The SKYHOOK Pneumatic Antenna Launcher
A quality, compact, portable and convenient device to put an antenna in the tree tops.

Background:
Amateur radio operators (Hams) have long pondered the methods of putting wire antennas at great heights to maximize their transmitted and received signals. Some antennas work well very near the ground, but most work best at increased elevation.

Hams have used almost every conceivable method of launching support ropes high into the tree tops to support their antennas. Among the methods are: a fishing pole and reel with a weight, a slingshot, throw bag, long bow and arrow, crossbow, launchers using some form of explosive mixture (i.e. - hair spray from an aerosol can) in a PVC cannon, and pneumatic launch devices, much like the SKYHOOK pneumatic launcher, that have proved most controllable of all. They are portable, accurate and offer exceptional ease of use.

Helping others erect their antennas is a long time amateur radio tradition. Constant testing, modification and improvement is a part of installing a ham radio antenna. Each year in June the ARRL conducts an operating event known as “Field Day” (http://www.arrl.org/field-day), during which thousands of amateur operators take to the outdoors to erect an antenna and “work the world”. Pneumatic antenna launchers have revolutionized the setup activity for this important event. Launchers get you “On the air” faster, with less effort, and more time for fun.

The overall design of the SKYHOOK takes advantage of the best features of other launchers and improves them. We have added extra durable brass pipe, altered the location of the aluminum trigger brace, and improved placement of the pressure relief valve, PSI gauge and Schrader bike/car air fill fitting, eliminating holes in the launcher pressure tank. Additionally, better mechanical construction with a close distance between the barrel (SDR21 – 2.5 inch ID, PVC pipe) and the pressure tank of the launcher creates additional ruggedness and support. There is more room in the case for accessories, too.
How the SKYHOOK pneumatic launcher works:

The SKYHOOK enables the launch of a 4 ounce (2 oz. ball + 2 oz. sand) tennis ball with an attached 50 pound test braided fishing line well above any trees (150 feet+) so as to provide reliable attachment points for a wire antenna such as the OCF dipole, traditional dipole and other wire antennas. User supplied stainless steel pulleys and a braided polyester 3/16” rope make for a quality and long lasting antenna support.

The SKYHOOK uses compressed air or CO₂ to propel an ordinary, but weighted, tennis ball (and optional survey tape streamer if desired) at the end of 350+ feet of fishing line to a height of 150-200 feet above the launch point. It has a very minor recoil and low noise level when launching a tennis ball. The SKYHOOK is operated by one person and comes in a hard case offering a highly portable and protected method of carrying the launcher and erecting a wire antenna.

You may expect your SKYHOOK to perform as follows, with a 4 oz. tennis ball and stated pounds of pressure (PSI):

50 PSI = 75 feet in height  
60 PSI = 100 feet  
70 PSI = 180 feet  
80 PSI MAX = 200+ feet

NOTE: Greater than 80 PSI is not recommended. At 100 PSI the pressure release valve will automatically activate and air will vent from the pressure tank.

How to use the SKYHOOK Pneumatic Antenna Launcher:
1. Attach the PVC spooling attachment to the barrel
   - Place the notch against the pressure tank to ensure a snug fit.

2. Pressurize the tank
   - Attach an air source or CO$_2$ source to the Schrader fill valve, such as a bicycle tire pump or CO$_2$ tank.
     - If using CO$_2$, be sure to hold the tank upright and only pressurize with the vapor.
     - Allowing liquid CO$_2$ into the SKYHOOK may cause the PVC to become brittle.
   - Pressurize the tank to between 50 and 80 pounds per square inch (PSI).
     - Greater than 80 PSI is not recommended. At 100 PSI the tank pressure safety release valve will automatically activate and air will vent from the pressure tank.
   - ***The SKYHOOK is now capable of firing and should be treated with respect and with SAFETY in mind!***
   - Do not overfill the tank or the pressure gauge could be permanently damaged!

