PG22 Aurora – 1.4

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Disclaimer

Please read and understand this manual fully before attempting assembly.

This product is not print-in-place. This design requires skilled machining and assembly of additional components for complete assembly. You will need a rotary tool with cutoff wheel at minimum. These plans are intended for educational purposes only and assembly is at your own risk.

These plans are provided as-is. They should be treated as a novelty, and nothing more. These files are not an actual gun, they are CAD files depicting design of a handgun. They require skill and knowledge to make into a functional object.

You are responsible for knowing the laws regarding firearms where you live. Before building, please read up on all applicable gun laws and decide for yourself whether or not you can legally build this where you live.

Read all instructions carefully. Do not skip or skim. It's all here for a reason.

Required Parts

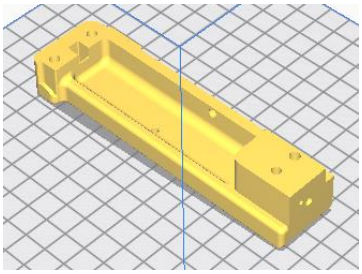
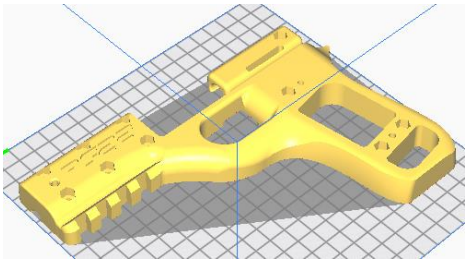
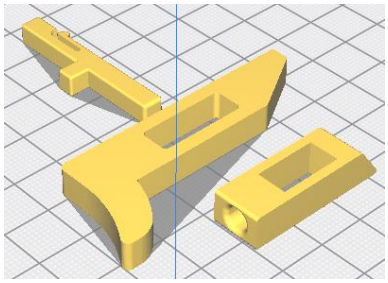
Amazon links are sponsored Affiliate Links and may change or disappear depending on availability.

- 12x M4 x 30mm Cap Head Screws - https://amzn.to/2xwUC1V
- 12x M4 Lock Nuts - https://amzn.to/33gOG8X
- 3x M4 x 6mm Set Screw - https://amzn.to/2wMXgjB
- 22 Caliber Rifled Barrel Liner - 5/16" OD - https://www.gunpartscorp.com/products/588180
- Firing Pin (5/64" Drill Bit)
- Strong Epoxy – JB Weld or Similar
- Trigger Springs (0.5 x 4 x 15mm – Ballpoint pen springs may work) - https://amzn.to/38KnXml
- Striker Spring - May need to be cut to length. Amazon source is unreliable.
    - Should be around 5/16” OD or Metric Equivalent
    - Should be around 44mm in length (Can be Cut)
    - A spring with a coil diameter of around 0.9mm or 0.035wg works best.

3D Printing

All prints were done using Cura as a slicer.

- Nozzle: 0.4mm
- Print Height: 0.3mm (Use Adaptive Layers for more detail)
- Material: High-Quality PLA. PETG or Nylon may work, but may be too soft.
- Slicer: Confirmed to print correctly on Cura 3.6 - 4.4
- Print in the orientations shown below. **Print each part separately for best results.**

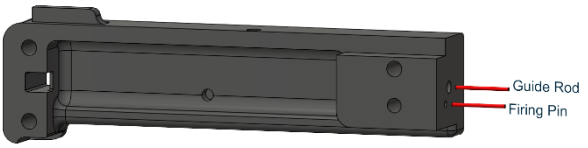




Print Settings

- Infill
    - Slide halves MUST be printed at 100% infill.
    - The trigger parts and safety should also be 100% infill.
    - The main frame halves can be printed at 30-35% infill. I use TriHexagon or Cubic.
- Supports
    - Placement: Touching Build Plate
    - Support Angle: 50 Degrees
    - Pattern: Zig-Zag
    - Density: 20-25%
    - You may have to turn off skirt or brim settings to allow the frame to fit on a 220mm bed.

