The Holdout

This is an improvement to the original Holdout. It is directly built on previously released STEP files, but has been mostly remodelled. Changes include easier to print features and parts, an improved barrel system, the inclusion of space for a steel block, the changing of the spring from plastic to rubber bands, a changed firing pin, and a changed firing mechanism. Any new parts in this version have been designed from the start to reduce any overhangs, and use 45-degree angles if overhangs are necessary. If you find any issues in this design, don't hesitate leave me a message on the FOSSCAD IRC.

Changes to the barrel include adding the hinge system, the change from rifling to straight cuts (as the Liberator uses), which helps to simplify the printing of that piece, and allows for easier smoothing of the length of the barrel. There is a hook on top of the barrel that allows it to be locked into place once loaded. The end of the barrel is also less rounded. The barrel should be printed on end in order to improve strength.

Changes to the main frame include the removal of cuts in the handle that were supposed to aid in grip, and the addition of larger cuts along the edges to replace them. This should also allow for easier printing. The additions of the hinge features replace the sliding system previously used. Holes are now no longer cut all the way through the frame. This removes the need for caps on the pins, and potentially may help to strengthen the body. The exceptions are the hole used for the barrel hinge, and the holes for the grip thickeners. The barrel hinge is cut all the way through to allow for the easy removal and replacement of the barrel. The entire firing pin holder has also been replaced to accommodate the new nail size. The cut for the steel block is also new and significant, as it fills the majority of the grip area. It is sllightly tapered in order to allow the block to fit in easier. As such, the centre of gravity of the gun should be just behind and below the trigger when the steel is in place. There is a semi-elliptical hole behind where the barrel should be. This is for the barrel block. Having a non-circular rod makes it harder to have misaligned pieces. The main fillets along the edges of the grip have been replaced by a 45-degree bevel, which should also be easier to print. There are also several significant changes to the general shape of the model, but they are largely aesthetic. There is a hook at the top to secure a rubber band. The rubber band should be slipped onto the hook and the hook on the barrel to keep the barrel pressure on. The sides should be printed flat on the outside face in order to avoid support structures and to improve strength. This is also the quickest printing orientation, as it has the fewest vertical layers.

The hammer was completely redesigned for this new version. It should be printed on its right to avoid the need for supports or bridging.

The barrel blocks are mostly aesthetic, but they should give the barrel more area to put force on when the weapon is fired. They should be printed on the flat sides that sit against the main frame sides.

The grip thickeners are there merely there to thicken the grip without making printing difficult. They also should be printed on their flat sides.

The nail tube is there to hold the nail in a single piece, rather than between the two sides. It should help strengthen the frame by providing a large surface area to glue together. It should be easiest to print on end.

All structural rods should be printed on their sides for strength; otherwise, they are in danger of splitting in half when under stress. For the semi-elliptical pieces, that would be on its spine.

The hammer sear is a new addition to the firing mechanism. It should be printed flat on its right side.

The trigger is also a complete redesign from the original. It should be printed on its side.

The barrel rod caps are easiest printed flat on end.

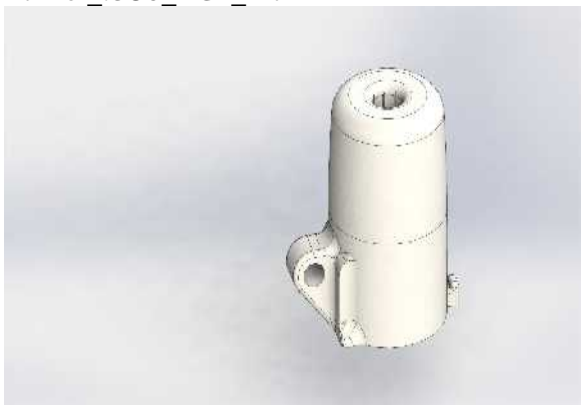
The firing pin (nail) buffer is supposed to keep the nail from slipping out, while still allowing the hammer to transfer energy though. It should be printed flat.

As I do not own a 3D Printer myself, I can make no promise that this design will work. However, I have consulted those who do own 3D printers, and have done everything within my capabilities to ensure the highest possible quality. 150+ hours have gone into making this design, stretched over 7 months, not including the original model from which this is based (likely another 75+ hours stretched over 2 months). The steel block that would be used to make this legal is integral to the frame if glued in. An included PDF and image gives dimensions for cutting the required piece. ALL pieces should be printed in ABS or Nylon at 100% infill!

