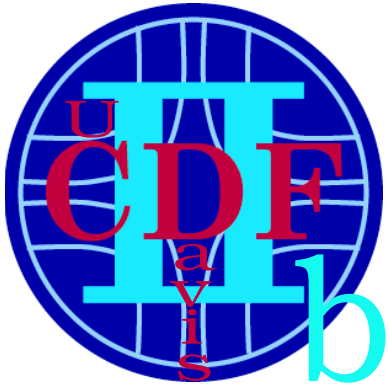
UC Davis
CDF Run 2b Hybrid Burn-in
Introduction to Status and Plans



David E. Pellett

CDF Run 2b Silicon Workshop

UC Davis, July 28, 2003

Agenda of UC Davis Session

- Marc Weber, LBL: Overview of Hybrid Production and Testing Workflow
- Dave Pellett, UC Davis: Intro. to UC Davis Burn-in and Debug Task
- Tiffany Wilkes, UC Davis: Physical Layout of Facilities
- Aron Soha, UC Davis: Hardware for Preproduction Burn-in
  - Britt Holbrook, UC Davis: Comments on Hardware
- John Freeman, LBL: Automated Chip/Hybrid Testing
- Aron Soha, UC Davis: Hybrid Burn-in Software Functionality
- Wajohn Yao, UC Davis: Overview of Web Database for Hybrid QA/QC

UC Davis Hybrid Burn-In: Logistics

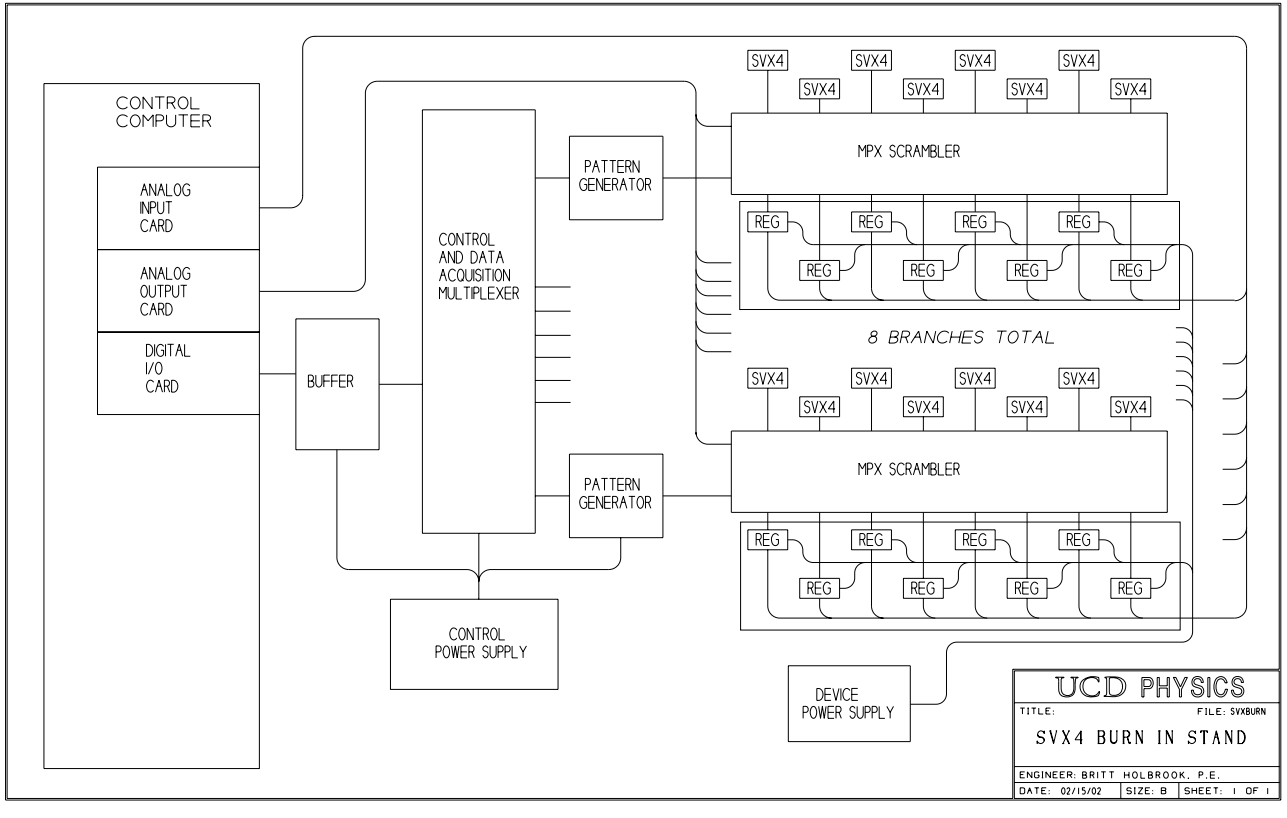
- Hybrids fabricated and checked at LBL, sent to UC Davis for burn-in
  - UC Davis will burn in all hybrids required for the upgrade
    - 1080 4-chip hybrids and 72 2-chip hybrids plus prototypes and spares
    - Estimate average load of 40 hybrids/week with 72 hour burn-in during production phase
    - Burn-in includes performance monitoring and record keeping
    - Monitor supply current, turn off modules which fail
    - QA/QC information entered in new database via the web
  - Developing 64 channel burn-in stand to add flexibility for the schedule
  - UC Davis will diagnose hybrids whch fail, return them to LBL for repair
    - *e.g.*, chip or other component replacement, wire bond repair,. . .
- Hybrids passing tests sent to Fermilab for module and stave assembly

