How to reduce ChiliCube noise level by replacing fans

Description for how to replace noisy fans which come with the ChiliCube with 3-speed fans which are quieter even on high, and allow speed selection.

Written By: Netmammal

INTRODUCTION

This guide will describe how to disassemble the ChiliCube cooling unit and replace the fans.

Please look through my teardown guide for the ChiliCube as well. **The teardown guide has additional info about ChiliCubes which did not fit in this repair/replacement guide.**

Then completely read through this guide before ordering the parts. Go out of your way to read comments by other iFixiters. The user Spectacle in particular did things differently, and may save you time and/or grief. You have to look at the bottom of each step, and expand the comments to view them.

The part count is based on repairing a single cube, double the quantity of parts if you are replacing the fans on two cubes.

This fix is much more difficult than replacing a fan on your computer.

This is not as simple a fix as one might wish.

The ChiliCube is poorly designed from the perspective of fan replacement (or any other repair), making this replacement more difficult than one would expect.

Caution:

The directions for installing the 3-way switch include steps which breach or defeat the "moat" created by the deck separating the reservoirs and filler neck on top with the electronics on the bottom. The cut in the flange, and the holes for the cable tie described in later steps might allow internal spills or leaks to flow through to the electronics area. If you want to install quieter fans, but you want to retain the same level of safety, you may want to either skip installing the 3-way switch as described (or just use another model of fan without a switch.)

Note: This describes the heating/cooling unit which is part of 2nd generation ChiliPad / ChiliCube system (introduced in 2014(?), and not the first generation unit (mostly sold pre-2015) which was more squat, and had a handle on top.

TOOLS:

- Long shaft Phillips #2 Screwdriver (1)

PARTS:

- Antec TriCool case fan (2)

92mm computer case fan

- 3 pin to 2 pin power adapter converter (2)

3-pin to 2-pin Adapter/Converter

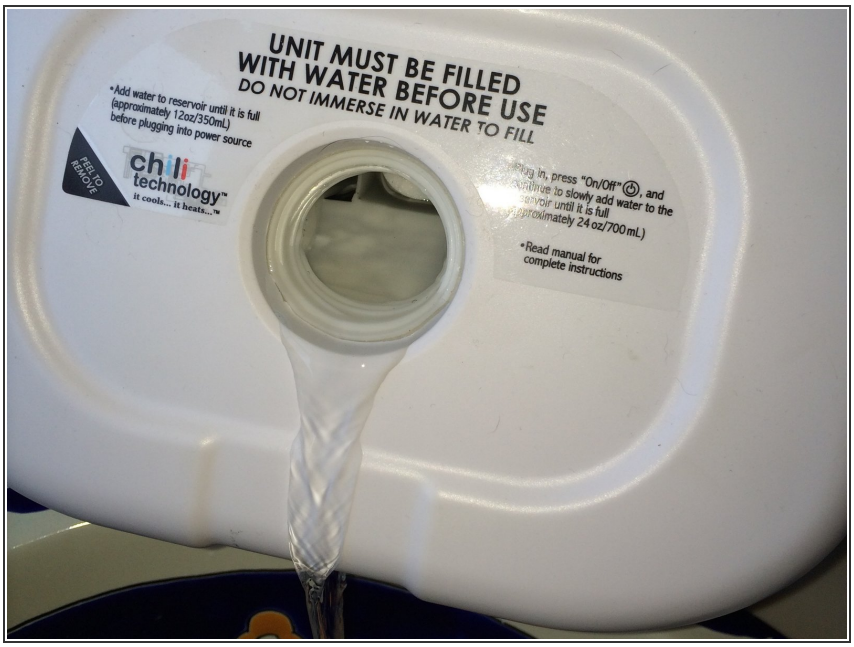
Note that the link provided is for a pair. You only need one pair per cube.

Step 1 — Unhook cube from power and from pad

- Unplug from power.
- Unhook the circulating tube.

