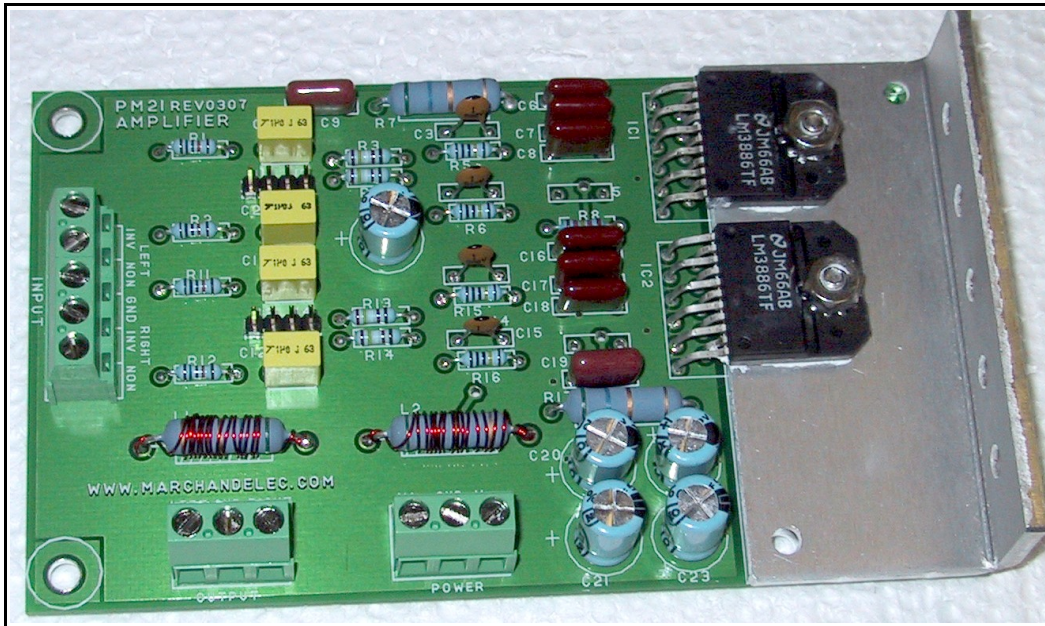




# Marchand Electronics Inc.

PO Box 18099, Rochester, NY 14618  
Tel:(585) 423 0462 Fax:(585) 423 9375

## PM21 Installation Instructions



### General

The PM21 is a dual power amplifier module capable of driving an 8 Ohm or 4 Ohm load. Each amplifier has a differential input, but can also be used with a single ended input. The PM21 needs an external dual DC power supply and must be bolted onto a heatsink.

### Input

The input is differential. There is a 5-position terminal block on the circuit board, labeled INV-L-NON-GND-INV-R-NON. These are the inverting input, the ground terminal and the non inverting inputs for the left and right channels. These should be hooked to the signal source. For single ended input, choose GND and either INV or NON INV. The unused terminal MUST be grounded to the GND terminal.

The inputs are AC or DC coupled. For DC coupling, install two shorting blocks on the 4-pin header near the input; these are J1 and J2 for the left channel and J3 and J4 for the right channel. The cutoff frequency for the AC coupled input is 6 Hz. For AC coupling remove the shorting blocks.

### Output

Connect the load to the two terminals labeled L-GND or R-GND on the 6-position terminal block. The PM21

is designed for loads of 4 Ohm or 8 Ohm. Maximum output power depends on the value of the load and the power supply voltage. With a 8 Ohm load and a power supply voltage of +/- 35 Volt, an output power of 60W RMS can be achieved.

### Power Supply

A dual power supply of nominally +/- 35 Volt should be connected to the terminals V- GND V+ of the 6-position terminal block. The minimum supply voltage is +/- 10V, and the maximum value is +/- 40 V. A higher value than 40V may damage the amplifier. The current capability of the power supply depends on the load and the voltage. For a 35 volt supply and an 8Ohm load, a rating of 2.5 Amp on each side is indicated.

