# Placid BP Power Supply

## User Manual

Revision 1.0

**For PCB Revision 2.1.1**

**Twisted Pear Audio**

## Overview

The Placid BP is a shunt regulated bipolar DC power supply designed for low noise and excellent line and load regulation. It is important your read the manual prior to trying to use this power supply. Make sure you understand how to adjust the output voltage and current before you do anything else. You could easily destroy something if you do not know what you are doing. So be careful, and read the schematic and this manual. This is not a difficult circuit to use, but it not trivial. You can learn a lot from the schematic. Take advantage of it. There is no shame in asking questions. Ask them before you do anything your might regret later.

## Default Configuration

The supply is designed to be fed by either a single dual secondary transformer or a pair of single secondary transformers. For the purposes of this manual we will assume you are aiming for +/-15VDC rails and ~200ma per rail load current. The kit includes parts suitable for this setup. If you need more current you will need to change some parts. This is covered later. We will also assume you have a transformer with dual 15VAC secondaries rated at 15VA or more.

The 200ma supply current configuration should fit projects like powering the analog rails of a Buffalo32S very well. It is very easy to configure the supply for other current demands by simply adjusting a few part values. As always you can ask us for help you you have a special need. If you need more or less current I will explain how to achieve it.

## First Steps

The simplest and most accurate way to setup the supply is by using the provided potentiometers. These potentiometers are actually used as variable resistors or rheostats. This manual assumes you are using them.

Populate the PCB as you normally would stuffing components from shorted to tallest. Mount the TO-220 transistors to the large heat sinks prior to soldering them.

**IMPORTANT!!! Prior to applying power or even wiring the transformers adjust the CCS pots so that the resistance across the CCS R positions (VR1 and VR2) is about 100Ω. Then adjust the VOUT pots(VR3 and VR4) to their maximum resistance which should be ~2K.** It is easy to check the resistance of the pots by placing your DMM probes on each the pads of the unpopulated R1/2 and R3/4. Do this with no power applied.

Once you have complete the above steps should leave the output of the supply unconnected to any load. Now connect it to the transformer secondaries. One secondary to AC1 and one to AC2. Power it up. You should see some nice glowing LEDs and no smoke. You need to adjust the output voltage next. Adjust the VOUT pots until the voltage at the output terminals is as desired. In the case of the analog supply of the Buffalo32S this is +/-15VDC.

Now adjust the CCS pots until the measured voltage across R17 and R18 are ~ 0.25V.

You are now ready to connect the supply to your load. Connect it and re-check the output voltage. There should be no sag. If there is you may need to increase the output current. The output current per rail is calculated as **V across RE divided by value of RE** where RE is either R17 for the positive rail or R18 for the negative rail.

## Advanced Tips

Advanced users who want to do something other than the default configuration should understand the schematic. If you don't then please don't bother. If you do understand the circuit well enough to be confident in changing things around a bit, well then here are some tips. The rest I will leave to your imagination.

If you need to supply > 500ma per rail then I would adjust the JFET CCS(Q2/R6 and Q6/R15) and/or VR1/VR2. You will also likely want to add capacitance after the rectifier.

You can also substitute fixed Rs for the pots. Just do the calculations before hand or measure the resistance across the pots after your happy can remove them and substitute .25W metal film fixed resistors.