3. Tie the fishing line to the tennis ball
   - Remove the braided fishing line from the holding screw and rubber washer.
   - Tie a 6” loop in the end of the fishing line and slip it through the cable loop on the tennis ball. Place the loop back over top of the ball towards the line and pull the ball up through. Pull to remove the slack. This makes it quick and easy to attach and remove a tennis ball to the launch line.
   - If desired, attach a survey tape streamer to the tennis ball at this point.
   - ***Note: Although a streamer can aid in the visibility of the tennis ball, use will affect the distance and height.***

4. Load the tennis ball into the barrel
   - Use the provided ramrod to seat the ball all the way at the bottom of the barrel.
   - ***Important! Remove the ramrod immediately!***
   - Release the line so that it is not attached to the holding screw and rubber washer on the spooling attachment.
   - Uncoil enough braided fishing line to place the ball into the barrel. The remainder should still be lightly and evenly coiled around the spooling attachment, free to uncoil when you fire.
5. **Aim and fire**
   - We recommend launching from the far side of a tree toward the location of the antenna.
   - Holding the **SKYHOOK** steady, sight along the barrel for placement and accuracy of your launch. Aim slightly higher. Try to avoid firing into the sun so that you do not loose sight of the tennis ball and line.
   - Ensure that bystanders are located a distance from the **SKYHOOK** and never fire with others in the line of sight.
   - Pull the trigger with a smooth, quick stroke to launch the tennis ball.
   - **DO NOT MOVE** the **SKYHOOK** from the launch position until the ball comes to rest. Failure to do so will negatively affect the launch accuracy and possibly tangle the fishing line.
   - Squeeze the trigger again to release any additional pressure remaining in the tank.
   - If the launch is not successful, skip to step #8 and repeat the launch process.

6. At the tennis ball landing point, remove the tennis ball and attach the provided nylon line to the end of the fishing line. Pull nylon line back to launch position.

7. Remove the fishing line and tie permanent rope to the nylon line, pulling back to the antenna location.
   - ***Note:*** Even though the provided fishing line is rated at 50 lb test, it is not likely strong enough to pull strong rope (such as 3/16” braided polyester) through trees. For this reason, use the nylon line first.

8. Rewind the fishing line onto the PCV spooling attachment
   - We recommend removing the spooling attachment from the barrel of the **SKYHOOK** for ease of winding.
   - Wear leather gloves when winding the fishing line to avoid cuts.
   - Be sure to wind evenly and lightly for the best performance on your next launch.
   - When beginning to wind the line, use only tape to attach the beginning of the line to the winder. Any sort of more permanent attachment can lead to injury due to the **SKYHOOK** being pulled with the line when fired.
   - Secure the end of the line to the holding screw and rubber washer.

**Cautions (always SAFETY first):**

When activated the **SKYHOOK** launcher is capable of launching a tennis ball at speeds similar to a fast serve of a tennis ball hit by a professional tennis player. Please realize the power and range of the **SKYHOOK** and act accordingly to keep friends and bystanders away as you launch the tennis ball and fishing line.

It is a good idea to wear safety glasses or goggles and keep the launcher pointed in a safe direction. Use appropriate gloves to protect your hands and avoid cuts when handling and winding the braided fishing line back onto the launcher reel.

When using the **SKYHOOK** use caution not to overfill the pressure tank. The tank has a pressure relief valve that vents the tank at a pressure greater than 100 pounds per square inch (PSI). The Rain Bird lawn sprinkler valve is rated at 150 PSI (operating pressure). When new, the Rain Bird internal valve seat may slowly leak air and may take a few launches to break in. The PVC construction materials are rated at 260 PSI working pressure (and 630 PSI burst) between approximately 50°F and 100°F. Bursting pressure for Schedule 40 PVC pipe is above 500 PSI according to various
manufacturers. Manufacturers do not promote pressure applications using PVC components.

These launchers are **triple pressure tested** using 100+ PSI. Each test must trigger the pressure relief valve before the launcher is deemed ready for use.

