Minutes
Charissa Group Meeting

Meeting held on: 7 October 1992
Meeting held at: Guildford (Surrey)

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

Minutes

1. **Minutes of Meeting of 11 June 1992:** Accepted as a true record.
2. **Matters Arising:**
All ACTIONS were briefly reviewed and found to be adequately covered. In particular, BRF had been approached by the NSC regarding the forward look, and was preparing a presentation for the meeting on 13 October.
3. **Update on NSC/SERC matters:**
Daresbury equipment: The NSC has considered bids for major equipment to be transferred from DL after shutdown. The major Charissa bids, for electronics/data acquisition, scattering chamber and pumps were successful. Smaller items of equipment will be considered by a subgroup including the four project physicists, to meet initially on 28 October.

   Project Physicists: It is expected that the NSC will require Project Physicists to report to meetings at 6 monthly intervals, with summaries of expenditure and manpower usage to be submitted every three months. The four Projects funded by NSC are Charissa (B.R. Fulton), Eurogam (P.J. Nolan), ISOLDE (I.S. Grant) and Electromagnetic Probes (D. Branford). Project physicists may contribute to NSC discussions (but not voting) as a representative of the collaboration.

   New Board Structure for SERC: As of September 1993, nuclear structure will be in the new 'Physics, Space and Astronomy Board' and at best will have a subcommittee acting in an advisory role.

Outline of new SERC board structure

Council	Board	Committee	Subcommittee
SERC	Physics, Space & Astronomy	Plasma, Atomic, Classical Optics & Nuclear Physics	Theory (all fields) Nuclear Physics? (advisory?)
		Particle Physics	
		Astronomy	
		Earth Observation	
	Engineering & Technology		
	Science & Materials		

Vivitron: A decision on the reaching of 25MV (without tubes) has been postponed until mid-December. Success will mean that Eurogam is sited at the Strasbourg Vivitron as originally planned.

Radioactive Nuclear Beams: A total of £0.3M had been approved by the NPB for the RNB test bed proposed for RAL. At least £1M is likely to be required to be found from existing projects.
The meeting discussed the Charissa position regarding R&D over the two years following the existing grants, i.e. Oct 94—Oct 96. Certain desirable development work was identified. The meeting agreed, however, that in the circumstances we would wish to demonstrate our support for the RNB development by concentrating on physics exploitation of the new array, and downplaying development (although a reduced expenditure on development would still be required with a view to using the array with RNB's). This position was adopted on the understanding that other Projects would show similar support. The chairman would report this position to the NSC. BRF

NSC membership: DLW remains a member. Profs. Twin and Johnson have left, and Drs Nolan and Mackintosh have joined along with the new chairman Prof. Morrison. The Particle Physics member has also changed.

Next NSC Meeting: Tuesday, 13 October, to consider the forward look, and BRF has been invited to attend.

4. **Report on Trip to the ANU:**
WDMR reported in detail on his visit in September. The meeting agreed that much progress had been made with the detailed planning of how to run experiments in Canberra.

The visit resulted in the signing of an agreement in Canberra, summarising important operational details. This document (Ch/Doc/92/07, "Charissa at the Australian National University") had been circulated within the collaboration and the ANU, and formed a basis for discussion at the meeting.

A visit by a group member is scheduled for late December.

Vacuum feedthroughs and detector mounts: All feedthroughs, insulating panels and cabling to be supplied by us. Viton O–rings, insulated flanges (Macor ceramic, or teflon) required. This should be considered by the MEGHA subgroup; copies of the agreement with the relevant sections highlighted should be distributed to MEGHA personnel. $\boxed{\text{MEGHA,WNC}}$

Cabling requirements: this should also be considered by MEGHA, and the use of coaxial strip cables is very desirable. Around 8—10 lengths of 50m may be required. $\boxed{\text{DLW}}$
At the moment, only 32 cables are provided between chamber and control room. DL should be informed of our needs for runs of coaxial cable. $\boxed{\text{BRF}}$

Manning of experiments: The ANU are keen that one RA and one Ph.D. student should stay in Canberra and collaborate with a group there for 6 months prior to our first experiment (i.e. April to Sep 1993). They believe this to be essential for efficient use of time, and satisfactory operation of the accelerator by Charissa experimenters.