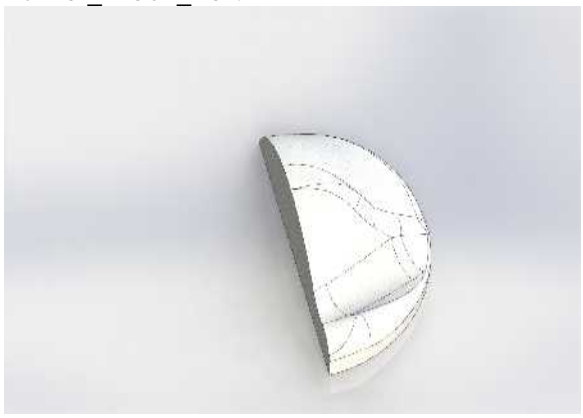
The creator of this design accepts no responsibility for any damages, direct or indirect, caused by design. Whether it be the manufacture, download or firing of this weapon, I am in no way responsible. Note that this firearm is not guaranteed to be legal in all countries or regions thereof.

Bill of Materials
Standard Printed Parts

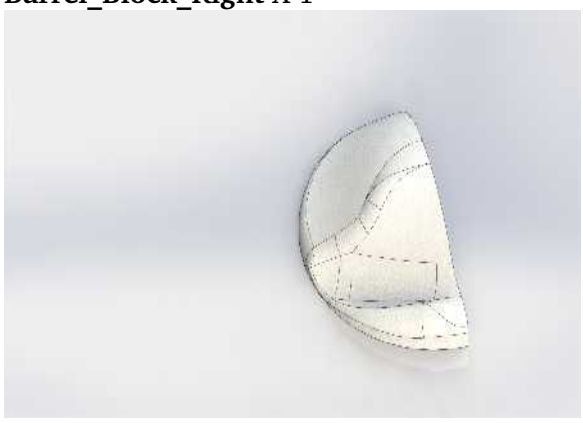
Barrel_.380_ACP_Plain X 1



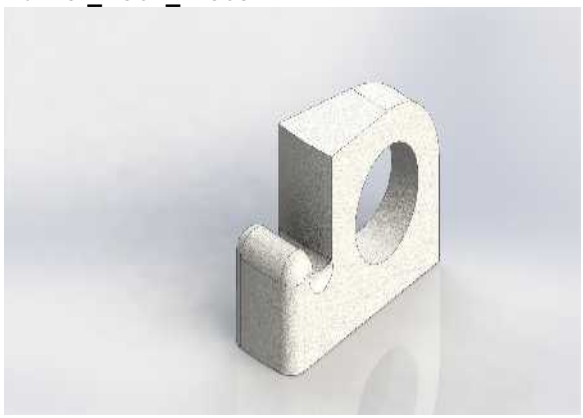
Barrel_Block_Left X 1



Barrel_Block_Right X 1



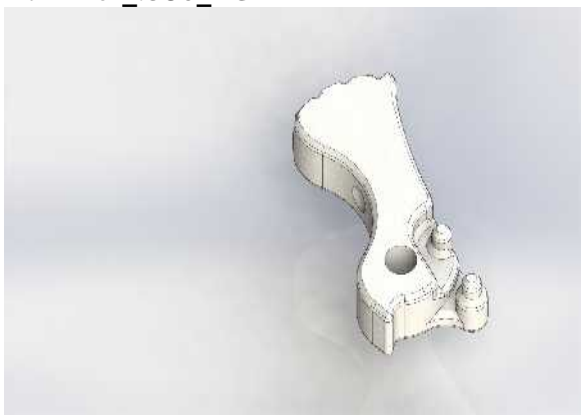
Barrel_Lock_Piece X 1



