Module Assembly
Quality Control
High Voltage

Ohio State Status Report
Module Assembly: Facilities

Van De Graaf Lab:
- Shipping and receiving
- Initial QC (R,C, singles rates)
- Long term test
Module Assembly: Facilities (VDG)

- 4 piles of 12 H-boxes
- Modules
- Tubes
- Utilities: Gas, HV, Exhaust, Network
- Gassystem (MKS)
Module Assembly: Facilities (Smith)
Module Assembly: Fixtures

- Two complete assembly fixtures
- Parts for remaining 2 fixtures machined, ready to assemble
- Tube and module carrier designed, currently being machined
Quality Control: Source Scan

Source Scan Table complete and operational

Scans of 3 large-cell prototype tubes underway
Quality Control: Database

- mySQL based
- Web browsing tools (php based)
- Complete tube+module history
- all (QC) test data
- INFN/PHT information will be integrated
- first version before Dec 25
Quality Control: Status and Summary

DONE:
• Source Scan Table ready
• Barcode Scanner (tube and box id’s) ready
• (Automatic) resistance and capacitance measurement ready
• Gas system monitor ready
• Weather station monitor ready
• Singles rates electronics

TO DO:
• Source Scan – HV integration, singles rates – HV integration
• Long term test software
• Database integration
• Barcode (software) for module tags

QUESTIONS:
• QC on “phi strips”? Laminated cables?
High Voltage: Power Supply

80 channels
1:4 Fan out
Up to 4 diff. voltages
Current Monitor
ZEUS over-current protection
Canbus, Ethernet
Interlocks
External HV
High Voltage: Power Supply

- All parts ordered
- PC boards designed, ordered (2/3)
- Modular connector, injection molded

- Digital part needs more work (canbus, software)
High Voltage: Power Supply, Current Monitor

- 2000 PC boards ordered
- Transformer being wound
- Assembly starts Dec 15
High Voltage: Controls and Interlocks

- Can-bus interface (to be tested)
- (Fast) Ethernet
- HV enable switch (local)
- “Interlocks”:
  - all opto-isolated
  - current design uses isolated BNC
  - all signals (except TRIP can be daisy-chained)
- HV Enable (Input)
- Goto $V_0$ (Injection, Input)
- At $V_0$ (Output)
- Over-current, Trip (Output)
- Ramping (Output)

⇒ need to talk to Walt, Ray
⇒ new OSU Post Doc
High Voltage: System Design

- 3x HV power supplies per sextant
- 3x 1u ground strips per sextant
⇒ 15u rack space per sextant

⇒ 3 racks in total
High Voltage: HV Box/Connector

- (half shell) design complete
- HV PC board designed
- HV capacitors ordered (INFN)
- Radiall pins available
- AMP connector integrated
- Extra ground connector
High Voltage: HV PC Board

• Simple 2 layer PC board
• HV tests have started
  • conformal coating?
  • pot entire connector?
• 1 MΩ resistor in series
• “Signal” resistor
  • 100 Ohm (in theory)
  • 10 K (in test module)
  • need to decide. How?
• Novacap HV capacitor
High Voltage: HV Infrastructure

baseline - until this morning...
High Voltage: HV Infrastructure II

(from Vito)
High Voltage: HV Infrastructure III

- more flexibility
- works for every tube
- works for 10 and 20 wire cable
Status and Summary

• Preparation for module assembly on track

• Good progress on QC tests
  • Source scan table ready

• HV Power Supply design complete
  • working prototype, close to production version
  • lot’s of assembly and test labor required...

• HV Box/Connector designed
  • improved cable routing
  • freeze design next week
Over-current protection (ZEUS)

- LST Voltage
- Limited streamer tube
- 6 kV

Diagram details:
- Voltage
- Current
- LST Voltage

Graph:
- Voltage vs. Current
- Legends: V (Volts), I (mA)
- Key points: Imax, I_{cc}

BaBar/LST Meeting Dec 8, 2003
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