

# **Status of CSC Trigger**

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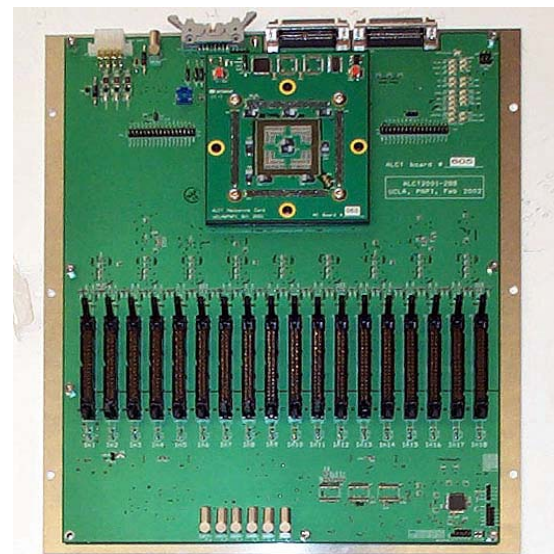
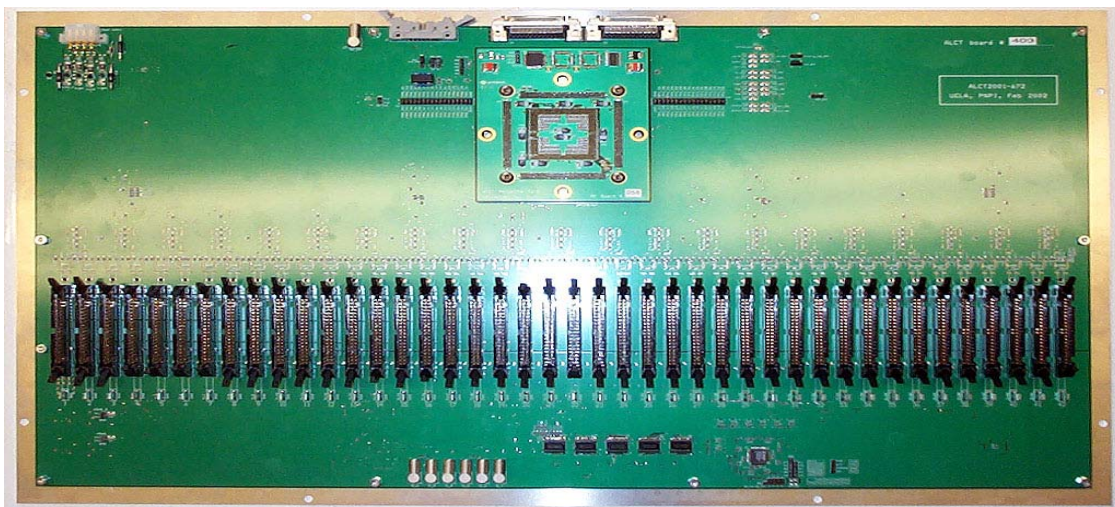


