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

Birmingham:	**Richard Booth*, Dave Charlton, Chris Curtis, Gilles Mahout, Richard Staley, Peter Watkins**
Heidelberg:	**Paul Hanke, Kambiz Mahboubi, Karlheinz Meier, Hans-Christian Schultz-Coulon**
Mainz:	**Uli Schäfer**
QMUL:	**Eric Eisenhandler*, Murrough Landon**,**
RAL:	**Bruce Barnett, Ian Brawn, Norman Gee, Tony Gillman, Dave Sankey**
Stockholm:	**Christian Bohm, Sten Hellman**

**at RAL **at CERN*

1. Birmingham

- The final stage of the PRR-requested full-crate test has been reached, with a fully-loaded CP crate containing 14 CPMs and 2 CMMs, driven with real-time data from 14 LSMs via 11m (ATLAS) LVDS cables. This has been run with parity error checks for continuous periods of up to 10 minutes, and the entire system (including data across the Backplane to the CMMs) has been error-free. This is a tremendous achievement, with congratulations due to the Birmingham team.

  The total crate power consumption will be measured this week, and final tests with full timing scans to check the timing windows will also be carried out. Gilles will then summarise the test conditions and the results in a note to the PRR Panel, requesting approval for full production of the remaining CPMs.

- The configuration time for the full CP crate is ~2 minutes, compared with ~3-4 minutes for the simulation.

- Richard now has all of the Types 1, 2 and 5 production RPPPs available. There was a small connectivity error discovered with the Type 2 version, which will be corrected in Birmingham on all boards. The remaining Types 3, 4 and 6 will now begin production.

- All of the RPPPs must be tested, using the existing JTAG test module. Hopefully, this can be done at RAL, in the same way as the TCPPs were tested.

2. Heidelberg

- Production of MCMs is continuing well, with the latest batch of 150 glob-topped and lidded devices passing their final tests without errors. It has now been demonstrated that the 3% of additional failures observed after packaging was caused by the glob-topping procedure and not by the lid attachment. Several hundred fully-functional packaged devices are currently available.

- Minor mechanical problems have been observed when inserting a PPM into either a “homebrew” or a Wiener crate, apparently causing the board to be under significant strain when the injector handle is in its final state. The proposed solution is to reduce the PCB depth by 0.5mm from its nominal 400.0mm.

  (Some lengthy discussion followed at this point, as similar problems have also been observed with the latest JEMs in the CP/JEP crate at Mainz, although not in the nominally identical crate at RAL. It has so far proven impossible to get the VITA dimensional specifications for 400mm boards. There is also a question about the IEEE conformity of the new TripleEase ejector handles.)

- Additional mechanical strengthening bars have been added to the PPM PCBs in the form of longitudinal stainless-steel “spokes”, which do not impede the cooling air flow.

- In order to avoid changes implied by the imminent EU Pb-free directive, all remaining components for the production PPMs must be ordered before 1st May 2006.

- The recent test week at RAL was successful in proving that the current LCD card design is now satisfactory, and no further changes should be needed to it or to the associated PPM circuitry. Two areas still need to be checked, however:

  The RAL tests of FCAL signal mapping to the JEM were not completed, although it was confirmed that every signal driven from the PPM does arrive on the JEM, so the connectivity is correct, but firmware changes may possibly still be needed. These final checks should be completed as soon as possible. Also, link operation should be re-checked using the final ATLAS 11m LVDS cables, rather than the prototype 15m assemblies, as there may possibly be some changes required to component values in the pre-compensation networks to prevent excessive over-compensation. Sten will bring a few of the 11m cables to the Heidelberg Joint Meeting later this month.

- There are also some issues still to be resolved concerning the implementation of the CANbus termination scheme, which will affect the design of the Supplementary Backplane on the PPr (and ROD) crates.

