

Description

Most every aspect of the SVTR is inspired by the Brugger & Thomet GHM9. from the aesthetics all the way down to the name choice. The B&T GHM9 is named after the Grass Hopper Mouse, which is a mouse that kills scorpions, because the GHM9 is a CZ Scorpion killer. It is only fitting for this build to be named similarly. The SVTR is named after **Salvatore** Lombardi, the Italian mobster, who killed rival mobster Paddy Mac (aka the Mac Daddy).

The SVTR uses a MAC 11 upper and MPA Sten mags. If you want to go for the GHM9 look, then you can print the one piece lower receiver. There is also a pistol grip version available. It features a DIY PDW style stock that only requires a 1/8 X 1/2 steel bar, found at any hardware store, and a spare Ender 3 bed spring. This build uses a AR-15 LPK and spare hardware that you likely have leftover if you have built the FGC-9.

Important Notes

The SVTR is designed around VMAC parts. Periodically check VelocityFirearms.com for the best prices.

Cobray parts are not currently compatible with the SVTR. There have been documented cases in which this frame failed when using Cobray uppers and bolts.

The SVTR is designed around MPA Magazines. These magazines are often hard to find but can be found on either Gun Broker or Velocity Firearms. These magazines also work the best.

Surplus Sten mags may work, but we have seen so much variation between surplus mags it is hit or miss whether they will feed reliably with this design or even fit in the magwell.

Minor modifications to your mag catch may be necessary. AR mag catches have a small bevel on one side. For the SVTR, the AR mag catch is upside down, so that bevel makes it easier for the mag to fall out. This bevel can be filed down. An alternative to filing your mag catch is to use @Windowstheos printable SVTR mag catch or @sschoor key stock mag catch.

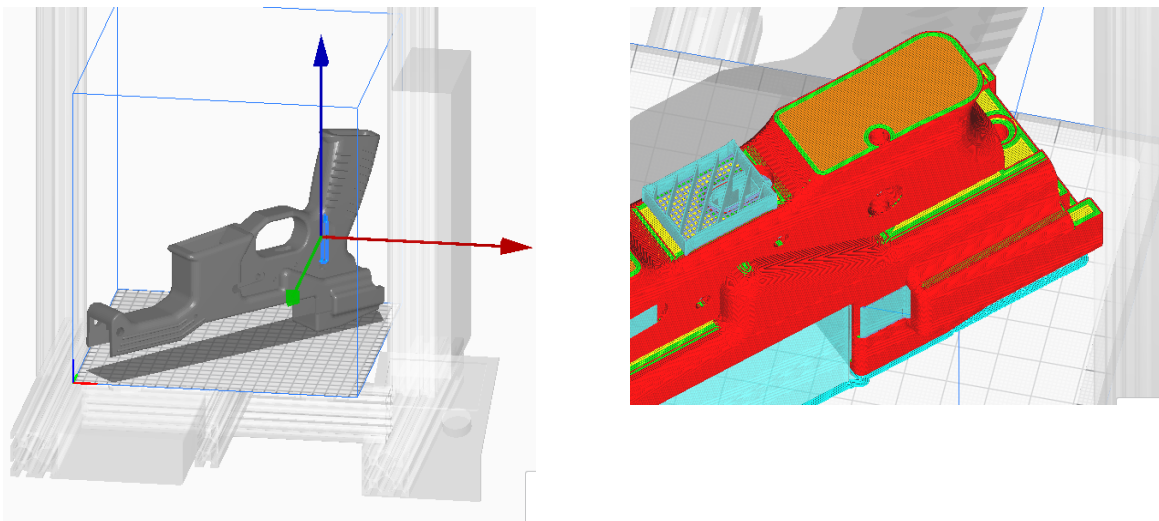
The SVTR will not work with 2 stage triggers. I designed the SVTR around an Anderson LPK. There are other triggers that work but 2 stage triggers will not. The SVTR was designed to be as aesthetically close to the GHM9 as possible as well as compact as possible. I could not achieve the look I wanted and have the FCG pocket deep enough for 2 stage trigger compatibility.

