4 Hybrid Thermal Test Procedure

Below are instructions for the thermal testing of CMS hybrids with pitch adapters. More details can be found at http://hep.ucsb.edu/people/simms/hybrid_test.htm

I. Pre-Loading

1) Turn the chiller on; preferably twenty minutes or so before testing begins in order to allow the water/antifreeze mixture to cool down to a low temperature. The lower the temperature of the chiller water the better since it is the thermal reservoir with which the peltier exchanges heat, but care should be taken to avoid going below the dew point because condensation can form around the plumbing and cause a potential hazard for the electronics on the flow control panel.

2) Activate ACDC.

3) Click on the front-panel controls to open the water-flow and high airflow valves.

4) Flip the TCP switch to active in order for ACDC and CERN_ARCS to communicate (the TCP switch will not default to active, so this must be done each time ACDC is initialized).

5) Make sure that the NIM crate and the peltier power supply are powered on.

II. Loading

1) Load the hybrids onto the peltier plate by clamping them down, making sure that the spacing between the pitch adapter and the antenna is minimized for each hybrid. Care should be taken to avoid reaching over the hybrids, so it is recommended that the back two be loaded before the front two.

2) Plug tails into UTRI card/adapters.

3) Start CERN_ARCS (a hybrid registration screen will pop up).

4) Scan the barcodes of each hybrid. Make sure that the numbers on the screen match with those in the box.

5) Close the box.

6) Turn airflow to maximum in order to purge box of moisture (for thermal cycle).

7) Turn on ARC Board power supplies.

8) Press the engage button in teststation_start.vi.

III. Testing

The testing is automatic so no intervention is required.

A Thermal cycle consists of three sets of tests on each hybrid. They are run

i) Before cooling (~20 °C)

ii) After cooling (-20 °C)

iii) After heating (~18 °C)

Each set consists of the following tests:

1) Pedestal and Noise (Invertor on, Deconvolution Mode)

2) Pedestal and Noise (Inverter Off, Peak Mode, Pulser on)

3) Pulseshape (Invertor Off, Peak Mode)

4) Pulseshape (Invertor On, Peak Mode)

The purpose of the tests are well described on the following web-page:

http://cms-tk-hytest.web.cern.ch/cms-tk-hytest/docs/shortsopens.ps.

The vis that are responsible for flagging shorts, opens, and noisy channels are teststation_find_shorts.vi, teststation_find_opens.vi, and teststation_report.vi, respectively.

A hybrid will fail the tests if any of the following conditions apply:

- It has one or more pairs of shorted channels

Or

- It has five or more open **or** noisy channels

After the tests are run, the program will automatically generate a report for each hybrid in teststation_final_report.vi. If the teststation program fnal/ucsb_arcs.exe is run, an xml file will be generated and saved in the directory specified in cern_arcs_main_config.cfg (e.g. C:\TrackerDB\results). If the testation program arcs_auto_xml.exe is run, the software will try and automatically upload the xml files into the big browser database according to the commands in TrackerDB\update.bat. If it succeeds, a copy of the file

will end up in TrackerDB\output\indb. If it fails, the file will wind up in TrackerDB\results (this indicates an error related to the file update.bat) or TrackerDB\output\error. Also, data from each test of each run is saved in ASCII format under the directory specified in CERN_ARCS_main_config.cfg.

IV. Unloading

1) Stop CERN_ARCS by pressing the abort button on the top right (you might have to shut it down using the windows task manager.

2) Stop ACDC by pressing the stop button.

3) Turn off the ARC board power supplies.

4) Remove the hybrids