

Minutes of ATLAS Level-1 Calorimeter Trigger Phone Conference – 28th July 2005

Birmingham: Gilles Mahout, Richard Staley, Peter Watkins

Heidelberg: Victor Andrei, Christoph Geweniger, Paul Hanke, Eike-Erik Kluge, Kambiz Mahboubi*, Frederik Rühr, Klaus Schmitt

Mainz: Uli Schäfer

QMUL: Eric Eisenhandler*

RAL: Bruce Barnett, Norman Gee, Tony Gillman, Viraj Perera, Weiming Qian, Dave Sankey

**at RAL*

1. Birmingham

- The 14 new LSMs have all been tested by Steve, and only one shows any faults. Richard will investigate this module. We already have a total of 15 fully-working LSMs for the full-crate CPM tests, and with the addition of this final module a full crate of JEMs can also be fed with LVDS data.
- The Scientific Linux system is undergoing an upgrade.
- The schematics and layout of the final CPM design (CPM 2.0) are now complete, and components have already been ordered for the first two modules. There is a four-week lead time for the Xilinx devices. The front-panel blanks and robust TripleEase ejector handles have been ordered from Triple E, for machining and fitting by DDi at the module assembly stage.
- The RPPP schematics require some minor changes involving the 37-way D-sub connector part, which will be passed on to the RAL Drawing Office. Their layout will start only after the TCPP layout is complete, as this is the more urgent job.

2. Heidelberg

- 39 completed MCMs have been received from Hasec, of which 29 have already been fitted with lids and tested.
- There has been a small problem with soldering the lids, caused by some of the solder used on the passive surface-mount components melting and bubbling through the covering glob-topping. Two solutions are possible:
 - Attach the lids by means of conducting adhesive
 - Solder the lids using only localised heating
- Kambiz reported on the status of the PPM integration week at RAL, which had been intended to confirm the operation of the new LCD card and to continue readout studies. Several issues had unfortunately prevented most of the objectives for the week being met.
- A major VME incident, whose cause was still unclear, had produced some widespread damage to VME bus buffers on several modules (CPU, ROD and PPM), and had also damaged the active bus termination network on the Wiener crate. To allow the PPM studies to continue, this crate was eventually replaced with another, the damaged modules replaced or repaired and the original PPM substituted for the new module.
- Most of the LVDS channels from the LCD card appeared to be stable, but at least one channel consistently produced parity errors.
- A VME addressing problem produced interference between the 9U ROD and the PPM when both were in the crate together and Read/Write operations were attempted to the PPM, which led to PPM configuration errors.

3. *Mainz*

- Uli reported on the current crosstalk and noise problem on the JEM, for which a test module had been built to carry out studies of the effect of microstrip geometry on inter-channel crosstalk.
- The ground-bounce seen on the Input daughter-cards is caused by an insufficient number of ground shields being provided on the Samtec connectors.
- Although the Xilinx design rules had been followed, the FPGA noise levels were still too high. Upgrading to Virtex-4 would be desirable, but devices are not yet available.
- FIO logic will be changed to use HSTL levels, which will improve noise margins by 150mV, and the FIO data buses will be widened in an attempt to reduce crosstalk levels. This latter modification will necessarily require more real estate, which implies one extra signal routing layer, together with blind vias. It is hoped that the combination of these two measures will reduce the problem to safe levels. Eric stressed that any pcb changes made at this stage should be minimal.
- To provide more I/O, the Jet Processor FPGA will be changed from an XCV2000 device to an XCV3000.
- JEM integration tests will continue at RAL next week.

4. *RAL*

- The TCPP schematics are complete, and the layout should be finished by the end of next week (12th August). Five pre-production modules will be manufactured, and after being assessed the remaining 65 modules will be ordered. Testing of the production modules will be carried out using Richard's JTAG-based test system, which should be available by early-September.
- The CMM pcb layout is not yet finished, requiring a further week of effort once the Drawing Office designer returns from the USA. A Request for Quotation for module manufacture has already been issued.
- Ian is revising the CMM firmware to modify the clock distribution.
- Most of the firmware bugs in the 9U ROD have been fixed, with only two small problems remaining.
- Bruce reported that the ROD works correctly at an instantaneous L1A rate of 16 triggers with a 1 BC separation. The BUSY problem has been solved, and at a trigger rate of a few hundred Hz errors are seen in about 1 in 10⁵ events.
- Some schematics changes need to be made, and then a further two RODs will be manufactured.
- Norman reported that the TCM specifications are under way.
- Weiming reported that the draft specification for the VMM is available, and some comments have already been received.

5. *Stockholm*

As no-one was able to be present at the Phone Conference, Sam sent a short report on the status of work in Stockholm.

- The Jet CMM firmware is finally starting to work again, after finding a subtle error in the overhaul that had taken some time to find.
- The backplane contract is finally ready to award, and will be announced by next Monday.
- Crate hardware is progressing.

6. AOB

- Tony reported that the fitting of connectors to the short TileCal cables was now under way in Birmingham, although only test pieces had been assembled so far. Final cable production would be starting next week, and the total job is expected to take about five weeks.
- Eric reported that he, Dave Charlton and Tony would be at CERN for four days from Monday 8th August for discussions about cabling installation preparations with Marzio Nessi *et al.* The need for latency minimisation will be stressed as the reason for insisting on additional overhead and under-floor cable trays in USA15.
- There are two possible routing schemes for the short analogue cables, and a decision to select one of them must be made very soon. The Heidelberg group is constructing a simple “space model” of the front of a crate to study possible bending difficulties for the different routing options. Compressed-air pipes of similar diameter to the analogue cables may be used to emulate the bulk of the cables to/from a single crate.
- An alternative to the BNL analogue cable support stocks, involving a comb and cable collar construction, has been proposed, and a decision must also be made very soon as to which scheme is preferred so that fabrication of the necessary parts can begin.

Next Phone Conference – Thursday 18th August 2005 at 10:00 (UK), 11:00 (Germany, Sweden)

Tony Gillman