Parabolic Microphone

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TOOLS:

- File (1)
- Hammer (1)
- Hobby knife (1)
- Laser pointer (1)
- Permanent marker (1)
- Razor saw (1)
- Reamer (1)
- Wire cutters (1)
  aka side cutters

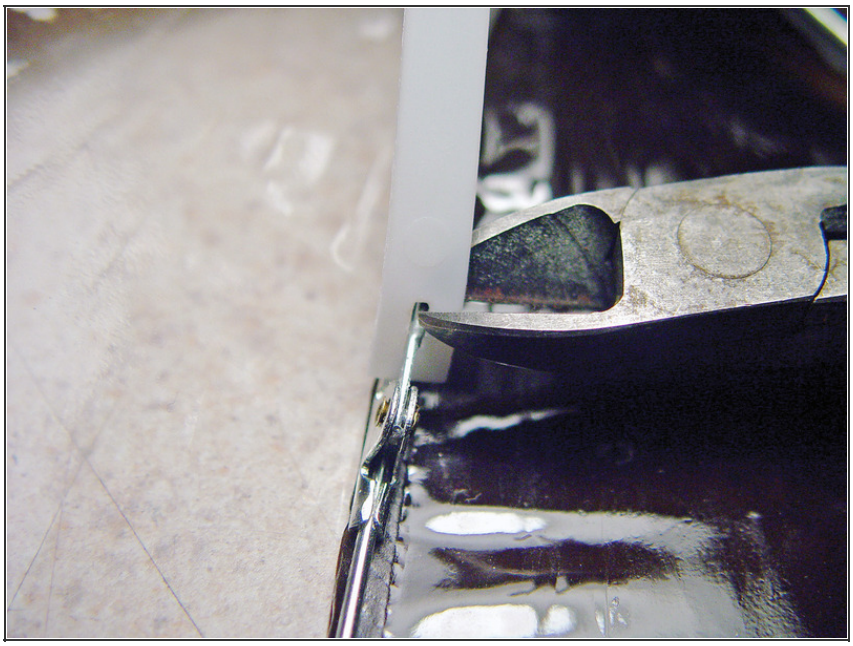
PARTS:

- Zip ties (1)
- Gaffer's tape (1)
- Umbrella hat (1)
- Paint roller handle (1)
- Microphone (1)
  I used RadioShack's discontinued Stereo Hands-Free Tie-Pin Microphone (#33-3028), but any decent small microphone will work. Dollar store purists can instead use earbud headphones as a microphone.

SUMMARY

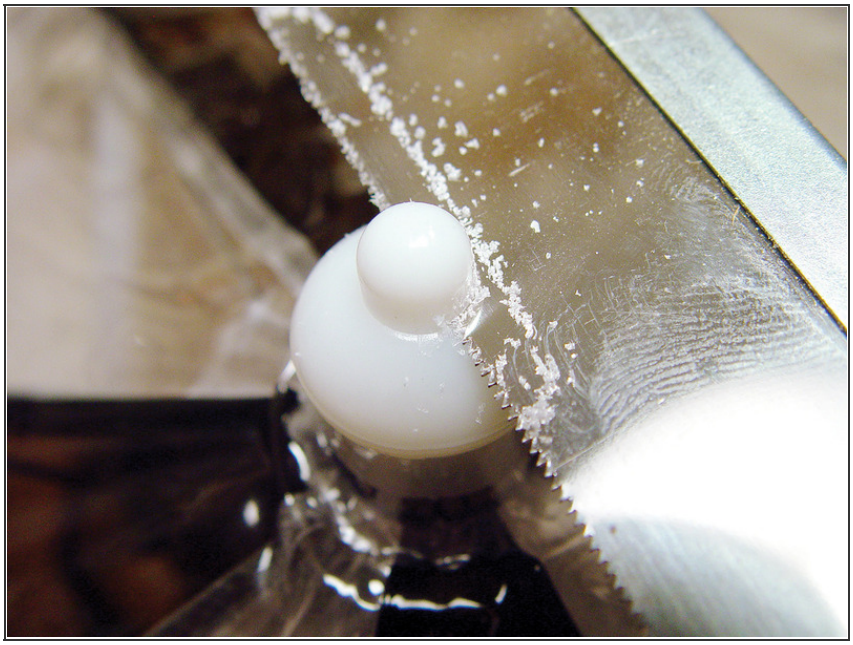
This is a ridiculously easy way to build a parabolic microphone using dollar store items. You'll attract lots of attention walking around in public with this rig. I usually welcome the inquiries, and let people listen to what I'm doing. Kids especially love it.

