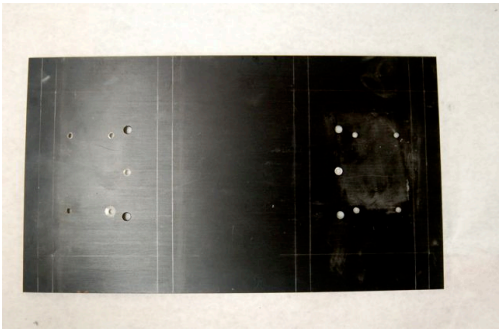
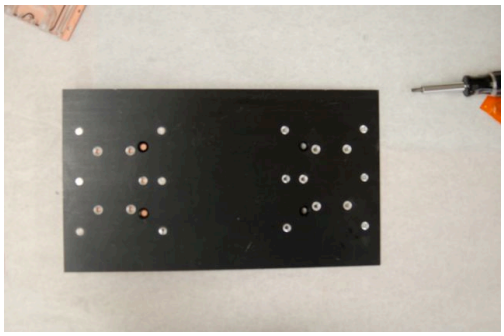
CC_Pictures



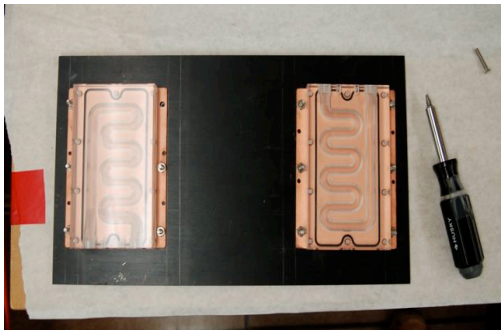
Laying out bottom of plate for attachment of hard drive cooler.

Scribe marks on hard drive cooler for placement of two thermoelectric units. This type arrangement found to be ineffectual because the large surface area leaks heat back to the aluminum plate.

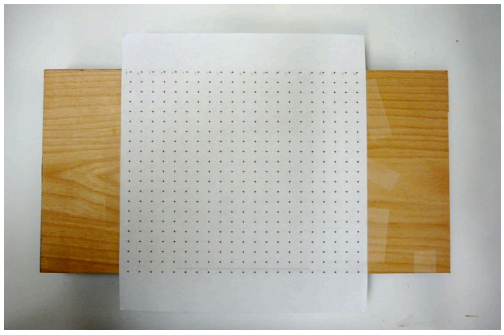
Opposite side of the hard drive cooler.



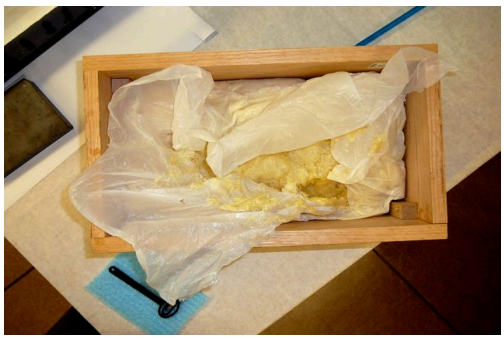
Two sets of cooler holes. The first arrangement allowed for only two thermoelectric units. Four units were found to be necessary to quickly bring the chamber to operating temperature. This second configuration was unsuccessful because heat leaked from the relatively large hard drive cooler to the black aluminum plate.



Imagine two thermoelectric units under each side.

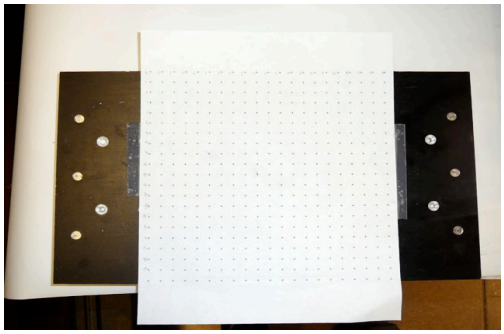


Magnetic field mapping board. This provided a way to measure the field 3/8" above the plate.

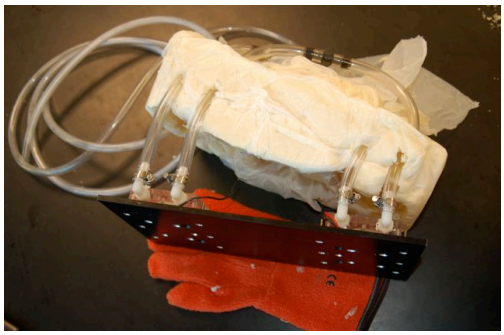


"Great Stuff" insulation form fitted to the plate. Because this did not fill the tiny gaps around the components mounted to the plate, this idea was abandoned.

