Instructions – new parallel heat transfer design

By using a "parallel" heat transfer system the 8 tubes will negate any restriction in the pickup loop, unlike the present "series" coil that introduces an unnecessary 50' travel of the water through the panel.

Four 3/8" tubes will be sufficient to equalize the flow through a ¾" (manifold) pipe and by using **8** tubes it will provide a coefficient of friction of around -2.5 – the system will not see the 8 tubes **at all**!

So, instead of having 54' of copper within the panel, this will reduce the path to 4.5' and HOPEFULLY this will eliminate our current quandary.

The pipe sizes are based on our current system diameter of PEX and copper. The copper we are using I think is ¾" but whatever size it is, as long as it is the same or larger than the PEX in our main run to/from the roof, we'll be okay. The individual 8 tubes should remain at 3/8" and spaced 1" apart so that when we press the tubes into an oval shape the edges will touch, allowing us to solder one to the other, further increasing our heat transfer capabilities. (Eventually, in a production version we will wave solder them, giving complete contact between the tubes and at the same time making it a large heat sink in itself, negating the necessity of using a copper sheet backing as a sink.)

I suggest that we take one of the two "spare" panels and adapt it as shown in the drawing. This will simplify our working out this flow problem; we can make other modifications to use **multiple** panels when we get this one going. I have one of the panels here at my house that I have been using to chart the dimensions shown in this document and the attached drawing.

Incidentally, by mocking up this (3rd) panel we come closer to a slimmed down production model as this "manifold rig" will mount underneath the PhCells, inside of the metal frame around the cells. If it works out, everything will be contained within the 1 ½" frame.

Obviously I don't have a vise or drill press to accurately align the row of holes in the manifolds and I don't have a torch (soldering equipment) but if you can help me find access to these items I could knock it out in a few hours.