Timothy Leishman Word Count: 00,000

Pocatello, Idaho, 83202

[leistimo@isu.edu](mailto:leistimo@isu.edu)

**Breadboard Power Supply**

**Timothy Leishman**

*Senior Instructor, Robotics Engineering Technology*

*Idaho State University*

Introduction

The electronic circuit design process involves defining the problem, determining a solution, circuit calculations & schematic development, ordering the needed circuit components, prototyping and circuit testing (often referred to as breadboarding), PCB or printed circuit board development, PCB assembly, and final testing. Typically, the breadboarding stage is done using a bench top or Laboratory DC Power Supply. Once the breadboarding phase is complete and the circuit is functionally operational, we may need to replace the laboratory DC power supply with a dedicated power source. A power source may be as simple as a 9V battery or may include purchasing a dedicated high-power rack mount Power Supply. Often times we can design our own power supplies using basic components rather than buying off the shelf units.

While the power supply may not be the most exciting aspect of your electronic projects it is a crucial and foundational component. Poor power supply design can lead to circuit, intermittent circuit problems, premature circuit failures, and frustration. Understanding how power supplies function will make you a better electronic troubleshooter. The Breadboard Power Supply will give you the ability to safely build and test circuits when you do not have access to a proper benchtop power supply. This small project will also expose you to the skills and tools needed for developing a finished PCB. Even if you have a dedicated Laboratory DC Power Supply in your home maker space, you can apply what you learn and build dedicated power supplies for your current and future electronic projects.

The Problem

During Covid students were required to do online at home learning. This is problematic for most electronics students due to the fact that they lost access to Laboratory Bench Test Equipment and the direct supervision of a Lab Instructor. You can now purchase relatively low-cost oscilloscopes, function generators, and laboratory DC power supplies for your home maker space and I encourage advanced students to acquire these tools as they can. However, the beginning student will not likely have access to these tools at home and for them the Breadboard PS along with a DMM will provide a basic and safe at home circuit prototyping power supply.

The problem defined:

* Access - students do not have access to home power supplies.
* Safety - due to the lack of direct instructor supervision, an at home power supply will need to be as safe as possible.
* Cost - cost is always a factor.

The Solution is the DC to DC Breadboard power supply.

Intro to Power Supplies

