

Pneumatic Antenna Launcher mkII

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Background

After several years of service, my old 'Spud Gun' antenna launcher has seen better days. It has been suffering from a leak in the fitting at the valve and has so far eluded a permanent repair. I haven't given up on it, but decided to explore some new ideas, and possibly simplify an already simple system.

My first stop was "Google" where I found many links to "antenna launchers". One of the most outstanding sites was "<http://www.antennalaunchers.com>" where I found many ideas for my new system.

Yes, I said 'system' 'cause an antenna launcher is not just a simple device. It has several components that must all work together or disaster takes over.

As I researched the new launcher, hereafter referred to as PAL, for Pneumatic Antenna Launcher, I realized that I would like to change several things to overcome shortcomings, or problems of the original PAL..

- Vulnerability of the solenoid to damage.
- Inability to repair/replace the valve or any other part of the main device.
- Reliance on batteries for power.
- Too large.
- Not enough tank volume for barrel volume.
- Reel and line.
- No pressure gauge to monitor pressure in tank.

Admittedly, no one has had any problems with the solenoid so far, but it sticks way out the backend.

The repair problems are self explanatory and the reason for this new PAL.

We've only had one "battery" problem, and mine has used the same two batteries since I built it.

I'd like to try a 24 inch barrel this time, the mkI is 32 inches.

The mkI model had same size tank as barrel. The new one has a tank that is twice the volume of the barrel.

We all know what troubles we've had with reels over the past several years. Both closed front reels and open faced ones suffer from various ailments, some are common to both styles. And, how many 'missiles' have we lost due to the bail not being set properly before launch, or the line getting caught at launch?

The pressure gauge is a simple thing, but not easily added to existing device due to inability to clean out chips which might foul the valve.

PAL mkII

Enter the PAL mkII, the next step in PAL development.



This is a radical change in design. All of our local launchers are copies of one another. Small changes appear in each one as different builders add their own touch to things like support, triggers etc. PAL mkII still uses PVC tubing, and a lawn sprinkler valve but the execution is vastly different from the others.

First, look at the tank-barrel support. It is made of two "TEES", cut down to form saddles for the tank and barrel. It is glued to the barrel, and attached to the tank with "zip" ties. The joint between the "T"'s is only pinned with 1/8 Aluminum tube. Therefore the tank can be removed as well as the valve. Repair/replacement of these major components can be accomplished, as well as the barrel assembly. The barrel is only 24 inches long, and made of the same 1 1/4 PVC pipe as the original mkI model. I can use the same missiles as before.

The tank is made of 2" PVC but is shorter than the barrel. But the volume is twice that of the 24" X 1 1/4 barrel. The pressure gauge and Schraeder Valve for inflation are both 1/8 NPT and threaded into the double wall of the slip-coupling/tank at the rear.



The valve is made by Orbit and needs two simple modifications to work in this system.



First, the black plastic fluted object to the left of the brass fitting is the 'bleed' screw for the valve. The solenoid was originally screwed into it and the combination could be turned to manually turn 'on' the sprinklers to flush the system and then turned 'off' again. There is also a very small hole in the center of this device which is covered by the solenoid plunger and is the release system for the sprinkler system. Unfortunately I did not take any pictures of this before I modified it, but will at a later date. In short terms, I plugged the hole with a toothpick, and fitted a dime on top of it and sealed the whole thing with a very good epoxy material (J-B WELD).

The second mod is the fitting of a 1/8 NMPT 'street elbow' to the top of the valve body. To this elbow, I attached a common air nozzle used to blow off dust in the shop. After pumping up the tank to pressurize the system, pull the trigger on the nozzle and it releases the pressure on the top side of the diaphragm thus firing the launcher. This system is simple, and more efficient than the solenoid system. Because the hole in the nozzle is so much larger than the hole covered by the solenoid, the pressure is released more quickly and the system dumps much faster providing more altitude for a given pressure.

All of the above items may be purchased locally at Lowes or Home Depot. The only part of the new launcher that must be ordered from out of town, is the reel.

ZIP REEL

I had not looked at launchers on the internet for a while and I was astonished to see what had occurred since I last visited some of the sites. The most astonishing improvements was the ZIP REEL. This item was borrowed from the BOW fishing hobbyists. It is made by the *Saunders Archery* people (<http://www.sausa.com>) and costs about \$37.00 plus shipping. It comes with about 50 ft of braided line and a bracket to mount it to a BOW. The aluminum bracket show here is just bent from a scrap of 0,060 T6 aluminum stock. It is mounted with four screws and nuts (8-32). I mounted it to a 1 1/4 PVC coupler so it would slip over the end of the barrel. The reel is mounted to the coupler with two 10-32 nylon screws and they are cut flush with the inside of the coupler.



The reel has two plastic fingers that hold the line from getting away before launch. You can make them out if you follow the loop to the missile. Pump up the tank to pressure, attach the reel. Now unwind a turn or two to get some free line and drop the missile in the barrel and reset the line in the fingers to keep it from unwinding. Aim the PAL and squeeze the release lever. It will fire with a noticeable 'crack' in stead of the 'pop' of the

solenoid fired launchers. Now squeeze the lever again to release the residual pressure in the tank.

When it's time to reel in the line, remove the reel from the barrel, and hold in your left hand. Wind the line in with the right hand, about 21 inches per wind.

My first shot was straight up, with 40 psi and it took 57 winds to put the line back on the reel. The reel is currently loaded with about 200 ft of cotton mason line (GOLD). The missile is two 3/4 end caps with a short segment of pipe as a joiner and a 1 oz fishing sinker inside. About two or three wraps of Teflon[®] tape provide a better fit to the barrel for better transfer of energy and less pressure loss.

Summary

Well, that's about it. I hope you have enjoyed this little item. I now have a smaller, lighter and less complex antenna launcher that will serve me and WAARC for many years to come. I will be glad to advise and assist anyone who wishes to duplicate my efforts. I want to get another valve and document the entire mod sequence to if anyone is interested, I may be coerced into making at least one more valve assembly, especially if you buy the parts!

I plan to repair the old launcher as I think I can adapt the new style strut to it and stabilize the tank/barrel to eliminate the un-wanted flexing that keeps un-doing my 'fixes' to the leaky joint. This launcher is very good, and has done well. I'd like to see it go to a new home.