CH/Meet/92/06

Minutes

Charissa Group Meeting

Meeting held on: 25 November 1992

Meeting held at: York

Present:	BRF(Chair),WNC,NMC,RAC,GJG,SJAH,RAH,CDJ,JK,JSL, WDMR,RPW,DLW
Apologies:	ACM,VP,GT
Distribution:	Those present, plus BB,ACM,VP,GT

Minutes

1. **Minutes of Meeting of 7 October 1992:** Accepted as a true record.

2. **Matters Arising:**
   Drs Steve Hall and Roger Ward (both Birmingham) were welcomed to the collaboration.

   WDMR requested that a bare-bones agenda be circulated by e-mail, in addition to the version available over the fileserver. This was agreed. WNC

3. **Update on NSC/SERC matters:** there was nothing urgent to report, so this item was skipped due to the long agenda.

4. **Progress on Silicon Detectors:**
   BRF reported on the results obtained by M. Leddy (Birmingham) for beam tests of two Q–Par 2D position sensitive detectors (see Ch/Tec/92/11 for preliminary results).

   The sheet resistances of 1 and 2 k$\Omega/\Box$ were too low for good position resolution, but a higher resistance would solve this. A new detector is likely to be available for testing, early in 1993.

   The discussion at the meeting noted that the surface barrier technology appeared to give large distortions that would require position corrections.

   CDJ reported regarding the NASA-style detector supplied by Micron. York are analysing data from a beam test, but the results so far are inconclusive.

   BRF reported that the test detector offered by Intertechnique had not arrived.

The Hamamatsu detector should be beam-tested in conjunction with one of the remaining NSF runs. Other detector tests will also need to be tied in with the experimental runs, due to the prioritization by the NSC subcommittee of remaining NSF proposals. This can be achieved most effectively if Birmingham coordinate the tests. SJAH agrred to take responsibility. **SJAH**

5. **Progress on Scintillator Detectors:**
NMC reported that the prototype ordered from Bicron (via Southern Scientific) had just arrived. The drawings supplied to Bicron had not been properly followed, and as a result the CsI crystal was machined to the wrong shape and was not usable. The detector had been returned with the error pointed out, and a response was awaited.

NMC stated that the order placed with John Caunt was being processed on schedule. Components had begun arriving for assembly by the supplier and it was hoped to produce 25 detectors by the end of the year, and a further 25 early in January 1993.

6. **Progress on Chamber and Detector Assemblies:**
New chamber: JSL reported on a preliminary design for the new forward-angle target chamber for five modules (each 3×3 detectors), as shown in Daresbury drawing A0–32/8039 ('Proposed Chamber (5 module)', S.J. Metcalf, 4/9/92). The drawing and a list of discussion points were circulated at the meeting (Ch/Tech/92/12). The construction timescale is for summer 1994 completion.

The proposed chamber incorporates features as requested apart from a cold shroud, which could be incorporated by compromising the gamma-ray access.

The meeting endorsed the choice of a Eurogam-type target controller, so long as manual over-ride was included. **MEGHA**

A list of relevant equipment for a 'minor equipment' bid is to be forwarded to BRF before 25 December. **JSL,JK**

New detector modules: A mock-up of the prototype CsI module and mount had been built by York and was shown at the meeting.

RAC and SJM (Daresbury) , liaising with Barney Brooks (Oxford), had advanced the design of the rear flange for the nine-detector modules, to incorporate all preamplifier mountings and electrical feedthroughs. This was included in Daresbury Drawing A0–NSE/SC/138, Issue A, '9 telescope module', S.J. Metcalf, 20/11/92). (To be renumbered as 32/8041 when completed.)

Features of the design are:

(a) one multi-pin feedthrough supplies all scintillator voltages, which are then chained around inside the module,

(b) there are separate coaxial feedthroughs for each scintillator signal,

(c) one 16-pin (2×8) feedthrough deals with each silicon/gas detector (this includes lines used as shielding). Hence, there is an array of 3×3 feedthroughs on the back plate,

(d) For the vertical groups of 3 detectors, plug-on modules contain the Oxford preamps on motherboards and their metal cans shield the boards. Signals are connected by twisted pair to BNC's on the backs of the cans.

