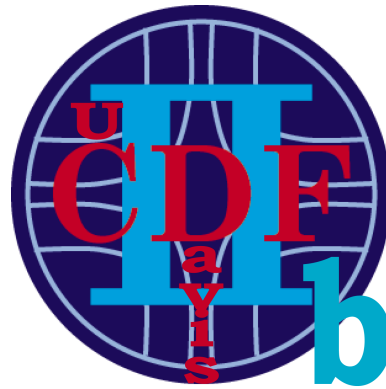


UC Davis
CDF Run 2b Hybrid Burn-in
Status and Plans



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CDF Run 2b Silicon Meeting

February 4, 2003

UC Davis Hybrid Burn-In: Logistics

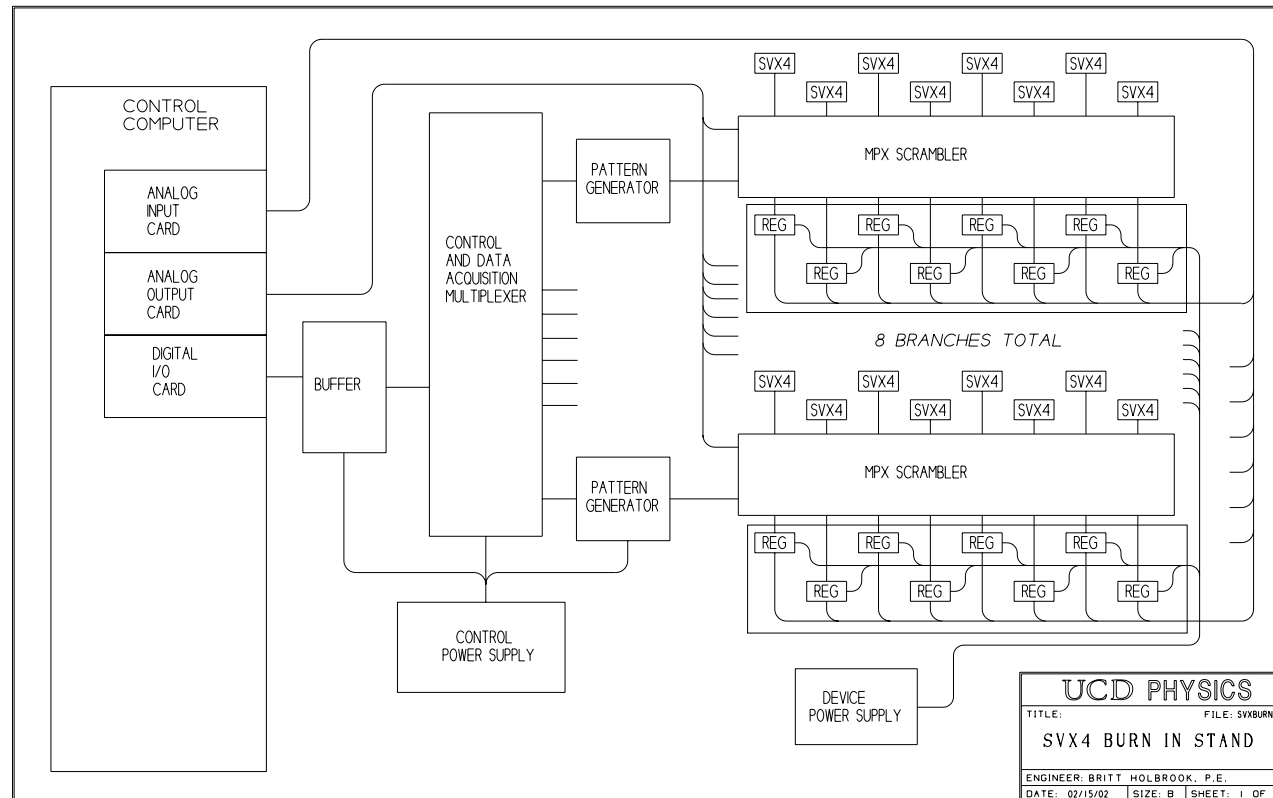
- Hybrids fabricated and checked at LBL, sent to UC Davis for burn-in
 - UC Davis will burn in all hybrids required for the upgrade
 - * 1080 4-chip hybrids and 72 2-chip hybrids plus prototypes and spares
 - * Estimate average load of 40 hybrids/week with 72 hour burn-in during production phase
 - * Burn-in includes performance monitoring and record keeping
 - * Monitor supply current, turn off modules which fail
 - A 40 channel burn-in stand is the minimum required, 64 channels adds flexibility for the schedule
 - UC Davis will diagnose hybrids which 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
 - 40-port burn-in stand connected to SGI computer by CAMAC interface
- 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
 - 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

