

## Minutes of ATLAS Level-1 Calorimeter Trigger Phone Conference – 18 May 2006

**Birmingham:** Richard Booth, Chris Curtis, Gilles Mahout

**Heidelberg:** Paul Hanke, Eike Kluge\*, Kambiz Mahboubi\*, Karlheinz Meier,  
Hans-Christian Schultz-Coulon

**Mainz:** Uli Schäfer

**Queen Mary:** Eric Eisenhandler\* (chair and minutes), Murrough Landon\*

**RAL:** Bruce Barnett\*, Ian Brawn, Norman Gee\*, Damien Prieur\*, Weiming Qian\*,  
Dave Sankey

**Stockholm:** Apologies and report from Sam Silverstein

\* *At CERN*

### **Birmingham**

Gilles reported on progress with a ROD being fed from multiple CPMs. He has two RODs, an older and a newer version. So far he has driven 6 inputs – the G-links are stable and he sees no parity errors. He needs 12 more fibres to fully populate the inputs; *later in the day he arranged with Viraj to get them.*

The newer ROD has a TTC problem, which may be due to firmware.

He plans to also use the new CMMs in this ROD test; this and general use in the full-crate rig will be good tests of the pre-production CMMs.

Chris Curtis has got Adam's CANbus development board working. This is good because it relieves some of Adam's current (too large) workload.

Richard (reported by Gilles) has been testing RPPPs. One short circuit has been found so far.

### **Heidelberg**

Karlheinz reported that the new PPM routing and layout were finally finished. It is about to be submitted, after some final tidying of power planes and auto-routing. They are also checking critical lines (e.g. clock trees), and comparing layout with schematics. It will be submitted next week, and in three weeks time they should have back 18–20 boards. In the interim they will make preparations needed for mounting of components. The first will be done in-house, the rest in industry.

The AnIn daughter cards are in final production, with the full set due back this or next week. They will be tested with prototype PPMs.

There are 20 LVDS fanout card PCBs made, and they will be assembled soon. The final production will be done after July.

On the MCMs, there are 1100 finished ones with lids, and 3100 tested unlidded ones. Later on they will decide whether it is worth repairing some of the failed ones (~10%).

*The PPMs will need TTCdec cards from the new batch of 50 (see RAL, below).*

### **Mainz**

Uli reported that the four pre-production JEMs had still not arrived, due to minor problems. They are now expected next week. Input daughter cards will arrive with the JEMs. There are four Control daughter cards at Mainz but one does not work; an old one can be modified for use. G-link daughter cards are also available. *TTCdec cards are needed from the new batch of 50 (see RAL, below).*

### **Queen Mary**

See CERN report.

## ***RAL***

Ian presented the status of an exhaustive list of modules and cards:

**RODs:** Finished commissioning RODs 3 and 4, and sent one to Gilles who has reported problems with TTC lock: ROD front-panel LED and status register report TTC not locked when LED on TTCdec reports locked. LED is understood – firmware not implemented, easy to fix. Currently investigating register behaviour (progress slowed by hard disk failure on Adam's PC).

**CMMs:** Testing of two pre-production CMMs is now complete except for I2C interface to TTCrx. Discovered a problem there – the CMM defines a TTC address using 100k pull-up resistors, but TTCdec also uses 100k resistors to define a different address. Will replace 100k resistors on CMM with 4k7 resistors to override TTCdec. Awaiting delivery of 4k7 resistor networks. The CMM is the only module that seems not to have spotted this change in TTCdec.

**CMM RTM:** Placed an order for four-off on 17/5/06. Modules due on 13/6/06.

**TCM-VME64x:** First two due today (*later in the day one arrived*). One component missing but it will be fitted at RAL

**TCM-CP/JE:** Design completed; awaiting initial tests on VME64x in case of any show-stoppers!

**VMM:** Have we done enough tests to go out for production? *Norman asked whether any particular function had not been exercised, or if illegal cycles were treated correctly. Gilles seemed to think the pre-production module was working well in his very complex tests, so the answer seems to be 'yes'. One small fault had been found and fixed.*

**ALC:** Four ALC PCBs were delivered to RAL on 17/5/06. Unsuccessful in placing the press-fit connector at RAL, so we will send them to Cemgraft.

