

## Minutes of ATLAS Level-1 Calorimeter Trigger Phone Conference – 16<sup>th</sup> May 2007

**Birmingham:** Dave Charlton\*, Steve Hillier\*, Simon Pyatt, Xen Serghi, Richard Staley

**Heidelberg:** Paul Hanke, Eike-Erik Kluge, Rainer Stamen

**Mainz:** Thorsten Kuhl, Uli Schäfer

**QMUL:** Eric Eisenhandler

**RAL:** Ian Brawn, Norman Gee, Tony Gillman, Viraj Perera, Damien Prieur, David Sankey

\* at CERN

### 1. Birmingham

- The CPM under test that had been showing errors on its HIT outputs has been investigated using ChipScope and new CP-chip firmware. The fault was traced (after several days) to a badly-soldered resistor, unfortunately not detected by the JTAG tests. Although now apparently working, a soak-tests is needed, but the test ROD has unfortunately now stopped working, and is itself under investigation.
- The total number of fully-working production CPMs is now 39, which provides a total of 51 usable modules (including the pre-production CPMs). If the repaired CPM noted above is also fully-working, there will be a total of 52 modules – just four less than required for the full trigger installation. Of course, even more modules are still needed for spares.
- The water-cooled CP/JEP crate was shipped to CERN earlier this week, for installation in USA15.
- The 9U CDE module and the 9U Extender have also been shipped to CERN.
- The CMM under test still has problems. It refuses to configure and the BCReset does not seem to be decoded correctly. The module will therefore be sent to RAL for Ian to study.
- Production of the RTM mechanical support structures is progressing in the Birmingham workshops, and it is hoped that they will be ready for the cabling week starting next Monday.

### 2. Heidelberg

- The LVDS and Readout Multiplexer boards have been assembled, and can be used to check all of the LVDS real-time outputs and the G-link ROD output from each slot in turn for the 16-PPM test crate.
- The second test crate has been successfully operated with 16 PPMs continuously under power for several weeks, with no failures observed.
- Single-board testing of production PPMs has been continuing steadily. So far, 50 modules have passed these electrical tests, and a further 60 modules have had a visual inspection but have not yet been tested electrically. The remaining 50 modules from the production batch of 160 have still to be inspected. There is increasing evidence that the yield of working modules has increased with later batches, apparently due to improved soldering quality.
- Paul et al have developed some tooling to assist with the insertion of LVDS cable connectors on to the rear of the PPr crate backplane stubs. They will take it to CERN to try out in USA15 as soon as possible. Norman asked if it might be possible to adapt the system for use with the different geometry of the CP/JEP crate backplane connectors; Paul will provide some drawings.
- Sets of blanking panels to prevent leaking of the cold air column from slots 3 and 4 in the PPr crates will also be taken to CERN as soon as they become available.

### 3. Mainz

- The JEM test programme continues, with over half of the production modules currently under test.

- With recent problems with Customs when shipping JEMs to CERN, it was suggested that it would be very helpful if all future L1Calo-related shipments to CERN were to be sent via the Preveessin site and care of the UK Admin Office, which would ensure their speedy reception and onward delivery. Norman will send around a note with the full details.

#### 4. RAL

- Viraj has sent a letter to the CPM assembly company requesting that they scrap the eleven faulty boards and re-make them. There has only been a brief acknowledgement so far, so we await a more detailed response from them, which we regard now as being very urgent.
- The faulty CMM in Birmingham has problems:
  - CANbus operation
  - BCReset (signal not reaching FPGA)
  - System ACE (not the formatting issue that was found with the ROD) – to be returned to RAL

- Several modules were sent to Birmingham for system tests earlier this week:

Two CPMs

One TCM-CP/JEP

One ROD

One CMM (to compare with the suspected faulty module)

- All three of the latest RODs have been partially tested at RAL (data paths, *etc.*), but CANbus operation and TTC interfacing has not yet been tested.

So far, everything looks good, except for readout errors seen when testing the G-link signals. Operating groups of four links together into a single DSS, errors are seen at a rate of ~1 per million events. This is believed to be a DSS problem, but definitive tests should be carried out in Birmingham.

- Bruce had also reported seeing ROD problems at CERN, where the first event immediately after switching the G-link mode from 16-bit to 20-bit, or after a G-link reset, showed protocol errors (error flag only, but no actual data errors). This is suspected to be a “feature” of the G-link design. Unfortunately, the ROD powers up by default with the G-links in 16-bit mode, so the switchover is always needed.
- Viraj has a quote for assembly of the next four RODs, using the already existing PCBs, of four weeks. It is a more complex than normal because the boards must be mounted on a special bracing frame during the oven assembly process, to prevent board warping.

It is therefore urgent that authorisation for assembly of these modules be given as soon as possible.

- It is similarly urgent to approve production of the next four pre-production CMM PCBs, and subsequent assembly, as soon as possible.
- Current status of Processor Backplane assessment (see L1Calo Twiki page for most recent information: [https://twiki.cern.ch/twiki/pub/Atlas/LevelOneCaloTrigger/backplane\\_status.xls](https://twiki.cern.ch/twiki/pub/Atlas/LevelOneCaloTrigger/backplane_status.xls))

P4M0 – faults observed during CERN JEM tests confirmed (to be sent for repair to *Erni* in Germany as soon as possible)

P6M2 – scanning almost complete (only XY columns still to do)

P1M2 – just received from CERN, will be scanned as soon as possible

P3M0 – returned to RAL for a second time from CERN, scanning to be repeated after possible problems with first scans

P1M0 – just received at CERN

P3M2 and P5M2 – installed in JEP crates in USA15

P4M2 – in Bat 3150 at CERN

P1M0 – just received at CERN

P2M2 – installed in CP crate at CERN

- Heidelberg would like the remainder of the TTCdecs reserved for the PPMs to allow them to populate the full production batch. Once Weiming returns from holiday, this will be sorted out.
- Authorisation of the full production of the TCM-64 modules awaits approval of the pre-production modules – Bruce and Gilles should confirm the current status of use in ROD crates.
- The ZDC group will require some small numbers of modules: there will be sufficient PPMs, but there will need to be another small batch of TTCdecs manufactured, for which more TTCrx chips must be obtained from Philippe Farthouat – to be checked with the ZDC group.

Dave Charlton has compiled a full list of all the modules that the ZDC group will need, all of which will be shipped only to CERN and not to the USA.

## 5. *Commissioning at CERN*

As there were few people attending today's phone conference, it was suggested that discussion of future commissioning work should be left until next week's General Meeting at CERN.

- The RoIB and JEP tests carried out last week were successful.
- A combined run with the CTP was carried out earlier this week; some BCReset-related problems were seen.
- There is a combined run taking place with TileCal, L1Calo (with PPMs) and the CTP to check timing issues.
- Next week (w/b 21<sup>st</sup> May) will be very busy in USA15: cabling, TDAQ, LAr signal testing, *etc.*
- Discussion of what L1Calo needs to prepare for participation in the forthcoming M3 integration run in June is still somewhat unclear.
- The date for the next integration run – M4 – has now been specified as w/b 6<sup>th</sup> August. L1Calo must be properly integrated into this run.

**Next Phone Conference – Thursday 31<sup>st</sup> May 2007 at 11:00 (10:00 in UK)**

*Tony Gillman*