

Minutes of GlueX Electronics Conference Call

17 March 2005

P. Smith, scribe

Participants:

Indiana: Paul Smith, Eric Scott

Jefferson Lab: Chris Cuevas, Fernando Barbosa, Simon Taylor, Dave Lawrence, James Proffitt, Ed Jastrzembski, Elliott Wolin

Indiana University Cyclotron: Gerard Visser

(Alberta: Jim Pinfold, Lars Holm, John Schaapan)

Chris Cuevas summarized a recent visit to JLab by personnel from CAEN USA. CAEN is an Italian company which has done a lot of electronics construction for CERN. They have a new office in California, and are interested in “collaborating” with the GlueX collaboration on electronics. They can help with both building and designing; they will develop a proposal and send it to Chris.

Some of their new products include 1 and 2 Gbps digitizers and VME-PCI bridges. Perhaps the crate level CPUs used in current JLab experiments could be replaced by bridges in GlueX. SBS and Struck also make similar bridge products.

There was some discussion of the tradeoffs between building and buying electronics; especially as regards high voltage, the consensus was that we should only build what isn't available commercially. An example is Cockcroft-Walton PMT bases: this type of base is needed for the FCAL because of low power requirements deriving from the dense packing. Standard resistor bases supplied from CAEN high voltage systems are adequate for most (if not all) of the other GlueX PMTs.

Fernando Barbosa summarized a recent engineering meeting to discuss details of the JLab flash ADC. A block diagram is on the portal as GlueX-doc-446. The goal is to be able to use a family of converter chips from Maxim which digitize from 170 - 250 Mbps and have 8 or 10 bit resolution. There will be a baseboard processor which can be supplemented by an optional mezzanine processor. More input from users is needed to develop processing algorithms.

Paul Smith summarized the Indiana R&D work on the calorimeter fADCs. Drawings are on the portal as GlueX-doc-447. The prototype will include the ability to try out:

“parallel” energy sum

“serial” energy sum

ethernet connectivity

cPCI packaging and readout

processing of the raw data down to an energy and time

Some ideas for processing the fADC data for the drift chambers and other PMT based detectors were shown.

Two articles describing other groups work on integrating new DAQ electronics into existing systems at other labs were shown. These include cPCI packaging, “real-time” ethernet readout, and linux.

Gerard Visser from the IU cyclotron talked briefly about his interest in fADCs for the GlueX forward drift chamber cathodes. Gerard is working on a scheme for another experiment which uses pulse shaping to reduce the sampling rate that would otherwise be required for good time resolution. He will investigate whether this will work for GlueX.

The Alberta group was unable to participate due to the inability to dial a Canadian area code from JLab. This will be fixed for the next conference call. Paul Smith called Alberta and spoke with the group. They have finished a prototype constant-fraction discriminator for the Time-of-flight detector and have sent it to Indiana for further testing with a 2.5 meter long scintillator. There will be a beam test at TRIUMF in June, 2005.

The Alberta group will start looking at preamps for the GlueX drift chambers next, specifically the ASD series of chips developed at Pennsylvania for the ATLAS detector.

The next Electronics Conference call is scheduled for April 7, and the one after that will be on April 28. The electronics group will meet at JLab the day before the next GlueX collaboration meeting in early May. The email list “halld-online@jlab.org” will be used for electronics as well as software discussions.