

Minutes of ATLAS Level-1 Calorimeter Trigger Phone Conference – 2nd November 2006

Birmingham: Richard Booth, Dave Charlton, Chris Curtis, Gilles Mahout, Simon Pyatt*, Xen Serghi*, Richard Staley

Heidelberg: Paul Hanke, Frederik Rühr*, Rainer Stamen

Mainz: Markus Bendel, Uli Schäfer

QMUL: Eric Eisenhandler*, Murrough Landon*

RAL: Bruce Barnett*, Norman Gee*, Tony Gillman*, Damien Prieur, Weiming Qian*, Dave Sankey

Stockholm: Barbro Åsman*, Sam Silverstein

* at CERN

1. Birmingham

- The 14 production CPMs that passed the JTAG tests have been delivered to Birmingham. Eight of these have been tested so far, of which four worked without any problems. Two modules initially exhibited problems where the CANbus indicated incorrect FPGA temperatures, and these were fixed. The other two modules had problems with their real-time data paths, which are still being investigated.

Further tests are still needed: a long overnight run on the four “good” CPMs, and some aggressive thermal/power cycling to stress the modules.

- More TTCdecs will be needed very soon to equip the new production CPMs.
- The remaining RPPPs (Types 2, 3 and 6) are gradually being completed.
- The Clock Alignment Module (CAM) is ready for layout as soon as the RAL Drawing Office workload permits.
- The prototype LVDS strain relief module from RAL, a modified version of the KIP design, is now at Birmingham to be evaluated in the *Wiener* CP/JEP crate.

2. Heidelberg

- The PPM PCB layout files are now with the PCB manufacturers; delivery of all of the boards is scheduled for 7th December. It is hoped that a slot will become available at *Lutke* to begin automated assemble of the surface-mount components on the 160 boards before Christmas. The final assembly stages (of non-surface-mount components, *etc*), which is necessarily a manual operation, will be carried out in the new year, producing completed modules in batches.
- The bare PCBs for all 160 LCD daughter-cards have already been manufactured and delivered to KIP. It is also hoped that *Lutke* can offer a slot to begin the SMD assembly before Christmas.
- Paul and Klaus will take two fully-prepared PreProcessor crates to CERN next Monday, for installation in USA15 on Tuesday morning. In return, the two existing PPr crates and PSU cages will be returned to KIP to be fitted with the necessary mechanical infrastructure.
- During the Joint Meeting next week, there will be discussions about the programme for signal testing.

3. Mainz

- There are continuing problems with production of the JEMs and their associated daughter-cards. The PCBs for the Input Modules, requiring controlled impedance traces, have been manufactured with impedances outside specifications; a tolerance of $\pm 10\%$ was defined, but the actual measurements show deviations of $\sim 20\%$, which is considered unacceptable.

As *Rohde & Schwarz* had earlier produced pre-production Input Modules with trace impedances within specifications, there was some speculation that the lead-free process used for these production boards may be the cause of the problem.

Rohde & Schwarz will re-manufacture the 180 PCBs, with a new delivery date of 24th November.

- There has been no further news on the status of the JEM motherboard production; at present, it seems that the 180 Input Modules and 45 motherboards may be all delivered at about the same time, towards the end on November.

4. *RAL*

- A total of 27 production CPMs had been delivered to RAL, but 13 of these failed JTAG (and other) tests and have been returned to the assembly company. The faults included bad BGA connections, the fitting of incorrect components and some shorts. The impression so far is that the QA level at the assembly company has deteriorated since the pre-production batch of CPMs was produced.

There is a more worrying concern about whether the long-term reliability of the modules will be affected.

- There will be a four-week lead-time for the next batch of four pre-production CMMs.
- Weiming has tested 25 of the batch of 50 pre-production TTCdecs and sent them to Birmingham. A further 24 units are in Heidelberg.
- The tests of the TTCdec address bits must still be completed before the final full production can be authorised. These tests will be carried out in Birmingham (and possibly also at CERN).

5. *Stockholm*

- Sam will bring the modified CP/JEP crate PSU “door” and the shorter power cable loom with him to CERN next week, and will exchange them with the units in the USA15 crate. The procedure has already been practised in Stockholm, so hopefully should proceed without problems.

The new 50mm² cross-section *Silistrom* cable is satisfactory, although the available space for routing is very limited.

Some mechanical work will be required – drilling out the ground lugs from 6mm to 8mm diameter, for example – so it would be best if the crate/PSU system were taken to a good working area, *e.g.* Bat 3150.

There are not yet any insulating safety covers available to fit over the bus-bar system for protection.

- There has been no response from *Wiener* to the questions on how to operate the CP/JEP crate water-cooled PSUs with remote voltage sensing without oscillation, so the default mode will use local voltage sensing.
- Sam pointed out that the CMM RTMs have no guide pins, and although the supporting runners are of some help, they are inadequate to ensure foolproof insertion into the backplane connectors, so there is a serious risk of misalignment and consequent connector pin damage. Some modifications may be required to the production RTMs and/or their mounting to avoid this problem.

Two water-cooled crates/PSUs are almost ready to ship from Stockholm to CERN, once the new wiring looms are confirmed to be adequate in USA15 next week. The shipping could therefore be during the week beginning 13th November.

- To ensure safe insertion of the RTMs into the backplane connectors, they could be pre-assembled before shipping. However, as there is no mechanism for securely holding them into the connectors they may well work loose during transit, so this is probably best avoided, and post-assembly in Bat 3150 is preferred.

Because of the lack of a fixing mechanism, there is clearly a possibility of poor connector mating, either with time or when an external cable is exchanged, which also suggests the need for some mechanical modifications.

6. CERN

- As the next batch of analogue cables has not yet appeared from *Cegelec*, there has been no significant cable installation this week.
- The remaining DCS cables have been assembled, and cable trunking prepared.
- Lat week saw a major installation of S-link fibres from the ROD crates to RoIBs and to ROS.
- The CMM-CTP SCSI cables have not yet been returned from being repaired and re-tested.
- The ROD test programme in USA15 has been continuing.

Next Phone Conference – Thursday 16th November 2006 at 11:00 (10:00 in UK)

Tony Gillman