

Lightweight, *Portable,* AUX POWER PLUG ADAPTOR

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Figure 1: All the parts needed.

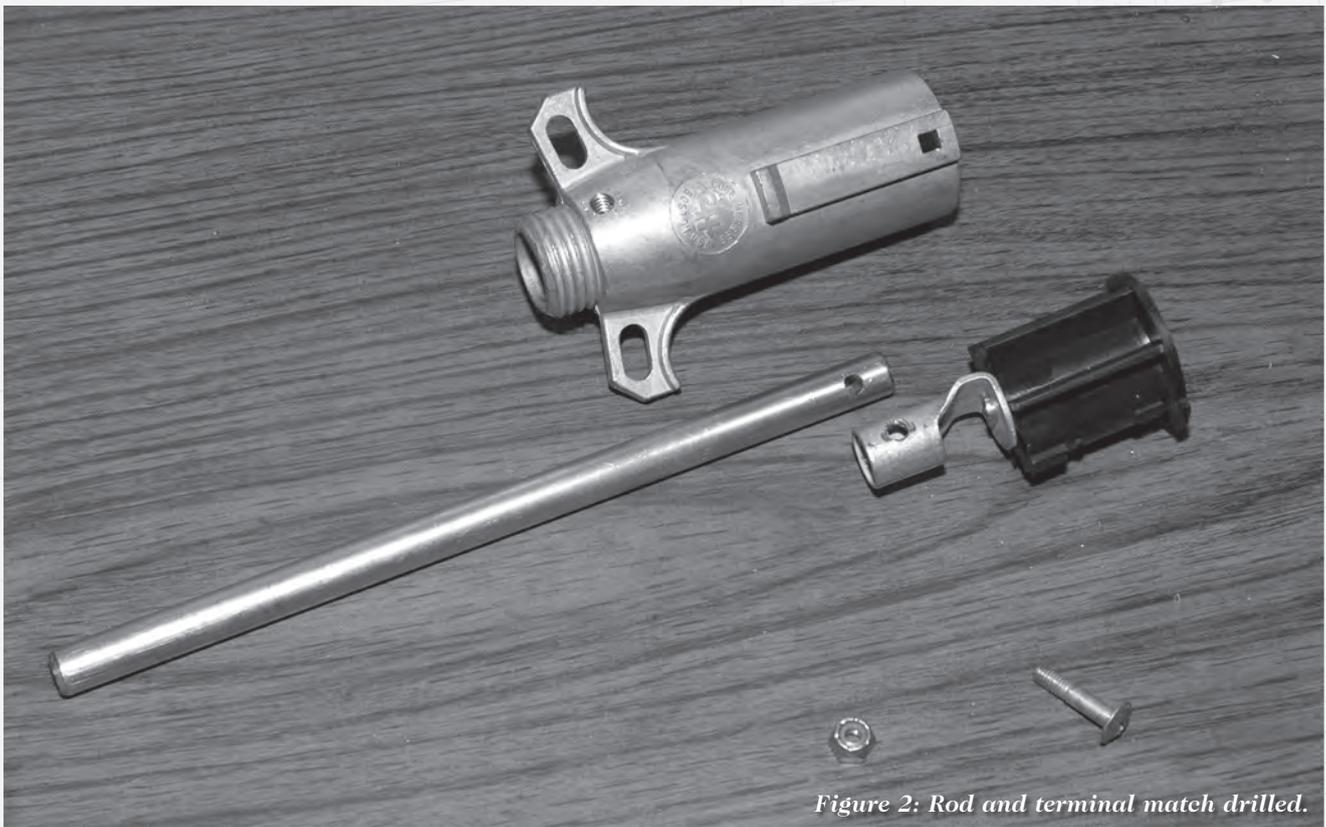


Figure 2: Rod and terminal match drilled.

