How to recreate “Schrader’s Ode to Dayspring”

By: Herr Potter

Schrader's Ode to Dayspring is a geocache container opened by pumping air with a bicycle pump to eject the log container. The air piston then retracts, and the user slides the log container back inside.

Supplies Needed:

- 2” PVC or DWV pipe
- A rubber plug
- Drill
- Rubber cement or shoe goo
- Irrigation syringe
- Electrical tape
- Magnet
- Screw top bottle

How to Build:

1. At the top of the pipe is a rubber end plug, secured with the plug's hose clamp. A hole is drilled in the center of the plug, through which the stem and valve of an old bike tire is pushed. The valve is secured with rubber cement or shoe goo.

2. A rubber plug, with a hole in it to accept the nozzle of an irrigation syringe. Other materials can be used, but the key is that the plug must completely seal the pipe. The area between the plug and the end cap gets pressurized, and leaks make the system fail.

Caulk can be used to get a good seal. I don't recommend glue, because it prevents disassembly for fixes.

3. The plug rests on a ring or other stop glued to the inside of the pipe. This stop resists the air pressure of the pump against the plug. Without the stop, the plug will slide down the pipe, which is bad.

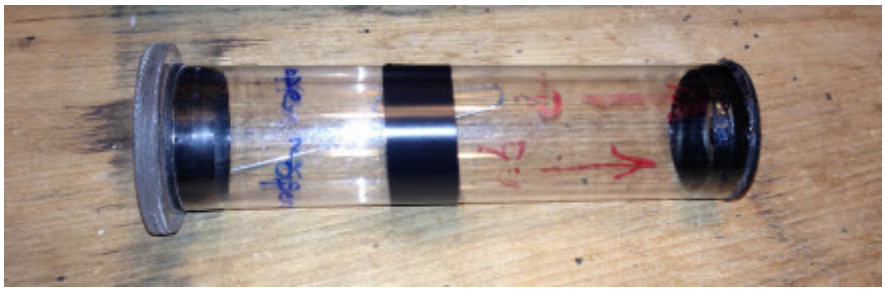
4. An "irrigation syringe" is inserted into the rubber stopper. This is the piston that air pressure from the pump extends:

5. Sliding seals that resist air leaks are very hard to make, which is why a syringe makes such good sense. Rubber bands attached between the nozzle and the thumb piston return the syringe piston. Use a needle to poke a very small hole at the top of the syringe by the nozzle - this leaks the pressurized air out of the syringe to return the piston. Drill a ring of 1/16" holes near the bottom of the syringe (you can just see them next to the circumferential ring by the electrical tape in the photo). These holes allow pressurized air to escape to prevent the thumb piston from being completely ejected by over pumping. The electrical tape is just to cover up jagged plastic edges so the rubber bands last longer.

6. Attach a magnet to the thumb piston of the syringe. I use a machine screw because it's easy and gives me some adjustability.

7. The log container is a screw top bottle. Glue a matching magnet into the lid - this magnet will connect the log container to the magnet on the syringe. The magnet allows the geocacher to remove the log container once it extends from the bottom of the cache.

8. Ideally, the log container should be less than 1.5" in diameter. Glue a 2" round disc of rigid material to the bottom of it. This disc should move freely up and down the inside of the pipe:



9. The disc makes it harder for a geocacher without a bike pump to sneak the log container out. More important, when the syringe extends, the lip between the disc and the log container "hangs up" on the bottom edge of the cache container so that the piston doesn't suck it back inside. This is important because it's pretty difficult to pump the cache, and grab the container before it withdraws again. There are other ways of doing this, but a slim log container with a disk is by far the easiest and most reliable.

10. To replace the log container, the geocacher just shoves the magnet end back up the tube until its magnet "catches" the magnet on the piston. Because the log container is under tension when grabbed, it's important that the log container not come apart under tension - that's why the screw top is important.

Obviously, some experimentation is required. Best of luck! Oh, and please no commercial use, though you're welcome to reprint these directions with a credit to me.