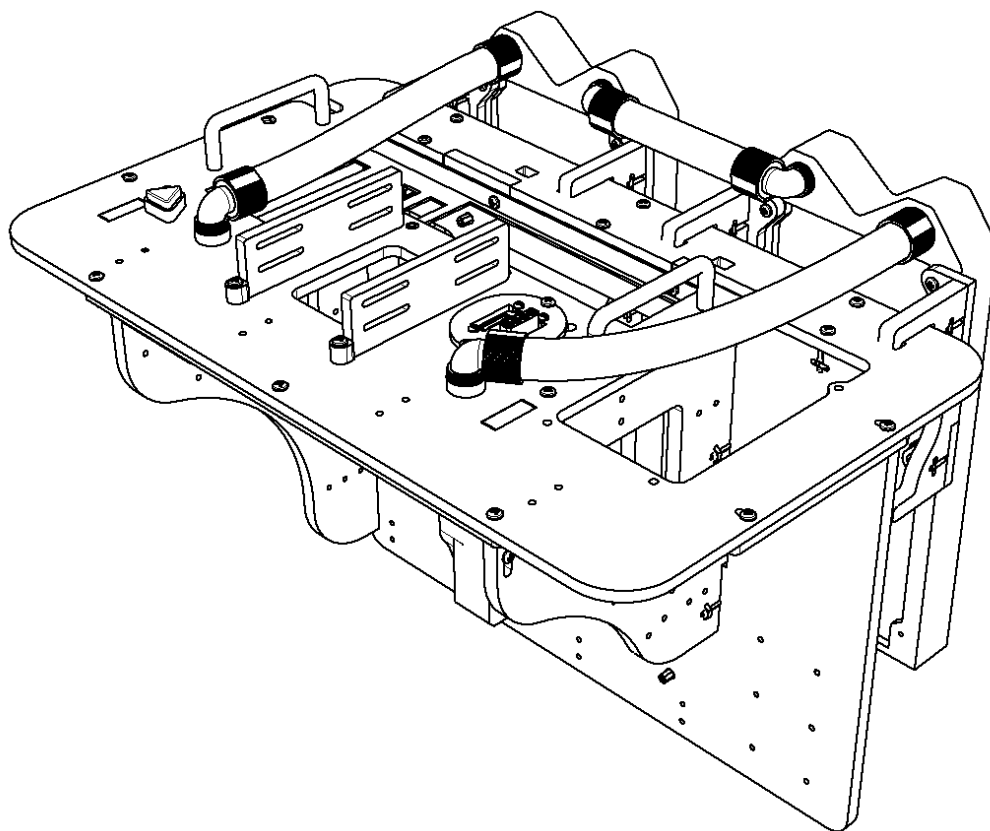# Puget systems

Aquarium DIY Kit
Micro ATX Version 2

Assembly Instructions

WARNING

Submerging your hardware in mineral oil will void your warranty. Do this project only at your own risk. Puget Systems is not liable for any hardware problems or damage to your personal property. Mineral oil is very difficult, if not impossible to clean from your components once they are submerged.

Please be sure to inspect your aquarium parts for shipping damage before installation. In particular, we recommend filling the acrylic tank with water and checking for leaks before proceeding.

Read Before Building Your Aquarium PC

Test your hardware before submerging.

The last thing you want is to find out you have a bad stick of memory once it is already covered in oil! Make sure to test everything thoroughly -- it will save you a lot of headache in the future.

Check that none of the power/data cables use rubber insulation.

Some heatsinks (specifically newer Intel Stock CPU Coolers) user rubber insulation instead of the more common plastic insulation. This gives the cables more flexibility, but since rubber quickly degrades in mineral oil the insulation can dissolve in a matter of days. This can very easily cause wires to come into contact with each other causing the system to short out. If you are not sure of the insulation material, we recommend submerging part of the wire in mineral oil for at least 48 hours. If the insulation appears degraded, use an alternative component with different wire insulation material.

Do <u>not</u> allow the oil to get above 50C

The aquarium tank will develop cracks if exposed to too high of temperatures. Make sure your radiator has adequate airflow to keep your aquarium running cool. The acrylic tank is rated for up to 50C, so allowing the oil to get above this temperature puts the tank at risk of cracking. For reference, 50C is roughly the same as the hottest water you should be able to get out of your tap.

Clean everything before submerging.

Make sure that there is no dust on any of the hardware that is going to be used in the system, especially if the hardware has been used before. Even a small amount of dust can make the mineral oil cloudy. If you are using aquarium rocks, be sure to ash your rocks before putting them in the aquarium! They are often covered in dust and other particles, which can cause your aquarium to look cloudy. Put them in a towel, and rinse them off in a sink, then spread them out and allow them time to thoroughly dry before adding them to your aquarium.

Do not power on the pump until it is filled with oil.

The pump **will** burn out if there is no liquid to provide resistance and cooling. If you need to test the system once installed but before filled, simply unplug the pump before powering the system on.

Do not over-tighten the screws.

Acrylic will crack if the screws are over-tightened. You want the screws to be tightened until they are just a little beyond snug.

Do not overfill the aquarium.