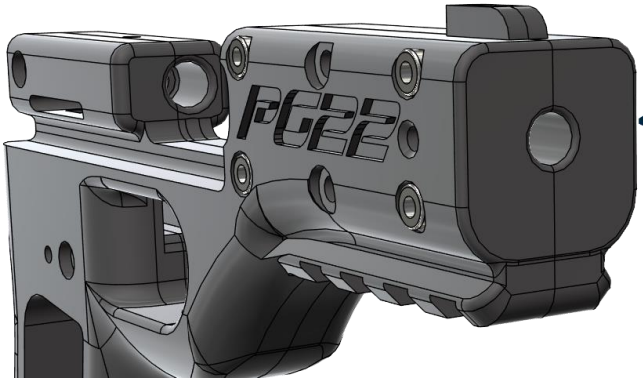
Assembly after Printing

Plastic Finishing / Cleanup



The smaller hole on the breech face (Slide_Left.stl) should be drilled out with a 5/64” bit, which we’ll later use as our firing pin. Ensure 3mm guide rod slides easily through the larger hole, and fits snugly into the Frame_Left.stl. You may need to use a drill bit to file the inside slightly.

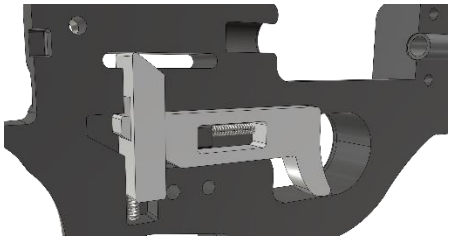
Temporarily screw the frame together, and use an 8mm or 5/16” drill bit to finish the hole for the barrel.



<- Drill to ensure size / shape.

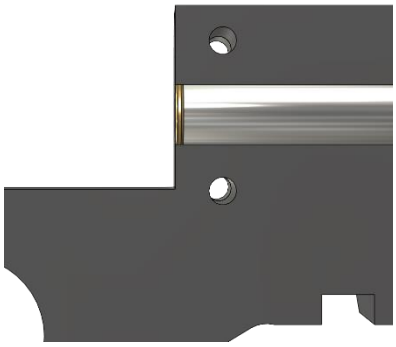
Trigger channels in the frame print with supports. If trigger operation is rough, you may need to smooth this area depending on your printer and settings. Depending on your print bed, you may want to sand the frame and slide halves to ensure they’re truly flat.

Trigger Assembly



The trigger assembly uses two 0.5mm x 4mm x 15mm springs. Ballpoint pen springs may be cut to work. Use plastic safe grease on all moving / sliding surfaces for best operation and light smooth trigger pull.

Barrel Assembly

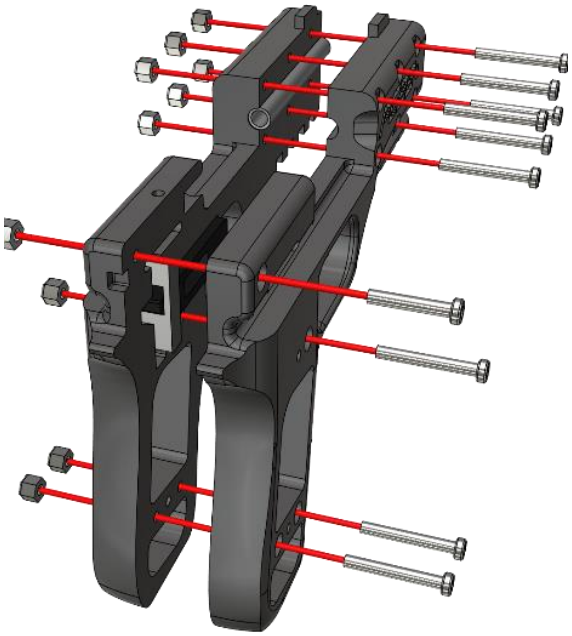


Use a small diameter pipe cutter, rotary tool, or hacksaw to cut the barrel liner to a length of 72.5mm. Ensure the ends are flat and even by chucking the barrel into a drill and using sandpaper to flatten each end. Use BarrelClamp.stl and a bench vice to clamp the barrel tightly, then ream a chamber using a #1 wire drill to a depth of approximately 20mm. Work slowly and carefully with lots of cutting oil. Periodically remove shavings. If you have a proper chamber reamer, obviously use that instead.

