

Electronics Breakout Report

May 2, 2006

LCFOA Meeting of May 1, 2006

SLAC May 2, 2006

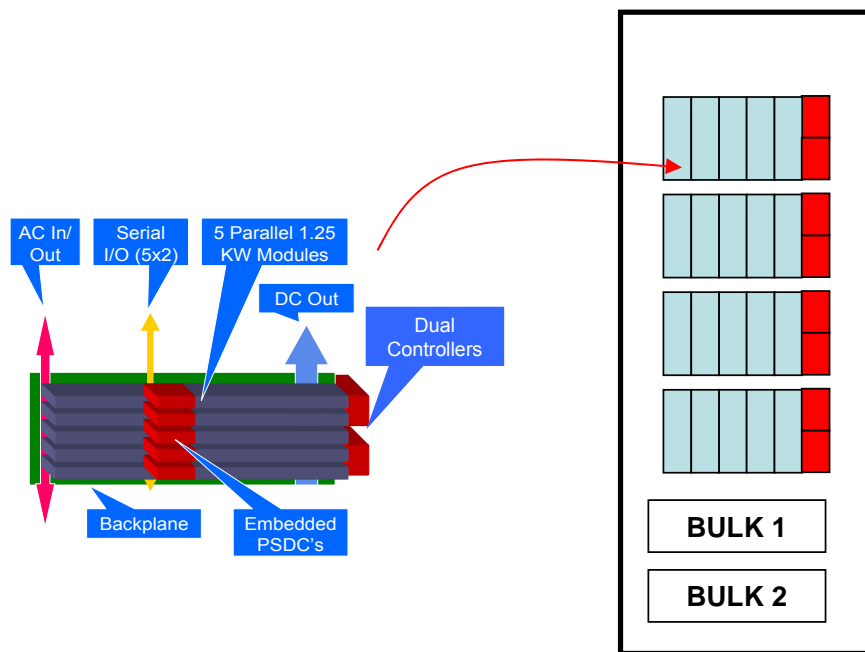
Ray Larsen

Attendees

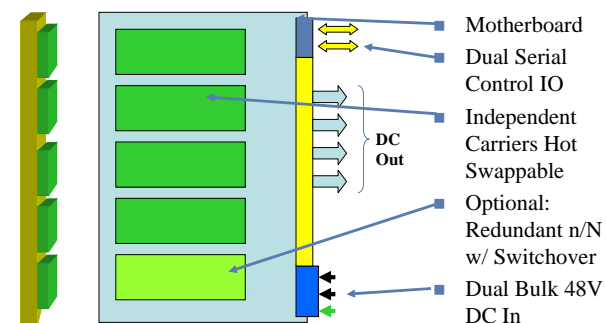
- Bill Umbenhaul Everson Tesla
- Roger Hitchcock Stangenes Industries
- Joe Foreman Meggitt Safety Systems
- Eric Robinson Scientific Devices – West
- Michael Sciulli Elgar Electronics Corp
- William Biswell Bi Ra Systems
- Randolph Champion Champion Research
- Shelley Stover Avar Inc
- Antonio de Lira SLAC Power Conversion
- Cherrill Spencer SLAC (Magnets)
- Ray Larsen SLAC (Electronics)

Power Supplies

- KW-Multi-kW HA Architecture
 - Redundant n/N Modules
 - Redundant Bulks for several supplies
 - Redundant Controllers
 - Single Module Diagnostics for HA management



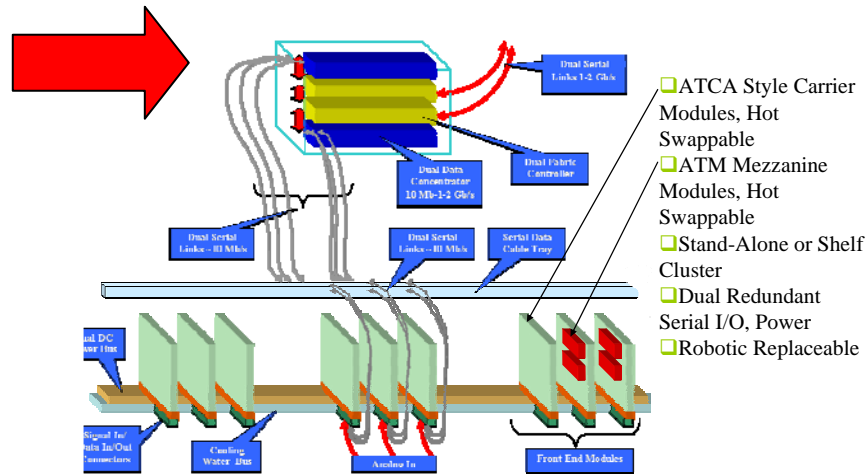
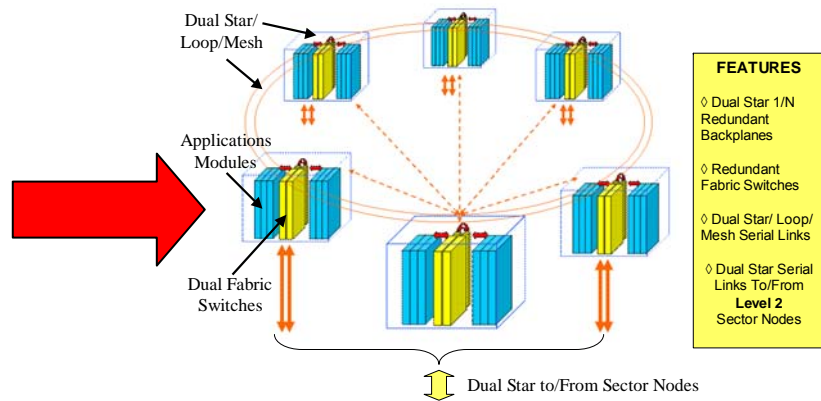
- Multi-Channel Single Board
 - Sub-kW supplies
 - Hot swappable sub-modules
 - n/N by output switching
- ATCA HA Platform/Ideas may be adaptable to Power Modules