Pistol grips with a beaver tail will not match the profile of the pistol grip lower. The OG SVTR has the built in pistol grip. Not everyone likes that so I provided another model that is based around the FGC-9 pistol grip.

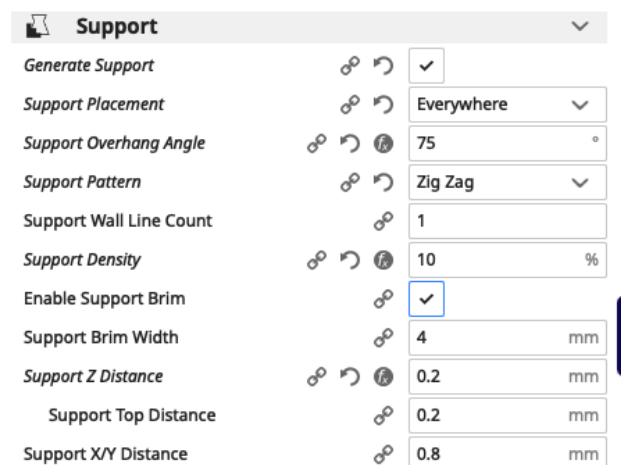
Printing (scale 2540%)

Both SVTR lowers will fit on a stock Ender 3 bed. If your model does not fit, then look at your bed adhesion settings and make sure you are using Cura with the Ender 3 Pro profile. The one piece lower will take almost have a roll of filament and over 2 days with the settings I use.

If you plan on printing the one piece lower receiver, you will need to use a support blocker for the safety detent hole. Be sure to verify that you have blocked the support or you will not be able to use a safety detent.



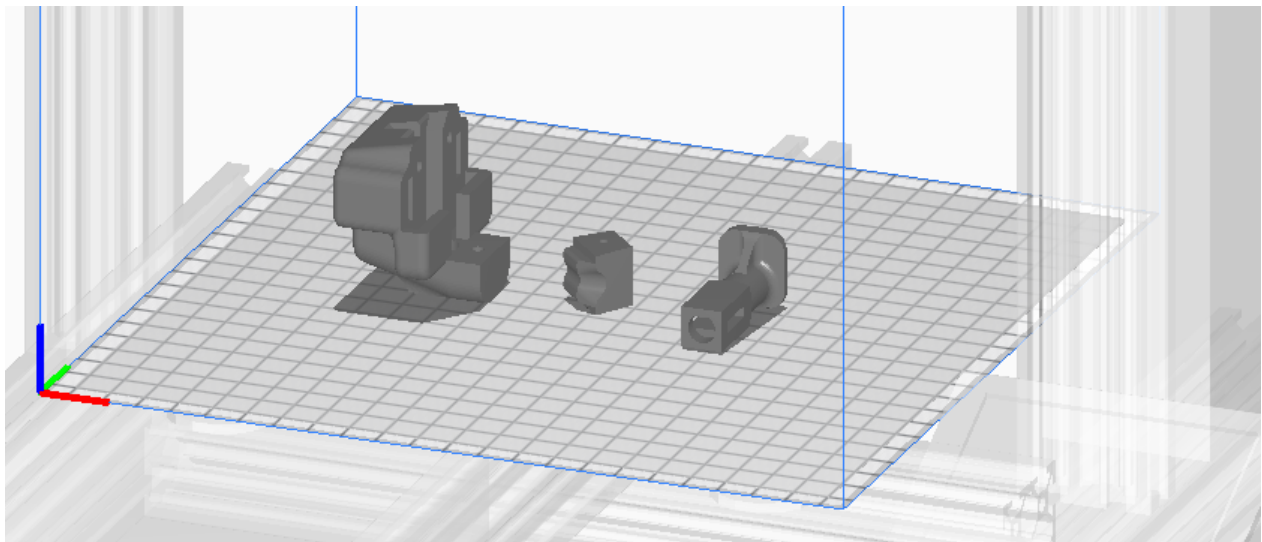
I would recommend not using tree supports. It has been done but you really have to have your settings dialed in perfectly. The following are the support settings that I have had most success with.