# ALCT Boards (EMU subsystem)

## Status:

- 284 boards produced
- 153 tested and passed
- 101 shipped out

UCLA





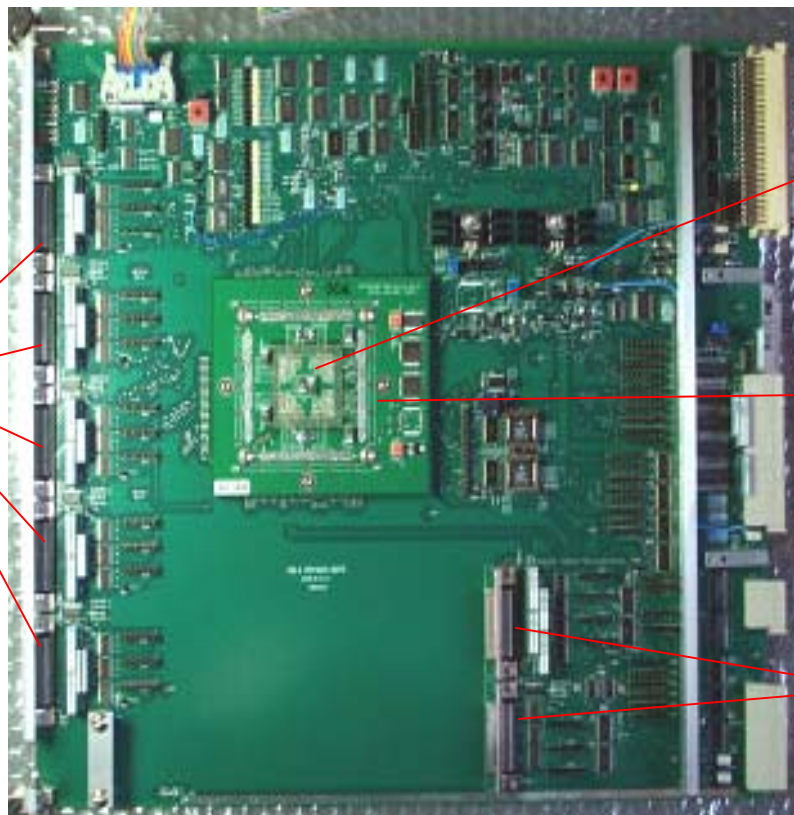
# TMB in Preproduction

UCLA

## Status:

- 18 built
- Firmware being updated

**Input connectors**  
*From 5 CFEB's*



**Main FPGA**  
**(on back)**  
*XILINX XCV1000E*

**Mezzanine board**

**Input connectors**  
*From ALCT*

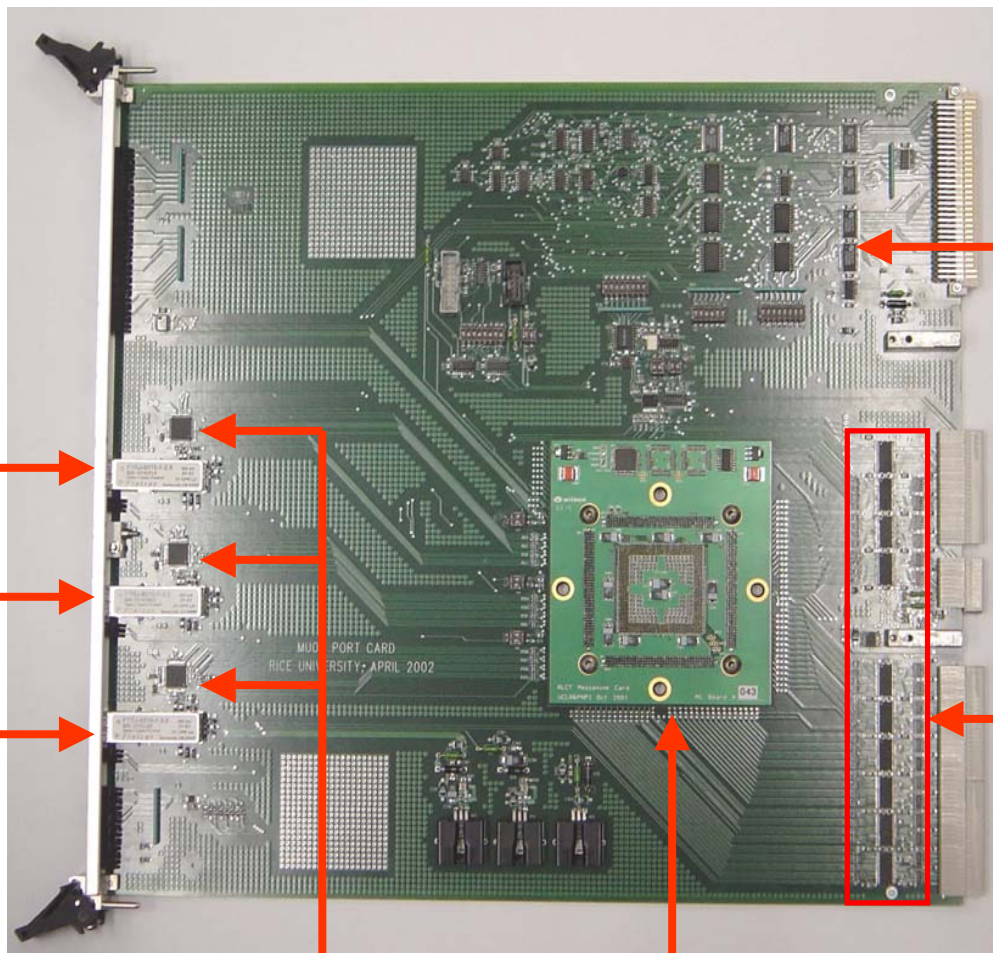
- ✓ Generates Cathode LCT trigger with input from CFEB (comparator)
- ✓ Matches ALCT and CLCT; sends trigger primitive info via MPC to Lev-1 muon trigger, sends anode and cathode hits to DMB.