Step 1 — Make the dish



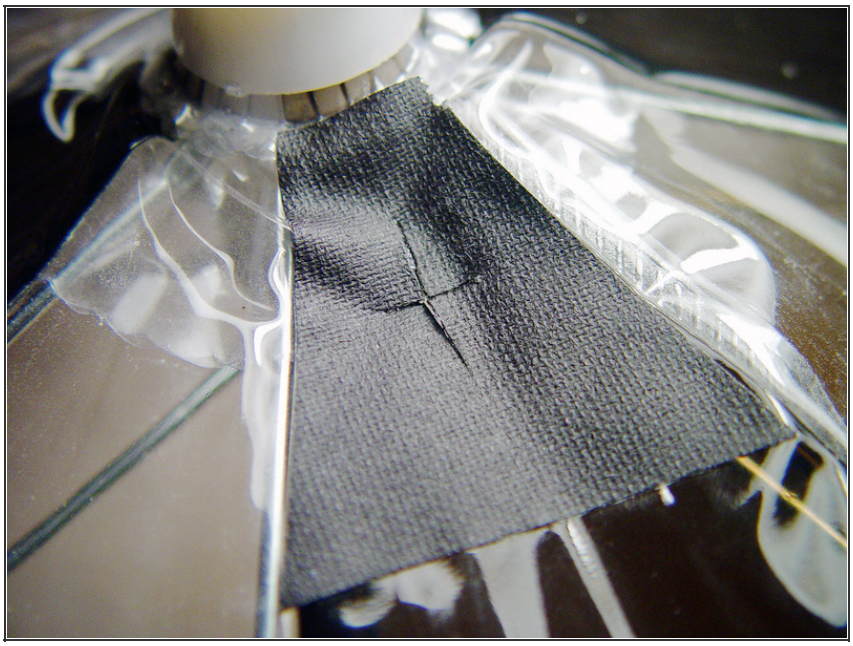
- Use wire cutters to snip away the 4 plastic holders that connect the hat's umbrella to its headband.

Step 2



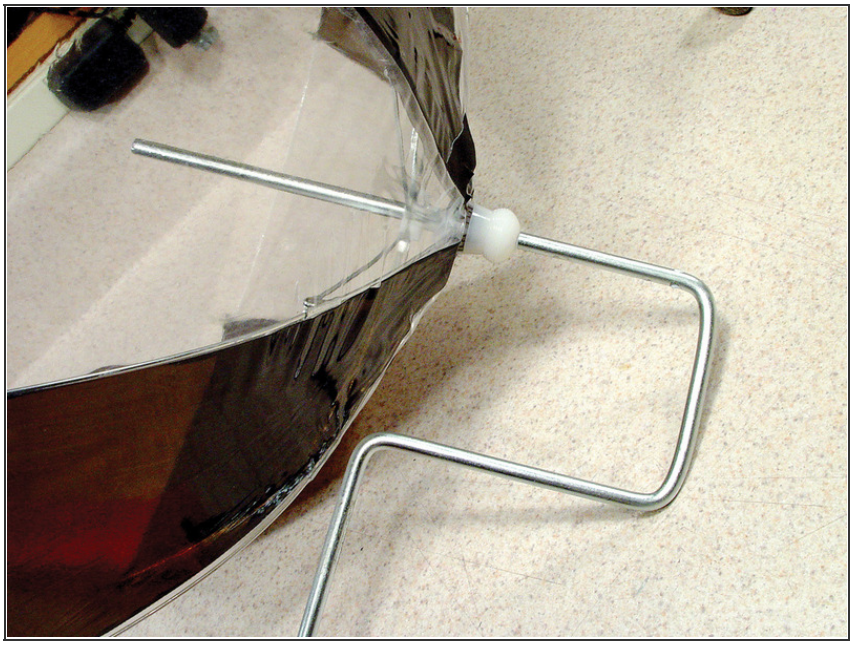
- Slice the top of the plastic knob off the top of the umbrella, and clean up the hole with a knife or reamer.