Discussion

- Some manufacturers currently offer custom configurable modular architectures
 - Parallel/serial, one basic module serves range of applications
 - HA for ILC needs extension of current designs to include dual bulks, controllers to get to 99% Full System Availability
- Warm-Cold Transition Cabling for PS
 - Industry people have full range of capabilities; SLAC people present have not experience and need to learn more.
- Build-to Print vs Bid to Spec
 - Probably both options open but prefer build to spec; industry design expertise needed. Specs may be dictatorial.
- Do we need magnet shunts (buck-boost)?
 - A definite TBD. May use shunting for beam-based alignment.
- Suggested Collaboration
 - Form Lab-Industry working group to help develop standard module functional, physical & interface specs for HA applications.
 - Industry can provide quantity quotations from specs for cost estimates.

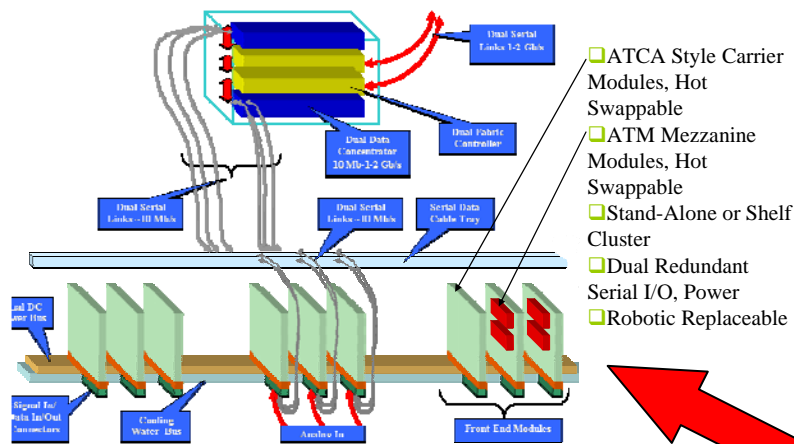
Controls & Instrumentation



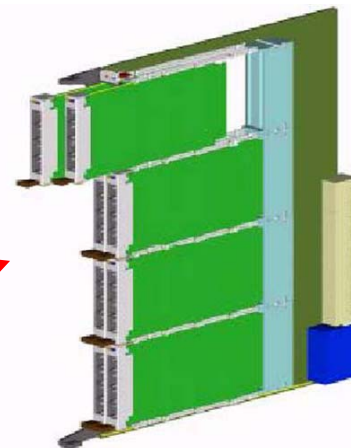
- Central Control & Sector Nodes
 - Commercial (COTS) crates, modules for Main Control, Sector IOCs, Serial Data Concentrators for Gigabit Networks
 - HA Software Major Issue
- ATCA Telecom Industry Standard beginning evaluation

Instrumentation & Standards

- Gigabit Serial Modular Architecture
 - Evaluate ATCA as possible standard platform for custom instrumentation modules, e.g. LLRF, BPM's, ADCs & DAC's
 - R&D plans to study package, HA management Hdwe, Swe
 - Collaborate w/ Industry on proposed solutions, implementation of standards
 - Similar effort should be mounted for detector electronics



ATCA Motherboard w/
Hot Swappable
Mezzanine Cards



Discussion - Conclusions

- Vacuum Instrumentation
 - Detailed questions were raised that we couldn't answer. Inputs needed from vacuum TS group.
- Collaboration
 - Discuss further ways for Industry to join standards, ATCA evaluation efforts, sharing of basic information
 - Collaborate with R&D contracts, joint SBIR solicitations for standard prototype components as was successful with past instrument standards efforts (NIM, CAMAC, FASTBUS, VME-p)
- Key ILC Contacts
 - John Carwardine, carwar@aps.anl.gov, Americas Rep to Controls & LLRF Global System
 - Paul Bellomo, bellomo@slac.stanford.edu, POC for Power Supplies under Magnets Technical Systems Group
 - Ray Larsen, larsen@slac.stanford.edu, SLAC manager of HA programs including power supplies, instrument standards, etc.