Run 2b Burn-In Stand Development

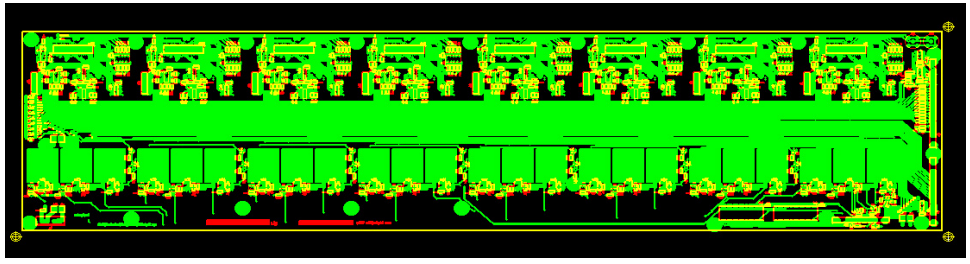
- For Run 2a, burn-in done at LBL with 40-port burn-in stand connected to SGI computer by CAMAC interface
  - Ran at 30 MHz
- For Run 2b need new boards and modified software due to
  - Use of Linux/PCI rather than SGI/CAMAC/GPIB
  - Different connections for the SVX4 hybrids, 2.5 V power supply for SVX4 (instead of 5 V)
- Requires
  - New buffer and interfaces to computer
  - New multiplexed hybrid interconnection boards ("MPX scrambler/regulator")
    - Has new power supply regulators and monitors on the board
    - 50 MHz operation highly desirable
  - PCI ADC card to monitor hybrid voltages and currents
  - Modified control program for SVX4 hybrids and ADC monitoring
  - Mechanical support and cooling (via fans)

