Notes of ATLAS Level-1 Calorimeter Trigger Phone Conference – 3rd June 2004

Birmingham: **Steve Hillier, Gilles Mahout**

Heidelberg: **Ralf Achenbach, Eike-Erik Kluge, Kambiz Mahboubi, Pavel Meshkov, Frederik Rühr, Klaus Schmitt, Hans-Christian Schultz-Coulon**

Mainz: **Uli Schäfer**

QMUL: **Eric Eisenhandler**

RAL: **Bruce Barnett, Ian Brawn, Tony Gillman**

Stockholm: **Sten Hellman, Attila Hidvégi, Sam Silverstein**

1. Birmingham

- The focus has been on modifying the firmware for the CP FPGA in order to widen the 160 Mbit/s data capture windows. By modifying the Serialiser FPGA firmware to delay the on-board data by 3.125 nsec, the parity-checked error-free timing window, including on-board and backplane data, has been increased to 1 nsec.

- The modified firmware in the CP FPGA has produced a very high utilisation factor in the Xilinx devices, which can possibly be reduced after some further work (removal of redundant blocks, etc.).

- It may be possible to reduce the latency in the CP FPGA by layout optimisation.

- Testing of the CPM1.5 modules is continuing. Most functions have now been checked, with the exception of the Hit outputs and the DAQ/RoI G-link data ports.

2. Heidelberg

- The preparations for the CERN ATLAS test-beam running, which starts next week, are well-advanced.

- Firmware in the PPM ReM FPGA now successfully provides VME access to the ASIC memories and registers. This is a significant milestone, as all the major functions of the PPM are now operational.

- A custom analogue board has been made which will generate an OR of the external BCID bits to provide a suitable L1A trigger signal for the test-beam set-up.

- Three sample chips from the new PPr ASIC wafer have been thoroughly tested, verifying that the design has been implemented correctly. The yield is not yet known. Larger scale wafer tests will take place after the June test-beam running is complete.

- Two of the latest MCM substrates from Würth, using FR4 material, have successfully passed the bond pull tests.

- A PRR date for the combined PPr ASIC and MCM PRR will be arranged with Philippe Farthouat soon.

- The layout of the LVDS Cable Driver (LCD) is complete, and the boards were submitted for manufacture on 2nd June. With a 10-(working?)day turnaround, they should be back at KIP for loading by ~16th June. The LVDS integration tests of PPM-JEM/CPM planned to take place in Mainz are still on target for the week of 21st June.

- Orders for assembly of he next three PPMs have not yet been placed.

- The location of the LAr and TileCal cables and receivers (upper or lower control room) will be checked during the June test-beam run.

3. *Mainz*

- The cause of the mysterious hang-ups of the Input FPGAs on the JEM1.0 board is still unknown, but for the moment they have disappeared. They may return…

- The firmware for the JEM1.0 is now at the stage where JEM1.0 is functionally identical to the JEM0 modules, although the jet code has not yet been integrated.

- Areas still to be tested include the System ACE flash configuration hardware, and the CANbus functionality.

- There have been no systematic checks yet of the DAQ/RoI G-link data. On the first JEM1.0 module, only electrical G-link outputs will be made available.

- The online software is almost ready, and will be tested with the JEM1.0 module today (3rd June). The goal is to reach the same status as for the JEM0 modules.

- Uli et al will be at RAL during the week beginning 7th June for integration tests of the JEM1.0.

- It was suggested that discussions about the CANbus architecture should be held during the forthcoming integration week at RAL, with the definite aim of reaching a decision. Note that the JEM1.0 modules do not have any form of opto-isolation to the CANbus.

- Assuming all goes well with these integration tests, approximately one week after returning from RAL assembly of the remaining three JEM1.0 modules could be started (the PCBs already exist).

- A total of at least two JEM1.0 modules will be needed to complete the full range of Processor Backplane tests defined by Sam and the Backplane Working Group.

4. *RAL*

- The 9U ROD PCB layout is complete, and manufacture will be started on 9th June, for delivery on July 5th. Three PCBs will be ordered, with the assembly of one module initially. A recent decision was made to eliminate the electrical G-link inputs entirely, with only optical inputs being provided.

- The Rear Transition Module (RTM) carrying the S-link drivers has been designed and the PCB layout completed. Quotes for manufacture are awaited.

- The 9U ROD firmware is progressing well, with progress meetings being held every two weeks.

- The G-link transmitter CMC daughter-card for the DSS modules is being re-designed to provide optical outputs only, in order to eliminate the potential problems associated with multi-channel single-ended electrical transmission (ground loops, crosstalk, etc.). When this work is complete, the matching G-link receiver CMC daughter-card, which is also used on the 6U ROD modules, will also be re-designed.

- For the CMM firmware, discussions have taken place regarding the implementation of TTC broadcast commands.

- There have been some firmware changes for the 6U ROD. To improve operational robustness, the requirement for the minimum DAV gap between events has been increased by 2-3 clock ticks.

5. *Stockholm*

- For the jet algorithm firmware, the re-mapping of the inputs has been completed, but the code has not yet been tested on the JEM1.0 in Mainz. Documentation is currently being written.

- The Wiener 9U crate shipped from RAL to Stockholm a couple of weeks ago has been received safely, but is missing its special non-Euro power lead (subsequently discovered "hiding" in the Trigger Lab at RAL!). This will be shipped to Stockholm next week.

- The crate is now being set up ready for installation of the new power distribution system. Sam will test the voltage drop down the bus-bar/cabling system when maximum current is drawn.

- The Backplane Working Group held a very useful phone conference on 28th May, which resulted in a proposal for a condensed set of backplane tests, based upon Sam's original list.

- Sam will visit the UK during the week of 14th June for a dedicated "backplane week", to be held probably in Birmingham. Three CPMs and one CMM will be needed to carry out most of the tests.

Next Phone Conference – Thursday 17th June 2004 at 10:00 (UK), 11:00 (Germany, Sweden)

Tony Gillman