

Minutes of ATLAS Level-1 Calorimeter Trigger Phone Conference – 3rd May 2007

Birmingham: Dave Charlton*, Chris Curtis, Gilles Mahout, Richard Staley, Peter Watkins*
Heidelberg: Florian Föhlisch*, Paul Hanke, Karlheinz Meier, Felix Müller*, Rainer Stamen*
Mainz: Thorsten Kuhl, Uli Schäfer
QMUL: Murrrough Landon*
RAL: Bruce Barnett*, Ian Brawn, Norman Gee, Tony Gillman, Viraj Perera, Damien Prieur, David Sankey

* at CERN

1. Birmingham

- Of a further four CPMs tested recently, only two are fully working. One required some minor cleaning and rework, was returned to RAL and has now been repaired. The second module requires further study using *Chipscope*.

Viraj added that of the total of 53 production modules, 41 have successfully passed JTAG tests, but only 39 of these have passed all system tests in Birmingham (the two faulty modules are those noted above).

Of the remaining twelve CPMs that had failed JTAG tests, three had been reworked at the assembly company and await JTAG tests, and three had been sent to a specialist rework company. The latter modules are being shipped to RAL today for testing.

Following a question from Dave Charlton, it was agreed to wait for the JTAG test results on these reworked modules before approaching the assembly company, who have already agreed to fabricate and assemble new PCBs (up to twelve modules) if these tests fail.

- Tests of the two new CMMs have been carried out. One is fully-working, and will be shipped to CERN next week, but the other has a persistent (slot-independent) fault with the bunch-crossing number, which Ian will be studying this week.
- The 9U Static Discharge module should be ready to ship to CERN early next week.
- There is a second 9U backplane extender for the CPM (and JEM?) ready to ship to CERN; the first module remains available for use in Birmingham.

2. Heidelberg

- Paul has sent around an e-mail warning of the risk of damaging connector pins in the 4-slot LVDS backplane stubs of the PPR crates. In summary:

During the previous cabling week, two isolated bent pins were discovered in two of these blocks where there had been module insertion/removal (TileCal Barrel crate, right-hand half). Repair will require replacement of the two backplane stubs, so more spare stubs will be produced for contingency.

Experience has shown that PPM insertion/removal is a safe procedure, if executed correctly, so it is important that anybody installing/removing PPMs learns the correct technique in advance. The recommended procedure is as follows:

1. *Insert a module in the slot and slide it back until gentle resistance can be felt.*
2. *NEVER apply "thumb-force" FIRST to the BOTTOM half of the PPM front-panel!!! Always push at the top until "catching" is felt (area of upper analog connectors – they are solid and well bolted to the PCB). The "alignment power" of the two fairly rugged VME-DIN-connectors (J1,J2) with their casing lifts the board to the correct height, because the PCB has up to 1 mm "play" in the rails. Reasoning: Normally, the VME connectors catch first. The "flimsy" CompactPCI has shorter pins (we changed this explicitly). By pushing at the bottom, one could still manage for the CompactPCI pins to touch first. With 2 mm pin-raster and 1mm PCB play, "disaster" can take place!!!*

3. *When done correctly, the PPM "sits" in the pin-holes. Now, the two levers can push it in. Apply force SIMULTANEOUSLY to top-bottom with courage. It is mandatory to acquire "the feeling".*

- Custom tooling is being constructed to assist with the connection of LVDS cables on to the PPr crate backplanes. It is hoped that this hardware will be available for the next cabling week (w/b 21 May).
- A further supply of tested TTCdecs from RAL will soon be needed in Heidelberg to populate the remaining production PPMs.
- There has been steady progress on commissioning production PPMs, and there are now at least 45 modules that have passed the single-board tests.
- One full crate of 16 PPMs has been operated under power continuously for more than one week, with L1As and readout all active.
- Three Multiplexer-Receiver boards to emulate LVDS and ROD inputs are being assembled for the PPM system tests.
- Firmware problems associated with loading individual PPM DAC values have been resolved.

3. *Mainz*

- JEM tests are continuing. At the end of next week, JEP system tests will continue in USA15 (operated remotely from Mainz?).

4. *RAL*

- Of the three new pre-production RODs, one was sent back to the assembly company to have the incorrectly-fitted optical transmitters changed for optical receivers, but it has not yet been returned to RAL. The remaining two modules have been successfully JTAG-tested at RAL, and Ian is currently continuing with the single-board tests, so far with encouraging results. Problems observed with System ACE are not believed to be serious. Another performance anomaly noted is that the first event received always shows G-link protocol errors, and although this requires further study its cause is expected to be firmware. A final system test will be carried out in Birmingham before sign-off.
- Three of the four new bare PCBs for the latest batch of pre-production RODs have been delivered to the assembly company, and depending on the above test results it is hoped that module assembly can be authorised very soon.
- The final number of production RODs must be re-calculated to take into account the latest needs of the ZDC collaboration.
- The order for the PCBs for the next batch of four pre-production CMMs at the new company is awaiting the final design sign-off, and the recent BC-number fault seen on one in Birmingham must first be resolved.
- The remaining nine production VMMs are scheduled for delivery to RAL on 15th May.
- Five of the new TCM-CP/JEP modules will be shipped to CERN.
- Approval for production of the 14 TCM-VME64 modules awaits final design sign-off. The only remaining untested feature is CANbus operation, and of the four pre-production modules at present in Heidelberg (2), CERN (1) and RAL (1), this functionality can only be verified on the CERN module.
- Approval is now granted for full production of the latest version of the CMM RTMs.
- For the S-link RTMs, it is suggested that the handle samples that do not require front-panels should be tested at CERN.

- Work has been continuing on scanning the Processor Backplanes (PBs), using a combination of the *Smartscope* and visual inspections. The first three PBs repaired by *Erni* (P2M2, P3M2 and P4M2) have already been delivered to CERN, and tomorrow (4th May) Sam will re-install them into crates. A recently-observed *Smartscope* anomaly has cast some doubt on the machine's efficiency in detecting absent pins in one particular operating mode, so it is proposed that the PB recently sent to CERN from RAL (P3M0) should be returned to RAL for re-scanning.

5. CERN

- The L1Calo Twiki pages contain details of the installation and commissioning plans for the next few weeks. In summary:

W/b 30th April: Rainer, Florian and Felix have been carrying out tests with LAr signals connected to six PPMs (~200 channels). Two channels appear not to work, but normal pedestals and noise are observed. They will use PHOS4 scans to check signal quality.

W/b 7th May: RoIB tests, followed by JEM tests later in the week.

W/b 14th May: Repeat of earlier CMM-CTP cable connectivity interface tests.

W/b 21st May: Cabling Week – connection of some LVDS cables? TDAQ Week. ROD tests, PPr tests with LAr and (possibly) TileCal signals.

W/b 28th May: (Not yet planned.)

W/b 4th/11th June: M3 run – should we participate (there will also be an M4 run in July)? The first week is designed for existing participants – our involvement would be only in the second week. The scope of our participation would be reading out a few PPMs, fed with LAr signals (operated with high Receiver gains), into a single ROD.

If we do participate, we must also have some system operating to monitor and control our PPr crates – either DCS or a temporary VME-based system monitoring MCM temperatures in the PPr crates as an environmental indicator.

The major work for us would be to establish pre-integration into T/DAQ and DCS.

Next Phone Conference – Thursday 17th May 2007 at 11:00 (10:00 in UK)

Tony Gillman