

DIY

Worthwhile projects you can build on your own



Pressurized Antenna Launcher

One of the most important parameters when working with HF (high-frequency) antennas is their transmission patterns, which are determined by factors like antenna type, element shape, and height above ground. But if we don't have the luxury of mounting our antennas using buildings or masts to get the height we need, we might have to resort to slinging paracord over nearby trees.

A pressurized (pneumatic) antenna launcher, similar to a T-shirt air cannon, could help with that. An antenna launcher actually launches a small projectile (not your antenna!) that's attached to a length of fishing line, and the one shown here can be manually pressurized by a tire pump. (It can easily be modified for use with a CO₂ cartridge.) There are several good designs available, and this article features one made by [Jay Rusgrove, W1VD](#). While simple in operation, this project takes a little more time and patience than others we've featured.

Parts list:

- ✓ 3" PVC end cap
- ✓ 4" of 3" PVC pipe
- ✓ 1-1/2" of 3" PVC reducing "Y"
- ✓ 3" of 3" PVC pipe
- ✓ 3" to 1-1/2" PVC reducer
- ✓ 1-1/2" x 1" PVC bushing
- ✓ 1-1/2" of 1" PVC pipe
- ✓ 1" PVC male adapter (slip to MPT)
- ✓ 1-1/2" PVC slip cap
- ✓ 2-1/2" of 3/4" PVC pipe
- ✓ Orbit 57461 1" sprinkler valve (NPT both ends)
- ✓ Victor 04100-8 tire valve
- ✓ McMaster 3847K72 pressure gauge 0-100 psi
- ✓ Mouser Mountain 10TC262 momentary switch
- ✓ Zebco 202 fishing reel (or equivalent)
- ✓ 24" of 1-1/4" PVC pipe
- ✓ 6" of 1-1/2" PVC pipe
- ✓ 1-1/4" slip to 1" MPT PVC male reducer
- ✓ 1-1/4" PVC coupling
- ✓ 2 of 3/4" PVC slip cap

Where to get the parts

You can pick up PVC pipe and fittings from Home Depot and/or Lowe's, as well as most good-sized plumbing stores, like Standard Plumbing Supply. You can purchase the sprinkler valve online or from Home Depot, and the fishing reel from Walmart. Auto Zone and O'Reilly's both carry the tire valve and pressure gauge. Purchase the switch online.

Building it

Drill and tap the "Y" fitting for the air pressure gauge. Drill the 3" x 1-1/2" reducer to accept the metal tire valve before assembly. The order of PVC assembly is not particularly critical. Start at the back end of a unit and work forward. The trigger/safety/battery assembly is the most difficult part of construction. Machined it out a PVC channel, and epoxy it to the handle. Other construction techniques could work equally well. The momentary action toggle switch acts as the trigger, closing the circuit to two 9-volt batteries to open the valve. You can place a miniature rocker switch in series with the momentary toggle switch as a safety.



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Epoxy the fishing reel to the 1-1/4" coupling. Contour the bottom of the fishing reel mount to approximately the same radius as the coupling. You can do this with a drum sander or alternatively, a piece of sandpaper wrapped around the coupling.

Glue one end cap of the projectile 3/4" PVC, but leave the other end unglued, to allow you to add weight to it, as needed. Drill two small holes in the end of the cemented on cap, then push a cut off paper clip through the holes, with the wires simply bent over inside (best to do this before gluing the cap). This forms a 'low profile' loop on the outside of the projectile. Tie one end of the fishing line to a standard fishing barrel swivel, then attach it to the loop on the projectile.



Legal, BTW

The Bureau of Alcohol, Tobacco and Firearms has determined that pneumatic launchers are not firearms. Check your local regulations that affect the use of such devices. A letter from the BATF on this subject can be found at <http://www.spudtech.com/content.asp?id=13>



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Pressurize the storage chamber using a bicycle pump or 12 VDC auto tire pump, compressor, or portable air tank. At this point you can make a test shot by not connecting the fishing line. The difference in range/height with and without the fishing line in tow is negligible. Make sure the down range is clear. When you're ready to make the actual shot, press the spinning reel line release button and attach the projectile to the fishing line. Insert the projectile into the barrel with the fishing line connection toward the open end of the barrel. Aim the launcher by sighting down the barrel and operating the trigger switch. Estimate the total *range* (distance) to where you would like the projectile to land, and the *height* of the tree:

Approximate Range/Height vs. Elevation Angle

	45°	50°	60°	70°	80°
25 psi	172/43	168/51	150/65	110/76	58/83
30 psi	207/52	202/61	180/78	132/91	70/100
35 psi	221/55	217/65	192/83	141/97	75/107
40 psi	241/60	236/71	210/90	154/106	82/117
45 psi	247/62	242/73	215/93	158/109	84/120
50 psi	259/65	254/76	225/97	166/114	88/126