# Muon Port Card

Rice



VME  
Interface  
(glue logic)

GTLP  
Receivers

Optomodules

TLK2501  
serializers

Mezzanine card





# MPC Design Status

Rice

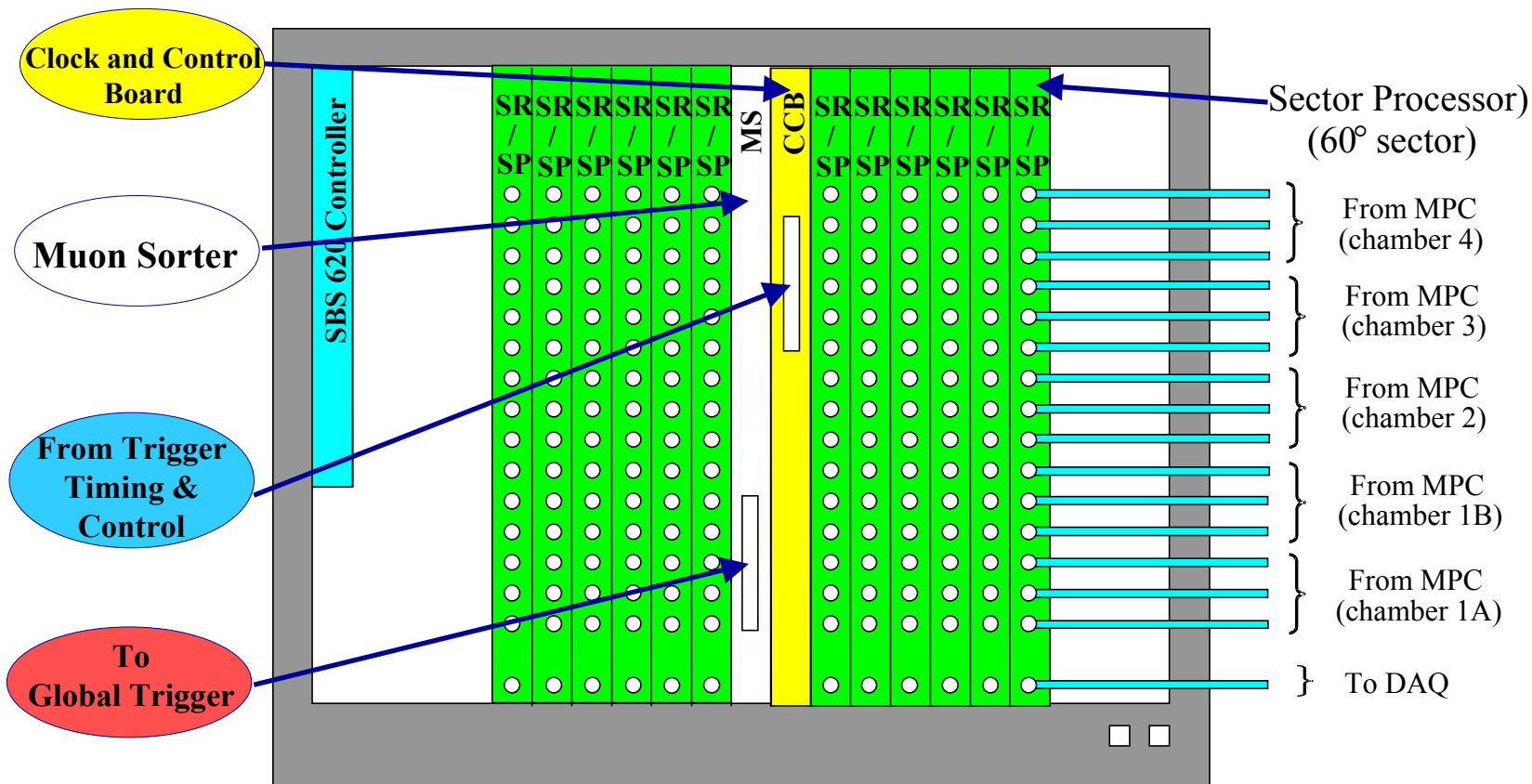
- 3 boards have been fabricated and assembled in summer
- Have 6 UCLA mezzanine cards in hand
- Tested MPC standalone (sorter logic) and with one and two Trigger Motherboards and full-size custom backplane
  - various patterns sent from TMB to MPC at 80Mhz
  - feedback “winner” bits from MPC to TMB
  - periodic FPGA reconfiguration from EPROMs (both MPC and TMB) upon “hard reset”
  - measured the board latency