The proposed design was discussed and the following points raised:

(a) motherboard spares: to ascertain the number to be kept on hand, the preamp failure rate should be measured when the necessary number are available for testing, $\boxed{\text{WDMR,BB}}$

(b) vacuum sealing screws: the size and number of retaining screws were of concern to some. These should be reassessed when a prototype is built,

(c) replacement/mounting of silicon: contrary to the understanding of the design group, the silicons are in fact the 'weakest link' in the design, because they will die due to beam exposure over one experiment, and will require replacement. The ease of replacement of silicon detectors without damaging them should be borne in mind, $\boxed{\text{MEGHA}}$

(d) A means of testing individual modules on the bench-top should be considered as there is a need to check silicon operation quickly and efficiently (e.g. using a blanking window, etc.). $\boxed{\text{MEGHA}}$

7. **Progress on Gas Supply:**
The Megha committee is progressing satisfactorily with this. RAC discussed a schematic of the proposed new gas handling (Daresbury Drawing A3–32/8042, Issue A, 'Schematic Megha Gas', 9/11/92, S.J. Metcalf).

Air freight of the gas rig may not be required (cf. advice from D.C. Weisser regarding sea freight), so space restrictions can be relaxed a little, whilst still keeping the rig as small as is convenient. $\boxed{\text{MEGHA}}$

8. **Progress on Electronics and Data Acquisition:**
Voltage-to-time conversion: RAH circulated a document (Ch/Tech/92/13) describing the latest developments. This involved tests of a prototype analog-to-time convertor (ATC) circuit connected to a Silena sample-and-hold chip. Results suggest that the linearity is good to $< 1 : 4000$, which is within the performance of the Silena ADC itself. Hence, 4K conversion range is indicated. An ATC conversion range of $8\mu s$ was sufficient to achieve this accuracy, giving a total conversion time of $\sim 12\mu s$, compared to $32\mu s$ at present.

Amplifiers: A new half-width module using the existing amplifier circuit was displayed at the meeting. A prototype setup is being constructed, for testing on the bench-top with three germanium detectors. The new slim-line construction can be extended to incorporate the ATC vertically below the amplifier in a unit to fit a double-height Euro frame.

It was noted that gains of up to 1K would be required to accommodate the gas detectors. Time constant values were still to be finalised.

WDMR described how a previous problem with pole-zeroing of position signals could be removed when taking signals from both ends of the resistive strips, and agreed to include this in documentation (cf. Item 11).

Preamplifiers: The two modified units, using surface mounted preamps, had worked well in the recent experiment (^{24}Mg+^{24}Mg). Two high-gain versions for gas detectors will be produced for the next experiment. $\boxed{\text{WDMR}}$

Centralized Store of Equipment: Transport to Oxford of the electronics recently purchased for data acquisition was in hand, and not causing any delays.

Small labels with the Charissa logo were required, to fit on the front of modules. $\boxed{\text{DLW}}$

9. **Developments on Hybrid Detectors:**
RAC reported that the required alterations to the present hybrid detectors had been completed: new O–rings are installed, extra windows made, and the 6μm windows can be replaced by 1.5μm for low pressures as used currently. Right-angles gas connectors are in hand for the high-resolution run.

If future detectors have thicker PCB's, they can be fitted using spacers.

The noise problem in Detector 3 is still to be traced. $\boxed{\text{RAC}}$

RAC is to be advised of window thicknesses for the next run. $\boxed{\text{NMC}}$

10. **Developments on Event Manager and GEC Emulator:**
BRF reported on the latest developments:

GEC emulation: Two emulators had been assembled: one for use in an experiment and one as a spare and for Oxford tests. Testing of an emulator connected to an event manager at DL was underway, with the aim of using an emulator in one of the remaining runs at the NSF.

The emulator system is planned as an intermediate solution to the question of data acquisition, and following the shift to VME we anticipate an evolution to a new system.

