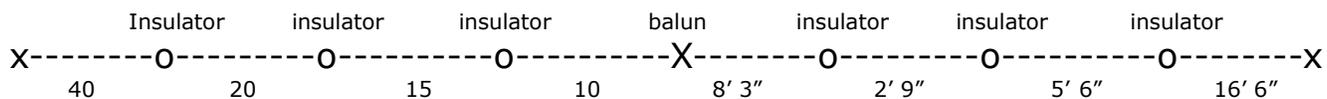


*Add some Air to your Aerial – by Bob Rosier, k4oce*

With the bands being rather poor these days, I decided it was a good time to do maintenance on my multi-band trap dipole. Some of the wire were frayed, and several of the home-made traps were in poor condition. It is designed for 12 , 30, 80, and 160 Meter.

I wasn't looking forward to winding new traps. I remembered as a kid I built a dipole by just inserting insulators along a wire. I had a pulley at one end so I could easily lower, and would place short clips across the insulators to change bands. It worked well, but it was somewhat of a pain to change bands.

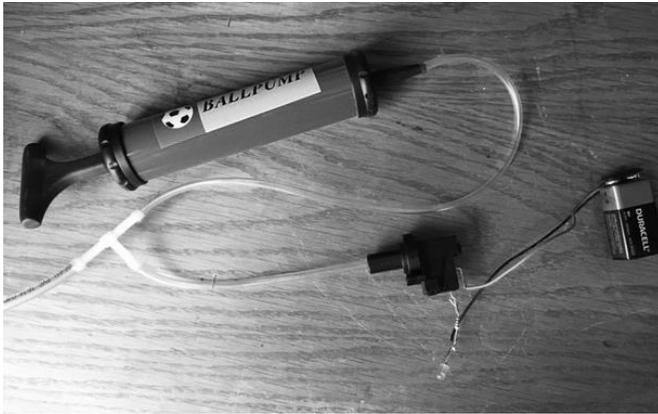
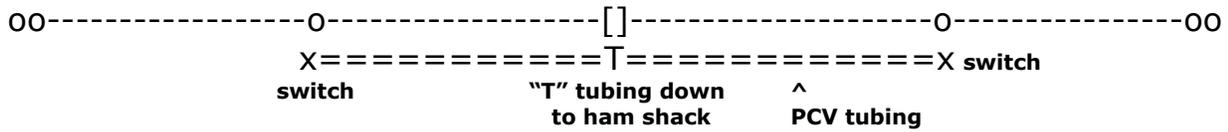


I recalled seeing a clever device that was designed to operate a Sink Disposal. It can also be used with Jacuzzi or Hot Tubs for safety reasons. If you wanted to add a Disposal to your sink, how would you turn it on or off? With just one hole drilled in the counter top, the plunger unit can be mounted. Then a push of this plunger would send air through a plastic tube and operate a latching switch. A second surge of air would open the switch back up. Sounds like this could be used on a dipole like the one mentioned above providing the electrical isolation required.

Priced at just \$4, I decided to give it a try. As a prototype, I decided on a two-band antenna for 12 and 30 meters. I found that the plunger provided with the kit worked up to about 20' of tubing, but as I expected, it didn't work through the 100'. I cut two pieces of tubing to 10' to reach the insulators on each side of the balun. I have a pulley on top of my tower to pull up the dipole. The remaining 80' of PVC tubing was plenty long enough to reach the ham shack from the top of the tower. The idea is to use these switches to short or open the insulators located on each side of the feed line. The 100' of PVC tubing only weighs about 1 pound, lighter than a couple of traps. And, you don't have to worry about the "Q" or the resonant frequency.

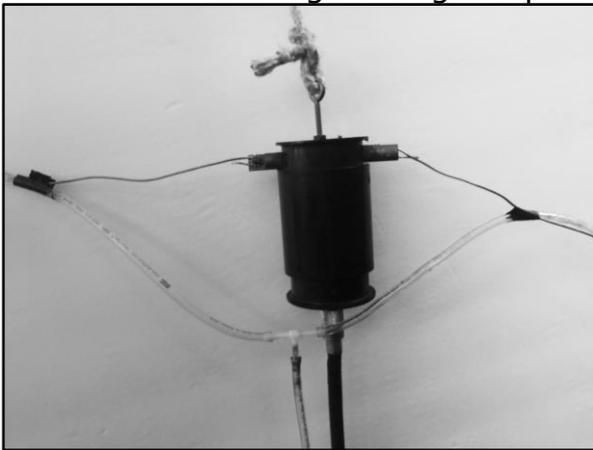
Here is the diagram of the prototype.