Recently I was thinking of a way to provide auxiliary power to my Twin Comanche while performing certain electrical tasks. Cycling the landing gear during annuals or having a pitot and static check performed by a free-lance avionics technician can be a drain on the battery to such an extent that it will require removing the nose bonnet, taking out the battery and hooking it to a charger unit. Using the battery charger to serve in the capacity of my “auxiliary power unit” to augment the aircraft’s battery seemed like the logical solution. However to do so, I would need to have a Piper Style Aux Power Plug. Fortunately, Aircraft Spruce sells the 11042 Power Plug for under \$20. After I purchased one of these plugs, I realized that I could make a universal type adaptor that would easily work, not only for powering the plane in the hangar, but also I found it would do double duty as a lightweight and less bulky alternative to the Piper jumper cables. In essence, I could fashion a plug with a length of brass rod extending out the back, surrounded by some insulator

material, which I could clamp onto with the battery charger or with any pair of auto jumper cables. This would mean that I could use this new adaptor to power the plane in the hangar without having to remove the nose bonnet. Furthermore, I would no longer have to carry my Piper jumper cables in the plane, especially on trips where weight is a consideration. I figured that at almost any airport where I would need the lineman to give me a jump, he would have a pair of auto jumper cables. As an added incentive, this adaptor plug and the associated hardware cost less than \$30 including the shipping and handling.

To make this adaptor, you will need one each of the following items:

1. A 11042 Piper Aux Power Plug. If you get one from Aircraft Spruce, the part number is the catalog number is 11-03159.
2. An 8-inch length of $\frac{7}{16}$ -inch solid brass dowel. I chose this diameter because it fit nicely into the opening in the positive terminal of the plug. The next size OD was too large. This dowel is available

at hardware stores or any metal supply store.

3. A 6.5-inch length of $\frac{1}{2}$ -inch ID red PEX flexible plastic pipe (the kind plumbers now use for hot water lines). You can buy white colored PEX pipe at Lowe’s or Home Depot in four-foot lengths, but the red comes in only 50 or 100 foot rolls. Ask any plumber to cut you off a short piece of the red pipe or get a scrap piece at a plumbing supply place. I chose red pipe because it would help remind anyone that the red or positive cable would connect to the brass rod protruding through it. And I chose the $\frac{1}{2}$ -inch ID variety because the OD of the pipe fit the plug very well and the ID was close enough to the brass rod, especially when the pipe was screw-clamped into in the rear end of the plug.
4. A one-inch long #10 screw and locknut. If the screw is much longer than this, it runs the risk of hitting the inside of the metal plug casing shorting it out in the process.

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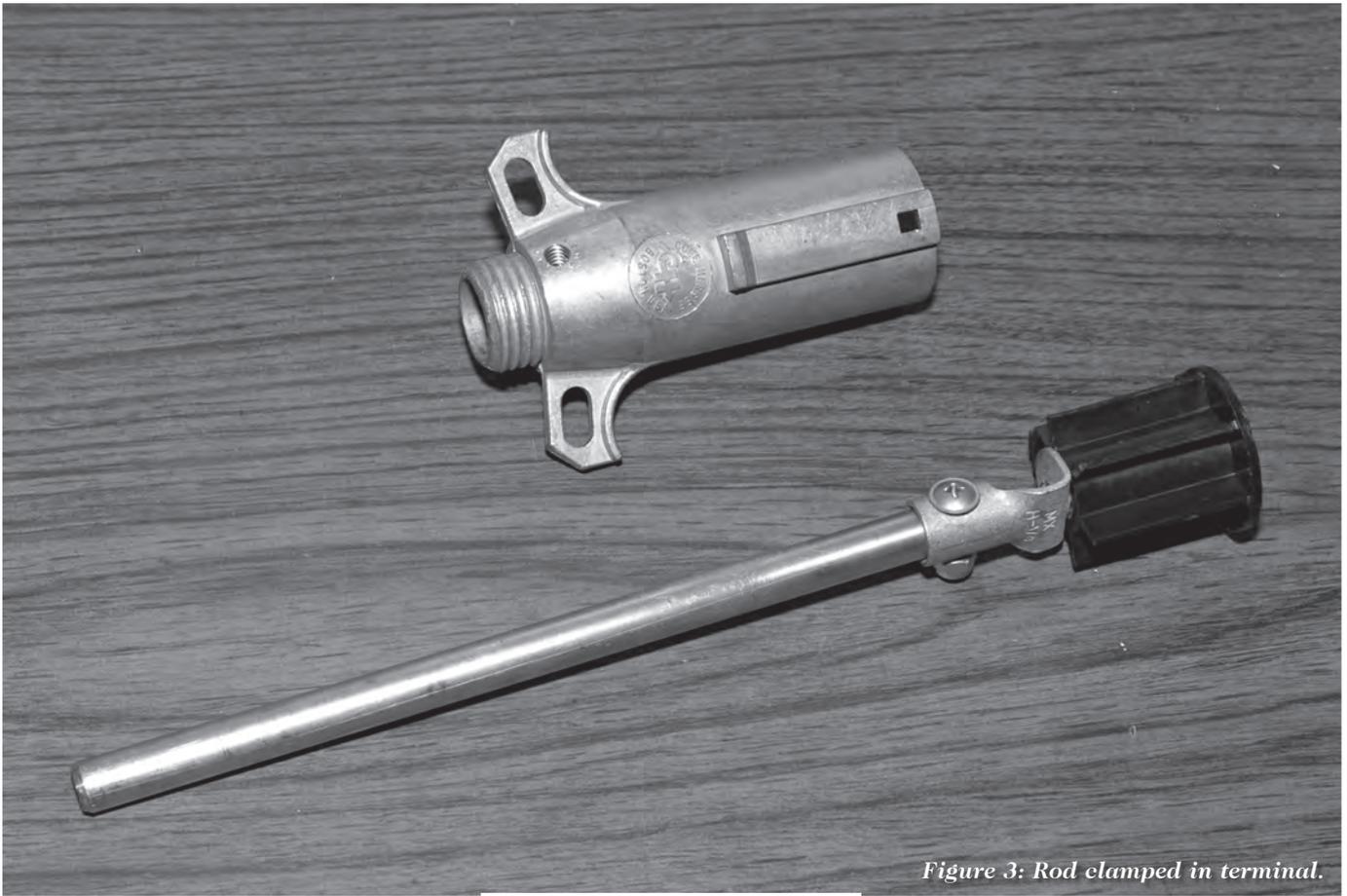