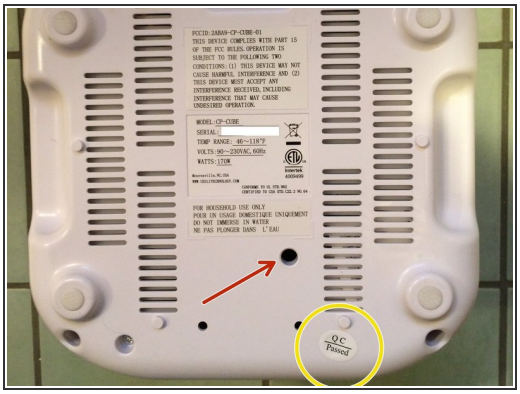
You may want to have a small container available to put end of tube in, often it will leak a bit before the stopper valve retracts.

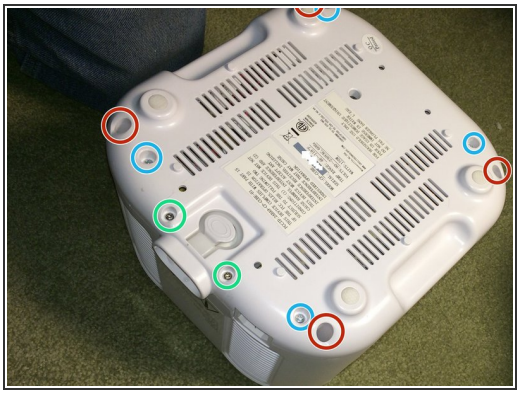
Step 2 — Drain cube?



- Its up to you whether you empty the cube first. If you do not, put it on a low baking pan to contain any drips. The advantage to not emptying is that you can then test the fans before final assembly. (The pumps and fan will not run if the reservoir is empty.)
- If you decide to empty it, take cube to sink and unscrew cap and empty out water from unit.
- You may want to stick your fingers in the two circulating tube holes to open up those valves so that you can drain water from the pump side of the unit.

Step 3 — Flip and Remove screws holding case together





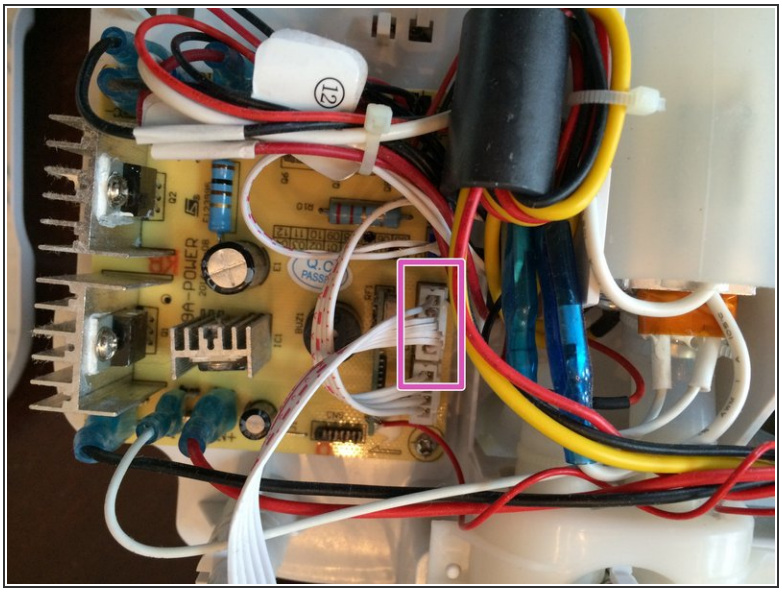
- Flip unit over.
- Slide razor blade under the QC sticker, it hides one of the screw holes. You should park it on top of one of the labels for future use. That is if you wish to pretend you have not opened a device you own.
- Remove 10 screws. Four of them are in deep narrow holes which presumably are intended to prevent casual repair like this. You will find most regular #2 philip's screwdrivers are not long and/or narrow enough.