Mineral oil will expand slightly as it heats up, so be sure to only fill the aquarium to within a few inches of the top. You should also avoid filling the aquarium to the point that the motherboard ports (keyboard, LAN, etc.) are submerged to help
prevent the oil from wicking along the cables.
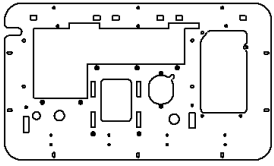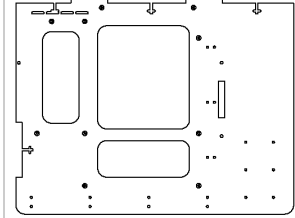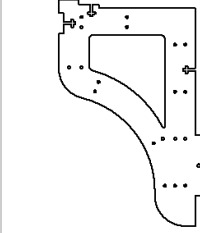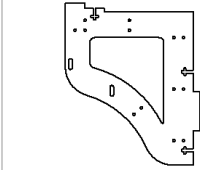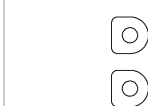
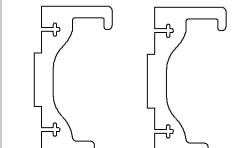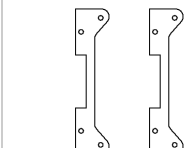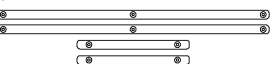## Use wireless devices whenever possible.
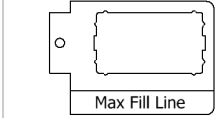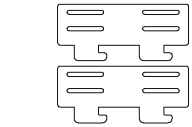
Mineral oil will wick along any cables it comes into contact with. Due to the potential mess this may cause, we recommend using wireless devices whenever possible.
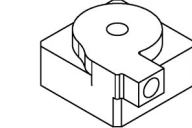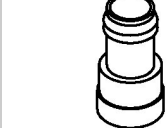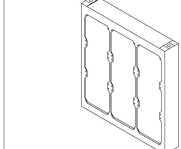
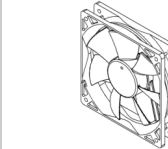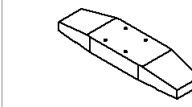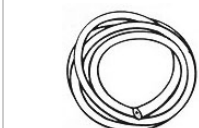## Choose the correct type of CPU Cooler.
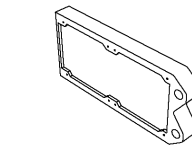
The best CPU cooler for an aquarium PC will have fins aligned vertically when the system is complete. This will allow convection to effectively circulate the oil through the cooler. The fan is not needed, but we have always elected to keep it installed to help circulate the oil. The fans will not burn out due to being in the oil, but will spin at a much lower RPM.
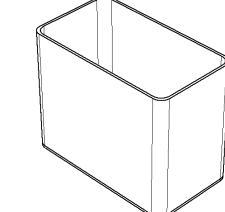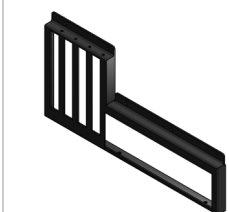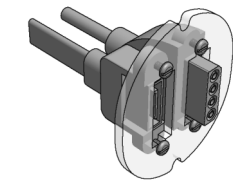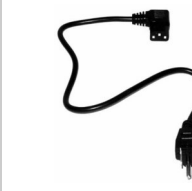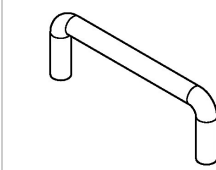
Included Hardware *Images not to scale
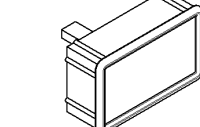
Acrylic Components

Top	Back	Left Side	Right Side	Thermal Sensor Mount
				Max Fill Line
2.5" HD Mount	**HD Locking Spacer**	**1-2 Radiator Mount A (varies by cooling kit)**	**1-2 Radiator Mount B (varies by cooling kit)**	**Centering Braces**

Cooling Components

Swiftech MCP35X Pump	1.5" Tubing Piece (1/2" Diameter)	2 Panel Mount Barb/ Sockets	2-4 Swivel Angled Barbs (varies by cooling kit)	1-3 Straight Barb (varies by cooling kit)
0-2 2x120mm Radiator (varies by cooling kit)	**0-1 9x120mm Radiator (varies by cooling kit)**	**2-9 120mm Fan (varies by cooling kit)**	**0-2 Radiator Stand (varies by cooling kit)**	**1.5-5' of 1/2" Tubing (varies by cooling kit)**

Other Components

8 Gallon Aquarium Tank	4 Slot IO Shield	SATA & Molex Pass-Through	Power Cord	2 3 inch Handle
Power/HD LEDs	**Power Switch**	**Thermal Display**		

Included Screws

Screw *to scale		Quantity	Length	Thread Size	Use
	🟣	4	7/8"	No. 6-32	Thick to Thick Acrylic Assembly
	🟠	14	3/4"	No. 6-32	Thick to Thin Acrylic Assembly
	🟢	4	5/8"	No. 6-32	Pump Mount, HD Lock
		22	3/8"	No. 6-32	PSU & Radiator Mount, & Centering Braces
	🔵	9	5/16"	No. 6-32	IO Shield and SATA Pass-Through Mount
		12	3/16"	No. 6-32	Motherboard & PCI Card Retention
	🟣	18	-	No. 6-32	Acrylic Assembly
	🟤	4	1/2"	No. 8-32	3" Handle Mount
		8	10mm	M3x0.5	2.5" HD Mount
		8	1/4"	-	Motherboard Mount

Items You May Need (Not Included)

Tools

Phillips Screwdriver	Scissors	Adjustable Wrench	Zip Ties

Miscellaneous

Mineral Oil

Available at your local hardware store, farm supply store, vet clinic or online from STE Oil.