Grip_Thickener_Left X 1

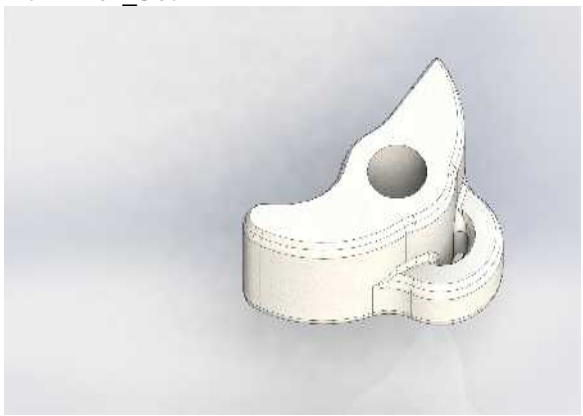
Grip_Thickener_Right X 1

Hammer_.380_ACP X 1

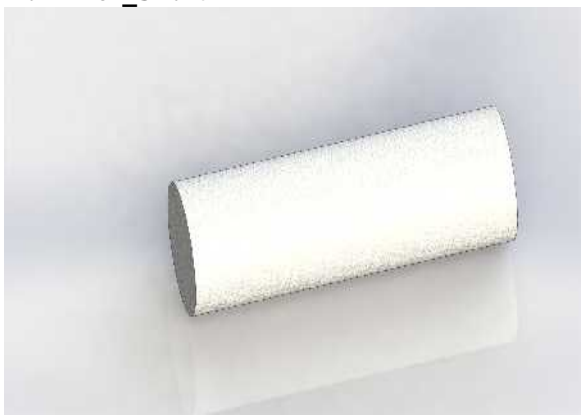


Hammer_Bridge X 1

Hammer_Sear X 1



Hammer_Shaft X 1



Nail_Head_Buffer X 1

Nail_Tube X 1

Rod_Barrel_Cap X 2

Rod_Barrel X 1

Rod_Long X 3

Rod_Semi_Ellipse X 2

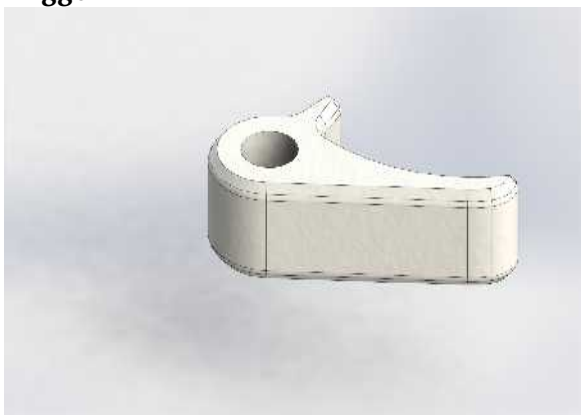
Rod_Short X 1

Rod_Standard X 8

Side_Left_.380_ACP X 1

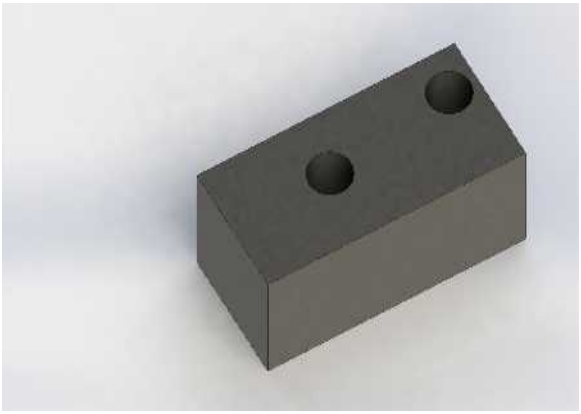
Side_Right_.380_ACP X 1

Trigger X 1



Standard Non-printed Parts

Steel Block X 1 (See provided image for dimensions)