Figure 3: Rod clamped in terminal.

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If you obtain the brass rod first, you can take it with you when you get the PEX pipe so you will get the right size ID. The metal rod really does not have to be a brass dowel. It could be any good metal conductor, but brass is just easier to work with.

When you take the plug apart, you will see that there is a terminal for the power or positive cable to connect to. It is riveted to a Bakelite plastic insert that will melt if you try to solder the rod or anything else into the terminal.

I used a brass rod for the positive terminal, but crimping really would not work with a solid dowel. As you can see in the Figure 1, the other terminal is bolted on the outside of the plug. This terminal is where you would normally crimp the ground or negative cable into and is not necessary in my configuration. Therefore, I removed it. (Remember in the Piper style plug the metal exterior of the plug itself is the conductor for the ground wire where it inserts into the receptacle on the

plane.) Since I was not going to be using any cable, but a solid brass rod instead, I match drilled the positive terminal and the rod while holding them in a drill press vise (Figure 2). Using a 3/16-inch drill bit, I drilled the holes 90 degrees to the split in the terminal to make maximum use of the clamping effect. I then used a #10 screw put through this hole to tightly clamp the rod into the terminal (Figure 3). Next, I slid the piece of PEX pipe over the brass rod and reassembled the plug. The pipe fits very well over the rod and acts as insulation. There is a screw clamp built into the plug case that will squeeze the plastic pipe and hold it in place. I leave about 1.5 inches of brass rod showing for the red or positive battery jumper cable to clamp on when I am actually using the adaptor. Likewise, I then use the threaded outside part of the plug itself to clamp on the black negative or ground cable (Figure 4). Of course you can also clamp the ground cable to any bare metal part on the airplane such as the landing gear, etc.

There are some things you should remember. All of the Piper style aux receptacles have a spring-loaded door

with a tooth on it that engages a similar tooth on the top of the power plug to hold the plug in place while it is being used. If you are at an airport away from home and the lineman is going to be removing this plug once you get the engine started, you should brief him ahead of time about hooking up the cables correctly, etc. And in so doing, you should emphasize that **he must pull up on the door of the receptacle while pulling outward on the plug in order to release the power plug.** If he tries just to pull the power plug straight out, he will tear off or damage the door. Failure to pull up on the door is why you see so many Comanches with damaged aux power receptacle doors or ones that have been replaced.

I have already used my adaptor plug hooked up to the jumper cables in my truck to help a friend start his Seneca when his battery ran down. And I used it last week when I was working on my landing gear. It looks like this new gadget works as intended and will find a place in my travel tool kit.



Figure 4: Adapter assembled and in action.