Aquarium Rocks

Available at your local pet store, aquarium rocks come in various colors and types. These rocks can be a cheap way to really make your computer look like an aquarium!
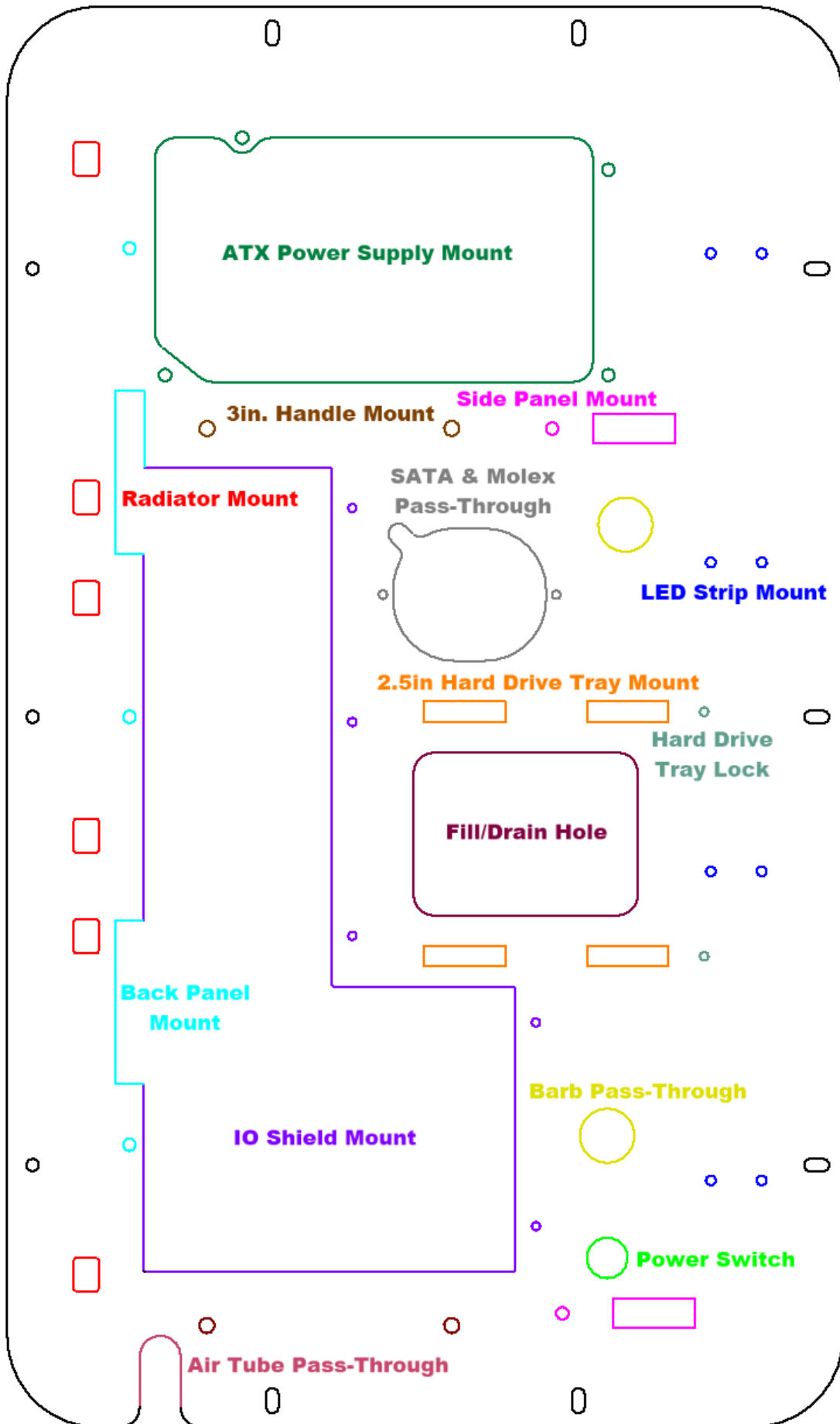
Bubble Bar, Tubing, Pump & Flow Valve

Also available at your local pet store, bubbles are an essential addon! We recommend a pair of 6 inch bars. The flow valve is necessary as we've found it very convenient to be able to control the flow of air. The valve also provides a convenient joint at which you can
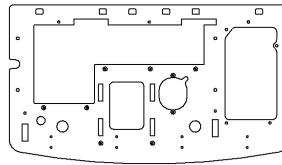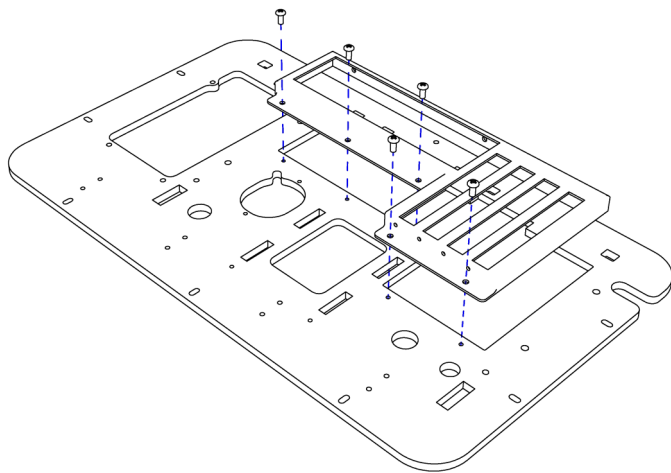
Cleaning Supplies & Tools

Mineral oil is messy! Make sure you have the following items on hand: a funnel for cleanly filling the system, paper towels to clean up spills and clean your hands, and orange clean to help make cleanup easier.

Top Panel Schematic

ATX Power Supply Mount

3in. Handle Mount

Side Panel Mount

Radiator Mount

SATA & Molex
Pass-Through

LED Strip Mount

2.5in Hard Drive Tray Mount

Hard Drive
Tray Lock

Fill/Drain Hole

Back Panel
Mount

Barb Pass-Through

IO Shield Mount
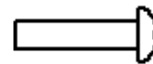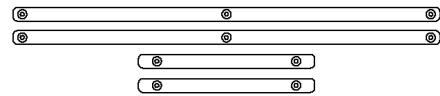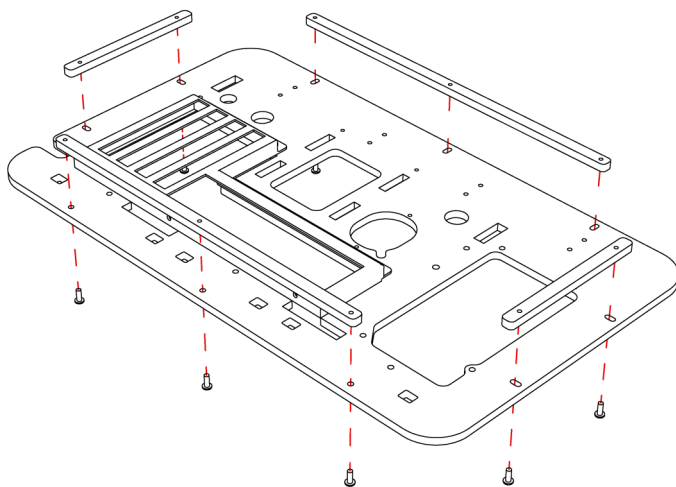
Power Switch

Air Tube Pass-Through

Tray Assembly

x5   5/16" - No. 6-32

- Place the top panel upside-down on a clean, soft surface.
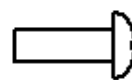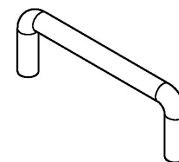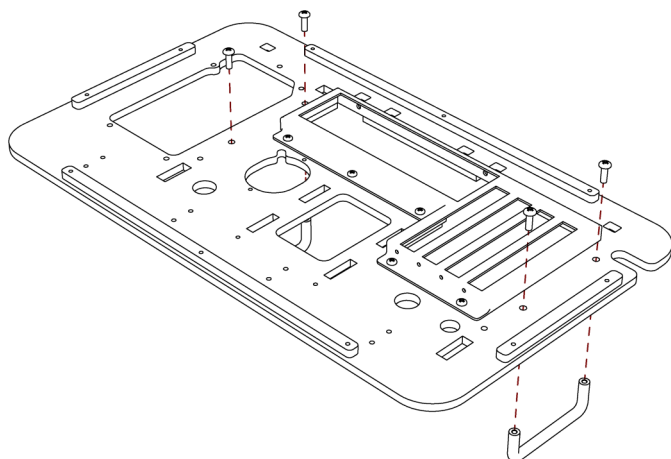- Position the IO shield over the mounting holes and secure with 5 screws.

