

# SINKDRAIN SUPPRESSOR

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# DISCLAIMER

The information in this document may be freely distributed, as long as it remains unmodified. I assume no responsibility for any damages caused by the use of the information contained within this document. It is for educational purposes only.

*I don't promote violence, I just encourage it.*

*- Eminem*

# INTRODUCTION

When I first decided that I needed a suppressor, I was building myself a Cobray Mac-11 9mm from a parts kit I had ordered online. As you may or may not know, the barrel of a Mac-11 is threaded, which allows for easy attachment of various barrel attachments such as flash suppressors, noise suppressors, and barrel extensions. Most of these attachments at the time of this writing are available for purchase online without any license from within North America. Noise suppressors, however, are not available without the proper paperwork, and if you live in certain countries or states, they're not available at all (legally). The few individuals who are allowed to purchase noise suppressors are still faced with considerable costs associated with their purchase, including a hefty tax as well as the retail costs which can exceed \$400 for a good suppressor. My personal decision to build my own suppressor came from at least one of the above reasons, and thus began my experimentation period where I tried various techniques to diminish the report of my gun.



It should be pointed out that the suppressor I will be detailing here is not the same one I ended up using on my Mac-11, but rather is the one that is used on my Sten Mk III. However, the suppressor that I did end up using on the Mac-11 uses the exact same design as the one described here, differing only in the method of attachment to the muzzle.

There are many ways to suppress the report of a pistol-calibre firearm effectively without spending a lot of money and without the resources of a machine shop, however they tend to have considerable effects on the accuracy of the fired bullet, and generally require more maintenance than their professional counterparts. They are, however, the preferred choice for suppression for those individuals who do not want others to know that they own such devices. That being said, it would be wise for the firearms enthusiast to carefully consider who he or she shows their creation to, as a homemade suppressor is not generally legal to own. Contrarily, if the firearm you own is also not legal to own, the use of a suppressor will diminish your chances of being caught firing your illegal weapon.

## TOOLS AND EQUIPMENT

As with any do-it-yourself project, there is a variety of basic tools you will need in order to complete this project. In many cases, there are alternative methods of tooling to complete a step in the process, and in some of them I will mention them. You should use your own best judgment when deciding which method to use, as often you will be using tools that are slightly different than what is used in this guide, and thus may require different techniques for effective usage. I've detailed the basic hand tools below:

- Hammer
- Wrench
- Screwdriver(dependent on what type of screws you buy)
- Gloves
- Hacksaw
- Drill with strong drill bit capable of cutting thin steel tube
- Tape measure
- Scissors
- Box-cutter knife

The above tools are absolutely essential to completing this project safely. I've also included a list of tools that will help immensely in the long term if you plan on doing any other projects involving firearms.

- Dremel
- Protective glasses

- Dust mask
- Sharpening stone
- Small flathead screwdriver
- Flashlight
- Brazing torch + MAPP gas

## MATERIALS

Again, there are certain items that you will absolutely need to complete this project. In order for your suppressor to operate safely, it's vital that it's always attached securely and is attached straight to avoid bullet collision with the inner walls. Most importantly, your suppressor must be able to contain the pressures created by your firearm without blowing out. Thus, the materials I'm listing here are the minimum you need to suppress your weapon safely. None of them are expensive, and all are genuinely strong enough to perform their job effectively. These can all be bought at any hardware store, although I usually check the local dollar store first because it's always cheaper. This is especially the case for the sink drain plugs, where the cheaper more flexible types tend to last longer than the more brittle and expensive ones.