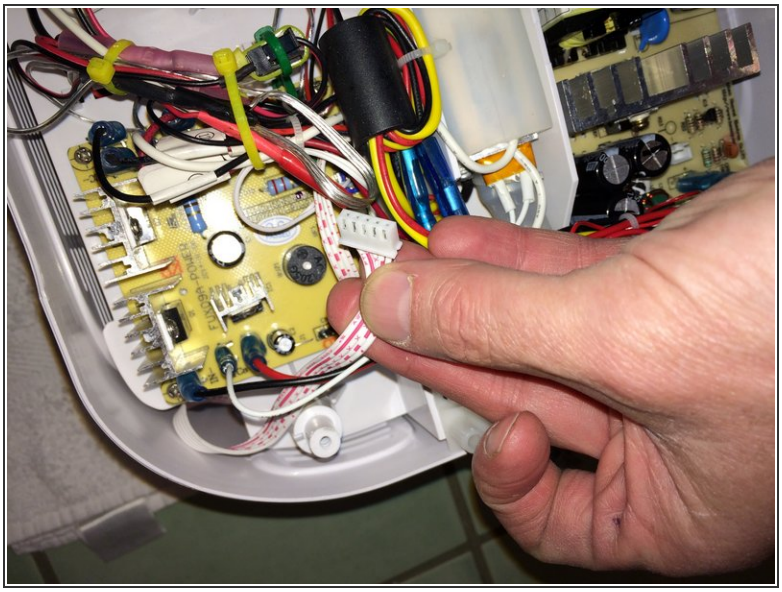
The #2 Philips screwdriver must have a shank at least 8" long. If you have an insulated electrician's driver which might be long enough, it is probably too wide for the hole.

Step 4 — Remove bottom part of case

- Once unscrewed, you can lift bottom part of case off cube.

Step 5 — Remove connection to top of case



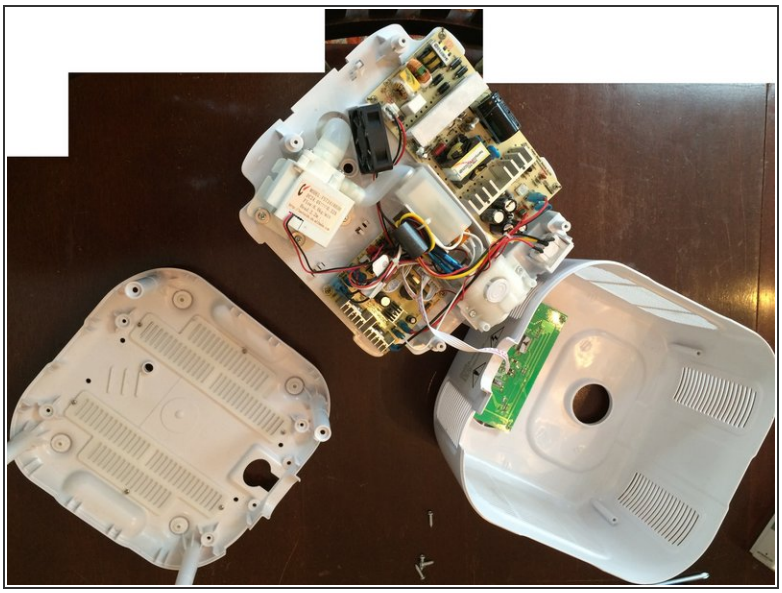


There is a small circuit board attached to the top part of the case for buttons and display readout. It is connected to the main circuit board on the unit by a small cable.

- Unhook connector this small ribbon cable from the main circuit bord on the bottom of the unit (which is now facing you.)

The connector should pull out without needing to be released in any way.

Step 6 — Remove cube mechanism from top part of case



⚠ Flip cube over (carefully supporting the inside mechanism--its not attached to the case anymore) and then lift case off. Don't go yanking it away brusquely, that control cable may have gotten pinned underneath even though you disconnected it.

- Flip the cube over again, so those circuit boards and pump are face-up again.

Step 7 — Fan bracket/shroud removal

These instructions are written as if you were only replacing one fan, but you may want to do these steps to both fans at the same time.