Step 2:

x10   3/8" - No. 6-32

- Loosely attach the four centering braces onto the same side of the top panel as the IO shield. These need to stay loose until the fully assembled tray can be centered onto the tank.

Step 3:

x4   1/2" - No. 8-32

- Secure the 3" wire handles to the top panel using 2 screws each. This step must be done now as some of the screws will not be accessible after the side pieces are mounted.

Step 4:
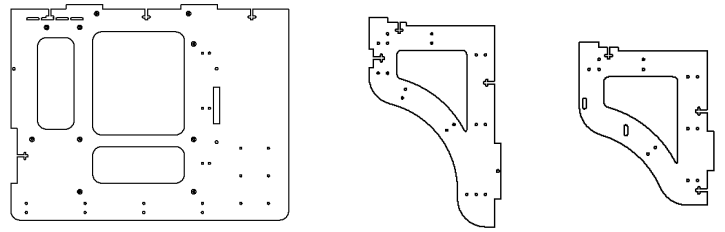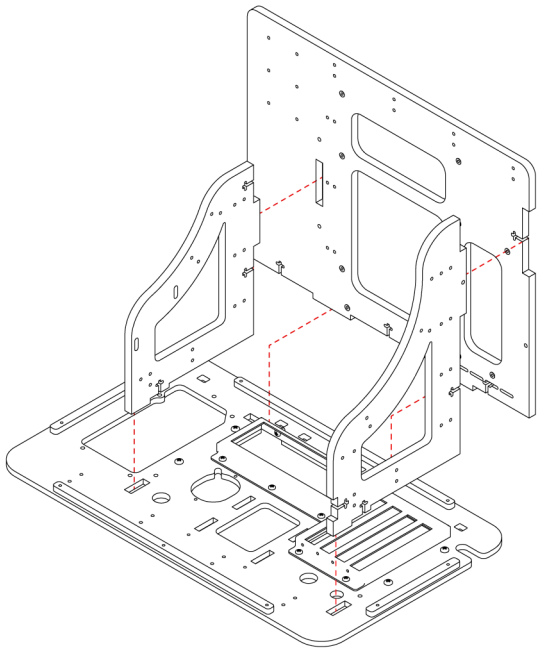
- Fit together the back and side panels. Ensure that the panels are exactly as pictured to prevent the back panel from being reversed
- Fit the back and side panels into the notches on the top panel.
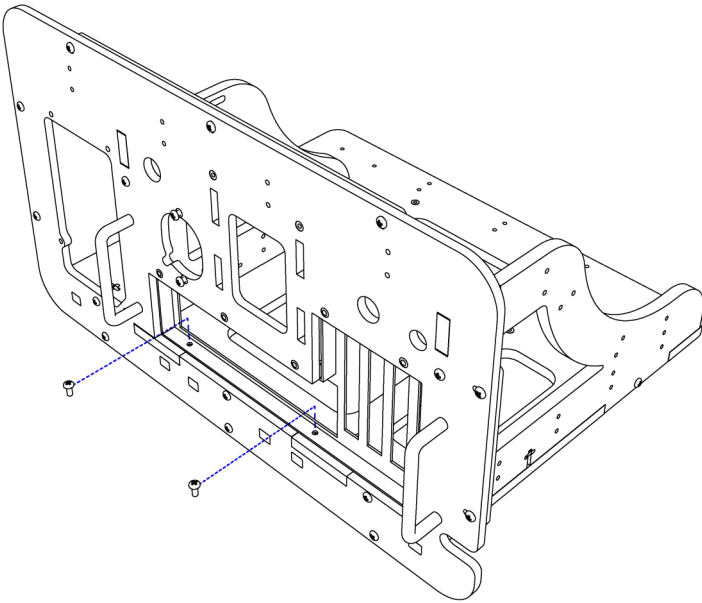
Step 5:

		x4	7/8" - No. 6-32
		x4	No. 6-32 Nut
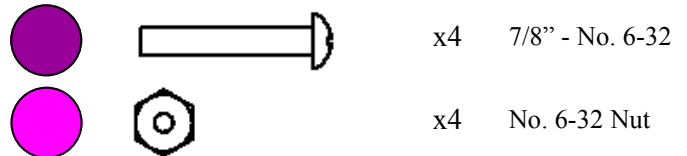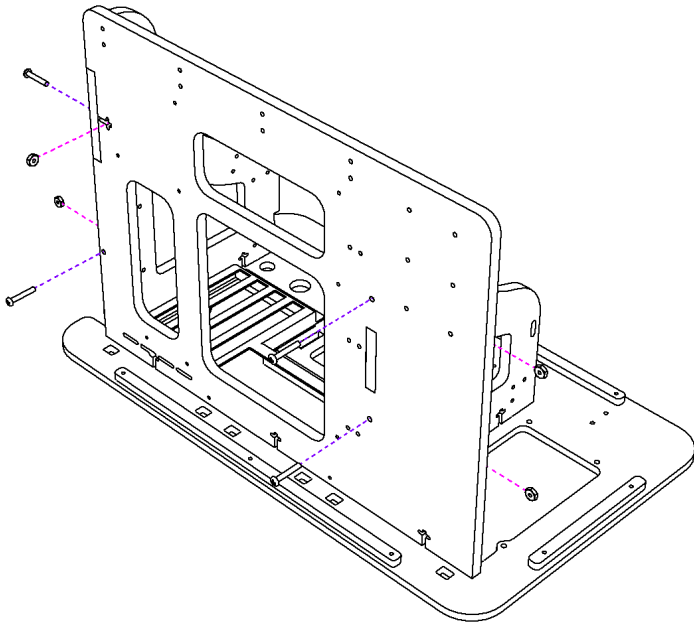
- Secure the side panels to the back using the 4 screws and nuts.

