ATLAS/T2UK/94-11

Minutes of T2-UK Meeting at RAL

13th April 1994

Present:	Bob Cranfield	
	Gordon Crone	
	Barry Green	
	Bob Hatley	
	Richard Hughes-Jones	
	Robin Middleton	(Chairman)
	John Strong	
	Fred Wickens	(Secretary)
Apologies:	Peter Clarke	
	Frank Harris	
	Stephen Hunt	

1 Minutes of Previous Meeting

Minutes of previous meeting (RAL 940316) were accepted.

Actions:

- Meeting to discuss measurements and monitoring had been held and the conclusions had been incorporated into Chapter 4 of the note by G Crone (version 0.07) describing the plans for LLVL2 s/w (secretary's note - this document is now ATLAS/T2UK/94-10). After the main points from the meeting had been reported, there followed a discussion on what measurements could be made in the Global system. It would be useful to measure the occupancy of the SCI ring, but not obvious how this could be done, could we borrow a LinkProbe from RD-24 ? Also do we have any mechanism to add timing stamps in the Global system, other than the ones already planned within the C40/SCI.
- The conclusions of the meeting to discuss data routing had also been summarised in G Crone's note (see Chapter 7). It was noted that this meeting had confirmed the decision of an earlier software meeting to transmit the whole event through to the C40/SCI with the RoI data. Given that RD6 will supply 135 words/event (i.e ~ 1 Kbyte, since words 2x24 bits) and 300 events/burst, this implies the need to store some 0.3 Mbyte in the DBV42 during the burst.

- Investigation of loading and starting the C40s from the OS/9 system was underway, but no clear conclusion yet.
- It has been decided to use the dBeX32 connection on the DBV42 for the C40/SCI i/f. This connection consists of a 60-way standard density IDC connector, which would use a simple cable, plus a 40-way high density IDC connector which would go via a small transition board - final details still to be agreed.
- It was suggested that the data enable/disable should be implemented using the VME prototyping board to send a signal to the RIB. Further discussion needed with the Cracow group.
- DBV42 does allow for external RDY signal - on both the PIM and dBeX connections.
- Robin had sorted out some of the details of a document archive on RLV2, and it was planned that Ann Richardson would assist in the running of the archive.
- GJC had sent a paper of the LLVL2 software document to RPM, but an electronic copy was needed for inclusion in the archive.
- 1-2 page summaries of work at each institute still required.
- Find out status of data/trigger input to T2 - ongoing.
- RPM has found that the only library available for GNU environment is a minimal C runtime library.
- VxWorks is not yet a product for the EB66 and hence DEC do not have a price for it. For Ultrix, however, it costs 15K Pounds. If the cost for the EB66 is such a sum perhaps DEC could provide it as part of their contribution to the project.
- FW had circulated the response sent to Chris Bee's questionnaire on the use of the test-beam. In a brief discussion the question was raised of how much space we will really need - should we ask for enough for 2 PC's and 2 Alpha w/s, inspite of the limited space available in the barrack? It was also noted that we could move to a different barrack, even though this would complicate communications with RD-6.
- Manchester have provided FW with some details of money committed for daughter-board (db) design and fab - further clarification will be sent.
- FW has bid for test-beam travel, allocation not yet known.

2 Simulation/Modelling Meetings in CERN

Two meetings had been held in CERN on 25th March on ATLAS Simulation and Modelling respectively. Minutes of the former had been circulated to the ATLDAQ list, but the minutes of the Modelling meeting had not been generally circulated although JS had received some - he would distribute them to T2UK. At the modelling meeting it had been agreed to model the geometric assignment of the detector to the local system. The generic model based on the Nick Ellis architecture would use DSL and the Saclay GUI. The ATM group would model their parts using micro-C++, once the data to be transmitted had been specified. Input data parameters will be specified by P le Du and R Bock. Further meetings will be convened by Frank Harris and Andre Bogaerts. It was also noted that Frank Harris and Stephen Hunt would attend the simulation meeting to be held in CERN on 14th April.