The possibilities of funding a Charissa person to be based at the ANU should be discussed with Prof. G.D. Dracoulis (Canberra). $\boxed{\text{BRF}}$

Running at the ANU is being planned for September 1993 and Easter 1994, with each anticipated to comprise around 14 days of beamtime. Regarding the scheduling of manpower coverage in Australia, individual comments will be sought from each group member, and assimilated by BRF. $\boxed{\text{BRF}}$

SERC Student Support: The means to support students in these circumstances must be established by the NSC. We should write to SERC to point out our needs within the new context wherein we are *obliged* to run overseas. $\boxed{\text{BRF}}$

Beamline for the LINAC: in accordance with Item 8(a) of the agreement, we will write to DL requesting a decision regarding the Charissa beamline by November 92 when Dr D.C. Weisser (Canberra) visits DL. $\boxed{\text{BRF}}$

Shipping of Equipment: this is anticipated to follow immediately after Easter 1993 run at Lawrence Berkeley Laboratory.

Specified Responsibilities: The ANU group have requested that the Charissa group should supply lists specifying (a) what we will achieve, and (b) what we are expecting from them. $\boxed{\text{WDMR,BRF}}$

General Information About Running at the ANU: WDMR presented books and folders of information gathered during his visit. These include two booklets of photographs showing the target chamber and other experimental items, and engineering drawings of same. The originals will be kept in Birmingham. Indexes will be copied and put on the document server (as CH/Doc/92/11). $\boxed{\text{WNC}}$

5. **Progress on Scintillator Detectors:**
NMC had sent a note summarising points relevant to Items 5, 8 10 and 13. Comments on scintillators are included at Item 8.

6. **Progress on Silicon Detectors:**
   Two NSF shifts had been run on proposal 914 (detector tests) in September. Data exist for two Q–Par Angus detectors of the sheet resistance type. Preliminary analysis at Birmingham by M. Leddy is encouraging for position and energy resolution. Data for the NASA–style detector (orthogonal strips with integrated resistors) will be analysed at York by S. Fox.

   The Hamamatsu detector is ready for testing. Beam time should be requested. A suitable time was anticipated to be immediately after the next tank opening. We should prepare for a run in the time window 11–14 Nov, and get hardware ready to run at short notice, early November. $\boxed{\text{WNC}}$

   WDMR produced two preamplifier units to the new design (cf. Item 9) which could be used, and should be taken to Daresbury. $\boxed{\text{BRF}}$

   The Intertechnique detector had not arrived — chase up. $\boxed{\text{BRF}}$

   The results of all these tests should be collated and written up as a Charissa document when complete. $\boxed{\text{WNC}}$

   The four strip detectors ordered by York from Micron had arrived. The 10 from Hamamatsu would be manufactured soon, as final checks on the PCB mask are now complete. The 2 Micron detectors ordered by Birmingham (to make 16 new detectors in total) have arrived. Also, two detectors sent to Micron for repair to strip connections have returned.

7. **Progress on Gas Supply:**
   DLW reported that the subgroup on gas supply met after the last MEGHA meeting. Of the equipment ordered by York, 90% had arrived so far. Some minor differences in specifications are to be clarified at the next MEGHA meeting. $\boxed{\text{DLW}}$

   Preliminary plans are being made at York for construction of the pipework. A version of the control device is under test at York using a PC to control the PLU with a mimic system.

8. **Progress on Chamber and Detector Assemblies:**
   Detector Flanges: A submission from NMC noted that a French manufacturer would be able to provide vacuum feedthroughs for 18-pin ribbon cables, secured by bolts with an O–ring. It is suggested that each of the 9 scintillator signals (signal line plus earth line) would come out on its own Sealectro push-on connector, to avoid an extra ribbon feedthrough.

   When the feedthroughs are ordered, spares for ANU should be obtained.

