

I wrote this in a hurry, please excuse any typos.

First, read “Expedient Homemade Firearms - 9mm Submachine Gun” by P.A. Luty.

My design is basically a Luty with 3d printed parts and a few improvements.

Some of these may help building a normal Luty, too.

I won't go in detail about the parts who are unchanged.

All pipe measurements are given as outside diameter x wall thickness.

In my opinion, Lutys design has some flaws.

Its quite big and heavy, uses a lot of different materials and hard to get pipe sizes, needs a lot of work hours to be build, optics need an extra mounting plate as the receiver is to thin for screws, and bending that main spring after a picture is a pain in the ass.

Of course, this design has flaws, too.

While lightweight, it's not as durable as a full steel weapon. The PLA could melt under intense use.

But I think most Lutys will only fire 1-2 magazines outside of testing before discarded, hidden or destroyed, so that shouldn't be a problem.

This gun is 440mm long (150mm barrel) and 40mm thick(without the charging handle) and 150mm high(without magazine). The only protruding object is the charging handle, which may be screwed of for better hiding. That is still quite big but shorten the action further would increase the firing rate to much. The bolt weights 520-560 gram, depending on charging handle screw/welding/filing. The gun weights around 2200g without a magazine.

Receiver

The upper receiver is made from 300mm 40x4 square aluminum pipe. It's light and you can directly screw a rail on the thicker wall. It's a common pipe size, too.

The lower receiver is made from 2 parts printed from PLA. This will help manufacturing time a lot, as that part is time consuming to make for a regular Luty. The printer surface needs to be at least 190mm long, print them upside down without supports. A M5x20mm bolt with a M5 nut will hold them together. The same screw sizes are used for trigger and sear.

The M5 nut holes in my print where a bit too small for the nuts. Reason for this could be the low printing quality of my cheap 100€ printer, or the recess is simply to small. I enlarged them with a dremel tool. After that they fit quite tight. I didn't change them in the .stl, so you would need to do that yourself.

The trigger and trigger guard (80x16mm steel strip) are made from 2,5mm steel plate. A M4x15mm bolt secures the trigger guard. The sear is made from an 8mm allen key, as the 12mm one in the original Luty is quite expensive. You need to grind the edge of on both sides to thin it from around 8,6mm to 8mm. A 2,5mm pin is used as trigger connect rod. The sear spring is a short piece from the same type as the bolt spring. A ball pen spring can be used as trigger spring.

A small piece of 12,5mm wide 0,6mm thick flat spring is used for the mag catch. It gets secured by 2 M4 screws with M4 nuts.

Barrel

5 M20 collars.

You need 15x3mm and 20x2,5mm seamless pipes for the barrel (or a 20x5,5mm).
Epoxy or silver solder(better option) them together.

Alternative: rifled barrel

I used a 20x6mm pipe, drilled it with a Din 340 8,5mm drill from both ends and reamed it to 8,8mm with an adjustable reamer pressed on a 250mm long 8x2mm pipe. Then I pushed a rifling button, made from a drill shank with 9mm diameter, through it. The rifling quality is bad, and I think it isn't worth the additional effort.

Bolt

6 M20 collars.

You need 100mm long 15x2mm and 20x2,5mm seamless pipes (or 20x4,5mm). Solder or weld them together. DON'T epoxy them, I did this for my first luty. It won't hold under the intensive pressure. I only got 10 shots out before the inner pipe got pushed 2mm out, rendering the gun unable to fire.

The outer pipe needs to be filed/sanded down the first 15mm, so it can run freely through the front stop collar. Drill a 20mm long hole in the inner pipe to secure the bolt-head.

The bolt head is made from an 80x12mm c-spring cut down with an angle grinder to 75mm. It should be welded/soldered, too. If you only hammer it in as Luty suggests, the high pressure while firing may push it deeper in, again, rendering the gun unable to fire.

Feeding ramp

Print solid from PLA, then sand smooth. Should hold with a friction fit under the barrel.
Will melt under high volume of fire. Make one from aluminum/steel, if you want a more durable option. A thin walled print could be used as mold for sand casting.

End cap

While not required, it will protect the inside against dirt. Weld/solder/epoxy a M8 nut on the outside of the spacer of the end stop collar. Use a M8 bolt to secure the end cap.

PLA magazine

This is still a prototype, make one from metal if you want reliability. The steel pipe size needed for that is 35x15x1,5mm.

I found that PLA is not strong enough and will occasionally break around the feeding lips. On top of that, the PLA feeding lips have enough elasticity that they will unload themselves when dropped. These are, of course, fatal flaws. I added the .stl nonetheless, as the steel pipes for Luty mags are hard to find and could theoretically banned.

Maybe nylon or some carbon fiber filament will function better.