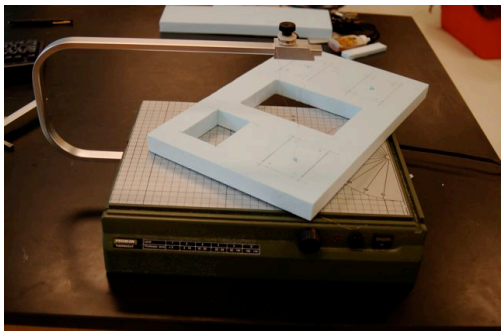
Prototype chamber used to determine optimal height for temperature gradient.



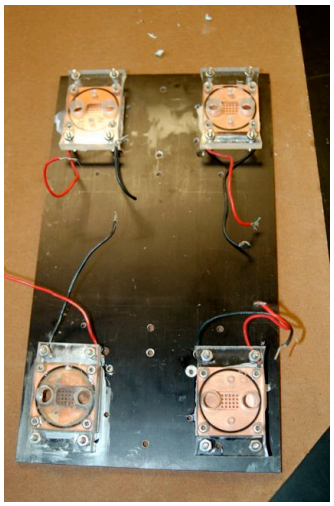
Magnetic field mapping at plate level.



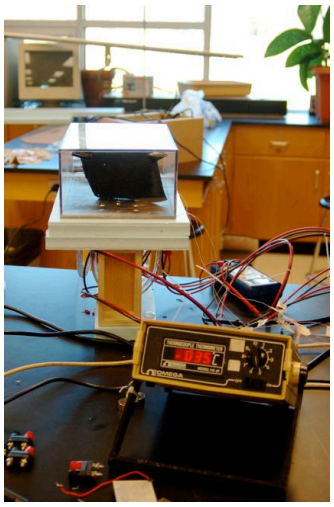
Combination plate, cooling system, and insulation. This prototype was abandoned.



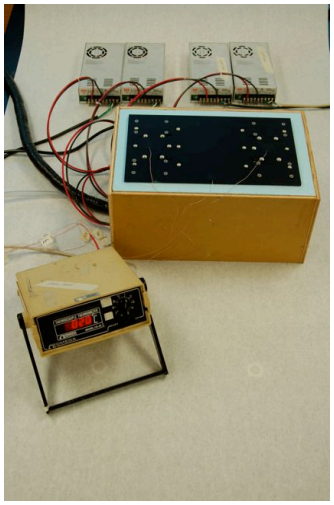
Hard styrofoam insulation used for siding homes. Thermal cutter provided for perfect fit with magnet (center) and thermoelectric units.



The final configuration. Each thermoelectric unit has its own water jacket that fits directly over the thermoelectric unit with no overlap.



Successful test of the final configuration. Note the temperature of -35 Celsius.



View of base with themocouples attached and power supplies in the backgound.

Setup prepared for operation. Note the ice bath to the left, cloud chamber to the right, and overhead light source behind the chamber.

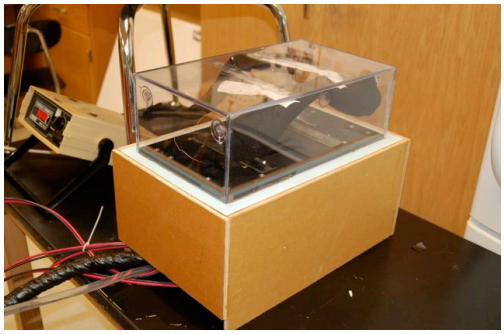
View of the chamber from behind the overhead projector. Note the folders on the overhead to provide a narrow beam. Also note that the light is focused as a narrow band on the side of the chamber.

Overhead light source.

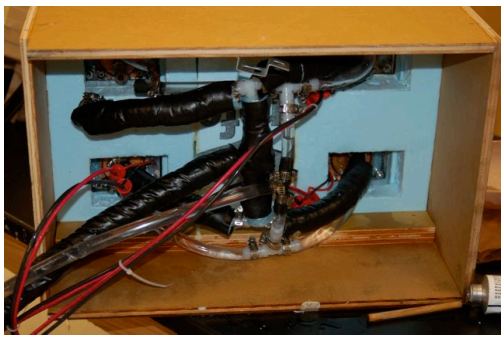
Top view of the chamber. Two 6-inch plastic rulers provide fiducial marks.

