Minutes of ATLAS Level-1 Calorimeter Trigger Phone Conference – 25th January 2007

Birmingham:	**Chris Curtis, Dave Charlton*, Stephen Hillier*, Joseph Lilley, Gilles Mahout*, Richard Staley, Peter Watkins**
Heidelberg:	**Florian Föhlisch, Paul Hanke, Eike-Erik Kluge**
Mainz:	**Markus Bendel, Andrea Neusiedl, Uli Schäfer**
QMUL:	**Eric Eisenhandler, Murrough Landon***
RAL:	**Bruce Barnett*, Norman Gee*, Tony Gillman, Viraj Perera, Damien Prieur, Weiming Qian***
Stockholm:	**Sten Hellman, Attila Hidvégi, Sam Silverstein**

** at CERN*

1. Birmingham

- Including the ten pre-production modules, there are now 44 fully-working CPMs (including three recently-tested). 15 modules are known to require some degree of re-working (involving the replacement of either large or small BGA packages) and four modules have still to be tested.

  The assembly company has removed two large packages to inspect the PCB, but no conclusions have yet been reached about the cause of the assembly problems. There are suspicions about over-etched traces and/or poor surface finish on some of the mounting pads.

  It is quite possible that the boards requiring re-work of the large BGA packages will eventually need to be re-made, but this would be the responsibility of the company. However, the whole process, either of re-work or new PCBs, would inevitably be time-consuming – new sets of components would have to be ordered and the large BGA devices would have to be re-balled.

  The question of concern is whether the currently working modules will be reliable, or whether they have inbuilt weaknesses which will produce premature failures.

- Ten of the latest production CPMs have been sent to CERN for installation in USA15, where they will be used for the first *in situ* full-crate system tests.

2. Heidelberg

- Paul, Klaus and Alex visited CERN last week to install a further four PPr crates in USA15. Paul issued a note summarising the status at the end of that week, one important part of which was as follows:

  It is highly recommended that anybody in the ATLAS L1 Calo Trigger group who changes any part of the crate/power-supply set-up should notify people at KIP Heidelberg (for now: P. Hanke) of the action taken.

  If a Power-Supply Unit is exchanged, it MUST be repaired as soon as possible (and not just put in a corner of USA15 or Bat 3150 with a "faulty" sticker and forgotten).

  Unused PPM slots during test-work shall be covered by blanking panels to avoid intrusion of external (dusty) air into the closed cooling circuit. The front-mounting Power-Supplies of the lower crates will be covered as soon as possible for the same reason.

- Paul *et al* will return to CERN in late-February to install the remaining two PPr crates.

- The first 20 production PPMs will be available at KIP later today. Batches of ~20 modules should continue to arrive at KIP regular intervals from now on.

  This is very good news, and exactly on the schedule announced at the PPM PRR in October.

- In order to test the production PPMs, 20 TTCdecs will be needed very soon in Heidelberg. For the latter, it was agreed to send immediately all of the 49 tested TTCdecs currently at CERN to Heidelberg (34 to be couriered by Florian) and Mainz (15 to be shipped). The cards are needed at Mainz in order to equip and test the first production JEMs (one crate). It is intended that the

TTCdecs should remain on their associated motherboards once the acceptance tests (PPM or JEM) have been completed. Weiming will test a further 100 TTCdecs at CERN as soon as possible.

- The first individual PPM tests will be carried out using external TTC clocks, but a TCM-64 will be needed in Heidelberg very soon after that (~mid-February). It was agreed that the next four pre-production TCM-64 modules would be ordered immediately, on a ten-day turnaround. (A prototype TCM-64, or even a TCM/ALC, could be used temporarily, if necessary, until the pre-production modules became available.)
- The production LCDs (with the new PCBs) should arrive in a few days time.

3. Mainz

- There is no further progress to report on the JEM production. The first batch of modules was scheduled for delivery last week, but there have been delays in the hand-soldering operation due to the use of Pb-free process. However, it is now expected that the entire batch of 41 JEMs will be delivered to Mainz early next week.
- All of the daughter-cards are available for testing once the JEM motherboards are delivered.

4. RAL

- The remaining RGTM-Os from the 142 production boards were sent to KIP yesterday.
- Three of the four pre-production CMMs are due to be delivered to RAL imminently. The fourth board has been rejected due to poor PCB surface finish.
- The first pre-production VMM has been successfully tested, and will be sent immediately to CERN. The remaining three modules still have to be tested.
- Full production of the 13 TCM-CP/JEPs will begin next week.
- The eight Auxiliary Backplanes for the ROD crates still have to be assembled. As there are currently only enough connectors for six units, with the remainder due in mid-February, we will wait until then to assemble all eight units in a single batch.
- The CMM RTMs require some minor mechanical re-layout, in order to allow standard VME module runners and ejector handles to be used. The Drawing Office at RAL has already started this work. It has not been decided whether front-panels (rear-panels?) should be added to the PCBs; the ejector handles would be compatible with either design. This work is quite urgent as the first pre-production board is needed to act as a realistic space model to complete the design of the mounting mechanics in Birmingham.
- Seven (of a total of 26) production S-link RTMs have been ordered.
- A similar surface-mount assembly problem to that seen on the fourth CMM has been observed on the pre-production ROD assembly – “Au-skipping” on the PCB pads. The proposal from the PCB manufacturers is to switch to immersion Ag in place of Au. Viraj will meet tomorrow with the assembly company to check if they will agree to this change, although they may increase the cost of carrying out the assembly work. The only other alternative is to change to another PCB company, but this raises other difficulties concerning PCB build details, *etc*.

5. Stockholm

- The next two water-cooled CP/JEP crates are finished and have been shipped to Birmingham and CERN. The first has already arrived in Birmingham, and the second should arrive at CERN next week.
- The final water-cooled CP/JEP crate and an air-cooled CP/JEP crate are now being prepared in Stockholm, starting with assembly of the Backplanes.
- Once the crate work is complete, Sam will start to work on the Jet Merger FPGA firmware.
- It was agreed some time ago that a further two Backplane pin repair kits should be purchased by RAL, but this has not yet happened. The cost (in 2004) was ~1,000 Euro per kit. It is becoming

urgent to have such a kit at CERN, as there is already a damaged Backplane pin needing replacement in one crate. *(It was agreed after the meeting that Mainz would order these two kits).*

- Simon will take the Backplane pin repair kit from Birmingham to CERN next week.
- Sam will make the module keying document that he wrote available on the web.

6. CERN

- The latest TCM-64 at CERN is working, and the external CANbus function has also been tested.
- Paul Harwood has supplied the necessary firmware upgrade to fix the *Wiener* crate PSU shut-down problem; it will be installed and tested this afternoon. If successful, it will be also installed on the PSUs in the Birmingham crates.
- Murrough re-iterated that official TC labels must be put on *all* of the modules and crates that are installed in USA15.
- Dave reminded everyone that the current schedule for installation could be found on the appropriate Twiki page - https://twiki.cern.ch/twiki/bin/view/Atlas/L1CaloInstallationSchedule.

  week beginning 12 February – commissioning first full CP crate

  week beginning 26 February – commissioning first partially-full JEP crate

Next Phone Conference – Thursday 8th February 2007 at 11:00 *(10:00 in UK)*

Tony Gillman