Always examine the launcher for aged or damaged components and avoid use until repaired and determined ready for use by a knowledgeable person. These types of devices have been used since the early 2000's by hundreds of radio amateurs and proven effective in the hands of thoughtful persons. The launcher is not a toy – it is an adult tool.

**Getting best results from the SKYHOOK:**

**Things to do:**

- Practice the operation of the **SKYHOOK** before taking it into the field.
- Wear leather gloves to avoid being cut by the braided fishing line.
- Use safety glasses for eye protection.
- Always be alert for a mechanical problem and repair immediately.
- Always point the **SKYHOOK** in a safe direction (pressurized or not).
- Take more than enough prepared tennis balls with you.
- Be sure to have plenty of rope with you.
- Organizing your launcher into a case assures you have all things you need.
- Be aware of local ordinances that might govern the **SKYHOOK** operation.
- It is a good idea to launch from the far side of a tree toward the location of the antenna. Repeat the process for the other end of the antenna.
- Consider using a “messenger line”.
- Make sure others are a reasonable distance away when launching.

**Things NOT to do:**

- Do NOT over pressure the pressure tank (80 pound MAXIMUM working pressure).
- Do NOT store the **SKYHOOK** in a charged condition.
- Do NOT store the **SKYHOOK** in direct sunlight.
- Do NOT let children operate the launcher without direct adult supervision.
- Do NOT launch over or near overhead power lines or other cables.
- Do NOT launch tennis balls onto other person's property without permission.

**Remember:**

- The best launches do not always require the highest pressures.
- High wind can blow the tennis ball and line way off target.
- Winds are usually greater at tree top levels than on the ground.
- Launching into the sun can make your ball disappear from sight.
- Using the **SKYHOOK** can be fun, but it is not a toy.
What is included in the SKYHOOK kit:

- **SKYHOOK** launcher
- Sturdy (18” X 6” X 13”) hard case with carrying strap and keys
- Spooling attachment
- 350+ feet double-braided fishing line
- (Three) 4 oz. weighted tennis balls
- Ramrod
- (Two) 270 ft. Stringliner nylon lines
- Protective leather gloves
- Instruction manual
- Laminated quick Reference Guide
- Weight 12 lbs.

Recommended additions to your kit:

- Air source such as bicycle tire pump or CO₂ canister
- Safety glasses or goggles
- 3/16” polyester rope
- Harken stainless pulleys
- Line-Grips
- Antennas (OCF, dipole, other)
- Additional braided fishing line
- Extra 4 oz. weighted tennis balls

READ THESE INSTRUCTIONS AGAIN AND REVIEW THE OPERATIONS DESCRIBED UNTIL UNDERSTOOD.
Thank You:

Thanks to those launcher pioneers that inspired and contributed to early pneumatic antenna launcher development and designs dating back as far as 2002. Launcher development is definitely a “work in progress”.

Among these pioneers (in no particular order) are: W6AKB(x-WB6ZQZ), K4ICY, NR4C, KG4JJH, WD6CMU, AE1S, AJ4DT, K5LXP, K5LAD, K6JCA, N1IR, NR4C, VK3KBC, W1VD and others too numerous to mention.

Please see the excellent reviews at http://www.eham.net and other Internet commentary on pneumatic antenna launchers for Amateur Radio use:

http://www.eham.net/reviews/detail/5199
http://www.eham.net/reviews/detail/4852
http://www.eham.net/reviews/detail/9370
http://www.eham.net/reviews/detail/11128
http://www.geocities.ws/izzydoesit_99/TBL100_Shorty_dia01.gif
https://www.youtube.com/watch?v=xC7u23ZI5ug
http://www.antennalaunchers.com/the_rest_of_the_story.html

Buyer's assumption of liability and indemnification:

The manufacturer and seller assumes no warranty or guarantee relating to the performance or SAFETY of this product and by your purchase or use you expressly warrant to the manufacturer and seller that you will have the product properly operated by qualified personnel at all times. You agree to defend, indemnify and hold harmless the manufacturer and seller from and against any and all losses, claims, damages, costs/expense, including court and attorney fees, arising from or related to your use or possession of this product.

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