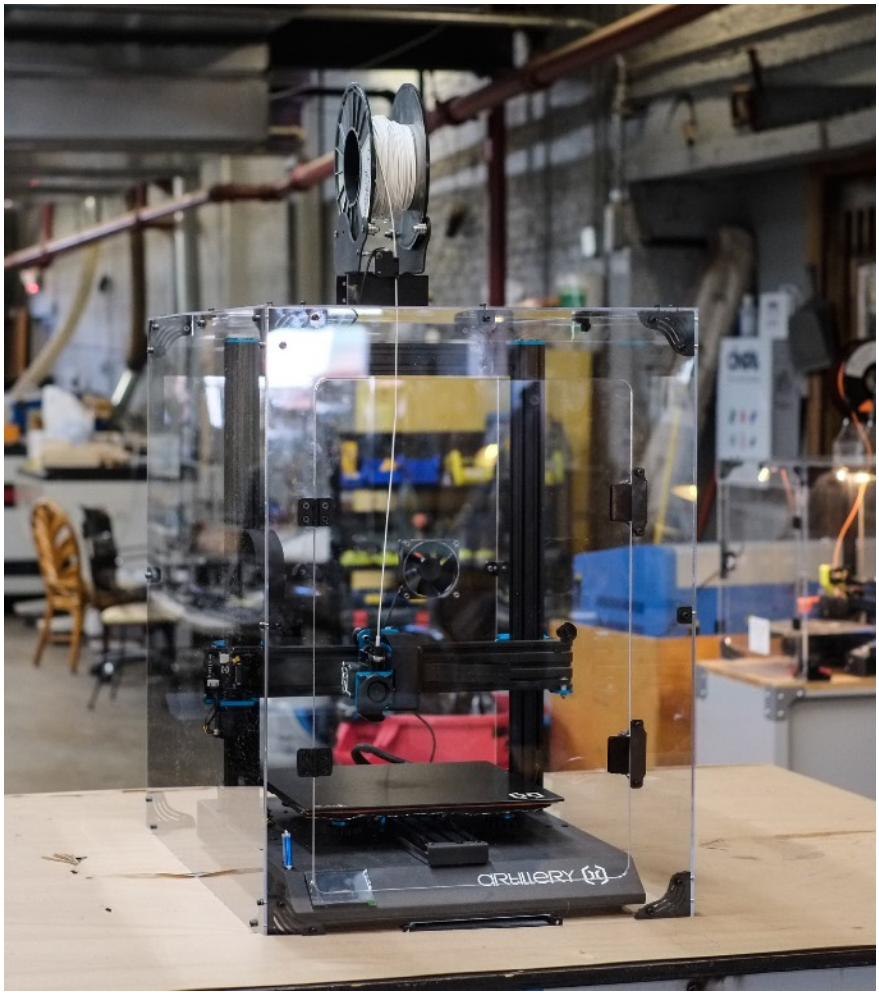
Artillery Sidewinder X1 Enclosure Kit

Installation Manual 1.3

January, 2020



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You Really Do Want to Read the Directions

Hey, we get it. You just got your new enclosure kit and want to start using it as fast as possible. How hard can assembling a few plastic panels possibly be? It's not really that hard, assuming you're following the directions, but try to use brute force and you'll end up working your way through your vocabulary of swear words. While the acrylic pieces in the kit are strong, they are still plastic and will break if bent far enough. The ghosts of the broken panels that have gone before you have become much stronger than you could ever imagine, and are whispering into your ear, "just be a little careful".

Before you Start

Is This Manual for *Your* Kit?

This installation manual covers the R1 enclosure design for the Artillery Sidewinder X1 printer. If you have a different version of the enclosure please read previous versions of the manual available on the website.

Is your Printer Customized?

