

NORTH FLORIDA AMATEUR RADIO CLUB
LAB N LUNCH POWER DISTRIBUTION PROJECT
SATURDAY JULY 20 2019

GOAL

Provide a simple 12-volt fused power distribution system for stations that need to power multiple items from a nominal 12-volt power source, and provide physical mounting for fuses.

SOLUTION

Use any of a number of readily available marine fuse panel products. One that can be used is <https://www.amazon.com/gp/product/B07CLWBSNJ> . That product has a bus-bar area with screw for negative wire attachments and two separate busses (left and right) each of which has positions for three fuses. This allows an incoming positive line to be fused at one position, and fed to as many as five outputs, each of which will be individually fused. This particular choice has LED indicators which will light up if the fuse on a circuit has blown.

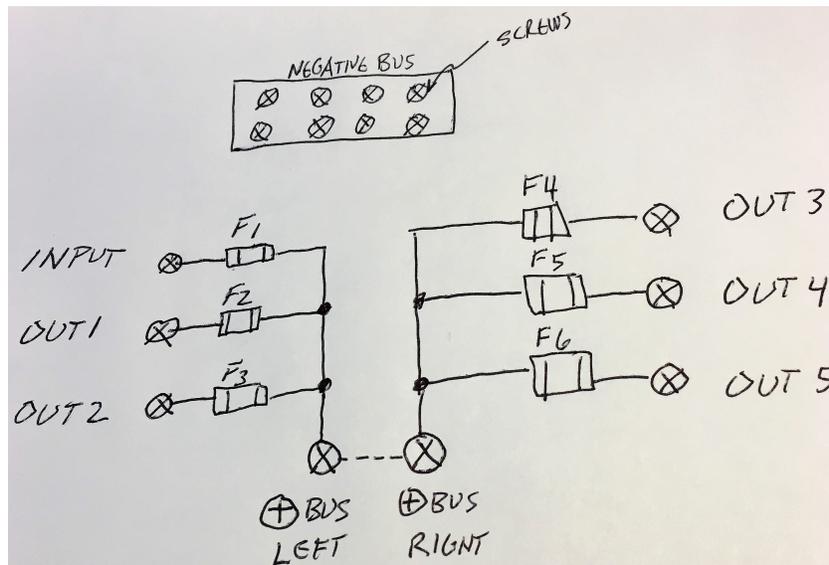
You can use this in several ways.

For most people, using a power supply rather close to this distribution box, you can use fuses only in the POSITIVE leads, and you have a choice whether you want one “main fuse” or not. **If you want a “main fuse”** then you’ll use one of the fuse positions as ‘INPUT’ and wire your system like the schematic in Figure 1.

If you don’t desire a “main fuse” then you can simply wire your positive input to either or both of the large bolts at the bottom, and use up to six individual fused circuits.

If you are in a mobile situation and wish to fuse both the positive AND negative lines (some people say the negative should be fused as well) then there is an advantage to using inline fuses very near your connection to the battery. That means that if your wires themselves overheat and short, the fuse near the battery will blow and protect against additional current on your heavy duty feed wires. If you can mount this distribution system reasonably close to the battery , then you can use one 3-fuse side for the positive lines, and the other three fuse side for the negative lines and then you’ll have everything fused. There are multiple variations of precisely how you can do this.

For outputs, you can connect to your devices with ring or spade terminals to wires, or you can provide intermediate POWERPOLE connectors to make it easy to connect or disconnect devices. Choice is yours.



POLARITY PROTECTION

The basis of this polarity protection is a FUSE which has to be on the SUPPLY side of a backwards diode connected from the positive line, to the negative ground. If the power supply voltage is backwards, the diode will conduct heavily, preventing more than a volt to reach the radio that otherwise would be damaged, and the FUSE will blow if the diode is able to conduct heavily enough. For this reason, we tend to use heavy duty diodes. Note that the BAR end of the diode (cathode) must be connected to the POSITIVE wire.