**RGTM-O:** First batch of four-off expected in two weeks time.

**TTCdec:** Awaiting the go-ahead from Kambiz to manufacture 50 cards. *Kambiz said he'd done that already, but would repeat the message. Manufacture will probably take about a month. These cards are needed soon for a number of new modules.*

**GIO cards:** Received quotations but having problems getting hold of the connectors (12-week lead time). Therefore trying other avenues.

**TTC Aux Backplane:** Layout is almost complete. Will be available for review by the end of this week

On the ROD, Dave Sankey reported that his PPM compression firmware now looked like it might fit into the currently used Input FPGA chips. However, as a way to provide contingency and flexibility, he had asked Viraj the extra cost to use XC2VP30 rather than XC2VP20, giving about 50% more resources. These more powerful chips cost nearly £200 more each and there are five per ROD, so that adds about £1k per ROD. Over all the RODs the extra sum is substantial, and Ian is not convinced that provides enough of a safety margin, so this needs further consideration – it is not just a simple and fairly cheap option to build the module sooner with high assurance that it will be all right.

## ***Stockholm***

*Sam could not participate in the phone conference, but he sent the following report:*

“The assembly was delayed a few days because I received the wrong kind of high-power contacts from ERNI (female rather than male) and had to get new ones. I had also overestimated the cable lengths between the bus bars and the power pins, so the power assemblies have had to be re-cut and stripped to fit properly. The assemblies are a tight fit, especially the short +5V connections, so they can't be a mm too short, or more than 1–2 mm too long. The end result

looks quite good, but it is taking time to install all 63 power connections. I expect this to be finished today, and I hope it will go faster in later crates.

“If all goes well the backplane should be installed in the first air-cooled crate by tomorrow, and then we will have to do power installation, the RTM card guides, sense wires, and coding keys. Barring any more surprises, I feel the crate could realistically be ready to ship early next week.

“Uli sent me an email yesterday about JEM fit tests. We discussed earlier the idea of a JEM being sent here for fit tests with a final backplane and crate. Given this time schedule, we could still possibly do it.” *Uli later agreed with Sam to send a JEM immediately, for mechanical checks before the crate is shipped to the UK.*

*It was also suggested that Sam should think ahead to the next crate, which would be a water-cooled one for USA15, and try to anticipate anything that might slow down producing it. It might also be worthwhile to send another backplane to ERNI for connector-fitting before the first crate has been fully tested.*

### **Report from CERN**

Murrough gave a summary of the work at Cegelec. They still have a large stock of untested cables, but progress now looks better than we thought. They have been given 462 cables, with a total of 486 connectors to do. (The total number is somewhat more than 1000.) They have done 280 connectors on 256 cables. Of these they have tested 133 cables with a total of 157 connectors done. So given a slow start and some glitches with parts, they are probably doing about the 100 per month initially requested. However, they are supposed to be ramping up to 150 per month, and this should be discussed with them.

The technicians have been working this week, and have now measured and cut all TCPP cables on the A side. It took a long time to carefully install and route the cables. They are now doing Receiver to PPM cables for bottom crates (under the floor) on the C side. Since the TCPP cables on that side will also take a long time to do, and installation of LAr HEC cables will soon be interfering, those TCPP cables should be next.

*Norman asked about getting test results from Cegelec. So far that has not been done, either for electronic or paper copies. We should do it, if only to make sure we can read the files.*

Kambiz described the (lack of) progress on signal testing. He showed first results with some TileCal and LAr signals in the TDAQ-week plenary, but routine testing has not been possible. The LAr group is concentrating on low-voltage supply problems (they trip off as temperature rises), receiver-mapping tests, and endcap-C cabling – a lot is going on and they have no time to fit us in. The TileCal has continuing low-voltage supply problems, but a discussion with them is planned for next week to see what can be arranged. They also have noise problems, and that is evident from the trigger signals we have seen.

The combined LAr-TileCal cosmics test is now delayed until July, but it will not be easy for us to get much by way of signals.

Weiming has now got water hoses and power on the ROD crates, and tried to turn them on. The upper crate has a bad power supply, diagnosed by swapping various components with the lower one. This should be given back for repair or exchange. *It was suggested to try the power supply for the spare ROD crate, to make sure it is ok.*