DT Muon Sorter

BOLOGNA GROUP:
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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

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Wedge Sorter: test and production

During March05 Tridas week, WS was tested with PHTFs in Vienna setup at CERN

- 3 PHTFs + WS: sorting @ 40 MHz OK
- 1 PHTF + ETTF + WS: sorting @ 40 MHz OK

Design validated

Full production (12 boards + 6 spares) finished !!
(All boards fully tested with dynamic patterns with our test jig: all boards OK with full functionality)

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Wedge Sorter reference manual

- Functionalities
- HW implementation
- Configuration
- Timing response
- Tools

Available on CMS information server

CMS Internal Note

The content of this note is intended for CMS internal use and distribution only

1 April 2005

DT Wedge Sorter reference manual

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Abstract

The DT Wedge Sorter (WS) is part of the muon regional trigger of CMS barrel drift tube chambers. It is dedicated to the sorting of the best four muons found in a 30 degrees longitudinal section of the barrel and to the suppression of the fake muons generated by the previous stages of the DT muon trigger system. The functionalities of the ghost suppression and sorting algorithms are reviewed, as well as all the details of the hardware implementations of the system.

Preliminary version

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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)
Barrel Sorter Mezzanine

- 18 layers
- ~1000 I/Os
- 32 Gbit/s throughput

- JTAG, ISP of 64 Mbit conf device
- Up to 12 on-chip PLLs
Barrel Sorter Mezzanine

✓ Board received last week
Mezzanine (first) tests

- Soldering, X-ray OK
- Power OK
- JTAG chain OK
- JTAG programming OK
- Configuration device programming OK
- StratixII registers: VME access OK
- First patterns sent in output OK
Barrel Sorter full test

- LVDS TX/RX boards for dynamic test with Pattern Units are in preparation
- We are confident to successfully test in standalone mode the full WS-BS system by end of June 05