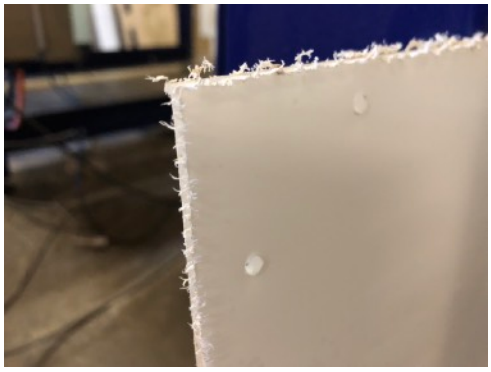
If your printer is stock then no customization is needed. If you have customized the printer, you should examine any modifications to make sure they don't block the panels. If part of one of the panels is blocked, you can use a laser or drill to customize one or more panels. **This should be done before removing the plastic or paper covers on the acrylic panels. Cutting acrylic requires great care as the plastic is prone to crack if mishandled.**

Preparing the Printer

Remove any filament from the hot end (will require heating the hot end) and remove the filament spool from the spool holder.

Turn the printer off and unplug the power cable from the printer's power supply.

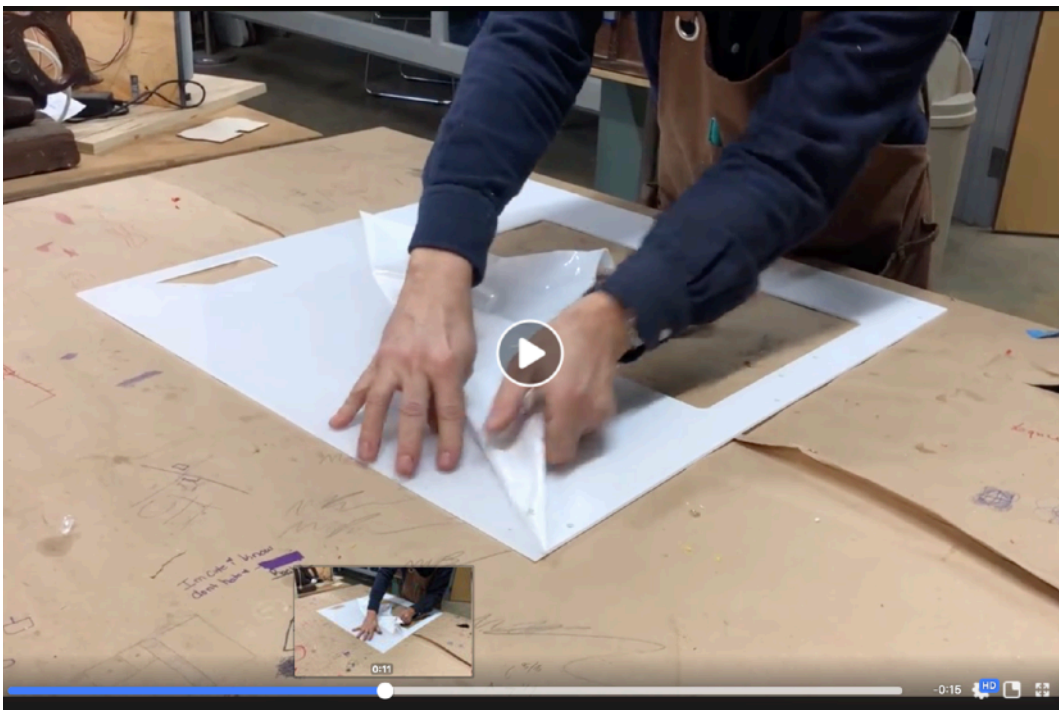
Don’t Panic If You See This!



If you can’t see through the plastic, please don’t panic! What you’re seeing is just the plastic or paper protective covering.

When plastic sheets are manufactured they are covered by either a paper (brown colored) or plastic (white) covering to protect against scratches. Follow the directions below to remove the cover and discover the beautiful plastic underneath.

To remove the covering from an acrylic panel, lay the panel flat on a table. Then peel up a corner of the covering and **CAREFULLY and SLOWLY** pull horizontally to the sheet to reduce the lateral forces that would bend the acrylic. This video shows just what to do.



Acrylic Cover Removal Instructional Video

Everything You Wanted to Know About Screwing But Were Afraid to Ask

Screw	Tool Needed	Usage	Relative Size
30-50mm Hex Cap Head	3mm Hex Wrench	Attach fan/filter, attach large front latch mounts	 30mm Hex Cap
12mm Hex Cap Head	3mm Hex Wrench	Connectors, hinges	 12mm Hex Cap
16mm Hex Cap Head	3mm Hex Wrench	Knobs, small latch mounts on some models	 16mm Hex Cap
#6 3/4” Wood Screw	Philips Head Screwdriver	Attach magnetic latch to mount	 3/4 #6 Wood Screw

Probably the most confusing thing about assembling this enclosure will be which fastener or screw to use. Luckily it's pretty easy to figure out once you know the system. While the exact screw to use will be detailed in each section of the manual, you probably won't need to refer to it once you know the secrets.

