

## Computer Room Air Conditioner / HVAC Failure

### General

The computer room is cooled by a 5-ton air conditioner located entirely in the room and the original 5-ton unit – now used as a back up - that has the air handler and evaporator in the room and the condenser outside along the north wall of the Operations building. Normally we run on the new unit inside the room, but we do occasionally run the old one for a day or two at a time.

The compressor starts and stops as required to maintain temperature in the room at 70 degrees. There is no heat, just cooling available. The fan/blower unit runs continuously on either unit. There are also humidifiers that are run with the blower and use RO (reverse-osmosis) water from under the sink in the main bathroom.

The blower is equipped with an automatic temperature- and humidity-controlled louver that will let outside air in if the temperature is below a certain temperature (currently set at 55 degrees) and below a set humidity (currently set at 60%). This functions as an economizer reducing the run time on the compressor during times when the outside is cold enough to maintain the temperature in the room.

There is also a temperature alarm (see Figure 5) by the fax machine that indicates if the computer room air conditioner is down by alerting when the temperature gets too high. It is essential that quick action be taken once the room temperature gets above 75 degrees to avoid hardware failure.

Common failure modes:

1. Fan blower motor fan belt breaks
2. Compressor stops for high or low pressure
3. Compressor trips on incoming power
4. Evaporator coils freeze up

In all of these cases knowledge of mechanical/electrical and HVAC systems is required to fix the problem.



FIGURE 1: HVAC unit switches

In the event of a problem with the primary HVAC unit you can switch to the other unit by changing the wall mounted knife switches, as shown above in Figure 1, from the failed unit to the standby unit.

***The failed unit must be turned OFF before turning the back-up unit ON.***

We have also implemented procedures to force in outside air to help cool the room in the event both HVAC condensing units are failed. We will also need to start turning off unused equipment and heat loads. The success of these procedures will depend to large extent what the outside temperature is. If it's hot outside we will likely have to shut down all essential computers and will not be able to observe. This needs to start as soon as possible.

### **WHAT TO DO WHEN THE TEMPERATURE ALARM GOES OFF:**

1. Go into the computer room and verify if the fan/blower is running. IF not the switch to back up HVAC unit (normally this will mean turning off power to the new unit and turning power on to the old unit.

2. Call Mark or Ben

**If room does not start cooling down in a few minutes:**

**If the fan/blower unit is running on the old unit then immediately:**

1. On right side of blower unit move toggle switch to "Bypass" (see Figure 2). You should hear if the outside louver motor opens.

2. On left side of outside air inlet on the exterior east wall of the Operations building slide up the cover plate on the small box attached to the hood and set temperature controller to 0 degrees (see Figures 3 and 4). If louver motor did not activate it should now unless it was already open.

3. Prop the door to the computer room open.

4. Close door to instrument lab (by bathroom).

5. Close door to Operations extension area.

6. Close door between kitchen and supply/shipping area.

7. Close all outside doors and windows to Operations building.

8. Open door to 3.5m Arcade.

9. Turn on Arcade fan by selecting "hand" on the front panel. The Arcade Fan should start (it will make lots of noise). See Figure 6.

10. Get large grey fan (5ft. tall) (see Figure 8) from base of 3.5m and roll down to computer room



11. Set fan in doorway of computer room and turn it on so it is pulling/blowing air *out* of the computer room.

12. **If outside temp is warmer than 30 degrees:** There is a small, louvered vent in the upper right corner on the east wall of the computer room. Remove screen and prop this louver open.

13. **Monitor room temperature:** If temperature exceeds 80 degrees and you cannot reach Fritz or Jon, start shutting down all equipment in the computer room that you're able to.

**IF THE FAN/BLOWER UNIT IS NOT RUNNING, *IMMEDIATELY*:**

1. Move toggle switch on right side of blower unit to "Bypass" (see Figure 2). You should hear if the outside louver motor opens, but continue whether you hear it or not.

2. On left side of outside air inlet on the exterior east wall of the Operations bldg., slide the cover plate on the small box attached to the hood and set temperature controller *up* to 0 deg. (See Figures 3 and 4.) If louver motor did not activate in step 1 above, it should now, unless it was already open.

3. Behind the fan/blower unit is a box that directs air from the outside louvers to the fan. There is a cover on this box held by a couple sheet metal screws. Remove this top cover. (See Figure 7)

4. On left side of outside air inlet on the east exterior wall of the Operations bldg. slide up the cover plate on the small box attached to the hood and set temperature controller to 20 deg. (See Figures 3 and 4)

5. Prop open door to computer room.

6. Close door by bathroom to instrument lab.

7. Close door to Operations extension area.

8. Close door between kitchen and supply area.

9. Close all outside Operations doors doors/windows.

10. Open door to 3.5m Arcade.

11. Turn on Arcade fan by selecting "hand"; the fan should start with lots of noise. (See Figure 6)

12. Get large grey fan (5ft. tall) from base of 3.5m and roll down to computer room. (See Figure 8)

13. Set fan near the fan/blower unit and turn on fan, blowing air down the computer room towards the door.

14. In the base of the 3.5m telescope get all of the box fans available and set up in computer room to circulate air towards the door.

15. There is a small louvered vent in the upper right corner on the east wall of the computer room, Remove screen and prop this louver open

16. Monitor room temperature: If temperature exceeds 82 deg. and you cannot reach IT staff, start shutting down all equipment in the computer room that you can.



FIGURE 2  
Fresh air inlet louver bypass and humidity control



Figure 3  
Fresh air inlet



Figure 4  
Fresh air inlet louver temperature control





Figure 5  
Computer Room Temperature alarm



Figure 6  
Arcade Fan Controller



Figure 7  
Old Computer Room Fan/Blower unit



Figure 8  
Extra fans