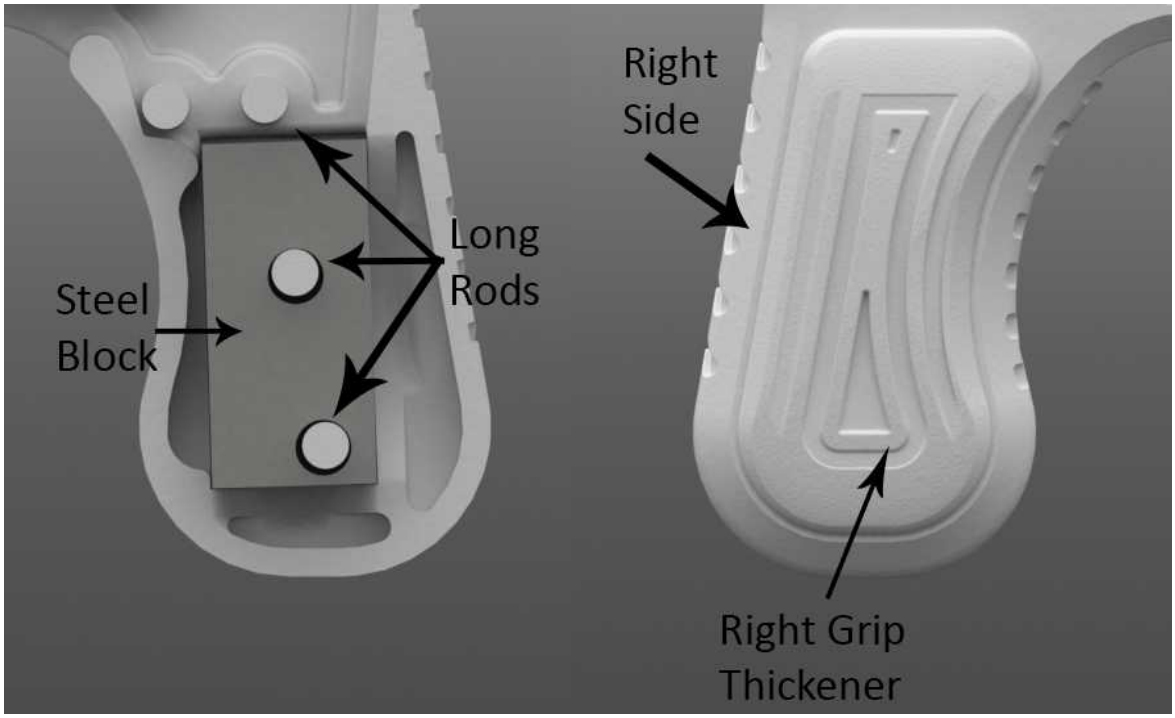


Rounded 20mm Nail X 1

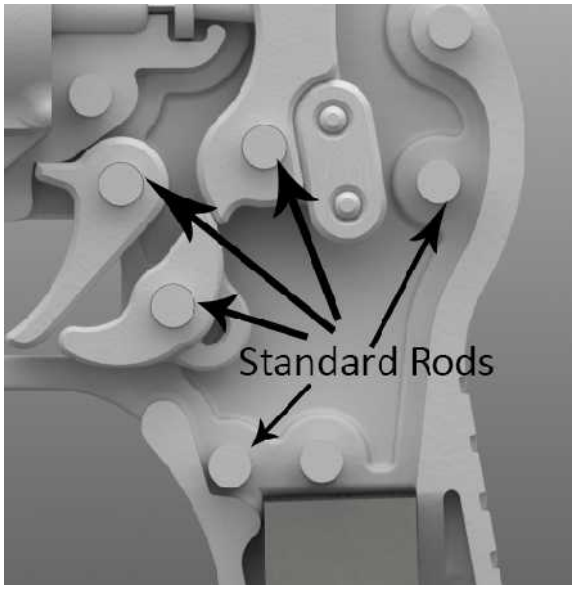
To (hopefully) clarify the above bill of materials, you will need all of the standard printed parts and all the non-printed parts. All renders of printed parts shows the orientation that they should be printed in.

I suggest following the instructions **without** adhesive first (a dry run), to see if everything fits, then do it again with adhesive. If rods do not fit, I would assume you could use some coarse sandpaper to make them thinner as needed.

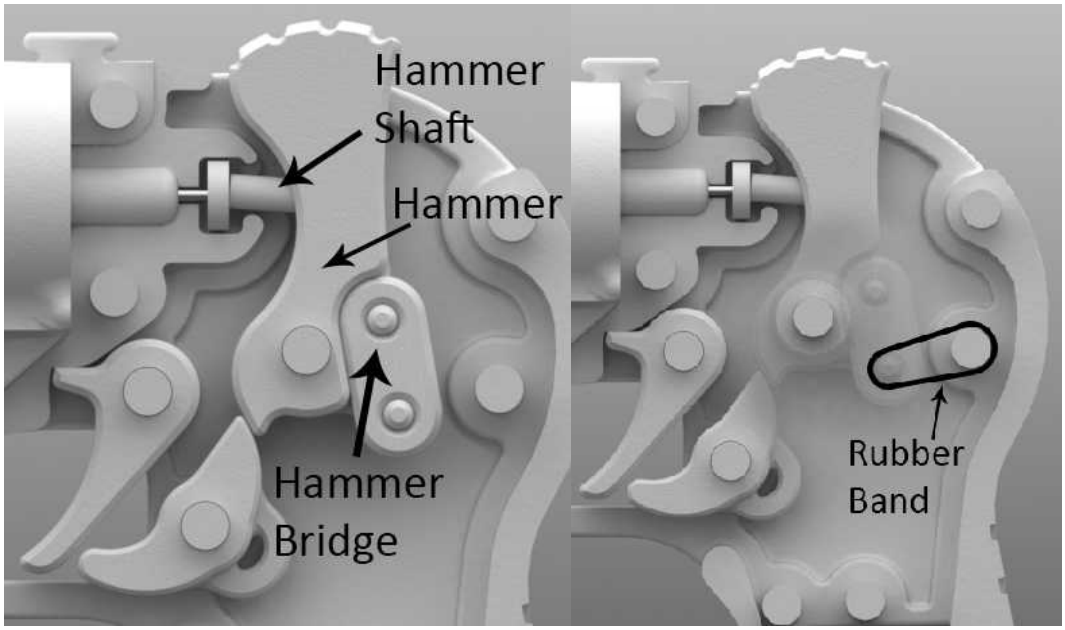
You should start with the right side, right grip thickener, and all three long rods. Glue all three rods into the grip thickener, then fit those through the holes on the side, and glue the two flat sides together. You should then epoxy the steel block into the slot, with the rods going through the drilled holes. See the photo for reference.



