ATLAS/T2UK/94-03

Minutes of UK-T2 Meeting at UCL

19th January 1994

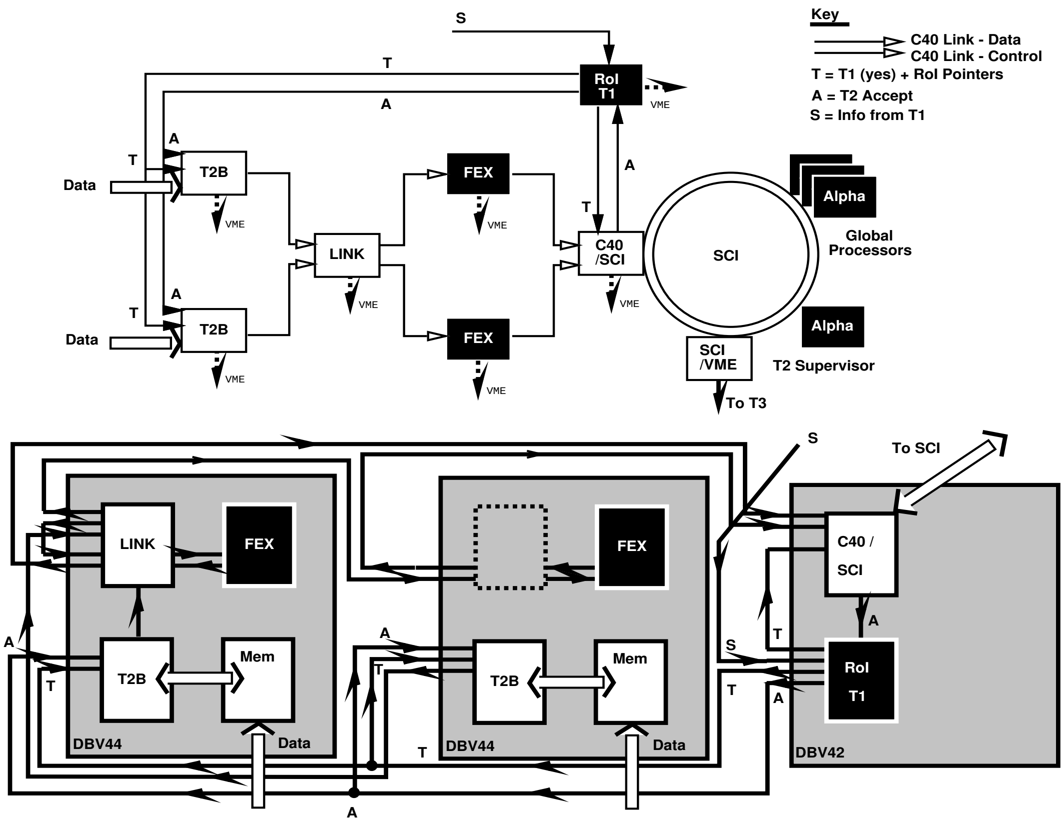
Present:	Peter Clarke	
	Bob Cranfield	
	Gordon Crone	
	Barry Green	
	Dominic Hayes	
	Richard Hughes-Jones	
	Scott Kolya	
	Dave Mercer	
	Robin Middleton	(Chairman)
	Martin Postranecky	
	John Strong	
	Fred Wickens	(Secretary)

1 System Architecture

The meeting started with a discussion on how the initial thoughts on the system architecture could be implemented with the C40 boards we will have available.

There will be two DBV44 modules and one DBV42. Each DBV44 can contain up to 4 TIM modules, but the T2B memory board uses one of these locations (must be site B, with the C40 controller in site A). From each site, 3 of the C40 links go to front panel connectors, 1 goes to the VME connector and the other two are hardwired to connect to other sites. The DBV42 can support 2 TIM modules, in this case 4 of the C40 links from each site go to the front panel, 1 to theVME and 1 to the other site. Other differences between these modules are that the DBV42 is both a VME master and slave, whereas the DBV44 is only a VME slave - although on the DBV44 the VME access to one of the C40 links on each TIM site allows words to be read one at a time from the C40. Also the DBV42 cannot support the T2B function (unless a redesigned intermediate card is made). Within these limitations we were able to find a scheme which gave us the functionality that we require and this is shown in Figure 1.

Figure 1 T2 Test Beam configuration.