- Large roll of duct tape (good quality)
- 1 foot of ½-inch electrical conduit
- 1 foot of 1 ½-inch PVC pipe
- at least 12 inexpensive rubber sink drain plugs
- 15 wood screws
- 2 hose clamps capable of being tightened to within ½ inch in diameter
- steel wool



*Don't skimp on good duct tape. The stickier, the better.*



*You can find bags of steel wool at most hardware stores, and will only need a small handful.*



*A short piece of PVC like the one shown here usually must be cut from a larger piece, since most stores won't sell it in lengths of less than several feet.*

## CONSTRUCTION

Once all of your materials and tools are acquired, you're ready to begin the fabrication process. Note that the order of construction outlined here need not be followed, as the order does not affect the final composition of this project. Thus, each part of the suppressor will be detailed separately.

### **Inner Tube**

This part of the suppressor will comprise the part which attaches to the muzzle and that allows the initial expansion of gases. In terms of suppression potential, it's not the most important part, but it does keep the suppressor on straight, so it's necessary to have here.

Start out by cutting a 5-inch piece of electrical conduit with the hacksaw. This doesn't have to be cut absolutely straight, but it helps. Make sure you wear your rubber gloves when doing the cutting.

#### *Tooling Tip*

Rather than using a hacksaw to cut the conduit, you could use a dremel with a reinforced cut-off wheel designed for grinding steel. It saves considerable time and effort when cutting a lot of steel to use a dremel instead.





*The cutting process can be supplemented with a dremel tool, although grinding does produce considerable amounts of powdered steel particles.*



*A vise-grip wrench can help considerably when cutting, either with a dremel or a hacksaw. The pipe can become hot very quickly, so this allows you to hold it without using your hand. Be careful not to squeeze the wrench too tightly when adjusting, as the conduit isn't that strong and will buckle if too much pressure is applied.*

Next, drill  $\frac{1}{4}$ -inch holes in the cut piece of conduit, starting 1 inch from the beginning of one end, and ending 2 inches from the other end. You need the extra inch for attaching to the muzzle, explained later.



*The left side should have an extra 2 inches of undrilled space, not one. Make sure you get lots of holes on there, but don't space them too close together. The best pattern is a staggered one – a checkerboard pattern.*

Now you need to start the duct-tape process. This is one of the most laborious parts of the entire suppressor construction process, but it is absolutely essential. Do not rush this. Start by taking a 3-foot piece of duct tape, then split it down the middle lengthwise. It should tear evenly, but don't let it bunch up as you need it all flat.



*Half-width strips of duct tape, each one approximately 1 inch in diameter.*

Wrap the inner tube with the duct tape so that it resembles this:



*The wrapped rolls of duct tape provide support for the rest of the suppressor once the inner tube has been installed, and also provides an expansion chamber for the hot gases as the bullet passes through.*