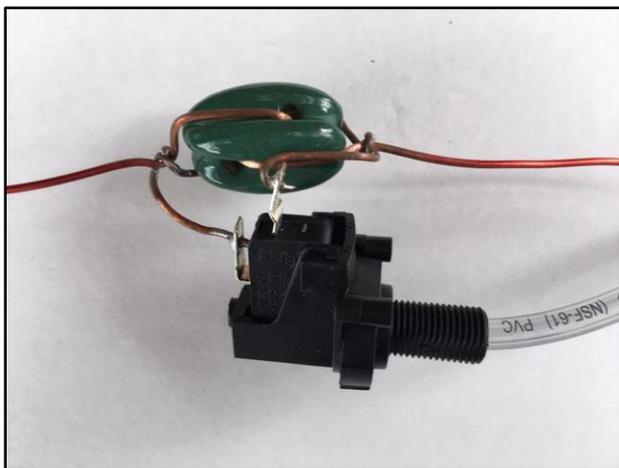


To indicate which position the switch was in, I added a third air switch in the ham shack (seen in the picture). I attached a battery plus an LED which will illuminate when this switch (and the two remote switches) were closed. Being closed meant the entire antenna was active which would be the 30 meter position. I thought I would always "push" off the LED when not in use, not only saving the battery, but I would also know that the

antenna was left in the 12 meter position (the shorter section). The small hand pump in the picture proved to be reliable and it operated all three switches every time. The tubing leaving the picture on the left goes to the antenna.



In this view you can see the "T" where the PVC tubes go out to the insulators on either side of the balun. Electrical tape doesn't stick well to the PVC, so I recommend using 4" black cable ties. Be sure they are "UV Protected", and don't pull too tight. You don't want to squeeze the UV tubing.



And here is one of the junctions where the switch is connected to the insulator. The switch unit itself was fairly well sealed, so I decided just to add some liquid tape to the two wire connections. I used black tie wraps along the antenna wire to fasten the PVC tubing. Even at 5 watts, the voltage at the ends of a half-wave dipole can be high, over 100 volts rms. The switches are rated at 250 volts rms, 15 amps, so power levels less than 20 watts would never be a problem. There are a lot of unknowns. Temperature, humidity, altitude,

physical shape and spacing of the switch contacts all can play a roll. Being sealed, we can eliminate humidity. So, at what power level will the voltage be

high enough to arc over the switch contacts? Rather than taking one apart, I decided I would just raise the transmit power to see if this system will work at higher powers. Maximum capable power in my ham shack is 50 watts, and the antennas worked fine at this level. I learned as a kid that the voltage at the ends of a dipole was the highest, so one day I climbed the tree on the street where one end of my dipole was connected, and taped a neon tube to the antenna. I remembered how cool it looked to see the neon following my CW signal. The next morning I saw a Electric Power Company truck with the driver looking around in the trees. I thought I was in a bit of trouble. He soon left and I climbed the tree and removed the neon.

I thought using some small neon tubes could be a way of showing which section of the dipole was active. I had a couple of small 10" long neon tubes so I attached them to the prototype antenna, one at the end of the 12 meter section, and one at the end of the 30 meter section They lite up when I reached about 15 watts. Obviously I don't recommend this method especially if you have neighbors, but it did indicate which dipole was active and it was fun to watch, and brought back those mischievous days of yesteryear.

I finally realized that there was a much simpler approach to determine which band was active. All you need to do is turn the transceiver to the band you want, then give the pump a few pushes and choose the louder signal. Works just fine every time. By the way, the total cost of prototype was around \$30.

If I decide to add 80 meters and 160 meters like my original dipole, I would have to run two more PVC tubes to the antenna. I then would have to use three switches and three LEDs at the ham shack to indicate the bands. Assuming "1" as ON, "0" as OFF, then all lite (111) would be for 160, (110) = 80, (100) = 30, and (000) = 12 meters.

I hope that one of my ham buddies will come over to the house soon so that I can demonstrate the fact that my received signal can be much improved merely by pumping a little Air into my Aerial.