EDGES MEMO #314

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To: EDGES Group

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Subject: Proposed air circulation for EDGES-3 at the MRO

An air circulation system for EDGES-3 was proposed in memo #312. This system requires 40 ft coil under the ground for heat exchange with the ground to keep the electronics below 50˚C under all conditions. If deployed at the MRO the EDGES-3 could either be powered down on summer days when the air temperature at the MRO can exceed 40 ˚C or an air circulation scheme proposed in figure 1 could be used to circulate air through existing pipes back to the electronics hut. This scheme is similar to that currently used for EDGES-2 at the MRO. The need to avoid moisture getting into the system is more critical for EDGES-3.

Figure 2 shows the details of the coupling of the airpipes to the metal pipes of the antenna whose details are in Figure 12 of memo #300.

Figure 3 shows the details of the couplings to the 82 mm underground pipes and to the fan in the hut.

An air path between the receiver and antenna box will be made using 1” ID plastic hose as shown in Figure 4. The brass coupling provides additional attenuation to ensure that significant internally generated RFI doesn’t lead out through the hole in the receiver box into the antenna.

In addition to the air path the 14 volt DC power along with optical fibers are carried to the receiver box in a pipe which needs to be sealed before mixing in with the air path. The negative connection of the DC power can be connected to the metal which connects the brass pipes on the antenna. The Nuvo computer bios will be set so that follow a shutdown and the + 14V is turned off the computer will re-boot when the +14v is turned back on. A Pulse Width Moduator (PWM) controller allows a manual adjustment of the FAN speed for an acceptable air flow. If needed this could be controlled by a PC in the hut.