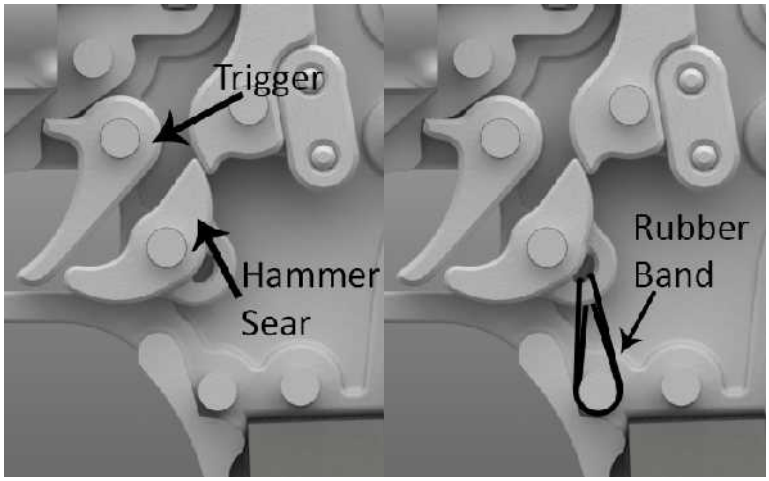
Next, you should take five standard rods and glue them into the five holes nearest the top long rod. See the photo for reference.



Collect the Hammer, Hammer Shaft, Hammer Bridge, and a small rubber band (or loop a larger one up for more strength). Fit the rubber band onto the rod built into the Hammer, then glue on the Hammer Bridge. Then glue the Hammer Shaft into the hole on the front of the Hammer, and fit the whole piece onto the shaft in the middle of the frame. Finally, loop the rubber band over the shaft to the rear of the hammer. You should use a powerful, small rubber band, as it must be strong enough to fire the round. See the photos for reference.

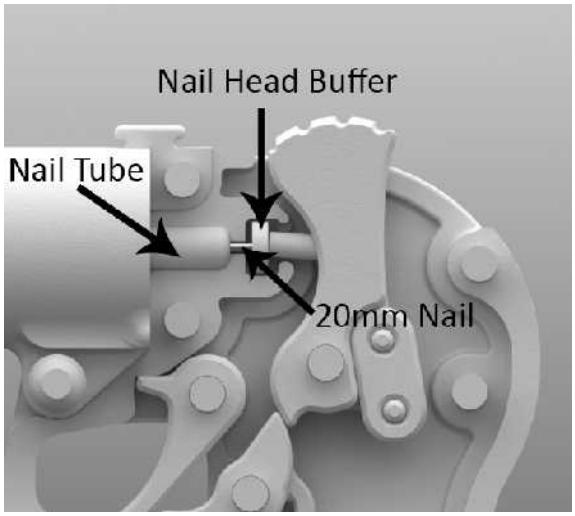


Collect the Trigger and Hammer Sear. Put the Trigger onto the furthest left standard rod that is in the open. Collect another small rubber band and join it between the loop on the Hammer Sear, and the Standard Rod fitted most directly below it, then fit the Hammer Sear onto the rod closest below the Trigger. Make sure your rubber band is small, and strong, but not too strong that you can't stretch it safely with a pull of the trigger. Just make sure it is held rather taut. To do so, you may need to double loop the rubber band around the lower rod. If need be, use multiple rubber bands. See photos for reference.

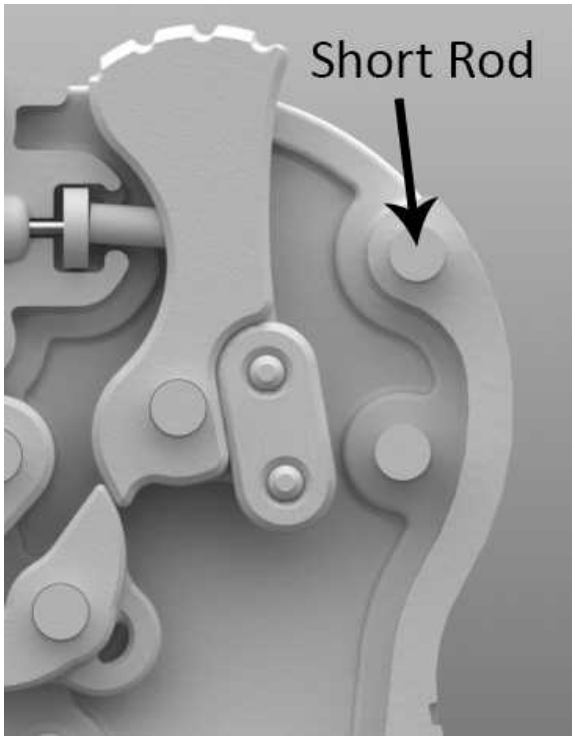


At this point, all internal mechanisms should be functioning. You should be able to (carefully) cock the Hammer and pull the Trigger to release it again. If it doesn't work, then make sure everything is oriented properly, all rubber bands are taut and all pieces are turning smoothly. If it continues not to work, then contact me on the FOSSCAD IRC and tell me what needs to be fixed, and/or share photos.