Inside of the copper water jacket. This one was removed and taken apart because of a freeze failure.

Inside the heat exchanger. Note the lint build-up on the right side.

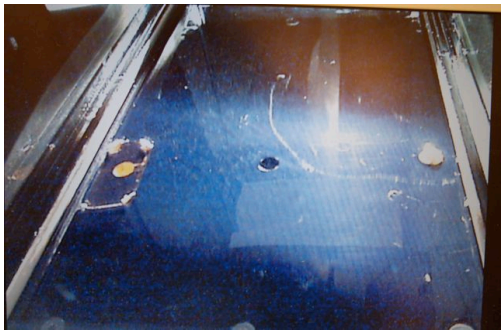


Prototype chamber used to determine optimal height for temperature gradient.

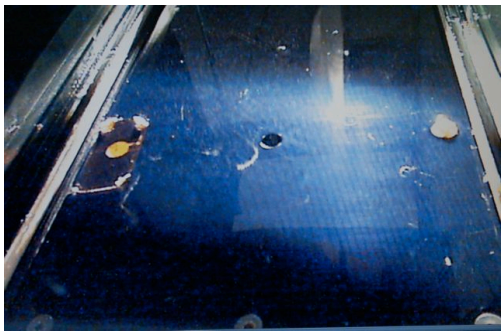


Electrical and water access in the bottom of the chamber. Note the incoming lines are insulated.

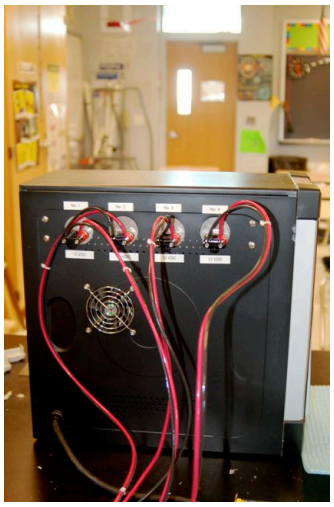
Event captured with webcam.



Event captured with webcam



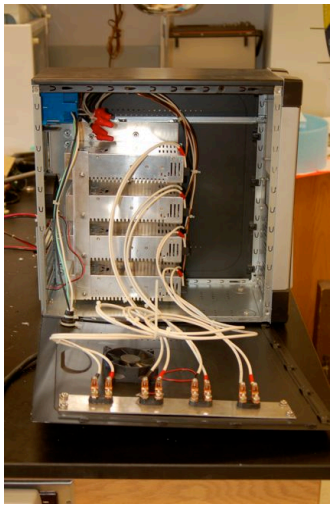
Event captured with webcam.



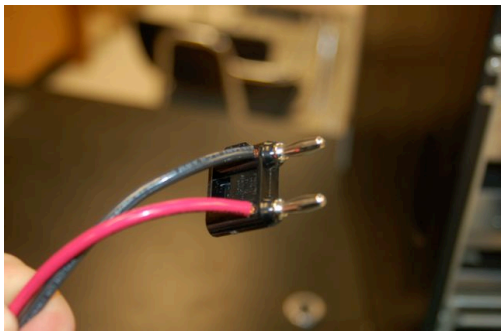
Modified computer case with power supplies inside.

"Kill-A-Watt" meter with plugged in power supply.

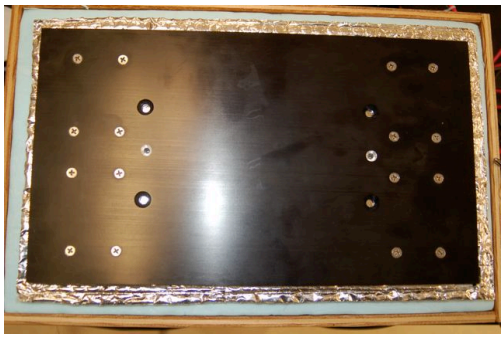
GFCI switch turns on the four internal power supplies.



Inside the power unit case. Note the four power supply units inside.



Heavy duty banana clips provide the connection to the outside of the case.



The aluminum base of the chamber without the lexan cover.

Working at near freezing temperature can be hazardous. The plastic was replaced with machined aluminum blocks for all four heat exchangers.

Heat exchanger as it appears new from the box.