It is critical that you monitor the first few layers of the print. If any of the first few layers look loose or are not adhered well, then restart the print. If you do not get good bed adhesion then the front of the receiver will likely lift off the bed and cause warping.

If you need help with other print settings, refer to the FGC-9 Manual. eSun PLA+ is recommended.

The orientations for the stock button, feed ramp, and stock cover are shown below. The orientation of the button is critical. If it is printed vertically, then it will eventually snap due to the repeated impulse of locking mechanism snapping into place. The orientation of the feed ramp will improve the life of the printed feed ramp.



Tools and Materials

- Hacksaw
- 1/8" or **preferably 9/64"** drill bit
- Files and Sandpaper
- Ender 3 Bed Spring
- 1/8" × 1/2" Steel Bar
- 7 M3 Heat Set Inserts
- 7 16mm M3 Hex Bolts
- 5/16-18 nut and bolt

Instructions

Lower

Take your time removing all of the support. I have yet to have any part of the lower break while removing the supports but it is possible. Before you go pulling at the supports in the enclosed stock rail guide slot, try to break the supports on the left and right of each support tab with either a small flat head screw driver or a metal pick.

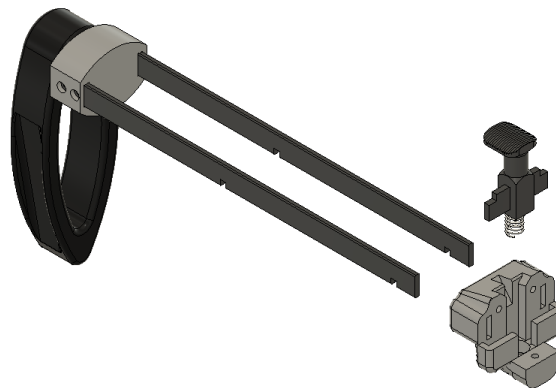
The three holes on the rear of the lower receiver are for 3 M3 heat set inserts. Press in and cut away any plastic that has oozed out around the insert. For more details see FGC9 documentation.

Earlier versions of the SVTR would crack around the front trunnion hole. The most recent version has pretty much eliminated that issue. If you would like to be extra cautious, you can heat weld around this area or use Ivan's method of fiberglass heat welding (<https://ivanthetroll.keybase.pub/Fiberglass%20Heat-Welding%20Tutorial.pdf>).

Regardless, make sure that there is not a gap between the receiver and the upper in this area when you tighten down on the take down bolt. If there is a gap, then add shims before tightening the take down bolt. These shims can be as simple as printed support scraps or scraps from your bed leveling prints.

Stock Assembly

The figure below shows the exploded view of the stock assembly.



To get the cleanest results the holes and grooves on the stock, use one jig per stock. I used a benchtop drill press to make the holes but a hand drill will work. It is recommended that if you do use a hand drill, then pre drill the holes near the edge with a smaller drill bit to avoid the bit walking off the work piece.

Once you drill the holes near the edge, take a hacksaw and cut on either side of the drilled hole to open it up. If the drill bit has walked off the side, then you can use a hacksaw to cut the proper size groove.

Inserting the stock rails into the slots for both the cover and the lower may not be super easy the first time. It can be done and I have done it with multiple different earlier prototypes. It's hard to get in the first time and might take some working to get the motion smooth and broken in. I would use a smaller portion of the bar stock with no drilled holes or cut grooves to do the first test fitting.

It will take some work at first but it is worth it.

It might take a hammer and some elbow grease to work the bar through the slots for the first time. If you do use a hammer on the metal bar, make sure that if you mushroom the end of the metal bar, then you must file it back flush or it will be a pain to try to fit through.

After you machine the stopping grooves on the bar stock, make sure that you file around where you cut so no metal edges catch on the inner walls of the stock channel.

The figure below shows the dimensions for the stock bar. It is 1.54" long.



Sandpaper and a metal file are your friend for the getting the stock assembly to fit and function properly.

The stock is very robust and I have used the same stock assembly for every prototype up until I made the stock rail jig and tested that.

Tailhook Adapter

Print buffer tube down with supports. This will leave the slot for the stock open. The tailhook adapter takes 4 M3 heat set inserts.