3. Mainz

- There was further discussion about the recent mechanical difficulties observed with the JEM and the PPM in several different crates. No conclusions were reached, but it is clearly urgent to understand this issue and resolve it, before full-scale module production begins. It is very important to try all of our modules in the final Wiener crates, and in particular the CP/JEP crates, once the production Processor Backplanes are available.
- The pre-production JEMs are still at Rohde & Schwarz, but are expected to be delivered to Mainz next week.
- Manufacture of the first few pre-production Control Module daughter-cards is almost complete, and the boards are due to be delivered to Mainz in the next few days, where they will be assembled by hand.
- JEM FPGA configuration via JTAG was tried last week at RAL, and was apparently working correctly, although there were still some problems.

4. RAL

- The first two pre-production VMMs are due to be delivered to RAL next week.
- The final design of the VME64x(P) version of the TCM will be sent for manufacture of two pre-production modules next week.
- The VME64x(P) Supplementary Backplane PCBs will be designed at RAL and manufactured in the UK, but those destined for the PPr crates will be assembled with the appropriate connectors in Heidelberg while RAL will organise the assembly of those intended for the ROD crates.
- A total of 274 TTCrx chips will be ordered from CERN for assembly of the full production batch of 344 TTCdec daughter-cards (70 chips are already in hand).
- The RGTM design is currently in the RAL Drawing Office for layout.
- The two latest ROD modules were successfully JTAG-tested and are awaiting further system tests.
- The pre-production CMMs are currently being taken through the Test Plan, and all functions tested so far are working correctly – System-ACE, VME access, Crate-System FPGA data transport and I/O data using a DSS. One small schematics error has been detected, where the CAN lines accessing the FPGA temperature monitors have been deleted.

  All of the Processor Backplane inputs must still be checked, and also both of the G-link outputs. There is no cable assembly yet available to check the CTP output socket – Ralf Spiwoks will be asked to supply one.

Once the system grounding scheme is finalised, the RTM design can be completed and the pre-production boards manufactured.

- Bruce summarised the outcome of the recent RAL Test Week, which was generally very successful. He subsequently issued a comprehensive e-mail to the ATLAST1 list, detailing all of the relevant points.

5. Stockholm

- The first two pre-production Processor backplane PCBs should be delivered to Stockholm tomorrow (03 March). If they pass the acceptance tests satisfactorily, they will be sent to Erni in Germany for assembly of the connectors.

6. CERN

- Murrough summarised the recent installation work in USA15. Our three technicians (Alexander, Simon and Xen) have been at CERN during this week, measuring and cutting cables ready for Cegelec to assemble connectors. They now have a total of ~300 pre-cut cables, each requiring one connector, which should take them ~3 months to complete at their current rate of 100 connectors per month.
- Unfortunately, the Saclay Cable tester that Cegelec have been using to verify each assembled cable has developed a fault, and so further delivery of assembled cables to Bat 3150 has stopped. So far, they have completed and delivered only 12 cables, with 24 connectors (although presumably there is a growing number still with them awaiting test).
- The screwlocks for the TCPPs are now at CERN, and the technicians have started to assemble them, but it is proving rather a slow job. They have not so far installed any of the modules in USA15, as they still require ATLAS labels. These can now be printed from Steve's spreadsheet list.
- Stocks will be installed at the rear of the TCPP crates, ready for the imminent installation of the long analogue cables from the TileCal.
- The power supply problems that caused the TileCal electronics to be shut down recently are still being investigated, but is believed to have been caused by control firmware. It is hoped that they may start to power everything up next week, so we may soon be seeing signals again.
- 17 CPUs purchased by Stockholm have been delivered to CERN, and it would be good if a few could be released for immediate use, so that the loaned ones could be returned to the Pool.
- A new TWIDO box has just been added on top of the trigger racks, and our customised cable tray was unfortunately de-customised in the process. The box will be moved to a better place, but we will have to get our cable tray re-made.
- There have been some developments regarding safety issues. Hard hats are no longer needed in USA15, although they must still be worn in transit. In the cavern there will soon be liquid argon filling the LAr calorimeter, and magnet tests starting. **Because of this, everyone working underground must have completed a further (web-based) safety course (Level 4A) *before 20th March*.** Eric will circulate details of where to find this.

Next Phone Conference – Thursday 30th March 2006 at 12:00 *(11:00 in UK)*

Tony Gillman