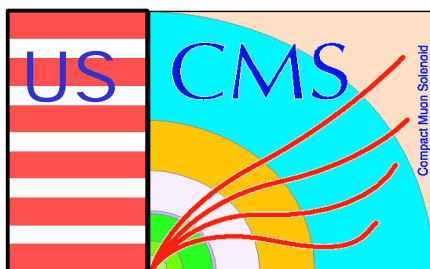


UF Beam Test 2002

Summary



J. Gilmore
CMS-EMU Meeting, Gainesville
April 2002



Test Goals

- **Goals**

- **Simultaneous operation of 3 CSCs**
 - Production versions of on-chamber electronics
 - Common gas, cooling, HV, LV, Slow Control and DAQ systems
 - Implement TTC and DDU
- **Synchronization, calibrations, continuous slow control monitoring**
- **Two crate operation modes**
 - 3 CSCs, readout on one full backplane
 - 3 CSCs, readout on 3 individual small backplanes or separate crates
 - Simulates our ultimate multi-crate system (timing, ground loops...)
- **Final pre-production versions of crate electronics**
- **Trigger and data quality analysis**

- **Test categories**

- **System Integration tests: basic timing and setup**
- **Performance tests: real muon data, many trigger modes**



Equipment Needs (1)

When to deliver and contact person responsible for each of the following:

| | | | |
|--|---------|--------|---------------|
| digital oscilloscope with probes | | UF | already there |
| pulse generator for random trigger | | UF | already there |
| BNC/Lemo cables, tees, terminators and BNC-Lemo adapters | | UF | already there |
| scintillator trigger system | | UF | July 1 |
| 3 CSCs and gas system | UF | | July 1 |
| HV supplies and cables | UF/PNPI | July 1 | |
| cooling and tubing | UF/UW | July 1 | |

Instrumentation for 3 CSCs**: CSCs set up and ready for testing July 1

| | | |
|---------------------------|------|--|
| AFEBs | CMU | |
| AFEB-ALCT cables | CMU | |
| 15 CFEBs | OSU | |
| 15 CFEB-DMB cables | OSU | ready next week? |
| 3 DMBs | OSU | ready by end of April |
| 3 TMBs | UCLA | ready by end of April? |
| 15 CFEB-TMB cables | UCLA | ready next week? |
| 3 ALCTs | UCLA | |
| ALCT-TMB cables | UCLA | ready next week? |
| 3 LVDBs | UW | |
| power cables to LVDB | UW | |
| power cables from LVDB | UW | |
| LV power (400 Hz source?) | UW | provide substitute for beam test; what and when? |
| 3 LVMBs | UCD | |



Equipment Needs (2)

Crate equipment**:

| | | |
|---|--------|------------------------------------|
| VME peripheral crate(s) | UF | available now |
| full and 3 partial VME backplanes | UF | available now |
| Dynatem (slow control VME computer) | OSU | UF should have 13 total |
| 1 10-base-T switch, cables/Tees/terminators | UF | |
| 3 CCBs | RICE | ready soon? |
| 1 DDU with fiber spools for DMB readout | OSU | ready by end of April: 20m length. |
| 1 Linux PC with gigabit/S-Link to readout DDU (1-2 fast hard drives, dual CPU with 64-bit/66MHz PCI) | UF/OSU | will ship from OSU when needed |
| TTCvi/vx and support, for 3 CCBs | Rice? | when ready? Fiber? |
| Trigger sync/delay board for TTC/CCB | OSU | ready by end of April |
| NIM crates & Modules (delays, logic, etc) | UF | already there? Which modules? |
| CAMAC crate & controller, TDCs, etc | UF | already there? |
| signal cables, short and long (Lemo/BNC) | UF | already there |

Software:

| | | |
|--|-----------|---|
| DCS Slow Control (Dynatem/VME/JTAG routines) | Bob Clare | later, but when? |
| Temporary Slow Control (Dynatem/VME/JTAG routines) | UF/OSU | work begins next week, |
| DAQ/Trigger/Run Control | UF | "0th version" June 1, full version June 15? |

****Some equipment may already be present at UF FAST site.**



Testing Plan (1)

- **1 CSC to start, eventually 3 CSCs**
 - Hardware-level integration at UF
- **Slow control system tests**
 - Resets, load constants, calibration setup
 - Monitor LV, temperature, error/status registers
 - eventually need continuous, regular monitoring during data running
- **Calibration triggers with data readout**
 - Pedestal tests
 - Pulse pattern testing
- **Synchronize LCT signals (anode and cathode)**
 - Trigger on one, then scan across delay range with the other?
 - Or time in using oscilloscope?
 - Potential differences in timing between CSCs due to cable length differences: each CSC type requires specific timing tuning
 - Include TDC readout?



Testing Plan (2)

- **Take muon data, multiple trigger modes**
 - **L1A x (CLCT/ALCT/both/neither?)**
 - **delayed scintillator signal used as L1A, with no pre-LCT**
 - **scintillator signal is pre-LCT, delayed for L1A**
 - **trigger efficiency tests, DAC threshold scan**
 - **TMB-self L1A: use any real LCT (delayed) for L1A?**
 - **L1A forces full readout of data from 3 m- sec ago?**
 - **“No LCT” mode, requires special CFEB-SCA control firmware**
 - **“Normal mode” test**
 - **Real A/CLCTs (coincidence), with L1A provided by scintillator**
 - **Above tests in multiple crates**
 - **Use source to provide localized high-rate LCTs**



Proposed Schedule

- **Ready now at UF for test/debug work**
 - 1 CSC with electronics, but no HV/gas
 - Good enough to start Hardware integration (TMB), new DAQ development, calibration tests through April?
- **Install HV/gas/cooling during May**
 - Develop new DAQ, initially for 1 CSC, with basic functions (slow control and calibration) ready by June 1
 - Fully functional 1-CSC DAQ ready by June 15
 - Tune ALCT/CLCT timing with cosmic muons
- **3 CSCs set up for testing by July 1**
 - Including HV/gas/cooling and scintillator system
 - DAQ for 3 CSCs ready by July 1
- **Later implement TTC system**
 - Move to multiple-crate system



EMU DCS Network Sketch