Feed Ramp

Minor hand fitting may be necessary for your feed ramp. Manually cycle the bolt a few times. If your bolt is leaving marks on the feed ramp then sand the face of the feed ramp. The goal is to make sure that the feed ramp does not ever so slightly push the bolt upwards when going into battery.

The through hole in the feed ramp should accept a M3 bolt, similar to the longer ones used on the FGC9. These holes can be drilled out to accept a roll pin if needed.

Upper Installation

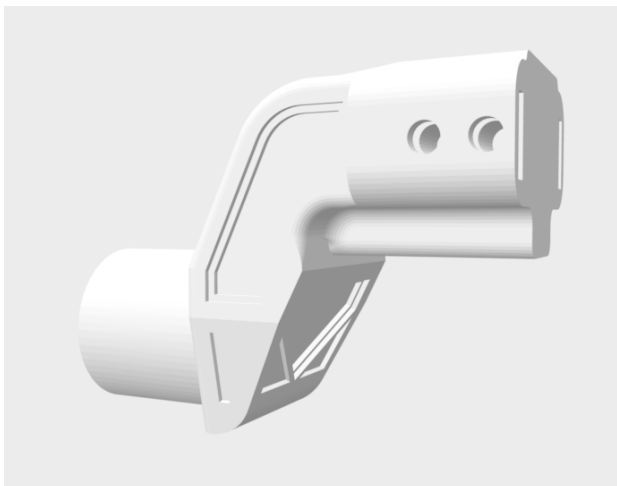
I used a front take down bolt for a Mac 11. You can grab a 5/16-18 nut and bolt from the hardware store. Make sure you tighten it down and sits flush against the receiver.

The upper installs with a tripped hammer. To remove the upper you must fire the trigger.

Visually and physically check that the chamber is clear before doing so.

Community Mods and Accessories

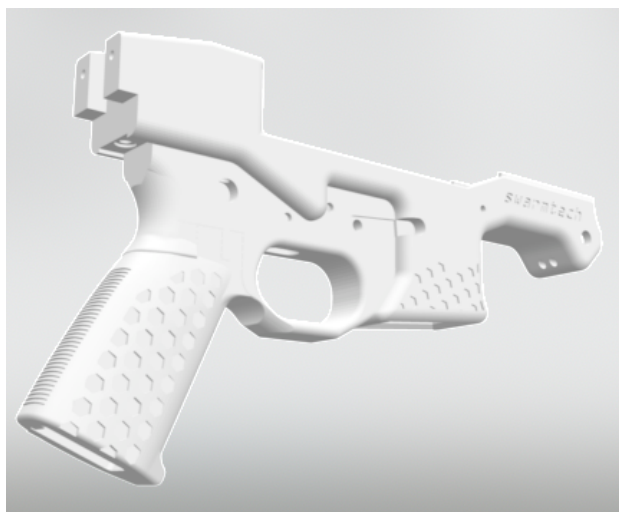
Below are a *few* byproducts of releasing the step files to the community during the beta stage of this frame.



Autoyeeten's Drop Adapter



Dognedo's Tailhook



Swarmtech Hex Stipple



1913 Rail Adapter

Credits

Special thanks to **SSCHOOR aka LUKE2236** for his involvement in the multiple beta's that this frame has been in. He has been a huge help since the beginning and likely holds the highest round count to date.

Special thanks to **Gunny McGunsmith** for all of his help and assistance with this lower. He is the lead developer on the printed mags and is doing big things for the VMAC family of printed receivers.

Special thanks to **Swarmtech** (cekfyajkbsneg & floppyflopflaps) for the extensive testing and design work of modified frames and accessories. They hold one of the highest round counts to date and have been heavily involved in the beta testing for the SVTR. They have provided multiple receiver options, including one designed to accept picatinny rail mounted stocks.

Special thanks to **Dognedo** for including his tail hook adapters as well as his work towards a curved mag specifically for the SVTR.

And special thanks to **v8vtwin** and the guys at **AWCY?** for hosting the most productive beta group for the SVTR.