</b> |        |                 |
| R1                                  | 134475 | Balance Control |

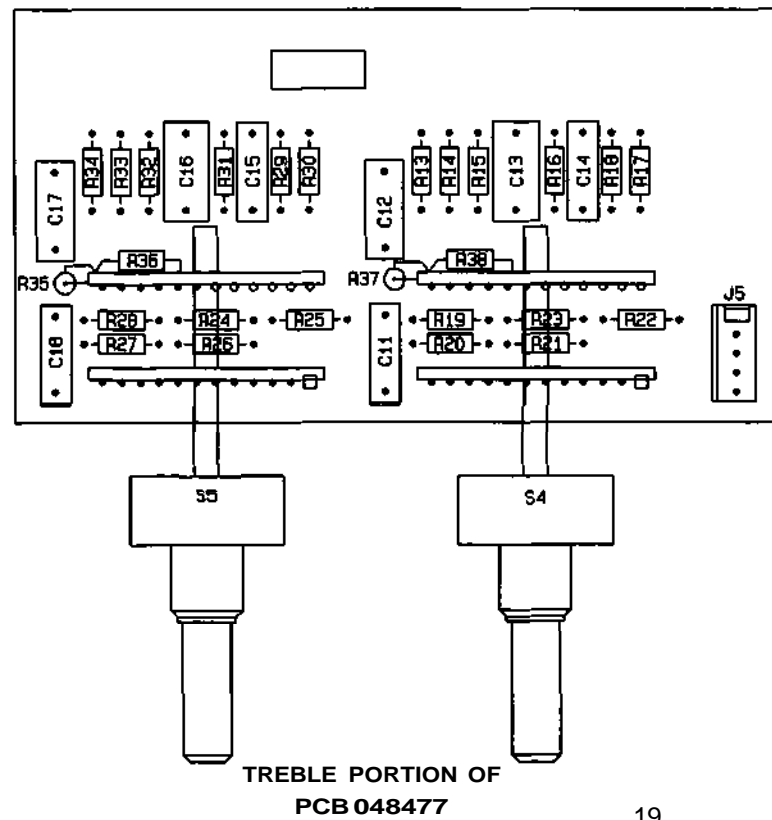
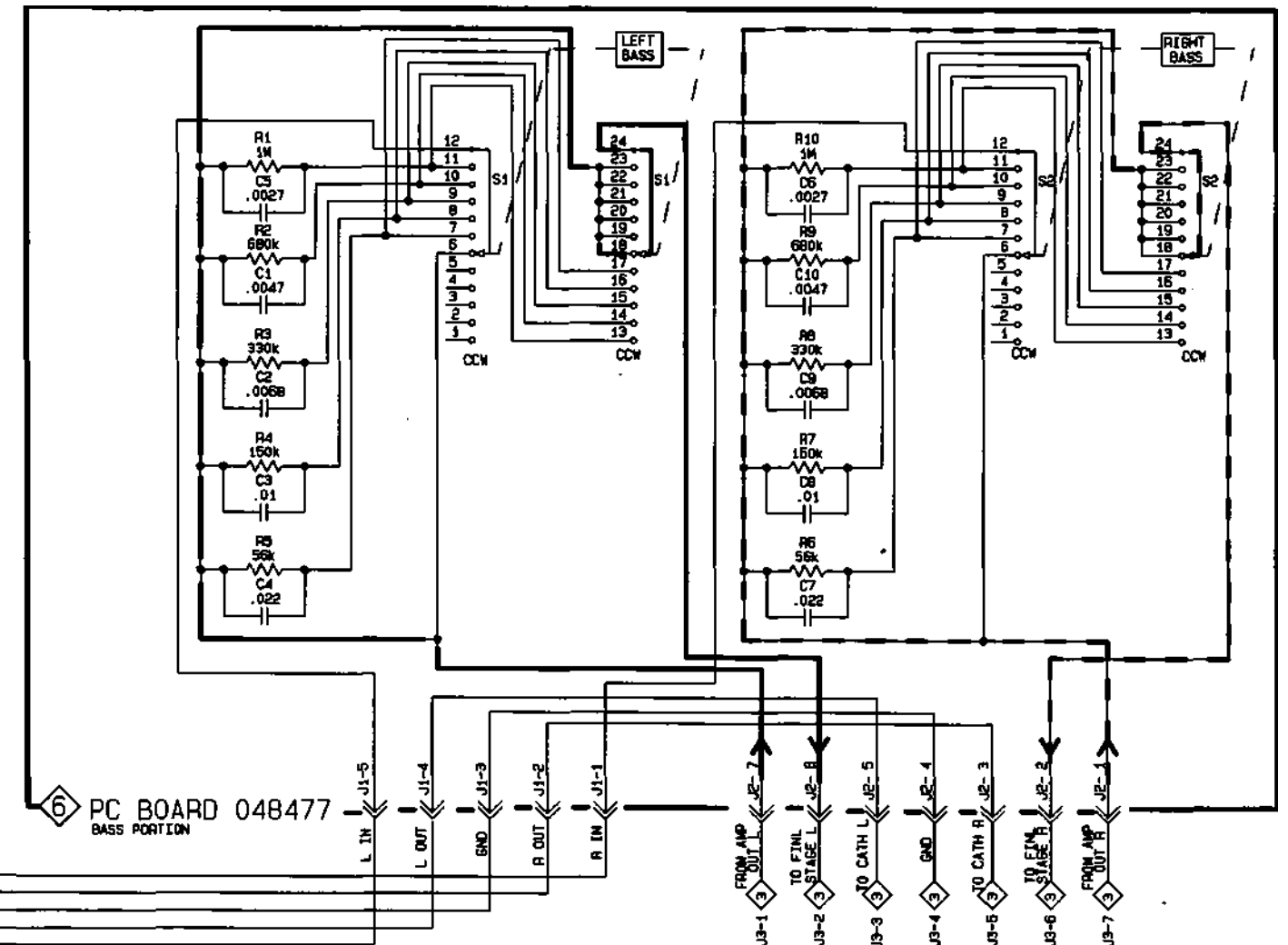
## CONTROL PARTS LIST

