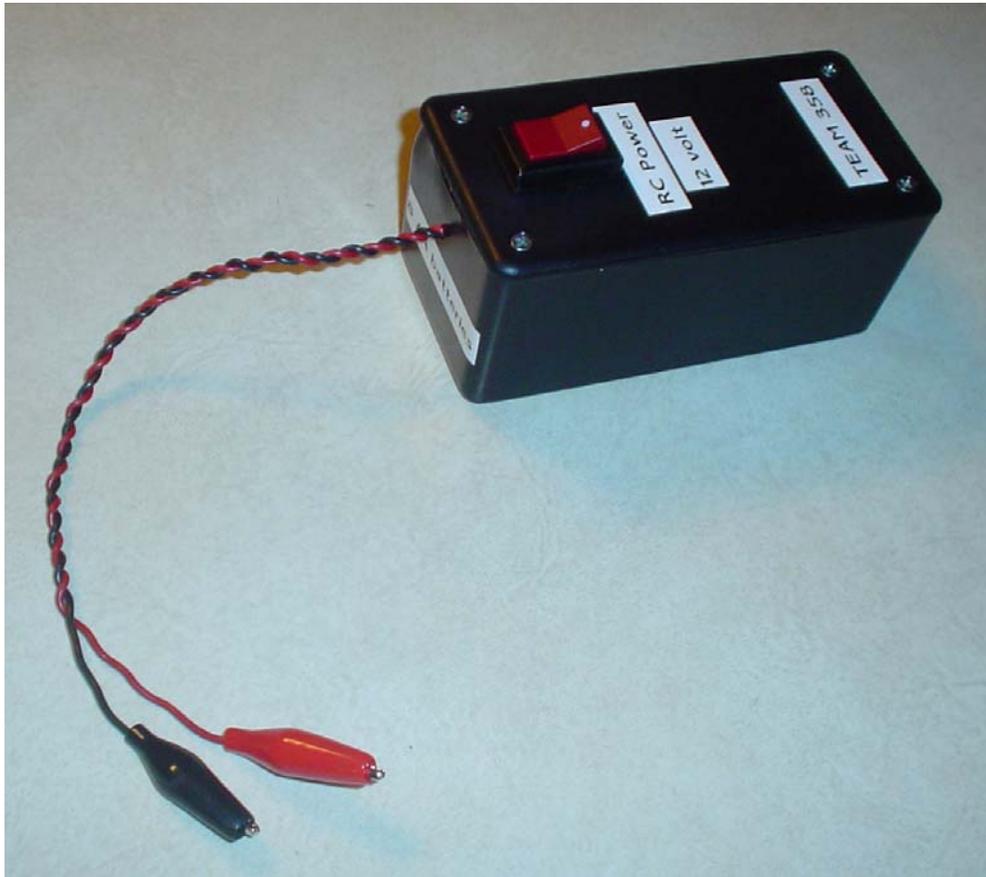


Robot Controller (RC) Portable Power Supply Team 358



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A portable power supply for the Robot Controller gives you the freedom to practice programming and test controls without requiring the full robot. It's especially useful for testing that new Robot Controller that just arrived in the Kit Of Parts to make sure it's fully operational.

When the new RC is first received with the KOP it's often not so convenient to lug around a full-sized 12v battery and it's accompanying support circuitry just to test programs and algorithms. A miniature power supply, perfectly adequate for driving the RC for testing purposes is as simple as a 9v battery. Just holding the battery to the RC 12v terminals will work, but is hard to balance in position. The easiest solution is to attach two spade connectors that match the RC spade bits, to a 9v snap connector (\$2.59 at Radio Shack) and use it to connect a 9v battery to the RC. The 9v battery will supply power for quite a while and is easily swapped out for another fresh battery as required. A project box, a switch, and several 9v snap connectors will build a longer lasting, more rugged version. A switch makes it much easier to turn on and off rather than pulling spade connectors every time. We give a description below of a AA battery based power supply to give the full 12v that gives you the extra power required to reliably test some sensors attached to the RC.

If you want to get fancy you can use the OI portable power supply approach by simply substituting spade connectors for the Inline Plug DC Power Connector. You can even design a box with both types of connections available.

The power requirements supplied by the FIRST power adaptor to the RC are:

- ❖ 8-12 volts DC
- ❖ Power draw depends on what's connected to the RC
- ❖ Older RCs had 12v screw terminals, newer ones use spade connectors

This is the power supply Team 358 built for roughly \$20 including batteries. The number of batteries used is entirely optional. We choose to use AA batteries because Radio shack stocked a battery holder that gave us 12v, the AA size is used by most of the devices we have including CD players, and it lasts a long time. The AA holder has a 9v style connector on the end, so we use a 9v terminal to make the holder easily removable. Replacing batteries will be a breeze. A "D" cell setup would last longer if you require more operating hours.

We chose alligator clips to attach to the RC in this case, because we use several years worth of IFI controllers that came with several different styles of connectors (screw terminals or spade bits), and they may change again in the future. If you only have one type then opt for the style connector you need. Many of the parts listed below are also optional. For instance Radio Shack sells inexpensive battery cases with built in on/off switches that can be used, although they may typically hold only 4 batteries, two holders could be joined together cheaply to do the job.

All parts mentioned here are freely available from Radio Shack or other retail electronics stores.

Parts:

1. (8) AA batteries  \$6.79

2. (1) AA battery holder for 8  \$1.89

3. (1) toggle switch  \$2.59

4. (2) covered alligator clips (or spade connectors if you so chose)  \$2.39

5. (1) Heavy-Duty 9V (yes 9v) Snap Connector  \$2.59

6. (1) Project box sized to fit the # of batteries you choose  \$3.69
7. ~12" of 18 awg wire
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Assembly:

1. Drill/cut hole in the project box for the power cable running to the RC.
2. Drill/cut hole in the project box lid for the on/off switch.
3. Mount the on/off switch in the lid.
4. Connect the on/off switch in series with the 9v terminal (for the AA battery holder) connector leads and the RC connector line that will exit the project box. Remember to add heat shrink before attaching the wires if that's what you are using to insulate the connections.
5. Insulate the wire connections with wire nuts, heat shrink, or electrical tape.
6. Feed the RC connector leads power wires out through the hole drilled in the project box. Knot or use some type of strain release where the RC connector leads exit the project box. We like to twist our wires to keep pairs together.
7. Wire in the alligator clips or spade connectors to the RC power leads outside the box.
8. Load AA batteries into the holder and connect it to the 9v terminal
9. Verify correct voltage and polarity with a multi-meter before connecting it to your RC.
10. Drop the battery holder into the project box and screw the lid down. Test again.