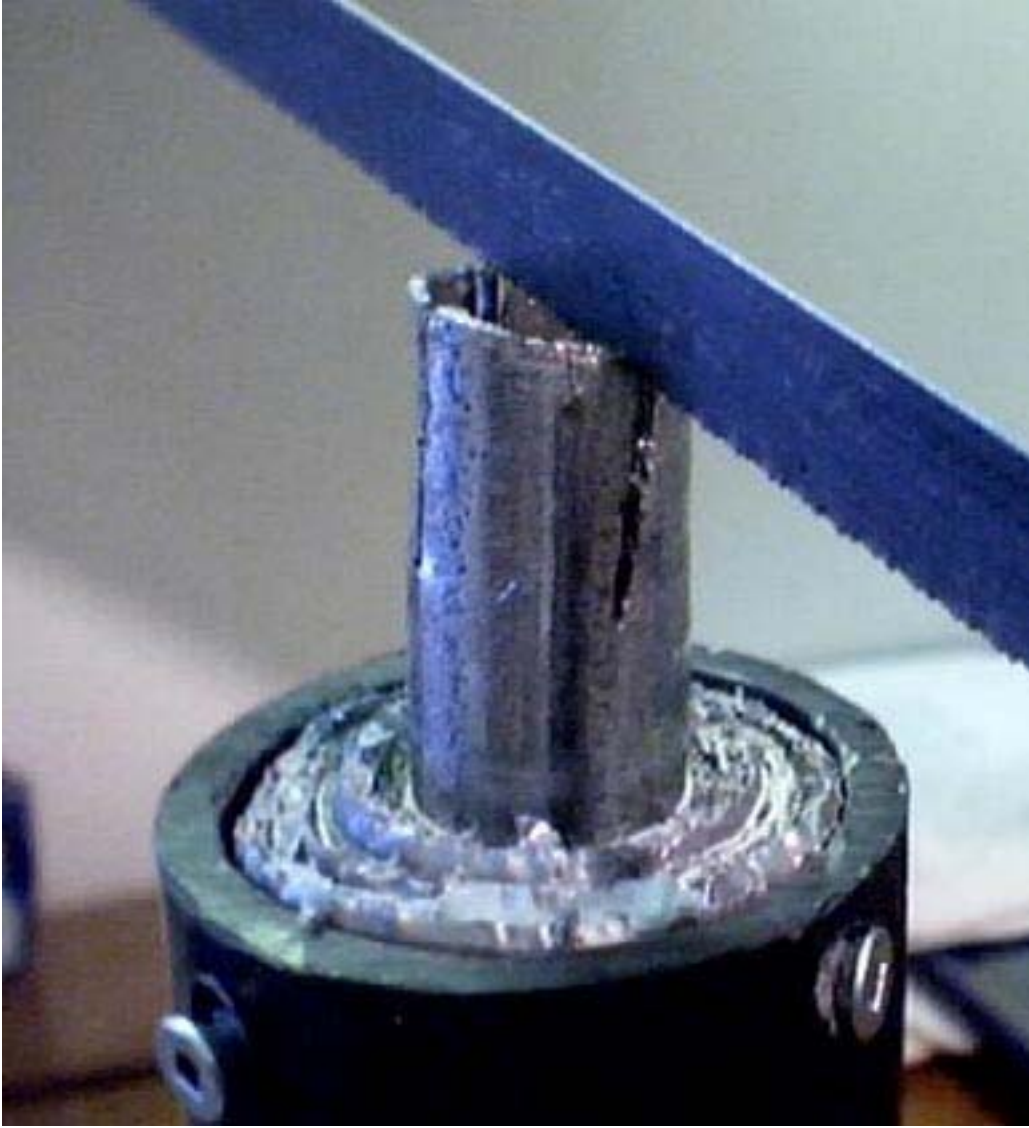
Make sure the duct tape is wrapped tight enough so that the passage into the PVC is snug, but not so much that the tape bunches up as it's inserted.





*Ideally, the tape shouldn't bunch up as it's pushed into the tube. If you have to force it, there's too much tape. Note that this figure is of a bushing (covered later), which uses the same method of securing to the outer tube as that of the inner tube.*

The next step is cutting the notches in the muzzle end of the inner tube to allow for a tight fit with the barrel.



*Shown here is the inner tube being cut to allow further tightening of the conduit onto the barrel. Note that the inner tube may instead be cut after already installed in the outer tube, as shown in the figure.*

Your inner tube is now completed, and you're ready to begin making the bushings.

### **Bushings**

Construction of the bushings is quite similar to that of the inner tube, with the exception of their completed length. The approach I find the easiest is to roll the tape on first, and then cut the conduit afterward, to insure a straight alignment with the tape.

Start out by creating more long strips of duct tape like you did for the inner tube, with each strip having been cut or ripped from a full piece of duct tape so that each strip is approximately 1 inch in diameter. Make them as long as you can comfortably without having to stretch your arms, to avoid the tape bunching up.



*From the above 3 figures, it should be obvious what you're attempting to do. The idea is to cut the conduit to the same diameter as the resulting roll of 1-inch duct tape. Unfortunately, during the process of wrapping the tape, you may find that the diameter of the completed bushing is longer than what you initially expected. The best way to match this diameter with the resulting conduit piece is to do your sawing AFTER wrapping the tape, rather than before.*

Repeat this step 3 times, so as you make 3 separate bushings. This is necessary so that you can give the wipes a support against which to push when the bullet passes through. If you only use 1 or 2 bushings, you're likely to end up with wipes that spin around inside the suppressor, causing bullet stoppages and a damaged tube.