| Symbol                     | Part   | Description                   |
|----------------------------|--------|-------------------------------|
| <b>DIODES</b>              |        |                               |
| D1-D32                     | 070047 | SIG, 75V, 150mA, 1N4148       |
| <b>INTEGRATED CIRCUITS</b> |        |                               |
| IC1                        | 133189 | Dual Op-Amp. MC33178P         |
| IC2                        | 133108 | 5V Regulator MC7805CT         |
| <b>RELAYS</b>              |        |                               |
| K1-K3                      | 087050 | SPST, 5VDC, Reed, HE3321A0400 |
| <b>RESISTORS</b>           |        |                               |
| R1                         | 134476 | Volume Control                |
| <b>SWITCHES</b>            |        |                               |
| S1                         | 146238 | Input Switch                  |
| S2                         | 146239 | Mode Switch                   |
| <b>TRANSISTORS</b>         |        |                               |
| Q1, Q2                     | 132224 | PNP, MPS4126                  |

# 5 Treble

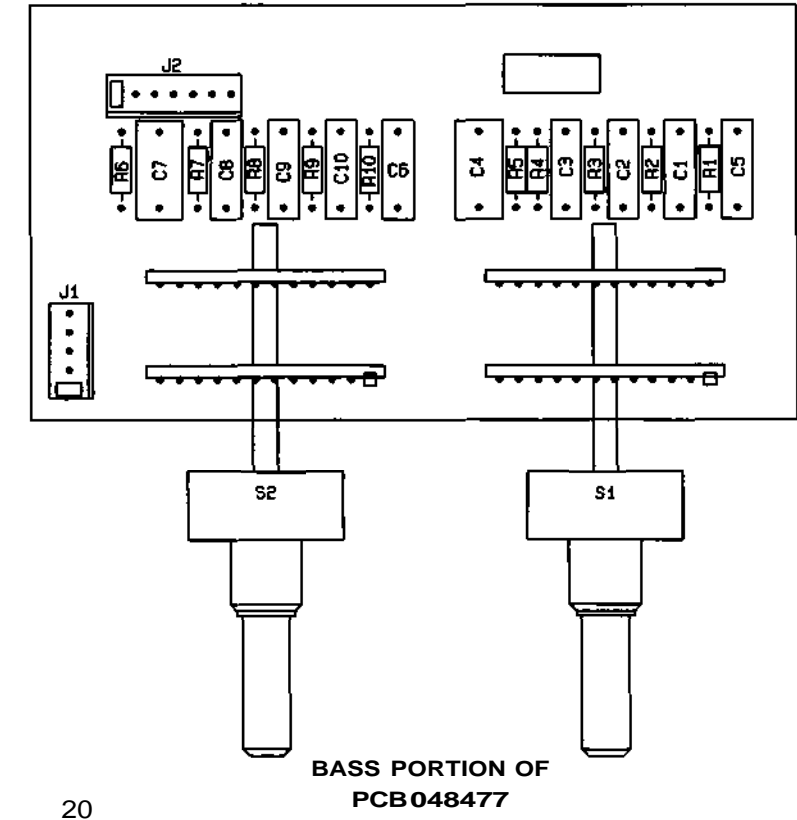


# 6 Bass



### TREBLE PARTS LIST

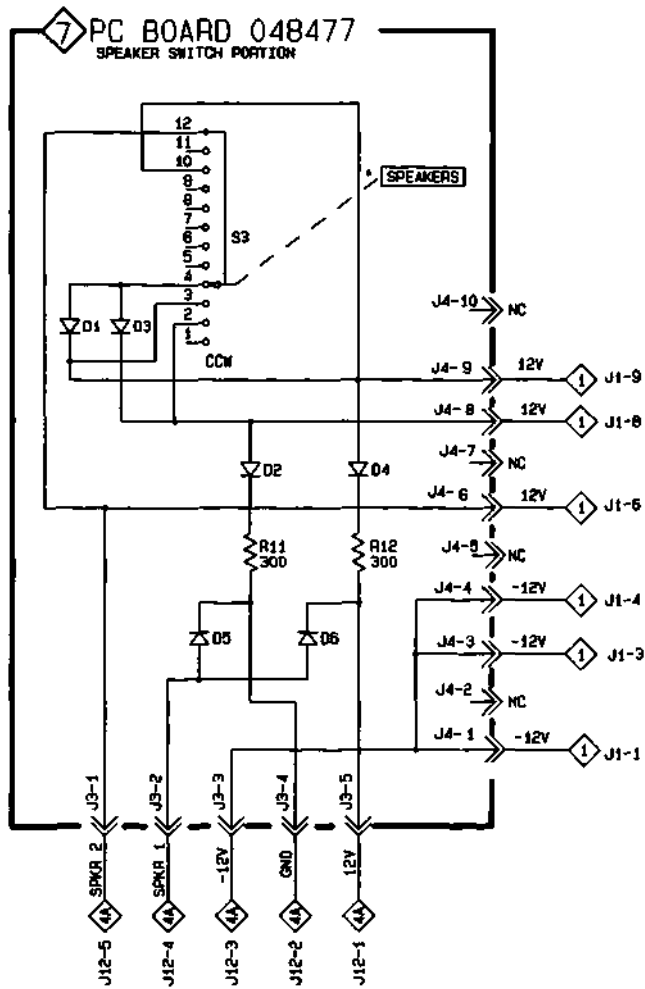
| Symbol            | Part   | Description        |
|-------------------|--------|--------------------|
| SWITCHES<br>S4,S5 | 146240 | Bass/Treble Switch |



### BASS PARTS LIST

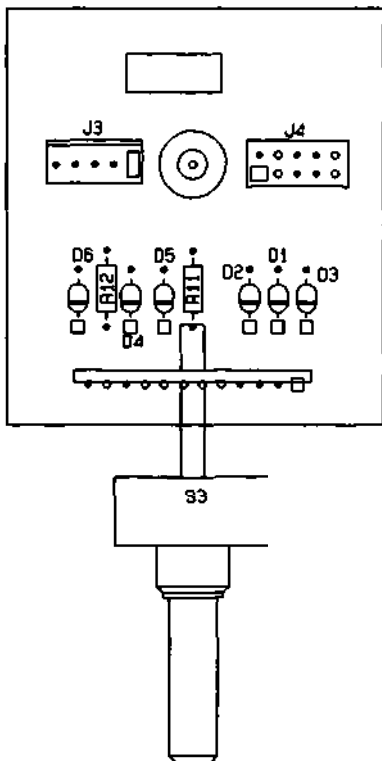
| Symbol            | Part   | Description        |
|-------------------|--------|--------------------|
| SWITCHES<br>S1,S2 | 146240 | Bass/Treble Switch |