New Burn-In Stand Block Diagram

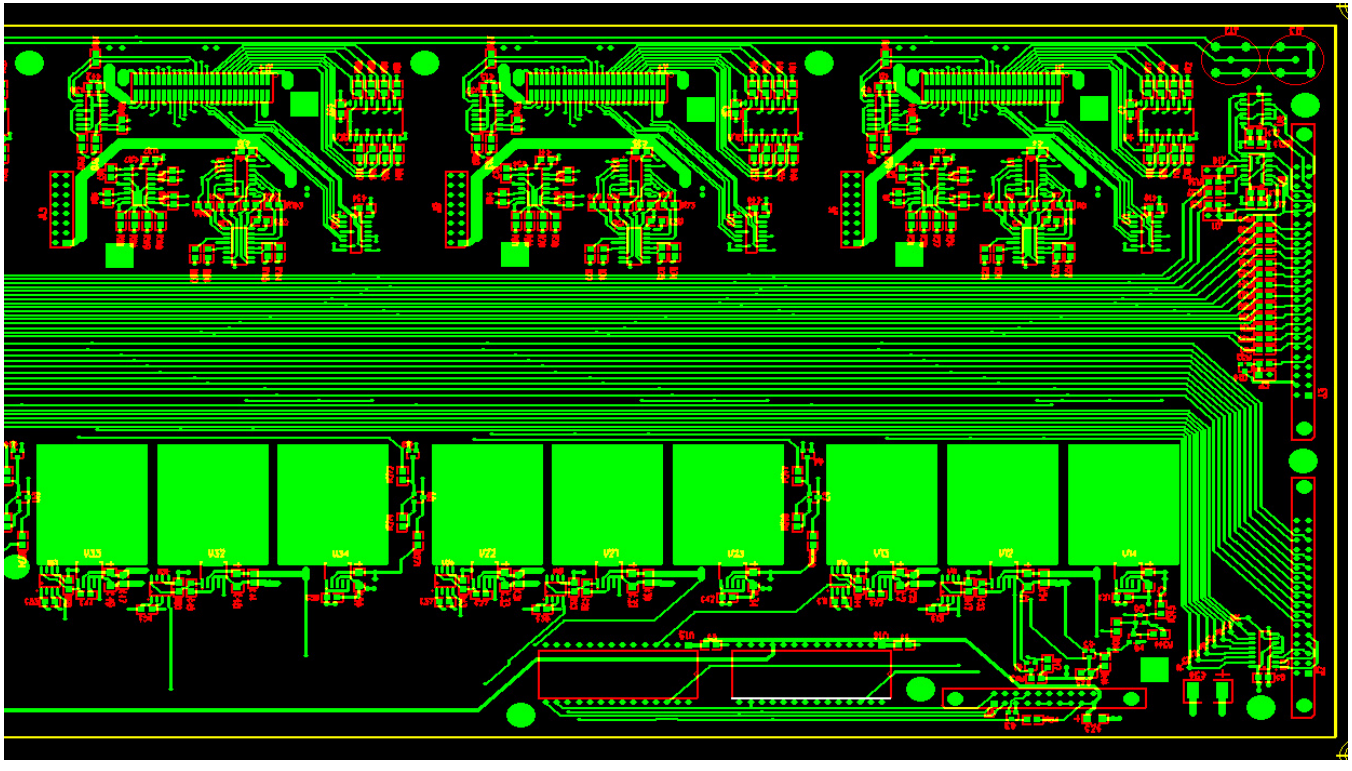
- Major components (red means new): computer with ADC, DAC, DIO cards, buffer, control and DAQ multiplexer ("switchboard"), SVX4 pattern generator boards, MPX scrambler/regulator (MSR) boards



