DT Muon Sorter

1xBarrel Sorter
In: max 24 tracks from 12 Wedge Sorters
Out: 4 “best” tracks

12xWedge Sorter
In: max 12 tracks from 6 f Track-Finder of a wedge
Out: 2 “best” tracks
March 05 PHTF-ETTF-WS combined tests

During March 05 Tridas week, WS was tested with PHTFs in Vienna setup at CERN.

- PHTF output timing changes: after firmware update OK
- ETTF-WS connection pinouts were not compatible: after firmware update OK

- 3 PHTFs + WS: sorting @ 40 MHz OK
- 1 PHTF + ETTF + WS: sorting @ 40 MHz OK
Wedge Sorter Production and Test

- Full production (17 boards + 1 evaluation board) finished
- All boards fully tested with dynamic patterns with our test jig
- Minor soldering bugs found on a few boards and fixed
- All boards OK with full functionality

TTL 128 I/O
up to 100 MHz

Shielded flat cables (VME)
Barrel Sorter Motherboard

- 3 Barrel Sorter motherboards mounted by end of March05

- Motherboard passed first tests:
  - Power: linear and switching regulators
  - JTAG chain: FPGA/Flash conf.
  - Cyclone FPGA: VME slave operation
    - Minor bugs on VME buffers fixed
  - Clocks: buffers and delays, PLLs
  - WS to BS connection
  - Signals sampled down to mezzanine connectors (shape, crosstalk)

- While waiting for mezzanine production, IN/OUT boards for standalone test jig are in preparation
Crosstalk measurements on BS Motherboard (1)

- BS motherboard has a large I/O and is large in size
  - Crowded busses up to 9.5” long

- Should we expect cross-talk problems on these lines?

✓ Stackup and routing parameters were checked by trace simulation

PCB parameters

With very aggressive patterns

Worst case (max) Xtalk amplitude ~ 450 mV
Crosstalk measurements on BS Motherboard (2)

Measured on BS motherboard (> 9” length nets):

Worst case (max) Xtalk amplitude ~ 380 mV

WS was used with a dedicated firmware to inject aggressive patterns into BS board and check noise induced on quiet lines.

V: 1 V/div
H: 10 ns/div

V: 200 mV/div
H: 10 ns/div

Tridas week, 10-May-2005
Barrel Sorter Mezzanine

✓ 18 layers ✓ ~ 1000 I/Os

✓ Layout was submitted to production firm; PCB delivery expected by end of May
# Milestones update

## March05 Week status

<table>
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<tr>
<th>DT</th>
<th>Component</th>
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<td>Nov-03</td>
<td>Delay: Apr-05</td>
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<td>Jul-04</td>
<td>Delay: Mar-05</td>
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<td>Jul-04</td>
<td>Delay: Jul-05</td>
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- DT Barrel Sorter Proto done Nov-03 Delay: Apr-05
- DT Wedge Sorter Prod done Jul-04 Delay: Mar-05
- DT Barrel Sorter Prod done Jul-04 Delay: Jul-05
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- ✓ Bt.904 & cosmics challenge: WS is ready, firmware is “quiet”
- ✓ BS and WS+BS tests should be completed by July 05