- The 2 screws supporting the fan are on the heat sink side of the bracket/shroud, so we remove the bracket first, so we can get to those screws next.
- Remove four screws holding the bracket/shroud to the heat sink.
- Tilt the bracket/shroud out. It may take a little more force than you would like. Thats OK. Try sliding it side-to-side as well.

Step 8 — Detach fan from bracket/shroud

- There will probably only be two of those stubby fan screws per fan.

Note that this is actually a photo of me installing the new fan, the old ones are white.

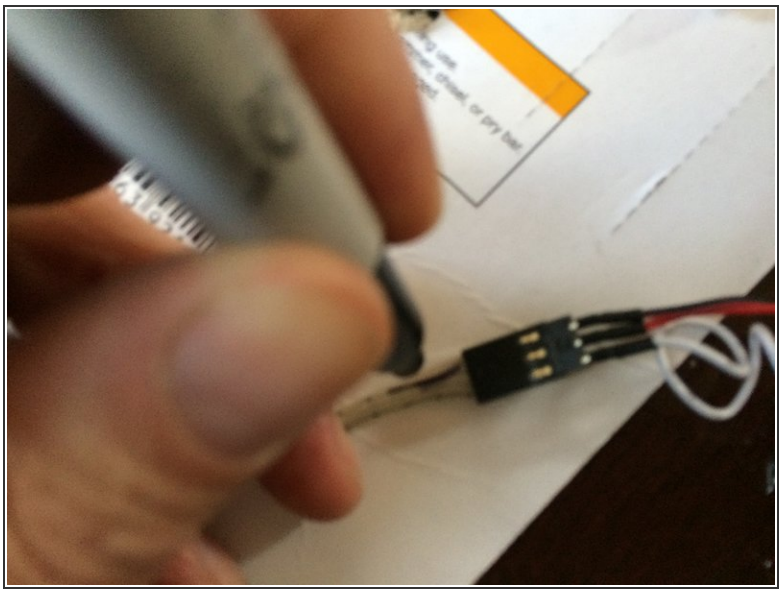
Step 9 — Cut old fans loose

You have several choices as to how much of the original wiring to re-use. See my Teardown for more detail on the fan wiring. Unfortunately this device is designed to make it almost impossible to replace the fans neatly.

In every method, you will be cutting the cables leading to the fans.

- You can either re-use the existing female 2-pin connector, or buy a new one. These instructions are written assuming you bought a new connector, and are wiring the fans with a new harness.
- This method has the advantage that you can test the fans/harness assembly before you re-assemble the whole kazoo, fill it up with water, and then find it does not work. (...And rinse, and repeat, and rinse and repeat, in your author's case.)

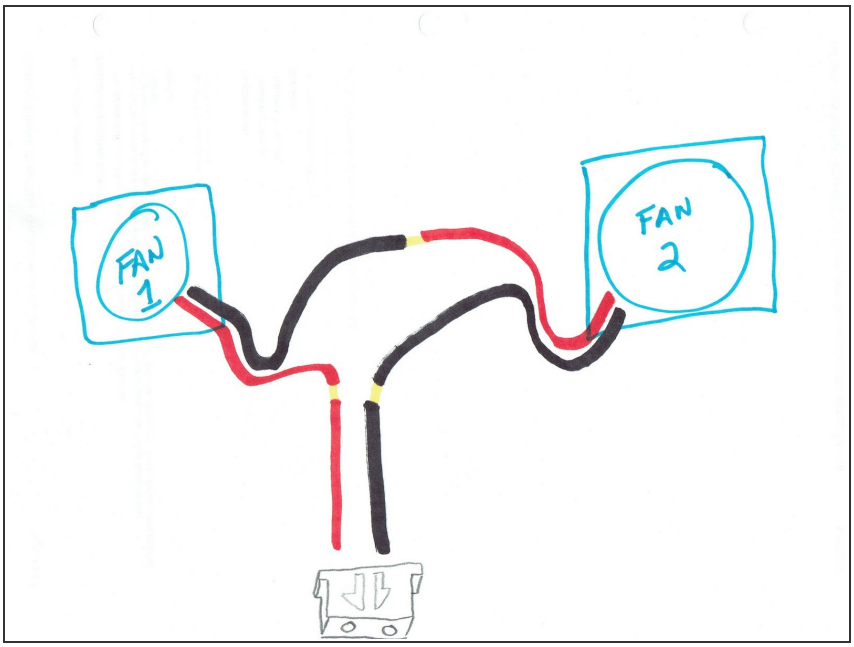
Step 10 — Prepare cables on new fan



The new fan in this guide is an Antec TriCool 92mm computer case Fan, with 3-speed switch. If you get another 92mm fan, just skip the instructions for the 3-way switch placement.

