

Policy on Compact Array and Mopra electronic equipment operating temperatures

Temperature environments for the main equipment areas at the Narrabri and Mopra Facility are as follows:

Narrabri Screened Room

Approximately 10 kW of heat energy is dissipated from the electronics. In summer with relatively low heat pump efficiency approximately 30 kW of thermal cooling capacity is available. If more than two of the four units fail the room will begin to heat up rapidly. The Correlator blocks should be shut down promptly.

Under normal operating conditions the sub floor temperature is 15°C, the room temperature is 23°C. (CAMON /temp page). The exhaust temperature from block racks is 28°C. The performance of Correlator becomes marginal at block exhaust temperatures of 32°C. (Each block contributes 4°C, there are three blocks per rack typically).

At room temperatures in excess of 30°C the equipment in the screened room must be turned off. (Rubidium and Time standard rack exempt)

Mopra Equipment Room

To facilitate wide bandwidth correlations (i.e. 256 MHz BW) high substrate voltages and hence high power dissipation is used in the block VLSI. In order to obtain adequate performance the sub floor temperature needs to be 13°C, the room temperature is 19°C. At room temperatures of 30°C, the equipment in the equipment room must be turned off.

Narrabri Control and Computer Room and Mopra Control Room

Although equipment in these areas is not as temperature dependent as other areas of the Compact Array, it is important that the equipment not be operated in temperatures exceeding 30°C. This particularly relates to vulnerable disk drives. The desirable operating point is for room temperatures of 23°C.

Compact Array Antenna Pedestal Rooms

The suggested set point for air conditioners in the Antenna Pedestal Rooms is 25°C. Operation below 17°C and above 27°C can compromise accuracy of position resolvers (both Azimuth and Elevation). Pedestal room equipment including 10 kA UPS and hence Vertex room electronics must be shut down when the room is likely to exceed 30°C for extended periods. If a large floor standing fan is used to aerate the room then with the pedestal room door open, the operation may be attempted for extended periods of 30°C so long as the possibility of rain, dust storms or insects (turn lights off) is minimal and the outside air temperature is less than 35°C.

Mopra Antenna Alidade Room

The suggested set point for the alidade room air conditioner is 20°C. Resolver performance is as for Compact Array. The lower set point is desirable as the 30 kV A Thytec UPS and batteries (whose life span are temperature dependent) are located in the room. The unit is self protected with automated abrupt shutdown at 40°C. As this will violently disable all site electronics, this point should not be reached.

Narrabri and Mopra Vertex Room

The suggested set point for Vertex room air conditioning is 25°C. At this temperature all teflon based substrates and cables will undergo minimal dimensional change with temperature and hence optimise phase stability.

In the event of air conditioning failure, operation may continue to 35°C, however considerable "baby sitting" will be required. Attention must be made to the following:

- 1 Open both vertex room doors (keep cone room door closed). The possibility of rain, dust or insects must be assessed.
- 2 Is the outside air temperature likely to exceed 35°C? (generally 3 pm is the hottest time of day).
- 3 Keep the vertex room air conditioner blower fan running if possible.
- 4 Continually check on 15 minute intervals, the temperature of high dissipation modules such as the L4 7 GHz YIG module (see 1 L4 TEM and 2 L4 TEM). These temperatures should never exceed 48°C. The normal running temperature is 38°C for 25°C ambient. A complete summary is found on CAMON /modtemp1 and /modtemp2 pages.

If vertex room power down is required follow the normal procedure, i.e., turn off receiver front-end biasing, RF module power switches on receivers (only after front-ends) B1 laser modules. Turn off main DC supply to sampler, conversion, front-end and LO racks.

It is not necessary to turn off cryodyne pumps (i.e keep dewars cold!)