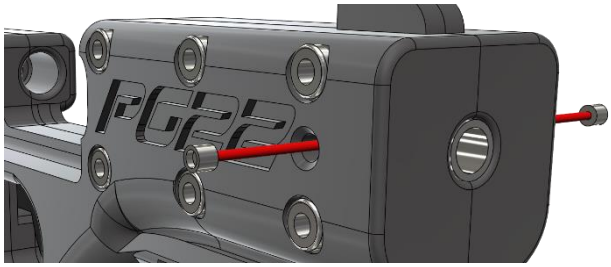
When fitting the barrel, use a 22lr case to ensure a chambered case head is flush with the frame. This is critical for proper headspacing.

Frame Halves

Press fit all nuts into the left half of the frame. Use M4 x 30mm screws to close the halves of the frame, with top-rear screw being cut to 22mm. Once closed, ensure the trigger assembly operates freely.



You may use M4 set screws to prevent the barrel from shifting backward or forward in the frame. Alternatively, you may use a small dab of epoxy before closing the frame halves on the barrel to secure the barrel to one half of the frame, though obviously, this method is more permanent. Clean and sand the exterior of the barrel for best adhesion.

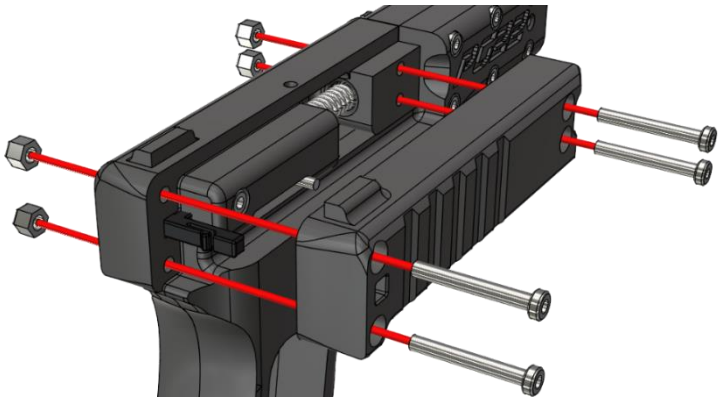


Slide Assembly

Apply plastic-safe grease to all sliding surfaces. Cut a length of 3mm rod to 30mm, and press fit into the hole on the inner wall of the left slide half.

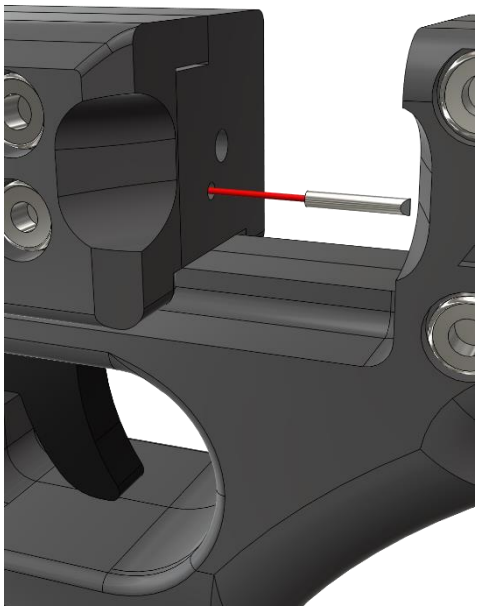
Cut 5/16” spring to a length of around 45-46mm, and insert into the frame. Compress the spring, and place the left half of the slide against the frame. Install the safety catch, with the tabbed notch facing to the right and rear. A spring with a coil diameter of around 0.9mm or 0.035wg works best.