**Waiting to test with Sector Receiver/Processor**





# CSC Track-Finder Crate Design



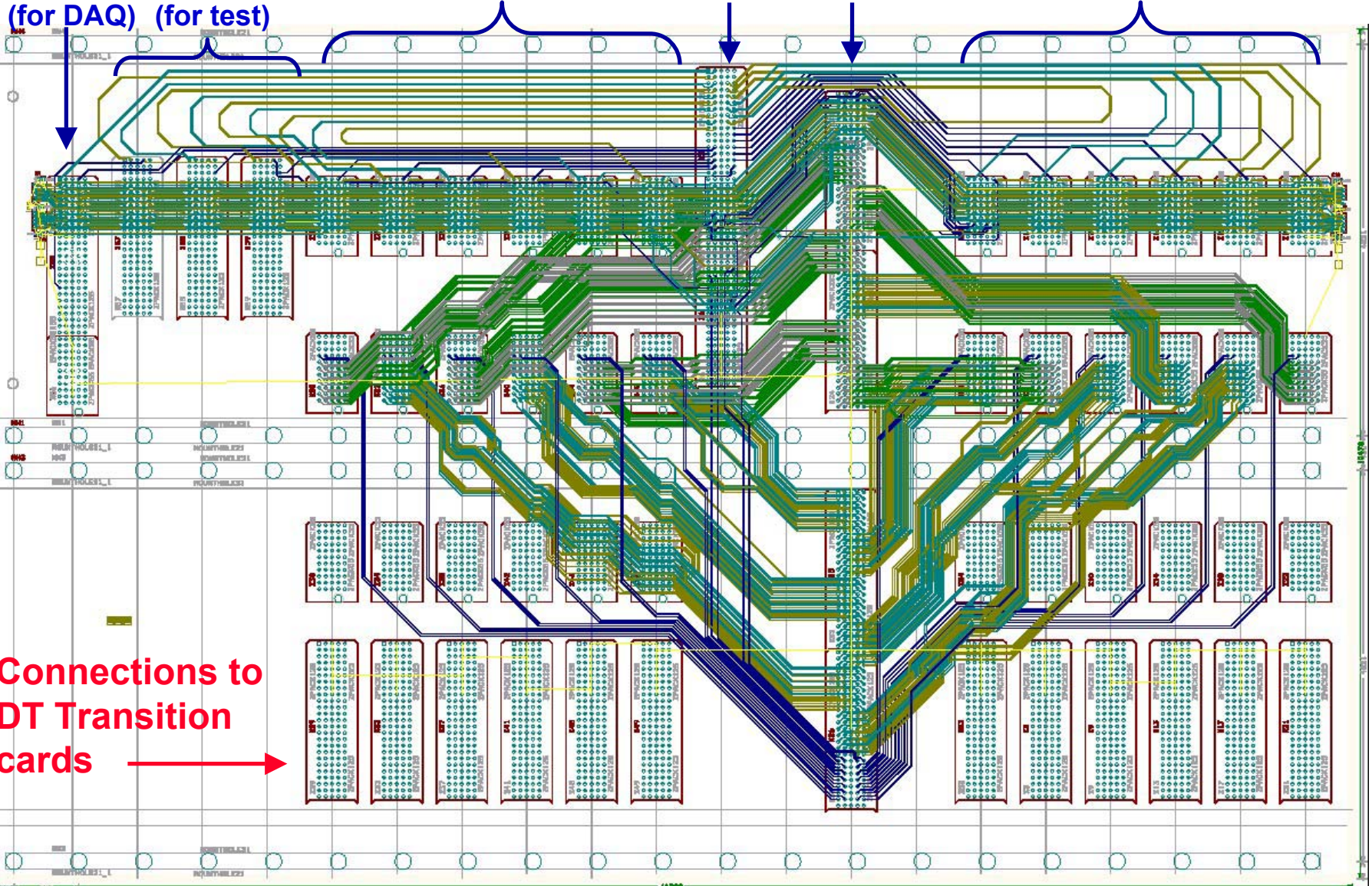
- Single Track-Finder Crate Design with 1.6 Gbit/s optical links