Step 6:

		x5	3/4" - No. 6-32
		x5	No. 6-32 Nut
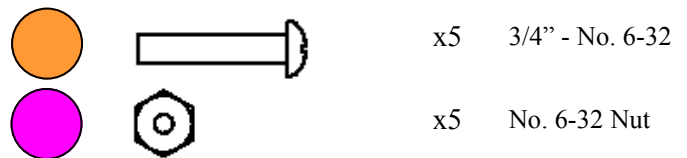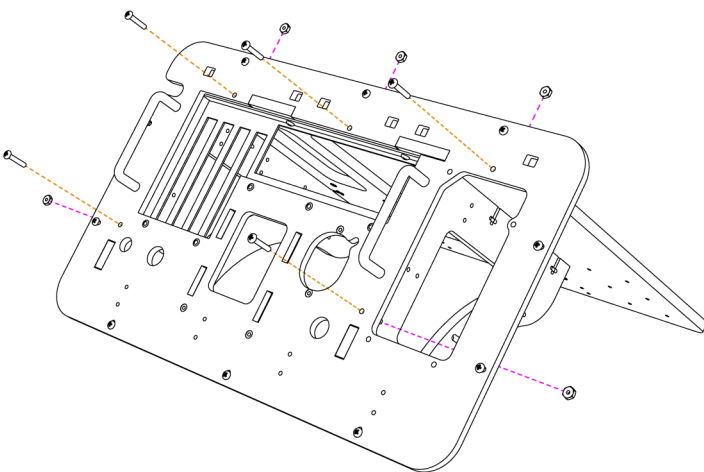
- Carefully flip the tray over so it rests face down with the top facing you.
- Secure the back and side panels to the top using the screws and nuts.

Step 7:

x2   5/16" - No. 6-32

- Flip the tray over so that it rests back down with the top facing you.
- Secure the IO shield to the back using the remaining 2 IO shield mount screws.

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Step 8:
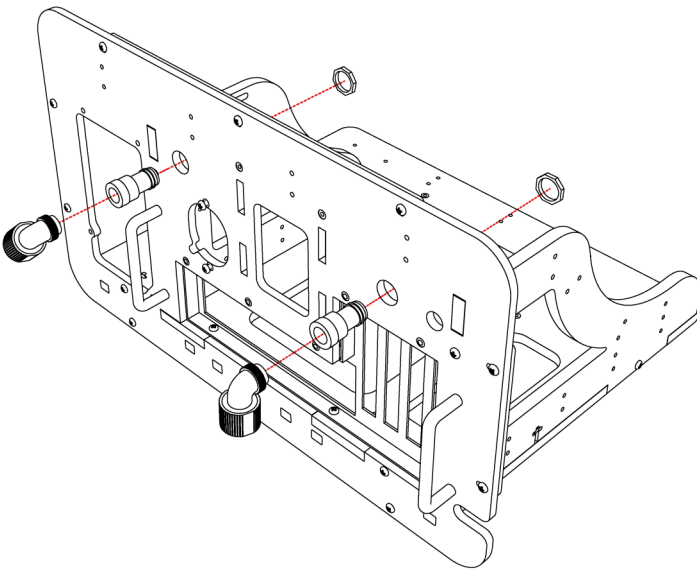
x2   x2

x2   5/8" - No. 6-32

- Install the swivel angled nozzles into the panel mount barb/sockets.
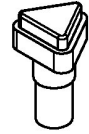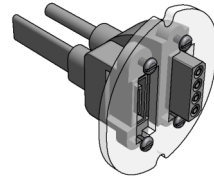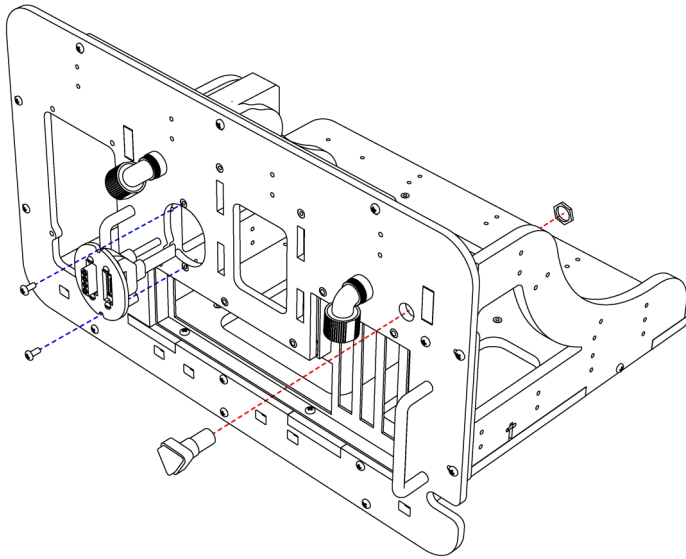- Install the panel mount barb/sockets into the top panel using the nuts that come with the panel mount barb/sockets.

Step 9:
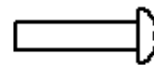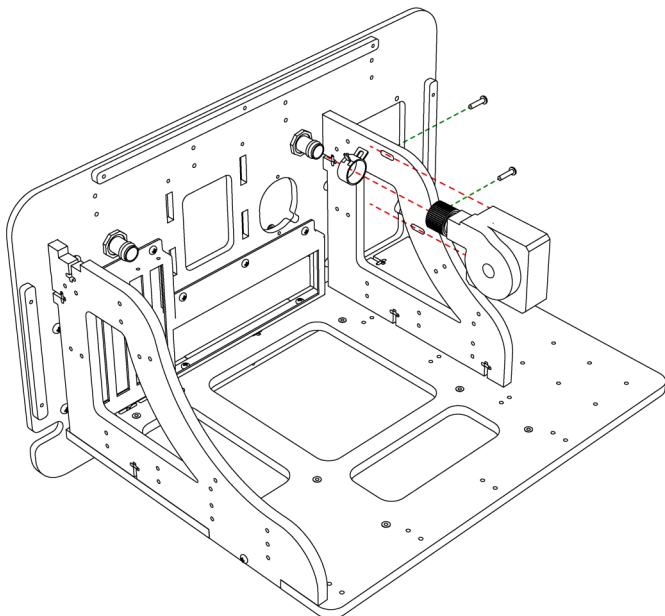
x2   5/16" - No. 6-32

- Install the straight barb into the pump.
- Secure the 1.625" tube between the pump and the panel mount barb/socket (using the collars/tube clamps that come with the nozzles).
- Secure the pump using the two screws.