Step 3



- Cover 1 gore of the umbrella near the center with a trapezoidal piece of the gaffer's tape. Cut a small X-shaped incision through the tape and umbrella; this will be the reinforced hole that the microphone wire will pass through.

Step 4 — Attach the handle

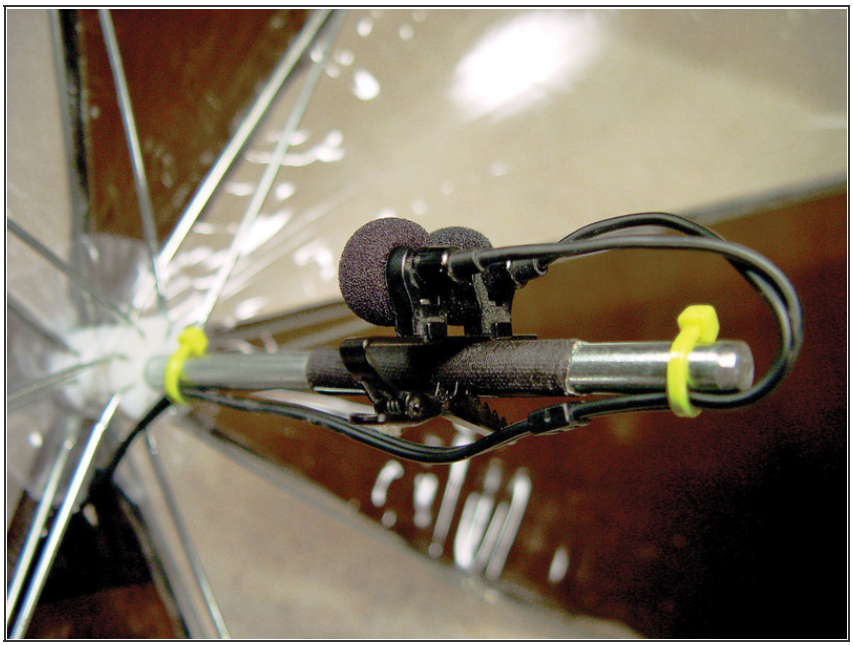


- Remove the paint roller's plastic caps and wire frame. Push the shaft through the hole in the top of the umbrella, so that it protrudes 6" underneath. Leave ½" of clearance between the outer surface of the umbrella and the bend of the handle.

Step 5

- Just above the umbrella's top knob, wrap a length of tape around the shaft and ring it with a cable tie pulled tight. Wrap the the shaft with more tape, to provide a gripping surface for the microphone.

Step 6 — Install the microphone



- Clip the mic to the shaft and thread the cable through the X hole. Secure the cable with cable ties.

Step 7

- You want to place the microphone at the focal point of the reflector, but realize that this is a plastic umbrella, not a perfect parabola. So this “point” will be more of a semifocal blur. Here are 3 ways to position the mic, in decreasing order of complexity:
  - Point a laser at different points on the inside of the umbrella from a distance of about 20 feet directly in front of the unit. Mark where it reflects onto the shaft to find the general region of focus.
  - Plug the mic into a recording device, put on some headphones, and point it toward a ticking clock some distance away. Move the microphone along the shaft until you get the loudest sound.
  - Just take my word for it, and position the mic about 3" from the inside surface of the umbrella.

Step 8 — Take it for a test ride

- Plug your new parabolic mic into a recorder. Use headphones to monitor your work. Then point it at something interesting. You're in for a pleasant surprise!
- Now try recording the same sound without the parabolic setup — forget it.
- Hear field recordings of a squirrel and a cardinal made with the Dollar Store Parabolic Mic at http://makezine.com/14/diyspy_mic.

This project originally appeared in MAKE Volume 14.

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