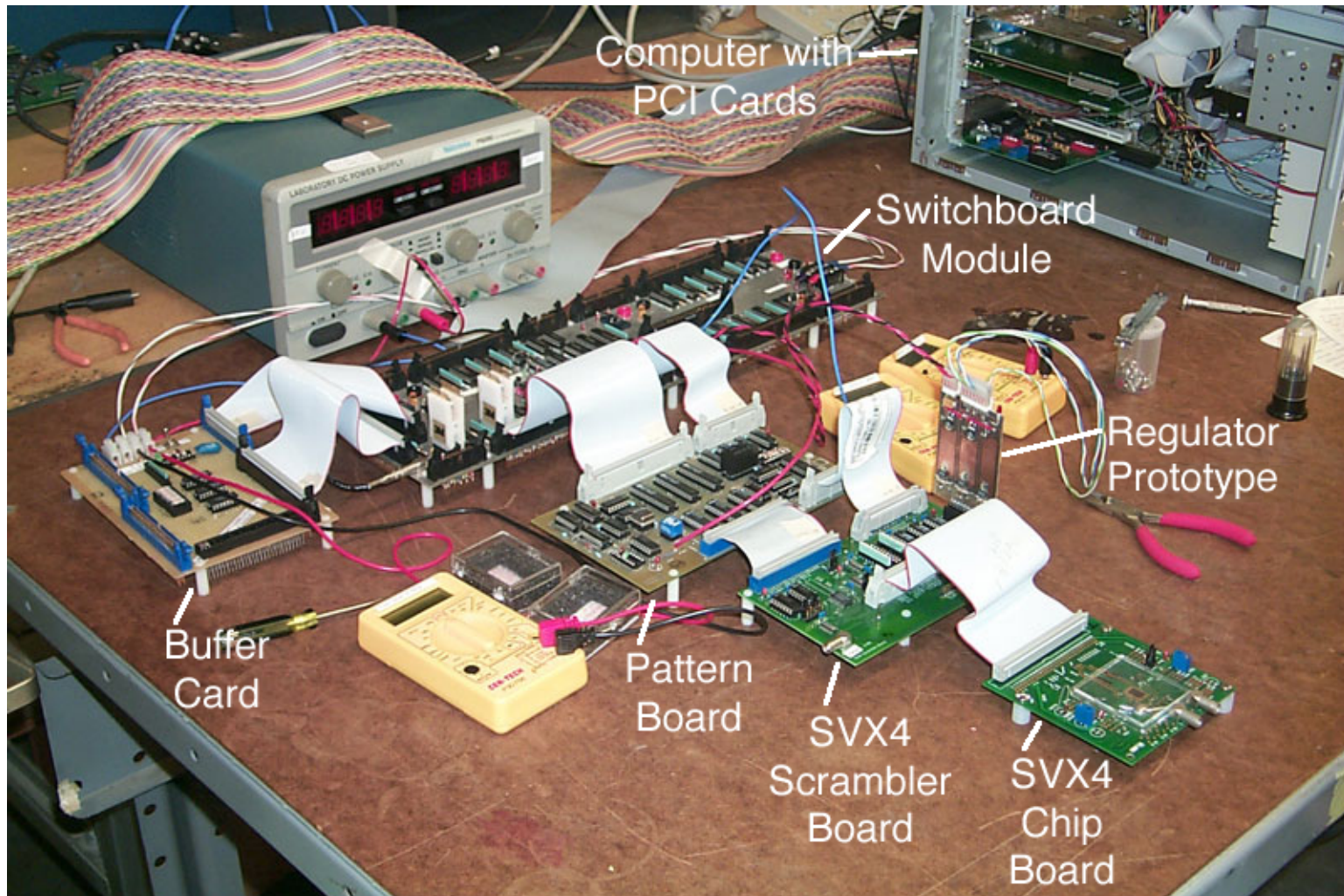
- Major components (red means new): computer with ADC, DAC, DIO cards, buffer, control and DAQ multiplexer (“switchboard”), SVX4 pattern generator boards, MPX scrambler/regulator boards



