

Final Report for the Summer of 2003

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1 Cable Assemblies

My first task for the summer was to build fourteen cable assemblies to connect the round BNC type outputs to the new VME ADCs. The cable assemblies were designed by Ru Igarashi and documented in Ref. [Igarashi]. While building these cable assemblies, I documented their construction in [IgarashiWurtz].

While it would take eight hours to build a cable assembly, it took much longer to test them. The assemblies needed to be tested for noise, attenuation and have their lengths measured. The details of this testing is documented in Ref. [RobbWurtz]. To facilitate the tests, I wrote a program called ScopeMe to communicate with a Tektronix TDS 210 Digital Oscilloscope with communications module using a Linux machine [Wurtz2]. These scopes were available from the instrumentation laboratory.

2 GEANT

I spent much time working with GEANT3 and GEANT4. I went though the GEANT3 tutorial. Then, I decided to get GEANT4 to work. I compiled GEANT4 from source, used the JAIDA library for histograms and used DAWN for postscript rendering. Information on installing GEANT4 and it's histogram packages can be found in Ref. [Wurtz1]. Because of the rapid development in GEANT4 and JAIDA, it is likely that much of the installation will change in the near future.

Because of the lack of standardization in histogramming, I had to determine which of the three recommended histogram software packages should be used with GEANT4. The details can be found in Ref. [Wurtz1].

3 Duke University

Jennifer Robb, Brian Bewer and I were flown to Duke University this summer to perform upgrades to the detectors on the Blowfish detector array. We upgraded twenty-four of the eighty-eight detectors on Blowfish. The details of the upgrade was recorded in Ref. [BRW].

On each of the twenty-four tubes, we replaced the photo-multiplier tube (PMT), PMT electronics and the housing. Also, we added a fiber-optic cable for a future gain monitoring system.

4 NSERC Poster

As part of my NSERC grant, I was asked to present my summer work in the form of a poster. This poster can be found on nucleus.usask.ca in /home/ward/poster2003.

5 Software on Nucleus

The reports [IgarashiWurtz] and [Wurtz2] are available in the directory /home/ward on nucleus.usask.ca. Refer to the file RoadMap for more information. Also available on nucleus are the ScopeMe program with its documentation, my NSERC poster and a GEANT4 program called simple. Simple is a program designed to be similar to the simple4.tgz used in the GEANT3 tutorial.

References

- [BRW] B. Bewer, J. Robb, W. Wurtz. *SPIR-114 Detector Upgrade Manual*. Internal Document, 2003.
- [Igarashi] Ru Igarashi. *SPIR-109 Design Considerations for Cable Adaptors for CAEN V792AA QDC in the Blowfish Electronics*. Internal Document, 2003.
- [IgarashiWurtz] Ru Igarashi and Ward Wurtz. *SPIR-110 U of S RG174 Cable Assembly for CAEN 792AA QDC*. Internal Document, 2003.
- [RobbWurtz] Jennifer Robb and Ward Wurtz. *SPIR-112 Cross-talk and Attenuation Tests for Cables and Splitters Used with CAEN 792AA VME QDC*. Internal Document, Summer 2003.
- [Wurtz1] Ward Andrew Wurtz. *SPIR-115 Installation Instructions for GEANT4*. Internal Document, Summer 2003.
- [Wurtz2] Ward Andrew Wurtz. *SPIR-113 ScopeMe Software Manual*. Internal Document, Summer 2003.