The most common screw is the 12mm hex cap head screws. The 12mm screws are long enough to attach things to the acrylic front, top, sides and back.

Each section will describe exactly which screw to use, to read carefully and use the specified screw for the best results.

The actual length of the "long" screws to attach the fan and or filter will vary depending on the depth of the particular shipment of fans we happen to get that month. They won't be hard to spot since they'll be the longest thing in the bags.

Assemble Panels

The front panels are made from thicker 1/4" acrylic to provide more structural rigidity where its needed: the door. Do not try to bend the 1/4” acrylic! The remaining panels are all 1/8”.

In general use the 10mm cap head screws to attach things to the 3mm side panels, and the longer 12mm cap head screws to attach things to the 6mm front.

1. The Front Panel

Each of the corners on the enclosure will be held together by the connectors pictured below. There are only two versions L and R, which can be identified by the letters stamped on the inside. The opposite connectors are identical, i.e. Bottom Right is the same as Top Left. In all cases the surface of the connector with the cutout pattern faces front or back.

The front door is designed so that the latches are on the left. Attach the corner connectors on the **back side** of the door frame using the provided cap head 12mm screws. See the photos below. The top of the connector should be flush with the top of the acrylic.

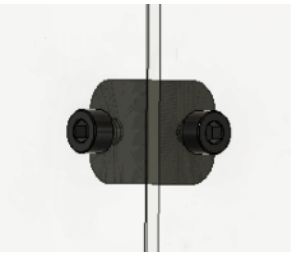
Top Left

Top Right

Bottom Left

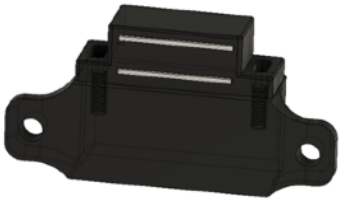
Bottom Right

There are also smaller connectors at the top and right side when viewed from the front.



The front should look like the picture to the right.

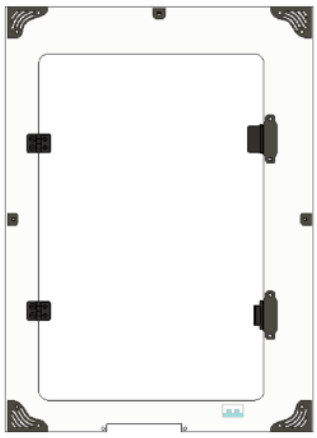
Locate the magnetic latch and use the **wood screws** to attach them to the latch mounts. Hand tighten and make sure they're secure, but do not over tighten or they may strip. The latch can be later adjusted front-to-back to make sure the door is flush with the door frame. The latch mount is attached via two M4 12mm cap heads



Attach the hinges to the door and door frame using M4 flat head 12mm screws and nuts. There will be some play in the hole size so that you can adjust the door to swing freely.

Attach the door knob by first inserting the square M4 nut into the slot. Use a 16mm cap head screw to attach the door.

Now that the latches are mounted it is time to connect the strike plates. Each plate comes with a squishy adhesive covering the same size of the plate. Carefully attach the adhesive side to the acrylic at the location of each latch. Then, adjust the width of the metal strike plate so that it is held on by the pressure of the two sides of the plate. The adhesive covering will keep the metal strike plate from scratching the acrylic.



2. Left Side Panel

Attach the left side to the front forming an L-shape that will stand up on its own, then attach one L and one R connector at the back. Then attach the two mid-panel connectors on the top and back as shown.

The vent is inserted from the outside and attaches with the standard M4 10mm screws.

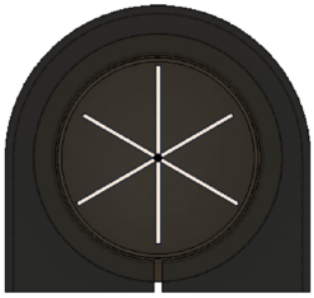
3. Back Panel

The back of the enclosure is shown to the right. The four corner connectors are mirror images of the front. The large hole is either for the fan, the optional an air filter (purchased separately) or completely covered up by printing a cover on Thingiverse. On each side and top are “mid panel corner connectors”.