## **Outer Tube**

The outer tube needs to have 5 sets of drilled holes, with 3 holes for each set. Thus, you will need a total of 15 wood screws to complete this step.

To begin with, measure the distance between the center of each bushing on the inner tube. This should be a few inches. The idea here is to know where to place your holes in the outer tube so that you can align the screws with the duct tape. You will be securing the wood screws in the duct tape to keep the bushing aligned.



Now take this measurement and apply it to first ½-inch of the outer tube. Thus, measure ½ an inch from either side of the tube, and mark that spot. Now add the measured distance taken from the inner tube to this ½ inch and mark that spot on the outer tube as well. Use a felt-tip marker to draw a circle around the tube at each marked spot, so that you can keep your drilled holes aligned with the bushing placing.

Do the same thing (drawing a circle) at the end of the tube, ½ an inch from the end. You will be left with a space where you can fit 2 more circles, where you should try and put them relatively evenly. The distance between these points isn't that important, as you can move the bushings to match the holes. Just make sure your circle is drawn on straight, as there is only ½ an inch of leeway for the location of the holes and corresponding screws.



*Drill 3 sets of screws for each circle drawn on the tube. This placement of holes and corresponding screws will allow for a reasonable amount of security against the immense pressures that the tube will contain, and will thus keep your wipes aligned. Also, the extra compartments created by these bushings will slow down the escape of the gases from the suppressor long enough for them to cool down somewhat.*

## **Wipes**

The final components for your suppressor are the rubber baffles that will drastically slow down the passage of hot gases from the end of it, hereon referred to as “wipes”. They’re constructed from the rubber sink drain plugs you can find in dollar stores and hardware stores, and are usually only \$1-\$2 per piece. The number of wipes you use will depend on the caliber of firearm you’re firing through them, the amount of powder charge per bullet, your required suppression level versus resulting bullet accuracy. For a semi-automatic assault pistol, such as a Mac-11, I’d recommend at least 10 wipes.

Construction of each wipe involves cutting the sink drain plugs so that they'll fit inside the 1 ½-inch PVC pipe you're using for your outer tube, as sink drain plugs generally are 1 ¾-inch in diameter. Once they've been trimmed along their outer edge, you'll want to remove the rubber hook used for the metal chain that's attached, and finally cut a small ½-inch slit in the middle of the wipe with a very sharp knife, such as a box-cutter.



*A used wipe, taken from a suppressor used on a homemade .22 pistol. The unburnt powder on the wipe is the result of a wide barrel, and is not the result of using wipes for suppression. Ideally, the only residue you'll find on the wipe is carbon deposit, which shouldn't affect the wipes functioning. Ultimately, you'll need to replace the wipe because the hole in the middle will become widened from excessive firing. Note that this particular wipe was "flattened" by cutting the rear circular piece that goes into the drain itself. The flattening option is good for fitting more wipes in a smaller space, but it tends to encourage over-use of wipes, and can result in a failed bullet exit if using a lower-powered firearm, such as a homemade brass .22 pipe pistol. For 9mm and up, you should be fine if you decide to stick 15+ wipes in there.*

# ASSEMBLY

Now that all the corresponding pieces have been constructed, you're ready to assemble your suppressor. This can be done in any order you prefer, but I like to have the inner tube installed first so that I know how much room I have left over for my wipes. This step is where you can make your final adjustments and decisions about option pieces to install, such as heat-absorbing wool or extra wipes.

As you insert the inner tube, you may wrap some steel wool around the middle section to fill in the expansion chamber created by the duct tape, which will absorb some of the heat from the hot gases. You don't need to have the steel wool if you don't have any, but it helps. Make sure you leave the cut part of the inner tube on the outside of the tube, as shown in the earlier figure. Next, install the wood screws, one at a time, but first hammering them in  $\frac{1}{2}$  an inch or so, then screwing them in with a screwdriver.