Step 10:

🔵 ⬜️➡️ x2 5/16" - No. 6-32

- Install the power switch using the nut that comes with the power switch.
- Insert the SATA & Molex Pass-Though into the cutout in the top panel. The pass-though can be installed with the either the plug on the side closest to the hard drive although we recommend having the SATA plug closest to the hard drive. Secure the pass-through with the two screws.
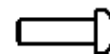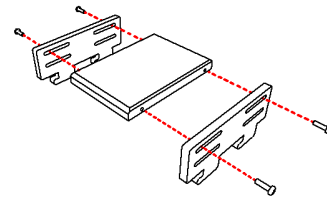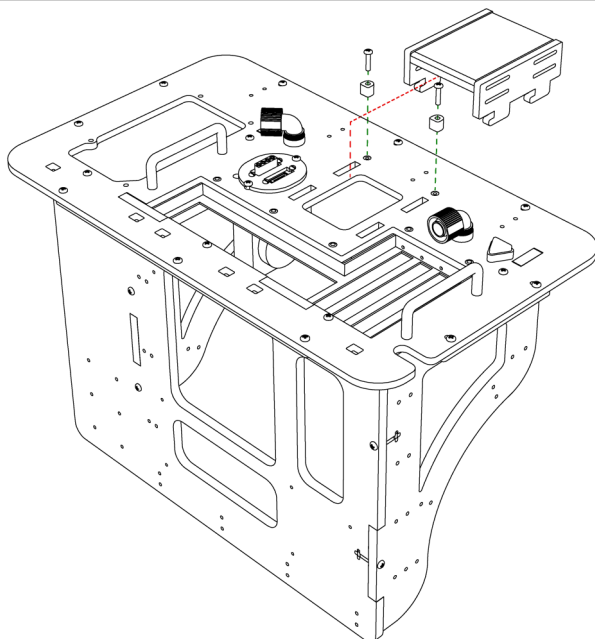
Step 11:


Max Fill Line
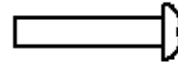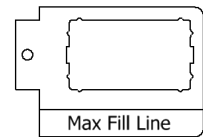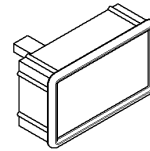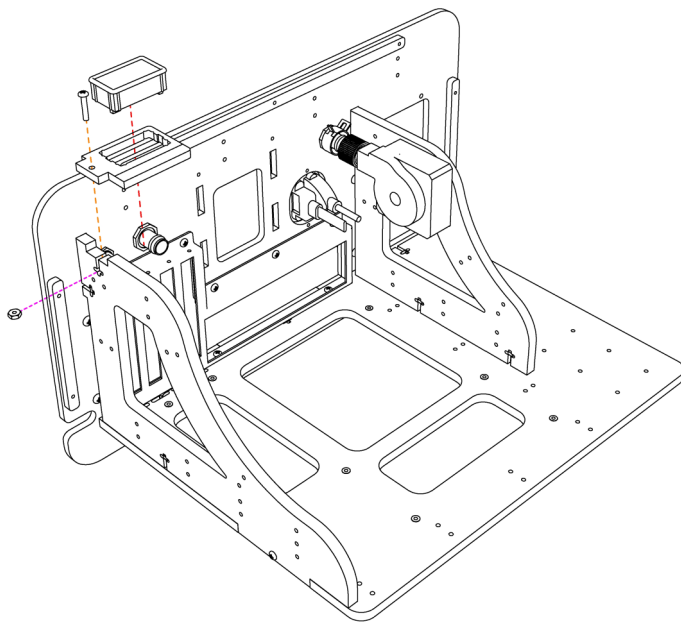
🟠 ⬜️➡️ x1 3/4" - No. 6-32

🟣 ⬡ x1 No. 6-32 Nut

- Install the Thermal Sensor into the mount by simply pressing it into place. Make sure that the power cable is towards the pump to ensure that the display is oriented right side up.
- Move the sensor mount into place and secure with the screw and nut.
- Position the sensor (gold end of the wire) so that it will be submerged near the top of the oil and zip tie it in place.
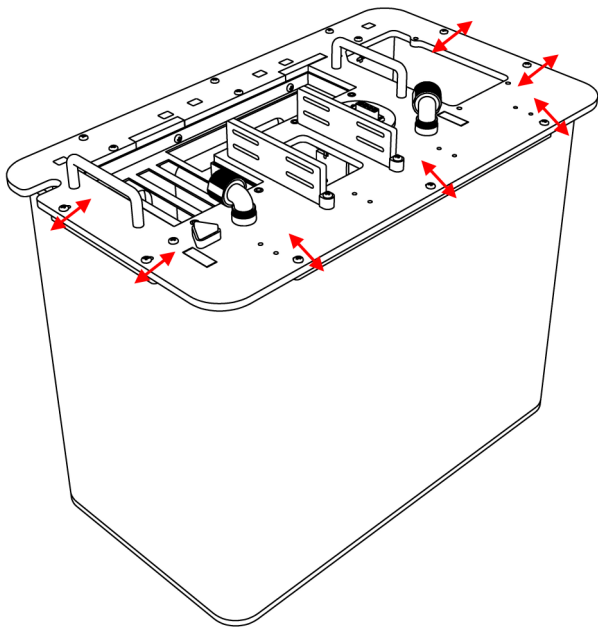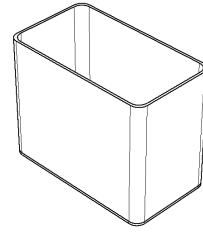
Step 12:

⬜️➡️ x4-8 10mm - M3x0.5
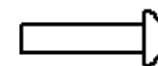
🟢 ⬜️➡️ x2 5/8" - No. 6-32