MPX Scrambler/Regulator (MSR) Prototype

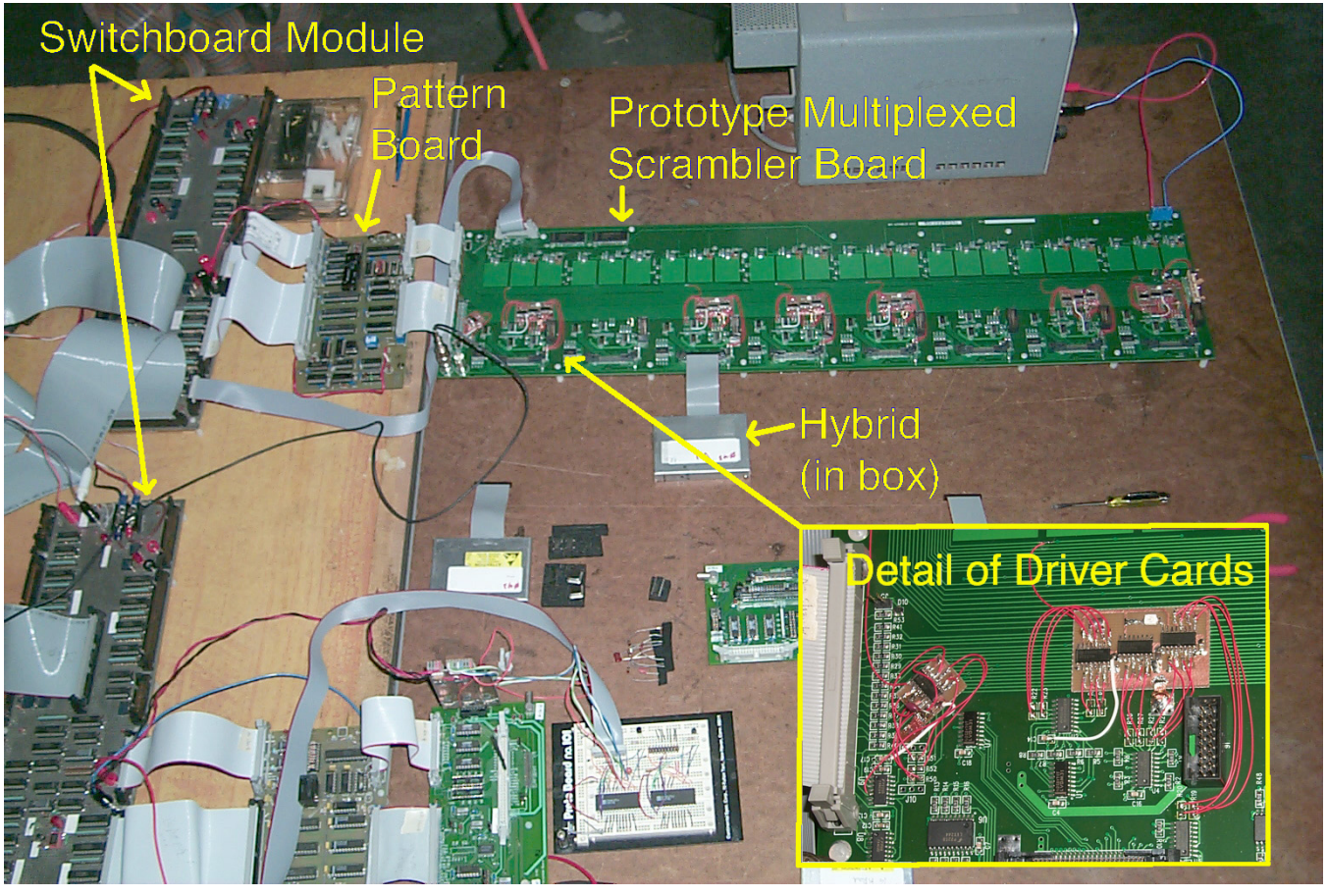


← Left: Gerber file of prototype



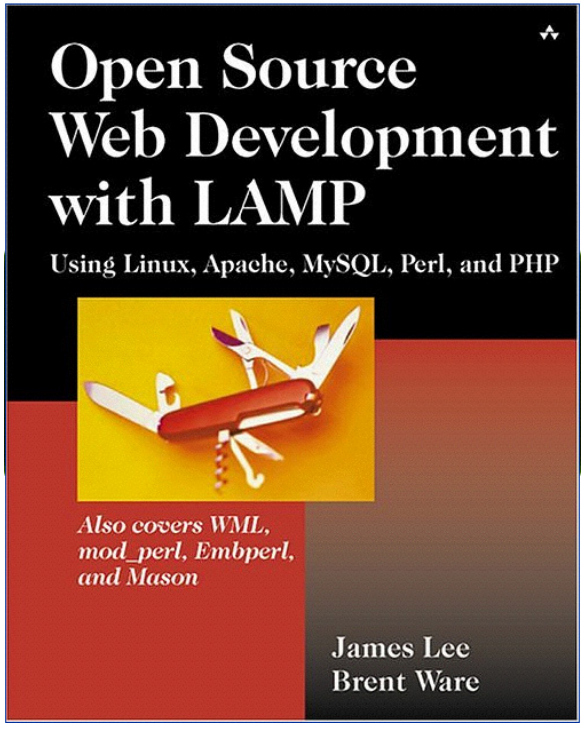
Above: detail of first three channels with input connectors on right

Burn-In Stand Test Bed With Prototype MSR Board



Inset: Driver cards and terminations have been added to achieve 50 MHz operation. These will be incorporated in the final board layout.

Database Development for QA/QC



(Image from Amazon.com)

We have started development of a Web-based database to track the production and testing of hybrids. It uses "open source" development tools. This will be described and demonstrated in Wajohn's talk.

Current and Near-Term Tasks

- Set up burn-in stand for pre-production
  - Use existing modified prototype MSR boards (2)
  - Populate 8 ports on one board and at least two on second board
  - Continue developing database
- Meanwhile, prepare final burn-in stand
  - Revise layout of prototypes with needed changes
  - Must be longer to accommodate new hybrid boxes
  - Probably requires another prototyping round
- Mention SEU test: cyclotron beam reserved for Sept. 4-5
- Fabricate final MPX scrambler/regulator boards
- Complete the additional test stands
- Build mechanical support for boards and hybrids (conceptual design exists)