

D0 Note: Run2b High Voltage Distribution System for Silicon Detector

Michal Tomasek, Lukas Tomasek - Institute of Physics ASCR, Prague
First Draft - February 30, 2003

1. Power Supply Sources

The bias HV will be supplied from a BiRa VME 4877PS High Voltage Power Supply System accommodated in the MCH2 space.

For the proposed configuration of the SiDetector it will be used at least:

11 VME crates i.e. $11*6=66$ motherboard slots i.e. $66*8=528$ HV channels

2. Fanout Boxes and Breakout Boxes for Layer 0-1

Since the proposed bias voltage for inner two layers is up to 1000 V, a new fanout box will be designed for L0 and L1 so that:

- a) the dimensions will be the same as for the current fanout box,
- b) 24 input SHV connectors for 24 HV channels routed from VME crate by cable RG58 will be used,
- c) 24 output Lemo connectors for 24 HV channels routed from a fanout box to the Platform space by cable RG174 will be used,
- d) no HV channel splitting,
- e) each HV channel inside the fanout box will contain one small signal diode, one over voltage spark gap and 1 pair of sockets for a bleeder resistor.

Breakout boxes for L0,L1 high voltage distribution will not be used, only connection Lemo to Lemo between Fanout to Platform HV cable and Platform to Adaptor Card HV cable. The total amount of 216 + proposed 24 spare new HV cables for L0,L1 will be added.

3. Fanout Boxes and Breakout Boxes for Layer 2-5

The current Run2a fanout box will be checked if it can sustain up to 300V.

If YES:

At least 12 pcs of them will be upgraded for Run2b so that:

- a) all 24 spark gaps specified for 150V will be replaced by 350 V ones,
- b) all 24 small signal diodes will be replaced by diodes ready for more than 300 V,
- c) other bleeder resistors will be used.

The current breakout boxes and its twisted pair cables (from fanout boxes to breakout boxes and from break boxes to Interface Board) will be preserved in Run2b.

If NO:

The new fanout boxes for splitting 1 to 4, the new breakout boxes and its corresponding cables will be designed and produced. In this case will be also solved the question if the current 34-conductor on the Interface Board backplane will be preserved.

4. Accommodation of the Fanout Boxes and the Breakout Boxes

All 21 fanout boxes will be accommodated in the MCH2 space.

All 12 breakout boxes will be accommodated in the Platform space.

5. Schedule and Responsibilities

- a) To check the current fanout box version, connectors and cables for 300V
- February 2003 -> Prague group
(Fermilab responsibility is to send all items for testing to Prague ASAP),
- b) Fanout box for L0-1 design and prototyping - March 2003 -> Prague group.