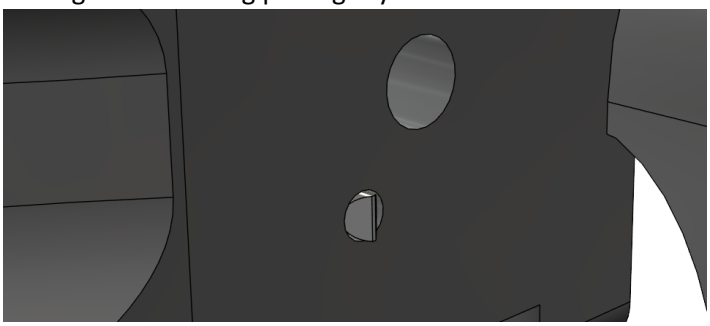
Fit the right half of the slide against the frame, ensuring the 3mm rod falls into hole on the right half of the slide. Do not force; round edges of the rod if it doesn’t fit. Press fit all nuts into the left half of the slide, then use M4 x 30mm screws to secure the halves of the slide together. Ensure the slide operates freely.



Firing Pin

Cut the shank of a 5/64” drill bit to between 10.75mm-11mm length. Chamfer the tip to a chisel point, leaving a flat face of about 0.5mm width. Clean and polish the firing pin, ensuring edges are not too sharp. Align the firing pin’s point vertically, and secure into the breech face using a strong epoxy. The firing pin should have around 0.75mm protruding from the breech face. Err on too short. Mine is 0.65mm and works great. If you find the gun does not reliably fire, you may need to lengthen the firing pin slightly.

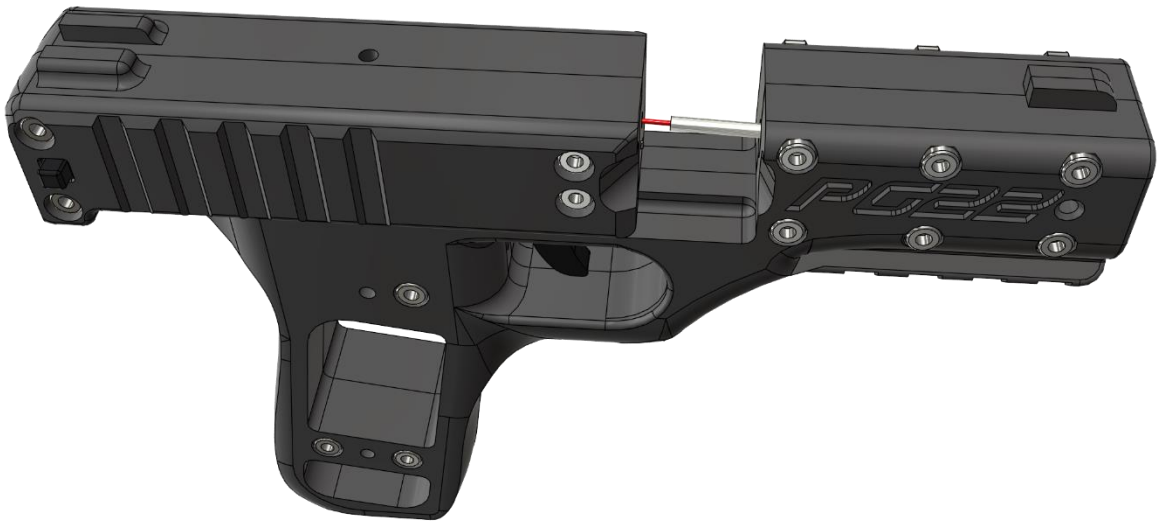




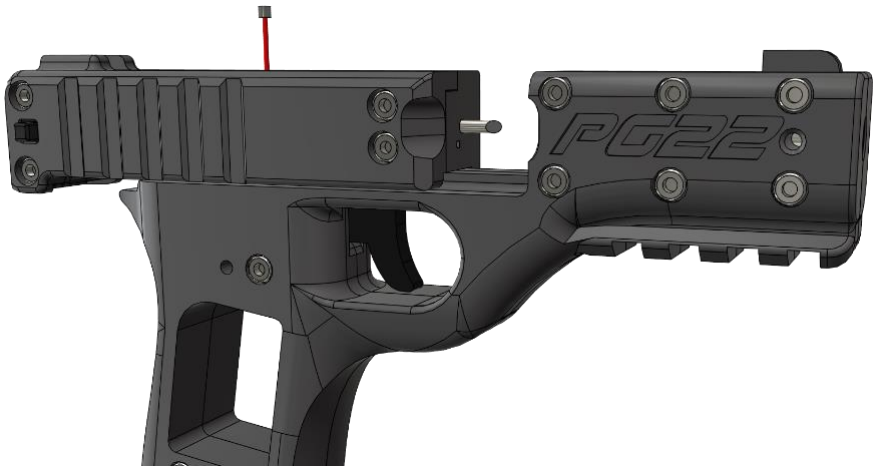
Guide Rod / Ejector

Cut a 45 degree angle at the tip of a 3mm rod, and round the other end. Overall length must be 74mm.