# Speaker Switch 7



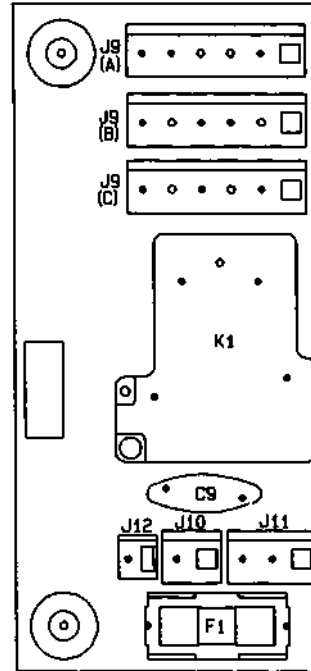
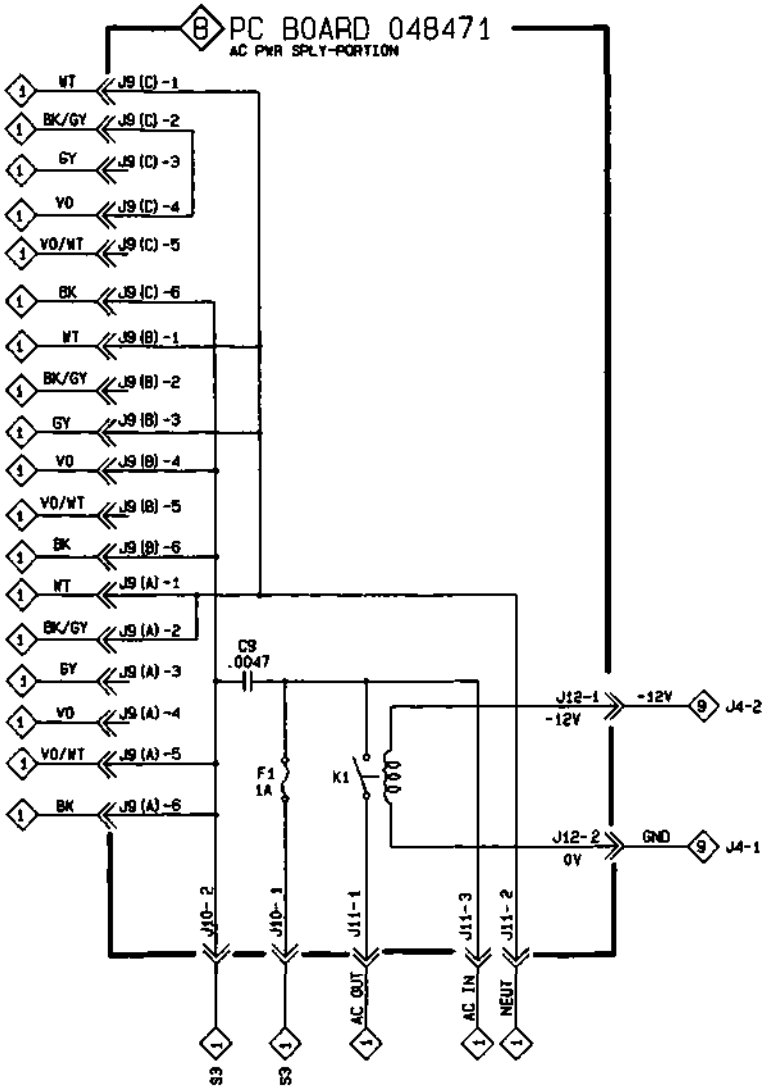
## SPEAKER SWITCH PARTS LIST

| Symbol                | Part   | Description      |
|-----------------------|--------|------------------|
| DIODES<br>D1-D6       | 070047 | SIG DIODE 1N4148 |
| <b>SWITCHES</b><br>S3 | 146241 | Speaker Switch   |



**SPEAKER SWITCH  
PORTION OF  
PCB 048477**

**WARNING:** Parts located in the below shaded area have critical characteristics. Use ONLY replacement parts recommended by the manufacturer.