ANU Data Acquisition Station: Two systems had been ordered, each comprising a workstation, an exabyte drive and 2 Gbyte disk. This provides a backup that would also allow off-line analysis of existing data to proceed efficiently.

With one or two additional small items, the reliability of the system could be further improved, and WDMR and RAH agreed to consult and inform BRF of these requirements. $\boxed{\text{WDMR,RAH}}$

Longer Term Software Requirements: a data acquisition program would be required to replace the GEC emulator system in, say, two years, and alternatives should be investigated during the coming year. $\boxed{\text{SJAH}}$

11. **Documentation of Experimental Setup:**
It is now apparent that proper documentation is needed for all aspects of the experimental set-up and procedure, particularly for when experiments are overseas.

A note from BRF, circulated with the Agenda (Ch/Agen/92/06) was discussed. It was agreed to produce a draft version of the documentation in time for the next meeting, on January 27, and the following responsibilities were assigned:

• Chamber & Gas:	York
• Electronics:	Oxford
• Data Acquisition:	Birmingham
• Running:	Surrey
• GEC Idiot's Guide:	Birmingham

12. **Completion of Programme at NSF:**
The prioritization of the remaining approved experiments was noted.

A note from BRF, circulated with the Agenda (Ch/Agen/92/06) was discussed. The implications were discussed with reference to students' requirements, and particularly second year students. It was agreed that York and Birmingham representatives would discuss this further. [DLW,BRF]

13. **Responsibilities for ANU preparation:**
WDMR suggested that best results would be obtained if the personnel primarily responsible for the planned experiments were those that spent the longest time at the ANU in advance of the runs.

Shipping: it was noted that a crate due for despatch to the ANU in June has some space available that could be utilised for beam-line components.

A note from BRF, circulated with the Agenda (Ch/Agen/92/06) was discussed, and the following responsibilities were agreed:

(a) *Detector mounts and Collimation:*
Hybrid Detector Mounts are a high priority. [DLW,CDJ]

(b) *Chamber Feedthroughs:*
number and type urgently to be decided, as these affect cabling requirements. Details needed for an order to be obtained on the next visit to the ANU (Feb 93). Coordination to be by York. [DLW]

(c) *Cable Runs:*
new cable runs from the chamber to the control room to be organised by Surrey. [WNC,GJG]

(d) *Gas Flow System:*
RAC agreed to check that the gas system will not be a problem. [RAC]

(e) *Electronics and DA system:*
shipping and installation to be organised and undertaken by Birmingham, in consultation with RAH/VP where necessary. $\boxed{\text{BRF,NMC}}$

Specific Queries: these can be directed to Paddy Regan, the local contact point at the ANU, on PDR103@nuc.anu.edu.au using e-mail.

14. **Student Training:**
DLW noted the need for a plan to ensure that all students in the collaboration are adequately provided with training in experimental technique. Further discussion was deferred due to time limitations, and DLW agreed to produce a discussion document for circulation to group members. $\boxed{\text{DLW}}$

15. **Future of the DL Detector Laboratory:**
It was agreed to send a note to DL, stating that we assume the detector laboratory is to remain in operation, that all the equipment will remain in it, and that if the situation is different from this we will be informed. $\boxed{\text{BRF}}$

16. **Disposal of NSF radioactive sources:**
There were no collaboration-specific needs, and hence bids for these items were a matter for individual groups.

17. **Disposal of NSF "minor" equipment:**
Each group agreed to provide BRF with a list of items required for their contribution to Charissa activities by 9 December, and if possible to indicate what other items might be included in their total bids. $\boxed{\text{ALL}}$

18. **Any Other Business:**
It was noted that the meeting to discuss "European Collaboration on Heavy Ion Mechanism Reaction Studies", in the context of the EC Human Capital and Mobility Program, would be held in Legnaro Laboratory, Padova, Italy on 16–18 December (cf. Ch/Doc/92/09, info from Multics Group). DLW will attend to represent Charissa. $\boxed{\text{DLW}}$

19. **Date of Next Meeting:** 11.00 am, *Wednesday* 27 January 1993,
in Birmingham.

W.N. Catford, Secretary.
December 7, 1992
(released December 14, 1992)