- On this fan, I first attached the "dongle" that adapts the 3-pin connector on the fan to the 4-pin old-school molex connector. This is to help figure out which conductors are positive, negative, and speed sensor, because the new fans did not have color-coded conductors. (The speed sensor will not get used here)
- Mark on you new fan which conductor is black (negative), and which is positive (red).
- Once you have marked the cable, cut the 3-pin connector off.

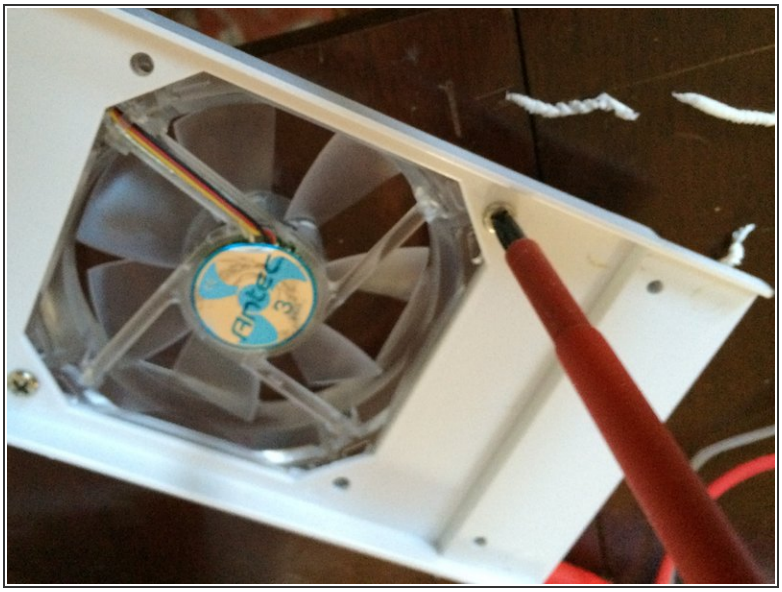
Step 11 — Cable up new fans and connector