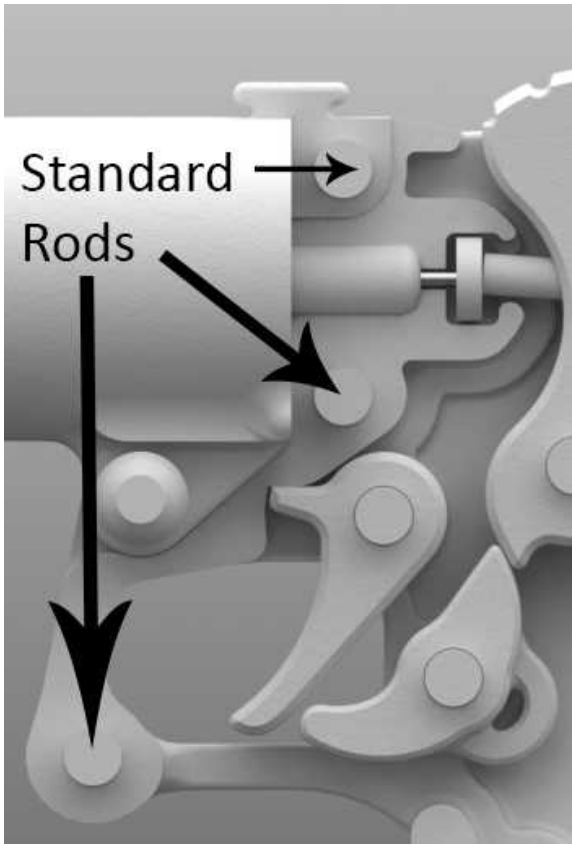
Now collect the Nail Head Buffer, a 20mm nail and. Make sure you have rounded off the end of your nail by about 1.5mm, so it is not sharp. Sit the nail inside the Nail Tube, with the head on the rounded side. Glue the Nail Tube into the set slot, with the nail head sticking out into the cavity to the rear of the tube. Then put the Nail Head Buffer into the cavity with the nail, sitting against the head. See photo for reference.



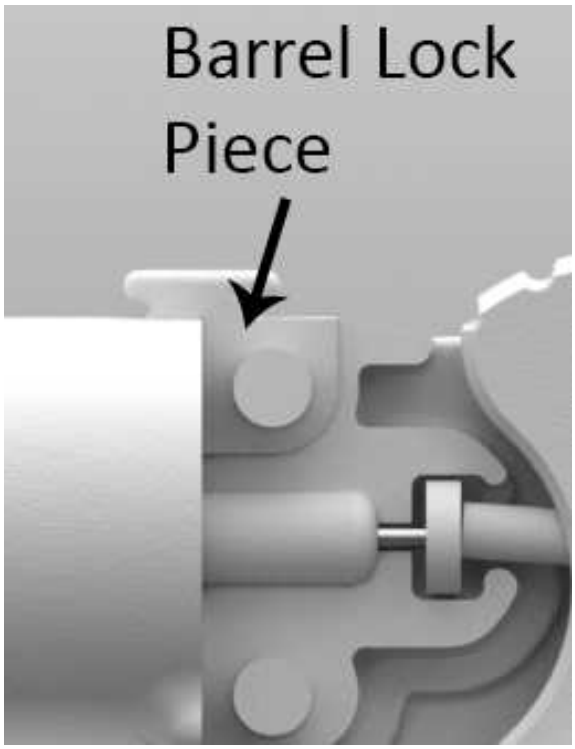
Collect the Short Rod and glue it into the furthest rear hole. See photo for reference.



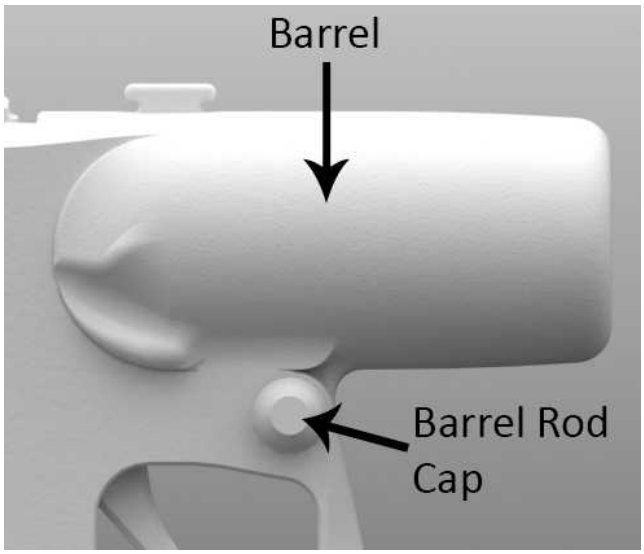
Collect the last three Standard Rods. Glue them in the holes above and below the Nail Tube, as well as in the trigger guard. See photo for reference.