3 Project status and problems

C40. (RC, GC, BG, FW)

- The design of the improved T2B hardware is done and a pcb is due by mid-May. The new design will allow 2Kbyte page size by reprogramming PALs. The decision point on which T2B design to use in the test beam (i.e. which design should have a copy made) is now deferred until the end of May. The T2B software performance has been improved using static variables in on-chip RAM and linker options and now runs twice as fast. Thus it is now almost fast enough if a 40MHz clock is used, although some external signals will cause some degradation of performance so further improvements still needed.
- The FEX code still needs to be defined, but first requires the definition of the data to be supplied by RD-6.
- The Link-Unit software is more or less complete. UCL currently using 4 TIM modules on a DBV44 with the following functions (1- T2B Buffer Manager, 2 - simulation of T2B memory card, 3 - Link-Unit, 4 - RoI/T).
- C40 support systems - OS/2 is now running at RAL, but problems when try to run the DBV42, LSI are due to visit to resolve these. The DBV42 was used briefly at RHBNC and an incompatibility of the JTAG with the DBV44 was identified. The DBV44s from RHBNC and UCL will be modified to make them compatible with the DBV42.
- Since we only have one DBV42, a failure here could be very serious. Should we buy a second or can we get some help from LSI. RJC and BG will review our policy on spares for all of the local system.

Alpha. (RH-J, RM, FW) - We are still trying to order the EB66s - once again a quote is awaited. Manchester are running a field-test version of OSF/1 on an Alpha w/s and have tapes with VxWorks s/w, but have so far failed to read them. (RAL have an older production version of OSF/1 on their w/s and are reluctant to upgrade now because of potential problems with DAT drive and tapes.)

SCI. (RH-J, SK, RM) -

- The 2nd pass of CMOS SCI NodeChips work and have been tested sucessfully at up to nearly twice the nominal speed.
- RAL has been promised delivery of the Dolphin SCI mezzanine card by the end of April.
- Work on the TC-RIO-SCI i/f continues at RAL, but is likely to stall because information needed from Rome to complete both the SCI and TC parts.
- Manchester has SCI chips on order from LSI via Manhatten Skyline, but no delivery date yet given.
- The Manchester daughter board pcb is out for manufacture. They will have 6 off by the end of April - thus some slippage from the schedule. DM is currently working on the PALs for the db.

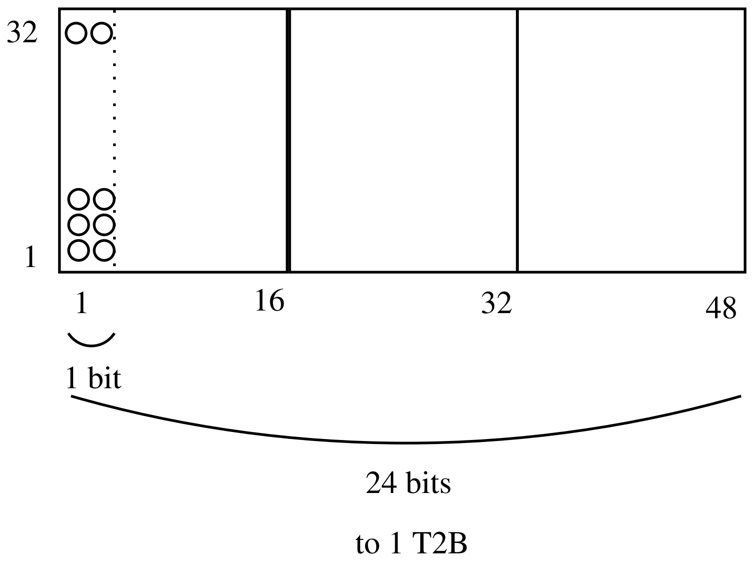
- VME interface card exists, wiring 90% complete and tests are underway.
- Manchester have received the full PCI spec (from Intel - not DEC implementation).
- SK is keen to start designing the wire-wrap card to be used between the DBV42 and the SCI db for the C40-SCI i/f.

RoI/T - precise details need to be defined - suggested that a meeting be arranged in a few weeks time.

Private DAQ (RC, GC, FW) - OS/9 is being installed next week on the new h/w at RAL We still need to resolve what type of tape drive should be used. It was agreed that it would be preferable to use a DAT drive if possible, since we already have a DAT drive available. GC (+ David Botterill) would investigate if a DAT drive could be used with SPIDER.