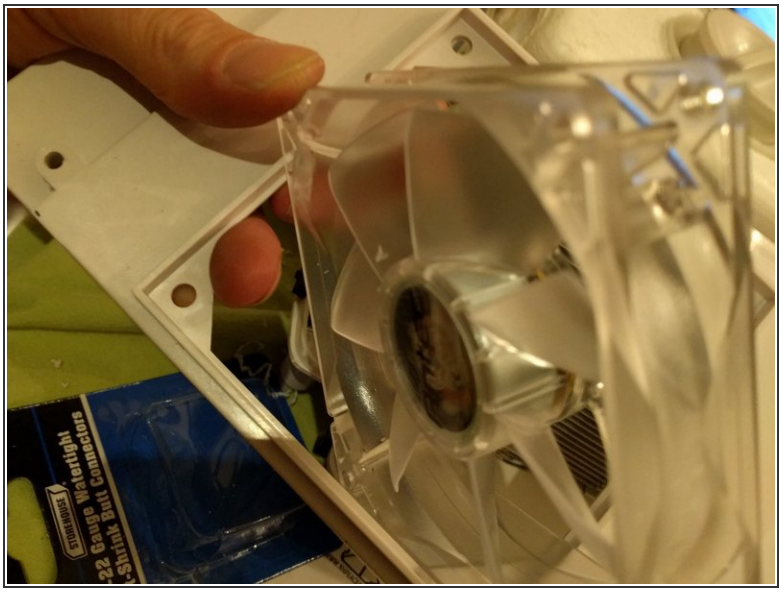


- Crude drawing of how you need to cable the fans up. I'll leave it up to you how you do it. Splice using crimps, or solder with shrink tubing to cover. Give yourself plenty of extra length on the cabling, you'll need more than you might think.
- As written the 3-pin to 2-pin adapter in the parts list is going to be cannibalized, you only really need need the single 2-pin connector, and you will discard the 3-pin connectors.
- You could leave the new fan's connectors attached, and rig this up so if one of the new fans fails, you only need to replace the fan without cutting wire, but then you will need to two 3-pin to 2-pin adapters per cube.
- Once you have the two fans and connector assembled, test them to see if they are connected correctly by testing the resistance between black and red at the connector using a voltmeter. If you have got it cabled right, it should not be an open circuit, there should be some resistance there.

- Of course, if you have got a 24V DC supply, you could test them that way too, or even hook them up to the cube, plug it in, and turn it on (it will have to have water in it, and be turned right-side up, and have the control board plugged back in.)

Step 12 — Attach fan so 3-way switch will reach



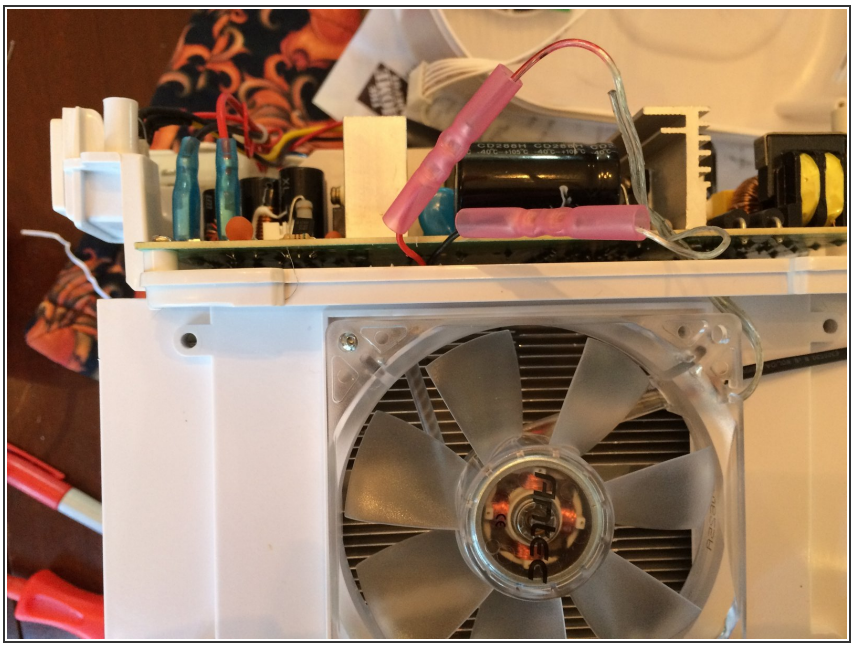


- If you do go with the 3-speed fan used here, look ahead in instructions to see where the switch gets positioned, then attach fan appropriately to the bracket/shroud plate.

Note direction fan is attached. The side with cable lead-in to motor, (and usually the only label or fancier of the two hub labels), that side faces inward towards the heat sink, and the bracket/shroud plate.

Don't freak out if you think you can't fish the cable through the shroud the right way. You can pass the whole fan through the shroud hole on the 45º.