## CAUTION

*Exercise extreme care when using a screwdriver to install the wood screws. They can be tough to screw in, and excessive pressure can cause the screwdriver to slip. I've personally given myself a nasty cut on my finger while installing the screws, and since then have resorted to using a wrench for most of the installation process. See the Tooling Tip below.*



*Installing the wood screws – make sure you do not install the screws pointing toward the center of the tube(the conduit)! If you do this, and your screws are too long, they will be sticking out of your finished suppressor, creating a snag hazard. If you hammer them in at this point, you'll end up denting the inner conduit walls, creating an obstruction for the passing bullet. Ideally, you want to install the screws pointing away from the inner conduit just enough so that they can go in all the way.*

#### *Tooling Tip*

To aid in the installation of the wood screws, using a wrench to twist them in can make the process easier on your wrists, and safer for your fingers.



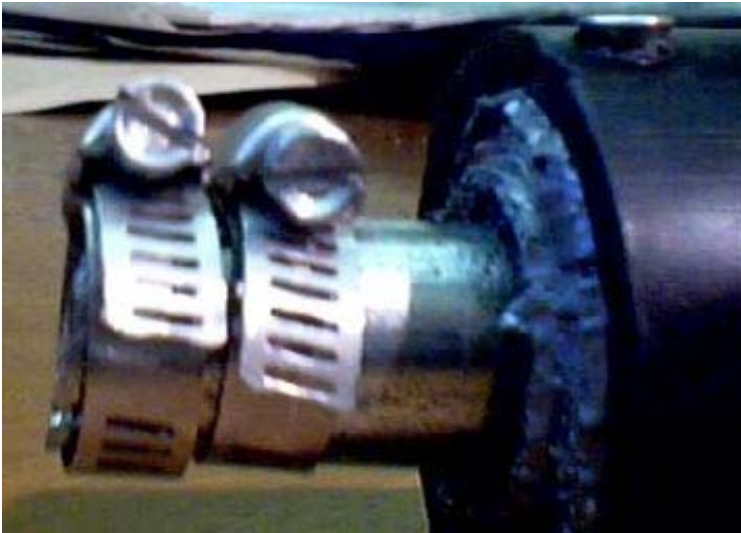
Repeat the above process with each bushing, while installing the wipes intermittently. Make sure the wipes are in tightly, as they're liable to move around if you don't have them in sardine-style. This is why you may not want to cut the rear portion of the sink drain plugs, as you'll need more wipes to fill the resulting space, or you'll have to drill more holes in the PVC, which is bad because the empty holes need to be filled to contain the pressure.





*Installing the wipes – Make sure they don't go in at an angle, as they will either trap the passing bullet or get too many holes punched through them, diminishing suppression.*

Once the last bushing has been installed, you're ready to mount it to your barrel. Cover your barrel in a few layers of duct tape, to give it a gripping surface for the conduit as well as to protect it from scratches resulting from the hose clamps.



*Installing the hose-clamps – Make sure you use 2 hose clamps, not just 1. This is necessary to keep the suppressor from falling off during firing, and also to keep it as straight as possible.*

### **CAUTION**

*As before, the screws can pose a hazard for your fingers. It's necessary to tighten these as much as possible, and thus you'll find yourself pushing very hard with the screwdriver. Be sure to keep your fingers well clear of the clamps and screwdriver while doing this.*



*Completed suppressor – You're now ready to fire hardball (non-hollowpoint) ammunition through your suppressor. I have not tested this design with hollowpoint ammunition, but I have read that it's a bad idea when using wipes for suppression as the hollowpoint slugs will expand upon impact with the baffles. Exercise caution if attempting to fire hollowpoints with this suppressor, as they may be exiting your suppressor partially expanded, or worse, putting cookie-cutter holes in your wipes!*

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