RD-6 Integration

- Contrary to the statements made at the previous meeting of T2UK, the data that will be available to us will be in 8-bit form and will come from all 6 HIPPI links (i.e. 2x24 bits). (Secretary's note - subsequent rumours have claimed that we will only have access to data from 2 HIPPI links. Clarification needed at next meeting.) We will receive an "OR" of the 3 time slices with a high and a low threshold for each straw. The data from the TRT is encoded essentially as follows : each T2B receives data from 3 detector modules of 32 x 16 straws, the data from 2 columns of straws are sent as a single bit in successive data words with low threshold, then high threshold. Thus the single bit from a pair of columns indicates in successive words hits for 1,1 Lo, 1,1 Hi, 1,2 Lo, 1,2 Hi, 2,1 Lo 2,1 Hi, 2,2 Lo, 2,2 Hi, 3,1 Lo, 3,2 Hi etc. To transmit all 64 straws within a pair of columns thus requires 128 transfers, each word being 24 bits wide to give all 48 columns. (There are also 7 extra words with each event, giving a total of 135 words/event.) i.e.



- The ROB sends a request to the RIB for each event and counters on the RIB find the start and end of the event. For the T2B we need to generate an end of event signal and also check for ROB resets which can abort the transfer of an event.
- If we use balanced ECL for the transmission of the data from the RIB to the T2B we could transmit the data over a moderate distance (e.g. 50m).
- The data enable/disable would feed into the receiver board close to the T2B.
- The timescale for this integration work has not yet been determined.
- Within RD-6 the event number for the 'Next event' is generated by the event builder and written into various VME memories ready for the data to arrive. SoB and EoB will be transmitted either by VIC links or by EtherNet (tbd). It is not yet clear how the trigger signal will be implemented. Thus we still need to clarify how we get SoR, EoR, SoB, EoB and the trigger.
- Can we generate our own trigger and event number from the RIB data ? Note we still have to convert it into C40 link protocol to be transmitted to the RoI/T.

4 Conference Presentations

CHEP 94 - it was agreed that we should withdraw the Alpha/SCI paper, since unfortunately we had no results on SCI (nor Alphas) to report. JS will be making a poster session for the Local system, so it was agreed that he would include an overview of our entire test-beam work.

Open Bus Systems (OBS) - this conference is scheduled for November, but abstracts due by May 27th so we should discuss at the next meeting.

5 ATLAS Organisation

Nick Ellis has made some statements recently about a Trigger/DAQ steering group and this topic may well come up at the next ATLAS week. Although many people will be at CHEP rather than the ATLAS week it was agreed that it was important for us to be represented in CERN during the ATLAS week.

6 New Collaborators

We have received expressions of interest in collaborating from Michigan State and Valencia. It was noted that further details should emerge at CHEP and the next ATLAS week.

7 Administrative Matters

Timescales - RM distributed a revised timescale chart - not discussed for lack of time (!!).

Infrastructure - RM distributed a handout showing a first pass at a physical layout for the test-beam equipment and lists of items to be supplied by each institute. Corrections, additions and amendments to RM.

Budget - Not discussed due to lack of time.

8 Date of next Meeting

Wednesday 18th May at Manchester.

9 Summary of Actions.

All:

- 1-2 page summaries of work at each institute still required.
- Consider abstracts for submissions to Open Bus Systems (OBS) in November (due by May 27th)

GC:

- (+ David Botterill) Investigate if a DAT drive can be used with SPIDER.
- Continue to investigate load and start of C40s from OS9.
- Send electronic version of ATLAS/T2UK/94-10 to RPM.

RC/BG:

- Review our policy on spares for all of the local system.

BG:

- Discuss data enable/disable with Cracow group.
- Find out status of data/trigger input to T2.

REH-J:

- Explore possibilities for monitoring SCI ring occupancy.

RPM:

- Complete setting up the document archiving system.
- Clarify options on what barrack space will be available and where.

JS:

- Distribute minutes of the Modelling meeting on 25th March to T2UK.
- Include an overview of our entire test-beam work in CHEP poster session.
- Clarify how we get SoR, EoR, SoB, EoB, trigger and event number.
- Determine the timescale for the RD-6 integration work.

FW

- (with SK + BG) Complete definition of C40/SCI i/f connection.
- Arrange meeting to define details of RoI/T