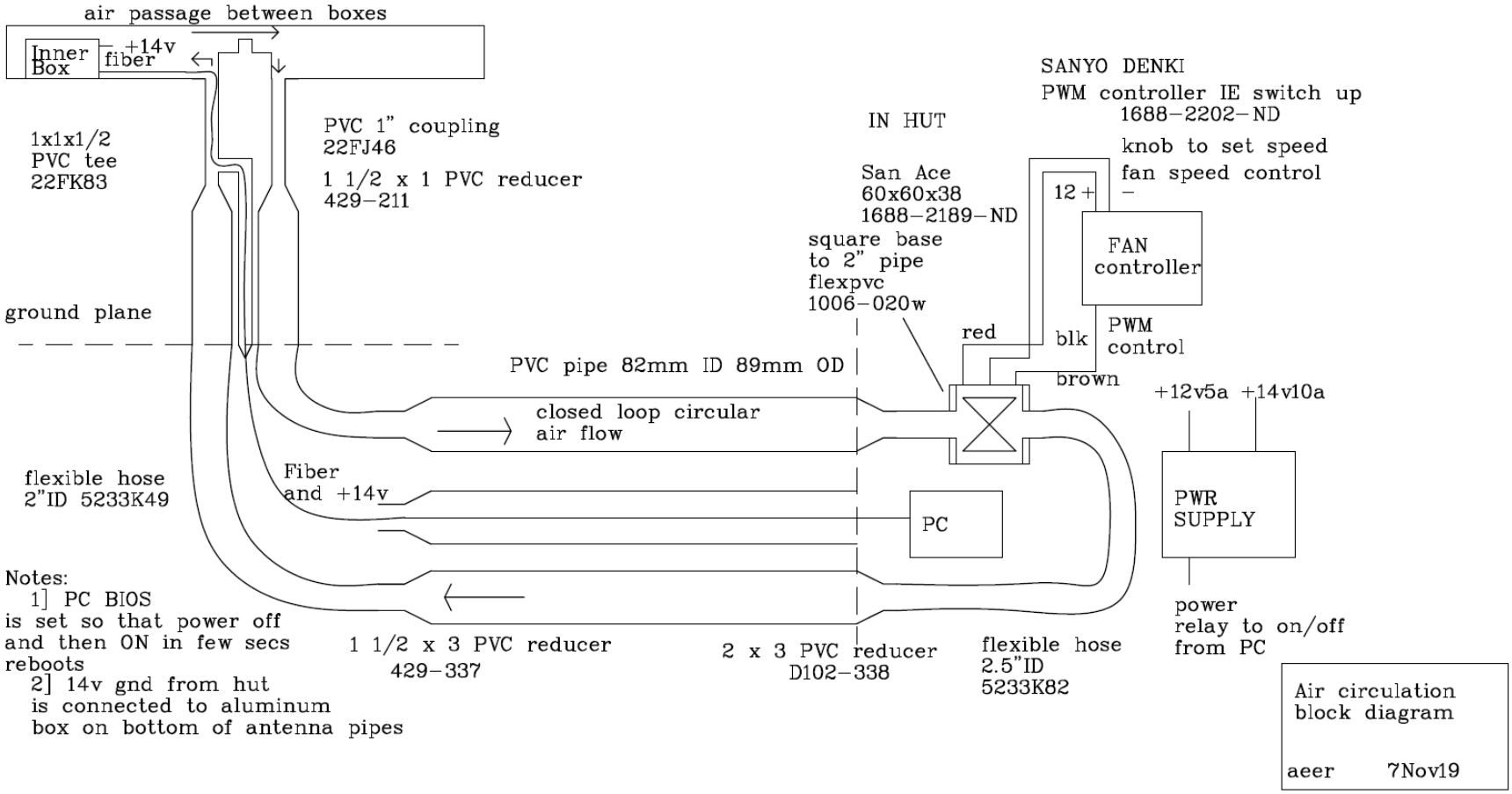

Figure 1. Diagram of proposed air circulation through antenna and back to the electronics hut.