   Strip Detectors: it should be confirmed to the engineers at DL that strip detectors will be omitted from the present design. $\boxed{\text{DLW}}$
   The concept of mounting strip detectors at a later date, within the same chamber, should be relayed in case it affects the present design work. $\boxed{\text{WDMR,DLW}}$

   Target mechanism: a Eurogam style device was suggested. This should be discussed at the next MEGHA meeting. $\boxed{\text{MEGHA}}$

Chamber: the following necessary features were identified: MEGHA

- collimator and anti-scatter aperture,
- target mechanism,
- gate valve to isolate chamber,
- pumping port,
- viewing port,
- anti-scatter baffles on side of cone where it splays out,
- cold shroud (possible),
- vacuum transfer for targets (possible).

Prototype Module: DLW reported that York would provide a correctly weighted model scintillator, for use in a prototype detector module to be constructed. The prototype would be used to test the practicalities of assembly and replacement.

9. **Progress Report on Electronics and Data Acquisition:**
Preamplifiers: WDMR reported that two units had been modified to include the new design of preamp. One module contains preamps with 4.7 pF capacitors and hence the present standard gain of 10 mV/MeV (silicon). The other has 50 mV/MeV (silicon), or 5 mV/MeV (gas). These have the same circuit as previously, but now use surface mounted technology.

The new preamps cost around £15 (replaceable component) per channel, plus bias resistors and capacitors, and are individually shielded. The previous design cost around £60 per unit including box and rack share.

Bias Supplies: The new method of compensation using computer control has been tested, and the new design should be ready in a few months.

Amplifiers: final design estimated to be ready in another three months.

Voltage-to-time conversion: RAH is working on this, using the Lecroy chip, or possibly our own replacement together with a Silena sample-and-hold (peak detect) chip. The Lecroy MQT chip requires significant ancilliary electronics. The Silena chips can be purchased for £60 each. The options of gated integration or else analog integration (plus sample-and-hold) could be provided as alternatives with interchanging boards.

Tests using Lecroy TDC: These have had to be cancelled due to DL requiring the 4300 TDC to be returned. The situation will be reviewed if the time conversion using the MQT chips is chosen.

Centralized Store of Equipment: It was agreed that specialised electronics bought on the Charissa grant would be transferred to a central store at Oxford, after local inventory labelling at the purchasing institution. WNC,DLW

We should investigate the manufacture of stickers small enough to attach to the front of CAMAC modules — both a Charissa design, and individual institution labels similar to the old 'Oxford Nuclear Physics' labels (which are metal, 8×16 mm^2). $\boxed{\text{WDMR}}$

Commitment of Funds: The spend on preamps and bias supplies will be able to be estimated before the end of the year. The amplifiers will follow shortly after.

10. **Developments on Hybrid Detectors:**
The note sent by NMC reported that R. Cunningham had completed the mods to the existing detectors: O–rings on the front windows, new screws, revised connection to grid (EHT to go through preamp). At least three detectors will be ready for the ^{24}Mg+^{24}Mg run, with a choice of 1.5 μm (as before) or 6 μm windows (to accommodate 150 torr). New elbow-type gas connections, required for the same run, were in hand.

11. **Developments on Event Manager and GEC Emulation:**
VP began by clarifying the 'first order solution' identified for the data acquisition system in the previous Minutes (CH/Meet/92/04, Item 9). This has the exabyte in the control room area. A FERA link between target area and control room should be suitable, provided that it is optical.

CAMAC link: Software has been received from GPT to allow the 88K VME processor to map the VME address space into its virtual address space. A modification to the CAMAC driver software now allows it to drive a HYTEC interface board and it does all CAMAC reads and writes. A LAM can be generated in the CAMAC crate, and this generates a demand message to the HYTEC interface, but the latter does not respond. This has been referred to HYTEC, but is not holding up the rest of the software tests.

Data transfer rates between CAMAC and VME have been measured as 1.4 Mbyte/sec in preliminary tests.

The time required to install the link with the Charissa interface is estimated to be one month.