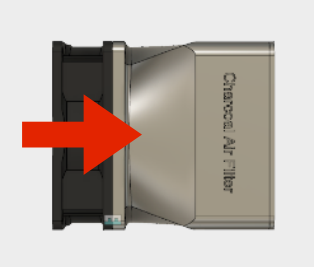
Make sure that the fan is oriented to blow air out of the enclosure.

On the back of the enclosure is a grommet and grommet holder. This makes it easy to take off the enclosure without unplugging the printer.

First insert the grommet into the grommet holder, then run the power supply cable through it. for easy access to the extruder. The entire assembly then slips into the similarly shaped opening in the left-side acrylic.



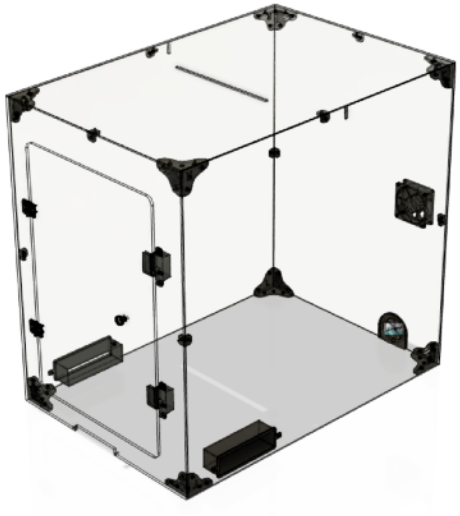
If assembling the Charcoal Air Filter, confirm the direction of the fan's air filter to pull air OUT of the enclosure and INTO the filter by plugging it into a USB power supply. Attach using M4 cap head 30mm or 40mm screws depending on the depth of the particular fan.



4. Top Panel

Attach the top of the enclosure using M4 10mm screws. The top has a front and back, so be sure to arrange the top so that the slit is to the front.

5. Right Panel

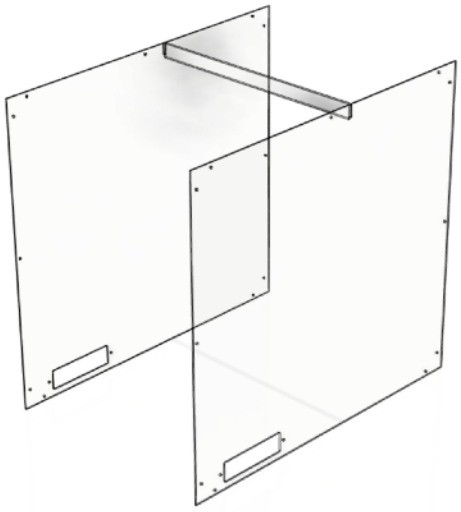


The last panel to attach is the right panel. All of the connectors are attached by now, so what remains is to attach the panel using 10mm M4 screws.

The right air input vent is also inserted from the outside at this side.

6. Attach Brace

The center brace fits into the slits on the left and right sides.



7. Assemble Filament Holder

First remove the cable connector to the filament runout sensor.

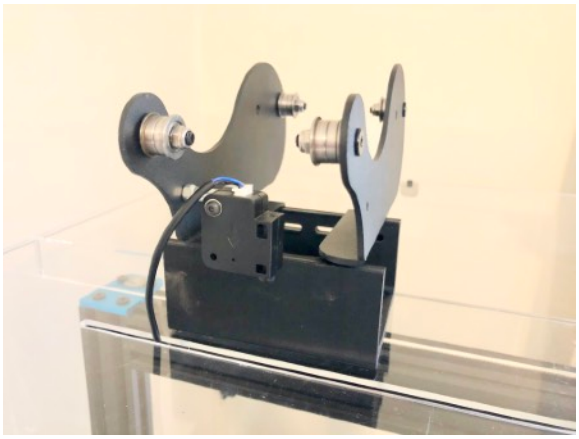
Next remove the stock filament holder sides from the Artillery Sidewinder.