### Heat sink

The PM21 should be bolted onto a heat sink of sufficient size to keep the amplifier cool. A thermal protection circuit in the LM3886T amplifier chip will turn it off when it gets too hot. The amplifier will automatically resume operation after it cools down to a safe temperature. With insufficient heat sink capacity and continuous operation the amplifier will cycle between hot and cold / on and off.

## Parts List

R1	100 K	1% Metal Film
R2	100 K	1% Metal Film
R3	24.9 K	1% Metal Film
R4	24.9 K	1% Metal Film
R5	1.00M	1% Metal Film
R6	1.00M	1% Metal Film
R7	5.6 Ohm	1 W
R8	12.4 K	1% Metal Film
R9	5.6 Ohm	1 W
R11	100 K	1% Metal Film
R12	100 K	1% Metal Film
R13	24.9 K	1% Metal Film
R14	24.9 K	1% Metal Film
R15	1.00M	1% Metal Film
R16	1.00M	1% Metal Film
R17	5.6 Ohm	1 W
R19	5.6 Ohm	1 W
C1	1 uF	Stacked Film
C2	1 uF	Stacked Film
C3	1 pF	Ceramic Disk
C4	1 pF	Ceramic Disk
C5	Not Used	
C6	.22 uF	Stacked Film
C7	.22 uF	Stacked Film
C8	.22 uF	Stacked Film
C9	.012 uF	Stacked Film
C11	1 uF	Stacked Film
C12	1 uF	Stacked Film
C13	1 pF	Ceramic Disk
C14	1 pF	Ceramic Disk
C15	Not Used	
C16	.22 uF	Stacked Film
C17	.22 uF	Stacked Film
C18	.22 uF	Stacked Film
C19	.012 uF	Stacked Film
C20	47 uF,50V	Radial Electrolytic
C21	47 uF,50V	Radial Electrolytic
C22	47 uF,50V	Radial Electrolytic
C23	47 uF,50V	Radial Electrolytic
C24	47 uF,50V	Radial Electrolytic
L1	1 uH	10 Turns on R9
L2	1 uH	10 Turns on R19
IC1	LM3886T	Power Amplifier
IC2	LM3886T	Power Amplifier
TB1		5 Position Terminal Block
TB2		6 Position Terminal Block
M1	2 ea	4 Position Jumper
M2	1 ea	Heat Sink Bracket
M3		Silicone compound
M4	1 ea	Circuit board
M5	2 ea	6-32 * 3/8" Screw
M6	2 ea	6-32 hex nut

### Each kit contains:

4	5.6 Ohm	1 W
1	12.4 K	1% Metal Film
4	24.9 K	1% Metal Film
4	100 K	1% Metal Film
4	1.00 M	1% Metal Film
4	1 pF	Ceramic Disk

2	.012 uF	Stacked Film
6	.22 uF	Stacked Film
4	1 uF	Stacked Film
5	47 uF,50V	Radial Electrolytic
2	LM3886TF	Power Amplifier
TB1		5 Position Terminal Block
TB2		6 Position Terminal Block
1'		magnet wire
2		4 Position Jumper
1		Heat Sink Bracket
1		Silicone compound
1		Circuit board PM21
2		6-32 * 1/2" Screw
2		6-32 hex locknut

## Assembly Instructions

Most parts are installed in the usual way. Insert the part at the location on the circuit board as indicated by the silk screen identification and solder on the solder side of the board.

**Resistors:** The 1% metal film resistors are identified with colored bands in the usual way. The 1% Metal film resistors have the following markings:

12.4 K	Brown-Red-Yellow-Red--Brown
24.9 K	Red-Yellow-White-Red--Brown
100 K	Brown-Black-Black-Orange--Brown
499 K	Yellow-White-White-Orange--Brown

The 1W power resistor:

5.6 Ohm Green-Blue-Gold--Gold

**Capacitors:** The Electrolytic capacitors are all radial type. Be sure to observe polarity markings when installing. The stacked film capacitors are brown and have marking 103 for .01 uF, 224 for .22 uF and 105 for the 1 uF part.

