

Minutes of ATLAS Level-1 Calorimeter Trigger Phone Conference – 21st September 2006

Birmingham: Dave Charlton*, Chris Curtis, Steve Hillier*, Gilles Mahout, Richard Staley, Pete Watkins

Heidelberg: Paul Hanke, Karlheinz Meier, Klaus Schmitt

QMUL: Eric Eisenhandler*, Murrrough Landon*

RAL: Bruce Barnett**, Ian Brawn, Norman Gee*, Tony Gillman, Viraj Perera, Damien Prieur**, Weiming Qian**

Stockholm: Christian Bohm, Sten Hellman, Sam Silverstein

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**at CERN

1. Birmingham

- The problem of PSU oscillations in the CP/JEP crate continues to be a concern. In order to replicate the geometry of the water-cooled crate/PSU wiring, it was attempted to equip the Birmingham air-cooled test crate with long (up to 1.9m) *Silistrom* flexible power cables, with equivalent Cu cross-section of 95mm². These were extremely difficult to fit to the PSU and crate bus-bars, as they required very large terminal lugs, and are considered unsuitably large for this environment. In addition, with these longer cables the oscillation on the 3.3V supply remained incurable even after clipping together the power and ground return leads.

Removal of the remote voltage sensing leads and reverting to local sensing removed the oscillation entirely, and the system was stable. However, it is not considered satisfactory to operate the system in this mode, for reasons of variable voltage (IR) drops down the long power supply leads.

It is hoped that re-routing of the power supply leads, and/or moving the PSU in the rack, may possibly reduce the lead lengths and consequently the probability of oscillations occurring.

- CANbus operation on the ROD has been checked to be working correctly.
- Operation of the CANbus system for the CMM cannot be checked yet, as there are PCB modifications still required.
- All the 9U variants of RPPPs are finished, except for the D-sub connector Screwlocks. The 6U RPPPs (types 4 and 5) still need some support bars to be fitted, which will take another week. They should be available to be sent to CERN ready for the next but one cabling week.

2. Heidelberg

- The 20 LVDS prototype cables sent from RAL for the PPM full-crate tests have arrived safely at KIP.
- All but the last 150 of the production MCMs have now been glob-topped and had their lids fitted in-house at KIP. Ralf will start to prepare |150 devices for repair.
- 16 pre-production PPMs have been installed and powered in their VME64xP crate, and clocked by their internal board crystal clocks. Stress patterns have been sent to the outputs of the LCD cards, but no LVDS cables have yet been connected (see first item above).
- The full 16-PPM crate draws a total current of 150A from the 5V supply. The total current drawn from the 3.3V supply is currently 175A, which is very low but will increase when driving and terminating the physical LVDS cables.
- The Auxiliary Backplane will be assembled and fitted to the PPr crate next week, with the aid of special tooling.
- The temperature gradient measured across the array of 16 MCMs on each PPM shows a distribution rising vertically up the PCB, from 30 degrees on the lowest device to 55 degrees on the highest.
- All 16 of the RGTMs are connected to the PPMs.

- The four surplus PPMs will be taken to CERN and installed in one (or two?) PPr crates for tests with the ROD. One PPM is equipped with a CANbus module, assembled by Klaus, which will be used to test the CAN firmware prepared by Chris in Birmingham, which can only be tested at CERN.
- The two PPr crates at KIP, fully-equipped mechanically (LVDS cable strain relief system, *etc.*) will be sent to CERN in exchange for the two non-equipped crates currently in USA15, which will in due course have the necessary modifications retro-fitted at KIP.

3. *Mainz*

- There is no news from Rohde & Schwarz. The module production seems to be under way. There were a few minor things sorted out between Bruno and Rohde & Schwarz in the last two weeks, but there are no current issues of concern.

4. *RAL*

- The PCB layout changes for the VMM have been completed by the RAL Drawing Office, and the design is ready for production.
- The drawings for the VMM and TCM-CP/JEP front-panels, which had been delayed due to shortage of Drawing Office effort, have now been sent out for manufacture.
- All of the known schematics changes for the production CMMs have been completed. Norman reported that there are still one or two items from his list of required modifications to be checked, but this should not take long. Ian has investigated the problem of the missing Parity bit observed during the CMM-CTP interface tests in August and concluded that it is caused by firmware, as he has confirmed that all of the connector pins are connected correctly.
- The CPM production modules are about to have the second side surface-mount assembly carried out, and finally the custom backplane connectors press-fitted.
- 53 CPMs have been ordered, making a total of 65 with the pre-production run of 12 modules, and delivery of the first batch should begin early in October.
- Weiming returned 26 TTCdec cards from CERN to *Cemgraft* to have the missing crystal oscillator chips fitted. The remaining 24 cards, from the original batch of 50, will have their missing crystal oscillator chips fitted in Heidelberg.
- Viraj has nine Input FPGAs for the ROD modules in stock, and once the five devices recovered from the faulty ROD have been re-balled, he will have enough FPGAs for two further pre-production modules to be manufactured.
- The long lead-time reported for ordering the lower speed grade Input FPGAs for the production RODs was based on obtaining Pb-free solder-balled devices. The leaded parts that we can use are on a much more acceptable 3-4 week lead-time.

5. *Stockholm*

- The next CP/JEP test crate (air-cooled PSU) is ready for shipment to Mainz.
- There was some discussion about the safety aspects of the power distribution system in the CP/JEP crates. Are the bus-bars and terminal lugs adequately insulated to prevent accidental shorting occurring? Although a lot of heat-shrink insulation has been added for just this purpose, would it be possible to provide a complete shroud – *e.g.* a simple large section of Perspex completely covering all exposed non-grounded metalwork?
- Sam will arrange a short fact-finding visit to CERN during the week of 2nd October to look at the CP/JEP crate *in situ* in USA15.
- There was a discussion about the provision of an LVDS cable strain-relief system, suitable for fitting in the CP/JEP crates. The system designed by Paul in Heidelberg should be easily adaptable to this environment. Could it be retro-fitted to crates already installed in USA15?

6. *CERN*

- Bruce reported on the good progress made with testing the compression firmware for the ROD in USA15. The error-handling blocks in the firmware were not yet quite complete. Bugs had been located and fixed both in the firmware and in the simulation. Some issues remained to be investigated further; in particular, the one in 10^4 events showing one extra word, which Weiming is trying to understand.
- Murrough reported that measurements of the RPPP cables on the C-side had been completed last week. Final installation of the direct under-floor cables on the A-side had been started, and should be completed during the next cabling week.
- Robert McLaren has agreed that we can install the ROS and RoIB fibres next week.
- The under-floor areas in USA15 will receive a thorough clean quite soon. This will take ~2days in total, and will obviously require extensive removal of the false flooring, which could have a significant impact on our work, especially if it occurs during a cabling week.

Next Phone Conference – Thursday 5th October 2006 at 11:00 (10:00 in UK)

Tony Gillman