- Install the hard drive(s) onto the tray.
- Drop the tray into the top panel and move it forward so the clips prevent the drive from being pulled up.
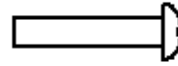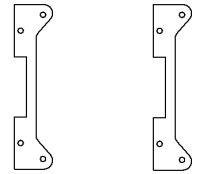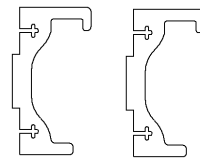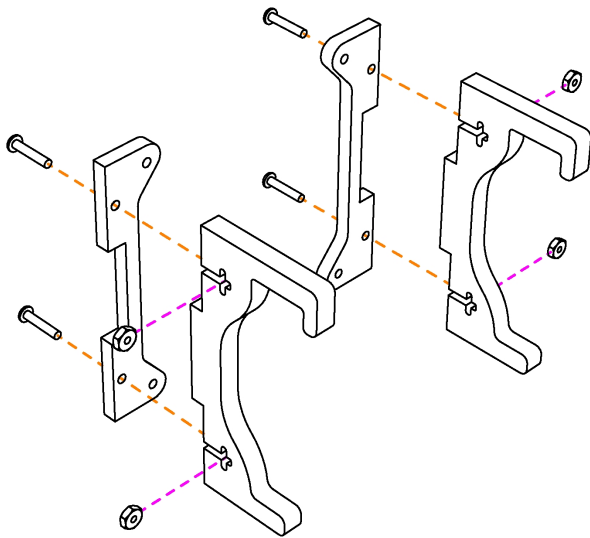- Install the two locking pieces that prevent the tray from backing out

- Drop the assembled tray into the tank
- Adjust the centering braces until the tray is centered in the tank and tighten the screws.
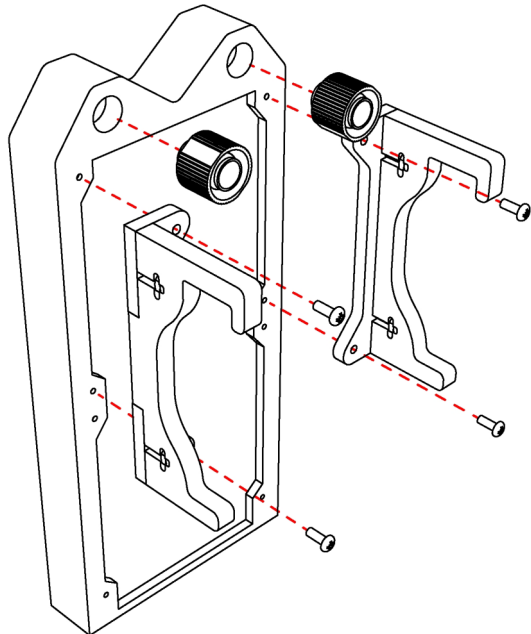
2x120mm Radiator

Step 1:

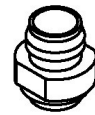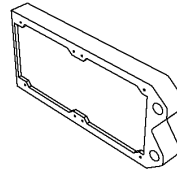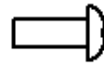|		x4	3/4" - No. 6-32
		x4	No. 6-32 Nut

- Assemble the radiator mount using the screws and nuts.
- Make sure that you end up with two mounts that are mirror images of each other rather than two identical mounts.
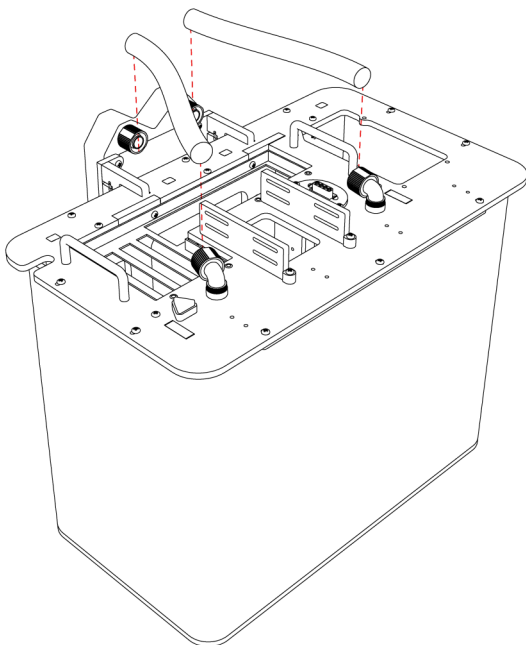
Step 2:

	x2
	x4 3/8" - No. 6-32

- Screw the radiator onto the mounts making sure that the hooks on the mount are towards the top of the radiator.
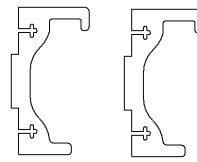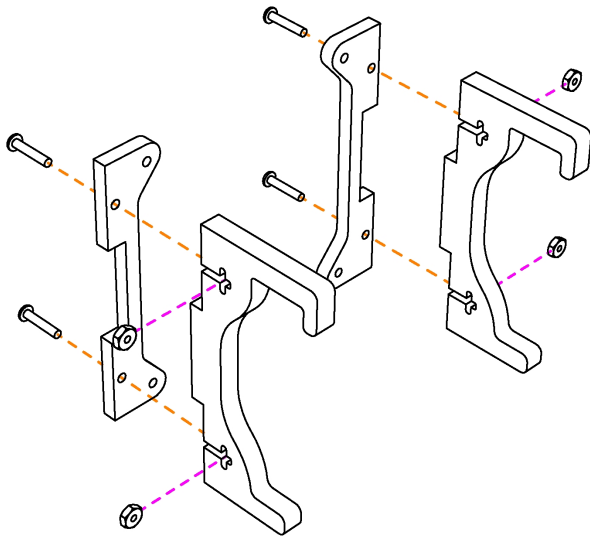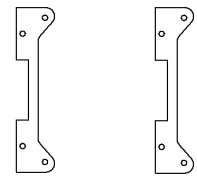- Install the two straight barbs onto the radiator.