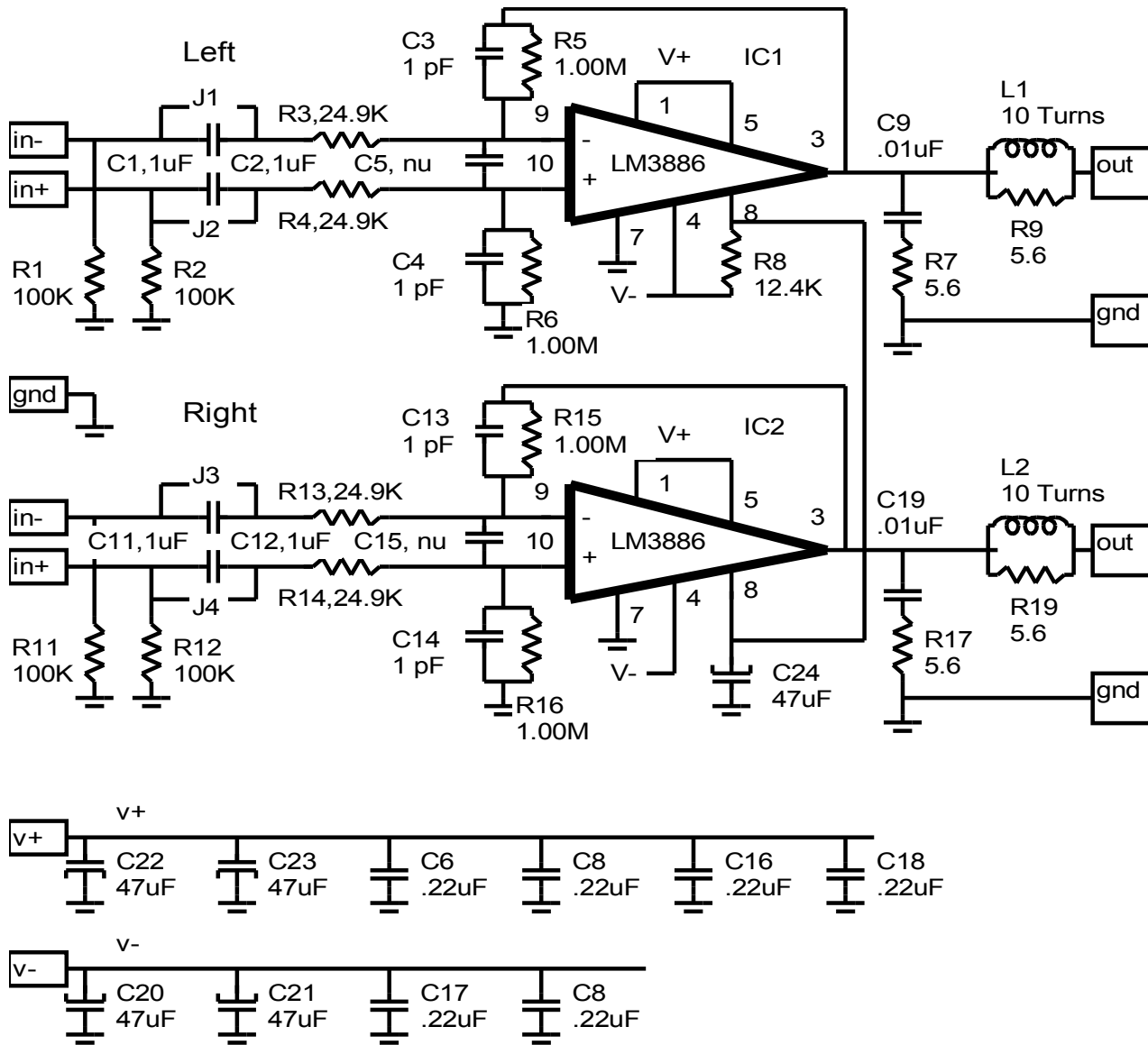
**Inductor:** Inductors L1 and L2 are made up with 11 turns of 24 gauge magnet wire on a 5.6 Ohm resistor. The inductor is fabricated as follows. Wind the wire tightly around the resistor body. Make 10 or 11 turns. Wrap the ends of the wire also around the resistor leads. Then insert the resistor leads, together with the magnet wire, into the mounting holes. Now solder the leads together with the magnet wire. Apply the soldering iron for a long enough time for the insulation of the magnet wire in the hole to dissolve. This takes about 60 seconds. L2 is the same.