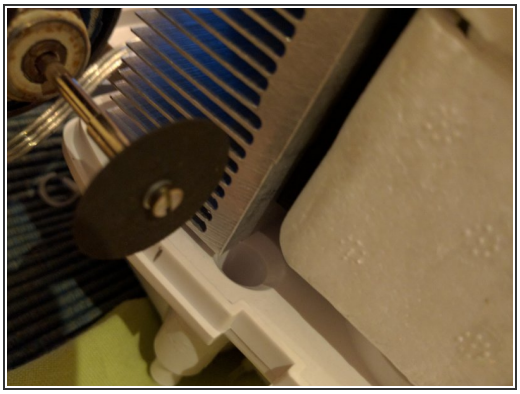
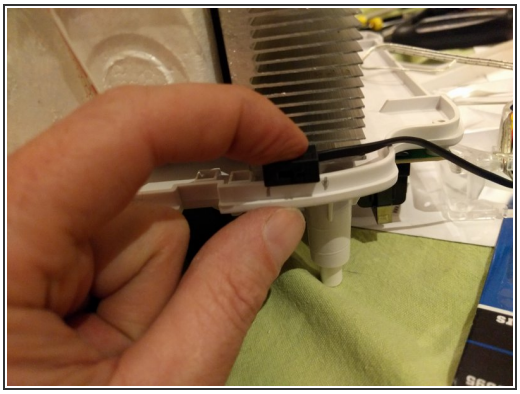
Step 13 — Re-attach fan bracket/shroud plate



- It seems to go on easier than it came off.

Note cable for 3-way switch goes around corner to right. The fan in this photo was made with slightly different cabling arrangement than described in text.

Step 14 — Create spot for 3-way switch

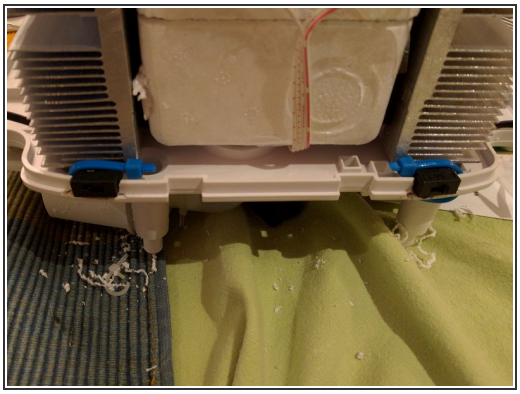
Caution. By cutting this flange (and drilling the holes in the next step), you will defeating a safety feature of this unit. In the case of internal leaks, or a water spill by the filler neck, water may now **not** be captured by the deck, and would be able to flow down onto the electronics area.

If you wish to retain the water retainment safety feature, install the 3-way switches differently, or use switchless fans.

- The 3-way switch will be positioned so that you can use a pencil point poked through the grill to change the setting after your ChiliCube is re-assembled.
- You can use a dremel tool to cut part of the flange surrounding the deck. Position the switch and mark, it will be just behind the grill on the front-side of the cube when it is upright.

Step 15 — Cable tie down the 3-way switches



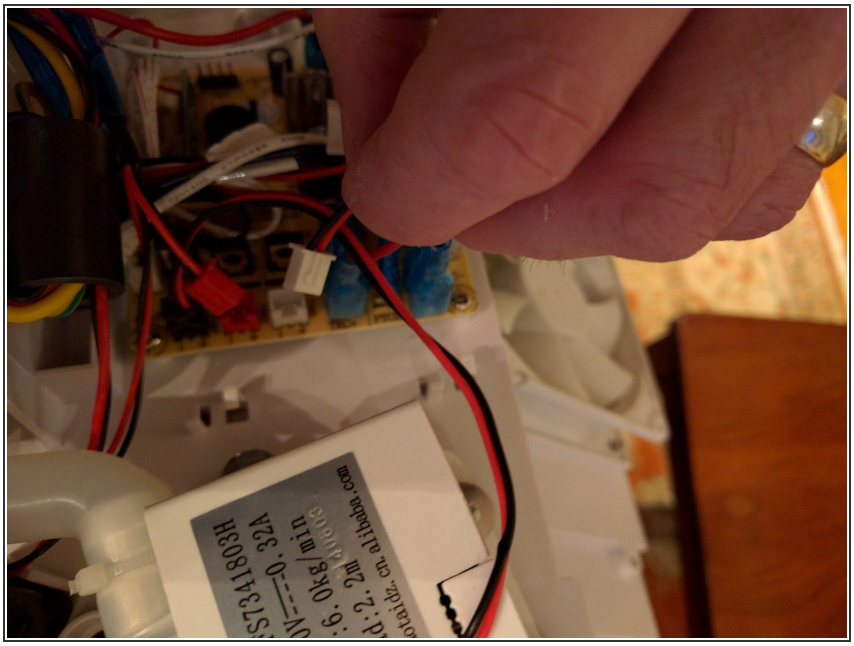


Again, if you are going to keep the water retaining safety feature, do not drill these holes.