Notes

- the A and T lines from the Roi/T1 C40 have to go to both T2Bs, to achieve this it is assumed that a simple "broadcast box" is made which accepts input from 1 C40 Link and transmits it to 2 C40 Links.
- It is assumed that we use a VME based DAQ system to record the data from the T2 system - i.e. separate to any DAQ by RD-3 or RD-6.. This system would run the CERN Spider software. (It was also noted that the Alphas would have SCSI ports so in principle they could also write data to disk or exabyte.)
- We need a unit to get the data into the T2Bs, the preferred solution would be some kind of HIPPI splitter/spy box - but who would build this and how would events be selected from the passing stream. The alternative is for the data to come from VME.
- It would also be necessary to get appropriate Trigger info and RoI pointers into the system. For RD-6 the pointers would have to be generated in the RoI/T1 C40 in some way, for RD-3 they would have to be received from RD-27. In either case how do we get the input (S) from the trigger system into the initial C40 link?
- In all cases our connections to the other R&D groups should cause minimal interference to them.

- We need some mechanism to stop further data being pushed into the T2Bs if either are full.

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- The following questions were raised and are as yet unresolved How do we "synchronise" data from the main input stream (HIPPI or VME) with the trigger information.
- If we have to get the event data from VME, can we do it at a rate which is of any use - it was noted that we could drive the input of a T2B via a SLATE box loaded from VME, this would give a high instantaneous rate, although a low average rate, but would need 1 SLATE box per T2B.
- The T2 specific DAQ needs to access the original data, derived features and decisions and diagnostic information - including timing stamps. This can be done using the VME access to the various TIM modules, alternatively all of this data could be transmitted via the C40 links through the system with the features. Transmitting all this data with the features to the Alphas in the global system would simplify the data monitoring, but would introduce problems of its own, including much larger packets being sent to through the C40-SCI i/f and major changes to the timing of data transfer through the system. (In a later discussion a further alternative was considered of making a separate transfer of the extra data via C40 links to the C40 in the C40-SCI i/f, and from this C40 write it to the VME. This extra transfer might even be done between beam spills to minimise the effect on the trigger latencies.)

2 Specific Goals

There was a discussion about what are our precise aims for doing the beam tests. Whilst it was agreed that a major reason is for political/PR reasons, we needed more specific goals in part for presentation to our ATLAS colleagues. In addition to making an existence proof of suitable hardware in a beam-line the following data plots were suggested:

- Plots of measured T2 trigger latencies
- Plots of latencies in components of the T2 system
- Correlation plot of on-line trigger decisions vs off-line decisions
- Plots showing effects of data volumes and trigger rates on latencies - do we see any signs of bottlenecks.

It is far from obvious how the latencies can be measured to give meaningful results, and for the system components what tools are available to make the measurements, e.g. is there any kind of system clock available to different C40s on the same or different DBV44/42s.

3 Project Schedule

Robin Middleton presented an initial break-down of the project into sub-tasks and first attempts at possible schedules for some of these tasks. Some minor changes to the break-down were suggested and responsibilities at the level of Institutes were agreed. It was also agreed that UCL/RHBNC would further refine the parts that refer to local level-2 and define the schedule for these areas. Whilst RAL/Manchester would do the same for the parts that refer to global level-2. It was agreed that the results of these separate discussions should be passed on to Robin as soon as possible so that a complete schedule could be drawn up.

4 A.O.B.

There was a discussion about the need to seek agreement from various relevant parties in CERN.

First we should come to an understanding with RD-6 and/or RD-3. Jacques Colas of RD-3 has been supportive in earlier contacts, but it is clear that we must be non-invasive. Daniel Froidevaux of RD-6 has also been informed previously that we are interested in running tests with them. John Strong will contact both of them again to discuss if their collaborations are willing to let us run our tests with their detetectors and also to clarify what connections we would make - it is believed that RD-3 will read-out their data via VME using VIC links, whilst RD-6 will read-out via HIPPI.

Secondly John will contact Robert Mclaren to clarify HIPPI issues and particularly if his group can provide help on the HIPPI splitter.

Thirdly Fred and Robin will talk to RD-27 about what connections could be made to their system (when they run with RD-3).

Finally we should present our test beam plans to ATLAS - it was suggested that the next Trigger/DAQ meeting on 3rd Feb would be a suitable place. John, Robin and Fred will all be in CERN for parts of the ATLAS week and the EAST meeting the following week, so they will pursue these contacts then, with initial contacts as above and follow-up meetings as appropriate.

There was then a brief discussion of who should be responsible for a number of ancillary topics. The following were agreed :

- RHBNC would be responsible for getting the data into the T2 system.
- UCL (GC and RC) and RAL (FW) would be responsible for our T2 specific DAQ.
- UCL would find out how to make meaningful timing tests in the C40 system.

Fred Wickens distributed copies of the current version of the document describing data-flow in the C40-SCI interface. There will be a special meeting at RAL on Monday 24th January, staringt at 14.30, to discuss detailed data-flow through the PCI-SCI i/f.

The next full T2UK meeting will be on 22nd February at RHBNC, starting at 11.00.