VME system: A suitable VME crate may become available at DL, but this is not certain. Two 160 Mbyte disks had been purchased for the VME system. These 3 1/2 inch disks mount on the back plane of VME cards. One disk is used for system software and programs. The other is left empty for spectra. A third disk (to be purchased) would be available as an online spare for either and would normally contain a copy of the system software and programs. It must be decided whether this disk space is sufficient.

GEC emulator: Regarding this unit that resides in VME, the 88110 is not expected until June 1993, wheras the 88010 is available now.

Peripherals: Exabyte drives at DL are all committed to university grant requests, so two would need to be purchased for the new system. It is likely that two workstations would be needed, with their own disks for data replay.

From general discussion, the requirements for data acquisition stations were identified generally as:

- Main system: sort engine plus spares (first experiment at ANU)
- Oxford test bed: development, plus spares.

It was noted that the system should employ the minimum number of different components, to maximize interchangeability and spares. VP indicated that he was already adopting this criterion.

It is necessary to identify precisely what is involved in the system to be used at the ANU. VP,BRF

12. **Update on Recent Analysis:**
BRF summarised the results from Birmingham. AM has distributed a preliminary report on ^{24}Mg+ ^{24}Mg, and plans are now being made for another ^{24}Mg+^{24}Mg run.

The analysis by JP of the ^{16}O–^{8}Be breakup of ^{24}Mg, from the ^{24}Mg beam experiment at DL has reached the stage of extracting E_{rel} spectra. The emphasis will now shift to the LBL data with the ^{20}Ne beam.

WDMR reported that PS has almost finished analysis of the calibration data in the most recent chain state experiment.

WNC reported that SUNsort has now been installed at Surrey.

13. **Discussion of Future Plans:**
Daresbury NSF: We have 5 experiments, plus some development time (914) approved for the NSF:

- Proposal 874 (BRF) ^{24}Mg+^{24}Mg
- Proposal 900 (WDMR) ^{28}Si chain state
- Proposal 903 (NMC) High resolution ^{24}Mg$\rightarrow$ ^{12}C+^{12}C
- Proposal 904 (DLW) ^{24}Mg+^{12}C reaction mechanism
- Proposal 907 (BRF) ^{24}Mg$\rightarrow$ ^{12}C+^{12}C*
- Proposal 914 (WNC) Detector tests

but not all will be possible at Daresbury due to Eurogam commitments.

Proposal 874: This will be run next. NMC's note reported that a cold trap has been designed to fit through the lid of the Charissa chamber to guard against carbon build-up. The hybrid detectors should be set up for the ^{24}Mg+^{24}Mg experiment, ready to run at short notice, if Eurogam has problems.

BRF

Proposal 903: NMC's note reported that an offset target ladder had been constructed to increase the target–detector distance, thus maximizing the angular resolution (450 mm should be possible). A special means of collimation, using detector mounts, will be employed due to the altered target geometry.

LBL: A run close to Easter 1993 is anticipated.

ANU Canberra: It is anticipated that we will get approval for running the remaining NSF proposals at the ANU. The method for approval of other future ANU runs is still to be determined.

14. **Any Other Business:**
    WDMR reported that a CHARISSA account had been set up at the ANU for use by group members in connection with our work there.

    VP agreed to set up a 'charissa' username at DL to allow ftp access to the Charissa document server. $\boxed{\text{VP}}$

    It was commented that e-mail to Oxford was getting bounced. This can be avoided by using name%ph.v1@ox.ac.uk. WDMR can also be reached at rae%unix1.trinity@ox.ac.uk.

    New students joining us this year are:
    Steven Singer, Surrey, php3ss@surrey.ph
    Steve Chappell, York,
    Neil Curtis, Birmingham, nc@bham.ph.np

    The date of the Charissa Physics Meeting was confirmed (4 November). The meeting will be planned around the Users' Meeting to be held that day, which WNC will be chairing.

15. **Date of Next Meeting:** 11.30 am, *Wednesday* 25 November 1992 in York.

W.N. Catford, Secretary.
October 12, 1992
(released October 15, 1992)