Apply a bit of plastic safe grease on the guide rod, and the hole in the slide. With the slide opened, fish the rod through the barrel, and into the breech face. This will be a tight fit as the hole is offset from the barrel, but the rod should have enough flex to fit through.

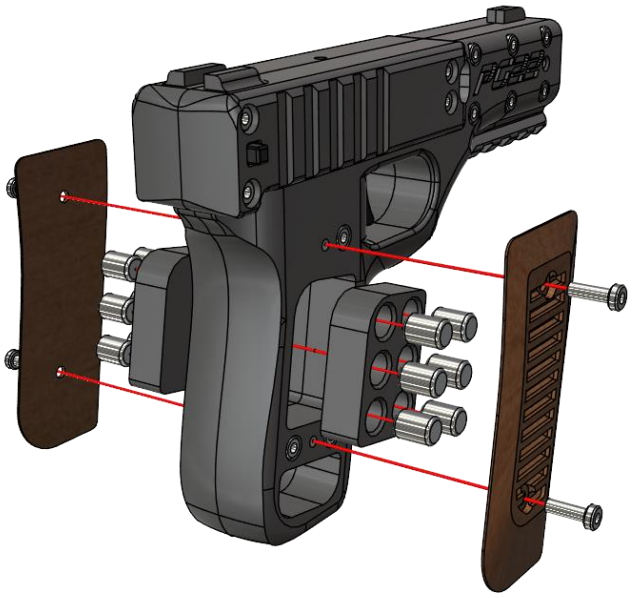


Ensure the guide rod is inserted fully into the frame. You may need to rotate the rod while applying force to work it into the frame fully. Align the flat side towards the right side of the gun, and secure in place with an M4 set screw.



Grips

Secure the grips to the left and right halves of the frame using M4 screws. You may opt for button head screws for a lower profile. To ensure detectability via metal detectors, you must permanently add metal mass inside the grips via epoxy. Cylindrical Pinwood Derby Car weights can be used with use with GripWeights.STL as an adapter. With all holes filled as shown, my final build used close to 5oz of metal total, plenty to ensure detectability.



Sights

The front sights are made with extra material. You will need to sand them to the point where they are accurate.

TEST FIRE THE GUN REMOTELY. Secure the gun to a solid surface and fire remotely with a string attached to the trigger.

Safety

Inspect the condition of the gun during and after each session of usage. Discard any parts which show excessive wear. Always wear safety glasses and ear projection when firing. You do not want ear or eye damage from vented gases in the case of cartridge failures.

Troubleshooting

- Casing stays in the chamber
    - Check slide for free operation, it should not stick. Excessive grease can cause problems.
    - Use a more powerful ammunition. I use a relatively strong spring, and because of this, mine hates Federal Champion (1080fps) but loves CCI Velocitors (1435fps).
    - Use a weaker slide spring. Keep same length spring, just thinner coil material.
    - Ensure the firing pin isn't too long. If it gouges into the brass too far, it will prevent ejection.
- Casing leaves chamber, but gets caught or stovepipes
    - Check slide for free operation.
    - Cut the ejection rod to a more aggressive slope.
- The safety broke
    - Too many dry fires onto the safety can damage it. For a more robust version, print using 95A TPU with file "Safety_TPU".

Legality

The PG22 is a CAD representation depicting theoretical design of a handgun. These plans are provided as-is for entertainment and educational purposes only. I am not liable for any injury or damage resulting from using these files. These plans do not represent a complete functional 3D Printed handgun, but a frame and components which require additional tools, materials, and knowledge to make into a functional object. You are responsible for knowing the laws regarding firearms where you live. Before building, please read up on all applicable gun laws and decide for yourself whether or not you can legally build this where you live.

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