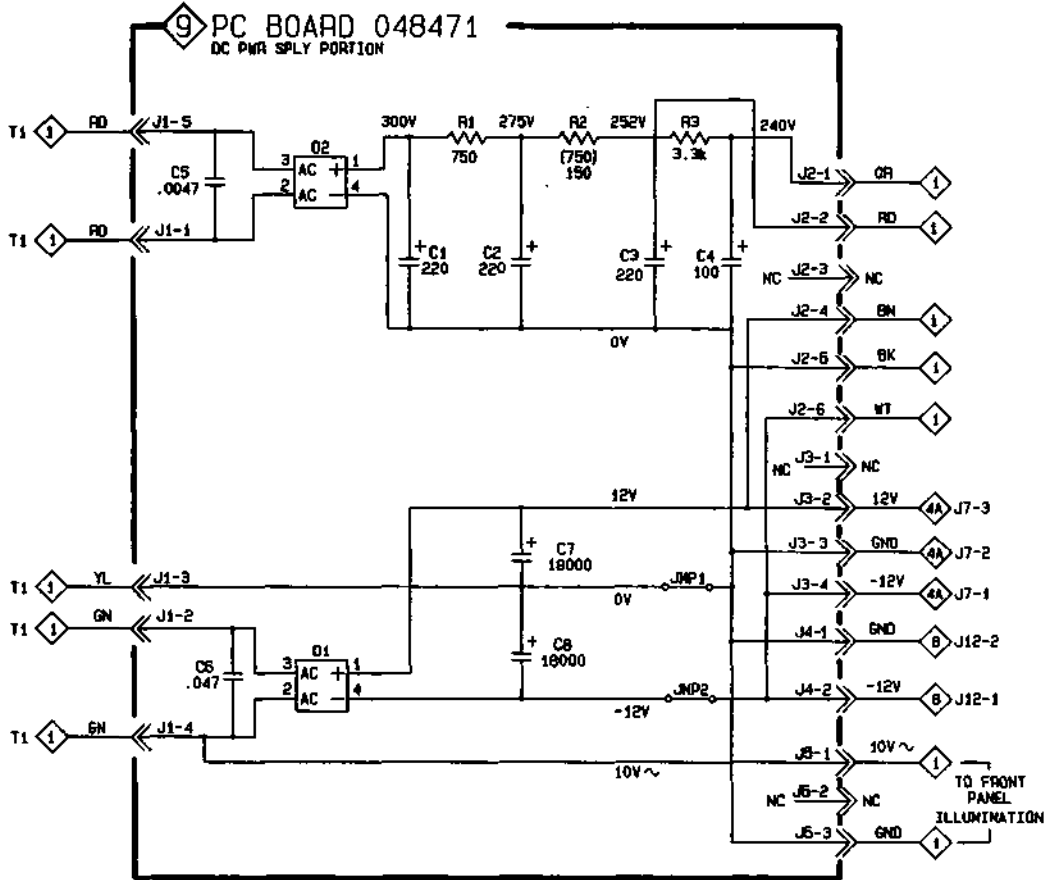


**AC POWER SUPPLY PORTION OF PCB 048471**

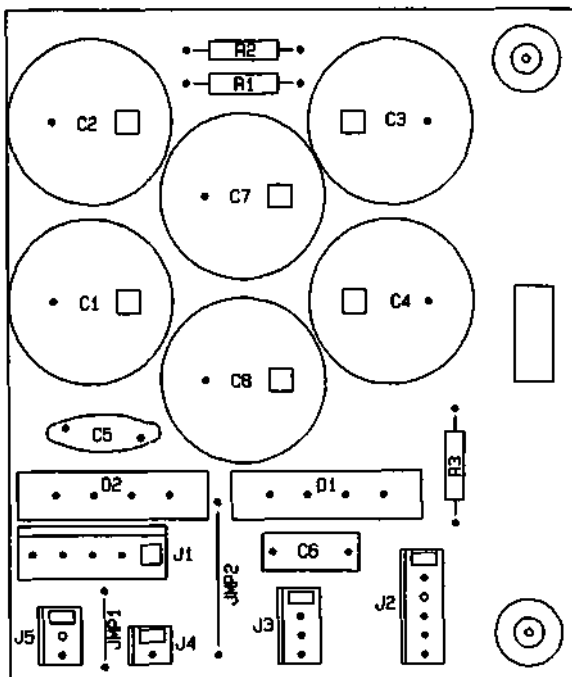
**AC POWER SUPPLY PARTSLIST**

| Symbol           | Part   | Description               |
|------------------|--------|---------------------------|
| <b>CAPACITOR</b> |        |                           |
| C9               | 061276 | Disc Cap, .0047uF, 400VAC |
| <b>FUSES</b>     |        |                           |
| F1               | 089081 | Fuse 1A, 2AG              |
| <b>RELAYS</b>    |        |                           |
| K1               | 087054 | SPST,12VDC                |

**!** WARNING: Parts located in the below shaded area have critical characteristics. Use ONLY replacement parts recommended by the manufacturer.