Step 3:

- Drop the radiator into the mounting holes on the rear of the top tray.
- Finally, connect the radiator to the two angled barbs on the main tray.
- Before running the system, install the fans onto the outside of the radiator and wire them to the system.
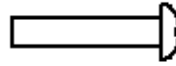
Dual 2x120mm Radiator

Step 1:

x2   x2
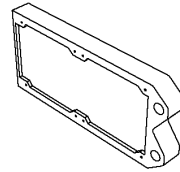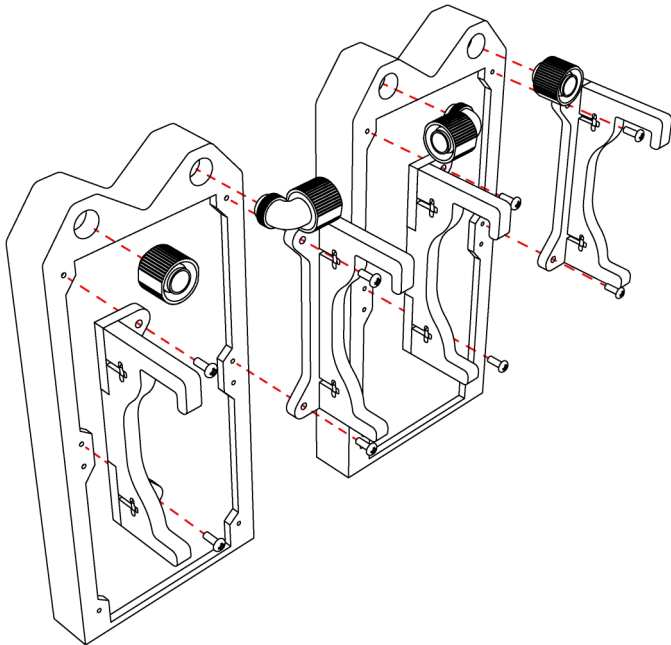
🟠 ⬛═══════D   x8   3/4" - No. 6-32

🟣 ⬡   x8   No. 6-32 Nut

- Assemble the radiator mount using the screws and nuts.
- Make sure that you end up with two mounts that are mirror images of each other rather than two identical mounts.
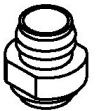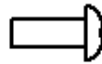- Repeat to make the second radiator mount

Step 2:

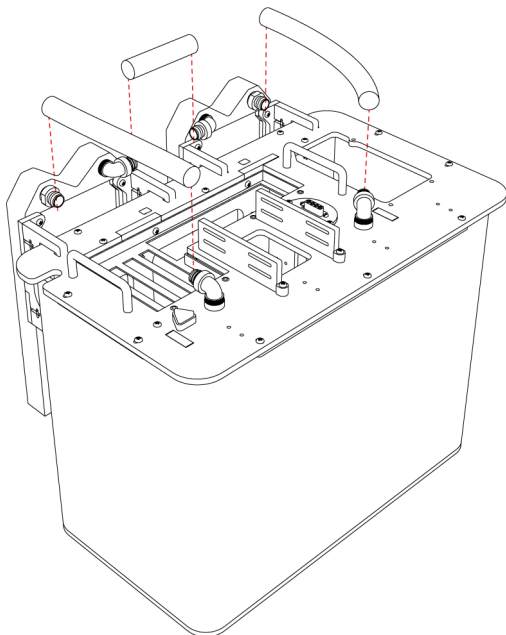x2   x2   x2

⬛══D   x8   3/8" - No. 6-32

- Screw the radiators onto the mounts making sure that the hooks on the mount are towards the top of the radiator
- Install the barbs onto the radiators. The two straight barbs go on the outside and the two angled barbs go on the inside.
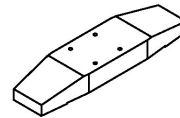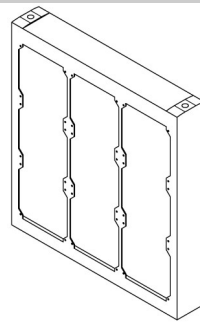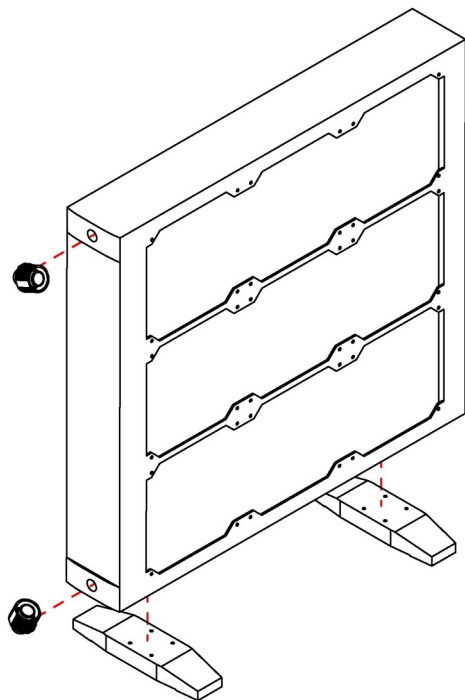
Step 3:

- Drop the radiators into the mounting holes on the rear of the top tray.
- Finally, connect the two radiators together with a short length of tubing then connect the radiators to the two angled barbs on the main tray.
- Before running the system, install the fans onto the outside of the radiators and wire them to the system.

9x120mm Radiator

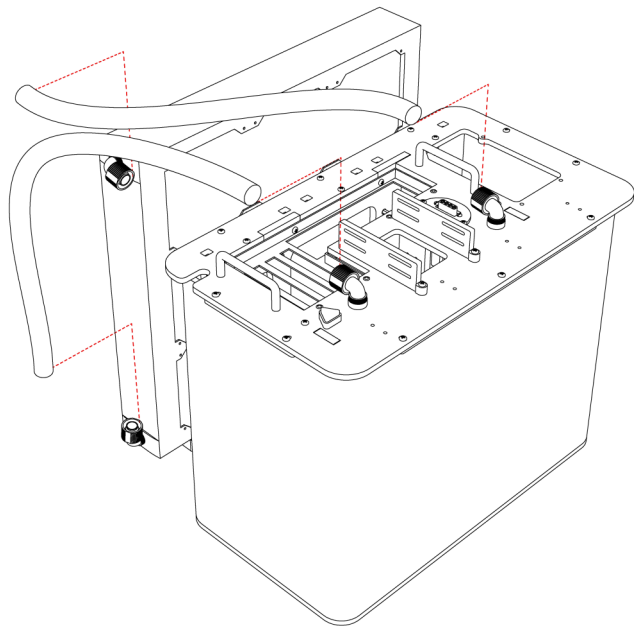## Step 1:

x2   x2

- Install the radiator stands onto the radiator.
- Install the swivel angled nozzles onto the radiator.

Step 2:

x8   3/8" - No. 6-32

- Connect the radiator to the two angled barbs on the main tray.
- Before running the system, install the fans onto the outside of the radiators and wire them to the system or external power supply.