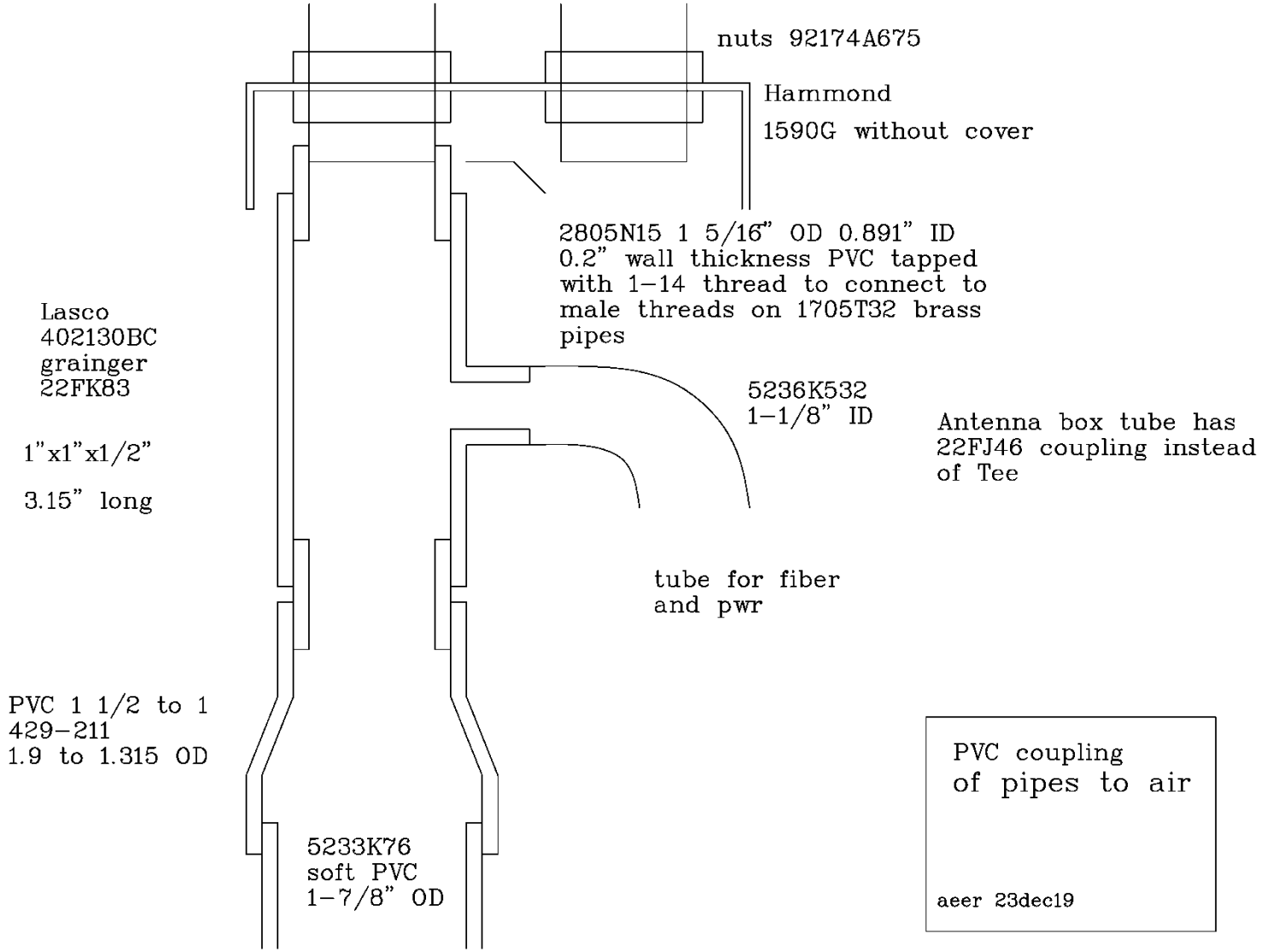

Figure 2. PVC parts to connect air pipes to antenna.

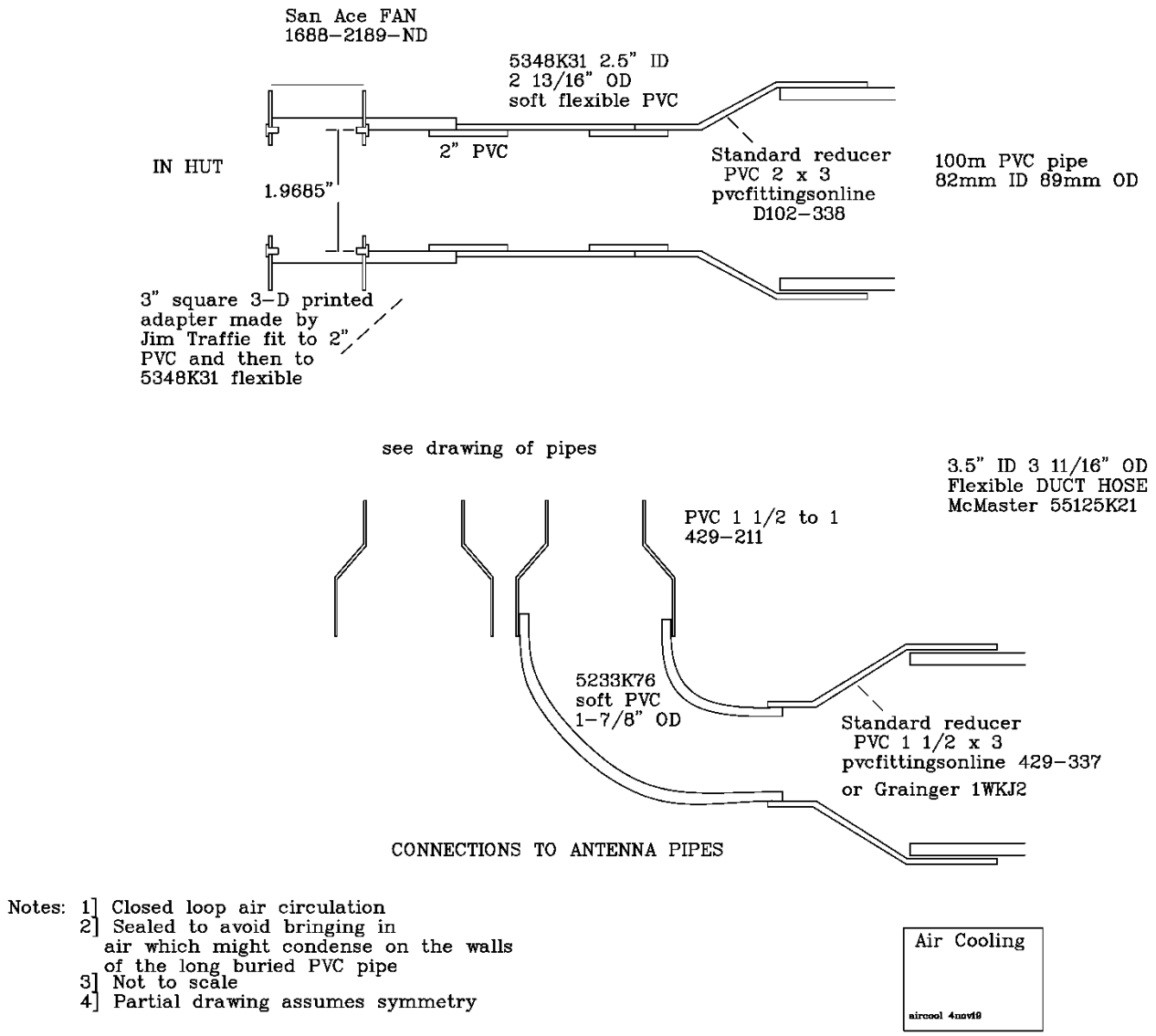

Figure 3. PVC parts to connect to hut and fan.