# CSC Track-Finder GTLP Backplane

DDU (for DAQ)    MPCs (for test)    Endcap 1 (6 SPs)    CCB    Sorter    Endcap 2 (6 SPs)

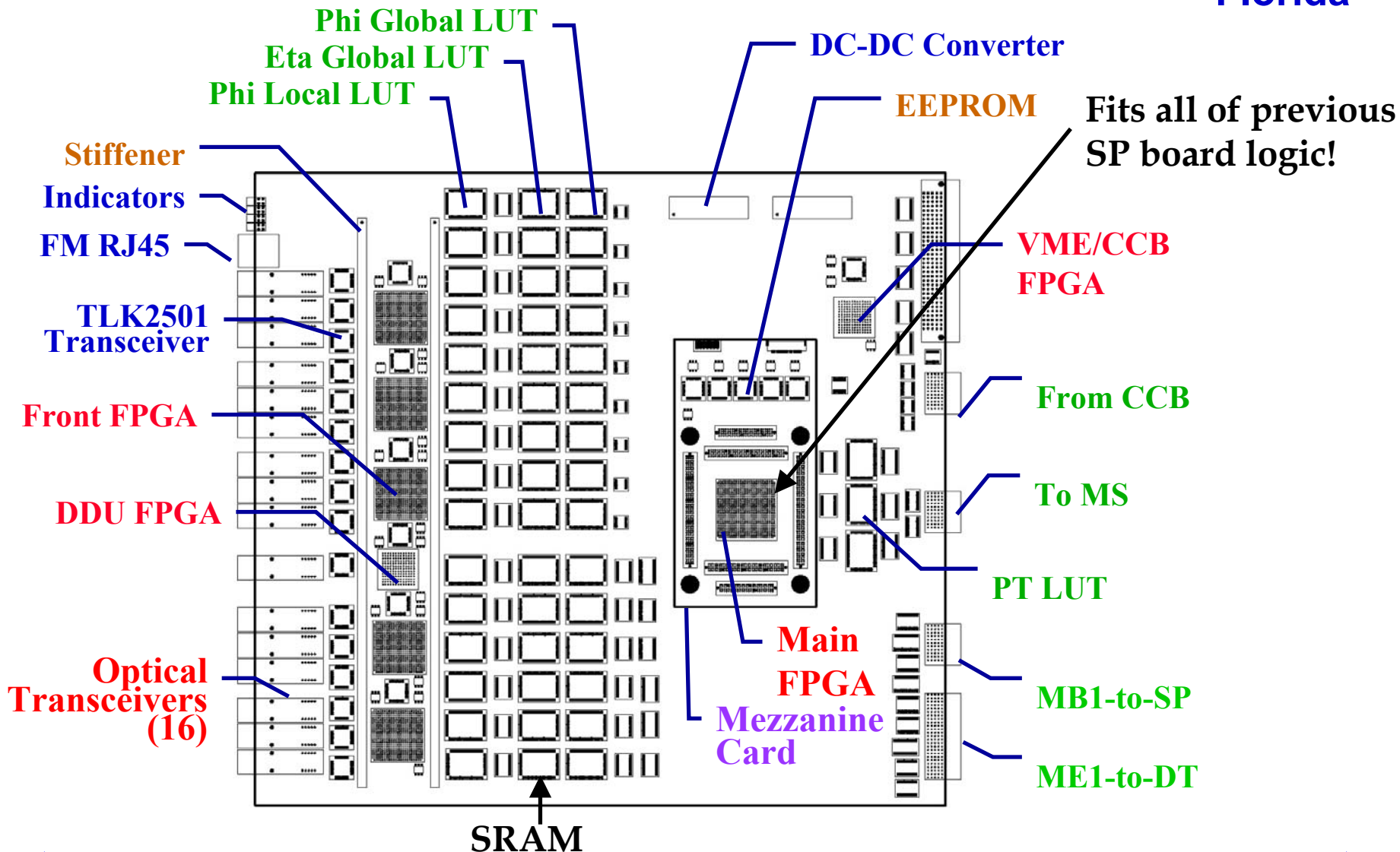


Connections to DT Transition cards →

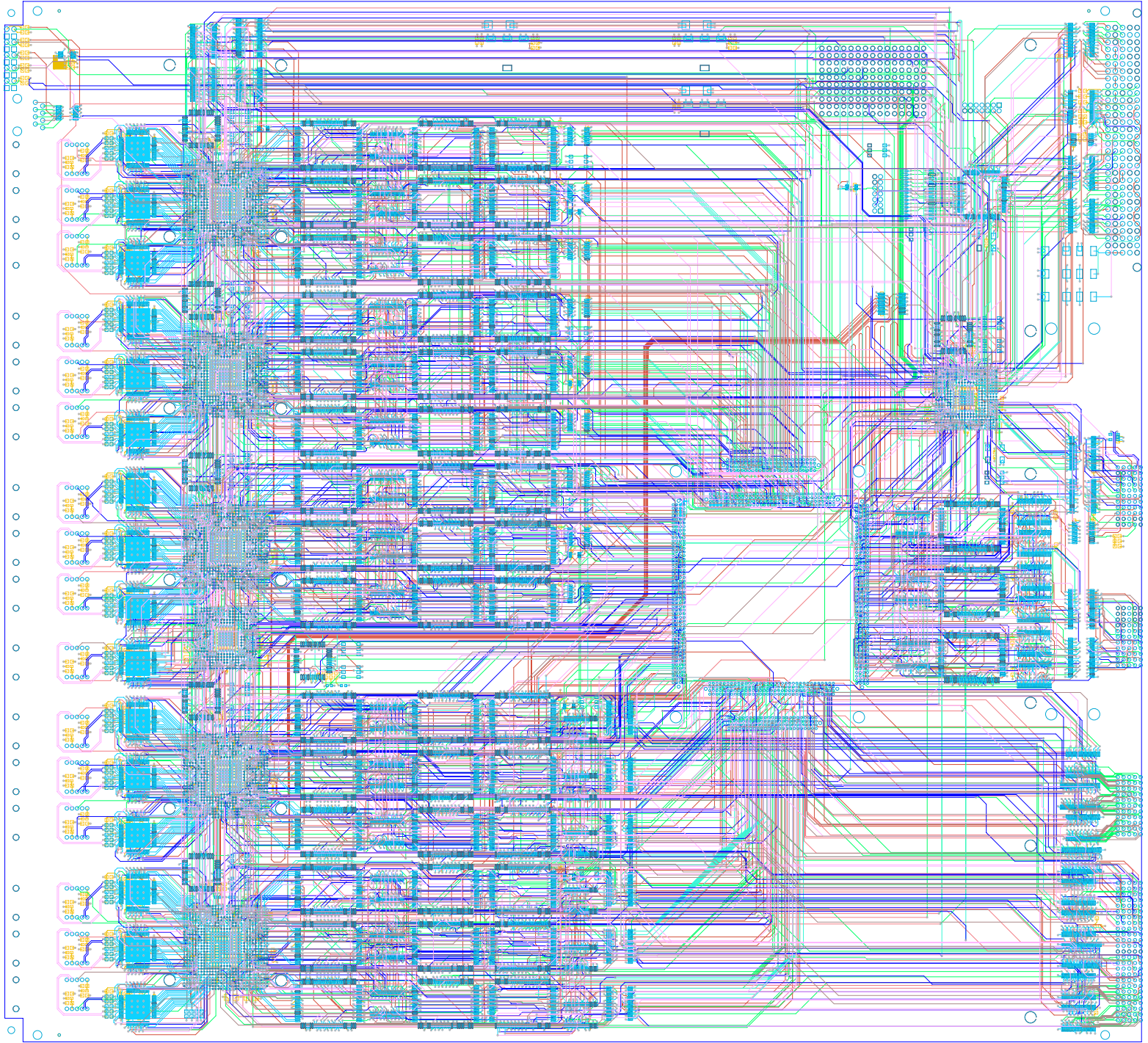


# CSC Sector Processor (2<sup>nd</sup> Prototype)

Florida









# Sector Processor Status

Florida

**Schematics complete**

**Mezzanine card layout complete**

**Main board:**

→ **Problems encountered using OrCAD Layout**

- **Board is too complex, manual routing is labor intensive, and program pushed to its limits**
- **Suffered catastrophic failure**

→ **Sent routing to outside vendor for completion (they use Cadence Allegro for layout)**

- **Preliminary layout received**
- **Under review by design engineers**

→ **Fabrication and Assembly expected to take 3 weeks**

- **Prototype ready by January**

**Components ordered, most in hand**





# SP Firmware Development

Florida