**NOTE:** Components and values toned in gray warrant your attention; parenthesized values apply to serial numbers LK1001-LK1989, non-parenthesized values apply to serial numbers LK1990 and above.



DC POWER SUPPLY  
PORTION OF PCB 048471

### DC POWER SUPPLY PARTS LIST

| Symbol        | Part   | Description      |
|---------------|--------|------------------|
| <b>DIODES</b> |        |                  |
| D1.D2         | 070044 | BRIDGE, 400V, 2A |

# Repacking Instructions

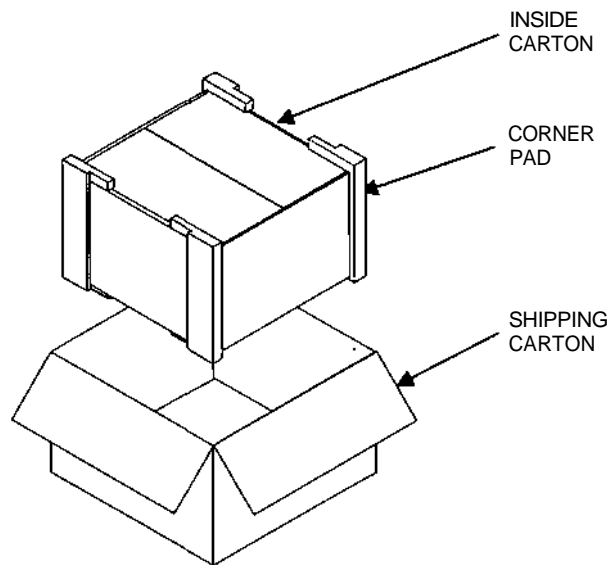
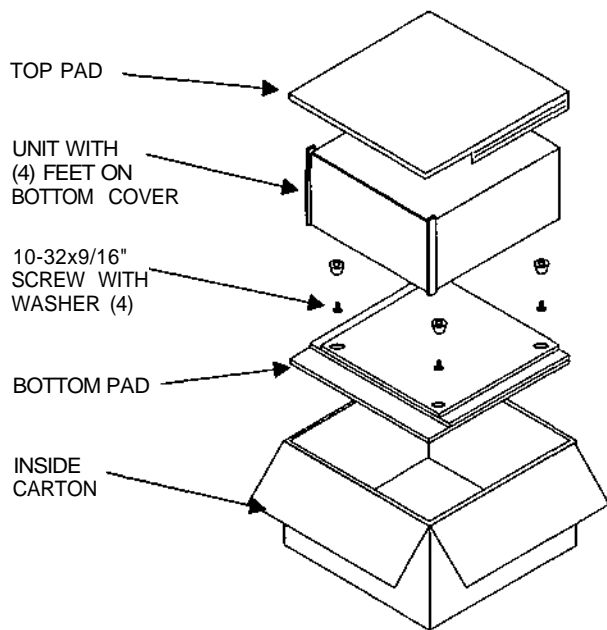
In the event it is necessary to repack the unit for shipment, the unit must be packed exactly as shown below.

*IMPORTANT - The four plastic feet must be attached to the bottom of the unit so they will locate in the four holes of the bottom pad. Failure to do this will result in shipping damage.*

If a shipping carton or any of the interior parts is needed, please call or write the Customer Service Department of McIntosh Laboratory. Order parts from the accompanying list by part number.

Use the original shipping carton and interior parts only if they are in good serviceable condition.

| Qty. | Part No. | Description                                       |
|------|----------|---|
| 1    | 033870   | Shipping carton only                              |
| 2    | 033884   | Corner pad  |
| 1    | 033883   | Inside carton only                                |
| 1    | 033885   | Top pad   |
| 1    | 033886   | Bottom pad  |
| 4    | 017156   | Plastic foot                                      |
| 4    | 100160   | #10-32 x 9/16" Screw                              |
| 4    | 104080   | #10 Flat washer                                   |
| 1    | 033915   | Shipping carton complete with all the above parts |



# McIntosh

C22 PREAMPLIFIER