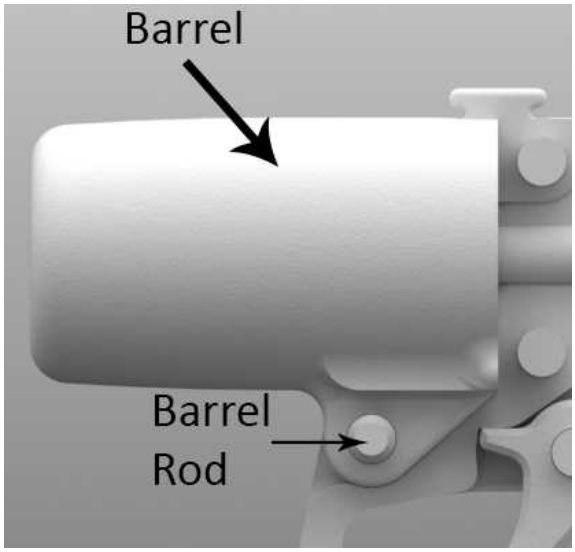


Now, collect the Barrel Lock Piece and fit and glue it over the top rod above the Nail Tube, with the main hook facing forward. See photo for reference.



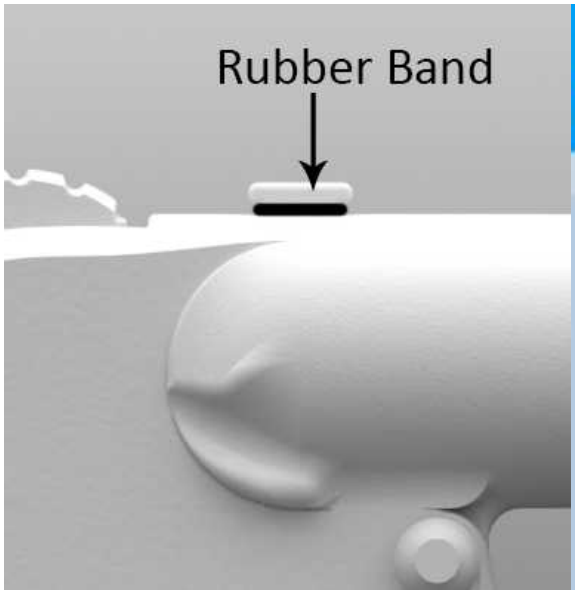
Collect the Barrel, Barrel Rod, and a Barrel Rod Cap. Fit the barrel rod through the hole most forward on the frame, then tightly press (**do <u>not</u> glue yet!**) the Barrel Rod Cap on the end the Barrel Rod. Now fit the Barrel onto the rod, with the chamber end facing the firing pin. See photos for reference.