Once the filament holder is removed it is safe to place the enclosure over the Artillery Sidewinder X1.

The stock filament holder can then be

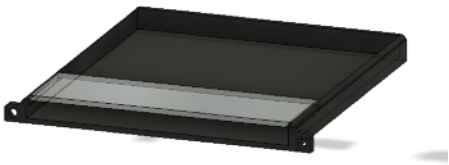
attached to the adapter as shown in the picture to the right. The screws are 14mm M5.

The cable for the runout sensor can be inserted through the top slit and attached as show to the right.



8. Air Input Tray

In order to get enough air to the electronics without also cooling down the inside there are two air input vents, one on each side of the case. The air is brought into the case through the side vents, and then it exits through the front tray, pictured at right. It consists of two parts, the tray, and a cover insert.



Slide the front tray into the front of the enclosure, and then lay the cover on top at the front as shown above. *Note that you'll need to lift the printer as you do so so that the tray can fit over the metal fan screen on the bottom of the printer.* **Adjust the location of the enclosure so that the tray completely covers the case's air intake vent.**

There are holes to use 12mm M4 screws to attach the tray, but it's not needed in many cases. **If you do attach it, it must be unscrewed before you can take off the enclosure.**

9. Sealing Gaps

Once the enclosure is completely put together, it is time to make sure that each of the panels is held tightly to each adjoining panel. The connectors are designed with a small amount of play that allows you to make small adjustments for the perfect fit.

1. Loosen screws on the panel to move.
2. Push that panel into place. You may need a friend to hold it tightly in the right spot.
3. Re-tighten the screws to hold the panel.

Repeat the product, going around the enclosure looking to make sure all of the panels are flush to each other.

10. Managing Enclosure Temperatures

There's not much to a 3D printer enclosure. Although ours look fancy, functionally they're not much different than putting a card box over the printers since both designs are passively heated by the heated beds.

We generally get two types of customers:

1. Those interested mostly in air quality.

2. Those interested mostly in print quality.

The problem is those two goals use two different techniques in terms of airflow. For the best air quality, as much air as possible needs to come into the enclosure and then be vented or filtered out. All of our enclosures come with fans, and we've chosen the CFM ratings to match the cubic size of the enclosures. This ensures that for filament types like PLA, which don't like the heat there's enough airflow to keep the temperatures in the safe zone.

At the same time, you want the internal temperatures higher for filaments like ABS, which happens naturally because the recommended bed temperatures are much higher than for PLA, typically in the 105-120C range. With the fans turned on we shoot for internal temps between 35C and 40C for 3D printers that use E3D hot ends, because E3D recommends that temp range to avoid clogging. By keeping the temperatures in that range it puts the least stress on the equipment and follows the manufacturer's guidelines.

This works great for people either interested mostly in air quality or those who are risk-averse and don't want to take a chance of clogging their hot ends or decreasing the useful life of their printers.

More experienced 3D printer owners though, those for whom a clogged nozzle is an acceptable risk, might want to run the temperatures higher for less warping of ABS parts or to print nylon. In those cases, you can turn off the fans or even print one of the vent covers and just not vent at all. For our internal print farm, we do the later on a couple of machines where the temperature when printing ABS gets as high as 46C.

They've been running like that for years with no clogging and even with no venting of the power supplies, we've never had a power supply fail either. Obviously, your mileage may vary, as it depends on a lot of variables such as filament quality and the quality of the power supply in your printer.

If you're looking for the highest temperature's possible, try turning the bed heater on for an hour before you print.

The other part of the equation is the printer design. Those printers where the hot end is at the top of the enclosure make it easier to achieve higher temperatures because the hot air rises to the top, and the vertical hot end position is fixed. Those printers with the hot ends at the bottom are always going to have more problems managing temperature simply because the temperature is more likely to vary as the hot end goes from the bottom to the top of the enclosure.

If you're looking to achieve a particular temperature with your enclosure, let us know and we'll give some advice on how to manage, but its really not that hard:

Lower Temperature = More Air Flow

Higher Temperature = Less Air Flow

The optional thermometer will let you know approximately what temperature it is inside the enclosure. It attaches to the left side of the door piece using the same hole as the top-most corner connector as shown. It comes with a longer screw to fit through everything.