**Integrated Circuits:** IC1 and IC2 are bolted onto the heat sink bracket with the two 6/32 X 3/8 screws. The best way is for the screw-head to be on the solder side of the board and the nut to be on the IC package side. The bracket is thus held in place between the IC package and the circuit board. Apply a small amount of heat sink compound between the LM3886 and the heat sink. Make sure the full bottom surface of the IC is covered with the heatsink compound. This improves the thermal contact between IC1, IC2 and the heatsink.

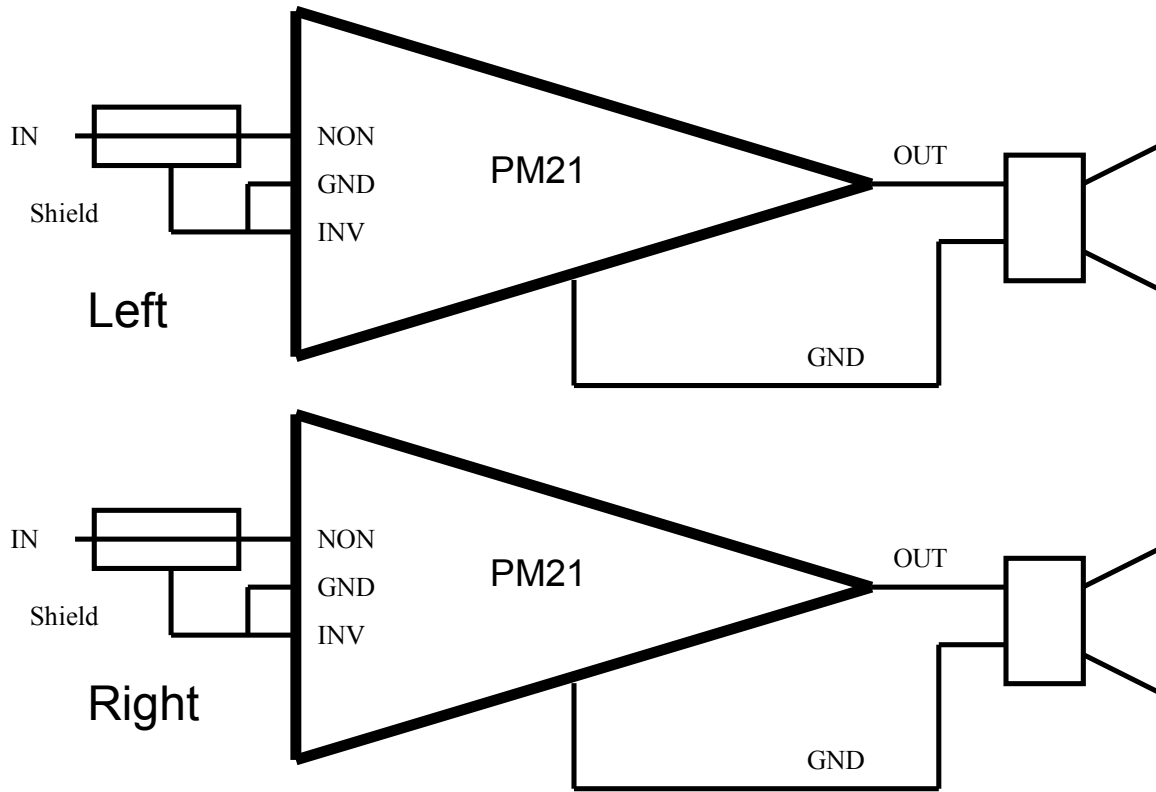
**Terminal Blocks:** Install the 5-pin and 6-pin terminal blocks at the edge of the circuit board.

Assembly is now complete. Take a few moments to check all components and orientations. Also make sure there are no solder bridges or bad solder joints.

# PM21 Circuit Diagram



### Stereo Hookup



### Bridged Hookup