Current and Near-Term Tasks

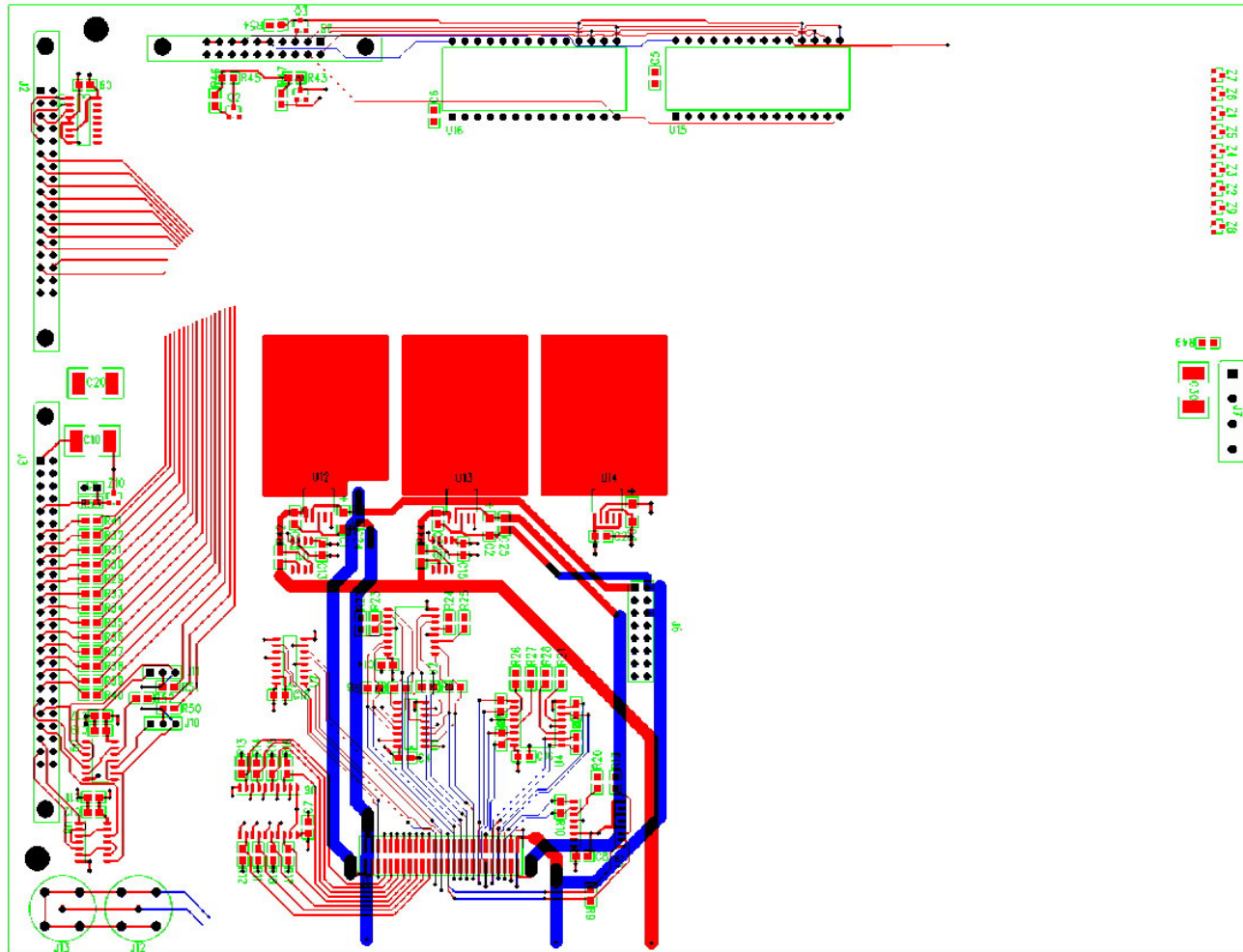
- Finish layout of new MPX scrambler/regulator boards
 - Schematic complete
 - Still have option for 8 port MPX (64 ports total)
- Meanwhile, work with “core” SVX4 test bed built around LBL wire-wrapped switchboard
 - Start with single pattern board, scrambler and regulator connected to switchboard (done)
 - Verify functionality of all switchboard ports
 - Use to test modified burn-in software (including power monitoring with new ADC card) – **Large task!**
 - Add prototype MPX scrambler/regulator cards when available
- Fabricate final MPX scrambler/regulator boards
- Design mechanical support for boards and hybrids (conceptual design exists)

Burn-In Stand Test Bed



SVX4 chip under test (using SVXscope) via single port on switchboard

MPX Scrambler/Regulator Board



Layout under way for MPX scrambler/regulator board (single cell shown)

Additional Hardware Needed for Hybrid Burn-in Debug

- In addition to burn-in stand need
 - Two more Linux-based test stations (like current one)
 - One high-quality oscilloscope
 - One probe station
- Probe station and oscilloscope on hand (oscilloscope from Chertok start-up funds)
- Additional pattern boards (9) and scramblers (2) needed from LBNL
- Count includes additional pattern boards needed for burn-in stand

Board Fabrication Schedule

- MPX scrambler/regulator prototype boards (2)
 - 2 weeks to complete layout
 - 2-3 weeks to specify vendor for board fabrication
 - 2 weeks to fabricate
 - 2-3 weeks to assemble by outside vendor
 - 1-2 weeks to test
 - Estimate setup and test complete by 4/18
 - Likely can use these to test hybrids while final boards are being fabricated
- Final MPX scrambler/regulator boards
 - Allow 2 weeks for re-layout, etc.
 - Repeat schedule above for final fabrication and assembly