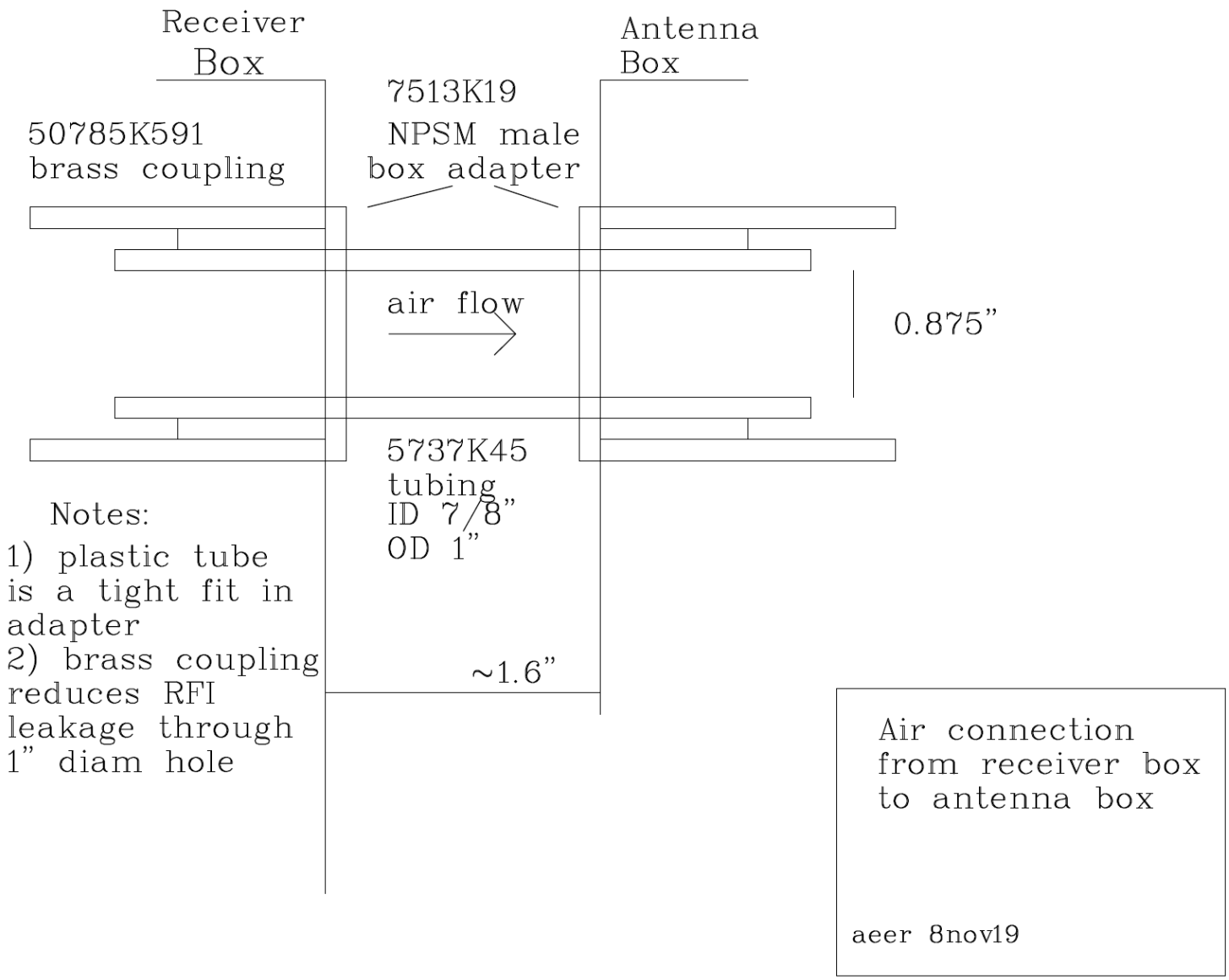

Figure 4. Air connection between boxes.