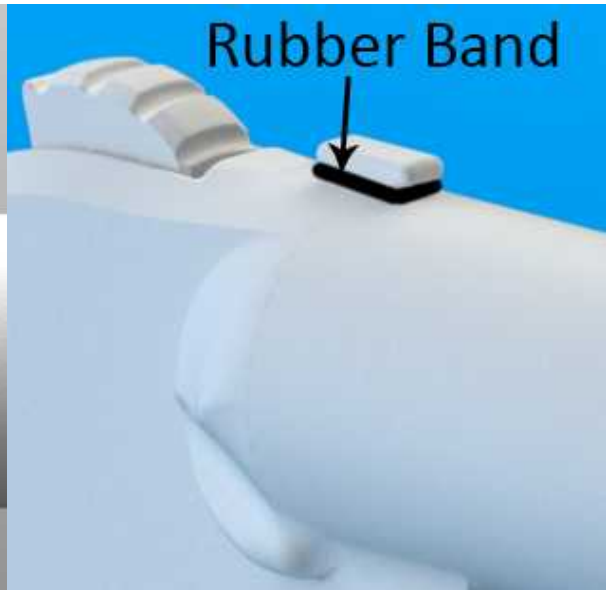




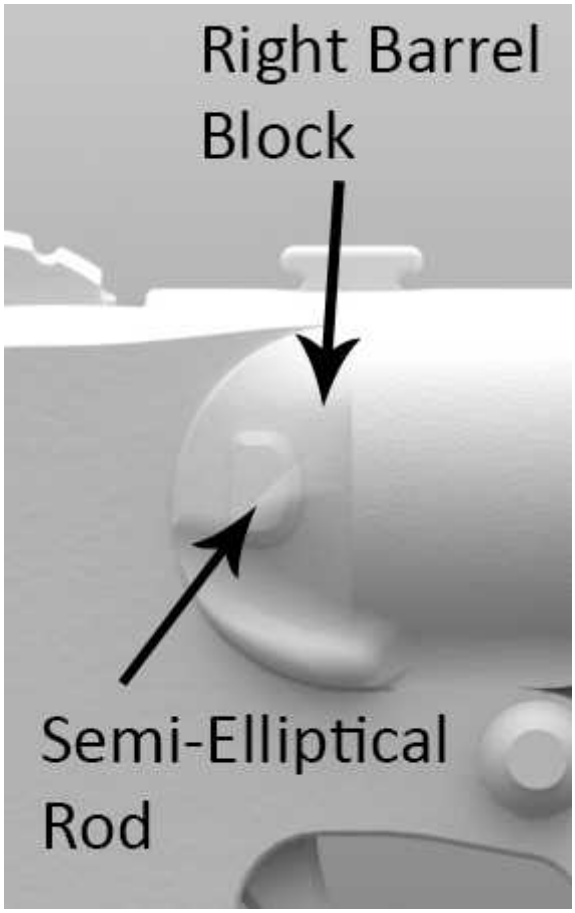
Now you should apply glue in all the holes on the Left Side (and a bit on the flat sides too) and carefully fit it against the Right Side. This is the most important bit of gluing, so make sure you get it right (this is where having done a dry run is most useful, as you can know everything will fit). Once this has been done, there is definitely no going back.

You can now glue (or press, as the case may be) the Barrel Rod Cap onto the left side to keep the barrel from falling off (it should now rotate on the Barrel Rod). Now loop (maybe even double loop) a small rubber band around the hooks on the frame and barrel to keep the barrel from turning. See photos for reference.





Collect the Right Barrel Block and a Semi-Elliptical Rod. Glue the rod into the hole on the flat side of the Right Barrel Block, and then glue the rod into the hole on the flat outside of the Right Side, also gluing the main flat side of the Right Barrel Block onto the flat outside of the Right Side. Make sure the front face sits flush to the same front face on the Right and Left Sides. Sand if necessary. Repeat for left side. See photo for reference.



You should now let the weapon sit for at least the recommended drying time, plus a bit to be safe (maybe a day, just to be safe). If you decide to test this, then you should clamp it somewhere and fire using a string. If it works, then cheer, clap and celebrate. If not, then tell me on the FOSSCAD IRC (also do that if it does work!). Feel free to edit at will. That is, after all, why I provide the files. I do not recommend using this design for regular use. It was designed to see what is possible in making an easily 3D printable firearm. It is in no way meant to be practical in the real world.

Notes

The steel block is provided as a STL in case you might like to try 3D printing it with an infill just as a structural piece. Note that in most cases, it would not be legal to do so.

Rant

If you are an Australian police force, or group of researchers working for the BBC, then prove you can read, and FOLLOW INSTRUCTIONS! Instructions are given for a **reason** (*gasp!*). Do not give biased results; do something right. I know that you want it to fail, because it makes us look bad. If it works when made properly, do it properly! One would usually assume that if you can build and run a 3D printer (unless you could not be bothered and bought preassembled or proprietary), you can read and do your (4th grade level) research on how to make a gun. Also, remember that it is a bit of a giveaway if you show yourself printing 50-60% infill parts on a printer WITHOUT A HEATED PLATFORM! That shows very clearly that you are producing weak parts (infill) with a weak material (PLA), due to your (selective) weak-mindedness. I have non tech-savvy/gun-loving friends who know it is stupid to use a weak material and/or infill with a firearm. If there was some benefit to having air bubbles in a firearms barrel, I am sure it would have been done by now. All you have shown is what happens when you do things incorrectly.

On a more personal note, if you intend to document your production of this design, then **please** follow my instruction. It would be heartbreaking for me have put so much effort and time into this design, only for people to run it into the ground only to “prove” that 3D printed guns don’t work. If it truly does not work, even when instructions are followed, then please contact me ASAP on the FOSSCAD IRC, and tell me what needs to be fixed. If you do print it (even if you never fire it, or it doesn’t work), then I would love to hear everything about it. Also, do not judge all printed guns by the Liberator. I developed this because I felt I could do better (or at least do something different) than Defense Distributed did. I have lost sleep working on my design, but in the end, I will have to leave it up to your conscience as to what you do.