

AROUND THE MAKER WORKSHOP, BROUGHT TO YOU BY DREMEL

By John Edgar Park

» Create an upscale marshmallow shooter for your next candy-coated conflict.

You are probably already familiar with the PVC pipe marshmallow shooter, a classic, fun weekend project. Maybe you already have one. Next time you show up for some gooey, air-powered confectionary warfare, why not come packing some classy heat — the Deluxe Copper Mini Marshmallow Shooter Mk. II!

You'll build it from lengths of copper pipe and standard fittings. The Dremel Multi-Max will cut your ½" dia. pipe to length with ease, so no more laboring over a hacksaw. Finally, you'll need some basic pipe soldering skills to put it all together.

Directions

Step 1: Clamp the pipe in your vise, then measure and mark a 7" section (Figure A) — this will be the barrel of your shooter. Put on your safety goggles, affix the metal cutting blade to your oscillating tool, and set it to 20,000 RPM (about "10" on the dial). Cut the pipe at the 7" mark (Figure B). Remember, let the tool do the work, there's no need to apply much pressure.

⚠ WARNING: It's always important to use safety goggles or safety glasses when operating any power tools. This project involves cutting metal, so all caution and common sense should be used.

Step 2: Use a file to smooth any rough edges on the barrel (Figure C). For an even better finish, use emery paper.

Step 3: Next, we'll cut five 3" sections of pipe from the remaining (non-barrel) section of pipe. Just as above, measure, mark, clamp, cut, and smooth the edges (Figure D).

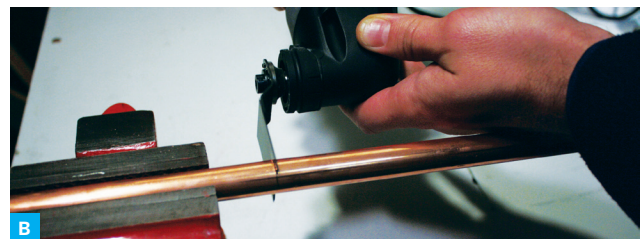
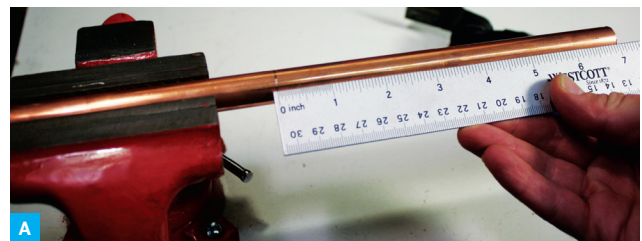
Step 4: One last cut to make (have you noticed how quick this is compared to using a hack saw?) Measure and mark a 1" section of pipe, then clamp, cut, and file.

Note: If you plan to use the threaded adapters to unscrew the barrel, you'll need to use the remaining approximately 1" scrap piece of pipe to join them.



MATERIALS AND TOOLS

- » Dremel Multi-Max oscillating tool and ¾" wood/metal flush cut blade. You could also use the Multi-Max MM462 Wood-Metal flush cut blade (1½" wide).
 - » Copper plumbing pipe (1) 2' length of ½" internal diameter
 - » ½" copper pipe elbows (2)
 - » ½" copper end caps (2)
 - » ½" copper T-joints (2)
 - » Metal files
 - » Bench vise
 - » Propane torch
 - » Lead-free pipe solder and flux
 - » Emery paper
 - » Safety goggles
- Optional:**
- » Threaded copper ½" MIP adapter (1), threaded copper ½" female adapter (1), and Teflon tape for unscrewing the barrel
 - » Tape or a latex glove tip for protecting the mouth piece



Step 5: Dry-fit the entire shooter together (Figure E) based on the original Howtoons blueprint (howtoons.com/?page_id=139).

Note: To add the threaded adapters, place the male adapter on the barrel, insert the extra 1" piece in the front T joint, and place the female adapter on the other end of the stub.

Step 6: Now we'll solder the shooter together. Clamp the pistol grip section of the shooter in your bench vise, then don your goggles. Loosen a section, then brush flux on both joints to be soldered (Figure F).

Step 7: Fit the joints back together, fire up your propane torch, and heat up the joint (Figure G).

⚠ WARNING: Copper pipe retains a lot of heat after soldering. Be careful not to handle it until it has cooled down.

Step 8: When the joint is good and hot, apply solder (Figure H). It should flow into the entire joint to make a good seal. My pipe soldering skills are not so impressive, so I've got some homely joints, but they're all sealed, and that's what counts!

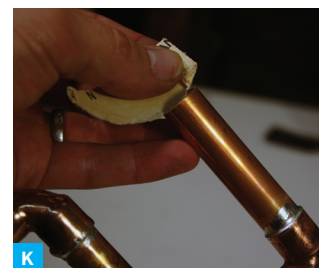
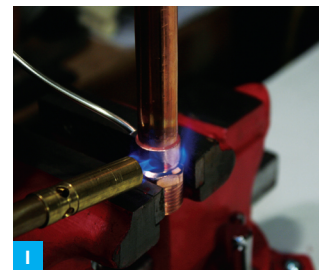
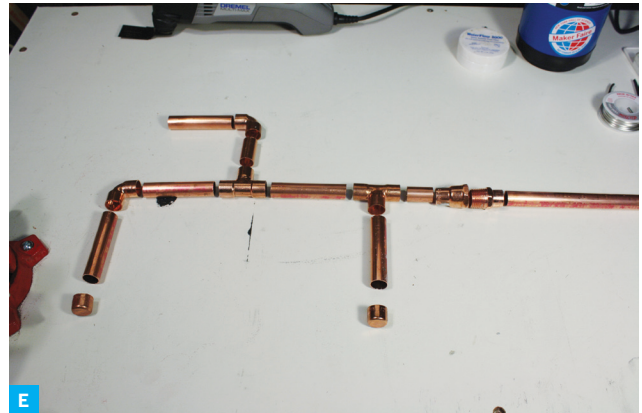
Step 9: Repeat steps 6–8 on all remaining joints, working your way to the front of the shooter. You may be able to solder multiple joints after a single heating in some areas that are close by, such as the T-joints.

If you want to be able to unthread the barrel, don't solder it in place. First, solder your extra 1" piece and the female adapter to the shooter body, and the male adapter to the barrel (Figure I). Thread the barrel into place (Figure J), adding a small bit of Teflon tape for air-tightness, if needed.

Step 10: Once the entire shooter is soldered together you can give the mouthpiece some extra smoothing care with the files and emery paper (Figure K).

I used water-safe plumbing pipe, so I'm going without a mouth guard. But if you have concerns (or don't particularly like the tang of copper), you can add some mouth protection, such as tape or a latex glove tip.

Now go grab a bag of mini marshmallows, load one in the breach, take a deep breath, and fire at will!



About the Author

John Edgar Park is the host of *Make:* television and a CG Supervisor at DisneyToon Studios. Find him online at jpixl.net.