- 1. VME/CCB interface and Front FPGAs**
  - PNPI. Started. Necessary for optical link tests to MPCs
- 2. SP chip**
  - Trigger logic done, but supporting logic still to do
- 3. DDU (DAQ interface) firmware**
  - PNPI. Still to be done. Not critical for initial tests.

**Hope to have first two items ready when board fabrication is complete**

→ **Approximately Jan.15**





# Track-Finder Test Plans

## Approximate schedule

- Jan.'03: SP prototype completed, initial tests begin
- Feb.'03: MPC→SP optical link tests
- Mar.'03: SP trigger logic tests
- Apr.'03: CSC system tests with cosmic rays
- May'03: beam tests with CSC chambers at CERN

**Time is very tight, and still have a lot of firmware and software to write**

- Software will be written using XDAQ, hopefully in a way that is relevant for future slice tests of muon system





# Software and Test Plans

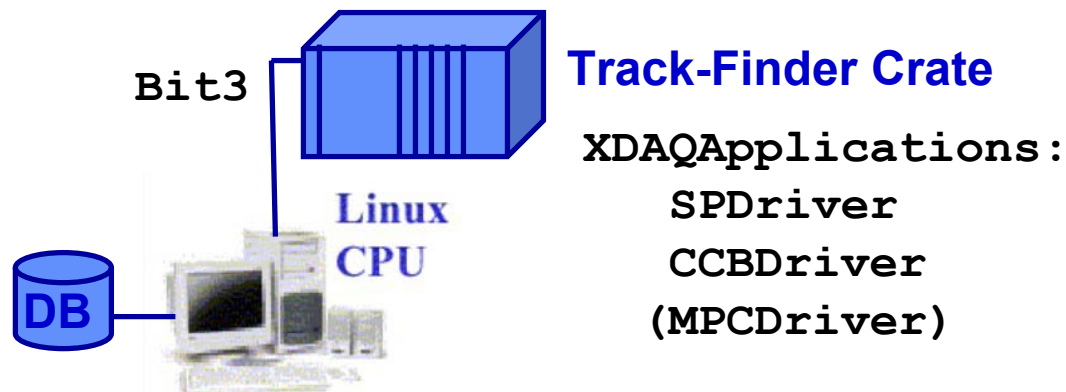
## Getting started on implementing a XDAQ compliant set of software to run CSC trigger tests

### VME (HAL):

- Classes exist for VME configuration of TMB, MPC, CCB, and TTC from Rice University.
- Developing similar SP class with additional capability to download LUTs and FPGAs from external files
  - Integrating previous code from prototype tests in 2000

### Front-End Drivers (XDAQApp)

- Developing “Driver” classes that instantiate VME classes and execute XDAQWin configuration commands





# CSC "TrigDAQ" Implementation

Track-Finder Crate

Peripheral Crate 1

Peripheral Crate n

Bit3

Bit3

Linux CPU

Linux CPU

Linux CPU

DB

DB

DB

XDAQApplications:

SPDriver  
CCBDriver  
(MPCDriver)

"FEDs"

XDAQApplications:

MPCDriver  
TMBCDriver  
CCBDriver

"FEDs"

Linux CPU

DB

XDAQ Win

"Run Control"

XDAQApplications:  
EventGenerator/  
Builder

"Event Builder"