It might be possible to use silicon caulk to seal these penetrations, and around the switches. It is just very hard to verify the security of those seals.

- Drill two small holes on each end of the where the switch will go, and then loop a cable tie through to hold the switch in position.

Step 16 — Test again?



- If you have not tested the fans yet, it is recommended that you attach the connector to the fan header on the circuit board, put water in the tank, temporarily re-attach the connector for the ribbon cable to the control panel.

- You will have to have to turn the cube over to be right-side up so that the float switch lets the unit sense that there is water in the reservoir.

This means that the cube will be sitting on top of those open circuit boards.

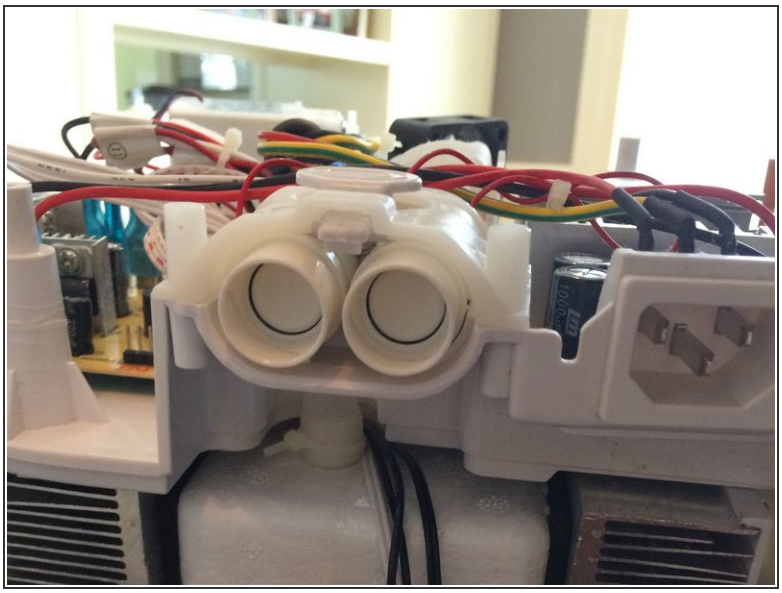
⚠ Just be careful about putting your hand near that power supply when you have this plugged in!

⚠ ...And if you have been resting this on a cookie sheet, find a towel or something else non-conductive so that it is not resting on metal, before you plug it in.

- Having done all of that, when you plug it in, and turn it on using the control panel on the top, the fans should spin.

ⓘ Please consider clicking on the "AtaBoy" button below even if you are not going to do the fix. This article took a ridiculous amount of my time to photo and write, and its nice for me to see how many people have read it (42 so far!) If you do the fix, please comment below (plus or minus), you'll be helping the next person a lot. Pay forward!

Step 17 — Cable tie everything and re-assemble



- Unplug the unit after testing, disconnect the ribbon again, and turn it upside down again.
- Tie down that new cable, so it does not wander.

⚠ You may find that the 3-way switches seem to be getting too much pressure from the covering grill, if so, you can trim away one rib of grill on each side to protect the switches.

ⓘ Experiment with the 3-way setting for the fans. Medium seems to work just fine, but if you really do not like noise, start with low. At this point, the pump and third fan are beginning to make more noise overall.

ⓘ If you have your temperature setting to "LO", you may need to set the fans higher to maintain the maximum dissipation of heat.

ⓘ If you have sudden hot flashes which need immediate cooling, you may need the fans on high, although the thermal mass of the whole system should moderate those heat swings.

ⓘ Users who select a higher target temperature (especially one above the ambient), will probably find they do not need the higher speeds.

To reassemble your device, follow these instructions in reverse order.